



***The California Department of Water Resources'
Real-Time Data and Forecasting Project:
Linking Water Quality Monitoring, Modeling,
and Communication***

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NWQMC

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Sacramento - San Joaquin River Delta as Source Water



Sacramento River

San Joaquin River

To the Pacific

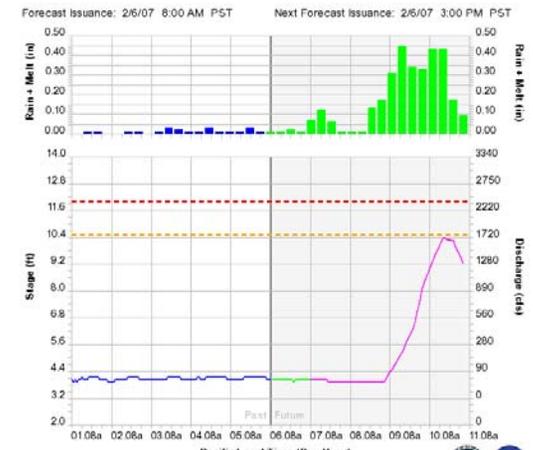
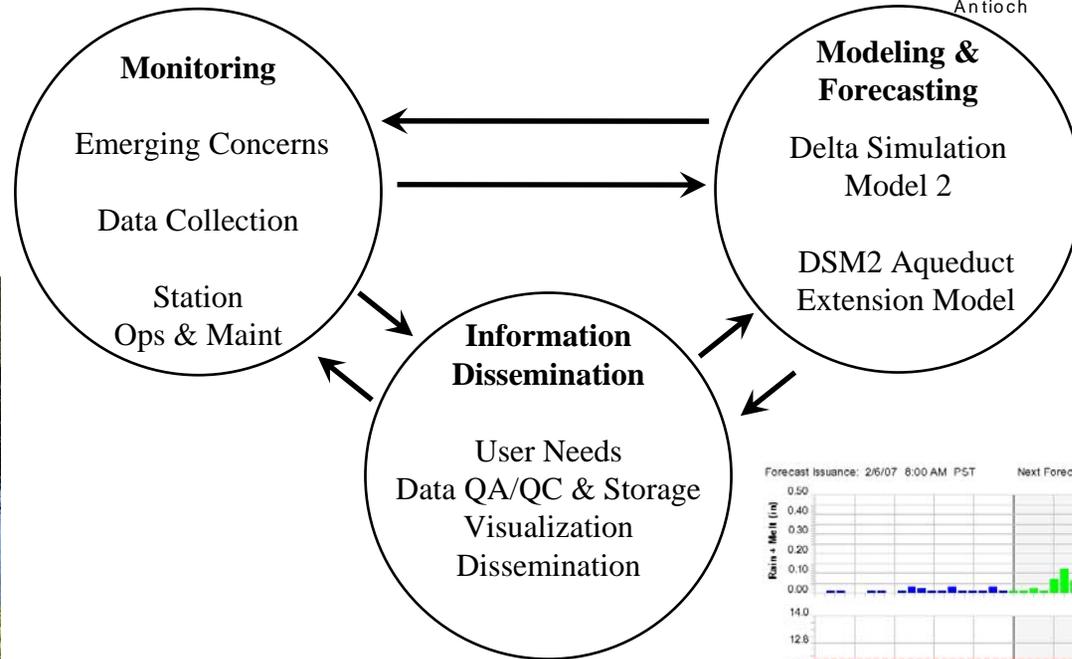
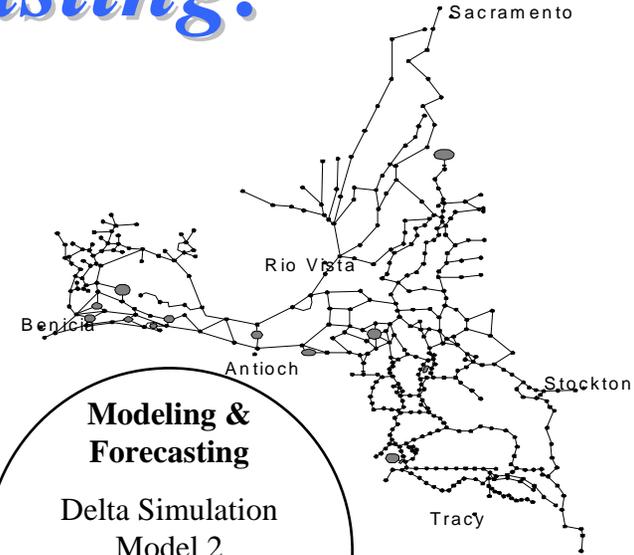
California Aqueduct

Central Valley Project

Main Themes

- *Real-time data and model forecasts can help minimize “unpleasant surprises” for drinking water managers*
- *(Source water) Knowledge is power:*
 - *Forecasting increases flexibility as other restrictions get tight*
- *Feedback between Models & Observations*
 - *Theory and Measurement feed each other*
- *Peer review and stakeholder feedback*

Real-Time Data & Forecasting: Three Components



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*

Design Results:

Innovative uses of information

An Early-Warning System for:

- *Source Water Managers*
- *State and Federal Project Operators*
- *Treatment Plant Operators*

Sources and Loads information for:

- *Scientists*
- *Government agencies, NGOs*

Other Interests:

- *Power generation planning & forecasting*

Assess Sources and Loads

- *Monitoring provides a way of assessing sources and loads of water contaminants:*
- *Loading information from various land uses*
- *Determine sampling locations to fill in the information gaps*
- *Model development for transport to and load at intakes.*
- *Monitor & model contaminant transport from different sources*
- *Determine priority sources for watershed protection efforts*
- *Apply information to regulatory processes or control efforts*

RTDF: Monitoring



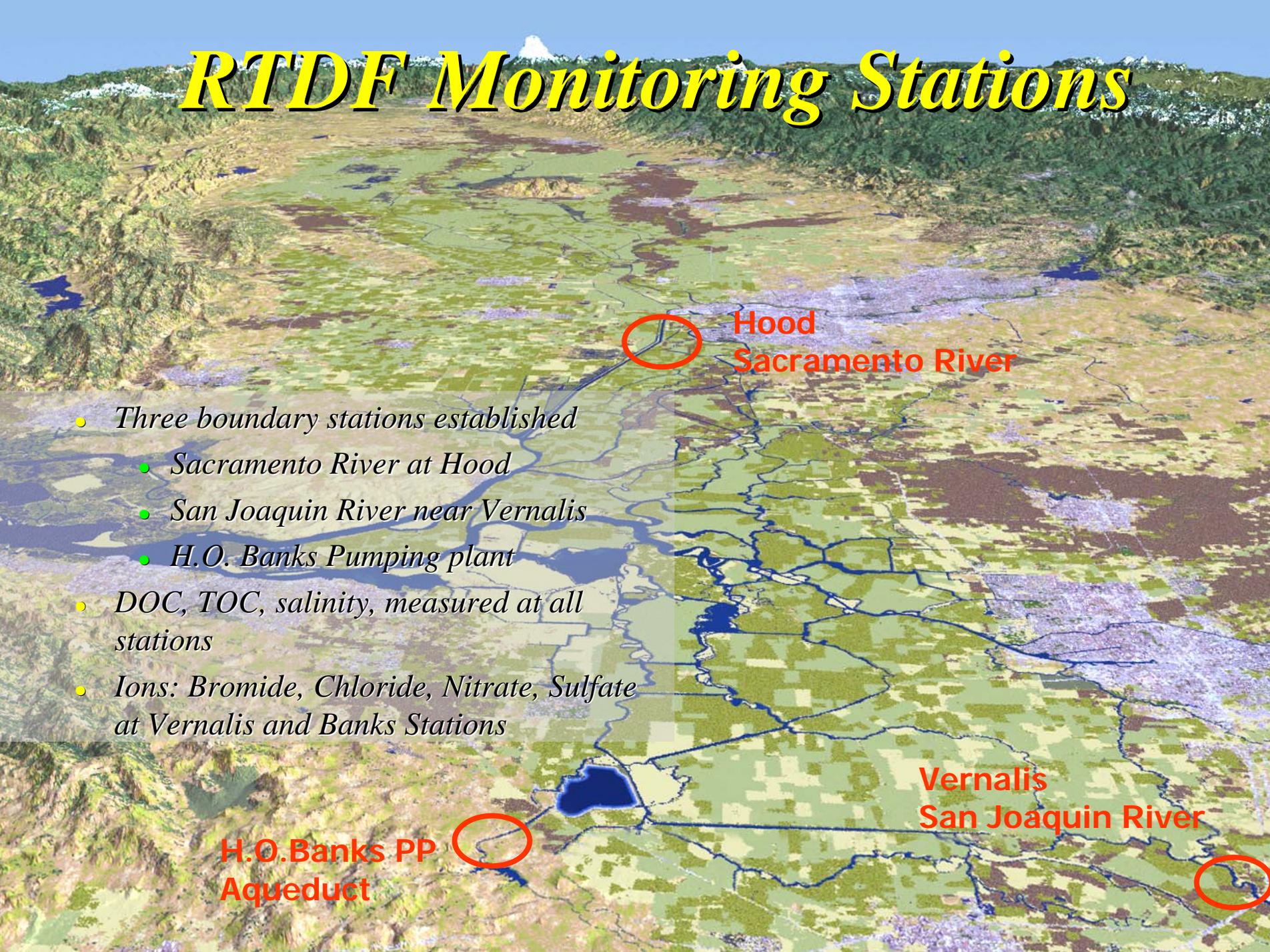
RTDF Monitoring Stations

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

**Hood
Sacramento River**

**H.O.Banks PP
Aqueduct**

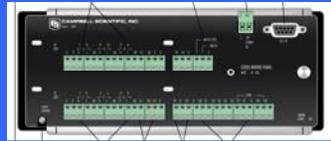
**Vernalis
San Joaquin River**



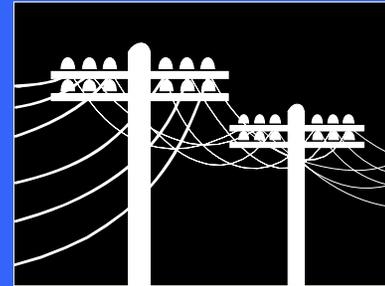
Real-time Data System



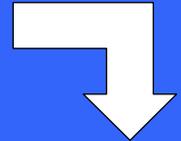
**TOC Analyzer
& Other Instruments**



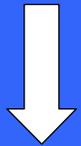
**Campbell Datalogger
or personal computer**



**Phone Modem
and frame relay**



**Access Database
QA/QC Data**



FTP

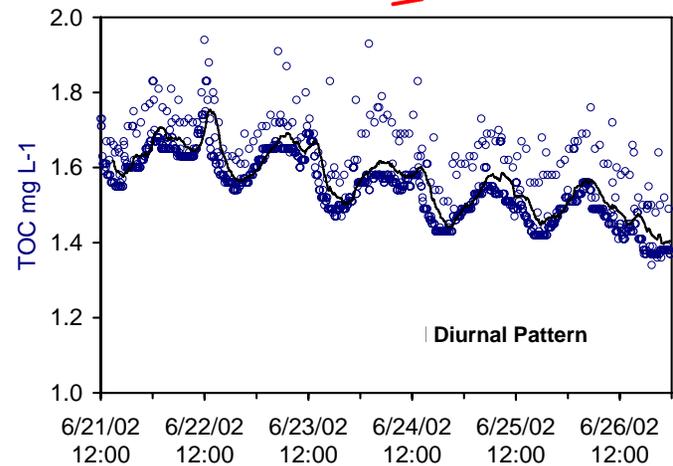
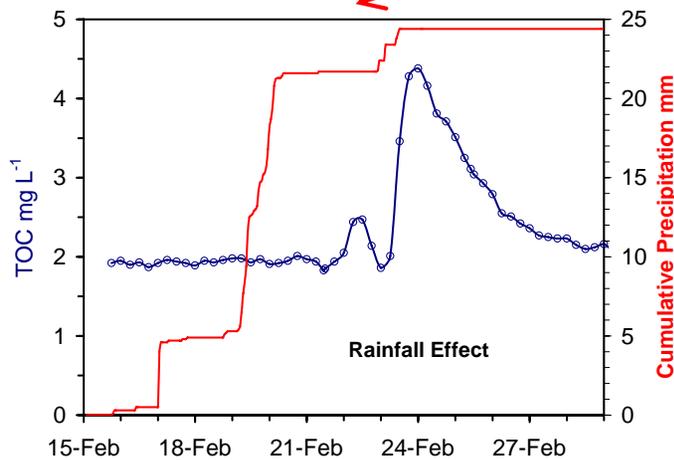
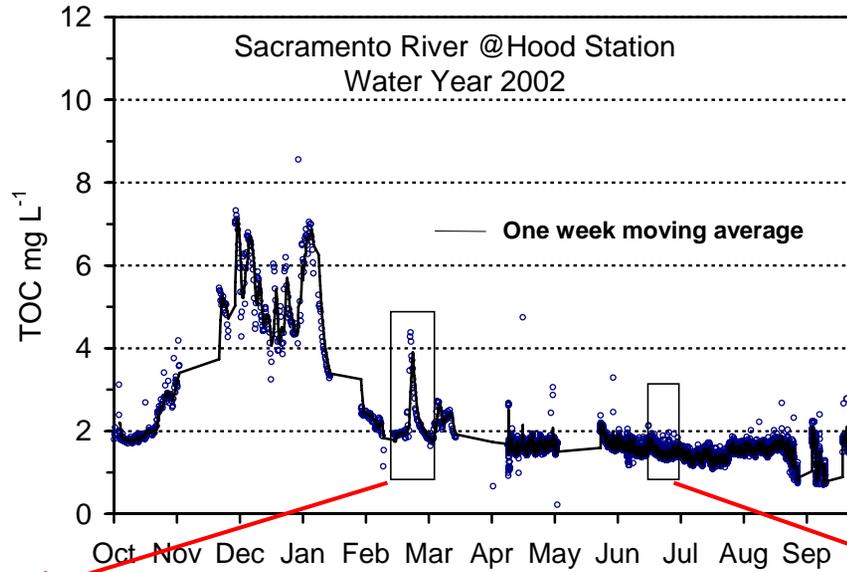
**DWR
California Data
Exchange**



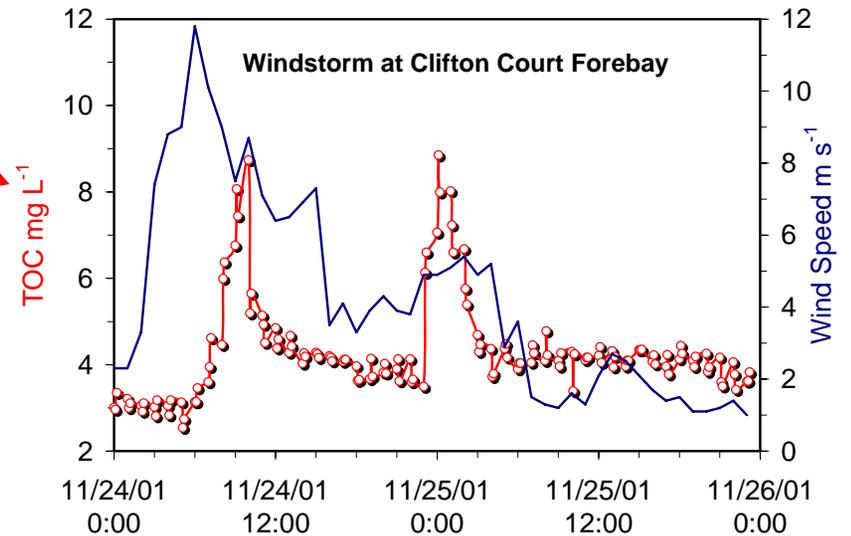
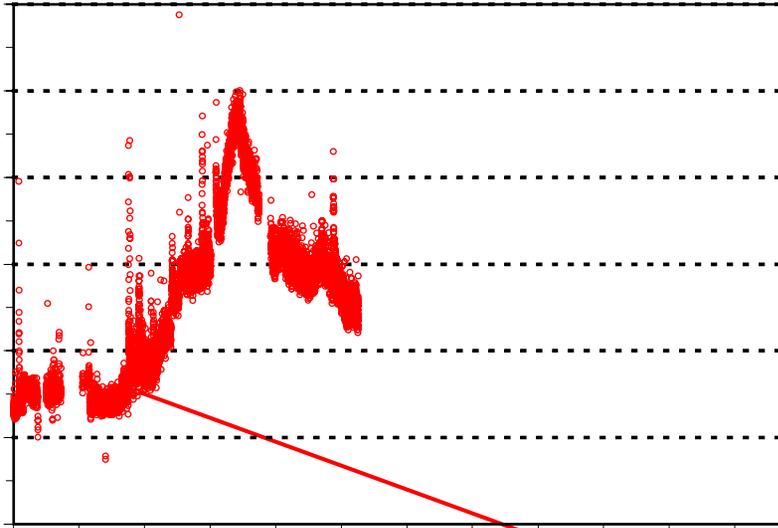
**World Wide Web,
PDF Emailed reports**



High-Frequency Data at Sacramento River

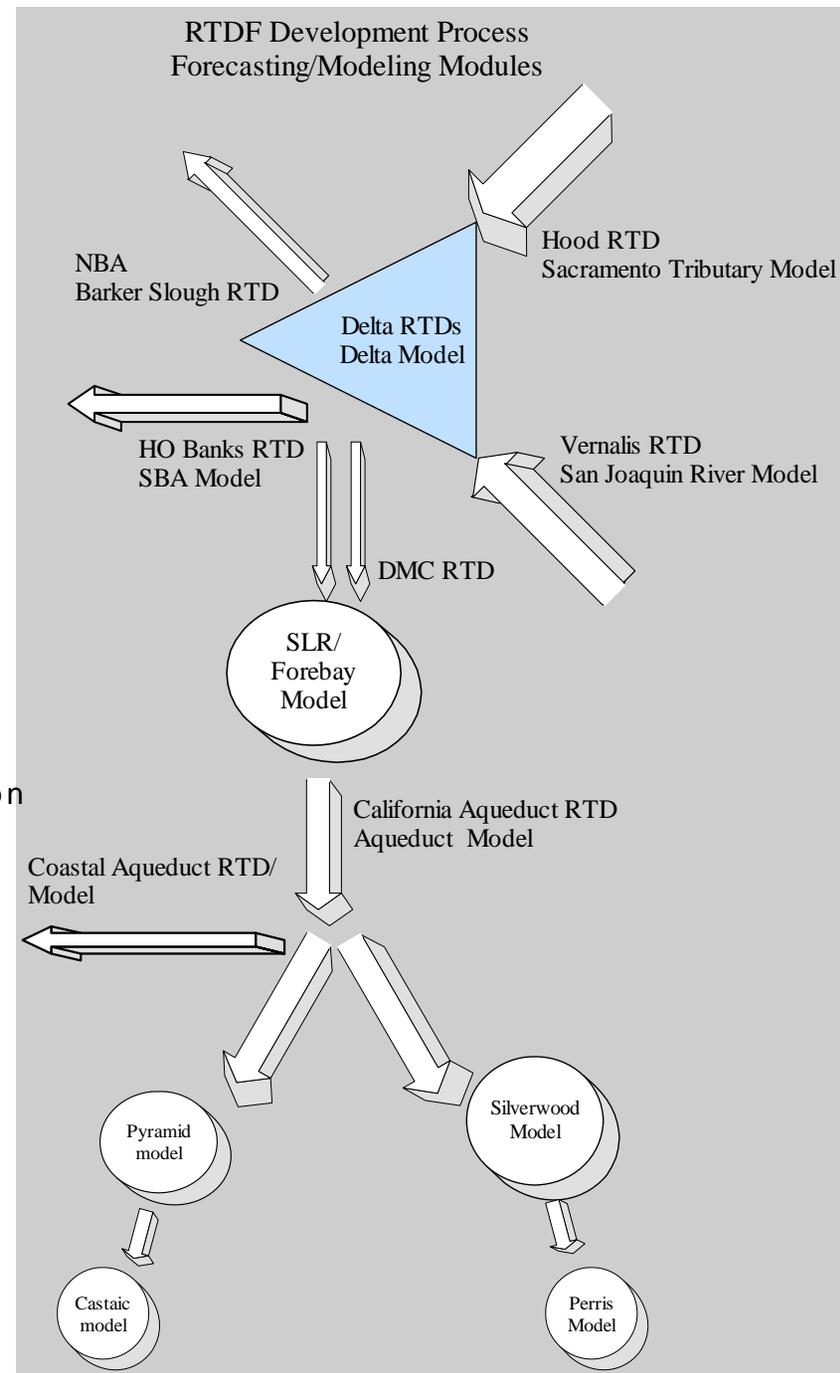
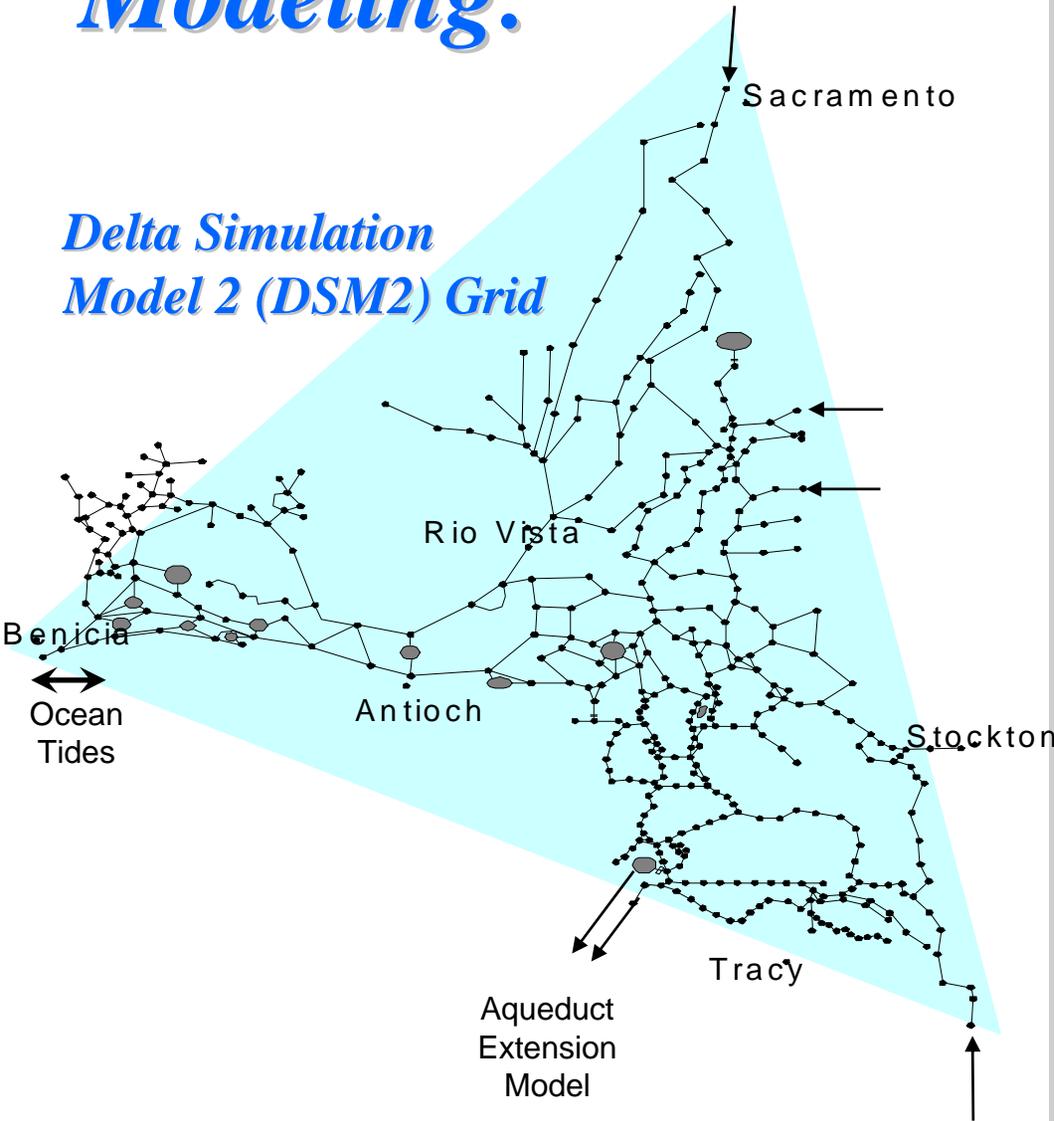


High-Frequency Data at the SWP

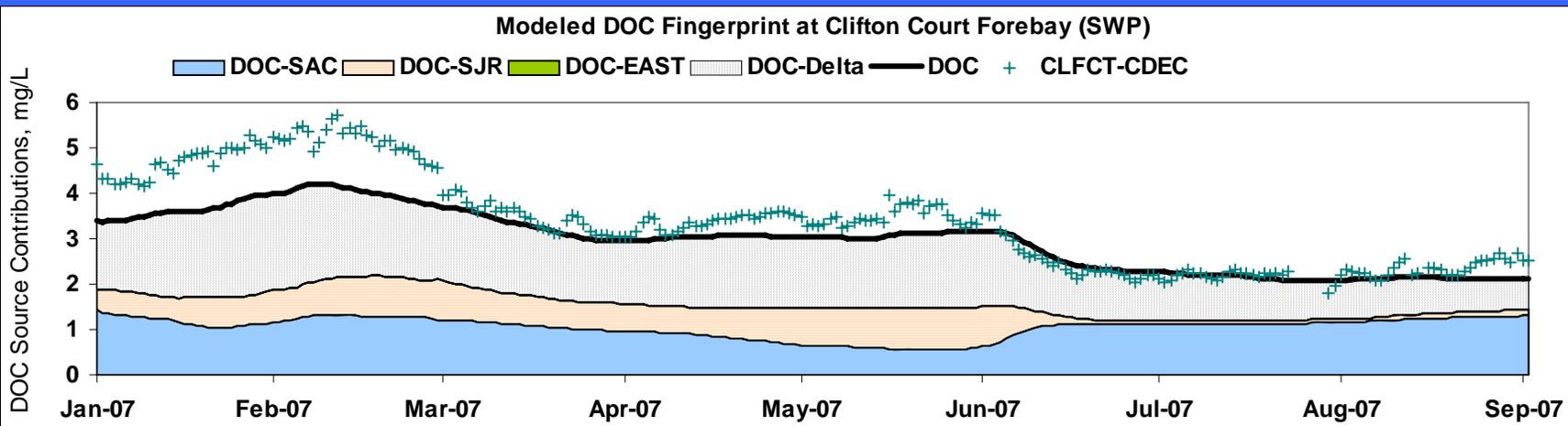
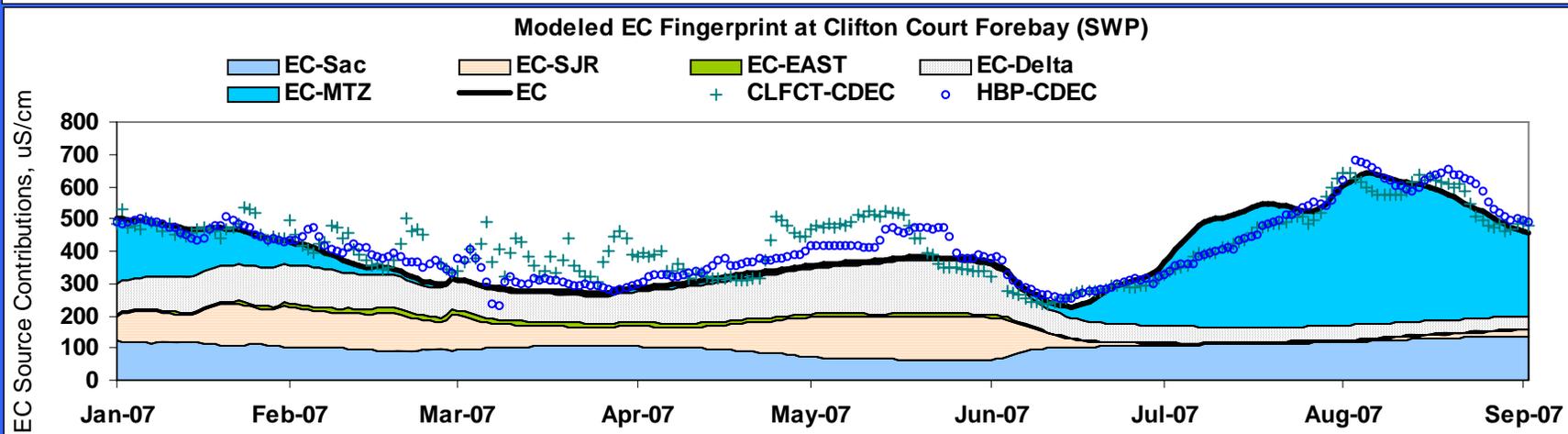
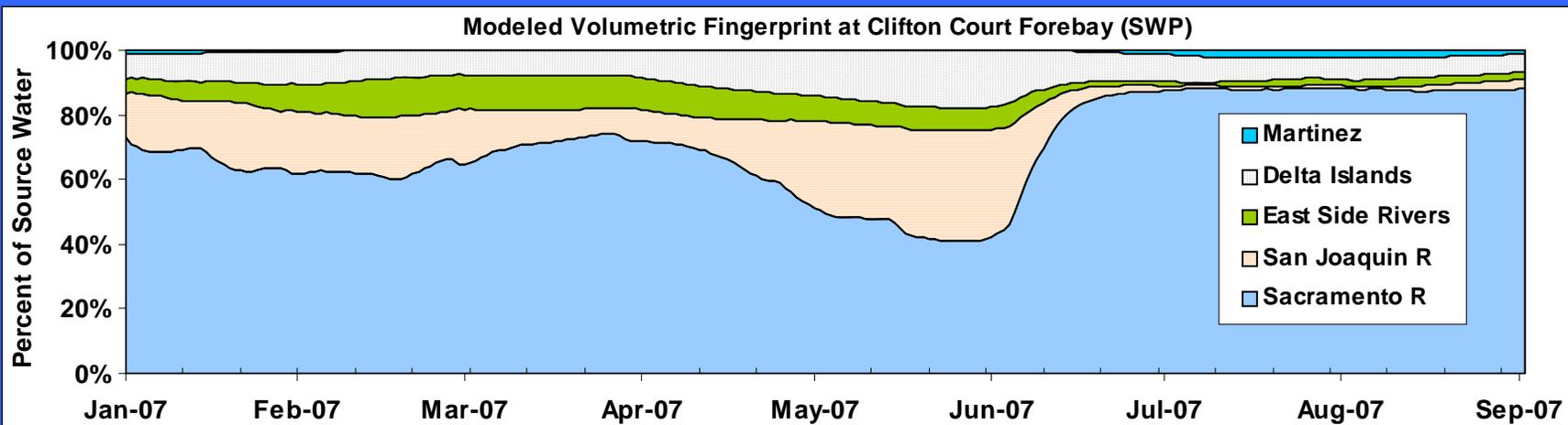


Modeling:

Delta Simulation Model 2 (DSM2) Grid

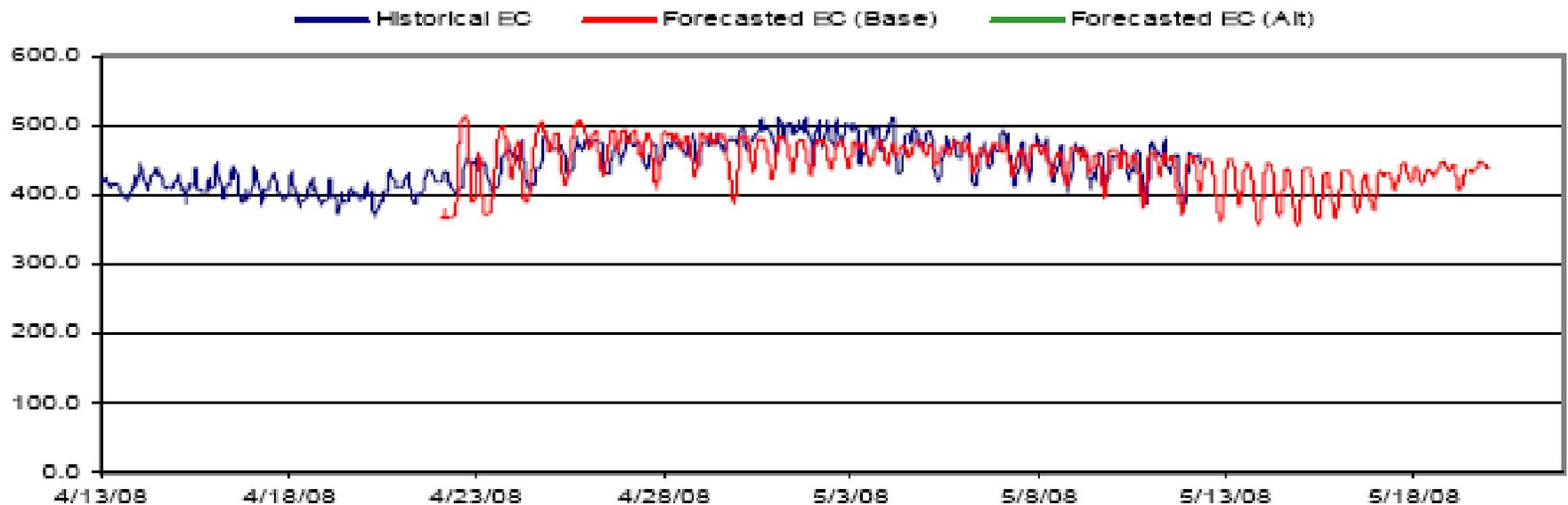


Source Tracking



EC Forecast Example

Old River at Los Vaqueros Reservoir Intake ($\mu\text{S}/\text{cm}$)



Information Dissemination: Goals & Guides



- Must meet user needs ... which will change*
- QA/QC and data management procedures especially important w/ large, real-time data sets*
- Data visualization & presentation are important to reach a variety of users*
- Create & foster feedback for improvement & collaboration*



Information Dissemination: Products

- *A weekly report & data set for the Delta, SWP and CVP e-mailed to about 240 subscribers, also made available on web site archive.*
- *In the near future, a continuously updated website where users can access historical, real-time and forecasted data and information.*
- *A long-term data management system for storing QC'ed real-time data*

RTDF Program Improving

- *Developing additional forecasting tools, e.g. DSM2 Aqueduct extension model*
- *Forming collaborative relationships with other monitoring programs*
- *Increased value to stakeholders as we integrate monitoring, modeling and dissemination*

Questions & Discussion?



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