Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: April 2003

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1. 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.

2. Monitoring Results

2.1 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 April 2003 (Table 1). Compliance with channel water salinity standards was determined for each compliance station by comparing April 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 11.0 mS/cm during April 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.

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

2.2 Delta Outflow

At the start of April, Delta outflow was low (~11,000 cfs) and slightly increase to about 12,000 cfs as a result precipitation during the first week of April. Outflow then decreased to about 8,000 cfs with no precipitation during the second week of April. Around mid-April, two storm events producing more than 0.65 inches of rain resulted an increase in outflow up to about 35,000 cfs. Thereafter, outflow fluctuated, and however, it never fell below 20,000 cfs for the remainder of April 2003. The monthly mean Net Delta Outflow Index (NDOI) for April is listed below:

Month	Mean NDOI (cubic feet per second)
April	21,000

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

2.3 Rainfall

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

Month	Total Rainfall (inches)
April	2.92

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

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

Date	Gate status	Flashboards status	Boat Lock status
April 1-30	3 gates open	Installed	Closed

All three gates continued to be open due to low water quality levels in the marsh during April. The flashboards remained installed in the event that gate operation is needed to control salinity in the coming month.

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

Salinity levels at all compliance stations did not exceed 4.0 mS/cm on the eastern portion (Figure 1) and 5 mS/cm on the western portion (Figure 2) of the marsh throughout April. Salinity levels were already low coming into April. With continued precipitation events during April 2003, salinity levels throughout the entire marsh were recorded well below the standard of 11.0 mS/cm.

Channel water salinity conditions in the Marsh were mainly influenced by continued precipitation in April 2003. Since December 31, 2002, gate operations ceased so gate operations was not a contributing factor to lower salinity levels in April. Compared to March 2003 (i.e. 15,800 cfs) mean monthly outflow, April 2003 mean monthly outflow was 6,000 cfs higher.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

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

Means salinity pattern of S97 and S35 were similar to that of 2001, however, with slightly lower magnitude. S21 salinity level was lower than S42 and S49 compared to previous nine years. That is probably due to 1 week of missing data altering the end result of salinity level. Generally, S21 salinity level is higher or about the same to that of S42 and S49, with the exception of 1994. In 1994, S21 salinity level is only lower than S42 but not lower than S49. Therefore, S21 being lower than both S42 and S49 is not common and is more than likely due to missing data. Compared to previous nine years, April 2003 salinity levels were ranked fourth in high Specific Conductance, except for Collinsville station. For April 2003, Collinsville station was ranked fifth in high Specific Conductance.

Table 1

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

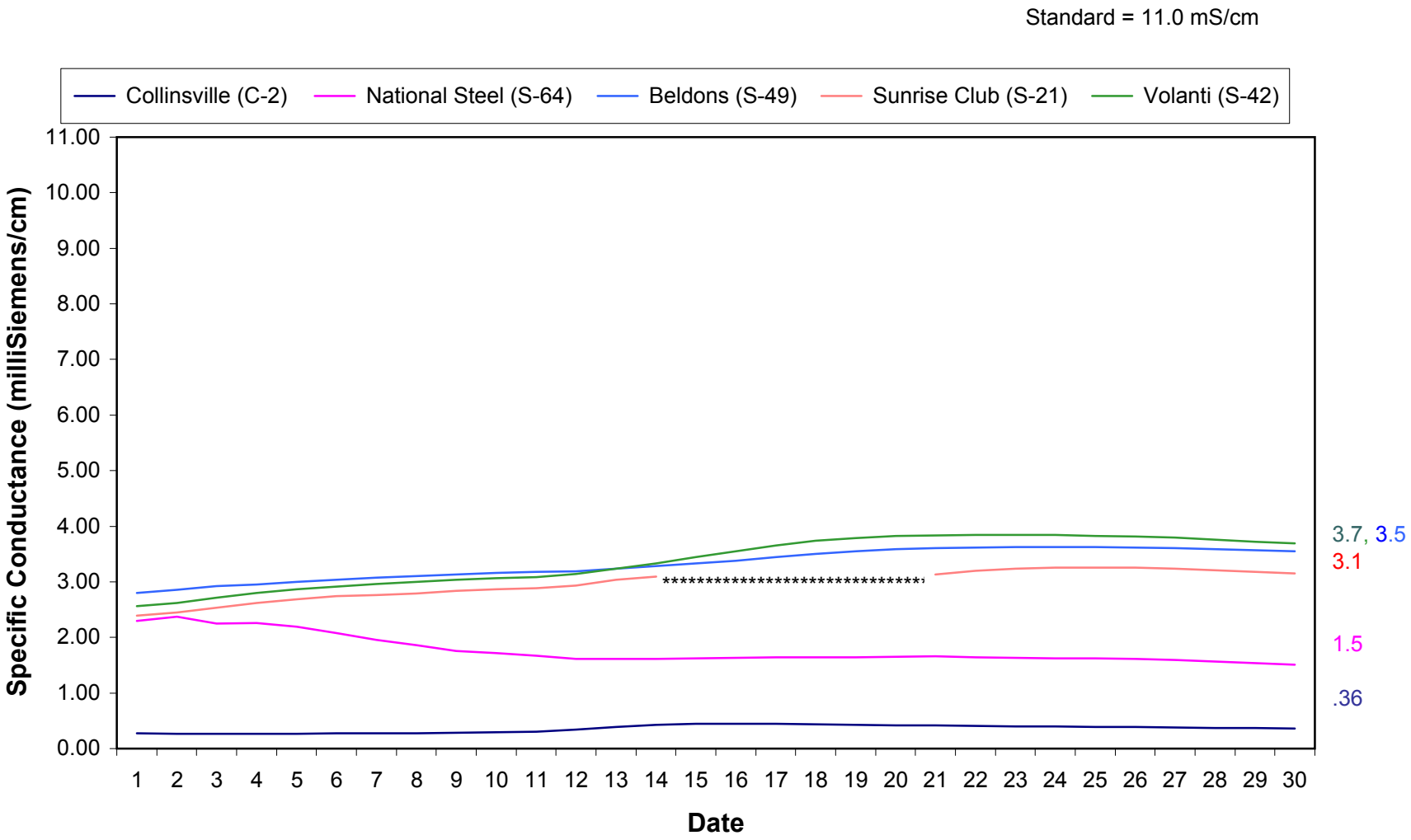
April 2003

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.4	11.0	Yes
S-64	1.5	11.0	Yes
S-49	3.5	11.0	Yes
S-42	3.7	11.0	Yes
S-21	3.2	11.0	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
April 2003



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

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

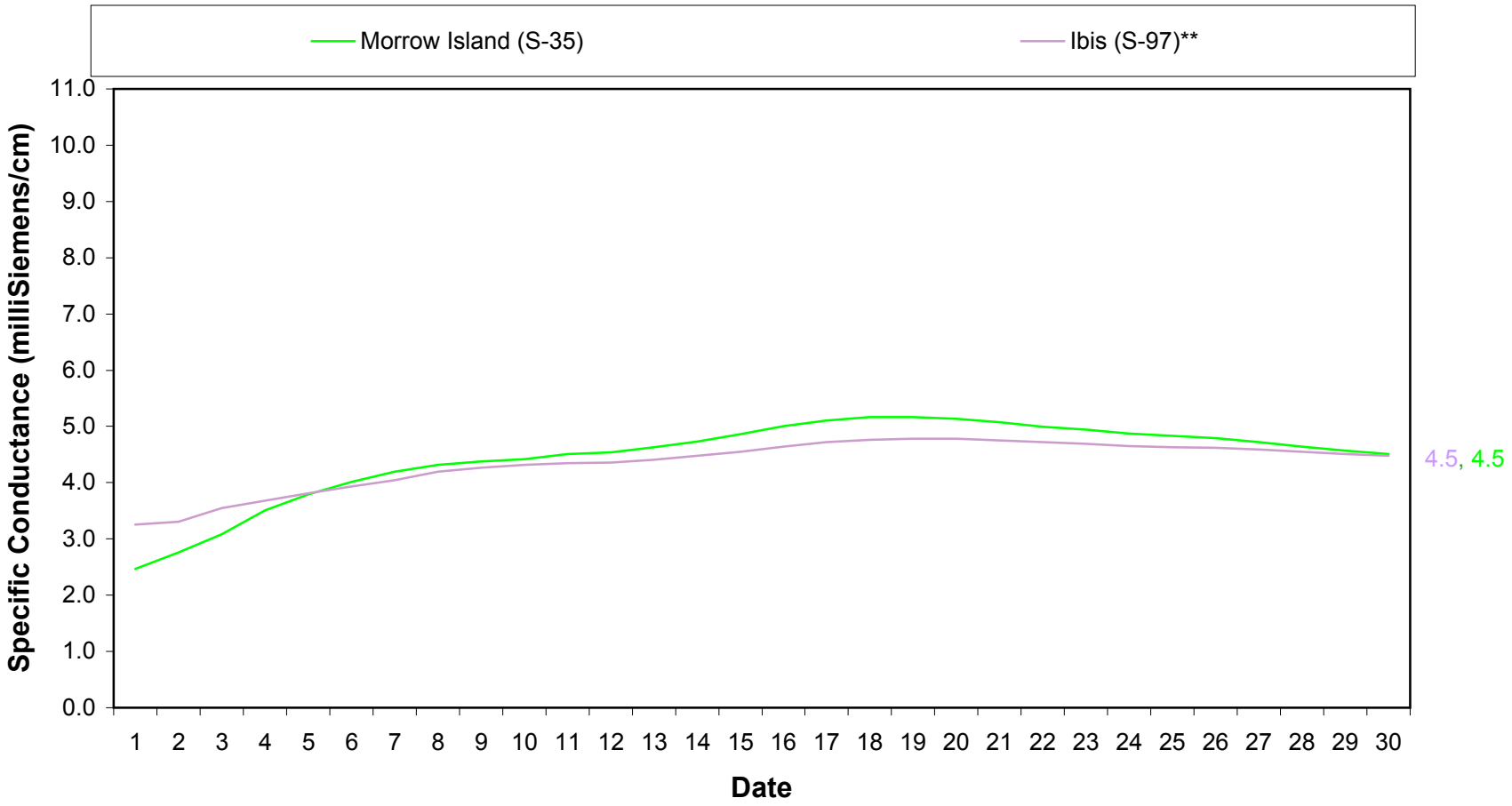
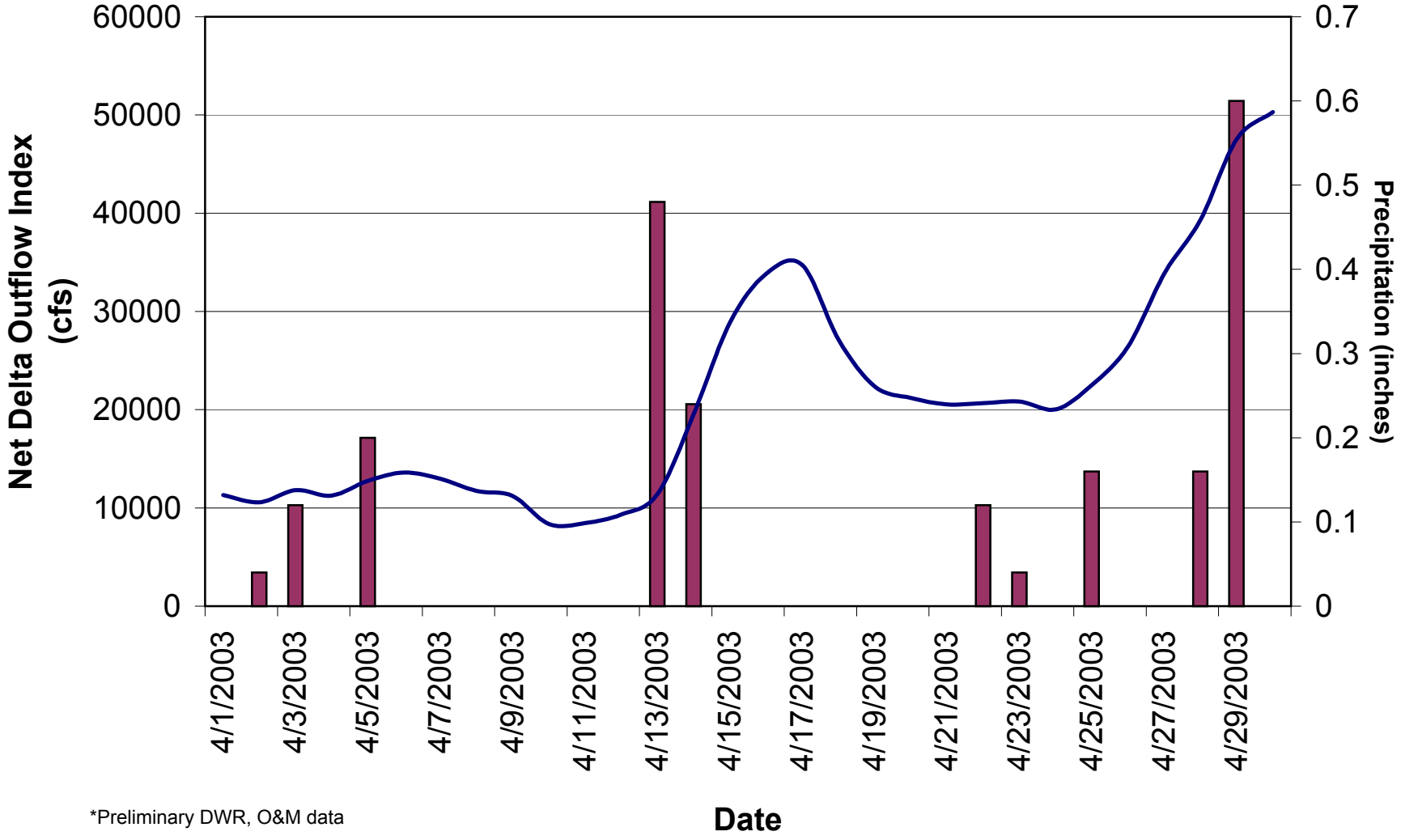


Figure 3. Daily Net Delta Outflow Index and Precipitation*
April 2003



*Preliminary DWR, O&M data

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

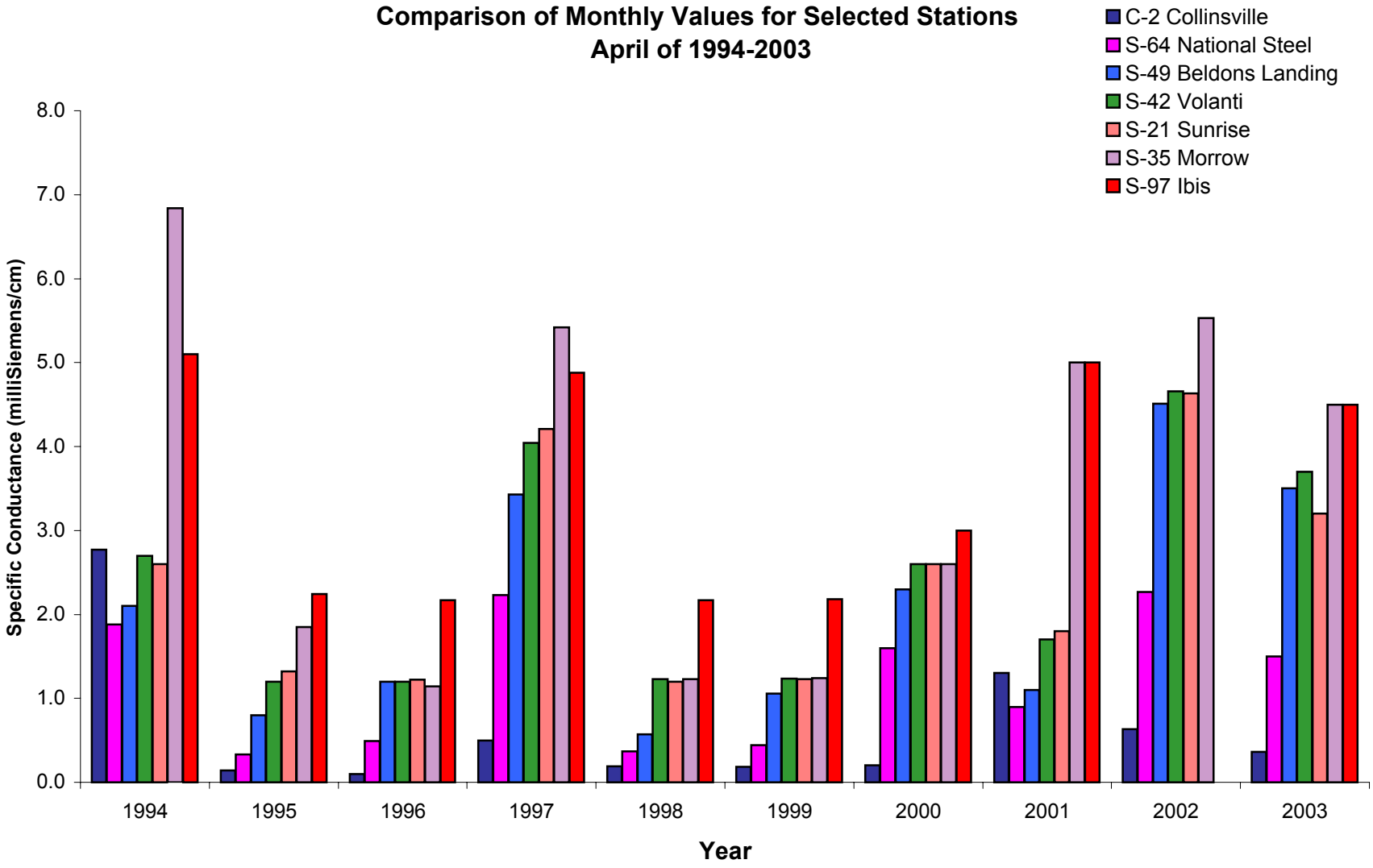
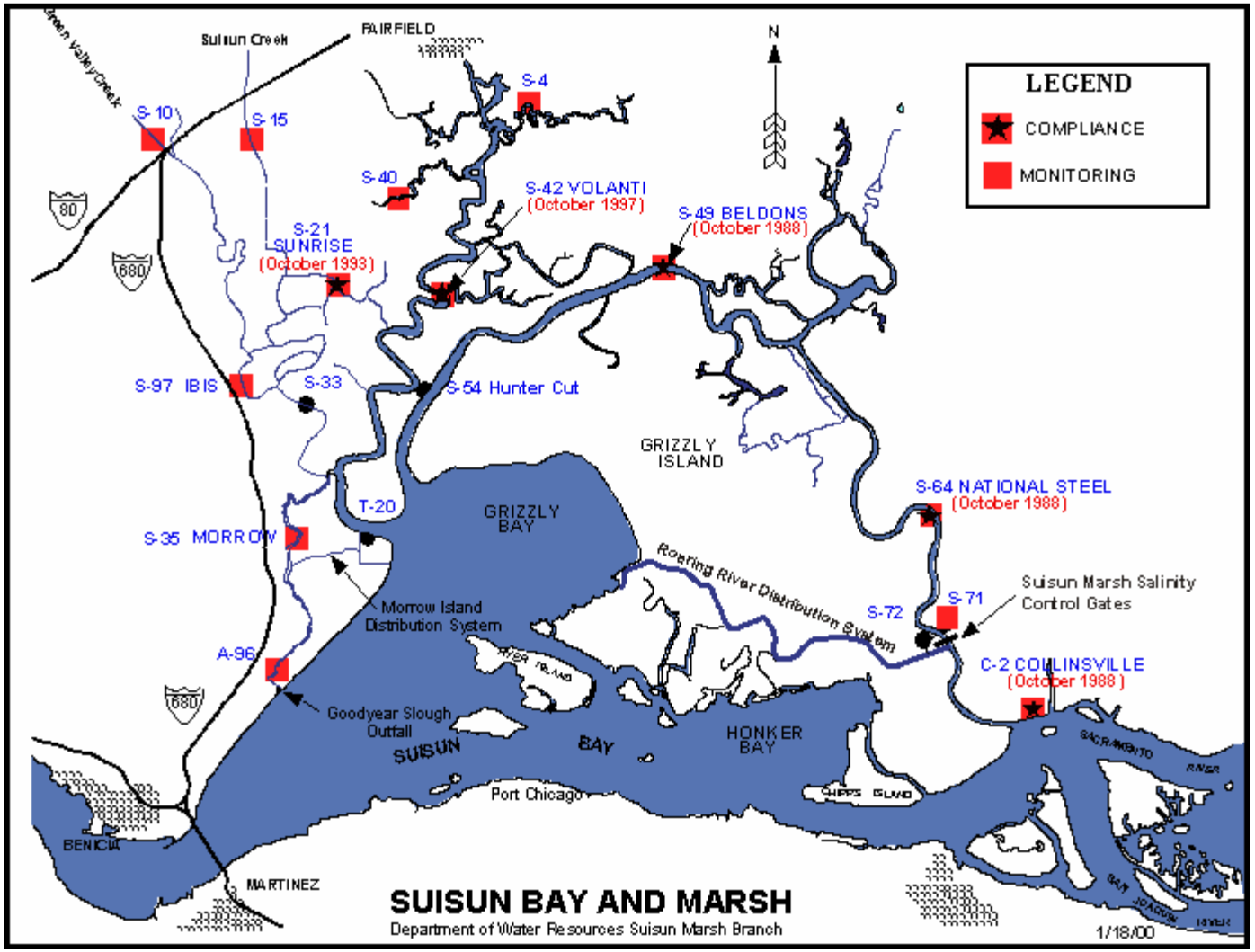


Figure 5


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