
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: May 2011

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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 May 2011, 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 May was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. During May, the standard for compliance stations C-2, S-64, S-49, S-42, and S-21 were 11.0 mS/cm. 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 May 2011 started off above 55,000 cfs and dropped down to about 45,000 cfs by mid-May as shown in Figure 3. Thereafter, NDOI increased slightly to about 55,000 cfs, then dropped off again to end the month above 40,000 cfs. The largest outflow for May 2011 occurred on the first day and the lowest outflow was on the last day. Overall, May 2011 NDOI was very high compared to past four years. 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 May 2011 is listed below:

Month	Mean NDOI (cubic feet per second)
May	49,065

2.3 Rainfall

Rainfall activities in the surrounding area of the Fairfield Treatment plant in May were very low. Less than 1 inch was the total for the entire month as shown in Figure 3. There were only three days of rainfall activities, all occurred at the second half of the month with the largest daily totals 0.37 inches among the three rain days. The monthly total is shown below.

Month	Total Rainfall (inches)
May	0.96

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during May 2011 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
May 1 - 17	3 OPEN	IN	Open
May 18 – 31	3 OPEN	OUT	Closed

Due to no salinity concern anticipated for the remainder of the control season, DWR did not operated the gates in May 2011 and suspended gate operations for the season on May 18 after the removal of the flashboards.

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 May 2011, PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were all below 1.5 mS/cm as shown in Figure 1. Despite low rainfall totals and no gate operations in May, salinity levels at all compliance stations were amazing low and stable as a result of high runoff carryover from the wet winter and spring. Salinity patterns on the western monitoring stations, S97 and S35, were no higher than 3.0 mS/cm for the entire month as shown in Figure 2. Again, this was a result of the wet winter and spring carryover effect. The levels were higher than compliance stations and as expected because of the proximity of these two stations.

Overall, salinity levels in May 2011 were well below standards at all compliance and monitoring stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for May 2011 were compared with means for those months during the previous ten years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations is most comparable to the 2006 but at a slightly higher level, except at Collinsville. Compared to previous ten years, May 2011 salinity levels were overall ranked tenth in high Specific Conductance, thus making it second to the last lowest salinity levels month. Salinity levels being much higher than previous nine years are results of an unusual wet winter and spring; which was welcoming compared to the previous four years of dry water conditions.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****May 2011**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.1	11.0	Yes
S-64	0.3	11.0	Yes
S-49	0.7	11.0	Yes
S-42	0.9	11.0	Yes
S-21	0.9	n/a	n/a

*milliSiemens per centimeter

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

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2011**

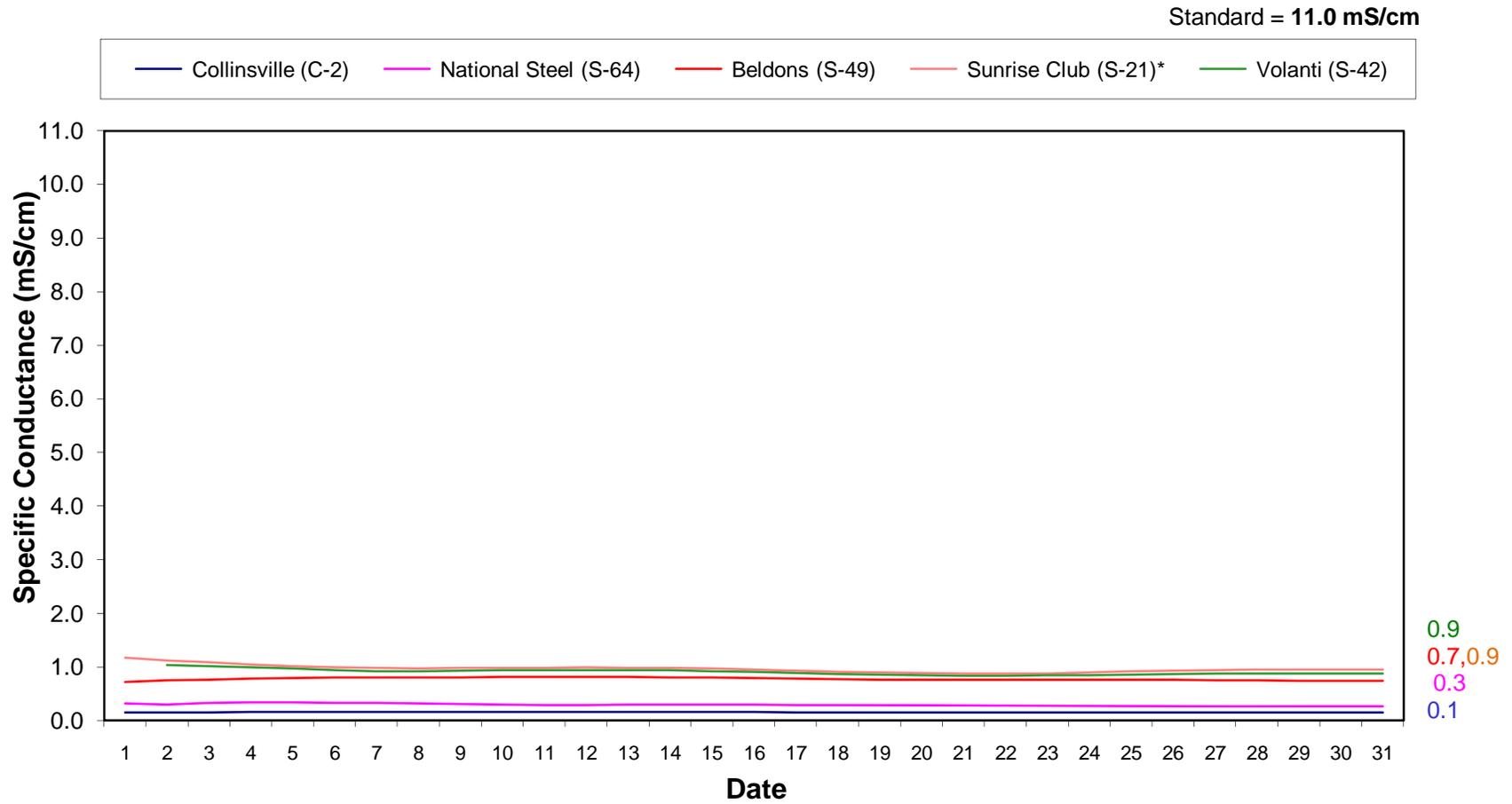
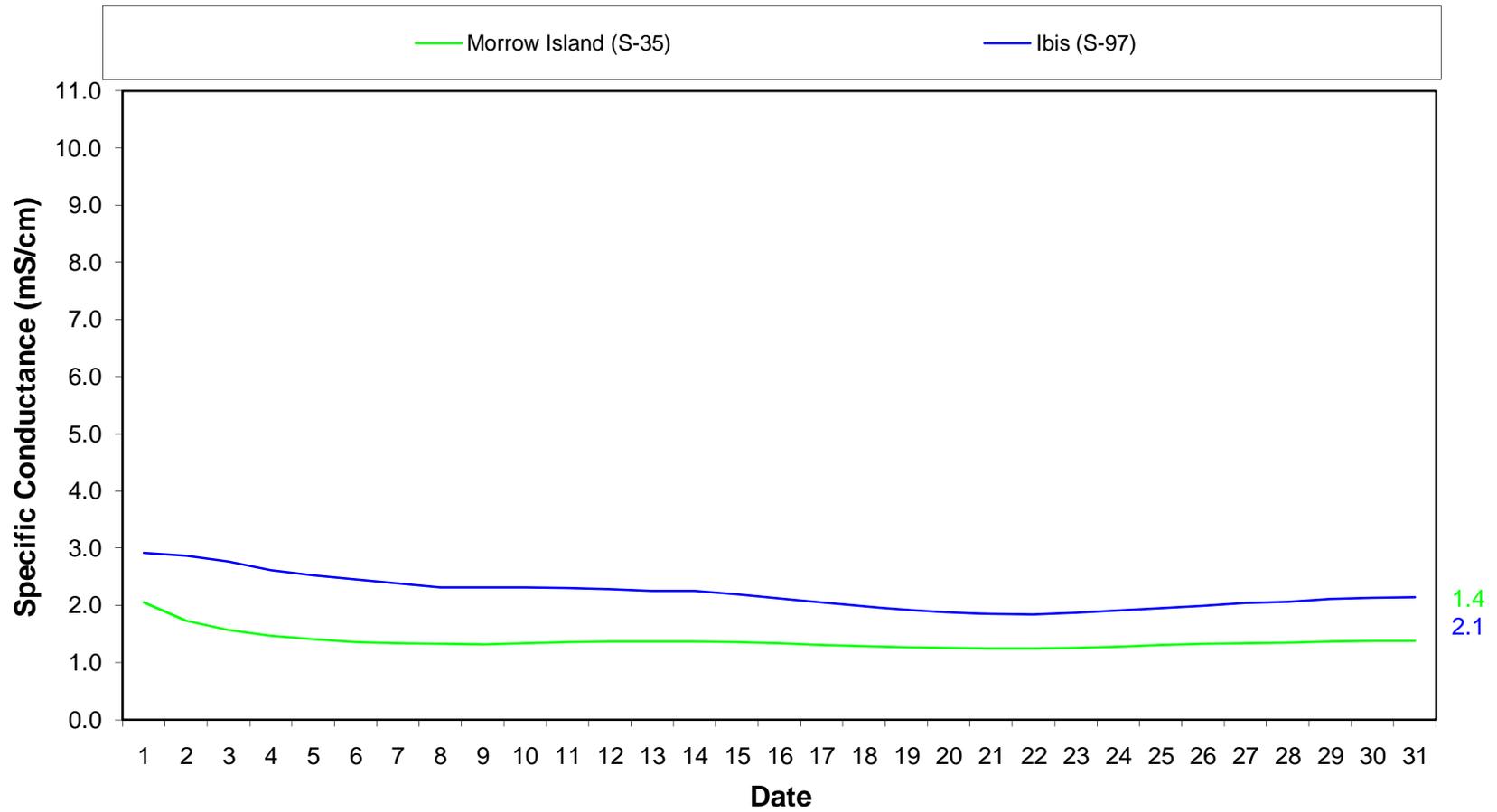
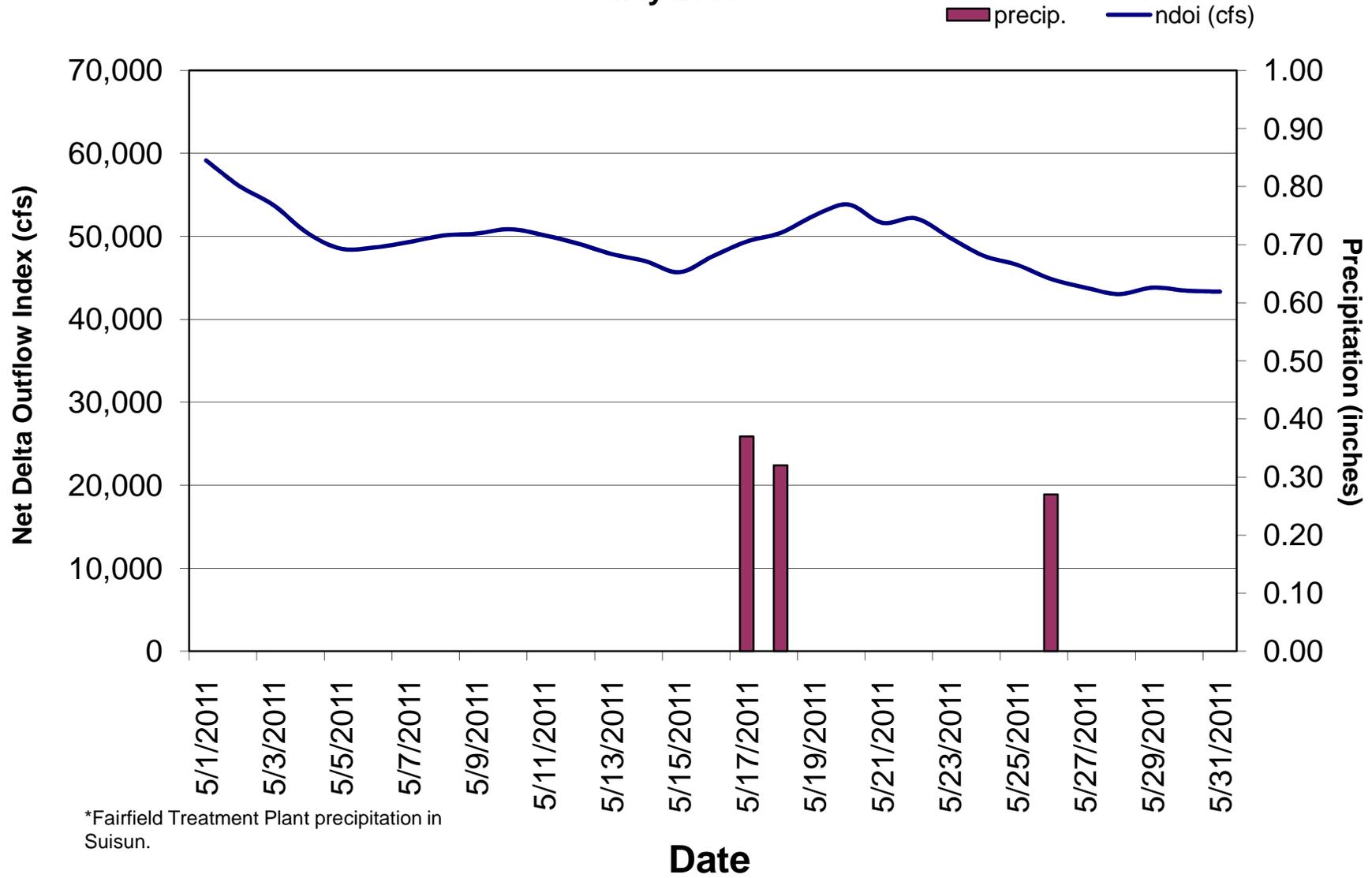


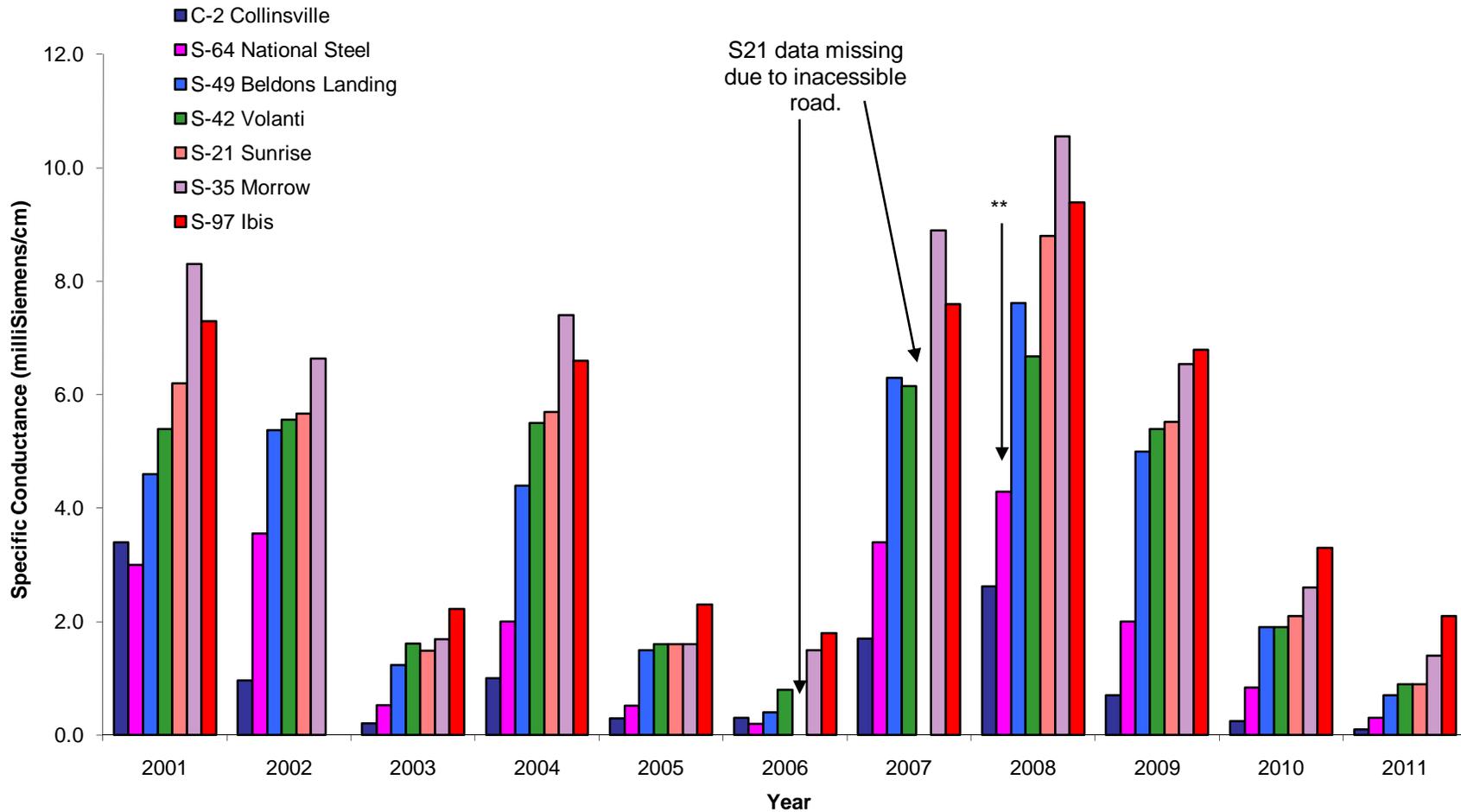
Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2011



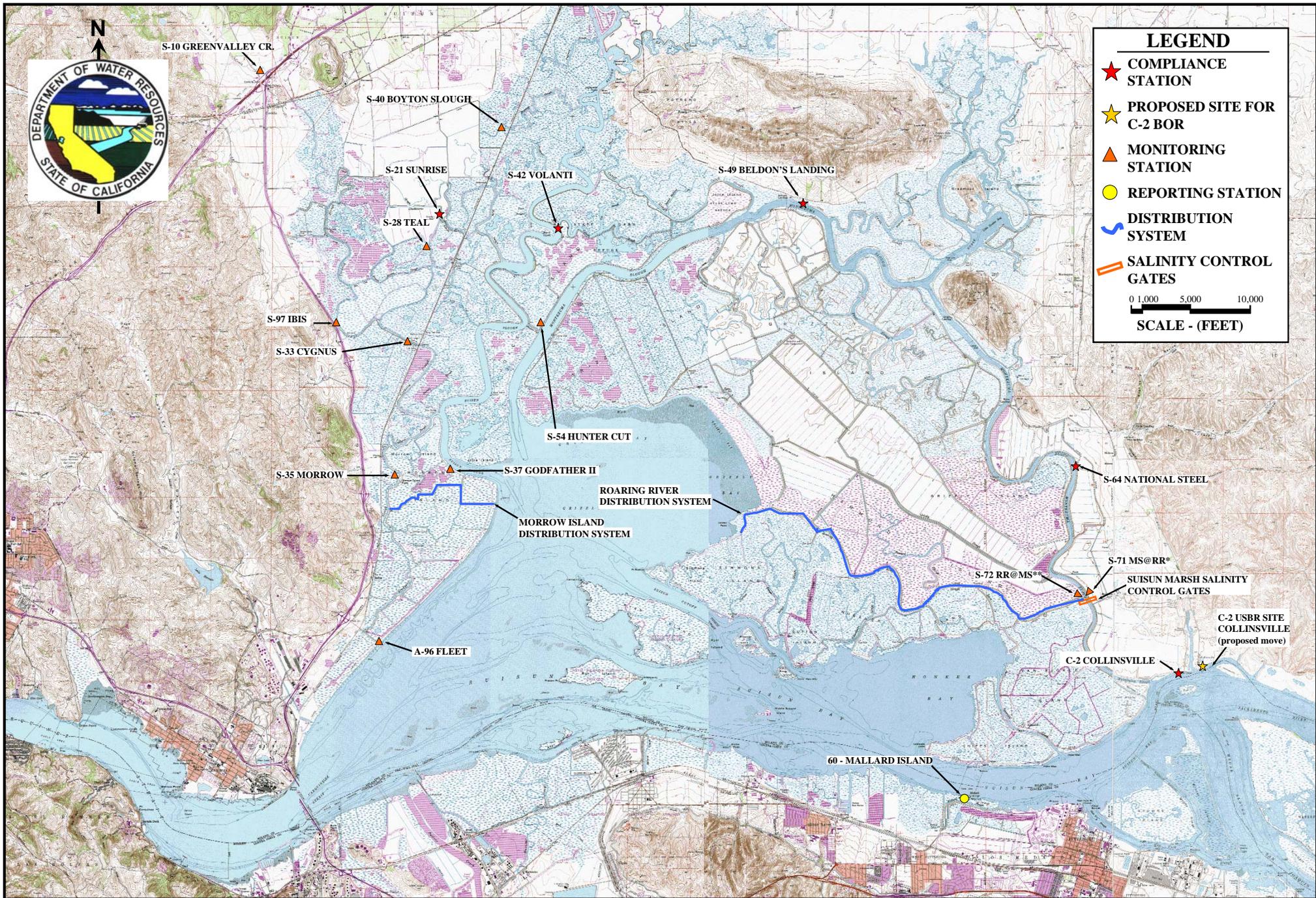
**Figure 3. Daily Net Delta Outflow Index and Precipitation*
May 2011**



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
May of 2001-2011**



**S64 PDM based on last good data (6/20/08).



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES