



— BUREAU OF —
RECLAMATION

Sponsor Presentation

National Academies Review of the Long-Term Operation
of the Central Valley Project and State Water Project

January 30, 2024



Interior Region 10, California Great Basin, Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.



Central Valley Project Purposes

- Flood Control
- River Regulation (Navigation)
- Fish and Wildlife*
- Water Supply
- Power Generation
- Recreation

*Prioritized in 1992 by the Central Valley Project Improvement Act



Problem Statement

- Species aren't doing well
- Water deliveries and power generation aren't doing well
- Climate change isn't going well

Where should Reclamation make investments in science to inform the advancement of our environmental, water, and power purposes?



Performance of Project Purposes

Water

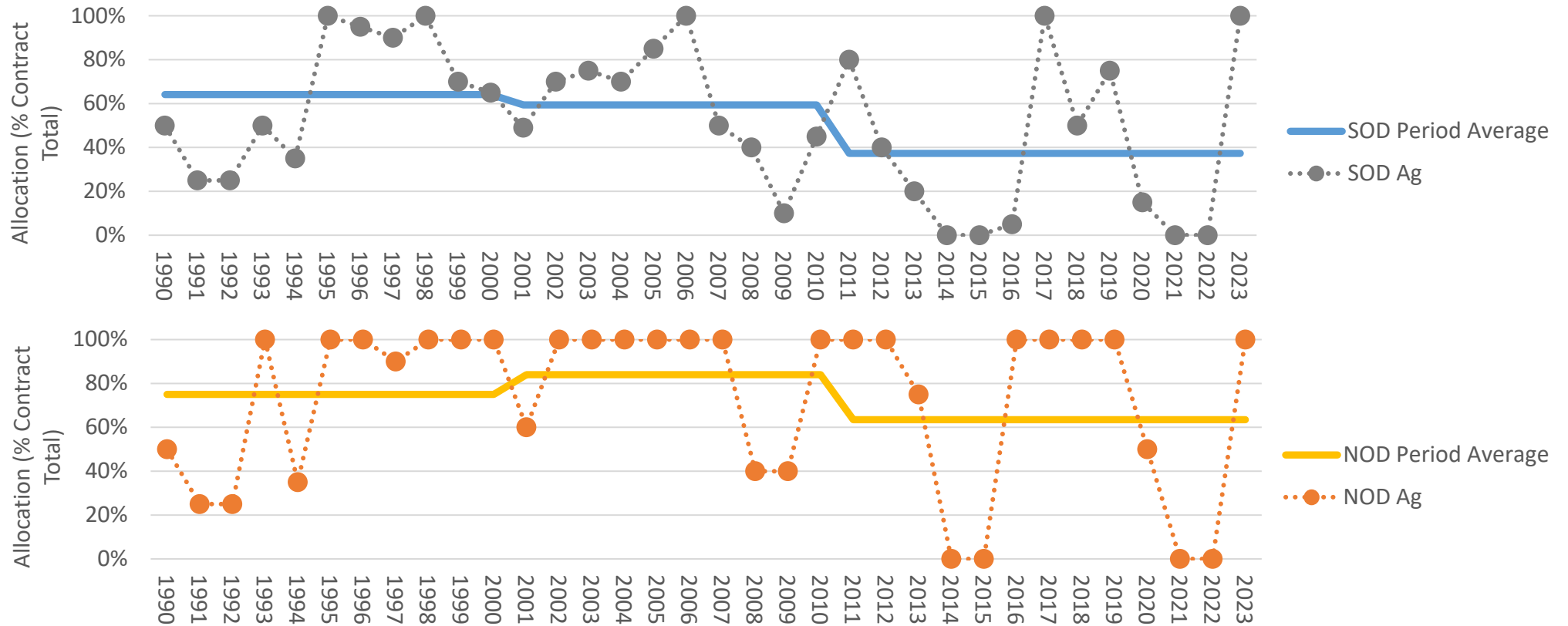
Power

Ecosystem

Dollars

Labor

Delays



https://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf



Performance of Project Purposes

Water

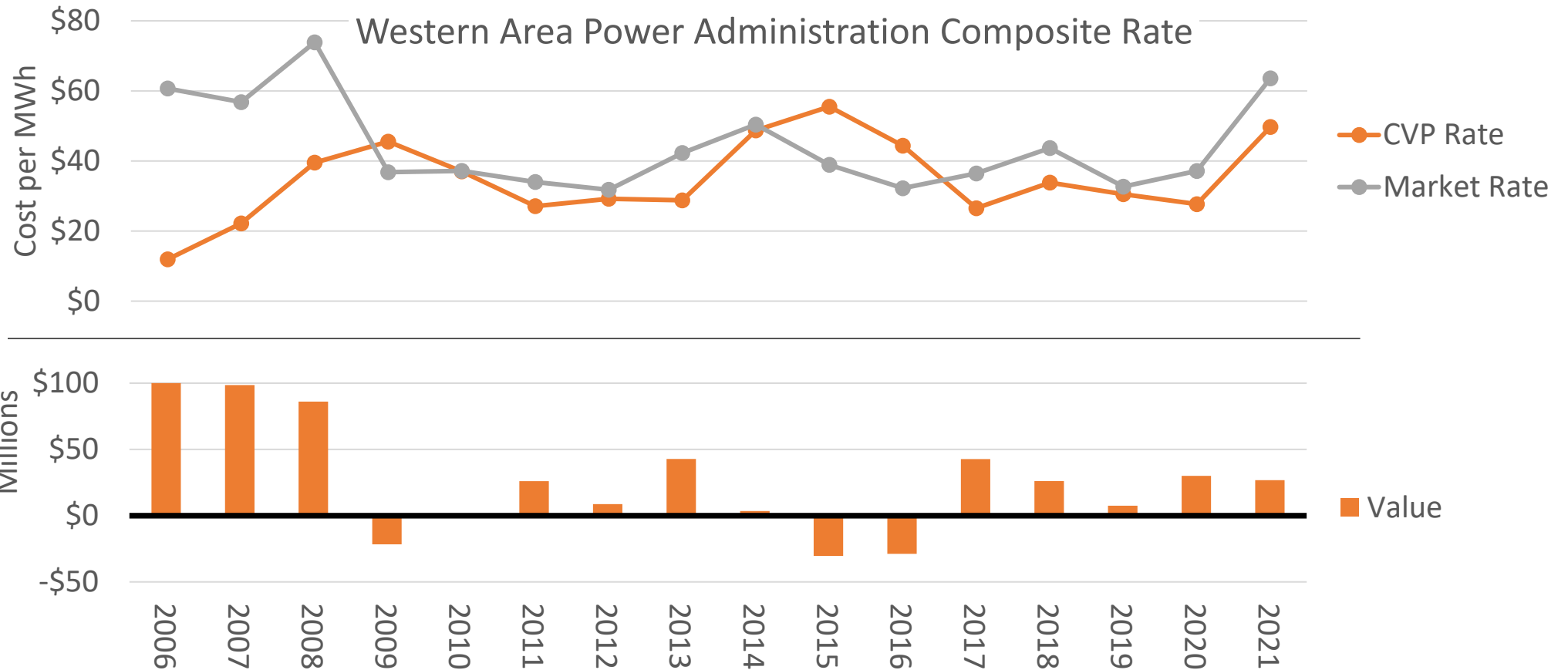
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<https://www.wapa.gov/regions/SN/rates/Documents/fy21-stacked-chart.pdf>



Performance of Project Purposes

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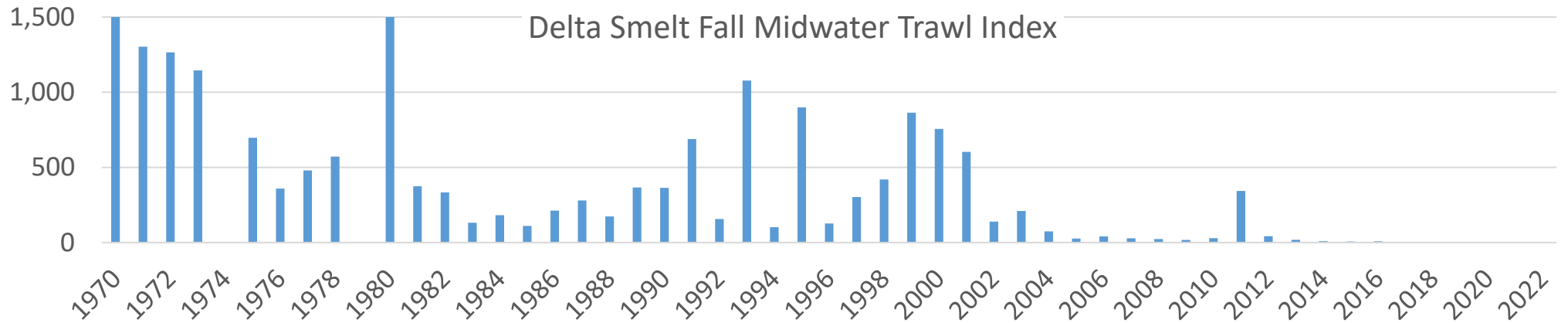
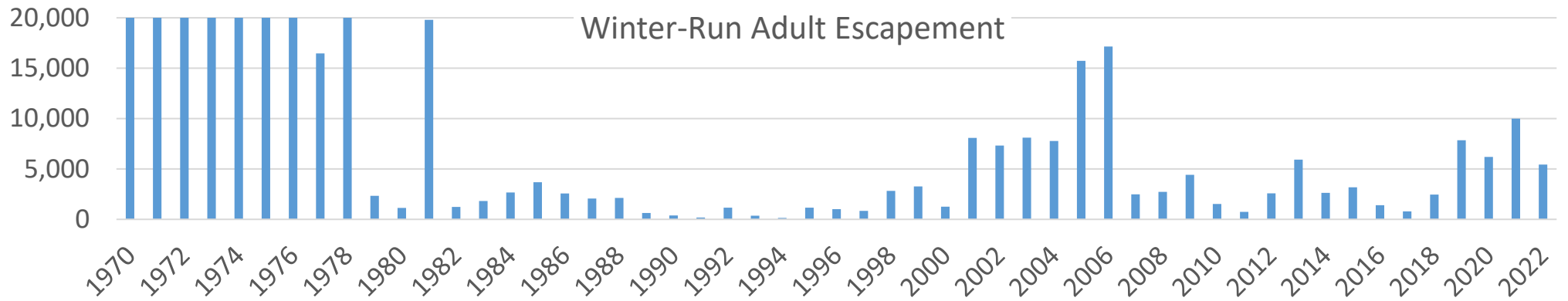
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Winter-Run GrandTab: www.cbr.washington.edu/sacramento/data/query_adult_grandtab.html

Delta Smelt FMWT: <https://apps.wildlife.ca.gov/FMWT>



Performance of Project Purposes

Water

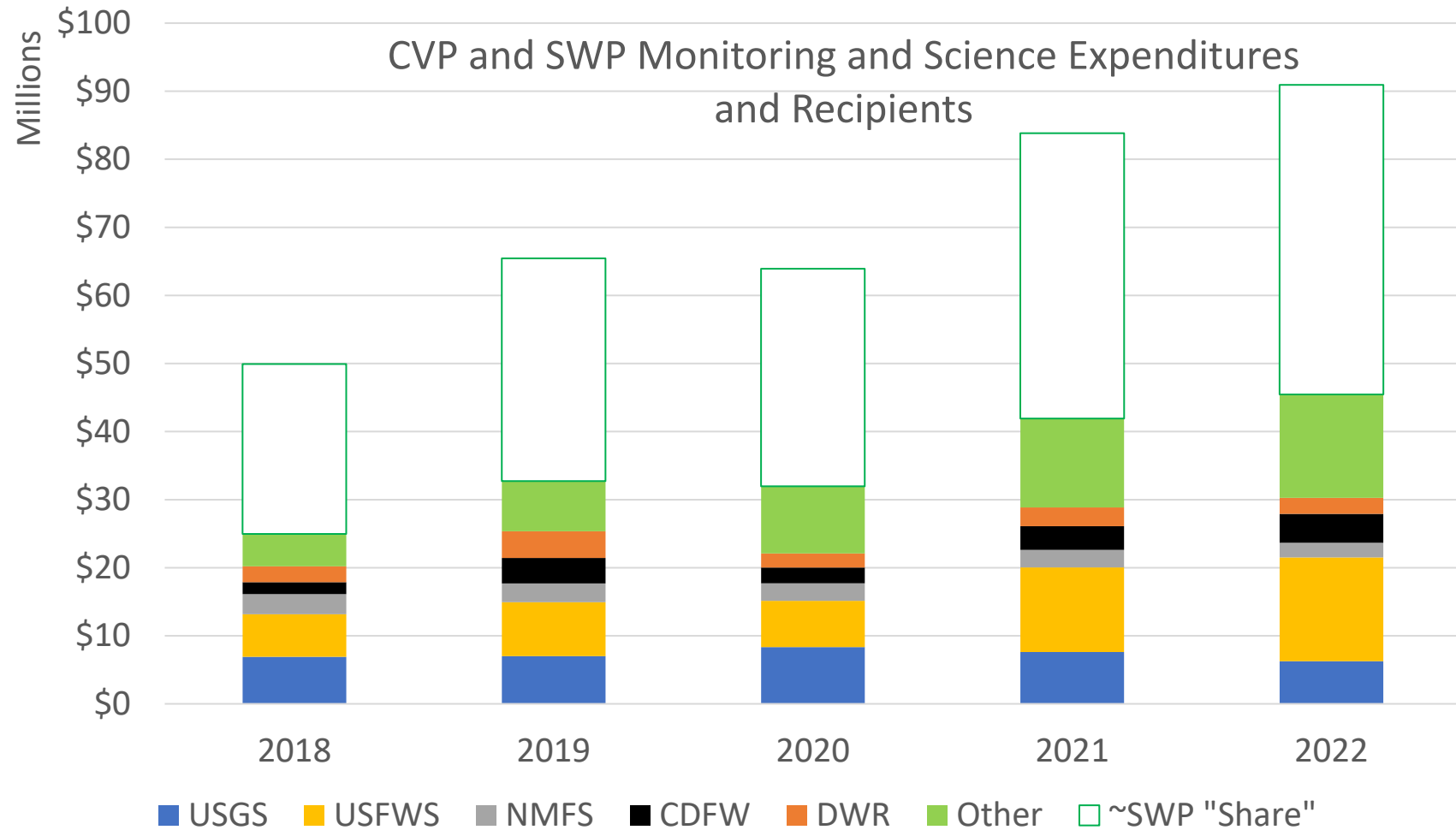
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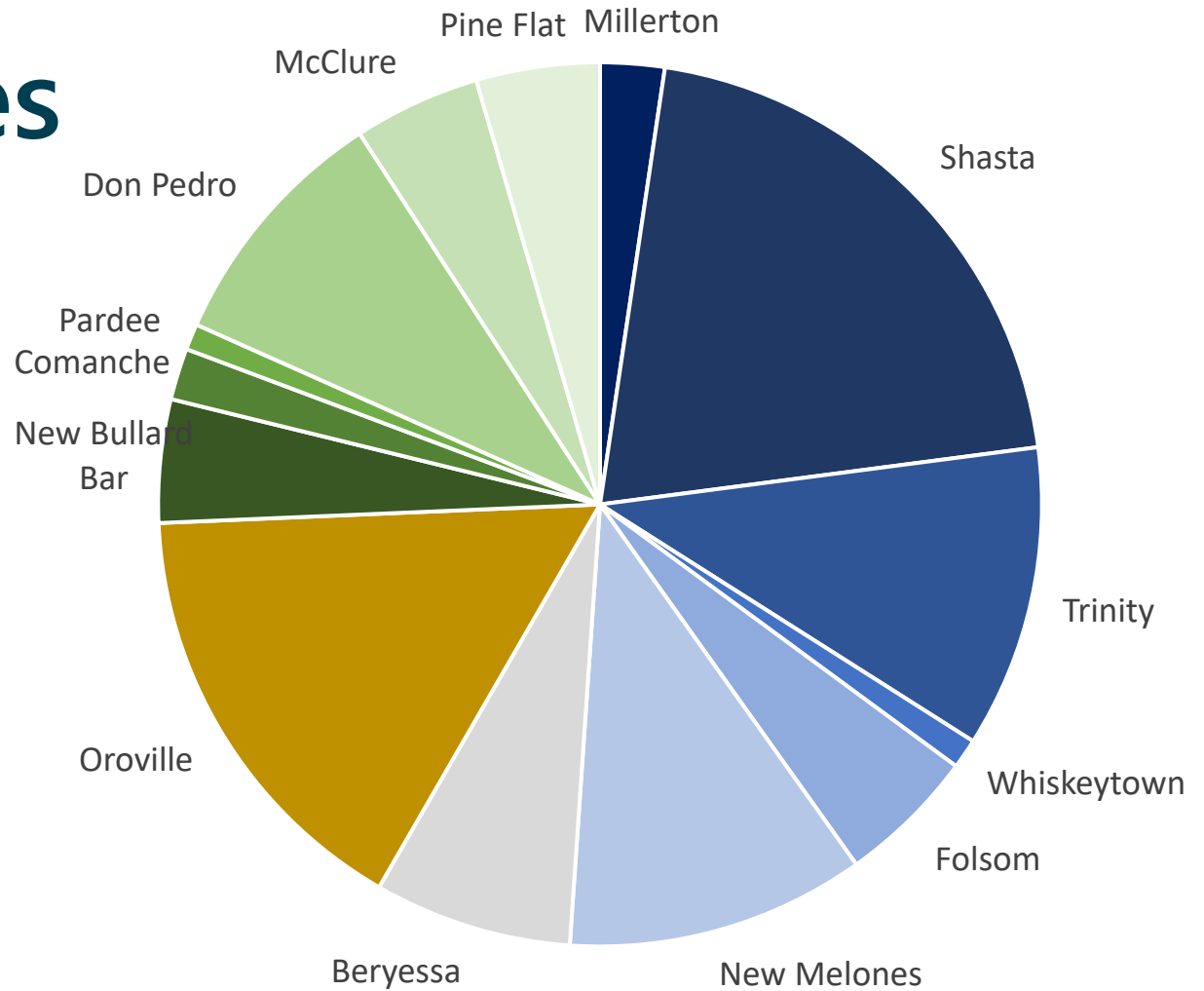
Labor

Delays



Reclamation Authorities

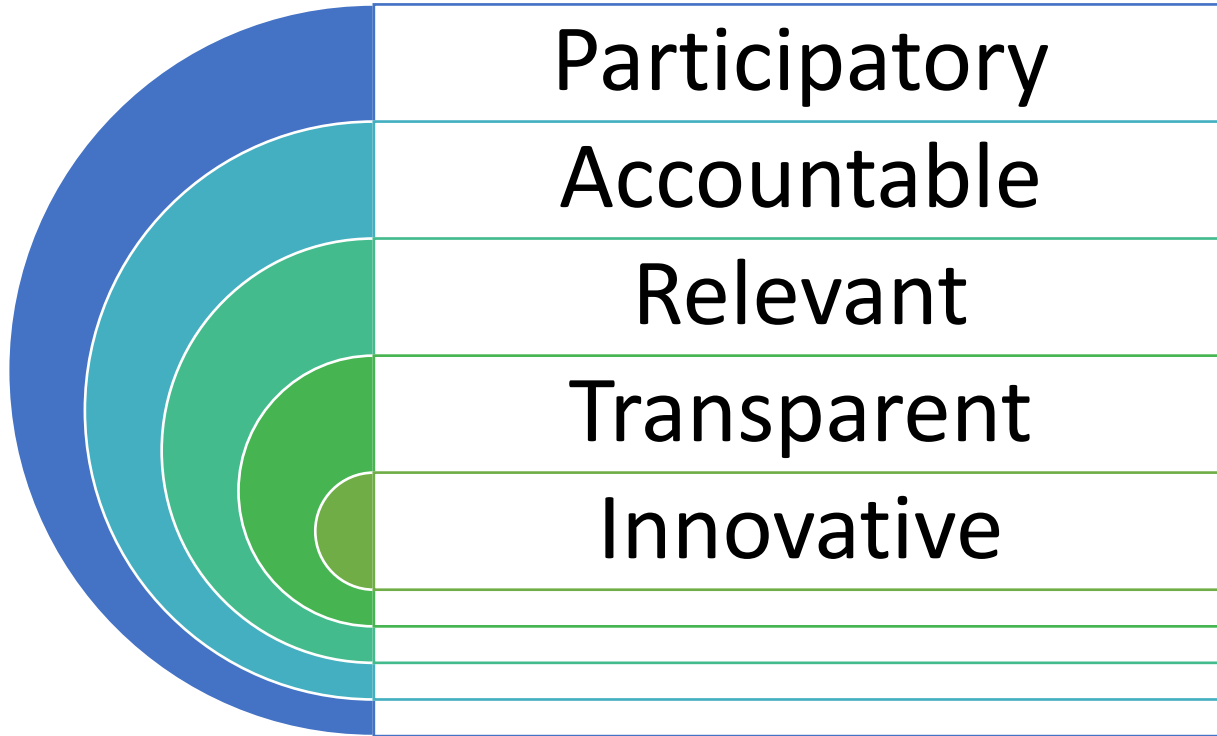
- Project Authorizations
- (Water Quality Control Plans)
- Endangered Species Act (ESA)
- Central Valley Project Improvement Act (CVPIA)
- CalFed Bay-Delta Authorization Act
- Watershed Specific Acts
- Water Infrastructure Improvement for the Nation (WIIN) Act



Relative capacity of major reservoirs in the Central Valley, CA, with Reclamation operated reservoirs in blue.



Advance the Central Valley Science Enterprise



- Meaningful engagement with the communities impacted by decisions
- Timely delivery of quality products
- Address conditions and challenges facing the management of the CVP
- Repeatable analyses with publicly-accessible machine-readable data and open-source documented code
- A culture of continuous learning and improvement



Reclamation's Analytical Structure

- Species Life Cycle Models and Stressors
- Metrics
- Knowledge Base Papers
 - Literature
 - Datasets
 - Models
- Multiple Lines of Evidence based on Conceptual Models and Mechanistic Understandings
- Application of Tools to Alternatives



Current CVP and SWP Delta Actions

Entrainment

- Fremont Weir (Yolo Bypass)
- Delta Cross Channel
- Georgiana Slough
- Old and Middle River Reverse Flow
- Salvage

Ecosystem

- Export to Inflow (E:I) Ratio
- Delta Outflow
- Low Saline Zone (X2)
- Delta Inflow

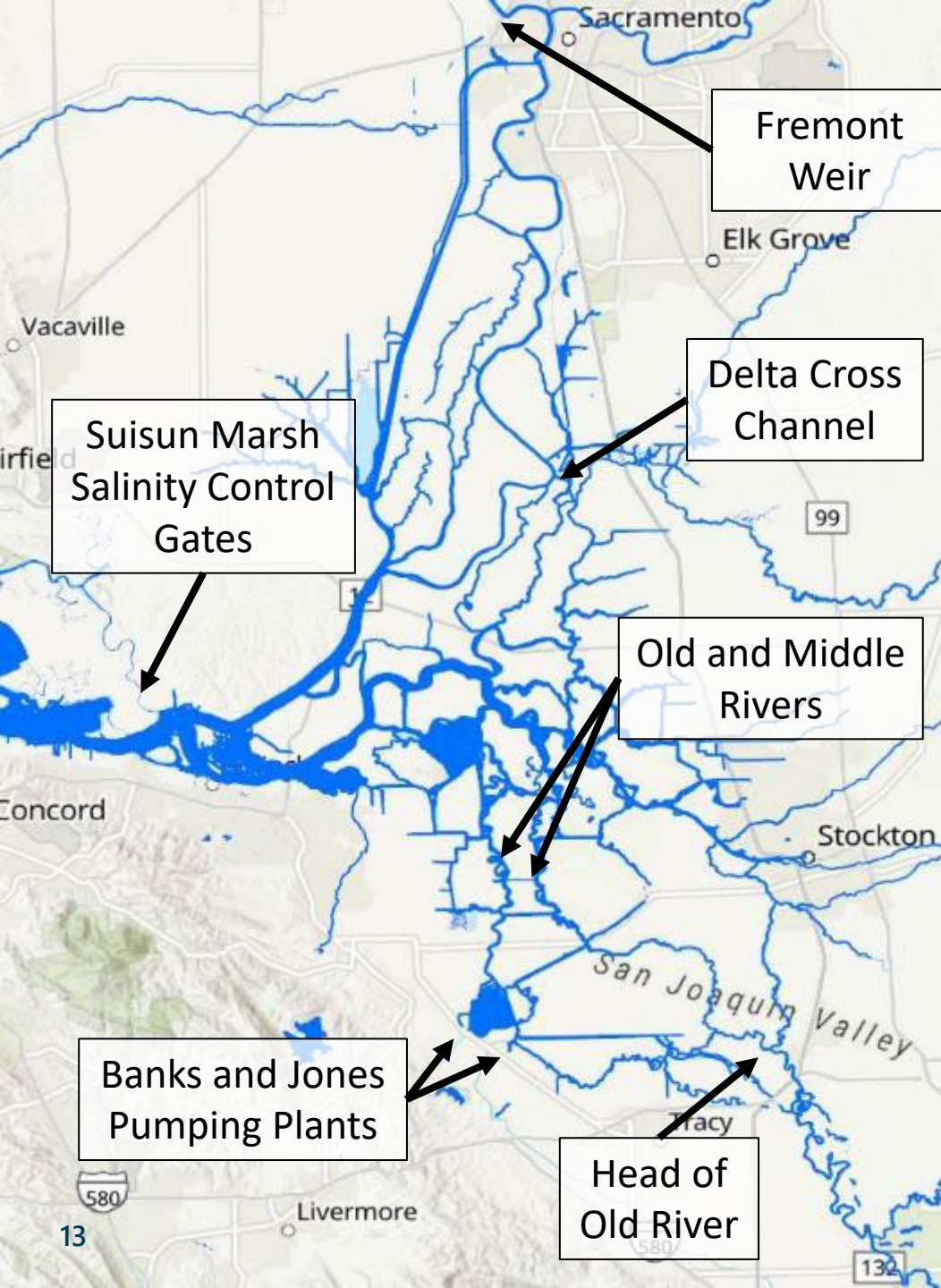
Habitat

- Suisun Marsh Salinity Control Gates
- Suisun Marsh Preservation Agreement
- Tidal Habitat Restoration

Other

- Hatchery Refugial and Supplementation
- Agricultural Barriers
- Monitoring





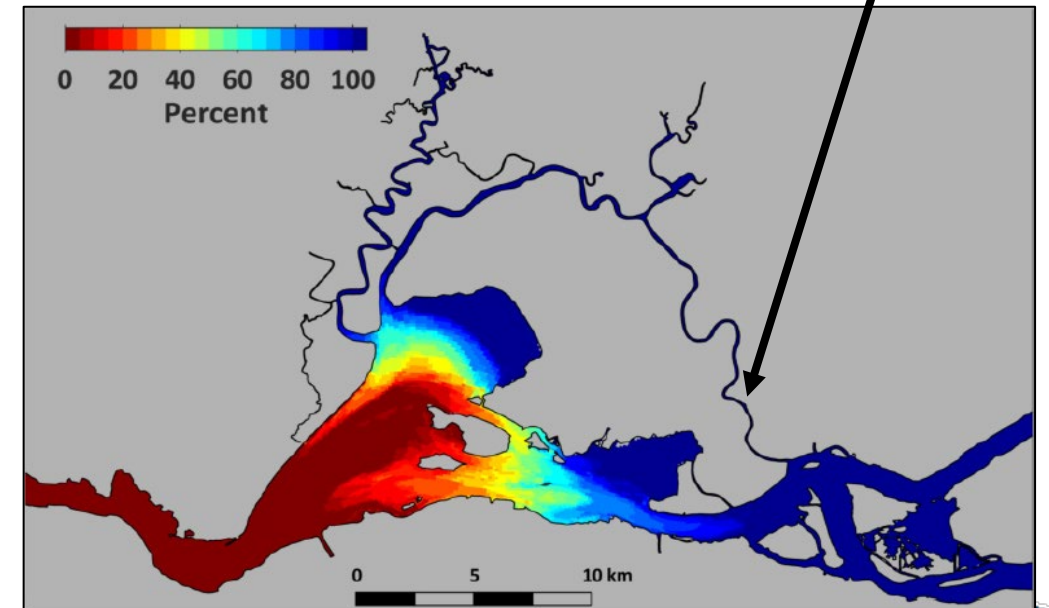
Old and Middle River Reverse Flow Management

- Metrics
 - Recruitment (Smelt)
 - Through-Delta Survival (Salmonids)
 - Detection in Salvage
- Mechanisms
 - Mysterious
 - Mixing
 - Streamlines
 - Environmental Cues
- Additional Complexity



Summer and Fall Delta Smelt Habitat

- Metrics
 - X2
 - Suitable Habitat
 - Supplementation
- Mechanisms
 - Connectivity
 - Overlapping Habitat Needs
- Additional Complexity



Salinity <6 ppt at an 80 km X2 with SMSCG Operation. Low saline habitat occurs in Grizzly and Honker Bays, but does not need to freshen all of Suisun Bay.



Upper Sacramento River Actions

Operations

- Minimum Flows
- Spring Pulse Flows
- Carryover Storage
- Temperature Control Device

Habitat

- Spawning and Rearing
- Floodplain

Monitoring

- Carcass and Redd Surveys
- Red Bluff Rotary Screw Trap

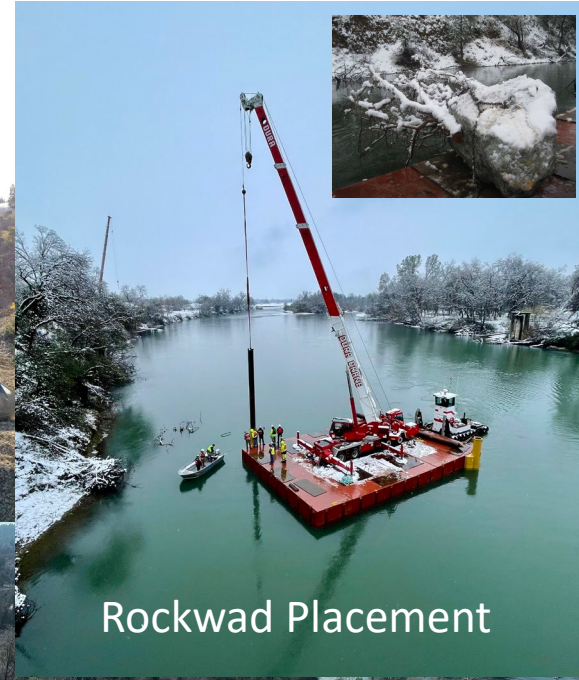
Intervention

- Livingston-Stone NFH
- Battle Creek Restoration
- McCloud River Reintroduction

Salt Creek Gravel Injection



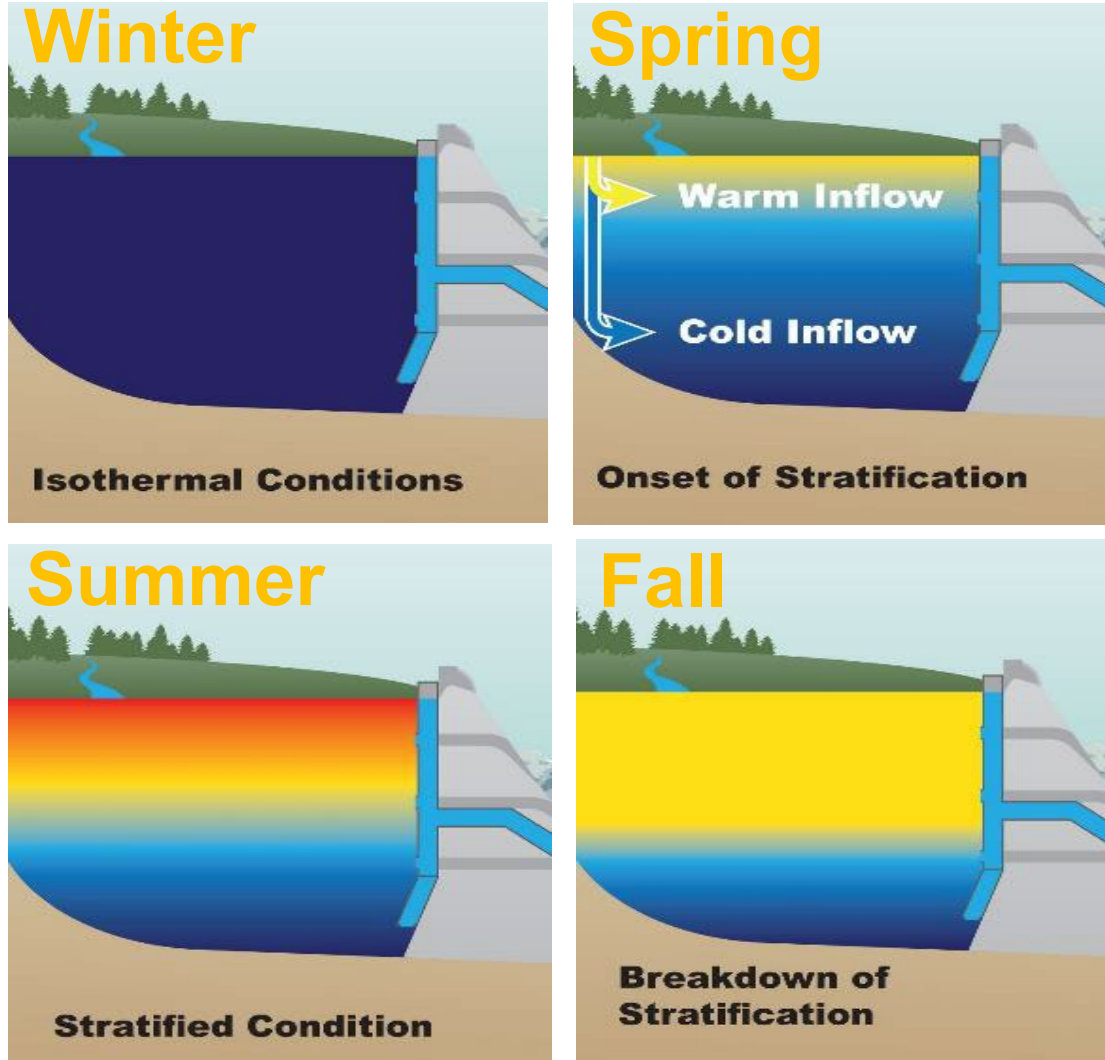
Rockwad Placement



Kapusta Island Side Channels



Shasta Temperature Operations



- Metrics
 - Egg to Fry Survival
 - Temperature-Dependent Mortality
- Mechanisms
 - 53.5°F
 - 56°F
 - Flows
- Additional Complexity



Reclamation NAS Review Interests Today

- Mechanisms: Identify candidate conceptual models to consider
- Tools: Inform direction for development of decision support analysis
- Participation: Involve Tribes, Federal and State Agencies, Water Agencies, Non-Governmental Organizations, and Interested Public



Mario Manzo, Bay Delta Office Deputy Manager

MManzo@usbr.gov

David Mooney, Bay Delta Office Manager

DMMooney@usbr.gov

www.usbr.gov/mp/bdo



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