
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: April 2013

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per the State Water Resources Control Board (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:

COMPLIANCE STATIONS:		
Station Identification	Station Name	General Location
C-2*	Collinsville	Western Delta
S-64	National Steel	Eastern Suisun Marsh
S-49	Beldon's Landing	North-Central Suisun Marsh
S-42	Volanti	North-Western Suisun Marsh
S-21	Sunrise	North-Western Suisun Marsh

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh:

MONITORING STATIONS:		
Station Identification	Station Name	General Location
S-97	Ibis	Western Suisun Marsh
S-35	Morrow Island	South-Western Suisun Marsh

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

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.

2. MONITORING RESULTS

2.1 Channel Water Salinity Compliance

During the month of April, salinity conditions at all five compliance stations were in compliance with channel water salinity standards (Table 1). Compliance with standards for the month was determined for each compliance station by comparing the progressive daily mean (PDM) of high tide SC with respective standards. The standard for April was 11.0 mS/cm. The progressive daily mean is the monthly average of both daily high tide SC values. The mathematical equation is shown below:

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days in the month}}$$

2.2 Delta Outflow

Outflow for April 2013 ranged between 6,605 cfs and 21,744 cfs (Figure 3). For the month, outflow began at 15,753 cfs, increased to 21,744 cfs in response to early April storm events then dropped to 6,605 cfs before rising again to end the month at 10,798 cfs. This last increase in outflow is probably due to a decrease in pumping at Banks Pumping Plant. 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 April 2013 is listed below:

Month	Mean NDOI (cubic feet per second)
April	13,048

2.3 Precipitation

Precipitation for the month totaled 1.41 inches. Two large events occurred during the month. The first occurred on April 1st and totaled 0.66 inches and a second event occurred on April 4th and 5th for a total of 0.63 inches. A third smaller event took place on April 8th and measured 0.12 inches. This data was recorded at the Fairfield Water Treatment Plant. The monthly total precipitation is below:

Month	Total Precipitation (inches)
April	1.41

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during April 2013 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
April 1-30	3 Open	In	Partially Closed

Given the dry conditions in April, salinity will continue to be monitored and if levels should increase, operation of the radial gates may be needed.

Boat lock gates are partially closed due to ongoing investigation on safety concerns expressed by Delta Field Division staff. NOAA was briefed about the safety concern and will schedule a field visit to assess options with DWR to balance fish needs and safety needs.

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

For April 2013, PDM salinity levels at compliance stations Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ended the month between 2.45 mS/cm and 7.68 mS/cm as shown in Figure 1. Salinity levels for April started in the range of 2.84 mS/cm to 8.03 mS/cm and gradually decreased before increasing again. The trend followed that of Delta outflow.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Both stations had a similar trend as the compliance stations, gradually decreasing and then increasing slightly at the end of the month. Salinity for S-35 started the month at 9.76 mS/cm and ended the month at 7.94 mS/cm. Salinity for S-97 went from 8.96 mS/cm to 8.59 mS/cm. Data for S-35 failed QA/QC for April 27-30.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high tide SC at the compliance and monitoring stations for April 2013 were compared with means for those months during the previous nine years (Figure 4).

April's mean salinity pattern for all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. The pattern followed that of 2009 which was another dry water year type and that of 2005 and 2010 which were below normal water year types. April's salinity levels are double the salinity levels of 2005 and 2010. As expected, the salinity levels gradually increased from east to west.

**Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations
April 2013**

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	2.45	11.0	Yes
S-64	3.55	11.0	Yes
S-49	7.48	11.0	Yes
S-42	7.68	11.0	Yes
S-21	7.07	11.0	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 Daily Mean High Tide Specific Conductance for Compliance Stations April 2013

Standard = 11.0 mS/cm

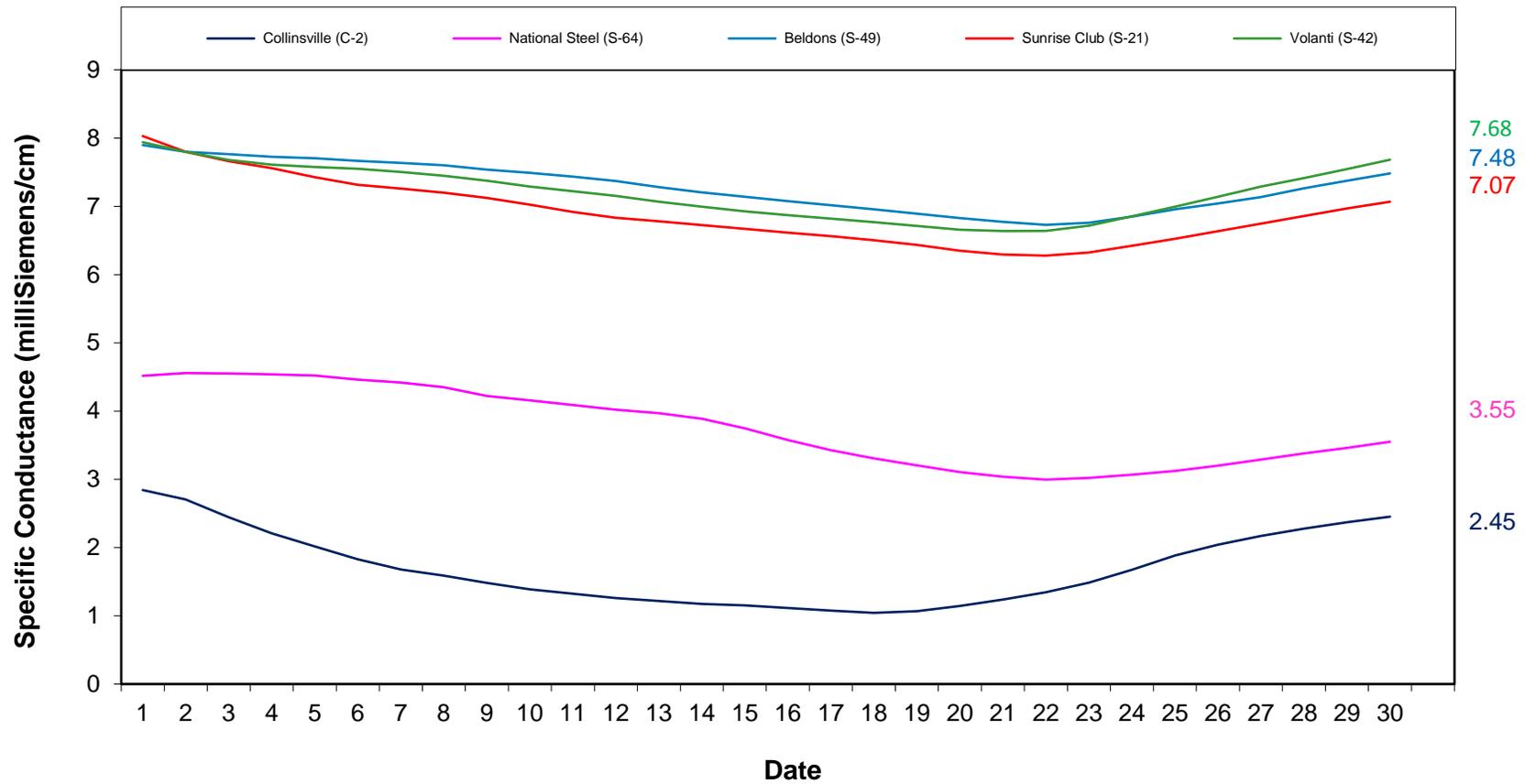
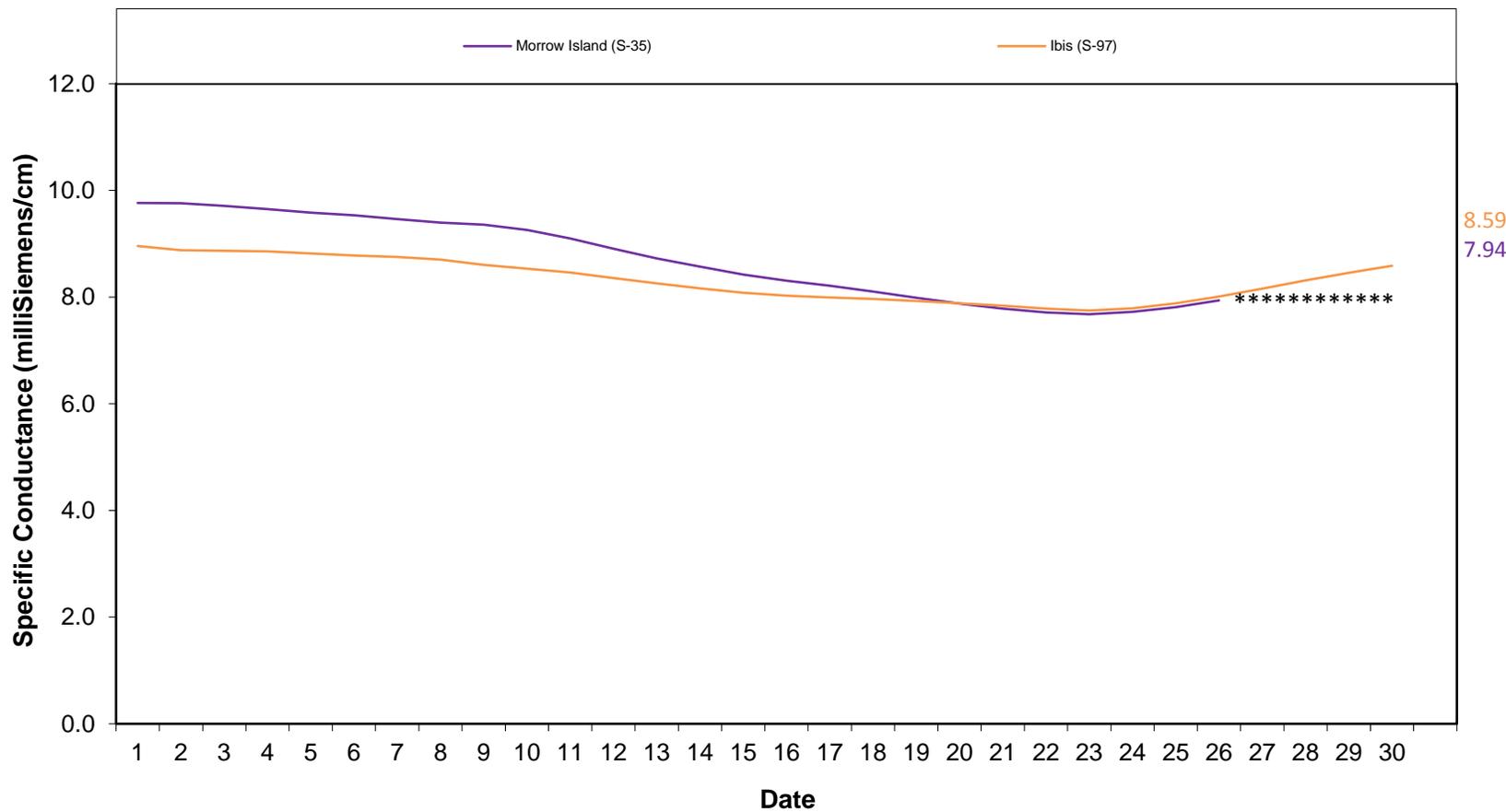
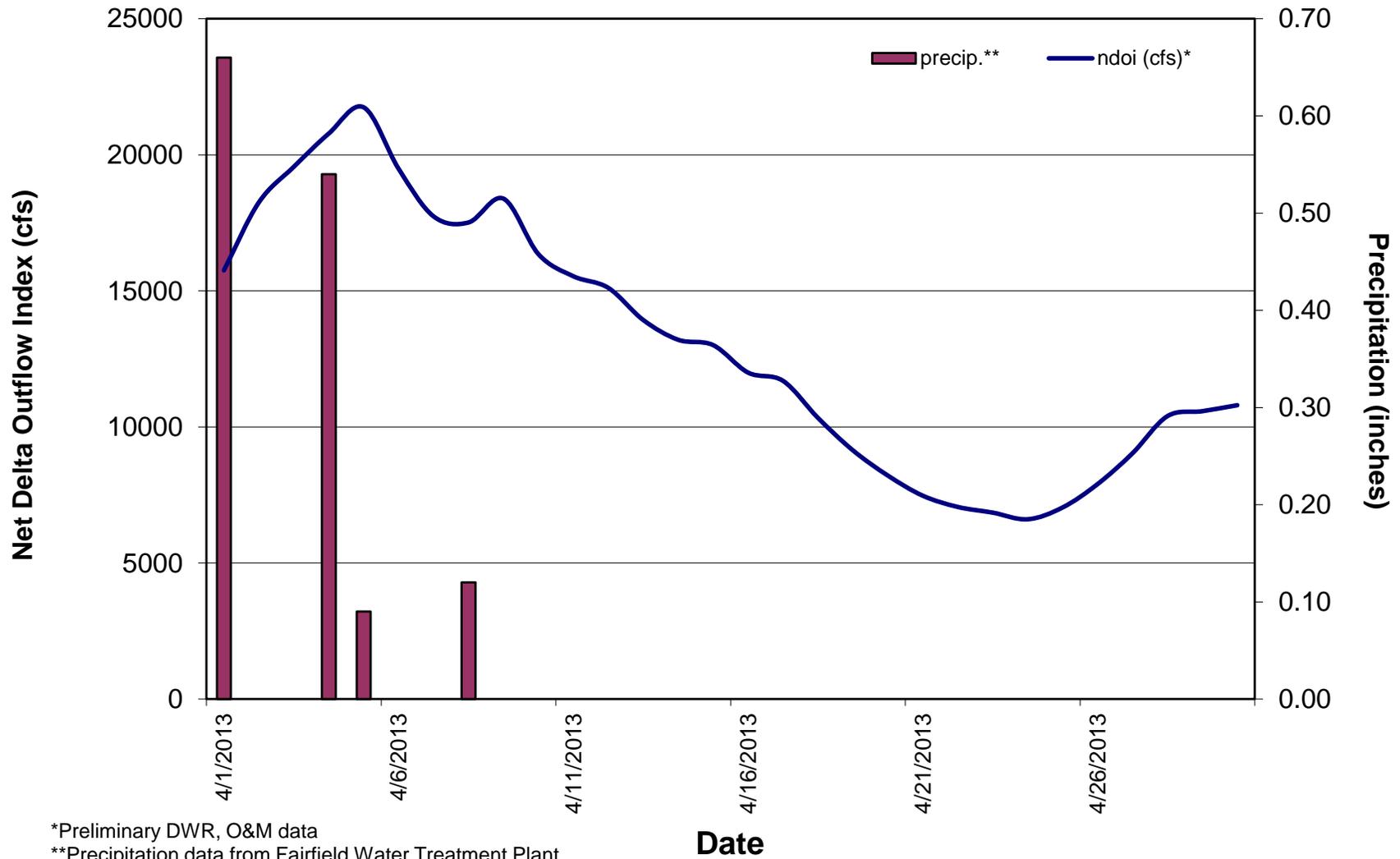


Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations April 2013

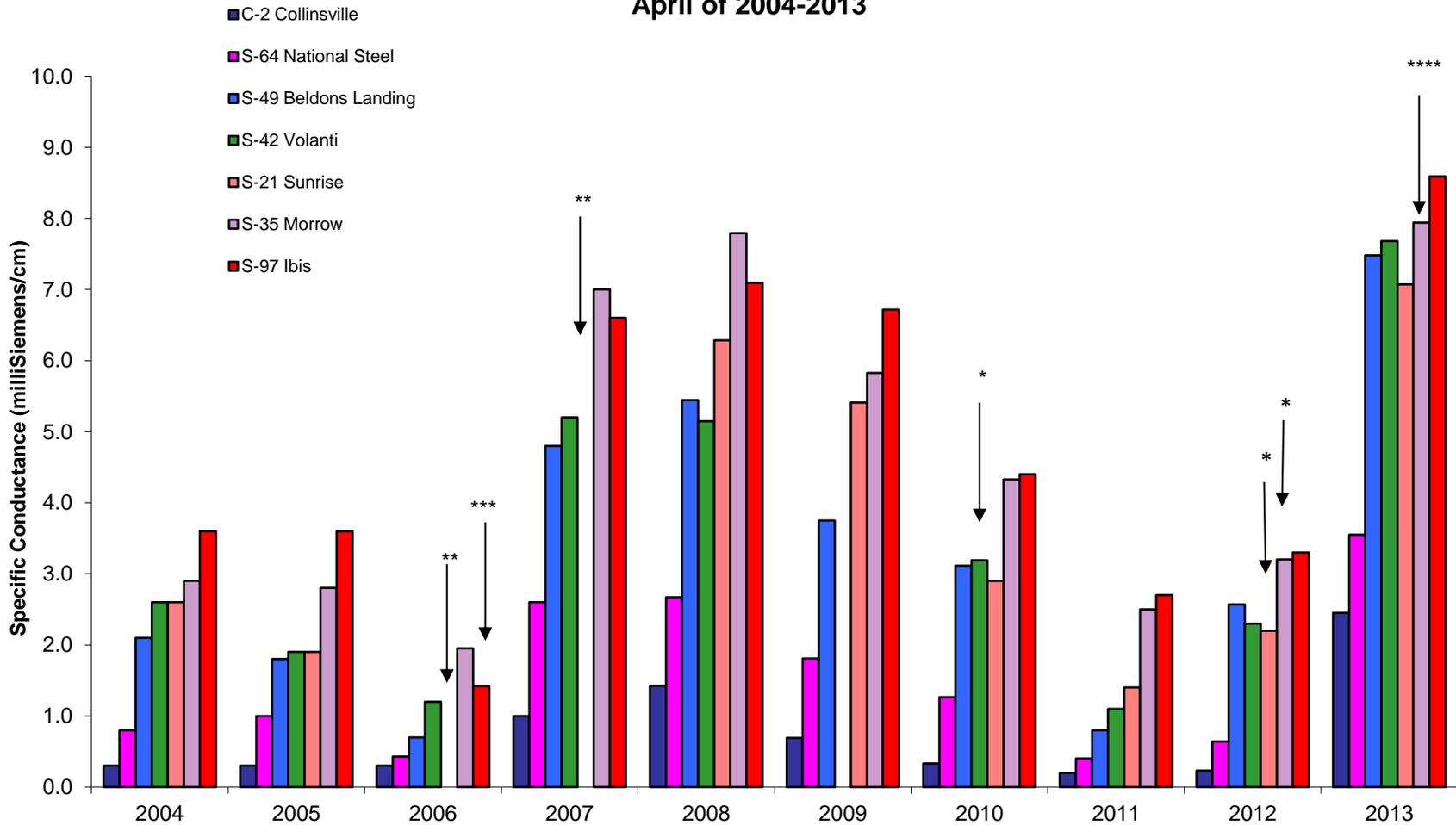


*** S-35 data for 4/27-4/30 failed QA/QC.

**Figure 3: Daily Net Delta Outflow Index and Precipitation
April 2013**



**Figure 4: Monthly Mean Specific Conductance at High Tide -
- Comparison of Monthly Values for Selected Stations
April of 2004-2013**



* S-21, S-35, S-42 and S-97 missing data due to equipment problem. **Year**
 ** S-21 data not available due to flooded roads.
 *** S-97 data not representative of end of month value due to missing data within the month.
 **** S-35 data from 4/27-4/30 failed QA/QC.

Figure 5: Suisun Marsh Stations

- ★ Compliance
- ▲ Monitoring
- ◆ Blacklock
- Initial Facilities

