

---

# **Suisun Marsh Monitoring Program Channel Water Salinity Report**

Reporting Period: March 2015

---

Questions regarding this report should be directed to:

**Michal Koller**

California Department of Water Resources  
Division of Environmental Services  
3500 Industrial Blvd  
West Sacramento, CA 95691

Telephone: (916) 376-9728  
[Michal.Koller@water.ca.gov](mailto:Michal.Koller@water.ca.gov)

**TABLE OF CONTENT**

<b>1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT .....</b>	<b>2</b>
<b>2. MONITORING RESULTS.....</b>	<b>3</b>
2.1 CHANNEL WATER SALINITY COMPLIANCE .....	3
2.2 DELTA OUTFLOW.....	3
2.3 PRECIPITATION.....	3
2.4 SUISUN MARSH SALINITY CONTROL GATES (SMSCG) OPERATIONS .....	4
<b>3. DISCUSSION.....</b>	<b>4</b>
3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH .....	4
3.2 OBSERVATIONS AND TRENDS.....	4
3.2.1 <i>Conditions During the Reporting Period</i> .....	4
3.2.2 <i>Comparison of Reporting Period Conditions with Previous Years</i> .....	5
<b>4. LIST OF FIGURES</b>	
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:

<b>COMPLIANCE STATIONS:</b>		
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:

<b>MONITORING STATIONS:</b>		
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

March 2015 was the 15<sup>th</sup> 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 March, 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 March was 8.0 mS/cm for stations Collinsville (C-2), National Steel (S-64), Beldon Landing (S-49), and the deficiency standard was 15.6 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 March 2015 ranged between 4,100 cfs and 5,900 cfs (Figure 3). For the month, outflow began at 5,900 cfs and decreased during the month to end at 4,100 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 March 2015 is listed below:

Month	Mean NDOI (cubic feet per second)
March	5,000

### 2.3 Precipitation

There were two small precipitation events in March. The first was on March 11<sup>th</sup> when 0.06 inch of rain was recorded. The second was on March 23<sup>rd</sup> when 0.10 inch of precipitation fell. March's historical average precipitation in Fairfield is 3.09 inches. The monthly total precipitation recorded at the Fairfield Water Treatment Plant is below:

Month	Total Precipitation (inches)
March	0.16

## 2.4 Suisun Marsh Salinity Control Gates Operations

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

Date	Gate Status	Flashboards Status	Boat Lock Status
March 1-31	3 Operational	In	Partially Closed

Due to salinity concerns in the western Marsh, the SMSCG were operated for the entire month of March.

## 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 March 2015, PDM salinity levels at the five compliance stations are shown in Figure 1. Salinity levels for March started in the range of 1.23 mS/cm to 4.08 mS/cm and ended the month in the range of 3.78 mS/cm to 4.50 mS/cm. Salinity at all five compliance stations stayed steady until March 10<sup>th</sup> then salinity at all stations increased at a fairly constant rate. Stage data at S-21 did not pass quality control inspection between March 19-31. Bad salinity data was recorded at S-49 on March 29<sup>th</sup>.

Salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. Salinity at S-35 began the month at 6.42 mS/cm and increased during the month to end at 8.58

mS/cm. At station S-97, salinity began the month at 7.36 mS/cm and increased slightly to 7.75 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 March 2015 were compared with means for those months during the previous nine years (Figure 4).

The average salinity for March 2015 at all compliance and monitoring stations ranked the second highest in salinity levels for the past 10 years following that of 2013. Four of the seven stations had higher salinity values than 2012 and 2013. The three stations with higher salinity values during 2012 and 2013 were S-49, S-42, and S-21. Water year 2012 was classified as below normal and 2013 was dry.

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

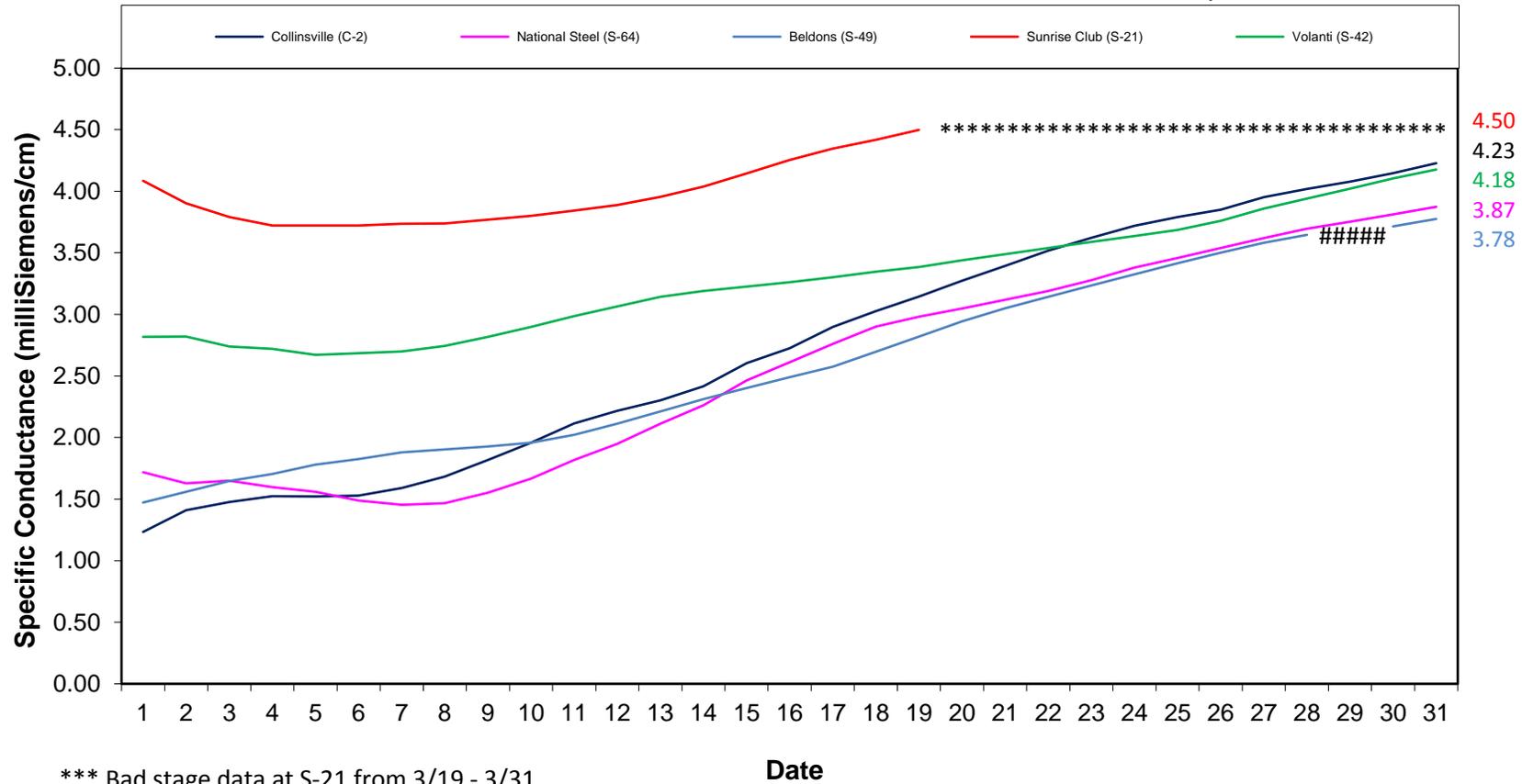
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	4.23	8.0	Yes	N/A	N/A
S-64	3.87	8.0	Yes	N/A	N/A
S-49	3.78	8.0	Yes	N/A	N/A
S-42	4.18	N/A	N/A	15.6	Yes
S-21	4.50	N/A	N/A	15.6	Yes

\*milliSiemens per centimeter

\*\*The representative data from nearby USBR station is used in lieu of data from station C-2.

**Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations March 2015**

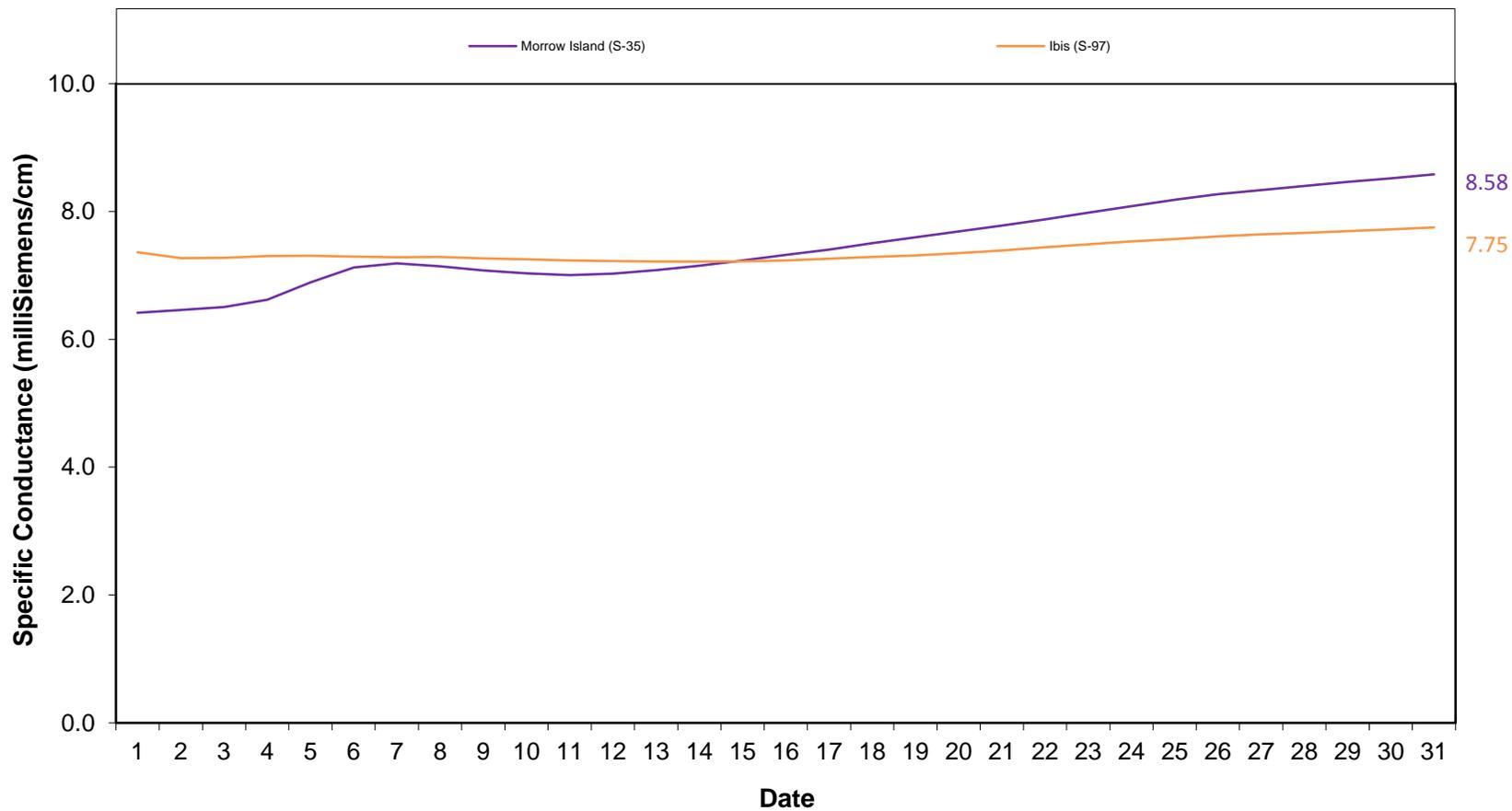
C-2, S-64, S49 Standard = 8.0 mS/cm  
 S-21, S-42 Deficiency Standard = 15.6 mS/cm



\*\*\* Bad stage data at S-21 from 3/19 - 3/31.

### Bad EC data at S-49 for 3/29.

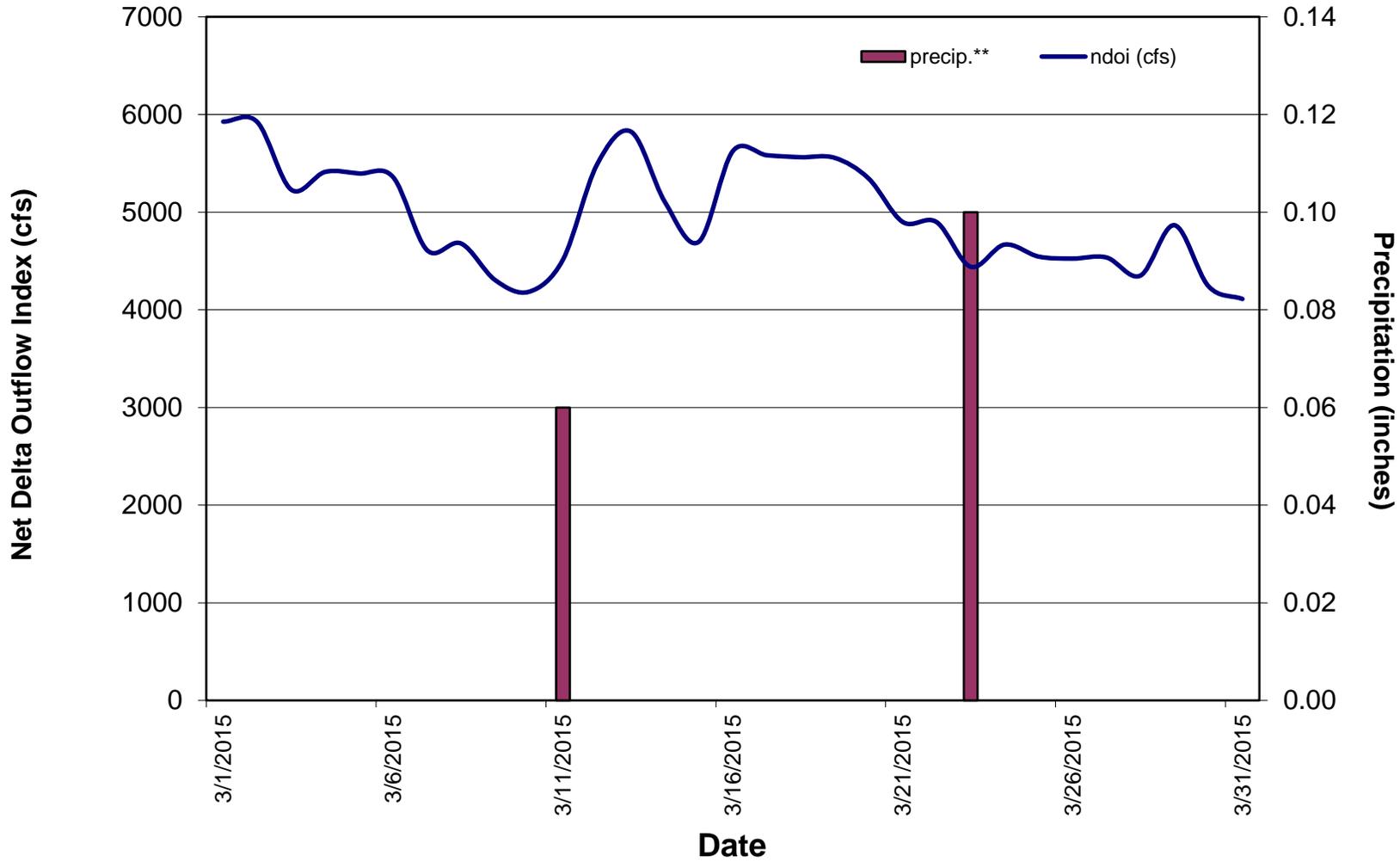
**Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations March 2015**



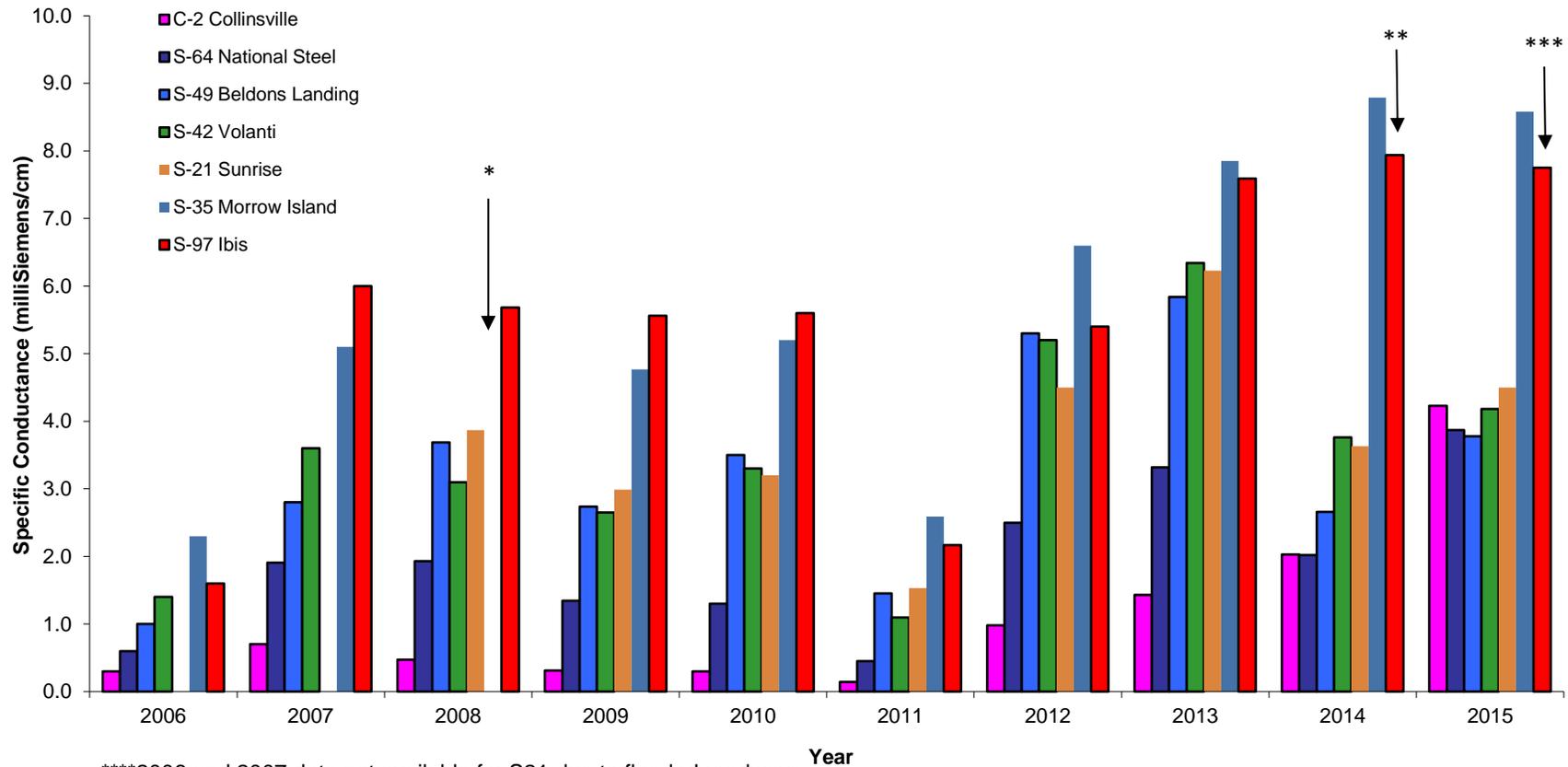
**Figure 3: Daily Net Delta Outflow Index and Precipitation  
March 2015**

\*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  
March of 2006-2015\*\*\*\***



\*\*\*\*2006 and 2007 data not available for S21 due to flooded roadways.

\*Data not available for S35 due to equipment upgrade.

\*\* Sensor malfunction 3/29/14-3/31/14.

\*\*\* Bad stage data 3/19/15-3/31/15.

**Figure 5: Suisun Marsh Stations**

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

