



Board of Directors
Michael W. Mobley, President
Bruce E. Dandy, Vice President
Sheldon G. Berger, Secretary/Treasurer
Mohammed A. Hasan
Lynn E. Maulhardt
Edwin T. McFadden III
Daniel C. Naumann

General Manager
Mauricio E. Guardado, Jr.

Legal Counsel
David D. Boyer

MINUTES
REGULAR BOARD MEETING
Wednesday, September 8, 2021, 12:00 P.M.
Board Room, UWCD Headquarters
1701 N. Lombard Street, Oxnard CA 93030

Board Members Present

Michael W. Mobley, president
Bruce E. Dandy, vice president
Sheldon G. Berger, secretary/treasurer
Mohammed A. Hasan
Lynn E. Maulhardt
Edwin T. McFadden, III
Daniel C. Naumann

Staff Present

Mauricio E. Guardado, Jr., general manager
David D. Boyer, legal counsel
Dr. Maryam Bral, chief engineer
John Carman, operations and maintenance program supervisor
Brian Collins, chief operations officer
Dan Detmer, water resources manager
Anthony Emmert, assistant general manager
Joseph Jereb, chief financial officer
Kathleen Kuepper, hydrogeologist
Evan Lashly, environmental scientist
John Lindquist, senior hydrogeologist
Randall McInvale, environmental scientist - regulatory affairs
Craig Morgan, engineering manager
Kevin Ortega, associate control systems programmer
Josh Perez, human resources manager
Zachary Plummer, IT administrator
Linda Purpus, environmental services manager
Robert Richardson, senior engineer
Daryl Smith, controller
Clayton Strahan, chief park ranger
Dr. Jason Sun, principal hydrogeologist – modeler
Kris Sofley, executive assistant/clerk of the board

Public Present

Burt Handy

1. FIRST OPEN SESSION 12:00 P.M.

President Mobley called the meeting to order at 12noon and asked the District's Legal Counsel David Boyer to announce what the Board will discuss in Executive (Closed) Session.

Mr. Boyer said the Board, pursuant to Government Code Section 54956.9(d)(2), would be discussing two cases of anticipated litigation and, pursuant to Government Code Section 54956.9(d)(1), would be discussing six cases of existing litigation, including three cases with the City of San Buenaventura, one case with Wishtoyo Foundation, one case brought by the Dorsey family regarding the drowning death of Naya Rivera, and one case regarding the OPV Coalition v Fox Canyon Groundwater Management Agency.

**1.1 Public Comments
Information Item**

President Mobley asked if there were any public comments at this time; none were offered.

1.2 EXECUTIVE (CLOSED) SESSION 12:04 P.M.

President Mobley adjourned the meeting into Executive (Closed) session at 12:04p.m.

2. SECOND OPEN SESSION AND CALL TO ORDER 1:07 P.M.

President Mobley called the Second Open Session of the Board meeting to order at 1:07 p.m. and asked Director Maulhardt to lead everyone in the Pledge of Allegiance.

2.1 Pledge of Allegiance

Director Maulhardt led everyone in reciting the Pledge of Allegiance.

**2.2 Public Comment
Information Item**

President Mobley asked if there were any public comments; none were offered.

**2.3 Approval of Agenda
Motion**

President Mobley asked General Manager Mauricio Guardado if there were any changes to the agenda. Mr. Guardado responded that there were no changes.

Motion to approve the agenda, Director Naumann; Second, Director McFadden. Voice vote: seven ayes (Berger, Dandy, Hasan, Maulhardt, McFadden, Naumann, Mobley); none opposed. Motion to approve the agenda carries unanimously 7/0.

**2.4 Oral Report Regarding Executive (Closed) Session
Information Item**

District Legal Counsel David D. Boyer reported that no action was taken by the Board in Executive (Closed) session that is reportable under the Brown Act.

2.5 Board Members' Activities Report

Information Item

The Board received and filed information regarding meeting participation provided by each of the Board Members through Monthly Activities (aka per diem) Reports.

2.6 General Manager's Report

Information Item

General Manager Mauricio Guardado reported that the District had received a great letter for U.S. Congresswoman Julia Brownley in support of the District's grant application for the National Dam Safety Program. He reminded the Board that it was Brownley's amendment and language that made the Santa Felicia Dam eligible for federal funding, which will help with the high dollar costs of design. He thanked Congresswoman Brownley and her staff for their support of the District.

Mr. Guardado then stated that he was super excited to announce seven internal promotions and two new hires as well as six part time positions have been filled by the District. He credited the Board's approval of the District's succession plan and revised organizational structure which makes it possible for the professional expertise of staff to not only be recognized but rewarded.

He went on to announce the internal promotions: Dan Detmer was named Water Resources Manager; Dr. Jason Sun was promoted to Principal Hydrogeologist – Modeler; Craig Morgan was elevated to Engineering Manager; Randall McInvale was promoted to Environmental Scientist Regulatory Affairs; Cherie Windsor was named Environmental Services Lead Field Technician; Kevin Ortega, who has been driving from Cerritos to work in the District's intern program, was hired as Associate Control Systems Programmer; Clayton Strahan was named Chief Park Ranger; and Kris Sofley was promoted to executive assistant/clerk of the board. Additionally, the District has hired six part time seasonal employees, two at the Lake Piru Recreation Area and four in Environmental Services.

Mr. Guardado said that he really appreciates everyone's efforts and drive and recognizes all the hard work of these individuals, each of whom was the most qualified for the position, and it sends a strong message of the 'best in class' performance of the District's staff that so many continue to rise up the ranks within the organization.

President Mobley congratulated staff and said to keep up the good work.

2.7 Election of Association of California Water Agencies (ACWA) Region 5 Chair, Vice Chair and Board Members for the 2022-2023 Term

Motion

The Board discussed the nominees as well as the ACWA recommended slate of candidates for the Region 5 seats as well as those individual candidates running for the Region 5 Board for the 2022-2023 term.

Motion to cast the District's vote for the recommended slate of candidates for Region 5, Director Naumann; Second, Director Dandy. Voice vote: seven ayes (Berger, Dandy, Hasan, Maulhardt, McFadden, Naumann, Mobley); none opposed; none abstaining. Motion carries unanimously 7/0.

- 3. CONSENT CALENDAR: All matters listed under the Consent Calendar are considered routine by the Board and will be enacted by one motion. There will be no separate discussion of these items unless a Board member pulls an item from the Calendar. Pulled items will be discussed and acted on separately by the Board. Members of the public who want to comment on a Consent Calendar item should do so under Public Comments. (ROLL CALL VOTE REQUIRED)**

Motion to approve the Consent Calendar items, Director Naumann; Second, Director Hasan. Roll call vote: seven ayes (Berger, Dandy, Hasan, Maulhardt, McFadden, Naumann, Mobley); none opposed; none abstaining. Motion carries unanimously 7/0.

A. Approval of Minutes

Motion

Approval of the Minutes for the Regular Board Meeting of July 14, 2021 and Minutes from the Special Board Meeting of August 30, 2021.

B. Groundwater Basin Status Reports

Information Item

Receive and file Monthly Hydrologic Conditions Report for the District.

C. Monthly Investment Reports

Information Item

Receive and file report on the District's investments and the availability or restriction of these funds. All investments are in compliance with the District's investment policy, which is reviewed and approved annually by the Board.

4. MOTION ITEMS (By Department)

Environmental Services Department – Linda Purpus

4.1 Resolution 2021-17 Approving the California Environmental Quality Act (CEQA) Initial Study-Mitigated Negative Declaration (IS-MND) and issuance of the Notice of Determination (NOD) for the Freeman Diversion Fish Passage Facility Geotechnical Exploration Project

Motion

Linda Purpus addressed the Board regarding Resolution 2021-17, approving and adopting the Initial Study-Mitigated Negative Declaration (IS-MND) and accompanying Mitigation Monitoring and Reporting Program (MMRP), approving the Freeman Diversion Fish Passage Facility Geotechnical Exploration Project (Project) and authorizing its implementation by the General Manager; and directing the General Manager to file a Notice of Determination in accordance with CEQA.

Director Naumann stated that the Engineering and Operations Committee had reviewed the Resolution and had agreed to recommend the approval of the Resolution to the full board.

Director Berger asked if he could see the presentation that was prepared for this motion item. Ms. Purpus introduced Randall McInvale who walked the Board through the presentation of the CEQA analysis and findings and added that the final CEQA documents included in the Board's packet covering pre-project, project, and post-project mitigation measures was conducted by Environmental Services in-house staff.

Motion to approve Resolution 2021-17 adopting the CEQA IS-MND and direct staff to issue the NOD for the Freeman Diversion Fish Passage Facility Geotechnical Exploration Project, Director Maulhardt; Second, Director Hasan. Roll call vote: seven ayes seven ayes (Berger, Dandy, Hasan, Maulhardt, McFadden, Naumann, Mobley); none opposed; none abstaining. Motion carries unanimously 7/0.

Engineering Department – Dr. Maryam Bral

4.2 Geotechnical Investigation at the Freeman Diversion Contract Award to GEI Consultants, Inc.

Motion

Dr. Maryam Bral addressed the Board and then introduced Craig Morgan who walked the Board through a presentation (see attached) of the work that GEI would be conducting if the Board approves the motion. This includes various tests that will help Engineering determine how the hardened ramp fish passage would be constructed.

Director Maulhardt said that the issue of access to the Lloyd Butler property came up in the Engineering and Operations Committee meeting and he asked that staff please follow-up with the Lloyd Butler Trust to get a memo of understanding regarding access to the property to complete this work. He then asked Mr. Morgan how the data compared to the studies that were done for the Freeman Diversion. Mr. Morgan said that the mid 1980s data was supplemented by more current data and that the data can be shared with the new designers so they are cognizant of the information.

Motion to award a consulting engineering contract to GEI Consultants, Inc., in the amount of \$499,724, including a 9 percent contingency to be used upon the District's written authorization only, and authorize the General Manager to execute the contract with GEI Consultants, Inc. for the Geotechnical Investigation at the Freeman Diversion, Director Maulhardt; Second, Director McFadden. Roll call vote: seven ayes (Berger, Dandy, Hasan, Maulhardt, McFadden, Naumann, Mobley); none opposed; none abstaining. Motion carries unanimously 7/0.

4.3 Authorize Execution of an Agreement with California American Water to Establish an Emergency Use Interconnection to the Oxnard Hueneme Pipeline for providing additional System Reliability to the El Rio Service Area.

Motion

Dr. Bral addressed the Board and stated that this motion item was presented at the Engineering and Operations Committee meeting the previous week. She explained that Division of Drinking Water requires water companies to have back-up. The high nitrate levels in the wells for Vineyard Avenue Acres can be remedied by this agreement which involves CalAm, Cloverdale, and Vineyard Avenue Acres connecting to the OH system. Rio Plaza Municipal Water Company has been acquired by CalAm and will merge connections at Simon Way (Rio Plaza) and North Road at Collins (Vineyard Avenue and Cloverdale).

Director Maulhardt stated that he thought this is a great solution to the problem and reminisced about an event where Brian Collins and the Operations team worked diligently to resolve an emergency situation by running a portable line tapped into the UWCD system. That was a short term fix, this is a long term solution, he said.

Director Dandy asked if there would be an issue regarding the potential adjudication and where does this agreement fall in line with water rights? Mr. Guardado explained that there are already provisions within the OH agreement relating to water outage or quality, and those provisions are limited to 15 days per year. President Mobley asked if there were liability issues and Mr. Guardado answered that OH users are the priority.

Motion to authorize the General Manager to execute an agreement with California American Water to establish an emergency use interconnection to the Oxnard Hueneme Pipeline for providing additional System Reliability to the El Rio Service Area, Director Maulhardt; Second, Director McFadden. Roll call vote: seven ayes (Berger, Dandy, Hasan, Maulhardt, McFadden, Naumann, Mobley); none opposed; none abstaining. Motion carries unanimously 7/0.

At 1:46 p.m. Director Dandy left the meeting

5. PRESENTATIONS AND MONTHLY STAFF REPORTS (By Department)

Operations and Maintenance Department – Brian Collins

5.1 Monthly Operation and Maintenance Department Report

Information Item

Chief Operations Officer Brian Collins presented a staff report and presentation on monthly activities of the Operations and Maintenance Department (see attached slides. When reporting on the physical modeling being done by the Bureau of Reclamation on the hardened ramp alternative fish passage, Director Maulhardt asked about permitting and Mr. Guardado replied that staff is working through issues with the regulatory agencies, including CA Department of Fish and Wildlife on streambed alteration agreements.

Director McFadden recalled the debris that has come down the Santa Clara River after storms and asked how that is being replicated. Mr. Collins replied that the Bureau has a world class team and they will introduce some of those challenges in the fourth phase of the modeling to determine if the hardened ramp design would work. Director McFadden reminded Mr. Collins that he has seen “rocks the size of pickup trucks” come down that river. There was more discussion of the debris issue among the Board and Mr. Collins concluded by saying that staff would continue to update the Board with photos from the Bureau of Reclamation modeling as well as updates from the University of Iowa modeling.

Park and Recreation Department – Clayton Strahan

5.2 Monthly Park and Recreation Department Report

Information Item

Chief Park Ranger Clayton Strahan addressed the Board and shared a presentation on monthly activities of the Park and Recreation Department (see attached slides). Chief Strahan reported on the Recreation Areas revenue and visitation numbers and reminded the Board that this was without any filming revenue. Director Naumann asked if the filming was coming back yet and Chief Strahan said California is getting a lot of competition from places like New Mexico and North Carolina, states that are offering incredible incentives to film crews. He also said that Lake Piru only has nine full hook-up sites and if upgrades could be made to offer more full hook-up sites, he’s sure the revenue would continue to increase.

Director Berger said the Recreation Committee has discussed increasing the number of full hook-up sites at the lake, and sees it as a return on investment. He said that the priority moving forward will be on increasing the number of full hook-up sites. Director Maulhardt reviewed the revenue increases and improvements made to the recreation area and Director Berger added that Chief Strahan and his staff are managing the recreation area well and should be commended for all of their hard work.

Chief Strahan reported that the average visit to Lake Piru is four and a half nights, and that of the 13,000 reservations since installing MySites, the online reservation system, the District has been able to track data and discovered that a large percentage of visitors are repeat customers. The reservation system also generates emails thanking customers after their visit. Chief Strahan concluded by stating that it has been a steep learning curve for him and his staff, and that the Engineering, Operations, Administration and Finance teams have all been part of the success. He added that Lake Piru has a really good story to tell.

Mr. Guardado reminded the Board that when the weather is cooler, perhaps in November, staff will arrange for a Special Board meeting at the lake so the Board may see for itself the number of improvements since Chief Strahan and his team have taken over management of the Recreation area.

Water Resources Department – Dr. Maryam Bral

5.3 Monthly Water Resources Department Report

Information Item

Dr. Bral introduced Dr. Jason Sun to present an update on the District's groundwater model review (see attached slides). Dr. Sun reported that the expert panel reviewing the model found it to be technically sound and defensible. Dr. Sun reported that it took one year to build, test and review the updated model.

Director Maulhardt it is a huge compliment that everyone had input to the process and that it is important for the Board to acknowledge to the public that it takes this process very seriously. The level of review and scrutiny makes him proud of what the District does and that the model is used wisely to make decisions. He added that the new buzz phrase is "follow the science," and that is exactly what the District is doing. It's finding, looking at and following the science.

John Lindquist then addressed the Board, sharing his presentation on climate change and drought cycles which will be used to introduce the projects presented at the Water Sustainability Summit II in October (see attached slides).

5.4 Update on Groundwater Sustainability Agencies (GSAs) and Sustainable Groundwater Management Act (SGMA)

Information Item

Dan Detmer provided the Board with an oral update on the monthly activities of the three local Groundwater Sustainability Agencies (Mound Basin GSA, Fillmore and Piru Basins GSA, and the Fox Canyon Groundwater Management Agency), for which the District serves as a member director, and the Santa Paula basin (adjudicated) Technical Advisory Committee.

Administrative Services Department – Joseph Jereb and Josh Perez

5.5 Monthly Administrative Services Department Report – Anthony Emmert

Information Item

The Board received a summary report on the monthly activities of the Administration Department.

Engineering Department – Dr. Maryam Bral

5.6 Monthly Engineering Department Report

Information Item

The Board received a summary report on the various monthly activities of the Engineering Department.,

Environmental Services Department – Linda Purpus

5.7 Monthly Environmental Services Department Report

Information Item

The Board received a summary report on the various monthly activities of the Environmental Services Department.

Director McFadden asked if the resurgence caused by the Delta variance of Covid would have any impact on the Water Sustainability Summit. Mr. Guardado responded that the October event would be a hybrid with participants accessing the event virtually and speakers attending in person, and that social distancing, masking and other public health guidelines would be observed.

6. BOARD OF DIRECTORS READING FILE

7. FUTURE AGENDA ITEMS

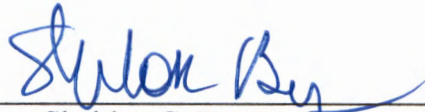
President Mobley asked if there were any future agenda items. None were offered.

8. ADJOURNMENT 3:48p.m.

President Mobley adjourned the meeting at 3:48p.m. until the next regular board meeting scheduled for Wednesday, October 13, 2021.

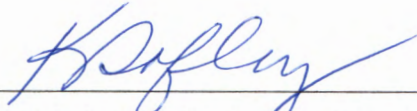
I certify that the above is a true and correct copy of the minutes of the UWCD Board of Directors meeting of September 8, 2021.

ATTEST:



Sheldon G. Berger, Secretary/Treasurer

ATTEST:



Kris Sofley, Clerk of the Board



Board of Directors Meeting

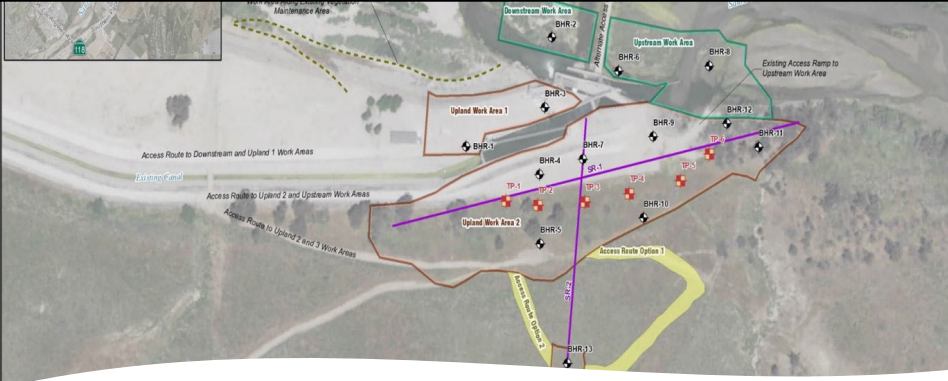
Agenda Item 4.1 RESOLUTION 2021-17

Recommendation for Board consideration in adopting the CEQA Initial Study-Mitigated Negative Declaration and directing staff to Issue the Notice of Determination for the Freeman Diversion Fish Passage Facility Geotechnical Exploration Project




United Water
CONSERVATION DISTRICT
September 8, 2021

1



CEQA Evaluation

- Both in-river and upland exploration locations
- Utilizing existing access routes to the extent feasible
- Scheduling work to minimize resource interactions



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2

CEQA Findings

Potentially significant impacts identified in the CEQA analysis:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology/ Soils
- Hazards and Hazardous Materials
- Hydrology/ Water Quality

All mitigated to less than
significant impact

Significance findings:

- The project will not have a significant impact on the environment
- The project will not make or contribute to significant cumulative impacts
- The project would not have a significant impact on humans



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Mitigation Measures




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Request to
the Board of
Directors

Consider adopting a
Resolution to approve the
CEQA findings and direct staff
to issue a Notice of
Determination

 *Questions*

 United Water Conservation District

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Motion Item

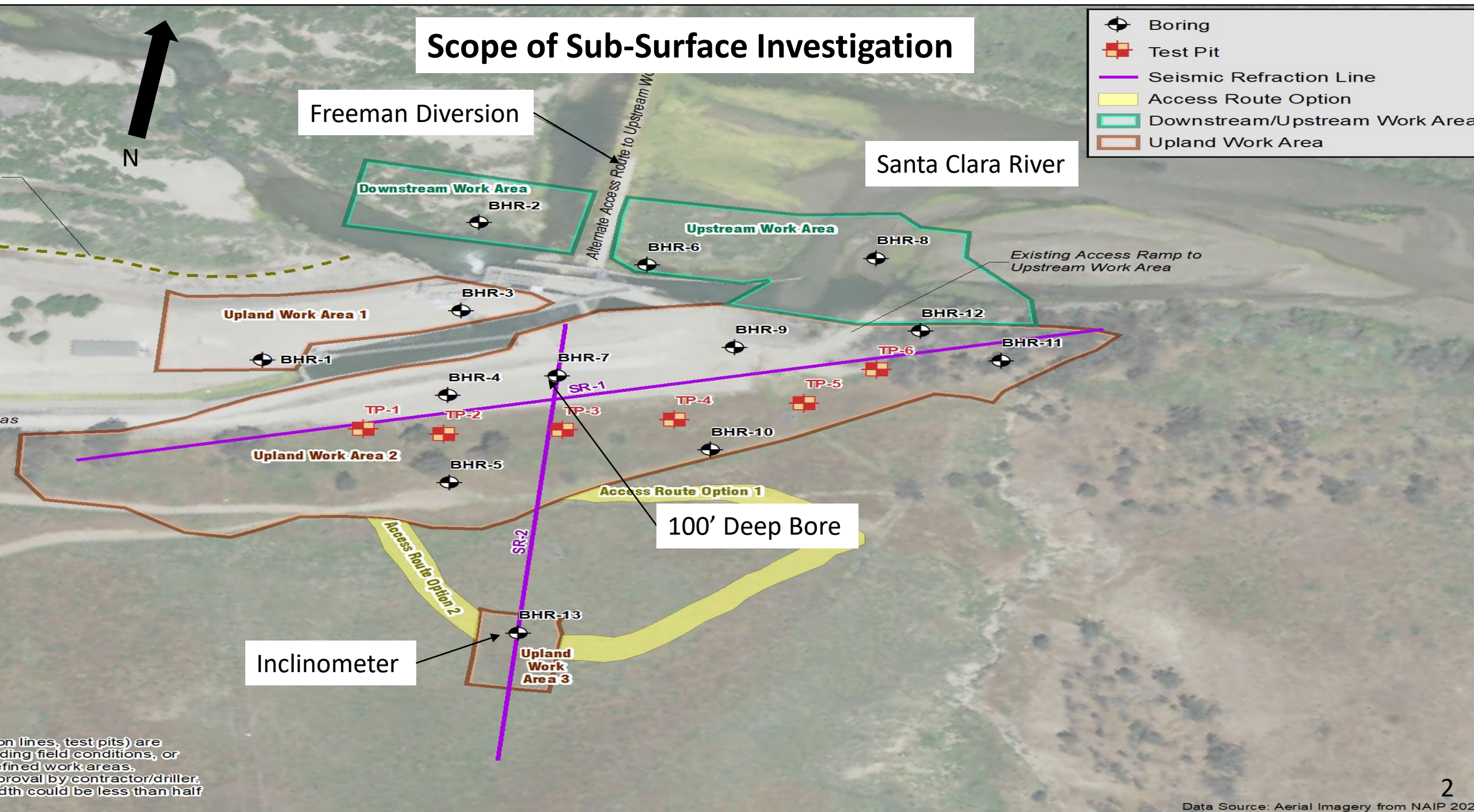
4.2

Geotechnical Investigation for the Hardened Ramp Design at the Freeman Diversion

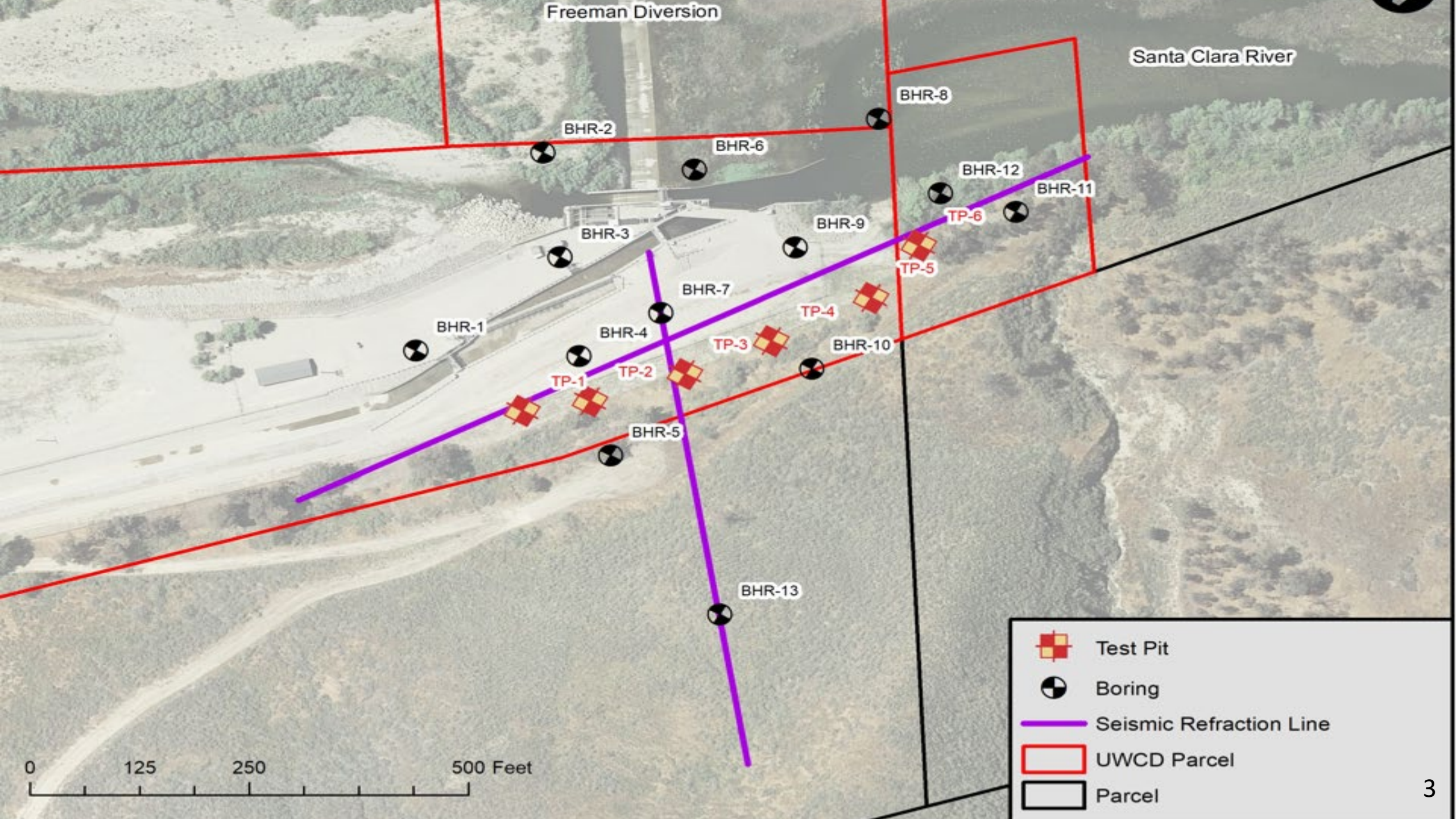
- ☐ GEI will perform a sub-surface investigation of the area in and around the Freeman Diversion
- ☐ Duration of the Geotechnical Investigation will be 5 months
- ☐ Geotechnical Investigation will inform the placement of the Hardened Ramp features on the bedrock/siltstone.



Scope of Sub-Surface Investigation



on lines, test pits) are
ding field conditions, or
efined work areas.
proval by contractor/driller,
dth could be less than half



Motion Item

4.2

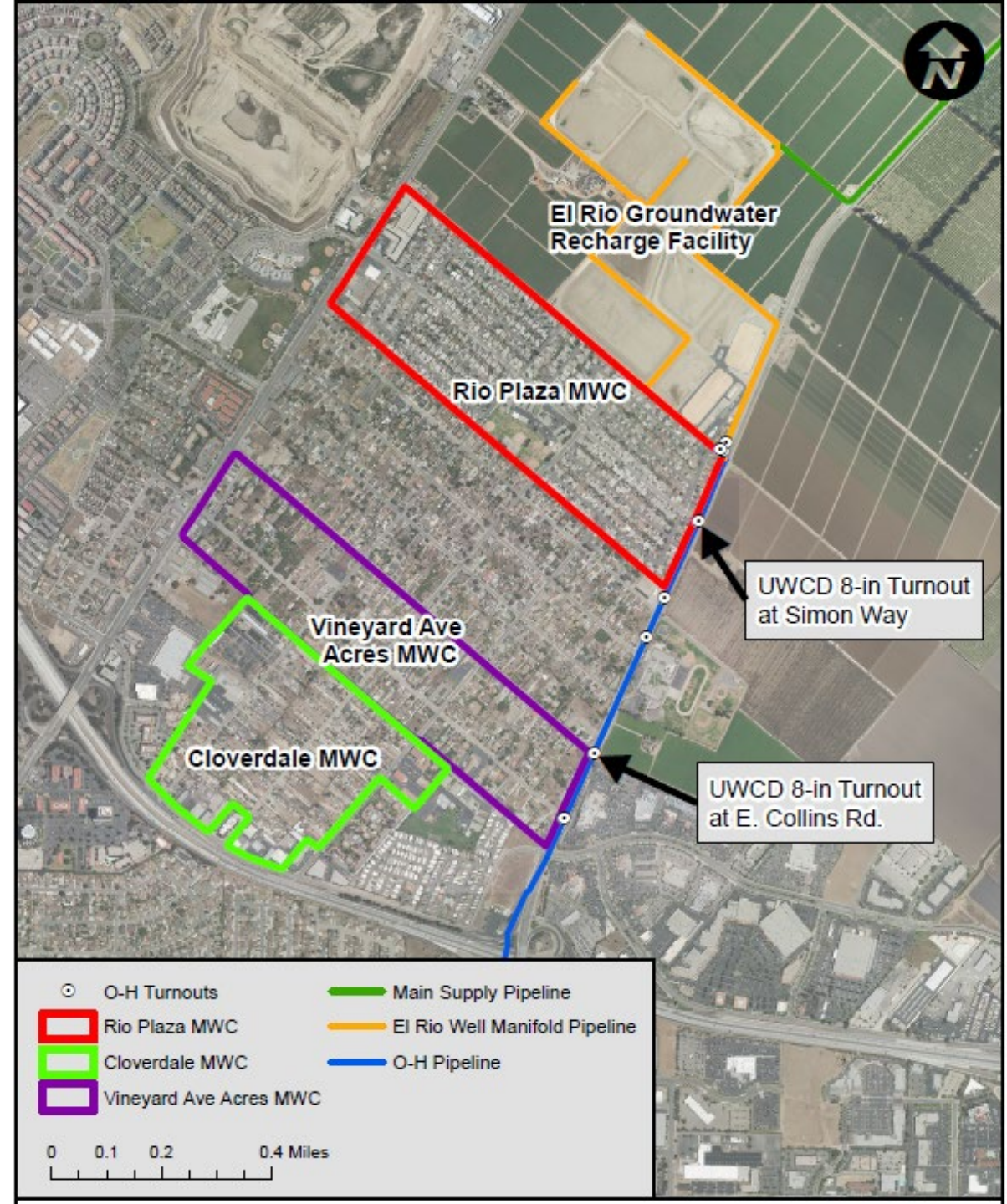
Geotechnical Investigation for the Hardened Ramp Design at the Freeman Diversion

- ☐ Laboratory Testing
- ☐ Geotechnical Data Report
- ☐ Geotechnical Evaluation Report
- ☐ Contract Amount: \$499,724 (including 9% contingency equating to \$41,403)



Agenda Item 4.3

Authorize an Emergency Use Interconnection with California American Water for the El Rio Service Area

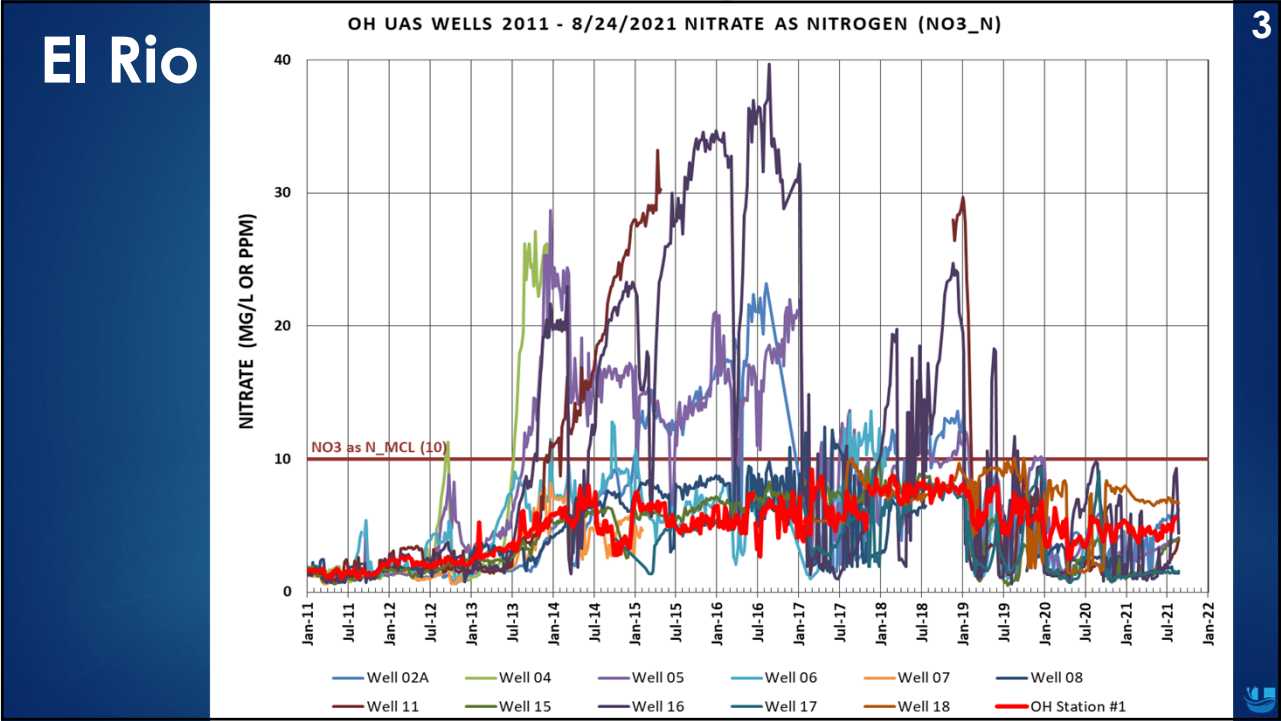




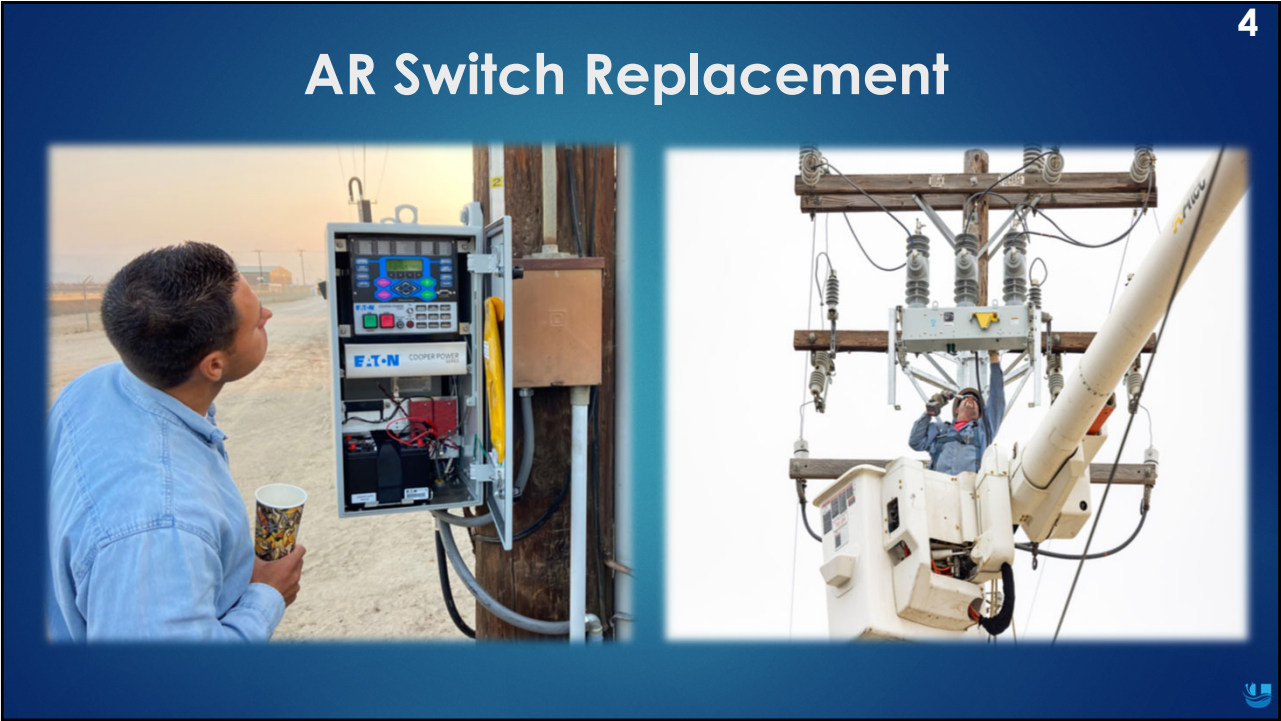
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PTP Reservoir Fill Valve



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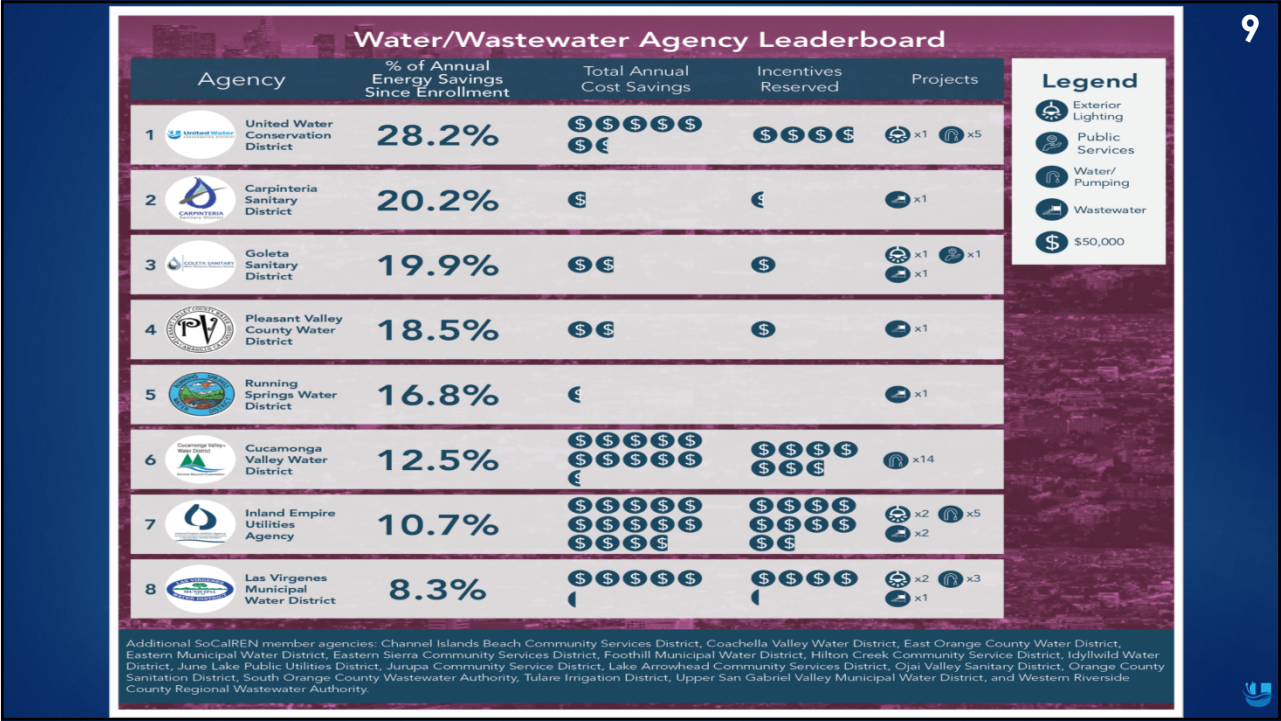
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PV Reservoir 42-inch Valve Replacement



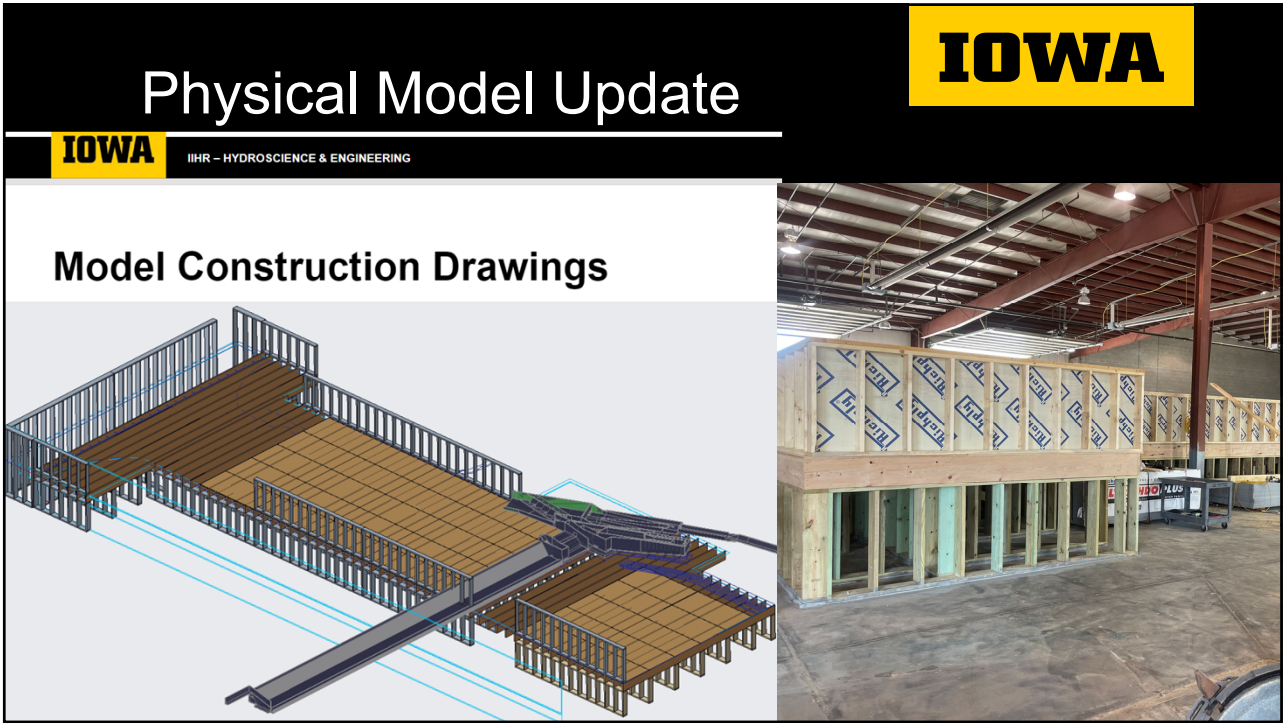
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#4 Economic Update

2021 vs. 2019
Day Use plus Camping Revenue and Visitation Comparison

Year	Day Use Revenue	Camping Revenue	Combined Revenue	Persons	Vehicles	Vessels
2021	\$274,111.20	\$389,198.40	\$663,309.60	34,893	18,357	3,778
2019	\$174,665.60	\$420,642.57	\$595,308.17	55,936	20,495	3503

2021 revenue and visitation figures are current through August 17, 2021.

2019 figures are for entire month and were provided by PMC.

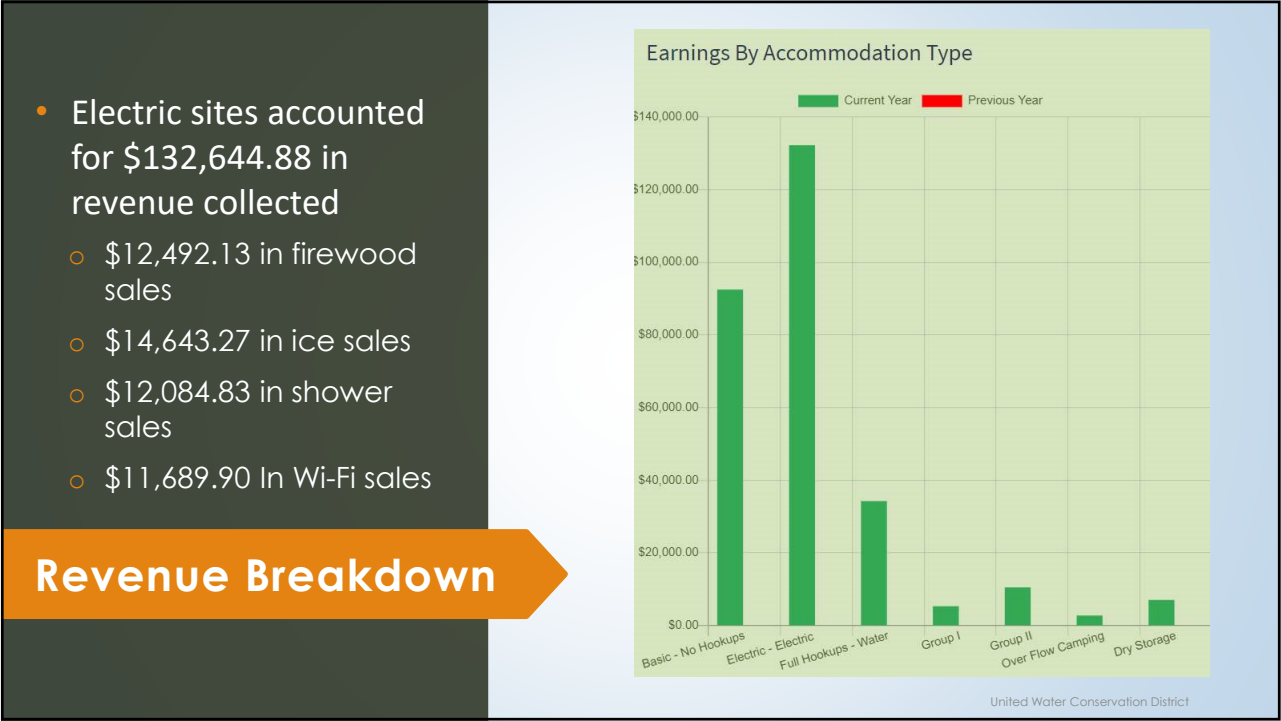
57% increase in **Day Use Revenue** between January 1 and August 17(2021 vs. same period 2019)

11% increase in total **revenue** between January 1 and August 17 (2021 vs. same period 2019)

11% increase in daily **revenue** collected January to August (2019 vs. 2021 collection period – \$2,611/day 2019 vs. \$2,909/day 2021)

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#5 Operational Update – General





- Irrigation Systems Overhaul & Repair:
 - One main line leak repair
 - Two lateral main line repairs
 - Pressure tested & repaired backflow devices.
 - Installation of an isolation valve and blow off (Long term improvements).
- Day Use irrigation system overhaul-CIP project (\$45,000.00). Completed August 3.

5

Operational Update

Facilities Maintenance

- Installed 15 site markers in overflow camping.
- Conducted annual fire clearance grading at Lisk Ranch and Pothole Trailhead.
- Partnered with Troop 126 of the Boy Scouts to rebuild & replace information kiosk at park entrance.
- Began mid-season repairs of picnic tables within the park.




United Water Conservation District

6

Operational Update

Travel, Training and Meetings

- Chief Strahan completed FEMA IS 29 PIO Awareness Training.
- All entry Kiosk staff completed Quagga Inspection Training.
- Staff participated in the District's annual FERC law enforcement security consultation for the Santa Felicia Dam.
- Participated in facility inspection at Lake Piru with Insurance Counsel (Dorsey litigation).
- Staff facilitated training with Ventura County Sheriff's and Fire on insertion of rescue personnel from helicopters and boats.
- Chief Strahan participated in an interview with KCLU and NPR for a story related to drought and reservoir levels in Southern California.



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Operational Update

Marketing, Outreach and Master Planning

- CV Strategies began a Facebook ad for camping July 1 (full report to come).
- Secured a full-page ad in the Santa Clarita Visitors Guide.
- Secured an ad in the Central Coast Tourism Council's Original Road Trip guidebook.
- Chief Strahan participated in an interview with SEPI's Mobile RV-ing podcast reaching nearly half a million RV podcast listeners.
- Staff and CV Strategies began efforts to design a new logo and brochure for Lake Piru.
- Awarded a contract to RRM Design Group, on July 26, 2021, for the Lake Piru Recreation Area's Master Plan, with a completion date of October 4, 2021.

HERITAGE VALLEY

Scenic Highway 126 through Heritage Valley offers the ultimate escape! Between Ventura and Valencia, discover the historic towns of Santa Paula, Fillmore and Piru, and the Rancho Camulos National Historic Landmark. Enjoy our natural bounty of produce, honey, and wine. Visit unique shops, restaurants and boutique hotels, ride a vintage railway or hot air balloon, discover outdoor adventures and ExploreLakePiru.com!

Heritagevalley.net | 805/524-7500





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#6 Proposed New Hiking Trail



United Water Conservation District



- Staff proposes a new hiking trail emanating from the existing Pothole Trailhead parking area:
 - 2-3 mile hiking trail on the District's Lisk Ranch property directly South of the Pothole Trailhead Parking area.
- Staff is planning to consult with a trail design firm to identify potential trail alignments.
- Develop interpretive signs to provide wilderness, historical and cultural designations
 - This could provide opportunities to collaborate with the Tataviam tribal community and Heritage Valley Historical Society

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Interpretive Features

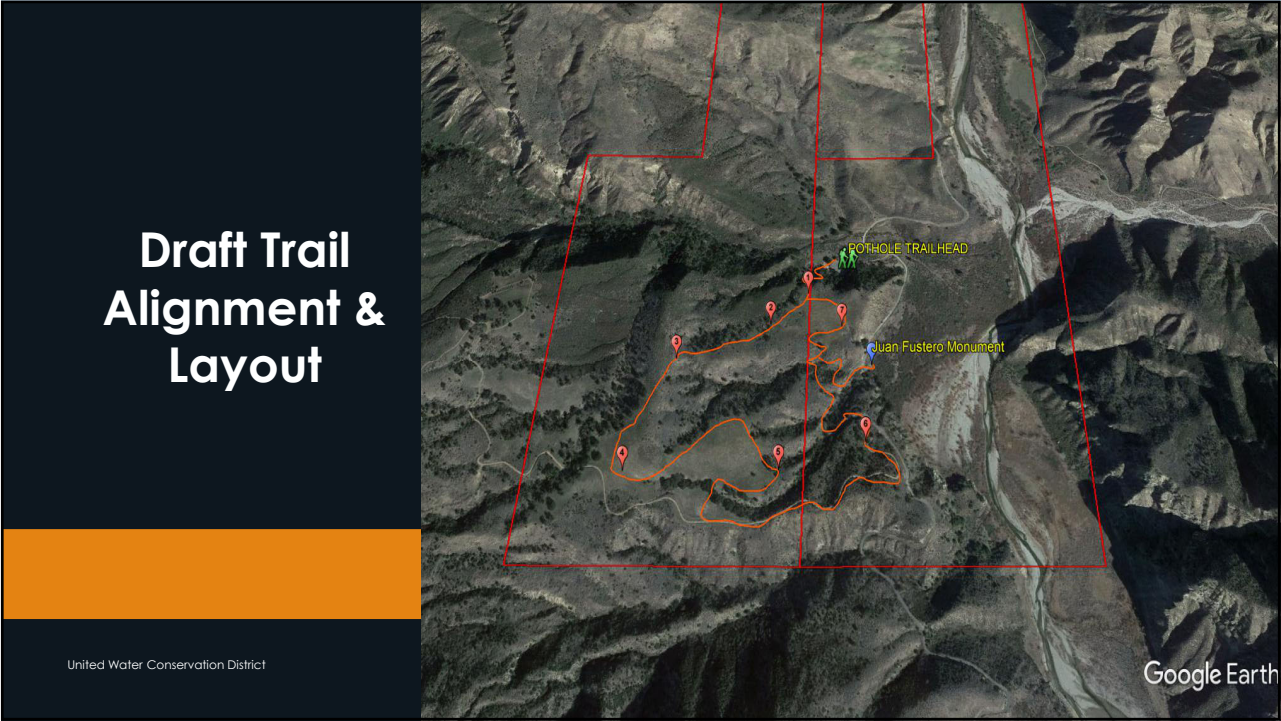
Trail Signage & Locations


- Staff is proposing to install Interpretive signage at key locations along the proposed trail
- Signage will focus on native cultural resources and historical activity within Piru Canyon
- Recreational features such as benches made of natural features like stone will be constructed at several key locations along the trail
- Information and Directional signage will lead visitors through an experience as they walk, making them feel as if they were visiting a time and place long forgotten



United Water Conservation District

10






When Will the Current Local Dry Cycle End?

A Brief Review of Historical Data and a Peek at What the National Weather Service Expects in 2022

Presented by John Lindquist, Senior Hydrogeologist
Board of Directors Meeting
September 8, 2021



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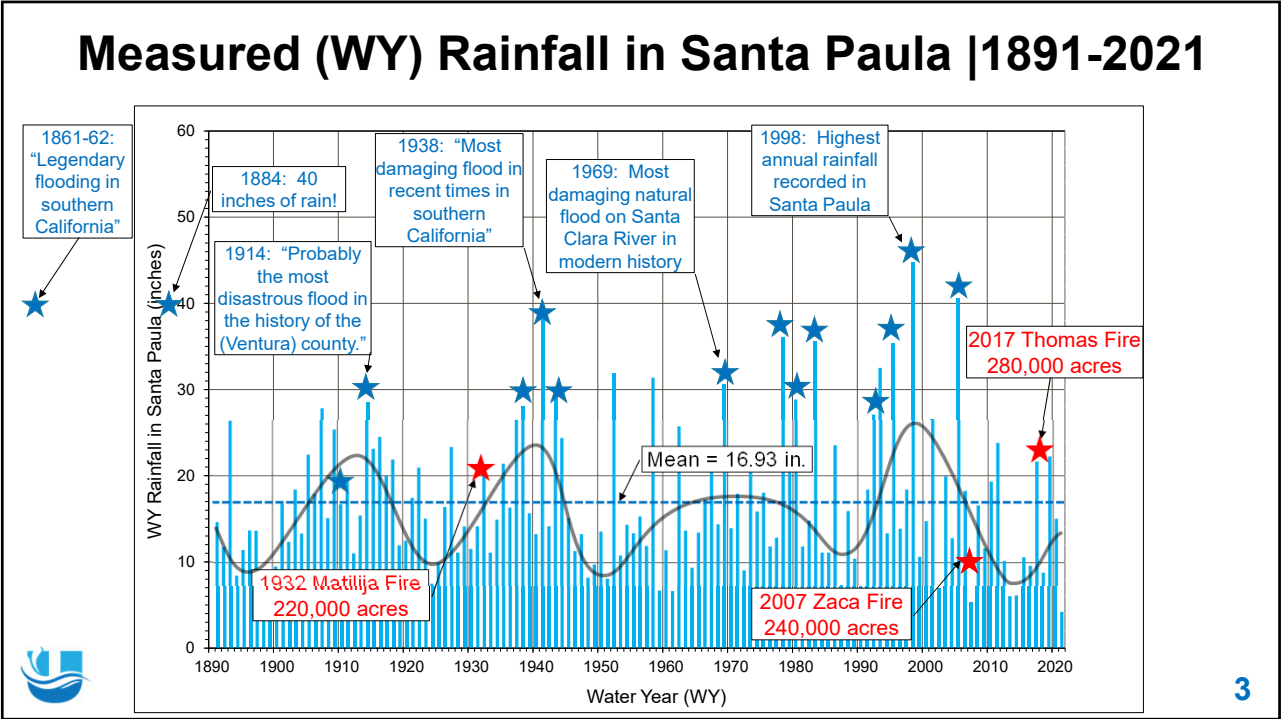
“The length of a complete wet and dry period during the time rainfall has been measured and recorded at Santa Paula...is in the order of twenty to thirty years.”



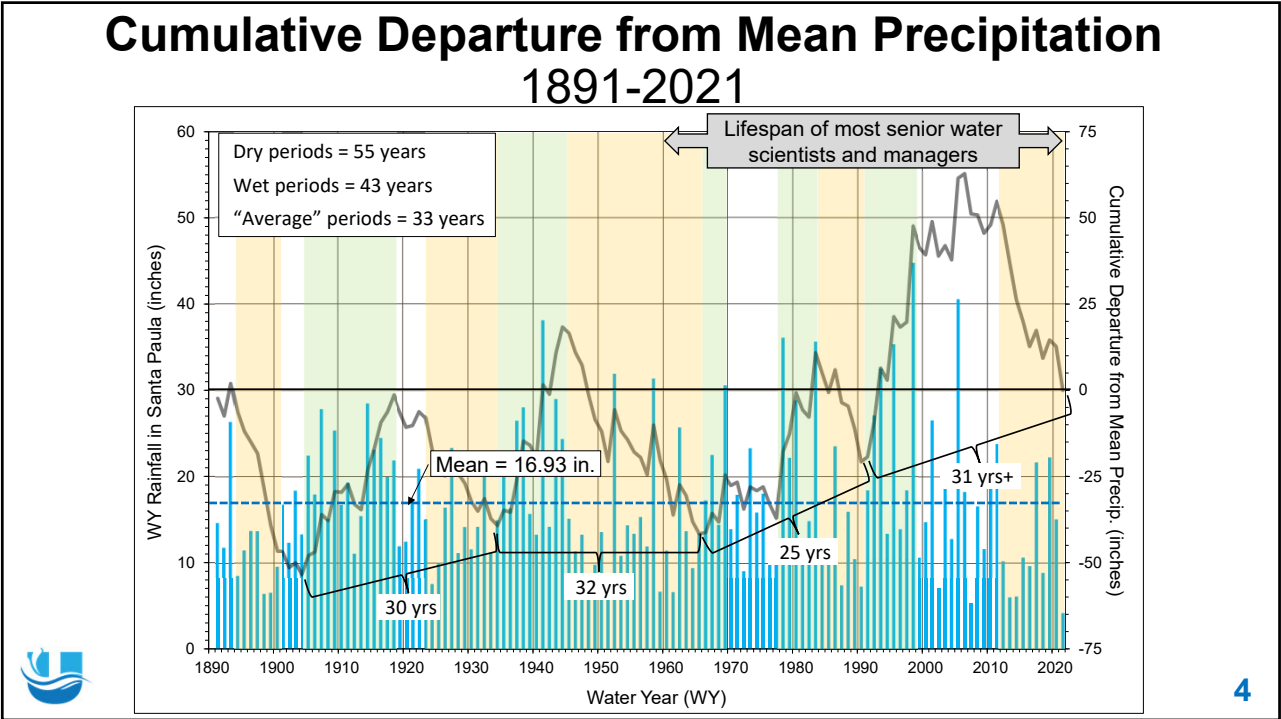
Vernon Freeman, “People – Land – Water” (1968)

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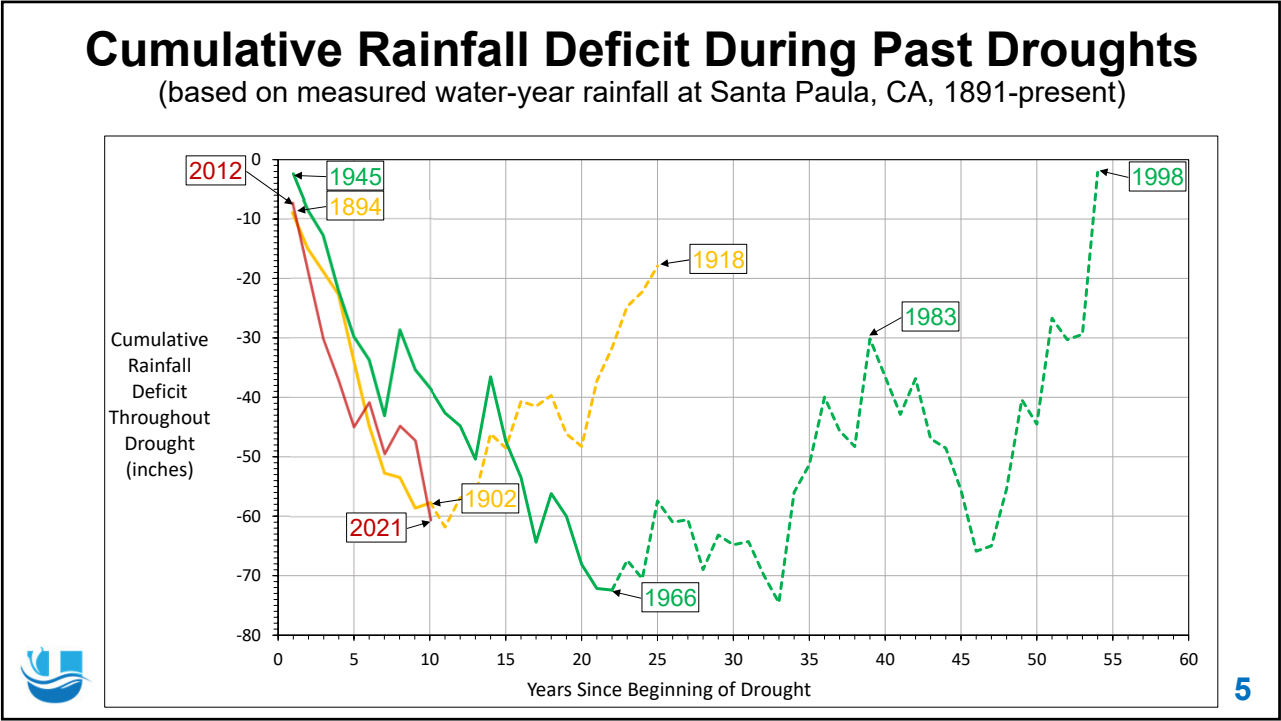
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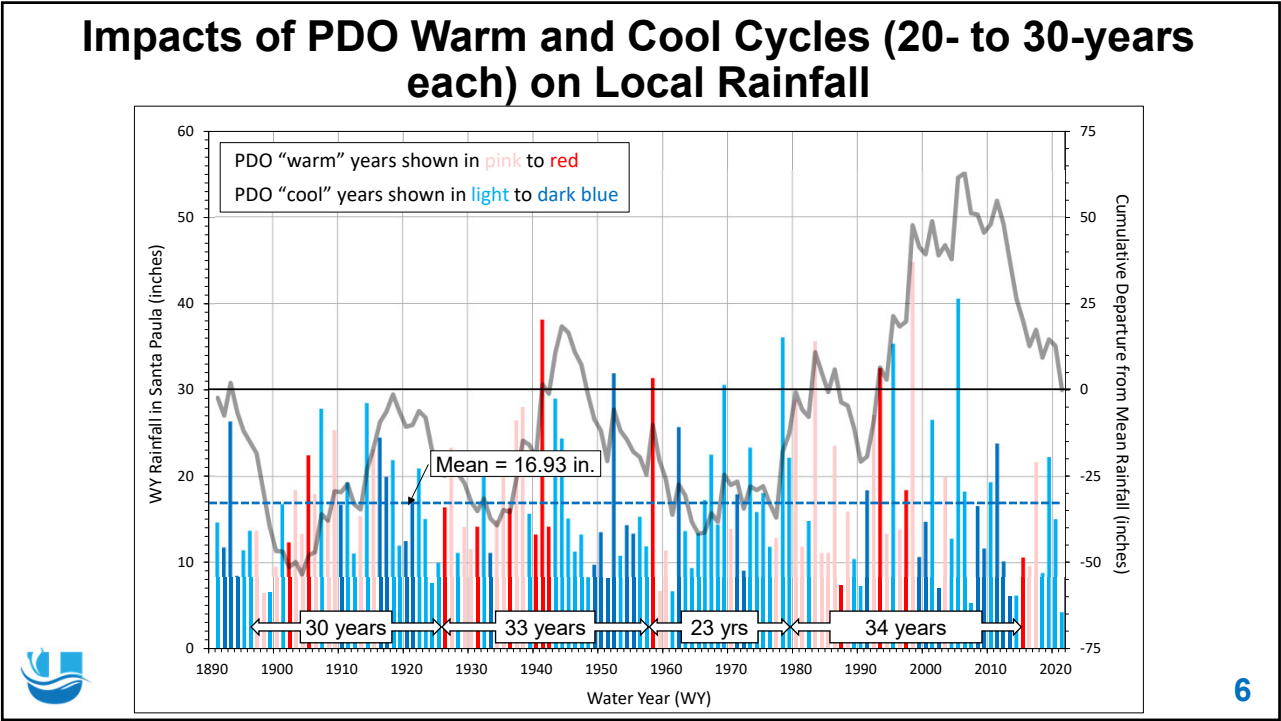
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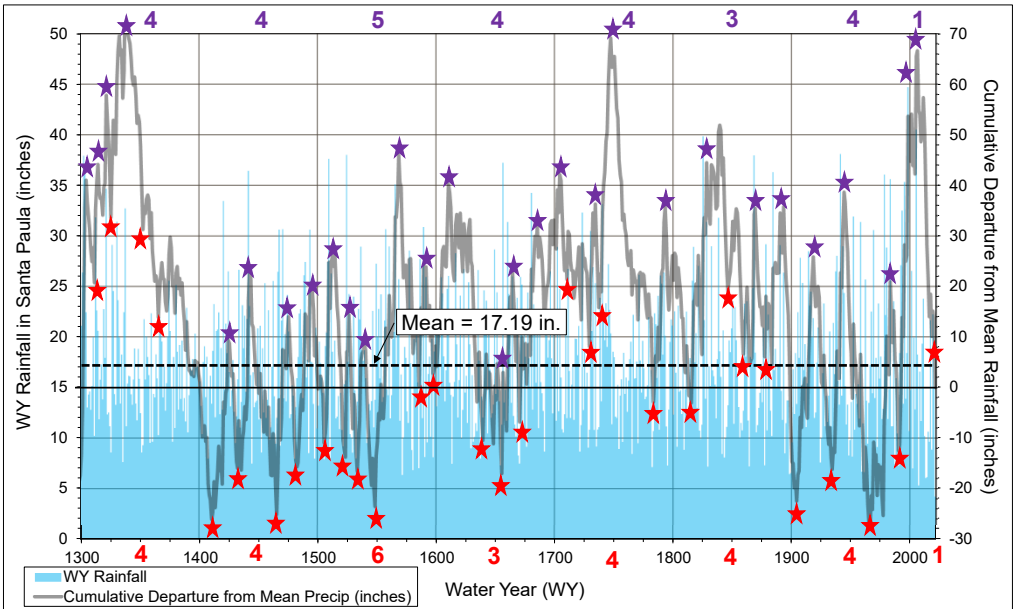


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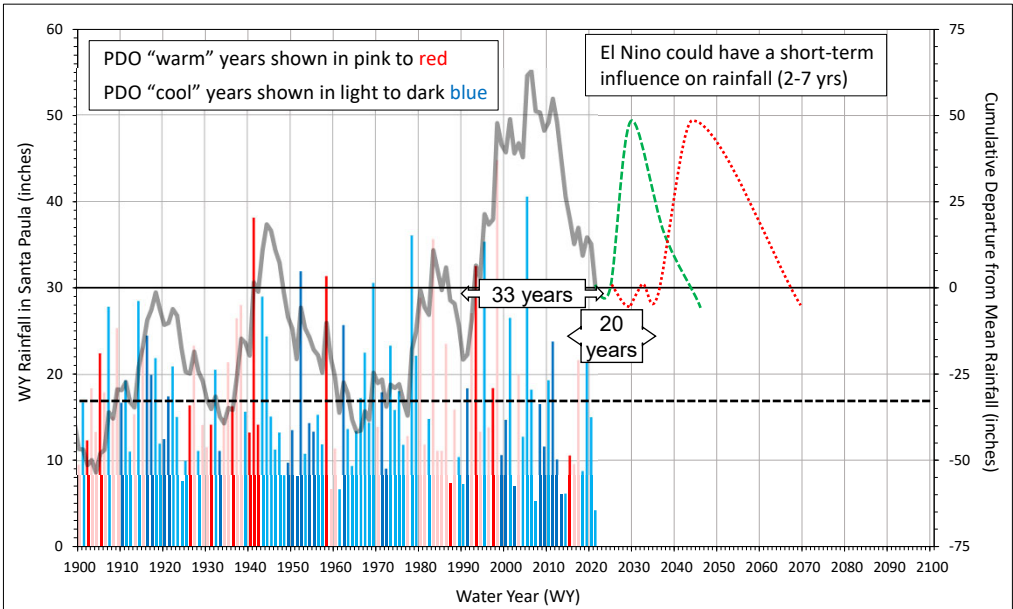
Cumulative Departure from Mean Precipitation, WY 1300-2021



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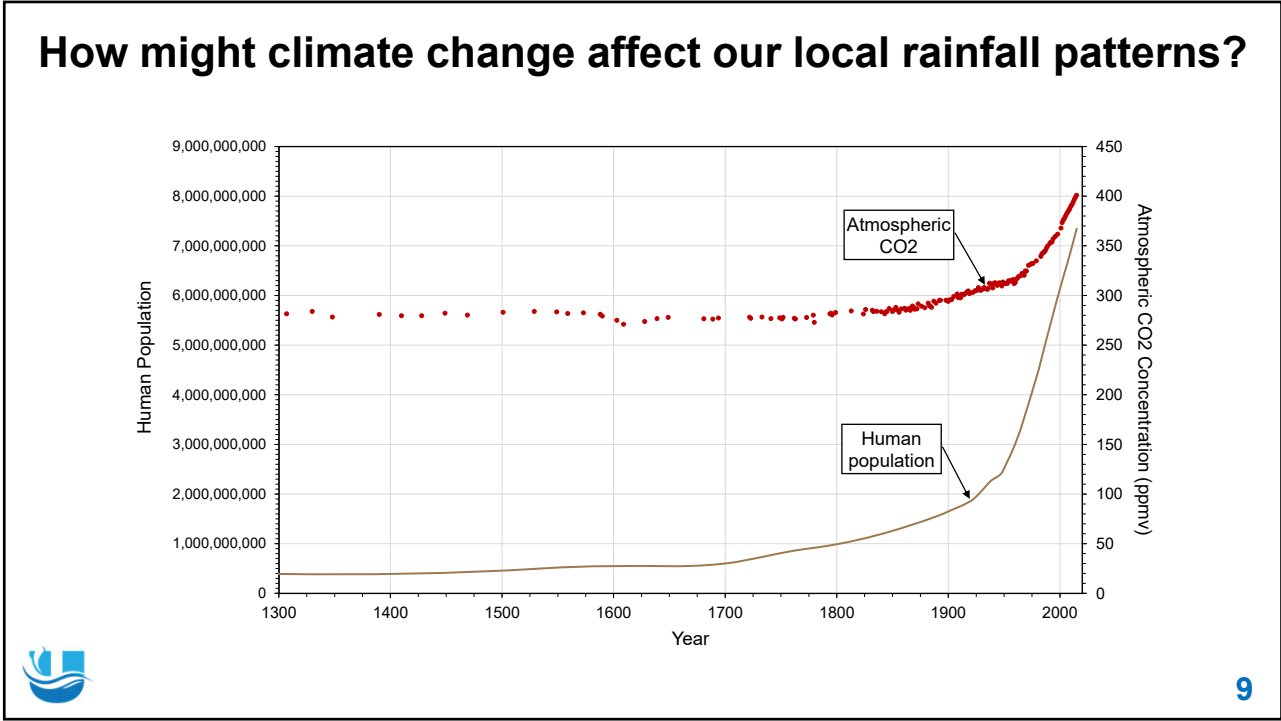
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When Will the Next PDO Warm Cycle Arrive?

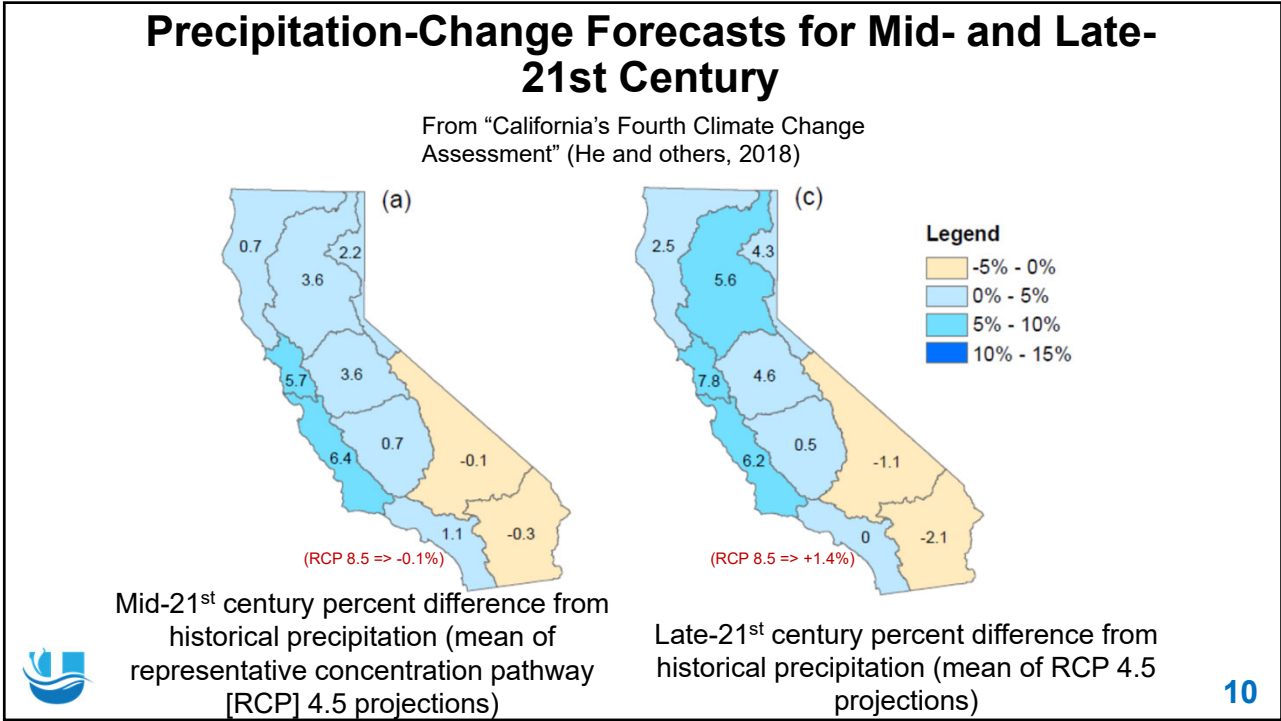


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In Summary

The past 10 to 20 years have been rough:

- Following the wettest decade in recorded history (1990s), we had an average decade (2000s) and then a very dry decade (2010s)
 - Extreme dry years in 2002, 2007, 2013, 2014, 2018, and 2021
- Not surprisingly, we've also seen major wildfires in the past 10 years

The 2000s and most of the 2010s coincided with a PDO cool phase:

- Drier conditions consistent with historical climate cycles
- **However**—Most climate scientists now recognize some degree of amplification of the impacts of the PDO, ENSO, and other ocean/atmosphere circulation cycles resulting from anthropogenic climate change

We likely will enter a warm (and wet) PDO phase sometime in the next decade (or two?)

- Be prepared for further “amplification” and uncertainty



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11

Questions?

*“It never rains in California
But girl, don't they warn ya?
It pours, man, it pours”*

--Albert Hammond, 1972



12

12



Update on Groundwater Flow Model

Expert Panel Technical Review Memo

Coastal Brackish Groundwater Simulation with MODFLOW-USG

Presented by Dr. Jason Sun, Ph.D., P.E, Senior Groundwater Modeler
Board of Directors Meeting
September 8, 2021





Expert Panel Technical Review Memo

UWCD Regional Groundwater Flow Model

2

Expert Review Panel

- **Jim Rumbaugh**

Developer of the widely used
MODFLOW pre- and post-processor,
Groundwater Vistas

The expert panel started to review
in 2016

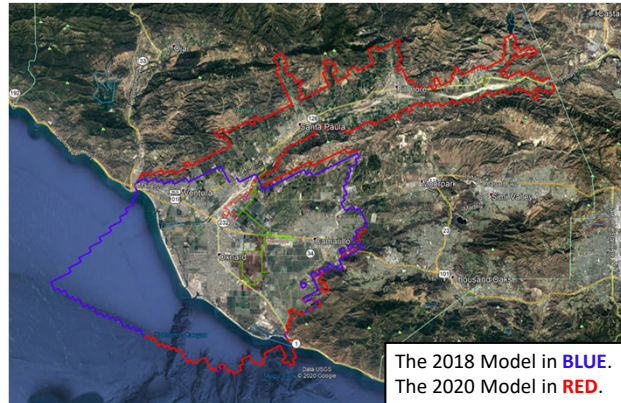
The expert panel has reviewed the
2018 and 2020 GW models

- **Dr. Sorab Panday**

Co-author of MODFLOW
Author of MODFLOW-USG
Member of National Academy of
Engineering

- **John Porcello**

Licensed Geologist and Hydrogeologist
Principal groundwater hydrologist, with
focus on western U.S.



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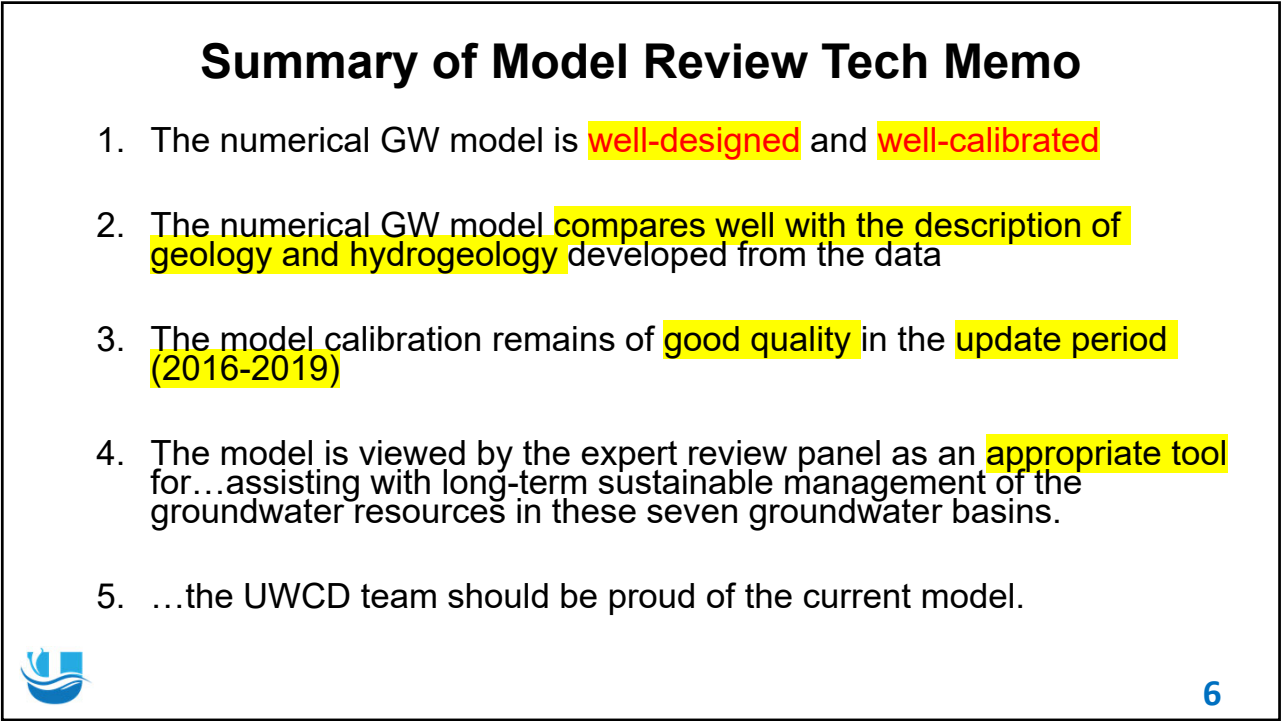
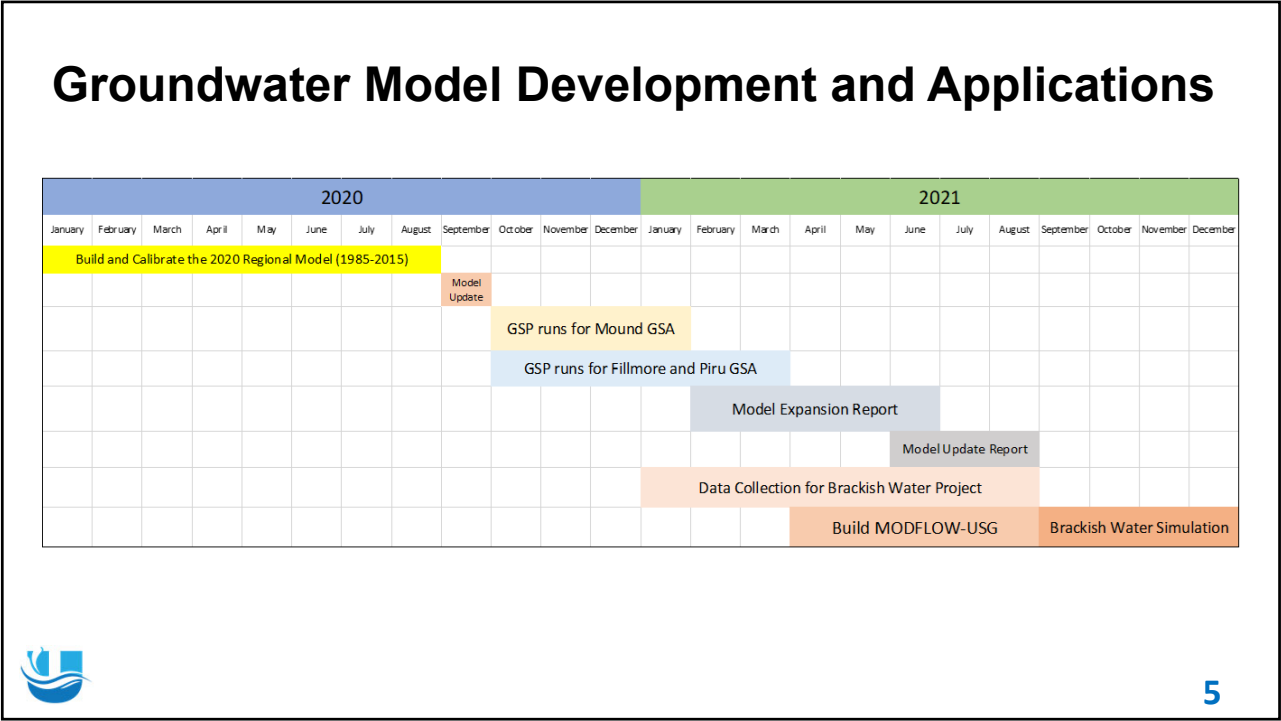
GW Model Review

- **Paper Review:** Read the model report
- **In Depth Review:**
 - Review the GW model input/output files
 - Review the report
- **Thorough Review (UWCD):**
 - Review the GW model input/output files
 - Receive the WL measurements and independently verify the model calibration with data
 - Review the model report
- The 2020 Regional Model was built and calibrated in August 2020
- The expert panel releases the tech memo on the model on August 19, 2021



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Acknowledgement:

Management:

General Manager
- Mauricio Guardado
Chief Engineer
- Dr. Maryam Bral

Water Resources Department:

Dan Detmer
Eric Elliot
Murray McEachron
Dr. Bram Sercu
Dr. Zach Hanson
John Lindquist
Kath Kuepper
Robert Marshall



7

7

Battle-Tested Model

- The model has been reviewed internally by UWCD surface water hydrologists and hydrogeologists
- The model has been reviewed externally by an expert panel composed of nationally recognized modelers (Dr. Sorab Panday, Mr. John Porcello, and Mr. Jim Rumbaugh)
- The model has been reviewed by Stanford professor, Dr. Daniel Tartakovsky
- City of Oxnard hires a consultant to review the model



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Questions/Comments



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Coastal Brackish Groundwater Simulation with MODFLOW-USG



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➤ Prop 1 Grant

➤ The 2018 Model (Coastal Plain Model) has been converted into MODFLOW-USG

➤ Model refinement (model layers and grids) has been applied

➤ Flow model calibration is analyzed to be good

➤ Transport model (seawater intrusion) is calibrated preliminarily




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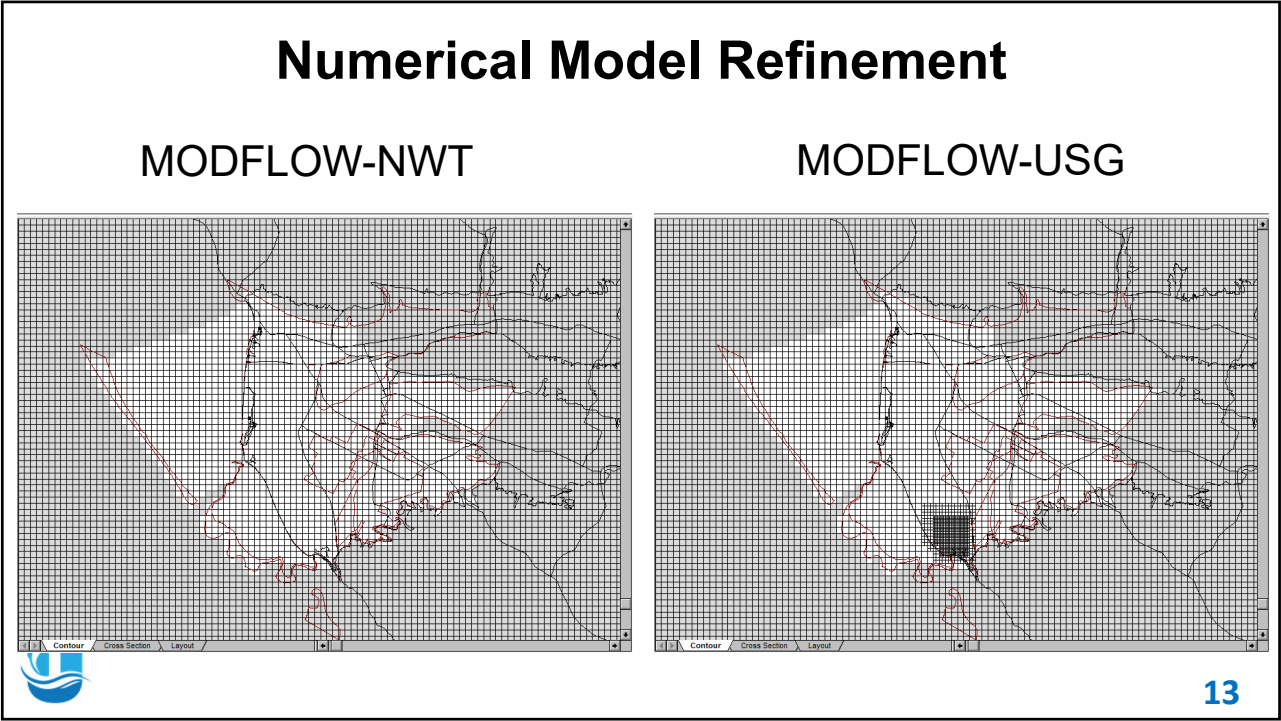
Coastal Basins (Oxnard Basin, PV, Mound, and West LP)

Aquifer System	Hydrostratigraphic Unit	Model Layer
Shallow	Ground Surface to the bottom of Semi-Perched Aquifer	1
UAS	Semi Perched-Oxnard Aquitard	2
	Oxnard Aquifer	3
	Oxnard-Mugu Aquitard	4
	Mugu Aquifer	5
LAS	Mugu-Hueneme Aquitard	6
	Hueneme Aquifer	7
	Hueneme-Fox Canyon Aquitard	8
	Fox Canyon Aquifer - upper	9
	Fox Canyon upper - basal Aquitard	10
	Fox Canyon Aquifer - basal	11
	Santa Barbara and/or other Formation - upper	12
	Grimes Canyon Aquifer	13
Deep	Older sedimentary rocks and Conejo Volcanics	Boundary

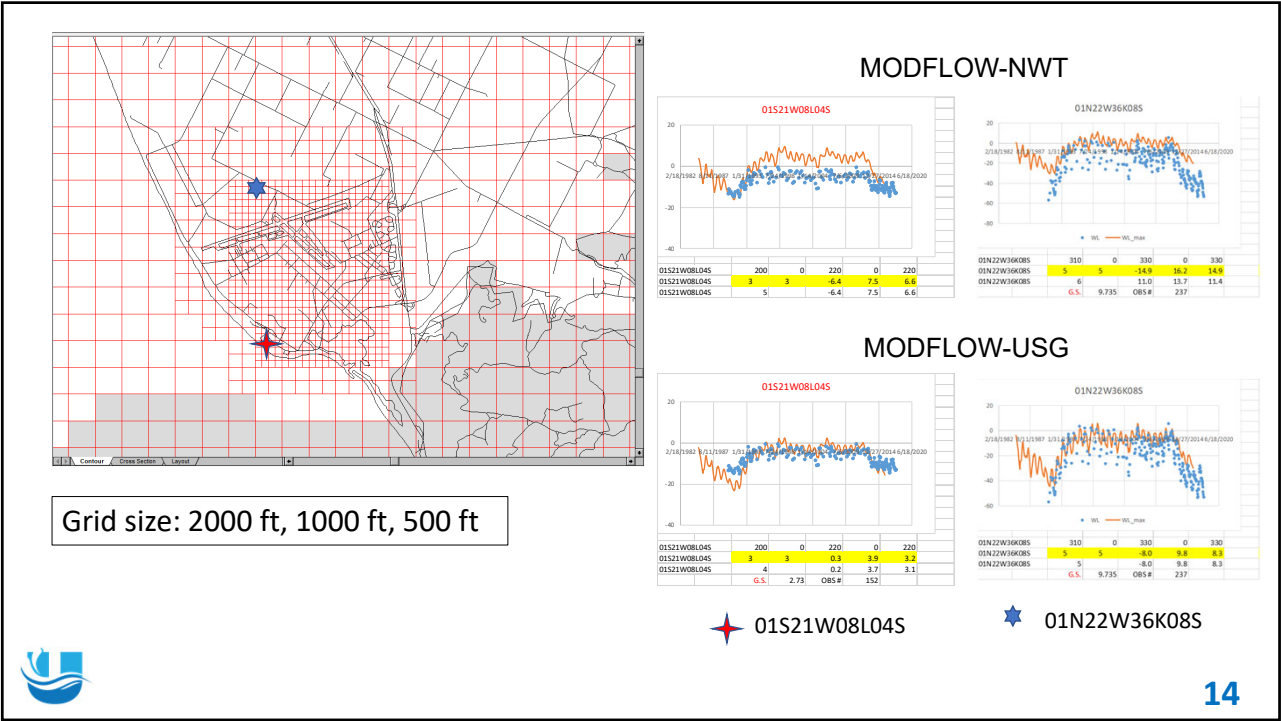


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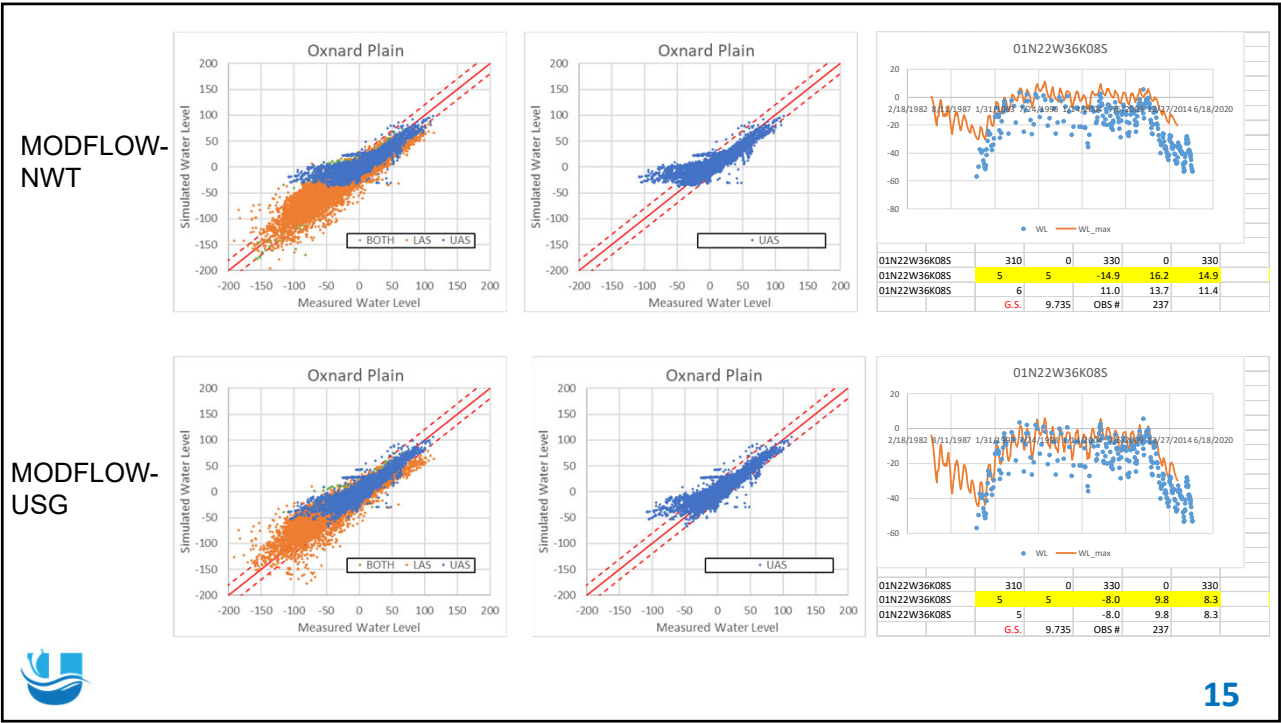
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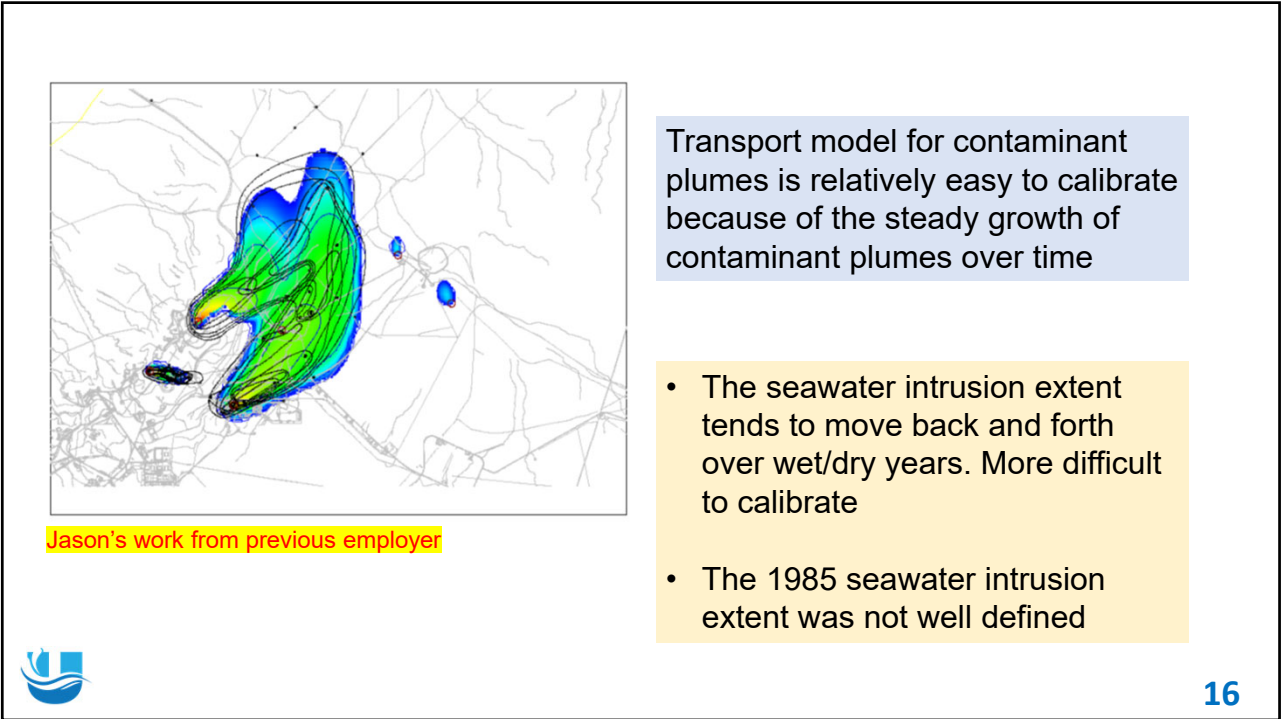
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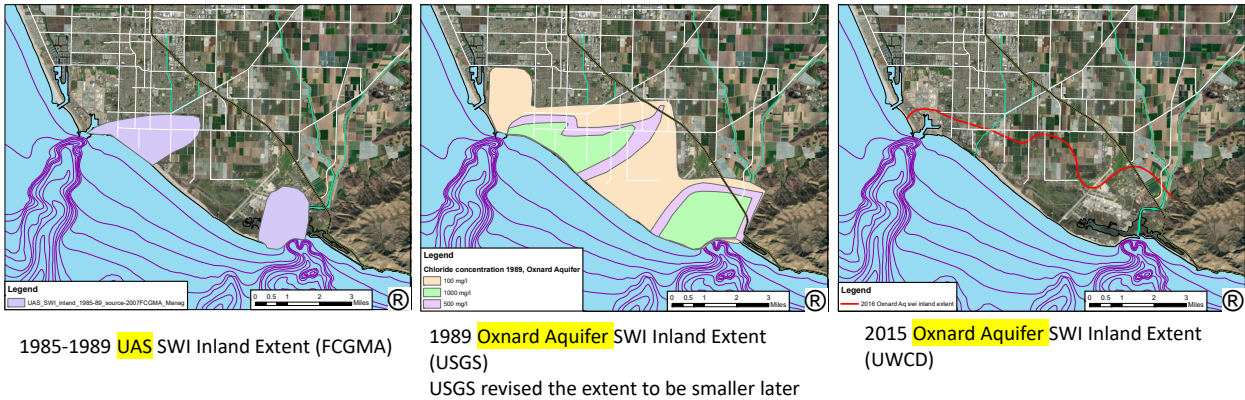


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16

Seawater Intrusion (SWI) Investigation



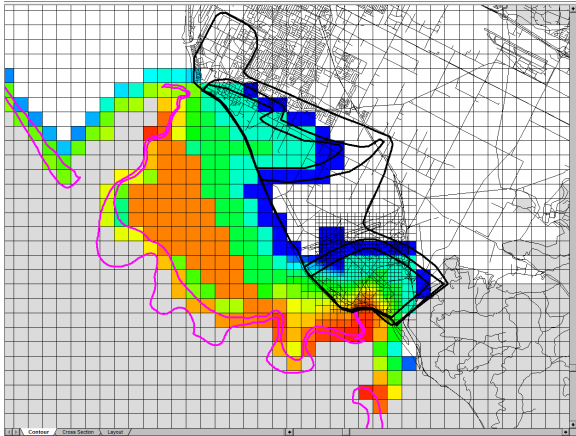
Little data available from 1985
More investigations in 1994, 1999, 2002, 2005 and 2015



17

Oxnard Aquifer

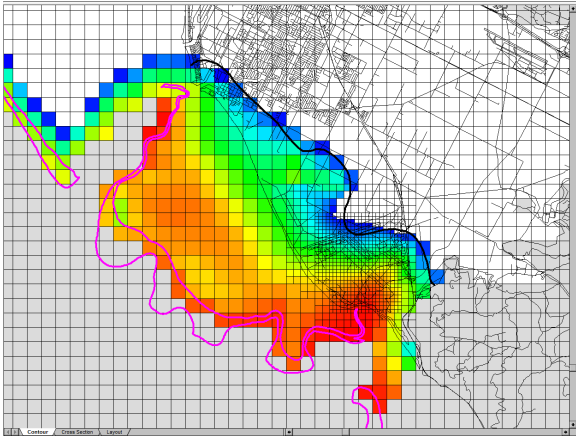
Estimated Initial Chloride Conc in 1985



Black line:
1989 Oxnard Aquifer SWI Inland Extent (USGS)

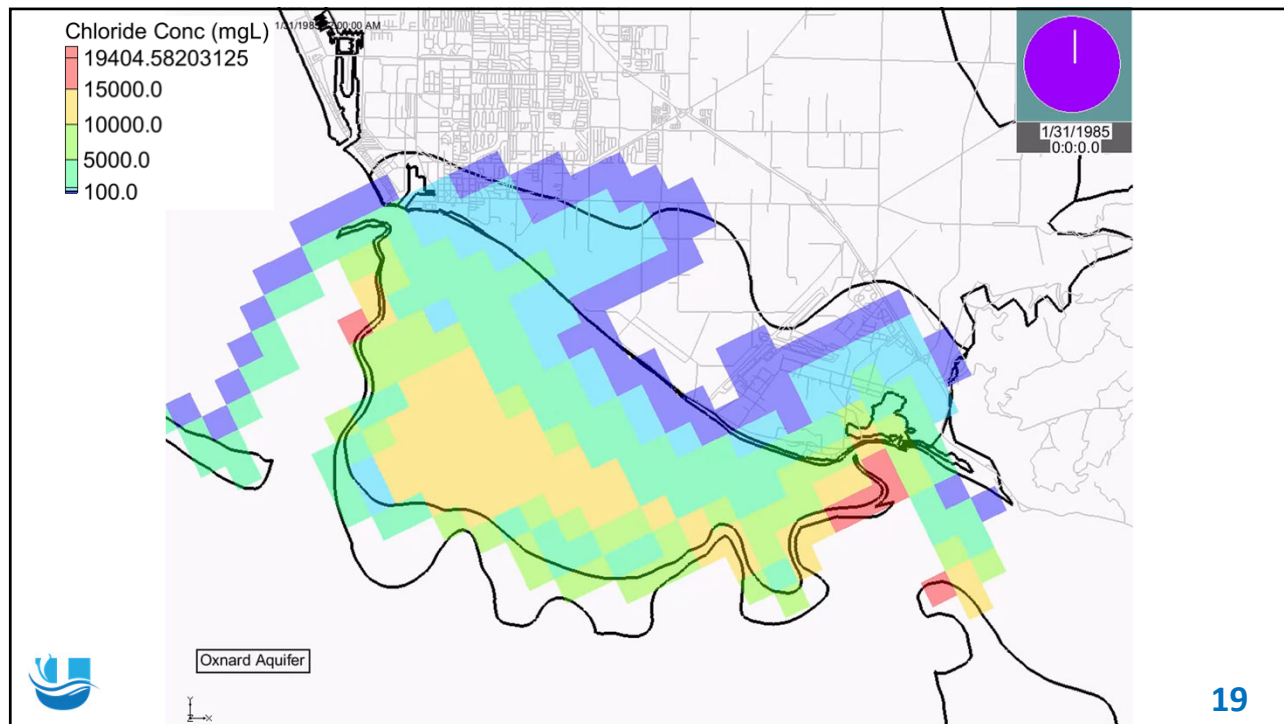


Simulated Chloride Conc in 2015



Black line:
2015-2016 Oxnard Aquifer SWI inland extent (UWCD)

18



19

Conclusions

- A detailed analysis on the seawater intrusion data from 1985 to 2015 may be beneficial
- The MODFLOW-USG model is ready for the brackish water project
- The MODFLOW-USG model will be sent to the Expert Panel for review
- The MODFLOW-USG model may continue to be improved while simulating the brackish water project in parallel



20

20

Questions/Comments



21