
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: November 2007

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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 November, 2007, salinity conditions at only four compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). The fifth compliance station, Beldons Landing (S-49), exceeded the standard. Compliance with standards for the month of November 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, was 15.5 mS/cm and for S-42 and S-21, was 16.5 mS/cm during November 2007. 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 2007 was low this time of year. The range was between 3,000 cfs and 4,500 cfs for most of the month with a short period of increased outflow between November 11 and 13 as a result of runoffs from the one day precipitation event with a peak outflow of about 10,400 cfs as shown in Figure 3. Thereafter, outflow dropped sharply and remained below 4,300 cfs for the remainder of the month. 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 2007 is listed below:

Month	Mean NDOI (cubic feet per second)
November	4,672

2.3 Rainfall

Unlike past years, November 2007 was extremely dry. There was only one day of precipitation during November. It occurred on November 11 with a daily total of 0.92 inches, which also was the monthly total for November. The monthly total is shown below:

Month	Total Rainfall (inches)
November	0.92

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during November 2007 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
November 1 – 29	Open	Out	Closed
November 30	3 gates tidally operated	In	Open-24/7

Efforts to start flashboards installation and gate operations were initiated in late October due to anticipated salinity level raises throughout the marsh as a result of dry weather conditions and low outflows. However, there were some delays in the internal process with respect to the contract and resulted the gates not to operate until November 30, 2007. At such time, the effect of the gates to control salinity in November was futile. DWR will continue to monitor and operate the gates as needed to control salinity and meet monthly standards for the remainder of the 2007-2008 control season.

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 November 2007 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 17.0 mS/cm as shown in Figure 1. Salinity levels started off high at all stations, both compliance and monitoring, and remained stable throughout the month. There was a slight drop in salinity at S-64 in mid-November, but at C-2 salinity started off about 7.0 mS/cm and slightly increased to about 7.4 and holding steady for the remaining month.

Overall, salinity levels in November 2007 were higher than past year salinity. Despite of the delay in gate operations, we were able to meet monthly standard at four of the five compliance stations. S-49 was the only compliance station where standard for November was exceeded, and the amount was small (i.e. by 0.2 mS/cm). The monthly standard at S-49 was 15.5 mS/cm, but the end of month value was 15.7 mS/cm.

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 November 2007 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 2006, but at a higher magnitude. Compared to previous nine years, November 2007 salinity levels were ranked first in high Specific Conductance, thus making it the month with the

tenth lowest salinity levels. Unlike the past nine years, higher salinity is observed at most of the compliance stations for November 2007 as shown in Figure 4, and is probably a result of delay gate operations in support of fish passage. Thus, allowing more salinity intrusion but salinity standards will not be compromised in the overall operational decisions.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****November 2007**

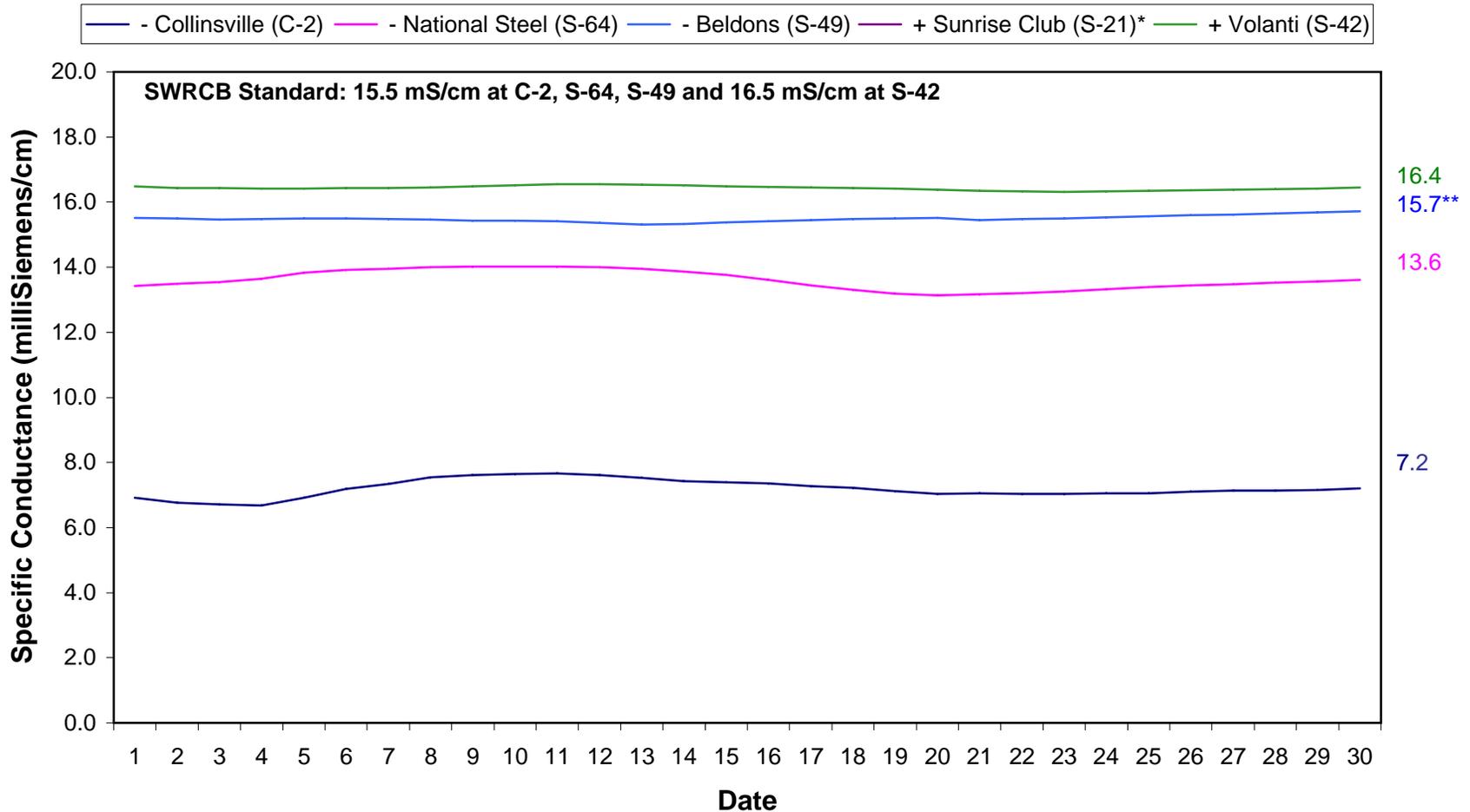
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	7.2	15.5	Yes
S-64	13.6	15.5	Yes
S-49	15.7	15.5	No
S-42	16.4	16.5	Yes
S-21***	n/a	n/a	n/a

*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.

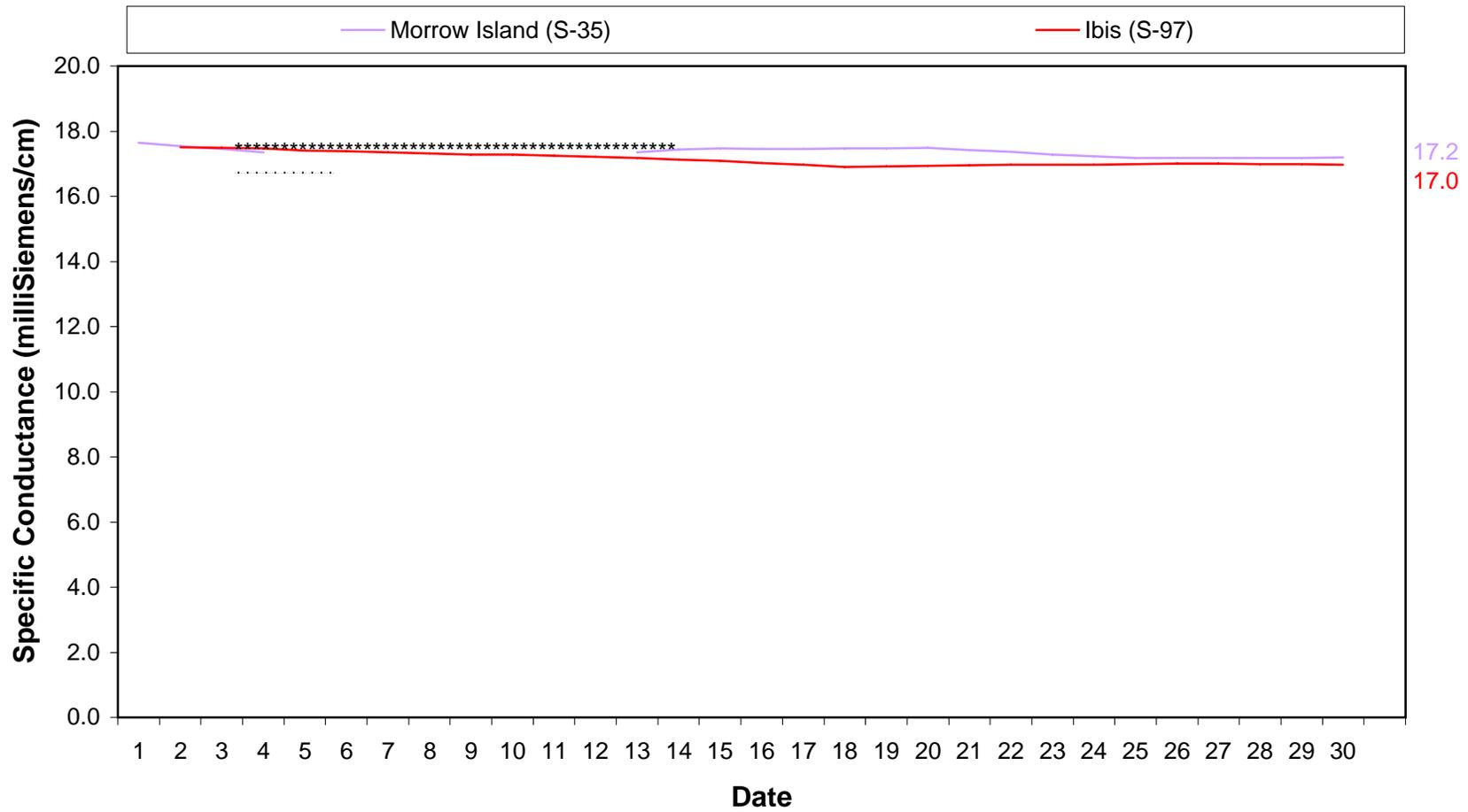
Figure 1 - Suisun Marsh Progressive Mean High-Tide Specific Conductance for November 2007



*S21 station is temporarily out of service . S42 is a surrogate for C-21

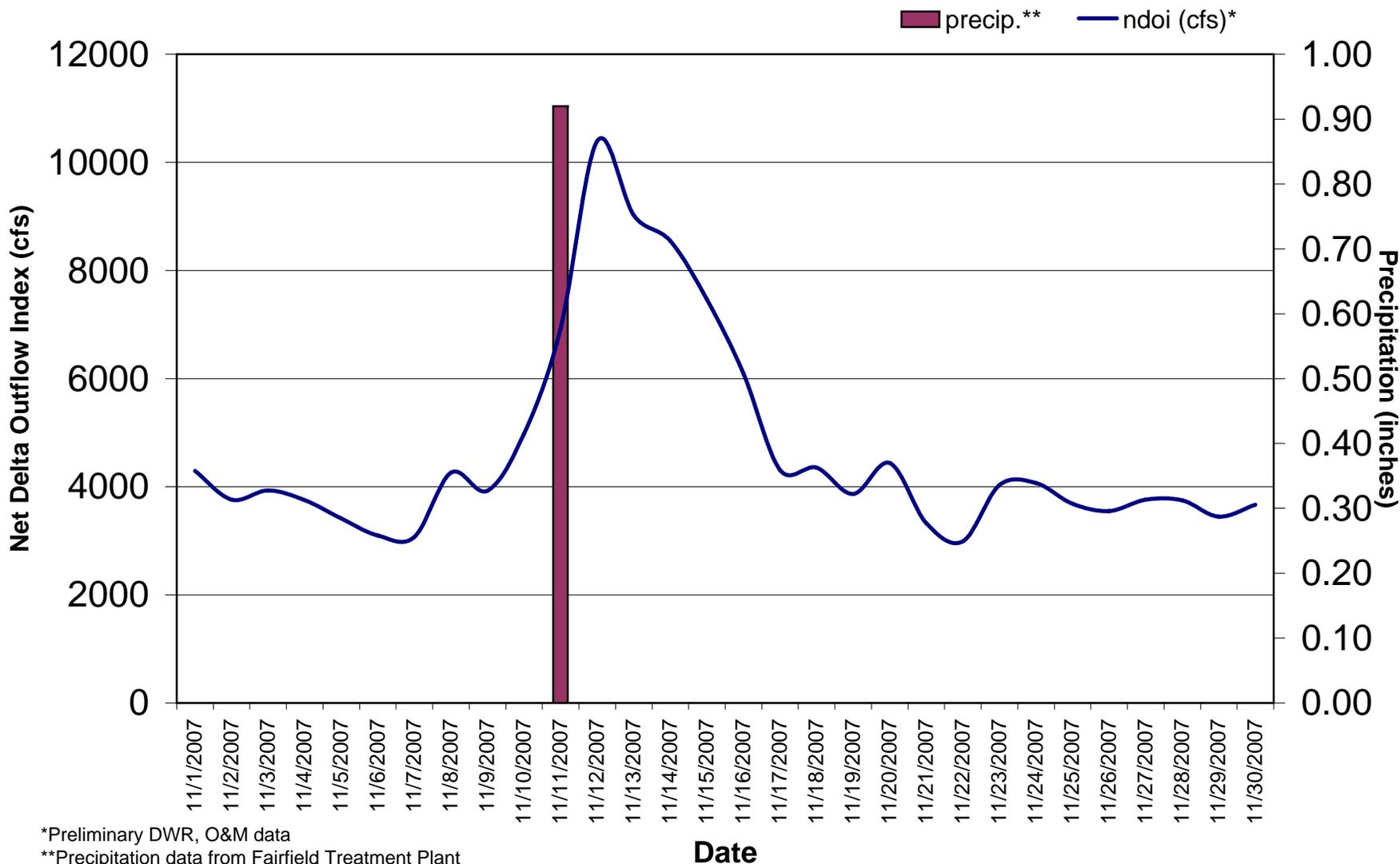
**Beldons station exceeded the standard by 0.2 mS/cm.

Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance at Monitoring Stations S35 and S97 November 2007



*****missing data at S35 due to equipment
problem

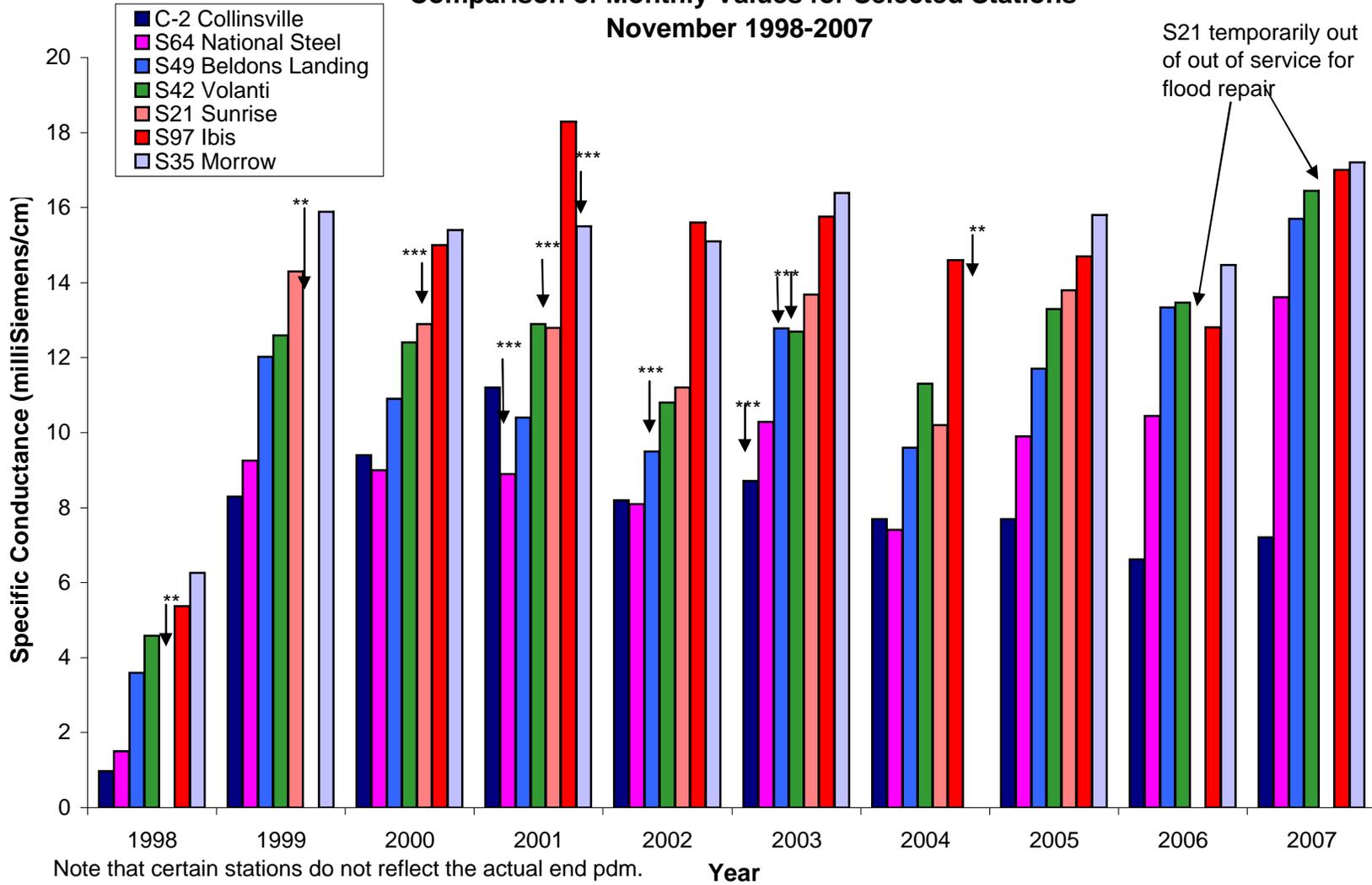
**Figure 3. Daily Net Delta Outflow Index and Precipitation
November 2007**

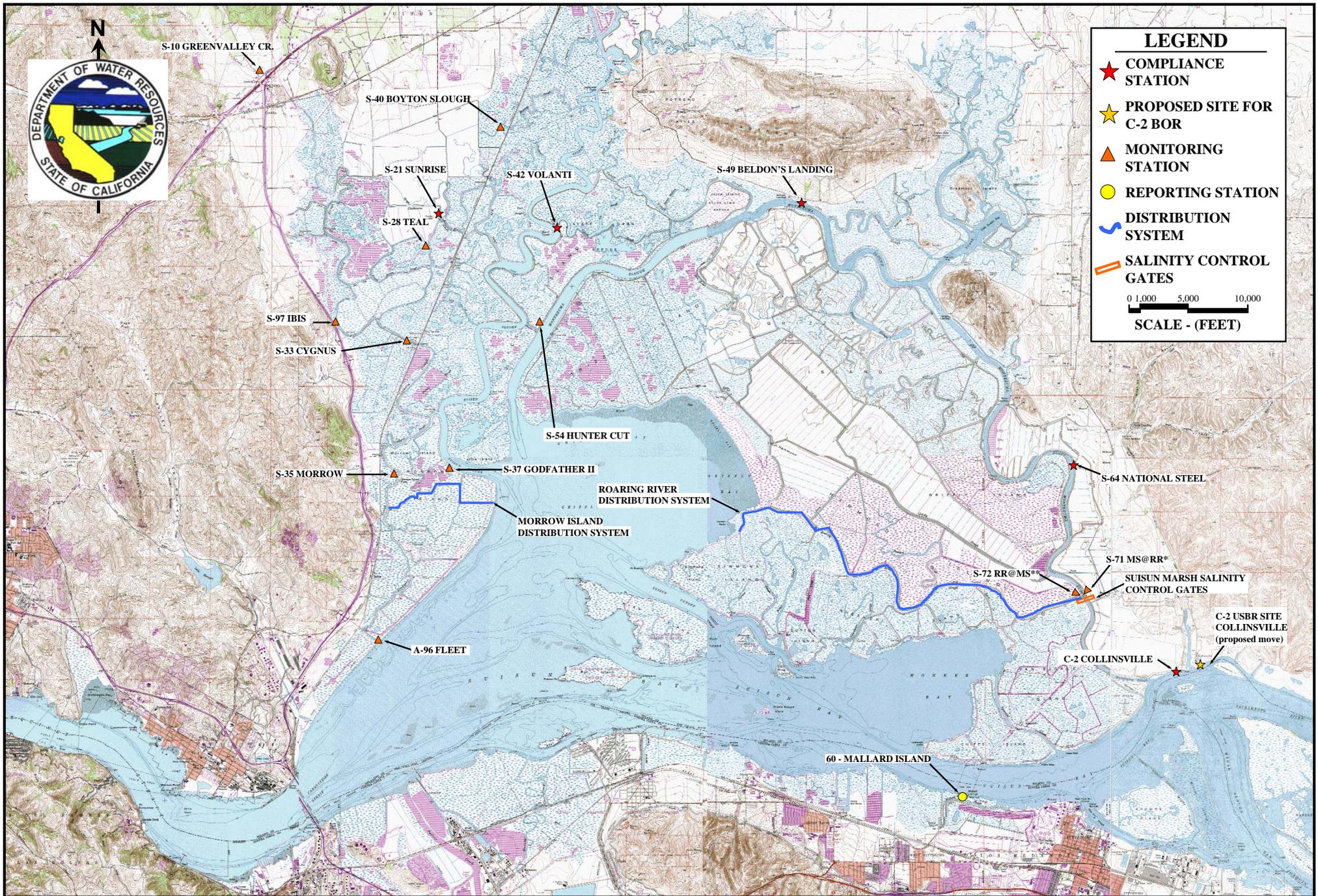


*Preliminary DWR, O&M data

**Precipitation data from Fairfield Treatment Plant

**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
November 1998-2007**





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