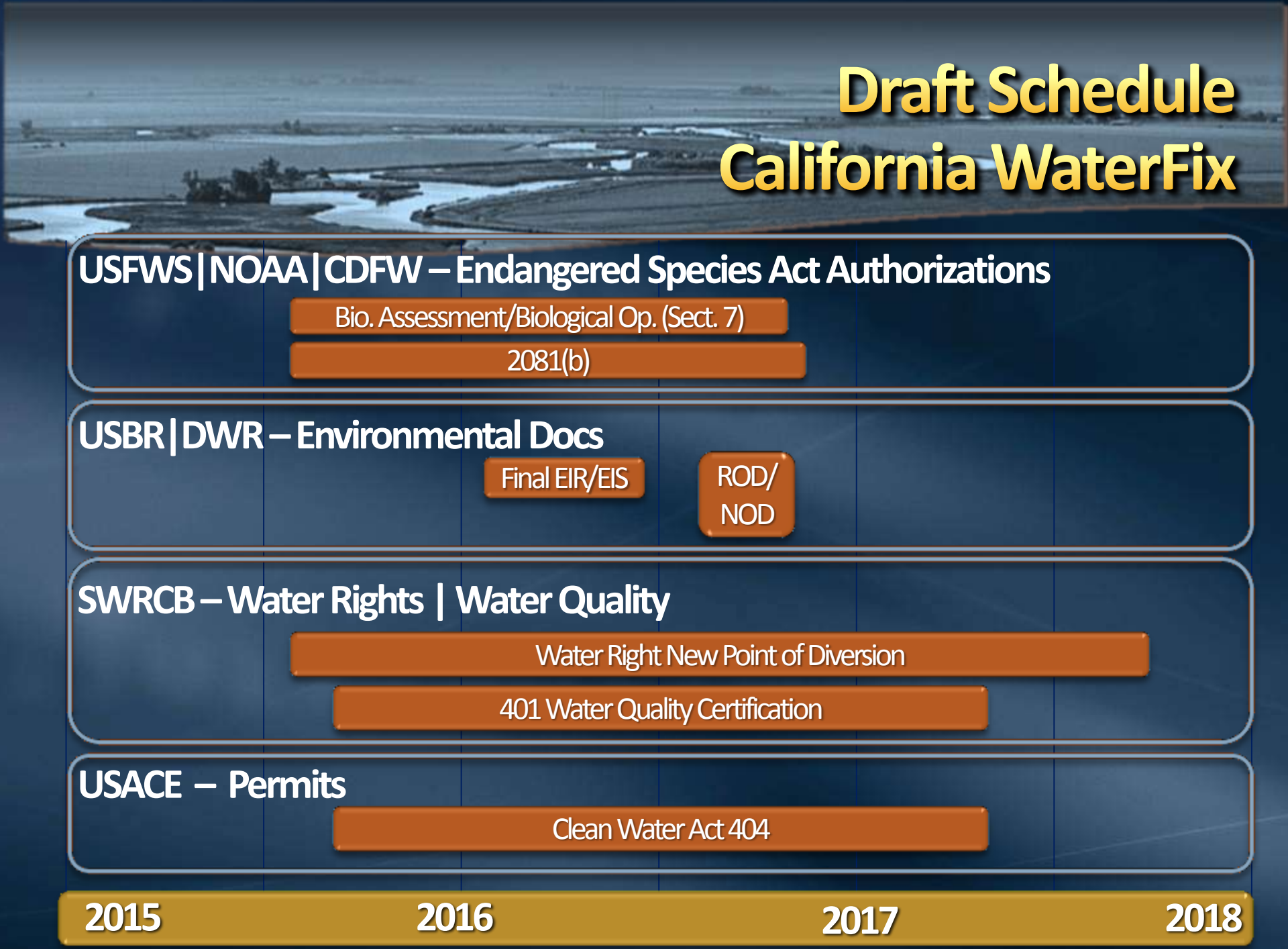
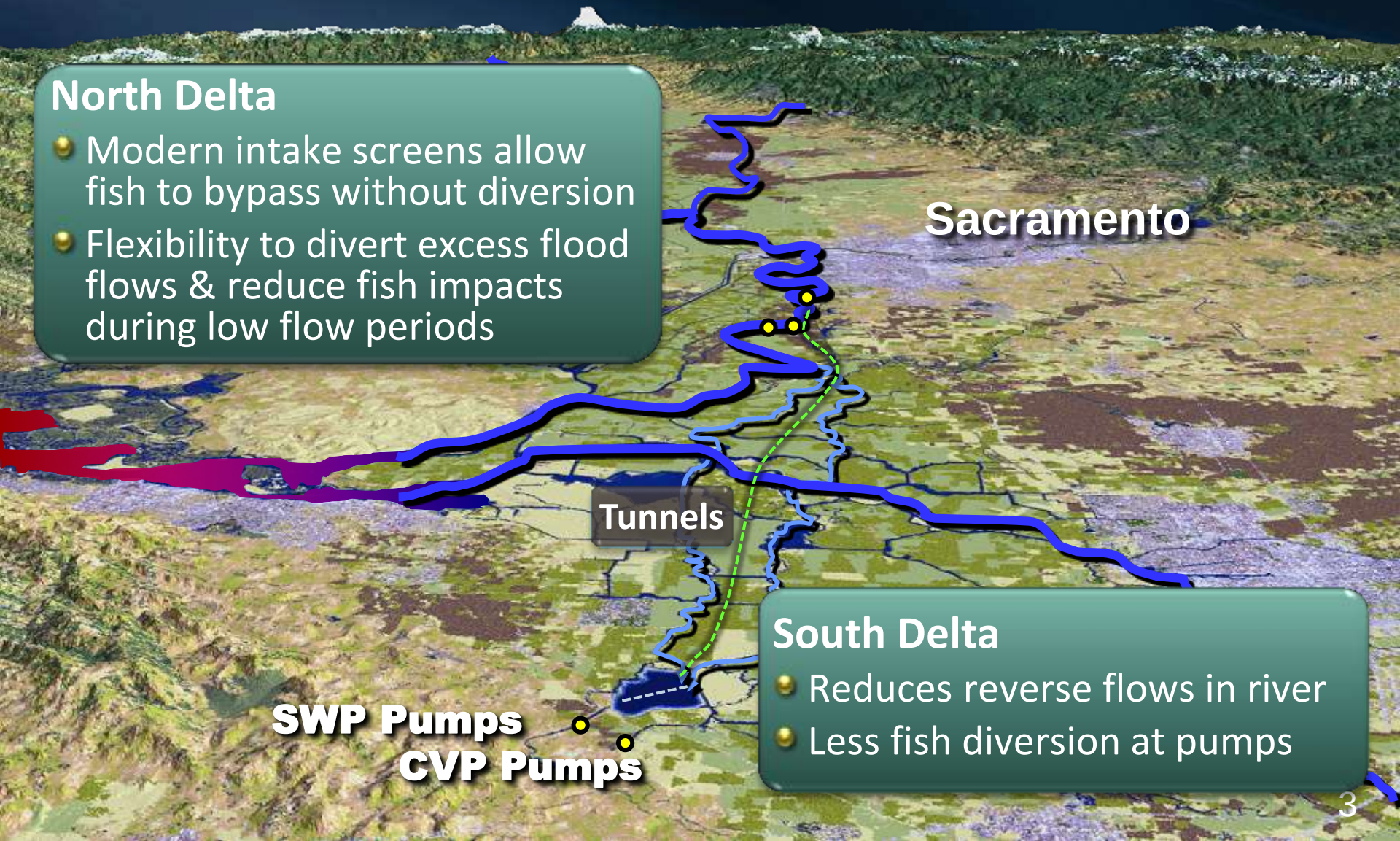
Primary Retreat Presentation Slides

Draft Schedule
California WaterFix



California WaterFix
Proposed Conveyance



CALIFORNIA
ECO RESTORE
A STRONGER DELTA ECOSYSTEM.

- Floodplain restoration
- Tidal restoration
- Managed wetlands
- Prop 1 & 1E funded restoration projects
  - Aquatic, Riparian, Upland
  - Multi-benefit flood management projects

Back-up Slides by Topic

Board Retreat – Agenda

Present Video	Metropolitan Water District Video Presentation	
8:30 – 8:45 PM	Presenter:	General Manager Jeff Kightlinger
	Objective:	Screen video
1. Call to Order	**Opening Remarks from Chairman**	
8:45 – 9:00 AM	Presenter:	Chairman Randy Record
	Objective:	Welcome and introduce Board Members and others to Day #2 of the retreat. Set objectives for the day.
2. Objectives	**General Manager's Objectives for CA WaterFix Discussion**	
9:00 – 9:15 PM	Presenter:	General Manager Jeff Kightlinger
	Objectives:	GM welcome. Set purpose and objectives for the discussion of CA WaterFix dialogue. Provide overview of the three topics that will be addressed.

2. Discussion Topic:	Timing and Requirements for Decision-Making	
9:00 – 10:00 AM	Objective:	Discuss the timing and conditions for decision-making related to CA WaterFix.
	Outcomes:	Obtain input on the extent of approvals and/or agreements needed before Metropolitan engages in decision-making regarding funding and commitments.
	Questions:	1. What stage in the approval process must be reached before addressing decisions regarding next steps in the planning phase (e.g., EIR/EIS approval, ESA permits issued, governance agreement executed, agreement on cost allocation and finance achieved, all of the above)? 2. How should benefits from the CA WaterFix be quantified (e.g., volume received, capacity used)? 3. How should the associated costs be allocated?

3. Communications Break		
10:00 –10:15 AM		

Board Retreat – Agenda

4. Discussion Topic:	Physical Benefits of California WaterFix	
10:15 – 12:00 PM	Objective:	Discuss expected benefits and uncertainties associated with CA WaterFix and EcoRestore.
	Outcomes:	Discussion of Board Member views on the benefits expected from future investments in the Bay-Delta, the uncertainty associated with assurances that they can be achieved, and the affordability of expected outcomes.
	Questions:	1. What benefits do the CA WaterFix and EcoRestore offer? 2. What are the uncertainties that threaten the realization of those benefits? 3. What can be done to reduce uncertainties and increase the likelihood of achieving desired benefits? 4. How affordable are the expected benefits compared to other investment opportunities?

5. Lunch Break	
12:00 –1:00 PM	

6. Discussion Topic:	CA EcoRestore and Role of Adaptive Mgmt and Science Programs	
1:00 – 2:30 PM	Objective:	Review and discussion of the regulatory context and proposed approaches to managing uncertainty.
	Outcomes:	Discussion of Board Member views on future regulatory trends and the potential effectiveness of adaptive management and long-term science program.
	Questions:	1. What is needed to respond to lack of regulatory assurances and potential future regulations?

7. Next Steps	Retreat Outcomes and Next Steps	
2:30 – 3:00 PM	Presenter:	Chairman Randy Record
	Objective:	Summarize outcomes of the retreat and discuss next steps.
	Outcomes:	Guidance on next steps following retreat,

Table of Contents

CA Water Fix Decisions

California WaterFix: Securing Water Supplies for California

- Enhances supply reliability and Delta ecosystem
- Supports Southern California's local resources
- Modernizes the State Water Project and addresses flaws since its creation
- Protects billions of dollars of past investments made by Southern California

California WaterFix

Major Permits and Authorizations

Agency	Document	Scope
USBR/DWR	Final EIS/EIR ROD/NOD	Environmental documents and project approval under CEQA and NEPA
USFWS/NMFS	Biological Opinion	Take of threatened or endangered species under Section 7 of ESA
CDFW	Section 2081(b) Permit	Take of threatened or endangered species under CESA
SWRCB	Change in Point of Diversion Permit	Water right permit for new point of diversion for new intakes
SWRCB	Section 401 Certification	Compliance with the state water quality laws and regulations
US Corp	Section 404 Permit	Permit for placement of fill in waters of the U.S. under the CWA
DSC	Consistency Certification	Appeal of Certification of Consistency with the Delta Plan

Metropolitan
Board Policies & Agreements

- Policies
  - Delta Action Plan Framework — Jun 2007
  - Delta Conveyance Criteria — Sep 2007
  - Delta Governance Principles — Aug 2008
  - Delta Vision Implementation — Jan 2009
  - Delta-Related Legislation — Apr 2009

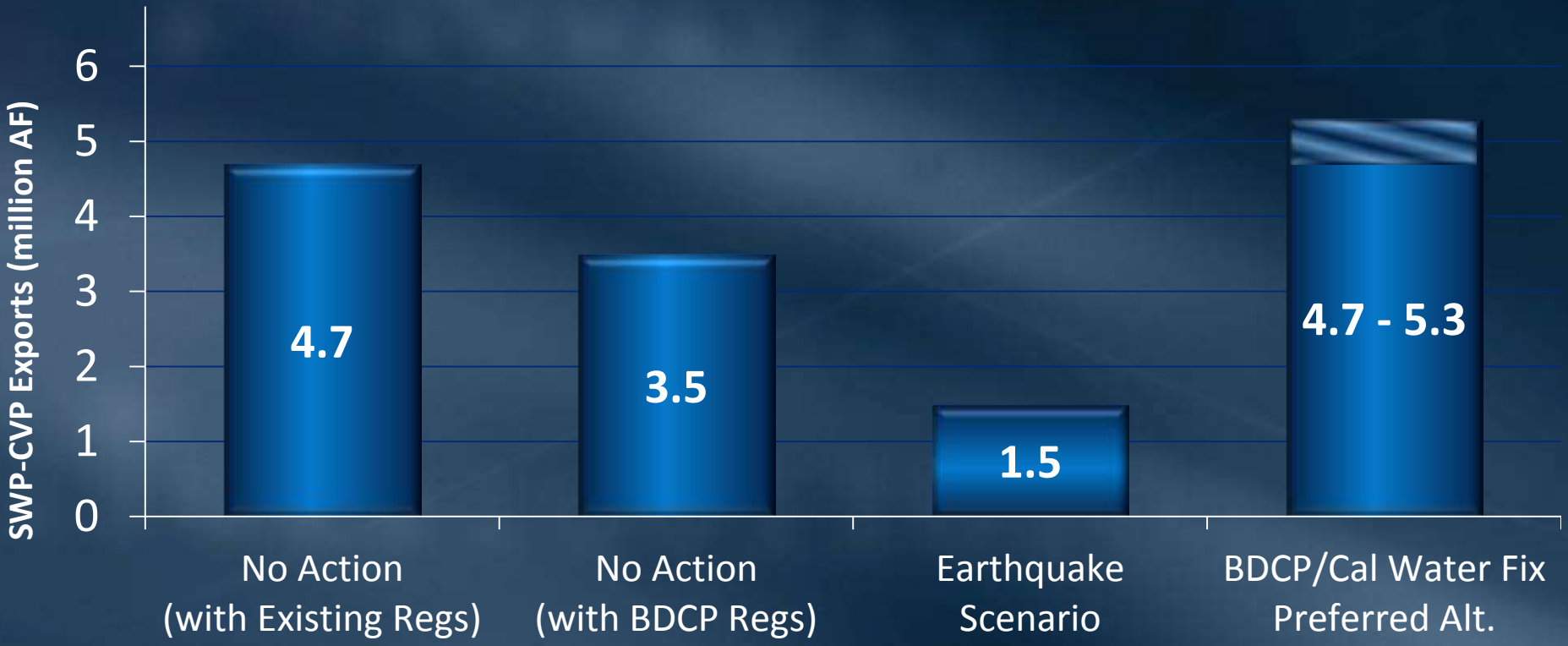
- Funding Agreements
  - Execution of Planning Agreement for BDCP — Oct 2006
  - Execution of BDCP Cost-Sharing Agreement — Nov 2006
  - Execution of Initial Funding Agreement — Dec 2008
  - Execution of Amendments to Planning Agmt — Dec 2009
  - Execution of Amendment (additional funds) — July 2010
  - Execution of Amendment to MOA — Aug 2011

Metropolitan Board Actions

Delta Conveyance Criteria (Sep 2007)

Enhance Ecosystem Fishery Habitat Throughout Delta	• Provide ability to restore fishery habitat throughout the Delta • Minimize disruption to tidal food web processes • Provide for fluctuating salinity levels
Allow Flexible Pumping Operations in a Dynamic Fishery Environment	• Allow the greatest flexibility in meeting water demands by taking water where and when it is least harmful to migrating salmon and in-Delta fish species • Reduce inherent conflict between fisheries & water conveyance
Provide Water Supply Reliability	• Consistent with DWR's State Water Project Reliability Report (2005)
Improve Export Water Quality	• Reduce bromide and dissolved organic carbon concentrations
Reduce Seismic Risks	• Provide significant reductions in risks to export water supplies from seismic-induced levee failure and flooding
Reduce Climate Change Risks	• Reduce long-term risks from salinity intrusion associated with rising sea levels • Intake locations should be able to withstand an estimated 1- to 3-foot sea-level rise in the next 100 years

State & Federal Project Supplies
Annual Average (in 2025)



Data based on hydrological period (1922-2003); indicates average annual SWP & CVP water supply exports with climate change in 2025

- *4.7 maf/yr – Existing Regulations (No Action Alternative) represents no new conveyance and no new/additional restrictions*
- *3.5 maf/yr – BDCP Proposed Regulations without Northern Intake (Existing Conditions High Outflow Scenario); BDCP Chapter 9*
- *1.5 maf/yr – Earthquake scenario BDCP Chapter 9; analyzed by Dr. David Sunding; minimal exports 1.5 to 3 years after earthquake*
- *4.7 – 5.3 maf/yr – NEW BDCP / Cal Water Fix Preferred Alternative (evaluated in Draft EIR/S as Alternative 4A H3-H4)*

Finance/Cost Allocation

California Water Fix
Revised Cost Analysis

IMPROVEMENTS	Capital	O&M (Total 50 Years)	TOTAL
Conveyance	$14.99 B	$1.46 B	$16.45 B
Mitigation, Monitoring	$0.56 to $0.82 B	$0.22 B	$0.78 to $1.04 B
TOTAL	**$15.55 to $15.81 billion**	**$1.68 billion**	**$17.23 to $17.49 billion**

Within $5 per household per month

Presented to Metropolitan's Board September 29, 2015

Estimated costs from DWR; in undiscounted 2014 dollars with a 36% contingency
Metropolitan's share is approximately 25%

16

California Water Fix
Estimated Cost Analysis

Capital Cost	
Land Acquisition	$0.12 billion
• **Land Acquisition contingency (20%)**	$0.02 billion
Subtotal Land Acquisition	**$0.14 billion**
Construction	$9.52 billion
• **Construction Contingency (36%)**	$3.41 billion
Subtotal Construction	**$12.93 billion**
Project, Construction Management and Design	$1.92 billion
TOTAL Capital (with $3.43 billion contingency)	**$14.99 billion**

California Water Fix
Estimated Cost Analysis

Mitigation	
Program Administration	$13 million
Mitigation	$395 million
Monitoring (terrestrial and aquatic)	$134 million
Property tax revenue replacement	$48 million
Contingency (35%)	$206 million
TOTAL (with & without contingency)	**$590 – 796 million**

Analysis from Cal Water Fix documents

Cost Allocation
Funding Agencies

Ecosystem Restoration

- State of California
- Federal Government

Conveyance & Mitigation

CVP/SWP Contractors

CVP Contractors

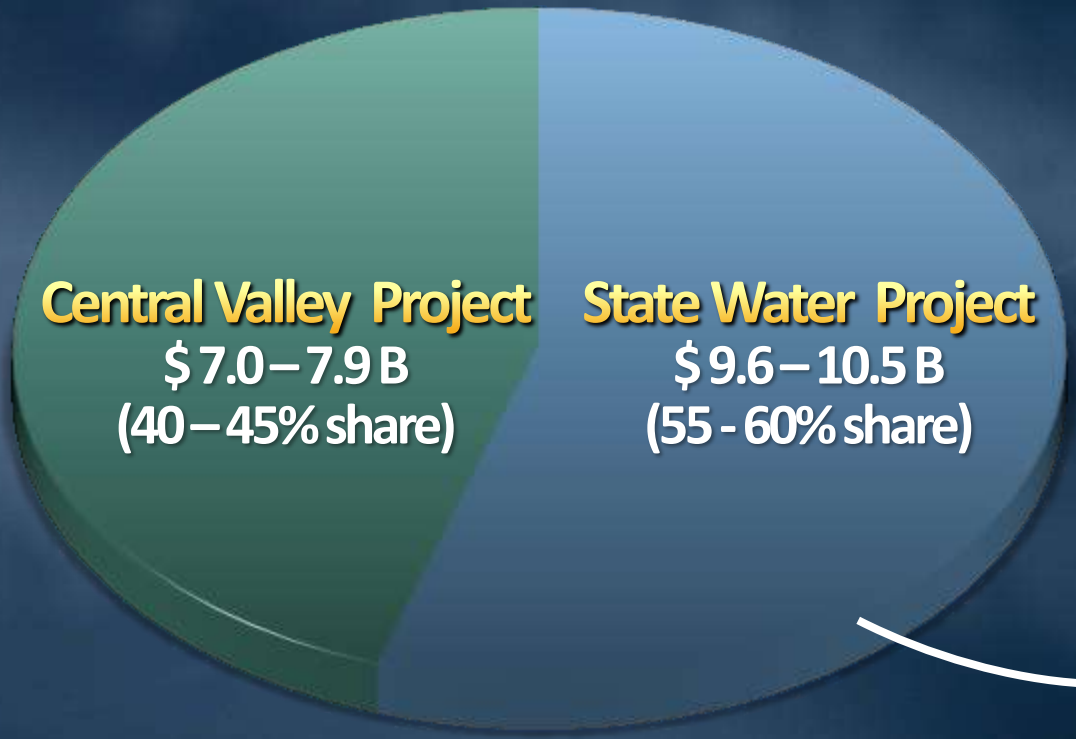
- Ag
- Urban
- Exchange
- Refuge
- Settlement

SWP Contractors

- Ag
- Urban

Central Valley Project / State Water Project

Estimated Costs & Split – Capital, O&M and Mitigation



Metropolitan Water District

$4.4 – 5.2 billion
$249 – 299 million/yr.
(25 – 30% share)

Based on 2015 assumptions

State Water Project
BDCP Cost Allocation Alternatives

- SWP Table 'A' Contract Approach
  - Participation based on existing Table 'A' contract amount
  - Payments based on fixed & variable water delivery costs
  - Additional provisions for water transfers
- Subscribed Capacity Approach
  - Participation based on desired capacity amount
  - Payments based on fixed & variable water delivery costs
  - Additional provisions for water transfers

MWD Expenditures on BDCP
Total (Jul 2005 – Sep 2015)

As reported to Board on October 27, 2015

BDCP – Internal MWD	**Total Costs (~10 yrs.)**
Labor & Benefits (1)	$ 20.91M
Professional Services	$ 4.15M
Travel	$ 1.03M
Other (2)	$ 0.14M
SUBTOTAL	**$ 26.23M**
Administrative Overhead	$ 7.97M
TOTAL	**$ 34.20M**

BDCP – Planning Cost by DWR	
BDCP/DHCCP	$ 63M

(1) Labor costs include salary, leave and non-leave benefits
(2) Other include charges for materials & supplies, trainings & seminars, conferences & meetings, and reprographics

Bay Delta Conservation Plan

Planning Agreement Payments (thru March 2016)

Funding Agreements	Total Project (in millions)		
	Budget	Incurred	Remaining
Dec 2008 – DHCCP Funding Agreement	$139.6	$139.6	$0
Jul 2010 – Supplemental Funding Agreement	$100.0	$100.0	$0
USBR Federal Funding Agreement	$ 5.7	$ 5.3	$.4
TOTAL	**$245.3**	**$244.9**	**$.4**

Metropolitan Total Share - $63 million

(1) *Prior to these funding agreements, an additional $13.5 million was expended under the November 2006 BDCP Cooperative Cost-Share Agreement for startup costs related to development and review of the BDCP and consulting resources necessary to prepare the BDCP.*

California Water Fix

2% Impact on Metropolitan Water Rates

- Rate impact for customers that are 50% reliant on MWD
  - 1.6% to 2% per year for 10 years
- Overall rate increase (with CA WaterFix)
  - ~ 3% to 5% per year

** Based on a 20 hundred cubic feet average water bill*

California Water Fix

2% Impact on Metropolitan Water Rates

- Rate Impact of Water Fix*
  - Annual increase of 1.6 to 2% per year for 10 years.
  -

Sales	$/AF
1.75 million AF	$142 to $171
2.00 million AF	$125 to $150

- Overall Rate Increase
  - When accounting for the cost of the Water Fix, MWD's overall rates are expected to increase 3% to 5% per year.

** Based on a Draft DWR Estimate*

California Water Fix

Protecting Metropolitan's Supplies

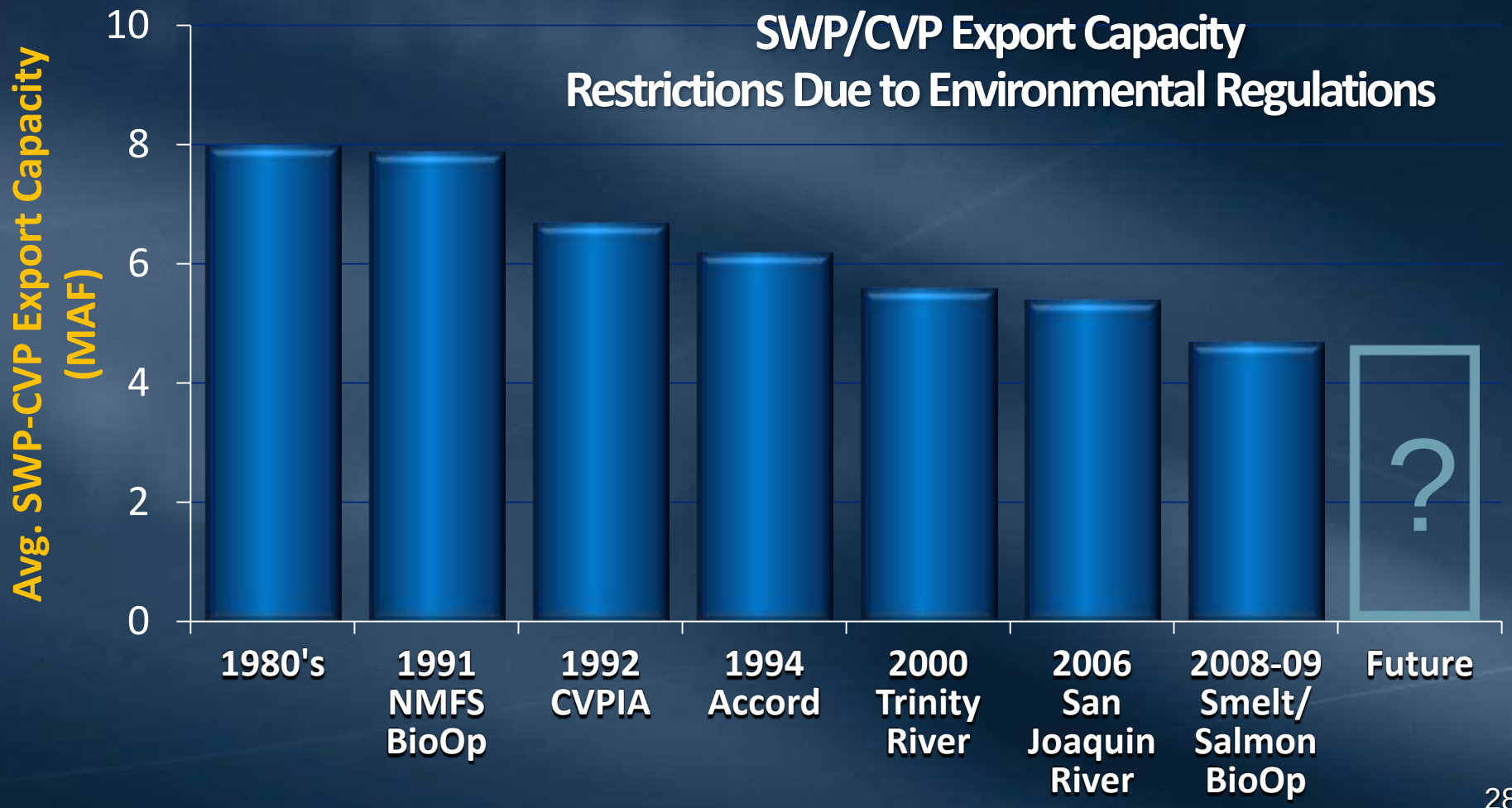
	Lower Yield	Higher Yield
MWD's SWP Improvement	302,000 af	453,000 af

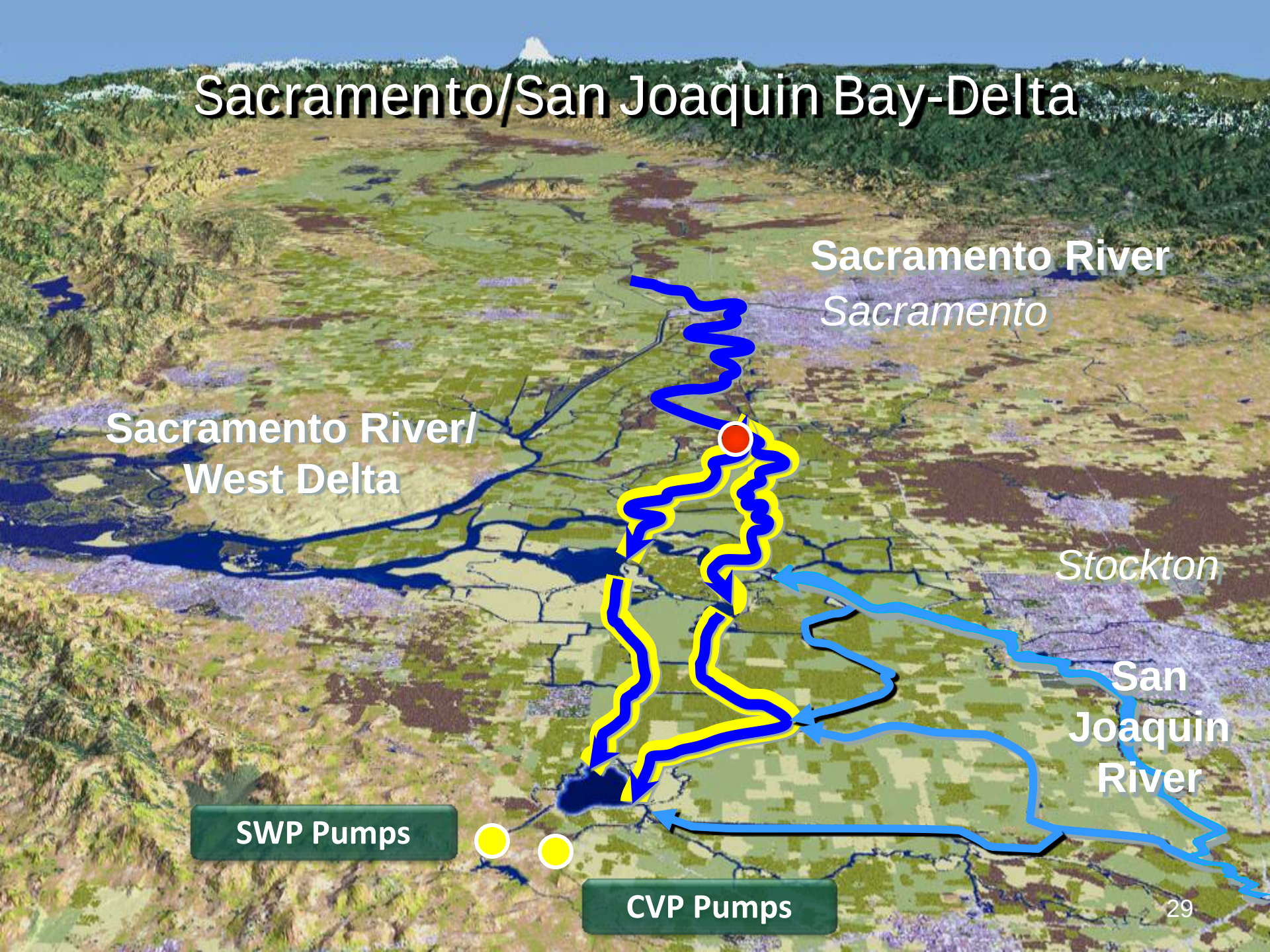
- *Water supply based on DWR CALSIM modeling of average Table A & incremental Cal Water Fix allocations*

Increasing Regulatory Trends

State & Federal Project Supplies

History of Regulatory Restrictions




Sacramento/San Joaquin Bay-Delta
Sacramento River
Sacramento
Sacramento River/
West Delta
Stockton
San
Joaquin
River
SWP Pumps
CVP Pumps

Delta Fisheries

Endangered Species Act Listings

Delta smelt

1993 – Threatened (CESA/FESA)

Chinook Salmon

1989 – Winter-Run: Endangered (CESA)
1990 – Winter-Run: Endangered (FESA)
1999 – Spring-Run: Threatened (CESA/FESA)

Steelhead

1998 – Threatened (FESA)
No CESA listing

Longfin smelt

2007 – Threatened (CESA)

Sacramento Splittail

1999 – Threatened (FESA)
2003 – FESA listing removed
No CESA listing

Green Sturgeon

2006 – Threatened (FESA)
No CESA listing

Improving Ecosystems through Adaptive Management

Impacts of Regulation
On California's Water Supply

Year	State/Federal Project Impacts
2008	655,000
2009	336,000
2010	1,080,000
2011	611,000
2012	634,000
2013	1,027,000
2014	65,000
2015	250,000
2016 *	503,000
TOTAL	**5.2 million AF**

** 2016 data thru March 3*

Bay Delta Conservation Plan

Collaborative Science & Adaptive Management

- Ongoing Collaborative Science
  - Two-tiered collaborate policy & technical team
  - Conducts joint research on key Delta fishery issues
  - Includes
    - United States Fish and Wildlife Service
    - National Marine Fisheries Service
    - California Department of Fish and Wildlife
    - United States Bureau of Reclamation
    - California Department of Water Resources
    - Environmental interests (NRDC, TNC, PCFFA and Water4Fish)
    - Non-Governmental Organizations
    - State and Federal water contractors

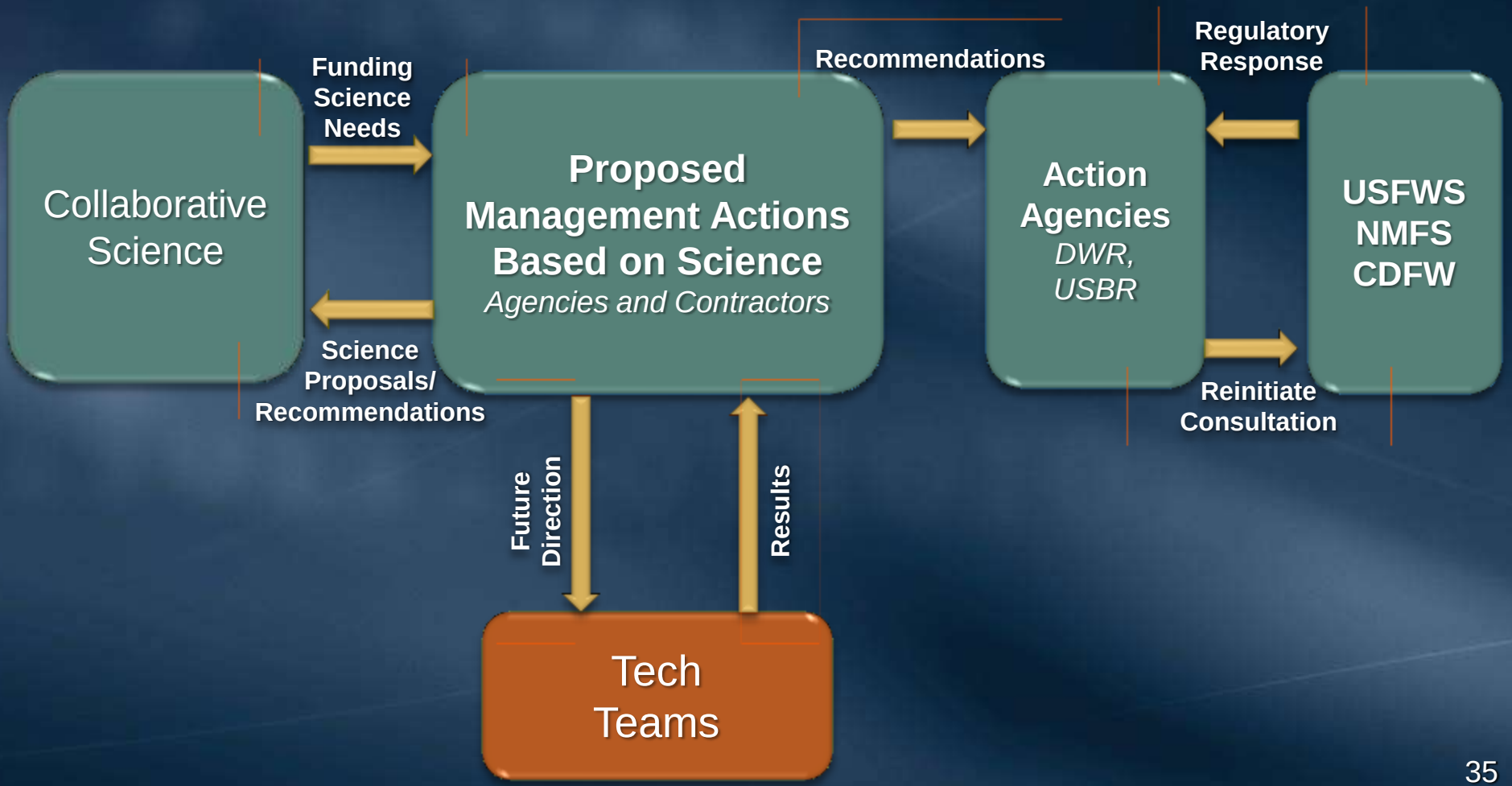
Bay Delta Conservation Plan

Collaborative Science & Adaptive Management

- Adaptive Management & Monitoring Plan
  - Mechanism to review and appropriately adjust existing and new operating requirements based on new scientific information and monitoring
  - Addresses gaps in knowledge
  - Demonstrate project avoids jeopardy to listed species

Adaptive Management

Conceptual Process



State Water Resources Control Board

Water Right Change Petition Process

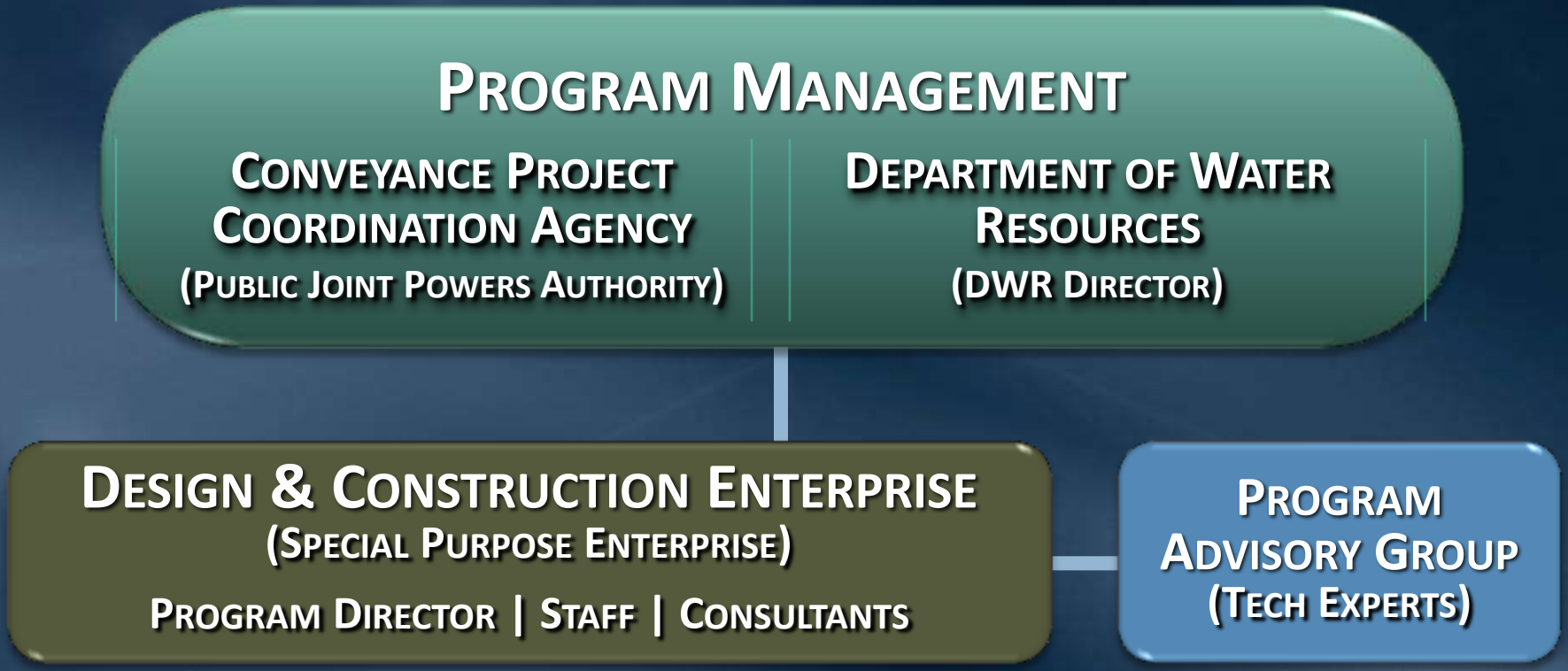
Adaptive Management

A Long-Term Science Program

- Management actions based on collaborative science
- Other Delta water agencies are taking similar approaches
  - Alternative intake locations
  - Adaptive management
  - Better science
- Metropolitan representation on both technical and policy teams to protect Metropolitan's interests
- Metropolitan has a recognized science program that contributes to decisions being made

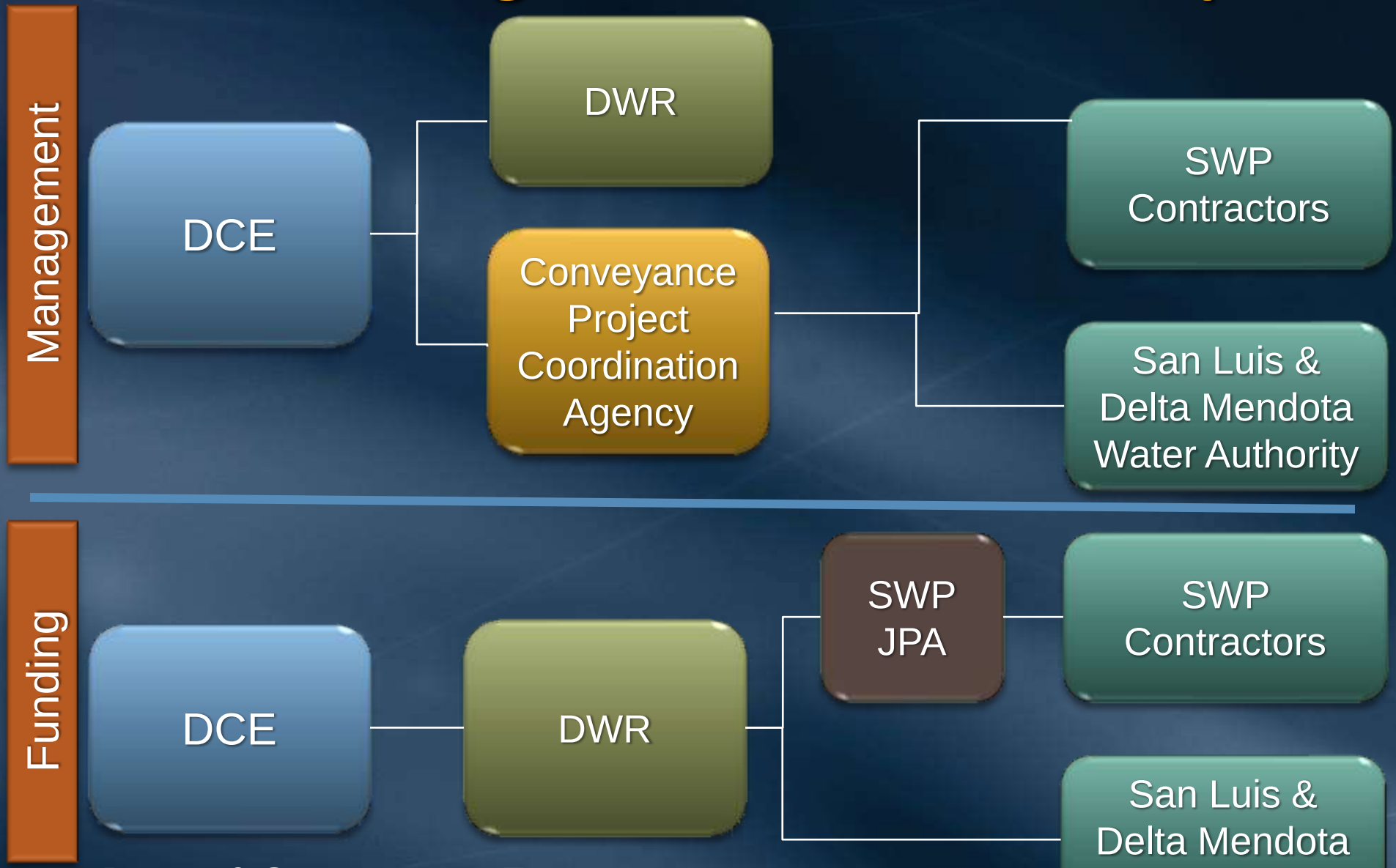
Cost and Schedule Management

Design & Construction Enterprise
Overview



The Director of the Department of Water Resources has the final decision making authority on all aspects of the design, construction and implementation of the Conveyance Project

Design & Construction Enterprise

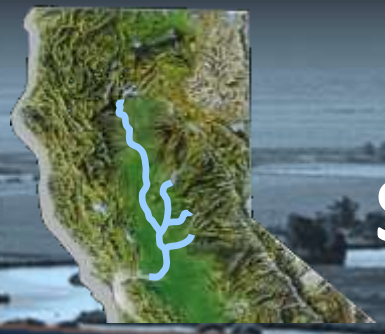


DESIGN & CONSTRUCTION ENTERPRISE
Special Purpose Enterprise within DWR dedicated to the design and construction of the conveyance Project

Cost and Schedule Control

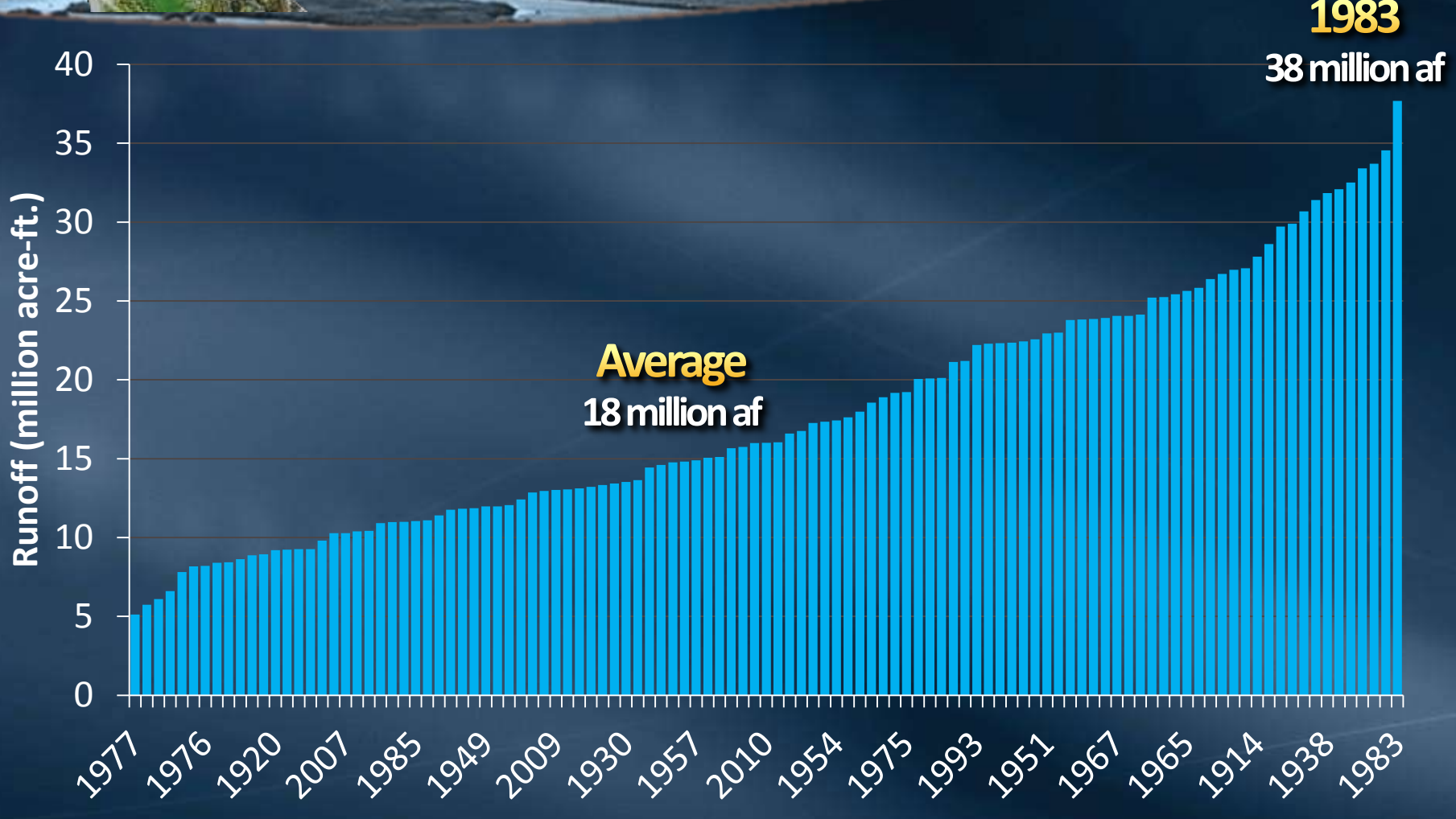
- Transparency
- Accountability
- Real-time reporting & updates
- Records management
- Oversight & independent audits

Supplies/Historic Runoff/ Storm Flows

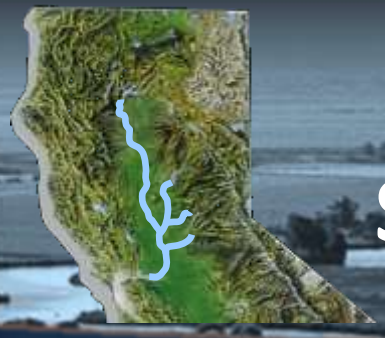


Excess Storm Flow Analysis

Sacramento Watershed Annual Runoff

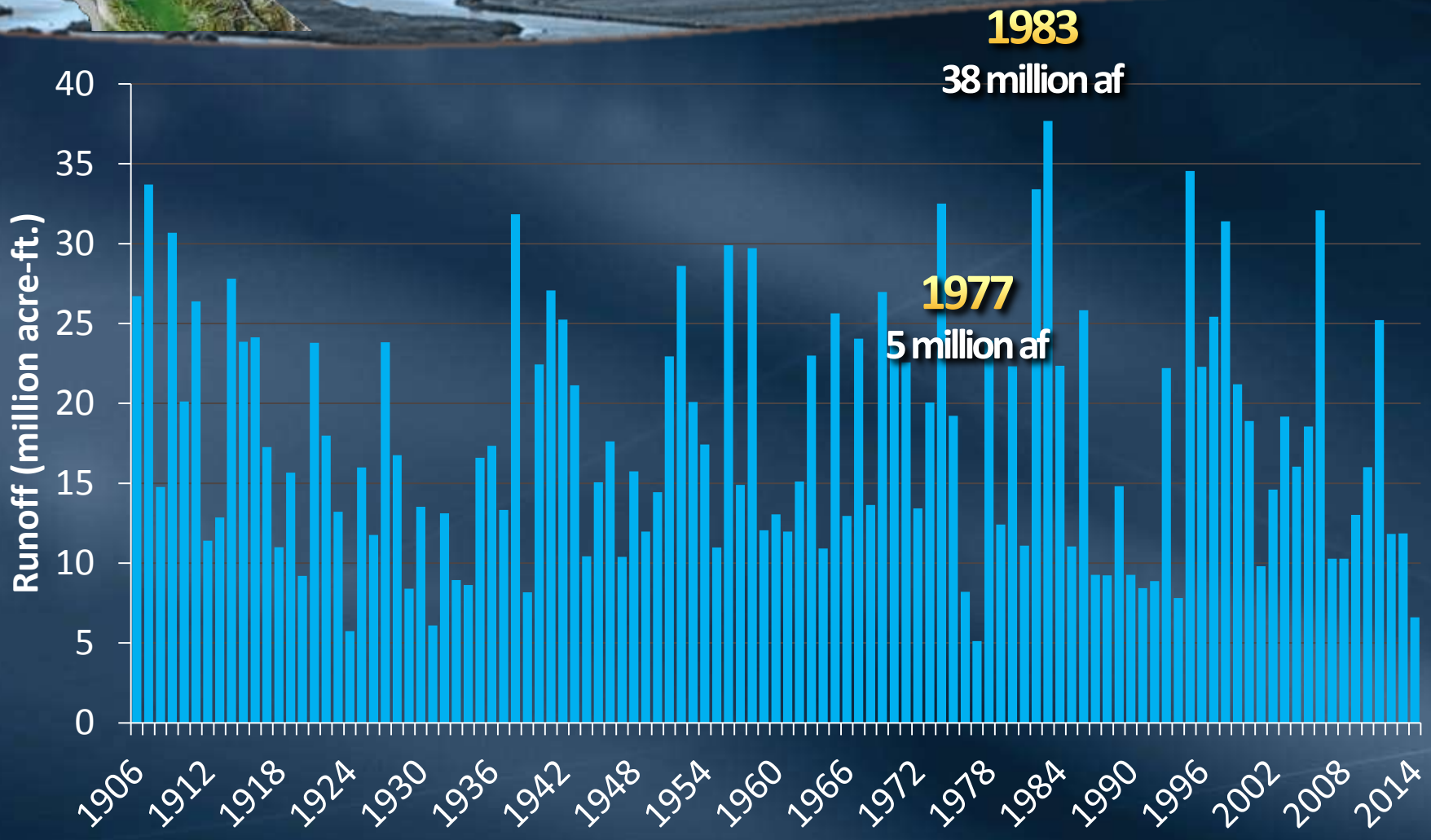


Sacramento Four Rivers Runoff (1906-2014 – Sacramento, Feather, Yuba, American)

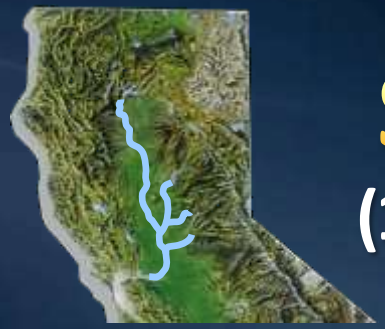


Excess Storm Flow Analysis

Sacramento Watershed Annual Runoff

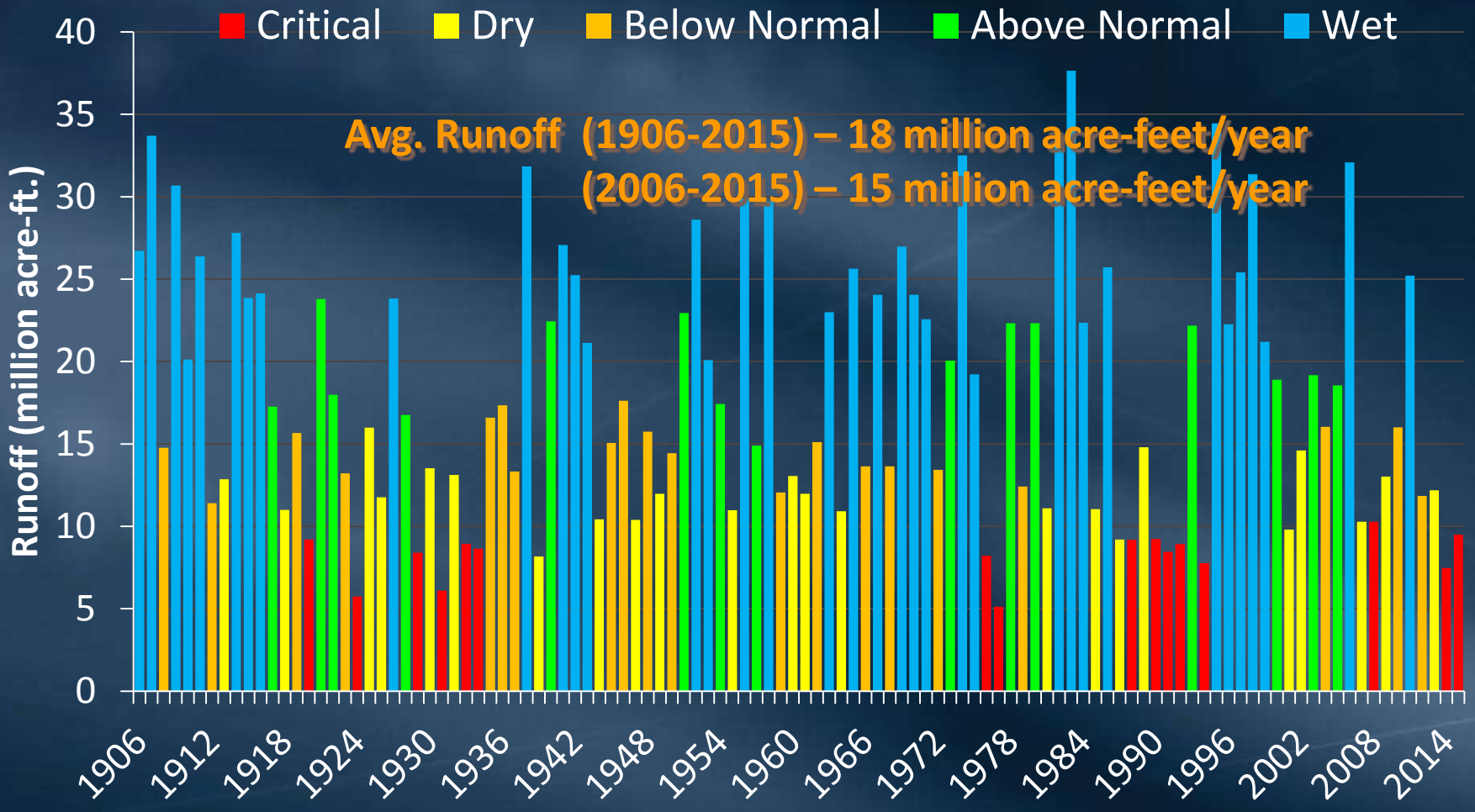


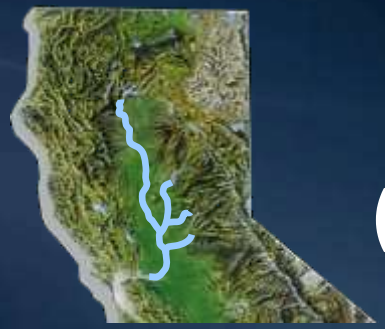
Sacramento Four Rivers Runoff (1906-2014 – Sacramento, Feather, Yuba, American)



Sacramento Four Rivers Runoff

(1906-2015 – Sacramento, Feather, Yuba, American)





Sacramento Four Rivers Runoff

(1906-2015 – Sacramento, Feather, Yuba, American)

Critical Dry Below Normal Above Normal Wet

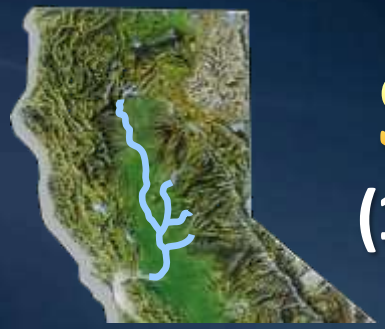
Updating

Runoff (million acre-ft.)

40 35 30 25 20 15 10 5 0

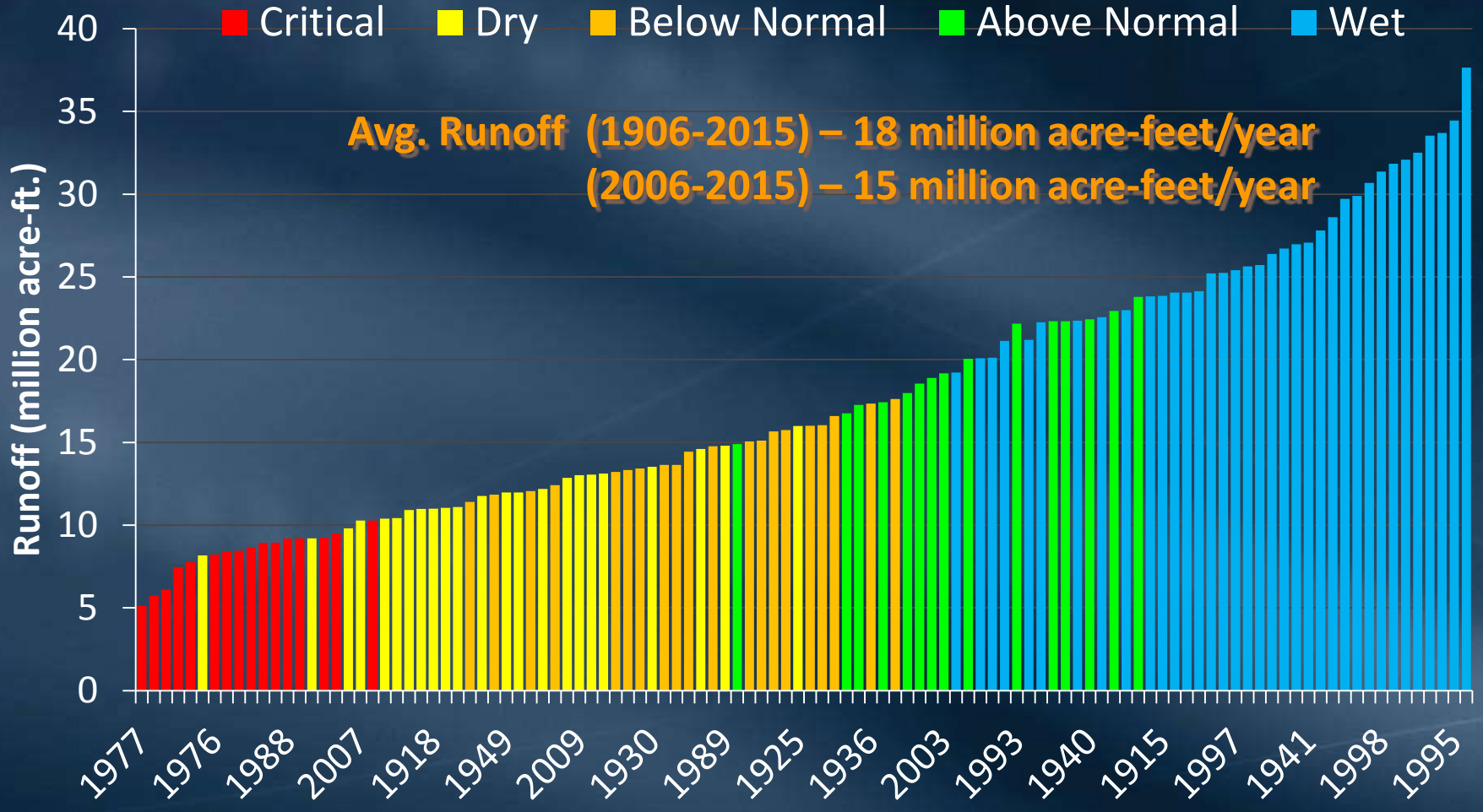
1906 1912 1918 1924 1930 1936 1942 1948 1954 1960 1966 1972 1978 1984 1990 1996 2002 2008 2014

	Period	Runoff (Avg.)
Full Record	1906 - 2015	18 million acre-ft.
Last 10 yrs	2006 - 2015	15 million acre-ft.
CalSim II Model	1922 - 2003	18 million acre-ft.
CalSim III Model	1922 - 2015	16 million acre-ft.



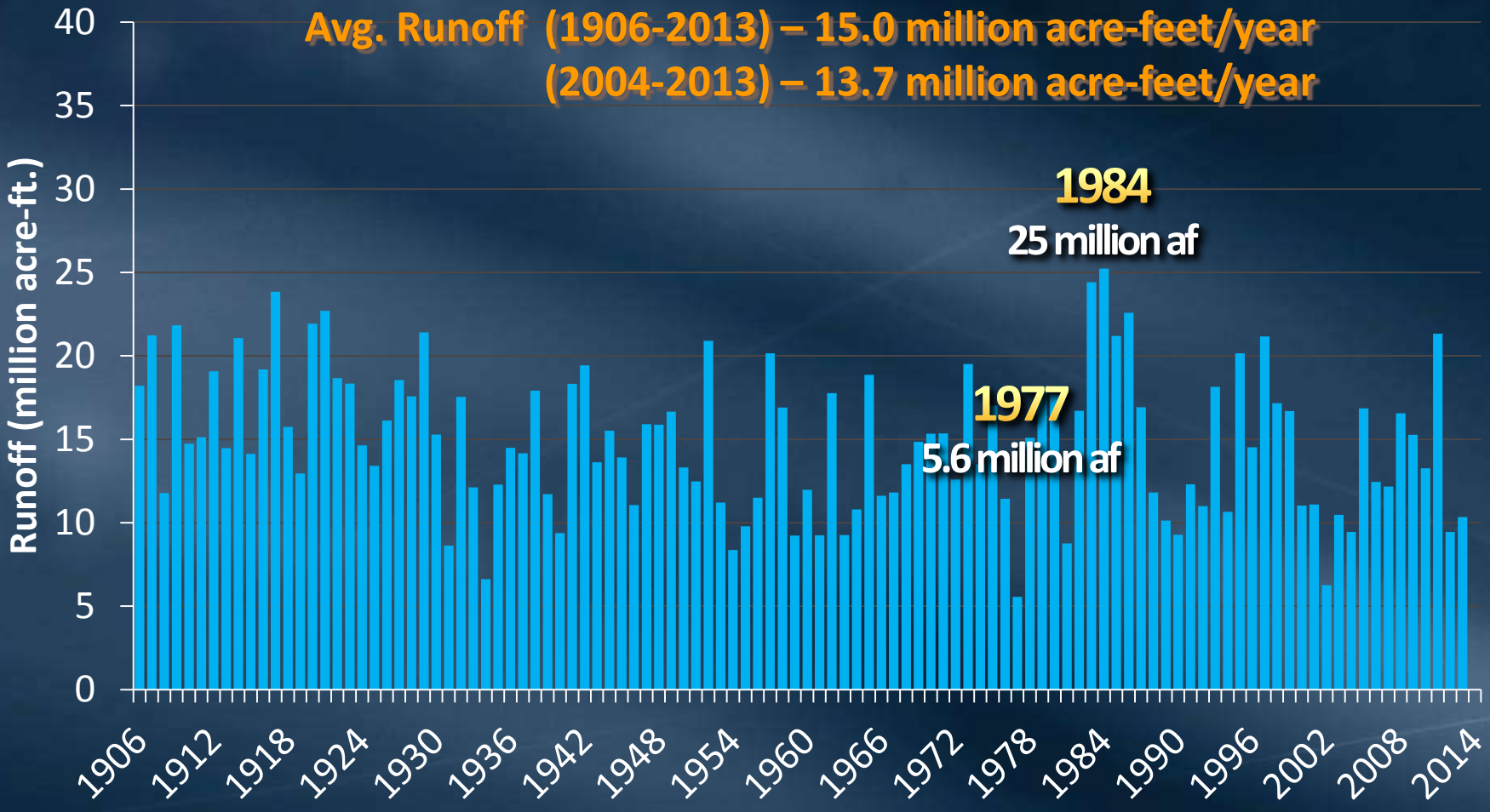
Sacramento Four Rivers Runoff

(1906-2015 – Sacramento, Feather, Yuba, American)



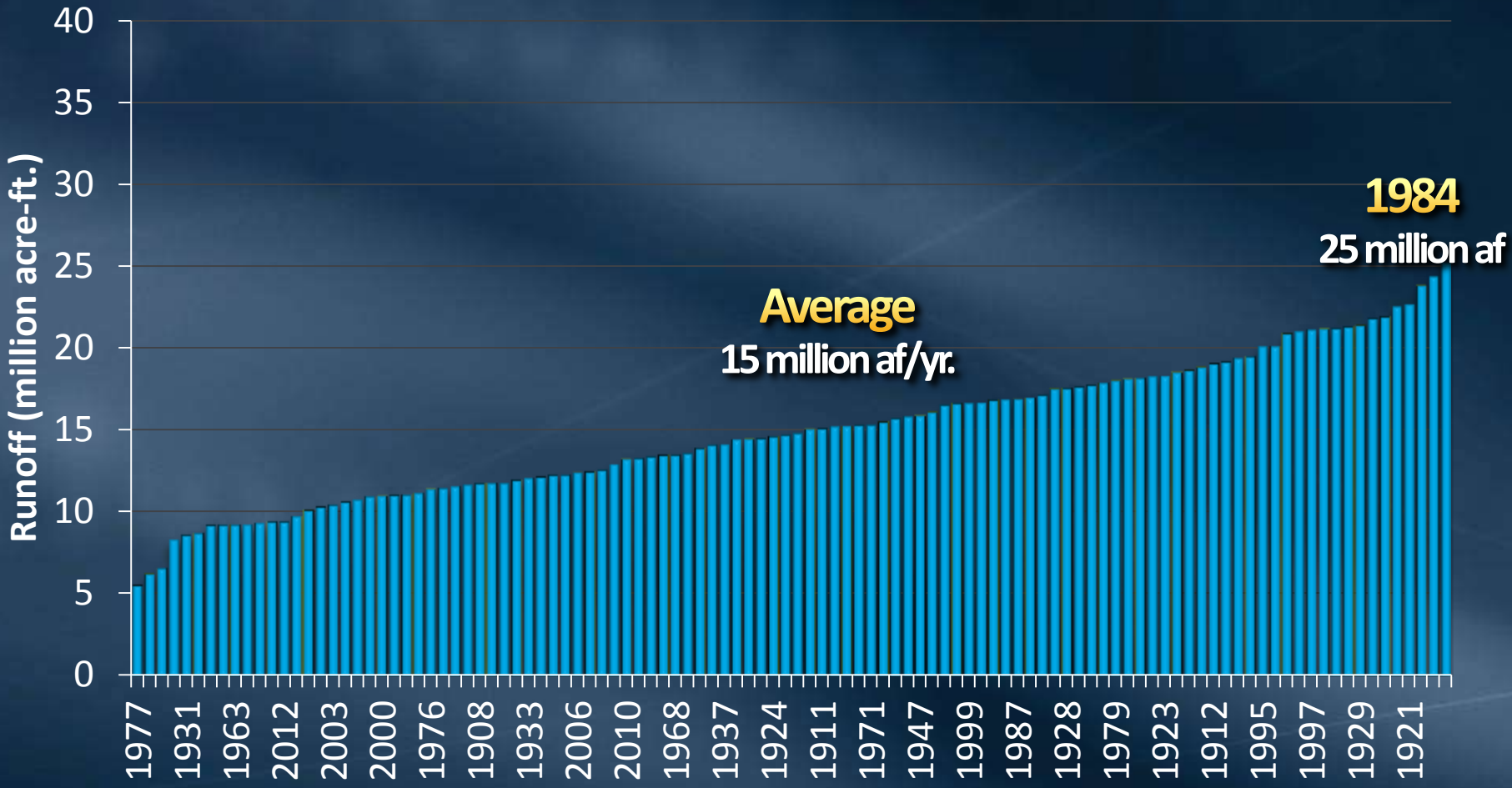
Colorado River Runoff

(1906-2013 – Green, San Juan, Gila, Gunnison Rivers)



Colorado River Runoff

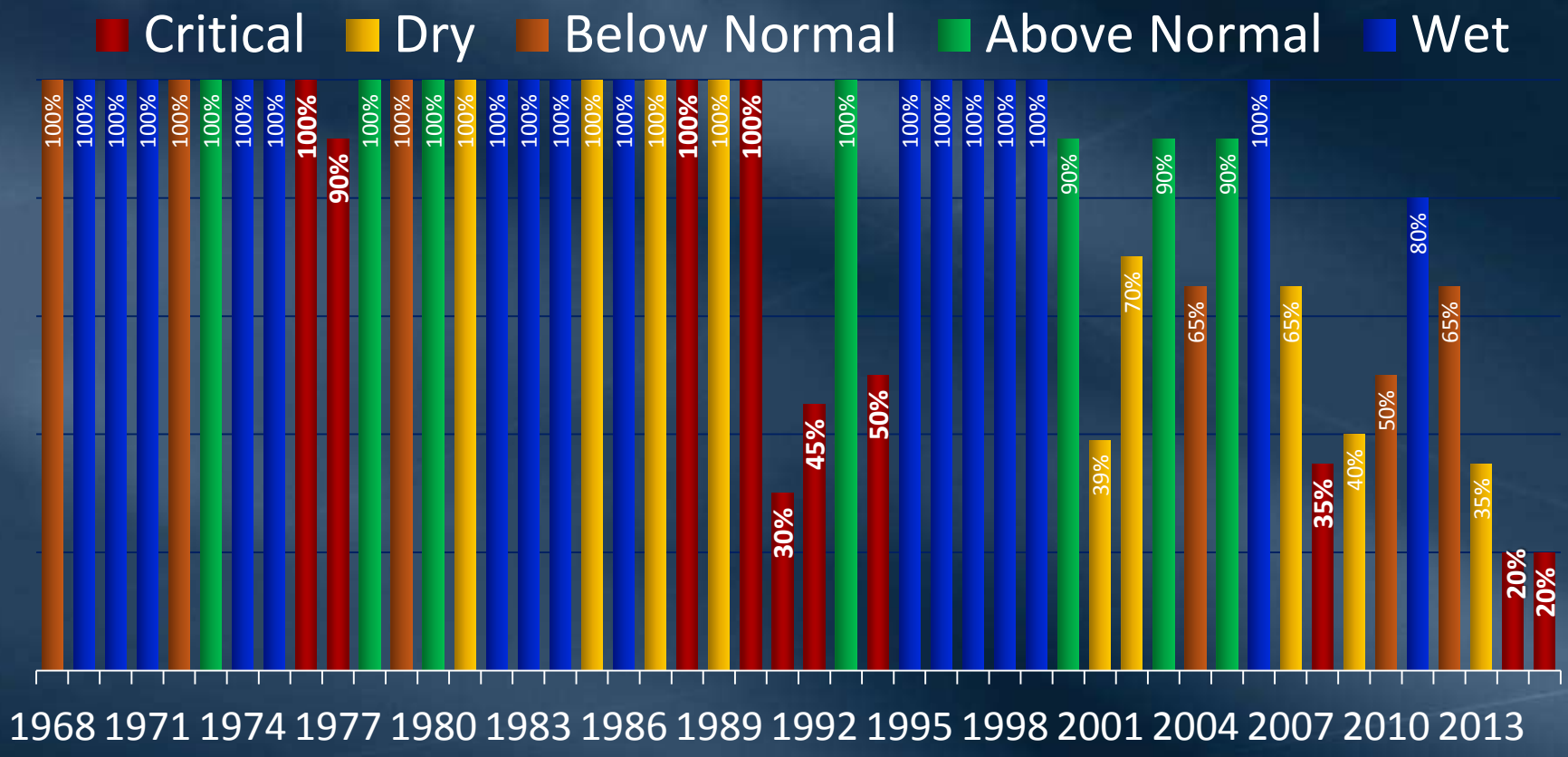
(1906-2013 – Green, San Juan, Gila, Gunnison Rivers)



Avg. Runoff – 15 million af/yr (1906-2013); 13.7 million af/yr. (2004-2013)

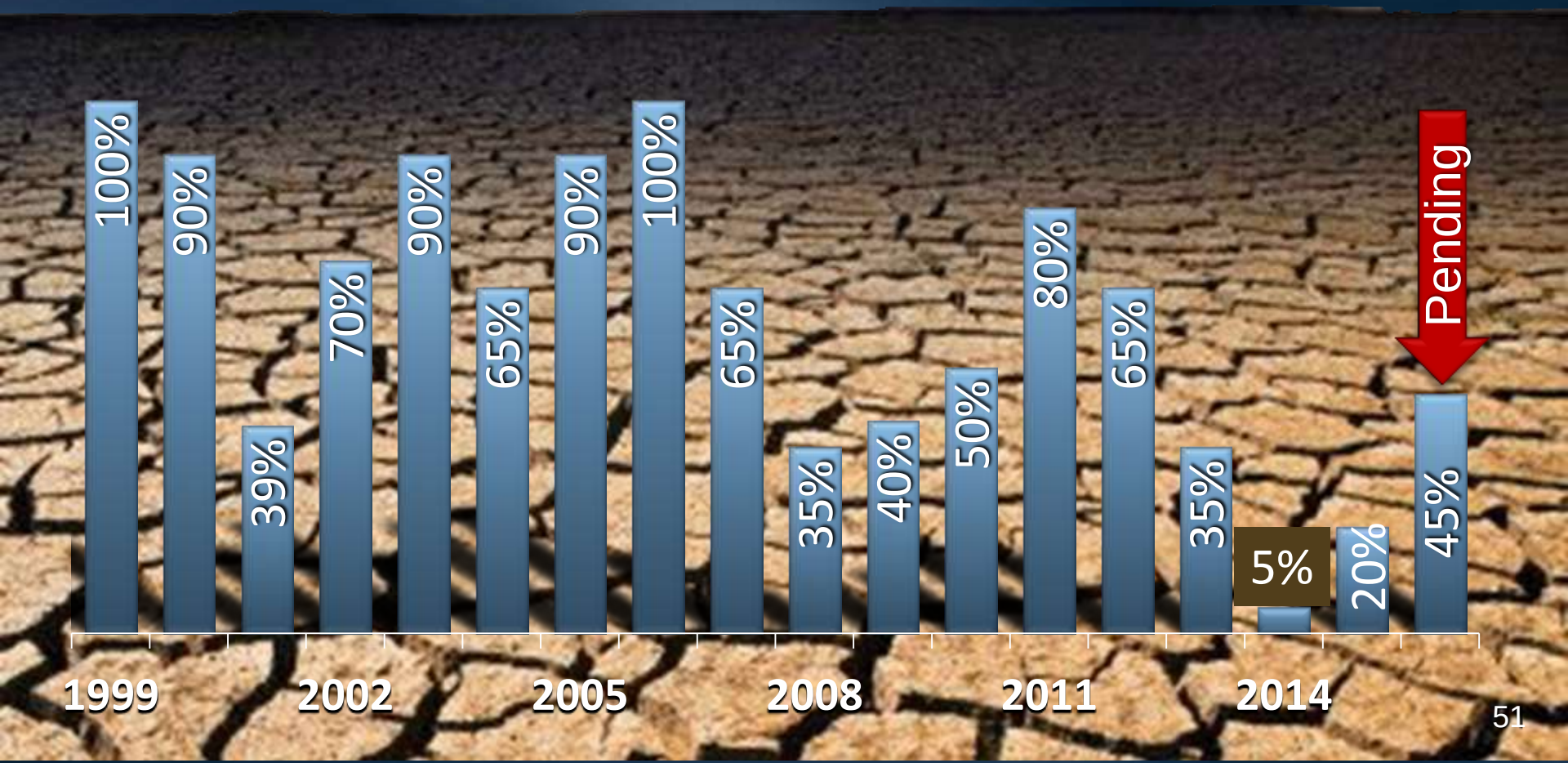
State Water Project

Water Allocation



State Water Project

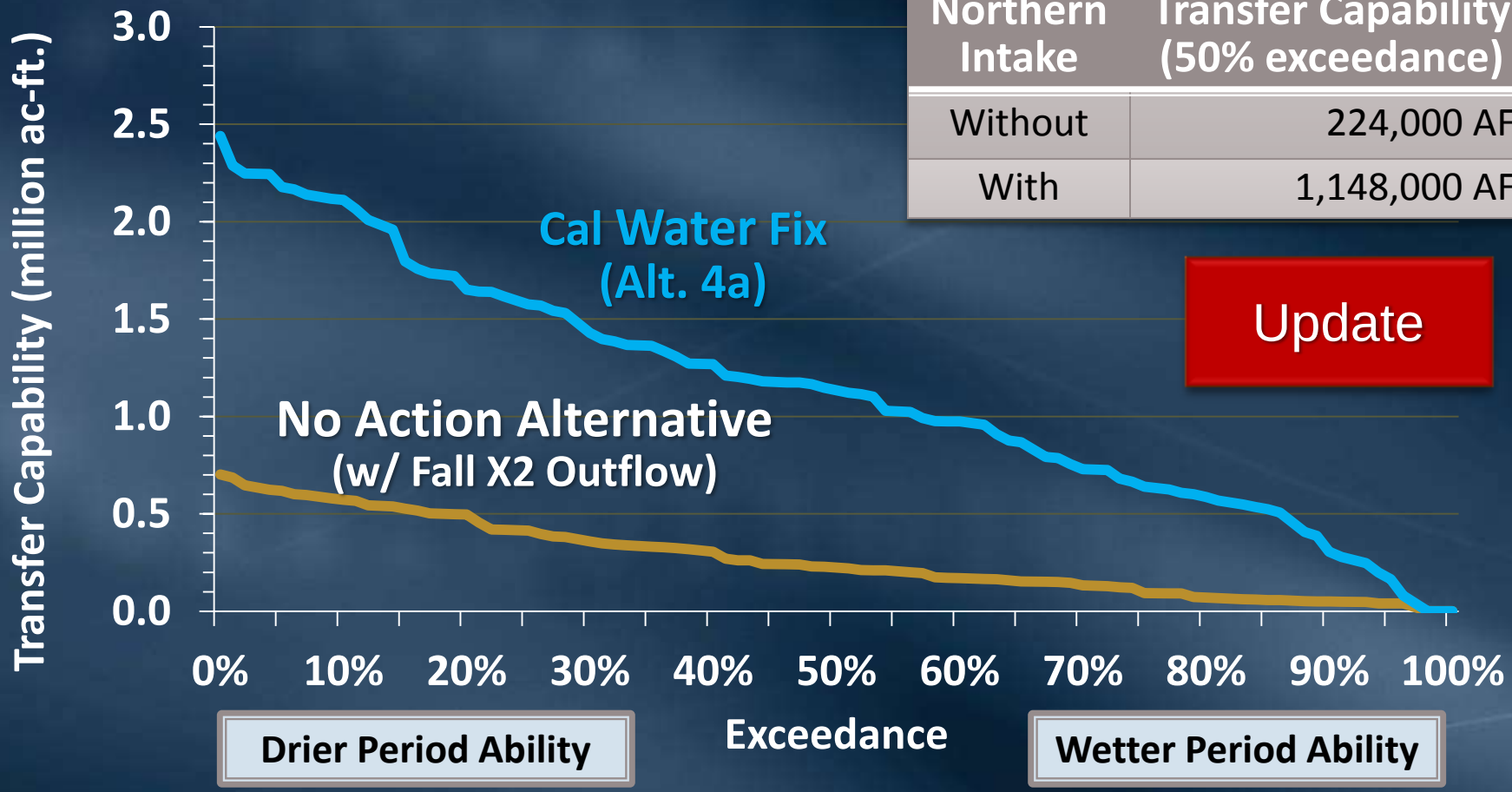
Water Allocation



State & Federal Project Supplies
Water Transfer Capability

Northern Intake	Transfer Capability (50% exceedance)
Without	224,000 AF
With	1,148,000 AF

Update



- *Data represents modeled transfer capability; Seller willingness & actual deliveries not represented*
- *Preliminary State Water Contractor analysis - Subject to Revision*

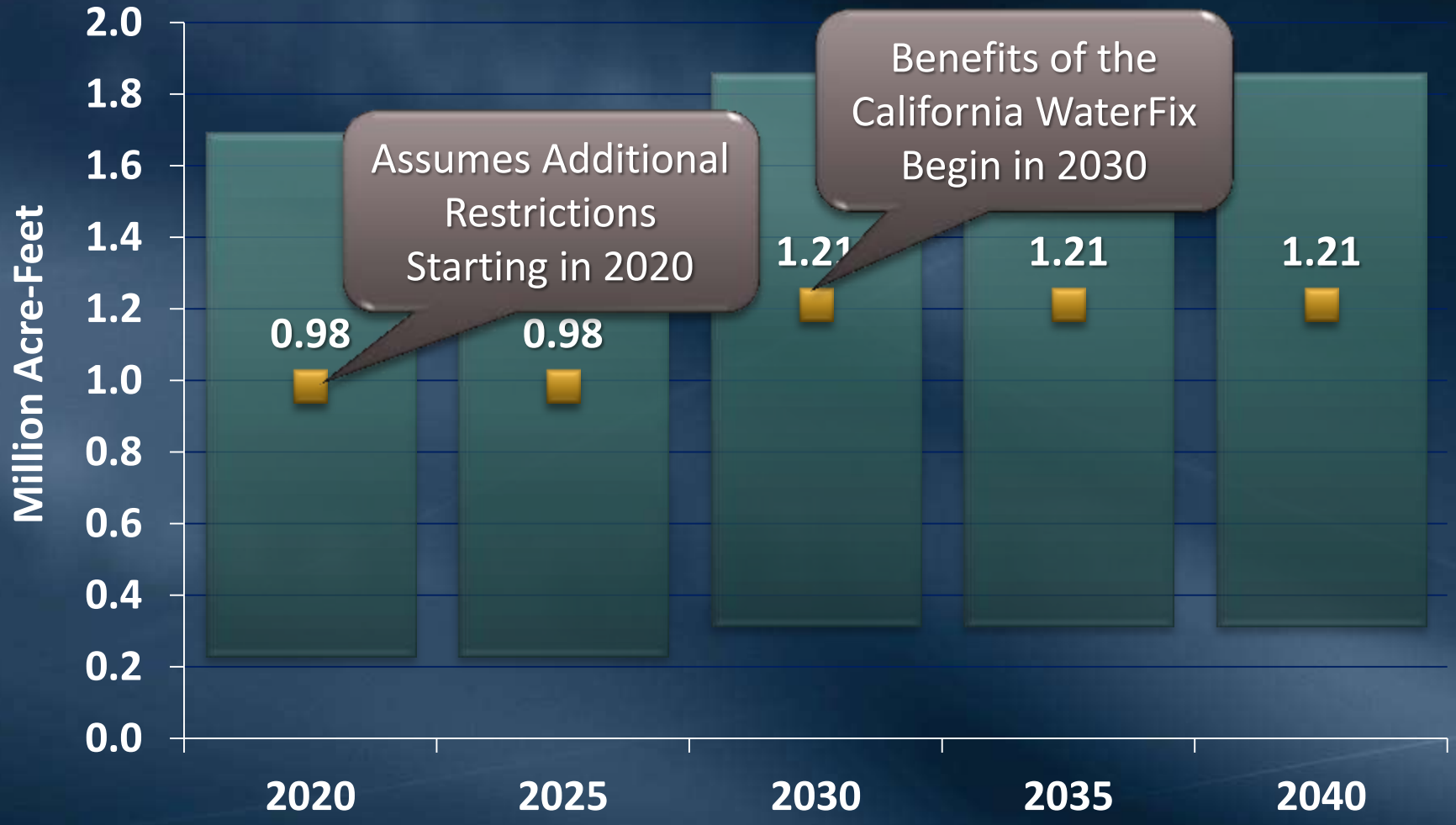
CA Water Fix and the IRP

IRP Technical Approach
State Water Project

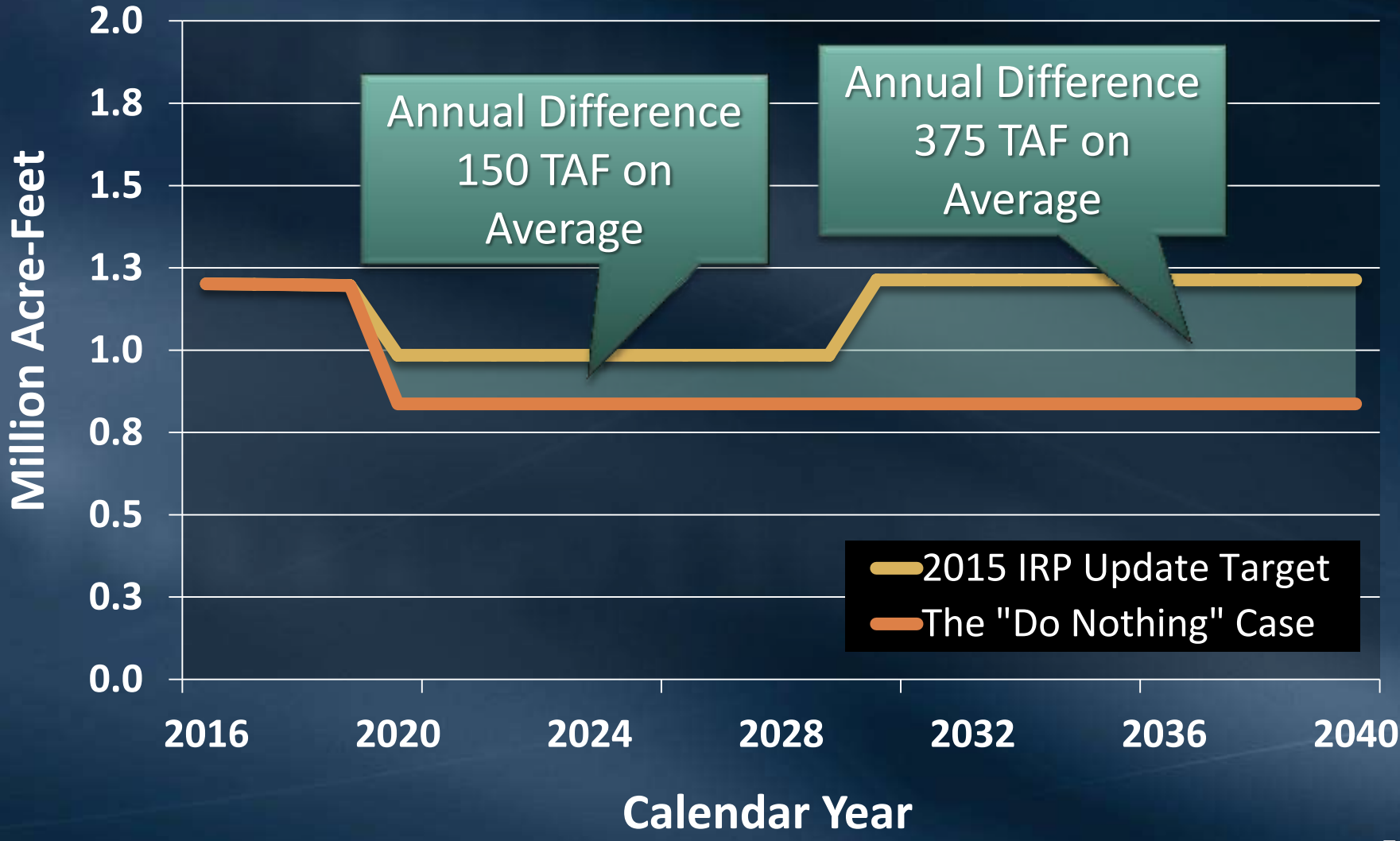
- Manage flow and export regulations in the near-term
  - Continue to engage in collaborative science-based approaches
- Pursue a long-term Delta solution
  - Continue active participation in the California WaterFix and the California EcoRestore efforts

2015 IRP Update Target – SWP

Table A + Article 21 Supplies

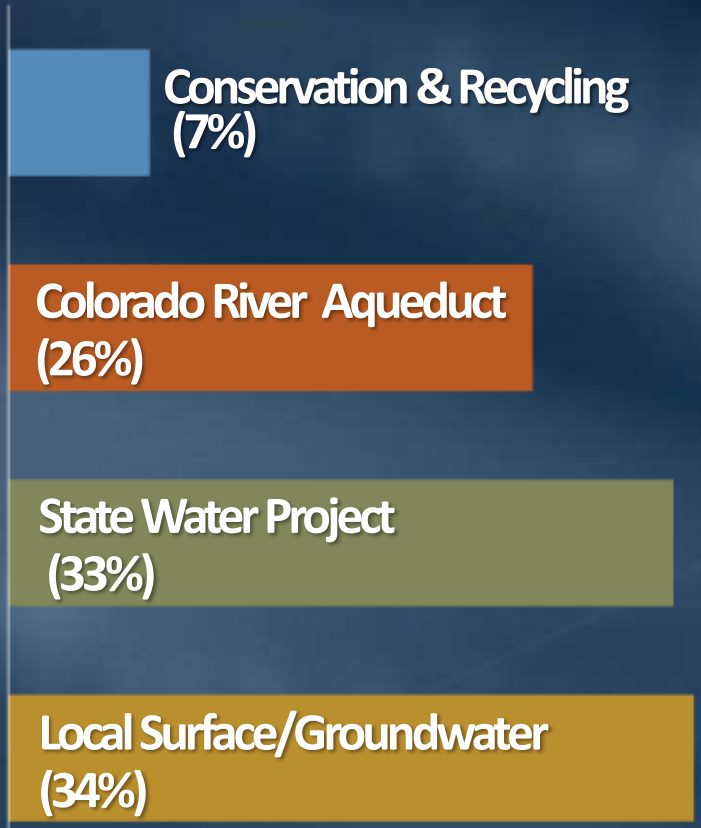


How Does the IRP Perform without the California WaterFix?



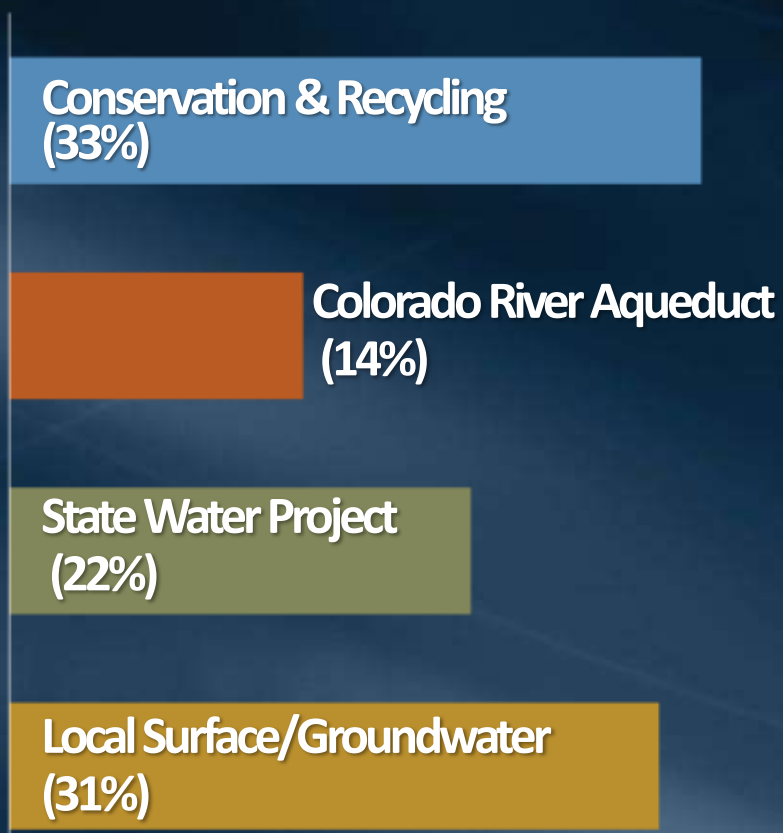
MWD Water Resource Strategy

Supply/Demand Management–1990 vs. 2035



1990 – 41% Local

Heavy dependence on imported supplies

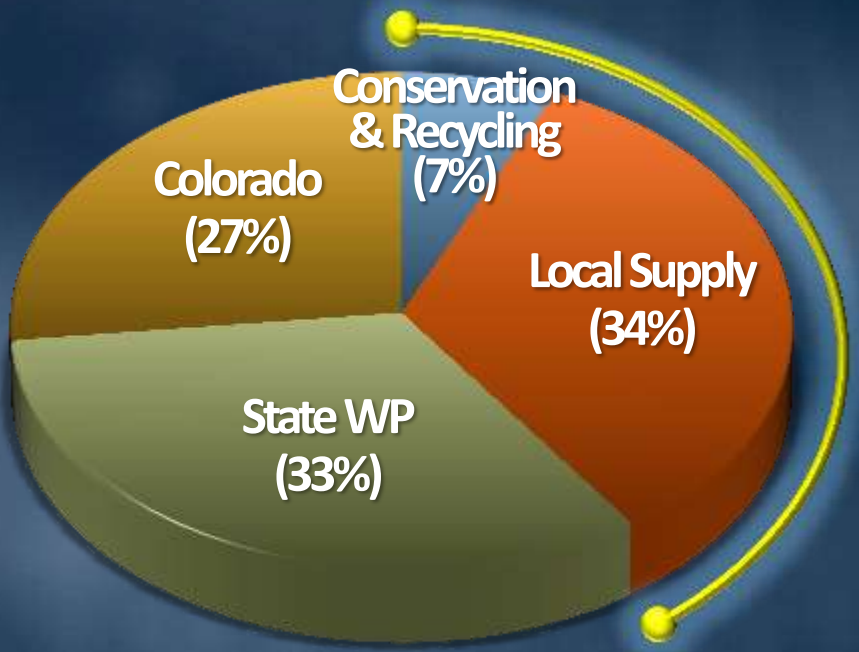


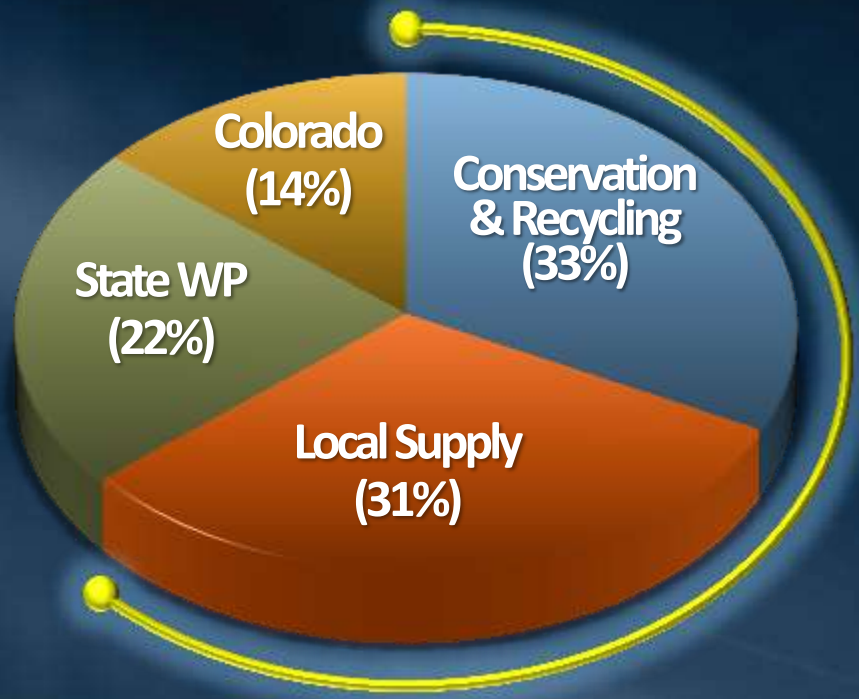
2035 – 64% Local

Emphasis on conservation, recycling, desalination and local supplies

Diversification of Water Portfolio

Average Year





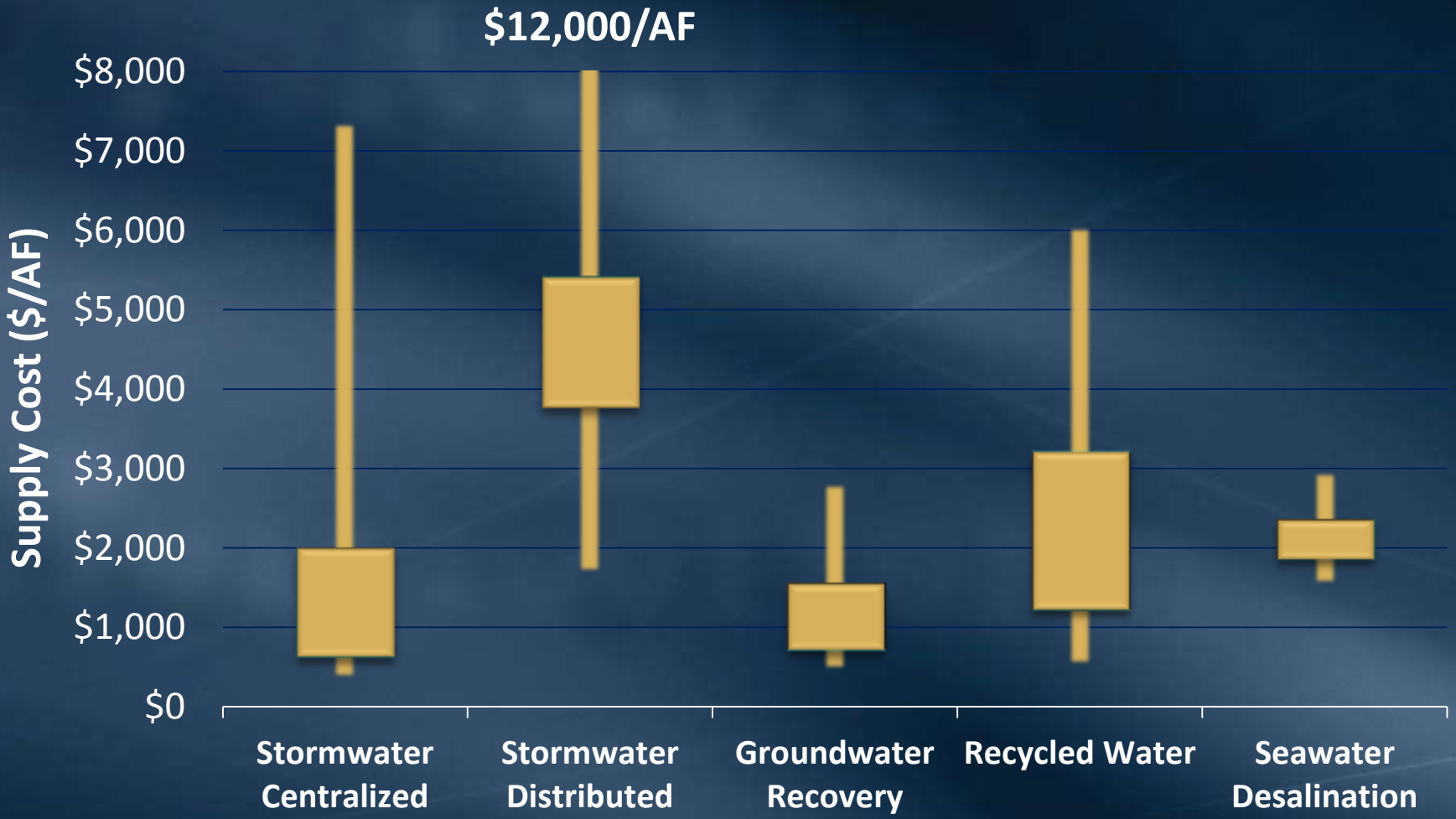
1990 – 41% Local

Heavy dependence on imported supplies

2035 – 64% Local

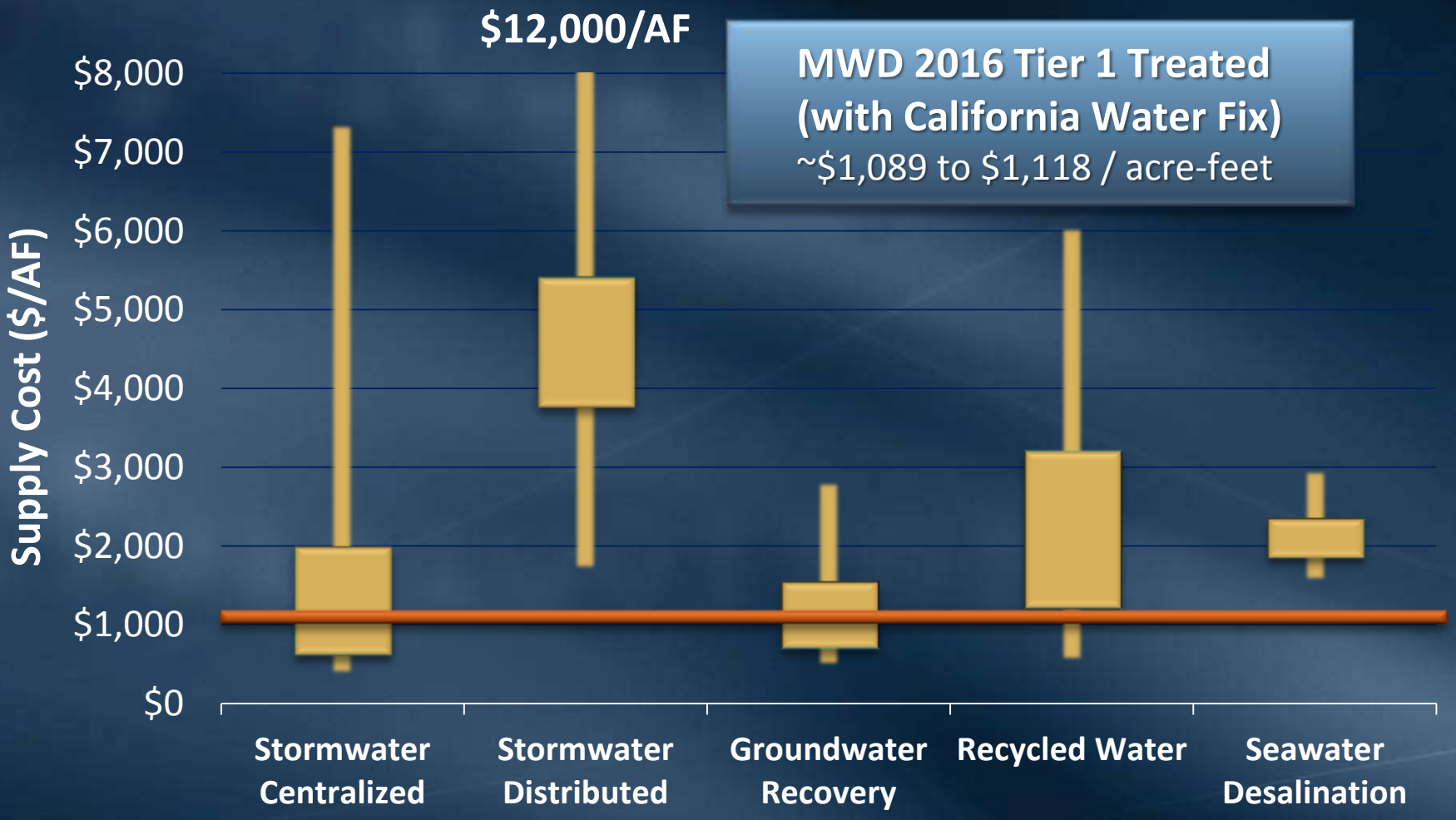
Emphasis on conservation, recycling, local supplies, and transfers

Future Resource Development Costs



** 2015 IRP Update local supply cost analysis as of November 2015, in 2015 dollars*

Future Resource Development Costs



** 2015 IRP Update local supply cost analysis as of November 2015, in 2015 dollars*

California Water Fix

Retail Impact – Household Water Costs

Future Supply Improvements	Monthly Impact Per Household
Desalination Focus	$11 / month
Recycling Focus	$7 to 11 / month
Diversified Portfolio (with Cal Water Fix)	Up to $5/month

Checking with RJ

20 HCF and 50% MWD
Based on analysis completed during IRP process
A diversified portfolio approach strives to meet future supply improvement needs with a cost-effective and reliable mix of local (conservation, recycling, groundwater improvement, desalination), transfers, and imported supplies.

California Water Fix

Examples of Alternative Resource Costs

- Recycled Water (Existing)
  - Edward C. Little Water Recycling Facility [1]
    - $1,739 /AF
  - Orange County Groundwater Replenishment System [2]
    - $887/AF
  - Local Resources Program (average of projects) [3]
    - $2,240/AF
- Recycled Water (Future)
  - San Diego Pure Water Project [4]
    - $1,975/AF to $2,375/AF

1. *Project unit cost from the Local Resources Program FY13/14 reconciliation; grants included in cost*
2. *FY09-10 overall project gross unit cost from the GWRS website*
3. *Weighted average unit cost from the Local Resources Program FY13/14 reconciliation*
4. *Unit costs in 2011 dollars and before grants or netting out avoided costs (from the June 14, 2012, SDCWA Board presentation)*

California Water Fix

Examples of Alternative Resource Costs

- Seawater Desalination
  - Carlsbad Desalination Project [1]
    - $2,367/AF
- Groundwater Recovery
  - Local Resources Program (average of projects) [2]
    - $1,157/AF

1. *Estimated unit cost from the June 9, 2012, SDCWA Board presentation*
2. *Weighted average unit cost from the Local Resources Program FY13/14 reconciliation*

California WaterFix allows MWD blending goals to be met

MWD SWP Supplies	Blending
Existing (Avg. Yr.)	Met
BDCP Preferred Alt	Met
Delta No Fix (Avg. Yr.)	Sometimes
Delta No Fix (Below Normal)	Rarely

Summary

- Cal Water Fix is less costly than shortages or other alternatives
- The do nothing approach is not sustainable
- With Cal Water Fix, rate impacts will be less than other resource alternatives and households will spend less

EcoRestore

California EcoRestore Projects

Estimated Acreage

- SWP/CVP Bio Op Mandates (25,000 acres)
  - Floodplain Restoration 17,000 ac
  - Tidal Habitat 8,000 ac
- State Proposition 1 Grants (5,000 acres)
  - Floodplain Restoration 500 ac
  - Managed Wetlands 3,500 ac
  - Tidal Habitat 1,000 ac

California EcoRestore Projects

Estimated Acreage

- SWP/CVP Bio Op Mandates (25,000 acres)
  - Floodplain Restoration (17,000 ac) ~$719 M
  - Tidal Habitat (8,000 ac) ~$235 M
- State Proposition 1 Grants (5,000 acres)
  - Floodplain Restoration (500 ac) ~$21 M
  - Managed Wetlands (3,500 ac) ~$40 M
  - Tidal Habitat (1,000 ac) ~$29 M

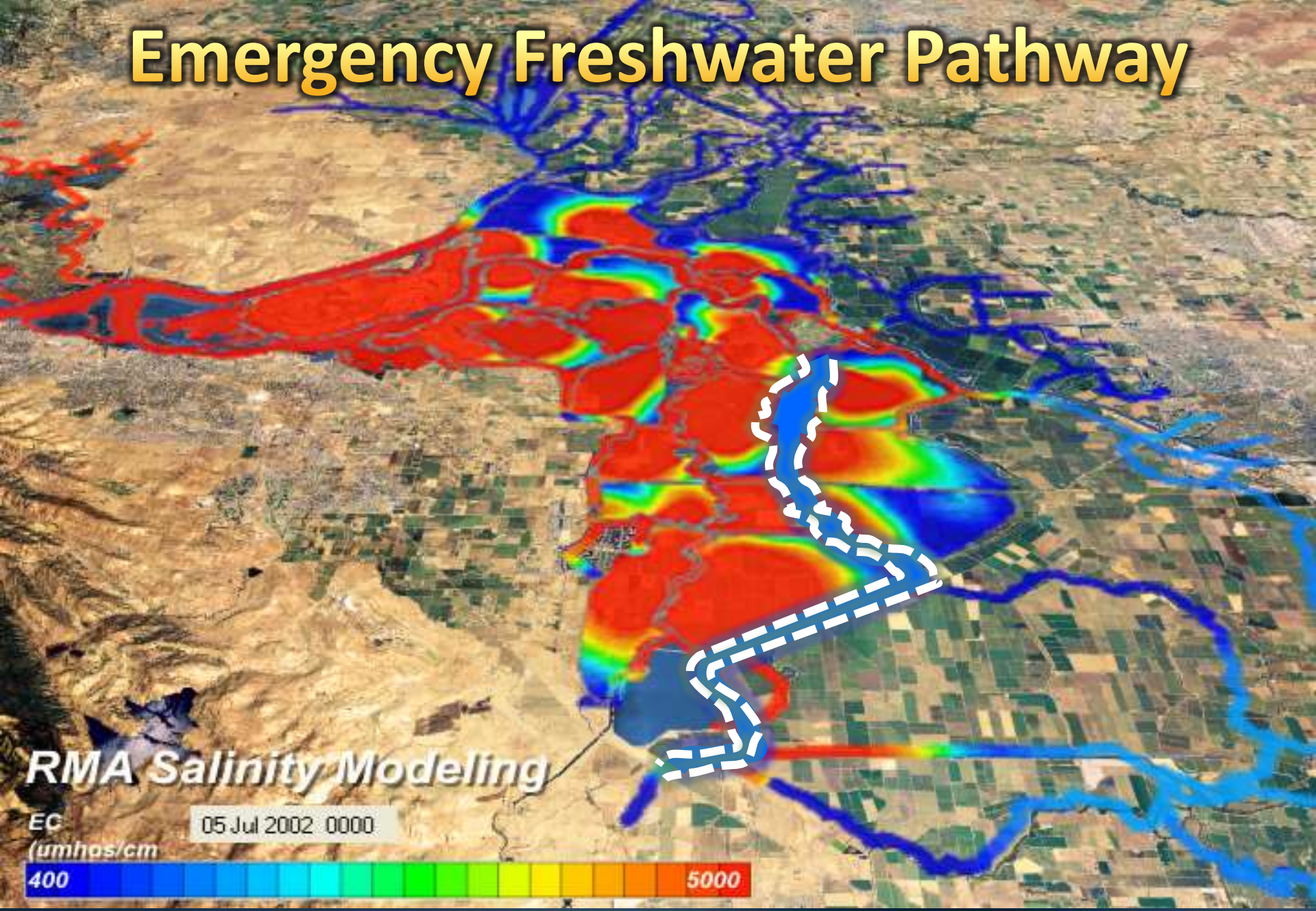
Delta Emergency Preparedness Plan and Progress

Overview of Plan Status

- Planning Schedule
  - Interim Plan – 2007
  - Draft Plan – 2014
  - Final Plan – 2017
- Implementation Schedule
  - Initial concepts (2006-08)
  - Place initial rock stockpiles (2007-08)
  - DWR Emergency Plan w/Corps (2008-13)
  - DWR additional stockpiles (2015-17)
  - RDs construct pathway levee improvements (2011-16)




Emergency Freshwater Pathway

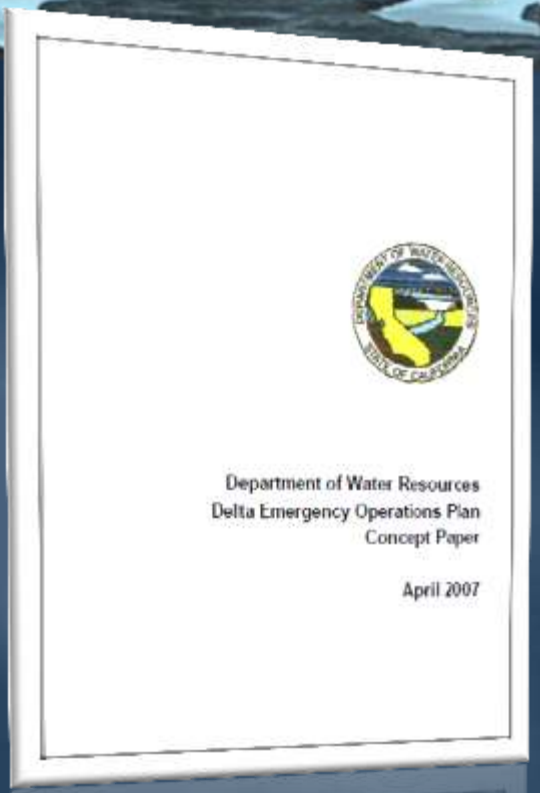


Freshwater Pathway

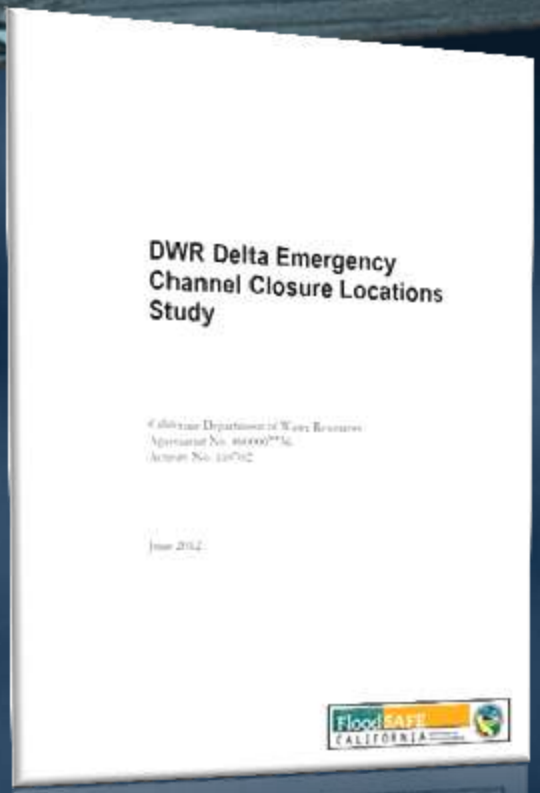
Status

- Improvements meet seismic preparedness needs
- Improvements ongoing
- Improvements needed

DWR Emergency Management Reports



Released: April 2007



Released: June 2012

Released: April 2014

Delta Flood Emergency Management

- Coordinated Cal OES, USACE, DWR, County and local response
  - Integral to Cal OES Northern CA Catastrophic Flood Management Plan
  - Memorandum of Agreement synthesizes DWR/USACE operations
- Pathway developed if island flooding and salinity intrusion is extensive
  - Restores exports by repairing levees and constructing channel barriers along Middle River

Policies/Processes

Metropolitan
Board Policies & Agreements

- Policies
  - Delta Action Plan Framework — Jun 2007
  - Delta Conveyance Criteria — Sep 2007
  - Delta Governance Principles — Aug 2008
  - Delta Vision Implementation — Jan 2009
  - Delta-Related Legislation — Apr 2009

- Funding Agreements
  - Execution of Planning Agreement for BDCP — Oct 2006
  - Execution of BDCP Cost-Sharing Agreement — Nov 2006
  - Execution of Initial Funding Agreement — Dec 2008
  - Execution of Amendments to Planning Agmt — Dec 2009
  - Execution of Amendment (additional funds) — July 2010
  - Execution of Amendment to MOA — Aug 2011

Metropolitan Board Actions

Delta Conveyance Criteria (Sep 2007)

Enhance Ecosystem Fishery Habitat Throughout Delta	• Provide ability to restore fishery habitat throughout the Delta • Minimize disruption to tidal food web processes • Provide for fluctuating salinity levels
Allow Flexible Pumping Operations in a Dynamic Fishery Environment	• Allow the greatest flexibility in meeting water demands by taking water where and when it is least harmful to migrating salmon and in-Delta fish species • Reduce inherent conflict between fisheries & water conveyance
Provide Water Supply Reliability	• Consistent with DWR's State Water Project Reliability Report (2005)
Improve Export Water Quality	• Reduce bromide and dissolved organic carbon concentrations
Reduce Seismic Risks	• Provide significant reductions in risks to export water supplies from seismic-induced levee failure and flooding
Reduce Climate Change Risks	• Reduce long-term risks from salinity intrusion associated with rising sea levels • Intake locations should be able to withstand an estimated 1- to 3-foot sea-level rise in the next 100 years

California WaterFix
Summary of Planning Process

2006 – 2009
- BDCP Stakeholder Steering Committee formed
- Planning Agreement signed
- Alternative scoping, modeling, environmental analysis, etc.

2010 – 2011
- 1st Administrative Draft BDCP released to the public
- Admin Draft EIR/S Chapters posted online

2012
- 2nd Administrative Draft BDCP released to the public

2013 - 2014
- First Public Draft EIR/S & Draft BDCP released to the public
- 228 day comment period (Dec 13, 2013 – Jul 29, 2014)

2015
- Partially Recirculated DEIR & Supplemental DEIS released
- 112 day comment period (July 10 – October 30, 2015)

Diverse Alternatives Analyzed

1930-50s	• Various seawater barriers (Biemond Plan, Reber Plan, etc.)
1960-70s	• Chipps Island barrier • Peripheral canal (21,800 cfs) • Through-Delta
1980s	• Peripheral canal + SB200 • Duke's Ditch (Through-Delta)
1990-2000s	• South & North Delta Programs • Bay Delta Accord • CALFED Plan (~ 19 alternatives, storage, etc.) • Post-CALFED Thru-Delta focus (>26 alternatives)
Recent	• BDCP - Multiple Initially Screened & 16 EIR/S Alts

Water Quality

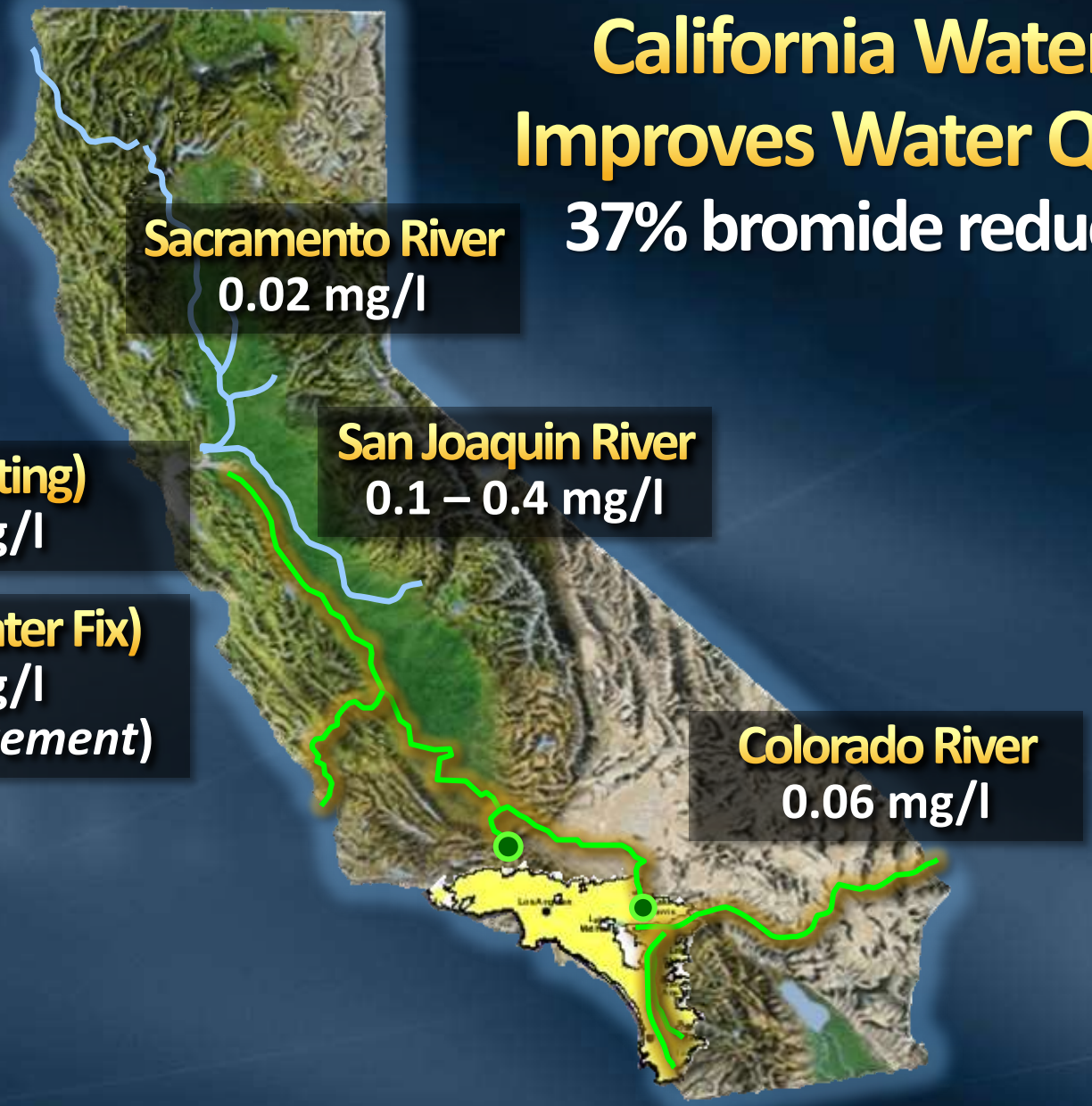
California WaterFix Improves Water Quality

27% salinity reduction

- *Sacramento, San Joaquin & Colorado River water quality represents historical average annual recorded data*
- *State Water Project water quality is a comparison of modeled data from the Recirculated Draft EIR/EIS*

California WaterFix Improves Water Quality

37% bromide reduction



- *Sacramento, San Joaquin & Colorado River water quality represents historical average annual recorded data*
- *State Water Project water quality is a comparison of modeled data from the Recirculated Draft EIR/EIS*

California WaterFix allows MWD blending goals to be met

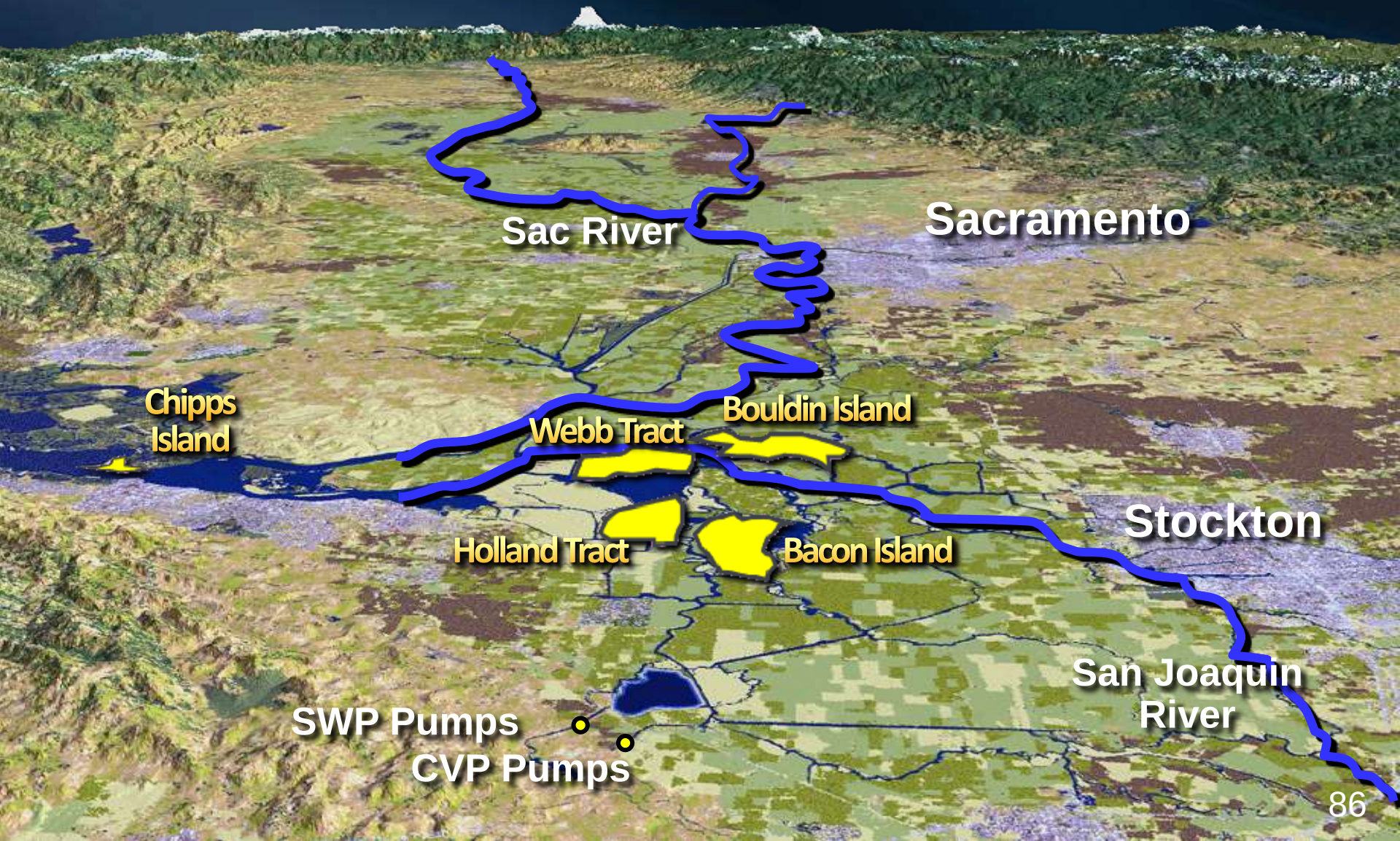
MWD SWP Supplies	Blending
Existing (Avg. Yr.)	Met
BDCP Preferred Alt	Met
Delta No Fix (Avg. Yr.)	Sometimes
Delta No Fix (Below Normal)	Rarely

California WaterFix is important for groundwater storage

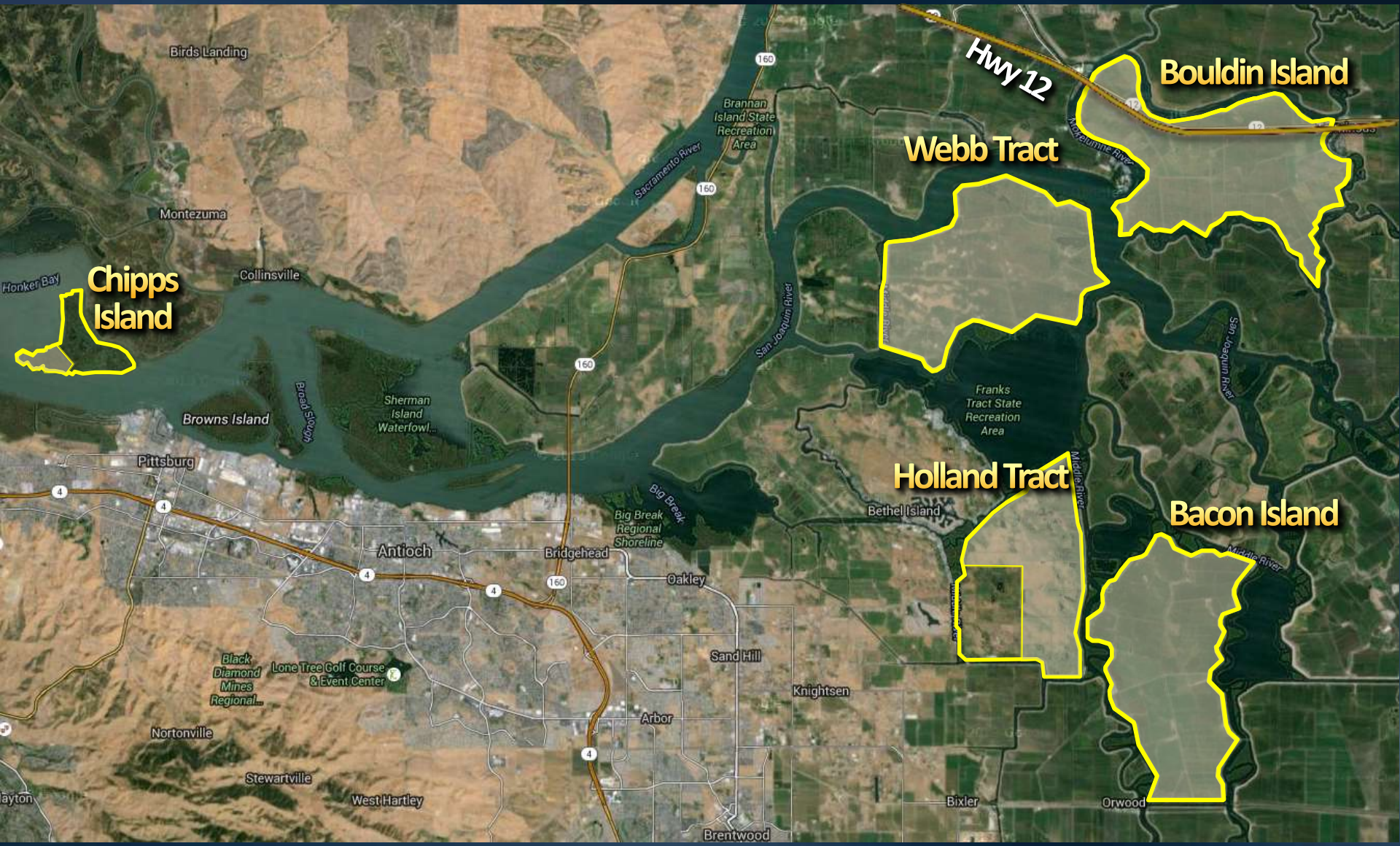
- Bay Delta provides high quality water
- Essential to reduce salt impacts
- Critical for groundwater storage

Delta Wetlands

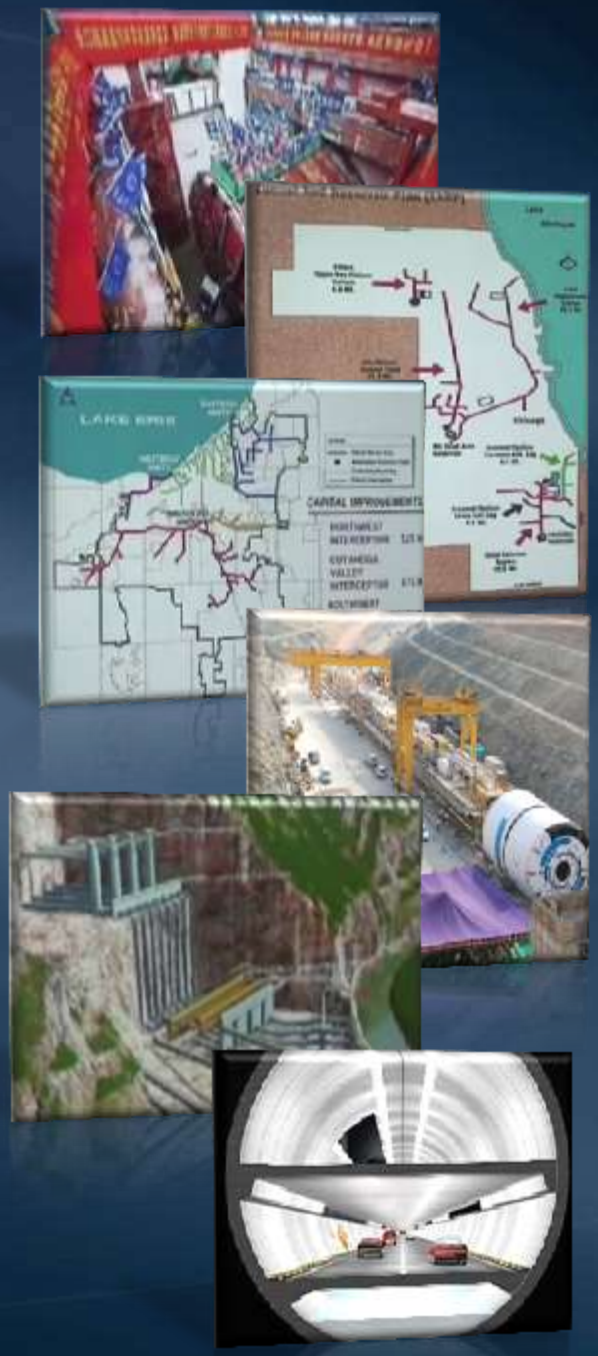
Regional Map



Location Map



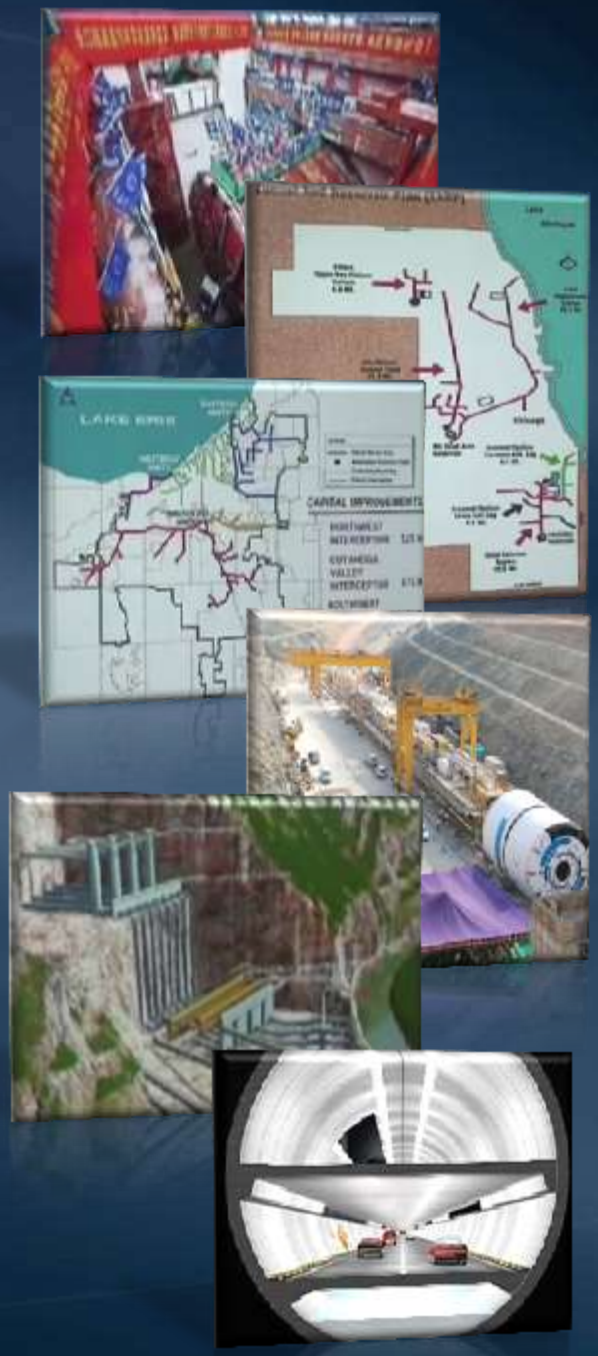
Other Tunnel/ Infrastructure Projects



Large Diameter Tunnels International

- **51 ft. – Shanghai, China**
  Yangtze River highway tunnel; 2 bores
- **33 ft. – Nagarjuna Sagar NP, India**
  27 mile water supply tunnels
- **41 ft. – Jinping, China**
  40 mile hydroelectric tunnels
- **44 ft. – Kuala Lumpur, Malaysia**
  Dual-deck transportation/stormwater

Updating



Large Diameter Tunnels United States

- **30 ft. – Chicago, USA**
  109 mile sewer overflow tunnel
  30 tunnel boring machines
- **24 to 45 ft. – Cleveland, USA**
  Sewer overflow tunnels

Updating

Statewide Comparison of Water Improvement Projects

Project	Cost	Population Served	Per Capita
MWD Diamond Valley Lake/Inland Feeder	$3,100,000,000	18,000,000	$172
EBMUD Freeport Project	$517,000,000	1,300,000	$398
SDCWA Emergency Storage Project	$1,500,000,000	2,800,000	$536
BDCP Conveyance (BDCP Draft EIR/S)	*$14,990,000,000*	*25,000,000*	*$600*
CCWD Los Vaqueros Project	$570,000,000	550,000	$1,036
SWP Coastal Aqueduct & CCWA Project	$575,000,000	430,000	$1,337
SFPUC's Hetch-Hetchy Improvement Project	$4,800,000,000	2,500,000	$1,920

BDCP Economic Benefits and Financial Strategies, SCWC/The PFM Group, February 2012


The Delta
Sacramento
Suisun Bay
Stockton
State & Federal
Pumping Plants
California's Bay-Delta

Backups

Delta Conveyance

Additional Old & Middle River Reverse Flow Restrictions

Month	Old & Middle River Criteria (Scenario 6)	BDCP Preferred Alternative		California WaterFix Preferred Alt.
		Alt. 4-H3	Alt. 4-H4	Alt. 4A
Oct - Nov	No diversion during pulse flow -5,000 cfs in Nov	- 313,000 af	- 231,000 af	- 313,000 af
Dec - Mar	-5,000 to -3,000 cfs	-454,000 af	- 379,000 af	-454,000 af
Apr - May	-2,000 to +3,000 cfs	-60,000 af	- 51,000 af	-60,000 af
Jun	- 3,500 to + 1,000 cfs	-113,000 af	- 95,000 af	-113,000 af
Jul – Sep	No flow restrictions	+26,000 af	+89,000 af	+26,000 af
	TOTAL Annual Impacts	**- 914,000 af**	**- 667,000 af**	**- 914,000 af**

Information produced by CH2M; Scenario 6 Breakdown


Cost Allocation Alternatives

State Water Project

BDCP Cost Allocation Alternatives

SWP 'Table A' Contract Approach	
Cost Allocation	• SWP "Table A" contract • Except for North of Delta contractors
Water Allocation	• SWP Table A amounts
Description	• Provides for reduced participation for North of Delta only • Includes provisions for contractor-to-contractor annual/multi-year transfers, and exchange programs • Contract amendment likely needed to reflect different cost allocations, supply deliveries, and transfer/exchange provisions
Summary & Issues	• Allocation similar to existing contract approach • Obligation of individual agency to work out water transfer and exchange agreements

State Water Project

BDCP Cost Allocation Alternatives

Subscribed Capacity Approach	
Cost Allocation	• Contractors subscribe to Delta tunnel capacity • Except for North of Delta contractors
Water Allocation	• Subscribe for tunnel capacity based on water supply needs • Remaining water supply benefits reallocated through transfers/exchanges
Description	• Includes provisions for contractor-to-contractor annual/multi-year transfers, and exchange programs • Contract amendment likely needed to reflect different cost allocations, supply deliveries, and transfer/exhange provisions
Summary & Issues	• Those who don't fully participate face unreliable thru-Delta supplies due to regulations or catastrophic events • More reliable water transfers through tunnel facility • More access to unregulated or flood flows through tunnel

Key in Determination of Alternative

Contractor's Participation May Determine Best Alternative

	Participation		
	0 %	100 %	200 %
Contractor 1		●	
Contractor 2		●	
Contractor 3		●	
Contractor 4	●		
Contractor …		●	
Contractor …		●	

Table 'A' Contract Approach

Participation		
0 %	100 %	200 %
●		
	●	
●		
		●
	●	
		●

Subscribed Capacity Approach

Metropolitan Water District

Cost Allocation "Example"

	No BDCP	100% Participation	110% Participation
Existing SWP Charge	$495 mill	$495 mill	$495 mill
Incremental BDCP Charge	$0 mill	$412 mill	$453 mill
Total	**$495 mill**	**$907 mill**	**$948 mill**
Average SWP Deliveries	960,500 af	960,500 af	960,500 af
Incremental BDCP	0 af	431,000 af	474,000 af
Total	**960,500 af**	**1,391,500 af**	**1,434,500 af**
Existing SWP Charge	$ 515 /af	$ 515 /af	$ 515 /af
Incremental BDCP Charge	--	$ 956 /af	$ 956 /af
Total	**$ 515 /af**	**$ 652 /af**	**$ 661 /af**

MWD Tier 1 Treated ($847/af) with Delta Improvements = $985 to $1,013/AF

- *Rate impact August 2013 analysis: 1.5% to 2% per year for 10 years ($138 to $166 per acre feet increase)*
- *BDCP costs preliminary; Existing SWP costs based on 2014-15 Statement of Charges includes power and O&M*
- *Water supply based on DWR CALSIM modeling of average Table A & incremental BDCP allocations*

State Water Project
Cost Allocation Consensus Principles

- New conveyance has definable benefits
- Participants have proportional share in tunnel capacity
- Available capacity/supply due to participation level can be purchased by other agencies on an at-cost basis
- Contract model assumes high level of participation


Financial Analysis

Cost Allocation
Funding Agencies

Ecosystem Restoration

- State of California
- Federal Government

Conveyance & Mitigation

CVP/SWP Contractors

CVP Contractors

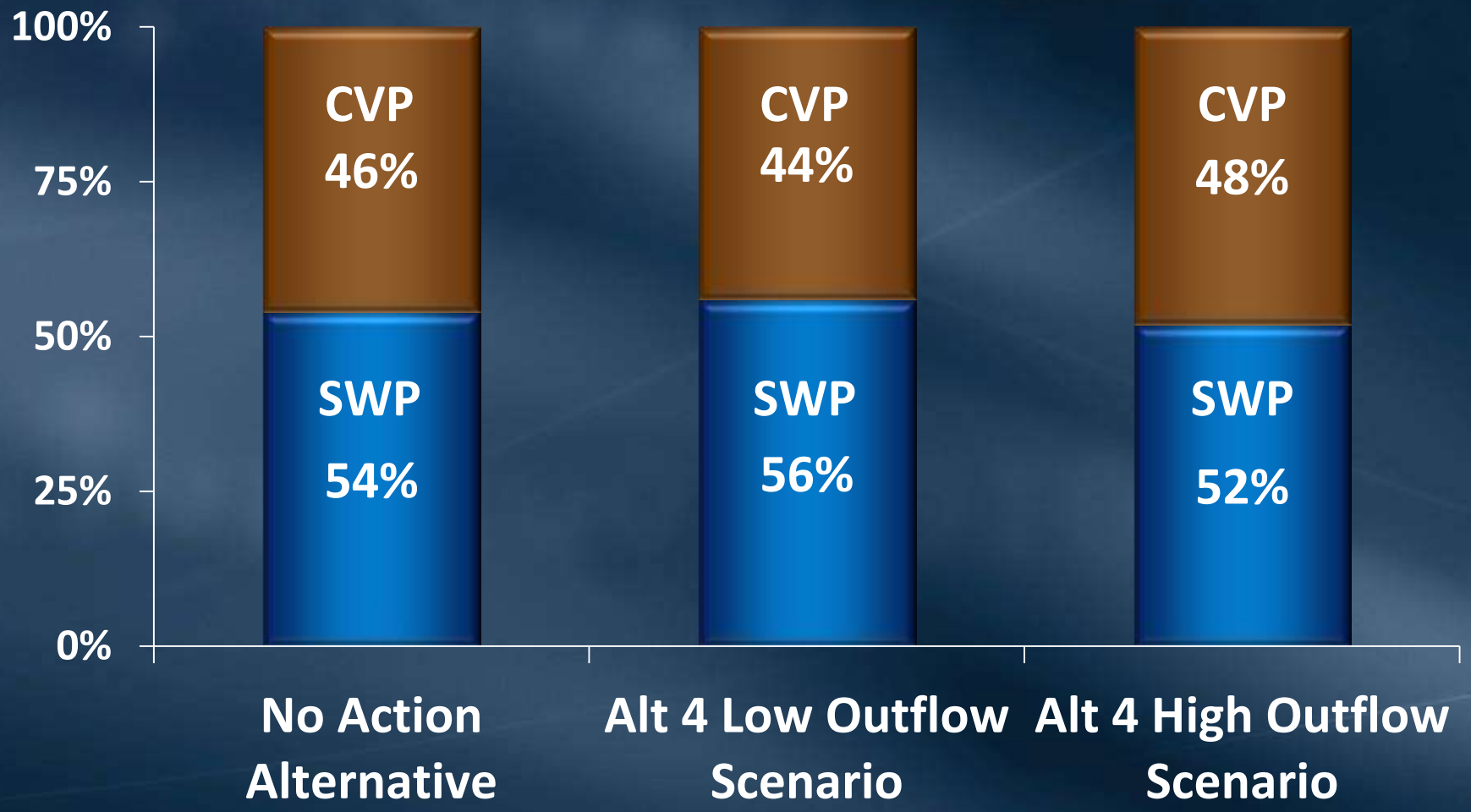
- Ag
- Urban
- Exchange
- Refuge
- Settlement

SWP Contractors

- Ag
- Urban

Central Valley Project/State Water Project

Long-Term Average Exports



Estimated Cost and Cost per Acre Foot Analysis

California WaterFix
Cost Allocation Analysis

	50% SWP Share	55% SWP Share	60% SWP Share
Financial Assumptions			
Capital	$14.99 billion	$14.99 billion	$14.99 billion
O&M (over repay period)	$1.20 billion	$1.20 billion	$1.20 billion
SWP/CVP Cost Share	50% / 50%	55% / 45%	60% / 40%
Contractor Share (MWD)	45.81 %	45.81 %	45.81 %
Bond Rate	6.135%	6.135%	6.135%
Discount-Inflation Rate	0.0%	0.0%	0.0%
Repayment Period	40 yrs.	40 yrs.	40 yrs.
MWD Annual Sales	1.75 million	1.75 million	1.75 million
Cal WaterFix Alternative 4A (Year 2025)			
SWP/CVP *without* Fix (2025)	3.5 maf	3.5 maf	3.5 maf
SWP/CVP *with* Fix (2025)	4.9 maf	4.9 maf	4.9 maf
SWP/CVP Restored Supplies	1.4 maf	1.4 maf	1.4 maf
SWP Restored Supplies	0.700 maf	0.770 maf	0.840 maf
MWD Restored Supplies	0.321 maf	0.353 maf	0.385 maf
MWD Total Capital Cost	$3.43 billion	$3.78 billion	$4.13 billion
MWD Annual Debt Service Cost	$251 million	$276 million	$301 million
Melded Capital/O&M (at Delta)	$223 /AF	$223 /AF	$223 /AF
Melded Capital/O&M (at MWD)	$454 /AF	$454 /AF	$454 /AF
Incremental Capital/O&M (at Delta)	$782 /AF	$782 /AF	$782 /AF
Incremental Capital/O&M (at MWD)	$1,013 /AF	$1,013 /AF	$1,013 /AF
MWD T1 Treated w-WaterFix	$1,085 /AF	$1,100 /AF	$1,114 /AF

** The "at MWD" costs include California Aqueduct Power Cost ($200/AF) and WQ Treatment ($31/AF)*

Financing Costs - Cal WaterFix

$15 Billion Capital Cost - 40 Year Term

Interest Rate		Annual Debt Service	Cost per Acre-foot (Based on 5 million af/yr.)
6.135%	(So. Cal Water Comm.)	$ 1.0B/year	$200/af
5.0%		$874M/year	$175/af
3.7%	(Current rates)	$732M/year	$146/af
2.62%	(30-yr Treasury rate)	$610M/year	$122/af

Water Rate Table

Effective January 1st		2012	2013	2014	2015	2016
Tier 1 Supply Rate ($/AF)		$106	$140	$148	$158	$156
Delta Supply Surcharge ($/AF)		$58	*	*	*	*
Tier 2 Supply Rate ($/AF)		$290	$290	$290	$290	$290
System Access Rate ($/AF)		$217	$223	$243	$257	$259
Water Stewardship Rate ($/AF)		$43	$41	$41	$41	$41
System Power Rate ($/AF)		$136	$189	$161	$126	$138
Full Service Untreated Volumetric Cost ($/AF)	Tier 1	$560	$593	$593	$582	$594
	Tier 2	$686	$743	$735	$714	$728
Replenishment Water Rate: untreated ($/AF)		$442	**	**	**	**
Interim Agricultural Water Program: untreated ($/AF)		$537	**	**	***	***
Treatment Surcharge ($/AF)		$234	$254	$297	$341	$348
Full Service Treated Volumetric Cost ($/AF)	Tier 1	$794	$847	$890	$923	$942

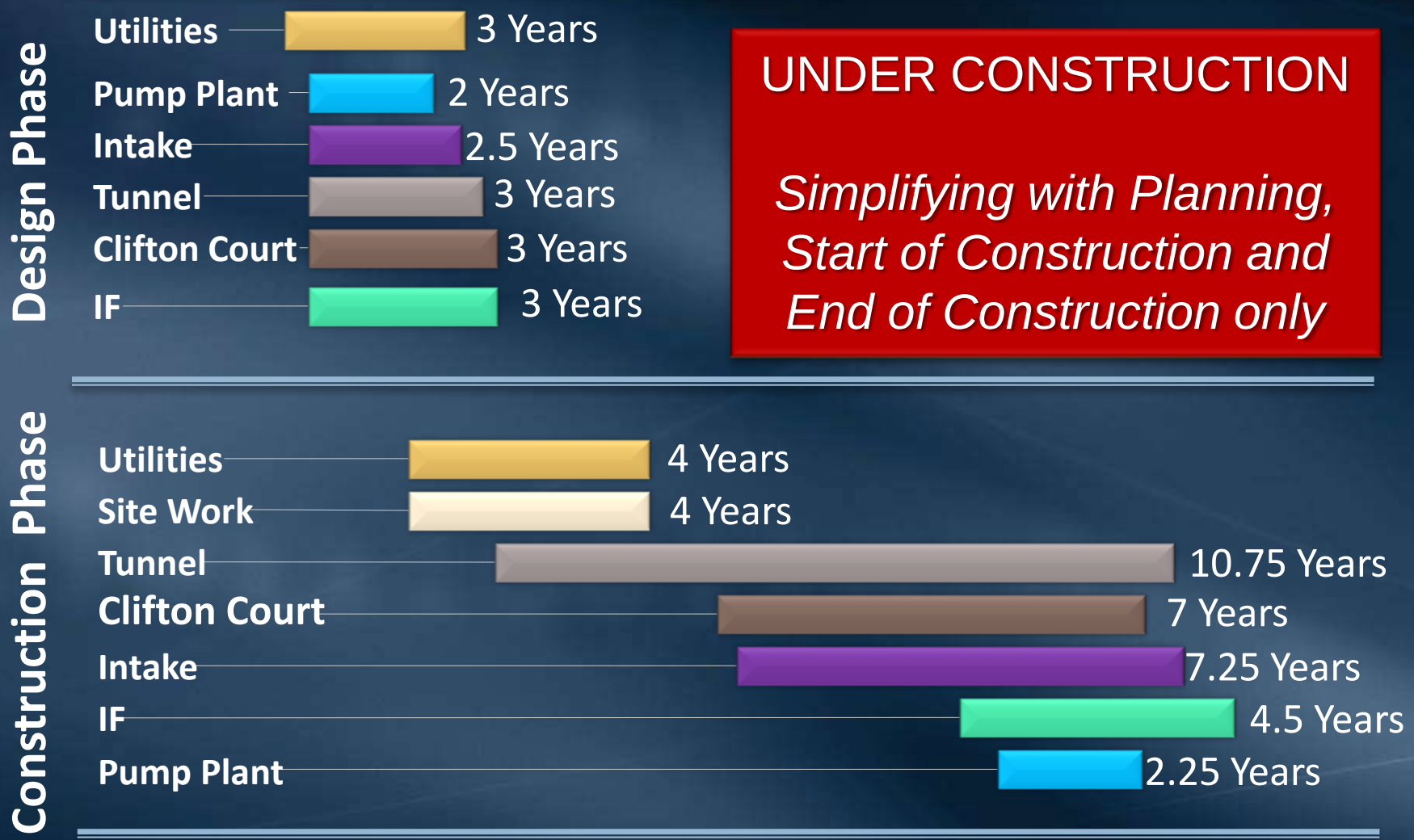
MWD Rates 2015

- Full service – $942/af
- Surcharges
  - Treatment – $348/af
  - Power – $138/af
  - Stewardship – $41/af
  - System Access – $259/af


Permitting & Schedule

California Water Fix

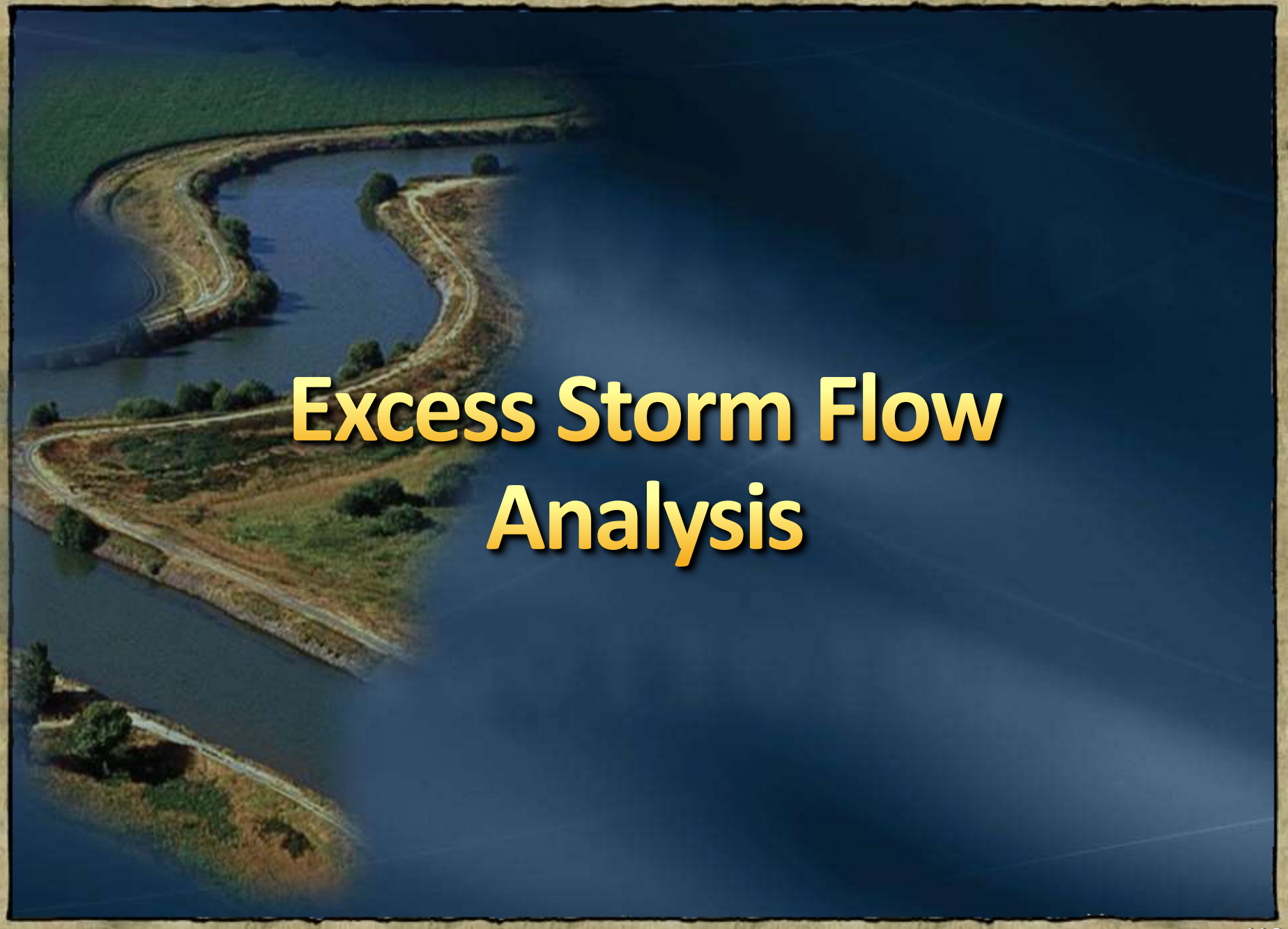
Preliminary Draft Design and Construction Phases




Regulatory Trends

Comparison of Regulatory Approaches

ESA Section 7 BO and CESA 2081 Permit	ESA Section 10 HCP and California NCCP
• Consistent with past compliance approach for SWP/CVP ops	• New compliance approach for SWP/CVP operations
• No regulatory or water supply assurances	• Regulatory and water supply assurances
• No coverage for unlisted and CA fully protected species	• Coverage for unlisted and CA fully protected species
• Shorter duration for permits	• Long-term permits (50 years)
• No funding liability for public benefit conservation measures	• Potential backstop of public funding shortfall
• Greater fishery agency control	• Greater opportunity for Contractor engagement


Excess Storm Flow
Analysis

A modern system would allow storage of excess water for California

Jan 1 – Mar 3

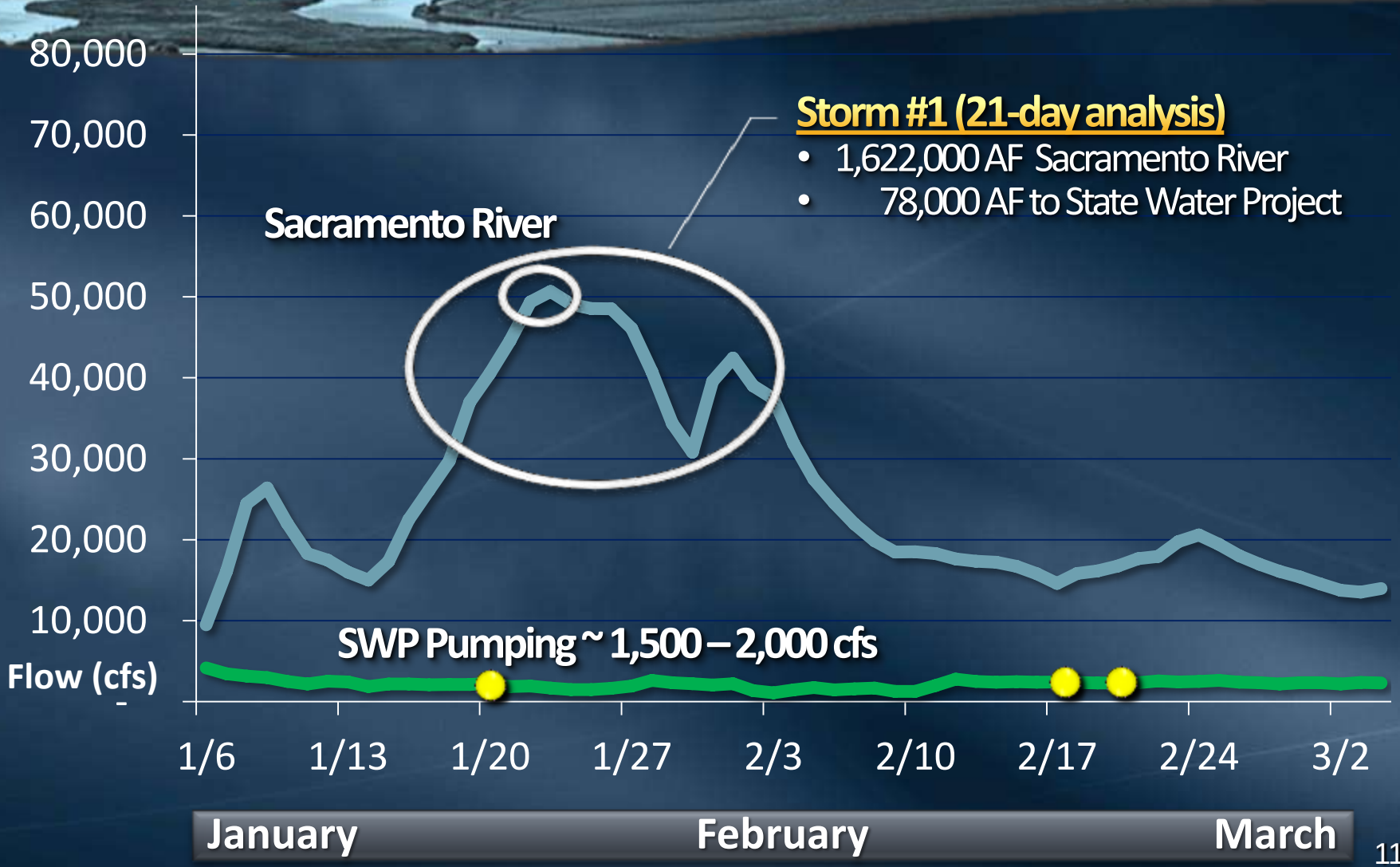
486,000 acre-feet

158 billion gallons

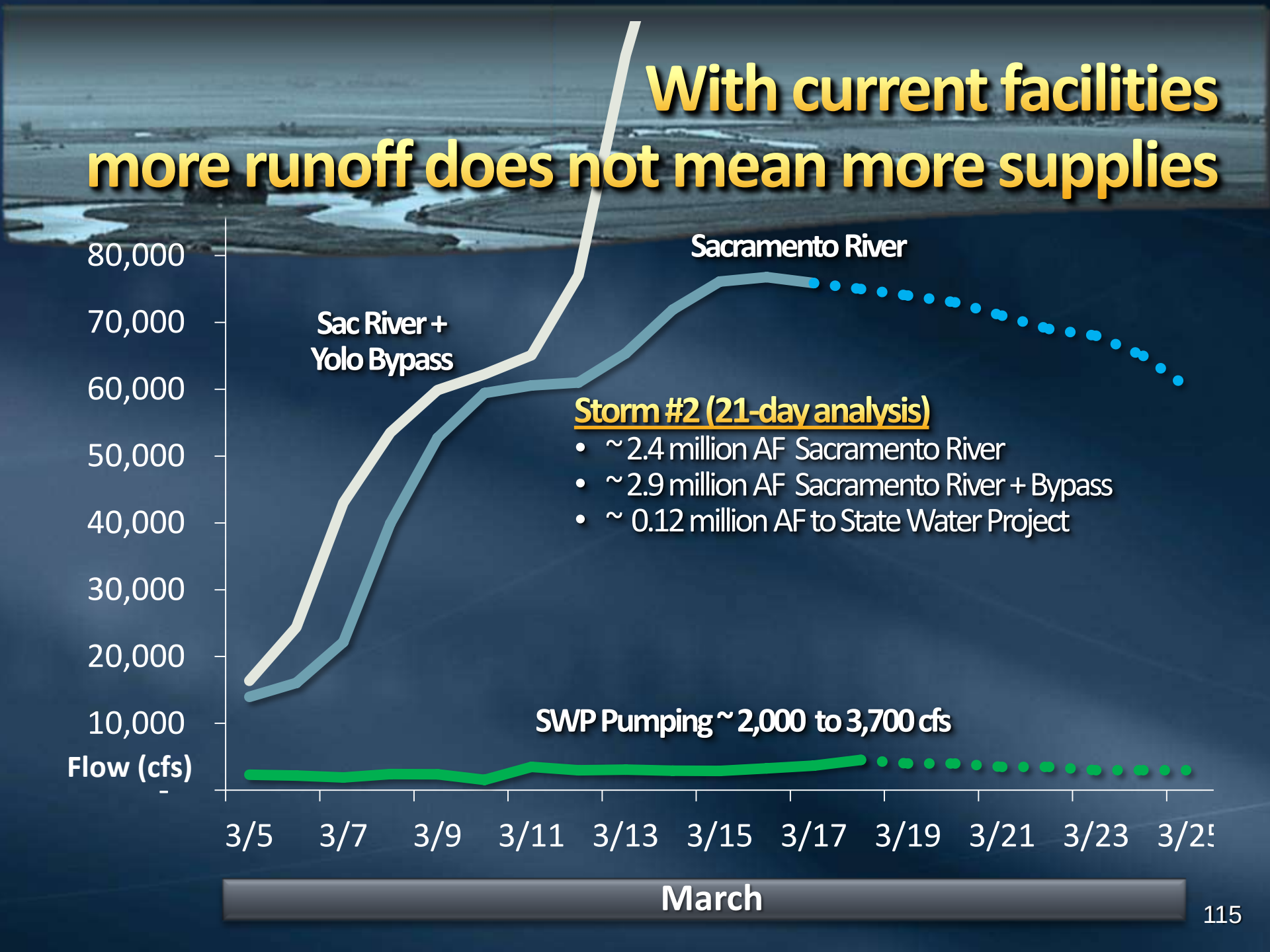
Enough for 3.6 million people for one year

Source: California WaterFix

With current facilities more runoff does not mean more supplies

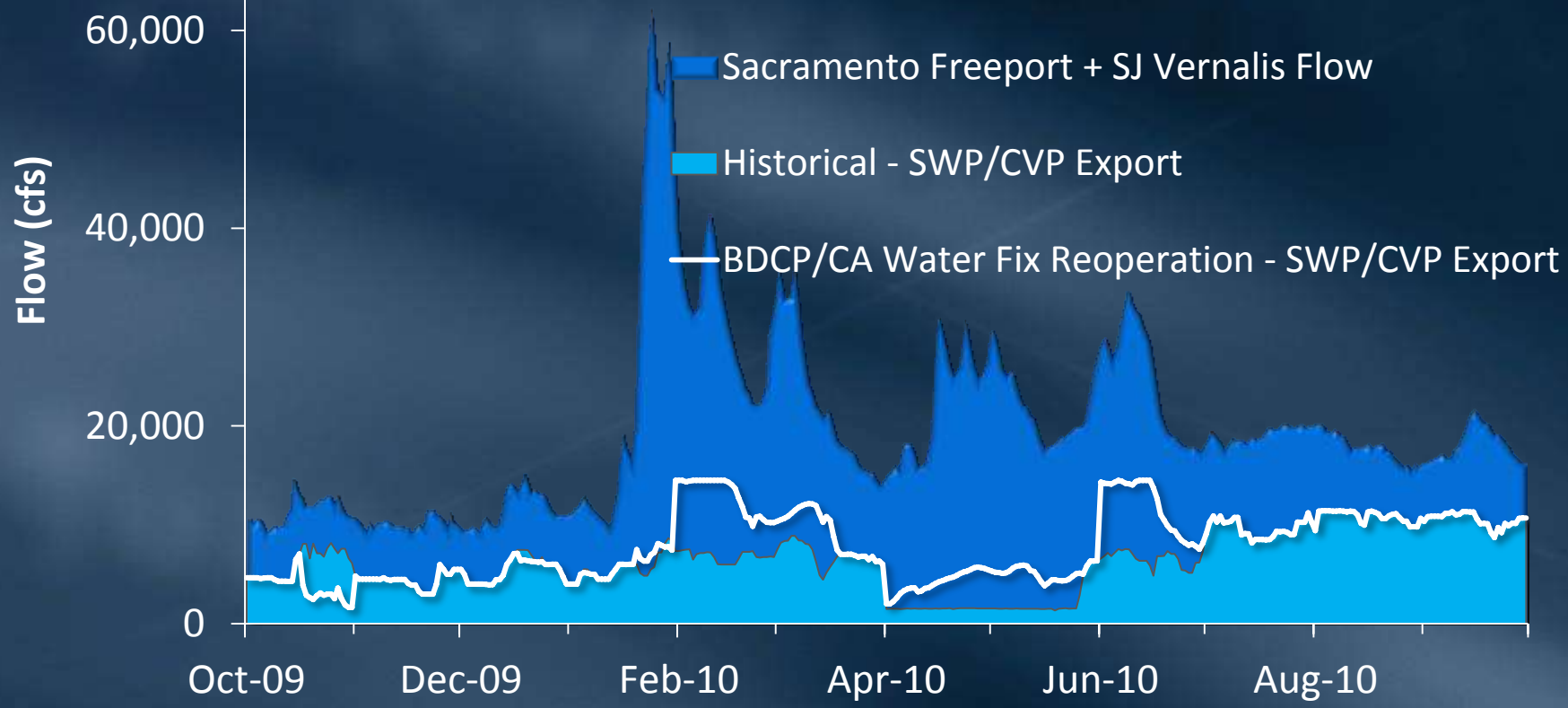


With current facilities more runoff does not mean more supplies



Excess Storm Flows – WY 2009-2010

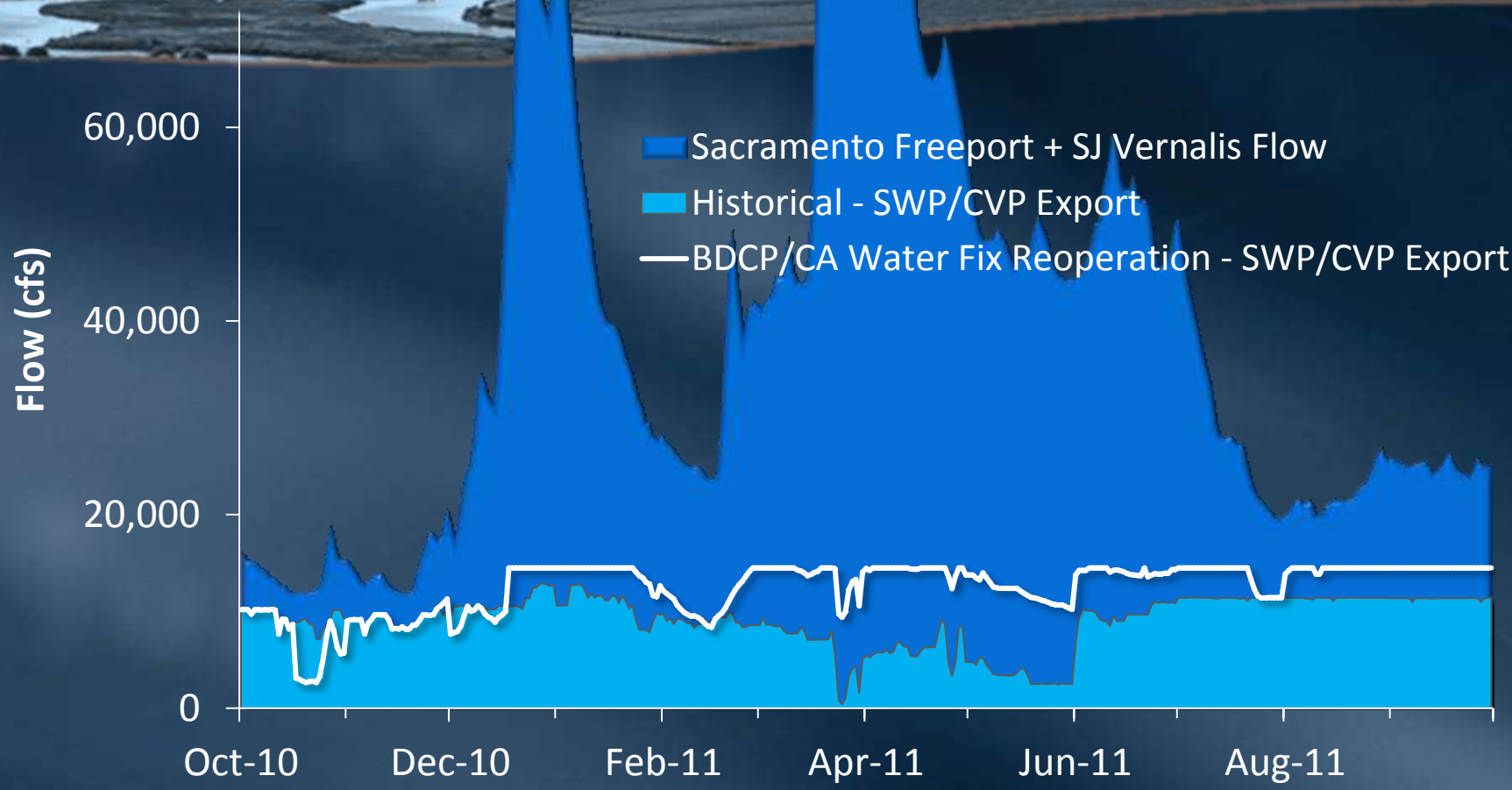
Reoperation Analysis with BDCP Cal Water Fix Alt. 4A



Water Year	Year Type	Excess Flow Period	Reoperation Benefit
2009-2010	Below Normal	1/20/2010 - 3/16/2010	450,000 AF

Excess Storm Flows – WY 2010-2011

Reoperation Analysis with BDCP Cal Water Fix Alt. 4A

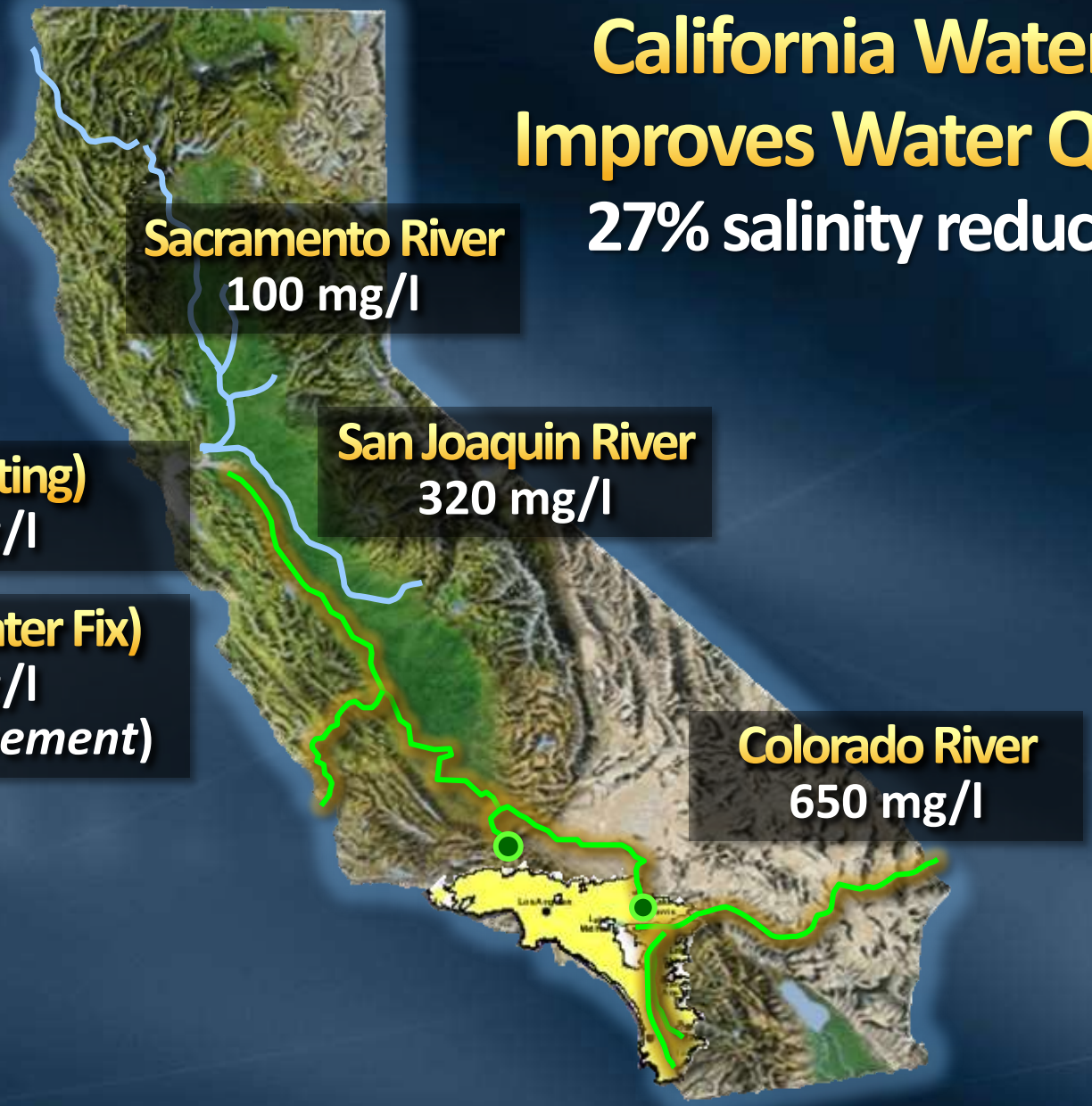


Water Year	Year Type	Excess Flow Period	Reoperation Benefit
2010-2011	Wet	12/07/2010 -7/11/2011	2,530,000 AF


Water Quality
Analysis

California WaterFix Improves Water Quality

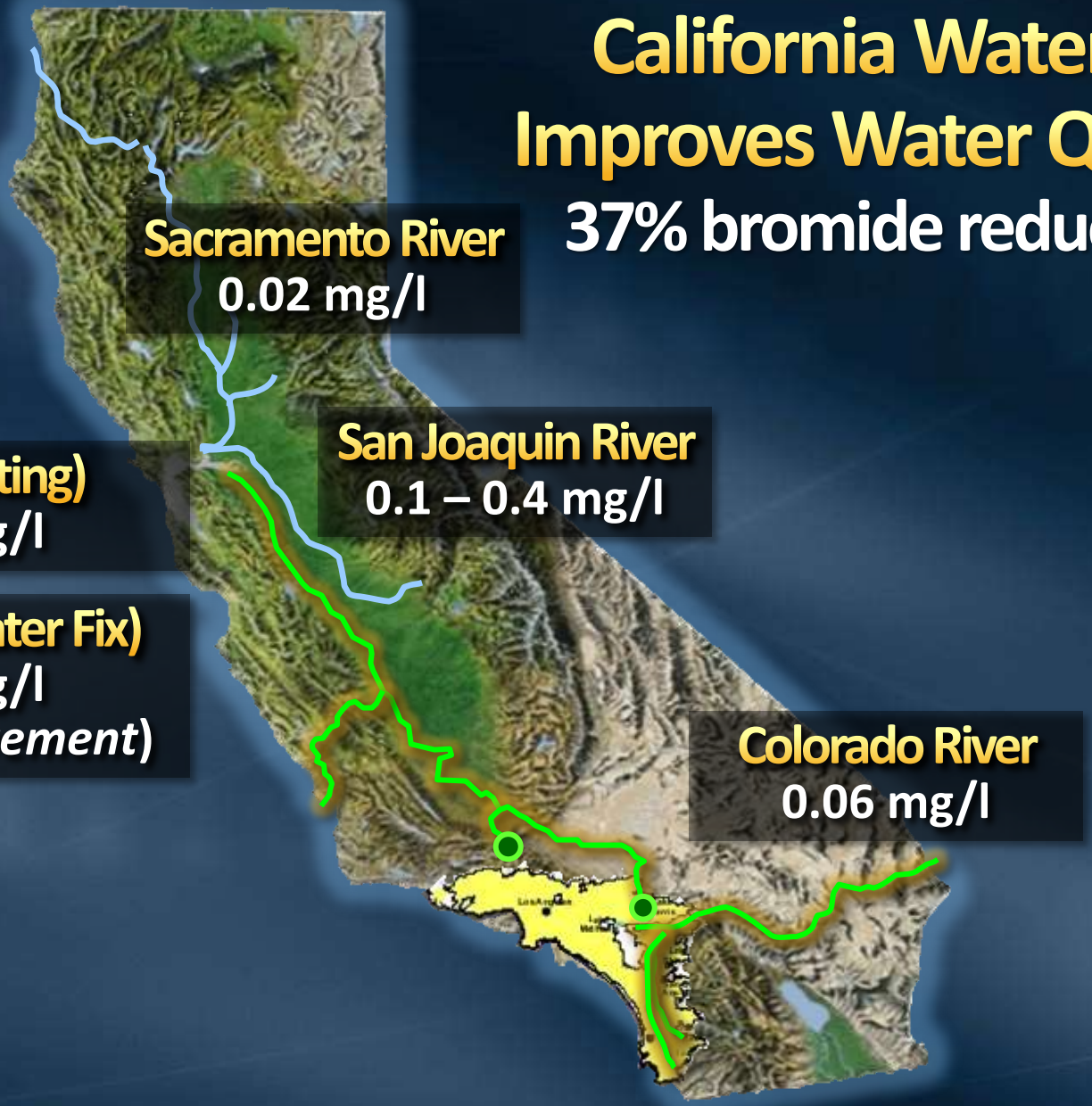
27% salinity reduction



- *Sacramento, San Joaquin & Colorado River water quality represents historical average annual recorded data*
- *State Water Project water quality is a comparison of modeled data from the Recirculated Draft EIR/EIS*

California WaterFix Improves Water Quality

37% bromide reduction



- *Sacramento, San Joaquin & Colorado River water quality represents historical average annual recorded data*
- *State Water Project water quality is a comparison of modeled data from the Recirculated Draft EIR/EIS*

California WaterFix is important for groundwater storage

- Bay Delta provides high quality water
- Essential to reduce salt impacts
- Critical for groundwater storage

California WaterFix allows MWD blending goals to be met

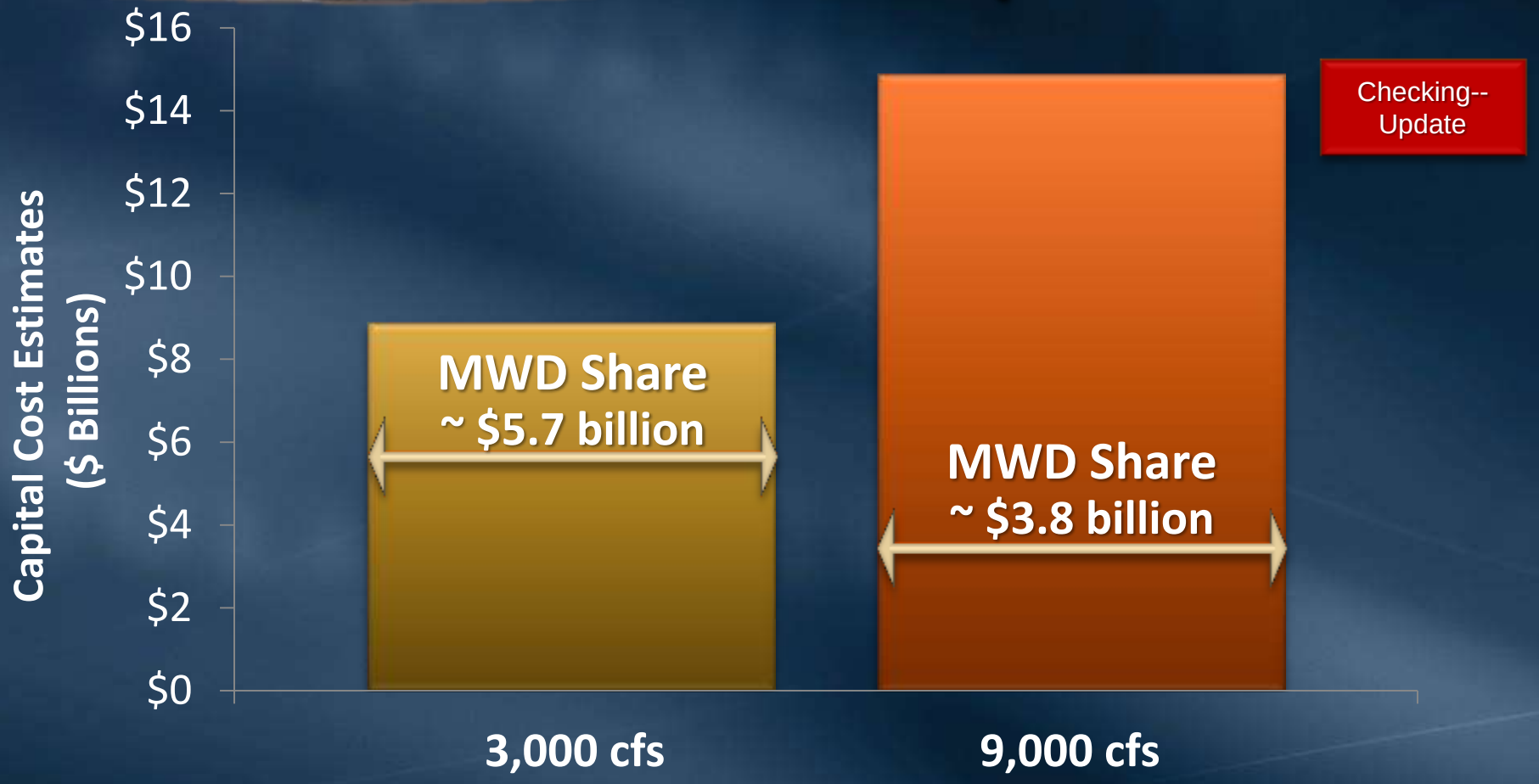
MWD SWP Supplies	Blending
Existing (Avg. Yr.)	Met
BDCP Preferred Alt	Met
Delta No Fix (Avg. Yr.)	Sometimes
Delta No Fix (Below Normal)	Rarely


3,000 vs 6,000 cfs
Capacity Analysis

3,000 vs. 9,000 cfs Conveyance

Preliminary Estimate of MWD's Cost Share

Capital Cost Estimate



- *3000 cfs – Assumes no participation/cost share from CVP Ag, SWP Ag, & Feather River urban*

3,000 cfs Conveyance
with 32'ID Single Main Tunnel

Features		Feature Costs (With PM/CM/Eng and Contingency)
Intakes	$	303,600,000
Conveyance	$	82,761,360
Pumping Plants	$	274,697,280
Forebays	$	581,856,000
Tunnels	$	6,581,929,024
Roads	$	382,158,082
Utilities and Communication	$	192,295,676
Subtotal	$	8,399,297,422
Land and Rights	$	150,000,000
Construction Related Mitigation	$	330,000,000
Grand Total	$	8,879,297,422

9,000 cfs Conveyance
with 40'ID Dual Main Tunnels

Summary		Feature Costs (With PM/CM/Eng and Contingency)
Intakes	$	597,168,000
Conveyance	$	249,585,600
Pumping Plants	$	687,508,800
Forebays	$	581,856,000
Tunnels	$	11,718,781,402
Roads	$	382,158,082
Utilities and Communication	$	192,295,676
Subtotal	$	14,409,353,560
Land and Rights	$	150,000,000
Construction Related Mitigation	$	330,000,000
Grand Total	$	14,889,353,560


Collaborative Science
& Adaptive Management

Bay Delta Conservation Plan

Collaborative Science & Adaptive Management

- Ongoing Collaborative Science
  - Two-tiered collaborate policy & technical team
  - Conducts joint research on key Delta fishery issues
  - Includes
    - United States Fish and Wildlife Service
    - National Marine Fisheries Service
    - California Department of Fish and Wildlife
    - United States Bureau of Reclamation
    - California Department of Water Resources
    - Environmental interests (NRDC, TNC, PCFFA and Water4Fish)
    - Non-Governmental Organizations
    - State and Federal water contractors

Bay Delta Conservation Plan

Collaborative Science & Adaptive Management

- Adaptive Management & Monitoring Plan
  - Mechanism to review and appropriately adjust existing and new operating requirements based on new scientific information and monitoring
  - Addresses gaps in knowledge
  - Demonstrate project avoids jeopardy to listed species


Emergency Preparedness

Tactical Coordination

- Unified command integrates Cal OES, DWR, USACE and local operations
- MOA between DWR and USACE
- DWR's model estimates time & cost of repairs
- Emergency plans are tested under simulated floods and earthquakes
- On-call contracts for materials

Stockton Loading & Stockpile Site

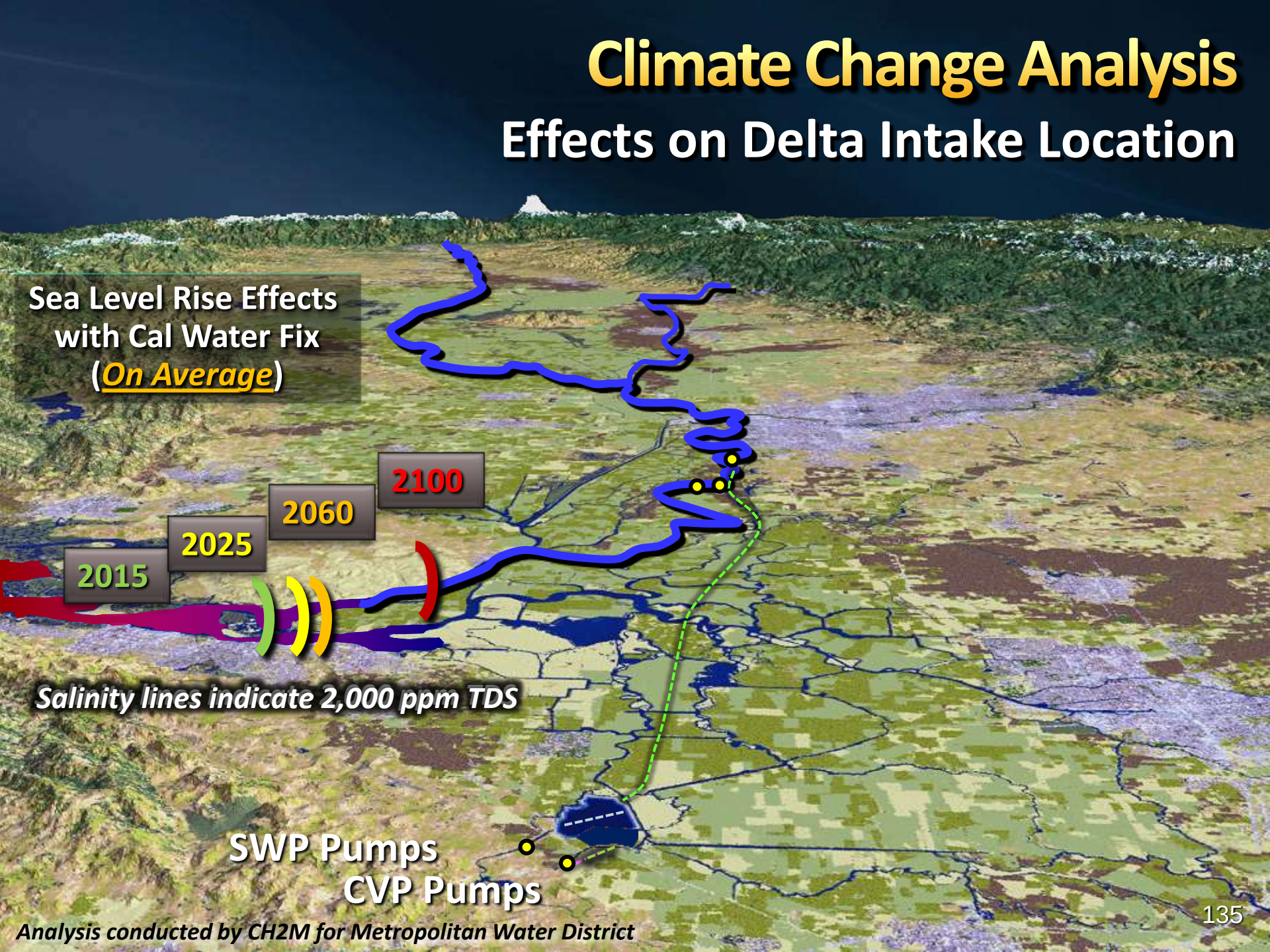

Climate Change Analysis

Climate Change Analysis
Overview

- Summary
  - Cal Water Fix analysis & design incorporates climate change
  - Cal Water Fix provides climate change adaptation
- Analyses
  - Effects on water quality & water supply (DWR analysis)
  - Effects on North Delta intake location (CH2M analysis)
- Assumptions
  - 20 global climate models used to project Delta sea-level rise
  - Time periods modeled – 2025, 2060, 2100

Climate Change Analysis

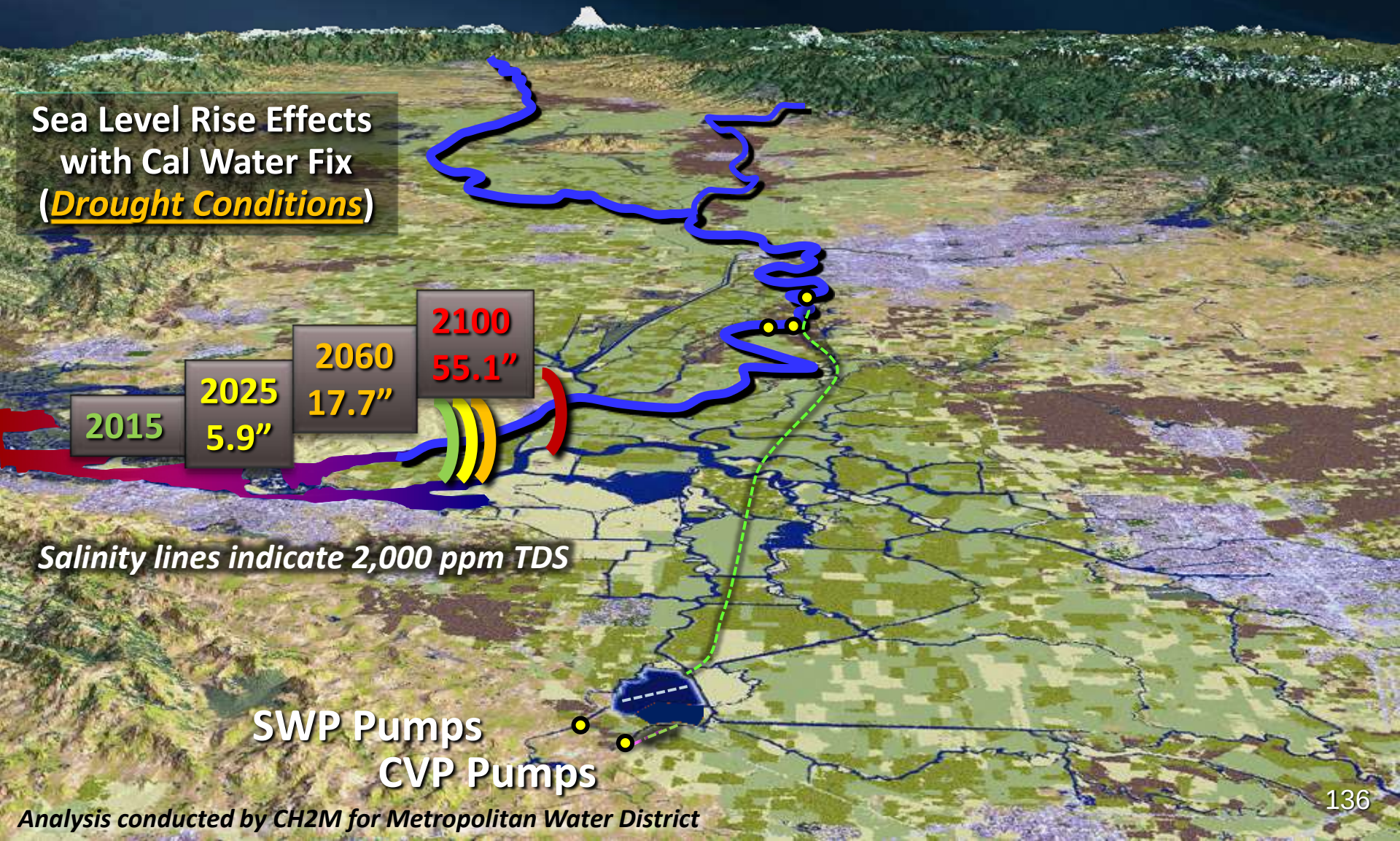
Effects on Delta Intake Location



Analysis conducted by CH2M for Metropolitan Water District

Climate Change Analysis

Effects on Delta Intake Location



Analysis conducted by CH2M for Metropolitan Water District

Climate Change Analysis
Effects on Delta Intake Location

North Intake	2010	2025	2060
Salinity (TDS mg/L)	111	111	111
Bromide (mg/L)	0.08	0.08	0.08

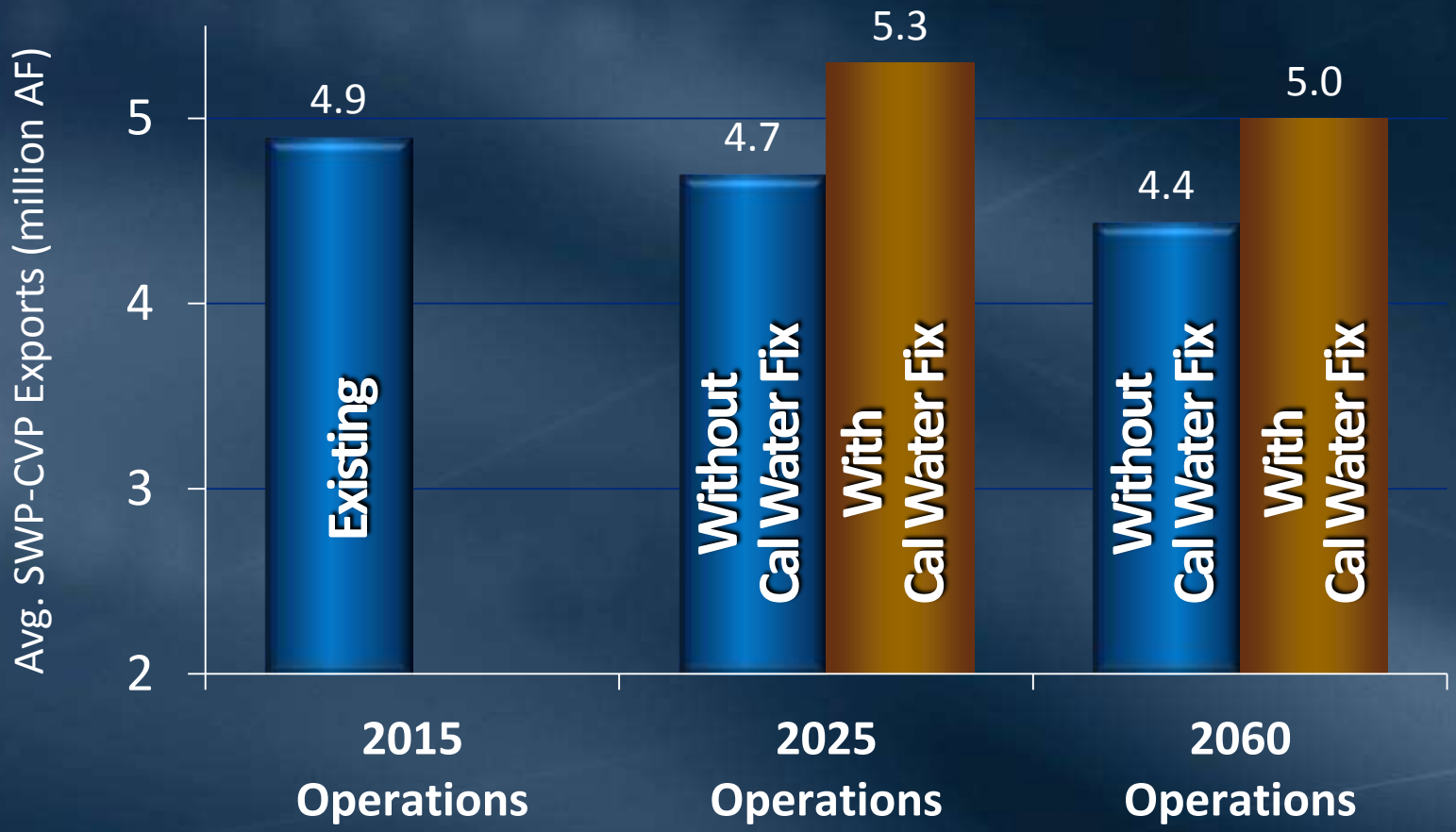
South Intake	2010	2025	2060
Salinity (TDS mg/L)	301	311	326
Bromide (mg/L)	0.34	0.35	0.35

Combined	2010	2025	2060
Salinity (TDS mg/L)	214	221	228
Bromide (mg/L)	0.21	0.22	0.22

Based on BDCP Draft EIR/S Alternative 4-H4
Analysis conducted in 2013 by CH2M for Metropolitan Water District.

Climate Change Analysis

Potential Impacts of Sea-Level Rise on SWP/CVP Exports



Information from DWR CALSim model; MWD share ~ 25%; 2060 operations are preliminary estimates
The "without" Cal Water Fix assumes no reduction in future supplies due to potential additional eco-restrictions


Conveyance Alternatives
Analyzed

CALFED Alternatives

- Transfer Supplies for the Drought Water Bank
- Yolo Bypass Conveyance Facility
- Habitat Restoration
- Habitat Restoration w/ Dedicated Enviro Water
- Extensive Habitat Restoration w/ New Storage
- Water Management w/ Environmental Storage
- Chain of Lakes Isolated Facility
- Additional Export Capacity w/ South of Delta Storage
- Delta Island Protection and Small Isolated Facility
- Improved Thru-Delta Conveyance w/ Screened Diversion at Hood
- Dual Transfer Facility
- East-Side Foothill Large Conveyance Facility
- West-Side Sacramento Small Transfer Facility
- West-Side Sacramento Storage/ Conveyance Facility
- East-Side Delta Isolated Facility
- Protection of Delta Islands/ Functions
- Delta Island Protection w/Storage
- Pollutant Source Controls/ Operational Changes
- Source Control/Added Storage

Post CALFED

Through-Delta Focus

- Eco-Crescent Conveyance
- CCWD – San Joaquin Intake
- Russ Brown – Delta Corridors
- Terry Spragg – Water Bags
- Polder Concept – Joint Protection of Multiple Islands
- Franks Tract Gates for Water Quality/Fish Avoidance
- Two-Gates Fish Protection Project
- In-Delta Gate Operations
- Three-Mile Slough Gate
- Central Delta Intake
- Op Changes for Fish Protection
- Georgiana Slough Gates
- Sutter/Steamboat Barriers for Delta Freshwater Enhancement
- Reoperation of Cross-Channel Gates
- Multiple Intake for Fish Protection
- South Delta Export Recirculation
- Deep Water Ship Channel Intake
- South Delta Fish Facilities Forum
- In-Delta Storage
- South Delta Operable Gates Study
- Phase VIII Enhanced Flow Process
- Tracy Fish Test Facility
- Salinity Protection Barriers/Gates at Railroad Cut and Empire Cut
- DWR Delta Emergency Preparedness and Response Plan
- Stockton Dissolved Oxygen Study
- Vernalis Adaptive Management Plan

Initial Alternative Screening Reports

- Conveyance Alternative – Dual Conveyance (A1-A4)
  - Dual Conveyance – Tunnels to South Delta (3k – 15k cfs)
  - Dual Conveyance – East Canal to South Delta (3k – 15k cfs)
  - Dual Conveyance – West Canal to South Delta (3k – 15k cfs)
  - Dual Conveyance – East Canal to San Joaquin R. (3k – 15k cfs)
- Conveyance Alternative – Isolated Conveyance (B1-B7)
  - North Delta Tunnel – Abandon South Delta Intakes (15k cfs)
  - East Canal – Abandon South Delta Intakes (15k cfs)
  - West Canal – Abandon South Delta Intakes (15k cfs)
  - Feather River/Foothill Canal – Abandon So. Delta (15k cfs)
  - Sac Ship Channel – Abandon South Delta Intakes (15k cfs)
  - Fremont Weir Tunnel – Abandon South Delta Intakes (15k cfs)
  - Antioch Tunnel w/Desal – Abandon South Delta Intakes (15k cfs)

Initial Alternative Screening Reports

- Conveyance Alternative – Through Delta (C1-C4)
  - Through-Delta – Separate Corridors (15k cfs)
  - Through-Delta– Armored Corridors (15k cfs)
  - Through-Delta – Delta Salinity Barrier (15k cfs)
  - Through-Delta – New Clifton Court Forebay Screens (15k cfs)

Bay Delta Conservation Plan

Summary of Alternatives Evaluated

- BDCP Proposed Action (9,000 cfs tunnel)
- West Canal (15,000 cfs)
- Tunnels (3,000, 6,0000 and 15,000 cfs)
- Isolated facility (15,000 cfs)
- Through-Delta
- Less Tidal Restoration
- More Restoration
- More Spring Outflow

Additional Proposals

- Delta
  - Natural Resources Defense Council – Portfolio Proposal
  - Robert Pyke – Western Delta Intakes Concept
  - Peer Swan – An Alternative Vision
- Statewide
  - ACWA – Statewide Water Action Plan
  - Delta Stewardship Council – Delta Plan
  - Delta Vision Foundation Process
  - Public Policy Institute of California – Comparing Futures for the Sacramento/San Joaquin Delta


California EcoRestore

California EcoRestore Projects

Rough Cost Estimate

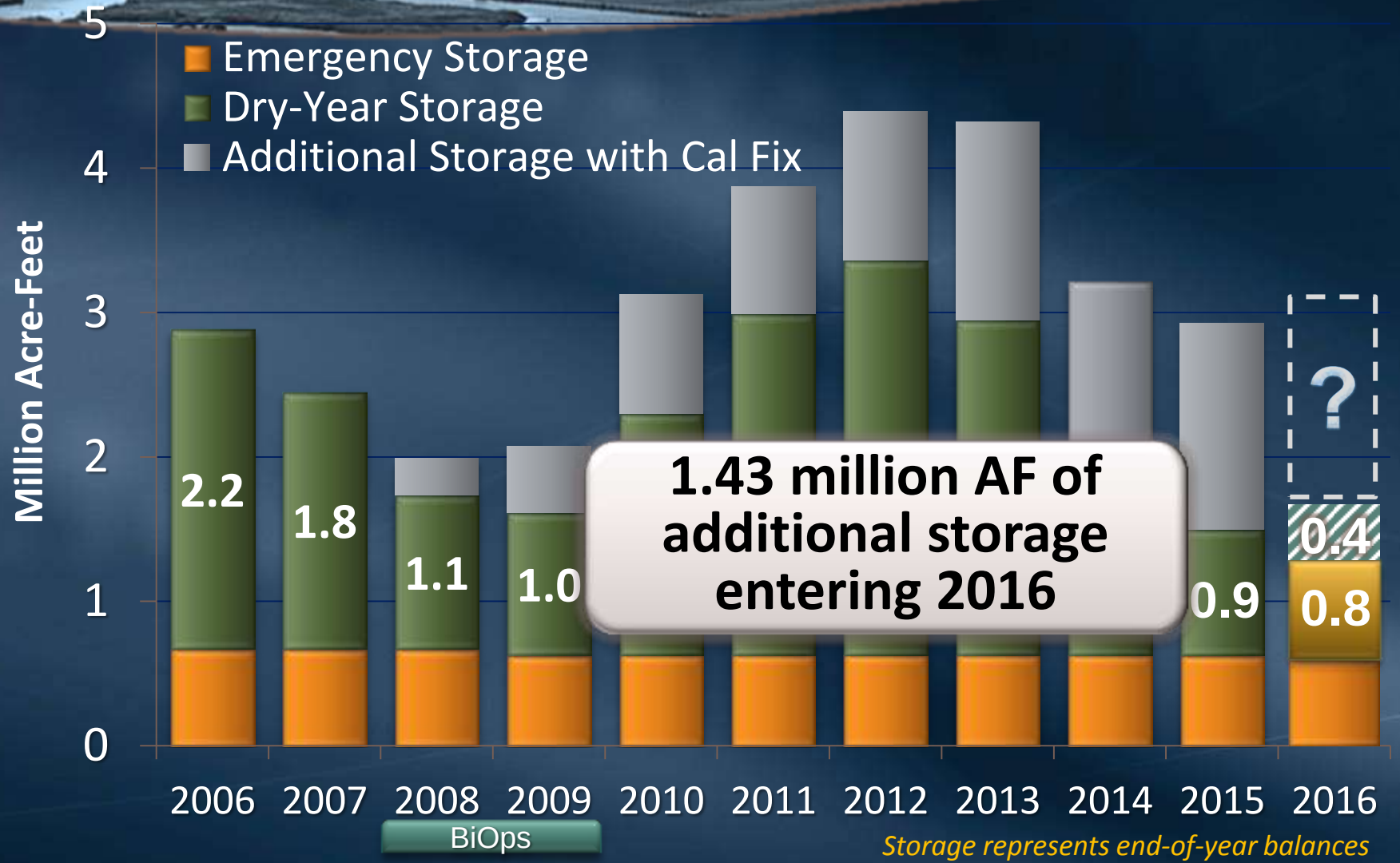
Add Assumptions

- SWP/CVP Bio Op Mandates (25,000 acres)
  - Floodplain Restoration (17,000 ac.) $719 M
  - Tidal Habitat (8,000 ac.) $235 M
- State Proposition 1 Grants (5,000 acres)
  - Floodplain Restoration (500 ac.) $21 M
  - Managed Wetlands (3,500 ac.) $40 M
  - Tidal Habitat (1,000 ac.) $29 M

MWD water sales average 2.0 million ft.

* *Includes Exchange*

Regional Storage Reserves Could be Higher with California WaterFix



Storage represents end-of-year balances


Design & Construction Enterprise
Budget and Schedule

California WaterFix

Summary - Funding Commitments Mar 2016

Commitments by Project	
DHCCP	207,048,878
BDCP	41,435,735
Total Committed by Project	248,484,613

Commitments by Funding Phase				
Phase	Original Amount of Phase	Current Amount of Phase	Amount Committed	Remaining to Commit
Original Budget	139,649,000	139,649,000	139,649,000	-
Admin Phase	12,165,353	8,484,808	8,484,808	-
Public Phase - Milestone 2	5,481,600	43,407,395	43,407,395	-
Final Phase - Milestone 3	22,029,954	33,315,052	36,430,935	(3,115,883)
Engineering	48,653,562	20,512,475	20,512,475	-
Contingency	11,669,531	-	-	-
Total Committed by Phase	239,649,000	245,368,730	248,484,613	(3,115,883)

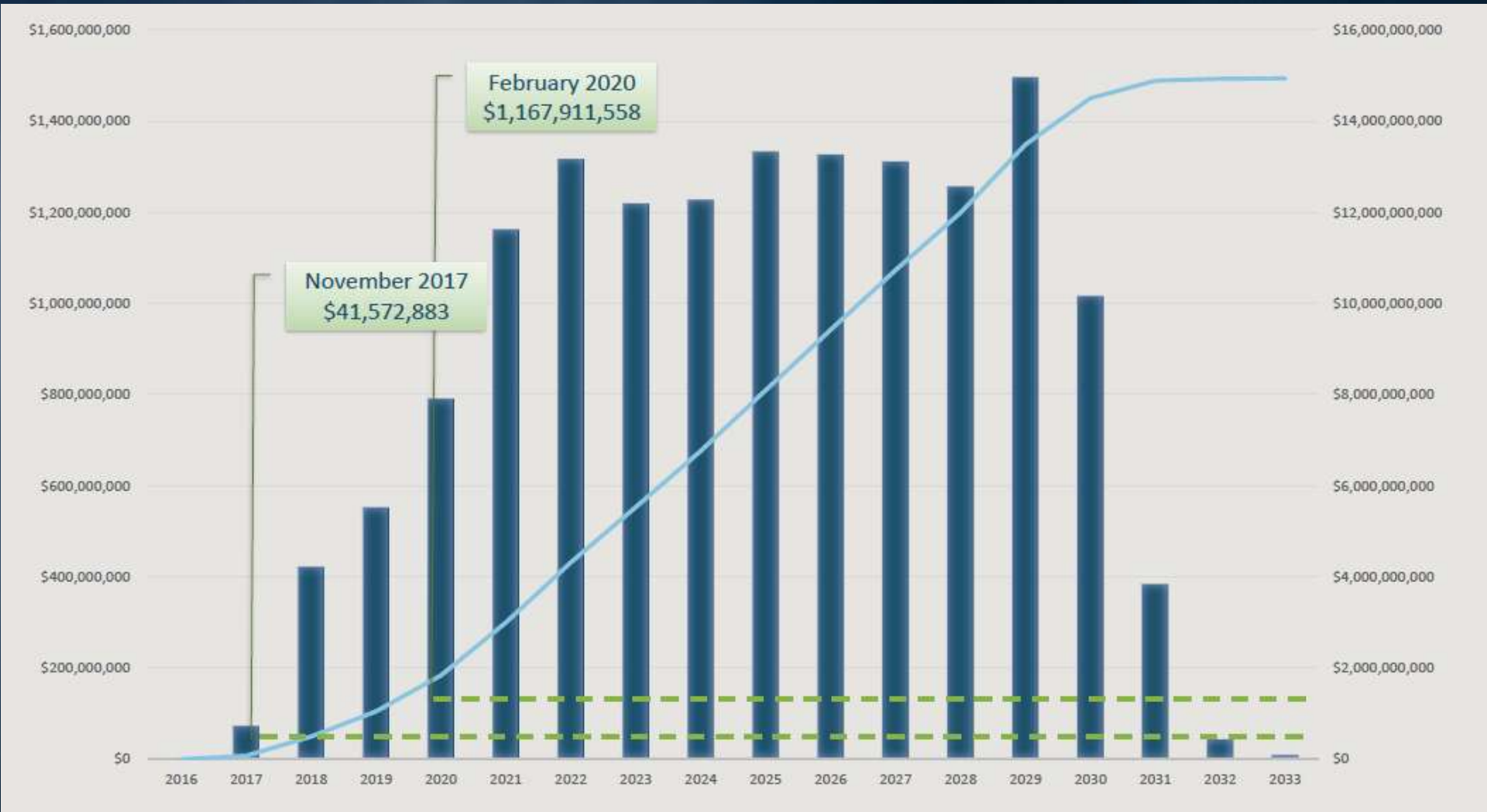
California WaterFix

Summary - Funding Incurred Mar 2016

Costs Incurred by Project	
DHCCP	205,098,616
BDCP	40,877,535
Total Incurred by Project	245,976,151

Costs Incurred by Funding Phase				
Phase	Original Amount of Phase	Current Amount of Phase	Amount Incurred	Remaining to Incur
Original Budget	139,649,000	139,649,000	139,649,000	-
Admin Phase	12,165,353	8,484,808	8,484,808	-
Public Phase - Milestone 2	5,481,600	43,407,395	42,949,713	457,682
Final Phase - Milestone 3	22,029,954	33,315,052	34,380,155	(1,065,103)
Engineering	48,653,562	20,512,475	20,512,475	-
Contingency	11,669,531	-	-	-
Total Incurred by Phase	239,649,000	245,368,730	245,976,151	(607,421)

Design & Construction Enterprise Annual & Cumulative Spending



California WaterFix Program Budget
Cumulative Cost (2014 Dollars)

Name		Cost
PM/CM/ENG	$	1,919,910,670
Construction	$	9,499,048,014
Contingency	$	3,378,400,000
Land Acquisition	$	146,100,000
Grand Total Cost	$	14,943,458,684

California WaterFix Mitigation Cost Estimate
Cumulative Cost (2014 Dollars)

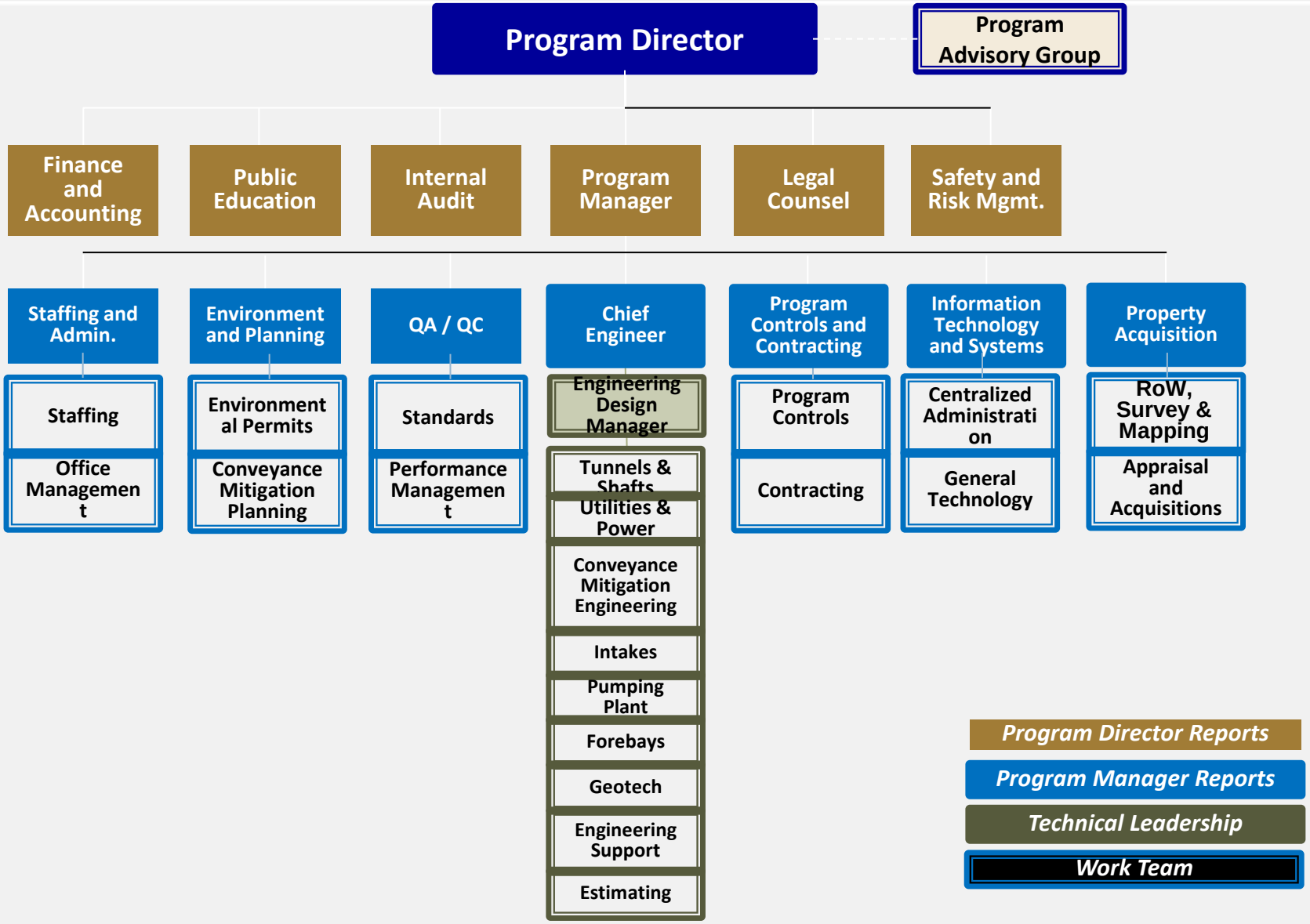
ID No.	Name		Cost
EC03	Natural Communities Protection	$	93,178,308
EC04	Tidal Natural Communities	$	23,622,027
EC06	Channel Margin Enhancement	$	39,654,662
EC07	Riparian Natural Community	$	3,133,564
EC08	Grassland Restoration	$	32,438,868
EC09	Vernal Pool and Alkali Seasonal Wetland	$	75,000
EC10	Nontidal Marsh Restoration	$	17,028,222
EC11	Natural Communities Management	$	26,934,539
EC15	Localized Reduction of Predatory Fish	$	19,703,298
EC16	Nonphysical Fish Barrier	$	76,550,897
CUL	Cultural Resources	$	13,350,000
AQ	Air Quality	$	37,630,000
BIO	Biological Resources	$	12,000,000
	Subtotal	$	395,299,385
Other Costs			
	Program Administration	$	12,775,000
	Monitoring (terrestrial and aquatic)	$	133,398,319
	Property tax revenue replacement	$	48,121,823
	Subtotal	$	194,295,142
	Total Costs	**$**	**589,594,527**
	Contingency 35%	$	206,358,084
	Grand Total Cost	**$**	**795,952,611**

California WaterFix Total Budget
Cumulative Cost (2014 Dollars)

Name		Cost
Total 2081/Section 7 Mitigation Costs	$	795,952,611
Total Design/Construction Budget	$	14,943,458,684
Grand Total Cost	**$**	**15,739,411,295**

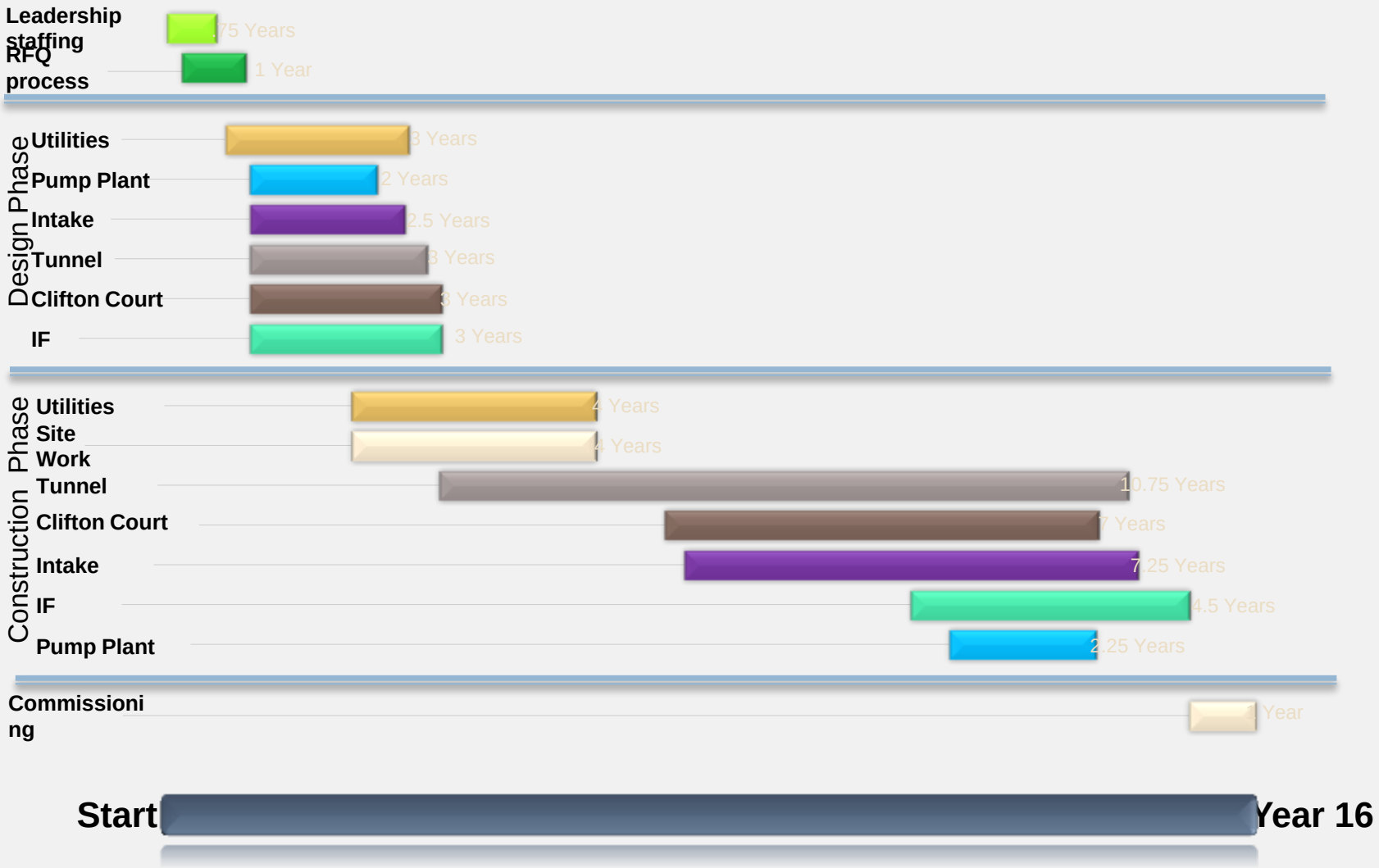
Design and Construction Enterprise

Organizational Structure



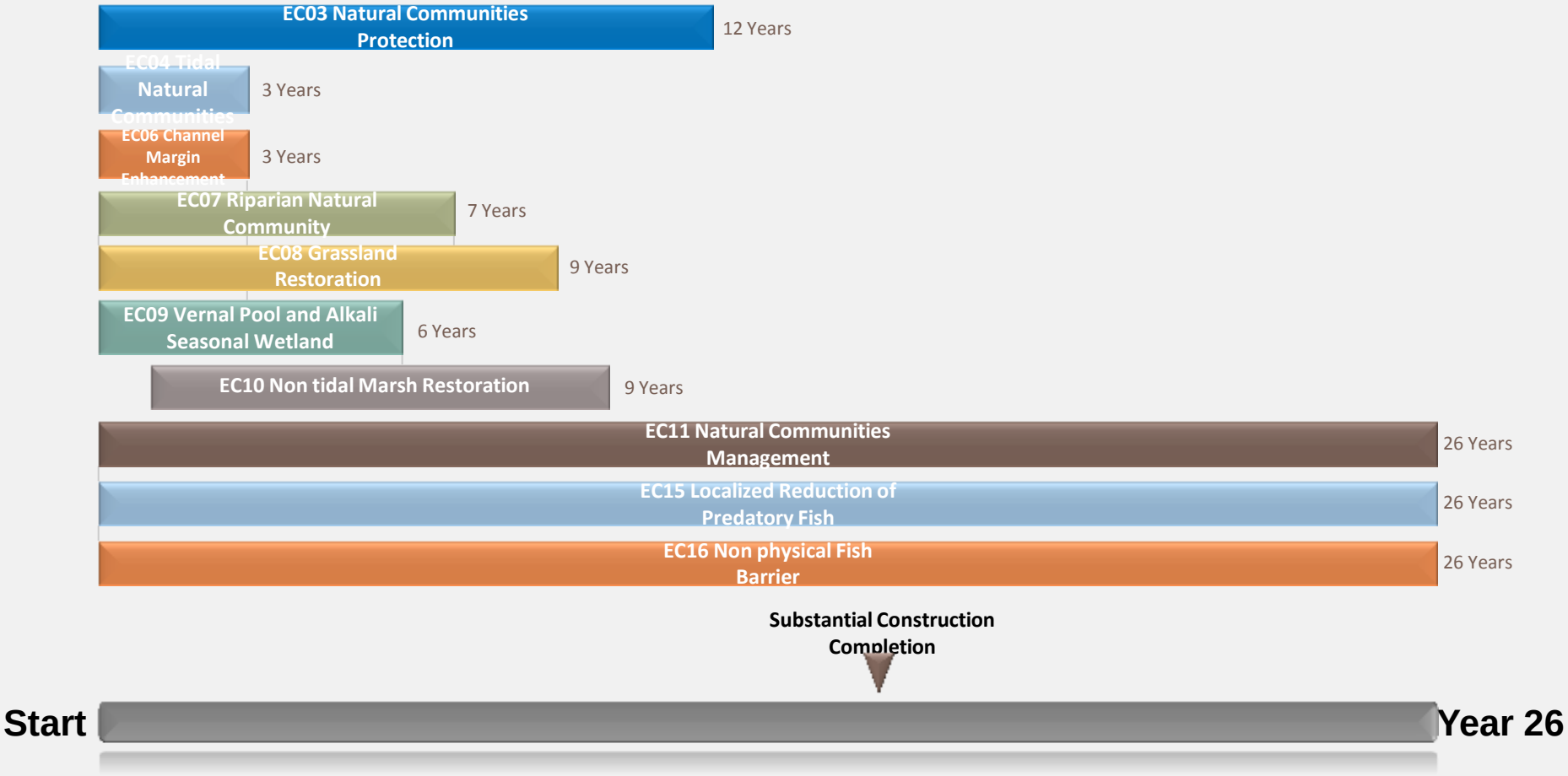
Design and Construction Enterprise

Program Schedule



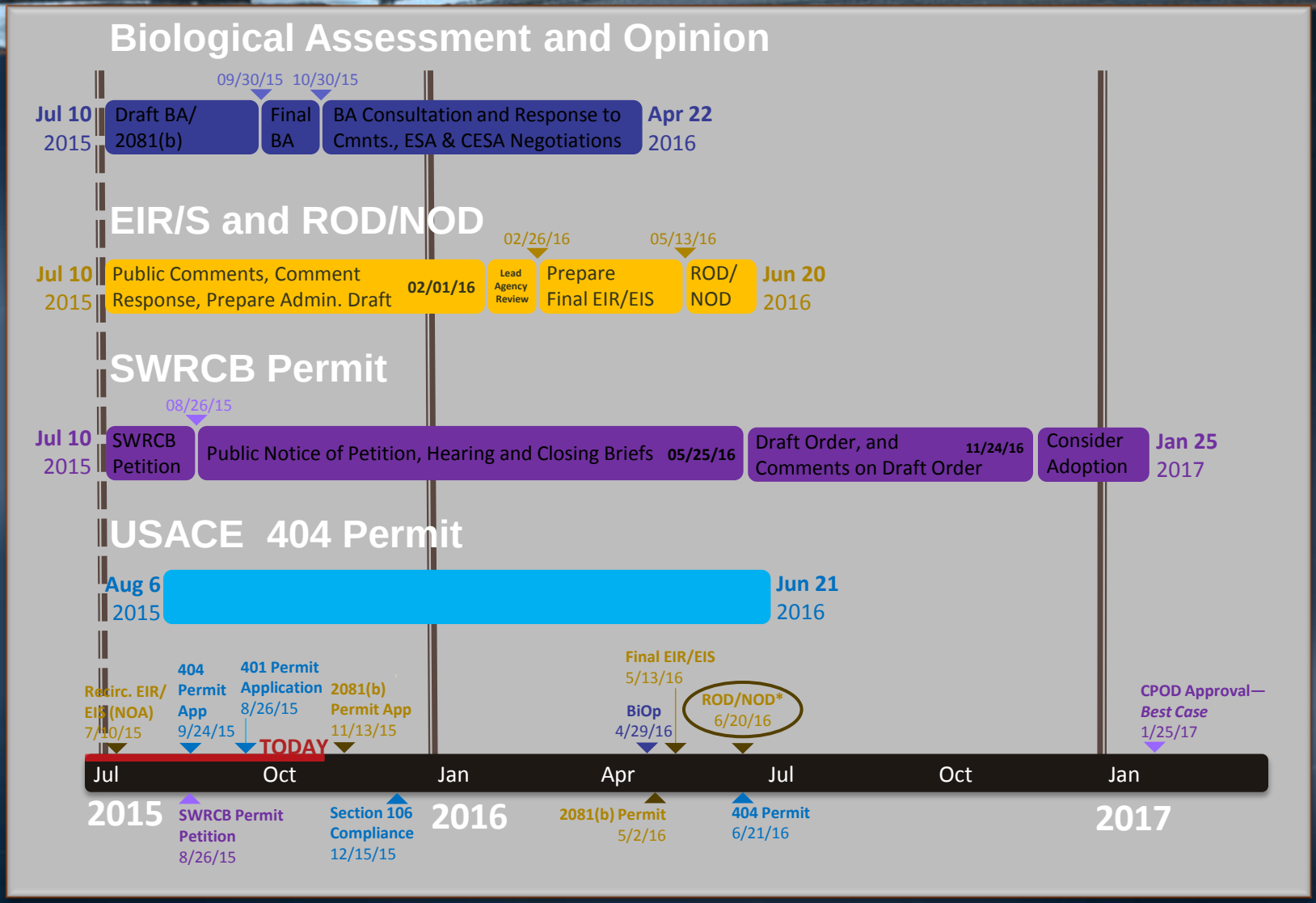
Design and Construction Enterprise

Mitigation Program Schedule

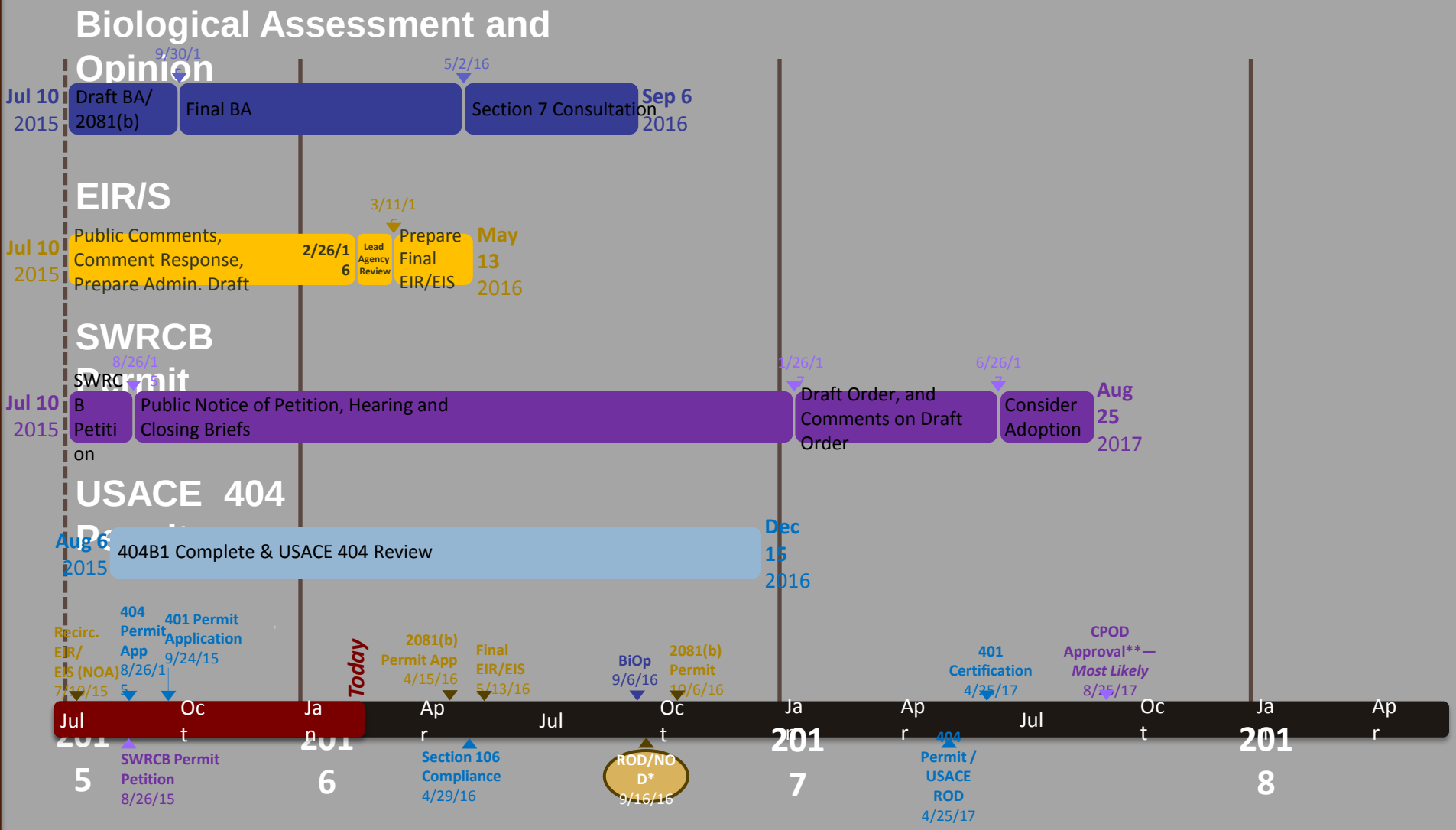


California WaterFix Draft Schedule

Updated Dec 2015



California WaterFix Draft Schedule: 2015-2017

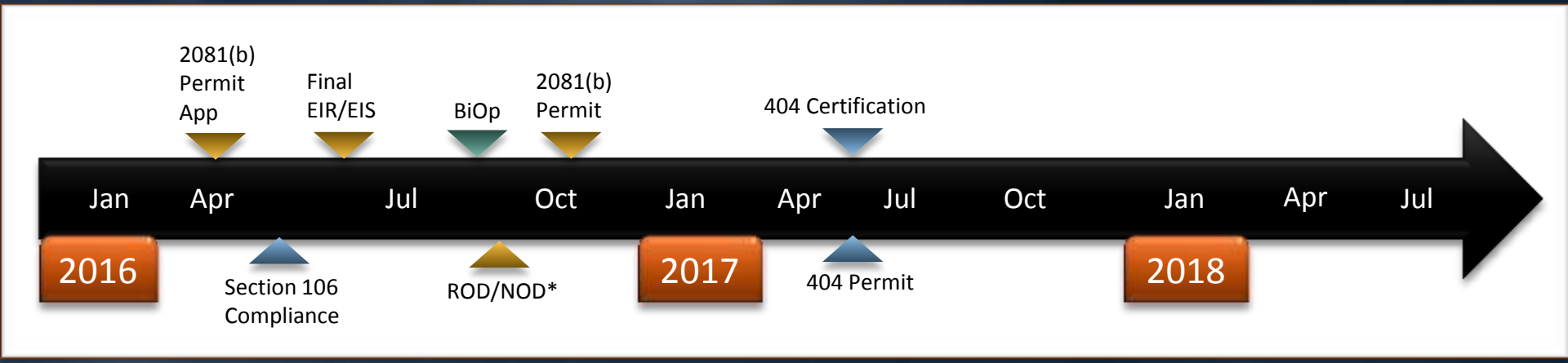


Kern County Water Agency

March 10, 2016

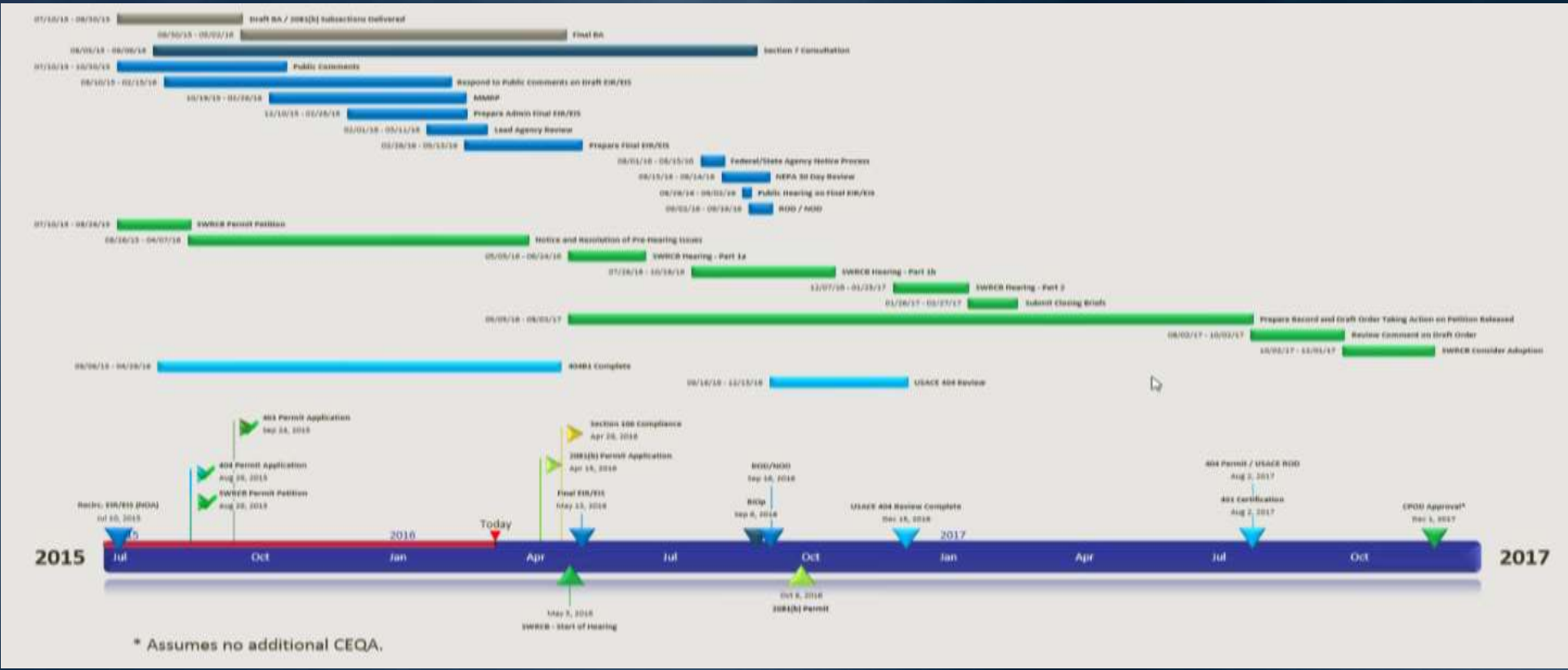
*BiOp is linked to the ROD/NOD | **Assumes no

California WaterFix
Draft Schedule2016-2018



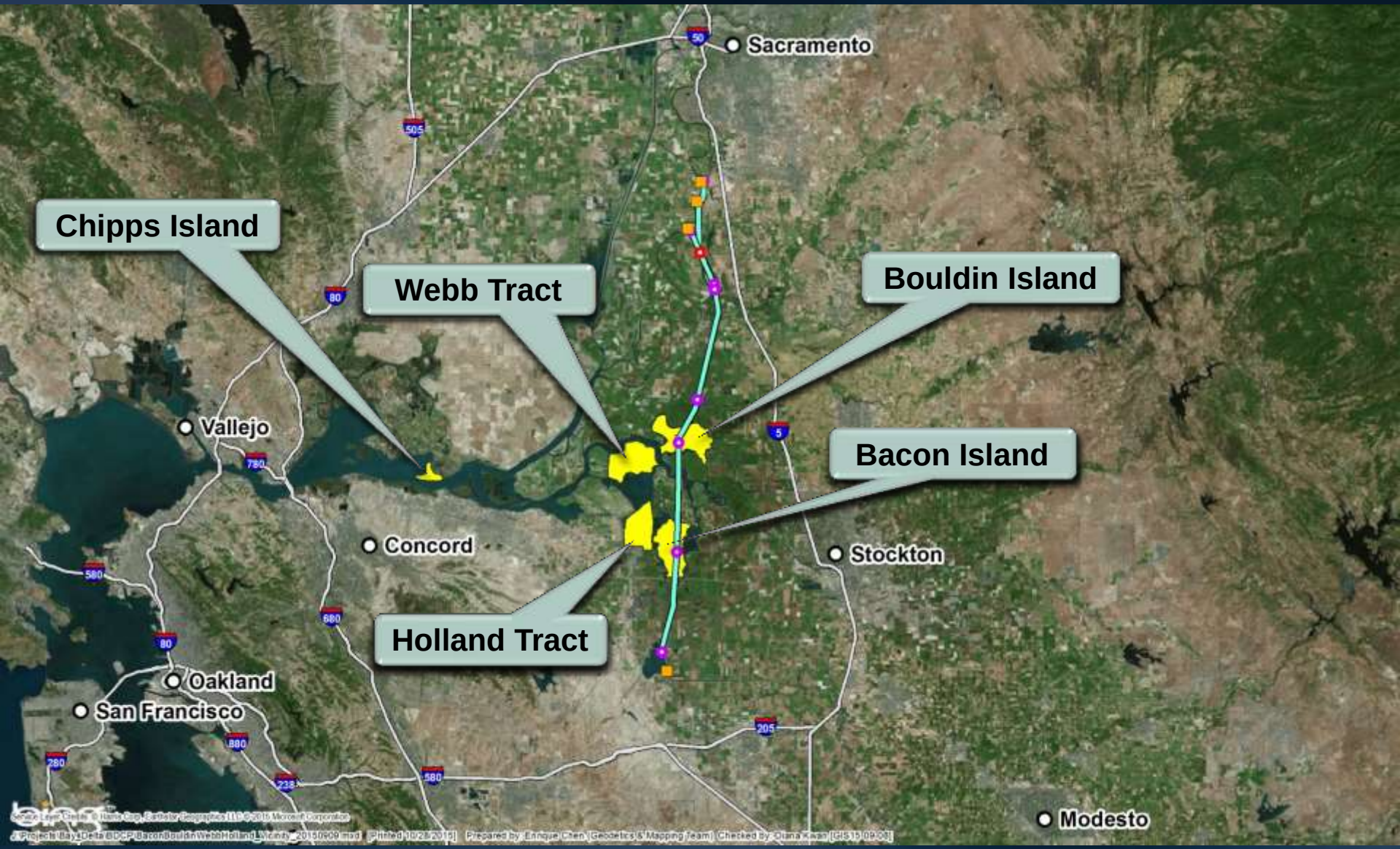
California WaterFix

EIR/EIS Schedule 3-16-2016




Delta Wetlands

Regional Context



General Location

Bacon Island

- Owner: Delta Wetlands Properties & Delta Wetlands Properties PTP
- County: San Joaquin
- 5,603.17± acres
- 28 parcels
- Land Use: Agricultural
- Planted Acres: 4,860±

Bouldin Island

- Owner: Delta Wetlands Properties
- County: San Joaquin
- 6,018.77± acres
- 35 parcels
- Land Use: Agricultural
- Planted Acres: 4,933±

Holland Tract

- Total Size:
  - 4,256.29± acres
  - 35 parcels
- Owner: Delta Wetlands Properties (portion)
- County: Contra Costa
- 3,007± acres
- 16 parcels
- Land Use: Agricultural, Vacant, Recreational
- Planted Acres: 3,020±

Webb Tract

- Owner: Delta Wetlands Properties
- County: Contra Costa
- 5,497.86± acres
- 20 parcels
- Land Use: Agricultural
- Planted Acres: 4,064±

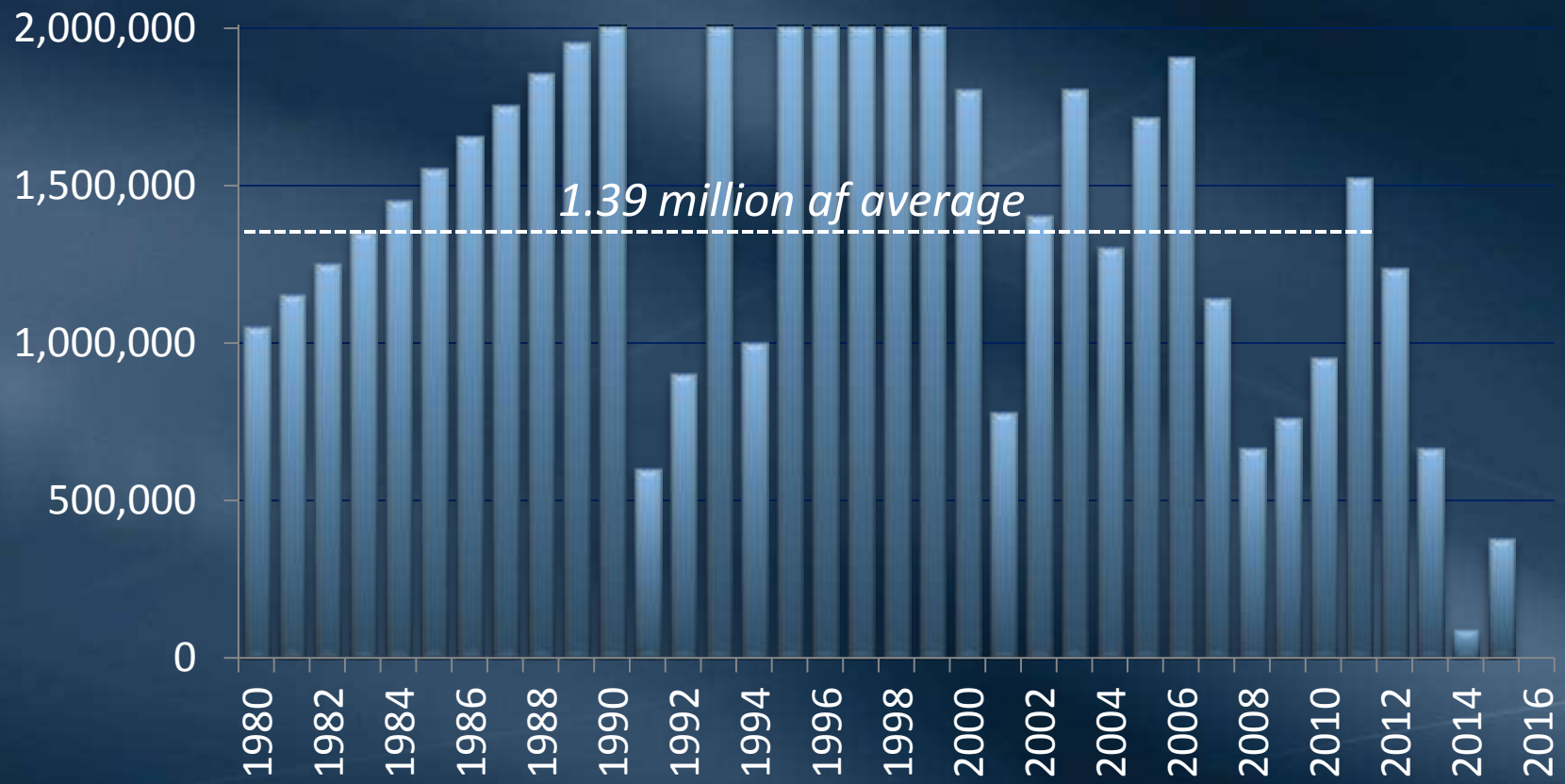
Chipps Island

- Owner: Delta Wetlands Properties
- County: Solano
- 243± acres
- 1 parcel
- Land Use: Agricultural


Miscellaneous

Metropolitan's Average Annual Delta Diversions

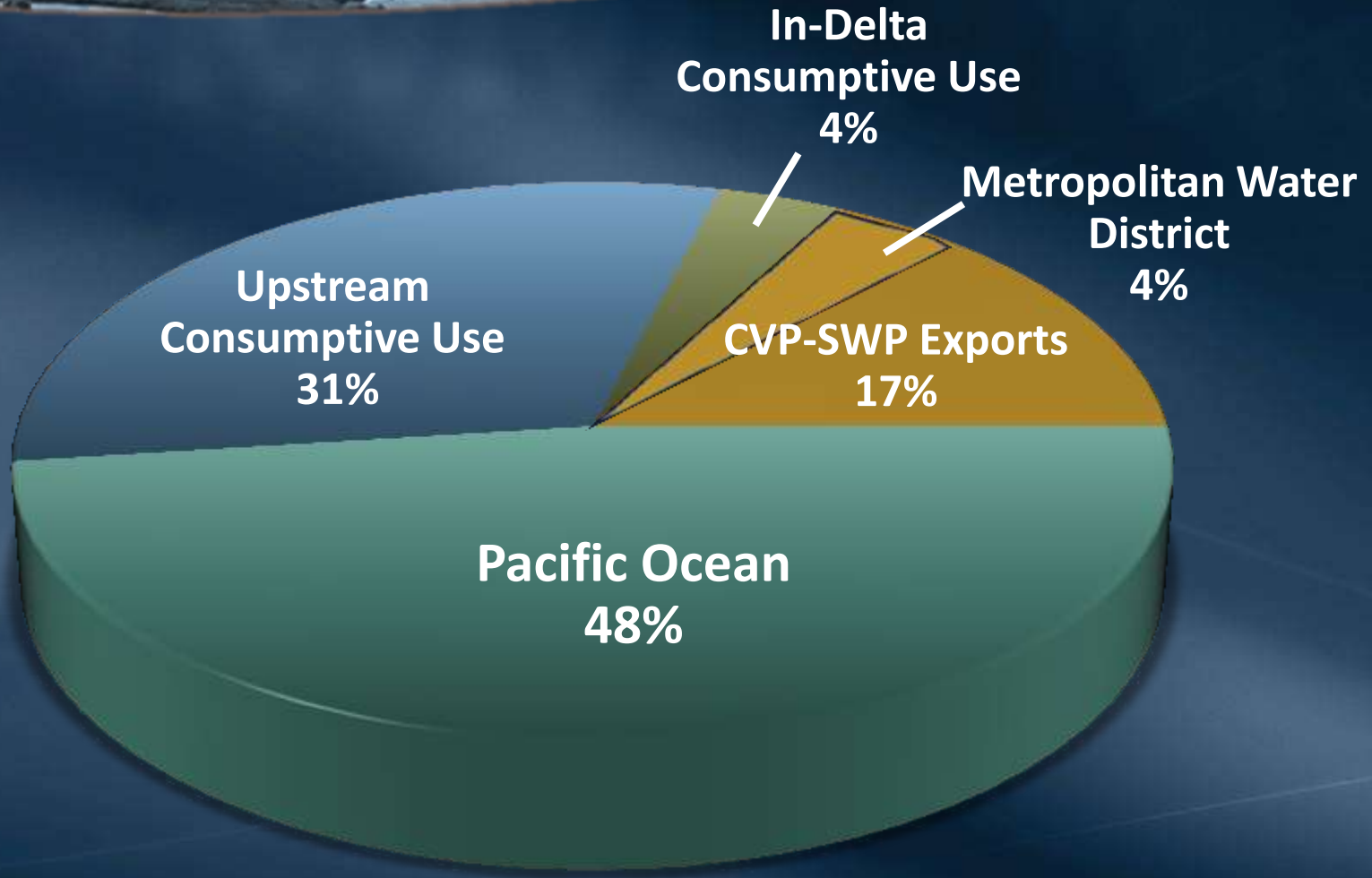
Table A (in acre-ft.)



Average diversions: 1980 – 2015 (1.39 maf), 1990 – 2015 (1.34 maf), 1980 – 2015 (1.14 maf)

Southern California | Bay Area | In-Delta Users

Each divert ~ 4% of the total annual runoff



Source: Governor's Delta Vision Report (estimated total annual runoff 32.85 million acre-feet)
Bay area water agencies divert 3.5% of the total annual runoff

Governor's Water Action Plan

Supports 'All of the Above' Approach (Jan 2014)

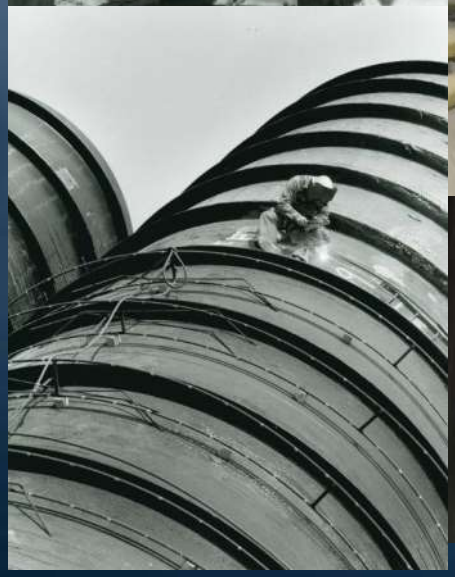
- Conservation
- Regional self-reliance and integrated water management
- Co-equal goals for the Delta
- Protect and restore important ecosystems
- Manage and prepare for dry periods
- Water storage and groundwater management
- Safe water for all communities
- Flood protection
- Operational and regulatory efficiency
- Sustainable and integrated financing

CalEPA

cdfa
CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

CALIFORNIA natural resources AGENCY

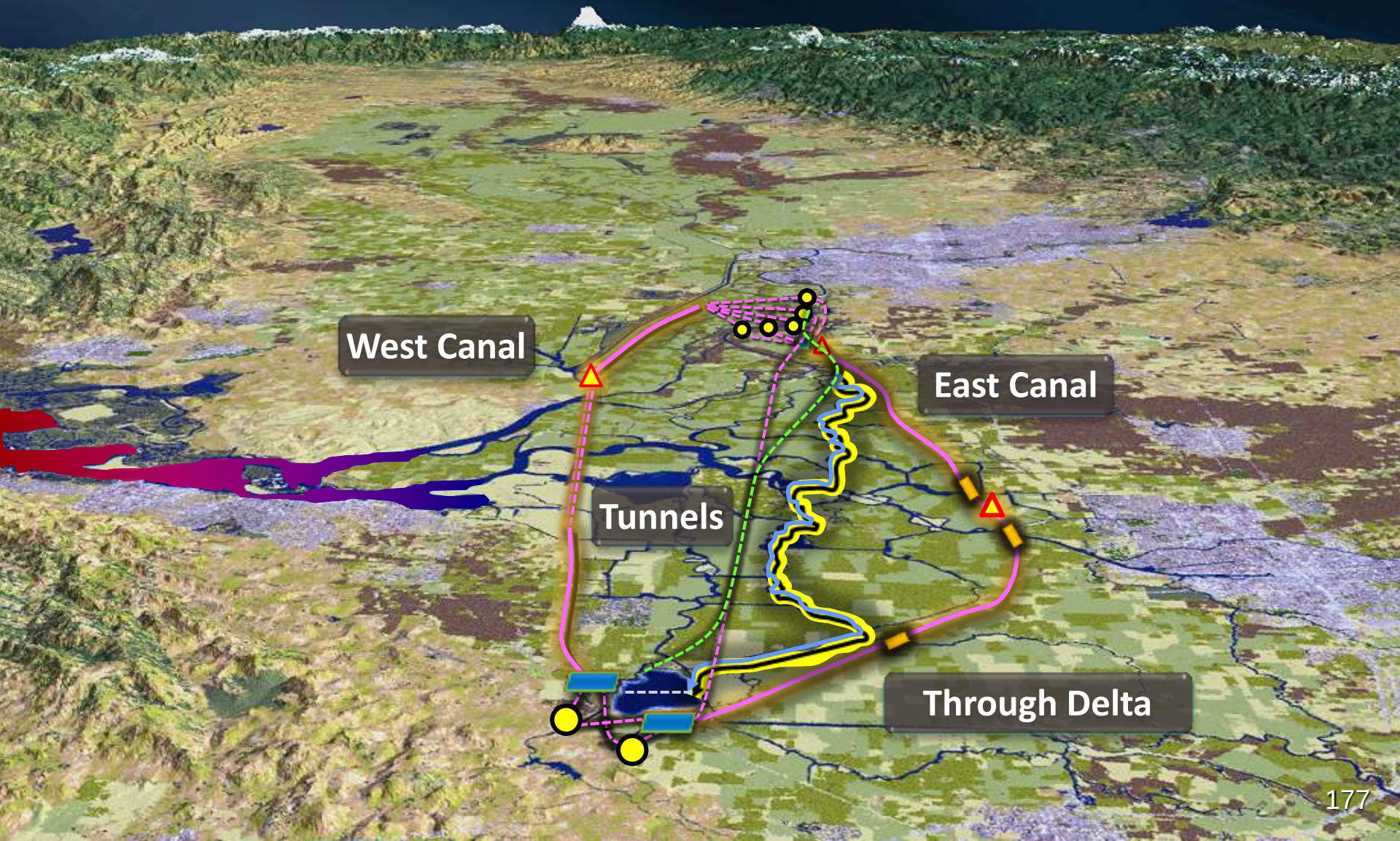
If the Delta is not Fixed, Billions of Dollars of Investments will be Stranded



- State Water Project
  - Construction
  - Nearly 50 years of maintenance
- Diamond Valley Lake
- Inland Feeder
- Water Treatment Processes

Bay Delta Conservation Plan

Conveyance Alignment Options



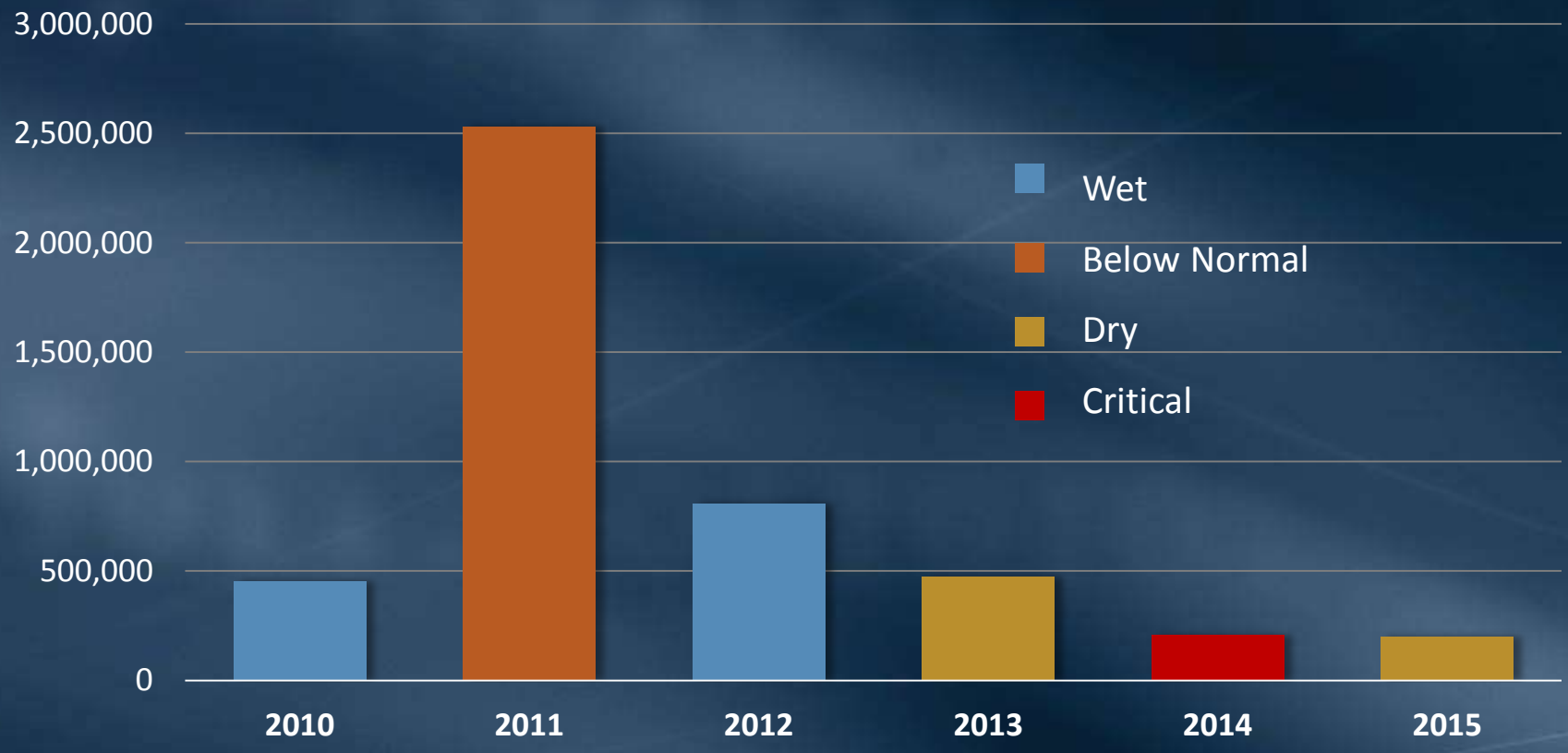
California Treasurer's Report & MWD's Budget Forecast (in 2015 dollars)

California Treasurer's Report			MWD's Budget & Rate Forecast Plan
Best Case	Base Case	Worst Case	
$2 per month	$3 per month	$4 to 5 per month	$5/ month

Overall rate increase (including BDCP) ~ 3% to 5% per year

- *Estimate in 2015 dollars*
- *Metropolitan's 2013 estimate displayed in 2015 Dollars*
- *Based on 20 hundred cubic feet per month*
- *MWD sales of 1.7 million acre-feet and 50% reliance on MWD*

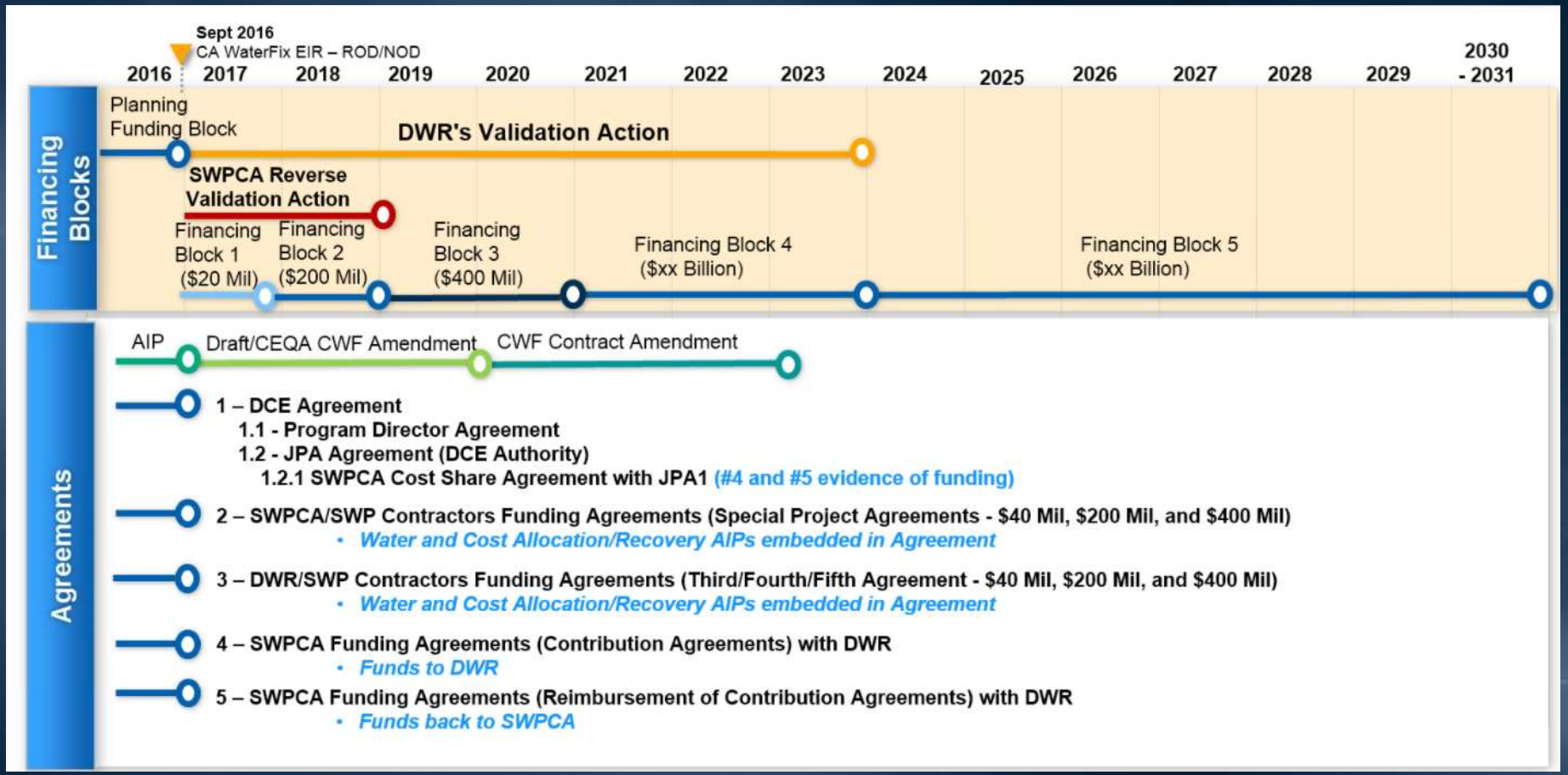
California WaterFix allows for improved capture of flood flows



Storm Flow Period:	1/20/10-3/16/10	12/7/10-7/11/11	1/23/12-5/16/12	12/1/12-2/17/13	2/9/14-4/10/14	12/12/14-1/11/15


Staff Reference
ONLY

California WaterFix
State Water Contractors Financing Agrmts



California WaterFix

State Water Project Agreements

	Agreement Name	Function	Signatories
1	DCE Agreement	Details how design and construction of the CWF will be managed and implemented.	DWR, Authority
1.1	Program Director Agreement	Assigns the managing individual of the Conveyance Project in accordance with the JPA Agreement.	DWR, Authority, Program Director
1.2	Conveyence Project Coordination Agency (JPA1) Agreement	Form Authority that is the signatory to the DCE Agreement.	MWD, KCWA, SCVWD, SLDMWA, WWD, SWC
1.2.1	State (JPA2) Cost Share Agreement with JPA1	Evidence of the state contractors' cost share and payment obligation for the design and construction of the CWF.	MWD, KCWA, SCVWD, SWC, JPA1
2	SWPCA/SWP Contractors Funding Agreements (Special Project Agreements - $40 Mil, $200 Mil and $400 Mil)	SWP contractor's agreement to pay its share of debt service to SWPCA, if and when, SWPCA bills, SWPCA's agreement to accept and collect funds	SWPCA, State Water Project Contractors
3	DWR/SWP Contractors Funding Agreements (Third/Fourth Agreement - - $40 Mil, $200 Mil and $400 Mil)	SWP contractor's agreement to pay its share of debt service to DWR, if and when, DWR bills, DWR's agreement to accept and collect funds	DWR, State Water Project Contractors
4	SWPCA Funding Agreements (Contribution Agreements) with DWR	SWPCA agreement to provide DWR with payments (a contribution) for the design and construction of the CWF.	SWPCA, DWR
5	SWPCA (Reimbursement of Contribution Agreements) with DWR	DWR's agreement to provide SWPCA with a source of funds (a repayment of the contribution) for the repayment of the debt incurred to provide the original contribution to DWR for the design and construction of the CWF.	SWPCA, DWR

MWD Expenditures on BDCP
Total (Jul 2005 – Sep 2015)

As reported to Board on October 27, 2015

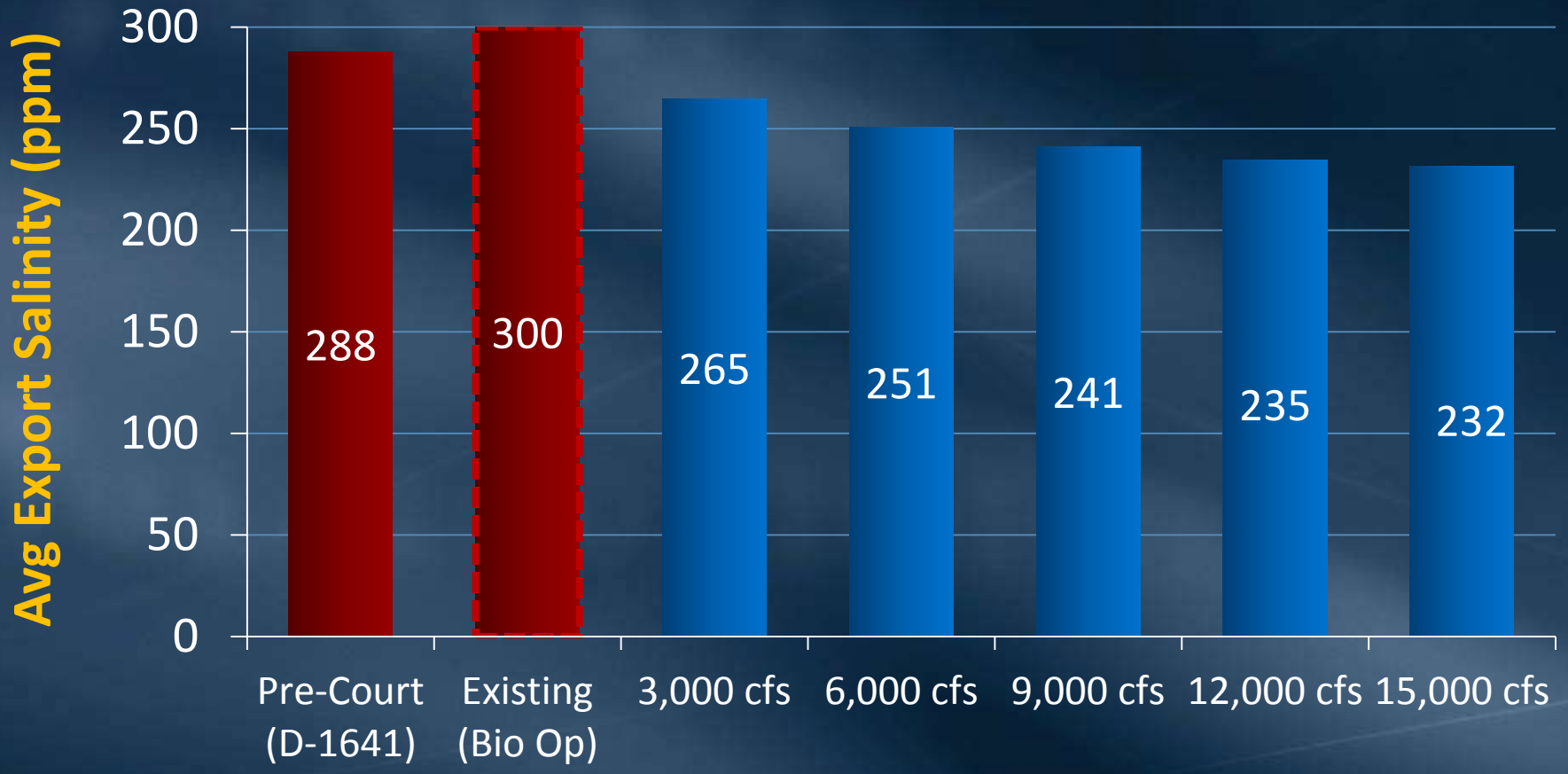
BDCP – Internal MWD	**Total Costs (~10 yrs.)**
Labor & Benefits (1)	$ 20.91M
Professional Services	$ 4.15M
Travel	$ 1.03M
Other (2)	$ 0.14M
SUBTOTAL	**$ 26.23M**
Administrative Overhead	$ 7.97M
TOTAL	**$ 34.20M**

BDCP – Planning Cost by DWR	
BDCP/DHCCP	$ 63M

(1) Labor costs include salary, leave and non-leave benefits
(2) Other include charges for materials & supplies, trainings & seminars, conferences & meetings, and reprographics

Export Water Quality Improvements

Salinity – BDCP Scenario 1

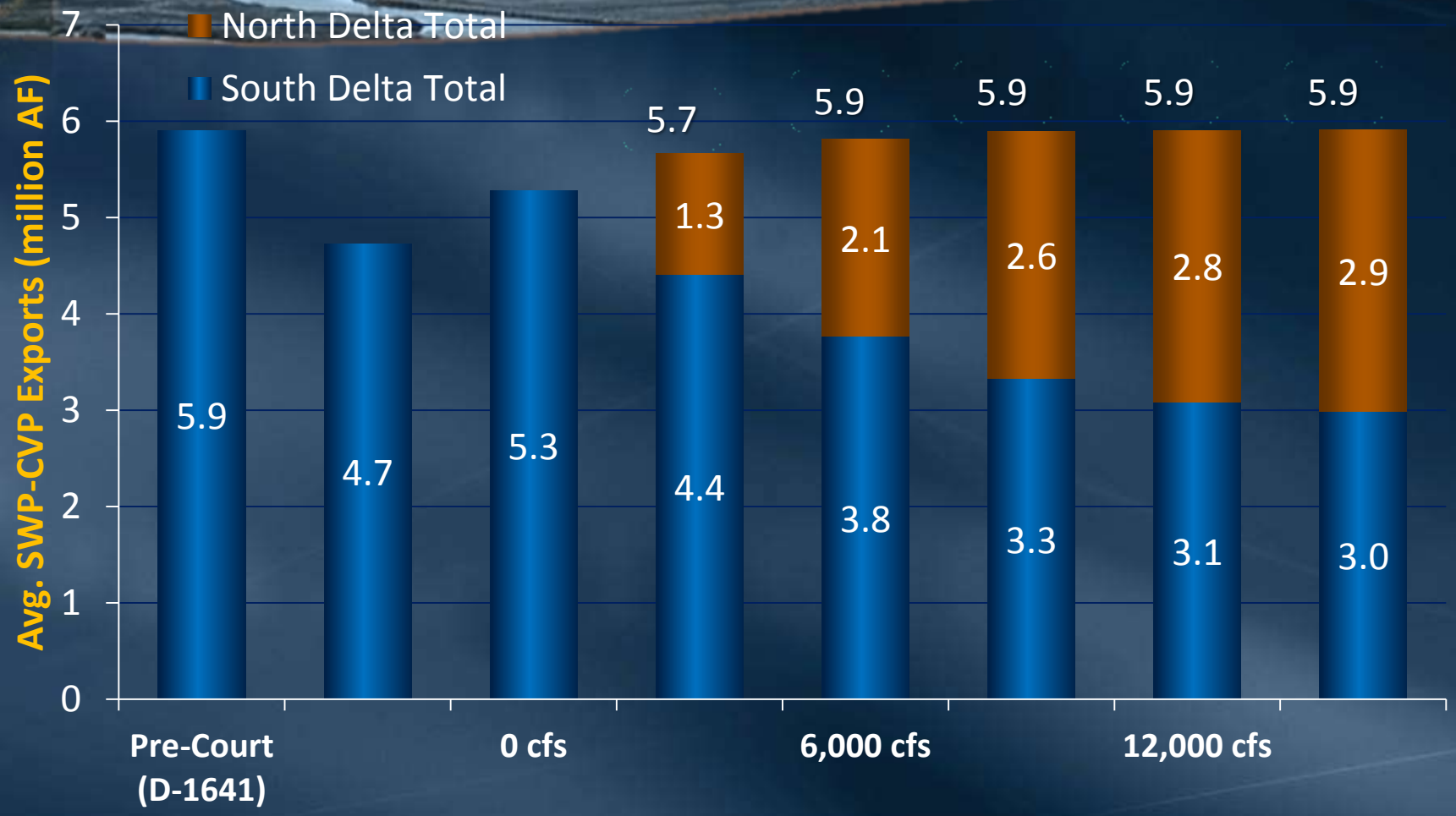


Based on preliminary operations forwarded by BDCP Steering Comm in 2010 (Scenario 1)

Delta Water Supply Analysis

Alt. 1 – BDCP Steering Committee 2010 Proposal

Metropolitan's share ~ 25%

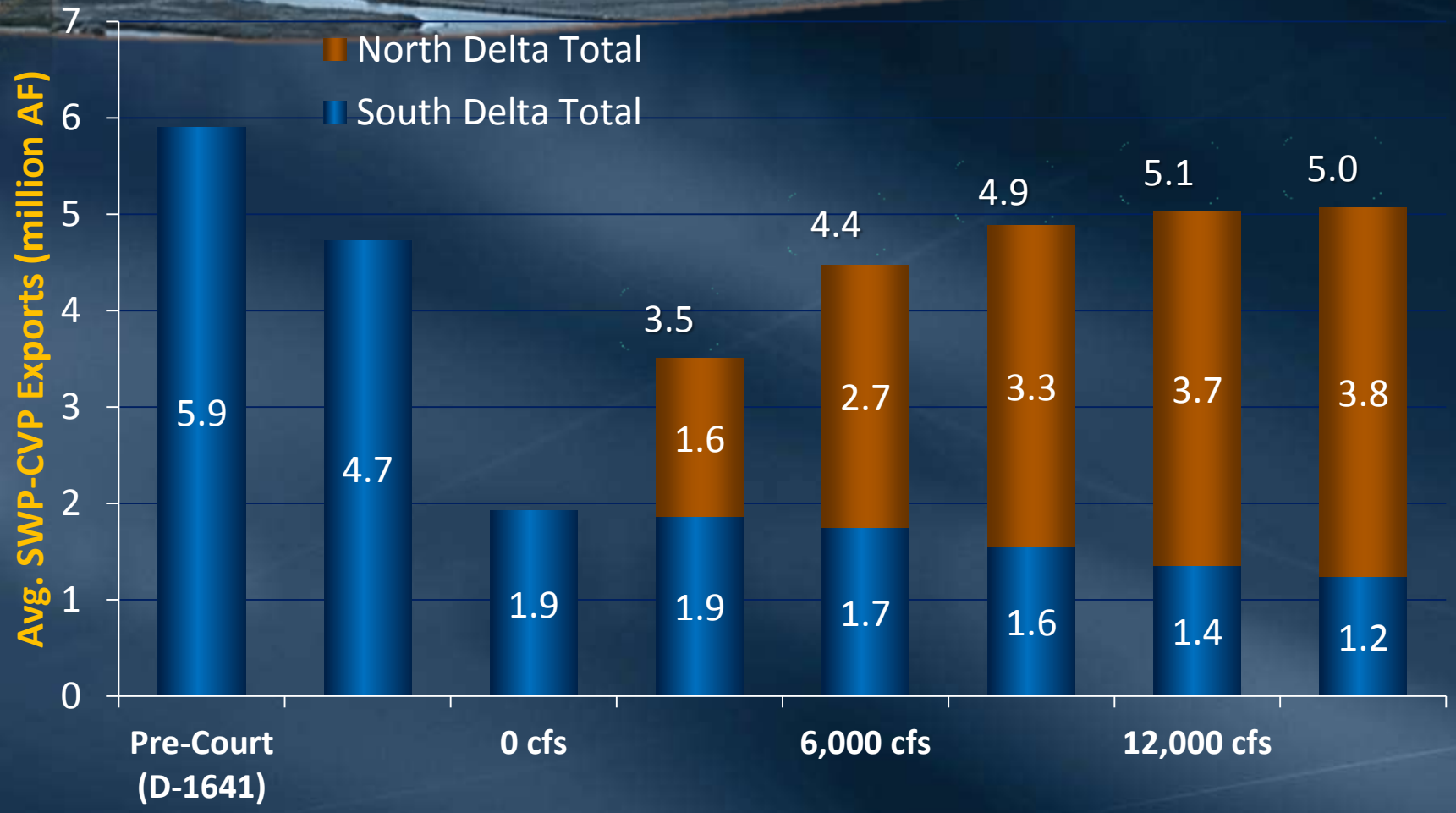


Alt 1. BDCP Steering Committee Dec 2010 proposed operations

Delta Water Supply Analysis

Alt. 2 – Additional Fish Restrictions

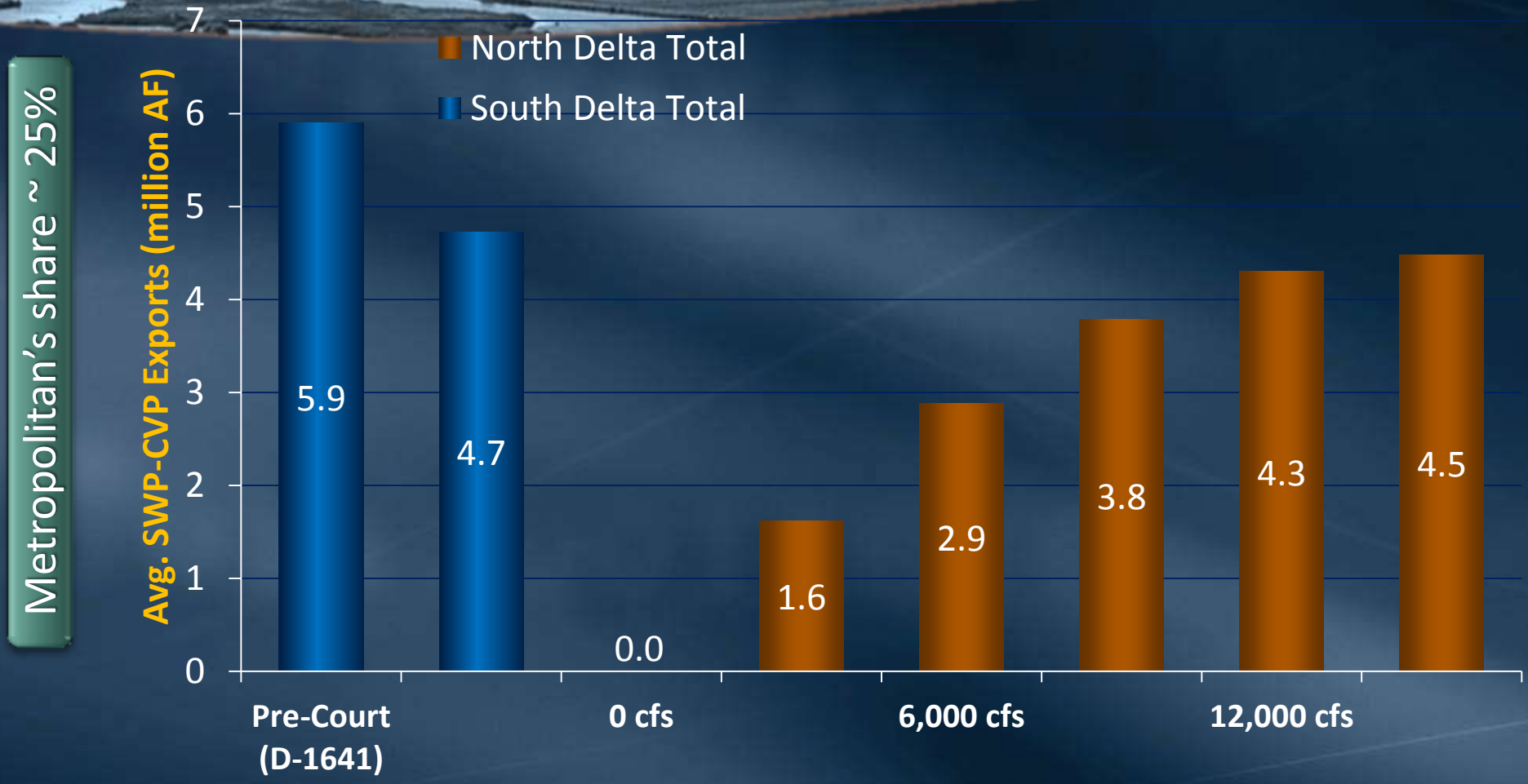
Metropolitan's share ~ 25%



Alt 2. – Addtl Fish Restrictions analysis (Old & Middle River flows in Jan-May 0 cfs, Jun-Dec -2,000 cfs)

Delta Water Supply Analysis

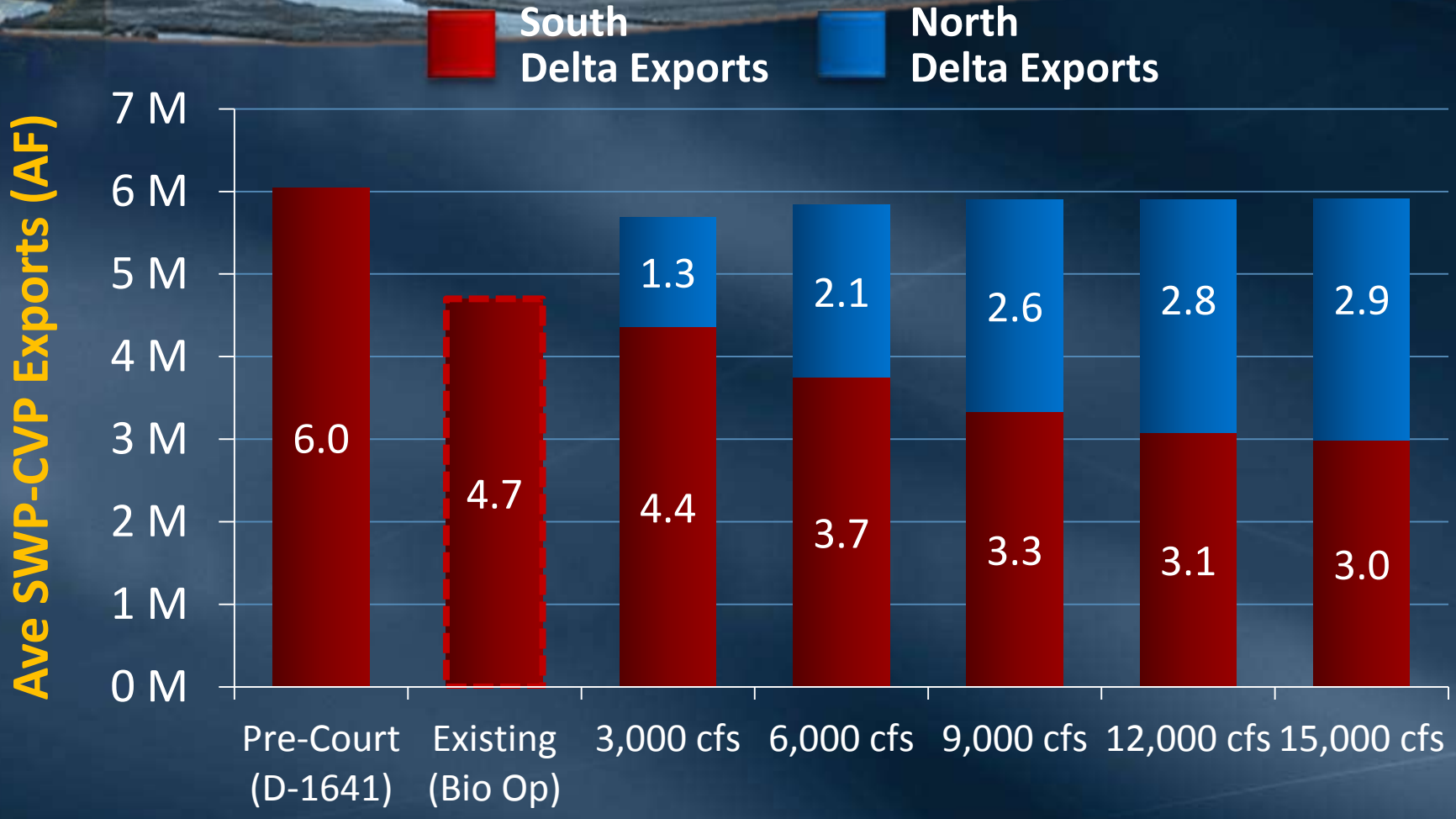
Alt. 3 – Earthquake/No South Delta Diversion



Alt 3. – Exports will be minimal for1.5 to 3 years following an earthquake

New Conveyance Improvements

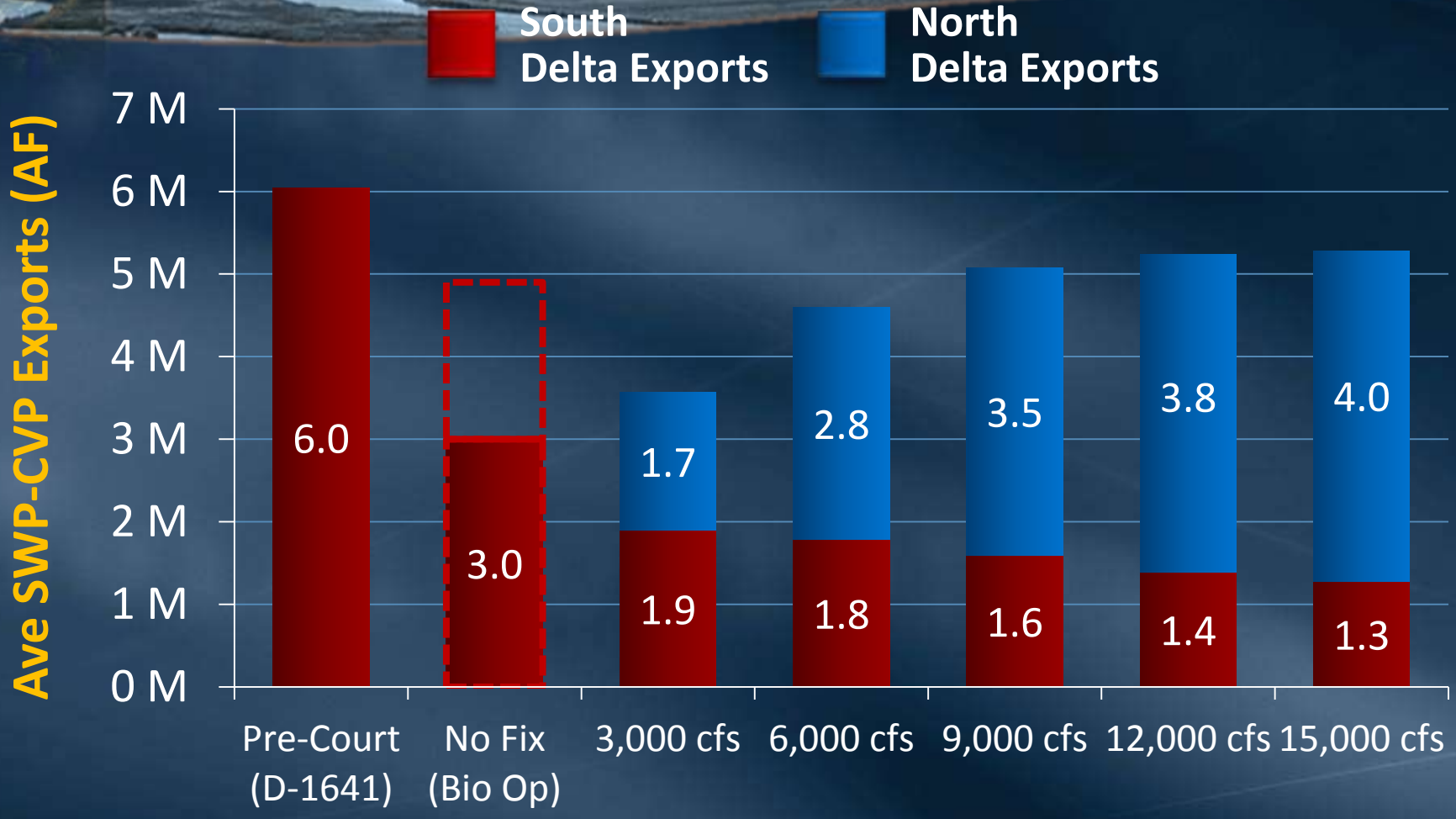
Operations forwarded by Steering Comm (Yr. 2025)



Based on preliminary operations forwarded by BDCP Steering Comm in 2010

Worsening Fishery Conditions

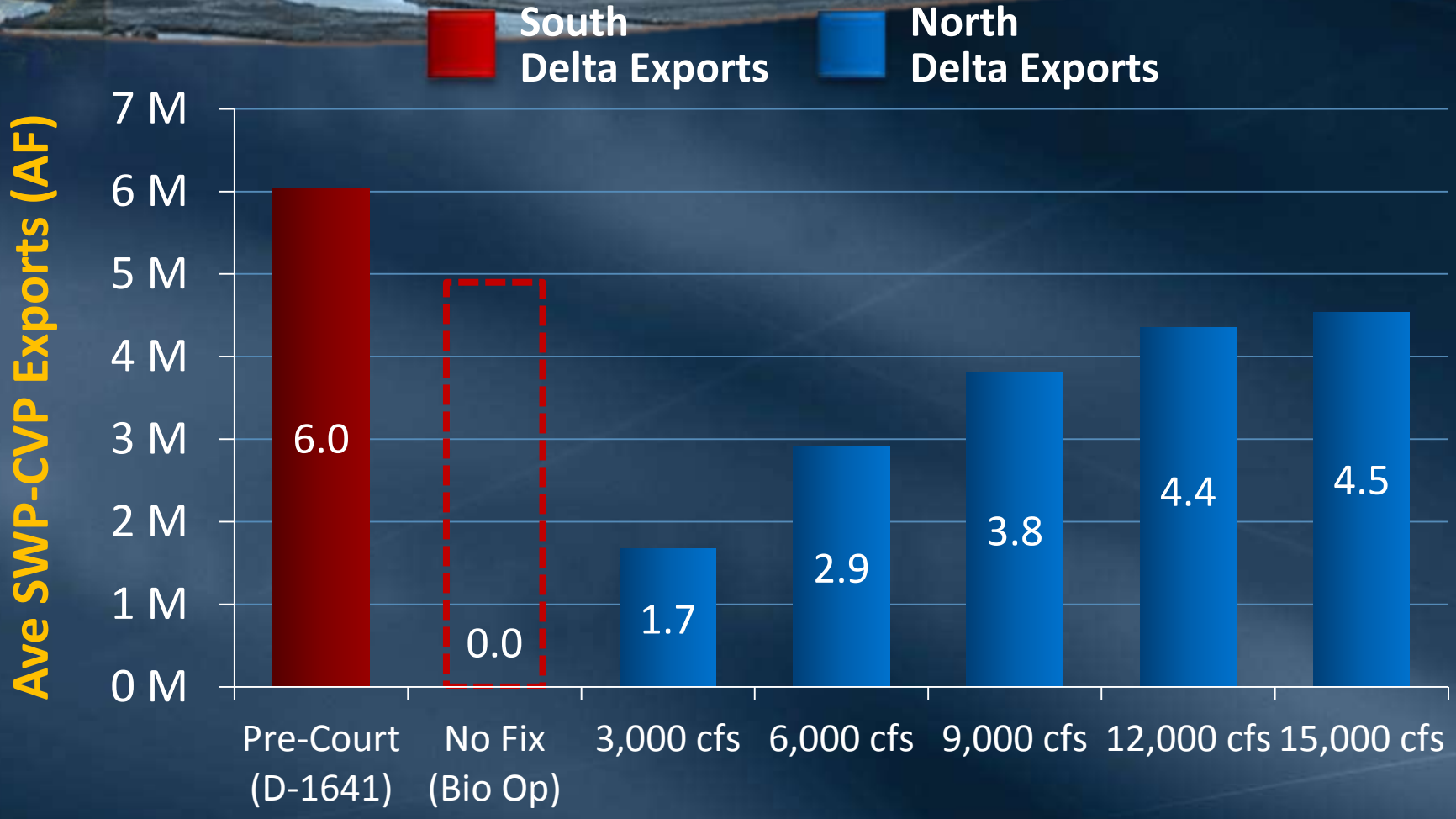
More restrictive Old & Middle River conditions



Based on preliminary operations forwarded by BDCP Steering Comm in 2010

No South Delta Diversions

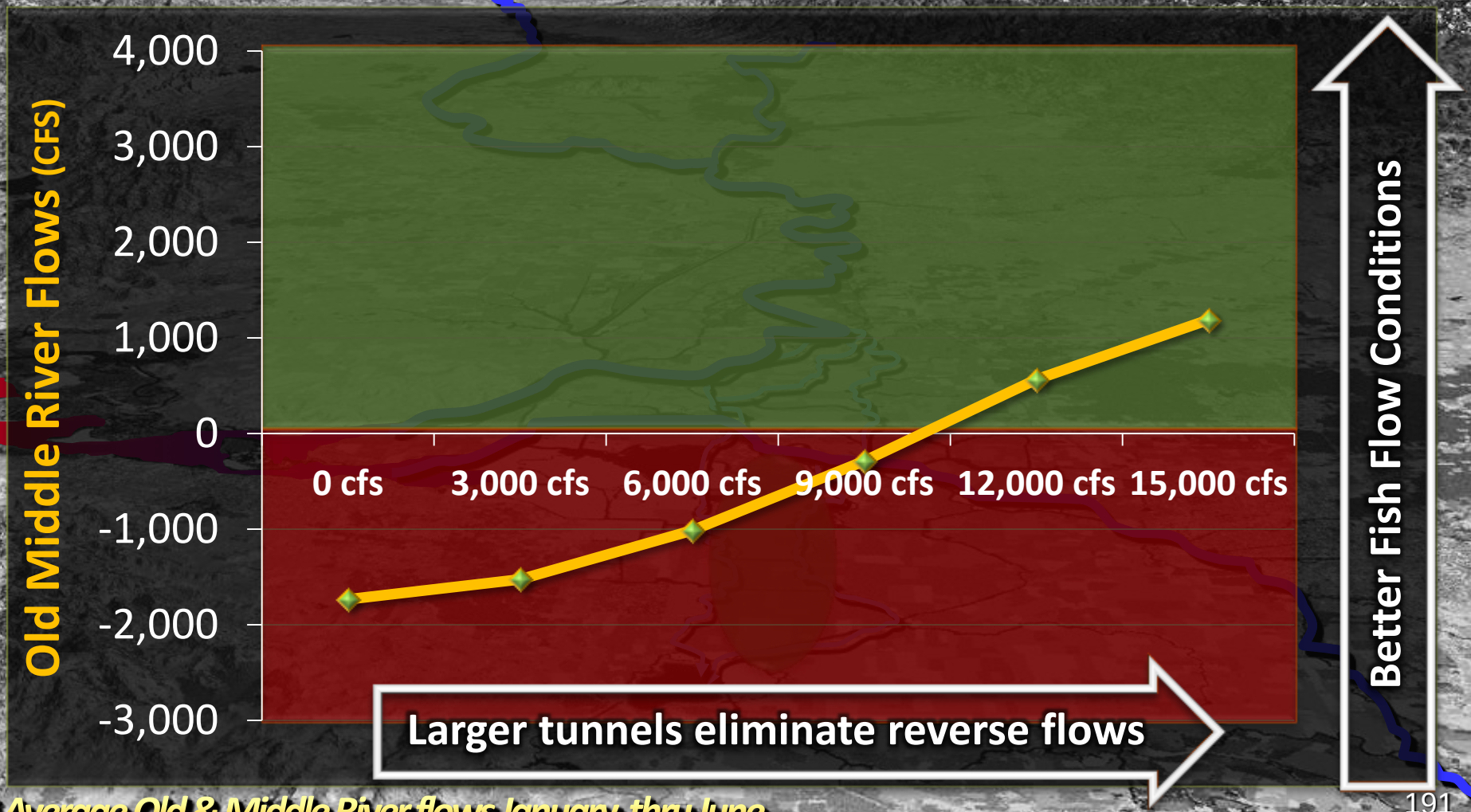
Due to sea-level rise, seismic/flood, ESA restrictions



Based on preliminary operations forwarded by BDCP Steering Comm in 2010

Goal – In-Delta Rivers Flowing Forward

Old & Middle River Flows*

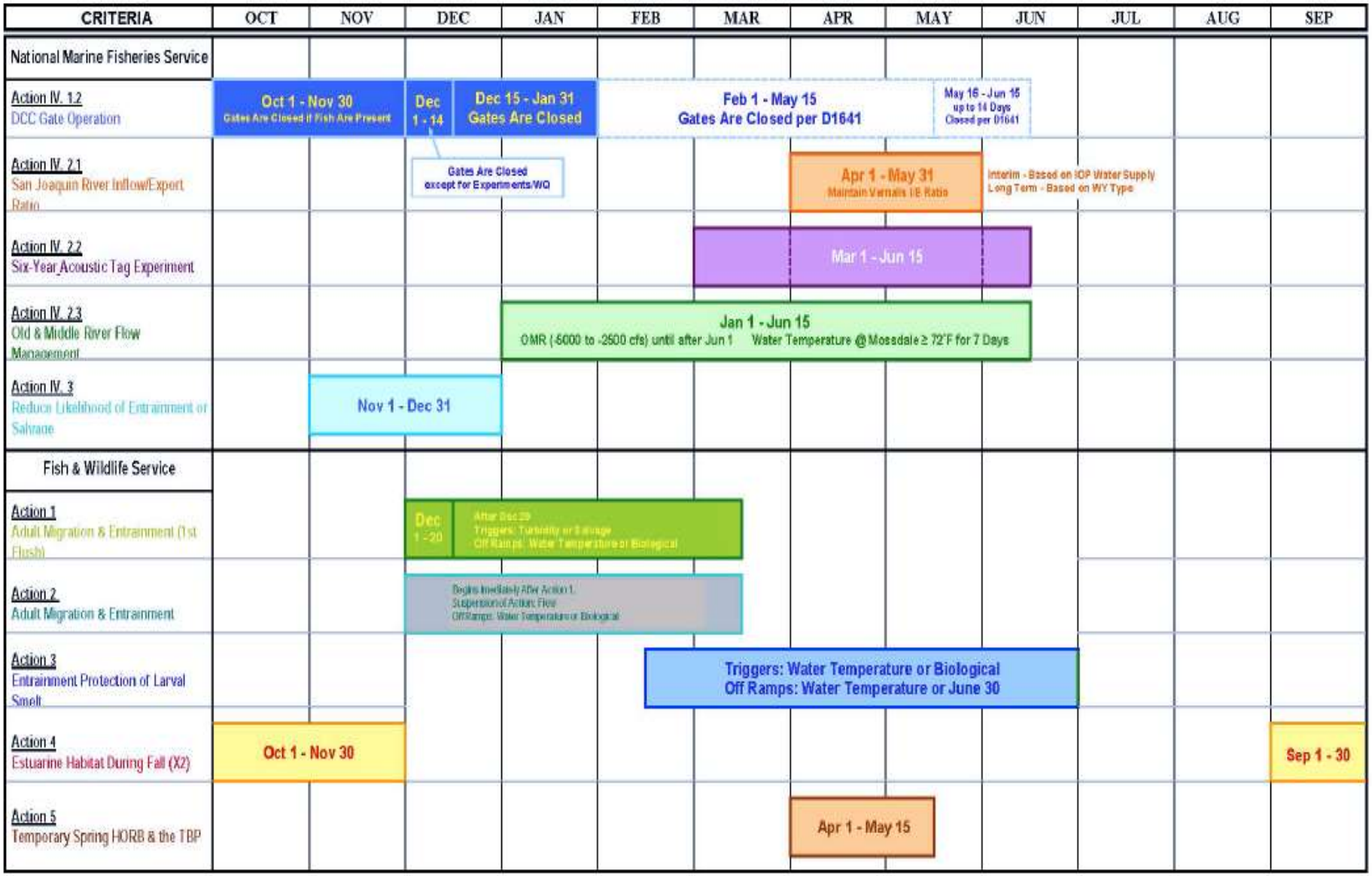


* Average Old & Middle River flows January thru June

NMFS & FWS Biological Opinions

Reasonable and Prudent Alternatives

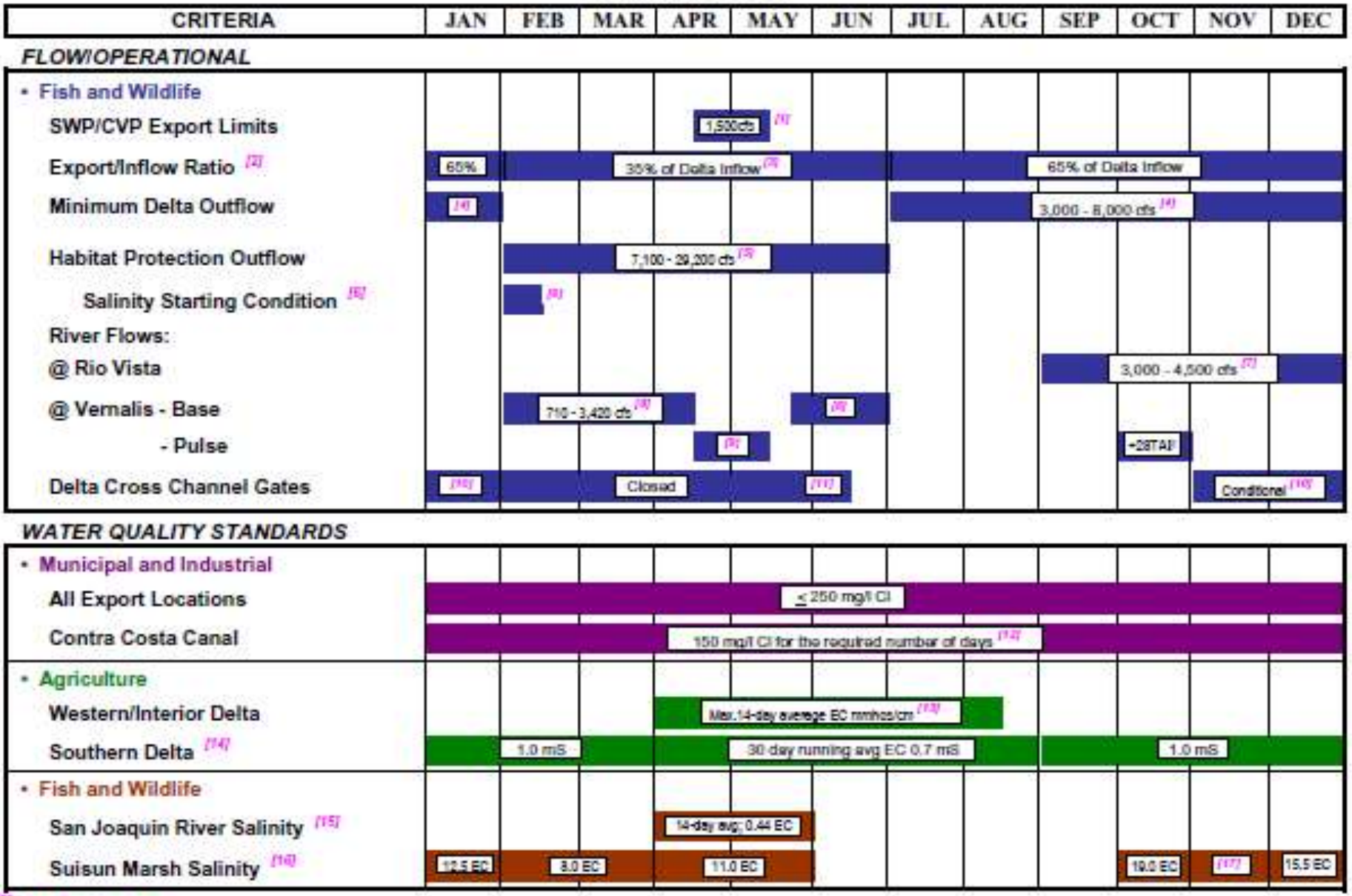
DRAFT



Bay-Delta Standards

Contained in D-1641

DRAFT



[#] See Footnotes

Key Delta Operational Standards

Source	Action	Applicable Time Frame
D-1641	Habitation Protection Flows between 7,100-29,200 cfs	February –June
D-1641	Export/Inflow Ratio 35 % of Delta Inflow	February-June
D-1641	San Joaquin River Inflow-to-Export Ratio of 1:1	31 days in April and May
D-1641	Delta Cross Channel Gates Closed	February-May
D-1641	Delta Cross Channel Gates conditionally closed	November - December
D-1641	Minimum Delta Outflow	July - December
D-1641	Minimum Sacramento River flow at Rio Vista	September - December
D-1641	Minimum San Joaquin River flow at Vernalis	Additional releases up to 28 taf during Oct
D-1641	150 mg/l of chloride for Contra Costa Canal	Total of 150 days during a critically dry year
D-1641	Southern Delta Electrical Conductivity	$\leq$ 0.7 EC during April - August
D-1641	Suisun Marsh Electrical Conductivity	October - May
NMFS BiOp Action IV.2.3	OMR (-5000- -2500) until after June 1; Water Temperature at Mossdale less than or equal to 72 degrees for 7 days	January – mid May
NMFS BiOp Action IV.2.1	SJR - Inflow/Export ratio	April 1—May 31
NMFS BiOp Action IV.1.2	Delta Cross Channel Gates Conditionally closed	October - January
NMFS BiOp Action IV.1.2	Delta Cross Channel Gates Closed	February - May
USFWS BiOp Action 1, 2, 3	OMR Flow Restrictions & Turbidity Triggers(-1,250 to -5,000 cfs)	Dec - Jun
USFWS BiOp Action 5	Install a barrier at the head of Old River	Spring

Rounding

Delta Conveyance

Existing & Proposed SWP/CVP Diversion Regulations

Regulations (Existing & Proposed)	BDCP Preferred Alternative Alt. 4-H3	BDCP Preferred Alternative Alt. 4-H4	NEW Cal WaterFix Preferred Alt. Alt. 4A
Existing SWP/CVP Diversions (in 2015)			
• SWRCB D-1641 Regulations – Diversion Capacity	6,000,000 af	6,000,000 af	6,000,000 af
• 2008 – Old & Middle River (USFWS BioOp)	- 700,000 af	- 700,000 af	- 700,000 af
• 2008 – Fall X2 Outflow (USFWS BioOp)	- 200,000 af	- 200,000 af	- 200,000 af
• 2009 – San Joaquin River I/E Ratio (NMFS)	- 300,000 af	- 300,000 af	- 300,000 af
SWP/CVP Diversions (in 2015)	**4,900,000 af**	**4,900,000 af**	**4,900,000 af**
Proposed Fish Ops *without* North Intake (in 2025)			
• Existing SWP/CVP Diversions (in 2015)	4,900,000 af	4,900,000 af	4,900,000 af
• Potential – Climate Change Impacts by 2025	- 200,000 af	- 200,000 af	- 200,000 af
• Proposed – Enhanced Spring Outflow	- 0 af	- 600,000 af	- 300,000 af
• Proposed – Add. OMR Restrictions (Scenario 6)	- 900,000 af	- 700,000 af	- 900,000 af
SWP/CVP Diversions *without* Fix (in 2025)	**3,800,000 af**	**3,400,000 af**	**3,500,000 af**
Proposed Fish Ops *with* North Intake (in 2025)			
• SWP/CVP without North Intake (in 2025)	3,800,000 af	3,400,000 af	3,500,000 af
• Proposed – North Delta Restrictions	- 400,000 af	- 400,000 af	- 400,000 af
• Proposed – North Delta Intake	+ 1,900,000 af	+ 1,700,000 af	+ 1,800,000 af
SWP/CVP Diversions *with* Fix (in 2025)	**5,300,000 af**	**4,700,000 af**	**4,900,000 af**
Proposed Fish Ops *with* North Intake & New Storage			
• North-of-Delta			300,000 af
• South-of-Delta			200,000 af
SWP/CVP Diversions *with* Fix & Storage (in 2025)			**5,400,000 af**

Information produced by CH2M; Updated 11-25-2015

No Rounding

Delta Conveyance

Existing & Proposed SWP/CVP Diversion Regulations

Regulations (Existing & Proposed)	BDCP Preferred Alternative Alt. 4-H3	BDCP Preferred Alternative Alt. 4-H4	NEW Cal WaterFix Preferred Alt. Alt. 4A
Existing SWP/CVP Diversions (in 2015)			
• SWRCB D-1641 Regulations – Diversion Capacity	6,051,000 af	6,051,000 af	6,051,000 af
• 2008 – Old & Middle River (USFWS BioOp)	- 651,000 af	- 651,000 af	- 651,000 af
• 2008 – Fall X2 Outflow (USFWS BioOp)	- 183,000 af	- 183,000 af	- 183,000 af
• 2009 – San Joaquin River I/E Ratio (NMFS)	- 319,000 af	- 319,000 af	- 319,000 af
SWP/CVP Diversions (in 2015)	**4,898,000 af**	**4,898,000 af**	**4,898,000 af**
Proposed Fish Ops *without* North Intake (in 2025)			
• Existing SWP/CVP Diversions (in 2015)	4,898,000 af	4,898,000 af	4,898,000 af
• Potential – Climate Change Impacts by 2025	- 170,000 af	- 170,000 af	- 170,000 af
• Proposed – Enhanced Spring Outflow	- 0 af	- 615,000 af	- 265,000 af
• Proposed – Add. OMR Restrictions (Scenario 6)	- 914,000 af	- 667,000 af	- 914,000 af
SWP/CVP Diversions *without* Fix (in 2025)	**3,814,000 af**	**3,446,000 af**	**3,549,000 af**
Proposed Fish Ops *with* North Intake (in 2025)			
• SWP/CVP without North Intake (in 2025)	3,814,000 af	3,446,000 af	3,549,000 af
• Proposed – North Delta Restrictions	- 419,000 af	- 419,000 af	- 419,000 af
• Proposed – North Delta Intake	+ 1,869,000 af	+ 1,678,000 af	+ 1,768,000 af
SWP/CVP Diversions *with* Fix (in 2025)	**5,265,000 af**	**4,705,000 af**	**4,898,000 af**
Proposed Fish Ops *with* North Intake & New Storage			
• North-of-Delta			292,000 af
• South-of-Delta			156,000 af
SWP/CVP Diversions *with* Fix & Storage (in 2025)			**5,346,000 af**

Information produced by CH2M; Updated 11-25-2015

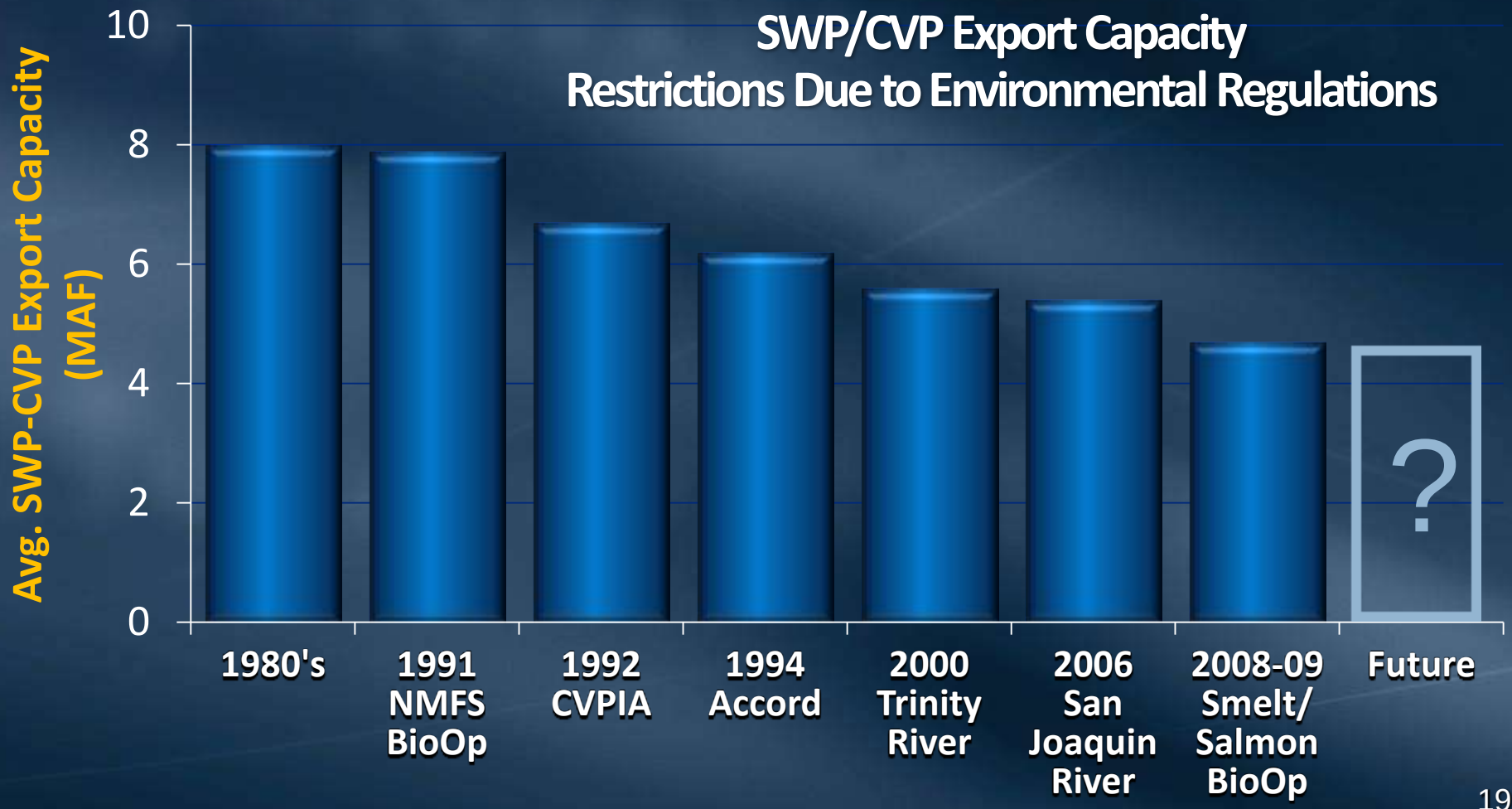
Delta Conveyance

Additional Old & Middle River Reverse Flow Restrictions

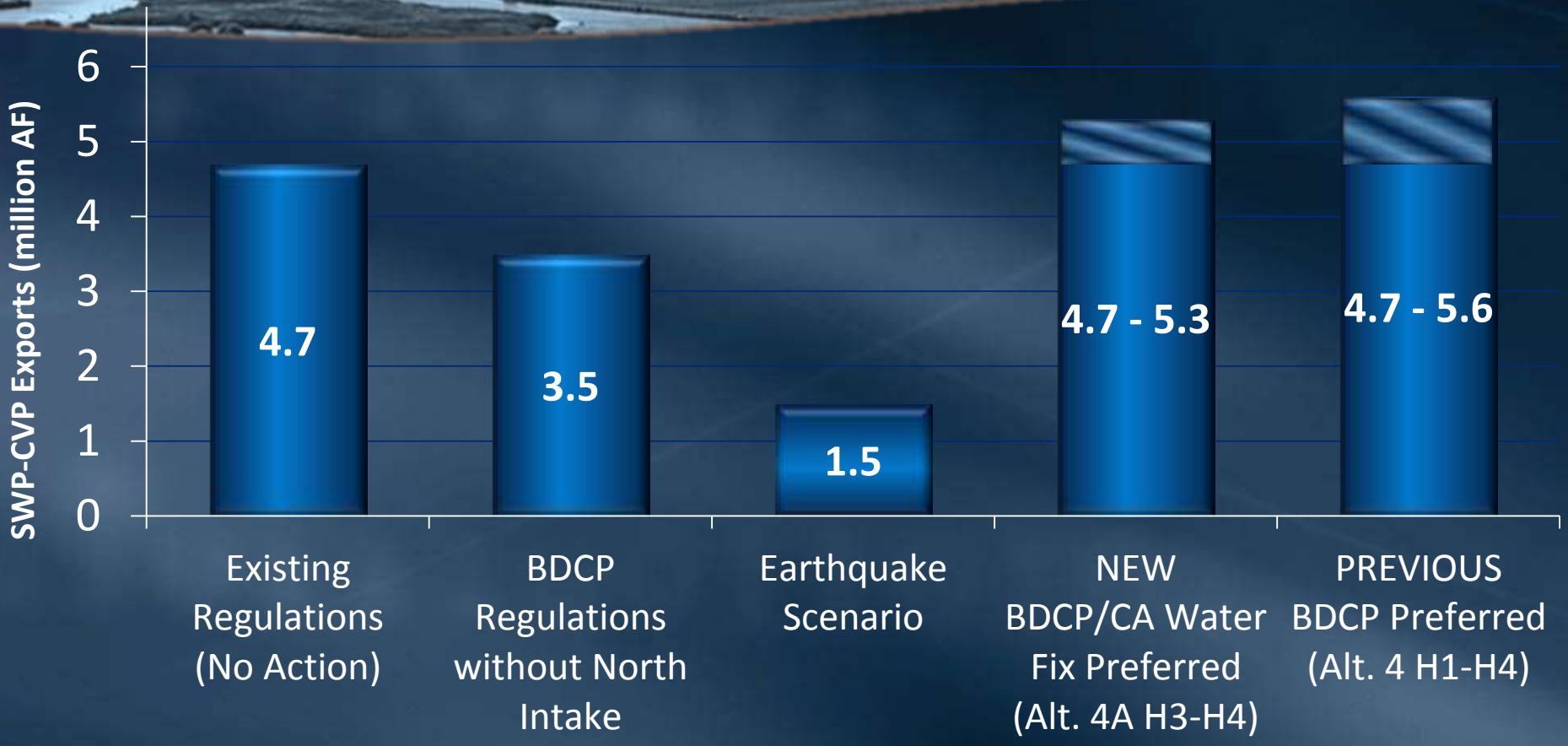
Month	Old & Middle River Criteria (Scenario 6)	BDCP Preferred Alternative		California WaterFix Preferred Alt.
		Alt. 4-H3	Alt. 4-H4	Alt. 4A
Oct - Nov	No diversion during pulse flow -5,000 cfs in Nov	- 313,000 af	- 231,000 af	- 313,000 af
Dec - Mar	-5,000 to -3,000 cfs	-454,000 af	- 379,000 af	-454,000 af
Apr - May	-2,000 to +3,000 cfs	-60,000 af	- 51,000 af	-60,000 af
Jun	- 3,500 to + 1,000 cfs	-113,000 af	- 95,000 af	-113,000 af
Jul – Sep	No flow restrictions	+26,000 af	+89,000 af	+26,000 af
	TOTAL Annual Impacts	**- 914,000 af**	**- 667,000 af**	**- 914,000 af**

Information produced by CH2M; Scenario 6 Breakdown

State & Federal Project Supplies
History of Regulatory Restrictions



State & Federal Project Supplies
Annual Average (in 2025)

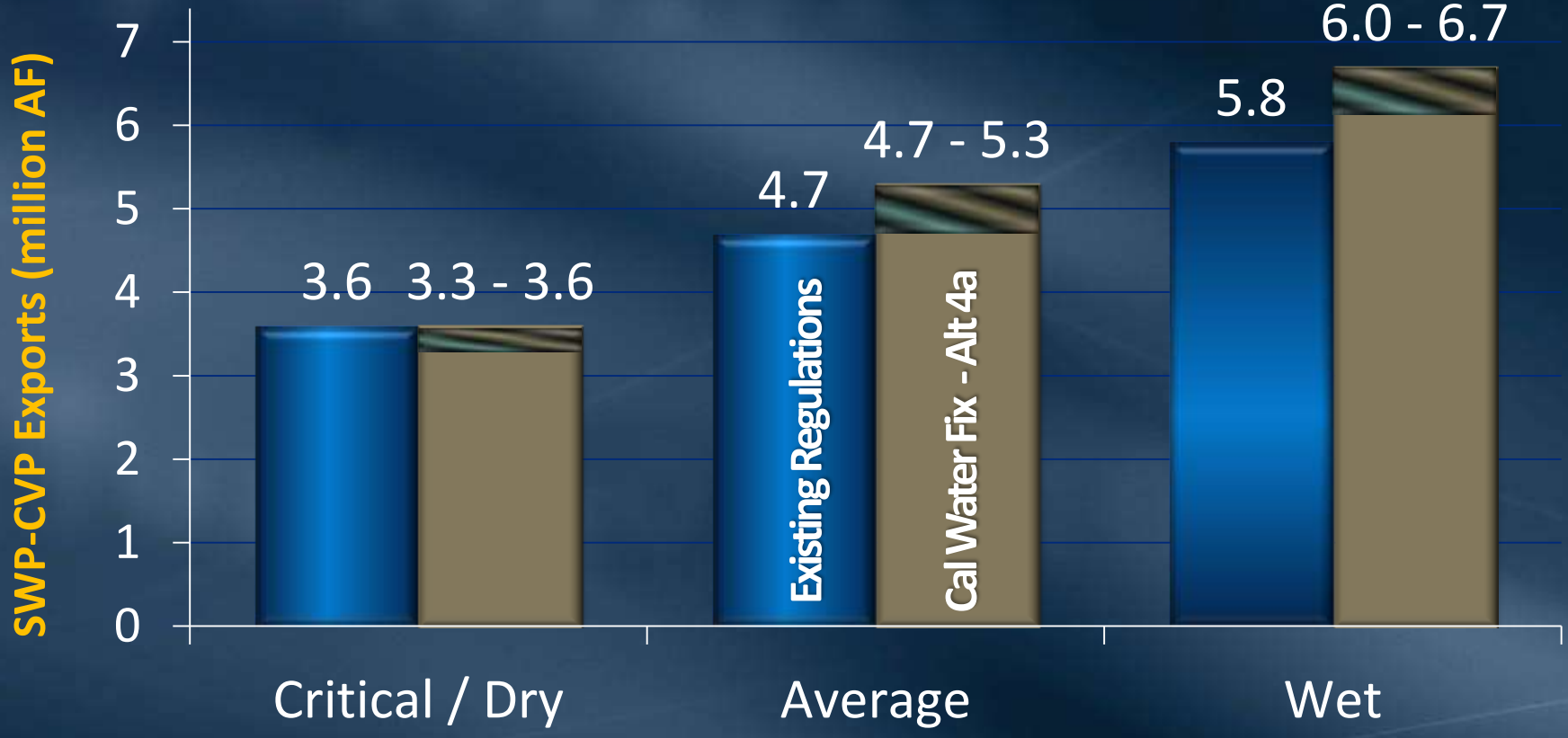


Data based on hydrological period (1922-2003); indicates average annual SWP & CVP water supply exports with climate change in 2025

- *4.7 maf/yr – Existing Regulations (No Action Alternative) represents no new conveyance and no new/additional restrictions*
- *3.5 maf/yr – BDCP Proposed Regulations without Northern Intake (Existing Conditions High Outflow Scenario); BDCP Chapter 9*
- *1.5 maf/yr – Earthquake scenario BDCP Chapter 9; analyzed by Dr. David Sunding; minimal exports 1.5 to 3 years after earthquake*
- *4.7 – 5.3 maf/yr – NEW BDCP / Cal Water Fix Preferred Alternative (evaluated in Draft EIR/S as Alternative 4A H3-H4)*
- *4.7 – 5.6 maf/yr – PREVIOUS BDCP Preferred Alternative (evaluated in Draft EIR/S as Alternative 4 H1-H4 at early long-term 2025)*

State & Federal Project Supplies

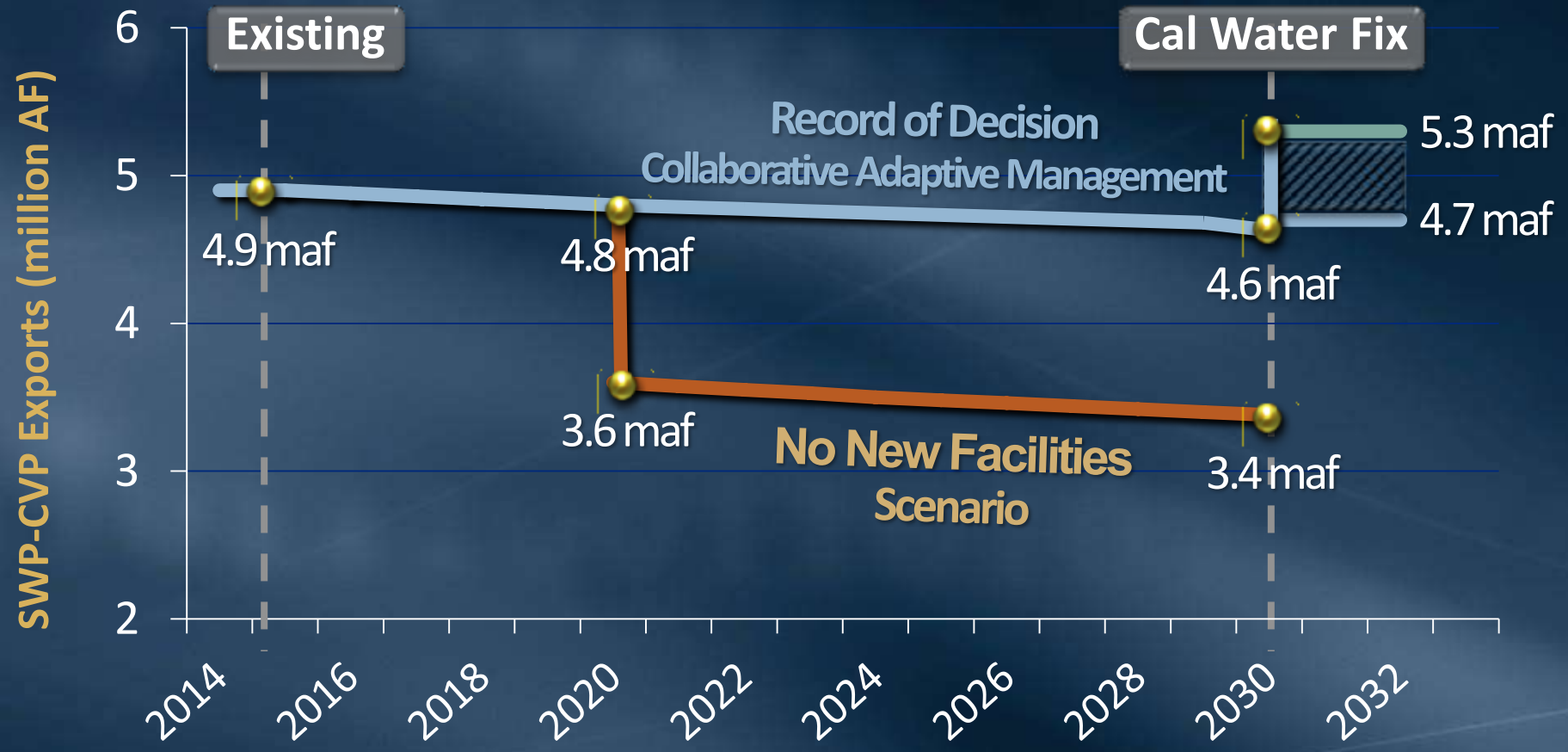
Existing Regulations vs. BDCP Cal Water Fix



SWP & CVP average annual water supply in 2025; Data from Recirculated Draft EIR/S

State & Federal Project Supplies

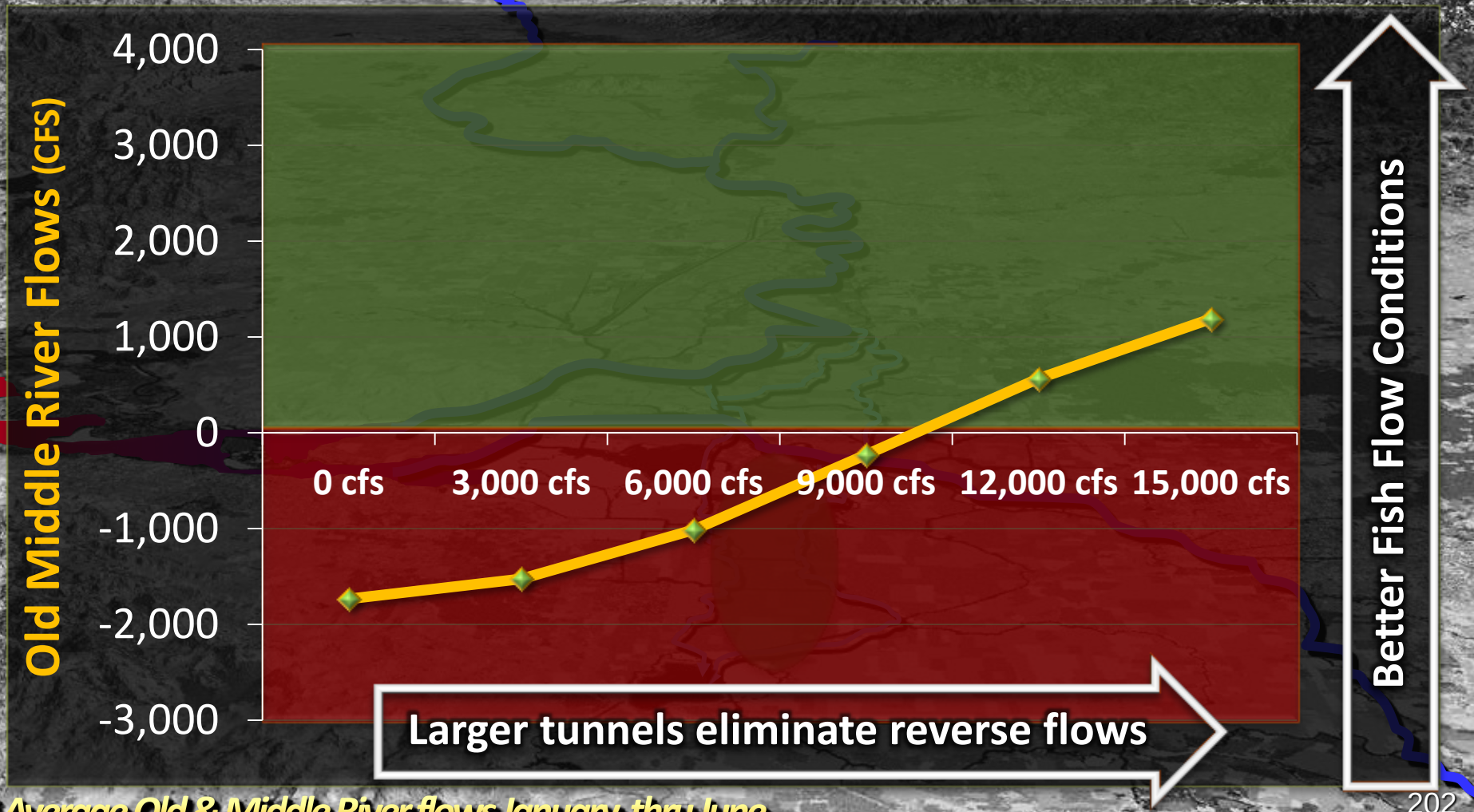
Average Annual (million AF/yr)



SWP & CVP water supply analysis; Includes effect of climate change; Data from BDCP Draft EIR/S

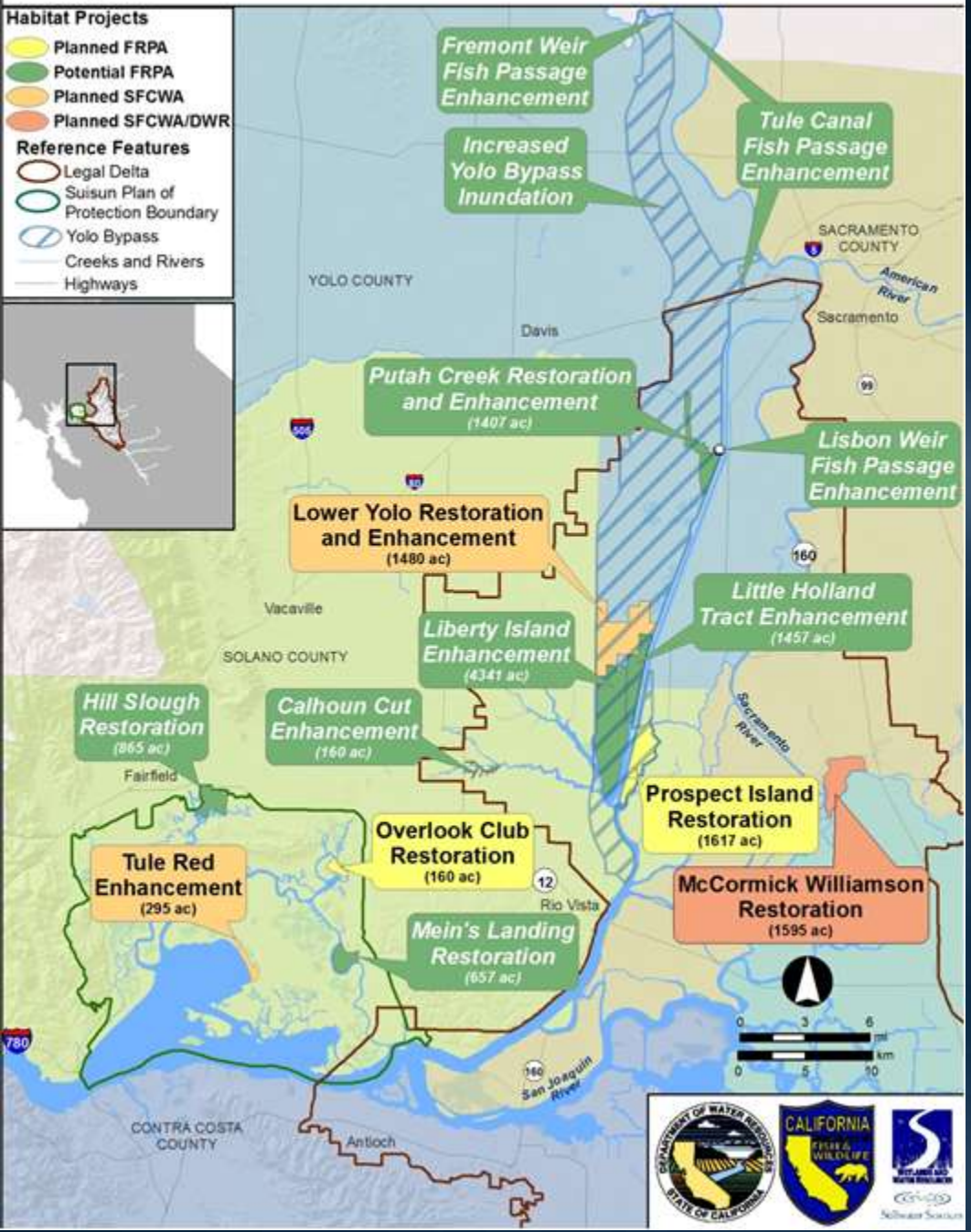
- *4.9 – 4.6 maf/yr. – BDCP Record of Decision, collaborative adaptive management, with climate change*
- *3.6 – 3.4 maf/yr. – BDCP proposed regulations without northern Intake (Existing Conditions High Outflow Scenario); BDCP Chapter 9*
- *4.7 – 5.3maf/yr. – Cal Water Fix Alternative 4a, range of SWP/CVP supply improvements*

South Delta Reverse Flow Analysis
California Water Fix Alt. 4a
Elimination of Reserve Flow Enhances Fish Flow Conditions



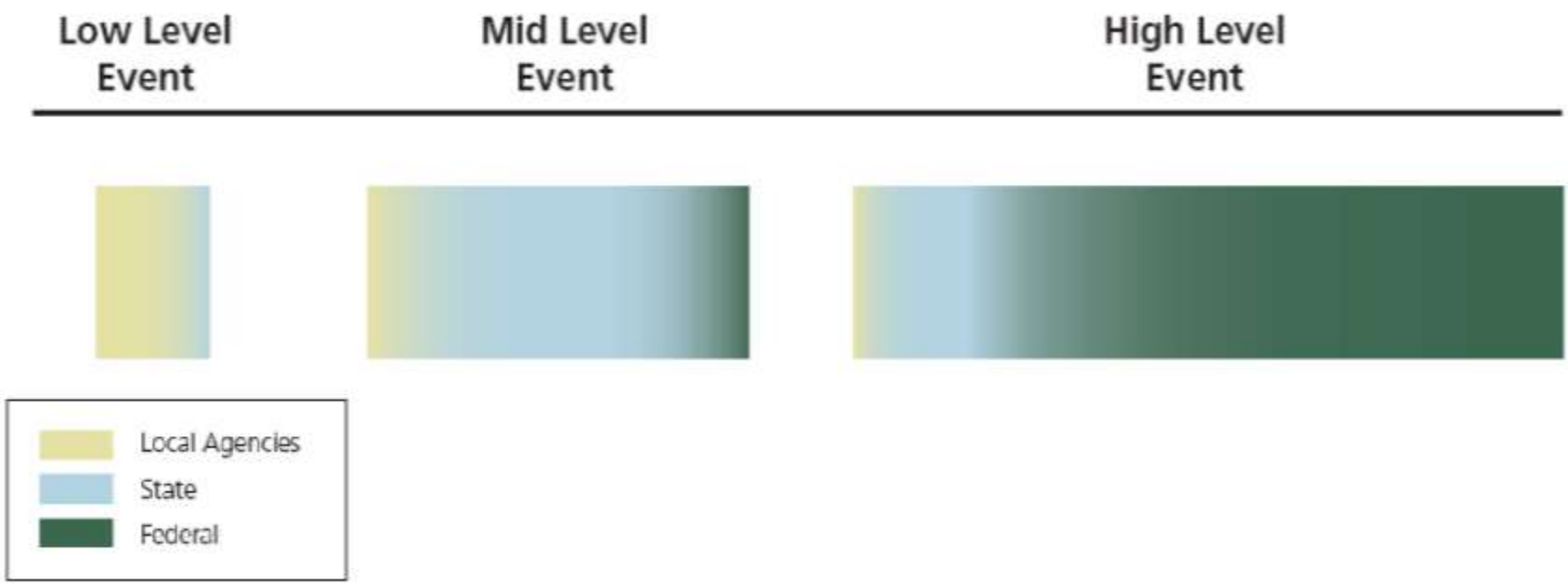
* Average Old & Middle River flows January thru June

FRPA AND OTHER HABITAT RESTORATION PROJECTS FOR BiOps AND ITP COMPLIANCE IN THE DELTA AND SUISUN MARSH



Scaled Response

Emergency Response Responsibilities in California



FloodSAFE CALIFORNIA

PUBLIC SAFETY ENVIRONMENTAL STEWARDSHIP ECONOMIC STABILITY

USACE Capital & Operational Investments

Inventory Type	USACE (existing)	USACE(future)
Capital Budget		
Warehouses/Storage Units	1 multi-feature facility	
Operations Budget		
Hesco Barriers	5,070 feet	a
Rapid Deploy Flood Wall	1,920 feet	a
Port-a-Dam	1,680 feet	a
Large Sandbags (3000 lb.)	300 large bags	a

a Similar inventories on hand at 3 other USACE sites to augment stockpiles

DWR Capital Budget

Costs ($M)	FY 07/08	FY 08/09 to Dec 14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	TOTAL ($M)
TOTAL (Proposition 1E)							$80.0
Loading & Storage Facilities		1.2	4.2	12.4	7.6		25.4
Rock Stockpiles				2.5	4.0		6.5
Sheet Pile Stockpiles		0.2	0.2	2.5	5.8		8.7
Land Acquisition		9.3	0.3	0.1			9.7
Emergency Response Predictive Model		1.3	0.5	0.7			2.5
Agency Training & Emergency Exercises			0.1	0.1	0.1	0.1	0.4
Delta Emergency Plan & Technical Studies		5.3	0.5	0.2			6.0
Design & Administration		5.2	1.9	2.4	0.9	0.4	10.8
Local Emergency Response Grants			1.0	4.0	4.0	1.0	10.0
TOTAL (Proposition 84)							$13.9
Rock Stockpiles	8.9						8.9
Communication Equipment		5.0					5.0


Seawater Desalination
Permits

Seawater Desalination Permits

Types of Regulations & Permits	
Regulatory/Permit Activity	**Responsible Fed/State Agency**
1. Lease of coastal and/or offshore land	• California State Lands Comm. (CSLC)
2. Coastal Development Permit	• California Coastal Commission (CCC) • Bay Conservation & Development Comm. (BCDC)
3. Environmental Impact Assessment/Report (EIA/EIR)	• Local Coastal Program (LCP), CCC, BCDC and CSLC
4. Endangered Species Act	• US Fish & Wildlife Service • California Dept of Fish & Game
5. Marine Habitat Consultation	• NOAA & National Marine Fisheries Service
6. Section 10 Rivers & Harbors Act Permit	• Us Army Corps of Engineers
7. Section 316(b) of the Clean Water Act	• State or Regional Water Quality Control Board • CSLC
8. Section 401/404 of the Clean Water Act	• US Army Corps of Engineers • CSLC
9. Revised NPDES Permit	• State or Regional Water Quality Control Board

Source: T. Secord, 2011 presentation

Seawater Desalination Permitting Agencies

- Effective & Comprehensive Permit Review

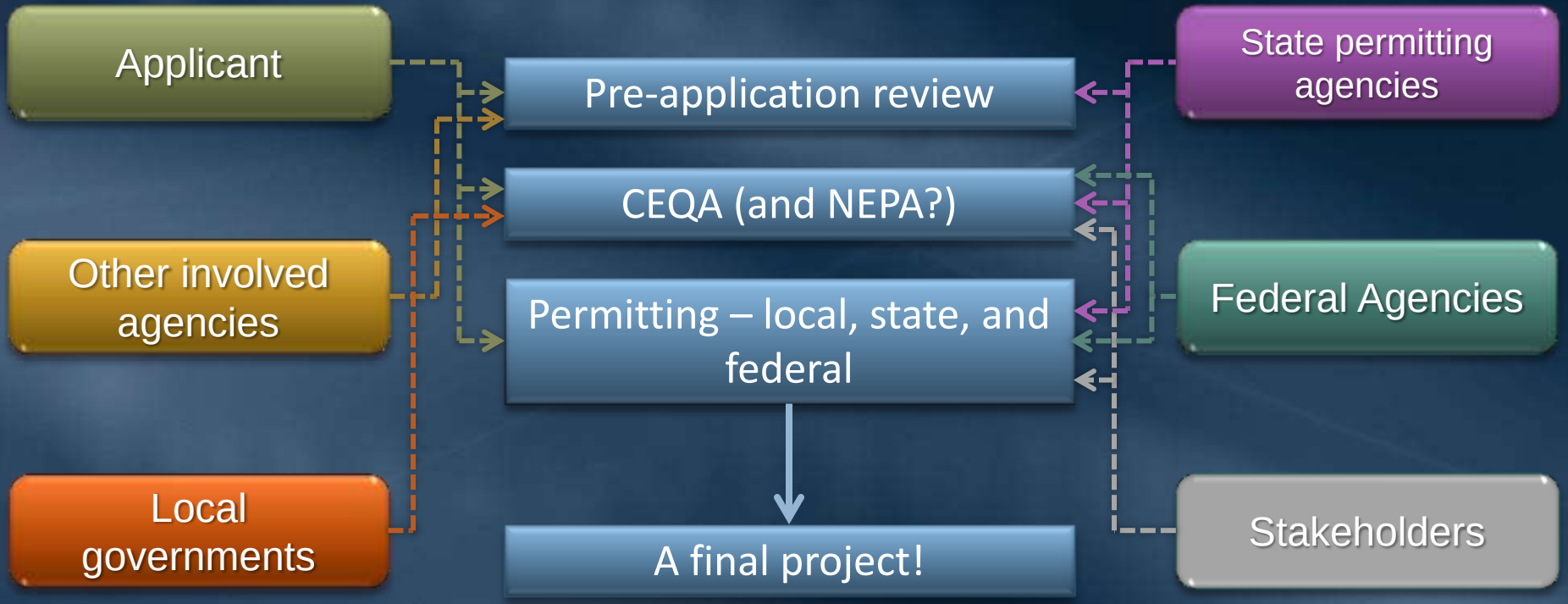
  Seawater desal facilities generally require the following State approvals:

  - **CEQA review:** (sometimes by local gov't)
  - **State Lands Commission:** Tidelands Lease
  - **Coastal Commission:** Coastal Permit
  - **State/Regional Water Boards:** NPDES/Waste Discharge permit
  - **Public Health:** Drinking water permit

Source: Coastal Commission Presentation, 2016

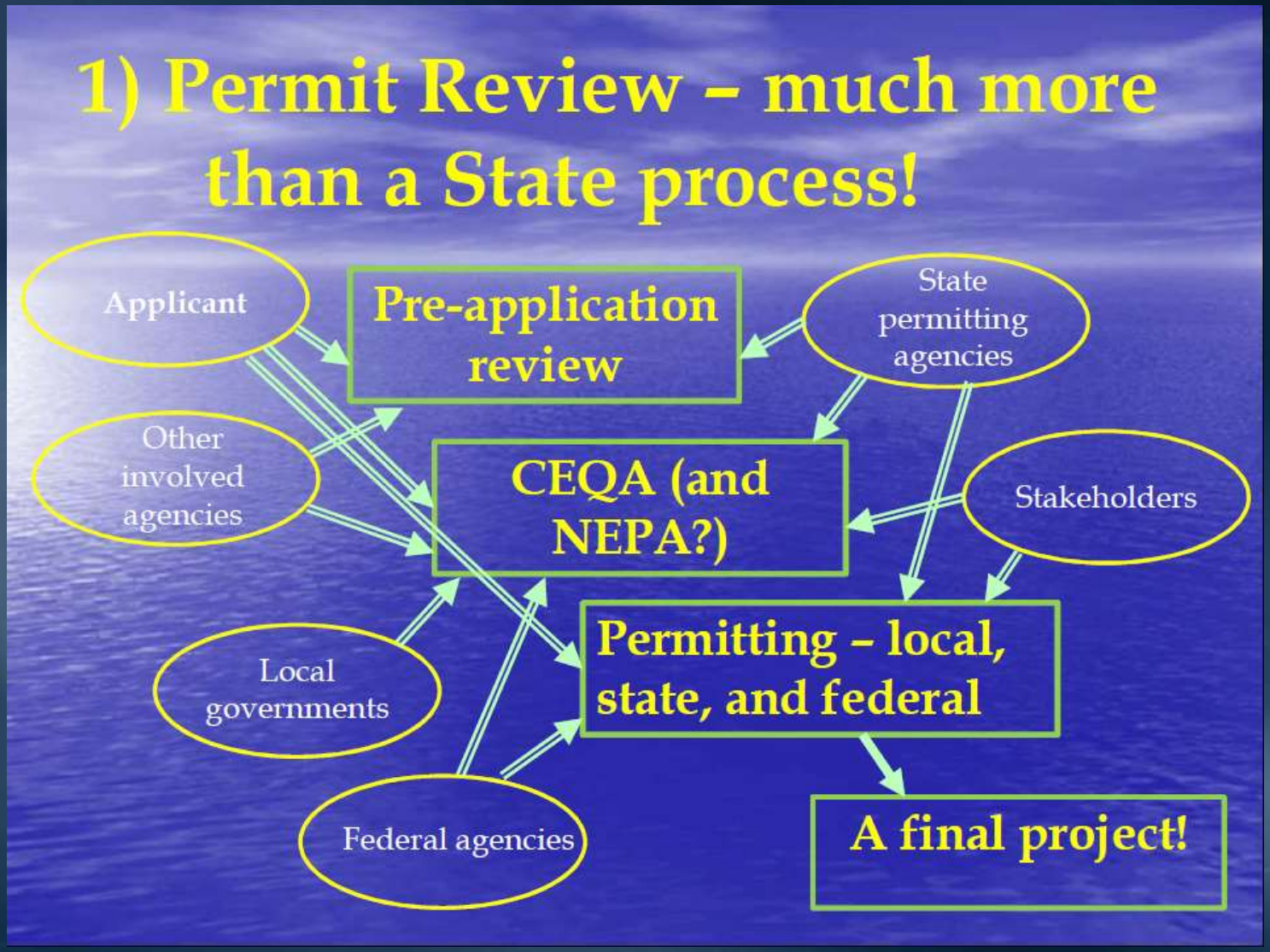
Seawater Desalination Permitting: Process

Permit Review – much more than a State process!



Source: Coastal Commission Presentation, 2016

Seawater Desalination Permitting: Process



Source: Coastal Commission Presentation, 2016