
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: January 2016

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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

January 2016 was the 25th 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 January, 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 Landing (S-49), and the deficiency standard was also 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 2016 ranged between 4,200 cfs and 52,800 cfs. For the month, outflow began at 4,300 cfs and increased to 28,900 cfs on January 10th in response to a storm event that started on January 4th. Outflow then decreased to 10,900 cfs on January 14th. Outflow then increased to a high of 52,800 cfs on January 24th, following two storm events that started on January 13th and January 22nd. Outflow decreased and ended the month at 32,800 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 2016 is listed below:

Month	Mean NDOI (cubic feet per second)
January	26,600

2.3 Precipitation

There were four precipitation events in January. Between January 4-9, a total of 2.97 inches of rain fell. Between January 13-19, 4.94 inches fell. Between January 22-24, 0.76 inch fell, and between January 29-31, 0.58 inch of precipitation fell. January's historical average precipitation in Fairfield is 4.77 inches. The monthly total precipitation recorded at the Fairfield Water Treatment Plant is below:

Month	Total Precipitation (inches)
January	9.25

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during January 2016 are summarized below:

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

The gates were in tidal operation mode for the entire month of January.

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 2016, PDM salinity levels at the five compliance stations are shown in Figure 1. Salinity levels for January started in the range of 4.25 mS/cm to 9.78 mS/cm and ended the month in the range of 3.43 mS/cm to 6.84 mS/cm. Salinity at the

compliance stations peaked around January 8th, then gradually decreased during the remainder of the month.

PDM salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. Salinity at S-35 began the month at 12.95 mS/cm and gradually decreased during the month to end at 9.65 mS/cm. At station S-97, salinity started the month at 17.49 mS/cm and decreased to 10.57 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 January 2016 were compared with means for those months during the previous nine years (Figure 4).

The average salinity for January 2016 at all compliance and monitoring stations ranked the sixth highest in salinity levels for the past 10 years. The highest salinity was in 2014 which was a critical water year followed by 2009 which was a dry water year, then 2010 and 2012 which were both below normal water years, then 2007 which was a dry water year.

Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations January 2016

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	3.77	12.5	Yes	N/A	N/A
S-64	3.43	12.5	Yes	N/A	N/A
S-49	4.70	12.5	Yes	N/A	N/A
S-42	6.33	N/A	N/A	15.6	Yes
S-21	6.84	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 2016

C-2, S-64, S-49 Standard = 12.5 mS/cm
 S-21, S-42 Deficiency Standard = 15.6 mS/cm

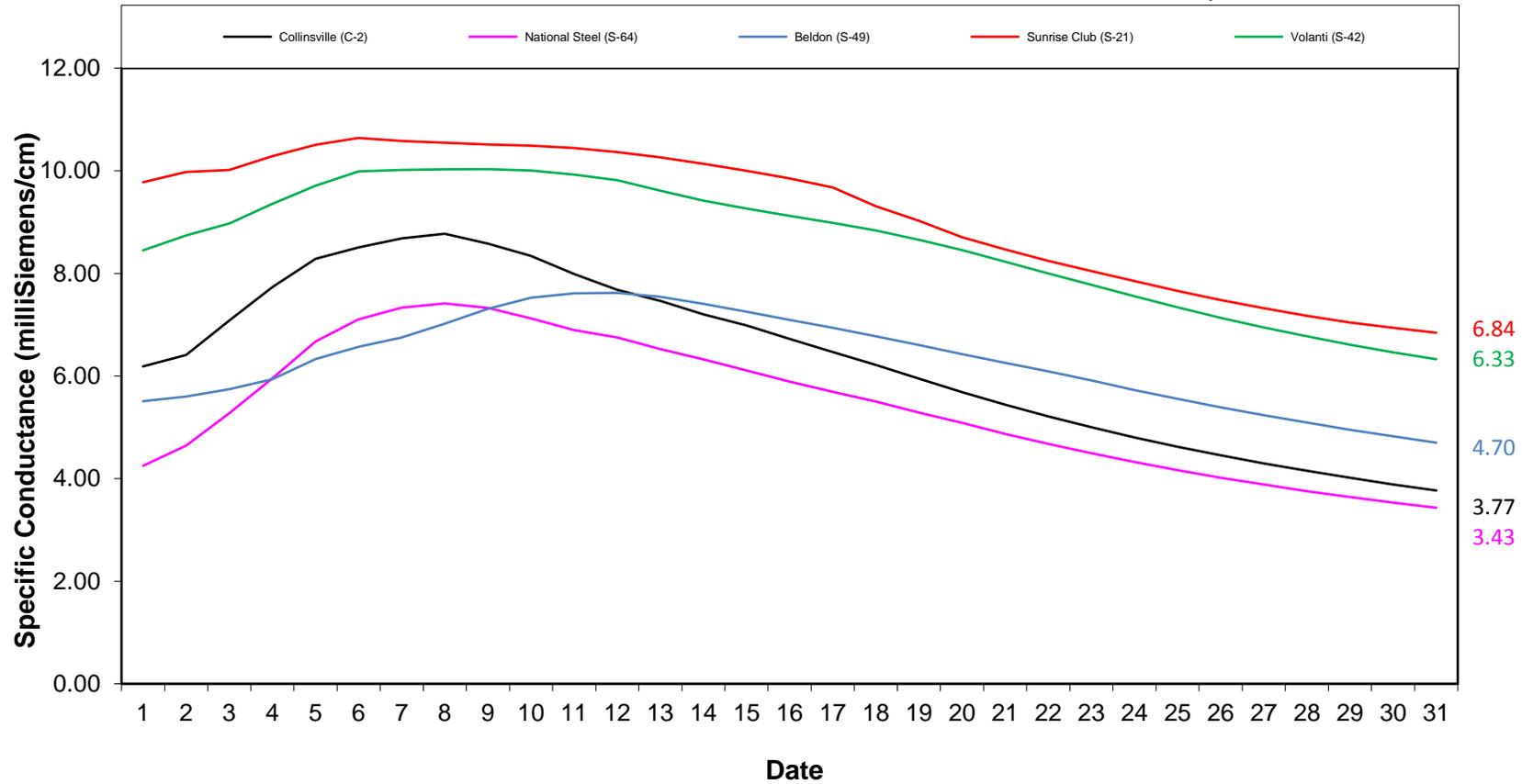
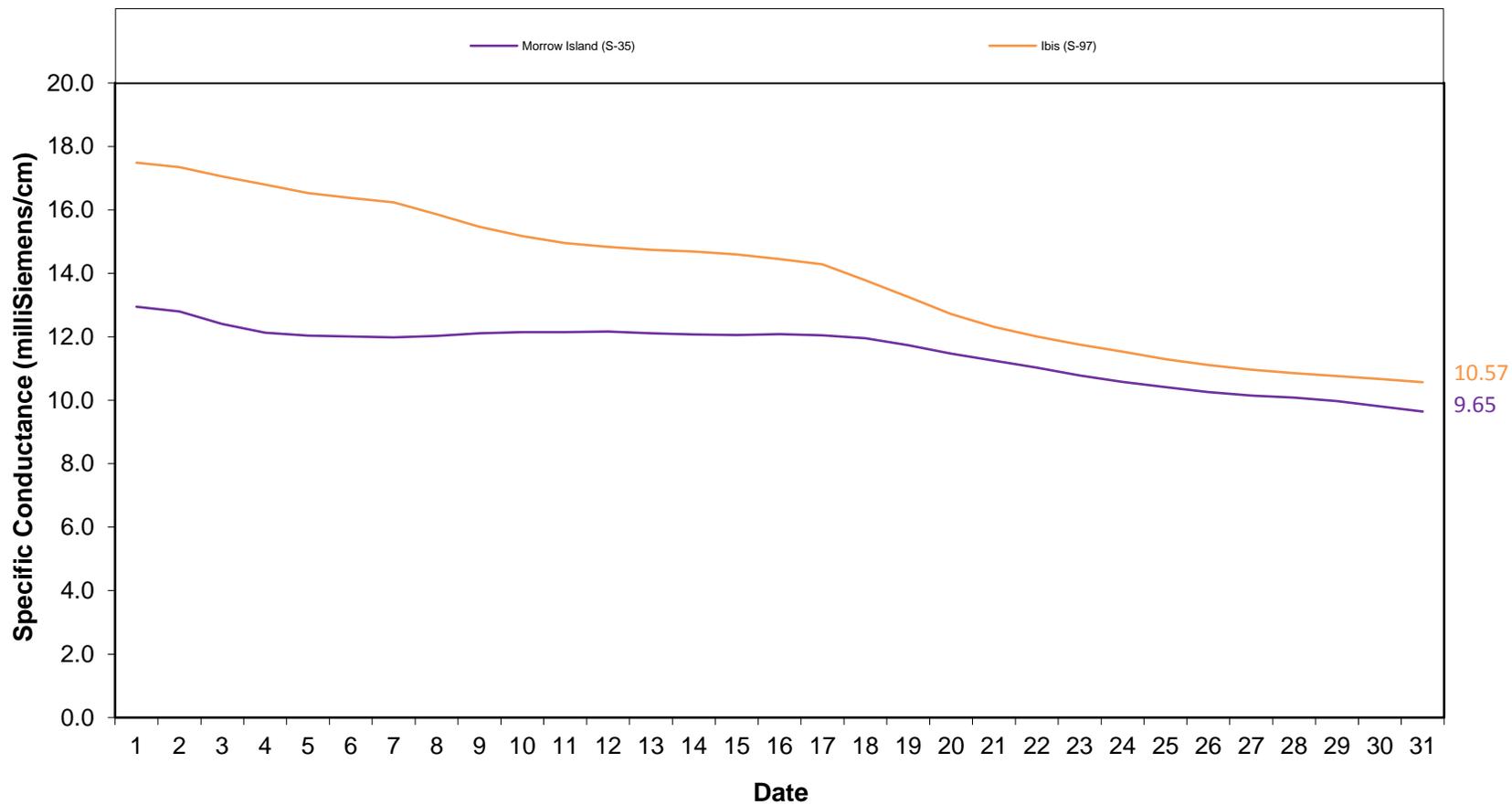


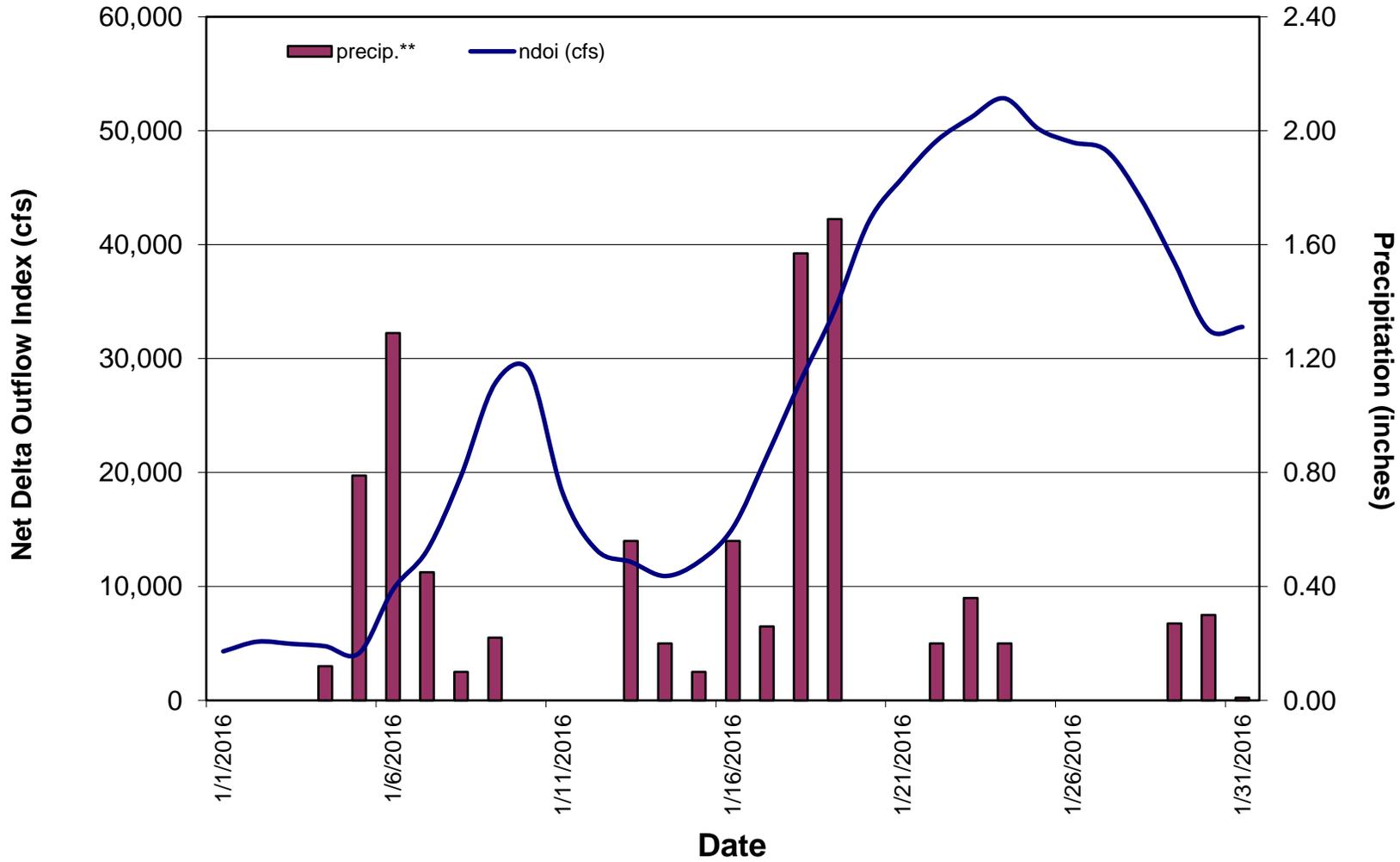
Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations January 2016



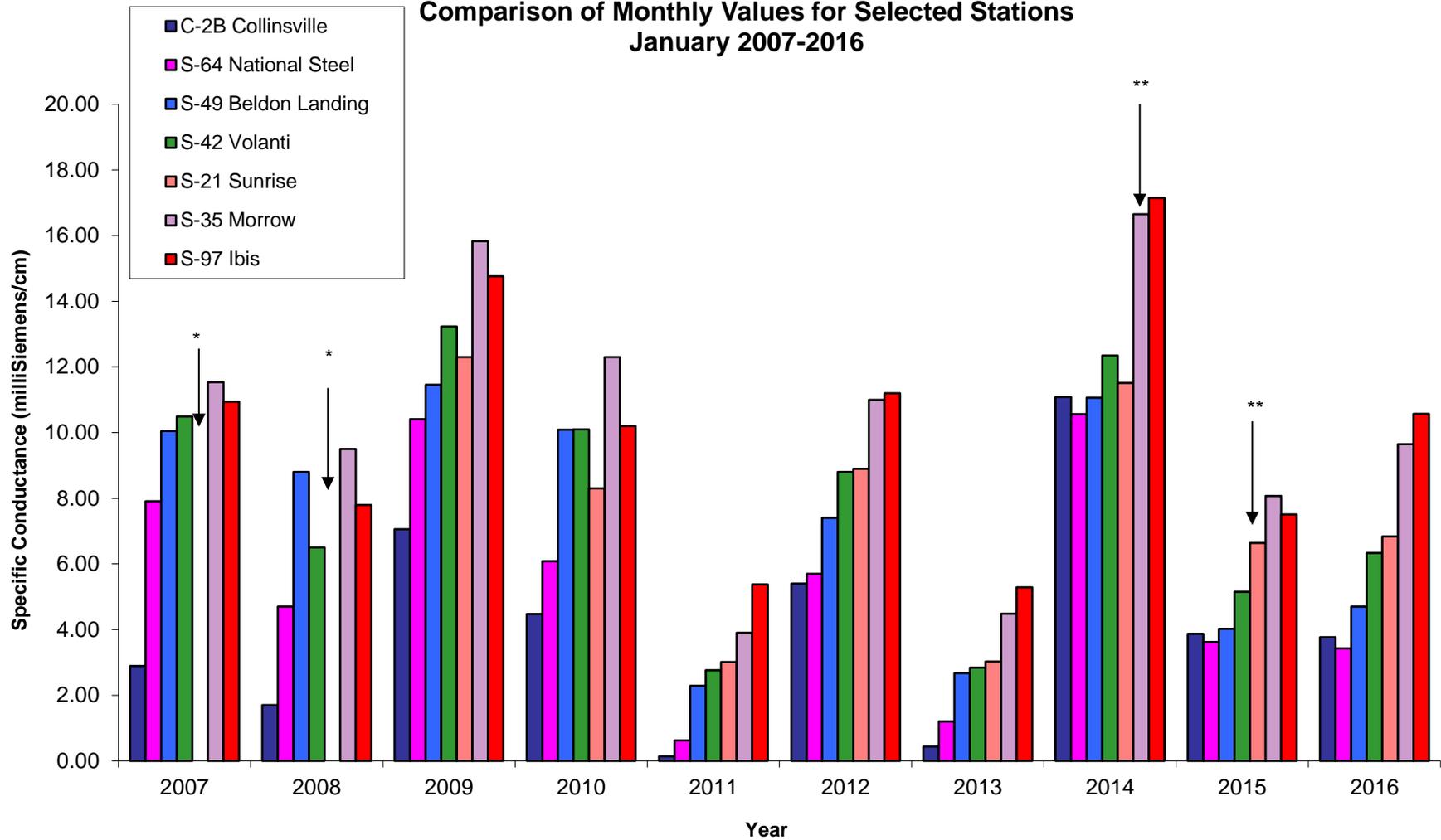
**Figure 3: Daily Net Delta Outflow Index and Precipitation
January 2016**

*Preliminary DWR, O&M data

**Precipitation data from the Fairfield Water Treatment Plant



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
January 2007-2016**



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

** Month contains missing data due to equipment failure.

Figure 5: Suisun Marsh Stations

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

