
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: April 2010

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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 8.

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 April, 2010, deficiency period applied thus two of the compliance stations (i.e. S21 and S42) salinity conditions were in compliance with channel water salinity standards of SWRCB (Table 1). The deficiency standard for the month of April was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations S-21 and S-42 were 14.0 mS/cm for April. 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 April 2010 ranged between 14,000 cfs and 25,000 cfs in the first half, whereas the second half was higher and ranged between 25,000 cfs and 35,000 cfs as shown on Figure 3. The largest outflow for the month was about 35,000 cfs and occurred mid-month. All the outflow patterns were in response to rainfall activities and the increased flows in the second part of the month was an accumulation of prior runoffs. Overall, April 2010 outflow was impressive this late in the spring time when typically is dry. 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 April 2010 is listed below:

Month	Mean NDOI (cubic feet per second)
April	27,296

2.3 Rainfall

Rainfall events for April 2010 was scattered throughout the month with the largest daily amount of .60 inches on April 20. There were only several occurrences in the month but due to antecedent conditions, this late spring rainfall events allowed additional much needed runoffs to offset the dry fall period. The monthly totals is shown below:

Month	Total Rainfall (inches)
April	2.52

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during April 2010 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
April 1 – April 13	3 gates held open	In	Open-24/7
April 14 – April 25	2 gates op; 1 open	In	Open-24/7
April 26 – April 30	3 gates held open	In	Open-24/7

Gate operation ceased since February 27, 2009 and continued to be non-operational during April 2010 due continuing low salinity levels in the marsh and meeting salinity standards for the month was not of concern. However, the gates were operated for a short duration between April 14 and April 25 to test out the newly installed AVM at the facility, which is used to trigger gate opening and closing.

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 April 2010 PDM salinity levels at all compliance stations were no higher than 5.0 mS/cm as shown in Figure 1. The salinity drop mid-month at S21 is due to creek runoff from rainfall events, whereas the faint drop at S64 was due to gate operations or testing as described in earlier section. This faint drop is also shown at S49, S42, and S21 around April 22 as a result of gate testing and took longer because of the proximity of these stations relative to the gates. At monitoring stations, S-97 and S-35, salinity levels in April started off below 7.5 mS/cm and by mid month gradually decline to end the month salinity at 4.4 mS/cm and 4.3 mS/cm, respectively. The salinity drop at both S97 and S35 were due to creek runoffs but at different times because of the stations proximity to the runoff locations.

Overall, salinity levels in April of 2010 were well below the monthly standards.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for April 2010 were compared with means for those months during the previous nine years (Figures 6 and 7).

Compared to previous nine years, April 2010 salinity levels and patterns were similar to that of 2003. Compared to previous year, salinity levels at all compliance stations were much lower due to impressive rainfall activities in late spring to hold down the levels on into April. April 2010 month was ranked seventh in high Specific Conductance, thus making it the month with the fourth lowest salinity levels.

Table 1
Deficiency Period
Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations

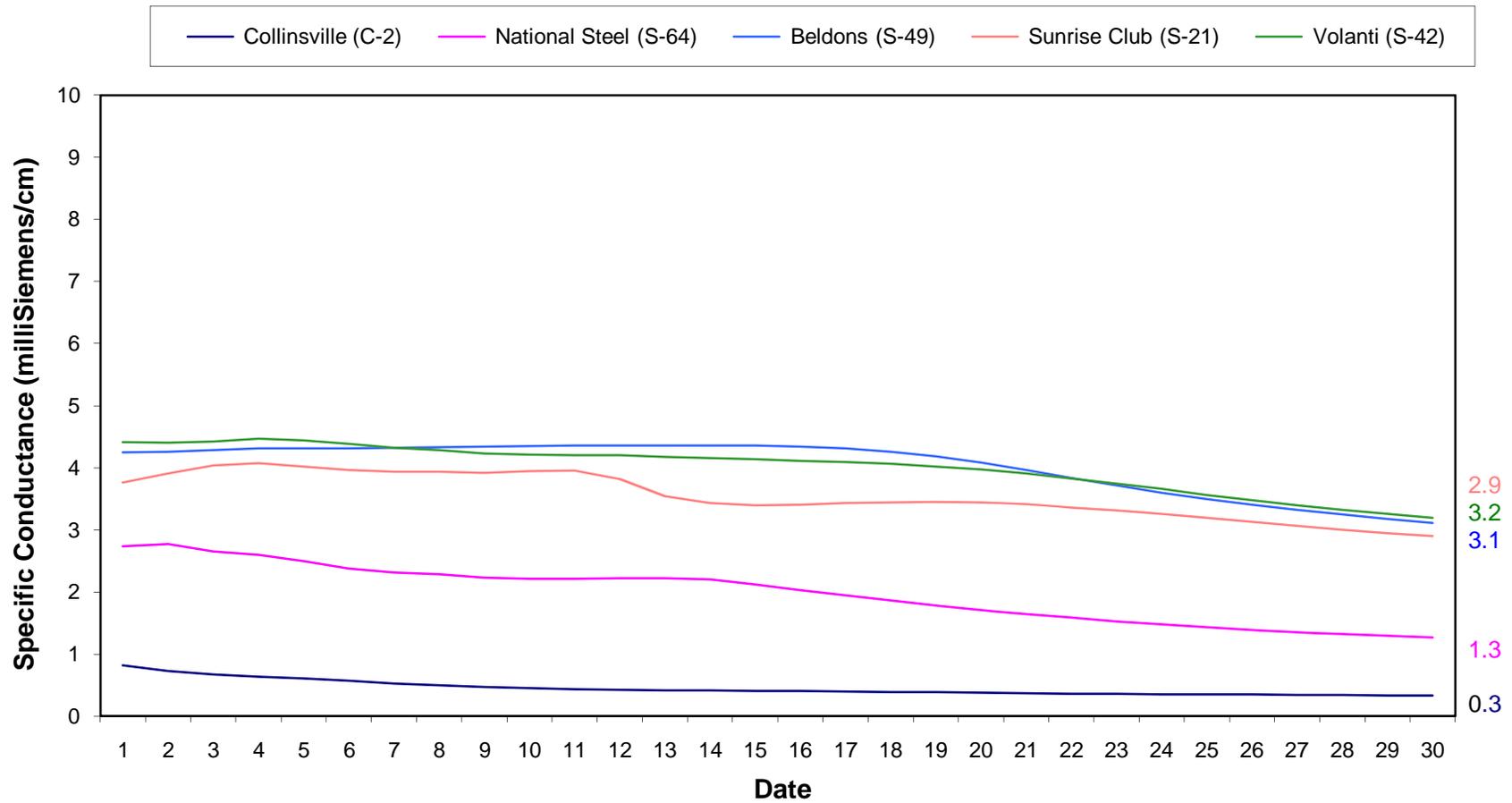
April 2010

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2	0.3	n/a	n/a
S-64	1.3	n/a	n/a
S-49	3.1	n/a	n/a
S-42	3.2	14.0	Yes
S-21	2.9	14.0	Yes

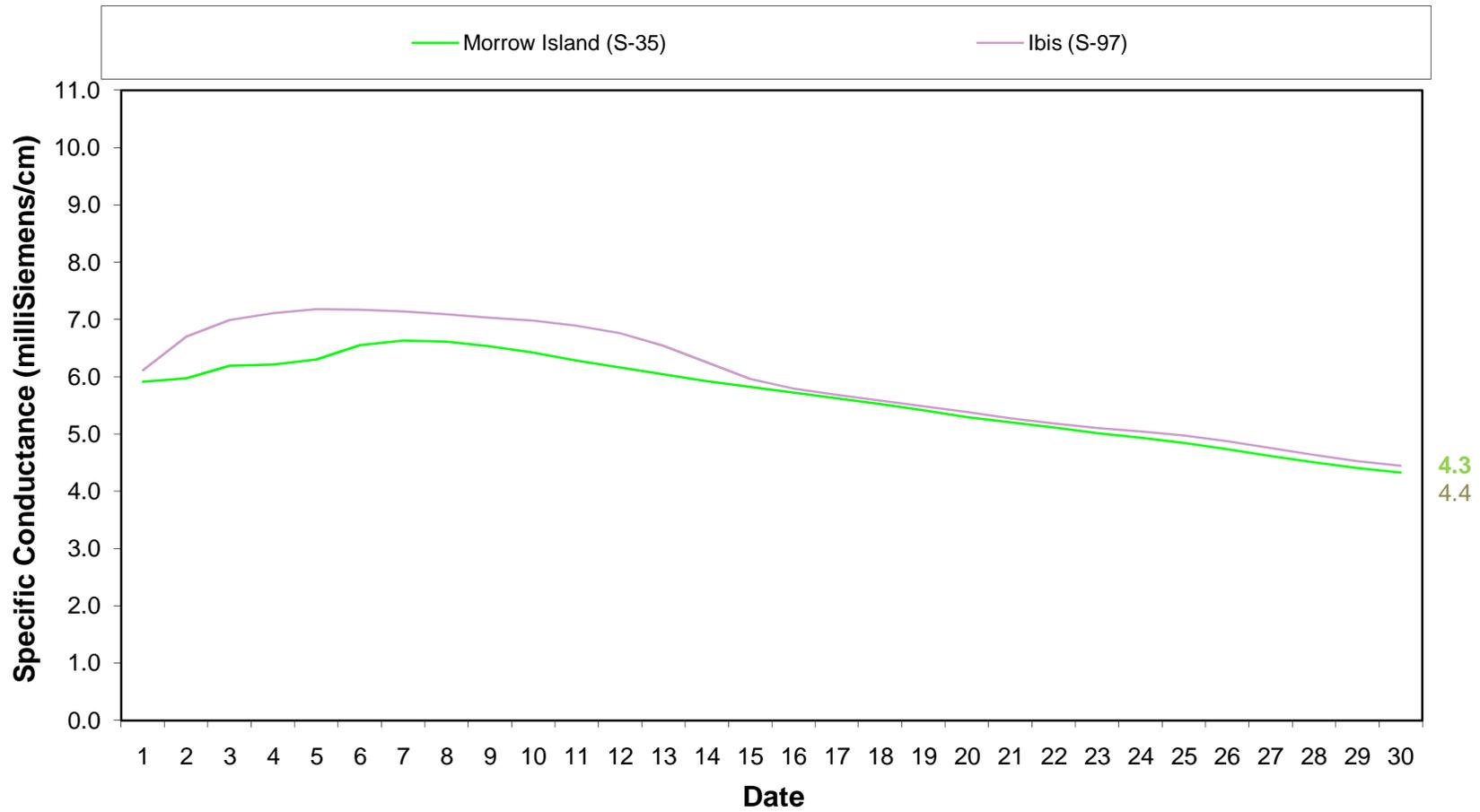
*milliSiemens per centimeter

**Figure 1. Suisun Marsh Daily Mean High Tide Specific Conductance
April 2010**

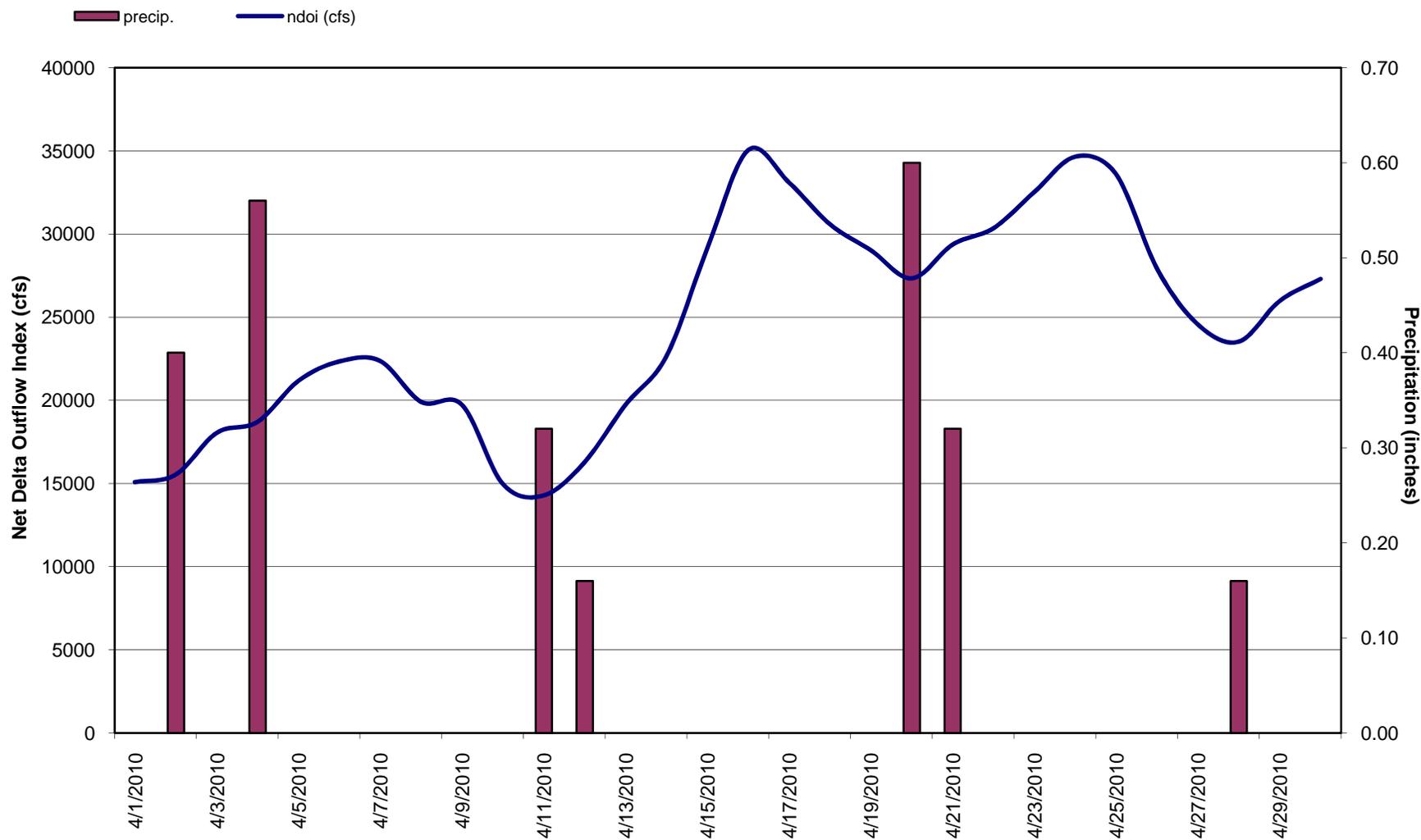
Standard = 14.0 (Deficiency)



**Figure 2. Suisun Marsh Daily Mean High Tide Specific Conductance
April 2010**

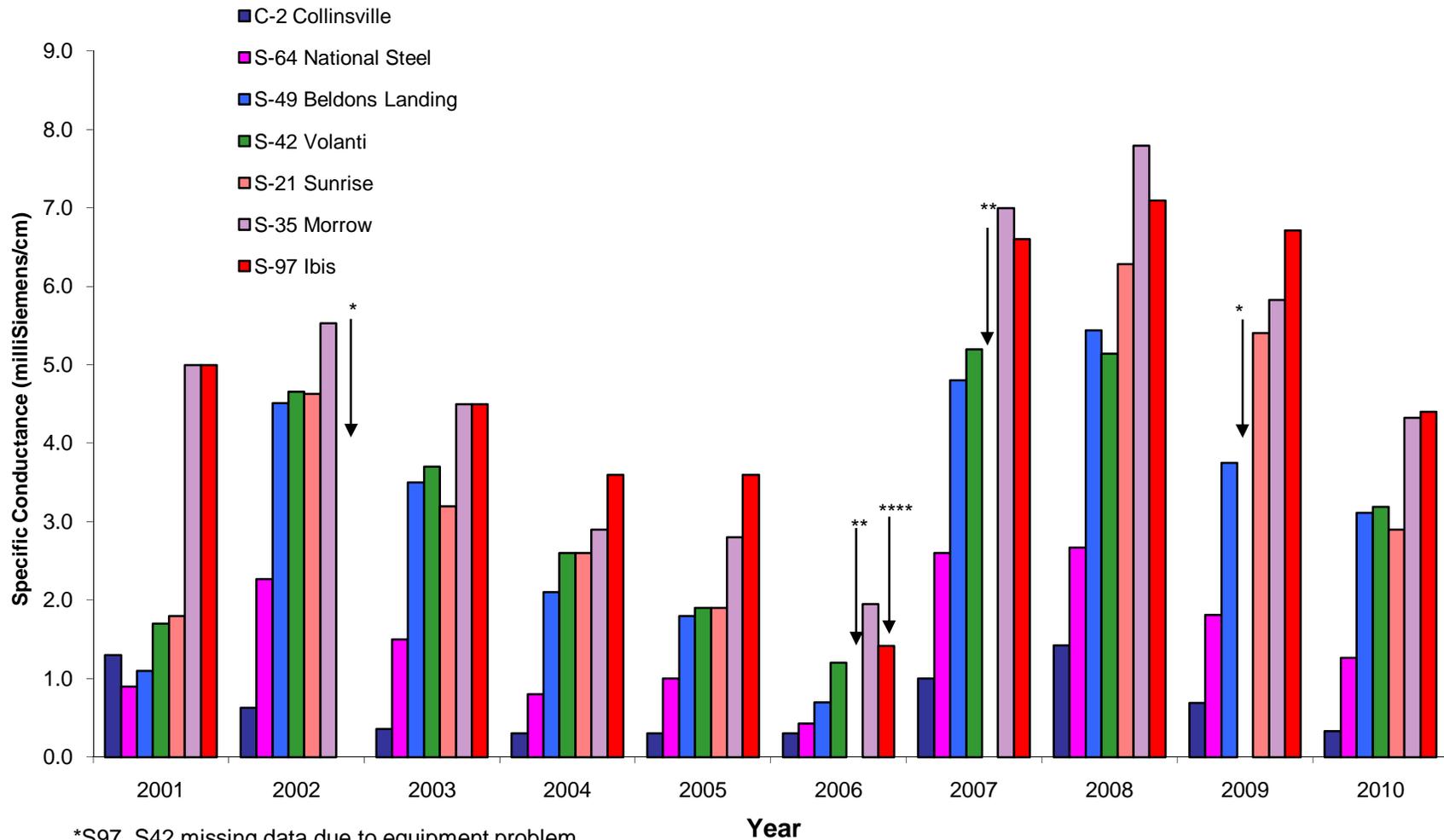


**Figure 3. Daily Net Delta Outflow Index and Precipitation*
April 2010**



*Preliminary DWR, O&M Delta Outflow data and precipitation from Stockton Fire Station.

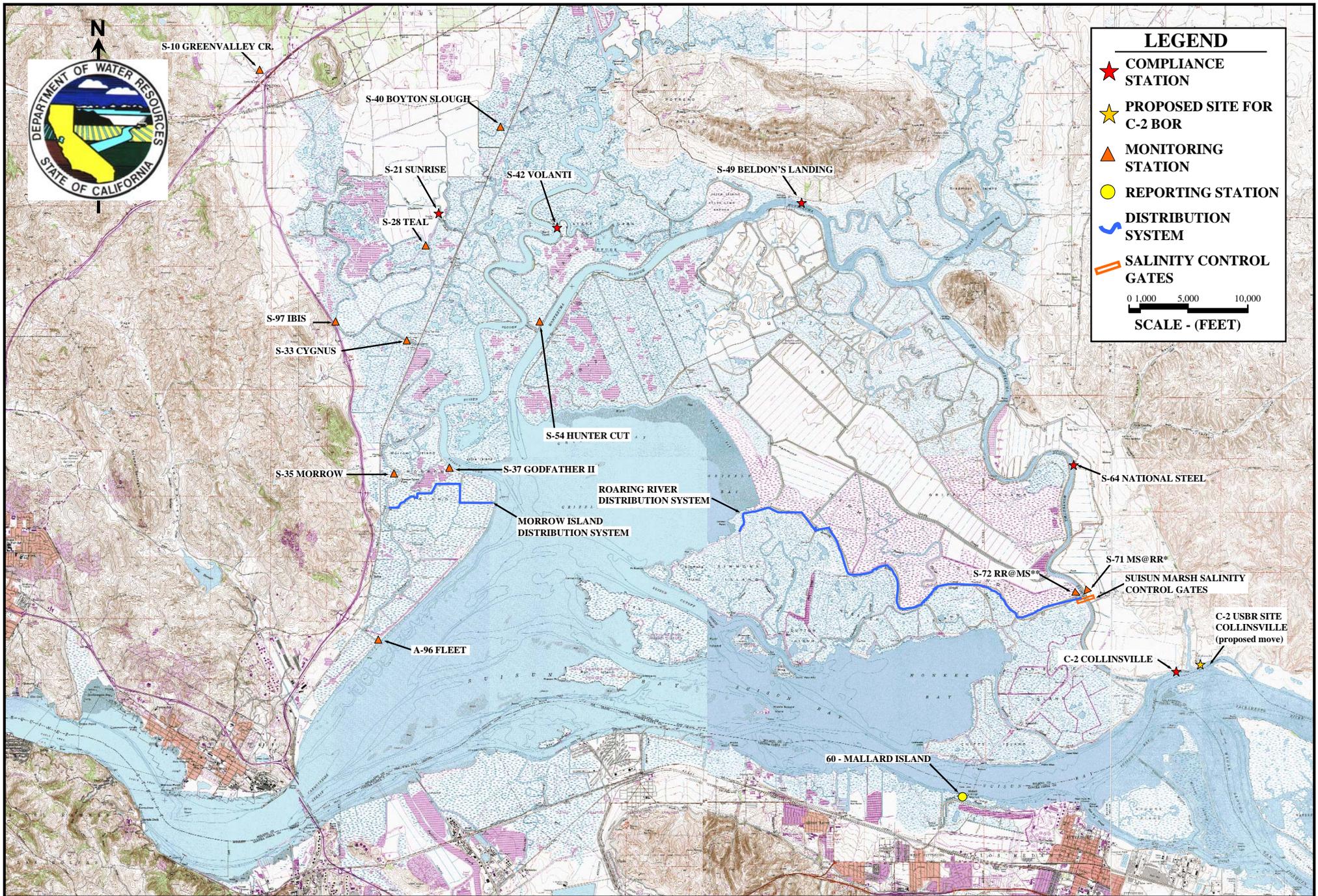
**Figure 4. Monthly Mean Specific Conductance at High Tide
Comparison of Monthly Values for Selected Stations
April of 2001-2010**



*S97, S42 missing data due to equipment problem.

**S21 data not available due to flooded roads.

****S97 data not representative of end of month value due to missing data within the month.



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