Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: October 2012

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 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 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 compliance stations C-2, S-64, S-49, S-21, and S-42 was 19.0 mS/cm for October 2012. 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 2012 ranged between 3,500 cfs and 8,900 cfs (Figure 3). For the month, outflow began at 4,100 cfs and increased to 8,900 cfs in response to a precipitation event on October 22nd. The month ended with outflow at 3,900 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 2012 is listed below:

Month	Mean NDOI (cubic feet per second)
October	4,500

2.3 Precipitation

Precipitation for the month totaled 1.48 inches and occurred between October 22nd and October 25th with the majority of the precipitation, 1.29 inches, occurring on October 22nd. This data was recorded at the Fairfield Water Treatment Plant. The monthly total precipitation is below:

Month	Total Precipitation (inches)
October	1.48

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during October 2012 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
October 1-8	3 Open	Out	Partially Closed
October 9-11	3 Open	In	Partially Closed
October 12-31	3 Tidally Operating	In	Partially Closed

The flashboards were installed on October 9th by contractors at the request of DWR, Delta Field Division (DFD). The radial gates began tidal operation on October 12th due to concerns with meeting the monthly salinity standard of 19 mS/cm.

Boat lock gates are partially closed due to ongoing investigation on safety concerns expressed by DFD staff. NOAA was briefed about the safety concern and will schedule a field visit to assess options with DWR to balance fish needs and safety needs.

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

During October 2012, PDM salinity levels at Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ranged between 7.01 mS/cm and 12.32 mS/cm as shown in Figure 1. For the month of October, salinity levels at all stations stayed relatively flat before gradually decreasing to levels lower than their beginning values. The exception was Collinsville which began the month at 4.34 mS/cm and ended at 7.01 mS/cm.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Morrow Island started the month at 15.61 mS/cm then sharply increased to 16.32 mS/cm on October 9th then gradually decreased to end the month at 15.80 mS/cm. Ibis began the month at 14.90 mS/cm, sharply increased to 15.89 mS/cm on October 9th then gradually increased before ending the month at 16.09 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 2012 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 fourth in lowest salinity levels for the past 10 years. The pattern followed that of 2008 and 2010 but at a slightly lower salinity level. 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 2012

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	7.01	19.0	Yes
S-64	8.13	19.0	Yes
S-49	10.75	19.0	Yes
S-42	12.32	19.0	Yes
S-21	11.77	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 October 2012

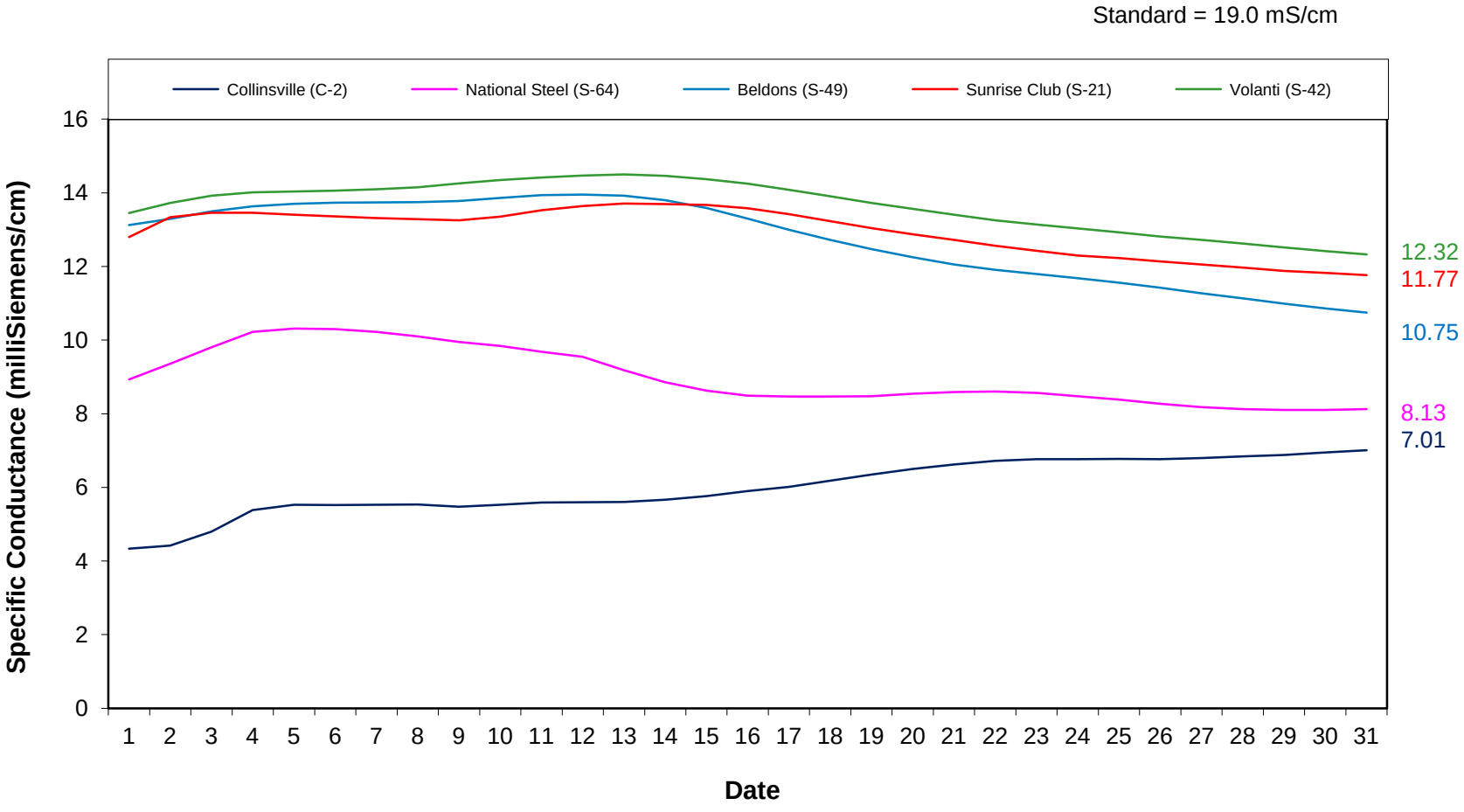


Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations October 2012

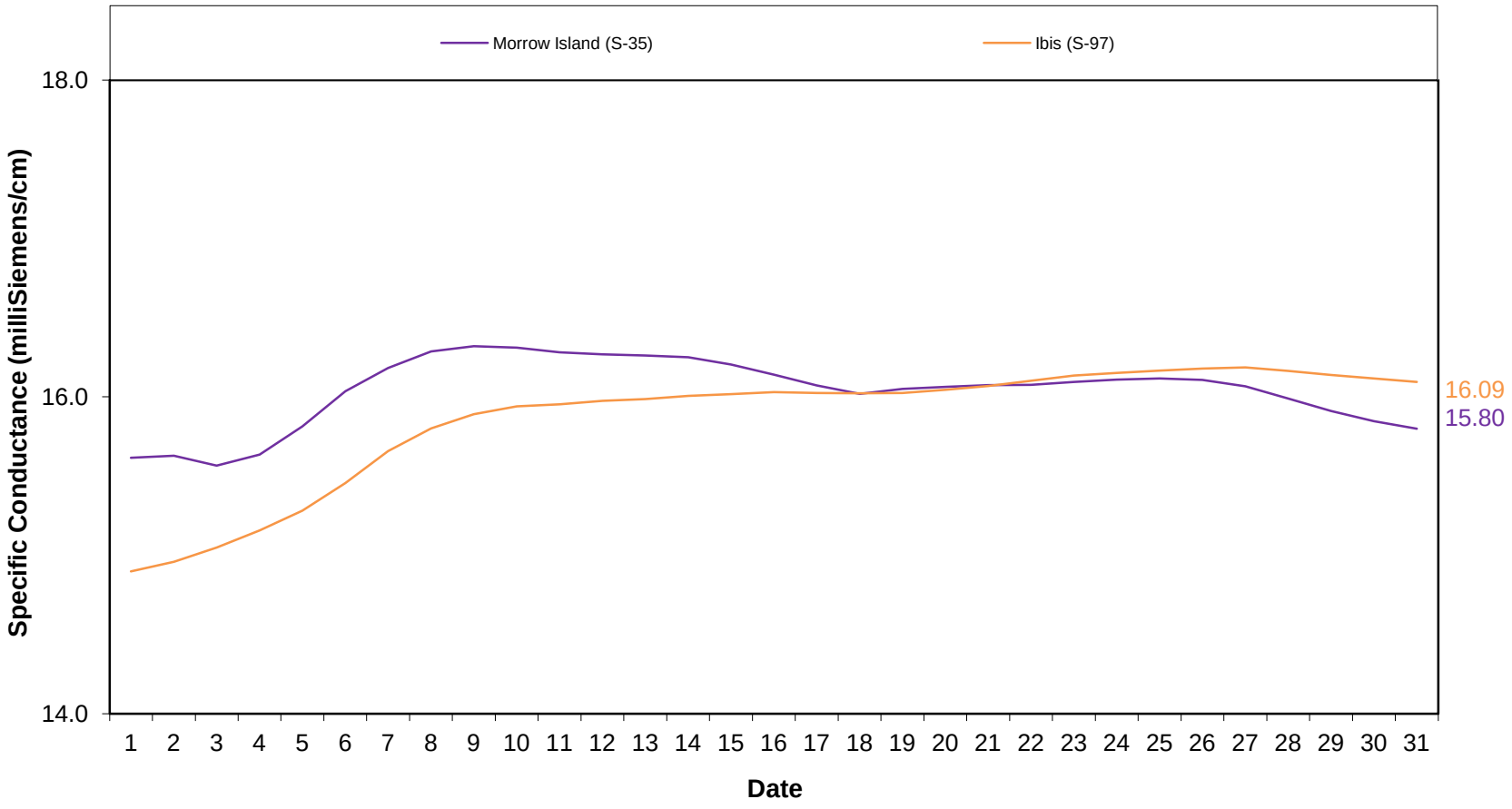
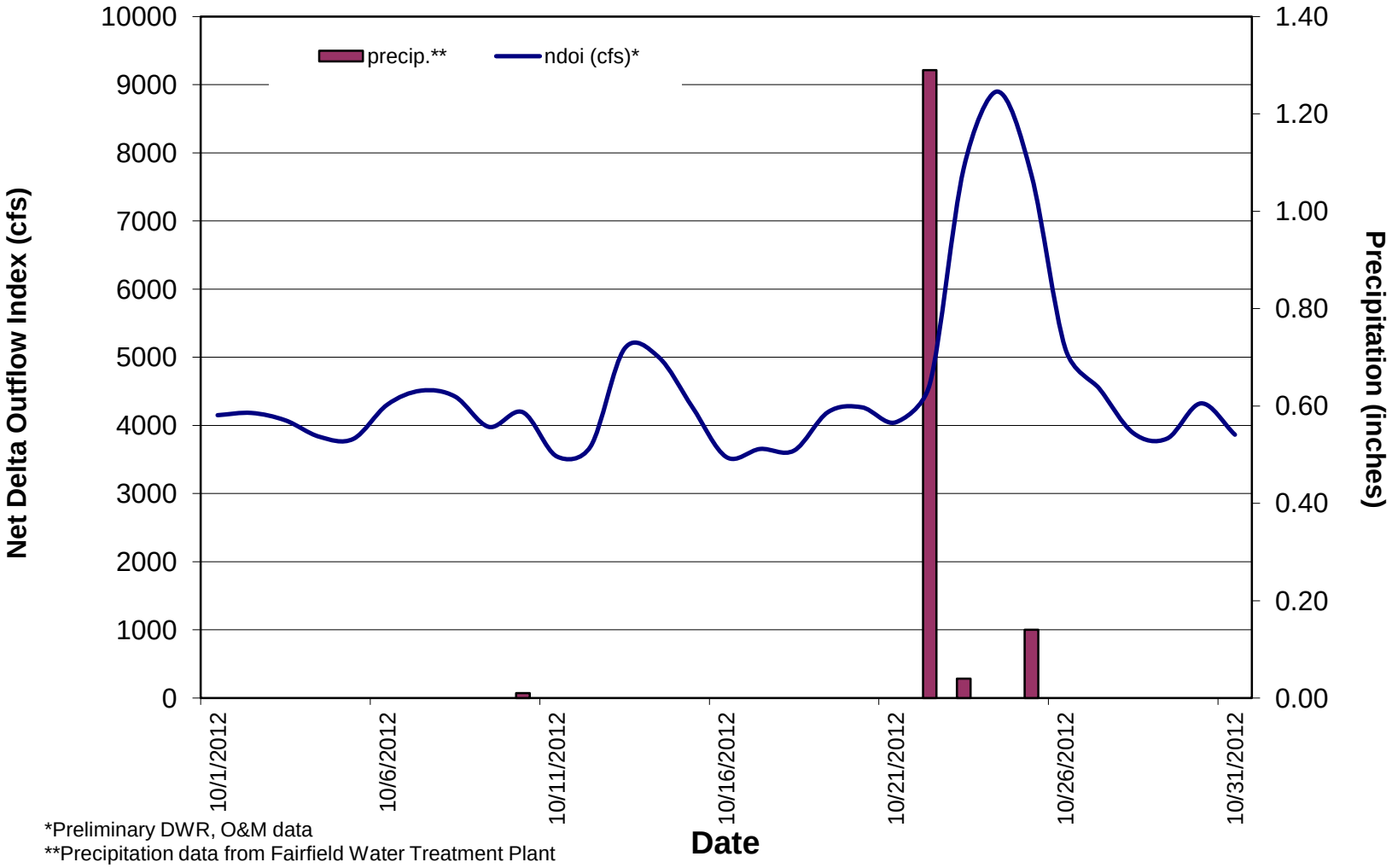


Figure 3: Daily Net Delta Outflow Index and Precipitation
October 2012



*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 October 2003-2012

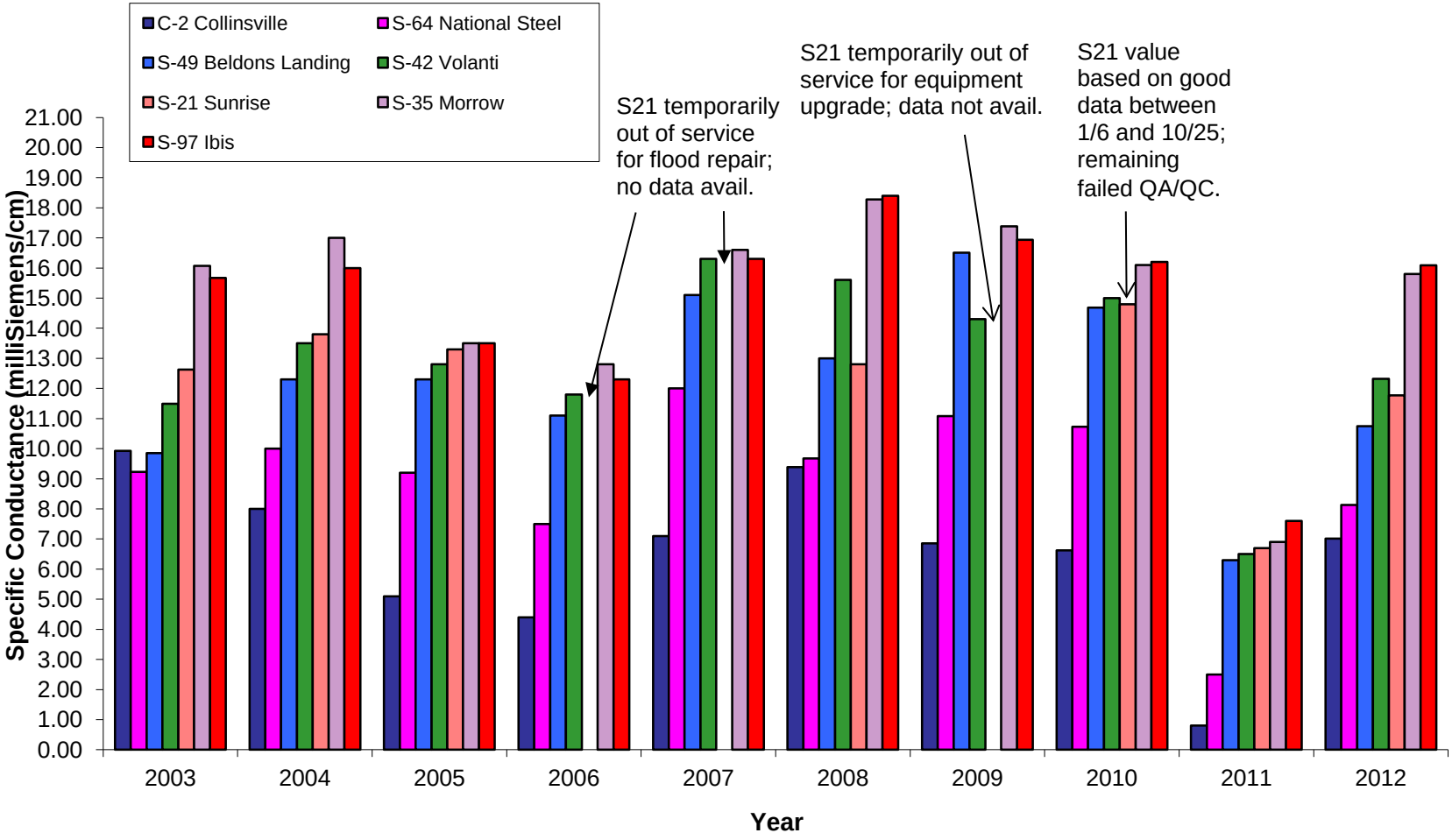


Figure 5: Suisun Marsh Stations
Compliance
Monitoring
Blacklock
Initial Facilities
0
1.25
2.5
5
Miles
N
Fairfield
Suisun City
80
Suisun Creek S-16
12
Green Valley Creek S-9
Beldons S-49
Sunrise Club S-21
Volanti S-42
Blacklock Pond
Teal Club S-28
Blacklock River
Ibis S-97
Hunter Cut S-54
Cygnus S-33
Godfather II S-37
National Steel S-64
Roaring River
Distribution System
Morrow Island S-35
Morrow Island
Distribution System
R R at Montezuma
Slough S-72
Montezuma Slough at R R S-71
Goodyear
Slough
Outfall
Collinsville C-2
Fleet A-96
680
Benicia
Pittsburg
Martinez
4
Antioch