

---

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

Reporting Period: May 2007

---

Questions regarding this report should be directed to:

**Jim Sung**

California Department of Water Resources  
Division of Environmental Services  
3251 S Street  
Sacramento, CA 95816-7017

Telephone: (916) 227-7520  
[sung@water.ca.gov](mailto:sung@water.ca.gov)

**TABLE OF CONTENT**

**1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT .....1**

**2. MONITORING RESULTS.....2**

    2.1 CHANNEL WATER SALINITY COMPLIANCE .....2

    2.2 DELTA OUTFLOW .....2

    2.3 RAINFALL .....3

    2.4 SUISUN MARSH SALINITY CONTROL GATE (SMSCG) OPERATIONS .....3

**3. DISCUSSION.....3**

    3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH .....3

    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

## 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 May 2007, 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 March was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. During May, the standard for compliance stations C-2, S-64, S-49, S-42, and S-21 were 11.0 mS/cm. 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 May 2007 started off between 10,000 cfs and 12,000 cfs and remained within this range before increasing for a short period to a high of about 13,000 cfs the early half of the month before decreasing to about 9,000 in mid-month and remained between 8,000 cfs and 10,000 cfs until May 23, where outflow drop again and continued to do so before leveling out at 7,000 cfs. At the end of the month, a brief increase in outflow ended the month at about 8,000 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 May 2007 is listed below:

Month	Mean NDOI (cubic feet per second)
May	9,810

### 2.3 Rainfall

Rainfall activities in May were very low. Less than 1 inch was the total for the entire month. There were only three days of rainfall activities, all occurred at the beginning of the month with the largest daily totals 0.29 inches among the three rain days. The monthly total is shown below.

Month	Total Rainfall (inches)
May	0.55

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

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

Date	Gate status	Flashboards status	Boat Lock status
May 1 - 31	3 OPEN	OUT	Closed

Due to no salinity concern anticipated for the remainder of the control season, DWR did not operated the gates in May.

## 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 May 2007, PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were all below 6.5 mS/cm as shown in Figure 1. Despite low rainfall totals and no gate operations in May, salinity levels at all compliance stations were amazing low and stable. Salinity patterns on the western monitoring stations, S97 and S35, were stable like other compliance stations, but the levels were higher and as expected because of the proximity of these two stations. However, salinity was still below 9.0 mS/cm throughout May as shown in Figure 2.

Overall, salinity levels in May 2007 were well below standards at all compliance and monitoring stations.

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. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season while repair work is being done at S21 site.

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

Monthly mean high-tide SC at the compliance and monitoring stations for May 2007 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations is most comparable to the 2001 and at a slightly higher level, except Collinsville is lower than National Steel in 2007. Compared to previous nine years, May 2007 salinity levels were overall ranked first in high Specific Conductance, thus making it the last lowest salinity levels month. Salinity levels being much higher than previous nine years is due to operational decision of the SMSCG. In support of fish passage, decision to operate the gates are being delay much more than past years to allow more opening of the gates for fish passage while pushing the salinity envelope to it's maximum.

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

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	1.7	11.0	Yes
S-64	3.4	11.0	Yes
S-49	6.3	11.0	Yes
S-42****	n/a	11.0	Yes
S-21***	n/a	n/a	n/a

\*milliSiemens per centimeter

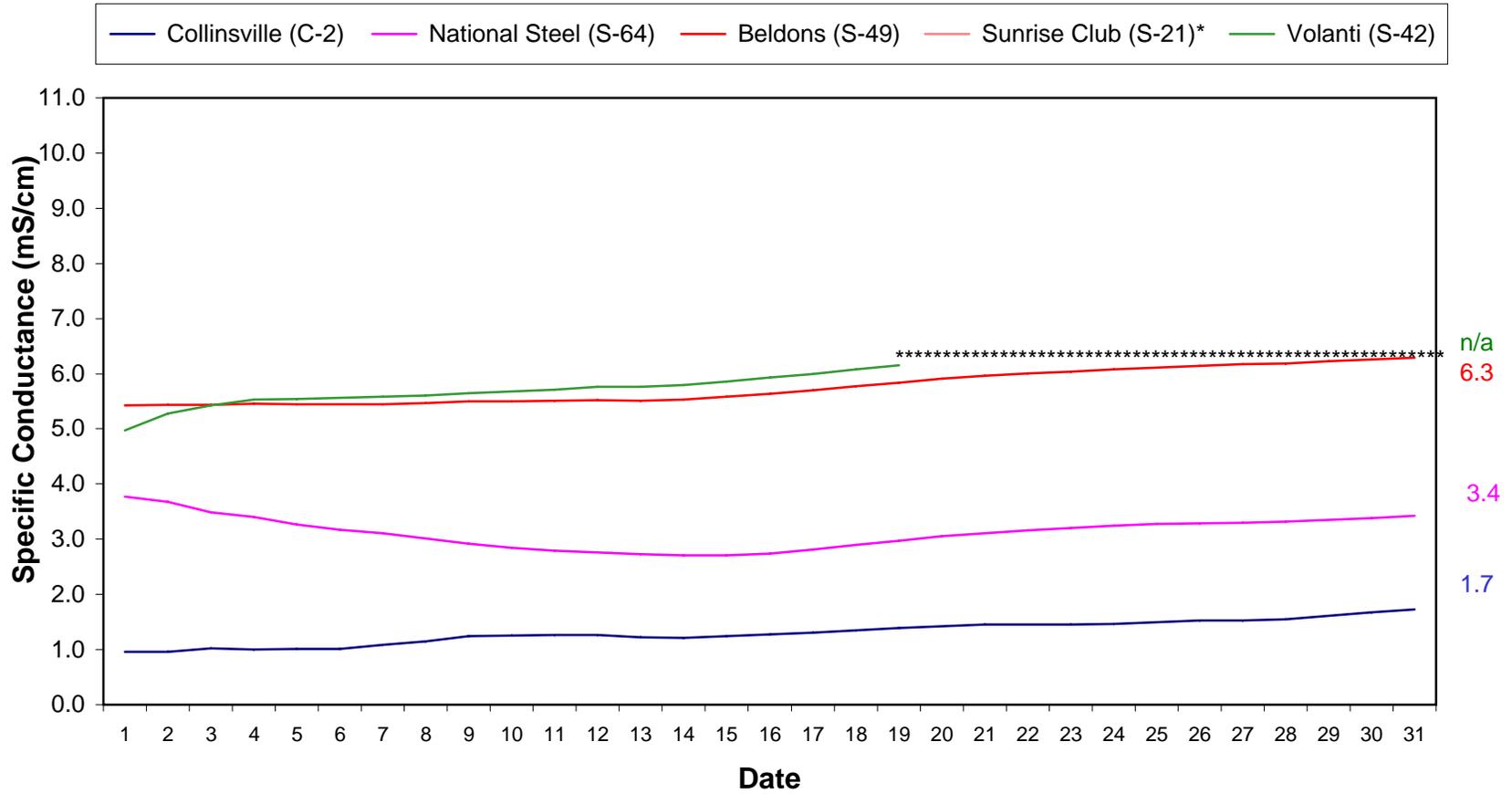
\*\*The representative data from nearby USBR station is used in lieu of data from station C-2.

\*\*\*station is temporarily out of service. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season.

\*\*\*\*S42 had lots of missing data in the later half of the month due to equipment failure, thus PDM value are not representative for reporting.

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance  
May 2007**

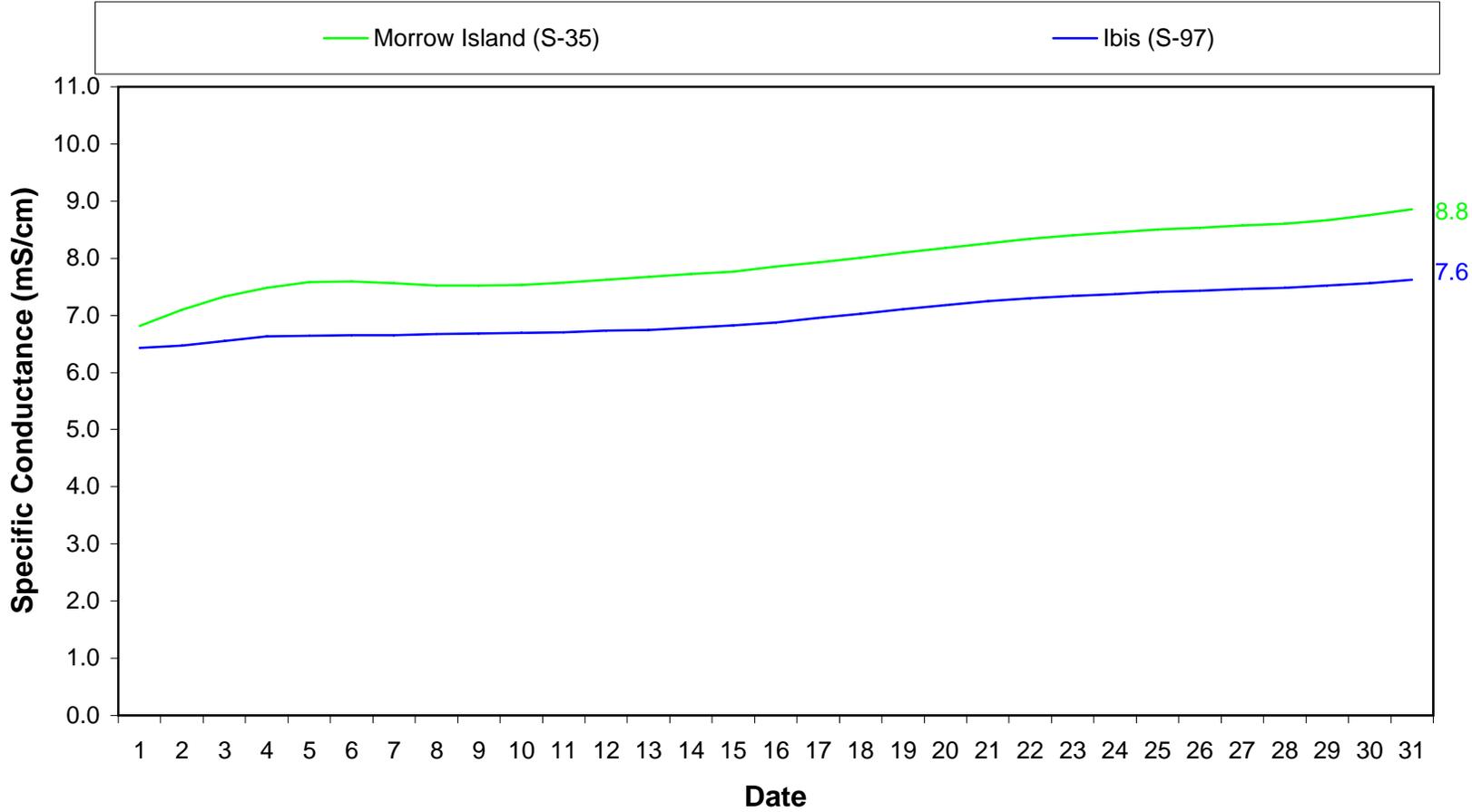
Standard = 11.0 mS/cm



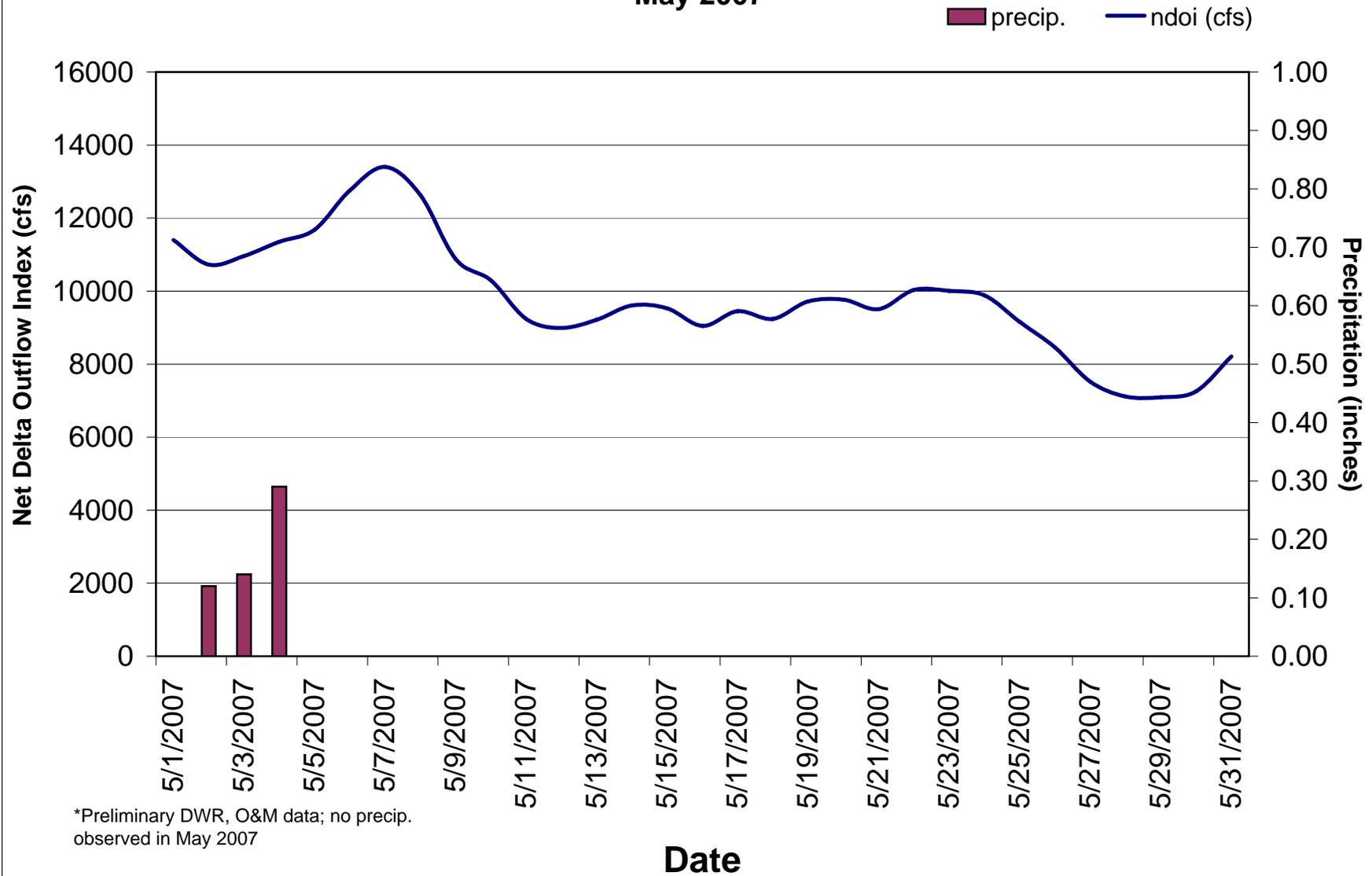
\*S21 data not available due to inaccessible road.

\*\*\*\*\* Missing data due to equipment failure at S-42.

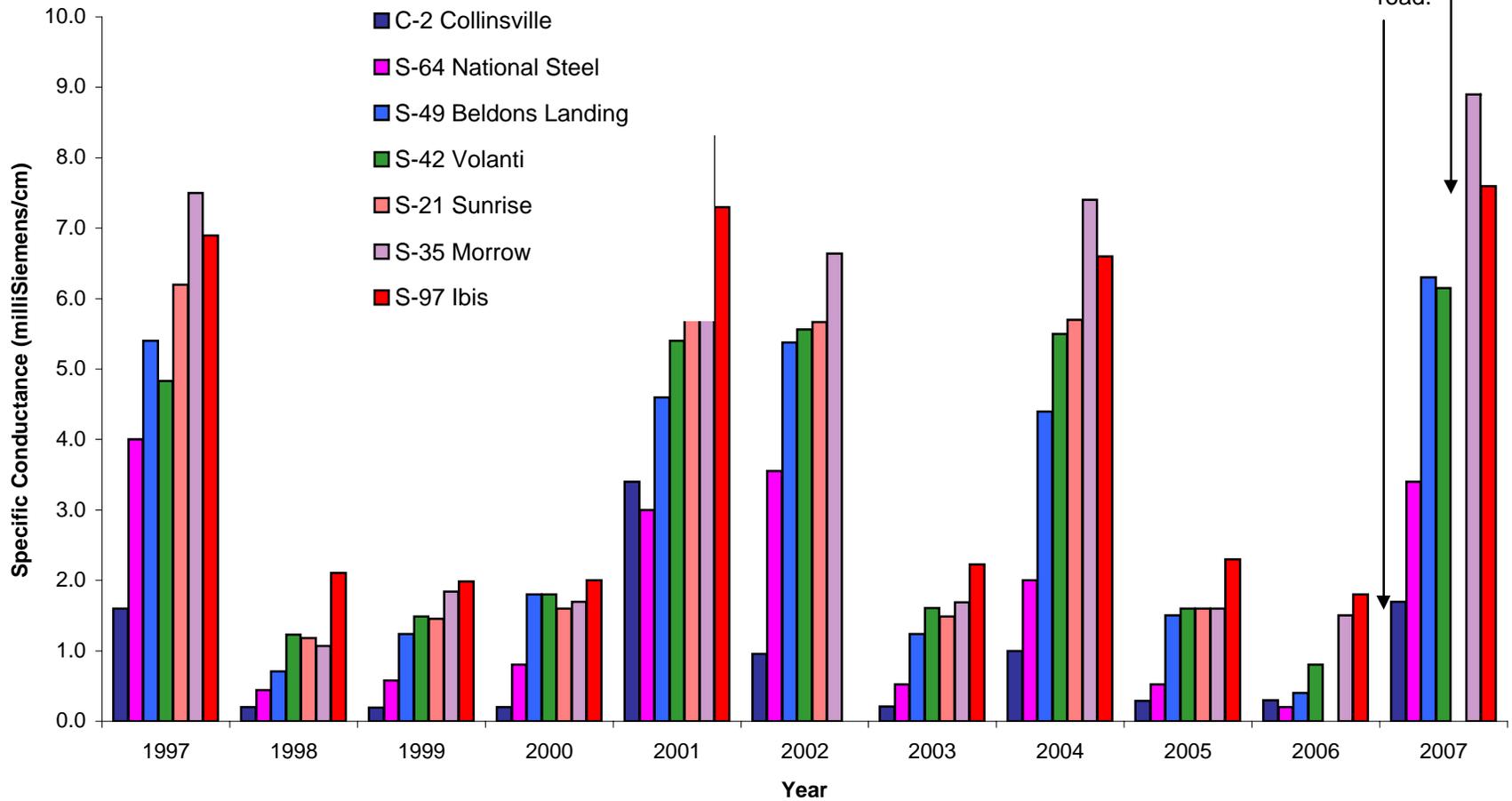
**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance  
May 2007**

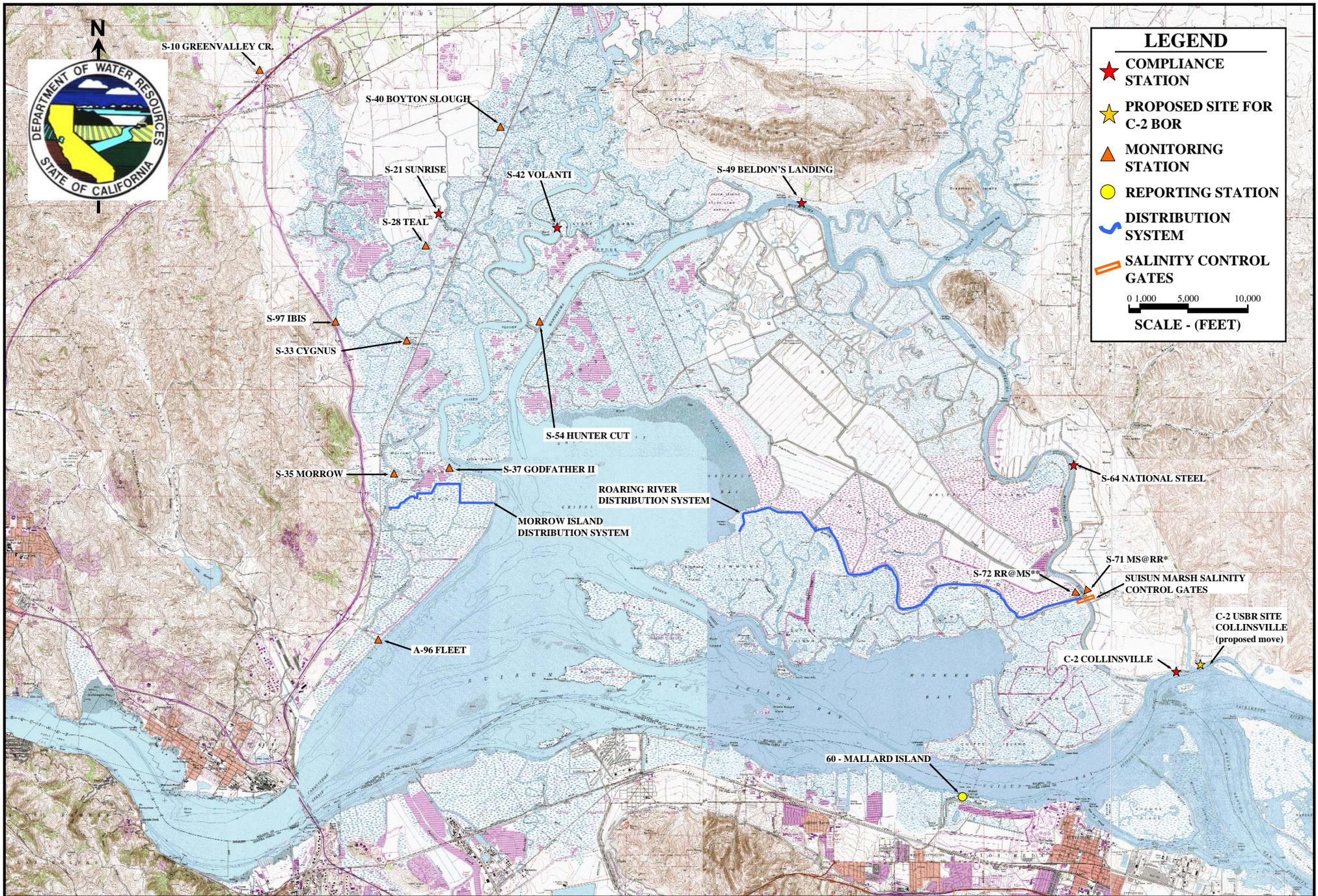


**Figure 3. Daily Net Delta Outflow Index and Precipitation\*  
May 2007**



**Figure 4. Monthly Mean Specific Conductance at High Tide:  
Comparison of Monthly Values for Selected Stations  
May of 1997-2007**





**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