GSP Stakeholder Committee

Stakeholder Committee Meeting – August 27, 2018

Image courtesy: Veronica Adrover/UC Merced

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Agenda

- Welcome, Introductions, and Agenda Review
- Minimum Thresholds
- Projected Water Budget
- Public Outreach Update
- Interbasin Coordination Update
- Public Comment on Items not on the Agenda
- Next Steps and Next Meeting

Stakeholder Committee Meeting Agreements

Guidelines for successful meetings

- Civility is required.
  - Treat one another with courtesy and respect for the personal integrity, values, motivations, and intentions of each member.
  - Be honest, fair, and as candid as possible.
  - Personal attacks and stereotyping are not acceptable.
- Creativity is encouraged.
  - Think outside the box and welcome new ideas.
  - Build on the ideas of others to improve results.
  - Disagreements are problems to be solved rather than battles to be won.
- Efficiency is important.
  - Participate fully, without distractions.
  - Respect time constraints and be succinct.
  - Let one person speak at a time.
- Constructiveness is essential.
  - Take responsibility for the group as a whole and ask for what you need.
  - Enter commitments honestly, and keep them.
  - Delay will not be employed as a tactic to avoid an undesired result.

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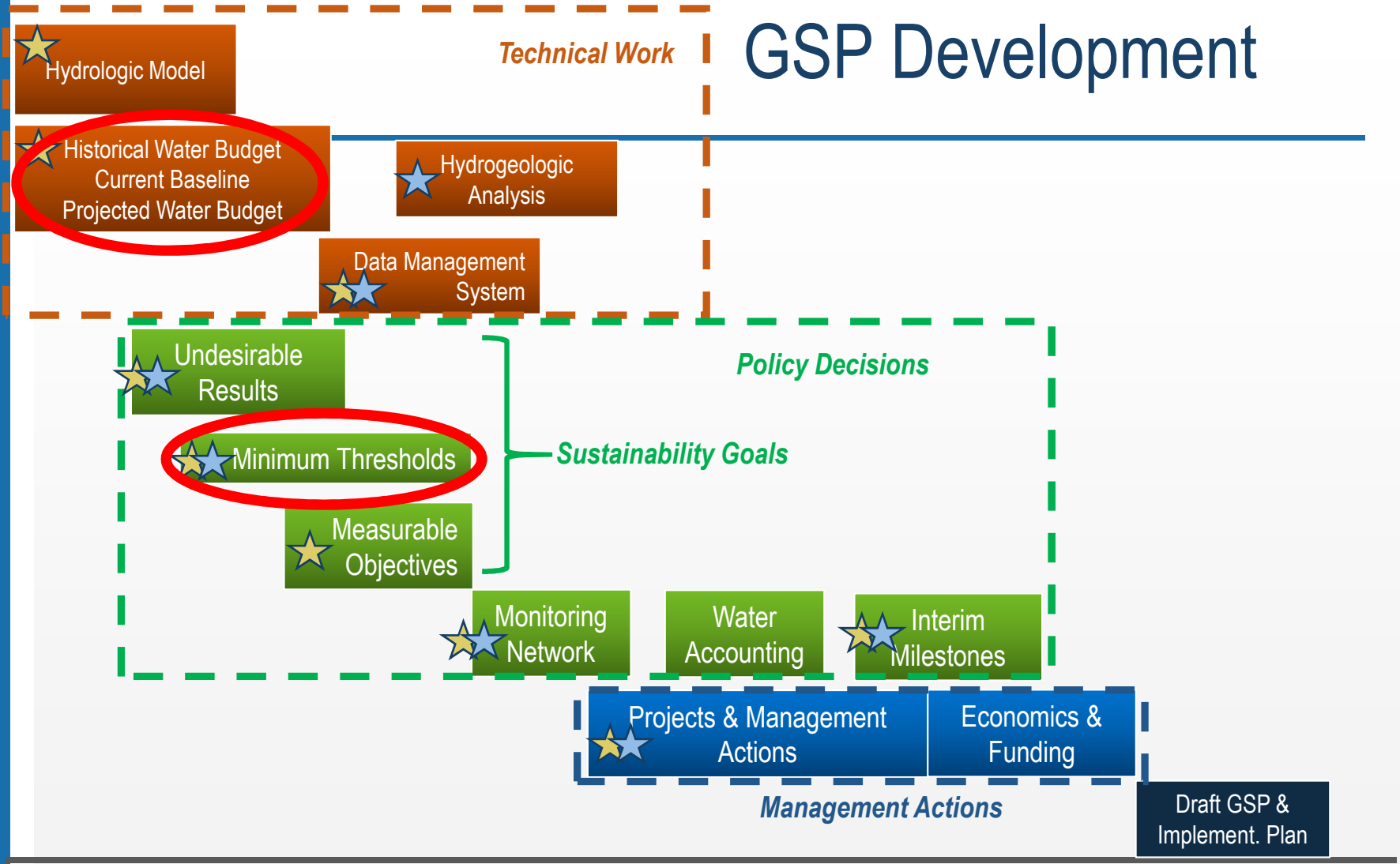
GSP Development



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Minimum Thresholds

Image courtesy: Veronica Adrover/UC Merced

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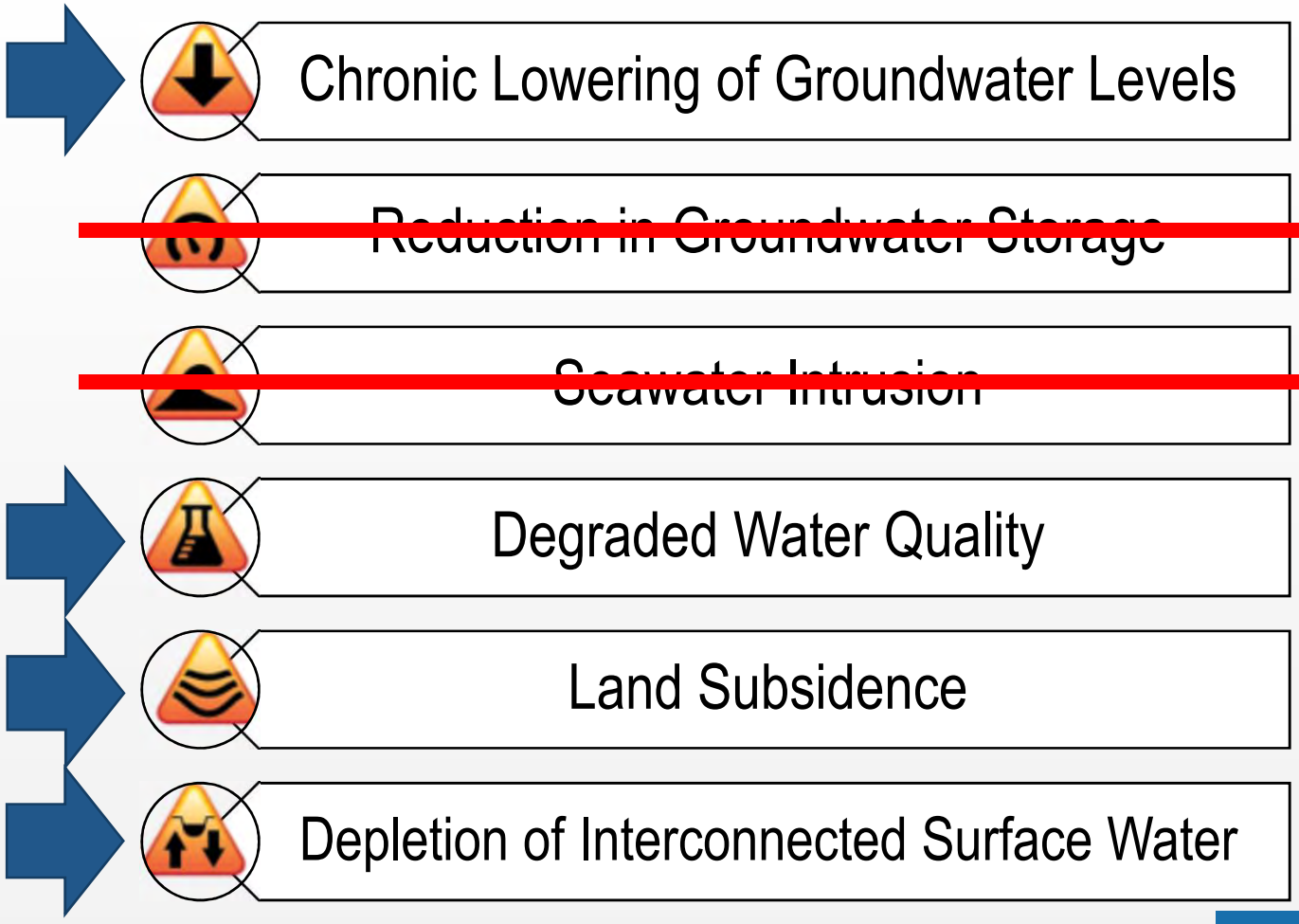
Minimum Thresholds Need to be Developed for All Six Sustainability Indicators



Storage addressed by bringing budget into balance

Salinity Addressed Under Water Quality

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Undesirable Results – Comments from July

Groundwater Elevation

1. Cost of pumping water
2. Harder to recharge (with decline in levels)
3. Energy requirements increasing
4. Shallow wells going dry
5. Well replacement costs
6. Decline in yields

Degraded Water Quality

1. Human consumption
2. Reduced crop yields
3. Soil impacts
4. Public health + sanitation

Subsidence

1. Loss of storage
2. Infrastructure impacts
3. Irreversible system impacts
4. Flood flow impacts
5. Planned projects impacts

Interconnected Surface Water

1. SED impacts
2. Environmental quality + habitat

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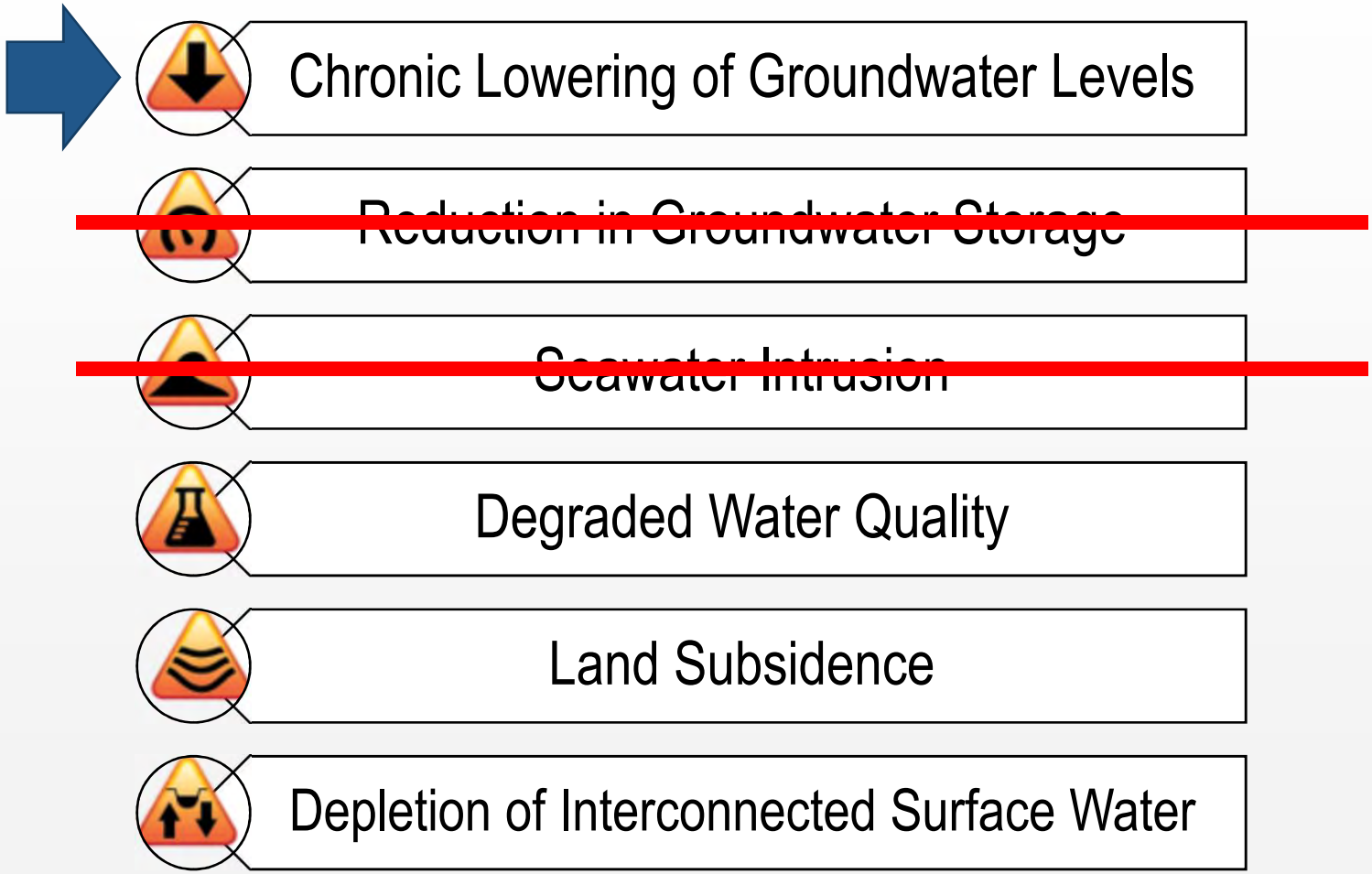
Minimum Thresholds Need to be Developed for All Six Sustainability Indicators



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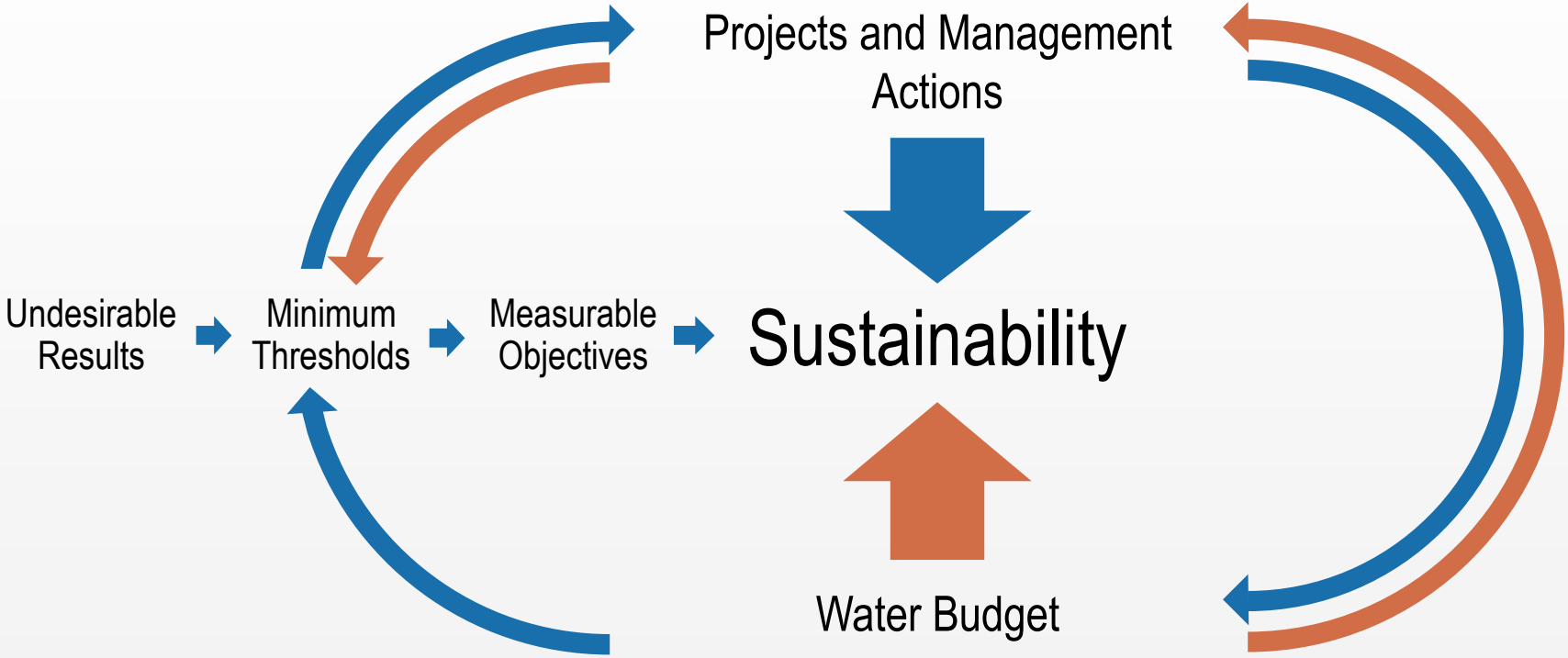
Developing Minimum Thresholds is an Iterative Process



Minimum Thresholds – Approach
Datasets to Identify Minimum Thresholds

- Historical Low Groundwater Elevations
  - Have we seen URs at past low groundwater levels?
  - If no historical indication of URs, then thresholds can be at this level or deeper
  - If indication of URs, thresholds can be set above that historical level or at 1/1/2015 levels
- Domestic well depths
  - Typically the shallowest wells, first impacted from declining groundwater elevations
  - Absent known historical URs, domestic well depth can define the minimum threshold
    - Minimum depth
    - Defined percentile

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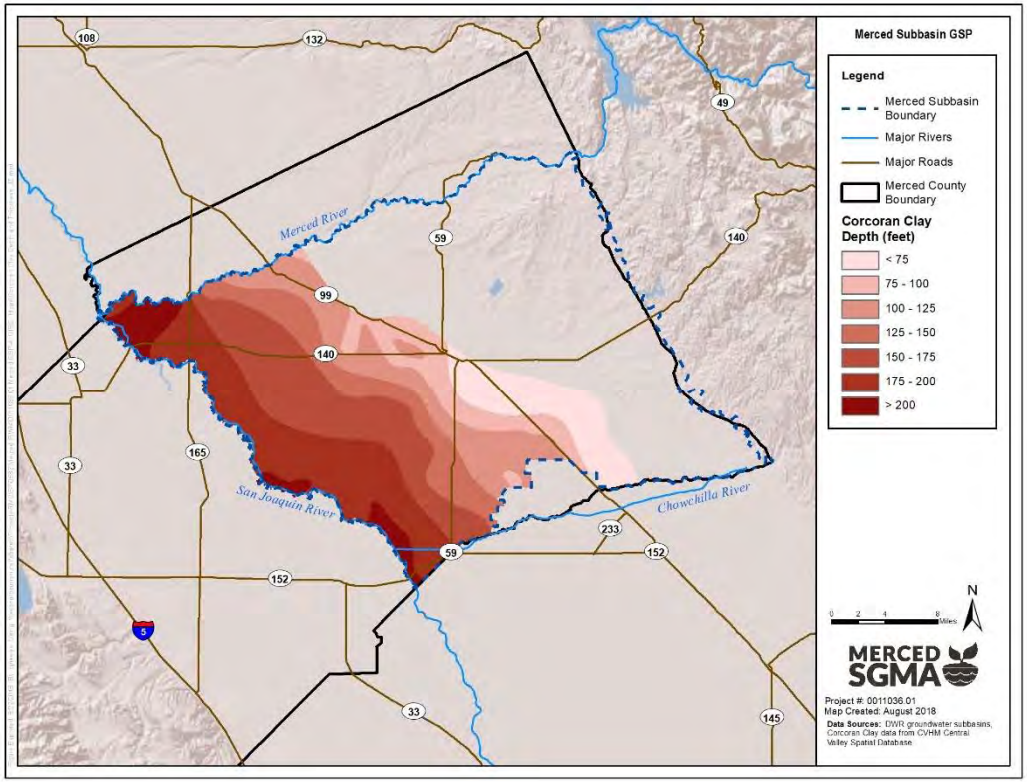
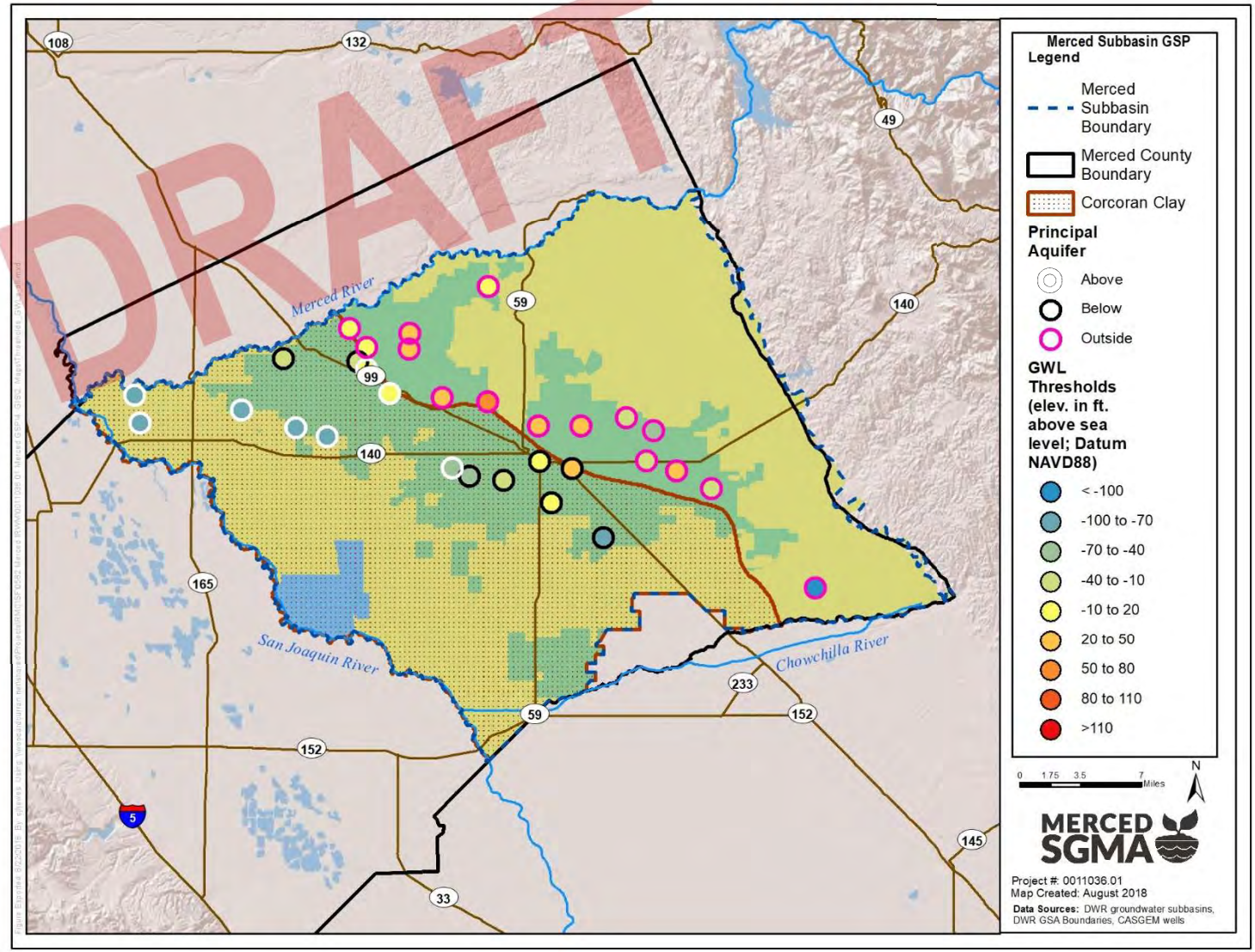
Minimum Thresholds

- Thresholds are required at each monitoring location
- Thresholds defined using the same methodology for all 3 principal aquifers:
  - Outside Corcoran
  - Above Corcoran
  - Below Corcoran



Minimum Thresholds – Approach



Minimum Thresholds – Approach

- Minimum threshold is defined as the shallowest of either
  - Historical low groundwater elevation at the monitoring well, minus a buffer (range of min & max GWLs from 2008-2018) – this assumes that over the next 20 years, GWE will decline at approximately half the max rate seen over the past 10 years
  - UNLESS this would dewater more than 25% of the shallowest nearby domestic wells – in this case, threshold was increased to protect 75% of nearby wells

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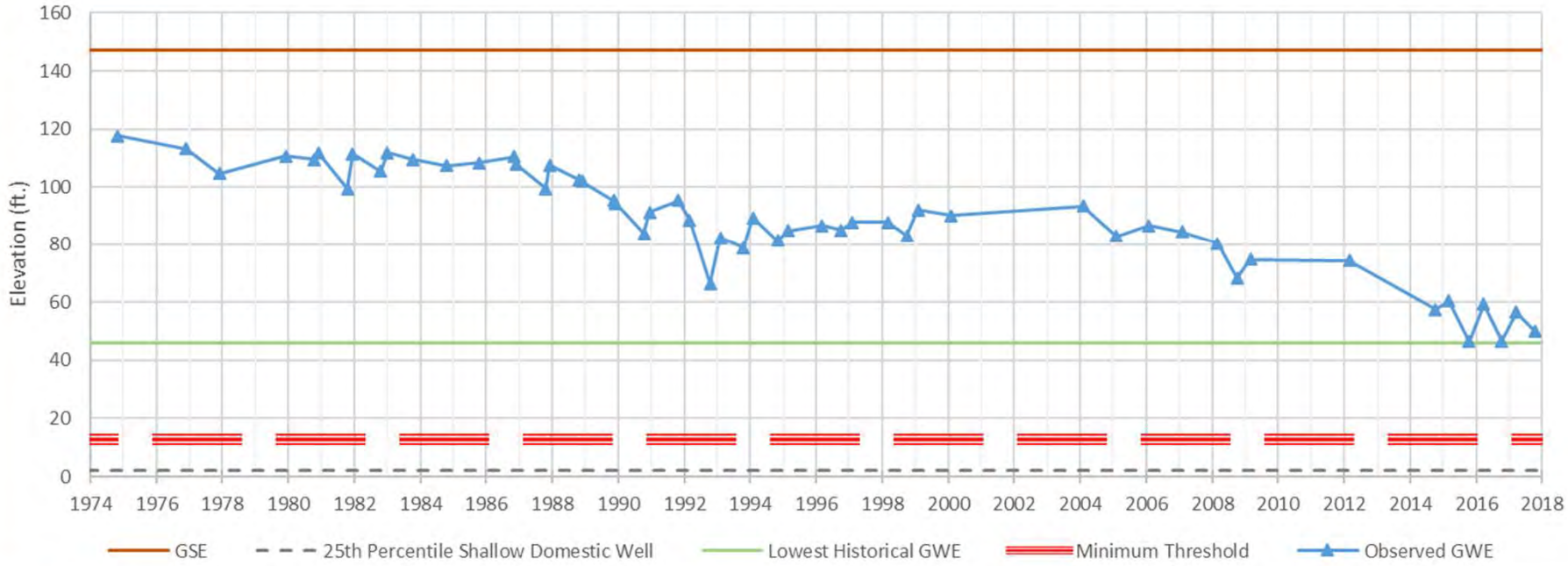
Minimum Thresholds – Example

Example: 373732N1206679W001 - GWE Minimum Threshold



Minimum Thresholds – Approach

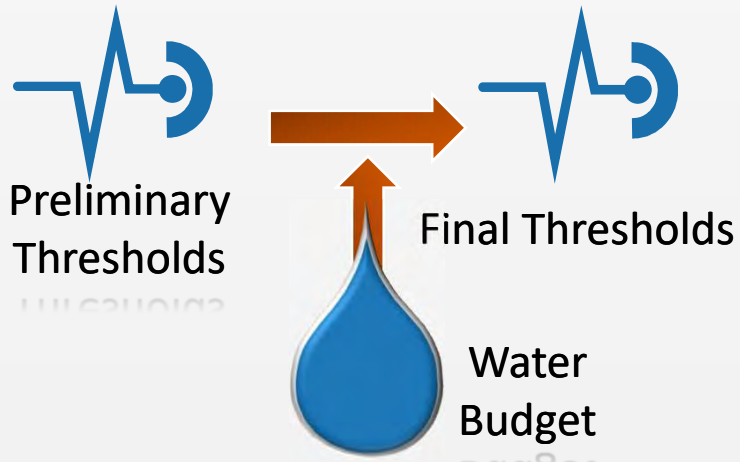
Example: 372734N1203071W002 - GWE Minimum Threshold

Next Steps

- Update analysis with additional domestic wells from Merced County database
- Coordinate with GSAs to identify wells in gap areas
- Compare potential thresholds to 2017 elevations

What Comes Next?

- Projected Water Budget will be used to understand average sustainable pumping rates basin-wide
- Projects and Management Actions need to be identified to include supply and demand-side measures to achieve sustainability
- Depending on rate of project implementation, groundwater elevation thresholds may need to be adjusted



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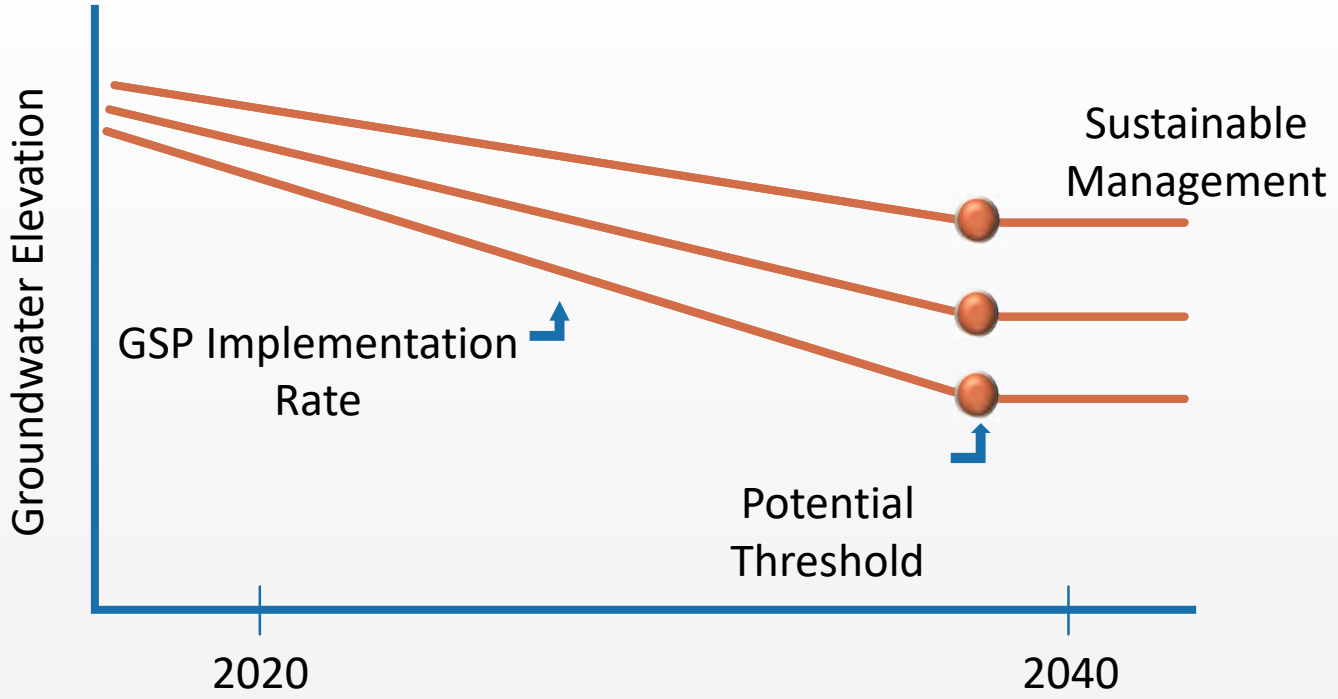
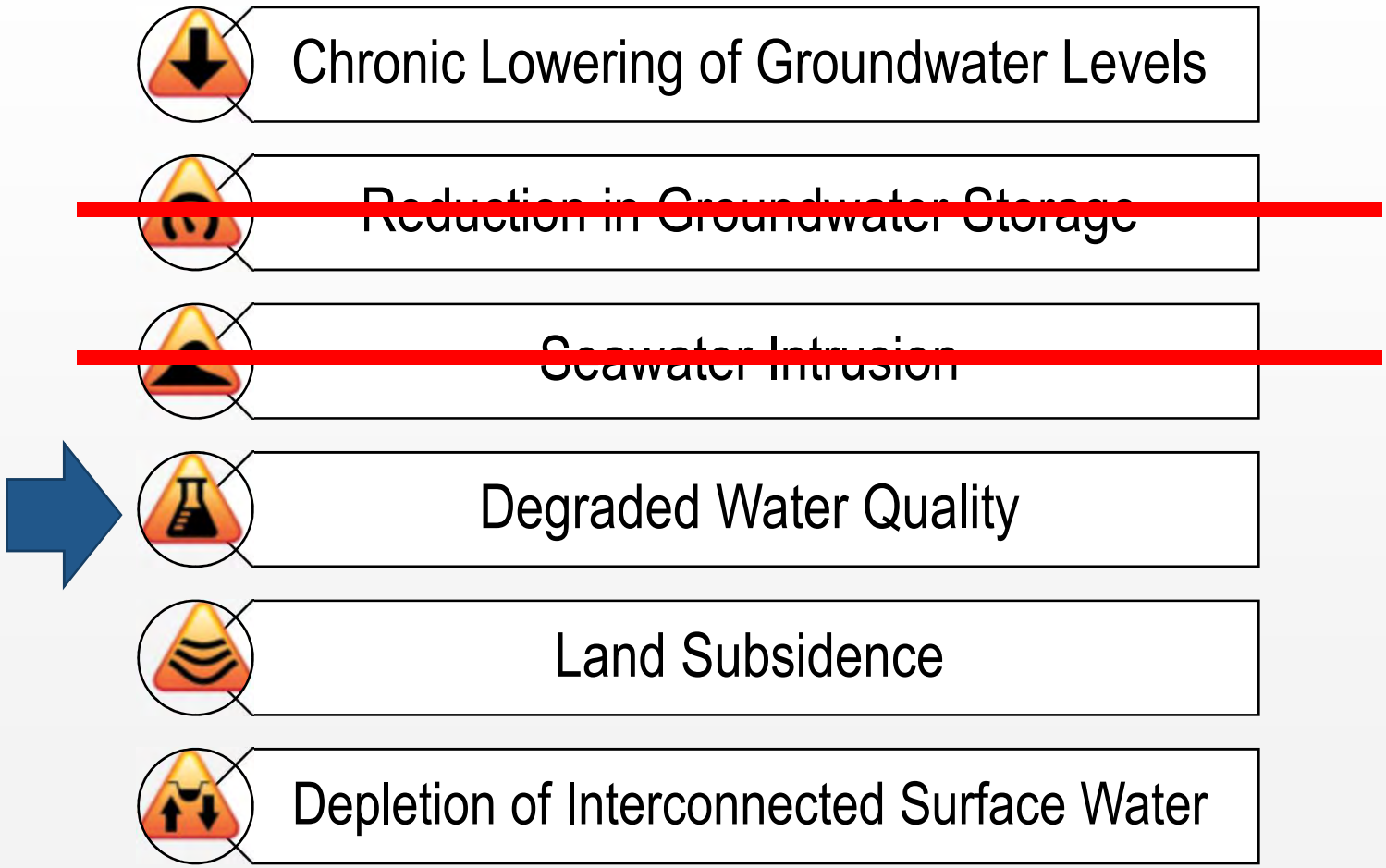
Rate of Plan Implementation May Necessitate Changes in GW Elevation Thresholds



Minimum Thresholds Need to be Developed for All Six Sustainability Indicators



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Minimum Thresholds – Water Quality

- Several constituents of concern in the basin
- GSP must focus on a causal nexus between water quality and SGMA groundwater management

Water Quality Constituents of Concern

MERCED COUNTY DEPARTMENT OF PUBLIC HEALTH
Division of Environmental Health
260 East 15th Street, Merced, CA 95341-6216
(209) 381-1100 fax (209) 384-1593

Adverse Groundwater Quality by Area in Merced GSP*

*Adjusted from list sent by Ron Rowe to include only areas within Merced GSP

Atwater	Nitrates, DBCP[2], EDB[2], TCE[3] and 1,2,3 TCP[2&3]
Cressey	Nitrates & DBCP
El Nido	Nitrates, Arsenic, Sodium, & TDS
Le Grand	Hard Water[1]
Livingston	Nitrates, Arsenic, DBCP, EDB, TCE and 1,2,3 TCP
McSwain Area	Nitrates, DBCP, EDB, TCE and 1,2,3 TCP
Merced	Nitrates & Hard Water
Planada	DBCP & Hard Water
Stevinson	Arsenic, Sodium, TDS, Manganese, Chlorides, Hard Water, & Tannins
Winton	Nitrates, DBCP, EDB, TCE and 1,2,3 TCP

[1] Hard Water = Total hardness > 150 mg/L (Mg/L = milligrams per liter = parts per million)
[2] Dibromochlopropane (DBCP), Ethylene Dibromide (EDB) and 1,2,3 Trichloropropane (1,2,3 TCP) are soil fumigants, use of DBCP and EDB was banned in 1977.
[3] TCE and 1,2,3 TCP are solvent/degreases.
[4] TDS refers to the total dissolved solids in water.

General Notes:

a. Chlorides, manganese, hard water, iron, tannins, TDS, and sodium in drinking water are, of themselves, not known causes of health problems.

b. The water quality information above refers to private wells in unincorporated areas and does not necessarily apply to the municipal water supply of the towns and cities.

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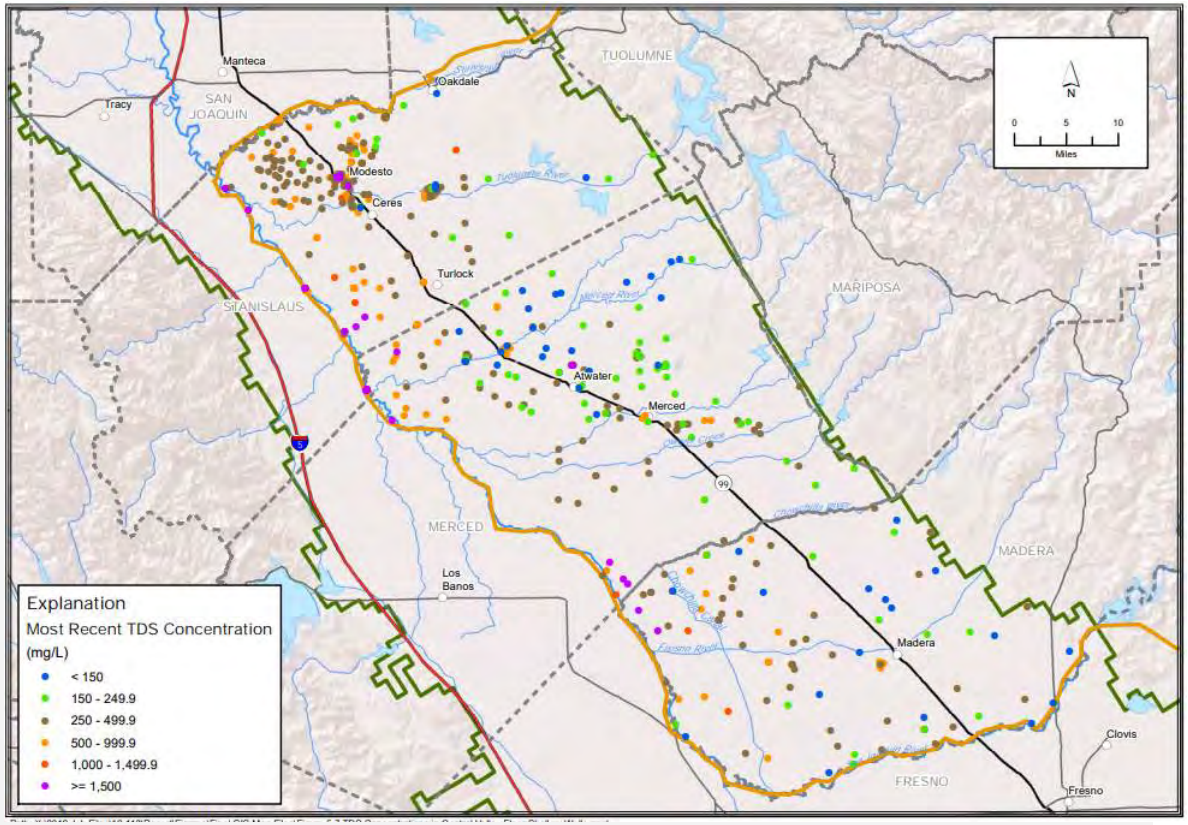
Salinity Issues

Primary Sources of High TDS Water

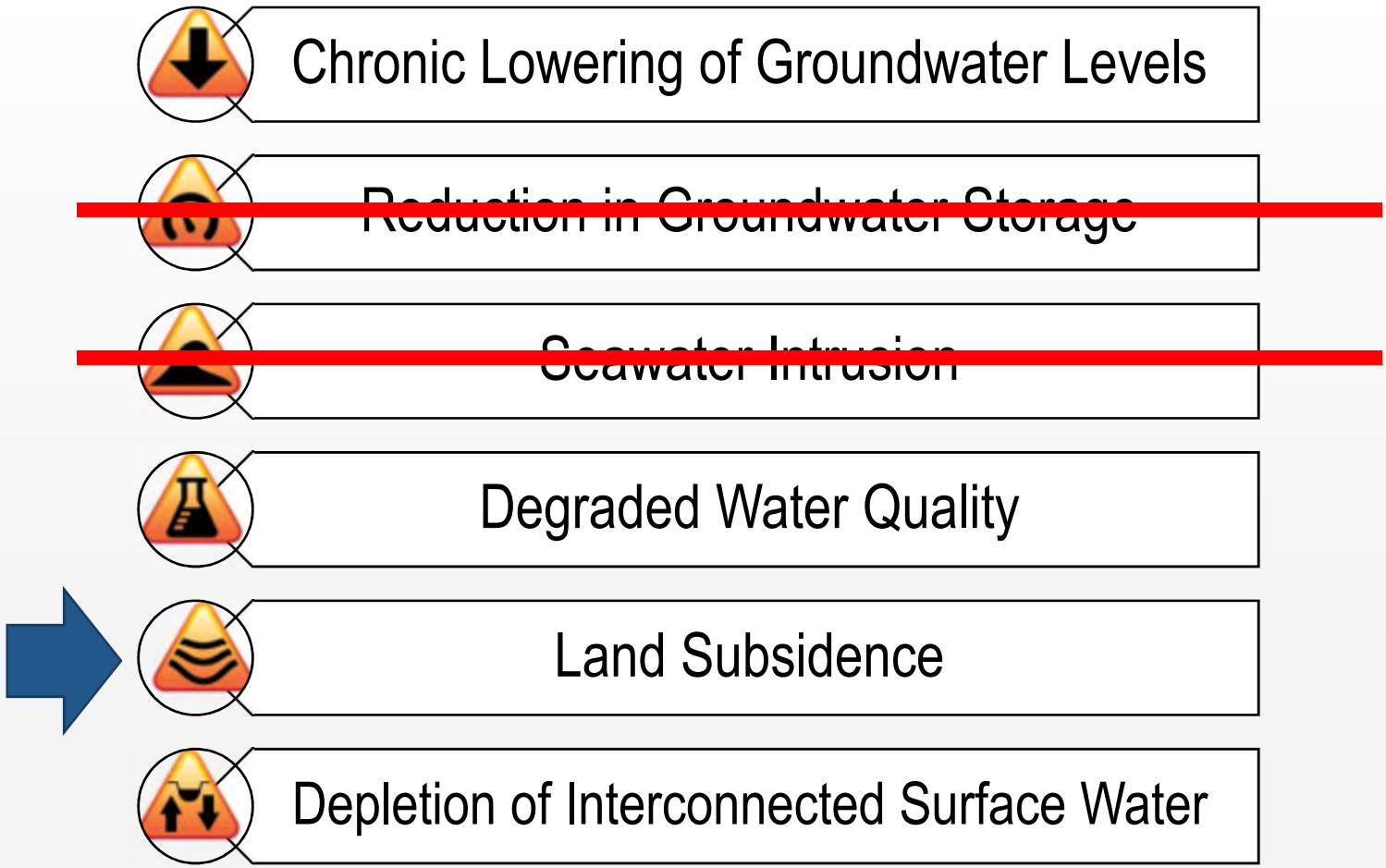
1. Saline, Connate Water from Marine Sedimentary Rocks
   a. Pumping of Wells - results in upwelling saline brines
   b. Corcoran Clay – Naturally impedes high TDS groundwater, but wells perforated create channels for TDS to migrate
2. Migration of poor quality water from west



Minimum Thresholds – Water Quality

- Thresholds are not appropriate for many constituents
  - Cannot be managed through SGMA
  - Are addressed through other programs (CV-SALTS, ILRP, RWQCB, EPA, others)
  - Plumes (Cal/Federal EPA, Regional Board, DTSC)
- Nexus exists for migration of low-quality (higher-TDS) water from the west / northwest
  - Control quality of recharge water

Minimum Thresholds Need to be Developed for All Six Sustainability Indicators



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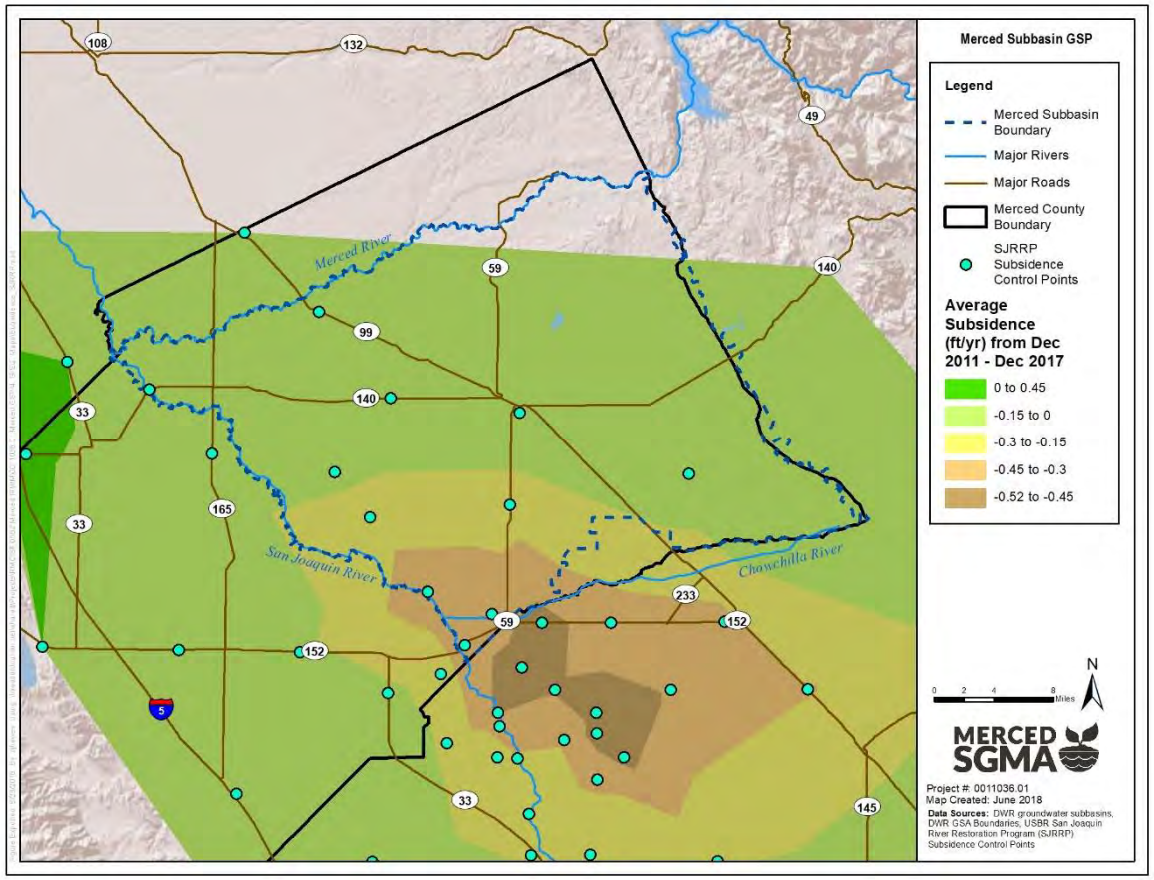
Minimum Thresholds – Land Subsidence

Average Annual Subsidence Rate (feet/year) Dec 2011 – Dec 2017



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Next Steps

- Subsidence thresholds can be defined through
  - Subsidence rates
  - Groundwater elevation as a proxy
- Recommended approach is groundwater elevation
  - GSAs can actively manage elevations
  - Subsidence rates may already be locked-in, with long-term subsidence due to pre-2015 groundwater elevations
  - Thresholds likely set at levels prior to 1/1/2015
- Subsidence rates may be reconsidered for consistency with neighboring subbasins

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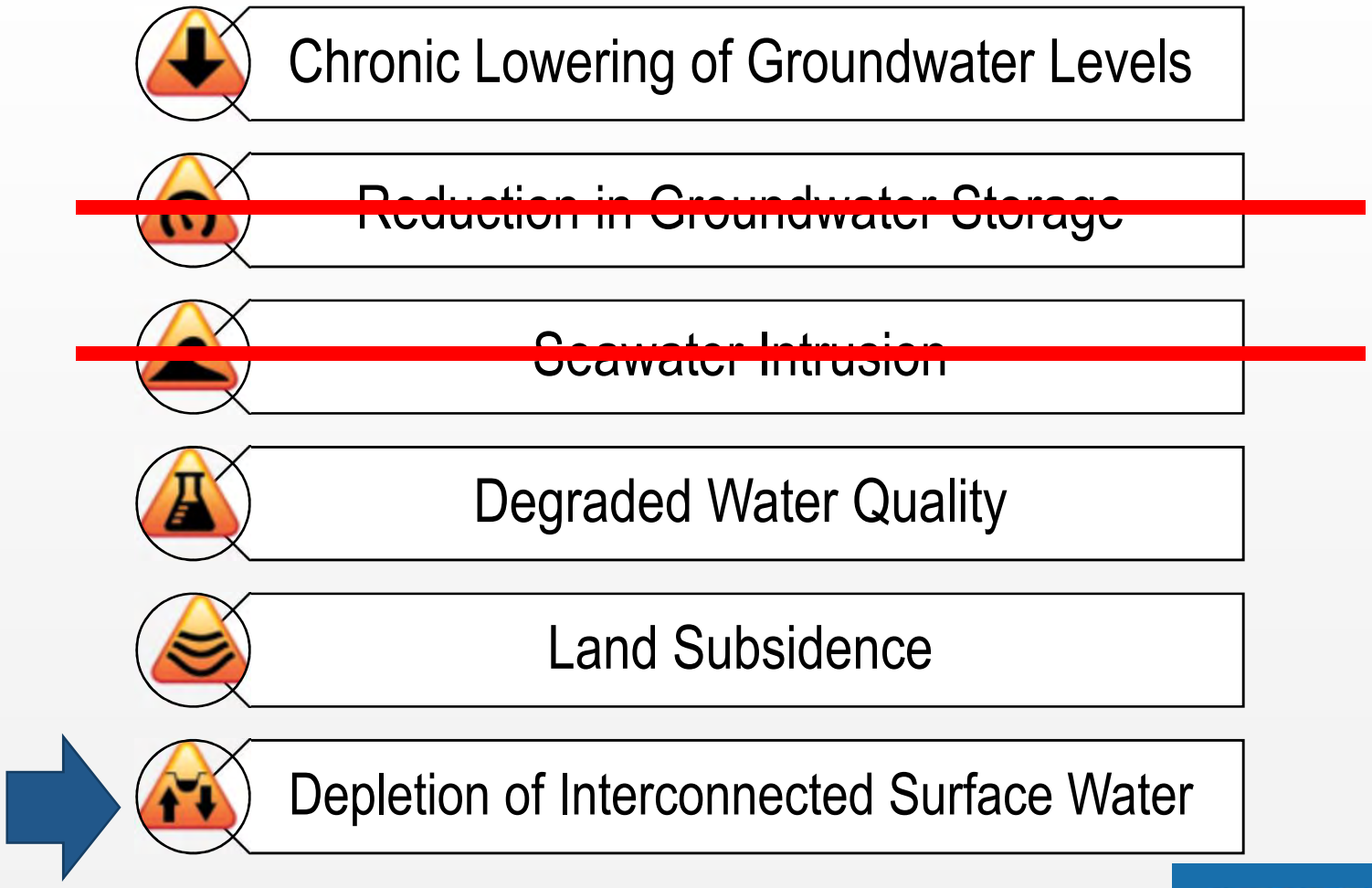

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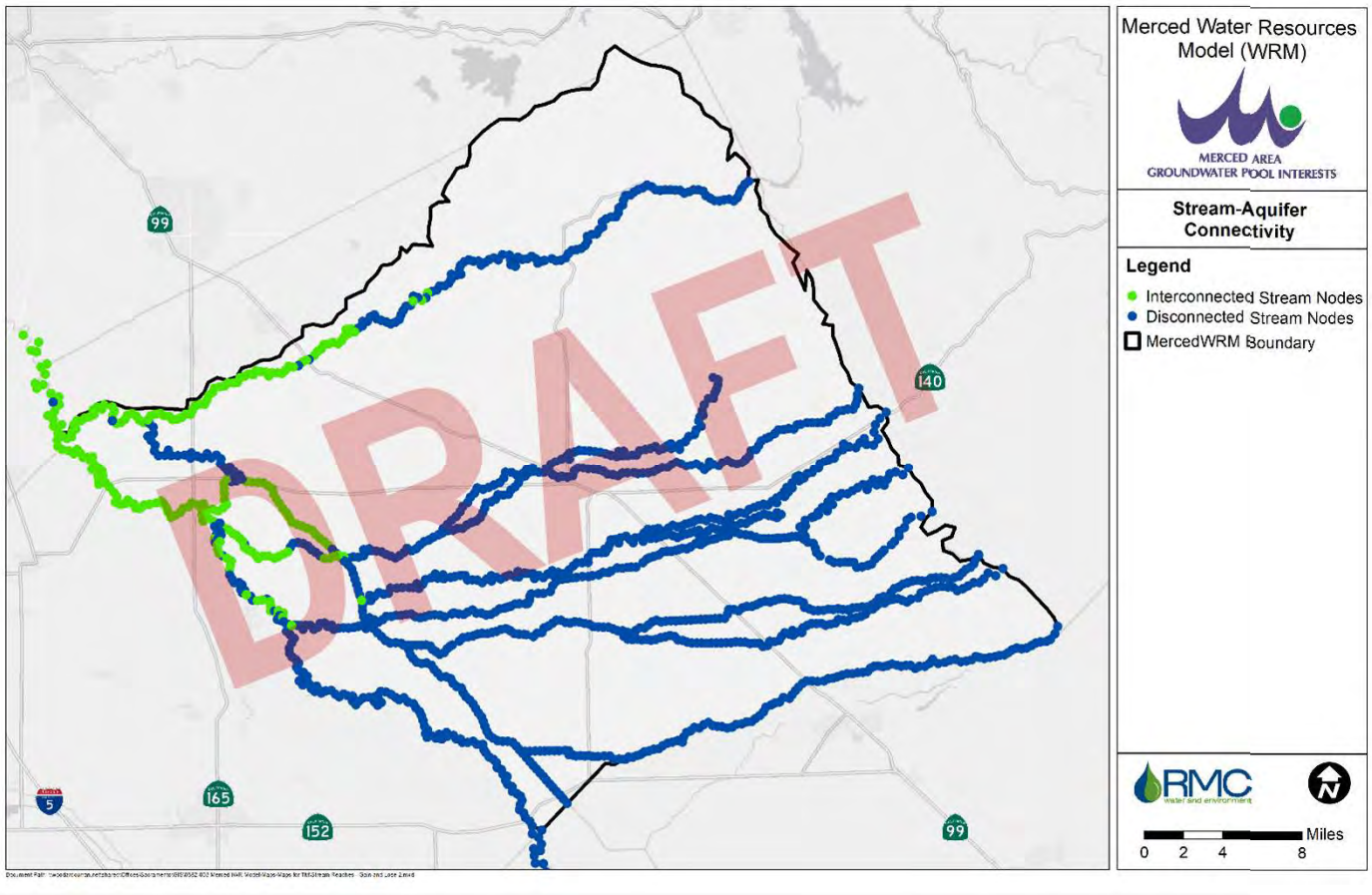
Minimum Thresholds – Depletion of Interconnected Surface Water

- Stream-Aquifer Connectivity Reveals Merced and San Joaquin Rivers as Potentially Affected



Next steps

- Develop proposed groundwater elevation thresholds
- Compare to groundwater elevation sustainability indictor thresholds
- Review with GSAs

Projected Water Budgets

Image courtesy: Veronica Adrover/UC Merced

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Water Budgets

Historical Water Budget

Uses historical information for hydrology, precipitation, water year type, water supply and demand, and land use going back a minimum of 10 years.

Current Conditions

Holds constant the most recent or "current" data on population, land use, year type, water supply and demand, and hydrologic conditions.

Projected Water Budget

Uses the future planning horizon to estimate population growth, land use changes, climate change, etc.

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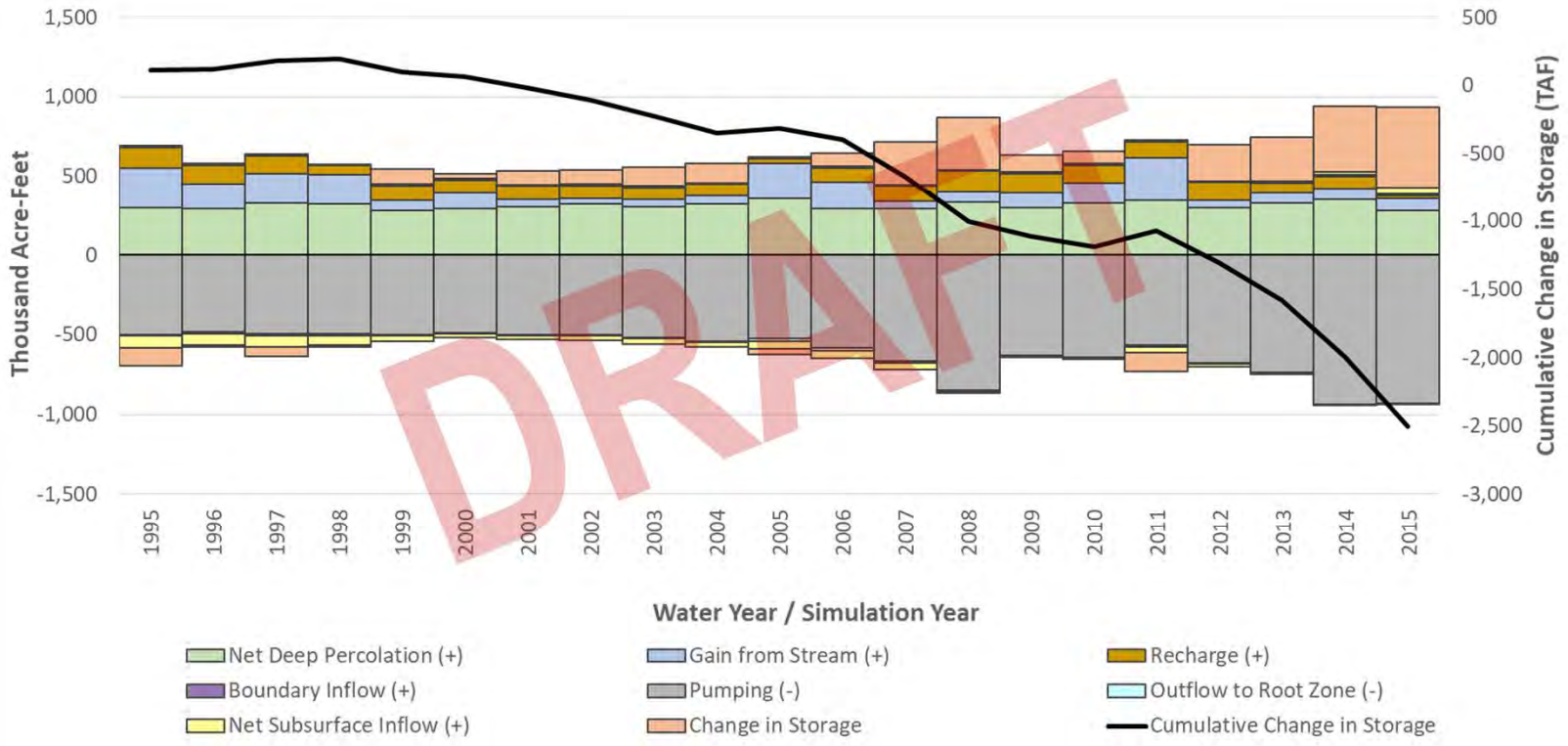
Historical Water Budget (WY 1995-2015)

Merced Groundwater Subbasin



Current Conditions Baseline - Assumptions

- Hydrologic Period: Water Years 1969-2018 (~50-Year Hydrology)
- River Flows
  - Merced: MercedSIM
  - San Joaquin: CalSim
  - Local Tributaries: Historic Records
- Land Use and Cropping Patterns: 2014 LandIQ
- Urban Water Use: 2013
- Surface Water Deliveries
  - MID
  - SWD
  - TIWD
  - Chowchilla WD

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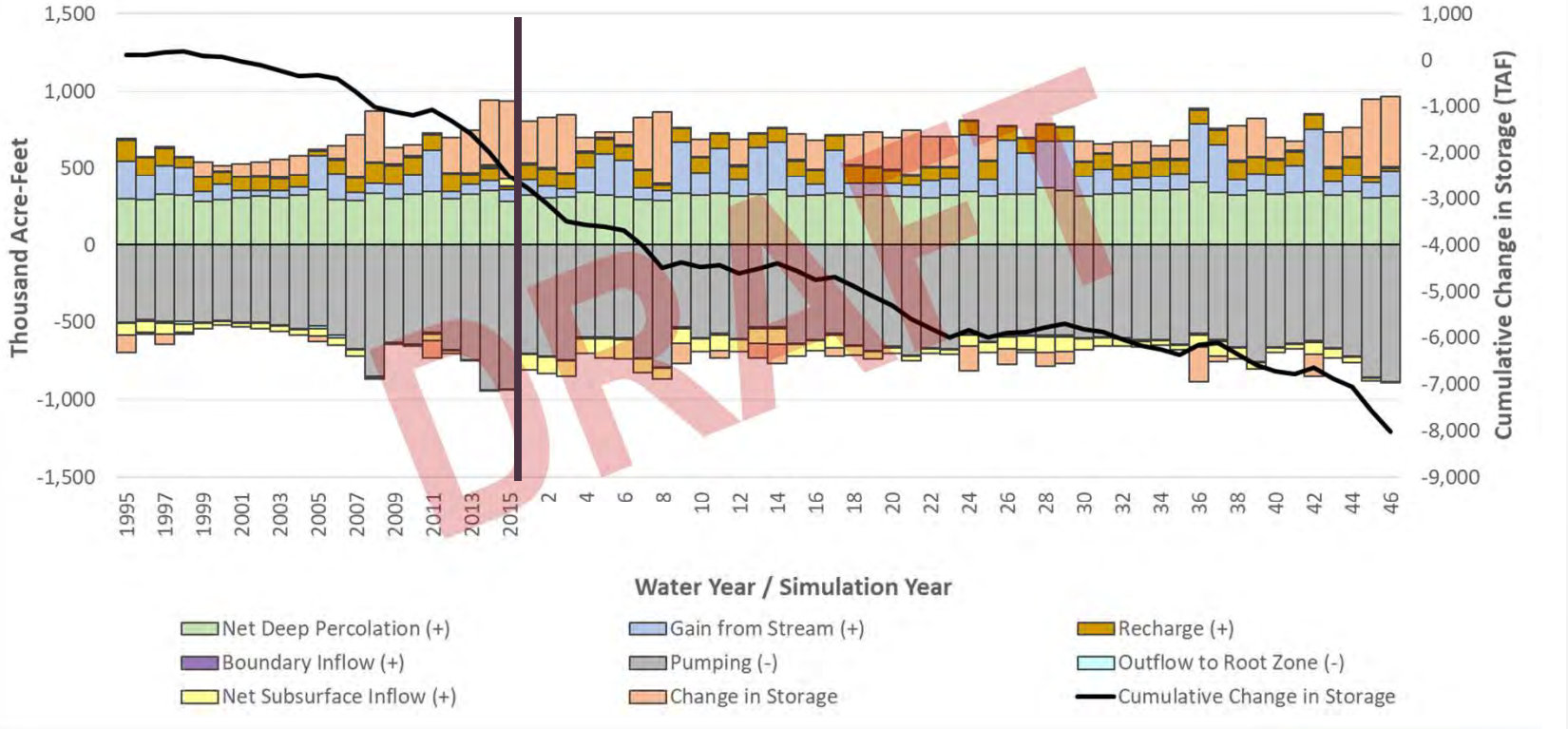
Current Condition Baseline Groundwater Budget

Merced Groundwater Subbasin



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- River Flows
  - Merced: MercedSIM
  - San Joaquin: CalSim
  - Local Tributaries: Historic Records
- Land Use and Cropping Patterns:
  - 2013 CropScape modified per locally supplied data
- Urban Water Use:
  - General Plan Buildout Conditions
  - Basin Average GPCD: 300
- Surface Water Deliveries
  - Merced Irrigation District
  - Stevinson Water District
  - Merquin County Water District
  - Turner Island Water District
  - Chowchilla Water District

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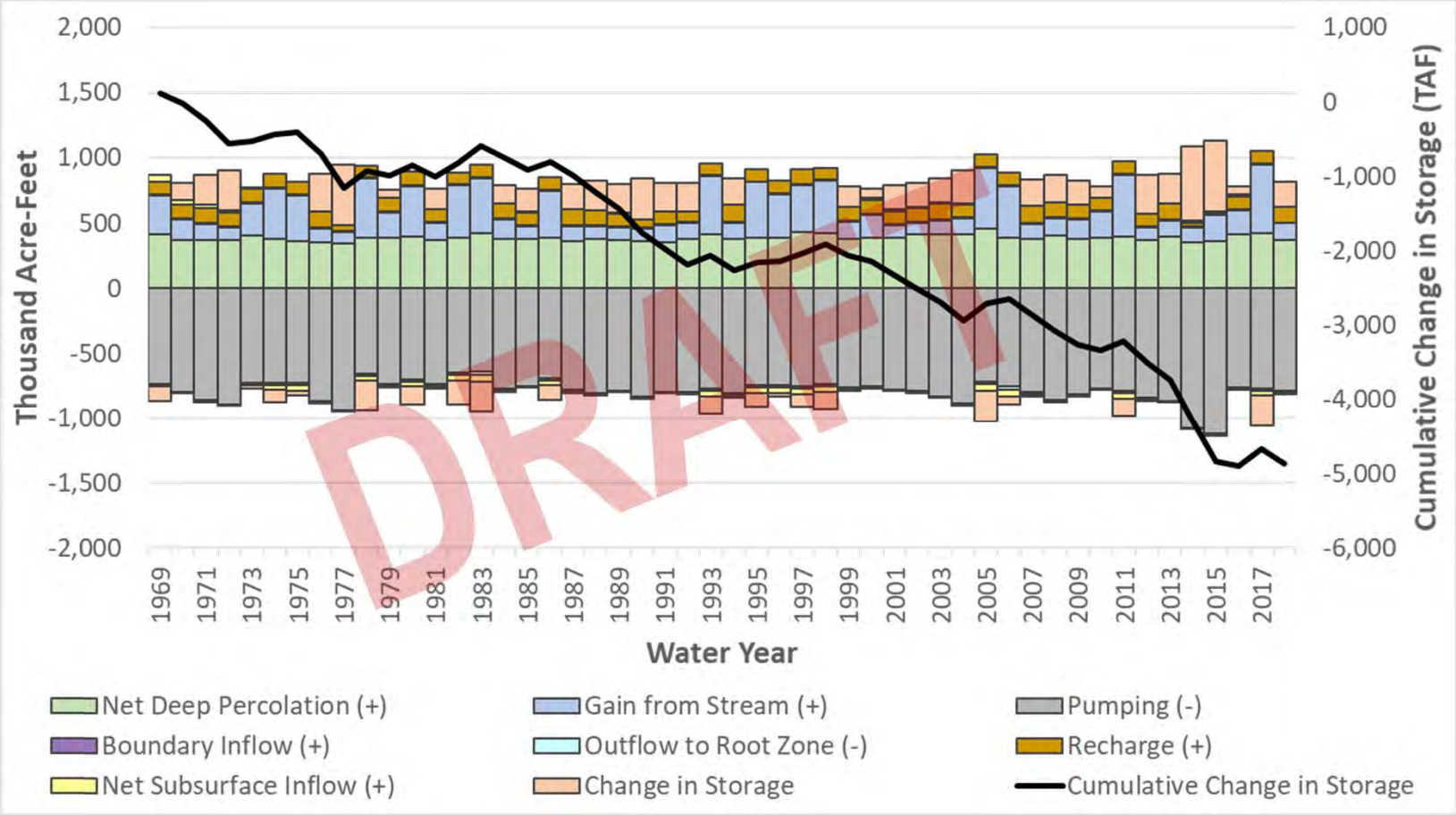
Projected Conditions Baseline Groundwater Budget

Merced Groundwater Subbasin



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Public Outreach Update

Image courtesy: Veronica Adrover/UC Merced

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Public Outreach Update

Public Workshop Presentation – August 2

- What is SGMA?
- What is a GSA?
- What is a GSP?
- Current Merced Subbasin Groundwater Conditions
- Undesirable Effects of Overuse of Groundwater
- Groundwater Sustainability and What it Means

Public Outreach Update

- **Sample Questions Asked about SGMA, GSAs and GSPS**
  - What is the approval process from the State?
  - Does the public get to review the draft GSP?
- **Sample Questions Asked about Current Groundwater Conditions**
  - For the groundwater model being used, will there be “ground truthing” or validation of the model with real time well data?
  - When it comes to measuring well depths, will it be the responsibility of each individual to recharge their own well if the elevation drops?
  - Are people going to have to track their individual well water usage?

Public Outreach Update

- **Discussion with Attendees about Undesirable Effects**
  - Improved land use planning is important
  - Coordination with private well groundwater use is needed
  - More education about water use efficiency is needed
  - More surface water is needed
  - Lower groundwater levels negatively affect drinking water supplies for rural schools
  - No water transfers out of the Merced Subbasin
  - Water shortages increase contamination
  - Smaller farmers are not able to afford deeper wells

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Public Outreach Update

- **Discussion about Sustainability and What it Means**
  - Farming and economics – need to keep the economy healthy, water is the driver of the whole area
  - Find ways to recharge the groundwater
  - Increase groundwater banking
  - Harvest rainwater/stormwater in urban areas
  - Use the groundwater model for land use decisions
  - Capture Merced River flood flows
  - Consider use of groundwater credits
  - Put recharge areas in subsidence areas
  - Supply surface water to subsidence areas
  - Capture urban runoff in subsidence areas
  - Need federal funding to pay for all this

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Interbasin Coordination Update

Image courtesy: Veronica Adrover/UC Merced

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Questions/Comments from Public

Image courtesy: Veronica Adrover/UC Merced

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Next Steps

Image courtesy: Veronica Adrover/UC Merced

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What's coming up next?

- Next Stakeholder Committee meeting – September 24th
  - Hydrogeologic Conceptual Model
  - Data Management System
- Planning activities underway
  - Initial sections of GSP under development
  - Using model to refine water budget, develop and refine sustainable yield

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