
Suisun Marsh Monitoring Program
Channel Water Salinity Report
Reporting Period: February 2008

Questions regarding this report should be directed to:

Jim Sung

California Department of Water Resources
Division of Environmental Services
901 P Street
Sacramento, CA 95814

Telephone: (916) 651--0182
sung@water.ca.gov

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of February, 2008, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of February was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations C-2, S-64, and S-49 was 8.0 mS/cm whereas at S-42 and S-21 it was 15.6 mS/cm since deficiency standard apply during February 2008. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\# \text{ days of the month}}$$

2.2 Delta Outflow

Outflow for February 2008 started off high as a result of January carry over. It decreased briefly to 35,000 cfs, then increased above 40,000 cfs shortly thereafter as a result of the February 3 rainfall event. A significant decrease in outflow occurred thereafter and continue to drop to about 12,000 cfs by late February before a final increase to end the month above 35,000 cfs. This was a result of a series of small precipitation events that occurred late in February as shown in Figure 3. Overall the monthly average outflow was normal for this time of year. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for February 2008 is listed below:

Month	Mean NDOI (cubic feet per second)
February	24,424

2.3 Rainfall

February 2008 rainfall amount was not impressive and much lower than previous month total of 7.80 inches. However, rainfall patterns were similar to January with activities only observed in the early and later half of February. The largest precipitation event occurred in the early half of February with a daily total of 1.66 inches on February 3, and the second largest rainfall amount occurred on February 1 with a daily total of 0.75 inches. The monthly total is shown below:

Month	Total Rainfall (inches)
February	3.96

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during February 2008 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
February 1 - 29	3 gates held open	In	Open-24/7

Gate operations ceased since December 17, 2007 and throughout February due to low channel water salinity levels in the marsh as a result of January outflows carry over along with February amount. The combined effect was enough to control salinity levels in February. DWR will continue to monitor and re-operate the gates, if needed, to control salinity.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During February 2008 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) was not higher than 5.0 mS/cm as shown in Figure 1. C-2 salinity was stable throughout February, whereas started of slightly above 1.0 mS/cm and ended with a 0.4 increase for the month. Volanti started off about 4.5 mS/cm and dropped down to about 3.1 mS/cm by end of February, whereas Beldons start and end levels were about the same as shown in Figure 1. February salinity levels at all compliance started off lower than the monthly value of 8.0 mS/cm and were pushed down lower with the early February precipitation event. At monitoring stations, S-97 and S-35, salinity levels started off about 9.0 mS/cm and 4.0 mS/cm, respectively, then both dropped significantly in early part of February due to the largest precipitation event in February, then both converge to end the month with 5.7 mS/cm and 4.8 mS/cm. S-97 salinity drop was steeper than S-35 because it is more influenced by creek runoffs.

Overall, salinity levels in February 2008 were well below the monthly standard.

S-21 (Sunrise Club) continues to be out of service since late December 2005 due to flooded event, thus S-21 station will not be reported in future reports until further notice. To date, on going repair work is being done at S21 site. S42 will continue to be the surrogate reporting station for the 2007-2008 control season.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for February 2008 were compared with means for those months during the previous nine years (Figure 4).

Compared to previous nine years, February 2008 salinity levels were ranked fourth in high Specific Conductance, thus making it the month with the seventh lowest salinity levels. Unlike the past nine years, higher salinity is observed at Beldons (S49) than Volanti (S42) in February 2008. This is most likely the hydrodynamic response of no gate operations during this month and antecedent conditions of no gate operations since December 17, 2007. Typically, gate operation has the greatest effect on salinity reduction at stations (i.e. S64 and S49) since they are closest to the gates, however as a result of no gate operation for February 2008, S49 becomes the 'bottle neck' location and as such allow more salt intrusion to idle there.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****February 2008**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.4	8.0	Yes
S-64	1.4	8.0	Yes
S-49	3.9	8.0	Yes
S-42	3.1	15.6****	Yes
S-21***	n/a	n/a	n/a

*milliSiemens per centimeter

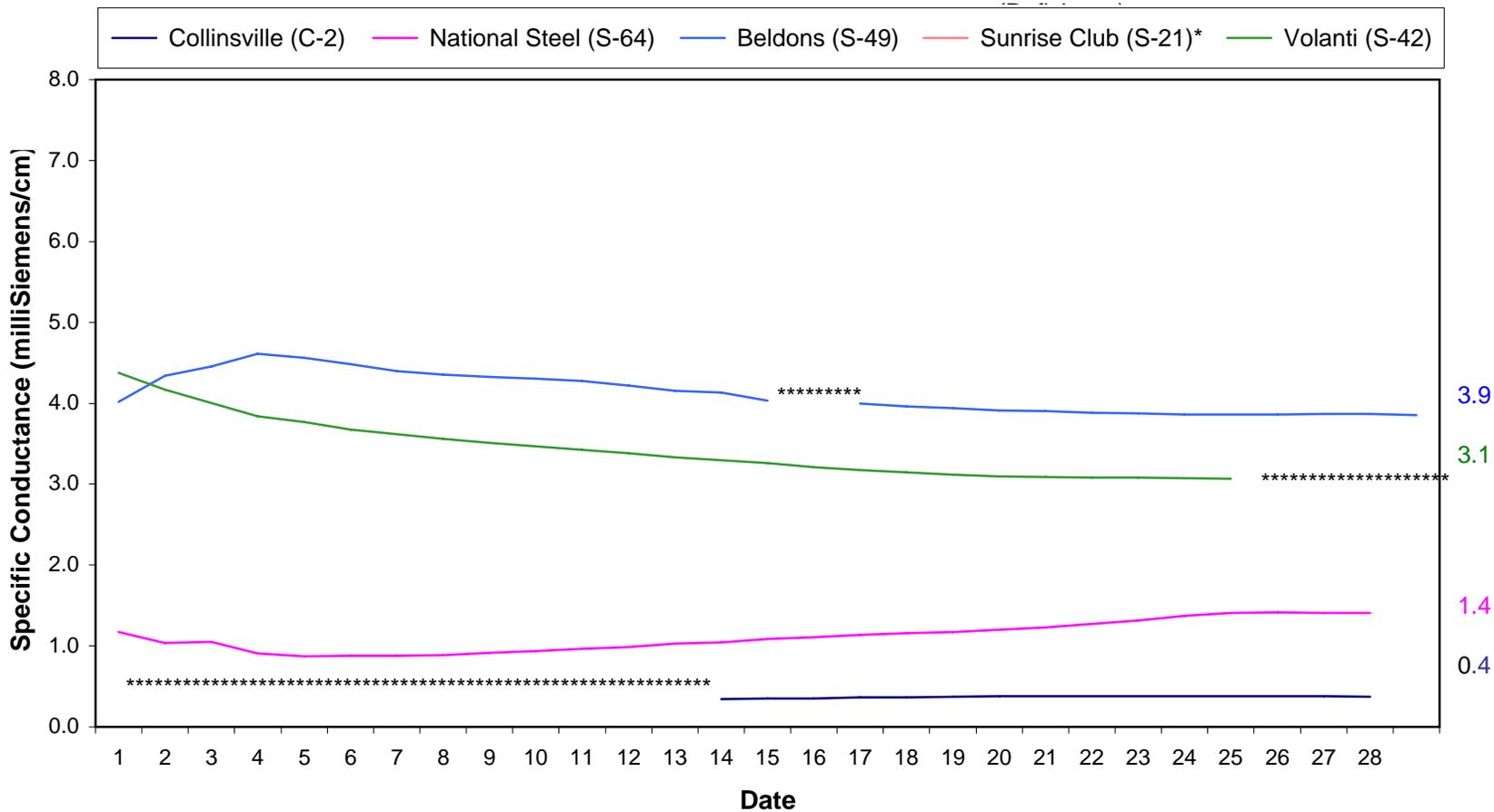
**The representative data from nearby USBR station is used in lieu of data from station C-2.

***station is temporarily out of service. S42 is a surrogate station for S21 during the 2007-2008 control season.

****Deficiency period was triggered in February 2008 due to 2/1/08 dry forecast and previous year 4-river index less than 11.4 MAF. Deficiency standard apply at sites S42 and S21 only as stated in D-1641.

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2008**

Standards = 8.0 mS/cm at C-2, S64, S49
15.6 mS/cm at S42 and S21



*S21 data not available due to flooded levees and inaccessible roads.
*****missing data due to equipment problem.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance February 2008

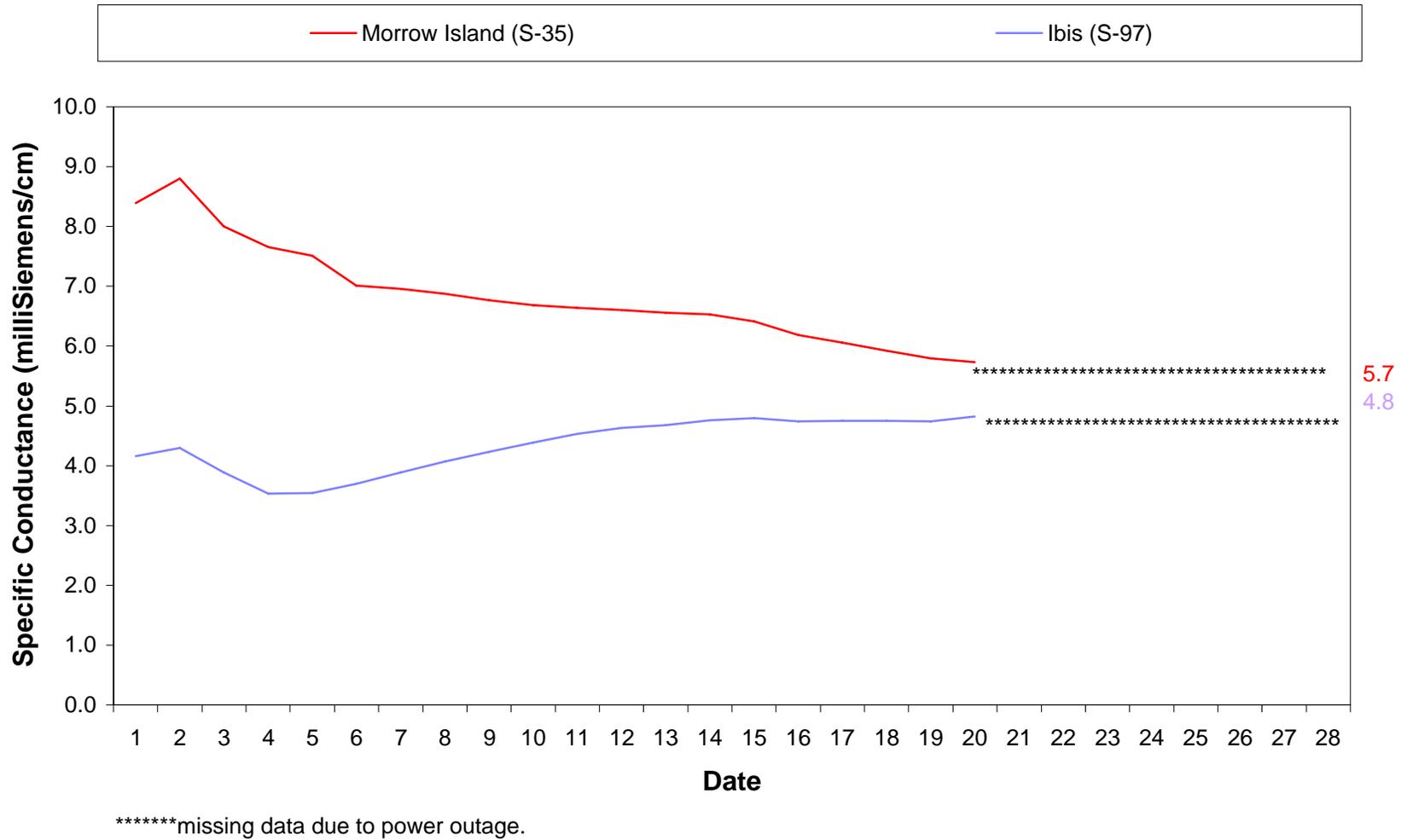
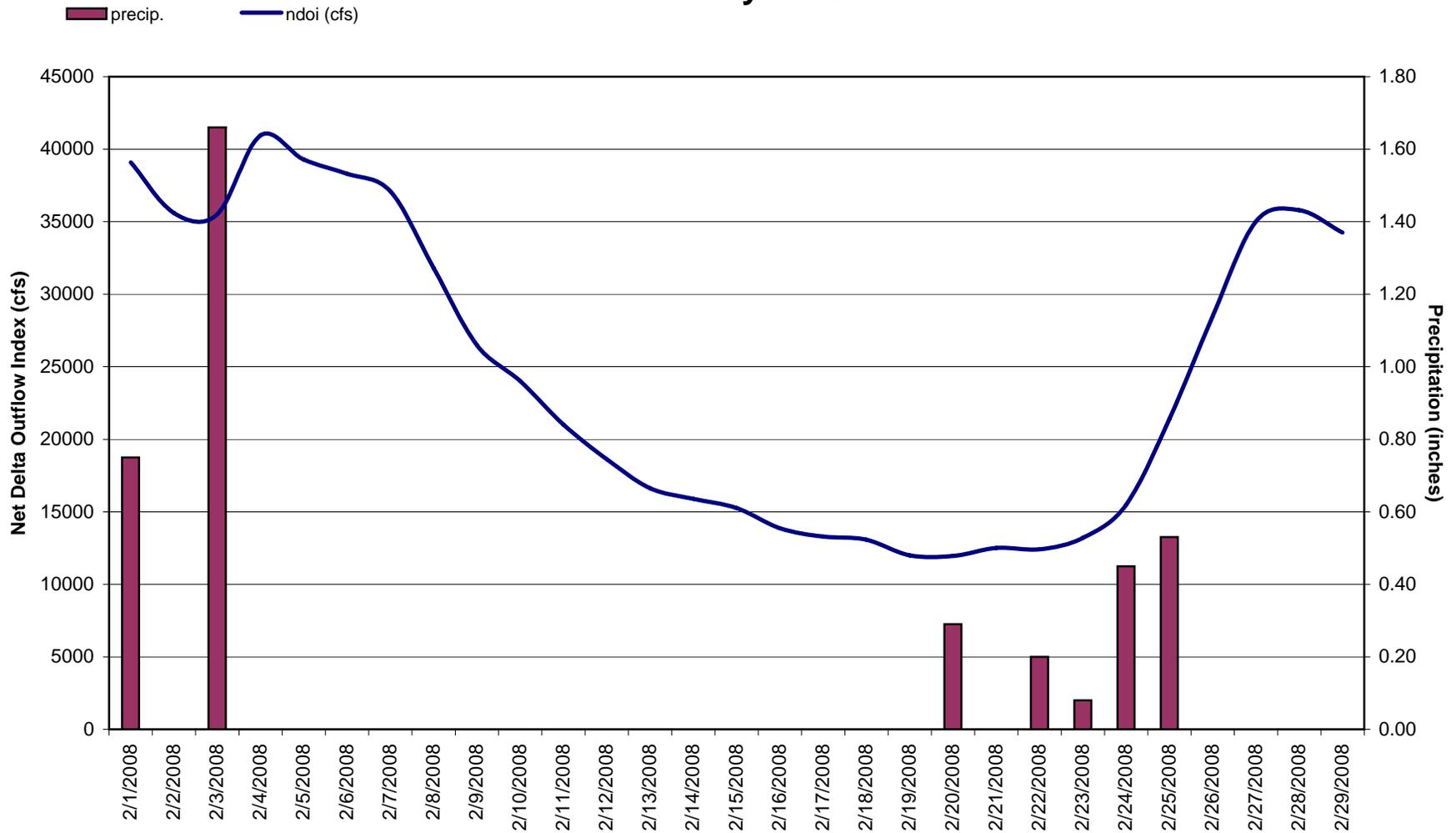
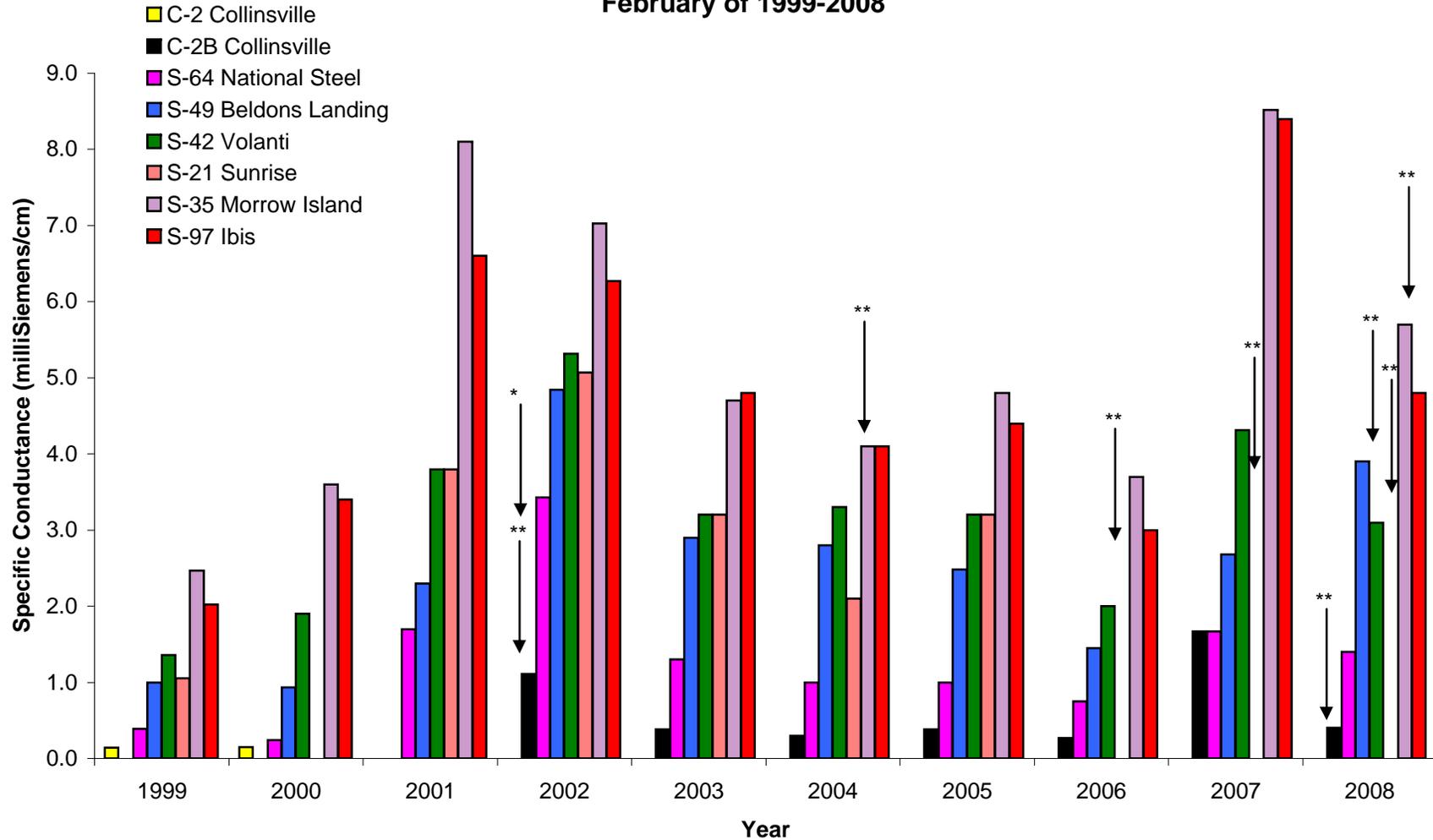


Figure 3. Daily Net Delta Outflow Index and Precipitation* February 2008



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

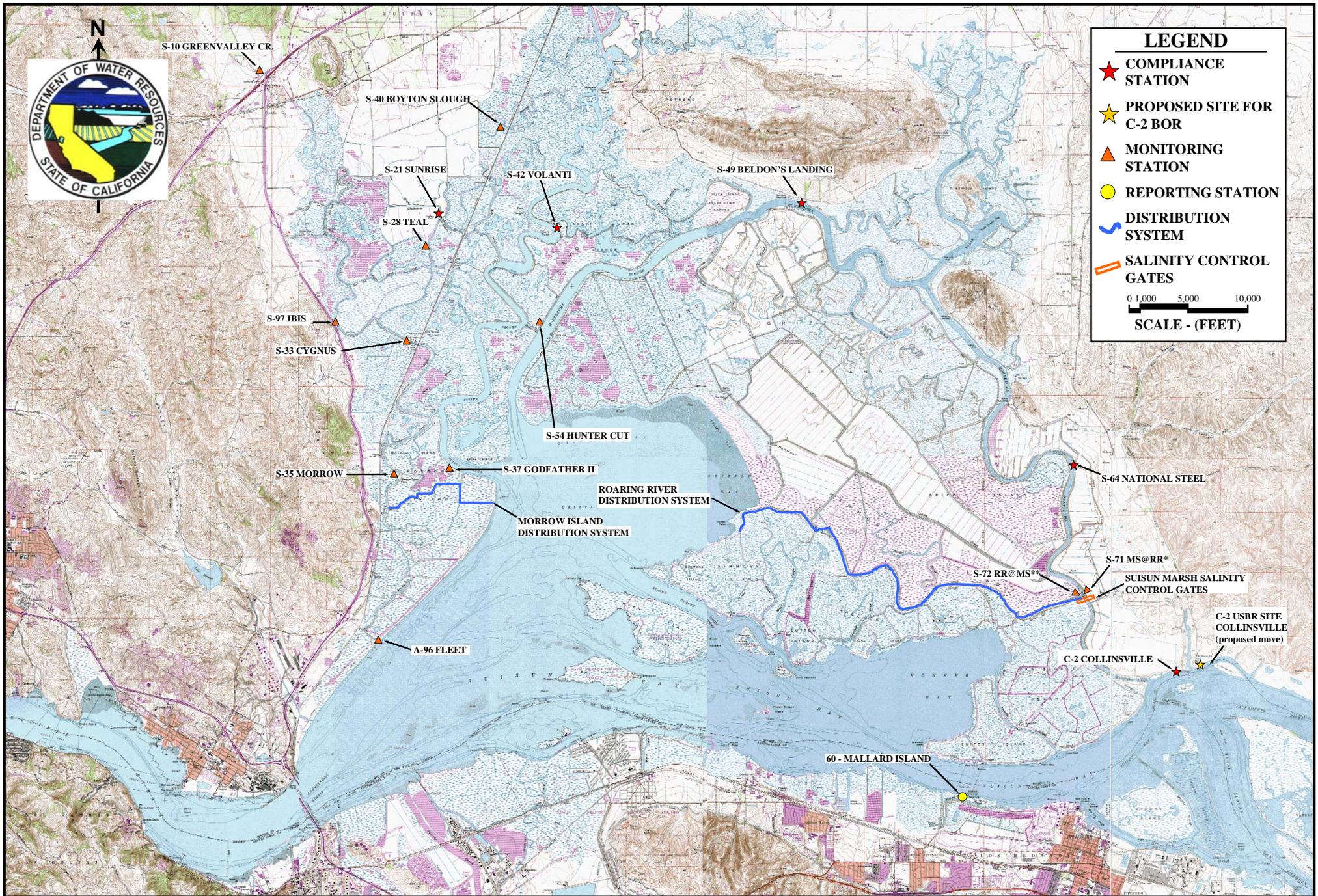
**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
February of 1999-2008**



*Representative data from nearby USBR station is used in lieu of station C-2 from 2002 and thereafter.

**Data missing due to equipment failure or power outage. Number of missing data is small enough not to alter end of month value.

***Data not available due to flooded levees and inaccessible roads.



LEGEND

- ★ COMPLIANCE STATION
- ★ PROPOSED SITE FOR C-2 BOR
- ▲ MONITORING STATION
- REPORTING STATION
- DISTRIBUTION SYSTEM
- SALINITY CONTROL GATES

0 1,000 5,000 10,000
SCALE - (FEET)

SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES