
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: October 2013

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
mkoller@water.ca.gov

TABLE OF CONTENT

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT2

2. MONITORING RESULTS.....3

 2.1 CHANNEL WATER SALINITY COMPLIANCE3

 2.2 DELTA OUTFLOW.....3

 2.3 PRECIPITATION.....3

 2.4 SUISUN MARSH SALINITY CONTROL GATES (SMSCG) OPERATIONS4

3. DISCUSSION.....4

 3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH4

 3.2 OBSERVATIONS AND TRENDS.....4

 3.2.1 *Conditions During the Reporting Period*.....4

 3.2.2 *Comparison of Reporting Period Conditions with Previous Years*.....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, 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

During the month of October, 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 October was 19.0 mS/cm. 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 October 2013 ranged between 3,033 cfs and 7,063 cfs (Figure 3). For the month, outflow began at 4,302 cfs and averaged 3,830 cfs before peaking at 7,063 cfs on October 29th. Outflow then decreased and ended the month at 4,600 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 October 2013 is listed below:

Month	Mean NDOI (cubic feet per second)
October	4,155

2.3 Precipitation

There were no precipitation events in October. Data was recorded at the Fairfield Water Treatment Plant with the exception of October 6, 8, 13, 14, and 15. Data from the Stockton Fire Station was used for these dates. The monthly total precipitation is below:

Month	Total Precipitation (inches)
October	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 October 2013 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
October 1-10	3 Open	Out	Closed
October 11-17	3 Open	In	Partially Closed
October 18	3 Operational	In	Partially Closed

The flashboards were install on October 11th. A delay in the refurbishment process kept the gates from being installed on October 1st. Given the dry conditions in October, operation of the radial gates began on October 18th. On start-up, a failure in the communication line between the physical gates and the control room prevented the gates from being operated in automatic mode. Manual operation of the gates proved to be less efficient and resulted in salinity levels not decrease as expected.

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 October 2013, PDM salinity levels at compliance stations Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ended the month between 8.39 mS/cm and 17.43 mS/cm as shown in Figure 1. Salinity levels for October started in the range of 6.15 mS/cm to 15.35 mS/cm and gradually increased during the month.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Both stations had an increase in salinity levels. The salinity for S-35 began at

14.39 mS/cm and ended the month at 17.30 mS/cm. Salinity for S-97 started the month at 14.22 mS/cm and ended the month at 17.81 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 October 2013 were compared with means for those months during the previous nine years (Figure 4).

October's mean salinity pattern for all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. The pattern came close to matching that of 2008 which was a critical water year type. The month falls within the range of 2004, 2007, 2009, 2010, and 2012 which were all either below normal or dry water year types. 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
October 2013**

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	8.39	19.0	Yes
S-64	12.20	19.0	Yes
S-49	17.43	19.0	Yes
S-42	16.67	19.0	Yes
S-21	14.20	19.0	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 Oct 2013

Standard = 19.0 mS/cm

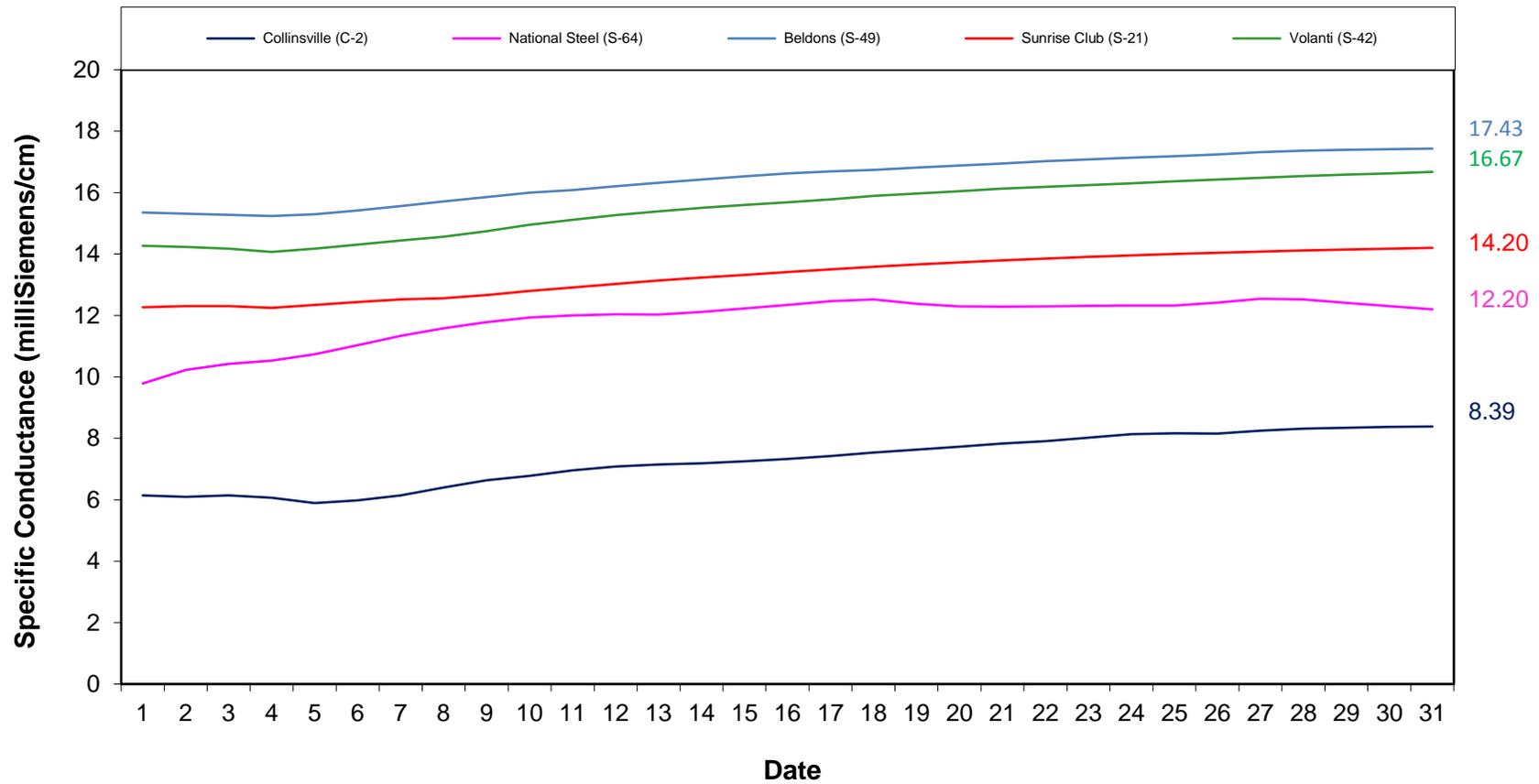
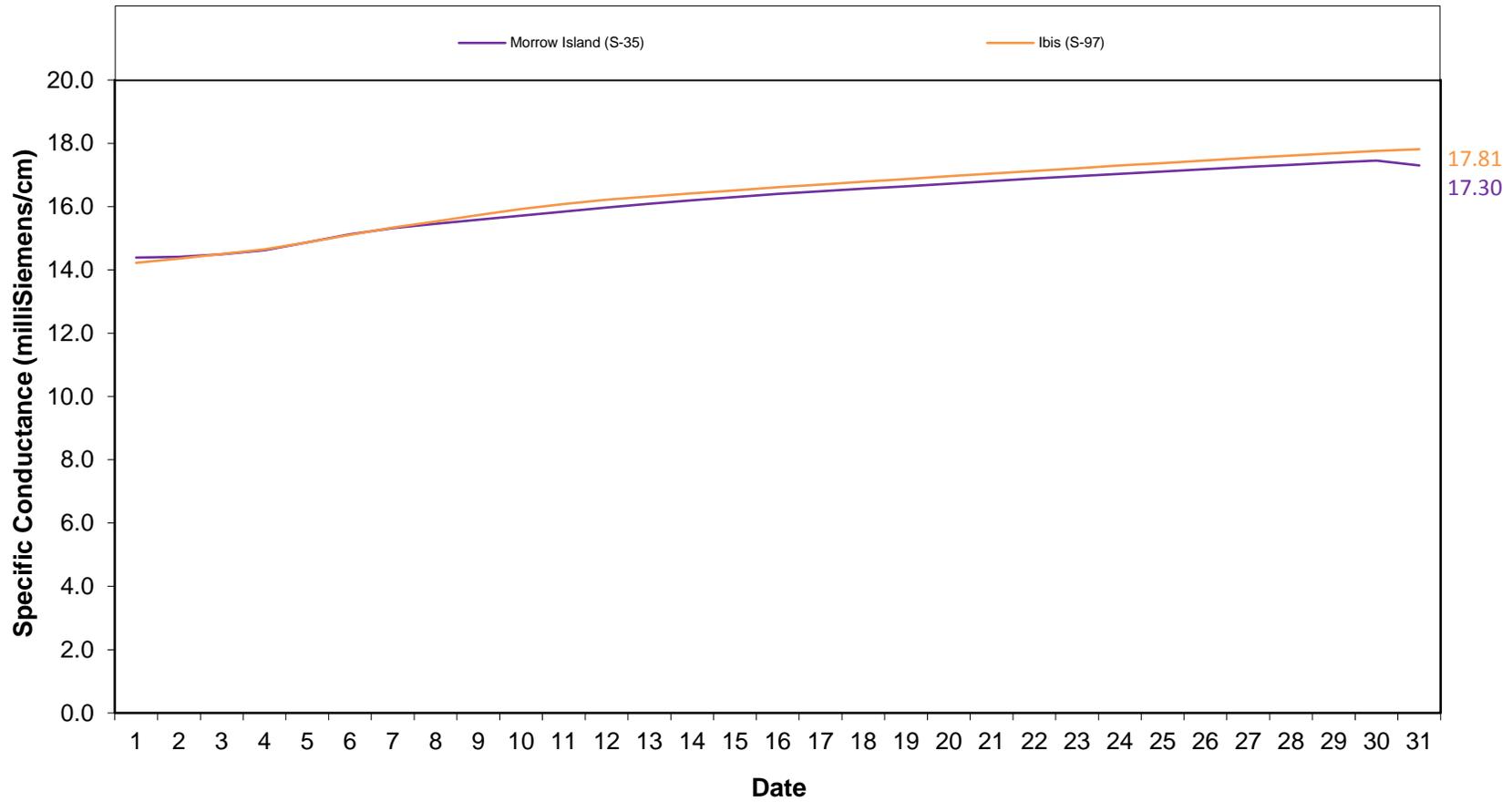


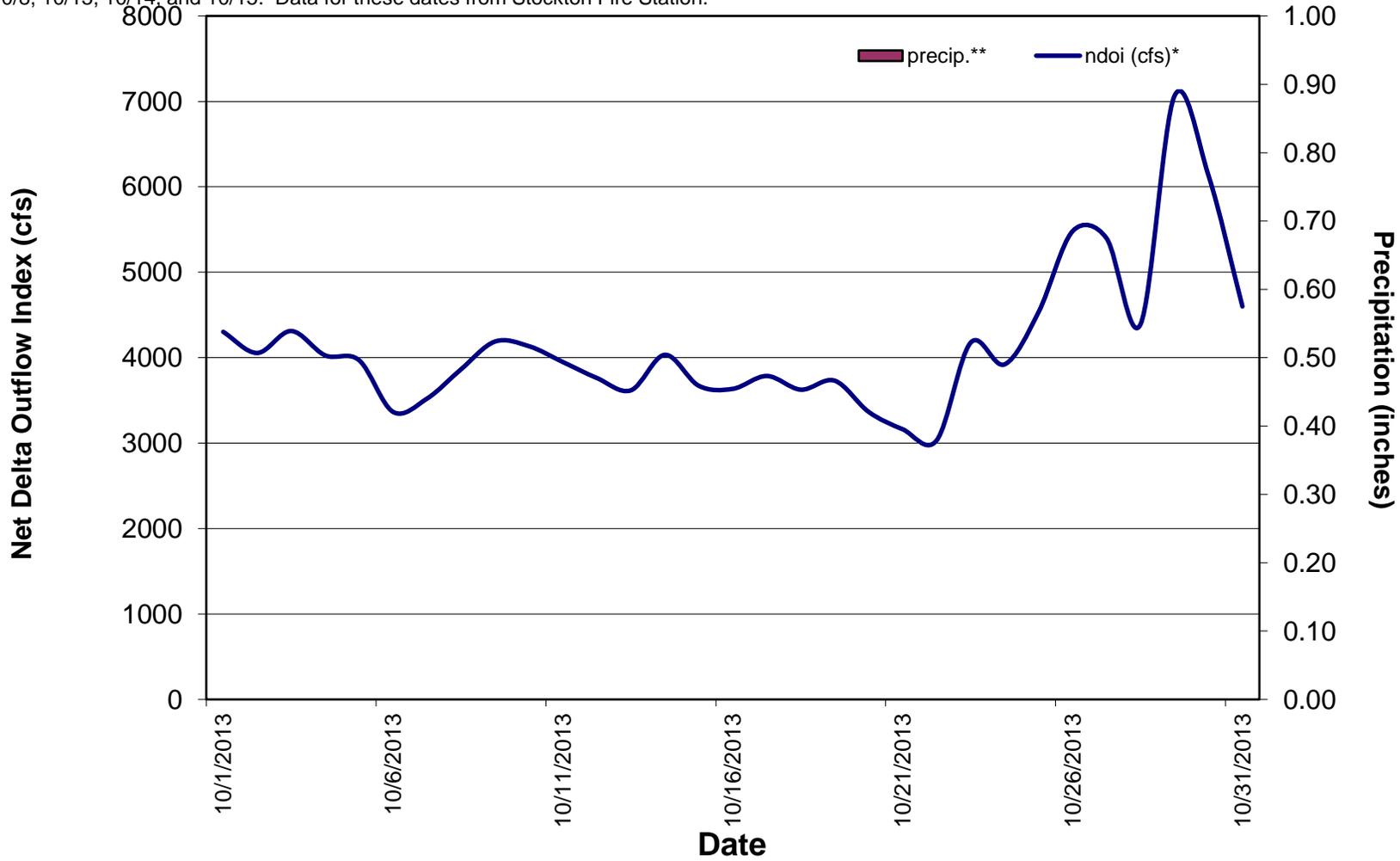
Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations October 2013



**Figure 3: Daily Net Delta Outflow Index and Precipitation
October 2013**

*Preliminary DWR, O&M data

**Precipitation data from Fairfield Water Treatment Plant. Missing data for 10/5, 10/6, 10/8, 10/13, 10/14, and 10/15. Data for these dates from Stockton Fire Station.



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
October 2004-2013**

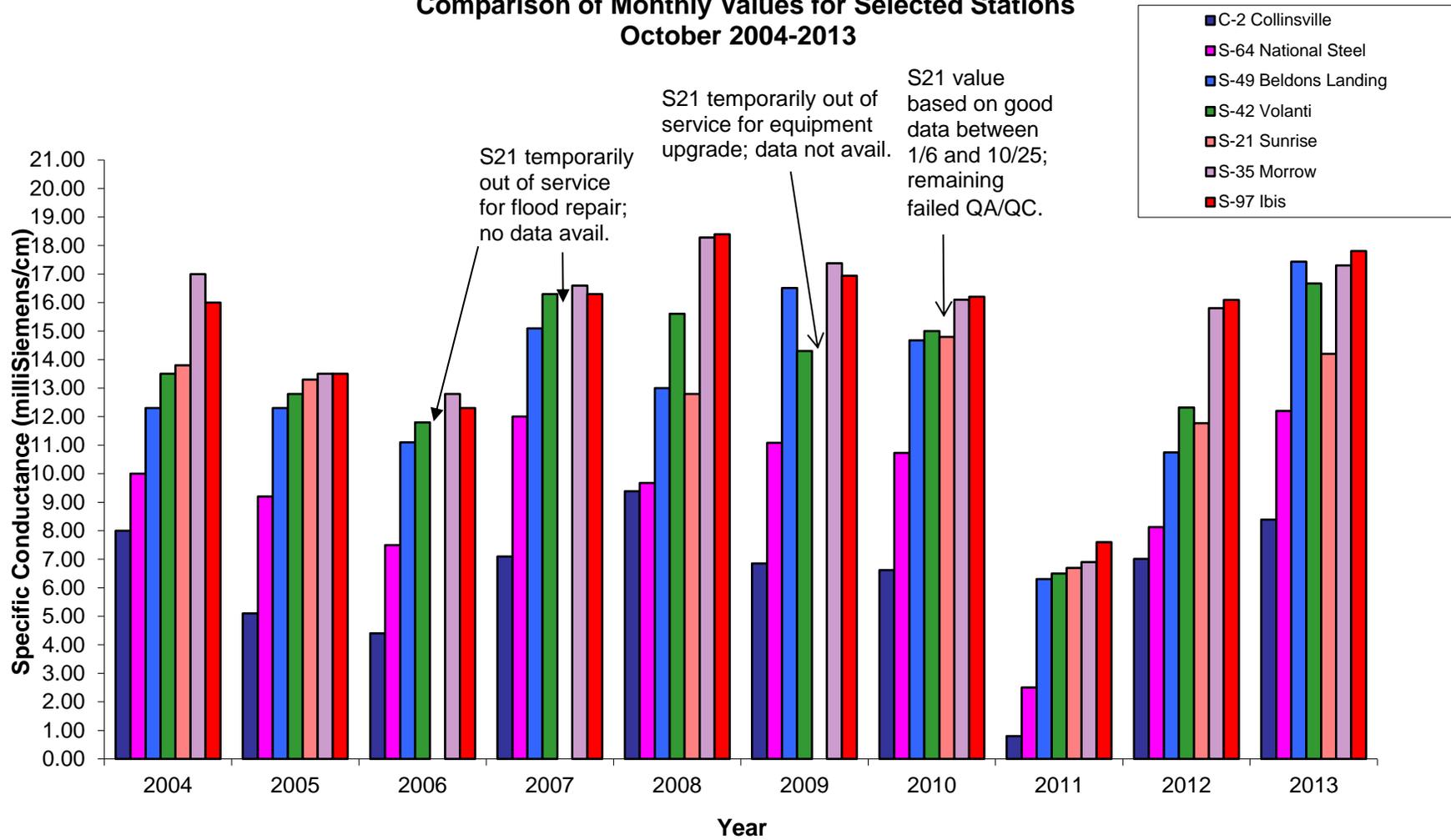


Figure 5: Suisun Marsh Stations

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

