



COLUSA SUBBASIN

Colusa Subbasin GSP Revisions

Joint GSA Board Meeting

April 12, 2024

Agenda

- 1. Timeline**
- 2. Overview of GSP Revisions**
- 3. Overview of Comments and Feedback**
- 4. Next Steps**

Timeline

Feb 2024	02/09 – Joint TAC Meeting 02/16 – DWR Meeting #3 02/23 – Joint Board Meeting
Mar 2024	03/08 – Joint TAC Meeting 03/14 – DWR Meeting #4 03/22 – Joint Board Meeting 03/25 – DWR Meeting #5
Apr 2024	04/01 – Draft Revised GSP for GSA Review 04/09 – Comments on Draft Revised GSP 04/12 – Joint GSA Board Meeting (Review Draft Revised GSP and Comments) 04/16 – Final Revised GSP Completed 04/19 – Joint GSA Board Meeting (Adopt Revised GSP) 04/22 – Submit Revised GSP

Overview of GSP Revisions

Deficiencies As Outlined in DWR's Review Letter

1. **Overdraft:** “The GSP does not include a reasonable assessment of overdraft conditions and reasonable means to mitigate overdraft.”
2. **Groundwater Levels:** “The GSP does not establish sustainable management criteria (SMC) for chronic lowering of groundwater levels in a manner substantially compliant with the GSP regulations.”
3. **Subsidence:** The GSP does not establish SMC for land subsidence in a manner substantially compliant with the GSP regulations.

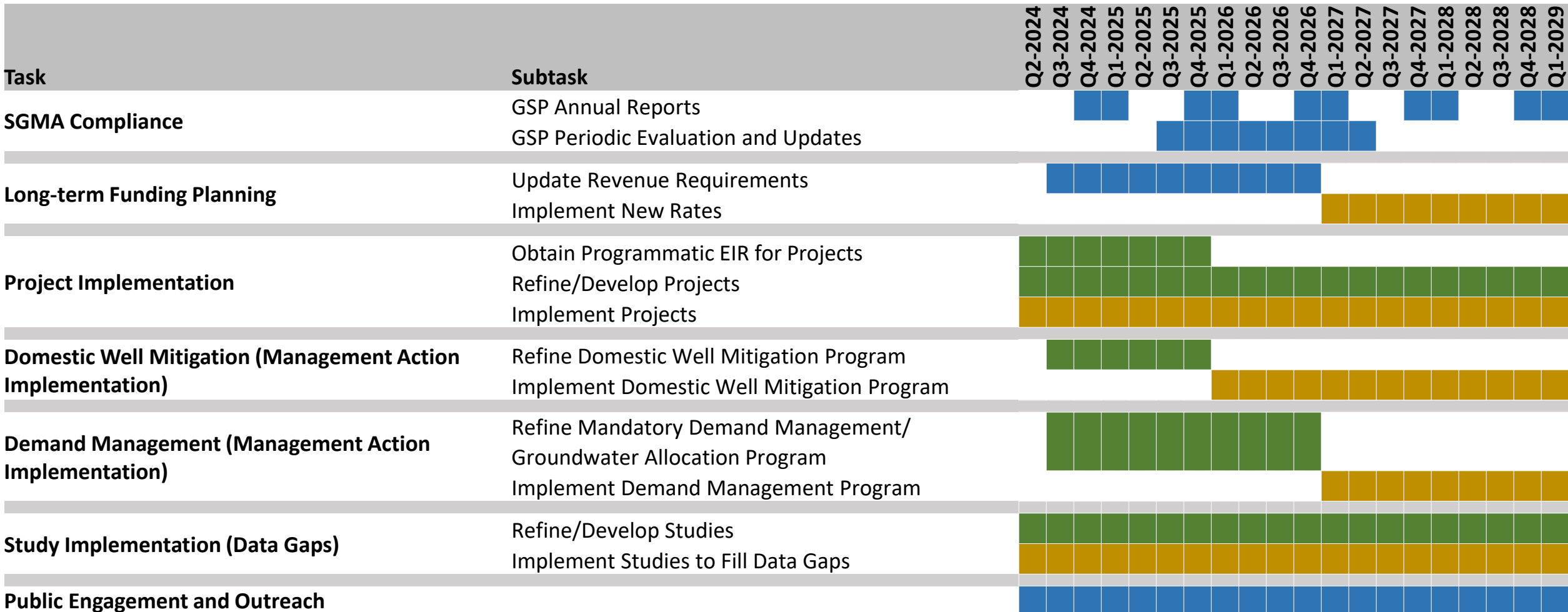
*Revisions were focused only on these deficiencies and the efforts needed to resolve these sufficiently (including **Projects and Management Actions**).*

Revised GSP Cover Letter and Implementation Timeline

- Cover letter for the Revised GSP:
 - GSP development and revisions processes
 - Summary of key GSP revisions, including (but not limited to):
 - Commitment to demand management
 - Commitment to domestic well mitigation
 - SMC revisions to address DWR’s identified deficiencies (GWL, subsidence)
 - Five-Year Timeline for GSP Implementation through Q1 2029, including:
 - Ongoing GSA coordination efforts (including GSA organizational structure)
 - GSA capacity-building (for GSP implementation)
 - Funding/financing discussions
 - Project implementation (recharge projects, etc.)
 - Management action tasks and timelines (domestic well mitigation and demand management)
 - SGMA reporting and compliance activities (Annual Reports, 2027 GSP evaluation, etc.)
 - Public outreach and engagement

5-Year Workplan (Overview)

Legend:



Summary of Revisions

- Timeline: Cover letter with timeline for actions to be taken during GSP implementation to move projects and management actions forward.
- Projects and Management Actions:
 - **Demand Management Program Memorandum of Understanding (MOU)** – Expressing the GSAs' commitment to developing the program in 2024-2026 and implementing no later than Jan 2027 if undesirable results are occurring.
 - **Domestic Well Mitigation Program MOU** – Expressing the GSAs' commitment to developing and implementing the program no later than Jan 2026.
 - Brief updates to other projects with information from Annual Reports.
- Overdraft:
 - **Revised overdraft estimate** based on recent measured groundwater levels
 - ~60 TAF/year (2016-2021 groundwater conditions)
 - **Provision for recurring evaluation of overdraft** each year in the Annual Report (as part of existing groundwater level monitoring and groundwater storage calculations)

Summary of Revisions (Continued)

- Groundwater Levels:
 - **Revised undesirable results (URs)** to speak to specific significant and unreasonable conditions (pointing to 2020-2022, well impacts and subsidence).
 - **Revised SMC for Focus/Non-Focus RMS wells** (*Summary to right*)

SMC	Initial GSP (January 2022)	Revised GSP (April 2024)
Undesirable Result	Occurs when 25% of RMS wells (12 of 48) continuously fall below their MT for 24 consecutive months	Occurs when any 12.5% of RMS wells (any 6 of 48) fall below their MT for two consecutive fall minimum measurements.
Minimum Threshold (MT)	The lower of: 1. The elevation corresponding to the 20th percentile of nearby domestic well depths, OR 2. 50% of measured historical groundwater elevation range below the historical measured low elevation.	<u>Focus RMS wells:</u> MTs set to 2020-2022 minimum groundwater elevation. <u>Non-focus RMS wells:</u> MTs set to 2020-2022 minimum groundwater elevation, minus a 15-25 ft margin (set based on local analyses of potential well impacts and subsidence risk, whichever is limiting).
Measurable Objective (MO)	Mean of the most recent 5 years of available groundwater elevation measurements up to 2020.	<u>All RMS wells:</u> 2011-2015 average groundwater elevation.
Interim Milestones (IM)	Equal to MO in all years (2027, 2032, and 2037)	<u>Focus RMS wells:</u> Groundwater elevations calculated as: 2027: $MT - 5 \text{ years} * 20\text{-year avg rate of groundwater elevation change at the RMS well (2003-2023)}$ 2032: MT 2037: $MT + 1/2 * (MO - MT)$ <u>Non-focus RMS wells:</u> MO (2027, 2032, 2037)

Summary of Revisions (Continued)

■ Subsidence:

- **Revised monitoring based on InSAR** (more frequent monitoring, opportunity for benchmark checks)
- **Revised URs** to speak to specific significant/unreasonable impacts to critical infrastructure (from analyses and discussions with infrastructure managers).
- **Revised SMC** (*Summary to right*)
- **Critical Infrastructure Working Group** proposed (infrastructure managers to meet annually to review concerns and actions)
- **Provision for “yellow light” and “red light” triggers**, outlining specific actions that will guide the GSAs’ subsidence response and mitigation efforts.

SMC	Initial GSP (January 2022)	Revised GSP (April 2024)
Undesirable Result	20% or more monitoring sites (benchmarks) experience subsidence rates above the MT	<u>Cumulative subsidence</u> averaged over 1 PLSS section exceeds 2 feet from January 2024, OR <u>Average rate of subsidence</u> in 10 or more contiguous PLSS sections, in any configuration, exceeds 0.1 feet per year in two consecutive years.
Minimum Threshold (MT)	0.5 feet per five years	<u>Cumulative Subsidence MT:</u> 2 feet from January 2024 <u>Rate of Subsidence MT:</u> 0.1 feet per year
Measurable Objective (MO)	0.25 feet per five years	0 feet per year
Interim Milestones (IM)	Equal to MO in all years (2027, 2032, and 2037)	January 2027: 0.3 feet per year (maximum rate of subsidence averaged over 2015-2023) January 2032: 0.1 feet per year (MT) January 2037: 0.08 feet per year (75 percent of the MT)

Overview of Comments and Feedback

Summary of Major Edits Since 03/22

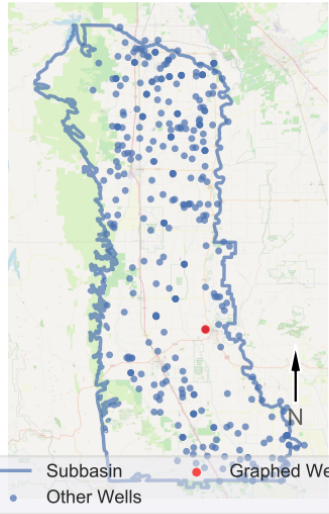
- **Subsidence URs/MTs**
 - **Cumulative Subsidence:** *Added following discussion with DWR on 03/25*
 - **MT:** 2 ft (from Jan 2024)
 - **UR:** Avg exceeds MT over 1 PLSS section (1 sq. mi)
 - **Subsidence Rate by Section:**
 - **MT:** 0.1 feet per year
 - **UR:** Avg exceeds MT over 10+ contiguous PLSS sections, in any configuration, for two consecutive years
- **Critical Infrastructure Working Group** proposed
 - Infrastructure managers to meet annually to review concerns and actions
- **Actions to Address Subsidence:** *Added following discussion with DWR on 03/25*
 - **“Yellow light” threshold** (if 1 ft of subsidence, or MT rate exceedance for one year): Prompts discussion among Critical Infrastructure Working Group to identify impacts and prioritize PMAs in impacted area.
 - **“Red light” limit** (if UR occurs): Prompts same actions as “yellow light,” with immediate action (projects, demand management)

Summary of Major Edits Since 03/22

- **Groundwater Level Interim Milestones** (i.e., red line/yellow line)
 - **Non-Focus Wells:** Maintain sustainable conditions (MOs).
 - **Focus Wells:** Provide buffer for potential decline by 2027 (i.e., “yellow line” based on 03/25 DWR discussion), recovering thereafter (→ MOs).

COLUSA Subbasin - State Well Number (SWN): 16N02W25B002M (Non-Focus RMS Well)

Well Location Map

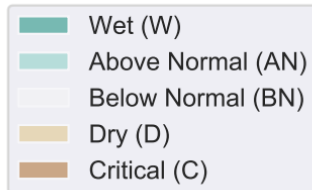


Sustainable Management Criteria:

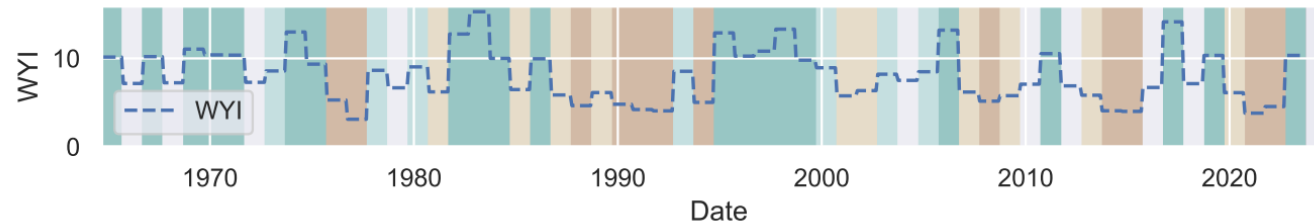
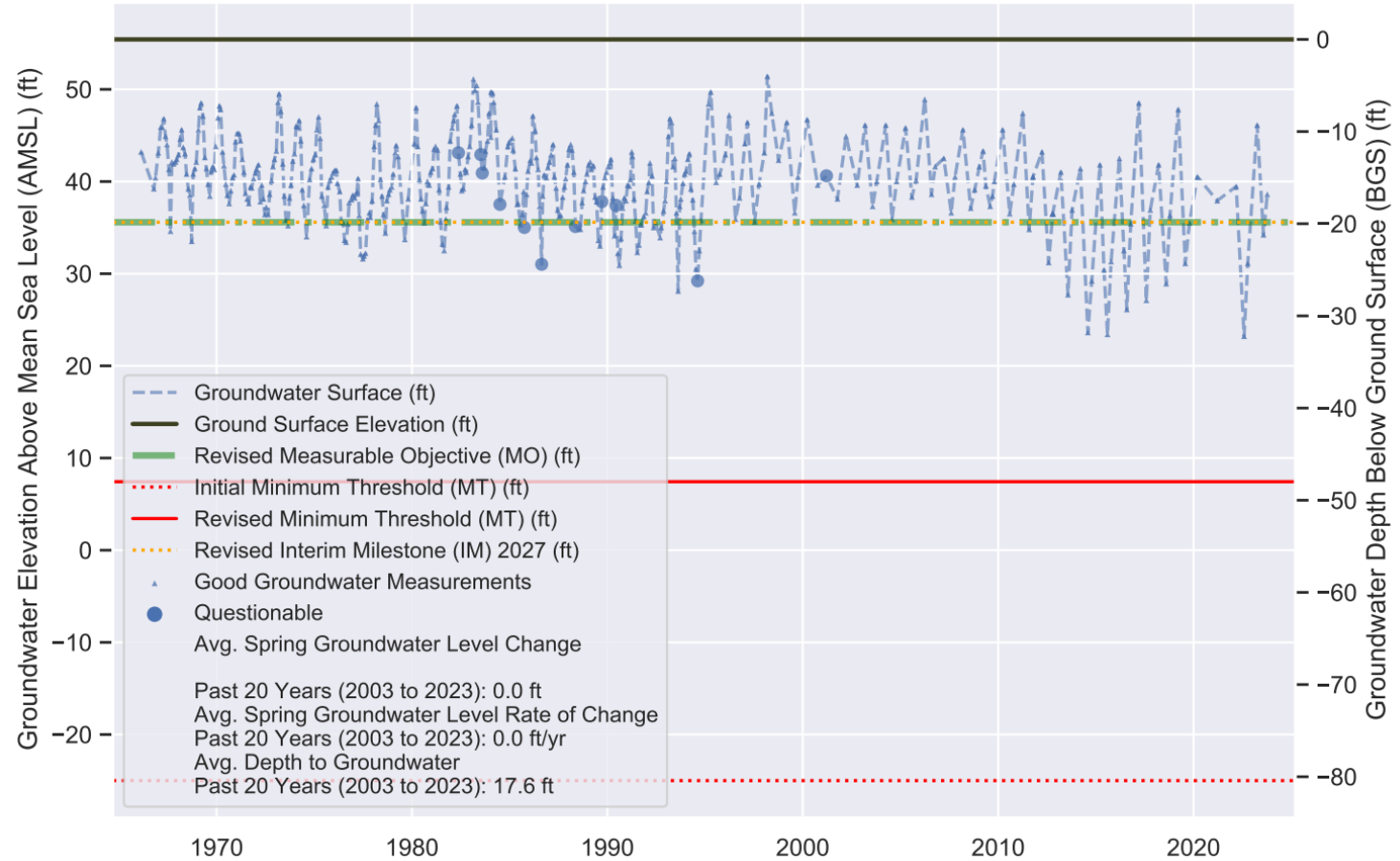
Proposed IM (2027) = 35.6 ft AMSL
 Proposed MO = 35.6 ft AMSL
 Proposed MT = 7.4 ft AMSL

Minimum Threshold is the 2020-2022 low minus a margin (15.8 FT).

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

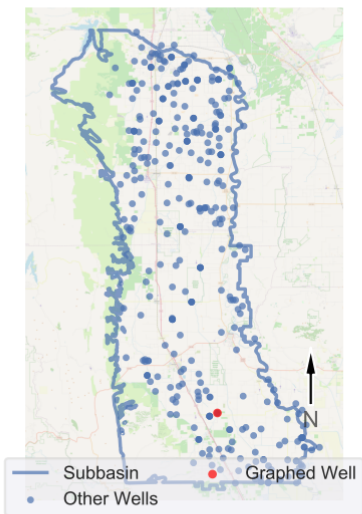


Perforation 1: 254.0 - 274.0 ft BGS



COLUSA Subbasin - State Well Number (SWN): 14N02W13N001M (Focus RMS Well)

Well Location Map

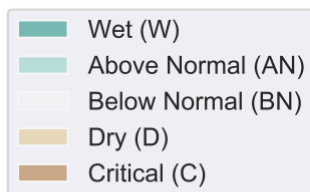


Sustainable Management Criteria:

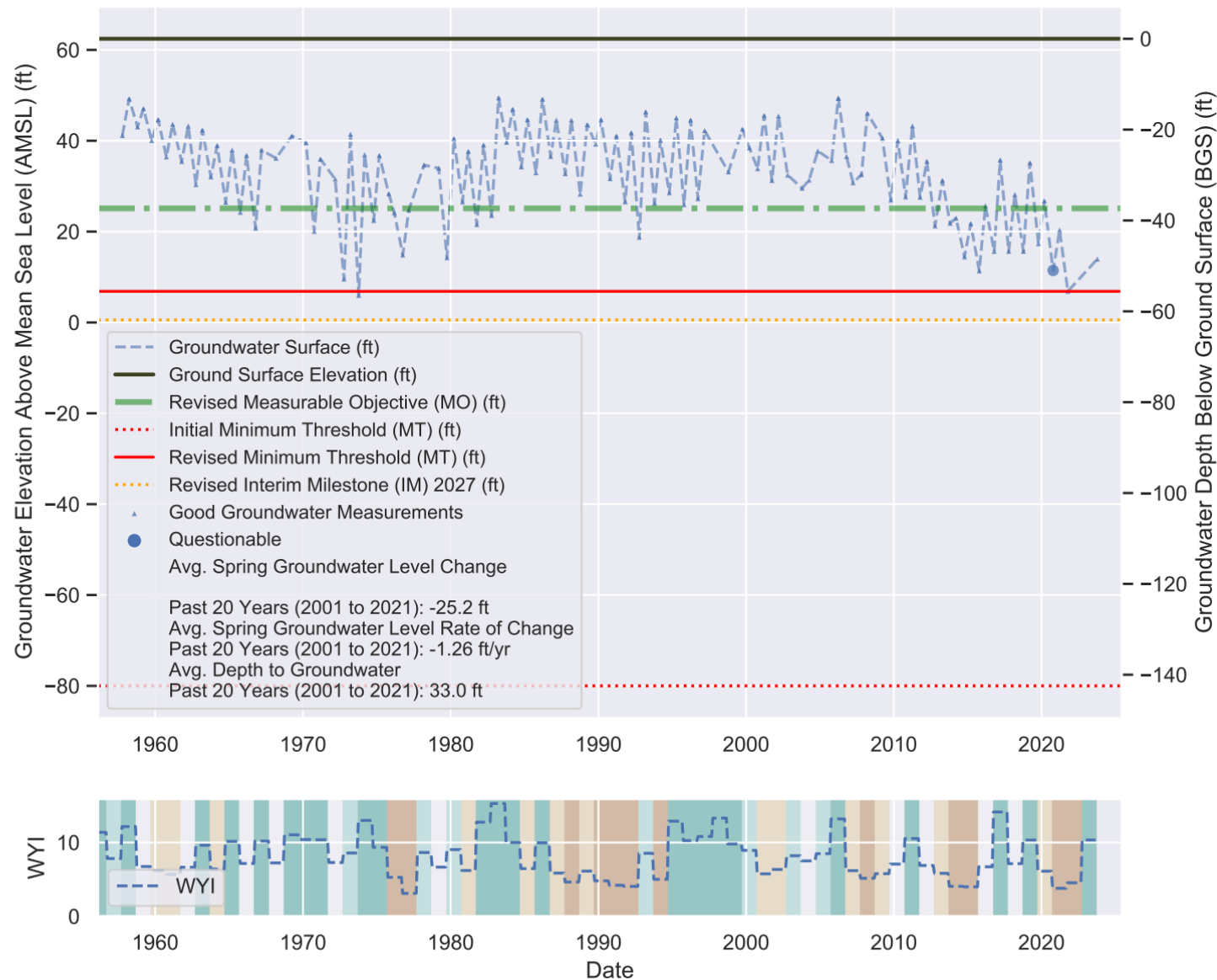
Proposed IM (2027) = 0.5 ft AMSL
 Proposed MO = 25.1 ft AMSL
 Proposed MT = 6.8 ft AMSL

Minimum Threshold is the 2020-2022 low.

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.



Perforation 1: 104.0 - 392.0 ft BGS



Summary of GSA Comments and Corresponding Edits

- **GSP implementation costs:**
 - Clarified which costs came from the initial GSP (i.e., Jan 2022) and have not been updated at this time
 - Disclaimer that costs will be revised, particularly in development of the demand management and domestic well mitigations programs
- **Projects from the initial GSP:**
 - Concern expressed about the accuracy of implementation timelines and project descriptions written in the initial GSP (Jan 2022)
 - *Heard from DWR that updates to all projects are not critical (focus time/effort elsewhere)*
 - Added updates and clarified implementation timeline (all planned projects, and elsewhere as possible)
 - Added disclaimer about content that comes from the initial GSP (benefits, etc.)

Summary of GSA Comments and Corresponding Edits (Continued)

- **Major additions and clarifications:**
 - Clarified that well impacts analysis did consider all potential wells (domestic, ag, etc.), but the focus of mitigation is on drinking water wells (most at risk, per analysis)
 - Added County critical infrastructure (roads, bridges, drainage conveyance) to list considered in discussion of subsidence-related URs (in addition to cities, districts, TCCA, CalTrans, etc.)
 - Clarified GSA discussions and coordination with DWR regarding data gaps (revisions acknowledge gaps, express interest in revising or adding monitoring sites to fill gaps, and also highlight GSAs' outreach to DWR to hopefully improve monitoring)

Next Steps

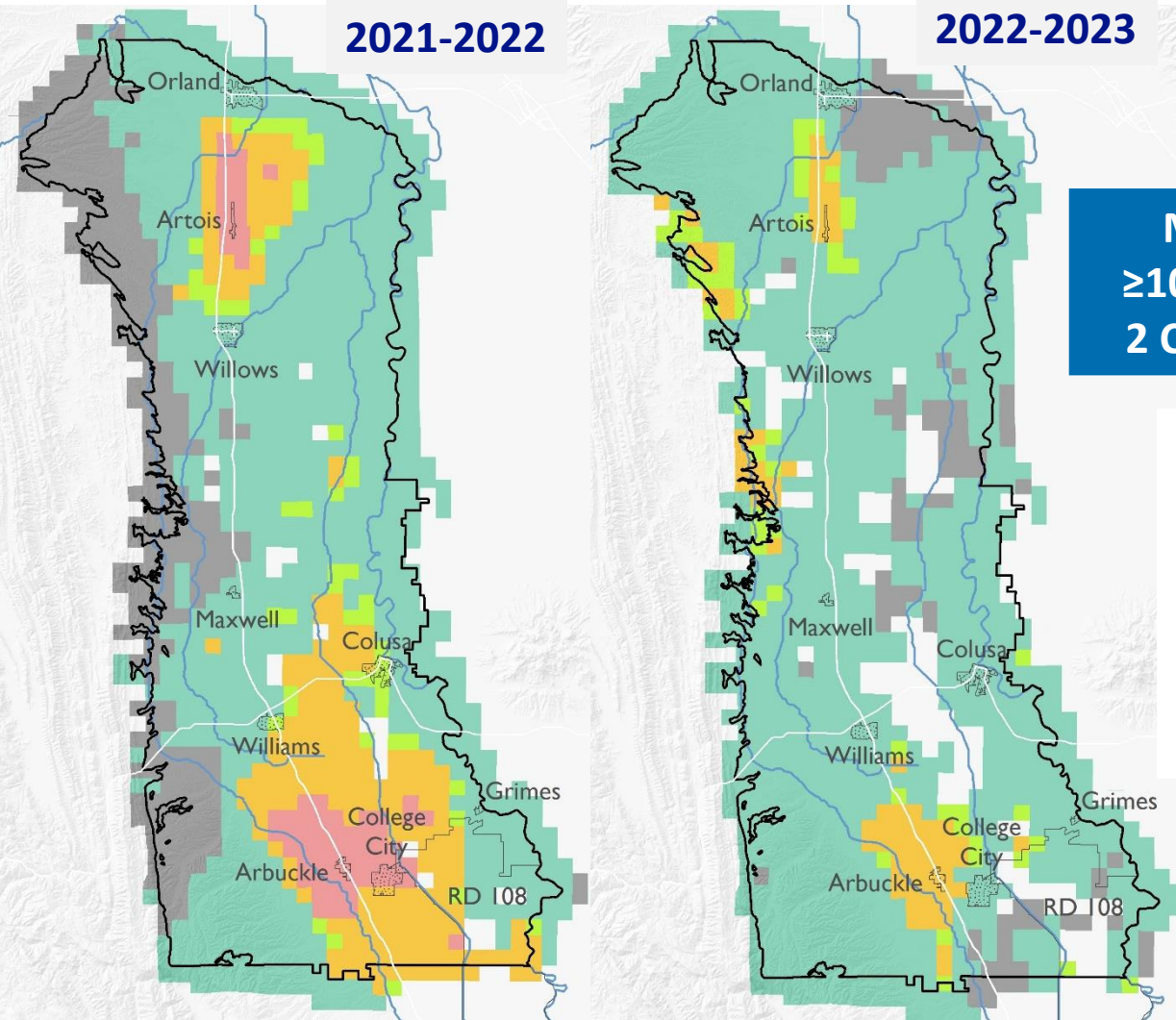
Next Steps

- Final Revised GSP anticipated to be completed on April 16, 2024
- Final Revised GSP approval at a public hearing on April 19, 2024
- Submittal to DWR anticipated on April 22, 2024
 - Before **April 23, 2024 deadline**

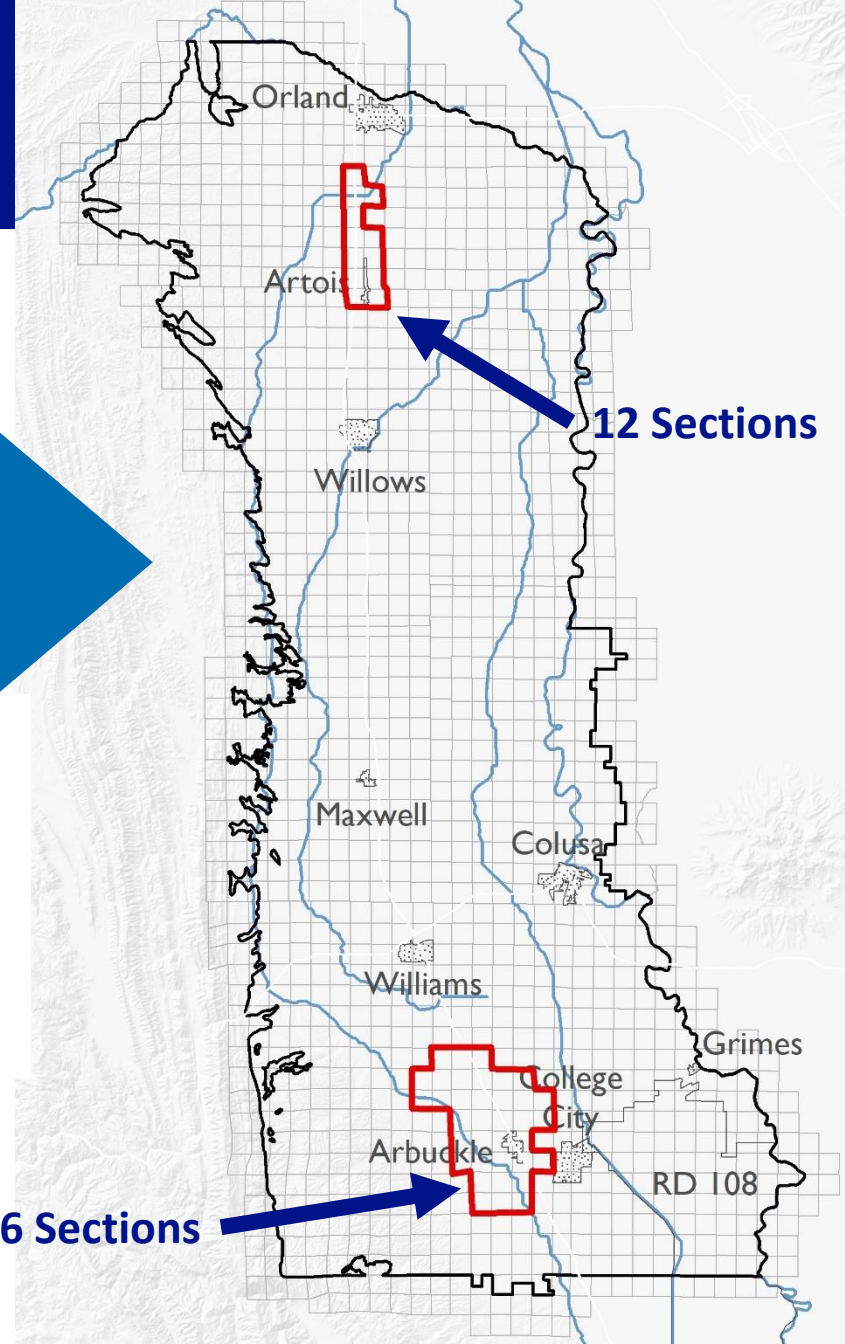
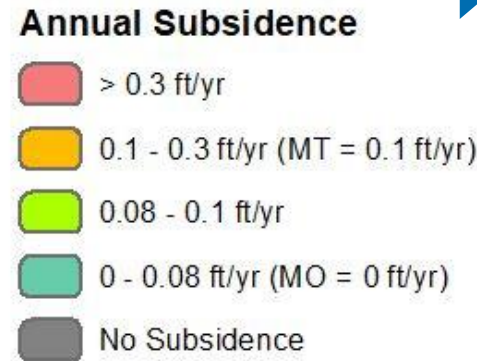


Additional Slides

Subsidence SMC: Impacts of Proposed SMC



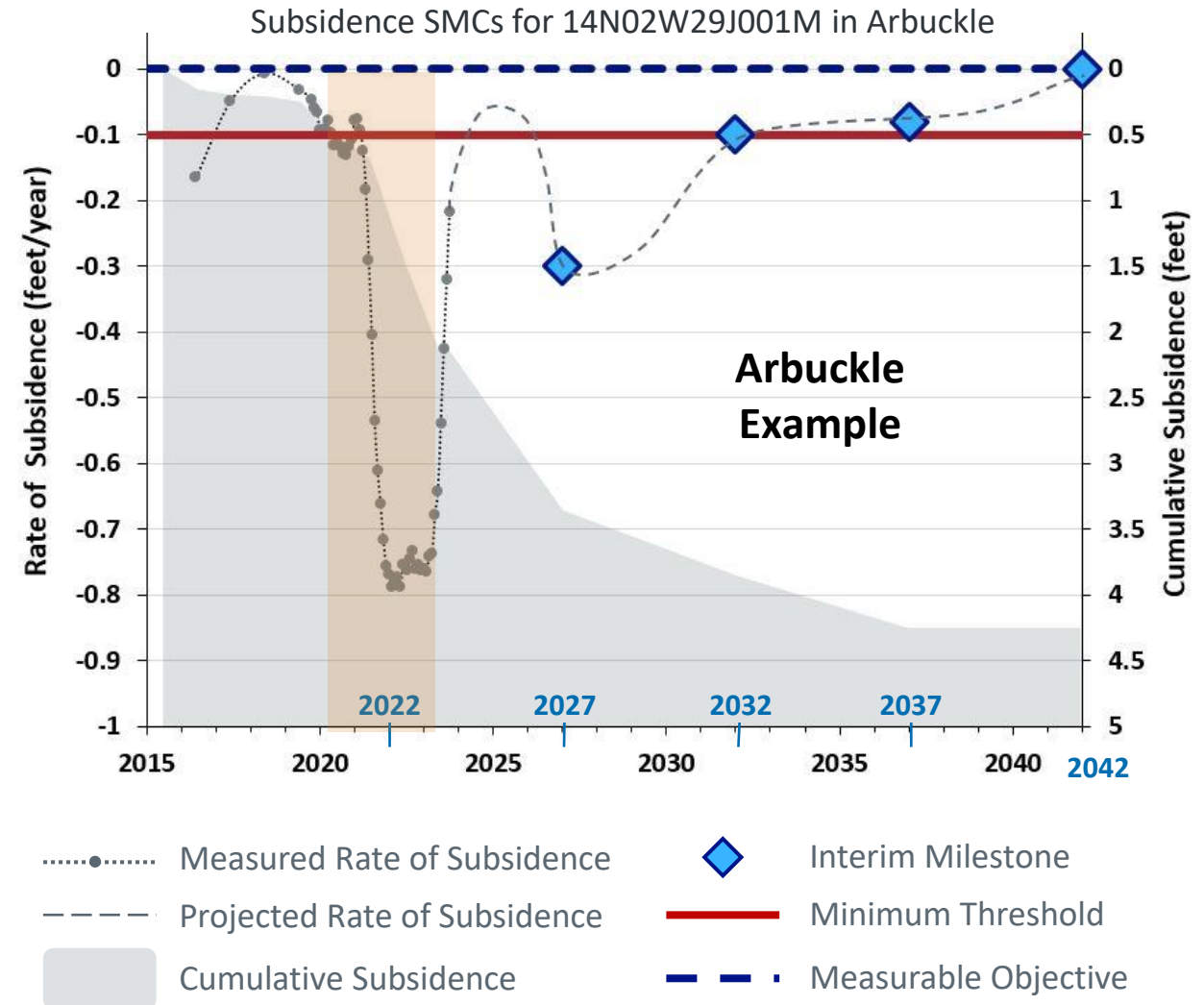
**MT Exceedance within
≥10 Contiguous Sections in
2 Consecutive Water Years**



Subsidence SMC: Measurable Objective (MO) & Minimum Thresholds (MT)

■ Proposed Revisions:

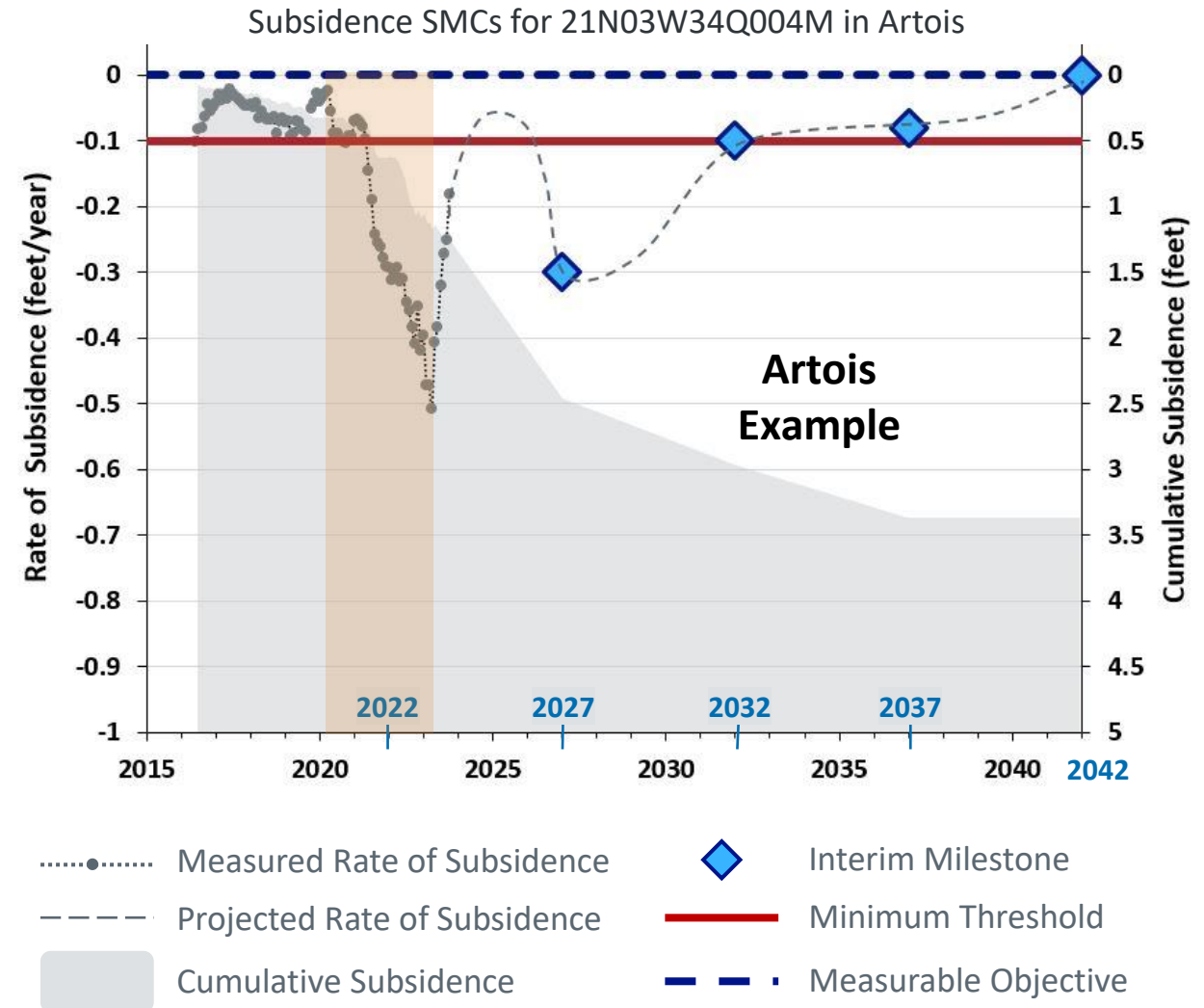
- Measurable Objective:
 - 0 ft/yr
- Minimum Threshold:
 - 0.1 ft/yr
- Interim Milestones:
 - 2027: 0.3 ft/yr
 - 2032: 0.1 ft/yr
 - 2037: 0.08 ft/yr
 - 2042: 0 ft/yr
- SMCs Evaluated Over:
 - 2 consecutive years
 - 10 or more contiguous PLS Sections



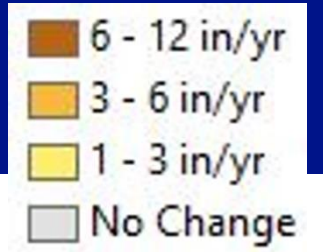
Subsidence SMC: Measurable Objective (MO) & Minimum Thresholds (MT)

■ Proposed Revisions:

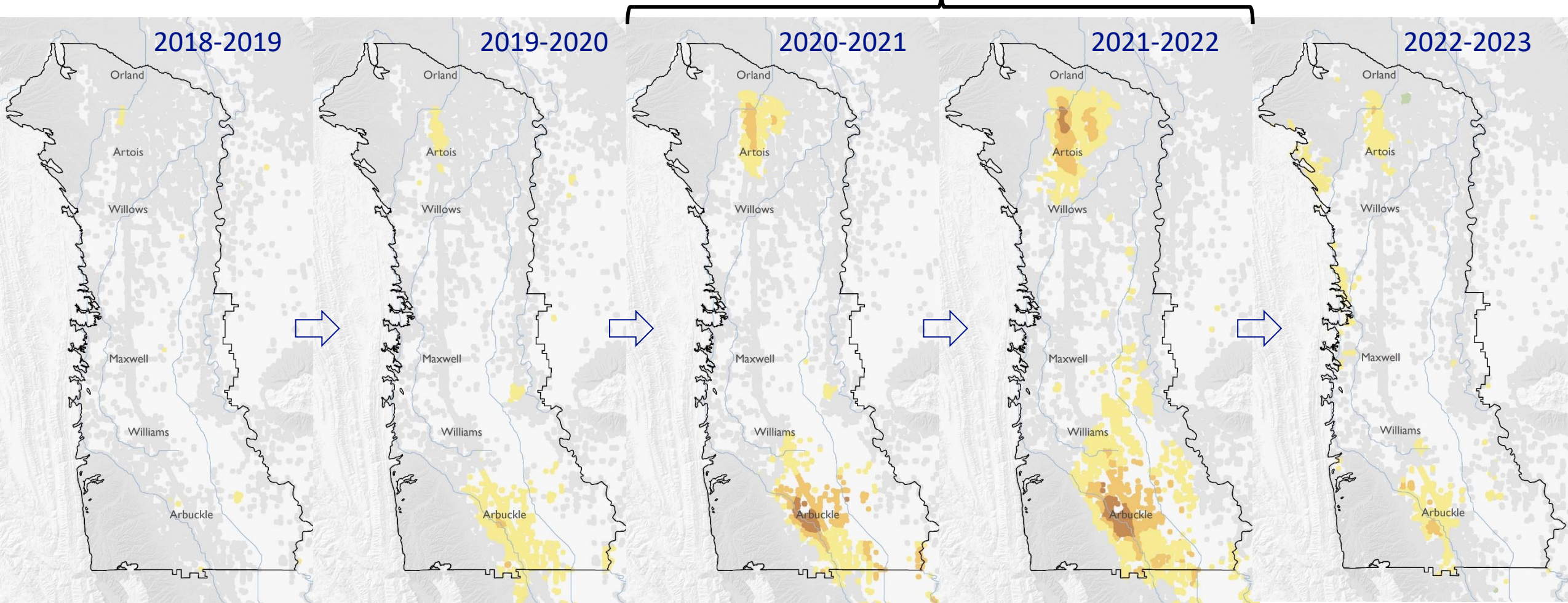
- Measurable Objective:
 - 0 ft/yr
- Minimum Threshold:
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- Interim Milestones:
 - 2027: 0.3 ft/yr
 - 2032: 0.1 ft/yr
 - 2037: 0.08 ft/yr
 - 2042: 0 ft/yr
- SMCs Evaluated Over:
 - 2 consecutive years
 - 10 or more contiguous PLS Sections



Annual Subsidence: October 2018 – October 2023



Rates peaked in 2020-2022



GWL SMC: Proposed Revisions to MTs

- **Minimum Thresholds (MTs):** Based on 2020-2022 GW elevations
 - **“Focus RMS Wells”:** MT is the **2020-2022 low** (in areas with dry wells and/or subsidence since 2015)
 - **“Non-Focus RMS Wells”:** MT is the **2020-2022 low – margin** (margin is **15-25 feet** depending on local conditions) (in areas without dry wells and/or subsidence since 2015)
 - Margin selected to be protective of well impacts and subsidence (whichever is more limiting)
 - Analysis conducted for each RMS well, analyzing:
 - Risk of surrounding well impacts (in Thiessen polygon)
 - Risk to subsidence (based on GWL-subsidence)
- **URs** occur if 12.5% of RMS wells (6 out of 48) exceed their MTs for two consecutive fall measurements

