
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: January 2014

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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'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

January 2014 was determined to be the start of a deficiency period as defined by D-1641 Table 3 footnote 6. The final Water Year Type for 2013 was classified as a dry year and 2014 was forecasted as a critical year in January 2014. During the month of January, 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 January was 12.5 mS/cm for stations Collinsville (C-2), National Steel (S-64), Beldon's 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 January 2014 ranged between 4,200 cfs and 6,300 cfs (Figure 3). For the month, outflow began at 5,600 cfs and peaked at 6,000 cfs on January 6th. Outflow then decreased and stayed around 4,400 cfs before gradually increasing at the end of the month. This increase was likely due to reduced Delta exports. Outflow responded to the precipitation event on January 30th and ended the month at 6,300 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 January 2014 is listed below:

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

2.3 Precipitation

There was only one precipitation event in January 2014. It amounted to 0.26 inch on January 30th. Data was recorded at the Fairfield Water Treatment Plant. January's average precipitation in Fairfield is 4.78 inches. The monthly total precipitation is below:

Month	Total Precipitation (inches)
January	0.26

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during January 2014 are summarized below:

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

Due to salinity concerns, the gates were operated between January 1-31.

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 January 2014, PDM salinity levels at compliance stations C-2, S-64, S-49, S-21 and S-42 ended the month between 10.56 mS/cm and 12.35 mS/cm as shown in Figure 1. Salinity levels for January started in the range of 11.08 mS/cm to 14.01 mS/cm and gradually decreased during the month. The lowering of salinity was due to SMSCG operations.

Salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. The salinity for S-35 began the month of January at 18.41 mS/cm and ended the month at 16.65 mS/cm. Due to equipment failure, data is missing for the period of January 3-8 and 10-13. Salinity for S-97 started the month at 17.34 mS/cm and decreased slightly to 17.15 mS/cm. SMSCG operations can have an effect on S-35 but only local inflows will affect S-97.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high tide SC at the compliance and monitoring stations for January 2014 were compared with means for those months during the previous nine years (Figure 4).

January 2014 mean salinity pattern for all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. Close behind January 2014 was January 2009 which was a dry water year. January 2009 was in a deficiency period as defined by D-1641. 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 January 2014

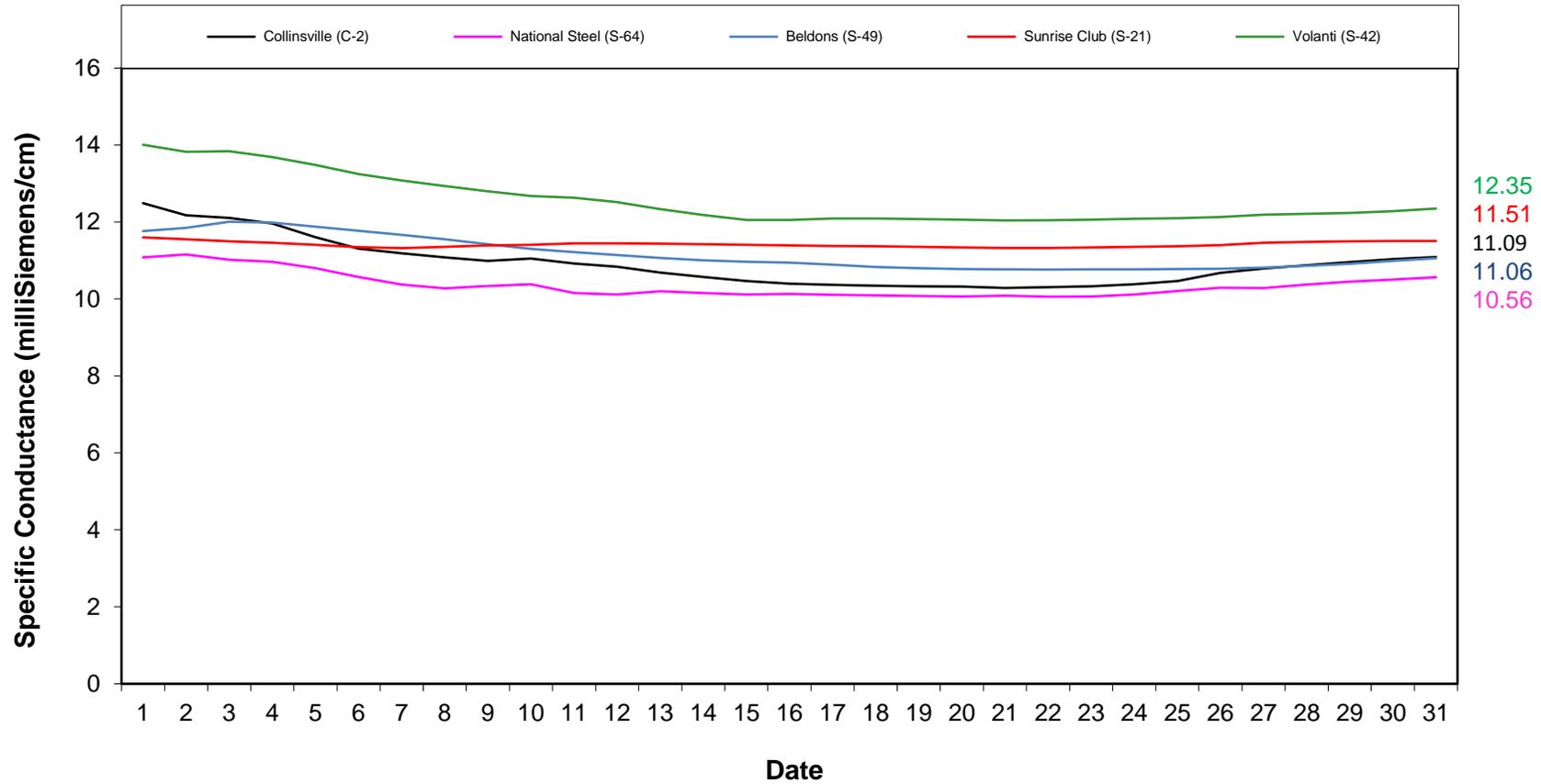
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	11.09	12.5	Yes	N/A	N/A
S-64	10.56	12.5	Yes	N/A	N/A
S-49	11.06	12.5	Yes	N/A	N/A
S-42	12.35	N/A	N/A	15.6	Yes
S-21	11.51	N/A	N/A	15.6	Yes

*milliSiemens per centimeter

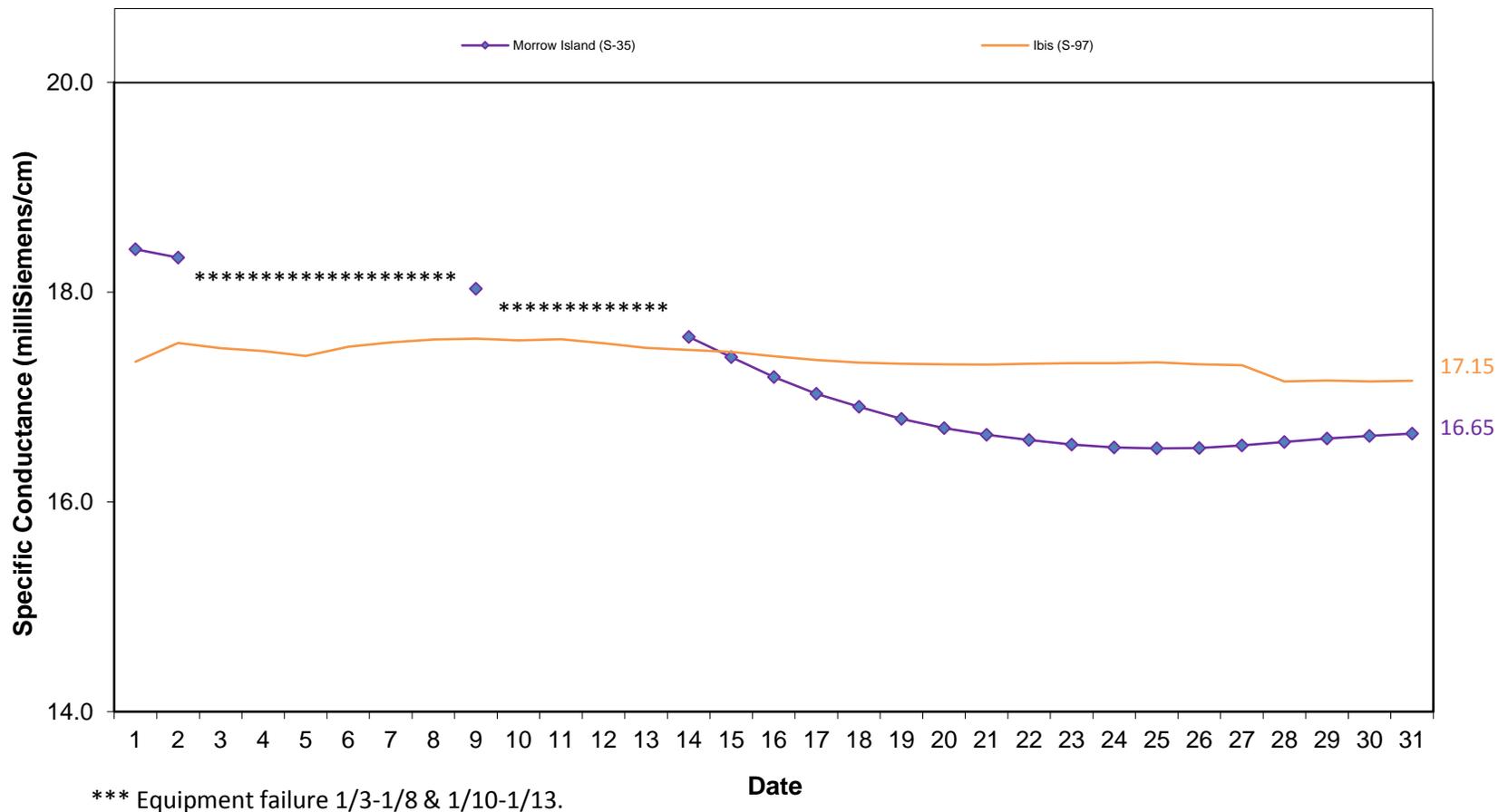
**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations January 2014

Standard = 12.5 mS/cm



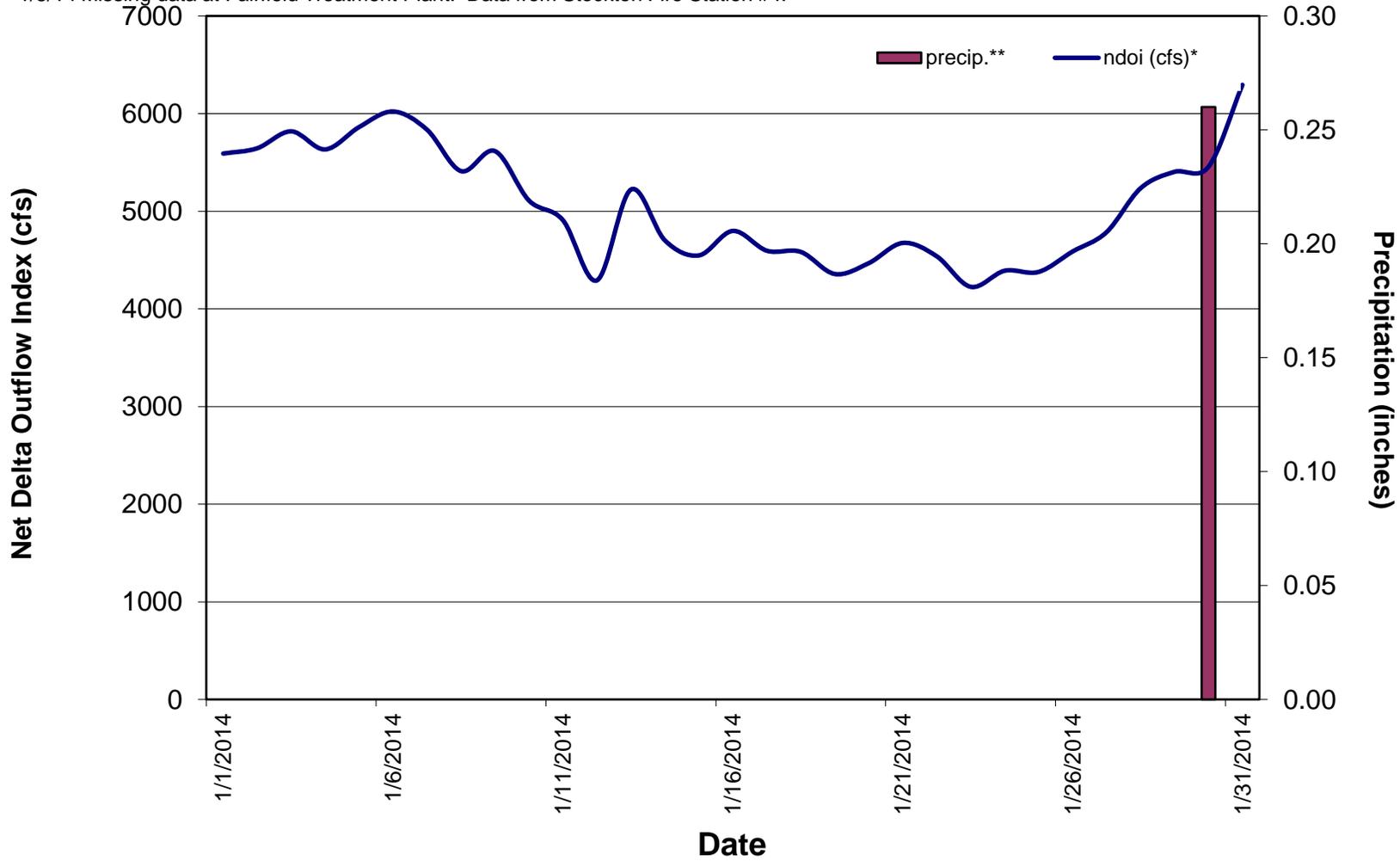
**Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance
for Monitoring Stations
January 2014**



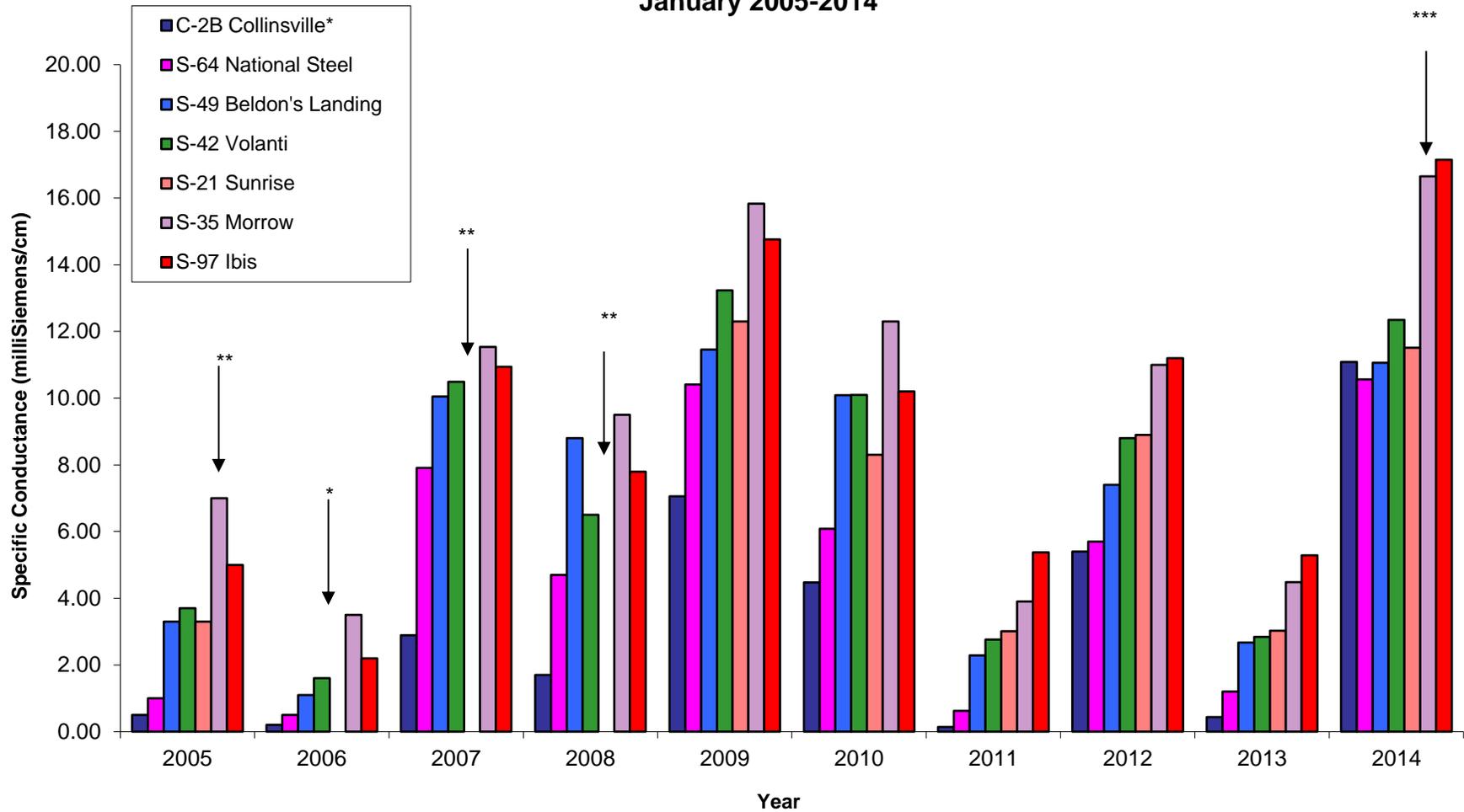
**Figure 3: Daily Net Delta Outflow Index and Precipitation
January 2014**

*Preliminary DWR, O&M data

** 1/5/14 Missing data at Fairfield Treatment Plant. Data from Stockton Fire Station #4.



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
January 2005-2014**



* Data was not obtained due to equipment problem or flood constraint.

**Data not representative of end of month value due to missing data.

*** Missing data due to equipment failure.

Figure 5: Suisun Marsh Stations

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

