

GSP Coordination Committee

Coordination Committee Meeting – February 22, 2021

Meeting will begin at 1:15 pm – thank you for joining us!

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

Image courtesy: Veronica Adrover/UC Merced

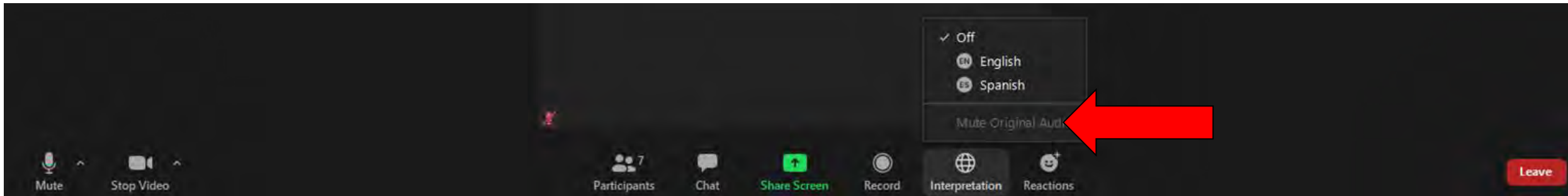
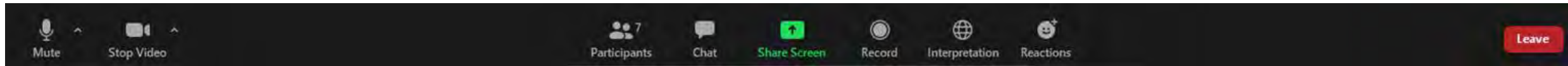


Welcome, Instructions for Zoom

Bienvenidos, Instrucciones para Zoom

We have two language audio channels available. English only speakers, please select English.

Si solamente habla español, debe seleccionar un canal de idioma



The meeting will have simultaneous interpreting, so you are welcome to comment in your native language.
La junta será interpretada simultáneamente, así que le invitamos a que haga comentarios en su lenguaje nativo.

Agenda

1. Call to order
2. Roll Call
3. Consent Calendar
 - a) Approval of December 1, 2020 Meeting Minutes
4. Public Comment
5. Reports
 - a) Coordination with Neighboring Basins
 - b) GSA Reports
6. Actions
 - a) Stakeholder Advisory Committee Recommendation
 - b) GSP Well Monitoring RFQ Recommendation

Image courtesy: Veronica Adrover/UC Merced

Agenda

6. Discussion Items

- a) Data Gaps Plan
- b) Remote-Sensing Tool Development
- c) Sustainability Criteria Approaches for Additional Representative Monitoring Wells
- d) Proposition 68 Implementation Grant Submittal

7. Next steps and adjourn

Image courtesy: Veronica Adrover/UC Merced



Approval of Minutes

Image courtesy: Veronica Adrover/UC Merced



Questions/Comments from Public:

If you would like to make a comment, please type the comment in the chat or request to be taken off mute

Image courtesy: Veronica Adrover/UC Merced



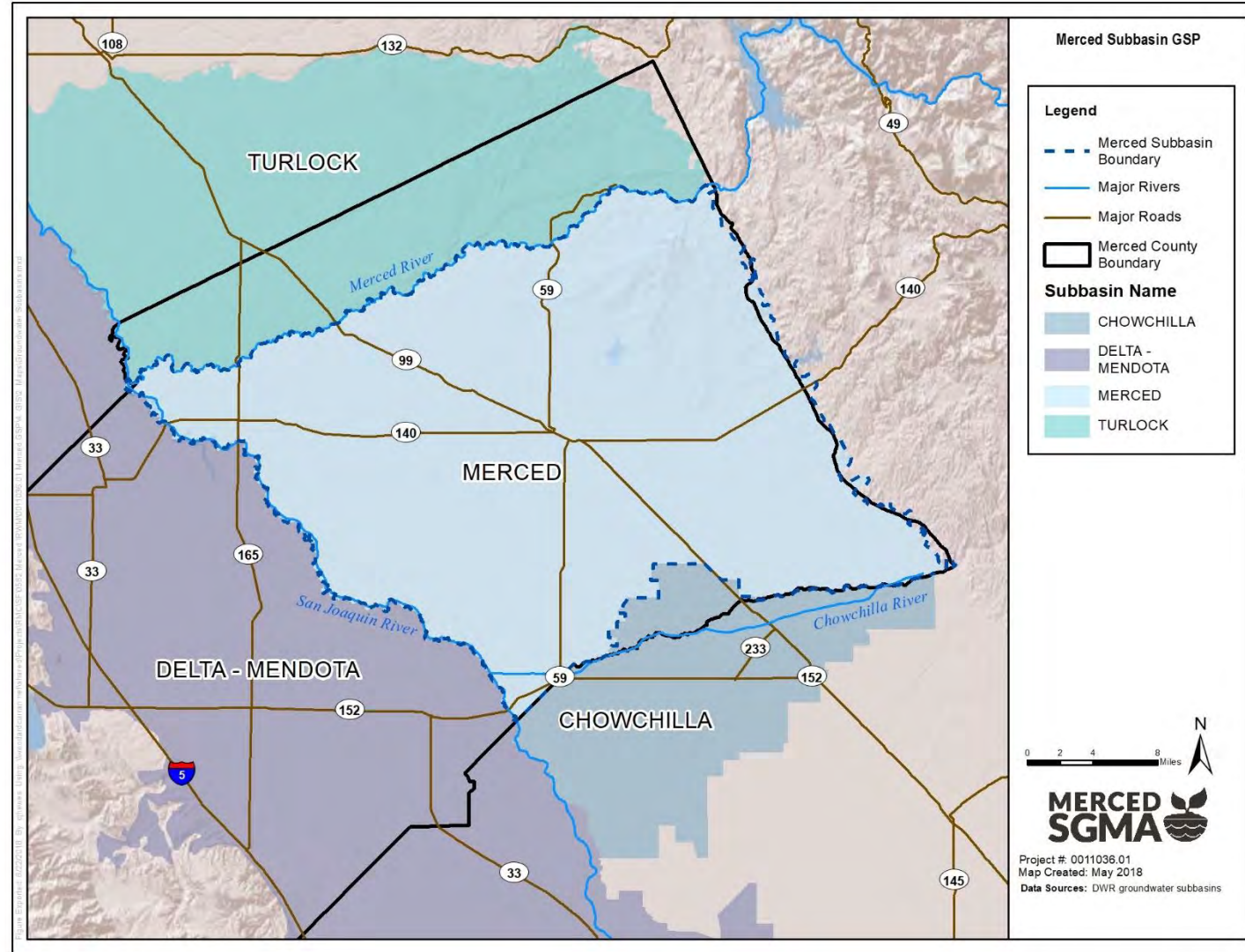


Reports

Image courtesy: Veronica Adrover/UC Merced



Coordination with Neighboring Basins



GSA Reports

- Updates from each GSA on activities they are undertaking in their own jurisdiction:
 - Merced Subbasin GSA
 - Merced Irrigation-Urban GSA
 - Turner Island Water District GSA #1

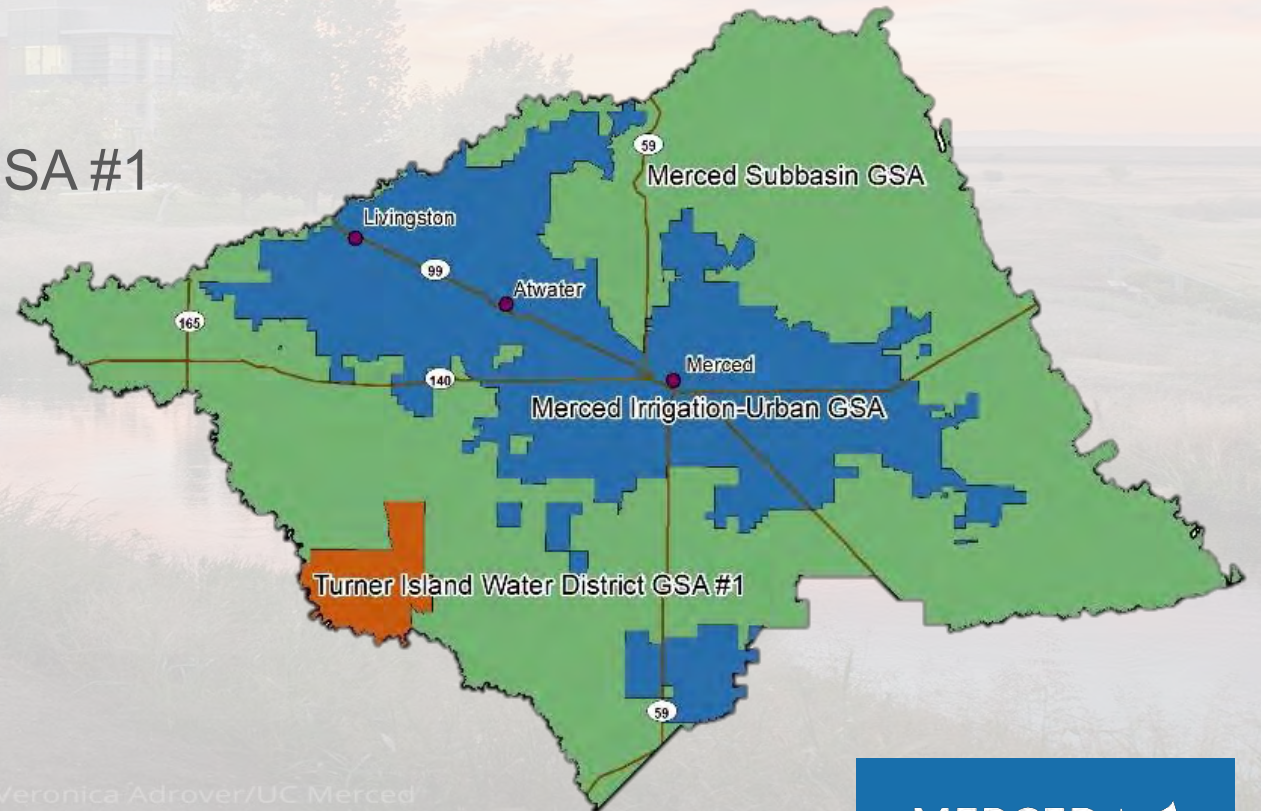


Image courtesy: Veronica Adrover/UC Merced



Actions

Image courtesy: Veronica Adrover/UC Merced



Stakeholder Advisory Committee Selection Process

- Coordination Committee decided to re-establish a Stakeholder Advisory Committee at its December 2020 meeting.
- Application posted on website and circulated to GSP email lists on Jan 14, 2021
- 30+ applications received and reviewed by GSA staff with focus on ensuring balanced representation of interests in basin



Recommended Stakeholder Advisory Committee

Applicant	Organization	Alternate	Alternate Organization
Mark Maxwell	UC Merced		
Reyn Akiona	River Partners		
Arlan Thomas	Chairman MIDAC	Ben Migliazzo	Live Oak Farm
Robert Weimer	Weimer Farms		
Joe Scoto	Scoto Brothers/McSwain School Dist.		
Nav Athwal	TriNut Farms		
Rick Drayer	Merced/Mariposa Cattlemen		
Susan Walsh	City of Merced	Bill Spriggs	Resident City of Merced
Lisa Kayser-Grant	Sierra Club		
Gil Cardon	Merced Co. Hispanic Chamber of Commerce		
Lacy Carothers	Cal Am Water		
David Belt	Foster Farms		
Thomas Dinwoodie	Master Gardener/McSwain		
Jean Okuye	E Merced RCD		
Jose Moran	Livingston City Council		
Perry Klassen	ESJWQC		
Maxwell Norton	Unincorporated area		
Darren Olguin	Resident of Merced County		
Breanne Ramos	MCFB		
Emma Reyes	Martin Reyes Farm/Land Leveling		
Joe Sansoni	Sansoni Farms/MCFB		
Simon Vander Woude	Sandy Mush MWC		
Trevor Hutton	Valley Land Alliance		
Wes Myers	Merced Grassland Coalition	Lou Myers	Benjamin Land LP
Greg Olzack	Atwater Resident		
Olivia Gomez	Community of Planada	Amanda Monaco	Leadership Council
Craig Arnold	Arnold Farms		
Bob Kelley	Stevinson Representative	Blake Nervino	Stevinson/Merquin
Dave Serrano	Le Grand Area Grower		
Lisa Baker	Clayton Water District		

Recommended Stakeholder Advisory Committee

- ACTION: Review the proposed membership for the Stakeholder Advisory Committee and make recommendation to GSA boards on committee membership.

Image courtesy: Veronica Adrover/UC Merced

GSP Well Monitoring Request for Qualifications (RFQ)

- Coordination Committee approved soliciting qualified consultants for technical support related to monitoring in November 2020
- **GSA's coordinated together in the development of the RFQ and released the RFQ on January 15, 2021**
- Two submissions were received by the deadline of February 12, 2021
- **GSA's coordinated the review of submissions and recommendation of a single firm to the Coordination Committee**

Image courtesy: Veronica Adrover/UC Merced

GSP Well Monitoring Request for Qualifications (RFQ)

- Technical support services may include
 - Monthly monitoring of groundwater levels in CASGEM wells
 - Coordinating groundwater quality and subsidence monitoring with other entities
 - Assisting in filling data gaps through the installation of new monitoring sites
 - Refinement of existing monitoring programs

Image courtesy: Veronica Adrover/UC Merced

GSP Well Monitoring Request for Qualifications (RFQ)

- Recommend GSAs select QK as consultant for monitoring work under SGMA for Merced Subbasin. Authorize MIUGSA to enter into an agreement with QK. Provide QK with initial budget of \$10,000 to conduct spring monitoring.

Image courtesy: Veronica Adrover/UC Merced



Discussion Items

Image courtesy: Veronica Adrover/UC Merced





Data Gaps Plan

Image courtesy: Veronica Adrover/UC Merced



Purpose & Goal

- **Purpose** – Improve scientific understanding of subbasin to support ongoing basin management and policy making
- **Goal** – Develop a plan that identifies and ranks priority areas for the installation of monitoring wells or subsidence monitoring stations to support basin characterization and future GSP refinement.

Image courtesy: Veronica Adrover/UC Merced

Data needs identified in GSP

- Better understand groundwater levels in poorly monitored portions of the subbasin
- Improve characterization of groundwater quality without duplicating other efforts
- Better understand depth at which subsidence is occurring
- Better understanding of shallow groundwater condition near GDEs and rivers
- Others
 - Inter-basin flows
 - Model improvement
 - Agro-climate station (e.g. CIMIS station)
 - Areas of interest (e.g., high pumping areas, groundwater level depressions, significant recharge areas, specific projects)

Image courtesy: Veronica Adrover/UC Merced



Data Gaps Plan Development – Process

1. Describe data gap areas
2. Use ranking and weighting methodology to prioritize different needs (e.g., groundwater levels, subsidence, interconnected surface water)
3. Prepare an Implementation Plan which lays out next steps for filling priority data gaps

Image courtesy: Veronica Adrover/UC Merced

Data Gaps Plan – Schedule

- 1. Coordination Committee Meetings – Feb. 22**
 - Background, Prioritization, and Ranking Methodology
- 2. Stakeholder Committee Meeting – March**
 - Background, Prioritization, and Ranking Methodology
- 3. Public Meeting – April/May**
 - Present and Seek Input on Draft Plan
- 4. Coordination Committee Meeting – May 24**
 - Present Final Data Gaps Plan

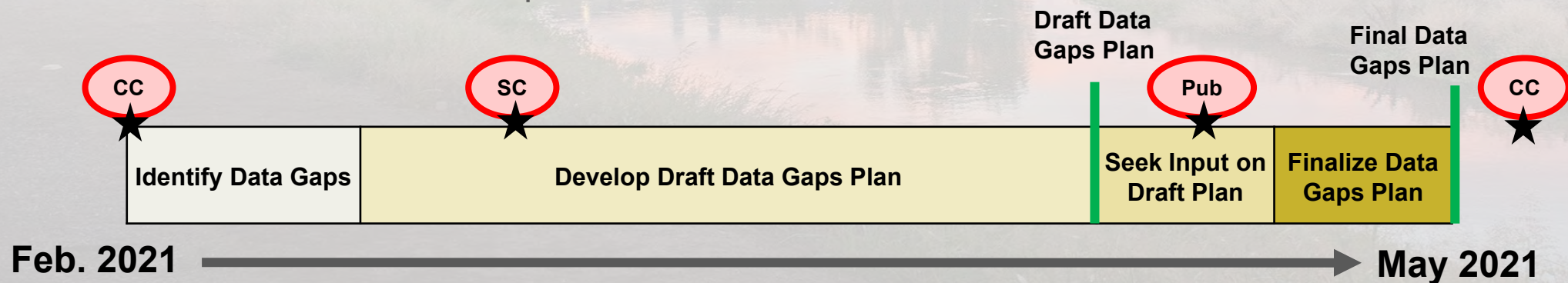


Image courtesy: Veronica Adrover/UC Merced



Data Gaps Plan – Description of Data Gap Areas

Image courtesy: Veronica Adrover/UC Merced

Groundwater Levels

- DWR's **Monitoring Networks and Identification of Data Gaps BMP** provides multiple sources to guide monitoring network well density, ranging from 0.2-10 wells per 100 square miles.

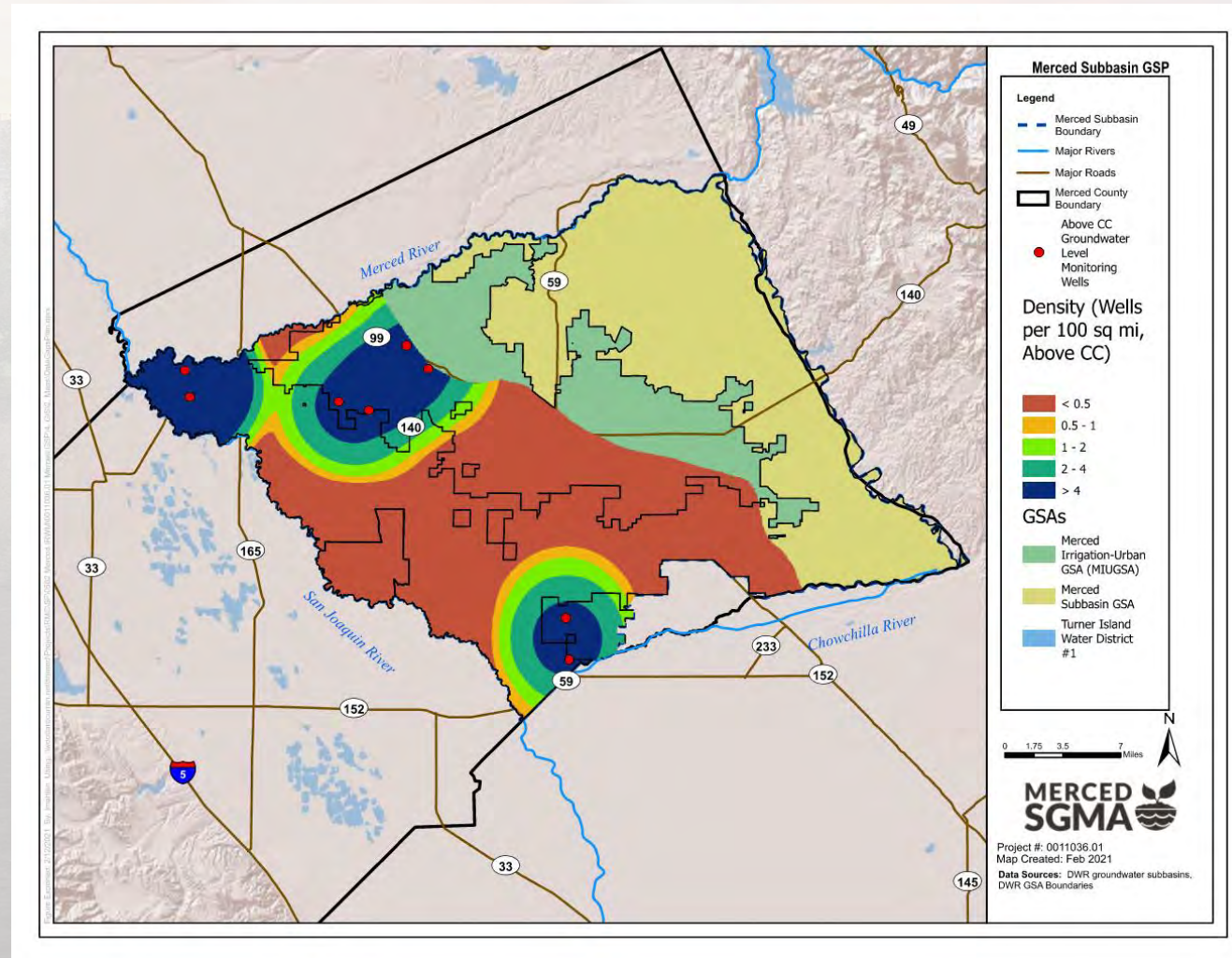
DWR Guidance

Reference	Monitoring Well Density (wells per 100 miles ²)
Heath (1976)	0.2 - 10
Sophodeous (1983)	6.3
Hopkins (1984)	4.0
Basins pumping more than 10,000 acre-feet/year per 100 miles ²	
Basins pumping between 1,000 and 10,000 acre-feet/year per 100 miles ²	2.0
Basins pumping between 250 and 1,000 acre-feet/year per 100 miles ²	1.0
Basins pumping between 100 and 250 acre-feet/year per 100 miles ²	0.7

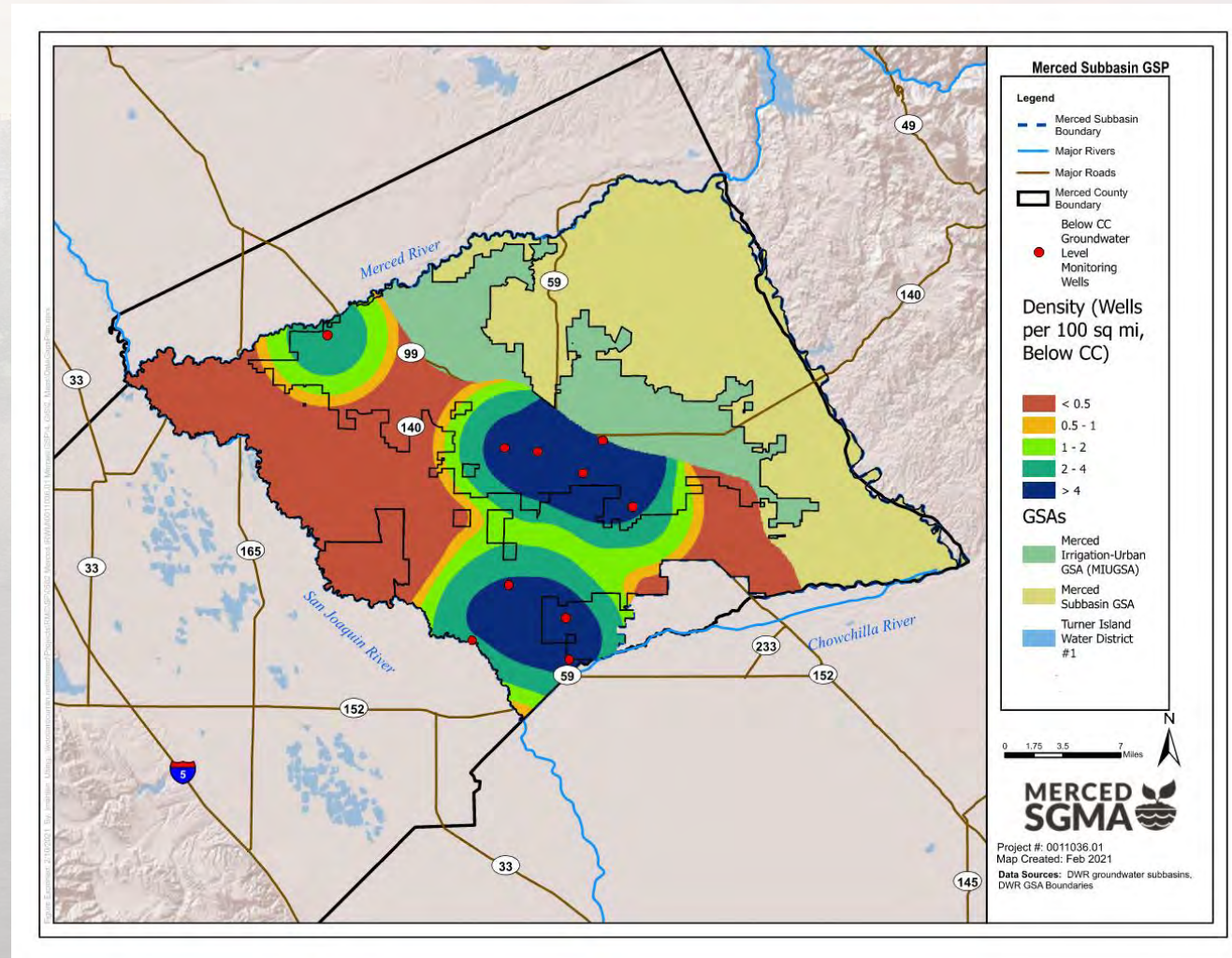
Current Monitoring Network

	Above Corcoran Clay	Below Corcoran Clay	Outside Corcoran Clay	Total
Density (number of wells per 100 mi ²)	1.8	2.3	4.9	4.5

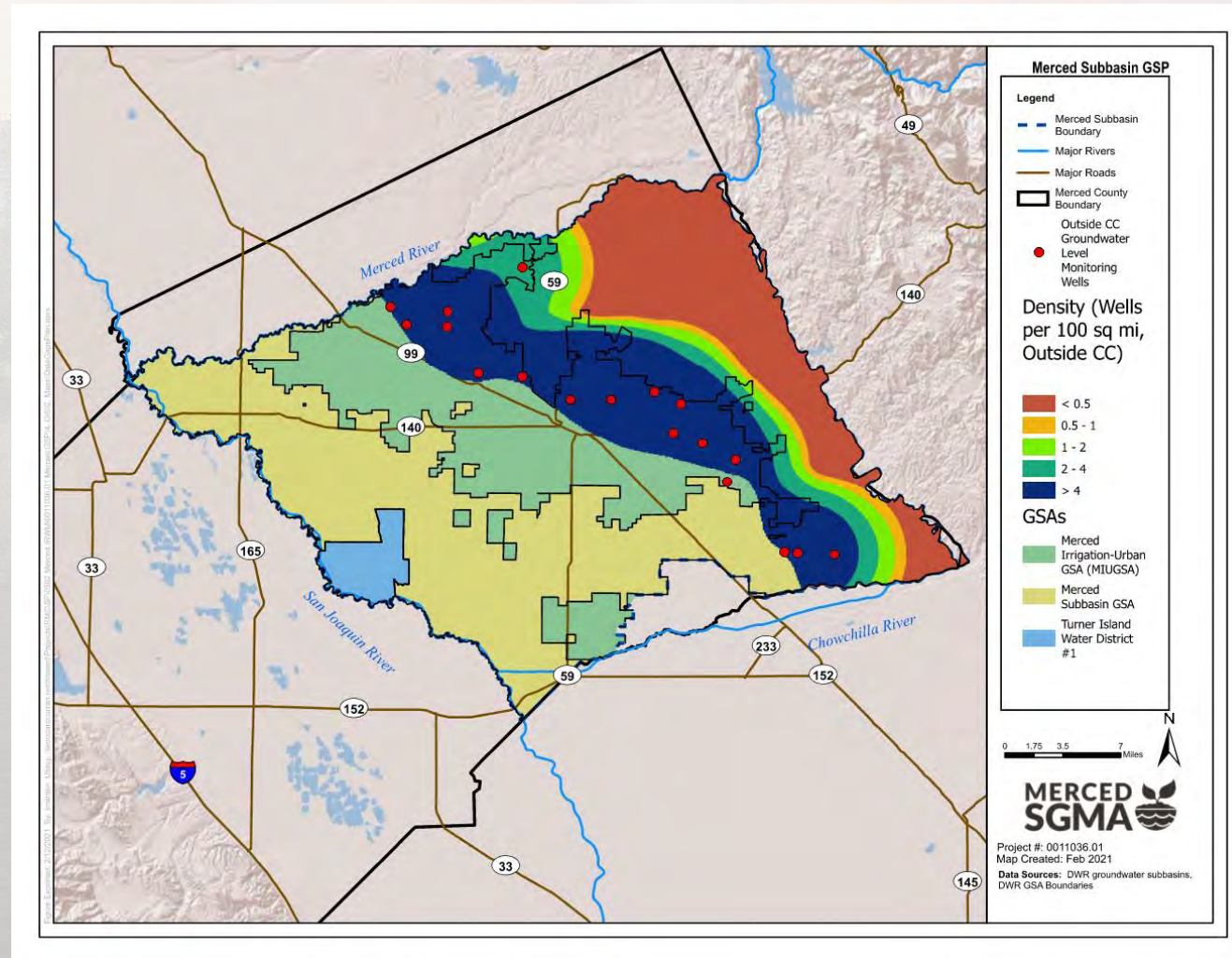
Groundwater Level Monitoring Network Density (Above CC)



Groundwater Level Monitoring Network Density (Below CC)



Groundwater Level Monitoring Network Density (Outside CC)



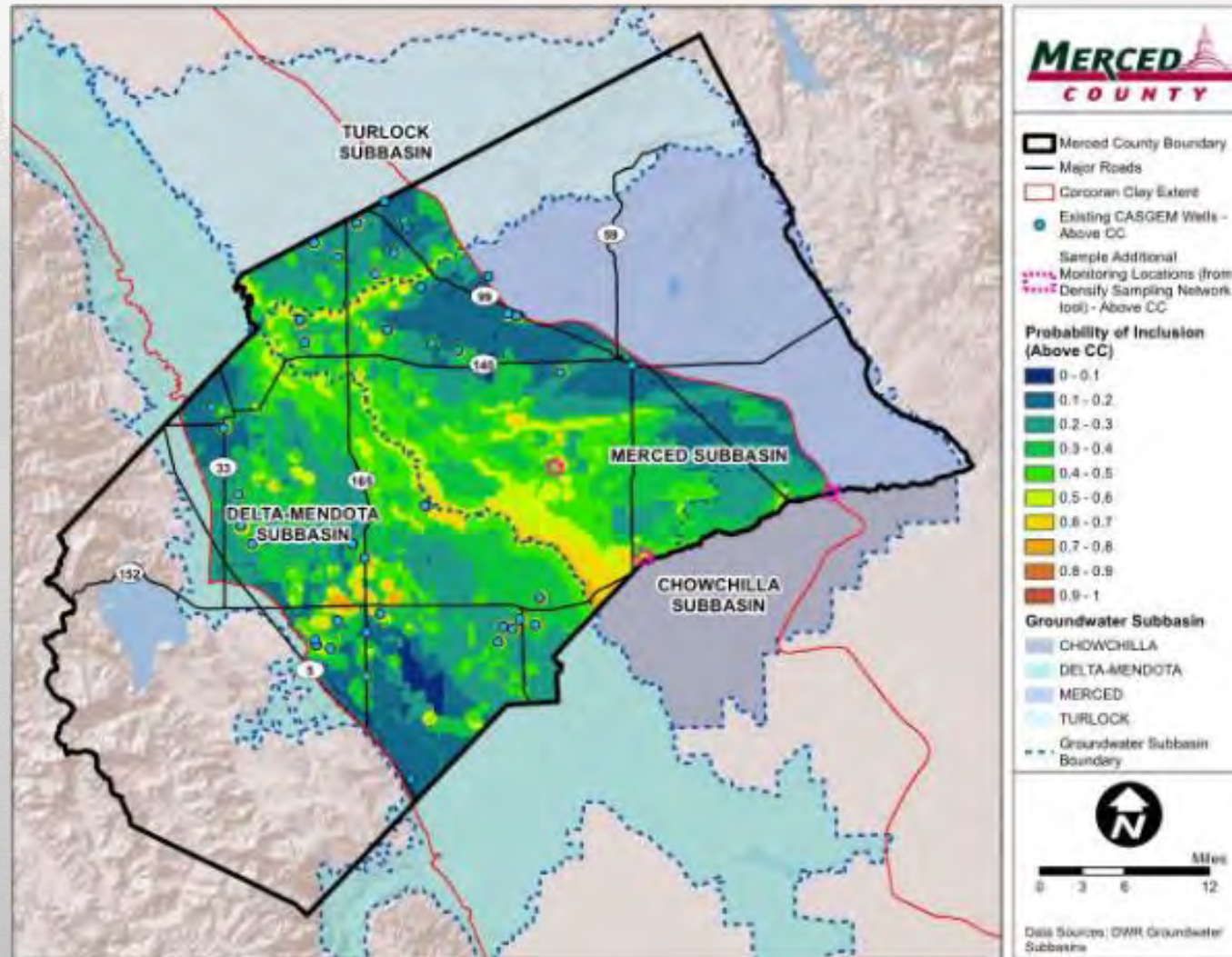
Groundwater Level Data Gap Approach

- Monitoring wells are expensive – prioritize use of existing facilities where possible
- Monitoring well siting can be challenging – flexibility is necessary on siting
- Funding or partnering opportunities can lead to wells in good areas rather than great areas
- Each facility that joins the network “changes the map.”
- Plan will be flexible and adaptable to guide efforts moving forward
- A number of folks in the basin have reached out to the GSAs with information about potential wells that could be added to network. The GSAs and Woodard & Curran are following up.

Image courtesy: Veronica Adrover/UC Merced

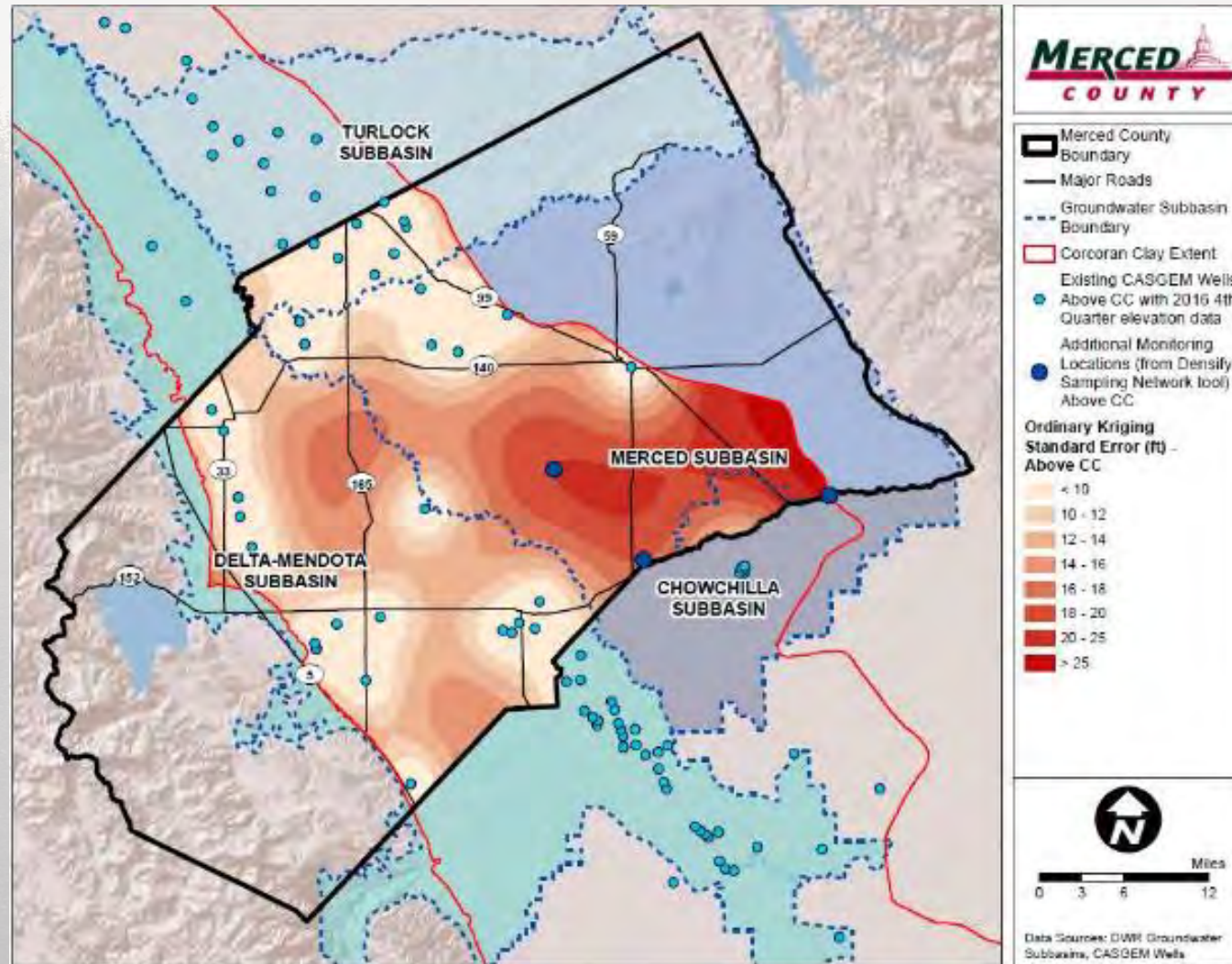


Groundwater Levels – Previous Data Gap Work (Merced County, 2018)



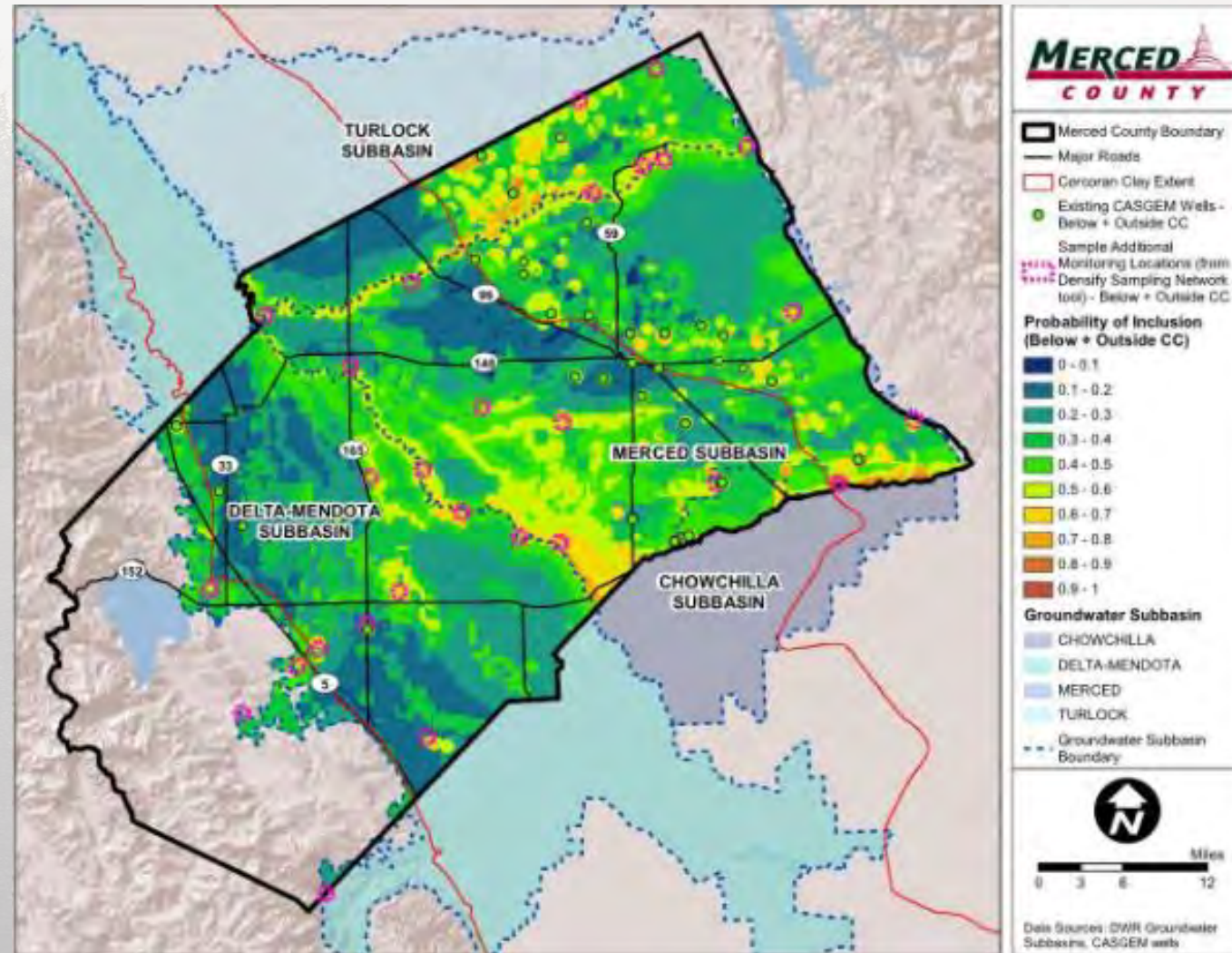
- Above Corcoran Clay
- Ranking of areas based on
 - Depth to water
 - Distance to rivers
 - Land use
 - Groundwater dependence
 - Water quality issues
 - Proximity to boundaries

Groundwater Levels – Previous Data Gap Work (Merced County, 2018)



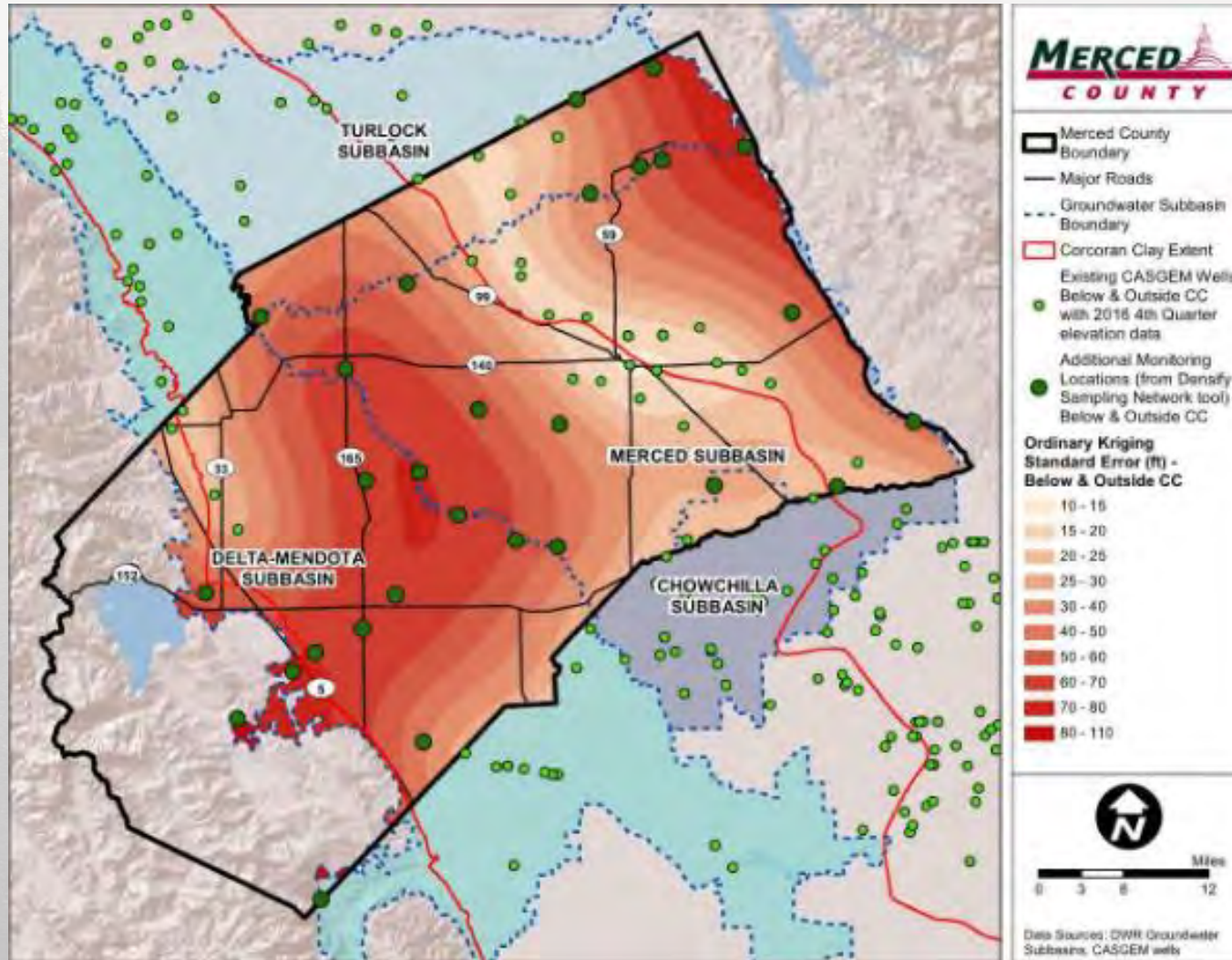
- Above Corcoran Clay
 - Uncertainty in interpolated groundwater estimates: ordinary kriging standard error

Groundwater Levels – Previous Data Gap Work (Merced County, 2018)



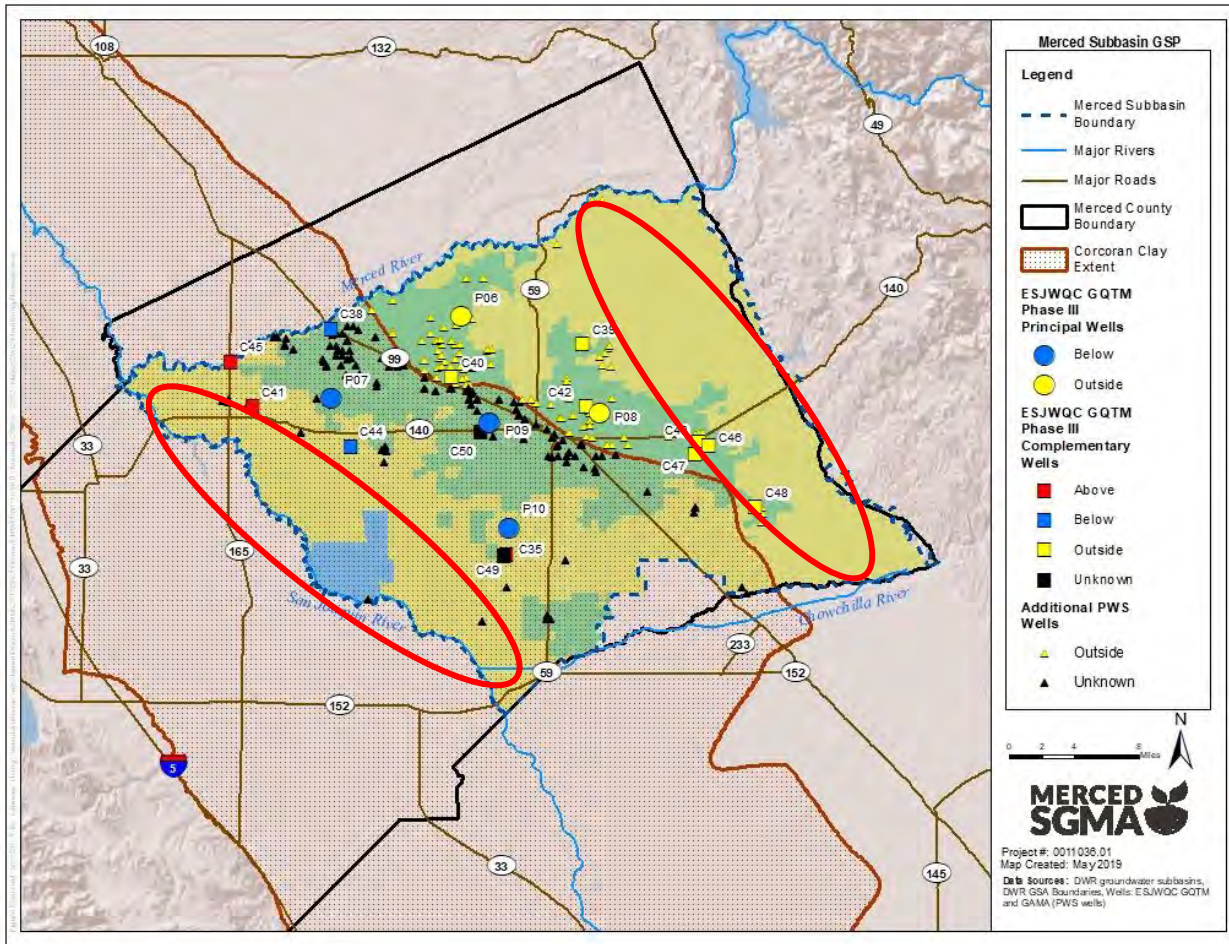
- Below/Outside Corcoran Clay
- Ranking of areas based on
 - Depth to water
 - Land use
 - Groundwater dependence
 - Water quality issues
 - Subsidence
 - Proximity to boundaries

Groundwater Levels – Previous Data Gap Work (Merced County, 2018)



- Below/Outside Corcoran Clay
 - Uncertainty in interpolated groundwater estimates: ordinary kriging standard error

Groundwater Quality – Data Gaps



■ Spatial data gaps:

- Relatively few monitoring wells closer to the San Joaquin River and closer to Mariposa County.
- Lack of construction information, limits the ability to distinguish whether wells are below or above the Corcoran Clay.

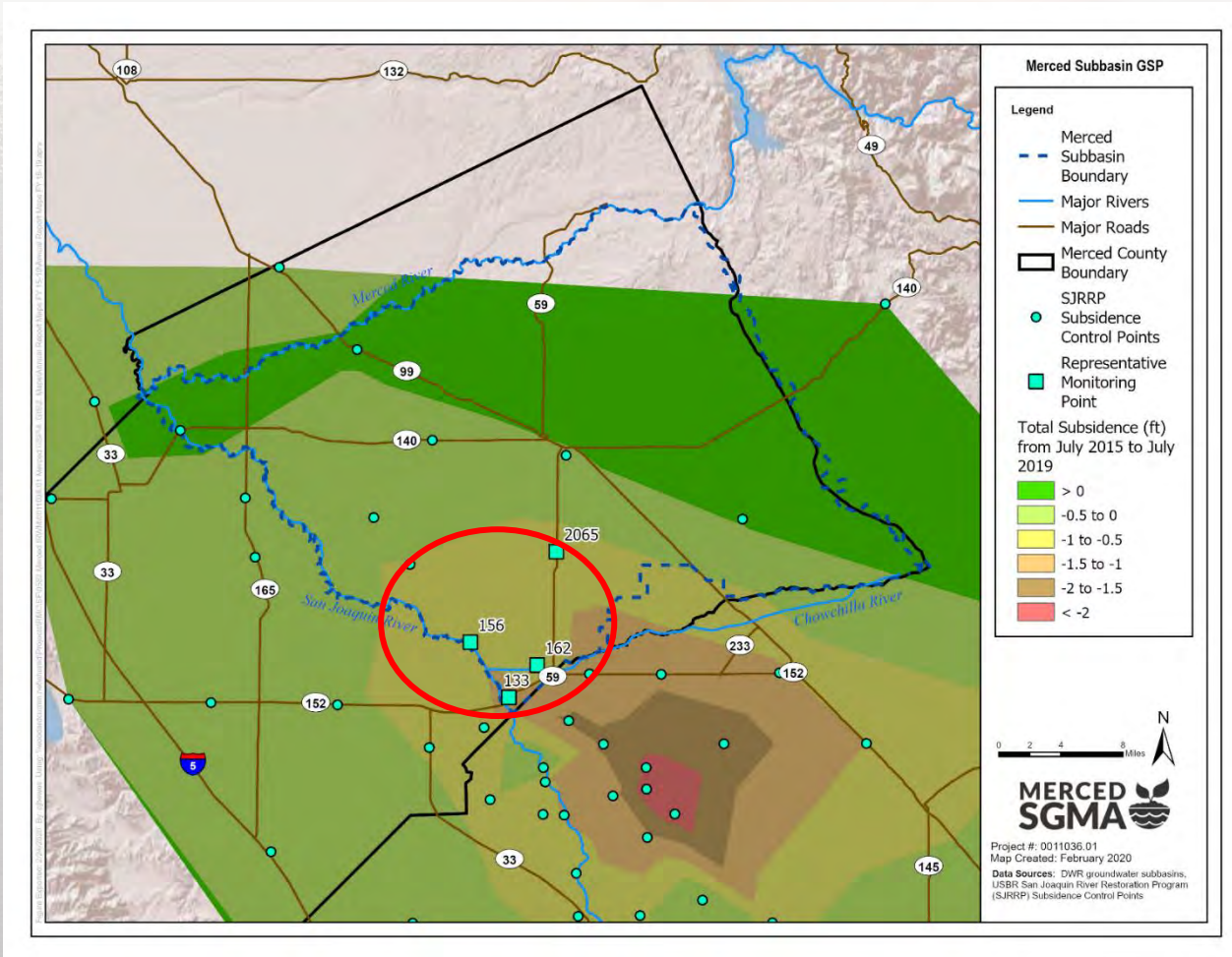
■ Areas of interest:

- Target areas in proximity to TDS or NO₃ concentrations above the maximum contaminant level (MCL).

■ Approach to filling gaps

- Attempt to fill quality and levels gaps with the same facilities
- Consideration of video surveys
- Coordination with other programs

Land Subsidence – Data Gap Areas

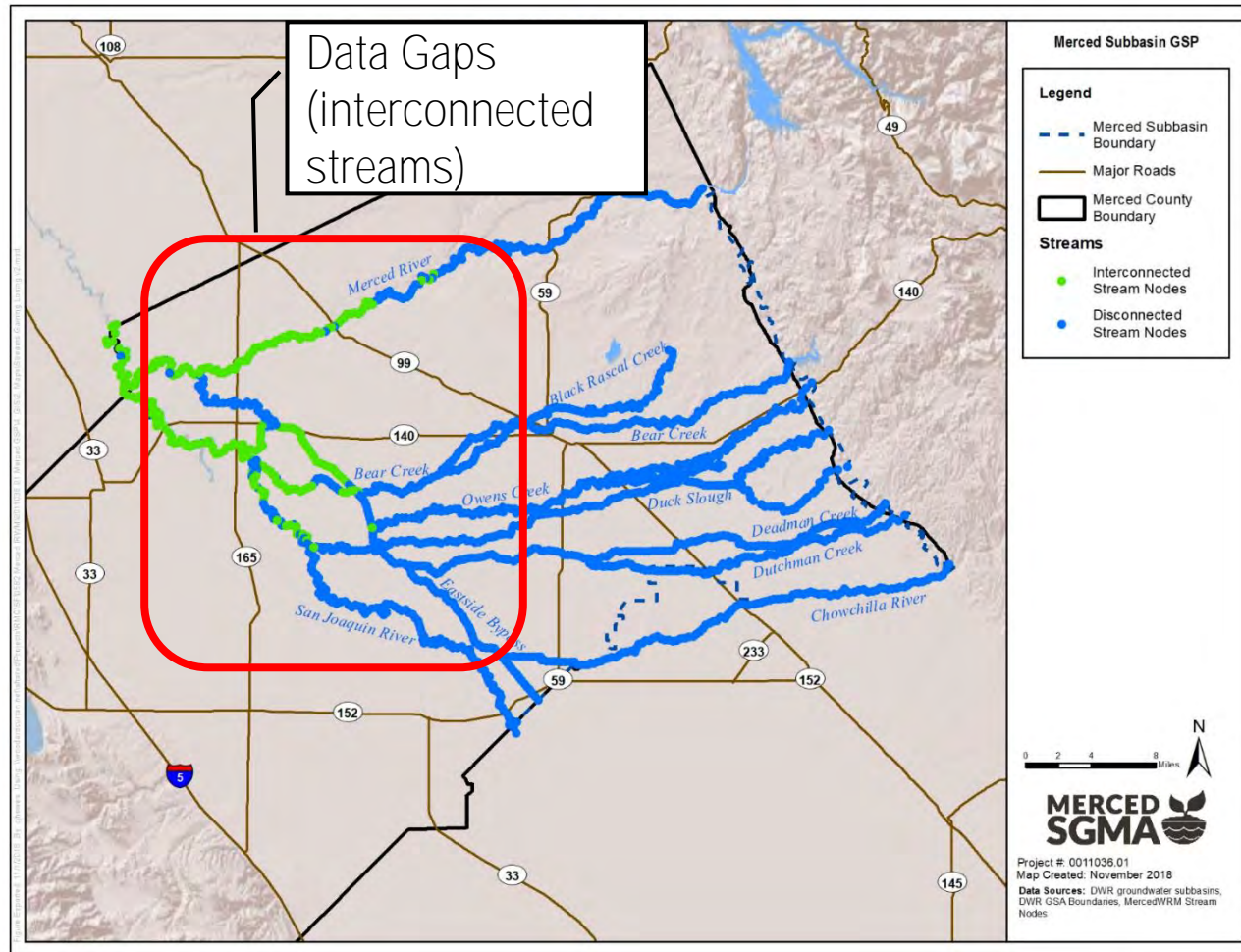


There are multiple methods used to evaluate land subsidence

1. Leveling surveys
2. CGPS surveys
3. InSAR surveys
4. Construction and use of borehole extensometers (to support understanding of the depth at which subsidence is occurring and the level of compaction)

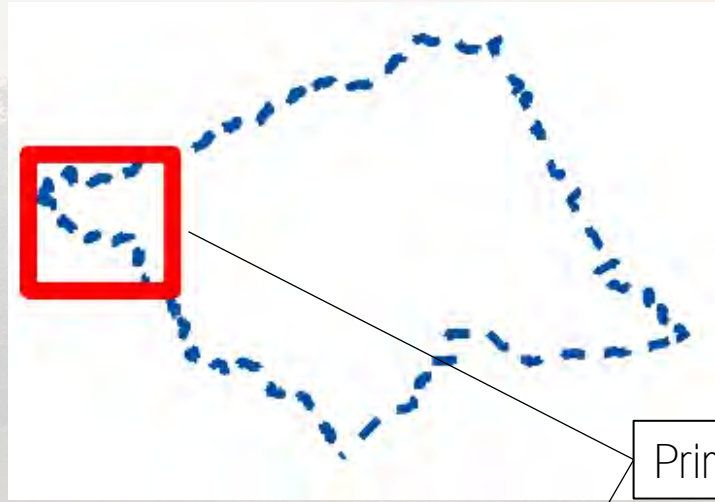
Focus of subsidence data gap evaluation

Interconnected Surface Waters – Data Gap Areas

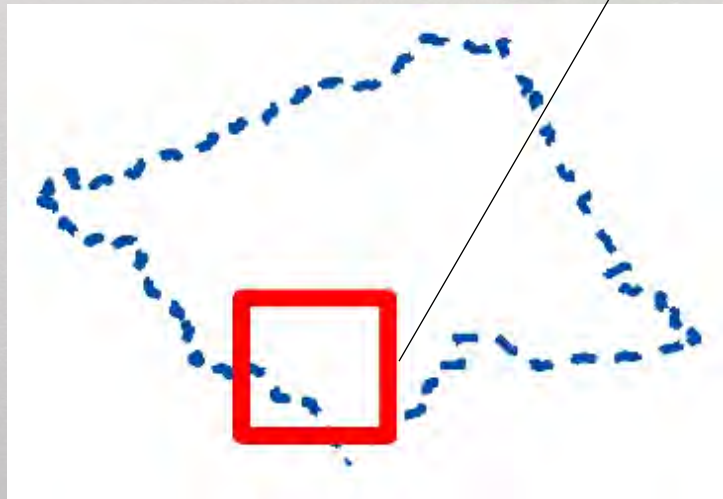


- Streams identified as interconnected are located in the western portion of the Subbasin.
- Areas near the transition from connected to interconnected streams can benefit from additional shallow groundwater monitoring
- Pair with other gap efforts

Groundwater-Dependent Ecosystems (GDEs)



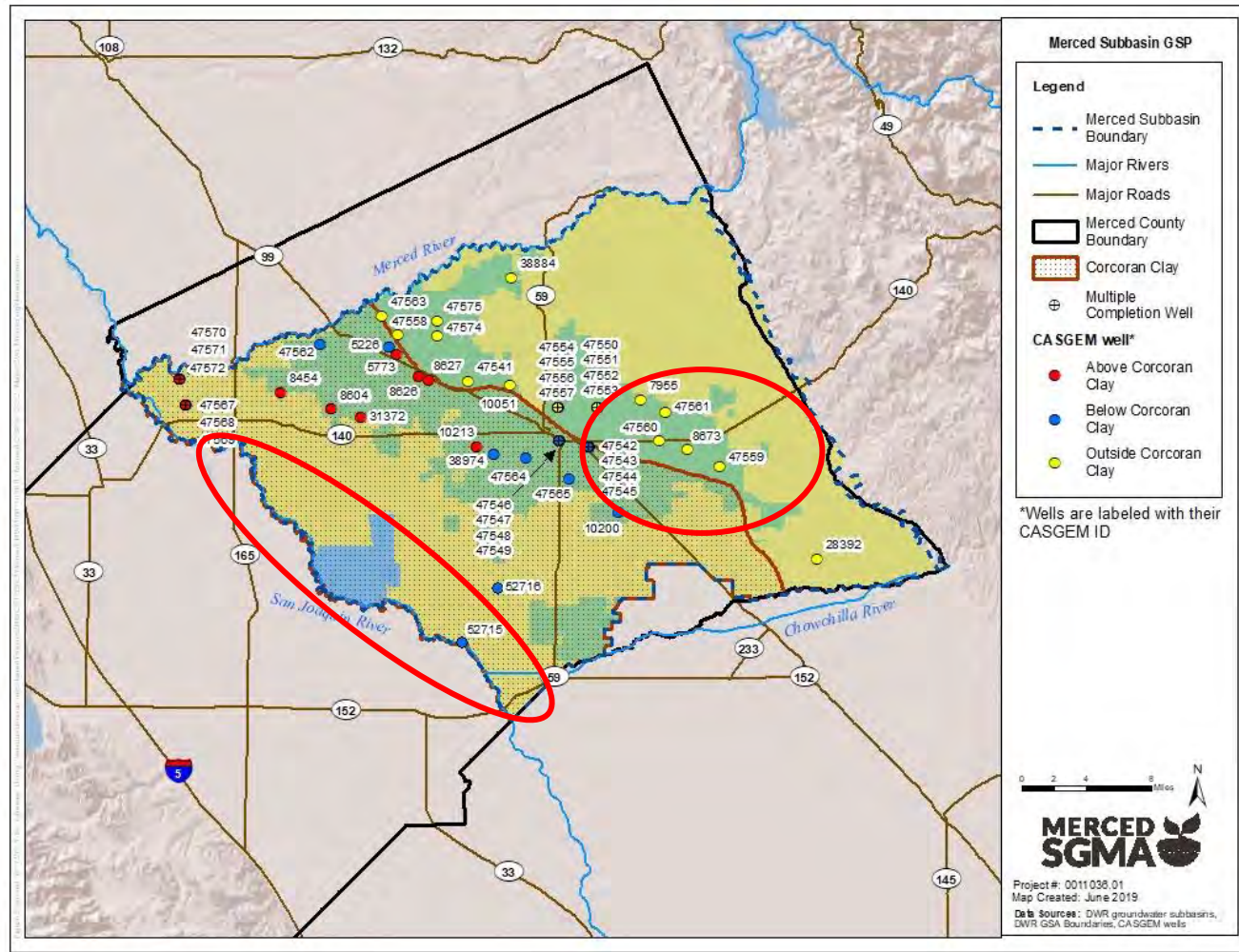
Primary areas of GDEs



- Shallow groundwater level data gaps – coordinated with levels gaps
- Ecosystem health data gaps – consideration of existing tools for vegetative health

Image courtesy: Veronica Adrover/UC Merced

Inter-basin Flows/Model Data Gaps



- Limited groundwater level data near San Joaquin River (to inform understanding of inter-basin flows).
- Area of limited groundwater level data in the Outside Corcoran Clay aquifer.
- Very similar to groundwater level data gaps



Remote-Sensing Tool Development

Image courtesy: Veronica Adrover/UC Merced

Net GW Use Estimation – GSA Support

- The Remote Sensing Tool can be used to support the local GSAs, manage the aquifer system by quantifying net-groundwater use within the Merced Subbasin
- RS technology estimates monthly crop ETC at the field scale. Total crop ETC less surface water supplied to fields would be used to estimate the monthly GW use at field scale

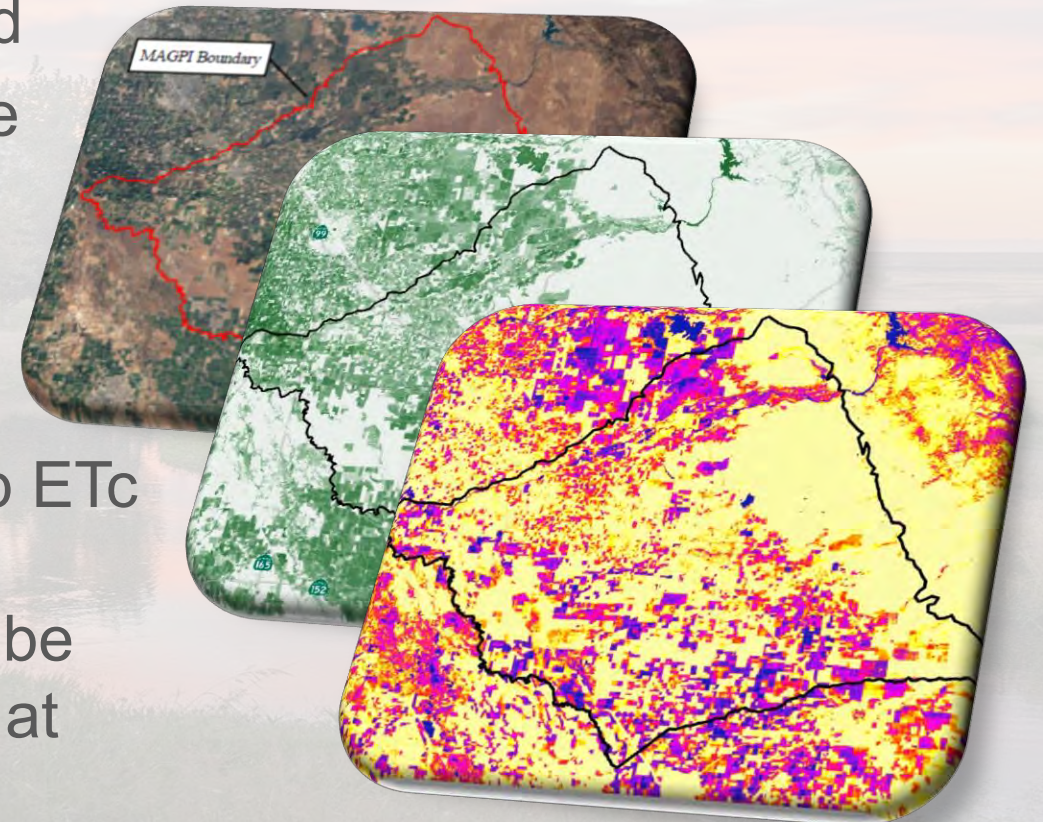
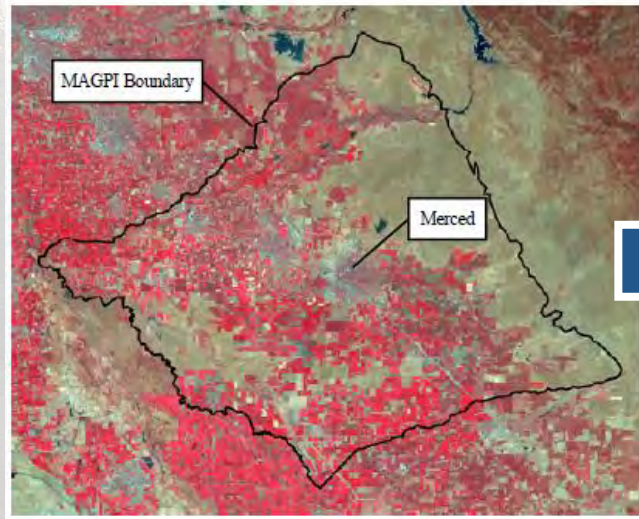
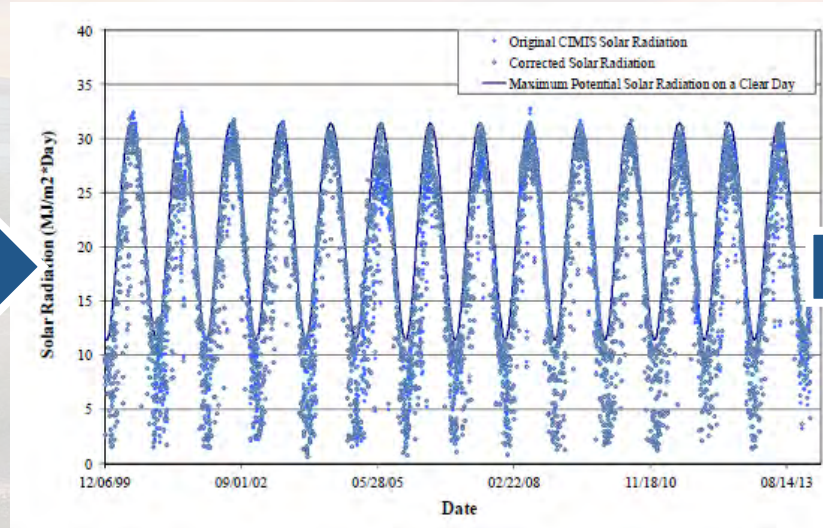


Image courtesy: Veronica Adrover/UC Merced

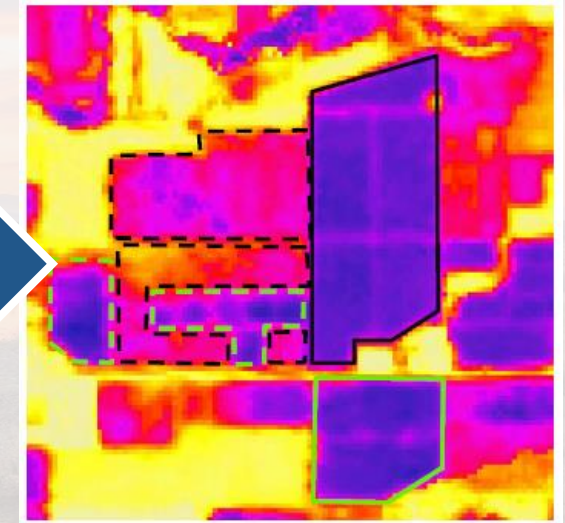
Remote Sensing Approach – Estimating Crop ET



30m LandSAT Infrared Imagery



Weather Data & Hydrological Modeling



Evapotranspiration

Image courtesy: Veronica Adrover/UC Merced

Image Source: Merced Water Resources Model (MercedWRM) Report (RMC 2017)
MAGPI Remote Sensing of Evapotranspiration and Net to and From Groundwater (ITRC 2016)

Remote Sensing Approach– Data Driven Results

Crop Evapotranspiration

- Actively working with DWR staff to evaluate remote sensing data and methodology to optimize accuracy and cost effectiveness
- **Methodology Options:** METRIC, SEBAL
- **Vendors:** ITRC, Formations Environmental, LandIQ, Spatial Wave, OPENET, Others

Surface Water Deliveries

- Variable resolution (Subbasin – GSA – Parcel)
- Accuracy of high-resolution output is dependent on available data

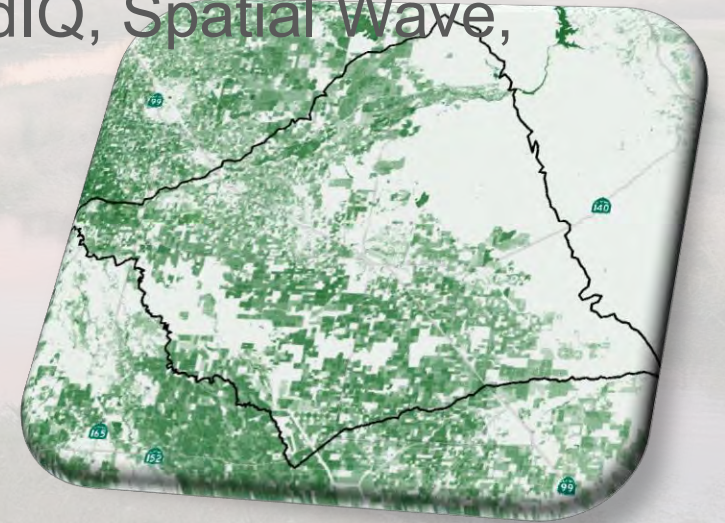


Image courtesy: Veronica Adrover/UC Merced

Next Steps

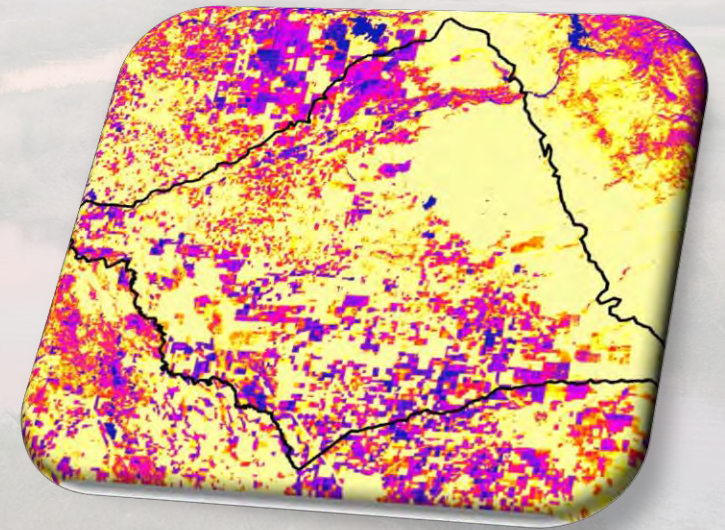
Actions:

- Conduct research and compile information on various methods, vendors and R&D options
- Develop screening criteria in coordination with GSA staff
- Collect and analyze surface water delivery data
- Groundtruthing with GSA staff and stakeholders

Schedule:

- Initiate process: April 2021
- Conduct outreach consistent with grant requirements
- Quarterly Updates to Merced GSP CC
- Complete work: August 2021

courtesy: Veronica Adrover/UC Merced





Sustainability Criteria Approaches for Additional Representative Monitoring Wells

Image courtesy: Veronica Adrover/UC Merced

Sustainable Management Criteria Definitions

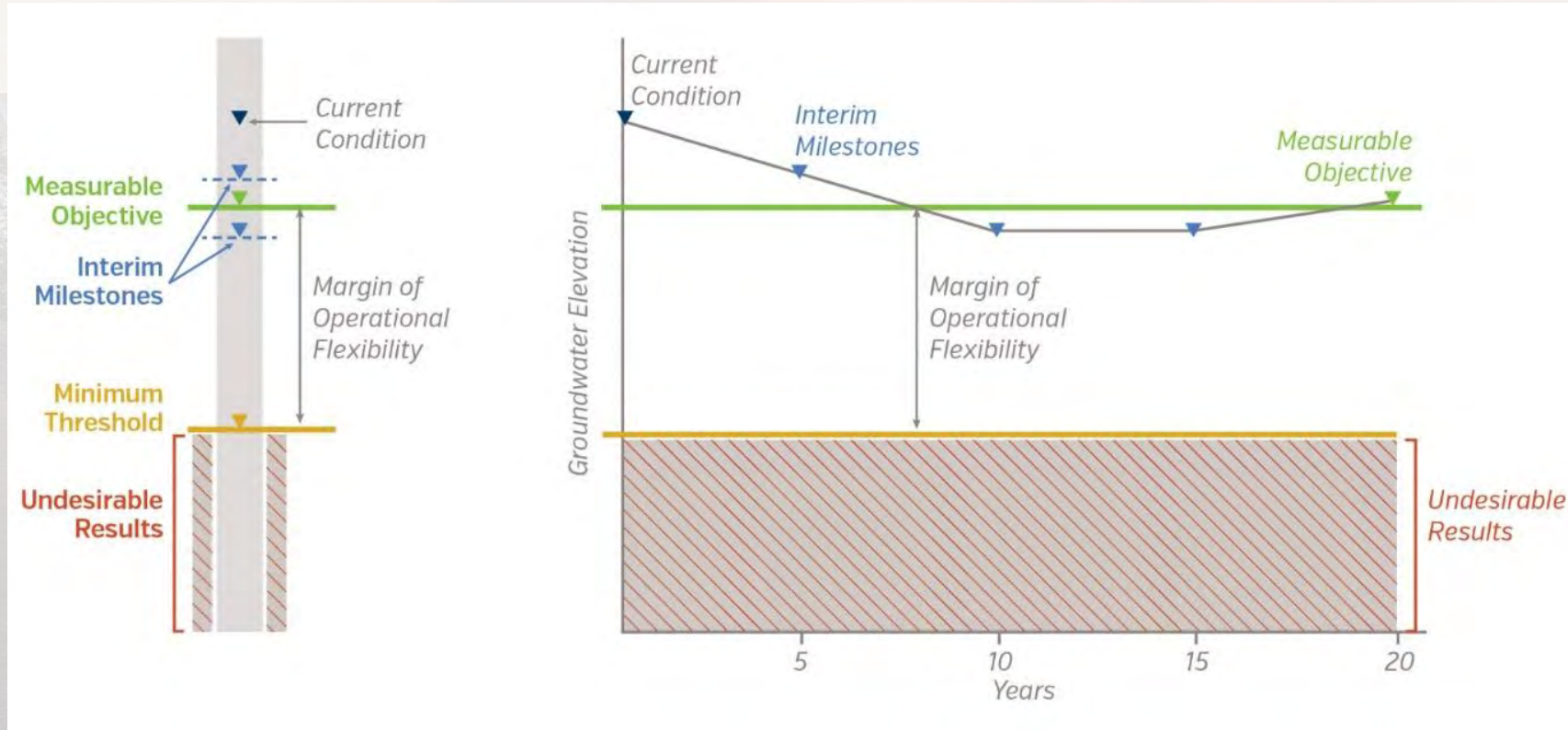


Image courtesy: Veronica Adrover/UC Merced

Approach for Establishing Sustainability Criteria at Additional Representative Monitoring Wells

- Current sustainability criteria for groundwater levels based on:
 - Evaluation of domestic well depths within two-mile radius of representative monitoring well
 - Historical groundwater elevation and trends
- Potential new representative monitoring wells may not have any historical elevation data or may not be located in a region with domestic wells within two miles

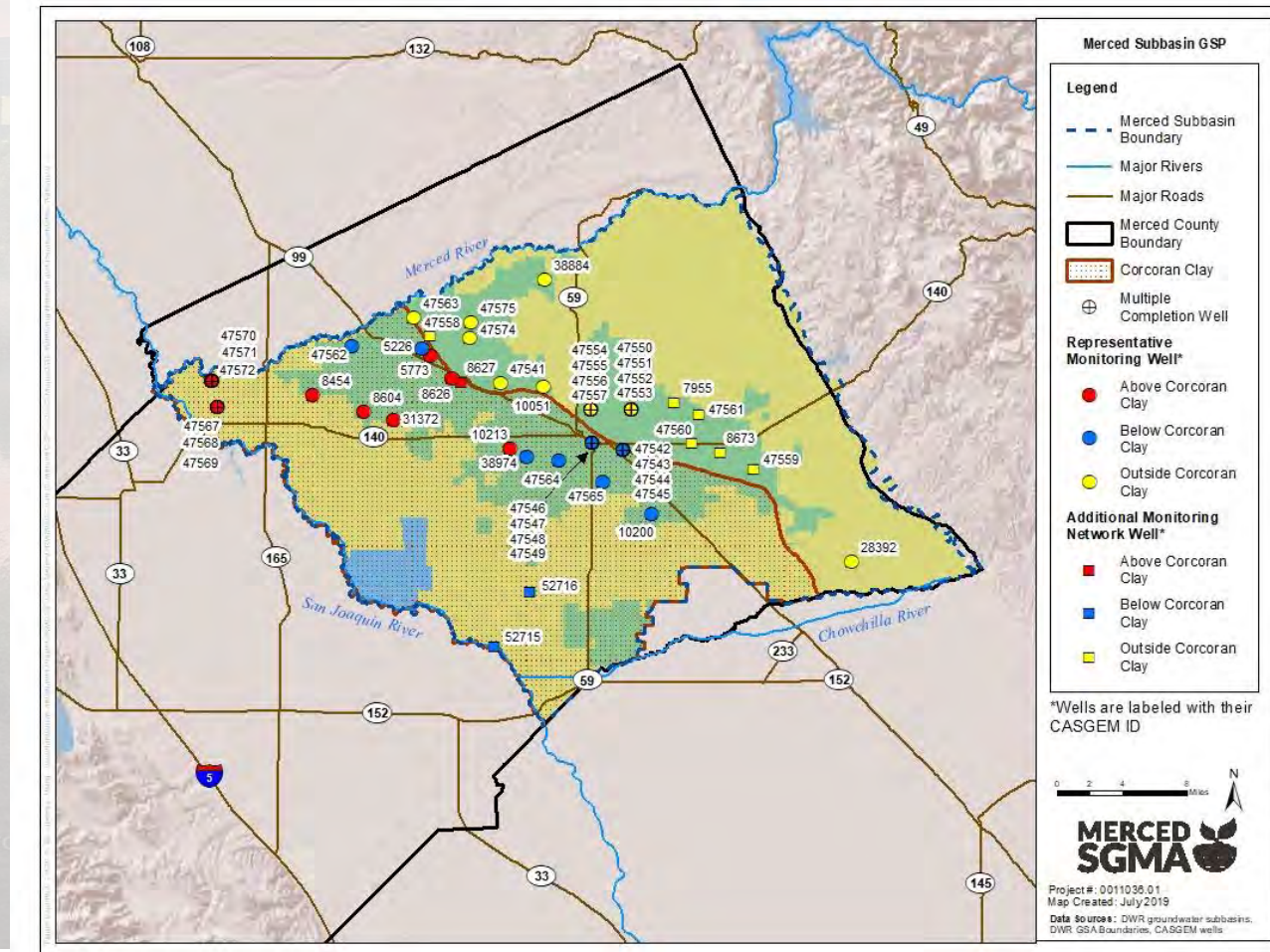


Image courtesy: Ver...

Possible Approaches for Establishing Thresholds and Sustainability Criteria

- Options to be evaluated:
 - Develop a regionally specific median well depth as a Minimum Threshold
 - Protective of half of regional wells while providing some flexibility as the basin approaches sustainable groundwater levels
 - Develop a regionally specific factor based on domestic well depths constructed in the last 5 years plus a buffer
 - New wells would be expected to be this deep, with protection during pathway to sustainability.

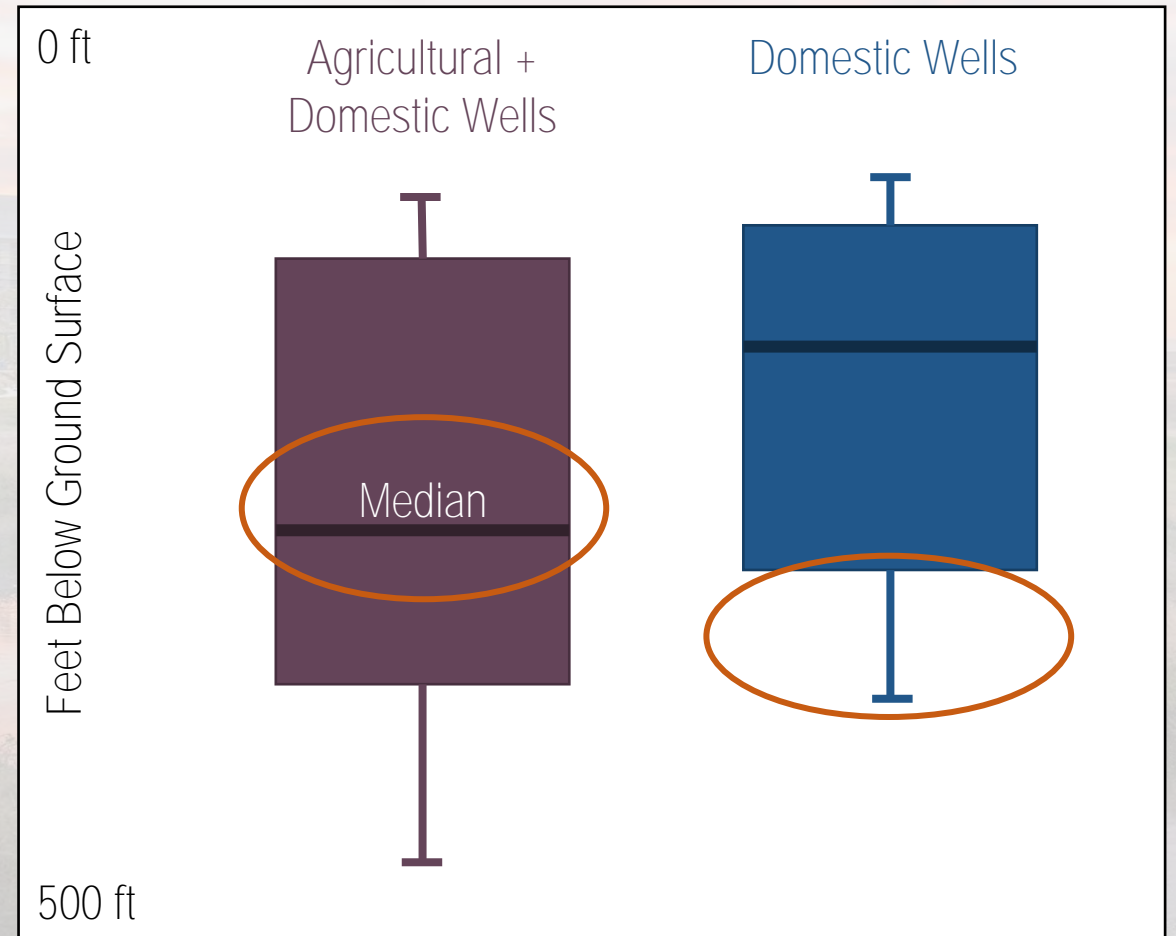


Image courtesy: Veronica Adrover/UC Merced



Prop 68 Implementation Grant

Image courtesy: Veronica Adrover/UC Merced

Prop 68 Implementation Grant Application Submitted in January

Southern Merced Groundwater Subbasin Recharge Program

Goal: to improve groundwater levels in the southern portion of the Merced Subbasin through direct and in-lieu groundwater recharge, while also reducing flood risk to underrepresented communities.

Le Grand Athlone-Water District Intertie and Recharge Project

Requested Grant Amount: \$4,200,000

Constructs a 2-mile conveyance system linking the MID surface water distribution system to LGAWD and creeks and a new 10-acre recharge basin (Bona Vista Recharge Basin) that will deliver surface water for direct and in-lieu recharge.

El Nido Conveyance System Improvements

Requested Grant Amount: \$764,000

Provides conveyance improvements at **four siphons/pipelines in MID's El Nido Conveyance System** to allow more surface water to be diverted from Mariposa Creek to the El Nido area for direct and in-lieu groundwater recharge

DWR Next steps:

- Release draft funding list for Round 1 in mid-March 2021
- Final grant awards in May 2021



Next Steps

Image courtesy: Veronica Adrover/UC Merced



What's coming up next?

- GSAs appoint Stakeholder Advisory Committee for implementation phase
- First Stakeholder Advisory Committee meeting TBD
- Annual Report due to DWR on April 1, 2021
- Adjourn to next meeting: April 26, 2021 at 1:15

Image courtesy: Veronica Adrover/UC Merced

GSP Coordination Committee

Coordination Committee Meeting – February 22, 2021

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

Image courtesy: Veronica Adrover/UC Merced

