Experience with real-time, in situ organic carbon and anion instrumentation

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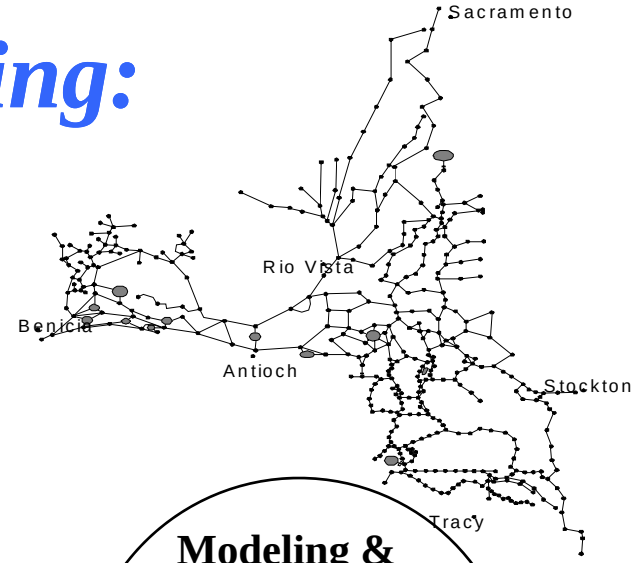
Real-Time Data & Forecasting: Three Components



Monitoring Stations

Hood

Vernalis

Banks PP

Jones PP

Monitoring

Emerging Concerns
Data Collection
Station Ops & Maint

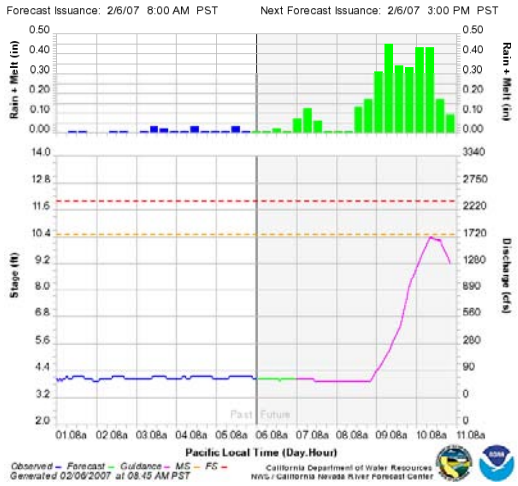
Modeling & Forecasting

Delta Simulation Model 2
DSM2 Aqueduct Extension Model

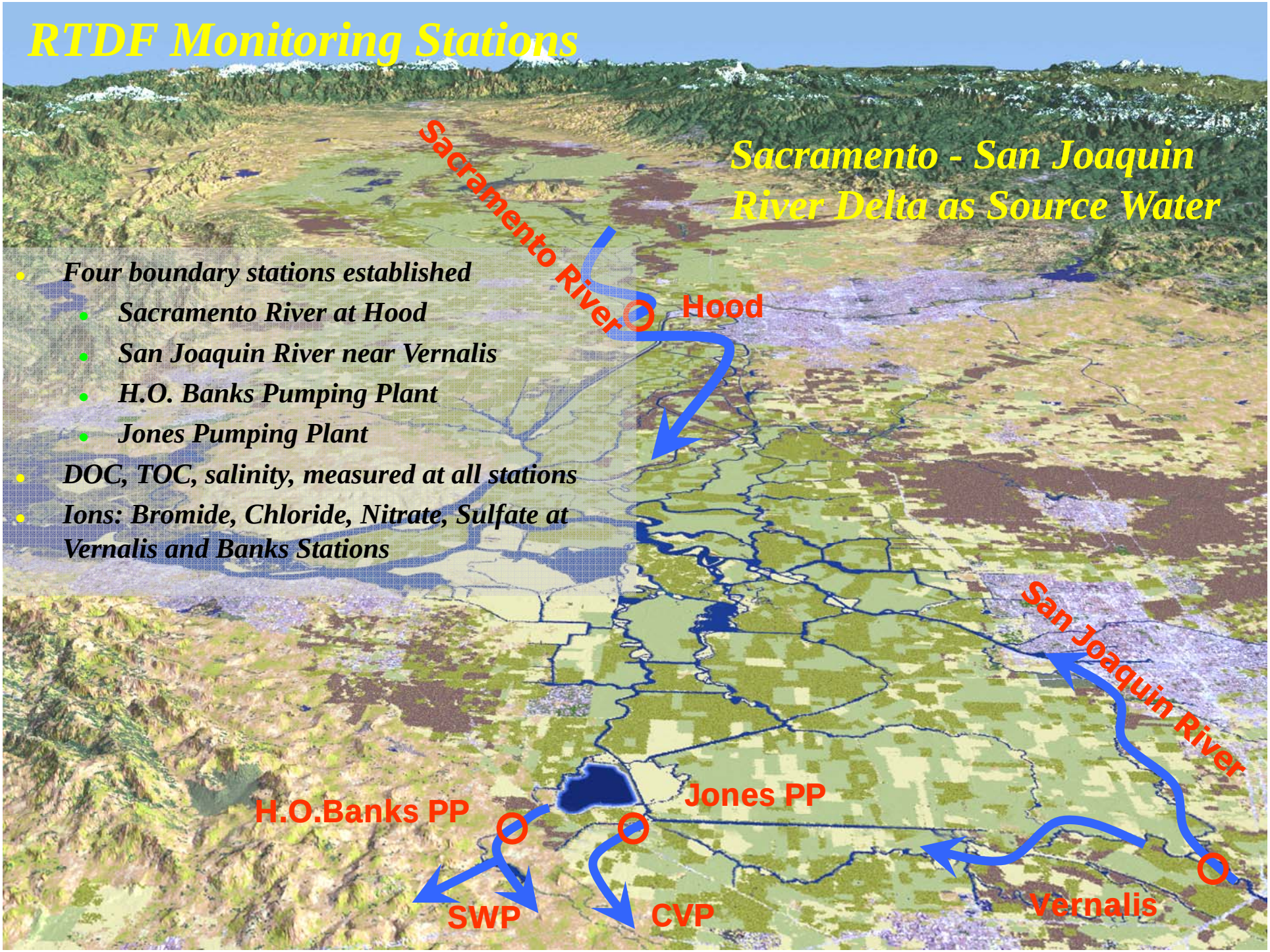
Information Dissemination

User Needs
Data QA/QC & Storage
Visualization
Dissemination

Information Users and Stakeholders

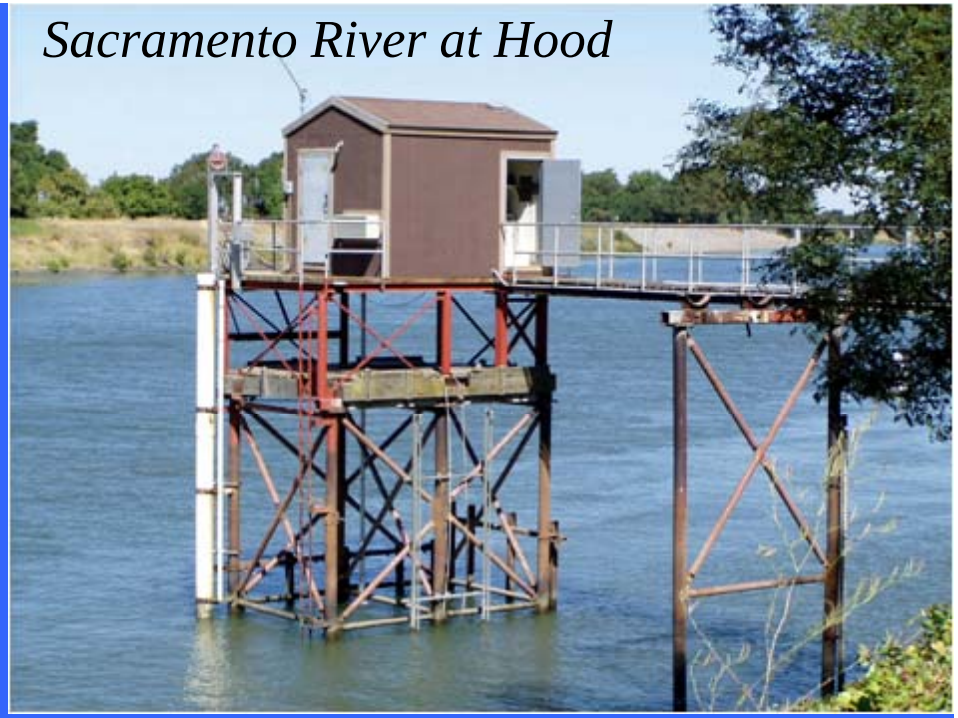


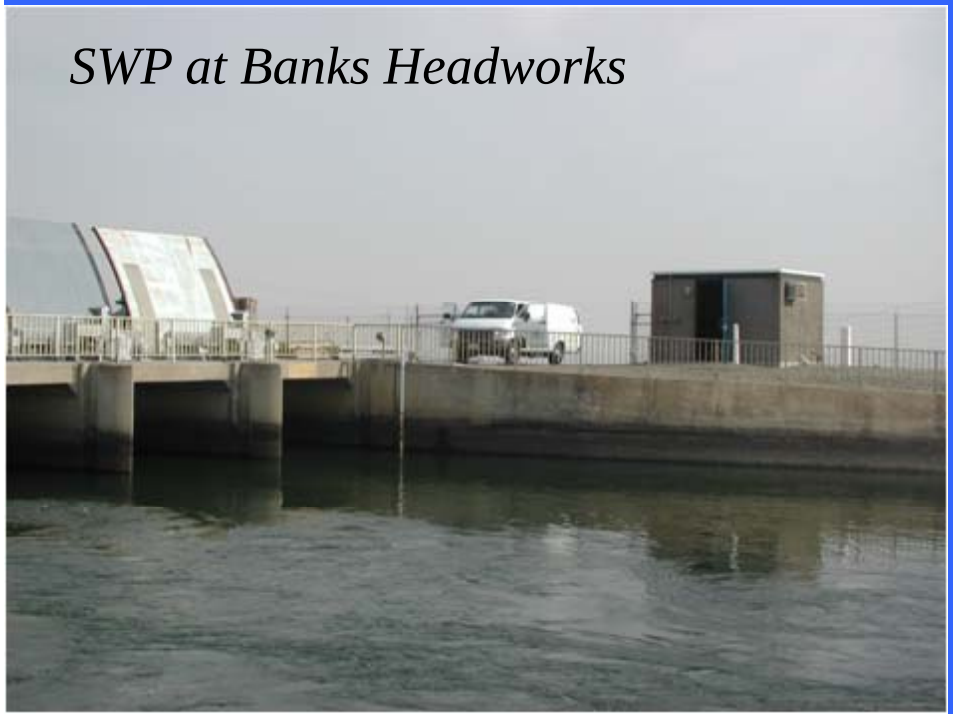
RTDF Monitoring Stations

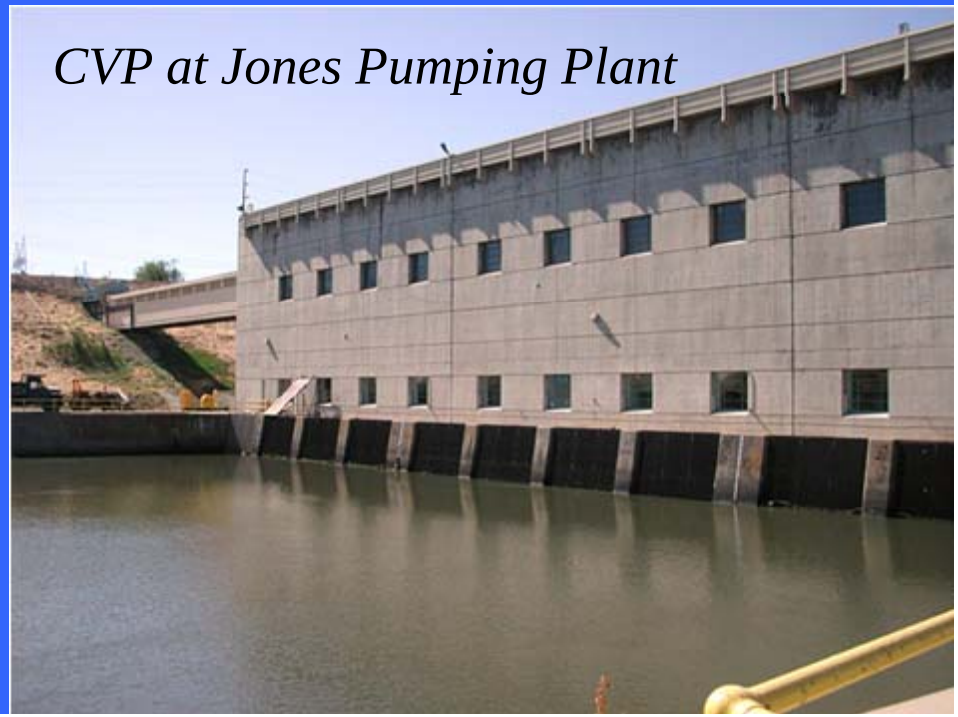


- *Four boundary stations established*
  - *Sacramento River at Hood*
  - *San Joaquin River near Vernalis*
  - *H.O. Banks Pumping Plant*
  - *Jones Pumping Plant*
- *DOC, TOC, salinity, measured at all stations*
- *Ions: Bromide, Chloride, Nitrate, Sulfate at Vernalis and Banks Stations*

San Joaquin at Vernalis

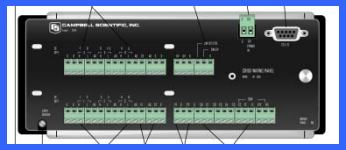

Sacramento River at Hood


SWP at Banks Headworks

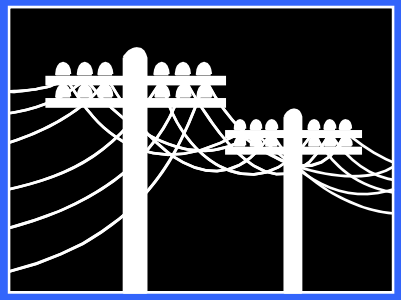

CVP at Jones Pumping Plant

Real-time Data System

Carbon, Anion Analyzer
& Other Instruments



Campbell Datalogger
or personal computer



Phone Modem
and frame relay

SQL Server Database
QA/QC Data

FTP

MWQI
On-Demand
Web Page

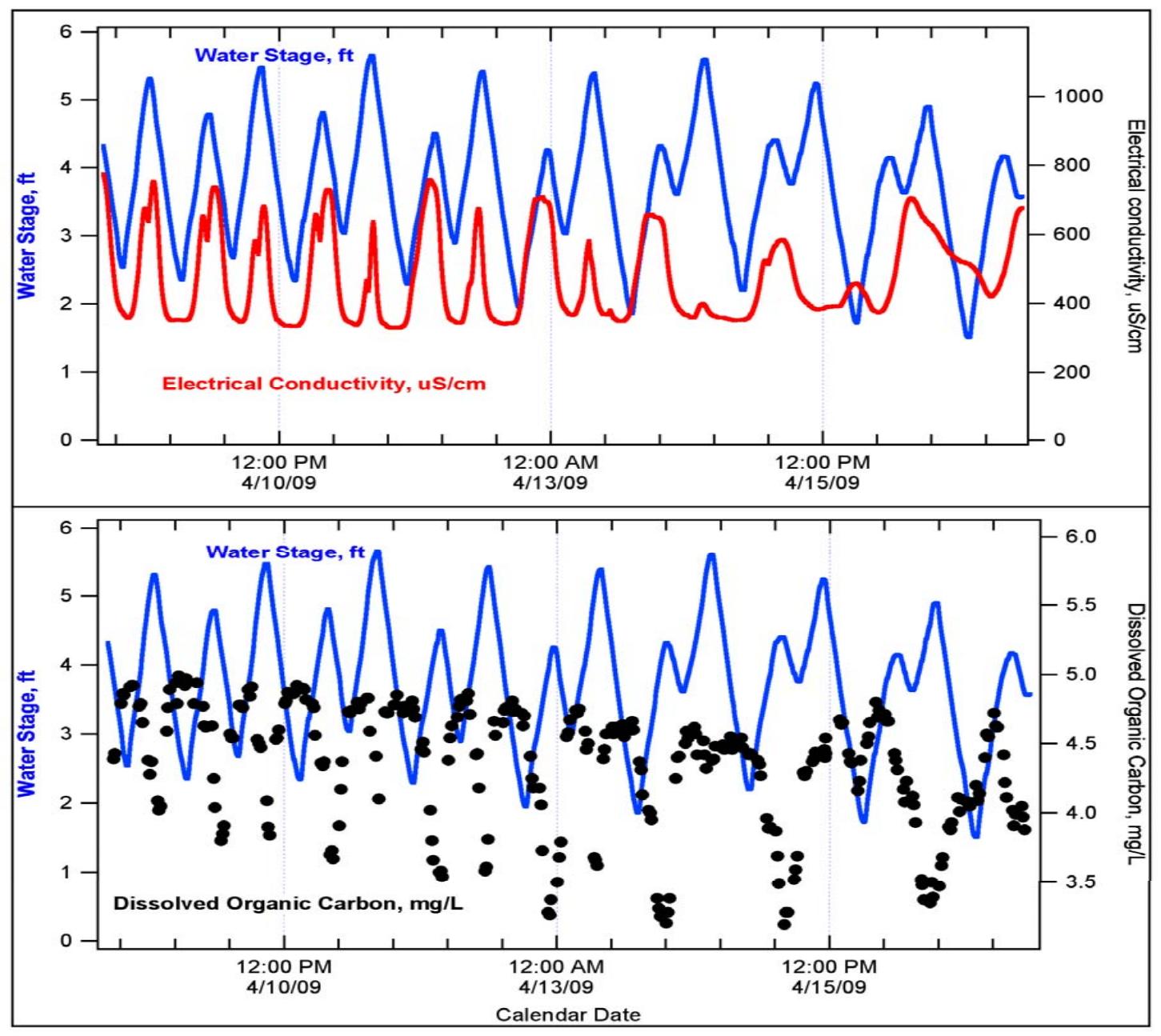
DWR
California Data
Exchange

World Wide Web,
PDF Emailed reports

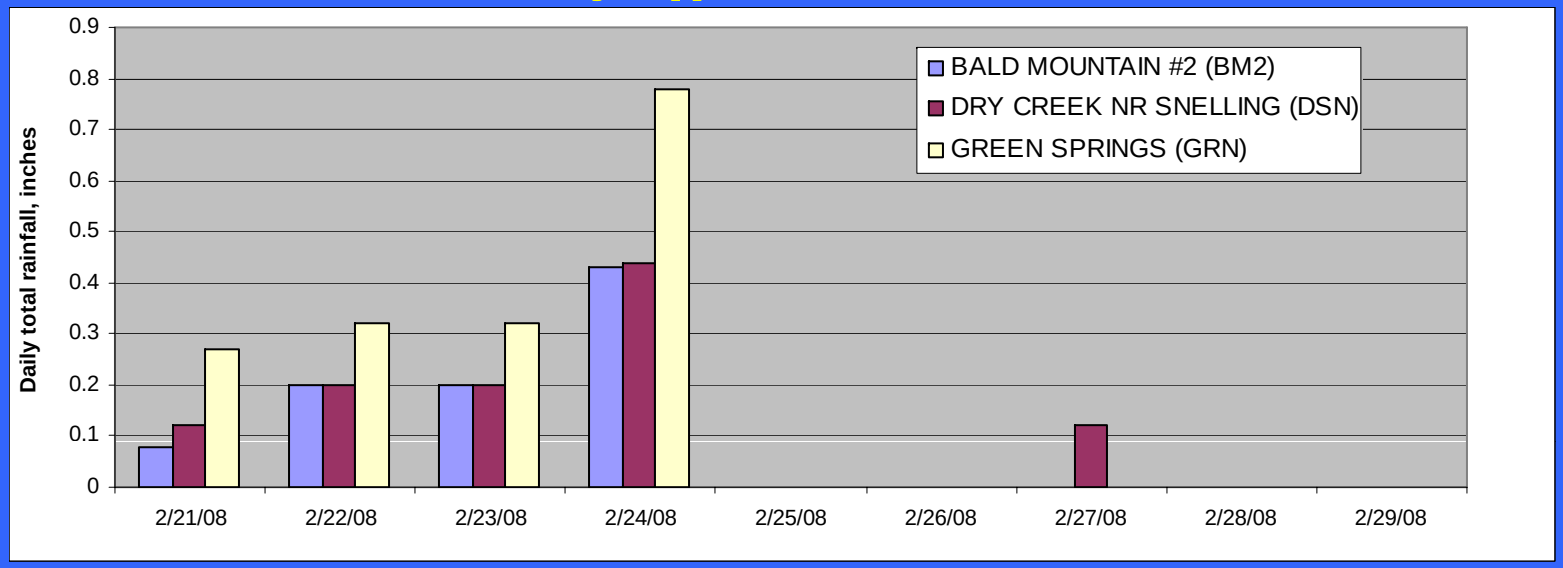
RTDF Project Design: Serve up information

- *Identify Customer Needs & Purposes*
- *Develop Tools and Processes to meet them*
- *Information Products are Valuable Resources*
- *Have a Feedback Process*

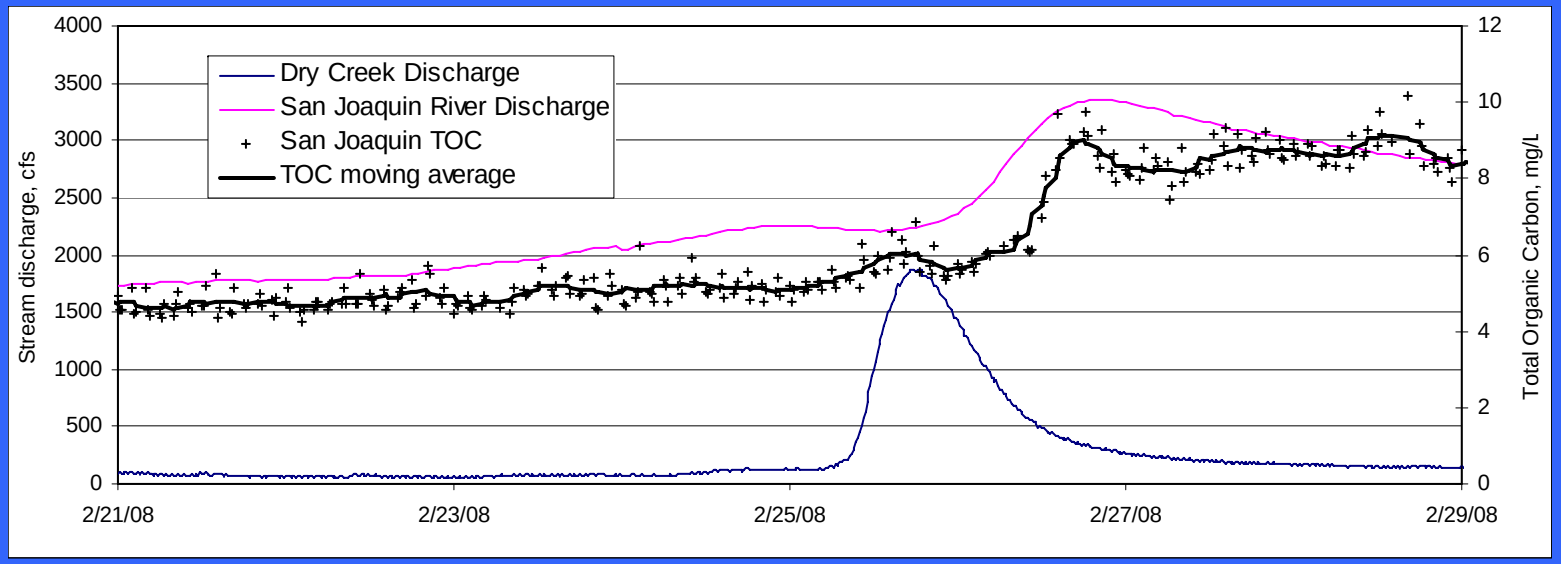
Jones Pumping Plant: Effects of Tides



Importance of detailed sampling: Tributary effects downstream

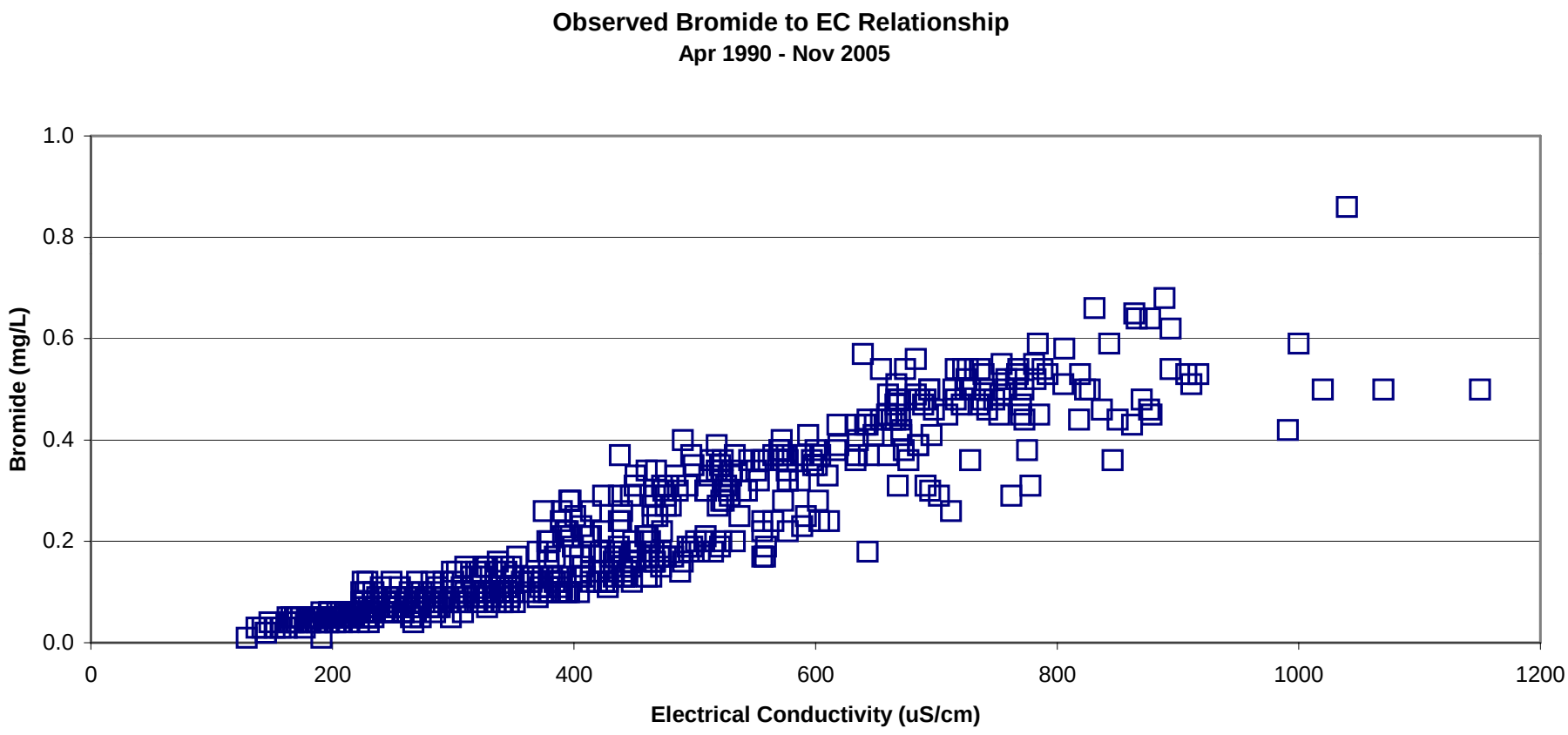


Data: NWS, CA Forestry, PG&E via CDEC



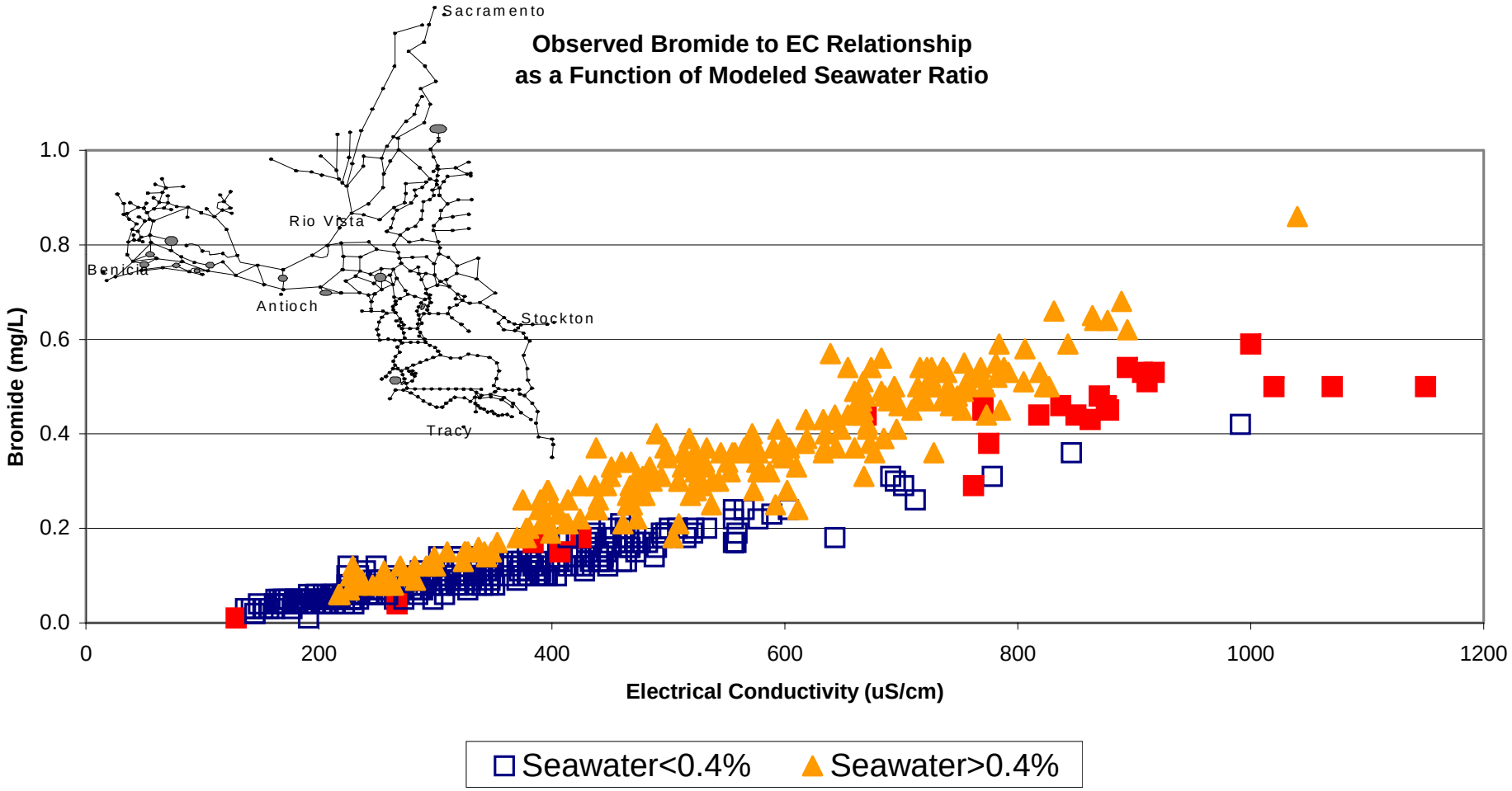
Data: DWR, USGS/DWR via CDEC

Importance of direct measurement: Sometimes surrogates are only surrogates



Paul Hutton, MWD
Data: DWR

Direct Bromide measurement provides insights



Paul Hutton, MWD
Data: DWR

Important Principles for Success

- *Real time monitoring requires*
  - *steady maintenance, inspection, and cleaning.*
  - *an inventory of spare parts, especially those prone to wear and breakage*

- *Success requires staff who:*
  - *understand the systems in detail*
  - *understand the unique dynamics at each site*
  - *want to do this kind of work; aptitude & creativity*
  - *know to prepare for preventative/seasonal maintenance*
- *Only then can you keep these systems running well*

Principles, continued

- *Develop skills to know what components work, e.g., reliable & inexpensive water delivery system*
- *Instrument manufacturer can make or break.*
- *Important to have a well-developed QC program and procedures*
  - *Regular check standards, certified check standards*
  - *"On-line" versus grab samples*
  - *Spike matrix sampling*

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Questions & Discussion?