GSP Coordinating Committee

Coordinating Committee Meeting – August 27, 2018

Merced Irrigation-Urban GSA
Merced Subbasin GSA
Turner Island Water District GSA-1

Image courtesy: Veronica Adrover/UC Merced

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Agenda

1. Call to Order
2. Approval of Minutes for July 23, 2018
3. Stakeholder Committee Update
4. Presentation by Woodard & Curran on GSP Development
    a) Minimum Thresholds
    b) Hydrogeologic conceptual model (HCM)
    c) Projected Water Budget and Sustainable Yield
    d) Data Management Approach and DMS Demo

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Agenda

5. Public Outreach Update
6. Coordination with Neighboring Basins
7. Update DWR's SGMA Technical Support Services (TSS) opportunity
8. Public Comment
9. Next Steps and Adjourn

Approval of Minutes

Image courtesy: Veronica Adrover/UC Merced

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Stakeholder Committee Update

Image courtesy: Veronica Adrover/UC Merced

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Minimum Thresholds

Image courtesy: Veronica Adrover/UC Merced

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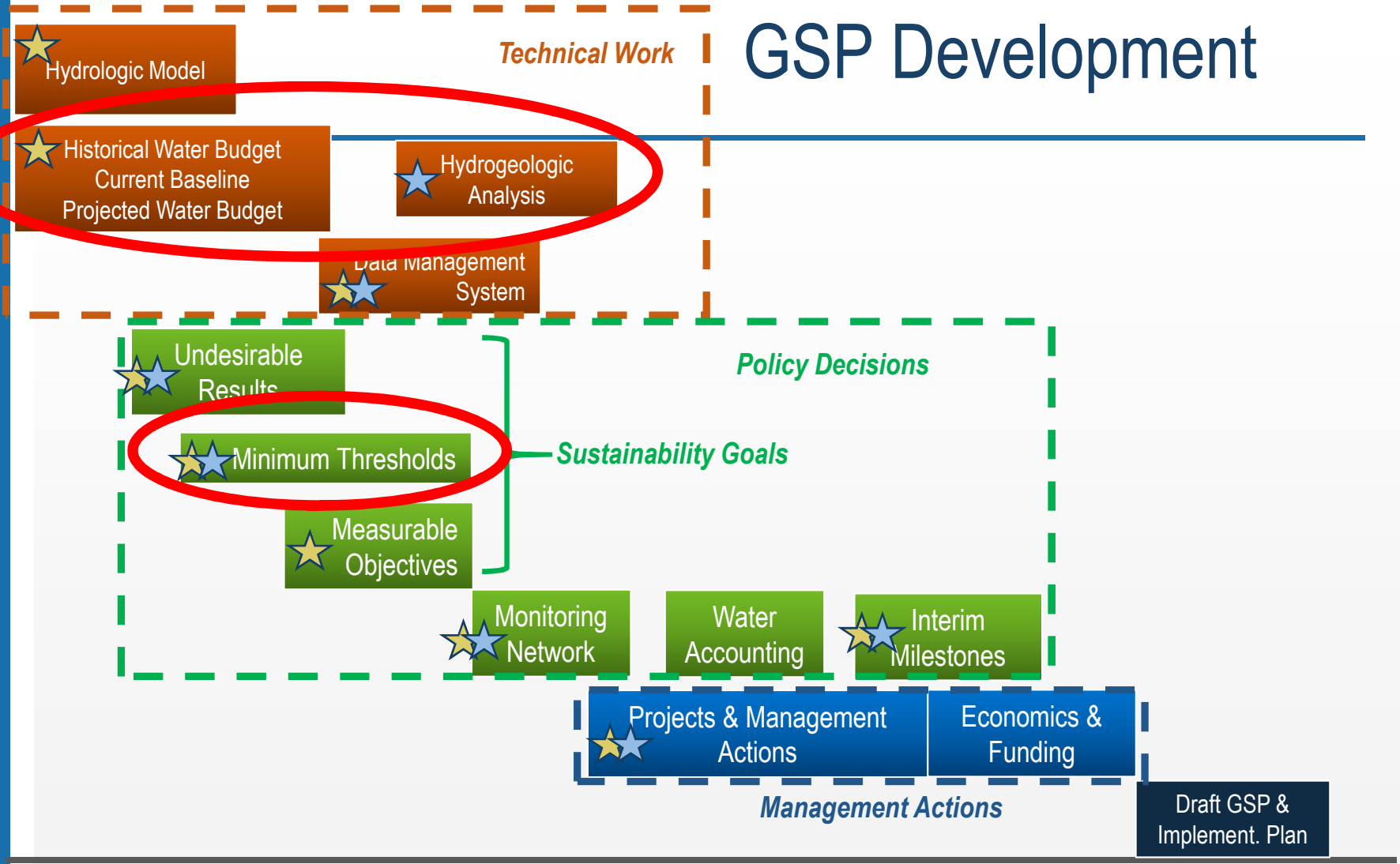
GSP Development



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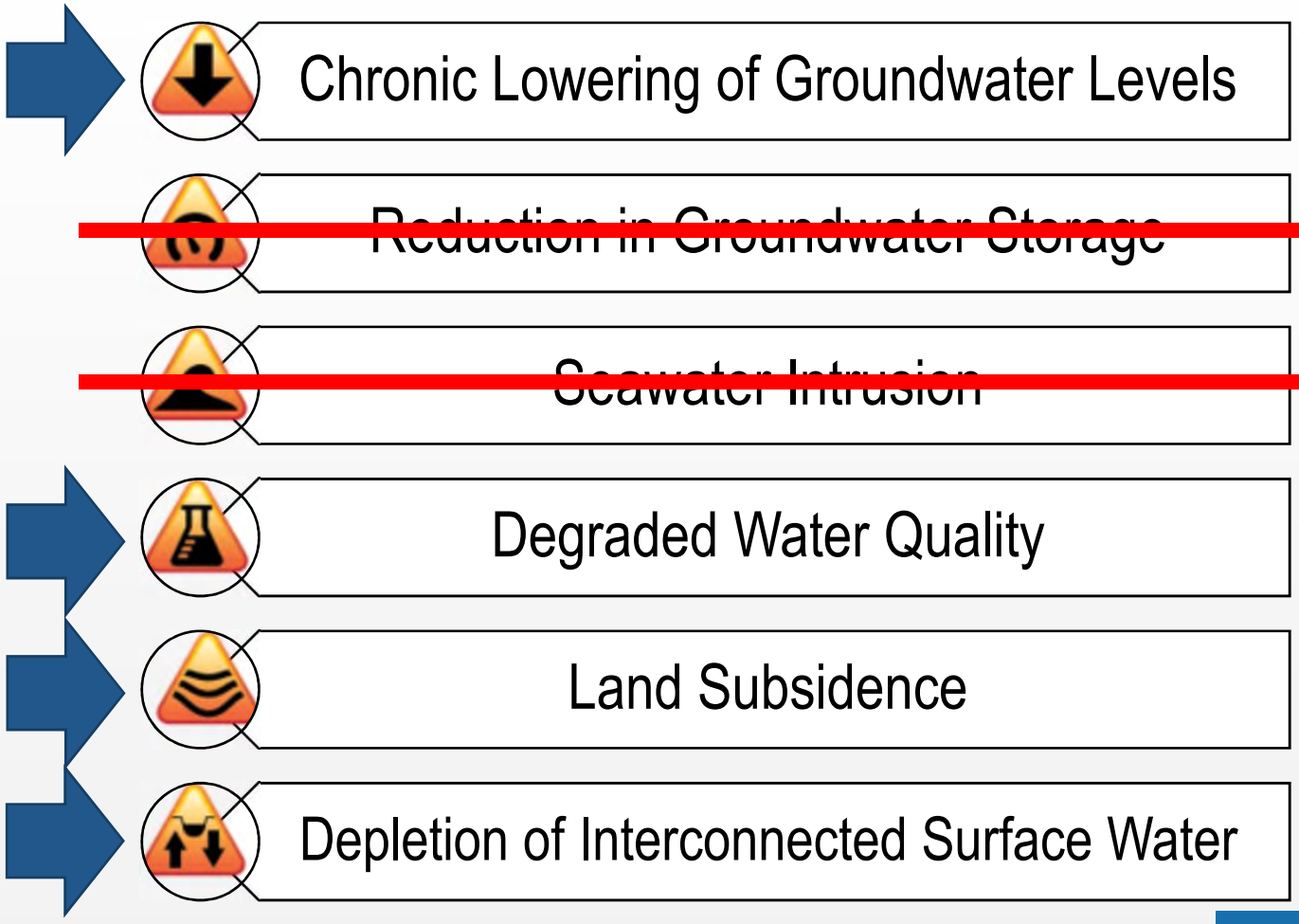
Minimum Thresholds Need to be Developed for All Six Sustainability Indicators



Storage addressed by bringing budget into balance

Salinity Addressed Under Water Quality

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Minimum Thresholds Should Be Set Where Undesirable Results Would Occur

- Undesirable Results are ***significant and unreasonable*** negative impacts that can occur for each Sustainability Indicator
  - Example: Lowest GW elevations can go at a monitoring point without something significant and unreasonable happening to groundwater
- Used to guide and justify GSP components
  - Monitoring Network
  - Minimum Threshold
  - Projects and Management Actions
- If issues are already occurring, we only need to "go back" to Jan 1, 2015 conditions; if no issues are occurring, can set threshold where they would be anticipated to occur

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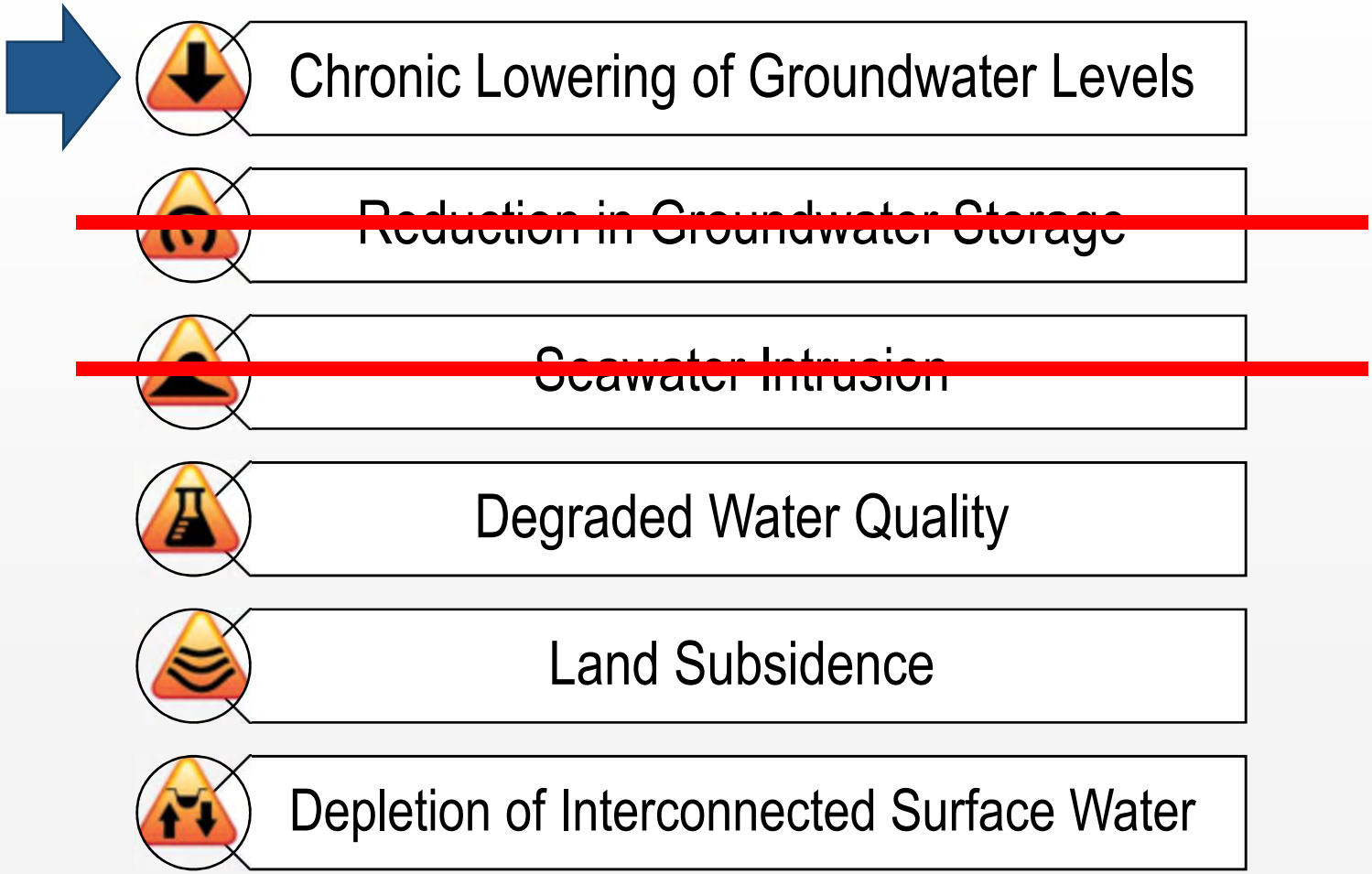
Minimum Thresholds Need to be Developed for All Six Sustainability Indicators



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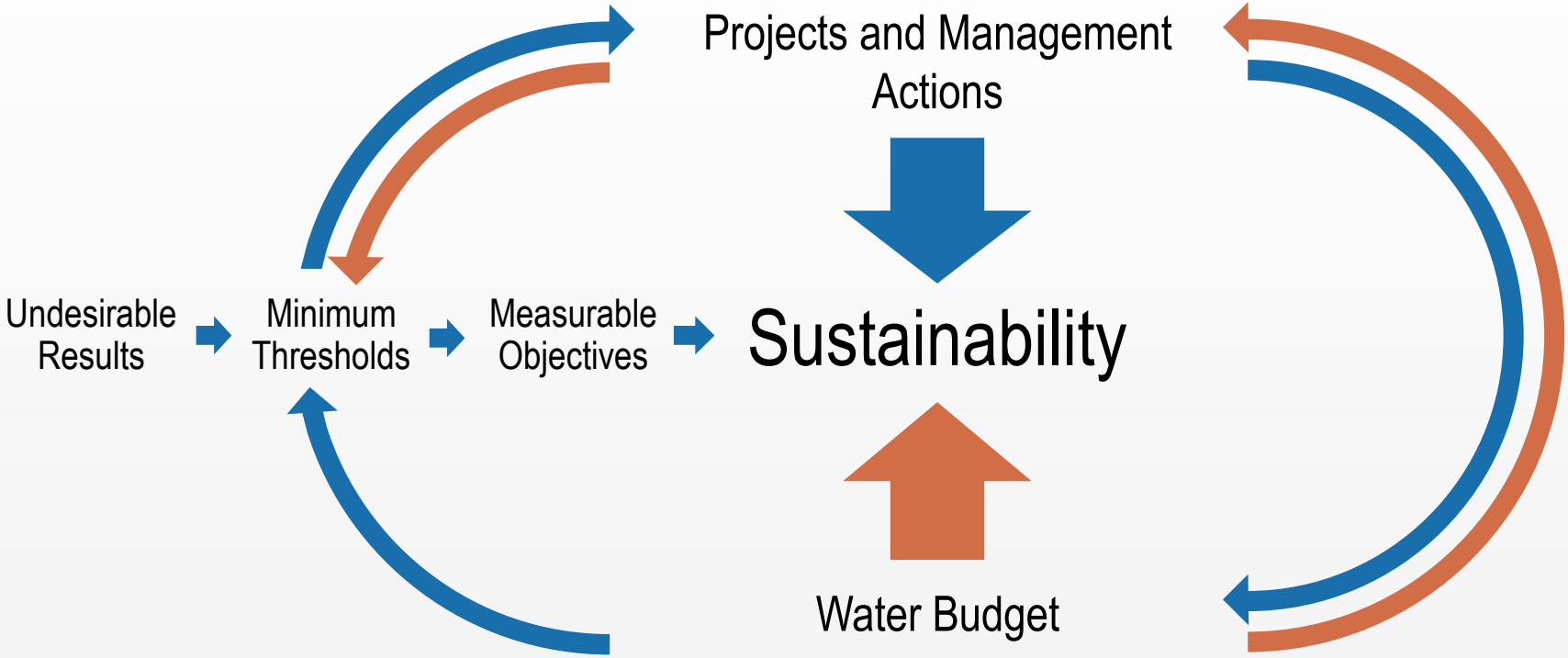
Developing Minimum Thresholds is an Iterative Process



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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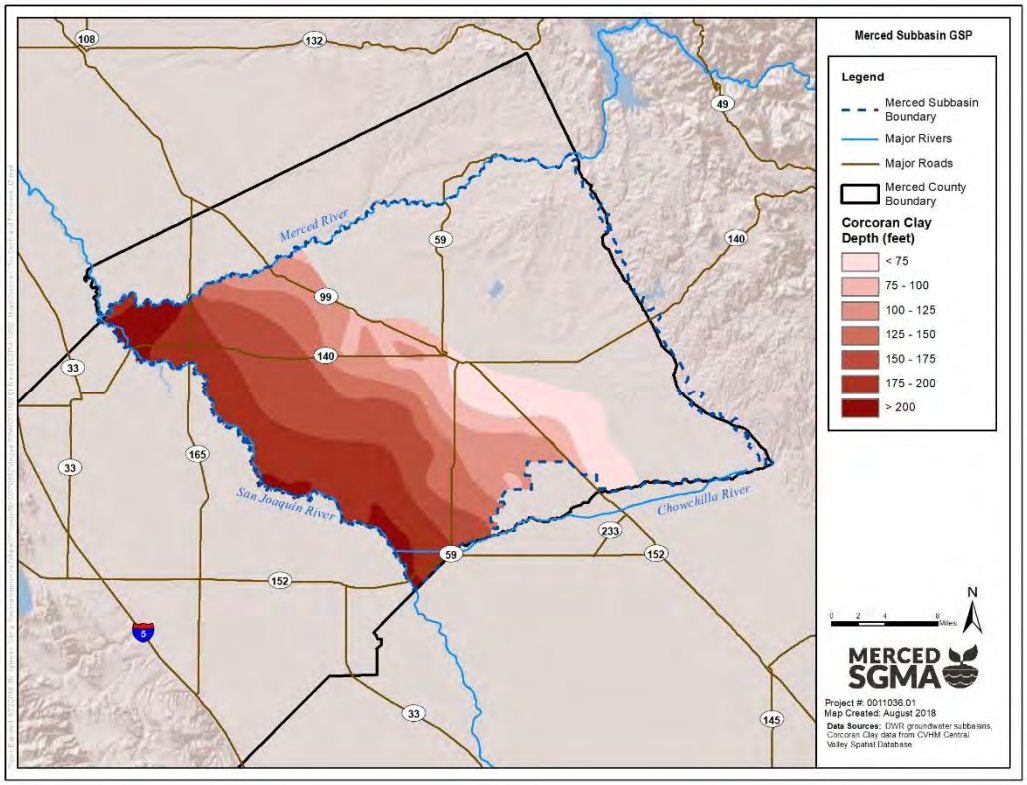
Minimum Thresholds

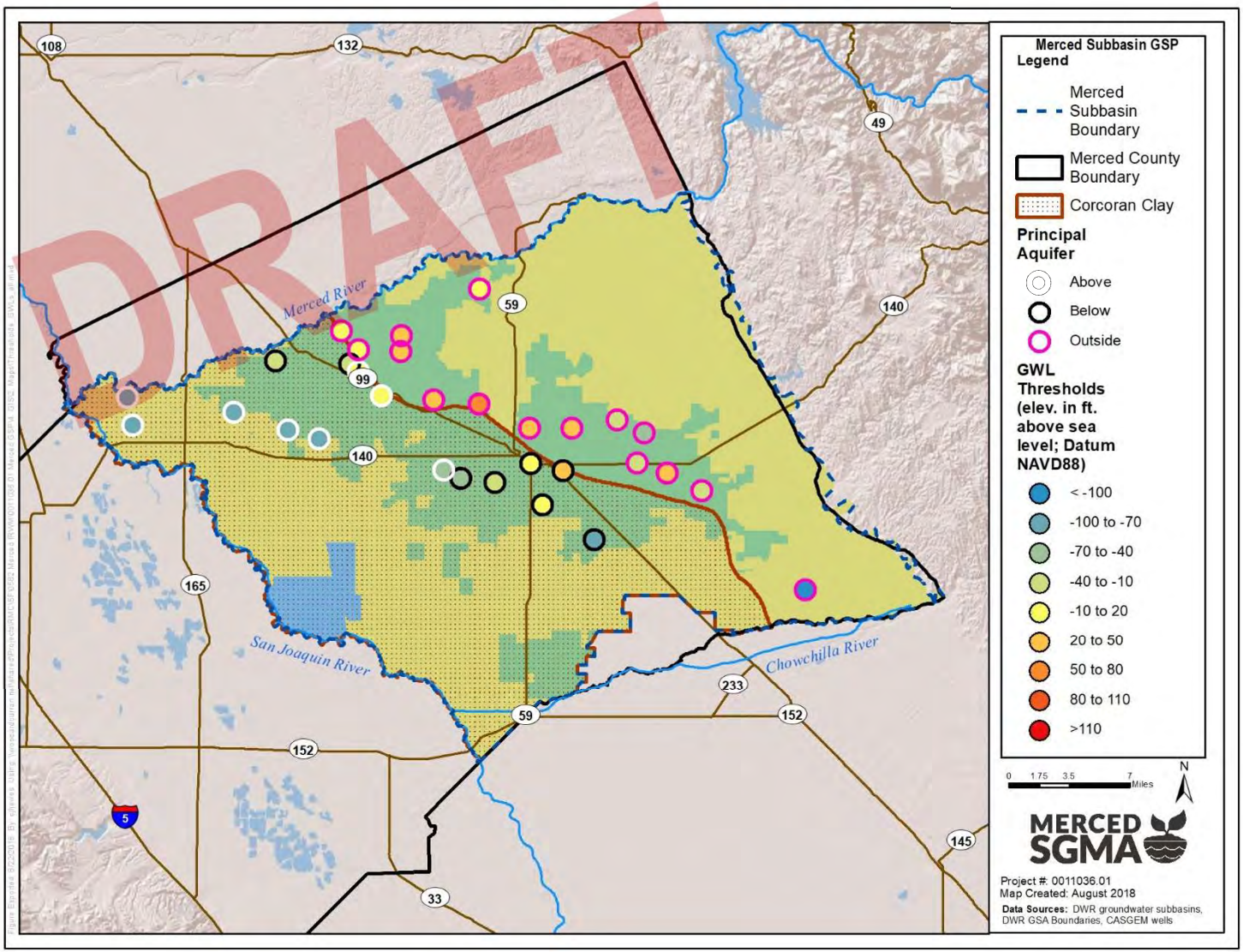
- Thresholds defined using the same methodology for all 3 principal aquifers:
  - Outside Corcoran
  - Above Corcoran
  - Below Corcoran



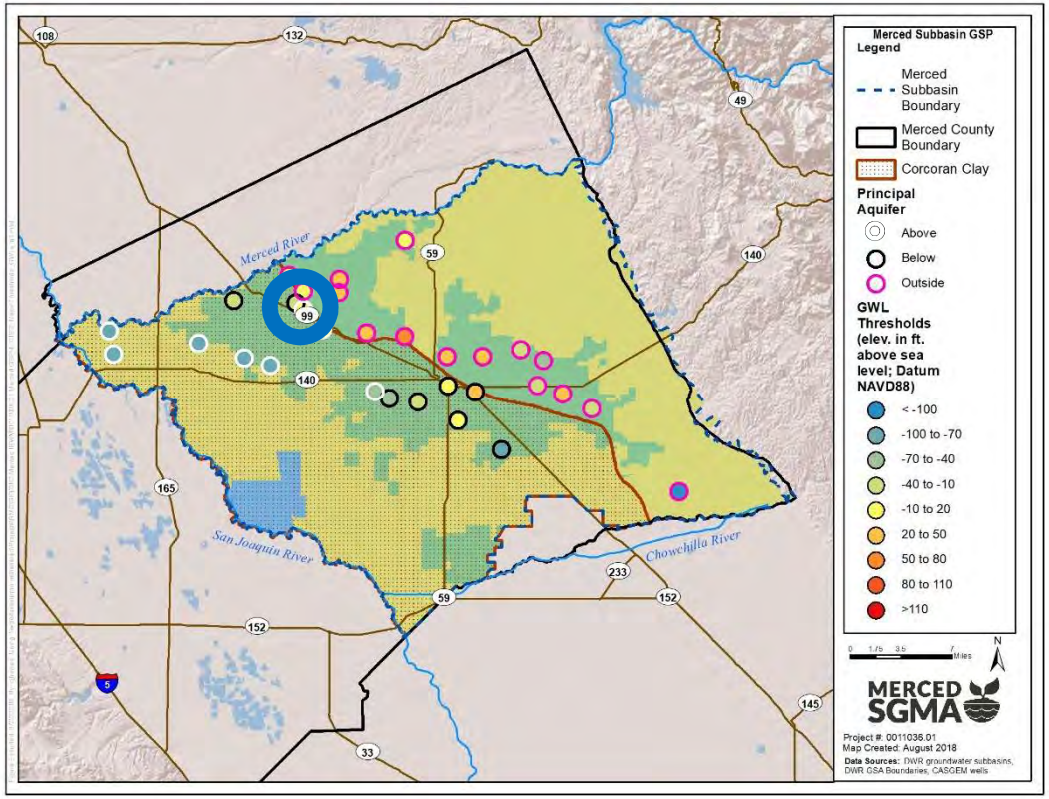
Minimum Thresholds – Updated Approach

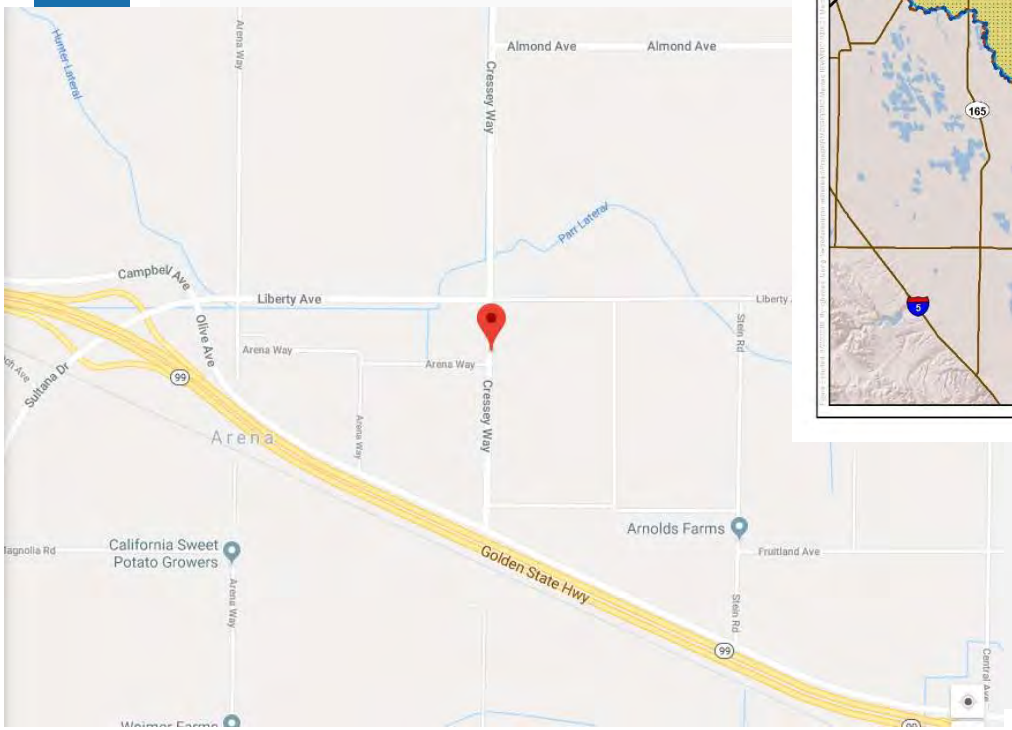
- Minimum threshold is defined as the shallowest of either
  - Historical low groundwater elevation at the monitoring well, minus a buffer (range of min & max GWLs from 2008-2018) – this assumes that over the next 20 years, GWE will decline at approximately half the max rate seen over the past 10 years
  - 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

Minimum Thresholds – Approach



Where is Well 373732N1206679W001?





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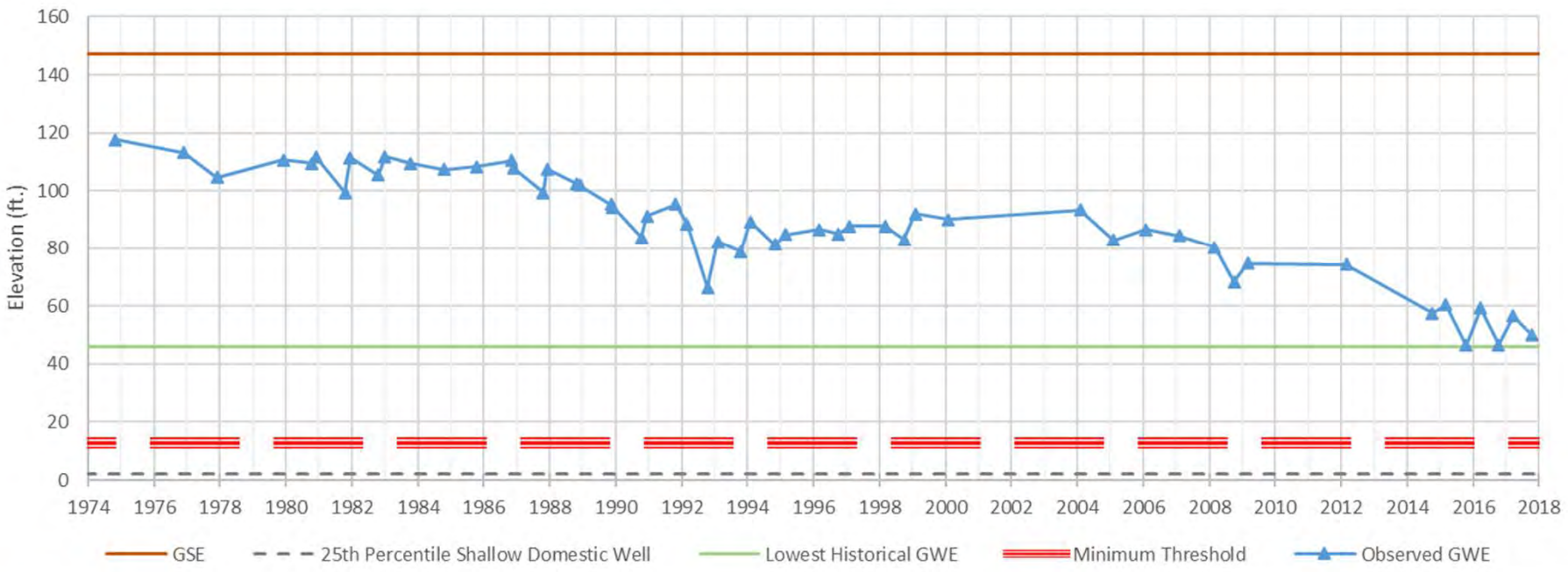
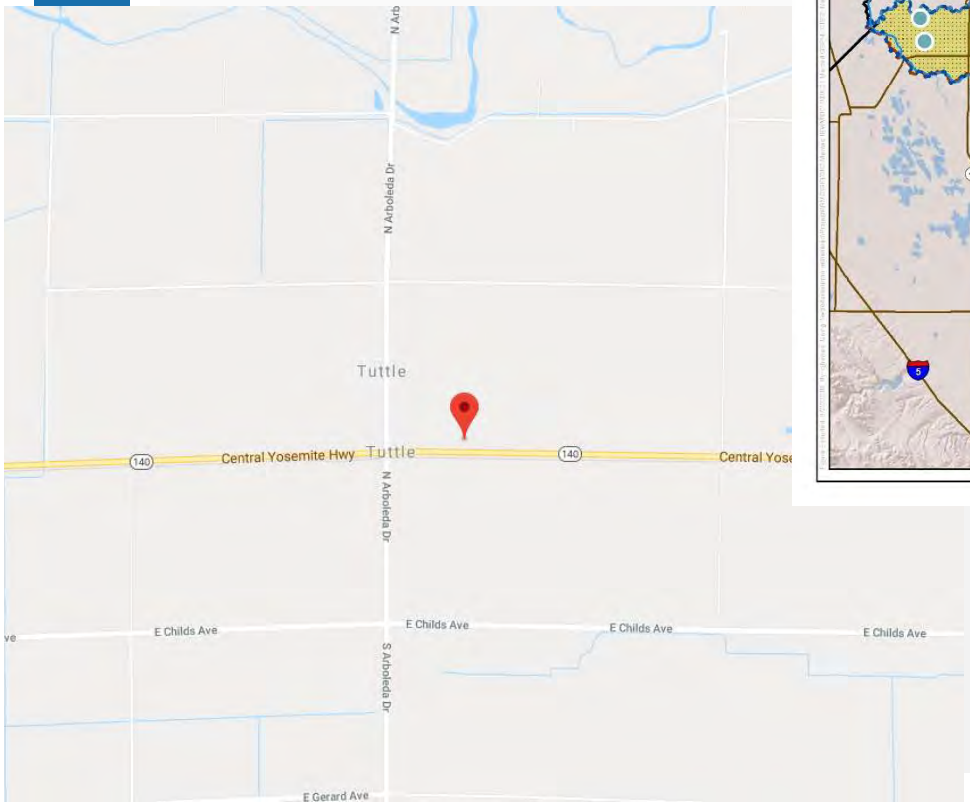
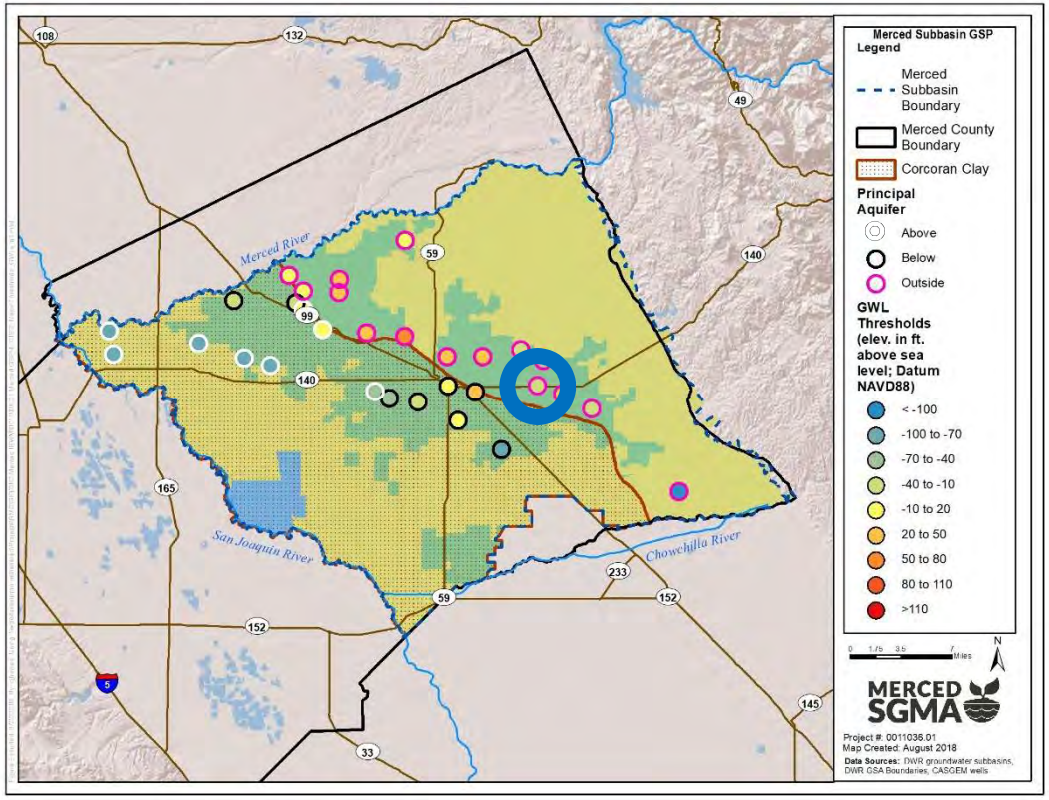
Minimum Thresholds – Example

Example: 373732N1206679W001 - GWE Minimum Threshold



Where is Well 372734N1203071W002?





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Minimum Thresholds – Example

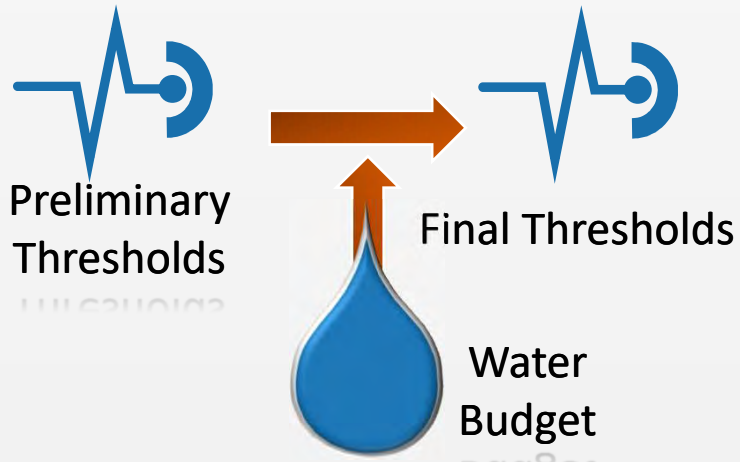
Example: 372734N1203071W002 - GWE Minimum Threshold

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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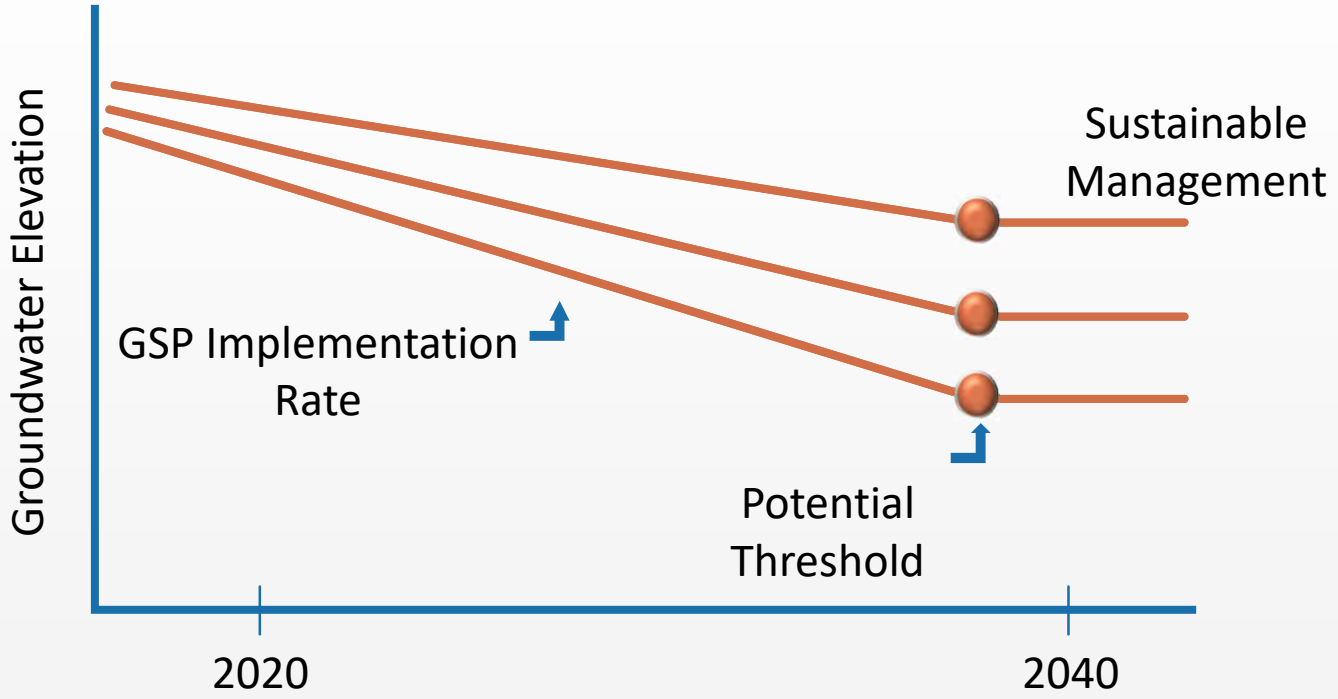
Rate of Plan Implementation May Necessitate Changes in GW Elevation Thresholds



Hydrogeologic Conceptual Model

Image courtesy: Veronica Adrover/UC Merced

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Hydrogeologic Conceptual Model (HCM)

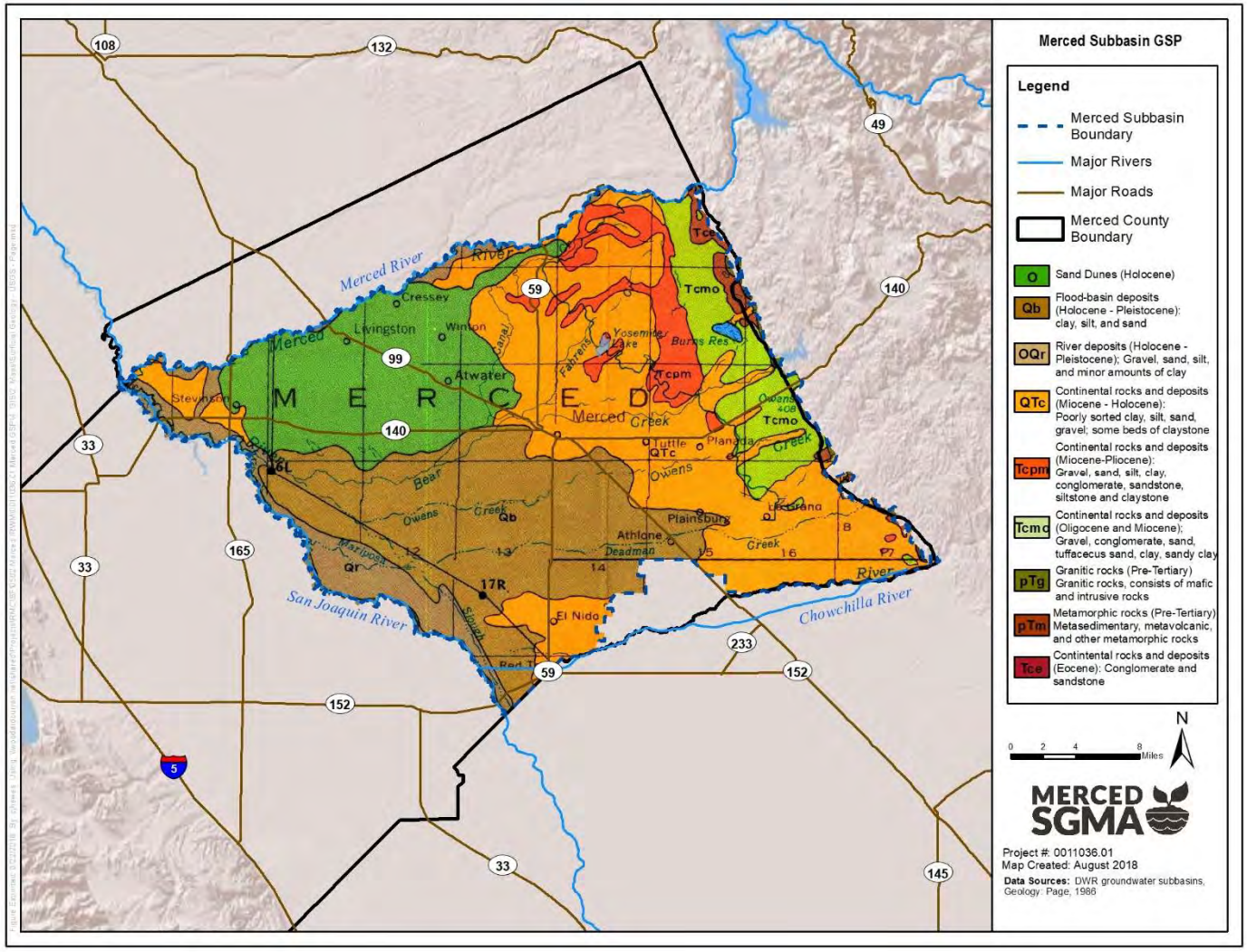
- According to DWR regulations, the HCM:
  - Provides an understanding of the general physical characteristics related to regional hydrology, land use, geology geologic structure, water quality, *principal aquifers,* and principal aquitards of the *basin setting*
  - Provides the context to develop water budgets, mathematical (analytical or numerical) models, and monitoring networks
  - Provides a tool for stakeholder outreach and communication

Hydrogeologic Conceptual Model (HCM), cont'd

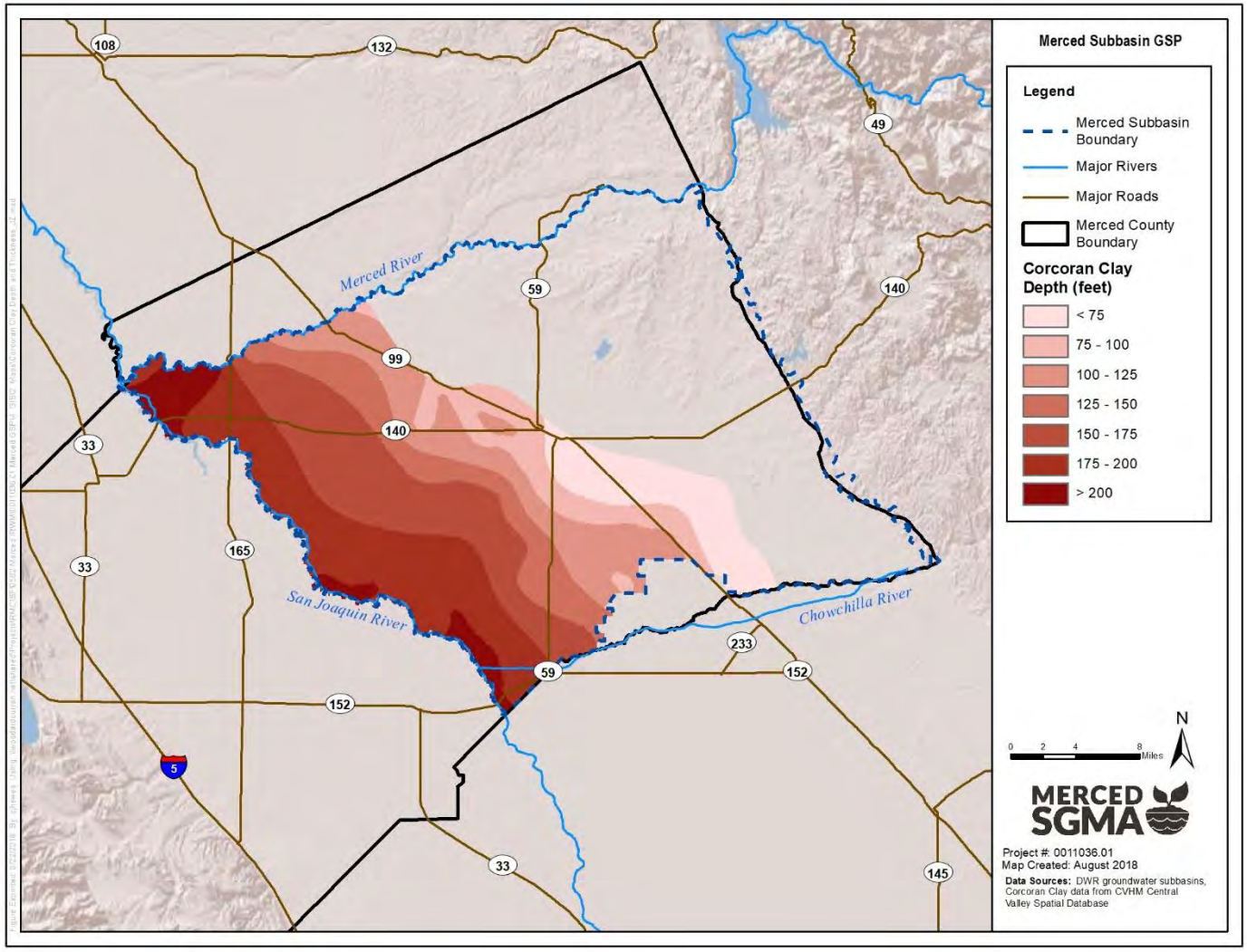
- HCM parameters include:
  - Topographic information, surficial (surface) geology, soil characteristics, delineation of existing recharge areas, surface water bodies, source and point of delivery for local and imported water supplies

- HCM Data gaps:
  - Portions of the basin not well understood
  - Plan to fill data gaps in understanding – currently addressing these gaps

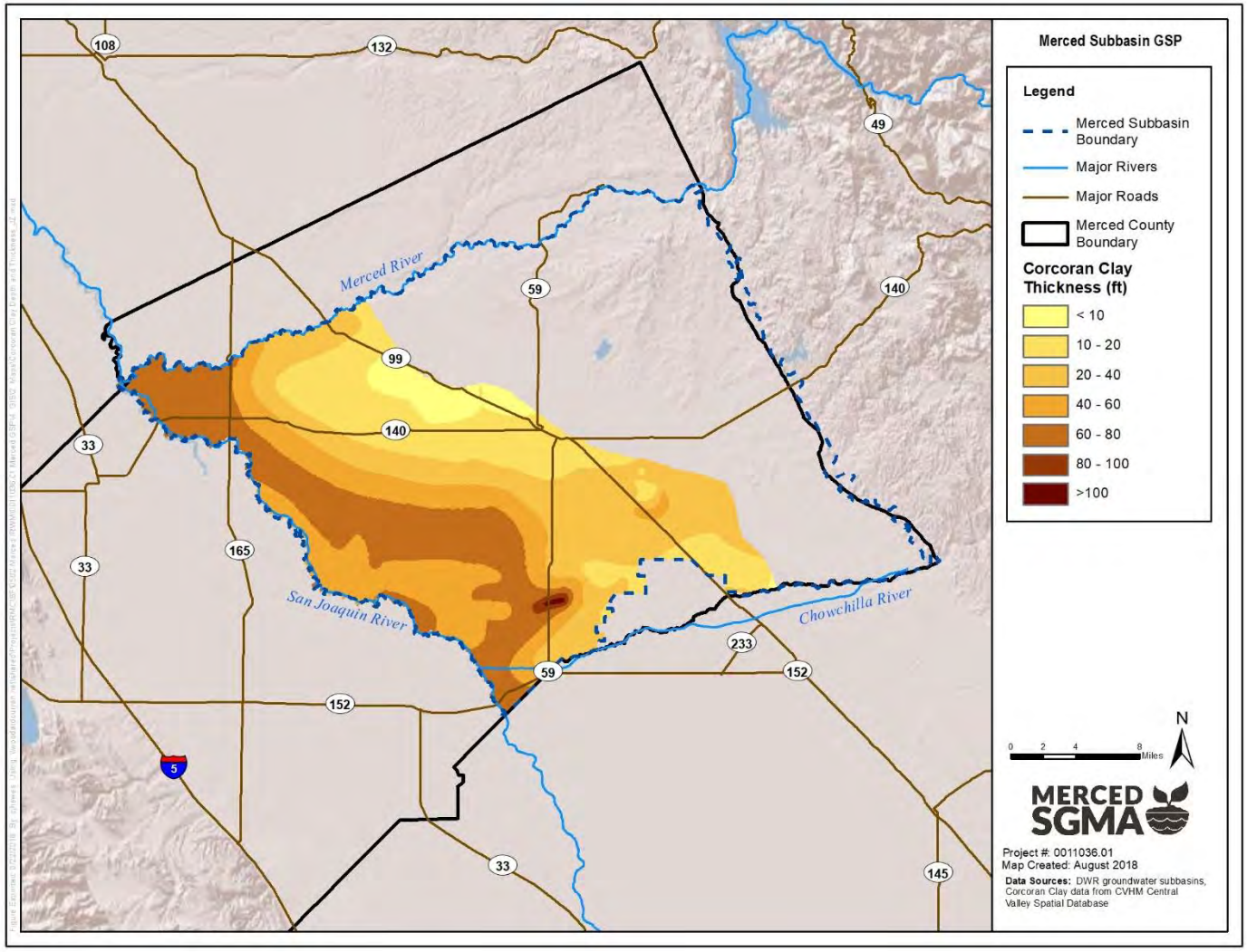
HCM: Surficial Geology



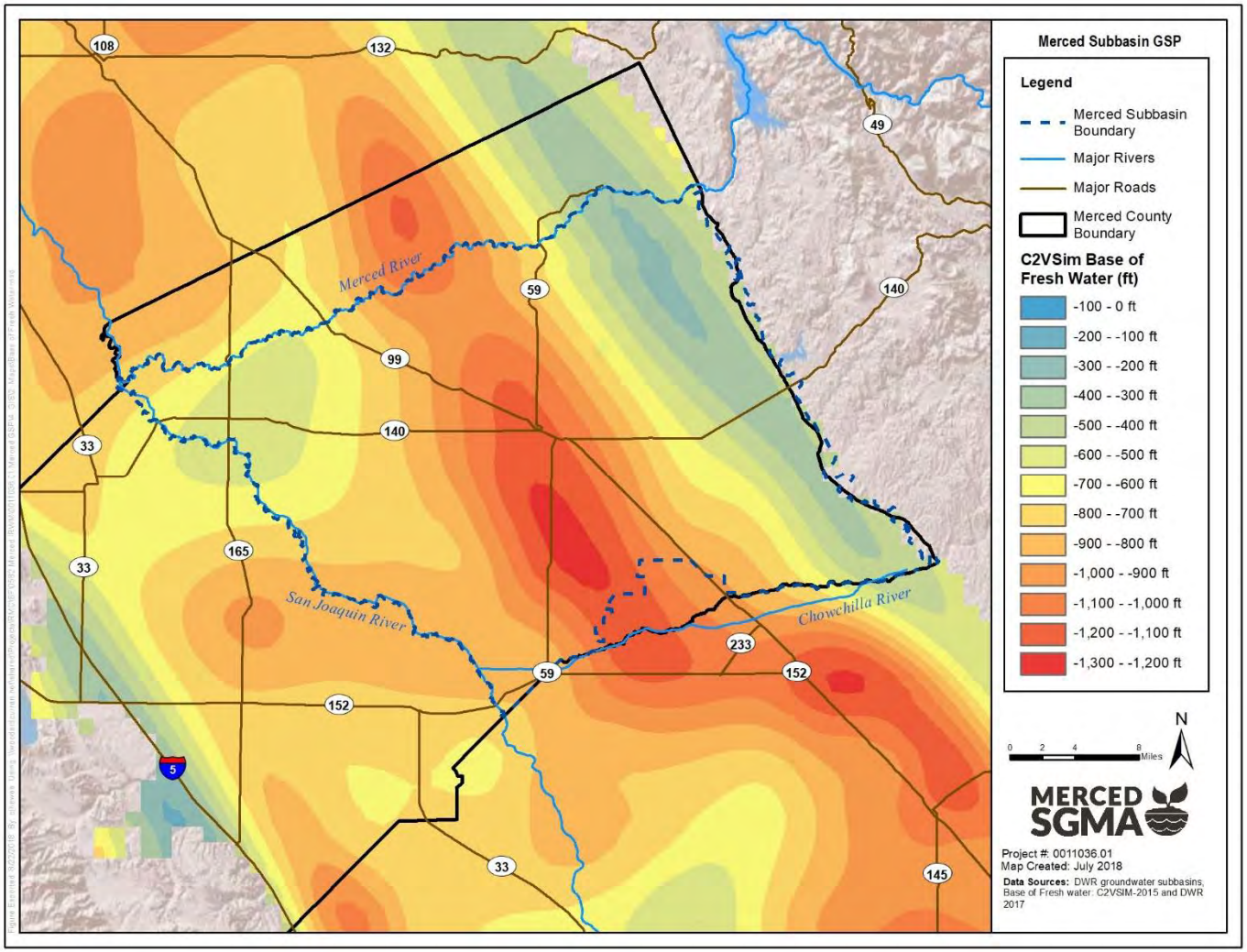
HCM: Corcoran Clay Depth



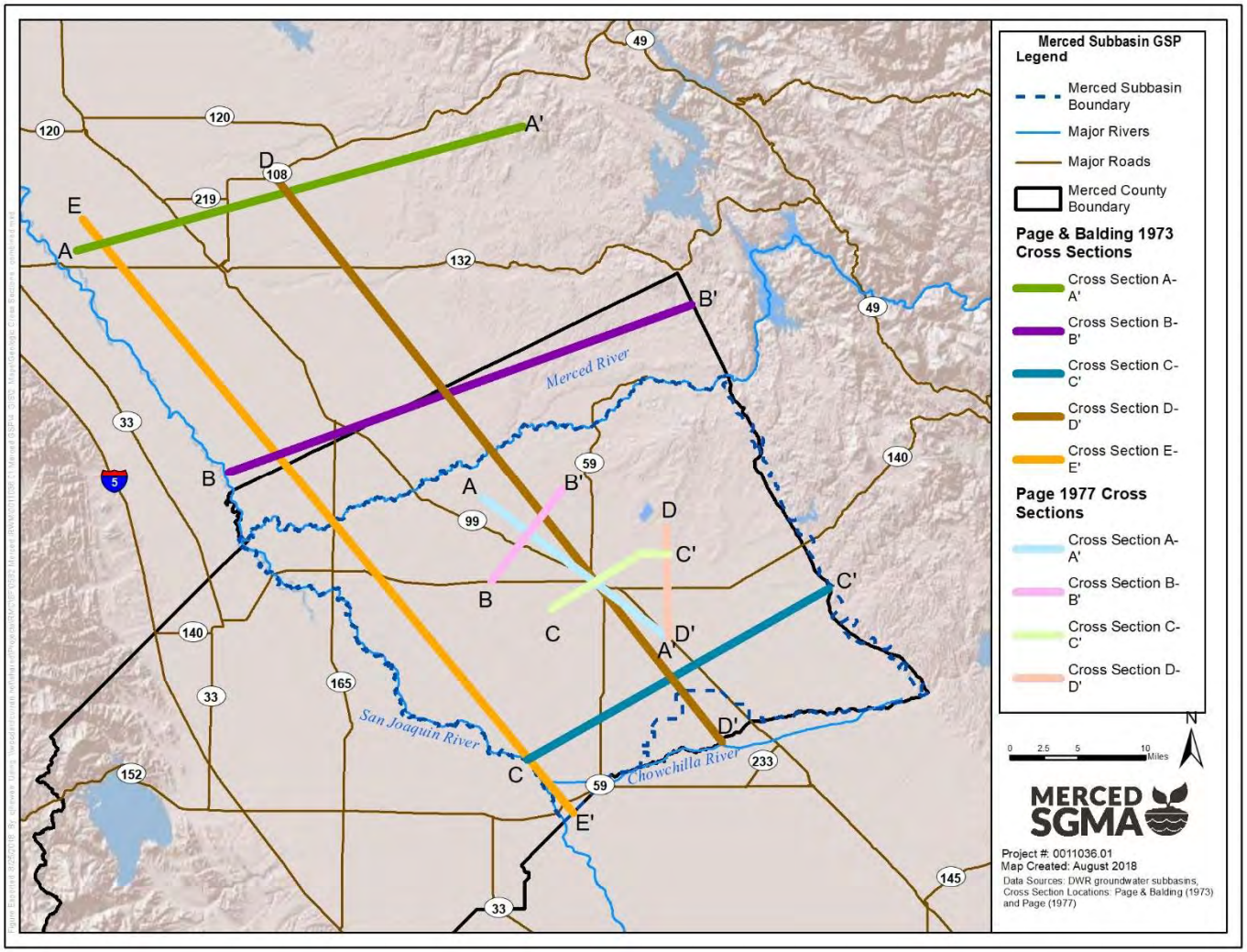
HCM: Corcoran Clay Thickness



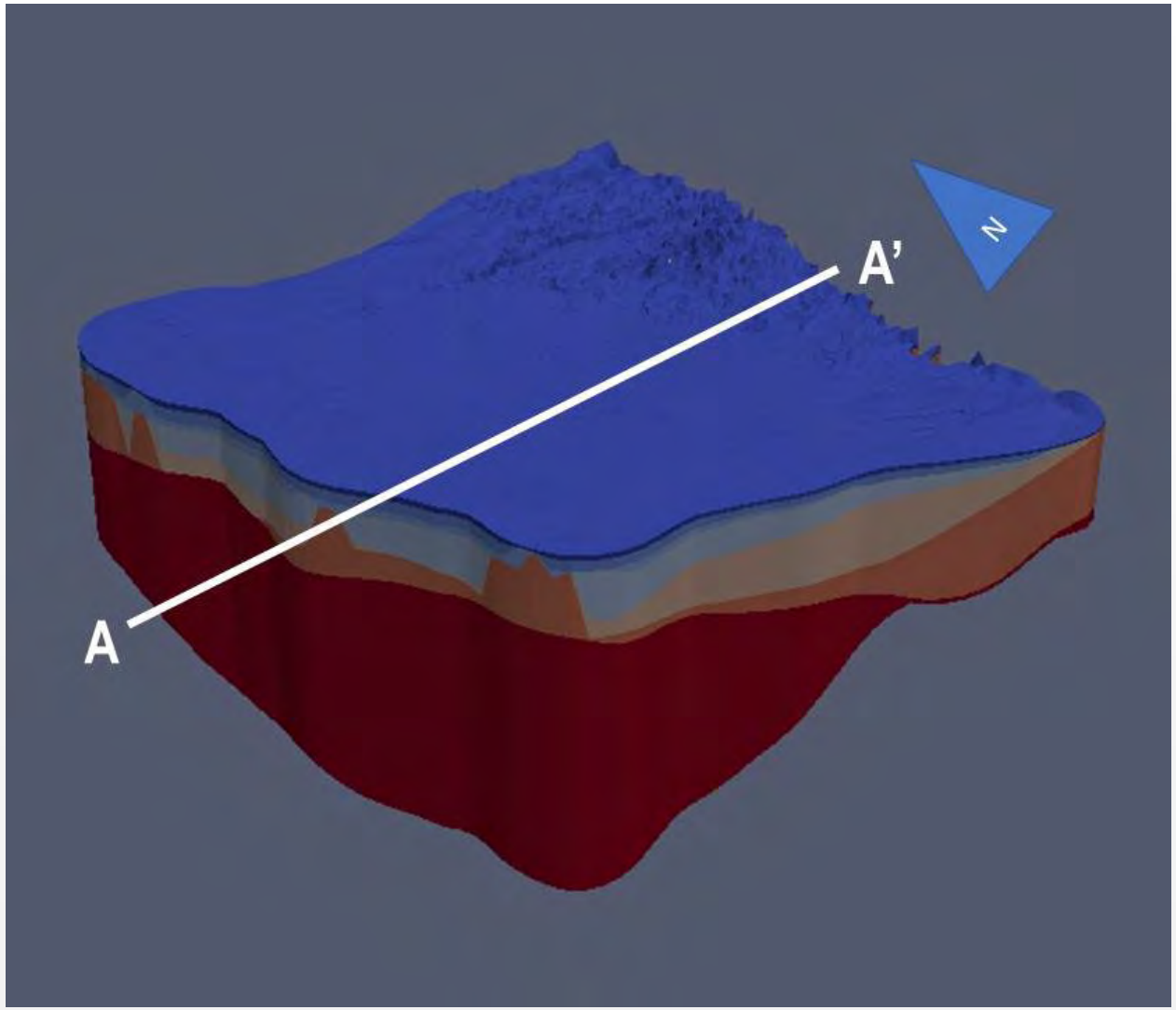
HCM: Base of Fresh Water



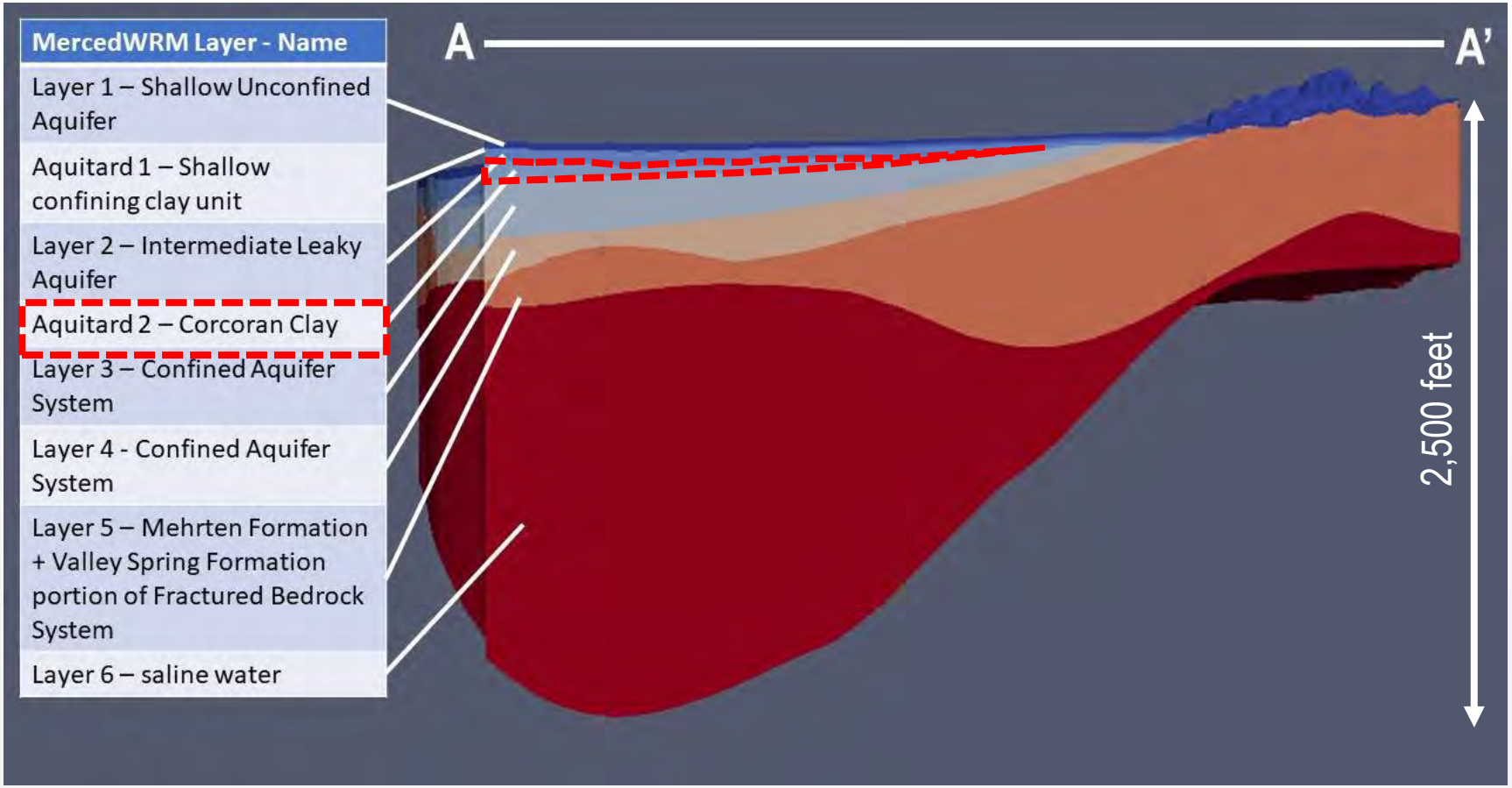
HCM: Geologic Cross Sections



HCM: 3D Visual



HCM: 3D Visual



Next Steps

- Continue drafting HCM
  - Water Quality
  - Current Conditions
- Define data gaps

Projected Water Budget, and Sustainable Yield

Image courtesy: Veronica Adrover/UC Merced

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Water Budgets: Defining Timeframes

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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Projected Conditions Baseline

- 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:
  - 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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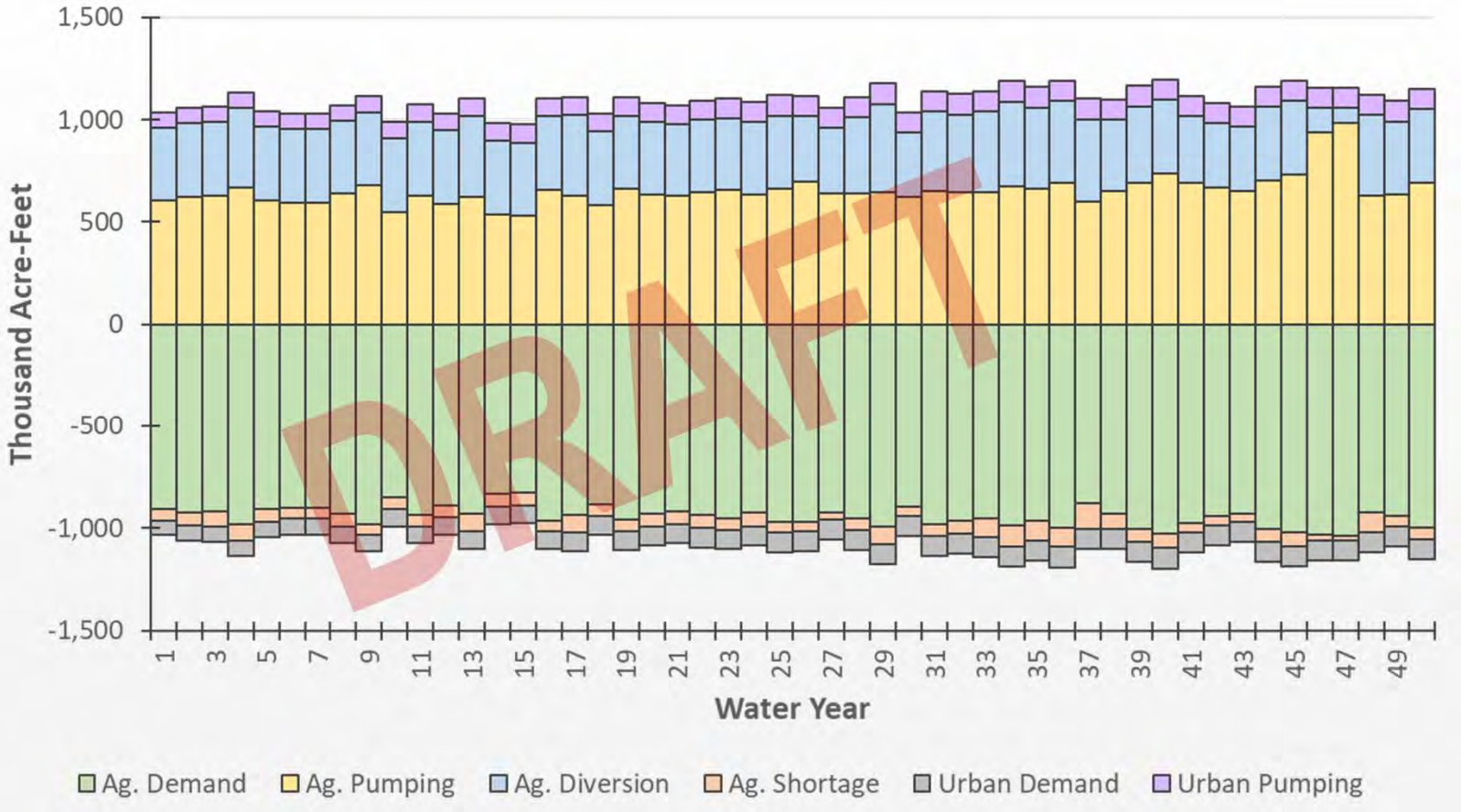
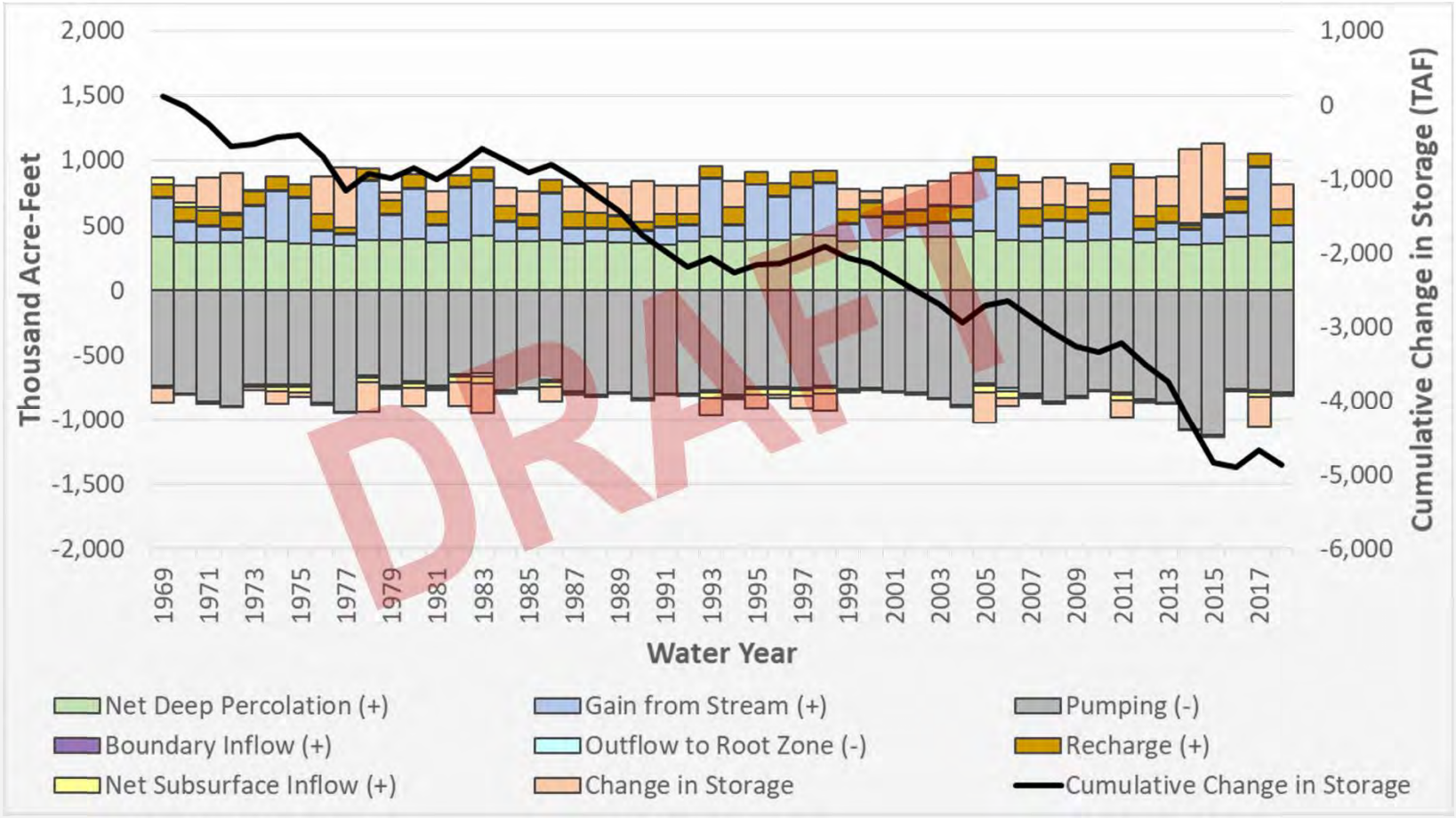
Projected Conditions Baseline Land & Water Use Budget

Merced Groundwater Subbasin



Projected Conditions Baseline Groundwater Budget

Merced Groundwater Subbasin



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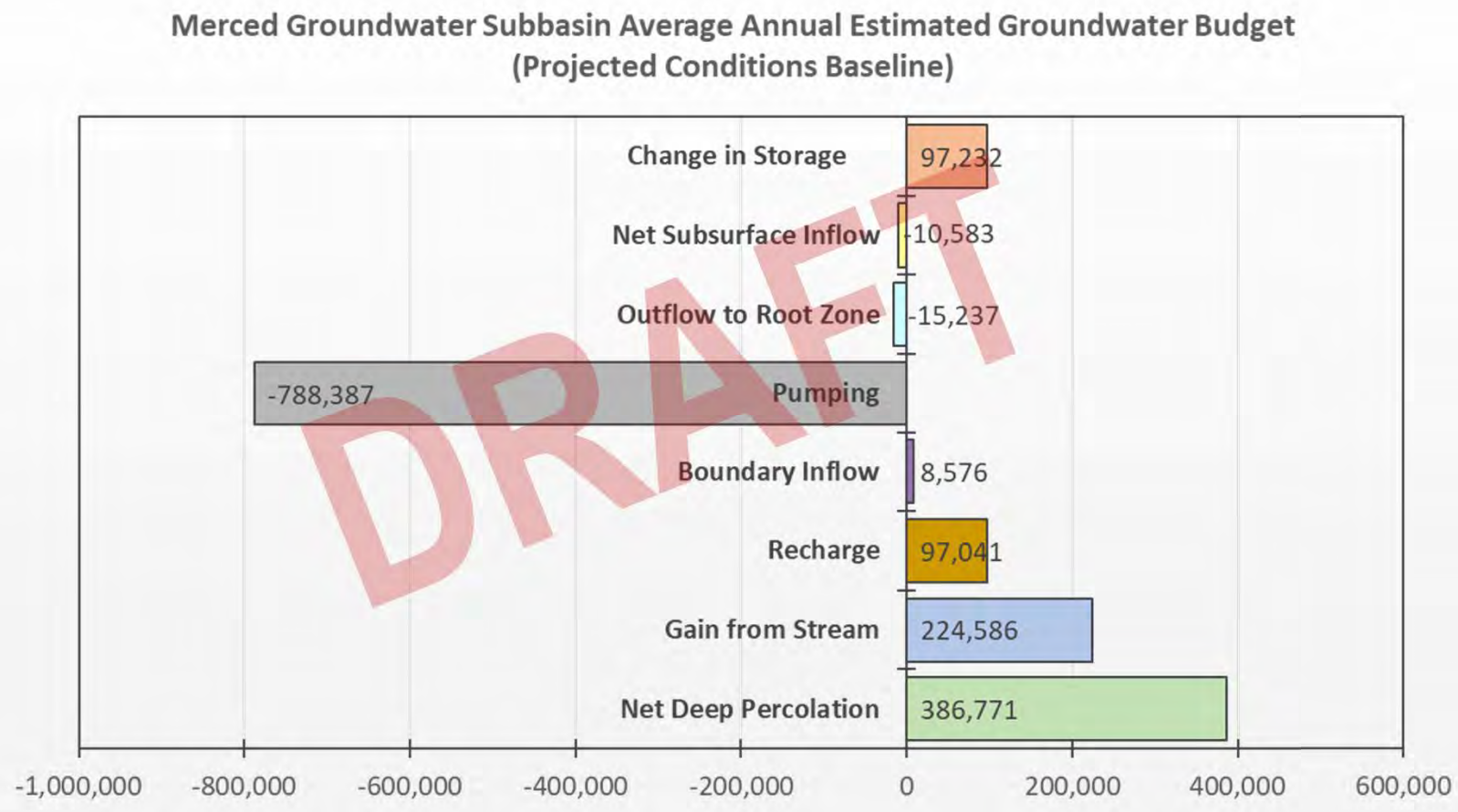
Projected Conditions Baseline Groundwater Budget

Merced Groundwater Subbasin



Sustainable Yield (recap)

- What is sustainable yield?
  - "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result."
- How do we develop this?
  - Can be developed through a groundwater model scenario, modifying conditions to avoid minimum thresholds
- How do we work toward a balance?
  - Value can direct the need to increase recharge or decrease production – leading to needs for projects.

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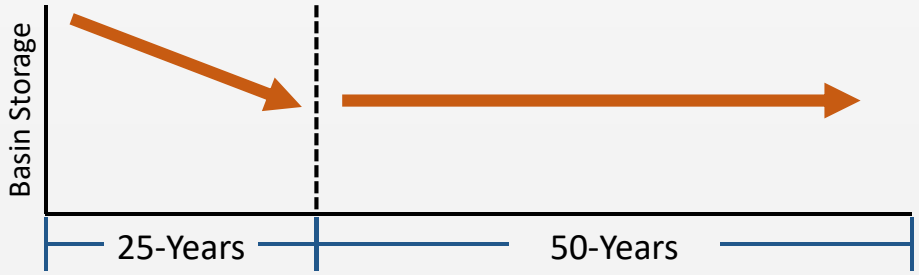
Sustainable Yield – Modeling Analysis

- Modeling Approach
  - Lower groundwater production through reduced agricultural acreage/demand across the model domain
  - Reduce Urban unit water use to 150-175 GPCD
- Assumptions
  - 25-Year Implementation Period: operations will remain consistent, and groundwater levels will continue to decline until 2040
  - Inter-Subbasin Flows: adjoining subbasins will operate similarly to Merced, whereas subsurface flows will remain similar to long-term average historical conditions



DRAFT Results: Initial simulations only address subbasin yield, analysis is needed to gauge effect on ensure minimum thresholds.

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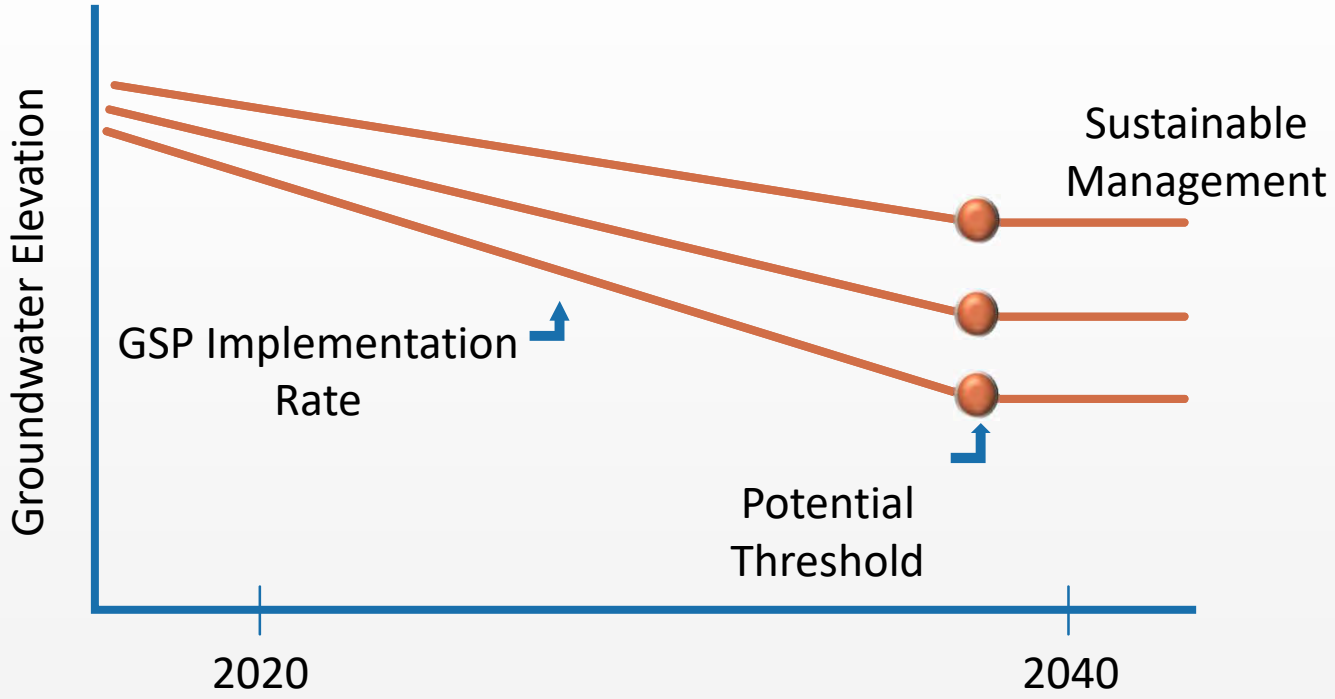
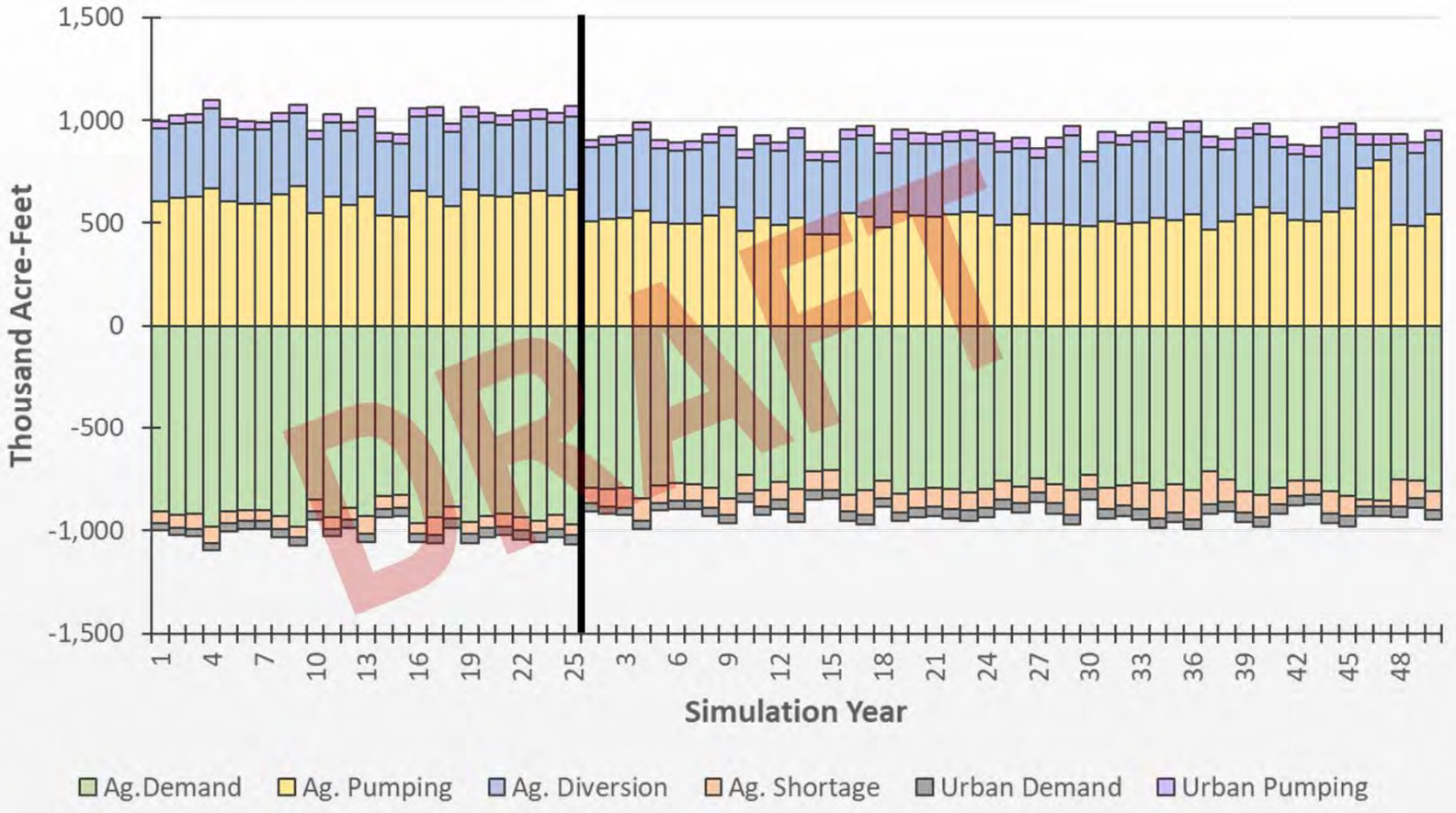
Modeling Assumes "Glidepath" to Sustainability Between 2020 and 2040



Sustainable Yield Land and Water Use Budget

Merced Groundwater Subbasin



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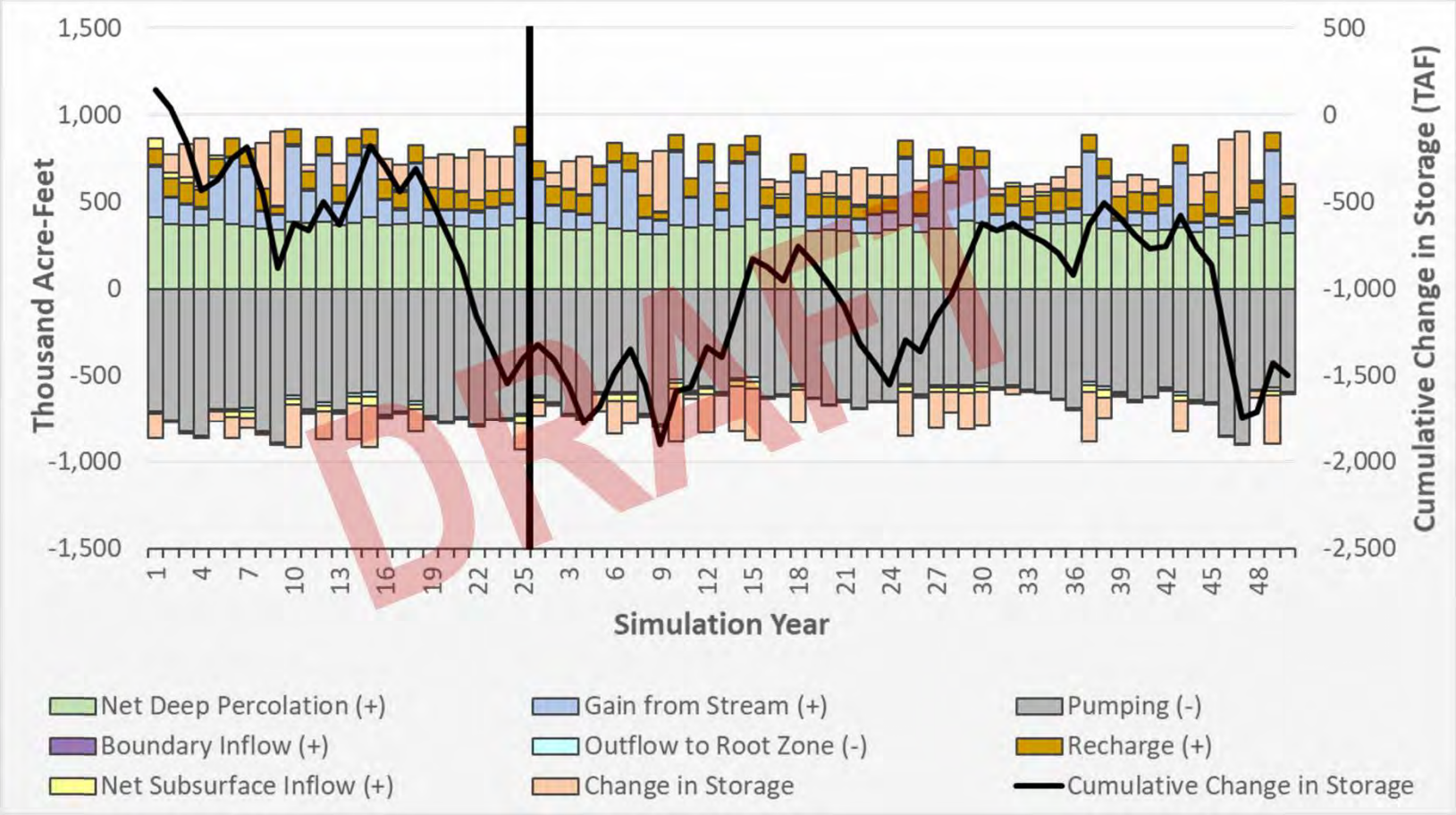
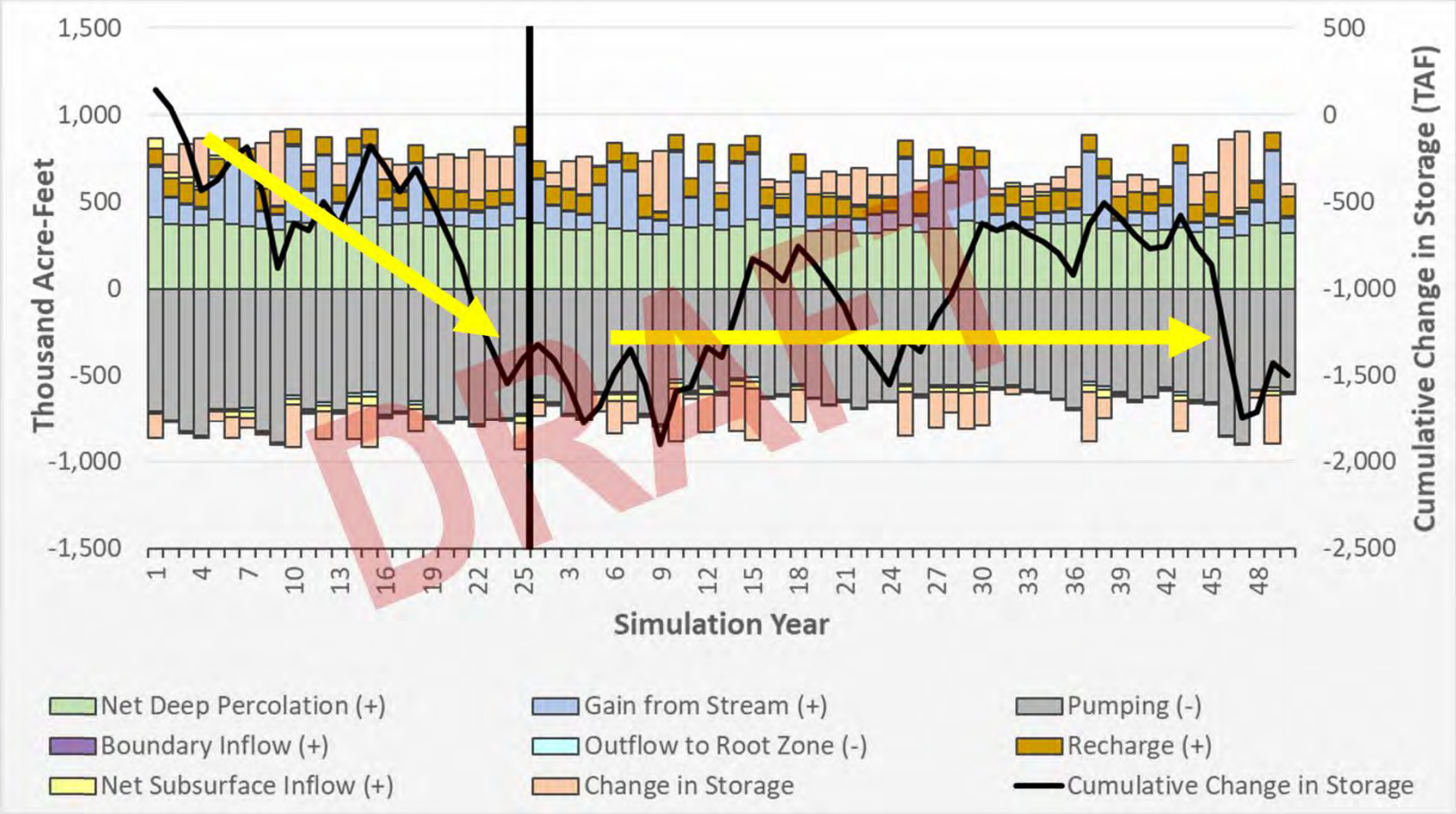
Sustainable Yield Groundwater Budget

Merced Groundwater Subbasin



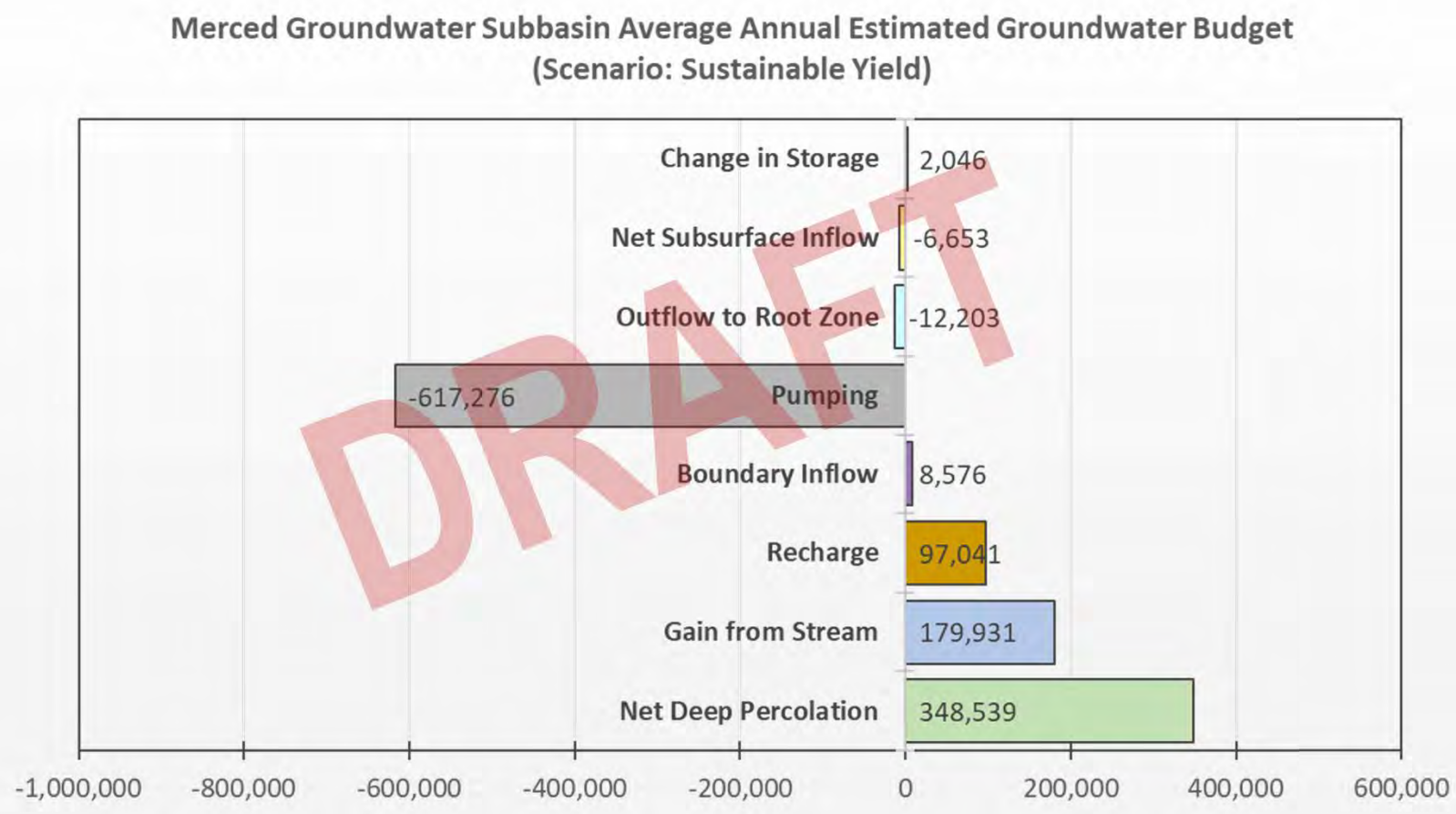
Sustainable Yield Groundwater Budget

Merced Groundwater Subbasin



Sustainable Yield Groundwater Budget

Merced Groundwater Subbasin



Sustainable Yield – Modeling Results

- "Allocations" needed to bring the basin into sustainability by 2040
  - Groundwater Production 620,000AF 1.0 AF/Ac**
  - Pumping Reduction 100,000AF ~20%
  - Surface Water Supply 360,000AF 2.6 AF/Ac*

Notes:

Surface Water Yield: is defined as total surface water supplies divided by the ag acreage within MID, SWD, MCWD, and TIWD

Groundwater Yield: is defined as basin pumping divided by the total acreage of the basin, both developed and undeveloped

Sustainable Yield - Next Steps

- Identify Projects and Management Actions to Increase Supply Availability and Potentially Reduce Demands
  - Evaluate supply-side options and their effect on yield
  - Evaluate various governance options (water market, etc.)

Data Management Approach and DMS Demo

Image courtesy: Veronica Adrover/UC Merced

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DMS Success Criteria Beyond Requirements

Now

- Flexible and open one-stop-shop
- Transparent and efficient data entry and visualization
- Coordination and sharing
- Automated reporting

Future

- Sustainable groundwater management monitoring
- Ability to track undesirable results

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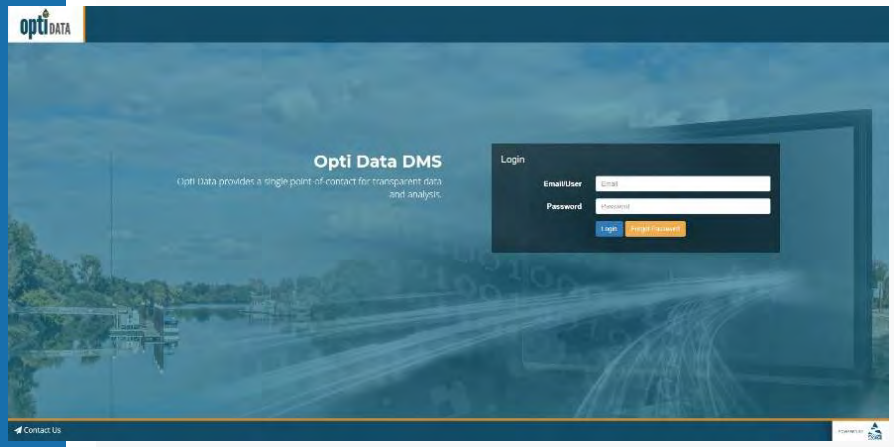
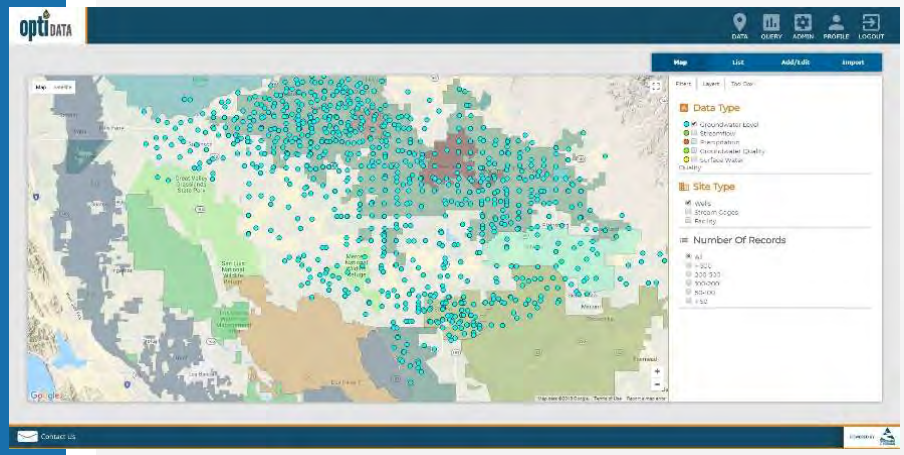
Opti is a Ready-to-Use Proven Tool





- 10 IRWM groups have used Opti, 3+ GSAs are implementing Opti
- Off-the-Shelf customized DMS to meet the specific needs of the Merced Basin
- Meets all current phase Success Criteria
- Open platform enables future enhancements

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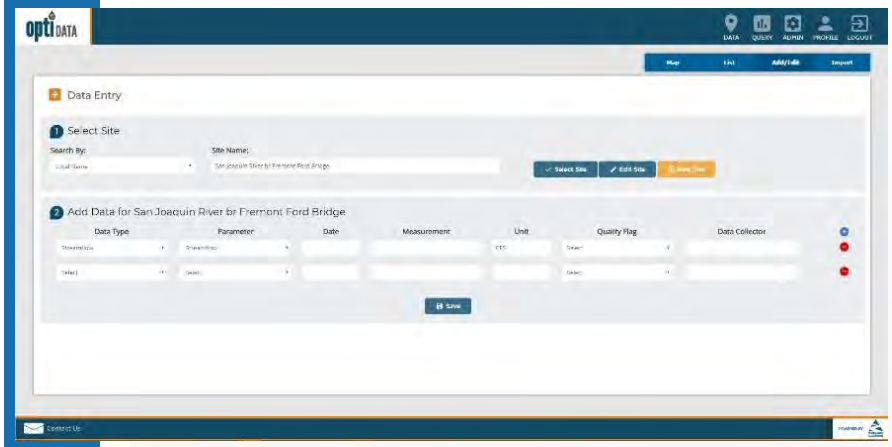
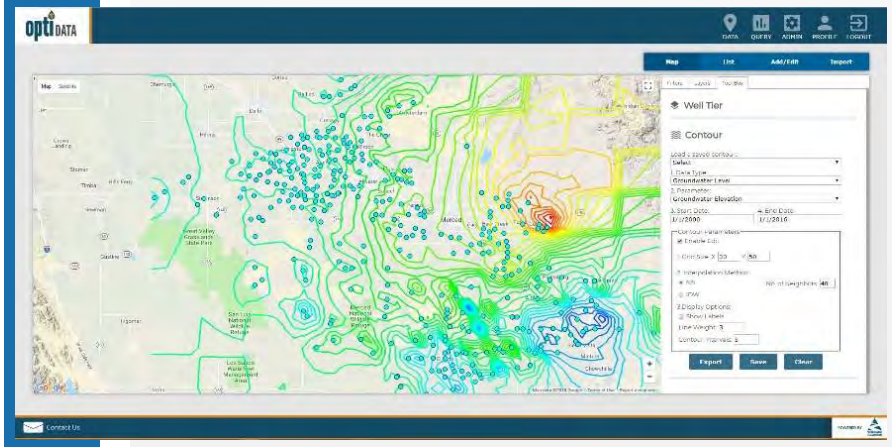
Opti Features





- Web-based, GIS-enabled
- Easy-to-Use
- Flexible Data Structure to Store and Manage Different Datasets
- User and Agency Security/Permissions
- Data Entry and Validation
- Visualization and Analysis
- Query and Reporting
- Framework to Link to other Data Management Systems and Modeling Results

How Opti Will Evolve (*Short-term*)

- Currently:
  - Imported groundwater level data collected through SGMA Readiness project
  - Imported streamflow, precipitation, groundwater quality, and surface water quality collected through previous IRWMP effort
  - Updated DWR/CASGEM data
- Planned:
  - Collect and input additional agency/private owner data
  - Add model results and ability to view

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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Coordination With Neighboring Basins Update

Image courtesy: Veronica Adrover/UC Merced

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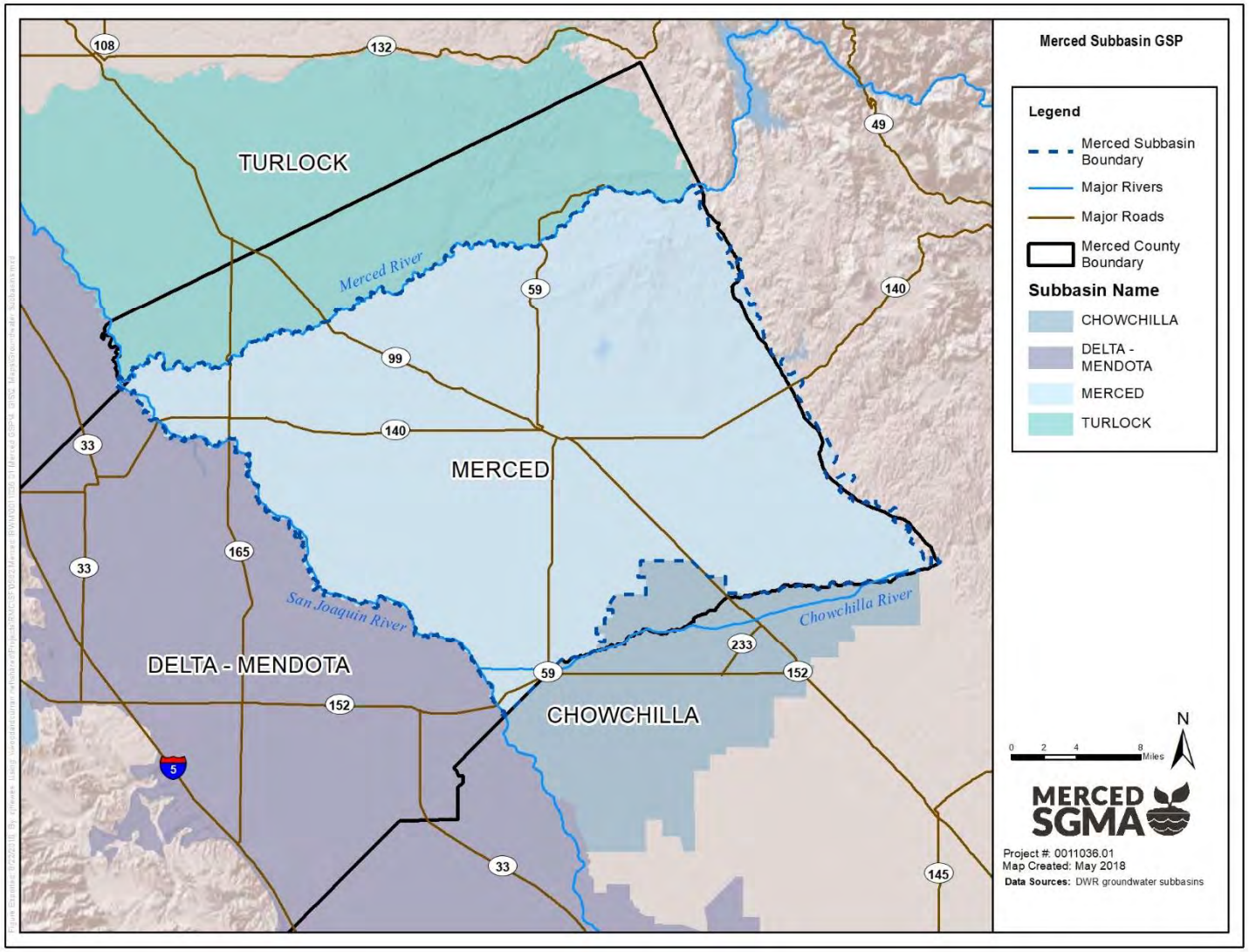
Coordination with Neighboring Basins



Inter-Subbasin Coordination - Chowchilla

- Modeling teams have met to discuss:
  - Interbasin coordination needs,
  - Data and information sharing
  - Technical approach by respective subbasins on sustainability analysis and relationship to the interbasin coordination

- Chowchilla Subbasin Modeling Approach
  - Development the “Madera County” Model, a refined version of the C2VSimFG, carved out to include the Chowchilla and Madera Subbasins with 5 mile buffer and will include:
    - Refinement of surface water features,
    - Refinement of the agricultural demand estimations,
    - Localized calibration and aquifer analysis

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DWR Technical Support Services 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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Next Steps

- Incorporate comments into Sustainable Yield analysis
- Begin discussion of projects and management actions
- Adjourn to next meeting (Monday, September 24, 2018 @ 1:30 PM, location Castle Airport)
- Focus for September meeting
  - Minimum Thresholds
  - Water Budget & Sustainable Yield
  - Projects and management actions

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GSP Coordinating Committee

Coordinating Committee Meeting – August 27, 2018

Merced Irrigation-Urban GSA
Merced Subbasin GSA
Turner Island Water District GSA-1

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