



Board of Directors Workshop

Bay-Delta 101: An Introduction & Overview

Item 5a

July 25, 2023

Agenda

- Introduction to the Bay-Delta
- Delta Agencies & Water Operations
- Science & Watershed Initiatives
- Delta Levees
- Metropolitan's Delta Islands
- Longer Term Projects



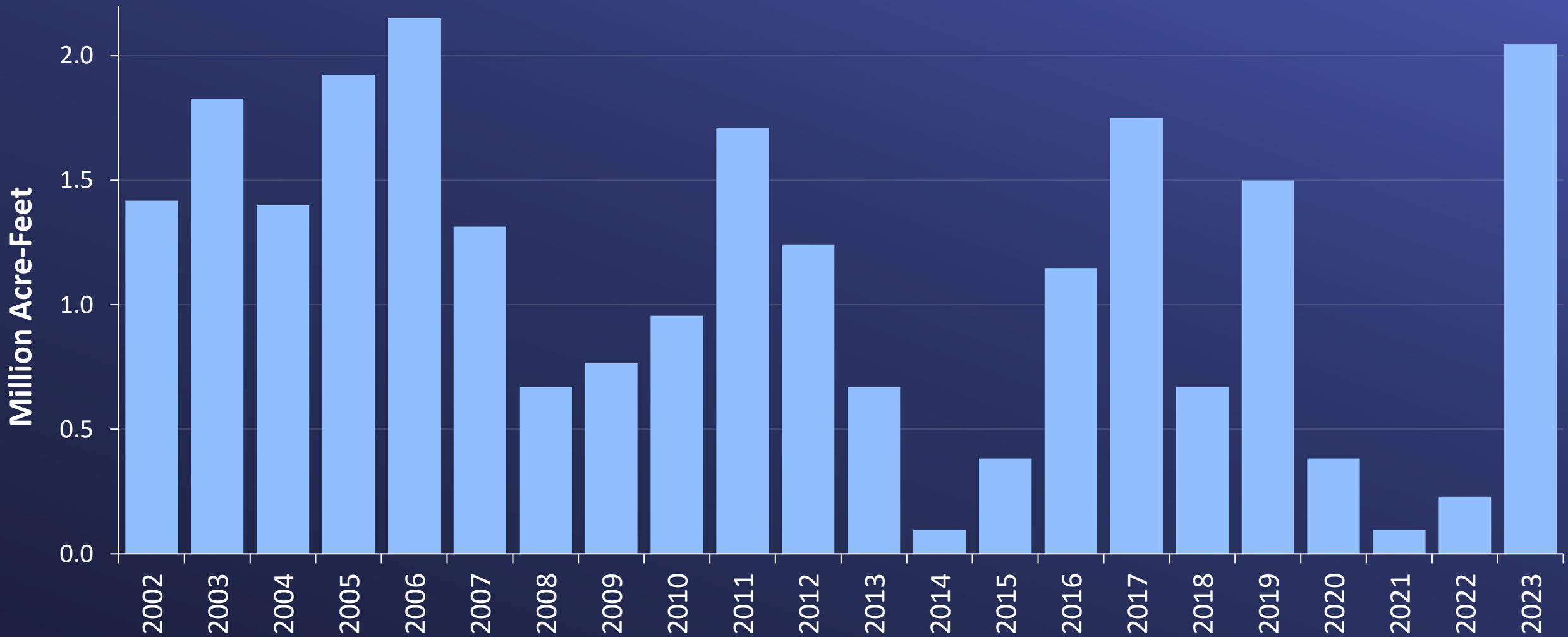
Photo Credit: CalMatters

Introduction to the Bay-Delta

Metropolitan Water District's Sources of Supplies



SWP Supplies Available to Metropolitan



Note: Graph depicts the total SWP Table A available to Metropolitan and deliveries of Article 21 and Human Health & Safety supplies during a given calendar year. Graph does not include takes from Metropolitan's storage accounts or water transfers. Calendar Year 2023 is a projection and subject to change.

Sacramento- San Joaquin Delta

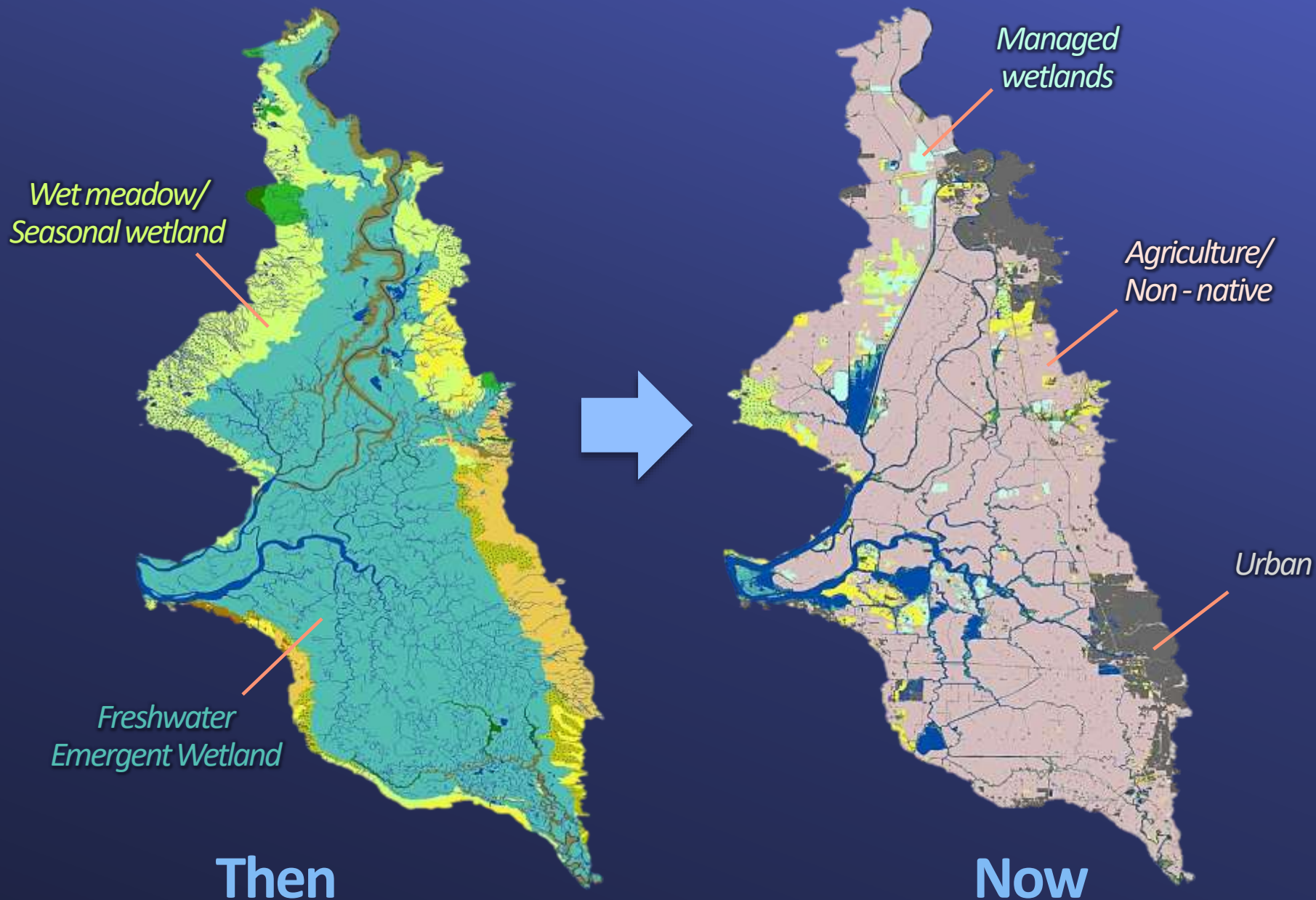
Key Nexus Point for California

- The Delta is the heart of California's water supply
 - Supplies water to 27 million Californians and millions of acres of highly productive farmland
 - Vital estuary for over 750 animal and plant species
 - Home to over half-a-million residents



Delta is a Highly-Altered Environment

Habitat



Source: San Francisco Estuary Institute Aquatic Science Center:
https://www.sfei.org/sites/default/files/biblio_files/DeltaTransformed_SFEI_110414.pdf

Delta is a Highly-Altered Environment

Landscape & Species



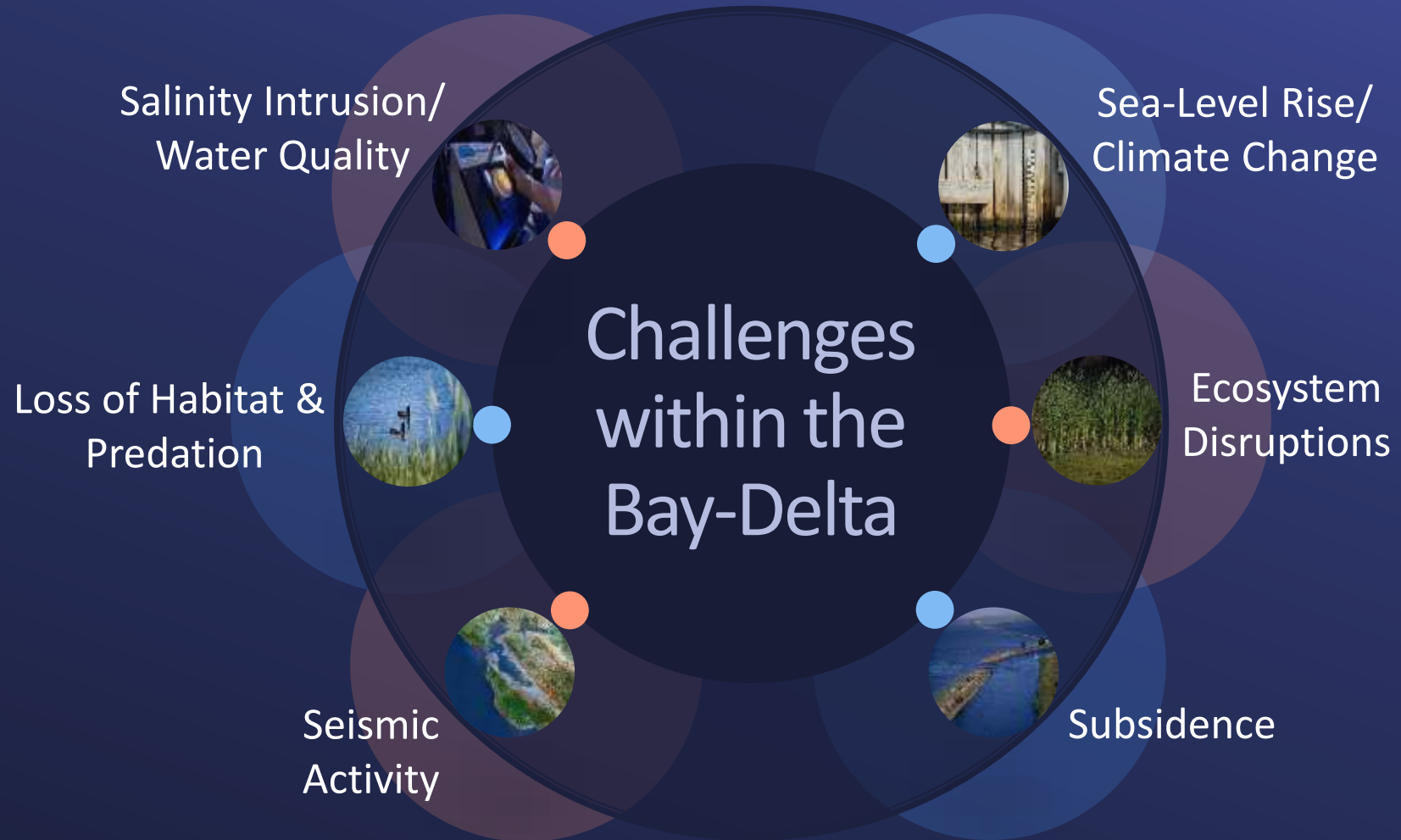
Delta Smelt
(endangered)

Then

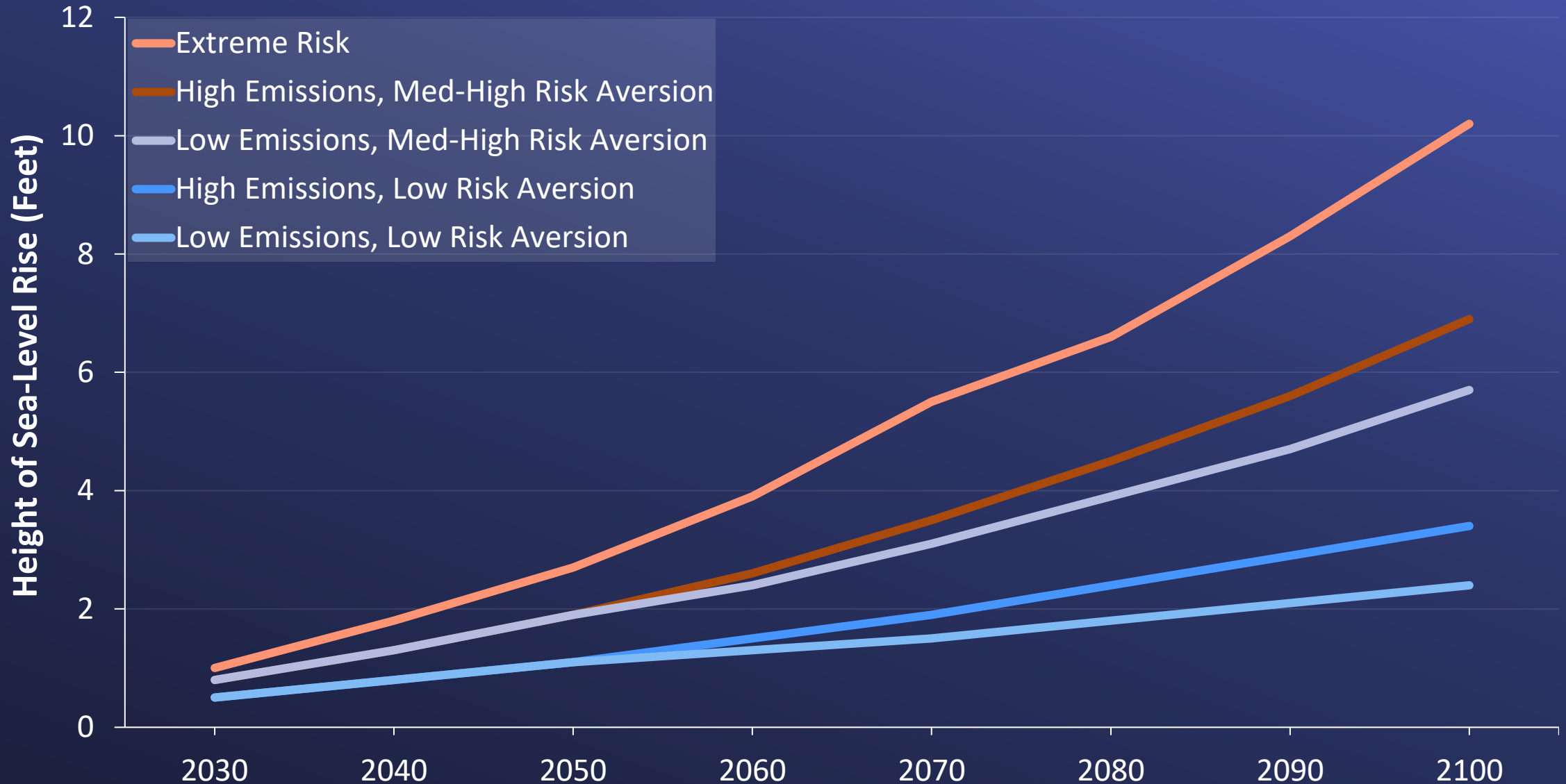


Asian Clam
(non-native)

Now



Climate Change: Projected Sea-Level Rise for San Francisco



Source: California Ocean Protection Council https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf



Delta Agencies

Delta Reform Act of 2009



Established the Delta Stewardship Council as an independent state agency

- Develops and implements an overarching plan for the Delta
 - **Furthers the coequal goals for the Delta**
 - **Guides state and local agency actions related to the Delta**

Reduced reliance on the Delta via investments in regional supply projects



More reliable water supply
for California



Protecting, restoring, & enhancing
the Delta ecosystem

Delta Protection Commission & Delta Conservancy



STATE OF CALIFORNIA
**DELTA PROTECTION
COMMISSION**



SACRAMENTO - SAN JOAQUIN
DELTA CONSERVANCY
A California State Agency

- Est. by Delta Protection Act (1992)
- Reviews regional land use projects for consistency with the Land Use and Resource Management Plan
- Mission is to:
 - Support agriculture, recreation, cultural heritage, and natural resources in the Delta

- Est. by Delta Reform Act (2009)
- Primary state agency in the implementation of ecosystem restoration in the Delta
- Goals are to:
 - Advance environmental protection of the Delta
 - Advance the economic well-being of Delta residents



Regulations and Water Operations

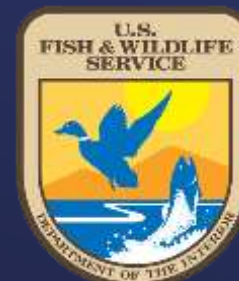
Key Agencies

- California Department of Water Resources
- U.S. Bureau of Reclamation

Project
Operators

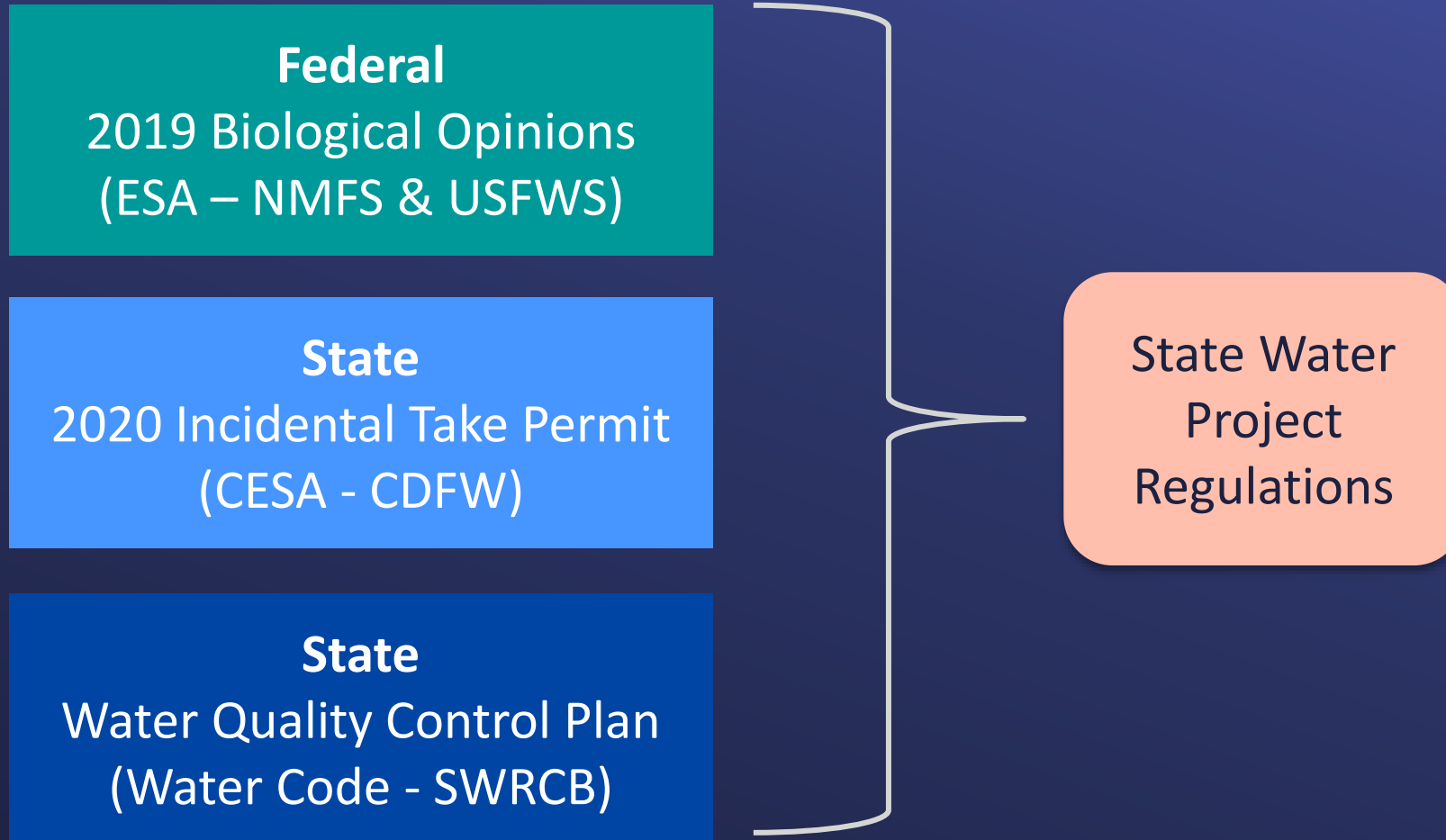
- California State Water Resources Control Board
- California Department of Fish & Wildlife
- U.S. Fish & Wildlife Service
- National Marine Fisheries Service

Regulatory
Agencies



SWP Regulatory Overview

Key Permits and Standards Governing Project Operations



ESA = Endangered Species Act

CESA = California Endangered Species Act

NMFS = National Marine Fisheries Service

USFWS = United States Fish and Wildlife Service

CDFW = California Department of Fish and Wildlife

SWRCB = State Water Resources Control Board

Shasta Reservoir

Shasta Reservoir

Temperature Management Temperature Management

Bay-Delta Regulatory Framework

Summer Flow

Export/Inflow Ratio

Cross Channel Gates
Cross Channel Gates

Winter/Spring X2

Agriculture/Urban Salinity

Fish and Wildlife Flows

Summer/Fall Habitat Actions

Summer/Fall Habitat Actions

Old and Middle River
Reverse Flows

San Joaquin River
Inflow/Export
Ratio

Old and Middle River
Reverse Flows

Inflow/Export Ratio

Federal

2019 Biological Opinions
(ESA – NMFS & USFWS)

State

2020 Incidental Take Permit
(CESA - CDFW)

State

Water Quality Control Plan
(Water Code - SWRCB)

Bay-Delta Water Quality Control Plan

Planned Update and Voluntary Agreements

- Balances beneficial uses of water by setting water quality objectives
- Currently in the process of being updated
 - 2018 Framework requires 55% of unimpaired flow
 - Voluntary Agreements provide up to an additional 825 TAF of environmental flows and 30,000 acres of new habitat
- SWRCB Draft Staff Report planned for release Summer 2023

Note: As of 05/25/23, Friant Water Authority (FWA) is unable to continue supporting the inclusion of Friant flows in the San Joaquin River specifically to support the Voluntary Agreements. Discussions remain ongoing between FWA and other relevant parties for resolution.

Reinitiation of Consultation

Long-Term Operations of the CVP and SWP

| |
|--|
| Federal |
| 2019 Biological Opinions (ESA – NMFS & USFWS) |
| State |
| 2020 Incidental Take Permit (CESA - CDFW) |
| State |
| Water Quality Control Plan (Water Code - SWRCB) |

January 2021
Executive Order 13990



September 2021
USBR Reinitiated Consultation



October 2021 - Present
Ongoing Technical Development



Remaining Milestones
Federal Biological Opinions

Draft EIS &
Biological
Assessment

Final EIS &
Biological
Opinion

Record of
Decision

Remaining Milestones
State Incidental Take Permit

Draft
Environmental
Impact
Report

Incidental
Take Permit
Application

Final EIR &
Incidental
Take
Permit

Science & Watershed Initiatives

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Importance of Metropolitan's Bay-Delta Science Efforts

- Water supply reliability & ecosystem restoration
- Supports policy & management actions
- Informs environmental solutions & investments
- Fosters collaborative partnerships statewide



Peer-Reviewed Science Publications Funded by Metropolitan through 2022



Metropolitan's Bay-Delta Science Investigation Priorities



Effectiveness of
Management Actions



Habitat Needs for
Listed Species



Innovation & New
Technology



Delta Stressors

Collaborative Adaptive
Management Team

Delta Smelt Structured Decision Making

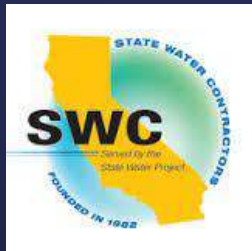
Federal, State, and Local
Interest Group collaborative

- **Purpose:** Collaborative effort to develop decision support tool to evaluate actions that improve the population of Delta Smelt within 5-10 generations
- **Key Findings:**
 - Improvements may be possible given the available tools
 - Increasing turbidity and food
 - Actions include
 - Wetland management and restoration
 - Flow Management
 - Aquatic Weed Control
 - Contaminant reduction

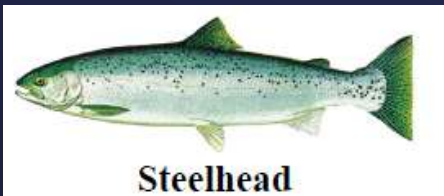


Delta Smelt Pilot Propagation Study

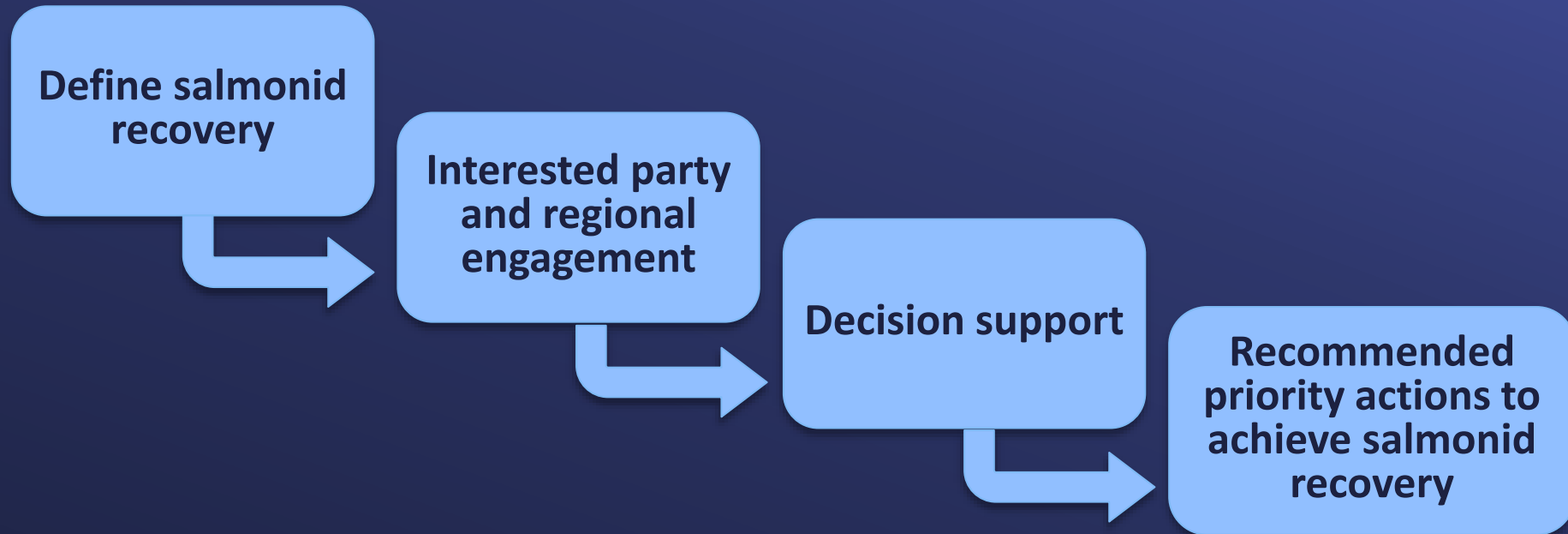
Purpose: Addressing unknowns to inform experimental release and supplementation



Reorienting to Salmonid Recovery



Purpose: Collaborative structured process to develop an effective and implementable strategy for recovering salmonids while considering other social, ecological, and economic interests in the region



Upper Watershed Activities



- Water Solutions Network Watershed Framework
 - Building relationships, systems thinking, and action at watershed scales
- Plumas Watershed Forum
 - Funding watershed improvements through the Monterey Settlement Agreement
- Northern California Pilot Investigations
 - Evaluating forest health proposals that advance science, evaluate proof of concept, and further partnerships



Water
Quality



Water Flow
Rates



Fire
Protection



Carbon
Security



Habitat &
Biodiversity

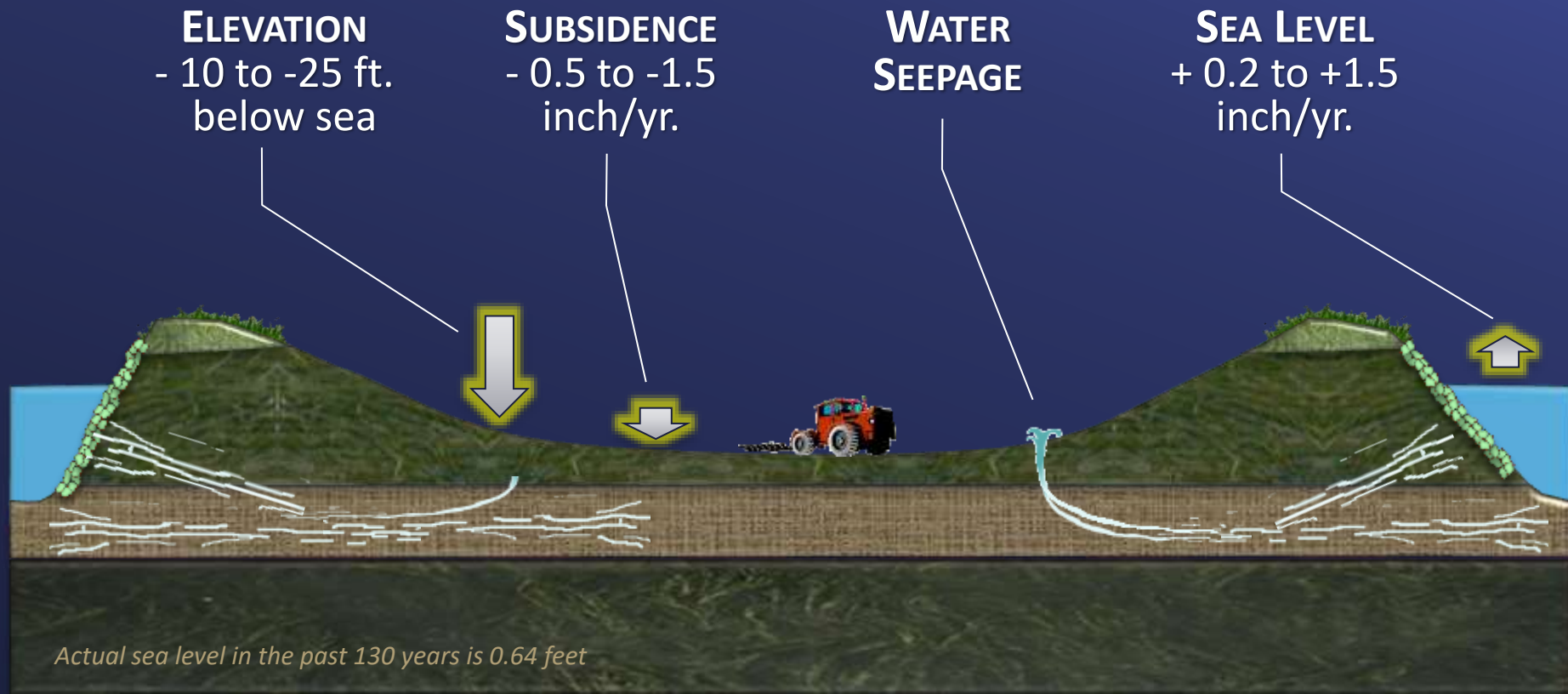
Source: USGS
<https://www.usgs.gov/media/images/upper-feather-river-watershed-study-area>



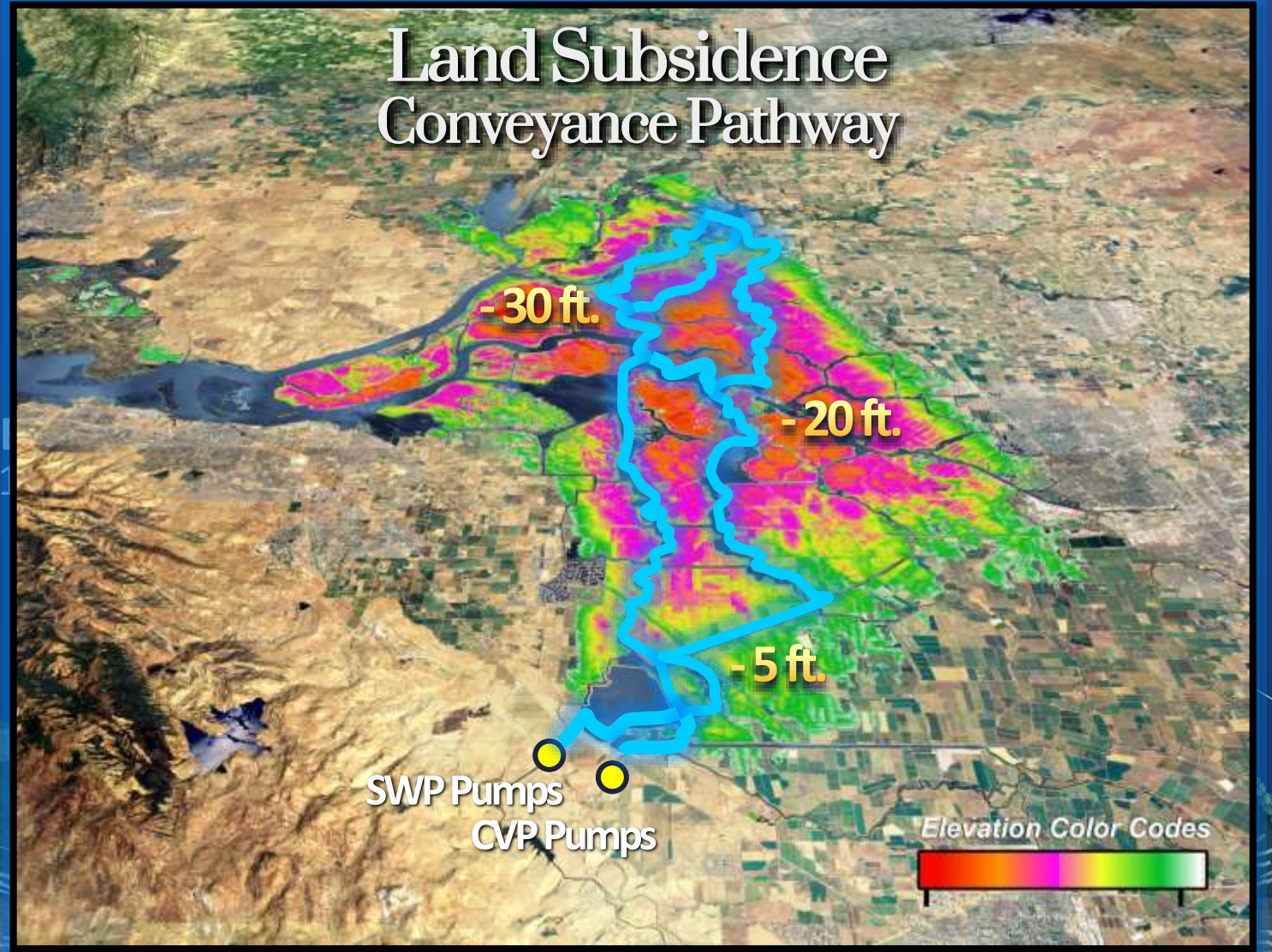
Delta Levees

Delta Levees Overview

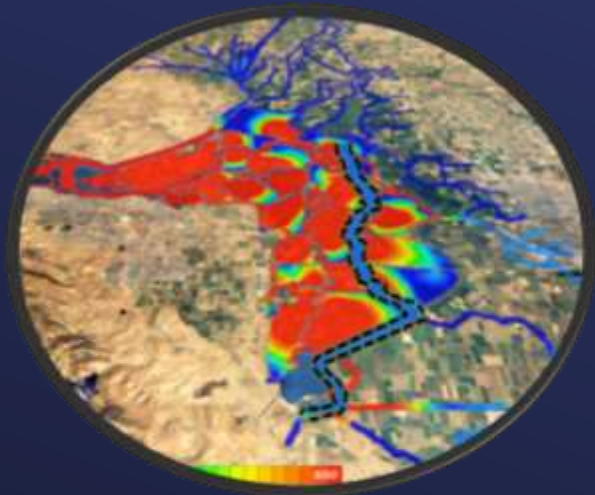
CURRENT LANDSCAPE



Delta Levees Overview



Delta Levees Accomplishments



Freshwater Pathway
3-yr. outage reduced < 6 mos.

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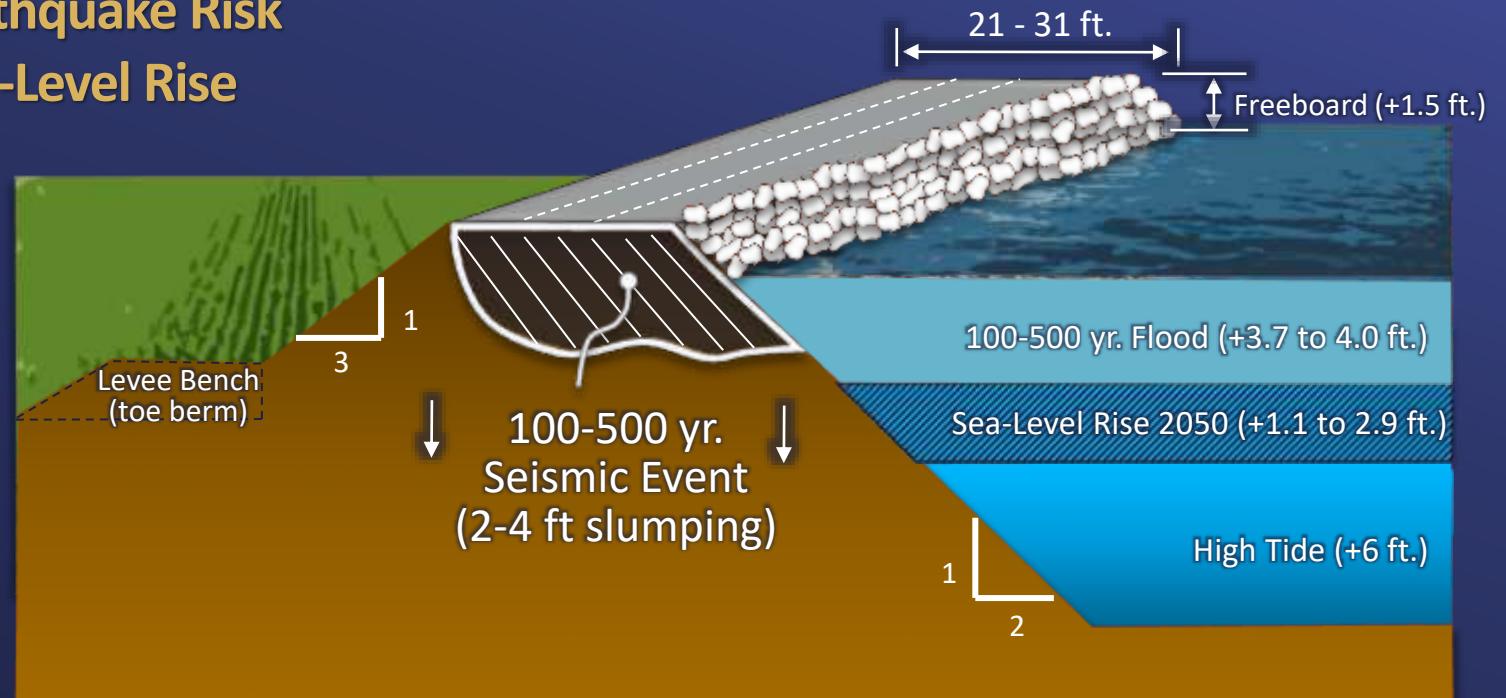


Delta Levees Future Focus

Levee Modernization

Mitigates

- ✓ Flood Risk
- ✓ Earthquake Risk
- ✓ Sea-Level Rise



1. Assumes continued State/Federal investment in levee improvements, stockpiles, etc. Flood & seismic risks were analyzed separately to mitigate a 1 in 500-year event; to mitigate both events happening simultaneously assumes a 1 in 50,000-year event

Metropolitan's Delta Islands

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Delta Islands

- 2016 purchase
- 5 islands; 20,400 acres
- 56 miles levees
- 2021 Chipps Island sold



Key Reasons for the Purchase of Delta Island Properties



Freshwater Conveyance Pathway & Supply Security



Benefits Relating to California WaterFix Project



Fish Food Enhancement & Regulatory Flexibility



Subsidence Control



Ecosystem Habitat



Carbon Credit Development

Bay-Delta Islands

Overview

- \$175 million purchase
 - Debt financed; paying interest only (\$1 to 5 M/yr.) till 2041
- \$6.7 million-year average annual expenses
 - \$1.68 million/island
- \$79 million in grants received for levees & habitat
- Initial plan
 - California WaterFix would participate in covering costs
- State Administration policy changes
 - Governor's decision to downscale & DWR's proposed new eastern alignment

Bay-Delta Islands

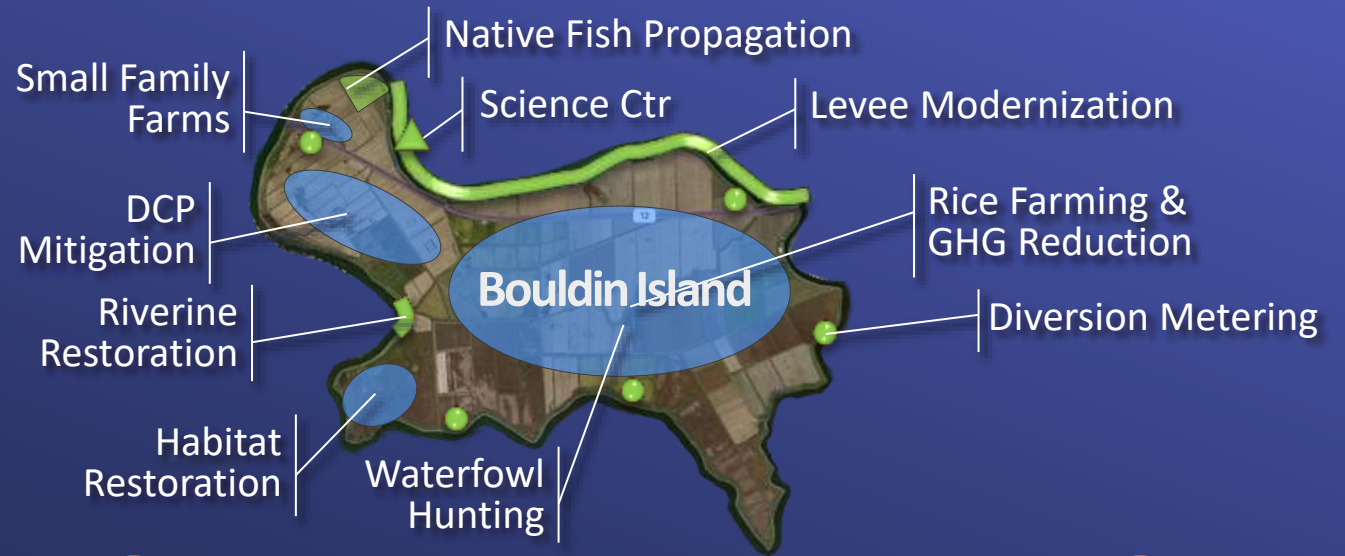
Value to Metropolitan

- Continuing Value
 - Board Policies show consistency and reasons to continue maintaining the islands for water reliability, quality, etc.
 - Continue enhancing strategic and revenue opportunities
- Analyzing the Value
 - Evaluate opportunities for each island individually
 - Consider strategic value, fiscal impact, risk, liability

Strategic & Fiscal Analysis

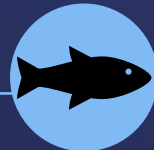
under development

- Ongoing Projects
- In Development (Near-Term)
- Initial Analysis



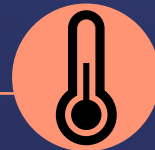
WATER SUPPLY

- Levee modernization
- Water diversion meters
- Delta Conveyance Project mitigation (\$)



ECOSYSTEM

- Native fish preservation
- Habitat restoration (\$)
- Floating wetlands
- Eco-mitigation bank (\$)
- Fish food production & regulatory flexibility (\$)
- Voluntary Agreement Water Conservation (\$)



CLIMATE

- Carbon sequestration & subsidence control (\$)
- Multi-benefit farming (\$)
- Renewable energy
- Carbon capture & underground storage (\$)



SCIENCE

- Aquatic research
- Science center
- Paludiculture farming (\$)



COMMUNITY

- Waterfowl recreation (\$)
- Small family farms
- Tribal activities
- Bird watching & nature trails

Strategic & Fiscal Analysis

under development

Draft Example

| CATEGORY | PROJECTS | STRATEGIC VALUES | | | | FISCAL VALUE |
|----------------------------|---|-----------------------------|---------------------------------|---------------------------|---------------------------|------------------------------|
| | | Improves Supply Reliability | Improves Regulatory Flexibility | Improves Ecosystem Health | Future Climate Resiliency | Initial Net Revenue Estimate |
| Ongoing Projects | Conventional Farming/Telecom Leases | | | | | Analysis Under Development |
| | Levee Modernization | ✓ | | ✓ | ✓ | |
| | Habitat Restoration | ✓ | ✓ | ✓ | ✓ | |
| | Waterfowl Recreation | | | | | |
| | Scientific Research | ✓ | ✓ | ✓ | ✓ | |
| | Water Diversion Meters | | ✓ | | | |
| In Development (Near-Term) | Multi-Benefit Farming (Rice, etc.) | | | ✓ | ✓ | |
| | Carbon Sequestration & Subsidence Control | ✓ | | ✓ | ✓ | |
| | Environmental Mitigation Banking | | ✓ | ✓ | ✓ | |
| | Native Fish Preservation & Regulatory Flexibility | | | ✓ | ✓ | |
| | Enhanced Waterfowl Recreation | | | | | |
| Initial Analysis | Fish Food Production & Regulatory Flexibility | ✓ | ✓ | ✓ | ✓ | |
| | Carbon Capture & Storage (underground) | | | | ✓ | |
| | Renewable Energy | | | | ✓ | |
| | Paludiculture Farming | ✓ | | ✓ | ✓ | |
| | Voluntary Agreement Water Conservation | | | ✓ | | |

Bay-Delta Grant Highlights

- **Grants approved (~ \$79 million)**
 - \$ 42.9 million - Levee improvements (2016-2023)
 - \$ 11.4 million - Riverine restoration levee setback (2022-23)
 - \$ 0.8 million - Webb Tract Ferry Vessel Repair/Upgrade (2019)
 - \$ 1.5 million - Emergency response supplies (2022)
 - \$ 1.1 million - Collaborative landscape planning (2022)
 - \$ 20.9 million - Webb Tract landscape mosaic (2023)
- **Grant applications in process (~\$8 million)**
 - \$ 360,000 - Delta Smelt Propagation research
 - \$ 7.5 million - Levee improvements

Next Steps

**Bay-Delta 101
Workshop**



July 2023

**Delta Islands
Strategic & Fiscal Analysis**



Late 2023

**Delta Interests
Input to Board**



Early 2024





Longer Term Projects

Delta Conveyance Project Overview



**CLIMATE
RESILIENCY**



**SEISMIC
RESILIENCY**



**WATER
SUPPLY
RELIABILITY**



**OPERATIONAL
FLEXIBILITY**

Delta Conveyance Project Overview



Progress to Date

- Draft Environmental Impact Report (CEQA)
- Draft Environmental Impact Statement (NEPA)
- Initial engineering design
- Regulatory agency consultation & permit application development

Future Updates to Board

- Regular Delta Conveyance Project Updates (Ongoing)
- Cost Estimate (Fall 2023 - Spring 2024)
- Cost Benefit Analysis (Fall 2023 - Spring 2024)
- Continued Project funding discussion and board deliberation (by mid 2024)

Sites Reservoir Overview



**WATER SUPPLY
RELIABILITY**



**ENHANCE THE
DELTA ECOSYSTEM**



**IMPROVE
ANADROMOUS
FISH SURVIVAL**



**WATER FOR
REFUGES**

Sites Reservoir Overview



Progress to Date

- Initial engineering design, supply modeling, operations
- Revised Draft Environmental Impact Report/Statement
- Regulatory agency consultation & initial permit applications
- State/Federal Funding
 - \$875 million State Proposition I grant;
 - \$104 million federal WIIN Act grant
 - \$449 million US Dept. of Agriculture loan
 - \$2.2 billion federal WIFIA loan (application)

Future Updates to Board

- Continued project updates (operations, funding, governance, etc.) & Board deliberation (thru 2024)

Discussion

