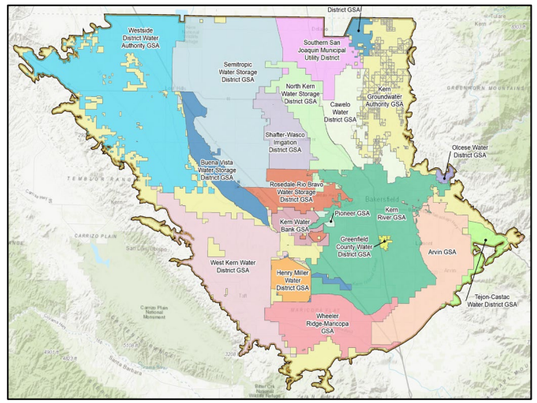
Highlights of the Kern Subbasin 2024 Amended Groundwater Sustainability Plan (GSP)

Kern County Subbasin
Groundwater Sustainability Agencies

Plan Area

Kern Subbasin and GSAs



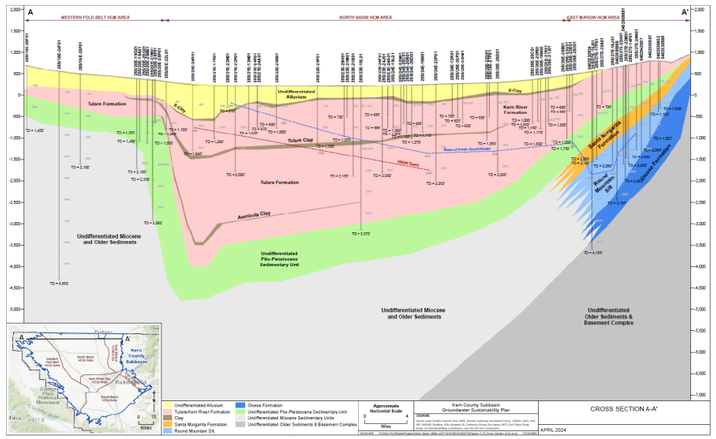
- The Kern County Subbasin (Subbasin) covers 1.8 million acres (largest in the state).
- The Subbasin contains 20 Groundwater Sustainability Agencies (GSAs).

Basin Setting: Hydrogeologic Conceptual Model

- A Hydrogeologic Conceptual Model (HCM) is a description of the physical setting of the groundwater system including:

Geology	**Climate**	**Groundwater Wells**
Aquifer Properties	**Topography**	**Recharge Processes**
Cross-Sections	**Soils**	**Surface Water Features**

- The Subbasin has three principal aquifers: the Primary Alluvial, the Santa Margarita, and the Olcese.
- Most wells are screened in the Primary Alluvial Principal Aquifer.
- The Subbasin is divided into five HCM areas with unique hydrogeology.



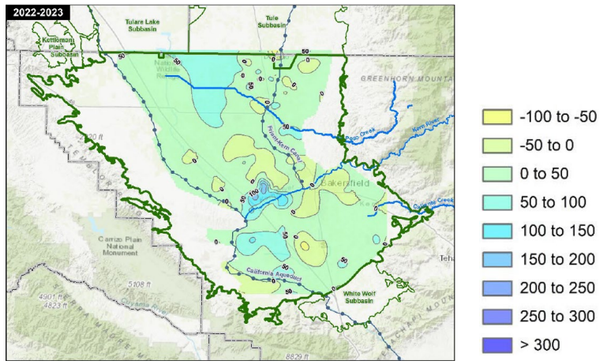
Cross section showing major geologic units

Basin Setting: Groundwater Conditions

- Summary of conditions for relevant Sustainability Indicators:

Groundwater Levels	**Groundwater Quality**	**Interconnected Surface Water**
Groundwater Storage	**Land Subsidence**	

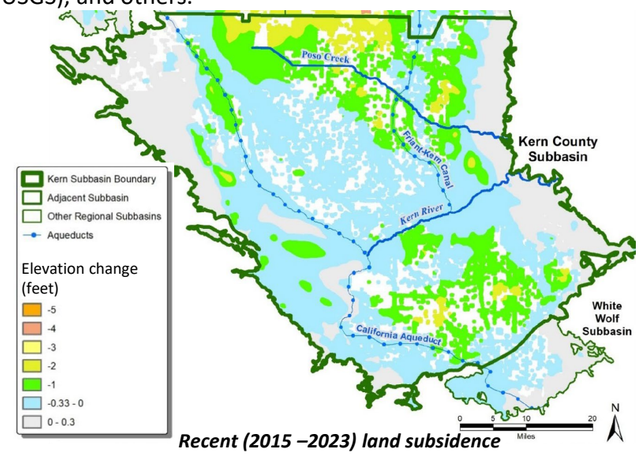
- Analysis of conditions including trends, spatial patterns, and causes of conditions.
- Groundwater levels respond positively to surface water imports and groundwater banking and negatively to severe droughts.



Change in groundwater elevation, 2022 – 2023 in Primary Alluvial Principal Aquifer (feet)

Groundwater Conditions: Land Subsidence

- Not all Subbasin land subsidence (sinking) is GSA-related. Land subsidence in the Subbasin is caused by multiple factors including agricultural and municipal pumping, oilfield extractions, hydro-compaction, and natural factors.
- Subsidence effects on critical infrastructure (the California Aqueduct and Friant-Kern Canal) are closely monitored by the California Department of Water Resources (DWR) California Aqueduct Subsidence Program, Friant Water Authority, United States Geological Survey (USGS), and others.

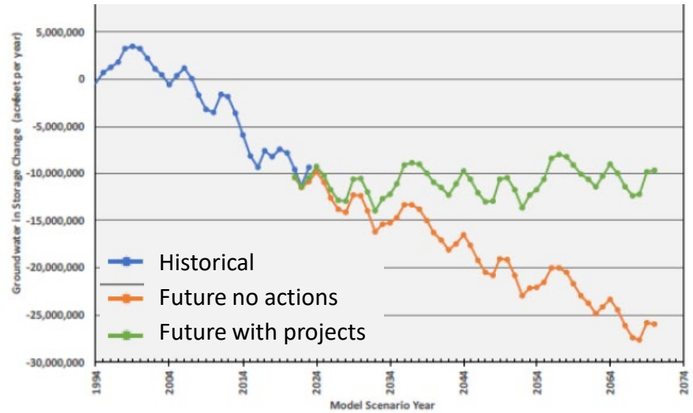


Recent (2015 –2023) land subsidence

Basin Setting: Water Budget

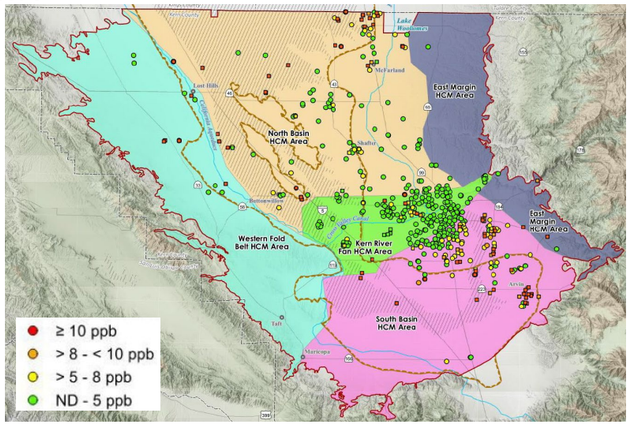
- Accounting of all inflows and outflows to the Subbasin for Historical (Water Year [WY] 1995-2014), Current (WY 2015-2023), and Projected (WY 2041-2070) Periods coordinated across the Subbasin.
- The sustainable yield for the Subbasin was conservatively estimated to be 1.31 million acre-feet per year (AFY).
- The GSAs have designed Projects and Management Actions with capacity and flexibility to effectively address overdraft and respond to anticipated climate changes by 2040.

Historical, current, and projected groundwater storage



Groundwater Conditions: Water Quality

- Constituents of concern are 1,2,3-trichloropropane, arsenic, nitrate, nitrate + nitrite, nitrite, selenium, total dissolved solids, and uranium.
- Emerging constituents perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) will be assessed following future data collection.



2010- 2023 median arsenic concentrations in the Subbasin

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Sustainable Management Criteria (SMCs)

- Relevant **Sustainability Indicators** in the Subbasin include:

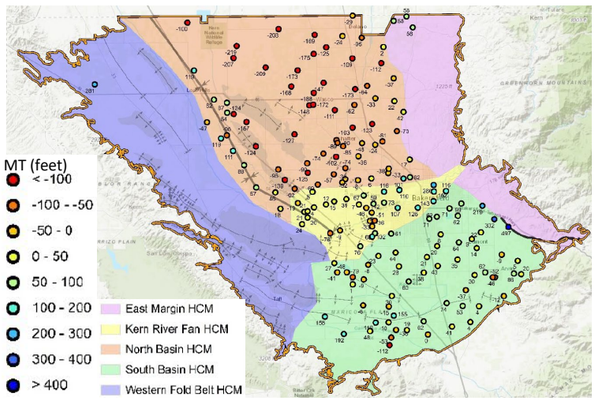
  Groundwater Levels **Groundwater Quality**

  Groundwater Storage **Land Subsidence**

- **Undesirable Results (UR)** Definitions
  - A UR occurs when a certain number of MT exceedances at monitoring sites occur.
  - Dewatering of more than 15 drinking water wells in a year or 255 by 2040 is also a UR for Groundwater Levels.
- **Minimum Thresholds (MT) – levels to avoid**
  - MTs have been set and justified to not cause significant and unreasonable and unmitigable impacts.
  - Groundwater Levels: Projected groundwater level in 2030 based on a regional trend extension from the 2015 low, or 25% of the historical water level fluctuation below the 2015 low. Fewer than 100 wells are projected to go dry at these levels.
  - Groundwater Storage: measured by groundwater levels
  - Land Subsidence: Rate and extent based on impacts to critical infrastructure or average 2015-2023 subsidence rate projected to 2040 along critical infrastructure and across an HCM area
  - Degraded Water Quality: Health based screening level (MCL) or maximum pre-2015 baseline

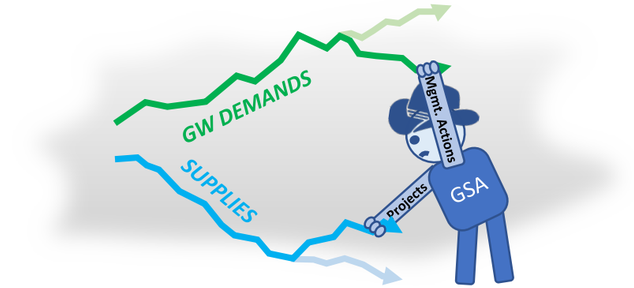
- The GSAs have adopted an **MT Exceedance Policy**, which requires a response to every exceedance.

Groundwater Level MTs in Primary Alluvial Principal Aquifer



- **Measurable Objectives (MO) – levels to achieve by 2040**
  - Groundwater Levels: 2015 low water level
  - Groundwater Storage: measured by groundwater levels
  - Land Subsidence: 50% of MT rate and extent
  - Degraded Water Quality: Health based screening level (MCL) or median pre-2015 baseline

Projects & Management Actions (P&MA)



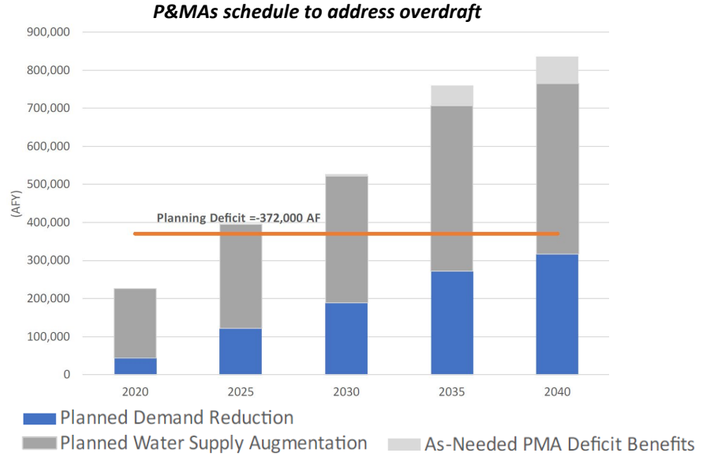
- The GSAs have developed a suite of 82 Projects and 48 Management Actions to collectively eliminate the 372,000 AFY groundwater deficit.

- Priority **Management Actions** to Reduce GW Demand**:**
  - Land conversion
  - Crop changes
  - Incentives for water use efficiency

- Priority **Projects** to Increase Supply:
  - Water banking and wet year recharge
  - Water recycling
  - Improved utilization of existing supplies
  - Imported water

- **Well Mitigation** for domestic and small community wells impacted by low groundwater levels. Subbasin-wide program funded by the GSAs includes:
  - Emergency bottled water within 24 hours
  - Investigation of well impacts
  - Long-term solution includes well modification or replacement or service connection to nearby supply

P&MAs schedule to address overdraft

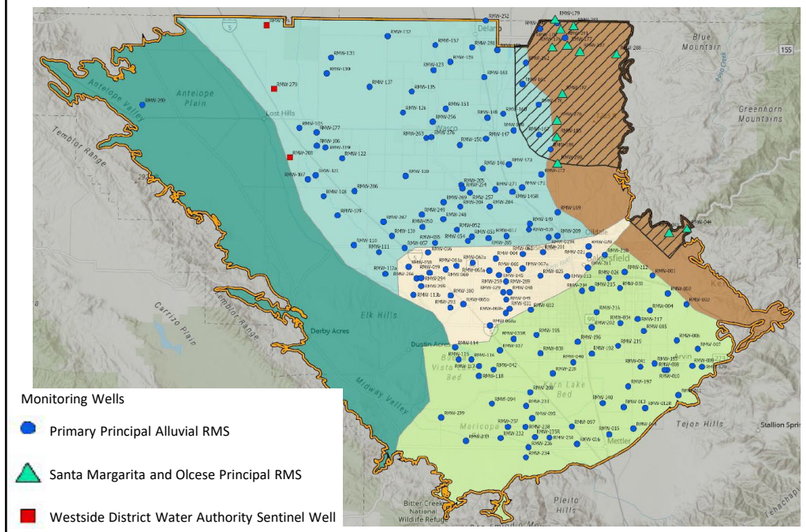


Monitoring Network

- Representative Monitoring Networks for relevant Sustainability Indicators have been expanded to monitor progress towards achieving the Subbasin's sustainability goal.

- Representative Monitoring Sites (RMS) are used for SGMA reporting and compliance; additional non-SGMA monitoring programs (Irrigated Lands, Department of Drinking Water) will continue through a coordinated effort.

Groundwater level representative monitoring network



Stakeholder Engagement & Basin Coordination

- Venues for public stakeholder engagement include:
  - GSA Board meetings
  - GSA Group meetings
  - Three Subbasin-wide public workshops to be held in September
  - Ongoing partnerships with Kern Water Collaborative and Self-Help Enterprises

- The GSAs invite stakeholders to view the GSP at www.KernGSP.com.

- For more information or to submit a public comment, please visit www.KernGSP.com or contact comments@kerngsp.com