
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: January 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 January, 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 January 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, S-49, S-42, and S-21 was 12.5 mS/cm during January 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 January 2008 started off below 10,000 cfs but increased significantly between January 4 and January 7 to a high of about 49,000 cfs as a result of the massive rainfall accumulation during this period. Thereafter, NDOI dropped significantly to about 20,000 cfs in mid-January followed by another drop to about 10,000 cfs in late January due to no rainfall activity. The next wave of rainfall events picked up on January 22 and led NDOI to end the month on a high note of about 40,000 cfs. 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 January 2008 is listed below:

Month	Mean NDOI (cubic feet per second)
January	21,884

2.3 Rainfall

January 2008 rainfall amounts were much needed from the dry conditions of previous months. There were several precipitation events during January. The rainfall amounts came in two waves; the early and later half of January. The largest precipitation event occurred in the early half of January with a daily total of 1.72 inches on January 5, and the second largest rainfall amount occurred in the later half of the month with a daily total of 1.2 inches on January 26. The monthly total is shown below:

Month	Total Rainfall (inches)
January	7.80

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

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

Date	Gate status	Flashboards status	Boat Lock status
January 1 - 31	3 gates held open	In	Open-24/7

Gate operations ceased since December 17, 2007 and throughout January due to low channel water salinity levels in the marsh as a result of high outflows from the impressive rainfall totals in January. 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 January 2008 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) ranged between 1.5 mS/cm and 13.0 mS/cm as shown in Figure 1. At the start of January, the highest salinity level was observed at Beldons (12.0 mS/cm), but soon dropped at both compliance and monitoring stations as a result of the first precipitation on January 5, also the largest daily amount for the month. Thereafter, several more rainfall events occurred and reduce salinity levels significantly throughout the marsh. Despite no rainfall activity in mid-January, salinity levels remained low. After the second wave of rainfall events in late January, meeting the January standards was never a concern.

Overall, salinity levels in January 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 January 2008 were compared with means for those months during the previous nine years (Figure 4).

Compared to previous nine years, January 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 January 2008. This is most likely the hydrodynamic response of no gate operations during this month. 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 January 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****January 2008**

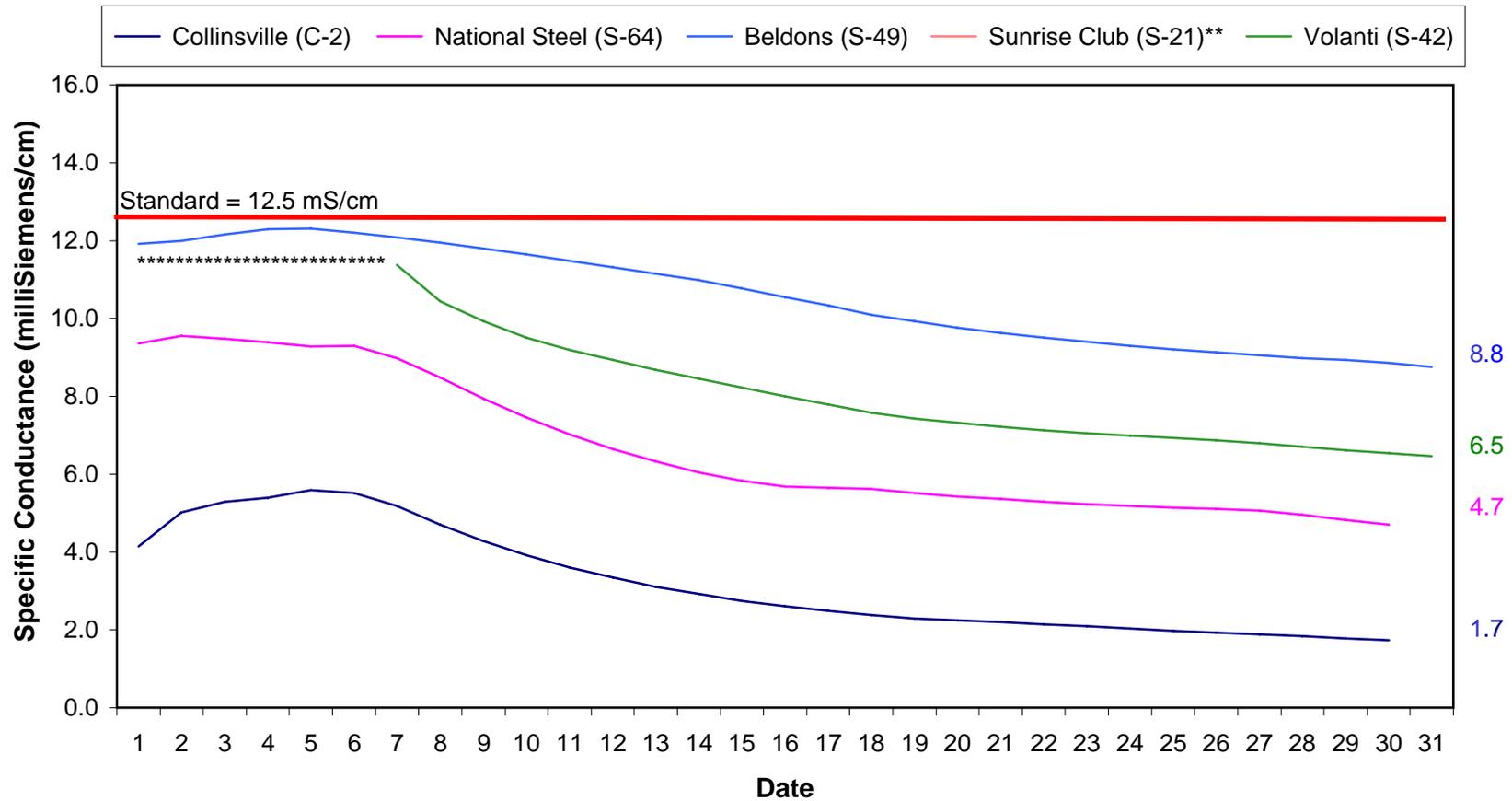
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	1.7	12.5	Yes
S-64	4.7	12.5	Yes
S-49	8.8	12.5	Yes
S-42	6.5	12.5	Yes
S-21***	n/a	n/a	n/a

*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.

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



*S42 missing data due to equipment failure.
**S21 remains out of service for flood repair work.

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

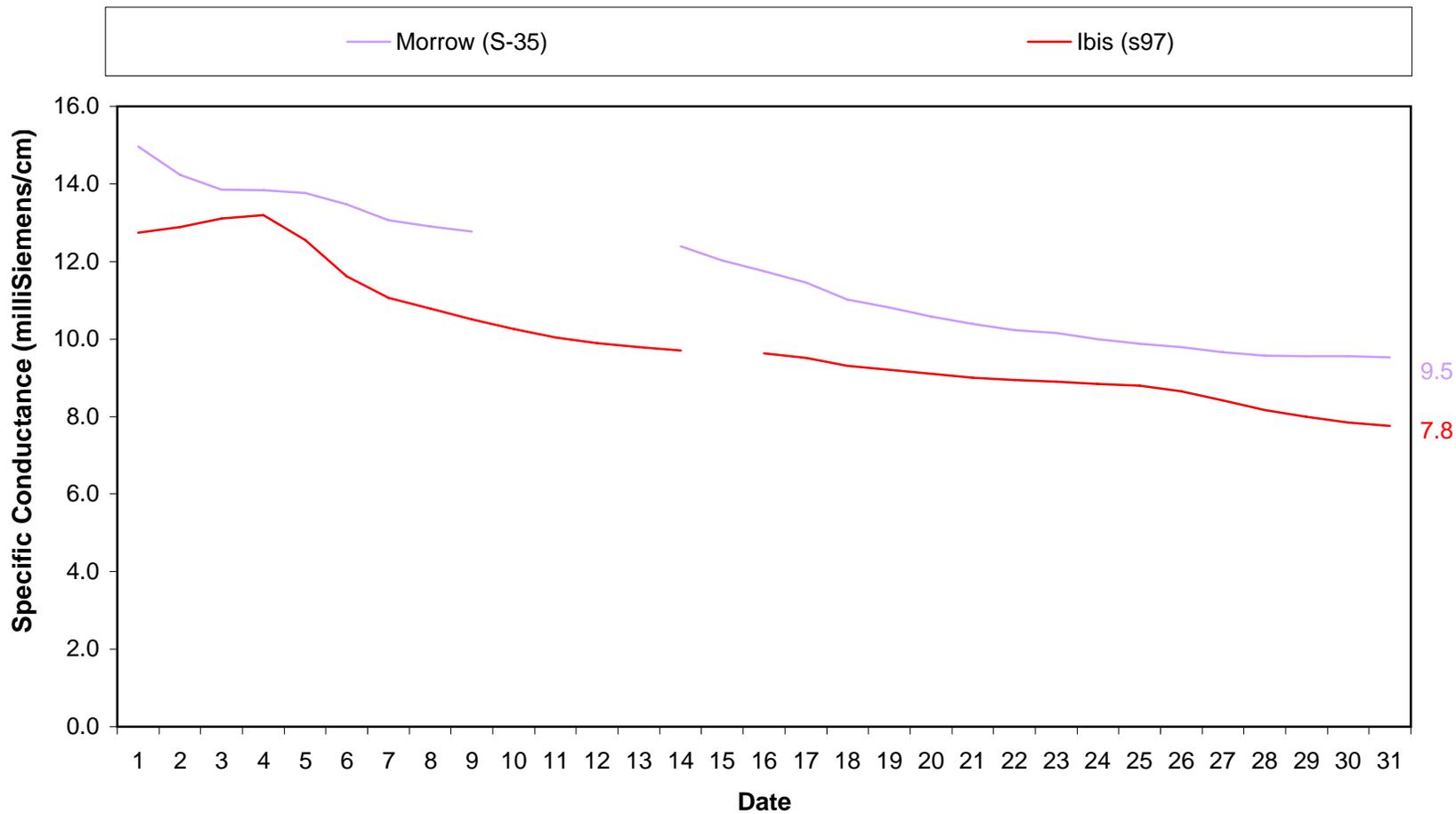
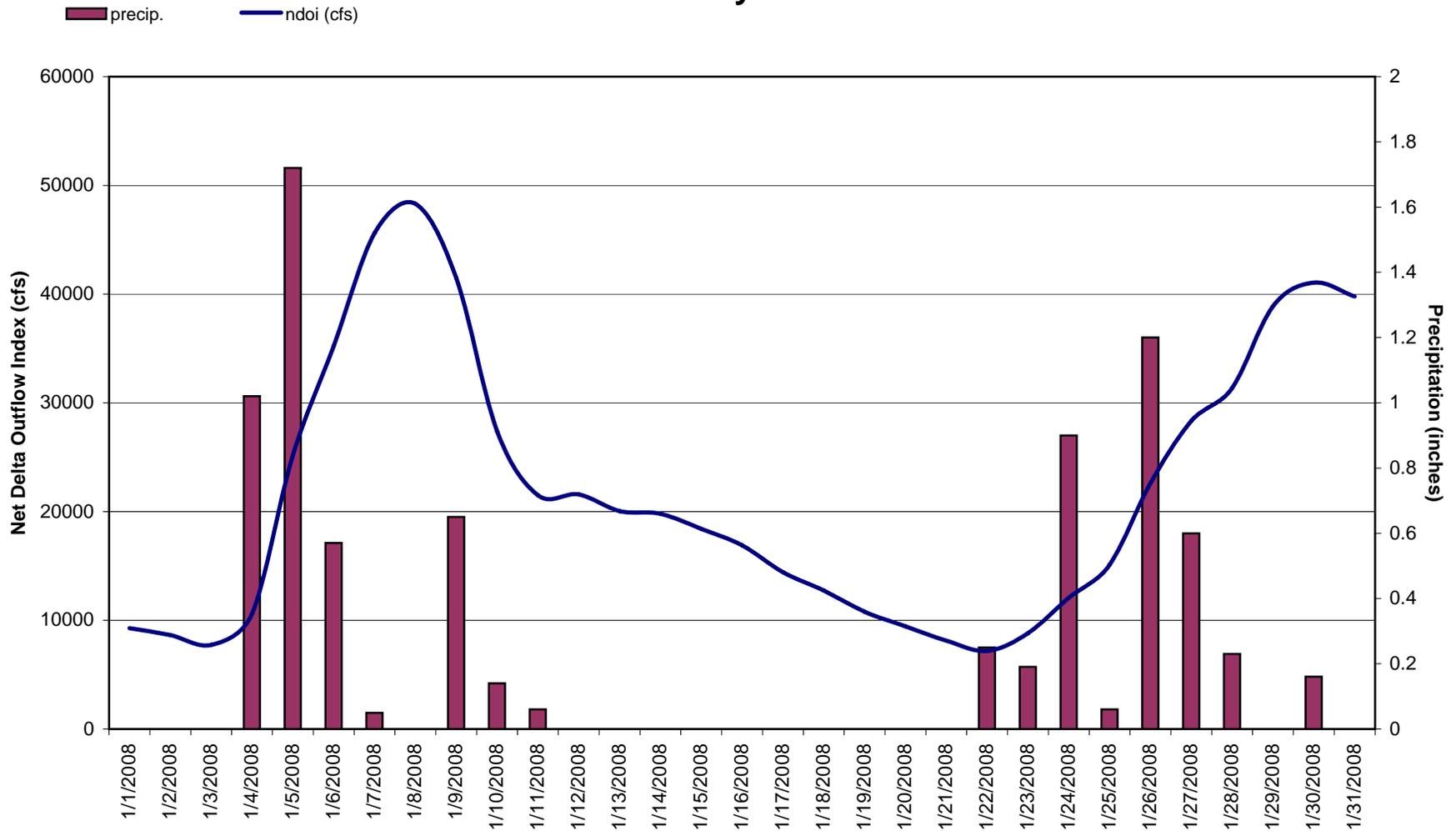
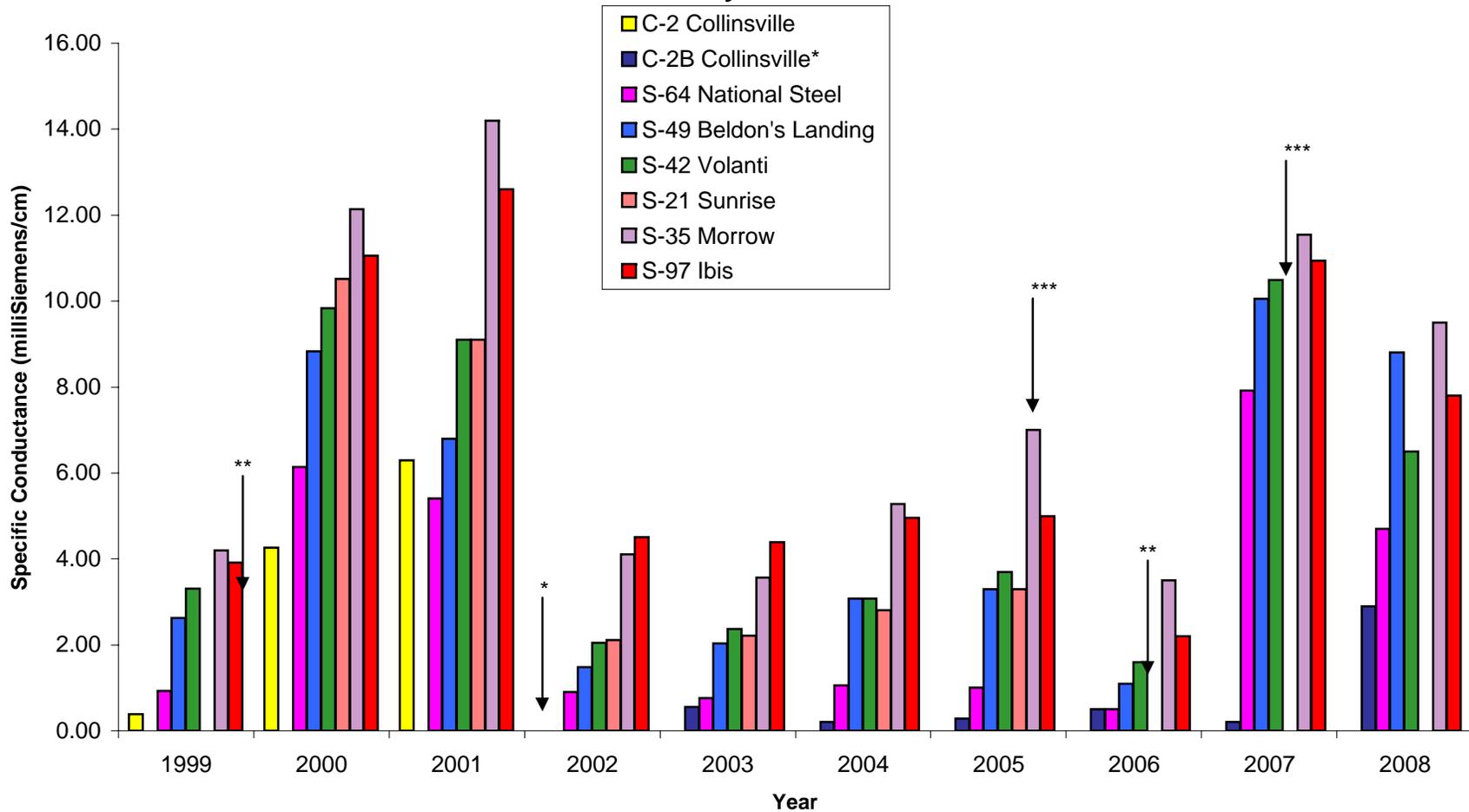


Figure 3. Daily Net Delta Outflow Index and Precipitation* January 2008



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

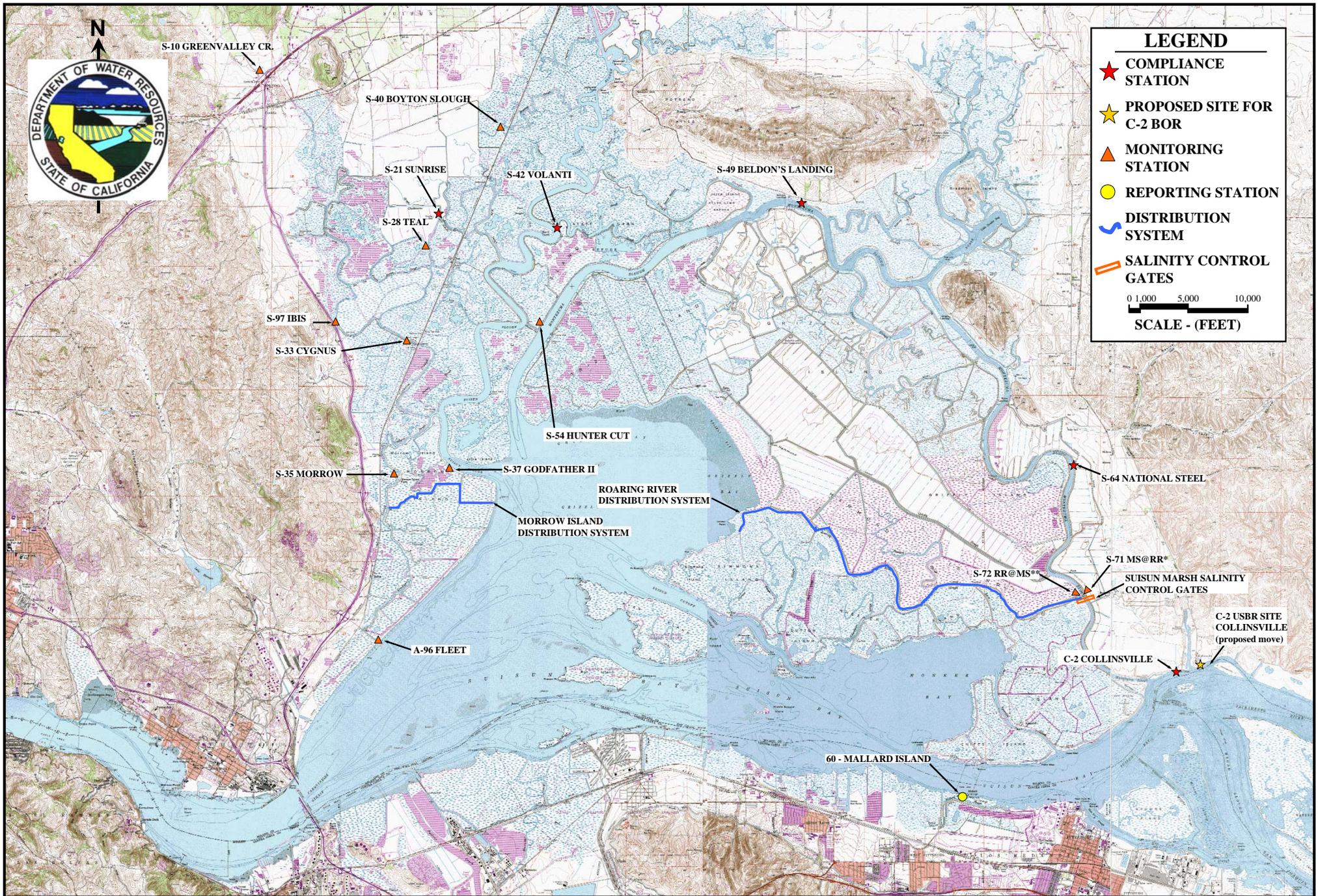
**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
January 1999-2008**



* = beginning in 2002.

** Data was not obtained due to equipment problem or flood constraint.

***Data not representative of end of month value due to missing data.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES