

Sierra Valley Groundwater Sustainability Plan Development

REVIEW OF HISTORICAL GROUNDWATER LEVEL TRENDS AND WELLS

Defining Undesirable Results to inform Sustainable Management Criteria

April 19, 2021



Agenda

- Objectives of the Groundwater Sustainability Plan (GSP)
- Sustainable Management Criteria (SMC)
 - Groundwater level decline
 - Groundwater dependent ecosystems (GDEs)
 - Interconnected Surface Water (ISW)
- Review groundwater level trends and well protection analysis: proposed approach
- Summarize path forward

Objective of the Groundwater Sustainability Plan (GSP) according to initial November 2020 TAC meeting

MAINTAIN

- Viable agriculture in the valley, at or a bit above current levels
- Maintain the quiet, rural nature of the basin
- Maintain and enhance presence of wildlife
- Support wetlands for migratory and local birds

PREVENT

- Degradation of water quality
- Drying out of wetlands, streams and braided channels
- Domestic well users having to drill deeper wells
- Development including industrial farming, airport expansion and housing developments



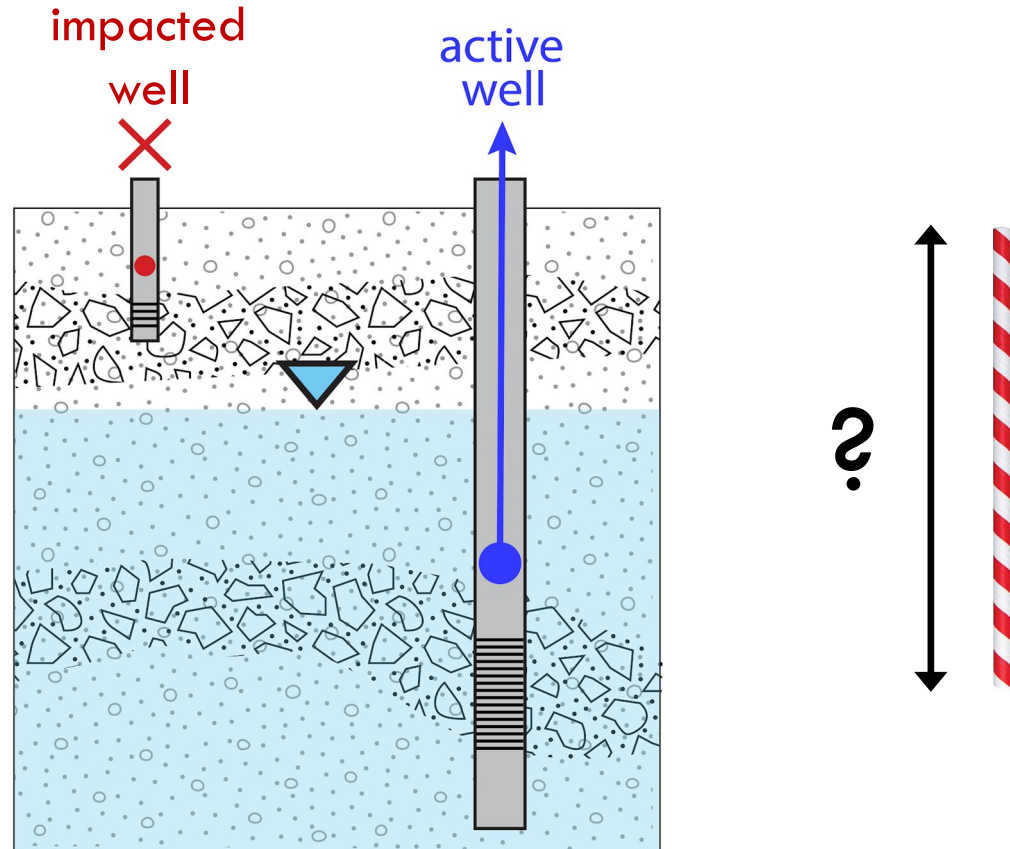
Objective of the Groundwater Sustainability Plan (GSP) according to SGMA

- Prevent **Undesirable Results** to **beneficial uses/users** through **Sustainable Management Criteria** (SMC) that bring demand into alignment with supply over a 20-year implementation time horizon (or less)
- Protect all **beneficial uses/users** of Sierra Valley groundwater, including (in no particular order) domestic, agricultural, municipal and ecosystem uses/users.



Beneficial uses: Wells

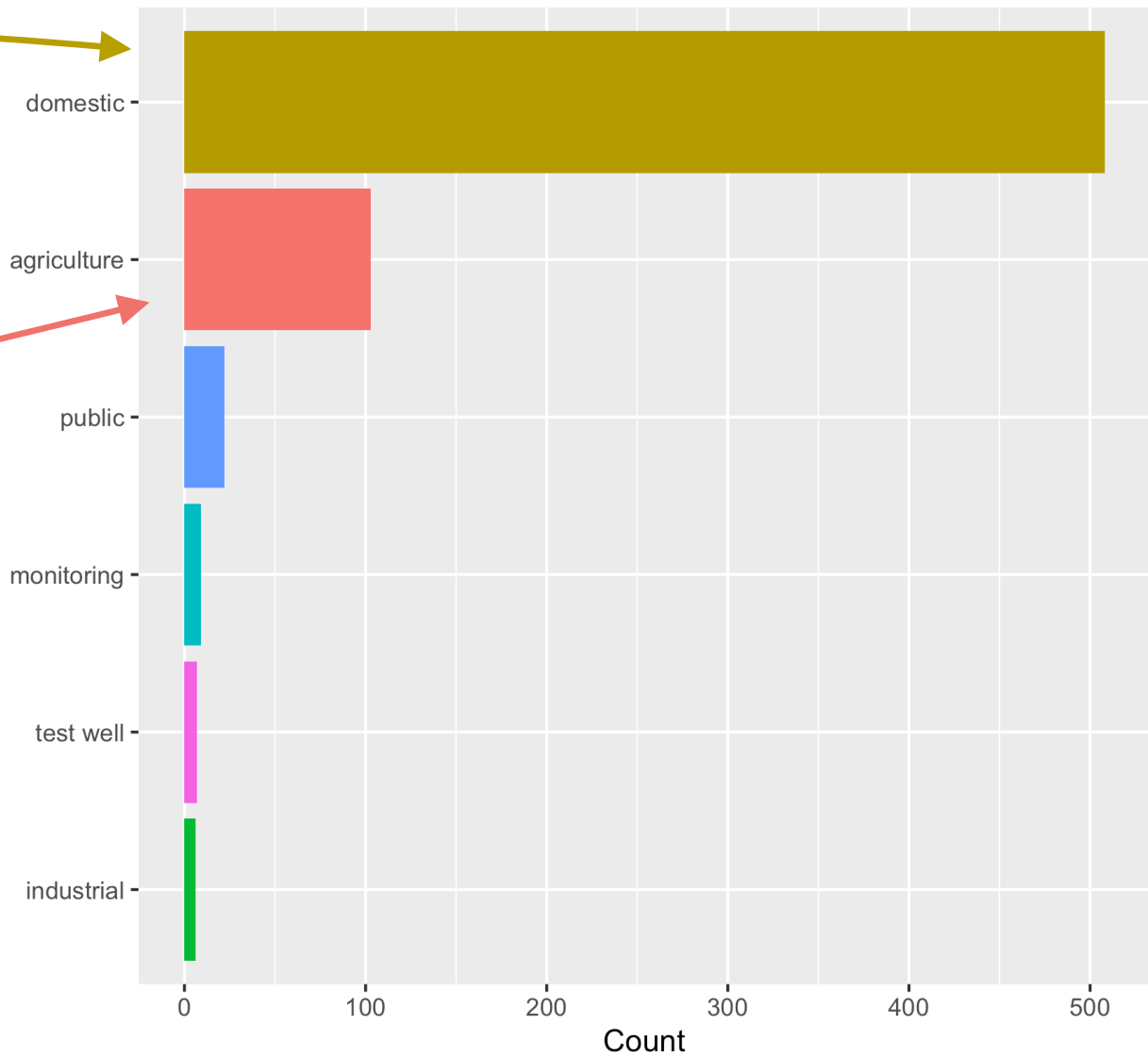
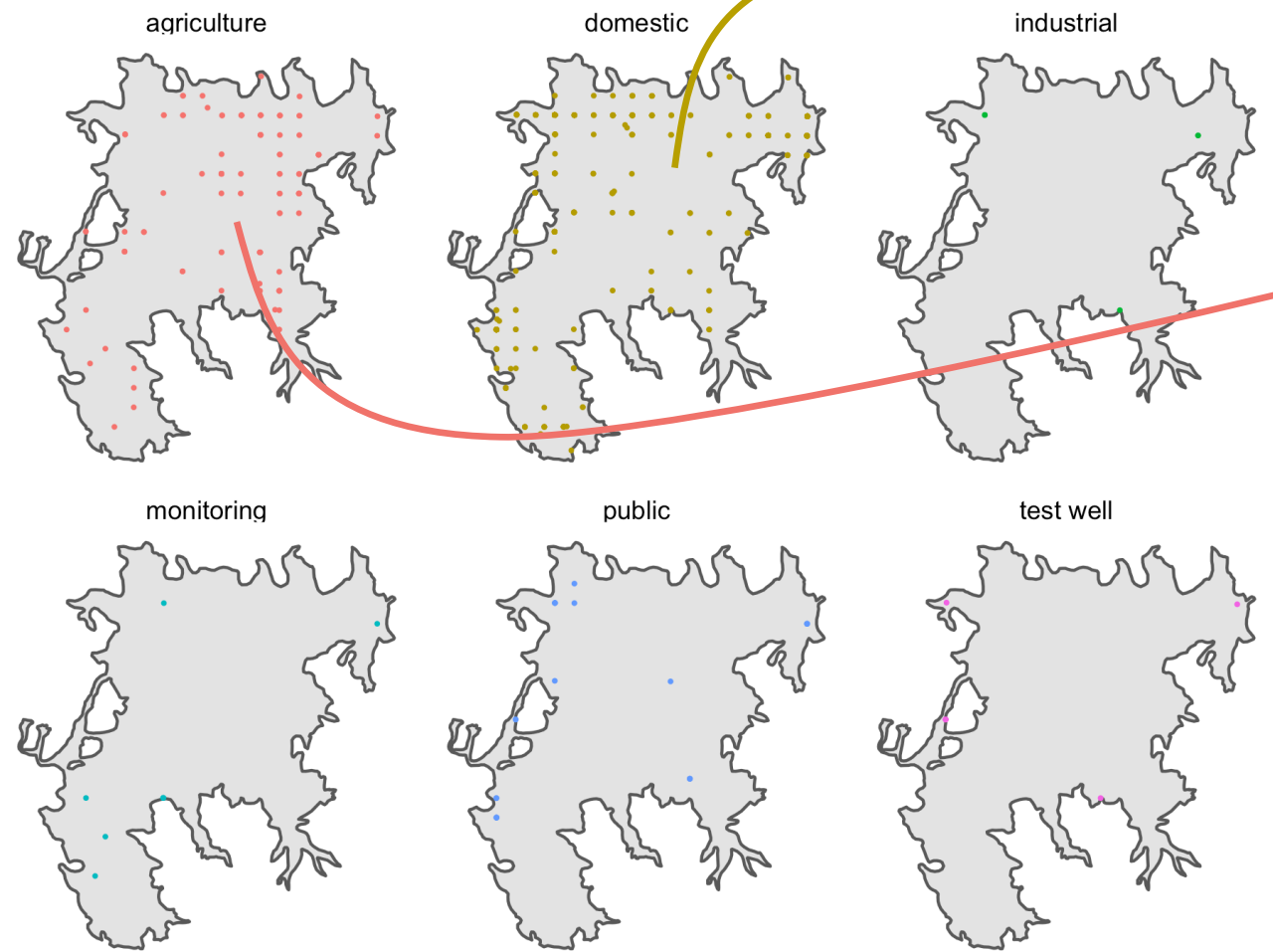
Regional-scale groundwater level declines may negatively impact wells



Well types: domestic and agricultural wells are most common

Domestic & agricultural wells are colocated

Domestic wells outnumber all other well types



Forecasted impacted wells under a return to 2012-2016 fall lows

31-year retirement age

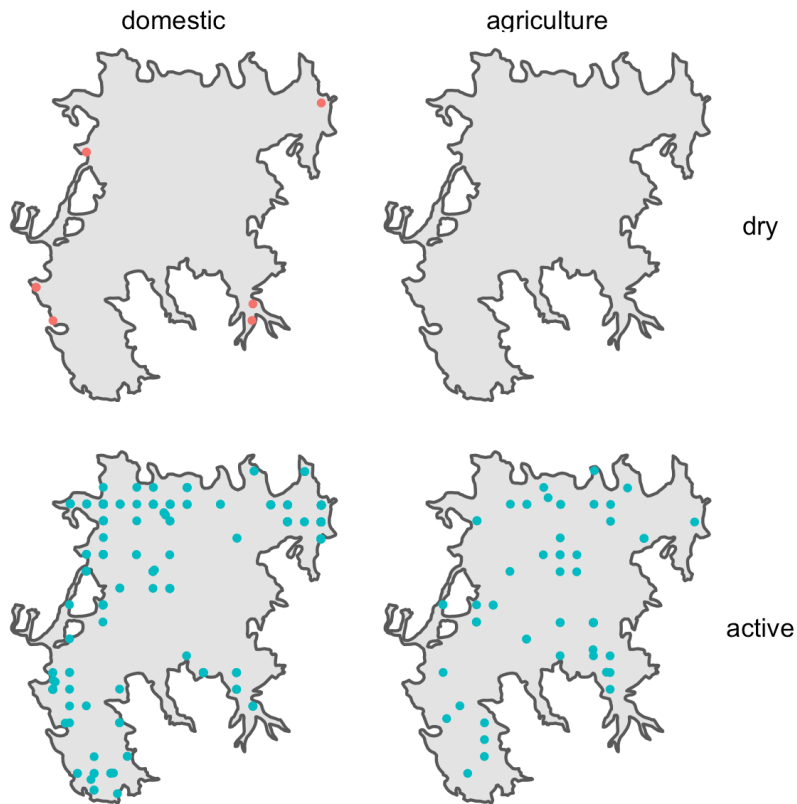
well type	number active	number dry
domestic	309	8
agricultural	57	0

~2%

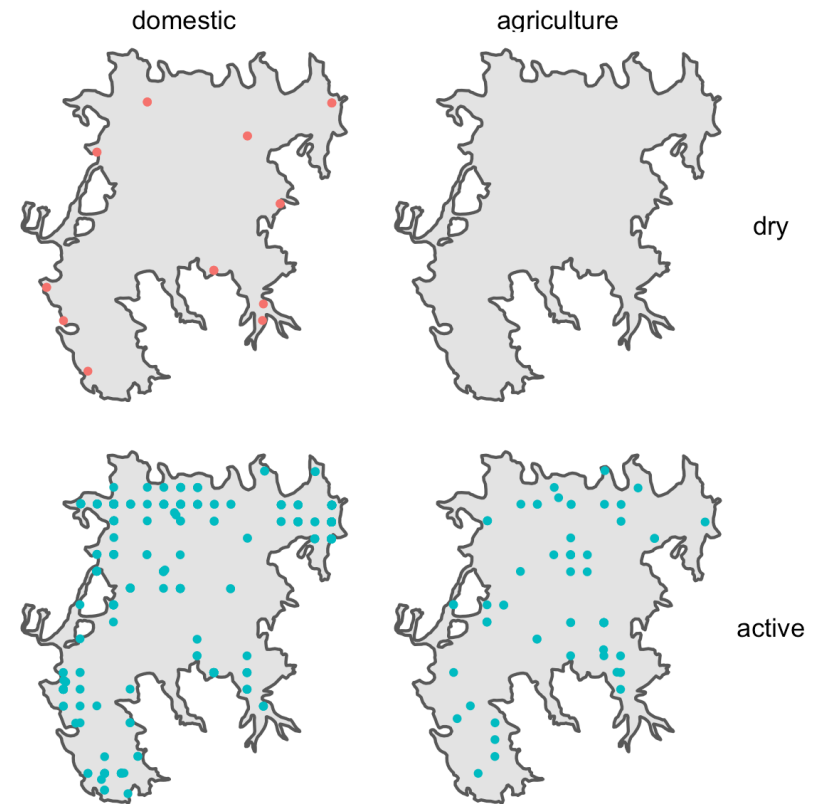
40-year retirement age

well type	number active	number dry
domestic	418	20
agricultural	61	0

~4%



assuming a 31 year retirement age



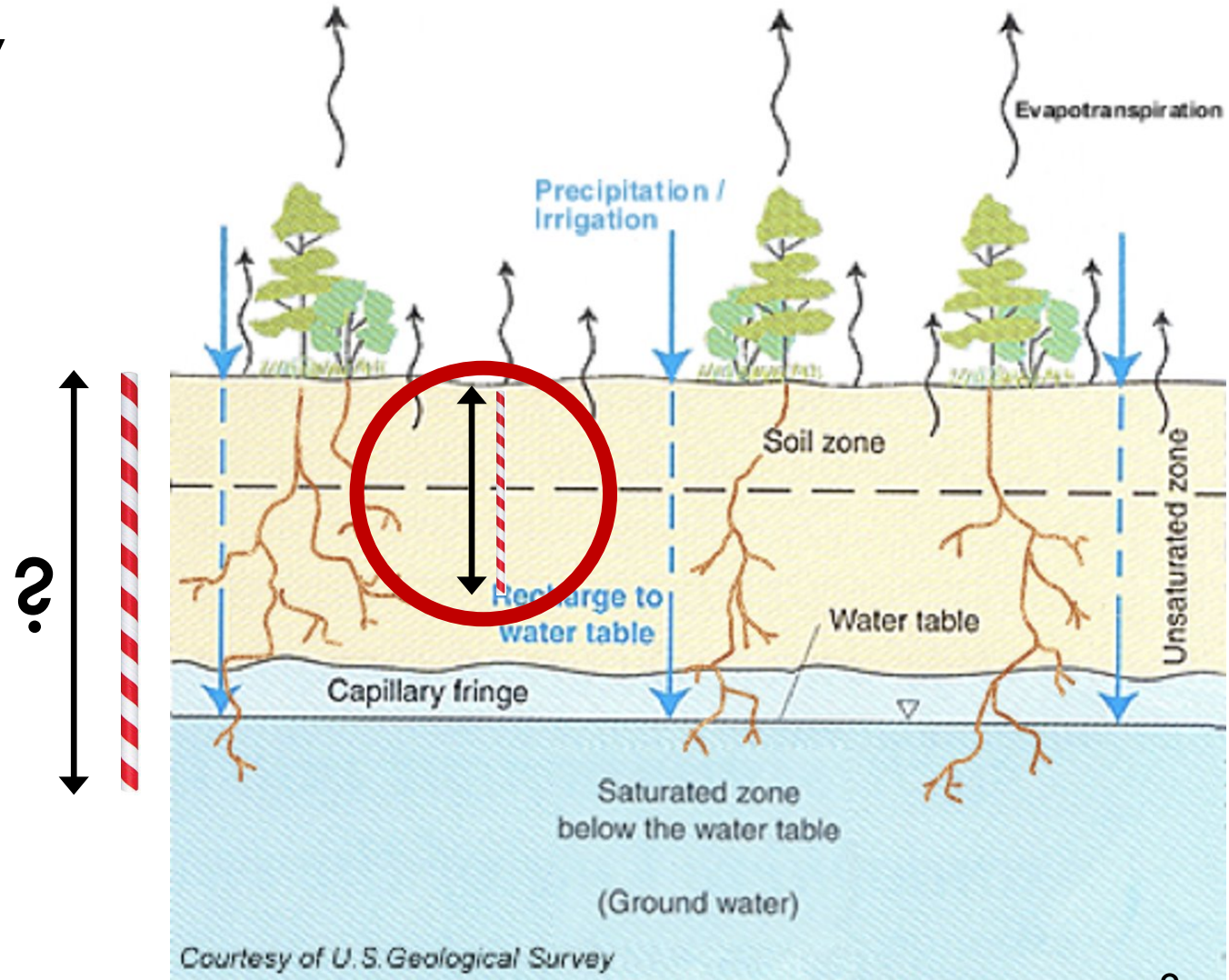
assuming a 40 year retirement age

Beneficial user: Groundwater dependent ecosystems (GDEs)

Regional-scale groundwater declines may negatively impact local-scale GDEs



Photos taken near
Marble Hot
Springs



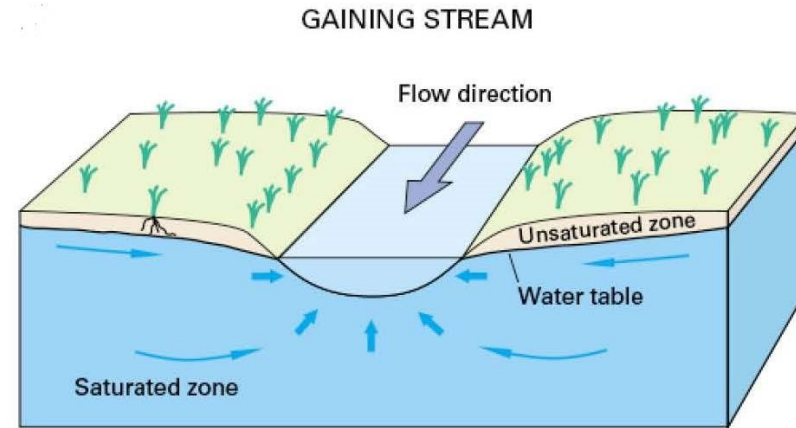
Courtesy of U.S. Geological Survey

Interconnected surface water (ISW)

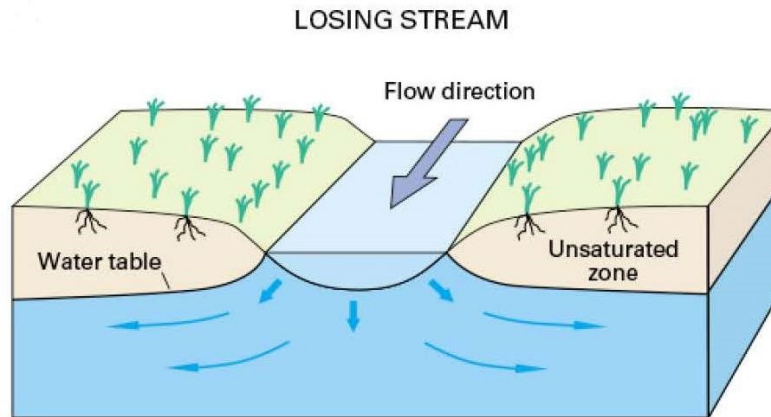
23 CCR § 351(o)

“Interconnected surface water” refers to 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.

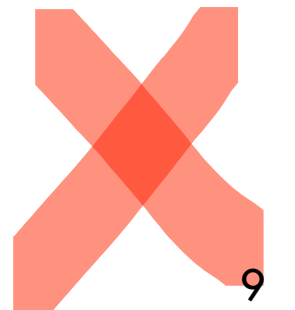
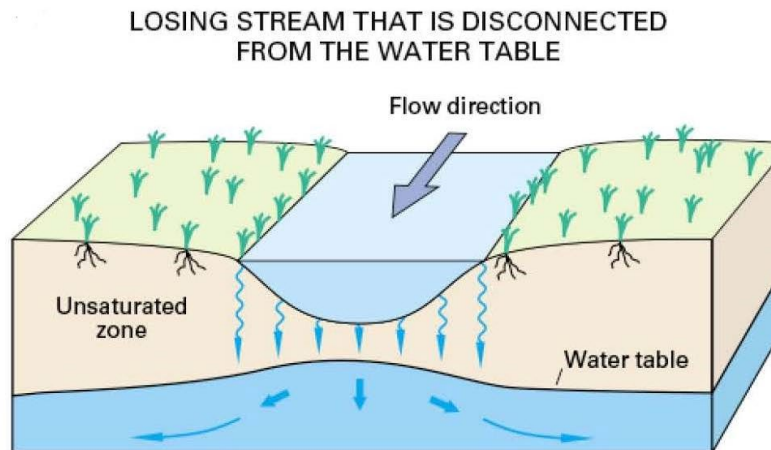
Gaining



Losing connected

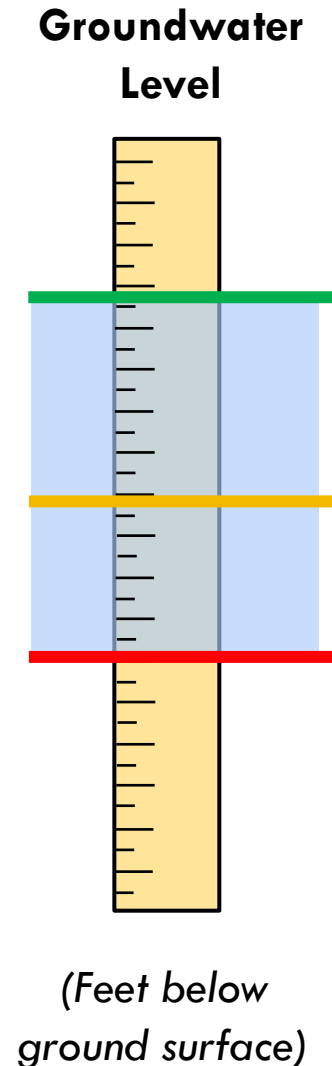


Losing disconnected



Proposed approach: Sustainable Management Criteria (SMC) for groundwater level

- A ruler to measure significant and unreasonable impacts to beneficial users/uses.
- Groundwater level SMC is perhaps the most important Sustainability Indicator because it is directly measurable and can be used as a proxy for groundwater storage, interconnected surface water, and GDEs.



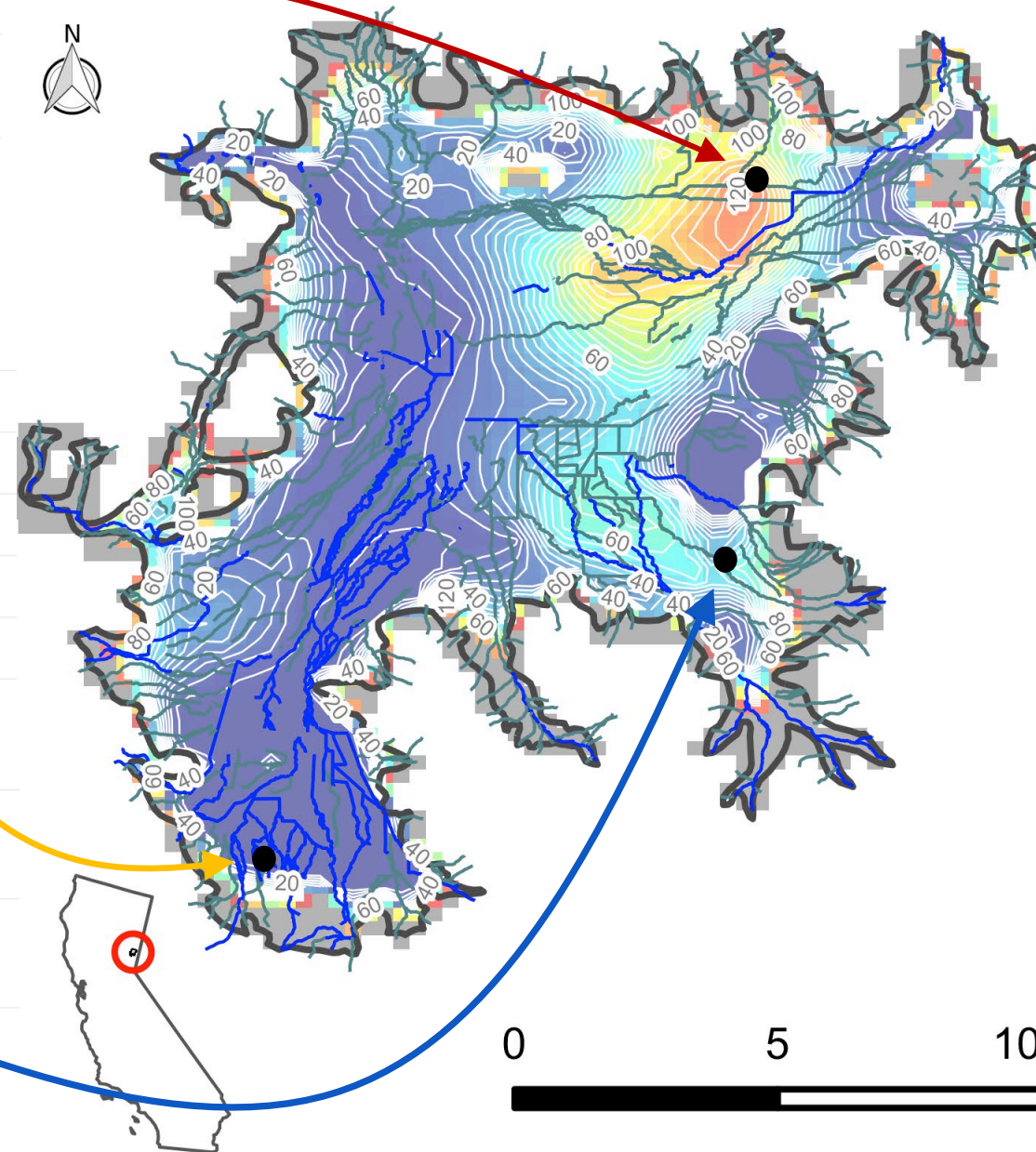
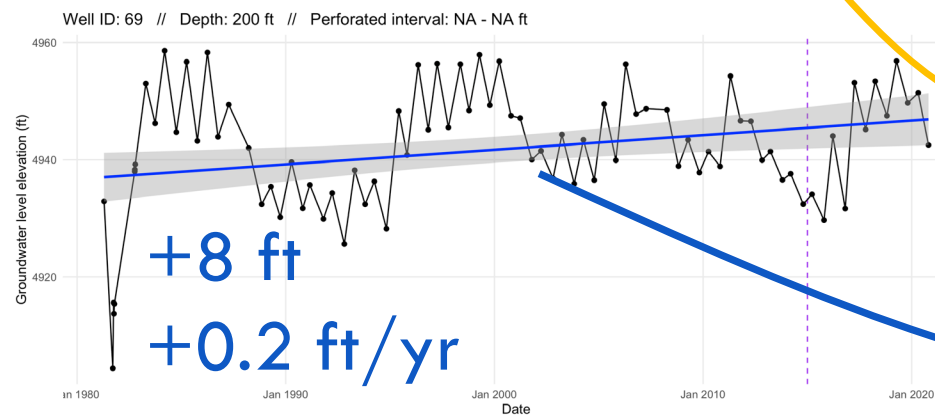
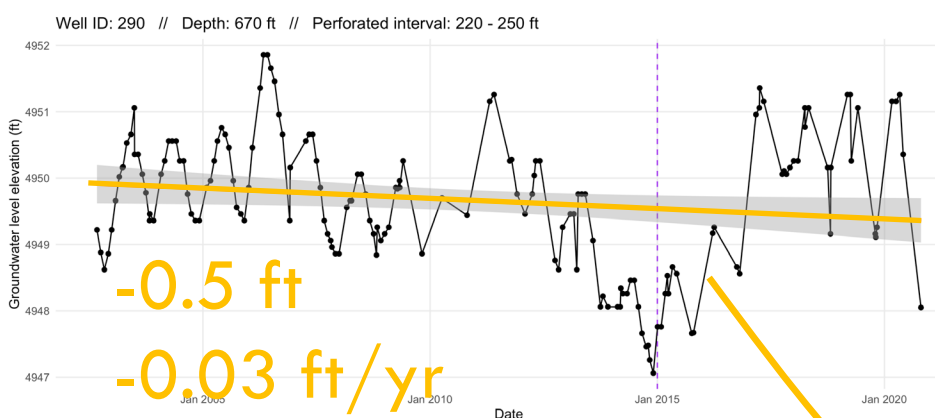
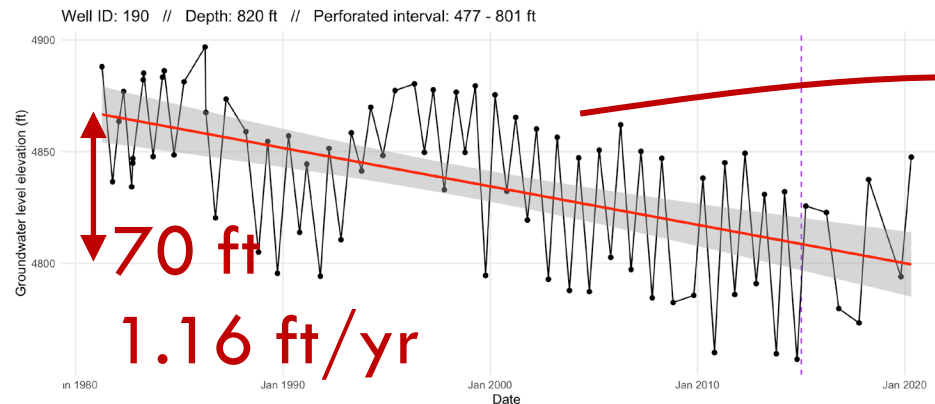
**Example SMC*

Measurable Objective: Avg post-2015 groundwater level

Action Trigger: Average post-2015 fall groundwater level

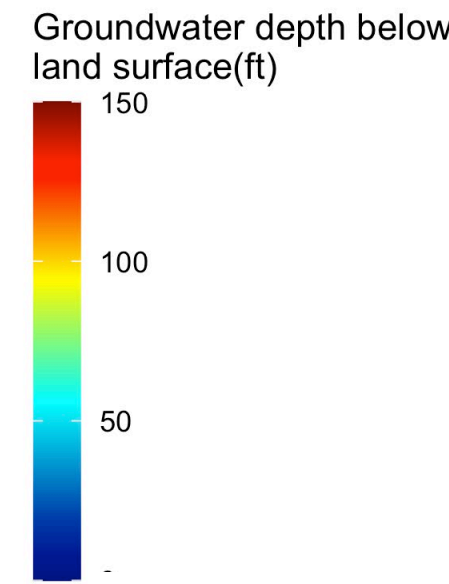
Minimum Threshold: 10 year projected groundwater level or the post 2015 groundwater low, whichever is lower

Average fall groundwater depth below land surface, 2000-2019



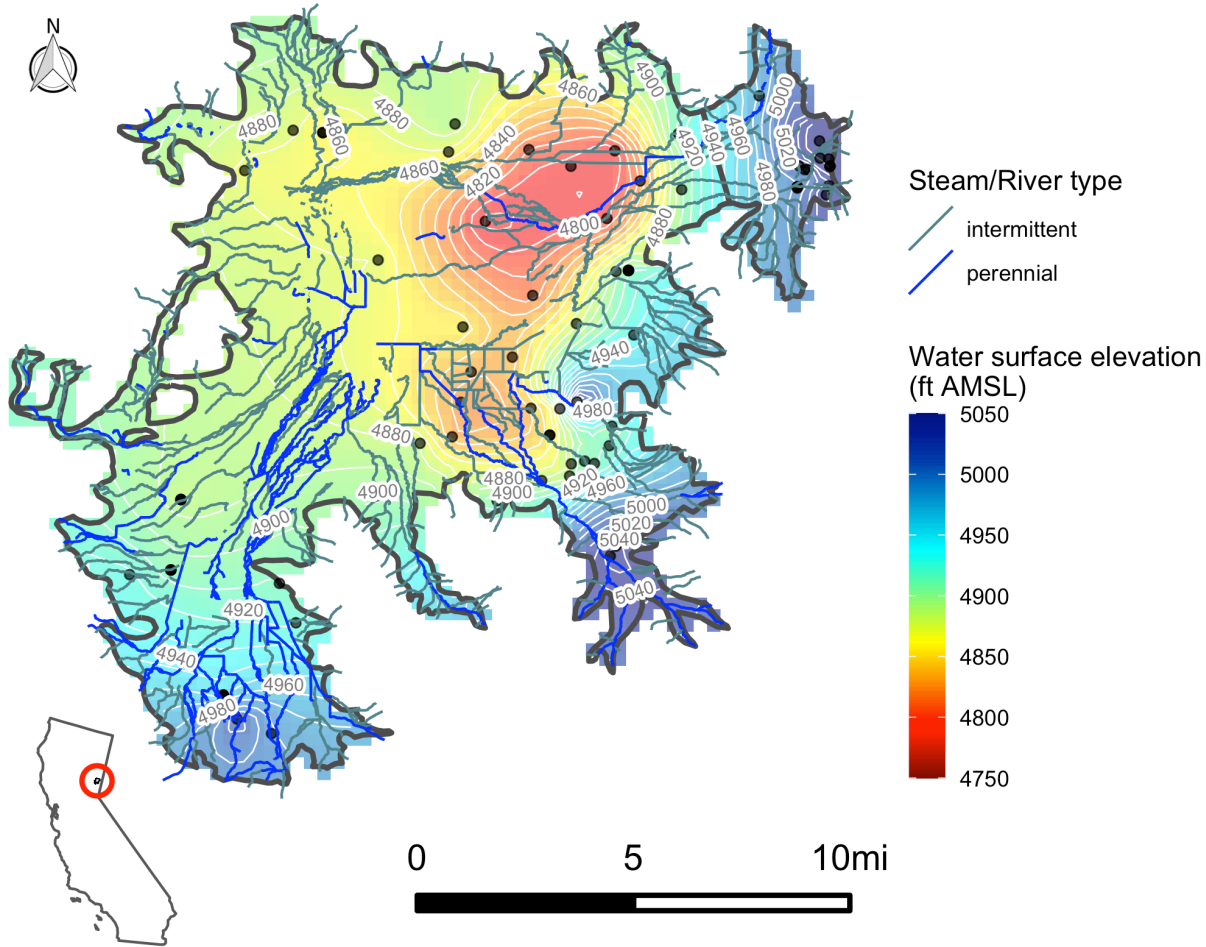
Stream/River type

- intermittent
- perennial

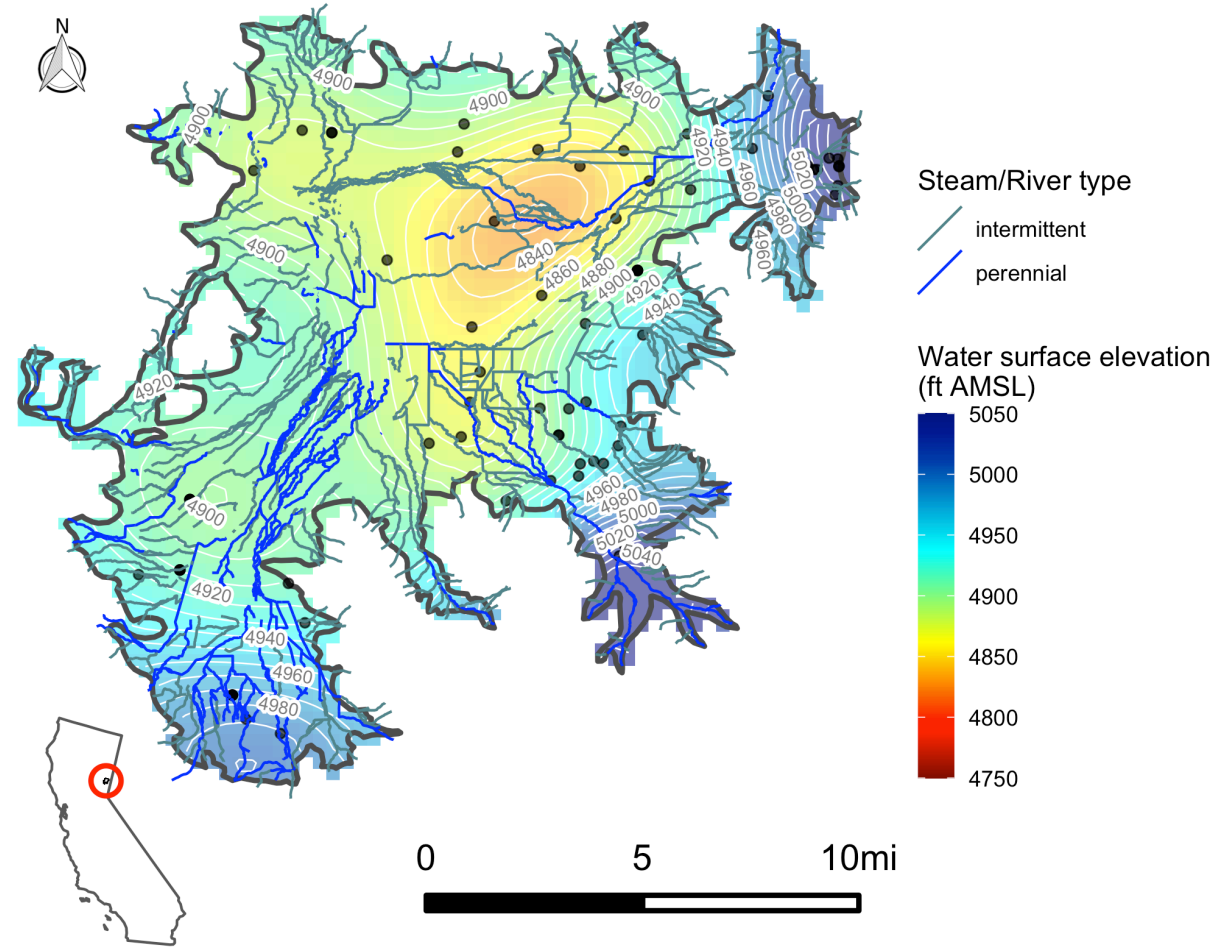


Long term data (2000 – 2019) show seasonal groundwater level oscillation...

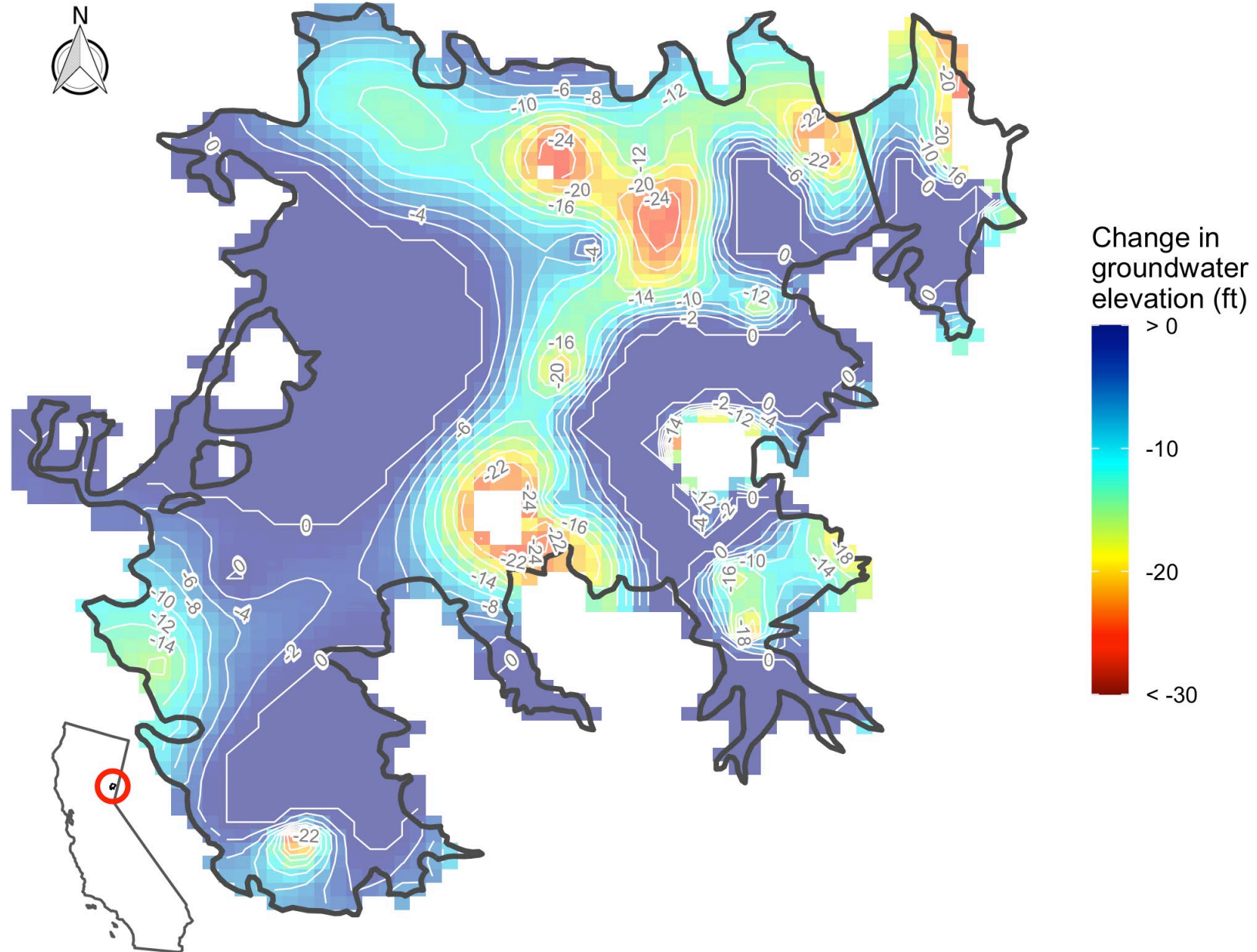
Average groundwater elevation, fall 2000 - 2019



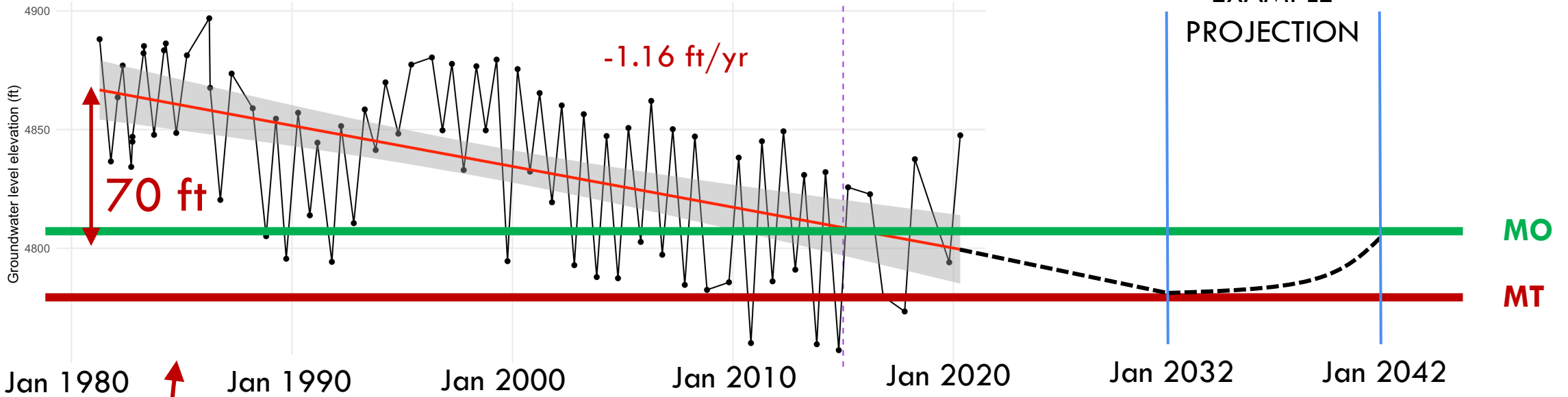
Average groundwater elevation, spring 2000 - 2019



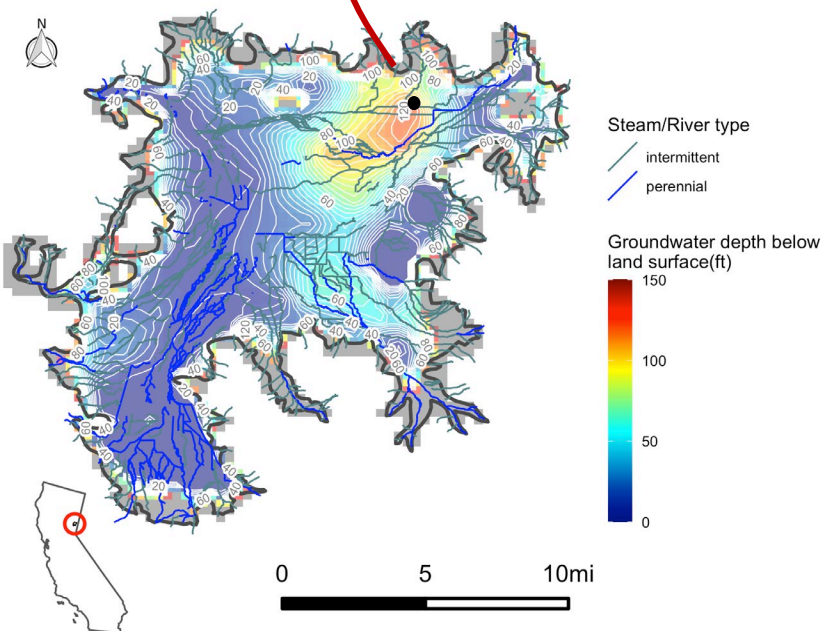
Difference in groundwater elevation between present day and 2000



Well ID: 190 // Depth: 820 ft // Perforated interval: 477 - 801 ft



Average fall groundwater depth below land surface, 2000-2019



Approach to set reasonable sustainable management criteria (SMC): minimum thresholds (MTs) & measurable objectives (MOs).

MTs are to be avoided, MOs are to be achieved.

EXAMPLE: MTs = projected 10 year* decline. MOs = 2015 low.

Provides a “soft landing” for a basin in steady decline, allowing time to pivot through demand reduction and supply augmentation

*the number of years can be adjusted based on modeling and stakeholder input

Objective of the Groundwater Sustainability Plan (GSP) according to SGMA

- Prevent **Undesirable Results** to **beneficial uses/users** through **Sustainable Management Criteria** (SMC) that bring demand into alignment with supply over a 20-year implementation time horizon (or less)
- Protect all **beneficial uses/users** of Sierra Valley groundwater, including (in no particular order) domestic, agricultural, municipal and ecosystem uses/users.



Summary

The Groundwater Sustainability Plan (GSP) must consider significant and unreasonable impact to **ALL** beneficial uses/users of groundwater (**domestic**, **agricultural**, **public**, and **ecosystem**).

Groundwater level decline during the 20-year implementation period is unlikely to stabilize without reduction in groundwater pumping, *unless management actions that increase supply (e.g., conjunctive use) and manage demand (e.g., water conservation, irrigation efficiency) are implemented*. Dry years will continue to result in further groundwater level decline. The groundwater model allow us to test the impact of specific management actions.

The GSP has the most likelihood of success if all parties participate in the planning process, understand and quantify tradeoffs, and agree on the Plan. State intervention and a loss of local control over groundwater management occurs when a Plan is not submitted; when a submitted Plan fails review by DWR; or when a submitted Plan passes review but fails to accomplish the stated Sustainability Goal during the implementation time horizon.