

CALIFORNIA WATER FIX

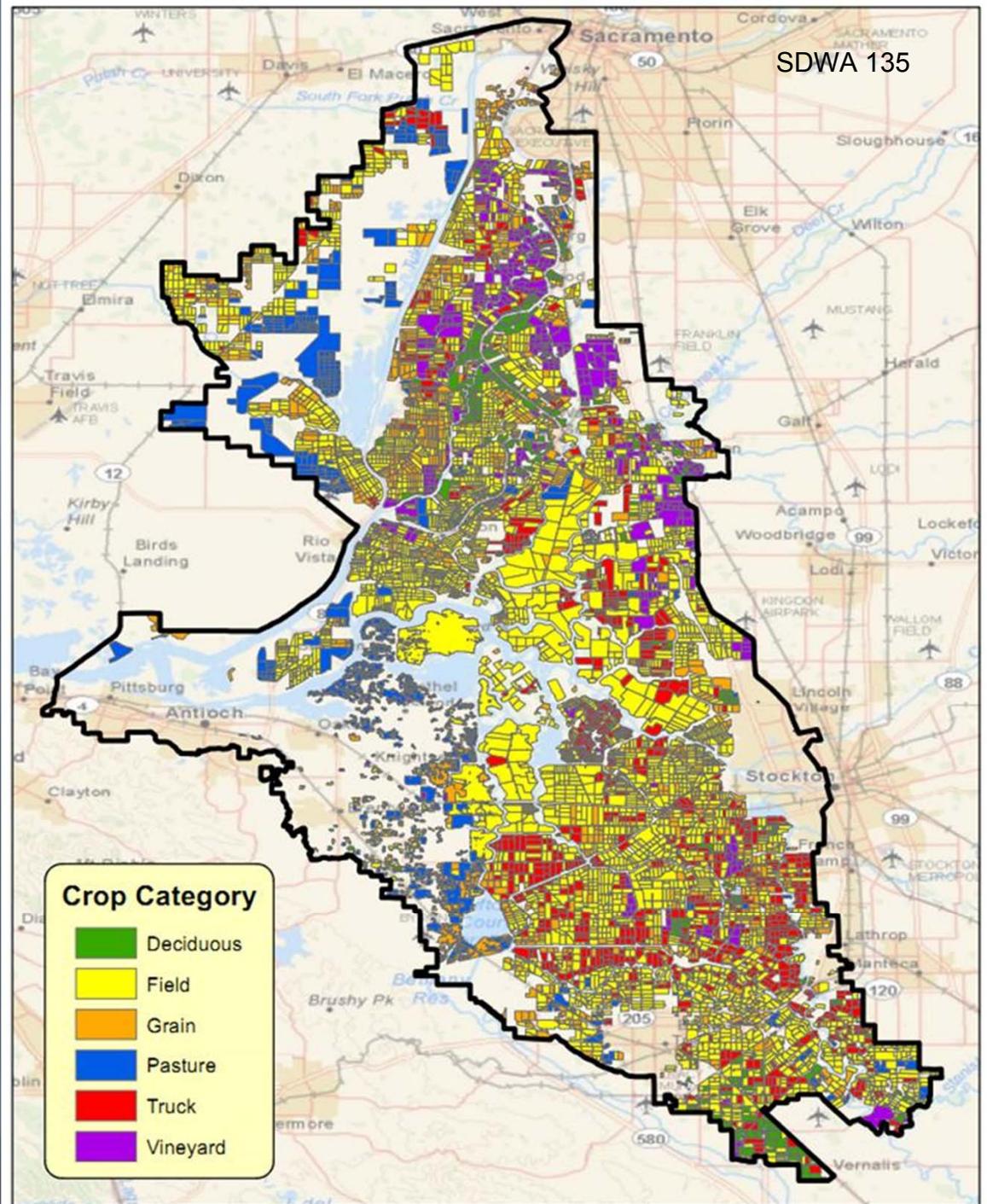
South Delta Water Agency Parties
Case-In-Chief Part 1b

TESTIMONY OF DR. JEFFREY
MICHAEL

OUTLINE

- ▣ Economic Harm To Delta Agriculture
 - Losses Are Likely Even With D-1641 Compliance
 - Spillover Effects to Surrounding Counties
- ▣ Other Drivers of Delta Economic Sustainability
 - Infrastructure Dependent Industries
 - Levees
- ▣ WaterFix Is Not Feasible
 - Testimony On This Issue Will Now Be Presented In Part 2

Agricultural Land Cover- 2010



Salinity Changes Can Decrease Delta Agricultural Revenue Even With D-1641 Compliance

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- ▣ Model used in Delta Protection Commission Economic Sustainability Plan (ESP) and Draft BDCP Statewide Economic Impact Report produced for DWR.
- ▣ Positively reviewed by ISB peer review panel.
- ▣ Shows statistically significant salinity impacts during a period that has been described as high-compliance with D-1641.

Modeling Crop Choice in the Delta

- ▣ Multinomial Logit Model
- ▣ 6 Crop Groups
- ▣ 6,000 fields
- ▣ 8 Years: 2002-2004, 2006-2010
- ▣ Model Variables

Variable	Description	Units	Mean	Standard Deviation
ec	May-August Electroconductivity Average, 2001 - 2010	micro Siemens / cr	353.24	159.81
acres	Field Acreage	Acres	49.9	59.81
soil	Soil Storie Index	0-100 Point Scale	49.43	16.08
elev	Elevation	Feet	3.11	7.47
tmax	Avg. Annual Maximum Temp.	Degrees Celsius	23.4	0.22
slope	Slope	Decimal Degrees	0.14	0.59
year	Annual Fixed Effects			
conzone	Conservation Zone Fixed Effects			

Estimated Salinity Elasticities by Crop Categories

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Deciduous	-0.5289 ***
	(0.1124)
Field	0.2034 ***
	(0.0226)
Grain	0.6744 ***
	(0.0510)
Pasture	0.8140 ***
	(0.1241)
Truck	-0.6150 ***
	(0.0381)
Vineyard	-0.6047 ***
	(0.1333)

Standard errors are reported in parentheses.

*, **, and *** indicates significance at the 90%, 95%, and 99% level, respectively.

DWR's BDCP Report Estimated Agricultural Losses Due to WaterFix

- ▣ BDCP Statewide Economic Impact Report finds a small change in salinity (+1.1% on average), would result in a \$1.8 million (2009\$) decrease to agricultural revenue over time.
- ▣ Scale of impact depends on amount of salinity change.
- ▣ Does not consider reduced yields, only shifts in crops.

Yield Reductions from Salinity For Important Delta Crops

Percentage Reduction in Yield For Leaching Fraction of 5%.

ECi	Ece	Bean	Corn	Alfalfa	Tomato	Almond	Grape
0.2	0.65	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.97	0.00	0.00	0.00	0.00	0.00	0.00
0.4	1.3	9.38	0.00	0.00	0.00	0.00	0.00
0.5	1.62	19.38	0.00	0.00	0.00	4.00	1.88
0.6	1.95	29.69	5.00	0.00	0.00	15.00	7.03
0.7	2.27	39.69	11.40	3.38	0.00	25.67	12.03
0.8	2.6	50.00	18.00	7.50	1.69	36.67	17.19
0.9	2.92	60.00	24.40	11.50	7.12	47.33	22.19
1	3.25	70.31	31.00	15.63	12.71	58.33	27.34

Illustrative Example Of Economic Impact From Yield Loss

Assumptions:

- ▣ 50% of SJ County Delta Area Has 5% LF
- ▣ Uniform distribution of baseline EC
- ▣ Uniform Increase of 0.1 EC, Likely To Maintain Compliance with D-1641

	0.4	0.5	0.6	Total
Almond	\$ 167,453	\$ 627,950	\$ 1,074,632	\$ 1,870,035
Corn/Alfalfa	\$ 0	\$ 445,838	\$ 1,319,679	\$ 1,765,517
Grape	\$ 100,577	\$ 376,093	\$ 643,585	\$ 1,120,255
Total	\$ 268,030	\$ 1,449,881	\$ 3,037,896	\$ 4,755,807

Decreased Agricultural Revenue Has Broad Economic Impacts on Delta Counties

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- ▣ WaterFix construction is estimated to permanently eliminate about 4,000 acres from production
- ▣ Total revenue loss of about \$12 million for the WaterFix operated as proposed
- ▣ Delta Counties impact as proposed:
 - Decrease of 146 jobs & \$11.6 million in lost income.

WaterFix Impacts On Other Components of Delta Economic Sustainability

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- ▣ Recreation and Tourism
- ▣ Infrastructure Services
 - Transportation
 - Energy
 - Water
- ▣ Levees
 - “The levee system is the foundation on which the entire Delta economy is built.”



Economic Sustainability Plan for the Sacramento-San Joaquin River Delta

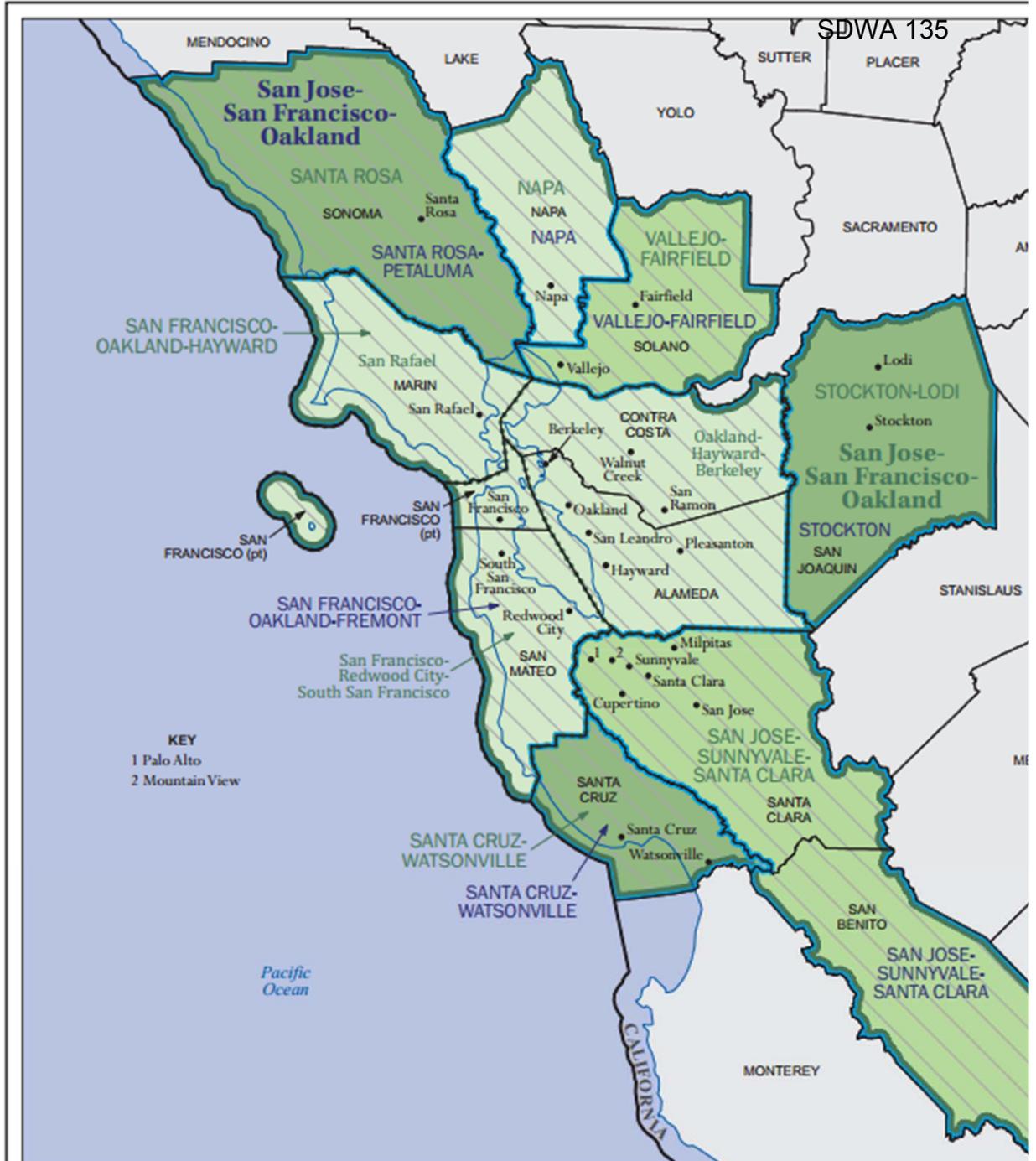
Executive Summary

19 January 2012

DELTA PROTECTION
COMMISSION

In 2013, the Federal Government added San Joaquin County to the San Jose-San Francisco-Oakland Combined Statistical Area

San Jose-San Francisco-Oakland, CA Combined Statistical Area



Impact on Other San Joaquin County Industries

- ▣ Federal designation of San Joaquin County as part of the Bay Area is due to rapid growth in flow of labor and goods between the regions.
- ▣ Transportation and Warehousing is fastest growing industry, and the largest non-agriculture industry concentration.
 - WaterFix construction will impede transportation between the regions.
 - Critical regional infrastructure depends on Delta levees which could be negatively impacted by WaterFix.

WaterFix Increases Risk Of Delta Levee Failures

- ▣ Levees and isolated conveyance are substitutes (DRMS, PPIC, ESP, etc.)
- ▣ If Levee Assessment District is created – implementing WaterFix will result in decreased assessments paid by SWP/CVP
- ▣ DRMS estimated billions of dollars of In-Delta damage and hundreds of lost lives from large-scale levee failure
 - Even small increases in risk are important because the consequences of failure are so large.

Example: DRMS Phase 2

- ▣ DRMS Phase 1: tens of billions in economic losses from large Delta flood
 - 20% of from water export interruptions
 - 80% from In-Delta impacts (loss of transportation, property, ag production, repairs, etc.)
- ▣ Fall 2007 DRMS Phase 2 Draft: not released by DWR (obtained 4 years later for ESP)
 - Compared Seismic Levee Upgrade Strategy to Isolated Conveyance Strategy.
 - Seismic Improved Levees Scenario had both the lowest costs and the highest risk reduction benefits.

AB 1200 Report to the Legislature (January 2008) ^{SDWA 135}

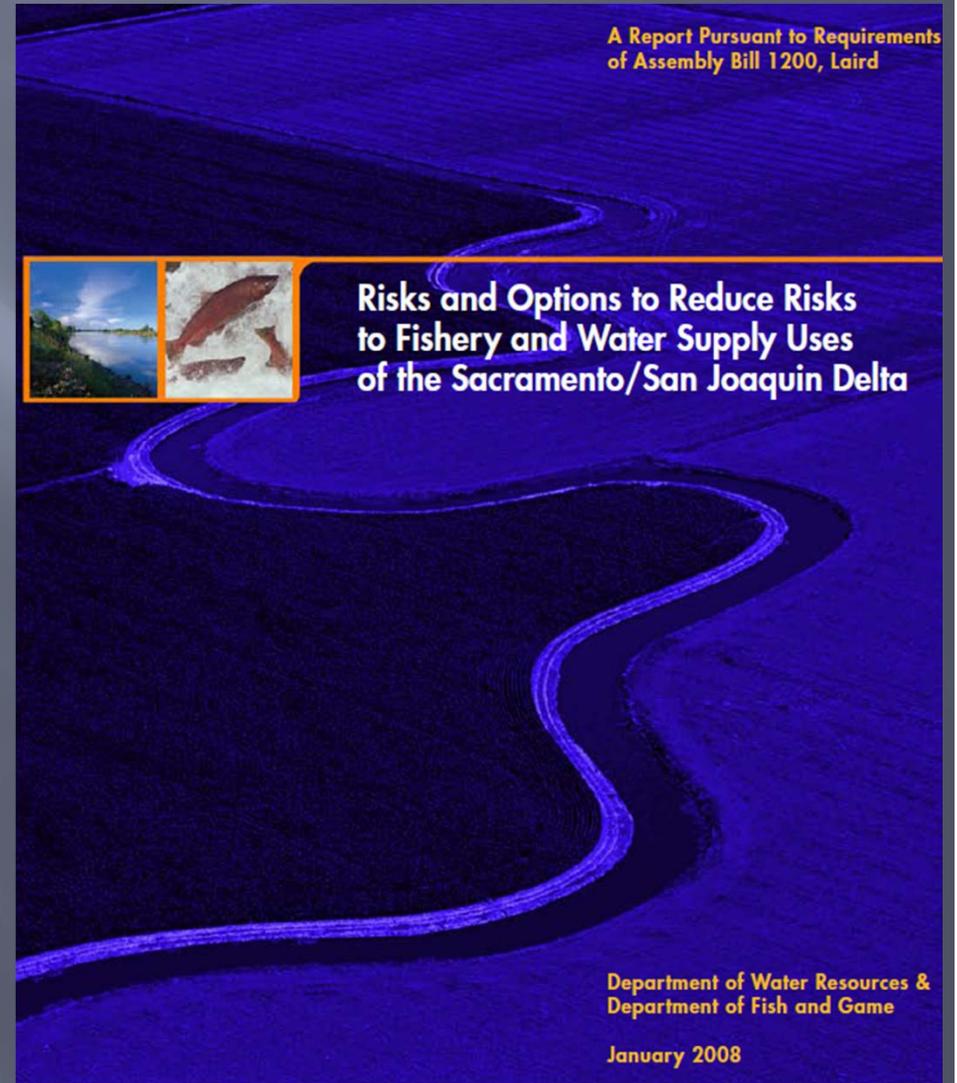
“DRMS is the primary process to provide technical information requested by AB 1200.”

http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/AB1200_Report_to_Legislature.pdf

“The (DRMS Phase 2) results suggest that three building blocks have the highest risk reduction potential...:

- **Armored Pathway Through Delta Conveyance.**
- **Seismically Improved Levees.** (included 100 miles of levees designed to withstand 300 year earthquake)
- **Isolated Conveyance Facility.”**

(Page 20)



AB 1200 Report to the Legislature (January 2008) SDWA 135

Page 24, Ranking of preliminary scenarios (emphasis added).

“The ranking of preliminary DRMS scenarios is shown in the following table. These rankings were developed by DWR and DFG staff based on DRMS analyses, **with adjustments based on the BDCP analyses.**”

TABLE 5. PRELIMINARY PERFORMANCE RANKING¹ FOR DRMS SCENARIOS

Goal ²	Existing: (Through Delta)	Scenario 1 (Improved Levees)	Scenario 2 (Armored Pathway)	Scenario 3 (Isolated Conveyance)
Prevent water supply disruption	●	● ●	● ● ●	● ● ● ●
Improve export water quality for drinking and agriculture (reduce salinity)	●	●	● ● ●	● ● ● ●
Maintain Delta water quality ³	● ● ●	● ● ●	● ● ●	● ● ●
Preserve lands and protect levees	●	● ● ● ●	● ● ●	● ●
Improve ecosystem	●	● ●	● ●	● ● ● ●
Overall risk reduction	●	● ●	● ● ●	● ● ● ●
Total long-term costs (including losses)	● ●	● ● ●	● ●	● ● ●

Notes: 1. Performance ranks are were prepared by DWR and DFG staff based on preliminary information from DRMS and BDCP:

Final DRMS Phase 2 Report

June 2011: Only results released by DWR

- ▣ Seismic levee improvements deleted
- ▣ Example of how BDCP/WaterFix results in reduced support for Delta levees & increased risk of devastating losses to Delta communities.

WaterFix Operations Are Not Feasible

- ▣ Testimony regarding economic feasibility will be presented in Part 2 of the CWF proceeding