Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: February 2003

CONTENTS

This report is organized into the following sections and subsections:

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SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

The California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. This requirement is based on SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions. Channel water salinity conditions in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance".

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:

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

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

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

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

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

Monitoring Results

Channel Water Salinity Compliance

State Water Resources Control Board channel water salinity standards for the Suisun Marsh were met at all five compliance stations during February 2003 (Table 1). Compliance with channel water salinity standards was determined for each compliance station by comparing February mean high-tide specific conductance (SC) with respective standards. The standard for all the compliance stations (i.e. C-2, S-64, S-49, S-42, S-21) was **8.0** mS/cm during February 2003. Table 1 lists monthly mean high-tide SC at the compliance stations.

The progressive daily mean SC for each station is used to track salinity conditions during each month (Figures 1). The progressive mean is calculated for each compliance station. The progressive daily mean (PDM) is the mean of daily average high-tide SC of the month. The mathematical equation is shown below. New progressive mean calculations begin at the start of each calendar month.

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

Delta Outflow

A good amount of Delta outflow occurred in February 2003 (Figure 3). At the start of February, Delta outflow was around 35,000 cfs and decreased to about 15,000 cfs on February 12, 2003. It began to raise thereafter with a serendipity pattern throughout the entire month. It peaked to about 38,700 cfs on February 20, 2003. The monthly mean Net Delta Outflow Index (NDOI) for February is listed below:

Month	Mean NDOI (cubic feet per second)
February	28,707

The NDOI is the estimated average daily rate of outflow from the Delta.

Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during February 2003 is listed below:

Month	Total Rainfall (inches)
February	1.53

Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during February 2003 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
February 1-28	3 gates open	Installed	Closed

All three gates were held open due to low water quality levels in the marsh as a result of continued precipitation on and off during February. The flashboards remained installed in the event that gate operation is needed to control salinity in the coming control months.

Discussion

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.

Observations and Trends

Conditions during the Reporting Period

Salinity levels at all compliance stations did not exceed 3.2 mS/cm on the eastern portion (Figure 1) and no higher than 6 mS/cm on the western portion (Figure 2) of the marsh throughout February. Continued increase precipitation resulting in high runoffs kept salinity level throughout the entire marsh well below the standard of 8.0 mS/cm.

Channel water salinity conditions in the Marsh were mainly driven by continued precipitation in February 2003. SMSCG operations ceased on December 31, 2002, so gate operations was not a contributing factor to lower salinity levels in February. Compared to January 2003 monthly outflow (i.e. 49,000 cfs), February 2003 was only about half that amount. High runoffs in January resulted in low salinity levels at the start of February and levels continued to remain low with the on and off precipitation occurring in February. The slight upward in salinity level around the second week of February at all compliance stations was due to the decreased in Delta outflow. This increase stabilized around February 16 and thereafter. But the overall salinity level was low throughout the marsh.

Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for February 2003 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations for February 2003 was similar to that of February 1995, however, significantly lower in magnitude. Compared to previous nine years, February 2003 salinity levels were ranked fourth in high water quality.

Table 1

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

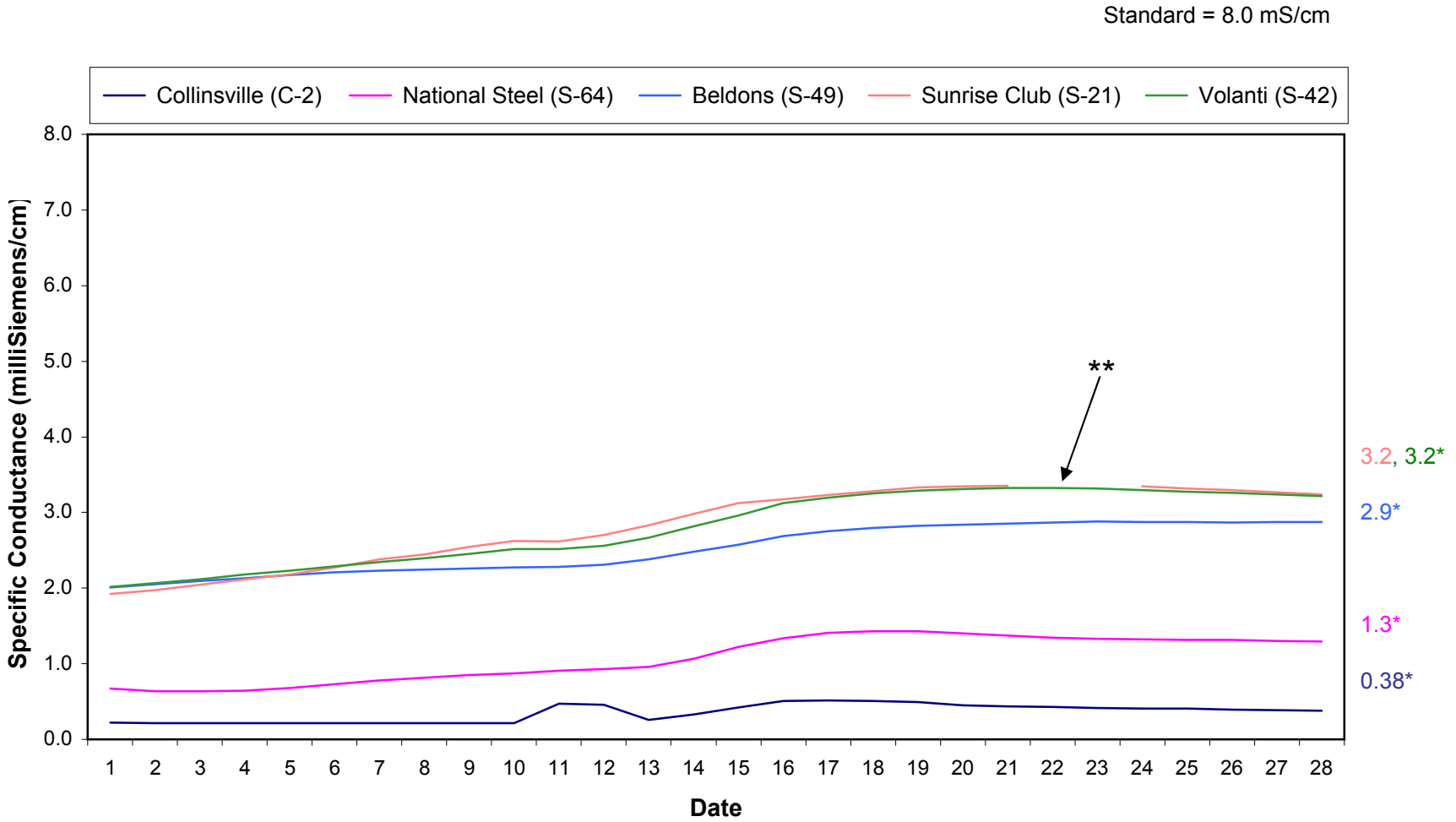
February 2003

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.4	8.0	Yes
S-64	1.3	8.0	Yes
S-49	2.9	8.0	Yes
S-42	3.2	8.0	Yes
S-21	3.2	8.0	Yes

*= milliSiemens per centimeter

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

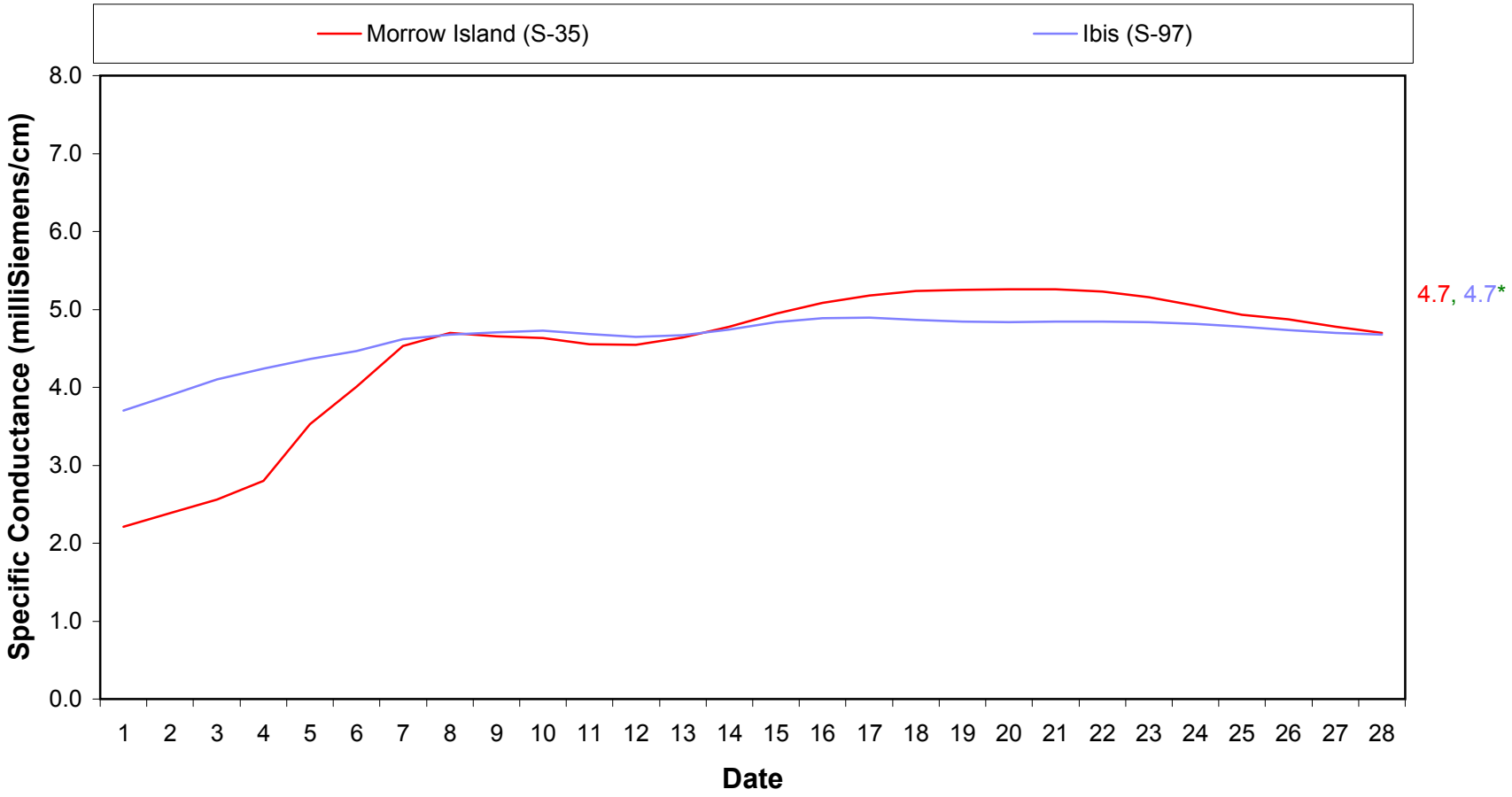
Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2003



* = monthly mean specific electrical conductance at high tide in milliSiemens/cm.

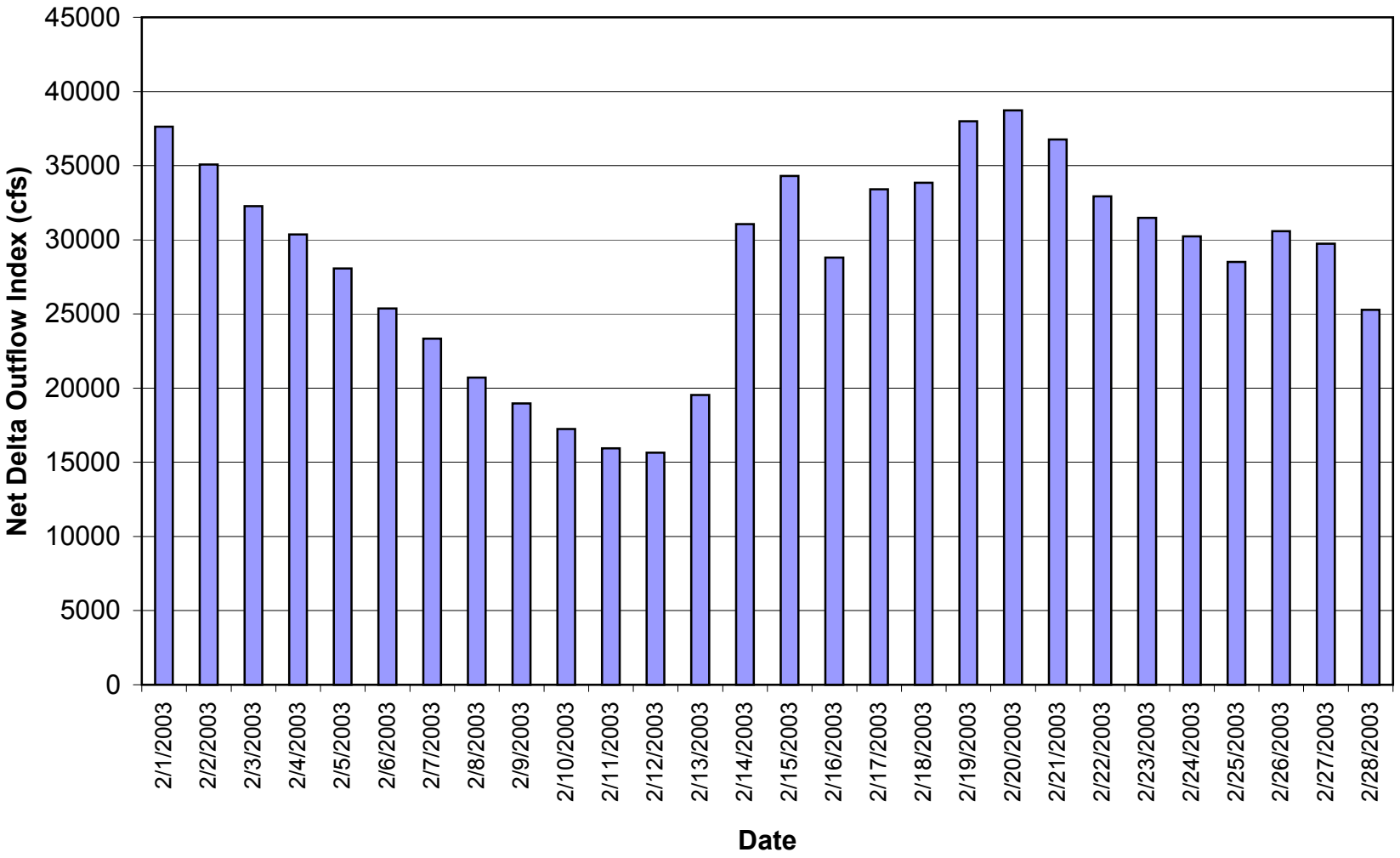
* * = Data missing at S21 due to equipment problem.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2003



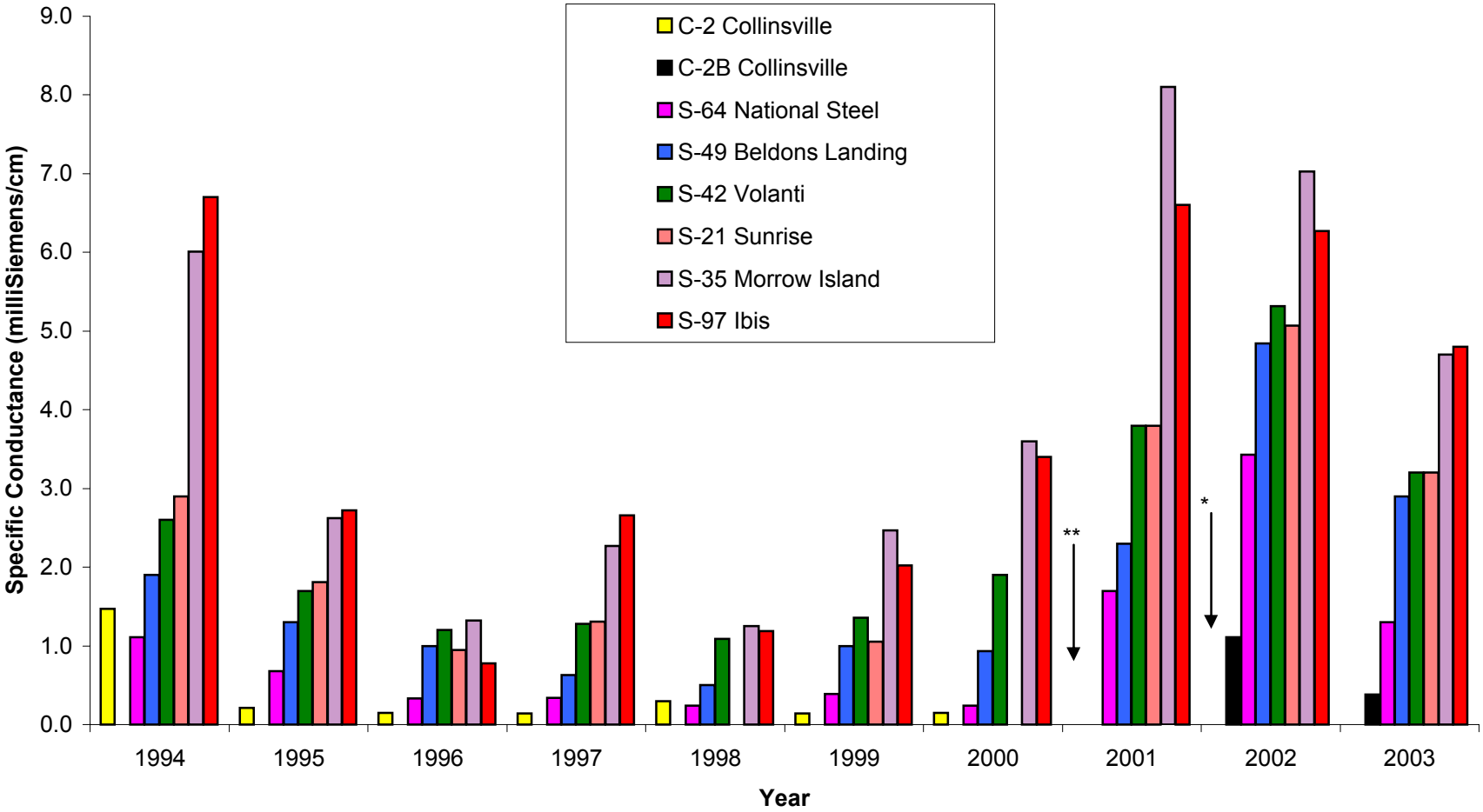
* = monthly mean specific electrical conductance at high tide in milliSiemens/cm.

Figure 3. Daily Net Delta Outflow Index For February 2003



*preliminary DWR, O&M data

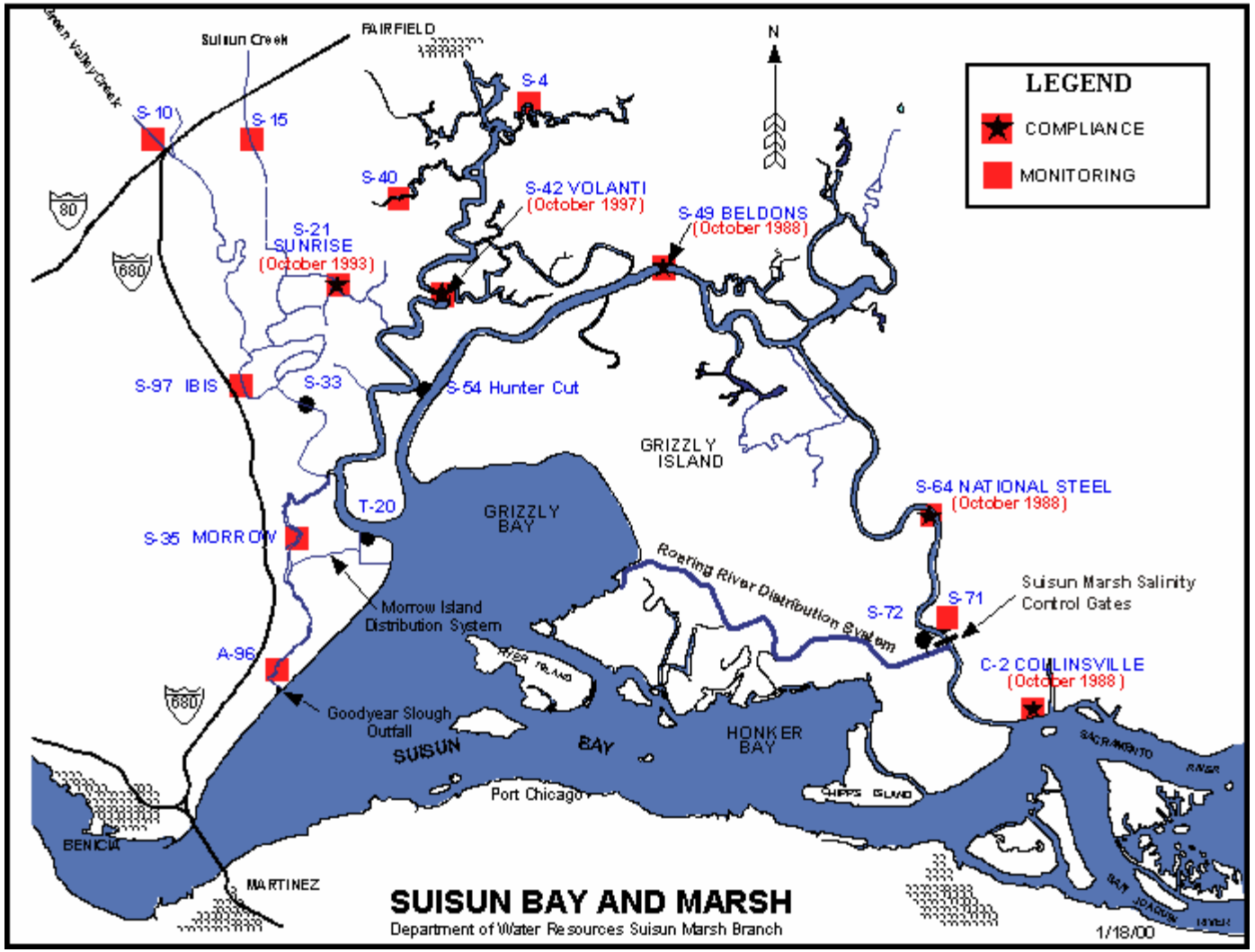
Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations February of 1994-2003



*Representative data from nearby USBR station is used in lieu of station C-2 from 2002 and thereafter.

**C-2 data missing due to equipment failure.

Figure 5


LEGEND
COMPLIANCE
MONITORING
N
Suisun Creek
FAIRFIELD
S-10
S-15
S-4
S-40
S-42 VOLANTI
(October 1997)
S-49 BELDONS
(October 1988)
S-21
SUNRISE
(October 1993)
S-97 IBIS
S-33
S-54 Hunter Cut
GRIZZLY
ISLAND
S-64 NATIONAL STEEL
(October 1988)
T-20
GRIZZLY
BAY
S-35 MORROW
Roaring River Distribution System
Suisun Marsh Salinity
Control Gates
S-72
S-71
Morrow Island
Distribution System
A-96
C-2 COLLINSVILLE
(October 1988)
Goodyear Slough
Outfall
SUISUN
BAY
HONKER
BAY
Port Chicago
BENICIA
MARTINEZ
SUISUN BAY AND MARSH
Department of Water Resources Suisun Marsh Branch
1/18/00