
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: November 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 November, 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 November was 15.5 mS/cm for stations C-2, S-64 and S-49, and 16.5 mS/cm for S-21 and S-42. 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 November 2013 ranged between 3,700 cfs and 13,100 cfs (Figure 3). For the month, outflow began at 5,800 cfs and stayed around 4,000 cfs before peaking at 13,100 cfs on November 22nd. Outflow then decreased and ended the month at 5,300 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 November 2013 is listed below:

Month	Mean NDOI (cubic feet per second)
November	5,900

2.3 Precipitation

There was one precipitation event in November that measured 1.28 inches. The event occurred between November 19-21. Data was recorded at the Fairfield Water Treatment Plant with the exception of November 10, 12, and 16. Data from the Stockton Fire Station was used for these dates. The monthly total precipitation is below:

Month	Total Precipitation (inches)
November	1.28

2.4 Suisun Marsh Salinity Control Gates Operations

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

Date	Gate Status	Flashboards Status	Boat Lock Status
November 1-24	3 Operational	In	Partially Closed
November 25-30	3 Open	In	Partially Closed

Due to salinity concerns, the gates were operated between October 18th- November 24th. Salinity was sufficiently lowered that operation of the gates was suspended on November 25th.

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 November 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 9.46 mS/cm and 13.71 mS/cm as shown in Figure 1. Salinity levels for November started in the range of 7.54 mS/cm to 17.47 mS/cm and gradually decreased during the month with the exception of National Steel which had a slight increase in salinity.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. The salinity for S-35 began the month of November at 13.24 mS/cm and ended the month at 18.59 mS/cm. Reviewing the mean daily salinity values for Morrow

Island, salinity took a steep drop from 19.36 mS/cm on October 30th to 12.80 mS/cm on October 31st. Salinity then steadily increased to 18.83 mS/cm on November 4th. Salinity for S-97 started the month at 19.48 mS/cm and gradually decreased to end the month at 18.01 mS/cm.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

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

November's mean salinity pattern for all compliance and monitoring stations ranked on average sixth highest in salinity levels for the past 10 years. The pattern came close to matching that of 2004, a below normal year, but at slightly higher salinity. The month falls just below the range of 2005, 2007, 2008, 2009, and 2010 which were all either below normal, dry, or critical water year types. 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
November 2013**

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	9.88	15.5	Yes
S-64	9.46	15.5	Yes
S-49	12.41	15.5	Yes
S-42	13.71	16.5	Yes
S-21	12.56	16.5	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 Daily Mean High Tide Specific Conductance for Compliance Stations
Nov 2013**

Standard = 15.5 mS/cm for C-2, S-64, S-49
Standard = 16.5 mS/cm S-21, S-42

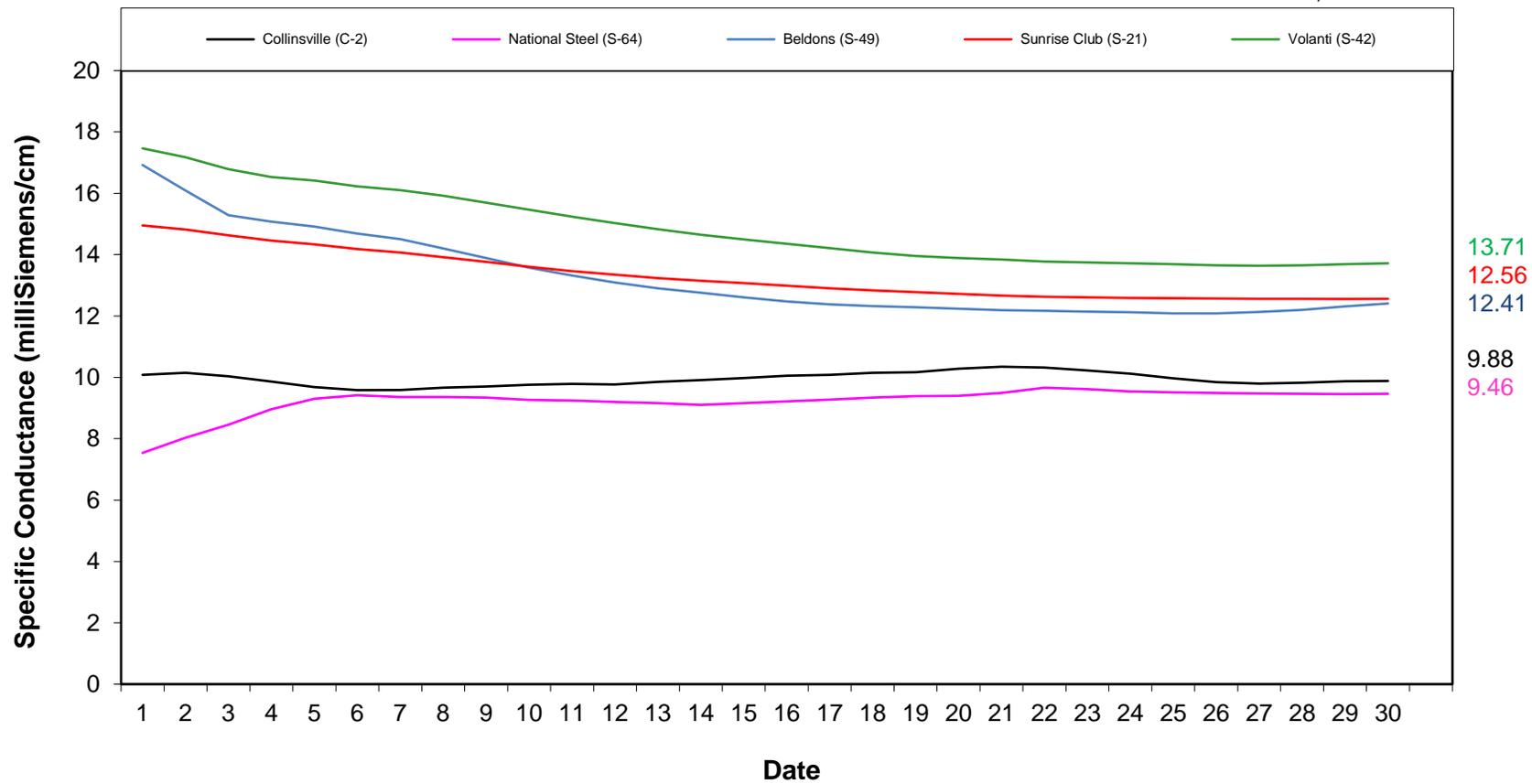
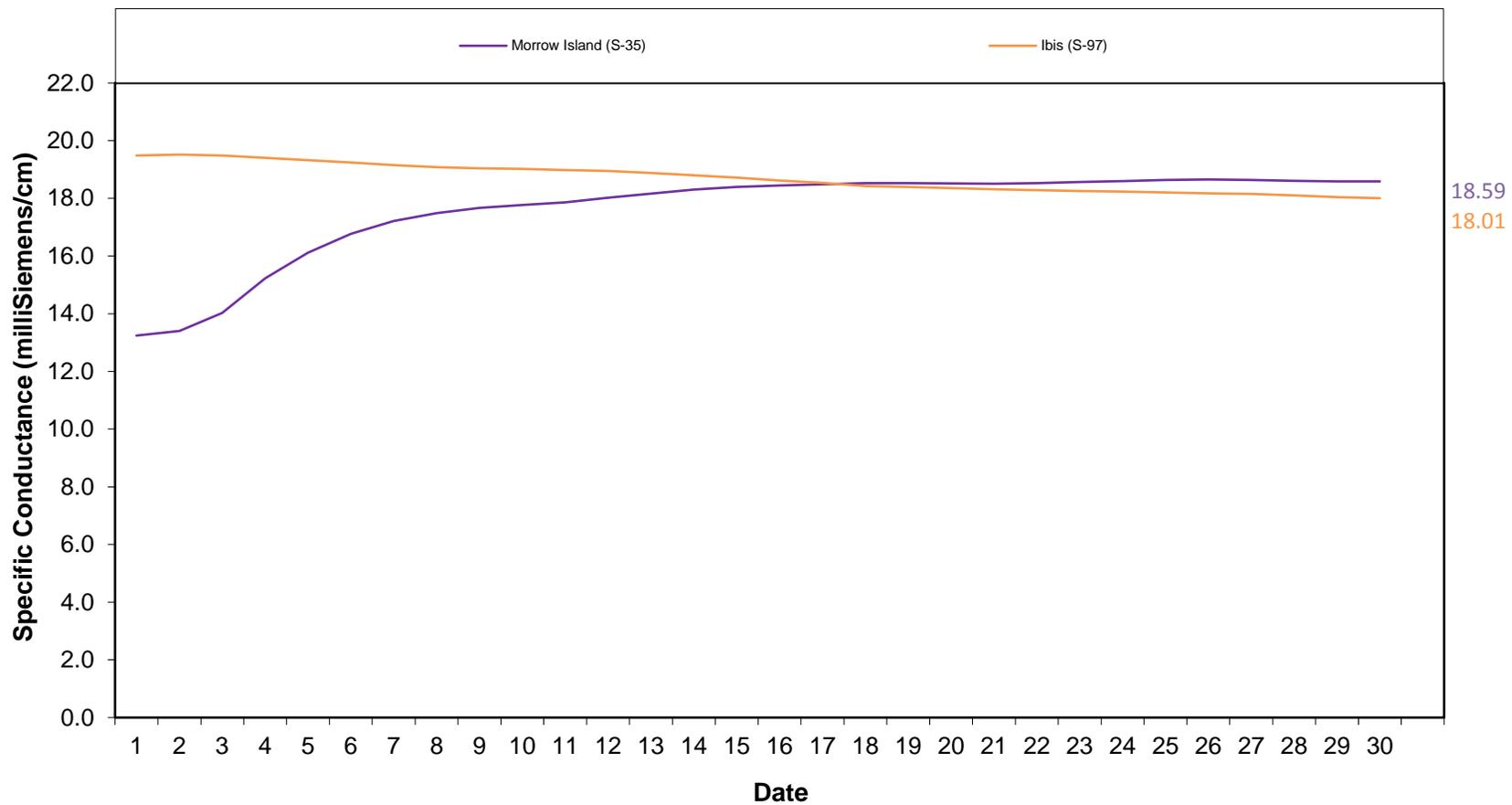


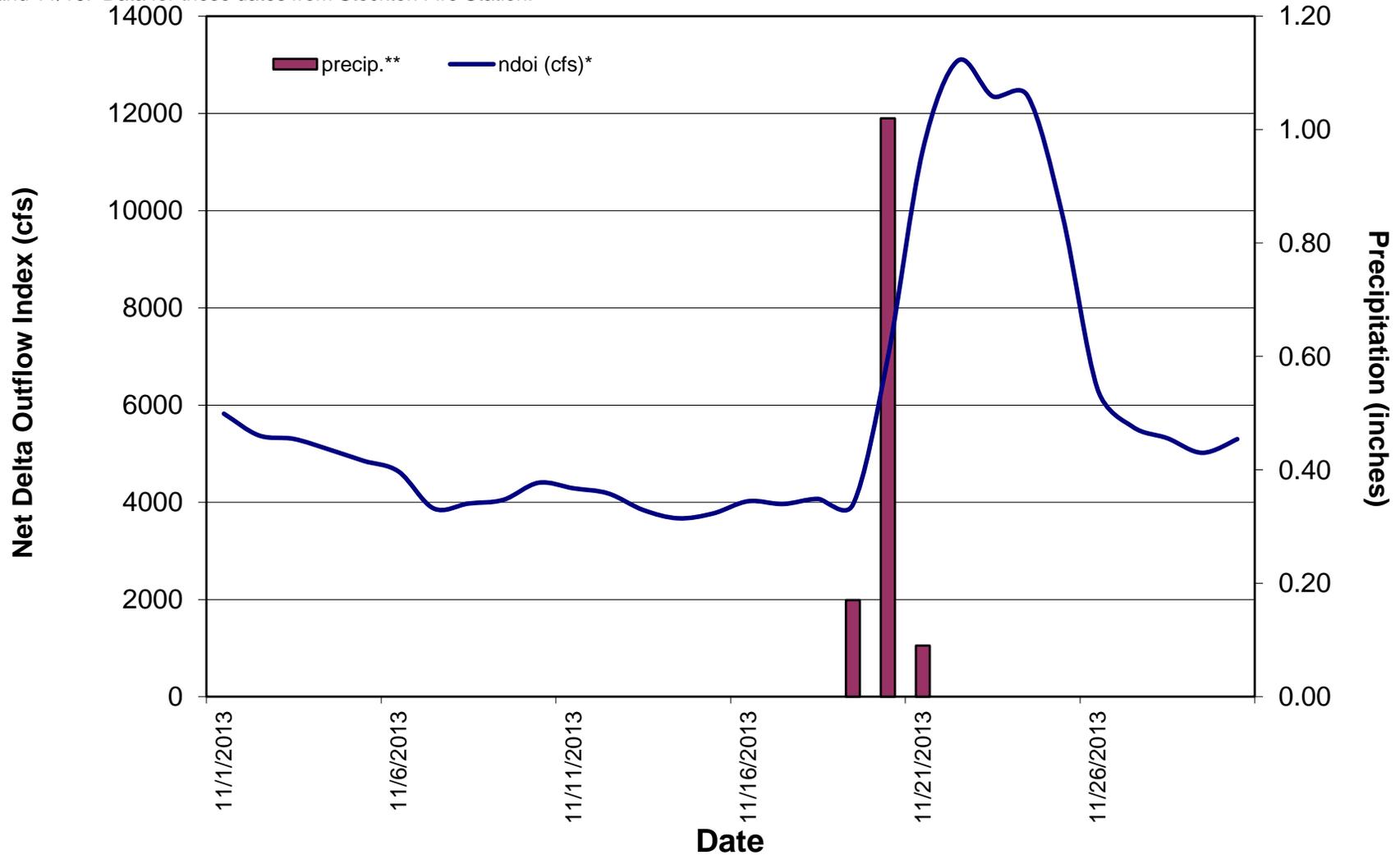
Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations November 2013



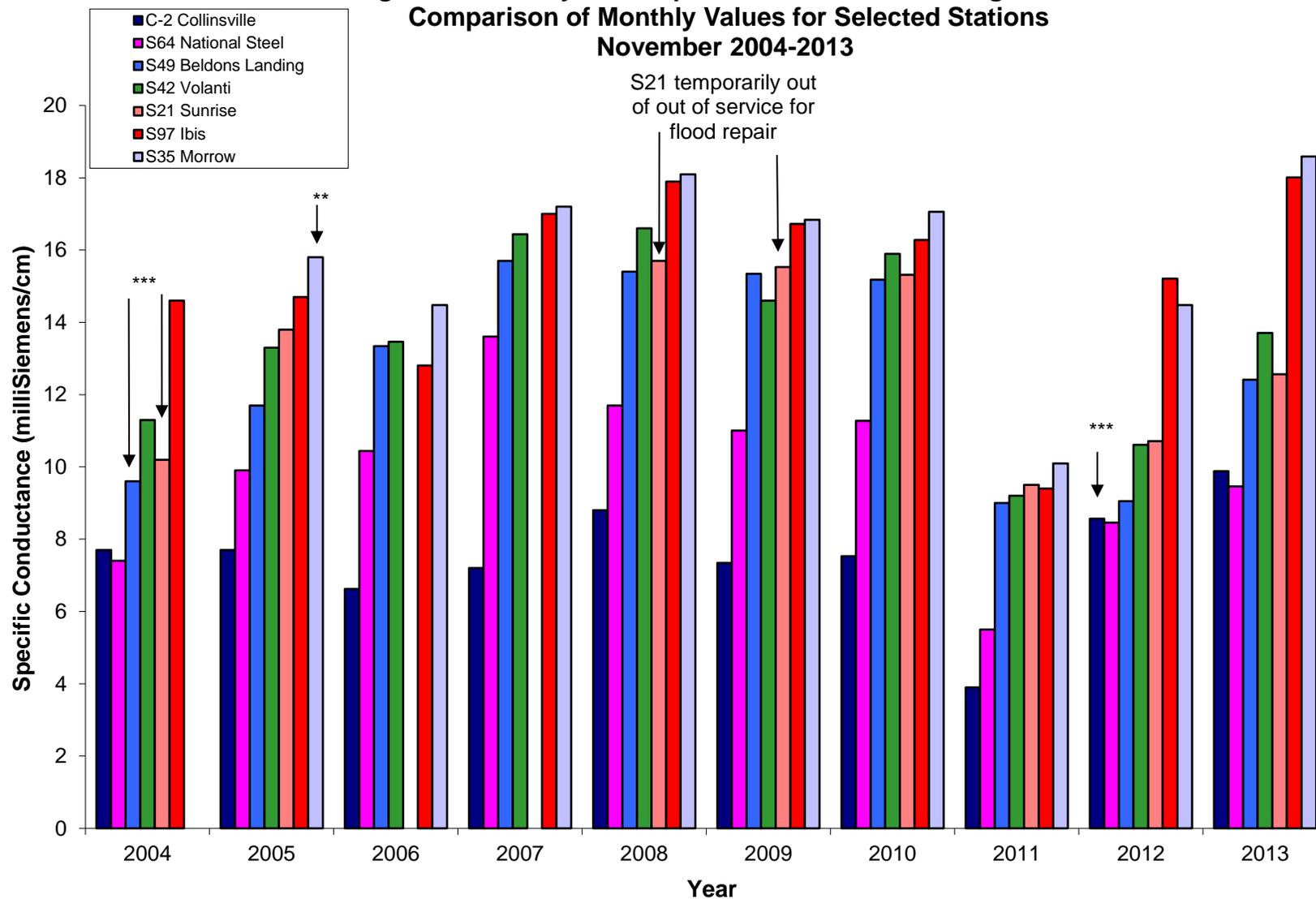
**Figure 3: Daily Net Delta Outflow Index and Precipitation
November 2013**

*Preliminary DWR, O&M data

**Precipitation data from Fairfield Water Treatment Plant. Missing data for 11/10, 11/12, and 11/16. Data for these dates from Stockton Fire Station.



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

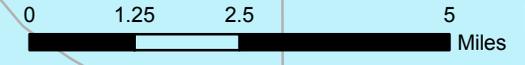


** Missing data due power problems at the station

*** Missing data due to equipment malfunction

Figure 5: Suisun Marsh Stations

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



Green Valley Creek S-9

Suisun Creek S-16

Sunrise Club S-21

Teal Club S-28

Ibis S-97

Cygnus S-33

Morrow Island S-35

Goodyear Slough Outfall

Fleet A-96

Godfather II S-37

Volanti S-42

Beldons S-49

Hunter Cut S-54

Roaring River Distribution System

Morrow Island Distribution System

R R at Montezuma Slough S-72

Montezuma Slough at R R S-71

National Steel S-64

Blacklock Pond

Blacklock River

Collinsville C-2

Fairfield

Suisun City

Benicia

Martinez

Pittsburg

Antioch

80

680

12

4