
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: December 2011

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TABLE OF CONTENT

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT2

2. MONITORING RESULTS.....3

 2.1 CHANNEL WATER SALINITY COMPLIANCE3

 2.2 DELTA OUTFLOW.....3

 2.3 RAINFALL3

 2.4 SUISUN MARSH SALINITY CONTROL GATES (SMSCG) OPERATIONS4

3. DISCUSSION.....4

 3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH4

 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*.....5

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: Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations

 Figure 5: Suisun Marsh Stations

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:

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

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 December, 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 of high-tide SC with respective standards. The standard for compliance stations C-2, S-64, S-49, S-21, and S-42 was 15.5 mS/cm for December 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 December 2011 ranged between 3,900 cfs and 8,100 cfs. The only precipitation event occurred on December 15th for a total of 0.23 inches. For the month, outflow steadily increased from a low of 3,900 cfs on December 7th to a peak of 8,100 cfs on December 20th. A second peak of 7,500 cfs occurred on the 23rd before decreasing to 4,200 cfs on the 30th. 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 December 2011 is listed below:

Month	Mean NDOI (cubic feet per second)
December	5,637

2.3 Rainfall

There was only one rainfall event in December. It occurred on December 15th and resulted in a total of 0.23 inches of precipitation recorded at the Fairfield Water Treatment Plant. The monthly total is below:

Month	Total Rainfall (inches)
December	0.23

2.4 Suisun Marsh Salinity Control Gates (SMSCG) Operations

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

Date	Gate Status	Flashboards Status	Boat Lock Status
December 1 – 31	3 Open	In	Partially Closed

Salinity conditions remain low in the marsh, thus gate operation was not warranted in December 2011. DWR will continue to monitor salinity levels and will initiate gate operations if salinity becomes a concern. 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

During December 2011 PDM salinity levels at Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ranged between 1.4 mS/cm and 11.3 mS/cm as shown in Figure 1. Salinity levels were stable throughout the month with a slight increase at all compliance stations.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) were also stable throughout December and ranged between 9.4 mS/cm and 11.6 mS/cm as shown in Figure 2.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

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

December's mean salinity pattern for all compliance and monitoring stations was the sixth lowest in the past 10 years. This follows 2010 which was a wet year and resulted in the lowest salinity levels in the previous nine years.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

December 2011

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	4.7	15.5	Yes
S-64	7.6	15.5	Yes
S-49	11.1	15.5	Yes
S-42	11.3	15.5	Yes
S-21	11.2	15.5	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 for Compliance Stations December 2011

Standard = 15.5 mS/cm

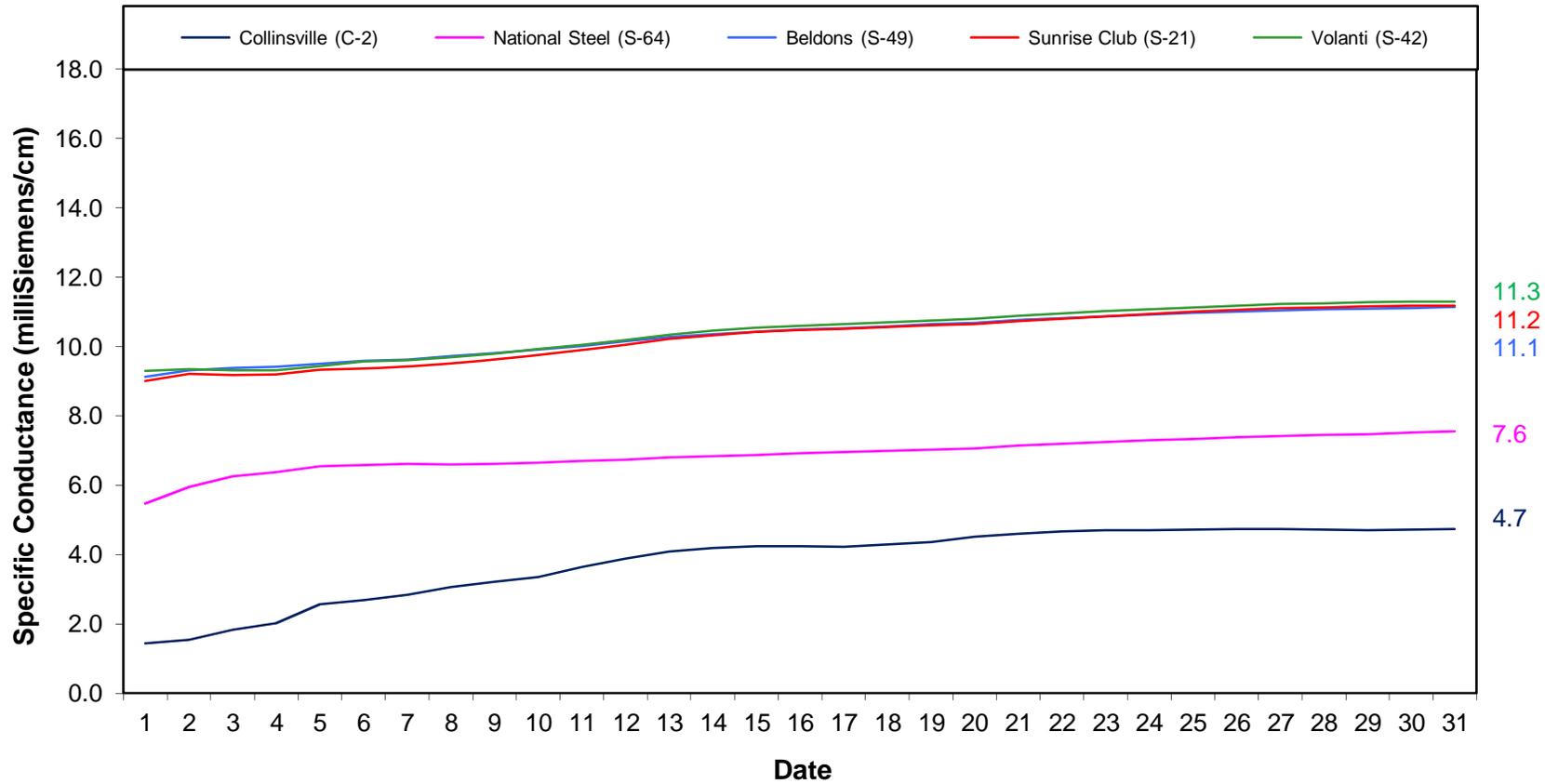
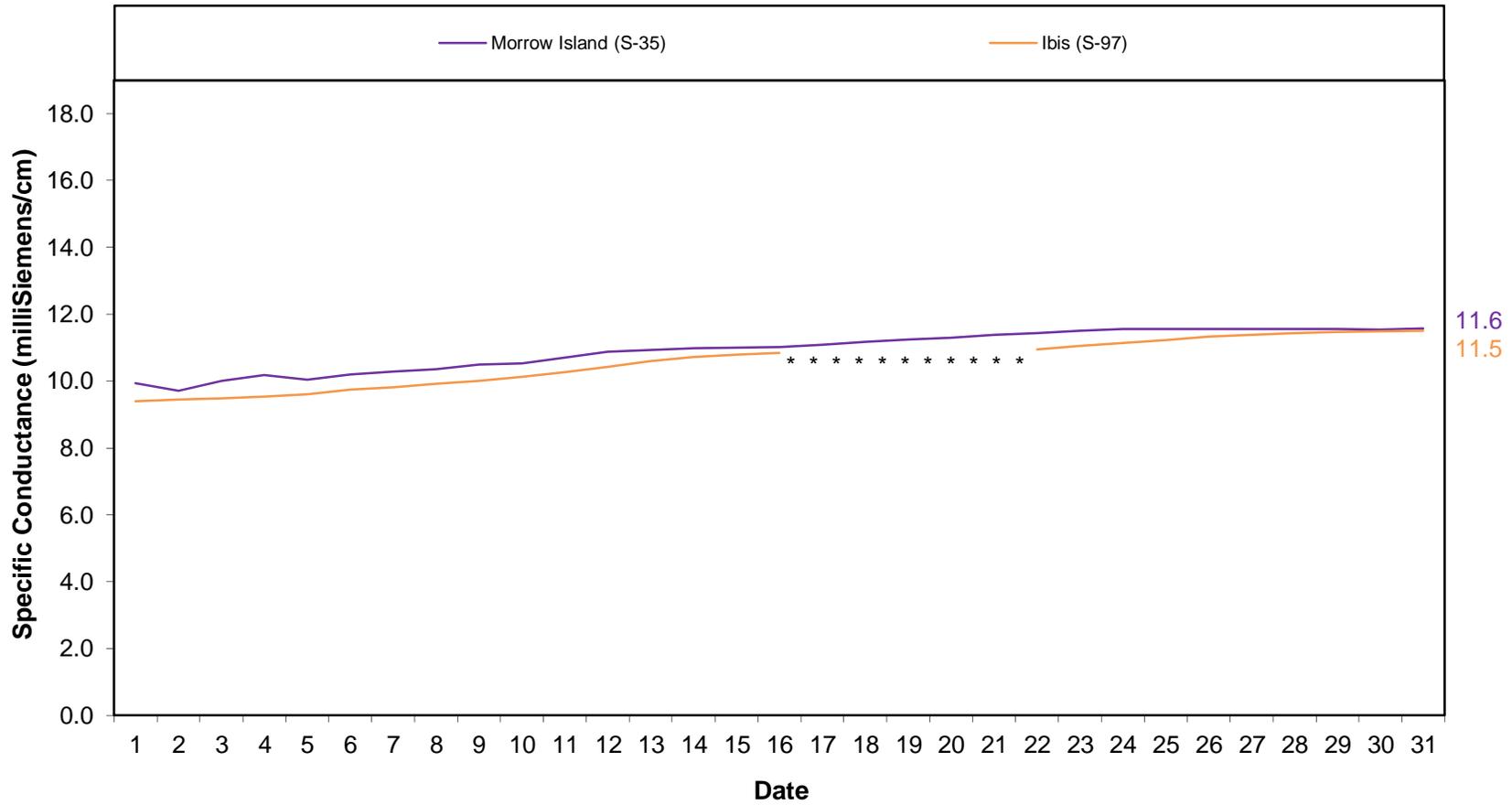
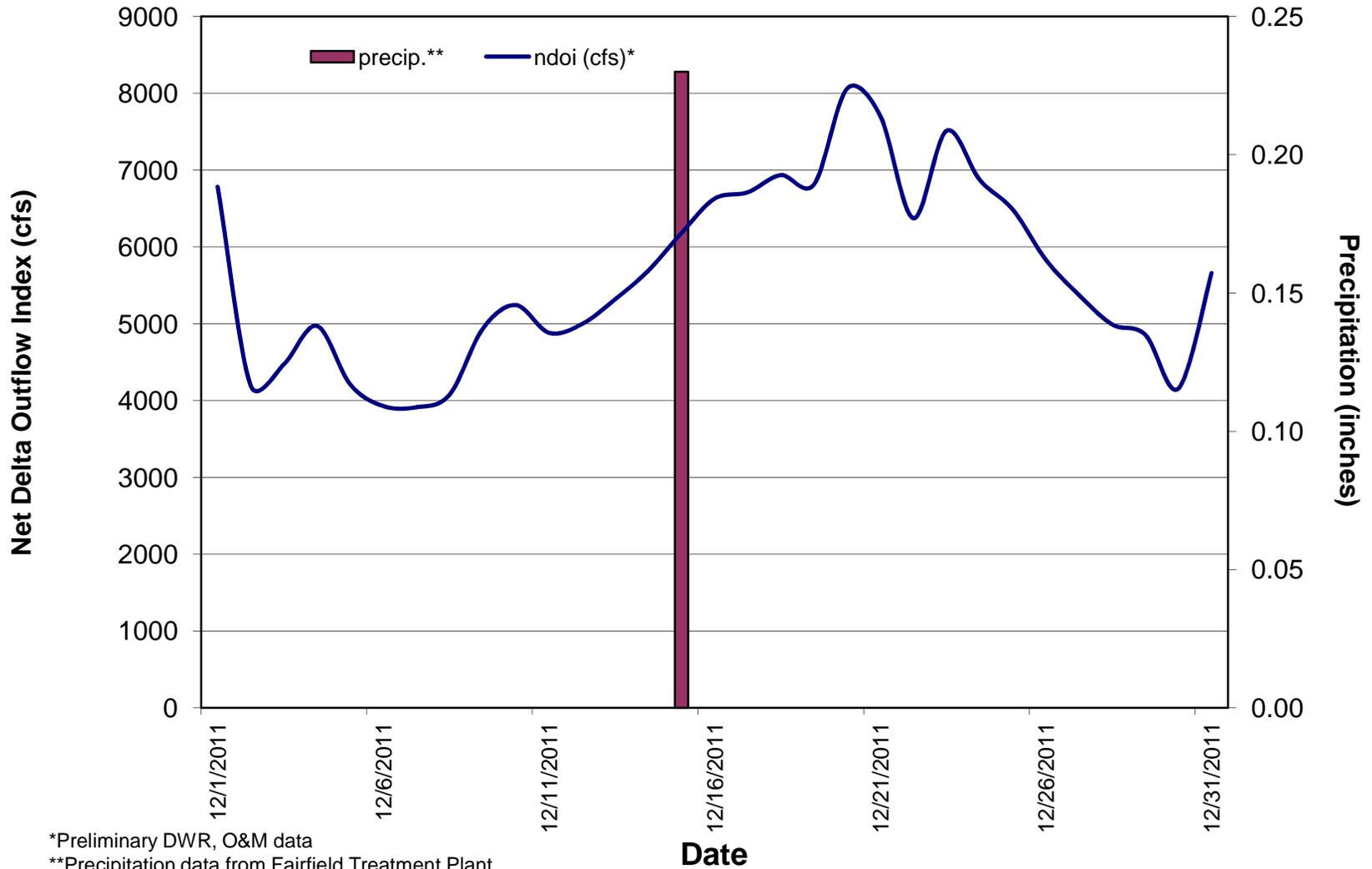


Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance for Monitoring Stations December 2011



* * * * * = data not available

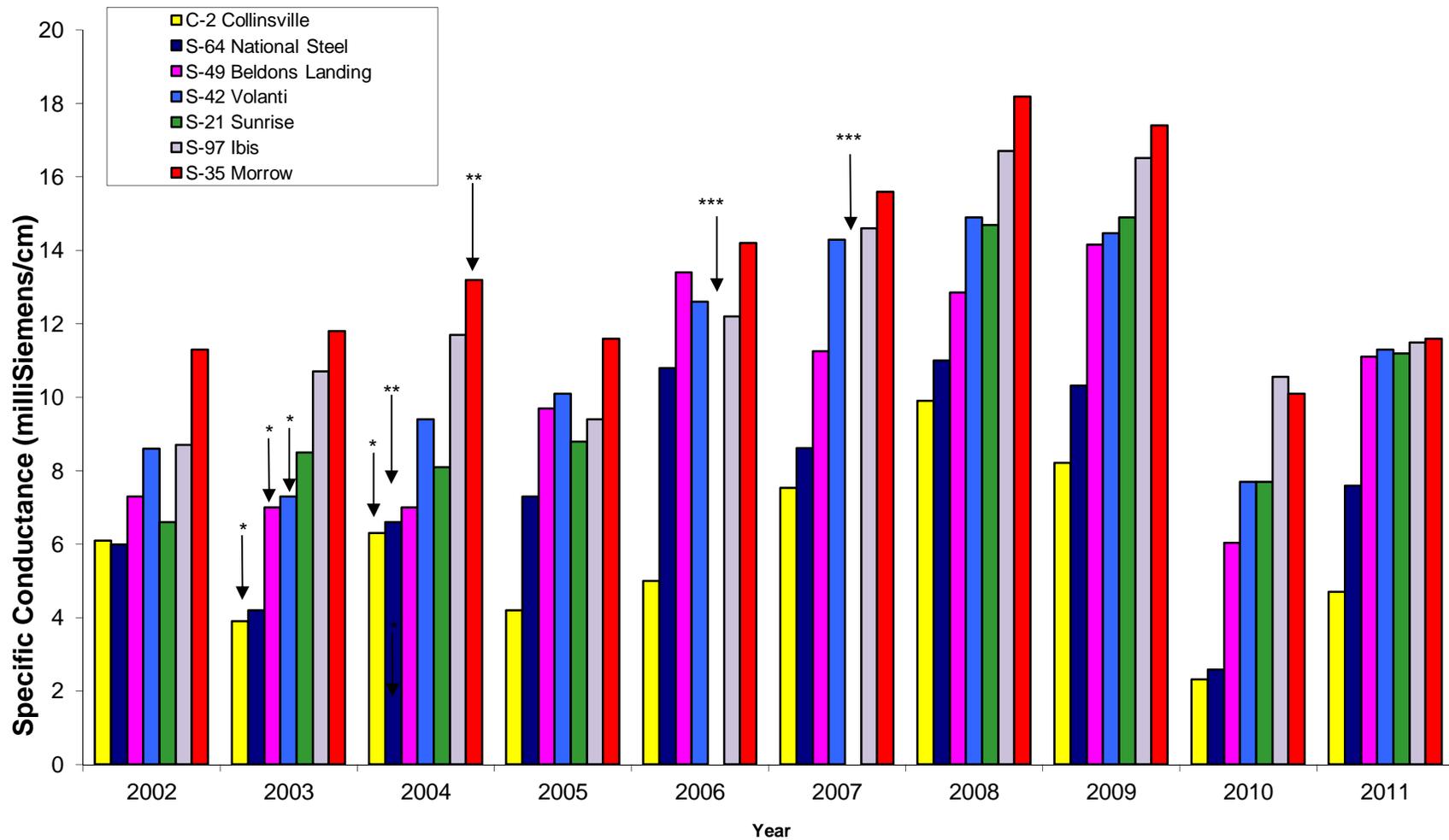
**Figure 3. Daily Net Delta Outflow Index and Precipitation
December 2011**



*Preliminary DWR, O&M data

**Precipitation data from Fairfield Treatment Plant

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



* Data does not reflect partial month. Data collection was interrupted before the end of the month due to equipment failure.
 ** Data was not obtained due to power problems at the station.
 *** Data was not obtained due to equipment failure.

Figure 5: Suisun Marsh Stations

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

