Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: March 2004

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per 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. The monthly reports summarizing channel water salinity conditions are submitted for October through May of the following calendar year in accordance with SWRCB requirements. Conditions of channel water salinity in the Suisun Marsh are determined by specific electrical conductivity and specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

This report is required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	Northern Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

In addition, data from the stations listed below are also included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area precipitation, 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 March, 2004, salinity conditions at all five compliance stations were in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of March was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for the eastern and western compliance stations was 8.0 mS/cm during March 2004. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is as shown below.

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Most of the high runoffs occurred in the beginning of March. Delta outflow for this month varied from as high as 150,000 cfs to as low as 17,500 cfs (Figure 3). The steep decline in outflow started at the beginning of the month and continues to mid-month. Thereafter, outflow continues to gradually decline to 25,000 cfs . Outflow raised for a day on March 27, due to a 0.5 inches of precipitation for the day, but dropped thereafter with no precipitation activity for the rest of the month.

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 March is listed below:

Month	Mean NDOI (cubic feet per second)
March	58,393

2.3 Rainfall

For the month of March, only three precipitation events occurred and ranged from 0.12 inches to 0.54 inches. Overall, there were minimal amount of precipitation activity this month. Total monthly rainfall at the Waterman Gauging Station in Fairfield during March 2004 is listed below:

Month	Total Rainfall (inches)
March	0.91

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock configuration at the SMSCG from December 15, 2003 and through the end of March 2004 are summarized below.

Date	Gate status	Flashboards status	Boat Lock status
March 1 - 31	3 gates open	Installed	Closed

The salinity control gates were not warranted to operate and continued to remain open during March because of low salinity levels throughout the marsh. This condition is also expected to continue in the coming months unless water quality condition changes and warrants re-operation of the gates.

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,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

Despite continued decrease in outflows during March, salinity levels at all compliance station remain remarkably low. Throughout the month, salinity levels at all compliance

stations were below 2.0 mS/cm, whereas at monitoring stations, the salinity levels were below 4.5 mS/cm. The standard for the month was 8.0 mS/cm, and both compliance and monitoring stations were well below the standard. The salinity level increase event at both Sunrise Club (S-21) and Morrow (S-35) in early March is probably due to local drainages during monitoring period. We believe that if it was a tidal effect, salinity levels at other compliance and/or monitoring stations would have also responded similarly. However, other stations did not have the salinity increase on that day (i.e. March 2, 2004) and it was, therefore, concluded that it was an isolated local water quality condition.

Channel water salinity conditions in the marsh were observed to be influenced by antecedent conditions of past months high outflows.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for March 2004 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations were similar to that of March 1999, but with slightly higher magnitude. Comparing to the previous nine years, the following observations are made for each of the stations salinity levels for March 2004:

- C-2 salinity level was similar to that of 2003 and fourth highest
- S64 salinity level was similar to that of 1995 and fifth highest
- S49 salinity level was similar to that of 1997 and fourth highest
- S42 was similar to that of 1998, 1999, and 2000, and was sixth highest
- S21 was similar to 2001 and was the fifth highest
- S97 was the fourth highest
- S35 was the fifth highest

Overall, March 2004 salinity levels were recorded as fourth highest in past nine years in terms of high Specific Conductance.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

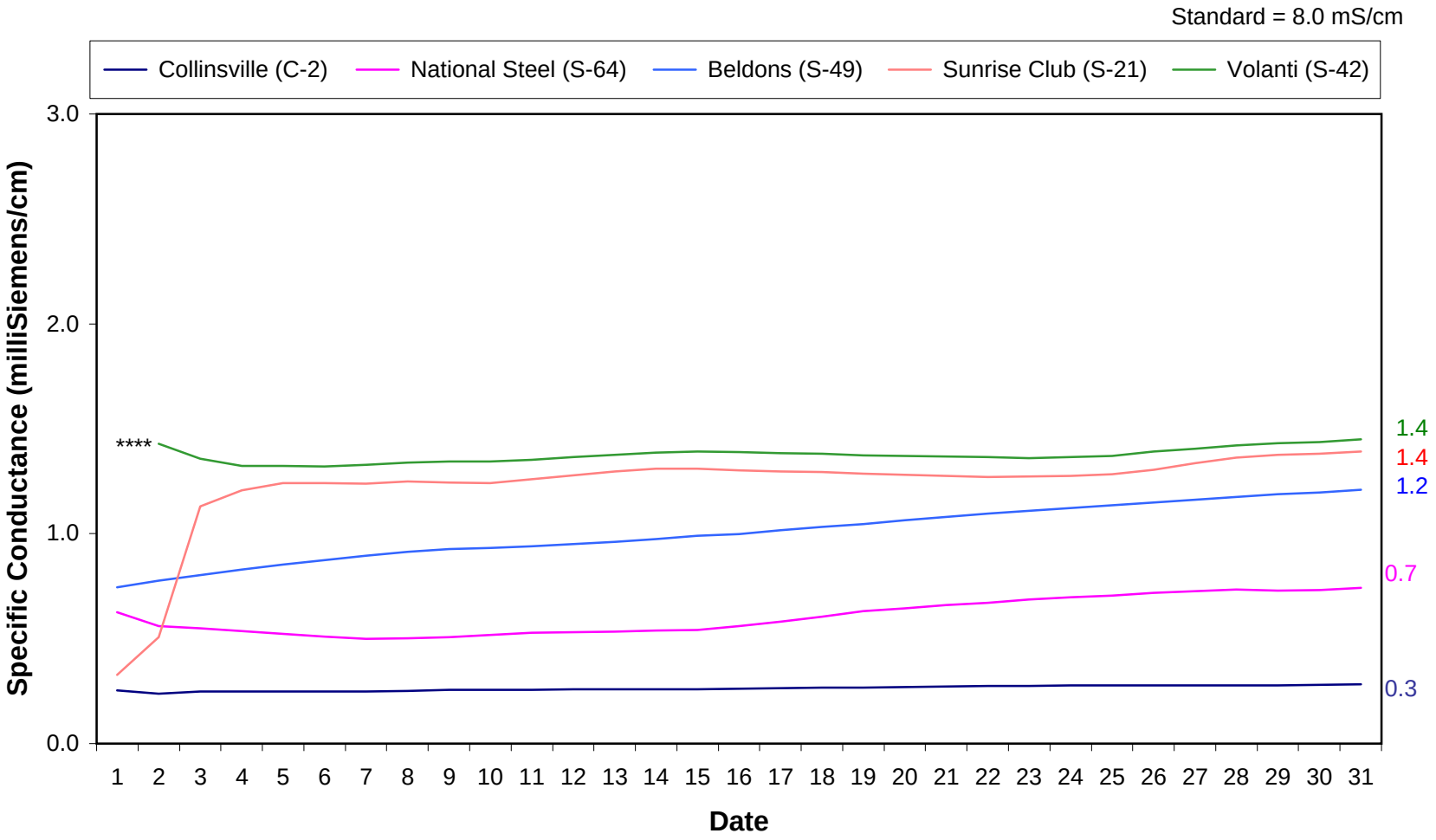
March 2004

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3	8.0	Yes
S-64	0.7	8.0	Yes
S-49	1.2	8.0	Yes
S-42	1.4	8.0	Yes
S-21	1.4	8.0	Yes

*milliSiemens per centimeter

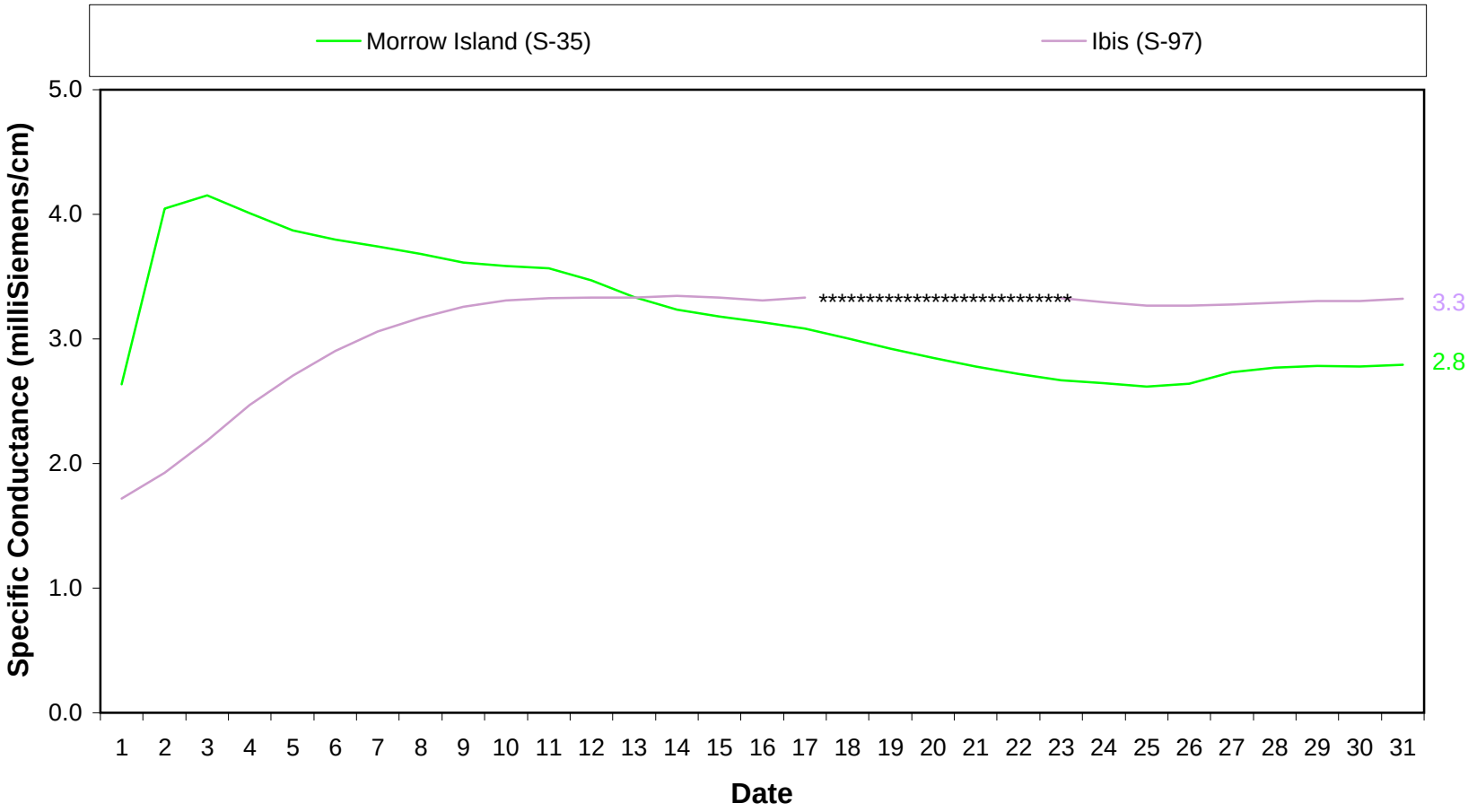
**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance For Compliance Stations March 2004



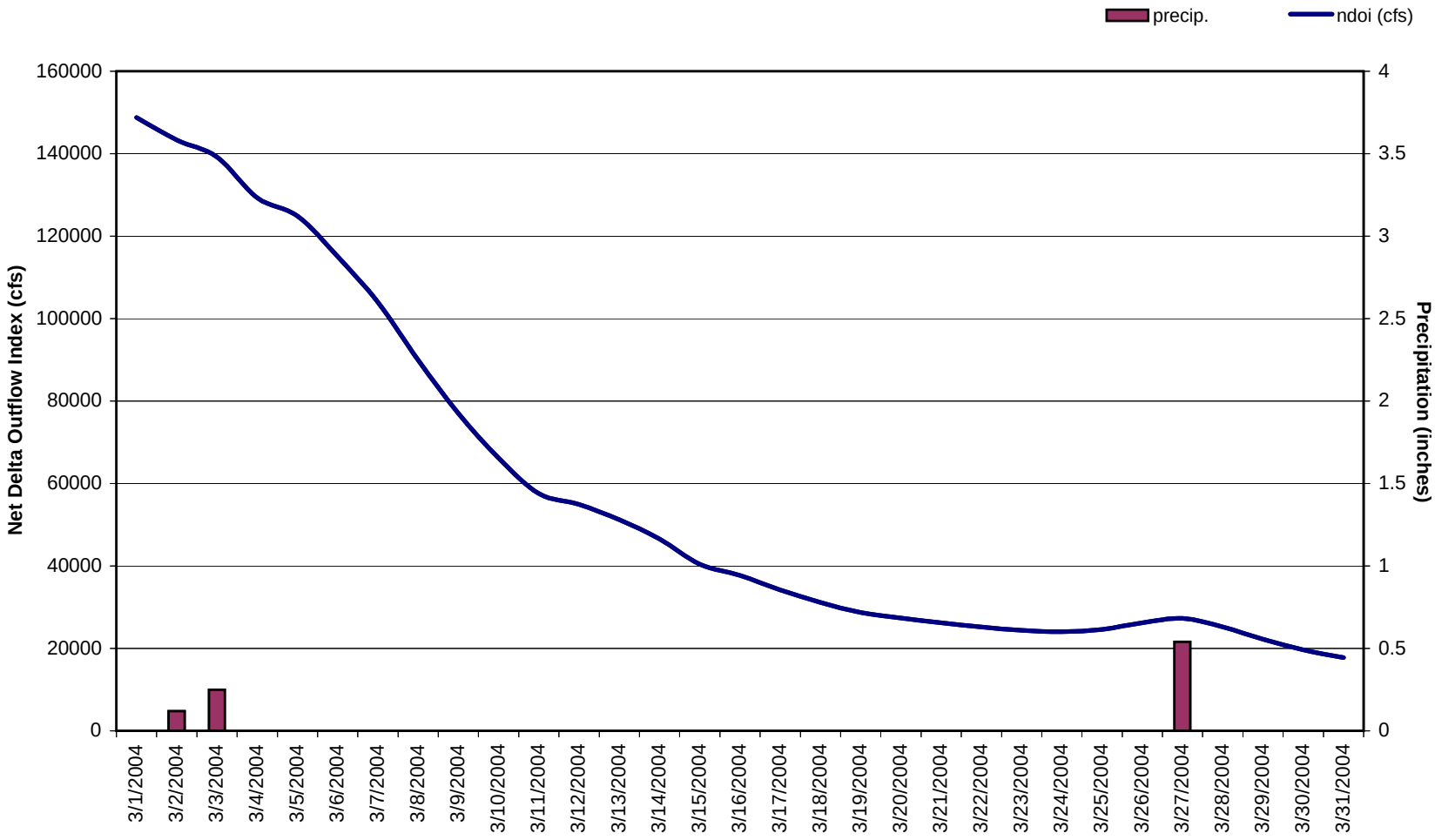
* * = missing data due to equipment failure or did not pass QA/QC

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance For Monitoring Stations S-35 and S-97 March 2004



* * = missing data due to equipment failure or did not pass QA/QC

Figure 3. Daily Net Delta Outflow Index and Precipitation*
March 2004



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations March of 1995-2004

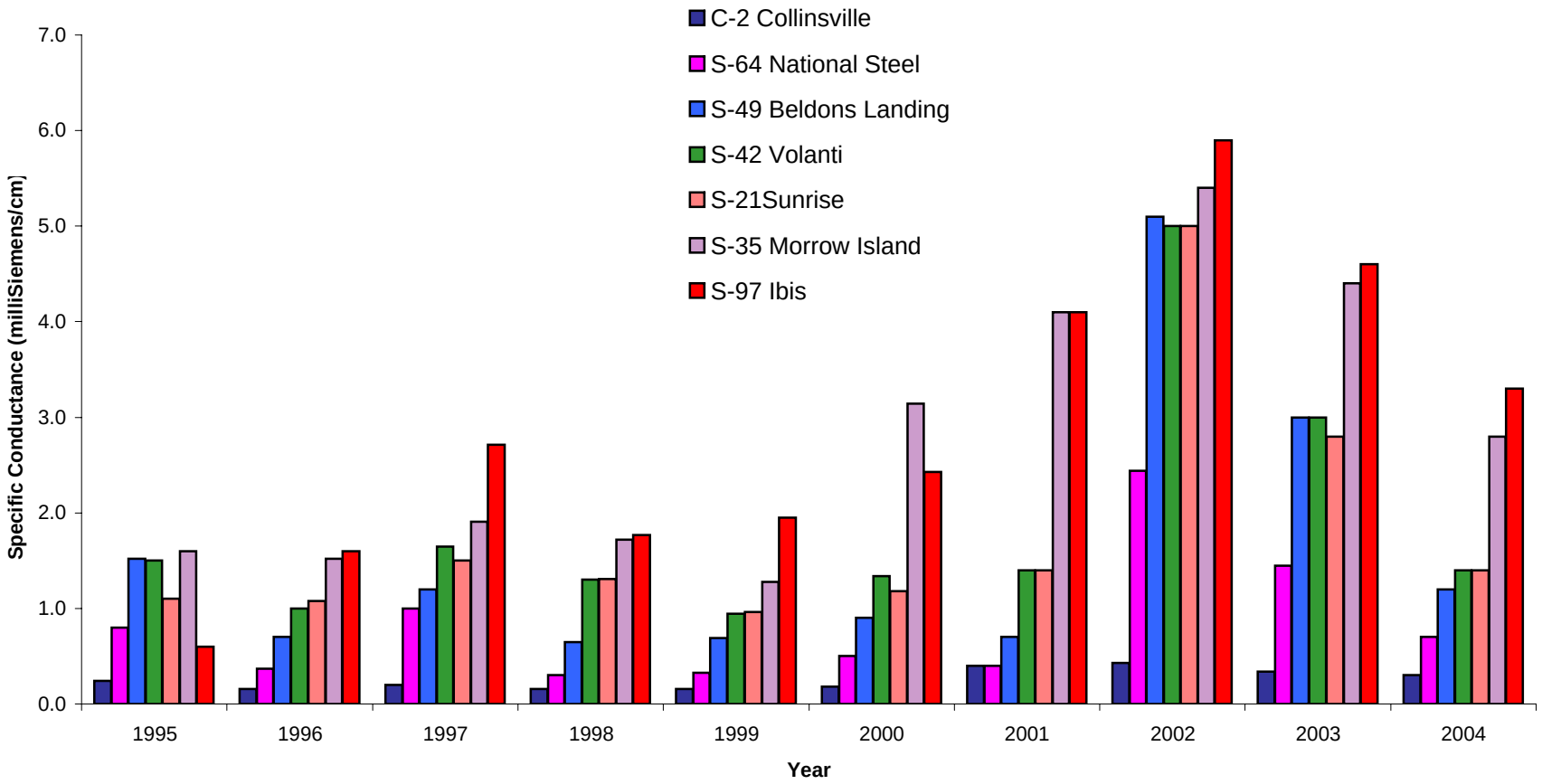
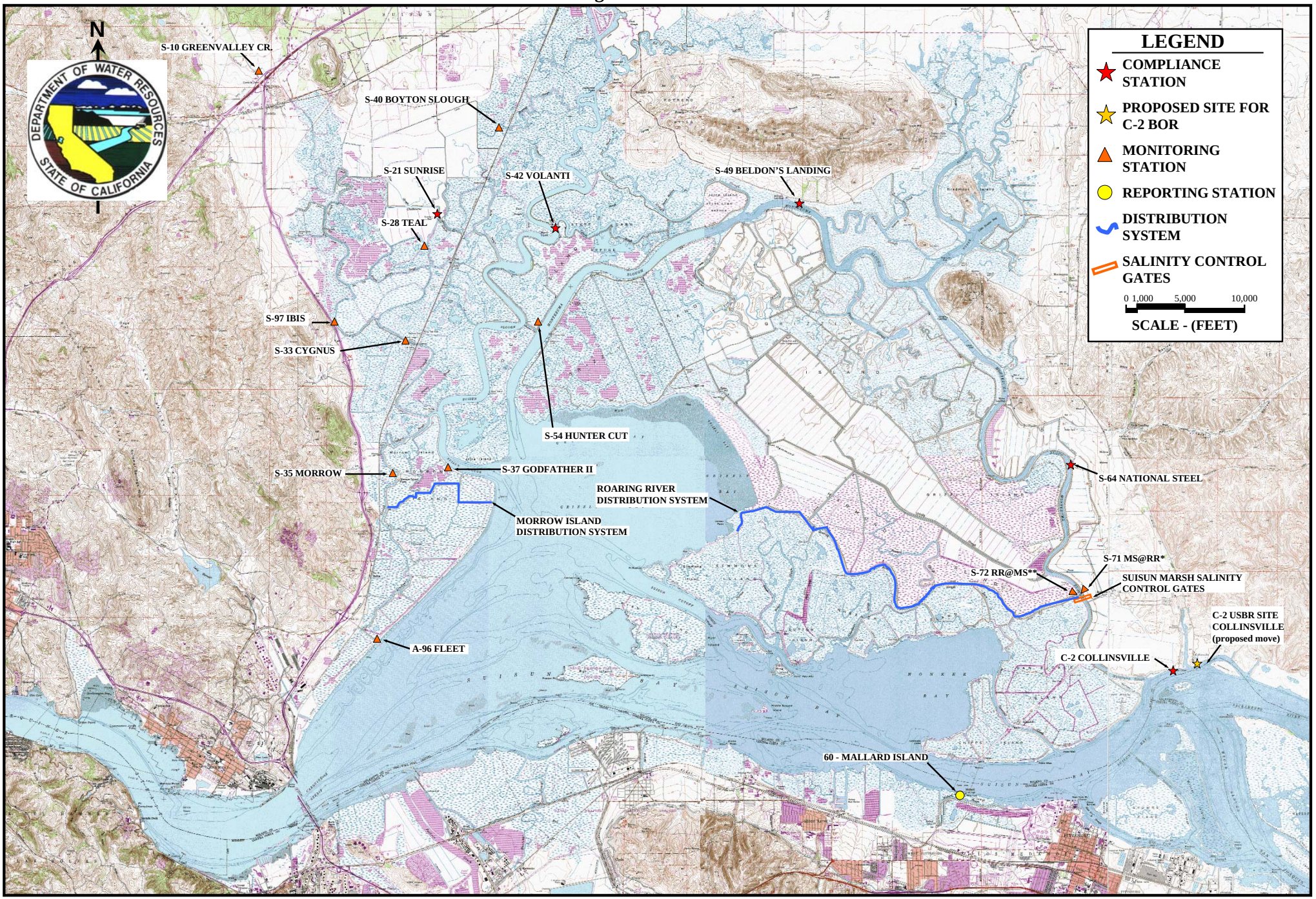


Figure 5



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES