

*San Joaquin River Water
Quality Modeling- A Beginning*

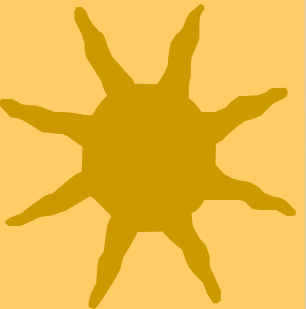
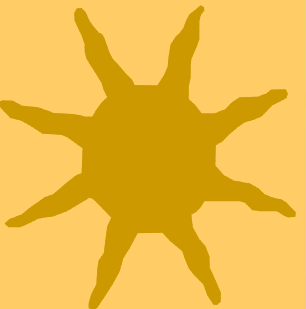
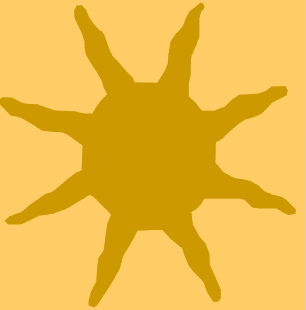
SJR-DO TMDL Technical Work
Group Presentation

Russ Brown- Jones & Stokes

January 20, 2005



San Joaquin River Data Atlas *-modeling without data is folly*



- ★ Initially Part of the DWSC and SJR WQ Modeling Contract with HydroQual (and Jones & Stokes)
- ★ Upstream Modeling Task will Update (2004+) and Expand (missing data sources)
- ★ Includes 1984-2003 (20 years) of daily/grabs
- ★ Annual Master Excel Files
- ★ Comparison Files with Basic Annual Graphs and simple calculations



Data retrieval can be hard work —with some spinning of wheels



Surface-Water Data for the Nation - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://waterdata.usgs.gov/nwis/sw>

USGS
science for a changing world

Water Resources

Data Category: Surface Water Geographic Area: United States go

Surface-Water Data for the Nation

Real-time
Data for selected sites recorded at 5-60 min interval-- may include surface-water, ground-water, water-quality, and meteorological parameters.

Recent
Provisional daily data for the previous 18 months--includes published streamflow.

Streamflow
Daily streamflow the period of record at each site.

Statistics
Daily **Monthly** **Annual**
Computed from published daily data.

Peaks
Annual maximum instantaneous peak streamflow and gage height

Measurements
Field measurements of streamflow and gage height

Tutorial
Tutorial explaining how to perform a surface water retrieval and understand the results

Introduction
Nationally, USGS surface-water data includes more than 850,000 station years of time-series data that describe stream levels, streamflow (discharge), reservoir and lake levels, surface-water quality, and rainfall. The data are collected by automatic recorders and manual [measurements](#) at field installations across the Nation.

Data are collected by field personnel or relayed through telephones or satellites to offices where it is stored and processed. The data relayed through the Geostationary Operational Environmental Satellite (GOES) system are processed automatically in near real time, and in many cases, [real-time data](#) are available online within minutes.

Once a complete day of readings are received from a site, daily summary data are generated and stored in the data base. [Recent provisional daily data](#) are updated on the web once a day when the computation is completed.

Annually, the USGS finalizes and publishes the daily data in a series of water-data reports. [Daily streamflow data](#) and [peak data](#) are updated annually following publication of the reports.

Questions about data [Water Webserver Team](#)

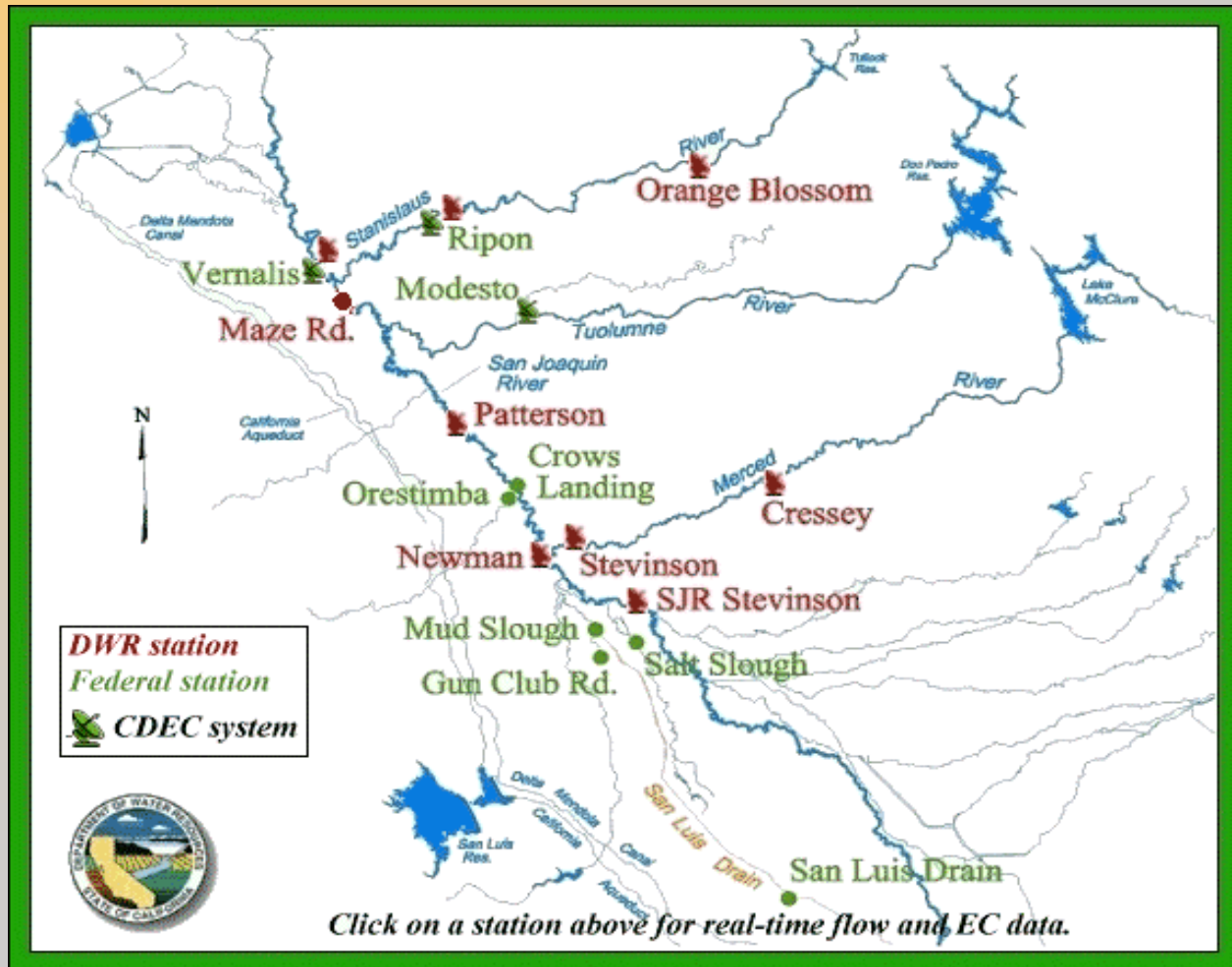
<http://waterdata.usgs.gov/nwis/discharge>

Start Stockton Water Quality ... Surface-Water Data f... Microsoft Excel Document1 - Microsoft ...

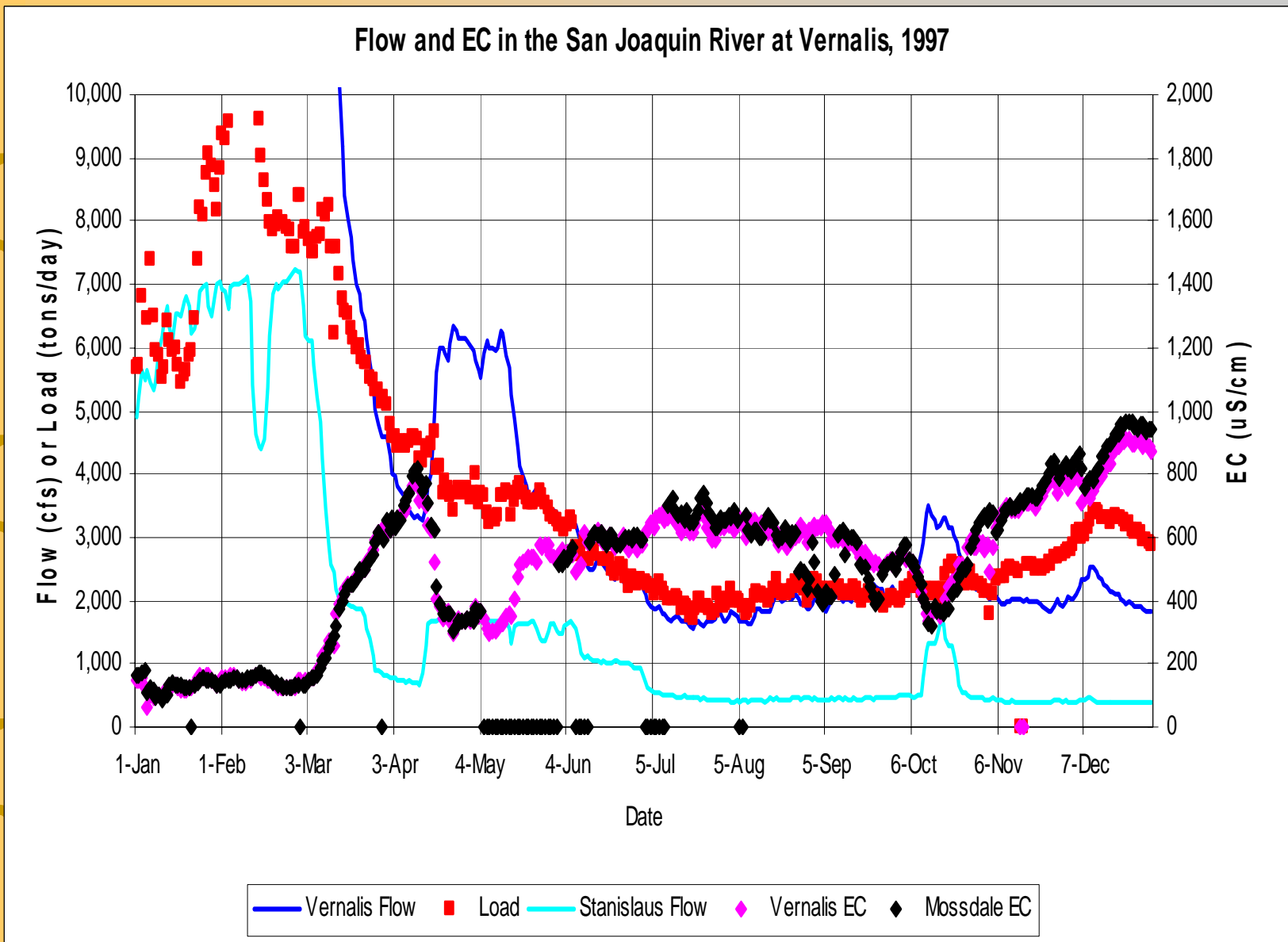
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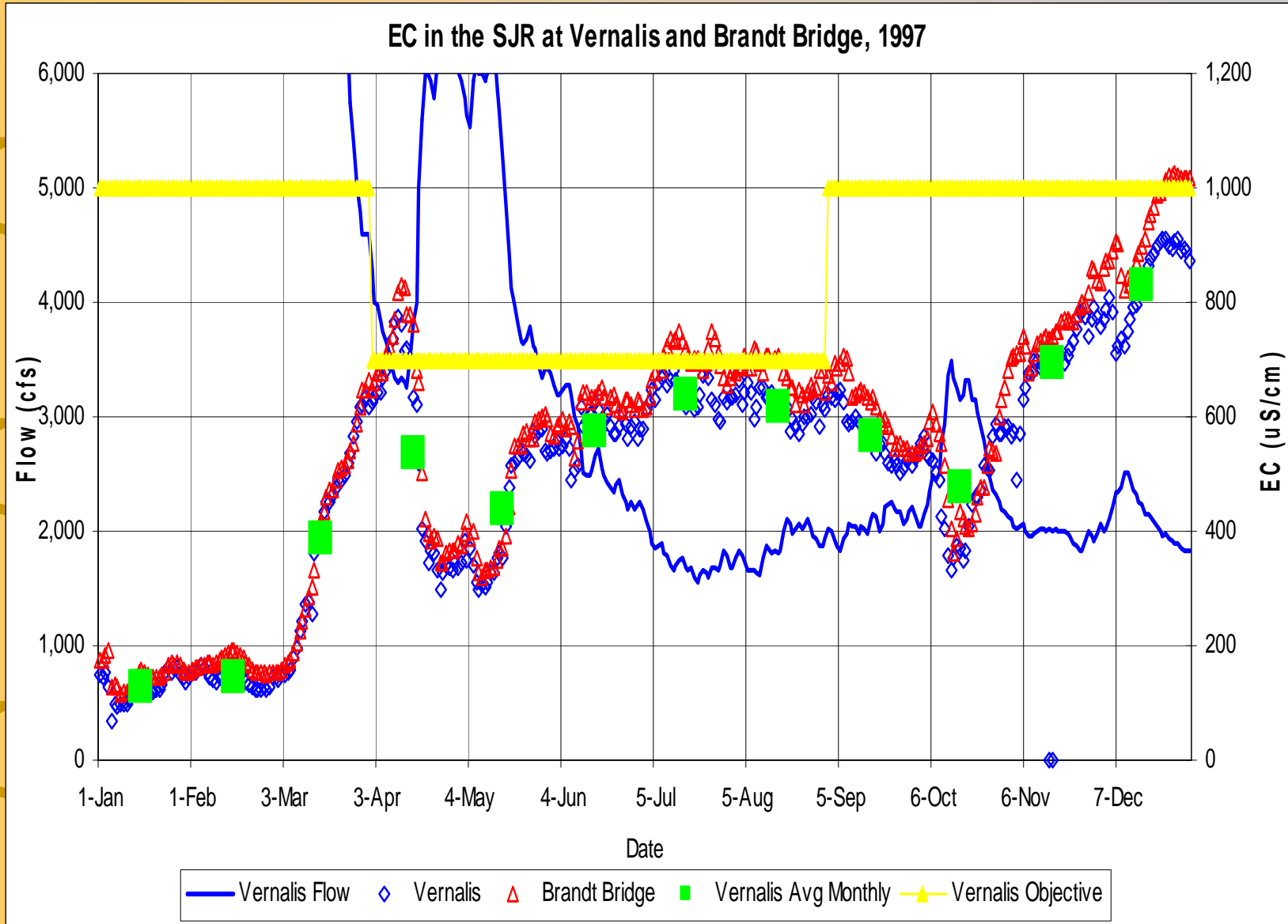
San Joaquin River Flows & EC -daily water and salt budgets

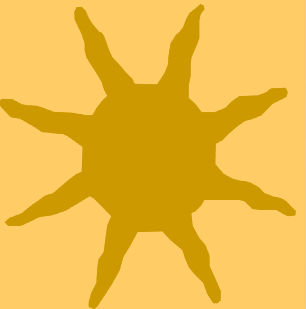
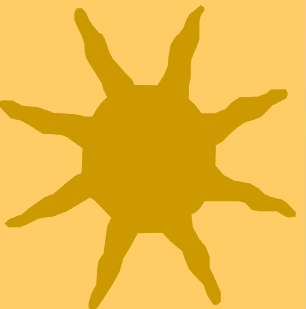
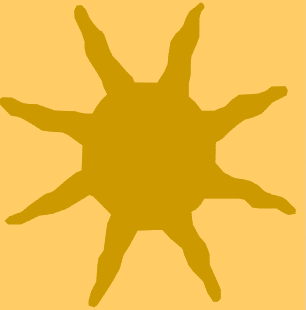


-let me see the data so that I can think about it!

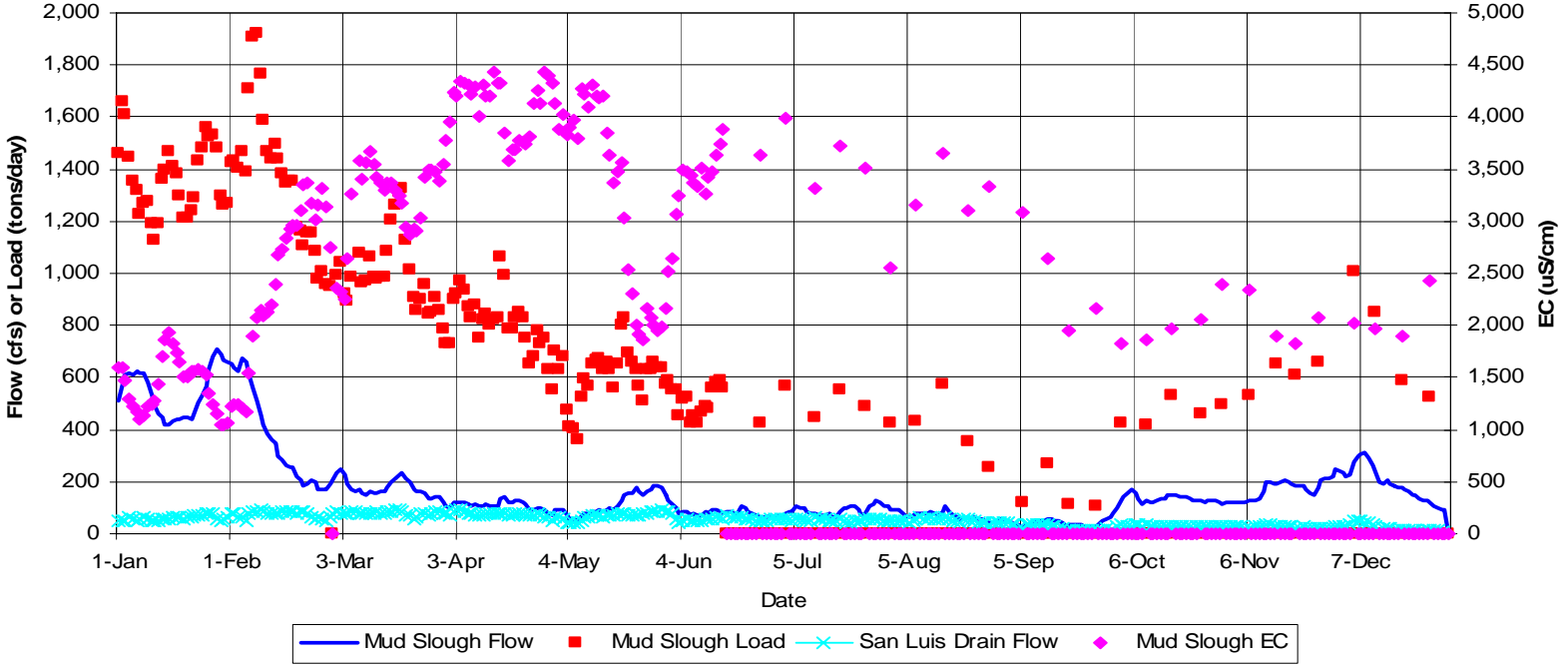


- Check compliance with WQ objectives

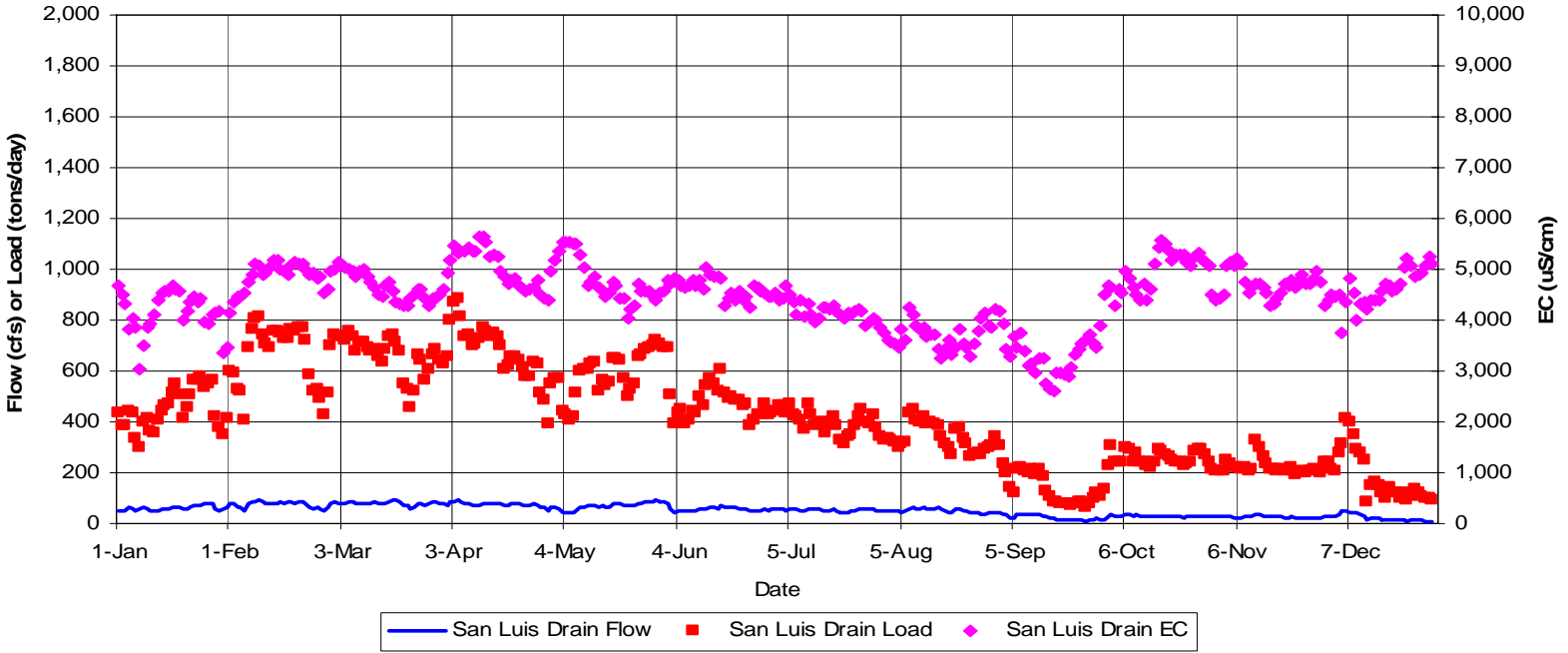




Flow and EC at Mud Slough near Gustine, 1997

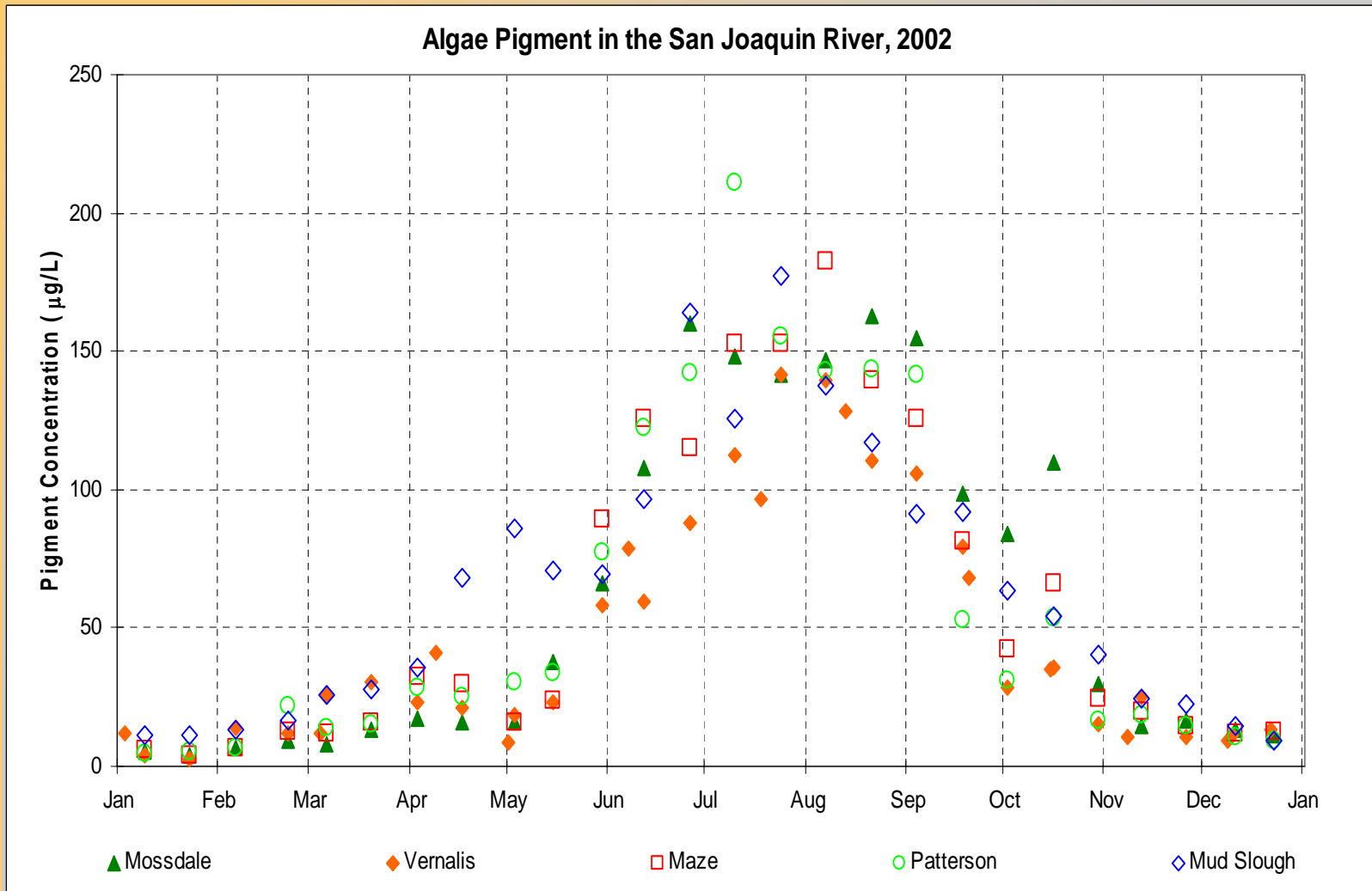


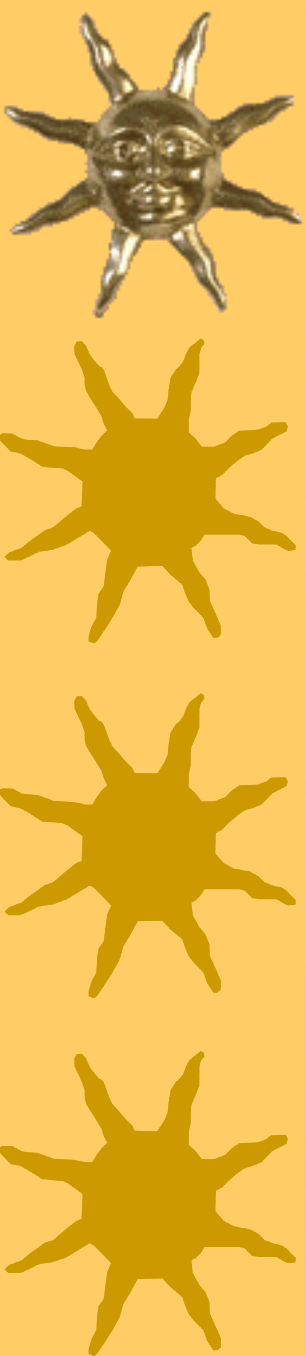
Flow and EC at San Luis Drain Site B, 1997



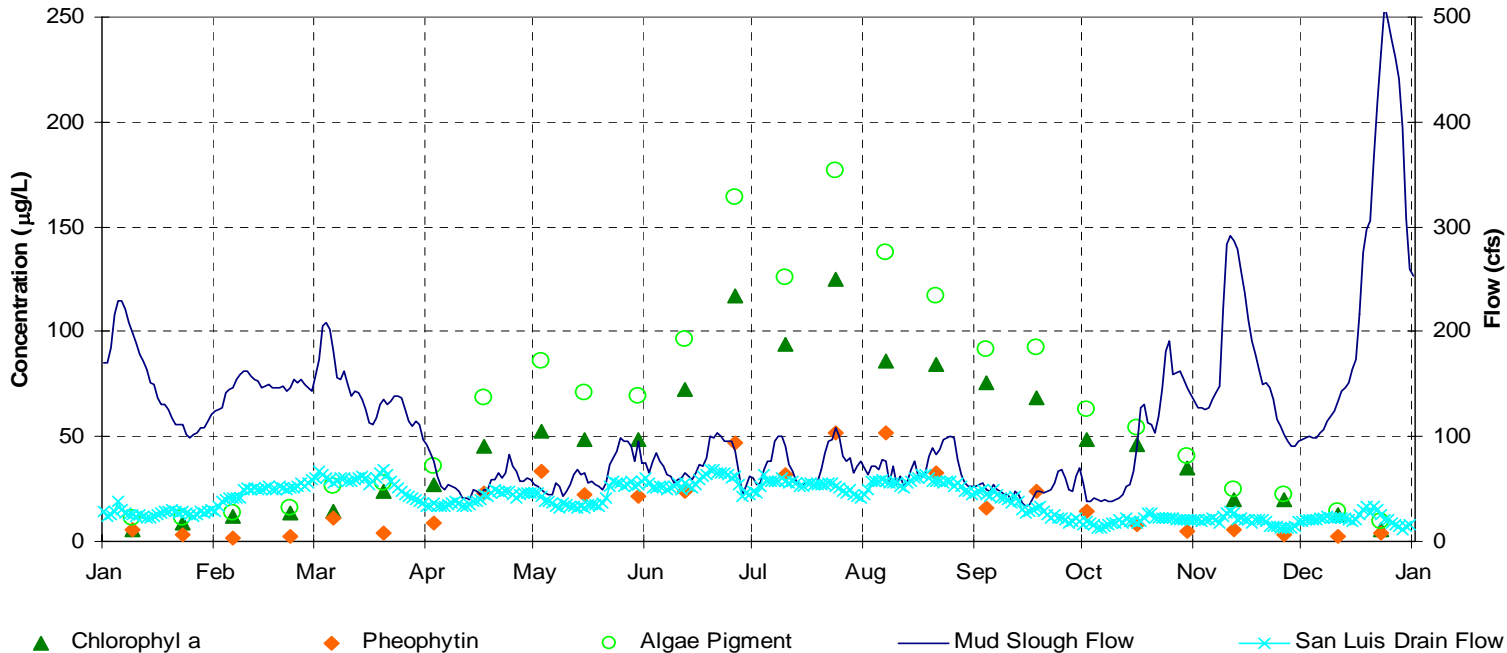


San Joaquin River Algae & Nutrients- green and brown water

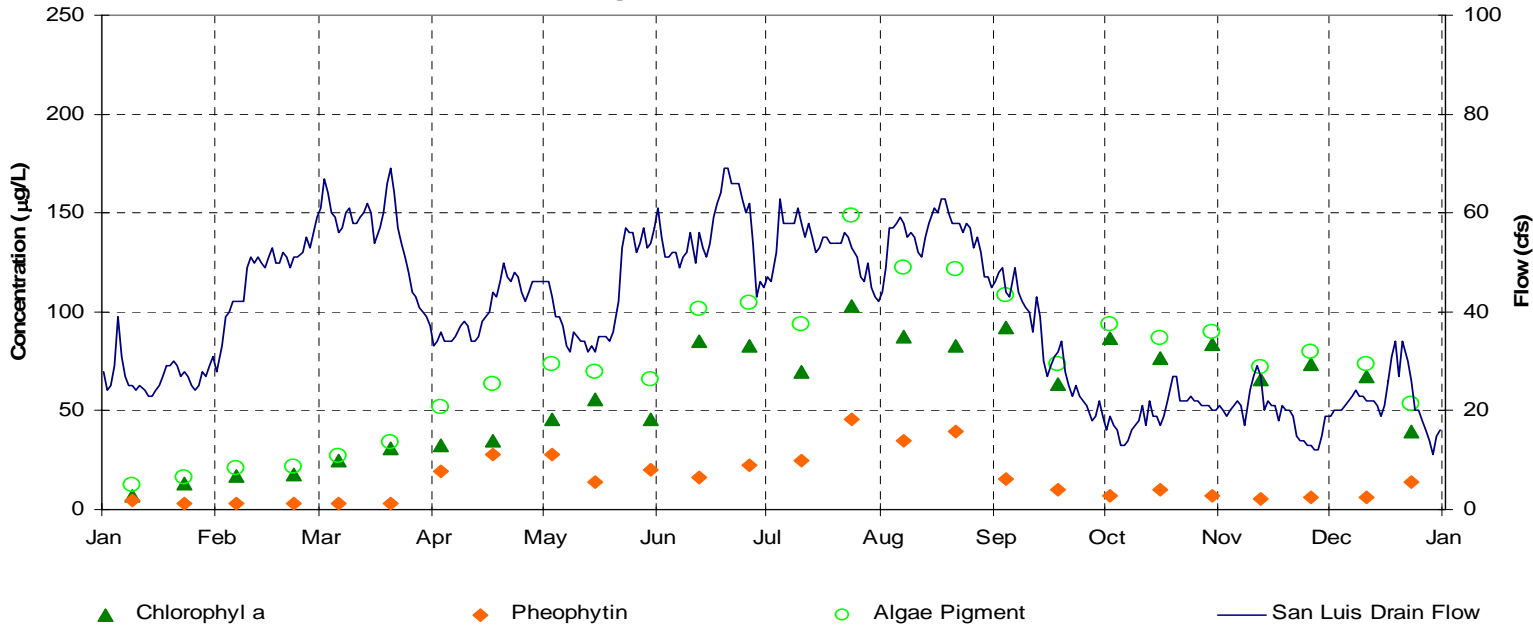


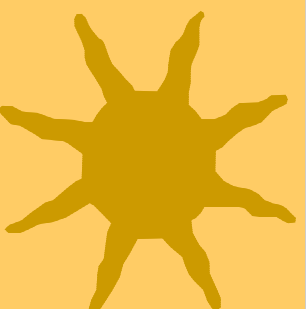
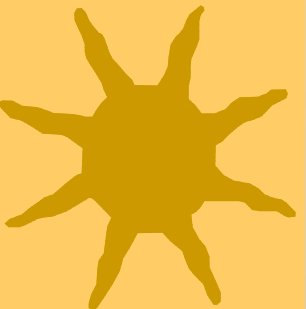
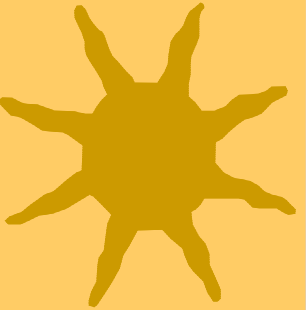


Algae in Mud Slough near Gustine, 2002

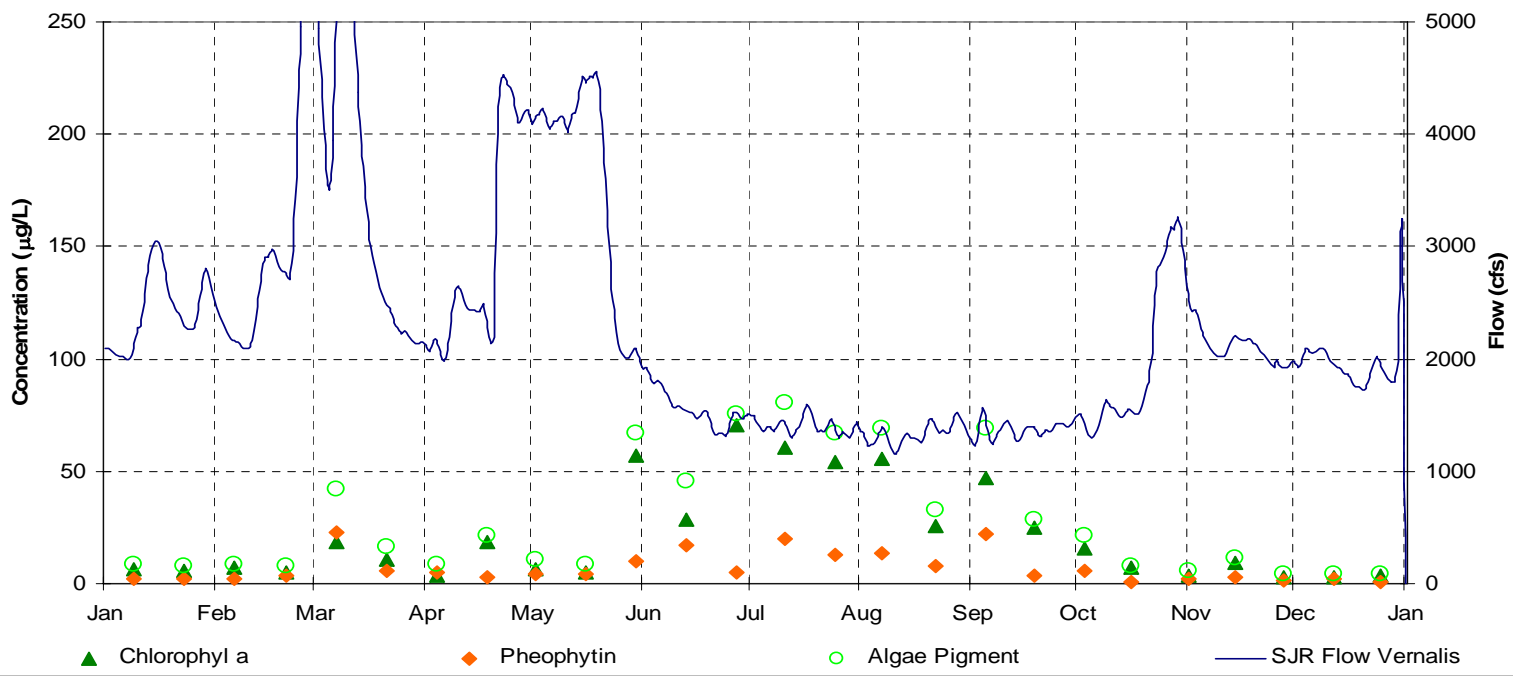


Algae in San Luis Drain, 2002

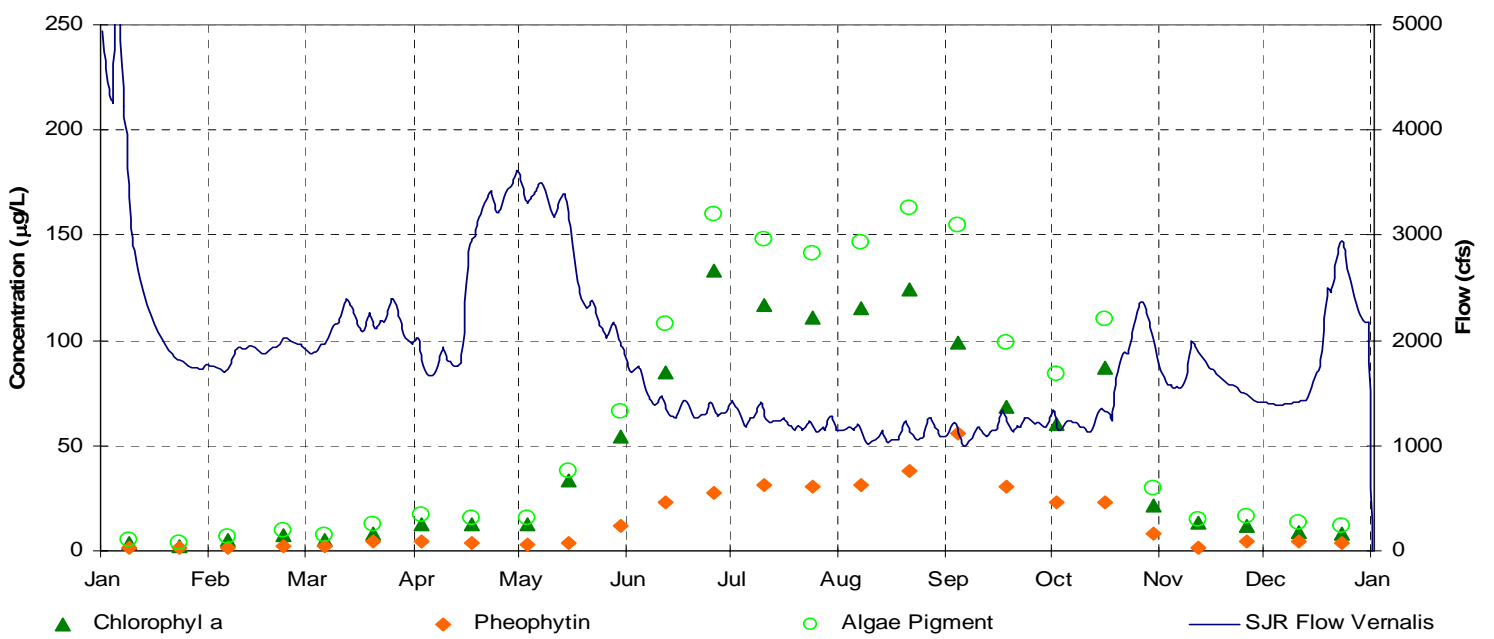




Algae in San Joaquin River at Mossdale, 2001

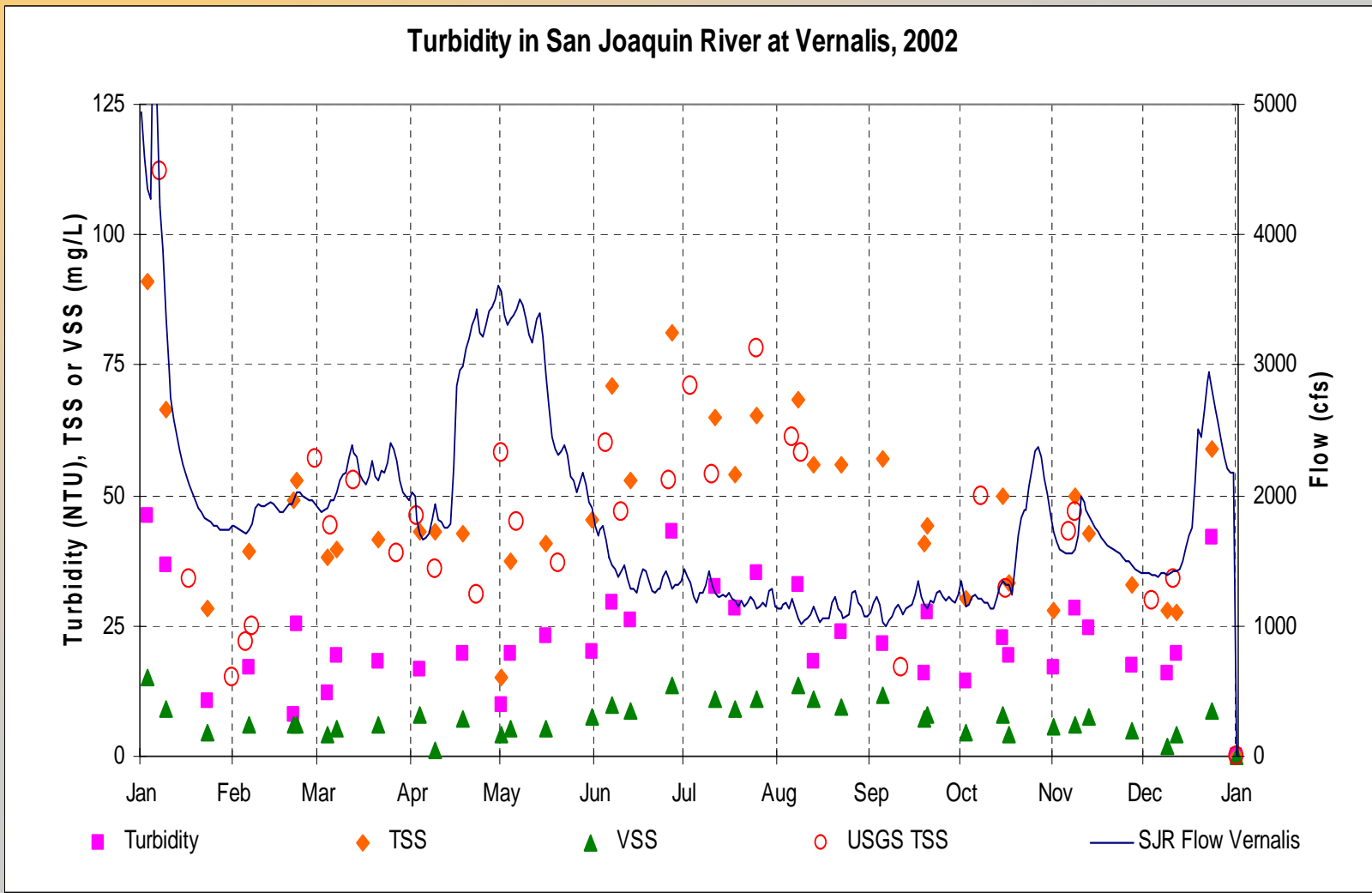
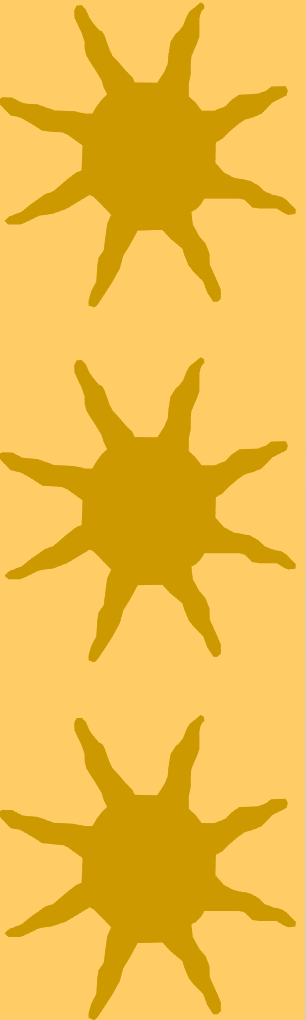


Algae in San Joaquin River at Mossdale, 2002



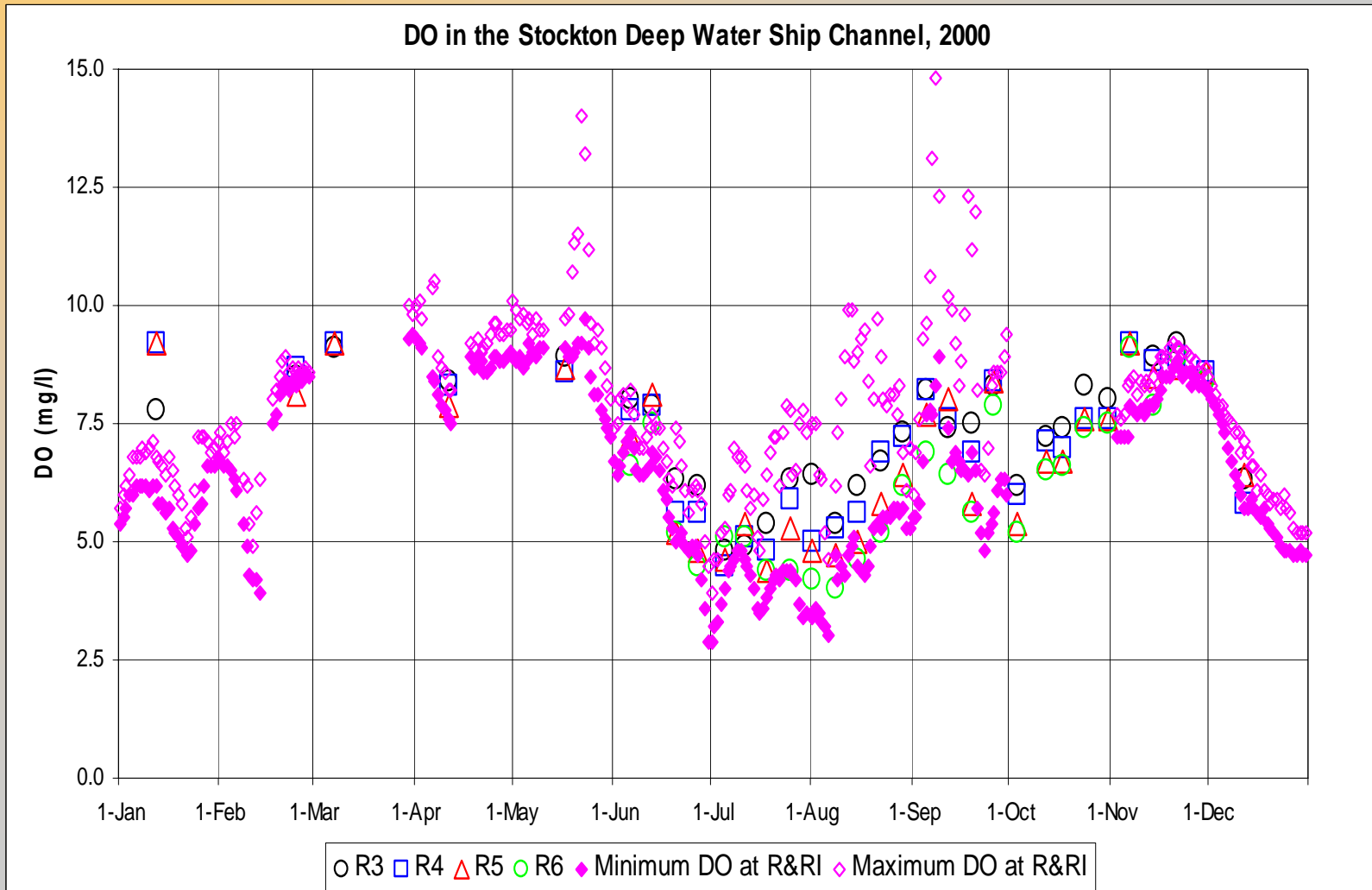
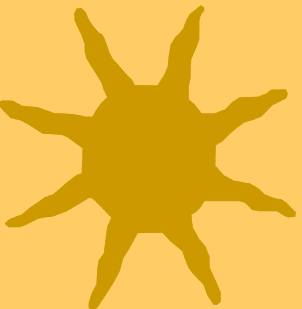


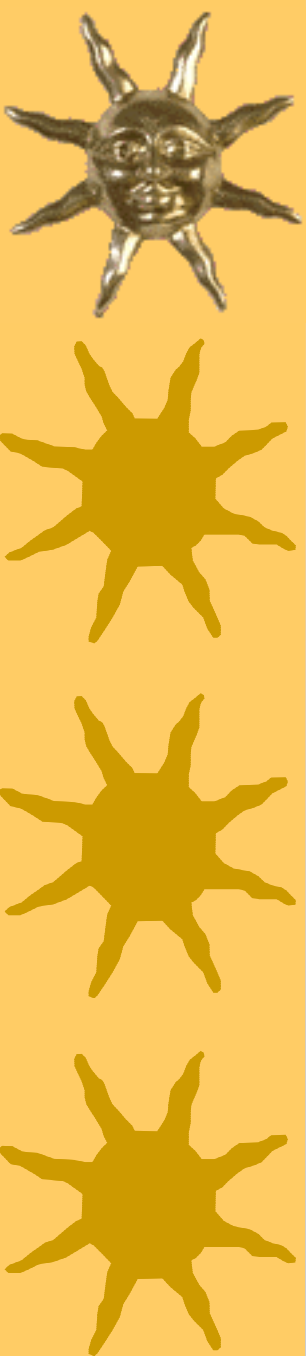
Suspended Solids and Turbidity -dead or alive?



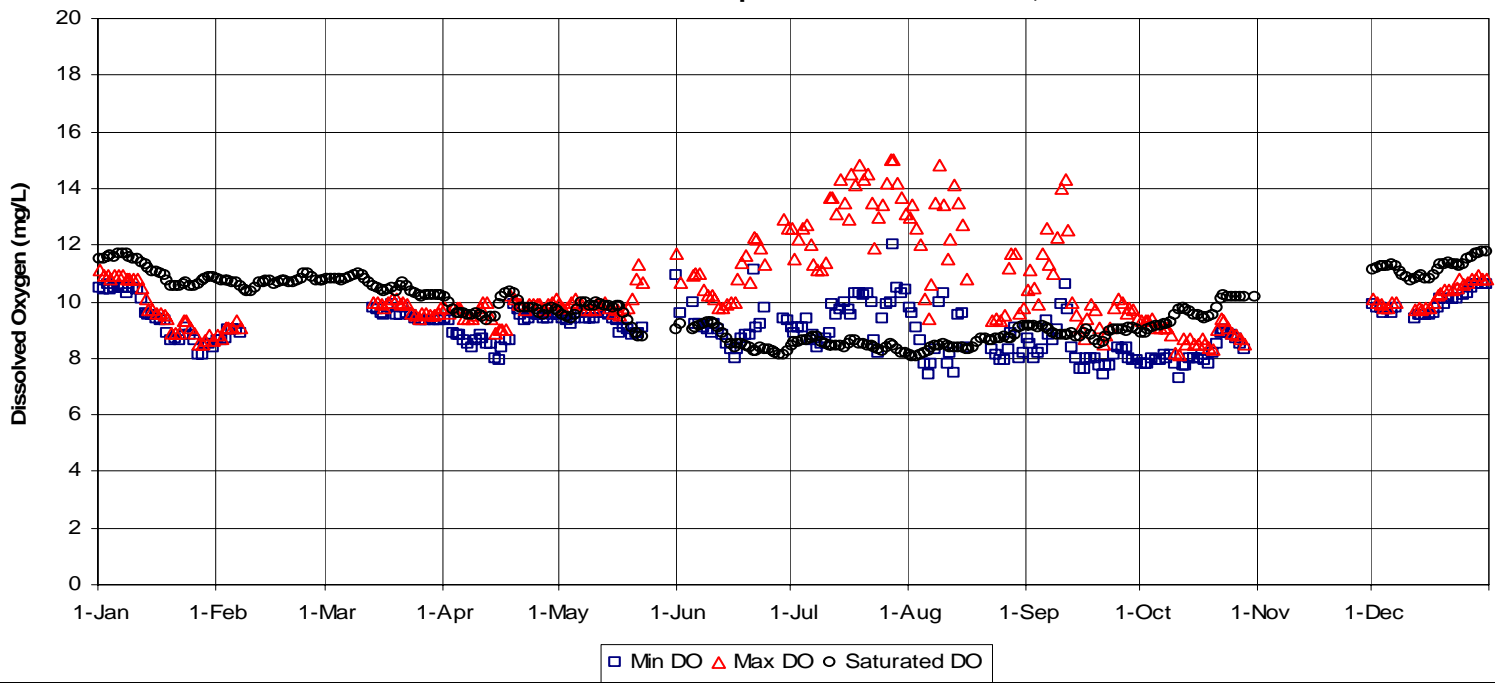


Stockton DWSC DO- tracking the seasonal and diurnal variations

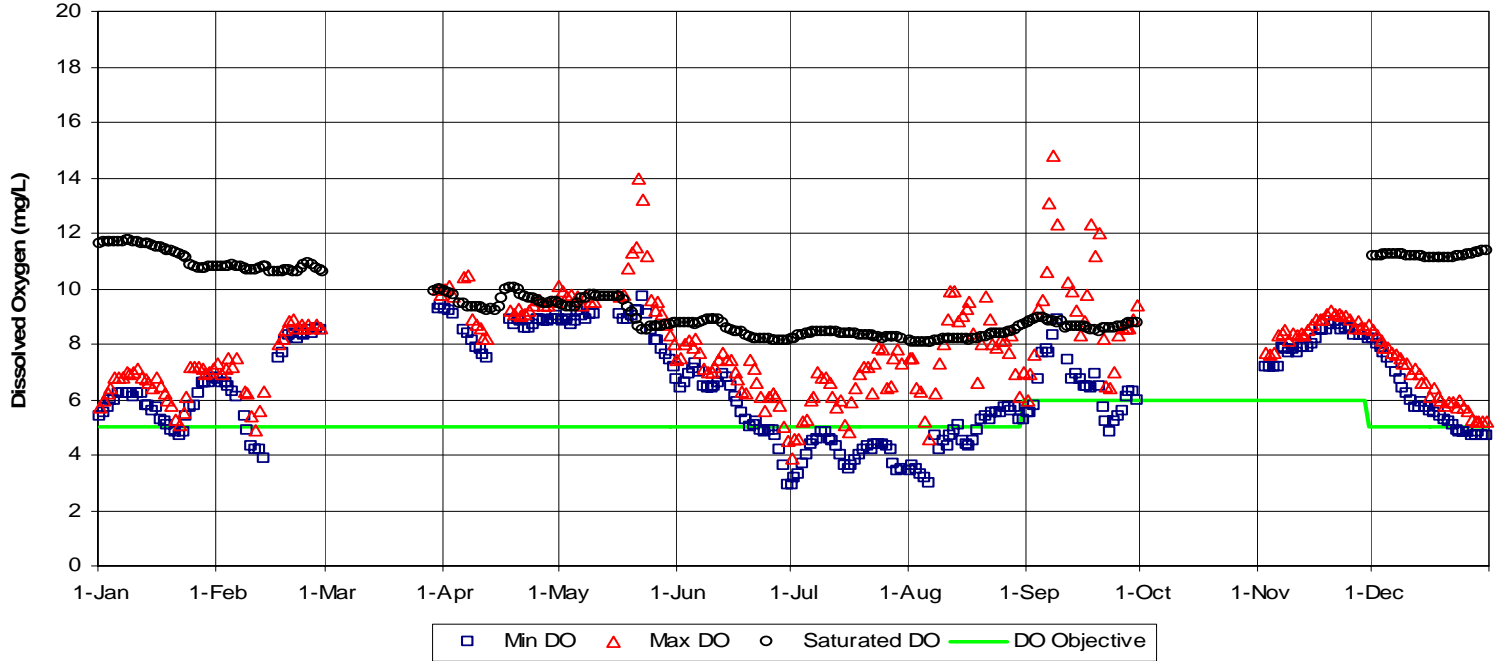


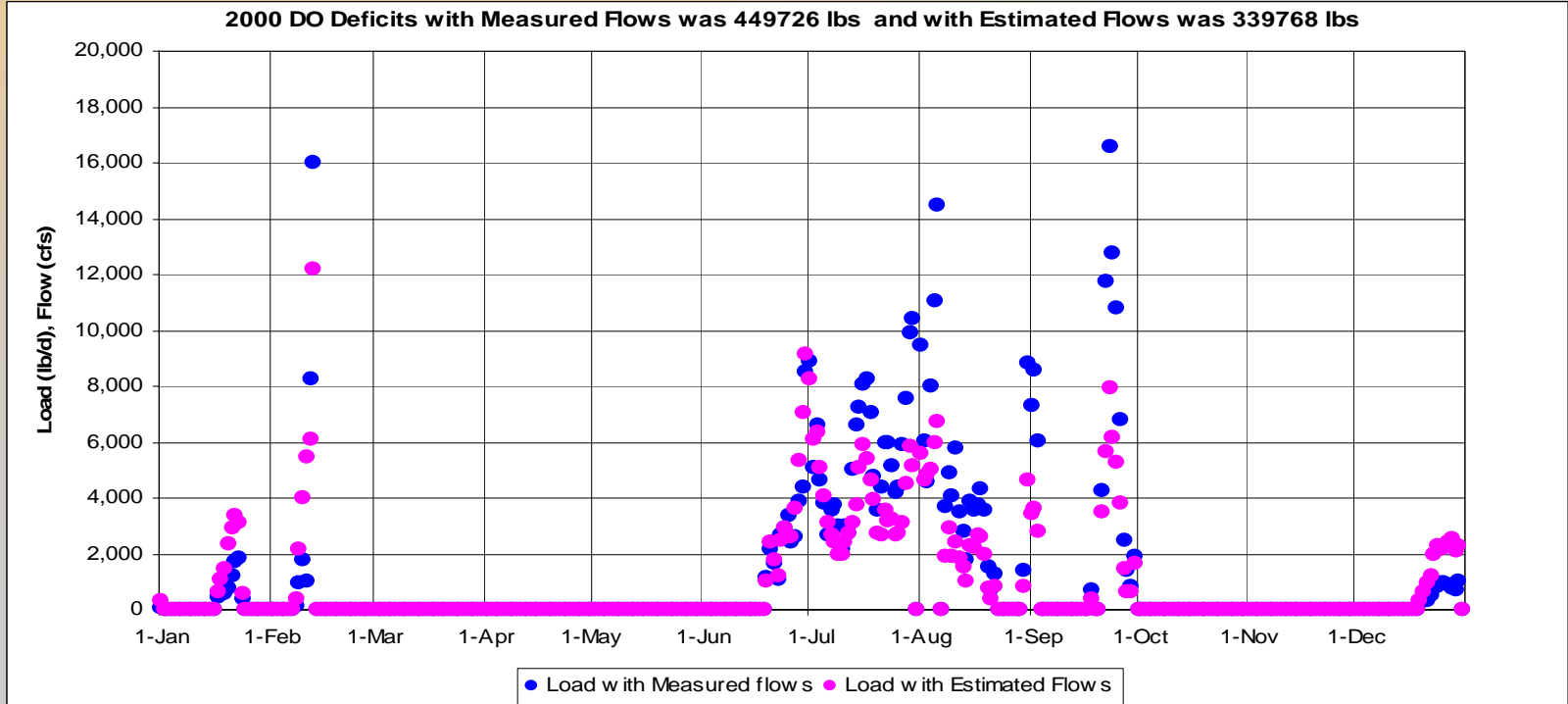
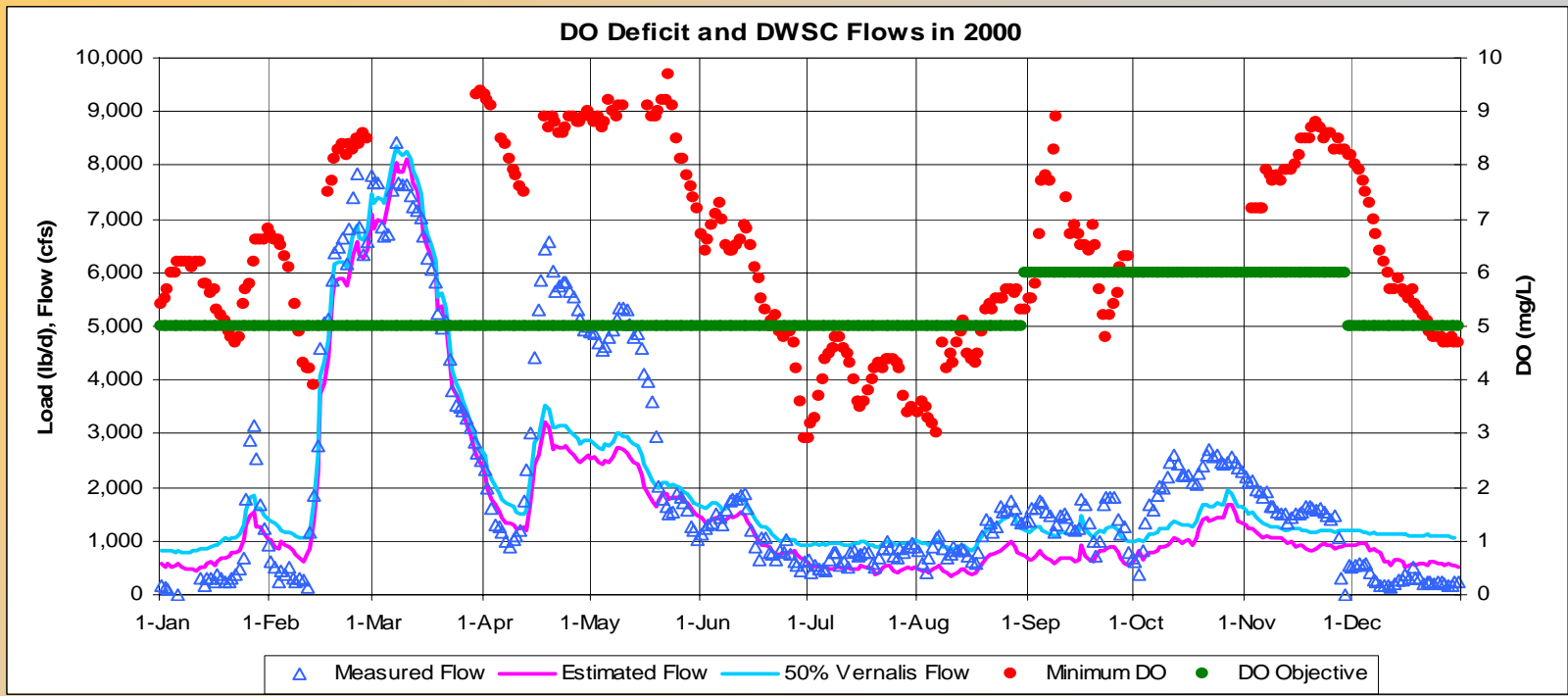
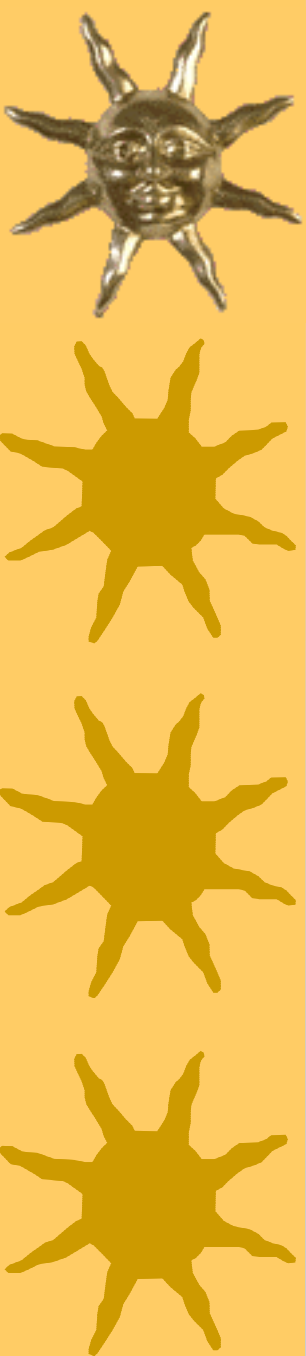


DO in the San Joaquin River at Mossdale, 2000



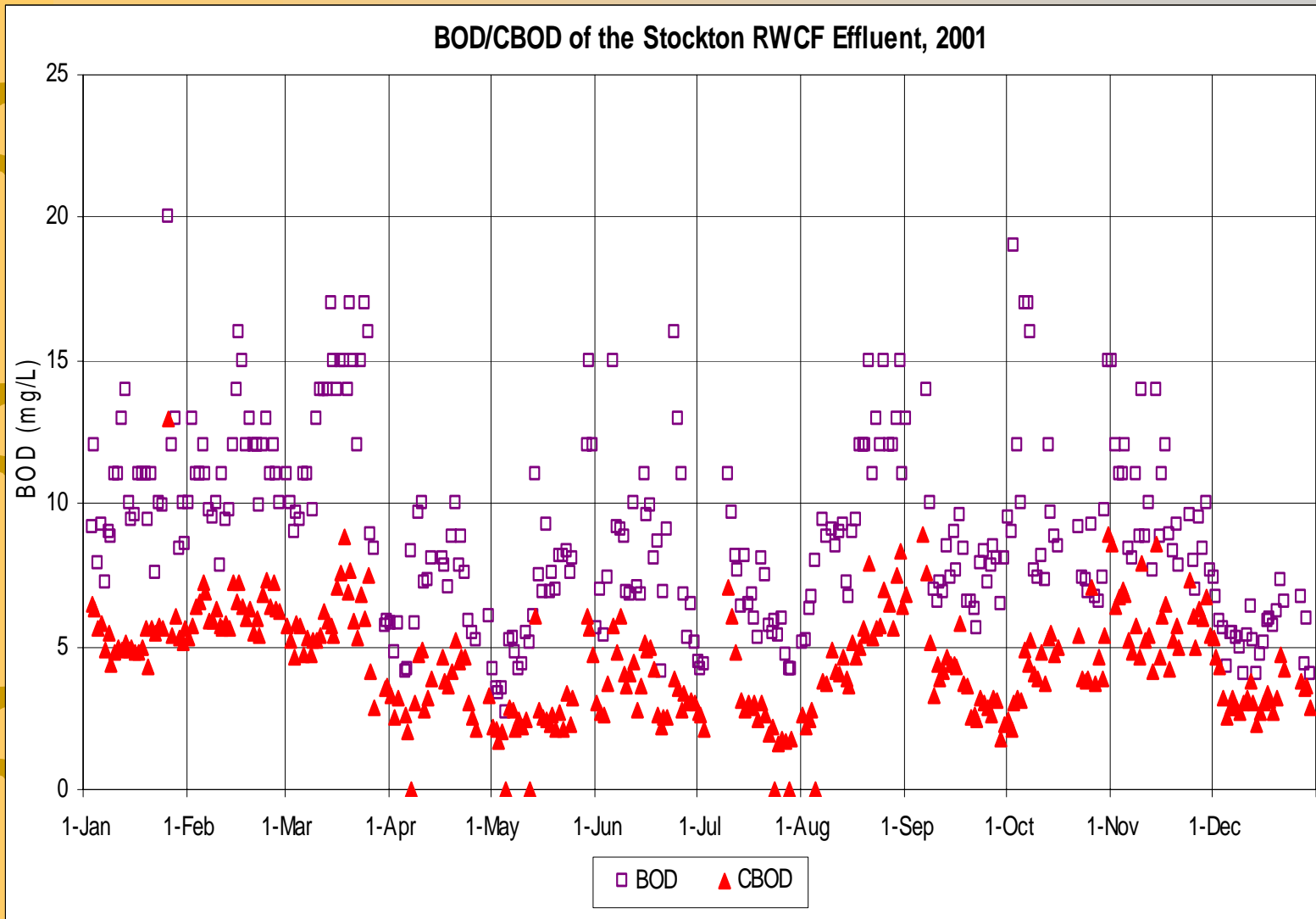
DO in the Stockton DWSC at Rough and Ready Island, 2000

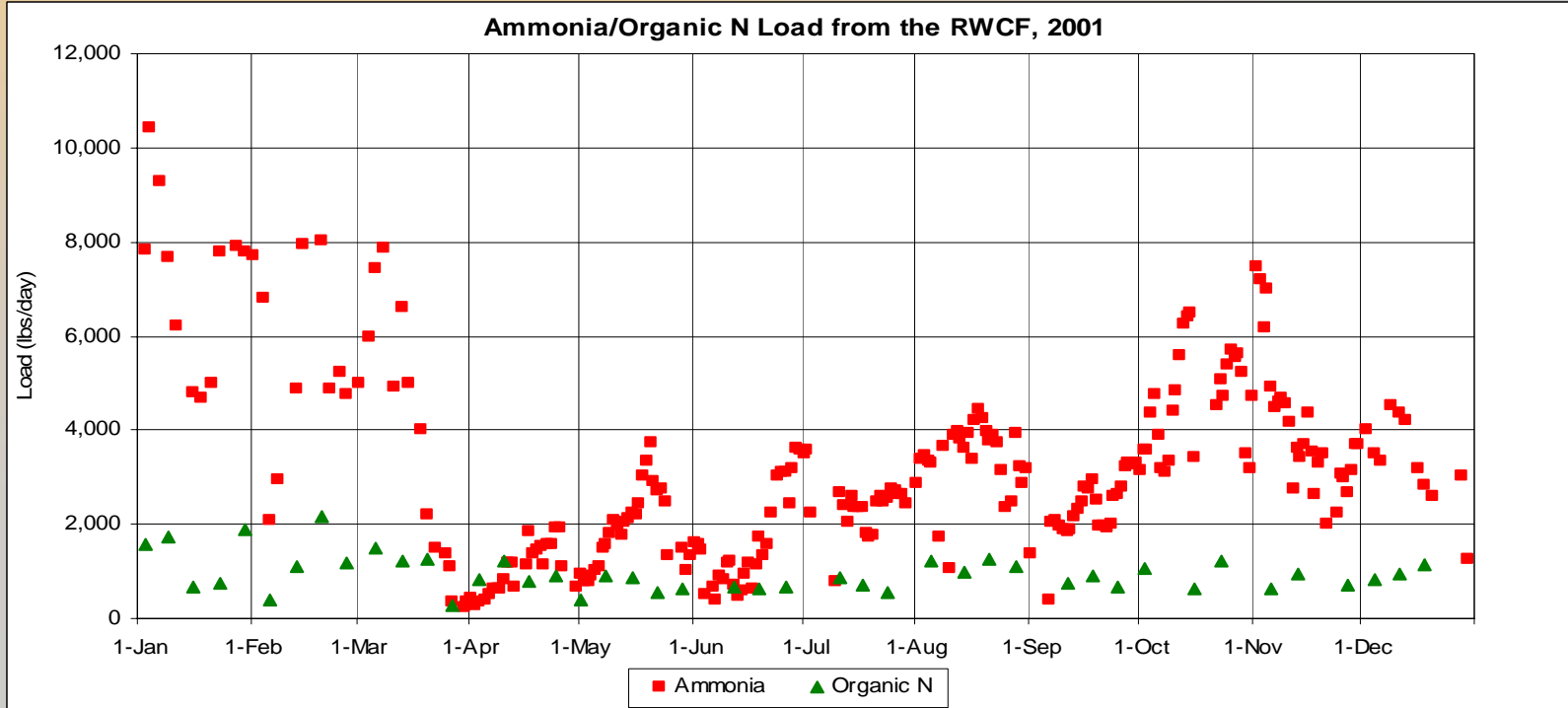
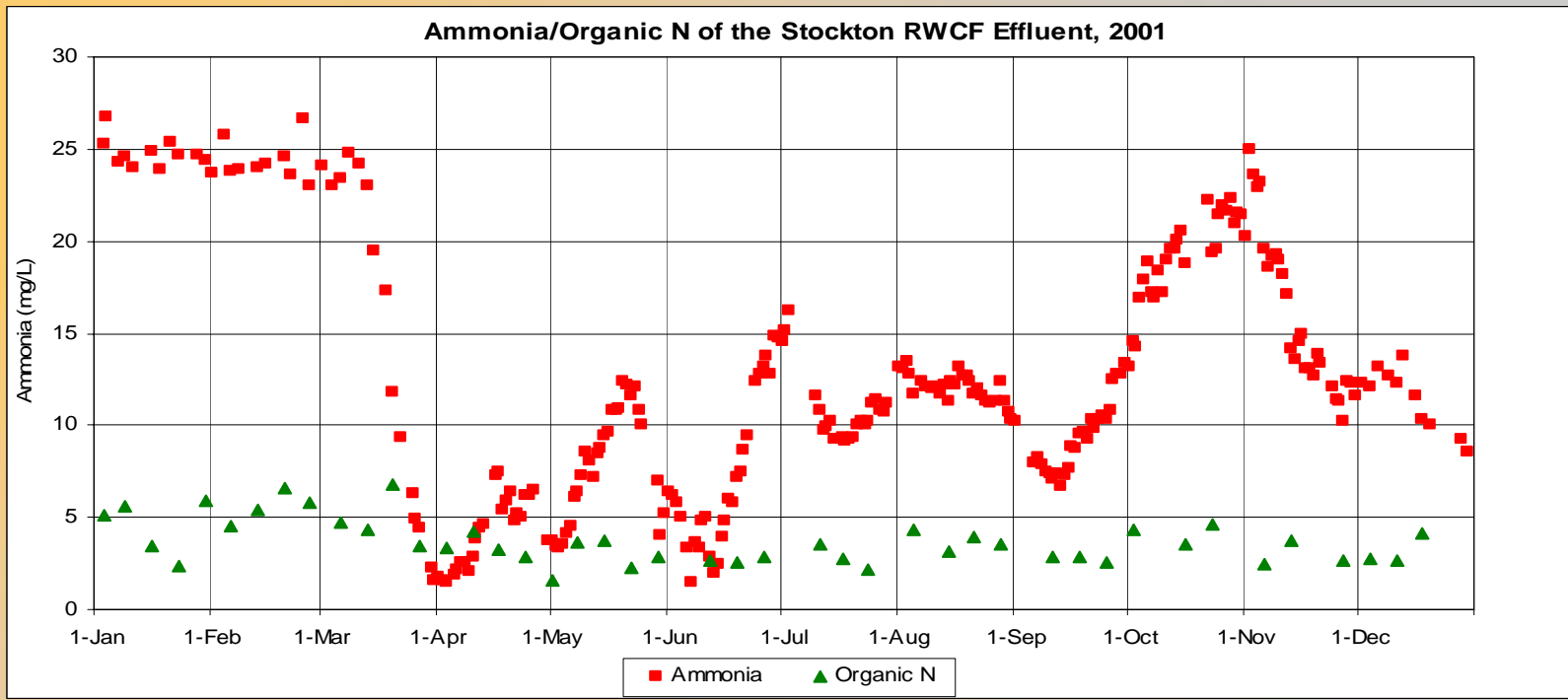
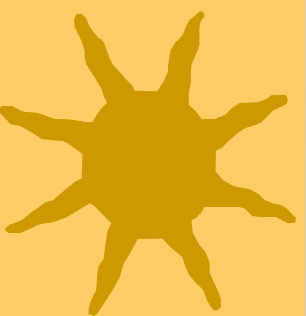
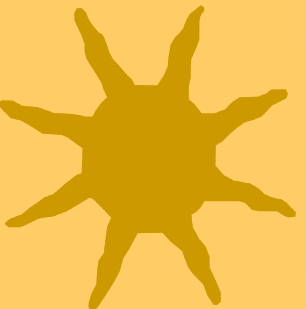
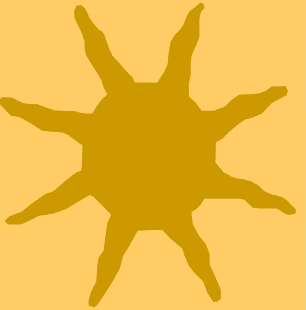






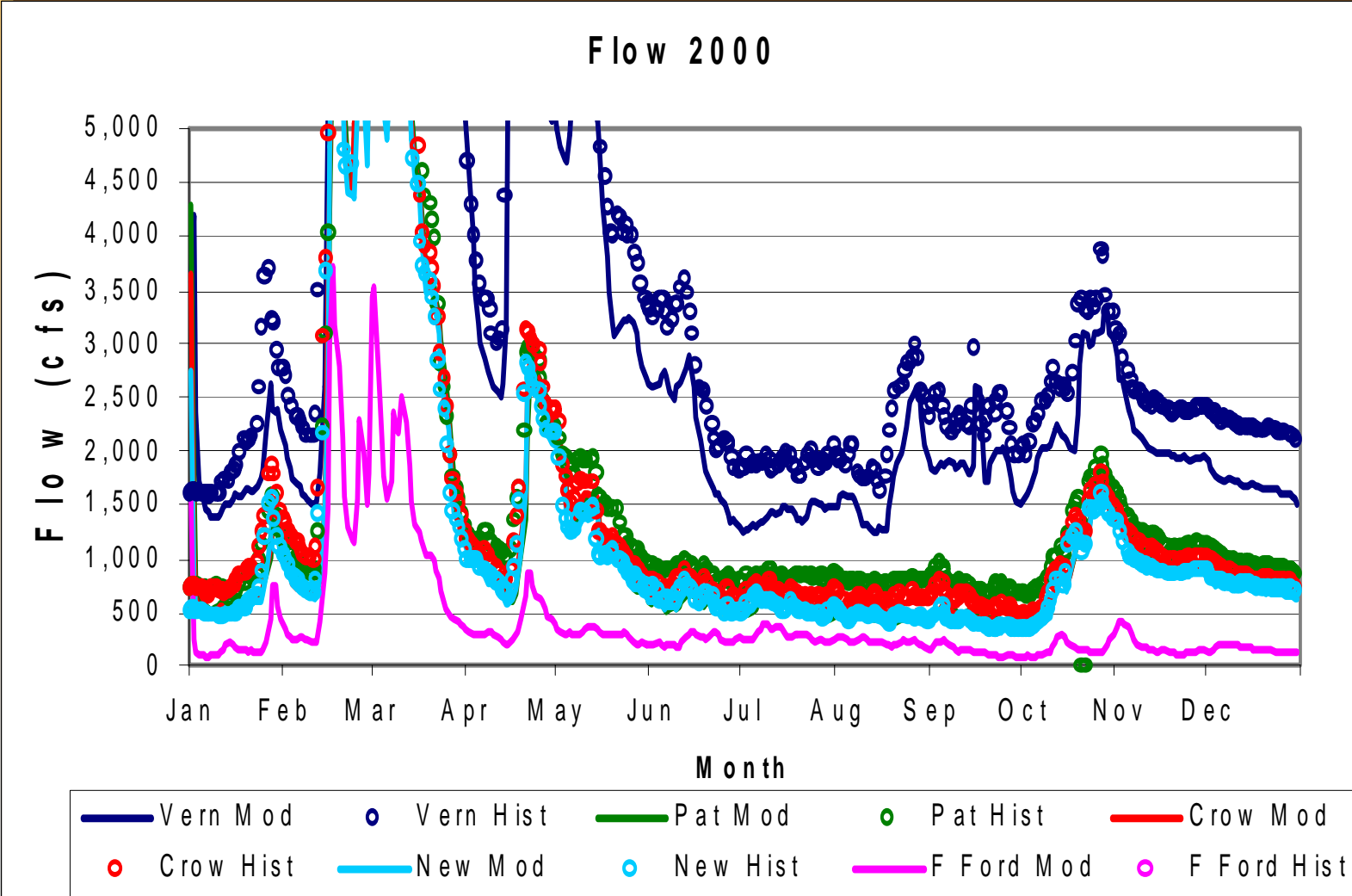
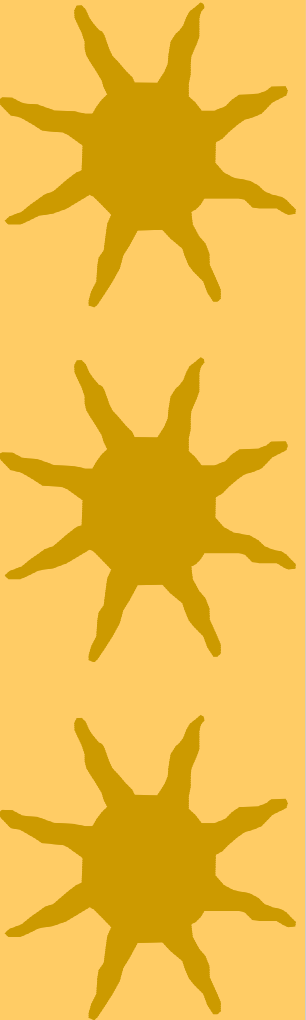
City of Stockton RWCF Loading

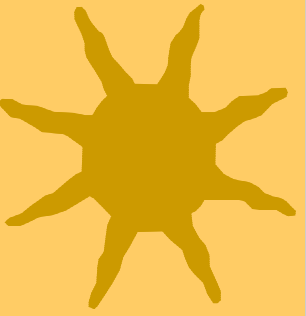
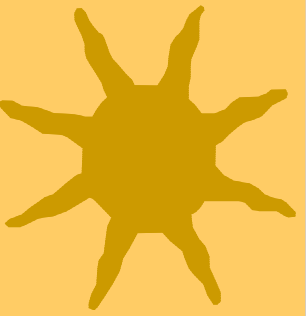
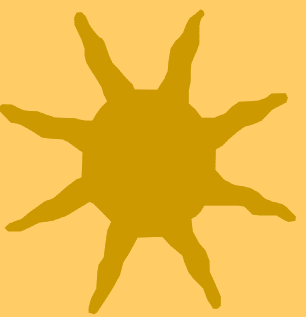




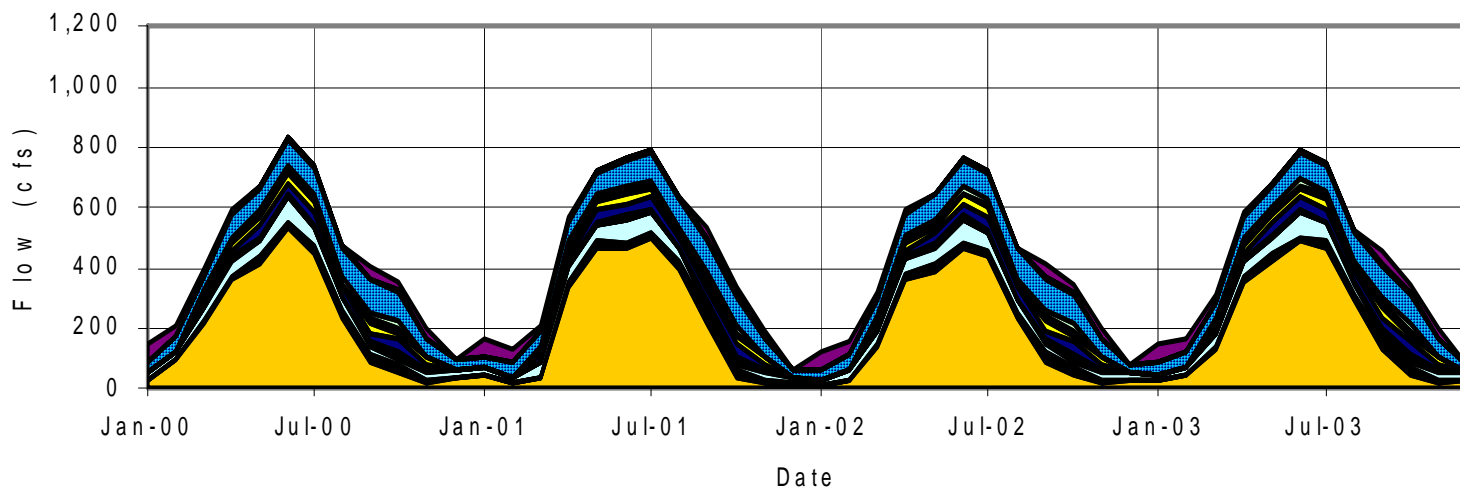


Initial Modeling of SJR Water Quality – its all about inputs

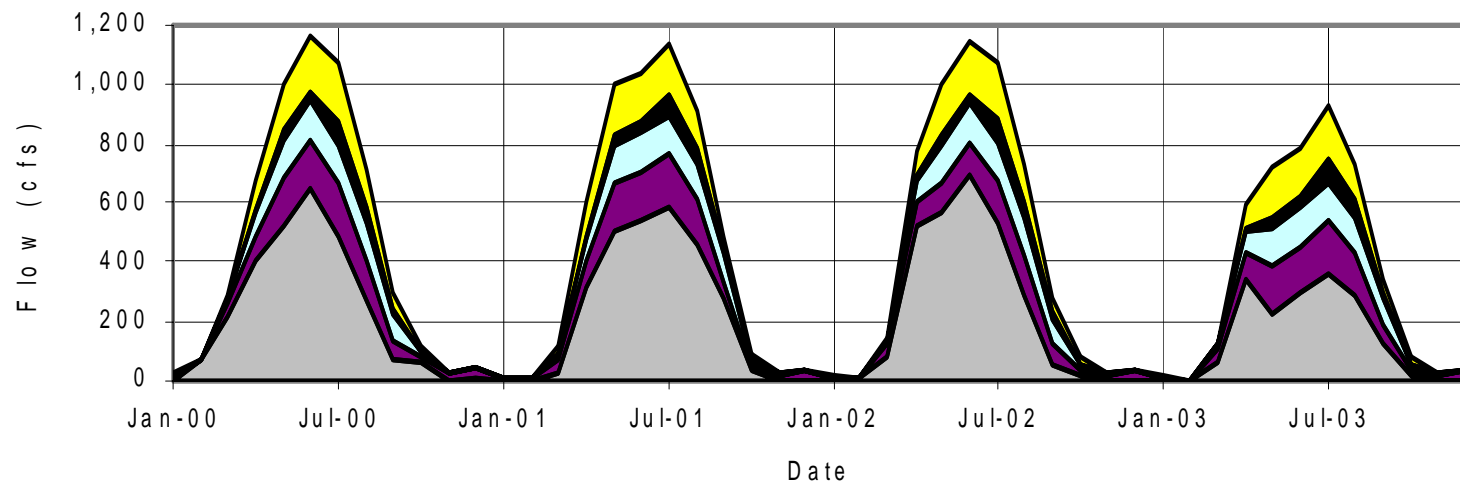




Inflow s



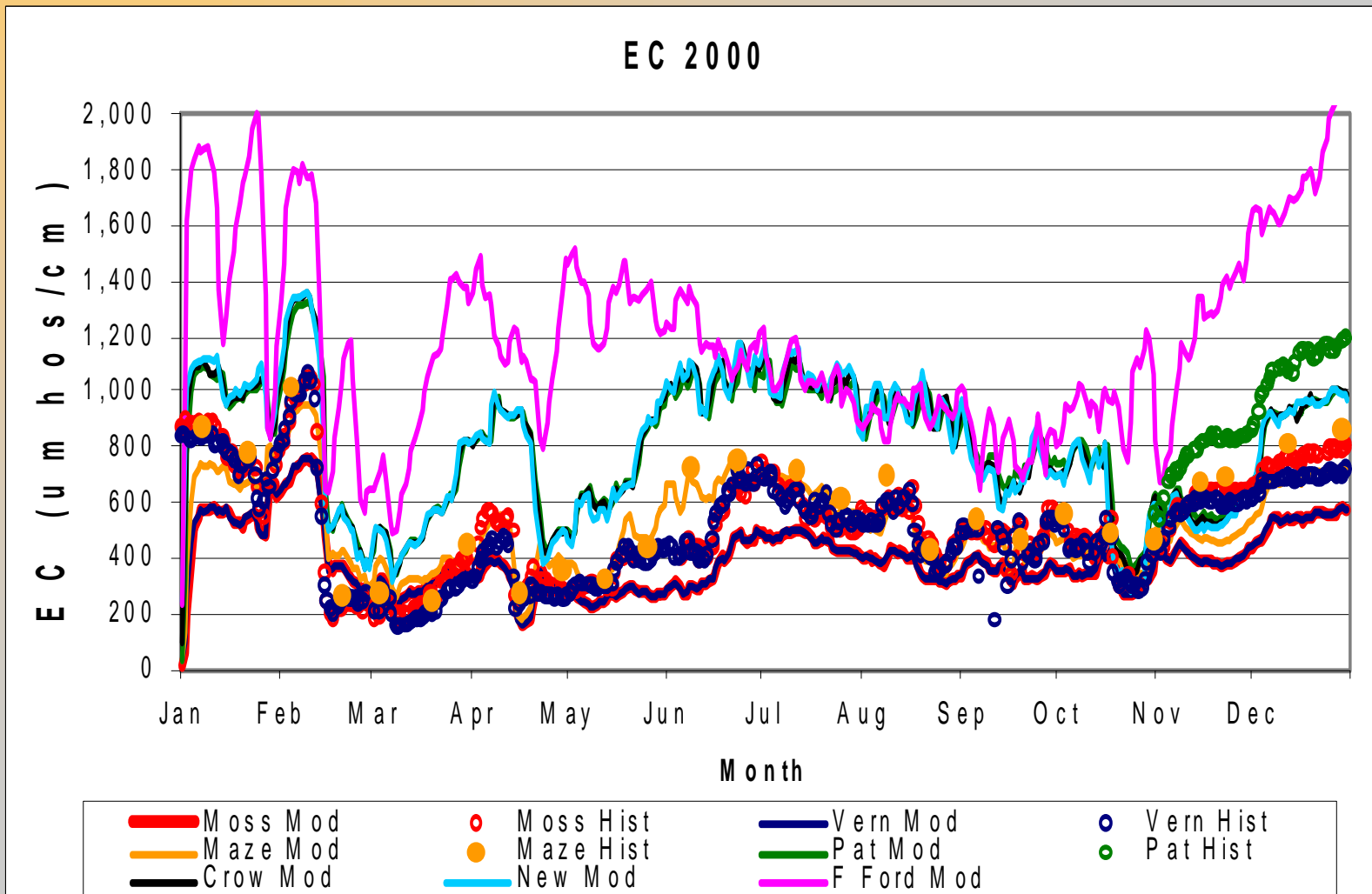
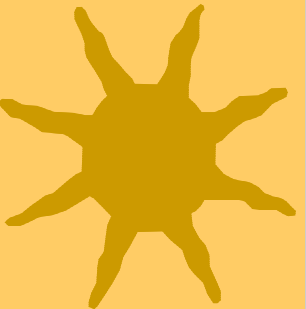
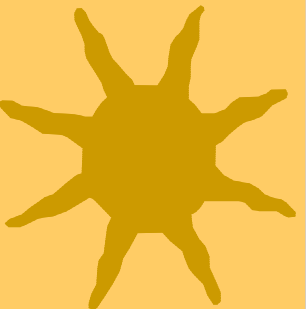
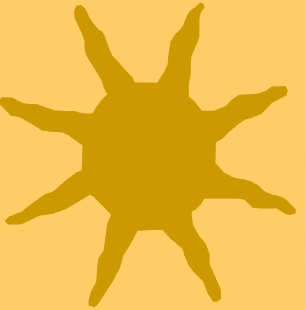
A g Diversions

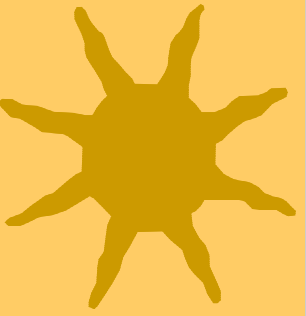
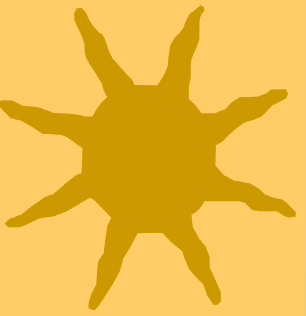
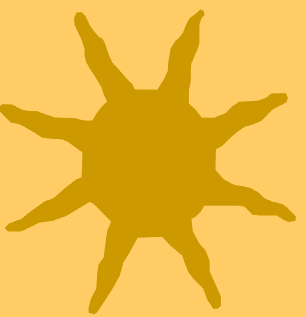


Sum of Small Diversions W S ID P W D E S W D B C I D

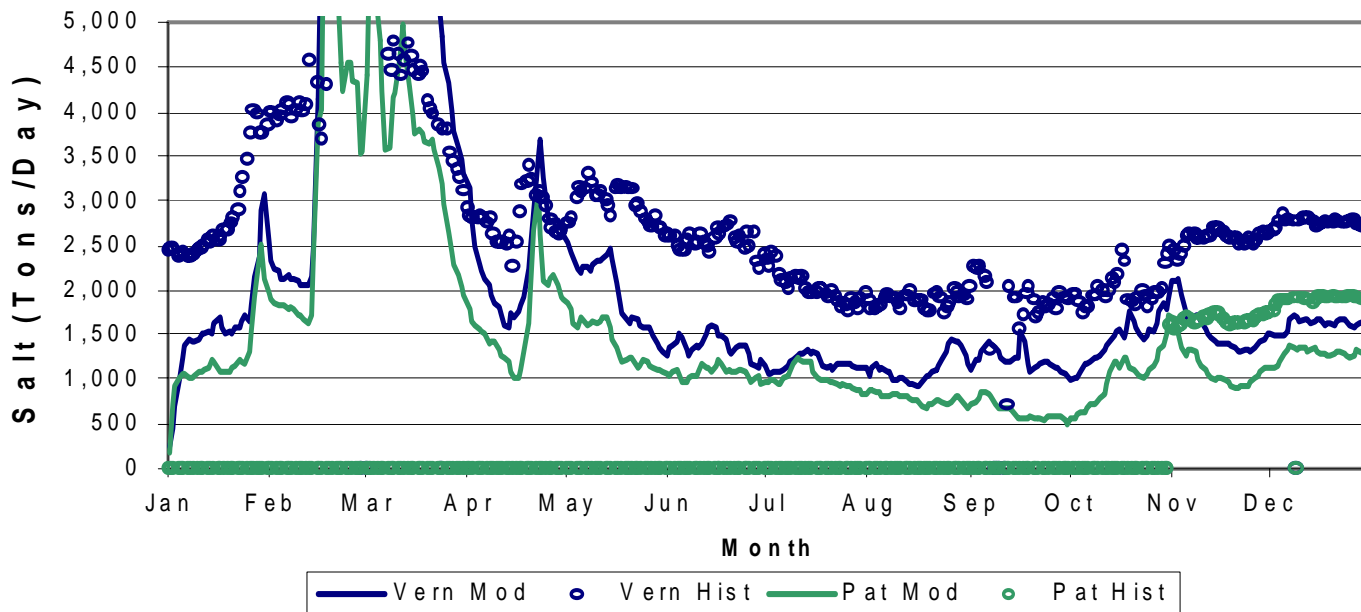


SJR Salt (EC) Budgets- Measured and Simulated

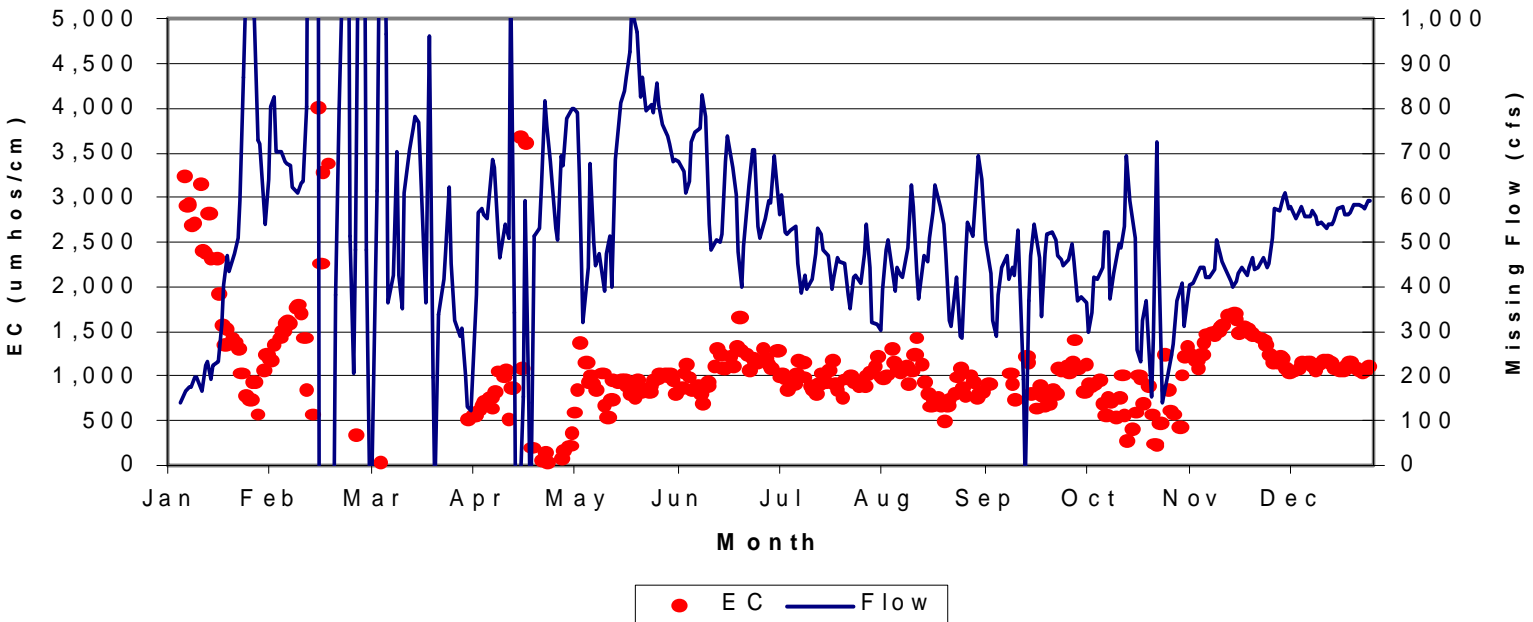




Measured and Simulated Salt Load 2000

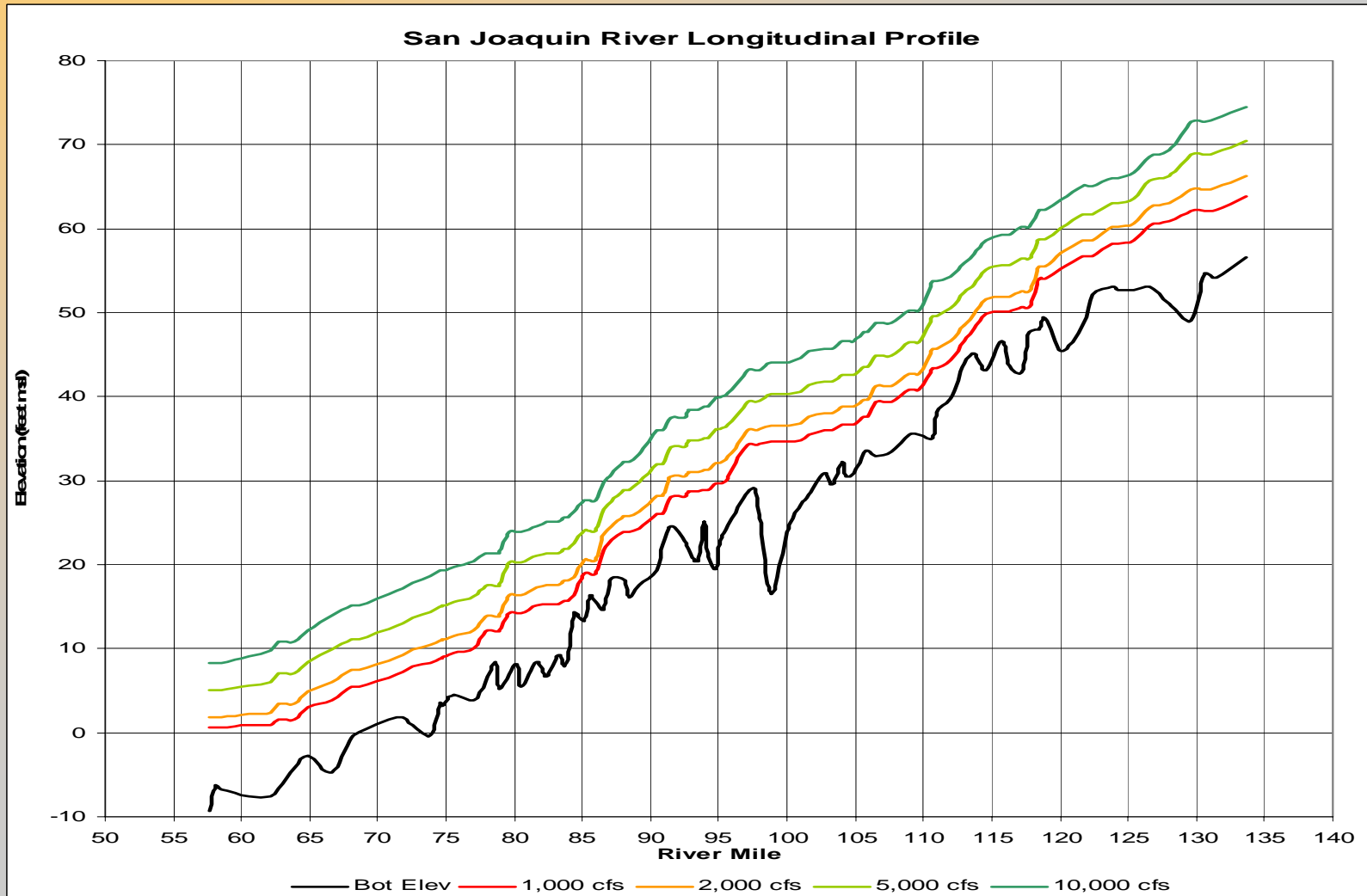


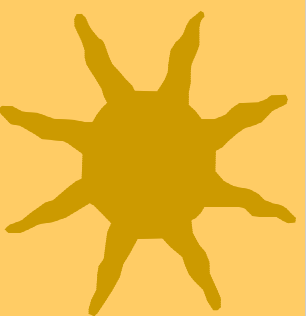
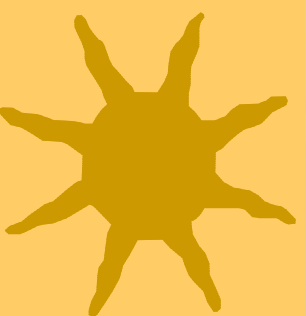
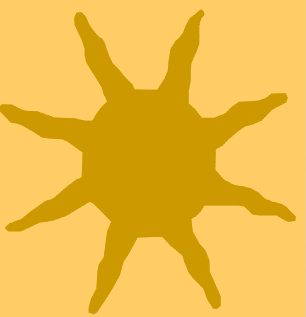
Calculated EC of Water Missing at Vernalis for 2000



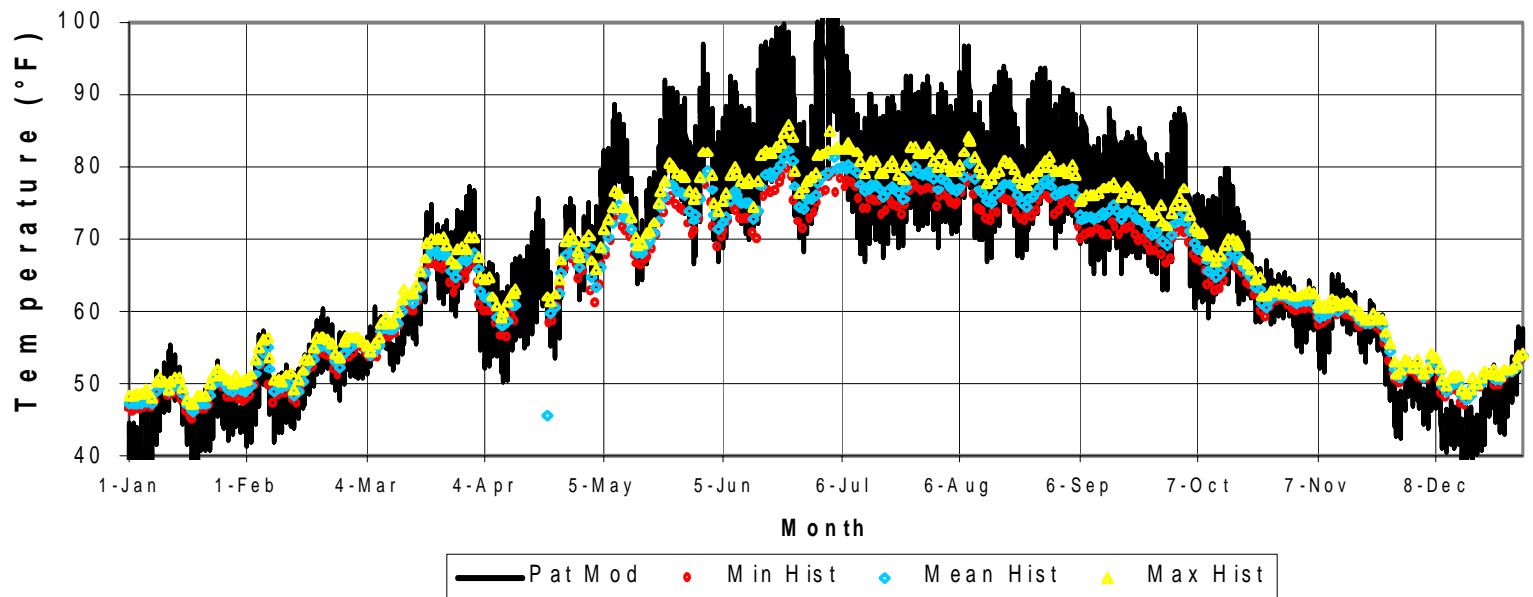


SJR Hydraulic Geometry- surface area, volume, depth, and travel time

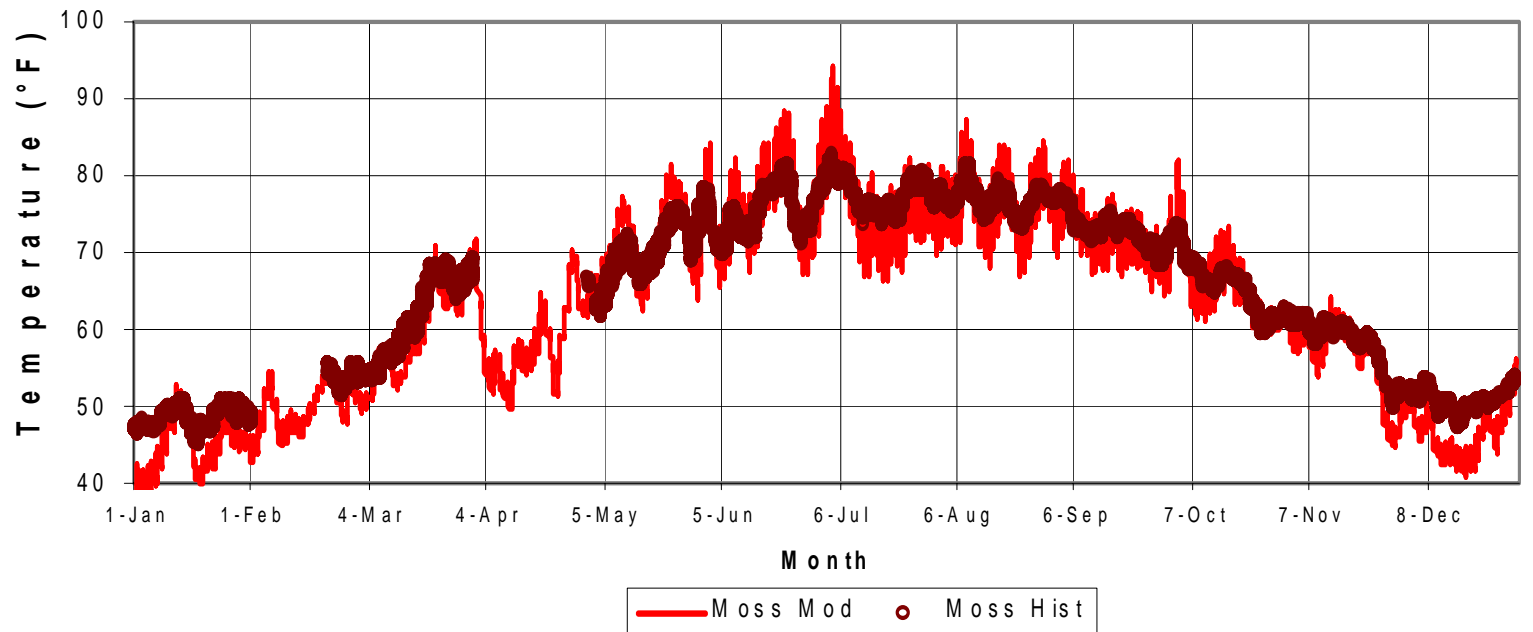




Patterson Temperature 2001



Mossdale Temperature 2001





SJR WQ Modeling- baby steps towards comprehensive adaptive management framework



- ★ Extend to tributary dams and Salt & Mud Sloughs and San Luis Drain



- ★ TSS & turbidity-seasonal inputs & settling

- ★ Temperature and light effects on algae

- ★ Diurnal growth and grazing of algae

- ★ Algae pigments, VSS, and BOD at Mossdale

- ★ Loss of algae from Mossdale to DWSC?

- ★ Old River diversion gates- DWSC flow and algae

- ★ DWSC DO management by oxygenation?

