
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: November 2010

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TABLE OF CONTENT

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT1

2. MONITORING RESULTS.....2

 2.1 CHANNEL WATER SALINITY COMPLIANCE2

 2.2 DELTA OUTFLOW2

 2.3 RAINFALL3

 2.4 SUISUN MARSH SALINITY CONTROL GATE (SMSCG) OPERATIONS3

3. DISCUSSION.....3

 3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH3

 3.2 OBSERVATIONS AND TRENDS.....4

 3.2.1 *Conditions during the Reporting Period*.....4

 3.2.2 *Comparison of Reporting Period Conditions with Previous Years*.....4

4. List of Figures

- Figure 1: Suisun Marsh Progressive Mean High Tide Specific Conductance for compliance stations
- Figure 2: Suisun Marsh Progressive Mean High Tide Specific Conductance for monitoring stations
- Figure 3: Daily Net Delta Outflow Index and Precipitation
- Figure 4: 10-yr Comparison of Monthly Values of Monthly Mean Specific Conductance at High Tide for compliance and monitoring stations
- Figure 5: Map of compliance and monitoring stations, and control facilities in Suisun Marsh

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of November, 2010, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of (Table 1). Compliance with standards for the month of October 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 were 15.5 mS/cm and 16.5 mS/cm for S-21 and S-42 during November 2010. 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 November 2010 ranged between 3,000 cfs and 15,000 cfs. The first precipitation event resulted outflow to increase to about 8,000 cfs in mid-November before dropping off to about 3,000 cfs thereafter. The next several precipitation events raised outflow to increase in the second half of the month to a peak flow of about 15,000 cfs then decreased to end the month around 10,000 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 November 2010 is listed below:

Month	Mean NDOI (cubic feet per second)
November	6,999

2.3 Rainfall

November 2010 rainfall total at the Fairfield Treatment Plant was more than last year total. This is a welcoming rain since November monthly totals for the past years have been dry. Rainfall activities occurred in mid and late November with most of the events in late November. The largest daily total was around 1.00 inches on occurred on November 21. The monthly total is below:

Month	Total Rainfall (inches)
November	2.50

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

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

Date	Gate status	Flashboards status	Boat Lock status
November 1 – 15	3 Open	In	Open
November 16 – 30	2 – Tidally operate 1- Closed	In	Open

The gates were not operated until mid-November due to salinity concern at compliance station S49 (Beldons Landing). At the onset of gate operation, the gates had electrical problems and were operating sporadically. Delta Field Division (DFD) resolved the problem for gate 2, but gate 3 remained out of service and placed in the closed position until repair work can be done by DFD staff. The gates operated for the remainder of the month with gate 3 in the closed position. Details of gate problems and actions taken during this month were summarized and notified via email transmittal by DWR, Operations Control Office to the SMPA four agencies along with USFWS.

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,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During November 2010 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) ranged between 6.0 mS/cm and 16.0 mS/cm as shown in Figure 1. Salinity levels were stable throughout the month at S21, S42, and S49, whereas at C-2 and S64 stations, salinity levels had minor changes. The salinity level dropped that occurred later in the month at most compliance stations were results of high outflow from runoffs. The controlling station for November was S49 and with the onset of gate operations in mid-November along with rainfall events in the second half of November allowed DWR to squeak by the November standard at S49 by .03 mS/cm.

Monitoring stations, S35 and S97 salinity levels were stable throughout November too and ranged between 16.0 mS/cm and 17.0 mS/cm as shown in Figure 2.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for November 2010 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations resembles that of 2009. Compared to previous nine years, November 2010 salinity levels overall were ranked third in high Specific Conductance. Unlike past years, the higher salinity for November 2010 is probably a result of operating on a knife's edge to balance fish concerns and salinity standard. But salinity standard was not compromised in the overall operational decisions.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****November 2010**

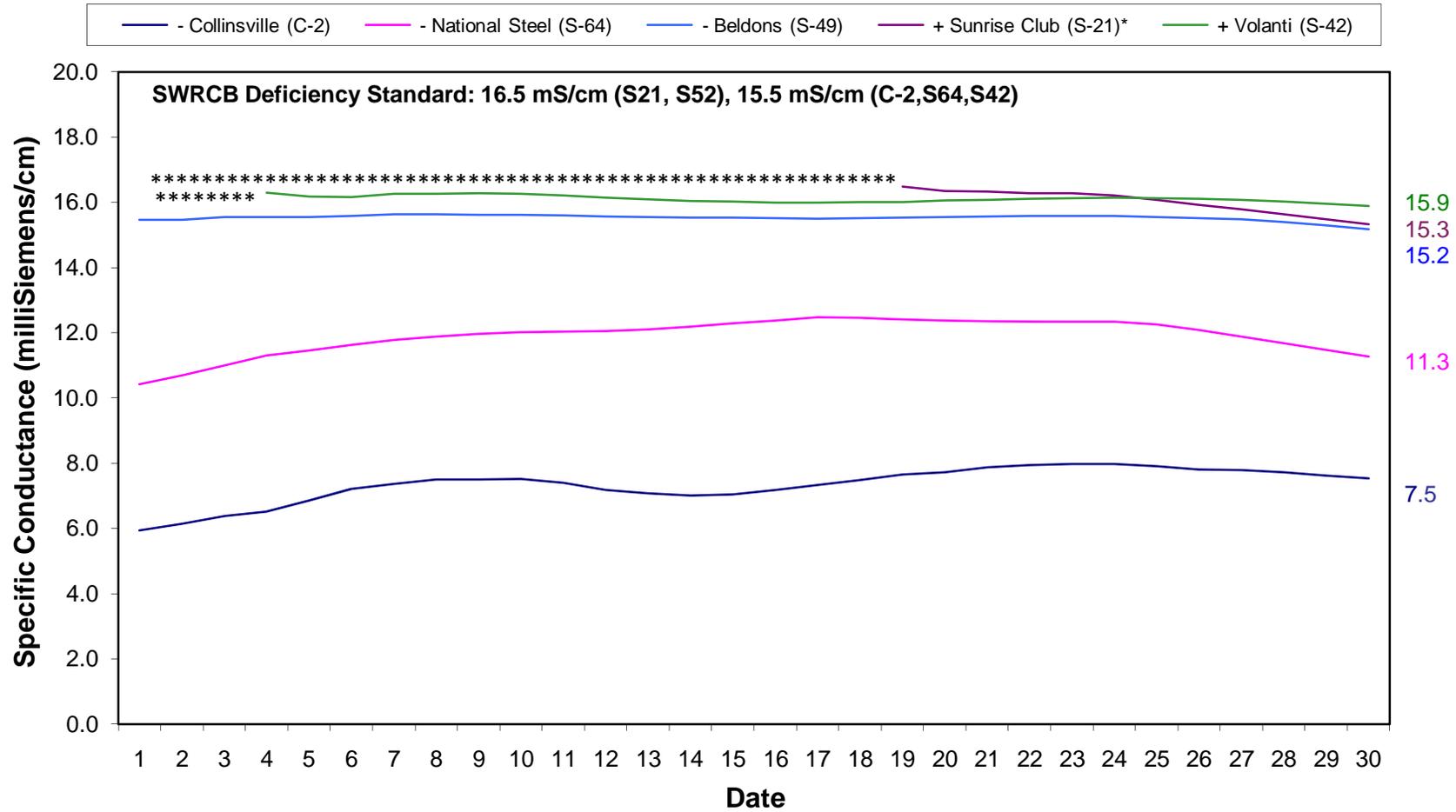
Station	Specific Conductance (mS/cm)*	Deficiency Standard	Deficiency Standard meet?
C-2**	7.5	15.5	Yes
S-64	11.3	15.5	Yes
S-49	15.2	15.5	Yes
S-42***	15.9	16.5	Yes
S-21***	15.3	16.5	Yes

*milliSiemens per centimeter

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

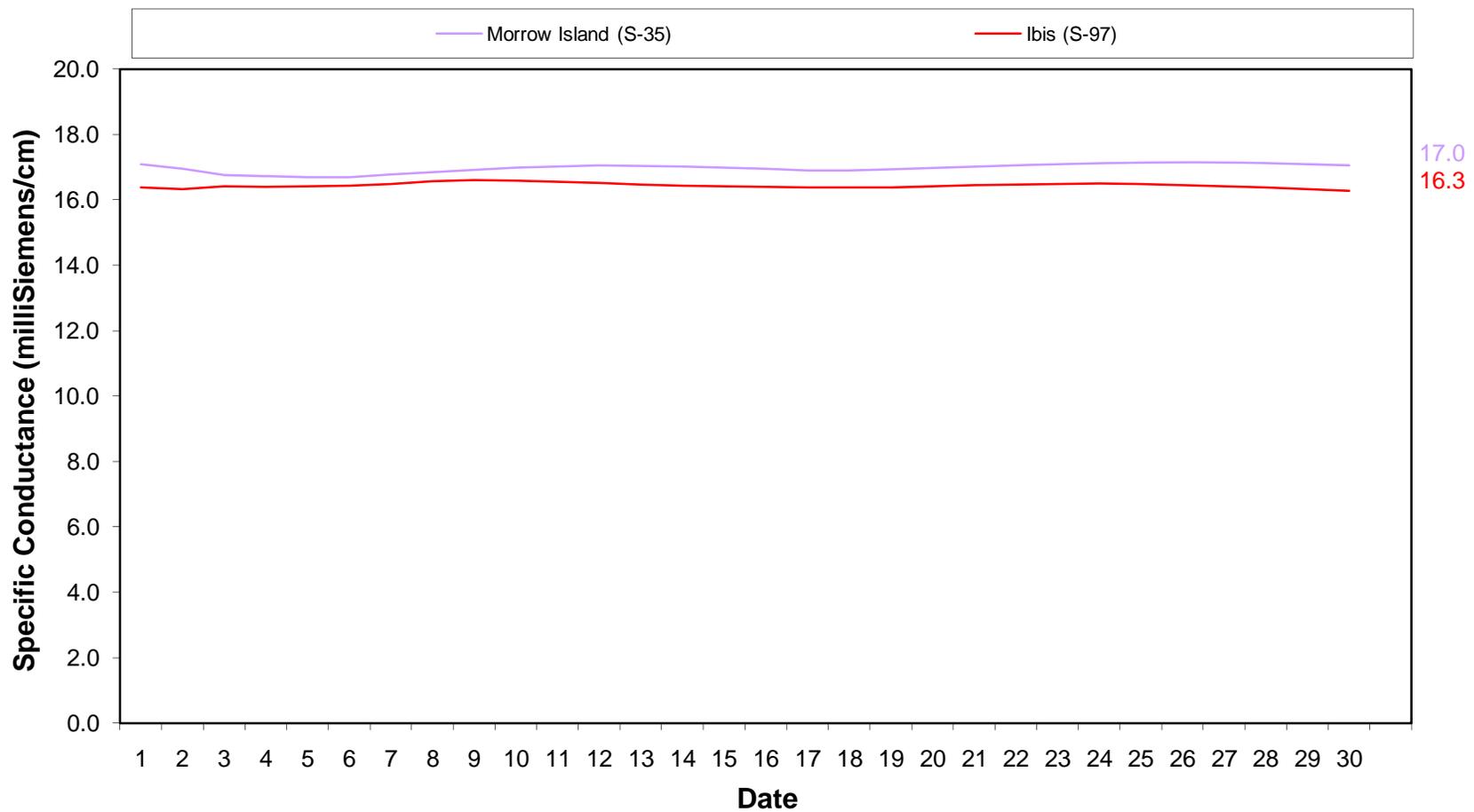
***value does not represent end of month value due to missing data; however more than likely the standard was met at these stations because neighboring stations salinity indicate that salinity levels were stable for the most part of the month.

Figure 1 - Suisun Marsh Progressive Mean High-Tide Specific Conductance for November 2010

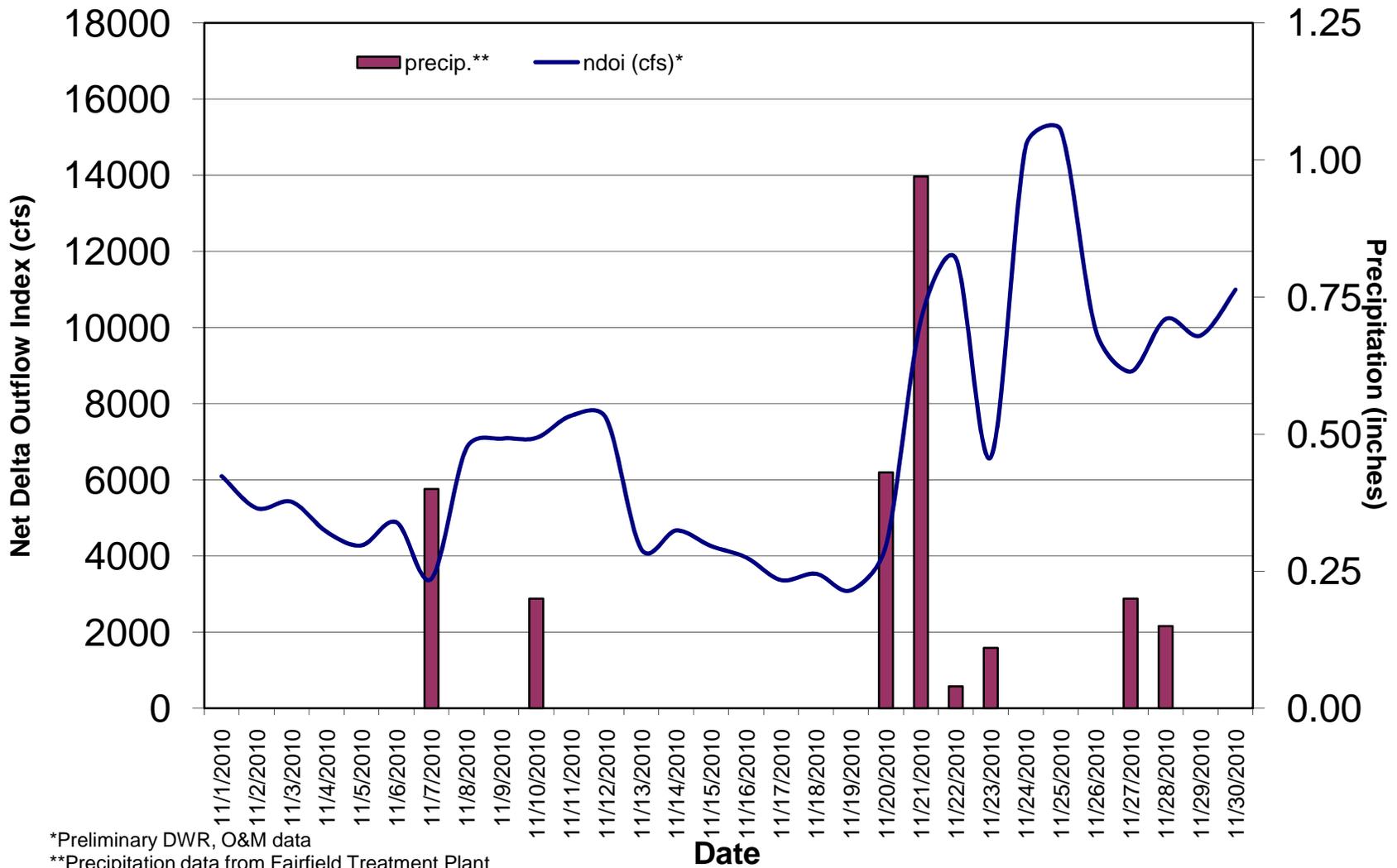


****data failed QA/QC.

**Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance
at Monitoring Stations S35 and S97
November 2010**



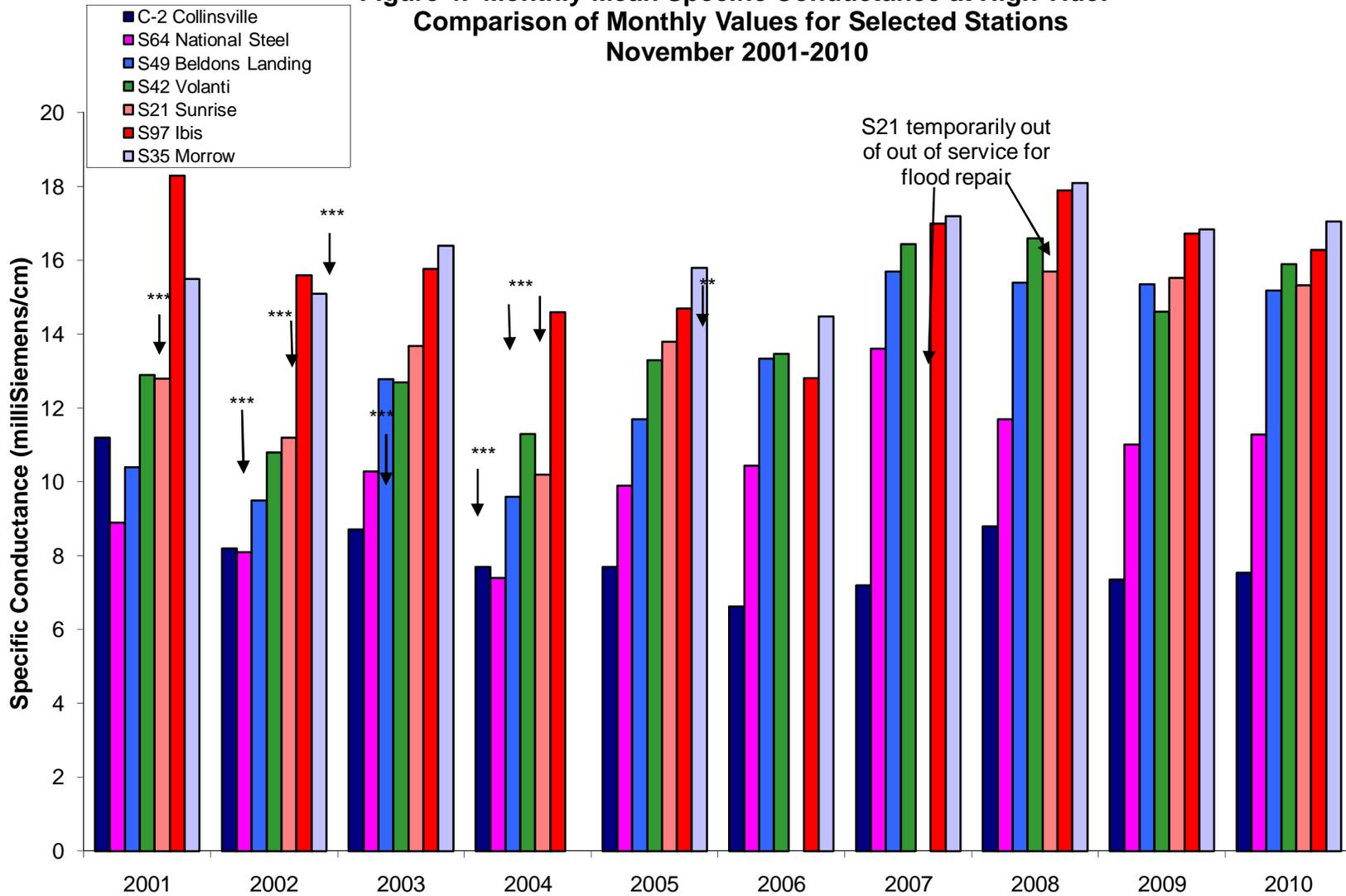
**Figure 3. Daily Net Delta Outflow Index and Precipitation
November 2010**



*Preliminary DWR, O&M data

**Precipitation data from Fairfield Treatment Plant

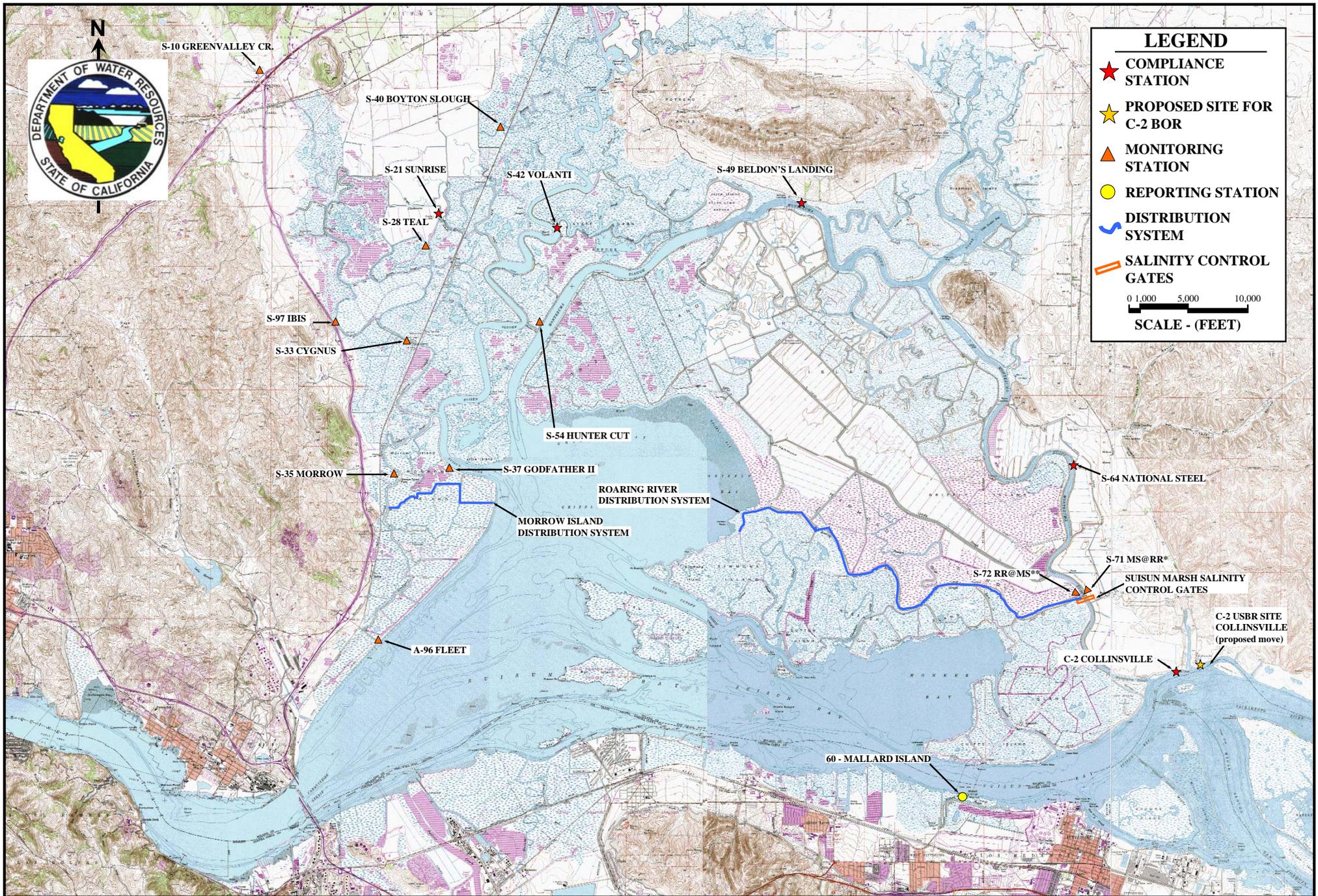
**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
November 2001-2010**



Note that certain stations do not reflect the actual end pdm.

** Data was not obtained due to powder problems at the station.

*** Some data not obtained due to equipment malfunction.



**SUISUN MARSH PROGRAM WATER QUALITY
MONITORING AND CONTROL FACILITIES**