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# **Suisun Marsh Monitoring Program Channel Water Salinity Report**

Reporting Period: January 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.

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\* 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 January, 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 December 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, S-42, and S-21 was 12.5 mS/cm during January 2011. 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 January 2011 started off high, above 70,000 cfs, but thereafter gradually dropped to about 30,000 cfs by mid-month and continue to decline at a less steeper slope to end the month around 20,000 cfs. The high outflow at the beginning of January was carryover flows from a wet December because precipitation was minimal in January as shown in Figure 3 that outflow continued to drop for the entire 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 January 2011 is listed below:

Month	Mean NDOI (cubic feet per second)
January	40,959

## 2.3 Rainfall

Rainfall data are recorded from Fairfield Water Treatment Plant in Suisun City, CA. January rainfall events were minimal and not enough to make a dent in outflow. In fact, it was so small that outflow continues to drop for the entire month of January. A total of three rainfall events were observed for the month with the largest daily total of 0.45 inches recorded January 1, 2011; and being the largest total for the month. Overall it was a dry January.

The monthly total for the month is shown below:

Month	Total Rainfall (inches)
January	0.55

## 2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

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

Date	Gate status	Flashboards status	Boat Lock status
January 1 – 31	1 closed; 2 held open	In	Open

Gate 3 remained in the closed position due to electrical problems. Gate operations continues to be suspended since December 8, 2010 with two gates held open due to low channel water salinity conditions. DWR will continue to monitor conditions and will re-operate as needed to control salinity in the marsh.

## 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 January 2011 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were less than 4.2 mS/cm for the entire month as shown in Figure 1. Salinity levels at all compliance and monitoring stations were stable throughout the month due to high outflow in early January which suppressed salinity and held it under control. There was very minimal rainfall activity in this month too, which would often led to some rise in salinity levels, but outflow was so dominant in this month that salinity levels had little movement as shown in Figures 1 and 2.

Overall, compliance was met at all stations in January 2011.

### **3.2.2 Comparison of Reporting Period Conditions with Previous Years**

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

Compared to previous nine years, January 2011 salinity levels resemble that of 2003, however, a bit higher in magnitude. Overall January 2011 was ranked seventh in high Specific Conductance, which means that salinity levels were low overall but not the lowest in the past 10 years. Unlike past years January, 2011 was a welcomed year compared to the past four years of dry conditions as shown in Figure 4.

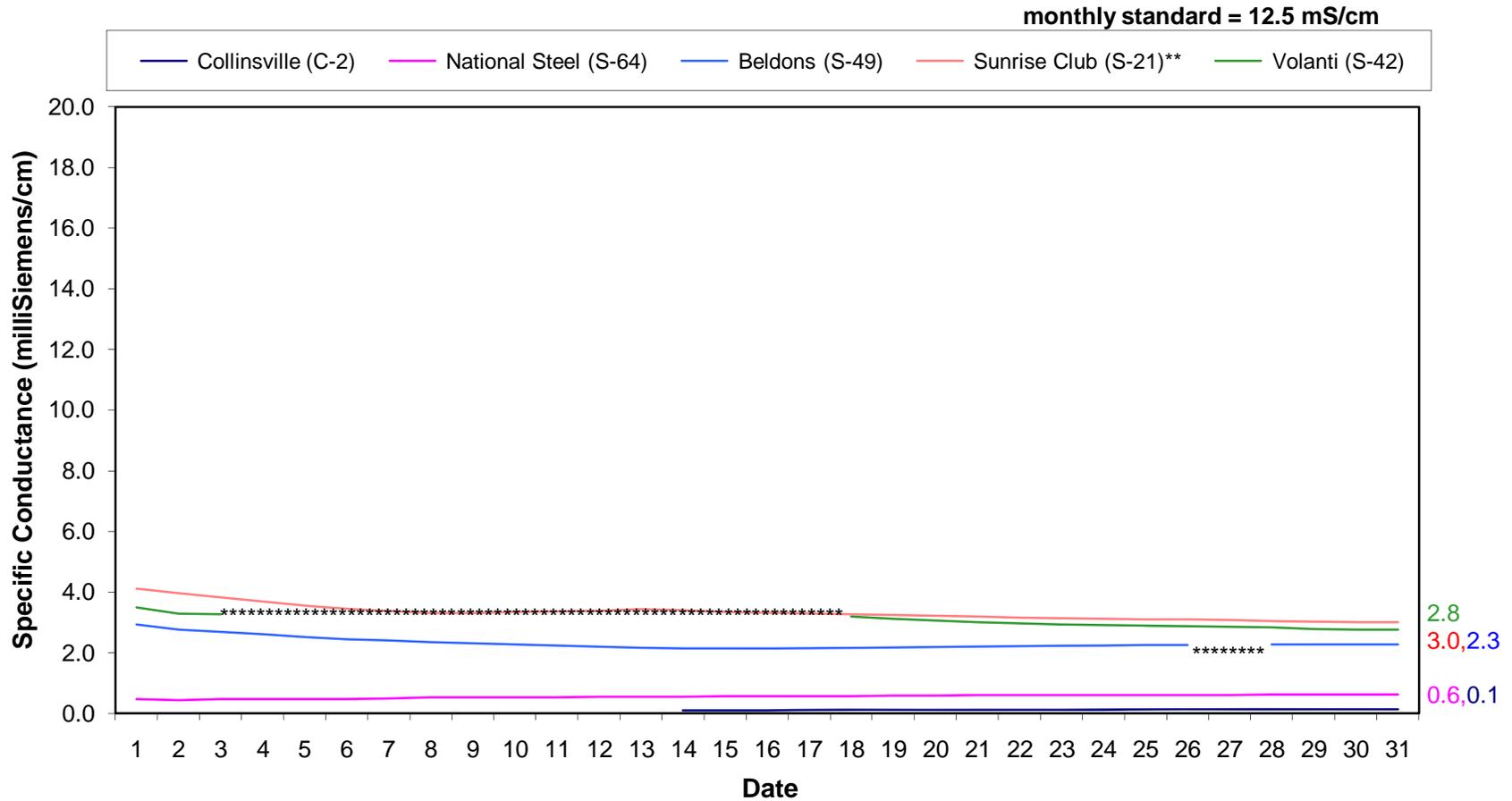
**Table 1****Monthly Mean High Tide Specific Conductance at Suisun Marsh  
Water Quality Compliance Stations****January 2011**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.1	12.5	Yes
S-64	0.6	12.5	Yes
S-49	2.3	12.5	Yes
S-42	2.8	12.5	Yes
S-21	3.0	12.5	Yes

\*milliSiemens per centimeter

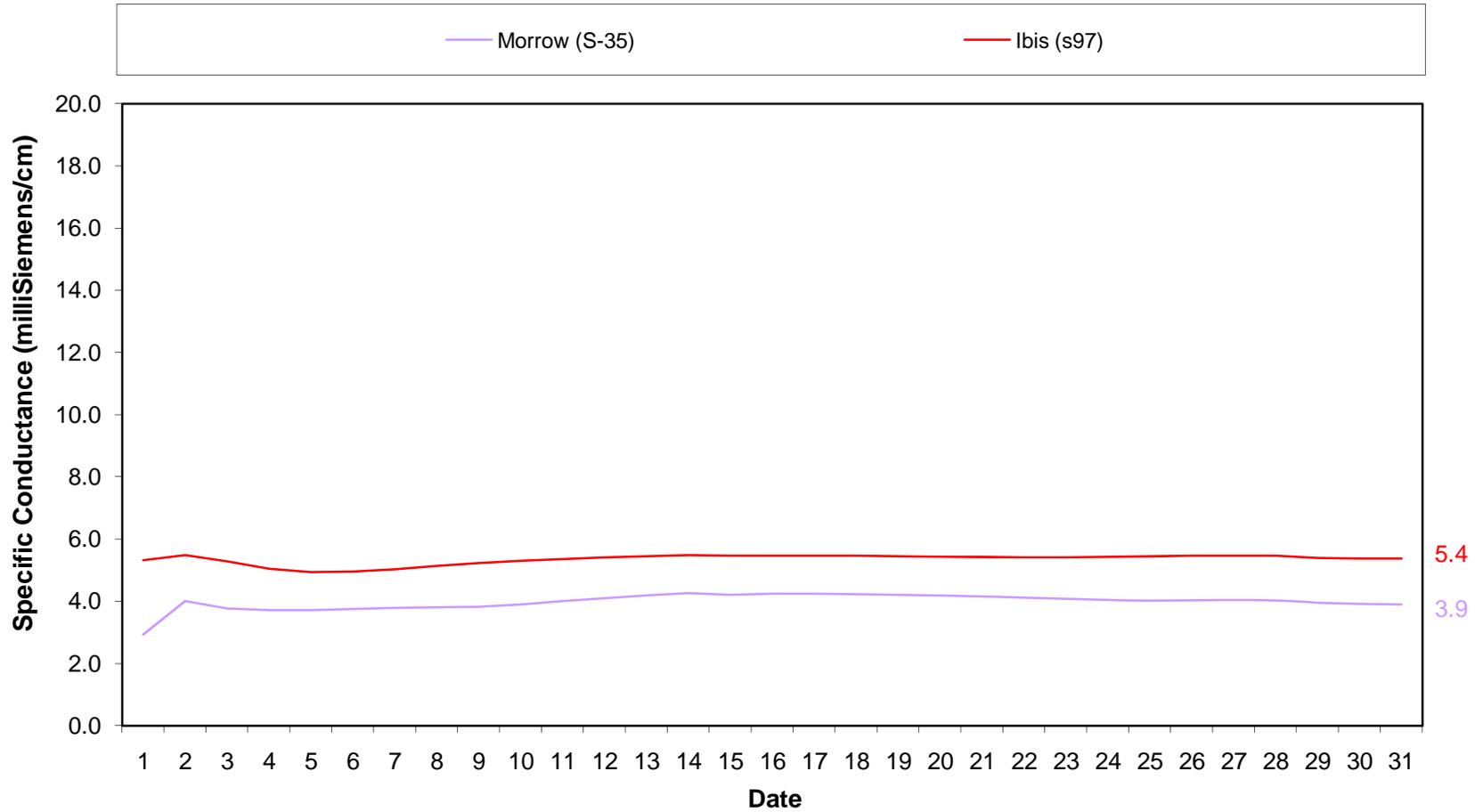
\*\*The representative data from nearby USBR station is used in lieu of data from station C-2.

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

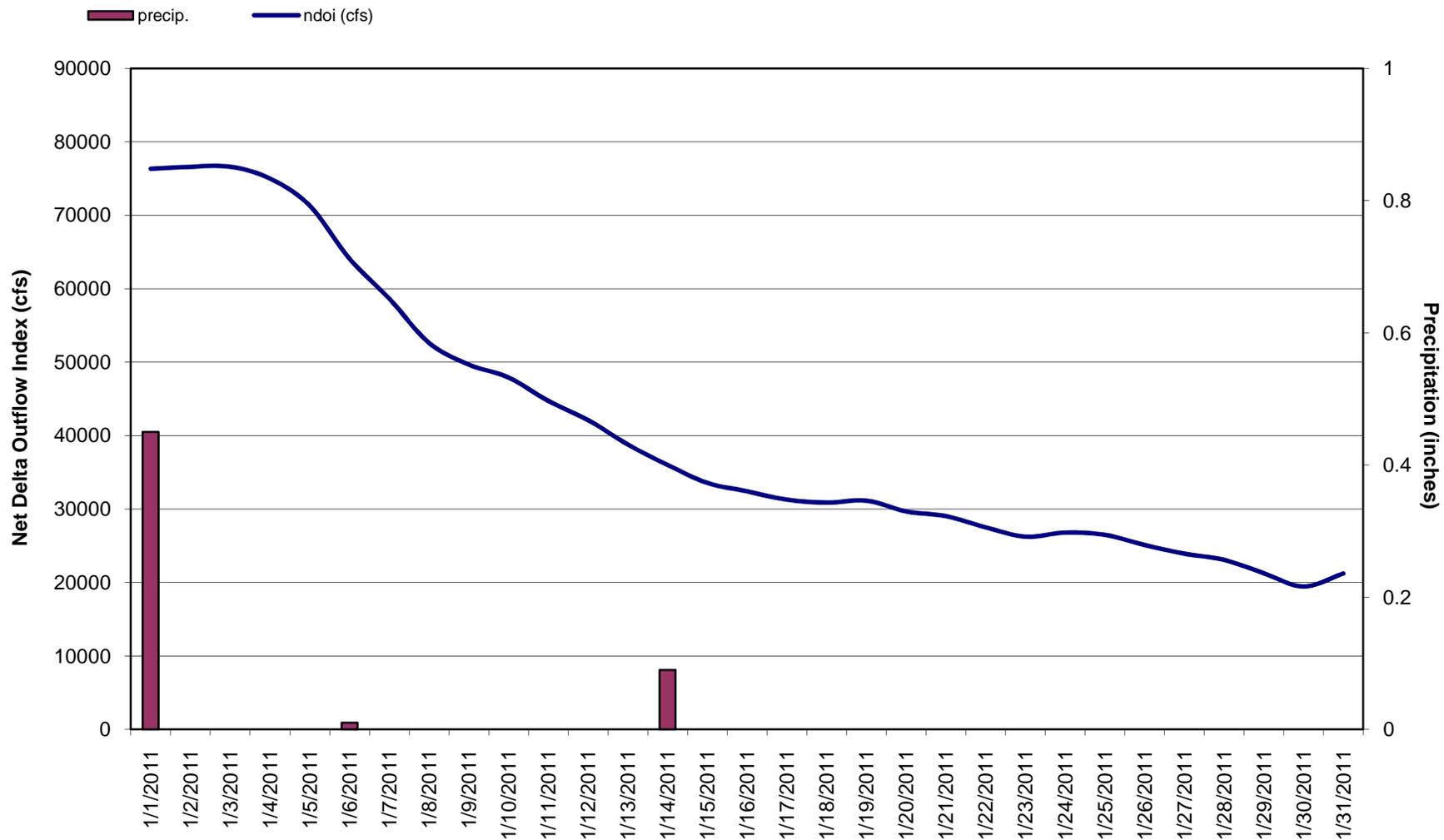


\*S42 missing data due to equipment failure and S49 missing due to QA/QC failure.

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

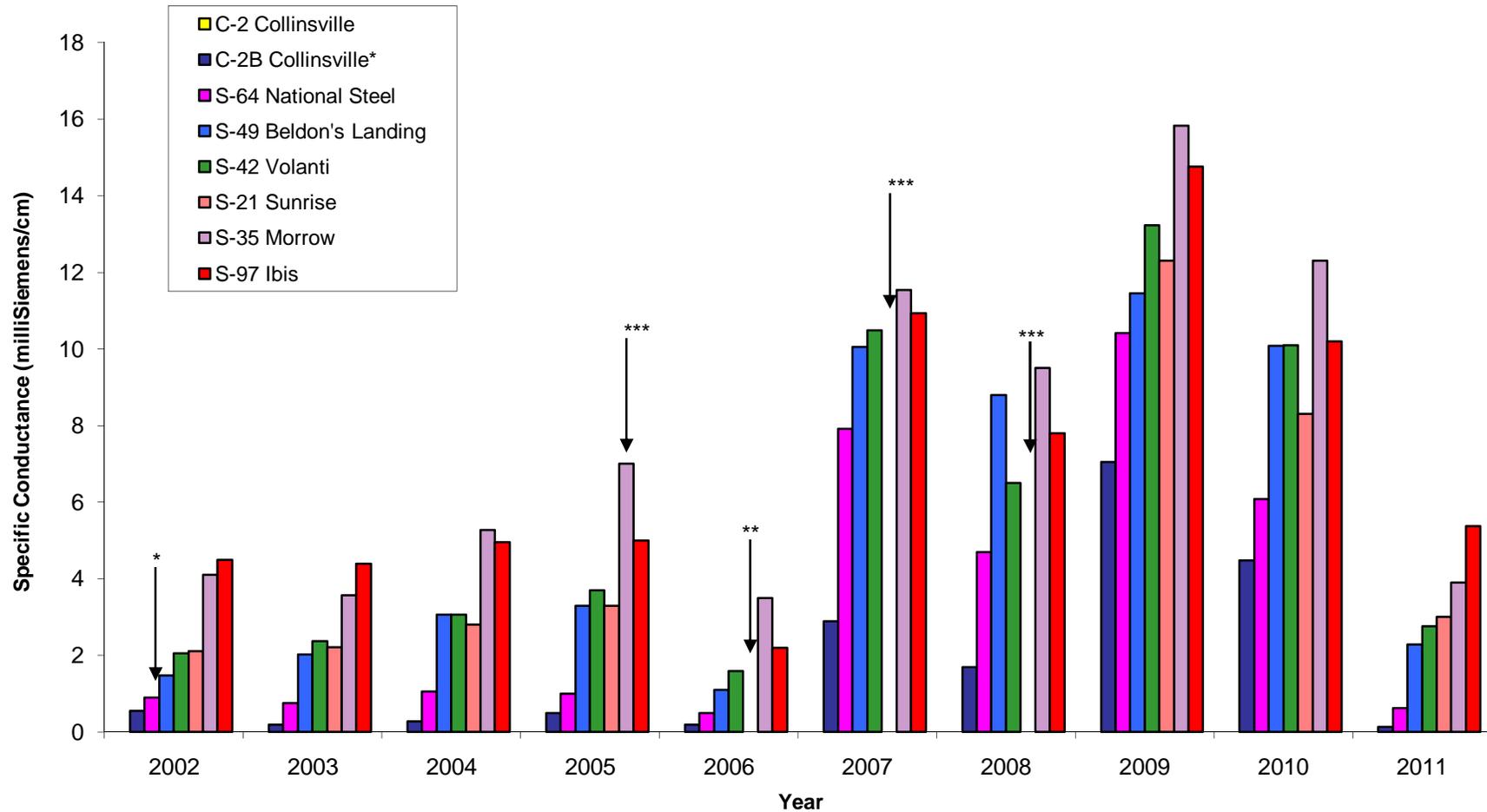


**Figure 3. Daily Net Delta Outflow Index and Precipitation\*  
January 2011**



\*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

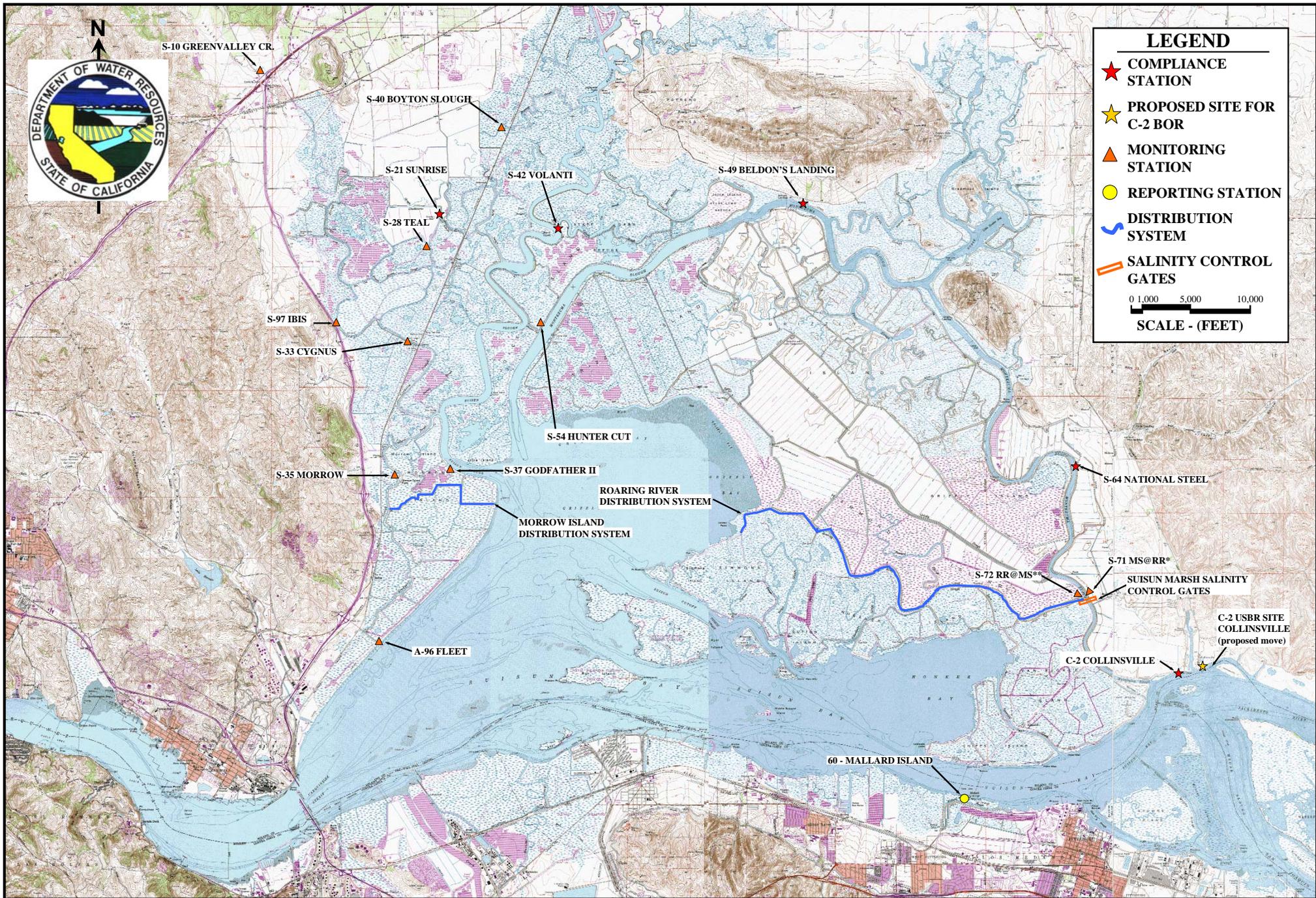
**Figure 4. Monthly Mean Specific Conductance at High Tide:  
Comparison of Monthly Values for Selected Stations  
January 2002-2011**



\* = beginning in 2002.

\*\* Data was not obtained due to equipment problem or flood constraint.

\*\*\*Data not representative of end of month value due to missing data.



## SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES