
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: March 2010

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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 March 2010, deficiency period applied thus two of the compliance stations (i.e. S21 and S42) salinity conditions were in compliance with channel water salinity standards of SWRCB (Table 1). The deficiency 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. The standards for compliance stations S-21 and S-42 were 15.6 mS/cm for March. 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 March 2010 started off about 30,000 cfs as shown in Figure 3, then dropped to about 17,000 cfs on March 10. Thereafter, a brief increase above 20,000 cfs on March 14 followed by a downward trend to end the month around 8,000 cfs. Not much rainfall activity during March to allow mean monthly outflow above 19,000 cfs, which was the case last year. 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 March 2010 is listed below:

Month	Mean NDOI (cubic feet per second)
March	17,760

2.3 Rainfall

Rainfall events for March 2010 occurred mostly in early half of the month and a bit at the end of the month as shown on Figure 3. The largest amount of daily rainfall in the month was 0.52 inches on March 12, but overall rainfall activities and amounts for the month were low. The monthly totals for both months are shown below:

Month	Total Rainfall (inches)
March	1.64

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during March 2010 are summarized below.

Date	Gate status	Flashboards status	Boat Lock status
March 1 – March 31	3 gates held open	In	Open-24/7

Gate operation ceased since January 4, 2010 and continued to be non-operational during March 2010 due to low salinity levels in the marsh and meeting salinity standards were not of concern. However, the flashboards remained in place with boat lock gates open per agreement with NOAA.

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 March 2010 PDM salinity levels at Collinsville(C-2), National Steel (S-64), Beldons (S-49), Sunrise (S-21), and Volanti(S-42) were mostly stable and not higher than 4.0 mS/cm as shown in Figure 1. The largest ending PDM value for March was 3.5 mS/cm at Beldons (S-49) and the lowest was 0.3 mS/cm at Collinsville (C-2). At monitoring stations, S-97 and S-35, salinity levels in March were erratic compared to the compliance stations in response to creek runoffs as a result of precipitation events, but remained low and below 8.0 mS/cm as shown in Figure 2 at both stations for the entire month.

Overall, salinity levels in March 2010 were well below the monthly standards.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for March 2010 were compared with means for those months during the previous nine years (Figure 4).

Compared to previous nine years, March 2010 salinity levels and patterns were similar to that of 2009, but higher in magnitude at Beldons(S49), Volanti(S42), and Sunrise(S21). Observed since 2008, S49 salinity is higher than S42, whereas in previous year these two stations salinity levels of S49 was lower than S42. This is more than likely the effect of operating the gates less compared to previous year, thus allowing more salinity intrusion further up to Beldons. March 2010 month was ranked third in high Specific Conductance, thus making it the month with the eighth lowest salinity levels.

Table 1
Deficiency Period
Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations

March 2010

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3	n/a	n/a
S-64	1.3	n/a	n/a
S-49	3.5	n/a	n/a
S-42	3.3	15.6	Yes
S-21	3.2	15.6	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 Daily Mean High Tide Specific Conductance
March 2010**

Standard = 15.6 mS/cm (Deficiency)

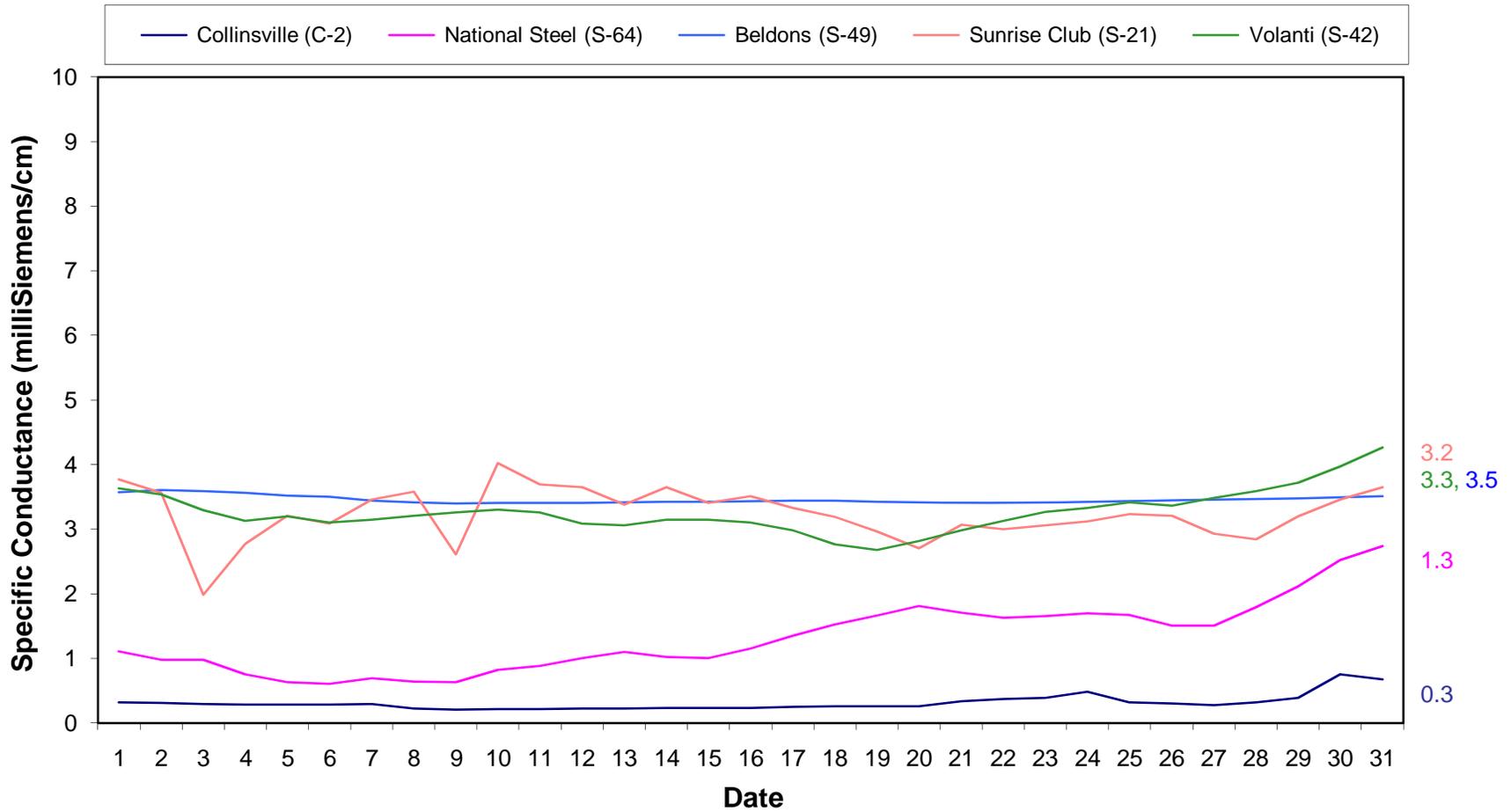
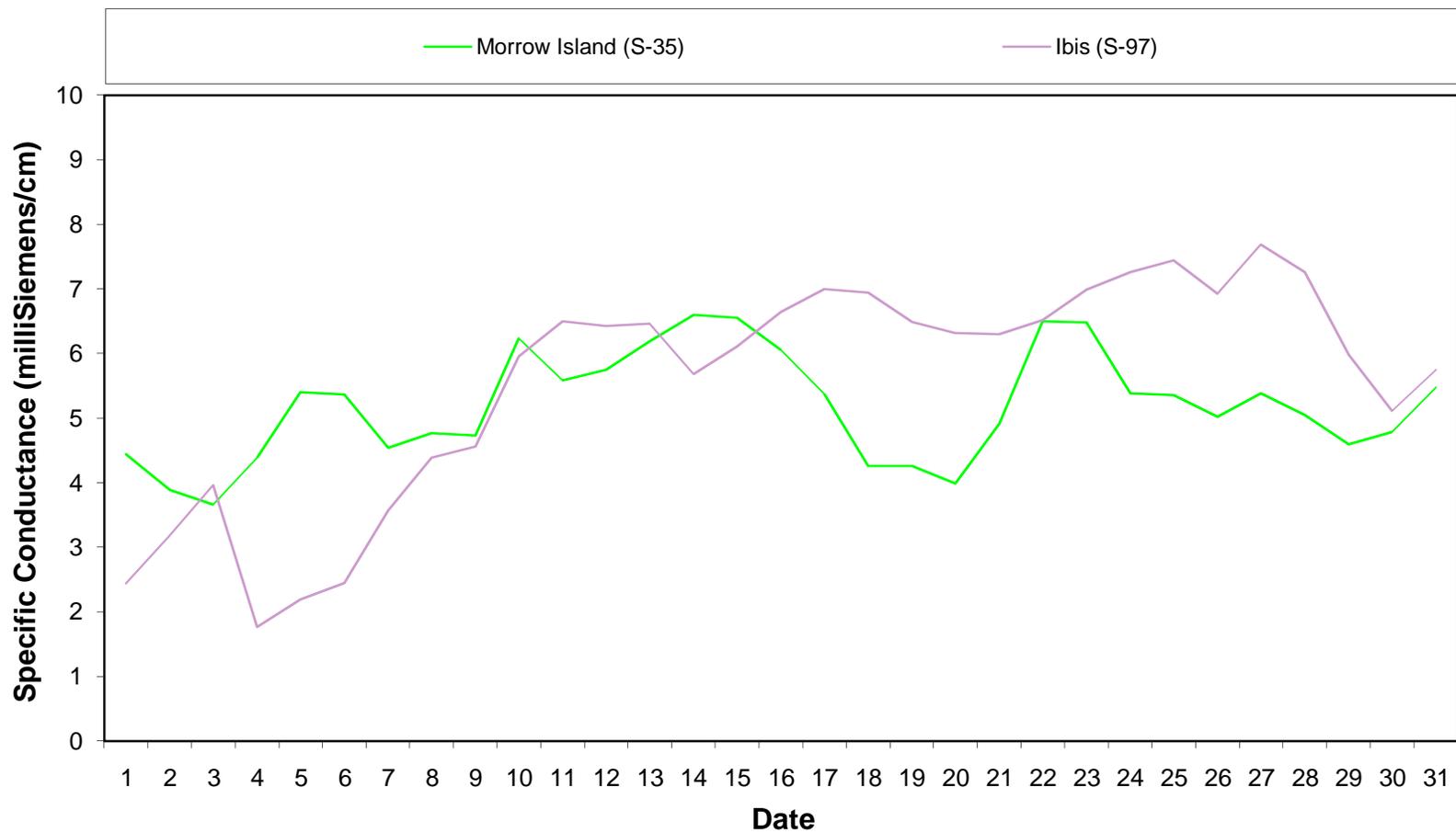
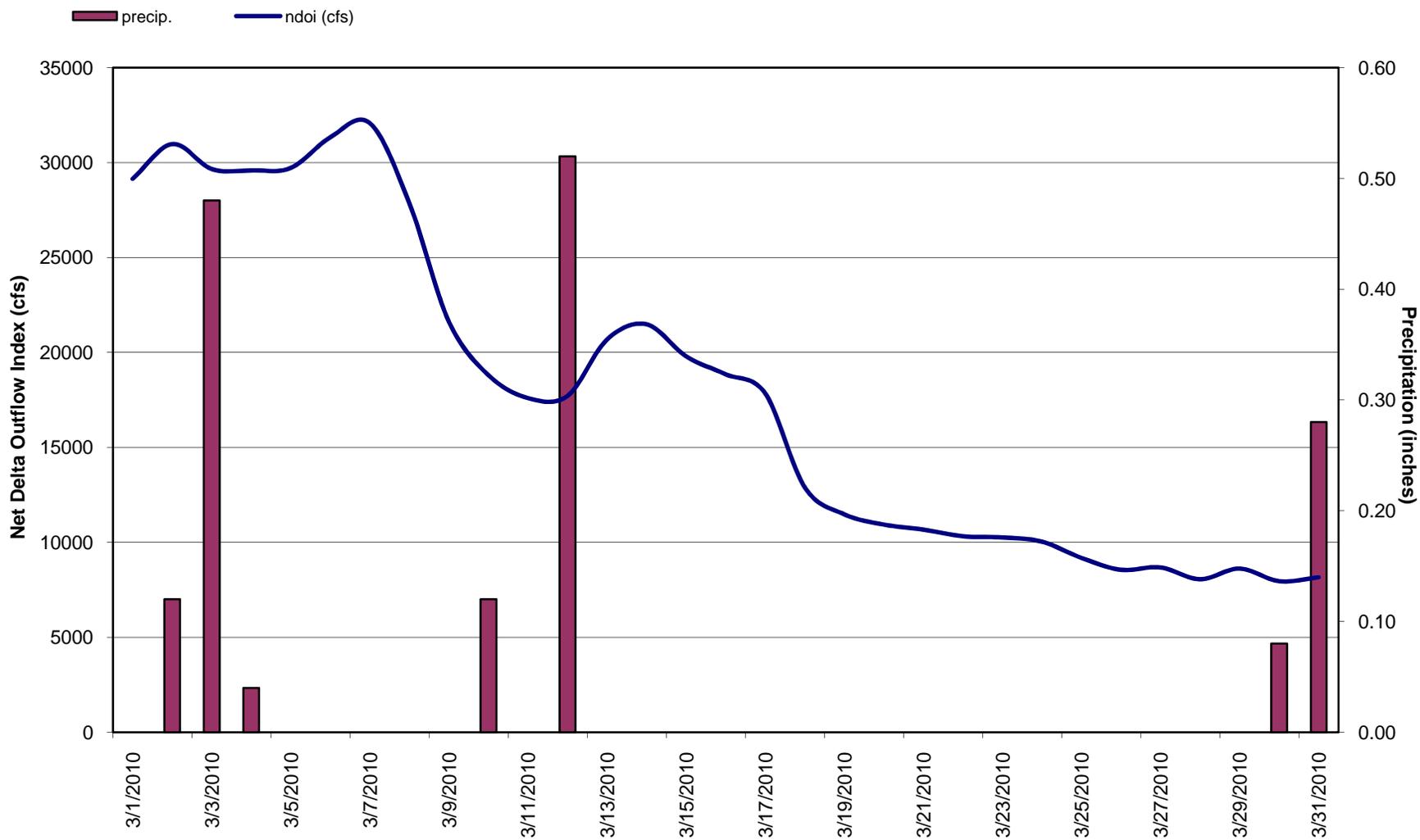


Figure 2. Suisun Marsh Daily Mean High Tide Specific Conductance
March 2010

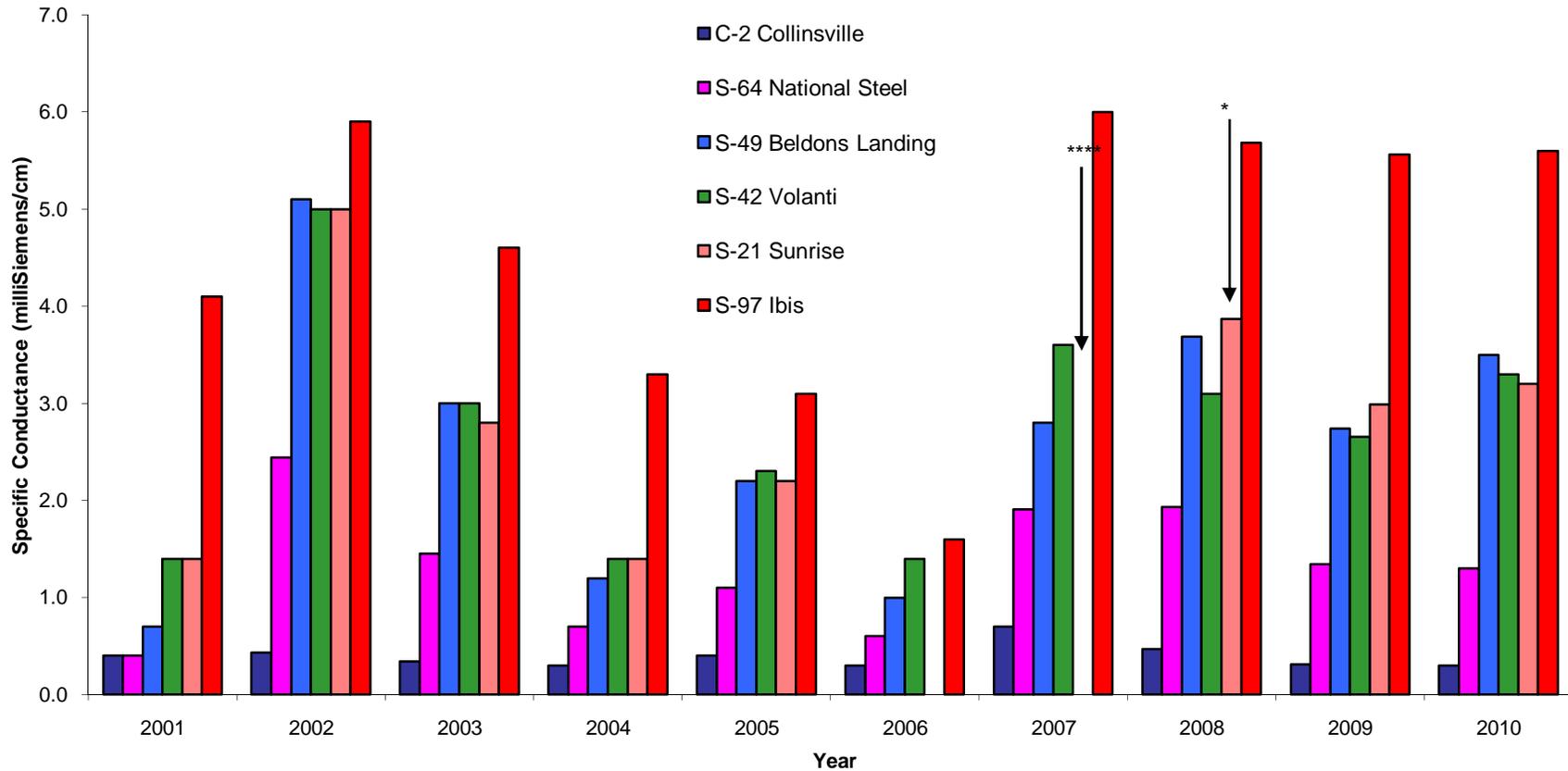


**Figure 3. Daily Net Delta Outflow Index and Precipitation*
March 2010**



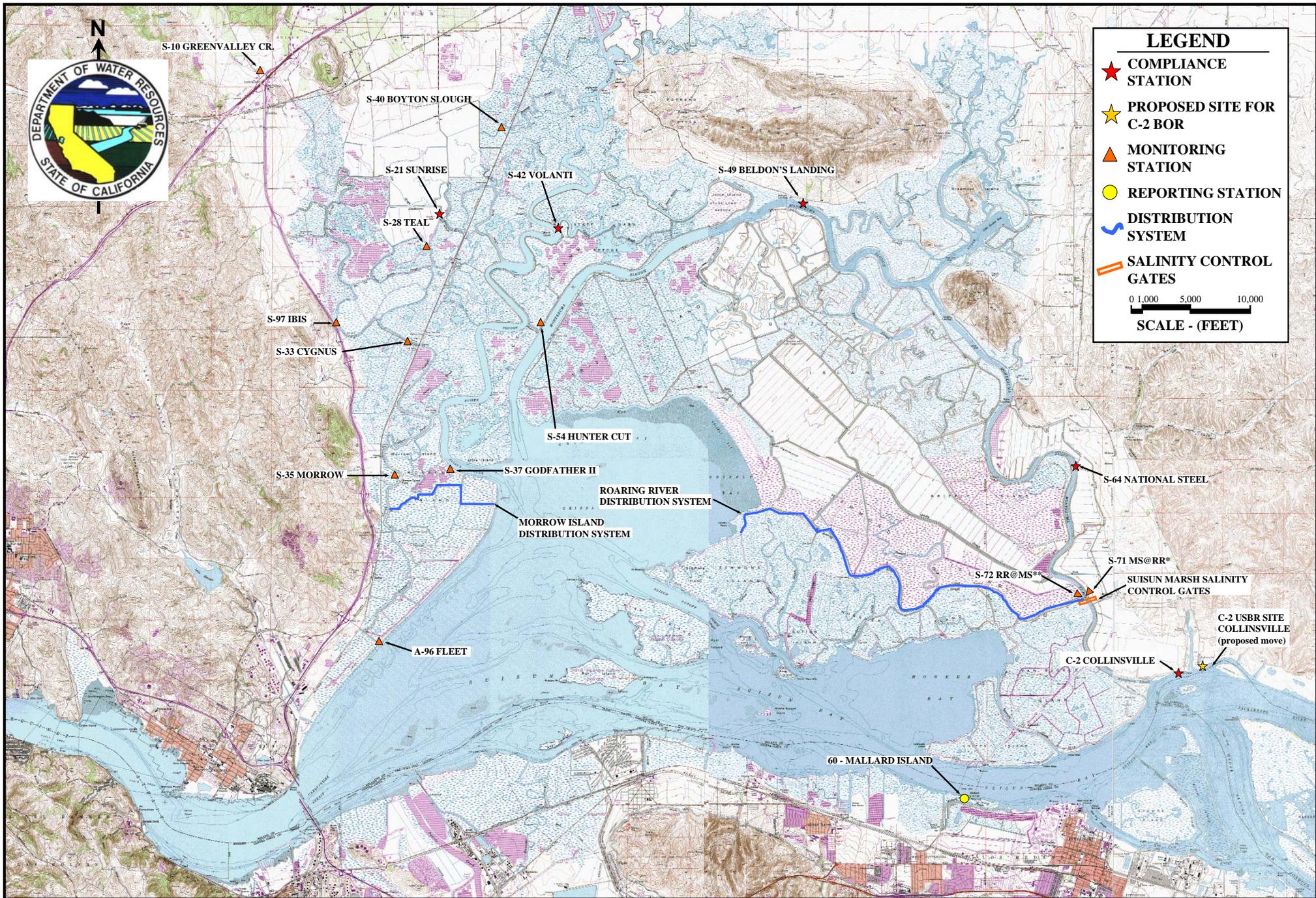
*Preliminary DWR, O&M Delta Outflow data and precipitation from Stockton Fire Station in the Delta.

**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
March of 2001-2010**



****Data not available for S21 due to flooded roadways.

*Data not available for S35 due to equipment upgrade down time.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES