
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: May 2014

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TABLE OF CONTENT

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT	2
2. MONITORING RESULTS.....	3
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
3. DISCUSSION.....	4
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
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'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

2014 is forecasted as a Critical Water Year Type based on the California Cooperative Snow Surveys Forecast of May 1, 2014. May 2014 was the fifth 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 May, 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 May was 11.0 mS/cm for stations Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), and the deficiency standard was 12.5 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 May 2014 ranged between 2,700 cfs and 4,700 cfs (Figure 3). For the month, outflow began at 4,700 cfs and fluctuated between 2,700 cfs and 4,500 cfs before ending the month at 4,000 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 May 2014 is listed below:

Month	Mean NDOI (cubic feet per second)
May	3,800

2.3 Precipitation

There were no precipitation events in May 2014. The last year in which no precipitation was recorded was 2008. This was also a critical water year type. May's historical

average precipitation in Fairfield is 0.55 inch. The monthly total precipitation recorded at the Fairfield Water Treatment Plant is below:

Month	Total Precipitation (inches)
May	0.00

2.4 Suisun Marsh Salinity Control Gates Operations

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

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

Due to salinity concerns, the gates were operated for the whole month of May. The gates were set in the open position on June 2nd and the flashboards were removed on June 3rd.

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 May 2014, PDM salinity levels at compliance stations C-2, S-64, S-49, S-21 and S-42 are shown in Figure 1. Salinity levels for May started in the range of 4.79 mS/cm to 5.84 mS/cm and ended the month in the range of 7.49 mS/cm to 8.90 mS/cm. Salinity values steadily increased during the month. There was a period of missing data at S-21. This occurred on May 6th between 0045 and 1230.

Salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. As with the compliance stations, salinity steadily increased during the month. S-35 began at 8.45 mS/cm and ended the month at 11.09 mS/cm. S-97 began at 8.12 mS/cm and ended at 11.55 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 May 2014 were compared with means for those months during the previous nine years (Figure 4).

May 2014 mean salinity pattern for all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. 2008 and 2013 were years of similar high salinity. In May 2014, C-2 and S-64 had significantly higher salinity values than 2008 and 2013. 2008 was a critical water year type and 2013 was a dry water year type. As expected, the salinity levels gradually increased from east to west with the exception of C-2 which started and ended the month with higher salinity values than the other compliance stations (Figure 1).

**Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations
May 2014**

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	8.90	11.0	Yes	N/A	N/A
S-64	7.49	11.0	Yes	N/A	N/A
S-49	7.69	11.0	Yes	N/A	N/A
S-42	8.16	N/A	N/A	12.5	Yes
S-21	8.52	N/A	N/A	12.5	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 May 2014

Standard = 11.0 mS/cm
 Deficiency Standard = 12.5 mS/cm (S-21 & S-42)

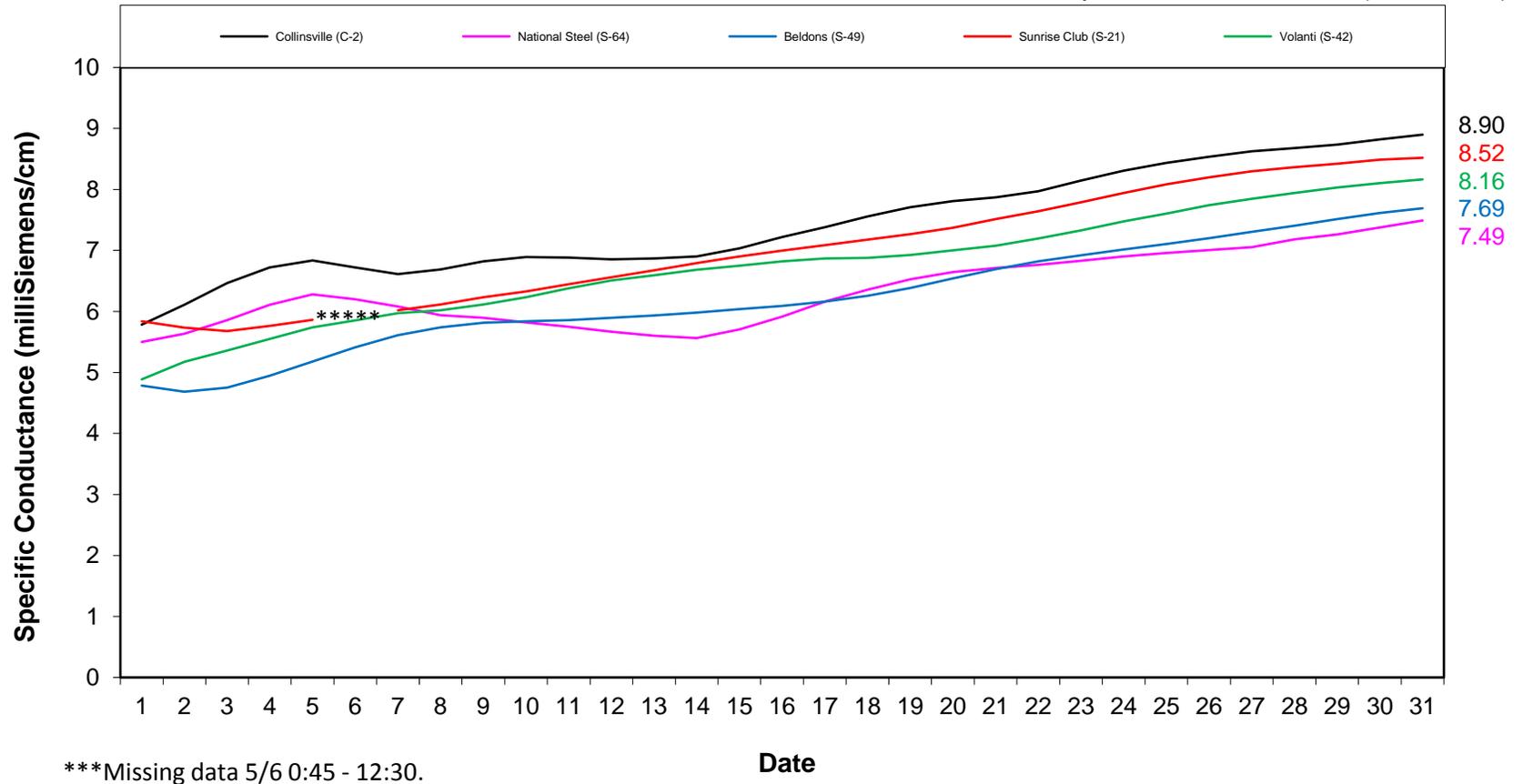
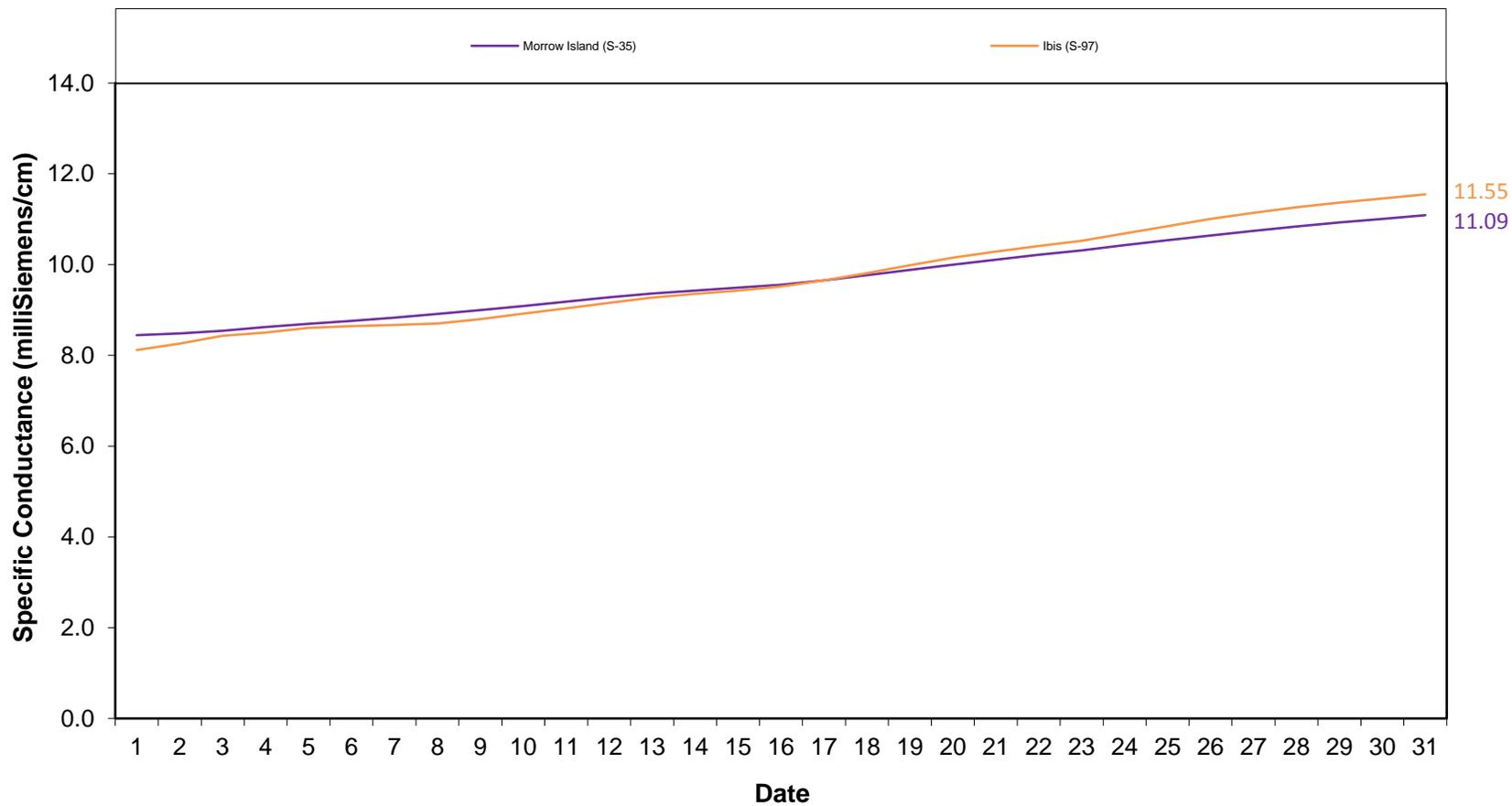
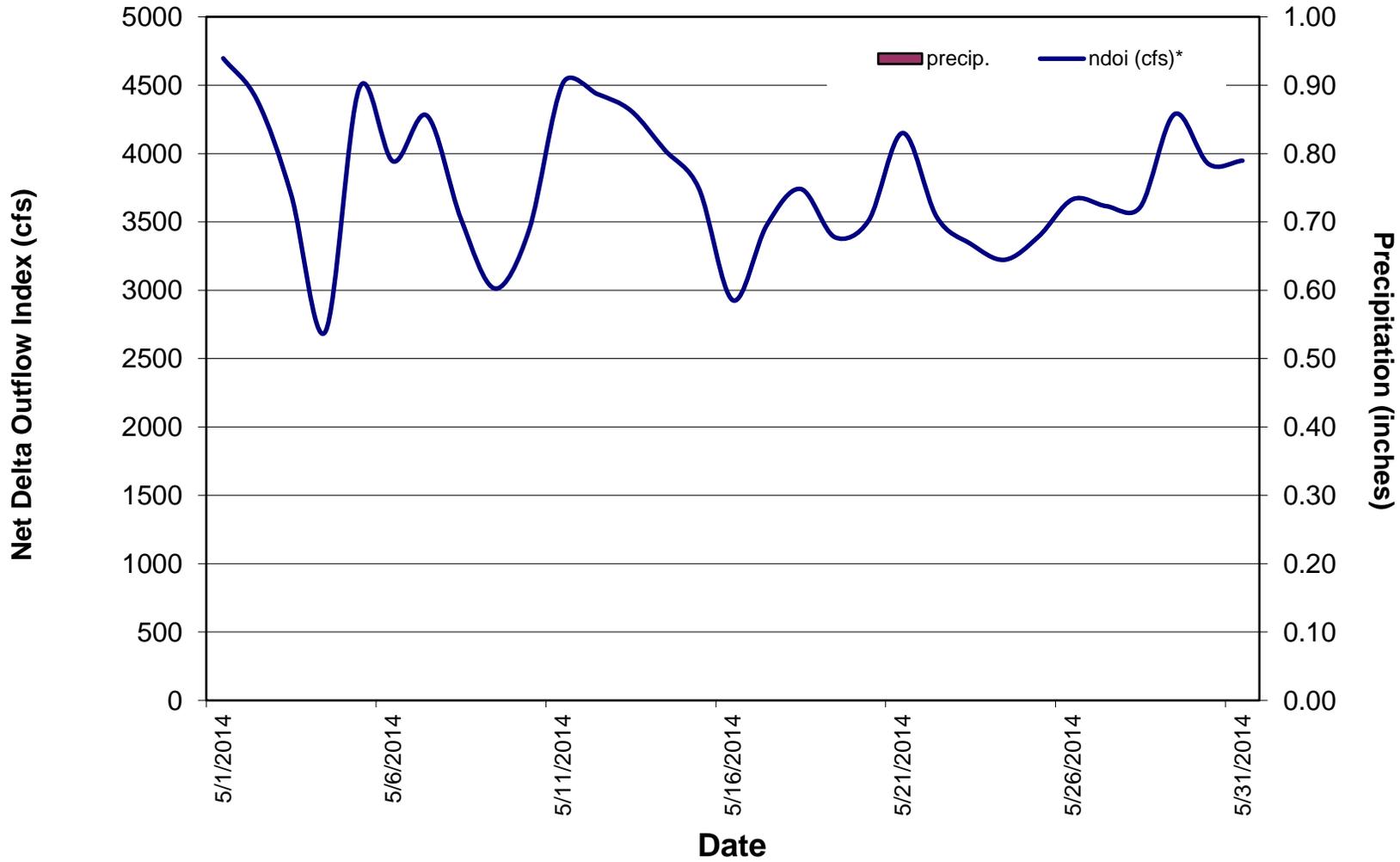


Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations May 2014

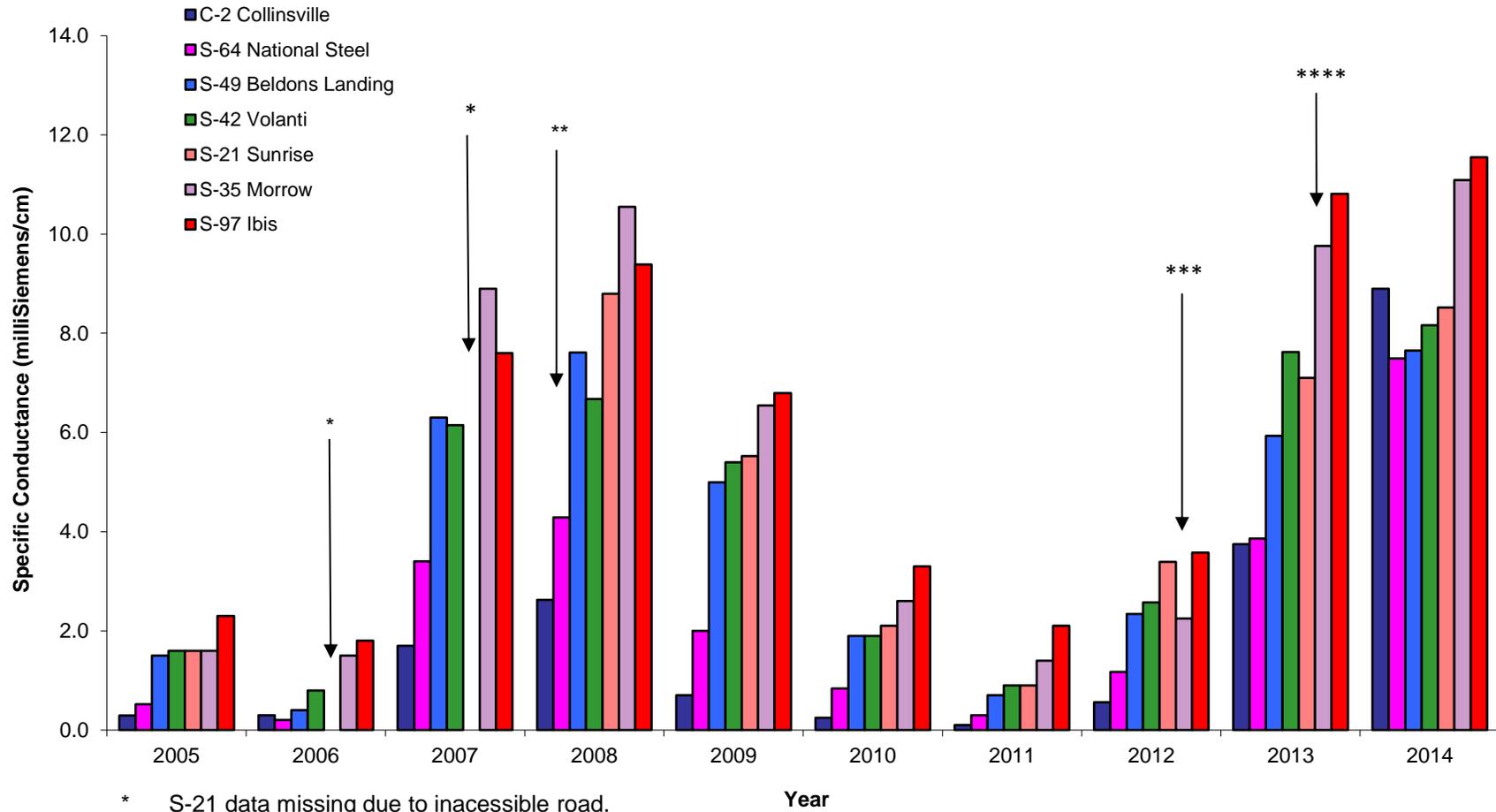


**Figure 3: Daily Net Delta Outflow Index and Precipitation
May 2014**

*Preliminary DWR, O&M data



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



* S-21 data missing due to inaccessible road.
 ** S-64 PDM based on last good entry (6/20/08).
 *** S-35 PDM based on last good entry (6/14/12).
 **** S-35 data for 5/1-5/16 failed QA/QC.

Figure 5: Suisun Marsh Stations

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

