



Report on Salinity Management

Engineering and Operations Committee

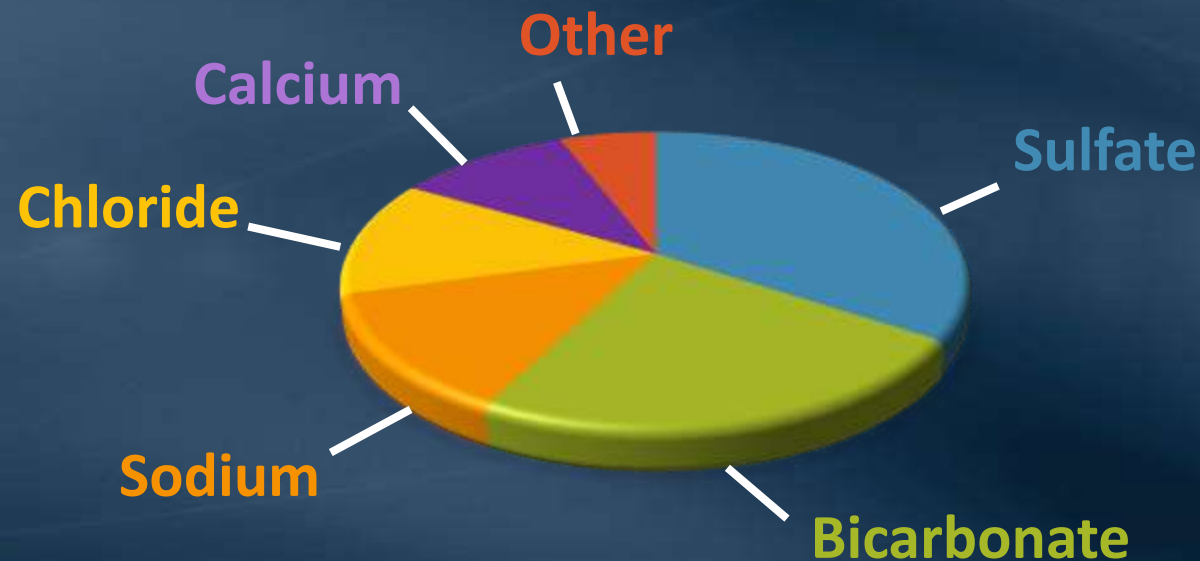
Item 6c

October 11, 2021

What is salinity?

- Measurement of salts (minerals) dissolved in water
- Commonly expressed as Total Dissolved Solids or “TDS”
- Naturally occurring, agricultural runoff, urban uses, seawater intrusion

Typical mineral comparison in Colorado River water



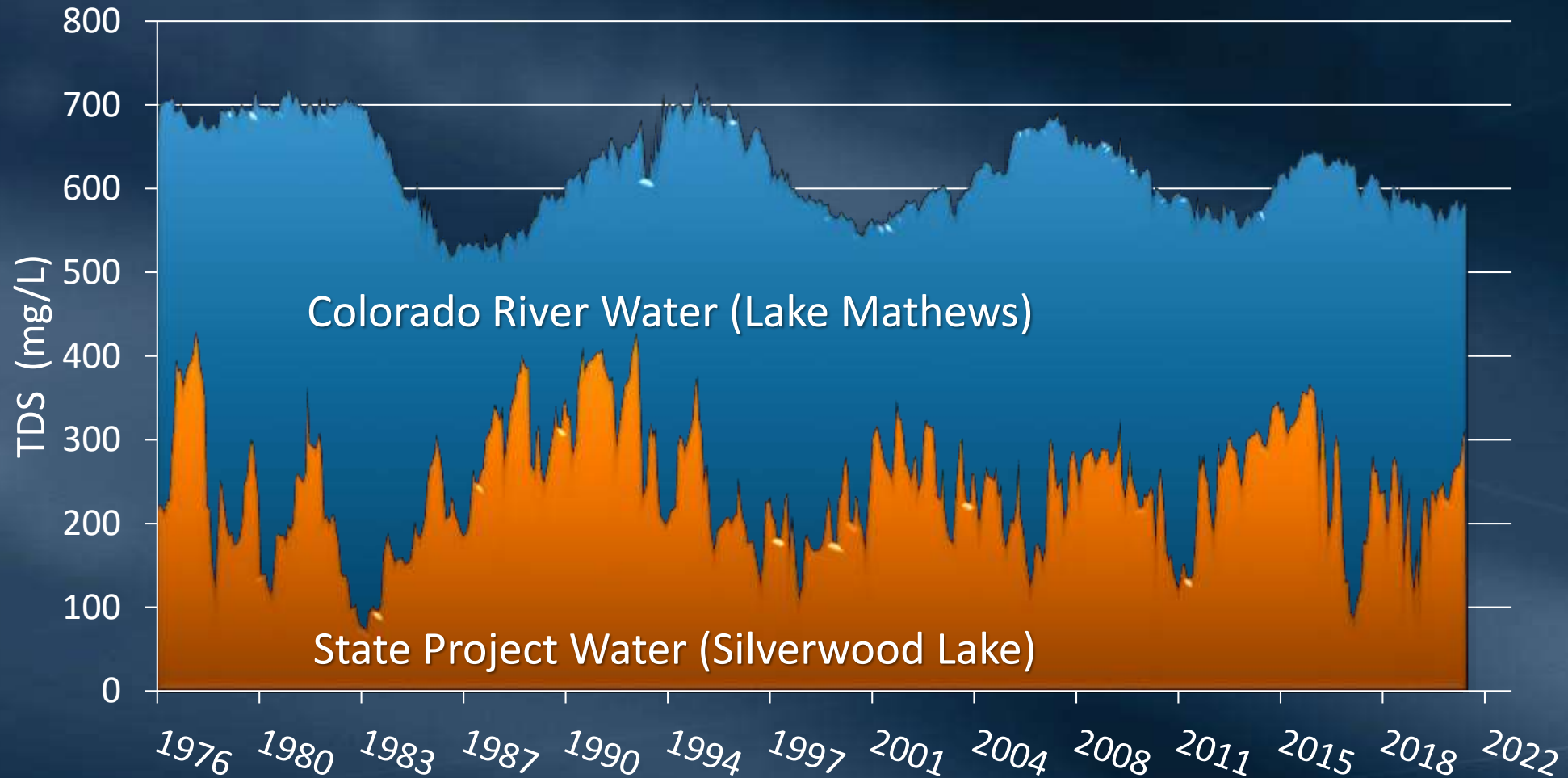
Why does salinity matter?

- Limits use of groundwater basins for storage
- Lowers usefulness and increases cost of recycled water
- Scaling of household appliances and plumbing fixtures; impacts industrial processes
- Reduces agricultural crop yields
- Imparts unpleasant taste in drinking water



Salinity in Metropolitan Supplies

Historical Trends



Colorado River Basin Salinity

Naturally
Occurring
(47%)

Human-
caused
(53%)

Est. Range of Salinity
Concentrations (mg/L)



Nearly 9 million tons of salt
pass Hoover Dam annually

Based on USBR figure using 2014-2018 salinity and flow data

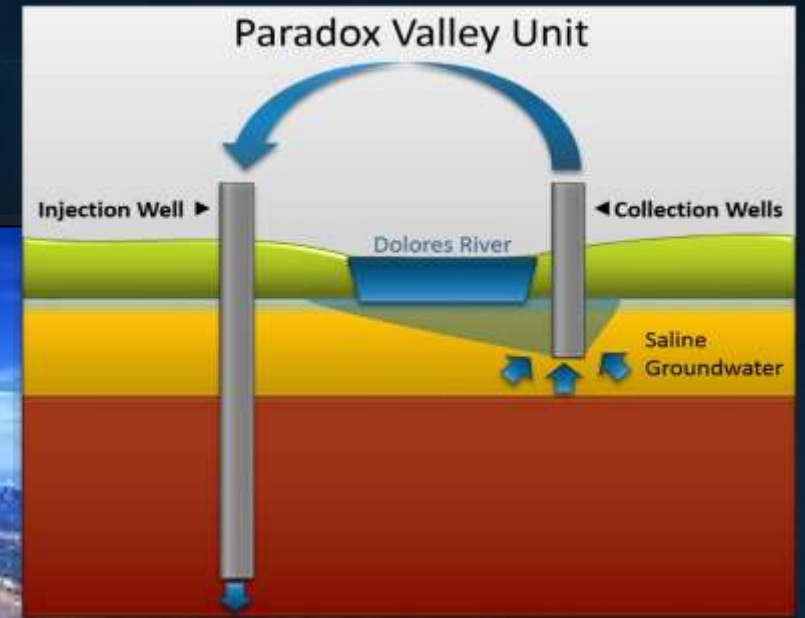
Colorado River Basin Salinity Control Program

- Salinity Control Forum (1973); federal government and Basin states
- Salinity control measures
 - Improved irrigation practices
 - Rangeland management
 - Deep-well brine injection
- 1.2 million tons/year removed → 100 mg/L reduction
- ~\$40 million spent annually; 70% federally funded
- Current challenges: Paradox Valley; Funding



Paradox Valley Salinity Control

Deep Well Injections



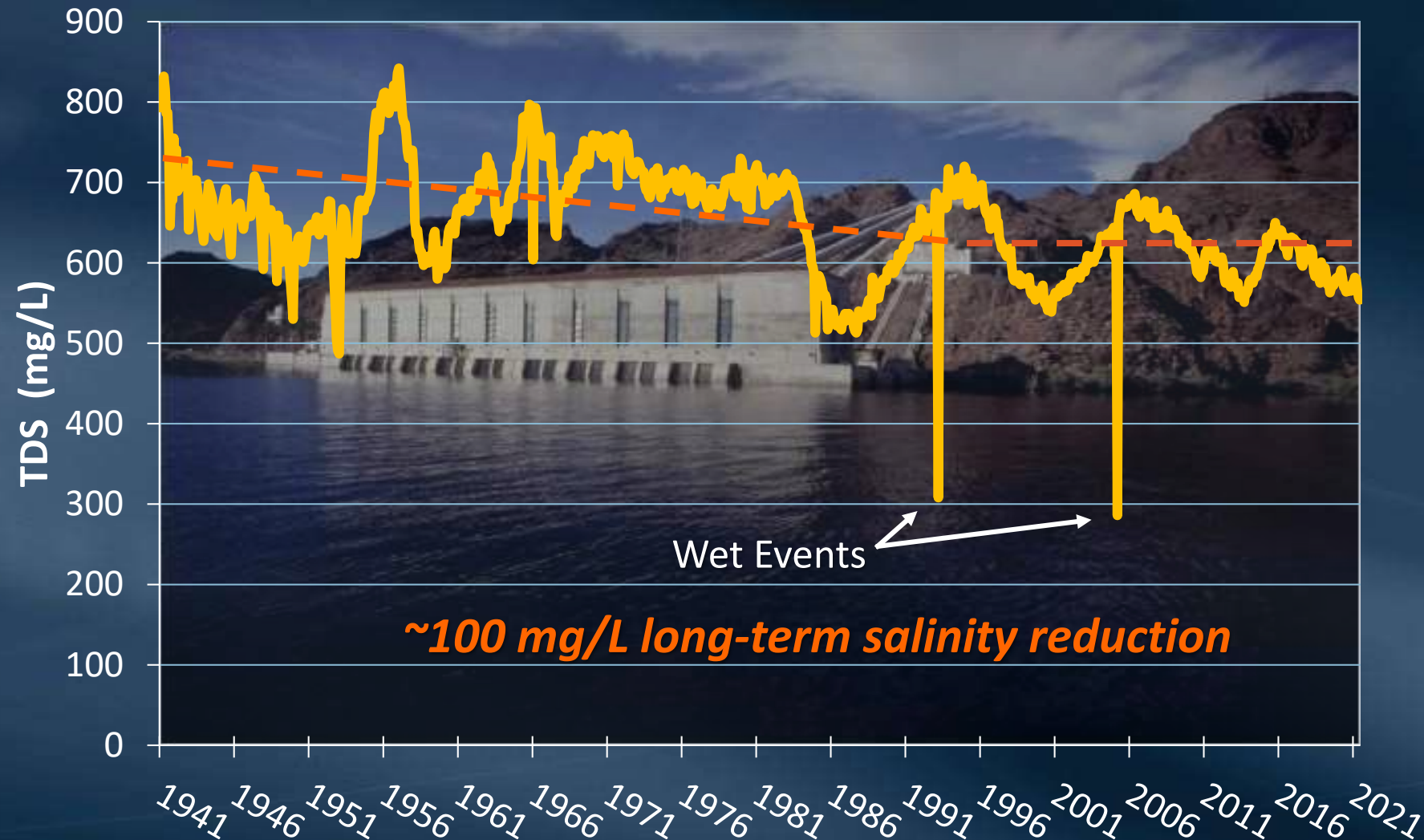
Paradox Valley Salinity Control Status

- Well hasn't operated since 4.1 magnitude earthquake in March 2019
- Reclamation analyzing injection and seismic data to optimize operations
- Final EIS analyzed replacement options – new injection well, evaporation ponds, zero liquid discharge, and **no action**
- Lake Powell and Lake Mead provide significant buffers



Colorado River Historical Salinity

Whitsett Intake



State Water Project

Primary Salinity Sources



Statewide Salinity Management Efforts

- Delta-State Water Project
 - Delta Cross Channel Gate
 - Emergency Drought Salinity Barrier
 - Salinity forecasts
- Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS) Initiative
- Salt and Nutrient Management Plans

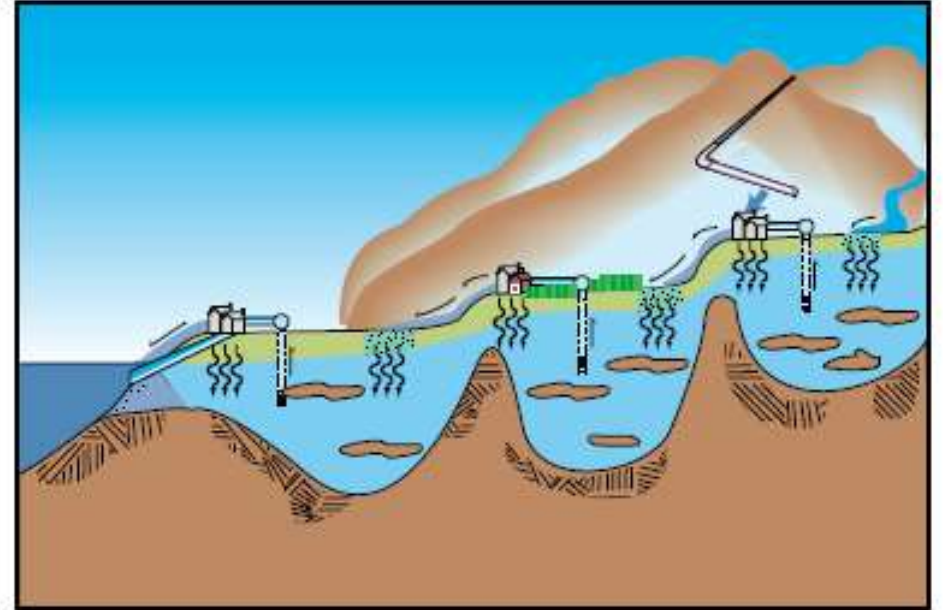


2021 Emergency Rock Barrier
Sacramento-San Joaquin Delta

Salinity Management Study

- Study estimated \$95 million/yr economic benefit with 100 mg/L salinity reduction (1999 dollars)
- Metropolitan Board adopted 500 mg/L TDS objective, annual average
 - System Blending
 - Dependent on availability of sufficient SWP water
- Protect imported source water
- Support groundwater and recycled water resources

SALINITY MANAGEMENT STUDY Final Report



MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA



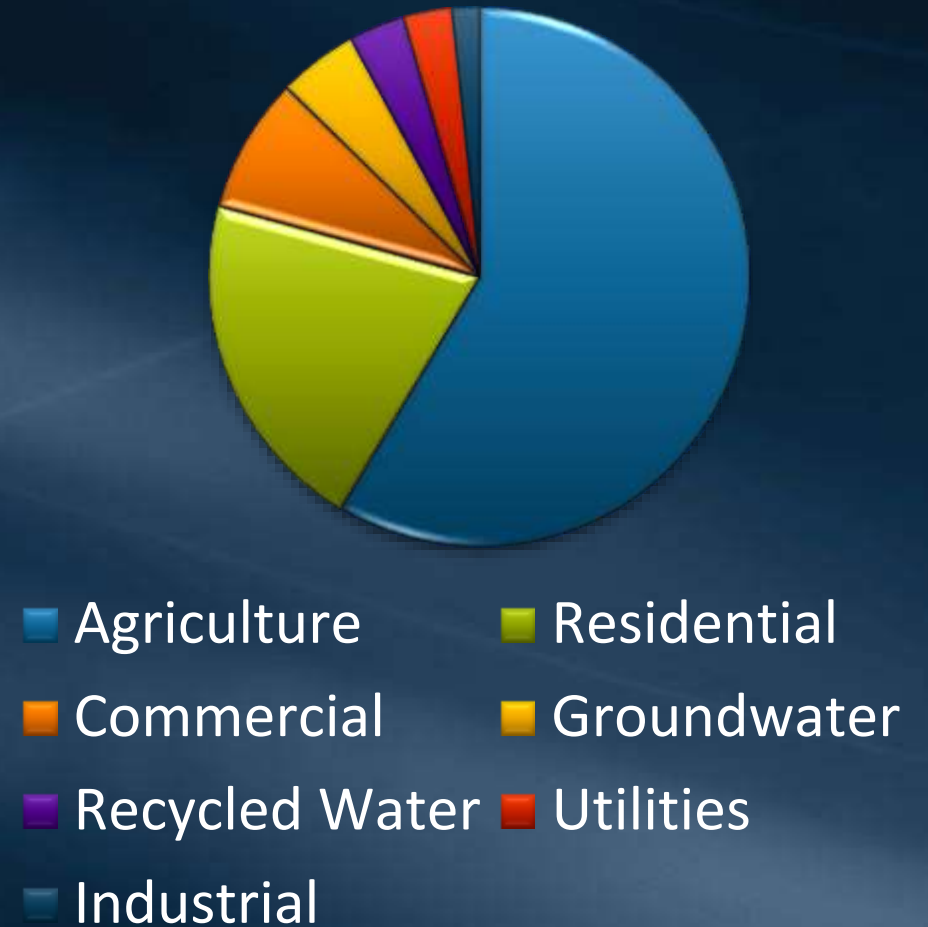
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

June 1999

Salinity Economic Impact Model

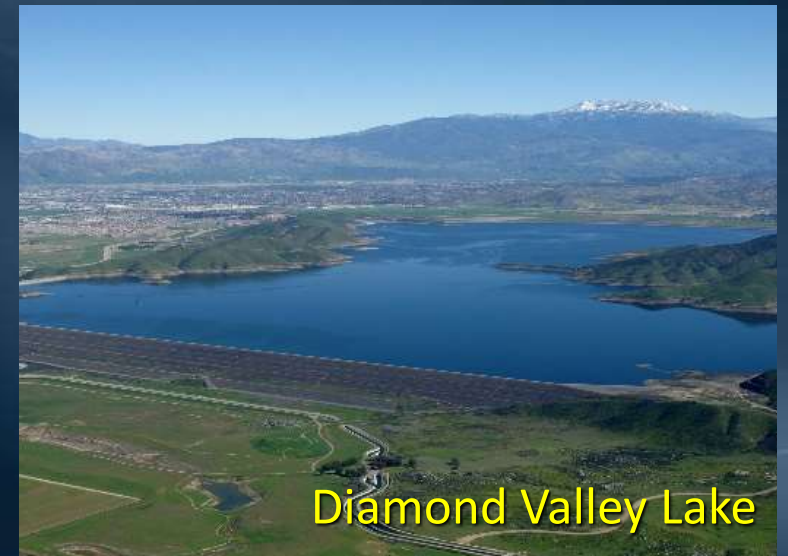
- Developed by USBR and Metropolitan; updated in 2020
- Quantifies economic impacts of salinity
 - Reduced appliance/ plumbing fixtures useful life
 - Reduced crop yields
 - Groundwater & Recycling impacts
- \$500 million/yr damages to lower Colorado River Basin (2035 projection)

Impact Sectors

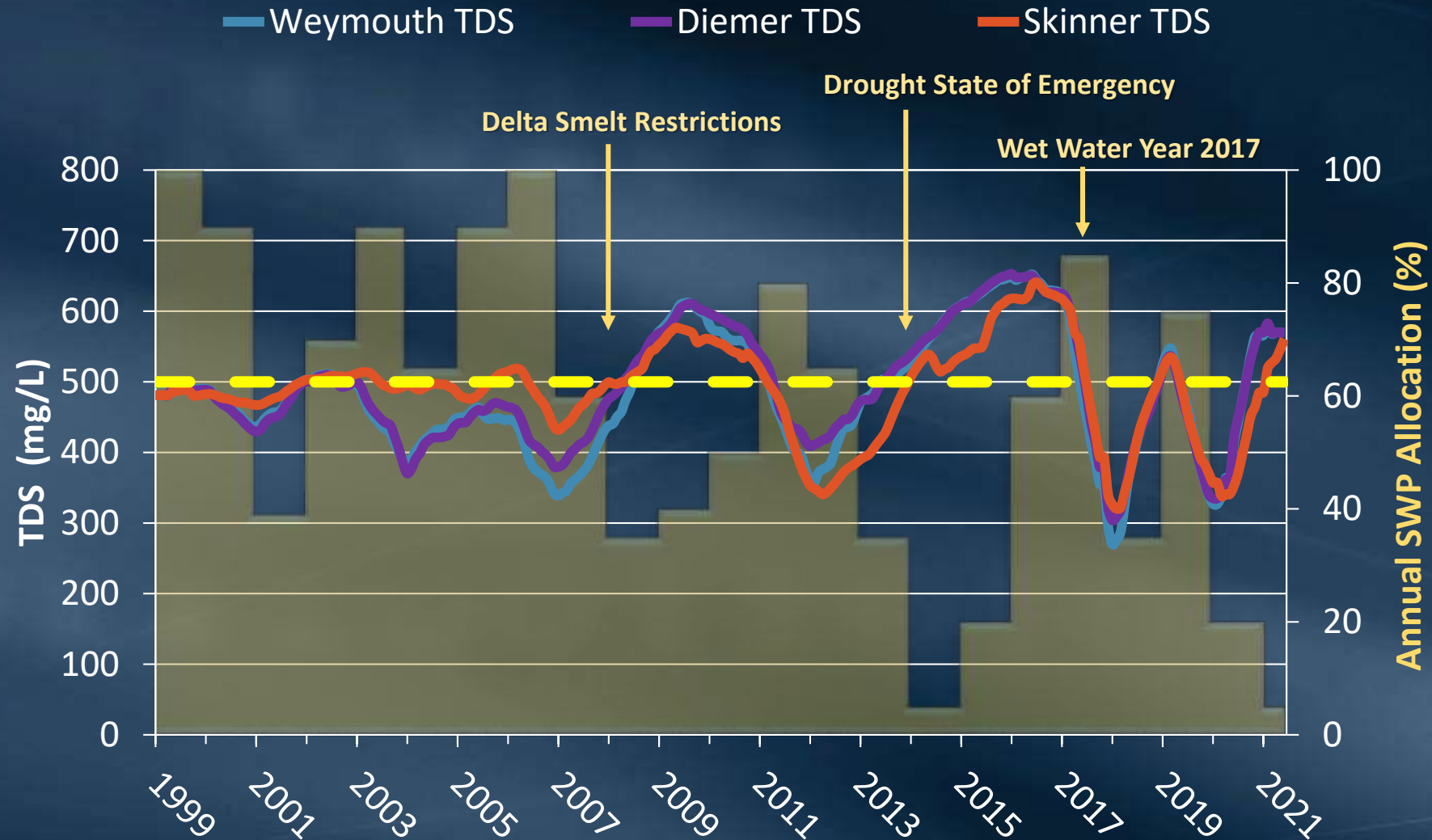


Efforts to Meet Salinity Goal

- Transfer and Exchange Programs
- Local Storage
 - Inland Feeder/ Diamond Valley Lake
- Operating Principles
 - Meet water quality requirements and salinity objectives



TDS Trends at Blend Plants



Moving Forward

- Work with Reclamation to find a long-term replacement for the Paradox Well and develop a sustainable funding plan for the Salinity Control Program
- Invest in reliable Delta water supplies
- Manage system to meet salinity management policy objectives
- Collaborate with stakeholders on regional approaches
 - Southern California Salinity Coalition
 - Future Supply Actions Funding Program
 - Participate in other state and national programs

