
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: October 2009

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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 October, 2009, **deficiency standard apply as define in D1641 and RSMFA, thus salinity conditions at only two compliance stations (i.e. S21 and S42)** are in compliance with channel water salinity standards of SWRCB (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 S-21 and S-42 are 19.0 mS/cm during October 2009. 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 October 2009 was higher than normal this time of year. For the most part of the month, outflow was between 3,000 and 5,000 cfs, except in mid-October where outflow peaked to about 19,500 cfs briefly due to runoffs from a big but short lived storm event, before dropping down below 5,000 cfs for the remainder of the month as shown in Figure 3. 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 October 2009 is listed below:

Month	Mean NDOI (cubic feet per second)
October	6,170

2.3 Rainfall

October 2009 had only two rainfall events. The largest rainfall amount occurred on October 14, 2009 with a daily total of 5.10 inches and the second rainfall occurred on October 20 with a daily total of only 0.61 inches. The monthly total is shown below:

Month	Total Rainfall (inches)
October	5.71

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during October 2009 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
October 1 – 7	3 Open	Out	Closed
October 8 – 31	3 Open	In	Open

Due to salinity concerns at the beginning of October, the flashboards were installed on October 8, 2009 by contractors at the request of DWR, DFD with radial gates open and boatlock gates open per NOAA agreement. In mid-October, a storm event washed away any further salinity concerns for the remainder of the month and resulted in no gate operations for October.

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 October 2009 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 at all compliance stations were stable throughout the month of October despite the storm in mid-October, which had very minor impact on salinity patterns as shown in Figure 1. The only station that responded to the mid-month rain was Ibis as shown in Figure 2 from the salinity decrease but that is to be expected since Ibis is more impacted by creek flows. Nevertheless the storm was enough to control salinity from raising above monthly standards during the month.

Overall, salinity levels in October 2009 were at least 3 mS/cm or more below the monthly standard at all compliance (i.e. S-42 and S-21 for deficiency year) stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for October 2009 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 2000 but at a lower level at C-2B and S64, and slightly higher at S49, S42, S35, and S97. Compared to previous nine years, October 2009 salinity levels were ranked fourth in high Specific Conductance, thus making it the month with the sixth lowest salinity levels. Unlike past years, the higher salinity for October 2009 is probably a result of no gate operations needed to meet monthly standards in October.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****October 2009**

Station	Specific Conductance (mS/cm)*	Deficiency Standard	Deficiency Standard meet?
C-2**	6.8	n/a	n/a
S-64	11.1	n/a	n/a
S-49	16.5	n/a	n/a
S-42***	14.3	19.0	Yes
S-21****	N/a	19.0	Yes

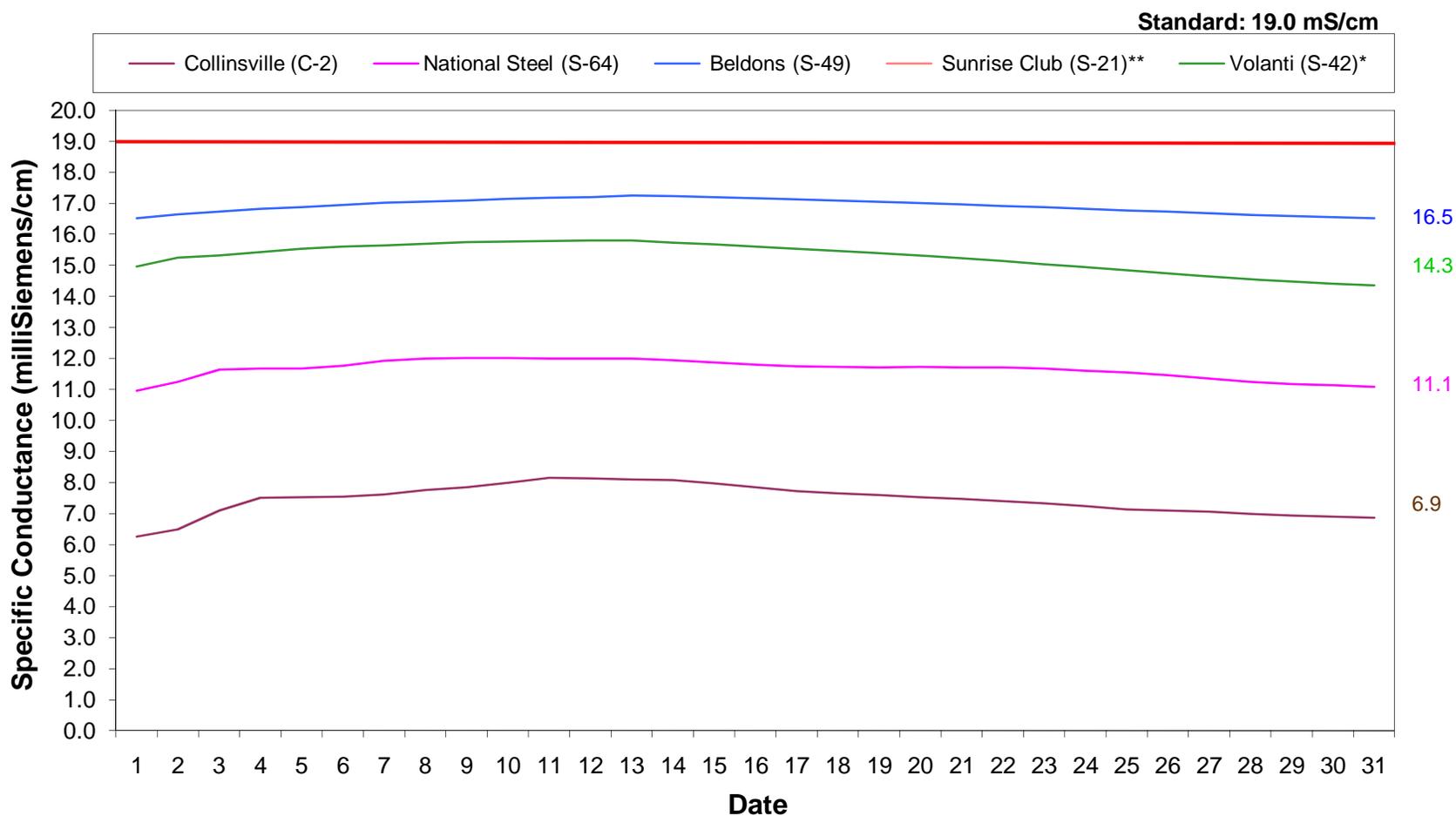
*milliSiemens per centimeter

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

***As define in D1641 and RSMMPA, monthly standard only apply to compliance stations, S-42 and S-21 during deficiency year.

****S21 not reported this month due to importing process issues as a result of equipment and software upgrade. SWRCB has been informed of the issue and DWR is requesting S42 as a surrogate for this control season until the matter is resolved. Approval is pending.

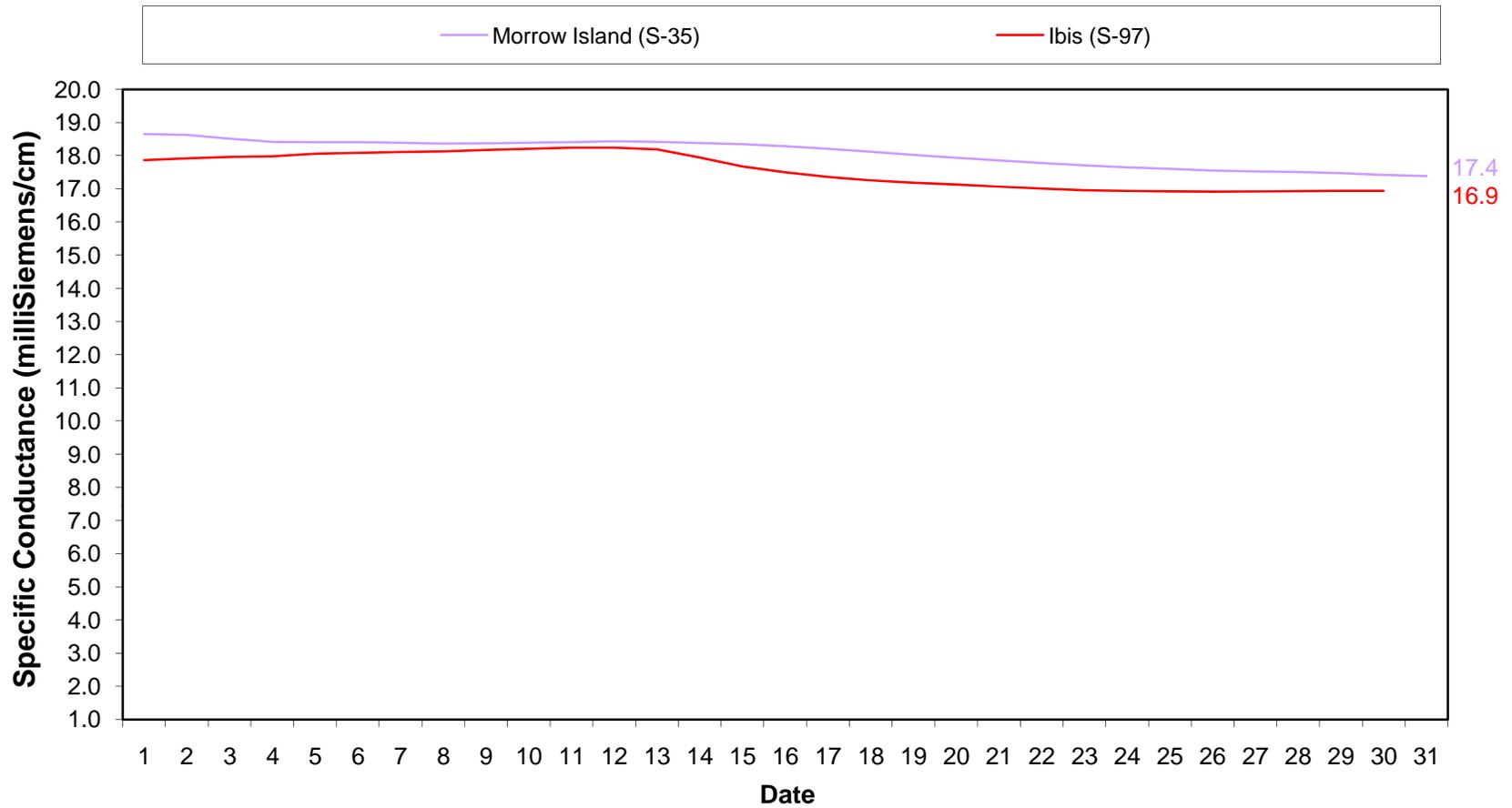
Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance for October 2009



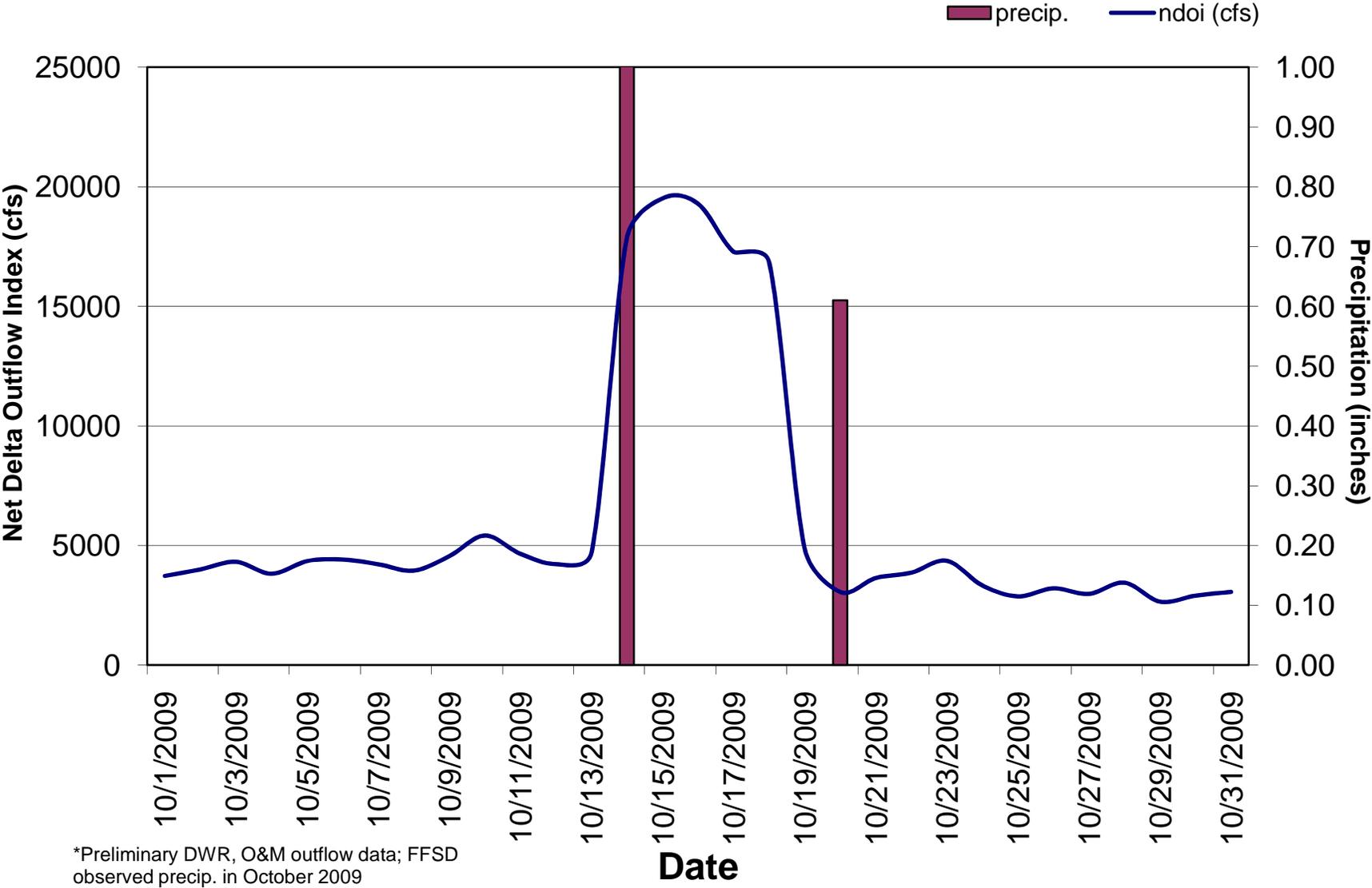
*Deficiency applies to only S42 and S21 per D1641 and RSMPA.

**not available for this month reporting due to importing process issues as a result of equipment and db changes. DWR notified SWRCB of this matter and awaiting SWRCB response to request S42 be the surrogate station for S21 until the issue has been resolved.

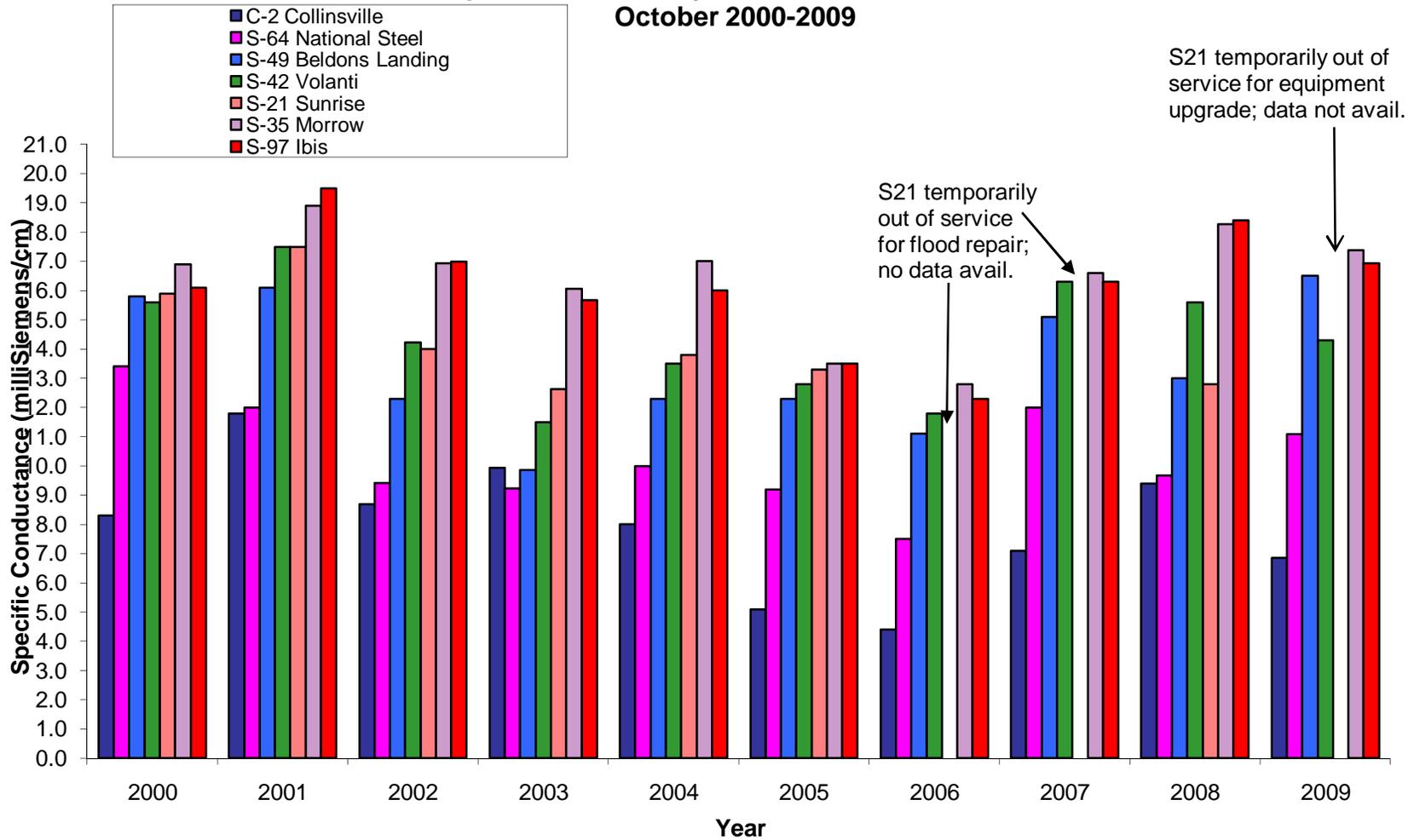
Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance For October 2009

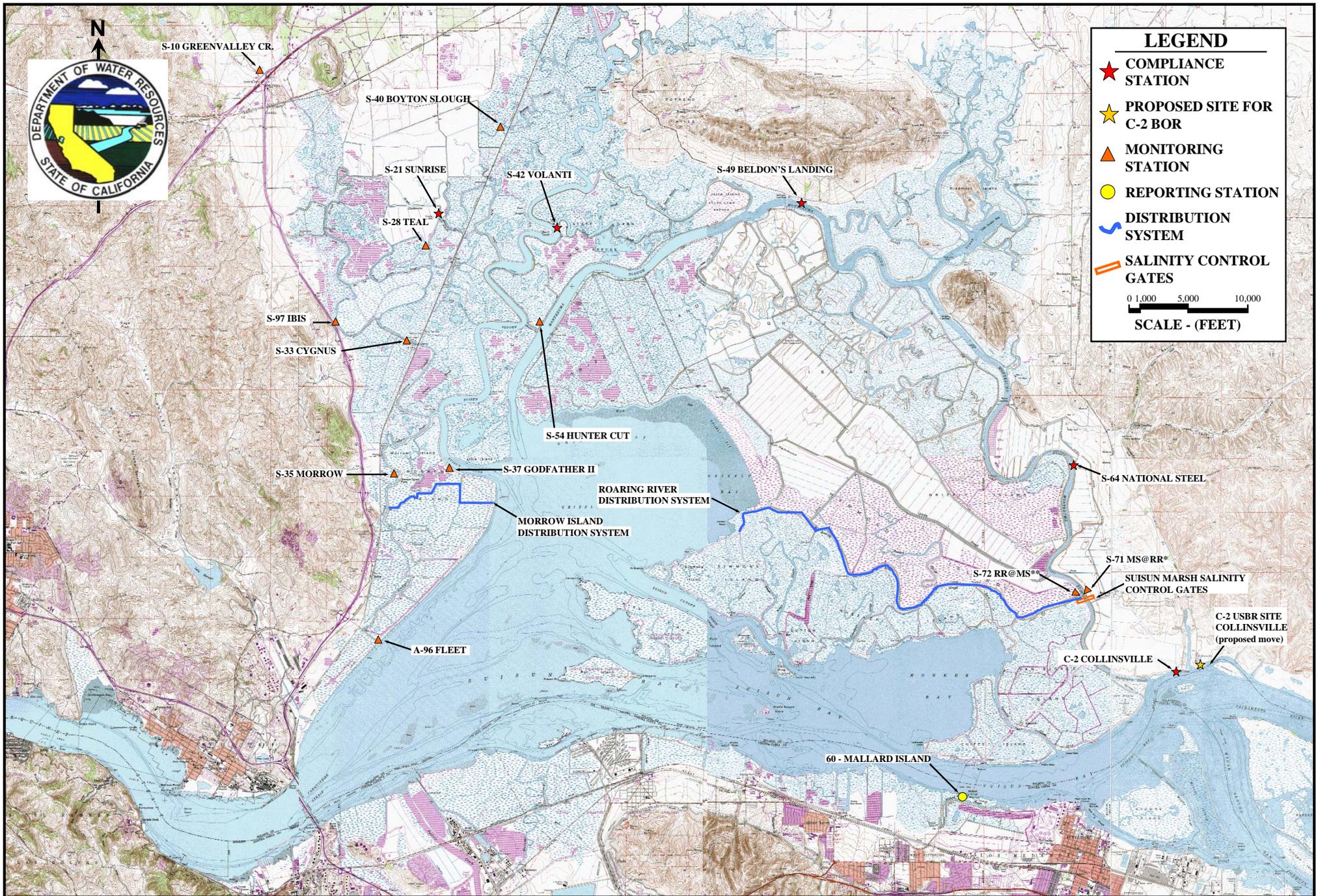


**Figure 3. Daily Net Delta Outflow Index and Precipitation*
October 2009**



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
October 2000-2009**





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