SAN JOAQUIN RIVER
RESTORATION PROGRAM

Water Quality Monitoring, Results, and Real-Time Management

State Water Resources Control Board Public Workshop

November 15, 2010

Why Monitoring is Needed

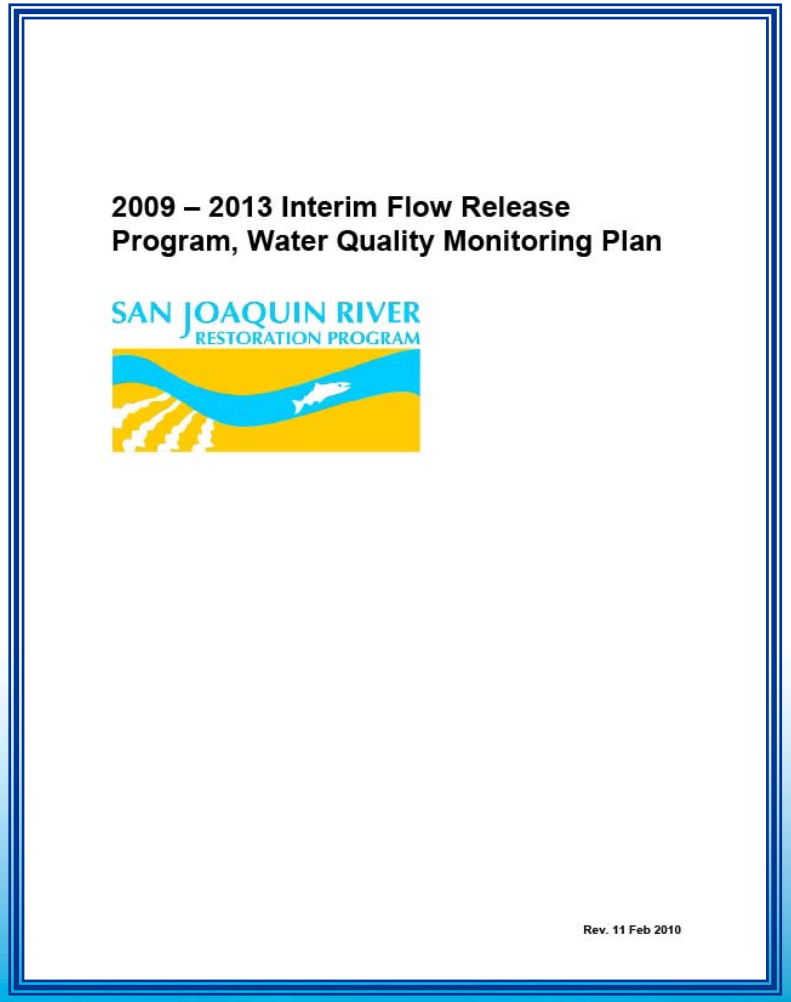
- **Dry sections of river not subjected to sustained flows in recent years**
- **Data collection for future fisheries implementation**
- **Order WR 2009-0058-DWR terms and conditions:**

- Collection of information on water quality and sediment

-Monitoring of flow and physical parameters

- Development of a monitoring plan

Monitoring Plan

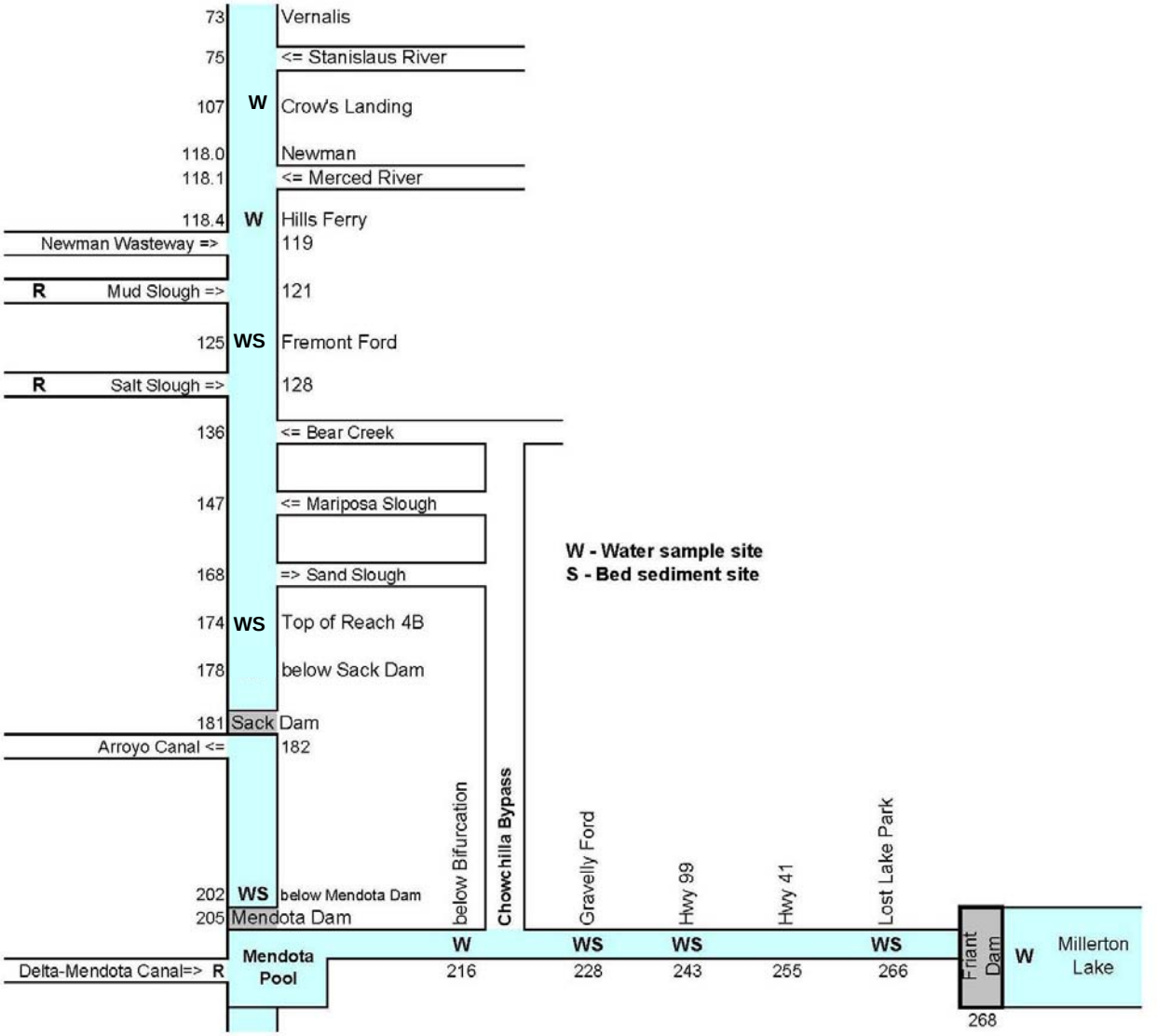


- Multi-agency approach to development, including input from CVRWQCB, USFWS, NMFS, DWR, DFG, EPA, and Reclamation.
- Adaptation to real-time conditions.
- Includes a weekly status meeting with agencies to discuss monitoring.
- Real-time and annual reporting

Monitoring Parameters

- TSS
- Nutrients: TN, NH_4, NO_2, NO_3, TKN, TP, PO_4, chlorophyll
- Bacteria: Fecal coliform and *E. coli*
- Trace elements/minerals: cations (Ca, Mg, K, Na); anions (Cl, CO_4, HCO_3); total TE (Cu, Cr, Pb, Ni, Zn, As, Hg)
- Pesticides: Water column scans of carbamates, organophosphates; organochlorines and pyrethoids if sediment samples dictate the need
- Bed sediment: TOC, trace elements (Cu, Cr, Pb, Ni, Zn, As, Hg), organochlorine scan, pyrethoid scan, toxicity

Water and Sediment Sampling Locations



Water and Sediment Monitoring Frequency

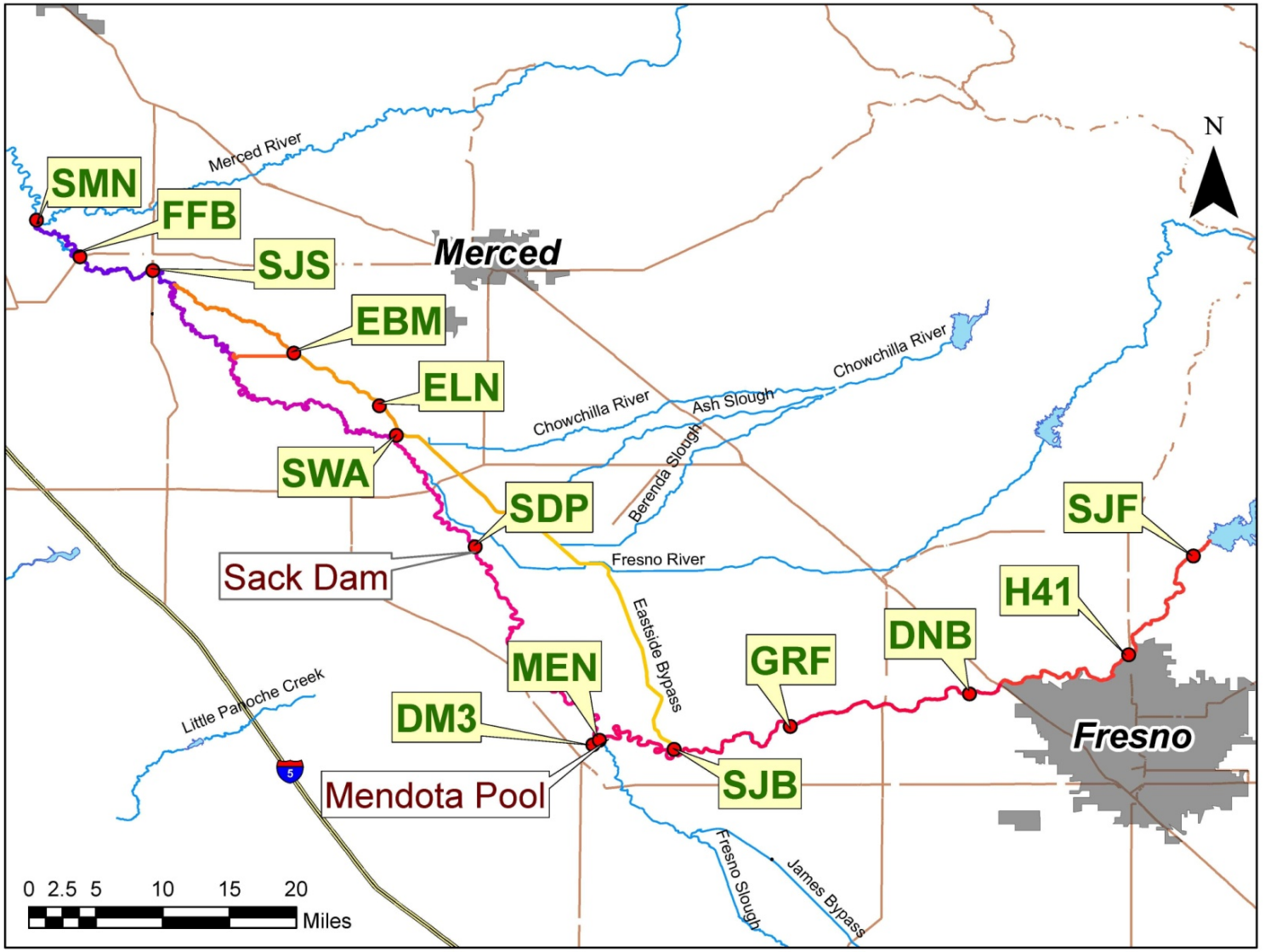
River Mile	Water Quality Monitoring Site*	Reach	TSS	Nutrients	TOC/DOC	Bacteria	Anions and	Trace Elements	Pesticides
266.0	SJR below Friant Dam (Lost Lake Park)	1A	X	X	X	X	X	X	TBD
243.2	SJR at Highway 99 (Camp Pashayan)	1A	X	X	X	X	X	X	TBD
227.1	SJR at Gravelly Ford	2A	X	X	X	X	X	X	TBD
205.1	SJR below Mendota Dam	3	X	X	X	X	X	X	TBD
173.9	SJR at Highway 152	4A	X	X	X	X	X	X	TBD
125.1	SJR at Fremont Ford	5		X	X	X	X	X	TBD
118.3	SJR above Merced River (Hills Ferry)	5	X	X	X	X	X	X	TBD

*Sampling Frequency: Weekly during February 2010, Monthly through December 2010

River Mile	Sediment Monitoring Site*	Reach	TOC	Trace elements	Pesticides	Toxicity
226.0	SJR below Friant Dam (Lost Lake Park)	11	X	X	TBD	TBD
227.1	SJR at Gravelly Ford	2A	X	X	TBD	TBD
211.8	SJR at San Mateo Road	2B	X	X	TBD	TBD
206.0	Mendota Wildlife Management Area	2B	X	X	TBD	TBD
205.5	Mendota Pool (above Mendota Dam)	2B	X	X	TBD	TBD
205.1	SJR below Mendota Dam	3	X	X	TBD	TBD
174.1	SJR at Highway 152	4A	X	X	TBD	TBD
118.3	SJR at Hills Ferry	5	X	X	TBD	TBD

*Sampling Frequency: April and October 2010

Real-Time Monitoring Locations for Physical Parameters



Monitoring Implementation

Summary of Results

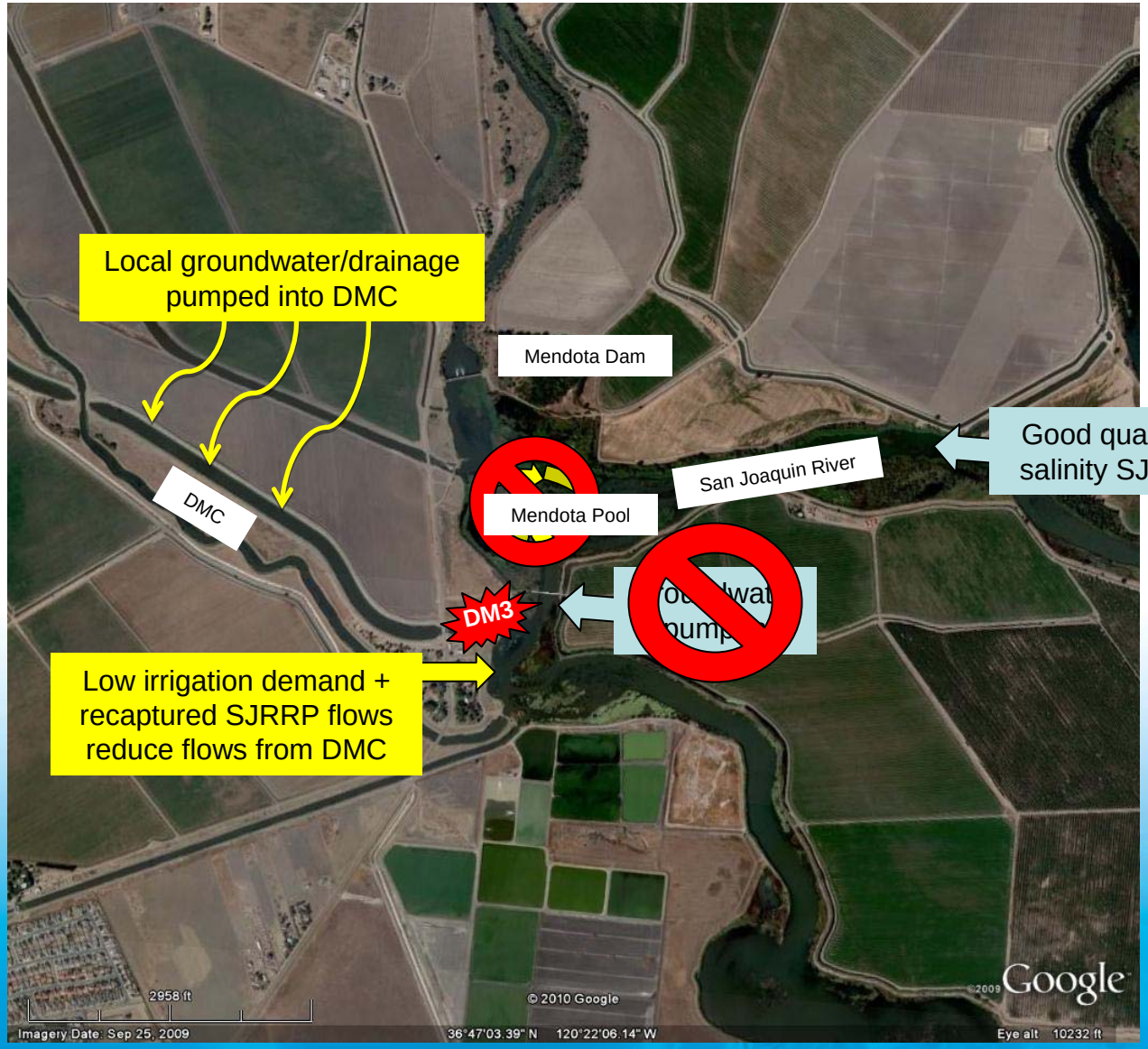
- Over 4,900 samples taken to date
- Issues with adequate flow, depth, DO, and temperature below Gravelly Ford and Sack Dam
- Higher turbidity, salinity, and trace metals below Mendota Dam
- Non-detectable levels of pesticides
- Measurable, but non-toxic levels of Hg, Se below Mendota Dam
- Sediment results difficult due to coarse, sandy textures (little organic matter for organic binding)

Complete results are available online at www.restoresjr.net

Challenge: Delta Mendota Canal and Mendota Pool

- The EC sensor at DM3 recorded a spike in Mendota Pool salinity due to the introduction of Delta water from the DMC, which has higher salinity than water released from Friant Dam.
- From April 22 through 28, recaptured SJRRP flows and low irrigation demand at Mendota Pool reduced Delta deliveries.
- Seepage drainage water returned to the DMC resulted in EC levels that would not permit the Mendota Pool pump-in program.
- Water delivered to the Pool from the DMC did not thoroughly mix with releases from Friant Dam and resulted in higher salinity water in Fresno Slough and the canal headworks than desired by irrigators.

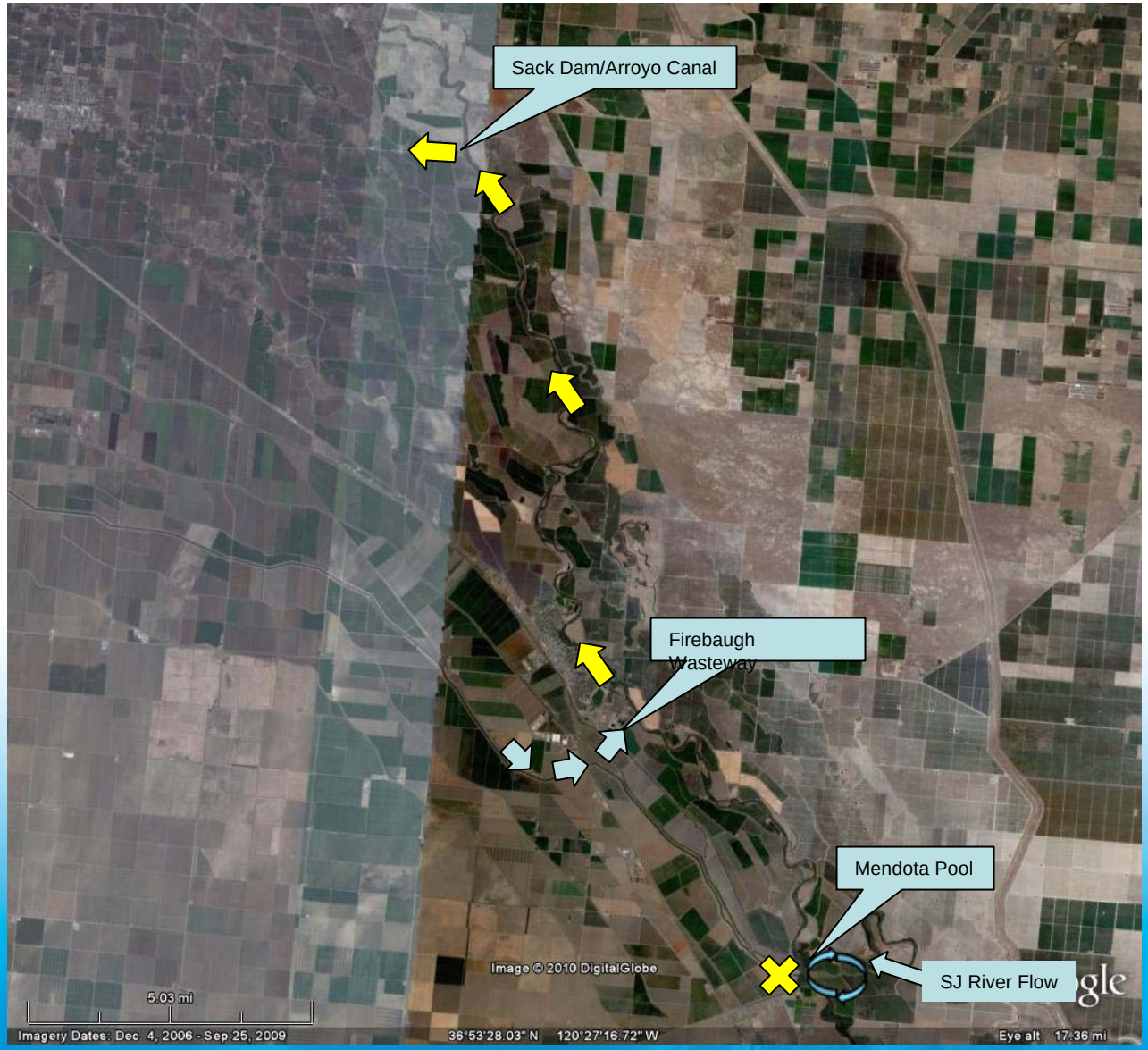
Context: Delta Mendota Canal and Mendota Pool



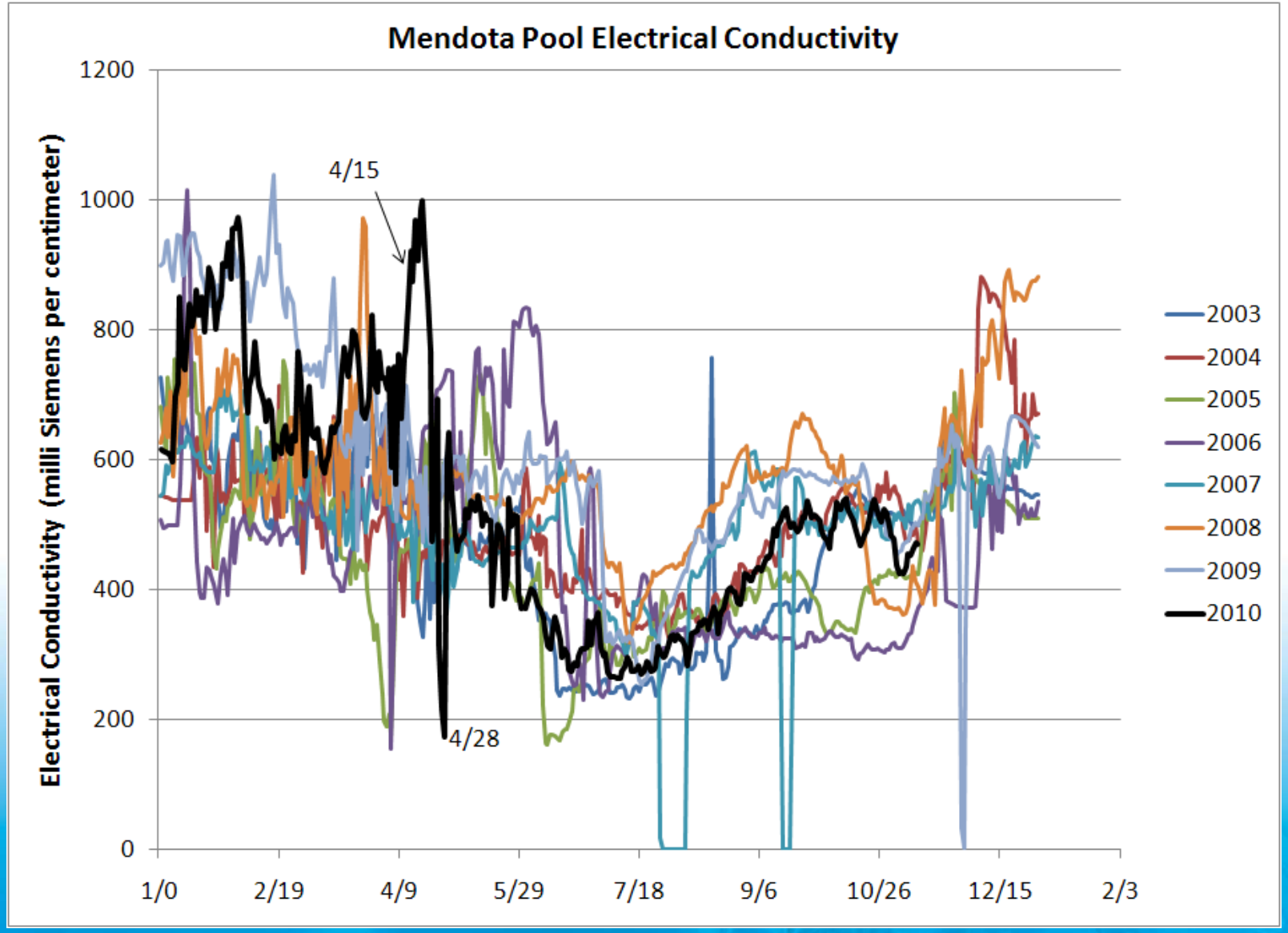
Real-Time Management: Delta Mendota Canal and Mendota Pool

- Reclamation, SL&DMWA, and the SJRECWA adjusted operations to close the DMC at Check 21.
- Arroyo Canal demands met through the Firebaugh Wasteway
- Dilute high salinity water in the Mendota Pool/Fresno Slough with low-salinity San Joaquin River water.
- Reclamation met Mendota Pool demands with deliveries from Friant Dam.

Context: Delta Mendota Canal and Mendota Pool



Learning from the Delta Mendota Canal and Mendota Pool Challenge



Future Monitoring Implementation

- WY 2010:

  - Monthly sampling from 7 sites, with analysis of pesticides in April and October.

  - Continued real-time management of conditions via gaging stations.

  - Contracted laboratories that can achieve lower detection levels for samples.

  - Water quality response plan related to DMC/Mendota Pool.

- WY 2011: Adaptation of the program with input from involved agencies to provide results needed by fish experts.

- WY 2012 and 2013: Continued adaptive management to respond to program and fish needs.

Thank you

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