
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: November 2015

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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 PRECIPITATION.....4

 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 Daily Mean High Tide Specific Conductance for Compliance Stations

 Figure 2: Suisun Marsh Progressive Daily 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 the State Water Resources Control Board (SWRCB) Water Rights Decision 1641 (D-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 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

November 2015 was the 23rd month in the deficiency period that started January 2014. A deficiency period is defined by D-1641 Table 3 footnote 6. During the month of November, 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 Collinsville (C-2), National Steel (S-64), Beldon Landing (S-49), and the deficiency standard was also 16.5 mS/cm for stations Sunrise Club (S-21) and Volanti (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 2015 ranged between 2,500 cfs and 10,200 cfs. For the month, outflow began at 4,800 cfs and quickly increased to 10,200 cfs in response to a precipitation event that occurred between November 1-3. Outflow then decreased to a monthly low of 2,500 cfs on November 8th. A second precipitation event on November 9th increased outflow to 5,700 cfs and then decreased again after this event. A third precipitation event occurred on November 15th and outflow increased to 5,600 cfs. Outflow fell again before responding to the last precipitation event that occurred on November 24th. 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 2015 is listed below:

Month	Mean NDOI (cubic feet per second)
November	5,100

2.3 Precipitation

There were four precipitation events in November. Between November 1-3, a total of 1.16 inches of rain fell. Between November 9-10, 0.56 inch fell. On November 15th, 0.2 inch fell and on November 24th 0.16 inch fell. November's historical average precipitation in Fairfield is 2.75 inches. The monthly total precipitation recorded at the Fairfield Water Treatment Plant is below:

Month	Total Precipitation (inches)
November	2.08

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during November 2015 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
November 1-19	3 Operational	In	Partially Closed
November 20-30	3 Open	In	Partially Closed

Due to salinity being in the 12-14 mS/cm range for the compliance stations, gate operations were suspended on November 20th.

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 2015, PDM salinity levels at the five compliance stations are shown in Figure 1. Salinity levels for November started in the range of 11.75 mS/cm to 13.14

mS/cm and ended the month in the range of 11.43 mS/cm to 13.80 mS/cm. Rehabilitation of National Steel was completed on November 19th and the station came back online on the 20th. Salinity at the compliance stations was fairly stable for the month.

Salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. Salinity at S-35 began the month at 18.10 mS/cm and stayed constant through the month. Salinity ended at 18.08 mS/cm. At station S-97, salinity started the month at 20.85 mS/cm and slightly decreased during the month to end at 19.15 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 2015 were compared with means for those months during the previous nine years (Figure 4).

The average salinity for November 2015 at all compliance and monitoring stations ranked the third highest in salinity levels for the past 10 years. The highest salinity was in 2014 which was a critical water year followed by 2008 which was also a critical water year.

Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations November 2015

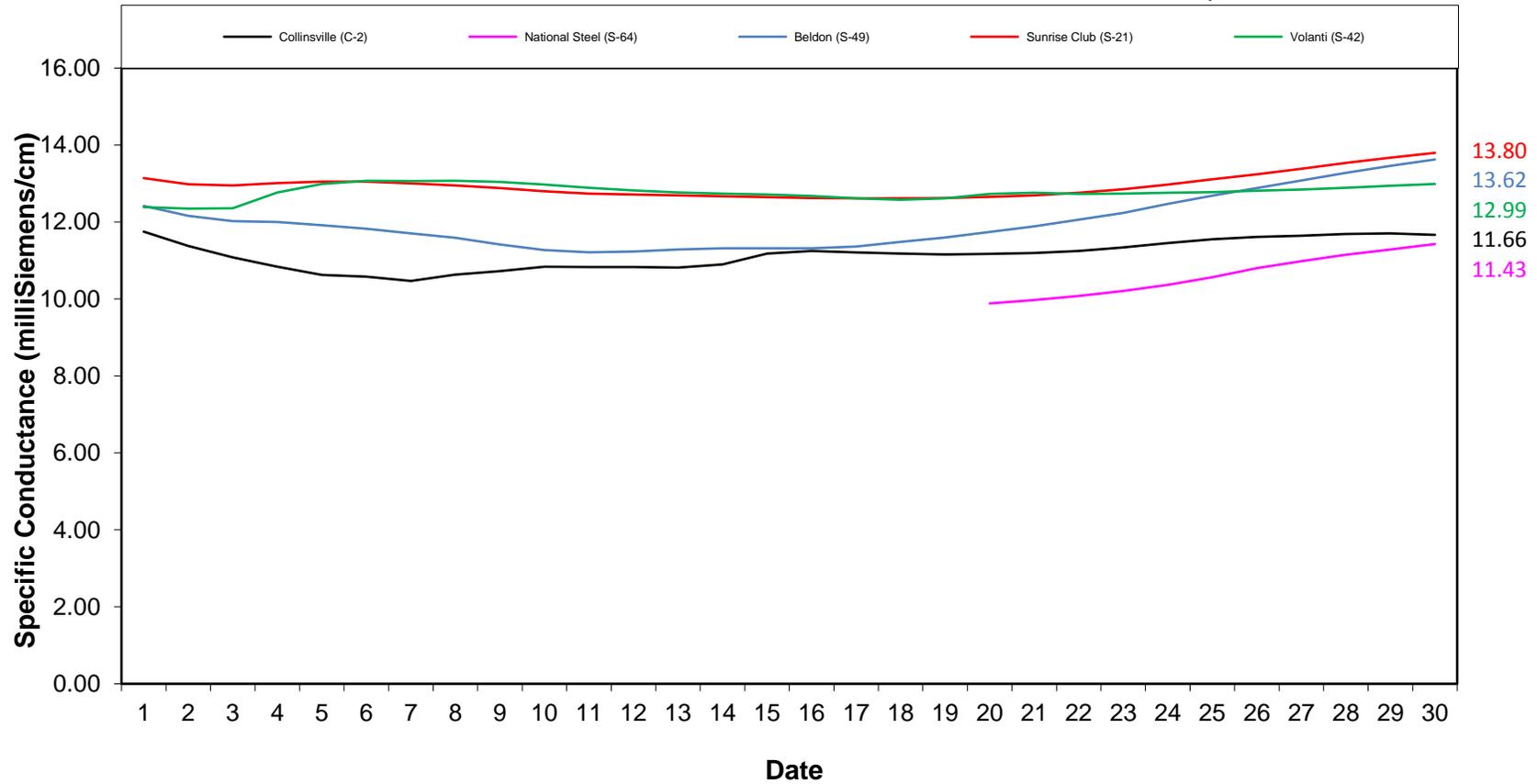
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	11.66	15.5	Yes	N/A	N/A
S-64	11.43	15.5	Yes	N/A	N/A
S-49	13.62	15.5	Yes	N/A	N/A
S-42	12.99	N/A	N/A	16.5	Yes
S-21	13.80	N/A	N/A	16.5	Yes

*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 November 2015

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



S-64 went offline on September 17th for station rehabilitation and came back online on November 20th.

Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations November 2015

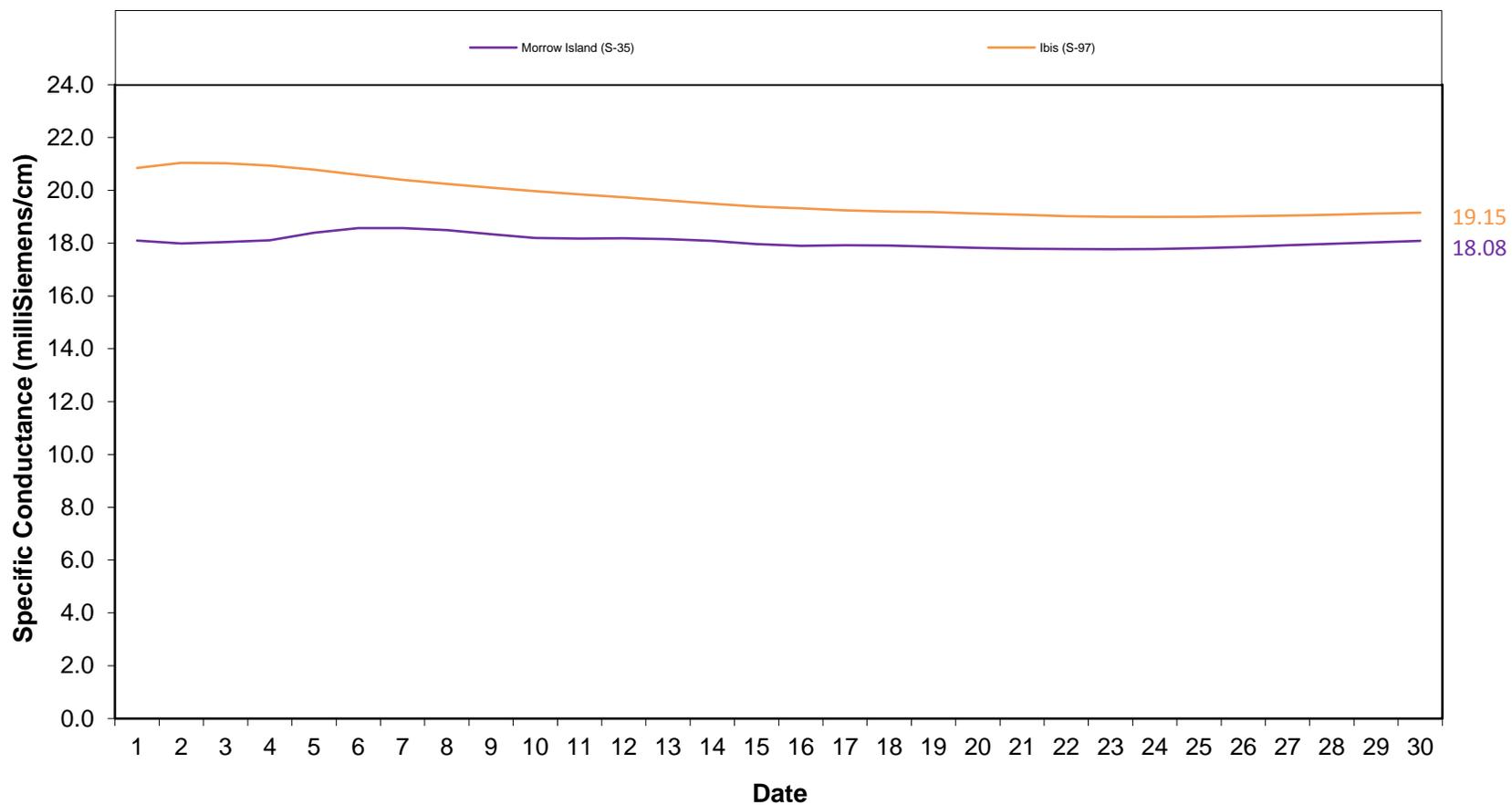
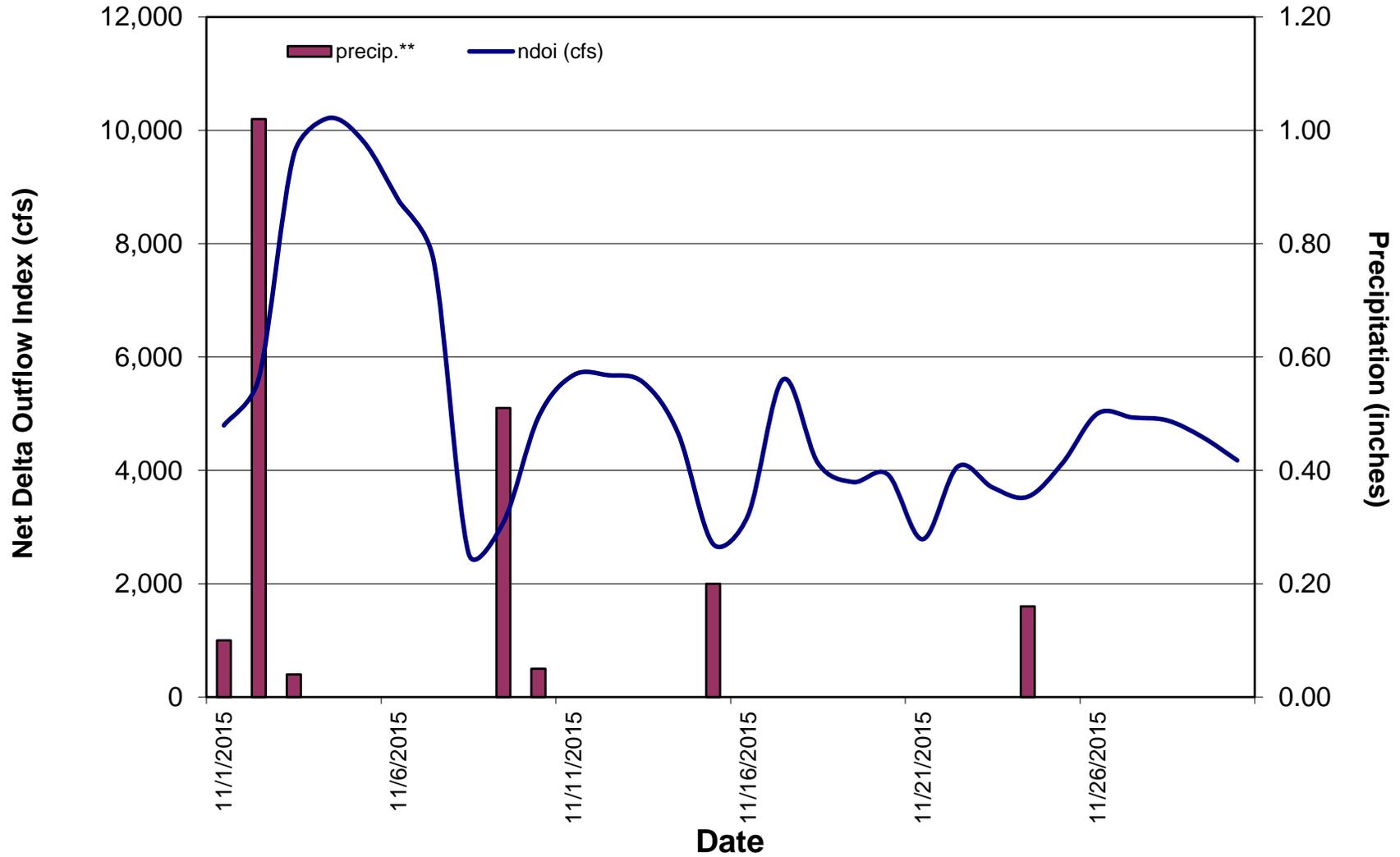


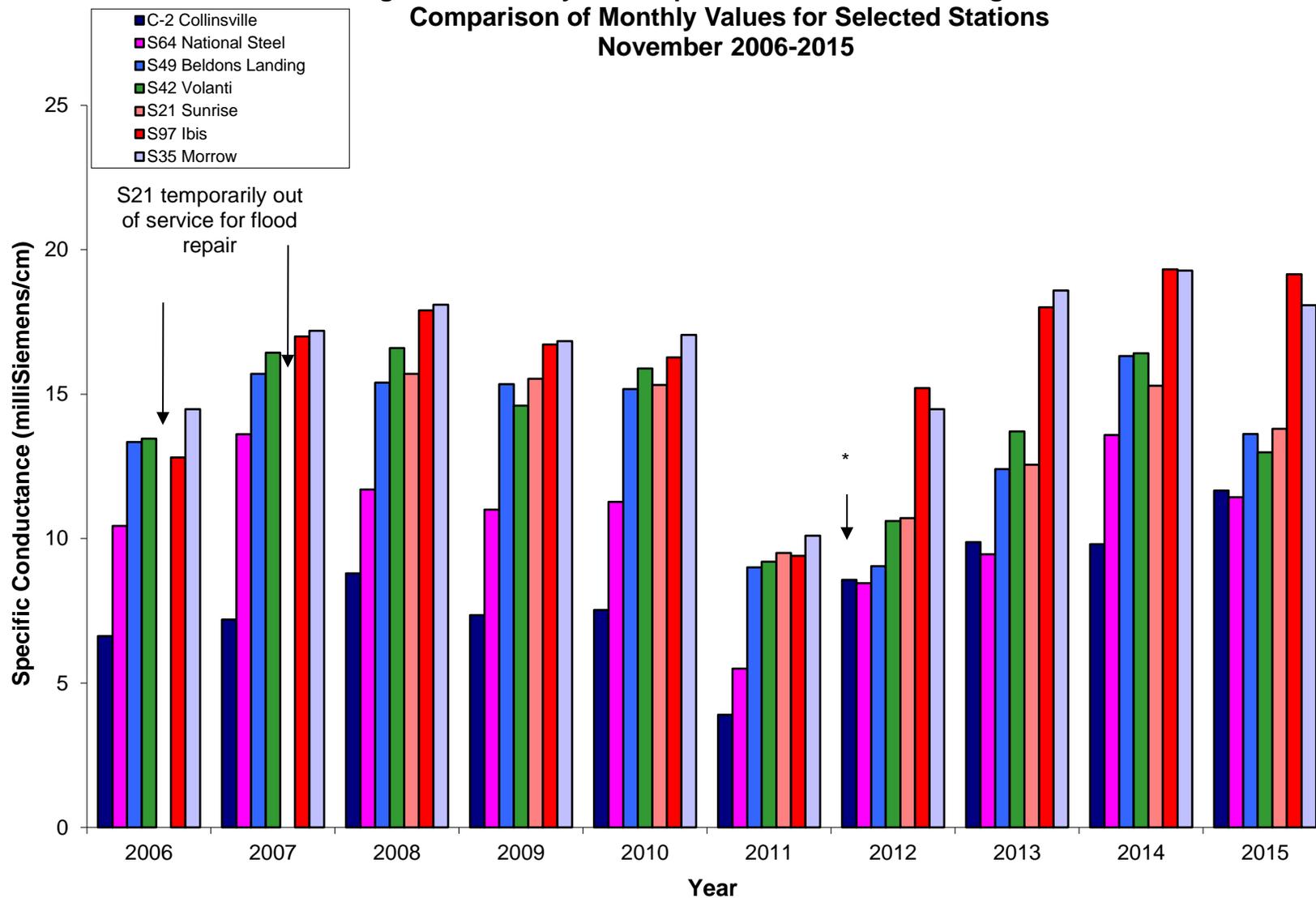
Figure 3: Daily Net Delta Outflow Index and Precipitation November 2015

*Preliminary DWR, O&M data

**Precipitation data from Fairfield Water Treatment Plant



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
November 2006-2015**



* Missing data due to equipment malfunction

Figure 5: Suisun Marsh Stations

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

