Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: February 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

February 2014 was the second month in the deficiency period that started January 2014, and is forecasted as a Critical Water Year Type. A deficiency period is defined by D-1641 Table 3 footnote 6. During the month of February, 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 February was 8.0 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 February 2014 ranged between 5,500 cfs and 26,900 cfs (Figure 3). For the month, outflow began at 7,100 cfs and peaked at 26,900 cfs on February 11th. Outflow then decreased and stayed around 7,000 cfs. Outflow did increase again in response to a second precipitation event and ended the month at 8,100 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 February 2014 is listed below:

Month	Mean NDOI (cubic feet per second)
February	10,800

2.3 Precipitation

There were two major precipitation events in February 2014. The first began on February 6th and ended on February 10th. It amounted to 7.08 inches of precipitation with 3.35 inches falling on February 8th. The second major event occurred between February 26th and February 28th and produced 2.33 inches of precipitation. February's average precipitation in Fairfield is 5.05 inches. The monthly total precipitation recorded at the Fairfield Water Treatment Plant is below:

Month	Total Precipitation (inches)
February	9.58

2.4 Suisun Marsh Salinity Control Gates Operations

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

Date	Gate Status	Flashboards Status	Boat Lock Status
February 1-28	3 Operational	In	Partially Closed

Due to salinity concerns, the gates were operated for the whole month of February.

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 February 2014, PDM salinity levels at compliance stations C-2, S-64, S-49, S-21 and S-42 ended the month between 5.37 mS/cm and 7.81 mS/cm as shown in Figure 1. Salinity levels for February started in the range of 11.37 mS/cm to 13.55 mS/cm and decreased during the month in response to the precipitation event that occurred between February 6th and February 10th.

Salinity levels at monitoring stations S-35 and S-97 are shown in Figure 2. The salinity for S-35 began the month of February at 17.12 mS/cm and ended the month at 13.24 mS/cm. Salinity for S-97 started the month at 17.25 mS/cm and decreased to 11.06 mS/cm. Both stations responded to the major precipitation event that started on February 6th with S-97 having a greater response to the local inflows that resulted from that event.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

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

February 2014 mean salinity pattern for all compliance and monitoring stations ranked about equal to 2009 as the highest in salinity levels for the past 10 years. February 2009 was a dry water year and 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 February 2014

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?	Deficiency Standard	Deficiency Standard Met?
C-2**	5.72	8.0	Yes	N/A	N/A
S-64	5.37	8.0	Yes	N/A	N/A
S-49	6.88	8.0	Yes	N/A	N/A
S-42	7.81	N/A	N/A	15.6	Yes
S-21	6.59	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 February 2014

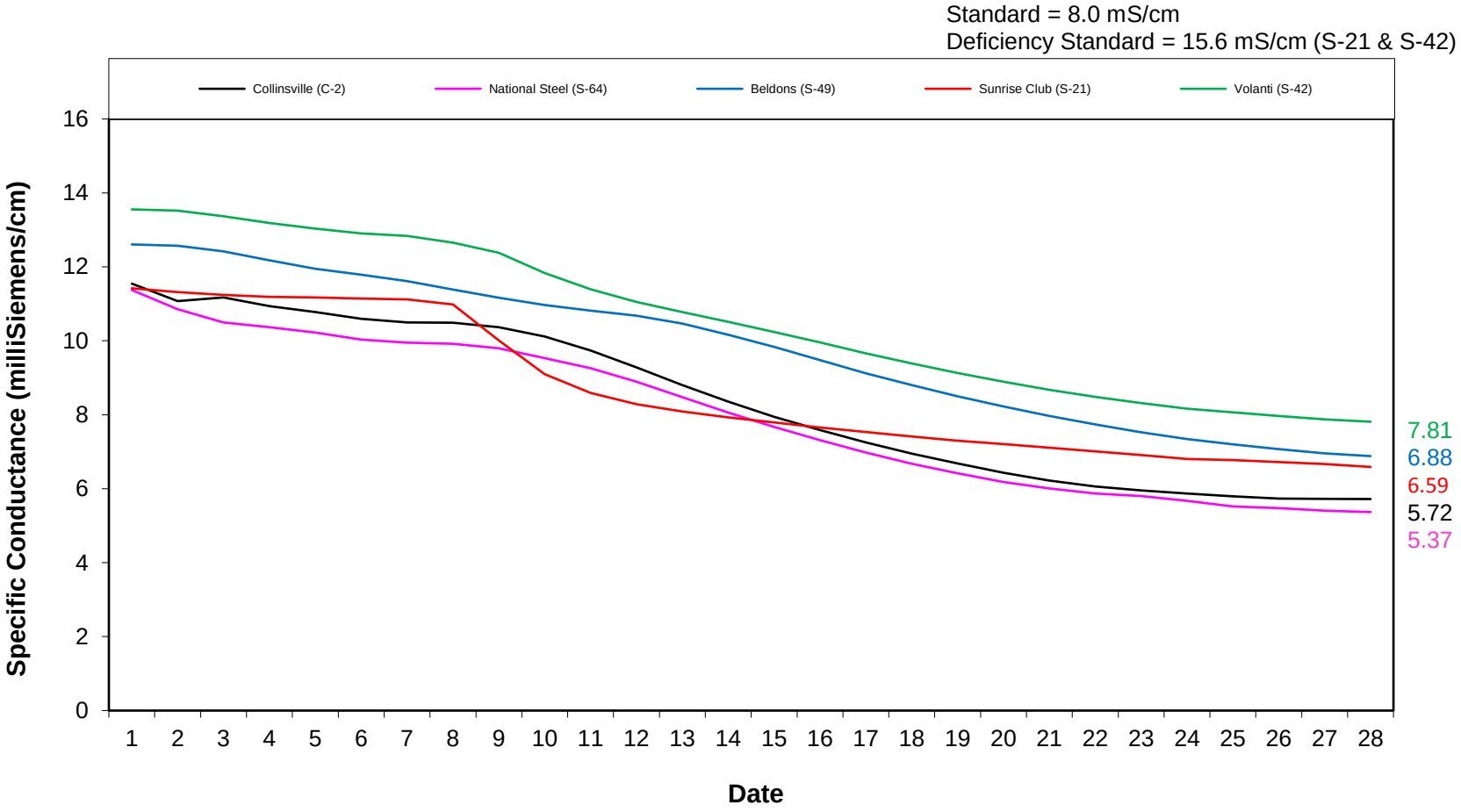


Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations February 2014

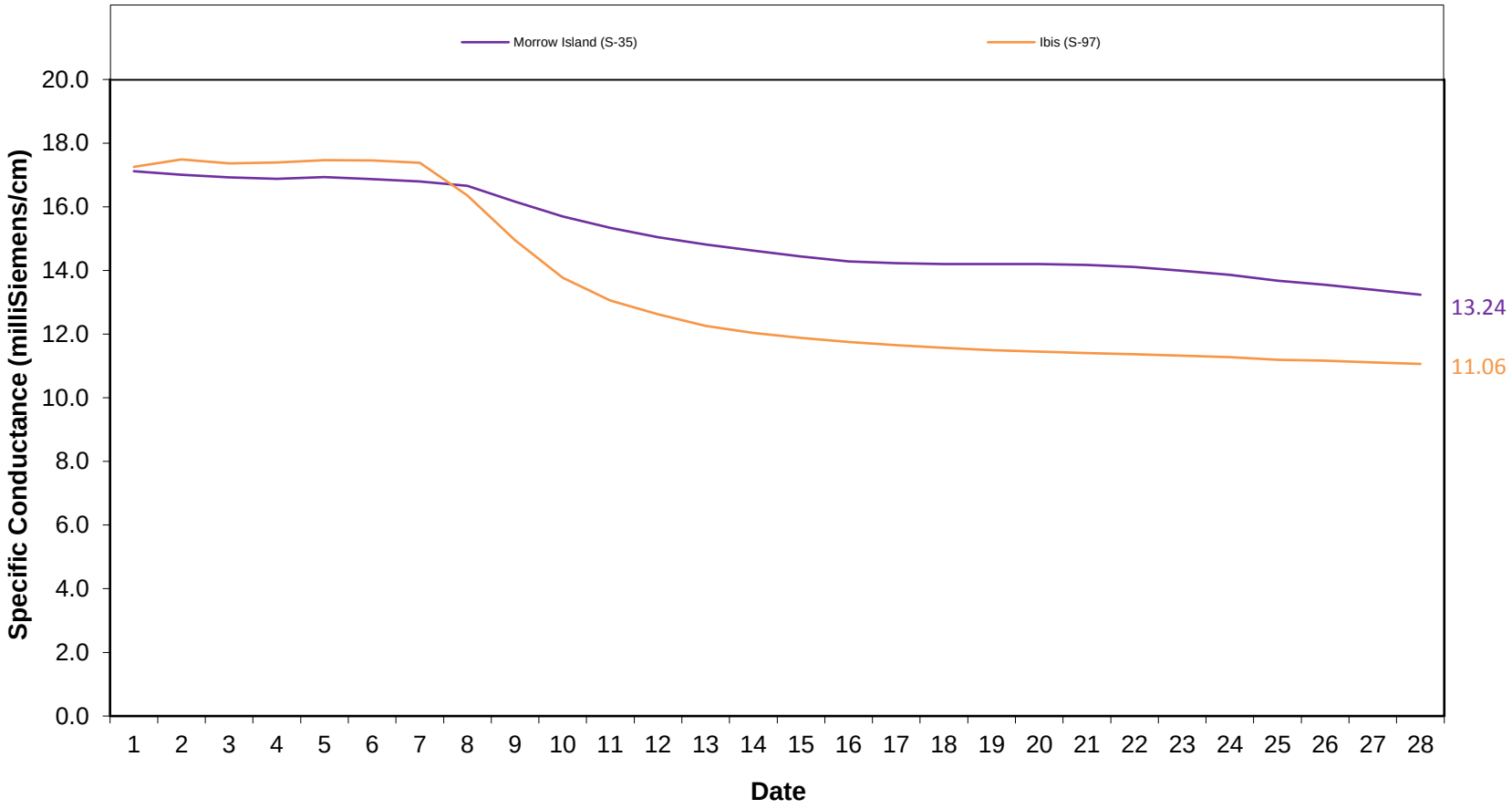


Figure 3: Daily Net Delta Outflow Index and Precipitation
February 2014

*Preliminary DWR, O&M data

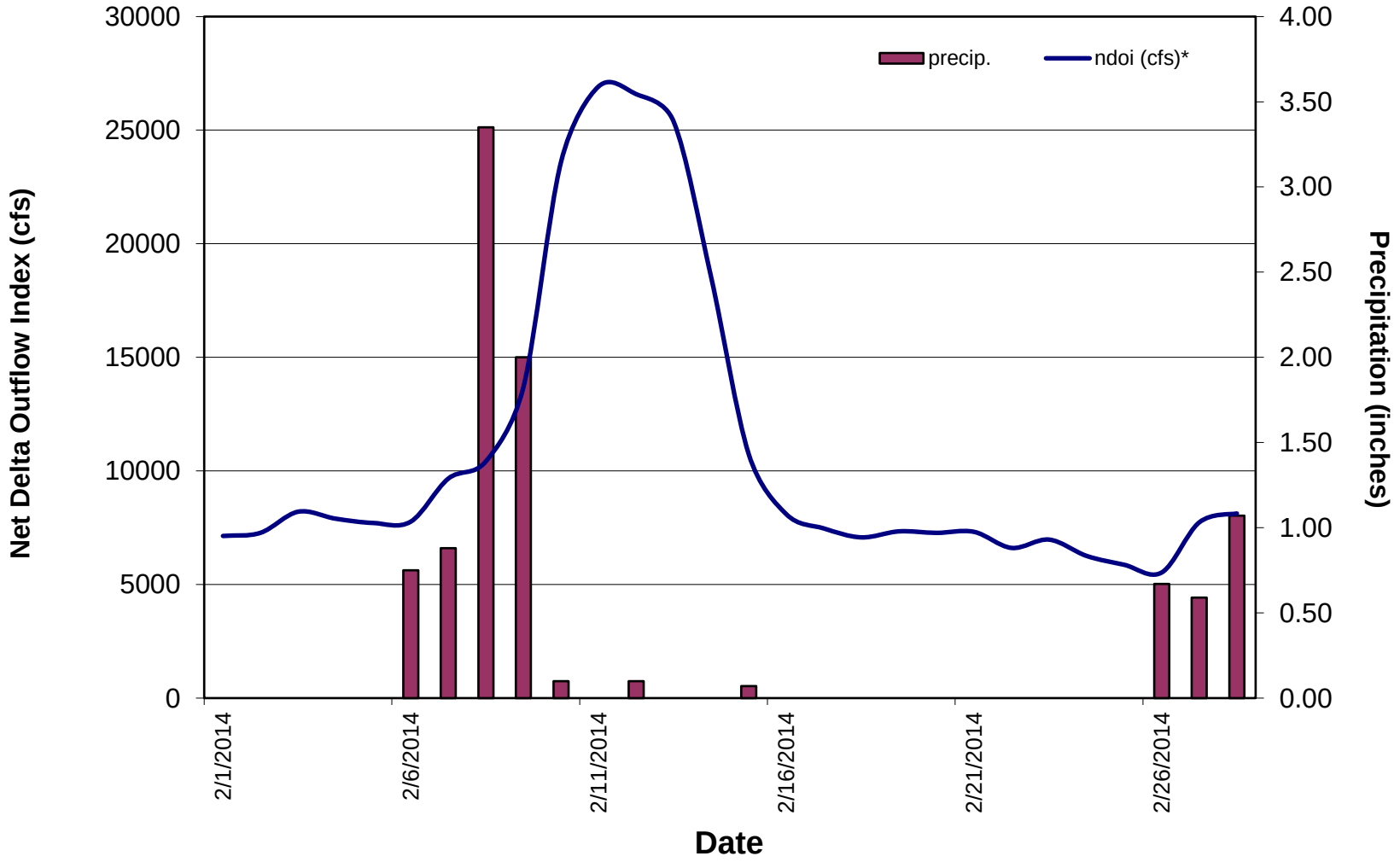
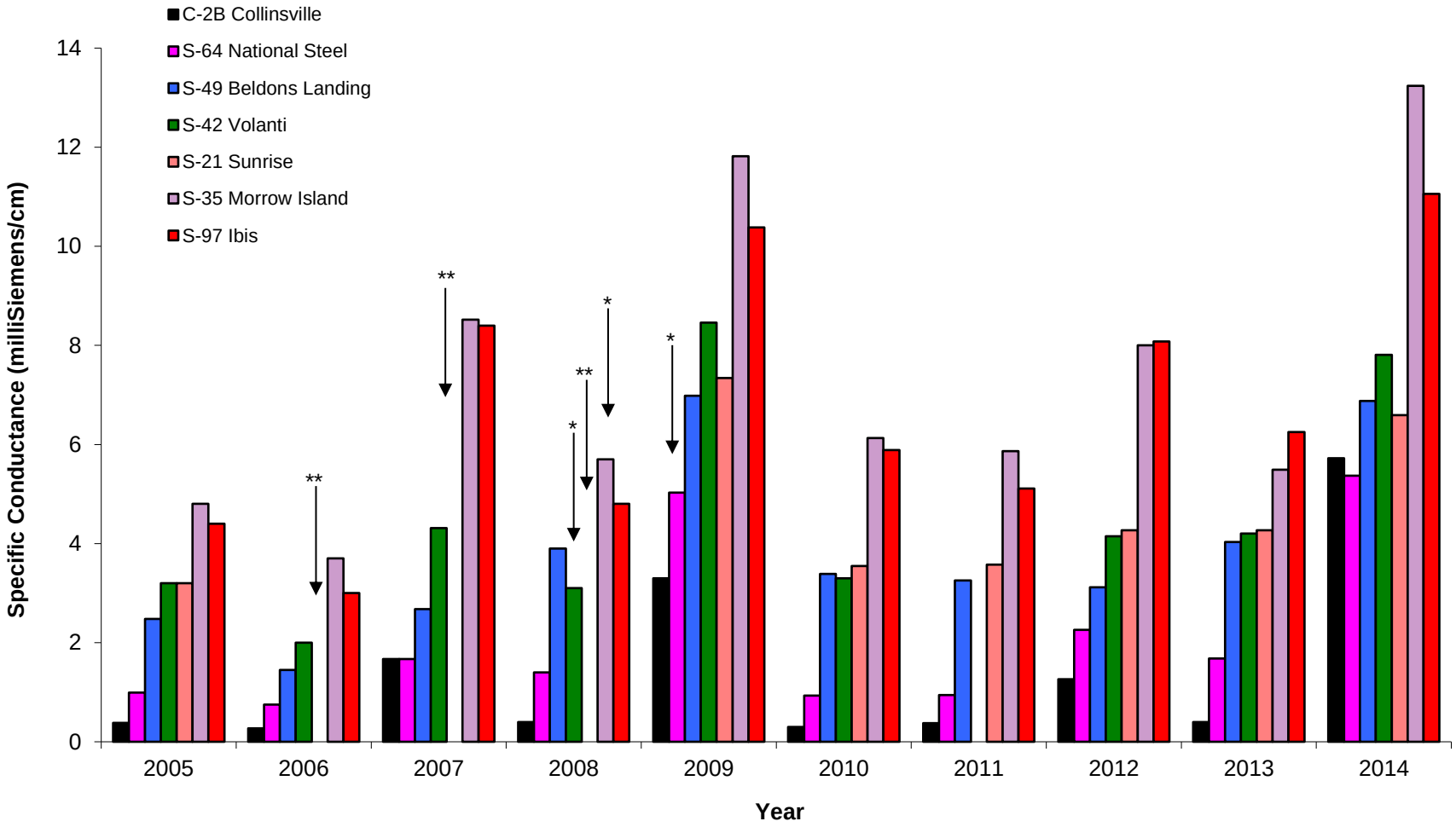


Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations February of 2005-2014



* Data missing due to equipment failure or power outage. Amount of data missing is small enough not to impact end of month value.
**Data not available due to flooded levees and inaccessible roads.

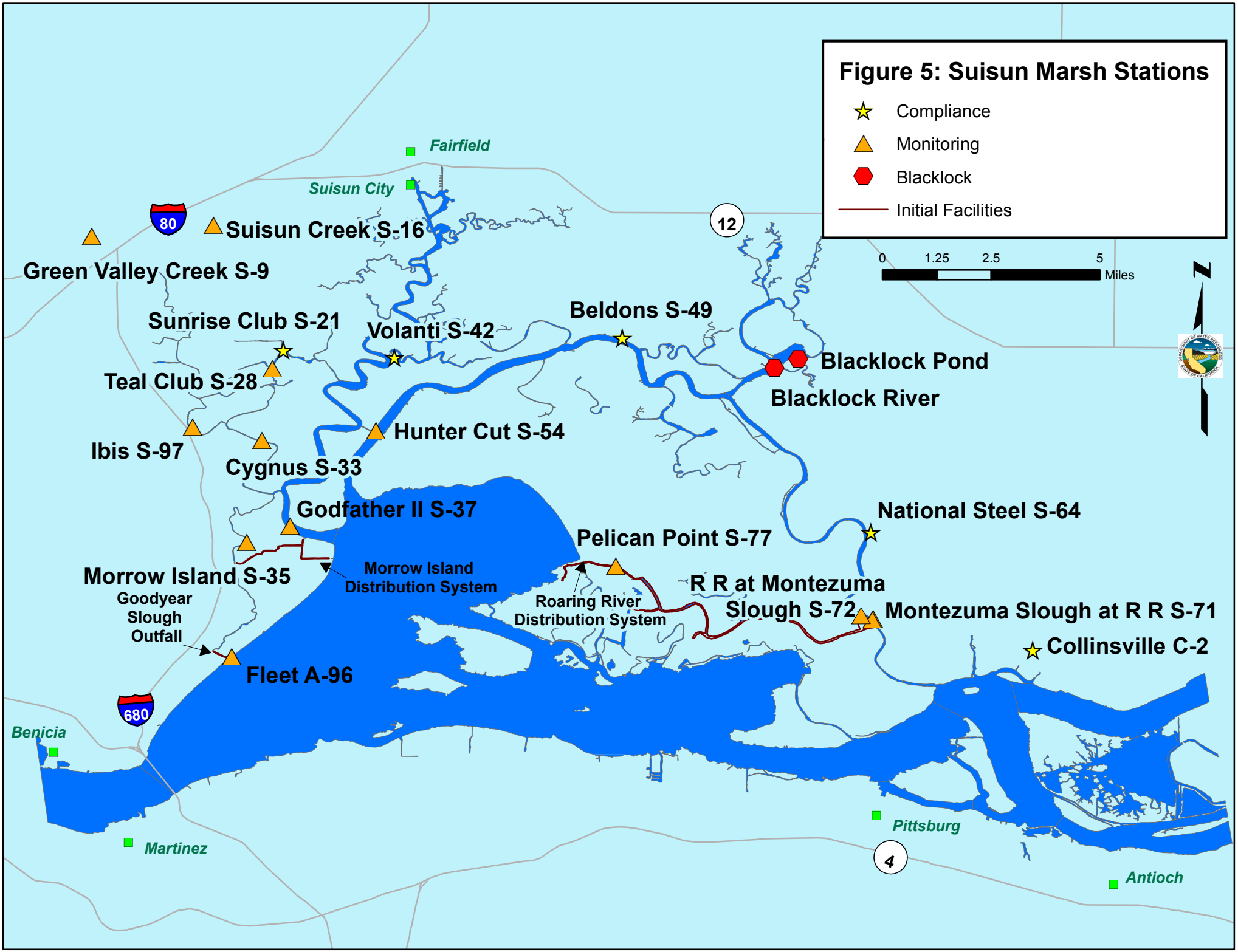


Figure 5: Suisun Marsh Stations
Compliance
Monitoring
Blacklock
Initial Facilities
0 1.25 2.5 5 Miles
N
Fairfield
Suisun City
80
12
Suisun Creek S-16
Green Valley Creek S-9
Sunrise Club S-21
Volanti S-42
Beldons S-49
Blacklock Pond
Blacklock River
Teal Club S-28
Ibis S-97
Hunter Cut S-54
Cygnus S-33
Godfather II S-37
National Steel S-64
Pelican Point S-77
Morrow Island S-35
Goodyear Slough Outfall
Morrow Island Distribution System
Roaring River Distribution System
R R at Montezuma Slough S-72
Montezuma Slough at R R S-71
Collinsville C-2
Fleet A-96
680
Benicia
Martinez
Pittsburg
4
Antioch