
**Suisun Marsh Monitoring Program
Channel Water Salinity Report**
Reporting Period: November 2005

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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. Specific electrical conductivity is referred to in the reports as "specific conductance". 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:

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, 2005, 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 November was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (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-42 and S21 during November 2005. 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 2005 started off low around 3,500 cfs and remained below 6,000 cfs until November 10, where it increased to a monthly high of about 8,400 cfs for a few days as a result of a 0.8 inches of precipitation event that occurred on November 8. NDOI decreased dramatically from 8,400 cfs to 4,000 cfs between November 12 and 15 due to no precipitation event. Thereafter, NDOI gradually increased and ended the month around 8,000 cfs. The gradual increase from mid-November to the end of the month was a result of both reduced exports and additional precipitation events towards the end 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 is listed below:

Month	Mean NDOI (cubic feet per second)
November	5,384

2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during November 2005 was favorable, but 1.2 inches short of last year November total. The largest precipitation occurred on November 8 with the daily total of 0.80 inches.

Month	Total Rainfall (inches)
November	2.16

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during November 2005 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
November 1 - 8	Open	Out	Closed
November 9 – 13	Open	Installed	Closed
November 14 -30	Operating	Installed	Open

During the first week of November 2005, SMSCG operation was not initiated until November 14 because water quality conditions in the marsh were favorable and salinity levels were not an immediate concern. After the installation of the flashboards on November 9, salinity levels began to increase at a level enough to alert and warrant gate operations. Gate operation commenced on November 14 and continues for the remainder of November.

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 2005, salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), Sunrise Club(S-21), and Volanti(S-42) were no higher than 16.0 mS/cm as shown in Figure 1. At the two monitoring stations, S-97 and S-35, salinity levels were below 17.0 mS/cm as shown in Figure 2. For the first half of November, salinity levels stabilized at both eastern and western marsh stations. In mid-November, salinity levels began to decrease from east to central marsh stations as a result of gate operations, except for C-2, where C-2 salinity was stabilized throughout November. The western marsh stations, S97 and S35 salinity levels did not respond to gate operation at all. The slight amount of salinity decreased at S97 from November 20 and beyond was attributed from stream runoffs resulting from precipitation events during the month. Salinity level at S35 is higher than S97 mid-month because S35 does not get any stream runoff effect like S97. In addition, S35 gets higher saline water from the Bay via the DFG Grizzly land located southwest of Goodyear Slough and gate operation has minimal effect.

Overall, salinity levels were 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 November 2005 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations resembles that of 1999. Compared to previous nine years, November 2005 salinity levels were ranked third in high Specific Conductance.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****November 2005**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	7.7	15.5	Yes
S-64	9.9	15.5	Yes
S-49	11.7	15.5	Yes
S-42	13.3	16.5	Yes
S-21	13.8	16.5	Yes

*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 for November 2005

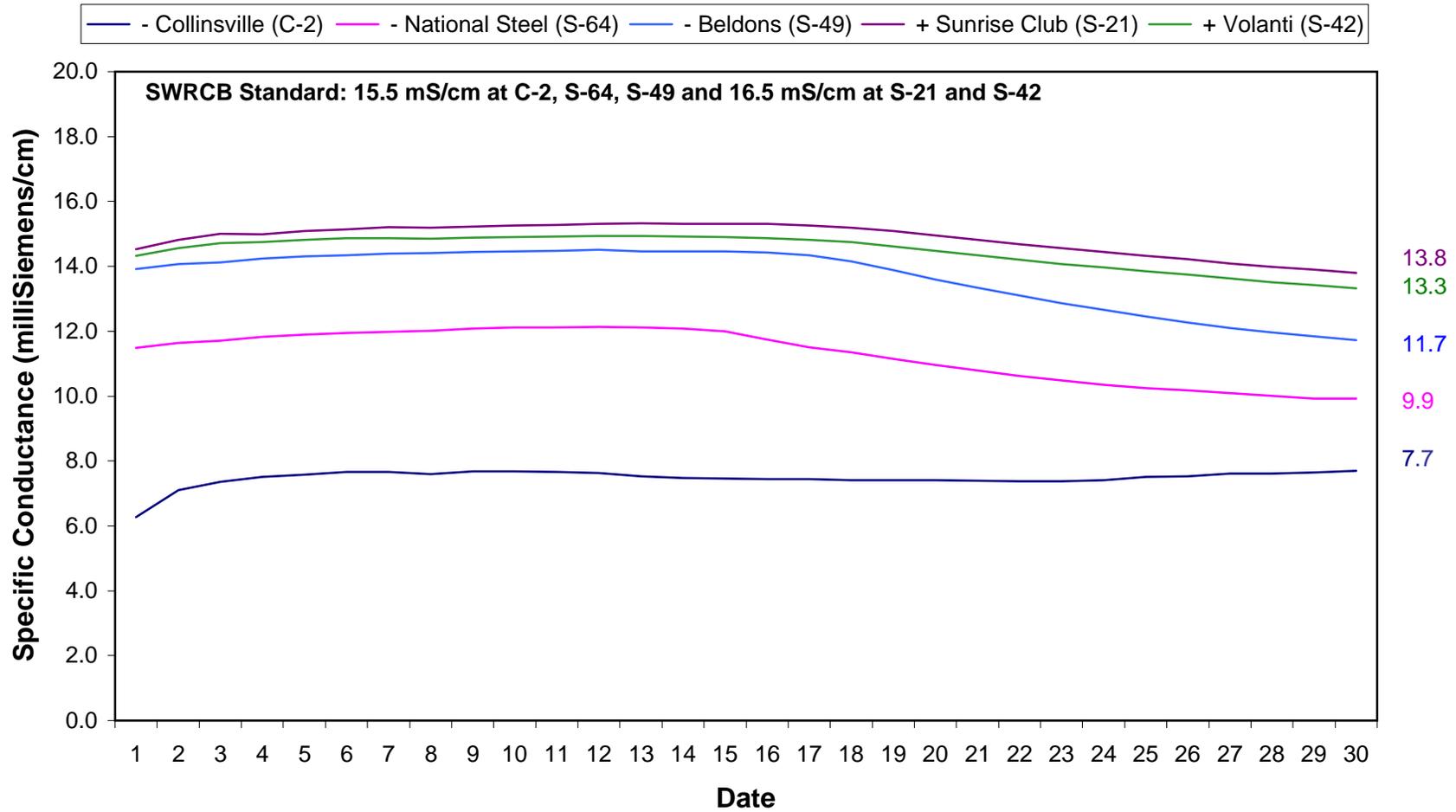
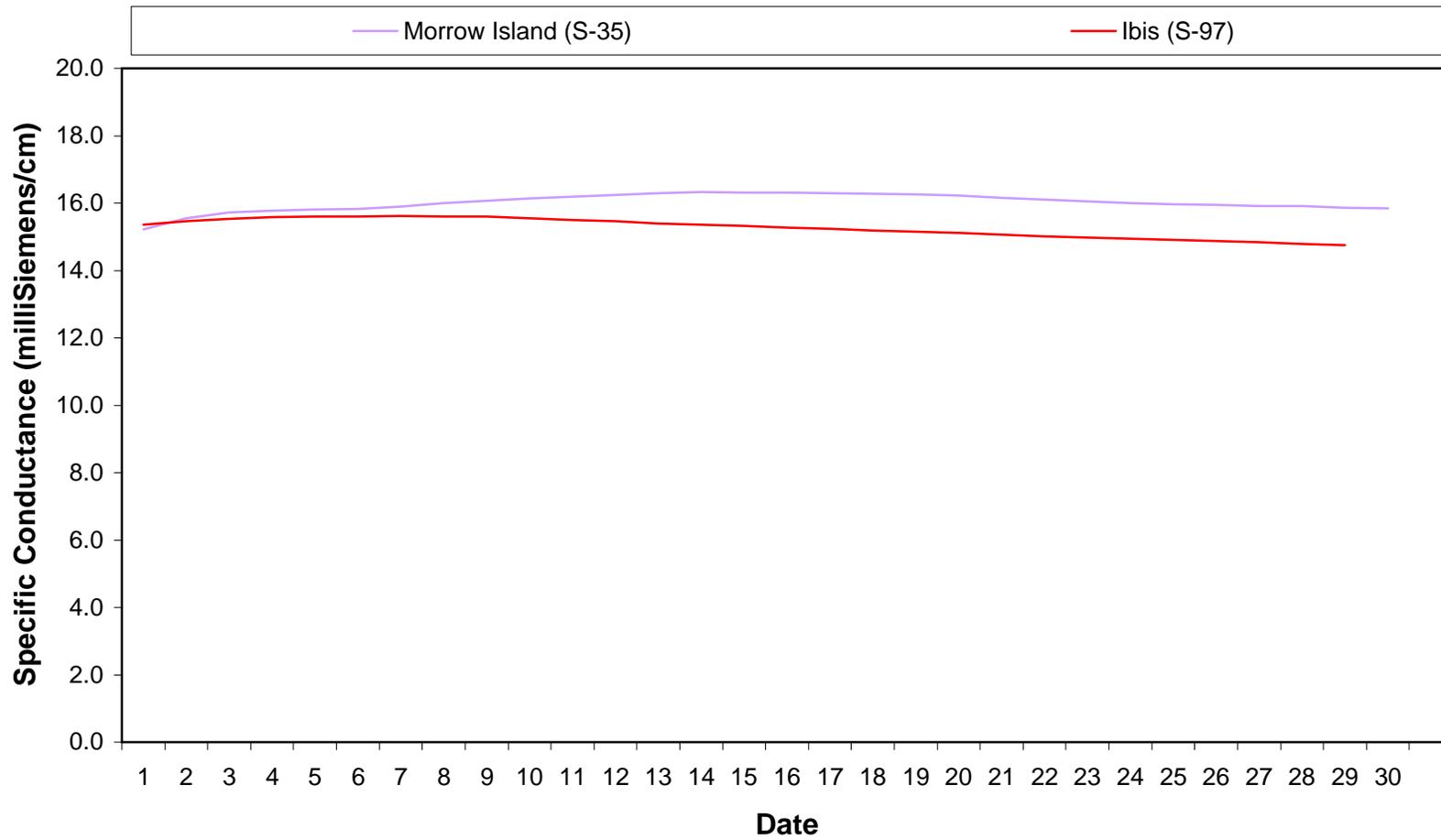
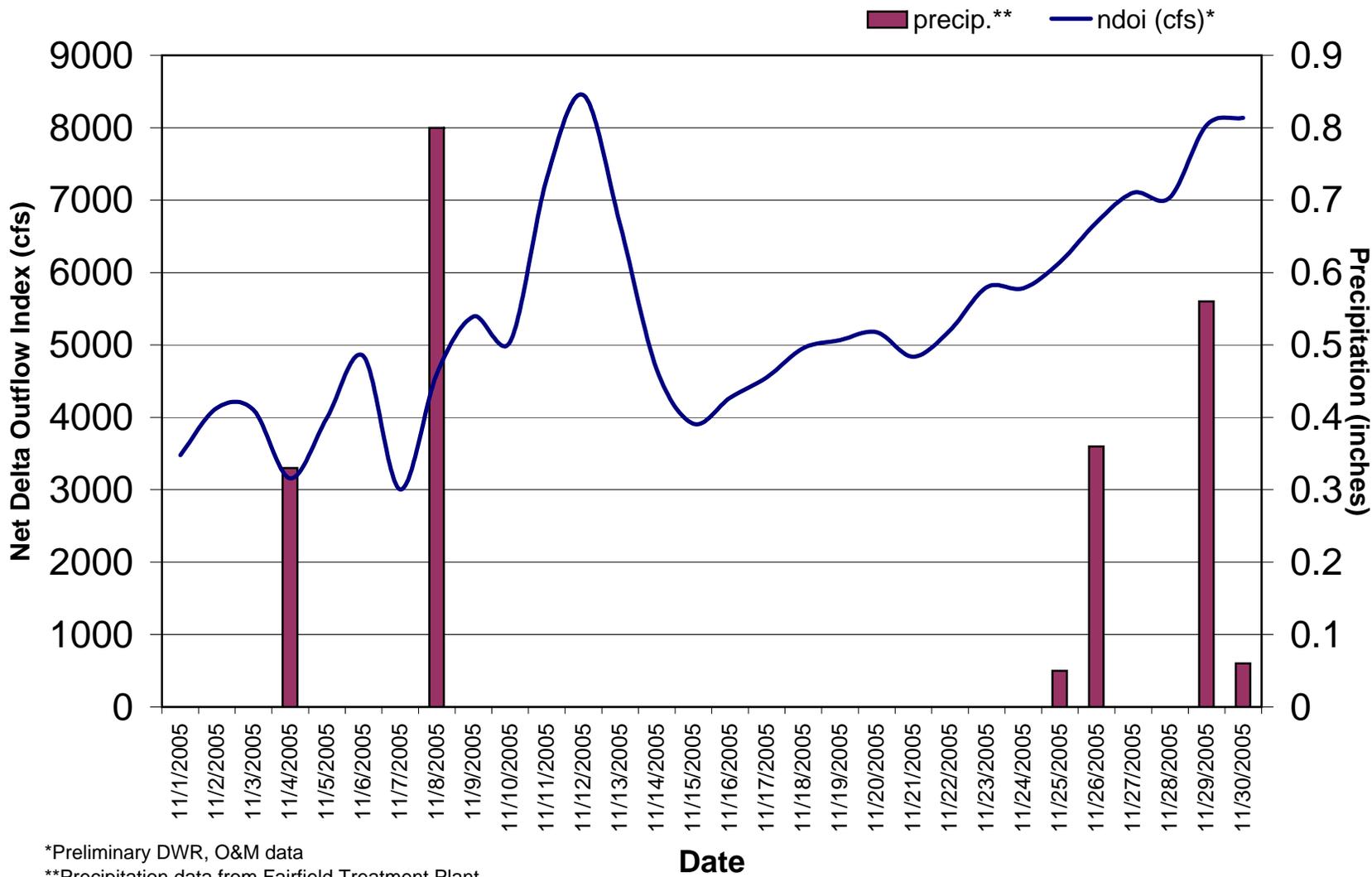


Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance at Monitoring Stations S35 and S97 November 2005



**Figure 3. Daily Net Delta Outflow Index and Precipitation
November 2005**

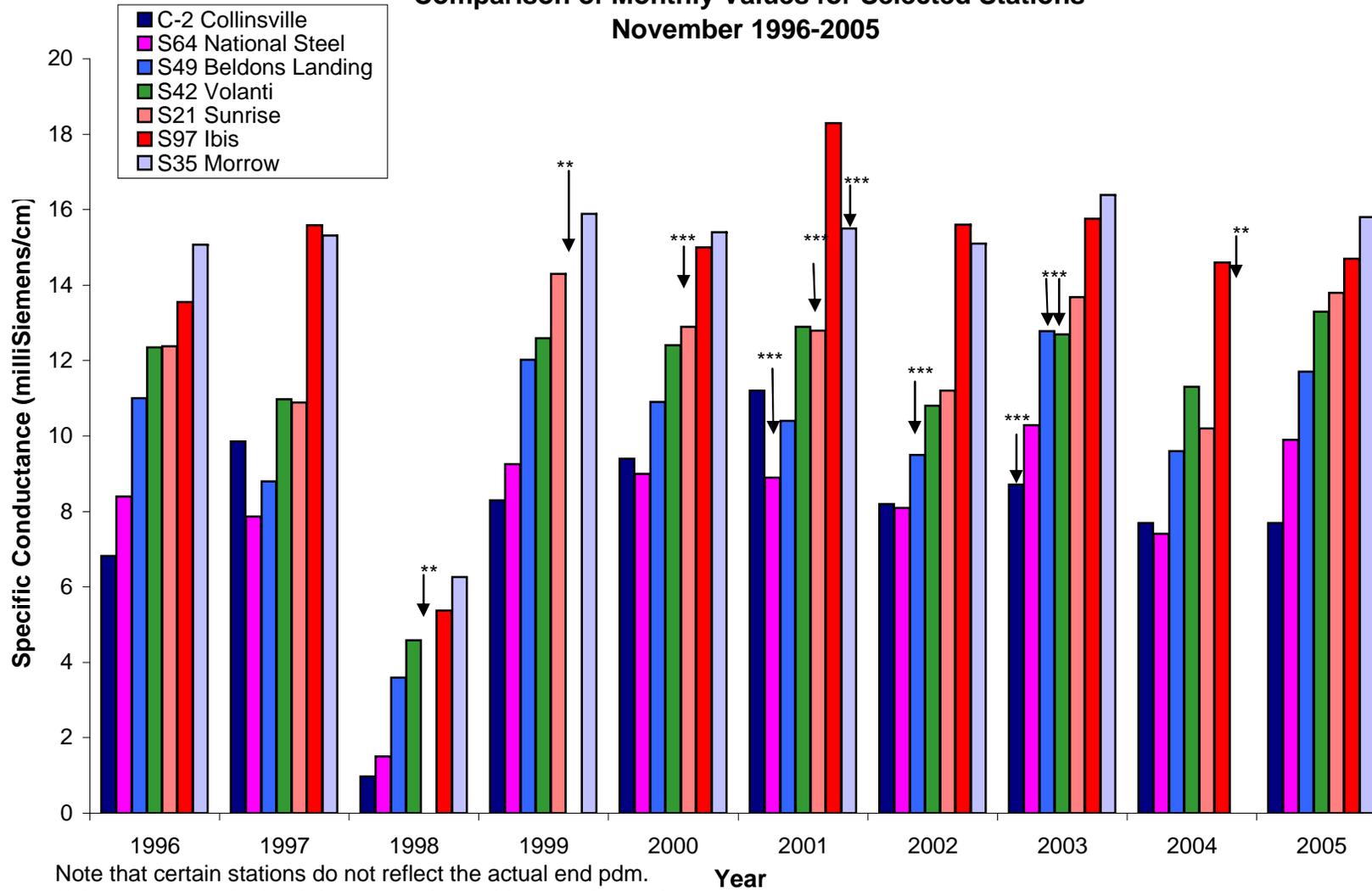


*Preliminary DWR, O&M data

**Precipitation data from Fairfield Treatment Plant



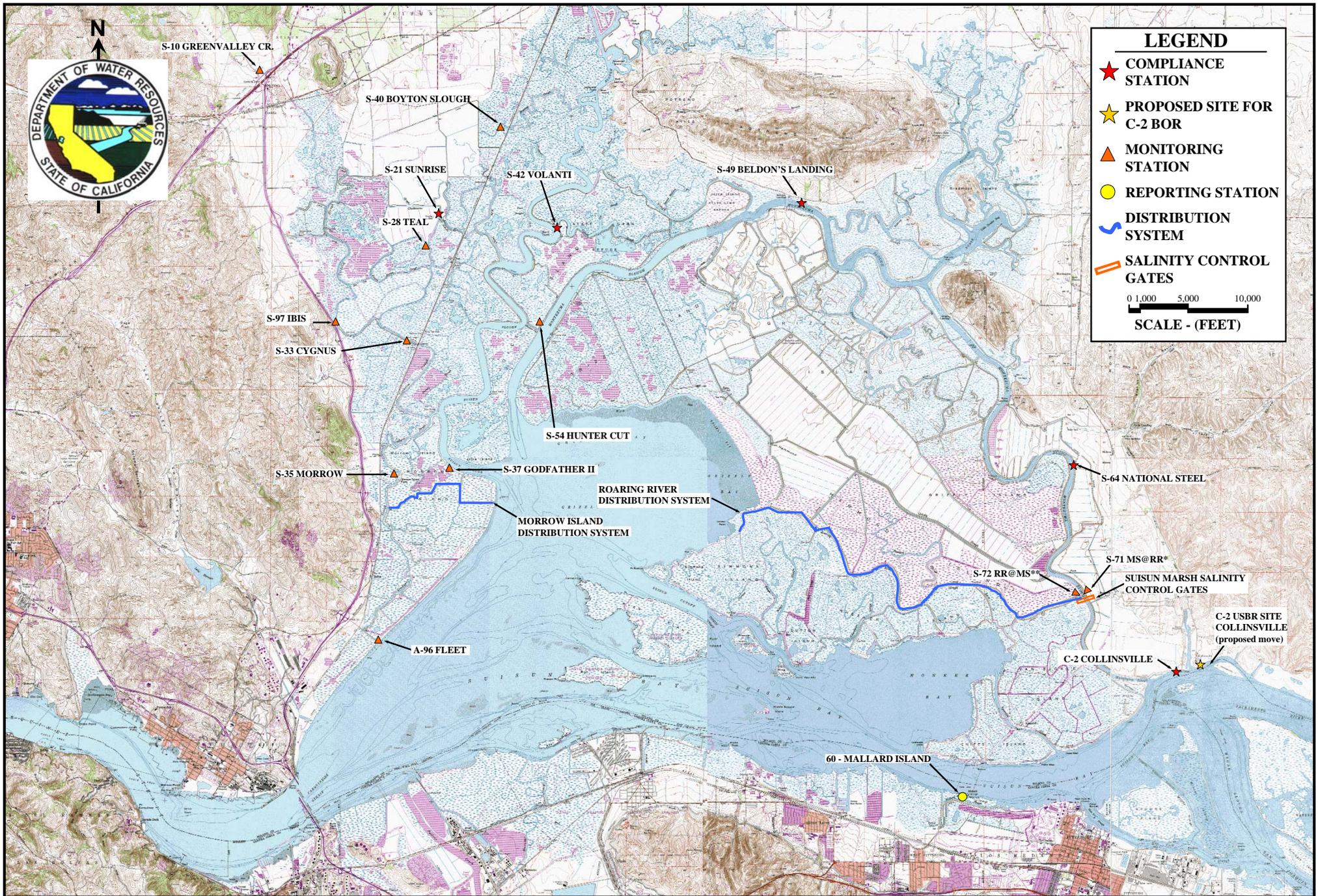
**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
November 1996-2005**



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.



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