

Regional Report

Sacramento – San Joaquin Delta

Hydrologic Region

California Water Plan

Update 2009

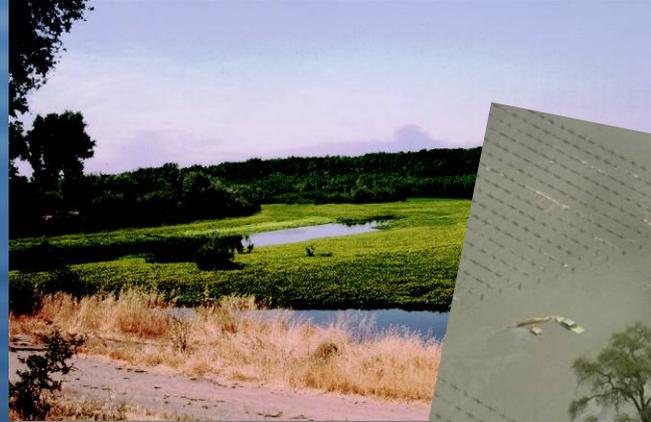
Regional Workshop

March 27, 2008 – Courtland, CA



Project Setting

- Watersheds
- Flood
- Ecosystem
- Demographics



Regional Water Conditions

- Water in the Environment
- Water Supplies and Uses
- Water Quality
- Project Operations
- Water Governance



Flood Management

- Historic
- Flood Hazards
- Institutions
- Flood Damage reduction Measures



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Questions?

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Regional Report

Sacramento – San Joaquin Delta Hydrologic Region

California Water Plan

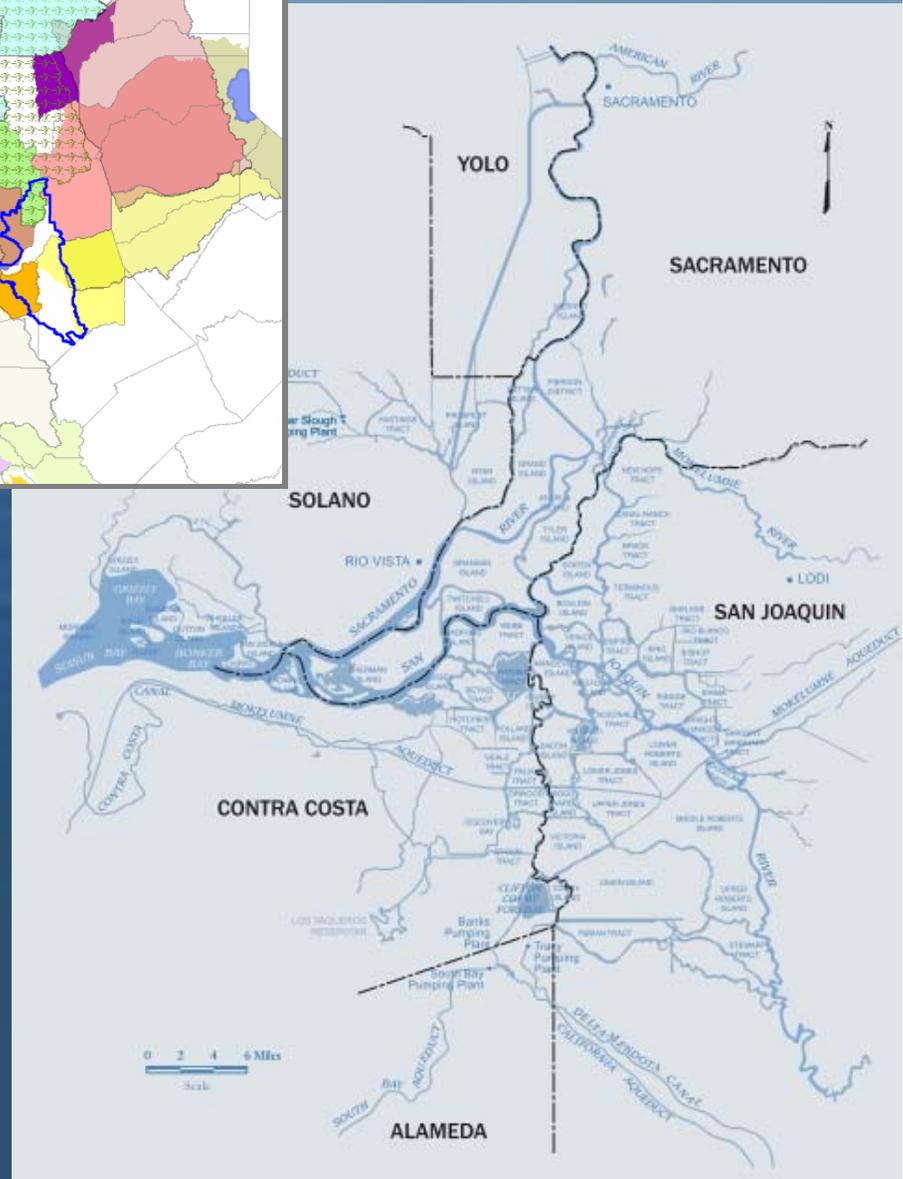
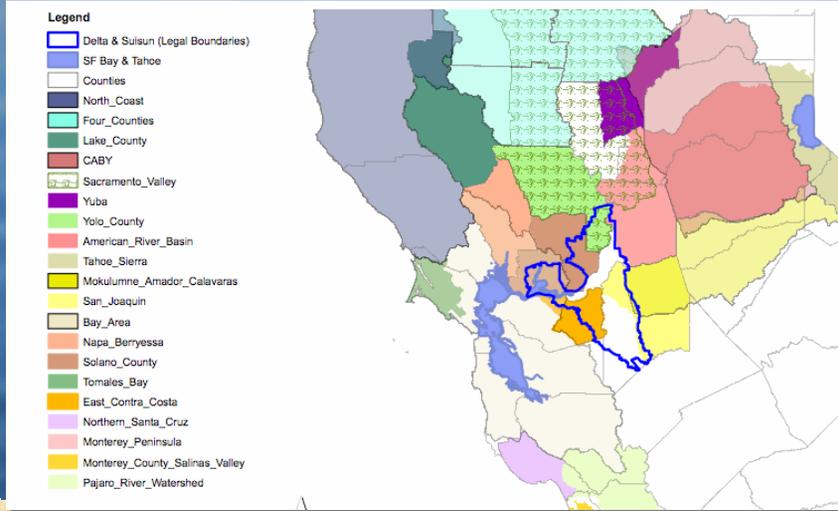
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Relationship with Other Regions



Articulation of Delta and Suisun Initiatives Timeline

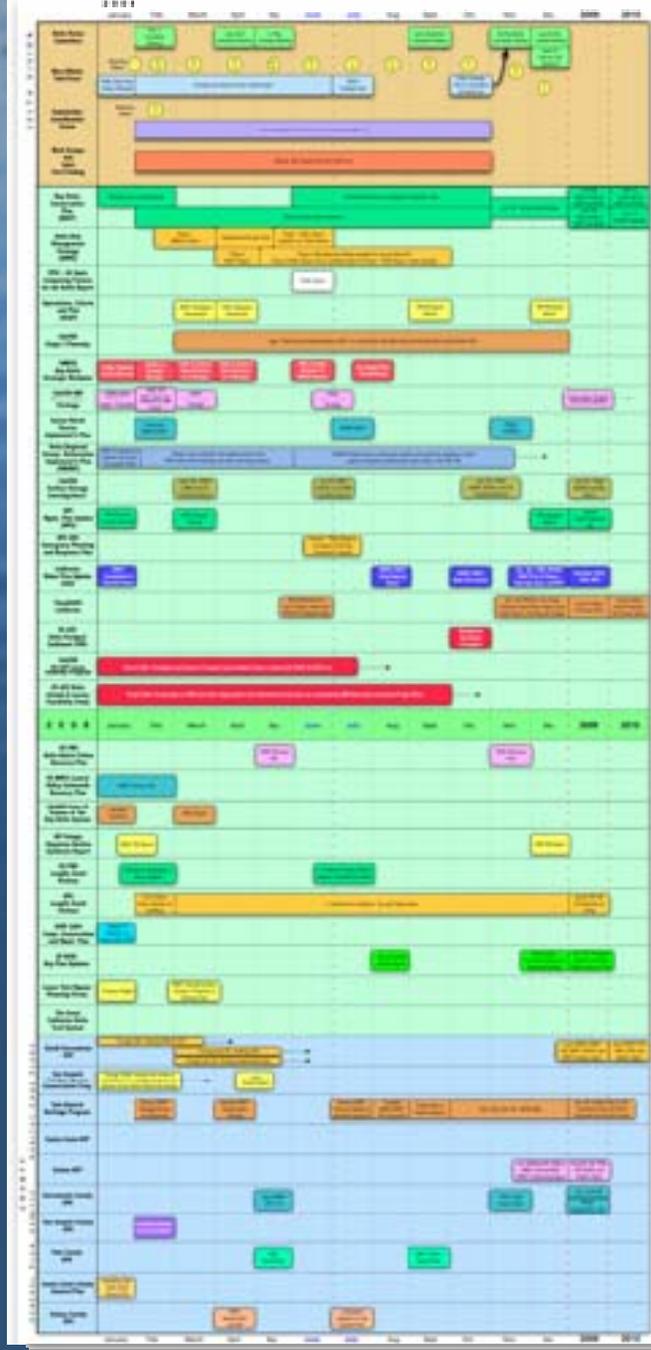
Prepared by Delta Vision and the CALFED Bay-Delta Program

The Full Picture

Counties

State and Federal Agencies

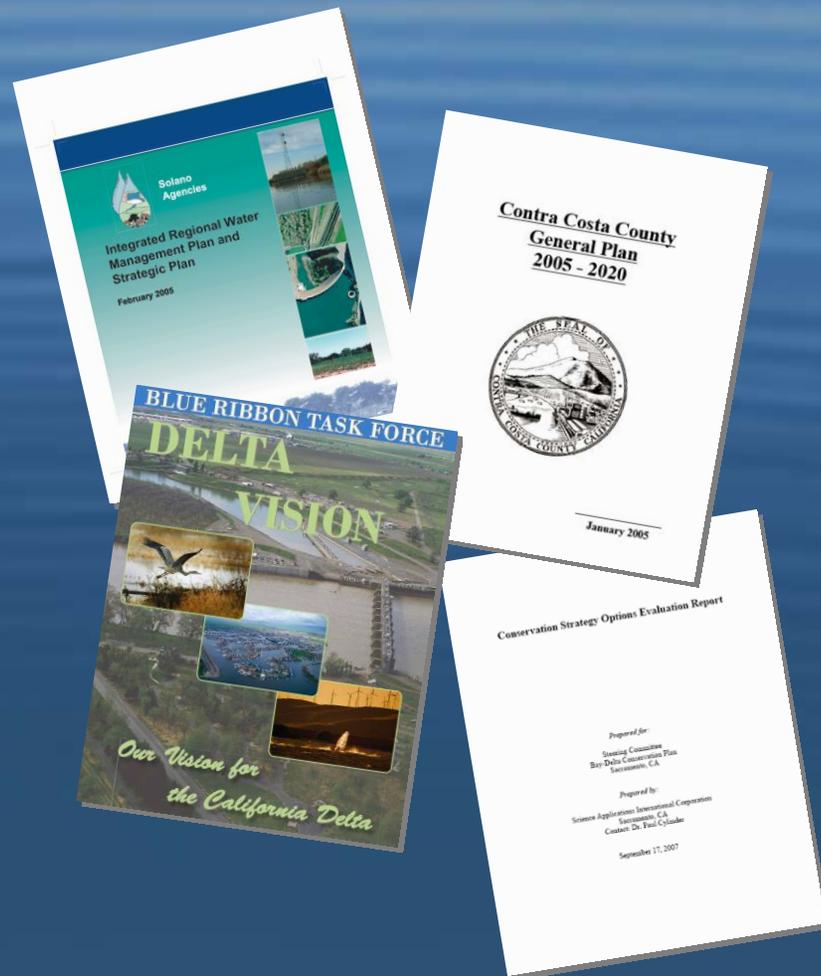
Delta Vision



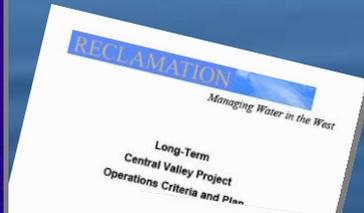
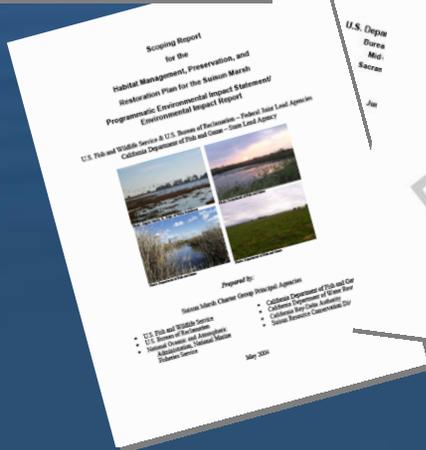
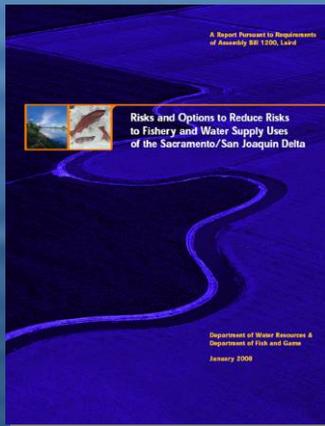
Regional Water and Flood Planning and Management

Snapshot of Activities

- Integrated Regional Water Management Plans
- County General Plans
- Delta Vision
- Bay-Delta Conservation Plan
- CALFED ERP Conservation Strategy



Snapshot of Activities



- OCAP Biological Opinion and the Wanger Decision
- Delta Risk Management Strategy
- Suisun Marsh Plan
- SWRCB: Bay-Delta Strategic Work Plan

Challenges

- Pelagic Organism Decline
- Wanger Decision: Judge throws Out Biological Opinion for Delta Smelt
- Drivers of Change
- Governance

Accomplishments

- IRWM and General Plans
- DRMS
- Delta Vision
- OCAP
- Bay-Delta Conservation Plan
- Pelagic Organisms

Looking to the Future

Discuss resource management strategies for meeting future water needs – predicated largely on outcome of initiatives.

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Questions?

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Contact

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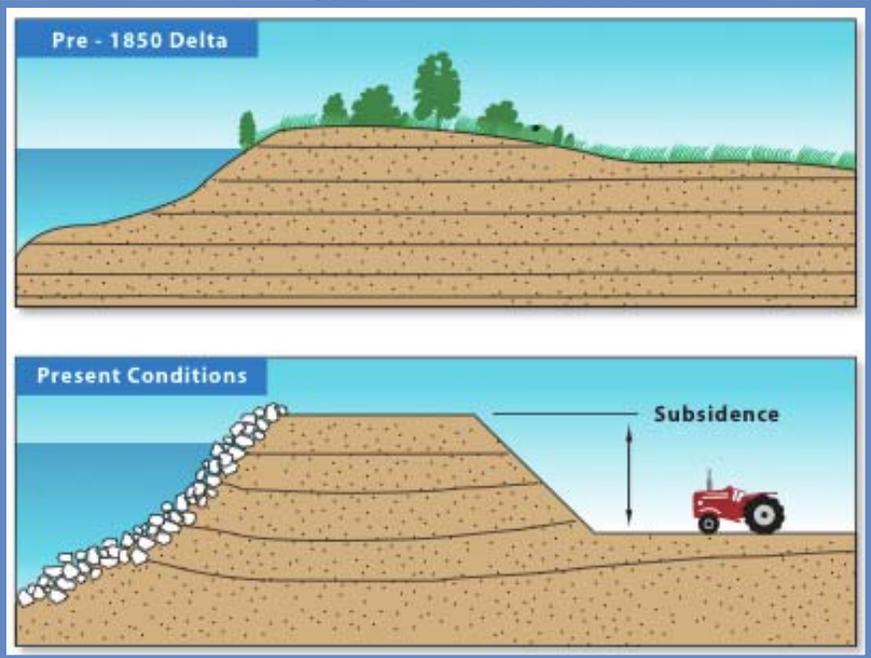
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Flood



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Ecosystem



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Demographics and Land Use

Land Use Change Within the Delta and Suisun Marsh

Land Use	Acres 1990	Acres 2004	Percentage of Total 2004	Acreage Change 1990-2004	Percent Change 1990-2004
<i>Urban and Built-up land</i>	57,351	74,098	9	16,747	29
<i>Agricultural</i>	596,603	557,896	67	-38,707	-6
<i>Other Land</i>	100,000	120,535	14	20,445	20
<i>Water</i>	83,170	85,065	10	1,895	2
<i>Total*</i>	837,214	837,594	100		

* Discrepancy in acreage may be due to refined mapping techniques or changes in land use definition between 1990 table.

Based on California Department of Conservation Farmland Mapping and Monitoring Program data.

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Water in the Environment

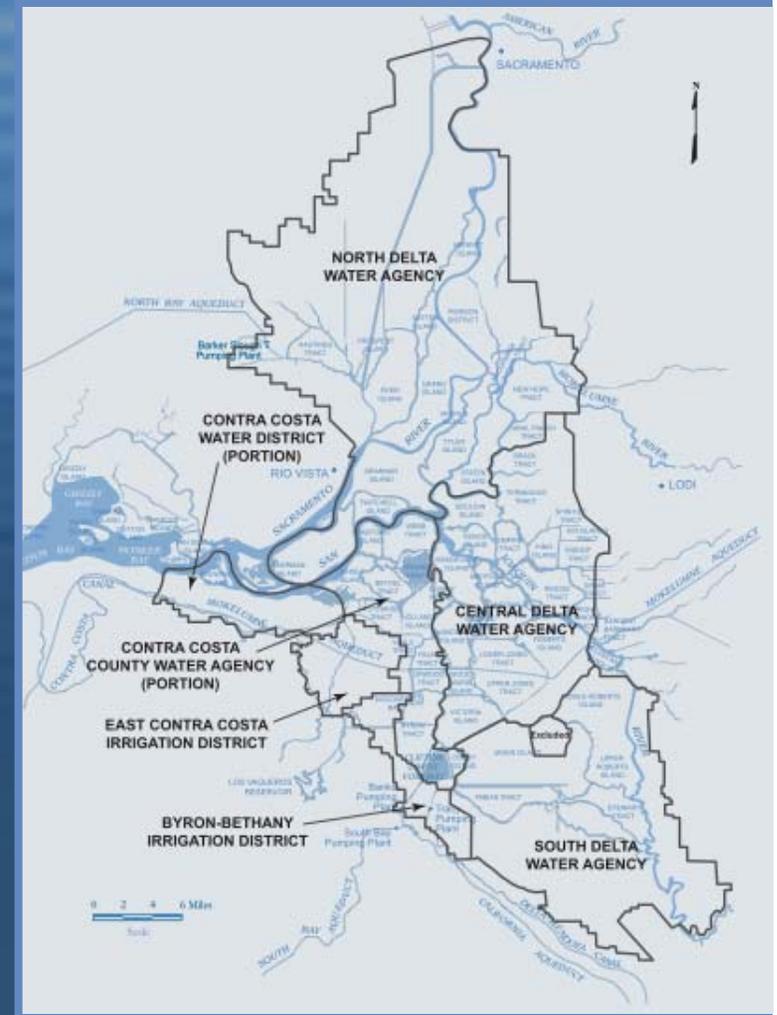
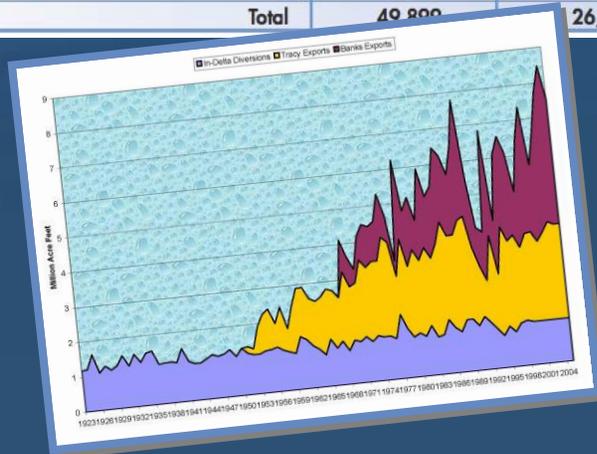
Actions Affecting CVP and SWP Operation in the California Delta.

Action	Date	Description
U.S. Army Corps of Engineer's Section 10 permit and Public Notice 5820-A	1981	Permitted operations of Banks Pumping Plant
Coordinated Operation of CVP and the SWP (COA)	1986	Agreement between the United States and State of California for Coordinated Operation of CVP and the SWP.
Four Pumps Agreement	1986	Agreement between DWR and DFG to offset direct fish losses in relation to the Banks Pumping Plant
Suisun Marsh Preservation Agreement	1987	Agreement between the CVP and SWP to develop a plan to improve and manage the Suisun Marsh's resources.
NOAA Fisheries Biological Opinion for Winter-run Chinook Salmon	1992, 1993 and 1995	Established operation criteria to protect the winter-run.
Central Valley Project Improvement Act	1992	Mandated changes in the management of the CVP, particularly for the protection, restoration and enhancement of fish and wildlife.
USFWS Biological Opinion for Delta Smelt and Sacramento Splittail	1992, 1993 and 1995.	Established operation criteria to protect the Delta smelt.
Bay-Delta Plan Accord and State Water Board Order WR 95-06	1945 and 1995	Agreement and Board order to provide for operations of the CVP and SWP to protect Bay-Delta water quality.
SWRCB Water Right Decision 1641	1999	Conditions the water rights permits of the SWP and CVP to implement the water quality objectives of the 1995 Bay-Delta Water Quality Control Plan
CALFED Environmental Water Account	2000	Cooperative water management Program
NOAA Fisheries Biological Opinion for salmonids	2004	Finding of no jeopardy on the effects of the system wide CVP/SWP operations. The opinion was challenged in the Federal Court. A decision has yet to be rendered.
USFWS Biological Opinion for Delta Smelt	2004 and 2005	Finding of no jeopardy on the effects of the system wide CVP/SWP operations. The opinion was challenged and the Federal Court has remanded the opinion to the USFWS to conform to the court's ruling and imposed interim remedies until a new opinion is completed.
Wanger Decision	2007	Federal Court has remanded the Delta Smelt Biological Opinion to the USFWS to conform to the court's ruling and imposed interim remedies until a new opinion is completed.

Water Supplies and Uses

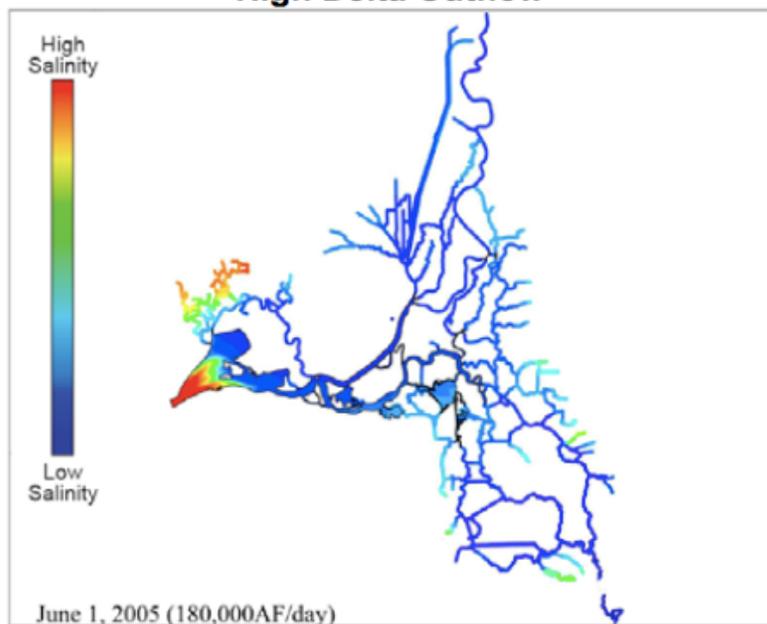
Table 12-2 Water Balance for the Delta Region (IEP Dayflow Data TAF)

Water Entering the Region	1998 (wet)	2000 (average)	2001 (dry)
Precipitation	1,421	954	762
Sacramento River	28,964	18,327	10,499
Yolo Bypass (incl. Sac. Weir spill and South Putah Cr.)	8,980	2,956	366
San Joaquin River	8,441	2,841	1,729
Cosumnes River	785	372	116
Mokelumne River	969	360	127
Misc. Eastside Tribs.	339	344	128
Total	49,899	26,155	13,727
Water Leaving the Region			
Consumptive Use (Gross Channel Depletion for Ag, M&I, Wetlands, ET)	1,688	1,690	1,688
SWP Exports			
Banks Pumping Plant	2,111	3,666	2,599
North Bay Aqueduct	39	47	45
CVP Exports	2,470	2,482	2,328
Contra Costa WD Exports	160	126	104
Outflow to Bay/Ocean	43,430	18,144	6,963
Total	49,899	26,155	13,727



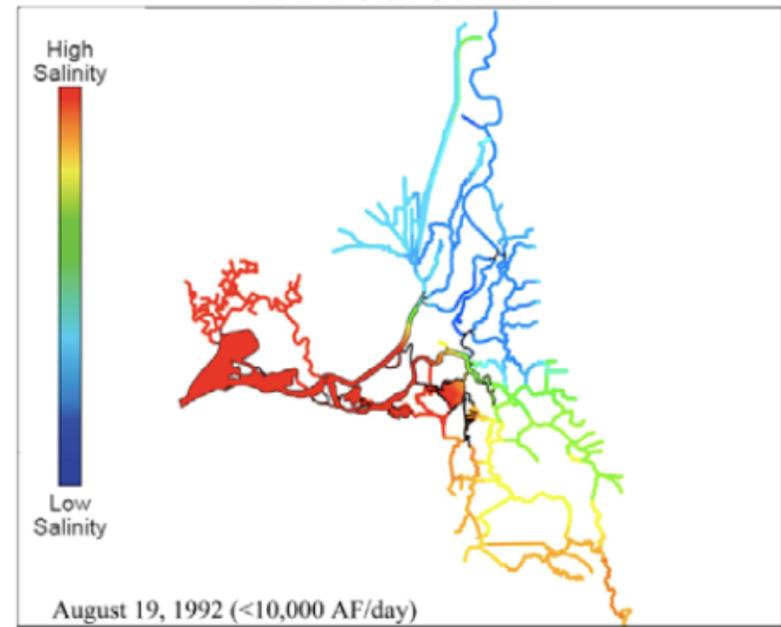
Water Quality

High Delta Outflow



Low salinity through most of the Delta

Low Delta Outflow



Higher salinity extends further into the Delta

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Project Operations



Project Operations

Institutional Framework for SWP Operations in the Sacramento-San Joaquin Delta during 2002

- Agreement between DWR and DFG concerning operations of the Oroville Division of the SWP for the management of fish and wildlife - 7/67 and 8/83
- U.S. Army Corps of Engineer's Section 10 permit and Public Notice 5820-A 10/81. Permitted operations of Banks Pumping Plant.
- Agreement between the United States and State of California for Coordinated Operation of CVP and the SWP (COA) - 1986
- Agreement between DWR and DFG to offset direct fish losses in relation to the Banks Pumping Plant (Four Pumps Agreement) - 12/86
- Suisun Marsh Preservation Agreement signed by the Department, the Bureau, DFG, and SRCD - 3/87
- Central Valley Project Improvement Act (PL 102-575, Title 34) (CVPIA) - 9/92
- NMFS Biological Opinion for Winter-run Salmon, long-term, 2/93. Amended 5/95 to conform to Bay/Delta Accord
- USFWS Formal Consultation on the 1994 Operation of the CVP and SWP: Effects on Delta Smelt (Long-term Biological Opinion) - 1/94, amended 3/95 to conform to the Bay/Delta Accord
- Framework Agreement between the Governor's Water Policy Council of the State of California and the Federal Ecosystem Directorate - 6/94
- Monterey Agreement - Statement of Principles by the State Water Contractors and the State of California Department of Water Resources for potential amendments to the State Water Supply contracts - 12/94
- Principles For Agreement On Bay-Delta Standards Between The State Of California and The Federal Government (Bay-Delta Accord) - 12/94
- Formal Consultation and Conference on Effects of Long-Term Operation of the Central Valley Project and State Water Project on the Threatened Delta Smelt, Delta Smelt Critical Habitat, and Proposed Threatened Sacramento Splittail, USFWS - 3/95
- Water Quality Control Plan for the San Francisco Bay /Sacramento-San Joaquin Estuary (1995 Bay-Delta Plan) 5/95
- SWRCB Water Right Decision 1641 - Conditions the water rights permits of the SWP and CVP to implement the water quality objectives of the 1995 Bay-Delta Water Quality Control Plan - 12/99
- Water Right Order 2000-02 - Order denying petitions for reconsideration and amending SWRCB Decision 1641-3/00
- Water Right Order 2001-05 - Order staying and dismissing Phase 8 of the Bay-Delta Water Right Hearing and amending revised Decision 1641 - 4/01
- Water Right Order 2002-03, Order denying reconsideration of D-1641 and approving a water level response plan prepared by the Bureau and the Department, with input for the South Delta Water Agency, to ensure water levels would not be harmed by changes in points of diversion in the south Delta - 5/28/02
- Water Right Order 2002-12, Order postponing the automatic dismissal of Phase 8 from 12/15/02 to 1/31/03, to allow additional time for negotiations and the completion of a short-term settlement agreement designed to help implement measures in the 1995 Bay-Delta Plan.

Water Governance

FEDERAL

Bureau of Reclamation (BOR)	Department of Defense (Defense Depot S.J. & Travis AFB)
Federal Emergency Management Agency (FEMA)	Fish and Wildlife Services (USFWS)
National Marine Fisheries Service (NMFS)	Geological Services (USGS)
Army Corps of Engineers (USACE)	Department of Homeland Security
USDA – Natural Resources Conservation Service (NRCS)	Department of Transportation (DOT)
Coast Guard	Environmental Protection Agency (EPA)

STATE

Dept. of Boating and Waterways	Office of Planning and Research (OPR)
Business, Transportation and Housing Agency (BTH)	S.F. Bay Conservation & Development Commission (BCDC)
California Bay-Delta Authority (CBDA)	State Coastal Conservancy
CALTRANS	State Insurance Commission
Dept. of Fish & Game	State Lands Commission
Dept. of Food and Agriculture (CDFA)	State Parks and Recreation
Dept. of Water Resources (DWR)	State Reclamation Board
Delta Protection Commission (DPC)	State Water Resources Control Board (SWRCB)
Dept. of Conservation	
Office of Emergency Management (OES)	

COUNTIES

Alameda	San Joaquin
Contra Costa	Solano
Sacramento	Yolo

LOCAL CITIES

Delta Cities (Primary & Secondary Zone)	Conservation Districts
- Bethel Island - Brentwood	Fire Departments & Fire Districts
- Clarksburg - Courtland	Police Departments
- Franklin - Freeport	Reclamation Districts
- Hood - Isleton	
- Lathrop - Lodi	
- Locke - Manteca	
- Oakley - Orwood	
- Rio Vista - Ryde	
- Stockton - Tracy	
- Thornton - Walnut Grove	

CITIES OUTSIDE DELTA-SUISUN

Bay Area Cities
 Central Valley Cities
 L.A. Basin Cities
 Sacramento Valley Cities

REGIONAL AIR QUALITY DISTRICTS

Governmental/County Associations
 Flood Control Associations
 Agriculture Commissioners
 Water Quality Control Boards
 Water Conservation Districts

OTHER INTERESTED PARTIES/NGOs/LAND OWNERS

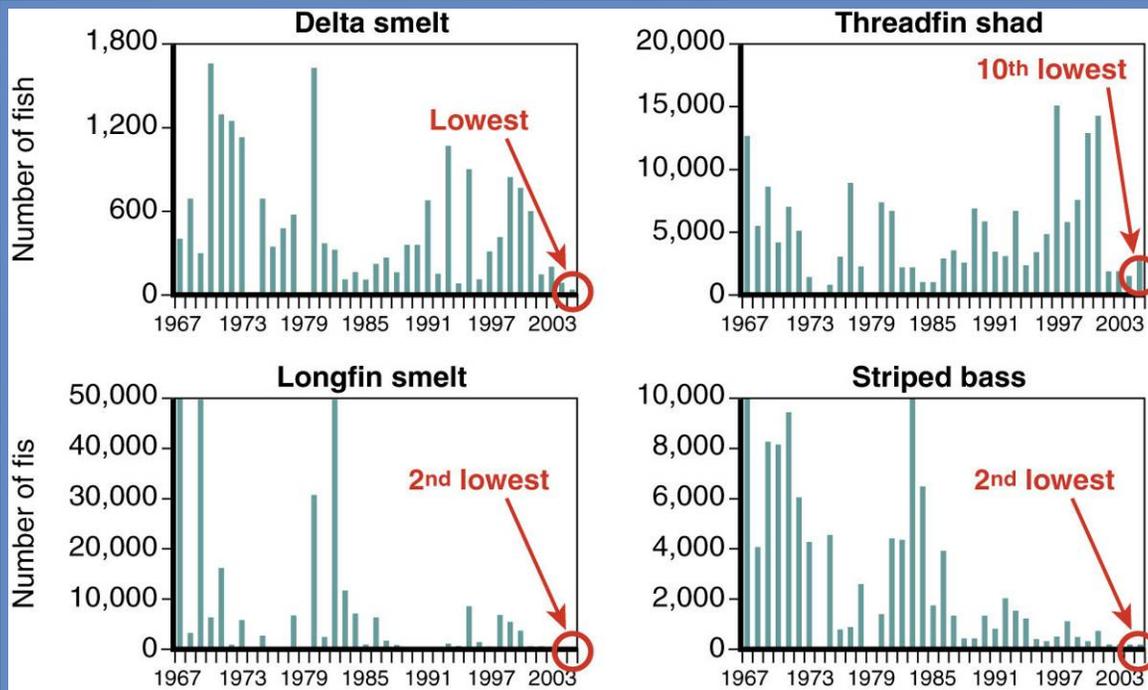
Chambers of Commerce	Ports
Conservation Leagues	Public Health Groups
Environmental Justice Groups	Recreational Users
Farmers	Sportsman's Organizations
Farm Bureaus	Scientific & Education Organizations
Hunters/Fishers	Tourism Industries
Labor Unions	Utility Companies/Providers
Land Trusts	Wildlife Conservation Groups
Local Residents	Suisun Resource Conservation District



WATER PURVEYORS/SPECIAL DISTRICTS

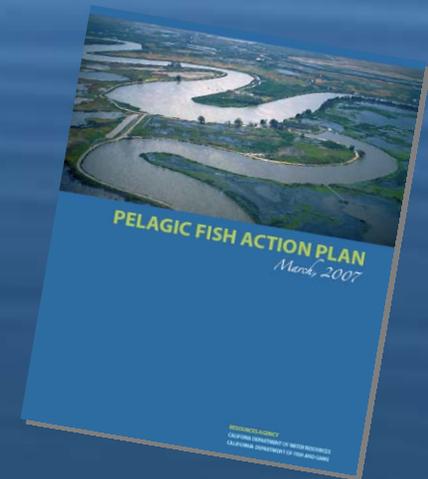
City, County, & Regional Water Districts & Agencies
 Flood Control Agencies
 Irrigation Districts
 Utility Districts
 Water Conservation Districts
 Water Contractors

Pelagic Organism Decline



SOURCE: California Department of Fish and Game.

NOTES: Graphs report the indices for the fall midwater trawl. Circles indicate the rank of indices in 2005. For delta smelt, longfin smelt, and striped bass, the recent indices represent low points in long-term declines of their populations.



Wanger Decision

Press Release

Federal Judge Throws Out Biological Opinion for Threatened Delta Smelt

Ruling means state and federal water projects may be required to reduce pumping to protect fish from extinction

May 25, 2007

Fresno, CA -- A federal judge ruled today that a government assessment of the risk to threatened fish from massive pumps in the San Francisco Bay Delta is illegal and must be rewritten. State and federal water project managers relied on the "biological opinion" by the U.S. Fish and Wildlife Service (FWS) to justify increased water exports to farms and cities south of the delta. Conservation groups sued the agency, arguing that its conclusion that increased pumping wouldn't harm the delta smelt ignored a steep decline in the fish's numbers and was not supported by science.



Delta smelt
Photo: NDAA

"The delta smelt population has crashed to the lowest levels ever recorded," said Kate Doole, an attorney with the Natural Resources Defense Council (NRDC), a plaintiff in the case. "The smelt's dramatic drop coincides with the highest levels of freshwater diversions from the delta ever. That's not a coincidence. Yet the Fish and Wildlife Service even further would not jeopardize the smelt and other threatened and endangered fish. The agency's opinion doesn't pass the laugh test."

The U.S. Bureau of Reclamation, which operates the federally-owned Central Valley Project (CVP) and the California State Water Project (SWP), which runs the State Water Project (SWP) used the wildlife's agency's opinion as a basis for its survival and recovery. The 2005 BiOp's 'no jeopardy' finding is arbitrary, capricious, and contrary to agency's failure to reasonably estimate the Delta smelt population and to analyze most recent smelt abundance data based on historical data unreliable and unreasonable."

In 2005, delta smelt numbers were the lowest ever measured, just 2.4 percent of the numbers counted when the state and federal endangered species acts in 1993. Fish surveyors are having trouble finding this year, increasing concern that the fish are on the brink of extinction.

"The water project operators must decrease pumping," said Andrea Treece, an attorney with Earthjustice, the plaintiff conservation groups in court. "That's the commonsense solution to protecting smelt and other endangered species in the delta."

Scientists say that smelt are an indicator of the health of the entire bay delta ecosystem, and are representative of native delta fisheries, including striped bass, longfin smelt, threadfin shad, and others. The decline in native delta fisheries, including California's water system, as a vital component in its fish economies, as a recreational mecca, and as home to millions of Californians.

The authors of a February 2007 report by the Public Policy Institute of California wrote, "Most Californians don't know whether they know it or not." (The report, "Envisioning Futures for the Sacramento-San Joaquin River Delta," is available online.)

The recent decline of the delta smelt coincides with huge increases in freshwater exports out of the delta. Annual exports increased by 25 percent from 1994-1998 and 2000-2006. Annual exports from 1994-1998 and 2001-2006 were the first time in over 1.2 million acre-feet of additional water. Annual exports from 1994-1998 and 2001-2006 were the first time in over 1.2 million acre-feet of additional water. Annual exports from 1994-1998 and 2001-2006 were the first time in over 1.2 million acre-feet of additional water. Annual exports from 1994-1998 and 2001-2006 were the first time in over 1.2 million acre-feet of additional water.

Recent research by a team of interagency scientists confirms that freshwater exports remains one of the most significant threats to the population decline of delta smelt and three other Delta fish species. Delta smelt abundance increases

IMPACTS

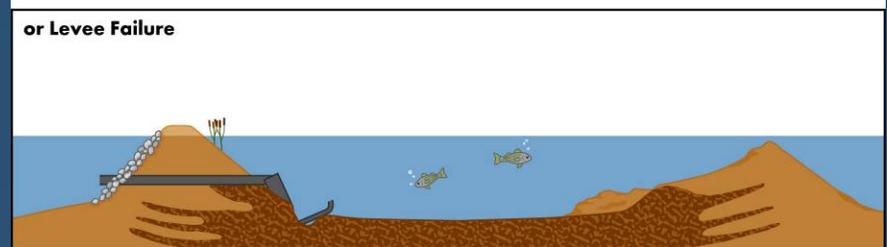
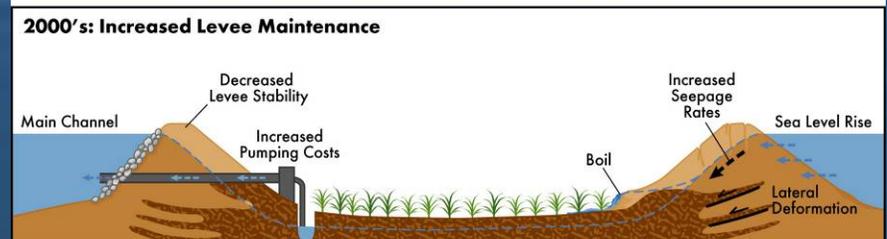
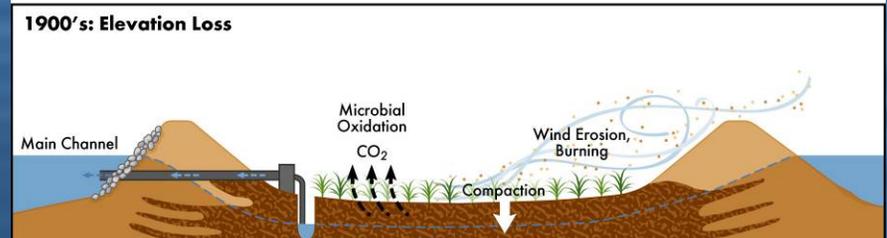
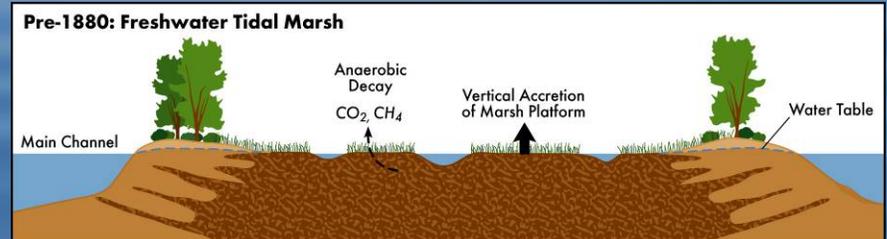
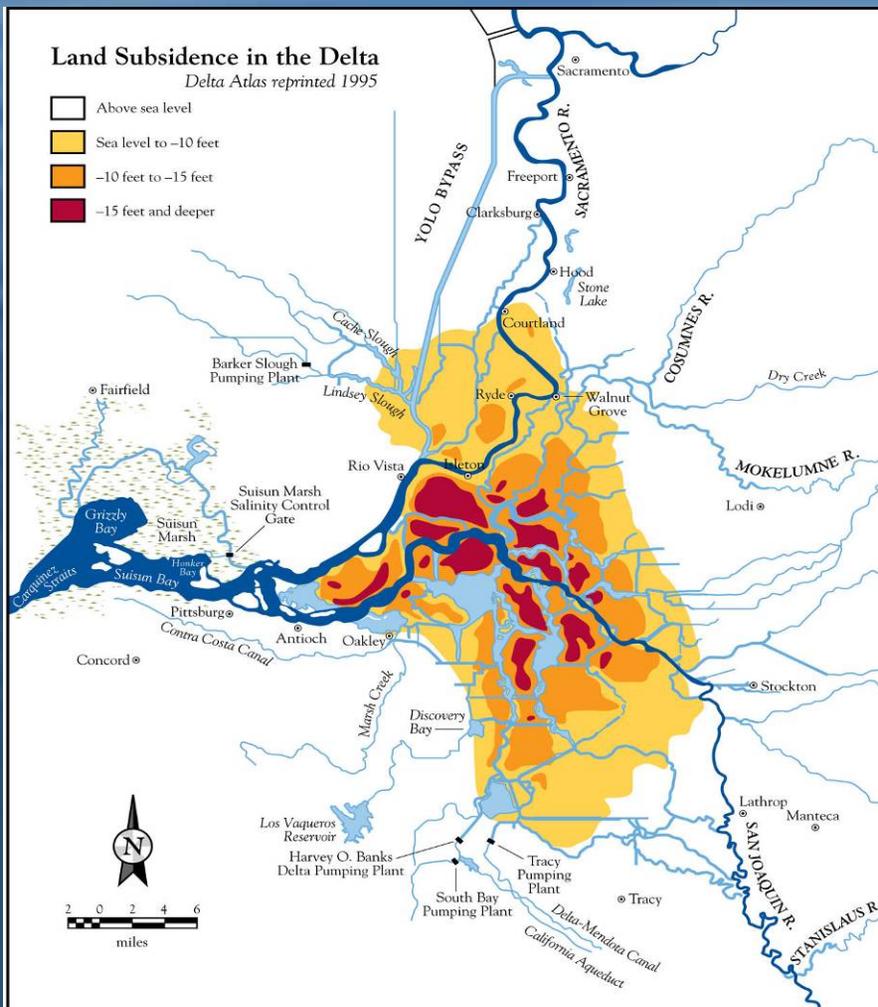
ESTIMATED TOTAL SWP AND CVP DELIVERY REDUCTIONS ASSOCIATED WITH INTERIM REMEDY PROPOSALS

Proposals	Average Year		Dry Year	
	Total Impacts to CVP and SWP	% Loss of Projects Yield	Total Impacts to CVP and SWP	% Loss of Projects Yield
USFWS Action Matrix	0 cfs OMR flow	-37%	-814,000 acre ft.	-25%
	-4,000 cfs OMR Flow	-14%	-183,000 acre ft.	-6%
DWR Changes to USFWS Action Matrix (Aug. 3)	-1,500 cfs OMR flow	-24%	-415,000 acre ft.	-13%
	-4,000 cfs OMR Flow	-8%	-84,000 acre ft.	-3%
Plaintiff's Proposal (July 23)		-54%	-1,423,000 acre ft.	-44%
Wanger Decision	-750 cfs OMR flow	-29%	-627,000 acre ft.	-19%
	-5,000 cfs OMR Flow	-9%	-80,000 acre ft.	-3%

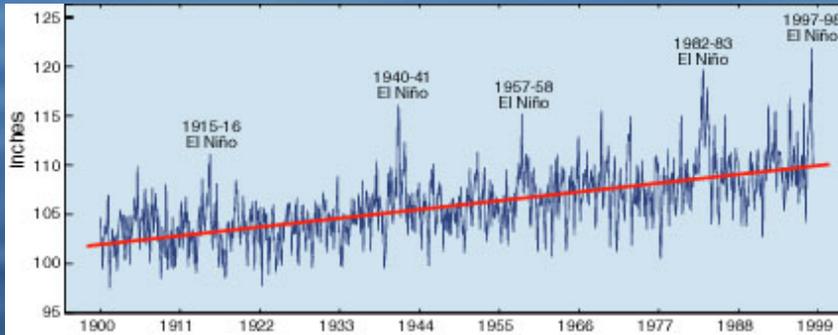
Source: Declaration of John Leahigh, DWR, 8/3/07, Exhibits C and F Impacts of Wanger Decision are compared to 6/07 impacts of all proposals.

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Driver 1. Subsidence: past & future

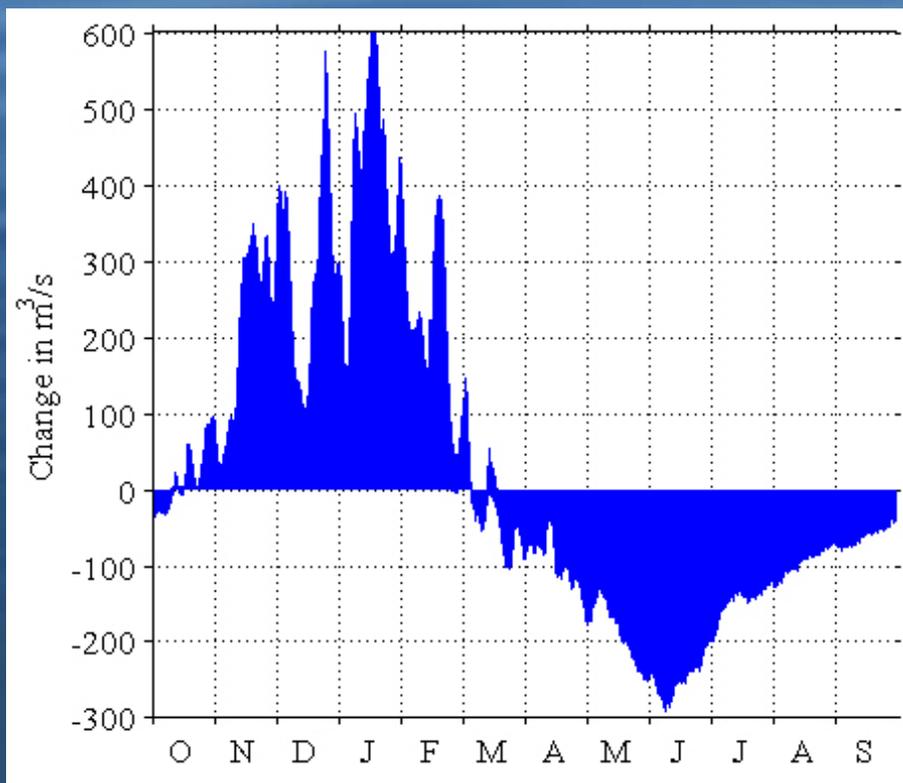


Driver 2. Sea Level Rise



- Character of Delta based on sea level
- All hydrodynamics, habitat conditions, levee heights tied to sea level
- Rate of sea level rise increasing
- A modest rise overwhelms current Delta levee network

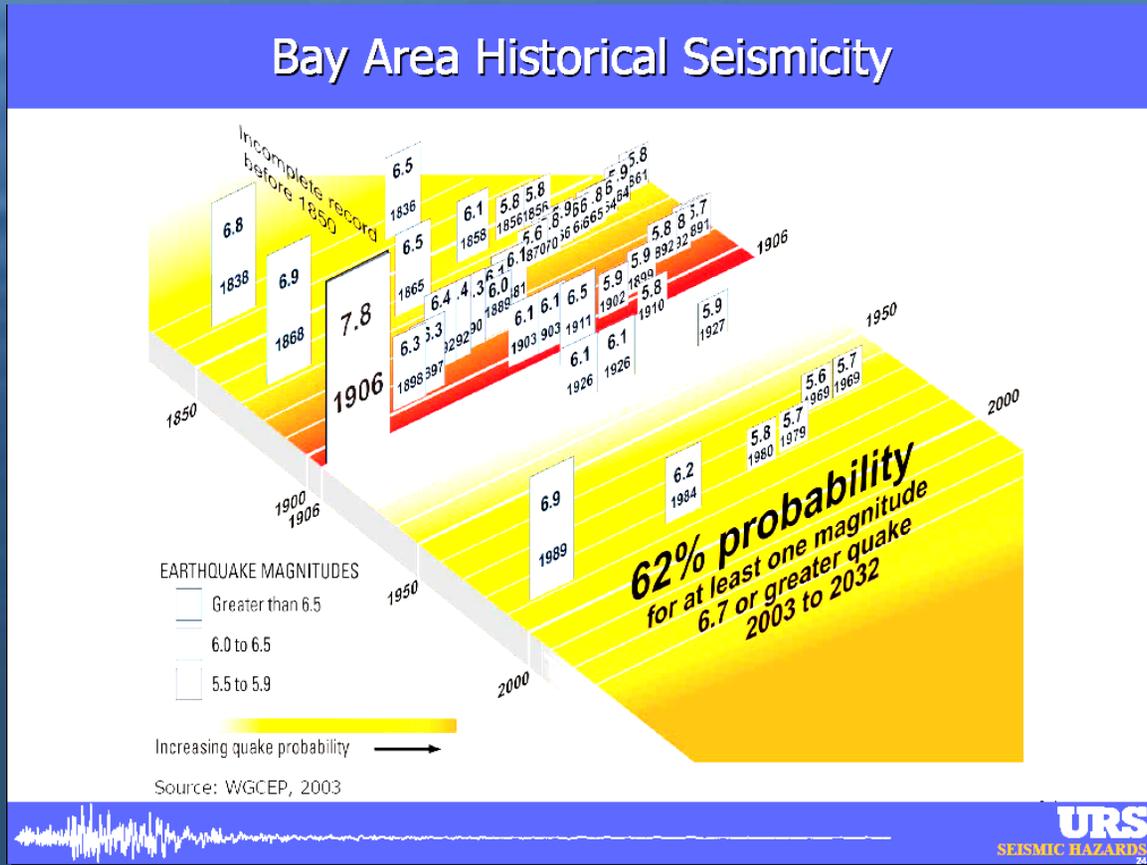
Driver 3. Climate Change



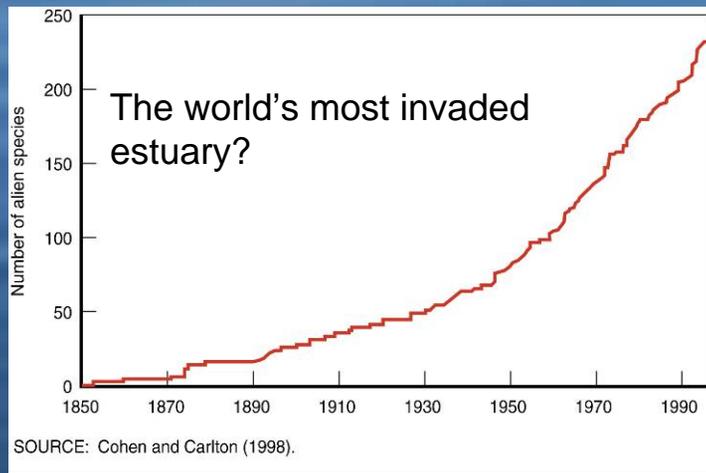
Change in inflows to Delta in 2060 (Knowles and Cayan, 2004)

- On-going shift in runoff timing toward winter, extending low-flow periods
- Increase in intensity and frequency of winter runoff events
- Compounded by increasing sea level (tides)

Driver 4. Seismic Risk



Driver 5. Invasive Species



- Profound, on-going changes in food webs and physical habitat due to invasions
- Alien species do best with constant salinity (fresh or saline) and altered hydrology



Asiatic clam

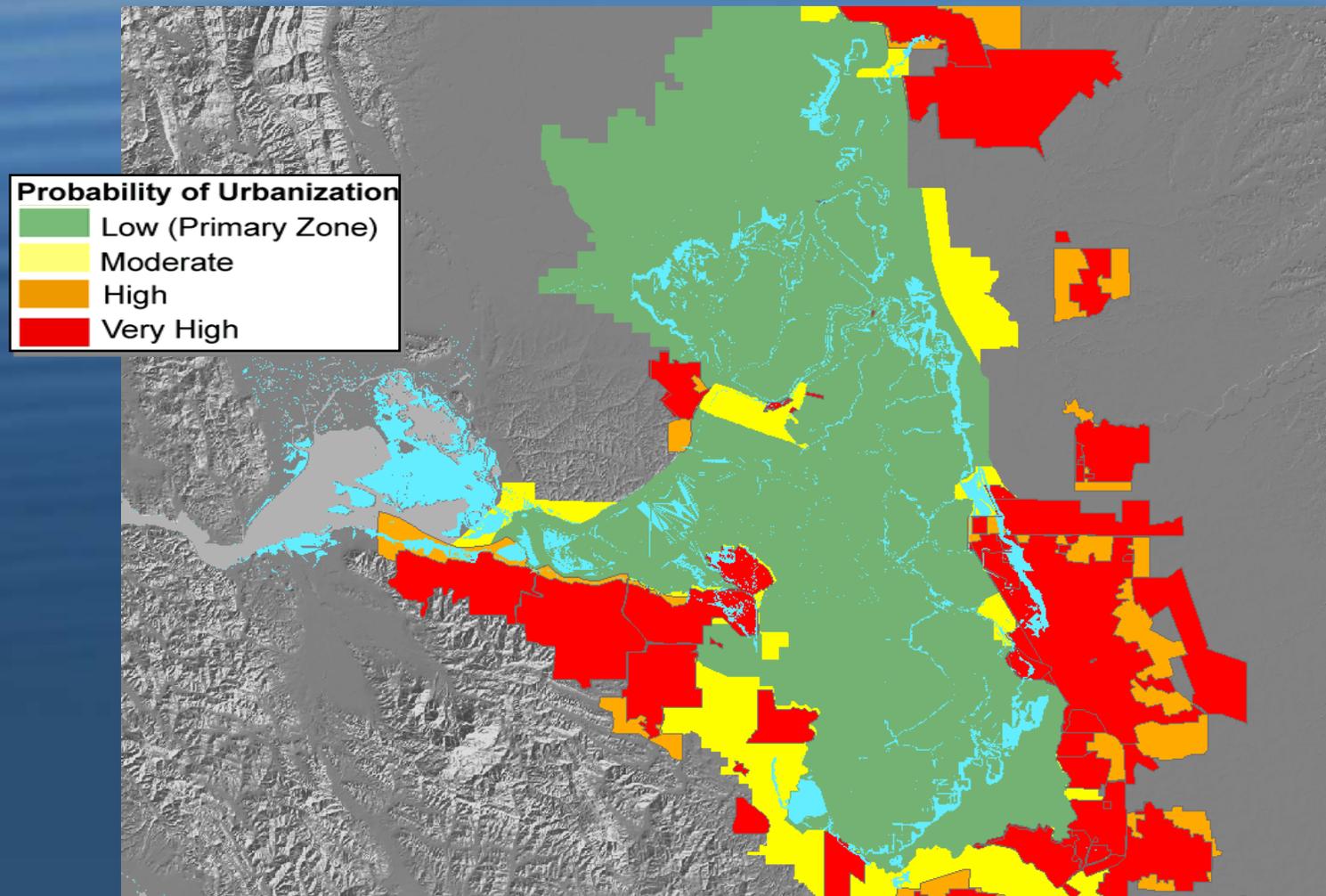


Brazilian waterweed



Overbite clam

Driver 6. Urbanization



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Governance

FEDERAL

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Army Corps of Engineers (USACE)	Department of Homeland Security
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Conservation Leagues	Public Health Groups
Environmental Justice Groups	Recreational Users
Farmers	Sportsman's Organizations
Farm Bureaus	Scientific & Education Organizations
Hunters/Fishers	Tourism Industries
Labor Unions	Utility Companies/Providers
Land Trusts	Wildlife Conservation Groups
Local Residents	Suisun Resource Conservation District



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