NORTHERN & CENTRAL DELTA-MENDOTA

Final Draft
Groundwater Sustainability Plan

For the Northern and Central Delta-Mendota Regions

November 2019

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

PROP 1
GOVERNOR EDMUND G. BROWN, JR.
WATER BOND 2014
RELIABILITY | RESTORATION | RESILIENCE

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Appendix C
Outreach Documentation

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Northern & Central Delta-Mendota GSP

Outreach Appendices

Appendix A:
GSP Notices

Northern and Central Delta-Mendota Regions
Groundwater Sustainability Agencies
15990 Kelso Road
Byron, CA 94514
(209) 835-2593

January 5, 2018

Via email and U.S. mail
Trevor Joseph, Section Chief
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

RE: *Notice of Intent to Develop a Groundwater Sustainability Plan*

Dear Mr. Joseph,

On behalf of the Groundwater Sustainability Agencies (GSAs) composing the Northern and Central Delta-Mendota Regions (referred to herein as the N-C DM GSAs and as listed below), pursuant to California Water Code Section 10727.8, 353.6, the San Luis & Delta-Mendota Water Authority (Water Authority), acting as plan manager on behalf of the N-C DM GSAs, hereby gives notice to the California Department of Water Resources (DWR) that it will initiate development of a Groundwater Sustainability Plan (GSP) for the northern and central portions of the Delta-Mendota Subbasin (Basin No. 5-022.07) as encompassed by the boundaries of the N-C DM GSAs.

Interested parties may participate in the planning and development of the GSP by attending the N-C DM GSAs coordination meetings and biannual public meetings. Information regarding the time and location of these meetings have been posted to date on the Water Authority's website and will be posted on to the N-C DM GSAs website at http://www.deltamendota.org/. For more information or questions, please refer to the N-C DM GSAs website.

The N-C DM GSAs have engaged each city and county located within the geographic area to be covered by the plan and intends to develop its GSP in coordination with the five other GSPs being prepared in the Delta-Mendota Groundwater Subbasin by the following GSAs: City of Firebaugh, City of Los Banos, City of Mendota, City of Newman, Merced County, San Joaquin River Exchange Contractors Water Authority, Turner Island Water District, Farmers Water District, Aliso Water District, Grassland Water District and Fresno County Management Area A & B.

The N-C DM GSAs look forward to working with DWR to develop and implement a GSP. Should DWR have any questions about this notice, please contact Andrew Garcia by email at andrew.garcia@sldmwa.org or by phone at (209) 832-6200.

Sincerely,

Andrew Garcia,
SGMA Coordinator for Northern and Central Delta-Mendota Regions

GSAs:
Northern and Central Delta-Mendota Region Plan Manager: San Luis & Delta-Mendota Water Authority
Northern and Central Delta-Mendota Regions GSAs:

- Central Delta-Mendota Multi-Agency GSA
- City of Patterson GSA
- DM-II GSA
- Northwestern Delta-Mendota GSA
- Ora Loma Water District GSA
- Patterson Irrigation District GSA
- West Stanislaus Irrigation District GSA
- Widren Water District GSA

NORTHERN & CENTRAL DELTA-MENDOTA

September 9, 2019

City of Patterson
County of Fresno
County of Merced
County of San Joaquin
County of Stanislaus

RE: *Notice of Intent to Adopt a Groundwater Sustainability Plan*

On behalf of the Groundwater Sustainability Agencies (GSAs) composing the Northern and Central Delta-Mendota Regions (referred to herein as the N-C DM GSAs and as listed below), pursuant to California Water Code Section 10727.8, 353.6, the San Luis & Delta-Mendota Water Authority (Water Authority), acting as plan manager on behalf of the N-C DM GSAs, hereby gives notice to that these GSAs intend to adopt a Groundwater Sustainability Plan (GSP) for the northern and central portions of the Delta-Mendota Subbasin (Basin No. 5-022.07) as encompassed by the boundaries of the N-C DM GSAs.

The undersigned GSAs specifically provide notice to the City of Patterson, San Joaquin County, Stanislaus County, Merced County, and Fresno County of each GSA's intent to adopt the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan (GSP) no earlier than 90-days upon your receipt of this notice. Considerations to adopt this joint document shall occur as part of public hearings to be held individually or jointly by the undersigned GSAs. Once adopted, the Northern & Central Delta-Mendota Region GSP will govern sustainable groundwater management actions within each GSA's jurisdictional boundaries located in the Delta-Mendota Subbasin (Groundwater Basin: 5-022.07). California Water Code (CWC) Section 10728.4, pursuant to passage of the Sustainable Groundwater Management Act of 2014, obligates distribution of this notice to any city or county whose jurisdictional area is within the area of the proposed GSP (see attached map).

Cities or counties that receive this notice may request to consult on the Northern & Central Delta-Mendota Region GSP. These requests must be received within 30 calendar days upon receipt of this notice. Written requests to consult with one or more GSAs intending to adopt the Northern & Central Delta-Mendota Region GSP shall be delivered to the GSP coordinator identified below.

Andrew Garcia, PE
842 6th Street, Los Banos, CA 93635
andrew.garcia@sldmwa.org or Fax: 209-826-9698

To review the list of GSA public hearings scheduled for adoption proceedings of the Northern & Central Delta-Mendota Region GSP, to download a copy of the Public Draft GSP, and to receive other information, visit http://deltamendota.org/NCDM-gsp-review/#ReviewDocs

Sincerely,

Andrew Garcia,
SGMA Coordinator for Northern and Central Delta-Mendota Regions and Plan Manager

This is a placeholder for the *GSP Adoption* notice.

This is a placeholder for the *GSP Submittal* notice.

Appendix B:
GSP Development Workshop Materials

Public Workshops No. 1

Public Workshop 1:
Meeting Sign In Sheets

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 14, 2018, 4:00 – 6:00 PM
San Luis & Delta-Mendota Water Authority Office
842 6th Street, Los Banos, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Gayle Holman	WWD	[illegible]	
Matt Owens	DWR	Matthew.Owens@water.ca.gov.	
Lara Sparks	CDFW Los Banos	Lara.Sparks@wildlife.ca.gov	GWD
Mike Baker	Dos Palos	MIKEBAER@YAHOO	?
JoAnne Lamas	Turlock	joanne.lamas@sen.ca.gov	email

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 14, 2018, 4:00 – 6:00 PM
San Luis & Delta-Mendota Water Authority Office
842 6th Street, Los Banos, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Pablo Rodriguez	Gustine	psrodi@hotmail.com	work
Candace Signorelli	Los Banos	candace.signorelli@wildlife.ca.gov	work
Joe Hopkins	ALISO WD	JHOPKINS@PPENG.com	work
LARRY RUNNEBERG	FIREBAUGH		MAIL
Larry Kirkpatrick	Merced Co.	lkirkpatrick@countyofmerced.com	
CLIFF BENECH	NEWMAN	—	TRACY Duck Club
Glenn Allen	COUNTY of Fresno	glallen@co.fresno.ca.us	

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 14, 2018, 4:00 – 6:00 PM
San Luis & Delta-Mendota Water Authority Office
842 6th Street, Los Banos, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Miriam macias	Santa nella	mmacias0025@yahoo.	Mail
Johnnie Leonard	Volta	info@voltawater.com	Flyer
[illegible]	Merced		Email
Bentos Hoover	Dos Palos		

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 14, 2018, 4:00 – 6:00 PM
San Luis & Delta-Mendota Water Authority Office
842 6th Street, Los Banos, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Alberto Espinoza	Dos Palos		Newsletter
Laurie Rouch		lrouch@sncwd.com Santa Nella Co WD	
Deborah Matos		DMatos@sncwd.com	
ERIC LOHMANN	PATTERSON	ERIC.LOHMANN@GMAIL.COM	UTILITY BILL INSERT

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 14, 2018, 4:00 – 6:00 PM
San Luis & Delta-Mendota Water Authority Office
842 6th Street, Los Banos, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
TOM BOZZO	FRESNO	T.BOZZO@MOLLRE.COM	GROSSLANDS WP
SAMMETT MARTIN	CCID ~~Crostine~~	–	—
Andrew Garcia	Gilroy	andrew.garcia@sldmwa.org	—
Grazyna Aust	Firebaugh		
Darlene Castro	Volta	info@voltawater.com	
Lynn Schultz	Crostine	lrschultz@SBCglobal.Net	
[illegible]	Los Banos	rortega@gvdwater.org	

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 16, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Vince Lucchesi	Modesto	VLucchesi@pattersonidaho	Patterson ID
Jarrett Martin	—	—	—
Ignacio Lopez	Patterson	nacho892@[illegible].com	Patt Irrigator
Hunter Riddle	Newman	—	—
Ida Tucker	Westley		Patterson Irrigator
Joe Rarden	Westley		
Norman Crow	Crowslanding	normancrow53@gmail.com	Patterson Irrigator

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 16, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Steve Boys	Westley		
Mike Willett	Patterson	MWillett@ci.patterson.ca.us	
Fernando Ulloa	Patterson		
John Hansen	Patt.	jwhfarms@cv-access	
Peter P. LaTorre	Patterson	peterlatorre@frontier.com	– email from City Hall
Pat Sun	Patterson		Water bill insert

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 16, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
MARCO TURCHETTI	TRACY	MTURCHETTI@ MORNINGSTARCO.COM	CARD IN THE MAIL
SAMANTHA TAYLOR	PATTERSON		" "
Fritz Schali	Patterson	fritzschali1959@ gmail.com	Paper
Donald Hess	Patterson	dghess52@aim.com	paper
Bassam Kassab	San José	bKassab@ VALLEYWATER.org	Email from Mr. A. García

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
May 16, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Herbert R. Drapp	Patterson		Mail
Trudy de Groot	Patterson		mail
Roger Accornero	Merced County		GWD
Fred Vega	Patterson		
Vicky & Larry Taylor	Patterson		Mail
Joe Martini	Patterson		mail
Jim + Joan Roper	Vernalis		MAIL

Westlands Water District's
Modeling Results Joint Workshop (Bilingual)
Thursday, May 17, 2018
4:00 PM - 6:00 PM
Mendota Branch Library

Name	Agency/Company	Email	Phone Number
Allen Vanbaitz	Vanbaitz Bros		559 (659-2717
Abel Serrano	East Acres Mutual Water Assn.	1013worm@sbcglobal.net	(559) 659-2673
Pedro Castaneda	Focus Intere		(559) 5 7808
Craig Horn	Harris Farms	CraigHorn@HarrisFarms.com	(559)383-4647
Alma Navarro	33218 W Hidalgo Cantua	almanavarro2000@yahoo.	559-647-7452
MIKE MANTELLI	LIVE TREE / CHRISTOPHER	MIKE@CHRISTOPHERRANCH.COM	408.887-9487
Leroy Ellinghouse	DWR	leroye@water.ca.gov	916 653-7168
Amanda Peisch-Duty	DWR	amanda.peisch@water.ca.gov	559-230-3307
Glenn Allen	Fresno County	glallen@co.fresno.ca.us	559-600-9672
Lynn Groundwater	Provost & Pritchard	lgroundwater@ppeng.com	559-326-1100
Royal Lloyd	City of Los Banos	royal.lloyd@losbanos.org	209-827-7044
Andy Gordus	CDFW	Andy.gordus.@wildlife.ca.gov	559 243-4014
Georgina Lad	Cantua Creek		
Amanda Monaco	Leadership Counsel	amonaco@leadershipcounsel.org	
Sal Fuentes	Fuentes Farms	afuentes4681@sbcglobal.net	559-694-0012

Westlands Water District's
Modeling Results Joint Workshop (Bilingual)
Thursday, May 17, 2018
4:00 PM - 6:00 PM
Mendota Branch Library

Name	Agency/Company	Email	Phone Number
JASON DEAN	MEYERS	JASON-MFI@SBCGLOBAL.NET	694.1562
RANDY WILLIAMSON	CITY OF LOS BANOS	RANDY.WILLIAMSON@LOSBANOS.ORG	209 827-7056
Brent Kreighbaum	EAST ACRES WATER CO.	Brent.Kreighbaum@Yahoo.com	559 974-7248
Jim Stilwell	F. Logoluso FARMS	JDS @ logoluso.com	559-479-2109
CHRIS OLIVER	DWR	CHRISTOPHER.OLIVERA@WATER.CA.GOV	557-307-3149
STEVE BRUEGGEMANN	CDFW	steve.brueggemann@wildlife.ca.gov	655-4645
Danny Wade	Tranquillity I.D	danny@trgid.com	(559)647-9195
Sal Alhomedi	Self-Help enterprises	Sala@selfhelpenterprises.org	559-802-1655
Leticia Fernandez	Self	halfwaystore@Yahoo.	(559)217-7669
Julia Alonso	self	Cantua	
Celia Franco	Self	Cantua	
Ruben Luna	self	Cantua Creek	(559) 8296228
Ruben Lopez	self	Cantua Creek	559-829-6416
John DIRICKSON	NAS Lemoore	john.dirickson@cardnugs.com	775-530-1045
Will Coit	Farmer	Coitranch@Hotmail.com	559 3529591

Public Workshop 1:
English Announcements and Materials

Contact: Kirsten Pringle, Delta-Mendota Subbasin, Stantec
(916) 418-8243, Kirsten.Pringle@stantec.com
Gayle Holman, Westside Subbasin, Westlands Water District
(559) 905-6736, gholman@westlandswater.org

FOR IMMEDIATE RELEASE
May 13, 2018

MEDIA ADVISORY

Sustainable Groundwater Management Act Public Workshops

What: Collaborating local agencies are hosting a series of public workshops about the Sustainable Groundwater Management Act. Learn how this landmark legislation may impact our communities, the planning process, and how people can get involved. Spanish translation will be provided.

Format: There are three workshop opportunities to attend; the content of each workshop will be the same. The first 30 minutes of each workshop will consist of an informational presentation, followed by an open house until 6:00 PM.

When:

Los Banos - Monday, May 14, 2018
4:00 – 6:00 PM
San Luis & Delta Mendota Water Authority Office
842 66h Street, Los Banos, CA

Patterson – Wednesday, May 16, 2018
4:00 – 6:00 PM
Hammon Senior Center
1033 W. Las Palmas Avenue, Patterson, CA

Mendota – Thursday, May 17, 2018
4:00 – 6:00 PM
Mendota Branch Library
1246 Belmont Avenue, Mendota, CA

Who: Representatives from local groundwater sustainability agencies will be available to answer questions.

Additional Resources: The Sustainable Groundwater Management Act, www.deltamendota.org/, wwd.ca.gov

Background: *The Sustainable Groundwater Management Act (SGMA) is a package of three bills (AB 1739, SB 1168, and SB 1319) that provides local agencies with a framework for managing groundwater basins in a sustainable manner. Recognizing that groundwater is most effectively managed at the local level, the SGMA empowers local agencies to achieve sustainability within 20 years.*

Groundwater management in our community is changing.

Learn more about how this may impact you.

Collaborating local agencies are hosting a series of public workshops about the Sustainable Groundwater Management Act. Come learn how this landmark legislation may impact our community, what we are doing about it, and how you can get involved. Representatives from local groundwater sustainability agencies will be available to answer questions. You have three opportunities to attend:

Los Banos
Monday, May 14
4:00 - 6:00 PM
San Luis & Delta-Mendota Water Authority Office
842 6th St, Los Banos

Patterson
Wednesday, May 16
4:00 - 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson

Mendota
Thursday, May 17
4:00 - 6:00 PM
Mendota Branch Library
Mendota Meeting Room
1246 Belmont Ave, Mendota

The content of each workshop will be the same. The first thirty minutes of each workshop will consist of an informational presentation, followed by an open house until 6:00 PM. For more information, please visit our website at: www.deltamendota.org.

We look forward to seeing you there!

Sustainable Groundwater Management Act

Agenda

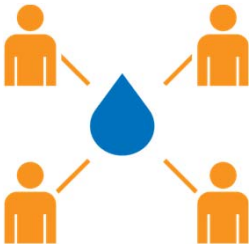
1. Welcome
2. Introductions
3. Presentation on Groundwater and Sustainable Groundwater Management Act
4. Questions/Answer
5. Open House

Sustainable Groundwater Management Act of 2014

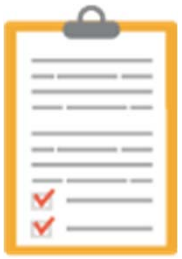
”A central feature of these bills is the recognition that **groundwater management in California is best accomplished locally**.”
Governor Jerry Brown, 2014

Sustainable Groundwater Management Act Terms

SGMA = Sustainable Groundwater Management Act



GSA = Groundwater Sustainability Agency



GSP = Groundwater Sustainability Plan

Sustainable Groundwater Management Act Timeline

June 30, 2017
Groundwater Sustainability Agencies must be formed.

January 31, 2020
Groundwater Sustainability Plans must be submitted

January 31, 2040
Delta-Mendota Subbasin must achieve sustainability.

Undesirable Results

1) Chronic **lowering of groundwater levels**.

2) Significant and unreasonable **reduction of groundwater storage**.

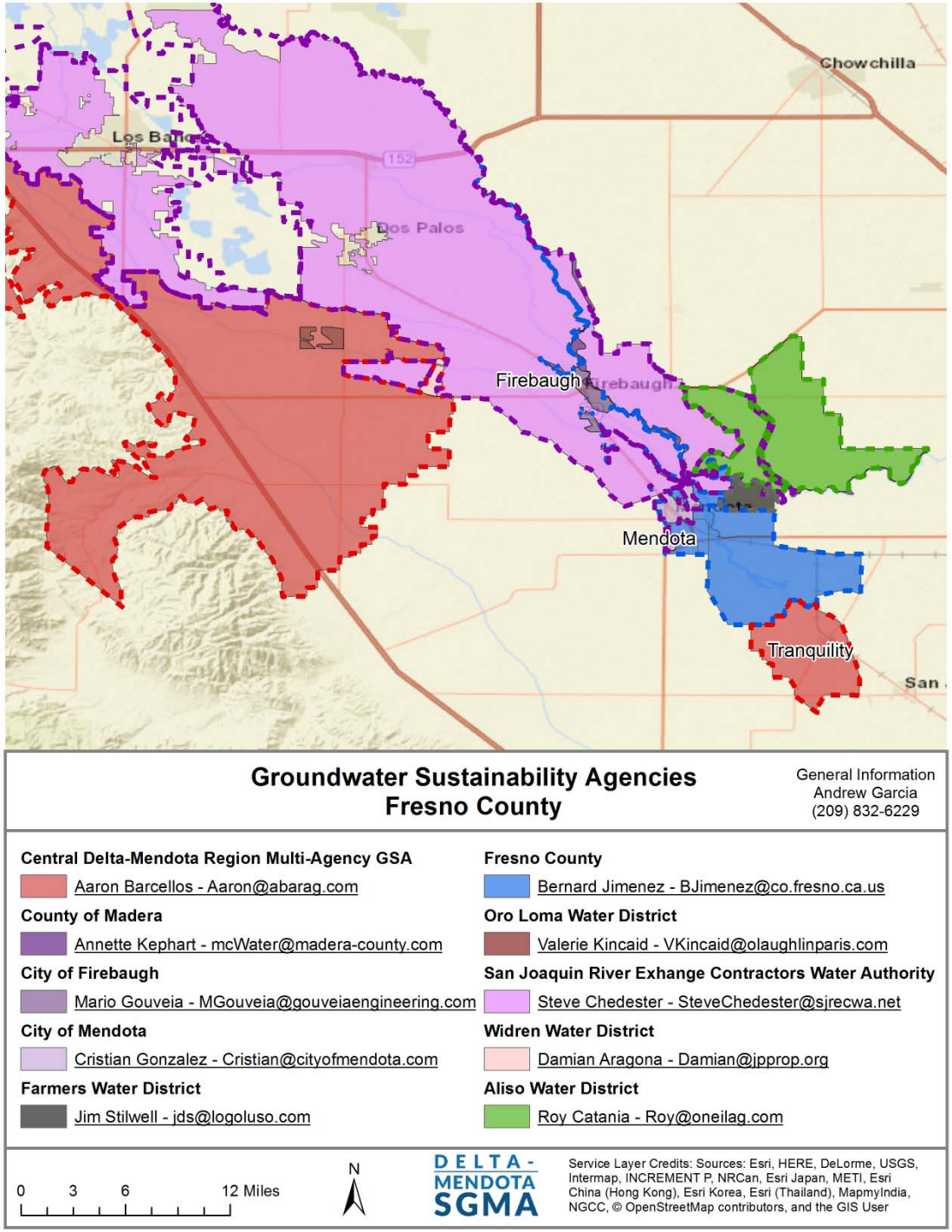
3) Significant and unreasonable **seawater intrusion.**

4) Significant and unreasonable **degraded water quality**, including the migration of contaminant plumes that impair water supplies.

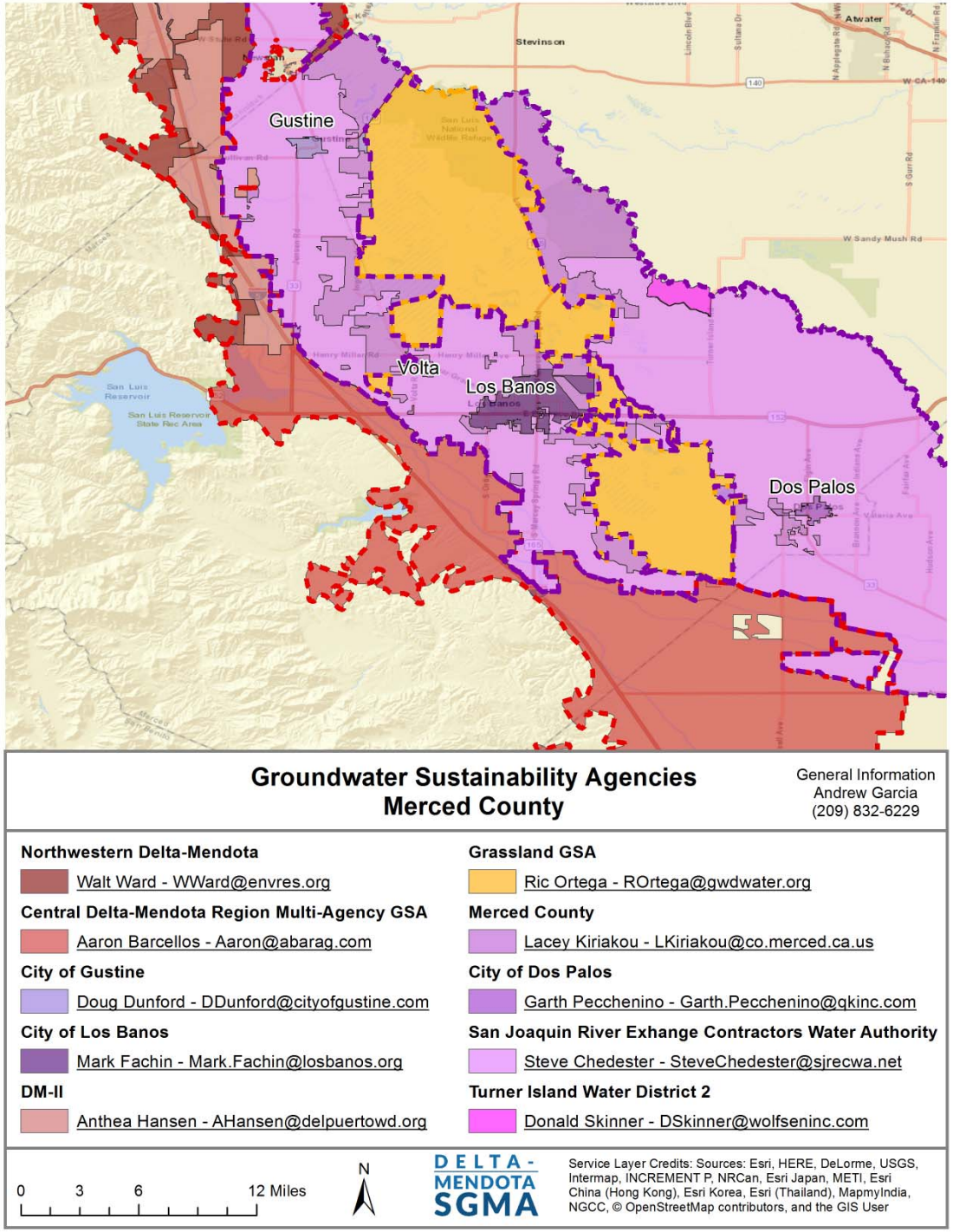
5) Significant and unreasonable **land subsidence** that substantially interferes with surface land uses.

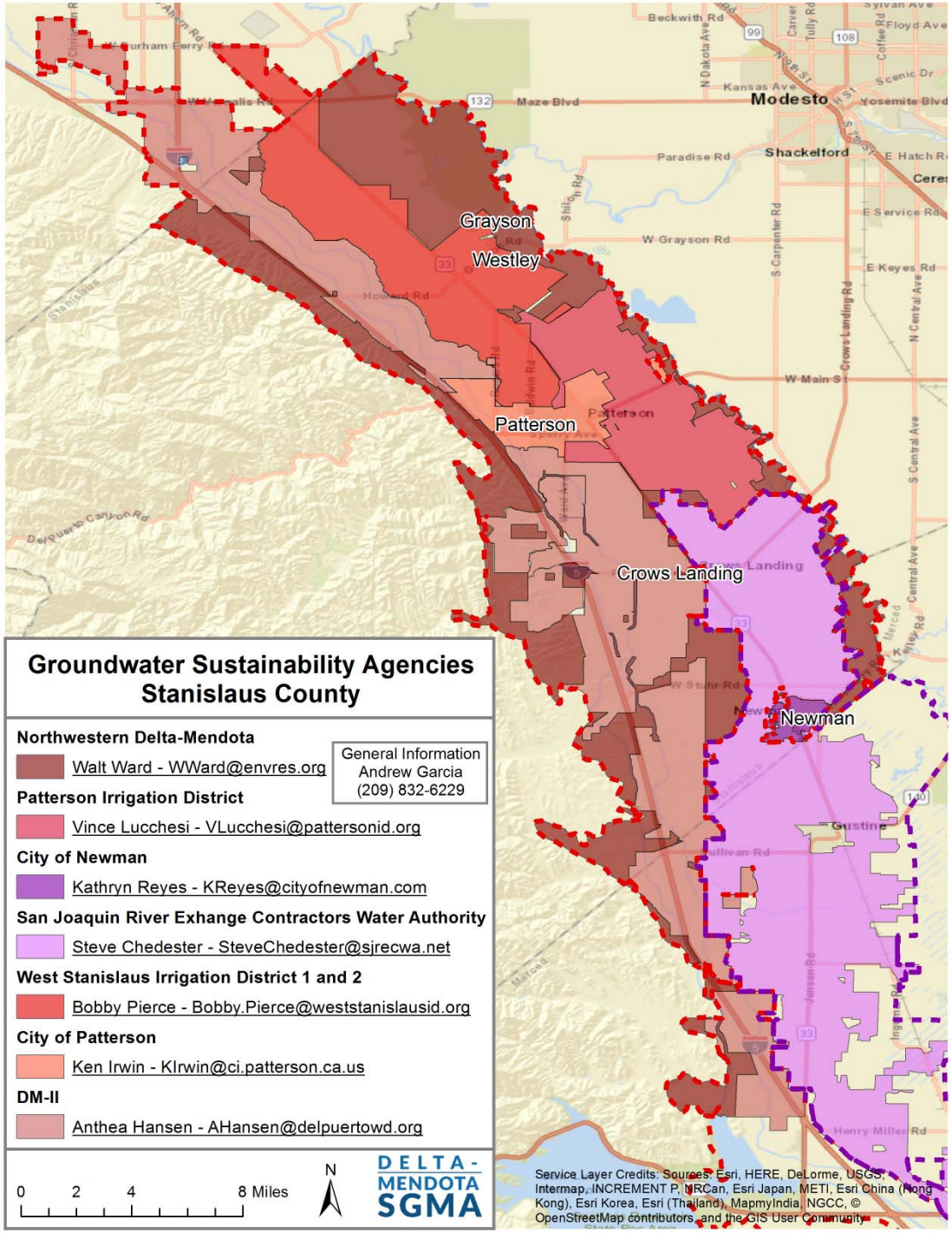
6) Depletions of **interconnected surface water** that has significant and unreasonable adverse impacts on beneficial uses of the surface water.

Groundwater Sustainability Agencies – Fresno County



Groundwater Sustainability Agencies – Merced County





Groundwater Sustainability Agencies – Stanislaus County

Groundwater Sustainability Plans

Groundwater Sustainability Plans must include:

- ✓ Description of plan area
- ✓ Groundwater conditions
- ✓ Water budget
- ✓ Managements areas
- ✓ Sustainability goals
- ✓ Description of undesirable results
- ✓ Measurable objectives
- ✓ Description of monitoring protocols and data management
- ✓ Description of projects to achieve sustainability

Next Steps

Fall 2018
Public Workshop #2: Water Budget and Groundwater Monitoring

Winter 2018
Public Workshop #3: Sustainable Management Goals and Criteria

Spring 2019
Public Workshop #4: Groundwater Projects and Management Actions

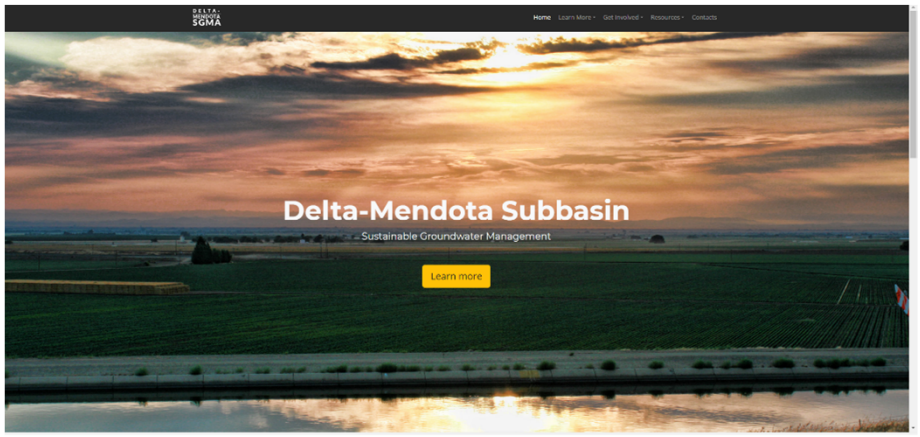
Sept - Nov 2019
Public Review of Draft Groundwater Sustainability Plans

Dec – Jan 2020
Groundwater Sustainability Plans adopted.

Jan 31, 2020
Groundwater Sustainability Plans submitted to State.

How to get involved

- ✓ **Talk** to your local groundwater sustainability agency representative
- ✓ **Sign-up** for your local groundwater sustainability agency's email list
- ✓ **Attend** public meetings and workshops
- ✓ **Provide input** on the groundwater sustainability plan
- ✓ Help us spread the word!



Questions?

Open House – Meet Your Local Groundwater Sustainability Agency Representative

Public Workshop 1:
Spanish Announcements and Materials

El manejo del agua subterránea en nuestra comunidad está cambiando.

Obtenga más información sobre como esto puede afectarlo.

Las agencias locales colaboradoras están organizando una serie de talleres públicos sobre la Ley de gestión sostenible del agua subterránea. Venga y aprenda como esta histórica legislación puede afectar a nuestra comunidad, que estamos haciendo al respecto y como puede participar. Los representantes de las agencias locales de sostenibilidad del agua subterránea estarán disponibles para responder preguntas. Tienes tres oportunidades para asistir:

Los Baños
Martes, 14 de Mayo
4:00 - 6:00 PM
San Luis & Delta-Mendota
Water Authority Office
842 6th St, Los Baños

Patterson
Miércoles, 16 de Mayo
4:00 - 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson

Mendota
Jueves, 17 de Mayo
4:00 - 6:00 PM
Mendota Branch Library
Mendota Meeting Room
1246 Belmont Ave, Mendota

El contenido de cada taller será el mismo. Los primeros treinta minutos de cada taller serán consisten de una presentación informativa, seguida de una jornada de puertas abiertas hasta las 6:00 P.M. Para obtener más información, visite nuestro sitio web en: www.deltamendota.org.

Términos de la Ley de Gestión Sostenible de Aguas Subterráneas

Programa

1. Bienvenida
2. Introducción
3. Presentación de la Ley de Gestión de Aguas Subterráneas y Aguas Subterráneas Sustentables
4. Preguntas/Respuestas
5. Evento abierto al público

Ley de Gestión de Aguas
Subterráneas Sustentables del 2014

"Una de las principales características de estos gastos es el reconocimiento de que **la gestión de aguas subterráneas en California es la que mejor ha tenido resultados de manera local.**"
Jerry Brown, Gobernador, 2014

Términos de la Ley de Gestión Sostenible de Aguas Subterráneas

SGMA = Ley de Gestión de Aguas Subterráneas

GSA = Empresas de Sustentabilidad para las Aguas Subterráneas

GSP = Plan de Sustentabilidad para las Aguas Subterráneas

Calendario de la Ley de Gestión de Aguas Subterráneas Sustentables

30 de junio de 2017
Las empresas para la Sustentabilidad de las Aguas Subterráneas deberán ser creadas.

31 de enero de 2020
Los planes para la Sustentabilidad de las Aguas Subterráneas deberán ser enviados.

31 de enero de 2040
La subcuenca Delta-Mendota deberá alcanzar la total sustentabilidad.

Resultados No Deseados

1) Reducción **crónica de los niveles de las aguas subterráneas.**

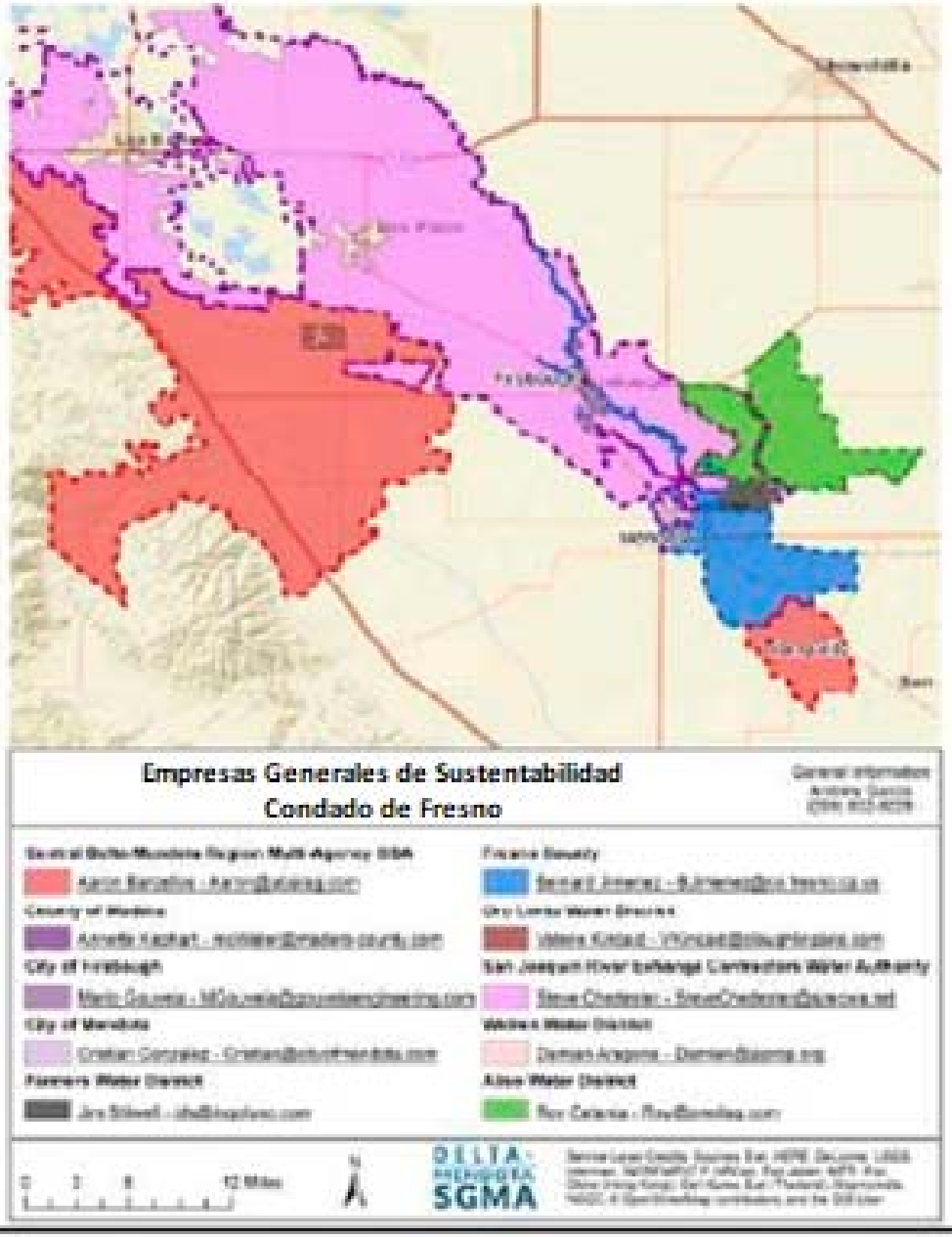
2) Reducción significativa y razonable del **almacenamiento de aguas subterráneas.**

3) Intromisión significativa y razonable de **agua marina.**

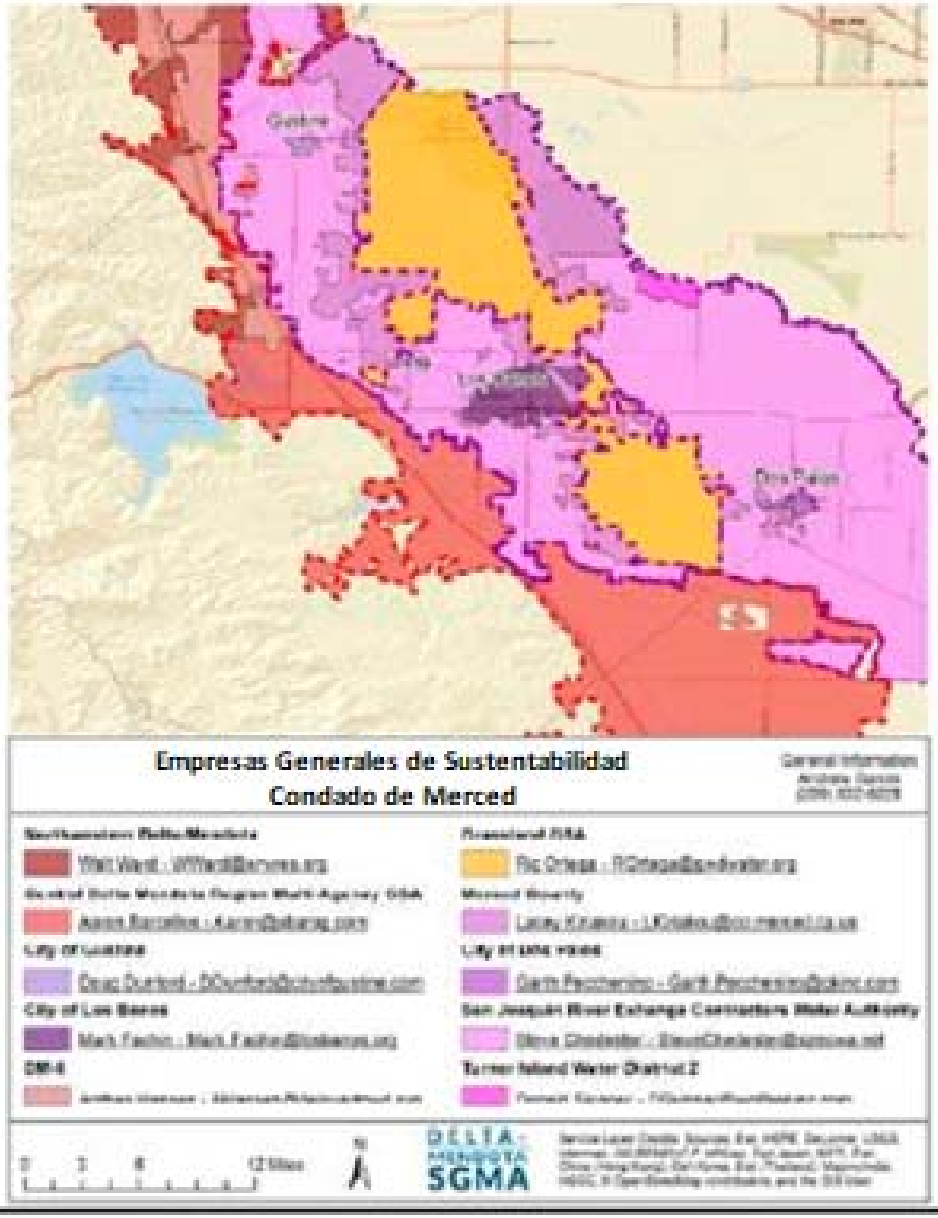
4) Degradación significativa y razonable de **calidad del agua**, incluida la migración de penachos contaminados que perjudiquen el suministro de agua.

5) Hundimiento significativo y razonable del **suelo** que interfiera sustancialmente con la superficie y usos de la tierra.

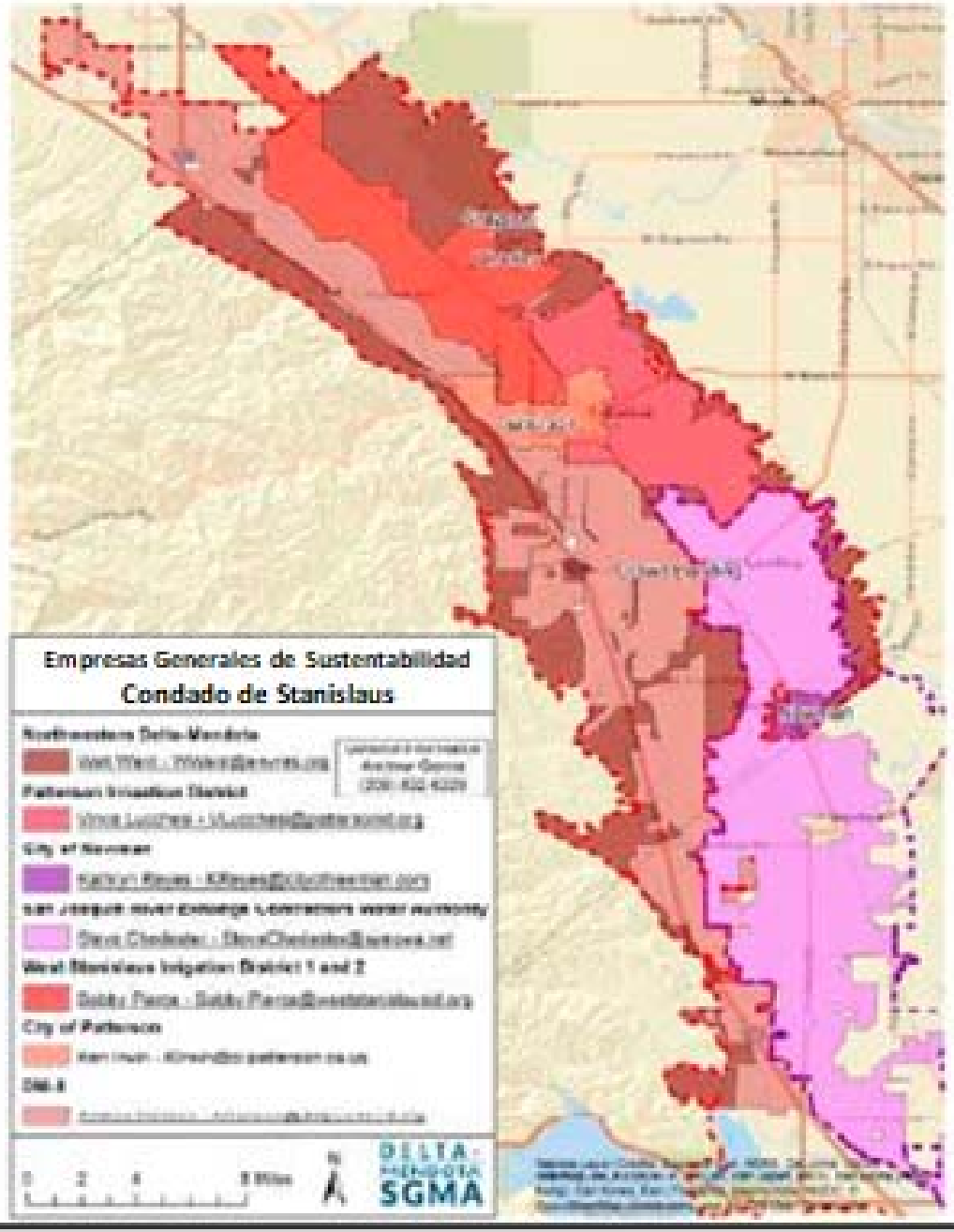
6) Agotamiento de la **interconexión entre las aguas superficiales** que tenga impactos adversos, significativos y razonables en los beneficios del uso del agua superficial.



Empresas de Sustentabilidad de Aguas Subterráneas – Condado de Fresno

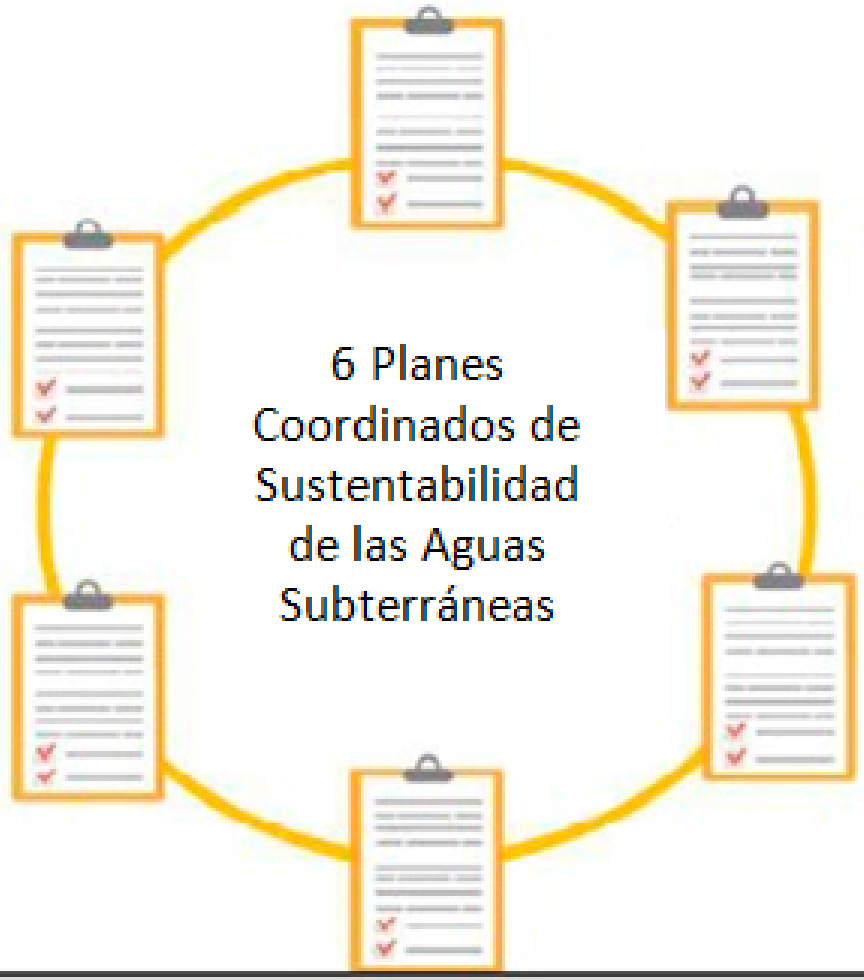


Empresas de Sustentabilidad de Aguas Subterráneas – Condado de Merced



Empresas de Sustentabilidad de Aguas Subterráneas – Condado de Stanislaus

Planes para la Sustentabilidad de las Aguas Subterráneas



Los planes para la Sustentabilidad de las Aguas Subterráneas deberán incluir:

- ✓ Descripción de la zona del plan
- ✓ Condiciones de las Aguas Subterráneas
- ✓ Presupuesto para el agua
- ✓ Áreas de gestión
- ✓ Metas de Sustentabilidad
- ✓ Descripción de los resultados no deseados
- ✓ Objetos medibles
- ✓ Descripción de los protocolos de monitoreo y gestión de información
- ✓ Descripción de los proyectos para lograr la sustentabilidad

Próximos Pasos:

Otoño del 2018
Taller Público #2: Presupuesto para el agua y Monitoreo de Aguas Subterráneas

Invierno del 2018
Taller Público #3: Criterios y Metas para la Gestión de Sustentabilidad

Primavera del 2019
Taller Público #4: Proyectos de Aguas Subterráneas y Acciones de Gestión

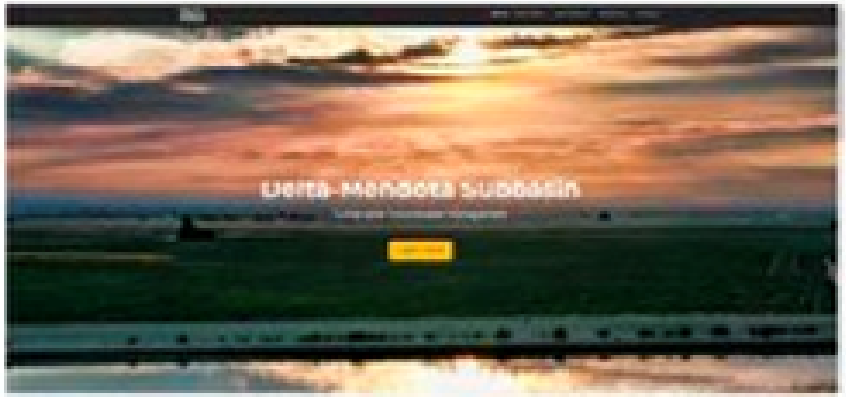
Sept - Nov del 2019
"Planes de Sustentabilidad para las Aguas Subterráneas".

Dic - Ene del 2020
Los planes para la Sustentabilidad ya han sido adoptados.

Enero 31, 2020
Los planes para la Sustentabilidad han sido suministrados al Estado.

Cómo involucrarse

- ✓ **Hable** con el representante de su empresa local para la sustentabilidad de las aguas subterráneas.
- ✓ **Regístrese** en la lista de correos electrónicos de dicha empresa.
- ✓ **Asista** a las reuniones públicas y a los talleres.
- ✓ **Ofrezca su aporte** para el plan de sustentabilidad de las aguas subterráneas.
- ✓ ¡Ayúdenos a correr la voz!



¿Preguntas?

Evento abierto al público– Conozca a sus representantes locales

Public Workshop 1:
Workshop Summary

DELTA-MENDOTA SUBBASIN
SUSTAINABLE GROUNDATER MANAGEMENT ACT
SPRING 2018 COORDINATED WORKSHOPS

Monday, May 14, 2018, Los Banos
Wednesday, May 16, 2018, Patterson
Thursday, May 17, 2018, Mendota

WORKSHOP SUMMARY

- Three workshops were held in the northern, central, and southern parts of the Delta-Mendota Subbasin. The purpose of the workshops was to educate stakeholders and members about the public about the Sustainable Groundwater Management Act (SGMA) and introduce participants to their local Groundwater Sustainability Agency representatives. Topics covered during the workshop included what is SGMA, the Delta-Mendota Subbasin, and opportunities for public engagement.
- Workshop participants' questions and feedback are summarized as follows:
  - Are the local groundwater regulations going to be re-set on an annual basis based on the water year, snowpack, etc.?
  - Who is the governing board that will make these decisions?
  - If this is a state-wide initiative, who is the decision-making body?
  - Will the California Department of Fish and Wildlife be involved?
  - Has the State provided criteria to what is considered a "chronic loss" of groundwater?
  - Are natural springs included under SGMA?
  - What criteria will you use to measure whether or not springs are overused?
  - What is the ultimate goal of SGMA? What does it mean to us?
  - How is the water budget going to be developed?
  - The Irrigated Lands Program already has a lot of requirements for growers. Is this going to be the same level of detail and effort?
  - What is the goal SGMA is trying to achieve? How are we going to get to sustainability?
  - What will happen when the State and districts do not receive their full surface water allocation and cities keep expanding?
  - It seems to me that the biggest problem is that the State wants to export water to Southern California. How can we come up with a solution if there are factors out of our control?

- How will you know how much I am pumping?

Public Workshops No. 2

Public Workshop 2:
Meeting Sign In Sheets

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 22, 2018, 5:00 – 7:00 PM
Firebaugh Middle School MPR
1600 16th St, Firebaugh, CA 93622

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Yerónimo Castañeda	Sacramento	xcastaneda@audubon.org	inter agency list serv
Bill Prentiss	Orange	Bill@BizIns.com	Flyer
Jim Stillwell	FRESNO	Jim@BAKerfarming.com	Farmers WD
Garrett Martin	Gustine	jmartin@cidwater.org	SSREE
Andrew Garcia	Gilroy	andrew.garcia@bldmwa.org	SLDMWA

DELTA-
MENDOTA
SGMA

Delta-Mendota SGMA Workshop
October 22, 2018, 5:00 – 7:00 PM
Firebaugh Middle School MPR
1600 16th St, Firebaugh, CA 93622

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
LISA FORD	FIREBAUGH	lford@kingsranch	EMAIL
JACK H. GRIFFIN	LOS BANOS	NNNTBJWBS@COMCAST.NET	WATER DIST.
Ric Ortega	Los Banos	rortega@gwdwater.org	SGDMWA

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 24, 2018, 4:00 – 6:00 PM
College Greens Building, Los Banos

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
MATT JACKSON	MERCED	mjackson@co.merced.ca.us	
Ric Ortega	Los Banos	rortega@gsedwater.org	
Justin Vandenberg	Dos Palos	justin.vbergis@yahoo.com	Farm Bureau
TRENT SHERMAN	FRESNO	TRENT.SHERMAN@WATER.CA.GOV	DWR
Patricia Ramos-Anderson	Santa Nella	patriciaramos42@yahoo.com	
[illegible]	Santa Nella		[illegible]
L. Geis	Dos Palos	tsgt159123forme@msn.com	

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 24, 2018, 4:00 – 6:00 PM
College Greens Building, Los Banos

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Steve Creighton	Los Banos	screighton67 yahoo	mail
Damian Arrecana	Los Banos	damian@pprop.com	
Kyle Hill	Atwater		
Chris Rogers	Los Banos		
Judy + Benton Hoover	Dos Palos		
Tom Faria LB City Council	Los Banos	tom.faria@losbanos.org	Staff
BASSAM KASSAB	San José	BKASSAB@VALLEYWATER.ORG	I'm on listserv

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 24, 2018, 4:00 – 6:00 PM
College Greens Building, Los Banos

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
DJ VALA	LOS BANOS	djvala@gmail.com	Water District
Andy Pu	Crestmore	wests.de@el-te.net	Panoche WD/CCID
Ed Mendes	Raymond		
DAVONICA M. JOHNSON	SANTOS LOS BANO	DAVONICA.JOHNSON-SANTOS	City Council @ LOS BANOS.OEG
Paul Alvarez Jr	Santa Nella		SNWD Council

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 24, 2018, 4:00 – 6:00 PM
College Greens Building, Los Banos

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Ronnie Roetsler	Visalia	RRoetsler@settonfarms.com	Email
Garrett Martin	Gustine	–	–
BREANNE RAMOS	DOS PALOS	bramos@mercedfarmbureau.org	
Chad Perry	Dos Palos	C.Perry454@yahoo.	
Deborah Lewis	Los Banos	deborah.Lewis@LosBanos.org	
Chris Medeiros	Los Banos	–	Email
ALESSANDRO PAOLINI			

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 25, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Barnett Martin	Gustine	—	—
Herbert DeDampe	Patterson	—	—
Mike Willett	Patterson	mwillett@ci.patterson.ca.us	
Earl Perez	DWR		
STEVE PALLUCA	TRACY	STEVE01234567 8@GMAIL.COM	
Zach Maring	Patterson	zach@delmartfarms.com	
Gary Scoles	Patterson	scoles209@Yahoo.com	Mail

DELTA-
MENDOTA
SGMA

Delta-Mendota SGMA Workshop
October 25, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Fritz Schali	915 Sycamore Patterson		
STEVEN FLIFLET	HUGHSON		
Bernhard H. Marks	Newman		
Bill Cox	Westley		
Steve Foada	Patterson		
Bob Martin	Ripon	bob.martin@sldmwa.org	Andrew Garcia

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
October 25, 2018, 4:00 – 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson, CA

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Joe Pereira Jr.	Patterson	JPP@yfc.ag	Post card
[illegible]	Modesto		CM Patterson ID
[illegible]	PATTERSON	[illegible]PTE@yahoo.	mail
John Michelsen	Patterson		mail
J D. [illegible]	Turlock		
David [illegible] AMID	Patterson	djames@ci.patterson.ca.us	

Public Workshop 2:
English Announcements and Materials

Contact: Kirsten Pringle, Delta-Mendota Subbasin, Stantec
(916) 418-8243, Kirsten.Pringle@stantec.com

FOR IMMEDIATE RELEASE
October 19, 2018

MEDIA ADVISORY

Sustainable Groundwater Management Act Public Workshops

What: Collaborating local agencies are hosting a series of public workshops about the Sustainable Groundwater Management Act. Learn how this landmark legislation may impact our communities, the planning process, and how people can get involved. Spanish translation will be provided.

Format: There are three workshop opportunities to attend; the content of each workshop will be the same. The first 45 minutes of each workshop will consist of an informational presentation, followed by an open house.

When: **Firebaugh – Monday, October 22, 2018**
5:00 - 7:00 PM
Firebaugh Middle School MPR
1600 16th Street, Firebaugh, CA

Los Banos – Wednesday, October 24, 2018
4:00 – 6:00 PM
College Greens Building
1815 Scripps Drive, Los Banos, CA

Patterson – Thursday, October 25, 2018
4:00 – 6:00 PM
Hammon Senior Center
1033 W. Las Palmas Avenue, Patterson, CA

Who: Representatives from local groundwater sustainability agencies will be available to answer questions.

Additional Resources: The Sustainable Groundwater Management Act, www.deltamendota.org/,

Background: *The Sustainable Groundwater Management Act (SGMA) is a package of three bills (AB 1739, SB 1168, and SB 1319) that provides local agencies with a framework for managing groundwater basins in a sustainable manner. Recognizing that groundwater is most effectively managed at the local level, the SGMA empowers local agencies to achieve sustainability within 20 years.*

Help Us Plan for the Future of Our Water Resources

Local agencies are developing groundwater sustainability plans to plan for the future of our groundwater resources. We want to hear from you! Come to an upcoming public workshop to learn more.

You have three opportunities to attend:

Firebaugh

Monday, October 22, 5:00 - 7:00 PM
Firebaugh Middle School MPR
1600 16th St, Firebaugh

Los Banos

Wednesday, October 24, 4:00 - 6:00 PM
College Greens Building
1815 Scripps Drive, Los Banos

Patterson

Thursday, October 25, 4:00 - 6:00 PM
Hammon Senior Center
1033 W Las Palmas Ave, Patterson

The content of each workshop will be the same. The first thirty minutes of each workshop will consist of an informational presentation, followed by an open house. Spanish interpretation will be provided.

Workshop topics:

- Sustainable Groundwater Management Act
- Water budget
- Water models

For more information, please visit our website at: www.deltamendota.org or contact Kirsten Pringle at Kirsten.Pringle@Stantec.com.

DELTA-MENDOTA SGMA

SUSTAINABLE GROUNDWATER MANAGEMENT ACT WORKSHOP

WHAT IS SGMA?

The **Sustainable Groundwater Management Act,** known as "SGMA" (pronounced sig-ma), is a California State law that was passed in 2014. SGMA's goal is to ensure the long-term sustainable management of the State's groundwater resources. SGMA requires agencies throughout California to meet certain requirements. These include:

- Forming Groundwater Sustainability Agencies
- Developing Groundwater Sustainability Plans
- Achieving balanced groundwater levels within 20 years

HOW DOES THIS IMPACT ME?

You may use groundwater and not even realize it. In our region, groundwater is used for crops, landscapes, pastures, livestock, and even to drink! Groundwater is in our homes, businesses, and schools. Sustainable water resources is a vital part of our health and economy.

Commonly Used Terms

Basin/Subbasin = groundwater basin/subbasin

Delta-Mendota = Delta-Mendota Subbasin region

HCM = hydrogeolgic conceptual model

GSA = groundwater sustainability agency

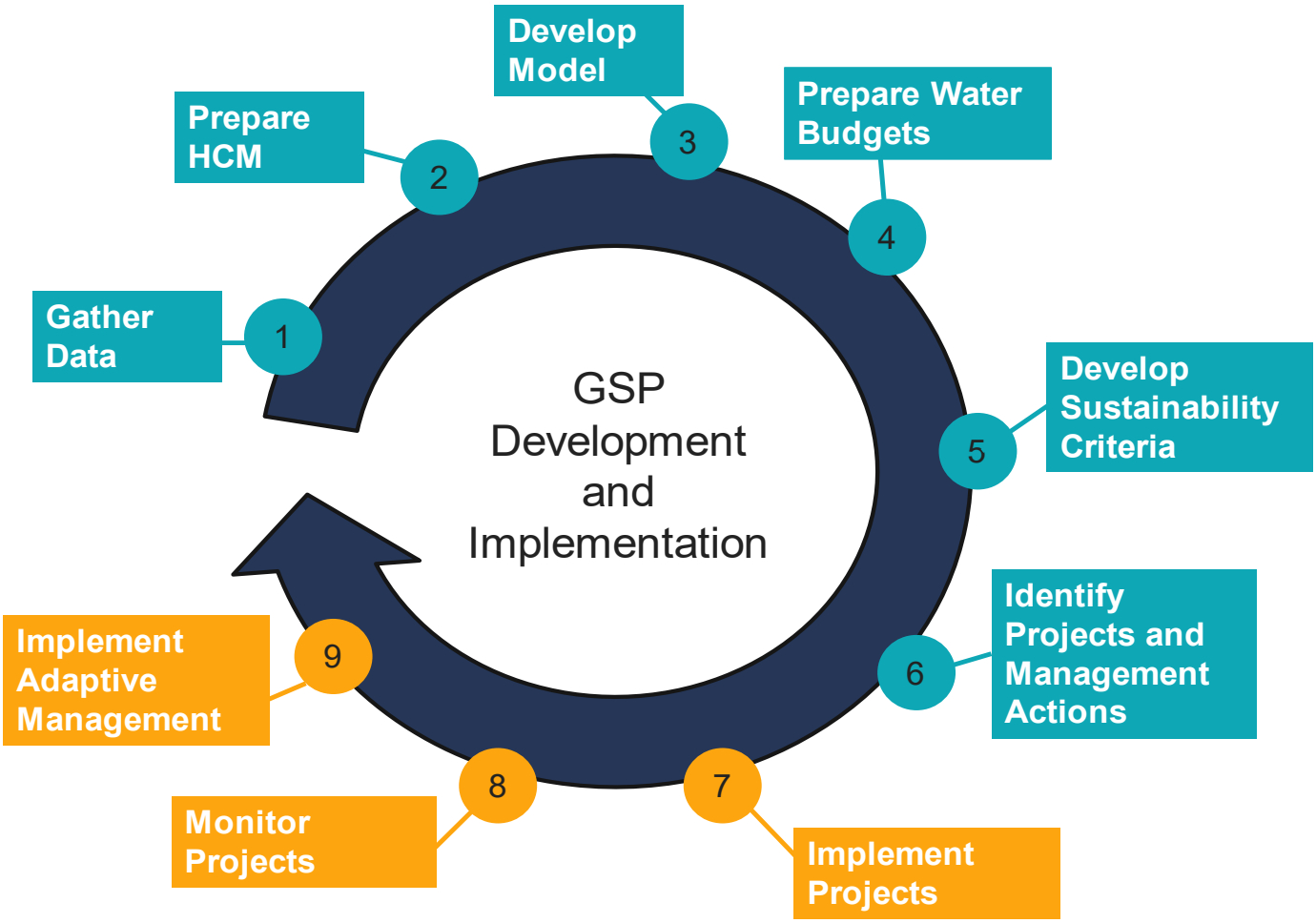
GSP = groundwater sustainability plan

SGMA = Sustainable Groundwater Management Act of 2014

WHAT IS BEING DONE?

Twenty-three groundwater sustainability agencies are working together to create six groundwater sustainability plans.

These plans will outline how the agencies will implement, manage, and measure specific actions to sustainably manage the groundwater. Groundwater sustainability plans for the Delta-Mendota Subbasin must be submitted to the State no later than January 31, 2020.

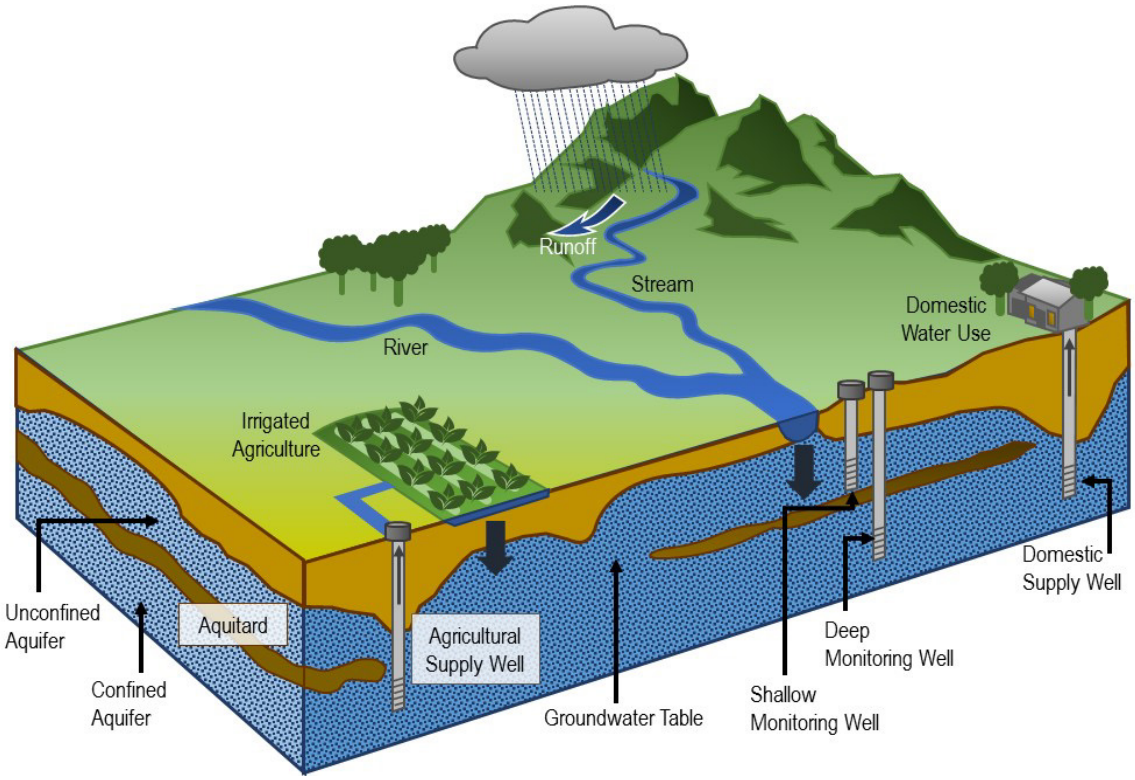


1 GATHER DATA

Good data is the foundation of the groundwater sustainability plan development process. Groundwater sustainability agencies will use this data to develop the models, prepare the water budgets, develop sustainability criteria, and monitor the effectiveness of the projects we implement. **You can help your local groundwater sustainability agency gather data on groundwater in the Delta-Mendota region.** Agencies are looking for data on: (1) well construction; (2) groundwater level/elevation (3) groundwater extraction/pumping; and (4) water quality.

PREPARE HCM 2

A hydrogeologic conceptual model (HCM) is the story of what is happening with water in Delta-Mendota Subbasin. A HCM describes what water is coming into the groundwater basin, what water is leaving, and how water is moving around. This information will be used to develop the "basin setting" in the groundwater sustainability plan.



3 DEVELOP MODEL

Models are tools that use equations, math and computers to numerically simulate what is happening in the groundwater basin. Groundwater sustainability agencies in the Delta-Mendota region are working together to build groundwater models to support groundwater sustainability plan development. Two different types of models are being used: numerical models and analytical models.

PREPARE WATER BUDGETS 4

A water budget is like a checking account.

Inflows into the Delta-Mendota Subbasin are deposits. Outflows out of the basin are withdrawals. The remaining balance is the water budget. Inflows and outflows are tracked overtime to tell use whether the ending balance is positive – there is water in the basin – or negative – too much water has been pulled out. **We are trying to maintain a positive water balance in the basin.**

Groundwater sustainability agencies in the region are collaboratively developing a water budget for the Delta-Mendota Subbasin. We will be discussing this subbasin water budget at our next workshop.

WHAT IS NEXT?

Groundwater sustainability agencies will be continuing to develop the groundwater sustainability plans over the next eight months. The draft plans will be available for review in Fall 2019, but we hope you provide input before then.

Winter 2018

Public Workshop #3: Water Budgets, Sustainability Goals and Criteria

Spring 2019

Public Workshop #4: Groundwater Projects and Management Actions

Sept - Nov 2019

Public Review of Draft Groundwater Sustainability Plans

Dec – Jan 2020

Groundwater Sustainability Plans adopted

Jan 31, 2020

Groundwater Sustainability Plans submitted to State

GET INVOLVED

Stay Informed - Sign-up for your local groundwater sustainability agency's mailing list.

Attend a Public Meeting or Workshop - Visit deltamendota.org for list of regularly-scheduled meetings and public workshops.

Provide Input - Help your groundwater sustainability agency by providing input on the groundwater sustainability plan development, identifying potential groundwater projects, and providing data.

Questions or Comments?

Talk to your local groundwater sustainability agency representative after the presentation

Visit our website at deltamendota.org

Send general questions to dmsgma@sldmwa.org

THANK YOU FOR JOINING!

Help us plan future workshops by filling out a feedback form.

DELTA-MENDOTA SGMA

Sustainable Groundwater Management Act Workshop

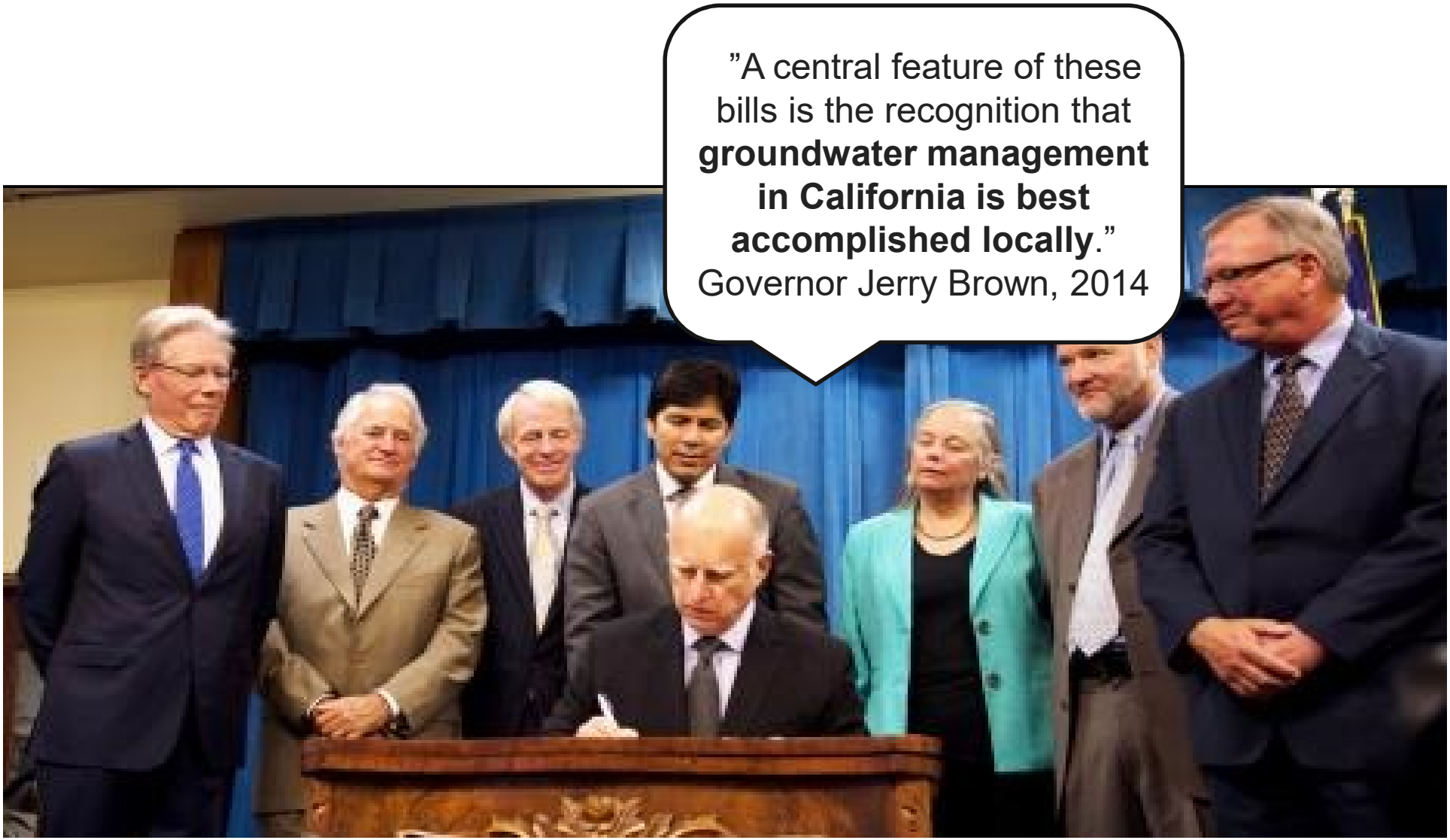
October 22, 2018

DELTA-MENDOTA SGMA

Agenda

1. Welcome
2. Introductions
3. Presentation on Groundwater and Sustainable Groundwater Management Act
4. Questions/Answer
5. Open House

Sustainable Groundwater Management Act of 2014



Sustainable Groundwater Management Act Terms

SGMA = Sustainable Groundwater Management Act

GSA = Groundwater Sustainability Agency

GSP = Groundwater Sustainability Plan

HCM = hydrogeologic conceptual model

DELTA-MENDOTA SGMA

Sustainable Groundwater Management Act Timeline

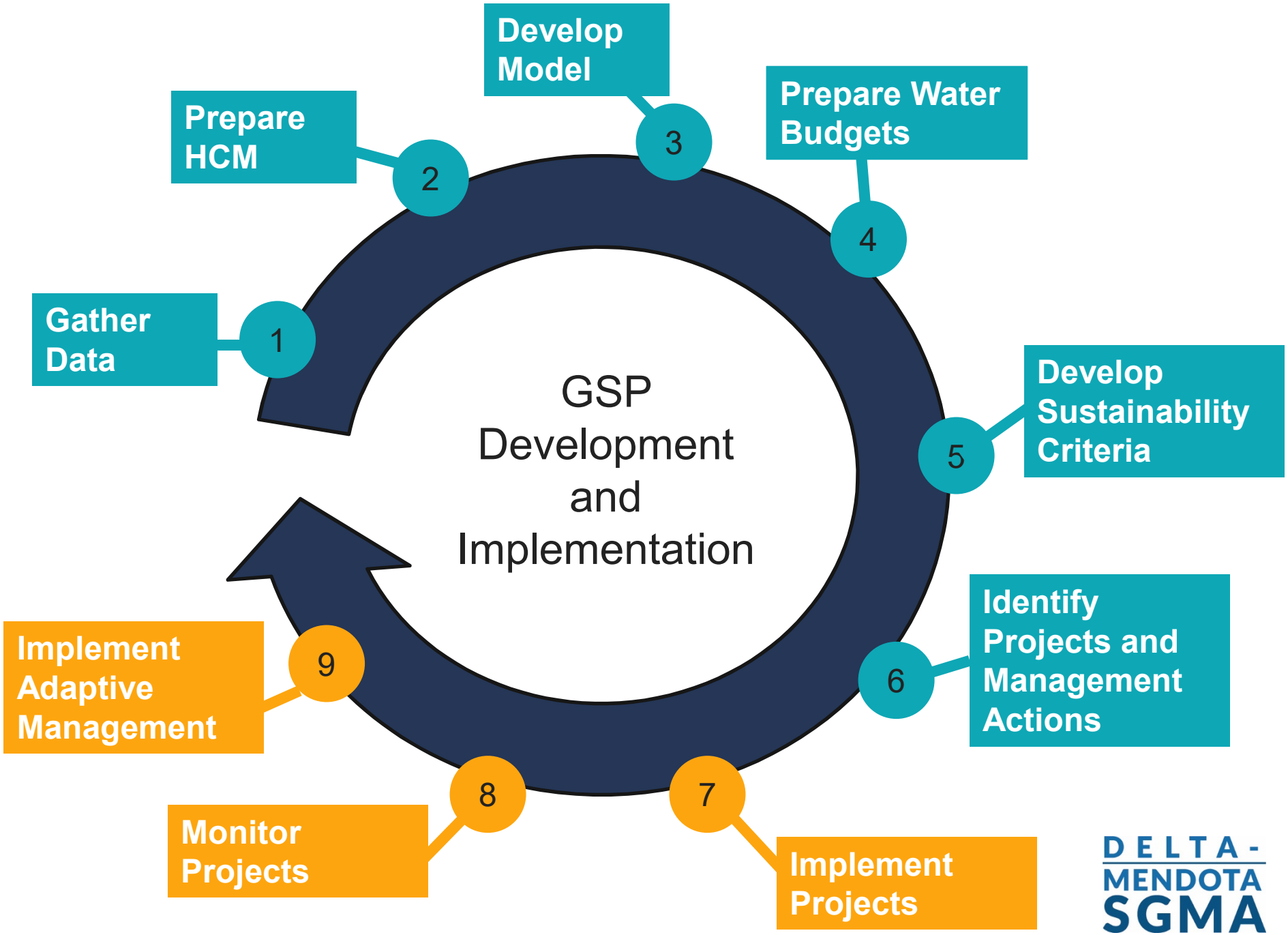
June 30, 2017
Groundwater Sustainability Agencies must be formed.

January 31, 2020
Groundwater Sustainability Plans must be submitted

January 31, 2040
Delta-Mendota Subbasin must achieve sustainability.

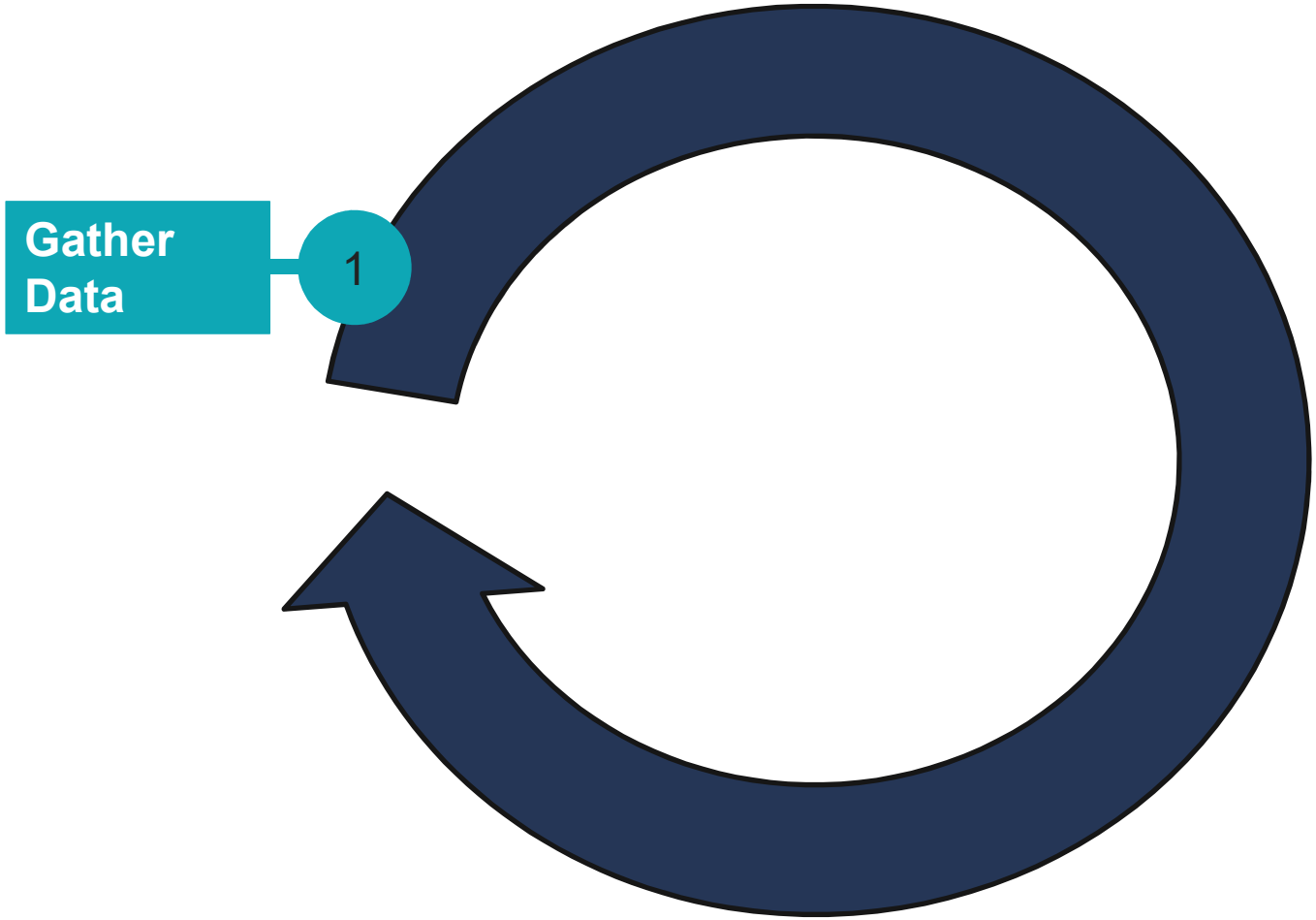
DELTA-MENDOTA SGMA

Questions?



DELTA-MENDOTA SGMA

Step 1: Gather Data



DELTA-MENDOTA SGMA

Step 1: Gather Data

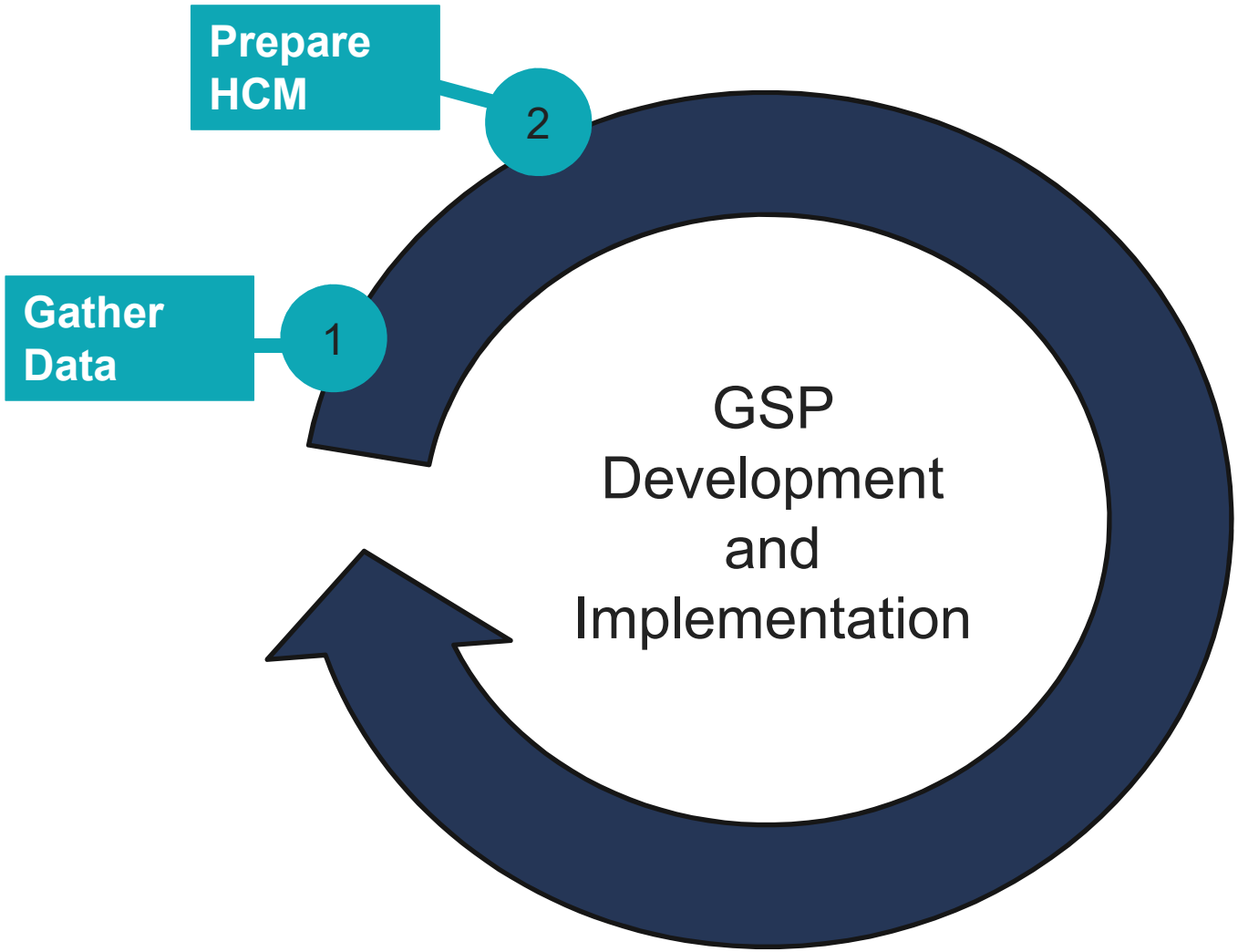
- Well data – Well construction information
- Groundwater extraction
- Groundwater levels
- Water quality
- Consumer demand
- Land use
- Crop types
- Information on how/if you are experiencing groundwater impacts

DELTA-MENDOTA SGMA

Data Gaps

You can help **us** fill data gaps

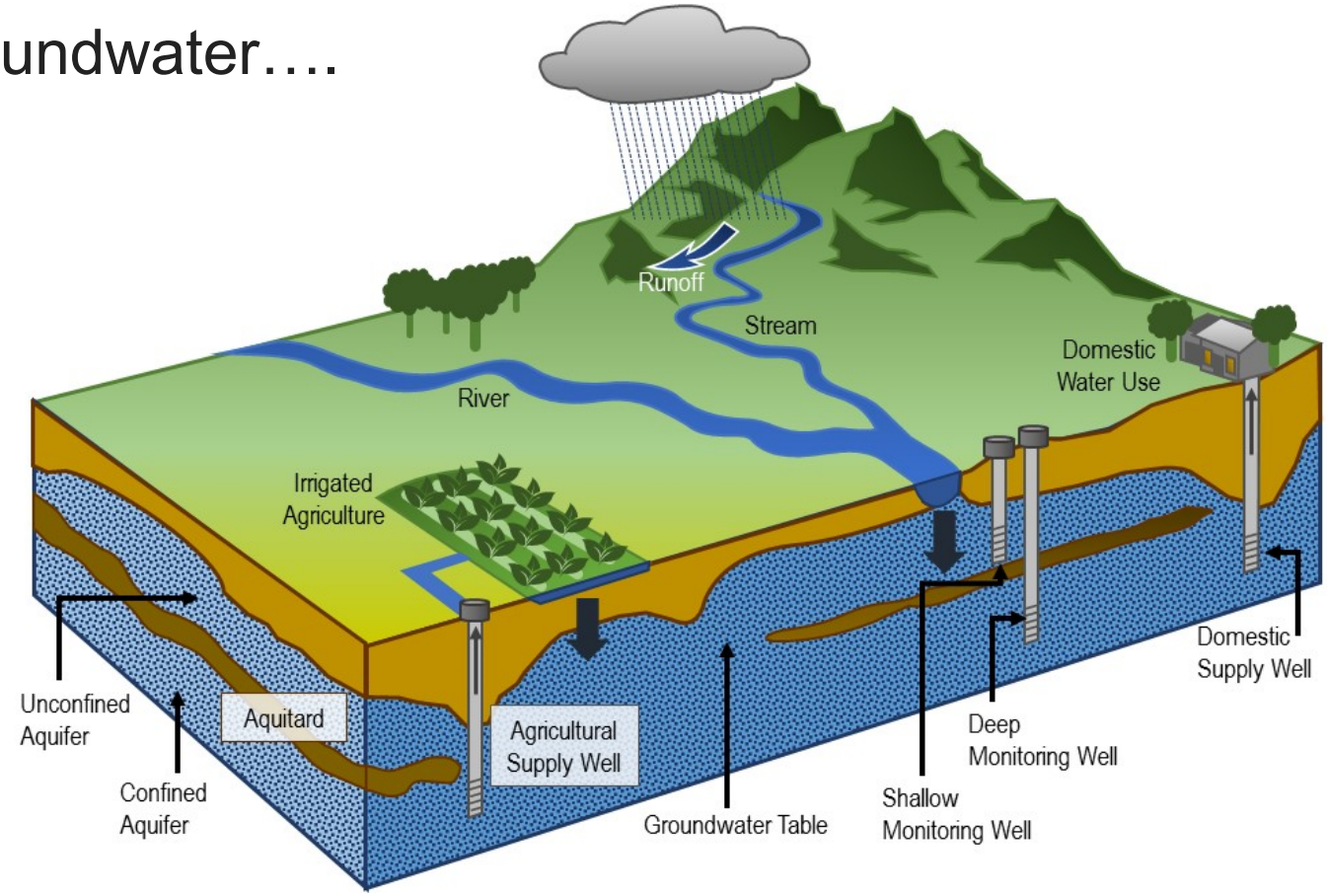
Questions?



DELTA-MENDOTA SGMA

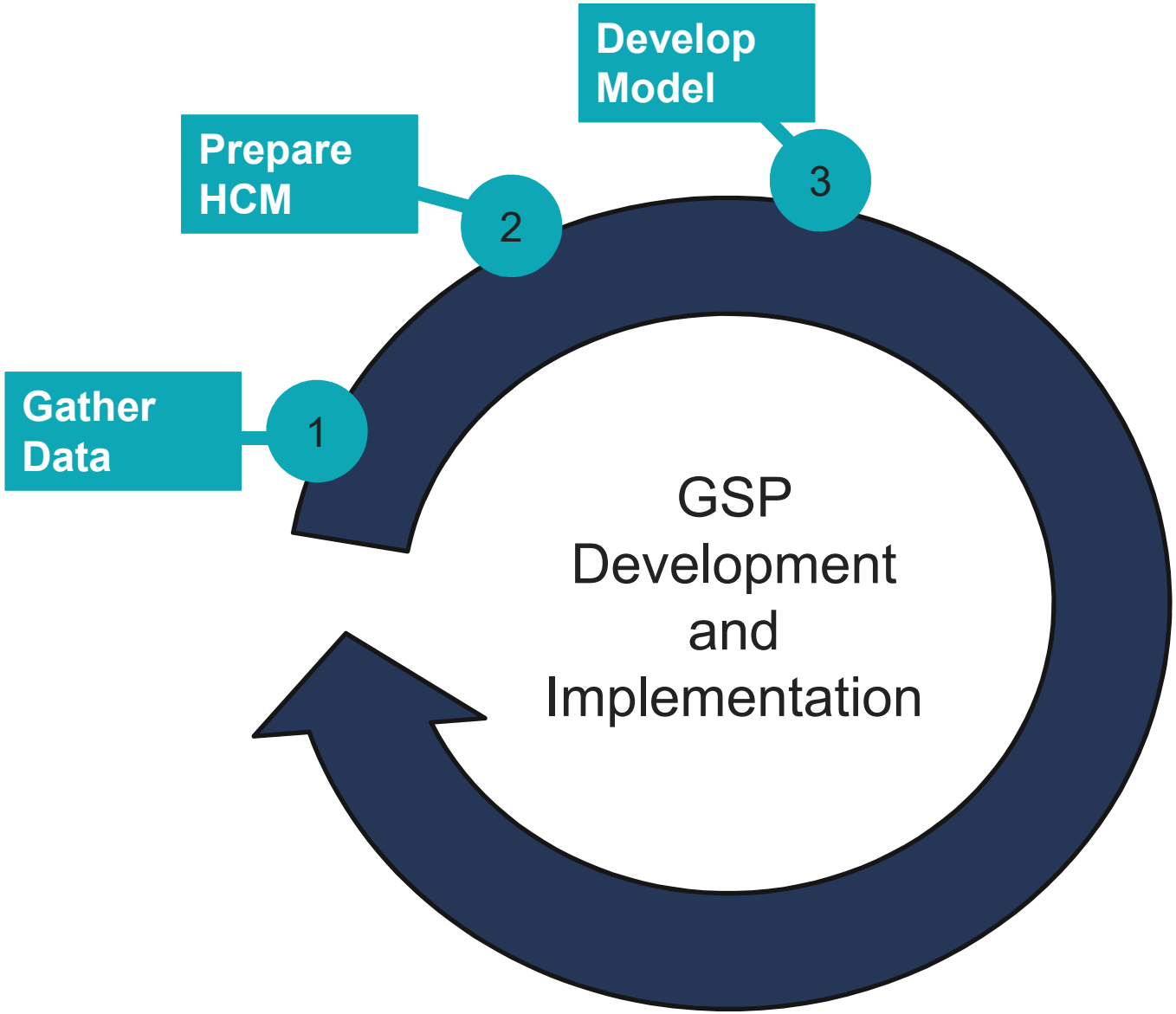
What is a Hydrogeologic Conceptual Model?

A story of groundwater….



DELTA-MENDOTA SGMA

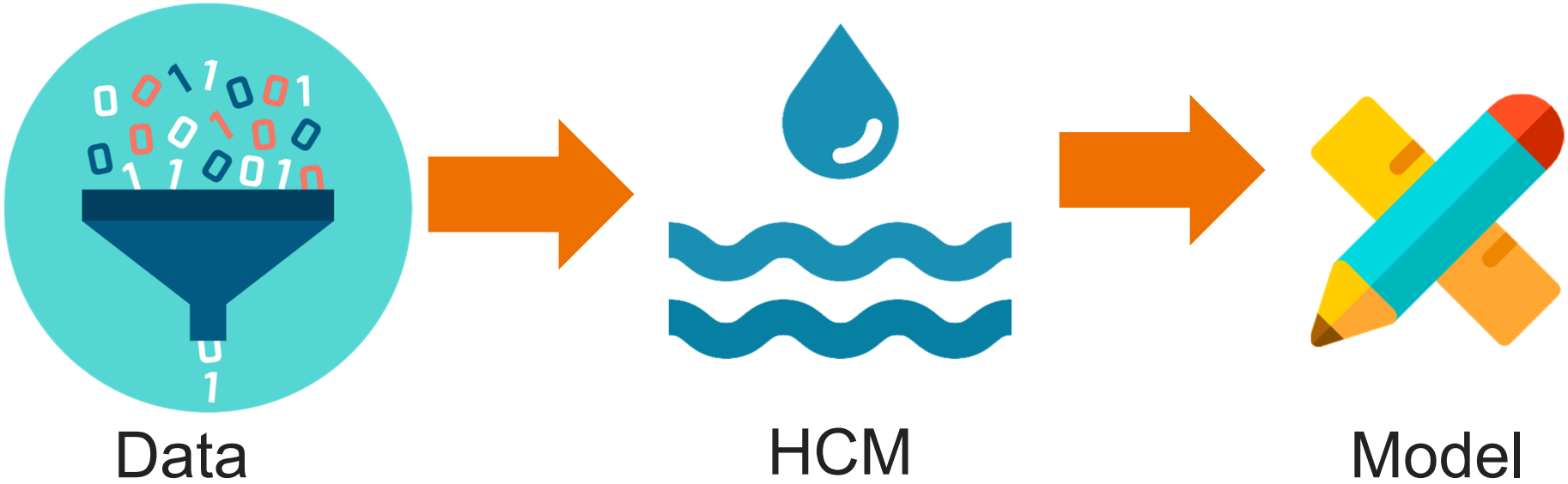
Questions?



DELTA-MENDOTA SGMA

Questions?

What are models?



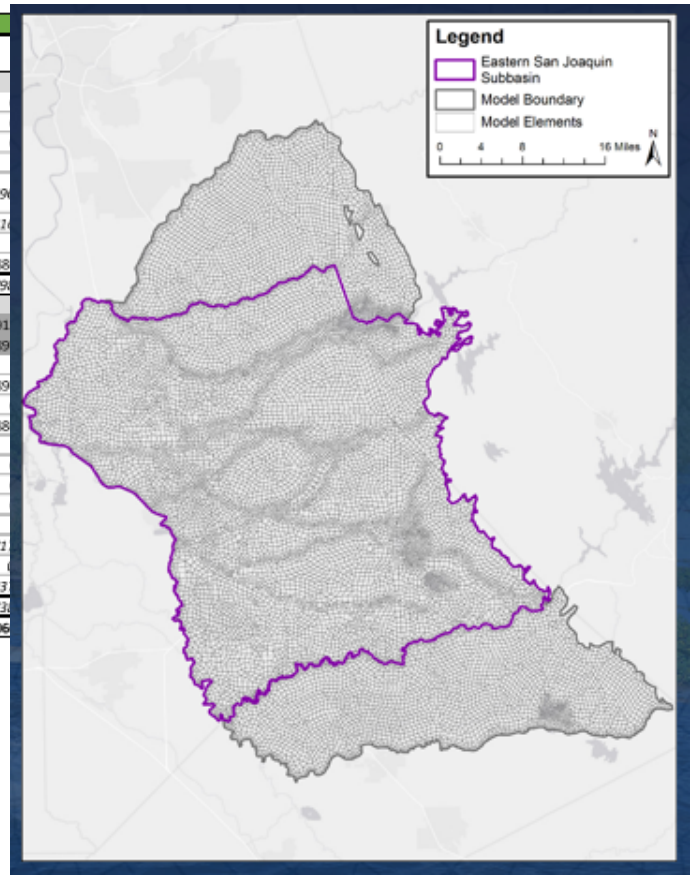
DELTA-MENDOTA SGMA

Model Types

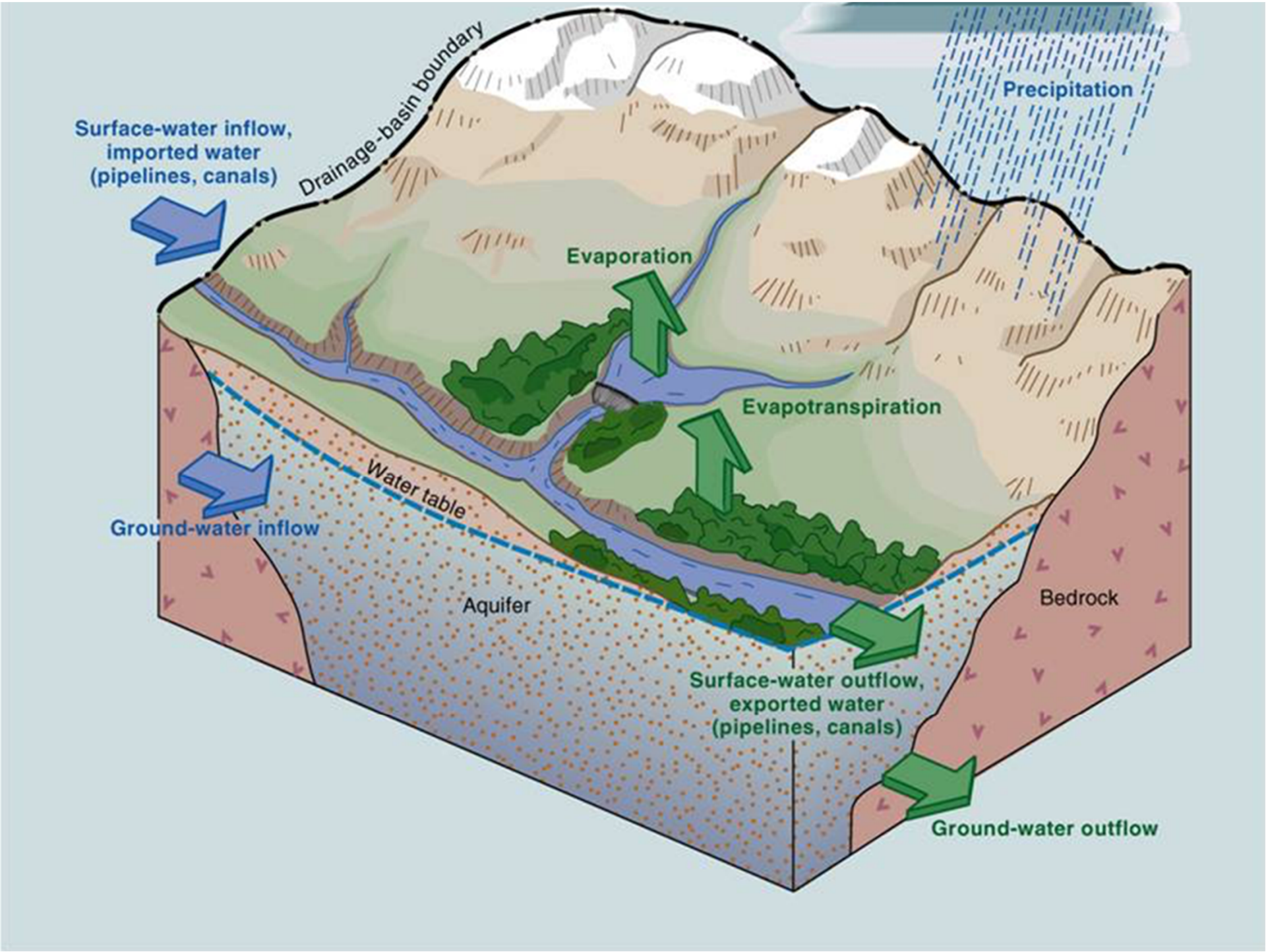
Analytical

Row #		LAND SURFACE SYSTEM (AF)								
		Component	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1		*Natural Supplies*									
2		Precip Ag (+)	0	40,905	37,530	7,983	35,699	20,852	51,922	17,101	
3		Precip Native(+)	0	6,642	6,093	1,296	5,796	3,386	8,430	2,777	
4		Precip Urban (+)	0	5,184	4,756	1,012	4,524	2,643	6,580	2,167	
5		Ag Supply									
6		*Ag SW Delivery (+) (Diversion minus losses)*	*4,652*	*568*	*243*	*64*	*137*	*2,032*	*4,661*	*45,517*	*138,49*
7		*Ag Pumping (+)*	*49,747*	*0*	*0*	*0*	*0*	*18,407*	*39,251*	*109,588*	*85,41*
8		Urban Supply									
9		Urban Pumping (+)	3,867	2,386	2,033	1,990	1,661	2,455	2,610	4,043	7,88
10		*Inflow Subtotal*	*58,265*	*2,953*	*2,276*	*2,054*	*1,798*	*22,895*	*46,522*	*159,149*	*231,79*
11	OUTFLOWS	*Ag water Demand*									
12		Total Ag Demand (ETc+Irr Eff)	54,399	17,169	8,017	7,756	11,599	41,292	95,833	172,207	223,91
13		Ag Demand (ETc)	45,237	14,537	6,825	6,587	9,850	34,073	79,127	141,784	183,89
14		Outflows to the Atmospheric System									
15		ET Ag (-)	45,237	14,537	6,825	6,587	9,850	34,073	79,127	141,784	183,89
16		ET Native	0	5,434	1,799	1,296	4,722	3,386	8,430	2,777	
17		ET Urban	3,867	1,901	702	702	1,843	4,110	5,807	6,210	7,88
18		Outflows to the Stream System									
19		Runoff Ag	0	6,355	4,947	0	4,241	362	11,761	37	
20		Runoff Native	0	0	0	0	0	0	0	0	
21		Runoff Urban	0	2,772	2,436	0	2,258	952	3,383	0	
22		Outflows to the Groundwater System									
23		*Recharge Ag*	*1,632*	*1,244*	*1,133*	*241*	*1,075*	*1,239*	*2,875*	*5,166*	*6,71*
24		*Recharge Native*	*0*	*199*	*183*	*39*	*174*	*102*	*253*	*83*	
25		*Recharge Urban*	*116*	*227*	*204*	*90*	*186*	*153*	*276*	*186*	*23*
26		*Outflow Subtotal*	*50,852*	*32,669*	*18,230*	*8,956*	*24,350*	*44,376*	*111,912*	*156,244*	*198,73*
27		**Land Surface System Budget**	**7,414**	**-29,716**	**-15,954**	**-6,902**	**-22,551**	**-21,481**	**-65,390**	**2,905**	**33,06**

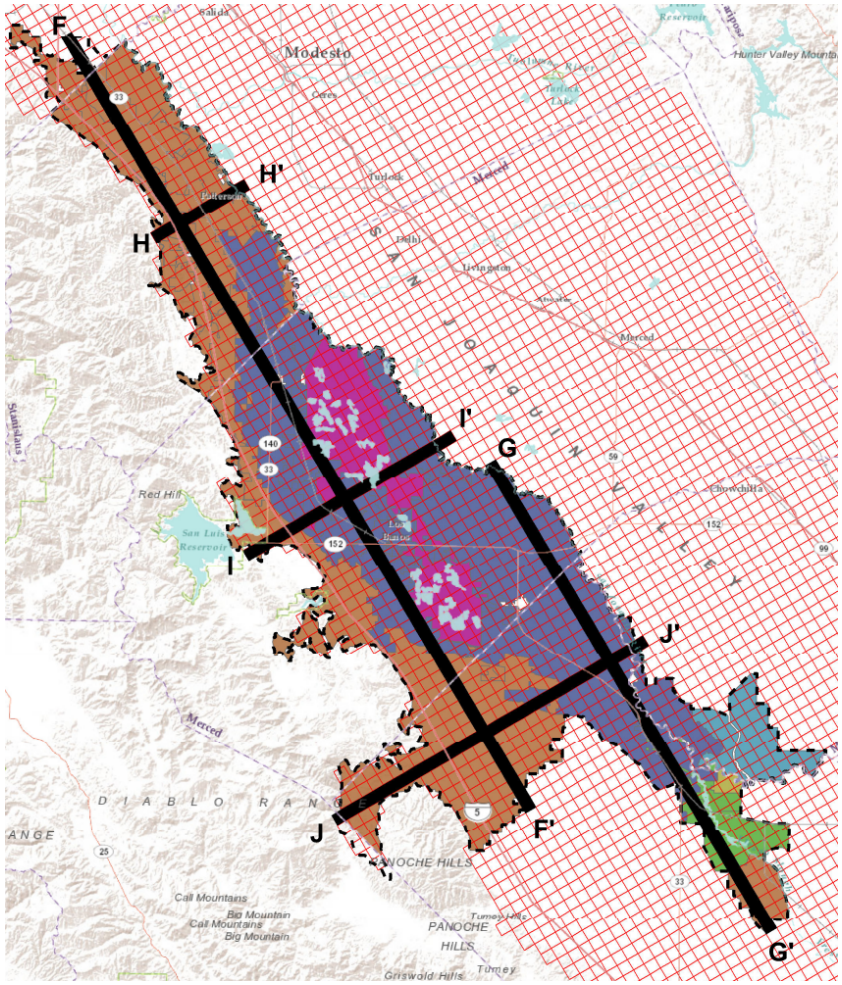
Numerical

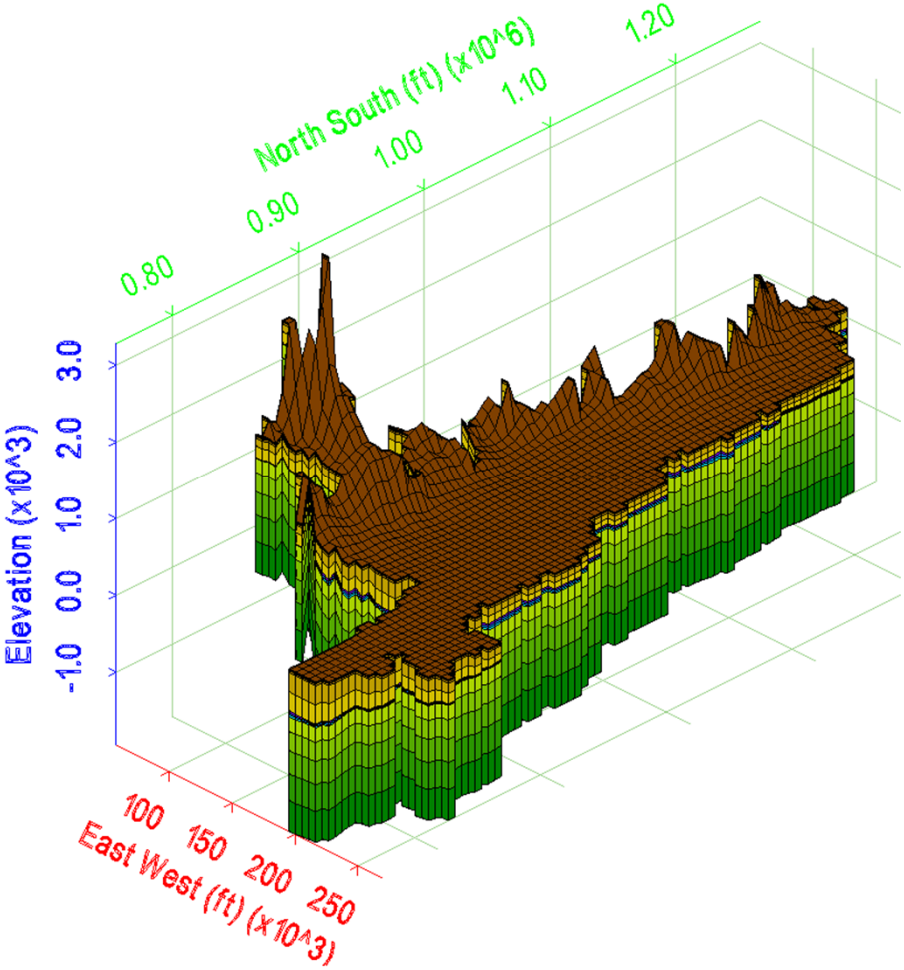


DELTA-MENDOTA SGMA

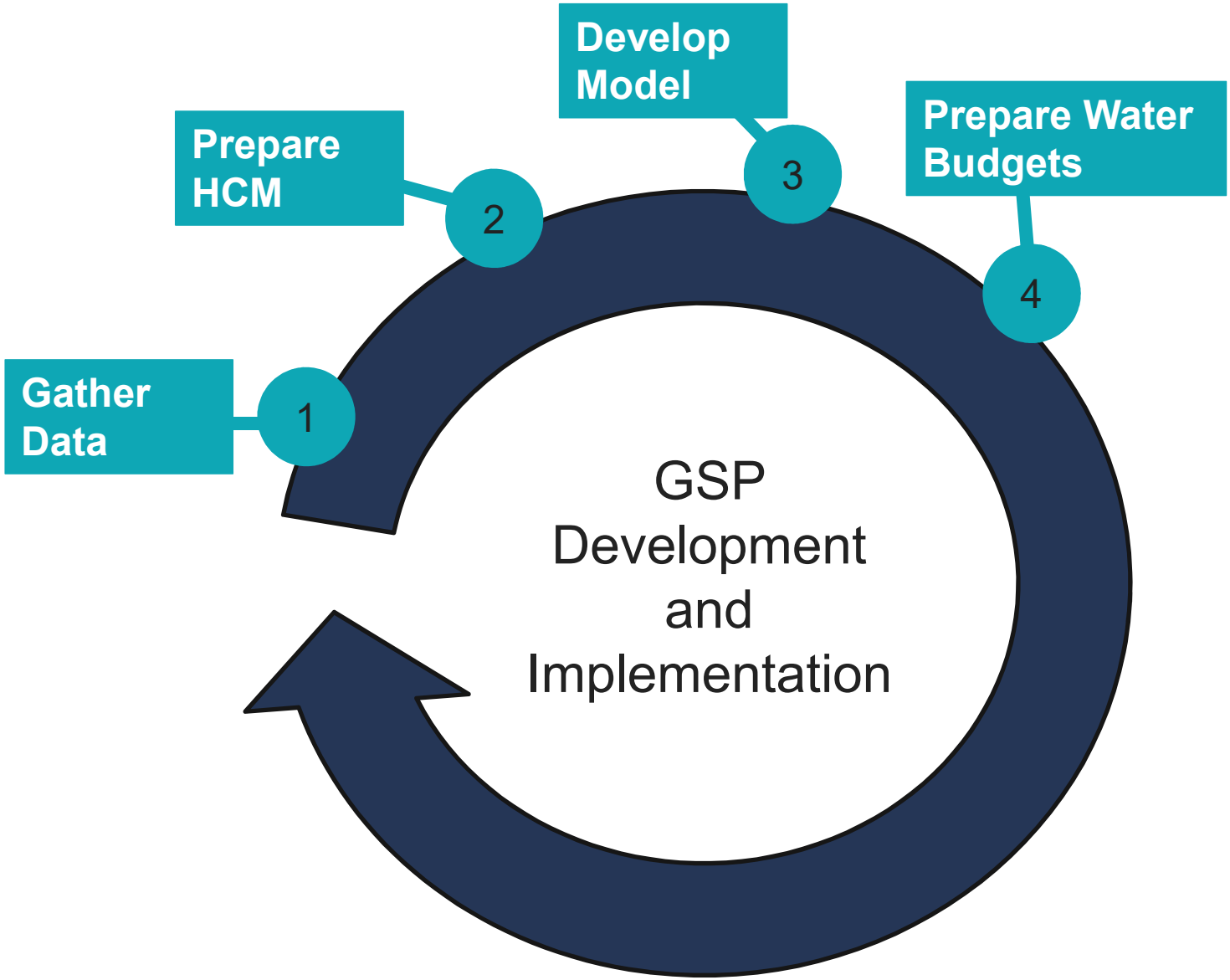

Drainage-basin boundary
Precipitation
Surface-water inflow, imported water (pipelines, canals)
Evaporation
Evapotranspiration
Water table
Ground-water inflow
Aquifer
Bedrock
Surface-water outflow, exported water (pipelines, canals)
Ground-water outflow

CVHM2 Grid



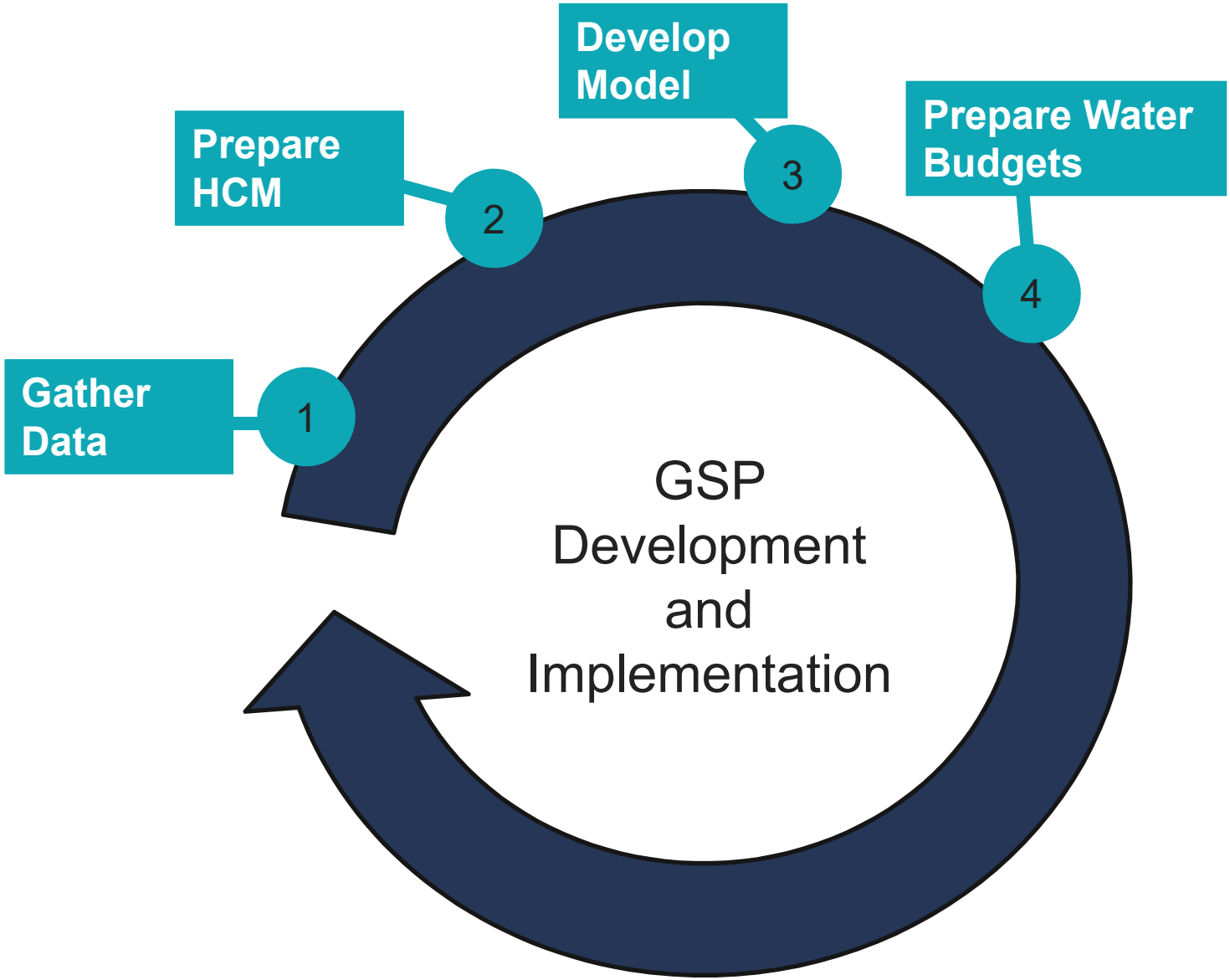


DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA

Questions?



DELTA-MENDOTA SGMA

What is a water budget?

DELTA-MENDOTA SGMA

A water budget is like a checking account..

Deposits

−

Withdrawals

=

Balance

DELTA-MENDOTA SGMA

Inflows

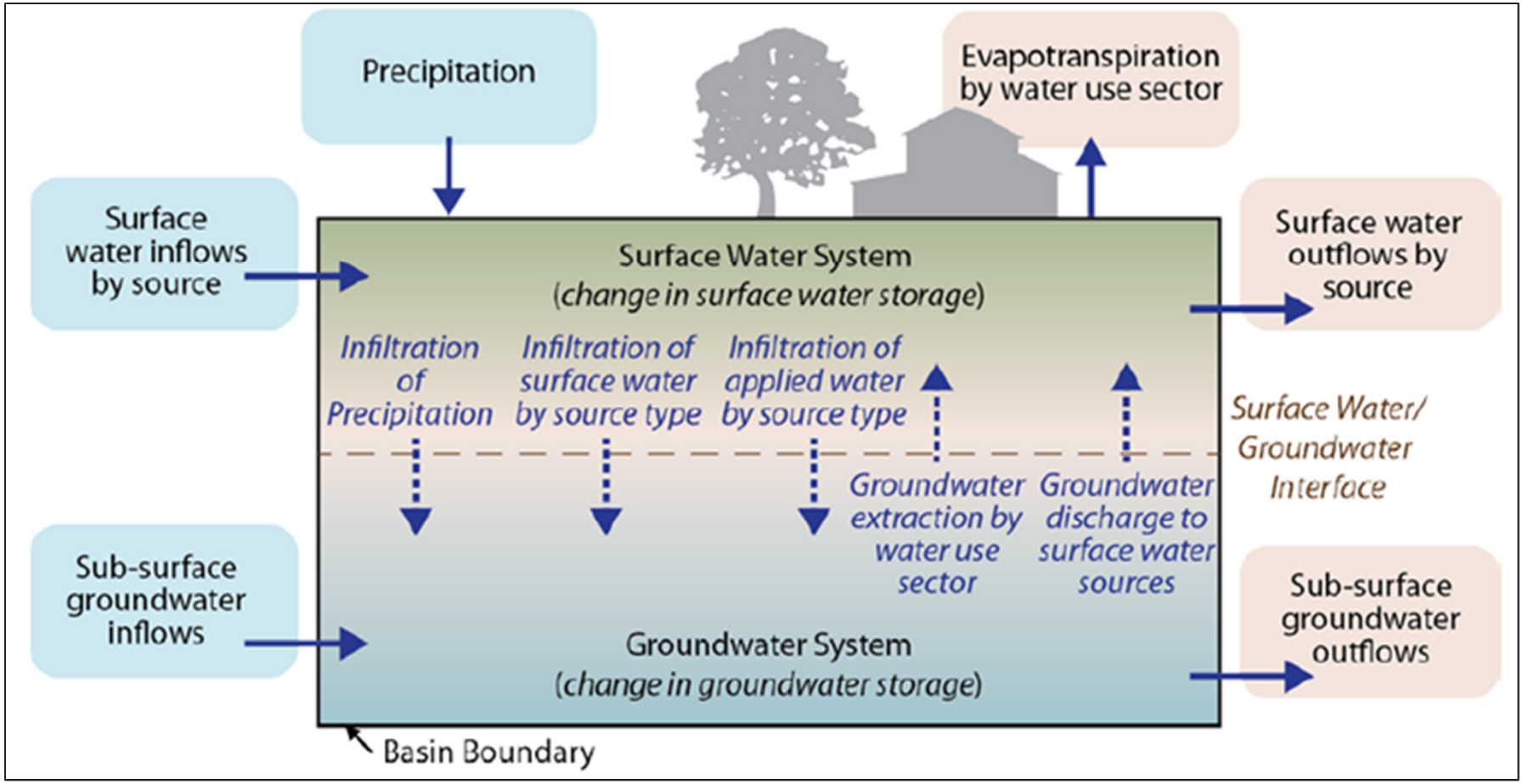
−

Outflows

=

Water Balance

DELTA-MENDOTA SGMA



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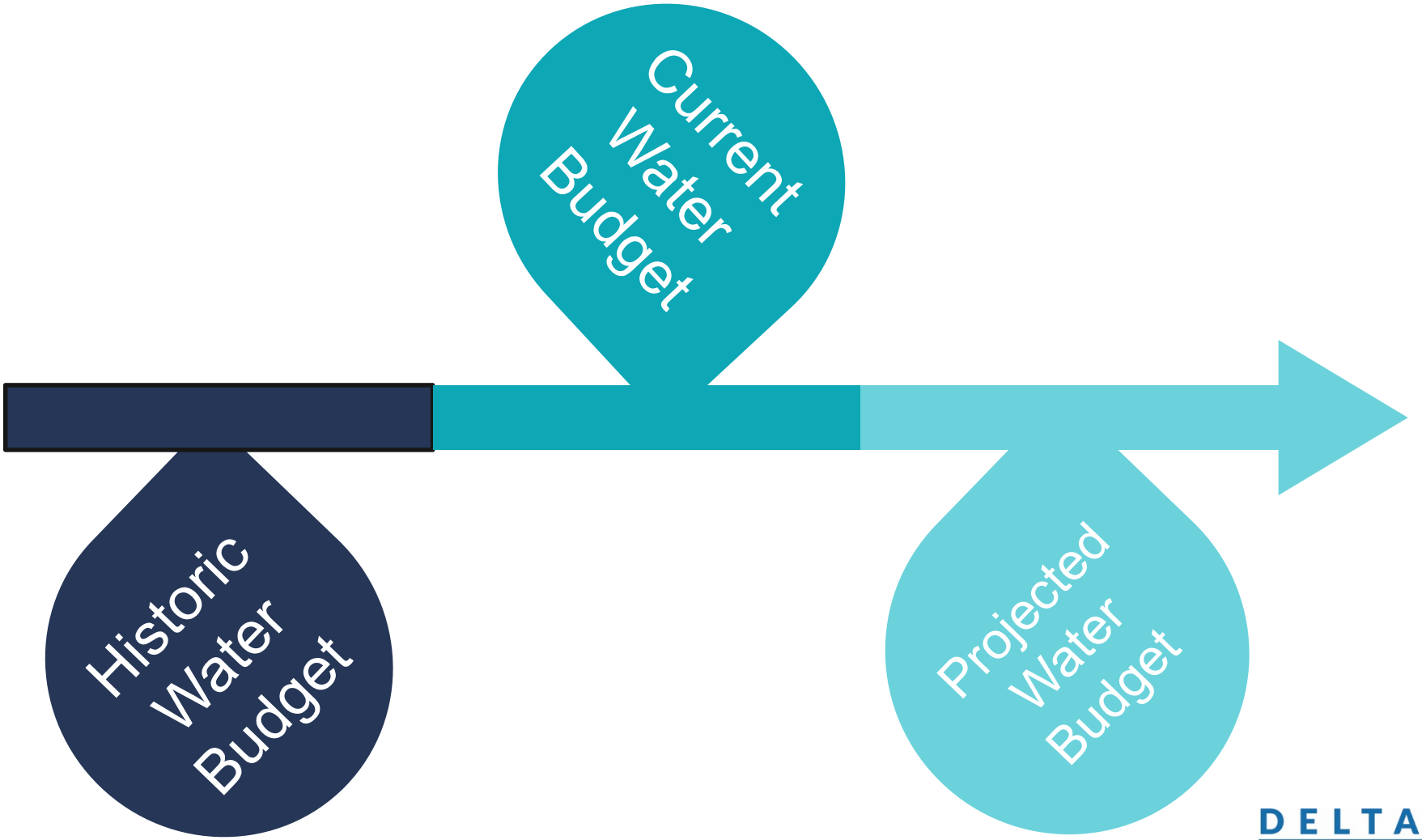
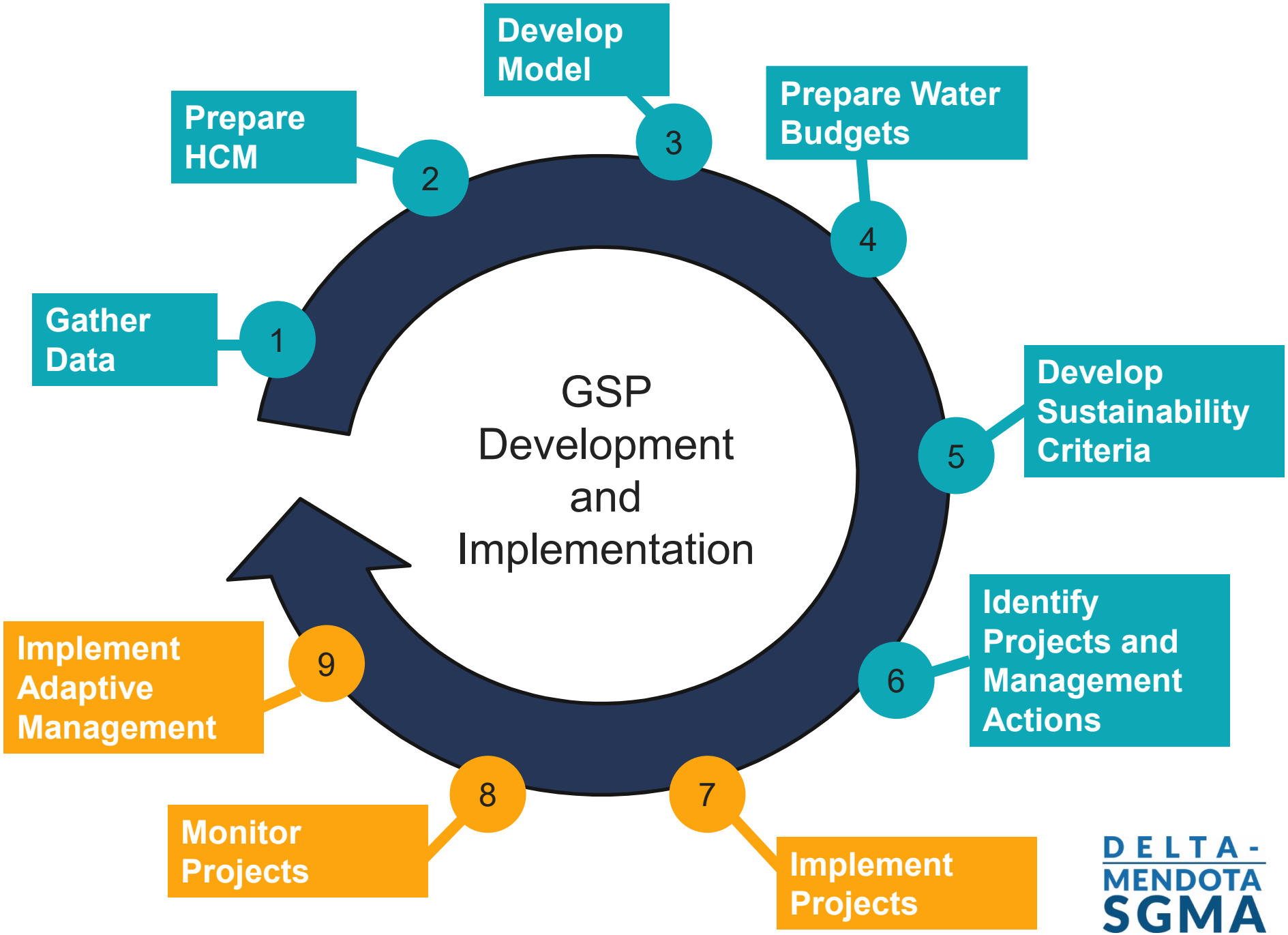
We are developing water budgets for three different periods.



DELTA-MENDOTA SGMA

Questions?

What's Next?



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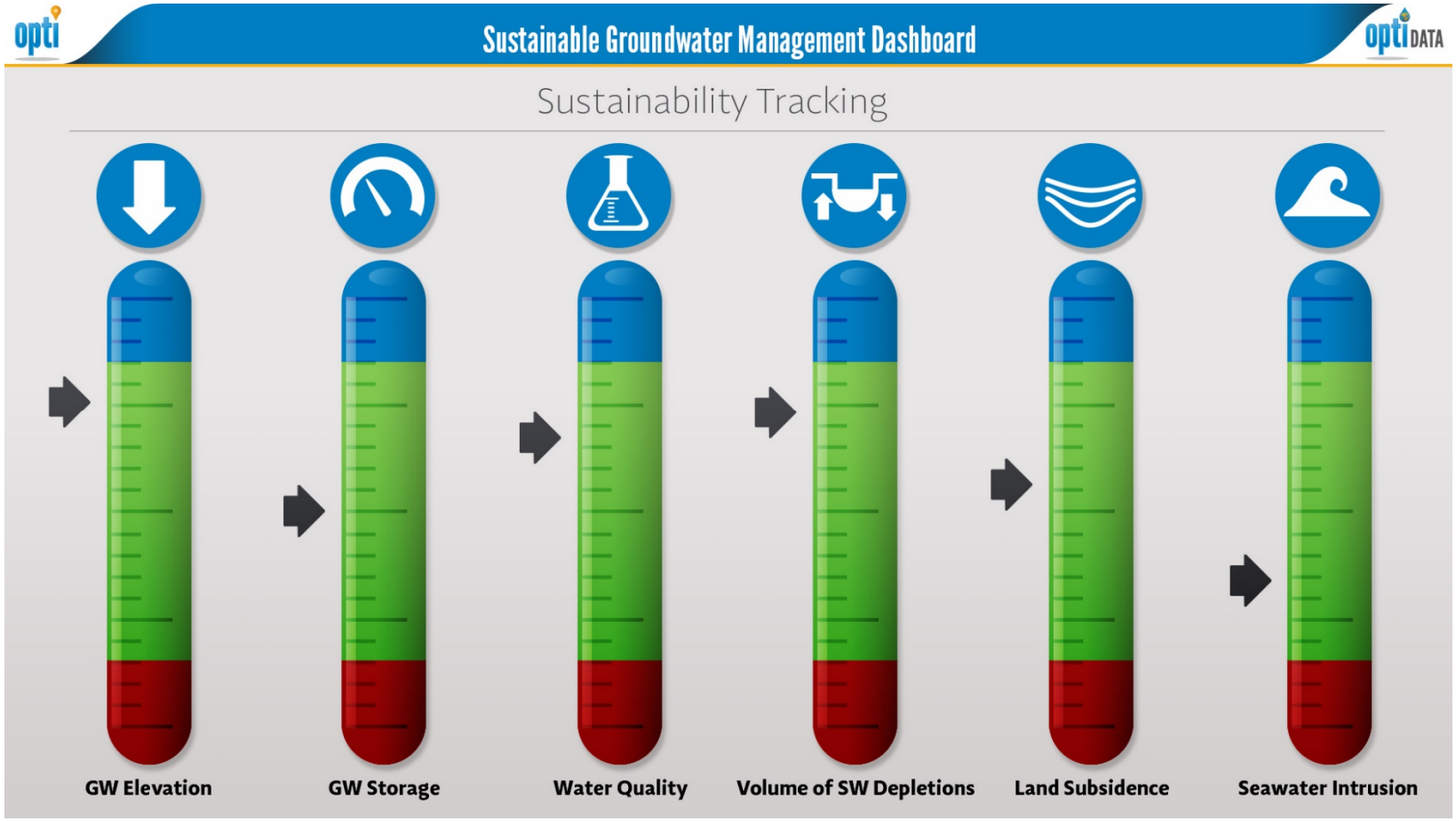
Sustainability indicators are like Gauges



DELTA-MENDOTA SGMA

What's next?

Winter 2018
Public Workshop #3: Water Budgets, Sustainability Goals and Criteria

Spring 2019
Public Workshop #4: Groundwater Projects and Management Actions

Sept - Nov 2019
Public Review of Draft Groundwater Sustainability Plans

Dec – Jan 2020
Groundwater Sustainability Plans adopted.

Jan 31, 2020
Groundwater Sustainability Plans submitted to State.

DELTA-MENDOTA SGMA

Get Involved

Talk to your local groundwater sustainability agency representative

Sign-up for your local groundwater sustainability agency's email list

Attend meetings and workshops

Provide input on groundwater sustainability plan development

Help us spread the word!

DELTA-MENDOTA SGMA

Attend Public Meetings and Workshops

Delta-Mendota Subbasin Coordination Committee: 4th Thursday of each month

Delta-Mendota Subbasin Technical Working Group: 3rd Tuesday of each month

Delta-Mendota Communications Working Group: 4th Tuesday of each month

DELTA-MENDOTA SGMA

Questions?

Open House – Meet Your Local Groundwater Sustainability Agency Representative

Public Workshop 2:
Spanish Announcements and Materials

Ayúdenos a Asegurar el Futuro de Nuestros Recursos Hídricos

Los organismos locales están desarrollando planes de sustentabilidad de las aguas subterráneas para asegurar el futuro de nuestros recursos hídricos. ¡Queremos saber su opinión! Asista al próximo taller público para saber un poco más. Cuenta con tres oportunidades de asistencia:

Firebaugh

Lunes, 22 de octubre, 5:00 - 7:00 PM
Escuela Secundaria MPR Firebaugh 1600 16th St, Firebaugh

Los Banos

Miércoles, 24 de octubre, 4:00 - 6:00 PM
Edificio de la Universidad Greens
1815 Scripps Drive, Los Banos

Patterson

Jueves, 25 de octubre, 4:00 - 6:00 PM
Centro Hammon para Ancianos 1033 W Las Palmas Ave, Patterson1033 W

El contenido de cada taller contendrá la misma información. Los primeros treinta minutos de cada taller consistirán en una presentación informativa, seguida de una exhibición. Se proporcionará interpretación al español. Los temas de los talleres incluyen:

- Ley para el Manejo de la Sustentabilidad de las Aguas Subterráneas,
- Balances hídricos, y
- Modelos del agua.

Para mayor información, por favor visite nuestra página web: www.deltamendota.org o contacte a Kirsten Pringle a través de Kirsten.Pringle@Stantec.com.

DELTA-MENDOTA SGMA

TALLER DE LA LEY PARA EL MANEJO DE LA SUSTENTABILIDAD DE AGUAS SUBTERRÁNEAS

¿QUÉ ES LA SGMA?

La **Ley para el Manejo de la Sustentabilidad de las Aguas Subterráneas** conocida como “SGMA” (y pronunciada sig-ma), es una ley estatal de California, aprobada en el 2014. La meta de la SGMA es asegurar el manejo sustentable a largo plazo de los recursos hídricos subterráneos del estado. La SGMA requiere que los organismos a lo largo de California cumplan con ciertos requerimientos. Estos incluyen:

- Formar Organismos para la Sustentabilidad de Aguas Subterráneas
- Desarrollar Planes para la Sustentabilidad de Aguas Subterráneas
- Lograr niveles balanceados de aguas subterráneas dentro de los próximos 20 años

¿CÓMO ME AFECTA ESTO?

Usted podría estar consumiendo agua subterránea sin darse cuenta. ¡En nuestra región, el agua subterránea es utilizada en los cultivos, paisajes, pastizales, ganado, e inclusive para tomar! El agua subterránea está en nuestros hogares, comercios y escuelas. Los recursos hídricos subterráneos forman una parte vital de nuestra salud y economía

Términos Comúnmente Usados

Cuenca/Subcuenca = Cuenca/Subcuenca de aguas subterráneas Delta-Mendota = Región de la Subcuenca Delta-Mendota

HCM = Modelo Conceptual Hidrogeológico

GSA = Organismo para la Sustentabilidad de Aguas Subterráneas

GSP = Plan para la Sustentabilidad de Aguas Subterráneas

SGMA = Ley para el Manejo de la Sustentabilidad de las Aguas Subterráneas del 2014

¿QUÉ SE ESTÁ HACIENDO AL RESPECTO?

Veinticuatro organismos para la sustentabilidad de las aguas subterráneas están trabajando en conjunto para crear seis planes para la sustentabilidad de las aguas subterráneas.

Tales planes definirán cómo los organismos implementarán, manejarán y medirán sus acciones específicas que manejen, de forma sustentable, el agua subterránea. Los planes de sustentabilidad para la Subcuenca Delta-Mendota deberán ser suministrados al estado en un plazo no mayor al 31 de enero del 2020.

APRENDA MÁS EN DELTAMENDOTA.ORG

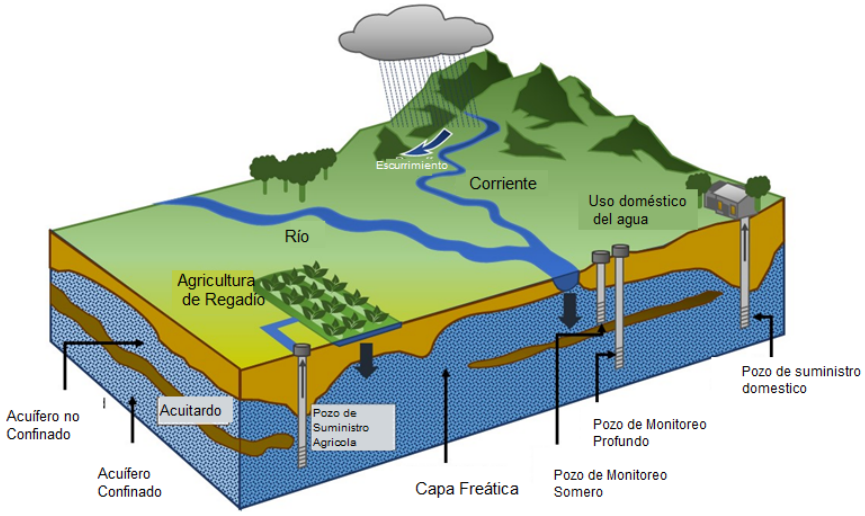
DELTA-MENDOTA SGMA

1 REUNIR INFORMACIÓN

La información de calidad es la base del proceso de desarrollo del plan para la sustentabilidad de las aguas subterráneas. Los organismos para la sustentabilidad de las aguas subterráneas utilizaran esta información para desarrollar los modelos, preparar los presupuestos hídricos, crear el criterio de sustentabilidad y monitorear la efectividad de los proyectos que implementemos. **Puede apoyar a su organismo para la sustentabilidad de las aguas subterráneas a recolectar información sobre las aguas subterráneas de la región Delta-Mendota.** Los organismos buscan información sobre:

PREPARAR EL HCM 2

Un modelo conceptual hidrogeológico (HCM) funge como la historia de lo que está sucediendo con el agua de la Subcuenca Delta-Mendota. Un HCM traza qué tipo de agua entra de la cuenca, cuál sale y de qué manera se mueve en la misma. Esta información será empleada para desarrollar los “basamentos fundamentales” del plan para la sustentabilidad de aguas subterráneas.



3 DESARROLLAR EL MODELO

Los modelos son herramientas que emplean ecuaciones, matemáticas y computadoras para estimular lo que sucede en la cuenca de aguas subterráneas. Los organismos para la sustentabilidad de aguas subterráneas en la región Delta-Mendota trabajan en conjunto para construir modelos de aguas subterráneas, apoyando así al desarrollo de los planes para la sustentabilidad de aguas subterráneas. Dos modelos distintos están siendo empleados: los modelos numéricos y los modelos analíticos.

PREPARAR LOS PRESUPUESTOS 4

Un presupuesto hídrico es como una cuenta corriente bancaria.

Los flujos entrantes son los depósitos. Los flujos salientes son los retiros. El saldo restante representa a los presupuestos hídricos. Los flujos entrantes y salientes son seguidos a través del tiempo para saber si el saldo final es positivo - en caso de que haya agua en la cuenca - o negativo - demasiada agua ha sido sacada. **Estamos tratando de mantener un balance hídrico positivo en la cuenca.**

Los organismos para la sustentabilidad de las aguas subterráneas en la región están, colaborativamente, desarrollando un presupuesto hídrico para la Subcuenca Delta-Mendota. Discutiremos sobre el presupuesto hídrico de esta subcuenca en nuestro próximo taller.

¿QUÉ ES LO SIGUIENTE?

Continuaremos desarrollando los planes para la sustentabilidad de aguas subterráneas durante los próximos ocho meses. Los borradores de los planes estarán disponibles para su revisión en otoño del 2019, pero esperamos que haga sus aportaciones antes de esto.

Invierno del 2018

Taller Público #3: Metas y Criterios para un Manejo Sustentable

Primavera del 2019

Taller Público #4: Proyectos de Aguas Subterráneas y Acciones de Manejo

Sept - Nov 2019

Revisión Pública de los Borradores de los Planes de Sustentabilidad de Aguas Subterráneas

Dic - Ene 2020

Desarrollar Planes para la Sustentabilidad de Aguas Subterráneas

Dic - Ene 2020

Se adoptan los Planes para la Sustentabilidad de Aguas Subterráneas

INVOLÚCRESE

Manténgase Informado - Inscríbase en la lista de correos electrónicos de su organismo para la sustentabilidad de aguas subterráneas local.

Asista a una Reunión Pública o Taller - Visite deltamendota.org para obtener una lista del cronograma regular de reuniones y talleres públicos.

Ofrezca Aportes - Ayude a su organismo para la sustentabilidad de aguas subterráneas al ofrecer aportes sobre el plan, identificando proyectos potenciales de aguas subterráneas y brindando información.

¿Dudas o Comentarios?

Hable con el representante de su organismo para la sustentabilidad de aguas subterráneas local luego de esta presentación

Visite nuestro sitio web en deltamendota.org

Envíe sus dudas generales a dmsgma@sldmwa.org

¡GRACIAS POR VENIR!

Ayúdenos a planificar talleres futuros llenando nuestro formulario de comentarios.

DELTA-MENDOTA SGMA

Taller de la Ley para el Manejo de la Sustentabilidad de Aguas Subterráneas

22 de octubre del 2018

DELTA-MENDOTA SGMA

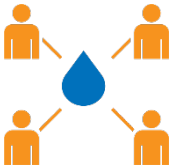
Programa

1. Bienvenida
2. Introducciones
3. Presentación de la Ley para el Manejo de la Sustentabilidad de Aguas Subterráneas
4. Preguntas/Respuestas
5. Panel Abierto

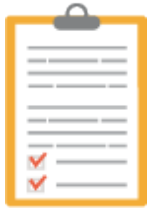
Ley para el Manejo de la Sustentabilidad de Aguas Subterráneas del 2014

Terminología de la Ley para el Manejo de la Sustentabilidad de Aguas Subterráneas

SGMA = Ley para el Manejo de la Sustentabilidad de Aguas Subterráneas



GSA = Organismo para la Sustentabilidad de Aguas Subterráneas



GSP = Plan para la Sustentabilidad de Aguas Subterráneas

HCM = Modelo Conceptual Hidrogeológico

DELTA-MENDOTA SGMA

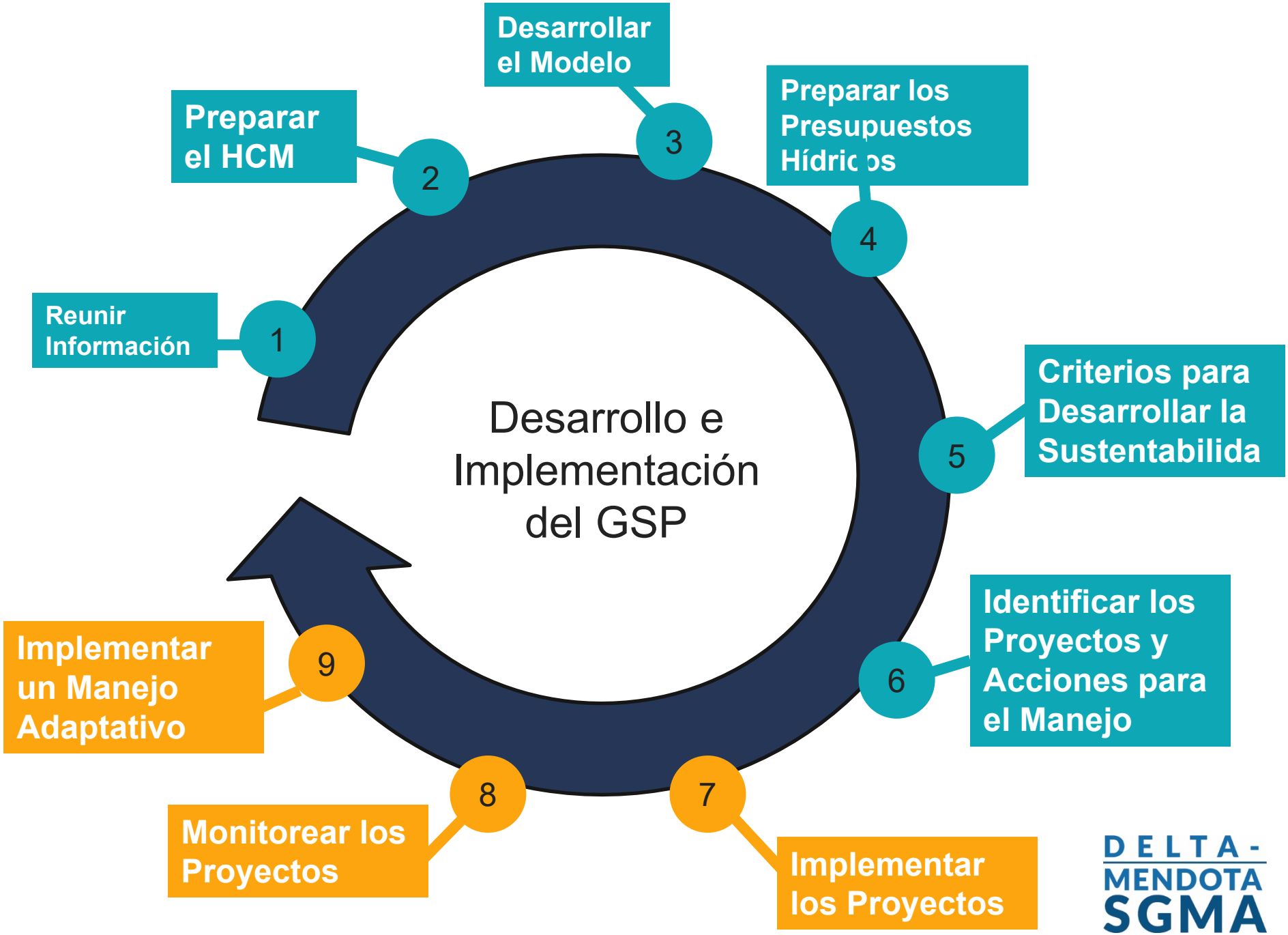
Cronograma de la Ley para el Manejo de la Sustentabilidad de Aguas Subterráneas

Para el **30 de junio del 2017** se deberán formar las Agencias de Sustentabilidad de Aguas Subterráneas.

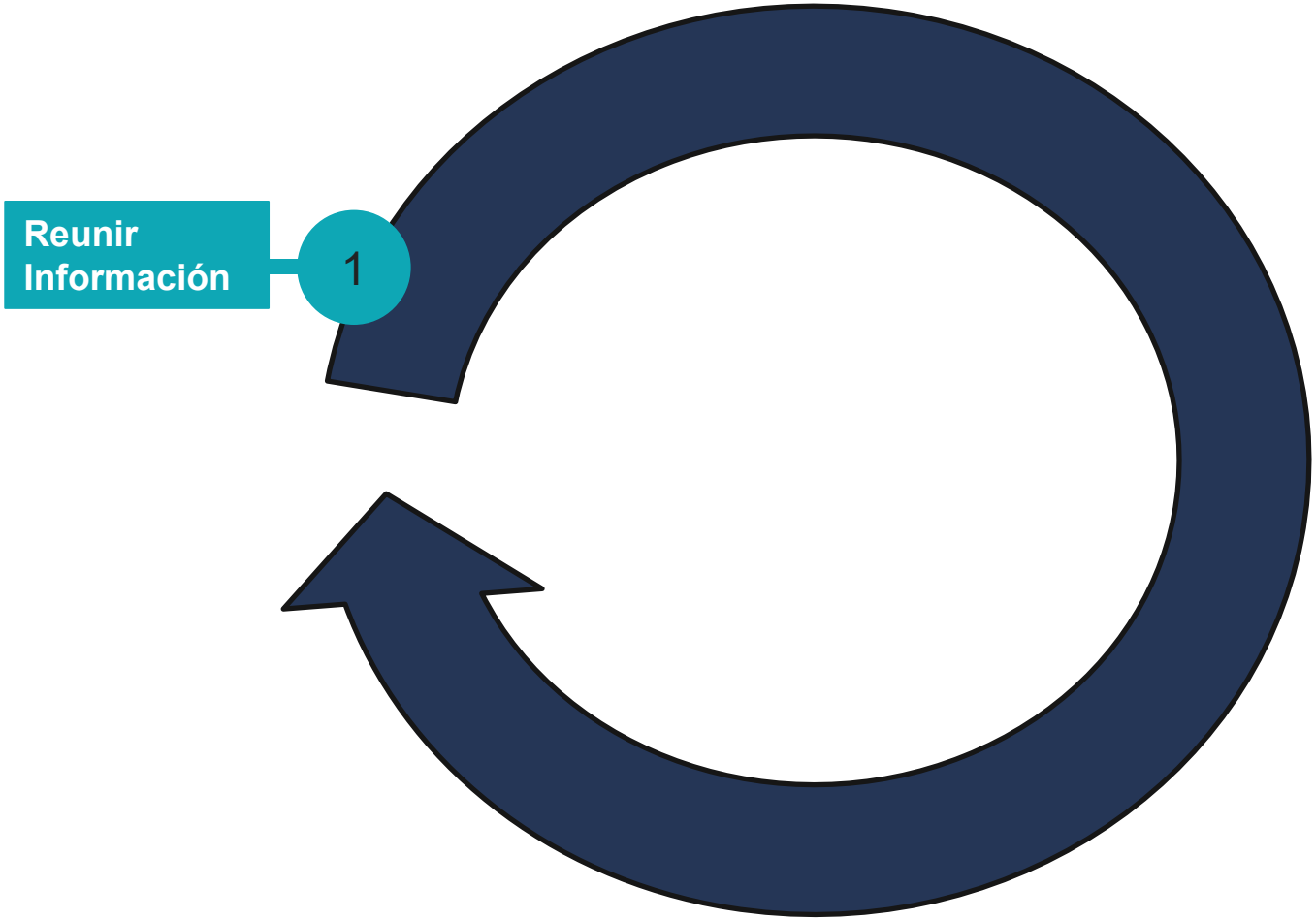
Para el **31 de enero del 2017** se deberán enviar los Planes para la Sustentabilidad de Aguas Subterráneas.

Para el **31 de enero del 2017** la Subcuenca Delta-Mendota deberá lograr la sustentabilidad.

DELTA-MENDOTA SGMA


Desarrollo e Implementación del GSP
1
Reunir Información
2
Preparar el HCM
3
Desarrollar el Modelo
4
Preparar los Presupuestos Hídricos
5
Criterios para Desarrollar la Sustentabilida
6
Identificar los Proyectos y Acciones para el Manejo
7
Implementar los Proyectos
8
Monitorear los Proyectos
9
Implementar un Manejo Adaptativo
DELTA-MENDOTA SGMA

Paso 1: Reunir Información



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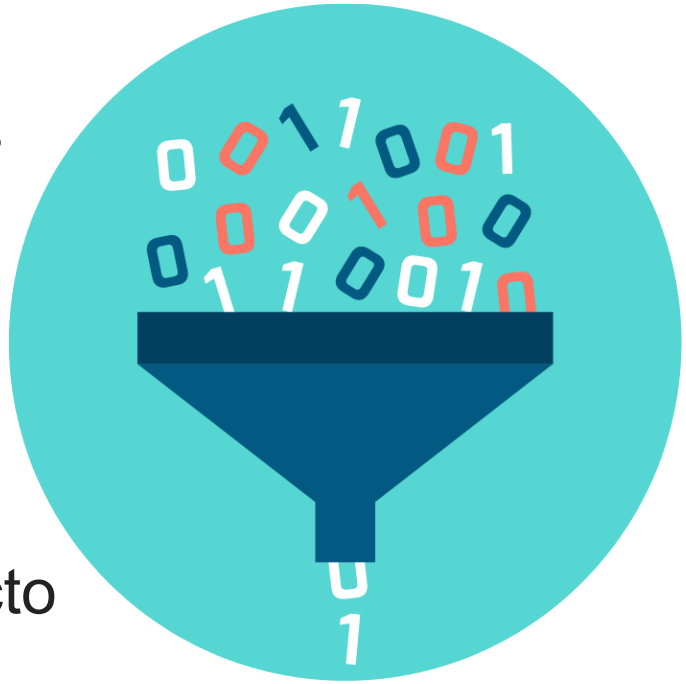
Paso 1: Reunir Información

- Información precisa
- Extracción de aguas subterráneas
- Niveles de aguas subterráneas
- Calidad del agua
- Entregas a los productores
- Uso de la tierra
- Tipos de suelo
- Información de recarga del proyecto
- Transferencias
- Derrames/Contaminación
- Localización de las instalaciones/Infraestructura
- Políticas de aguas subterráneas
- Información de cómo/en caso de que experimente los impactos de las aguas subterráneas



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Lagunas de Información

Usted puede **ayudarnos** a poner fin a estas lagunas de información

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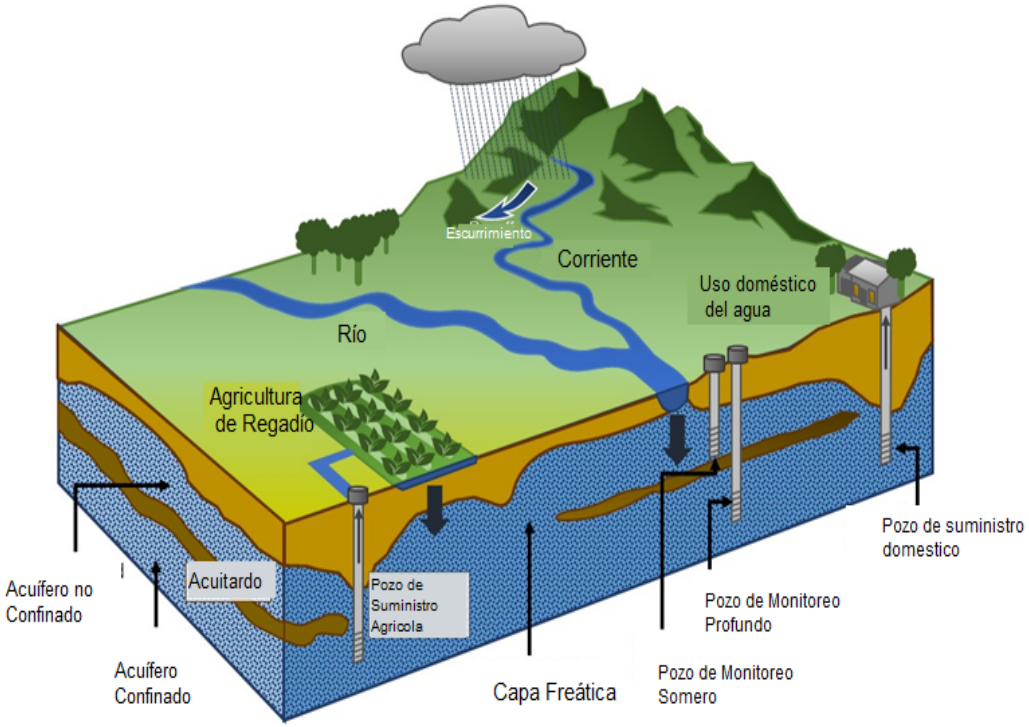
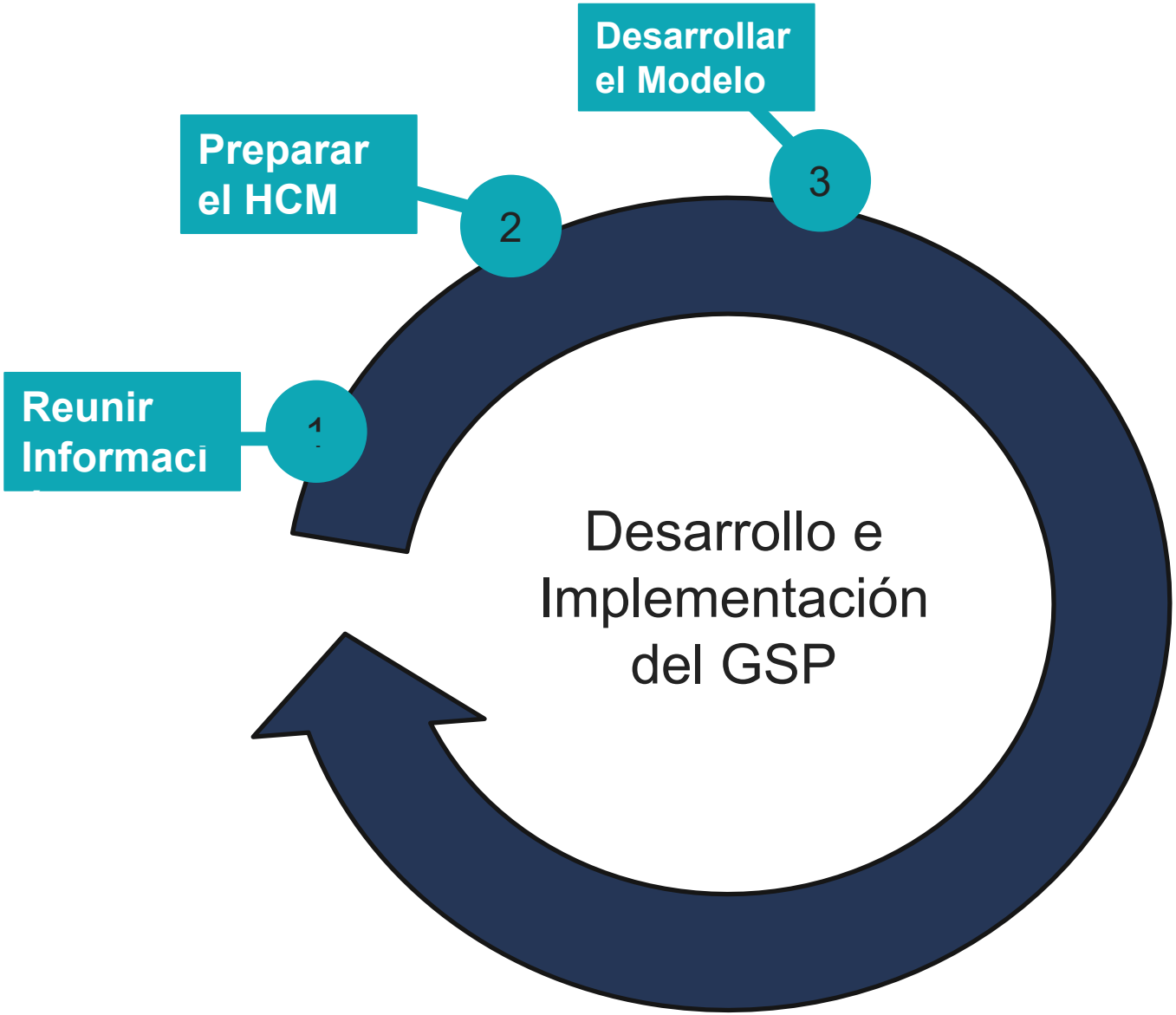
¿Qué es un Modelo Conceptual Hidrogeológico?

Una historia de aguas subterráneas...



DELTA-MENDOTA SGMA



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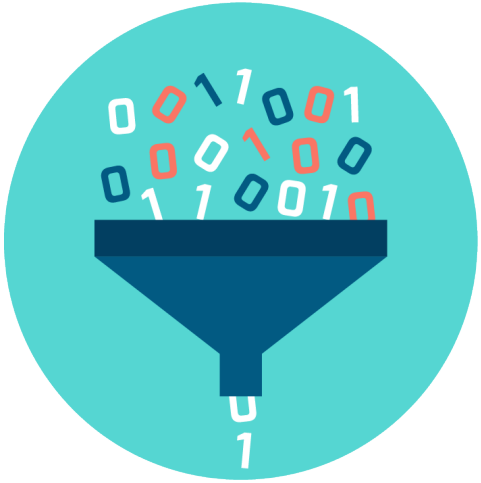
¿Qué son los modelos?



Información

El HCM

Modelo

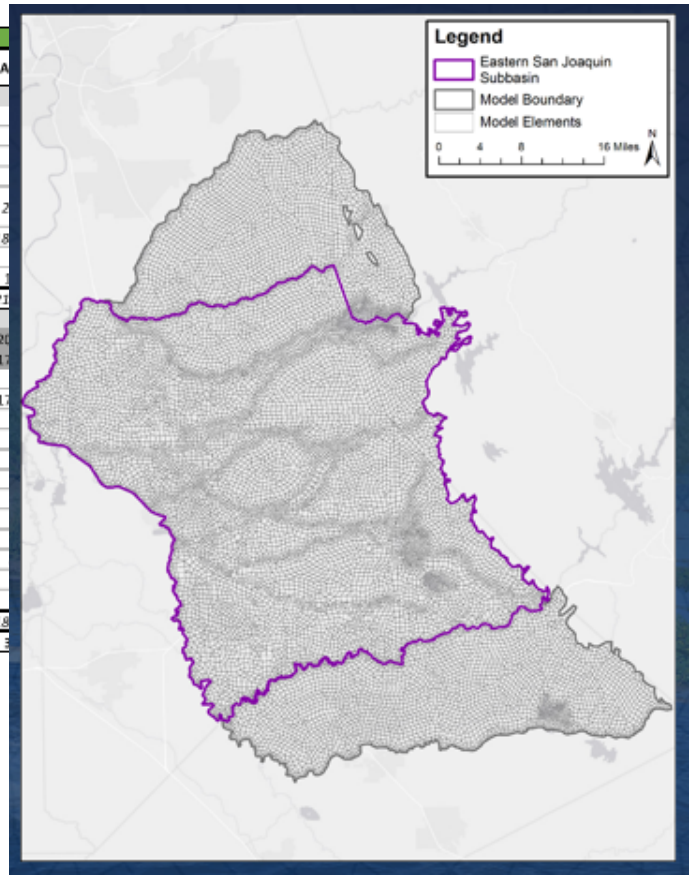
DELTA-MENDOTA SGMA

Tipos de Modelos

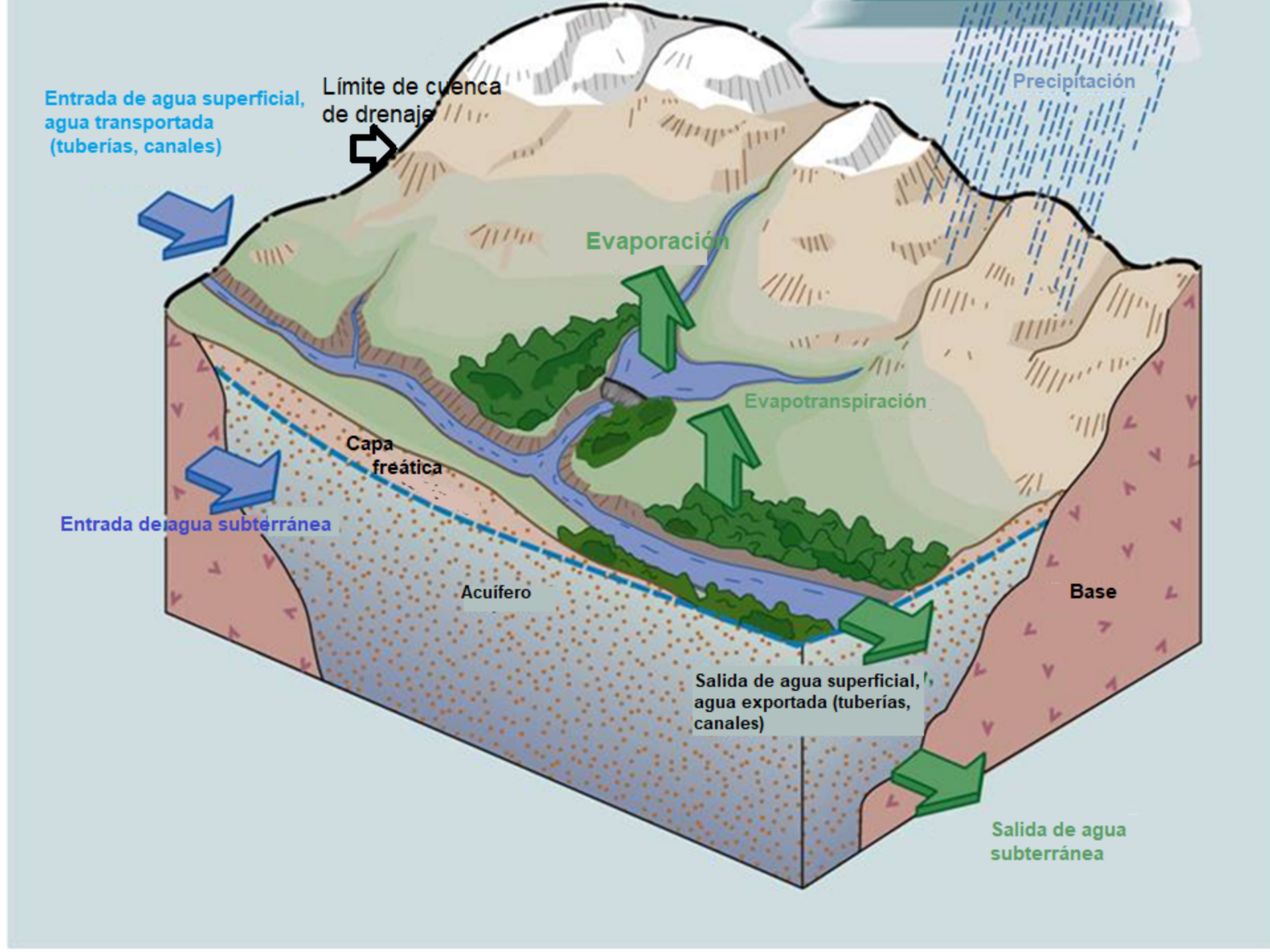
Analítico

Row #		LAND SURFACE SYSTEM (AF)										
		Component	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	A
1		*Natural Supplies*											
2		Precip Ag (+)	0	40,905	37,530	7,983	35,699	20,852	51,922	17,101	0	382	
3		Precip Native(+)	0	6,642	6,093	1,296	5,796	3,386	8,430	2,777	0	62	
4		Precip Urban (+)	0	5,184	4,756	1,012	4,524	2,643	6,580	2,167	0	48	
5		Ag Supply											
6		*Ag SW Delivery (+) (Diversion minus losses)*	*4,652*	*568*	*243*	*64*	*137*	*2,032*	*4,661*	*45,517*	*138,496*	*125,280*	*2*
7		*Ag Pumping (+)*	*49,747*	*0*	*0*	*0*	*0*	*18,407*	*39,251*	*109,588*	*85,416*	*122,440*	*18*
8		Urban Supply											
9		Urban Pumping (+)	3,867	2,386	2,033	1,990	1,661	2,455	2,610	4,043	7,886	5,848	1
10		*Inflow Subtotal*	*58,265*	*2,953*	*2,276*	*2,054*	*1,798*	*22,895*	*46,522*	*159,149*	*231,798*	*253,569*	*21*
11	OUTFLOWS	*Ag water Demand*											
12		Total Ag Demand (ETc+Irr Eff)	54,399	17,169	8,017	7,756	11,599	41,292	95,833	172,207	223,912	248,102	20
13		Ag Demand (ETc)	45,237	14,537	6,825	6,587	9,850	34,073	79,127	141,784	183,897	203,345	17
14		Outflows to the Atmospheric System											
15		ET Ag (-)	45,237	14,537	6,825	6,587	9,850	34,073	79,127	141,784	183,897	203,345	17
16		ET Native	0	5,434	1,799	1,296	4,722	3,386	8,430	2,777	0	62	
17		ET Urban	3,867	1,901	702	702	1,843	4,110	5,807	6,210	7,886	5,896	
18		Outflows to the Stream System											
19		Runoff Ag	0	6,355	4,947	0	4,241	362	11,761	37	0	0	
20		Runoff Native	0	0	0	0	0	0	0	0	0	0	
21		Runoff Urban	0	2,772	2,436	0	2,258	952	3,383	0	0	0	
22		Outflows to the Groundwater System											
23		*Recharge Ag*	*1,632*	*1,244*	*1,133*	*241*	*1,075*	*1,239*	*2,875*	*5,166*	*6,717*	*7,443*	
24		*Recharge Native*	*0*	*199*	*183*	*39*	*174*	*102*	*253*	*83*	*0*	*2*	
25		*Recharge Urban*	*116*	*227*	*204*	*90*	*186*	*153*	*276*	*186*	*237*	*177*	
26		*Outflow Subtotal*	*50,852*	*32,669*	*18,230*	*8,956*	*24,350*	*44,376*	*111,912*	*156,244*	*198,738*	*216,925*	*18*
27		**Land Surface System Budget**	**7,414**	**-29,716**	**-15,954**	**-6,902**	**-22,551**	**-21,481**	**-65,390**	**2,905**	**33,060**	**36,644**	**3**

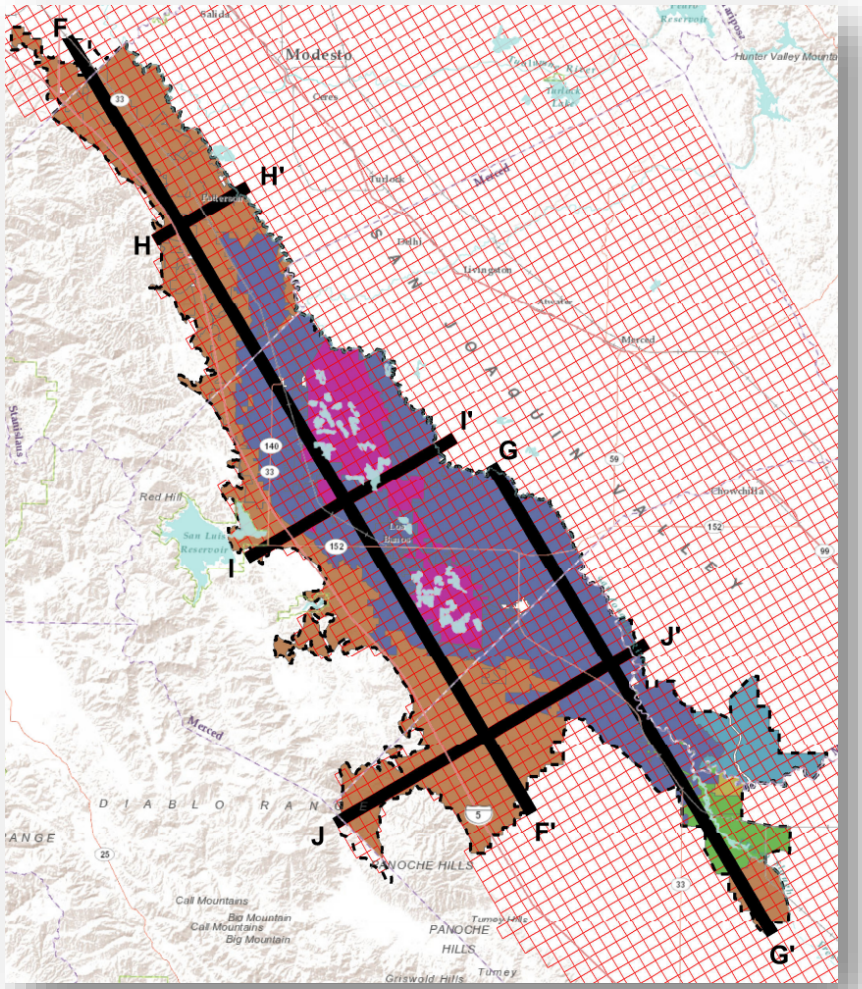
Numérico

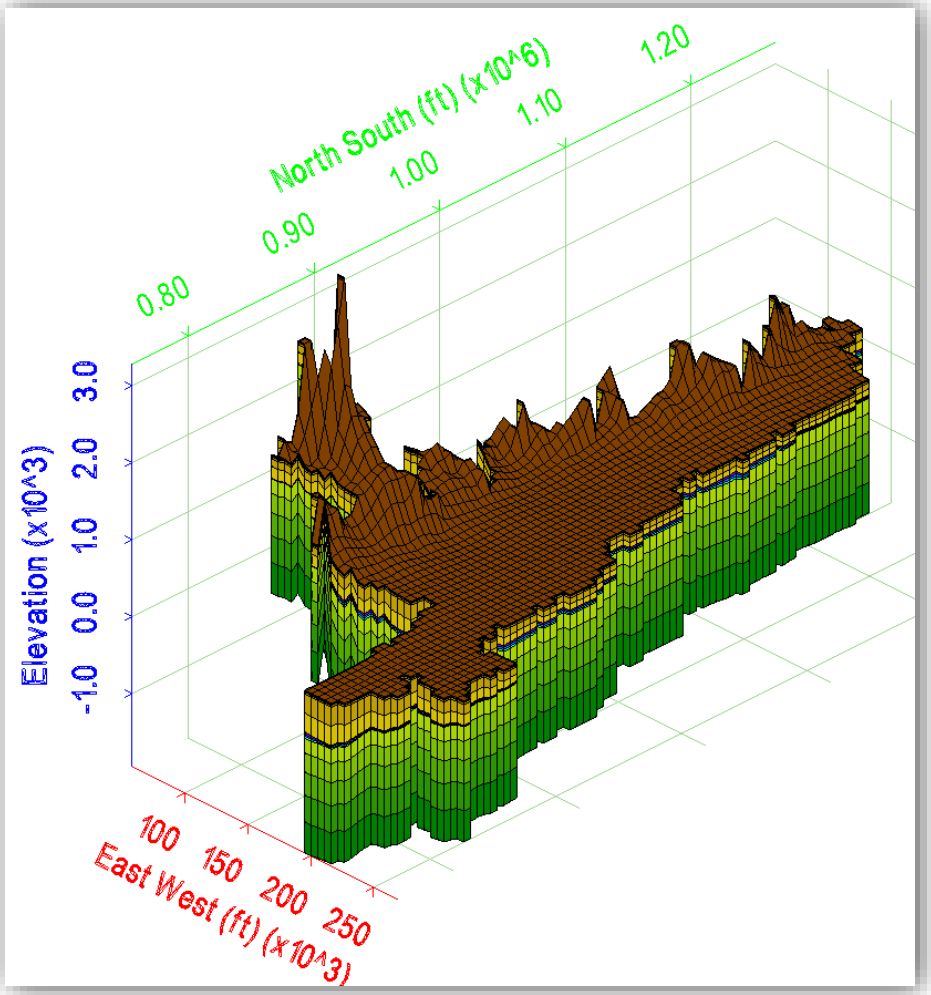


DELTA-MENDOTA SGMA


Entrada de agua superficial, agua transportada (tuberías, canales)
Límite de cuenca de drenaje
Precipitación
Evaporación
Evapotranspiración
Capa freática
Entrada de agua subterránea
Acuífero
Base
Salida de agua superficial, agua exportada (tuberías, canales)
Salida de agua subterránea

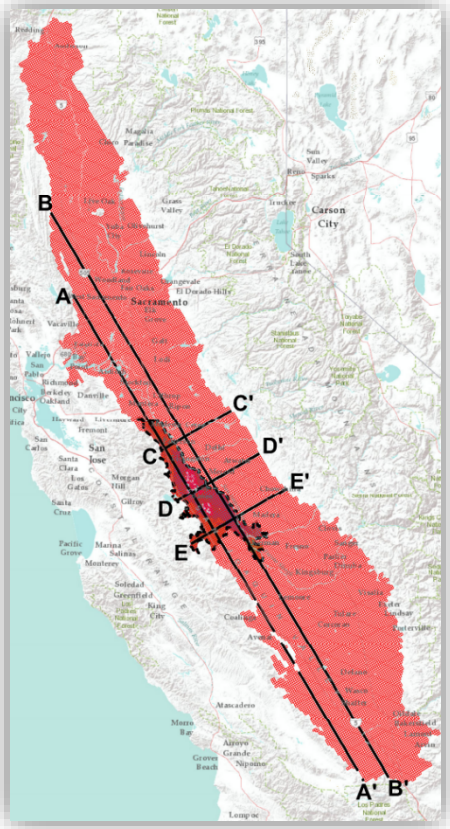
GSP Noroeste y del Centro: Red CVHM2

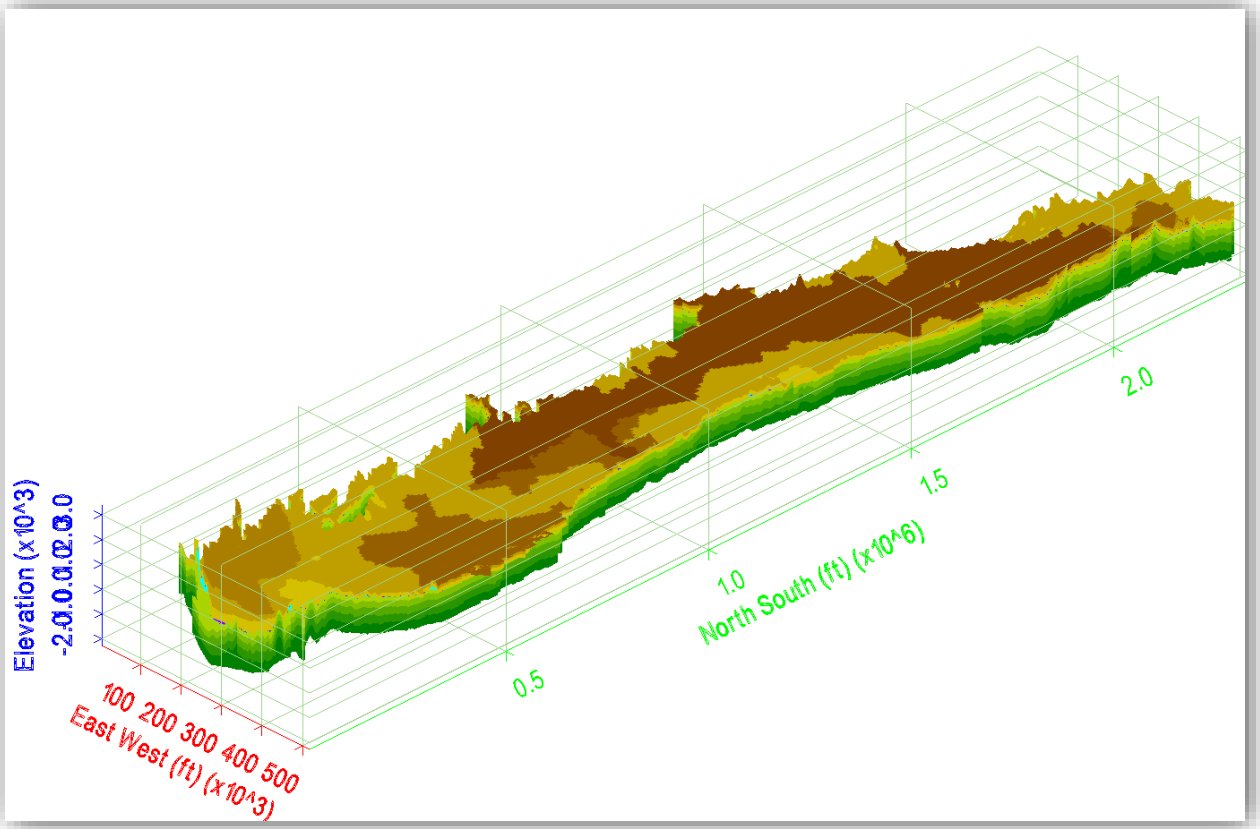




DELTA-MENDOTA SGMA

GSP Noroeste y del Centro: Capas CVHM2





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[Con la presentación en los dos tipos de modelos]

Marcador para la presentación de los modelos para otros GSPs

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¿Qué es un Presupuesto Hídrico?

DELTA-MENDOTA SGMA

Un presupuesto hídrico es como una cuenta corriente bancaria...

Depósitos

−

Retiros

=

Balance

DELTA-MENDOTA SGMA

Aportes

−

Resultados

=

Balance Hídrico

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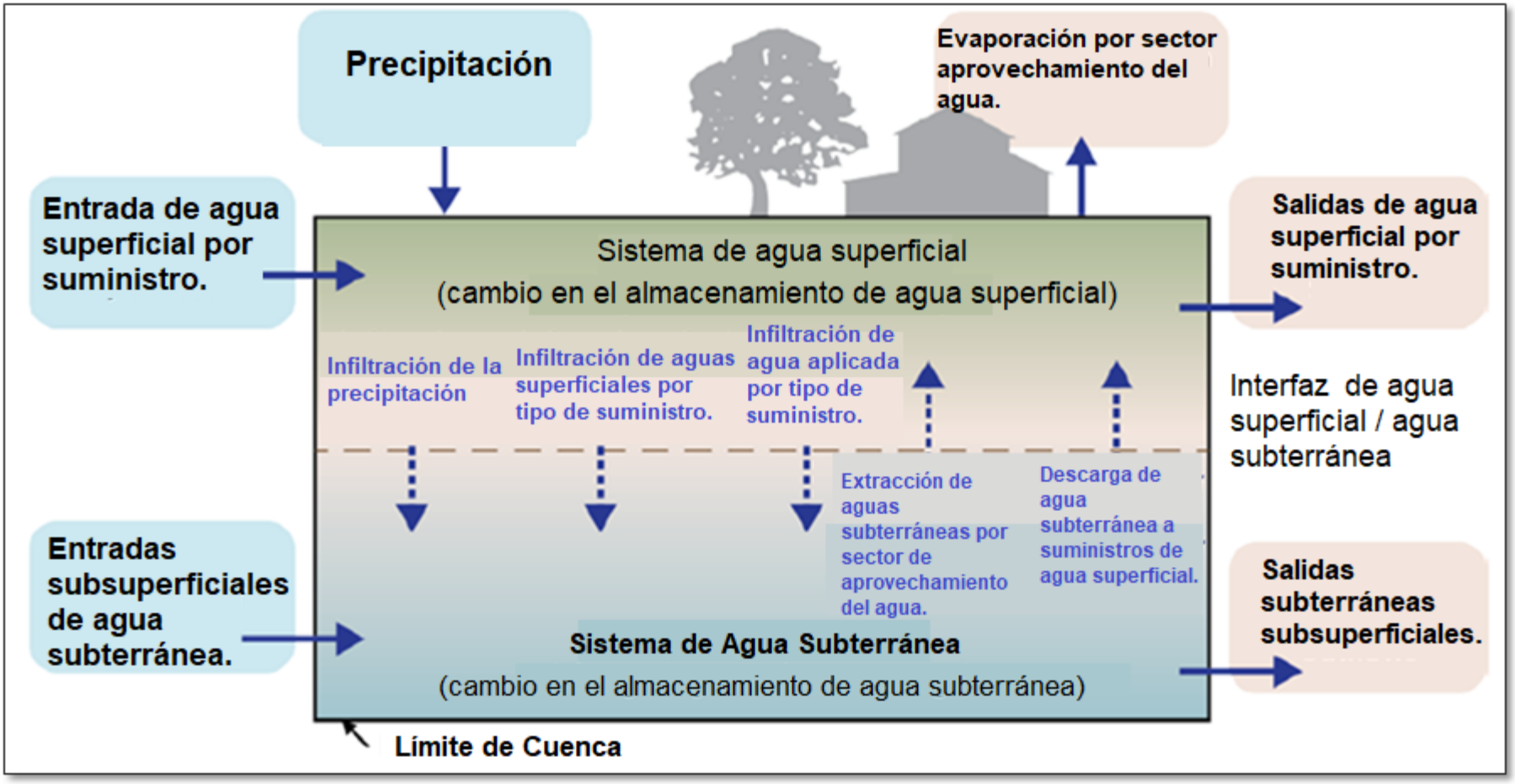
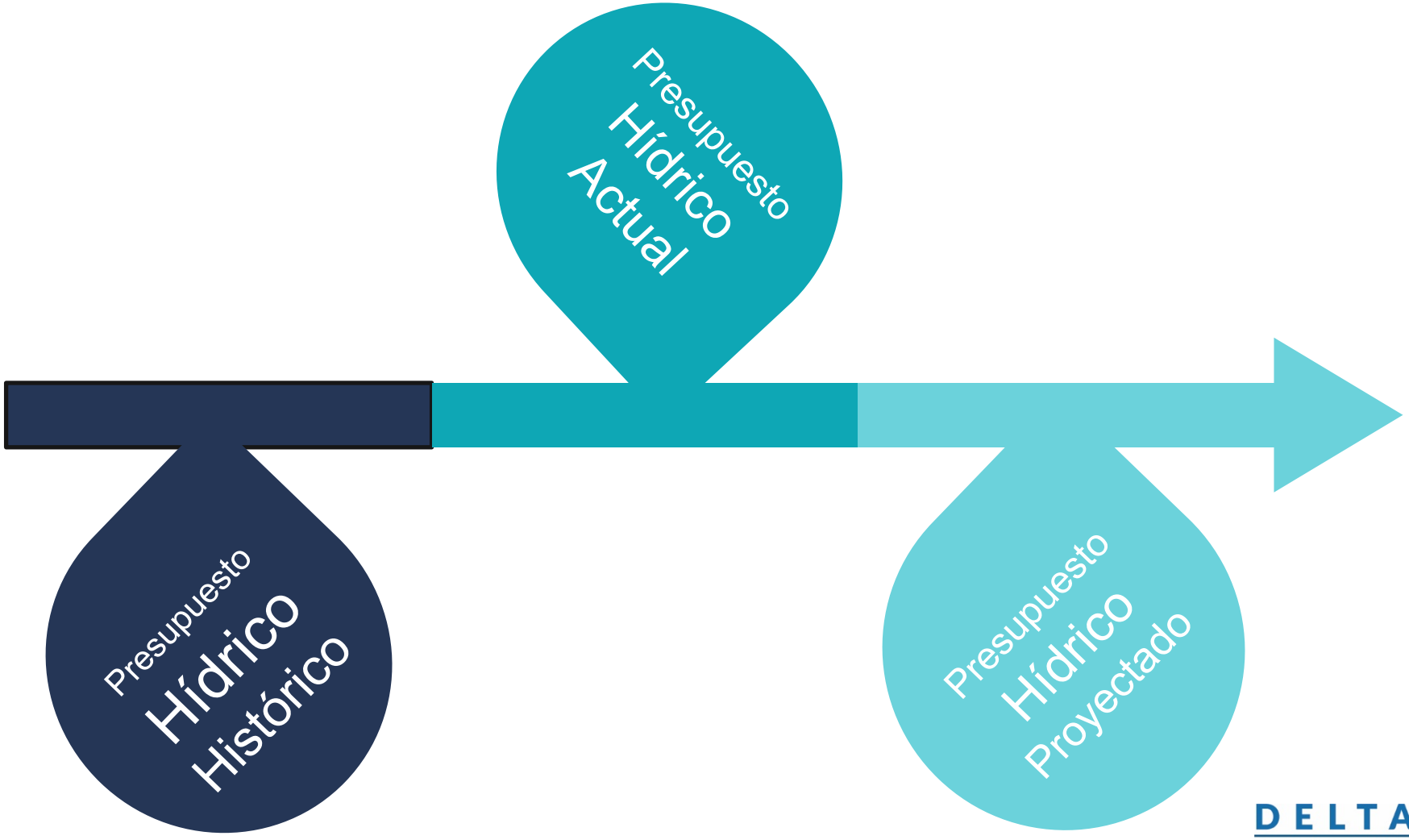


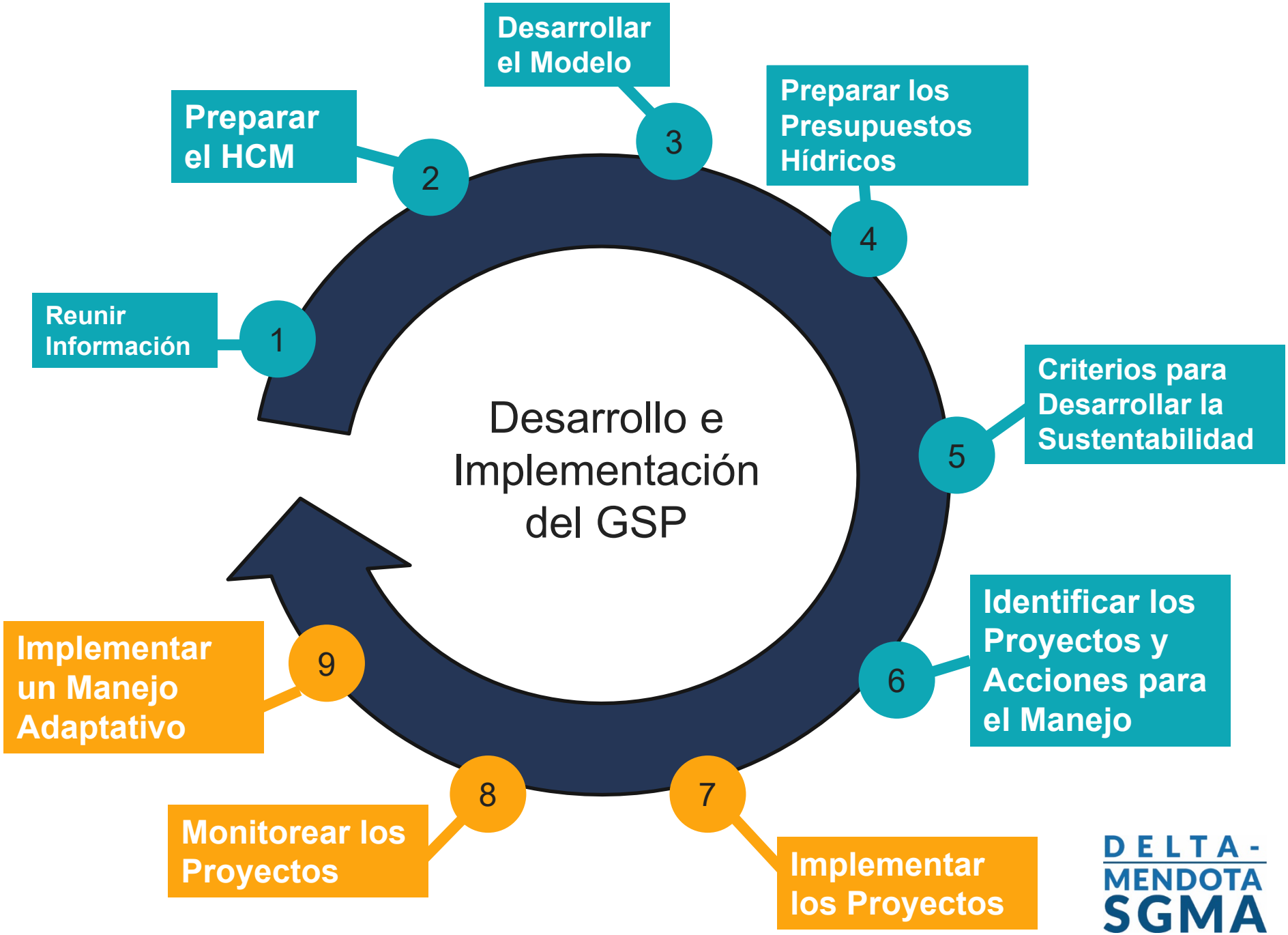
DELTA-MENDOTA SGMA

Estamos desarrollando presupuestos hídricos para tres períodos distintos.

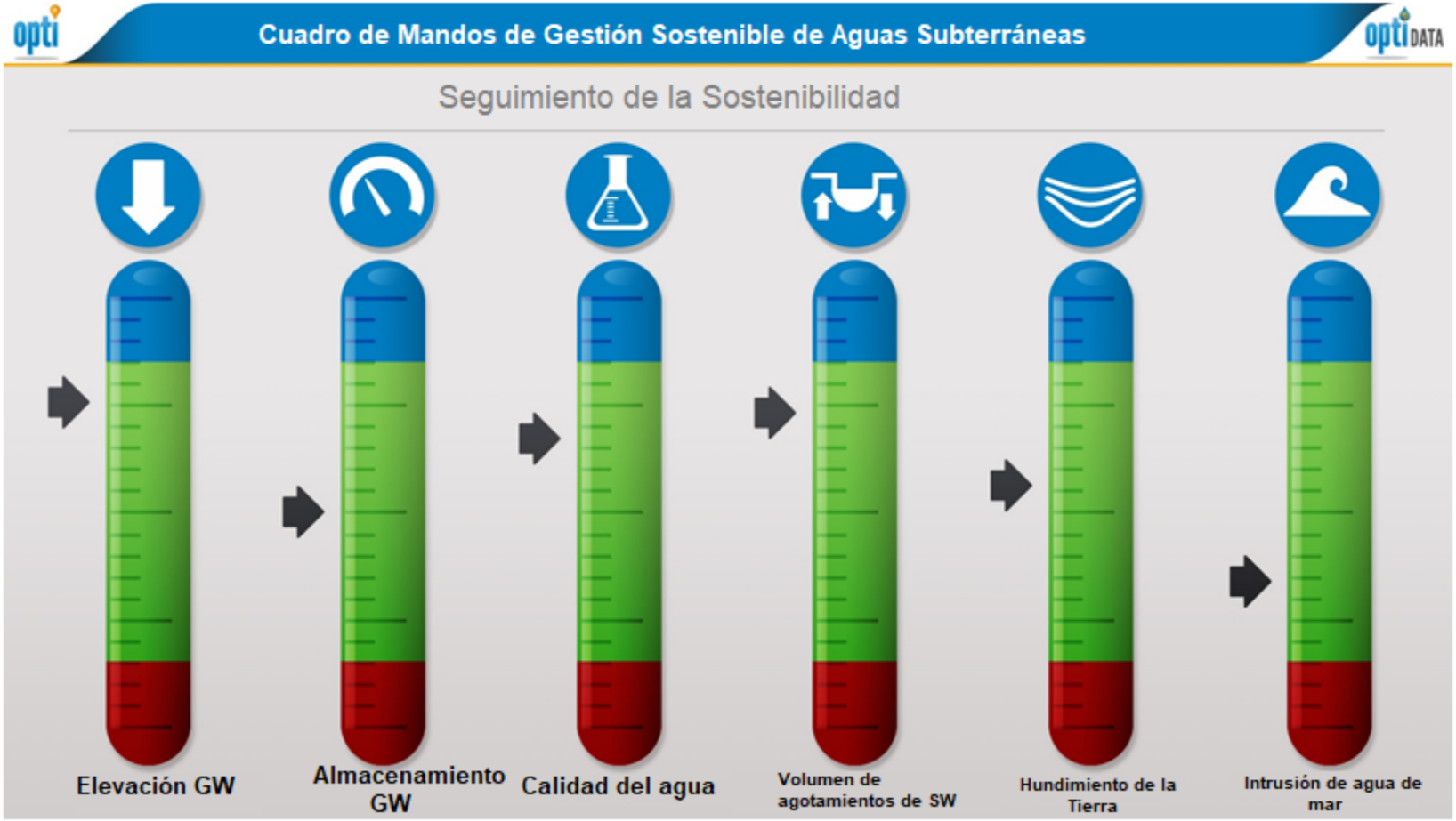


DELTA-MENDOTA SGMA

¿Qué es lo siguiente?


Desarrollo e Implementación del GSP
1
Reunir Información
2
Preparar el HCM
3
Desarrollar el Modelo
4
Preparar los Presupuestos Hídricos
5
Criterios para Desarrollar la Sustentabilidad
6
Identificar los Proyectos y Acciones para el Manejo
7
Implementar los Proyectos
8
Monitorear los Proyectos
9
Implementar un Manejo Adaptativo
DELTA-MENDOTA SGMA

Los indicadores de sustentabilidad son como medidores



DELTA-MENDOTA SGMA

¿Qué es lo siguiente?

Invierno del 2018
Taller Público #3: Metas y Criterios para un Manejo Sustentable

Primavera del 2019
Taller Público #4: Proyectos de Aguas Subterráneas y Acciones de Manejo

Sept - Nov del 2019
Revisión Pública de los Borradores de los Planes de Sustentabilidad de Aguas Subterráneas.

Dic - Ene del 2020
Se adoptan los Planes para la Sustentabilidad de Aguas Subterráneas.

31 de enero del 2020
Los Planes para la Sustentabilidad de Aguas Subterráneas son enviados al estado.

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Involúcrese

Hable con el representante de su agencia de sustentabilidad local

Regístrese en la lista de correos electrónicos de su agencia de sustentabilidad local

Asista a las reuniones públicas y a los talleres

Ofrezca aportes sobre el plan de sustentabilidad de aguas subterráneas

¡Ayúdenos a correr la voz!

DELTA-MENDOTA SGMA

Asista a las reuniones públicas y a los talleres

Comité Coordinadora de la Subcuenca Delta-Mendota: 4to jueves de cada mes

Grupo de Trabajo Técnico de la Subcuenca Delta-Mendota: 3er martes de cada mes

Grupo de Trabajo de Comunicaciones de la Subcuenca Delta-Mendota: 4to jueves de cada mes

DELTA-MENDOTA SGMA

¿Preguntas?

Panel Abierto - Conozca al Representante de su Organismo para la Sustentabilidad de Aguas Subterráneas Local

Public Workshop 2:
Workshop Summary

DELTA-MENDOTA SUBBASIN
SUSTAINABLE GROUNDATER MANAGEMENT ACT
FALL 2018 COORDINATED WORKSHOPS

Monday, October 22, Firebaugh
5:00 – 7:00 PM
Firebaugh Middle School MPR

Wednesday, October 24, Los Banos
4:00 – 6:00 PM
College Greens Building

Thursday, October 25, Patterson
4:00 – 6:00 PM
Patterson Senior Center

WORKSHOP SUMMARY

- Three workshops were held in the northern, central, and southern parts of the Delta-Mendota Subbasin. The purpose of the workshops was to educate stakeholders and members about the public about key Sustainable Groundwater Management Act (SGMA) topics in preparation for Groundwater Sustainability Plan (GSP) development workshops in 2019.
- The format and content of each workshop was the same. The workshops began with a 45-minute presentation, followed by an open house period for participants to talk with their Groundwater Sustainability Agency (GSA) representative. Spanish interpretation was provided at each workshop.
- In total, approximately 45 individuals (not including GSA representatives and supporting staff) participated in the workshops. Attendance by location was as follows: Firebaugh – 5 participants; Los Banos – 23 participants; Patterson – 17 participants. Three participants requested Spanish interpretation.
- Most participants heard about the workshops through emails from their local water or irrigation district, or direct flyers and bill inserts sent to them by their water/irrigation district or municipality.
- Presentation topics included: Overview of SGMA, GSP development and implementation process, data management, hydrogeologic conceptual model, numerical and analytical models, and the water budget.
- Workshop participants' questions and feedback are summarized as follows:

  Data

  - How much historical data are the GSAs using to make their assumptions?
  - Will data from counties be used?

- Is the numerical data available on the Delta-Mendota website?
- How big will the GSAs' monitoring network be? Do the GSAs anticipate drilling new monitoring wells?
- How will the GSAs monitor water quality and subsidence? Do the GSAs already have subsidence monitoring wells and data?
- How much data have the GSAs gathered? When will the GSAs stop gathering data?
- How much data will the GSAs be collecting from individual landowners?

Models

- Will the models take into account availability of surface water supplies?
- Will the models take into account changing crops?
- Will the models take into account agricultural areas that are being converted to commercial or urban areas?

Water Budget and Sustainable Yield

- What is the sustainable yield for the Delta-Mendota Subbasin?
- It sounds like the sustainable yield will be a number that oscillates around a baseline. What is this baseline?
- How will the GSAs determine the minimum threshold for the subbasin?
- How will the water budgets account for existing and new wells?
- What are the years for the historic water budget? How was this period set?

Projects and Management Actions

- Based on what is currently known, will the GSAs be able to limit groundwater pumping in the future?
- When the GSAs come up with groundwater management policies, will the policies impact groundwater pumping on an individual level, regional level, or basin-wide level?
- Will the California Department of Water Resources (DWR) or the GSAs be the ones to limit pumping?
- Could a potential management action be limiting pumping?
- Will the GSAs be the agencies to determine if new wells can or cannot be drilled?

Integration with Other Programs/Organizations

- How much are the GSAs integrating with the Irrigated Lands Program?
- How closely do GSAs work with local farm bureaus?

Other

- Will there be an administrative fee for the GSAs to oversee GSP implementation?
- How will the costs for GSP development and implementation be covered?
- Do the GSAs know what DWR's GSP review and certification process will consist of?

- Will the GSAs in the region have influence over how surface water resources are managed on a state-wide level?
- How many GSAs were formed after SGMA passed in 2014?

Public Workshops No. 3

Public Workshop 3:
Meeting Sign In Sheets

TUESDAY, FEB 9

DELTA-MENDOTA SGMA WORKSHOP

NAME	EMAIL
JEFF MICHELENA	jeffmichelena@yahoo.com
Jerry Michelena	jeraldjohnmichelena@gmail.com
John Michelena	
Ric Ortega	rortega@guadwater.org
Romenger Silva	
Bobby Pierce	
Walt Ward	wward@envres.org
JP Rubino	jphoot1@yahoo.com
Garrett Martin	
Mani Sandhu	sbrosfarms@gmail.com
John Willis Jonbrink	JJTEWbrink@AOL.com
Seth Harris	SethHarris@SLDMWA.org
Adam Scheuber	ascheuber@delpuertowd.org
Laura Guido	trinta Brothers
Brian S. Lopes	brianjlopes@hotmail.com
Arthur Hanson	ahansen@delpuertowd.org
Kevin Donlon	kevin@donlonrealty.com
Joe Martini	JoeJMartinii@Yahoo.com
Nav Athwal	nav@trinitfarms.com
Michael Petz	petzfarmingco@gmail.com
George Klopping	Klopping Ranch

NAME	EMAIL
FERNANDO ULLOA	fulloa@ci.patterson.ca.us
Daniel Roberts	
Edward MAGEE	MAgee1@LLNL.gov
Maria Encinas	mencinas@ci.patterson.ca.us

TUES, FEB 19

DELTA-MENDOTA SGMA WORKSHOP

NAME	EMAIL
Mark Fachin	Markf@LosBanos.org
Laurie Rouch	Lrouch@sldmwa.org
Deborah Matos	DMatos@SMCWD.com
Sean Allen	Sean.Allen@wildlife.ca.gov
Jarett Martin	—
Roy Catania	roy@oneilhay.com
Ben Fenters	BFenters@SCWD.NET
LISA FORD	ALMENDRA FARMS
Maria Gamino	17093 N RUSSELL
Ramiro Gamino	"
Andrew Garcia	andrew.garcia@sldmwa.org
JOE HOPKINS	JHOPKINS@MCMG.COM

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
March 4, 2019, 6:00 – 8:00 PM
Romero Elementary School
13500 West Luis Rd. Santa Nella, CA 95322

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Pablo Rodriguez	Gustine	psrod1@hotmail.com	Work
Dominga Mosquez			
Dimas Misquez	Santa Nella		Sign
Danny Galindez	Santa Nella	danny1tq@yahoo.com	Water board news
Fred L. Mishler	Santa Nella	Fredroe02@Gmail.com	Sign
Steve Lamoy	Santa Nella		[illegible]
Laurie Rouch	Los Banos	Lrouch@sldmwa.org	work @ SNCWD
Silvia Tobon	Santa Nella		sing

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
March 4, 2019, 6:00 – 8:00 PM
Romero Elementary School
13500 West Luis Rd. Santa Nella, CA 95322

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Genaro Tobon	Gustine		Work
Petra Ramos-Andrade	Santa Nella		mtg.
Richard Guimmond	SANTA NELLA	SLTROJAN81@SBCGlobal.NET	

DELTA-MENDOTA SGMA

Delta-Mendota SGMA Workshop
March 4, 2019, 6:00 – 8:00 PM
Romero Elementary School
13500 West Luis Rd. Santa Nella, CA 95322

NAME	CITY OF RESIDENCY	EMAIL	HOW DID YOU HEAR ABOUT THE WORKSHOP?
Paul Villarreal	Santa Nella	—	—
Pamela Guido-King	Santa Nella		

Public Workshop 3:
English Announcements and Materials

Help Us Plan for the Future of Our Water Resources

Local agencies are developing groundwater sustainability plans to plan for the future of our groundwater resources. We want to hear from you! Come to an upcoming public workshop to learn more.

You have multiple opportunities to attend:

Los Banos

Tuesday, February 19, 4:00 - 6:00 PM
College Greens Building
1815 Scripps Drive, Los Banos, 93635

Patterson

Wednesday, February 20, 4:00 - 6:00 PM
Patterson City Hall
1 Plaza Circle, Patterson, CA 95363

The content of each workshop will be the same. The first forty minutes of each workshop will consist of an informational presentation. The presentation will be followed by an interactive breakout session where we will discuss the region's groundwater "budget."

Spanish-language interpreters and materials will be available.

For more information, please visit our website at www.deltamendota.org.

We look forward to seeing you there!

PROP 1
GOVERNOR EDMUND G. BROWN, JR.
WATER BOND 2014
RELIABILITY | RESTORATION | RESILIENCE

DELTA-MENDOTA SGMA

Delta-Mendota Subbasin Sustainable Groundwater Management Act Workshop

February 2019

DELTA-MENDOTA SGMA

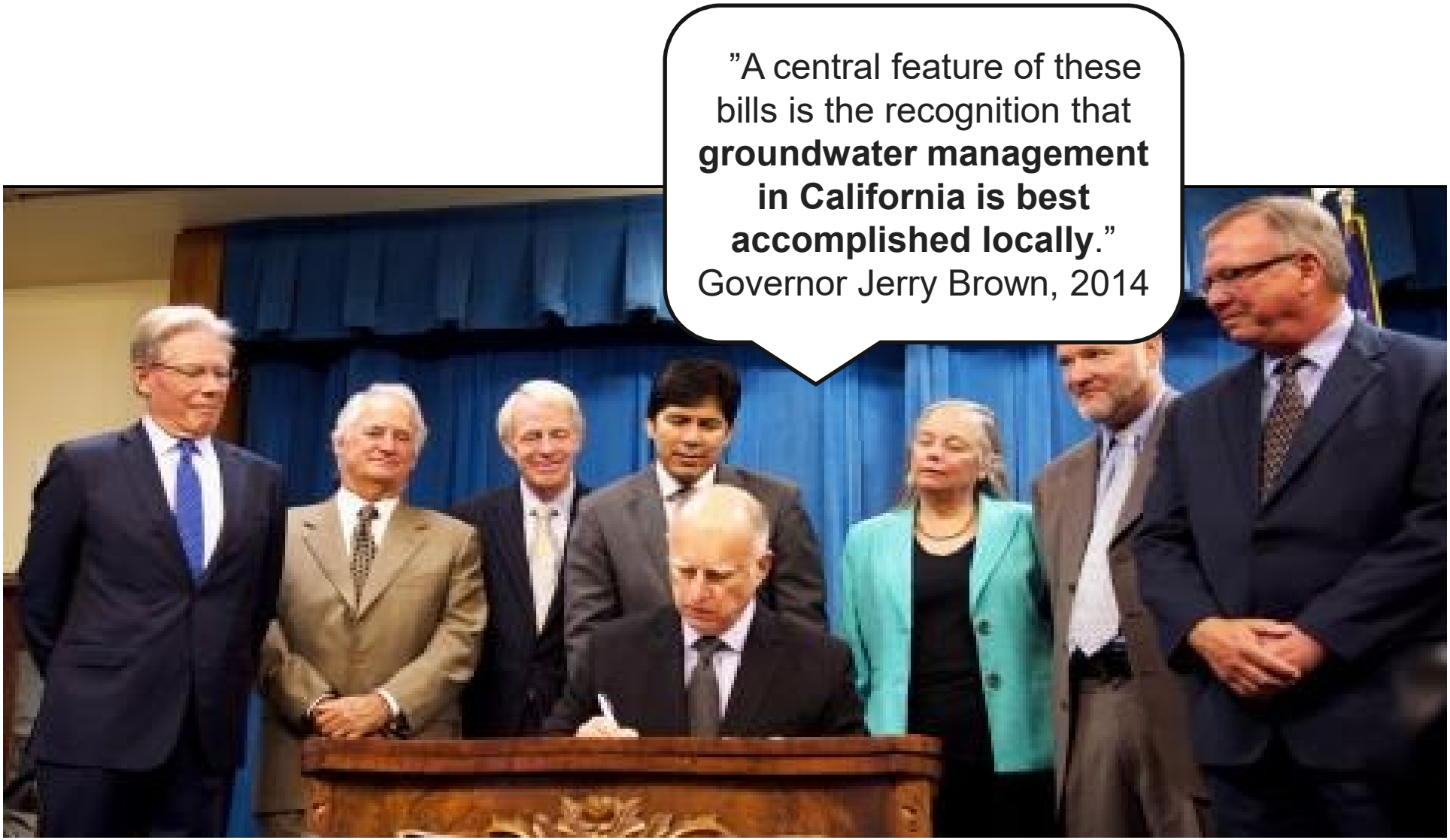
DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

PROP 1 · GOVERNOR EDMUND G. BROWN, JR. · WATER BOND 2014 · RELIABILITY | RESTORATION | RESILIENCE

Agenda

1. Welcome
2. Introductions
3. Presentation
4. Breakout Sessions

Sustainable Groundwater Management Act of 2014



Sustainable Groundwater Management Act Terms

SGMA = Sustainable Groundwater Management Act

GSA = Groundwater Sustainability Agency

GSP = Groundwater Sustainability Plan

aquifer = an underground layer of water-bearing materials, such as gravel or sand, from which water can be pumped

DELTA-MENDOTA SGMA

Sustainable Groundwater Management Act Timeline

June 30, 2017
Groundwater Sustainability Agencies must be formed.

January 31, 2020
Groundwater Sustainability Plans must be submitted to the State.

January 31, 2040
Delta-Mendota Subbasin must achieve sustainability.

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Public Participation and Outreach

- ✓ Consider interests of all beneficial uses and users of groundwater
- ✓ Provide opportunities for public engagement
- ✓ Adopt groundwater sustainability plan at public meeting

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Questions?

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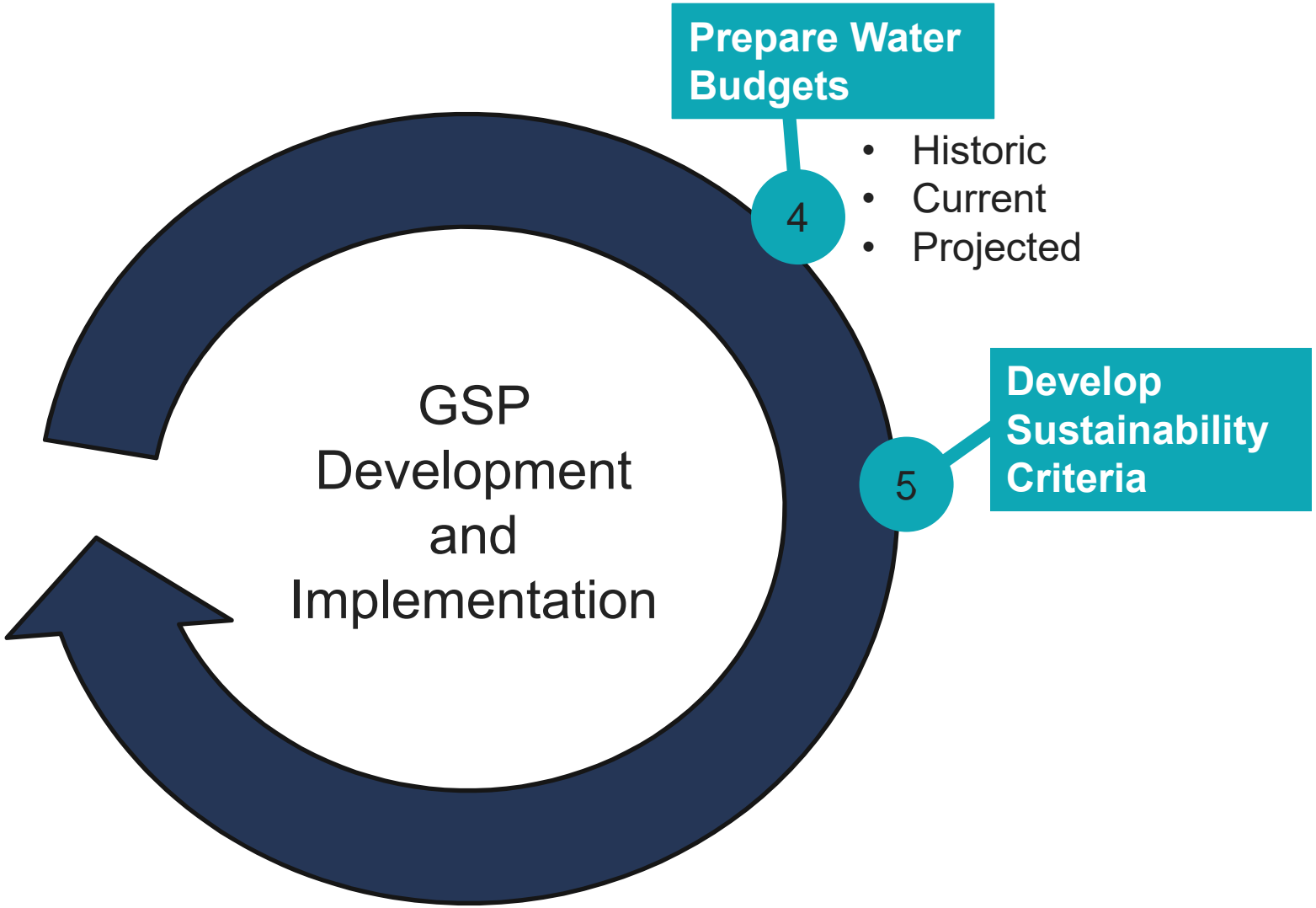

DELTA-MENDOTA SGMA

SGMA GSP Requirements

- Establish sustainability goals
- Define “significant and unreasonable” and criteria for undesirable results
- Develop sustainability goal, minimum thresholds and measurable objectives
- Develop plan for meeting sustainability goal
- Implement plan
- Monitor progress
- Engage stakeholders throughout process

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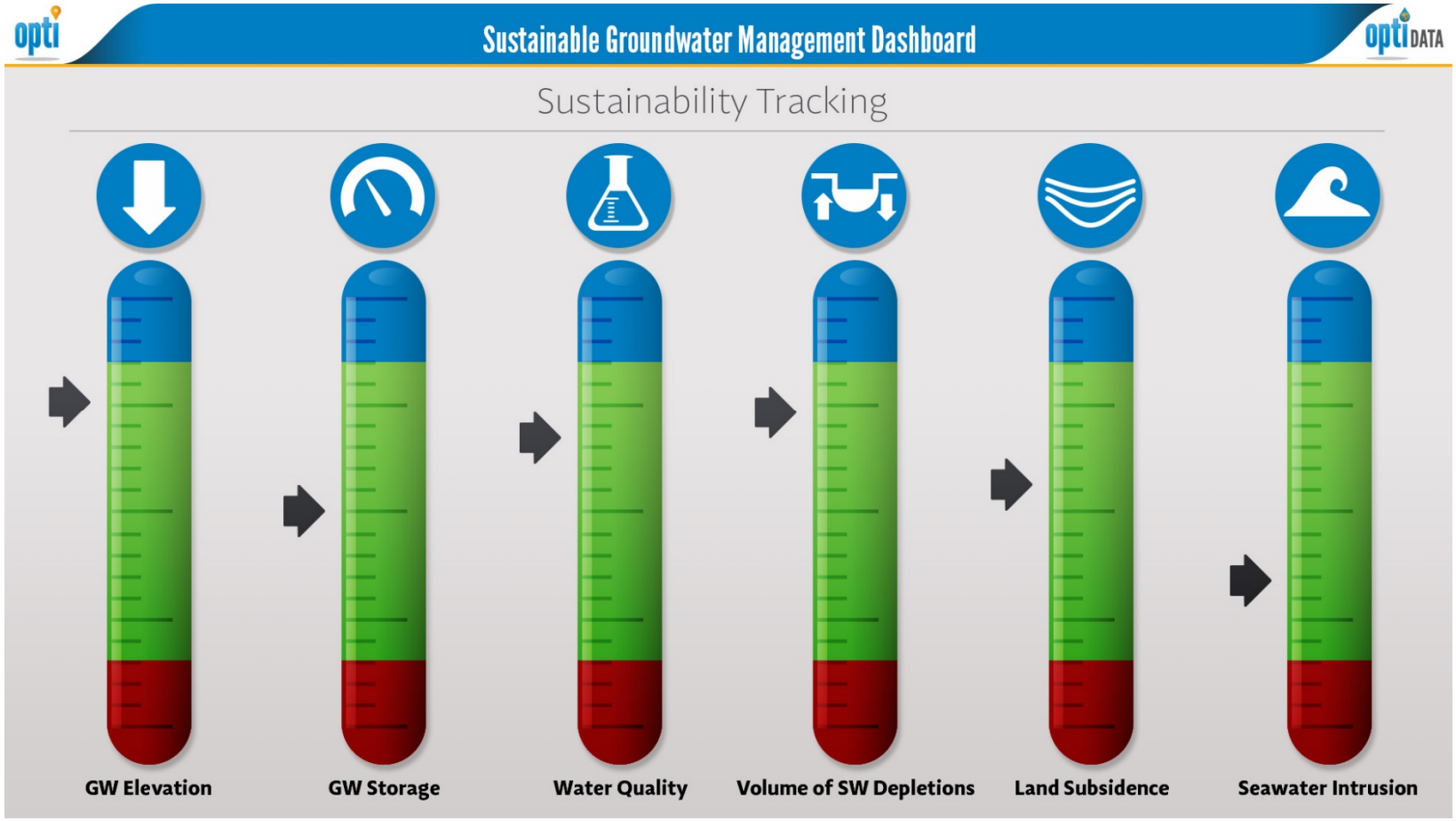
So What Are Undesirable Results?

Undesirable results are <u>significant and unreasonable</u> impacts caused by:

1. Chronic lowering of groundwater levels
2. Reduction of groundwater storage
3. Degraded water quality
4. Land subsidence
5. Depletions of interconnected surface water

What are sustainability indicators?



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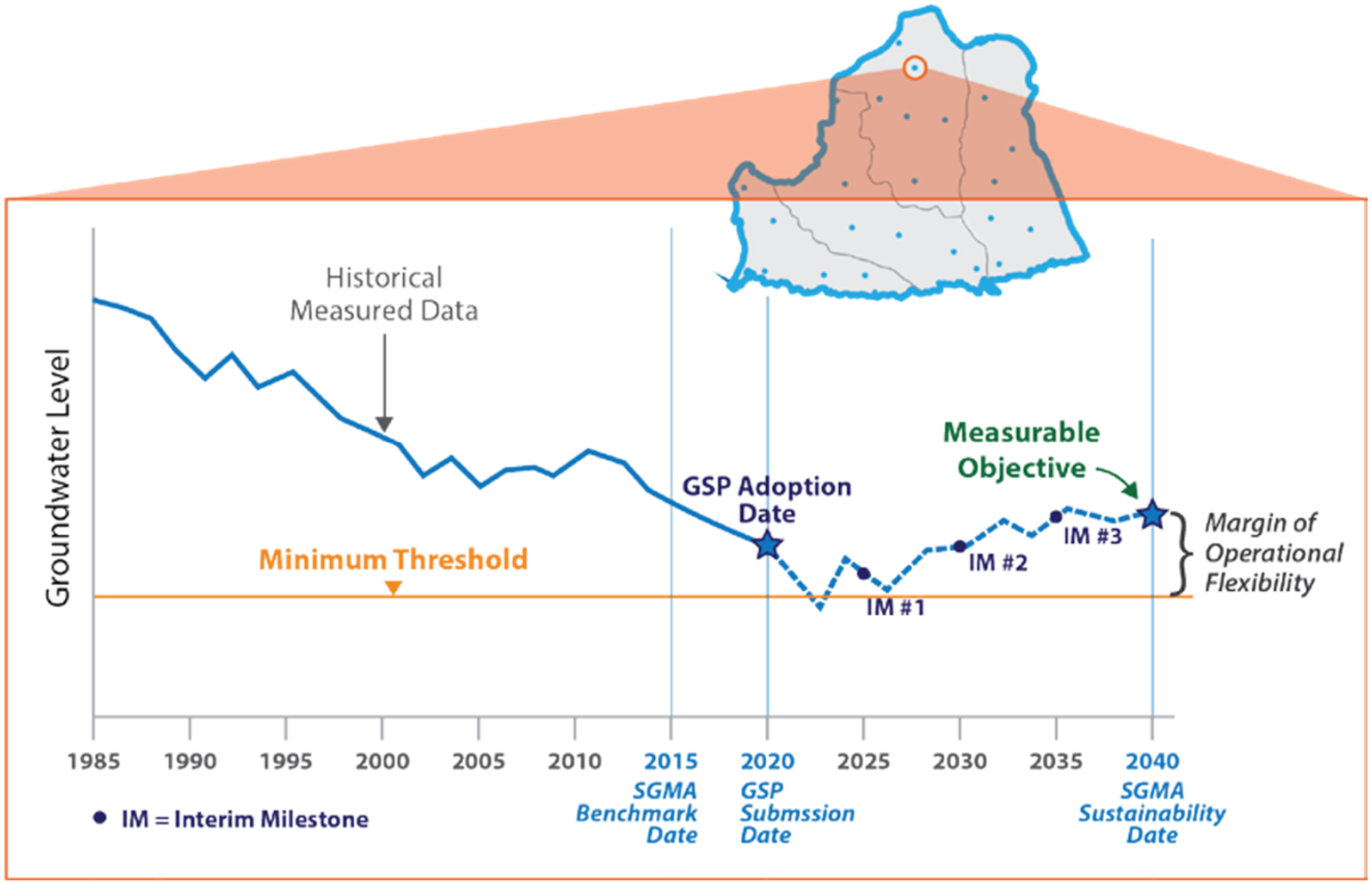
Thresholds & Measurable Objectives



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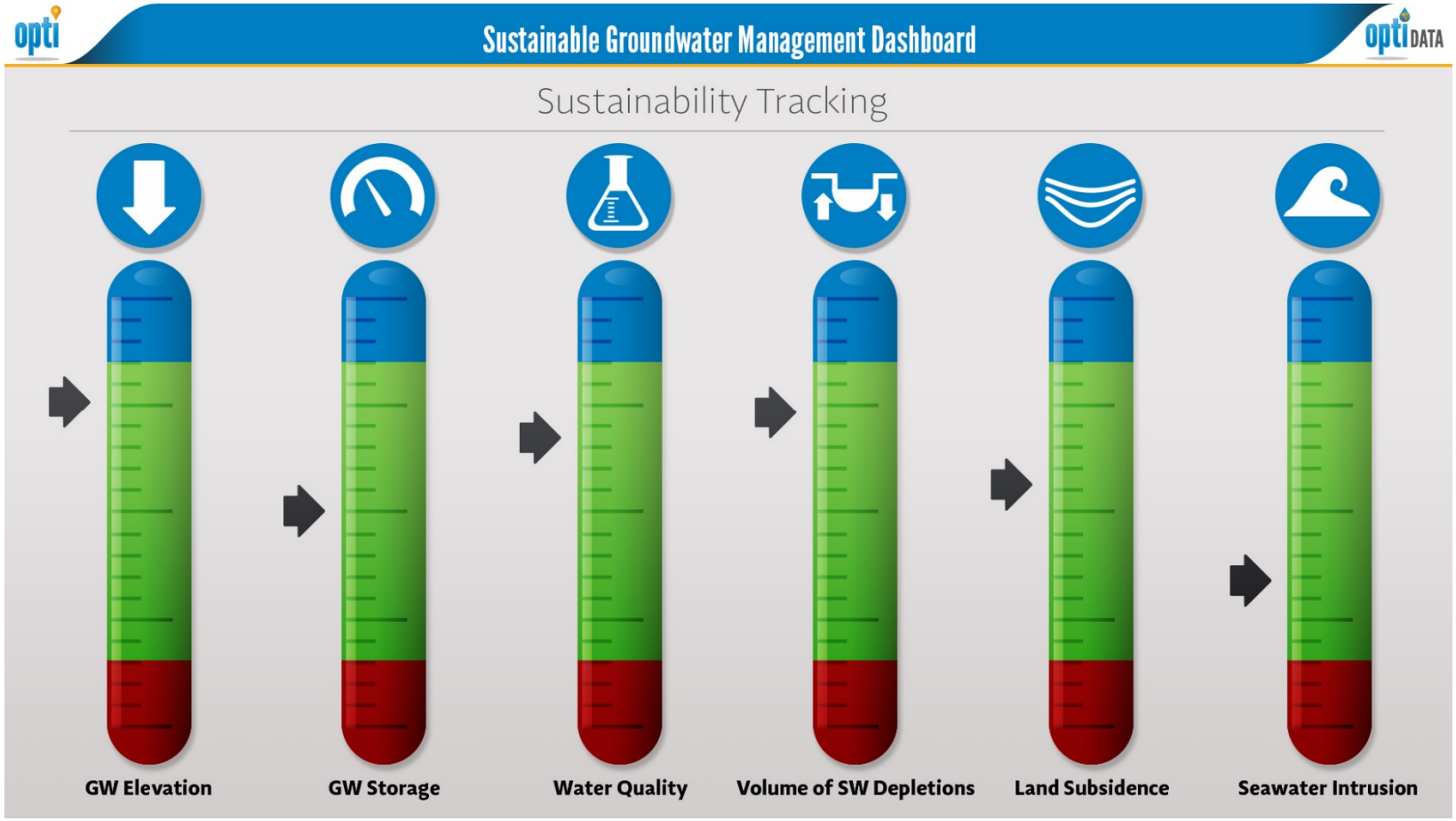
Sustainability indicators are like Gauges



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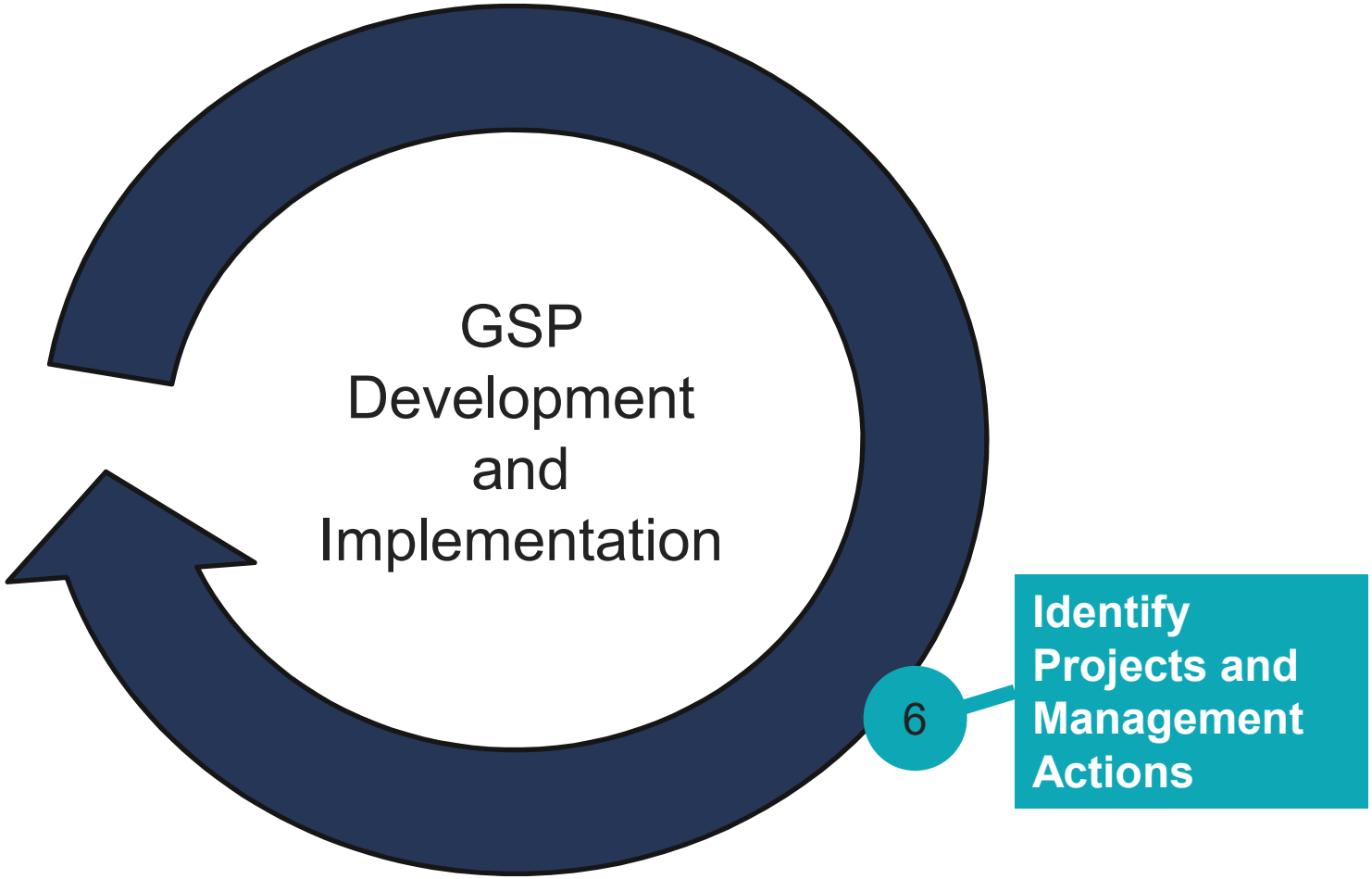
Questions?



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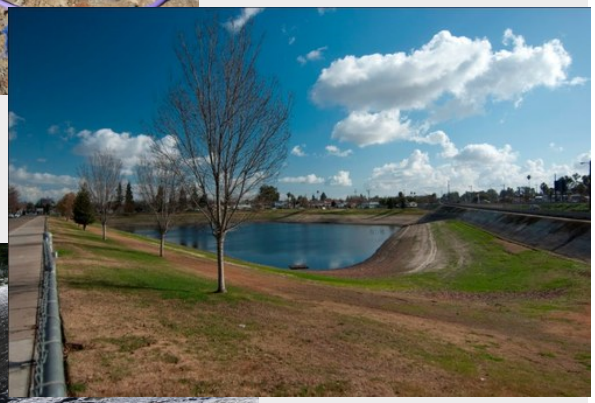
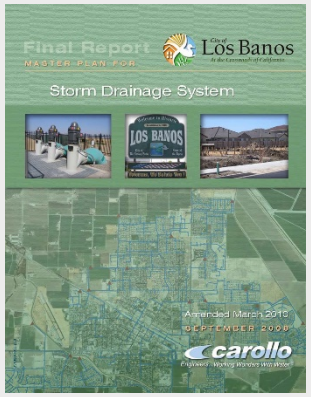
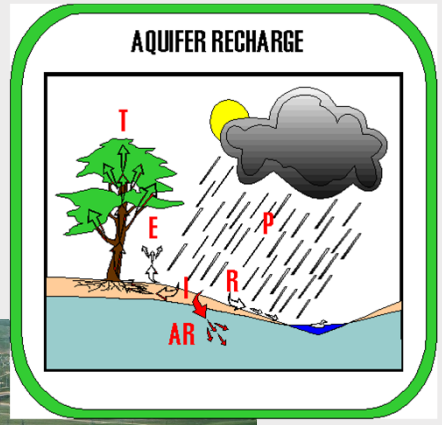
Step 6: Identify Projects and Management Actions

Projects = Things you can construct



Management Actions = Plans, permits, policies, or other actions





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Prioritizing Projects and Management Actions

Option Name	Cost	Quantity of Yield	Timing	Technical Feasibility	Permitting	Legal	Policy
In-Basin Water Supply							
Recycled Water	D	B	C	C	C	C	C
Storm & Flood Water Capture	C	B	C	B	C	C	A
Imported Water Supply							
Twitchell Exchange	E	C	C	B	D	C	B
New Imported Supply	B	A	C	B	C	C	B
In-Basin Water Management							
Water Allocations	C	B	C	B	B	B	A
Managed Aquifer Recharge	A	B	C	D	C	C	E

EXAMPLE

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Questions?

What is a water budget?

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A water budget is like a checking account..

Deposits

−

Withdrawals

=

Balance

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Inflows

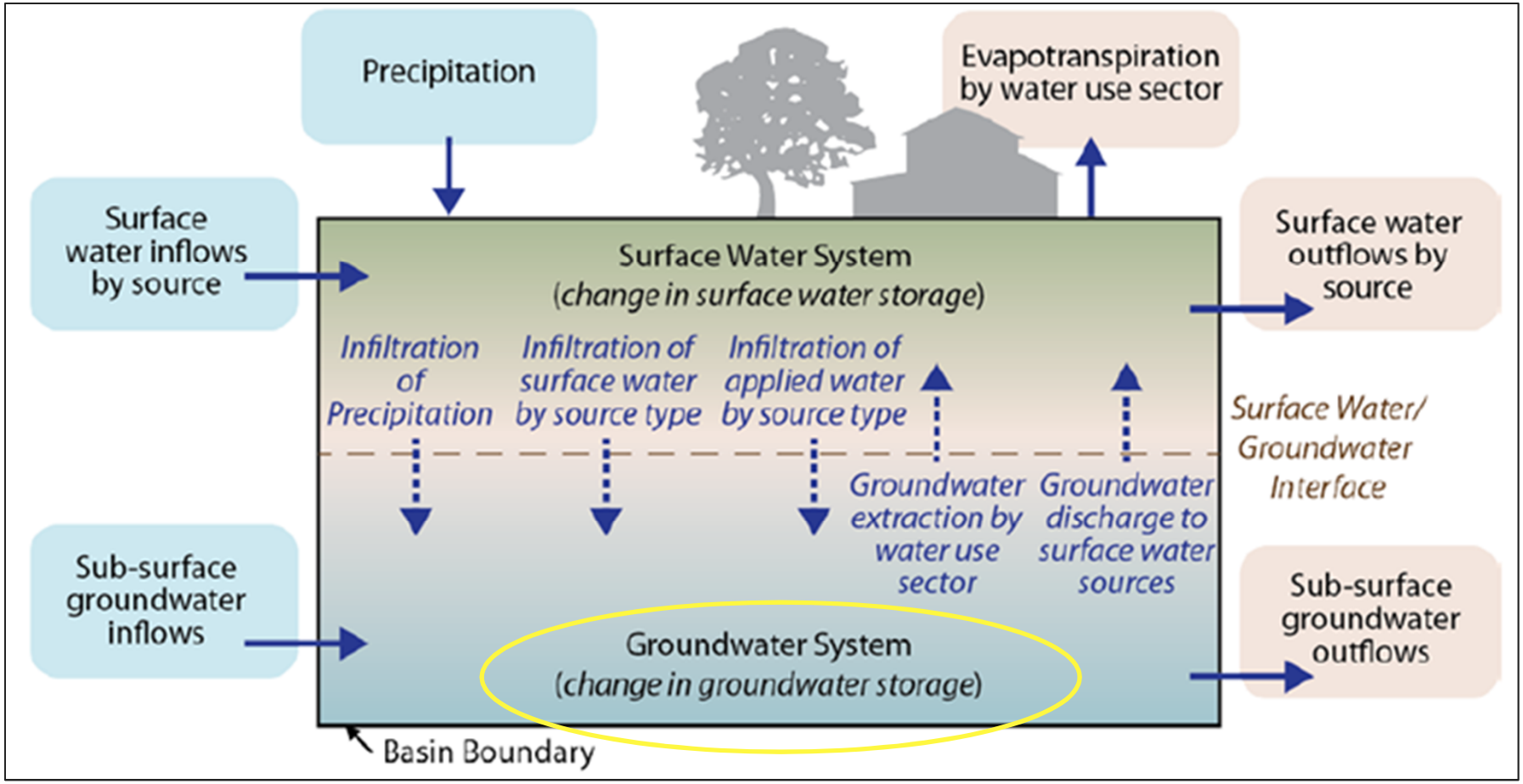
−

Outflows

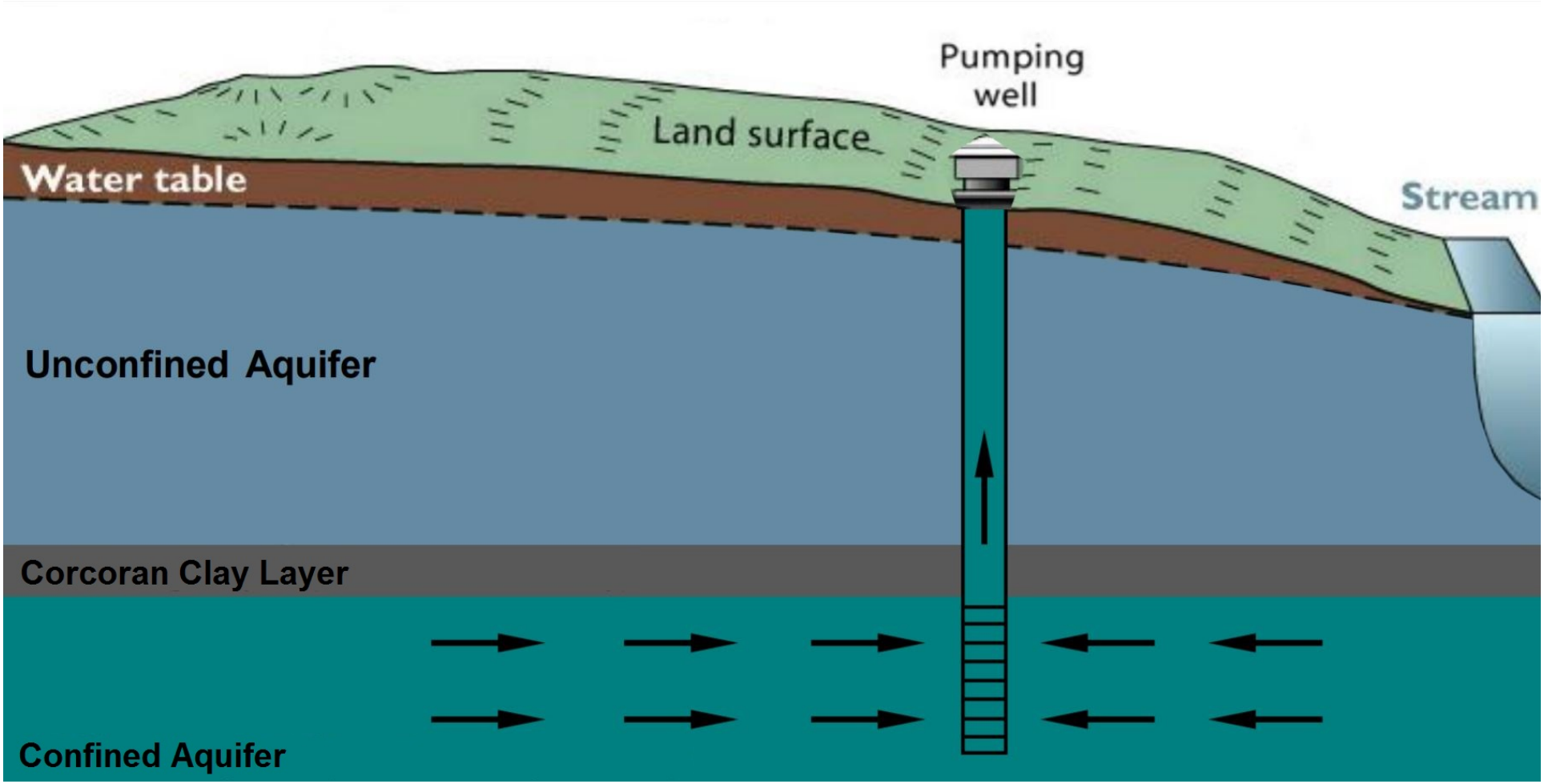
=

Water Balance

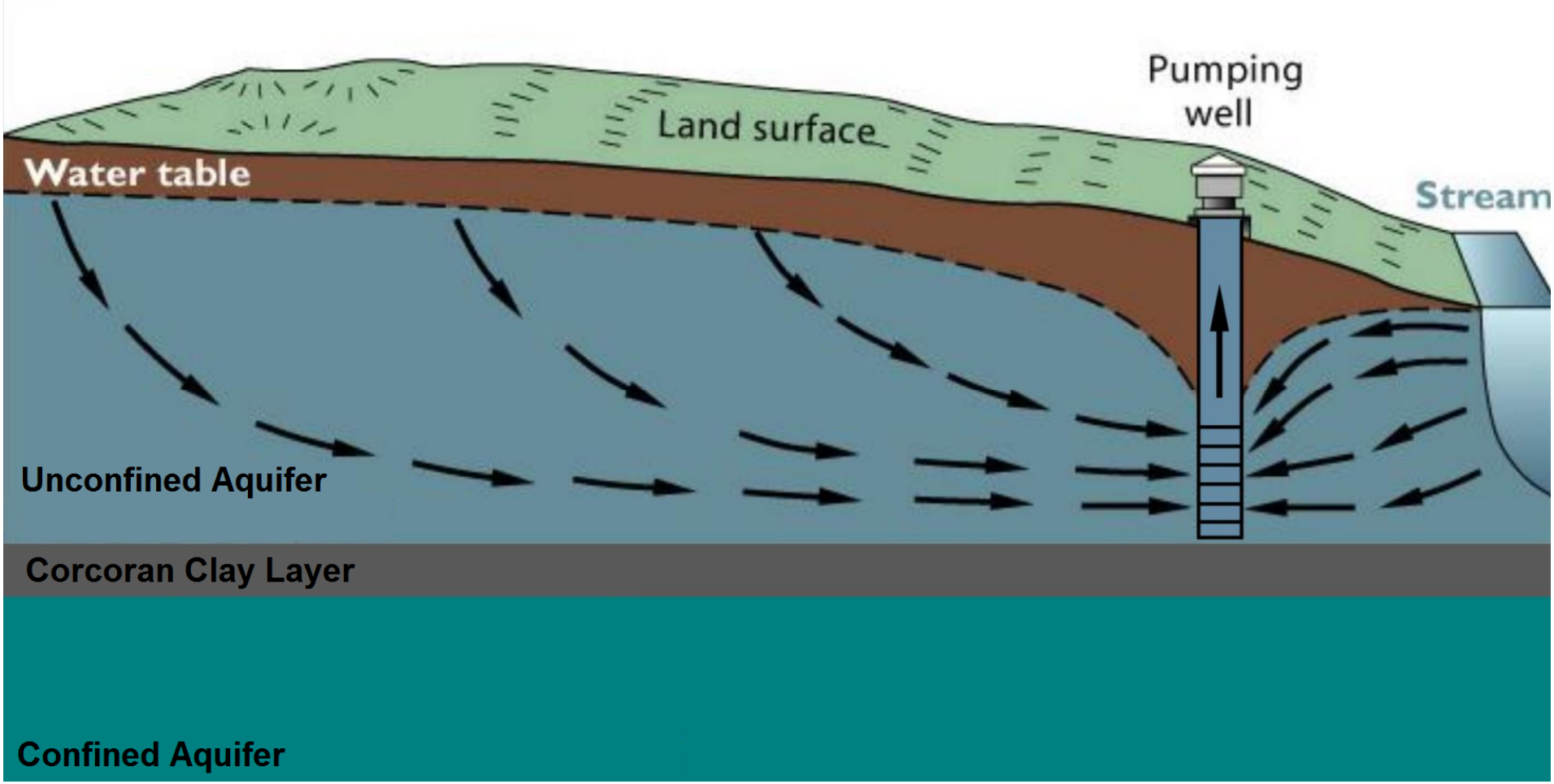
DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA



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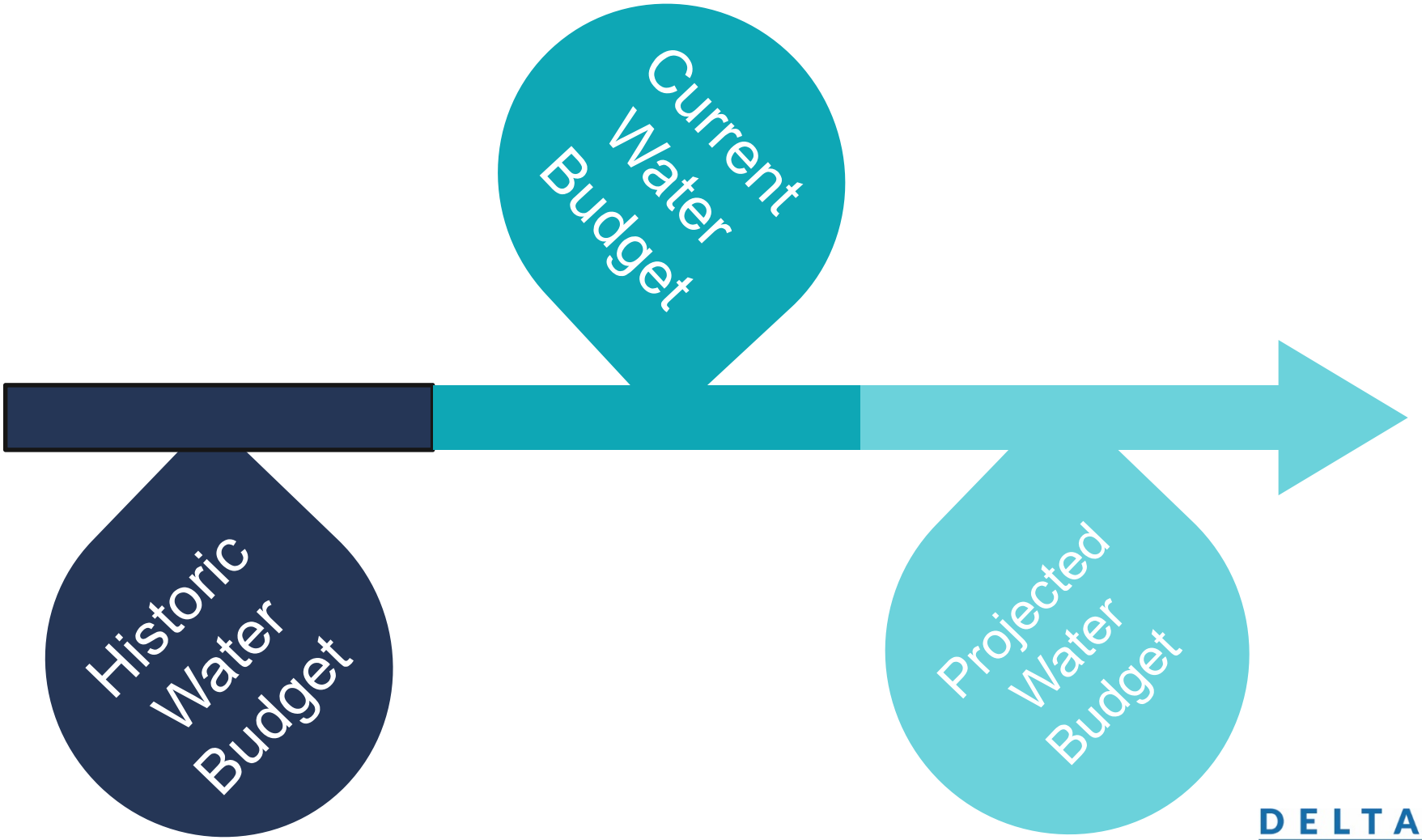
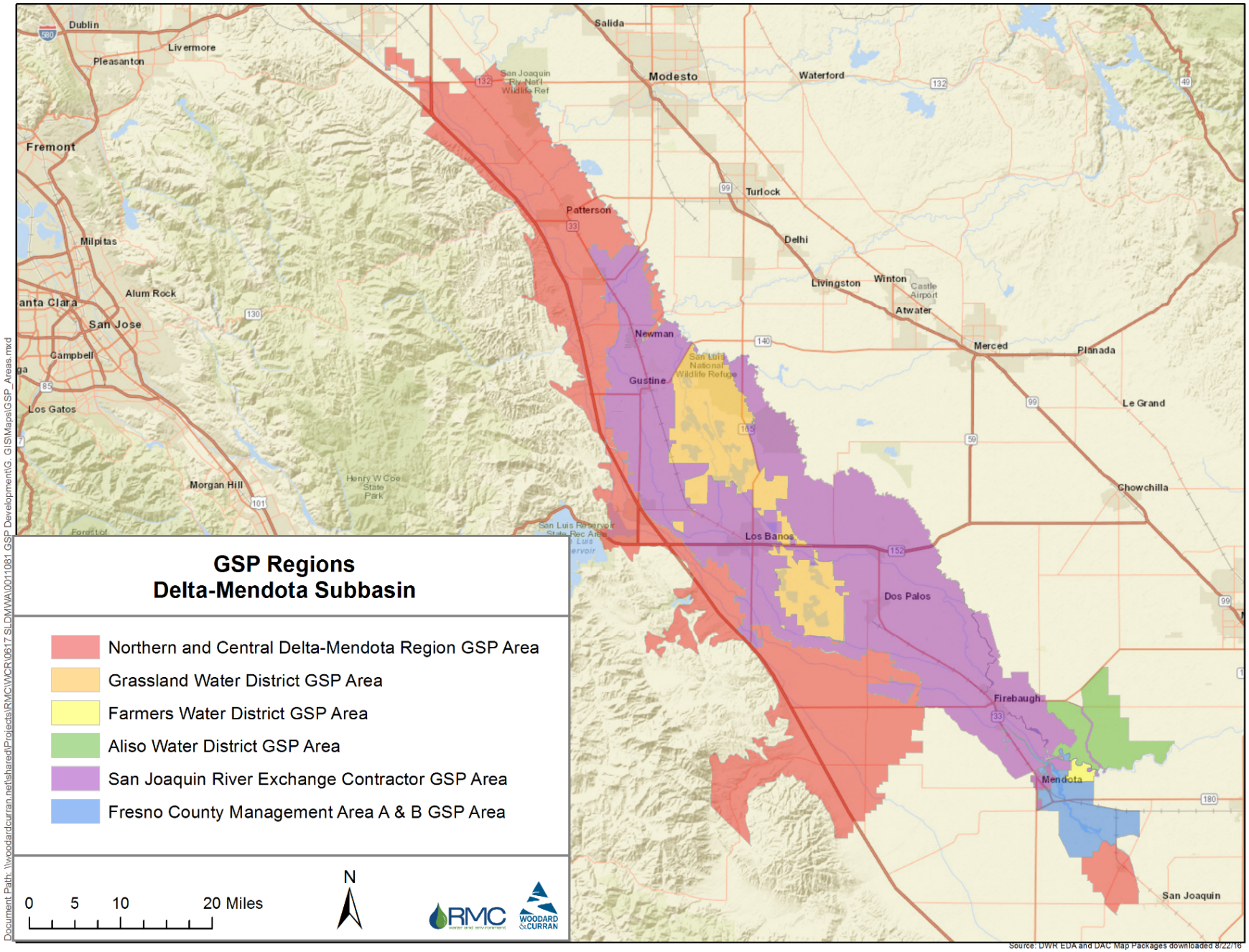
We are developing water budgets for three different periods.

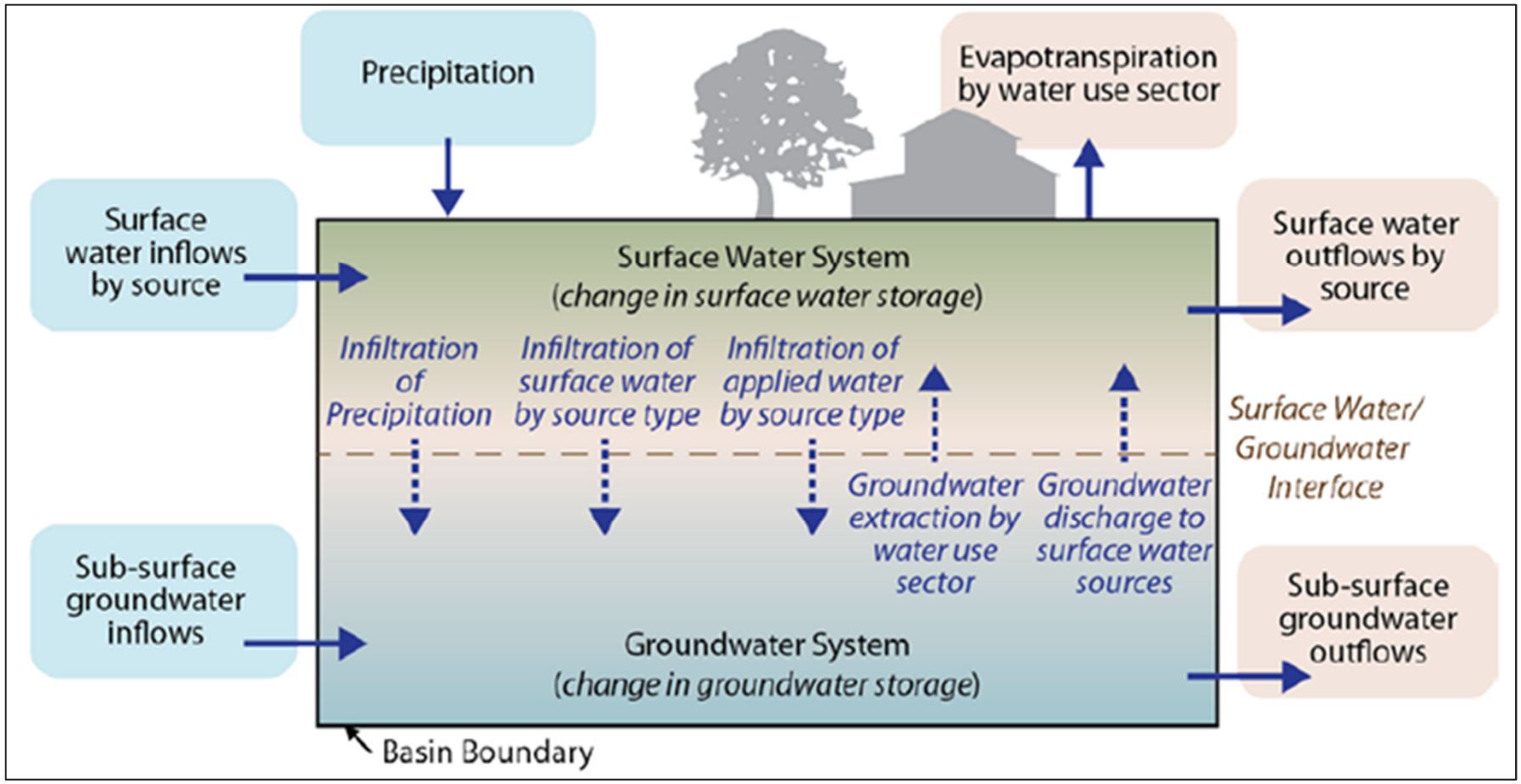


DELTA-MENDOTA SGMA


GSP Regions
Delta-Mendota Subbasin
Northern and Central Delta-Mendota Region GSP Area
Grassland Water District GSP Area
Farmers Water District GSP Area
Aliso Water District GSP Area
San Joaquin River Exchange Contractor GSP Area
Fresno County Management Area A & B GSP Area
0 5 10 20 Miles
N
Dublin
Livermore
Pleasanton
Fremont
Milpitas
Alum Rock
San Jose
Campbell
Los Gatos
Morgan Hill
Salida
Modesto
Waterford
Turlock
Patterson
Delhi
Livingston
Winton
Atwater
Newman
Gustine
Merced
Planada
Le Grand
Chowchilla
Los Banos
Dos Palos
Firebaugh
Mendota
San Joaquin
Source: DWR EDA and DAC Map Packages downloaded 8/22/16
Document Path: \\woodardcurran.net\shared\Projects\RMC\WCR\0617 SLDMWA\0011081 GSP Development\G_GIS\Maps\GSP_Areas.mxd

SGMA

Basin-Wide Water Budget



DELTA-MENDOTA SGMA

Basin-Wide Water Budget - Inflows

- Subsurface (below surface) inflow
- Infiltration of precipitation
- Applied water
- Canal seepage
- Surface water

DELTA-MENDOTA SGMA

Basin-Wide Water Budget - Outflows

- Evapotranspiration/Evaporation
- Groundwater extraction (pumping)
- Groundwater discharge to surface water
- Subsurface (below surface) groundwater outflow

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Basin-Wide Land Surface Water Budget

Land Surface Budget	Historic Conditions											Current Conditions
Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Historic Average	2013
Inflows												
1) Precipitation	400,000	270,000	580,000	500,000	220,000	280,000	240,000	430,000	550,000	310,000	380,000	330,000
2) Surface Water Inflows	820,000	810,000	770,000	800,000	830,000	780,000	790,000	770,000	790,000	830,000	800,000	780,000
3) Applied Water - Groundwater	260,000	250,000	210,000	210,000	280,000	360,000	350,000	290,000	170,000	320,000	270,000	310,000
4) Applied Water - Imported Surface Water	700,000	710,000	750,000	740,000	700,000	630,000	600,000	650,000	800,000	710,000	700,000	690,000
5) Other Direct Recharge	7,900	6,600	20,200	18,800	9,800	8,500	5,000	10,600	31,300	8,800	12,800	6,200
6) Other Pumping (M&I)	200	200	200	200	200	200	200	200	200	200	200	200
Total Inflows	**2,188,100**	**2,046,800**	**2,330,400**	**2,269,000**	**2,040,000**	**2,058,700**	**1,985,200**	**2,150,800**	**2,341,500**	**2,179,000**	**2,158,950**	**2,116,400**
Outflows												
1) Runoff	74,800	55,200	81,800	81,800	35,500	65,500	36,300	58,100	81,300	33,700	60,400	60,400
2) Evapotranspiration	1,730,000	1,670,000	1,710,000	1,710,000	1,730,000	1,690,000	1,670,000	1,580,000	1,690,000	1,790,000	1,700,000	1,700,000
3) Surface Water Outflows	160,000	160,000	150,000	150,000	140,000	130,000	120,000	140,000	160,000	120,000	140,000	130,000
4) Deep Percolation	180,000	160,000	220,000	200,000	150,000	180,000	160,000	190,000	240,000	180,000	190,000	180,000
Total Outflows	**2,144,800**	**2,045,200**	**2,161,800**	**2,141,800**	**2,055,500**	**2,065,500**	**1,986,300**	**1,968,100**	**2,171,300**	**2,123,700**	**2,086,400**	**2,070,400**

DELTA-MENDOTA SGMA

Basin-Wide Land Surface Water Budget

INFLOWS

Historic Average: 2,158,950 acre-feet

Current Conditions (2013): 2,116,400 acre-feet

OUTFLOWS

Historic Average: 2,086,400 acre-feet

Current Conditions (2013): 2,070,400 acre-feet

DELTA-MENDOTA SGMA

Basin-Wide Land Surface Water Budget

	INFLOWS	OUTFLOWS
Historic Average	2,158,950 acre-feet	2,086,400 acre-feet
Current Conditions (2013)	2,116,400 acre-feet	2,070,400 acre-feet

DELTA-MENDOTA SGMA

Basin-Wide Groundwater Budget

Groundwater Budget	Historic Conditions											Current Conditions
Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Historic Average	2013
Inflows												
1) Deep Percolation	71,000	54,000	76,000	71,000	44,000	52,000	43,000	64,000	80,000	56,000	61,000	61,000
Precipitation Infiltration	22,000	17,000	40,000	31,000	14,000	15,000	12,000	28,000	37,000	17,000	23,000	16,000
Surface Water Infiltration	60,000	60,000	72,000	72,000	61,000	63,000	61,000	67,000	89,000	66,000	67,000	62,000
Stream Recharge	15,000	14,000	24,000	23,000	14,000	15,000	14,000	15,000	24,000	14,000	17,000	15,000
Applied Water Infiltration	146,000	123,000	252,000	203,000	105,000	111,000	117,000	285,000	260,000	184,000	179,000	159,000
2) Subsurface Groundwater Inflows[1]												
Upper Aquifer	115,000	106,000	134,000	119,000	93,000	118,000	110,000	136,000	136,000	118,000	119,000	116,000
Lower Aquifer	53,000	47,000	60,000	55,000	33,000	45,000	44,000	58,000	64,000	49,000	51,000	59,000
5) Other Direct Recharge	32,000	30,000	72,000	98,000	48,000	40,000	33,000	65,000	101,000	62,000	58,000	65,000
Total Inflows	**514,000**	**451,000**	**730,000**	**672,000**	**412,000**	**459,000**	**434,000**	**718,000**	**791,000**	**566,000**	**574,700**	**553,000**
Outflows												
1) Groundwater Extraction from Upper Aquifer	353,000	367,000	255,000	241,000	434,000	478,000	470,000	337,000	237,000	434,000	361,000	439,000
2) Groundwater Extraction from Lower Aquifer	45,000	46,000	43,000	42,000	54,000	67,000	63,000	49,000	36,000	53,000	50,000	56,000
3) Subsurface Groundwater Outflows[1]												
Upper Aquifer	135,000	142,000	122,000	120,000	126,000	143,000	135,000	141,000	128,000	139,000	133,000	130,000
Lower Aquifer	75,000	89,000	62,000	62,000	85,000	89,000	74,000	82,000	70,000	94,000	78,000	98,000
4) *Spills (tile drainage and groundwater)*	23,000	22,000	21,000	19,000	20,000	17,000	16,000	19,000	20,000	16,000	19,000	17,000
5) *Other Consumptive Use of Groundwater*												
Flow to Lower Aquifer	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Discharge to Surface Water/Consumptive Use by GDEs	14,000	14,000	58,000	58,000	14,000	14,000	14,000	14,000	58,000	14,000	27,000	14,000
Exported Groundwater	14,000	14,000	0	0	14,000	14,000	14,000	14,000	0	14,000	10,000	14,000
Total Outflows	**679,000**	**714,000**	**581,000**	**562,000**	**767,000**	**842,000**	**806,000**	**676,000**	**569,000**	**784,000**	**698,000**	**788,000**
Change in Storage												
Estimated Annual Change in Groundwater Storage												
Inflows	514,000	451,000	730,000	672,000	412,000	459,000	434,000	718,000	791,000	566,000	574,700	553,000
Outflows	679,000	714,000	581,000	562,000	767,000	842,000	806,000	676,000	569,000	784,000	698,000	788,000
Change in Storage	(165,000)	(263,000)	149,000	110,000	(355,000)	(383,000)	(372,000)	42,000	222,000	(218,000)	(123,300)	(235,000)

[1]Subsurface flows are reflective of external flows between the Delta-Mendota Subbasin and its neighboring subbasins

DRAFT

DELTA-MENDOTA SGMA

Basin-Wide Land Groundwater Budget

I think that this title is supposed to be Groundwater Budget (e.g. delete the Land)

	INFLOWS	OUTFLOWS
Historic Average	574,700 acre-feet	698,000 acre-feet
Current Conditions (2013)	553,000 acre-feet	788,000 acre-feet
Change in Storage	-123,300 acre-feet	-235,000 acre-feet

DELTA-MENDOTA SGMA

Inflows

−

Outflows

=

Water Balance

DELTA-MENDOTA SGMA

What's Next?

DELTA-MENDOTA SGMA

What's next?

Winter 2019
Public Workshop #3: Historic and Current Water Budgets

Spring 2019
Public Workshop #4: Sustainability Goals and Criteria, Groundwater Projects and Management Actions

Sept - Dec 2019
Public Review of Draft Groundwater Sustainability Plans

Dec – Jan 2020
Groundwater Sustainability Plans adopted

Jan 31, 2020
Groundwater Sustainability Plans submitted to State

Either no periods or all periods at end

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Get Involved

Talk to your local groundwater sustainability agency representative

Sign-up for your local groundwater sustainability agency's email list

Attend meetings and workshops

Provide input on groundwater sustainability plan development

Help us spread the word!

DELTA-MENDOTA SGMA

Attend Public Meetings and Workshops

Delta-Mendota Subbasin Coordination Committee: 4th Thursday of each month

Delta-Mendota Subbasin Technical Working Group: 3rd Tuesday of each month

Delta-Mendota Communications Working Group: 4th Tuesday of each month

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Questions?

Breakout Session

Public Workshop 3:
Spanish Announcements and Materials

Subcuenca Delta-Mendota

Taller sobre el Acta de Gestión Sostenible del Agua Subterránea

Febrero del 2019

DELTA-MENDOTA SGMA

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

PROP 1

GOVERNADOR EDMUND G. BROWN JR.

ENLACE DE AGUA 2014

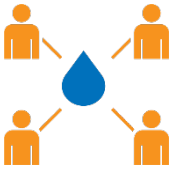
Agenda

1. Bienvenida
2. Introducciones
3. Presentación
4. Sesión de Análisis

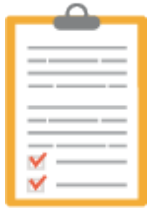
El Acta de Gestión Sostenible del Agua Subterránea del 2014

Términos de El Acta de Gestión Sostenible del Agua Subterránea

SGMA (Por sus siglas en inglés) = El Acta de Gestión Sostenible del Agua Subterránea



GSA (Por sus siglas en inglés) = Agencia de Sustentabilidad del Agua Subterránea



GSP (Por sus siglas en inglés) = Plan de Sostentabilidad del Agua Subterránea

Acuífero = una capa subterránea de materiales que contienen agua, ejemplo como grava o arena, de donde se puede bombear el agua

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Cronología de El Acta de Gestión Sostenible del Agua Subterránea

30 de junio del 2017
Se deben formar agencias de Sustentabilidad de Aguas Subterráneas.

31 de enero, 2020
Se deben presentar los Planes de Sustentabilidad de Aguas Subterráneas

31 de enero del 2040
La subcuenca Delta-Mendota debe conseguir la sustentabilidad.

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Participación Pública y de Alcance

- ✓ Considerar los intereses de todos los usuarios y usos beneficiosos del la agua subterránea
- ✓ Proporcionar oportunidades para la participación pública
- ✓ Adoptar el plan de sostentabilidad del agua subterránea en una reunión pública

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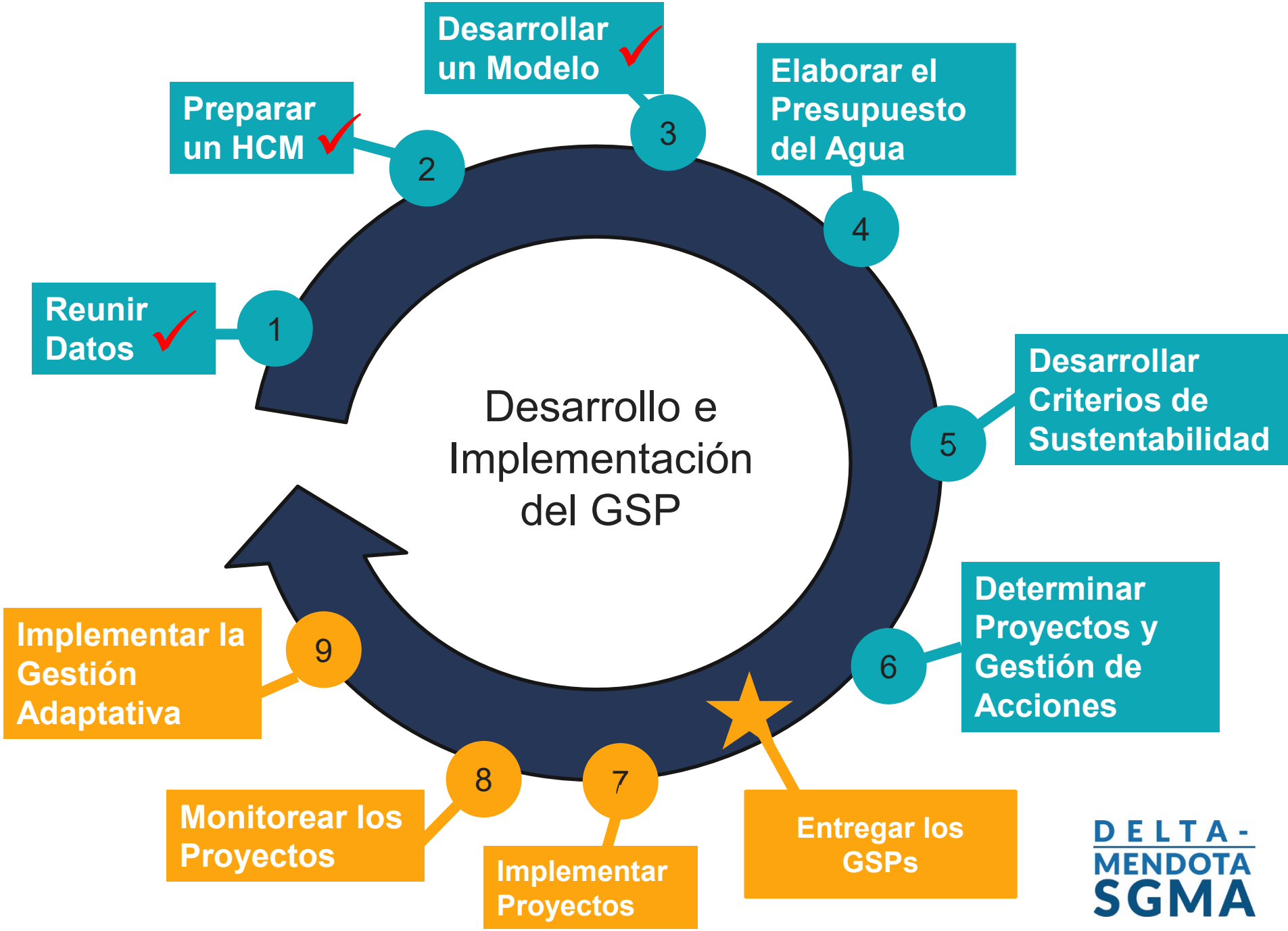
¿Preguntas?


Desarrollo e Implementación del GSP
1
Reunir Datos
2
Preparar un HCM
3
Desarrollar un Modelo
4
Elaborar el Presupuesto del Agua
5
Desarrollar Criterios de Sustentabilidad
6
Determinar Proyectos y Gestión de Acciones
Entregar los GSPs
7
Implementar Proyectos
8
Monitorear los Proyectos
9
Implementar la Gestión Adaptativa
DELTA-MENDOTA SGMA

DELTA-MENDOTA SGMA

Requisitos del SGMA y GSP

- Establecer metas de sostenibilidad
- Definir que es "significativo e irrazonable" y criterios para resultados indeseables
- Desarrollar metas para la sostenibilidad, umbrales mínimos y objetivos medibles
- Desarrollar el plan para alcanzar la meta de sostenibilidad
- Implementar un plan
- Monitorear el progreso
- Involucrar a las personas interesadas en todo el proceso

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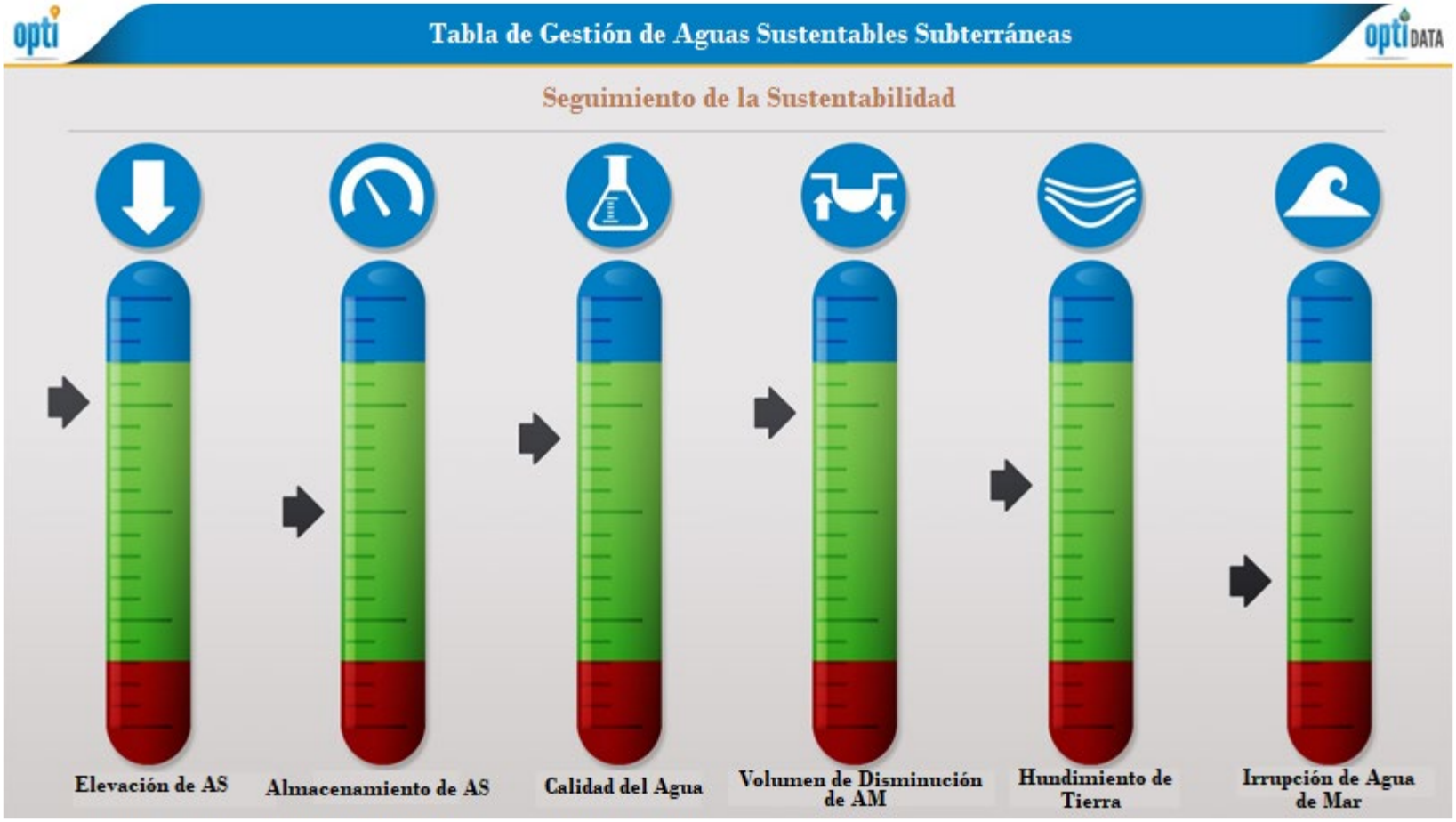
Entonces, Qué son los resultados indeseables?

Los resultados indeseables son impactos significativos e irrazonables causados por:

1. Reducción de los niveles del agua subterránea
2. Reducción del almacenamiento del agua subterránea
3. Calidad del agua degradada
4. Hundimiento de tierra
5. Disminución de aguas superficiales interconectadas

¿Qué son los indicadores de sustentabilidad?



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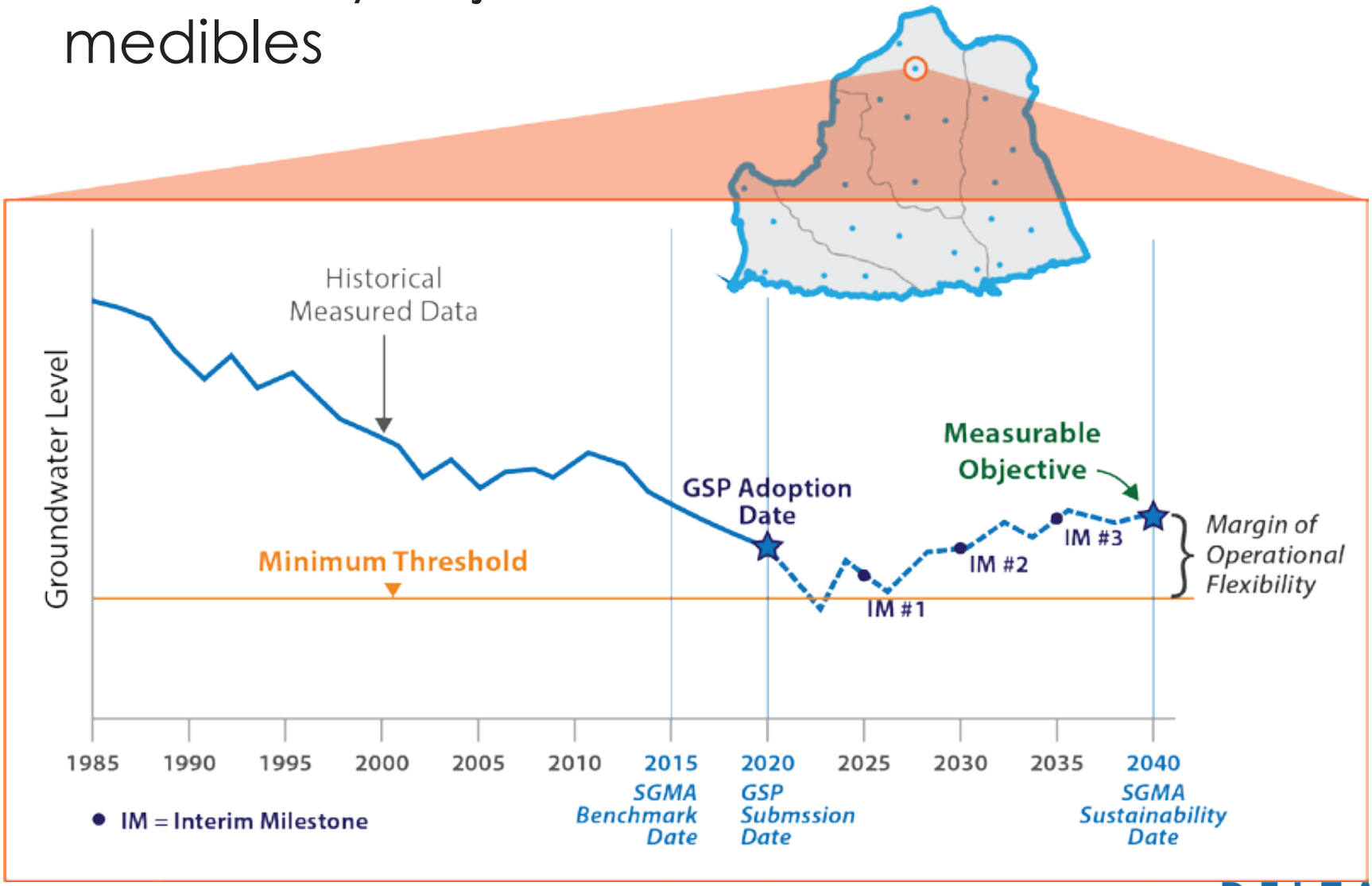
Umbrales y objetivos medibles



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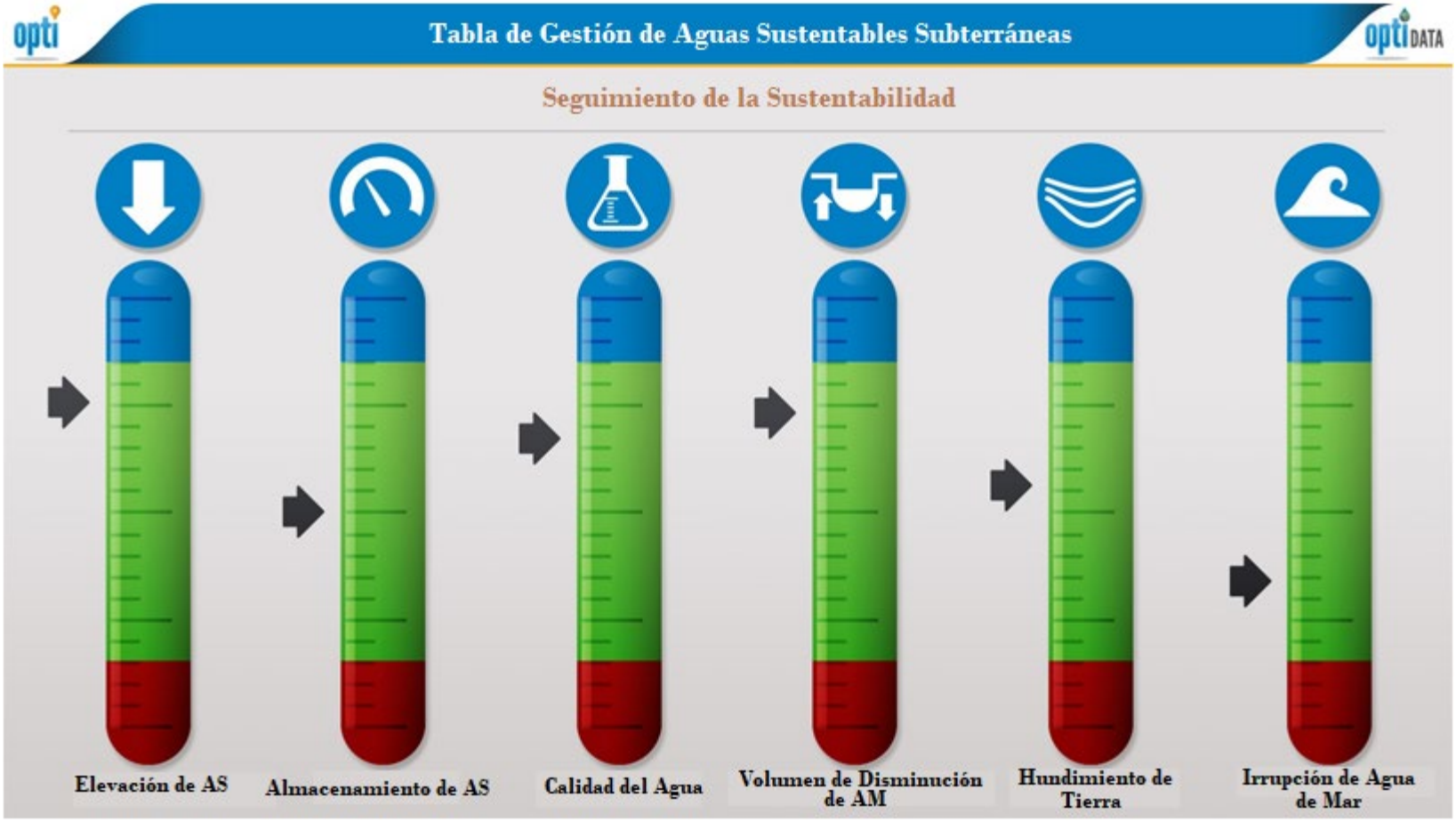
Los indicadores de sostenibilidad son como los medidores



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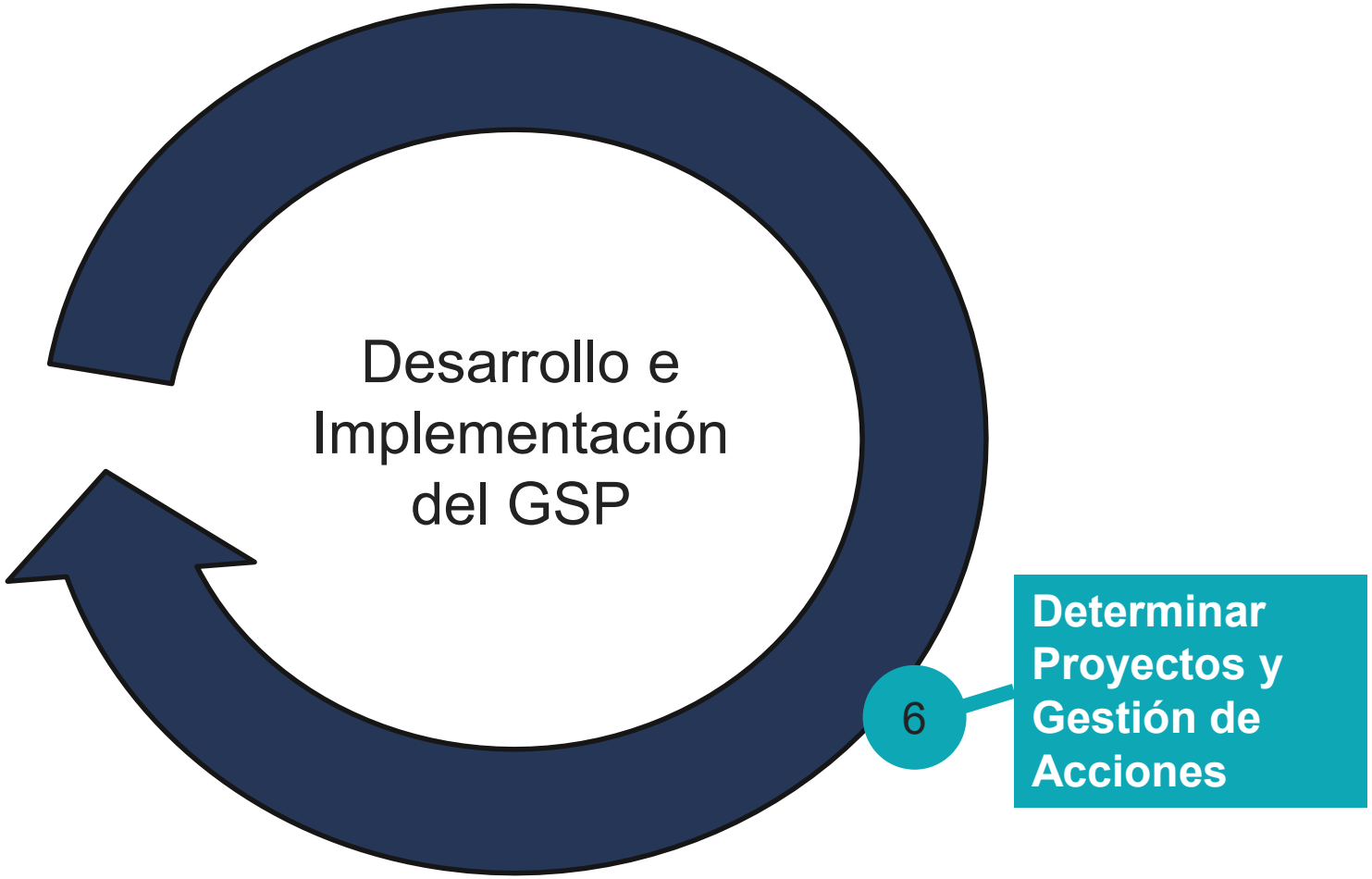
¿Preguntas?



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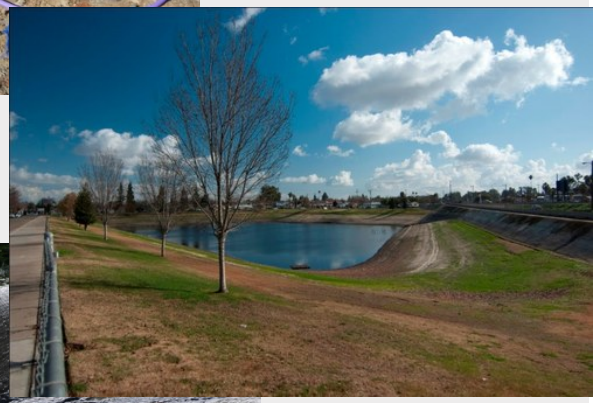
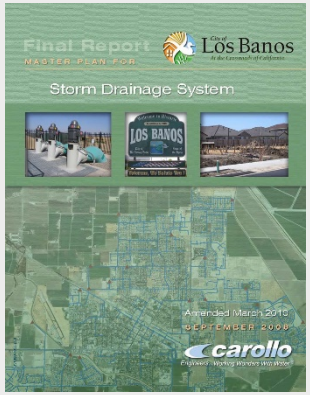
Paso 6: Determinar proyectos y gestión de acciones

Proyectos = Cosas que puedes construir



Gestión de Acciones= Planes, permisos, políticas u otras acciones



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Priorización de Proyectos y Gestión de Acciones

Nombre de la Opción	Costo	Cantidad de Rendimiento	Tiempo	Vialidad Técnica	Permiso	Legal	Política
Abastecimiento de agua en la cuenta	D	B	C	C	C	C	C
Agua Reciclada	C	B	C	B	C	C	A
Retención de agua de tormenta e inundación							
Suministro de Agua importada	E	C	C	B	D	C	B
Intercambio con Twitchell	B	A	C	B	C	C	B
Suministro de nuevas importaciones							
Gestión del agua en la cuenca	C	B	C	B	B	B	A
Asignaciones de agua	A	B	C	D	C	C	E
Recarga de Acuíferos Gestionados							

EJEMPLO

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¿Preguntas?

Qué es un presupuesto de agua?

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Un presupuesto de agua es como una cuenta de cheques...

Depósitos

−

Retiros

=

Balance

DELTA-MENDOTA SGMA

Entradas de agua

−

Salidas de agua

=

Equilibrio hídrico

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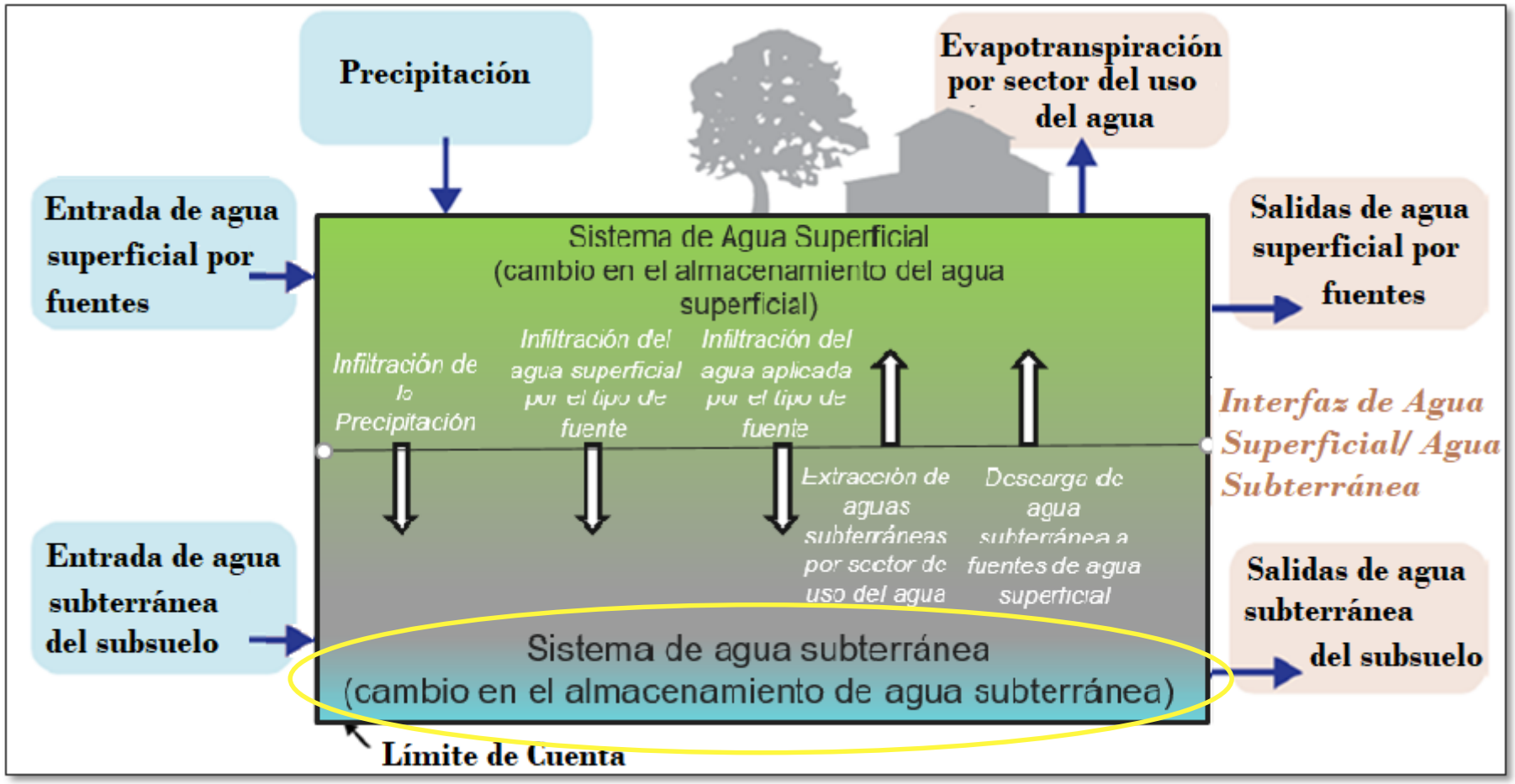
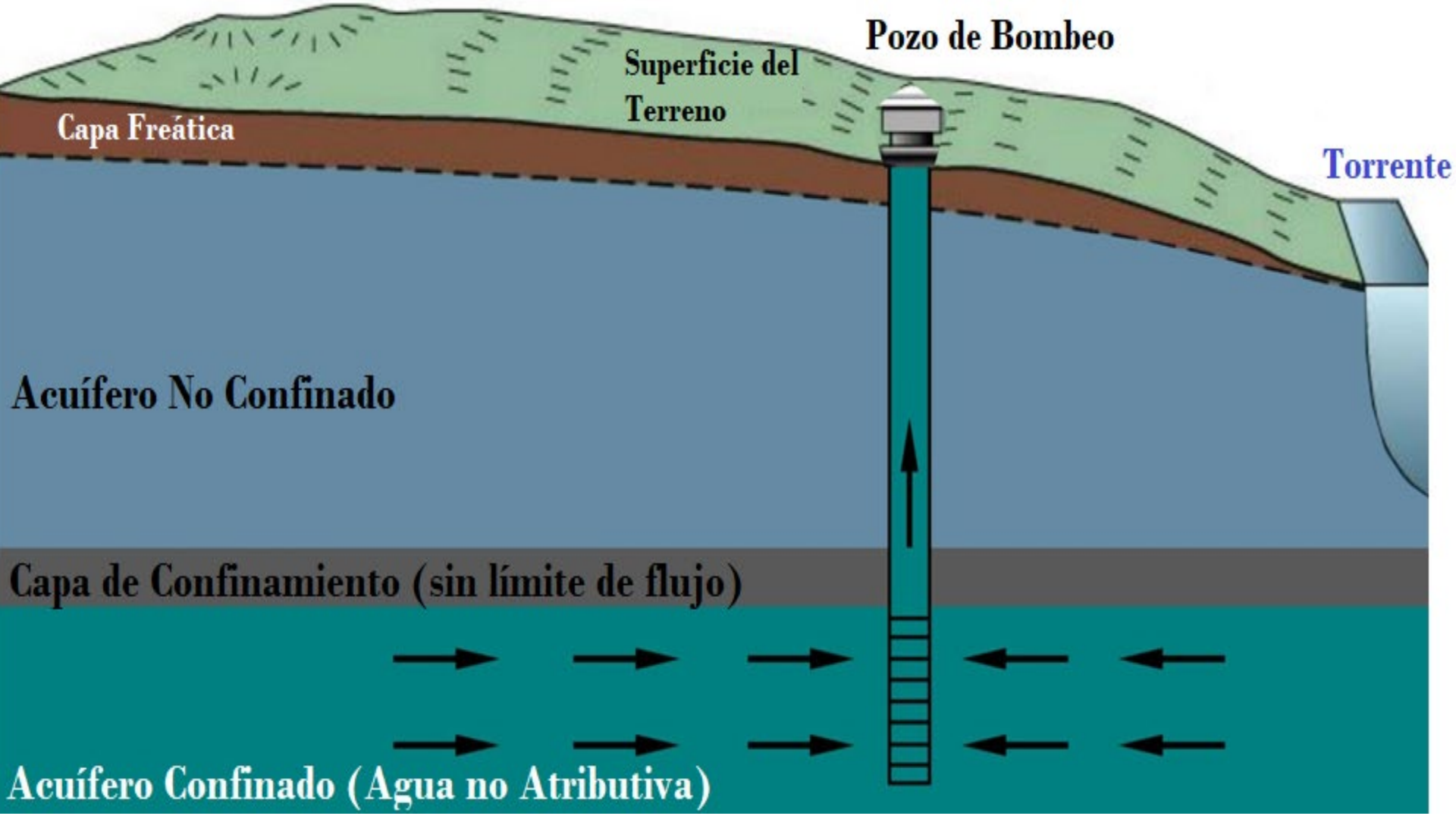
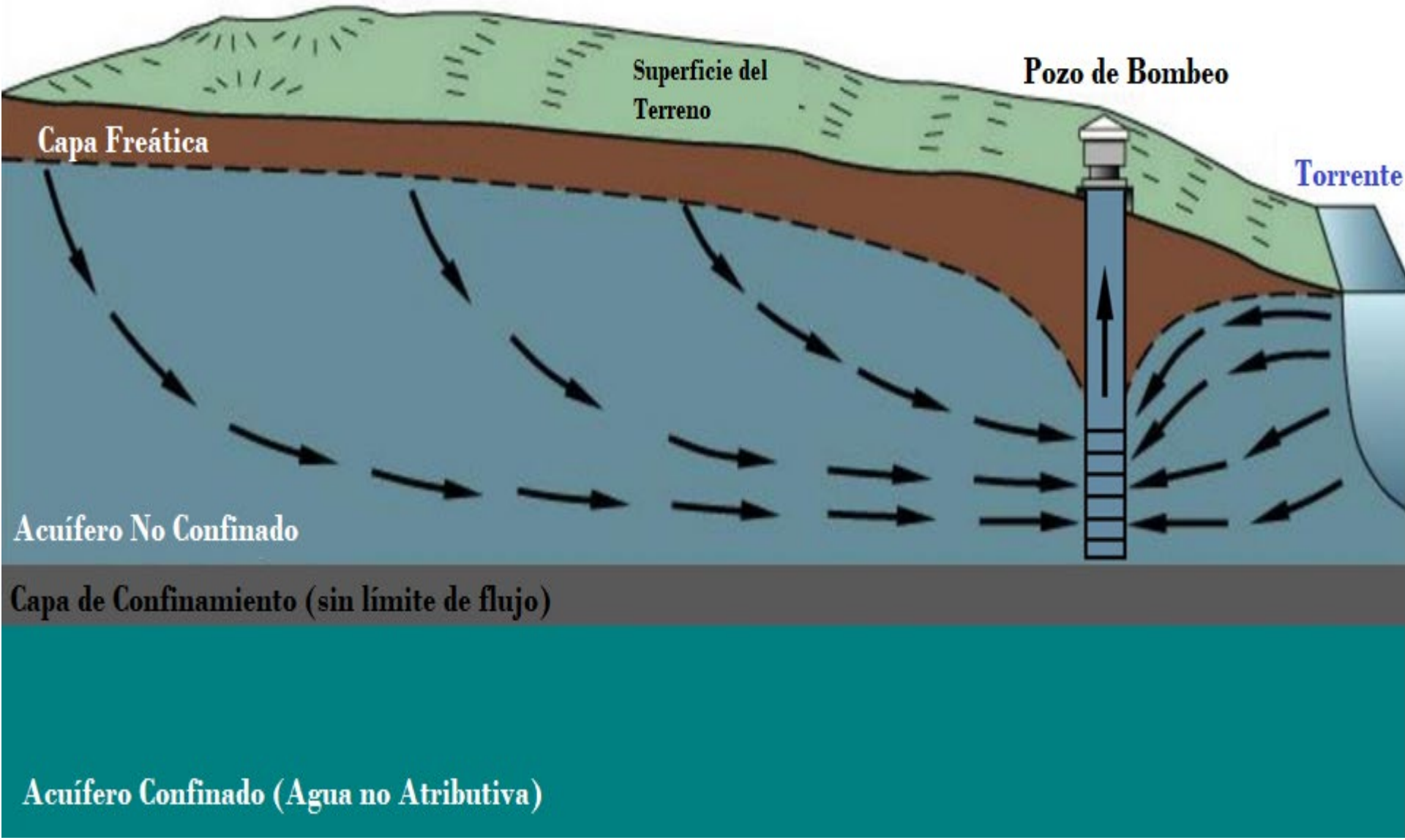


DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA



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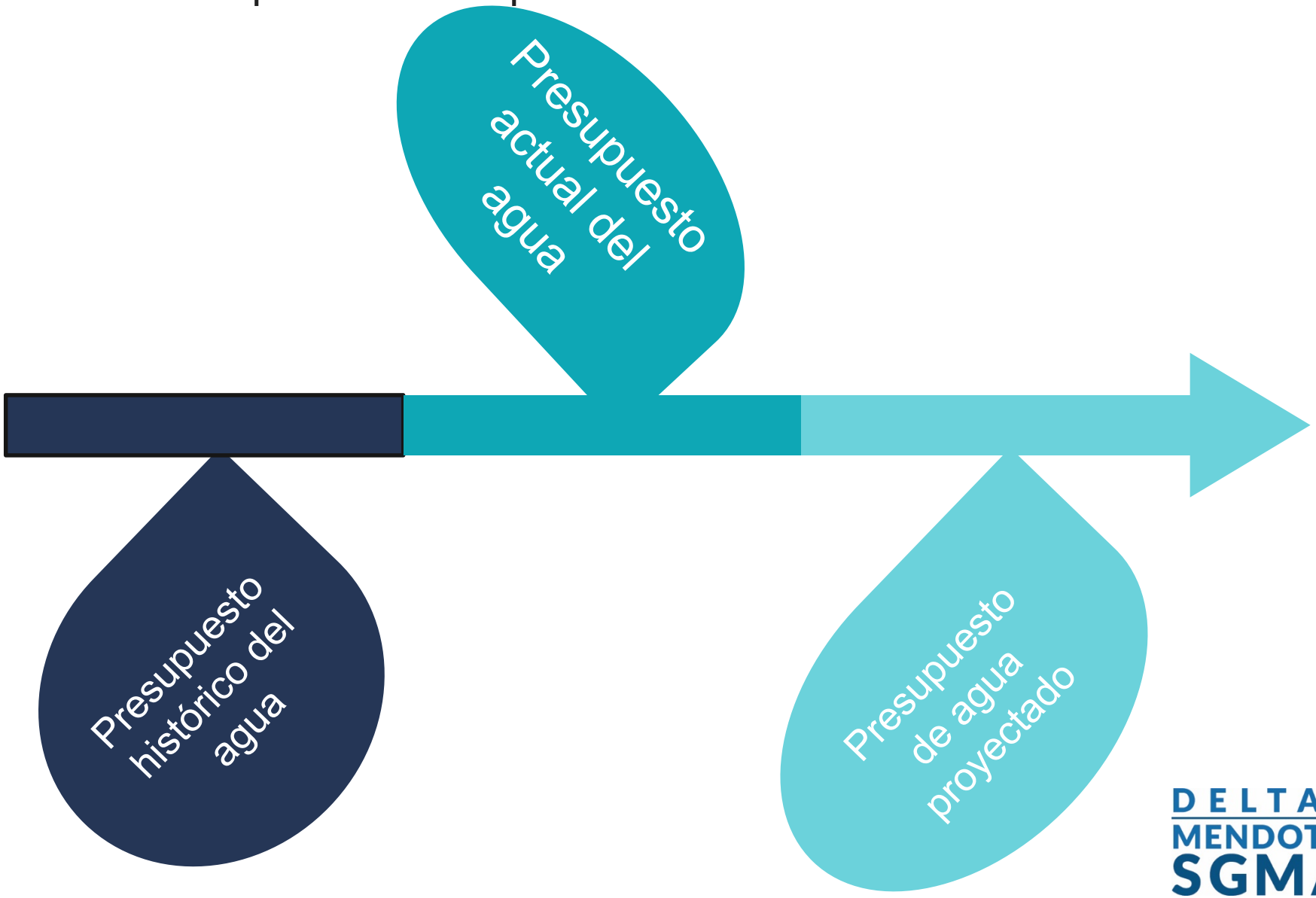
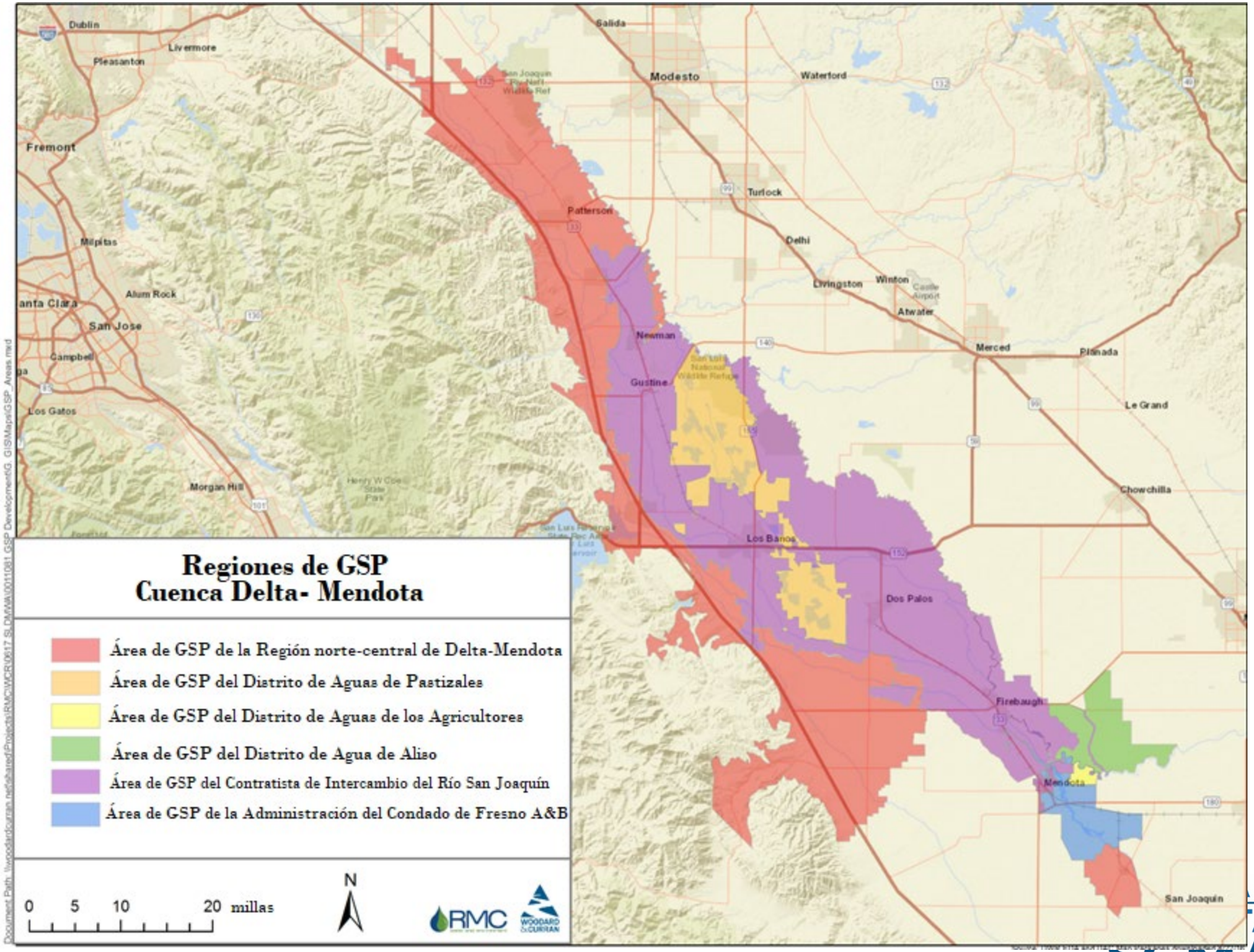
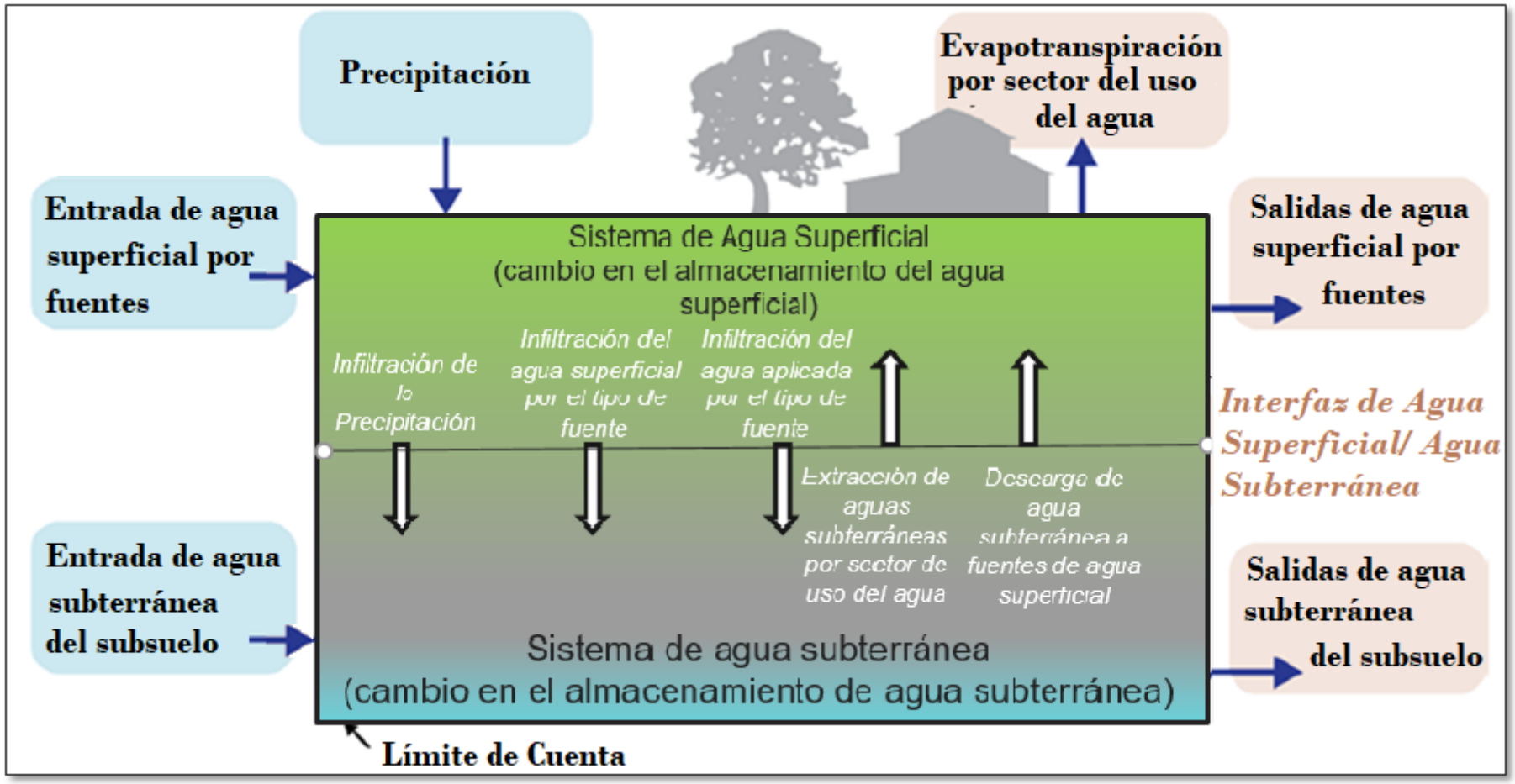
Estamos desarrollando presupuestos de agua para tres períodos diferentes.



DELTA-MENDOTA SGMA


Regiones de GSP
Cuenca Delta- Mendota
Área de GSP de la Región norte-central de Delta-Mendota
Área de GSP del Distrito de Aguas de Pastizales
Área de GSP del Distrito de Aguas de los Agricultores
Área de GSP del Distrito de Agua de Aliso
Área de GSP del Contratista de Intercambio del Río San Joaquín
Área de GSP de la Administración del Condado de Fresno A&B
0 5 10 20 millas
N
RMC
WOODARD & CURRAN
Dublin
Livermore
Pleasanton
Fremont
Milpitas
Alum Rock
San Jose
Campbell
Los Gatos
Morgan Hill
Salida
Modesto
Waterford
Turlock
Patterson
Delhi
Livingston
Winton
Atwater
Newman
Gustine
Merced
Planada
Le Grand
Chowchilla
Los Banos
Dos Palos
Firebaugh
Mendota
San Joaquin

Presupuesto de agua en toda la cuenca



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Presupuesto de agua en toda la cuenca - Entradas

- Afluencia subsuperficial (debajo de la superficie)
- Infiltración de la precipitación
- Agua aplicada
- Filtración de conductos
- Aguas superficiales

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Presupuesto de agua en toda la cuenca - salidas

- Evapotranspiración/Evaporación
- Extracción de agua subterránea (bombeo)
- Descarga de aguas subterráneas a aguas superficiales
- Salida de agua subterránea del subsuelo (debajo de la superficie)

DELTA-MENDOTA SGMA

Presupuesto de agua de toda la cuenca

[Presentar el presupuesto de agua de toda la cuenca]

Land Surface Budget	Historic Conditions											Current Conditions
Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Historic Average	2013
Inflows												
1) Precipitation	400,000	270,000	580,000	500,000	220,000	280,000	240,000	430,000	550,000	310,000	380,000	330,000
2) Surface Water Inflows	820,000	810,000	770,000	800,000	830,000	780,000	790,000	770,000	790,000	830,000	800,000	780,000
3) Applied Water - Groundwater	260,000	250,000	210,000	210,000	280,000	360,000	350,000	290,000	170,000	320,000	270,000	310,000
4) Applied Water - Imported Surface Water	700,000	710,000	750,000	740,000	700,000	630,000	600,000	650,000	800,000	710,000	700,000	690,000
5) Other Direct Recharge	7,900	6,600	20,200	18,800	9,800	8,500	5,000	10,600	31,300	8,800	12,800	6,200
6) Other Pumping (M&I)	200	200	200	200	200	200	200	200	200	200	200	200
Total Inflows	**2,188,100**	**2,046,800**	**2,330,400**	**2,269,000**	**2,040,000**	**2,058,700**	**1,985,200**	**2,150,800**	**2,341,500**	**2,179,000**	**2,158,950**	**2,116,400**
Outflows												
1) Runoff	74,800	55,200	81,800	81,800	35,500	65,500	36,300	58,100	81,300	33,700	60,400	60,400
2) Evapotranspiration	1,730,000	1,670,000	1,710,000	1,710,000	1,730,000	1,690,000	1,670,000	1,580,000	1,690,000	1,790,000	1,700,000	1,700,000
3) Surface Water Outflows	160,000	160,000	150,000	150,000	140,000	130,000	120,000	140,000	160,000	120,000	140,000	130,000
4) Deep Percolation	180,000	160,000	220,000	200,000	150,000	180,000	160,000	190,000	240,000	180,000	190,000	180,000
Total Outflows	**2,144,800**	**2,045,200**	**2,161,800**	**2,141,800**	**2,055,500**	**2,065,500**	**1,986,300**	**1,968,100**	**2,171,300**	**2,123,700**	**2,086,400**	**2,070,400**

DELTA-MENDOTA SGMA

Presupuesto de agua superficial en toda la cuenca

	ENTRADAS de Agua	SALIDAS de Agua
Promedio histórico	2,158,950 acre pies	2,086,400 acre pies
Condiciones actuales	2,116,400 acre pies	2,070,400 acre-pies

DELTA-MENDOTA SGMA

Presupuesto de agua subterránea en toda la cuenca

Groundwater Budget	Historic Conditions											Current Conditions
Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Historic Average	2013
Inflows												
1) Deep Percolation	71,000	54,000	76,000	71,000	44,000	52,000	43,000	64,000	80,000	56,000	61,000	61,000
Precipitation Infiltration	22,000	17,000	40,000	31,000	14,000	15,000	12,000	28,000	37,000	17,000	23,000	16,000
Surface Water Infiltration	60,000	60,000	72,000	72,000	61,000	63,000	61,000	67,000	89,000	66,000	67,000	62,000
Stream Recharge	15,000	14,000	24,000	23,000	14,000	15,000	14,000	15,000	24,000	14,000	17,000	15,000
Applied Water Infiltration	146,000	123,000	252,000	203,000	105,000	111,000	117,000	285,000	260,000	184,000	179,000	159,000
2) Subsurface Groundwater Inflows[1]												
Upper Aquifer	115,000	106,000	134,000	119,000	93,000	118,000	110,000	136,000	136,000	118,000	119,000	116,000
Lower Aquifer	53,000	47,000	60,000	55,000	33,000	45,000	44,000	58,000	64,000	49,000	51,000	59,000
5) Other Direct Recharge	32,000	30,000	72,000	98,000	48,000	40,000	33,000	65,000	101,000	62,000	58,000	65,000
Total Inflows	**514,000**	**451,000**	**730,000**	**672,000**	**412,000**	**459,000**	**434,000**	**718,000**	**791,000**	**566,000**	**574,700**	**553,000**
Outflows												
1) Groundwater Extraction from Upper Aquifer	353,000	367,000	255,000	241,000	434,000	478,000	470,000	337,000	237,000	434,000	361,000	439,000
2) Groundwater Extraction from Lower Aquifer	45,000	46,000	43,000	42,000	54,000	67,000	63,000	49,000	36,000	53,000	50,000	56,000
3) Subsurface Groundwater Outflows[1]												
Upper Aquifer	135,000	142,000	122,000	120,000	126,000	143,000	135,000	141,000	128,000	139,000	133,000	130,000
Lower Aquifer	75,000	89,000	62,000	62,000	85,000	89,000	74,000	82,000	70,000	94,000	78,000	98,000
4) *Spills (tile drainage and groundwater)*	23,000	22,000	21,000	19,000	20,000	17,000	16,000	19,000	20,000	16,000	19,000	17,000
5) *Other Consumptive Use of Groundwater*												
Flow to Lower Aquifer	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Discharge to Surface Water/Consumptive Use by GDEs	14,000	14,000	58,000	58,000	14,000	14,000	14,000	14,000	58,000	14,000	27,000	14,000
Exported Groundwater	14,000	14,000	0	0	14,000	14,000	14,000	14,000	0	14,000	10,000	14,000
Total Outflows	**679,000**	**714,000**	**581,000**	**562,000**	**767,000**	**842,000**	**806,000**	**676,000**	**569,000**	**784,000**	**698,000**	**788,000**
Change in Storage												
Estimated Annual Change in Groundwater Storage												
Inflows	514,000	451,000	730,000	672,000	412,000	459,000	434,000	718,000	791,000	566,000	574,700	553,000
Outflows	679,000	714,000	581,000	562,000	767,000	842,000	806,000	676,000	569,000	784,000	698,000	788,000
Change in Storage	(165,000)	(263,000)	149,000	110,000	(355,000)	(383,000)	(372,000)	42,000	222,000	(218,000)	(123,300)	(235,000)

[1]Subsurface flows are reflective of external flows between the Delta-Mendota Subbasin and its neighboring subbasins

DRAFT

DELTA-MENDOTA SGMA

Presupuesto de agua subterránea en toda la cuenca

	ENTRADAD de Agua	SALIDAS de Agua
Promedio histórico	574,700 acre pies	698,000 acre pies
Condiciones actuales	553,000 acre pies	788,000 acre pies
Cambio en el almacenamiento	-123,300 acre pies	-235,000 acre pies

DELTA-MENDOTA SGMA

Afluencias

−

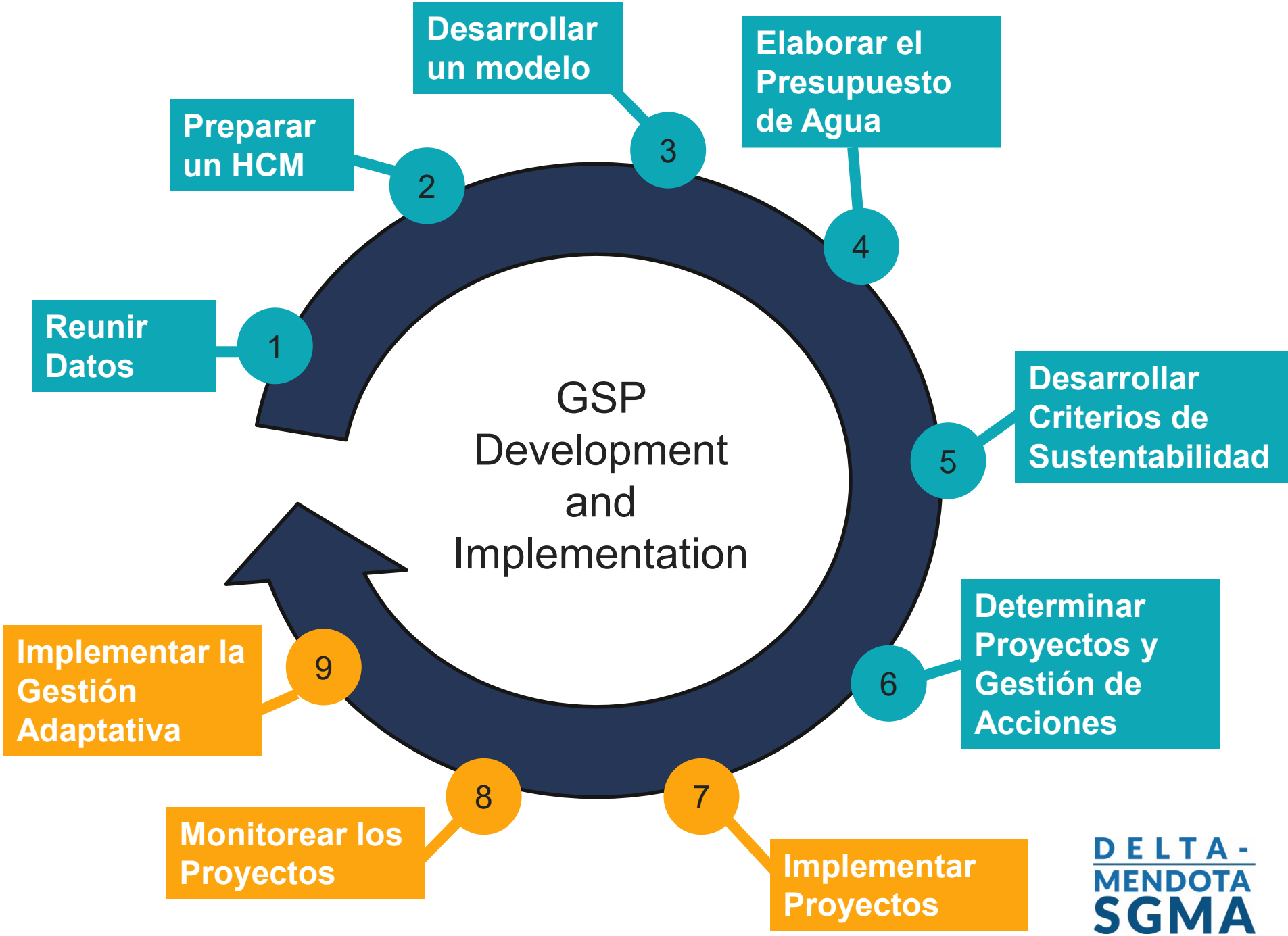
Desagües

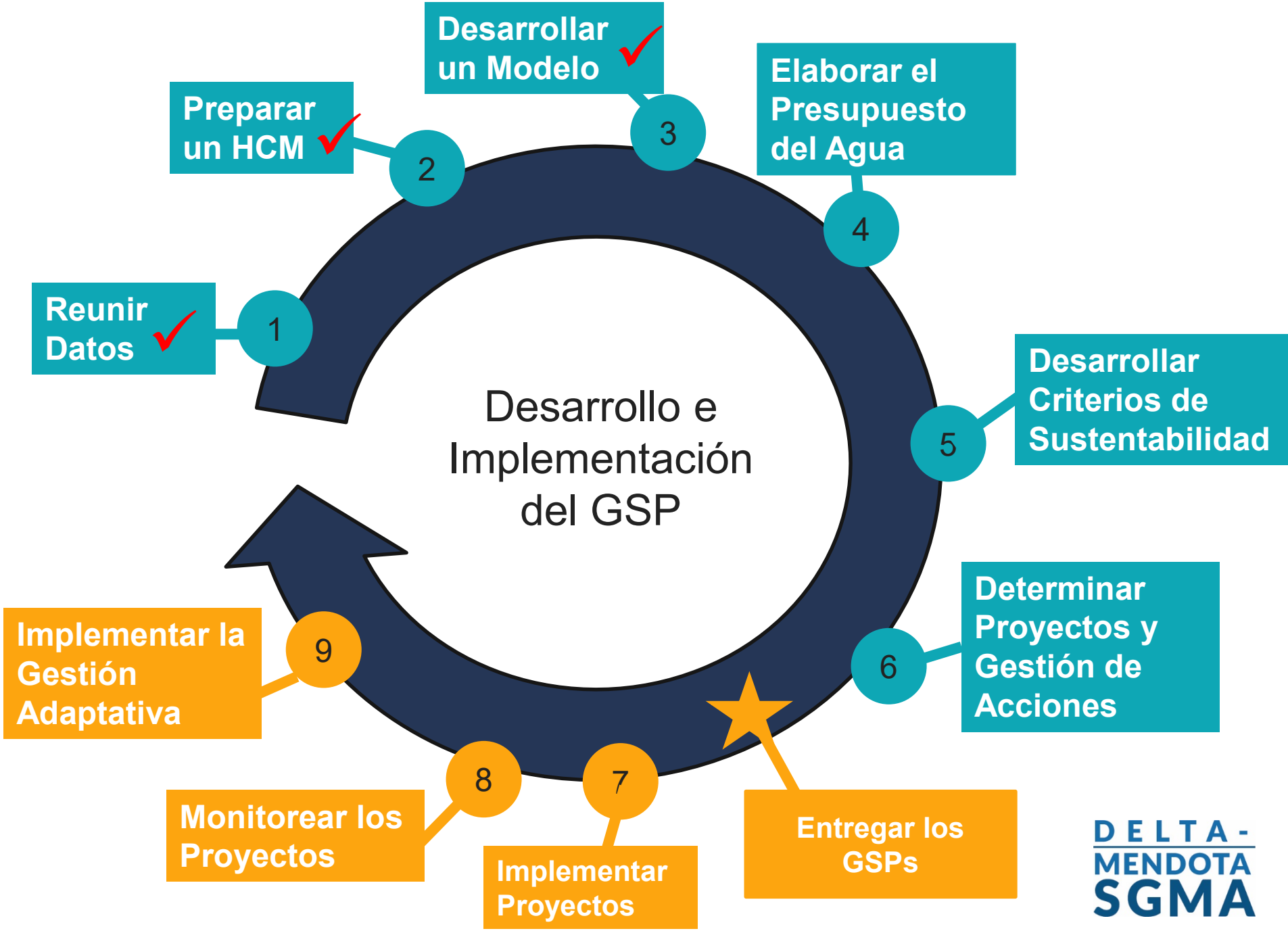
=

Equilibrio hídrico

DELTA-MENDOTA SGMA

Que sigue?


GSP Development and Implementation
1
Reunir Datos
2
Preparar un HCM
3
Desarrollar un modelo
4
Elaborar el Presupuesto de Agua
5
Desarrollar Criterios de Sustentabilidad
6
Determinar Proyectos y Gestión de Acciones
7
Implementar Proyectos
8
Monitorear los Proyectos
9
Implementar la Gestión Adaptativa
DELTA-MENDOTA SGMA


Desarrollo e Implementación del GSP
1
Reunir Datos
2
Preparar un HCM
3
Desarrollar un Modelo
4
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5
Desarrollar Criterios de Sustentabilidad
6
Determinar Proyectos y Gestión de Acciones
Entregar los GSPs
7
Implementar Proyectos
8
Monitorear los Proyectos
9
Implementar la Gestión Adaptativa
DELTA-MENDOTA SGMA

Que sigue?

Invierno del 2018
Taller público #3: Presupuestos de Agua, Objetivos y Criterios de Sustentabilidad

Primavera del 2019
Taller público #4: Proyectos de Aguas Subterráneas y Gestión de Acciones

Sept - Dic del 2019
Revisión pública de los proyectos de Planes de Sustentabilidad de Aguas Subterráneas

Dic – Ene 2020
Aprobación de los Planes de Sustentabilidad de Aguas Subterráneas

31 de Enero del 2020
Planes de Sustentabilidad de Aguas Subterráneas presentados al Estado

DELTA-MENDOTA SGMA

Involúcrese

Hable con su representante local de la agencia de sustentabilidad de aguas subterráneas

Regístrese en el correo electrónico de su agencia local de sustentabilidad de aguas subterráneas

Asista a las reuniones y talleres

Proporcionar información sobre el desarrollo del plan de sustentabilidad de aguas subterráneas

¡Ayúdenos a correr la voz!

DELTA-MENDOTA SGMA

Asista a las Reuniones y Talleres Públicos

Comité de Coordinación de la Subcuenca Delta-Mendota: 4to jueves de cada mes

Grupo de trabajo técnico de la subcuenca Delta-Mendota: 3er martes de cada mes

Grupo de Trabajo de Comunicaciones Delta-Mendota: 4to martes de cada mes.

DELTA-MENDOTA SGMA

¿Preguntas?

Sesión de Análisis

Public Workshop 3:
Workshop Feedback and Summary

DELTA-MENDOTA SUBBASIN
SUSTAINABLE GROUNDATER MANAGEMENT ACT
WINTER 2019 COORDINATED WORKSHOPS

Tuesday, February 19, 2019, Los Banos
4:00 – 6:00 PM
College Greens Building

Wednesday, February 20, 2019, Patterson
4:00 – 6:00 pm
City of Patterson City Hall

Monday, March 4, 2019, Santa Nella
6:00 – 8:00 PM
Romero Elementary School

WORKSHOP SUMMARY

- Three workshops were held in the northern, central, and southern parts of the Delta-Mendota Subbasin during February and March 2019. The purpose of the workshops was to educate stakeholders and members about the public about topics covered in the draft Groundwater Sustainability Plans (GSP) being developed for the subbasin. Topics covered during the workshop included historic and current water budgets, sustainability criteria, undesirable results, and projects and management actions.
- Workshops were promoted via emails sent to each GSA's interested parties database, flyers and utility bill inserts, and social media posts.
- The format and content of each workshop was the same. The workshops began with a short presentation, followed by an open house period for participants to talk with their Groundwater Sustainability Agency (GSA) representative. Spanish interpretation was provided at each workshop.
- In total, approximately 30 individuals (not including GSA representatives and supporting staff) participated in the workshops. Attendance by location was as follows: Patterson – 14, Los Banos – 4, and Santa Nella – 12. Participants represented a range of beneficial users in the subbasin, including domestic well owners, agricultural water users, public water systems, and disadvantaged communities.

- Workshop participants' questions and feedback are summarized as follows:

  Water Budgets

  - Does the land surface budget include inflows from precipitation and applied water to crops?
  - Who provides the information about the inflows and outflows of the aquifer?
  - How is the aquifer recharged?
  - Do reservoirs lose water?
  - What happened between 1985 – now [regarding the historic water budget]?
  - What affect does precipitation have on the aquifer?

  Projects and Management Actions

  - Who will make the decision on who can drill wells and how much can well owners can pump?
  - Will GSAs in the subbasin be able to restrict selling of groundwater outside of the subbasin?
  - Projects and management actions should emphasize flood and stormwater capture and increased stormwater storage.
  - Will use of recycled water in new developments be considered a source of water to balance the water budget?
  - Are there percolation ponds by golf course?

  Sustainability Criteria and Undesirable Results

  - Is it the GSAs' responsibility to set the sustainability criteria for the subbasin?
  - Could this region experience seawater intrusion?
  - What's going to happen in areas like Dos Palos that have poor groundwater quality?

  Other

  - Does the GSP only cover of agricultural uses of groundwater or does it also cover residential and commercial uses of groundwater?
  - Who is doing the work to prepare the GSP?
  - How much does it cost to prepare a GSP?
  - Are there any agencies currently monitoring groundwater pumping and levels?
  - How is groundwater currently being removed from the groundwater basin?
  - How many monitoring stations have been identified? Have GSAs already identified where these monitoring pumps are?
  - Does the California Aqueduct affect the water table in the subbasin?
  - What is the rationale for the North-Central GSP group's boundaries? The north and south areas of the North-Central GSP group are very different.
  - Do water agencies in the subbasin send water to the Santa Clara Valley Water District?
  - Where are the coordinated meetings are held? What time are these meetings?
  - Will this raise our water rates?
  - The community of Tranquillity is currently experiencing land subsidence.

Public Workshops No. 4

Public Workshop 4:
Meeting Sign In Sheets

Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/20/19 Time: 4:00 – 6:00 PM
Location: Patterson

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Adam Scheuber			ascheuber@delpuerto.com	209-892-4470
Rafael Rodriguez		628 church st modesto CA	RafaelRcloe@gmail.com	Tel 209 505 2200
Walt Ward	Stan Co - DER			
MARCO TURCHETTI	CALIFORNIA MASTERPLANT	492 W DURHAM FERRY RD TRACY CA 95304	MTURCHETTI@MORNINGSTARCO.COM	(209) 605 9330
Andrew Garcia	SLDMWA		andrew.garcia@sldmwa.org	209 832 6200
Steve Olson	Home owner	4179 Sequoia Patterson C.	AGMEC@ns.@gmail.com	892-8965
Seth Harris	SLDMWA		SethHarris@SLDMWA.org	209-832-6200

*Note: All email addresses entered onto this sign-in sheet will be automatically added to the contacts email list.
*Nota: Todas las direcciones de correo electrónico ingresadas en esta hoja de registro se agregarán automáticamente a la lista de contactos.

Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/20/19 **Time:** 4:00 - 6:00 PM
Location: Patterson

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Vince Lucchesi			VLucchesi@Pattersonid.org	
Miguel Dorros	MODEST - Employ	209)345-6741		
Jarrett Martin	—	—	—	—
Jim Cox	Landowner	Westley	jcoxdbelive.com	
Fernando Ulloa	City of Patterson		—	—
Carol Olson	Yes		agmecinca@gmail.com	
Maria Encinas	City of Patterson			

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/20/19 Time: 4:00 – 6:00 PM
Location: Patterson

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
ANDY NGUYEN			anguyen@sjgov.org	
Robert Brown			Robert@brownsmedinc.com	209-993-5208

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 4/21/19 **Time:** 4:00 - 6:00 PM
Location: LOS BANOS

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Sarah Mann	—	—	—	—
Joe Harvey				(559) 779-5842
Alessandro Paolini				(209) 826-5112
Rick Iger			riserepping.com	
Joe Mello				
TODD SILVA			tanddsilva@aol.com	

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 4/21/19 **Time:** 4:00 - 6:00 PM
Location: LOS BANOS

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Juanita Jimenez	home owner	15763 Badger Flat.		
WAYNE WESTREEN	HAMMONS RANCH	47325 W. DAKOTA FIREBAUGH. 93622	KKPWW@AOL.COM	559 978 0331
Deborah Matos	Santa Nella County Water District			
LISA FORD	ALMENDRA	44414 WEST NEES FIREBAUGH	lford@king-ranch.com	
Ben Fenters		P.O. BOX 888 NEWARK, CA 94560		
PATRICK GEE			otraworld@yahoo.com	— Add to DM mailing list
Tom Kalyian		645 Pacheco Blvd Los Banos	TomLosBanosRealEstate.Com	209 769 8091

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 4/21/19 Time: 4:00 - 6:00 PM
Location: LOS BANOS

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
L. Geis	GWD CCID	8720 Cypress Dos Palos, CA 93620	159123forme@msn.com	~~209~~ 559 435.3686
ED MENDES	—	34514 RD 600 RAYMOND, CA 93653		559-760-0360
Frank Silveira		17395 Henderson Los Banos		769 6191
Richard + Kathy Mandarello		1117 Symphony St Los Banos CA 93635		
Laurie Rouch		SNCWD		
STEVE DALLURA	AUBIES TRUCKING	BOX 1089 TRACY CA 95378		209 ~~48~~ 4915
Ric Orozco	GRASSLAND GSA/GSP area	2020 W. Wilmoth Los Banos		209-675-0924

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 4/21/19 **Time:** 4:00 - 6:00 PM
Location: Los Banos

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Brendan Costa	Lone Tree Creek Vineyards	17000 E. Hwy 120 Ripon, CA	brendan.costa@thewinegroup.com	209-599-0502

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/22/19 **Time:** 6:30-8:30 PM
Location: SANTA NELLA

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Darlene Castro	Volta CSD	Volta	info@voltawater.com	(209)829-3406
Maria Fraga				559-210-2668
AMY CHAN TRAN	OAKLAND	OAKland, CA 94602 3477 Laurel AVe		(510)388-3783

*Note: All email addresses entered onto this sign-in sheet will be automatically added to the contacts email list.
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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/22/19 **Time:** 6:30-8:30PM
Location: SANTA NELLA

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Anthony				587 5569

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/23/19 **Time:** 6:00 – 8:00PM
Location: Mendota

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Stacia Olivera		681 S. Boyd Dr Kerman CA 93630	sholivera@aol.com	—
Giana Olivera	Olivera Inc	15750 W E St Kerman CA 93630	gianaoliveraa@yahoo.com	—
Miguel Flores		1585 WE Hy Ave	—	—
Annie + Garrick Stuhr	Homeowner	28619 W. Whiteshindge Mendota CA 93640	garrick stuhr@hotmail.com	
Will Halligan	Farmers WO			
Kenneth Kronberg	FARMER.	2706 W Beechwood Fresno, CA.	kenco.KK@gmail.com	

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/23/19 **Time:** 6:00pm – 8:00pm
Location: Mendota

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Jeannie French		10292 W California		(559) 708-9079
Kevin French		" " " "		" " " "

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Delta-Mendota SGMA Workshop Sign–In / Registro de Taller

Date: 5/23/19 **Time:** 6:00-8:00 PM
Location: Mendota

DELTA-MENDOTA SGMA

Name / Nombre	Homeowner/ Dueño de Casa Organization/ Organización	Address/Domicilio	Email*	Phone / Teléfono
Joe Hopkens	Duejo WD		JHopkens@ PPWG.com	559-779-5842
Chris Ocho	Dwr		[illegible]	
Garrett Martin	—	—	—	—
Jim Stilwell	Farmers WD		Jim@ Bakerfarming.com	559 479-2109
Jeff Oliveira	Farmer		JOliveraC@AOL.com	5
Christina Guzman	Fresno County		chguzman@fresnocountyca.gov	559 600 4297

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Public Workshop 4:
English Announcements and Materials

Help Us Plan for the Future of Our Water Resources

Local agencies are developing groundwater sustainability plans to plan for the future of our groundwater resources. Come to the last workshops of the planning process to learn more.

You have multiple opportunities to attend:

Patterson
Monday, May 20, 4:00 - 6:00 PM
Patterson City Hall
1 Plaza Circle, Patterson, CA 95363

Los Banos
Tuesday, May 21, 4:00 - 6:00 PM
College Greens Building
1815 Scripps Drive, Los Banos, 93635

Santa Nella
Wednesday, May 22, 6:30 - 8:30 PM
Romero Elementary School MPR
13500 Luis Ave, Gustine, CA 95322

Mendota
Thursday, May 23, 6:00 - 8:00 PM
Mendota Library
1246 Belmont Ave, Mendota, CA 93640

The content of each workshop is the same. The first forty minutes of the workshops will consist of a bilingual presentation on:

- Present and future state of our groundwater resources (water budget)
- Sustainable yield of our groundwater basin
- Regional groundwater monitoring network
- Projects and actions to manage our groundwater

Food will be provided. Spanish-language interpreters and materials will be available. For more information, please visit our website at www.deltamendota.org. We look forward to seeing you there!

PROP 1
GOVERNOR EDMUND G. BROWN, JR.
WATER BOND 2014
RELIABILITY | RESTORATION | RESILIENCE

DELTA-MENDOTA SGMA

Delta-Mendota Subbasin Sustainable Groundwater Management Act Workshop

May 2019

DELTA-MENDOTA SGMA

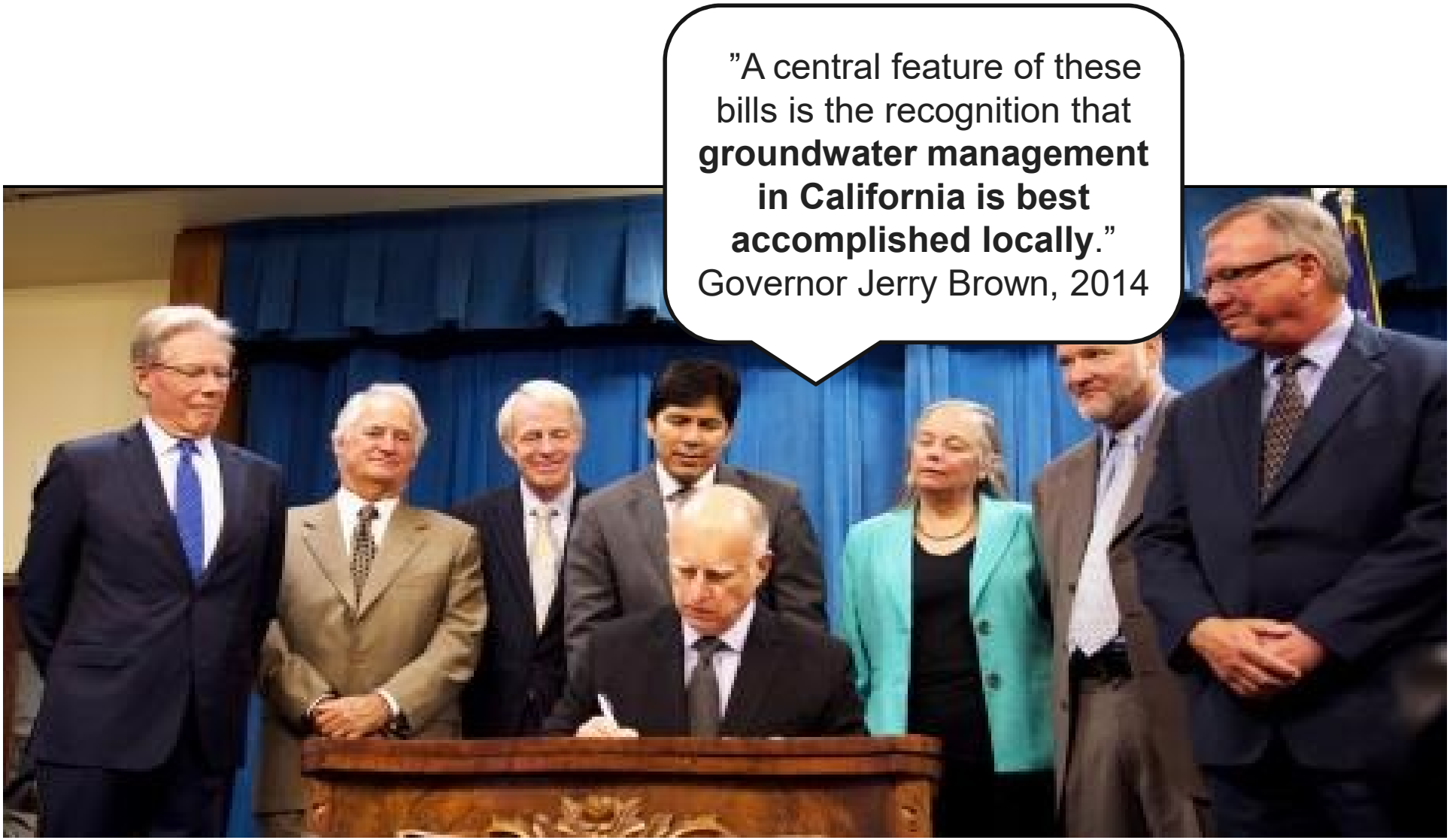
DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

PROP 1 · GOVERNOR EDMUND G. BROWN, JR. · WATER BOND 2014 · RELIABILITY | RESTORATION | RESILIENCE

Agenda

1. Welcome
2. Introductions
3. Presentation
4. Breakout Sessions

Sustainable Groundwater Management Act of 2014



Sustainable Groundwater Management Act Terms

SGMA = Sustainable Groundwater Management Act

GSA = Groundwater Sustainability Agency

GSP = Groundwater Sustainability Plan

aquifer = an underground layer of water-bearing materials, such as gravel or sand, from which water can be pumped

DELTA-MENDOTA SGMA

Sustainable Groundwater Management Act Timeline

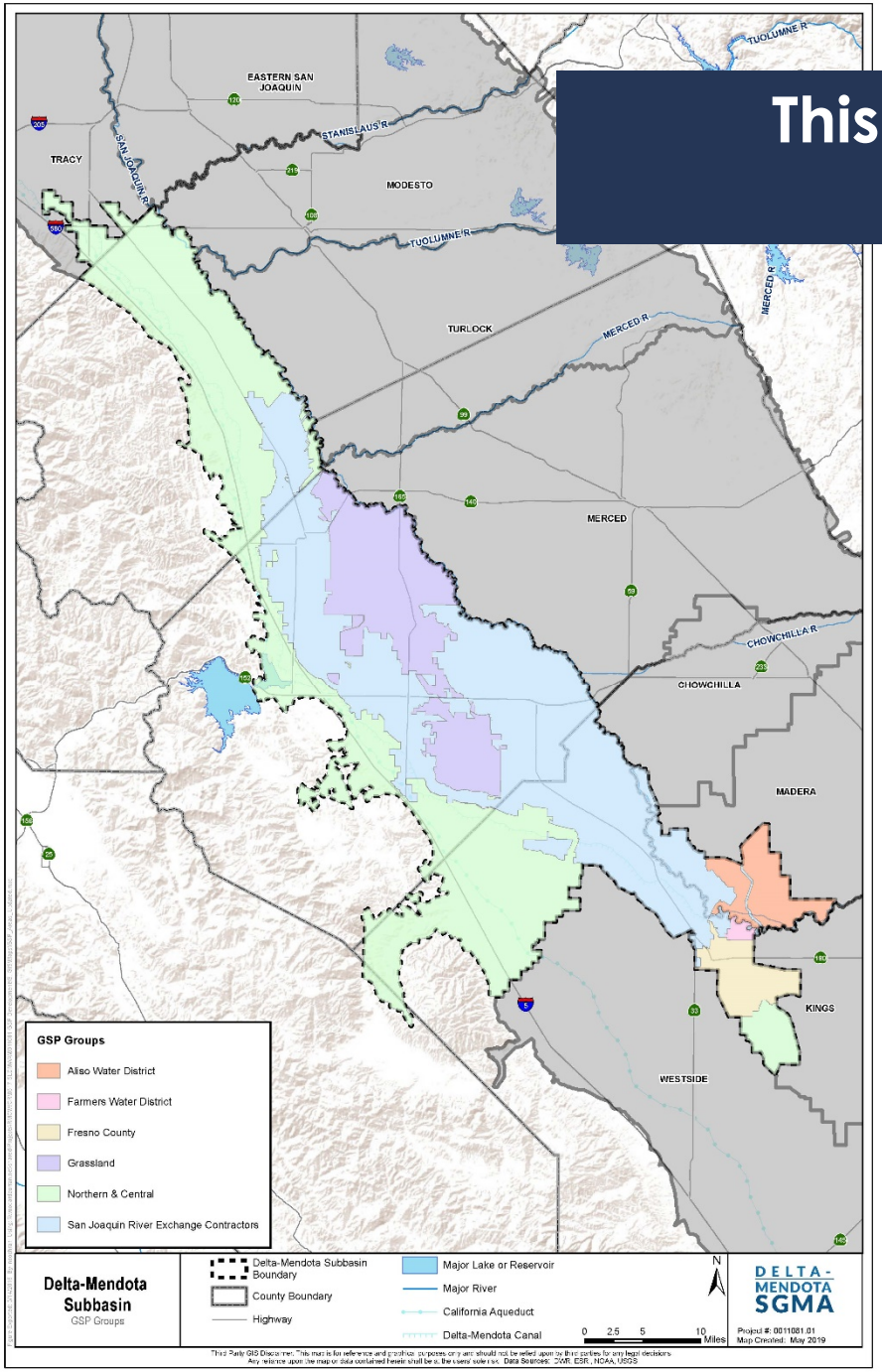
June 30, 2017
Groundwater Sustainability Agencies must be formed.

January 31, 2020
Groundwater Sustainability Plans must be submitted to the State.

January 31, 2040
Delta-Mendota Subbasin must achieve sustainability.

DELTA-MENDOTA SGMA

This is a collaborative, regional effort.



DELTA-MENDOTA SGMA

Our Timeline – Pathway to Sustainability

Spring 2019

Workshop #4

Summer 2019

Refine Admin Draft GSPs

Fall 2019

Release Public Draft GSPs for Review

Winter 2019

Adopt Final GSPs at Public meetings

Jan 31, 2020

Deadline to Submit GSPs to State

April 1, 2020 (and Annually Thereafter)

Submit Annual Report on GSPs to State

Every Five Years

Five Year Review of GSPs

DELTA-MENDOTA SGMA

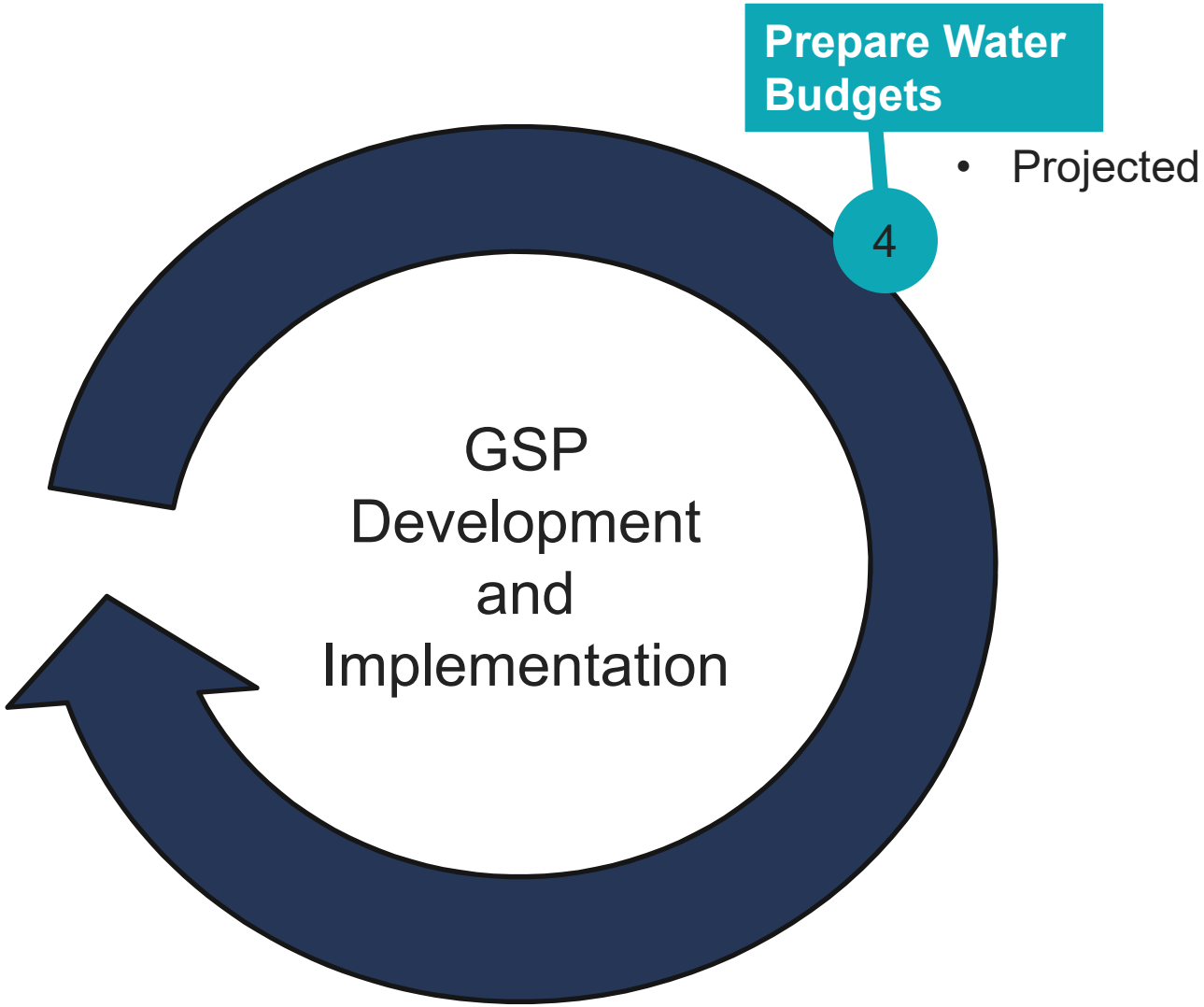
Public Review and Participation

- Public workshops
- GSP Public Draft review
- Adoption of GSPs at public meetings
- Public comment process after adopted to State

DELTA-MENDOTA SGMA

Questions?

DELTA-MENDOTA SGMA



- Projected

DELTA-MENDOTA SGMA

A water budget is like a checking account…

Inflows

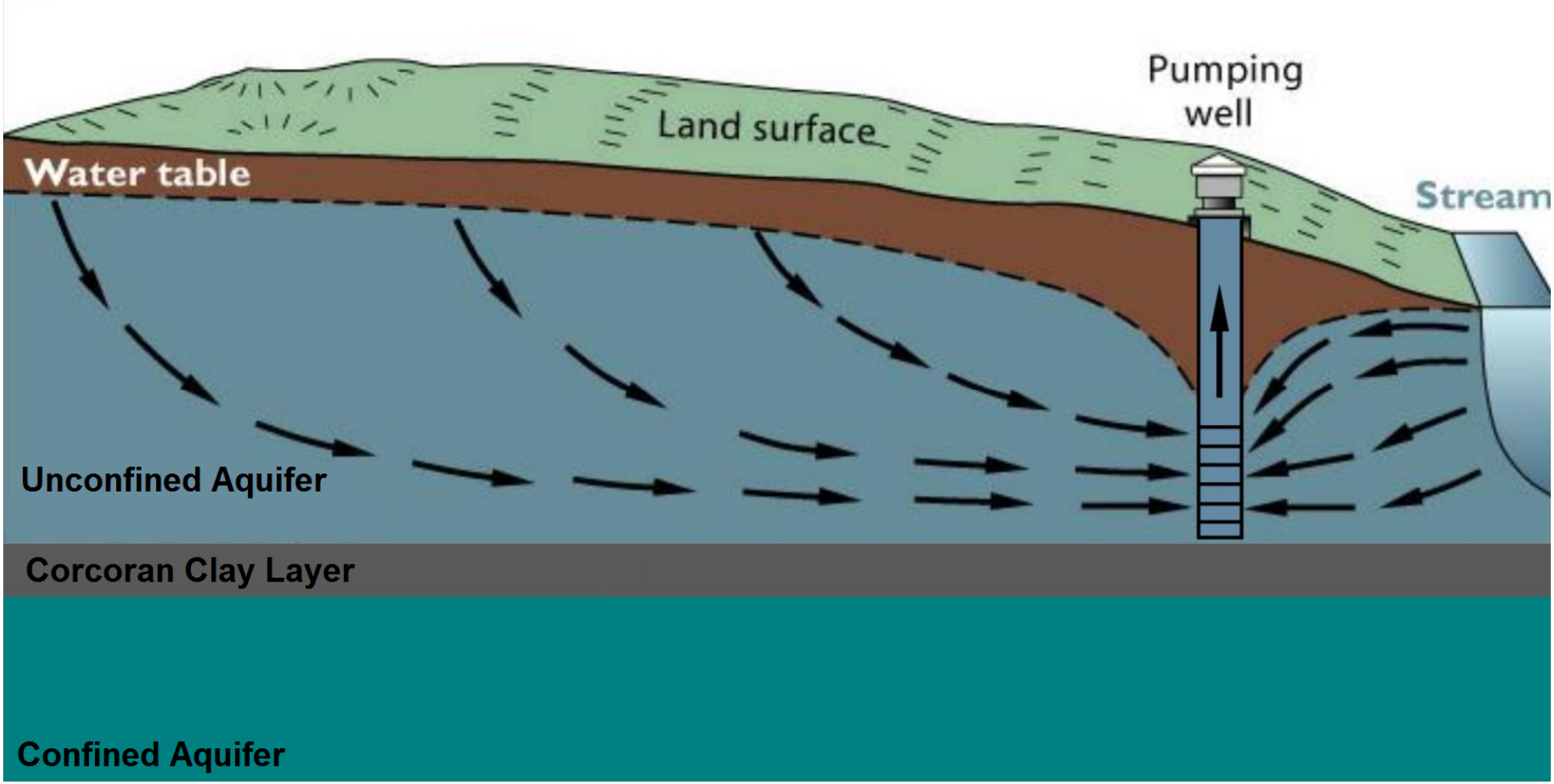
−

Outflows

=

Change in Storage

DELTA-MENDOTA SGMA



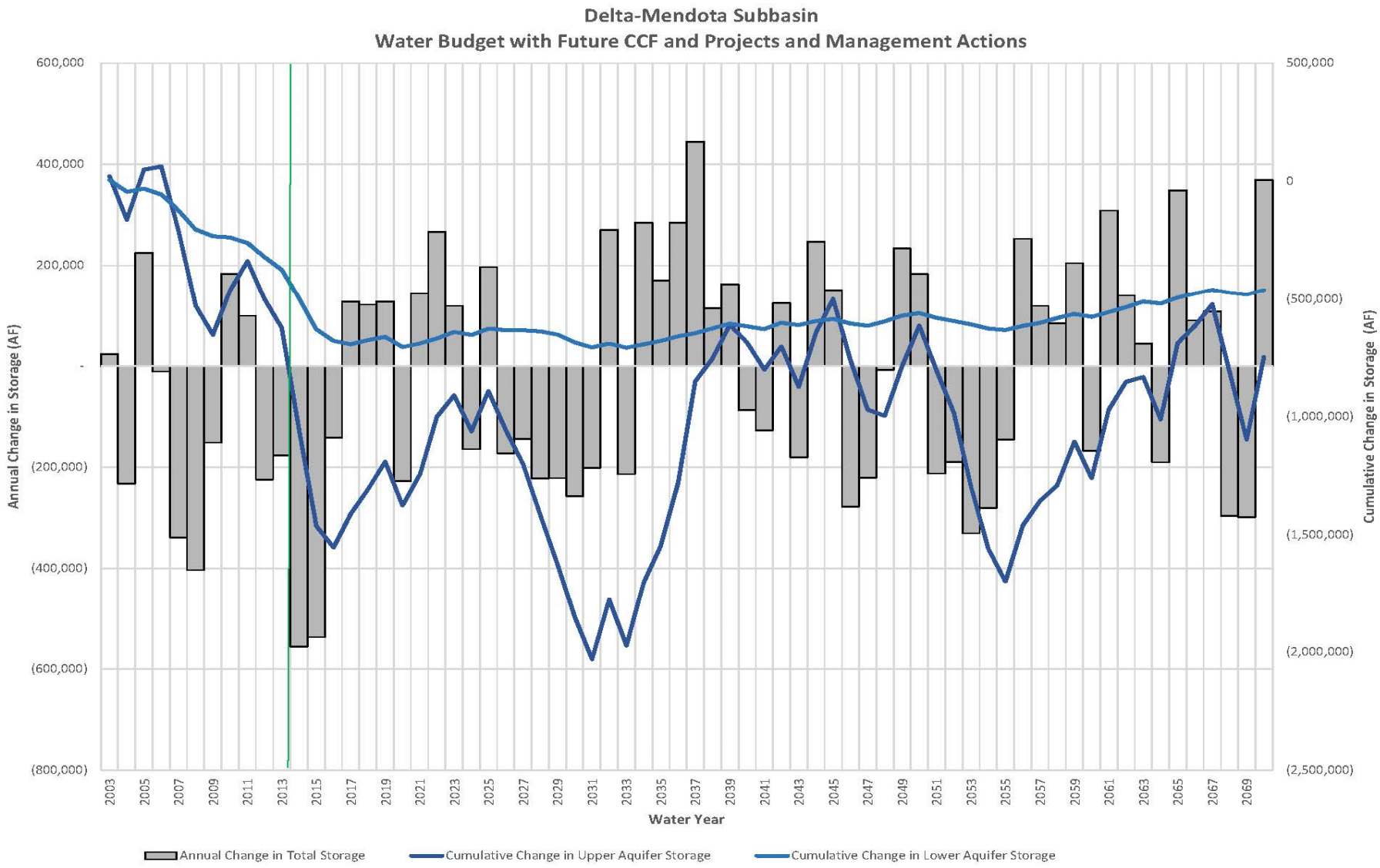
DELTA-MENDOTA SGMA

Basin-Wide Water Budgets

	UPPER AQUIFER Average Annual Change in Storage	LOWER AQUIFER Average Annual Change in Storage
Historic (2003-2012)	-50,200 acre-feet	-32,400 acre-feet
Current (2013)	-123,400 acre-feet	-52,700 acre-feet
Projected (2014-2070)	-2,100 acre-feet	-1,500 acre-feet

DELTA-MENDOTA SGMA

Delta-Mendota Subbasin Change in Storage (Projected Water Budget with Climate Change Factors, Projects and Management Actions)



Estimated **Sustainable Yield** for the Delta-Mendota Subbasin

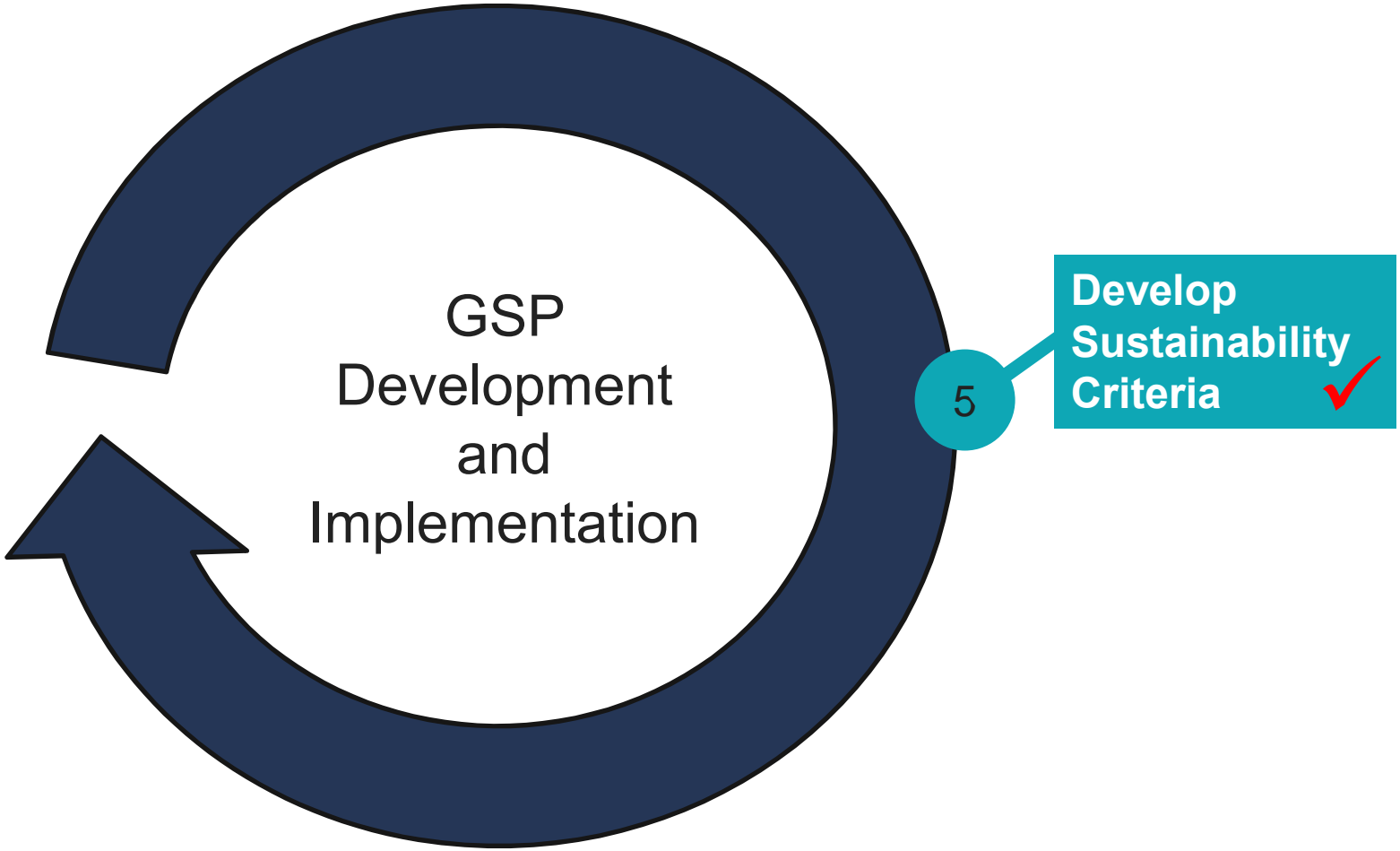
	UPPER AQUIFER	LOWER AQUIFER
Estimated Average Annual Sustainable Yield	320,000 – 450,000 acre-feet	250,000 acre-feet

DELTA-MENDOTA SGMA

Why is this important?

- Compliance
- Long-term groundwater resources for all beneficial uses, including: drinking water, agriculture, and the environment.
- Short-term and long-term planning and management for water resources.

DELTA-MENDOTA SGMA



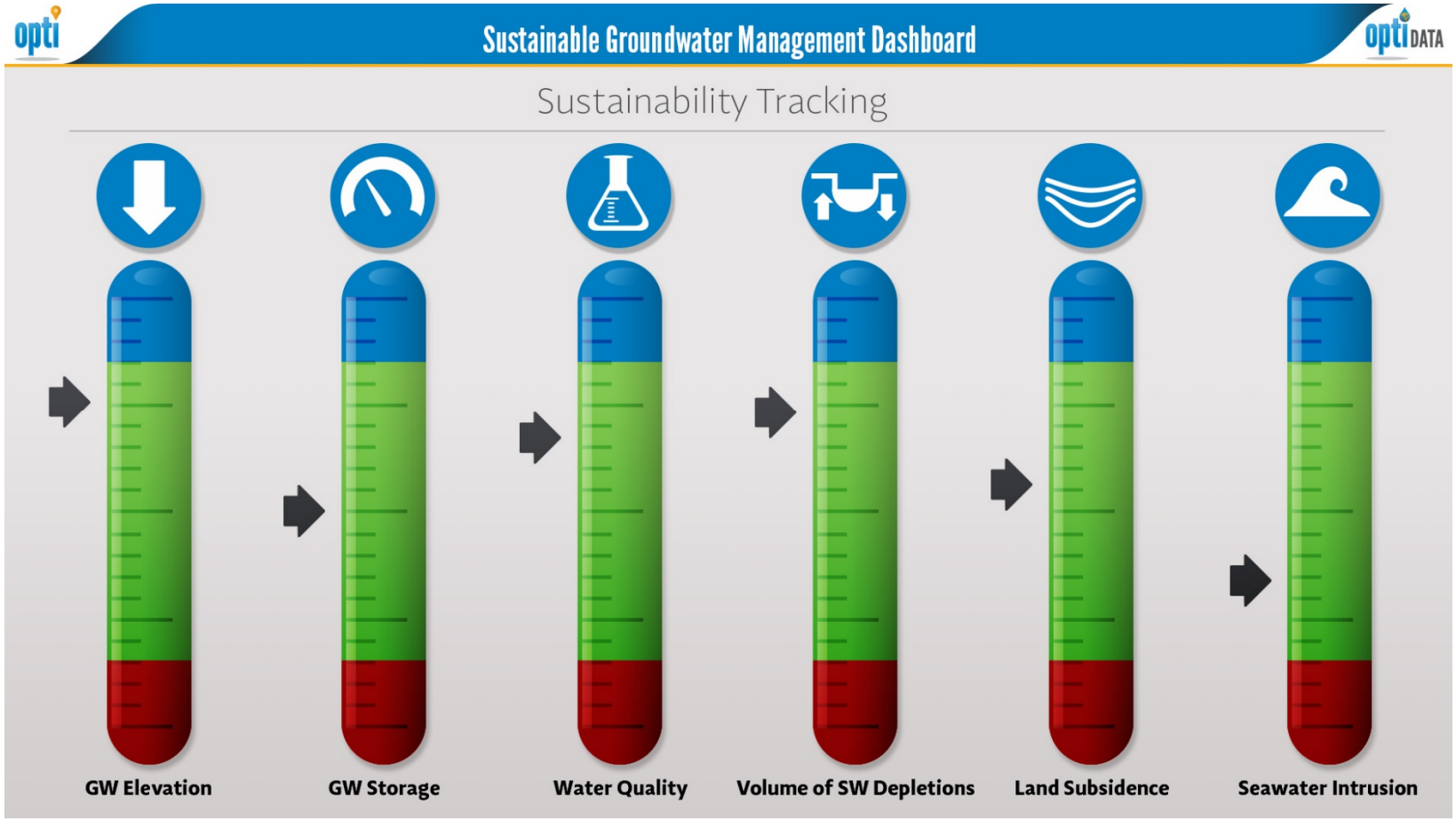
DELTA-MENDOTA SGMA

So What Are Undesirable Results?

Undesirable results are <u>significant and unreasonable</u> impacts caused by:

1. Chronic lowering of groundwater levels
2. Reduction of groundwater storage
3. Degraded water quality
4. Land subsidence
5. Depletions of interconnected surface water

What are sustainability indicators?



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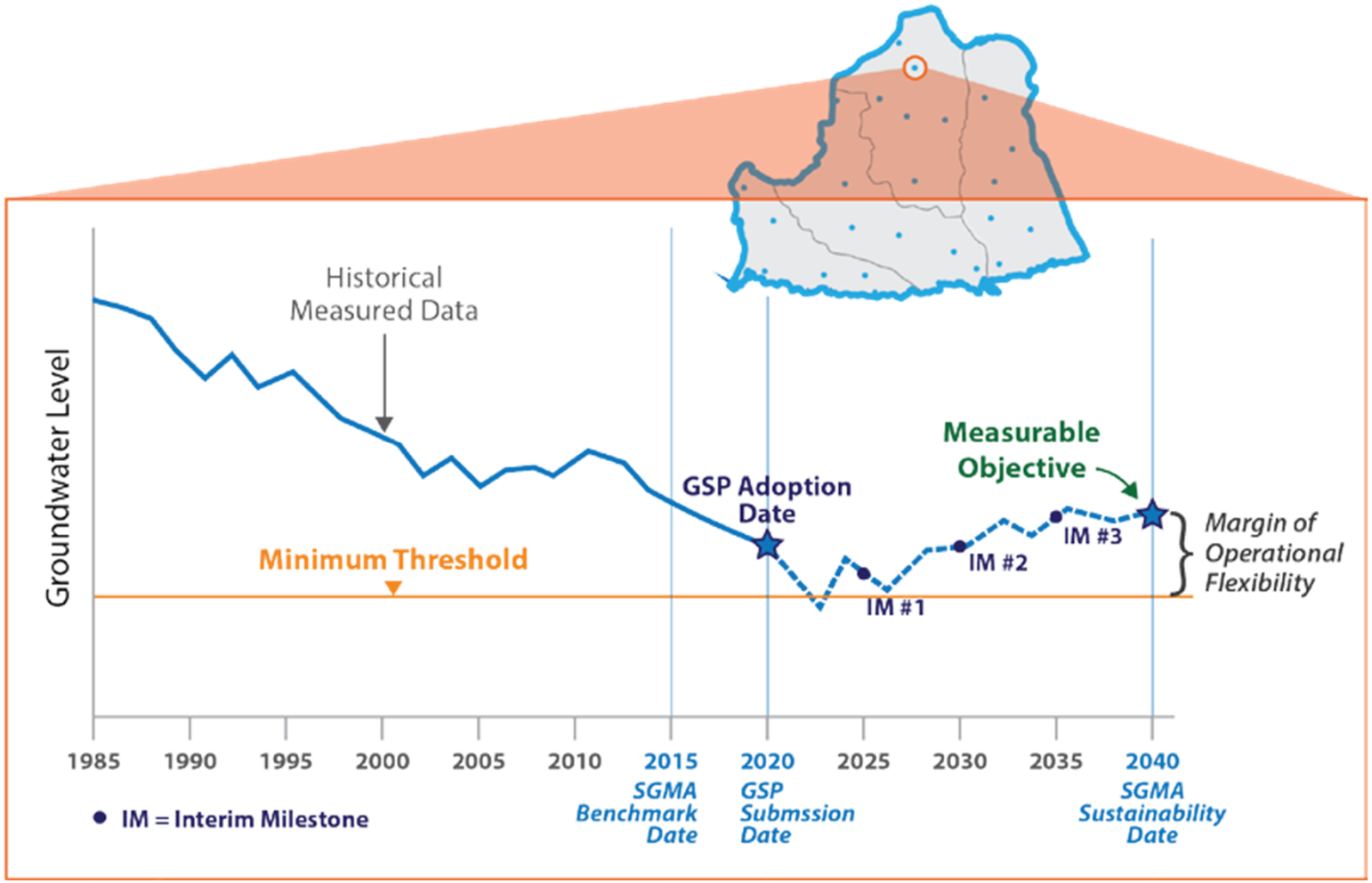
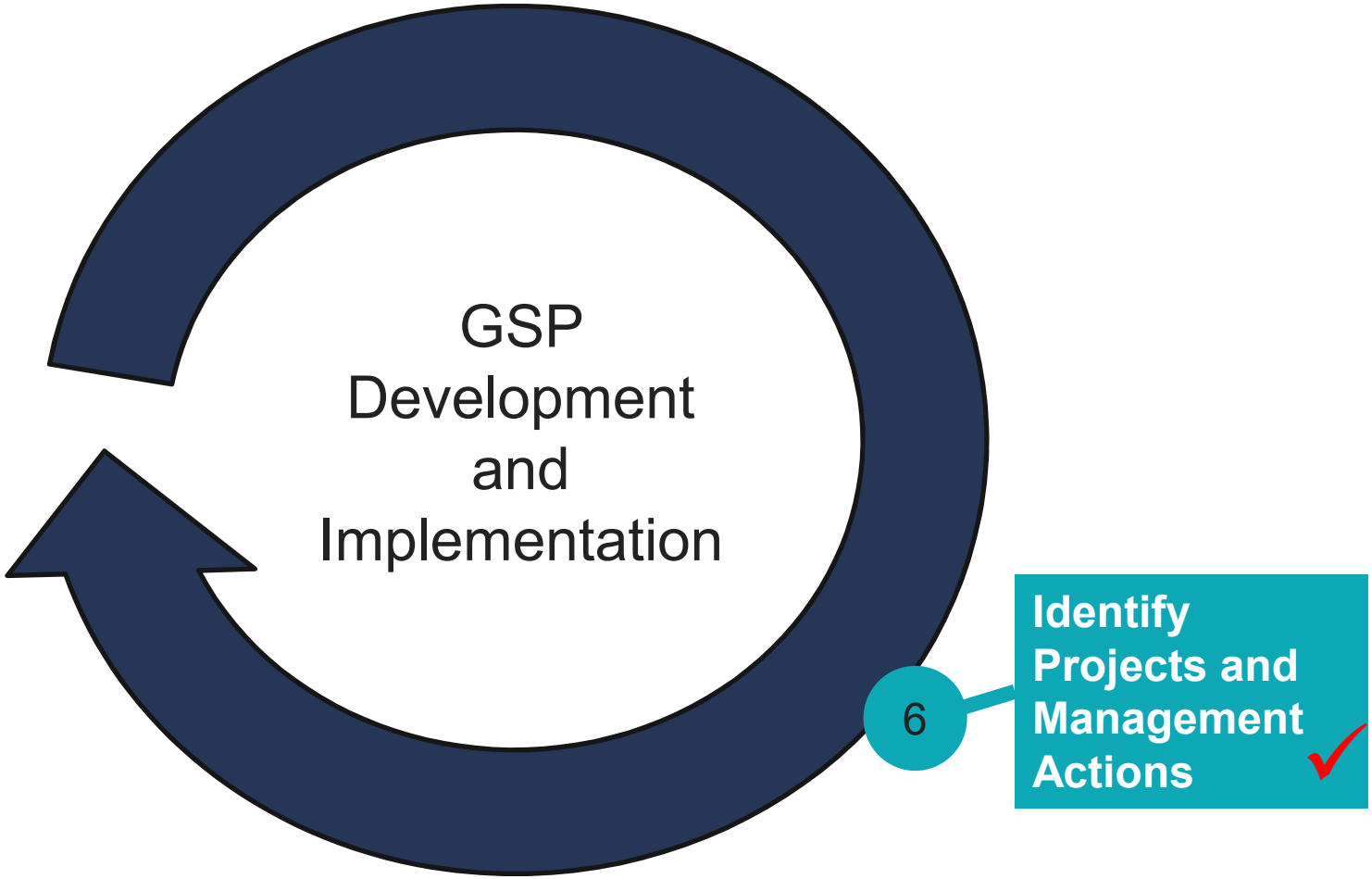
Thresholds & Measurable Objectives



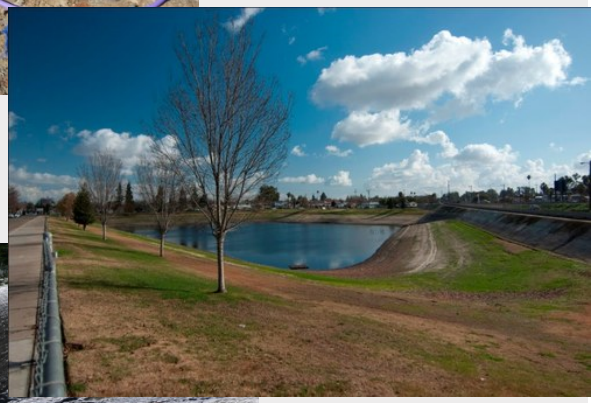
DELTA-MENDOTA SGMA



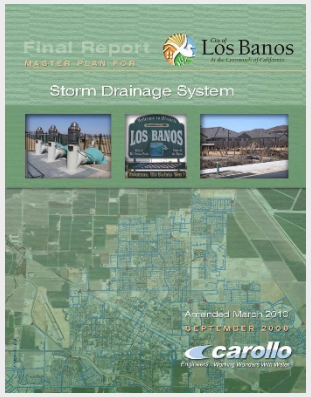
DELTA-MENDOTA SGMA

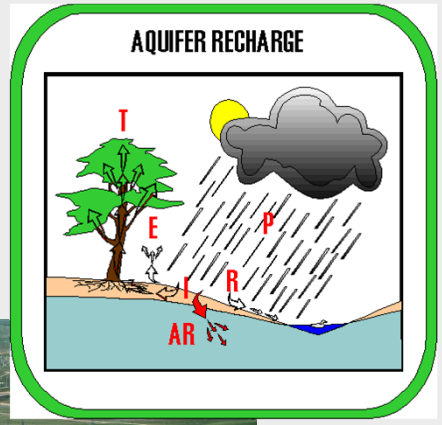
Step 6: Identify Projects and Management Actions

Projects = Things you can construct



Management Actions = Plans, permits, policies, or other actions



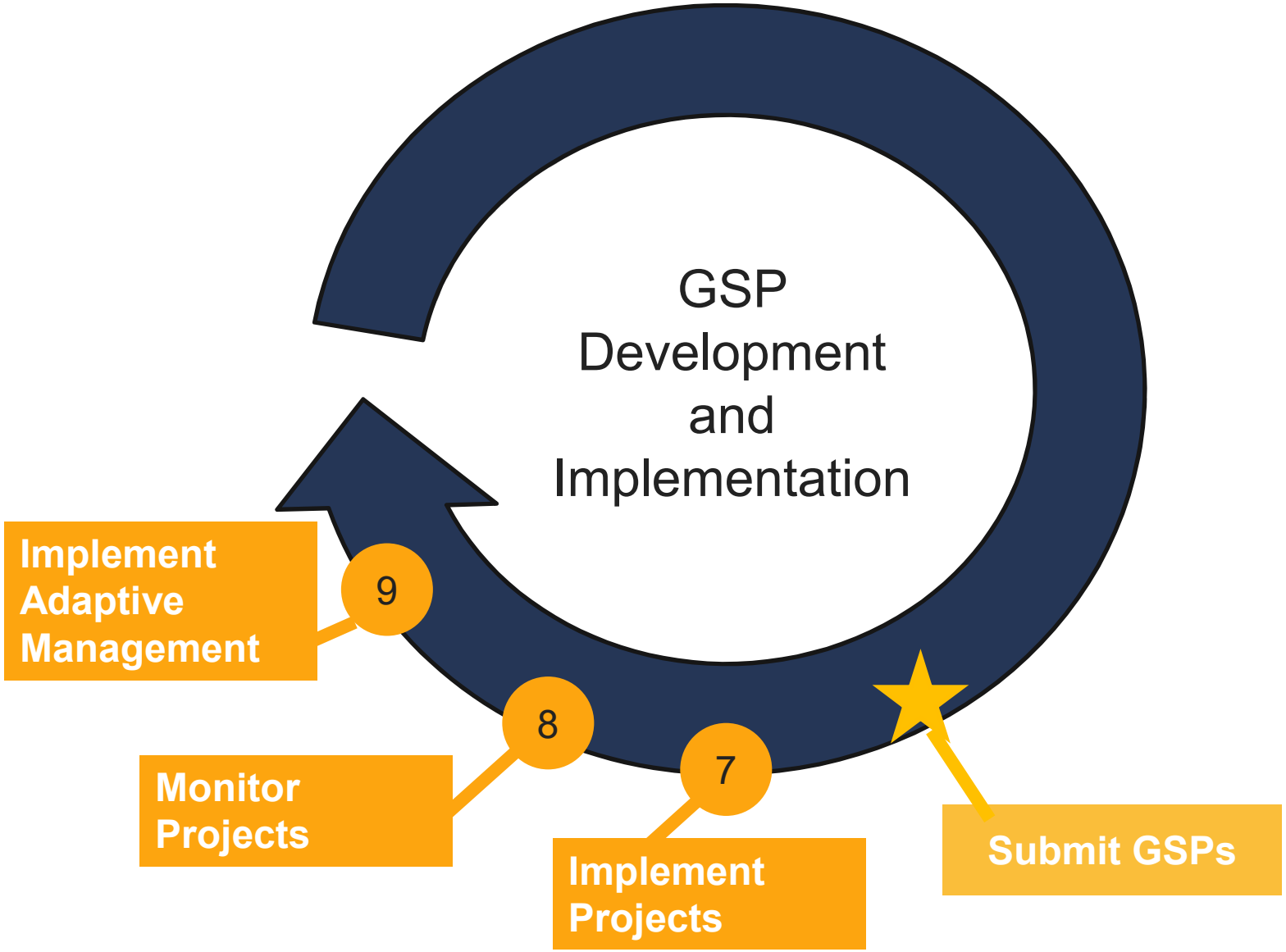


DELTA-MENDOTA SGMA

Examples of Projects and Management Actions in the Delta-Mendota Subbasin

Projects	Management Actions
Direct and indirect groundwater recharge	Revising pumping regimes
Stormwater capture and reuse	Revising existing or implementing new pumping rules
Drainwater capture and reuse	Rotational fallowing of crop lands
Recycled water use	Drought contingency planning
Recapture and recirculation	Maximizing use of surface water and other 'alternatives' supplies
Surface water storage	Incentivizing use of surface water and reduction of groundwater demand
	Developing groundwater extraction reporting system
	Limiting groundwater pumping for credit by transferring outside a specified management area

DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA

Monitoring is like a "check-up" for the groundwater basin. It gives us data to assess the "health" of the basin.

DELTA-MENDOTA SGMA

We will be monitoring for impacts to beneficial users, including…

- Groundwater extraction volumes
- Surface water-groundwater interactions
- Shallow wells
- Stage data (water levels in rivers)
- Groundwater dependent ecosystems
- Upper and lower aquifer groundwater levels
- Upper and lower aquifer groundwater quality
- Subsidence
- Evapotranspiration

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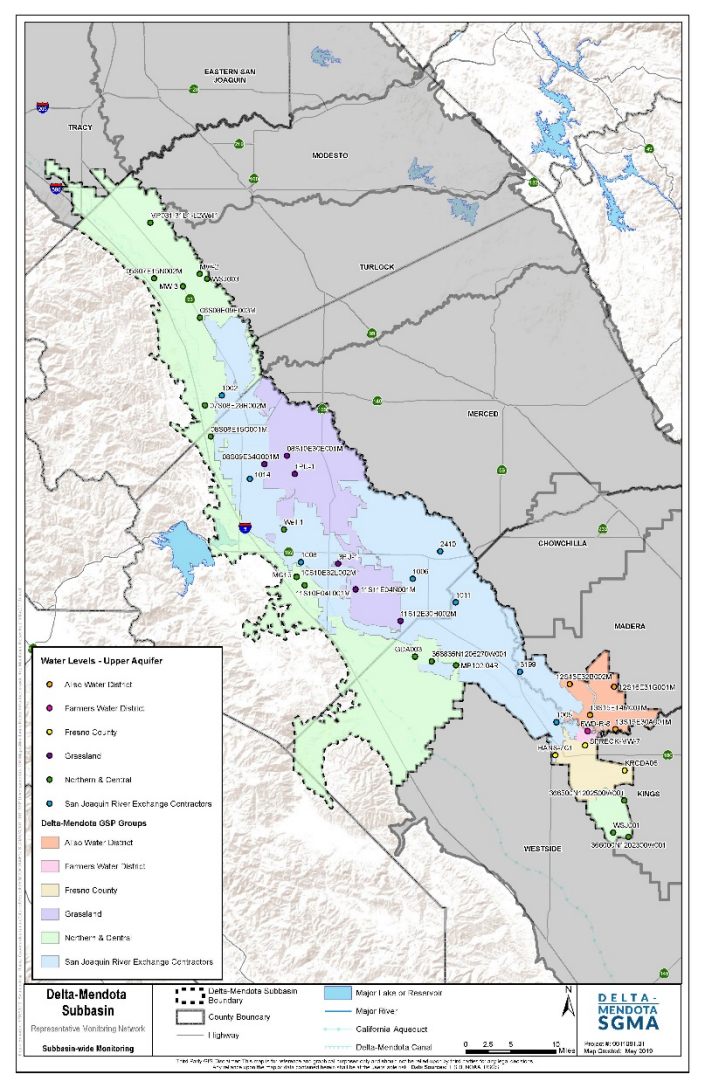
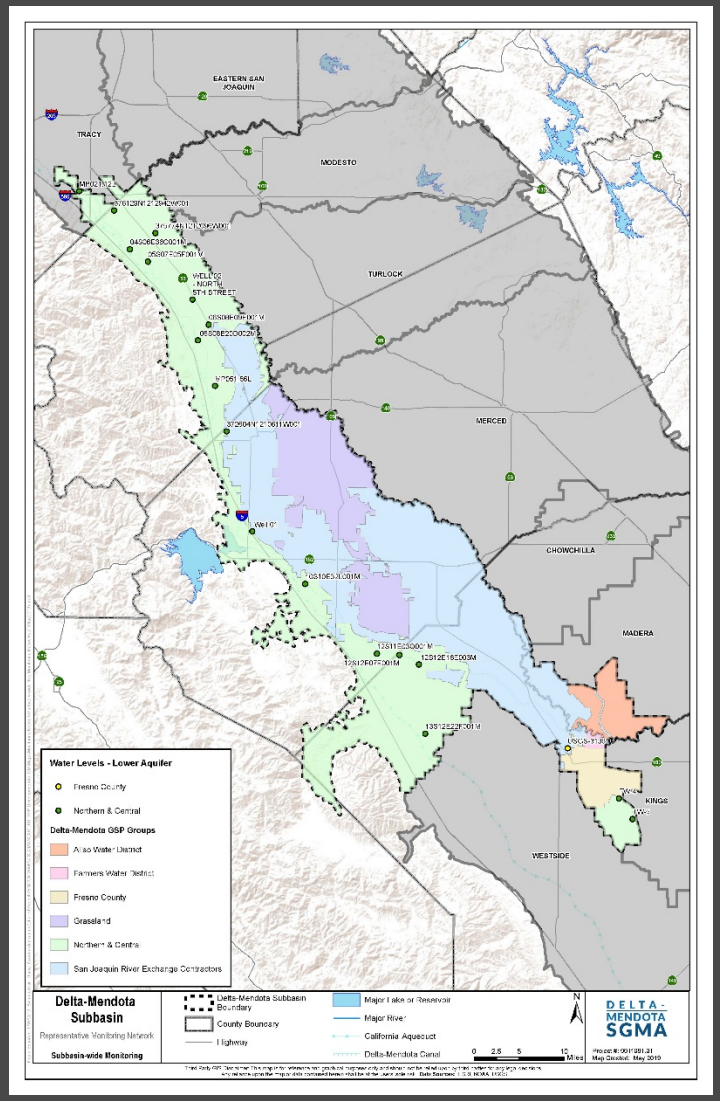
Delta-Mendota Monitoring Network Maps



Upper Aquifer Water Level Monitoring Network



Lower Aquifer Water Level Monitoring Network

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What's Next?

Our Timeline

Spring 2019

Workshop #4

Summer 2019

Refine Admin Draft GSPs

Fall 2019

Release Public Draft GSPs for Review

Winter 2019

Adopt Final GSPs at Public meetings

Jan 31, 2020

Deadline to Submit GSPs to State

April 1, 2020 (and Annually Thereafter)

Submit Annual Report on GSPs to State

Every Five Years

Five Year Review of GSPs

DELTA-MENDOTA SGMA

Get Involved

Talk to your local groundwater sustainability agency representative

Sign-up for your local groundwater sustainability agency's email list

Attend meetings and workshops

Provide input on groundwater sustainability plan development

Help us spread the word!

DELTA-MENDOTA SGMA

Attend Public Meetings and Workshops

Delta-Mendota Subbasin Coordination Committee: 2nd Monday of each month, 9:30 AM – 12:00 PM

Delta-Mendota Technical Working Group, 3rd Tuesday of each month, 10:00 AM – 12:00 PM

Delta-Mendota Communications Working Group: 4th Tuesday of each month, 1:00 – 3:00 PM

All in-person meetings located at the San Luis & Delta-Mendota Water Authority's office at: 842 6th Street, Los Banos, CA 93635

DELTA-MENDOTA SGMA

For more information on groundwater sustainability plan development and a full calendar of public meetings, visit our website at:

DeltaMendota.org

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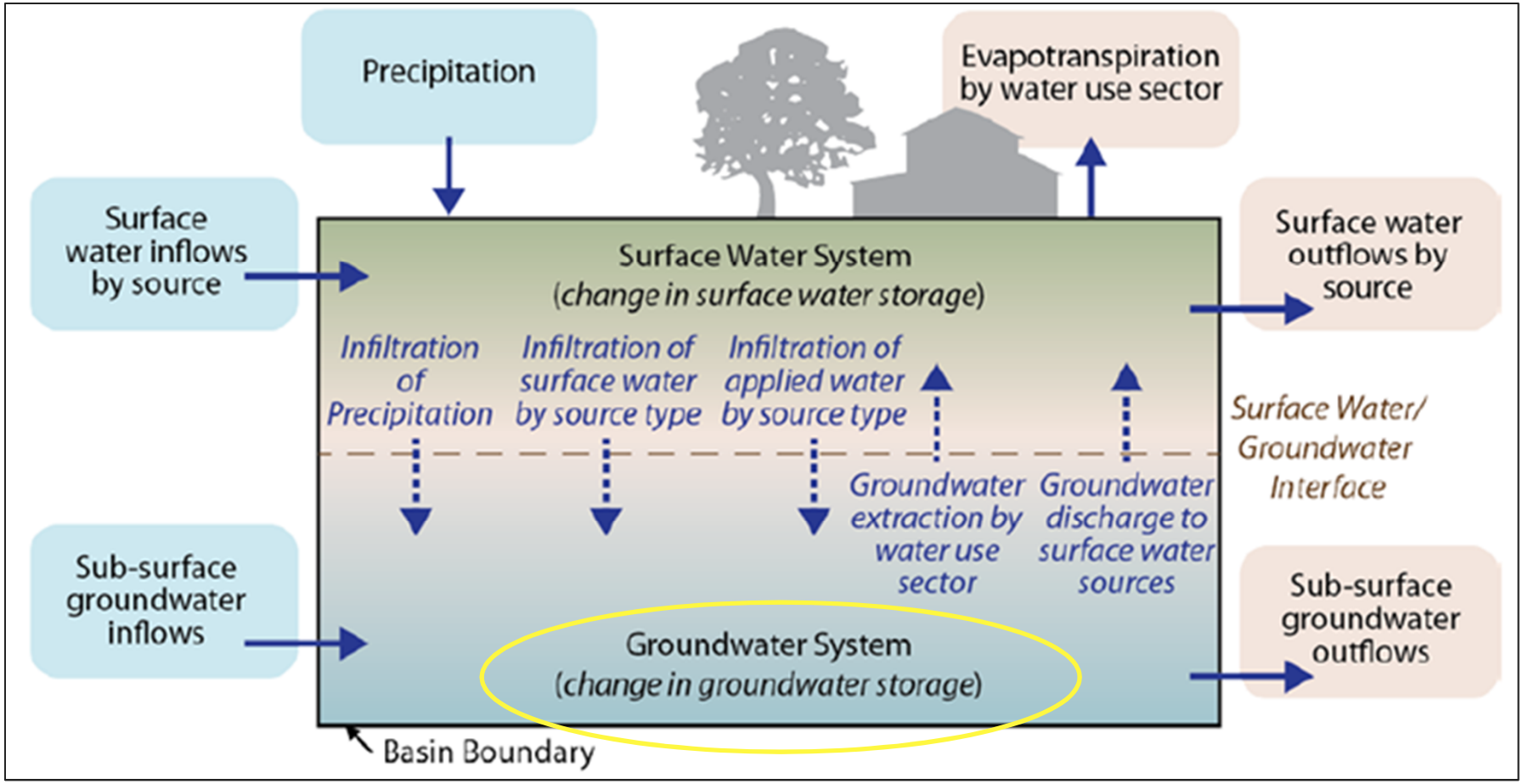
Questions?

Breakout Session

Appendix Slides

DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA

SGMA GSP Requirements

- Establish sustainability goals
- Define “significant and unreasonable” and criteria for undesirable results
- Develop sustainability goal, minimum thresholds and measurable objectives
- Develop plan for meeting sustainability goal
- Implement plan
- Monitor progress
- Engage stakeholders throughout process

DELTA-MENDOTA SGMA

Public Workshop 4:
Spanish Announcements and Materials

Ayúdenos a planificar para el futuro de Nuestros Recusos Hidricos

Las agencias locales están desarrollando planes de sostenibilidad del agua subterránea (GSP) para planificar el futuro de nuestros recursos del agua subterránea. ¡Queremos escuchar de usted! Asista a un taller público para aprender más de su agencia de agua local.

Los detalles del taller son los siguientes:

Taller de Patterson
Lunes 20 de Mayo, 4:00 - 6:00 PM
Patterson City Hall, 1 Plaza Circle, Patterson, CA 95363

Taller de Los Banos
Martes 21 de Mayo, 4:00 - 6:00 PM
College Greens Building, 1815 Scripps Drive, Los Banos, 93635

Taller de Santa Nella
Miercoles, 22 de Mayo, 6:30 PM - 8:30 PM
Escuela Primaria Romero, En la sala multipropósito, 13500 Luis Ave, Gustine, CA 95322

Taller de Mendota
Jueves 23 de Mayo, 6:00 - 8:00 PM
Biblioteca de Mendota, 1246 Belmont Avenue, Mendota, CA 93640
Los

Los primeros cuarenta minutos de cada taller consistirá en una presentación bilingüe sobre:

- El estado actual y el futuro de nuestros recursos del agua subterránea (presupuesto de agua)
- Rendimiento sostenible de nuestra cuenca del agua subterránea
- Red regional de monitoreo del agua subterránea
- Proyectos y acciones para gestionar nuestra agua subterránea

Se proporcionarán alimentos y refrigerios. Habrá intérpretes y materiales en español disponibles.

Para preguntas o comentarios, envíe un correo electrónico a DMSGMA@sldmwa.org o comuníquese con Laura Castillo, de Stantec, en Laura.Castillo@stantec.com. Visite los sitios de web en www.deltamendota.org y www.sncwd.com.

PROP 1
GOVERNOR EDMUND G. BROWN, JR.
WATER BOND 2014
RELIABILITY | RESTORATION | RESILIENCE

DELTA-MENDOTA SGMA

Taller sobre el Ley de Gestión Sostenible del Agua Subterránea de la Subcuenca Delta-Mendota

Mayo 2019

DELTA-MENDOTA SGMA

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

PROP 1

GOVERNADOR EDMUND G. BROWN JR.

ENLACE DE AGUA 2014

Agenda

1. Bienvenida
2. Introducciones
3. Presentación
4. Sesión de Análisis

El Acta de Gestión Sostenible del Agua Subterránea del 2014

Términos de El Acta de Gestión Sostenible del Agua Subterránea

SGMA (Por sus siglas en inglés) = El Acta de Gestión Sostenible del Agua Subterránea

GSA (Por sus siglas en inglés) = Agencia de Sostentabilidad del Agua Subterránea

GSP (Por sus siglas en inglés) = Plan de Sostentabilidad del Agua Subterránea

Acuífero = una capa subterránea de materiales que contienen agua, ejemplo como grava o arena, de donde se puede bombear el agua

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Cronología de El Acta de Gestión Sostenible del Agua Subterránea

30 de junio del 2017
Se deben formar agencias de Sustentabilidad de Aguas Subterráneas.

31 de enero, 2020
Se deben presentar los Planes de Sustentabilidad de Aguas Subterráneas

31 de enero del 2040
La subcuenca Delta-Mendota debe conseguir la sustentabilidad.

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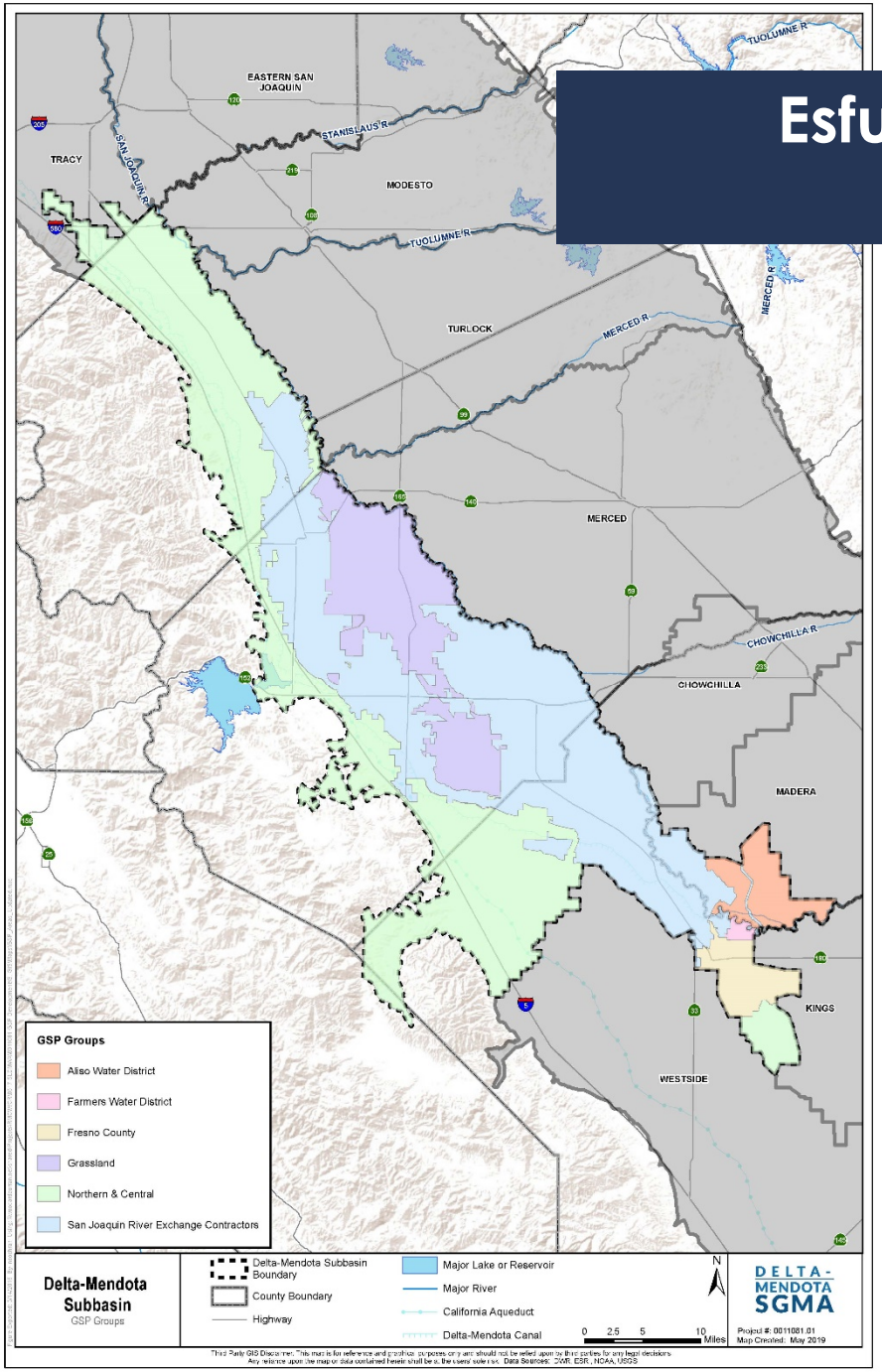
Esfuerzo Colaborativo Regional



DELTA-MENDOTA SGMA

Línea de tiempo - Camino a la sostenibilidad

Primavera 2019

Taller #4

Verano 2019

Refinar el Borrador Administrativo de los GSPs

Otoño 2019

Publicación del Borrador Público para revisión de los GSPs

Invirno 2019

Adoptar los GSPs Finales en los Talleres Públicos

31 de enero, 2020

Fecha para Presentar los GSPs al Estado

1 de Abril, 2020 (y anualmenta despues)

Presentar un Reporte Annual al Estado Sobre los GSPs

Cada Cinco Años

Revisión de los GSPs Cada Cinco Años

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Participación y Revisión Pública

- Talleres públicos
- Revisión del borrador público del GSP
- Adopción de los GSPs Finales en talleres públicos
- Proceso de comentario público despues de la adopción al estado

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¿Preguntas?

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Un presupuesto de agua es como una cuenta de cheques...

Depósitos

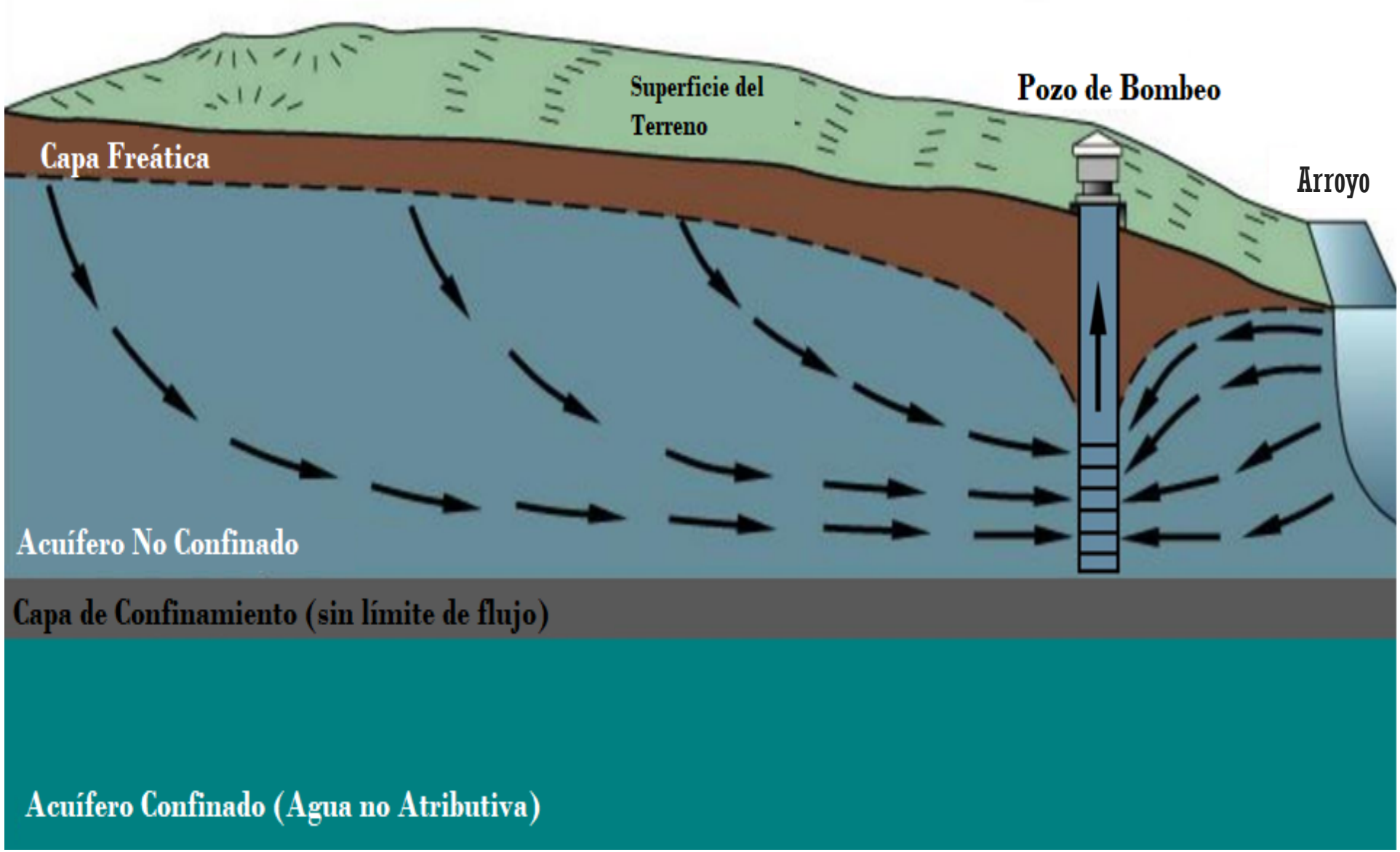
−

Retiros

=

Cambio en el Almacenamiento

DELTA-MENDOTA SGMA



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Presupuestos de Agua en la Cuenca

	Acuífero Superior Cambio Annual Promedio en Almacenamiento	**Acuífero Inferior** Cambio Annual Promedio en Almacenamiento
Promedio histórico (2003-2012)	-50,200 acre pies	-32,400 acre pies
Condiciones actuales (2013)	-123,400 acre pies	-52,700 acre pies
Condiciones Proyectados (2014-2070)	-2,100 acre pies	-1,500 acre pies

DELTA-MENDOTA SGMA

Rendimiento Estimado para la subcuenca Delta-Mendota

	ACUÍFERO SUPERIOR	ACUÍFERO INFERIOR
Rendimiento Estimado Sostenible del Promedio Annual	320,000 – 450,000 acre pies	250,000 acre pies

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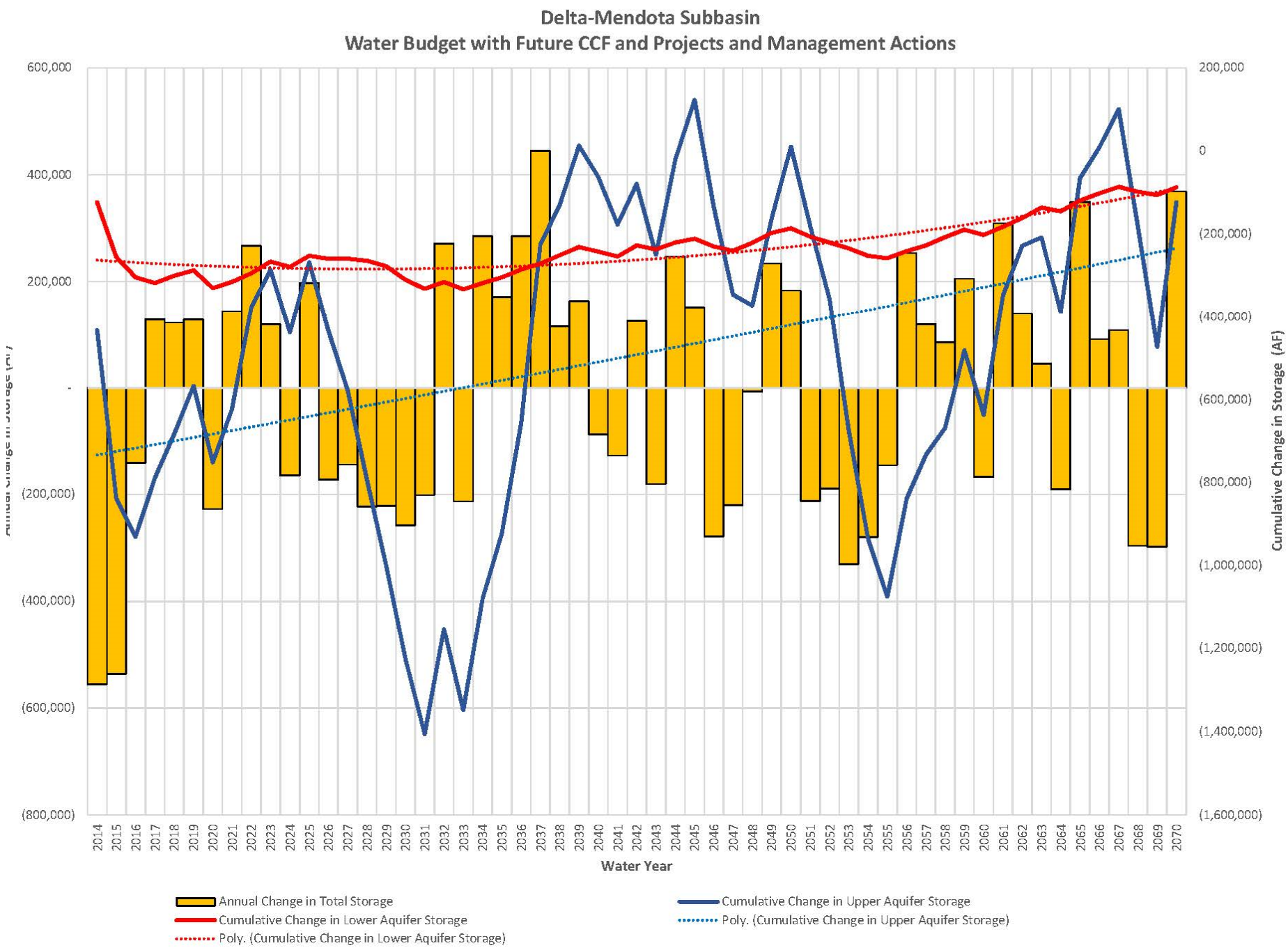
Delta-Mendota Subbasin
Water Budget with Future CCF and Projects and Management Actions
600,000
400,000
200,000
-
(200,000)
(400,000)
(600,000)
(800,000)
200,000
0
(200,000)
(400,000)
(600,000)
(800,000)
(1,000,000)
(1,200,000)
(1,400,000)
(1,600,000)
Cumulative Change in Storage (AF)
2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070
Water Year
Annual Change in Total Storage
Cumulative Change in Upper Aquifer Storage
Cumulative Change in Lower Aquifer Storage
Poly. (Cumulative Change in Upper Aquifer Storage)
Poly. (Cumulative Change in Lower Aquifer Storage)

¿Por Qué es Importante?

- Cumplimiento con el estado
- Recursos del agua subterránea a largo plazo para todos los usos beneficiosos, incluso: agua potable, agricultura y el medio ambiente.
- Planificación y gestión a corto y largo plazo de los recursos hídricos.

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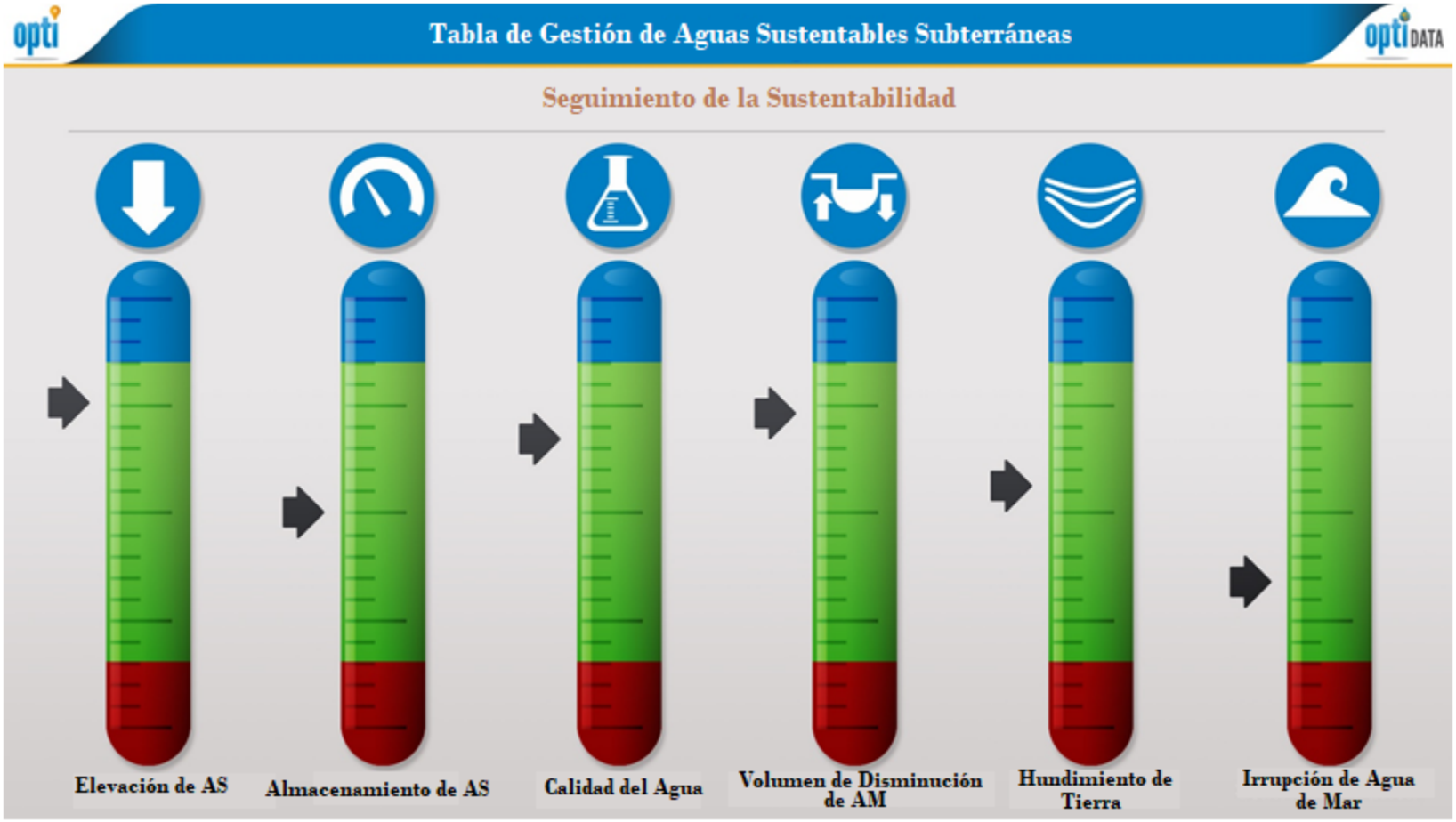
Entonces, ¿Qué son los resultados indeseables?

Los resultados indeseables son impactos significativos e irrazonables causados por:

1. Reducción de los niveles del agua subterránea
2. Reducción del almacenamiento del agua subterránea
3. Calidad del agua degradada
4. Hundimiento de tierra
5. Disminución de aguas superficiales interconectadas

¿Qué son los indicadores de sustentabilidad?



AS = Agua Subterránea
AA = Agua de Almacenamiento

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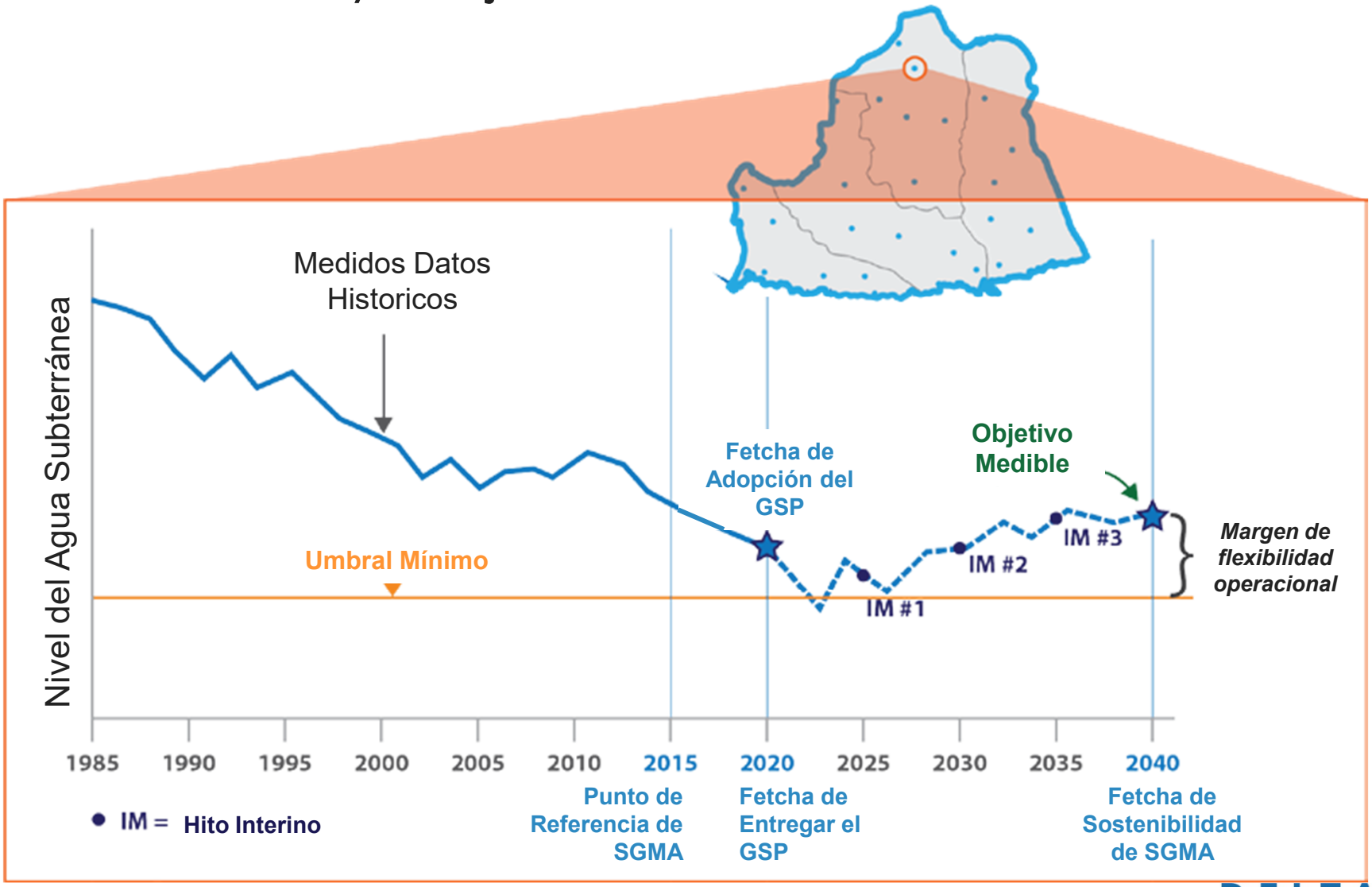
Umbrales y Objetivos Medibles



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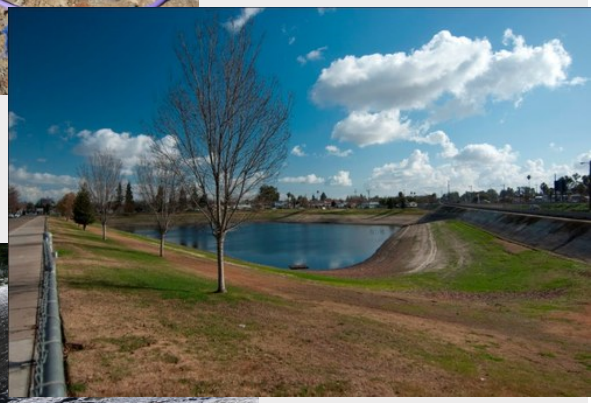
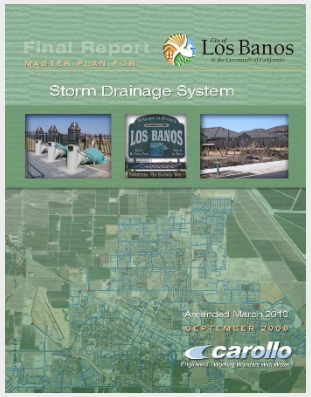
Paso 6: Determinar proyectos y gestión de acciones

Proyectos = Cosas que puedes construir



Gestión de Acciones= Planes, permisos, políticas u otras acciones



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Ejemplos de Proyectos y Acciones de Gestion en la Subcuenca Delta-Mendota

Proyectos	Acciones de Gestion
Recarga directa e indirecta del agua subterránea	Revisar regimens de bombeo
Captura y reutilización de agua plucial	Revisar o implementar nuevas regls de bombeo
Captura y reutilización de agua de drenaje	Caída reotacional de tierras de cultivo
Uso de agua reciclada	Plan de contingencia de sequia
Recaptura y recirculación	Maximizar el uso del agua superficial y otros suministros “alternativos”
Almacenamiento de agua superficial	Incentivación del uso de aguas superficiales y reducción de la demanda del agua subterránea
	Desarrollo del sistema de reporte de extracción de agua subterránea
	Limitar el bombeo del agua subterránea para obtener crédito por medio una transferencia fuera de un área de gestión específica

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DELTA-MENDOTA SGMA

Monitoring is like a "check-up" for the groundwater basin. It gives us data to assess the "health" of the basin.

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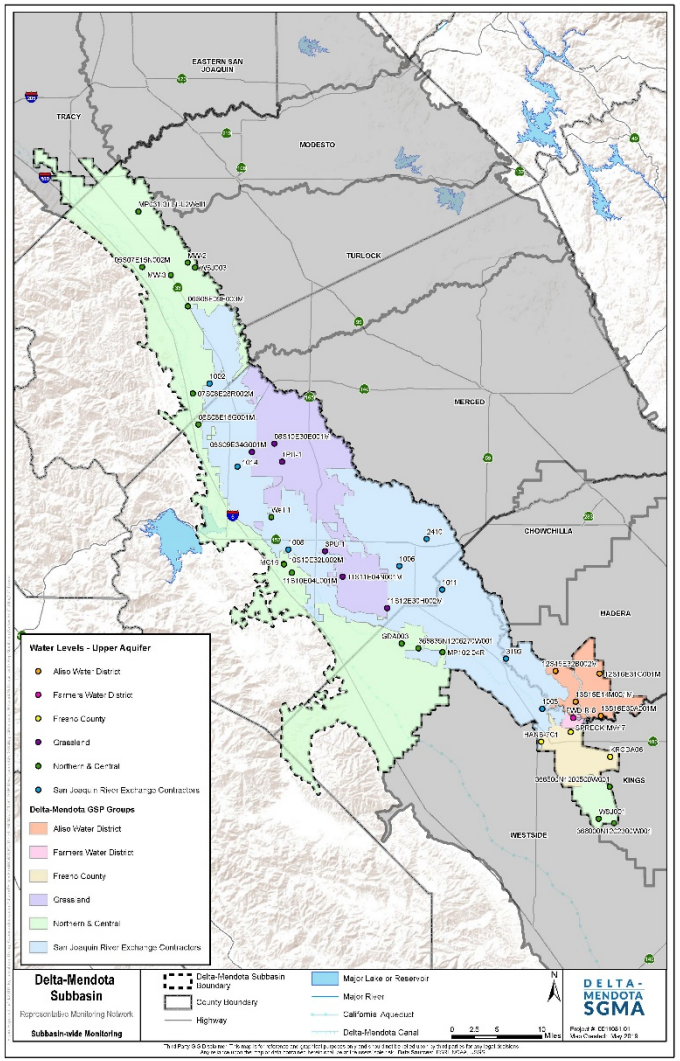
Estaremos monitoreando los impactos a usuarios beneficiosos, incluyendo...

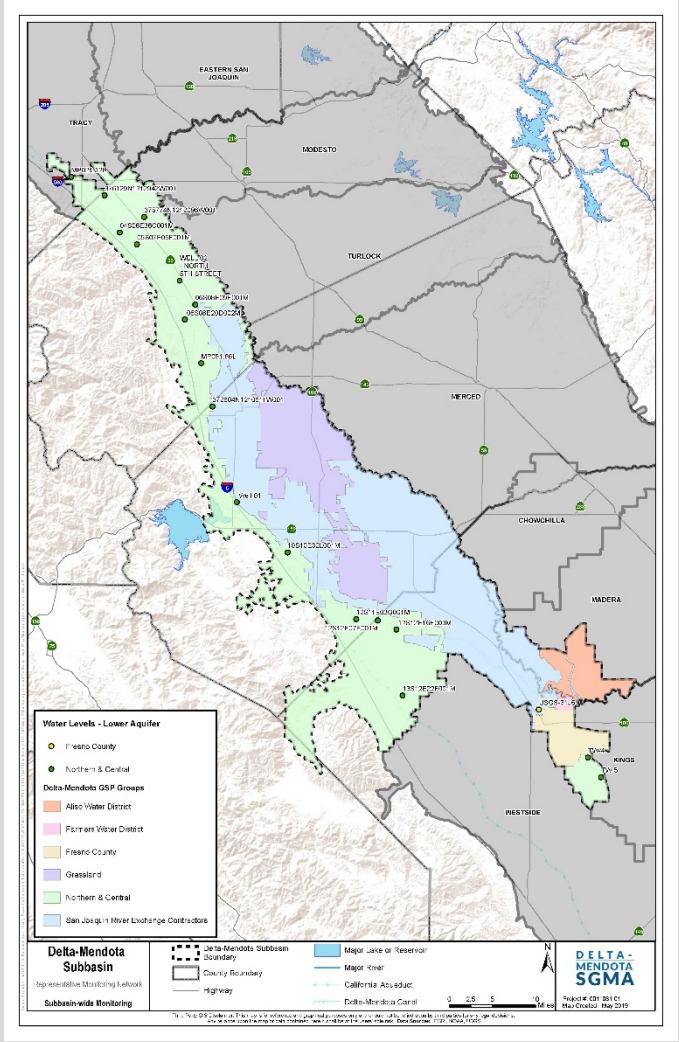
- Volúmenes de extracción de agua subterránea
- Interacciones ague superficial-agua subterránea
- Pozos poco profundos
- Datos de la etapa (niveles de agua en los ríos)
- Ecosistemas dependientes de aguas subterráneas
- Niveles de aguas subterráneas de los acuíferos superiores e inferiores
- Calidad del agua subterránea del acuífero superior e inferior
- Hundimiento
- Evapotranspiración

DELTA-MENDOTA SGMA

Mapas de red de monitoreo de Delta-Mendota



Red de monitoreo de calidad del agua y del nivel de agua del acuífero superior



Red de monitoreo de calidad del agua y del nivel de agua del acuífero inferior

DELTA-MENDOTA SGMA

Que sigue?

Línea de tiempo

Primavera 2019

Taller #4

Verano 2019

Refinar el Borrador Administrativo de los GSPs

Otoño 2019

Publicación del Borrador Público para revisión de los GSPs

Invirno 2019

Adoptar los GSPs Finales en los Talleres Públicos

31 de enero, 2020

Fecha para Presentar los GSPs al Estado

1 de Abril, 2020 (y anualmenta despues)

Presentar un Reporte Annual al Estado Sobre los GSPs

Cada Cinco Años

Revisión de los GSPs Cada Cinco Años

DELTA-MENDOTA SGMA

Involúcrese

Hable con su representante local de la agencia de sustentabilidad de aguas subterráneas

Regístrese en el correo electrónico de su agencia local de sustentabilidad de aguas subterráneas

Asista a las reuniones y talleres

Proporcionar información sobre el desarrollo del plan de sustentabilidad de aguas subterráneas

¡Ayúdenos a correr la voz!

DELTA-MENDOTA SGMA

Asista a las Reuniones y Talleres Públicos

Comité de Coordinación de la Subcuenca Delta-Mendota: 2do lunes de cada mes. 9:30am-12:00pm

Grupo de trabajo técnico de la subcuenca Delta-Mendota: Cada 3er Martes de cada mes, 10:00am-12:00am

Grupo de Trabajo de Comunicaciones Delta-Mendota: 4to martes de cada mes, 1:00pm-3:00pm

Todas las reuniones en persona serán ubicadas en la oficina de la Autoridad del Agua de San Luis y Delta-Mendota en:
842 6th Street, Los Banos, CA 93635

DELTA-MENDOTA SGMA

Para obtener más información sobre el desarrollo del plan de sostenibilidad del agua subterránea y un calendario completo de reuniones públicas, visite nuestro sitio web en:

DeltaMendota.org

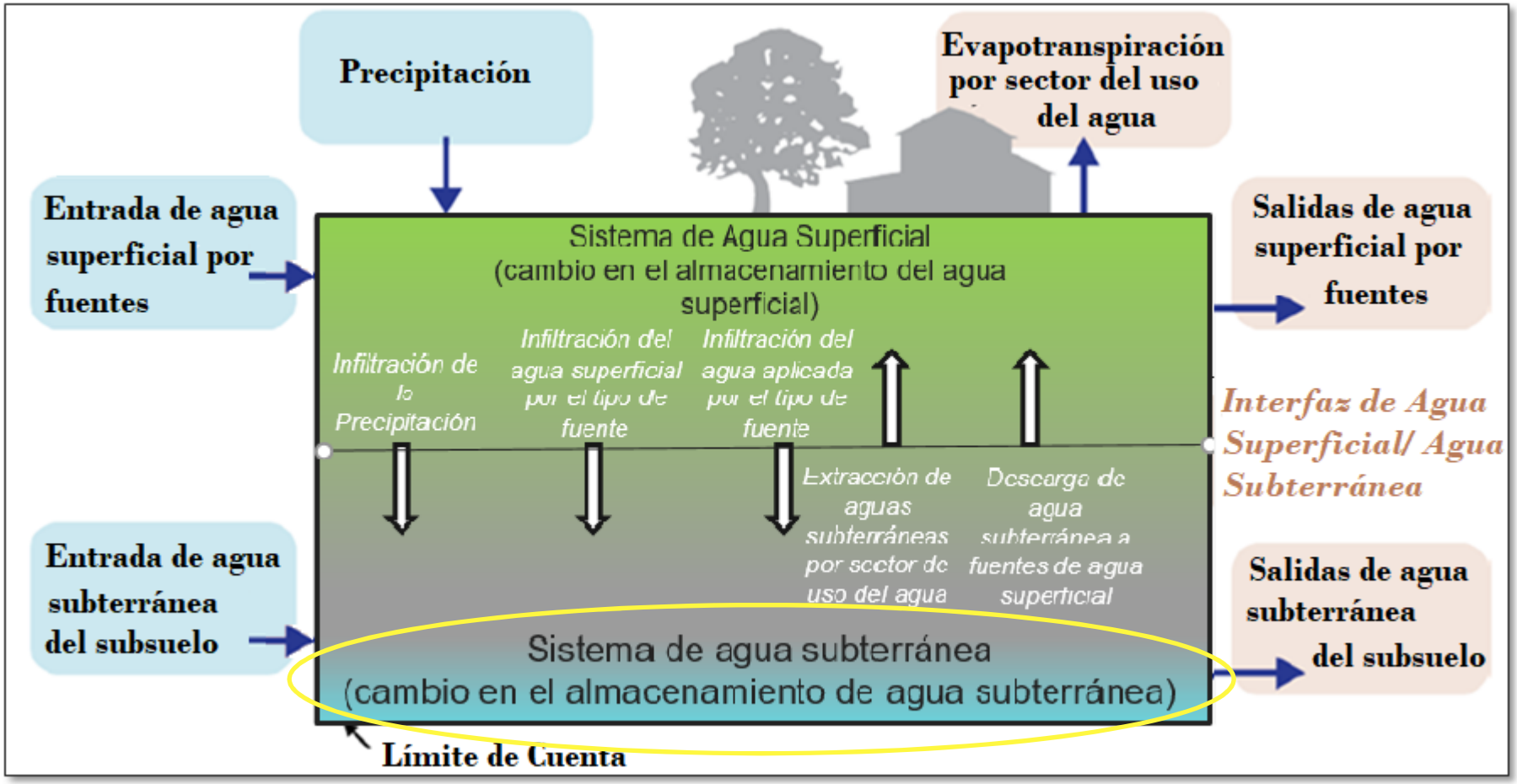
DELTA-MENDOTA SGMA

¿Preguntas?

Sesión de Análisis

Apéndice

DELTA-MENDOTA SGMA



DELTA-MENDOTA SGMA

Requisitos del SGMA y GSP

- Establecer metas de sostenibilidad
- Definir que es "significativo e irrazonable" y criterios para resultados indeseables
- Desarrollar metas para la sostenibilidad, umbrales mínimos y objetivos medibles
- Desarrollar el plan para alcanzar la meta de sostenibilidad
- Implementar un plan
- Monitorear el progreso
- Involucrar a las personas interesadas en todo el proceso

DELTA-MENDOTA SGMA

Public Workshop 4:
Workshop Feedback and Summary

DELTA-MENDOTA SUBBASIN
SUSTAINABLE GROUNDATER MANAGEMENT ACT
SPRING 2019 COORDINATED WORKSHOPS

Monday, May 20, 2019, Patterson
4:00 – 6:00 pm
City of Patterson City Hall

Tuesday, May 21, 2019, Los Banos
4:00 – 6:00 PM
College Greens Building

Wednesday, May 22, 2019, Santa Nella
6:30 – 8:30 PM
Romero Elementary School

Thursday, May 23, 2019, Mendota
6:00 – 8:00 PM
Mendota Library

WORKSHOP SUMMARY

- Four workshops were held in the northern, central, and southern parts of the Delta-Mendota Subbasin. The purpose of the workshops was to educate stakeholders and members about the public about topics covered in the draft Groundwater Sustainability Plans (GSP) being developed for the subbasin. Topics covered during the workshop included water budgets, sustainable yield, projects and management actions, and groundwater monitoring networks.
- Workshops were promoted via emails sent to each GSA's interested parties database, flyers and utility bill inserts, social media posts, and direct outreach to community stakeholders.
- The format and content of each workshop was the same. The workshops began with a short presentation, followed by an open house period for participants to talk with their Groundwater Sustainability Agency (GSA) representative. Spanish interpretation was provided at each workshop.
- In total, approximately 30 individuals participated in the workshops. Attendance by location was as follows: Patterson – 7, Los Banos – 10, Santa Nella – 4, and Mendota – 9. Participants represented a range of beneficial users in the subbasin, including domestic well owners, agricultural water users, public water systems, and disadvantaged communities.

- Workshop participants' questions and feedback are summarized as follows:

  Water Budgets

  - Why is there a difference between the water budgets for the upper and lower aquifers?
  - Why is the change in storage negative?
  - Is there a water budget for each aquifer?
  - When the projected water budgets are finalized, will they include specific projects and management actions?
  - How was the data for the climate change factors developed?
  - Historically, California goes through periodic droughts. Do the projected water budgets account for future droughts?
  - Do the projected water budgets account for future population growth and new developments?
  - Do the water budgets account for percolation from water applied to crops?

  Projects and Management Actions

  - Will management actions include a charge for water pumping?
  - Will pumping restrictions be implemented during dry periods or drought?
  - Will the GSPs identify specific projects and management actions?
  - Will GSAs in the subbasin form a water bank?
  - If pumping restrictions are enacted, GSPs should include a provision that allows private well owners to demonstrate that they aren't overpumping or causing undesirable results.
  - The region needs more surface water storage to supplement groundwater pumping.
  - There should be restrictions on development in the region.

  Sustainable Yield

  - Does increases in groundwater demand relate to the cost of surface water supplies?

  Groundwater Monitoring

  - When local agencies monitor for groundwater, how far down do they monitor?

  GSP Adoption, Implementation and Enforcement

  - What agency approves the GSPs?
  - Will the California Department of Water Resources be the lead agency for providing oversight after the GSP is submitted?
  - Could the State Water Resources Control Board mandate pumping restrictions?
  - Will the state be looking at the drawdown of individual, private wells?
  - Where does the funding to implement GSPs come from?
  - How much will GSP implementation cost?
  - Who has to submit the annual report?

  Other

  - GSAs should be divided into even smaller units to manage projects and management actions locally.

Special Coordinated GDE Workshop

COORDINATION – GROUNDWATER DEPENDENT ECOSYSTEM DISCUSSION

AUGUST 24, 2018
1:00-3:00PM
MEETING/TELECONFERENCE

Meeting Goals and Purpose

- Review Requirements and Accurately Identify GDEs
- Provide background on Delta-Mendota Subbasin GDE reclassification and GSP Work

Teleconference # Call-in

- 1-866-661-7061
- 9811738464

SESSION AGENDA

#	TIME	CONTENT	PRESENTERS
1.	1:00-1:10 pm	Welcome and Introductions	Leslie Dumas, Woodard & Curran
2.	1:10-1:30 pm	The Nature Conservancy • GDEs under SGMA • GDE Tools/Datasets	Melissa Rohde & Kirk Klausmeyer, The Nature Conservancy

3.	1:30-2:15 pm	GDE Reclassification Process
		• Previous Discussions and Meetings
		• Methodology for Rejection
		  • Groundwater Levels, Vegetative and Wetland
		  • Groundwater Levels and Rooting Depth, Vegetative
		  • Land Use Conversion
		  • Mapping Errors
		• Maps / Results
			Leslie Dumas, Woodard & Curran
			
			Kait Palys, Provost & Pritchard
			
			Zachary Roy, SLDMWA

4.	2:15-2:55 pm	Discussion on Processes and Results • Future Stakeholder involvement • Issues Relative to SGMA and GSPs	All
5.	2:55-3:00 pm	Wrap-Up & Next Steps	Leslie Dumas, Woodard & Curran

Name	Affiliation	Initials
Leslie Dumas	Woodard & Curran/SLDMWA	
Linda Harris	Murdoc	
Linda Sloan	Provost & Pritchard	
Lon Martin	San Luis WD	
Palmer McCoy	Henry Miller Reclamation District #2131; San Luis Canal Company	
Rebecca Akroyd	SLDMWA	
Ricardo Ortega	Grassland WD	
Rick Iger	Provost & Pritchard	
Steve Chedester	SJR Exchange Contractors	
Valerie Kincaid	O'Laughlin & Paris LLP	
Vince Lucchesi	Patterson Irrigation District	
Will Halligan	LSCE	
Zachary Roy	SLDMWA	
Kait Polys	Provost & Pritchard	KP
Kyle Hill	CCID	KH
Chris Rogers	CCID	CR
Andrew Francis	LSCE	AF
Susan Tatayon	TNC	ST
Kirk Klausmeyer	TNC	KK
Juan Cadena	PWD	JC
Pat McGoney	TID	PM
Melissa Rohde	TNC	MMR
Samantha Anderson	Anderson	SA
Debbie Liebersbach	Turlock ID.	
Ric Ortega	GGSA	RO

Delta-Mendota Technical Working Group Sign-In Sheet

Date:

Name	Affiliation	Initials
Adam Scheuber	Del Puerto WD	✓
Alejandro Paolini	Henry Miller Reclamation District	
Amanda Peisch	DWR	
Andrew Francia	LSCE	
Andrew Garcia	SLDMWA	
Anthea Hansen	Del Puerto WD	
Ben Fenters	SLWD	BF
Bobby Pierce	West Stanislaus ID	
Breanne Ramos	Merced County Farm Bureau	
Briana Seapy	California Fish and Wildlife	
Cheri Worthy	SLDMWA	
Chris Olvera	DWR	
Christina Guzman	Fresno County	
Diane Cannon	LSCE	
Diane Rathmann	SLDMWA	
Don Wright	Waterwrights	
Ellen Wehr	Grassland WD	
Frances Mizuno	SLDMWA	
Glenn Allen	Fresno County	
Jarrett Martin	CCID	
Jason Dean	Meyers	
Jim Stilwell	Farmers WD	
Joe Hopkins	Provost & Pritchard	
Joe McGahan	Summers Engineering	
John Beam	JAB Environmental	
Ken Swanson	Grassland WD — GWD	
Lacey Kiriakou	Merced County	
Larry Harris	Turner Island WD	

Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act

The Nature Conservancy
Protecting nature. Preserving life.

MELISSA M. ROHDE and KIRK R. KLAUSMEYER
GROUNDWATER SCIENTIST and SPATIAL DATA SCIENTIST
CALIFORNIA WATER PROGRAM
melissa.rohde@tnc.org

OUR MISSION:

To conserve the lands and water on which all life depends

SANTA CLARA RIVER

95%

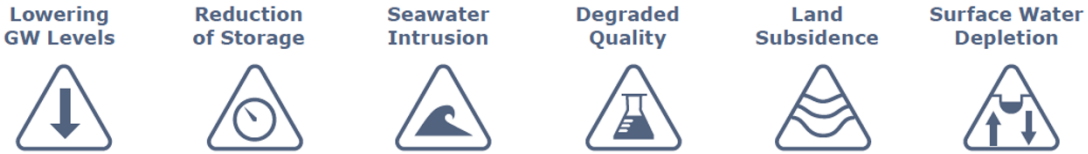
Wetland and River Habitat Gone

Source: The Bay Institute, 1998; SFEI-ASC, 2016

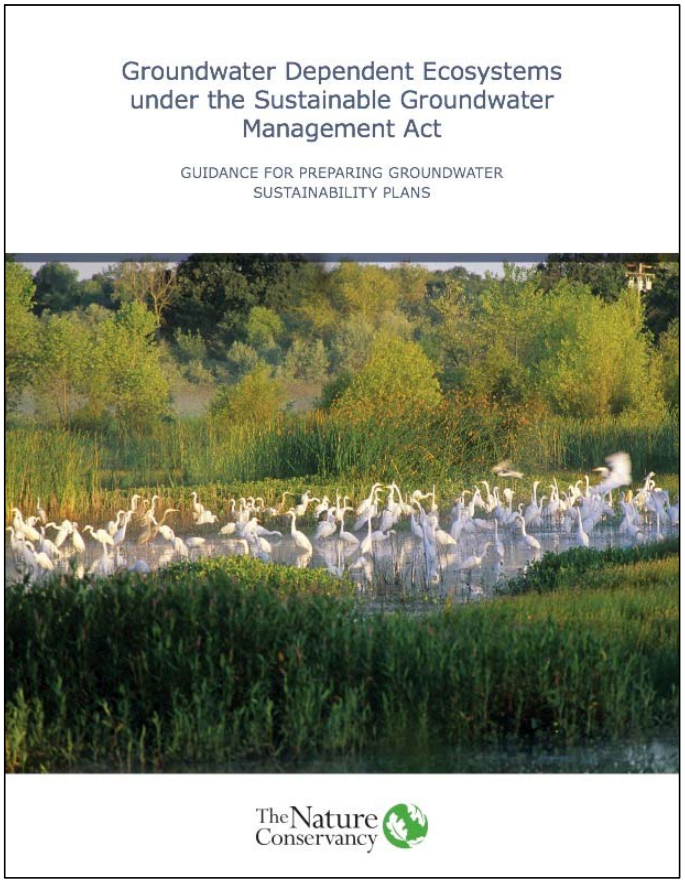
The Sustainable Groundwater Management Act

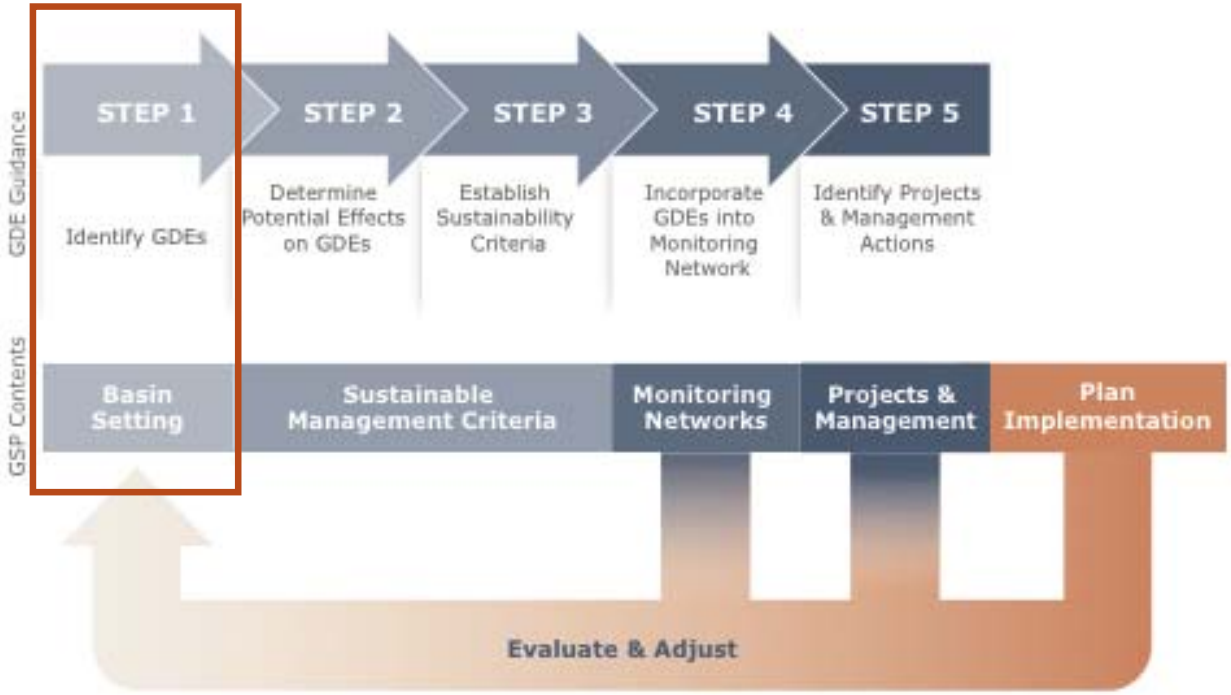
Groundwater Dependent Ecosystems
(a beneficial use of groundwater) **are a required element for GSPs**

- identify (map)
- describe potential effects due to groundwater conditions
- monitor impacts due to groundwater conditions



GDE GUIDANCE DOCUMENT





Groundwater-Dependent Ecosystems:

Ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface.

Interconnected Surface Waters:

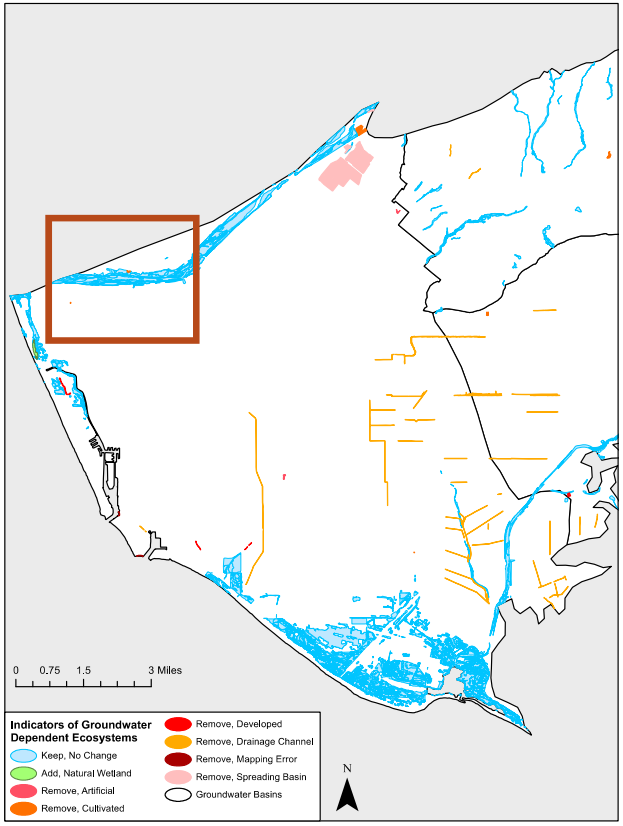
Surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.

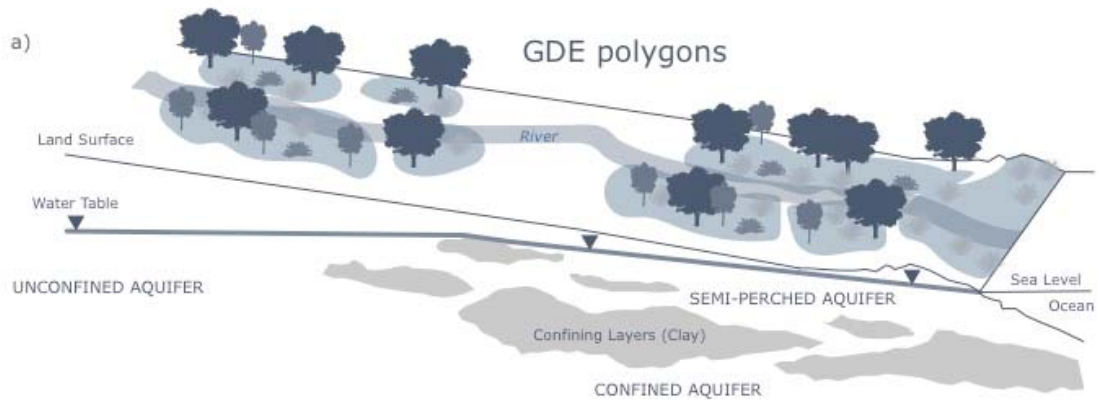
Principal Aquifer:

Aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems.

Connection to Groundwater

Example 1: Santa Clara GDE (Semi-Perched Aquifer)





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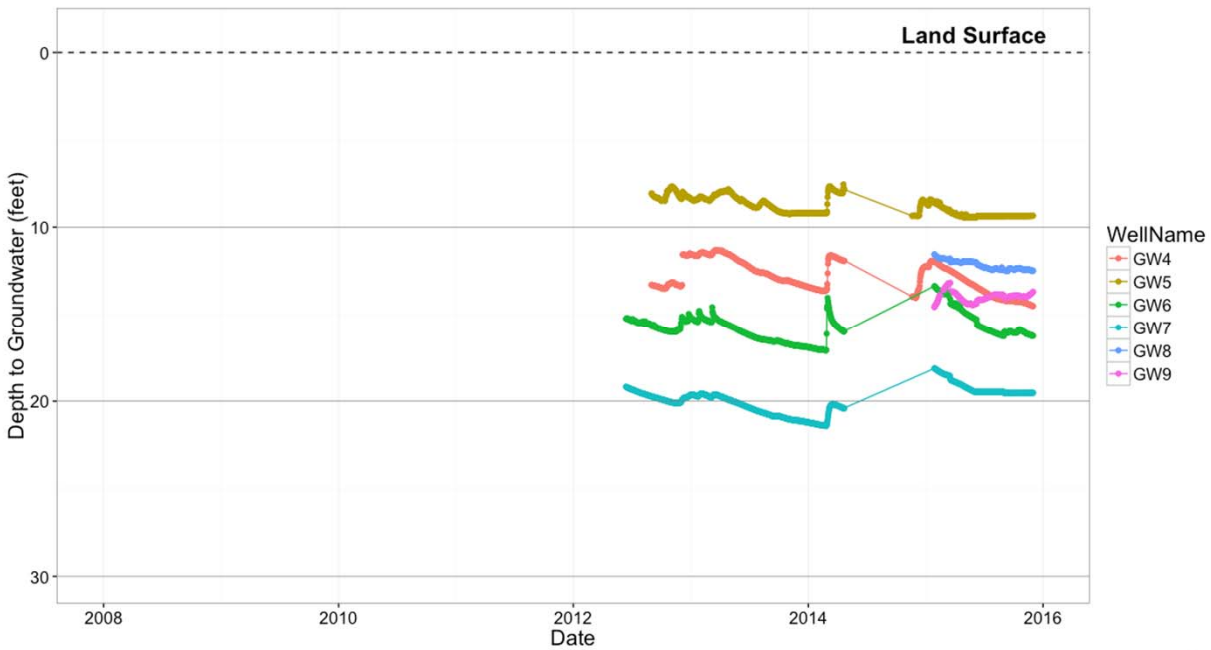
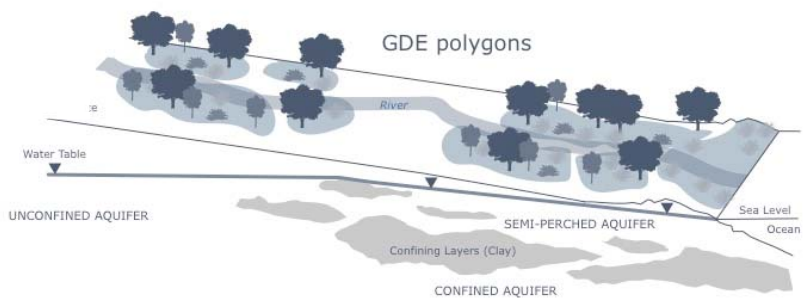
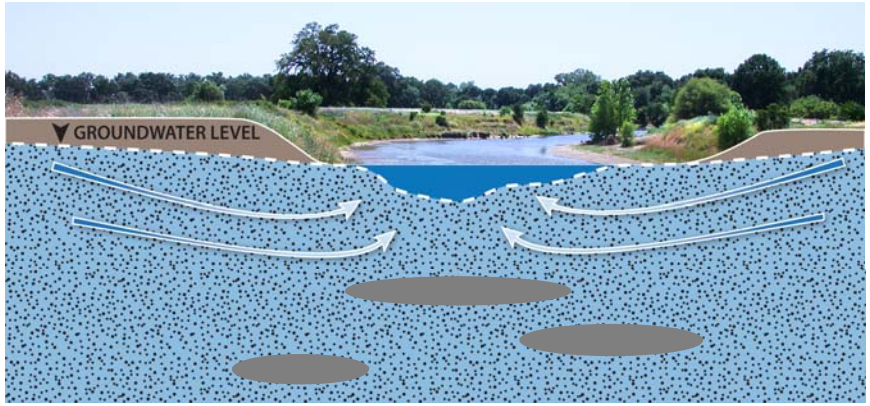
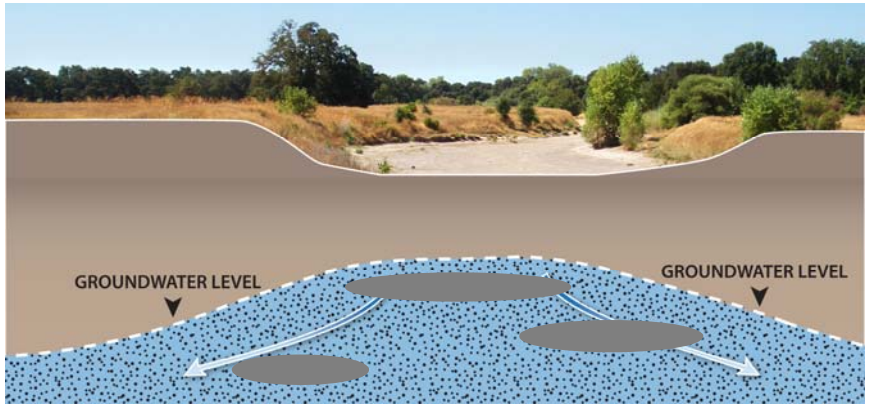
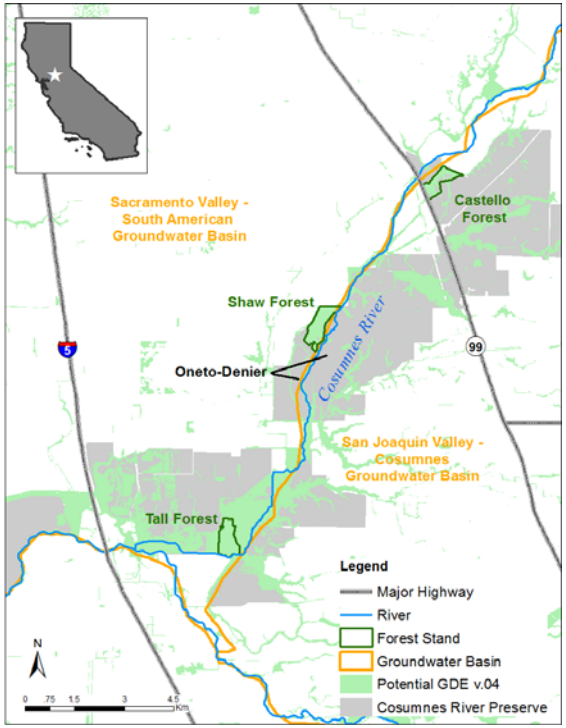




Example 2: Cosumnes River GDE (Unconfined Aquifer)







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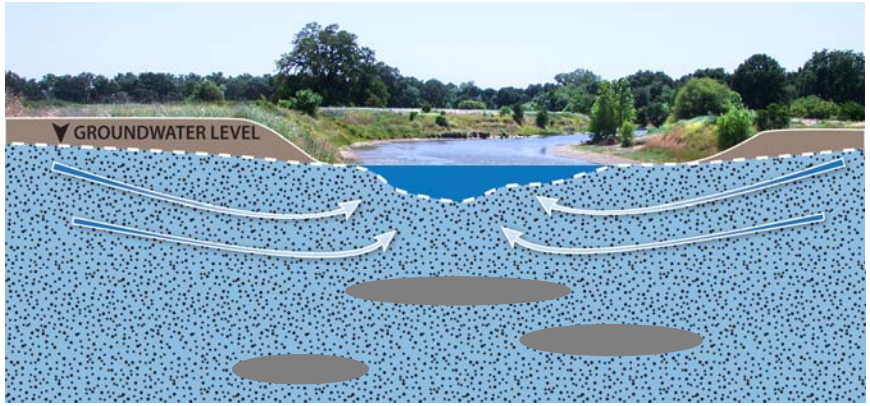
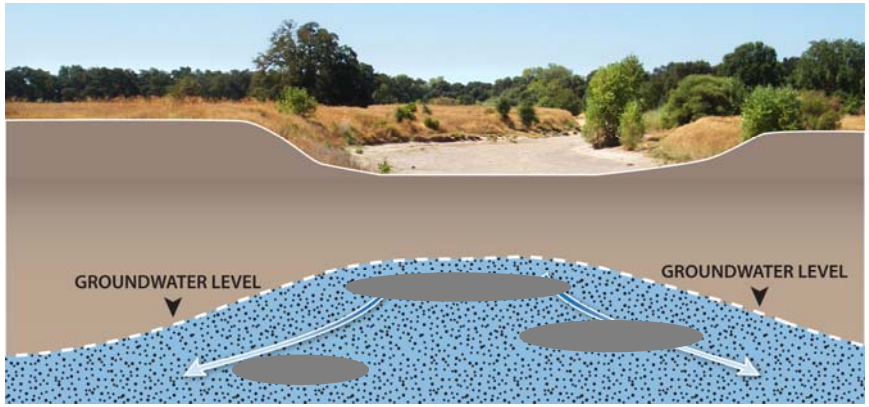
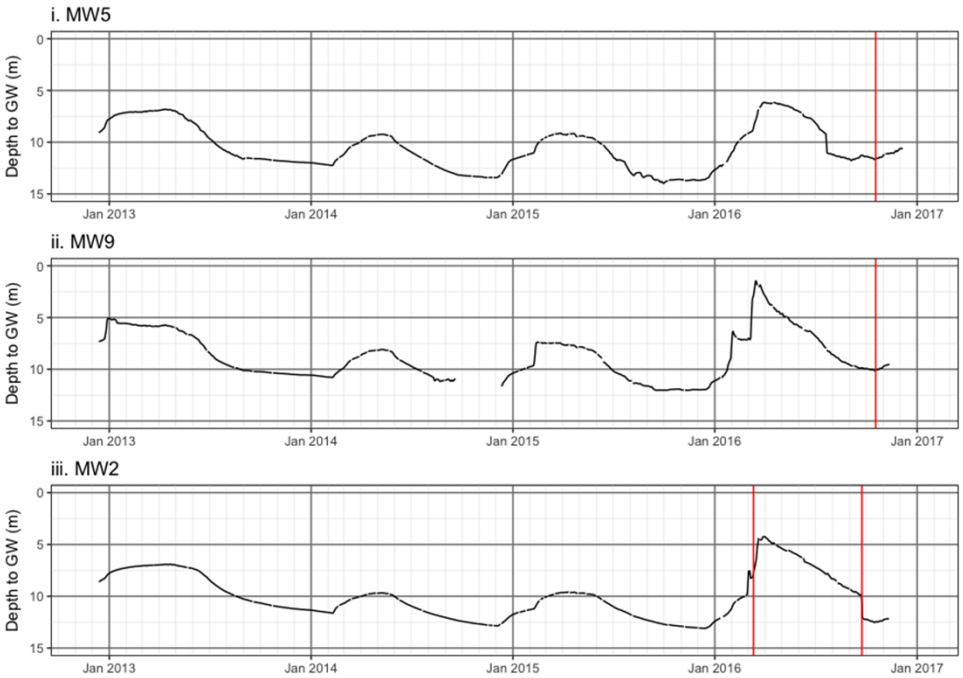
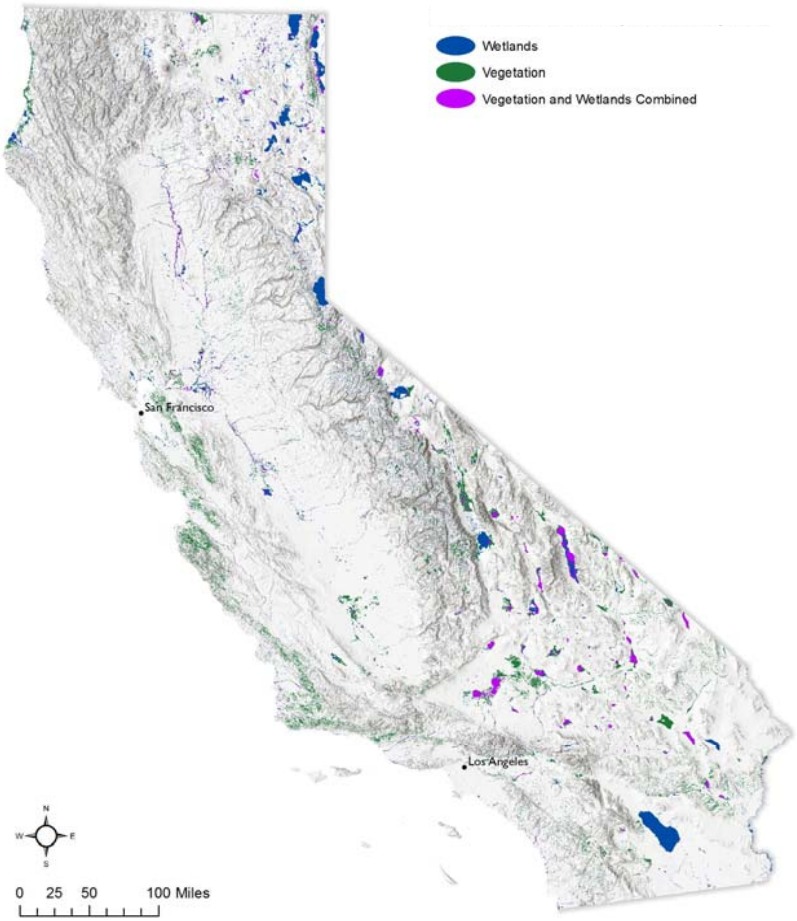






MAPPING GDEs



OPEN ACCESS Freely available online PLoS one

Mapping Groundwater Dependent Ecosystems in California

Jeanette Howard*, Matt Merrifield

The Nature Conservancy, San Francisco, California, United States of America

Abstract

Background: Most groundwater conservation and management efforts focus on protecting groundwater for drinking water and for other human uses with little understanding or focus on the ecosystems that depend on groundwater. However, groundwater plays an integral role in sustaining certain types of aquatic, terrestrial and coastal ecosystems, and their associated landscapes. Our aim was to illuminate the connection between groundwater and surface ecosystems by identifying and mapping the distribution of groundwater dependent ecosystems (GDEs) in California.

Methodology/Principal Findings: To locate where groundwater flow sustains ecosystems we identified and mapped groundwater dependent ecosystems using a GIS. We developed an index of groundwater dependency by analyzing geospatial data for three ecosystem types that depend on groundwater: (1) springs and seeps; (2) wetlands and associated vegetation alliances; and (3) stream discharge from groundwater sources (baseflow index). Each variable was summarized at the scale of a small watershed (Hydrologic Unit Code-12; mean size = 9,570 ha; n = 4,621), and then stratified and summarized to 10 regions of relative homogeneity in terms of hydrologic, ecologic and climatic conditions. We found that groundwater dependent ecosystems are widely, although unevenly, distributed across California. Although different types of GDEs are clustered more densely in certain areas of the state, watersheds with multiple types of GDEs are found in both humid (e.g. coastal) and more arid regions. Springs are most densely concentrated in the North Coast and North Lahontan, whereas groundwater dependent wetlands and associated vegetation alliances are concentrated in the North and South Lahontan and Sacramento River hydrologic regions. The percentage of land area where stream discharge is most dependent on groundwater is found in the North Coast, Sacramento River and Tulare Lake regions. GDE clusters are located at the highest percentage in the North Coast (an area of the highest annual rainfall totals), North Lahontan (an arid, high desert climate with low annual rainfall), and Sacramento River hydrologic regions. That GDEs occur in such distinct climatic and hydrologic settings reveals the widespread distribution of these ecosystems.

Conclusions/Significance: Protection and management of groundwater-dependent ecosystems are hindered by lack of information on their diversity, abundance and location. By developing a methodology that uses existing datasets to locate GDEs, this assessment addresses that knowledge gap. We report here on the application of this method across California, but believe the method can be expanded to regions where spatial data exist.

Citation: Howard J, Merrifield M (2010) Mapping Groundwater Dependent Ecosystems in California. PLoS ONE 5(6): e11249. doi:10.1371/journal.pone.0011249

Editor: Adina Maya Merenlender, University of California, United States of America

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Funding: The authors have no support or funding to report.

Competing Interests: The authors have declared that no competing interests exist.

* Email: Jeanette_howard@tnc.org

Introduction

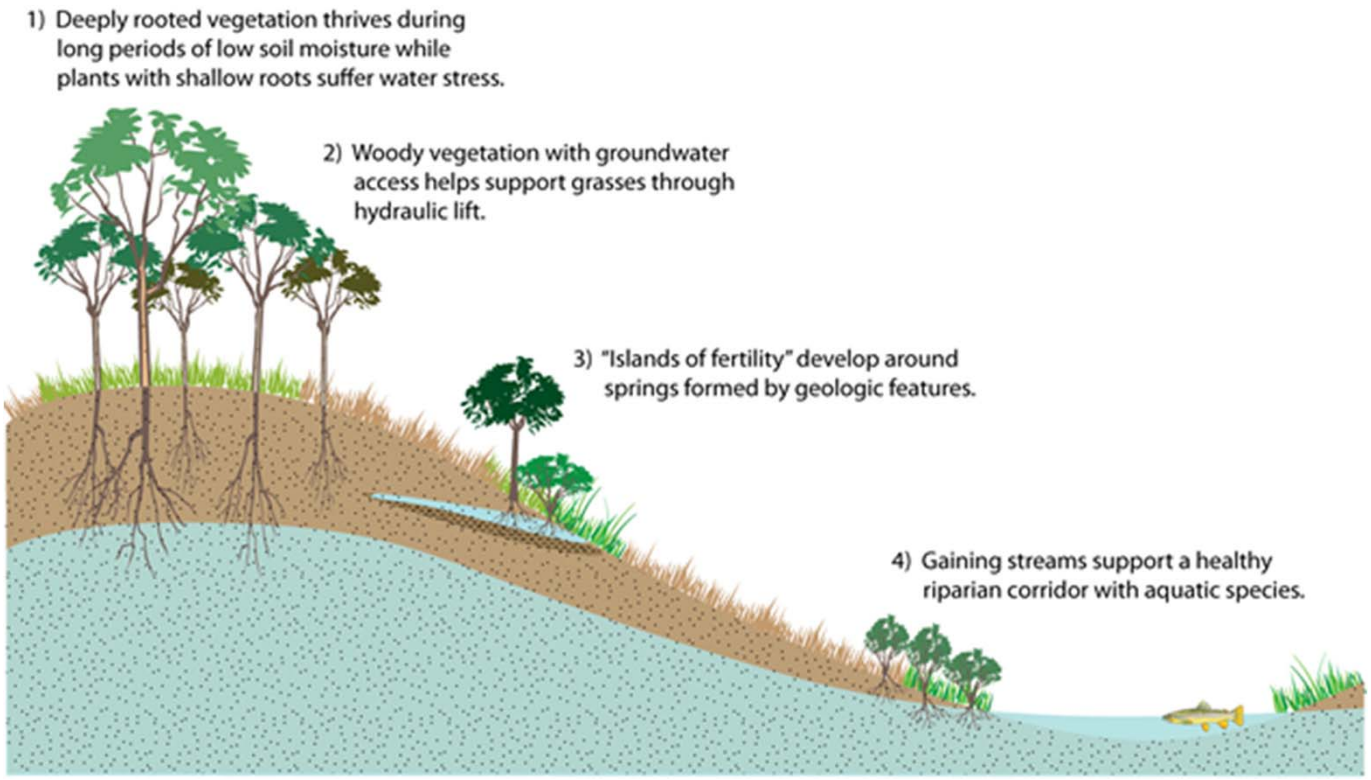
Only , 1% of freshwater resources on the Earth's surface are contained within surface waters – such as rivers, lakes, and swamps. The remaining 99% is stored in either icecaps/ glaciers (69%) or in groundwater (30%). Because of groundwater's accessibility and quantity, groundwater is a vital source of freshwater for human communities throughout the world [1], [2], [3].

In the U.S. and other developed countries, the value of groundwater for drinking water, irrigation, and industry is reflected in government policies that control groundwater availability and quality (e.g. U.S. EPA 2002). Some governments, including Australia [4] and European countries through The European Union (EU) Groundwater Directive (GWD Directive 2006/ 118/ EC) [5] also now require the ecological condition of groundwater ecosystems to be considered when making policy decisions. However, in the U.S. few or no policies consider groundwater dependent ecosystems when allocating resources.

Most groundwater conservation and management efforts focus on protecting groundwater for drinking water and for other human uses with little understanding or focus on the ecosystems that depend on groundwater. The disconnect between ecological and human uses of groundwater is key as it suggests that policies and regulations that protect groundwater for human purposes may not necessarily protect groundwater dependent ecosystems (GDEs).

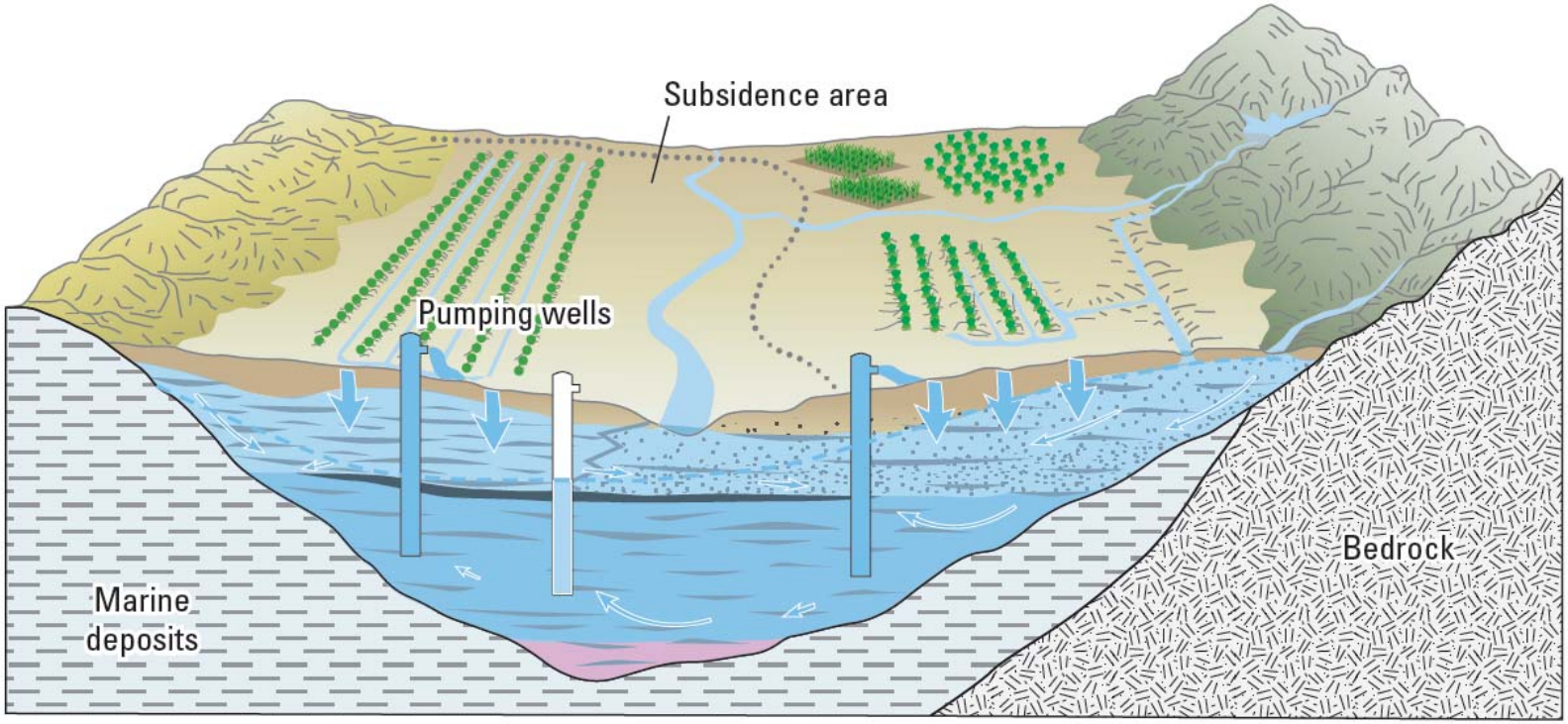
Although groundwater monitoring is incomplete in many parts of the world, available data suggest that groundwater supply and quality are widely threatened by over-extraction and contamination [1]. This loss and degradation are likely to increase in the future, as a result of climate-change-induced drought and human population growth, with serious consequences for both people and ecosystems [1].

GROUDNWATER DEPENDENT ECOSYSTEMS (GDEs)



http://www.geography.hunter.cuny.edu/tbw/wc.notes/15.climates.veg/veg.images/desert/vegetation.htm

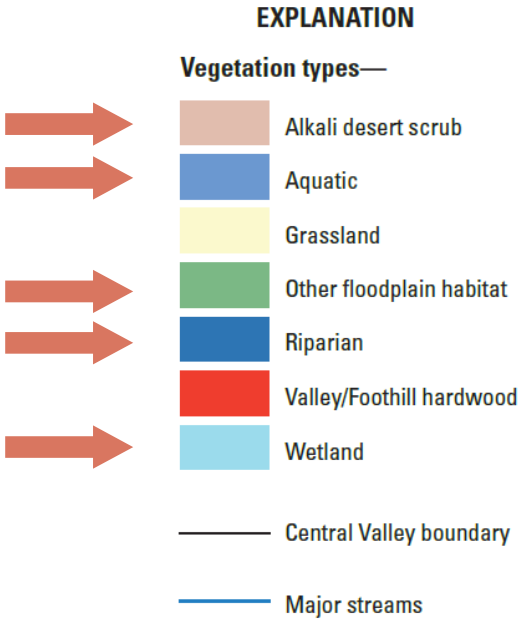
GDEs IN THE SAN JOAQUIN

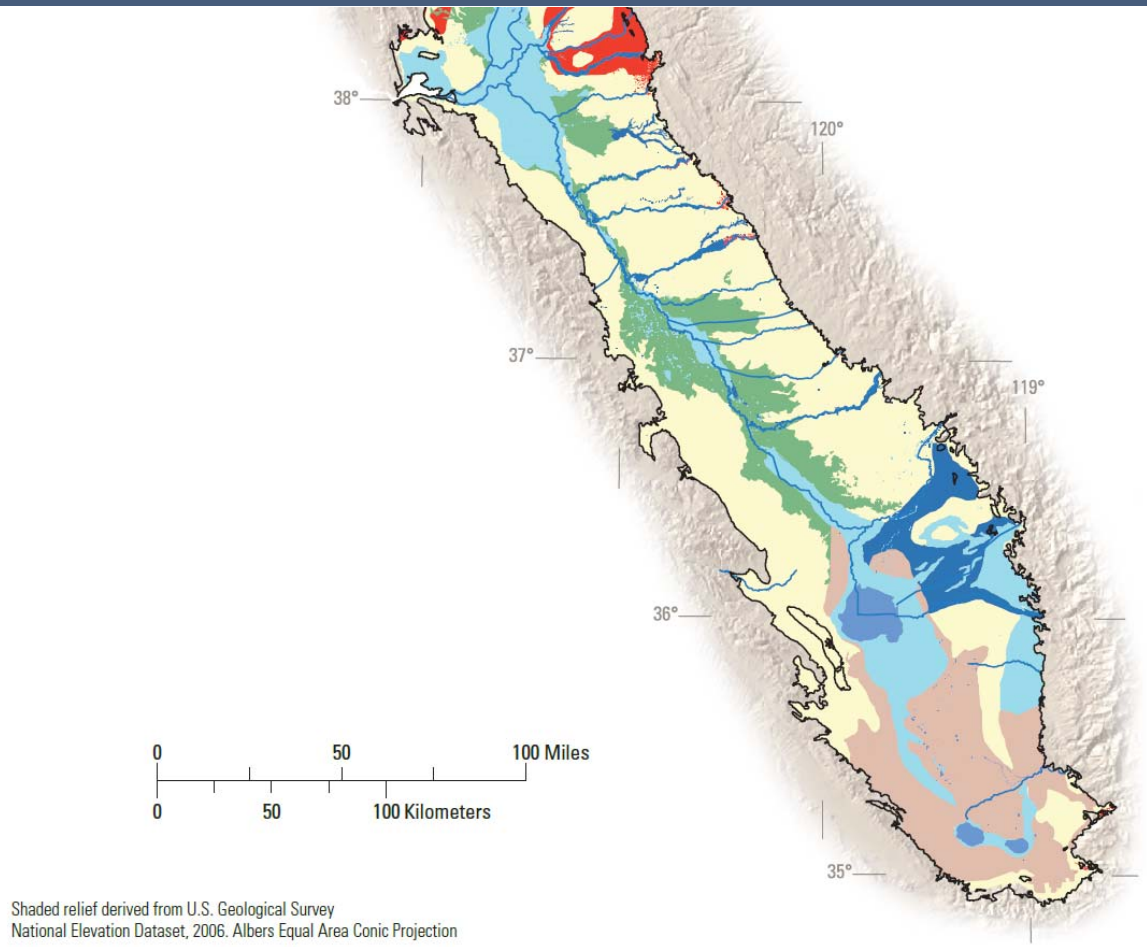


Faunt, C.C., ed., 2009, Groundwater Availability of the Central Valley Aquifer, California: U.S. Geological Survey Professional Paper 1766, 225 p.

Groundwater Dependent Ecosystems Historically Extensive

Indicators of Groundwater Dependent Ecosystems





Faunt, C.C., ed., 2009 USGS

Interconnected Streams along the San Joaquin River Trough

EXPLANATION

Central Valley boundary

Selected streams and canals

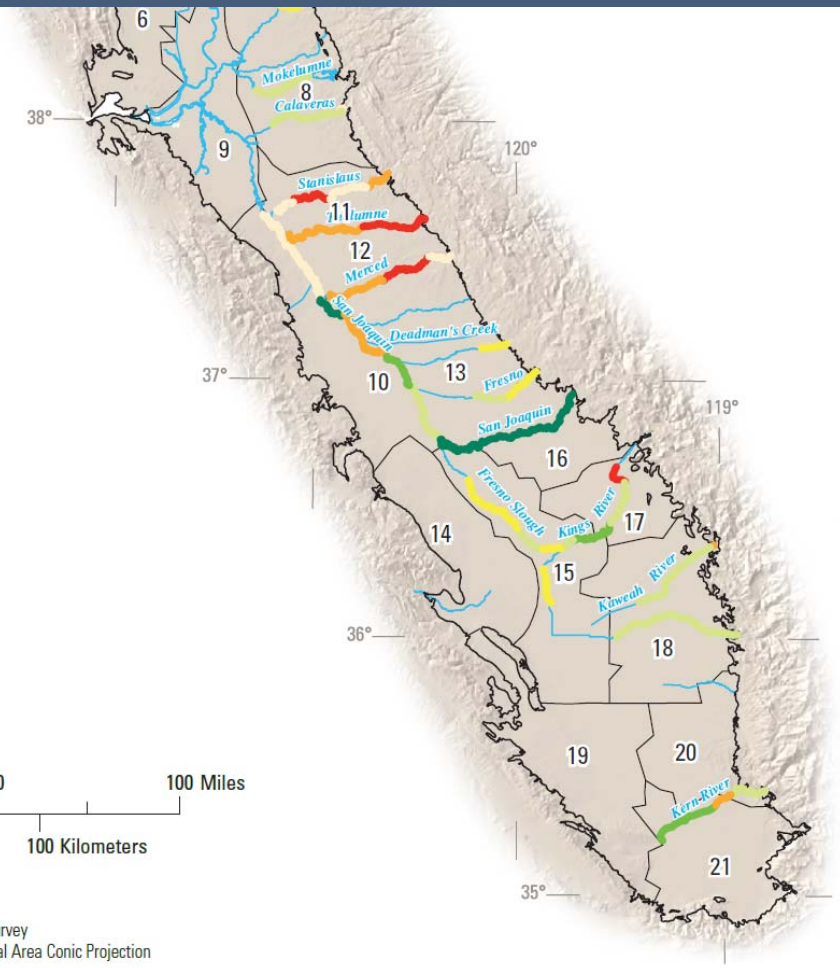
Groundwater/surface-water interaction, in acre-feet per year

STREAMFLOW GAIN
- −54.97 to −44.42
- −44.39 to −14.81
- −14.78 to −1.48
- −1.45 to 0

Out of groundwater system

STREAMFLOW LOSS
- 0.03 to 1.48
- 1.51 to 14.81
- 14.84 to 44.42
- 44.45 to 113.07

Into groundwater system



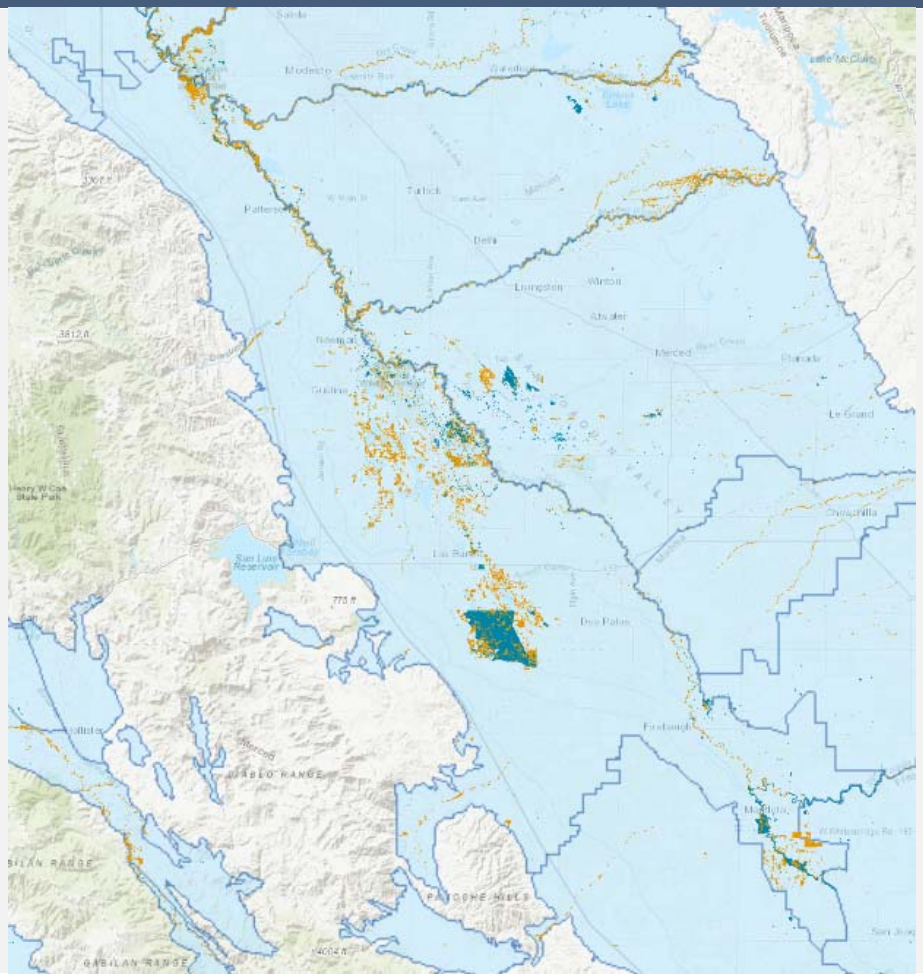
Shaded relief derived from U.S. Geological Survey National Elevation Dataset, 2006. Albers Equal Area Conic Projection

Faunt, C.C., ed., 2009 USGS

NATURAL COMMUNITIES COMMONLY ASSOCIATED WITH GROUNDWATER DATASET

Primary Data Sources for Delta Mendota Sub-Basin:

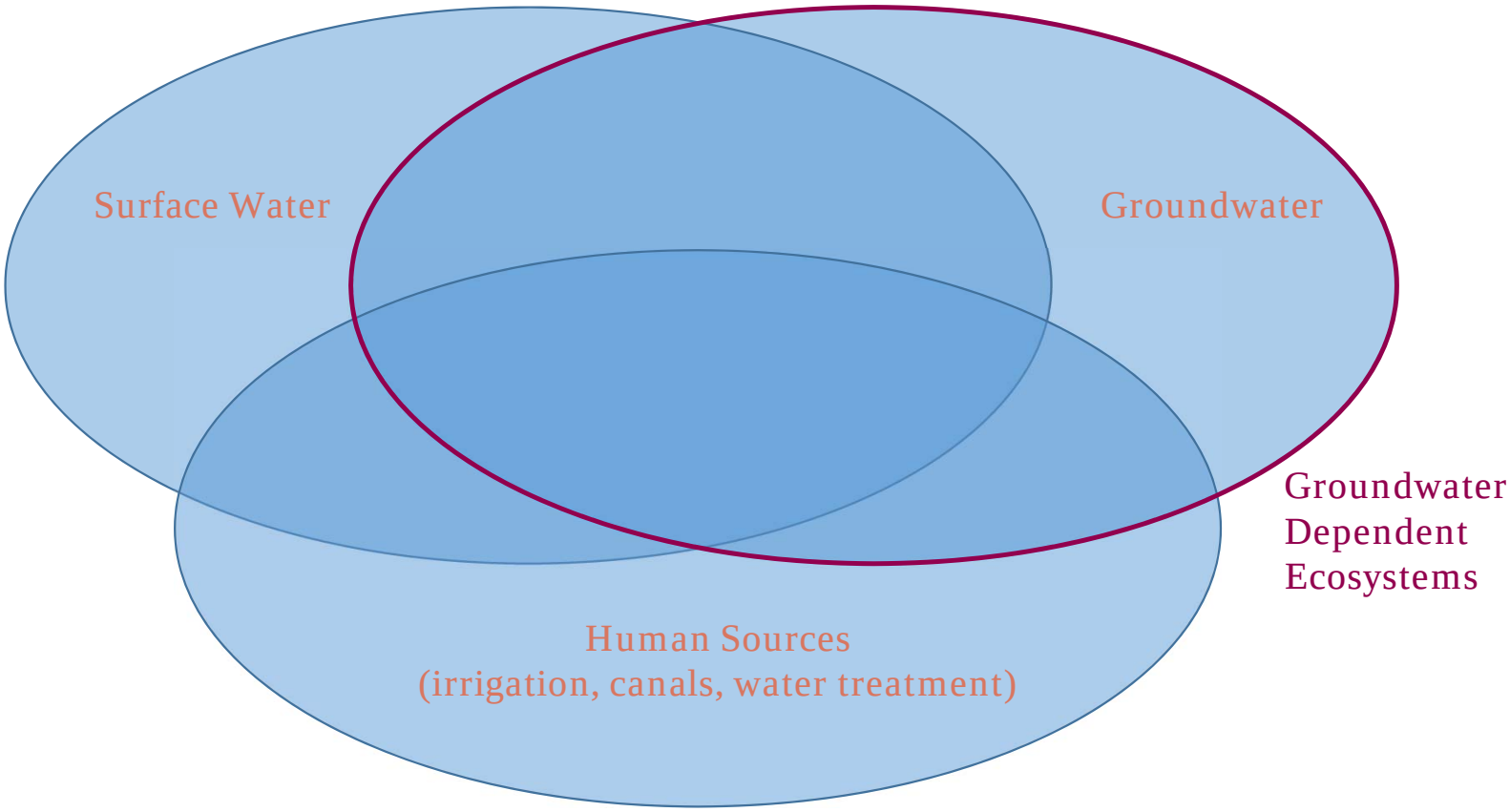
- Vegetation from 2009 imagery. Source: *CA Dept. of Fish and Wildlife, VegCAMP. 2016. Great Valley Ecoregion. Digital vegetation map managed through the California Vegetation Classification and Mapping Program (VegCAMP). Accessed January 2016.*
- Wetlands from 1987 imagery. Source: *US Fish and Wildlife Service. 2016. National Wetlands Inventory, v2, California Wetlands. Accessed May 2016.*



Common reasons for making changes to the NCCAG dataset

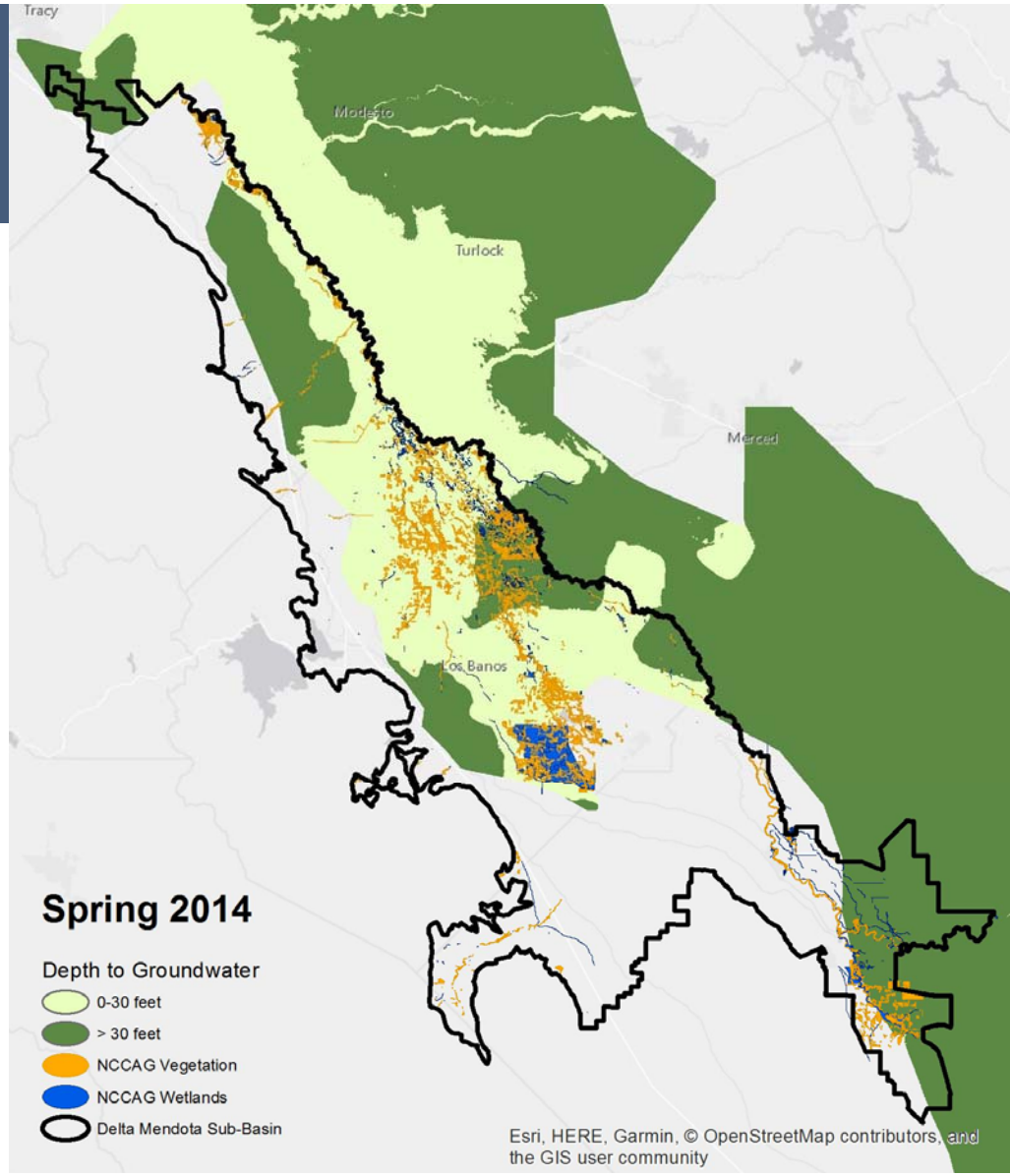
Change Type	Change Reason
REMOVE	Artificial Wetland
	Cultivated
	Developed
	Drainage Channel
	Mapping Error
	Spreading Basin
	Not connected groundwater in a principal aquifer
ADDED	Natural Wetland
	Managed Wetland
	Natural Seep or Spring
	Gaining reach
	Natural lake or pond
KEPT	No change

REFINING THE NCCAG



DEPTH TO GROUNDWATER

Groundwater depth changes over time



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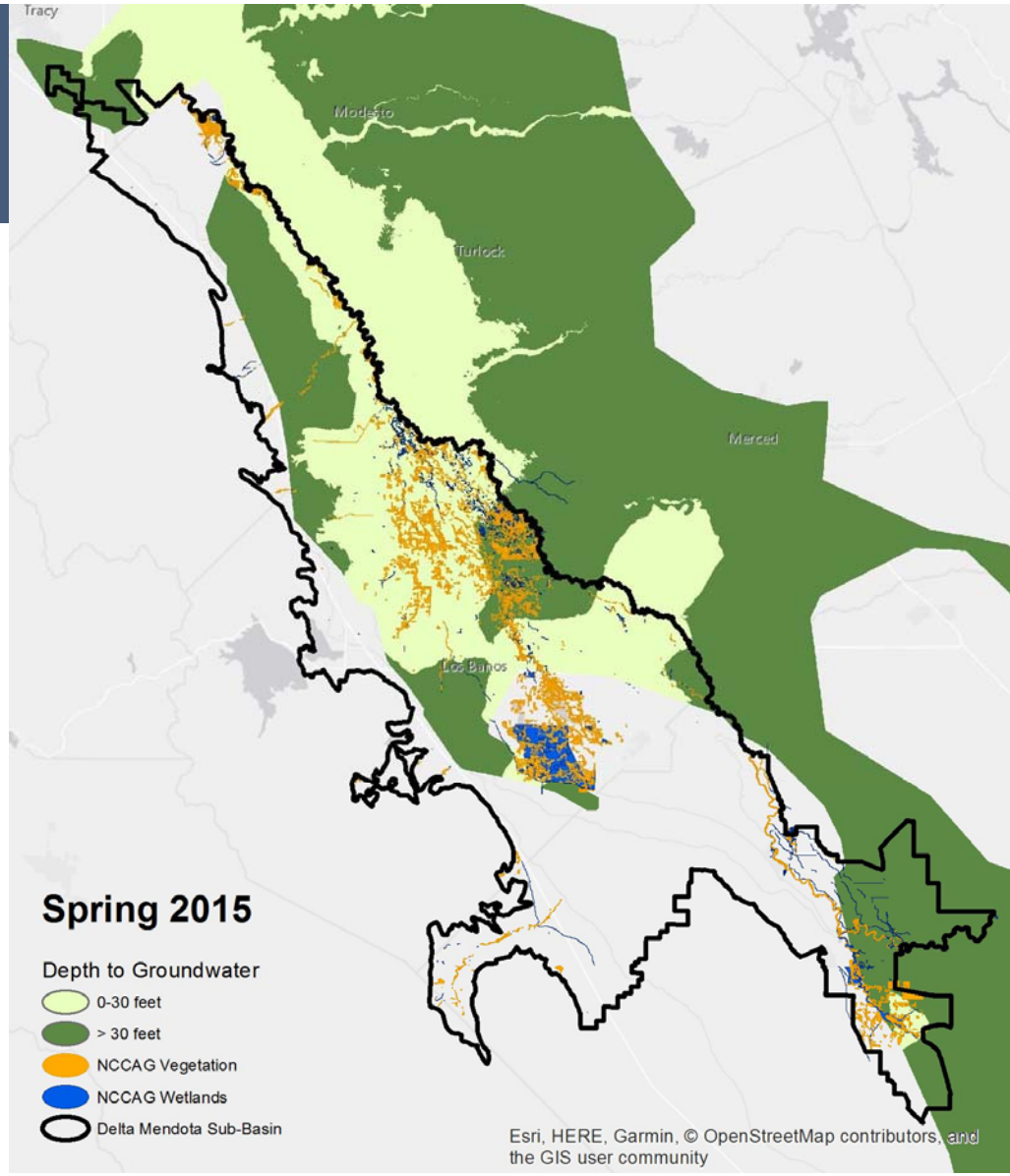

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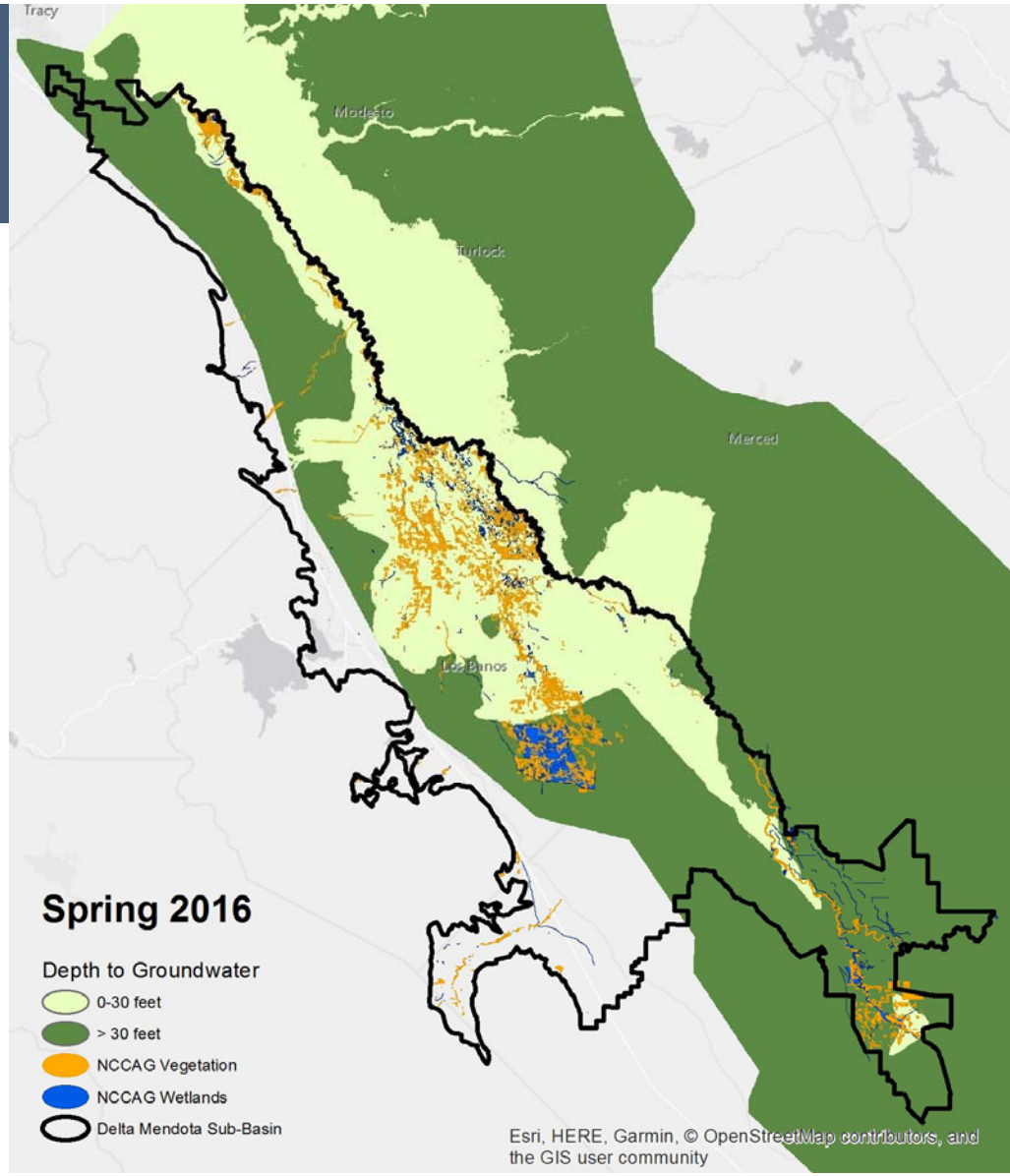

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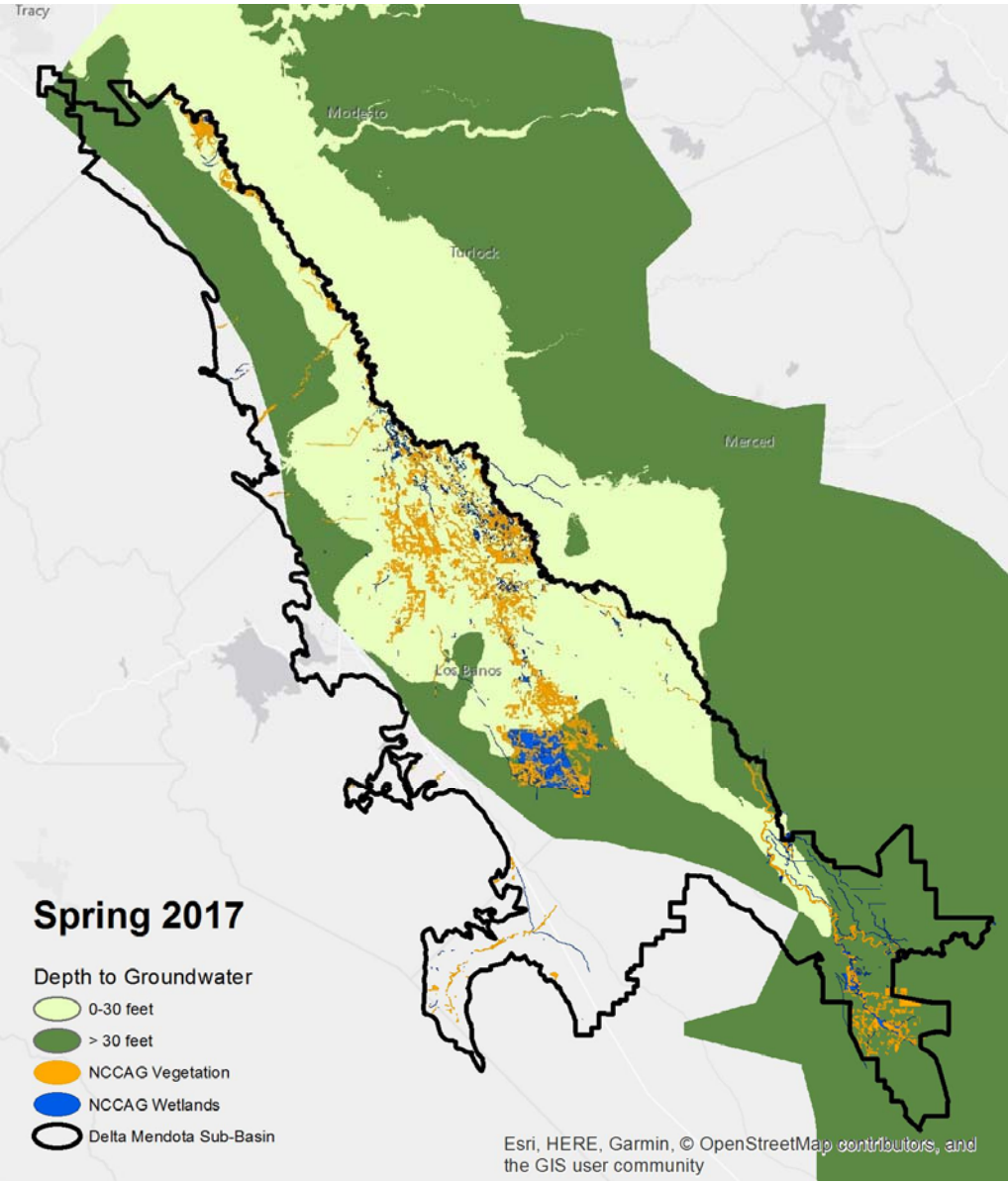
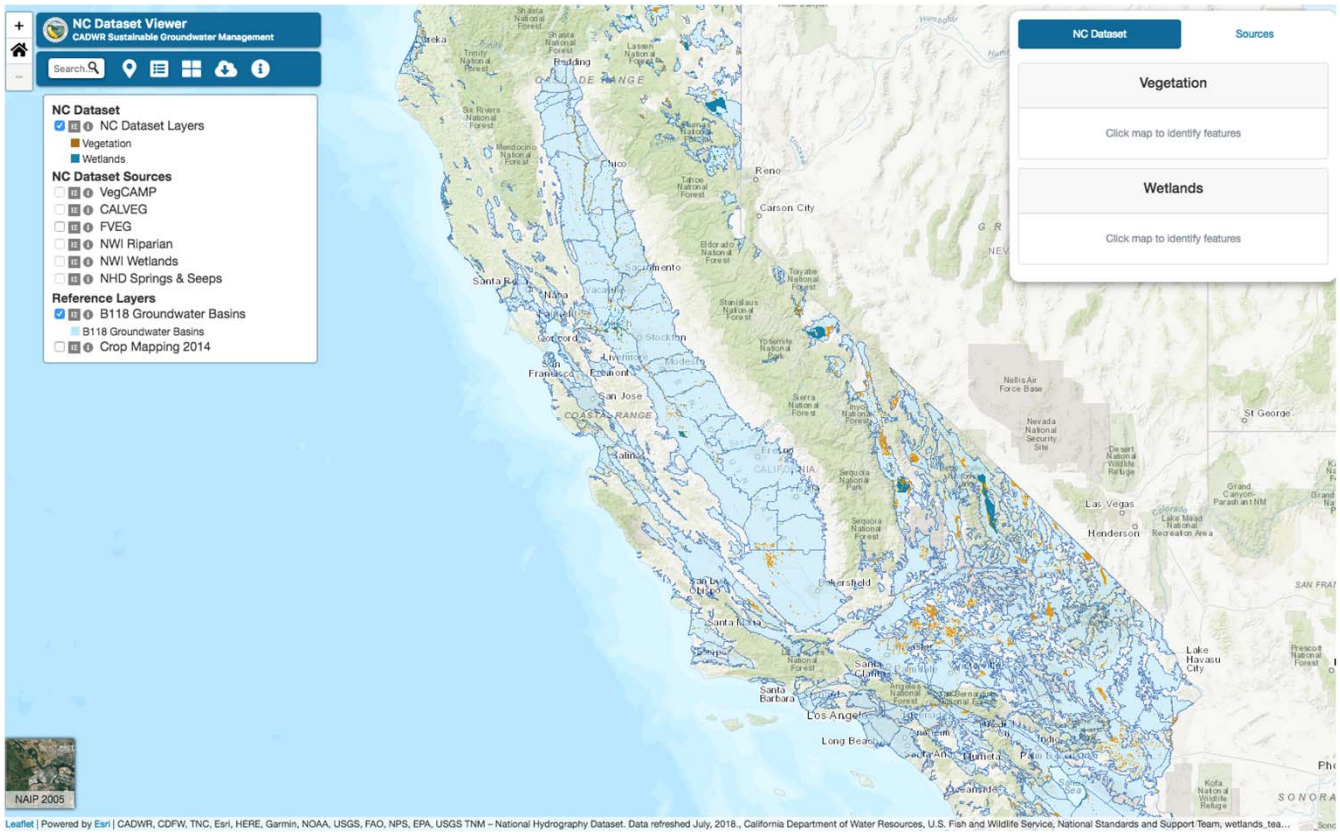


MAPPING GDEs



EXTRA SLIDES

GDEs UNDER SGMA:
What’s true?

MISCONCEPTION #1

SGMA is going to require GDEs to be restored to pre-settlement conditions

Redwood Logging

Walnut Orchard, Orange County, 1938

MISCONCEPTION #2

All impacts to GDEs are the responsibility of GSAs.

LITTLE TO NO IMPACT

Healthy Ecosystem

SHORT-TERM ADVERSE IMPACTS

Water Stress

PROLONGED ADVERSE IMPACTS

Reduced Growth

Reduced Reproduction

Habitat Loss

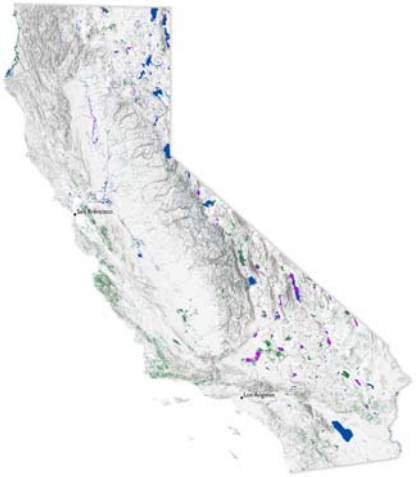
SEVERE ADVERSE IMPACTS

Ecosystem Collapse

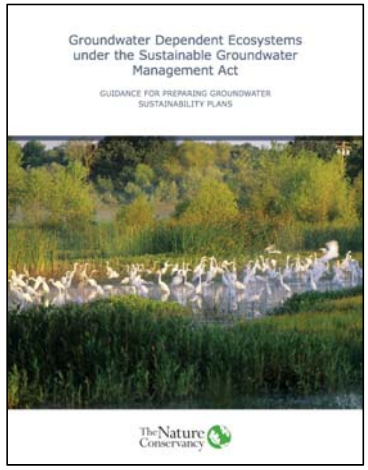
OPTIMAL — GROUNDWATER CONDITIONS — POOR

GDE TOOLS

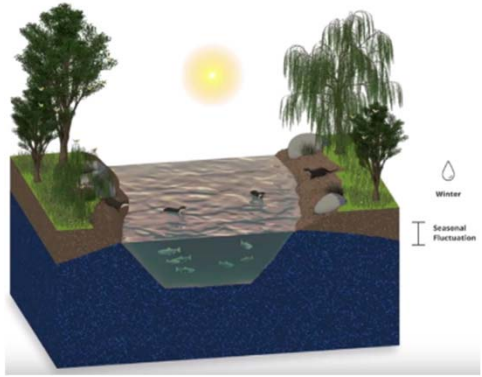
Statewide GDE Indicators Database



GDE Guidance for GSPs

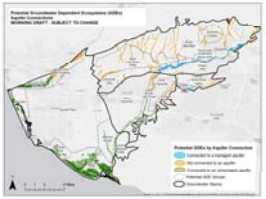


Educational Resources



Data & Research

Case Studies



www.GroundwaterResourceHub.org

GDE GUIDANCE DOCUMENT

DESIGN PRINCIPLES:

1. Consistent with SGMA & GSP Regulations
2. Based on Best Available Science
3. Facilitate Local Control
4. Practical and Easy-To-Use

Customizable

PRACTICAL RESOURCES

BOX 5. WHAT YOU NEED

STATEWIDE DATA

- **Critical Habitat for Threatened and Endangered Species**
  The Environmental Conservation Online System (ECOS) contains spatial data of critical habitat for threatened and endangered species. The ECOS spatial data can be downloaded as shapefiles.

  http://ecos.fws.gov/ecp/report/table/critical-habitat.html

- **California Special Status Species**
  The California National Diversity Database (CNDDB) contains text and spatial information on California's special status species. The CNDDB spatial data can be downloaded as a shapefile or accessed via the BIOS Data Viewer. Users must have a CNDDB subscription to access RareFind and CNDDB spatial data downloads.

  https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data#43018407-rarefind-5

- **California Protected Areas**
  The California Protected Areas Data Portal (CPAD) contains spatial information about lands that are protected for open space purposes by more than 1,000 public agencies or non-profit organizations. The CPAD spatial downloadable GIS data contain shapefiles and geodatabases.

  http://www.calands.org/data

- **Areas of Conservation Emphasis**
  The Areas of Conservation Emphasis (ACE) Project contains spatial data on native species richness, rarity, endemism, and sensitive habitats for six taxonomic groups: birds, fish, amphibians, plants, mammals, and reptiles. Information on the location of four sensitive habitat types (i.e., wetlands, riparian habitat, rare upland natural communities, and high-value salmonid habitat) are also summarized. The ACE dataset is available statewide at a 2.5-square-mile hexagon grid. The ACE spatial data are available online or downloadable for GIS.

  https://www.wildlife.ca.gov/Data/Analysis/ACE

LOCAL DATA

- **Beneficial Use Designations**
  Regional Water Quality Control Board basin plans contain a list of beneficial uses of surface waters, groundwater, marshes, and wetlands that pertain to water quality objectives. According to the State Water Resources Control Board, "beneficial use designations for any given water body do not rule out the possibility that other beneficial uses exist or have the potential to exist."

  http://www.waterboards.ca.gov/plans_policies/#plans

- **Local Plans or Studies**
  Local plans or studies (e.g., habitat conservation plans, conservation plans, wildlife corridor plans, ecological and biological assessment studies, natural resource management plans developed for specific areas) often contain descriptions and assessments of the species and habitat for specific areas.

- **Takes advantage of local and statewide information to inform local decision making**
- Summary of relevant science
- Worksheets

PRACTICAL RESOURCES

APPENDIX IV: GDE ASSESSMENT TOOLBOX

This table provides a summary of the methods and approaches used in Australia to identify GDEs and determine their reliance on groundwater (modified from Richardson et al. 2011). Citations for case study examples and key references related to the assessment tools below can be found in Richardson et al. (2011).

Assessment Tool	Description	Data Sources/Methods	Pros	Cons
Landscape Mapping	• Location and identification of ecosystems that are potentially groundwater dependent based on biophysical parameters (i.e., depth to water table, soil type, vegetation type) • Assessment of primary productivity, water relations, and/or condition of vegetation communities using remote sensing images to infer use of groundwater	• Native vegetation cover, wetlands, and drainage maps • Vegetation composition • Root depth • Geol struc • Grou and table • Land • Soil t • Vege • Leaf	• Provides a map/list of potential GDE areas • Utilizes available local, state, federal, and worldwide datasets	• Analysis needs to be repeated over time since data offers one time slice • Some components rely on prior knowledge or datasets
Conceptual Modeling	• Documentation of a conceptual understanding of the location of GDEs and interaction between ecosystems and groundwater • Qualitatively links hydrologic, soil, and climate processes to GDE elements and processes • Clarifies the relationships and interactions between hydrology and ecology	• Hydr boun grour • Clima • Geol • Land • Topo elevat • Gene desc • Vege • Profe sever • Scier • AB 3 Mana		

TABLE 2. Examples of measurable thresholds and objectives for GDEs under water management regimes outside SGMA.
Note: The thresholds listed here were compiled from published scientific literature or from water management standards and are provided as examples only. GDE thresholds are location specific and will vary based on differences in species composition, soil type, local climate, and hydrologic regime, among other factors.

Measurable Thresholds and Objectives	Observed Biological Change or Rationale	Location (Reference)
GROUNDWATER LEVELS		
Depth to water of 2 m for grasslands and 4 m for shrub	Maintain groundwater levels to support terrestrial vegetation based on maximum effective depth of rooting and confirmed by soil water and annual vegetation conditions.	Inyo County, California (Inyo County and City of Los Angeles 1990)
75th percentile of maximum depth to water table	Based on quantitative relationships between the position of the water table and wetland indicator plant species. A maximum depth to water table of 0.9–34.8 cm for fen plants and 16.6–32.2 cm for peat accretion can be tolerated in these wetlands.	Fremont-Winema National Forest, Oregon (Aldous & Bach 2014)
Average decline in groundwater levels must not exceed 30 feet over the next 50 years	Limit the decline in groundwater elevation to provide for sustainable yield.	Dockum Aquifer, Texas (TWDB 2016)
INTERCONNECTED SURFACE WATER		
Water level decline at the GDE level not to exceed 0.05 m/year	Groundwater flows will no longer support functioning wetlands due to chronic lowering of groundwater levels.	Tindall Limestone Aquifer, Katherine, Australia (Christian-Smith & Abhold 2015)

PRACTICAL RESOURCES

- Takes advantage of local and statewide information to inform local decision making
- **Summary of relevant science**
- Worksheets

WORKSHEETS

WORKSHEET 1. ASSESS A CONNECTION TO GROUNDWATER

The Nature Conservancy

Use the following questions to assess whether iGDE polygons are connected to groundwater.	Yes	No	Insufficient Data
GENERAL QUESTIONS FOR ALL GDE TYPES			
Is the iGDE underlain by a shallow unconfined or perched aquifer that has been delineated as being part of a Bulletin 118 principal aquifer in the basin?			
Is the depth to groundwater under the iGDE less than 30 feet?			
Is the iGDE located in an area known to discharge groundwater (e.g., springs/seeps)?			
*If you answer **Yes** to any of the above questions, then you likely have a GDE. Stop here. If you selected **No** or **Insufficient Data** or cannot confidently answer any of the above questions, then answer the following questions to infer groundwater dependency.*			
RIVERS, STREAMS, AND ESTUARIES			
Is the iGDE located in a portion of a river or stream that is likely a gaining reach?			
Are water temperatures around the iGDE relatively constant over time, indicating a potential for gaining conditions?			
Are there stable/permanent natural flows detected by stream gauges near the iGDE, indicating a potential for gaining conditions?			
Is there water or flows around the iGDE during summer months?			
For iGDEs near estuaries, does the salinity drop below that of seawater in the absence of surface water inputs (e.g., surface runoff or stormwater)?			
Are the isohaline contour lines of the saline wedge relatively constant under an iGDE?			
WETLANDS			
Is the level of water around the iGDE maintained during extended dry periods without surface water inflow or management?			

WORKSHEET 3. POTENTIAL EFFECTS ON GDE SUMMARY

The Nature Conservancy

GDE Unit ID_____

Ecological Value (Step 1.2)—*Check the one that applies* ☐ High ☐ Moderate ☐ Low ☐ Insufficient Data/Not Applicable

Susceptibility to Changing Groundwater Conditions (Step 2.1)—*Check the one that applies*
☐ High ☐ Moderate ☐ Low ☐ Insufficient Data/Not Applicable

Corresponding Sustainability Indicator	Groundwater Levels	Groundwater Storage	Seawater Intrusion	Water Quality	Land Subsidence	Interconnected Surface Water
Hydrologic Data (Step 2.1)						
Baseline Average (Step 2.1)						
Baseline Range (Step 2.1)						
Biological Data (Step 2.2)						
Description of Adverse Impacts to GDE (Step 2.3)						

NEXT STEPS

Check out our website:
www.GroundwaterResourceHub.org

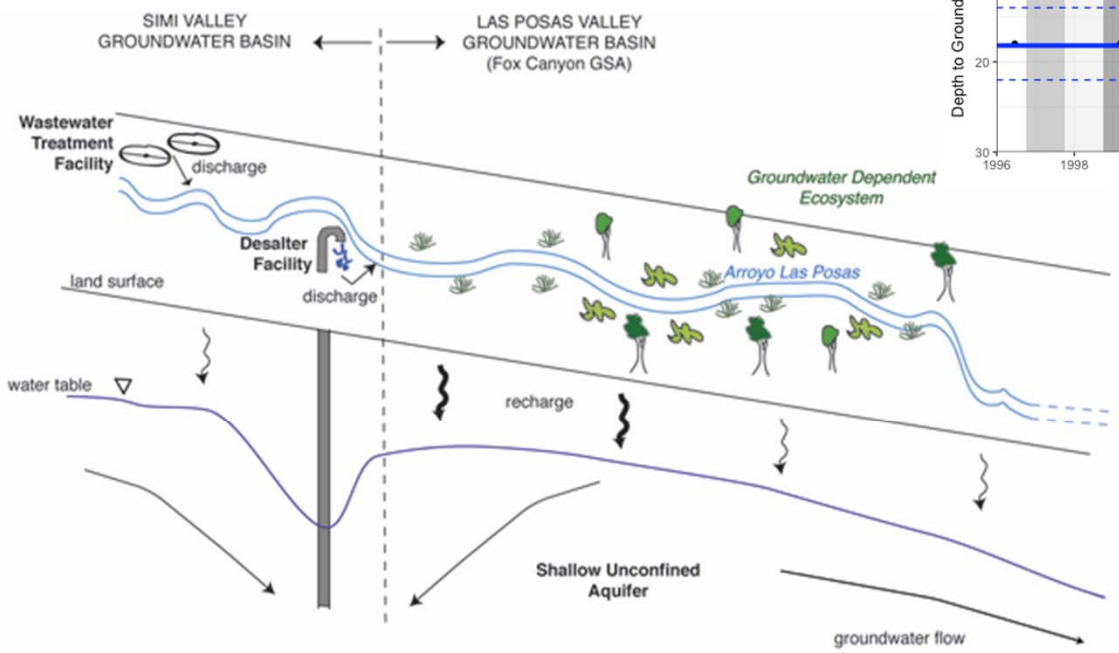
Designate an environmental representative on the GSA board – see our case study on the Hub!

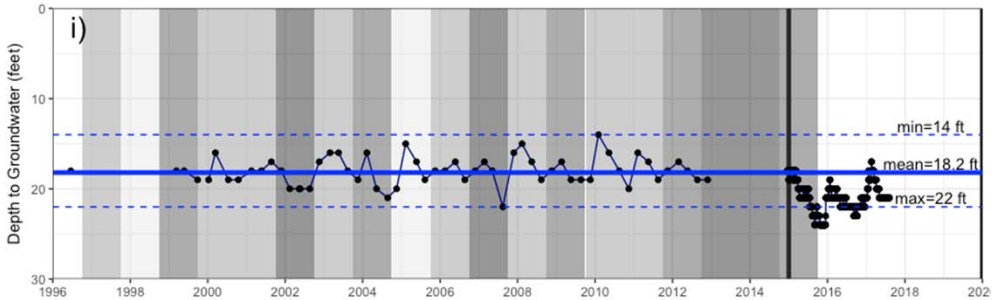
Budget time (and funds) for GSA technical staff or consultant to use this document during GSP development

Help us help you! Give us feedback and questions about support needed.

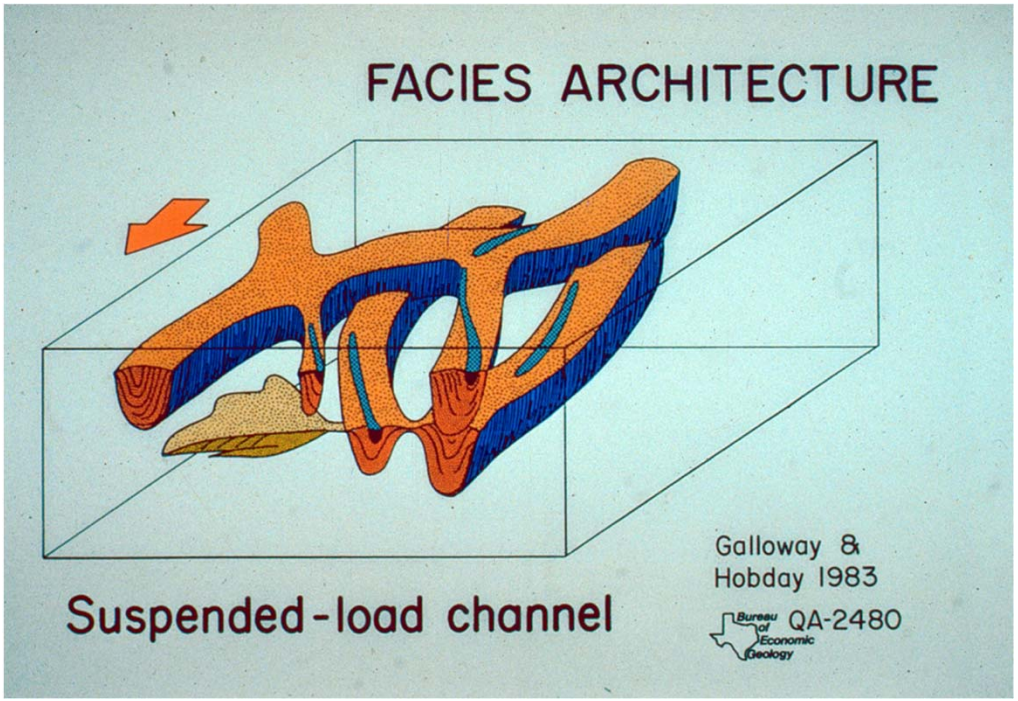
melissa.rohde@tnc.org

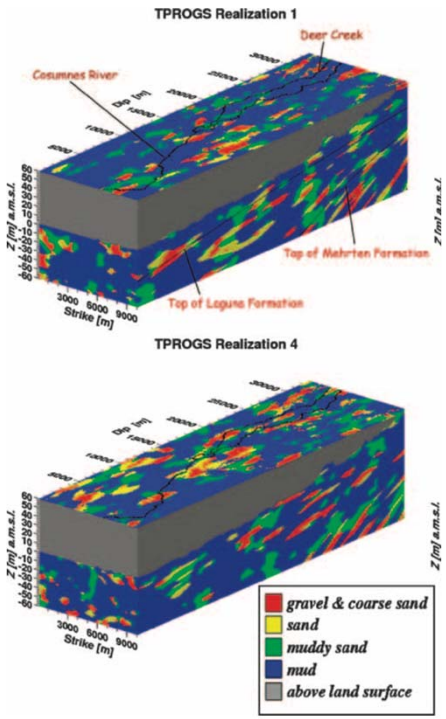
Example 2: Arroyo Las Posas GDE (Unconfined Aquifer)





Example 2: Cosumnes River Basin (Unconfined Aquifer)





Fleckenstein et al. (2006)

Thank You

Special Northern & Central GDE Workshop

TECHNICAL MEMORANDUM

RE: Meeting with The Nature Conservancy on the Northern & Central Delta-Mendota GSP

PREPARED BY: Leslie Dumas, Woodard & Curran

DATE: April 29, 2019

The meeting between the Northern & Central Delta-Mendota Region and The Nature Conservancy included the following attendees:

Andrew Garcia – San Luis & Delta-Mendota Water Authority

Leslie Dumas – Woodard & Curran

Leslie Jordan – TNC

Sandi Matsumoto – TNC

Kirk Klausmeyer – TNC

Sally Liu – TNC

Melissa Rohde – TNC

Ryan Luster - TNC

- GDE mapping in the Delta-Mendota Subbasin used Spring 2015 water surface elevations to determine if a plant community was groundwater dependent. Depth to groundwater was used.
- TNC is concerned that 2015 represents a low water level and is therefore not representative of "typical" conditions. They suggest potentially rerunning GDE mapping with Spring 2013 groundwater elevations.
- While GDEs may have died off during the 2015 drought period, TNC claims GDEs can reestablish and therefore would not be accounted for.
- After reviewing the GDE mapping completed to date, there were several locations where the TNC had questions regarding the mapping. The circled areas on the amp are those locations of concern. TNC recommends looking the publicly-available DEM data.
- TNC also noted that the ground surface slopes closer to river and asked if the analysis take this into account in excluding GDEs due to 'deep water'?
- TNC also requested that groundwater elevation contours be added to the GDE mapping
- TNC noted that we should separate between identified GDEs and that this analysis should be mapped in Basin Setting section of the GSP.
- There was a discussion about the agreement the prevents pumping from above the A Clay in the southern portion of the Subbasin. In developing the sustainability indicators, it should be explained how/why the GSAs no control over groundwater management above A Clay
- TNC then asked if pumping in the lower groundwater zone is affecting downward vertical gradients (thereby potentially impacting interconnected surface water in the upper zone), and if not, are there nested wells that show no downward gradient influence?

- TNC then asked about the Farmers and Fresno GSP areas and if there was a vertical gradient between the very shallow (5-10 ft bgs) and deeper upper zones (35-50 ft bgs). They also asked how the 100 ft buffer was derived? What was the basis for this info and for eliminating GDEs.
- If the GSAs are using surface water flow or vertical gradients relating to surface flows to establish measurable objectives and minimum thresholds, how is this being linked to groundwater conditions or water level elevations?
- TNC feels that clustered wells are important for establishing the interconnection between surface water and groundwater, and that it's important to match the locations of clustered wells with surface water staff gauges.
- In terms of ecosystems, TNC believes that there is a need to get better at identifying which species are protected and which areas in basin have protected species relative to interconnected surface water. They feel that the GSPs should contain lists all freshwater species that are protected. These lists can be developed from the California Natural Diversity Database (though it requires a subscription). They feel that the GSPs should include a table listing protected species within GDE and that a few of these species should be selected as "indicator species" and monitored as part of the larger monitoring program. Identifying protected species and their locations is very important relative to TNC.
- In the letters TNC have sent out, they emphasize the 4 key expectations they have for first rounds of GSPs:
    - Involving/outreach to environmental stakeholders
    - Mapping GDEs
    - Identify what's being impacted
    - Monitoring
- They recommend that GSAs be conservative in mapping GDEs.
- TNC is currently working with CDFW and USFWS to map sensitive species in high and medium priority subbasins. They are working with these groups to establish parameters for monitoring species for potential future impacts.

Appendix C:
Outreach Activity Log

Outreach Conducted by	Targeted Parties	Parties in Attendance	Activity (e.g. public workshop, committee meeting, city council meeting, etc.)	Purpose/Description of Outreach Activity	Date	Location (Address)	Media Used for Outreach Activity (e.g. in-person, teleconference, e-mail, etc.)	Additional Notes/Comments
Woodard & Curran	Stakeholders and the public		Website goes live		2018		Website	http://www.deltamendota.org/
Peter Reitkerk	Board of Directors	Board of Directors	Board Meeting	Status of GSA formation	7/23/2014	948 Orange Avenue, Patterson, CA	Discussion	
Peter Reitkerk	Board of Directors	Board of Directors	Board Meeting	Status of GSA formation	8/20/2014	948 Orange Avenue, Patterson, CA	Discussion	
Peter Reitkerk	Board of Directors	Board of Directors	Board Meeting	Status of GSA formation	9/17/2014	948 Orange Avenue, Patterson, CA	Discussion	
Peter Reitkerk	Board of Directors	Board of Directors	Board Meeting	Status of GSA formation	12/19/2014	948 Orange Avenue, Patterson, CA	Discussion	
Walt Ward	Turlock Rotary Club	Public	Club Meeting	SGMA Awareness/Education	1/6/2015	Turlock	In-person	PowerPoint
Walt Ward	Modesto Garden Club	Public	Club Meeting	SGMA Awareness/Education	1/8/2015	Modesto	In-person	PowerPoint
Walt Ward	Patterson Lions Club	Public	Club Meeting	SGMA Awareness/Education	1/14/2015	Patterson	In-person	PowerPoint
Walt Ward	Turlock Lions Club	Public	Club Meeting	SGMA Awareness/Education	1/15/2015	Turlock	In-person	PowerPoint
Walt Ward	2015 Water Summit	Public	Workshop	SGMA Awareness-Regional Water Issues	1/16/2015	Stan. Co.	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Newman Rotary Club	Public	Club Meeting	SGMA Awareness/Education	1/22/2015	Newman	In-person	PowerPoint
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 6	Conduct Public Presentation/Direct Staff on SGMA	1/27/2015	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Received
Walt Ward	ACWA-SWF-CSAC-GSA	Public	ACWA-SWF-CSAC-GSA Workshop	SGMA Awareness/Education	2/5/2015	Modesto	In-person	PowerPoint
Walt Ward	Waterford Lions Club	Public	Club Meeting	SGMA Awareness/Education	2/17/2015	Waterford	In-person	PowerPoint
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	2/18/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Peter Reitkerk	PID Growers/Landowners	BOD, members of the public	Grower Workshop, Special Board Meeting	Status of GSA formation	2/19/2015	1950 Keystone Parkway, Patterson, CA	Presentation	
Walt Ward	Patterson Rotary Club	Public	Club Meeting	SGMA Awareness/Education	2/25/2015	Patterson	In-person	PowerPoint
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 8	Conduct Public Hearing/ Direction for Staff Relating to Implementation of SGMA of 2014	3/10/2015	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	By consensu Board Endorsed
Walt Ward	League of California Cities	Public	League Meeting	SGMA Awareness/Education	3/12/2015	Lodi	In-person	PowerPoint
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	3/18/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Peter Reitkerk	Board of Directors	Board of Directors	Board Meeting	Status of GSA formation	3/18/2015	948 Orange Avenue, Patterson, CA	Discussion	
Walt Ward	League of Women Voters	Public	League Meeting	SGMA Awareness/Education	3/26/2015	Modesto	In-person	PowerPoint
Walt Ward	Modesto Engineer's Club	Public	Club Meeting	SGMA Awareness/Education	4/17/2015	Modesto	In-person	PowerPoint
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	4/22/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	StanCo Ag Advisory Board	Public	Board Meeting	SGMA Awareness/Education	5/4/2015	Modesto	In-person	PowerPoint
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	SGMA Awareness/Education	5/19/2015	Modesto	In-person	http://www.stancounty.com/bos/
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	5/27/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Denair Community	Public	Municipal Advisory Committee	SGMA Awareness-Regional Water Issues	6/2/2015	Denair	In-person	PowerPoint
Supervisor Jim DeMartini	Board of Directors	Board of Directors	Board Meeting	Groundwater Mgt. within the County	6/17/2015	948 Orange Avenue, Patterson, CA	Discussion	
Walt Ward	Knights Ferry Community	Public	Town Hall Meeting	SGMA Awareness-Regional Water Issues	6/25/2015	Knights Ferry	In-person	PowerPoint
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	SGMA Awareness/Education	6/30/2015	Modesto	In-person	http://www.stancounty.com/bos/
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	7/29/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Denair Community	Public	Town Hall Meeting	SGMA Awareness-Regional Water Issues	8/12/2015	Denair	In-person	PowerPoint
Walt Ward	MJC Science Colloquium	Public	Educational Forum	SGMA Awareness-Regional Water Issues	9/9/2015	Modesto	In-person	PowerPoint
(Patterson) City water consultant	*City staff and water stakeholders*	*Staff, water stakeholders and members of the public*	*Stakeholder workshop*	*Introduction to Groundwater Recharge Study and SGMA*	*9/23/2015*	*1 Plaza, Patterson, CA 95363*	*Presentation*	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	9/30/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Valley Home Community	Public	Town Hall Meeting	SGMA Awareness-Regional Water Issues	10/8/2015	Valley Home	In-person	PowerPoint
Walt Ward	Sanislaus County Constituents	Public	Board of Supervisors Meeting	SGMA Awareness/Education	10/20/2015	Modesto	In-person	http://www.stancounty.com/bos/
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	11/18/2015	Modesto	In-person	http://www.stancounty.com/er/groundwater/
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 13	Conduct Public Hearing/Direction on Implementation of SGMA and Forming GSA's within Fresno County	1/26/2016	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	1/27/2016	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	SGMA Awareness/Education	2/9/2016	Modesto	In-person	http://www.stancounty.com/bos/
Marc Vanden	Board of Directors	BOD, Legal Counsel	Board Meeting	Status of GSA formation	2/17/2016	948 Orange Avenue, Patterson, CA	Discussion	

County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 43	Consent Item/ Approve and Authorize MOU with SJRECWA for SGMA	3/15/2016	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Marc Vanden	Board of Directors	BOD, Legal Counsel	Board Meeting	Status of GSA formation	3/16/2016	948 Orange Avenue, Patterson, CA	Discussion	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	3/30/2016	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Amy Montgomery	Board of Directors	BOD, staff	Introduce SGMA in Board Meeting	Info of requirement to form GSA	4/14/2016	12931 S Hwy 33, Santa Nella	Board meeting presentation	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	5/25/2016	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	6/15/2016	25390 W Silveira, Tranquillity	in person	
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	7/20/2016	25390 W Silveira, Tranquillity	in person	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	7/27/2016	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	SGMA Awareness/Education	8/6/2016	Modesto	In-person	http://www.stancounty.com/bos/
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	8/17/2016	25390 W Silveira, Tranquillity	in person	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 45	Consent Item/Approve and Authorize MOU with Farmers Water District for Implementaion of SGMA	8/23/2016	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	9/28/2016	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	10/19/2016	25390 W Silveira, Tranquillity	in person	
Lacey Kiriakou	Merced County Board Of Supervisors	BOS, members of the public	SGMA Update to BOS	SGMA Update in Merced County	10/25/16	2222 M Street, Merced	Presentation	County wide information including Central and Northern GSAs.
(Patterson) Del Puerto Water District and City of Patterson	*Principal landowners and water stakeholders*	*City staff, DPWD and affected landowners*	*Joint workshop*	*As a result of SGMA, parcels needed to be detached from DPWD service area. These parcels were already inside the city's limits.*	*10/26/2016*	*1 Plaza, Patterson, CA 95363*	*Presentation*	
Amy Montgomery	Board of Directors	BOD, staff	Presentation of SGMA in Board Meeting	Discussion of SGMA and requirement to form GSA and participate in Central DM GSA	11/10/2016	12931 S Hwy 33, Santa Nella	Board meeting presentation	
(Patterson) City Staff	*City Council*	*City staff and council members (two at a time)*	*Individual meetings*	*SGMA and next steps*	*11/14/2016*	*1 Plaza, Patterson, CA 95363*	*Presentation*	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	11/16/2016	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Marc Vanden	Board of Directors	BOD, Legal Counsel	Board Meeting	PID GSA Boundaries	11/16/2016	948 Orange Avenue, Patterson, CA	Discussion	
(Patterson) City Staff	*City Council and members of the public*	*City council and members of the public*	*City Council meeting*	*Approve resolution to become GSA*	*12/6/2016*	*1 Plaza, Patterson, CA 95363*	*Presentation, website, newspaper*	
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	12/14/2016	25390 W Silveira, Tranquillity	in person	
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	SGMA Awareness/Education	12/20/2016	Modesto	In-person	http://www.stancounty.com/bos/
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	1/18/2017	25390 W Silveira, Tranquillity	in person	
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	GSA Formation	1/24/2017	Modesto	In-person	http://www.stancounty.com/bos/
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	1/28/2017	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Amy Montgomery	Board of Directors	BOD, staff	Advised Board of upcoming public meeting	Adopted resolutions authorizing multi-agency services agreement; appointing rep(s); delare intention to become party to GSA; CEQA; execution of MOA	2/9/2017	12931 S Hwy 33, Santa Nella	Board meeting presentation	
Marc Vanden	Board of Directors	BOD,DPWD,WSID,OFWD Representatives	Special Board Meeting	Overview of SWGMA Act	2/10/2017	1950 Keystone Parkway, Patterson, CA	Discussion	
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	GSA Formation	2/14/2017	Modesto	In-person	http://www.stancounty.com/bos/
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	2/15/2017	25390 W Silveira, Tranquillity	in person	
Marc Vanden	PID Growers/Landowners	BOD, members of the public	Grower Workshop, Special Board Meeting	SGMA Update	2/22/2017	1950 Keystone Parkway, Patterson, CA	Presentation	
Amy Montgomery	SNCWD Water and Sewer Service Customers	Mailing	Notice of SGMA Public Meeting	Notice of Public Meeting to discuss formation of Central DM GSA	3/1/2017	12931 S Hwy 33, Santa Nella	Direct Mail	
Lacey Kiriakou	Merced County Board Of Supervisors	BOS, members of the public	Public Hearing for Northwestern GSA Formation	GSA Formation	3/7/17	2222 M Street, Merced	Presentation	
Lacey Kiriakou	Merced County Board Of Supervisors	BOS, members of the public	Board Meeting Approving the Central DM GSA Formation and Activity Agreement	GSA Formation	3/7/17	2222 M Street, Merced	Presentation	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 12	Conduct Public Hearing/Approve and Authorize Agreement to Establish the Central DM Multi-Agency GSA	3/7/2017	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted.

Lacey Kiriakou & Stantec	Delta-Mendota White Area Growers and Northern and Central Delta-Mendota public	Some Delta-Mendota Members of the Public	Public Workshop	SGMA Education prior to public hearing for Central DM GSA formation	3/8/17	Santa Nella Water District	Presentation	Merced County partnered with Stantec on this public meeting, so you may already have this down. Merced County's target was white area growers
Walt Ward	Stanislaus County Constituents	Public	PEIR-SGMA Workshop	SGMA Awareness/Contract Deliverable	3/9/2017	Modesto	In-person	PowerPoint
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Status of Widren Water District GSA formation	3/10/2017	259 I Street, Los Banos	Presentation	
Andrew Garcia	GSA members in bottom 1/2 of basin	GSA members in bottom 1/2 of basin	public hearing/workshop	Status of GSA formation	3/13/2017	25390 W Silveira, Tranquillity	in person	
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	3/15/2017	25390 W Silveira, Tranquillity	in person	
Marc Vanden	Board of Directors	BOD, members of the public	Board Meeting	Northern DMC Region SGMA Activities Agreement	3/15/2017	948 Orange Avenue, Patterson, CA	Discussion	
(Patterson) City staff/City water consultant	*City Council and members of the public*	*City council and members of the public*	*Public hearing, City Council meeting*	*Discuss final water master plan draft and next steps for SGMA*	*3/20/2017*	*1 Plaza, Patterson, CA 95363*	*Presentation, website, newspaper*	
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	GSA Formation	3/28/2017	Modesto	In-person	http://www.stancounty.com/bos/
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	4/20/2017	25390 W Silveira, Tranquillity	in person	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe & Jean P. Sagouspe III	Monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	5/2/2017	259 I Street, Los Banos	in-person	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 11	Conduct public hearing/adopt resolution County of Fresno exclusive GSA for "Management Area A" of DM Subbasin	5/2/2017	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/ Adopted
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 13	Conduct public hearing/adopt resolution County of Fresno exclusive GSA for "Management Area B" of DM Subbasin	5/2/2017	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/ Adopted
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	5/17/2017	25390 W Silveira, Tranquillity	in person	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	5/31/2017	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Walt Ward	Stanislaus County Constituents	Public	Board of Supervisors Meeting	GSA Formation	6/13/2017	Modesto	In-person	http://www.stancounty.com/bos/
Lauren Layne	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	7/19/2017	25390 W Silveira, Tranquillity	in person	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe	Monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	8/1/2017	259 I Street, Los Banos	in-person	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 40	Consent Item/Adopt and Approve Budget for FY 2017-18 for Central DM Multi-Agency GSA	8/22/2017	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Walt Ward	Stanislaus County Constituents	Public	PEIR-SGMA Workshop	SGMA Awareness/Contract Deliverable	8/28/2017	Modesto	In-person	PowerPoint
(Patterson) City staff/City water consultant	*Principal landowners and water stakeholders*	*City staff, water stakeholders and members of the public*	*Stakeholder workshop*	*Progress on WMP, Groundwater Recharge Study and SGMA*	*9/18/2017*	*1 Plaza, Patterson, CA 95363*	*Presentation*	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	9/27/2017	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Self Help Enterprises with Fresno County as a participant	SGMA Fresno County Roundtable for Schools	Staff from various Fresno County schools, members of the public	Public workshop	Introduction/Overview of SGMA for Fresno County schools	9/29/2017	Fresno County Office of Education 1117 Van Ness Avenue, Fresno CA 93721 Towers Building 1st Floor, Conference Rm 101T	Presentation/Group Activity	Received
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe & Jean P. Sagouspe III	Monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	10/3/2017	259 I Street, Los Banos	in-person	
Vince Lucchesi	Board of Directors	BOD	Board Meeting	SGMA Update	10/18/2017	948 Orange Avenue, Patterson, CA	Discussion	
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	10/25/2017	25390 W Silveira, Tranquillity	in person	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe & Jean P. Sagouspe III	Monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	10/31/2017	259 I Street, Los Banos	in-person	
Vince Lucchesi	Board of Directors	BOD	Board Meeting	SGMA Update	11/15/2017	948 Orange Avenue, Patterson, CA	Discussion	
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	11/16/2017	25390 W Silveira, Tranquillity	in person	

County of Fresno	Stakeholders Fresno County Management Areas A & B	Stakeholders, MPG, Meyers Farming, Mendota Wildlife Area, County Staff	Stakeholder Update Fresno County Management Areas A&B	GSP Development	11/17/2017	Amec Foster Wheeler Office, 1281 E. Alluvial Ave., Suite 101, Fresno, CA	Calendar invite/email In person discussion	Received
County of Fresno	Stakeholders Fresno County Management Areas A & B	Farmers' WD, MPG, Terra Linda Farms, Meyers Farming, Mendota Wildlife Area, LSCE, County Staff	SGMA Overview Specific to GSAs area	GSP Development	12/7/2017	Amec Foster Wheeler Office, 1281 E. Alluvial Ave., Suite 101, Fresno, CA	Calendar invite/email Presentation/Q&A Discussion	Received
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe & Jean P. Sagouspe III	Monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	12/12/2017	259 I Street, Los Banos	in-person	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 43	Consent Item/Approve and Authorize First Amendment to MOU with SJRECGSA	12/12/2017	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Walt Ward	Stanislaus County Constituents	Public	PEIR-SGMA Workshop	SGMA Awareness/Contract Deliverable	12/14/2017	Modesto	In-person	PowerPoint
Vince Lucchesi	Board of Directors	BOD	Board Meeting	SGMA Update	12/20/2017	948 Orange Avenue, Patterson, CA	Discussion	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe III	Monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	1/16/2018	259 I Street, Los Banos	in-person	
Danny M Wade	Tranquillity ID Board of Directors	BOD, members of public	update to BOD	Status of GSA formation	1/22/2018	25390 W Silveira, Tranquillity	in person	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	1/24/2018	PID 948 Orange Ave Patterson, CA	Presentation	
Walt Ward	Stanislaus County Constituents	Public	Water Advisory Committee	SGMA Awareness/Education	1/31/2018	Modesto	In-person	http://www.stancounty.com/er/groundwater/
Vince Lucchesi	Board of Directors	BOD	Board Meeting	SGMA Update	2/21/2018	948 Orange Avenue, Patterson, CA	Discussion	
Vince Lucchesi	Board of Directors	BOD	Board Meeting	SGMA Update	2/21/2018	948 Orange Avenue, Patterson, CA	Discussion	
Damian Aragona	Widren Water District Stakeholders	Jean P. Sagouspe III	Landowner monthly Update	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	2/27/2018	259 I Street, Los Banos	in-person	
Vince Lucchesi	PID Growers/Landowners	BOD, members of the public	Grower Workshop, Special Board Meeting	SGMA Update	2/28/2018	1950 Keystone Parkway, Patterson, CA	Presentation	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Annual Growers Meeting	GSA/SGMA updates	2/28/2018	Patterson Fire Station No 2 1950 Keystone Pacific Parkway Patterson, CA	Presentation	
Merced County Farm Bureau	Farmers, ranchers, ag community in general	Farmers, ranchers, ag community in general, members of the public	Water Symposium - public workshop	Information covering SGMA in general and an overview of each subbasin thus far	3/1/2018	2145 Wardrobe Road, Merced	In-person	
County of Fresno	Members of the Public/Stakeholders/Interested Parties/Governement Agencies/NGOs	Members of the Public/Stakeholders/Interested Parties/Government Agencies/NGOs	SGMA Working Group	Updates/Coord./Implementation Efforts Groundwater Subbasins w/in Fresno County	3/1/2018	Fresno County Plaza Ballroom 2220 Tulare Street Fresno, CA 93721	Presentation/Comments	Received
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe III	Board of Directors meeting		3/13/2018	259 I Street, Los Banos	in-person	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	3/21/2018	PID 948 Orange Ave Patterson, CA	Presentation	
Amy Montgomery	Customers	NA	Made copies of GSP Workshop and placed at counter for customers	Notice of GSP Workshop	4/3/2018	12931 S Hwy 33, Santa Nella	Over the counter outreach	
Amy Montgomery	Customers	NA	Posted Notice of GSP Workshop on District website	Notice of GSP Workshop	4/3/2018	sncwd.com	Posted on website	
Amy Montgomery	Board of Directors	BOD	Notice of GSP Workshop	Notice of GSP Workshop	4/3/2018		Mailed in Board packets	
Amy Montgomery	Board of Directors	BOD, staff	Board Meeting	Shared DM Groundwater Subbasin SGMA Frequently Asked Questions	4/12/2018	12931 S Hwy 33, Santa Nella	Presented handout to Board and public attendees; gave GSA update	
Amy Montgomery	Customers	NA	Notice of upcoming workshops	Direct mail inserts into billing	4/17/2018	NA	Direct Mail	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 47	Consent Item/Approve and Authorize Agreement with Luhdorf and Scalmanini, Consulting Engineers	4/17/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Walt Ward	Manufacturer's Council of the Central Valley	Manufacturer's Council of the Central Valley	council meeting	SGMA Compliance Update	4/18/18 8:30 AM	Gallo Winery, Modesto		
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	4/30/2018	PID 948 Orange Ave Patterson, CA	Presentation	
Amy Montgomery	Volta CSD Cutomers	NA	Emailed Notice for Public Workshops and FAQ sheet	To outreach for public workshops	5/1/2018	Volta	Emailed the notices in English & Spanish and the FAQs sheet	Sent to VCSD Board President and Secretary
Amy Montgomery	Santa Nella Chamber of Commerce Members	NA	Emailed Notice for Public Workshops and FAQ sheet	To outreach for public workshops	5/1/2018	Santa Nella	Emailed the notices in English & Spanish and the FAQs sheet	Sent to all Chamber current and past members on Mailing List
Amy Montgomery	Romero Elementary School	NA	Emailed Notice for Public Workshops and FAQ sheet	To outreach for public workshops	5/1/2018	Santa Nella	Emailed the notices in English & Spanish and the FAQs sheet	Sent email to Principal, Terry Souza

Damian Aragona	Widren Water District Stakeholders	Jean P. Sagouspe III	Landowner monthly Update	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	5/1/2018	259 I Street, Los Banos	in-person	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 49	Consider and Approve Proposed Modification to Fresno County SGMA Working Group Membership	5/1/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted.
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 8	Proclaim the month of May 2018 Water Awareness Month	5/1/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted. (SGMA mentioned regarding County of Fresno as a backstop and leader)
Darlene Castro	Volta Customers	NA	Mail out notices of Public Workshops and FAQ sheet	To outreach for public workshops	5/3/2018	Volta	Direct Mail	
Darlene Castro	Volta Elementary School	NA	Notice for Public Workshops and FAQ sheet	To outreach for public workshops	5/3/2018	Volta Elementary School	Phone call to Principal	
County of Fresno	Landowners	Landowners	SGMA Workshop Notice DM Subbasin	Notification mailer/SGMA Workshop Information and Dates	5/4/2018	Landowners within the County GSA's in the Delta-Mendota Subbasin (Central DM Multi-GSA, A&B)	Mailer/Notice	Mailed out UPS
Amy Montgomery	Board of Directors	BOD, staff	Board Meeting	GSA update	5/10/2018	Santa Nella	Presentation in Project Update Report	
Andrew Garcia	Public in the Central Delta Mendota Subbasin	Public	Public Workshop	Description of SGMA, Introduction of Local GSA's in the Area	5/14/2018	842 6th Street, Los Banos	Presentation	
County of Fresno	Members of the Public/Landowners/Interested Parties	Members of the Public	Public Outreach SGMA Workshop	SGMA Overview	5/14/2018	San Luis & Delta-Mendota Water Authority Office 842 6th St, Los Banos	Presentation/Q&A Discussion	Received
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	5/16/2018	PID 948 Orange Ave Patterson, CA	Presentation	
County of Fresno	Members of the Public/Landowners/Interested Parties	Members of the Public	Public Outreach SGMA Workshop	SGMA Overview	5/17/2018	Mendota Branch Library Mendota Meeting Room 1246 Belmont Ave, Mendota	Presentation/Q&A Discussion	Received
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe III	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	5/18/2018	259 I Street, Los Banos	in-person	
Walt Ward	Eastin WD landowners	landowners	Public Workshop	SGMA outreach	26-May	Stewart & Jasper (nut processing) outside of Newman		
Walt Ward	Stanislaus County Water Advisory Committee	Committee	Committee meeting	SGMA/GSA/GSP update	30-May	Modesto		
Walt Ward	Stanislaus County Agricultural Advisory Board	Board members	Board meeting	SGMA/GSA/GSP update	4-Jun	Ceres		
Amy Montgomery	Board of Directors	BOD, staff	Board Meeting	GSA update	6/14/2018	Santa Nella	Presentation in Project Update Report	
County of Fresno	Landowners	N/A	Notification Mailer Announcing Website Launch for Management Areas A&B	Notification mailer announcing website launch for Fresno County Management Areas A&B GSA	6/14/2018	Landowners within the County Management Areas A&B	Mailer/Notice	Mailed out UPS
Amy Montgomery	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	SGMA Information	18-Jun	Santa Nella		
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	6/20/2018	259 I Street, Los Banos	in-person	
County of Fresno	Stakeholders Fresno County Management Areas A & B	Stakeholders, MPG, Meyers Farming, Mendota Wildlife Area, LSCE, County Staff	Stakeholder Update Fresno County Management Areas A&B	GSP Development	6/20/2018	Wood Office (formerly Amec), 1281 E. Alluvial Ave., Suite 101, Fresno, CA	Presentation/Q&A Discussion	Group consensus
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	6/20/2018	PID 948 Orange Ave Patterson, CA	Presentation	
County of Fresno	Landowners	N/A	Mailer questionnaire for Management Areas A&B	Mailer questionnaire for Management Areas A&B	7/6/2018	Landowners within the Freno County Management Areas A&B GSA	Mailed out a letter/questionnaire	14 total responses (7 contact; 7 no contact)
Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	7/12/2018	Santa Nella	Presentation in Project Update Report	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	7/25/2018	259 I Street, Los Banos	in-person	
Amy Montgomery	Board of Directors	BOD, staff	Board Meeting	GSA update	8/9/2018	Santa Nella	Presentation in Project Update Report	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	8/15/2018	PID 948 Orange Ave Patterson, CA	Presentation	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 48	Conduct public hearing/Approve and Authorize Second Amendment MOU w/SJRECWA	8/21/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted

County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 45	Conduct public hearing/approve Coordination&Cost Sharing Agreement with GSAs in DM Subbasin	8/21/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 48	Consent Item/Approve and Authorize 2nd Amendment to MOU with SJRECGSA	8/21/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	8/29/2018	259 I Street, Los Banos	in-person	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	9/19/2018	PID 948 Orange Ave Patterson, CA	Presentation	
Damian Aragona	Widren Water District Stakeholders	Jean P. Sagouspe & Jean P. Sagouspe III	Landowner monthly Update	Update of GSA's participation in Management Committee of the Central Delta-Mendota Region Activity Agreement	10/2/2018	259 I Street, Los Banos	in-person	
Amy Montgomery	Customers	NA	Notice for Public Workshops in Oct	To outreach for public workshops	10/3/2018	Santa Nella	Direct Mail	
County of Fresno	Stakeholders Fresno County Management Areas A & B	Stakeholders, MPG, Meyers Farming, Mendota Wildlife Area, LSCE, County Staff	Stakeholder Update Fresno County Management Areas A&B	SGMA GSP Development	10/4/2018	Wood Office (formerly Amec), 1281 E. Alluvial Ave., Suite 101, Fresno, CA	Calendar invite/email In person discussion/presentation	Received
Walt Ward	Central Valley Association of Realtors, Oakdale Council	Central Valley Association of Realtors, Oakdale Council	SGMA-GSA-GSP Overview and Status	SGMA-GSA-GSP Overview and Status	10/11/2018		Presentation	
County of Fresno	Landowners	Landowners	SGMA Workshop II Notice DM Subbasin	Notification mailer/SGMA Workshop Information and Dates	10/12/2018	Landowners within the County GSA's in the Delta-Mendota Subbasin (Central DM Multi-GSA, A&B)	Mailer/Notice	Mailed out UPS
Danny M Wade & Lauren Layne	Tranquillity Irrigation District Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	10/17/2018	25390 W Silveira, Tranquillity	Presentation	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	10/17/2018	PID 948 Orange Ave Patterson, CA	Presentation	
Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA and public outreach update	10/18/2018	Santa Nella	Presentation in Project Update Report	
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	Public Outreach SGMA Workshop II	GSP Development	10/22/2018	Firebaugh Middle School MPR 1600 16th St, Firebaugh	Presentation/Q&A Discussion	Received
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 46	Consent Item/Designate Reps & Alternative Reps for Fresno County Mgmt Areas A&B Coord. Committee DM Subbasin	10/23/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/adopted
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 41	Consent Item/Approve and Authorize Amendments to the Central DM Region SGMA Services Activity Agreement	10/23/2018	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/adopted
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	Public Outreach SGMA Workshop II	GSP Development	10/24/2018	College Greens Building 1815 Scripps Drive, Los Banos	Presentation/Q&A Discussion	Received
Damian Aragona	Widren Water District Stakeholders	Jean P. Sagouspe III	Landowner monthly Update	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	10/30/18	259 I Street, Los Banos	in-person	
Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	11/8/2018	Santa Nella	Presentation in Project Update Report	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	11/21/2018	PID 948 Orange Ave Patterson, CA	Presentation	
Danny M Wade	Tranquillity ID Farmers	Mailing of newsletter	Delta Mendota SGGMA December 2018 Newsletter	notification requirment	12/11/2018	25390 W Silveira	mail	
Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update		12/13/2018	Santa Nella	Presentation in Project Update Report	
SNCWD Water and Sewer Service Customers	NA	Mail out SGMA December 2018 Newsletter	To outreach for SGMA		12/15/2018	Santa Nella	Inserts into customer bills; direct mailing	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	12/18/18	259 I Street, Los Banos	in-person	
Danny M Wade & Lauren Layne	Tranquillity ID Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	12/19/18	25390 W Silveira	Presentation	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	12/19/2018	PID 948 Orange Ave Patterson, CA	Presentation	
SNCWD Water and Sewer Service Customers	na	Mail out SGMA December 2018 Newsletter	To outreach for SGMA		12/31/2018	Santa Nella	Inserts into customer bills; direct mailing	
Damian Aragona	Widren Water District Stakeholders	Jean P. Sagouspe III	Landowner monthly Update	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	1/8/19	259 I Street, Los Banos	in-person	

Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	1/10/2019	Santa Nella	Presentation in Project Update Report	
Amy Montgomery	SNCWD Water and Sewer Service Customers	NA	mail out SGMA January 2018 Newsletter	To outreach for SGMA	1/15/2019	Santa Nella	Inserts into customer bills; direct mailing	
Danny M Wade, Lauren Layne	Tranquillity Irrigation District Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	1/16/2019	25390 W Silveira, Tranquillity	Presentation	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	1/16/2019	PID 948 Orange Ave Patterson, CA	Presentation	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 59	Consent Item/Authorize and Approve Amendments for Central DM Multi-Agency GSA	1/29/2019	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/adopted
Amy Montgomery	SNCWD Water and Sewer Service Customers	NA	mail out SGMA January 2018 Newsletter	To outreach for SGMA	1/31/2019	Santa Nella	Inserts into customer bills; direct mailing	
District Staff	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	Newsletter and meeting notices	2/1/19	Santa Nella	Over the counter outreach	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	2/5/19	259 I Street, Los Banos	in-person	
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out Notice of SGMA Public Meeting	Notify customers of upcoming workshops	2/7/2019	Santa Nella	Inserts into customer bills; direct mailing	
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	Stakeholder Update Fresno County Management Areas A&B	GSP Development	2/7/2019	Wood Office (formerly Amec), 1281 E. Alluvial Ave., Suite 101, Fresno, CA	Presentation	Received
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	SGMA Workshop III Notice DM Subbasin	Notification mailer/SGMA Workshop Information and Dates	2/11/2019	Landowners within Central DM Multi-Agency GSA	Mailer/Notice	Mailed out UPS
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out SGMA Newsletter February 2019	Outreach for SGMA	2/15/2019	Santa Nella	Inserts into customer bills; direct mailing	
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	Public Outreach SGMA Workshop III	GSP Development	2/19/2019	College Greens Building 1815 Scripps Drive, Los Banos	Presentation/Breakout Session	Received
Danny M Wade, Lauren Layne, Provost & Pritchard	Tranquillity Irrigation District Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	2/20/2019	25390 W Silveira, Tranquillity	Presentation	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	2/20/2019	PID 948 Orange Ave Patterson, CA	Presentation	
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out notices for SN special workshop	Notify customers of upcoming workshops	2/22/19	Santa Nella	Direct Mail	
Andrew Garcia	PID Growers/Landowners	PID Growers/Landowners/Stakeholders	PID Annual District Event	Present update of GSP progress and answer stakeholder questions	2/27/2019		Presentation	
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out SGMA Newsletter February 2019	Outreach for SGMA	2/28/2019	Santa Nella	Inserts into customer bills; direct mailing	
District Staff	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	Newsletter and meeting notices	3/1/19	Santa Nella	Over the counter outreach	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	3/5/19	259 I Street, Los Banos	in-person	
Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	3/14/19	Santa Nella	Presentation in Project Update Report	
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out SGMA Newsletter March 2019	Outreach for SGMA	3/15/19	Santa Nella	Inserts into customer bills; direct mailing	
Danny M Wade, Lauren Layne, Provost & Pritchard	Tranquillity Irrigation District Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	3/20/2019	25390 W Silveira, Tranquillity	Presentation	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	3/20/2019	PID 948 Orange Ave Patterson, CA	Presentation	
District Staff	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	Newsletter and meeting notices	4/1/2019	Santa Nella	Over the counter outreach	
SNCWD District Staff	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	Newsletter and meeting notices	4/1/2019	Santa Nella	Over the counter outreach	
Damian Aragona	Widren Water District Board of Directors	Jean P. Sagouspe, Julie Sagouspe-Aragona, Jean P. Sagouspe III, & Diane Sagouspe	Board of Directors meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	4/2/19	259 I Street, Los Banos	in-person	
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out notices for SN May workshop	Notify customers of upcoming workshops	4/3/19	Santa Nella	Inserts into customer bills; direct mailing	
Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	4/11/2019	Santa Nella	Presentation in Project Update Report	
SNCWD (Amy Montgomery)	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	4/11/2019	Santa Nella	Presentation in Project Update Report	
District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out notices for SN May workshop	Notify customers of upcoming workshops	4/15/2019	Santa Nella	Inserts into customer bills; direct mailing	
SNCWD District Staff	SNCWD Water and Sewer Service Customers	NA	Mail out notices for SN May workshop	Notify customers of upcoming workshops	4/15/2019	Santa Nella	Inserts into customer bills; direct mailing	

Damian Aragona	Widren Water District Stakeholders	Jean P. Sagouspe & Jean P. Sagouspe III	Update on 4/11/19 Special Management Committee Meeting	Report on monthly Management Committee meeting of the Central Delta-Mendota Region Activity Agreement	4/16/19	259 I Street, Los Banos	in-person	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	4/17/2019	PID 948 Orange Ave Patterson, CA	Presentation	
Danny M Wade, Lauren Layne, Provost & Pritchard	Tranquillity Irrigation District Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	4/23/2019	25390 W Silveira, Tranquillity	Presentation	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 48	Consent Item/ Approve and Authorize LPS Agreement w/ West Stanislaus ID and LPS for DM Subbasin Grant Management Prop 1 SGP	4/23/2019	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Items approved/Adopted
SNCWD District Staff	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	Upcoming workshop notices	5/1/2019	Santa Nella	Over the counter outreach	
SNCWD District Staff	SNCWD Website	NA	Posted instructions of how to view draft GSP Chapters	To teach customers and website visitors how to view the draft GSP chapters online	5/1/2019	Santa Nella	Online outreach	
SNCWD (Amy Montgomery)	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	5/9/2019	Santa Nella	Presentation in Project Update Report	
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	SGMA Workshop IV Spring 2019 Notice DM Subbasin	Notification mailer/SGMA Workshop Information and Dates	5/10/2019	Landowners within the County GSA's in the Delta-Mendota Subbasin (Central DM Multi-GSA, A&B)	Mailer/Notice	Mailed out UPS
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	5/10/2019	PID 948 Orange Ave Patterson, CA	Presentation	
County of Fresno	Fresno County Board of Supervisors, members of the public	BOS, members of the public	BAI 7	Presentation Regarding Implementation of SGMA within Fresno County	5/14/2019	Board Chambers, Hall of Records, Third Floor, Room 301, 2281 Tulare Street, Fresno, CA 93721	In person BAI presented to BOS and members of the public.	Received
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	Public Outreach SGMA Workshop IV Spring 2019	GSP Development/Water Budget/Sustainable Yield/Monitoring Network/Projects and Actions	5/21/2019	College Greens Building 1815 Scripps Dr., Los Banos, CA 93635	Presentation/Breakout Session	Received
Danny M Wade, Lauren Layne, Provost & Pritchard	Tranquillity Irrigation District Board of Directors	BOS, members of the public	Update to BOS	Status of GSA formation	5/23/2019	25390 W Silveira, Tranquillity	Presentation	
County of Fresno	Stakeholders Fresno County Management Areas A & B	stakeholders, members of the public	Public Outreach SGMA Workshop IV Spring 2019	GSP Development/Water Budget/Sustainable Yield/Monitoring Network/Projects and Actions	5/23/2019	Mendota Library, 1246 Belmont Avenue, Mendota, CA 93640	Presentation/Breakout Session	Received
SNCWD (Amy Montgomery)	Board of Directors	NA	Sent letter advising Board Members how to view draft GSP Chapters online	To teach Board members how to review draft GSP Chapters	5/24/2019	Santa Nella	Direct Mail	
District Staff	SNCWD Water and Sewer Service Customers	NA	Counter where customers make payments	Newsletter and meeting notices	6/1/2019	Santa Nella	Over the counter outreach	
District Staff	SNCWD Website	NA	Posted June Newsletter	Outreach for SGMA	6/19/2019	Santa Nella	Website	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	6/19/2019	PID 948 Orange Ave Patterson, CA	Presentation	
Amy Montgomery	Board of Directors	BOD, staff, meeting attendees	Board Meeting	GSA update	6/20/2019	Santa Nella	Presentation in Project Update Report	
PID Staff (Vince Lucchesi)	Stakeholders/Constituents	Board, stakeholders	Board Meeting	GSA/SGMA updates	7/18/2019	PID 948 Orange Ave Patterson, CA	Presentation	
Lacey Kiriakou	Merced County property owners	All Merced County property owners	SGMA Information Flyer included in Merced County Property Tax Bill	SGMA Education	August/September 2017	Mailer	1/3 flyer	
WSID Staff	Stakeholders/Constituents	n/a	Emailed monthly newsletter	GSA/SGMA updates	Monthly	West Stanislaus Irrigation District	emailed the newsletter	
WSID Staff	Stakeholders/Constituents	Board, stakeholders	Disctrict Board of Supervisors Meeting	GSA/SGMA updates	Monthly		Presentation	
PID Staff	Stakeholders/Constituents	n/a	Emailed monthly newsletter	GSA/SGMA updates	Monthly	Patterson Irrigation District	emailed the newsletter	
City of Patterson Staff	Customers	n/a	Mailed newsletter with monthly billing statements	GSA/SGMA updates	Monthly	Patterson	newsletter	
WSID Staff	Stakeholders/Constituents	stakeholders	Annual Growers Meeting	GSA/SGMA updates				

Appendix D:
GSP Newsletters

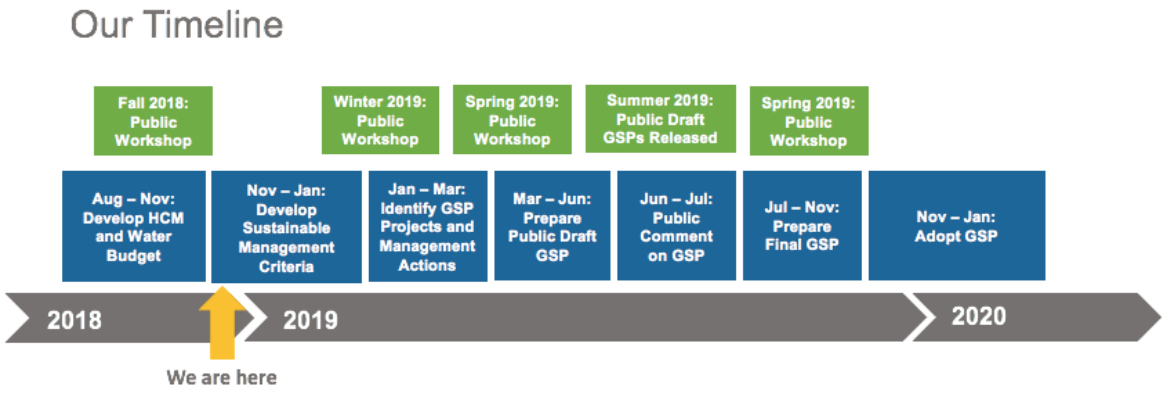
Subbasin Announcements

At the end of October, the Delta-Mendota Subbasin held three community workshops. These public meetings introduced the use of water budgets and groundwater models within the Subbasin's groundwater sustainability plan (GSP) development. Workshops were held in Firebaugh, Los Banos, and Patterson. Materials presented at the workshops can be found here.[1]

The next set of public workshops will be held in February 2019. These meetings will provide water budget results developed throughout the Subbasin that will inform the current status of the basin and potential future changes that may affect sustainability.

Additionally, the Delta-Mendota Subbasin Technical Working Group discussed strategies and datasets for subsidence monitoring, identifying critical infrastructure, and determining sustainability criteria within the Subbasin.

The Delta-Mendota Subbasin Coordination Committee reviewed strategies for determining water budgets for historical, current, and projected results. The Coordination Committee also discussed incorporating climate change factors into water budget modeling and calculations, as well as determining gaining and losing reaches along the San Joaquin River. The Committee discussed and approved the use of subject-specific technical memorandums and a common chapter to facilitate basin-wide GSP development and to demonstrate commonalities of the GSPs being developed.



Upcoming Meetings

Coordination Committee
Monday, January 14
10:00 – 11:30 AM
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos, CA

Technical Working Group
Tuesday, January 15
10:00 AM – 12:00 PM
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos, CA

Communications Working Group
Tuesday, January 22
1:00 – 3:00 PM
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos, CA

[1] The December Newsletter can be accessed at: http://deltamendota.org/delta-mendota-newsletter-december-2018/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan Group Updates from November

NORTHERN & CENTRAL DELTA-MENDOTA

- Completed historic and current water budgets
- Identified critical infrastructure subject to subsidence
- Completed mapping of Groundwater Dependent Ecosystems
- Completed hydrogeologic conceptual model
- In December, the N-C Delta-Mendota GSP group will prepare projected water budgets

FARMERS WATER DISTRICT

- Development and refinement of historical and current water budgets and coordination with other GSP groups in comparing results
- Research into whether there is any infrastructure that could be impacted by spatial variations in subsidence and submittal of that information to the basin-wide GSP effort
- Development of draft survey of groundwater dependent ecosystems.
- Initial Identification of SGMA related projects that may be necessary to achieve sustainability.
- Continuation of coordination with other GSP groups in development of historical and current water budgets
- Development of data management system with a structure consistent with basin-wide DMS being developed by the North Central GSP group.
- Development of projected water budget period model datasets and draft management actions and projects

San Joaquin River Exchange Contractors GSP Group

- Collaborated with GSAs in the Delta-Mendota Subbasin regarding historic and current water budgets
- Reviewed subsidence thresholds for critical infrastructure
- In December, SJREC will develop draft basin setting for the following cities: Newman, Gustine, Firebaugh, Mendota, and Dos Palos
- Also in December, SJREC will prepare draft projected water budgets and review potential Groundwater Dependent Ecosystems

GRASSLAND WATER DISTRICT

- Reached agreement with Merced County to establish a SGMA management area for the state, federal, and private lands surrounding the Grassland GSA.
- Working closely with hydrogeological and engineering experts to finalize an accurate historic and current water budget for the Grassland GSA and surrounding management area.
- Identifying future projects to be incorporated into projected water budgets
- Working closely with NGO partners such as The Nature Conservancy and Audubon California on characterizing GDE and GSPs
- Participating in public workshops and conducting outreach to landowners and wetland advocacy organizations.
- Finalizing map of groundwater dependent ecosystems for the Grassland GSA.

THE COUNTY OF FRESNO 1856

- Developed historical and current water budgets
- Identified infrastructure impacted by subsidence
- Developed new monitoring well facility
- Developed groundwater dependent ecosystems draft survey.
- Upcoming activities include development of projected water budget period, model datasets, draft management actions, and projects, as well as development of data management system

Aliso Water District Groundwater Sustainability Agency

- Stakeholder meeting to discuss undesirable results held on November 20, 2018
- Draft historic water budget complete
- Beginning efforts on projected water budget

Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

Subbasin Announcements

The Delta-Mendota Subbasin is currently finalizing historic and current water budgets within the Subbasin as a whole and coordinating results between each GSP group. The Coordination Committee developed strategies to support Subbasin-wide confirmation of historical, current, and projected water budgets, as well as new approaches to streamline Subbasin-wide technical progress. Subbasin-wide results have been compiled to include in Technical Memoranda for the final GSP submission.

A series of Technical Working Group meetings were held in December to provide opportunities for GSP group representatives and technical consultants to talk through their water budget processes and determine next steps. Each of the six GSP groups discussed their individual water budgets as well as the alignment of boundary conditions between each GSP group.

The San Luis & Delta-Mendota Water Authority coordinated with a senior facilitator from Stantec, Lisa Beutler, for the final technical meeting held in December to assist in the water budget status discussions. Upcoming technical tasks and Subbasin-wide goals will involve the development of a finalized projected water budget and additional Technical Memoranda development.

The Communications Working Group began preparing for the Delta-Mendota Subbasin's third series of public workshops, which will be held in February. These workshops will focus on water budget results, an introduction to sustainability indicators, measurable objectives, minimum thresholds, and other parameters central to the GSP formation process. Event timing and dates will be shared once details are finalized.

Our Timeline

Upcoming Meetings

Coordination Committee
Monday, January 14
10:00 – 11:30 AM
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos, CA

Technical Working Group
Tuesday, January 15
10:00 AM – 12:00 PM
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos, CA

Communications Working Group
Tuesday, January 22
1:00 – 3:00 PM
San Luis & Delta-Mendota Water Authority
842 6th St, Los Banos, CA

The January 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-january-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In December, the Northern & Central Region GSP Group:

- Completed historic and current water budgets
- Identified preliminary sustainability indicators for subsidence, water quality and interconnected surface water
- Initiated development of a data management system

In January, the Northern & Central Region GSP Group will be:

- Preparing preliminary baseline projected water budgets
- Refining our sustainability indicators
- Identifying projects and management actions for inclusion in the GSP

FARMERS WATER DISTRICT

The following activities were conducted by Farmers WD GSP Group in December:

- Completion of historic water budget
- Development of geologic cross sections
- Ongoing internal review of HCM first draft

Current and upcoming activities for the Farmers WD GSP Group:

- Historic/Current Groundwater Conditions section
- Completion of HCM first draft
- Development of confirmation period (2014-2017) in water budget
- Development of projected water budget period (2018-2070) and draft management actions and projects
- Development of data management system with a structure consistent with basin-wide DMS being developed by the North Central

San Joaquin River Exchange Contractors GSP Group

In December, the SJREC GSP Group:

- Developed draft Historic and Current Water Budgets for each GSA in the SJREC GSP Group
- Held meetings between the SJREC GSA and each partner GSA to discuss projected demand on groundwater and projects to achieve sustainability
- Developed a draft for Sustainable Management Criteria (SMC)

GRASSLAND WATER DISTRICT

In December, the Grassland GSP Group:

- Working closely with hydrogeological and engineering experts to finalize an accurate historic and current water budget for the Grassland GSA and surrounding management area.
- Identifying future projects to be incorporated into projected water budgets
- Finalizing map of groundwater ecosystems for the Grassland GSA

THE COUNTY OF FRESNO 1856

The following activities were conducted by the Fresno County GSP Group in December:

- Completion of historic water budget
- Continued work on Current/Historic Groundwater Conditions section
- Ongoing internal review of HCM first draft

Current and upcoming activities for the Fresno GSP Group:

- Continued work on Current/Historic Groundwater Conditions and internal review of first draft
- Completion of HCM first draft
- Development of confirmation period (2014-2017) in water budget
- Development of projected water budget period (2018-2070) and draft management actions and projects
- Discussion with Fresno County on alternatives for new monitoring well facility in Management Area B to help fill data gap in monitoring aquifer conditions
- Development of data management system with a structure consistent with basin-wide DMS being developed by the North Central GSP group (waiting for basin-wide survey)

Aliso Water District Groundwater Sustainability Agency

In December, the Aliso Water District GSP Group:

- Organizing and digitizing data for inclusion in future DMS
- Review water budget for coordination with Neighboring GSA
- Evaluating Sustainable management criteria
- Drafting chapters of GSP

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

Subbasin Announcements

In January, the Coordination Committee and Technical Working Group of Delta-Mendota Subbasin focused on confirming the historic and current water budget results for the Subbasin. Each GSP group provided finalized historic and current water budgets and the Woodard & Curran team, led by Leslie Dumas, assembled the individual results to form a collective Subbasin-wide historic and current water budget. Iterations of the water budgets were developed and reviewed by each GSP group and by the Coordination Committee and its Technical Working Group to verify the results.

A formalized coordinated task list and project schedule was adopted by the Coordination Committee this month. This schedule is intended to ensure continued progress within the Delta-Mendota Subbasin's GSP development and to support Subbasin-wide collaboration as needed.

The Technical Working Group has also been developing projected water budget results, which will inform the projects and management actions agencies may develop to address deficits.

The Subbasin is hosting a series of public workshops this month. This round of workshops will provide community members with an overview of SGMA, results of the confirmed historic and current water budgets, and an opportunity to discuss results or other topics with their respective GSP group representatives. Guided by Kirsten Pringle from Stantec, the Communications Working Group has developed a presentation and discussion materials in English and Spanish for the technical representatives to share water budget results with the workshop attendees.

Our Timeline

Upcoming Workshops and Meetings

Delta-Mendota Winter 2019 Workshop
Los Banos College Greens Building
Tuesday, February 19
4:00 - 6:00 PM
1815 Scripps Drive, Los Banos, CA

Delta-Mendota Winter 2019 Workshop
Patterson City Hall
Wednesday, February 20
4:00 – 6:00 PM
1 Plaza Circle, Patterson, CA

Joint Workshop of the Coordination Committee and Technical Working Group
Monday, March 11
10:00 AM – 12:00 PM
842 6th St, Los Banos, CA

The February 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-february-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In January, the Northern & Central GSP group:

- Worked on finalizing the Historic and Current Water Budget
- Began development of Projected Water Budgets and identifying Projects & Management Actions to include in the Projected Water Budget
- Developed Draft Sustainability Indicators, including Minimum Thresholds and Measurable Objectives
- Began development of the Preliminary Monitoring Network

In February, the Northern & Central GSP group will:

- Finalize and adopt Historic and Current Water Budgets in early February
- Finalize all Projected Water Budgets by end of February, including those with Climate Change Factors and Projects & Management Actions
- Continue development of Sustainability Indicators, including Minimum Thresholds and Measurable Objectives
- Continue development of the Preliminary Monitoring Network and Monitoring Protocols
- Publish Public Drafts of the Governance & Administration, HCM, and Plan Area sections for public review/comment

FARMERS WATER DISTRICT

In January, the Farmers GSP group:

- Prepared draft historical and current GSP water budgets
- Assisted with basin-wide preparation of groundwater elevation contour maps
- Coordination efforts on development of projected water budget baseline with and without climate change factors
- Finalized draft groundwater dependent ecosystem map
- Preparation of draft basin setting section for Farmers Water District

Grassland GROUNDWATER SUSTAINABILITY AGENCY

In January, the Grassland GSP group:

- Finalized historic and current water budgets.
- Finalized groundwater dependent ecosystem mapping.
- Established locations for groundwater elevation and water quality monitoring network.

San Joaquin River Exchange Contractors GSP Group

In January, the SJREC GSP Group:

- Held meetings between SJREC GSA and partner GSA's to discuss Projected Water Budgets

In February, the SJREC GSP Group plans to:

- Draft Sustainable Management Criteria (SMC)
- Update the Data Management System (DMS)
- Draft Monitoring Network

Aliso Water District Groundwater Sustainability Agency

In January, the Aliso GSP group continued:

- Organizing and digitizing data for inclusion in future DMS
- Reviewing water budget for coordination with Neighboring GSA
- Evaluating Sustainable management criteria
- Drafting chapters of GSP

THE COUNTY OF FRESNO 1856

In January, the Fresno GSP group:

- Prepared draft historical and current GSP water budgets
- Assisted with basin-wide preparation of groundwater elevation contour maps
- Coordination efforts on development of projected water budget baseline with and without climate change factors
- Identified data gaps in southern portion of GSA
- Development of draft basin setting section for Fresno County GSP

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

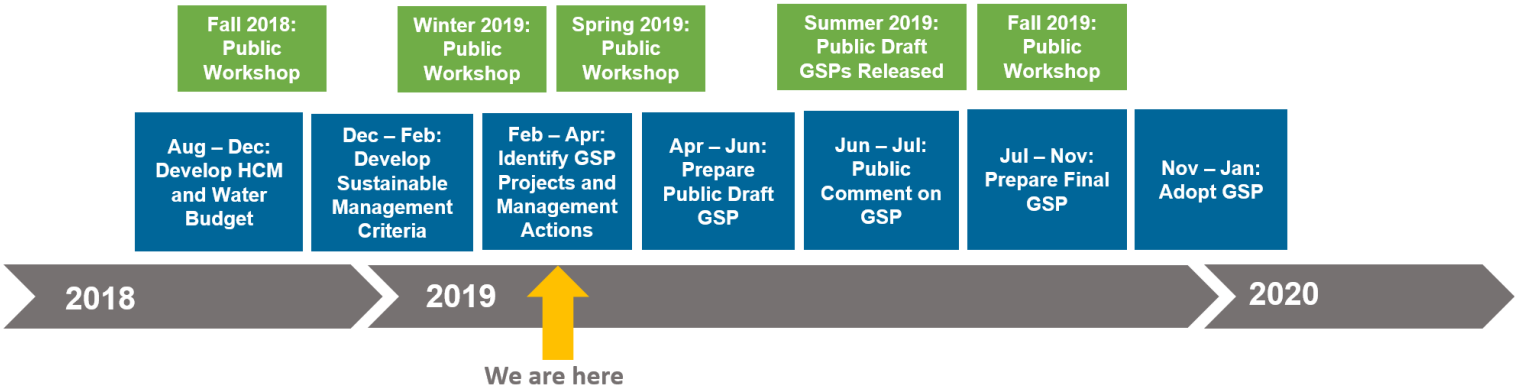
Subbasin Announcements

The Delta-Mendota Subbasin achieved several technical milestones throughout February. Over the past several months, each of the six groundwater sustainability plan (GSP) groups developed individual historic and current water budgets. After many iterations of these individual water budgets, the Woodard & Curran team compiled the results into a coordinated Subbasin-wide historic and current water budget. The Technical Working Group worked closely with the Woodard & Curran team to finalize the compiled historic and current water budgets and to ensure accuracy for the separate GSP regions. The Coordination Committee adopted the completed historic and current water budgets earlier in February, as well as a preliminary projected water budget with and without climate change factors.

The Technical Working Group is now finalizing the projected water budgets with incorporated projects and management actions. Also in March, the Subbasin will focus on developing sustainable yield results and monitoring networks.

The finalized historic and current water budgets were shared in a series of public workshops held in February. This round of community meetings provided attendees with another opportunity to learn about SGMA, an update on the GSP development process throughout the Subbasin, as well as time to meet with their GSP region's technical representative. The next round of public workshops will be held in spring and will provide another opportunity for stakeholders to learn more about SGMA and individual GSP implementation.

Our Timeline



Upcoming Meetings

Coordination Committee
Monday, March 11
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

Technical Working Group
Tuesday, March 19
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

Communications Working Group
Tuesday, March 26
1:00 – 3:00 PM
842 6th St, Los Banos, CA

The March 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-march-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In February, the Northern & Central Region GSP Group:

- Completed Baseline Projected Water Budgets
- Identified a final list of Projects and Management Actions, and prepared a preliminary projected water budget incorporating these items.
- Finalized and adopted the Historic and Current Water Budget for inclusion in the subbasin-wide roll up

In March, the Northern & Central Region GSP Group will be:

- Finalizing and adopting the Projected Water Budgets, with Climate Change Factors and Projects and Management actions incorporated
- Posting the Public Drafts for the following sections to the Northern & Central GSP website:
  - Governance and Administration
  - Plan Area
  - Hydrogeologic Conceptual Model
- Developing preliminary water level and water quality monitoring networks
- Refining our Sustainable Management Criteria

San Joaquin River Exchange Contractors GSP Group

In February, the SJREC GSP Group:

- Participated in Public Outreach Workshops
- Updated plan to include the recent Bulletin 118 Basin Boundary Modification in Madera County
- Prepared Projected Water Budget for the SJREC GSA

In March, the SJREC GSP Group plans to:

- Continue drafting Sustainable Management Criteria (SMC)
- Update Projected Water Budgets and Projects for the Cities and Counties
- Prepare for Spring Public Outreach Workshops and present projected water budget for the Subbasin

THE COUNTY OF FRESNO 1856

February activities for the Fresno GSP Group include:

- Established draft sustainable management criteria for interconnected surface waters and water quality.
- Management Area A&B Stakeholders Meeting
- Continued work on projected water budgets, incorporating climate change factors and projects/management actions.

Current and upcoming activities include:

- Development of sustainable management criteria for water levels, subsidence, and groundwater storage
- Development of representative monitoring network.
- Provide feedback on basin wide DMS structure.

FARMERS WATER DISTRICT

In February, the Farmers GSP Group completed the following activities:

- Established draft sustainable management criteria for interconnected surface waters and water quality.
- Continued work on projected water budget, incorporating climate change factors and projects/management actions.

Current and upcoming activities for the Farmers GSP group include:

- Development of sustainable management criteria for water levels, subsidence, and groundwater storage
- Development of representative monitoring network.
- Provide feedback on basin wide DMS structure.

Grassland Groundwater Sustainability Agency

In February, the Grassland GSP group:

- Finalized projected water budgets.
- Updated groundwater dependent ecosystem mapping.
- Refined locations for groundwater elevation and water quality monitoring network.
- Completed preliminary drafts of Chapter 2 and the Communication & Engagement Plan.

Aliso Water District Groundwater Sustainability Agency

In February, the Aliso GSP Group completed:

- Finalized projected water budgets.
- Completed draft thresholds for water quality, depletion of surface water.

The Aliso GSP Group is also in the process of:

- Identifying locations for monitoring network.
- Developing draft thresholds for water levels and storage.
- Identifying potential projects and management actions.

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

Subbasin Announcements

April meetings bring May workshops! The Delta-Mendota Subbasin is hosting another round of workshops at the end of May:

May 20th: Patterson City Hall, Patterson; 4-6 PM

May 21st: College Greens Building, Los Banos; 4-6 PM

May 22nd: Romero Elementary, Santa Nella; 6:30-8:30 PM

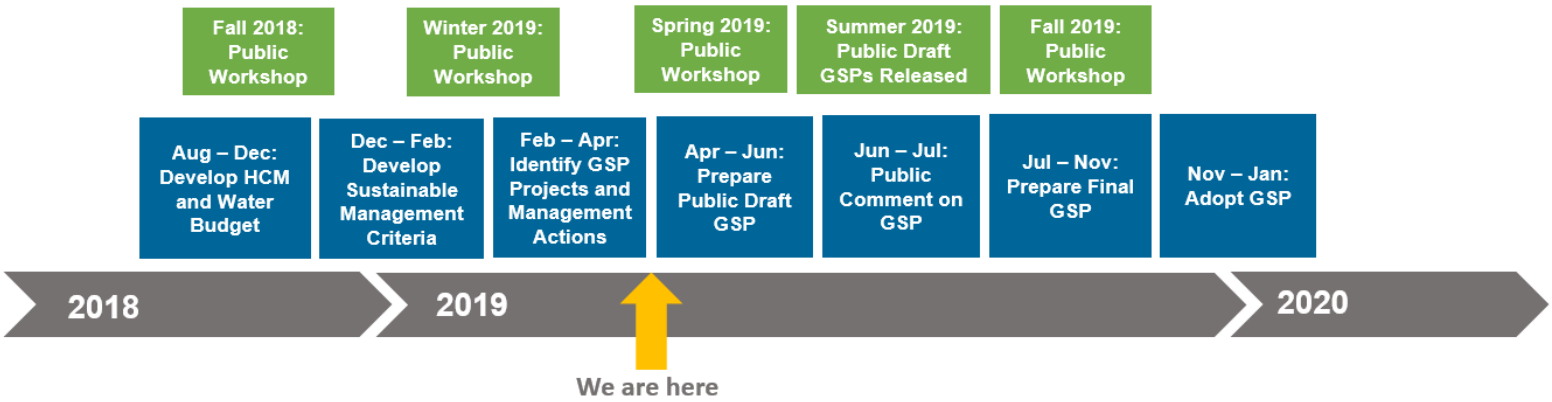
May 23rd: Mendota Library, Mendota; 6-8 PM

These meetings are open to the public and will provide an opportunity to learn more about the Sustainable Groundwater Management Act and the specific development of the Groundwater Sustainability Plans (GSPs) in the Delta-Mendota Subbasin. These workshops will provide attendees the opportunity to meet with their GSP Group representative and learn about the development of projected water budgets, sustainable management criteria, and context for the future of SGMA within in the area.

The groundwater sustainability agencies (GSAs) participating in the Delta-Mendota Subbasin collaborated to refine water budget results on the Subbasin level. Each GSP group provided water budgets for their specific region, and the Coordination Committee and Technical Working Group finalized results for the Subbasin as a whole.

The Technical Working Group and Coordination Committee members are also working toward the development of a Subbasin-wide monitoring network. Each GSP group is determining potential well locations and monitoring strategies that will form into a Subbasin-wide system.

Our Timeline



Upcoming Meetings

Technical Working Group
Tuesday, April 16
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

Communications Working Group
Tuesday, April 23
1:00 – 3:00 PM
842 6th St, Los Banos, CA

Coordination Committee
Monday, May 13
9:30 AM – 12:00 PM
842 6th Street, Los Banos, CA

The April 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-april-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In March, the Northern & Central Region GSP Group:

- Developed the Water Level, Water Quality, and Surface Water-Groundwater Interaction Monitoring Networks
- Continued to develop the Water Budget section of the Basin Setting for the GSP
- Continued to develop the Groundwater Conditions section of the Basin Setting for the GSP
- Posted the Public Drafts for the following sections to the Northern & Central GSP website:
  - Governance and Administration
  - Plan Area
  - Hydrogeologic Conceptual Model

In April, the Northern & Central Region GSP Group will be:

- Finalizing and adopting the Projected Water Budgets, with Climate Change Factors and Projects and Management actions incorporated
- Finalizing the Monitoring Networks
- Posting the Public Drafts for the Groundwater Conditions section to the Northern & Central GSP website
- Refining our Sustainable Management Criteria

San Joaquin River Exchange Contractors GSP Group

In March, the SJREC GSP Group:

- Working with DAC's on sustainability
- Developed Draft Projected Water Budget
- Updated growers at the district's annual meeting

In April, the SJREC GSP Group plans to:

- Coordinate with the Delta-Mendota Subbasin, ensuring the GSPs are utilizing the same data and methodologies
- Prepare for Public Workshops in May

THE COUNTY OF FRESNO 1856

In March, the Fresno GSP Group:

- Established draft sustainability management criteria for groundwater levels and reduction in storage
- Work on Sustainable Management Criteria and Monitoring Network GSP sections
- Revised projected groundwater budget
- Review and provided feedback on GSP structure

The Fresno GSP Group's current and upcoming activities include:

- Sustainable yield estimates
- Develop subsidence sustainability management criteria
- Continued work on Sustainable Management Criteria and Monitoring Network GSP sections

FARMERS WATER DISTRICT

In March, the Farmers Water District GSP Group:

- Established draft sustainability management criteria for groundwater levels and reduction in storage
- Work on Sustainable Management Criteria and Monitoring Network GSP sections
- Revised projected groundwater budget
- Review and provided feedback on GSP structure

The Farmers Water District GSP Group's current and upcoming activities include:

- Sustainable yield estimates
- Develop subsidence sustainability management criteria
- Continued work on Sustainable Management Criteria and Monitoring Network GSP sections

Grassland GROUNDWATER SUSTAINABILITY AGENCY

In March, the Grassland GSP group:

- Defined significant and unreasonable effects, minimum thresholds, and measurable objectives for the six sustainability indicators.
- Refined the representative monitoring network.
- Completed the preliminary draft of Chapter 6.

Aliso Water District Groundwater Sustainability Agency

In March, the Aliso GSP Group completed:

- Finalized projected water budgets.
- Completed draft thresholds for water quality, depletion of surface water.

The Aliso GSP Group is in the process of:

- Identifying locations for monitoring network.
- Developing draft thresholds for water levels and storage.
- Identifying potential projects and management actions.

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

Subbasin Announcements

The agencies and representatives active in the Delta-Mendota Subbasin have been preparing for the upcoming public workshops scheduled for the end of May. As a reminder, the dates and locations are included below:

May 20th: Patterson City Hall, Patterson; 4-6 PM

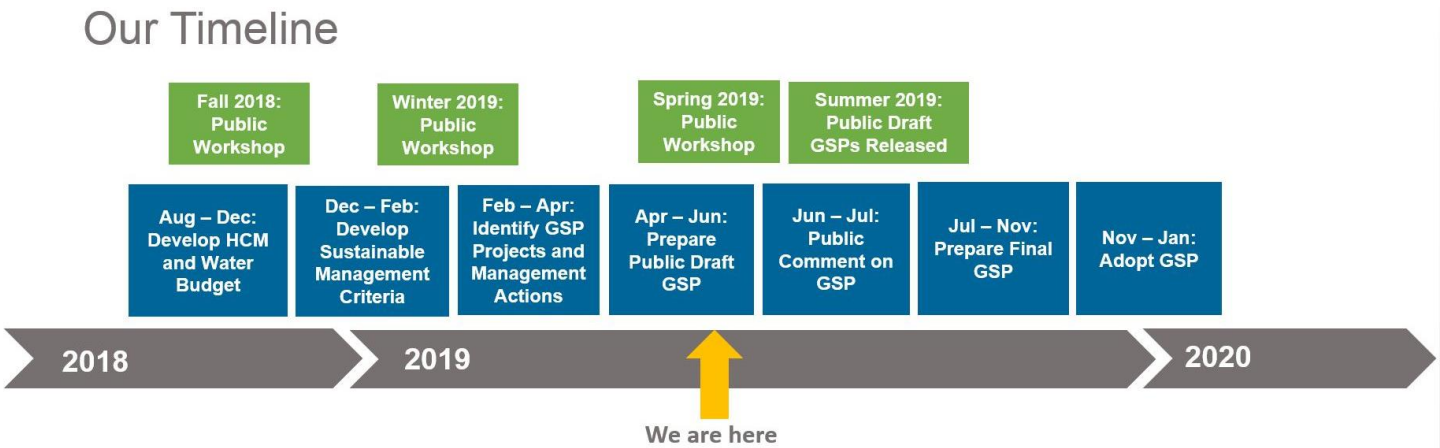
May 21st: College Greens Building, Los Banos; 4-6 PM

May 22nd: Romero Elementary, Santa Nella; 6:30-8:30 PM

May 23rd: Mendota Library, Mendota; 6-8 PM

These meetings are open to the public and will provide community members an opportunity to learn more about the Sustainable Groundwater Management Act and the specific development of the Groundwater Sustainability Plans (GSPs) in the Delta-Mendota Subbasin. These workshops will provide attendees the opportunity to meet with their GSP Group representative and learn about the development of projected water budgets, sustainable management criteria, and context for the future of SGMA within in the area.

In preparation for these workshops, the groundwater sustainability agencies (GSAs) refined the Subbasin-wide projected water budgets, developed each GSP group's sustainable management criteria and monitoring networks, and contacted local organization and communities to promote the workshops.



Upcoming Meetings

Technical Working Group
Tuesday, May 21
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

Communications Working Group
Tuesday, May 28
1:00 – 3:00 PM
842 6th St, Los Banos, CA

Coordination Committee
Monday, June 10
9:30 AM – 12:00 PM
842 6th Street, Los Banos, CA

The May 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-may-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In April, the N-C Group:

- Developed Preliminary Representative Monitoring Network for all Sustainability Indicators
- Finalized Sustainable Management Criteria
  - Including Minimum Thresholds and Measurable Objectives for all Representative Monitoring Locations
- Finalized and adopted the Projected Water Budgets, with Climate Change Factors and Projects and Management Actions incorporated
- Continued development of the following GSP sections:
  - Water Budget
  - Groundwater Conditions
  - Projects & Management Actions
  - Management Areas
  - Monitoring Network

In May, the Northern & Central GSP Group will:

- Meet with neighboring GSPs to coordinate on Sustainable Management Criteria
- Approve and adopt Representative Monitoring Network for all Sustainability Indicators
- Approve and adopt Finalized Sustainable Management Criteria
- Continue development of GSP sections

San Joaquin River Exchange Contractors GSP Group

In April, the SJREC GSP Group:

- Drafted Projected Water Budgets for the DAC's
- Drafted Sustainable Management Criteria for DAC's
- Coordinated Subbasin Sustainable Yield

In May, the SJREC GSP Group plans to:

- Draft Projected Water Budget for County White Areas
- Draft Sustainable Management Criteria for County White Areas
- Participate in Public Workshops; outreaching to beneficial users in the subbasin.

THE COUNTY OF FRESNO 1856

April activities for the Fresno GSP Group include:

- Completed first draft of sustainable management criteria for each sustainability indicator
- Completed first draft of representative monitoring network.
- Met with North-Central GSP group to discuss measurable objectives and minimum thresholds.

Current and Upcoming Activities for the Fresno GSP Group:

- Prepare sustainable management criteria and monitoring network chapters for GSP document
- Meet with neighboring GSP areas and subbasins to discuss measurable objectives and minimum thresholds
- Meet with local stakeholders to discuss measurable objective and minimum thresholds.

FARMERS WATER DISTRICT

April activities for the Farmers GSP Group include:

- Completed first draft of sustainable management criteria for each sustainability indicator
- Completed first draft of representative monitoring network.
- Met with North-Central GSP group to discuss measurable objectives and minimum thresholds.

Current and Upcoming Activities for the Farmers GSP Group:

- Prepare sustainable management criteria and monitoring network chapters for GSP document
- Meet with neighboring GSP areas and subbasins to discuss measurable objectives and minimum thresholds

Grassland GROUNDWATER SUSTAINABILITY AGENCY

In April, the Grassland GSP group:

- Refined representative monitoring network
- Developed site-specific minimum thresholds and measurable objectives
- Continued progress on drafting the Groundwater Sustainability Plan
- Scheduled a Grassland GSA public Board Meeting on May 17th and a SGMA presentation at the annual public Landowners Meeting on May 18th (see website for more information)
- Coordinated with Merced County regarding water budgets and GSP development process

Aliso Water District Groundwater Sustainability Agency

In April, the Aliso GSP Group completed:

- Developed Projects and Management Actions with the GSP Group's ad-hoc committee

The Aliso GSP Group is in the process of:

- Holding a stakeholder workshop on May 17th that will focus on sustainable management criteria and approval of monitoring locations, minimum thresholds, and measurable objectives.
- Continuing to draft GSP

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

Subbasin Announcements

The Groundwater Sustainability Agencies (GSAs) in the Delta-Mendota Subbasin held four public workshops at the end of May across the Subbasin's region. These workshops provided community members another opportunity to meet with their respective representatives, learn more about the development of Groundwater Sustainability Plans (GSPs), and provide input on next steps for groundwater sustainability within their communities.

The workshops were held in Patterson, Los Banos, Gustine, and Mendota, with an effort to reach as many local groundwater users as possible. Community members are encouraged to continue their involvement in this process by attending upcoming public meetings or visiting the Delta-Mendota SGMA website.

Leaders within the Delta-Mendota Subbasin have continued to share their insights on GSP development with others working on SGMA both locally and across the state. Andrew Garcia, a Senior Civil Engineer with the San Luis & Delta-Mendota Water Authority, is guiding the coordination and development of the GSPs within the Delta-Mendota Subbasin. He recently presented on a panel at a conference hosted by the Association of California Water Agencies in which he shared with other SGMA leaders the challenges and lessons learned in the Delta-Mendota Subbasin thus far.

Andrew Garcia, second from right, presenting at the Association of California Water Agencies (ACWA) Conference in May, 2019 on behalf of the Delta-Mendota Subbasin. *Photo shared by ACWA.*

Our Timeline

Upcoming Meetings

Technical Working Group
Tuesday, June 18
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

Communications Working Group
Tuesday, June 25
1:00 – 3:00 PM
842 6th St, Los Banos, CA

Coordination Committee
Tuesday, July 16
9:30 AM – 12:00 PM
842 6th Street, Los Banos, CA

The June 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-june-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In May, the North-Central Group completed:

- Adopted Monitoring Networks for all Sustainability Indicators
- Adopted Sustainable Management Criteria
- Continued development of the following GSP sections
  - Water Budget
  - Groundwater Conditions
  - Projects & Management Actions
  - Monitoring Networks
  - Outreach

In June, the North-Central Group will:

- Continue to post draft chapters or sections as they are completed

FARMERS WATER DISTRICT

Farmers Water District GSP Group completed the following activities in May:

- Developed draft of Sustainable Management Criteria chapter
- Internal review of draft Basin Setting chapters

Farmers Water District GSP Group's current and upcoming activities include:

- Develop draft Monitoring Network chapter
- Continued internal review of completed draft GSP chapters
- Provide feedback on basin wide annual report format.

San Joaquin River Exchange Contractors GSP Group

In May, the SJREC GSP Group:

- Drafted Projected Water Budgets for the County White Areas
- Drafted Sustainable Management Criteria for County White Areas
- Participated in Public Workshops; outreaching to beneficial users in the subbasin

In June, the SJREC GSP Group plans to:

- Have a completed draft GSP
- Review GSP with DWR
- Coordinate to complete the Delta-Mendota Subbasin Common

Grassland GROUNDWATER SUSTAINABILITY AGENCY

In May, the Grassland GSP Group:

- Refined site-specific minimum thresholds and measurable objectives
- Continued progress on drafting the Groundwater Sustainability Plan
- Engaged in the Grassland GSA public Board Meeting on May 17th
- Presented on SGMA at the annual public Landowners Meeting on May 18th
- Coordinated with Merced County regarding GSP development
- Finalized the Wetland GDE and potential GDE vegetation maps.
- Coordinated with CDFW on language describing existing water conservation

THE COUNTY OF FRESNO 1856

In May, the Fresno GSP Group completed the following activities:

- Developed draft of Sustainable Management Criteria chapter
- Meeting with Fresno Co stakeholders on Sustainable Management Criteria
- Meeting with James ID on minimum thresholds and measurable objectives

The Fresno GSP Group's current and upcoming activities include:

- Develop draft Monitoring Network chapter
- Internal review of draft GSP chapters
- Provide feedback on basin wide annual report format

Aliso Water District Groundwater Sustainability Agency

In May, the Aliso GSP Group completed the following activities:

- Developed Projects and Management Actions with the GSP Group's ad-hoc committee
- Held landowner workshops to discuss projects and management actions and finalize sustainable management criteria
- Continuing to draft GSP

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

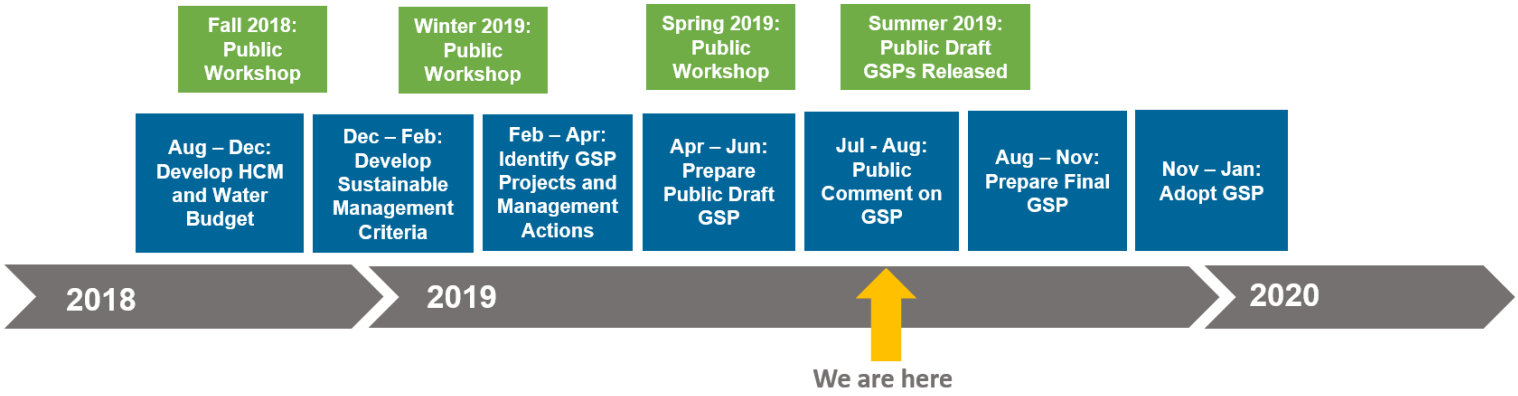
Subbasin Announcements

The groundwater sustainability agencies (GSAs) within the Delta-Mendota Subbasin have finalized the majority of the technical content and decisions for each groundwater sustainability plan (GSP). Now each GSP group is currently finalizing draft sections for the GSPs. The six coordinated GSPs within the Delta-Mendota Subbasin developed common sections that describe their collective decisions and methods. These sections include a single Common Chapter and eight supporting Technical Memoranda. These documents follow requirements outlined in the Sustainable Groundwater Management Act (SGMA) and supporting legislation for coordination on topics including data, assumptions, water budgets, public outreach, and continued coordination through GSP implementation.

The agencies are utilizing a shared schedule in order to ensure coordination for finalizing the draft sections, public comment, and adoption processes. Each of the GSP groups is developing a timeline for noticing the final GSPs prior to adoption and submission of the finalized plans in advance of the January 31, 2020 deadline.

Another requirement of SGMA is the development of an Annual Report explaining the status of the goals set forth in the GSPs. The first Annual Report is due April 1, 2020, so the GSP groups are currently developing a template, data collection process, and timeline for ongoing coordination within GSP implementation.

Our Timeline



Upcoming Meetings

July Coordination Committee
Tuesday, July 16
10:00 AM – 12:30 PM
842 6th Street, Los Banos, CA

August Coordination Committee
Monday, August 12
9:30 AM – 12:00 PM
842 6th St, Los Banos, CA

August Technical Working Group
Tuesday, August 20
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

The July 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-july-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In June the North-Central GSP Group completed:

- Continued development of the following GSP sections:
  - Introduction
  - Groundwater Conditions
  - Water Budgets
  - Management Areas
  - Projects & Management Actions
  - Sustainable Management Criteria
  - Monitoring Networks
  - Plan Implementation
  - Outreach

In July, the North-Central GSP Group will:

- Post the admin drafts of all GSP chapters yet to be posted for public review
- Compile References and Technical Studies used to develop the NCDM GSP

San Joaquin River Exchange Contractors GSP Group

In June the SJREC GSP Group:

- Completed the draft GSP

In July the SJREC GSP Group plans to:

- Coordinate the completion of the Subbasin Common Chapter and Technical Memos

THE COUNTY OF FRESNO 1856

In June the Fresno GSP Group completed the following activities:

- Continued development of SMC and Monitoring Network chapters
- Continued internal review of completed draft GSP chapters
- Assisted with development of subsidence import wizard
- Reviewed and provided comments for Delta-Mendota Technical Memoranda

The Fresno GSP Group's current and upcoming activities include:

- Continued development of SMC and Monitoring Network chapters
- Continued internal review of completed draft GSP chapters
- Updates to internal DMS
- Review of basin wide common chapters

FARMERS WATER DISTRICT

Farmers Water District GSP Group completed the following activities in June:

- Continued development of SMC and Monitoring Network chapters
- Continued internal review of completed draft GSP chapters
- Assisted with development of subsidence import wizard
- Reviewed and provided comments for Delta-Mendota Technical Memoranda

Current and Upcoming Activities:

- Continued development of SMC and Monitoring Network chapters
- Continued internal review of completed draft GSP chapters
- Updates to internal DMS
- Review of basin wide common chapters

Grassland Groundwater Sustainability Agency

In June, the Grassland GSP Group:

- Internally reviewed preliminary Drafts of Chapters 2, 3, and 6.
- Continued progress on drafting the Groundwater Sustainability Plan
- Continued Coordination with Merced County regarding GSP development
- Refined potential future representative monitoring network

Aliso Water District Groundwater Sustainability Agency

In June, the Aliso GSP Group completed the following activities:

- Continued finalizing all Chapters of the GSP for Board Review

In July, the Aliso GSP Group:

- Anticipates having all Chapters drafted for Board Review
- Aliso Water District GSA's next Board Meeting will be July 23, 2019 following the 1:30 AWD regular board meeting

Department of Water Resources State of California

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Questions? Contact your local groundwater sustainability agency or send an email to **dmsgma@sldmwa.org**

Learn more at **deltamendota.org**

Subbasin Announcements

The Groundwater Sustainability Agencies (GSAs) in the Delta-Mendota Subbasin continued their on-going coordination in development of the groundwater sustainability plans (GSPs) during the month of July. Multiple Coordination Committee, Technical Working Group, and Data Management System Working Group meetings were held during the month. In addition, two in-person meetings were held this month with GSA representatives to review comments on the Common Chapter. The Committees and working groups focused on the development of a Subbasin-wide data management system and incorporation of edits and comments to the eight Technical Memoranda and Subbasin Common Chapter that will accompany the six individual GSPs and Subbasin Coordination Agreement.

An in-person meeting with Department of Water Resources Sustainable Groundwater Management Program staff was conducted in early July to address various questions from the six GSPs in the Subbasin. The questions were regarding the development and implementation of the sustainability plans. The topics for discussion included change in storage and hydrographs required for annual reporting, water use sector and extraction reporting, and SGMA monitoring on State owned lands (wildlife refuges). A follow-up call was held later in the month where DWR Staff provided some direction, and they continue to work internally to resolve outstanding questions. Agencies in the Subbasin continued to work with DWR to identify funding through available Technical Support Services for groundwater monitoring wells and subsidence monitoring locations.

Our Timeline

Upcoming Meetings

Technical Working Group
Tuesday, August 20
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

Coordination Committee
Monday, September 9
9:30 AM– 12:00 PM
842 6th St, Los Banos, CA

Technical Working Group
Tuesday, September 17
10:00 AM – 12:00 PM
842 6th Street, Los Banos, CA

The August 2019 Newsletter can be accessed online at http://deltamendota.org/delta-mendota-newsletter-august-2019/

DELTA-MENDOTA SGMA

Groundwater Sustainability Plan (GSP) Group Updates

NORTHERN & CENTRAL DELTA-MENDOTA

In July, the North-Central GSP Group:

- Compiled References and Technical Studies used to develop the North-Central GSP
- Approved Common Chapter and Technical Memorandum
- Continued development of the following GSP sections
  - Introduction
  - Groundwater Conditions
  - Water Budgets
  - Management Areas
  - Projects & Management Actions
  - Monitoring Networks
  - Plan Implementation
  - Outreach

In August, the North-Central GSP Group will:

- Post the admin drafts of all GSP chapters yet to be posted for review
- Continue compiling References and Technical Studies used to develop the North-Central Delta-Mendota GSP

San Joaquin River Exchange Contractors GSP Group

In July, the SJREC GSP Group:

- Coordinated the completion of the Subbasin Common Chapter and Technical Memorandum

In August, the SJREC GSP Group plans to:

- Send the notice of public hearing to adopt the GSP to the Cities and Counties
- Prepare Annual Reporting requirements
- Support the development of the Data Management System for the Subbasin

THE COUNTY OF FRESNO 1856

In July, the Fresno GSP Group completed the following activities:

- Edits to Basin Setting Chapters
- Completed first draft of Sustainable Management Criteria and Monitoring Network Chapters
- Review of basin wide Common Chapters
- Provide feedback on basin wide Data Management System
- Updates to internal Data Management System

The Fresno GSP Group's current and upcoming activities include:

- Complete internal review of Draft GSP
- 90-day notice of intent to adopt GSP

FARMERS WATER DISTRICT

Farmers Water District GSP Group completed the following activities in July:

- Edits to Basin Setting Chapters
- Completed first draft of Sustainable Management Criteria and Monitoring Network Chapters
- Review of basin wide Common Chapters
- Provide feedback on basin wide DMS
- Update to internal DMS

Farmers Water District GSP Group's current and upcoming activities include:

- Completing internal review of Draft GSP
- 90-day notice of intent to adopt GSP

Grassland GROUNDWATER SUSTAINABILITY AGENCY

In July, the Grassland GSP Group completed the following activities:

- Merced County and Grassland GSA reviewed draft Chapters 2, 6, and 7
- Internal Review of Chapters 1 and 3
- Updated Sustainable Management Criteria and associated draft Chapter 4
- Updated Representative Monitoring Network and associated draft Chapter 5
- Continued engagement with Merced County regarding GSP development
- Ongoing coordination with Delta-Mendota Subbasin Data Management System Subcommittee
- Provide input on the Delta-Mendota Subbasin Technical Memoranda and Common Chapter

Aliso Water District Groundwater Sustainability Agency

In July, the Aliso GSP Group completed the following activities:

- Review Monitoring Network Chapter
- Ongoing coordination with the Delta-Mendota Subbasin for development of the Common Chapter and Data Management System

The Aliso GSP Group's current and upcoming activities include:

- Review of Sustainable Management Criteria Chapter

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Learn more at **deltamendota.org**

Appendix E:

Comments Received on Public Draft Northern & Central Delta-Mendota Region GSP

Appendix E – Comments Received on the Public Draft Northern & Central Delta-Mendota Region GSP

The Public Draft version of the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan (GSP) was released for public review and consideration on September 9, 2019. The public review period closed on October 11, 2019. The following table summarizes the comments received on the public draft plan.

Comments received to date on the Public Draft version of the GSP have not been addressed in the Final Draft GSP submitted for adoption by the Groundwater Sustainability Agencies (GSAs) comprising the Northern and Central Regions of the Delta-Mendota Subbasin; however, the GSAs are beginning consideration and discussion of the comments received to date. Furthermore, the GSAs are anticipating receiving additional comments during the 60-day public comment period to be held after the GSP is submitted to the California Department of Water Resources (DWR) and is posted to their SGMA Portal; these comments will be combined with those received during the 60-day comment period for subsequent consideration.

The Northern and Central Delta-Mendota Region GSAs thank those entities who took the time to review and comment on the Public Draft GSP. We look forward to working with those who expressed interest in participating in the development, completion and implementation of the Northern & Central Delta-Mendota Region GSP.

Northern & Central Delta-Mendota Subbasin GSP Public Draft
Tracking of Comments Received as of 21Oct2019

	Letter No.	Commenter	Commenter Organization	Comment No.	Page	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	1	Thomas N. Lippe	California Sportfishing Protection Alliance	1				The Plan improperly uses Water Year 2013 data to represent "current conditions." Per the GSP regulations, the Plan must present data at least as recent as January 1, 2015, and must present data "from January 1, 2015 to" the present where available. The Plan provides no explanation as to why data from 2016, 2017 or 2018 is not presented as required by the regulations. As Mr. Kamman observes, 2013 was a drought year; while 2017 and 2018 were not drought years. Consequently, there was more demand for groundwater in 2013 than in 2017 and 2018.
2	1	Thomas N. Lippe	California Sportfishing Protection Alliance	2				Also, in addition, the draft Plan's identification of Groundwater Dependent Ecosystems is derived from data from DWR and TNC, but the draft plan then "excludes seasonally-managed areas and wetlands" dependent "on applied surface water." (Plan, p. 5-172.) This exclusion is inconsistent with the Plan's inclusion of the areas mapped by DWR and TNC as long as the area's depth to groundwater is less than 30 feet. If 30-feet depth to groundwater is a reliable criterion for GDE areas that are not seasonally-managed areas or wetlands dependent on applied surface water, it should be a reliable criterion for GDE areas that are seasonally-managed areas/wetlands dependent on applied surface water. Put another way, the fact that GDE vegetation or wetland features may be partially "dependent" on applied surface water does not mean the GDE is not also partially dependent on groundwater or would not be entirely dependent on groundwater if surface were no longer applied. Indeed, the Plan recognizes that "Management and protection of GDEs may require more focus on land use or irrigation activities more so than groundwater management." (Plan, p. 5-173.) The contemplated use of changing irrigation activities to maintain GDEs reflects the facts that GDEs may be dependent on both groundwater and surface water, and an area's partial dependence on surface water should not exclude it from classification as a GDE.
3	1	Thomas N. Lippe	California Sportfishing Protection Alliance	3				In addition, section 6.3.2.1.2 states: "Long-term reductions in storage are not anticipated for either principal aquifer so long as groundwater levels are managed above minimum thresholds." (Plan p. 6-13.) This conclusion is directly contradicted by the change in aquifer storage figures for the Upper Aquifer presented by Mr. Kamman, which show long-term downward trend in storage for the Upper Aquifer, even with implementation of proposed Projects and Management Actions.
4	2	Samantha Arthur	Audubon California	1	P. 2-12	2.1.2.3		Groundwater Use. Managed habitat should be included as groundwater users in this section. Federal, state, and private wetlands and habitat regularly rely on applied water, including groundwater, to manage and maintain important habitat for migratory birds and wildlife. The Delta-Mendota Subbasin is home to the largest contiguous tract of inland wetlands remaining on the west coast and is an important component to the Pacific Flyway.
5	2	Samantha Arthur	Audubon California	2	P. 2-19	2.1.2.5		Major Land Use Divisions. This section needs to include wetlands, as wetlands are neither grassland nor rangeland and comprise ~120,300 acres of the subbasin (see above section 2.1.2.1). The map cited in this section, Figure 2-14, does not include two of the listed land use divisions described here, Grassland and Rangeland, and Deciduous Forest (Riparian). These should be added to the map. Wetland is identified in the map, Figure 2-14, and should be added as a typical land use and described accordingly.
6	2	Samantha Arthur	Audubon California	3	P. 2-37	2.2		Land Use Elements. Figure 2-23 is inconsistent with land use maps in the previous sections (Figure 2-14). This inconsistency makes it unclear what the most accurate land use information is for the subbasin. Additionally, wetlands should be identified in this figure and are a separate land use than riparian. The description of Figure 2-24 should also include San Joaquin National Wildlife Refuge as practicing conjunctive use, and that they rely on groundwater when surface water is not available.
7	2	Samantha Arthur	Audubon California	4	P. 2-41	Figure 2-25		Land Use by Water Use Sector in the Northern and Central Delta-Mendota Regions. The area on the map that covers the San Joaquin River National Wildlife Refuge is identified as being non-irrigated. This is inaccurate and should reflect that habitat is managed with applied water, including groundwater.
8	2	Samantha Arthur	Audubon California	5	P. 2-101	2.5.8		Efforts to Develop Relationships with State and Federal Regulatory Agencies. As stated in our previous comment letter dated April 3, 2019 (attached below), the list of state lands owned and operated by California Department of Fish and Wildlife is incomplete. Volta Wildlife Area and Los Banos Wildlife Area are missing from the list and should be included.
9	2	Samantha Arthur	Audubon California	6	P. 5-88	Figure 5-63		Imported Supplies, Delta-Mendota Subbasin. As stated in our previous comment letter dated April 3, 2019 (attached below), many of the public and private refuge and wildlife areas depicted in Figure 2-7 (Chapter 2) receive surface water through contracts or other arrangements, either from the State Water Project, Central Valley Project, or other adjacent subbasins (e.g. the Merced subbasin). The list of areas that receive imported supplies in Section 5.2.9.5 and the map of areas that receive imported supplies represented in Figure 5-63 should be modified to include state, federal and private wildlife refuges.
10	2	Samantha Arthur	Audubon California	7	P. 5-170	5.3.7.1		Available Data. It should be noted that the areas in the Northern and Central Delta-Mendota Region where GDEs are identified around the San Joaquin River are predominantly at the San Joaquin River National Wildlife Refuge, which provides important habitat to birds and wildlife.
11	2	Samantha Arthur	Audubon California	8	P.5-172	5.3.7.6		Groundwater Dependent Ecosystems. Many of the seasonally managed habitats and wetlands rely on pumped groundwater to meet their needs so should not be eliminated from the list of potential GDEs that are mapped. Additionally, it is unclear the basis for why 100-feet was selected as the buffer distance to evaluate potential GDEs surrounding the San Joaquin River. In many places along the river and nearby drainages GDEs are present at much further distances. Please clarify how these decisions were made. Depth to water used to identify GDEs was based on 2015 data. Due to natural inter-annual fluctuations and annual seasonality impacting water depths, it is recommended that multiple years are used to determine the extent of GDEs.
12	2	Samantha Arthur	Audubon California	9	P.5-176	Table 5-10		List of Potential Freshwater Species, Northern and Central Delta-Mendota Regions. This table is incomplete and does not accurately reflect the status for some species. Swainson's Hawk, *Buteo Swainsoni* , is not on this list and needs to be added. Its Federal Protection Status is Bird of Conservation Concern and its State Protection Status is Threatened. The State Protection Status of Tricolored Blackbirds is Threatened. The Federal Protection Status of Long-billed Curlew, *Numenius americanus* , is Bird of Conservation Concern. These updates and additions should be added to table 5-10.
13	2	Samantha Arthur	Audubon California	10	P. 5-192	Table 5-15		Historic and Current Land Surface Budget Assumptions. Environmental users, including areas with managed wetlands, should be included in the Pumping and Surface Water Deliveries categories in this table. Please clarify whether this land use and water demand is included in the Historic and Current Land Surface Budget Assumptions. Habitat water demands need to be recognized as an existing user, similar to other surface water and overlying groundwater users, particularly as the GSAs may move towards allocation systems that reflect current or past groundwater use.
14	2	Samantha Arthur	Audubon California	11	P.5-194	Table 5-17		Projected Land Surface Budget Assumptions. The environmental users, including areas with managed wetlands, should be included in the Pumping category in this table. Please clarify whether this land use and water demand is included in the Projected Land Surface Budget Assumptions.
15	2	Samantha Arthur	Audubon California	12	P. 5-199	Table 5-20		Land Surface Budget, Historic Water Budget (AFY). It is unclear whether the water demand information used in the Historic Land Surface Budget includes the water demands of managed wetlands. Please clarify whether this land use and water demand is included in the Historic Land Surface Budget. Habitat water demands need to be recognized as an existing user, similar to other surface water and overlying groundwater users, particularly as the GSAs may move towards allocation systems that reflect current or past groundwater use.
16	2	Samantha Arthur	Audubon California	13	P. 5-199	Table 5-21		Groundwater Budget, Historic Water Budget (AFY). It is unclear whether the water demand information used in the Historic Groundwater Budget includes the water demands of managed habitat and wetlands. Please clarify whether this land use and water demand is included in the Historic Groundwater Budget. See our above comments regarding the Historic Land Surface Budget.
17	2	Samantha Arthur	Audubon California	14	P. 5-200	Table 5-23		Land Surface Budget, Current Water Budget (AFY). It is unclear whether the water demand information used in the Current Land Surface Budget includes the water demands of managed habitats and wetlands. Please clarify whether this land use and water demand is included in the Land Surface Budget. See our above comments regarding the Historic Land Surface Budget.
18	2	Samantha Arthur	Audubon California	15	P. 5-200	Table 5-24		Groundwater Budget, Current Water Budget (AFY). It is unclear whether the water demand information used in the Current Groundwater Budget includes the water demands of managed habitats and wetlands. Please clarify whether this land use and water demand is included in the Current Groundwater Budget. See our above comments regarding the Historic Land Surface Budget.
19	2	Samantha Arthur	Audubon California	16	P. 5-201	Table 5-26		Land Surface Budget, Baseline Projected Water Budget (AFY). The water budget should add managed habitats to the Groundwater Pumping component in this table. Surface deliveries for managed habitat should also be included in the totals for each component, respectively, under Surface Water Deliveries. It is unclear whether the water demand information used in the Land Surface Budget, Baseline Projected Water Budget includes the water demands of managed habitats. Please clarify whether this land use and water demand is included here. These changes should also be reflected in Table 5-29 and 5-32. See our above comments regarding the Historic Land Surface Budget.
20	2	Samantha Arthur	Audubon California	17	P. 5-203	Table 5-27		Groundwater Budget, Baseline Projected Water Budget (AFY). The water budget should add managed habitats to the Groundwater Pumping component in this table. Surface deliveries for managed habitat should be included in the totals for each component, respectively, under Surface Water Deliveries. It is unclear whether the water demand information used in the Groundwater Budget, Baseline Projected Water Budget includes the water demands of managed habitats. Please clarify whether this land use and water demand is included here. These changes should also be reflected in Tables 5-30 and 5-33. See our above comments regarding the Historic Land Surface Budget.
21	2	Samantha Arthur	Audubon California	18	P. 7-5 thru 7-8	Table 7-2		Summary of How Northern & Central Delta-Mendota Region GSP Projects and Management Actions Address Sustainability Indicators. We are enthusiastic that many of the proposed and ongoing projects address multiple sustainability indicators. In-line with providing multiple benefits during project implementation we recommend that projects also include consideration of how to provide benefits to wildlife and habitat. Expanding priorities that have added benefit, such as habitat and wildlife value, can also lead to non-target benefits (e.g. water filtration or recreation opportunities). This may allow access to additional funding sources that otherwise would not have been available if these added benefits were not incorporated into project designs.

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22	2	Samantha Arthur	Audubon California	19	P. 7-9			Description of Projects and Management Actions. As specific projects become further developed, managed habitat areas may offer ideal opportunities for recharge or temporary storage of water during high flow events. Projects that utilize habitat lands may lessen negative impacts to cultivated lands from flooding or intentional recharge. We recommend that the GSAs investigate opportunities that can allow habitat areas to function both for habitat and to provide recharge or temporary storage.
23	3	Samantha Arthur	Audubon California	1				The Department of Water Resources guidance document Groundwater Sustainability Plan (GSP) Annotated Outline, places the requirement to describe beneficial uses and users of groundwater in the basin in the Plan Area chapter. California Code of Regulations § 354.10.(a) requires "A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties." This description of beneficial uses and users is currently not included in the Plan Area chapter, so it should be added to this chapter or included elsewhere in a notice and communication section of the GSP.
24	3	Samantha Arthur	Audubon California	2		Figure 5-63		Many of the refuge areas depicted in Figure 2-7 (Chapter 2) receive surface water through contracts or other arrangements, where the water is imported from the Delta (either as State Water Project or Central Valley Project water) or from other adjacent subbasins (e.g. the Merced subbasin). The list of areas that receive imported supplies in Section 5.2.9.5 and the map of areas that receive imported supplies represented in Figure 5-63 should be modified to include state, federal and private wildlife refuges. The refuge areas depicted in Figure 2-7 should be included in the lands that receive imported supplies.
25	3	Samantha Arthur	Audubon California	3	p. 101			The list of state lands owned or operated by the California Department of Fish and Wildlife in Chapter 2 (p. 101) is not complete. Both Los Banos and Volta Wildlife Areas are missing from this list.
26	4	Julie Vance	California Department of Fish and Wildlife	1		Section 2.5.8		Efforts To Develop Relationships With State And Federal Regulatory Agencies (pages 2-100 to 2-101 and Figure 2-7). This section lists Department-owned lands within the Delta-Mendota Subbasin. Two additional lands not mentioned in the text are the Los Banos Wildlife Area and Volta Wildlife Area, but were included on Figure 2-7. It is the Department's understanding that the West Hilmar Wildlife Area, which is located on the east side of the San Joaquin River, is within the West Turlock Subbasin Groundwater Sustainability Agency (GSA). Please clarify if this is the case. Figure 2-7 identifies the Grasslands Wildlife Management Area in yellow. This identified area is under federal jurisdiction. The Department recommends the NCDMGSP contact the United States Fish and Wildlife Service for the proper designation.
27	4	Julie Vance	California Department of Fish and Wildlife	2	pages 5-170 to 5-172	5.3.7.2		The narrative describing the basin's interconnected surface water conditions lacks specifics and does not map surface water-groundwater interconnectivity. *Issue:* The interconnected surface water conditions narrative includes estimations of the quantity of streamflow depletions as specified in 23 CCR § 354.16(f), but it does not provide specifics on how the identified resources on page 5-171 were used to determine interconnectivity, nor does the plan provide timing of depletions. West-side streams in the Delta Mendota Basin are characterized as losing their "flows to the underlying vadose zone (net-losing streams)0 and therefore they are not considered potential GDEs (page 5-170). Losing streams can still be interconnected with surface water if there is a continuous saturated layer connecting the stream to the groundwater. The GSP uses the term 'vadose zone,' meaning an unsaturated zone, but offers no specifics on how these streams were determined to be disconnected. *Recommendation:* The Department recommends the NCDMGSP clarify methods used to identify streamflow interconnectivity for gaining and losing streams, estimate streamflow depletion, and display interconnected river reaches on a map. The Department also recommends specific plan be prepared for determining the timing of streamflow depletions
28	4	Julie Vance	California Department of Fish and Wildlife	3	pages 5-172 to 5-179	Section 5.3.7.6		The GDE identification section, pursuant to 23 CCR § 354.16 (g), is based on limited information to identify ecosystems that may depend on groundwater. Issue: Methods applied to the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset to identify potential GDE's needs further evaluation. Depth to Groundwater: Evaluating only areas with a depth to groundwater greater than 30 feet in Spring 2015 relies on a single-point-in-time baseline hydrology, specifically a point in time that is several years into a historic drought when groundwater levels were trending significantly lower due to reduced surface water availability. Exclusion of potential GDEs based on this singular groundwater elevation measurement is questionable because it does not consider representative climate conditions (i.e., seasons and a range of water type years) and it does not account for GDE's that can survive a finite period of time without groundwater access (Naumburg et al. 2005), but that rely on groundwater table recovery periods for long term survival. Adjacent to Surface Water: The GSP needs further evaluation for potential GDE's that depend on adjacent losing surface water bodies and a GDE's adaptability and opportunistic nature in accessing water supply. GDEs that are near interconnected surface water bodies may depend on sustained groundwater elevations that stabilize the gradient or rate of loss of surface water, meaning that ecosystems near interconnected surface waters may depend on sustainable groundwater elevations. Therefore, it is possible that any of these potential GDEs rely on groundwater during specific seasons or water year types. No land use protections for GDE's: The Department does not concur that there are no laws or regulations that protect GDE's. The Department has a 11 No net wetland loss" policy established by the Fish and Game Commission to protect our states remaining natural wetlands. Furthermore, there are other State and federal laws to protect natural wetlands. Recommendations: The Department recommends the NCDMGSP consider the following for information gathering related to GDEs: Depth to Groundwater: Develop a hydrologically robust baseline which includes areas with a depth to groundwater greater than 30 feet that relies on multiple, climatically representative years of groundwater elevation and that accounts for the inter-seasonal and inter-annual variability of GOE water demand. Adjacent to Surface Water: Evaluate potential GDE's that are in proximity to a losing surface water body. The Department recommends the GSP be more conservative and all-inclusive until there is evidence that the overlying ecosystem has no significant dependence on groundwater across seasons and water year types. The Department advises that these riparian GOE beneficial users of groundwater and surface water are carefully considered in the analysis of undesirable results and minimum thresholds for depletions of interconnected surface waters. The Department further recommends the streams on the west side of the valley in the Coastal Range be further evaluated for GDE's, as there are ripariar.1 zones along those streams. Include additional references for evaluation: The Department recognizes that NCCAG (Klausmeyer et al. 2018) provided by California Department of Water Resources (DWR) is a good starting reference for GDE's; however, the Department recommends the GSP include additional resources for evaluating GOE locations. The Department recommends consulting other references, including, but not limited to, the following tools and other resources: the California Department of Fish ·and Wildlife (CDFW) Vegetation Classification and Mapping Program (VegCAMP) (CDFW 2019A); the CDFW California Natural Diversity Database (CNDDB) (20198); the California Native Plant Society (CNPS) Manual of California Vegetation (CNPS 2019A); the CNPS California Protected Areas Database (CNPS 20198); the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (2018); the USFWS online mapping tool for listed species critical habitat (2019); the U.S. Forest Service CALVEG ecological grouping classification and assessment system (2019); and other publications by Klausmeyer et al. (2019), Rohde et al. (2018), The Nature Conservancy (TNC) (2014), and Witham et al. (2014).

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29	4	Julie Vance	California Department of Fish and Wildlife	4	page 5-121	5.3.5		The GSP abdicates responsibility for specific groundwater constituents by implying there is no nexus between specific groundwater contaminants and groundwater pumping. Issue: The GSP identifies three primary water quality constituents of concern in the Delta Mendota Subbasin: total dissolved solids, nitrate, and boron (page 5-121). The GSP explains that other constituents, including arsenic, are naturally occurring and managed through other regulatory programs, and suggests that because there are no GSA management practices that can be implemented to mitigate for these constituents (page 5-121), the GSP will not analyze and address these constituent issues. Science suggests that over-pumping of aquifers can cause clay layers to compress and release dissolved arsenic, resulting in an increase of arsenic in extracted water (Fendorf et al 2019). Thus, groundwater pumping actions can affect the presence, movement, and concentration of naturally occurring arsenic in groundwater, potentially increasing anthropogenic and ecosystem exposure to arsenic contamination. According to SGMA statue, GSAs have the authority to establish groundwater extraction allocations, among other relevant authorities (WC § 10726.4). Because arsenic contamination can potentially result from groundwater pumping, and because GSAs have the authority to manage groundwater pumping, the GSA has a viable management opportunity to address arsenic contamination in the Delta Mendota-Subbasin. Recommendation: There are numerous other constituents of concern on the west side of the San Joaquin Valley that were not evaluated such as: salinity, arsenic, selenium, and uranium. The Department has one well at its China Island Wildlife Area that has 2.7 ug/l uranium. Furthermore, salinity, arsenic and selenium have been ongoing concerns for decades in the valley. The Mendota Pools Pumpers Project and other groundwater pumping near Mendota Wildlife Area have increased the salinity in our surface water supply for the wildlife area. In addition, the Mendota Pool Pumpers have years of groundwater data and the USBR has groundwater data for their sump pumps along the Delta Mendota Canal that should be included for evaluation in the Delta Mendota Subbasin. The Department recommends the NCDMGSP evaluate these other constituents of concern and references. The Department further recommends a plan be developed to identify the relationship between groundwater pumping and the presence and movement of constituents of concern in the Delta Mendota Subbasin and include the plan in the GSP. The Department also recommen.ds the development of sustainability criteria for constituents of concern accordingly and in partnership with existing regulatory programs for the first 5-year GSP update due in January 2025.
30	4	Julie Vance	California Department of Fish and Wildlife	5	Starting on page 6-3	6.3.1 and 6.3.6		Groundwater level and interconnected surface water sustainable management criteria demonstrate limited consideration of undesirable results for environmental beneficial uses and interconnected surface waters. *Issue:* Groundwater Level 'undesirable results' and 'effects of undesirable results' did not evaluate specify impacts to environmental beneficial users such as terrestrial GDE's (see page 6-4), nor does this section explicitly identify fish and wildlife or habitat as beneficial users of interconnected surface water. Though environmental use is identified as one of the many groundwater beneficial use considered in establishing minimum thresholds, there is no explanation for how environmental users were considered. Depletions of interconnected surface water 'undesirable results' and 'effects of undesirable results' do not specify potential adverse impacts to environmental beneficial users other than to note the potential failure to support regulatory environmental requirements (page 6-34). With only two monitoring sites as presented on Figure 6-7 (page 6-37), the current monitoring network for the depletion of interconnected surface water is insufficient to characterize impacts to environmental beneficial users of groundwater (23 CCR § 354.34(b)(2)). *Recommendation:* The Department recommends the NCDMGSP clarify how species and habitat groundwater needs were considered in the identification of Sustainable Management Criteria and identify specific potential adverse impacts on environmental beneficial users of groundwater (e.g., terrestrial GOE stress/loss, increased instream temperatures, etc.). Install additional shallow groundwater monitoring wells near GDEs and interconnected surface waters, potentially pairing multiple-completion wells with streamflow gauges for improved understanding of surface water-groundwater interconnectivity.
31	4	Julie Vance	California Department of Fish and Wildlife	6	page 6-25	6.3.5.1.2		An undesirable result for land subsidence is triggered, or considered "significant and unreasonable," for Tranquility Area using a minimum threshold of four (4) feet additional subsidence ·compared to 2019 benchmark elevations. *Issue:* The Mendota Wildlife Area has experienced land subsidence for decades. The first significant issue was subsidence at the Mendota Pool Dam which caused the water level to be lower resulting in less ability to back water up the Fresno Slough to our water inlets in the wildlife area. This was later compounded when Division of Dam Safety determined the water levels at the Mendota Pool had to be lowered further to maintain the integrity of the dam. Thus, these two incidents have significantly impacted Mendota Wildlife Area ability to flood using gravity flow and has impacted our lift pump sites. During the recent drought, a zone of subsidence centered around the town of Tranquility and covering over 75% of the wildlife area was detected. This relatively new subsidence feature has severely impacted the flooding and draining of the southeastern portion of the wildlife area as well as impacting the flood control levees of the James Bypass that make up the levees of the Mendota Pool, which roughly bisect the wildlife area. This recent subsidence on the wildlife area has resulted in our water flowing backwards. The Department does not concur allowing four feet additional subsidence as a benchmark. *Recommendation:* The Department recommends the NCDMGSP and neighboring GSP's include and discuss that the Mendota Wildlife Area has an established subsidence management area _with a goal of zero further subsidence to maintain the ability to deliver surface water supplies to and within the wildlife area. Further, the Department advises that the NCDMGSP acknowledge that the current baseline subsidence is the benchmark and that a criterion of zero feet subsidence from the current benchmark is the long-term goal.
32	4	Julie Vance	California Department of Fish and Wildlife	7	page 7-72	7.2.5.6.6		The GSP plan indicates that the addition of four new monitoring well locations will be placed in areas along the San Joaquin River in the plan area to monitor for depletion of interconnected surface water; however, there is no indication as to the plan or location for installation of shallow groundwater monitoring wells near potential GDE's in areas for example; westside streams in the Delta Mendota Basin where the GSP indicates these streams as losing their flow to the underlying vadose zone. As previously mentioned above, losing streams can still be interconnected with surface water if there is a continuous saturated layer connecting the stream to the groundwater. The GSP offers no specifics on how these streams were determined to be disconnected. Issue: In Section 5.3.7.6 Groundwater Dependent Ecosystems (page 5-173), the GSP indicates species (listed in Table 5-10) have either been observed or have the potential to exist within the Northern and Central Delta-Mendota Regions. The GSP indicates that future efforts in GOE mapping prior to the 2025 5-Year GSP Update will further refine GOE locations within the Plan area. While mapping of potential GOE is beneficial in an effort characterize the potential existence of GDE's, it will also be necessary to define shallow groundwater level interaction with these GDE's. In Section 5.3.8 Data Gaps (page 5-180), the GSP indicates that the locations of GDE's will be refined using most recent groundwater elevation/depth to water contour mapping. The installation of shallow groundwater monitoring wells specific to these locations will be needed to refine groundwater elevation/depth to water contouring maps. Recommendation: The Department recommends that the NCDMGSP identify areas and install additional shallow groundwater monitoring wells near potential GDE's to identify interactions with groundwater.
33	5	Russ Freeman	Westlands Water District	1	page 3-26	3.3.3.2		Section 3.3.3.2 states the following: *The purpose of the agreement is to establish a set of common assumptions on groundwater conditions on either side of the boundary between Westland Water District's service area and the Delta-Mendota Subbasin to be used for the development of GSPs in support of implementation of SGMA."* The purpose of the interbasin agreement between the District's service area and the Delta-Mendota Subbasin is to share hydrogeological data to support GSP development and implementation, rather than to establish common assumptions on groundwater conditions.
34	6	Russ Freeman	Westlands Water District	1	page 5-29	5.2.7		Section 5.2.7: Structural Properties and Restricted Groundwater states the following: *Groundwater southwest of this divide generally flows southwest toward Panoche Water District and Westlands Water District."* Analysis shows that groundwater from the Lower Aquifer does not flow into Westlands Water District. Westlands requests that the language be amended to not include Westlands Water District.

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35	7	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	1				We know that SGMA plan development and implementation is a major undertaking, and we want every basin to be successful. We would be happy to meet with you to discuss evaluation as you finalize your Plan for submittal to DWR. Feel free to contact Suzannah Sosman at suzannah@aginnovations.org for more information or to schedule a conversation.
36	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	1	4			1. Do beneficial users (BUs) identified within the GSP area include: c. Small community public water systems (<3,300 connections) "Not explicitly identified as such."
37	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	2	5	Ch. 2 2.2.1.6 (pg. 29)		2. What data were used to identify presence or absence of DACs? A. DWR DAC Mapping Tool i. Census Places ii. Census Block Groups iii. Census Tracts b. Other data sources "The GSP does not specify but the areas mapped on Figure 2-16 appear to be Census Tracts."
38	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	3	6			4. What local, state, and federal standards or plans were used to assess drinking water BUs in the development of Minimum Thresholds (MTs)? D. Sustainable Communities Strategies/Regional Transportation Plans No additional comment provided, marked as "No" (not addressed)
39	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	4	8			1. Is Stakeholder Communication and Engagement Plan (SCEP) included? No additional comment provided, marked as "No" (not addressed)
40	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	5	11			1. Does the GSP Include Maps Related to Drinking Water Users? "Only density of domestic and public wells are given in a map. Specific location or depth of each well is not specified in the GSP."
41	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	6	12	CH. 5.3.7.1 (pg. 174)		2. Does the GSP include maps related to Groundwater Dependent Ecosystem (GDE) locations? B. Map of Interconnected Surface Waters (ISWs) No additional comment provided, marked as "No" (not addressed)
42	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	7	12	CH. 5.3.7.2 (pg. 174)		2. Does the GSP include maps related to Groundwater Dependent Ecosystem (GDE) locations? B. Map of Interconnected Surface Waters (ISWs) iii. Depletions of ISWs are quantified seasonally. No additional comment provided, marked as "No" (not addressed)

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43	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	8	13	CH. 2.3.3.6 (pg. 92)		3. Does the GSP include maps of monitoring networks? B. Existing Monitoring Well Data sources ii. Water Board Regulated monitoring sites "However, no data from environmental cleanup sites appear to be included."
44	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	9	14	CH. 2.3.3.6 (pg. 92)		3. Does the GSP include maps of monitoring networks? B. Existing Monitoring Well Data sources iii. Department of Pesticide Regulation (DPR) monitoring wells No additional comment provided, marked as "No" (not addressed)
45	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	10	14	CH. 7		3. Does the GSP include maps of monitoring networks? C. SGMA-Compliance Monitoring Network i. SGMA Monitoring Network map includes identified DACs? "The maps listed above do not include DACs or GDEs."
46	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	11	14	CH. 7		3. Does the GSP include maps of monitoring networks? C. SGMA-Compliance Monitoring Network ii. SGMA Monitoring Network map includes identified GDEs? "The maps listed above do not include DACs or GDEs."
47	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	12	17	CH. 5, 5.4.3 (pg. 190)		4. Does the GSP use multiple climate scenarios? "Water budget is projected with one climate change scenario, and with climate change plus implementation of P&MAs."
48	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	13	18	CH. 5.4.9 (pg. 231)		7. Are demands by these sectors (drinking water users) explicitly included in the future/projected water budget? A. Domestic Well users (<5 connections) b. State Small Water systems (5-14 connections) c. Small community water systems (<3,300 connections) d. Medium and Large community water systems (>3,300 connections) e. Non-community water systems "5.4.9 Projected Water Budget with Climate Change The Projected water budget includes groundwater pumping by 'Municipal & Industrial,' but results do not appear to be presented at a finer scale than this. The GSP mentioned that surface water delivery projections include demands from local water purveyors. However, it is not clear whether the local water purveyors include the sectors in the question."
49	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	14	18	Table 5-16 (pg. 196), Table 5-17 (pg. 198)		8. Are water uses for native vegetation and/or wetlands explicitly included in the current and historical water budgets? "Evapotranspiration is included as an outflow category in the land surface budget, however it is not split between type of evapotranspiration. Groundwater outflow to ET does not appear to be identified as a groundwater budget component."
50	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	15	19	Table 5-16 (pg. 196), Table 5-17 (pg. 198)		9. Are water uses for native vegetation and/or wetlands explicitly included in the projected/future water budget? "Table 5-16. Historical and Current Groundwater Budget Assumptions Table 5-17 Projected Land Surface Budget Assumptions ... It appears that the GSP groups all the crop evapotranspiration demands into one sector."

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51	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	16	20	CH. 5.5.5.1 (pg. 241)		2. Were the management areas defined specifically to manage GDEs? "Management areas are not set up for purposes of managing other sustainability indicators or aspects."
52	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	17	21	CH. 5.5.5.1 (pg. 241)		3. Were the management areas defined specifically to manage DACS? "Management areas are not set up for purposes of managing other sustainability indicators or aspects."
53	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	18	21	Figure 2-16 (pg. 30), Figure 5-140 (pg. 243)		4. Does the GSP include maps or descriptions indicating what DACs are located in each Management Area(s)? "Per Figure 2-16, nearly entire basin is declared a Disadvantaged Communities to Severely Disadvantaged Community at the Census tract level. The GSP does not identify what DACs are located in what Management Area. This information can be indirectly extracted from the two figures: Figure 2-16 and Figure 5-140. However, these figures don't identify the specific communities (i.e., towns and Census Designated Places) that really make up DACs."
54	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	19	21	Figure 5-118 (pg. 178), Figure 5-140 (pg. 243)		5. Does the GSP include maps or descriptions indicating what GDEs are located in each Management Area(s)? "Maps or descriptions of GDEs do not specify which Management Area they are located in. This information can be indirectly extracted from the two figures: Figure 5-188 and Figure 5-140."
55	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	20	24	CH 6.3.1.3 (pg. 14-16), CH. 6.3.3.3 (pg. 23-25)		3. Does the GSP explicitly consider impacts to GDEs and environmental BUs of surface water in the development of MOs and MTs for groundwater levels and depletions of ISWs? "Section 6.3.1.3 Measurable Objectives for Groundwater Levels Section 6.3.3.3 Measurable Objectives and Interim Milestones The Measurable Objectives do not consider GDEs."
56	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	21	24	CH. 6.3.1.1.4 (pg. 8)		4. Does the GSP explicitly consider impacts GDEs and Bus of surface water and recreational lands in the discussion and development of Undesirable Results? "Section 6.3.1.1 (URs for water levels) only describes undesirable results relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline."
57	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	22	26	Table 7-2 (pg. 9-12)		1. Does the GSP identify benefits or impacts to DACs as a result of identified management actions? "Table 7-2 lists how each project can impact the five sustainability indicators, including chronic lowering of groundwater level, reduction of groundwater storage, degraded water quality, land subsidence, and depletions of interconnected surface water. However, specific benefits or potential impacts to DACs and drinking water users are not identified."
58	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	23	26			2. If yes, b. is a plan to mitigate impacts on DAC drinking water users included in the proposed Projects and Management Actions? C. Does the GSP identify costs to fund a mitigation program? "It should be noted that the proposed water level SMC for the upper aquifer are based on hydrologic lows, comparable to the last drought period, and that based on this, the GSP identified that significant impacts are not expected to drinking water users, including domestic well users."

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59	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	24	26	Table 7-1 (pg. 7), Table 7-2 (pg.9-12), Table 8-2 (pg. 12)		2. Does the GSP identify specific management actions and funding mechanisms to meet the identified MOs for groundwater quality and groundwater levels? "Table 7-1 Northern & Central Delta-Mendota GSP Projects and Management Actions Table 7-2. Summary of How Northern & Central Delta-Mendota Region GSP Projects and Management Actions Address Sustainability Indicators Table 8-2. Potential Funding Sources for GSP Implementation Many management actions are identified to fill in the data gaps, increase groundwater level, and improve water quality. However, the text is not addressed to MOs. The funding sources are not for meeting MOs solely."
60	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	25	26	CH. 7.2.5.1.6 (pg. 49), Sections 7.2.5.1.2 and 7.2.5.1.3 (pg. 45-47), Table 7-6 and Table 7-7 (pg. 41-42)		3. Does the GSP include plans to fill identified data gaps by the first five-year report? "The GSP identifies plans to fill data gaps, but does not include a timeline for doing so."
61	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	26	27	Table 7-1 (pg. 7), CH.7.1 (pg. 6)		4. Do proposed management actions include any changes to local ordinances or land use planning? "The proposed management actions do not include changes to local ordinances or land use planning. However, rotational fallowing of crop lands is included in their Tier 3 management actions."
62	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	27	28	CH. 7.2.5.1.6 (pg. 49)		7. If yes: a. Does the GSP identify costs to study the interconnectedness of surface water bodies? b. Does the GSP include a funding mechanism to support the study of interconnectedness surface water bodies? "The GSP does not identify costs to study the interconnectedness of the surface water bodes. However, it does state that 'Data gaps identified in the above section for the groundwater level monitoring networks for each principal aquifer will be filled through a combination of video surveying well boreholes to identify screen intervals and constructing new dedicated monitoring wells as funding allows....."
63	8	Jennifer Clary, Samantha Artuerh, Sandi Matsumoto, Danielle V. Dolan	Clean Water Action | Clean Water Fund; Local Government Commission; Audubon; The Nature Conservancy	28	29	CH. 6.3.6.1.4 (pg. 38), Table 7-2 (pg. 9)		8. Does the GSP explicitly evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies? "The GSP states that depletions will be considered from monitoring data collected between 2020 and 2025. At a minimum the GSP should maintain the current level of ISWs until additional information is collected and measurable objectives and minimum thresholds can be more precisely defined. For example, Table 5-9 (p. 5-172) estimates the quantity of gains and depletions of reaches of the San Joaquin River only. This type of information should be used to support the statement of undesirable results and should be expanded to other streams that are potential ISWs. Table 7-2 Summary of How Northern & Central Delta-Mendota Region GSP Projects and Management Actions Address Sustainability Indicators"
64	9	Courtney DePorto	Granite Construction Company	1				Construction aggregate mining occurs predominantly in rural areas disconnected from public water systems. 67% of California Construction aggregate production in 2012 was produced predominantly from alluvial deposits in historic floodplains. These locations usually do not have access to public water systems and rely on groundwater wells as their only source of water. We urge your agency to recognize these rural wells, and their probable inability to be replaced by surface delivery systems, in basin modeling and infrastructure planning.
65	9	Courtney DePorto	Granite Construction Company	2				Volumes for groundwater produced for quarry operations are not de mlnimis. Many agencies have defined "de minimis users" as users who pump less than 5 acre-feet per year (AFY). Quarry operations use hundreds of AFY (the exact amount varies based on climate, soils and nature of the mineral deposit of each facility). Lack of consideration of quarry groundwater production will potentially result in flawed modeling, hampering long term sustainability goals. We encourage your agency to establish a production threshold for "de minimis users" and collect all groundwater production data in excess of the defined threshold to insure the basin model is accurate.
66	9	Courtney DePorto	Granite Construction Company	3				Quarries operations have basin benefits which may need to be considered. Quarries engage in significant water recycling practices by recirculating aggregate wash water through onsite ponds, significantly reducing groundwater pumped relative to production needs. Wash ponds, and areas of impermeable surfaces, allow for groundwater recharge during operations. Further, washwater doesn't need to be potable. By using onsite wells quarries help municipal providers reduce the volumes of potable water treated and freeing system delivery capacity. Mining activities are an interim land use which includes reclamation plans focused planning for a post mining use. Quarries may present future opportunities for water storage and/or recharge facilities, and should be considered in long term planning. When determining undesirable impacts, sustainable practices, and future GSA projects we encourage your agency to consider efficiencies of use, and future opportunities, of quarry operations.
67	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	1	Page 5-89	5.3	"This section..."	The current conditions in the GSP is represented by Water Year (WY) 2013 conditions. WY 2013 is outdated when compared to the year (2020) that this plan represents. Section 354.16 of the GSP Regulations (Groundwater Conditions) states, "Each Plan shall provide a description of current and historical groundwater condition in the basin, including data from January 1, 2015, to current conditions, based on the best available information..." The WY2013 period used in the GSP to represent "current conditions" predates the "current condition" period stipulated in GSP regulations.
68	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	2	Page 5-94	5.3.2.4	"Due to insufficient..."	Due to insufficient data, groundwater elevation contour maps for the Lower Aquifer for the spring and fall of 2013 could not be prepared. This is another issue with choosing WY 2013 to represent current conditions. A different and preferably more current year should be considered. The GSP fails to fully describe current groundwater conditions.

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69	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	3	Page 5-170	5.3.7.2	"The San Joaquin..."	Section 354.16 of the GSP Regulations stipulates that each plan describe current and historic groundwater conditions in the basin based on the best available information. With regard to Interconnected Surface Water Systems, I would like you to be aware of a study completed by Kamman Hydrology & Engineering, Inc. (Kamman Hydrology & Engineering, Inc., 2018, Delineating subterranean streams and Potential Stream Depletion Areas, Lower Stanislaus and Tuolumne River Watershed. Draft Technical Memorandum prepared for: Law Offices of Thomas N. Lippe, APC, July 23, 9p. and 15 sheets. https://www.dropbox.com/s/2ser942wkeb5d3v/PSDA-mapping-Tech-Memorandum_v1%2Bquads.pdf?dl=0), which delineates subterranean streams and Potential Stream Depletion Areas (PSDA) along the San Joaquin River. PSDA's are areas where groundwater pumping could potentially cause stream depletion. A link to this report and associated maps is provided in the footnote below for reference and integration into the GSP.
70	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	4	Page 5-170	5.3.7.2	"The San Joaquin..."	The GSP only addresses interconnected surface water systems along the San Joaquin River north of Newman, California, where the river is characterized as a gaining stream. This constitutes only 1/3rd of the river length within the Delta-Mendota Subbasin boundary. South (upstream) of Newman, the Nature Conservancy (2016) characterizes groundwater and stream interaction along the San Joaquin River as a mix of gaining and losing reaches, but dominated by gaining reaches. The GSP fails to fully characterize the interconnected surface water conditions along the San Joaquin River within the Subbasin boundary. Understanding and properly managing and protecting these interconnected surface- and groundwater systems is important as there are significant GDE's and associated resources like fish, riparian vegetation and wetlands along the entire length of River in the Subbasin.
71	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	5	Page 5-172	5.3.7.6	"The NCCAG dataset..."	The GSP Regulations define "groundwater dependent ecosystem" (GDE) as ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. Section 354.16 of the Regulations stipulate that Plans identify (current and historic) GDEs within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information. As stated on page 5-172, the Natural Communities Commonly Associated with Groundwater (NCCAG) database, developed by DWR, CDFW and The Nature Conservancy (TNC), is used to identify GDEs within the Delta-Mendota Subbasin. The GSP then describes a methodology to further screen available information and establishes the following standards to identify GDEs: (1) Areas with depths to groundwater levels greater than 30 feet were eliminated unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks); (2) Seasonally-managed areas and wetlands were eliminated due to their dependence on applied surface water; and (3) A 100-foot buffer was applied around the San Joaquin River within the Northern Delta-Mendota Region to include all communities in the NCCAG dataset as potential GDEs, except where professional judgment and local knowledge determined GDEs were not present. A problem with this GDE screening methodology is the failure to acknowledge that GDEs may depend on shallow groundwater regardless of the presence of applied surface water sources. For example, wetlands within or adjacent to irrigated agriculture may not rely on that irrigation for survival; if they did, we would expect to find wetlands growing in all irrigated lands. In addition, the presence and sustainability of perennial surface water in Central Valley Rivers is controlled by many factors (e.g., groundwater inflow, reservoir operations, irrigation drainage, etc.). Information presented in the GSP indicate significant contributions of groundwater flow to "gaining" reaches of the San Joaquin River. The riparian and wetland vegetation bordering these gaining reaches are surely sustained to some degree by this groundwater inflow to the river and the shallow groundwater conditions that likely accompany gaining reaches. The interconnected condition is also likely influenced significantly by seasonal and long-term wet and dry cycles. However, the GSP does not quantify the relative spatial or temporal contributions of groundwater supply to riparian habitats. Instead, the GPS simply dismisses these habitats as GDE's under the assumption that perennial flow is sustained through the summer by agricultural deliveries or tailwater. Therefore, it is my opinion that the process of elimination of GDEs as presented in the GSP is seriously flawed and does not correctly recognize or delineate GDEs in the basin.
72	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	6	Page 5-173	5.3.7.6	"As a result..."	The GSP states, "*Management and protection of GDEs may require more focus on land use or irrigation activities more than groundwater management.*" This is a bizarre statement because the GSP eliminates areas mapped as GDEs if they are, "*seasonally-managed areas and wetlands due to dependence on applied surface water.*" Per the GDE screening methodology described above, the "management and protection" practices being suggested for GDEs would eliminate these areas from consideration as a GDE.
73	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	7	Page 5-185	5.4.3	"The current water budget..."	The GSP states, *"The current water budget year is defined as WY2013. While "current water budget conditions" are defined in the GSP Emergency Regulations §354.18(c)(1) as the year with "the most recent population, land use, and hydrologic conditions," WY2015, WY2016 and WY2017 were not thought to be representative of the Delta-Mendota Subbasin under "normal" or "average" conditions. Response to the most recent drought began in WY2014 with some initial fallowing of lands. By WY2015 and WY2016, which are both classified as dry years, more lands were fallowed throughout the Subbasin in response to multiple dry year conditions. Agricultural production was higher in WY2017, compared to WY2015 and WY2016, but the delivery allocations from the Central Valley Project (CVP) came late in the season, so a considerable amount of land was still fallowed. By WY2018, agricultural land production increased and was similar to conditions in WY2013, however complete datasets were not yet available for use in the water budgets. Therefore, the Coordination Committee agreed that WY2013 represents the most recent water year with a complete data set representing typical demands and supplies*." WY 2013 is a critically dry year-type falling within the 2012-2016 recent drought period, which heavily influences the meteorology, hydrology and water operations reflected in the associated "current conditions" water budget. There are more current years reflecting normal or average conditions. For example, Figures 5-84 and 5-85 (page 5-120) indicate that 2017 and 2018 were wet and average year types respectively. During WY2017, there was little change in aquifer storage in both the upper and lower aquifers, suggesting water operations balanced with available supplies. WY2017 also better representative of "current conditions" as it post-dates January 1, 2015 and reflects an average water operational period. WY2018 would also be a suitable when complete datasets become available.
74	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	8	Page 5-186	5.4.3	"Streamflow Climate Change..."	California Department of Water Resources (DWR) has developed a document (July 2018) entitled, Guidance for Climate change Data Use During Groundwater Sustainability Plan Development (Guidance Document). This document explains the DWR-provided climate change data, including how the data were developed, the methods and assumptions used for data development, and how they can be used in the development of a projected water budget. DWR has prepared climatological, hydrological and water operations datasets. This Guidance Document also describes tools and processes relevant to perform climate change data analysis (i.e., incorporating climate change analysis into projected water budgets, with and without numerical surface water/groundwater models). The data and methods described in the Guidance Document are optional and other local analysis and methods may be used. The projected (climate change) water budgets presented in the GSP utilize much of the climatological datasets. However, stream flow climate change factors from DWR were not applied – the proposed GSP considers them out-of-date and considers the result of using them as producing skewed (unreasonable) results for future surface water deliveries. Instead, the GSP states that GSA member agencies provided estimates for anticipated future surface water deliveries that were used in the water budget calculations. However, there is no discussion on the methods and assumptions used for data development, and how climate change was integrated into data values. Therefore, there is no way to evaluate the validity or applicability of these water budget variables with the information provided in the GSP. These information deficiencies should be remedied before approving the GSP.
75	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	9	Page 5-189	5.4.4	"The selected alternative..."	The GSP uses a spreadsheet modeling approach for water budget development in lieu of numerical groundwater modeling. The spreadsheet modeling approach does not account for surface water-groundwater interaction and is therefore not an "equally effective method" (see §354.18(e)) to numerical modeling with respect to identification on interconnected surface water systems and estimating the quantity and timing of depletions of those systems.

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76	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	10	Page 5-234	5.4.10	"With the addition..."	Based on the results of the Projected Annual Groundwater Budget with Climate Change and Projects & Management Actions, the subbasin should still be considered in a state of overdraft. Although water results indicate a trend of recovery and surplus storage in the Upper Aquifer, the Upper Aquifer displays a long-term trend in storage decline. To better visualize results for this water budget, the annual and cumulative change in storage volumes for the Upper Aquifer, Lower Aquifer and Total (combined Upper and Lower Aquifers) were plotted. These plots are presented below. The plot of cumulative change in storage for the Upper Aquifer indicates multi-year periods of large fluctuations in storage, but a long-term trend in declining storage. The GSP states that over the WY2014 to WY2070 period, the average annual change in Upper Aquifer storage is -4,000 AF and the average annual change in Lower Aquifer is +3,000 AF. This statement in itself indicates the Upper Aquifer is in overdraft and long-term decline under this water budget scenario. Based on the graphs below, I estimate that the long-term annual change (deficit) in Upper Aquifer storage is twice as high (-8000 AFY) as that reported in the GSP (-448,000 AF divided by 56 years). I also estimate an annual change in storage in the Lower Aquifer is +6214 AFY (+348,000 AF divided by 56 year) and the total annual change in storage of the Upper and Lower combined is -1785 AFY (-100,000 AF divided by 56 years). Although the proposed Projects and Management Actions presented in the GSP will address overdraft sustainable management of the Lower Aquifer, the GSP has not demonstrated sustainable management for the Upper Aquifer, which provides a much larger percentage of total groundwater supply in the subbasin than the lower aquifer.
77	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	11	Page 5-235	5.4.11	"This analysis results..."	The GSP presents a description and formula for estimating sustainable yield. However, the Upper or Lower Aquifer estimates are not reproducible using this formula and the water budget result tables presented earlier in the GSP. Therefore, the draft GSP should be revised to provide more detailed explanation of these calculations, including a sample calculation so the reader can understand and verify how they are quantified, and then recirculated from public comment.
78	10	Greg Kamman	Kamman Hydrology & Engineering, Inc.	12	Page 6-12	6.3.2	"Reduction of Groundwater..."	This section indicates that the GSP uses groundwater levels minimum thresholds as a proxy for the reduction of groundwater storage sustainability indicator. The plots of annual and cumulative annual change in groundwater storage presented above are very helpful in identifying and understanding long-term trends in aquifer storage. I recommend that in lieu of (or in addition to) using groundwater levels as a proxy, water budgets and the resulting annual and cumulative aquifer storage graphics (like those above) should be used as a more meaningful groundwater storage sustainability indicator. The data to maintain current annual water budgets would be required. The existing GSP and future reporting graphs can be used to define and track undesirable results, minimum thresholds, measurable objectives, and interim milestones for the reduction in groundwater storage. For example, one measurable objective may be positive or neutral trends in long-term cumulative storage. An example minimum threshold may be maintaining a neutral or positive long-term average change in annual storage for both the Upper and Lower Aquifers.
79	11	Sandi Matsumoto	The Nature Conservancy	1	Page 5-12	5.2.5.2		Defining the bottom of subbasin based on geochemical properties is a suitable approach for defining the base of freshwater, however, as noted on page 9 of DWR's Hydrogeologic Conceptual Model BMP (https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12- 23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". Thus, groundwater extraction well depth data should also be included in the determination of the basin bottom. This will prevent the possibility of extractors with wells deeper than the basin boundary (defined by the base of freshwater) from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary.
80	11	Sandi Matsumoto	The Nature Conservancy	2	Page 5-14	5.2.6.1		The very shallow unconfined groundwater falls under DWR's definition of a principal aquifer, which is defined as "aquifer or aquifer system that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems" [23 CCR §351(aa)]. Thus, this shallow groundwater should be included as part of the principal aquifer regardless of its "shallow nature and high salinity". This is especially true in the places where projects to develop the shallow groundwater for use on more salt-tolerant crops. SGMA requires GSAs to sustainably manage groundwater resources in all aquifers, especially if groundwater use and management can result to impacts on beneficial uses and users. Please refer to Best Practice #1 in Attachment D for further explanation and accompanying graphics.
81	12	Sandi Matsumoto	The Nature Conservancy	1	Pages 4-1 to 4-3	4.1		The California Water Code §1305(f) defines that beneficial uses of waters of the State include "preservation and enhancement of fish, wildlife, and other aquatic resources and preserves" (p. 4-1). Table 4-1 lists beneficial uses and user stakeholder groups (p. 4-2 to 4-3) and includes federal and state lands and facilities; environmental agencies and groups; rivers, creeks, and recreational and wildlife refuges; and recreational areas in addition to the direct users of groundwater and surface water. The GSP noted further refinement of the Table 4-1 list will be made by 2025. Please describe whether other beneficial uses and users of groundwater in the Subbasin are present: Protected Lands, including conservation areas and other protected lands; and Public Trust Uses including wildlife, aquatic habitat, fisheries, and recreation.
82	12	Sandi Matsumoto	The Nature Conservancy	2	Pages 4-1 to 4-3	4.1		The types and locations of environmental uses, species and habitats supported, and the designated beneficial environmental uses of surface waters that may be affected by groundwater extraction in the Subbasin should be specified. Please identify environmental users, and refer to the following: - Natural Communities Commonly Associated with Groundwater dataset (NC Dataset) - https://gis.water.ca.gov/app/NCDatasetViewer/ - The list of freshwater species located in the Delta-Mendota Subbasin in Table 5-10 of the GSP. Please take particular note of the species with protected status.
83	12	Sandi Matsumoto	The Nature Conservancy	3	Page 2-43	Figure 2-26		Figure 2-26 (p. 2-43) shows the area covered by city, community, and county general plans. There are five county plans, one city plan, and three community plans that cover a portion of the Northern and Central Delta-Mendota Regions. The plans should be modified to include a discussion of General Plan goals and policies related to the protection and management of GDEs and aquatic resources that could be affected by groundwater withdrawals. Please include a discussion of how implementation of the GSP may affect and be coordinated with General Plan policies and procedures regarding the protection of wetlands, aquatic resources and other GDEs and ISWs.
84	12	Sandi Matsumoto	The Nature Conservancy	4	Page 2-43	Figure 2-26		In general the plans seek to protect riparian habitat. This section should identify Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) within the Subbasin and if they are associated with critical, GDE or ISW habitats. Please identify all relevant HCPs and NCCPs within the Subbasin and address how GSP implementation will coordinate with the goals of these HCPs or NCCPs.
85	12	Sandi Matsumoto	The Nature Conservancy	5	Page 2-43	Figure 2-26		Please refer to the Critical Species Lookbook (Available online at: https://groundwaterresourcehub.org/sgma-tools/the-critical-species-lookbook/) to review and discuss the potential groundwater reliance of critical species in the basin. Please include a discussion regarding the management of critical habitat for these aquatic species and its relationship to the GSP.
86	12	Sandi Matsumoto	The Nature Conservancy	6	Pages 2-10 to 2-12	2.1.2.2		The GSP provides a description of the major water infrastructure projects including the Central Valley Project, the State Water Project, and the Tracy Fish Collection Project, however there is no discussion of any in-stream flow requirements. Please describe any current or planned in-stream flow requirements of the San Joaquin and Merced Rivers or any of the westside creeks.
87	12	Sandi Matsumoto	The Nature Conservancy	7	Page 2-78	Table 2-7		Table 2-7 (p. 2-78) summarizes well permitting requirements and county ordinances for the counties of Fresno, San Benito, Merced, Stanislaus, and San Joaquin. The counties have ordinances that limit groundwater export and several counties have ordinances that minimize unsustainable groundwater extraction. Please include a discussion of the following in this section: - Future well permitting must be coordinated with the GSP to assure achievement of the Plan's sustainability goals. - The State Third Appellate District recently found that Counties have a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting new wells near streams with public trust uses (ELF v. SWRCB and Siskiyou County, No. C083239). The need for well permitting programs to comply with this requirement should be stated in the text.
88	12	Sandi Matsumoto	The Nature Conservancy	8	Page 5-12	5.2.5.2		Defining the bottom of Subbasin based on geochemical properties is a suitable approach for defining the base of freshwater, however, as noted on page 9 of DWR's Hydrogeologic Conceptual Model BMP (https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12-23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". Thus, groundwater extraction well depth data should also be included in the determination of the basin bottom. This will prevent the possibility of extractors with wells deeper than the basin boundary (defined by the base of freshwater) from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary.
89	12	Sandi Matsumoto	The Nature Conservancy	9	Pages 5-12 to 5-24	5.2.6.1		The very shallow unconfined groundwater falls under DWR's definition of a principal aquifer, which is defined as "aquifer or aquifer system that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems" [23 CCR §351(aa)]. Thus, disregarding this shallow groundwater as a principal aquifer due to its "shallow nature and high salinity" is inadequate. This is especially true in the places where projects to develop the shallow groundwater may be considered for use on more salt-tolerant crops. SGMA requires GSAs to sustainably manage groundwater resources in all aquifers, especially if groundwater use and management can result to impacts on beneficial uses and users. Please refer to Best Practice #1 in Attachment C for further explanation and accompanying graphics.

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90	12	Sandi Matsumoto	The Nature Conservancy	10	Pages 5-14 to 5-31	5.2.6.1		Regional basin-wide geologic cross sections are provided in Figures 5-7 through 5-16 (p. 5-15 to 5-27). These cross-sections do not include a graphical representation of the manner in which the very shallow groundwater or perched water may interact with ISWs or GDEs that would allow the reader to understand this topic. Please include example near-surface cross section details that depict the conceptual understanding of shallow groundwater and stream interactions at different locations, including the perched aquifer and the Upper Aquifer.
91	12	Sandi Matsumoto	The Nature Conservancy	11	Pages 5-14 to 5-31	5.2.6.1		The two-aquifer system is separated primarily by the Corcoran Clay, which has a variable depth as shown on Figure 5-17 (p. 5-28). The Corcoran Clay is absent in the far western parts of the Subbasin. There is also a Very Shallow unconfined groundwater zone, and perched water is sometimes present due to fine-grained clay layers. Please provide a map showing where the Very Shallow groundwater zone and the perched aquifers are located.
92	12	Sandi Matsumoto	The Nature Conservancy	12	Pages 5-92 to 5-118	5.3.2.4		Data gap areas for the Upper Aquifer, Lower Aquifer, or both are shown in Figure 5- 64 (p. 5-96). Much of the data gaps area is located within the Northern and Central Delta-Mendota Regions. There are very few wells screened in the Upper Aquifer shown in the groundwater contour map in Spring 2013 and Fall 2013, as shown on Figures 5-80 and 5-81, within the Northern and Central Delta-Mendota Regions. Please explain how these data gaps will be filled, or refer to a section later in the GSP.
93	12	Sandi Matsumoto	The Nature Conservancy	13	Pages 5-92 to 5-118	5.3.2.4		Well hydrographs are shown for wells screened in the Very Shallow Groundwater in Figure 5-67 (p. 5-99). Please indicate which of these wells are located within the Northern and Central Delta-Mendota Regions.
94	12	Sandi Matsumoto	The Nature Conservancy	14	Pages 5-92 to 5-118	5.3.2.4		The GSP states (p. 5-94) that vertical gradients are restricted by the Corcoran Clay. In the western part of the Subbasin, interfingering clay layers minimize downward gradients, except where the clay has been compromised by the construction of composite wells. Please provide data or analysis to explain and substantiate the vertical gradients noted in the text.
95	12	Sandi Matsumoto	The Nature Conservancy	15	Pages 5-170 to 5-172	5.3.7		The regulations [23 CCR §351(o)] define interconnected surface waters (ISW) as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted". "At any point" has both a spatial and temporal component. Even short durations of interconnections of groundwater and surface water can be crucial for surface water flow and supporting environmental users of groundwater and surface water. ISWs can be either gaining or losing. The text states (p. 5-170) "Streams stemming from the west side of the Delta-Mendota Subbasin are ephemeral in nature, and only two of these creeks reach the San Joaquin River (Del Puerto Creek and Orestimba Creek). These creeks lose their flows to the underlying vadose zone (net-losing streams) and therefore do not represent areas of potential GDEs." No evidence is provided in the Plan that states that these streams are not connected to the Upper Aquifer along some portion of the drainage for some time period. Please provide data or analysis to back up the statement that these westside streams do not represent areas of potential GDEs. Please reconcile data gaps (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP to improve ISW mapping in future GSPs.
96	12	Sandi Matsumoto	The Nature Conservancy	16	Pages 5-170 to 5-172	5.3.7		Please provide more detail on how the quantity of gains and/or depletions from the groundwater at each reach of the San Joaquin River was determined. For example, were the values taken from the cited literature sources or determined from further analysis or modeling? Please provide or refer to a map that shows the designated reaches listed in Table 5-9.
97	12	Sandi Matsumoto	The Nature Conservancy	17	Page 5-172	5.3.7.6		The text states (p. 5-172): "To further screen available information regarding GDEs, the following standards were set for identifying GDEs in the Northern and Central Delta-Mendota Regions: (1) areas with depths to groundwater levels greater than 30 feet were eliminated unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks); (2) seasonally-managed areas and wetlands were eliminated due to their dependence on applied surface water; and (3) a 100-foot buffer was applied around the San Joaquin River within the Northern Delta-Mendota Region to include all communities in the NCCAG dataset as potential GDEs, except where professional judgement and local knowledge determined GDEs were not present." The three standards are discussed in turn below.
98	12	Sandi Matsumoto	The Nature Conservancy	18	Page 5-172	5.3.7.6		The following comments apply to Standard (1): Areas with depth to groundwater greater than 30 feet in Spring 2015, unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks). - While depth to groundwater levels within 30 feet are generally accepted as being a proxy for confirming that polygons in the NC dataset are connected to groundwater, it is highly advised that seasonal and interannual groundwater fluctuations in the groundwater regime are taken into consideration. Utilizing groundwater data from one point in time (e.g., Spring 2015) can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Based on a study we recently submitted to Frontiers in Environmental Science Journal, we've observed riparian forests along the Cosumnes River to experience a range in groundwater levels between 1.5 and 75 feet over seasonal and interannual timescales. Seasonal fluctuations in the regional water table can support perched groundwater near an intermittent river that seasonally runs dry due to large seasonal fluctuations in the regional water table. While perched groundwater itself cannot directly be managed due to its position in the vadose zone, the water table position within the regional aquifer (via pumping rate restrictions, restricted pumping at certain depths, restricted pumping around GDEs, well density rules) and its interactions with surface water (e.g., timing and duration) can be managed to prevent adverse impacts to ecosystems due to changes in groundwater quality and quantity under SGMA. We highly recommend using depth to groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. Please refer to Attachment C of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network. Additionally, Spring 2015 is after the SGMA benchmark date of January 1, 2015. Please include groundwater condition data prior to the SGMA benchmark date in the analysis.
99	12	Sandi Matsumoto	The Nature Conservancy	19	Page 5-172	5.3.7.6		Please confirm that wells screened in the Upper Aquifer (or very shallow groundwater where present) are being used to verify whether NCCAGs are actual GDEs, given the significant data gap areas noted on Figure 5-64 (page 5-96). Using "depth to groundwater" measurements from confined aquifers is mapping piezometric head of the confined aquifer and not detecting groundwater conditions in the principal aquifers of the unconfined aquifer that are supporting the ecosystem. If there is insufficient groundwater level data in the Upper Aquifer, then the NCCAGs in these areas should be included as GDEs in the GSP until data gaps are reconciled in the monitoring network.
100	12	Sandi Matsumoto	The Nature Conservancy	20	Page 5-172	5.3.7.6		Please provide depth to groundwater contour maps and note the following best practices for doing so. i) Are the wells used for interpolating depth to groundwater sufficiently close (<5km) to NC Dataset polygons to reflect local conditions relevant to ecosystems? ii) Are the wells used for interpolating depth to groundwater screened within the surficial unconfined aquifer and capable of measuring the true water table (see comment b above)? iii) Is depth to groundwater contoured using groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape? This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM) to estimate depth-to-groundwater contours across the landscape. This will provide much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. Depth to groundwater contours developed from depth to groundwater measurements at wells assumes that the land surface is constant, which is a poor assumption to make. It is better to assume that water surface elevations are constant in between wells, and then calculate depth to groundwater using a DEM of the land surface to contour depth to groundwater.
101	12	Sandi Matsumoto	The Nature Conservancy	21	Page 5-172	5.3.7.6		Please use care when considering rooting depths of vegetation. Please list the species in each GDE, and whether the GDE was eliminated or retained based on the 30-foot standard, and provide evidence for the decision. While Valley Oak (Quercus lobata) have been observed to have a max rooting depth of ~24 feet (https://groundwaterresourcehub.org/gde-tools/gde-rooting-depths-database-for-gdes/), rooting depths are likely to spatially vary based on the local hydrologic conditions available to the plant. Also, max rooting depths do not take capillary action into consideration, which will vary with soil type and is an important consideration since woody phreatophytes generally do not prefer to have their roots submerged in groundwater for extended periods of time, and hence can access groundwater at deeper depths.
102	12	Sandi Matsumoto	The Nature Conservancy	22	Page 5-172	5.3.7.6		The following comment applies to Standard (2): Habitat areas with supplemental water. The application of supplemental water to managed wetlands does not preclude the possibility that NC polygons could be accessing groundwater in addition to the supplied water. In the scientific literature, it is generally acknowledged that GDEs can rely on groundwater for some or all of their requirements. GDEs can rely on multiple water sources simultaneously and at different temporal/spatial scales (e.g., precipitation, river water, reservoir water, soil moisture in the vadose zone, groundwater, applied water, treated wastewater effluent, urban stormwater, irrigated return flow). SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface". Hence, we recommend that depth to groundwater contour maps are used to identify whether a connection to groundwater exists for the managed wetlands in the Northern and Central Delta-Mendota Regions. Please refer to Attachment C of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer.

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103	12	Sandi Matsumoto	The Nature Conservancy	23	Page 5-172	5.3.7.6		The following comment applies to Standard (3): 100-foot buffer area applied around the San Joaquin River. We disagree with the use of an arbitrary 100-foot cutoff. In addition to "professional judgement and local knowledge" please explain how this criterion is supported by groundwater level and plant physiological data to exclude potential GDEs near the river.
104	12	Sandi Matsumoto	The Nature Conservancy	24	Page 5-172	5.3.7.6		On p. 5-173 the GSP states, "Possible GDEs have also been identified along streams originating from the Coast Range; however, these areas are topographically disconnected from the Subbasin's principal aquifers and are located in areas of de minimis or zero groundwater use and are therefore are unmanageable through the Sustainable Groundwater Management Act (SGMA)." Please provide further information on the analysis of GDEs on westside streams, including citing field studies or modeling studies that show the disconnected nature of these streams. Indicate on which streams GDE polygons were excluded and on which streams GDE polygons were retained. Identify any data gaps and ensure that GDE polygons are retained until data gaps are reconciled.
105	12	Sandi Matsumoto	The Nature Conservancy	25	Page 5-172	5.3.7.6		The NC Dataset comprises 4,852 acres of potential GDEs for the Northern and Central Delta Mendota Regions. On Figures 5-118 and 5-119, it is difficult to distinguish the colors underneath the hatching, and thus see which removal categories apply to the Northern and Central Delta-Mendota Regions. Please consider changing the hatching pattern or supplying a map for just the Northern and Central Delta-Mendota Regions. Please be more specific when denoting "mapping error". The basin's GDE shapefile, which is submitted via the SGMA Portal, should also include two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed). In addition, in the text please cite the acreage of GDEs retained and removed.
106	12	Sandi Matsumoto	The Nature Conservancy	26	Page 5-172	5.3.7.6		Please provide information on the historical or current groundwater conditions in the GDEs or the ecological conditions present. Refer to GDE Pulse (https://gde.codefornature.org; See Attachment D of this letter for more details) or any other locally available data (e.g., leaf area index, evapotranspiration or other data) to describe depth to groundwater trends in and around GDE areas, as well as trends in plant growth (e.g., NDVI) and plant moisture (e.g., NDMI). Below is a screenshot example of data available in GDE Pulse for NC dataset polygons found in the Northern and Central Delta-Mendota Regions.
107	12	Sandi Matsumoto	The Nature Conservancy	27	Page 5-172	5.3.7.6		Please provide an ecological inventory (see Appendix III, Worksheet 2 of the GDE Guidance) for all potential GDEs that includes the vegetation types or habitat types and rank the GDEs as having a high, moderate or low value; and what characterizes the rank.
108	12	Sandi Matsumoto	The Nature Conservancy	28	Page 5-172	5.3.7.6		Please identify whether any endangered or threatened freshwater species of animals and plants, or areas with critical habitat were found in or near any of the GDEs since some organisms rely on uplands and wetlands during different stages of their lifecycle. Please refer to the list of species included as Table 5-10 of the GSP, the Critical Species Lookbook, and CDFW's CNDDB database.
109	12	Sandi Matsumoto	The Nature Conservancy	29	Pages 5-181 to 5-235	5.4		Evapotranspiration is included as an outflow category in the land surface budget, however it is not split between type of evapotranspiration. Please separate this term by land-use type (for example, agricultural; municipal and domestic; and native and riparian).
110	12	Sandi Matsumoto	The Nature Conservancy	30	Pages 5-181 to 5-235	5.4		Groundwater outflow to ET does not appear to be identified as a groundwater budget component. Since GDEs (including wetlands, riparian vegetation, phreatophytes and other communities) are recognized as beneficial users of groundwater in the Northern and Central Delta-Mendota Regions, it is appropriate to include them in these calculations.
111	12	Sandi Matsumoto	The Nature Conservancy	31	page 6-25	6.2		Since GDEs are present within the Subbasin (please see comments under checklist items 16-20) they should be recognized as beneficial users of groundwater and should be included in the Sustainability Goal. In addition, a statement about any intention to address pre-SGMA impacts to GDEs and ISWs should be included here and within the interim milestones and measurable objectives.
112	12	Sandi Matsumoto	The Nature Conservancy	32	page 6-25	6.2		We request that the connectivity of GDEs and ISWs to each aquifer (including the very shallow groundwater, where present) be made clear. If connectivity to the very shallow surficial aquifer exists, please establish its current and/or future management to determine if it is a principal aquifer. If it is a principal aquifer, it should be included in the sustainability goal and sustainability criteria. If it isn't a principal aquifer, please include text that states the future protection of GDEs would be incorporated into the 5-year update as future management plans are developed.
113	12	Sandi Matsumoto	The Nature Conservancy	33	page 6-25	6.2		The GSP states that there are time periods of ISW connectivity along the San Joaquin River on the northern end of the basin. Please include protection of ISWs as a part of the Sustainability Goal.
114	12	Sandi Matsumoto	The Nature Conservancy	34	page 6-25	6.2		GDEs are dependent, in part, on suitable water quality; however, this GSP only considers water quality for irrigation and domestic use. Since GDEs may also be affected by water quality they should be included in the Sustainability Goal.
115	12	Sandi Matsumoto	The Nature Conservancy	35	Page 6-12	6.3.1.3		This Measurable Objective does not consider GDEs. Please include GDEs (see comments under Checklist Items 16-20) in this section and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.
116	12	Sandi Matsumoto	The Nature Conservancy	36	Page 6-29	6.5.3		This Measurable Objective does not consider water quality needs of GDEs. Please modify this section to specifically address degraded water quality from total dissolved solids (TDS), arsenic (As), boron (B), and other potential constituents of concern to wildlife and vegetation communities of GDEs.
117	12	Sandi Matsumoto	The Nature Conservancy	37	Page 6-35	6.3.6.3		The GSP states that depletions will be considered from monitoring data collected in 2020 to 2025 and proposes a qualitative statement of no increased depletions. Based on statements made in Chapter 5, Sections 5.3.7 (pp. 5-170 to 5-173), this GSP only considers gaining and losing reaches of the San Joaquin River as being potentially interconnected (See Table 5-9 on p. 5-172). There are several ephemeral streams that may reach the San Joaquin in a given year that are dismissed because they are not regularly connected and, or flow is ephemeral. Streams that are not continuously connected spatially and, or temporally, or are ephemeral in nature, are still potential ISWs and should not be excluded from this GSP. Ephemeral water courses in the basin include Orestimba Creek, Del Puerto Creek, Mercy Creek, Hospital Creek, Inghram Creek Salado Creek, and Cow Creek. For example, on page 4-7 in the Stanislaus County Hydrologic Model: Development and Forecast Modeling (Stanislaus County, California) it states "data from nearby calibration wells suggests that in fact Orestimba Creek is groundwater connected and gaining in its middle and lower reaches". Because the question of ISWs is a data gap, it needs to be acknowledged and a plan to reconcile the data gap specified. Even though the streams may not be continuously connected, they may still be ISWs, and should be included in the Measurable Objectives.
118	12	Sandi Matsumoto	The Nature Conservancy	38	Page 6-5	6.3.1.2		The GSP states that environmental use was considered when establishing the groundwater level minimum threshold; however, the criteria used was not included in the narrative. In addition, Table 6-1 (p. 6-9) does not identify which DMS ID corresponds to GDEs and, or ISWs. Please update this section to provide detail on criteria used to evaluate minimum thresholds for GDEs and ISWs, and to establish proposed thresholds, or a process for establishing thresholds in regards of protecting GDEs and ISWs.
119	12	Sandi Matsumoto	The Nature Conservancy	39	Page 6-16	6.3.3.2		Although agricultural water quality concerns were articulated, similar concerns were not identified for GDEs. Please include a discussion about GDEs and water quality, and how the minimum thresholds and interim milestones will help achieve the sustainability goal as it pertains to the environment.
120	12	Sandi Matsumoto	The Nature Conservancy	40	Page 6-35	6.3.6.2		The GSP states that depletions will be analyzed to determine the location, timing, and quantity of depletions from monitoring data collected between 2020 to 2025, and proposes a qualitative statement of no increased depletions. Please modify this section of the GSP to provide a statement that quantifies gains and, or losses similar to those shown in Table 5-9 (p. 5-172) as they relate to the 2015 conditions.
121	12	Sandi Matsumoto	The Nature Conservancy	41	Page 6-3	6.3.1.1		This section only describes undesirable results relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline. Please add "potential adverse impacts to GDEs and ISWs" to the list of potential undesirable results presented in Section 6.3.1.1.
122	12	Sandi Matsumoto	The Nature Conservancy	42	Page 6-4	6.3.1.1.2		This section states that "..conditions are deemed significant and unreasonable, when groundwater elevations drop below the site-specific minimum threshold of 25% of representative monitoring wells in a principal aquifer.....in a given year". Please describe how a drop below the site-specific minimum threshold of 25% of representative monitoring wells in a principal aquifer relates to undesirable results. A specific threshold should be provided for monitoring wells that measure groundwater levels near GDEs.
123	12	Sandi Matsumoto	The Nature Conservancy	43	Page 6-4	6.3.1.1.2		For each identifiable GDE unit with supporting hydrological datasets please include the following: - Plot and provide hydrological datasets for each GDE. - Define the baseline period in the hydrologic data. - Classify GDE units as having high, moderate, or low susceptibility to changes in groundwater. - Explore cause-and-effect relationships between groundwater changes and GDEs.
124	12	Sandi Matsumoto	The Nature Conservancy	44	Page 6-4	6.3.1.1.2		For each identifiable GDE unit without supporting hydrological datasets please describe data gaps and/or insufficiencies.
125	12	Sandi Matsumoto	The Nature Conservancy	45	Page 6-4	6.3.1.1.2		Compile and synthesize biological data for each GDE unit by including: - Plots of biological datasets for each GDE unit, and when possible provide baseline conditions for assessment of trends and variability. - Describe data gaps/insufficiencies.

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126	12	Sandi Matsumoto	The Nature Conservancy	46	Page 6-4	6.3.1.1.2		Description of potential effects on GDEs, land uses, and property interests, including: - Cause-and-effect relationships between GDE and groundwater conditions. - Impacts to GDEs that are considered to be "significant and unreasonable". - Report known hydrological thresholds or triggers (e.g., instream flow criteria, groundwater depths, water quality parameters) for significant impacts to relevant species or ecological communities. - Land uses include and consider recreational uses (e.g., fishing/hunting, hiking, boating). - Property interests include and consider privately and publicly protected conservation lands and opens spaces, including wildlife refuges, parks, and natural preserves.
127	12	Sandi Matsumoto	The Nature Conservancy	47	Page 6-15	6.3.3.1.2		This Section discusses MCLs and WQOs but does not include metrics for GDEs. Please modify this section to specifically address degraded water quality from TDS, As, B and other constituents that could pose a threat to wildlife and / or vegetative communities associated with GDEs and ISWs. Although As and CrVI are mentioned in this section, please add a statement addressing that overpumping and dewatering of aquitards has been identified as a potential source of elevated As concentrations above drinking water standards in San Joaquin Valley aquifers. The following is a link to a paper by Smith, Knight and Fendorf (2018) titled "Overpumping leads to California groundwater arsenic threat": (https://www.nature.com/articles/s41467-018-04475- 3.
128	12	Sandi Matsumoto	The Nature Conservancy	48	Page 6-34	6.3.6		The GSP states that depletions will be considered from monitoring data collected between 2020 to 2025. At a minimum the GSP should maintain the current level of ISWs until additional information is collected and measurable objectives and minimum thresholds can be more precisely defined. For example, Table 5-9 (p. 5- 172) estimates the quantity of gains and depletions for reaches of the San Joaquin River only. This type of information should be used to support the statement of undesirable results and should be expanded to other streams that are potential ISWs. Please modify this section of the GSP to include a statement that there will be no increase in depletions for confirmed and potential ISWs, at least until data gaps are filled.
129	12	Sandi Matsumoto	The Nature Conservancy	49	Page 7-35	7.2.5.1		The GSP proposes to use groundwater level monitoring for tracking chronic groundwater level and as a proxy for groundwater storage and depletion of interconnected surface waters. A set of representative wells has been selected in six subregions, shown in Figure 7-2 (p. 7-33). The representative wells to be used for monitoring groundwater levels in the semi-confined Upper Aquifer and the confined Lower Aquifer are shown in Figure 7-3 (p. 7-39) and Figure 7-4 (p. 7-40). Areas with spatial data gaps have been identified and are shown on both maps. The potential locations for wells for monitoring both aquifers are shown in Figures 7-5 and 7-6 (p. 7-47 and 7-48). Tables 7-6 and 7-7 (p. 7-37 and 7-38) indicate that some wells are missing key information, e.g. status, well depth or screened interval. Although a list of criteria including "adequate construction information" were listed on page 7-41, it appears that not all criteria were met in all the wells. A plan to fill these data gaps is included in Section 7.2.5.6.6 (Plan to Fill Data Gaps) that includes obtaining video logs of some wells and drilling new wells. Please emphasize in the text the importance of using dedicated monitoring wells with complete construction information in order to accurately monitor single aquifers.
130	12	Sandi Matsumoto	The Nature Conservancy	50	Page 7-35	7.2.5.1		The GSP states on p. 7-45: "Not all wells included in these networks are dedicated monitoring wells, as recommended by DWR's Monitoring Networks and Identifications of Data Gaps BMP (2016a)." The GSP noted that an effort would be made to replace pumping wells with dedicated monitoring wells. Please discuss the importance of using dedicated monitoring wells instead of pumping wells at all locations.
131	12	Sandi Matsumoto	The Nature Conservancy	51	Page 7-35	7.2.5.1		The GSP states on p. 7-45: "For the purpose of monitoring depletions of interconnected surface water, where groundwater levels are used as a proxy, four additional wells with tentative locations have been identified that would also be included in the groundwater level monitoring network. These wells are located within three miles of the San Joaquin River within the Northwestern Delta-Mendota GSA and Patterson Irrigation District GSA." Consideration should be given to using wells closer to the river, or installing new wells. Please discuss how the data will be used to verify ISWs and quantify depletions of stream flow due to groundwater extraction.
132	12	Sandi Matsumoto	The Nature Conservancy	52	Page 7-67	7.2.5.6		At present there are only two wells located within 3 miles of the San Joaquin River in the ISW area. Locations of four clustered wells have been identified and other stream gauging sites proposed as shown in Figure 7-11 (p. 7-73). Please expand on the discussion of how the new well and stream data will be used to improve ISW mapping and inform an adequate analysis. Please discuss how the data will be used to verify possible GDEs and reaches that include ISWs.
133	12	Sandi Matsumoto	The Nature Conservancy	53	Page 7-67	7.2.5.6		As stated above in the comments for Checklist Items 8-10, please reconcile data gaps (shallow monitoring wells, stream gauges, and nested/clustered wells) along westside ephemeral streams in this section of the GSP to improve ISW mapping in future GSPs.
134	12	Sandi Matsumoto	The Nature Conservancy	54	Page 7-5	Table 7-2		Although Table 7-2 (p. 7-5) provides information on how each project supports ISWs there are no criteria provided on how GDEs and ISWs were considered in project selection. Please include criteria considered for project selection as it relates to GDEs and ISWs.
135	12	Sandi Matsumoto	The Nature Conservancy	55	Page 7-9	7.1.1.1.1		In Section 7.1.1.1.1 (p. 7-9), the narrative supporting the Los Banos Creek Recharge and Recovery Project states that project beneficiaries are groundwater users but there is no discussion about how environmental users (i.e., GDEs and ISWs) will specifically benefit. Please update the environmental benefits and multiple benefits as criteria for assessing project priorities and articulate how project monitoring will support GDEs and ISWs.
136	12	Sandi Matsumoto	The Nature Conservancy	56	Pages 7-5 to 7-8	Table 7-2		Table 7-2 (pp. 7-5 to 7-8) identifies many important projects; however, the descriptions of objectives for each sustainability indicator for these projects only identify benefits to water level and storage. Since maintenance or recovery of groundwater levels, or construction of recharge facilities, may have potential environmental benefits in many cases it would be advantageous to demonstrate these multiple benefits from a funding and prioritization perspective. For the projects already identified, please consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue.
137	12	Sandi Matsumoto	The Nature Conservancy	57		7.1		If ISWs will not be adequately protected or enhanced by those listed, please include and describe additional management actions and projects targeted for protecting known and potential ISWs.
138	12	Sandi Matsumoto	The Nature Conservancy	58	Page 7-21	Table 7.4		Recharge ponds, reservoirs and facilities for managed stormwater recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. In some cases, such facilities have been incorporated into local Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs), more fully recognizing the value of the habitat that they provide and the species they support. In addition, incorporating HCPs, NCCPs, and managed wetlands into recharge projects may effectively tie into the project's permitting strategy described in Section 7.1.5. For projects that construct recharge ponds, please update Table 7-4 (p. 7-21) to identify if there are multi-benefit opportunities that can incorporate habitat components into project designs and how the recharge ponds will be managed to benefit environmental uses and users.
139	12	Sandi Matsumoto	The Nature Conservancy	59	Page 7-12	7.1.1.2		This section discusses the Management Actions for GSP implementation and SGMA compliance; however, these actions are focused on meeting groundwater level and storage measures and do not include support for GDEs or ISWs. Please modify the Management Actions to include education and outreach for GDEs, ISWs and the sensitive habitats they support. Please update Section 7.1.1.2 Tier 1 Management Actions (p. 7-12) and Section 7.1.1.4 Tier 2 Management Actions (p. 7-15) to include GDEs and ISWs.
140	13	Gordon Enas	Modesto Irrigation District	1	Page 2-101			Page 2-101, 2nd paragraph reads, "West Stanislaus Irrigation District is entitled to extract up to 189,790 AFY from the San Joaquin and Tuolumne rivers..." This is incorrect. WSID is not entitled to divert water from the Tuolumne River.
141	14	Ted Craddock	State Water Project	1				The GSP provides a good description of the Plan Area (Section 2), governance and administration (Section 3), outreach and communication (Section 4), and basin setting (Section 5). The basin setting section appropriately describes the Aqueduct and the impacts of continued land subsidence. However, Sustainable Management Criteria (SMC) in Section 6 and Sustainability Implementation in Section 7 requires further information and discussion of the impacts of land subsidence on conveyance capacity and operational flexibility of the Aqueduct. This additional information is needed for consistency with later chapters.
142	14	Ted Craddock	State Water Project	2		6.3.5.2		Section 6.3.5.2 says that the GSP developers met and coordinated with DWR on development of the SMCs and thresholds; however, these meetings and coordination did not include DWR-SWP. The statement that these criteria and thresholds address "DWR's tolerance for additional land subsidence along the Aqueduct to ensure minimum thresholds set are compatible with DWR's projected operations of the Aqueduct" is incorrect.
143	14	Ted Craddock	State Water Project	3				There is a need for additional monitoring sites in the southern quarter of the basin proximal to the Aqueduct in an area on the north end of the Panoche subsidence bowl. The collection of quality monitoring data over time will be critical to delineate the extent of land subsidence along the Aqueduct. The current plan does not adequately address the effects of land subsidence with regards to impacts on the operation and maintenance of the Aqueduct as well as damage to the Aqueduct. As this is a critical data gap, we recommend inclusion of DWR-SWP Aqueduct survey data in the GSP's monitoring plan and commit to facilitating transfer of this data. This approach will allow the GSAs and DWR-SWP to obtain relevant, high-quality data related to subsidence along the Aqueduct.

Northern & Central Delta-Mendota Subbasin GSP Public Draft
Tracking of Comments Received as of 21Oct2019

	Letter No.	Commenter	Commenter Organization	Comment No.	Page	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
144	14	Ted Craddock	State Water Project	4				Some hydrologic interpretations appear to be unsupported by data. For example, Section 6.3.2.1.1 states that "Depletion of groundwater storage appears to have occurred over the historic and current period established in the water budgets for the Northern and Central Delta-Mendota Regions; however, based on existing data, this trend appears to have been reversed as a result of recent wet years, and are not anticipated to occur in the future." This statement suggests there will always be significant wet years to offset the trend of depletion of groundwater, which is an unrealistic assumption. When drought conditions reemerge and surface water supplies are limited, groundwater use will likely increase and cause a decrease in groundwater recharge
145	15	Kerry Fuller	ChurchwellWhite	1		7		The City's detention basins, the Del Puerto Dam, and detention basins on Little Salado Creek for the Crows Landing military site are all still listed in the GSP, but the amount of storage and recharge is now discussed. (Pages 7-11, 7-13, 7-14.) The City's basins are anticipated to provide 1,700 AFY of recharge using stormwater runoff, but the connection to Del Puerto Creek for the runoff is not identified. (Page 7-11.) The Del Puerto Dam description acknowledges that seasonal storm flows through Del Puerto Canyon would be captured and discharged perennially for downstream use with on average 2,756 AFY from Del Puerto Creek being captured and stored with wet years estimates of up to 35,570 AFY of creek flows being stored for later use. (Page 7-13, 7-14.) Finally, the planned detention basin for Little Salado Creek associated with the County's Crow's Landing project is discussed as providing flood relief for the City of Patterson with the potential of providing 489 AFY of recharge in wet years
146	15	Kerry Fuller	ChurchwellWhite	2		7		Chapter 7 continues to include the idea of Patterson shifting to a water portfolio that goes beyond groundwater. It is contemplated that if the basin is not meeting its sustainability goals, that shift could start being discussed as early as 2026, in addition to other activities to limit pumping like fallowing fields.
147	15	Kerry Fuller	ChurchwellWhite	3		8		To implement and fund the GSP, chapter 8 acknowledges that the cost to implement the GSP will be significant and the continued studies and updates to the GSP will likely cost $1.5 million and $2.5 million per year. The City's share of the ongoing studies and updates is somewhere around 1/9 of 16.67% of the costs. With this division of costs, in VERY rough numbers, the GSP costs, not the projects or management activities needed to implement it, are likely around $5,000 a year. The costs for the projects and management activities is estimated at $6.6 million to $40 million per year over the 20-year planning period for the GSP. The City, as the GSA in its jurisdiction, has the authority to determine the funding mechanism it will use to cover those costs. The ones contemplated in the GSP are assessments, pumping fees, or a combination of both. (pages 8-7, 8-8.) The division of costs is included in Exhibit B through the cooperative agreement that the City executed in September of 2018.
148	16	Russ Freeman	Westlands Water District	1	Pg. 5-32	Section 5.2.7	"Groundwater southwest of this divide generally flows southwest toward Panoche Water District and Westlands Water District."	"Analysis from the Mendota Pool Group EIS-EIR shows that groundwater from the Lower Aquifer does not flow into the Westside Subbasin. Westlands GSA requests that the language be amended to remove the statement that groundwater flows into Westlands Water District or Westside Subbasin."
149	16	Russ Freeman	Westlands Water District	2	Pg. 5-94	Section 5.3.2.4	"Figure 5-79 shows a distinct trough-like depression in the Lower Aquifer's groundwater... indicated by the flow direction vectors"	"Figure 5-79 illustrates a groundwater contour map and includes the northern portion of the Westside Subbasin. The figure also depicts a trough-like depression immediately adjacent to the Westside Subbasin. The Westlands GSA respectfully requests that Figure 5-79 and any related figures be revised to exclude the Westside Subbasin. Figure 5-79 shows inconsistencies due to the timeline average used to create the groundwater contours."
150	16	Russ Freeman	Westlands Water District	3	Pgs. 5-36 to 5-79; 5-135 to 5-147		"Figures 5-21 - 5-57 & 5-93 - 5-102 display groundwater quality data within the Westside Subbasin that is inconsistent with the Westlands Water District GSA's groundwater quality data."	"The groundwater quality data depicted within the Westside Subbasin in Figures 5-21 - 5-57 and 5-93 - 5-102 is inconsistent with the Westlands GSA's groundwater quality data. Westlands respectfully requests that the groundwater quality data within the Westside Subbasin be removed from the Figures dur to this inconsistency."

PD-01

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October 11, 2019

Mr. Andrew Garcia
San Luis & Delta-Mendota Water Authority
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Telephone: (209)832-6229
By email to: andrew.garcia@sldmwa.org

Re: California Sportfishing Protection Alliance Comments on the Northern and Central Delta-Mendota Regions - Public Draft Groundwater Sustainability Plan.

Dear Mr. Garcia:

This office represents the California Sportfishing Protection Alliance (CSPA) regarding your review and adoption of the Northern and Central Delta-Mendota Regions - Public Draft Groundwater Sustainability Plan (Plan).

CSPA objects to your adoption of the Plan because it does not meet the requirements of the Sustainable Groundwater Management Act or the GSP Emergency Regulations at Title 23, Cal. Code Regs. section 350 et seq. (GSP Rules), as more fully explained in comments submitted by Hydrogeologist Greg Kamman under separate cover on this date.

The Plan does not satisfy GSP Rule 355.4(b)(1) because the Plan's description of the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable or supported by the best available information and best available science.

The Plan does not satisfy GSP Rule 355.4(b)(3) because the sustainable management criteria and projects and management actions identified in the plan are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Plan.

The Plan does not satisfy GSP Rule 355.4(b)(5) because the Plan does not contain or present substantial evidence to conclude that the projects and management actions identified to achieve sustainable yield are effective or feasible or not likely to prevent undesirable results or to ensure that the basin is operated within its sustainable yield.

These deficiencies are described in more detail in Mr. Kamman's October 11, 2019, comments.

For example, Section 354.16 of the GSP Regulations (Groundwater Conditions) states, "Each Plan shall provide a description of current and historical groundwater condition in the basin, including data from January 1, 2015, to current conditions, based on the best available information…."

The Plan improperly uses Water Year 2013 data to represent "current conditions." Per the GSP regulations, the Plan must present data at least as recent as January 1, 2015, and must present data "from January 1, 2015 to" the present where available. The Plan provides no explanation as to why data from 2016, 2017 or 2018 is not presented as required by the regulations. As Mr. Kamman observes, 2013 was a drought year; while 2017 and 2018 were not drought years. Consequently, there was more demand for groundwater in 2013 than in 2017 and 2018. 1

Also, in addition, the draft Plan's identification of Groundwater Dependent Ecosystems is derived from data from DWR and TNC, but the draft plan then "excludes seasonally-managed areas and wetlands" dependent "on applied surface water." (Plan, p. 5-172.) This exclusion is inconsistent with the Plan's inclusion of the areas mapped by DWR and TNC as long as the area's depth to groundwater is less than 30 feet. If 30-feet depth to groundwater is a reliable criterion for GDE areas that are not seasonally-managed areas or wetlands dependent on applied surface water, it should be a reliable criterion for GDE areas that are seasonally-managed areas/wetlands dependent on applied surface water. 2

Put another way, the fact that GDE vegetation or wetland features may be partially "dependent" on applied surface water does not mean the GDE is not also partially dependant on groundwater or would not be entirely dependent on groundwater if surface were no longer applied. Indeed, the Plan recognizes that "Management and protection of GDEs may require more focus on land use or irrigation activities more so than groundwater management." (Plan, p. 5-173.) The contemplated use of changing irrigation activities to maintain GDEs reflects the facts that GDEs may be dependent on both groundwater and surface water, and an area's partial dependence on surface water should not exclude it from classification as a GDE.

In addition, section 6.3.2.1.2 states: "Long-term reductions in storage are not anticipated for either principal aquifer so long as groundwater levels are managed above minimum thresholds." (Plan p. 6-13.) This conclusion is directly contradicted by the change in aquifer storage figures for the Upper Aquifer presented by Mr. Kamman, which show long-term downward trend in storage for the Upper Aquifer, even with implementation of proposed Projects and Management Actions. 3

CSPA urges the Authority to not adopt the Plan in its current form; to revise the draft Plan to remedy these informational deficiencies; and to recirculate the revised Plan for public comment.

Thank you for your attention to this matter.

Very Truly Yours,

Tom Lippe

Thomas N. Lippe

AD002a North Central Delta Mendota.wpd

PD-02

Audubon | CALIFORNIA

October 11, 2019

Submitted online at deltamendota.org/gsp-summary/

Re: Comments on Draft Groundwater Sustainability Plan for Northern and Central Delta-Mendota

Dear Northern and Central Delta-Mendota Region GSP Group,

Audubon California appreciates the opportunity to provide public comment on the draft Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Region.

Audubon California is a statewide nonprofit organization with a mission to protect birds and the places they need. Our organization has a long history of solutions-focused work in the Central Valley in collaboration with state and federal agencies, water districts, non-profits, and industry. We are commenting on draft Groundwater Sustainability Plans (GSPs) to provide technical information that may be missing or misrepresented and to identify areas of opportunity to partner with landowners or Groundwater Sustainability Agencies to provide groundwater and wildlife habitat benefits.

Audubon California is reviewing GSPs as a stakeholder for the environment with a particular focus on wetlands. Over 95 percent of historic wetlands in the Central Valley have been replaced with agriculture or urban development. The remaining wetlands are a critical component of the Pacific Flyway, supporting millions of migratory waterfowl and hundreds of thousands of shorebirds. Many wetlands in the Central Valley are highly managed, operating similar to agriculture in that they utilize delivered surface water or pumped groundwater to grow food resources and habitat for waterbirds.

Our comments on the North and Central Delta-Mendota Region draft GSP are detailed below. We welcome any follow up questions and look forward to seeing the issues raised below addressed in the final GSP submittal in January 2020.

P. 2-12: 2.1.2.3 Groundwater Use. Managed habitat should be included as groundwater users in this section. Federal, state, and private wetlands and habitat regularly rely on applied water, including groundwater, to manage and maintain important habitat for migratory birds and wildlife. The Delta-Mendota Subbasin is home to the largest contiguous tract of inland wetlands remaining on the west coast and is an important component to the Pacific Flyway. 1

P. 2-19: 2.1.2.5 Major Land Use Divisions. This section needs to include wetlands, as wetlands are neither grassland nor rangeland and comprise ~120,300 acres of the subbasin (see above section 2.1.2.1). The map cited in this section, Figure 2-14, does not include two of the listed land use divisions described here, Grassland and Rangeland, and Deciduous Forest (Riparian). These should be added to the map. Wetland is identified in the map, Figure 2-14, and should be added as a typical land use and described accordingly. 2

P. 2-37: 2.2 Land Use Elements. Figure 2-23 is inconsistent with land use maps in the previous sections (Figure 2-14). This inconsistency makes it unclear what the most accurate land use information is for the 3

subbasin. Additionally, wetlands should be identified in this figure and are a separate land use than riparian. The description of Figure 2-24 should also include San Joaquin National Wildlife Refuge as practicing conjunctive use, and that they rely on groundwater when surface water is not available. 3

P. 2-41: Figure 2-25 Land Use by Water Use Sector in the Northern and Central Delta-Mendota Regions. The area on the map that covers the San Joaquin River National Wildlife Refuge is identified as being non-irrigated. This is inaccurate and should reflect that habitat is managed with applied water, including groundwater. 4

P. 2-101: 2.5.8 Efforts to Develop Relationships with State and Federal Regulatory Agencies. As stated in our previous comment letter dated April 3, 2019 (attached below), the list of state lands owned and operated by California Department of Fish and Wildlife is incomplete. Volta Wildlife Area and Los Banos Wildlife Area are missing from the list and should be included. 5

P. 5-88: Figure 5-63 Imported Supplies, Delta-Mendota Subbasin. As stated in our previous comment letter dated April 3, 2019 (attached below), many of the public and private refuge and wildlife areas depicted in Figure 2-7 (Chapter 2) receive surface water through contracts or other arrangements, either from the State Water Project, Central Valley Project, or other adjacent subbasins (e.g. the Merced subbasin). The list of areas that receive imported supplies in Section 5.2.9.5 and the map of areas that receive imported supplies represented in Figure 5-63 should be modified to include state, federal and private wildlife refuges. 6

P. 5-170: 5.3.7.1 Available Data. It should be noted that the areas in the Northern and Central Delta-Mendota Region where GDEs are identified around the San Joaquin River are predominantly at the San Joaquin River National Wildlife Refuge, which provides important habitat to birds and wildlife. 7

P.5-172: 5.3.7.6 Groundwater Dependent Ecosystems. Many of the seasonally managed habitats and wetlands rely on pumped groundwater to meet their needs so should not be eliminated from the list of potential GDEs that are mapped. Additionally, it is unclear the basis for why 100-feet was selected as the buffer distance to evaluate potential GDEs surrounding the San Joaquin River. In many places along the river and nearby drainages GDEs are present at much further distances. Please clarify how these decisions were made. Depth to water used to identify GDEs was based on 2015 data. Due to natural inter-annual fluctuations and annual seasonality impacting water depths, it is recommended that multiple years are used to determine the extent of GDEs. 8

P.5-176: Table 5-10. List of Potential Freshwater Species, Northern and Central Delta-Mendota Regions. This table is incomplete and does not accurately reflect the status for some species. Swainson's Hawk, *Buteo Swainsoni*, is not on this list and needs to be added. Its Federal Protection Status is Bird of Conservation Concern and its State Protection Status is Threatened. The State Protection Status of Tricolored Blackbirds is Threatened. The Federal Protection Status of Long-billed Curlew, *Numenius americanus*, is Bird of Conservation Concern. These updates and additions should be added to table 5-10. 9

P. 5-192: Table 5-15. Historic and Current Land Surface Budget Assumptions. Environmental users, including areas with managed wetlands, should be included in the Pumping and Surface Water Deliveries categories in this table. Please clarify whether this land use and water demand is included in the Historic and Current Land Surface Budget Assumptions. Habitat water demands need to be recognized as an existing user, similar to other surface water and overlying groundwater users, particularly as the GSAs may move towards allocation systems that reflect current or past groundwater use. 10

P.5-194: Table 5-17. Projected Land Surface Budget Assumptions. The environmental users, including areas with managed wetlands, should be included in the Pumping category in this table. Please clarify whether this land use and water demand is included in the Projected Land Surface Budget Assumptions. 11

P. 5-199: Table 5-20. Land Surface Budget, Historic Water Budget (AFY). It is unclear whether the water demand information used in the Historic Land Surface Budget includes the water demands of managed wetlands. Please clarify whether this land use and water demand is included in the Historic Land Surface Budget. Habitat water demands need to be recognized as an existing user, similar to other surface water and overlying groundwater users, particularly as the GSAs may move towards allocation systems that reflect current or past groundwater use. 12

P. 5-199: Table 5-21. Groundwater Budget, Historic Water Budget (AFY). It is unclear whether the water demand information used in the Historic Groundwater Budget includes the water demands of managed habitat and wetlands. Please clarify whether this land use and water demand is included in the Historic Groundwater Budget. See our above comments regarding the Historic Land Surface Budget. 13

P. 5-200: Table 5-23. Land Surface Budget, Current Water Budget (AFY). It is unclear whether the water demand information used in the Current Land Surface Budget includes the water demands of managed habitats and wetlands. Please clarify whether this land use and water demand is included in the Land Surface Budget. See our above comments regarding the Historic Land Surface Budget. 14

P. 5-200: Table 5-24. Groundwater Budget, Current Water Budget (AFY). It is unclear whether the water demand information used in the Current Groundwater Budget includes the water demands of managed habitats and wetlands. Please clarify whether this land use and water demand is included in the Current Groundwater Budget. See our above comments regarding the Historic Land Surface Budget. 15

P. 5-201: Table 5-26. Land Surface Budget, Baseline Projected Water Budget (AFY). The water budget should add managed habitats to the Groundwater Pumping component in this table. Surface deliveries for managed habitat should also be included in the totals for each component, respectively, under Surface Water Deliveries. It is unclear whether the water demand information used in the Land Surface Budget, Baseline Projected Water Budget includes the water demands of managed habitats. Please clarify whether this land use and water demand is included here. These changes should also be reflected in Table 5-29 and 5-32. See our above comments regarding the Historic Land Surface Budget. 16

P. 5-203: Table 5-27. Groundwater Budget, Baseline Projected Water Budget (AFY). The water budget should add managed habitats to the Groundwater Pumping component in this table. Surface deliveries for managed habitat should be included in the totals for each component, respectively, under Surface Water Deliveries. It is unclear whether the water demand information used in the Groundwater Budget, Baseline Projected Water Budget includes the water demands of managed habitats. Please clarify whether this land use and water demand is included here. These changes should also be reflected in Tables 5-30 and 5-33. See our above comments regarding the Historic Land Surface Budget. 17

P. 7-5 thru 7-8: Table 7-2. Summary of How Northern & Central Delta-Mendota Region GSP Projects and Management Actions Address Sustainability Indicators. We are enthusiastic that many of the proposed and ongoing projects address multiple sustainability indicators. In-line with providing multiple benefits during project implementation we recommend that projects also include consideration of how to provide benefits to wildlife and habitat. Expanding priorities that have added benefit, such as habitat and wildlife value, can also lead to non-target benefits (e.g. water filtration or recreation opportunities). This may allow access to additional funding sources that otherwise would not have been available if these added benefits were not incorporated into project designs. 18

P. 7-9: Description of Projects and Management Actions. As specific projects become further developed, managed habitat areas may offer ideal opportunities for recharge or temporary storage of water during high flow events. Projects that utilize habitat lands may lessen negative impacts to cultivated lands from flooding or intentional recharge. We recommend that the GSAs investigate opportunities that can allow habitat areas to function both for habitat and to provide recharge or temporary storage. 19

Many priorities across a wide stakeholder group need to be addressed in order to effectively develop and implement successful projects and management actions. Recognizing the opportunity for projects and management actions to provide multiple benefits, including for wildlife and birds, Audubon is interested in helping the GSAs investigate these potential opportunities. The following proposed projects may provide opportunity for added benefits to wildlife and birds: Los Banos Creek Recharge and Recovery Project, Orestimba Creek Recharge and Recovery Project, City of Patterson Ponds for Stormwater Capture and Recharge, Little Salado Creek Groundwater Recharge and Flood Control Basin, Patterson Irrigation District Groundwater Banking and/or Flood-Managed Aquifer Recharge (MAR)-type Project, Ortigalita Creek Groundwater Recharge and Recovery Project, Develop Program to Incentivize Use of Surface Water and Reduce Groundwater Demand, and Rotational Fallowing of Crop Lands.

Thank you for your consideration of Audubon California's comments. If you would like to discuss this matter further, please do not hesitate to contact me at (916) 737-5707 or via email at sarthur@audubon.org.

Sincerely,

Samantha Arthur
Working Lands Program Director
Audubon California

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April 3, 2019

Dear North and Central Delta-Mendota GSP Group,

Thank you for the opportunity to review select chapters of the Northern & Central Delta-Mendota Groundwater Sustainability Plan (GSP). As an interested party, Audubon California received notice of the availability of draft chapters – Chapter 2 Plan Area and Chapter 5 Basin Setting – in an email from Woodard & Curran on March 14, 2019 with comments due April 3, 2019. This limited review period makes it challenging to provide comprehensive comments on the draft chapters, but we offer the below initial feedback and look forward to participating in the official comment period of the entire draft GSP.

The Department of Water Resources guidance document *Groundwater Sustainability Plan (GSP) Annotated Outline*, places the requirement to describe beneficial uses and users of groundwater in the basin in the Plan Area chapter. California Code of Regulations § 354.10.(a) requires "A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties." This description of beneficial uses and users is currently not included in the Plan Area chapter, so it should be added to this chapter or included elsewhere in a notice and communication section of the GSP.

Many of the refuge areas depicted in Figure 2-7 (Chapter 2) receive surface water through contracts or other arrangements, where the water is imported from the Delta (either as State Water Project or Central Valley Project water) or from other adjacent subbasins (e.g. the Merced subbasin). The list of areas that receive imported supplies in Section 5.2.9.5 and the map of areas that receive imported supplies represented in Figure 5-63 should be modified to include state, federal and private wildlife refuges. The refuge areas depicted in Figure 2-7 should be included in the lands that receive imported supplies.

The list of state lands owned or operated by the California Department of Fish and Wildlife in Chapter 2 (p. 101) is not complete. Both Los Banos and Volta Wildlife Areas are missing from this list.

Thank you for your consideration of these initial comments, and Audubon California looks forward to the official public release of the full GSP draft. Please feel free to contact me with any questions at sarthur@audubon.org.

Sincerely,

Audubon | CALIFORNIA

Samantha Arthur
Conservation Project Director
Audubon California

PD-03

Audubon | CALIFORNIA

Dear North and Central Delta-Mendota GSP Group,

Thank you for the opportunity to review select chapters of the Northern & Central Delta-Mendota Groundwater Sustainability Plan (GSP). As an interested party, Audubon California received notice of the availability of draft chapters – Chapter 2 Plan Area and Chapter 5 Basin Setting – in an email from Woodard & Curran on March 14, 2019 with comments due April 3, 2019. This limited review period makes it challenging to provide comprehensive comments on the draft chapters, but we offer the below initial feedback and look forward to participating in the official comment period of the entire draft GSP.

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Thank you for your consideration of these initial comments, and Audubon California looks forward to the official public release of the full GSP draft. Please feel free to contact me with any questions at sarthur@audubon.org.

Sincerely,

Audubon | CALIFORNIA

Samantha Arthur
Conservation Project Director
Audubon California

PD-04

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October 7, 2019

Via Mail and Electronic Mail

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San Luis & Delta-Mendota Water Authority
842 6th Street
Los Banos, California 93635
Email: andrew.garcia@sldmwa.org

Subject: Comments on the Northern and Central Delta Mendota Groundwater Sustainability Plan

Dear Mr. Garcia:

The California Department of Fish and Wildlife (Department) Central Region is providing comments on the Northern and Central Delta Mendota Draft Groundwater Sustainability Plan (NCDMGSP) prepared by San Luis & Delta-Mendota Water Authority pursuant to the Sustainable Groundwater Management Act (SGMA). As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of Groundwater Sustainability Plans (GSP) under SGMA represents a new era of California groundwater management. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems and species depend on groundwater and interconnected surface waters. SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to GSPs:

- Groundwater Sustainability Plans should identify and consider impacts to groundwater dependent ecosystems (GDEs) pursuant to 23 CCR § 354.16(g) and Water Code § 10727.4(l);

- Groundwater Sustainability Agencies should consider all beneficial uses and users of groundwater, including environmental users of groundwater pursuant to Water Code § 10723.2(e); and Groundwater Sustainability Plans should identify and consider potential effects on all beneficial uses and users of groundwater pursuant to 23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3);

- Groundwater Sustainability Plans should establish sustainable management criteria that avoid undesirable results within 20 years of the applicable statutory deadline, including depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water pursuant to 23 CCR § 354.22 *et seq*. and Water Code §§ 10721(x)(6) and 10727.2(b) and describe monitoring networks that can identify adverse impacts to beneficial uses of interconnected surface waters pursuant to 23 CCR § 354.34(c)(6)(D); and

- Groundwater Sustainability Plans should account for groundwater extraction for all Water Use Sectors including managed wetlands, managed recharge, and native vegetation pursuant to 23 CCR §§ 351(al) and 354.18(b)(3).

Accordingly, the Department values SGMA groundwater planning that carefully considers and protects groundwater dependent ecosystems and fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.

COMMENT OVERVIEW

The Department supports ecosystem preservation in compliance with SGMA and its implementing regulations based on Department expertise and best available information and science.

The Department recommends the GSP provide additional information and analysis that considers all environmental beneficial uses and users of groundwater in its sustainability management criteria and better characterize or consider surface water-groundwater connectivity. In addition, the Department is providing additional comments and recommendations below.

COMMENTS AND RECOMMENDATIONS

The Department comments are as follows:

1. **Comment #1 Plan Area.** Section 2.5.8. Efforts To Develop Relationships With State And Federal Regulatory Agencies (pages 2-100 to 2-101 and Figure 2-7). This section lists Department-owned lands within the Delta-Mendota Subbasin. Two additional lands not mentioned in the text are the Los Banos Wildlife Area and Volta Wildlife Area, but were included on Figure 2-7. It is the Department's understanding that the West Hilmar Wildlife Area, which is located on the east side of the San Joaquin River, is within the West Turlock Subbasin Groundwater Sustainability Agency (GSA). Please clarify if this is the case. Figure 2-7 identifies the Grasslands Wildlife Management Area in yellow. This identified 1

area is under federal jurisdiction. The Department recommends the NCDMGSP contact the United States Fish and Wildlife Service for the proper designation. 1

2. **Comment #2 Interconnected Surface Water.** Section 5. Basin Setting. 5.3.7.2 Identification of Interconnected Surface Water Systems (pages 5-170 to 5-172). The narrative describing the basin's interconnected surface water conditions lacks specifics and does not map surface water-groundwater interconnectivity. 2

    a. *Issue*: The interconnected surface water conditions narrative includes estimations of the quantity of streamflow depletions as specified in 23 CCR § 354.16(f), but it does not provide specifics on how the identified resources on page 5-171 were used to determine interconnectivity, nor does the plan provide timing of depletions.

        i. West-side streams in the Delta Mendota Basin are characterized as losing their "flows to the underlying vadose zone (net-losing streams)" and therefore they are not considered potential GDEs (page 5-170). Losing streams can still be interconnected with surface water if there is a continuous saturated layer connecting the stream to the groundwater. The GSP uses the term 'vadose zone,' meaning an unsaturated zone, but offers no specifics on how these streams were determined to be disconnected.

    b. *Recommendation*: The Department recommends the NCDMGSP clarify methods used to identify streamflow interconnectivity for gaining and losing streams, estimate streamflow depletion, and display interconnected river reaches on a map. The Department also recommends specific plan be prepared for determining the timing of streamflow depletions.

3. **Comment #3 Groundwater Dependent Ecosystems.** Section 5.3.7.6 Groundwater Dependent Ecosystems (pages 5-172 to 5-179). The GDE identification section, pursuant to 23 CCR § 354.16 (g), is based on limited information to identify ecosystems that may depend on groundwater. 3

    a. *Issue*: Methods applied to the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset to identify potential GDE's needs further evaluation.

        i. <u>Depth to Groundwater</u>: Evaluating only areas with a depth to groundwater greater than 30 feet in Spring 2015 relies on a single-point-in-time baseline hydrology, specifically a point in time that is several years into a historic drought when groundwater

levels were trending significantly lower due to reduced surface water availability. Exclusion of potential GDEs based on this singular groundwater elevation measurement is questionable because it does not consider representative climate conditions (i.e., seasons and a range of water type years) and it does not account for GDE's that can survive a finite period of time without groundwater access (Naumburg et al. 2005), but that rely on groundwater table recovery periods for long term survival.

ii. Adjacent to Surface Water: The GSP needs further evaluation for potential GDE's that depend on adjacent losing surface water bodies and a GDE's adaptability and opportunistic nature in accessing water supply. GDEs that are near interconnected surface water bodies may depend on sustained groundwater elevations that stabilize the gradient or rate of loss of surface water, meaning that ecosystems near interconnected surface waters may depend on sustainable groundwater elevations. Therefore, it is possible that any of these potential GDEs rely on groundwater during specific seasons or water year types. 3

iii. No land use protections for GDE's: The Department does not concur that there are no laws or regulations that protect GDE's. The Department has a "No net wetland loss" policy established by the Fish and Game Commission to protect our states remaining natural wetlands. Furthermore, there are other State and federal laws to protect natural wetlands.

b. *Recommendations:* The Department recommends the NCDMGSP consider the following for information gathering related to GDEs:

i. Depth to Groundwater: Develop a hydrologically robust baseline which includes areas with a depth to groundwater greater than 30 feet that relies on multiple, climatically representative years of groundwater elevation and that accounts for the inter-seasonal and inter-annual variability of GDE water demand.

ii. Adjacent to Surface Water: Evaluate potential GDE's that are in proximity to a losing surface water body. The Department recommends the GSP be more conservative and all-inclusive until there is evidence that the overlying ecosystem has no significant dependence on groundwater across seasons and water year types. The Department advises that these riparian GDE beneficial users of groundwater and surface water are carefully considered in the

analysis of undesirable results and minimum thresholds for depletions of interconnected surface waters. The Department further recommends the streams on the west side of the valley in the Coastal Range be further evaluated for GDE's, as there are riparian zones along those streams.

iii. Include additional references for evaluation: The Department recognizes that NCCAG (Klausmeyer et al. 2018) provided by California Department of Water Resources (DWR) is a good starting reference for GDE's; however, the Department recommends the GSP include additional resources for evaluating GDE locations. The Department recommends consulting other references, including, but not limited to, the following tools and other resources: the California Department of Fish and Wildlife (CDFW) Vegetation Classification and Mapping Program (VegCAMP) (CDFW 2019A); the CDFW California Natural Diversity Database (CNDDB) (2019B); the California Native Plant Society (CNPS) Manual of California Vegetation (CNPS 2019A); the CNPS California Protected Areas Database (CNPS 2019B); the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (2018); the USFWS online mapping tool for listed species critical habitat (2019); the U.S. Forest Service CALVEG ecological grouping classification and assessment system (2019); and other publications by Klausmeyer et al. (2019), Rohde et al. (2018), The Nature Conservancy (TNC) (2014), and Witham et al. (2014). 3

4. **Comment #4 Water Quality.** Section 5. Basin Setting, 5.3.5 Groundwater Quality (page 5-121). The GSP abdicates responsibility for specific groundwater constituents by implying there is no nexus between specific groundwater contaminants and groundwater pumping. 4

   a. *Issue*: The GSP identifies three primary water quality constituents of concern in the Delta Mendota Subbasin: total dissolved solids, nitrate, and boron (page 5-121). The GSP explains that other constituents, including arsenic, are naturally occurring and managed through other regulatory programs, and suggests that because there are no GSA management practices that can be implemented to mitigate for these constituents (page 5-121), the GSP will not analyze and address these constituent issues. Science suggests that over-pumping of aquifers can cause clay layers to compress and release dissolved arsenic, resulting in an increase of arsenic in extracted water (Fendorf et al 2019). Thus, groundwater pumping actions can affect the presence, movement, and concentration of naturally occurring arsenic in groundwater, potentially increasing

anthropogenic and ecosystem exposure to arsenic contamination. According to SGMA statue, GSAs have the authority to establish groundwater extraction allocations, among other relevant authorities (WC § 10726.4). Because arsenic contamination can potentially result from groundwater pumping, and because GSAs have the authority to manage groundwater pumping, the GSA has a viable management opportunity to address arsenic contamination in the Delta Mendota Subbasin.

b. *Recommendation*: There are numerous other constituents of concern on the west side of the San Joaquin Valley that were not evaluated such as: salinity, arsenic, selenium, and uranium. The Department has one well at its China Island Wildlife Area that has 2.7 ug/l uranium. Furthermore, salinity, arsenic and selenium have been ongoing concerns for decades in the valley. The Mendota Pools Pumpers Project and other groundwater pumping near Mendota Wildlife Area have increased the salinity in our surface water supply for the wildlife area. In addition, the Mendota Pool Pumpers have years of groundwater data and the USBR has groundwater data for their sump pumps along the Delta Mendota Canal that should be included for evaluation in the Delta Mendota Subbasin. The Department recommends the NCDMGSP evaluate these other constituents of concern and references. The Department further recommends a plan be developed to identify the relationship between groundwater pumping and the presence and movement of constituents of concern in the Delta Mendota Subbasin and include the plan in the GSP. The Department also recommends the development of sustainability criteria for constituents of concern accordingly and in partnership with existing regulatory programs for the first 5-year GSP update due in January 2025. 4

5. **Comment #5 Sustainable Management.** Section 6 Sustainable Management Criteria. 6.3.1 Chronic Lowing of Groundwater Levels and 6.3.6 Depletions of Interconnected Surface Water, starting on page 6-3). Groundwater level and interconnected surface water sustainable management criteria demonstrate limited consideration of undesirable results for environmental beneficial uses and interconnected surface waters. 5

   a. *Issue*: Groundwater Level 'undesirable results' and 'effects of undesirable results' did not evaluate specify impacts to environmental beneficial users such as terrestrial GDE's (see page 6-4), nor does this section explicitly identify fish and wildlife or habitat as beneficial users of interconnected surface water. Though environmental use is identified as one of the many groundwater beneficial use considered in establishing minimum thresholds, there is no explanation for how environmental users were considered. Depletions of interconnected surface water 'undesirable

results' and 'effects of undesirable results' do not specify potential adverse impacts to environmental beneficial users other than to note the potential failure to support regulatory environmental requirements (page 6-34). With only two monitoring sites as presented on Figure 6-7 (page 6-37), the current monitoring network for the depletion of interconnected surface water is insufficient to characterize impacts to environmental beneficial users of groundwater (23 CCR § 354.34(b)(2)).

b. *Recommendation*: The Department recommends the NCDMGSP clarify how species and habitat groundwater needs were considered in the identification of Sustainable Management Criteria and identify specific potential adverse impacts on environmental beneficial users of groundwater (e.g., terrestrial GDE stress/loss, increased instream temperatures, etc.). Install additional shallow groundwater monitoring wells near GDEs and interconnected surface waters, potentially pairing multiple-completion wells with streamflow gauges for improved understanding of surface water-groundwater interconnectivity. 5

6. **Comment #6 Land Subsidence.** Section 6 Sustainable Management Criteria. 6.3.5 Land Subsidence, 6.3.5.1.2 Identification of Undesirable Results (page 6-25). An undesirable result for land subsidence is triggered, or considered "significant and unreasonable," for Tranquility Area using a minimum threshold of four (4) feet additional subsidence compared to 2019 benchmark elevations (page 6-26). 6

a. *Issue*. The Mendota Wildlife Area has experienced land subsidence for decades. The first significant issue was subsidence at the Mendota Pool Dam which caused the water level to be lower resulting in less ability to back water up the Fresno Slough to our water inlets in the wildlife area. This was later compounded when Division of Dam Safety determined the water levels at the Mendota Pool had to be lowered further to maintain the integrity of the dam. Thus, these two incidents have significantly impacted Mendota Wildlife Area ability to flood using gravity flow and has impacted our lift pump sites. During the recent drought, a zone of subsidence centered around the town of Tranquility and covering over 75% of the wildlife area was detected. This relatively new subsidence feature has severely impacted the flooding and draining of the southeastern portion of the wildlife area as well as impacting the flood control levees of the James Bypass that make up the levees of the Mendota Pool, which roughly bisect the wildlife area. This recent subsidence on the wildlife area has resulted in our water flowing backwards. The Department does not concur allowing four feet additional subsidence as a benchmark.

b. *Recommendation*: The Department recommends the NCDMGSP and neighboring GSP's include and discuss that the Mendota Wildlife Area has an established subsidence management area with a goal of zero further subsidence to maintain the ability to deliver surface water supplies to and within the wildlife area. Further, the Department advises that the NCDMGSP acknowledge that the current baseline subsidence is the benchmark and that a criterion of zero feet subsidence from the current benchmark is the long-term goal. 6

7. **Comment #7 Monitoring Network.** Section 7. Monitoring Network, 7.2.5.6.6 Plans to Fill Data Gaps (page 7-72). The GSP plan indicates that the addition of four new monitoring well locations will be placed in areas along the San Joaquin River in the plan area to monitor for depletion of interconnected surface water; however, there is no indication as to the plan or location for installation of shallow groundwater monitoring wells near potential GDE's in areas for example; west side streams in the Delta Mendota Basin where the GSP indicates these streams as losing their flow to the underlying vadose zone. As previously mentioned above, losing streams can still be interconnected with surface water if there is a continuous saturated layer connecting the stream to the groundwater. The GSP offers no specifics on how these streams were determined to be disconnected. 7

   a. *Issue*: In Section 5.3.7.6 Groundwater Dependent Ecosystems (page 5-173), the GSP indicates species (listed in Table 5-10) have either been observed or have the potential to exist within the Northern and Central Delta-Mendota Regions. The GSP indicates that future efforts in GDE mapping prior to the 2025 5-Year GSP Update will further refine GDE locations within the Plan area. While mapping of potential GDE is beneficial in an effort characterize the potential existence of GDE's, it will also be necessary to define shallow groundwater level interaction with these GDE's. In Section 5.3.8 Data Gaps (page 5-180), the GSP indicates that the locations of GDE's will be refined using most recent groundwater elevation/depth to water contour mapping. The installation of shallow groundwater monitoring wells specific to these locations will be needed to refine groundwater elevation/depth to water contouring maps.

   b. *Recommendation*: The Department recommends that the NCDMGSP identify areas and install additional shallow groundwater monitoring wells near potential GDE's to identify interactions with groundwater.

CONCLUSION

In conclusion, the Northern and Central Delta Mendota Draft GSP needs to address all SGMA statutes and regulations, and the Department recommends the GSP seriously

consider fish and wildlife beneficial uses and interconnected surface waters. The Department recommends that the NCDMGSP consider the above comments before the GSP is submitted to DWR. The Department appreciates the opportunity to provide comments on the Northern and Central Delta Mendota Draft GSP. If you have any further questions, please contact Dr. Andrew Gordus at Andy.Gordus@wildlife.ca.gov or (559) 243-4014 extension 239.

Sincerely,

Julie A. Vance
Regional Manager, Central Region

Enclosures (Literature Cited)

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PD-05

Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

April 1, 2019

North & Central Delta-Mendota GSP Group
Delta-Mendota Subbasin
Basin Number 5-22.07
Transmitted via online submission at: http://deltamendota.org

Subject: Chapter 3 of the North and Central Delta-Mendota GSP

Dear North & Central Delta-Mendota GSP Group:

Westlands Water District (District) appreciates the opportunity to provide comments on Chapter 3 – Governance and Administration of the North and Central Delta-Mendota Groundwater Sustainability Plan (GSP).

North and Central Delta-Mendota GSP

Page numbers specified in the comments below refer to the printed PDF version, as listed on Chapter 3 of the North and Central Delta-Mendota GSP.

Finding 1 (Page 3-26): Section 3.3.3.2 states the following: "*The purpose of the agreement is to establish a set of common assumptions on groundwater conditions on either side of the boundary between Westlands Water District's service area and the Delta-Mendota Subbasin to be used for the development of GPSs in support of implementation of SGMA.*" 1

Westlands' Comment: The purpose of the interbasin agreement between the District's service area and the Delta-Mendota Subbasin is to share hydrogeological data to support GSP development and implementation, rather than to establish common assumptions on groundwater conditions.

If you have any questions or concerns, regarding these comments, please contact Antonio Solorio by email at asolorio@wwd.ca.gov or by phone at (559) 241-6244. Thank you for the opportunity to provide comments on the North and Central Delta-Mendota Groundwater Sustainability Plan.

Sincerely,

Russ Freeman, P.E.
Deputy General Manager – Resources
Westlands Water District

PD-06

Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

April 1, 2019

North & Central Delta-Mendota GSP Group
Delta-Mendota Subbasin
Basin Number 5-22.07
Transmitted via online submission at: http://deltamendota.org

Subject: Chapter 5 of the North and Central Delta-Mendota GSP

Dear North & Central Delta-Mendota GSP Group:

Westlands Water District (District) appreciates the opportunity to provide comments on Chapter 5, Section 2 – Hydrological Conceptual Model of the North and Central Delta-Mendota Groundwater Sustainability Plan (GSP).

North and Central Delta-Mendota GSP

Page numbers specified in the comments below refer to the printed PDF version, as listed on Chapter 5 of the North and Central Delta-Mendota GSP.

Finding 1 (Page 5-29): Section 5.2.7: Structural Properties and Restricted Groundwater states the following: "*Groundwater southwest of this divide generally flows southwest toward Panoche Water District and Westlands Water District.*" 1

Westlands' Comment: Analysis shows that groundwater from the Lower Aquifer does not flow into Westlands Water District. Westlands requests that the language be amended to not include Westlands Water District.

If you have any questions or concerns, regarding these comments, please contact Antonio Solorio by email at asolorio@wwd.ca.gov or by phone at (559) 241-6244. Thank you for the opportunity to provide comments on the North and Central Delta-Mendota Groundwater Sustainability Plan.

Sincerely,

Russ Freeman

Russ Freeman, P.E.
Deputy General Manager – Resources
Westlands Water District

PD-07

Leslie Dumas

From: Andrew Garcia <andrew.garcia@sldmwa.org>
Sent: Friday, October 11, 2019 4:06 PM
To: Leslie Dumas; Natalie Cochran
Cc: Claire Howard
Subject: Comment submitted thru the SGMA portal
Attachments: Northern and Central Delta Mendota GSP Analysis.pdf

Leslie

This one was submitted thru the SGMA PORTAL.

Wanted to capture the sentiment at the end of the letter in this email as well.

(Claire, notice a familiar name?)

"Conclusion
We know that SGMA plan development and implementation is a major undertaking, and we want every basin to be successful. We would be happy to meet with you to discuss our evaluation as you finalize your Plan for submittal to DWR. Feel free to contact Suzannah Sosman at suzannah@aginnovations.org for more information or to schedule a conversation." 1

Sincerely,
Jennifer Clary
Water Program Manager
Clean Water Action/Clean Water Fund
Samantha Arthur
Working Lands Program Director Audubon California
Sandi Matsumoto
Associate Director, California Water Program The Nature Conservancy
Danielle V. Dolan
Water Program Director
Local Government Commission

Andrew Garcia

October 11, 2019

Sent via website http://deltamendota.org/gsp-summary/

Re: Comments on Draft Groundwater Sustainability Plan for Northern and Central Delta-Mendota Region Groundwater Basin

To Whom It May Concern,

On behalf of the above-listed organizations, we would like to offer the attached comments on the draft Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Region Groundwater Basin. Our organizations are deeply engaged in and committed to the successful implementation of the Sustainable Groundwater Management Act (SGMA) because we understand that groundwater is a critical piece of a resilient California water portfolio, particularly in light of our changing climate. Because California's water and economy are interconnected, the sustainable management of each basin is of interest to both local communities and the state as a whole.

Our organizations have significant expertise in the environmental needs of groundwater and the needs of disadvantaged communities.

- The Nature Conservancy, in collaboration with state agencies, has developed several tools[1] for identifying groundwater dependent ecosystems in every SGMA groundwater basin and has made that tool available to each Groundwater Sustainability Agency.
- Local Government Commission supports leadership development, performs community engagement, and provides technical assistance dealing with groundwater management and other resilience-related topics at the local and regional scales; we provide guidance and resources for statewide applicability to the communities and GSAs we are working with directly in multiple groundwater basins.
- Audubon California is an expert in understanding wetlands and their role in groundwater recharge and applying conservation science to develop multiple-benefit solutions for sustainable groundwater management.
- Clean Water Action and Clean Water Fund are sister organizations that have deep expertise in the provision of safe drinking water, particularly in California's small disadvantaged communities, and co-authored a report on public and stakeholder engagement in SGMA[2].

[1] https://groundwaterresourcehub.org/

[2] https://www.cleanwater.org/publications/collaborating-success-stakeholder-engagement-sustainable-groundwater-management-act

Because of the number of draft plans being released and our interest in reviewing every plan, we have identified key plan elements that are necessary to ensure that each plan adequately addresses essential requirements of SGMA. A summary review of your plan using our evaluation framework is attached to this letter as Appendix A. Our hope is that you can use our feedback to improve your plan before it is submitted in January 2020.

This review does not look at data quality but instead looks at how data was presented and used to identify and address the needs of disadvantaged communities (DACs), drinking water and the environment. In addition to informing individual groundwater sustainability agencies of our analysis, we plan to aggregate the results of our reviews to identify trends in GSP development, compare plans and determine which basins may require greater attention from our organizations.

Key Indicators

Appendix A provides a list of the questions we posed, how the draft plan responds to those questions and an evaluation by element of major issues with the plan. Below is a summary by element of the questions used to evaluate the plan.

1. Identification of Beneficial Users. This element is meant to ascertain whether and how DACs and groundwater-dependent ecosystems (GDEs) were identified, what standards and guidance were used to determine groundwater quality conditions and establish minimum thresholds for groundwater quality, and how environmental beneficial users and stakeholders were engaged through the development of the draft plan.
2. Communications plan. This element looks at the sufficiency of the communications plan in identifying ongoing stakeholder engagement during plan implementation, explicit information about how DACs were engaged in the planning process and how stakeholder input was incorporated into the GSP process and decision-making.
3. Maps related to Key Beneficial Uses. This element looks for maps related to drinking water users, including the density, location and depths of public supply and domestic wells; maps of GDE and interconnected surface waters with gaining and losing reaches; and monitoring networks.
4. Water Budgets. This element looks at how climate change is explicitly incorporated into current and future water budgets; how demands from urban and domestic water users were incorporated; and whether the historic, current and future water demands of native vegetation and wetlands are included in the budget.
5. Management areas and Monitoring Network. This element looks at where, why and how management areas are established, as well what data gaps have been identified and how the plan addresses those gaps.
6. Measurable Objectives and Undesirable Results. This element evaluates whether the plan explicitly considers the impacts on DACs, GDEs and environmental beneficial users in the development of Undesirable Results and Measurable Objectives. In addition, it examines whether stakeholder input was solicited from these beneficial users during the development of those metrics.
7. Management Actions and Costs. This element looks at how identified management actions impact DACs, GDEs and interconnected surface water bodies; whether mitigation for impacts to DACs is discussed or funded; and what efforts will be made to fill identified data gaps in the first five years of the plan. Additionally, this element asks whether any changes to local ordinances or land use plans are included as management actions.

Conclusion

We know that SGMA plan development and implementation is a major undertaking, and we want every basin to be successful. We would be happy to meet with you to discuss our evaluation as you finalize your Plan for submittal to DWR. Feel free to contact Suzannah Sosman at suzannah@aginnovations.org for more information or to schedule a conversation.

Sincerely,

Jennifer Clary
Water Program Manager
Clean Water Action/Clean Water Fund

Danielle V. Dolan
Water Program Director
Local Government Commission

Samantha Arthur
Working Lands Program Director
Audubon California

Sandi Matsumoto
Associate Director, California Water Program
The Nature Conservancy

Appendix A
Review of Public Draft GSP

Groundwater Basin/Subbasin: Delta-Mendota Subbasin (DWR No. 5-022.07)
GSA: Northern and Central Delta-Mendota Region GSAs
GSP Date: September 2019 Public Review Draft

1. Identification of Beneficial Users

Were key beneficial users identified and engaged?

Selected relevant requirements and guidance:
GSP Element 2.1.5, "Notice & Communication" (§354.10):
(a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.
GSP Element 2.2.2, "Groundwater Conditions" (§354.16):
(d) Groundwater quality issues that may affect the supply and beneficial uses of groundwater, including a description and map of the location of known groundwater contamination sites and plumes.
(f) Identification of interconnected surface water systems within the basin and an estimate of the quantity and timing of depletions of those systems, utilizing data available from the Department, as specified in Section 353.2, or the best available information.
(g) Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.
GSP Element 3.3, "Minimum Thresholds" (§354.28):
(4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.

Review Criteria		Yes	No	N/A	Relevant Info per GSP	Location (Section, Page[1])
1. Do beneficial users (BUs) identified within the GSP area include:	a. Disadvantaged Communities (DACs)	X			"As noted above, a significant portion of the Subbasin contains DACs. Of the total population of 117,120 within the Subbasin, 80% of the population lives within a DAC, with 93% of the Subbasins total geographic area consisting of DACs. Table 2-1 includes the proportion of DACs in the Subbasin based on population and geographic area." Figure 2-16 Disadvantaged and Severely Disadvantaged Communities in the Delta-Mendota Subbasin	Ch.2 2.1.2.6 pg.28 Figure 2-16, pg 30
	b. Tribes			X	"Note that according to the U.S. Department of the Interior Indian Affairs, as of January 2017 there are no listed federally recognized tribes within the Region (Mosley, 2017)."	Ch.2 2.1.2.6 pg.29
	c. Small community public water systems (<3,300 connections)		X		Not explicitly identified as such.	
2. What data were used to identify presence or absence of DACs?	a. DWR DAC Mapping Tool[2]	X			"Table 2-2 includes Census Designated Places that are DACs in the Delta-Mendota Subbasin, with their associated MHIs and percentage of the California MHI from the ACS 5-Year 2012-2016 average. Several DACs in the Subbasin have considerably lower MHI than 80% of the California Statewide MHI and are further designated as SDACs. In Table 2-2, SDACs are indicated in	Ch.2 2.1.2.6 pg.29 Table 2-2, pg 30

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[1] Page numbers refer to the page of the PDF.
[2] DWR DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/

					bold text." Table 2 DAC and SDAC Census Designated Places in Delta-Mendota Subbasin	
	i. Census Places		X		The GSP does not specify, but the areas mapped on Figure 2-16 appear to be Census Tracts	See above.
	ii. Census Block Groups		X			
	iii. Census Tracts	X				
	b. Other data source		X			
3. Groundwater Conditions section includes discussion of:	a. Drinking Water Quality	X			"Primary constituents of concern within the Northern and Central Delta-Mendota Regions are nitrate, total dissolved solids (TDS), and boron, which all have anthropogenic as well as natural sources. Table 5-2 includes the State and federal primary and secondary MCLs for drinking water in milligrams per liter (mg/L). These are also the Water Quality Objectives (WQOs) in the Central Valley Regional Water Quality Control Board's (CV-RWQCB) Water Quality Control Plan for the Sacramento and San Joaquin River Basins (or Basin Plan) (2009) for waters designated as having municipal (MUN) beneficial use."	Ch.5 5.3.5 pg.125
	b. California Maximum Contaminant Levels (CA MCLs)[3] (or Public Health Goals where MCL does not exist, e.g. Chromium VI)	X			"The maximum nitrate (as N) concentrations observed in all wells throughout the Delta-Mendota Subbasin are depicted in Figure 5-21. The majority of wells have maximum concentrations below 5 mg/L; however, several areas exist with a greater density of wells with maximum concentrations exceeding the primary maximum contaminant level (MCL) of 10 mg/L (as N), especially in the area immediately south of Los Banos and trending northwest along Highway 33 to north of Patterson. …. Figure 5-22 shows the most recent nitrate concentrations (for a period of around 2000 to 2014) in all the wells in the Subbasin. The overall picture illustrated by the nitrate data in Figure 5-22 is very similar, though slightly improving, to that seen in Figure 5-21 for maximum nitrate concentrations." "Figure 5-31 through Figure 5-40 present the maximum and most recent (for the period around 2000-2014) TDS concentrations in wells within the Delta-Mendota Subbasin and indicate the general salinity of groundwater. The concentration of TDS in drinking water is regulated as a Secondary Drinking Water Standard and the standards are established for aesthetic reasons such as taste, odor, and color and not based on public health concerns. TDS concentrations in groundwater, as shown in Figure 5-31 through Figure 5-40, are symbolized by five classes related to the Secondary MCL (SMCL): less than 500 mg/L, a concentration which is equivalent to the recommended SMCL; 500 to 1,000 mg/L (1,000 mg/L is equivalent to the upper level of the SMCL); 1,000 to 1,500 mg/L; 1,500 to 3,000 mg/L, equivalent and greater than the short-term level of the SMCL; and greater than 3,000 mg/L. The spatial distribution of available TDS data is similar in density to the nitrate data." "Pesticide concentration data for the Delta-Mendota Subbasin are limited to data obtained from the California Department of Pesticide Regulation (DPR), as originally presented in Luhdorff & Scalmanini Consulting Engineers (LSCE) (2015) and LSCE (2016). … Figure 5-41 shows the locations of sections where wells have been sampled for pesticides and where pesticide test results are	CH.5.2.8.2,1, pg 38 CH. 5.2.8.2.2, pg 50 Section 5.2.8.2.3, pg 62

[3] CA MCLs: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html

					reported by DPR and include sections that may only be partially within the Subbasin. … Sections with detected concentrations of pesticides exceeding levels provided in the State Water Resources Control Board (SWRCB) Water Quality Goals Online Database are symbolized red in Figure 5-41; sections where pesticide detections have occurred at concentrations below the identified exceedance threshold are symbolized as orange, and green sections signify areas where pesticides were not detected. Figure 5-41 shows all available pesticide sample data from DPR within the Delta-Mendota Subbasin. Table 5-1 summarizes pesticides that have been detected in wells that are in sections that overlap with the Subbasin completely or partially, as reported in the DPR database. The threshold values used as a basis for identifying pesticide exceedances are also included in Table 5-1. The thresholds used to define pesticide exceedances were based first on a California Primary MCL; otherwise, the California Notification (action) Level and U.S. Environmental Protection Agency (EPA) Health and Water Quality advisory concentrations were used for comparison, as available."	
4. What local, state, and federal standards or plans were used to assess drinking water BUs in the development of Minimum Thresholds (MTs)?	a. Office of Environmental Health Hazard Assessment Public Health Goal (OEHHA PHGs)[4]			X		
	b. CA MCLs[3]	X			"Primary constituents of concern within the Northern and Central Delta-Mendota Regions are nitrate, total dissolved solids (TDS), and boron, which all have anthropogenic as well as natural sources. Table 5-2 includes the State and federal primary and secondary MCLs for drinking water in milligrams per liter (mg/L). These are also the Water Quality Objectives (WQOs) in the Central Valley Regional Water Quality Control Board's (CV-RWQCB) Water Quality Control Plan for the Sacramento and San Joaquin River Basins (or Basin Plan) (2009) for waters designated as having municipal (MUN) beneficial use."	Ch.5 5.3.5 pg.125
	c. Water Quality Objectives (WQOs) in Regional Water Quality Control Plans	X				
	d. Sustainable Communities Strategies/ Regional Transportation Plans[5]		X			
	e. County and/or City General Plans, Zoning Codes and Ordinances[6]	X			County Groundwater Use Ordinances "All of the counties in which the Delta-Mendota Subbasin lies include groundwater export limitations within their county ordinances. These ordinances will limit Subbasin operational flexibility by limiting the ability to move water around the Delta-Mendota Subbasin to balance demands and supplies."	Ch.2 2.3.4 pg.98
5. Does the GSP identify how environmental BUs and environmental stakeholders were engaged throughout the development of the GSP?		X			Table 4-1 lists beneficial uses and user stakeholder groups and includes federal and state lands and facilities; environmental agencies and groups; rivers, creeks, and recreational and wildlife refuges; and recreational areas in addition to the direct users of groundwater and surface water. The GSP noted further refinement of the Table 4-1 list will be made by 2025. "Throughout the GSP development process, stakeholders, and the public were	Table 4-1, pg 6 Section 4.3.2

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[4] OEHHA PHGs: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html
[5] CARB: https://ww2.arb.ca.gov/resources/documents/scs-evaluation-resources
[6] OPR General Plan Guidelines: http://www.opr.ca.gov/planning/general-plan/

				encouraged to engage with the GSP development team. Through use of the stakeholder list and other noticing strategies (detailed in Section 4.3.4), the Northern & Central Delta-Mendota Region GSP Group invited interested parties to join in deliberation, dialogue, and discussions related to the development of the GSP. The primary opportunity for engagement with the GSP team came during the subbasin-wide public workshops, but additional targeted meetings and events were held as well as direct communications via website-based communications links, email and letters. Public input gathered during the engagement events was documented for consideration during GSP development, with formal comments presented in Error! Reference source not found.[sic].” Table 4-2 lists 12 public workshops held at 5 different locations within the GSA area.	

Summary/ Comments

The GSP identifies public drinking water systems under jurisdictional boundaries in the Plan Area section, but does not provide an indication of their size. It is recommended that the GSP identify the number of service connections and/or population served by each system, so that the public can understand how many drinking water beneficial users are present in this area.

Section 2.1.2.3 provides a detailed discussion of communities dependent on groundwater for drinking water purposes, including domestic well users. It is also recommended that the GSP include an estimate of the population dependent on domestic wells.

The GSP should describe whether other beneficial uses and users of groundwater in the Subbasin are present: Protected Lands, including conservation areas and other protected lands; and Public Trust Uses including wildlife, aquatic habitat, fisheries, and recreation. It should also identify environmental users, and refer to the following:

- Natural Communities Commonly Associated with Groundwater dataset (NC Dataset) - https://gis.water.ca.gov/app/NCDatasetViewer/
- The list of freshwater species located in the Delta-Mendota Subbasin can be found here: https://groundwaterresourcehub.org/sgma-tools/environmental-surface-water-beneficiaries/. The GSP should take particular note of the species with protected status.

2. Communications Plan

How were key beneficial users engaged and how was their input incorporated into the GSP process and decisions?

Selected relevant requirements and guidance:
GSP Element 2.1.5, "Notice & Communication" (§354.10):
Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:
(c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.
(d) A communication section of the Plan that includes the following:
(1) An explanation of the Agency's decision-making process.
(2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.
(3) A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.
(4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

DWR Guidance Document for GSP Stakeholder Communication and Engagement[7]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Is a Stakeholder Communication and Engagement Plan (SCEP) included?		X			
2. Does the SCEP or GSP identify that ongoing engagement will be conducted during GSP implementation?	X			"Stakeholder/Board engagement: Monthly Northern and Central Delta-Mendota Activity Agreement Management Committee meetings for first two (2) years, then quarterly thereafter; monthly Delta-Mendota Subbasin Coordination Committee meetings for first two (2) years, then quarterly thereafter; and semi-annual public workshops"	Ch.8.2.1, pg 11
3. Does the SCEP or GSP specifically identify how DAC beneficial users were engaged in the planning process?	X			Appendix C Outreach Appendices documented past public workshops, which included presentations in Spanish. It also includes Outreach Activity log (Appendix C in the Appendix C). The log lists a number of meetings and presentations in different locations. 4.3.3 Outreach to Diverse Social, Cultural, and Economic Areas of the Population "The Northern and Central Delta-Mendota Regions include a diversity of community types, including many non-native non-English (predominantly Spanish) speakers and disadvantaged communities. In order to reach as much of the population as possible, the following best practices were implemented to increase project visibility and opportunities for engagement: ● All outreach materials (including meeting flyers, fact sheets, frequently asked questions [FAQs], and videos) were translated and made available in Spanish ● Spanish-speaking interpreters were available at public meetings	Appendix C Appendix C, pg 412-418 CH.4.3.3, pg 11

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[7] DWR Guidance Document for GSP Stakeholder Communication and Engagement
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Document-for-Groundwater-Sustainability-Plan---Stakeholder-Communication-and-Engagement.pdf

				● Public meetings were held in disadvantaged communities to provide easier access to the GSP process ● Meetings were held both in the late afternoon and the evening to avoid conflicts with work schedules and provide the greatest flexibility for attendance Further, the Northern & Central Delta-Mendota Region GSP Group coordinated with other community development and planning efforts in the region to reach a greater audience. These efforts include: ● Self-Help Enterprises (SHE), a local community development organization focused on working with low income families and communities, helped the GSP Group reach a greater number of members of the disadvantaged communities identified within the Plan area. ● SGMA information and materials were incorporated into efforts related to the IRWM Disadvantaged Community Involvement Program (DACIP) and into applicable IRWM documents (including the East Stanislaus, Merced, and Westside-San Joaquin IRWM Regions)"	
4. Does the SCEP or GSP explicitly describe how stakeholder input was incorporated into the GSP process and decisions?	**X**			"Plan development and updates has been iterative and driven by stakeholder participation and has resulted in this Plan's overarching goal of providing a more reliable water supply, protecting agricultural, municipal, and environmental water uses, and meeting community needs (including those of disadvantaged communities), by improving water supply sustainability, water quality, and drainage." "As one of six GSPs being prepared for the Delta-Mendota Subbasin, the Northern & Central Delta-Mendota Region GSP development required decision making at both the GSP- and subbasin-level. … This process is outlined below where differences in the GSP and Subbasin decision-making processes are identified as necessary: 1. The project team develops the initial recommendation 2. The initial recommendation is presented to the Groundwater Sustainability Agencies (GSAs) via the Northern and Central Delta-Mendota Technical Advisory Committee and Northern and Central Delta- Mendota Regional Management Committees at the GSP-level, and to the Delta-Mendota Subbasin Communication and Technical Working Groups and Delta-Mendota Subbasin Coordination Committee at the subbasin-level 3. Feedback from the Northern and Central Delta-Mendota Technical Advisory Committee and Northern and Central Delta-Mendota Regional Management Committees at the GSP-level, and Delta-Mendota Subbasin Working Groups and Delta-Mendota Subbasin Coordination Committee at the subbasin-level are incorporated into the recommendation 4. Step 2 and 3 are repeated as needed 5. The agreed-upon recommendation is presented at a public workshop 6. Feedback from stakeholders is incorporated into the recommendation as appropriate 7. The recommendation is documented in the appropriate GSP section and	Ch.2.3.1.3.1, pg 72 Ch. 4.2.1, pg 8

				Subbasin Common Chapter 8. Completed GSP or Common Chapter sections are circulated to the GSAs in the Plan Area or Delta-Mendota Subbasin GSP Working Groups and Coordination Committee for comment 9. Comments on the recommended approach/section are incorporated into the appropriate document(s) 10. The GSP or Common Chapter section is posted online for public review and comment 11. Public comments are collected and documented As detailed above, the decision-making process includes multiple points for both internal (GSA members) and external (public) stakeholders to contribute to the GSP development. Participation in this process was encouraged through stakeholder outreach, communications, and public workshops conducted throughout GSP development."	

Summary/ Comments
The GSP describes the stakeholder communication process that was implemented throughout GSP development, but does not include or reference a SCEP. If a SCEP was created (consistent with DWR and other guidance documents,)[7,8] then it should be included as part of the GSP.

[8] Collaborating for Success: Stakeholder engagement for Sustainable Groundwater Management Act Implementation: http://www.cleanwateraction.org/files/publications/ca/SGMA_Stakeholder_Engagement_White_Paper.pdf

3. Maps Related to Key Beneficial Uses

Were best available data sources used for information related to key beneficial users?

Selected relevant requirements and guidance:
GSP Element 2.1.4 "Additional GSP Elements" (§354.8):
Each Plan shall include a description of the geographic areas covered, including the following information:
(a) One or more maps of the basin that depict the following, as applicable:
(5) The density of wells per square mile, by dasymetric or similar mapping techniques, showing the general distribution of agricultural, industrial, and domestic water supply wells in the basin, including de minimis extractors, and the location and extent of communities dependent upon groundwater, utilizing data provided by the Department, as specified in Section 353.2, or the best available information.

GSP Element 3.5 Monitoring Network (§354.34)
(b) Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation. The monitoring network objectives shall be implemented to accomplish the following:
(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:
(1) Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:
(A) A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table or potentiometric surface for each principal aquifer.
(4) Degraded Water Quality. Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.
(6) Depletions of Interconnected Surface Water. Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following:
(A) Flow conditions including surface water discharge, surface water head, and baseflow contribution.
(B) Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable.
(C) Temporal change in conditions due to variations in stream discharge and regional groundwater extraction.
(D) Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.
(f) The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:
(3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.

Review Criteria		Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP Include Maps Related to Drinking Water Users?	a. Well Density	X			Figures 2-10, 2-11, 2-12	Figures 2-10, 2-11, 2-12, pg 20-22
	b. Domestic and Public Supply Well Locations & Depths		X		Only density of domestic and public wells are given in a map. Specific location or depth of each well is not specified in the GSP.	

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	i. Based on DWR Well Completion Report Map Application[9]?	X			"Figure 2-10 through Figure 2-12 show the density per square mile (PLSS Section) of domestic, production, and public wells in the Delta-Mendota Subbasin as identified by the California Department of Water Resources' (DWR) Well Completion Report Map Application."	CH. 2.1.2.3, pg 17 Figure 2-10 to Figure 2-12, pg 20 -22
	ii. Based on Other Source(s)?		X			
2. Does the GSP include maps related to Groundwater Dependent Ecosystem (GDE) locations?	a. Map of GDE Locations				5.3.7.6 Groundwater Dependent Ecosystems "The NCCAG dataset (2018a) provided by DWR was used in conjunction with information provided by TNC to identify GDEs within the Delta-Mendota Subbasin. To further screen available information regarding GDEs, the following standards were set for identifying GDEs in the Northern and Central Delta-Mendota Regions: (1) areas with depths to groundwater levels greater than 30 feet were eliminated unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks); (2) seasonally-managed areas and wetlands were eliminated due to their dependence on applied surface water; and (3) a 100-foot buffer was applied around the San Joaquin River within the Northern Delta-Mendota Region to include all communities in the NCCAG dataset as potential GDEs, except where professional judgement and local knowledge determined GDEs were not present. To determine where groundwater is typically deeper than 30 feet below the ground surface, Spring 2015 depth to water contour mapping was used as a basis for establishing a connection between shallow groundwater and potential GDEs. The ESRI World Imagery layer (2017) was also used by local GSA representatives for ground-truthing and identifying potential mapping errors." "Possible GDEs have also been identified along streams originating from the Coast Range; however, these areas are topographically disconnected from the Subbasin's principal aquifers and are located in areas of de minimus or zero groundwater use and are therefore are unmanageable through the Sustainable Groundwater Management Act (SGMA)."	Figure 5-118, pg 178 Figure 5-119, pg 179 CH. 5.3.7.6, PG 177 CH. 5.3.7.6, PG 177
	b. Map of Interconnected Surface Waters (ISWs)		X		"Streams stemming from the west side of the Delta-Mendota Subbasin are ephemeral in nature, and only two of these creeks reach the San Joaquin River (Del Puerto Creek and Orestimba Creek). These creeks lose their flows to the underlying vadose zone (net-losing streams) and therefore do not represent areas of potential GDEs."	CH. 5.3.7.1, pg 174
	i. Does it identify which reaches are gaining and which are losing?	X			"The San Joaquin River is the primary surface water body interconnected with Delta-Mendota Subbasin groundwater. Within the Northern and Central Delta-Mendota Regions, four reaches of the San Joaquin River have been identified as gaining streams with their associated California Data Exchange Center (CDEC) stream gauges: Newman (NEW) to Crows Landing (SCL), Crows Landing to Patterson (SJP), Patterson to Maze Road Bridge (MRB), and Maze Road Bridge to Vernalis (VNS). These reaches of the San Joaquin River were identified as gaining from a compendium of sources including a 2014 analysis of diversion water demand for diverters of the San	CH. 5.3.7.2, pg 174
	ii. Depletions to ISWs are quantified by stream segments.	X				
	iii. Depletions to ISWs are quantified seasonally.		X			

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[9] DWR Well Completion Report Map Application: https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37

						Joaquin River between Hills Ferry Bridge and Mossdale Bridge (Provost & Pritchard, June 2014) as well as the following: …" "Using available data, the quantity of gains and/or depletions from the groundwater at each reach of the San Joaquin River identified along the Northern and Central Delta-Mendota Regions was estimated. Table 5-9 summarizes these estimates. Estimates of the timing of gains and/or depletions were unavailable in related literature, and insufficient data were available to estimate the timing of losses and gains in the Northern and Central Delta-Mendota Regions.Such information will be gathered through future monitoring efforts related to this GSP." "Historically, most of the San Joaquin River, which forms the great majority of the Delta-Mendota Subbasin's eastern border, was a gaining reach. Snowmelt runoff during the spring and early summer resulted in these conditions through a good portion of the year. However, significant decreases in groundwater elevations due to pumping, storage, and upstream diversions on the river have reversed this condition so most reaches are now losing reaches. Some localized gaining reaches still remain on the lower river, such as between the Stanislaus and Merced Rivers, corresponding to the reaches of the San Joaquin River bordering the Northern and Central Delta-Mendota Regions."	CH. 5.3.7.5,pg 176 CH. 5.3.7.4, pg 176
3. Does the GSP include maps of monitoring networks?	a. Existing Monitoring Wells		X			Figure 2-32. Groundwater Quality Trend Monitoring Program Wells, Western San Joaquin River Watershed Coalition Figure 2-33. Delta-Mendota Subbasin CASGEM Groundwater Monitoring Network Figure 2-34. Voluntary Monitoring Wells in the Delta-Mendota Subbasin	Figure 2-32, pg 91 Figure 2-33, pg 94 Figure 2-34, pg 95
	b. Existing Monitoring Well Data sources:	i. California Statewide Groundwater Elevation Monitoring (CASGEM)	X			"In 2009, the CASGEM Program began systematic, local monitoring of groundwater levels throughout the state. The intent of the program is to track and make publicly available seasonal and long-term groundwater elevation trends to use as a tool for effective groundwater management. The Groundwater Monitoring Program (GMP) in the Delta-Mendota Subbasin is managed by the San Luis & Delta- Mendota Water Authority. The GMP characterizes the groundwater basin and outlines monitoring procedures for depth-to-water and groundwater quality. The figures below display the CASGEM network of groundwater wells by aquifer (Figure 2-33) and additional groundwater wells that voluntarily share groundwater depth data (Figure 2-34)."	CH. 2.3.3.7, pg 93
		ii. Water Board Regulated monitoring sites		X		"The SWRCB's Division of Drinking Water (DDW, and formerly the Department of Health Services) monitors public water system wells for California Code of Regulations Title 22 requirements relative to levels of organic and inorganic compounds such as metals, microbial compounds and radiological analytes. Data are available for active and inactive drinking water sources, for water systems that serve the public, and wells defined as serving 15 or more connections, or more than 25 people per day for 60 or more days per year. In the Delta-Mendota Subbasin, DDW wells are monitored for Title 22 requirements, including pH, alkalinity, bicarbonate,	CH. 2.3.3.6, pg 92

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					calcium, magnesium, potassium, sulfate, barium, copper, iron, zinc, and nitrate." However, no data from environmental cleanup sites appear to be included.	
	iii. Department of Pesticide Regulation (DPR) monitoring wells		X			9
	c. SGMA-Compliance Monitoring Network	X			Figure 7-3. Groundwater Level Monitoring Network, Upper Aquifer Figure 7-4. Groundwater Level Monitoring Network, Lower Aquifer Figure 7-5. Potential Future Groundwater Level Monitoring Sites, Upper Aquifer Figure 7-6. Potential Future Groundwater Level Monitoring Sites, Lower Aquifer Figure 7-7. Groundwater Quality Monitoring Network, Upper Aquifer Figure 7-8. Groundwater Quality Monitoring Network, Lower Aquifer Figure 7-9. Land Subsidence Monitoring Network Figure 7-10. Depletions of Interconnected Surface Water Monitoring Network Figure 7-11. Potential Future Depletions of Interconnected Surface Water Monitoring Sites	Figure 7-3, pg 43 Figure 7-4, pg 44 Figure 7-6, pg 52 Figure 7-7, pg 58 Figure 7-8, pg 59 Figure 7-9, pg 68 Figure 7-10, pg 74 Figure 7-11, pg 77	
	i. SGMA Monitoring Network map includes identified DACs?		X		The maps listed above do not include DACs or GDEs.	CH 7	10
	ii. SGMA Monitoring Network map includes identified GDEs?		X				11

Summary/ Comments

Providing maps of the monitoring network overlaid with location of DACs, domestic wells, community water systems, GDEs, and any other sensitive beneficial users will allow the reader to evaluate the adequacy of the network to monitor conditions near these beneficial users.

On Figures 5-118 (Groundwater Dependent Ecosystems in the Delta-Mendota Subbasin, Wetlands) and 5-119 (Groundwater Dependent Ecosystems in the Delta-Mendota Subbasin, Vegetation), it is difficult to distinguish the colors underneath the hatching, and thus see which categories apply to the Northern and Central Delta-Mendota Regions. Consider changing the hatching pattern or supplying a map for just the Northern and Central Delta-Mendota Regions. The GSP should be more specific when denoting "mapping error". The basin's GDE shapefile, which is submitted via the SGMA Portal, should also include two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed).

Based on a study TNC recently submitted to Frontiers in Environmental Science Journal, they have observed riparian forests along the Cosumnes River to experience a range in groundwater levels between 1.5 and 75 feet over seasonal and interannual timescales. Given this, the GSP should use depth to groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. Please refer to TNC's guidance on Identifying GDEs Under SGMA (https://groundwaterresourcehub.org/public/uploads/pdfs/TNC_NCdataset_BestPracticesGuide_2019.pdf) for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network. Additionally, Spring 2015 is after the SGMA benchmark date of January 1, 2015. Please include groundwater condition data prior to the SGMA benchmark date in the analysis.

Given the significant data gap areas noted on Figure 5-64 (pg 100), the GSP should confirm that wells screened in the Upper Aquifer are being used to verify whether NCCAGs are actual GDEs.

The GSP should provide depth to groundwater contour maps and note the following best practices for doing so:

- Are the wells used for interpolating depth to groundwater sufficiently close (<5km) to NC Dataset polygons to reflect local conditions relevant to ecosystems?
- Are the wells used for interpolating depth to groundwater screened within the surficial unconfined aquifer and capable of measuring the true water table (see comment b above)?
- Is depth to groundwater contoured using groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape? This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM) to estimate depth-to-groundwater contours across the landscape. This will provide much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. Depth to groundwater contours developed from depth to groundwater measurements at wells assumes that the land surface is constant, which is a poor assumption to make. It is better to assume that water surface elevations are constant in between wells, and then calculate depth to groundwater using a DEM of the land surface to contour depth to groundwater.

The GSP should use the depth to groundwater contour maps to identify whether a connection to groundwater exists for the managed wetlands in the Northern and Central Delta-Mendota Regions.

The GSP should list the species in each GDE, and whether the GDE was eliminated or retained based on the 30-foot standard, and provide evidence for the decision.

The GSP should elaborate on the “professional judgement and local knowledge” referenced in Section 5.3.7.6 and discuss the types of GDEs excluded and how this criterion is supported by groundwater level and plant physiological data. If there is a potential GDE near the river, we suggest the entire GDE is included, rather than using an arbitrary 100-foot cutoff. It should also provide further information on the analysis of GDEs on westside streams, including citing field studies or modeling studies that show the disconnected nature of these streams, indicate on which streams GDE polygons were excluded and on which streams GDE polygons were retained, and identify any data gaps and ensure that GDE polygons are retained until data gaps are reconciled.

We disagree with the statement that the westside ephemeral streams do not represent areas of potential GDEs (Section 5.3.7.1), without data or analysis provided. The GSP should reconcile data gaps (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP to improve ISW mapping in future GSPs and provide more detail on how the quantity of gains and/or depletions from the groundwater at each reach of the San Joaquin River was determined.

The GSP should provide information on the historical or current groundwater conditions in the GDEs or the ecological conditions present and an ecological inventory (see Appendix III, Worksheet 2 of the GDE Guidance) for all potential GDEs that includes the vegetation types or habitat types and rank the GDEs as having a high, moderate or low value; and what characterizes the rank. It should also identify whether any endangered or threatened freshwater species of animals and plants, or areas with critical habitat were found in or near any of the GDEs since some organisms rely on uplands and wetlands during different stages of their lifecycle.

4. Water Budgets

How were climate change projections incorporated into projected/future water budget and how were key beneficial users addressed?

Selected relevant requirements and guidance:
GSP Element 2.2.3 "Water Budget Information" (Reg. § 354.18)
Each Plan shall include a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in the volume of water stored. Water budget information shall be reported in tabular and graphical form.

*Projected water budgets shall be used to estimate future baseline conditions of supply, **demand**, and aquifer response to Plan implementation, and to identify the uncertainties of these projected water budget components. The projected water budget shall utilize the following methodologies and assumptions to estimate future baseline conditions concerning hydrology, water demand and surface water supply availability or reliability over the planning and implementation horizon:*
(b) The water budget shall quantify the following, either through direct measurements or estimates based on data:
(5) If overdraft conditions occur, as defined in Bulletin 118, the water budget shall include a quantification of overdraft over a period of years during which water year and water supply conditions approximate average conditions.
(6) The water year type associated with the annual supply, demand, and change in groundwater stored.
(c) Each Plan shall quantify the current, historical, and projected water budget for the basin as follows:
*(1) Current water budget information shall quantify current inflows and outflows for the basin using the most recent hydrology, water supply, **water demand**, and land use information.*

DWR Water Budget BMP[10]
DWR Guidance for Climate Change Data Use During GSP Development and Resource Guide[11]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Are climate change projections explicitly incorporated in future/ projected water budget scenario(s)?	X			"Projected water budget with Climate Change (CC) represents the simulated future condition of the land surface system and groundwater system from WY2014 through WY2070 relative to the projected baseline water budget with the addition of the application of DWR's climate change factors. Projected water budget with Climate Change (CC) and Projects & Management Actions (P&MAs) represents simulated future condition of the land surface system and groundwater system from WY2014 through WY2070 relative to the projected baseline water budget with the addition of DWR's climate change factors as well as projects and management actions to achieve groundwater sustainability within the Plan area by 2040, as required by SGMA."	Ch.5, 5.4., pg.193

[10] DWR BMP for the Sustainable <management of Groundwater Water Budget:
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-4-Water-Budget.pdf
[11] DWR Guidance Document for the Sustainable Management of Groundwater Guidance for Climate Change Data Use During GSP Development:
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final.pdf

2. Is there a description of the methodology used to include climate change?	X			"Water budget tabulating predicted flows into and out of the Northern & Central Delta-Mendota Region GSP Plan area during the WYs 2014 through 2070 with the California Department of Water Resources' (DWR's) climate change factors (CCFs) applied to Subbasin hydrology. This is an accounting of annual predicted flows based on the climate change scenario, without the influence of additional projects or management actions for the purposes of SGMA and evaluating the impacts of CCF application to the water budget." "Climate change data under 2030 and 2070 conditions was provided by DWR for use in development of the projected water budgets with climate change conditions (DWR, 2018b). These data, however, did not span the full projection period, with a gap in CCFs provided for WY2051 through WY2056. Per communications with DWR and in coordination with the Technical Working Group and Coordination Committee, hydrologic water years from the DWR dataset were selected for these years in order to identify the appropriate CCF. The methodology for applying DWR provided climate change factors was agreed upon by the Technical Working Group. Climate change factors under 2030 conditions were applied to WY2018 through WY2045 and climate change factors under 2070 conditions were applied to WY2046 through WY2070. The precipitation and evapotranspiration datasets provided by DWR include monthly climate change factors from Calendar Year 1915 through 2011. The hydrologic years chosen to fill gaps in the CCF dataset for the precipitation and evapotranspiration climate change factors for representative WY2012 through WY2017 are shown in Table 5-11. These hydrologic years were selected to best approximate the water conditions of the representative water year."	Ch.5, 5.4.1, pg.186 CH. 5.4.3, pg 190
3. What is used as the basis for climate change assumptions? a. DWR-Provided Climate Change Data and Guidance[12]	X			As discussed above, the GSP developed a new climate factor based on the ones that developed by DWR. The new climate factors were developed along with DWR and the Technical Working Group and Coordination Committee.	Ch.5, 5.4.3, pg.190
b. Other	X				
4. Does the GSP use multiple climate scenarios?		X		Water budget is projected with one climate change scenario, and with climate change plus implementation of P&MAs.	Ch.5.4.6, pg 201-240
5. Does the GSP quantitatively incorporate climate change projections?	X			" 5.4.6 Water Budget Estimates	CH. 5.4.6, pg 201-222

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[12] DWR Guidance Document for the Sustainable Management of Groundwater Guidance for Climate Change Data Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final.pdf
DWR Resource Guide DWR-Provided Climate Change Data and Guidance for Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Resource-Guide-Climate-Change-Guidance_v8.pdf

						"Flow category definitions, data sources, and their assumptions are described in Section 5.4.5. The annual estimates for the historic, current, and projected water budgets are detailed in the following tables in acre-feet per year (AFY): … • Projected Water Budget with Climate Change o Land Surface Budget (Table 5-29) o Groundwater Budget (Table 5-30) o Change in Storage (Table 5-31) • Projected Water Budget with Climate Change and Projects & Management Actions o Land Surface Budget (Table 5-32) o Groundwater Budget (Table 5-33) o Change in Storage (Table 5-34)"	
6. Does the GSP explicitly account for climate change in the following elements of the future/projected water budget?	a. Inflows:	i. Precipitation	X			Table 5-17. Projected Land Surface Budget Assumptions "CIMIS data were applied across the Plan area so that the nearest or most representative station's data were applied to each GSA area. The monthly precipitation data were then used to calculate yearly precipitation volumes." Precipitation volume see listed tables above.	Ch.6 Table 6-7, pg.44
		ii. Surface Water	X			Volumes of water budget elements see tables listed above.	See above.
		iii. Imported Water	X				
		iv. Subsurface Inflow	X				
	b. Outflows:	i. Evapotranspiration	X				
		ii. Surface Water Outflows (incl. Exports)	X				
		iii. Groundwater Outflows (incl. Exports)	X				
7. Are demands by these sectors (drinking water users) explicitly included in the future/projected water budget?	a. Domestic Well users (<5 connections)			X		5.4.9 Projected Water Budget with Climate Change The Projected water budget includes groundwater pumping by "Municipal & Industrial," but results do not appear to be presented at a finer scale than this. The GSP mentioned that the surface water delivery projections include demands from local water purveyors. However, it is not clear whether the local water purveyors include the sectors in the questions.	CH. 5.4.9, pg 231
	b. State Small Water systems (5-14 connections)			X			
	c. Small community water systems (<3,300 connections)			X			
	d. Medium and Large community water systems (> 3,300 connections)			X			
	e. Non-community water systems			X			
8. Are water uses for native vegetation and/or wetlands explicitly included in the current and historical water budgets?				X		Evapotranspiration is included as an outflow category in the land surface budget, however it is not split between type of evapotranspiration. Groundwater outflow to ET does not appear to be identified as a	Table 5-16, pg 196 Table 5-17, pg 198

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9. Are water uses for native vegetation and/or wetlands explicitly included in the projected/future water budget?		**X**		groundwater budget component. Table 5-16. Historic and Current Groundwater Budget Assumptions Table 5-17 Projected Land Surface Budget Assumptions "CIMIS data were applied across the Plan area so that the nearest or most representative station's data were applied to each GSA area. The monthly ET0 data were then used with observed seasonal land use trends and crop coefficients (for each crop type from the Cal Poly Crop Coefficients1) to calculate Evapotranspiration volumes." It appears that the GSP groups all the crop evapotranspiration demands into one sector.	15

Summary/ Comments

The GSP should clearly identify current and projected demands by sensitive beneficial users, including domestic well users, small water systems, and native vegetation and/or wetlands.

Evapotranspiration is included as an outflow category in the land surface budget, however it is not split between type of evapotranspiration. The GSP should separate ET by land-use type (for example, agricultural; municipal and domestic; and native and riparian). Groundwater outflow to ET does not appear to be identified as a groundwater budget component. Since GDEs (including wetlands, riparian vegetation, phreatophytes and other communities) are recognized as beneficial users of groundwater in the Northern and Central Delta-Mendota Regions, it is appropriate to include them in these calculations.

5. Management Areas and Monitoring Network

How were key beneficial users considered in the selection and monitoring of Management Areas and was the monitoring network designed appropriately to identify impacts on DACs and GDEs?

Selected relevant requirements and guidance:
GSP Element 3.3, "Management Areas" (§354.20):

(b) A basin that includes one or more management areas shall describe the following in the Plan:
(2) The minimum thresholds and measurable objectives established for each management area, and an explanation of the rationale for selecting those values, if different from the basin at large.
(3) The level of monitoring and analysis appropriate for each management area.
(4) An explanation of how the management area can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the management area, if applicable.
(c) If a Plan includes one or more management areas, the Plan shall include descriptions, maps, and other information required by this Subarticle sufficient to describe conditions in those areas.

CWC Guide to Protecting Drinking Water Quality under the SGMA[13]
TNC's Groundwater Dependent Ecosystems under the SGMA, Guidance for Preparing GSPs[14]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP define one or more Management Area?	X			5.5.5 Land Subsidence "There are two management areas (MAs) established for land subsidence within the Plan Area: the West Stanislaus Irrigation District and Patterson Irrigation District (WSID-PID) MA and the Tranquillity Irrigation District (TRID) MA (Figure 5-140). The WSID-PID MA includes the entirety of the WSID and PID Groundwater Sustainability Agencies (GSAs), located primarily within Stanislaus County and extending into San Joaquin County. The TRID MA is located at the southeastern tip of the Delta-Mendota Subbasin and encompasses both the TRID and Fresno Slough Water District service areas. The following subsections describe the reason for these MAs, an explanation and rationale for selecting minimum thresholds and measurable objectives established for each MA, the level of monitoring and analysis appropriate for each MA, and an explanation of how the established MAs can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the MAs." Figure 5-140. Subsidence Management Areas, Northern and Central Delta-Mendota Regions	CH.5.5.5, pg 241 Figure 5-140, pg 243
2. Were the management areas defined specifically to manage GDEs?		X		5.5.5.1 Reason for Management Areas "The WSID-PID and TRID MAs have been established to better manage	CH. 5.5.5.1, pg 241

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[13] CWC Guide to Protecting Drinking Water Quality under the SGMA: https://d3n8a8pro7vhmx.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858
[14] TNC's Groundwater Dependent Ecosystems under the SGMA, Guidance for Preparing GSPs: https://www.scienceforconservation.org/assets/downloads/GDEsUnderSGMA.pdf

3. Were the management areas defined specifically to manage DACs?		X		progress toward sustainability through sustainable management criteria for the land subsidence sustainability indicator, as detailed in Chapter 6 Sustainable Management Criteria. Subsidence in the remaining Northern and Central Delta-Mendota Regions outside of the established MAs has the potential to impact water conveyance infrastructure of statewide importance, which includes the California Aqueduct and Delta-Mendota Canal (DMC) that run nearly the entire length of the remaining Plan Area. The WSID-PID and TRID MAs have been delineated to account for their respective unique, localized circumstances and conditions and to help facilitate implementation of the Plan to aid in achieving the sustainability goal for the Delta-Mendota Subbasin by 2040." Management areas are not set up for purposes of managing other sustainability indicators or aspects. See above		17
a. If yes, are the Measurable Objectives (MOs) and MTs for GDE/DAC management areas more restrictive than for the basin as a whole?			X			
b. If yes, are the proposed management actions for GDE/DAC management areas more restrictive/ aggressive than for the basin as a whole?			X			
4. Does the GSP include maps or descriptions indicating what DACs are located in each Management Area(s)?		X		Per Figure 2-16, nearly entire basin is declared as a Disadvantaged Communities to Severely Disadvantaged Community at the Census tract level. The GSP does not identify what DACs are located in what Management Area. This information can be indirectly extracted from the two figures: Figure 2-16 and Figure 5-140. However, these figures don't identify the specific communities (i.e., towns and Census Designated Places) that really make up DACs.	Figure 2-16, pg 30 Figure 5-140, pg 243	18
5. Does the GSP include maps or descriptions indicating what GDEs are located in each Management Area(s)?		X		Maps or descriptions of GDEs do not specify which Management Area they are located in. This information can be indirectly extracted from the two figures: Figure 5-118 and Figure 5-140.	Figure 5-118, pg 178 Figure 5-140, pg 243	19
6. Does the plan identify gaps in the monitoring network for DACs and/or GDEs?	X			5.3.8 Data Gaps "The Delta-Mendota Subbasin is an extensive subbasin covering a large area extending along the northwestern end of the San Joaquin Valley. While there is a significant amount of data available regarding various groundwater related aspects of the Subbasin, much is still not known in multiple locations around the Northern and Central Delta- Mendota Regions. To this end, the following data gaps have been identified and will be addressed as part of the interim period between adoption of this GSP and its first 5-year update. Information regarding subsidence varies in extent around the region. While there is a large amount of land elevation survey data available in association with the DMC and other regional infrastructure, other areas in the Northern and Central Delta-Mendota Regions require additional data collection to both further establish and monitor future land subsidence rates. … An updated DMC Conveyance Capacity Analysis should be conducted to provide data for refining the sustainability indicators for subsidence in the	Ch.5, 5.3.8, pg.184	

				Northern and Central Delta-Mendota Regions." The GSP identifies many data gaps, including land subsidence, interconnectedness of surface water bodies, well construction information, GDEs verification, lack of sufficient monitoring points, questionable ET values from CIMIS, and limited data to provide better estimates on sustainable yield and sustainability indicators for subsidence.	
a. If yes, are plans included to address the identified deficiencies?	**X**			"Data gaps, and a plan to fill data gaps, are also identified for each monitoring network (GSP Emergency Regulations § 354.38)." "Groundwater level monitoring is conducted through a groundwater well monitoring network. The following subsections provide information about how the groundwater level monitoring network for each principal aquifer was developed, criteria for selecting monitoring wells, summary of protocols, monitoring frequency and timing, spatial density, and identification and strategies to fill data gaps." Table 8-1. Northern and Central Delta-Mendota Region GSP Estimated Implementation Costs "Data Gap Tracking"," "$51,000", "annually Tracking of ongoing studies and data collection by other entities and programs)" Even though no specific plans were identified in the monitoring network for DACs and/or GDEs in the GSP, it appeared that the monitoring network will help to close the data gaps.	CH. 7.2, pg 527 CH. 7.2.5.1, pg 539 Table 8-1, 590

Summary/ Comments

The GSP should identify how the various DACs (at the Census Place level) and GDEs are distributed between the two management areas, and discuss what, if any, differential impacts would be anticipated as a result of the separate management of these areas.

6. Measurable Objectives and Undesirable Results

How were DAC and GDE beneficial uses and users considered in the establishment of Sustainable Management Criteria?

Selected relevant requirements and guidance:
GSP Element 3.4 "Undesirable Results" (§ 354.26):
(b) The description of undesirable results shall include the following:
(3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results

GSP Element 3.2 "Measurable Objectives" (§ 354.30)
(a) Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Are DAC impacts considered in the development of Undesirable Results (URs), MOs, and MTs for groundwater levels and groundwater quality?	X			"An undesirable result for chronic lowering of groundwater levels is triggered, or conditions are deemed "significant and unreasonable," when groundwater elevations drop below the site-specific minimum threshold at 25 percent of representative monitoring wells in a principal aquifer in the Northern and Central Delta-Mendota Regions concurrently over a given year (5 out of 17 wells in the Upper Aquifer and/or 5 out of 18 wells in the Lower Aquifer). If these conditions were to occur, it is anticipated that shallow domestic wells in the same subregion as the representative monitoring points in exceedance of the minimum threshold would go dry and/or these conditions would result in higher pumping costs and/or the need to modify wells to obtain groundwater (for more information about monitoring network subregions, refer to Section 7.2 Monitoring of the Sustainability Implementation chapter)." "Beneficial uses and users of groundwater, including domestic, municipal, agricultural and environmental use and their associated land uses and property interests, were considered in establishing minimum thresholds for the chronic lowering of groundwater levels sustainability indicator. Stakeholders, including the public, were invited to provide feedback on minimum thresholds during Working Group meetings and during public workshops centered around SMC held throughout the Delta-Mendota Subbasin in May 2019. Northern and Central Delta-Mendota Regional representatives from the municipal and agricultural sectors are Working Group members and provided input in setting the minimum thresholds for the chronic lowering of groundwater levels sustainability indicator throughout the development process. Municipal and agricultural representatives stated that setting the minimum thresholds as the hydrologic low for the Upper Aquifer and 95 percent of the hydrologic low for the Lower Aquifer were not likely to cause an undesirable result, based on observed conditions and impacts to operations during the most recent drought. Domestic wells are generally shallower than agricultural and municipal wells and thus more sensitive to undesirable results. Additionally, the loss of a domestic well usually results in a	CH.6.3.1.1.4, pg 8 CH. 6.3.1.2, PG 10

				loss of water for consumption, cooking, and sanitary purposes, which can often have substantial impacts on the users of the water and can be financially difficult for the well owner to replace. Based on local knowledge and experience during the last drought, setting the minimum threshold for the Upper Aquifer as the hydrologic low (analogous to WY2015 groundwater elevations in most places) is protective of an undesirable result for chronic lowering of groundwater levels." "An undesirable result for degraded water quality is triggered, or considered "significant and unreasonable," when: ● Groundwater quality exceeds Maximum Contaminant Levels (MCLs) or water quality objectives (WQOs) for TDS, nitrate, or boron over three (3) consecutive sampling events in non-drought years, or additional degradation of current groundwater quality where current groundwater quality exceeds the MCLs or WQOs. ● Water quality degradation due to recharge projects that exceeds 20 percent of the aquifer's assimilative capacity for one or more constituents without justification of a greater public benefit achieved." "The minimum thresholds for the degraded water quality sustainability indicator are set as the upper Secondary MCL for TDS (1,000 mg/L) (State of California, 2006), the Primary MCL for nitrate (10 mg/L as N) (SWRCB, March 2018), and the agricultural WQO for irrigation for boron (0.7 mg/L) (Ayers and Westcot, 1985) or current groundwater quality as of December 2018 for both the Upper Aquifer and Lower Aquifer if the listed MCL or WQO is already exceeded … The Basin Plan, Statewide Recycled Water Policy, and Resolution 68-18, combined with the requirement to establish existing baseline conditions under SGMA, were relied upon to establish and justify the minimum thresholds for the degraded water quality sustainability indicator."	CH. 6.3.3.1.2, pg 19 CH. 6.3.3.2, PG 20
2. Does the GSP explicitly discuss how stakeholder input from DAC community members was considered in the development of URs, MOs, and MTs?	X			A discussion of outreach, feedback, and consideration for stakeholder input is provided in the discussion of each sustainability indicator.	CH. 6.3.1.1.1, pg 7
3. Does the GSP explicitly consider impacts to GDEs and environmental BUs of surface water in the development of MOs and MTs for groundwater levels and depletions of ISWs?		X		Section 6.3.1.3 Measurable Objectives for Groundwater Levels Section 6.3.3.3 Measurable Objectives and Interim Milestones The Measurable Objectives do not consider GDEs.	CH. 6.3.1.3, PG 14-16 CH. 6.3.3.3, pg 23-25
4. Does the GSP explicitly consider impacts GDEs and environmental BUs of surface water and recreational lands in the discussion and development of Undesirable Results?		X		Section 6.3.1.1 (URs for water levels) only describes undesirable results relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline. "Reduced groundwater levels could result in surface water depletions that may impact beneficial uses of interconnected surface water within the Plan area. Similarly, significantly declining groundwater elevations could also	CH. 6.3.1.1.4, PG 8

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				impact productive agriculture. Municipal users of groundwater may be impacted where groundwater is the primary or sole supply source, such as for the City of Patterson and the communities of Grayson and Westley. Potable water supply costs for municipalities are likely to increase in the event of undesirable results due to a need to deepen wells, increased power-related costs to lift the water, a need for new wells, and/or if municipalities are forced to seek supplemental or alternative potable water supplies, such as surface water."	

Summary/ Comments

It is impossible to assess the efficacy of the proposed MTs without the ability to understand the population adjacent to those monitoring locations.

The reference to Resolution 68-18 on page 20 should be changed to 68-16, assuming that the reference is intended to refer to the State Water Board's anti-degradation policy.

The GSP should include GDEs and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment. It should also modify this section to specifically address degraded water quality from total dissolved solids (TDS), arsenic (As), boron (B), and other potential constituents of concern to wildlife and vegetation communities of GDEs.

Section 6.3.1.1.2 states that "..conditions are deemed significant and unreasonable, when groundwater elevations drop below the site-specific minimum threshold of 25% of representative monitoring wells in a principal aquifer…..in a given year.'' This proportion will affect GDEs since 25% may be beyond the threshold for these ecosystems to maintain healthy function and continue to provide the habitat and wildlife that they currently support. A specific threshold should be provided for monitoring wells that measure groundwater levels near GDEs.

Section 6.3.3.1.2 discusses MCLs and WQOs but does not include metrics for GDEs. The GSP should modify this section to specifically address degraded water quality from TDS, As, B and other constituents that could pose a threat to wildlife and / or vegetative communities associated with GDEs and ISWs. Although As and CrVI are mentioned in this section, please add a statement addressing that over pumping and dewatering of aquitards has been identified as a potential source of elevated As concentrations above drinking water standards in San Joaquin Valley aquifers. The following is a link to a paper by Smith, Knight and Fendorf (2018) titled "Overpumping leads to California groundwater arsenic threat": (https://www.nature.com/articles/s41467-018-04475-3.

Section 6.3.6 states that depletions will be considered from monitoring data collected between 2020 to 2025. At a minimum the GSP should maintain the current level of ISWs until additional information is collected and measurable objectives and minimum thresholds can be more precisely defined. For example, Table 5-9 (p. 5-172) estimates the quantity of gains and depletions for reaches of the San Joaquin River only. This type of information should be used to support the statement of undesirable results and should be expanded to other streams that are potential ISWs. The GSP should be modified to include a statement that there will be no increase in depletions for confirmed and potential ISWs, at least until data gaps are filled.

7. Management Actions and Costs

What does the GSP identify as specific actions to achieve the MOs, particularly those that affect the key BUs, including actions triggered by failure to meet MOs? What funding mechanisms and processes are identified that will ensure that the proposed projects and management actions are achievable and implementable?

Selected relevant requirements and guidance
GSP Element 4.0 Projects and Management Actions to Achieve Sustainability Goal (§ 354.44)
(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
(b) Each Plan shall include a description of the projects and management actions that include the following:
(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action.

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)	
1. Does the GSP identify benefits or impacts to DACs as a result of identified management actions?		X		Table 7-2 lists how each project can impact the five sustainability indicators, including chronic lowering of groundwater level, reduction of groundwater storage, degraded water quality, land subsidence, and depletions of interconnected surface water. However, specific benefits or potential impacts to DACs and drinking water users are not identified.	Table 7-2, pg 9-12	22
2. If yes: b. Is a plan to mitigate impacts on DAC drinking water users included in the proposed Projects and Management Actions?		X		It should be noted that the proposed water level SMCs for the upper aquifer are based on hydrologic lows, comparable to the last drought period, and that based on this, the GSP identifies that significant impacts are not expected to drinking water users, including domestic well users.		23
c. Does the GSP identify costs to fund a mitigation program?		X				
d. Does the GSP include a funding mechanism to support the mitigation program?		X				
2. Does the GSP identify specific management actions and funding mechanisms to meet the identified MOs for groundwater quality and groundwater levels?		X		Table 7-1. Northern & Central Delta-Mendota Region GSP Projects and Management Actions Table 7-2. Summary of How Northern & Central Delta-Mendota Region GSP Projects and Management Actions Address Sustainability Indicators Table 8-2. Potential Funding Sources for GSP Implementation Many management actions are identified to fill in the data gap, increase groundwater level, and improve water quality. However, the text is not addressed to MOs. The funding sources are not for meeting MOs solely.	Table 7-1, pg 7 Table 7-2, pg 9-12 Table 8-2, pg 12	24
3. Does the GSP include plans to fill identified data gaps by the first five-year report?		X		7.2.5.1.6 Plan to Fill Data Gaps "Within the Northern and Central Delta- Mendota Regions, a total of 14 wells will be video logged to identify screen intervals and determine aquifer designation, and one multi-completion well will be installed near Panoche Creek within the Central Delta-Mendota Subbasin GSA through DWR's TSS program. Additionally, four nested wells will be installed with tentative	CH. 7.2.5.1.6, pg 49, Sections 7.2.5.1.2 and 7.2.5.1.3, pg 45-47	25

				locations between the boundaries of Del Puerto Water District (DM-II GSA), Patterson Irrigation District, and West Stanislaus Irrigation District utilizing future grant funding. For the purpose of monitoring depletions of interconnected surface water, where groundwater levels are used as a proxy, four additional wells with tentative locations have been identified that would also be included in the groundwater level monitoring network. These wells are located within three miles of the San Joaquin River within the Northwestern Delta-Mendota GSA and Patterson Irrigation District GSA. As wells with unknown construction are video surveyed and new wells are installed, professional judgement will be used to determine if each well meets the criteria for inclusion in the groundwater level monitoring network for each principal aquifer. Any new monitoring wells will be installed in accordance with guidance provided in DWR's Monitoring Networks and Identifications of Data Gaps BMP (2016a) and with the State's well standards." "While past temporal data gaps cannot be rectified, future temporal data gaps can be prevented or reduced by ensuring proper sampling and data management protocols are followed, as detailed in Sections 7.2.5.1.2 and 7.2.5.1.3." "Current uses for each well within the groundwater level monitoring networks for the Upper Aquifer and Lower Aquifer are identified in Table 7-6 and Table 7-7. Not all wells included in these networks are dedicated monitoring wells, as recommended by DWR's Monitoring Networks and Identifications of Data Gaps BMP (2016a). A concerted effort will be made to convert or replace production wells with dedicated monitoring wells over time as funding allows. As production wells are replaced by dedicated monitoring wells, GSA member agencies will provide input regarding converting existing monitoring wells to a dedicated monitoring wells, selecting an alternative well to convert to a dedicated monitoring well, or selecting the location to install a new dedicated monitoring well." The GSP identifies plans to fill data gaps, but does not indicate a timeline for doing so.	Table 7-6 and Table 7-7, pg 41-42
4. Do proposed management actions include any changes to local ordinances or land use planning?		X		The proposed management actions do not include changes to local ordinances or land use planning. However, rotational fallowing of crop lands is included in their Tier 3 management actions. Tier 3's definition in 7.1: "Longer-term projects and management actions that may be implemented in the future as needed. Many of these projects are outside of the GSAs' control but could have implications on surface water availability and/or are additional projects/management actions that could be implemented under an adaptive management approach."	Table 7-1, pg 7 CH. 7.1. pg 6
5. Does the GSP identify additional/contingent actions and funding mechanisms in the event that MOs are not met by the identified actions?	X			"The projects and management actions contained herein were divided into three tiers based on design and funding status and anticipated timeframe of implementation: ● Tier 1 – Near-term projects and management actions that the Groundwater Sustainability Agencies (GSAs) are committed to	CH. 7.1. pg 5-7 Table 7-1, pg 7

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				implementing at this time. These projects and management actions are either currently in the process of being implemented or could be implemented in the near future (constructed and operational) within the next five years (by 2025). ● Tier 2 – Projects and management actions that have been identified and require further development before implementation can occur. It is anticipated that these projects and management actions could be developed over the next five years and implemented beginning in 2026 or later, pending re-evaluation prior to the 5-Year GSP Update in 2025. ● Tier 3 – Longer-term projects and management actions that may be implemented in the future as needed. Many of these projects are outside of the GSAs' control but could have implications on surface water availability **and/or are additional projects/management actions that could be implemented under an adaptive management approach."**	
6. Does the GSP provide a plan to study the interconnectedness of surface water bodies?		X		7.2.5.6.3 Frequency and Timing of Monitoring "Since groundwater levels are being used as a proxy for monitoring depletions of interconnected surface water, the frequency and timing of monitoring events can be found in Section 7.2.5.1.3. Publicly available stream gauge data, such as from the USGS's National Water Information System (NWIS) and DWR's California Data Exchange Center (CDEC), will be paired with groundwater level and extraction data to evaluate for any significant and sustained change in gradient between monitoring wells and the San Joaquin River, potentially indicating a significant and unreasonable loss of interconnected surface water as a result of groundwater extractions." "As described in Chapter 6 Sustainable Management Criteria, the first 5-year interim goal is to establish numeric minimum thresholds, measurable objectives, and subsequent interim milestones for the depletion of interconnected surface water sustainability indicator. Prior to the 5-Year GSP Update, the frequency and timing of depletion of interconnected surface water monitoring will be evaluated and refined to better understand the timing and quantity of depletions (if any) from the San Joaquin River."	
7. If yes: a. Does the GSP identify costs to study the interconnectedness of surface water bodies?			X		The GSP does not identify costs to study the interconnectedness of the surface water bodies. However, it does state that "Data gaps identified in the above section for the groundwater level monitoring networks for each principal aquifer will be filled through a combination of video surveying well boreholes to identify screen intervals and constructing new dedicated monitoring wells as funding allows (including through Technical Support Services [TSS] funding provided by DWR, future grant funding, and GSA funding)Data gaps identified in the above section for the groundwater level monitoring networks for each principal aquifer will be filled through a combination of video surveying well boreholes to identify screen intervals and constructing new dedicated monitoring wells as funding allows (including through Technical Support Services [TSS] funding provided by DWR, future grant funding, and GSA funding)."	CH 7.2.5.1.6, pg 49
b. Does the GSP include a funding mechanism to support the study of interconnectedness surface water bodies?			X			

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8. Does the GSP explicitly evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies?		X		6.3.6.1.4 Potential Effects of Undesirable Results "If depletions of interconnected surface water were to reach levels causing undesirable results, adverse effects could include reduced flow and stage within the San Joaquin River to the extent that insufficient surface water flows would be available to support diversions for agricultural uses or to support regulatory environmental requirements. This could result in increased groundwater production, changes in irrigation practices and crops grown, and could cause adverse effects to property values and the subbasin-wide economy. Such impacts could also be tied to the inability to meet minimum flow requirements, which are defined for the San Joaquin River and are managed by upstream dams and reservoir releases." The GSP states that depletions will be considered from monitoring data collected between 2020 to 2025. At a minimum the GSP should maintain the current level of ISWs until additional information is collected and measurable objectives and minimum thresholds can be more precisely defined. For example, Table 5-9 (p. 5-172) estimates the quantity of gains and depletions for reaches of the San Joaquin River only. This type of information should be used to support the statement of undesirable results and should be expanded to other streams that are potential ISWs. Table 7-2 Summary of How Northern & Central Delta-Mendota Region GSP Projects and Management Actions Address Sustainability Indicators	CH. 6.3.6.1.4, PG 38 Table 7-2, pg 9

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Summary/ Comments

The GSP should explicitly discuss any potential impacts or benefits of the management actions and projects on DACs and drinking water users and evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies

The GSP should identify specific management actions and funding mechanisms to meet the identified MOs for groundwater quality and groundwater levels.

The GSP should also clarify whether the plans to fill the data gaps will be finished by the first five-year report.

The GSP should identify costs to study the interconnectedness of surface water bodies and clarify the funding sources, and it should modify this section of the GSP to include a statement that there will be no increase in depletions for confirmed and potential ISWs, at least until data gaps are filled.

Although Table 7-2 (p. 7-5) provides information on how each project supports ISWs there are no criteria provided on how GDEs and ISWs were considered in project selection. The GSP should include criteria considered for project selection as it relates to GDEs and ISWs. Examples of case studies on how to incorporate environmental benefits into groundwater projects, can be found here: https://groundwaterresourcehub.org/case-studies/recharge-case-studies/

PD-09

GRANITE™

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May 8, 2019

Delta Mendota II Groundwater Sustainability Agency
P.O. Box 1596
Patterson, CA 95363
Attention: Adam Scheuber

COMMENT LETTER ON PENDING SAN JOAQUIN VALLEY-DELTA MENDOTA MODELING AND SUSTAINABLE GROUNDWATER MANAGEMENT PLAN DEVELOPMENT

Dear Mr. Scheuber,

Granite is a full service general contractor, construction management firm, and construction materials producer. Granite has a long history of building in California and specializes in heavy civil construction of complex infrastructure projects serving the transportation, industrial, and federal markets.

Additionally, Granite has quarry operations within the San Joaquin Valley-Delta Mendota basin, which provides aggregate materials (such as road base, aggregate, and asphalt paving materials) needed to build and maintain the roads, highways, airports, water systems and other public infrastructure.

Historically most water agencies have not needed to interact directly with quarry operations (who usually operate groundwater production wells) leading to a tendency to either ignore, or treat our operations as "de minimis" users.

We strongly urge your agency to give full consideration of our operations in the development of the San Joaquin Valley-Delta Mendota groundwater basin model and future Groundwater Sustainability Plan (GSP).

We have outlined some of our concerns below.

1. **Construction aggregate mining occurs predominantly in rural areas disconnected from public water systems**

   67% of California Construction aggregate production in 2012 was produced predominantly from alluvial deposits in historic floodplains. These locations usually do not have access to public water systems and rely on groundwater wells as their only source of water. 1

   We urge your agency to recognize these rural wells, and their probable inability to be replaced by surface delivery systems, in basin modeling and infrastructure planning.

2. **Volumes for groundwater produced for quarry operations are not de minimis**

   Many agencies have defined "de minimis users" as users who pump less than 5 acre-feet per year (AFY). Quarry operations use hundreds of AFY (the exact amount varies based on climate, soils and nature of the mineral deposit of each facility). Lack of consideration of quarry 2

groundwater production will potentially result in flawed modeling, hampering long term sustainability goals.

We encourage your agency to establish a production threshold for "de minimis users" and collect all groundwater production data in excess of the defined threshold to insure the basin model is accurate. 2

3. **Quarries operations have basin benefits which may need to be considered**

Quarries engage in significant water recycling practices by recirculating aggregate wash water through onsite ponds, significantly reducing groundwater pumped relative to production needs. Wash ponds, and areas of impermeable surfaces, allow for groundwater recharge during operations. Further, wash water doesn't need to be potable. By using onsite wells quarries help municipal providers reduce the volumes of potable water treated and freeing system delivery capacity. 3

Mining activities are an interim land use which includes reclamation plans focused planning for a post mining use. Quarries may present future opportunities for water storage and/or recharge facilities, and should be considered in long term planning.

When determining undesirable impacts, sustainable practices, and future GSA projects we encourage your agency to consider efficiencies of use, and future opportunities, of quarry operations.

Granite notes that the State has recognized that the state's mineral resources are vital, finite, and important natural resources; and *encourages the responsible protection and development of these mineral resources is vital to a sustainable California*.

We have learned from experience that groundwater management plans that do not balance the needs of all natural resources produce unintended negative consequences to other protected resources (such as mineral resources); which is contrary to the State's stated sustainability goals.

Granite requests that future basin modeling and GSP development gives full consideration of the needs of aggregate facilities to insure the protection of aggregate producer's rights and furthering the State's sustainability goals relative to both water and mineral resources.

Please to contact me at 916-825-5708 or **Courtney.Deporto@gcinc.com** to further discuss our request and concerns.

Sincerely,
Granite Construction Company

Courtney DePorto
Valley Region Environmental Coordinator II

CC: Adam Harper, California Construction and Industrial Materials Association (CalCIMA)

Kamman Hydrology & Engineering, Inc.
539 Bret Harte Road, San Rafael, CA 94901
Telephone: (415) 491-9600
Facsimile: (415) 680-1538
E-mail: greg@KHE-Inc.com

October 11, 2019

San Luis & Delta-Mendota Water Authority
842 6th Street
Los Banos, CA 93635
Via email: andrew.garcia@sldmwa.org

Subject: Review of Public Draft Groundwater Sustainability Plan
For the Northern and Central Delta-Mendota Regions

Dear Sir/Madame:

I am a hydrologist with over thirty years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology. I have been providing professional hydrology and geomorphology services throughout California since 1989 and routinely manage and lead projects in the areas of surface- and groundwater hydrology, water supply, water quality assessments, water resources management, and geomorphology. A copy of my resume is attached.

On behalf of the California Sportfishing Protection Alliance, I have been retained by the Law Offices of Thomas N. Lippe, APC to review and evaluate the Public Draft Groundwater Sustainability Plan (GSP) for the Northern and Central Delta-Mendota Regions, especially as it pertains to groundwater interaction with the San Joaquin River. Based on my review, it is my opinion that the GSP is deficient in many areas. The rationale for this opinion is based on the findings presented below.

1. **Page 5-89, Section 5.3, Sentence starting with, "This section..."**
   The current conditions in the GSP is represented by Water Year (WY) 2013 conditions. WY 2013 is out-dated when compared to the year (2020) that this plan represents. Section 354.16 of the GSP Regulations (Groundwater Conditions) states, "Each Plan shall provide a description of current and historical groundwater condition in the basin, including data from January 1, 2015, to current conditions, based on the best available information…" The WY2013 period used in the GSP to represent "current conditions" predates the "current condition" period stipulated in GSP regulations. 1

2. **Page 5-94, Section 5.3.2.4, Sentence starting with, "Due to insufficient..."**
   Due to insufficient data, groundwater elevation contour maps for the Lower Aquifer for the spring and fall of 2013 could not be prepared. This is another issue with choosing WY 2013 to represent current conditions. A different and preferably more current year should be considered. The GSP fails to fully describe current groundwater conditions. 2

3. **Page 5-170, Section 5.3.7.2, Sentence starting with, "The San Joaquin..."** Section 354.16 of the GSP Regulations stipulates that each plan describe current and historic groundwater conditions in the basin based on the best available information. With regard to Interconnected Surface Water Systems, I would like you to be aware of a study completed by Kamman Hydrology & Engineering, Inc.[1], which delineates subterranean streams and Potential Stream Depletion Areas (PSDA) along the San Joaquin River. PSDA's are areas where groundwater pumping could potentially cause stream depletion. A link to this report and associated maps is provided in the footnote below for reference and integration into the GSP. 3

4. **Page 5-170, Section 5.3.7.2, Sentence starting with, "The San Joaquin..."** The GSP only addresses interconnected surface water systems along the San Joaquin River north of Newman, California, where the river is characterized as a gaining stream. This constitutes only 1/3rd of the river length within the Delta-Mendota Subbasin boundary. South (upstream) of Newman, the Nature Conservancy (2016) characterizes groundwater and stream interaction along the San Joaquin River as a mix of gaining and losing reaches, but dominated by gaining reaches. The GSP fails to fully characterize the interconnected surface water conditions along the San Joaquin River within the Subbasin boundary. Understanding and properly managing and protecting these interconnected surface- and groundwater systems is important as there are significant GDE's and associated resources like fish, riparian vegetation and wetlands along the entire length of River in the Subbasin. 4

5. **Page 5-172, Section 5.3.7.6, Sentence starting with, "The NCCAG dataset..."** The GSP Regulations define "groundwater dependent ecosystem" (GDE) as ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. Section 354.16 of the Regulations stipulate that Plans identify (current and historic) GDEs within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information. As stated on page 5-172, the Natural Communities Commonly Associated with Groundwater (NCCAG) database, developed by DWR, CDFW and The Nature Conservancy (TNC), is used to identify GDEs within the Delta-Mendota Subbasin. The GSP then describes a methodology to further screen available information and establishes the following standards to identify GDEs: 5

[1] Kamman Hydrology & Engineering, Inc., 2018, Delineating subterranean streams and Potential Stream Depletion Areas, Lower Stanislaus and Tuolumne River Watershed. Draft Technical Memorandum prepared for: Law Offices of Thomas N. Lippe, APC, July 23, 9p. and 15 sheets. https://www.dropbox.com/s/2ser942wkeb5d3v/PSDA-mapping-Tech-Memorandum_v1%2Bquads.pdf?dl=0

(1) Areas with depths to groundwater levels greater than 30 feet were eliminated unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks);
(2) Seasonally-managed areas and wetlands were eliminated due to their dependence on applied surface water; and
(3) A 100-foot buffer was applied around the San Joaquin River within the Northern Delta-Mendota Region to include all communities in the NCCAG dataset as potential GDEs, except where professional juedement and local knowledge determined GDEs were not present.

A problem with this GDE screening methodology is the failure to acknowledge that GDEs may depend on shallow groundwater regardless of the presence of applied surface water sources. For example, wetlands within or adjacent to irrigated agriculture may not rely on that irrigation for survival; if they did, we would expect to find wetlands growing in all irrigated lands. In addition, the presence and sustainability of perennial surface water in Central Valley Rivers is controlled by many factors (e.g., groundwater inflow, reservoir operations, irrigation drainage, etc.). Information presented in the GSP indicate significant contributions of groundwater flow to "gaining" reaches of the San Joaquin River. The riparian and wetland vegetation bordering these gaining reaches are surely sustained to some degree by this groundwater inflow to the river and the shallow groundwater conditions that likely accompany gaining reaches. The interconnected condition is also likely influenced significantly by seasonal and long-term wet and dry cycles. However, the GSP does not quantify the relative spatial or temporal contributions of groundwater supply to riparian habitats. Instead, the GPS simply dismisses these habitats as GDE's under the assumption that perennial flow is sustained through the summer by agricultural deliveries or tailwater. Therefore, it is my opinion that the process of elimination of GDEs as presented in the GSP is seriously flawed and does not correctly recognize or delineate GDEs in the basin. 5

6. **Page 5-173, Section 5.3.7.6, Sentence starting with, "As a result..."**
The GSP states, "*Management and protection of GDEs may require more focus on land use or irrigation activities more than groundwater management*." This is a bizarre statement because the GSP eliminates areas mapped as GDEs if they are, "*seasonally-managed areas and wetlands due to dependence on applied surface water*." Per the GDE screening methodology described above, the "management and protection" practices being suggested for GDEs would eliminate these areas from consideration as a GDE. 6

7. **Page 5-185, Section 5.4.3, Sentence starting with, "The current water budget..."**
The GSP states, "*The current water budget year is defined as WY2013. While "current water budget conditions" are defined in the GSP Emergency Regulations §354.18(c)(1) as the year with "the most recent population, land use,* 7

and hydrologic conditions," WY2015, WY2016 and WY2017 were not thought to be representative of the Delta-Mendota Subbasin under "normal" or "average" conditions. Response to the most recent drought began in WY2014 with some initial fallowing of lands. By WY2015 and WY2016, which are both classified as dry years, more lands were fallowed throughout the Subbasin in response to multiple dry year conditions. Agricultural production was higher in WY2017, compared to WY2015 and WY2016, but the delivery allocations from the Central Valley Project (CVP) came late in the season, so a considerable amount of land was still fallowed. By WY2018, agricultural land production increased and was similar to conditions in WY2013, however complete datasets were not yet available for use in the water budgets. Therefore, the Coordination Committee agreed that WY2013 represents the most recent water year with a complete data set representing typical demands and supplies." 7

WY 2013 is a critically dry year-type falling within the 2012-2016 recent drought period, which heavily influences the meteorology, hydrology and water operations reflected in the associated "current conditions" water budget. There are more current years reflecting normal or average conditions. For example, Figures 5-84 and 5-85 (page 5-120) indicate that 2017 and 2018 were wet and average year types respectively. During WY2017, there was little change in aquifer storage in both the upper and lower aquifers, suggesting water operations balanced with available supplies. WY2017 also better representative of "current conditions" as it post-dates January 1, 2015 and reflects an average water operational period. WY2018 would also be a suitable when complete datasets become available.

8. **Page 5-186, Section 5.4.3, Sentence starting with, "Streamflow Climate Change..."**
California Department of Water Resources (DWR) has developed a document (July 2018) entitled, Guidance for Climate change *Data Use During Groundwater Sustainability Plan Development* (Guidance Document). This document explains the DWR-provided climate change data, including how the data were developed, the methods and assumptions used for data development, and how they can be used in the development of a projected water budget. DWR has prepared climatological, hydrological and water operations datasets. This Guidance Document also describes tools and processes relevant to perform climate change data analysis (i.e., incorporating climate change analysis into projected water budgets, with and without numerical surface water/groundwater models). The data and methods described in the Guidance Document are optional and other local analysis and methods may be used. 8

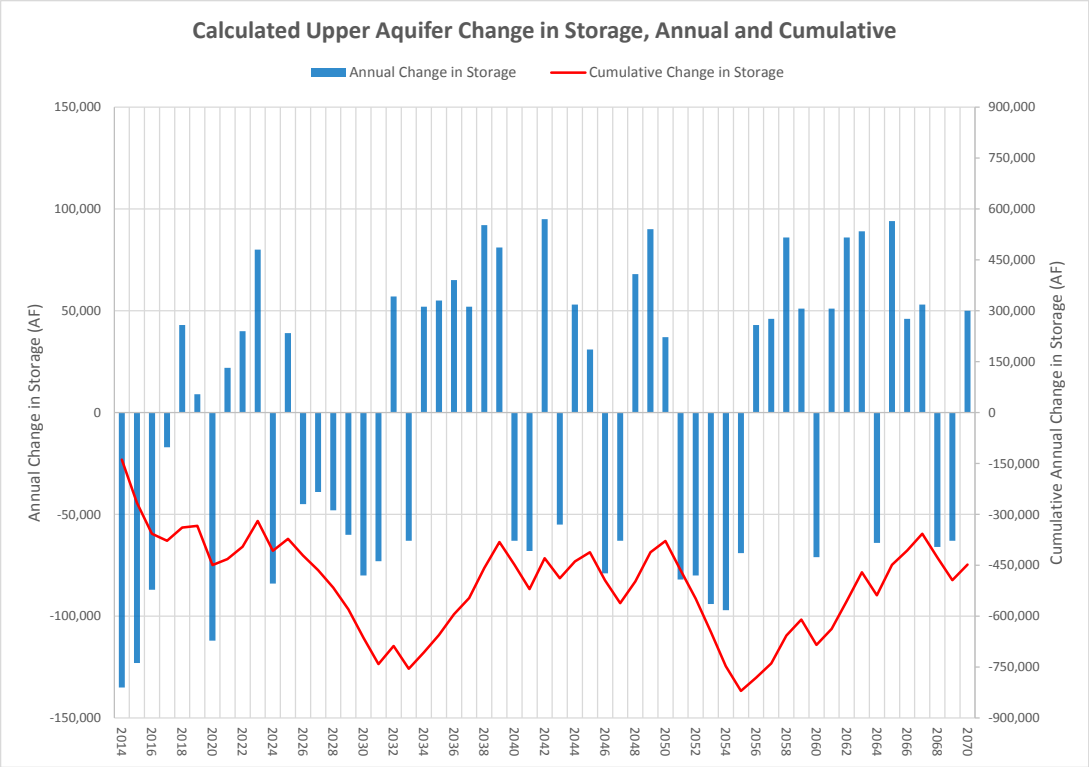
The projected (climate change) water budgets presented in the GSP utilize much of the climatological datasets. However, stream flow climate change factors from DWR were not applied – the proposed GSP considers them out-of-date and considers the result of using them as producing skewed (unreasonable) results for future surface water deliveries. Instead, the GSP states that GSA member

agencies provided estimates for anticipated future surface water deliveries that were used in the water budget calculations. However, there is no discussion on the methods and assumptions used for data development, and how climate change was integrated into data values. Therefore, there is no way to evaluate the validity or applicability of these water budget variables with the information provided in the GSP. These information deficiencies should be remedied before approving the GSP. 8

9. **Page 5-189, Section 5.4.4, Sentence starting with, "The selected alternative..."** The GSP uses a spreadsheet modeling approach for water budget development in lieu of numerical groundwater modeling. The spreadsheet modeling approach does not account for surface water-groundwater interaction and is therefore not an "equally effective method" (see *§354.18(e))* to numerical modeling with respect to identification on interconnected surface water systems and estimating the quantity and timing of depletions of those systems. 9

10. **Page 5-234, Section 5.4.10, Sentence starting with, "With the addition..."** Based on the results of the Projected Annual Groundwater Budget with Climate Change and Projects & Management Actions, the subbasin should still be considered in a state of overdraft. Although water results indicate a trend of recovery and surplus storage in the Upper Aquifer, the Upper Aquifer displays a long-term trend in storage decline. To better visualize results for this water budget, the annual and cumulative change in storage volumes for the Upper Aquifer, Lower Aquifer and Total (combined Upper and Lower Aquifers) were plotted. These plots are presented below. 10

    The plot of cumulative change in storage for the Upper Aquifer indicates multi-year periods of large fluctuations in storage, but a long-term trend in declining storage. The GSP states that over the WY2014 to WY2070 period, the average annual change in Upper Aquifer storage is -4,000 AF and the average annual change in Lower Aquifer is +3,000 AF. This statement in itself indicates the Upper Aquifer is in overdraft and long-term decline under this water budget scenario. Based on the graphs below, I estimate that the long-term annual change (deficit) in Upper Aquifer storage is twice as high (-8000 AFY) as that reported in the GSP (-448,000 AF divided by 56 years). I also estimate an annual change in storage in the Lower Aquifer is +6214 AFY (+348,000 AF divided by 56 year) and the total annual change in storage of the Upper and Lower combined is -1785 AFY (-100,000 AF divided by 56 years). Although the proposed Projects and Management Actions presented in the GSP will address overdraft sustainable management of the Lower Aquifer, the GSP has not demonstrated sustainable management for the Upper Aquifer, which provides a much larger percentage of total groundwater supply in the subbasin than the lower aquifer.


Calculated Upper Aquifer Change in Storage, Annual and Cumulative
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Cumulative Annual Change in Storage (AF)
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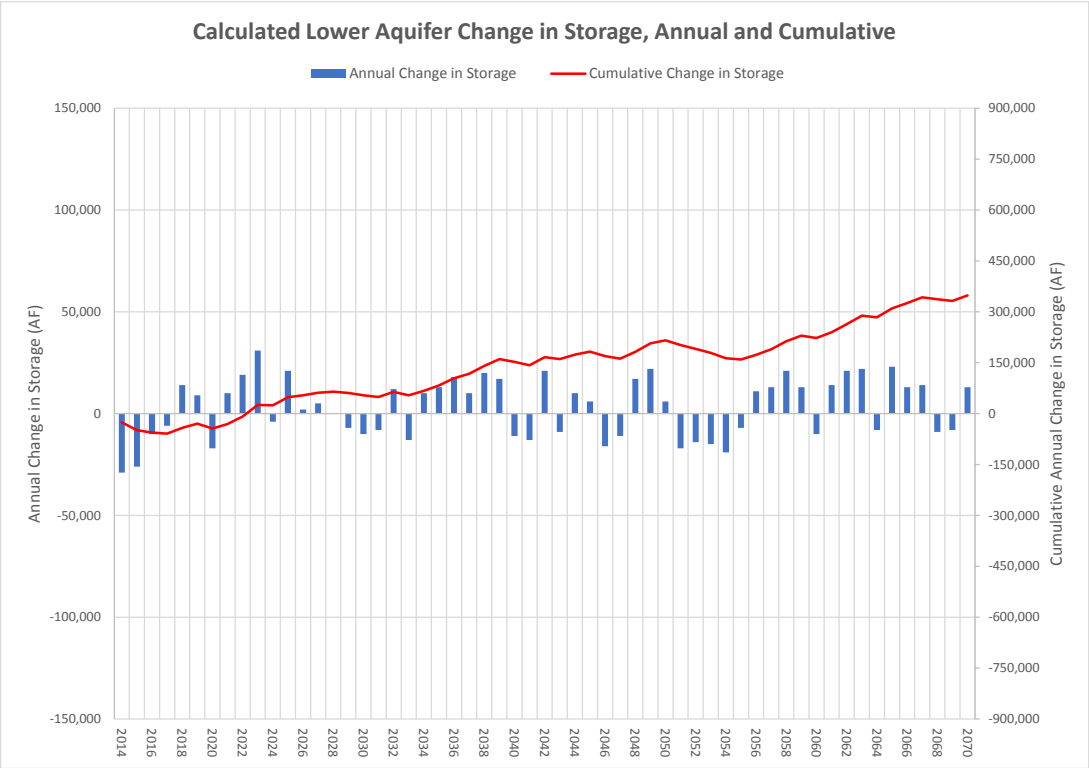
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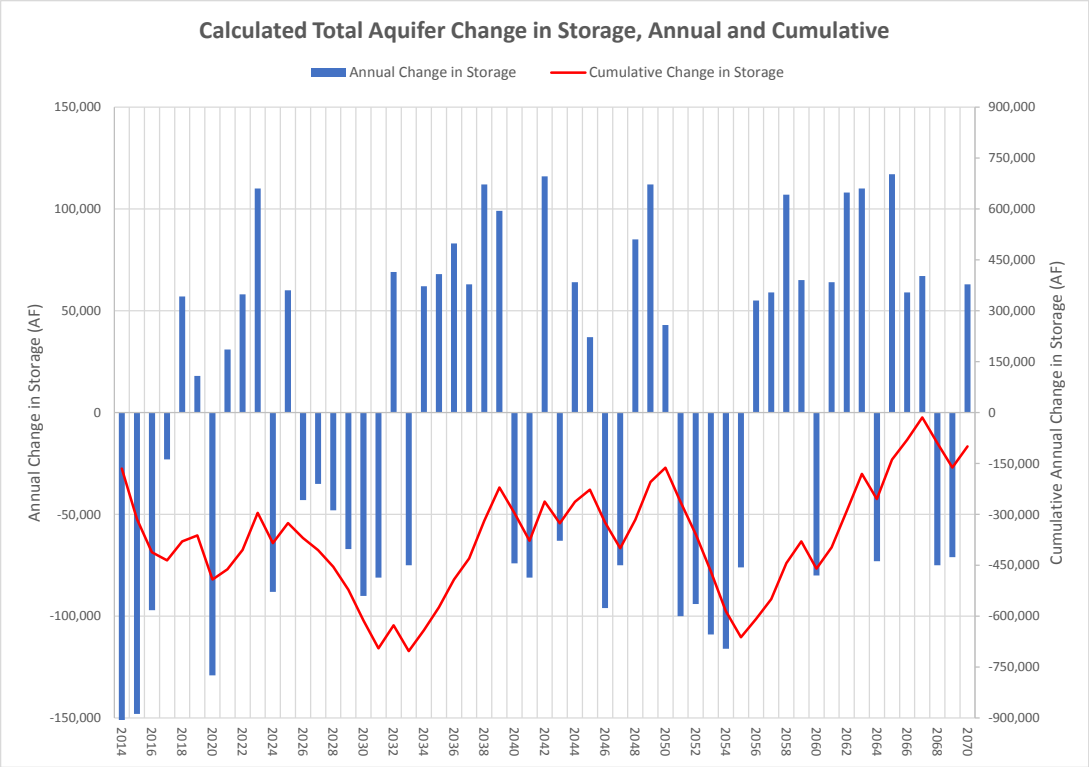


11. **Page 5-235, Section 5.4.11, Sentence starting with, "This analysis resulted..."**
The GSP presents a description and formula for estimating sustainable yield. However, the Upper or Lower Aquifer estimates are not reproducible using this formula and the water budget result tables presented earlier in the GSP. Therefore, the draft GSP should be revised to provide more detailed explanation of these calculations, including a sample calculation so the reader can understand and verify how they are quantified, and then recirculated from public comment. 11

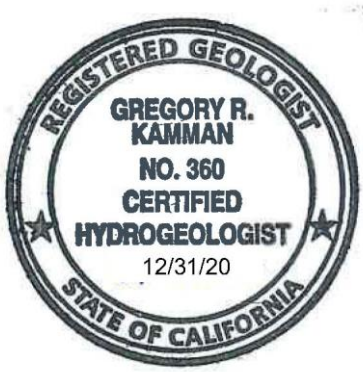
12. **Page 6-12, Section 6.3.2, Sentence starting with, "Reduction of Groundwater"**
This section indicates that the GSP uses groundwater levels minimum thresholds as a proxy for the reduction of groundwater storage sustainability indicator. The plots of annual and cumulative annual change in groundwater storage presented above are very helpful in identifying and understanding long-term trends in aquifer storage. I recommend that in lieu of (or in addition to) using groundwater levels as a proxy, water budgets and the resulting annual and cumulative aquifer storage graphics (like those above) should be used as a more meaningful groundwater storage sustainability indicator. The data to maintain current annual water budgets would be required. The existing GSP and future reporting graphs can be used to define and track undesirable results, minimum thresholds, measureable objectives, and interim milestones for the reduction in groundwater 12

storage. For example, one measureable objective may be positive or neutral trends in long-term cumulative storage. An example minimum threshold may be maintaining a neutral or positive long-term average change in annual storage for both the Upper and Lower Aquifers. 12

Please feel free to contact me with any questions regarding the material and conclusions contained in this letter.

Sincerely,

Greg Kamman, PG, CHG
Principal Hydrologist



Attachment - Kamman Resume

Greg Kamman, PG, CHG

Principal Hydrologist

EDUCATION	1989	M.S. Geology - Sedimentology and Hydrogeology Miami University, Oxford, OH
	1985	A.B. Geology Miami University, Oxford, OH
REGISTRATION	No. 360 No. 5737	Certified Hydrogeologist (CHG.), CA Professional Geologist (PG), CA
PROFESSIONAL HISTORY	1997 - Present	Principal Hydrologist/Vice President Kamman Hydrology & Engineering, Inc. San Rafael, CA
	1994 - 1997	Senior Hydrologist/Vice President Balance Hydrologics, Inc., Berkeley, CA
	1991 - 1994	Project Geologist/Hydrogeologist Geomatrix Consultants, Inc., San Francisco, CA
	1989 - 1991	Senior Staff Geologist/Hydrogeologist Environ International Corporation, Princeton, NJ
	1986 - 1989	Instructor and Research/Teaching Assistant Miami University, Oxford, OH

SKILLS AND EXPERIENCE

As a Principal Hydrologist with 30 years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology, Mr. Kamman routinely manages projects in the areas of surface- and ground-water hydrology, stream and wetland habitat restoration, water supply, water quality assessments, water resources management, and geomorphology. Areas of expertise include: stream and wetland habitat restoration; characterizing and modeling basin-scale hydrologic and geologic processes; assessing hydraulic and geomorphic responses to land-use changes in watersheds and causes of stream channel instability; evaluating surface- and ground-water resources and their interaction; and designing and implementing field investigations characterizing surface and subsurface conditions; and stream and wetland habitat restoration feasibility assessments and design. In addition, Mr. Kamman commonly works on projects that revolve around sensitive fishery, wetland, wildlife and/or riparian habitat enhancement. Mr. Kamman performs many of these projects in response to local, state (CEQA) and federal statutes (NEPA, ESA), and other regulatory frameworks. Thus, Mr. Kamman is accustomed to working within a multi-disciplined team and maintains close collaborative relationships with biologists, engineers, planners, architects, lawyers, and resource and regulatory agency staff. Mr. Kamman is a prime or contributing author to over 80 technical publications and reports in the discipline of hydrology – the majority pertaining to ecological restoration. Mr. Kamman routinely teaches courses on stream and wetland restoration through U.C. Berkeley Extension and San Francisco State University's Romberg Tiburon Center.

PROFESSIONAL SOCIETIES & AFFILIATIONS	Groundwater Resources Association of California Society for Ecological Restoration International California Native Plant Society

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3 April 2019

General Manager Andrew Garcia
Delta-Mendota Groundwater Sustainability Agency
15990 Kelso Road
Byron, CA 94514

Submitted online via: http://deltamendota.org/chapter-five/

Re: DRAFT Section 5.2: Hydrogeologic Conceptual Model Northern & Central Delta-Mendota Regions Groundwater Sustainability Plan

Dear Mr. Garcia,

The Nature Conservancy (TNC) appreciates the opportunity to comment on Section 5.2 of the Northern & Central Delta-Mendota Regions Draft Groundwater Sustainability Plan (GSP) being prepared under the Sustainable Groundwater Management Act (SGMA).

TNC as a Stakeholder Representative for the Environment

TNC is a global, nonprofit organization dedicated to conserving the lands and waters on which all life depends. We seek to achieve our mission through science-based planning and implementation of conservation strategies. For decades, we have dedicated resources to establishing diverse partnerships and developing foundational science products for achieving positive outcomes for people and nature in California. TNC was part of a stakeholder group formed by the Water Foundation in early 2014 to develop recommendations for groundwater reform and actively worked to shape and pass SGMA.

Our reason for engaging is simple: California's freshwater biodiversity is highly imperiled. We have lost more than 90 percent of our native wetland and river habitats, leading to precipitous declines in native plants and the populations of animals that call these places home. These natural resources are intricately connected to California's economy providing direct benefits through industries such as fisheries, timber and hunting, as well as indirect benefits such as clean water supplies. SGMA must be successful for us to achieve a sustainable future, in which people and nature can thrive within the Delta-Mendota region and California.

We believe that the success of SGMA depends on bringing the best available science to the table, engaging all stakeholders in robust dialog, providing strong incentives for beneficial outcomes and rigorous enforcement by the State of California.

Given our mission, we are particularly concerned about the inclusion of nature, as required, in GSPs. The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs. These tools and resources are available online at GroundwaterResourceHub.org. The Nature

Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Addressing Nature's Water Needs in GSPs

SGMA requires that all beneficial uses and users, including environmental users of groundwater, be considered in the development and implementation of GSPs (Water Code § 10723.2).

The GSP Regulations include specific requirements to identify and consider groundwater dependent ecosystems (23 CCR §354.16(g)) when determining whether groundwater conditions are having potential effects on beneficial uses and users. GSAs must also assess whether sustainable management criteria may cause adverse impacts to beneficial uses, which include environmental uses, such as plants and animals. In addition, monitoring networks should be designed to detect potential adverse impacts to beneficial uses due to groundwater. Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decision, and using data collected through monitoring to revise decisions in the future. Over time, GSPs should improve as data gaps are reduced and uncertainties addressed.

To help ensure that GSPs adequately address nature as required under SGMA, The Nature Conservancy has prepared a checklist (**Attachment A**) for GSAs and their consultants to use. The Nature Conservancy believes the following elements are foundational for 2020 GSP submittals. For detailed guidance on how to address the checklist items, please also see our publication, *GDEs under SGMA: Guidance for Preparing GSPs* (https://groundwaterresourcehub.org/public/uploads/pdfs/GWR_Hub_GDE_Guidance_Doc_2-1-18.pdf).

1. Environmental Representation
SGMA requires that groundwater sustainability agencies (GSAs) consider the interests of all beneficial uses and users of groundwater. To meet this requirement, we recommend actively engaging environmental stakeholders by including environmental representation on the GSA board, technical advisory group, and/or working groups. This could include local staff from state and federal resource agencies, nonprofit organizations and other environmental interests. By engaging these stakeholders, GSAs will benefit from access to additional data and resources, as well as a more robust and inclusive GSP.

2. Basin GDE and ISW Maps
SGMA requires that groundwater dependent ecosystems (GDEs) and interconnected surface waters (ISWs) be identified in the GSP. We recommend using the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) provided online (https://gis.water.ca.gov/app/NCDatasetViewer/) by the Department of Water Resources (DWR) as a starting point for the GDE map. The NC Dataset was developed through a collaboration between DWR, the Department of Fish and Wildlife and TNC.

3. Potential Effects on Environmental Beneficial Users
SGMA requires that potential effects on GDEs and environmental surface water users be described when defining undesirable results. In addition to identifying GDEs in the basin, The Nature Conservancy recommends identifying beneficial users of surface water, which include environmental users. This is a critical step, as it is impossible to define "significant and unreasonable adverse impacts" without knowing *what* is being impacted. For your convenience, we've provided a list of freshwater species within the boundary of the Delta-Mendota groundwater basin in **Attachment C**. Our hope is that this information will help your GSA better evaluate the impacts of groundwater management on environmental

beneficial users of surface water. We recommend that after identifying which freshwater species exist in your basin, especially federal and state listed species, that you contact staff at the Department of Fish and Wildlife (DFW), United States Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Services (NMFS) to obtain their input on the groundwater and surface water needs of the organisms on the GSA's freshwater species list. Because effects to plants and animals are difficult and sometimes impossible to reverse, we recommend erring on the side of caution to preserve sufficient groundwater conditions to sustain GDEs and ISWs.

4. Biological and Hydrological Monitoring
If sufficient hydrological and biological data in and around GDEs is not available in time for the 2020/2022 plan, data gaps should be identified along with actions to reconcile the gaps in the monitoring network.

Our comments related to the North and Central Delta-Mendota Draft GSP Section 5.2 are provided in detail in **Attachment B** and are in reference to the numbered items in **Attachment A. Attachment D** describes six best practices that GSAs and their consultants can apply when using local groundwater data to confirm a connection to groundwater for DWR's Natural Communities Commonly Associated with Groundwater Dataset (https://gis.water.ca.gov/app/NCDatasetViewer/).

Thank you for fully considering our comments as you develop your GSP.

Best Regards,

Sandi Matsumoto
Associate Director, California Water Program
The Nature Conservancy

Attachment A
Considering Nature under SGMA: A Checklist

The Nature Conservancy is neither dispensing legal advice nor warranting any outcome that could result from the use of this checklist. Following this checklist does not guarantee approval of a GSP or compliance with SGMA, both of which will be determined by DWR and the State Water Resources Control Board. The checklist is available online: https://groundwaterresourcehub.org/public/uploads/pdfs/TNC_GDE_Checklist_for_SGMA_Sept2018.pdf

GSP Plan Element*		GDE Inclusion in GSPs: Identification and Consideration Elements		Item Number
Admin Info	**2.1.5 Notice & Communication** *23 CCR §354.10*	**Description of the types of environmental beneficial uses of groundwater that exist within GDEs and a description of how environmental stakeholders were engaged throughout the development of the GSP.**		1.
Basin Setting	**2.2.2 Current & Historical Groundwater Conditions** *23 CCR §354.16*	**Interconnected surface waters:**		2.
		Interconnected surface water maps for the basin with gaining and losing reaches defined (included as a figure in GSP & submitted as a shapefile on SGMA portal).		3.
		Estimates of current and historical surface water depletions for interconnected surface waters quantified and described by reach, season, and water year type.		4.
		Basin GDE map included (as figure in text & submitted as a shapefile on SGMA Portal).		5.
		If NC Dataset *was* used:	Basin GDE map denotes which polygons were kept, removed, and added from NC Dataset (Worksheet 1, can be attached in GSP section 6.0).	6.
			The basin's GDE shapefile, which is submitted via the SGMA Portal, includes two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed).	7.
			GDEs polygons are consolidated into larger units and named for easier identification throughout GSP.	8.
		If NC Dataset *was not* used:	Description of why NC dataset was not used, and how an alternative dataset and/or mapping approach used is best available information.	9.
		Description of GDEs included:		10.
		Historical and current groundwater conditions described in each GDE unit.		11.
		Ecological condition described in each GDE unit.		12.
		Each GDE unit has been characterized as having high, moderate, or low ecological value.		13.
		Inventory of species, habitats, and protected lands for each GDE unit with ecological importance (Worksheet 2, can be attached in GSP section 6.0).		14.

	2.2.3 Water Budget *23 CCR §354.18*	Groundwater inputs and outputs (e.g., evapotranspiration) of native vegetation and managed wetlands are included in the basin's historical and current water budget.		15.
		Potential impacts to groundwater conditions due to land use changes, climate change, and population growth to GDEs and aquatic ecosystems are considered in the projected water budget.		16.
Sustainable Management Criteria	**3.1 Sustainability Goal** *23 CCR §354.24*	**Environmental stakeholders/representatives were consulted.**		17.
		Sustainability goal mentions GDEs or species and habitats that are of particular concern or interest.		18.
		Sustainability goal mentions whether the intention is to address pre-SGMA impacts, maintain or improve conditions within GDEs or species and habitats that are of particular concern or interest.		19.
	3.2 Measurable Objectives *23 CCR §354.30*	**Description of how GDEs were considered and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.**		20.
	3.3 Minimum Thresholds *23 CCR §354.28*	**Description of how GDEs and environmental uses of surface water were considered when setting minimum thresholds for relevant sustainability indicators:**		21.
		Will adverse impacts to GDEs and/or aquatic ecosystems dependent on interconnected surface waters (beneficial user of surface water) be avoided with the selected minimum thresholds?		22.
		Are there any differences between the selected minimum threshold and state, federal, or local standards relevant to the species or habitats residing in GDEs or aquatic ecosystems dependent on interconnected surface waters?		23.
	3.4 Undesirable Results *23 CCR §354.26*	**For GDEs, hydrological data are compiled and synthesized for each GDE unit:**		24.
		If hydrological data *are available* within/nearby the GDE	Hydrological datasets are plotted and provided for each GDE unit (Worksheet 3, can be attached in GSP Section 6.0).	25.
			Baseline period in the hydrologic data is defined.	26.
			GDE unit is classified as having high, moderate, or low susceptibility to changes in groundwater.	27.
			Cause-and-effect relationships between groundwater changes and GDEs are explored.	28.
		If hydrological data *are not available* within/nearby the GDE	Data gaps/insufficiencies are described.	29.
			Plans to reconcile data gaps in the monitoring network are stated.	30.
		For GDEs, biological data are compiled and synthesized for each GDE unit:		31.
		Biological datasets are plotted and provided for each GDE unit.		32.
		Data gaps/insufficiencies are described.		33.
		Plans to reconcile data gaps in the monitoring network are stated.		34.
		Description of potential effects on GDEs, land uses and property interests:		35.

		Cause-and-effect relationships between GDE and groundwater conditions are described.	36.
		Impacts to GDEs that are considered to be "significant and unreasonable" are described.	37.
		Known hydrological thresholds or triggers (e.g., instream flow criteria, groundwater depths, water quality parameters) for relevant species or ecological communities are reported.	38.
		Land uses include and consider recreational uses (e.g., fishing/hunting, hiking, boating).	39.
		Property interests include and consider privately and publicly protected conservation lands and opens spaces, including wildlife refuges, parks, and natural preserves.	40.
Sustainable Management Criteria	**3.5 Monitoring Network** *23 CCR §354.34*	Description of whether hydrological data are spatially and temporally sufficient to monitor groundwater conditions for each GDE unit.	41.
		Description of how hydrological data gaps and insufficiencies will be reconciled in the monitoring network.	42.
		Description of how impacts to GDEs and environmental surface water users, as detected by biological responses, will be monitored and which monitoring methods will be used in conjunction with hydrologic data to evaluate cause-and-effect relationships with groundwater conditions.	43.
Projects & Mgmt Actions	**4.0. Projects & Mgmt Actions to Achieve Sustainability Goal** *23 CCR §354.44*	Description of how GDEs will benefit from relevant project or management actions.	44.
		Description of how projects and management actions will be evaluated to assess whether adverse impacts to the GDE will be mitigated or prevented.	45.

* In reference to DWR's GSP annotated outline guidance document, available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD_GSP_Outline_Final_2016-12-23.pdf

Attachment B

TNC Evaluation of DRAFT Section 5.2: Hydrogeologic Conceptual Model Northern & Central Delta-Mendota Regions Groundwater Sustainability Plan

Although none of the items on the Environmental User Checklist (Attachment A) were relevant to Section 5.2., we have the following suggestions:

5.2.5.2 Definable Bottom of Basin (p. 5-12)

- Defining the bottom of subbasin based on geochemical properties is a suitable approach for defining the base of freshwater, however, as noted on page 9 of DWR's Hydrogeologic Conceptual Model BMP (https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12-23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". **Thus, groundwater extraction well depth data should also be included in the determination of the basin bottom.** This will prevent the possibility of extractors with wells deeper than the basin boundary (defined by the base of freshwater) from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary. 1

5.2.6.1 Principal Aquifers (p. 5-14)

- The very shallow unconfined groundwater falls under DWR's definition of a principal aquifer, which is defined as "aquifer or aquifer system that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems" [*23 CCR §351(aa)*]. **Thus, this shallow groundwater should be included as part of the principal aquifer regardless of its "shallow nature and high salinity".** This is especially true in the places where projects to develop the shallow groundwater for use on more salt-tolerant crops. SGMA requires GSAs to sustainably manage groundwater resources in all aquifers, especially if groundwater use and management can result to impacts on beneficial uses and users. Please refer to Best Practice #1 in Attachment D for further explanation and accompanying graphics. 2

Attachment C

Freshwater Species Located in the Delta-Mendota Basin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result "depletion of interconnected surface waters", Attachment C provides a list of freshwater species located in the Delta-Mendota Basin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the GSA's boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 2015[1]. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS[2] as well as on The Nature Conservancy's science website[3].

Scientific Name	Common Name	Legally Protected Status		
		Federal	State	Other
BIRD				
Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
Plegadis chihi	White-faced Ibis		Watch list	
Vireo bellii pusillus	Least Bell's Vireo	Endangered	Endangered	
Actitis macularius	Spotted Sandpiper			
Aechmophorus clarkii	Clark's Grebe			
Aechmophorus occidentalis	Western Grebe			
Aix sponsa	Wood Duck			
Anas acuta	Northern Pintail			
Anas americana	American Wigeon			
Anas clypeata	Northern Shoveler			
Anas crecca	Green-winged Teal			
Anas cyanoptera	Cinnamon Teal			
Anas discors	Blue-winged Teal			
Anas platyrhynchos	Mallard			
Anas strepera	Gadwall			
Anser albifrons	Greater White-fronted Goose			
Ardea alba	Great Egret			
Ardea herodias	Great Blue Heron			
Aythya affinis	Lesser Scaup			

[1] Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoSONE, 11(7). Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710
[2] California Department of Fish and Wildlife BIOS: https://www.wildlife.ca.gov/data/BIOS
[3] Science for Conservation: https://www.scienceforconservation.org/products/california-freshwater-species-database

Aythya americana	Redhead		Special Concern	BSSC - Third priority
Aythya collaris	Ring-necked Duck			
Aythya marila	Greater Scaup			
Aythya valisineria	Canvasback		Special	
Botaurus lentiginosus	American Bittern			
Bucephala albeola	Bufflehead			
Bucephala clangula	Common Goldeneye			
Butorides virescens	Green Heron			
Calidris alpina	Dunlin			
Calidris mauri	Western Sandpiper			
Calidris minutilla	Least Sandpiper			
Chen caerulescens	Snow Goose			
Chen rossii	Ross's Goose			
Chlidonias niger	Black Tern		Special Concern	BSSC - Second priority
Chroicocephalus philadelphia	Bonaparte's Gull			
Cistothorus palustris palustris	Marsh Wren			
Cygnus columbianus	Tundra Swan			
Cypseloides niger	Black Swift	Bird of Conservation Concern	Special Concern	BSSC - Third priority
Dendrocygna bicolor	Fulvous Whistling-Duck		Special Concern	BSSC - First priority
Egretta thula	Snowy Egret			
Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Fulica americana	American Coot			
Gallinago delicata	Wilson's Snipe			
Gallinula chloropus	Common Moorhen			
Geothlypis trichas trichas	Common Yellowthroat			
Grus canadensis	Sandhill Crane			
Haliaeetus leucocephalus	Bald Eagle	Bird of Conservation Concern	Endangered	
Himantopus mexicanus	Black-necked Stilt			
Icteria virens	Yellow-breasted Chat		Special Concern	BSSC - Third priority
Limnodromus scolopaceus	Long-billed Dowitcher			
Lophodytes cucullatus	Hooded Merganser			
Megaceryle alcyon	Belted Kingfisher			
Mergus merganser	Common Merganser			
Mergus serrator	Red-breasted Merganser			
Numenius americanus	Long-billed Curlew			
Numenius phaeopus	Whimbrel			
Nycticorax nycticorax	Black-crowned Night-Heron			

Oxyura jamaicensis	Ruddy Duck			
Pandion haliaetus	Osprey		Watch list	
Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority
Phalacrocorax auritus	Double-crested Cormorant			
Phalaropus tricolor	Wilson's Phalarope			
Pluvialis squatarola	Black-bellied Plover			
Podiceps nigricollis	Eared Grebe			
Podilymbus podiceps	Pied-billed Grebe			
Porzana carolina	Sora			
Rallus limicola	Virginia Rail			
Recurvirostra americana	American Avocet			
Riparia riparia	Bank Swallow		Threatened	
Setophaga petechia	Yellow Warbler			BSSC - Second priority
Tachycineta bicolor	Tree Swallow			
Tringa melanoleuca	Greater Yellowlegs			
Tringa semipalmata	Willet			
Tringa solitaria	Solitary Sandpiper			
Vireo bellii	Bell's Vireo			
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
CRUSTACEAN				
Branchinecta conservatio	Conservancy Fairy Shrimp	Endangered	Special	IUCN - Endangered
Branchinecta longiantenna	Longhorn Fairy Shrimp	Endangered	Special	IUCN - Endangered
Branchinecta lynchi	Vernal Pool Fairy Shrimp	Threatened	Special	IUCN - Vulnerable
Lepidurus packardi	Vernal Pool Tadpole Shrimp	Endangered	Special	IUCN - Endangered
Linderiella occidentalis	California Fairy Shrimp		Special	IUCN - Near Threatened
Artemia franciscana	San Francisco Brine Shrimp			
Branchinecta lindahli	Versatile Fairy Shrimp			
FISH				
Oncorhynchus mykiss irideus	Coastal rainbow trout			Least Concern - Moyle 2013
Pogonichthys macrolepidotus	Sacramento splittail		Special Concern	Vulnerable - Moyle 2013
Oncorhynchus mykiss - CV	Central Valley steelhead	Threatened	Special	Vulnerable - Moyle 2013
Acipenser medirostris ssp. 1	Southern green sturgeon	Threatened	Special Concern	Endangered - Moyle 2013
Acipenser transmontanus	White sturgeon		Special	Vulnerable - Moyle 2013
Archoplites interruptus	Sacramento perch		Special Concern	Endangered - Moyle 2013
Catostomus occidentalis occidentalis	Sacramento sucker			Least Concern - Moyle 2013
Cottus asper ssp. 1	Prickly sculpin			Least Concern - Moyle 2013

Entosphenus tridentata ssp. 1	Pacific lamprey		Special	Near-Threatened - Moyle 2013
Gasterosteus aculeatus microcephalus	Inland threespine stickleback		Special	Least Concern - Moyle 2013
Hysterocarpus traskii traskii	Sacramento tule perch		Special	Near-Threatened - Moyle 2013
Lampetra ayersi	River lamprey		Special Concern	Near-Threatened - Moyle 2013
Lampetra hubbsi	Kern brook lamprey		Special Concern	Vulnerable - Moyle 2013
Lampetra richardsoni	Western brook lamprey			Near-Threatened - Moyle 2013
Lavinia exilicauda exilicauda	Sacramento hitch		Special	Near-Threatened - Moyle 2013
Lavinia symmetricus symmetricus	Central California roach		Special Concern	Near-Threatened - Moyle 2013
Mylopharodon conocephalus	Hardhead		Special Concern	Near-Threatened - Moyle 2013
Oncorhynchus tshawytscha - CV fall	Central Valley fall Chinook salmon	Species of Special Concern	Special Concern	Vulnerable - Moyle 2013
Oncorhynchus tshawytscha - CV late fall	Central Valley late fall Chinook salmon	Species of Special Concern		Endangered - Moyle 2013
Orthodon microlepidotus	Sacramento blackfish			Least Concern - Moyle 2013
Ptychocheilus grandis	Sacramento pikeminnow			Least Concern - Moyle 2013
HERP				
Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC
Ambystoma californiense californiense	California Tiger Salamander	Threatened	Threatened	ARSSC
Anaxyrus boreas boreas	Boreal Toad			
Rana boylii	Foothill Yellow-legged Frog	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Rana draytonii	California Red-legged Frog	Threatened	Special Concern	ARSSC
Spea hammondii	Western Spadefoot	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Thamnophis gigas	Giant Gartersnake	Threatened	Threatened	
Thamnophis sirtalis sirtalis	Common Gartersnake			
Pseudacris regilla	Northern Pacific Chorus Frog			
Thamnophis atratus atratus	Santa Cruz Gartersnake			Not on any status lists

Thamnophis elegans elegans	Mountain Gartersnake			Not on any status lists
Thamnophis hammondii hammondii	Two-striped Gartersnake		Special Concern	ARSSC
INSECT & OTHER INVERTEBRATES				
Aeshnidae fam.	Aeshnidae fam.			
Anax junius	Common Green Darner			
Brillia spp.	Brillia spp.			
Callicorixa spp.	Callicorixa spp.			
Chironomus spp.	Chironomus spp.			
Coenagrionidae fam.	Coenagrionidae fam.			
Corisella spp.	Corisella spp.			
Cricotopus spp.	Cricotopus spp.			
Ischnura cervula	Pacific Forktail			
Ischnura denticollis	Black-fronted Forktail			
Paraleptophlebia associata	A Mayfly			
Paratanytarsus spp.	Paratanytarsus spp.			
Phaenopsectra spp.	Phaenopsectra spp.			
Procladius spp.	Procladius spp.			
Psectrocladius spp.	Psectrocladius spp.			
Tanypus spp.	Tanypus spp.			
Tipulidae fam.	Tipulidae fam.			
Trichocorixa spp.	Trichocorixa spp.			
Capnia hitchcocki	Arroyo Snowfly			
Mesocapnia bulbosa	Bulbous Snowfly			
MAMMAL				
Castor canadensis	American Beaver			Not on any status lists
Lontra canadensis canadensis	North American River Otter			Not on any status lists
Neovison vison	American Mink			Not on any status lists
Ondatra zibethicus	Common Muskrat			Not on any status lists
Anodonta californiensis	California Floater		Special	
Margaritifera falcata	Western Pearlshell		Special	
Pyrgulopsis diablensis	Diablo Range Pyrg		Special	E
PLANT				
Chloropyron molle hispidum			Special	CRPR - 1B.1
Chloropyron palmatum	NA	Endangered	Special	CRPR - 1B.1
Eryngium racemosum	Delta Coyote-thistle		Endangered	CRPR - 1B.1
Eryngium spinosepalum	Spiny Sepaled Coyote-thistle		Special	CRPR - 1B.2
Navarretia prostrata	Prostrate Navarretia		Special	CRPR - 1B.1
Puccinellia simplex	Little Alkali Grass			
Alopecurus saccatus	Pacific Foxtail			
Ammannia coccinea	Scarlet Ammannia			
Anemopsis californica	Yerba Mansa			

Arundo donax	NA			
Azolla filiculoides	NA			
Azolla microphylla	Mexican mosquito fern		Special	CRPR - 4.3
Baccharis salicina				Not on any status lists
Bacopa eisenii	Gila River Water-hyssop			
Bidens laevis	Smooth Bur-marigold			
Bolboschoenus glaucus	NA			Not on any status lists
Bolboschoenus maritimus paludosus	NA			Not on any status lists
Callitriche marginata	Winged Water-starwort			
Ceratophyllum demersum	Common Hornwort			
Cotula coronopifolia	NA			
Crassula aquatica	Water Pygmyweed			
Crypsis vaginiflora	NA			
Cyperus erythrorhizos	Red-root Flatsedge			
Cyperus squarrosus	Awned Cyperus			
Downingia bella	Hoover's Downingia			
Downingia pulchella	Flat-face Downingia			
Echinodorus berteroi	Upright Burhead			
Elatine brachysperma	Shortseed Waterwort			
Elatine californica	California Waterwort			
Eleocharis acicularis acicularis	Least Spikerush			
Eleocharis atropurpurea	Purple Spikerush			
Eleocharis coloradoensis				Not on any status lists
Eleocharis macrostachya	Creeping Spikerush			
Eleocharis montevidensis	Sand Spikerush			
Eleocharis quadrangulata	NA			
Elodea canadensis	Broad Waterweed			
Epilobium cleistogamum	Cleistogamous Spike-primrose			
Eragrostis hypnoides	Teal Lovegrass			
Eryngium castrense	Great Valley Eryngo			
Eryngium vaseyi vallicola				Not on any status lists
Eryngium vaseyi vaseyi	Vasey's Coyote-thistle			Not on any status lists
Euthamia occidentalis	Western Fragrant Goldenrod			
Hydrocotyle verticillata verticillata	Whorled Marsh-pennywort			
Juncus acuminatus	Sharp-fruit Rush			
Juncus xiphioides	Iris-leaf Rush			
Lasthenia ferrisiae	Ferris' Goldfields		Special	CRPR - 4.2
Lasthenia fremontii	Fremont's Goldfields			
Lemna aequinoctialis	Lesser Duckweed			
Lemna gibba	Inflated Duckweed			

Lemna minor	Lesser Duckweed			
Lepidium jaredii jaredii	Jared's Pepper-grass		Special	CRPR - 1B.2
Lepidium oxycarpum	Sharp-pod Pepper-grass			
Limnanthes douglasii douglasii	Douglas' Meadowfoam			
Limosella acaulis	Southern Mudwort			
Lipocarpha micrantha	Dwarf Bulrush			
Ludwigia peploides peploides	NA			Not on any status lists
Ludwigia repens	Creeping Seedbox			
Lythrum californicum	California Loosestrife			
Marsilea vestita vestita	NA			Not on any status lists
Mimulus cardinalis	Scarlet Monkeyflower			
Mimulus guttatus	Common Large Monkeyflower			
Montia fontana fontana	Fountain Miner's-lettuce			
Myosurus minimus	NA			
Myosurus sessilis	Sessile Mousetail			
Myriophyllum aquaticum	NA			
Najas guadalupensis guadalupensis	Southern Naiad			
Navarretia heterandra	Tehama Navarretia			
Navarretia leucocephala leucocephala	White-flower Navarretia			
Neostapfia colusana	Colusa Grass	Threatened	Endangered	CRPR - 1B.1
Panicum dichotomiflorum	NA			
Paspalum distichum	Joint Paspalum			
Persicaria hydropiperoides				Not on any status lists
Persicaria lapathifolia				Not on any status lists
Persicaria maculosa	NA			Not on any status lists
Persicaria pensylvanica	NA			Not on any status lists
Phacelia distans	NA			
Phyla lanceolata	Fog-fruit			
Phyla nodiflora	Common Frog-fruit			
Pilularia americana	NA			
Plagiobothrys acanthocarpus	Adobe Popcorn-flower			
Plagiobothrys greenei	Greene's Popcorn-flower			
Plagiobothrys humistratus	Dwarf Popcorn-flower			
Plagiobothrys leptocladus	Alkali Popcorn-flower			
Plantago elongata elongata	Slender Plantain			
Pluchea odorata odorata	Scented Conyza			
Pogogyne douglasii	NA			
Pogogyne zizyphoroides				Not on any status lists
Potamogeton diversifolius	Water-thread Pondweed			

Potamogeton foliosus foliosus	Leafy Pondweed			
Potamogeton nodosus	Longleaf Pondweed			
Potamogeton pusillus pusillus	Slender Pondweed			
Psilocarphus brevissimus brevissimus	Dwarf Woolly-heads			
Psilocarphus oregonus	Oregon Woolly-heads			
Psilocarphus tenellus	NA			
Ranunculus sceleratus	NA			
Rorippa curvisiliqua curvisiliqua	Curve-pod Yellowcress			
Rorippa palustris palustris	Bog Yellowcress			
Rotala ramosior	Toothcup			
Ruppia cirrhosa	Widgeon-grass			
Ruppia maritima	Ditch-grass			
Sagittaria longiloba	Longbarb Arrowhead			
Sagittaria montevidensis calycina				Not on any status lists
Salix exigua exigua	Narrowleaf Willow			
Salix gooddingii	Goodding's Willow			
Schoenoplectus acutus occidentalis	Hardstem Bulrush			
Schoenoplectus americanus	Three-square Bulrush			
Sinapis alba	NA			
Sparganium eurycarpum eurycarpum				
Stuckenia pectinata				Not on any status lists
Typha domingensis	Southern Cattail			
Typha latifolia	Broadleaf Cattail			
Veronica americana	American Speedwell			
Wolffiella lingulata	Tongue Bogmat			
Zannichellia palustris	Horned Pondweed			

Attachment D

IDENTIFYING GDEs UNDER SGMA

Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). The California Department of Water Resources (DWR) has provided the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online (https://gis.water.ca.gov/app/NCDatasetViewer/) to help Groundwater Sustainability Agencies (GSAs) identify GDEs within a groundwater basin. The NC Dataset is a compilation of 48 publicly available State and Federal agency datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[4].

The NC Dataset indicates the vegetation and wetland features that are good indicators of a GDE. The NC dataset is a starting point, and it is the responsibility of GSAs to utilize best available science and local knowledge on the hydrology, geology, and groundwater levels to verify its presence or absence, as well as whether a connection to groundwater in an aquifer exists (Figure 1)[5]. Detailed guidance on identifying GDEs within a groundwater basin from the NC dataset is available[6]. This document highlights six best practices that GSAs and their consultants can apply when using local groundwater data to confirm a connection to groundwater for the NC Dataset.

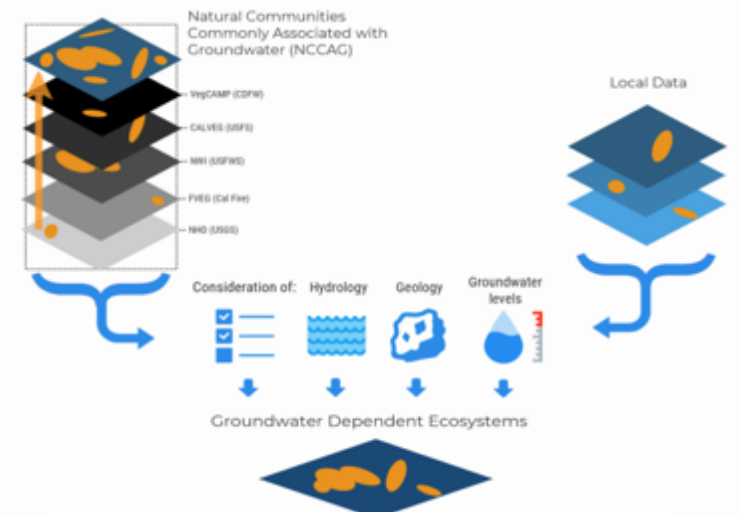

Figure 1. Considerations for GDE identification.
Source: DWR[2]

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[4] For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf

[5] *California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf*

[6] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/

BEST PRACTICE #1. Connection to an Aquifer

Groundwater basins can be comprised of one continuous aquifer or multiple aquifers stacked on top of each other. Basins with a stacked series of aquifers may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, and groundwater dependent ecosystems (Figure 2). This is because the goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits, and while groundwater pumping may not be currently occurring in a shallower aquifer, it could be in the future. For example, if a shallow perched aquifer is currently not being pumped due to poor water quality resulting from irrigation return flow, producing this water will become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided and a GSA's legal risk be minimized. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer*.

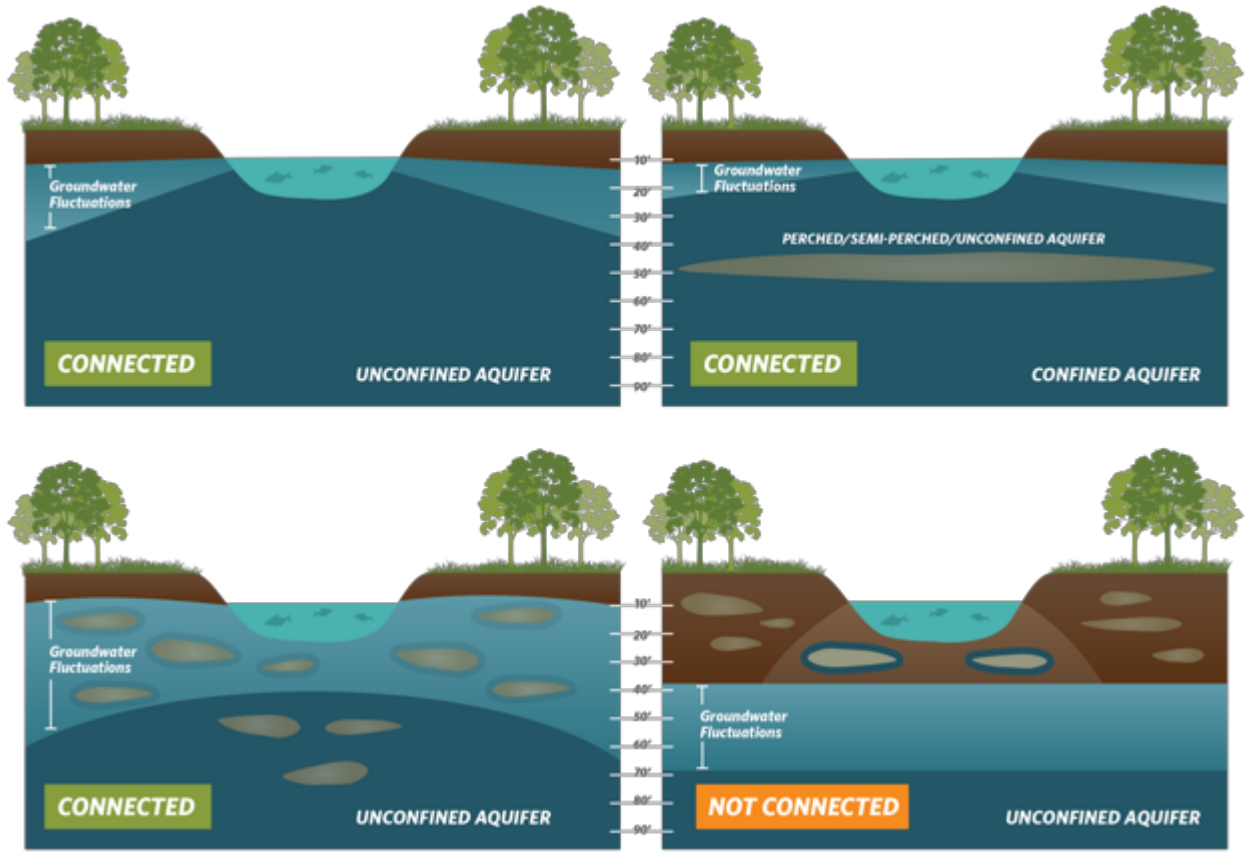

Figure 2. Confirming whether an ecosystem is connected to groundwater in a principal aquifer. Top: (Left) Depth to Groundwater in the aquifer under the ecosystem is an unconfined aquifer with depth to groundwater fluctuating seasonally and interannually within 30 feet from land surface. **(Right)** Depth to Groundwater in the *shallow* aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the *shallow* aquifer. **Bottom: (Left)** Depth to groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystems connection to groundwater. (Right) Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is *due to* direct recharge from precipitation and indirect recharge under surface water feature.

BEST PRACTICE #2. Characterize Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth to groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability (i.e., wet, average, dry, and drought years) that is characteristic of California's climate. DWR's Best Management Practices document on water budgets[7] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[8] could be determined based on data between 2005 and 2015.

GDEs existing on the earth's surface depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[9] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in the GDE guidance document[2], one of the key factors to consider when mapping GDEs is to contour depth to groundwater in the aquifer that is in direct contact with the ecosystem.

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however, if these groundwater conditions are prolonged adverse impacts to GDEs can result. While depth to groundwater levels within 30 feet[2] are generally accepted as being a proxy for confirming that polygons in the NC dataset are connected to groundwater, it is highly advised that fluctuations in the groundwater regime are taken into consideration and to characterize the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[10]. However, if insufficient data are available to describe groundwater conditions within polygons from the NC dataset, it is highly advised that they be included in the GSP until data gaps are reconciled in the monitoring network (See Best Practice #6).

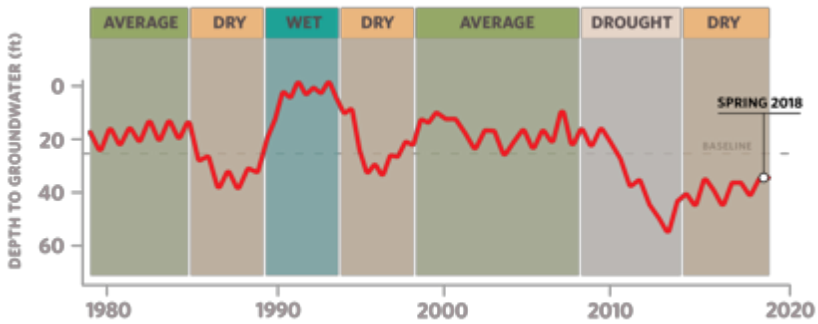

Figure 3. Example seasonality and interannual variability in depth to groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

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[7] DWR. 2016. Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

[8] *Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]*

[9] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs - link in footnote above).

[10] *SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer*

BEST PRACTICE #3. Ecosystems Can Rely on Both Surface and Groundwater

GDEs can rely on groundwater for all or some of its requirements, using multiple water sources simultaneously and at different temporal or spatial scales. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around NC polygons does not preclude the possibility that a connection to groundwater exists. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth to groundwater data should be used to identify whether NC polygons are connected to groundwater and should be considered GDEs.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and would not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

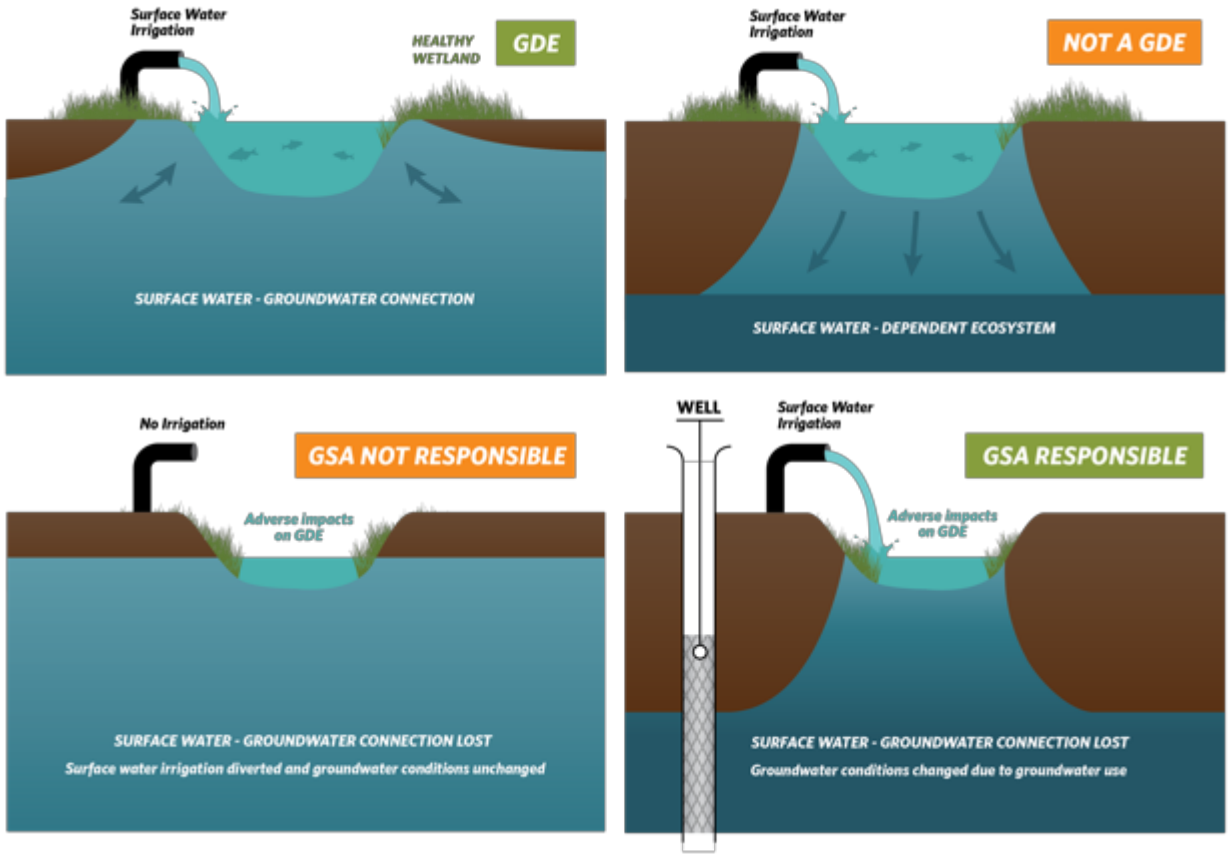

Figure 4. Ecosystems can depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, such that a connection to groundwater exists for the ecosystem. **(Right)** Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. **Bottom: (Left)** An ecosystem that was once dependent on an interconnected surface water and groundwater connection, but then loses this connection due to surface water diversions would not be the GSA's responsibility. **(Right)** Groundwater dependent ecosystems in places where a surface water – groundwater connection existed, but then loose that connection due to groundwater pumping would be the GSA's responsibility.

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin require that groundwater conditions are characterized to confirm whether polygons in the NC dataset are connected to an underlying aquifer. Once an aquifer has been identified, representative groundwater wells are necessary to characterize groundwater conditions (Figure 5). It is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of the NC Dataset polygons, and more likely to reflect the local conditions relevant to the ecosystem. NC dataset polygons that are farther than 5 km from a well should not be excluded because of interpolated groundwater depth conditions, as there is insufficient information to make that determination. Instead, they should be retained as potential GDEs until there is sufficient data to determine whether or not the NC Dataset polygon is connected to groundwater and is a GDE.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient well information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer.

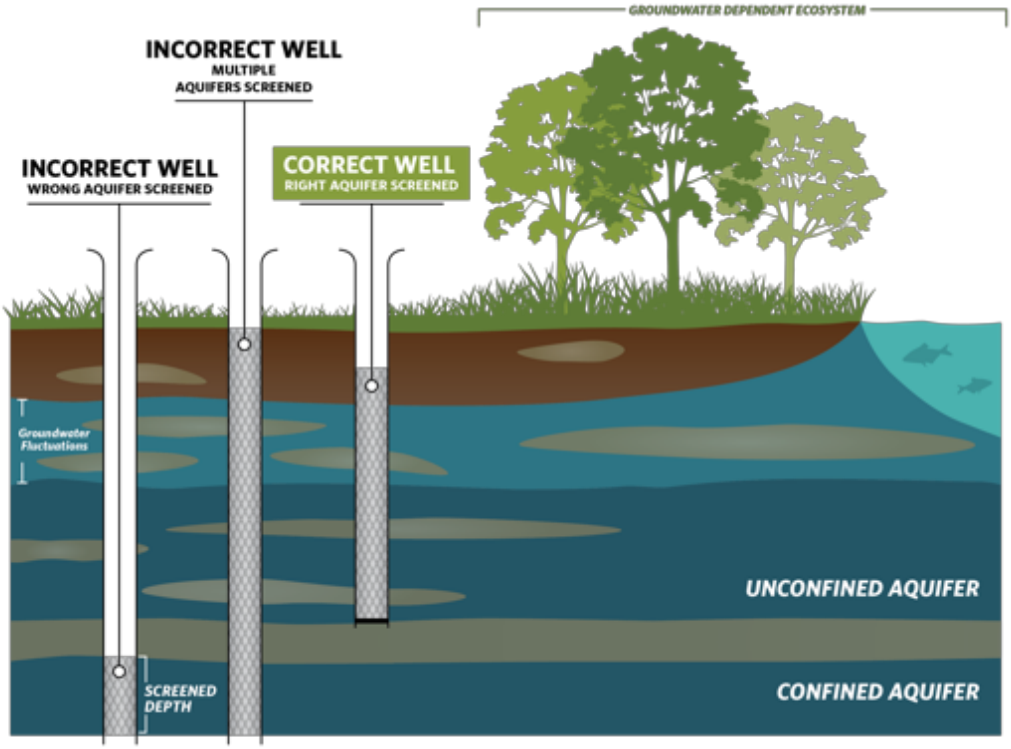

Figure 5. Selecting representative wells to characterize groundwater conditions in the aquifers directly connected with GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

A common, but error prone practice, to contour depth to groundwater over a large area is to interpolate depth to groundwater measurements at monitoring wells. This practice causes errors when the land surface contains features like streams and wetlands depressions because it assumes the land surface is constant across the landscape and depth to groundwater is constant below these low-lying areas (Figure 6). A more accurate approach is to interpolate **groundwater elevations** at monitoring wells to get an estimate of groundwater elevation across the landscape. This layer can then be subtracted from the land surface elevation from a Digital Elevation Model (DEM)[11] to estimate depth to groundwater contours across the landscape (Figure 7). This will provide a much more accurate contours of depth to groundwater along streams and other land surface depressions where GDEs are commonly found.

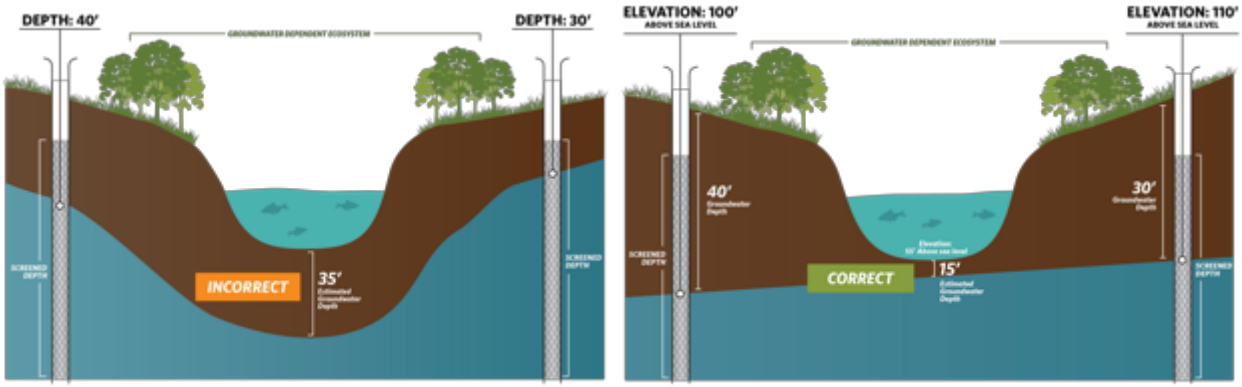

Figure 6. Contouring depth to groundwater around surface water features and GDEs. (Left) Groundwater level interpolation using depth to groundwater data from monitoring wells. **(Right)** Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

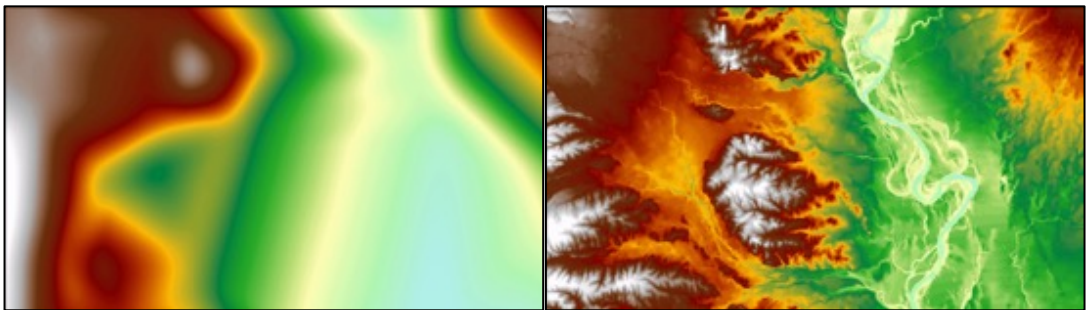

Figure 7. Depth to Groundwater Contours in Northern California. (Left) Contours were interpolated using depth to groundwater measurements determined at each well. **(Right)** Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth to groundwater contours. The image on the right shows a more accurate depth to groundwater estimate because it takes the local topography and elevation changes into account.

[11] *Digital Elevation Model data is available at: https://catalog.data.gov/dataset/usgs-national-elevation-dataset-ned-1-meter-downloadable-data-collection-from-the-national-map-*

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, **The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network.** Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

The Nature Conservancy
Protecting nature. Preserving life.

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nature.org
GroundwaterResourceHub.org

October 11, 2019

Andrew Garcia
San Luis & Delta-Mendota Water Authority
842 6th St
Los Banos, CA 93635

Submitted online via: http://deltamendota.org/gsp-summary/

Re: Public Draft Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Regions

Dear Mr. Garcia,

The Nature Conservancy (TNC) appreciates the opportunity to comment on the Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Regions being prepared under the Sustainable Groundwater Management Act (SGMA).

TNC as a Stakeholder Representative for the Environment

TNC is a global, nonprofit organization dedicated to conserving the lands and waters on which all life depends. We seek to achieve our mission through science-based planning and implementation of conservation strategies. For decades, we have dedicated resources to establishing diverse partnerships and developing foundational science products for achieving positive outcomes for people and nature in California. TNC was part of a stakeholder group formed by the Water Foundation in early 2014 to develop recommendations for groundwater reform and actively worked to shape and pass SGMA.

Our reason for engaging is simple: California's freshwater biodiversity is highly imperiled. We have lost more than 90 percent of our native wetland and river habitats, leading to precipitous declines in native plants and the populations of animals that call these places home. These natural resources are intricately connected to California's economy providing direct benefits through industries such as fisheries, timber and hunting, as well as indirect benefits such as clean water supplies. SGMA must be successful for us to achieve a sustainable future, in which people and nature can thrive within the Northern and Central Delta-Mendota Regions and California.

We believe that the success of SGMA depends on bringing the best available science to the table, engaging all stakeholders in robust dialog, providing strong incentives for beneficial outcomes and rigorous enforcement by the State of California.

Given our mission, we are particularly concerned about the inclusion of nature, as required, in GSPs. The Nature Conservancy (TNC) has developed a suite of tools based on best available science to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders efficiently incorporate nature into GSPs. These tools and resources are available online at

GroundwaterResourceHub.org. TNC's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Addressing Nature's Water Needs in GSPs

SGMA requires that all beneficial uses and users, including environmental users of groundwater, be considered in the development and implementation of GSPs (Water Code § 10723.2).

The GSP Regulations include specific requirements to identify and consider groundwater-dependent ecosystems (GDEs) [23 CCR §354.16(g)] when determining whether groundwater conditions are having potential effects on beneficial uses and users. GSAs must also assess whether sustainable management criteria may cause adverse impacts to beneficial uses and users, which include environmental uses, such as plants and animals. TNC has identified each part of GSPs where consideration of beneficial uses and users are required. That list is available here: https://groundwaterresourcehub.org/importance-of-gdes/provisions-related-to-groundwater-dependent-ecosystems-in-the-groundwater-s. Please ensure that environmental beneficial users are addressed accordingly throughout the GSP. Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decision, and using data collected through monitoring to revise decisions in the future. Over time, GSPs should improve as data gaps are reduced and uncertainties addressed.

To help ensure that GSPs adequately address nature as required under SGMA, TNC has prepared a checklist (**Attachment A**) for GSAs and their consultants to use. TNC believes the following elements are foundational for 2020 GSP submittals. For detailed guidance on how to address the checklist items, please also see our publication, *GDEs under SGMA: Guidance for Preparing GSPs*[1].

1. Environmental Representation

SGMA requires that GSAs consider the interests of all beneficial uses and users of groundwater. To meet this requirement, we recommend actively engaging environmental stakeholders by including environmental representation on the GSA board, technical advisory group, and/or working groups. This could include local staff from state and federal resource agencies, nonprofit organizations and other environmental interests. By engaging these stakeholders, GSAs will benefit from access to additional data and resources, as well as a more robust and inclusive GSP.

2. Basin GDE and ISW Maps

SGMA requires that GDEs and interconnected surface waters (ISWs) be identified in the GSP. We recommend using the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) provided online[2] by the Department of Water Resources (DWR) as a starting point for the GDE map. The NC Dataset was developed through a collaboration between DWR, the California Department of Fish and Wildlife (CDFW) and TNC. We also recommend using GDE Pulse, which is also available on the internet at https://gde.codefornature.org/#/home. We also recommend using the California Natural

[1] GDEs under SGMA: Guidance for Preparing GSPs is available at: https://groundwaterresourcehub.org/public/uploads/pdfs/GWR_Hub_GDE_Guidance_Doc_2-1-18.pdf

[2] The Department of Water Resources' Natural Communities Commonly Associated with Groundwater dataset is available at: https://gis.water.ca.gov/app/NCDatasetViewer/

Diversity Database (CNDDB) data set provided by CDFW to look up species occurrences within your area.

3. Potential Effects on Environmental Beneficial Users

SGMA requires that potential effects on GDEs and environmental surface water users be described when defining undesirable results. In addition to identifying GDEs in the basin, TNC recommends identifying beneficial users of surface water, which include environmental users. This is a critical step, as it is impossible to define "significant and unreasonable adverse impacts" without knowing *what* is being impacted. We acknowledge and appreciate your inclusion of TNC's freshwater species list for the Northern and Central Delta-Mendota Region in your GSP. Our hope is that this information will help your GSA better evaluate the impacts of groundwater management on environmental beneficial users of surface water. We recommend that after identifying which freshwater species exist in your basin, especially federal- and state-listed species, that you contact staff at CDFW, United States Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Services (NMFS) to obtain their input on the groundwater and surface water needs of the organisms on the GSA's freshwater species list. We also refer you to the Critical Species Lookbook[3] prepared by TNC and partner organizations for additional background information on the water needs and groundwater reliance of critical species. Since effects to plants and animals are difficult and sometimes impossible to reverse, we recommend erring on the side of caution to preserve sufficient groundwater conditions to sustain GDEs and ISWs.

4. Biological and Hydrological Monitoring

If sufficient hydrological and biological data in and around GDEs is not available in time for the 2020/2022 plan, data gaps should be identified along with actions to reconcile the gaps in the monitoring network.

TNC has reviewed the Northern and Central Delta-Mendota Regions Draft GSP and acknowledges and appreciates the use of some our relevant resources in addressing GDE-related topics. However, we consider it to be **inadequate** under SGMA since key environmental beneficial uses and users are not adequately identified and considered. In particular, ISWs and GDEs are not adequately identified and evaluated for ecological importance or adequately considered in the basin's sustainable management criteria. **Please present a more thorough analysis of the identification and evaluation of ISWs and GDEs in subsequent drafts of the GSP**. **Once GDEs are identified, they must be considered when defining undesirable results and evaluated for further monitoring needs**.

Our specific comments related to the Northern and Central Delta-Mendota Regions GSP are provided in detail in **Attachment B** and are in reference to the numbered items in **Attachment A.** **Attachment C** describes six best practices that GSAs and their consultants can apply when using local groundwater data to confirm a connection to groundwater for DWR's NC Dataset. **Attachment D** provides an overview of a new, free online tool (i.e., GDE Pulse) that allows GSAs to assess changes in GDE health using satellite, rainfall, and groundwater data.

Thank you for fully considering our comments as you develop your GSP.

[3] Available online at: https://groundwaterresourcehub.org/sgma-tools/the-critical-species-lookbook/

Best Regards,

Sandi Matsumoto
Associate Director, California Water Program
The Nature Conservancy

Attachment A

Environmental User Checklist

The Nature Conservancy is neither dispensing legal advice nor warranting any outcome that could result from the use of this checklist. Following this checklist does not guarantee approval of a GSP or compliance with SGMA, both of which will be determined by DWR and the State Water Resources Control Board.

GSP Plan Element*		GDE Inclusion in GSPs: Identification and Consideration Elements	Check Box
Admin Info	**2.1.5 Notice & Communication** *23 CCR §354.10*	**Description of the types of environmental beneficial uses of groundwater that exist within GDEs and a description of how environmental stakeholders were engaged throughout the development of the GSP.**	1
Planning Framework	**2.1.2 to 2.1.4 Description of Plan Area** *23 CCR §354.8*	**Description of jurisdictional boundaries, existing land use designations, water use management and monitoring programs; general plans and other land use plans relevant to GDEs and their relationship to the GSP.**	2
		Description of instream flow requirements, threatened and endangered species habitat, critical habitat, and protected areas.	3
		Summary of process for permitting new or replacement wells for the basin, and how the process incorporates any protection of GDEs	4
Basin Setting	**2.2.1 Hydrogeologic Conceptual Model** *23 CCR §354.14*	**Basin Bottom Boundary:** Is the bottom of the basin defined as at least as deep as the deepest groundwater extractions?	5
		Principal aquifers and aquitards: Are shallow aquifers adequately described, so that interconnections with surface water and vertical groundwater gradients with other aquifers can be characterized?	6
		Basin cross sections: Do cross-sections illustrate the relationships between GDEs, surface waters and principal aquifers?	7
	2.2.2 Current & Historical Groundwater Conditions *23 CCR §354.16*	**Interconnected surface waters:**	8
		Interconnected surface water maps for the basin with gaining and losing reaches defined (included as a figure in GSP & submitted as a shapefile on SGMA portal).	9
		Estimates of current and historical surface water depletions for interconnected surface waters quantified and described by reach, season, and water year type.	10
		Basin GDE map included (as figure in text & submitted as a shapefile on SGMA Portal).	11

		If NC Dataset *was* used:	Basin GDE map denotes which polygons were kept, removed, and added from NC Dataset (Worksheet 1, can be attached in GSP section 6.0).	12
			The basin's GDE shapefile, which is submitted via the SGMA Portal, includes two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed).	13
			GDEs polygons are consolidated into larger units and named for easier identification throughout GSP.	14
		If NC Dataset *was not* used:	Description of why NC dataset was not used, and how an alternative dataset and/or mapping approach used is best available information.	15
		Description of GDEs included:		16
		Historical and current groundwater conditions and variability are described in each GDE unit.		17
		Historical and current ecological conditions and variability are described in each GDE unit.		18
		Each GDE unit has been characterized as having high, moderate, or low ecological value.		19
		Inventory of species, habitats, and protected lands for each GDE unit with ecological importance (Worksheet 2, can be attached in GSP section 6.0).		20
	2.2.3 Water Budget *23 CCR §354.18*	Groundwater inputs and outputs (e.g., evapotranspiration) of native vegetation and managed wetlands are included in the basin's historical and current water budget.		21
		Potential impacts to groundwater conditions due to land use changes, climate change, and population growth to GDEs and aquatic ecosystems are considered in the projected water budget.		22
Sustainable Management Criteria	**3.1 Sustainability Goal** *23 CCR §354.24*	**Environmental stakeholders/representatives were consulted.**		23
		Sustainability goal mentions GDEs or species and habitats that are of particular concern or interest.		24
		Sustainability goal mentions whether the intention is to address pre-SGMA impacts, maintain or improve conditions within GDEs or species and habitats that are of particular concern or interest.		25
	3.2 Measurable Objectives *23 CCR §354.30*	**Description of how GDEs were considered and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.**		26
	3.3 Minimum Thresholds *23 CCR §354.28*	**Description of how GDEs and environmental uses of surface water were considered when setting minimum thresholds for relevant sustainability indicators:**		27
		Will adverse impacts to GDEs and/or aquatic ecosystems dependent on interconnected surface waters (beneficial user of surface water) be avoided with the selected minimum thresholds?		28
		Are there any differences between the selected minimum threshold and state, federal, or local standards relevant to the species or habitats residing in GDEs or aquatic ecosystems dependent on interconnected surface waters?		29
	3.4 Undesirable Results *23 CCR §354.26*	**For GDEs, hydrological data are compiled and synthesized for each GDE unit:**		30
		If hydrological data *are available* within/nearby the GDE	Hydrological datasets are plotted and provided for each GDE unit (Worksheet 3, can be attached in GSP Section 6.0).	31
			Baseline period in the hydrologic data is defined.	32

			GDE unit is classified as having high, moderate, or low susceptibility to changes in groundwater.	33
			Cause-and-effect relationships between groundwater changes and GDEs are explored.	34
		If hydrological data *are not available* within/nearby the GDE	Data gaps/insufficiencies are described.	35
			Plans to reconcile data gaps in the monitoring network are stated.	36
		For GDEs, biological data are compiled and synthesized for each GDE unit:		37
		Biological datasets are plotted and provided for each GDE unit, and when possible provide baseline conditions for assessment of trends and variability.		38
		Data gaps/insufficiencies are described.		39
		Plans to reconcile data gaps in the monitoring network are stated.		40
		Description of potential effects on GDEs, land uses and property interests:		41
		Cause-and-effect relationships between GDE and groundwater conditions are described.		42
		Impacts to GDEs that are considered to be "significant and unreasonable" are described.		43
		Known hydrological thresholds or triggers (e.g., instream flow criteria, groundwater depths, water quality parameters) for significant impacts to relevant species or ecological communities are reported.		44
		Land uses include and consider recreational uses (e.g., fishing/hunting, hiking, boating).		45
		Property interests include and consider privately and publicly protected conservation lands and opens spaces, including wildlife refuges, parks, and natural preserves.		46
Sustainable Management Criteria	**3.5 Monitoring Network** *23 CCR §354.34*	Description of whether hydrological data are spatially and temporally sufficient to monitor groundwater conditions for each GDE unit.		47
		Description of how hydrological data gaps and insufficiencies will be reconciled in the monitoring network.		48
		Description of how impacts to GDEs and environmental surface water users, as detected by biological responses, will be monitored and which GDE monitoring methods will be used in conjunction with hydrologic data to evaluate cause-and-effect relationships with groundwater conditions.		49
Projects & Mgmt Actions	**4.0. Projects & Mgmt Actions to Achieve Sustainability Goal** *23 CCR §354.44*	Description of how GDEs will benefit from relevant project or management actions.		50
		Description of how projects and management actions will be evaluated to assess whether adverse impacts to the GDE will be mitigated or prevented.		51

* In reference to DWR's GSP annotated outline guidance document, available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD_GSP_Outline_Final_2016-12-23.pdf

Attachment B

TNC Evaluation of the
Northern and Central Delta-Mendota Regions Groundwater Sustainability Plan,
Public Review Draft

A complete draft of the Northern and Central Delta-Mendota Regions was provided for public review on September 9, 2019. TNC has previously provided comments on GSP Draft Section 5.2 (Hydrogeologic Conceptual Model) in a letter dated April 3, 2019. This attachment summarizes our comments on the complete public draft GSP and includes any initial review comments from our April 3, 2019 letter that have not yet been addressed. Comments are provided in the order of the checklist items included as Attachment A.

Checklist Item 1 - Notice & Communication (23 CCR §354.10)

[Section 4.1 Description of Beneficial Uses and Users in Plan Area (p. 4-1-4-3)]

- The California Water Code §1305(f) defines that beneficial uses of waters of the State include "preservation and enhancement of fish, wildlife, and other aquatic resources and preserves" (p. 4-1). Table 4-1 lists beneficial uses and user stakeholder groups (p. 4-2 to 4-3) and includes federal and state lands and facilities; environmental agencies and groups; rivers, creeks, and recreational and wildlife refuges; and recreational areas in addition to the direct users of groundwater and surface water. The GSP noted further refinement of the Table 4-1 list will be made by 2025. **Please describe whether other beneficial uses and users of groundwater in the Subbasin are present: Protected Lands, including conservation areas and other protected lands; and Public Trust Uses including wildlife, aquatic habitat, fisheries, and recreation.** 1
- The types and locations of environmental uses, species and habitats supported, and the designated beneficial environmental uses of surface waters that may be affected by groundwater extraction in the Subbasin should be specified. **Please identify environmental users, and refer to the following:** 2
    - Natural Communities Commonly Associated with Groundwater dataset (NC Dataset) - https://gis.water.ca.gov/app/NCDatasetViewer/
    - The list of freshwater species located in the Delta-Mendota Subbasin in Table 5-10 of the GSP. Please take particular note of the species with protected status.

Checklist Items 2 to 4 - Description of general plans and other land use plans relevant to GDEs and their relationship to the GSP (23 CCR §354.8)

[Section 2.2.1 General Plans in Plan Area (p. 2-42 to 2-66)]

- Figure 2-26 (p. 2-43) shows the area covered by city, community, and county general plans. There are five county plans, one city plan, and three community plans that cover a portion of the Northern and Central Delta-Mendota Regions. The plans should be modified to include a discussion of General Plan goals and policies related to the protection and management of GDEs and aquatic resources that could 3

be affected by groundwater withdrawals. **Please include a discussion of how implementation of the GSP may affect and be coordinated with General Plan policies and procedures regarding the protection of wetlands, aquatic resources and other GDEs and ISWs.** 3

- In general the plans seek to protect riparian habitat. This section should identify Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) within the Subbasin and if they are associated with critical, GDE or ISW habitats. **Please identify all relevant HCPs and NCCPs within the Subbasin and address how GSP implementation will coordinate with the goals of these HCPs or NCCPs.** 4
- Please refer to the Critical Species Lookbook[4] to review and discuss the potential groundwater reliance of critical species in the basin. **Please include a discussion regarding the management of critical habitat for these aquatic species and its relationship to the GSP.** 5

[Section 2.1.2.2 Major Water-Related Infrastructure (p. 2-10 to 2-12)]

- The GSP provides a description of the major water infrastructure projects including the Central Valley Project, the State Water Project, and the Tracy Fish Collection Project, however there is no discussion of any in-stream flow requirements. **Please describe any current or planned in-stream flow requirements of the San Joaquin and Merced Rivers or any of the westside creeks.** 6

[Section 2.3.2 County Well Construction/Destruction Standards and Permitting (p. 2-77)]

- Table 2-7 (p. 2-78) summarizes well permitting requirements and county ordinances for the counties of Fresno, San Benito, Merced, Stanislaus, and San Joaquin. The counties have ordinances that limit groundwater export and several counties have ordinances that minimize unsustainable groundwater extraction. **Please include a discussion of the following in this section:** 7
    - Future well permitting must be coordinated with the GSP to assure achievement of the Plan's sustainability goals.
    - The State Third Appellate District recently found that Counties have a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting new wells near streams with public trust uses (ELF v. SWRCB and Siskiyou County, No. C083239). The need for well permitting programs to comply with this requirement should be stated in the text.

<u>Checklist Items 5, 6, and 7 – Hydrogeologic Conceptual Model (23 CCR §354.14)</u>

[Section 5.2.5.2 Definable Bottom of Basin (p. 5-12)]

- Defining the bottom of Subbasin based on geochemical properties is a suitable approach for defining the base of freshwater, however, as noted on page 9 of DWR's 8

[4] Available online at: https://groundwaterresourcehub.org/sgma-tools/the-critical-species-lookbook/

Hydrogeologic Conceptual Model BMP (https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12-23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". **Thus, groundwater extraction well depth data should also be included in the determination of the basin bottom.** This will prevent the possibility of extractors with wells deeper than the basin boundary (defined by the base of freshwater) from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary. 8

[Section 5.2.6.1 Principal Aquifers (p. 5-12 to 5-14)]

- The very shallow unconfined groundwater falls under DWR's definition of a principal aquifer, which is defined as "aquifer or aquifer system that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems" [*23 CCR §351(aa)*]. **Thus, disregarding this shallow groundwater as a principal aquifer due to its "shallow nature and high salinity" is inadequate.** This is especially true in the places where projects to develop the shallow groundwater may be considered for use on more salt-tolerant crops. SGMA requires GSAs to sustainably manage groundwater resources in all aquifers, especially if groundwater use and management can result to impacts on beneficial uses and users. Please refer to Best Practice #1 in Attachment C for further explanation and accompanying graphics. 9

[Section 5.2.6.2 Aquifer Properties p. 5-14 to 5-31]

- Regional basin-wide geologic cross sections are provided in Figures 5-7 through 5-16 (p. 5-15 to 5-27). These cross-sections do not include a graphical representation of the manner in which the very shallow groundwater or perched water may interact with ISWs or GDEs that would allow the reader to understand this topic. **Please include example near-surface cross section details that depict the conceptual understanding of shallow groundwater and stream interactions at different locations, including the perched aquifer and the Upper Aquifer**. 10
- The two-aquifer system is separated primarily by the Corcoran Clay, which has a variable depth as shown on Figure 5-17 (p. 5-28). The Corcoran Clay is absent in the far western parts of the Subbasin. There is also a Very Shallow unconfined groundwater zone, and perched water is sometimes present due to fine-grained clay layers. **Please provide a map showing where the Very Shallow groundwater zone and the perched aquifers are located.** 11

[Section 5.3.2.4 Groundwater Trends (p. 5-92 to 5-118)]

- Data gap areas for the Upper Aquifer, Lower Aquifer, or both are shown in Figure 5-64 (p. 5-96). Much of the data gaps area is located within the Northern and Central Delta-Mendota Regions. There are very few wells screened in the Upper Aquifer shown in the groundwater contour map in Spring 2013 and Fall 2013, as shown on Figures 5-80 and 5-81, within the Northern and Central Delta-Mendota Regions. **Please explain how these data gaps will be filled, or refer to a section later in the GSP.** 12

- Well hydrographs are shown for wells screened in the Very Shallow Groundwater in Figure 5-67 (p. 5-99). **Please indicate which of these wells are located within the Northern and Central Delta-Mendota Regions.** 13
- The GSP states (p. 5-94) that vertical gradients are restricted by the Corcoran Clay. In the western part of the Subbasin, interfingering clay layers minimize downward gradients, except where the clay has been compromised by the construction of composite wells. **Please provide data or analysis to explain and substantiate the vertical gradients noted in the text.** 14

<u>Checklist Items 8, 9, and 10 – Interconnected Surface Waters (ISW) (23 CCR §354.16)</u>

[Section 5.3.7 Interconnected Surface Water Systems (p. 5-170 to 5-172)]

- The regulations [23 CCR §351(o)] define interconnected surface waters (ISW) as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted". "At any point" has both a spatial and temporal component. Even short durations of interconnections of groundwater and surface water can be crucial for surface water flow and supporting environmental users of groundwater and surface water. ISWs can be either gaining or losing. The text states (p. 5-170) "Streams stemming from the west side of the Delta-Mendota Subbasin are ephemeral in nature, and only two of these creeks reach the San Joaquin River (Del Puerto Creek and Orestimba Creek). These creeks lose their flows to the underlying vadose zone (net-losing streams) and therefore do not represent areas of potential GDEs." No evidence is provided in the Plan that states that these streams are not connected to the Upper Aquifer along some portion of the drainage for some time period. **Please provide data or analysis to back up the statement that these westside streams do not represent areas of potential GDEs. Please reconcile data gaps (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP to improve ISW mapping in future GSPs**. 15
- **Please provide more detail on how the quantity of gains and/or depletions from the groundwater at each reach of the San Joaquin River was determined.** For example, were the values taken from the cited literature sources or determined from further analysis or modeling? Please provide or refer to a map that shows the designated reaches listed in Table 5-9. 16

<u>Checklist Items 11 to 15, Identifying and Mapping GDEs (23 CCR §354.16)</u>

[Section 5.3.7.6 Groundwater Dependent Ecosystems (p. 5-172)]

- The text states (p. 5-172): "To further screen available information regarding GDEs, the following standards were set for identifying GDEs in the Northern and Central Delta-Mendota Regions: (1) areas with depths to groundwater levels greater than 30 feet were eliminated unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks); (2) seasonally-managed areas 17

and wetlands were eliminated due to their dependence on applied surface water; and (3) a 100-foot buffer was applied around the San Joaquin River within the Northern Delta-Mendota Region to include all communities in the NCCAG dataset as potential GDEs, except where professional judgement and local knowledge determined GDEs were not present." The three standards are discussed in turn below. 17

- The following comments apply to *Standard (1): Areas with depth to groundwater greater than 30 feet in Spring 2015, unless the vegetation identified in those areas were consistent with species with deep root systems (e.g. live oaks).*
    - While depth to groundwater levels within 30 feet are generally accepted as being a proxy for confirming that polygons in the NC dataset are connected to groundwater, it is highly advised that seasonal and interannual groundwater fluctuations in the groundwater regime are taken into consideration. Utilizing groundwater data from one point in time (e.g., Spring 2015) can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Based on a study we recently submitted to Frontiers in Environmental Science Journal, we've observed riparian forests along the Cosumnes River to experience a range in groundwater levels between 1.5 and 75 feet over seasonal and interannual timescales. Seasonal fluctuations in the regional water table can support perched groundwater near an intermittent river that seasonally runs dry due to large seasonal fluctuations in the regional water table. While perched groundwater itself cannot directly be managed due to its position in the vadose zone, the water table position within the regional aquifer (via pumping rate restrictions, restricted pumping at certain depths, restricted pumping around GDEs, well density rules) and its interactions with surface water (e.g., timing and duration) can be managed to prevent adverse impacts to ecosystems due to changes in groundwater quality and quantity under SGMA. **We highly recommend using depth to groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. Please refer to Attachment C of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network. Additionally, Spring 2015 is after the SGMA benchmark date of January 1, 2015. Please include groundwater condition data prior to the SGMA benchmark date in the analysis.** 18
    - **Please confirm that wells screened in the Upper Aquifer (or very shallow groundwater where present) are being used to verify whether NCCAGs are actual GDEs, given the significant data gap areas noted on Figure 5-64 (page 5-96).** Using "depth to groundwater" measurements from confined aquifers is mapping piezometric head of the confined aquifer and not detecting groundwater conditions in the principal aquifers of the unconfined aquifer that are supporting the ecosystem. If there 19

is insufficient groundwater level data in the Upper Aquifer, then the NCCAGs in these areas should be included as GDEs in the GSP until data gaps are reconciled in the monitoring network. 19

- **Please provide depth to groundwater contour maps and note the following best practices for doing so.**
  - i) Are the wells used for interpolating depth to groundwater sufficiently close (<5km) to NC Dataset polygons to reflect local conditions relevant to ecosystems?
  - ii) Are the wells used for interpolating depth to groundwater screened within the surficial unconfined aquifer and capable of measuring the true water table (see comment b above)?
  - iii) Is depth to groundwater contoured using groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape? This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM) to estimate depth-to-groundwater contours across the landscape. This will provide much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. Depth to groundwater contours developed from depth to groundwater measurements at wells assumes that the land surface is constant, which is a poor assumption to make. It is better to assume that water surface elevations are constant in between wells, and then calculate depth to groundwater using a DEM of the land surface to contour depth to groundwater. 20
- **Please use care when considering rooting depths of vegetation. Please list the species in each GDE, and whether the GDE was eliminated or retained based on the 30-foot standard, and provide evidence for the decision.** While Valley Oak (Quercus lobata) have been observed to have a max rooting depth of ~24 feet (https://groundwaterresourcehub.org/gde-tools/gde-rooting-depths-database-for-gdes/), rooting depths are likely to spatially vary based on the local hydrologic conditions available to the plant. Also, max rooting depths do not take capillary action into consideration, which will vary with soil type and is an important consideration since woody phreatophytes generally do not prefer to have their roots submerged in groundwater for extended periods of time, and hence can access groundwater at deeper depths. 21

- The following comment applies to *Standard (2): Habitat areas with supplemental water*. The application of supplemental water to managed wetlands <u>does not preclude</u> the possibility that NC polygons could be accessing groundwater in addition to the supplied water. In the scientific literature, it is generally acknowledged that GDEs can rely on groundwater for <u>some or all</u> of their requirements. GDEs can rely on multiple water sources simultaneously and at different temporal/spatial scales (e.g., precipitation, river water, reservoir water, soil moisture in the vadose zone, groundwater, applied water, treated wastewater effluent, urban stormwater, irrigated return flow). SGMA defines GDEs as "ecological communities and species that depend on groundwater <u>emerging from aquifers</u> or on groundwater <u>occurring</u> 22

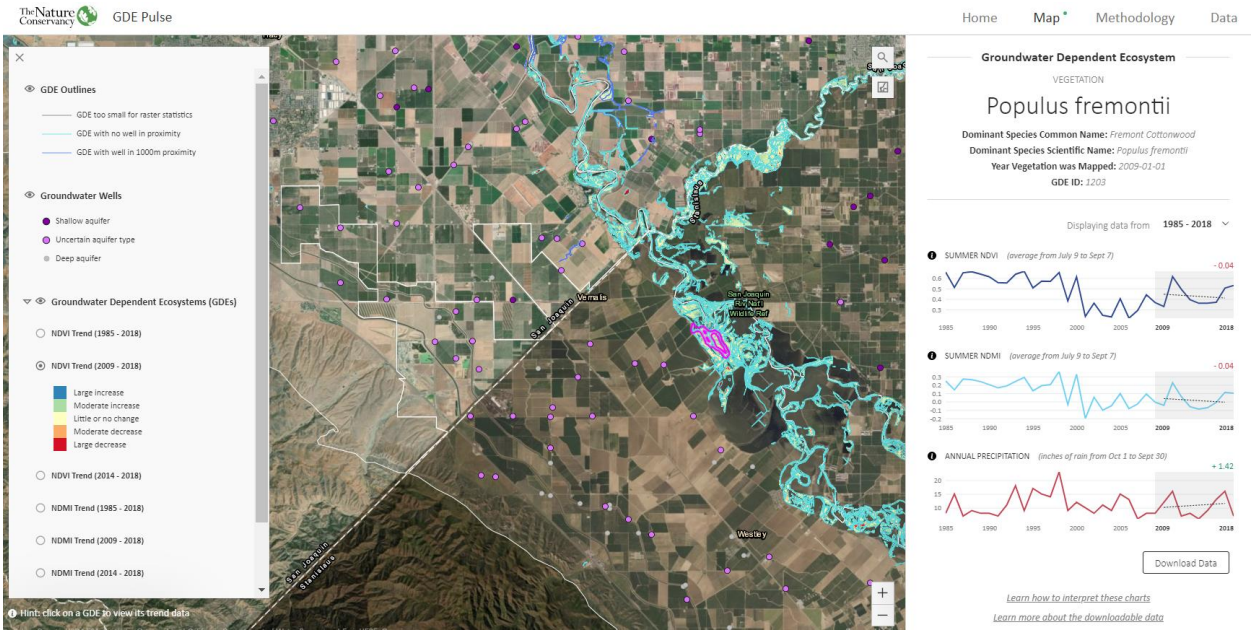
near the ground surface". **Hence, we recommend that depth to groundwater contour maps are used to identify whether a connection to groundwater exists for the managed wetlands in the Northern and Central Delta-Mendota Regions. Please refer to Attachment C of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer.** 22

- The following comment applies to *Standard (3): 100-foot buffer area applied around the San Joaquin River.* **We disagree with the use of an arbitrary 100-foot cutoff. In addition to "professional judgement and local knowledge" please explain how this criterion is supported by groundwater level and plant physiological data to exclude potential GDEs near the river.** 23
- On p. 5-173 the GSP states, "Possible GDEs have also been identified along streams originating from the Coast Range; however, these areas are topographically disconnected from the Subbasin's principal aquifers and are located in areas of de minimus or zero groundwater use and are therefore are unmanageable through the Sustainable Groundwater Management Act (SGMA)." **Please provide further information on the analysis of GDEs on westside streams, including citing field studies or modeling studies that show the disconnected nature of these streams. Indicate on which streams GDE polygons were excluded and on which streams GDE polygons were retained. Identify any data gaps and ensure that GDE polygons are retained until data gaps are reconciled.** 24
- The NC Dataset comprises 4,852 acres of potential GDEs for the Northern and Central Delta Mendota Regions. On Figures 5-118 and 5-119, it is difficult to distinguish the colors underneath the hatching, and thus see which removal categories apply to the Northern and Central Delta-Mendota Regions. **Please consider changing the hatching pattern or supplying a map for just the Northern and Central Delta-Mendota Regions. Please be more specific when denoting "mapping error". The basin's GDE shapefile, which is submitted via the SGMA Portal, should also include two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed). In addition, in the text please cite the acreage of GDEs retained and removed.** 25

Checklist Items 16 to 20, Describing GDEs (23 CCR §354.16)

[Section 5.3.7.6 Groundwater Dependent Ecosystems (p. 5-172)]

- **Please provide information on the historical or current groundwater conditions in the GDEs or the ecological conditions present**. Refer to GDE Pulse (https://gde.codefornature.org; See Attachment D of this letter for more details) or any other locally available data (e.g., leaf area index, evapotranspiration or other data) to describe depth to groundwater trends in and around GDE areas, as well as trends in plant growth (e.g., NDVI) and plant moisture (e.g., NDMI). Below is a screenshot example of data available in GDE Pulse for NC dataset polygons found in the Northern and Central Delta-Mendota Regions. 26



- **Please provide an ecological inventory (see Appendix III, Worksheet 2 of the GDE Guidance) for all potential GDEs that includes the vegetation types or habitat types and rank the GDEs as having a high, moderate or low value; and what characterizes the rank.** 27
- **Please identify whether any endangered or threatened freshwater species of animals and plants, or areas with critical habitat were found in or near any of the GDEs since some organisms rely on uplands and wetlands during different stages of their lifecycle**. Please refer to the list of species included as Table 5-10 of the GSP, the Critical Species Lookbook, and CDFW's CNDDB database. 28

<u>Checklist Items 21 and 22 – Water Budget (23 CCR §354.18)</u>

[Section 5.4 Water Budgets (p. 5-181 to 5-235)]

- Evapotranspiration is included as an outflow category in the land surface budget, however it is not split between type of evapotranspiration. **Please separate this term by land-use type (for example, agricultural; municipal and domestic; and native and riparian).** 29
- Groundwater outflow to ET does not appear to be identified as a groundwater budget component. **Since GDEs (including wetlands, riparian vegetation, phreatophytes and other communities) are recognized as beneficial users of groundwater in the Northern and Central Delta-Mendota Regions, it is appropriate to include them in these calculations.** 30

<u>Checklist Item 23-26 Sustainability Goal (23 CCR §354.24)</u>

[Section 6.2 Sustainability Goal (p. 6-2)]

- **Since GDEs are present within the Subbasin (please see comments under checklist items 16-20) they should be recognized as beneficial users of groundwater and should be included in the Sustainability Goal. In addition, a statement about any intention to address pre-SGMA impacts to GDEs and ISWs should be included here and within the interim milestones and measurable objectives.** 31
- **We request that the connectivity of GDEs and ISWs to each aquifer (including the very shallow groundwater, where present) be made clear. If connectivity to the very shallow surficial aquifer exists, please establish its current and/or future management to determine if it is a principal aquifer. If it is a principal aquifer, it should be included in the sustainability goal and sustainability criteria. If it isn't a principal aquifer, please include text that states the future protection of GDEs would be incorporated into the 5-year update as future management plans are developed.** 32
- The GSP states that there are time periods of ISW connectivity along the San Joaquin River on the northern end of the basin. **Please include protection of ISWs as a part of the Sustainability Goal.** 33
- GDEs are dependent, in part, on suitable water quality; however, this GSP only considers water quality for irrigation and domestic use. **Since GDEs may also be affected by water quality they should be included in the Sustainability Goal.** 34

<u>Checklist Item 26 – Measurable Objectives (23 CCR §354.30)</u>

[Section 6.3.1.3 Measurable Objectives for Groundwater Levels (p. 6-10)]

- This Measurable Objective does not consider GDEs. **Please include GDEs (see comments under Checklist Items 16-20) in this section and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.** 35

[Section 6.5.3 Measurable Objectives for Water Quality (p. 4-29)]

- This Measurable Objective does not consider water quality needs of GDEs. **Please modify this section to specifically address degraded water quality from total dissolved solids (TDS), arsenic (As), boron (B), and other potential constituents of concern to wildlife and vegetation communities of GDEs**. 36

[Section 6.3.6.3 Measurable Objectives and Interim Milestones (for Interconnected Groundwater Surface Water Systems) (p. 6-35)]

- The GSP states that depletions will be considered from monitoring data collected in 2020 to 2025 and proposes a qualitative statement of no increased depletions. Based on statements made in Chapter 5, Sections 5.3.7 (pp. 5-170 to 5-173), this GSP only considers gaining and losing reaches of the San Joaquin River as being potentially interconnected (See Table 5-9 on p. 5-172). There are several ephemeral 37

streams that may reach the San Joaquin in a given year that are dismissed because they are not regularly connected and, or flow is ephemeral. Streams that are not continuously connected spatially and, or temporally, or are ephemeral in nature, are still potential ISWs and should not be excluded from this GSP. Ephemeral water courses in the basin include Orestimba Creek, Del Puerto Creek, Mercy Creek, Hospital Creek, Inghram Creek Salado Creek, and Cow Creek. For example, on page 4-7 in the *Stanislaus County Hydrologic Model: Development and Forecast Modeling* (Stanislaus County, California) it states "data from nearby calibration wells suggests that in fact Orestimba Creek is groundwater connected and gaining in its middle and lower reaches". **Because the question of ISWs is a data gap, it needs to be acknowledged and a plan to reconcile the data gap specified. Even though the streams may not be continuously connected, they may still be ISWs, and should be included in the Measurable Objectives.** 37

Checklist Item 27-29 – Minimum Thresholds (23 CCR §354.28)

[Sections 6.3.1.2 Minimum Thresholds for Groundwater Levels (p. 6-5)]

- The GSP states that environmental use was considered when establishing the groundwater level minimum threshold; however, the criteria used was not included in the narrative. In addition, Table 6-1 (p. 6-9) does not identify which DMS ID corresponds to GDEs and, or ISWs. **Please update this section to provide detail on criteria used to evaluate minimum thresholds for GDEs and ISWs, and to establish proposed thresholds, or a process for establishing thresholds in regards of protecting GDEs and ISWs.** 38

[Section 6.3.3.2 Minimum Thresholds for Water Quality (p. 6-16)]

- Although agricultural water quality concerns were articulated, similar concerns were not identified for GDEs. **Please include a discussion about GDEs and water quality, and how the minimum thresholds and interim milestones will help achieve the sustainability goal as it pertains to the environment.** 39

[Sections 6.3.6.2 Minimum Thresholds for Interconnected Groundwater Surface Water Systems (p. 6-35)]

- The GSP states that depletions will be analyzed to determine the location, timing, and quantity of depletions from monitoring data collected between 2020 to 2025, and proposes a qualitative statement of no increased depletions. **Please modify this section of the GSP to provide a statement that quantifies gains and, or losses similar to those shown in Table 5-9 (p. 5-172) as they relate to the 2015 conditions.** 40

Checklist Item 30-46 – Undesirable Results (23 CCR §354.26)

[Section 6.3.1.1 Undesirable Results (for chronic lowering of groundwater levels) (p. 6-3)]

- This section only describes undesirable results relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline. **Please add "potential adverse impacts to GDEs and ISWs" to the list of potential undesirable results presented in Section 6.3.1.1.** 41

[Section 6.3.1.1.2 Identification of Undesirable Results (for chronic lowering of groundwater levels) (p. 6-4)]

- This section states that "..conditions are deemed significant and unreasonable, when groundwater elevations drop below the site-specific minimum threshold of 25% of representative monitoring wells in a principal aquifer…..in a given year". **Please describe how a drop below the site-specific minimum threshold of 25% of representative monitoring wells in a principal aquifer relates to undesirable results.** A specific threshold should be provided for monitoring wells that measure groundwater levels near GDEs. 42

- The GDE Pulse web application developed by TNC provides easy access to 35 years of satellite remote sensing data to view trends of vegetation metrics, groundwater depth (where available), and precipitation data. This satellite imagery can be used to observe trends for NC dataset polygons within and near the GSA. Over the past 10 years (2009-2018), some NC dataset vegetation polygons have experienced adverse impacts to vegetation growth and moisture along the San Joaquin River. An example screen shot from the GDE Pulse tool is presented under Checklist Items 11-15 above.

  - **For each identifiable GDE unit with supporting hydrological datasets please include the following:**
    - Plot and provide hydrological datasets for each GDE.
    - Define the baseline period in the hydrologic data.
    - Classify GDE units as having high, moderate, or low susceptibility to changes in groundwater. 43
    - Explore cause-and-effect relationships between groundwater changes and GDEs.

  - **For each identifiable GDE unit without supporting hydrological datasets please describe data gaps and/or insufficiencies.** 44

  - **Compile and synthesize biological data for each GDE unit by including:**
    - Plots of biological datasets for each GDE unit, and when possible provide baseline conditions for assessment of trends and variability. 45
    - Describe data gaps/insufficiencies.

  - **Description of potential effects on GDEs, land uses, and property interests, including:**
    - Cause-and-effect relationships between GDE and groundwater conditions. 46

- Impacts to GDEs that are considered to be "significant and unreasonable".
- Report known hydrological thresholds or triggers (e.g., instream flow criteria, groundwater depths, water quality parameters) for significant impacts to relevant species or ecological communities. 46
- Land uses include and consider recreational uses (e.g., fishing/hunting, hiking, boating).
- Property interests include and consider privately and publicly protected conservation lands and opens spaces, including wildlife refuges, parks, and natural preserves.

[Section 6.3.3.1.2 Identification of Undesirable Results (for degraded water quality) (p. 6-15)]

- This Section discusses MCLs and WQOs but does not include metrics for GDEs. **Please modify this section to specifically address degraded water quality from TDS, As, B and other constituents that could pose a threat to wildlife and / or vegetative communities associated with GDEs and ISWs. Although As and CrVI are mentioned in this section, please add a statement addressing that overpumping and dewatering of aquitards has been identified as a potential source of elevated As concentrations above drinking water standards in San Joaquin Valley aquifers.** The following is a link to a paper by Smith, Knight and Fendorf (2018) titled "Overpumping leads to California groundwater arsenic threat": (https://www.nature.com/articles/s41467-018-04475-3. 47

[Sections 6.3.6 Depletions of Interconnected Surface Water (p. 6-34)]

- The GSP states that depletions will be considered from monitoring data collected between 2020 to 2025. At a minimum the GSP should maintain the current level of ISWs until additional information is collected and measurable objectives and minimum thresholds can be more precisely defined. For example, Table 5-9 (p. 5-172) estimates the quantity of gains and depletions for reaches of the San Joaquin River only. This type of information should be used to support the statement of undesirable results and should be expanded to other streams that are potential ISWs. **Please modify this section of the GSP to include a statement that there will be no increase in depletions for confirmed and potential ISWs, at least until data gaps are filled.** 48

Checklist Items 47, 48 and 49 – Monitoring Network (23 CCR §354.34)

[Section 7.2.5.1 Groundwater Level Monitoring Network (p. 7-35)]

- The GSP proposes to use groundwater level monitoring for tracking chronic groundwater level and as a proxy for groundwater storage and depletion of interconnected surface waters. A set of representative wells has been selected in six 49

subregions, shown in Figure 7-2 (p. 7-33). The representative wells to be used for monitoring groundwater levels in the semi-confined Upper Aquifer and the confined Lower Aquifer are shown in Figure 7-3 (p. 7-39) and Figure 7-4 (p. 7-40). Areas with spatial data gaps have been identified and are shown on both maps. The potential locations for wells for monitoring both aquifers are shown in Figures 7-5 and 7-6 (p. 7-47 and 7-48). Tables 7-6 and 7-7 (p. 7-37 and 7-38) indicate that some wells are missing key information, e.g. status, well depth or screened interval. Although a list of criteria including "adequate construction information" were listed on page 7-41, it appears that not all criteria were met in all the wells. A plan to fill these data gaps is included in Section 7.2.5.6.6 (Plan to Fill Data Gaps) that includes obtaining video logs of some wells and drilling new wells. **Please emphasize in the text the importance of using dedicated monitoring wells with complete construction information in order to accurately monitor single aquifers.** 49

- The GSP states on p. 7-45: "Not all wells included in these networks are dedicated monitoring wells, as recommended by DWR's Monitoring Networks and Identifications of Data Gaps BMP (2016a)." The GSP noted that an effort would be made to replace pumping wells with dedicated monitoring wells. **Please discuss the importance of using dedicated monitoring wells instead of pumping wells at all locations.** 50
- The GSP states on p. 7-45: "For the purpose of monitoring depletions of interconnected surface water, where groundwater levels are used as a proxy, four additional wells with tentative locations have been identified that would also be included in the groundwater level monitoring network. These wells are located within three miles of the San Joaquin River within the Northwestern Delta-Mendota GSA and Patterson Irrigation District GSA." **Consideration should be given to using wells closer to the river, or installing new wells. Please discuss how the data will be used to verify ISWs and quantify depletions of stream flow due to groundwater extraction.** 51

[Section 7.2.5.6 Depletions of Interconnected Surface Water Monitoring Network (p. 7-67)]

- At present there are only two wells located within 3 miles of the San Joaquin River in the ISW area. Locations of four clustered wells have been identified and other stream gauging sites proposed as shown in Figure 7-11 (p. 7-73). **Please expand on the discussion of how the new well and stream data will be used to improve ISW mapping and inform an adequate analysis. Please discuss how the data will be used to verify possible GDEs and reaches that include ISWs.** 52
- As stated above in the comments for Checklist Items 8-10, **please reconcile data gaps (shallow monitoring wells, stream gauges, and nested/clustered wells) along westside ephemeral streams in this section of the GSP to improve ISW mapping in future GSPs**. 53

<u>Checklist Items 50 and 51 – Projects and Management Actions to Achieve Sustainability Goal (23 CCR §354.44)</u>

[Section 7.1 Projects and Management Actions (p. 7-1)]

- The Subbasin includes many potential GDEs and ISWs (see our comments under Checklist Items 8-10 and 16-20 above) that are beneficial uses and users of groundwater and may include sensitive resources and protected lands. Environmental resource protection needs should be considered in establishing project priorities. In addition and consistent with existing grant and funding guidelines for SGMA-related work, priority should be given to multi-benefit projects that can address water quantity and quality as well as providing environmental benefits or benefits to disadvantaged communities.
    - Although Table 7-2 (p. 7-5) provides information on how each project supports ISWs there are no criteria provided on how GDEs and ISWs were considered in project selection. **Please include criteria considered for project selection as it relates to GDEs and ISWs.** 54
    - In Section 7.1.1.1.1 (p. 7-9), the narrative supporting the Los Banos Creek Recharge and Recovery Project states that project beneficiaries are groundwater users but there is no discussion about how environmental users (i.e., GDEs and ISWs) will specifically benefit. **Please update the environmental benefits and multiple benefits as criteria for assessing project priorities and articulate how project monitoring will support GDEs and ISWs.** 55
    - Table 7-2 (pp. 7-5 to 7-8) identifies many important projects; however, the descriptions of objectives for each sustainability indicator for these projects only identify benefits to water level and storage. Since maintenance or recovery of groundwater levels, or construction of recharge facilities, may have potential environmental benefits in many cases it would be advantageous to demonstrate these multiple benefits from a funding and prioritization perspective. **For the projects already identified, please consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue.** 56
    - **If ISWs will not be adequately protected or enhanced by those listed, please include and describe additional management actions and projects targeted for protecting known and potential ISWs.** 57
    - Recharge ponds, reservoirs and facilities for managed stormwater recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. In some cases, such facilities have been incorporated into local Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs), more fully recognizing the value of the habitat that they provide and the species they support. In addition, incorporating HCPs, NCCPs, and managed wetlands into recharge projects may effectively tie into the project's permitting strategy described in Section 7.1.5. For projects that construct recharge ponds, **please update Table 7-4 (p. 7-21) to identify if there are multi-benefit opportunities that can incorporate habitat components into project designs and how the recharge ponds will be managed to benefit environmental uses and users.** 58

- For examples of case studies on how to incorporate environmental benefits into groundwater projects, please visit our website: https://groundwaterresourcehub.org/case-studies/recharge-case-studies/

[Section 7.1.1.2 Tier 1 Management Actions (p. 7-12)]

- This section discusses the Management Actions for GSP implementation and SGMA compliance; however, these actions are focused on meeting groundwater level and storage measures and do not include support for GDEs or ISWs. **Please modify the Management Actions to include education and outreach for GDEs, ISWs and the sensitive habitats they support. Please update Section 7.1.1.2 Tier 1 Management Actions (p. 7-12) and Section 7.1.1.4 Tier 2 Management Actions (p. 7-15) to include GDEs and ISWs.** 59

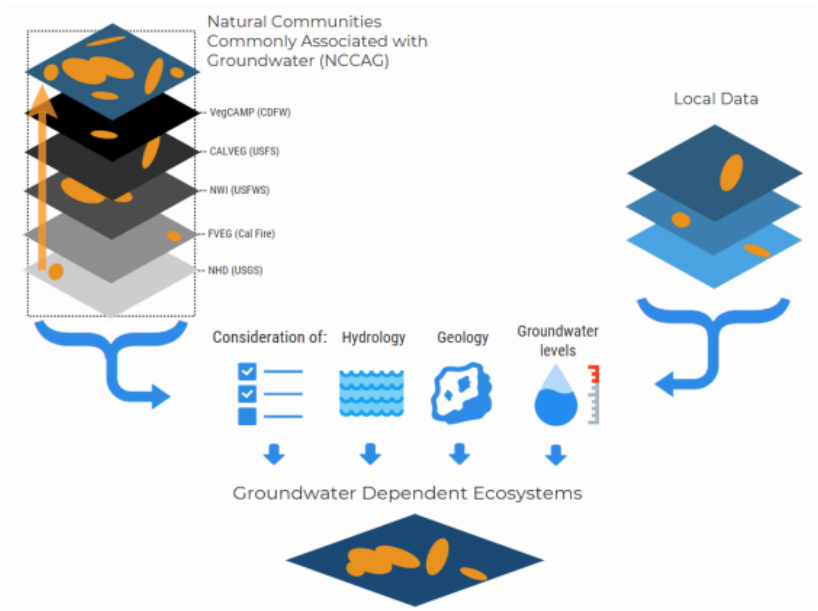
Attachment C

July 2019

IDENTIFYING GDEs UNDER SGMA

Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online[5] to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)[6]. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.



[5] *NC Dataset Online Viewer: https://gis.water.ca.gov/app/NCDatasetViewer/*

[6] California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf

The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[7]. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset[8] on the Groundwater Resource Hub[9], a website dedicated to GDEs.

BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2a) or multiple aquifers stacked on top of each other (Figure 2b). In unconfined aquifers (Figure 2a), using the depth-to-groundwater and the rooting depth of the vegetation is a reasonable method to infer groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2d). However, it is important to consider local conditions (e.g., soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2c). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2b) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and GDEs (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer*.

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[7] *For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf*

[8] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at: https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/

[9] *The Groundwater Resource Hub: www.GroundwaterResourceHub.org*

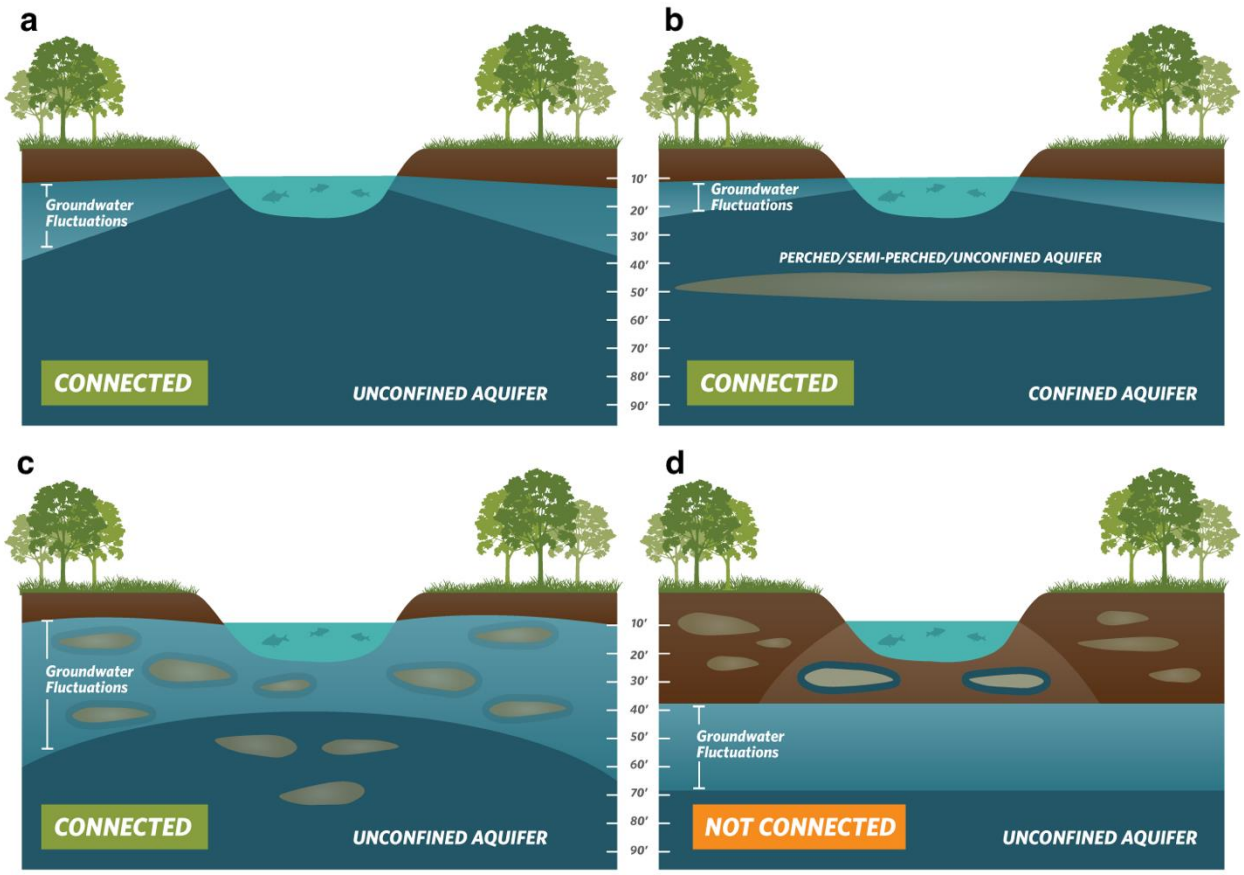


Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. **(b)** Depth-to-groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. **Bottom: (c)** Depth-to-groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. **(d)** Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under the surface water feature. These areas are not connected to groundwater and typically support species that do not require access to groundwater to survive.

BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets[10] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[11] could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[12] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document[4], one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (see Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however if these groundwater conditions are prolonged, adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet[4] of the land surface are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[13]. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network (see Best Practice #6).

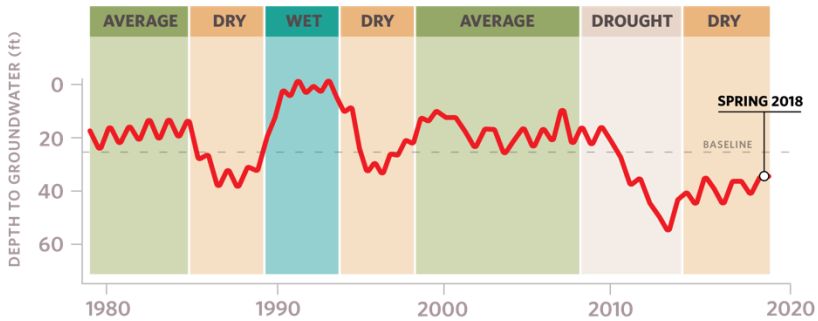


Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

[10] DWR. 2016. Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

[11] *Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]*

[12] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs[4]).

[13] *SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer*

BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around a GDE does not preclude the possibility that it is supported by groundwater, too. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals[14], which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

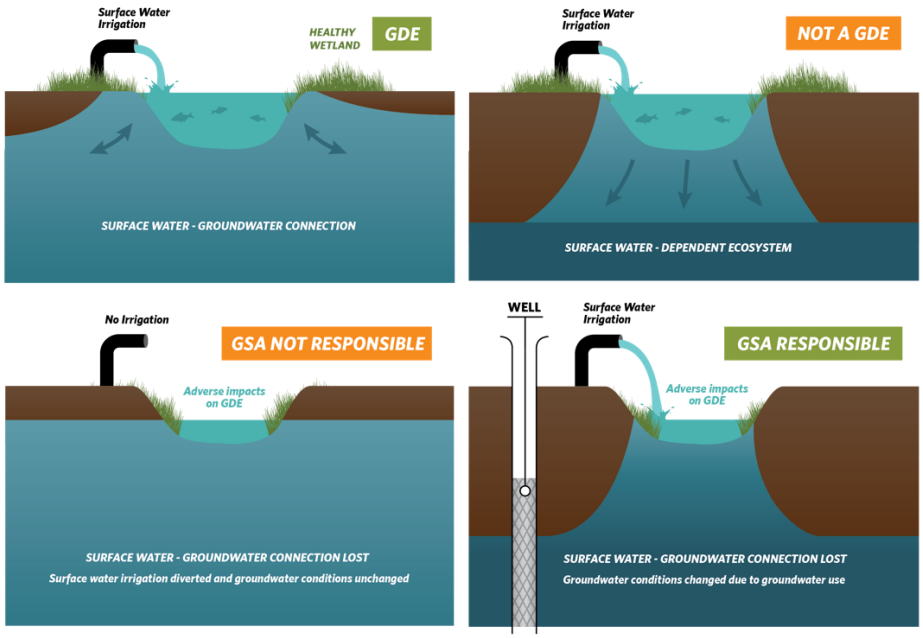


Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. **(Right)** Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. **Bottom: (Left)** An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. **(Right)** Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

[14] *For a list of environmental beneficial users of surface water by basin, visit: https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/*

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

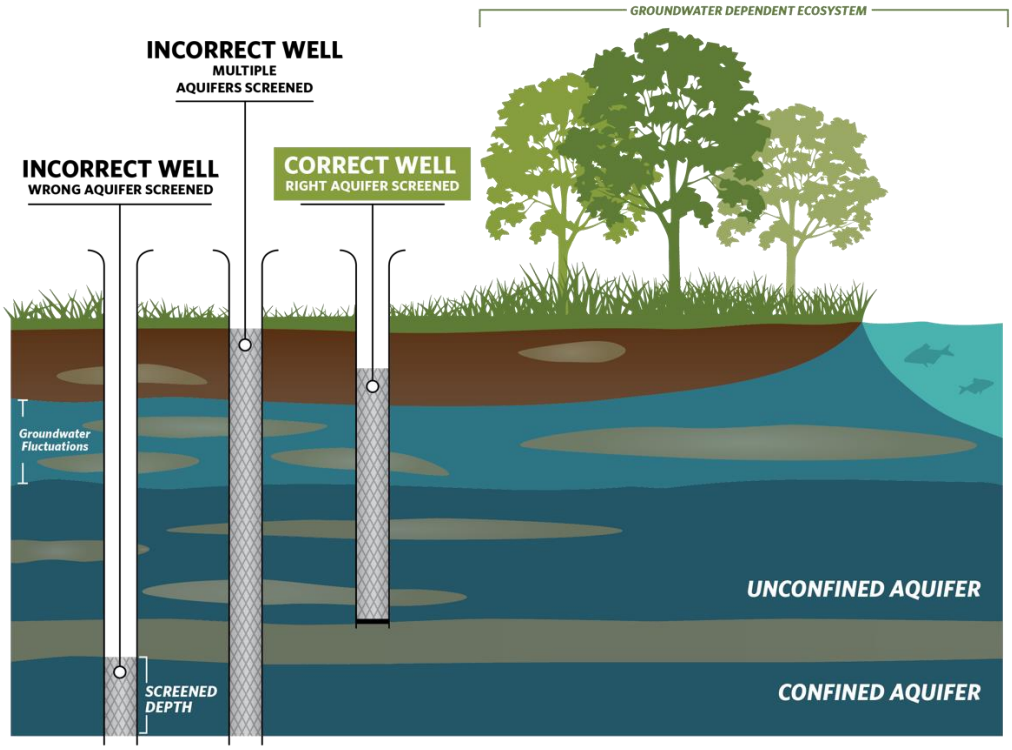


Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like stream and wetland depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6a). A more accurate approach is to interpolate **groundwater elevations** at monitoring wells to get groundwater elevation contours across the landscape. This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)[15] to estimate depth-to-groundwater contours across the landscape (Figure b; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found.

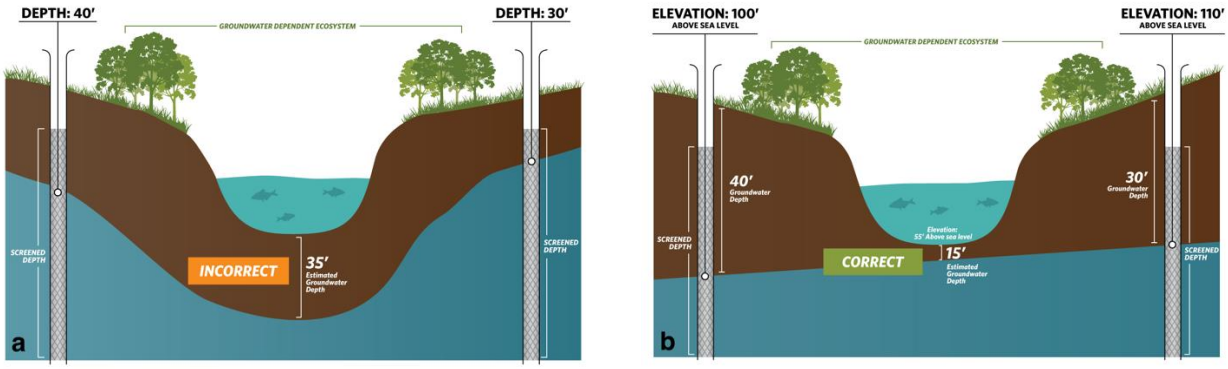


Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. **(b)** Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

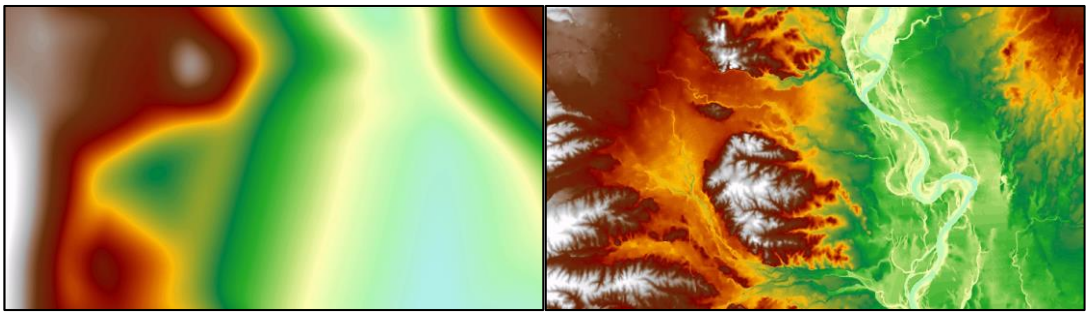


Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. **(Right)** Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth-to-groundwater contours. The image on the right shows a more accurate depth-to-groundwater estimate because it takes the local topography and elevation changes into account.

[15] USGS Digital Elevation Model data products are described at: https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services and can be downloaded at: https://iewer.nationalmap.gov/basic/

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring programs to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, **The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network.** Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

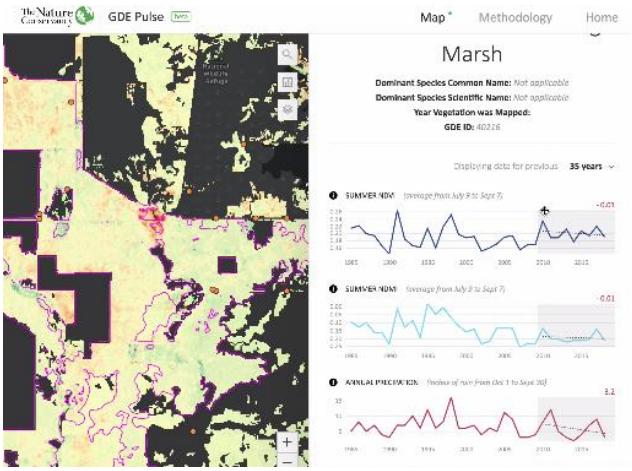
Attachment D

GDE Pulse

A new, free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data.

The Nature Conservancy
Protecting nature. Preserving life.

Visit
https://gde.codefornature.org/



Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA's Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset[16]. The following datasets are included:

Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

Annual Precipitation is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset[17]. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

Depth to Groundwater measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

[16] The Natural Communities Commonly Associated with Groundwater Dataset is hosted on the California Department of Water Resources' website: https://gis.water.ca.gov/app/NCDatasetViewer/#

[17] The PRISM dataset is hosted on Oregon State University's website: http://www.prism.oregonstate.edu/

Natalie Cochran

From: Leslie Dumas
Sent: Monday, October 7, 2019 3:21 PM
To: Natalie Cochran
Subject: FW: Chapter 2 Comment Received.

FYI – comment and response on the WSID water rights question

Leslie Dumas, P.E., D.WRE
Senior Water Resources Engineer
916.999.8778
916.224.3316 mobile

From: Bobby Pierce <bobby.pierce@weststanislausid.org>
Sent: Thursday, October 3, 2019 11:44 AM
To: Andrew Garcia <andrew.garcia@sldmwa.org>
Cc: Leslie Dumas <ldumas@woodardcurran.com>
Subject: RE: Chapter 2 Comment Received.

You can just respond with the following:

The statement is correct. By the terms of License 3957 with a priority of August 27, 1920, West Stanislaus Irrigation District is entitled to divert 262.15 cubic feet per second from the San Joaquin River and Tuolumne River in Stanislaus County.

BP

From: Andrew Garcia <andrew.garcia@sldmwa.org>
Sent: Thursday, September 26, 2019 6:06 PM
To: Bobby Pierce <bobby.pierce@weststanislausid.org>
Cc: Leslie Dumas <ldumas@woodardcurran.com>
Subject: Fwd: Chapter 2 Comment Received.

FYI

Someone from MID commented on a description of your diversion rights.

Leslie and I will be looking for clarification so we can compile or respond in the final draft.

Can you elaborate further into the validity of the statement in the GSP and the comment?

Thanks

Andrew Garcia

---------- Forwarded message ----------
From: "**Brandon Souza**" <bsouza@farmwater.org>

Date: Thu, Sep 26, 2019 at 5:24 PM -0700
Subject: FW: Chapter 2 Comment Received.
To: "Claire Howard" <claire.howard@sldmwa.org>, "Andrew Garcia" <andrew.garcia@sldmwa.org>

I wanted to validate that you received this submission through the form system.

Thanks!

Brandon

From: Delta-Mendota SGMA Form <email@deltamendota.org>
Reply-To: "gordon.enas@mid.org" <gordon.enas@mid.org>
Date: Thursday, September 26, 2019 at 4:50 PM
To: "DMSGMA@sldmwa.org" <DMSGMA@sldmwa.org>, Brandon Souza <bsouza@farmwater.org>
Subject: Chapter 2 Comment Received.

Name: Gordon Enas
Email: gordon.enas@mid.org
Message: Page 2-101, 2nd paragraph reads, "West Stanislaus Irrigation District is entitled to extract up to 189,790 AFY from the San Joaquin and Tuolumne rivers..." This is incorrect. WSID is not entitled to divert water from the Tuolumne River. 1
Upload up to 5MB file below. (PDF, DOC, DOCX):

Date: September 26, 2019
Time: 4:50 pm
Page URL: http://deltamendota.org/chapter-two/
User Agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:60.0) Gecko/20100101 Firefox/60.0
Remote IP: 204.153.57.44
Powered by: Elementor

DRAFT

Date

Andrew Garcia
Northern and Central Delta-Mendota Regions
Groundwater Sustainability Agencies
15990 Kelso Road
Byron, CA 94514

Dear Mr. Garcia:

Thank you for affording the California Department of Water Resources State Water Project (DWR-SWP) the opportunity to review the draft Northern and Central Delta-Mendota Region Groundwater Sustainability Plan (GSP) as required under the Sustainable Groundwater Management Act of 2014. Moreover, we appreciated the helpful discussion at the October 10, 2019 coordination meeting with your staff and look forward to continuing this dialog to advance our common interests.

DWR owns, operates and maintains the SWP, the key component of the State's water delivery system, to supply water to 27 million Californians and irrigate 750,000 acres of farmland. Central to the SWP is the 220-mile-long portion of the California Aqueduct (Aqueduct) that runs through the San Joaquin Valley from San Luis Reservoir to the Edmonston Pumping Plant near Bakersfield. Though organizationally within DWR, the SWP is separate and apart from the Sustainable Groundwater Management Office, which is charged with administering many aspects of the 2014 SGMA.

While subsidence has impacted the Aqueduct since its construction in the 1960s, rates of subsidence have recently accelerated due to increased groundwater withdrawal. Ongoing subsidence has substantially reduced both the conveyance capacity and operational flexibility of the Aqueduct. The areas and magnitudes of these impacts can be found in the Department's California Aqueduct Subsidence Study (June 2017) and the California Aqueduct Subsidence Study: Supplemental Report (March 2019).

Over 90 miles of the Aqueduct are located within the Northern and Central Delta-Mendota Region. DWR-SWP's chief goals are to remediate past and ongoing damage to the Aqueduct while also addressing the causes of subsidence. To this end we have completed an initial review of the draft GSP and have the following general comments. We will also continue to provide additional information and comment to improve the document:

1) The GSP provides a good description of the Plan Area (Section 2), governance and administration (Section 3), outreach and communication (Section 4), and basin setting (Section 5). The basin setting section appropriately describes the Aqueduct and the impacts of continued land subsidence. However, Sustainable Management Criteria (SMC) in Section 6 and Sustainability Implementation in Section 7 requires further information and discussion of the impacts of land subsidence on conveyance capacity and operational flexibility of the Aqueduct. This additional information is needed for consistency with later chapters. 1

2) Section 6.3.5.2 says that the GSP developers met and coordinated with DWR on development of the SMCs and thresholds; however, these meetings and coordination did not include DWR-SWP. The statement that these criteria and thresholds address "DWR's tolerance for additional land subsidence along the Aqueduct to ensure minimum thresholds set are compatible with DWR's projected operations of the Aqueduct" is incorrect. 2

3) There is a need for additional monitoring sites in the southern quarter of the basin proximal to the Aqueduct in an area on the north end of the Panoche subsidence bowl. The collection of 3

quality monitoring data over time will be critical to delineate the extent of land subsidence along the Aqueduct. The current plan does not adequately address the effects of land subsidence with regards to impacts on the operation and maintenance of the Aqueduct as well as damage to the Aqueduct. As this is a critical data gap, we recommend inclusion of DWR-SWP Aqueduct survey data in the GSP's monitoring plan and commit to facilitating transfer of this data. This approach will allow the GSAs and DWR-SWP to obtain relevant, high-quality data related to subsidence along the Aqueduct. 3

4) Some hydrologic interpretations appear to be unsupported by data. For example, Section 6.3.2.1.1 states that "Depletion of groundwater storage appears to have occurred over the historic and current period established in the water budgets for the Northern and Central Delta-Mendota Regions; however, based on existing data, this trend appears to have been reversed as a result of recent wet years, and are not anticipated to occur in the future." This statement suggests there will always be significant wet years to offset the trend of depletion of groundwater, which is an unrealistic assumption. When drought conditions reemerge and surface water supplies are limited, groundwater use will likely increase and cause a decrease in groundwater recharge. 4

We look forward to working with your agency to engage on these comments and improve this plan. If you have any questions, please contact DWR's California Aqueduct Subsidence Program Manager Mike Inamine at (916) 213-3810 or michael.inamine@water.ca.gov.

Sincerely,

Ted Craddock
Acting Deputy Director
State Water Project

DRAFT

Leslie Dumas

From: Maria Encinas <mencinas@ci.patterson.ca.us>
Sent: Thursday, October 17, 2019 3:22 PM
To: Andrew Garcia
Cc: Seth Harris (sethharris@sldmwa.org); Leslie Dumas
Subject: FW: Public Draft Northern & Central Delta-Mendota Region GSP

Hi Andrew. I had asked everyone to send you any comments they might have had. I received these yesterday. I don't think you have seen the comments below.

Let me know if you have questions.

-Maria

From: Barbara Brenner <barbara@churchwellwhite.com>
Sent: Wednesday, October 16, 2019 1:14 PM
To: Maria Encinas <mencinas@ci.patterson.ca.us>; Ken Irwin <kirwin@ci.patterson.ca.us>; Fernando Ulloa <fulloa@ci.patterson.ca.us>; Joel Andrews <jandrews@ci.patterson.ca.us>; Mike Willett <MWillett@ci.patterson.ca.us>; Kerry Fuller <kerry@churchwellwhite.com>
Subject: FW: Public Draft Northern & Central Delta-Mendota Region GSP

All-

See the comments below regarding the GSP. I am not including any of the GSP chapters due to size. Please let Kerry and I know if you want to discuss the comments and the GSP.

Thanks,
Barbara

Churchwell White LLP

Barbara A. Brenner | Partner
916.468.0625 | barbara@churchwellwhite.com

From: Kerry Fuller
Sent: Monday, October 14, 2019 7:53 PM
To: Barbara Brenner <barbara@churchwellwhite.com>
Subject: RE: Public Draft Northern & Central Delta-Mendota Region GSP

Barb,

I have a minor edit to Chapter 3 as it identifies Patterson as a charter city, but no other comments on that Chapter. Appendix B and Chapters 7 and 8 include information that the City needs to be aware of if they aren't already. Chapter 7 discusses the projects to potentially be implemented as part of the GSP while Appendix B and Chapter 8 discuss financing the costs associated with the GSP. The most pertinent elements of Chapters 7 and 8 are highlighted below along with the page numbers on which that information appears.

Chapter 7

The City's detention basins, the Del Puerto Dam, and detention basins on Little Salado Creek for the Crows Landing military site are all still listed in the GSP, but the amount of storage and recharge is now discussed. (Pages 7-11, 7-13, 7-14.) The City's basins are anticipated to provide 1,700 AFY of recharge using stormwater runoff, but the connection to Del Puerto Creek for the runoff is not identified. (Page 7-11.) The Del Puerto Dam description acknowledges that seasonal storm flows through Del Puerto Canyon would be captured and discharged perennially for downstream use with on average 2,756 AFY from Del Puerto Creek being captured and stored with wet years estimates of up to 35,570 AFY of creek flows being stored for later use. (Page 7-13, 7-14.) Finally, the planned detention basin for Little Salado Creek associated with the County's Crow's Landing project is discussed as providing flood relief for the City of Patterson with the potential of providing 489 AFY of recharge in wet years. 1

Also, Chapter 7 continues to include the idea of Patterson shifting to a water portfolio that goes beyond groundwater. It is contemplated that if the basin is not meeting its sustainability goals, that shift could start being discussed as early as 2026, in addition to other activities to limit pumping like fallowing fields. 2

Chapter 8

To implement and fund the GSP, chapter 8 acknowledges that the cost to implement the GSP will be significant and the continued studies and updates to the GSP will likely cost $1.5 million and $2.5 million per year. The City's share of the ongoing studies and updates is somewhere around 1/9 of 16.67% of the costs. With this division of costs, in **VERY** rough numbers, the GSP costs, not the projects or management activities needed to implement it, are likely around $5,000 a year. The costs for the projects and management activities is estimated at $6.6 million to $40 million per year over the 20-year planning period for the GSP. The City, as the GSA in its jurisdiction, has the authority to determine the funding mechanism it will use to cover those costs. The ones contemplated in the GSP are assessments, pumping fees, or a combination of both. (pages 8-7, 8-8.) The division of costs is included in Exhibit B through the cooperative agreement that the City executed in September of 2018. 3

Thanks,
Kerry

Churchwell White LLP

Kerry Fuller | Attorney
916.468.0620 | kerry@churchwellwhite.com

All,

FYI. Most of the public draft for the Northern and Central Delta-Mendota Region GSP is complete. However, there are too many documents to send through email, so I am sending you a Dropbox link where you can download each chapter. The folder includes individual PDF Files for each chapter of the GSP, the front-end section, executive summary and each of the GSP appendices. Not included (and not prepared to date) are Appendix G- Noticing Documentation and Appendix H -GSP cross-walk. These appendices will be completed following the plan's finalization and adoption. A public hearing will be held October 1st and a presentation will be given to the public and City Council. The intent to adopt will occur no earlier than 90 days upon the receipt of the attached Notice of Intent.

https://www.dropbox.com/sh/4uf4fpjh4u1kpqg/AAAWs8Nw6pNpy0IKh6WeaA4Na?dl=0

For those that do not have Dropbox, you can view the files using the following server file path:

J:\MARIA\Water Programs\SGMA\Council Presentation 20191001\Public Draft NC DM Region GSP

Please let me know if you have any questions. If you wish to comment on the public draft, please send your comments to Andrew Garcia by October 3, 2019. Andrew's contact information is on attached NOI.

Thank you everyone. We are almost there!

Maria Encinas, CFM
Water Resources Coordinator
Management Analyst
Department of Public Works
City of Patterson | 1 Plaza | Patterson CA 95363
209.895.8061 | 209.895.8069 fax
mencinas@ci.patterson.ca.us | www.ci.patterson.ca.us

PD-16

Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

October 18, 2019

North & Central Delta-Mendota Groundwater Sustainability Plan Group
Delta-Mendota Subbasin
Basin Number 5-22.07
Transmitted via online submission at: http://deltamendota.org

Subject: North and Central Delta-Mendota Draft GSP

Dear North & Central Delta-Mendota GSP Group:

Westlands Water District ("Westlands GSA") appreciates the opportunity to provide comments on the North and Central Delta-Mendota Region Draft Groundwater Sustainability Plan ("Draft GSP"). The Westlands GSA respectfully submits the following comments.

North and Central Delta-Mendota GSP

Finding 1 (Page 5-32)[1]: Section 5.2.7: Structural Properties and Restricted Groundwater states the following: "*Groundwater southwest of this divide generally flows southwest toward Panoche Water District and Westlands Water District.*"

1

Westlands' Comment: Analysis from the Mendota Pool Group EIS-EIR shows that groundwater from the Lower Aquifer does not flow into the Westside Subbasin. Westlands GSA requests that the language be amended to remove the statement that groundwater flows into Westlands Water District or Westside Subbasin.

Finding 2 (Page 5-94): Section 5.3.2.4: Groundwater Trends states the following: "*Figure 5-79 shows a distinct trough-like depression in the Lower Aquifer's groundwater... indicated by the flow direction vectors*

2

Westlands' Comment: Figure 5-79 illustrates a groundwater contour map and includes the northern portion of the Westside Subbasin. The figure also depicts a trough-like depression immediately adjacent to the Westside Subbasin. The Westlands GSA respectfully requests that Figure 5-79 and any related figures be revised to exclude the Westside Subbasin. Figure 5-79 shows inconsistencies due to the timeline average used to create the groundwater contours.

Finding 3 (Page 5-36–5-79; 5-135–5-147): Figures 5-21–5-57 & 5-93–5-102 display groundwater quality data within the Westside Subbasin that is inconsistent with the Westlands Water District GSA's groundwater quality data.

3

[1] Page numbers specified in the comments below refer to the printed PDF version, as listed on Chapter 5 of the North and Central Delta-Mendota GSP.

Westlands' Comment: The groundwater quality data depicted within the Westside Subbasin in Figures 5-21–5-57 and 5-93–102 is inconsistent with the Westlands GSA's groundwater quality data. Westlands respectfully requests that the groundwater quality data within the Westside Subbasin be removed from the Figures due to this inconsistency. 3

If you have any questions regarding these comments, please contact Antonio Solorio by email at asolorio@wwd.ca.gov or by phone at (559) 241-6244. Thank you for the opportunity to provide comments on the North and Central Delta-Mendota Draft Groundwater Sustainability Plan.

Sincerely,

Russ Freeman, P.E.
Deputy General Manager – Resources
Westlands Water District

Prepared by:

WOODARD & CURRAN

In association with:

PROVOST & PRITCHARD CONSULTING GROUP

1545 River Park Dr., Suite 425
Sacramento, CA 95815
916.999.8700