

**MINUTES**  
**WATER RESOURCES COMMITTEE**  
**Tuesday, October 5, 2021, at 9 a.m.**  
**UNITED WATER CONSERVATION DISTRICT**  
**Boardroom, 1701 N. Lombard Street, Oxnard CA 93030**

**Committee Members Present:**

Chair Edwin McFadden  
Director Naumann  
Director Maulhardt

**Staff Present:**

Anthony Emmert, assistant general manager  
Dr. Maryam Bral, chief engineer  
Dan Detmer, water resources manager  
Dr. Zachary Hanson, hydrogeologist  
Kathleen Kuepper, hydrogeologist  
John Lindquist, senior hydrogeologist  
Zachary Plummer, IT administrator  
Dr. Bram Sercu, senior hydrologist  
Dr. Jason Sun, principal hydrogeologist/modeler  
Eric Elliott, associate hydrogeologist  
Josh Perez, human resources manager

**Public Present:**

Heidi Gonzales  
Burt Handy  
Jennifer Tribo

**OPEN SESSION: 9:00 a.m.**

Chair McFadden called the Water Resources Committee Meeting to order at 9:00 a.m.

**1. Public Comment**

Chair McFadden asked if there were any public comments for the Water Resources Committee. None were offered.

**2. Approval of Minutes - Motion**

Motion to approve the August 31, 2021, Water Resources Committee meeting minutes, Director Maulhardt; Second, Director Naumann. Voice vote: three ayes (McFadden, Maulhardt and Naumann); none opposed; motion carries 3/0.



### 3. **Seawater Intrusion Update 2020**

Hydrogeologist Kathleen Kuepper provided updates and slides (see attached) on current seawater intrusion in the Oxnard basin. Ms. Kuepper stated that a seawater intrusion report was last published in 2016. While presenting a slide on reported groundwater usage in 2020, Director Naumann pointed out the wells reporting pumping 1,000 AF or above and asked if it was safe to assume those are M&I wells. Ms. Kuepper agreed with Director Naumann and stated that wells pumping over 1,000 AF were likely M&I wells.

Director Naumann inquired about climate cycles. Senior Hydrogeologist John Lindquist stated that there are cycles of wet and dry periods related to the Pacific Decadal Oscillation.

Ms. Kuepper presented the 2020 maximum chloride levels in monitoring wells along the coast for each aquifer, starting with the Oxnard Aquifer and moving down to the Grimes Canyon aquifer. Director McFadden asked about the varying chloride levels, for example why the chloride levels of CM5-220 are so low and the chloride levels in CM7-110 are so high. Water Resources Manager, Dan Detmer stated that the chloride level over 29,000 mg/l in CM7-110 is much higher than the seawater and that the high salinity is thought to be caused by brines at that location. He added, well CM1A-220 at the coast near Mugu Lagoon has about 16,000 mg/l chloride, nearing that of seawater. It was stated that the predominant groundwater flow inland of Port Hueneme during wetter periods is to the southeast and down the coast towards Mugu Lagoon. Also, the Hueneme and Mugu submarine canyons were pointed out as major features that influence the seawater intrusion on the Oxnard plain by providing a short flow path to inland aquifers.

Time series and trends of chloride concentrations were presented for select wells in each aquifer. Ms. Kuepper stated changes in chloride levels can be caused by a seawater plume moving down the coast or caused by brines at certain locations. Mr. Detmer also stated that vertical movement of groundwater is occurring much more than we used to suspect. He added that the new groundwater flow model will help with our understanding of vertical groundwater flow and the movements of saline water.

Director Naumann inquired about the depth the Grimes Canyon aquifer and Ms. Kuepper responded that it has an approximate depth of 1,800 feet. She added that the Grimes Canyon aquifer is not mapped in the northern Oxnard plain and showed that there were no monitoring wells screened in the Grimes Canyon aquifer near Port Hueneme. It was also stated and shown that the Hueneme aquifer is not mapped in the southern part of the Oxnard basin near Mugu Lagoon, where the unit has been uplifted and eroded away.

Director Maulhardt asked if staff is communicating when trends are observed. He stated that the information presented and trends that are observed needs to be available, especially for those responsible for managing water or pumping in the basin. Mr. Detmer stated that Grimes Canyon is the least responsive to recharge and added that staff is preparing this material for publication and will incorporate his suggestions into the report.

Director Naumann asked how large production from the Grimes Canyon aquifer is in comparison to others. Mr. Detmer stated he believes it is mapped from about 200-400 feet thick but staff does not know if any wells are producing solely from that aquifer and it is a bit of a data gap. The proposed coastal brackish extraction barrier and treatment plant, located near Mugu Lagoon, was



briefly discussed. Chief Engineer Maryam Bral confirmed the project is planning to pump and treat groundwater from the Oxnard and Mugu aquifers.

**4. Update on Water Supply and Demand Trends in the OPV Basins**

Mr. Lindquist provided an update (see attached presentation) on Water Supply and Demand Trends in the Oxnard and Pleasant Valley (OPV) basins, based on data presented in the FCGMA's Groundwater Sustainability Plans (GSPs) and Annual GSP Update reports. A key conclusion of the presentation was that water demand, including use by both the municipal and industrial (M&I) and agricultural sectors, has declined a total of 25 to 30% from 2008 to 2020, when normalized for variability in rainfall. The committee members noted that it would be interesting to look at water use trends by city.

**5. Operations of the Hardened Ramp with Mod 6 and Mod 9 Designs**

Murray McEachron presented updates and slides (see attached) on design and operation considerations for the Mod 6 and Mod 9 designs for the Freeman Diversion and hardened ramp fish passage structure. Director Maulhardt stated that he is pleased to hear about the computer and physical modeling and requested that staff inform the Board on how they can be helpful in applying pressure to get the message that some potential designs are problematic out to elected officials. He added that the problem is bigger than just the riverbed and designs have an impact on the river both upstream and downstream.

**6. Water Resources Department Update**

Mr. Detmer provided a verbal update to the Committee regarding Water Resources Department activities for the previous month. He stated that staff has been working hard on the coastal groundwater modeling and model conversion for solute transport modeling. Mr. Detmer also stated that staff delivered a Technical Memo on our daily surface water routing model that FCGMA staff had requested and our work on basin optimization modeling continues. Mr. Detmer then provided updates on the recent Prop 1 Grant Technical Advisory Committee meeting and stated that staff are now ready to run various model scenarios to see how much water can be pumped and from where.

**7. Groundwater Sustainability Agencies Update**

Mr. Detmer provided a verbal update to the Committee regarding the activities of the various GSAs within United's service area, and activities related to Santa Paula basin management.

**FUTURE AGENDA ITEMS**

None were suggested.

**ADJOURNMENT**

Chair McFadden adjourned the meeting at 11:28 am.

I certify that the above is a true and correct copy of the Minutes of the UWCD Water Resources Committee Meeting of October 5, 2021.

Chair Edwin McFadden



**Legal Counsel**  
**David D. Boyer**

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# Saline Water Intrusion Update 2020

Presented by Kathleen Kuepper, PG  
Water Resources Committee Meeting  
October 5, 2021



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## Outline

1. General Stratigraphy of the Oxnard Plain
2. Reported Groundwater Usage
3. Groundwater Elevations
4. Chloride Levels
5. Saline Water Sources



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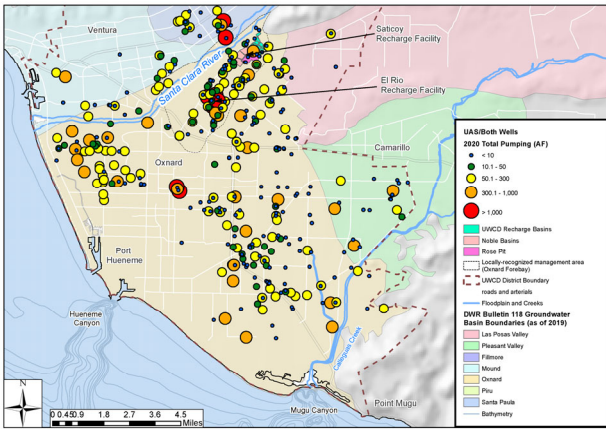
General Stratigraphy of the Oxnard Plain

| System                     | Hydrostratigraphic Unit    |
|----------------------------|----------------------------|
| Shallow                    | Semi-Perched Aquifer       |
| Upper Aquifer System (UAS) | Oxnard Aquifer             |
|                            | Mugu Aquifer               |
|                            | Hueneme Aquifer            |
| Lower Aquifer System (LAS) | Fox Canyon Aquifer - upper |
|                            | Fox Canyon Aquifer - basal |
|                            | Grimes Canyon Aquifer      |
|                            |                            |

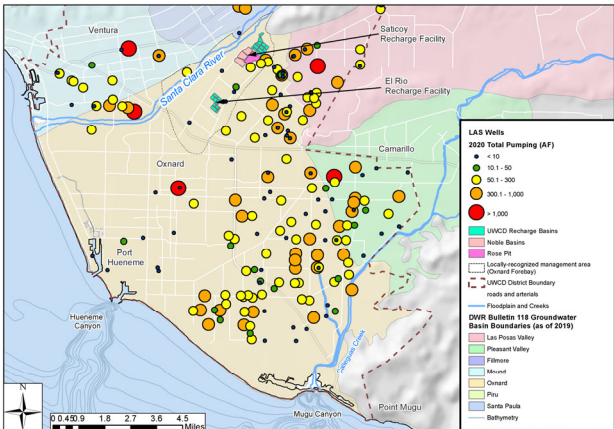


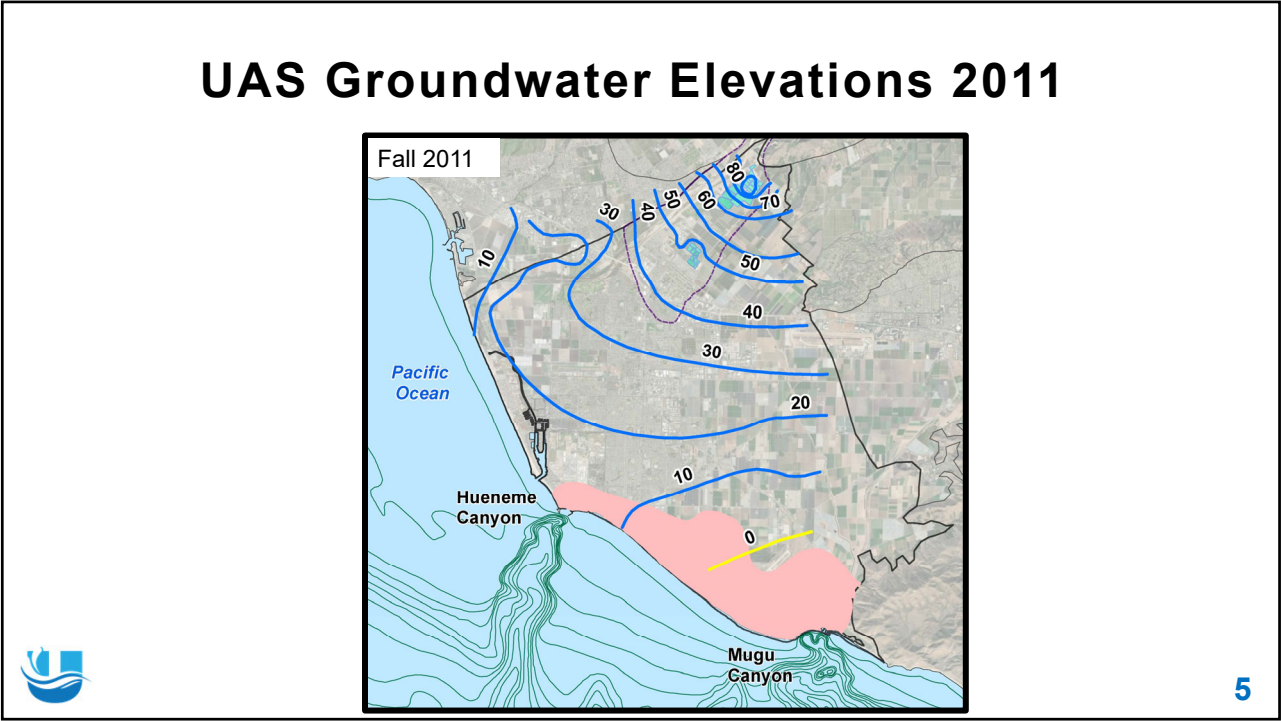
Reported Groundwater Usage 2020

Upper Aquifer System

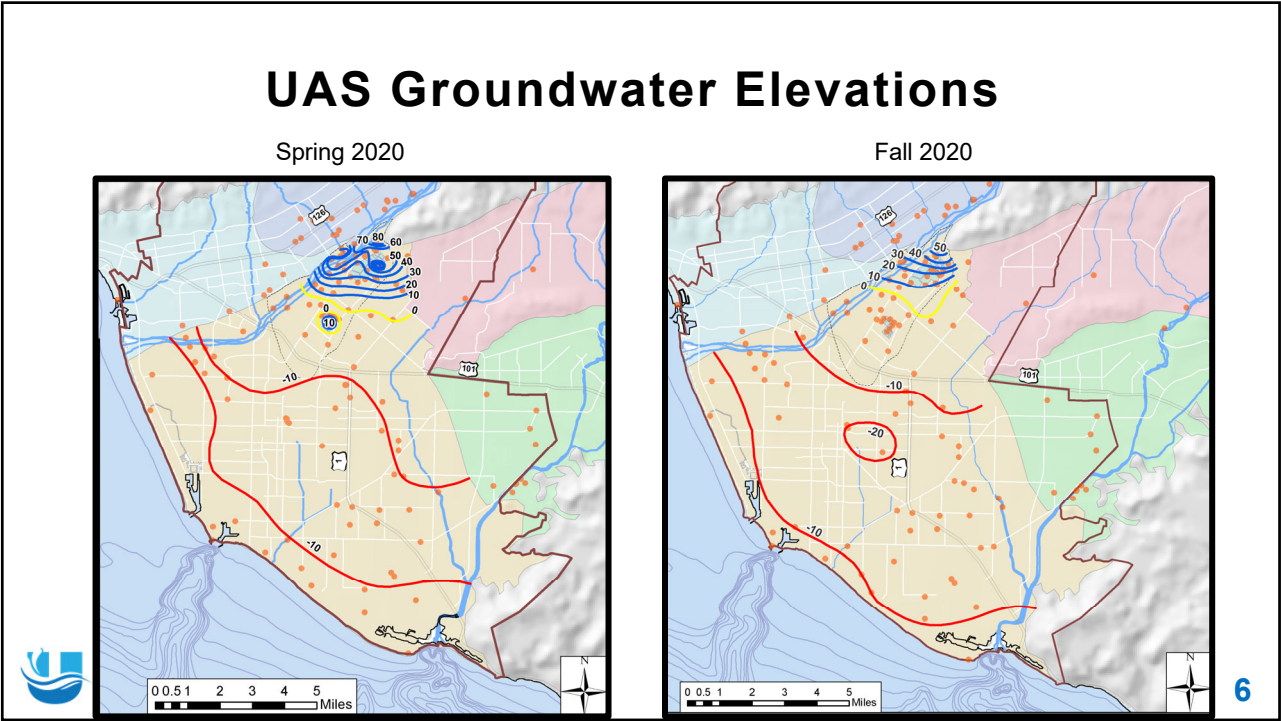


Lower Aquifer System

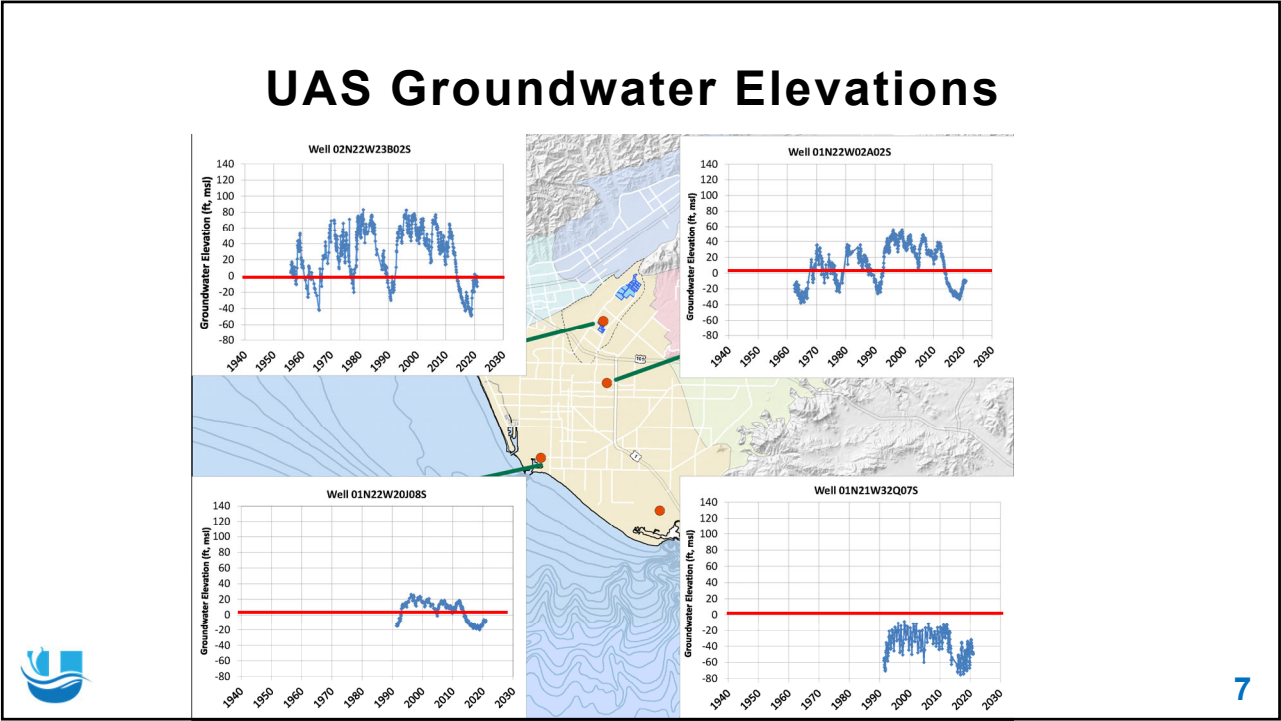




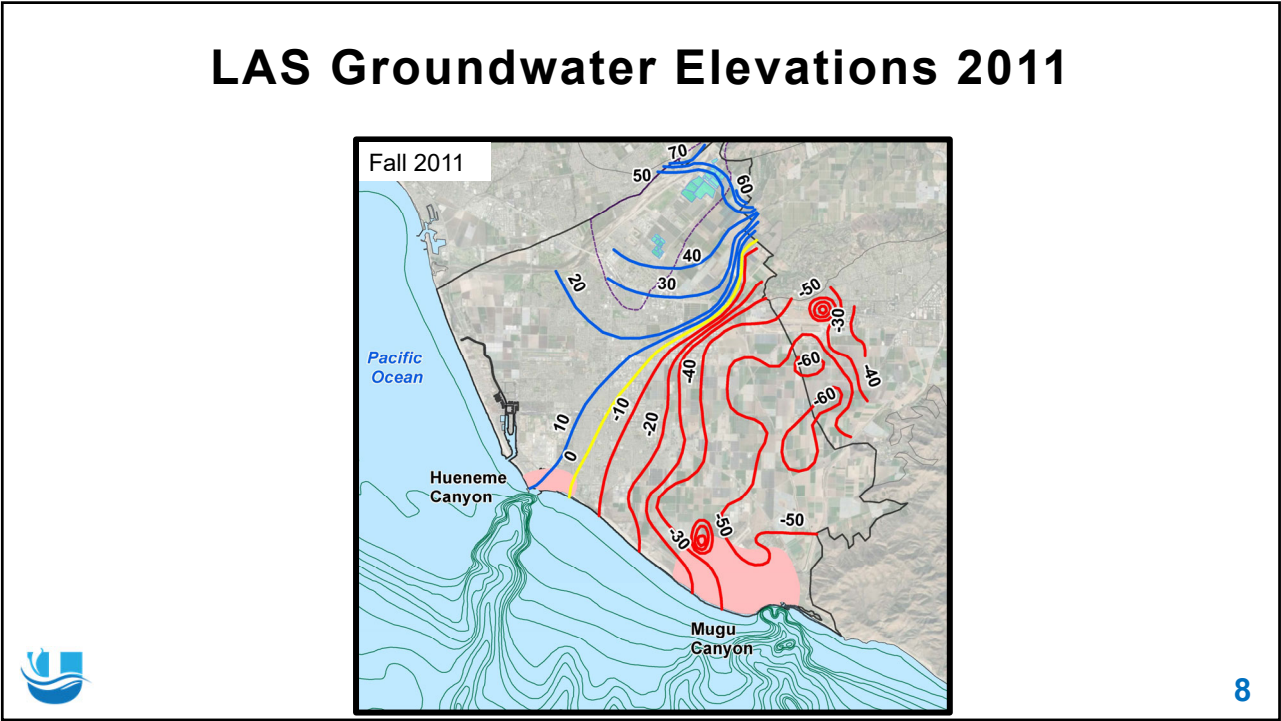
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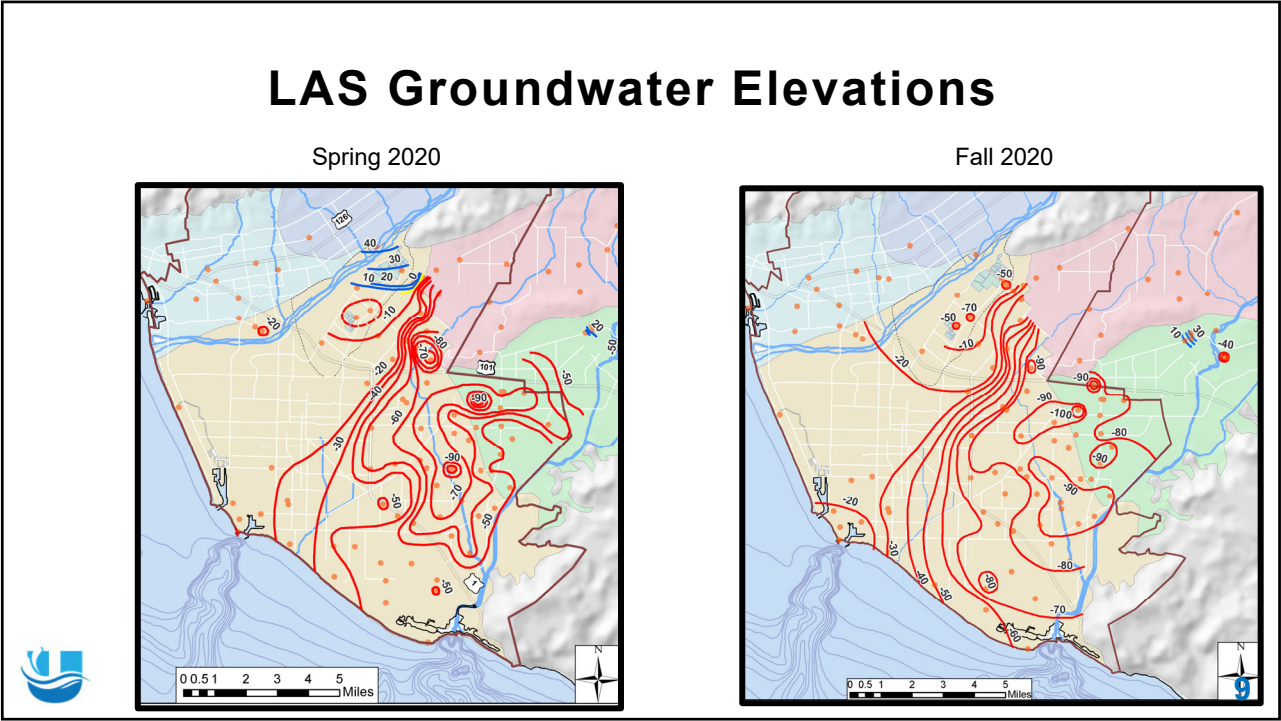


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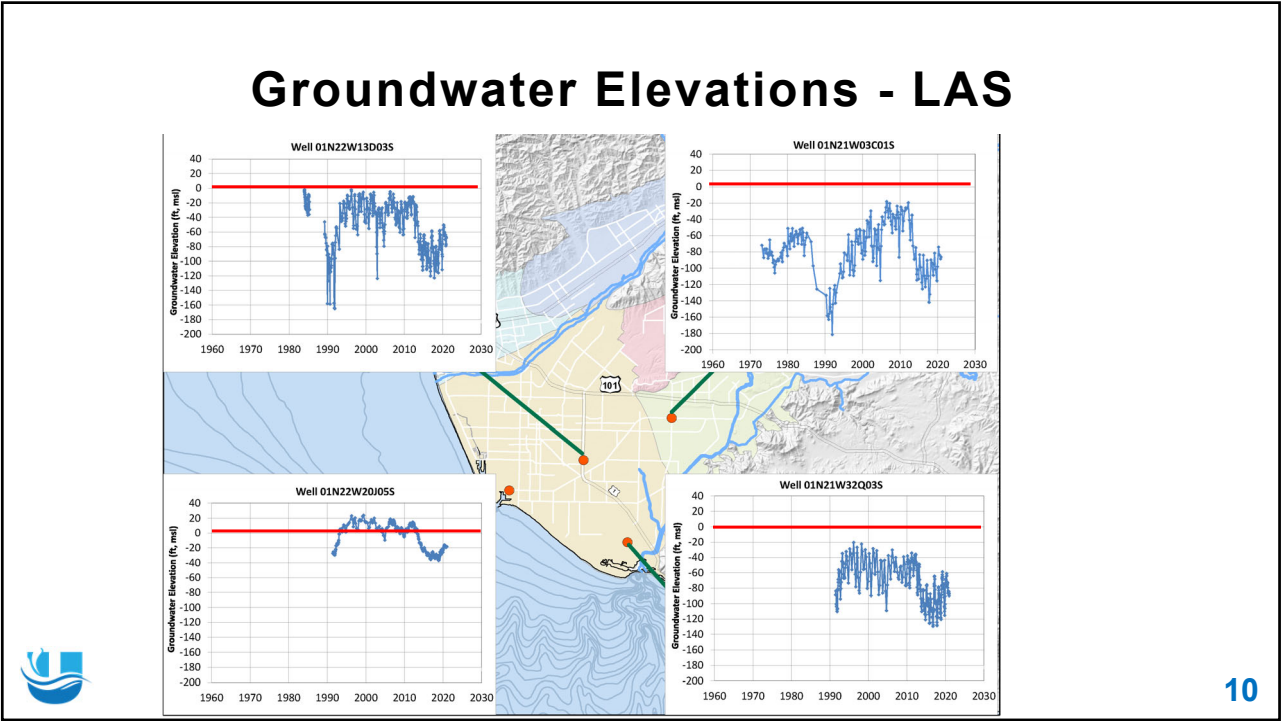


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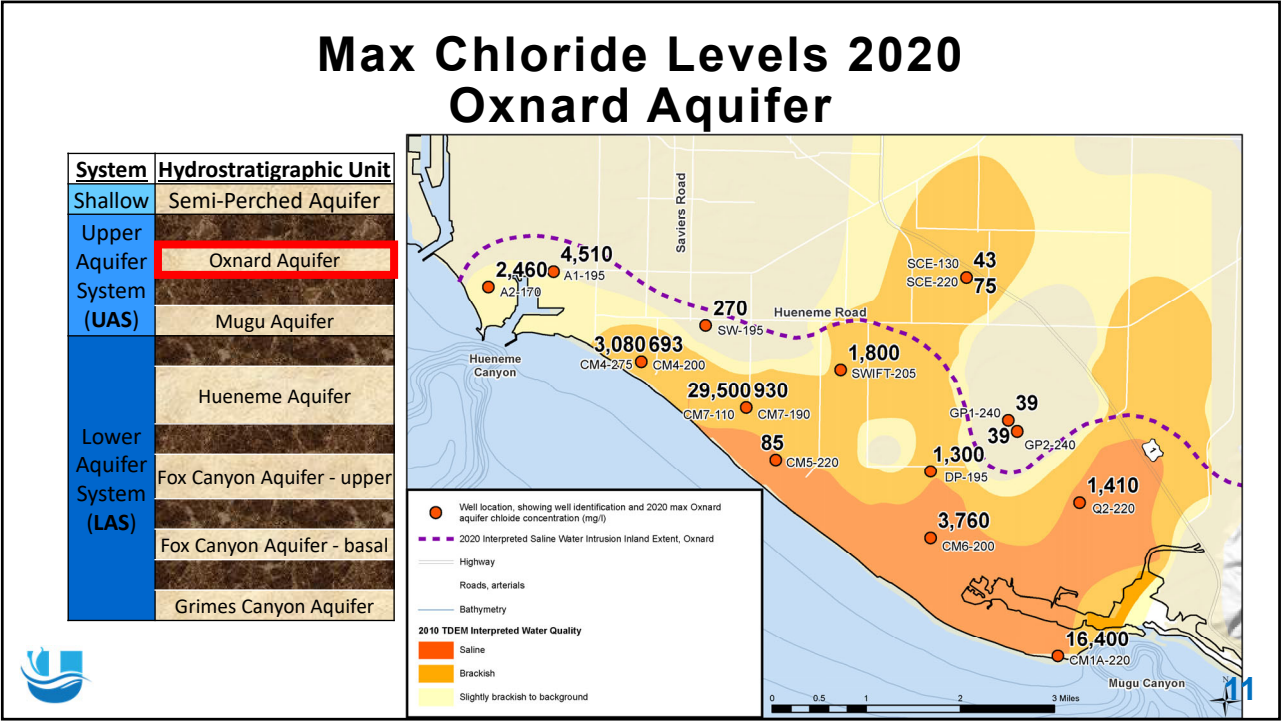




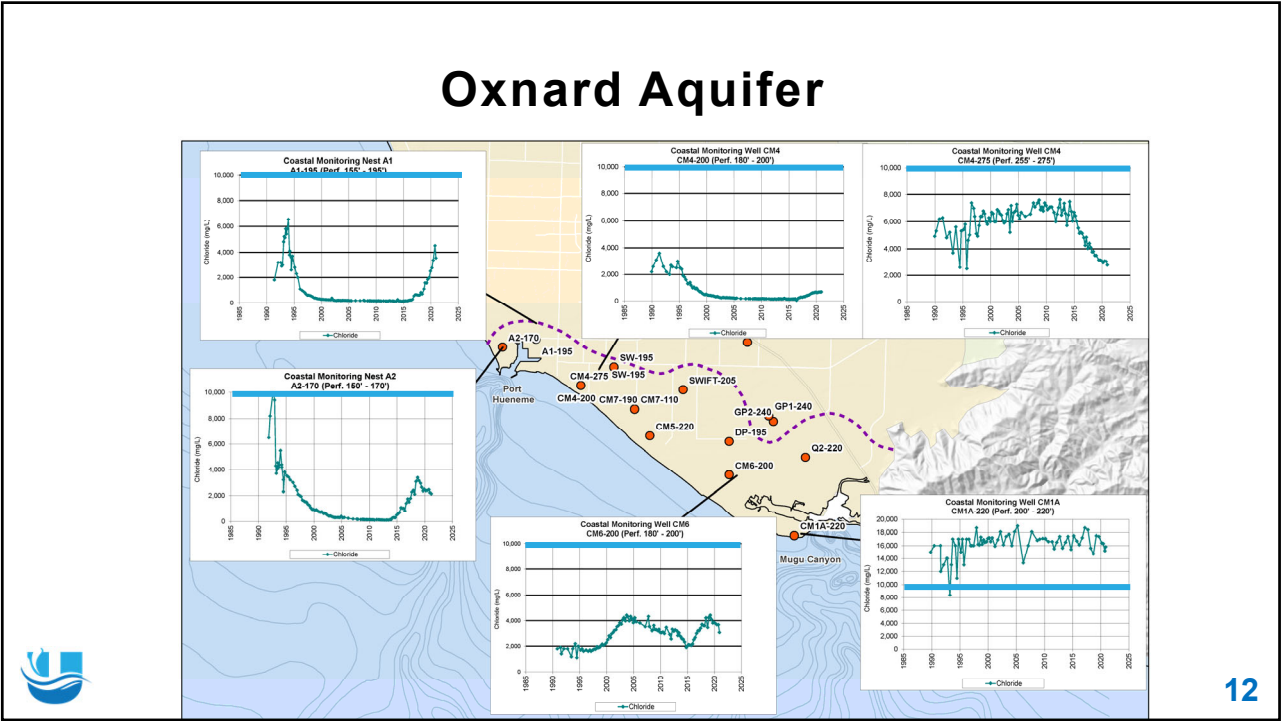
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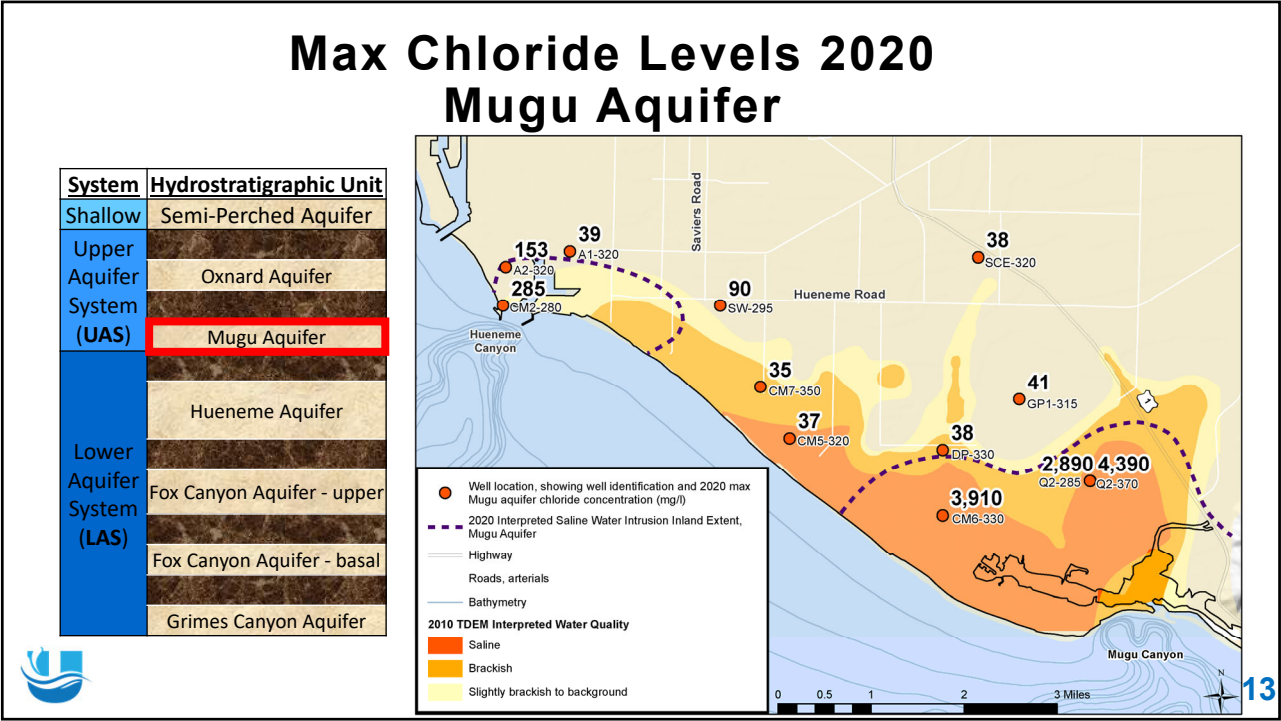


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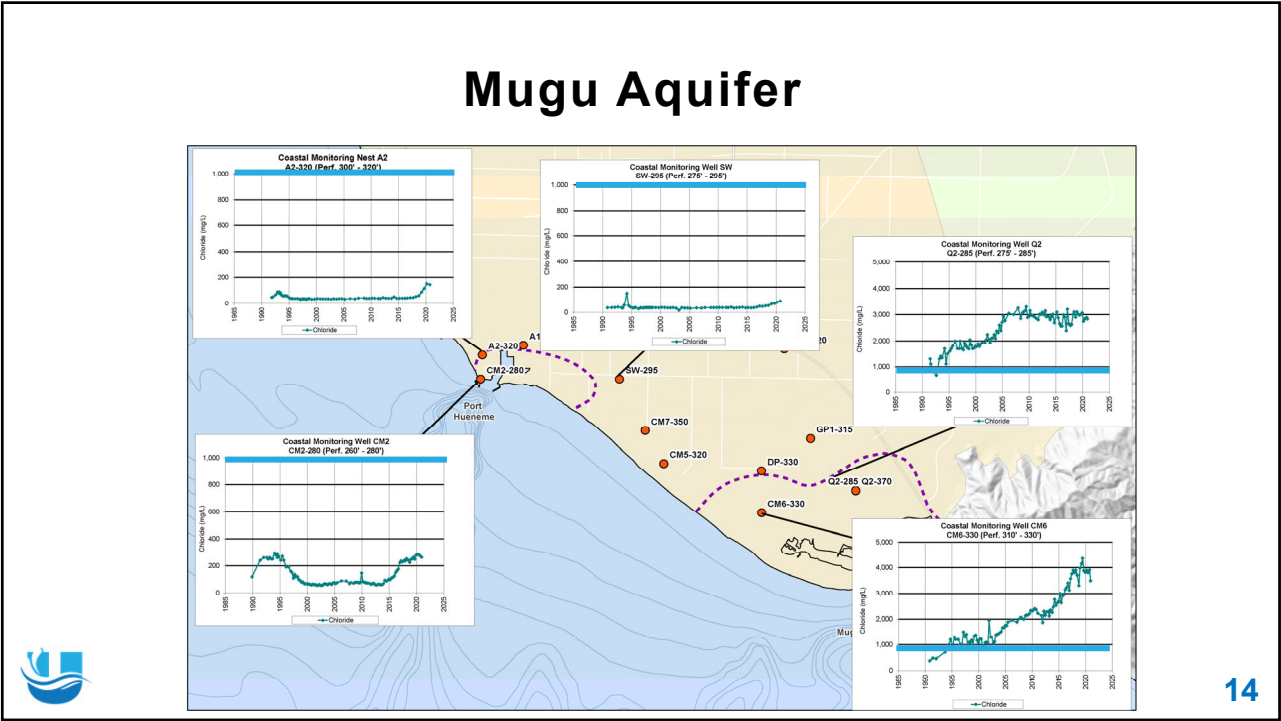


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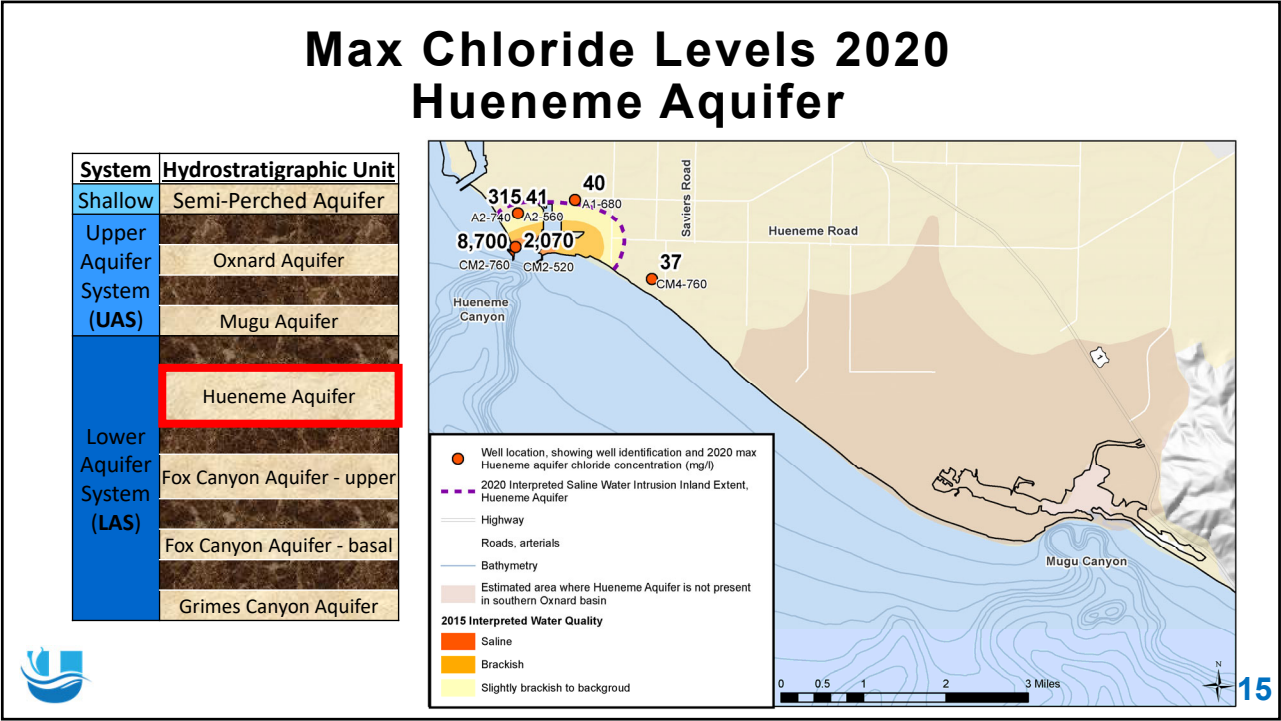




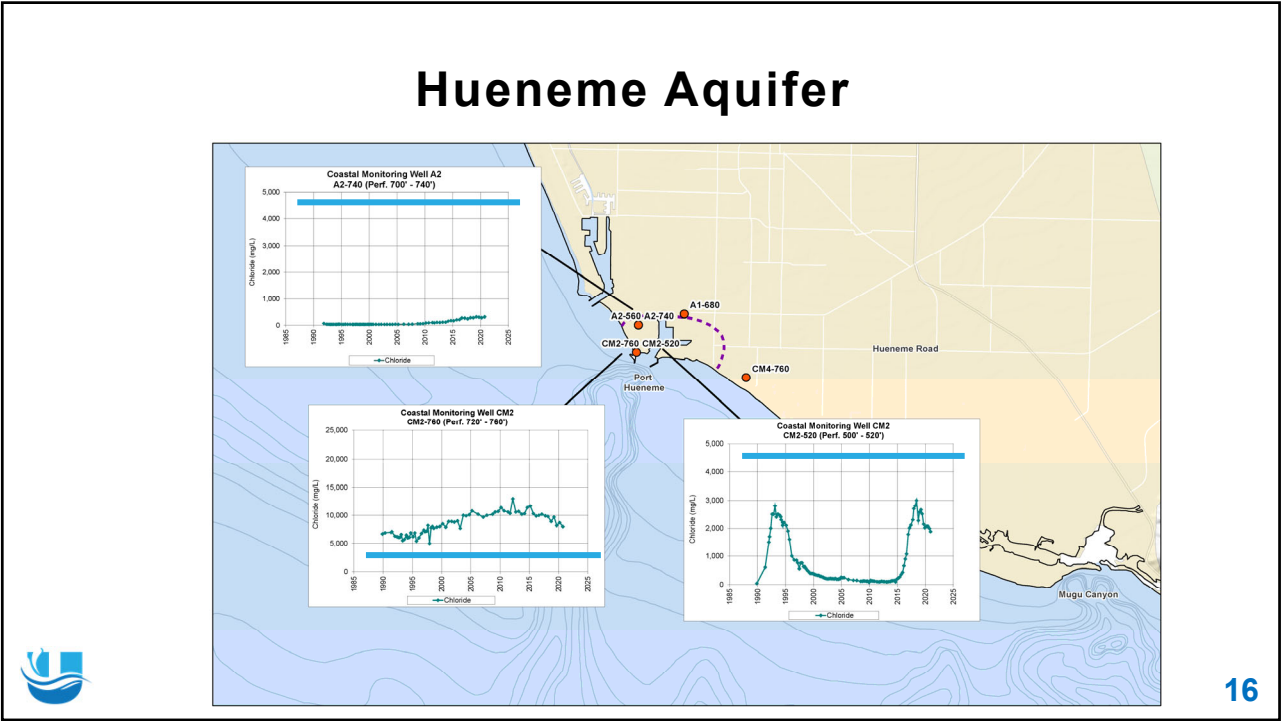
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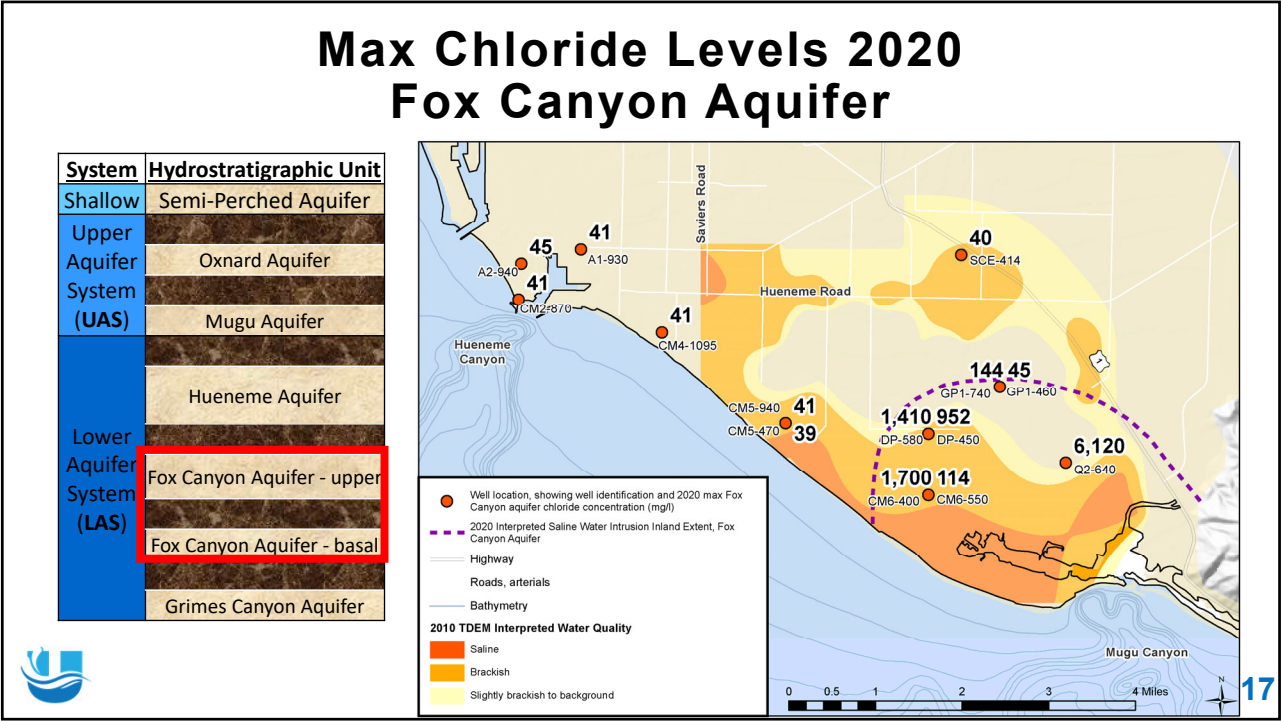
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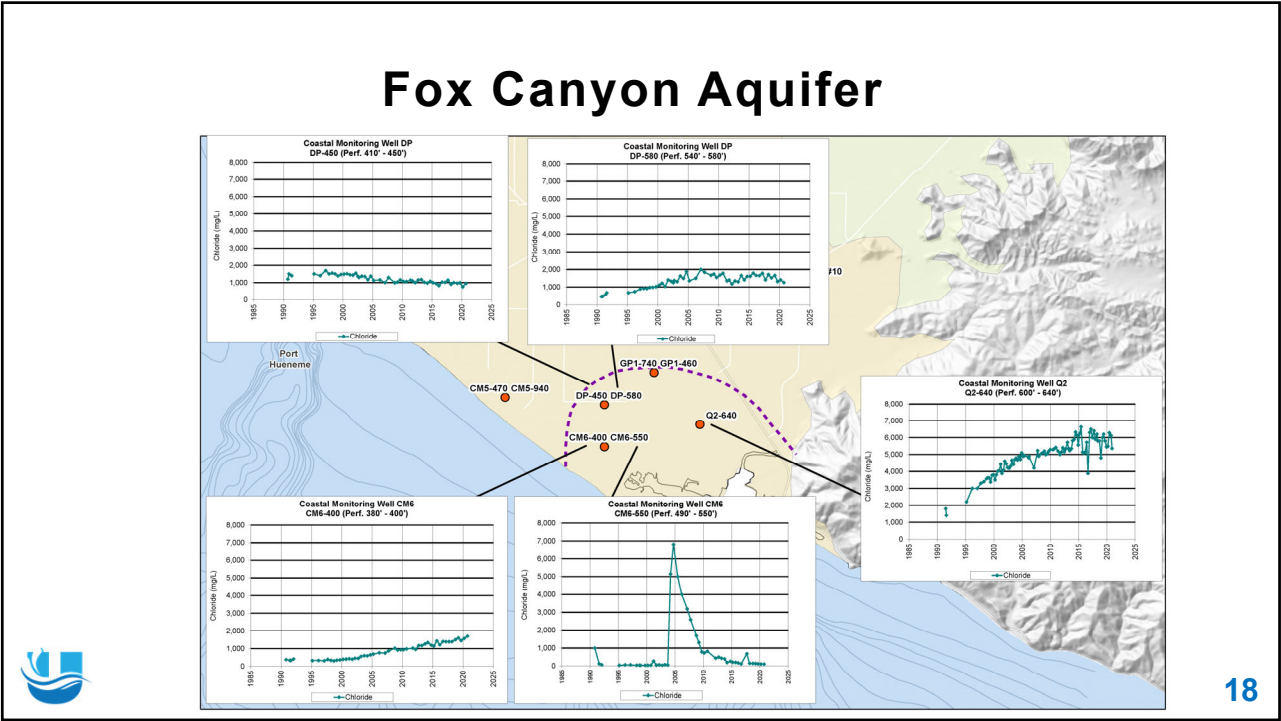
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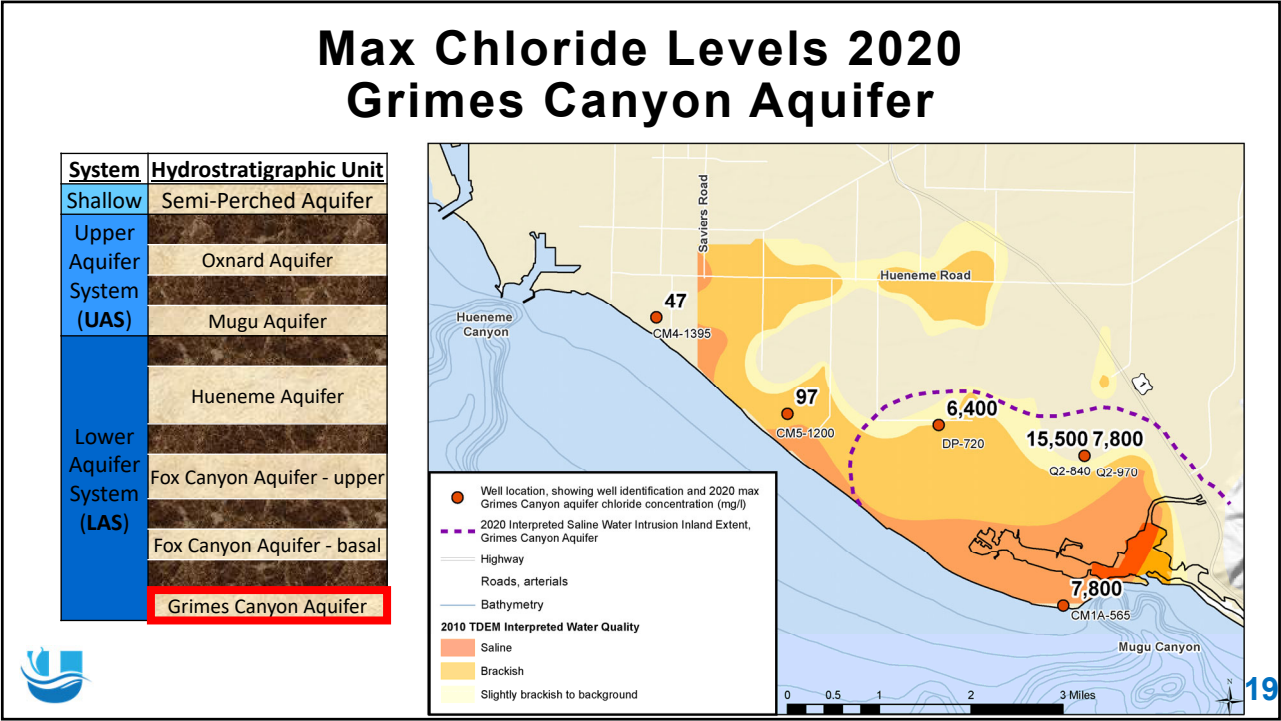
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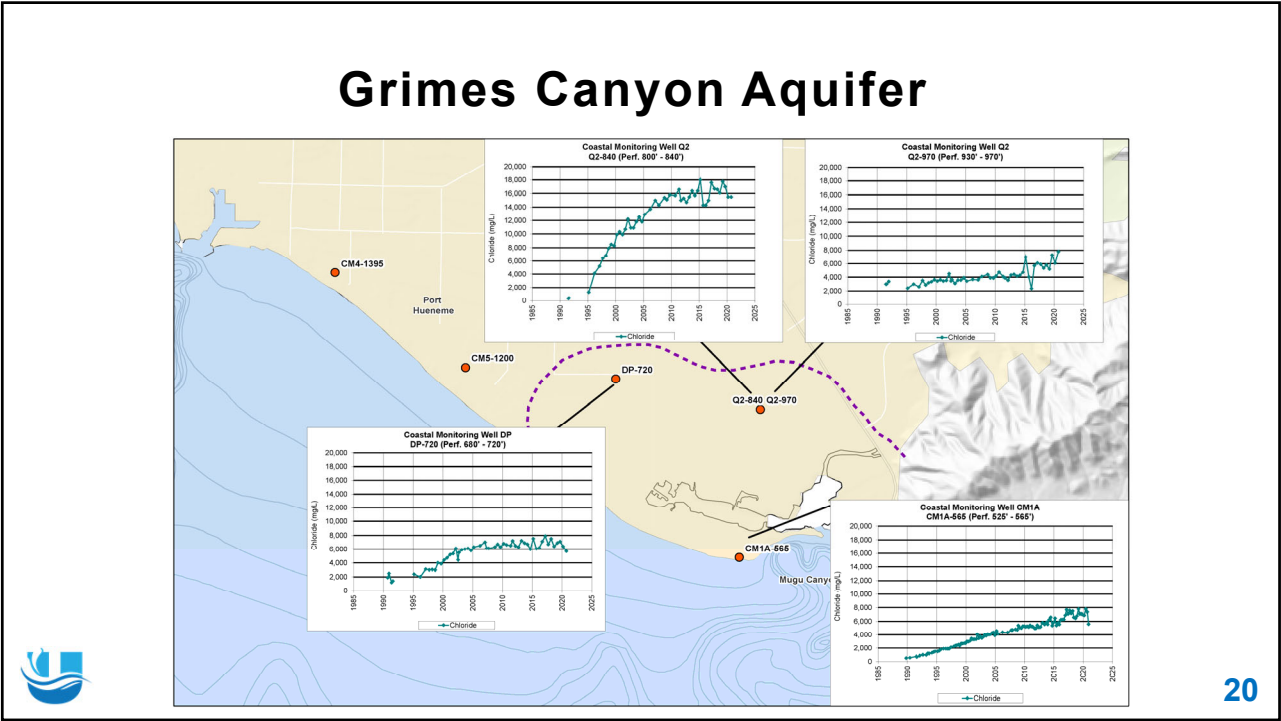
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## **Sources of High Salinity**

1. Lateral Seawater Intrusion
2. Vertical Flow between Aquifers
3. Compaction of Salt-Laden Marine Clays
4. Movement of Brines from Tertiary formations, often along faults
5. Reduction of recharge production through Freeman Diversion



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# Update On Water Supply And Demand Trends in the Oxnard and Pleasant Valley (OPV) Basins

Presented by John Lindquist, Senior Hydrogeologist  
Water Resources Committee Meeting  
October 5, 2021



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## Key Points

1. Total volumes of water use reported to the FCGMA in the Oxnard and Pleasant Valley basins (OPV basins) since 2016 are among the lowest seen during the period of record (1985-2020)
2. Ag groundwater use increased during 2013-15 due to low rainfall and limited availability of surface-water deliveries to the PTP and PVP
3. M&I groundwater use increased modestly in 2020
4. Application rates (water use per acre) for both Ag and M&I have trended downward overall since 2008, especially when adjusted for rainfall

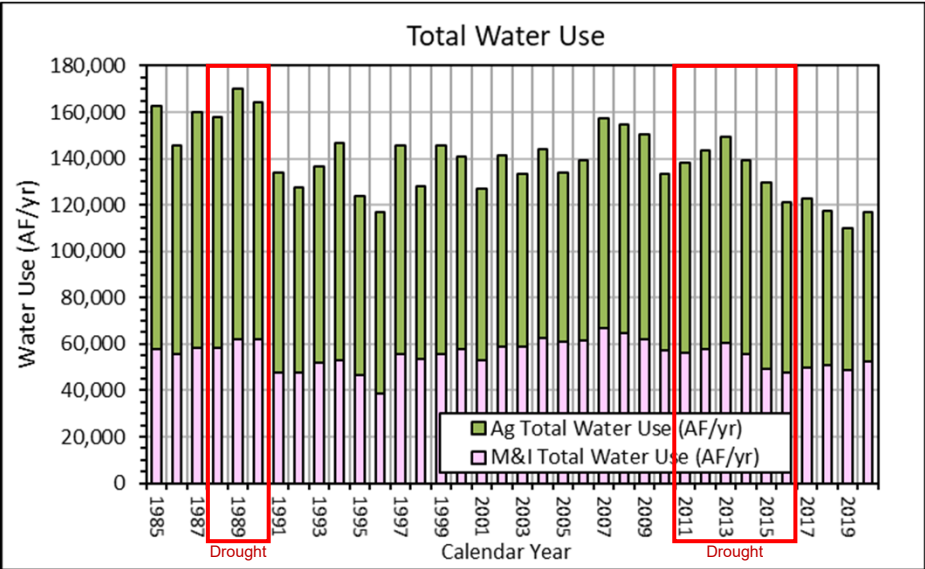


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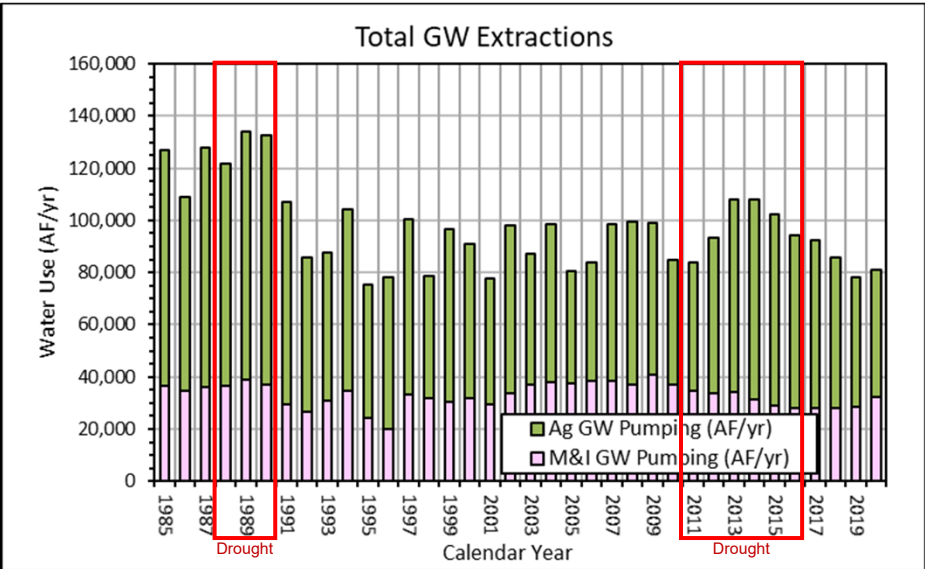
Total Water Use in OPV Basins, 1985-2020



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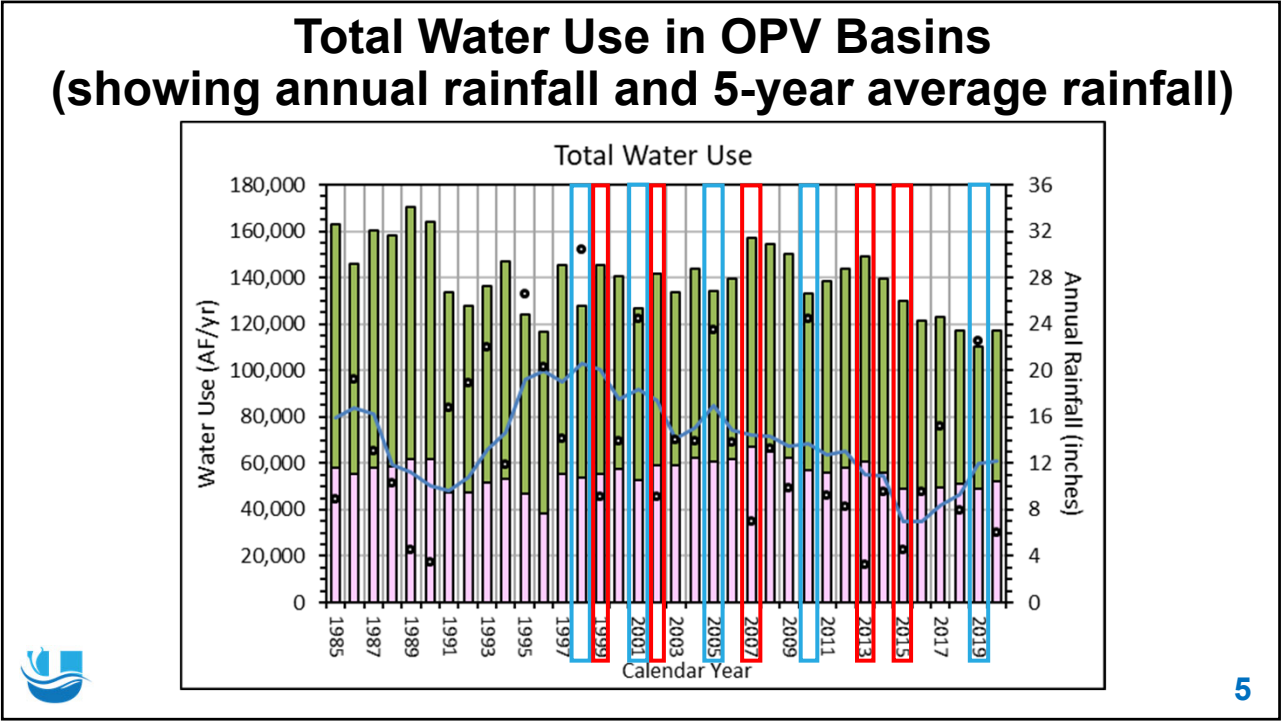
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Total Groundwater Extractions in OPV Basins, 1985-2020

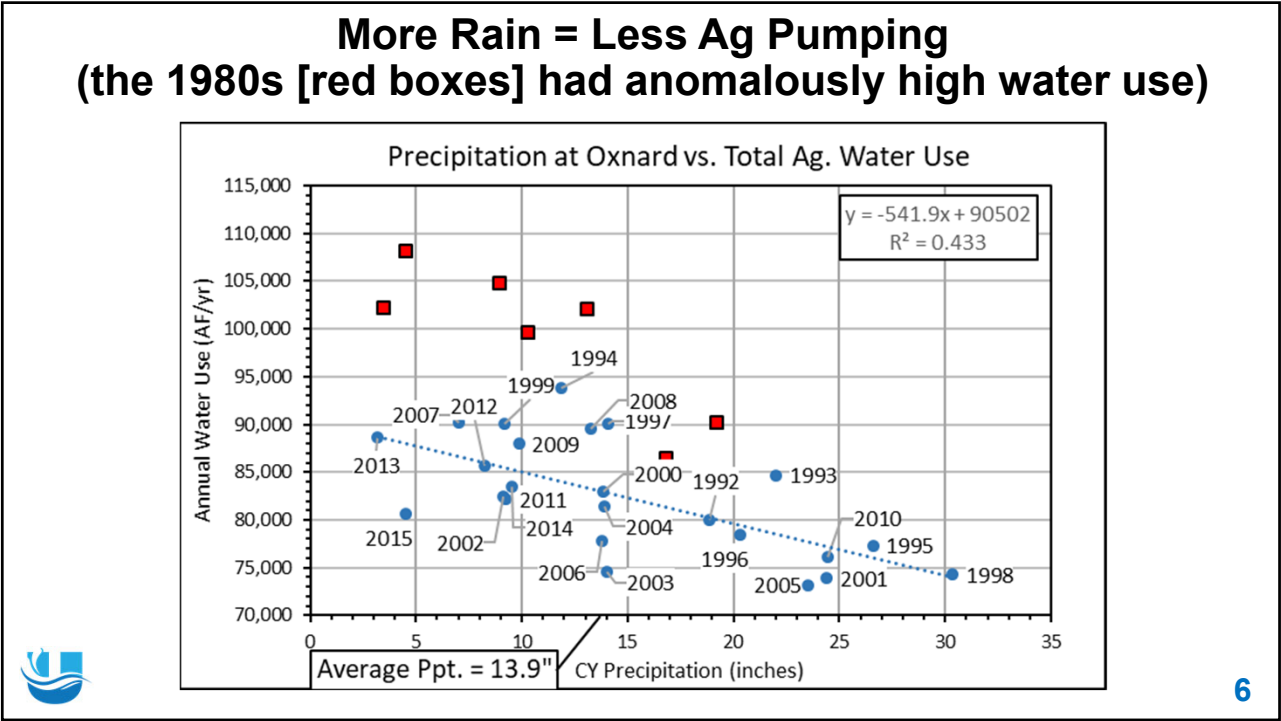


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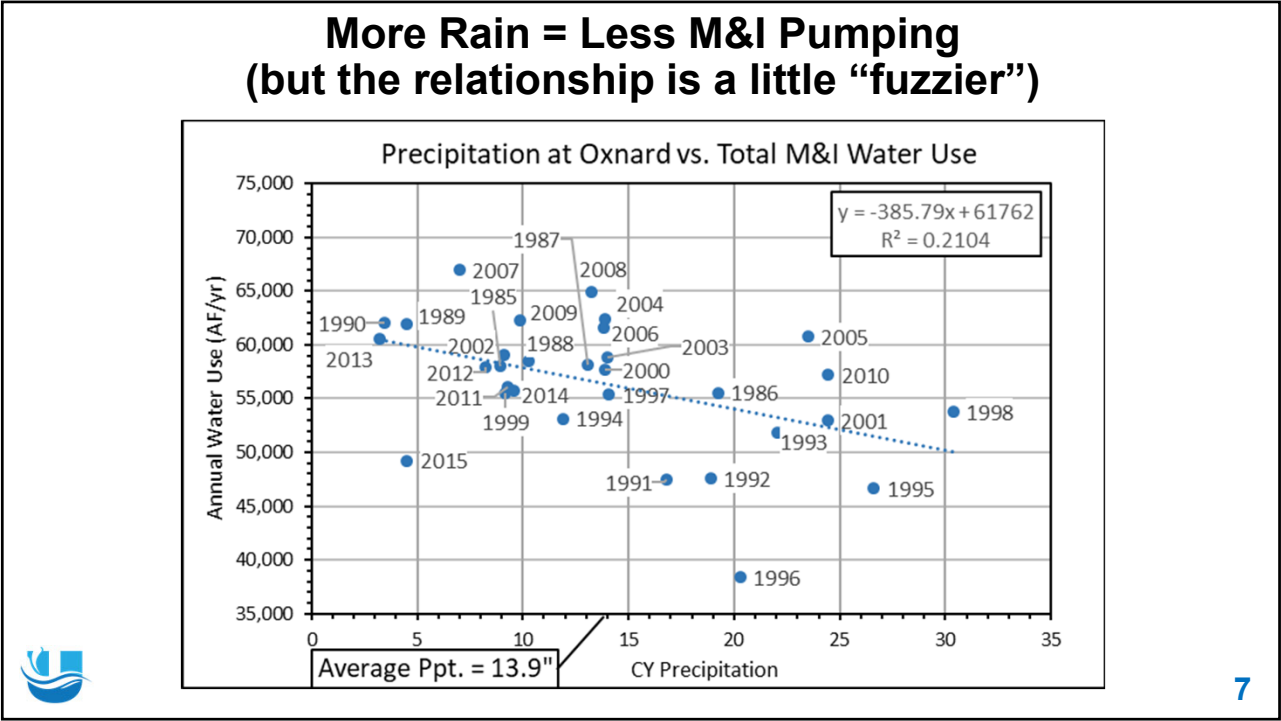
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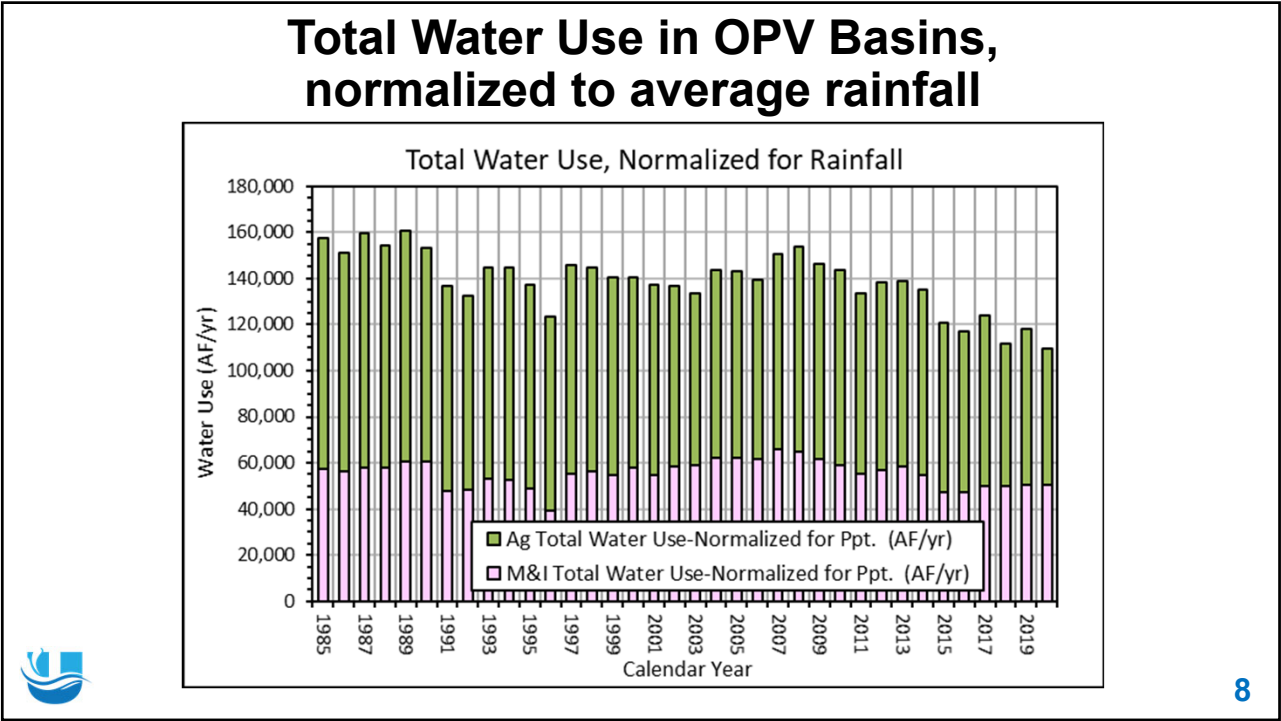
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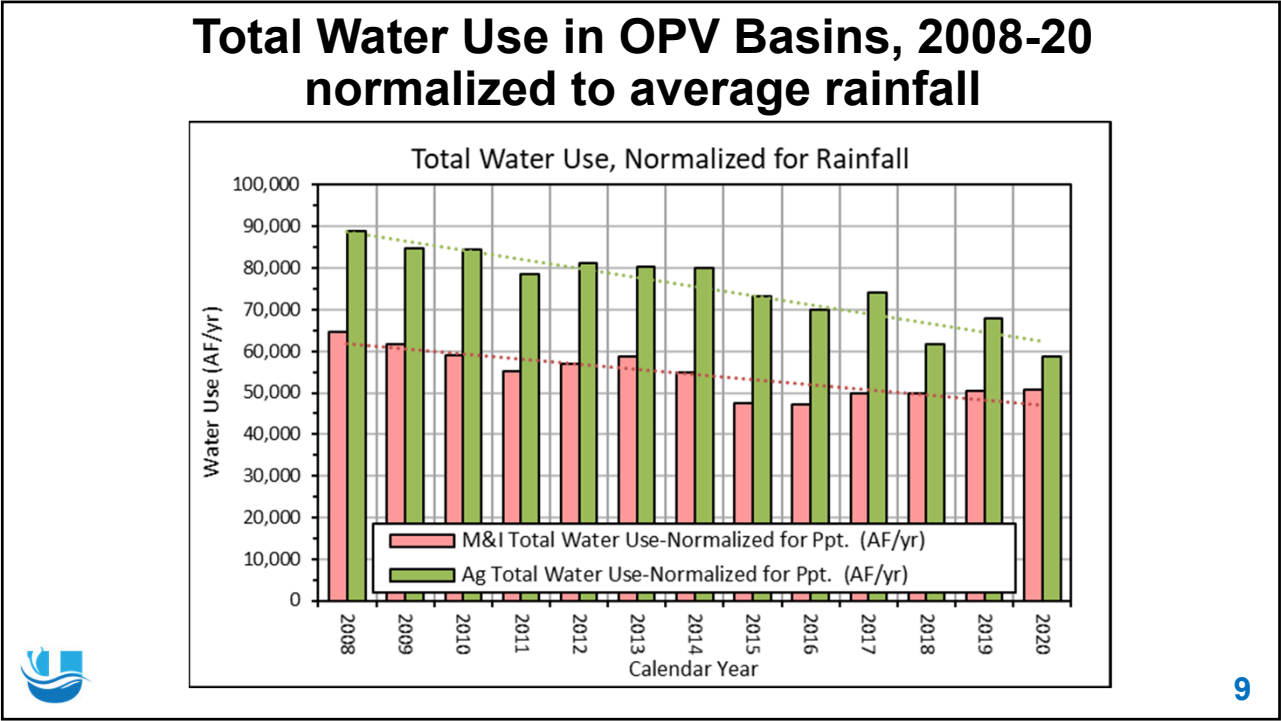
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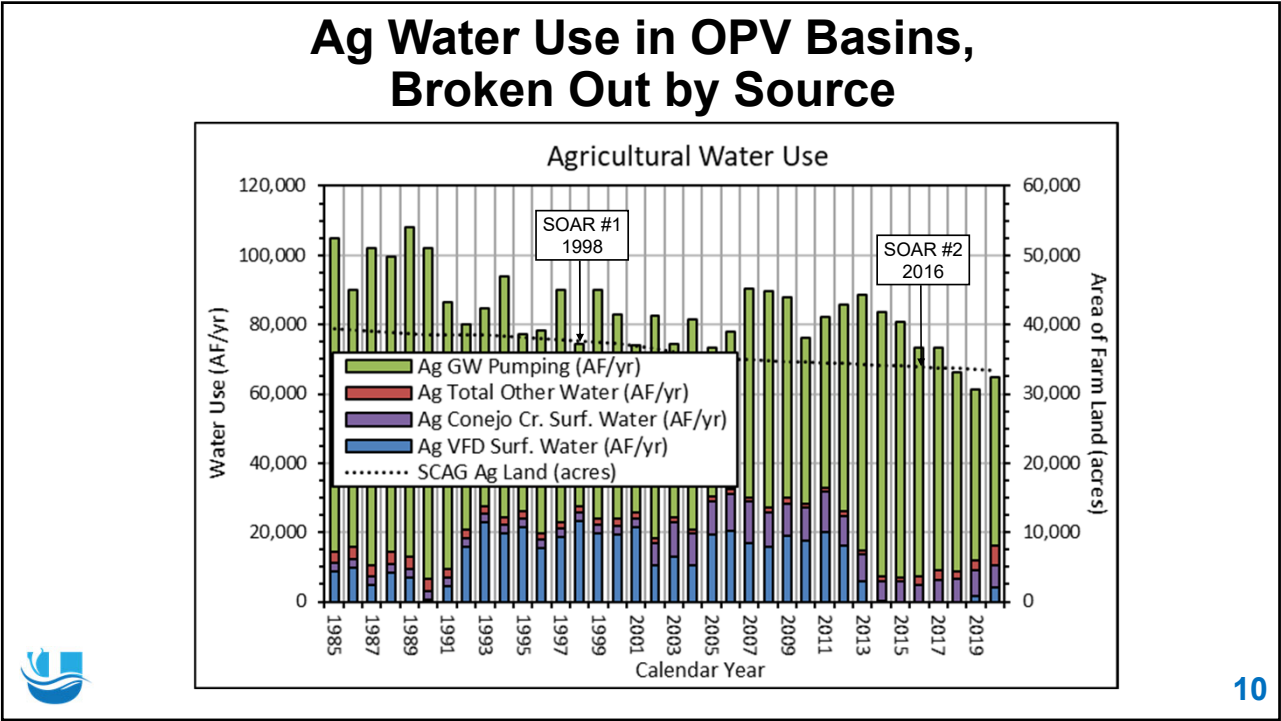
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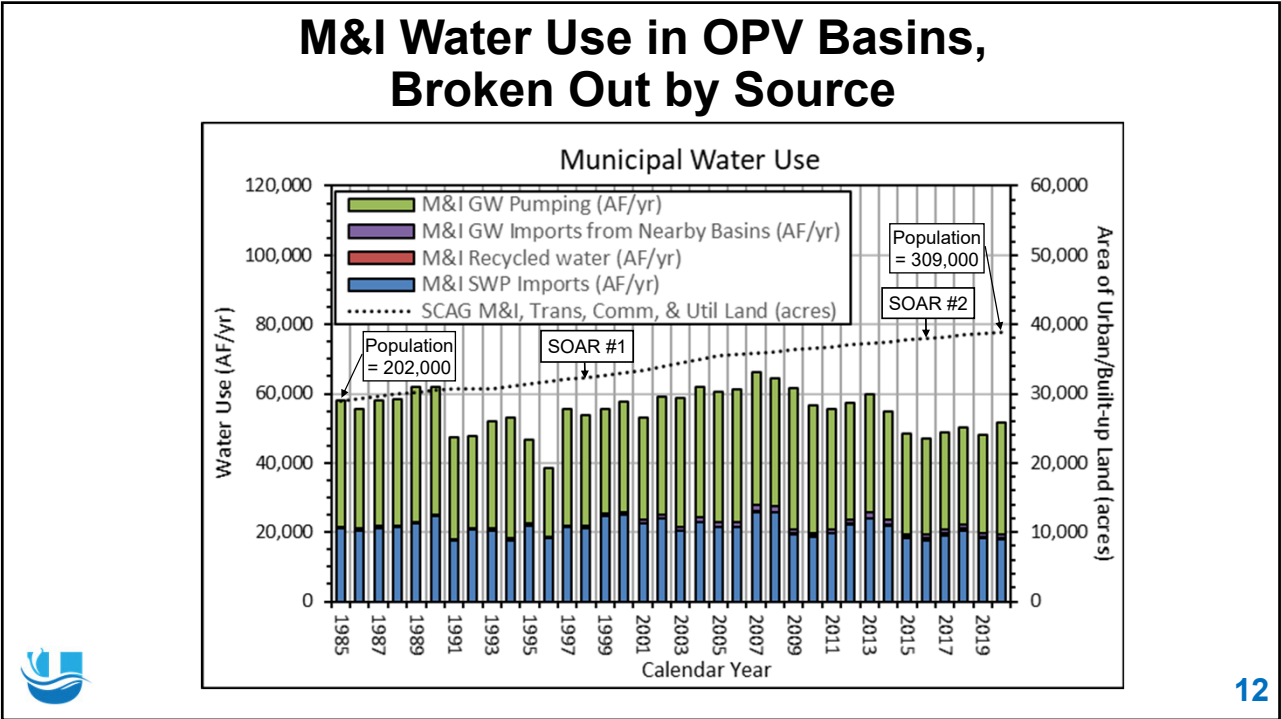
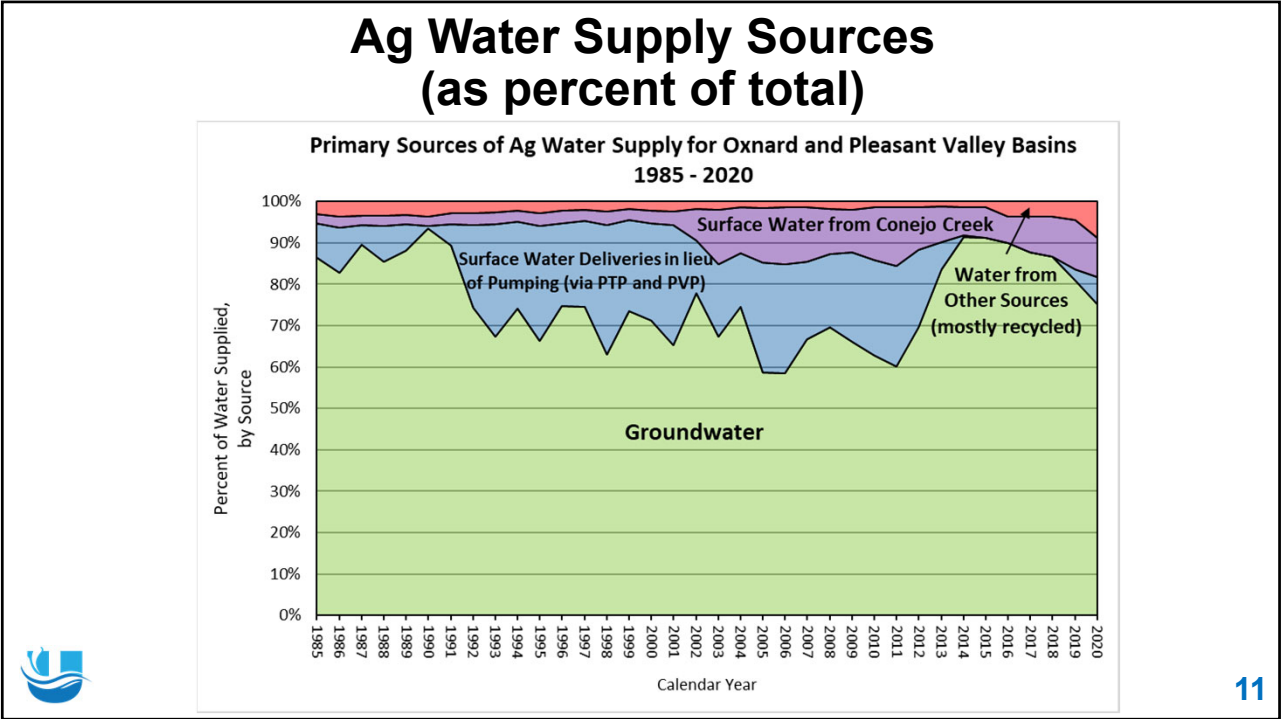
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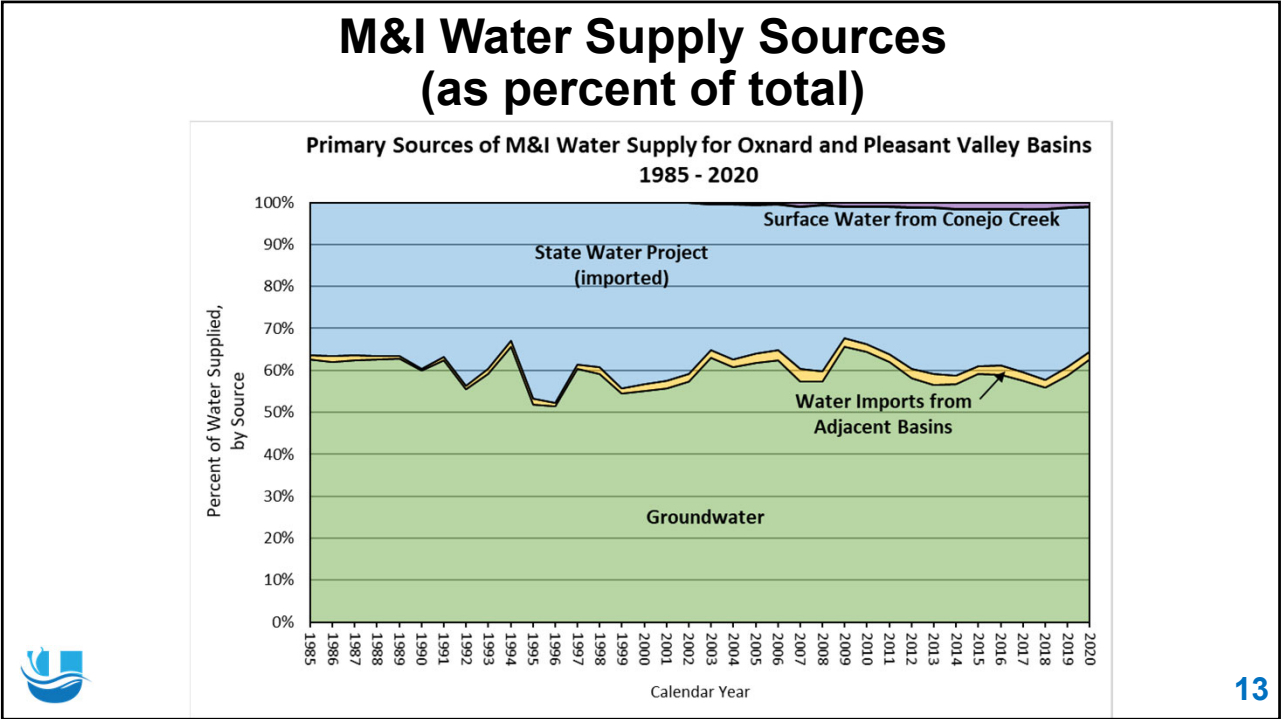


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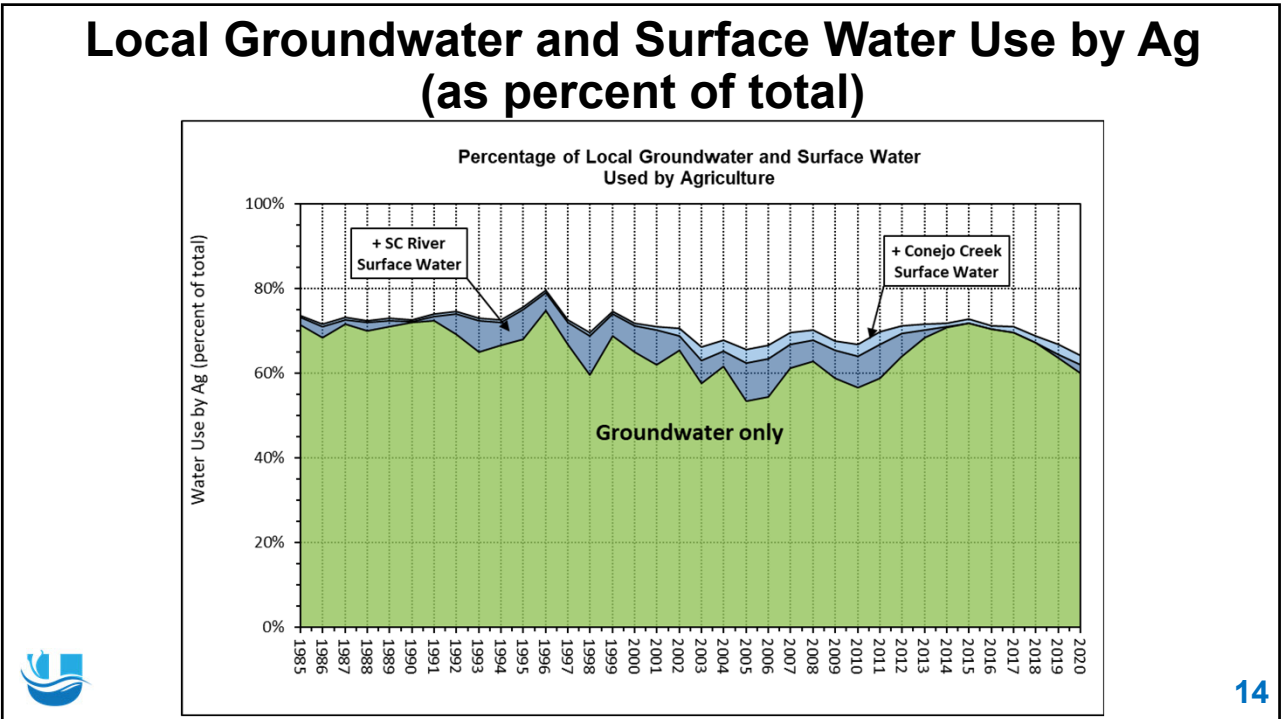


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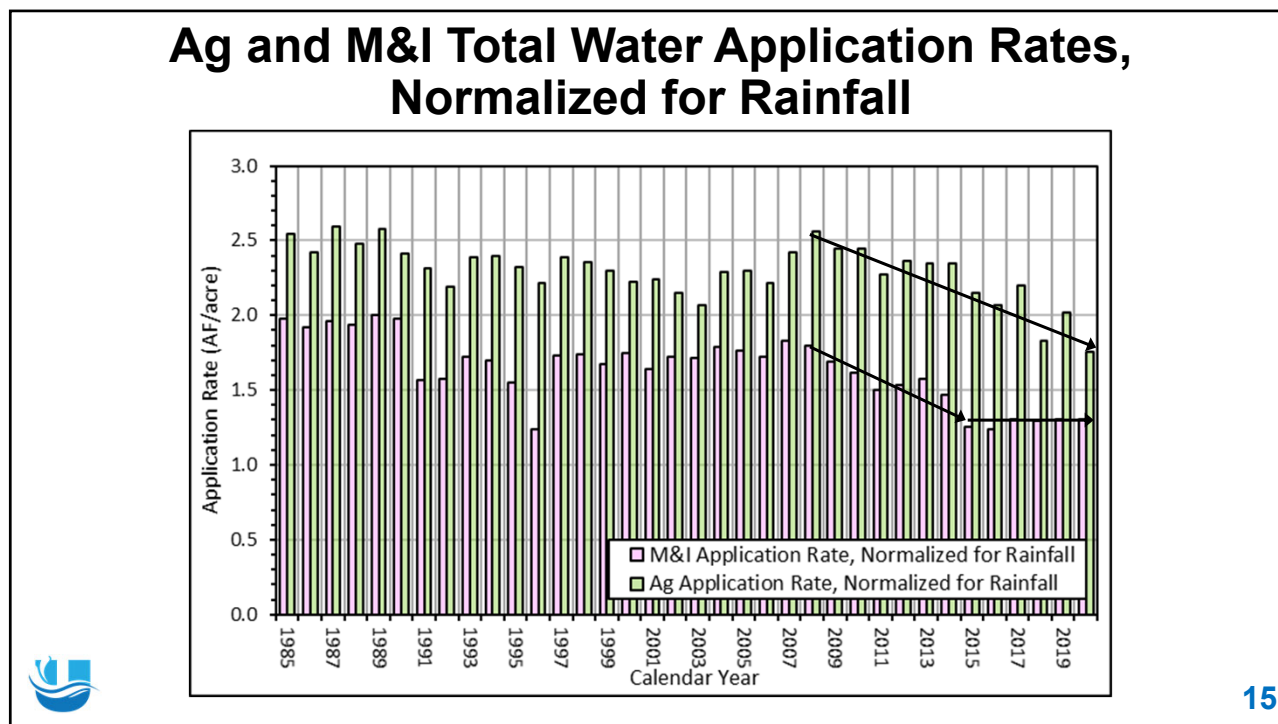


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- ## Conclusions
1. Total water use/demand in the OPV basins has declined ~25 to 30% since 2008
    - Normalized M&I use has been stable to slightly increasing since 2015
  2. Ag groundwater use increased during the 2012-16 drought
    - Current Ag groundwater use equivalent to that seen during the wettest years of the 1990s
  3. Will the declining trends in water use/application rate continue?
    - Both Ag and M&I will be subject to new conservation requirements from the State
    - Some farm operators have indicated that Ag conservation might be approaching its practical limit
      - What is the real cause of the recent downward trend in Ag application rates:  
Conservation, or temporary changes in crop rotation and scheduling?
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# Questions?

*“Data is not information,  
information is not knowledge,  
knowledge is not understanding,  
understanding is not wisdom.”*

-- Tim Berners-Lee, the inventor of the World Wide Web





# Operations of the Hardened Ramp with Mod 6 and Mod 9 designs

Presented by Murray McEachron,  
Principal Hydrologist

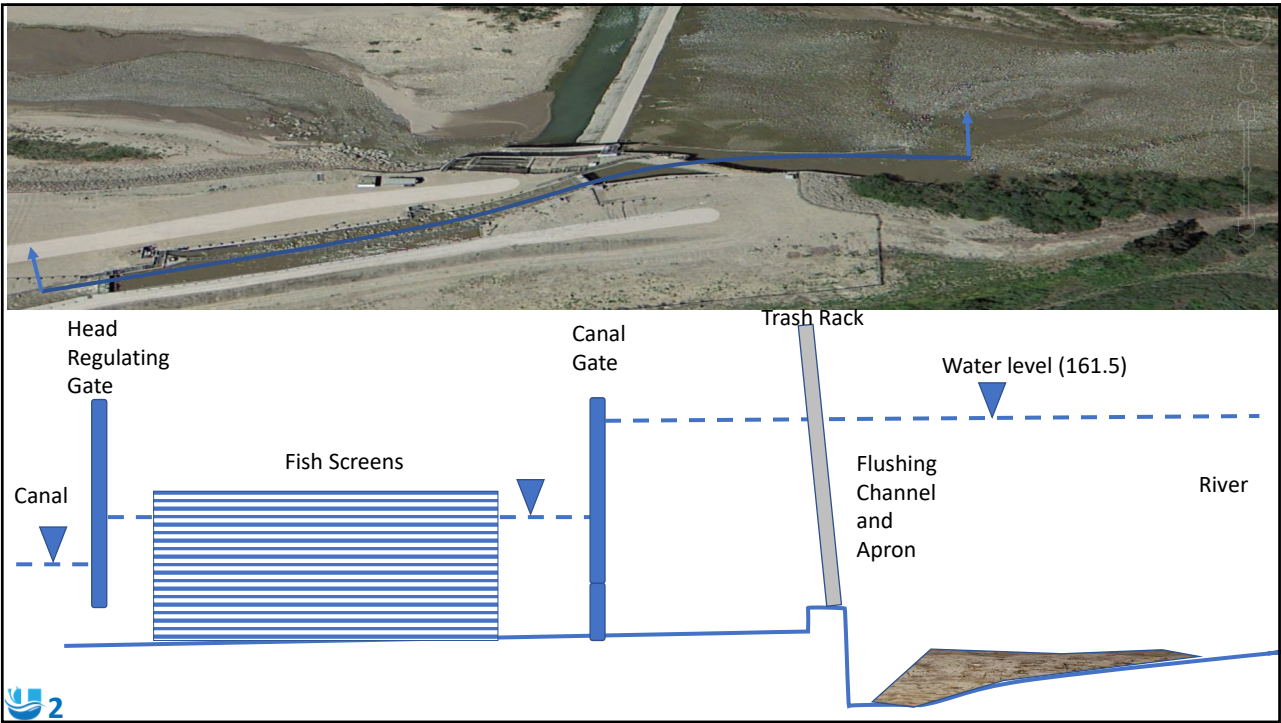
Water Resources Committee  
Meeting

October 5, 2021

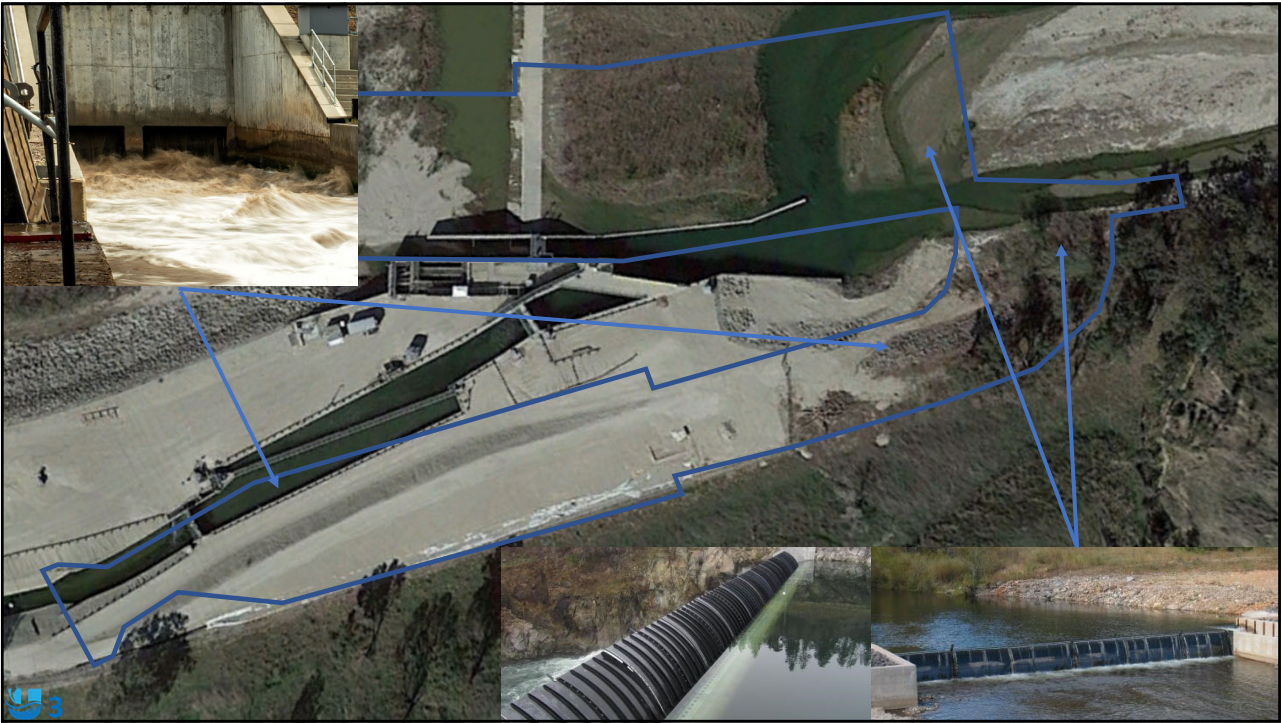




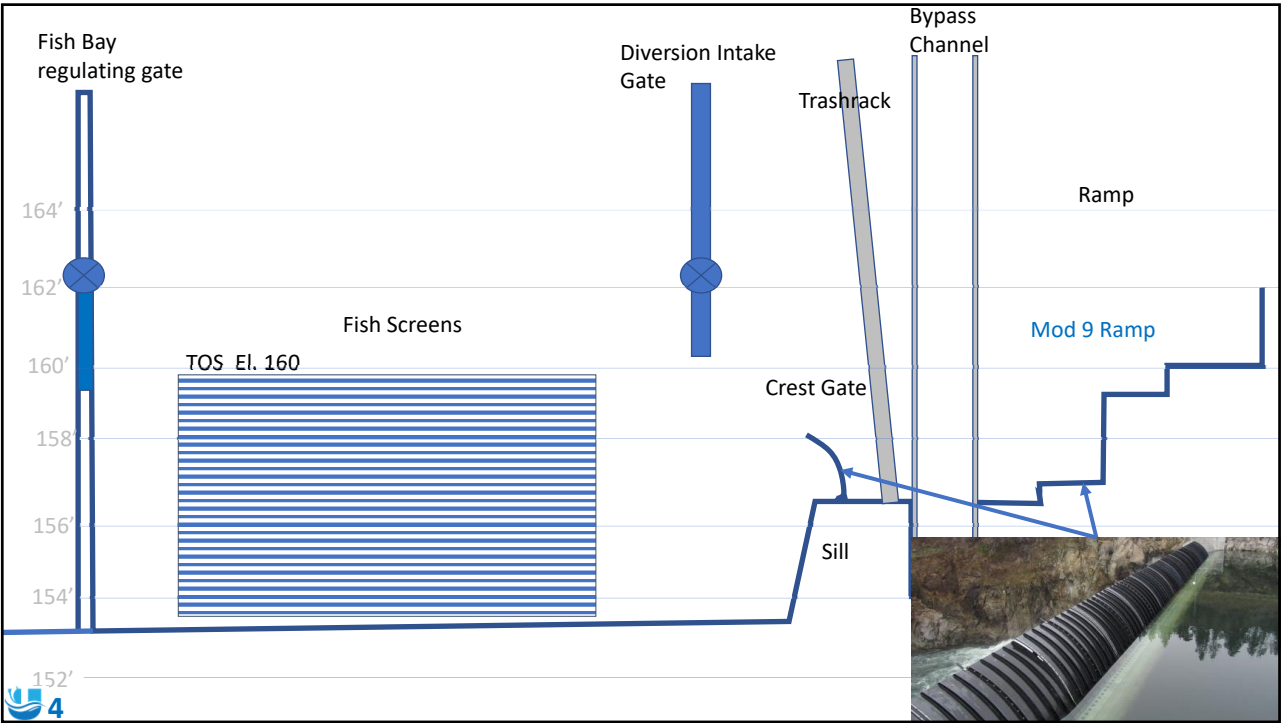
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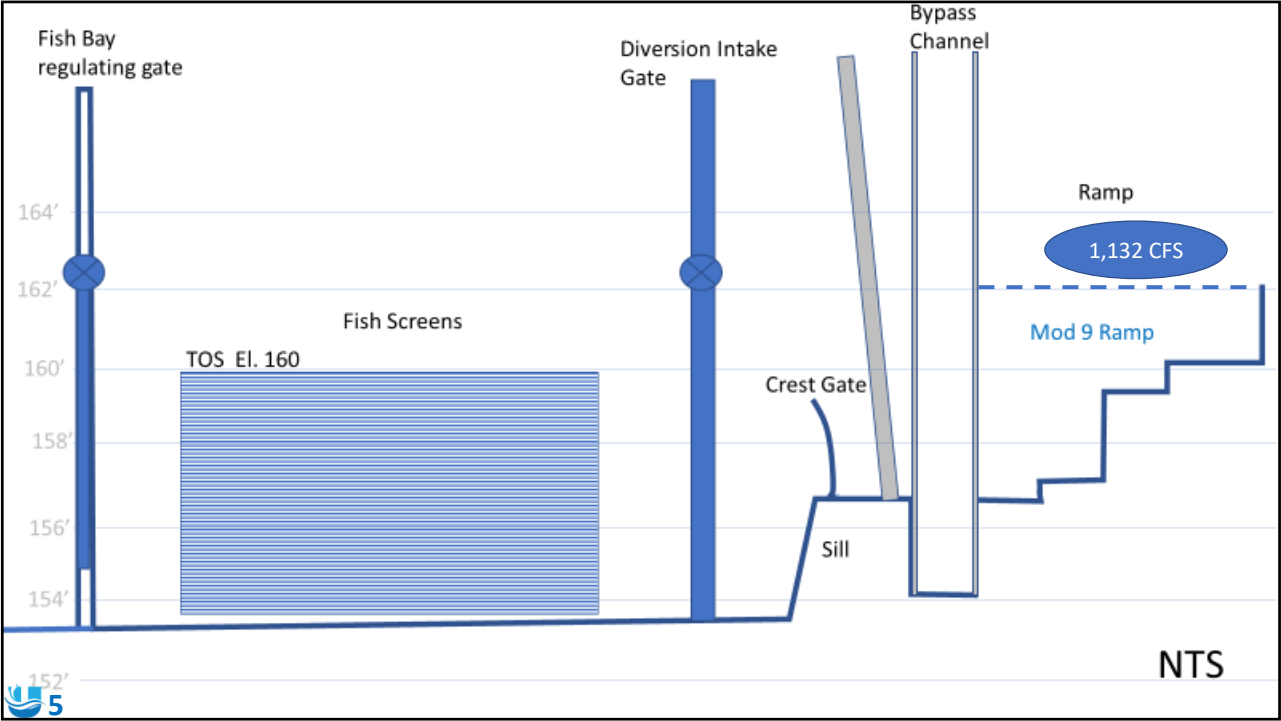


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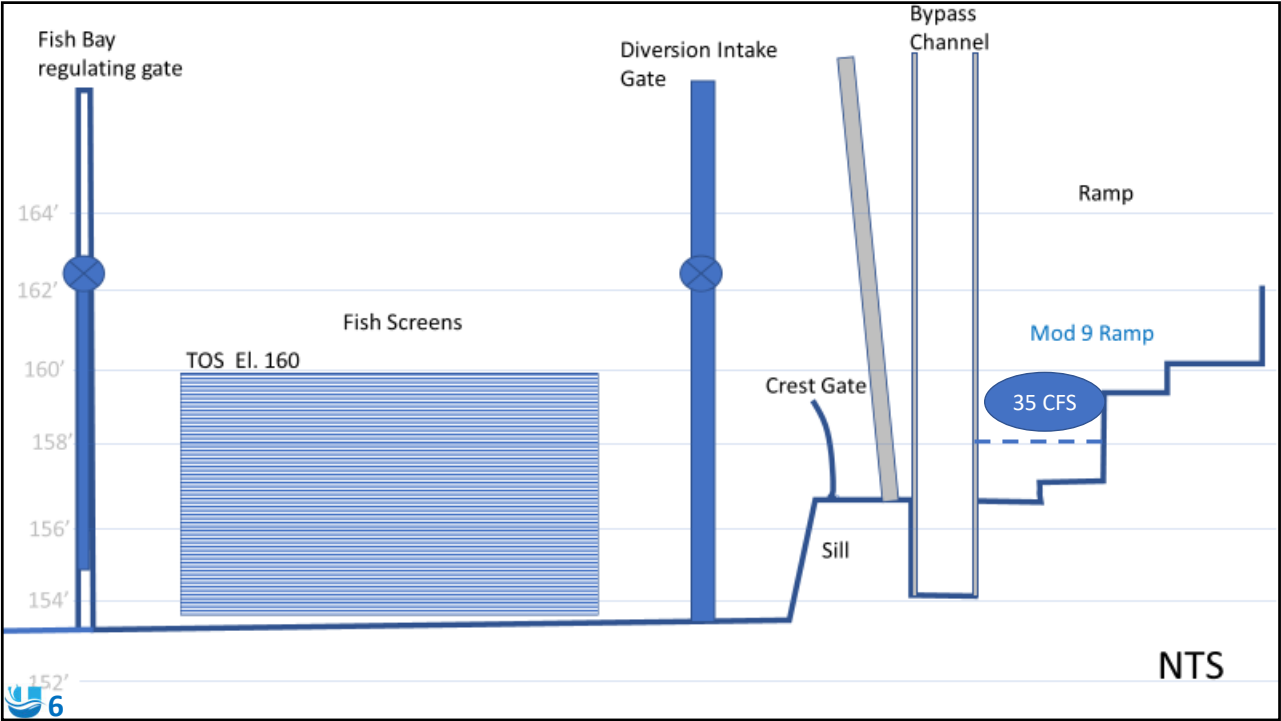


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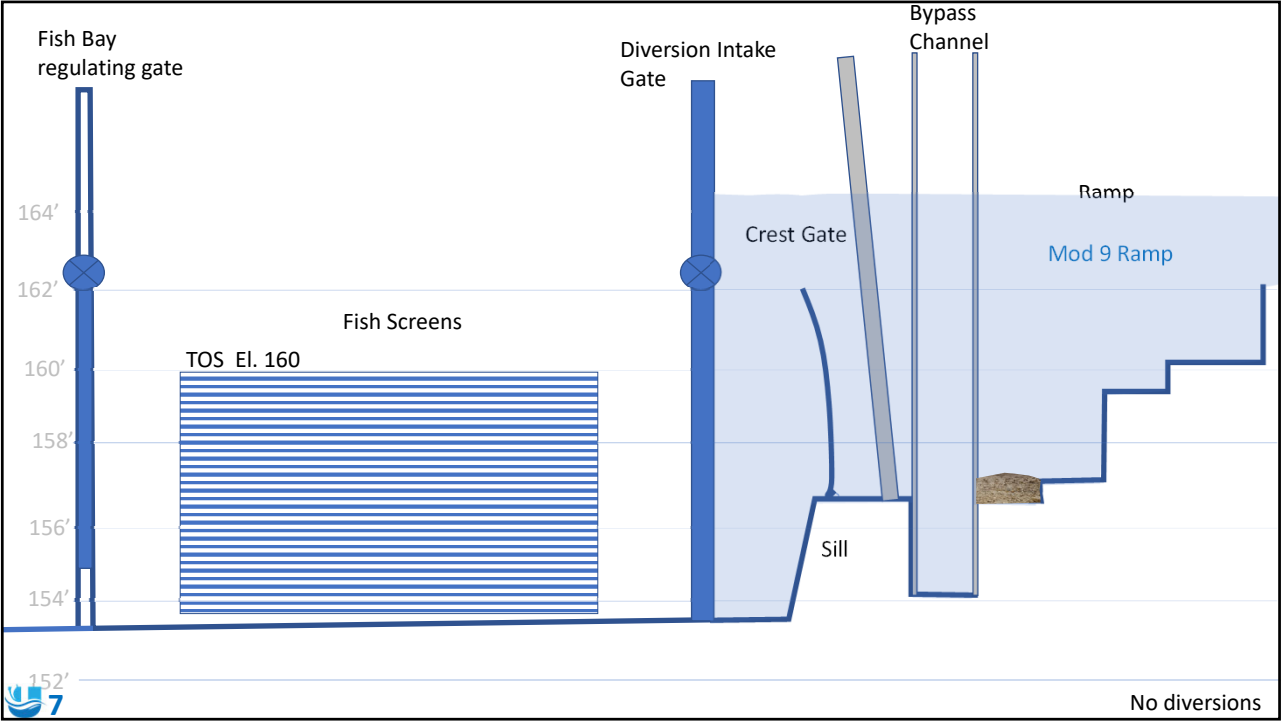




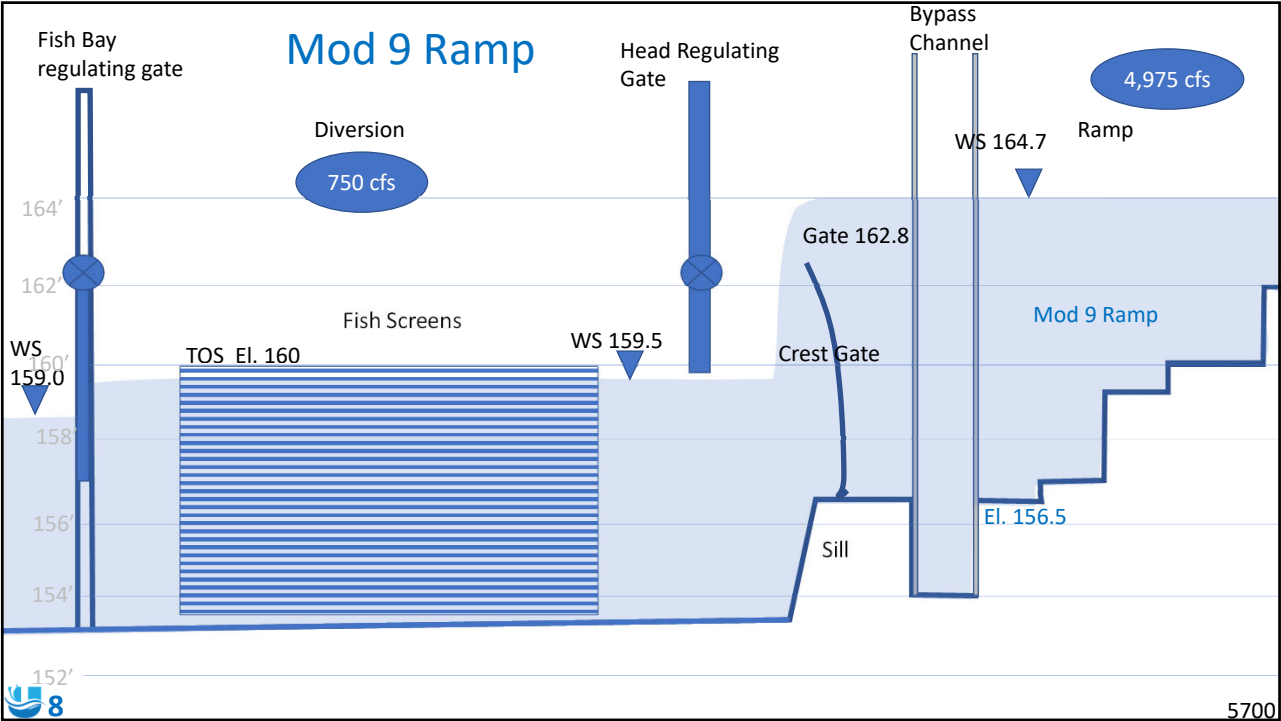
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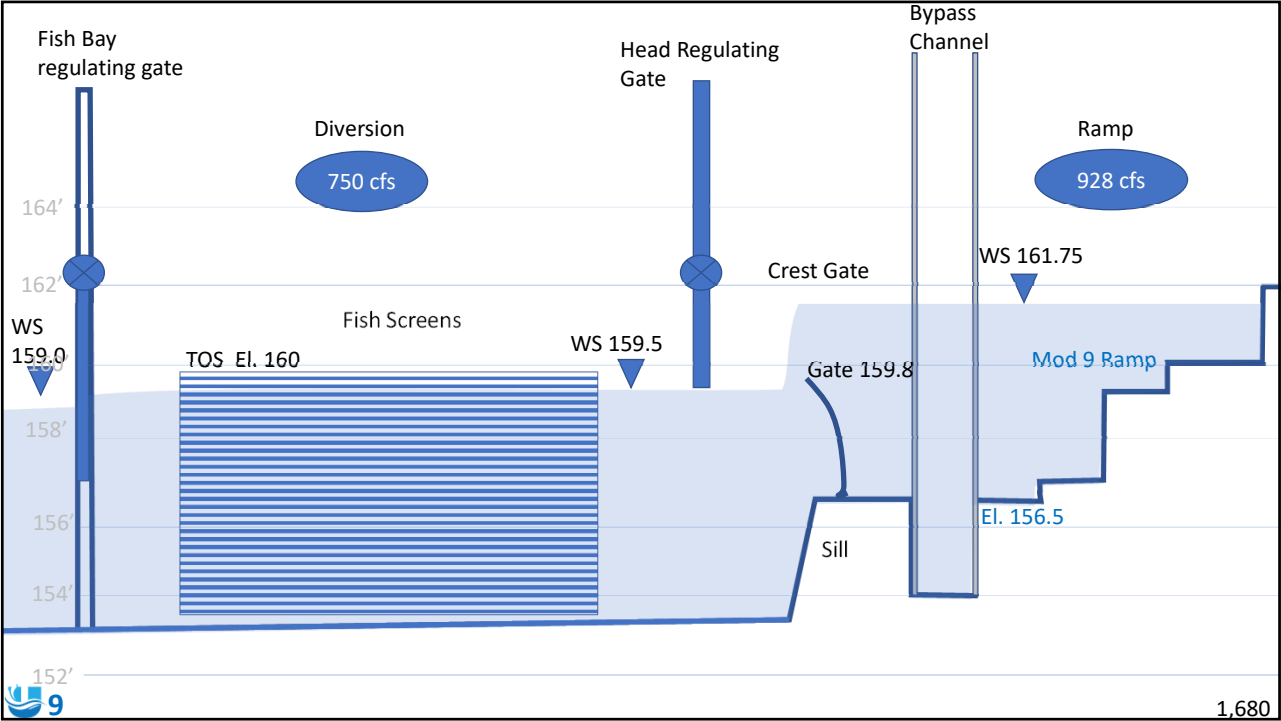


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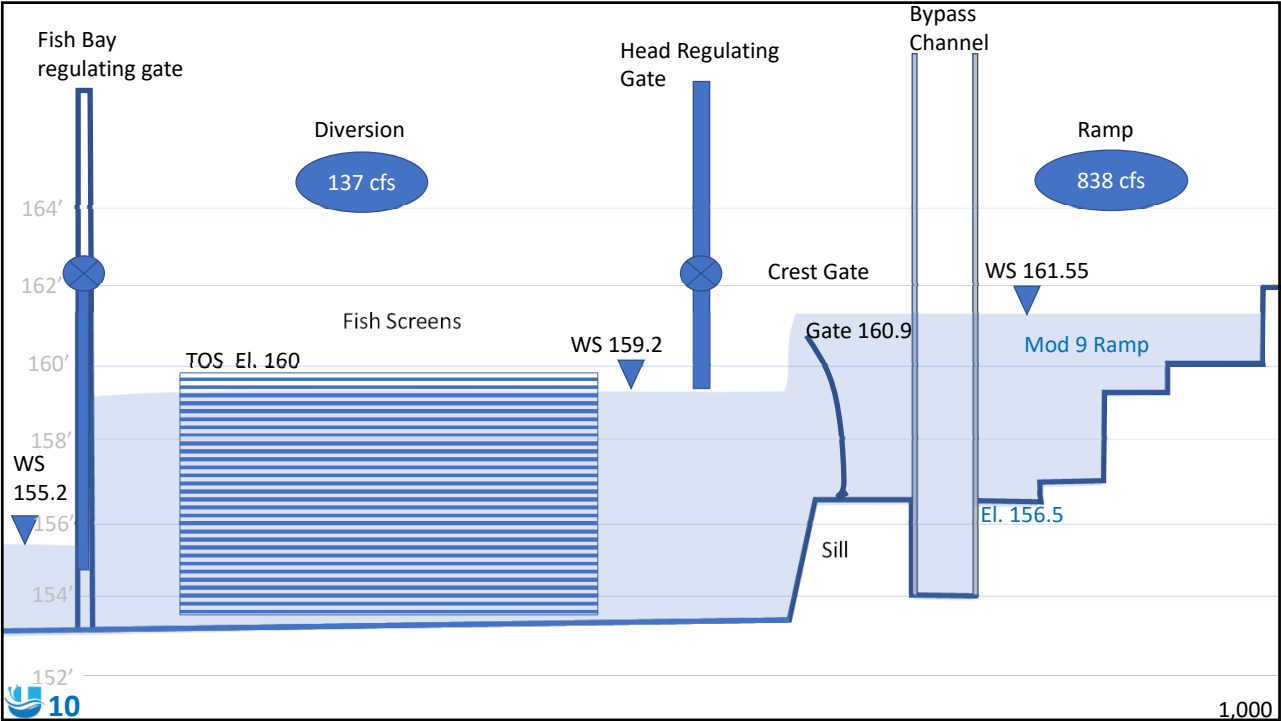


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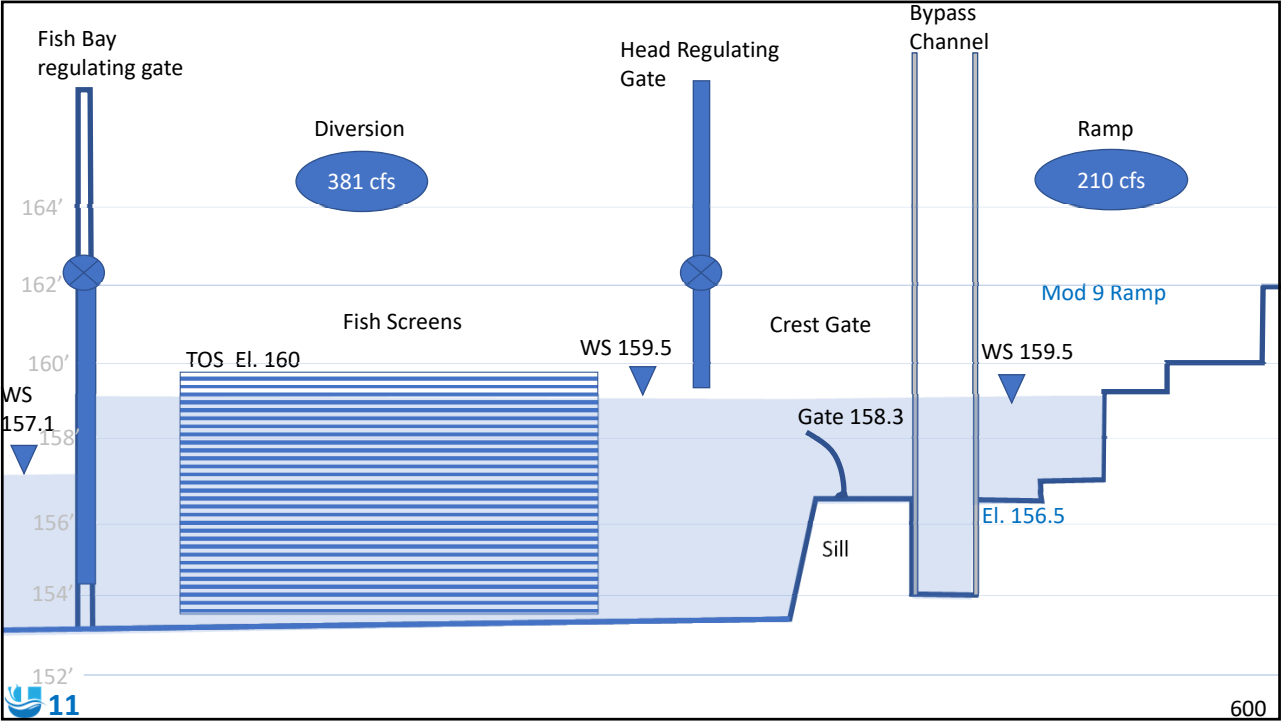




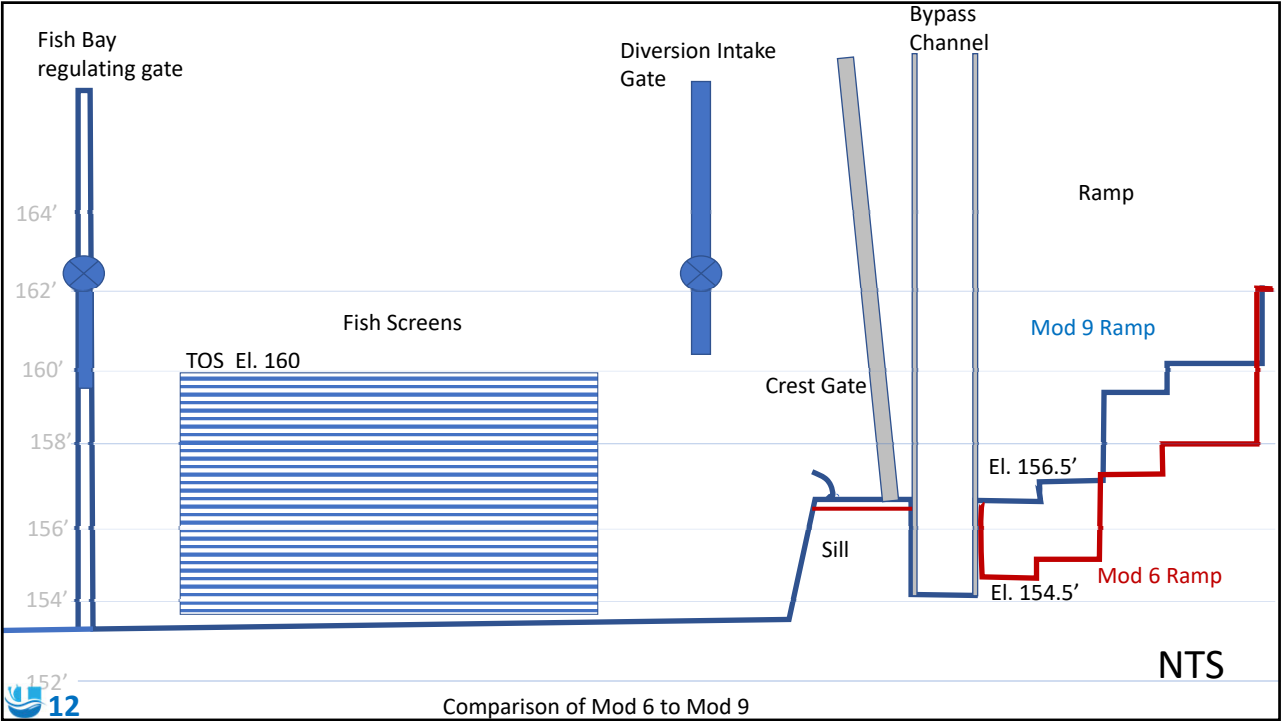
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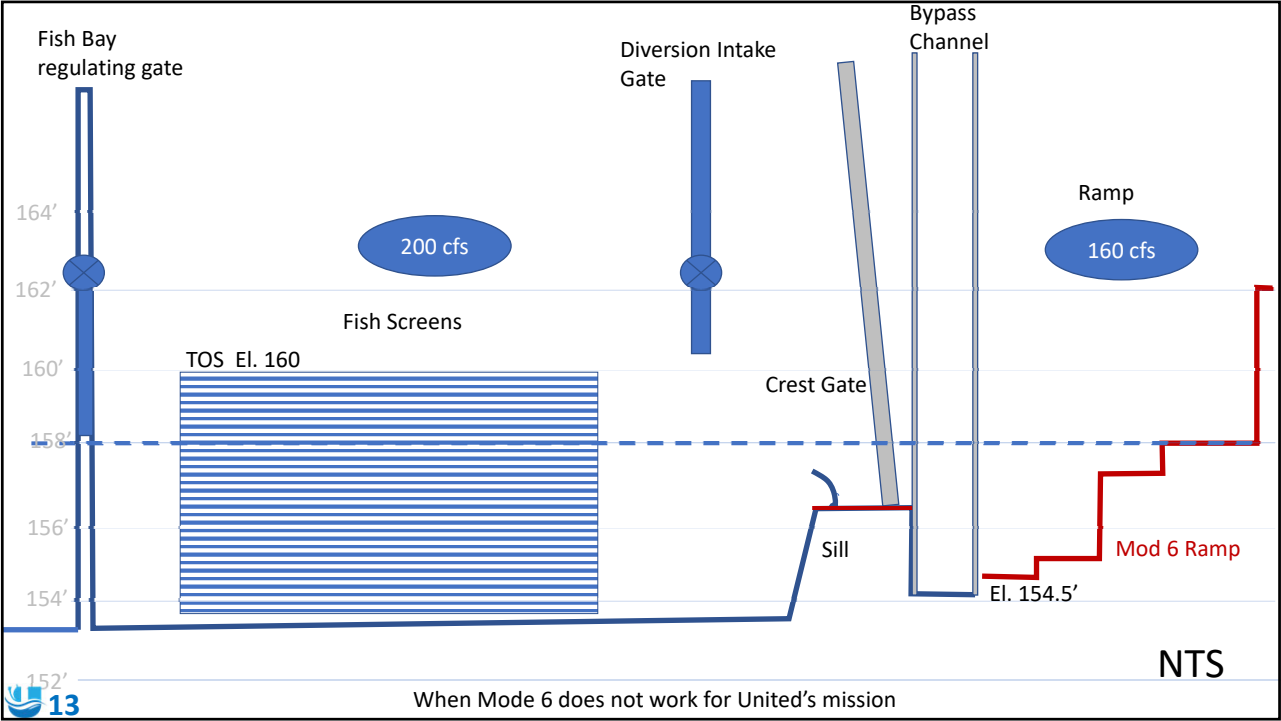
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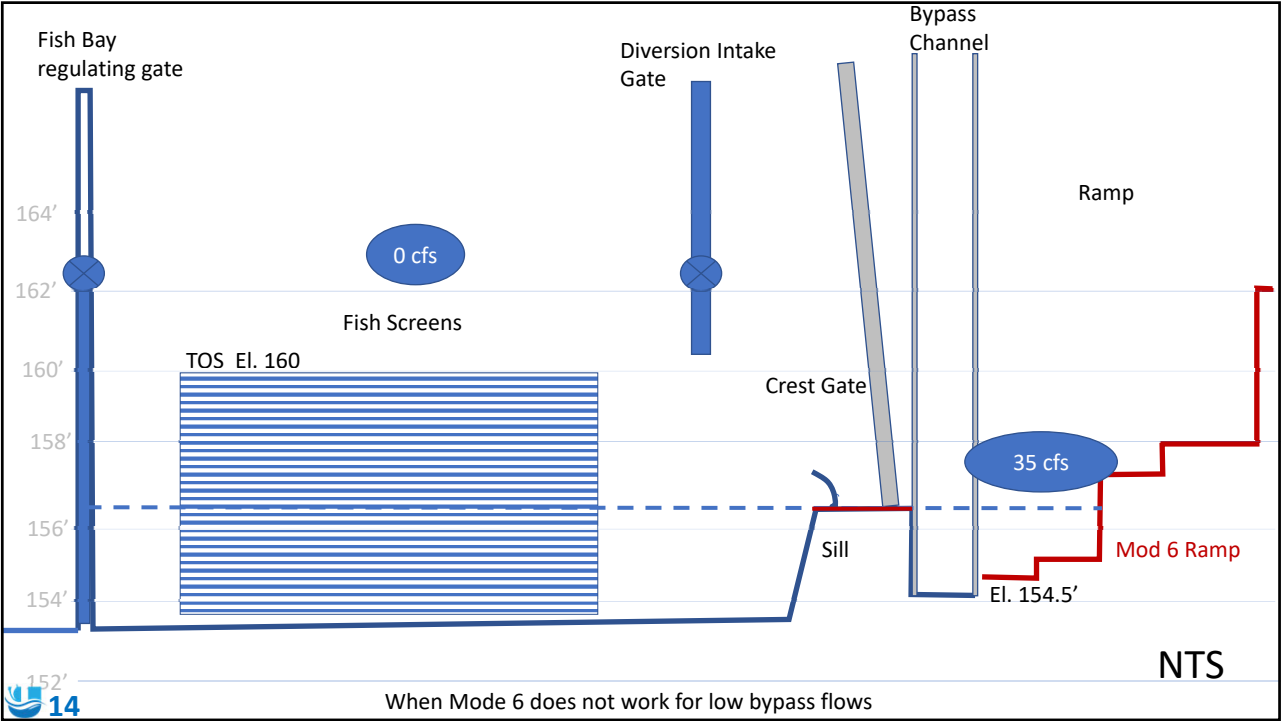
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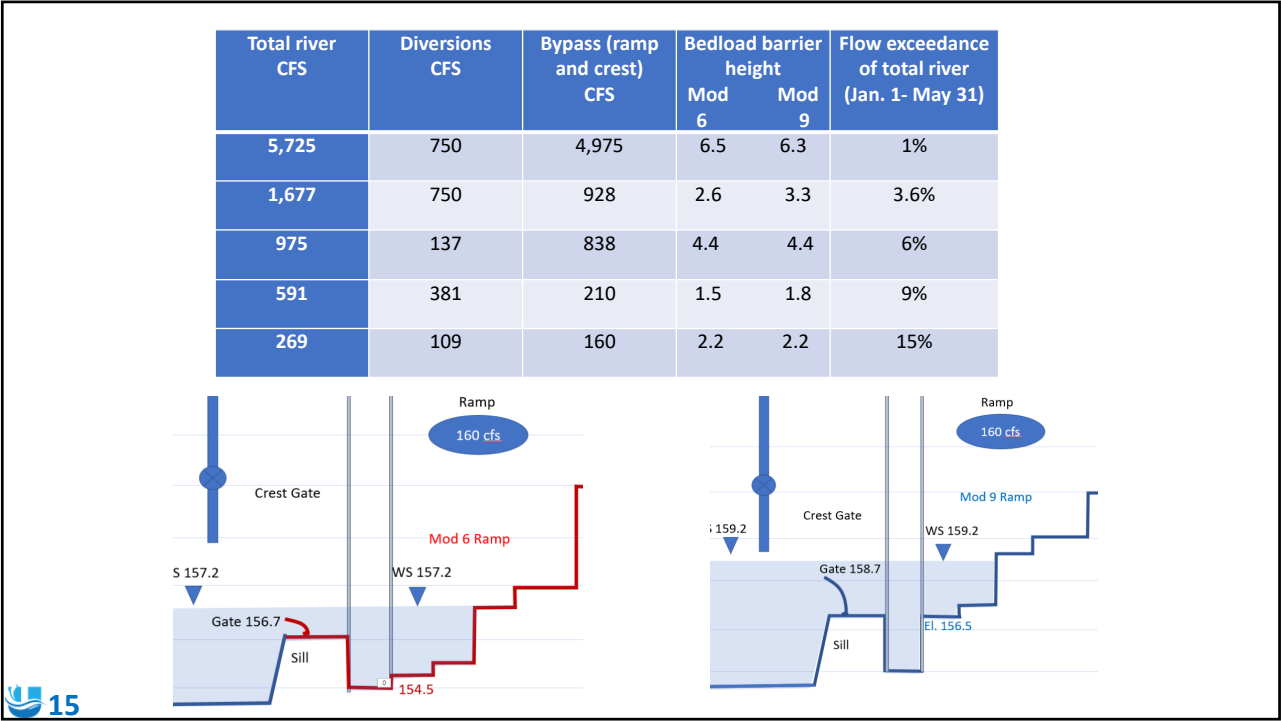
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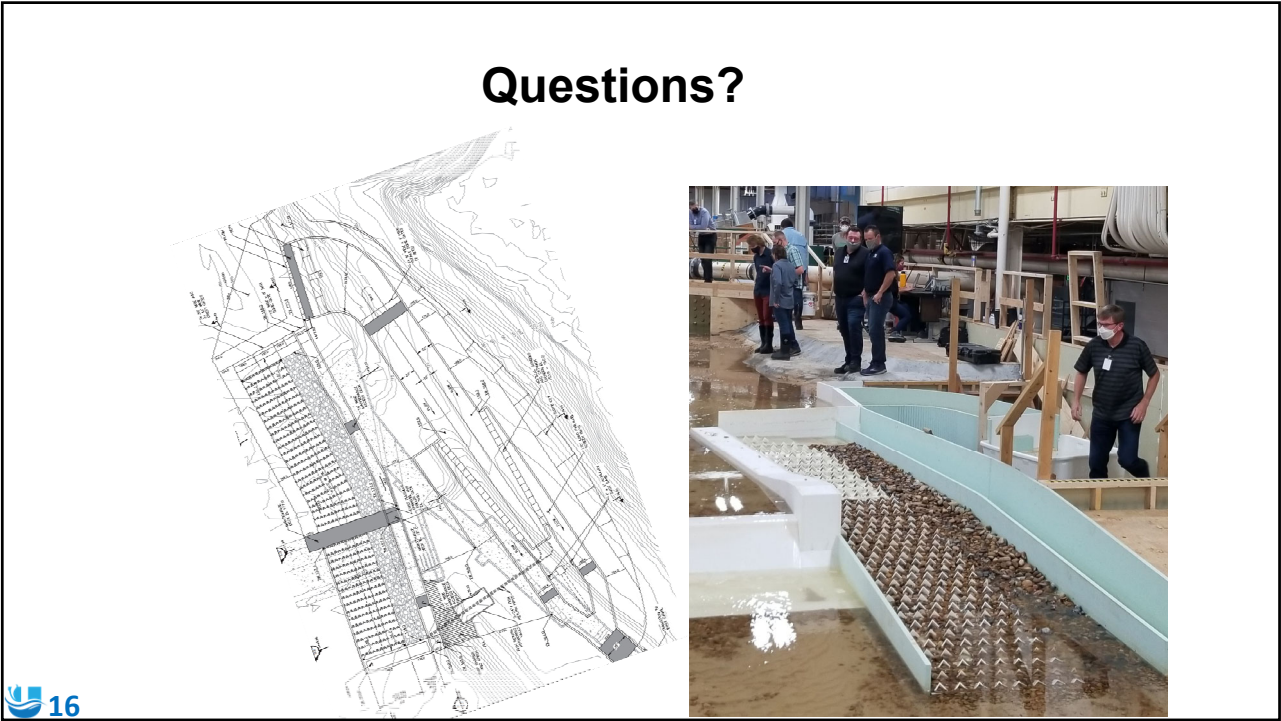
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