
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: April 2015

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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 (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

April 2015 was the 16th 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 April, 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 for stations Collinsville (C-2), National Steel (S-64), Beldon Landing (S-49), and the deficiency standard was 14.0 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 April 2015 ranged between 2,800 cfs and 10,800 cfs (Figure 3). For the month, outflow began at 4,100 cfs and increased to 10,800 cfs on April 9th in response to a storm event that occurred on April 7th. Outflow then decreased and averaged around 3,900 cfs before increasing to 7,300 cfs in response to a storm event on April 25th. Outflow ended the month at 6,400 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 April 2015 is listed below:

Month	Mean NDOI (cubic feet per second)
April	5,400

2.3 Precipitation

There were two precipitation events in April. The first occurred on April 7th when 0.83 inch of rain was recorded. The second was on April 25th when 0.43 inch of precipitation

fell. April's historical average precipitation in Fairfield is 1.39 inches. The monthly total precipitation recorded at the Fairfield Water Treatment Plant is below:

Month	Total Precipitation (inches)
April	1.26

2.4 Suisun Marsh Salinity Control Gates Operations

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

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

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

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 2015, PDM salinity levels at the five compliance stations are shown in Figure 1. Salinity levels for April started in the range of 5.61 mS/cm to 6.28 mS/cm and ended the month in the range of 7.07 mS/cm to 9.24 mS/cm. Salinity at all five compliance stations gradually increased during the month. Stage data at S-21 did not pass quality control inspection between April 1-7. Bad salinity data was recorded at S-49 on April 7th, 9th, and 14th.

Salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. Salinity at S-35 began the month at 11.15 mS/cm and increased slightly during the month to end at 12.45 mS/cm. At station S-97, salinity began the month at 8.61 mS/cm and ended the month at 10.32 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 April 2015 were compared with means for those months during the previous nine years (Figure 4).

The average salinity for April 2015 at all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. The next highest salinity was in 2013 which was a dry water year. Following close behind 2013 are 2014 and 2008 which were both critical water years.

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

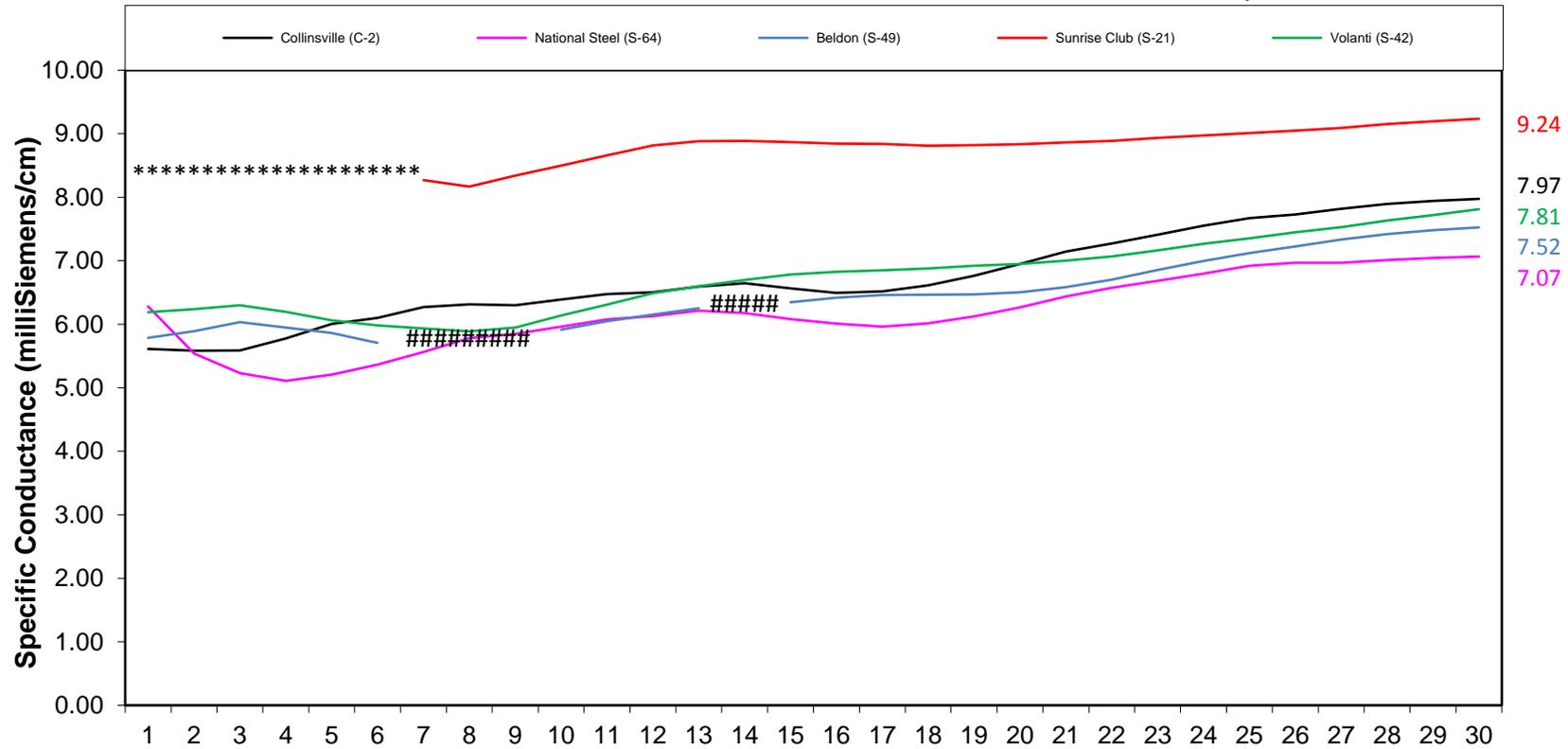
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	7.97	11.0	Yes	N/A	N/A
S-64	7.07	11.0	Yes	N/A	N/A
S-49	7.52	11.0	Yes	N/A	N/A
S-42	7.81	N/A	N/A	14.0	Yes
S-21	9.24	N/A	N/A	14.0	Yes

*milliSiemens per centimeter

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

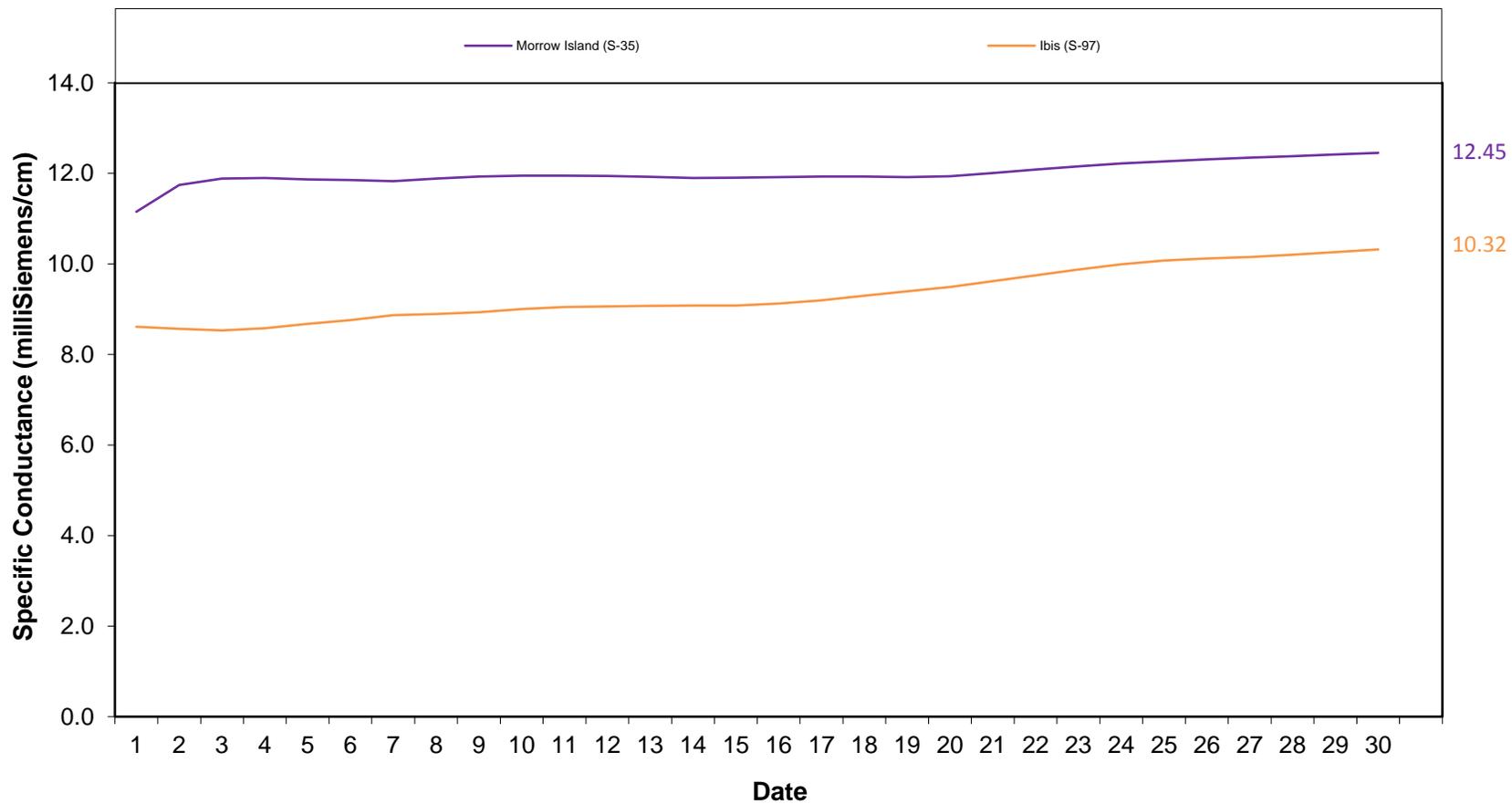
Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations April 2015

C-2, S-64, S49 Standard = 11.0 mS/cm
 S-21, S-42 Deficiency Standard = 14.0 mS/cm



*** Bad stage data at S-21 from 4/1-4/7.
 ### Bad EC data at S-49 for 4/7, 4/9, and 4/14.

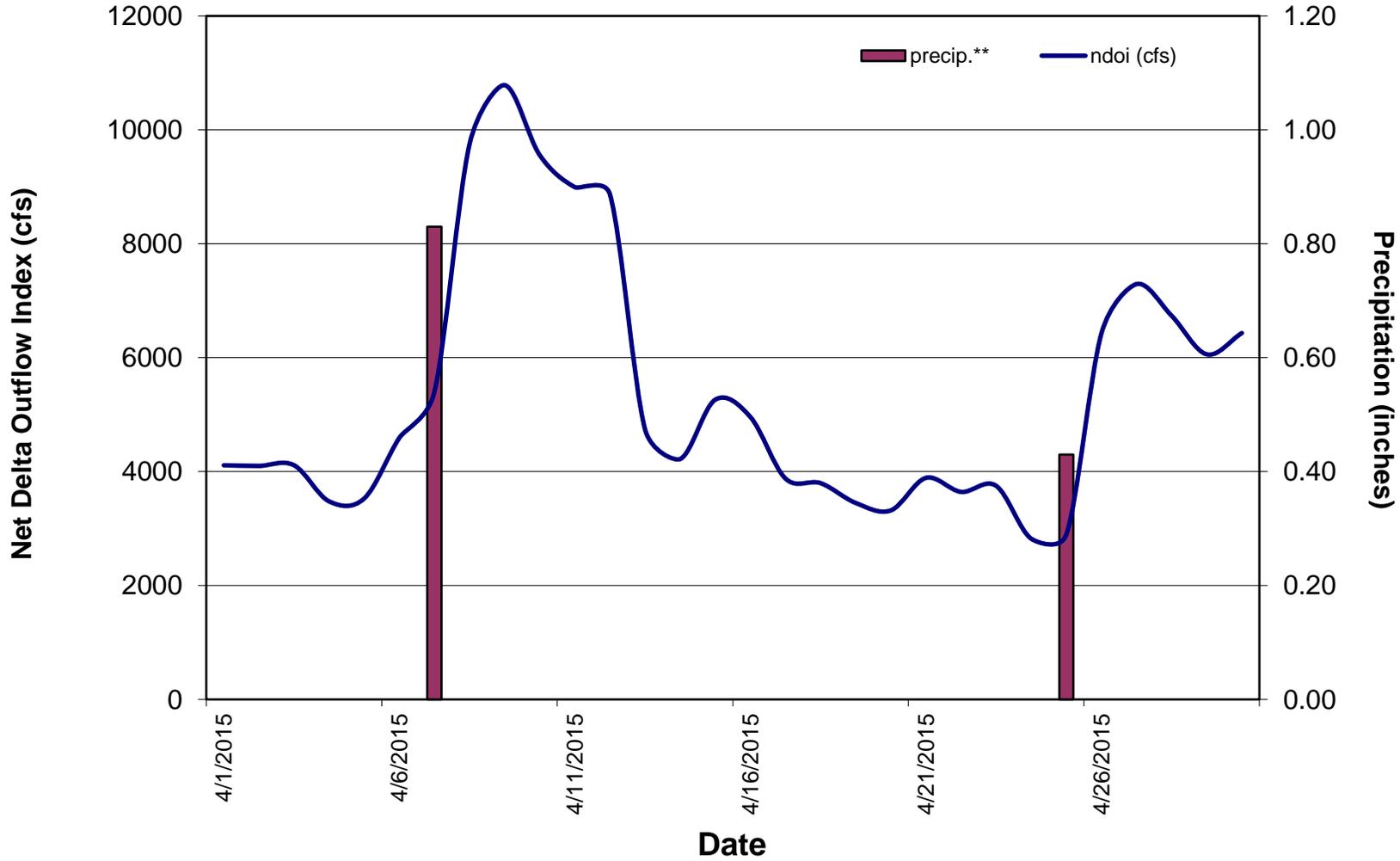
Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations Apr 2015



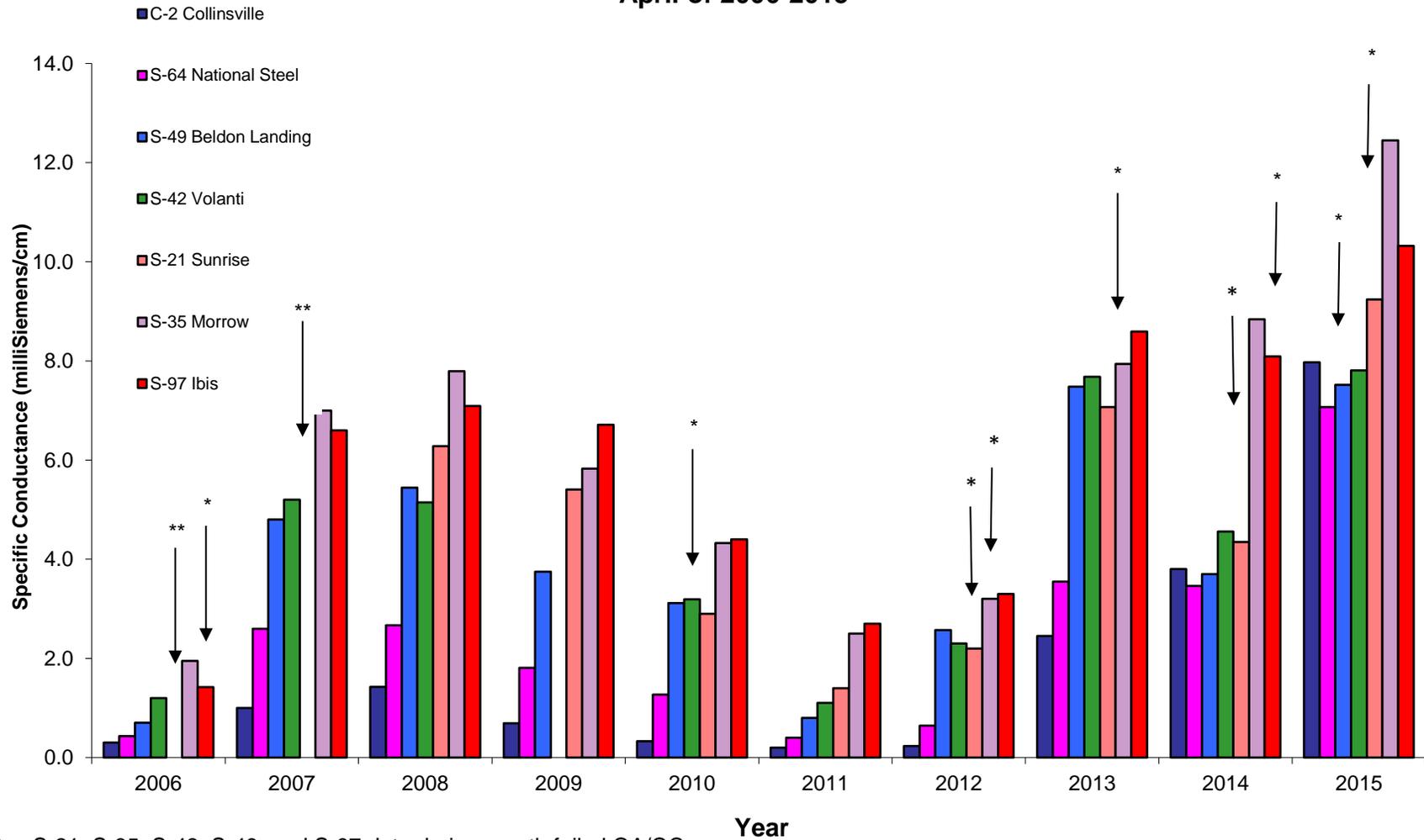
**Figure 3: Daily Net Delta Outflow Index and Precipitation
April 2015**

*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
April of 2006-2015**



* S-21, S-35, S-42, S-49, and S-97 data during month failed QA/QC.

** S-21 data not available due to flooded roads.

Figure 5: Suisun Marsh Stations

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

