



# BDACP

## BAY DELTA CONSERVATION PLAN



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# CALIFORNIA WATER PROJECTS



- *Largest publically-built and operated water supply project in the world*
- *Bay-Delta is the hub of this infrastructure*
- 54 reservoirs and lakes
- 16 hydro facilities
- 1,200 miles of canals and pipelines



# IMPORTANCE OF THE DELTA

Water supply to  
25 million Californians  
(2/3 of state)

Water for 3 million acres of  
agriculture  
(4,600 sq. mi)

Supports  
\$400 billion of annual  
economic activity



Supports wide range of  
specialty crops:  
almonds, walnuts,  
pistachios, grapes, rice



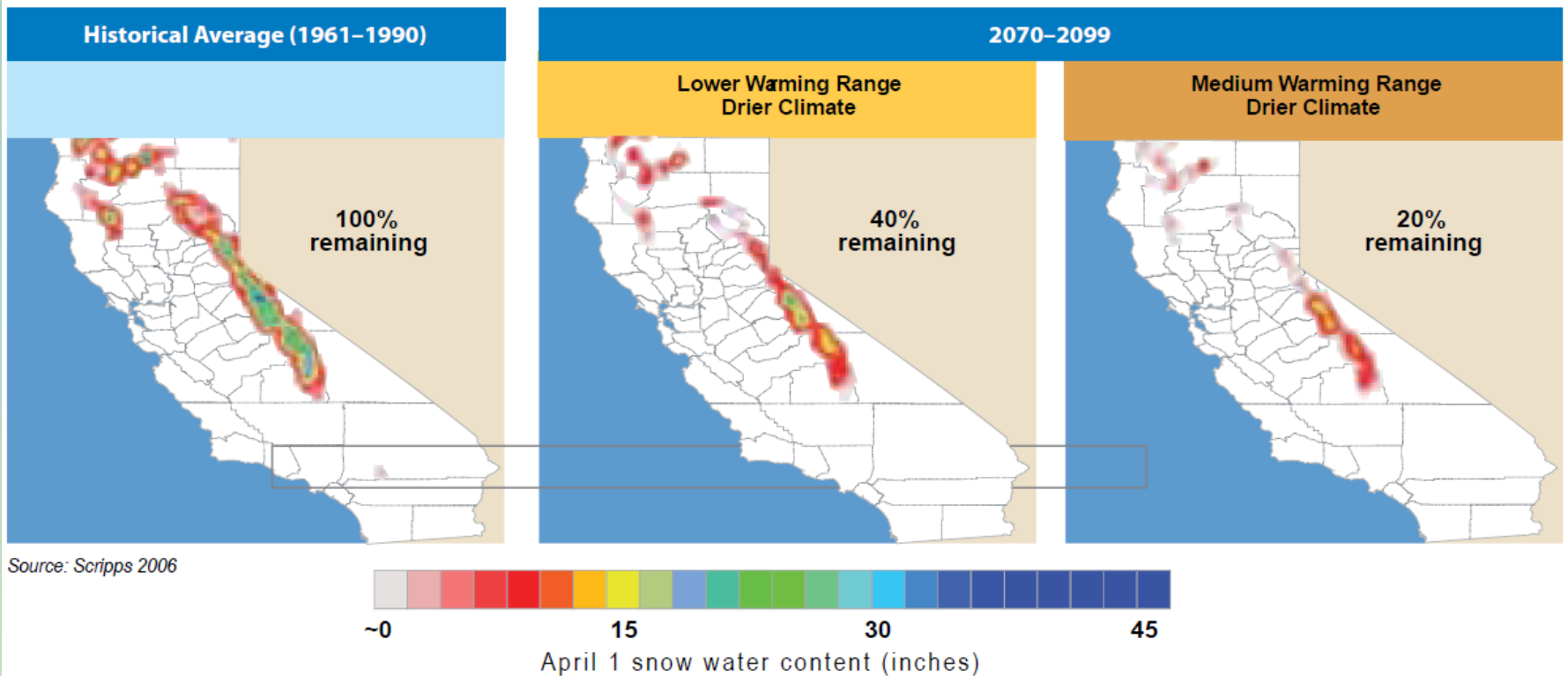
## THE DELTA



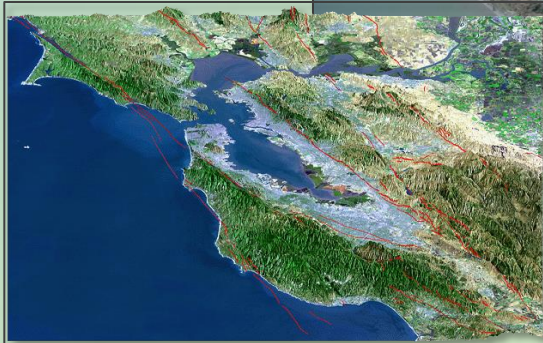
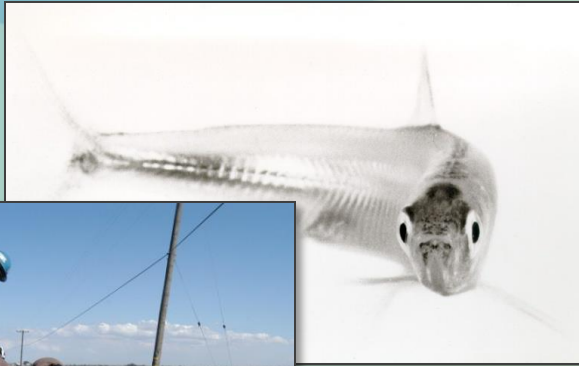
# SNOWPACK PREDICTIONS

## Decreasing California Snowpack

These figures show projections of how two climate scenarios may reduce Sierra snowpacks to 40% and 20% of recent historical averages



# DELTA CHALLENGES

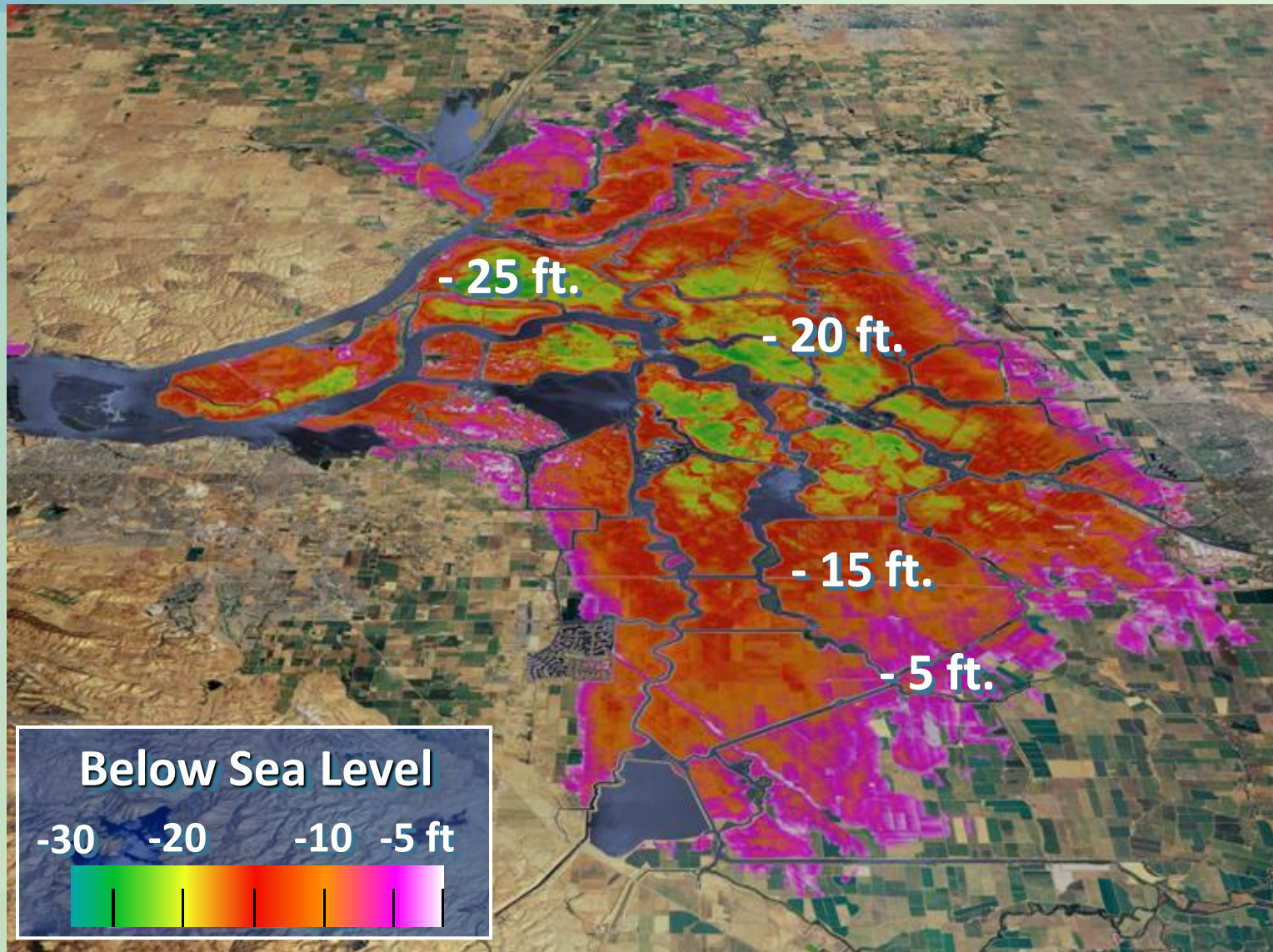


- Subsidence
- Earthquakes
- Climate Change
- Declining Species
- Regulatory Uncertainty

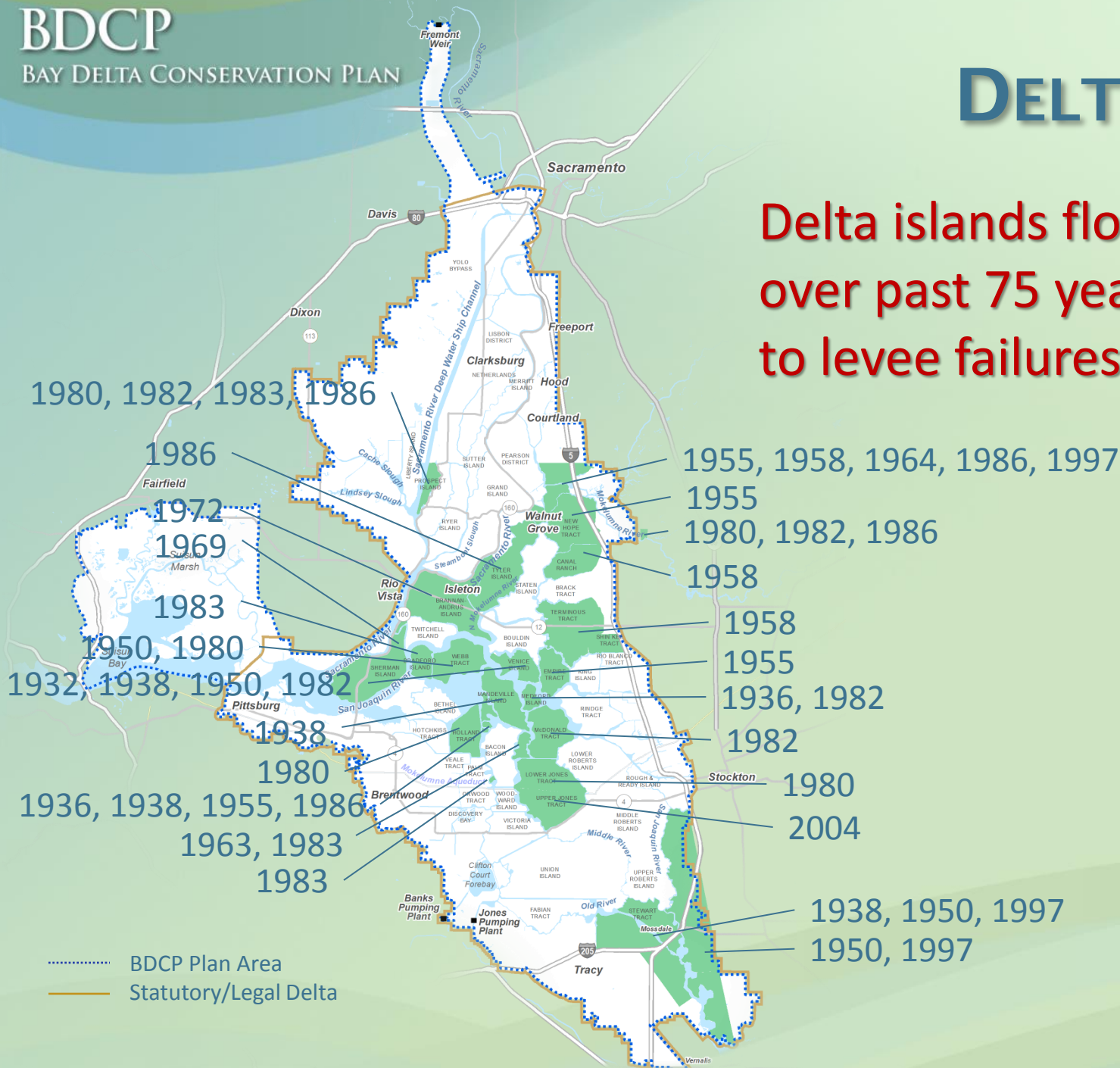
**“64% chance of catastrophic failure due to earthquake or storm in the next 50 years.”**



## SUBSIDENCE



Delta islands flooded  
over past 75 years due  
to levee failures.





# COMPLIANCE & BDCP

- Habitat Conservation Plan (Federal ESA)
  - U.S. Fish and Wildlife Service
  - National Marine Fisheries Service
- Natural Community Conservation Plan (State ESA)
  - Ca Department of Fish and Wildlife
- Permittees
  - Ca Department of Water Resources
  - State and federal water contractors
  - U.S. Bureau of Reclamation



## COVERED SPECIES

### DELTA SMELT



### LONGFIN SMELT



### CHINOOK SALMON

winter, spring,  
fall, late fall



### GREEN AND WHITE STURGEON



### CENTRAL VALLEY STEELHEAD



### SACRAMENTO SPLITTAIL



### 45 TERRESTRIAL SPECIES





# DUAL CONVEYANCE TUNNELS

## Gravity Flow Benefits Include:

- Reduced energy consumption and greenhouse gas emissions
- Installation of fewer transmission lines

## Current Proposal

- Gravity flow
- Three proposed intakes and three proposed pumping plants for a total of 9,000 cfs capacity
- Three state-of-the-art fish screens held to performance standards to protect passing fish
- Intermediate forebay for temporarily storing the water pumped from the river



# DUAL CONVEYANCE TUNNELS

## Current Proposal continued

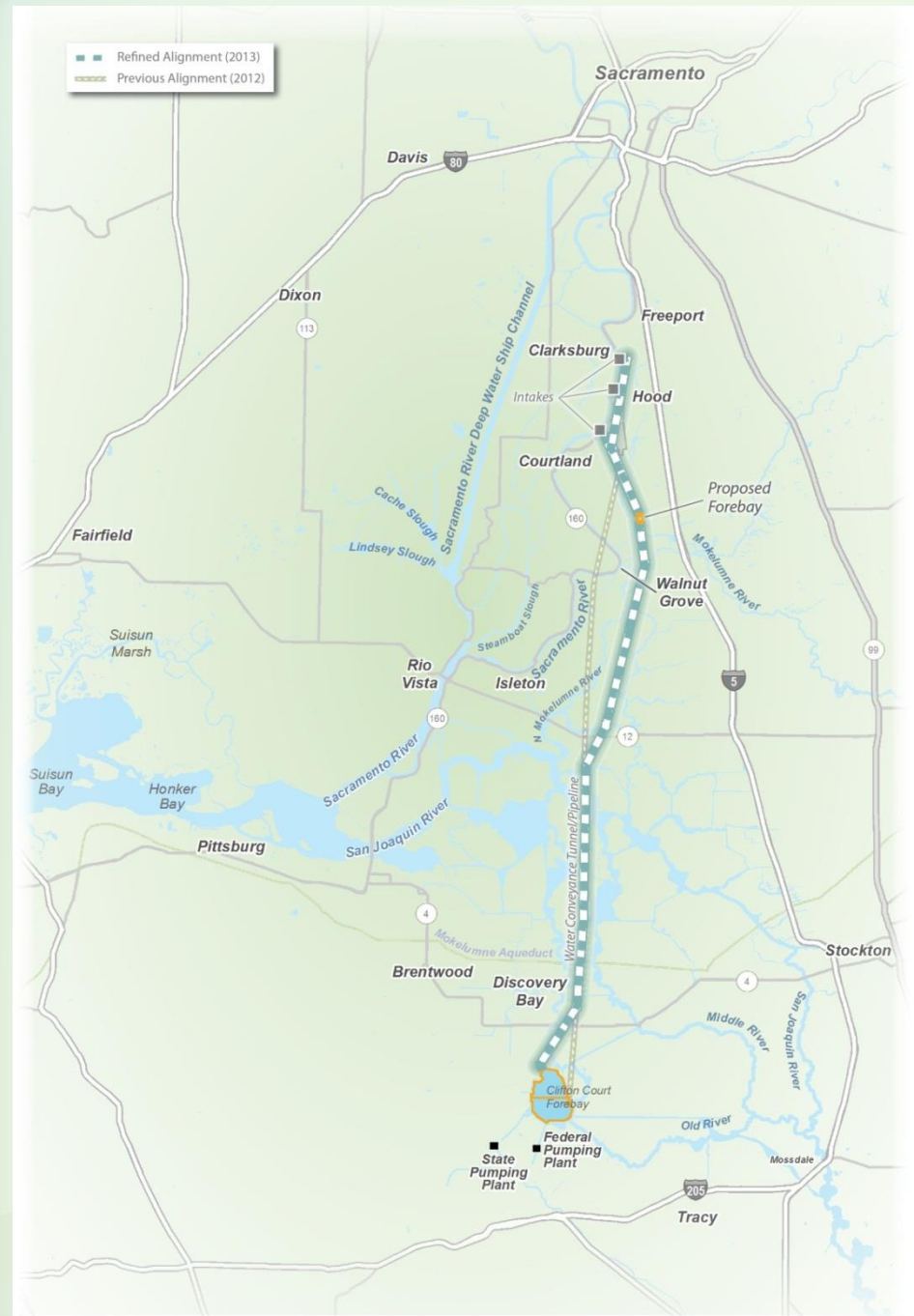
- Two tunnels to carry water 30 miles to the existing pumping plants in the south Delta, where it would be moved into existing aqueducts
- 840-acre forebay at Byron Tract
- Total power requirement- 50 MW
- Continued use of South Delta SWP/CVP facilities





# NEW ALIGNMENT

- Reduced forebay from 750 to 40 acres
- Reduced tunnel shafts from 7 to 5
- Moved alignment east – away from towns
- Reduced height of pump buildings from 60 to 30 feet
- Reconfigured Clifton Court forebay



# HOW WATER PROJECT SUPPLIES FLOW THROUGH THE DELTA





# RESTORING NATURAL FLOW PATTERNS UNDER BDCP



# PROPOSED HABITAT PROTECTION & RESTORATION



Channel Margin – 20 levee miles

Floodplain (new) – 10,000 acres in S Delta

Floodplain (enhance existing) in Yolo Bypass

Riparian Forest (new) – 5,000 acres

Tidal Wetland – 65,000 acres

Non-Tidal Marsh – 1,200 acres

Agriculture and Grassland Habitat  
Preservation – 50,000 acres



# CONSERVATION MEASURE 4 (CM4)

## TIDAL NATURAL COMMUNITIES RESTORATION

65,000 acres freshwater & brackish tidal habitat

- 55,000 acres of tidal perennial aquatic, tidal mudflat, tidal freshwater emergent wetland, and tidal brackish emergent wetland natural communities.
  - 20,600 acres must occur in particular ROAs
  - Remaining 44,400 acres would be distributed among the ROAs
- 10,000 acres transitional uplands to accommodate sea level rise.



# CONSERVATION MEASURE 8 (CM8)

## GRASSLAND NATURAL COMMUNITY RESTORATION

2,000 acres restored  
8,000 acres protected

Strategic restoration areas:

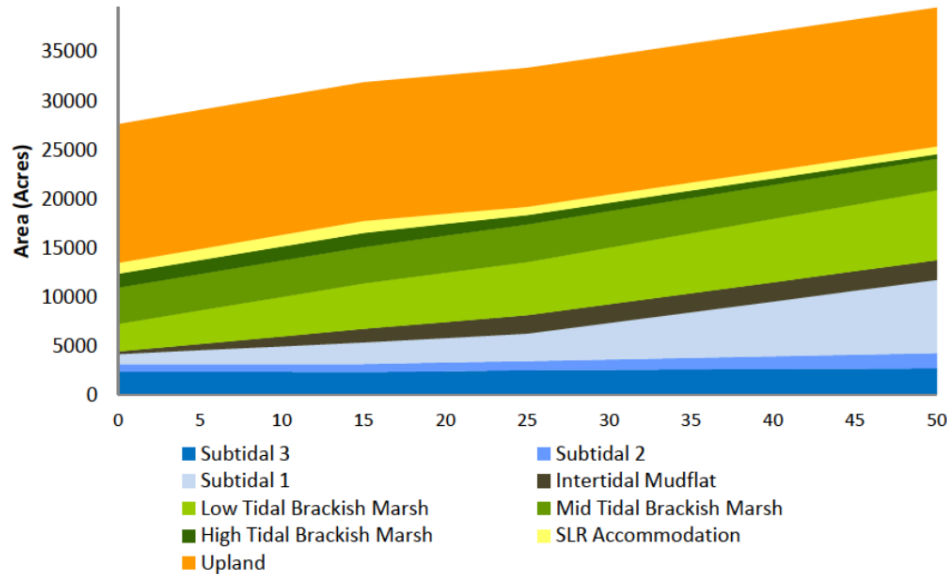
- Grasslands in CZs 1 and 11, may be connected with the Jepson Prairie area
- Grasslands in CZ8 that may be connected to the west and southwest of the Plan Area
- Uplands adjacent to restored tidal brackish emergent wetlands in Suisun Marsh
- Areas adjacent to restored freshwater emergent wetland

### Restoration Opportunity Areas

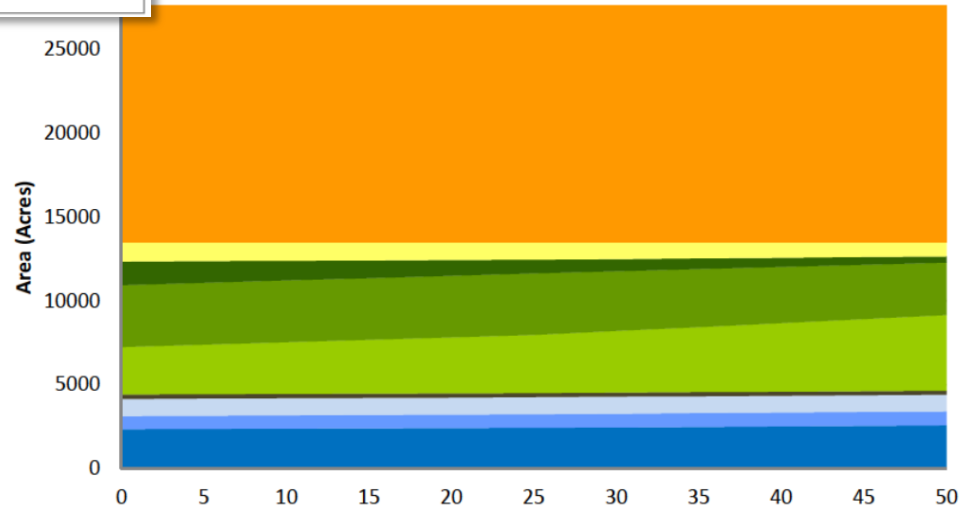


# HABITAT EVOLUTION

**Suisun Marsh- With Project**



**Suisun Marsh- Without Project**





## NET EFFECTS

## Net Effects of BDCP Implementation on the Total Extent of Natural Communities in Suisun Marsh

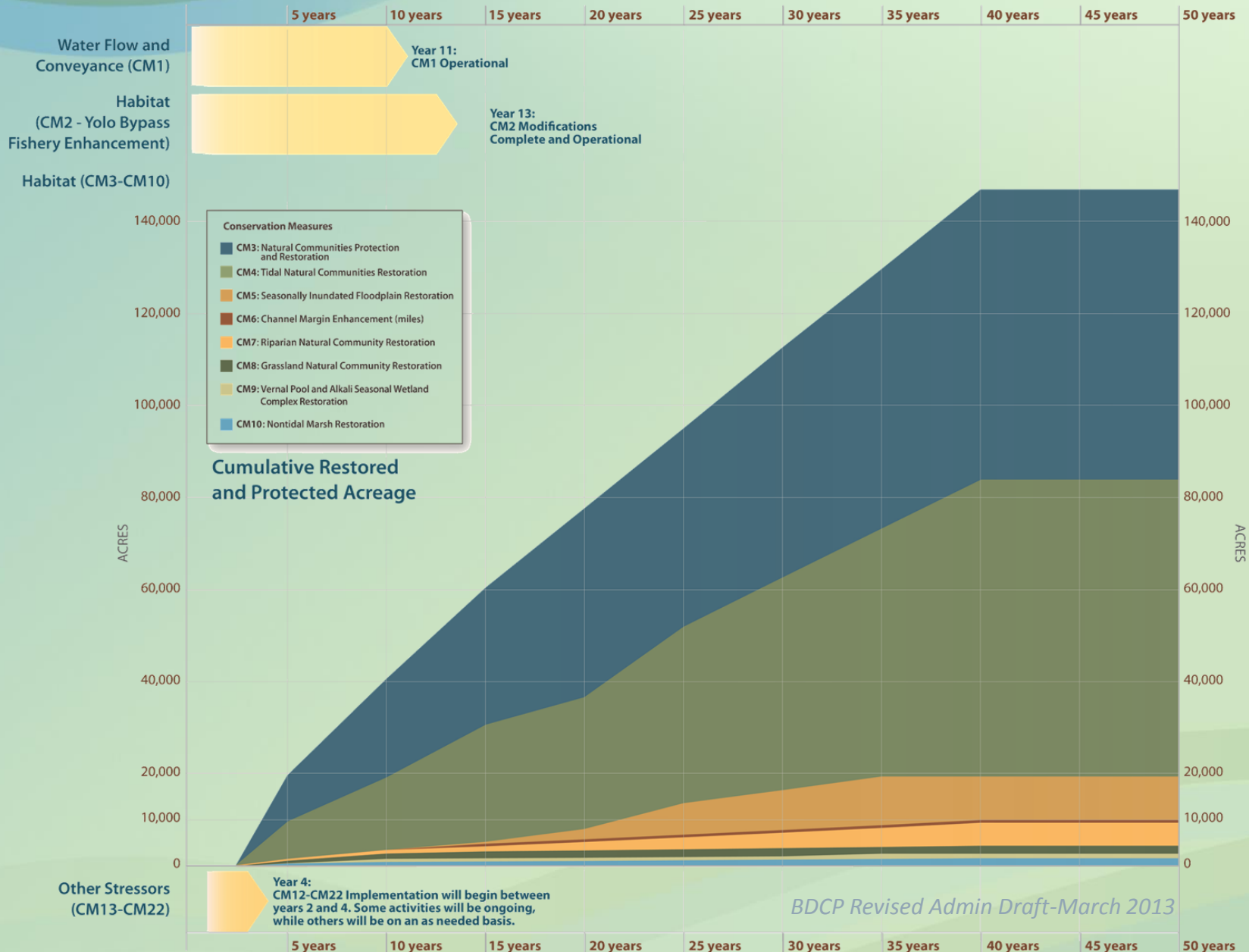
Natural Community	Total Existing Natural Community (Acres)	Permanent Loss or Conversion			BDCP Conservation		Net Effect of BDCP Implementation on Total Extent of Natural Communities in CZ11	
		CM4 Tidal Natural Communities Restoration (Acres)	CM8 Grassland Restoration (Acres)	Total <sup>4</sup> (Acres)	Restoration (Acres)	Protection (Acres)	Net Change in Total Extent (acres) <sup>5</sup>	Percent Change in Total Extent over Existing
Tidal Perennial Aquatic	25,654	2	0	2	0 <sup>5</sup>	0	-2	-0.008%
Mudflat	Not available	Not available	0	Not available	-	-	-	-
Tidal Brackish Emergent Wetland	8,501	1	0	1	6,000 <sup>5</sup>	0	5,999	71%
Tidal Freshwater Emergent Wetland	154	0	0	0	0	0	0	0
Valley/Foothill Riparian	686	0	0	0	0	0	0	0
Grassland	18,518	3	0	20 <sup>6</sup>	0 <sup>7</sup>	2,000 <sup>7</sup>	-20	-0.1%
Alkali Seasonal Wetland Complex	270	0	0	0	0	0 <sup>8</sup>	0	0
Vernal Pool Complex	1,861	1	0	1	0	0 <sup>8</sup>	-1	-0.05%
Other Natural Seasonal Wetland	66	0	0	0	0	0	0	0
ONontidal Freshwater Perennial Emergent Wetland	10	0	0	0	0	0	0	0
Nontidal Perennial Aquatic	82	0	0	0	0	0	0	0
Managed Wetland	49,999	11,532 <sup>9</sup>	0	11,532 <sup>9</sup>	0	8,100	-11,532	-23%
Cultivated Lands	3,801	2	467	469	0	0	-469	-12%
Developed	2,688	81	0	81	0	0	-81	-3%

# OTHER STRESSORS CONSERVATION MEASURES

- Methylmercury minimization
- Invasive Aquatic Vegetation Control
- Stockton Deep Water Ship Channel Dissolved Oxygen Levels
- Predator Reduction at Hot-Spots
- Non-Physical Fish Barriers
- Illegal Harvest Reduction
- Conservation Hatcheries
- Recreational Invasive Species Inspections
- Non-project Diversion Screening

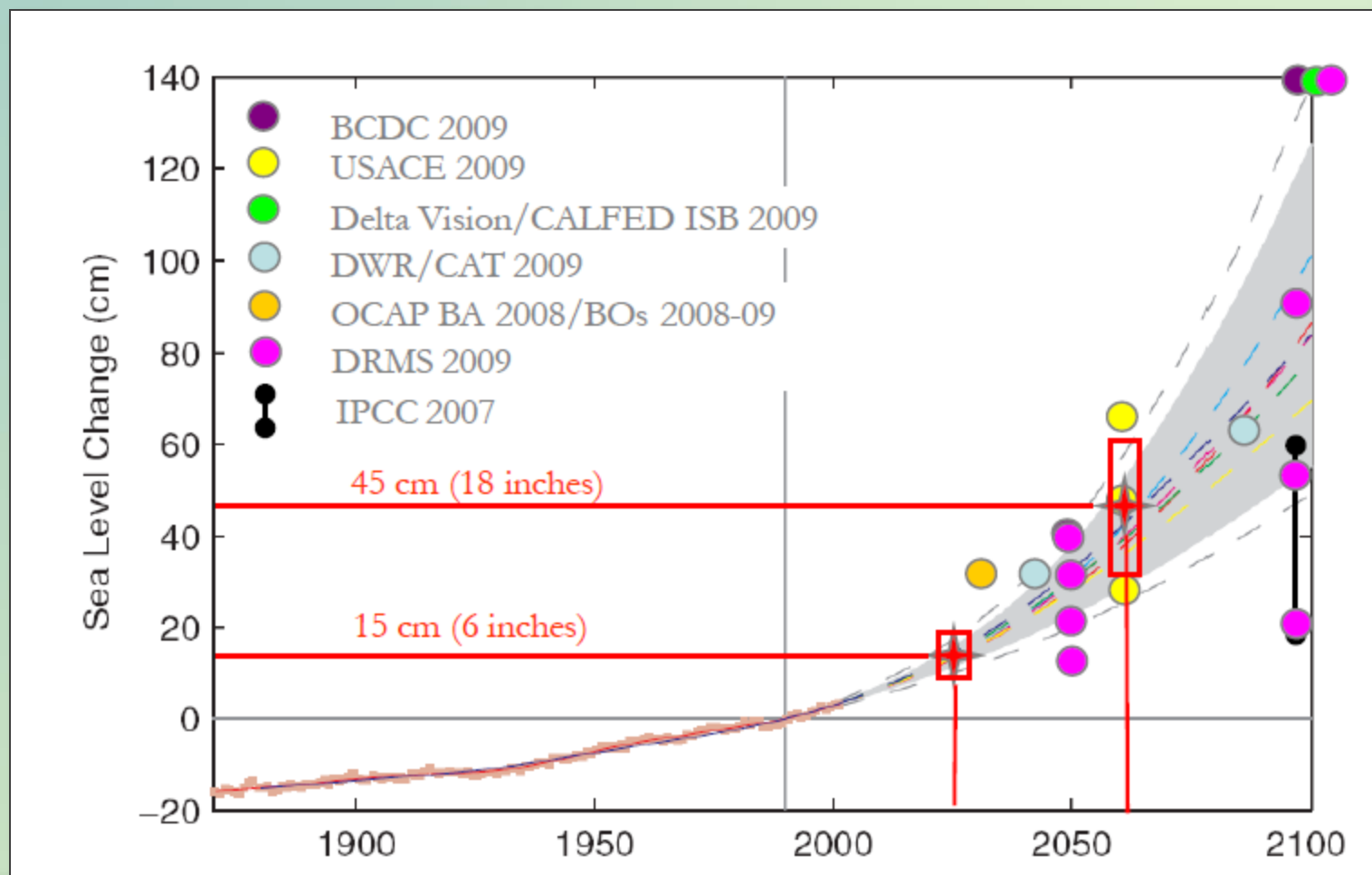


# HABITAT IMPLEMENTATION SCHEDULE

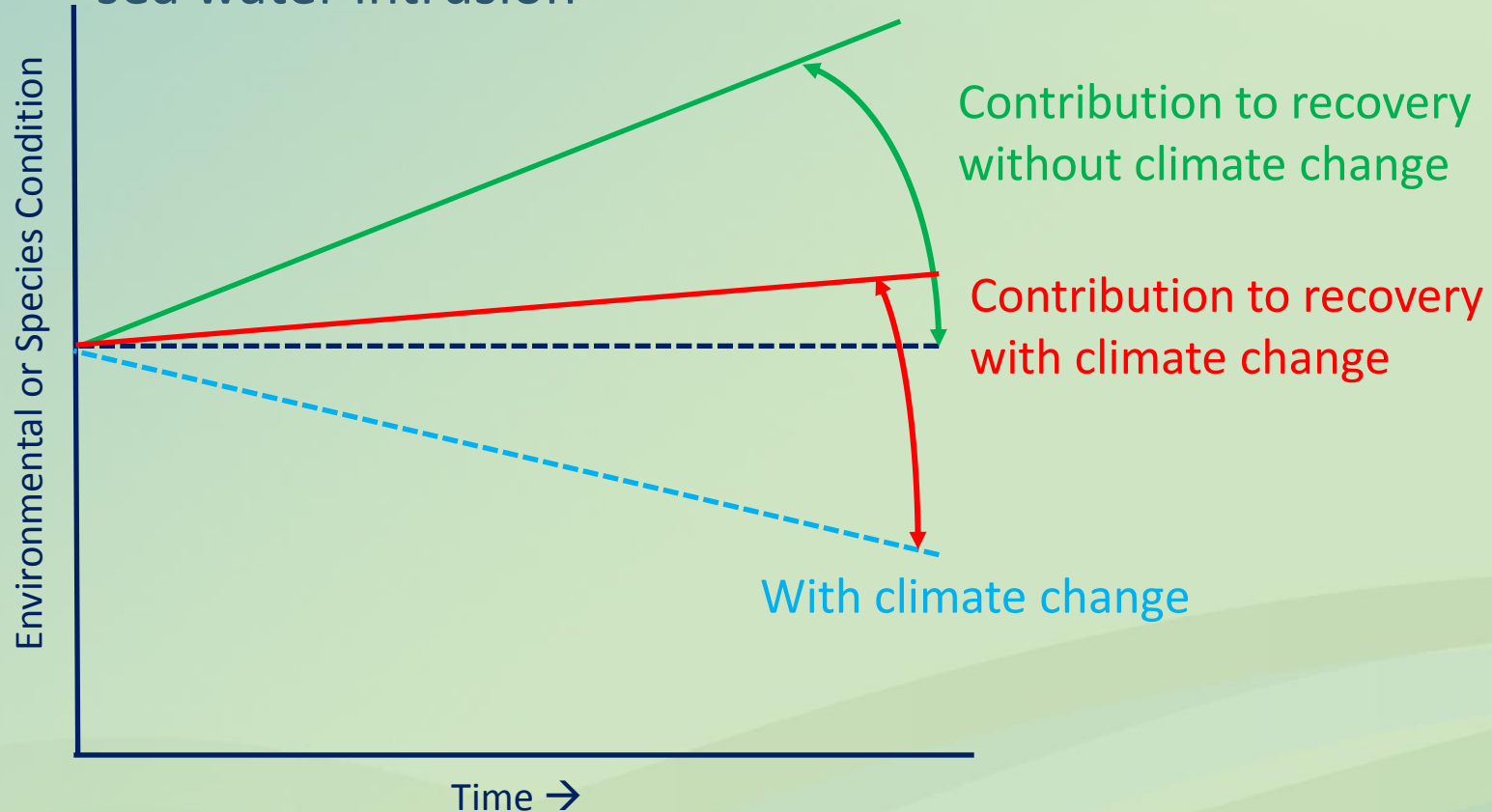




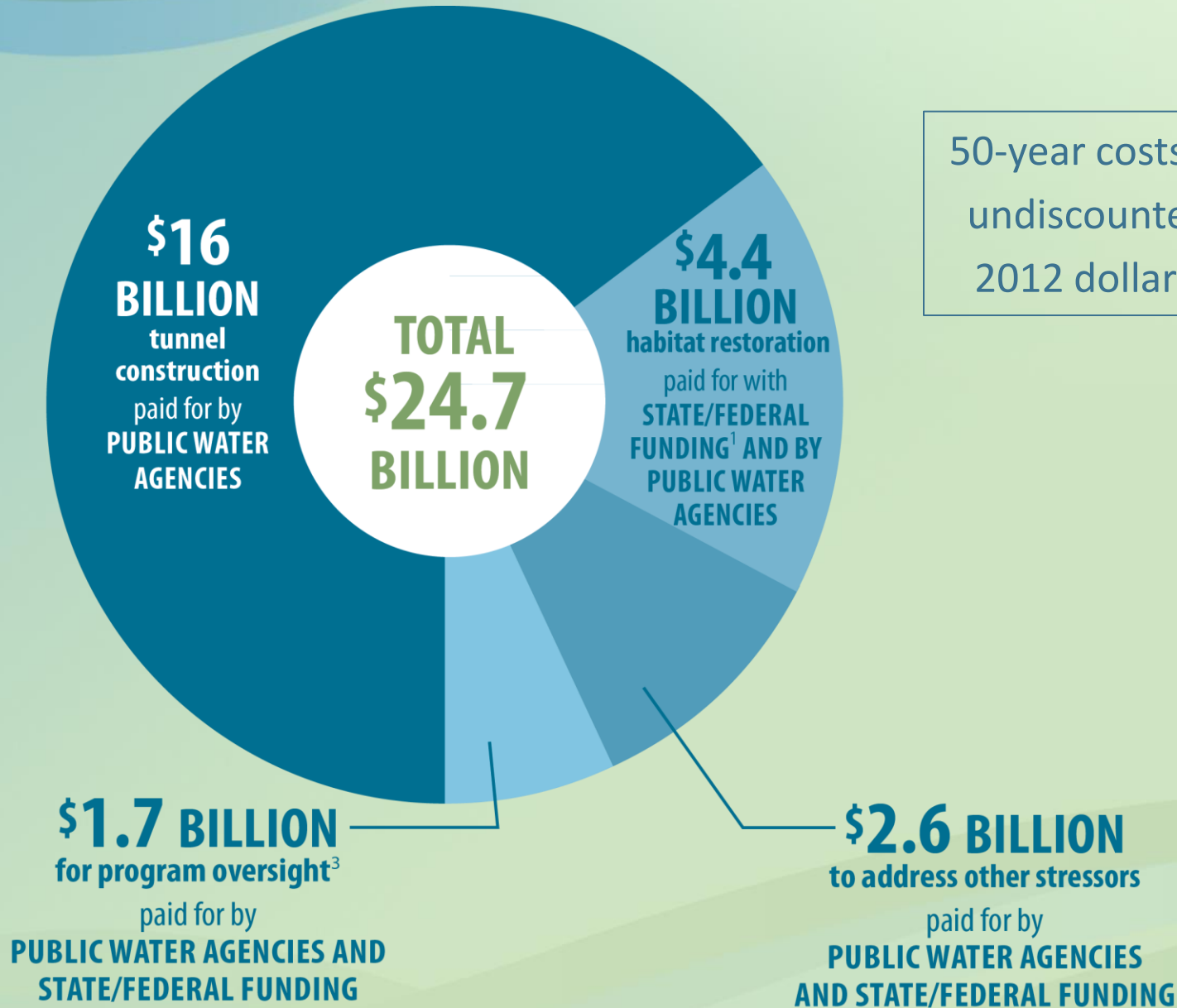
# SEA LEVEL RISE PROJECTIONS



- Contribution to recovery must consider changing baseline for some conditions:
  - Change in reservoir inflow, increased Delta temp., increased sea water intrusion



# BDCP COSTS & FUNDING





# A 21<sup>ST</sup> CENTURY STRATEGY

	Peripheral Canal	BDCP*
Conveyance	43 miles Above ground open channel	35 miles Underground gravity tunnels
Conveyance Type	Fully isolated	Dual conveyance allowing through Delta operations
Capacity	21,800 cfs	9,000 cfs (tentative)
Number of Intakes	1	3
Number of Fish Screens	1	3
Potential impact to Agriculture land	Approximately 6,600 acres	Approximately 2,400 acres**
Regulatory controls	Avoid jeopardy	Conserve/contribute to recovery
Habitat Conservation	No HCP (not law until 1982)	Yes
Natural Community Conservation Planning	No (State law not enacted until 1991)	Yes

\* A final decision on the proposed conveyance facility awaits the completion of regulatory and environmental review and public input consideration.

\*\* Additional acres of agricultural land would be impacted due to disposal of dirt and material during construction. The Peripheral Canal proposal did not quantify such materials in detail.

Source: BDCP : A 21<sup>st</sup> century Strategy. <http://baydeltaconservationplan.com/Home.aspx>

# TENTATIVE TIMELINE

2012	July: Governor and Secretary release preferred project, subject to further analysis
2013	December: release draft BDCP and EIR/S for public comment
2014	Spring: Submit application for change in place of diversion to State Water Resources Control Board Fall: Final EIR/EIS and BDCP approved and adopted Fall: Submit application to Corps of Engineers for permits Winter: Delta Stewardship Council determination of compliance with 2009 Delta legislation
2015	Army Corps of Engineers processes permit applications State Water Resources Control Board holds hearings
2016	Army Corps of Engineers permits granted State Water Resources Control Board permits granted
2017	Construction starts

**BDCP**

BAY DELTA CONSERVATION PLAN

# Bay Delta Conservation Plan

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# Average Delta Outflow (cfs)

	Long-term average	Wet water years	Dry water years	Critical water years
Existing Conditions	21,598	39,652	9,999	6,889
No Action (future without BDCP)	22,651	41,312	10,554	7,589
BDCP, low outflow	21,445	38,873	10,225	7,778
BDCP, enhanced spring outflow	22,162	39,877	10,542	7,864
BDCP, enhanced fall outflow	21,939	39,956	10,384	7,846
BDCP, high outflow	22,643	41,001	10,667	7,812

# Annual Delta Exports (taf)

	Long-term average	Wet water years	Dry water years	Critical water years
Existing Conditions	5,144	6,128	4,719	3,352
No Action (future without BDCP)	4,441	5,533	3,778	2,532
BDCP, low outflow	5,255	6,890	3,955	2,500
BDCP, enhanced spring outflow	4,710	6,201	3,712	2,444
BDCP, enhanced fall outflow	4,945	6,497	3,700	2,366
BDCP, high outflow	4,414	5,824	3,439	2,347

# PRESENT VALUE BENEFITS & COSTS (\$ MILLIONS)

Alternative Description			Total Benefits and Costs <sup>a, b</sup>		
Alternative	Facility Size (cfs)	Deliveries (MAF)	Total Benefits <sup>c</sup>	Total Costs <sup>d</sup>	Net Benefits
BDCP Proposed Action High-Outflow	9,000	4.705	\$18,011	\$13,472	\$4,540
BDCP Proposed Action Low-Outflow <sup>e</sup>	9,000	5.591	\$18,826	\$13,487	\$5,339
A: W Canal 15,000 cfs	15,000	5.009	\$23,187	\$11,110	\$12,076
B: Tunnels 6,000 cfs	6,000	4.487	\$14,445	\$12,347	\$2,098
C: Tunnels 15,000 cfs	15,000	5.009	\$23,187	\$15,641	\$7,545
D: Tunnels 3,000 cfs	3,000	4.188	\$8,923	\$10,240	-\$1,317
E: Isolated 15,000 cfs	15,000	3.399	-\$8,697	\$15,711	-\$24,407
F: Through Delta	N/A	4.172	\$12,060	\$5,233	\$6,826
G: Less Tidal Restoration	9,000	4.705	\$18,011	\$13,432	\$4,579
H: More Restoration	9,000	4.705	\$18,011	\$13,505	\$4,506
I: More Spring Outflow	9,000	4.338	\$13,417	\$13,472	-\$55

BDCP Table 9.A-2

### Notes:

<sup>a</sup> Construction is assumed to begin in 2015. BDCP operations are assumed to begin in 2025.

<sup>b</sup> All values are in 2012 \$ (millions), and are discounted to present value using 3% real discount rate.

<sup>c</sup> Benefits are calculated out to year 2075.

<sup>d</sup> Costs are calculated out to year 2075.

<sup>e</sup> Benefits for the BDCP Proposed Action Low-Outflow Scenario are calculated relative to the Existing Conveyance Low-Outflow Scenario, which assumes Scenario 6 operations, no Fall X2, no north Delta diversions.

cfs = cubic feet per second; MAF = million acre-feet



# RISK OF DOING NOTHING

- **Status Quo**
  - Ecosystem decline
  - Water supply restrictions
  - Significant negative economic impact
- **Major Levee Failure**
  - Up to three-year disruption of water deliveries
  - \$40 billion estimated impact to California's economy



## The Time is Now