Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Phone: (209) 526-7564 | Fax: (209) 526-7352
Email: strgba@mid.org

SPECIAL TECHNICAL ADVISORY COMMITTEE AGENDA

July 28, 2021 (2:00 p.m. – 4:00 p.m.)
Webinar Digital Platform or Phone Meeting
https://us02web.zoom.us/j/87846141611
By phone: 1-669-900-9128
Webinar ID: 878 4614 1611

PUBLIC PARTICIPATION
The public may participate in this meeting in the two ways described below.

Instructions for Participating in STRGBA GSA & Technical Advisory Meeting via Zoom Webinar or Phone

On your desktop/iPad or tablet/laptop:

1. To join the webinar, click the link published in the Agenda for the current meeting about 5 minutes before webinar begins.
2. Follow the on-screen instructions to install and/or launch the Zoom application.
3. If prompted, enter the Webinar ID published in the Agenda.
4. All public attendees will enter the meeting muted.
5. If you wish to speak under Business from the Public, or after the Chairman calls for Public Comment, click on the “Raise Hand” button to request to speak.

On your phone:

1. To join the meeting by phone, call the number published in the Agenda for the meeting.
2. Enter the Webinar ID published in the Agenda, then hit the # symbol.
3. All public attendees will enter the meeting muted.
4. If you wish to speak under Business from the Public, or after the Chairman calls for Public Comment, press *9 on your phone to “Raise Hand” or simply request to speak.
    a. Wait until the last four digits of your phone number is called by the Host.

Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Phone: (209) 526-7564 | Fax: (209) 526-7352
Email: strgba@mid.org

1. Call to Order/Welcome and Introductions
   (Four agencies needed for a quorum)

2. Business from the Public
   Who: Public
   Expected Outcome: Interested persons are welcome to introduce any topic within the Agency's jurisdiction. Matters presented under this heading may be discussed but no action will be taken by the Agency at this meeting.

3. Topic: Approve 7/14/21 Meeting Minutes [Action Items]
   Who: Eric Thorburn, Committee
   Expected Outcome: Approval

4. Topic: Reduction of Groundwater Storage
   Who: Todd Groundwater, Committee
   Expected Outcome: Discussion

5. Topic: Land Subsidence
   Who: Todd Groundwater, Committee
   Expected Outcome: Discussion

6. Next Meeting
   August 11, 2021 at 2 p.m. (following STRGBA GSA monthly meeting) via Zoom

7. Items too late for the agenda

Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Phone: (209) 526-7564 | Fax: (209) 526-7352
Email: strgba@mid.org

TECHNICAL ADVISORY COMMITTEE MEETING MINUTES

July 14, 2021 (1:30 p.m. – 3:00 p.m.)

The meeting was called to order at 1:32 p.m.

1. **Welcome and Introductions**

   The following members of the Stanislaus and Tuolumne Rivers Groundwater Basin Association Groundwater Sustainability Agency (STRGBA GSA) attended via Zoom:

Modesto Irrigation District (MID):	Chad Tienken
City of Waterford:	Mike Pitcock
Stanislaus County:	Walt Ward
Oakdale Irrigation District:	Eric Thorburn

   Other Attendees:

   Alexis Stevens
   John Mauterer, MID
   Amanda Peisch-Derby
   Hilary Reinhard
   Gordon Enas, MID
   Steve Knell
   Samantha Wookey, MID
   John Mensinger
   Marisa Perez – Reyes, Stantec
   Phyllis Stanin, Todd Groundwater
   John Davids
   Allison & Dave Boucher
   Emily Sheldon
   Liz Elliott, Todd Groundwater
   Khandriale Clark, Stantec
   Tom Orvis
   Louie Brichetto
   Stacy Henderson
   Kim Harness
   Dana Ferreira
   Spenser Hager
   Dennis Wittchow
   Valerie Kincaid

2. **Business from the Public**
   N/A

Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Phone: (209) 526-7564 | Fax: (209) 526-7352
Email: strgba@mid.org

3. **Approve 6/23/21 Minutes** [Action item]
   Tienken moved, 2nd by Ward, to approve 6/23/21 meeting minutes. Motion carried.

4. **Sustainable Criteria and Groundwater Dependent Ecosystems**

   Stanin began with a presentation on Interconnected Surface Water and an analysis of Groundwater Dependent Ecosystems. The presentation can be accessed at the STRGBA GSA website: www.strgba.org .
   - Reinhard mentioned that the approach presented in the analysis neglects areas served by ag returns which are not considered groundwater dependent ecosystems. Stanin agreed and stated that GDEs considered in the analysis are potential GDEs based on the DWR database and not yet final. They also removed most of the polygons in the western portion of the subbasin, except for those in the National Wildlife Refuge.
   - Ward stated that all GDEs should be kept for consideration unless eliminated by ground-truthing and field work. Stanin responded that further ground-truthing beyond the initial analysis will have to wait until after the GSP is completed.
   - Stevens asked will you accept information submitted by a private party pertaining to potential GDE's or should it be submitted by a member agency? Stanin stated either a member agency or the GSA can accept the information. The technical team will need the rationale behind the request. Stevens asked if there is a time frame to be submitted to make it in the GSP? Stanin said anytime in the next month of so.
   - Henderson asked does the undesirable result standard have to be the same throughout the entire subbasin? Stanin responded that the definition for undesirable results has to be the same for the entire subbasin, but the details and settings (such as where and when) can differ by management area.

Stanin next gave a presentation on Chronic Lowering of Water Levels.
   - Pitcock asked if using the 1991-2020 data would result in water levels being lower than 2015. Stanin said yes, generally in your area but not by much.
   - Reinhard asked what has been going on this year, 2021, with severe drought? Are there reports of domestic wells or ag wells going dry? Are we going to start off in a probationary status? Stanin responded there has been one report of a well drying up in the eastern portion of the Modesto Irrigation District. The well is very shallow, and we are continuing to exam water level depths. As far as probation status, SGMA provides a 20-year implementation period allowing time to put details of the plan into place before exceeding Minimum Thresholds. So there are several stop-gap measures that keep you from being placed on probation during the very first year.

Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Phone: (209) 526-7564 | Fax: (209) 526-7352
Email: strgba@mid.org

5. **Next Meeting**
   Special Technical Advisory Committee Meeting, July 28, 2021 at 2 p.m. via Zoom

6. **Items too late for the agenda**
   N/A

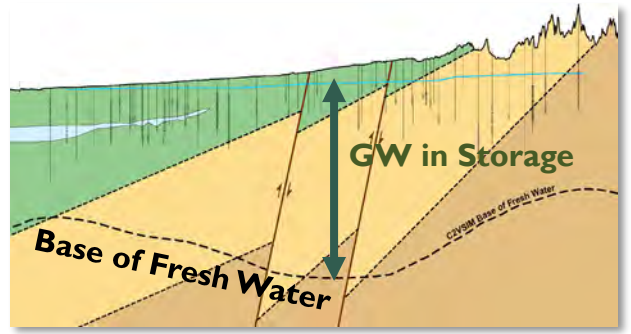
Sustainable Management Criteria
Reduction of Groundwater in Storage
Land Subsidence

Technical Advisory committee (TAC) Special Meeting

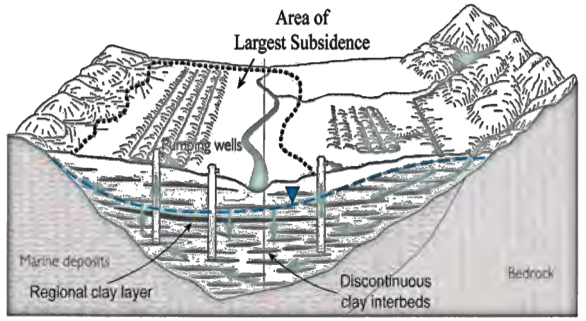
July 28, 2021

Presentation Outline

- Reduction of Groundwater in Storage
  - Definitions and Requirements
  - Modesto Subbasin conditions
  - Approach from adjacent subbasins
  - Approach for Undesirable Results and Minimum Thresholds (MTs)



- Land Subsidence
  - Definitions and Requirements
  - Modesto Subbasin conditions
  - Approach from adjacent subbasins
  - Approach for Undesirable Results and Minimum Thresholds (MTs)



TODD GROUNDWATER

DRAFT

Reduction of Groundwater in Storage Nexus with Sustainable Yield

Minimum Thresholds for Reduction of Groundwater in Storage:

- MT shall be a total volume of groundwater that can be withdrawn from the basin without causing conditions that lead to undesirable results.
- MT shall be supported by the sustainable yield of the basin, calculated on historical trends, water year type, and projected water use. (354.28(c)(2)

SGMA Definition of Sustainable Yield:

- Maximum quantity of water, calculated over a base period representative of long-term conditions in the basin…that can be withdrawn annually from a groundwater supply without causing an undesirable result. (10721(w))

- Sustainable Yield for the Modesto Subbasin: 267,000 AFY

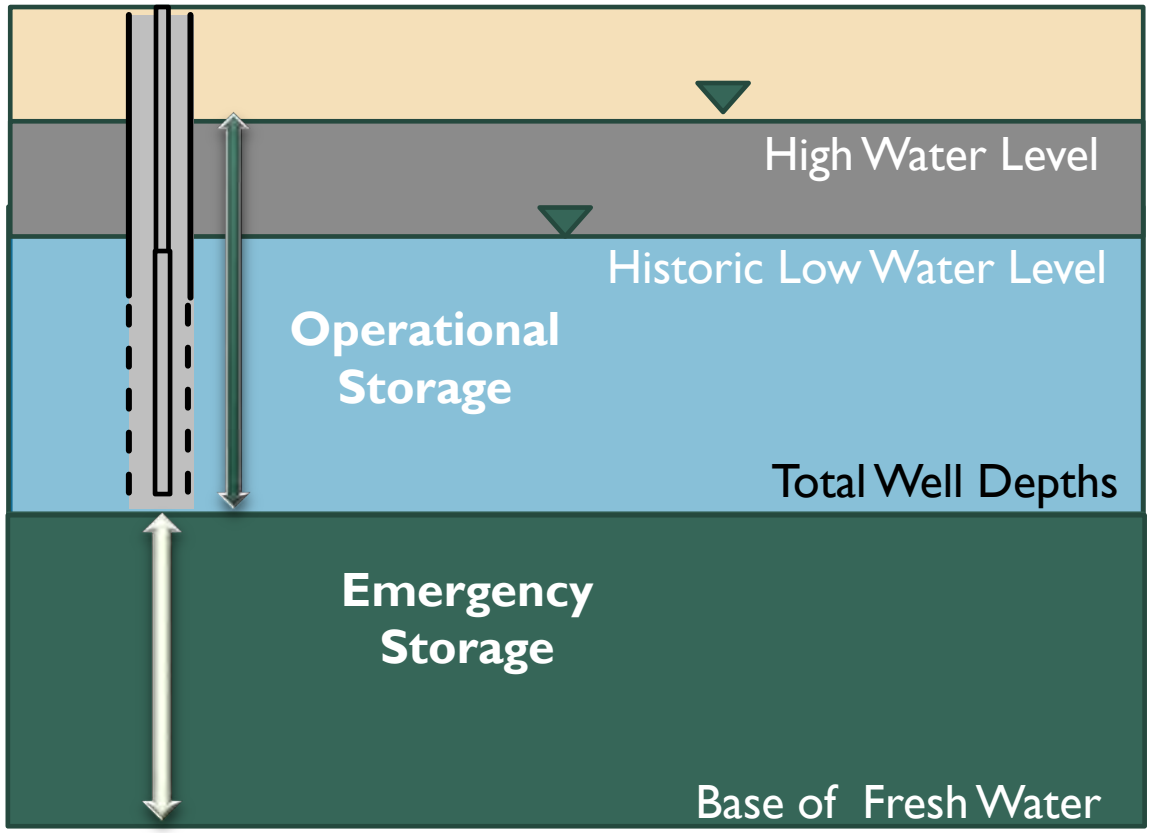
TODD GROUNDWATER

DRAFT

Reduction of Groundwater in Storage

Two Aspects for this Sustainability Indicator:

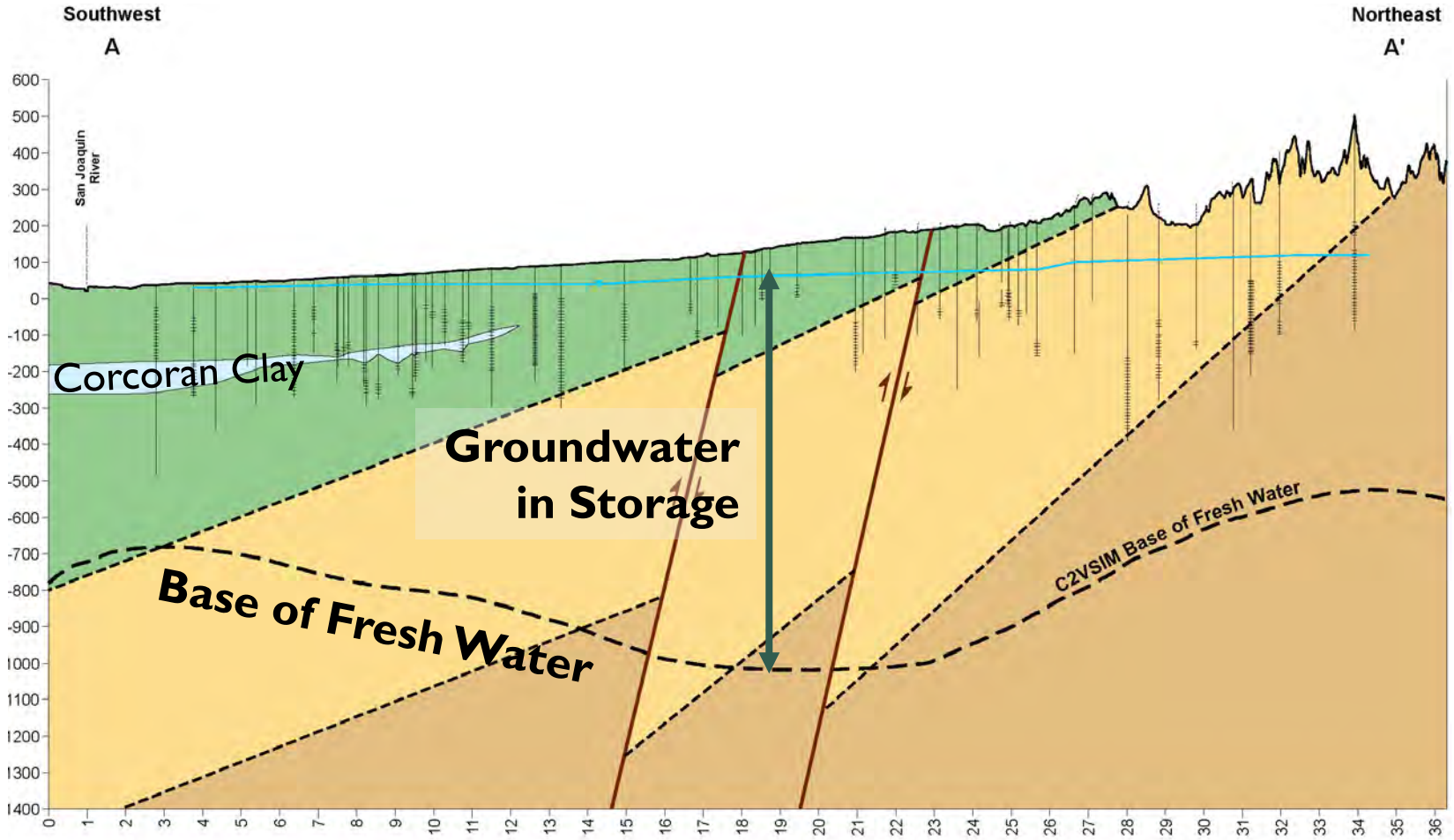
- Depletion of Supply
  - *Will we "run out of water"?*
- Overdraft Conditions
  - *Is overdraft causing significant and unreasonable depletion?*



TODD GROUNDWATER

DRAFT

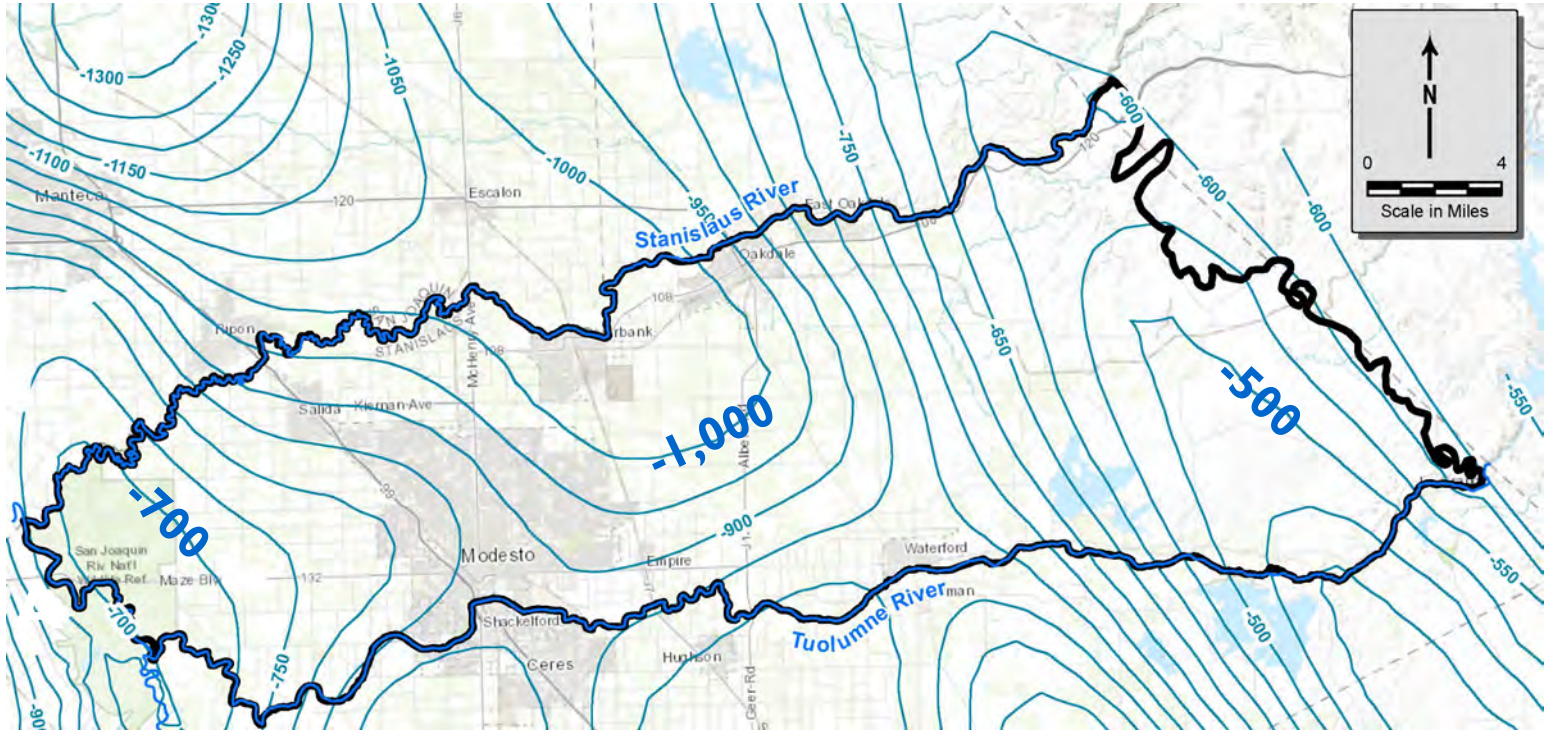
Fresh Groundwater in Storage



- Large volume of fresh groundwater in storage
- More than 1,000 feet to base of fresh water in some areas
- Some GSPs conclude that this indicator is not applicable because of the unlikely depletion of significant volumes of supply

TODD GROUNDWATER

Depletion of Supply and Overdraft Conditions



Elevation of the Base of Fresh Water

- DWR suggestion: consider alternatives to relying on the large volume of remaining groundwater for avoiding undesirable results
- GSP required to correct overdraft conditions, which is also a depletion of supply

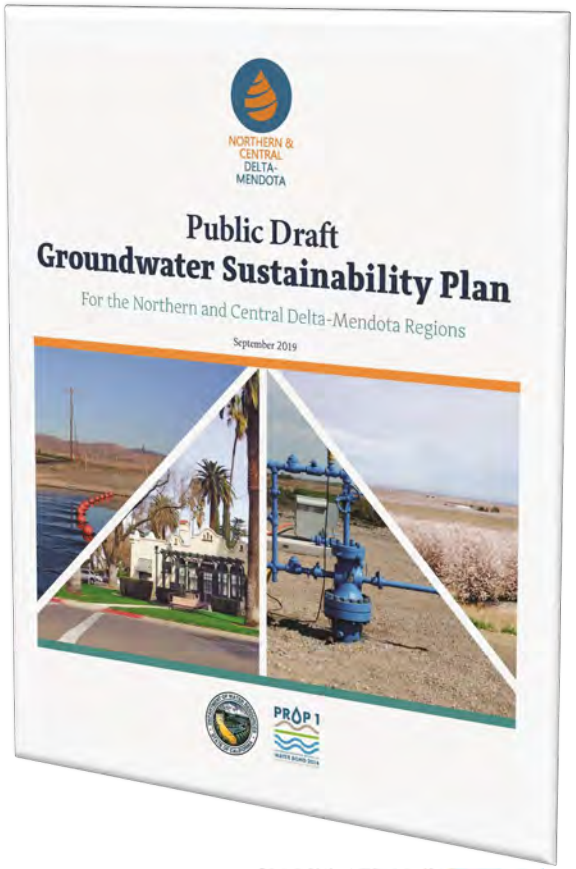
TODD GROUNDWATER

DRAFT

Reduction of Groundwater in Storage Approach in Delta-Mendota Subbasin

Reduction of Groundwater in Storage

- Undesirable results occur when significant and unreasonable decrease in storage impacts beneficial users of groundwater
- Similar definition as for Chronic Lowering of Water Levels
- Same minimum threshold (MTs) values as used for Chronic Lowering of Water Levels



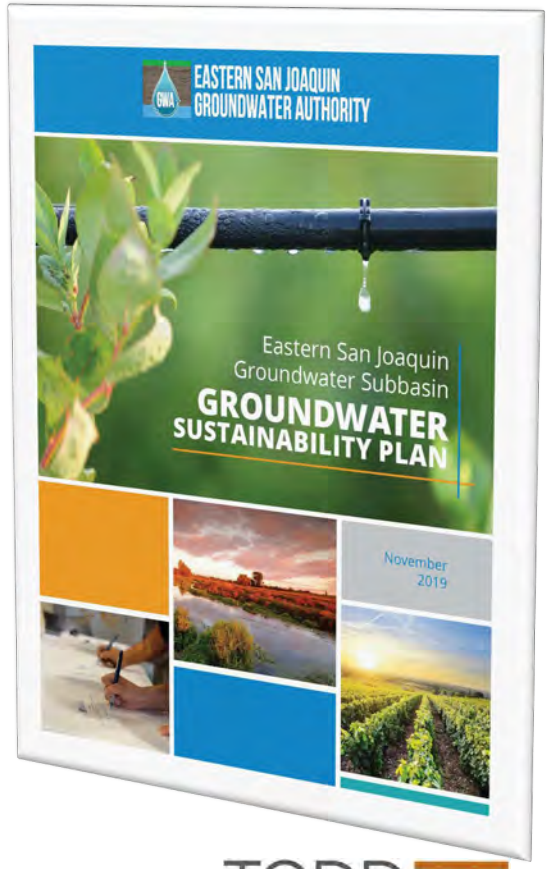
TODD GROUNDWATER

DRAFT

Reduction of Groundwater in Storage Approach in Eastern San Joaquin Subbasin

Reduction of Groundwater in Storage

- Undesirable results related to the ability of wells to economically access groundwater
- Also relates to sustainability of GDEs along streams
- Same minimum thresholds (MTs) as used for Chronic Lowering of Water Levels



TODD GROUNDWATER

DRAFT

Reduction of groundwater in storage Draft Approach in Turlock Subbasin

Reduction of Groundwater in Storage

- Undesirable results related to both depletion of supply and overdraft
- Supported by sustainable yield
- Same minimum thresholds (MTs) as used for Chronic Lowering of Water Levels
- Draft approach approved by TAC; not yet approved by GSAs

TODD GROUNDWATER

DRAFT

Recommended Approach for Modesto GSP Reduction of GroundWater in Storage

- Acknowledge that we are not at risk of depleting a large percentage of the total volume of groundwater supply. However, the ongoing depletion from overdraft requires correction under GSP regulations.
- Our sustainability goal includes operation of the Subbasin within its sustainable yield, which includes overdraft correction.
- When overdraft is corrected, long-term water level declines will be arrested. If water levels can be maintained at or close to the current levels on an average basis, then those conditions can be used as a clear indication that overdraft has been corrected.
- Consider using the same Minimum Thresholds (MTs) established for *Chronic Lowering of Water Levels* as a proxy for this indicator; consistent with the approach in adjacent subbasins.

TODD GROUNDWATER

DRAFT

Reduction of Groundwater in Storage Undesirable Results Framework

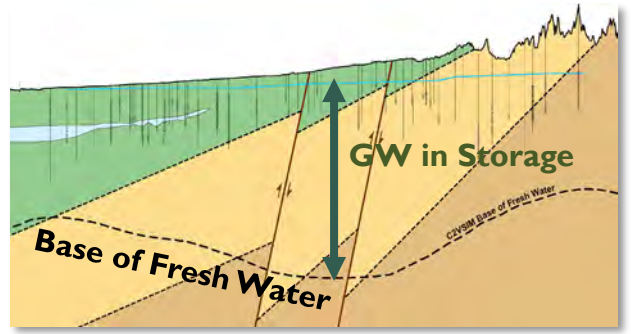
Undesirable Result (UR) Definition	Significant and unreasonable reduction of groundwater in storage would occur if the volume of groundwater supply is at risk of depletion and/or may not be accessible for beneficial use. An Undesirable Result for this sustainability indicator would also occur if the Subbasin remains in a condition of long-term overdraft, based on projected water use and average hydrologic conditions.
	The chronic lowering of water levels MTs and MOs are protective against depletion of supply and long-term overdraft conditions. Prevention of long-term water level declines are directly supported by the sustainable yield of the Subbasin. MTs and MOs that have been approved for chronic lowering of water levels are selected as a proxy for this sustainability indicator.

TODD GROUNDWATER

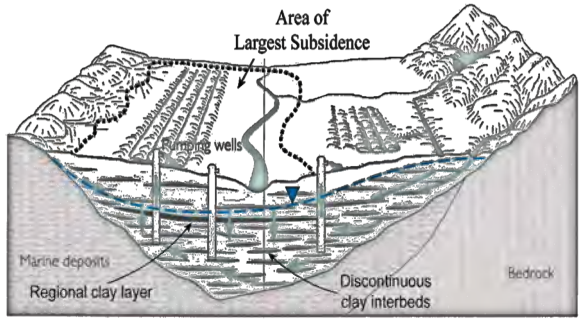
DRAFT

Presentation Outline

- Reduction of Groundwater in Storage
  - Definitions and Requirements
  - Modesto Subbasin conditions
  - Approach from adjacent subbasins
  - Approach for Undesirable Results and Minimum Thresholds (MTs)



- Land Subsidence
  - Definitions and Requirements
  - Modesto Subbasin conditions
  - Approach from adjacent subbasins
  - Approach for Undesirable Results and Minimum Thresholds (MTs)



TODD GROUNDWATER

DRAFT

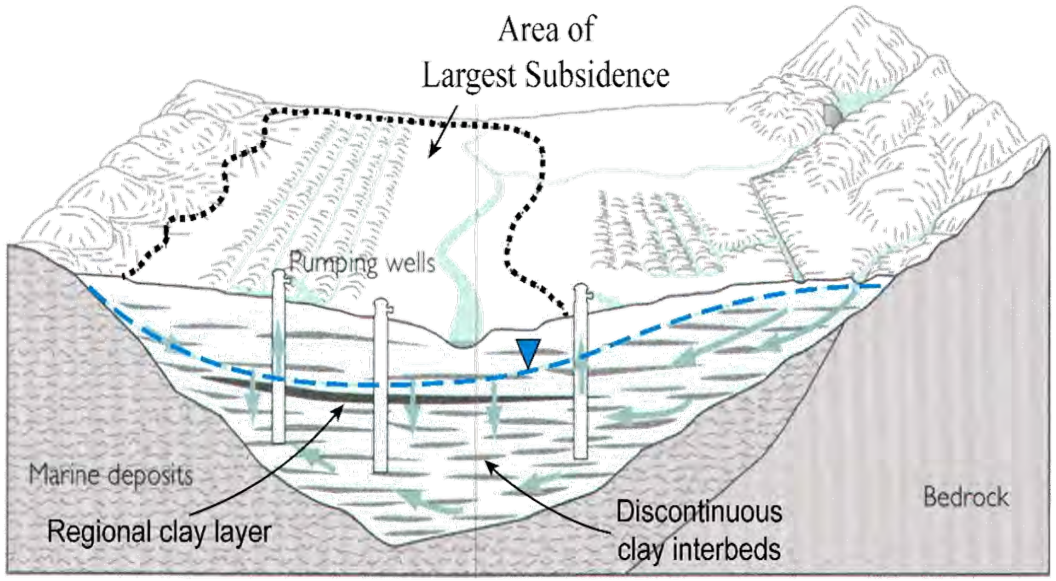
Requirements for Minimum Thresholds Land subsidence

- SGMA defines undesirable results as:
  - Significant and unreasonable land subsidence that substantially interferes with surface land uses
- GSP Regulations requirements for the Land Subsidence MT:
  - MT shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results (354.28(c)(5)
  - MT will be supported by:
    - Identification of land uses and property interests that have or are likely to be affected by land subsidence
    - Maps and graphs showing the extent of rate of land subsidence that define the MTs and MOs

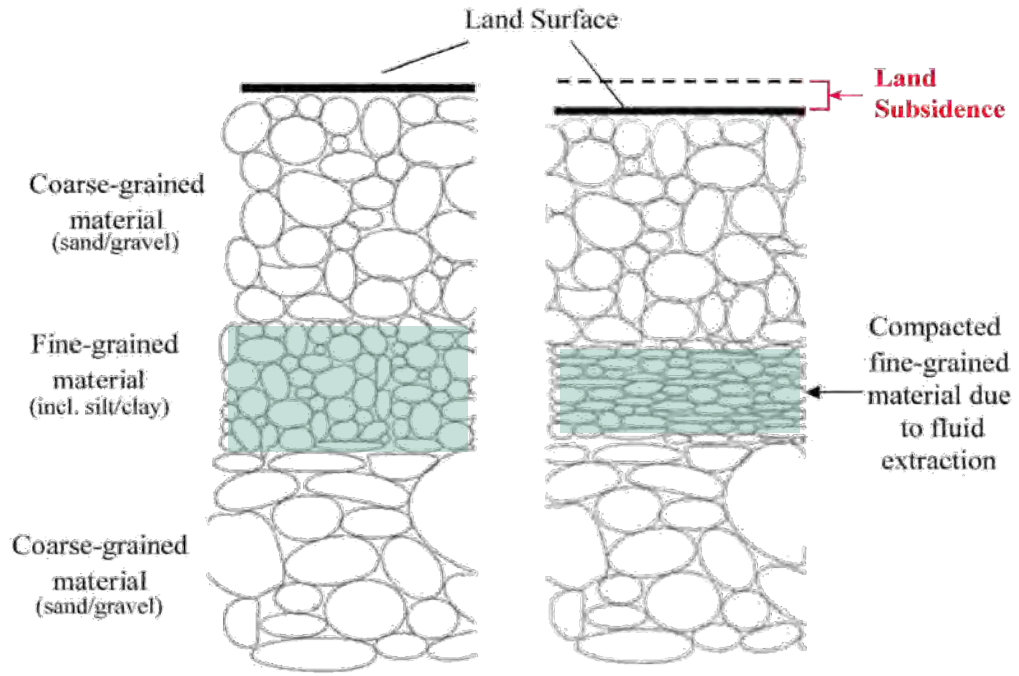
TODD GROUNDWATER

DRAFT

Land Subsidence Concepts



Source: Galloway et al., 1999.



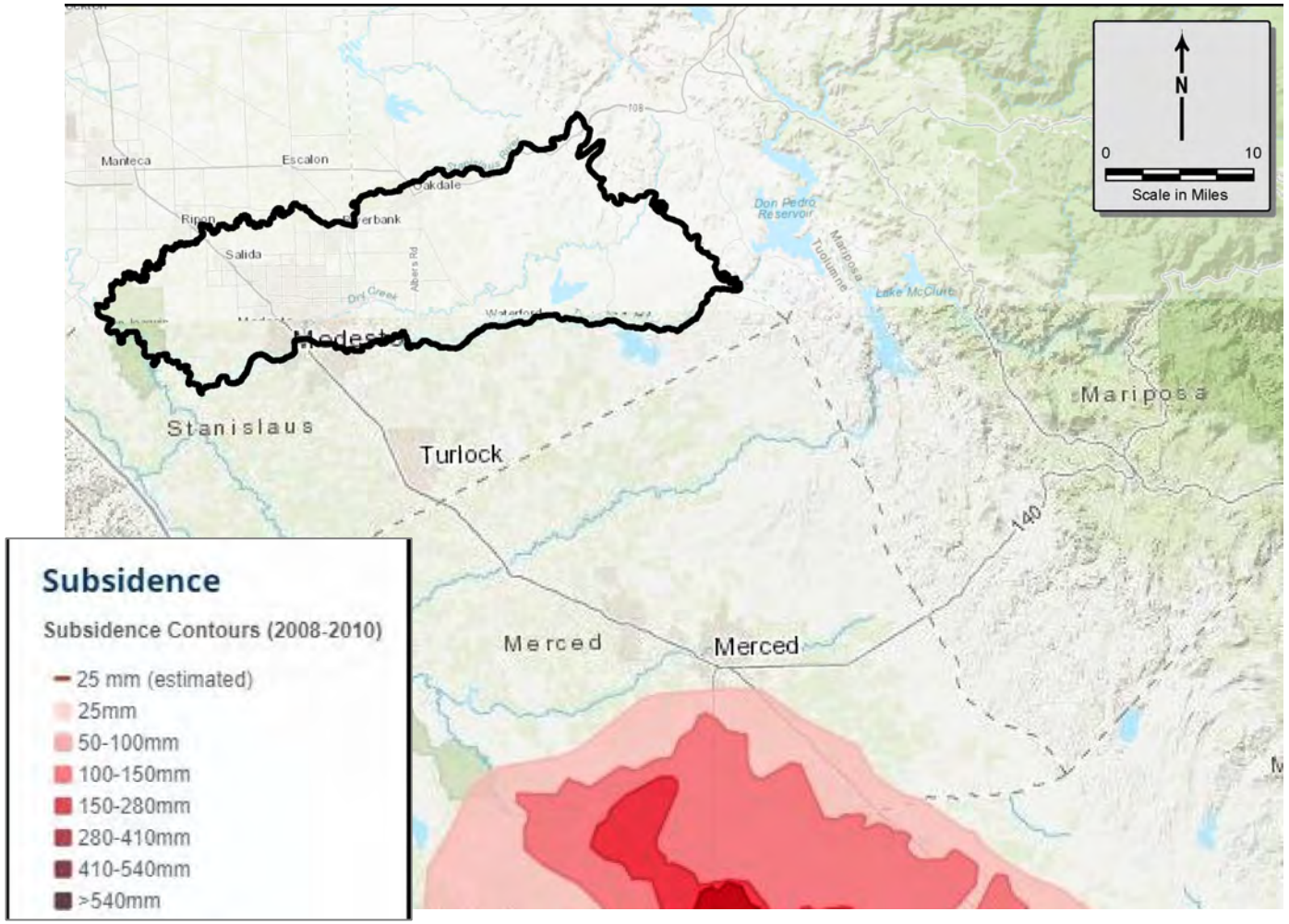
After LSCE et al., 2014.

In the Central Valley, the Corcoran Clay has been associated with inelastic land subsidence issues.

TODD GROUNDWATER

DRAFT

Land Subsidence Affecting Land Use

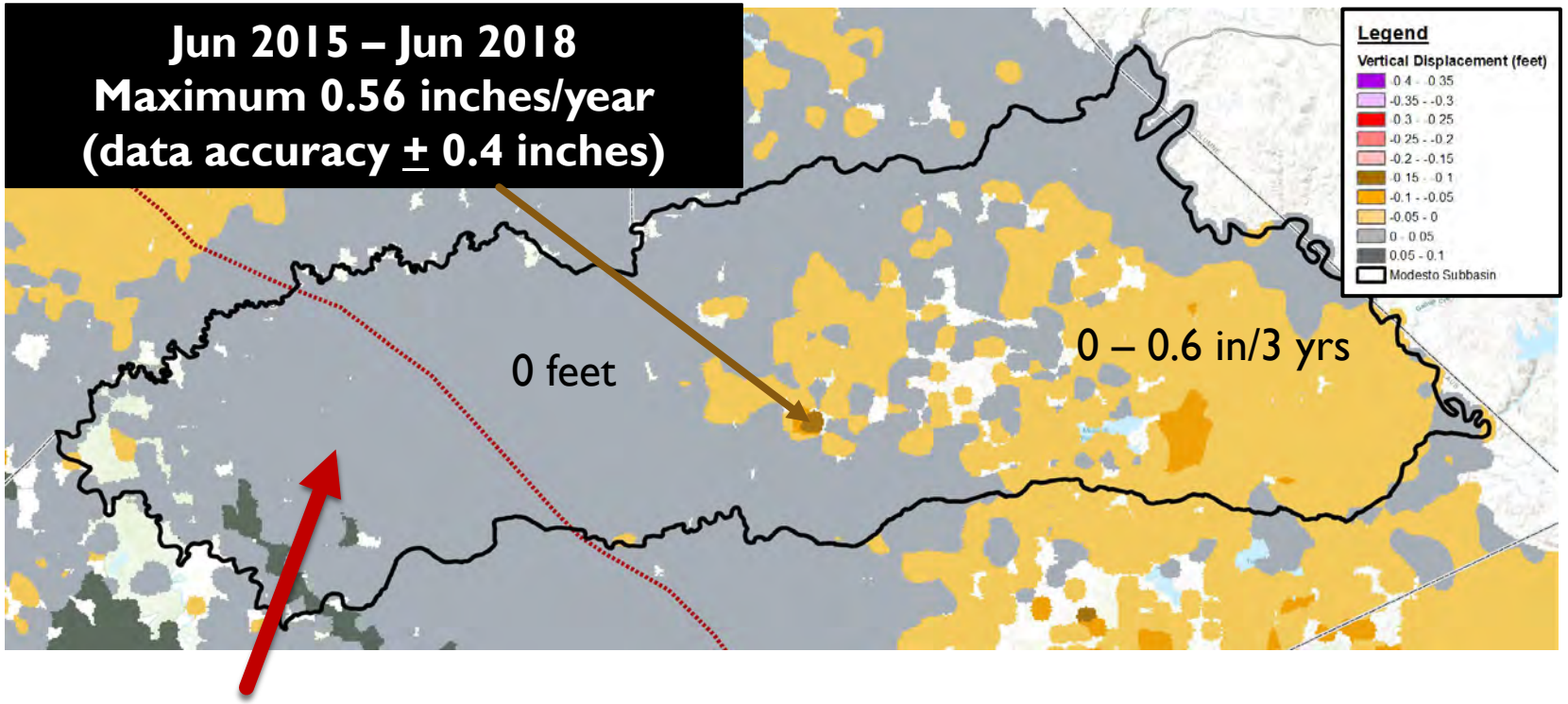


- No known subsidence impacts in the Modesto Subbasin
- Central Valley subsidence located primarily south of the Subbasin
- Most subsidence occurs in areas where the Corcoran Clay has been dewatered

TODD GROUNDWATER

DRAFT

Recent DWR InSAR Data for Land Subsidence



- Potential for future subsidence if extensive clay layers, such as the Corcoran Clay, are depressurized / dewatered
- Western subbasin most likely area for future subsidence
- Annual InSAR data can be used for subbasin-wide screening
- No significant land subsidence indicated in susceptible areas of Corcoran Clay in recent data

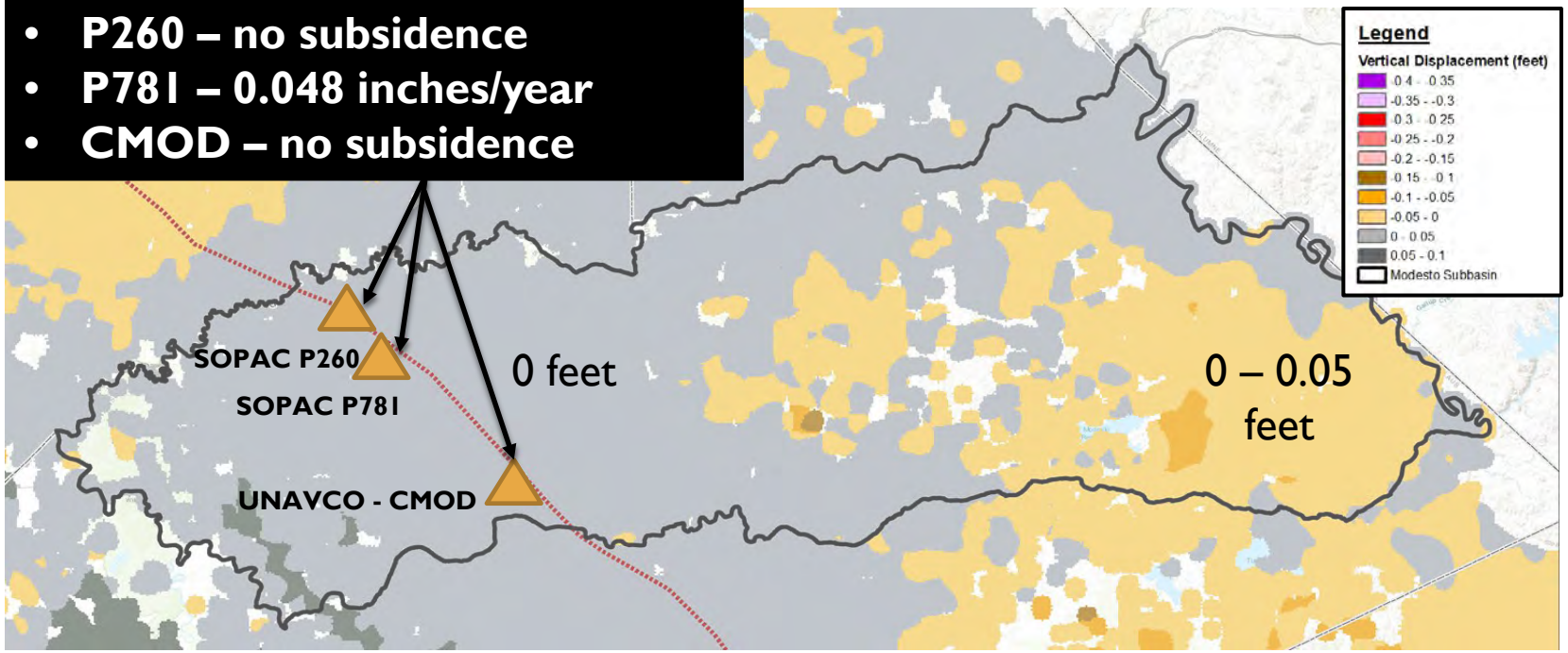
Vertical displacement (<1 inch/yr) indicated outside of Corcoran Clay area. Clay soils and routine land operations can result in localized vertical displacement. Not likely inelastic land subsidence from groundwater extractions.

TODD GROUNDWATER

DRAFT

Existing GPS Stations in Modesto Subbasin Provide Data for Land Subsidence Analysis

SOPAC – UNAVCO GSP Data:
- **P260 – no subsidence**
- **P781 – 0.048 inches/year**
- **CMOD – no subsidence**



GPS Stations in the Modesto Subbasin monitored by SOPAC or UNAVCO

- 3 GPS stations monitored by others for land subsidence
- Southern UNAVCO station is active; SOPAC stations status unknown
- Indicate zero to low rates of vertical displacement
- Track GPS data for future indications of subsidence (screening)

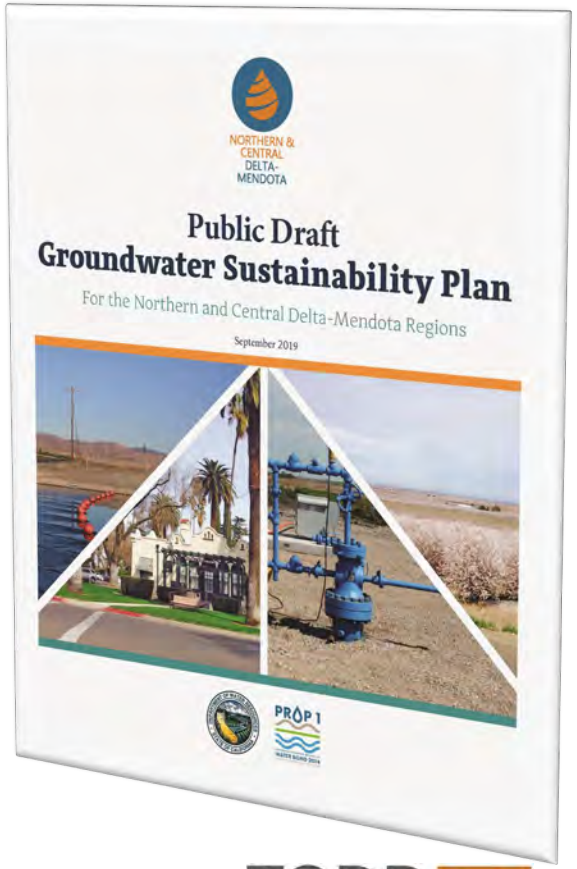
TODD GROUNDWATER

DRAFT

Land Subsidence Approach in Delta-Mendota Subbasin

Inelastic Land Subsidence

- Changes in ground surface elevation that cause damage to critical infrastructure such as significant and unreasonable reductions of conveyance capacity, personal property damage, impacts to natural resources, or create conditions that threaten public health and safety
- MTs – different for various management areas (MAs) and related primarily to canal capacity; e.g., 4 feet below current land surface



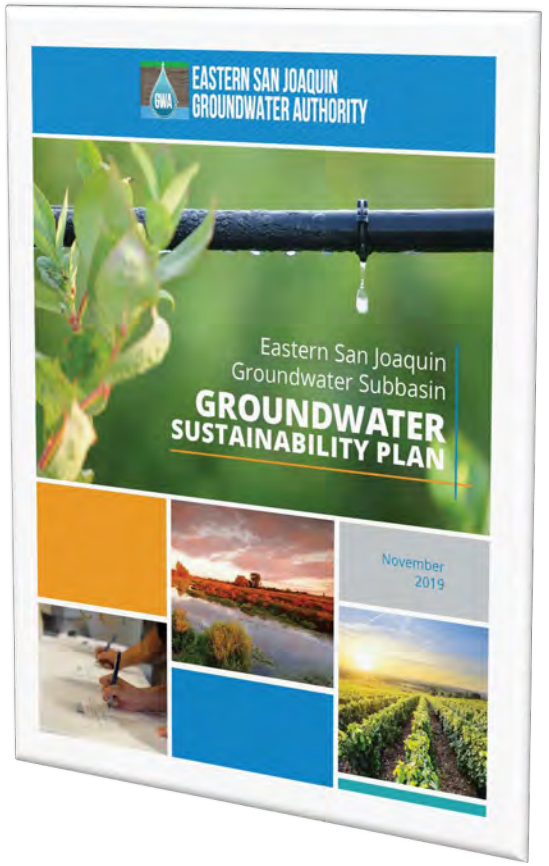
TODD GROUNDWATER

DRAFT

Land Subsidence Approach in Eastern San Joaquin Subbasin

Inelastic Land Subsidence

- Lack of potential for widespread problems
- Set values for minimum thresholds the same as used for Chronic Lowering of Water Levels



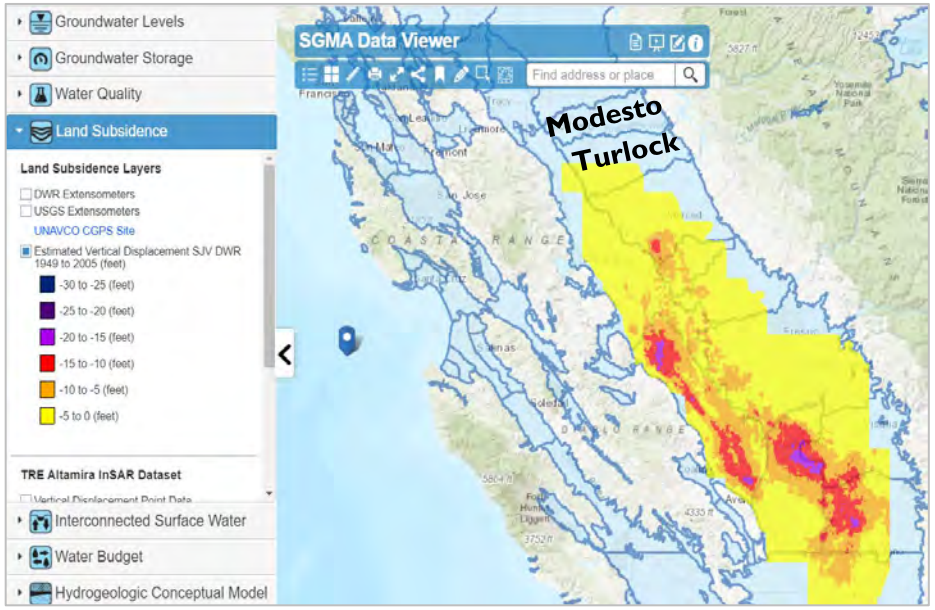
TODD GROUNDWATER

DRAFT

Land Subsidence Approach in Turlock Subbasin

Land Subsidence

- No known impacts from land subsidence
- TACs approved MTs and MOs for chronic lowering of water levels (Fall 2015 levels) as a proxy for land subsidence in Western Upper Principal Aquifer
- Data gap for water levels in Western Lower Principal Aquifer; lack of historical records
- Selected the top of the Corcoran Clay as a MT for the Western Lower Principal Aquifer



TODD GROUNDWATER

DRAFT

Land subsidence - Undesirable Results and Minimum Thresholds Western Upper and Lower Principal Aquifers

Undesirable Result (UR) Definition	Significant and unreasonable inelastic land subsidence, caused by groundwater extraction and associated water levels declines, that adversely affects land use or reduces the viability of the use of critical infrastructure (critical infrastructure to be determined).
	The MT for the chronic lowering of water levels sustainability indicator – set at the historic low water level – is sufficiently protective to avoid undesirable results from future potential inelastic land subsidence. Although no significant inelastic land subsidence has occurred in the Modesto Subbasin, declining water levels can be directly correlated to the future potential for land subsidence, consistent with impacted areas in the San Joaquin Valley. Accordingly, the MTs and MOs set for the Chronic Lowering of Water Levels are recommended as a proxy for this sustainability indicator.

TODD GROUNDWATER

DRAFT

NEXT STEPS

- Present additional criteria for MTs and MOs using draft GSP monitoring networks
- Approve sustainable management criteria for *Reduction of Groundwater in Storage* and *Land Subsidence* *sustainability indicators* at August meeting
- Finalize sustainable management criteria
- Release additional GSP chapters – Water Budget chapter coming next