Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: January - May 2001

CONTENTS

This report is organized into the following sections and subsections:

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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 January through May 2001 (Table 1). Compliance with channel water salinity standards was determined for each compliance station by comparing January through May mean high-tide specific conductance (SC) with their respective standards. The standard for all compliance stations (i.e. C-2, S-64, S-49, S-42, S-21) during January 2001 was 12.5 millisiemens per centimeter (mS/cm), February and March 2001 was 8.0 (mS/cm), and April and May 2001 was 11.0 mS/cm. Table 1 lists monthly mean high-tide SC at the compliance stations.

The progressive monthly mean SC for each station is used to track salinity conditions during each month (Figures 1 through 5). The progressive mean is calculated for each compliance station by averaging mean high-tide SC for a given day and all previous days of that month. New progressive mean calculations begin at the start of each calendar month.

Delta Outflow

During January through May, 2001, there were several NDOI peaks occurring in early and mid-January, mid-February and late February, and early March as a result of increased precipitation (Figure 6). From April through May, NDOI decreased due to little precipitation. The NDOI spikes in early and late April was a result of both minor precipitation and water projects (i.e. SWP and CVP) exports reduction. The monthly mean Net Delta Outflow Index (NDOI) for January through May is listed below:

Month	Mean NDOI (cubic feet per second)
January	15,780
February	18,600
March	23,240
April	12,400
May	9,980

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 January through May 2001 is listed below:

Month	Total Rainfall (inches)
January	3.36
February	6.35
March	1.37
April	0.62
May	0.00

Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard installations at the SMSCG during January through May 2001 are summarized below.

Date	Flashboard Installation	Gate Status
January 1 – May 13	Full*	Operating
May 14 – May 31	Out	Held Open

*Full flashboards were installed this year since modified flashboards testing was suspended for 1 year.

SMSCG operations ceased on May 14, 2001 due to low channel water salinity condition and anticipation of no water quality concerns for the remaining month.

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.

State Water Resources Control Board Order WR 98-6, issued September 25, 1998, authorizes DWR to experimentally test the effects of "modified" flashboards at the SMSCG on salmon behavior. The modifications include gaps between adjacent flashboards. The modified flashboards tend to allow channel water salinity levels in the Marsh to rise somewhat higher than when the standard, full flashboard configuration is used. Experimentation with the modified flashboards began in October 1998 and may continue periodically through May 2001.

Observations and Trends

Conditions during the Reporting Period

From January through May 2001, Delta outflow resulting from precipitation was the driving force on low channel water salinity levels in the Marsh. At the beginning of January, a gradual increase in channel water salinity level at both east and west marsh stations were apparent (Figure 1). The first precipitation occurred around January 9, 2001 resulting in high runoffs and the first drop in channel water salinity in both east and west marsh stations. Channel salinity had another drop when the second wave of precipitation occurred in late January that resulted in another high Delta outflow event. Thereafter, channel water salinity levels continues to drop and remain low through April as a result of a few more precipitation events happening in mid and late February, and early March (Figures 1 through 11, excluding Figure 6). A slow increase in channel water salinity occurred in May at both east and west marsh sites, however, it was not enough to be of any concern to meet standards for the month (Figure 5). In fact, channel salinity was low enough that the decision to ceased SMSCG operations on May 14, 2001 was ordered.

Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance stations and at monitoring stations S-35 and S-97 for January through May 2001 were compared with means for those months during the previous nine years (Figures 12 through 16).

Means at C-2, S-35, and S-97 stations were somewhat higher in January of 2001 compared to 2000, however, at S-64, S-49, S-42, and S-21 were somewhat lower. In

February, all stations were higher in 2001 compared to 2000. In March 2001, C-2, S-35, and S-97 were somewhat higher compared to the last five years, whereas, S-64, S-49, S-42, and S-21 were similar to 1999. In April 2001, C-2, S-35, and S-97 were much higher compared to 2000, however, at S-64, S-49, S-42, and S-21 stations, they were much lower compared to 2000. In May 2001, all stations were much higher compared to 2000.

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 17.

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
60	Mallard Island	South of the Eastern Portion of the Suisun marsh	Reporting Station for Conditions in the Vicinity of Chipps and Van Sickle Islands

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 is included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

Table 1

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

January 2001

Station	Specific Conductance (mS/cm)*
Collinsville, C-2	6.3
National Steel, S-64	5.4
Beldon's Landing, S-49	6.8
Volanti, S-42	9.1
Sunrise Club, S-21	9.1

February 2001

Station	Specific Conductance (mS/cm)*
Collinsville, C-2	Telemetry problem
National Steel, S-64	1.7
Beldon's Landing, S-49	2.3
Volanti, S-42	3.8
Sunrise Club, S-21	3.8

March 2001

Station	Specific Conductance (mS/cm)*
Collinsville, C-2	0.4
National Steel, S-64	0.4
Beldon's Landing, S-49	0.7
Volanti, S-42	1.4
Sunrise Club, S-21	1.4

April 2001

Station	Specific Conductance (mS/cm)*
Collinsville, C-2	1.3
National Steel, S-64	0.9
Beldon's Landing, S-49	1.1
Volanti, S-42	1.7
Sunrise Club, S-21	1.8

May 2001

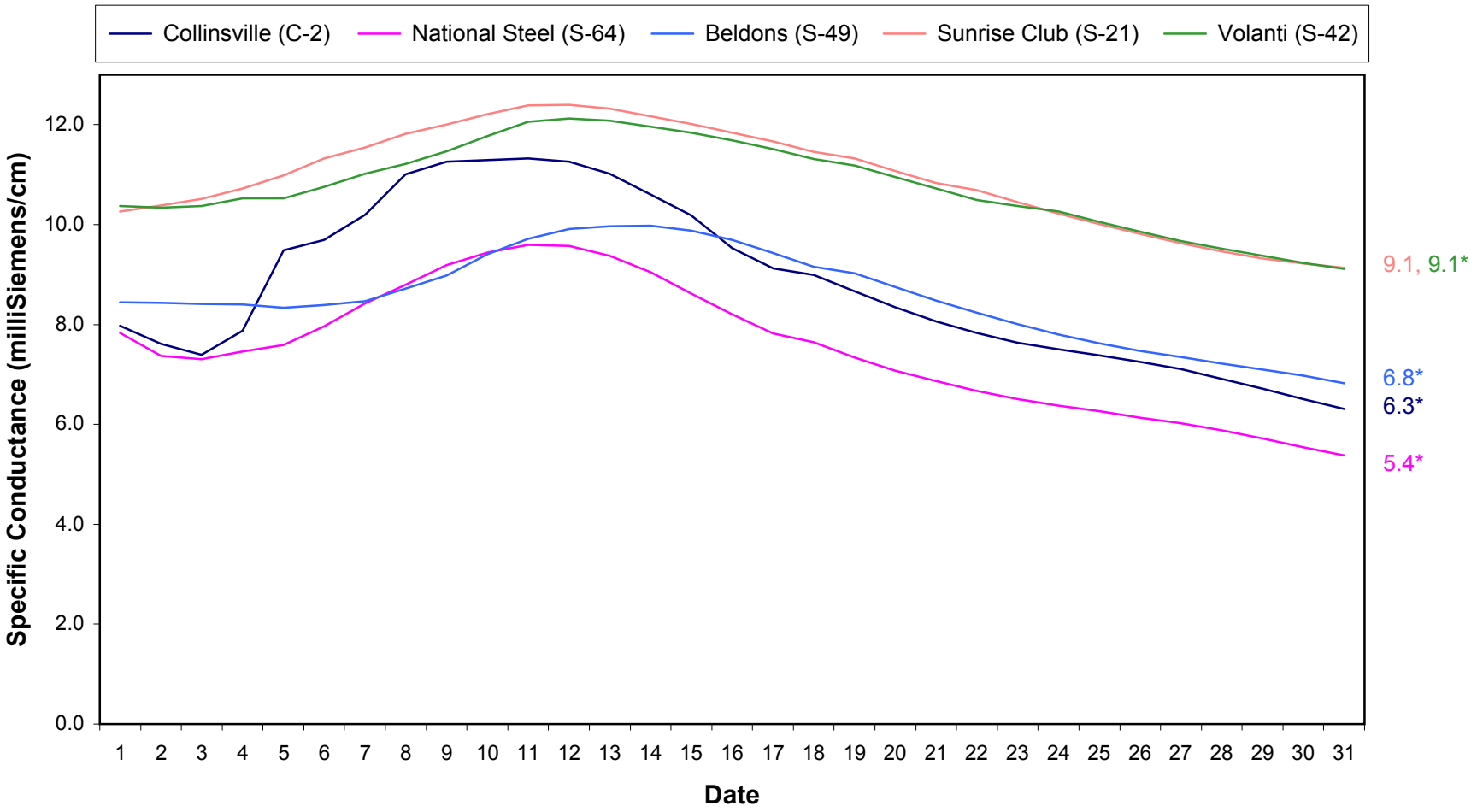
Station	Specific Conductance (mS/cm)*
Collinsville, C-2	3.4
National Steel, S-64	3.0
Beldon's Landing, S-49	4.6
Volanti, S-42	5.4
Sunrise Club, S-21	6.2

***** = milliSiemens per centimeter

Note: SWRCB standards for January 2001 is 12.5 mS/cm, February and March 2001 are 8.0 mS/cm, and April and May 2001 are 11.0 mS/cm, for compliance stations C-2, S-64, S-49, S-42, and S-21.

Figure 1. Suisun Marsh Calendar Month Progressive Mean of the Specific Conductance at High Tide January 2001

Standard = 12.5 mS/cm

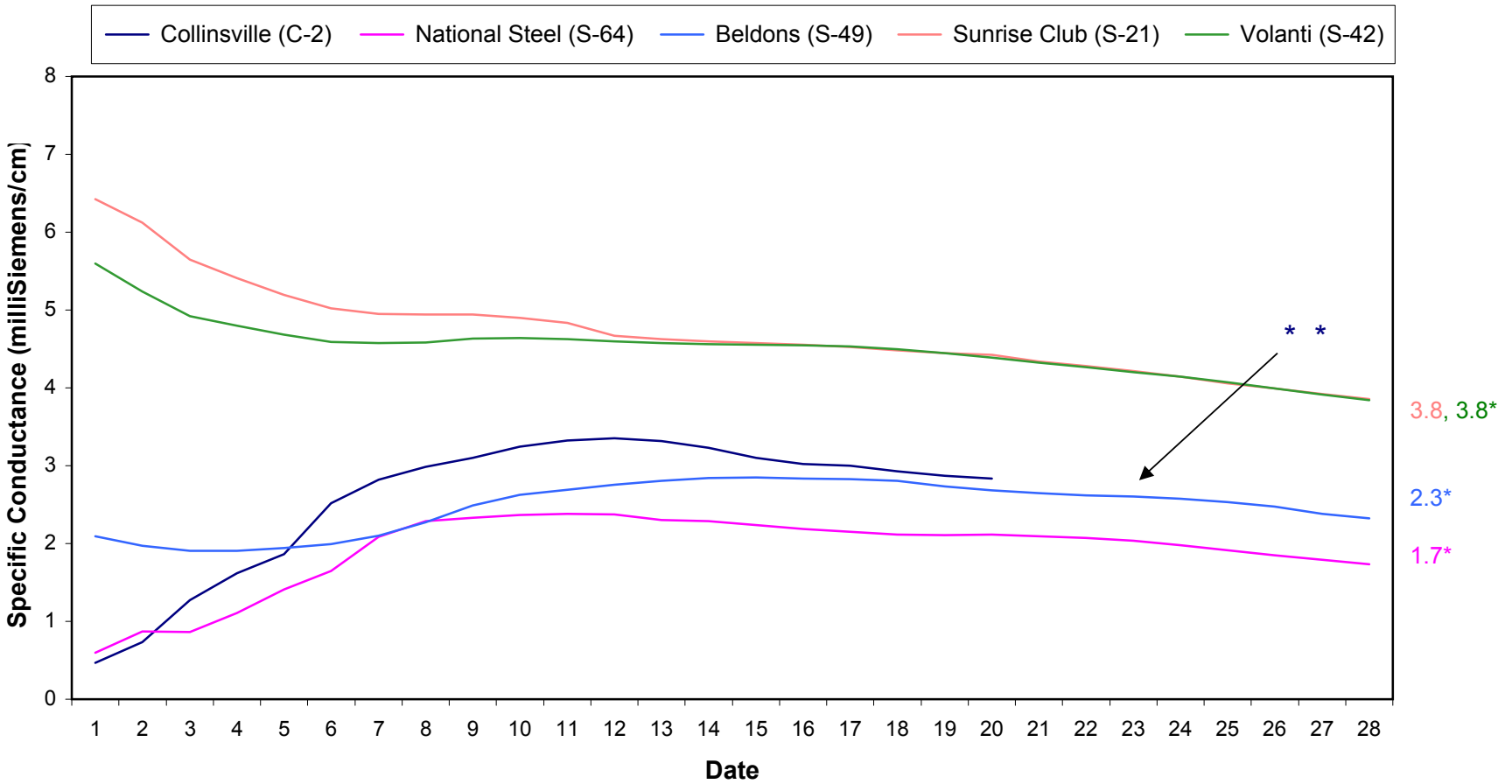


* = monthly mean specific electrical conductance at high tide.

** = data not available.

Figure 2. Suisun Marsh Calendar Month Progressive Mean of the Specific Conductance at High Tide February 2001

Standard = 8.0 mS/cm

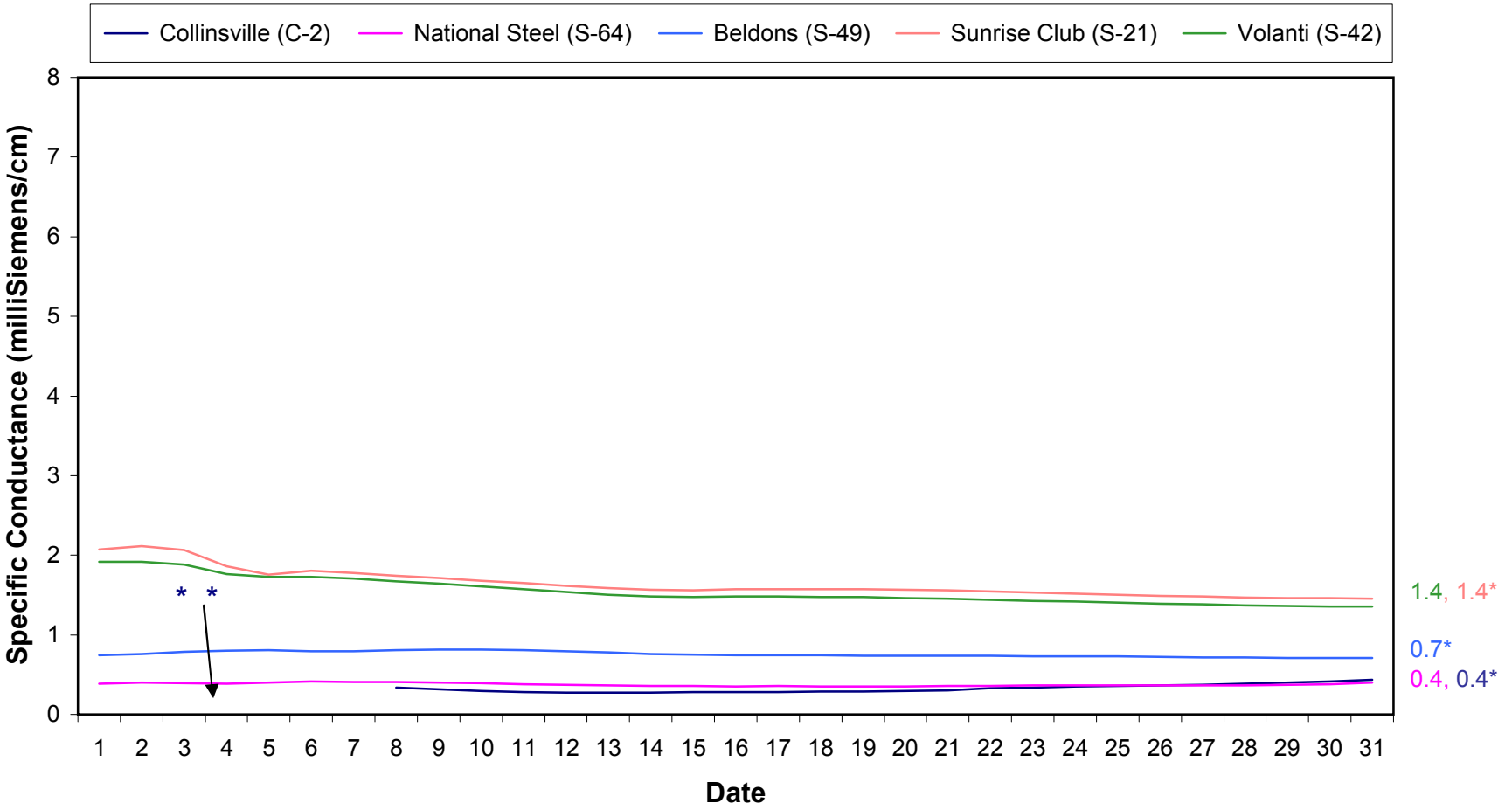


* = monthly mean specific electrical conductance at high tide in milliSiemens/cm.

* * = stage data did not pass QA/QC

Figure 3. Suisun Marsh Calendar Month Progressive Mean of the Specific Conductance at High Tide March 2001

Standard = 8 mS/cm

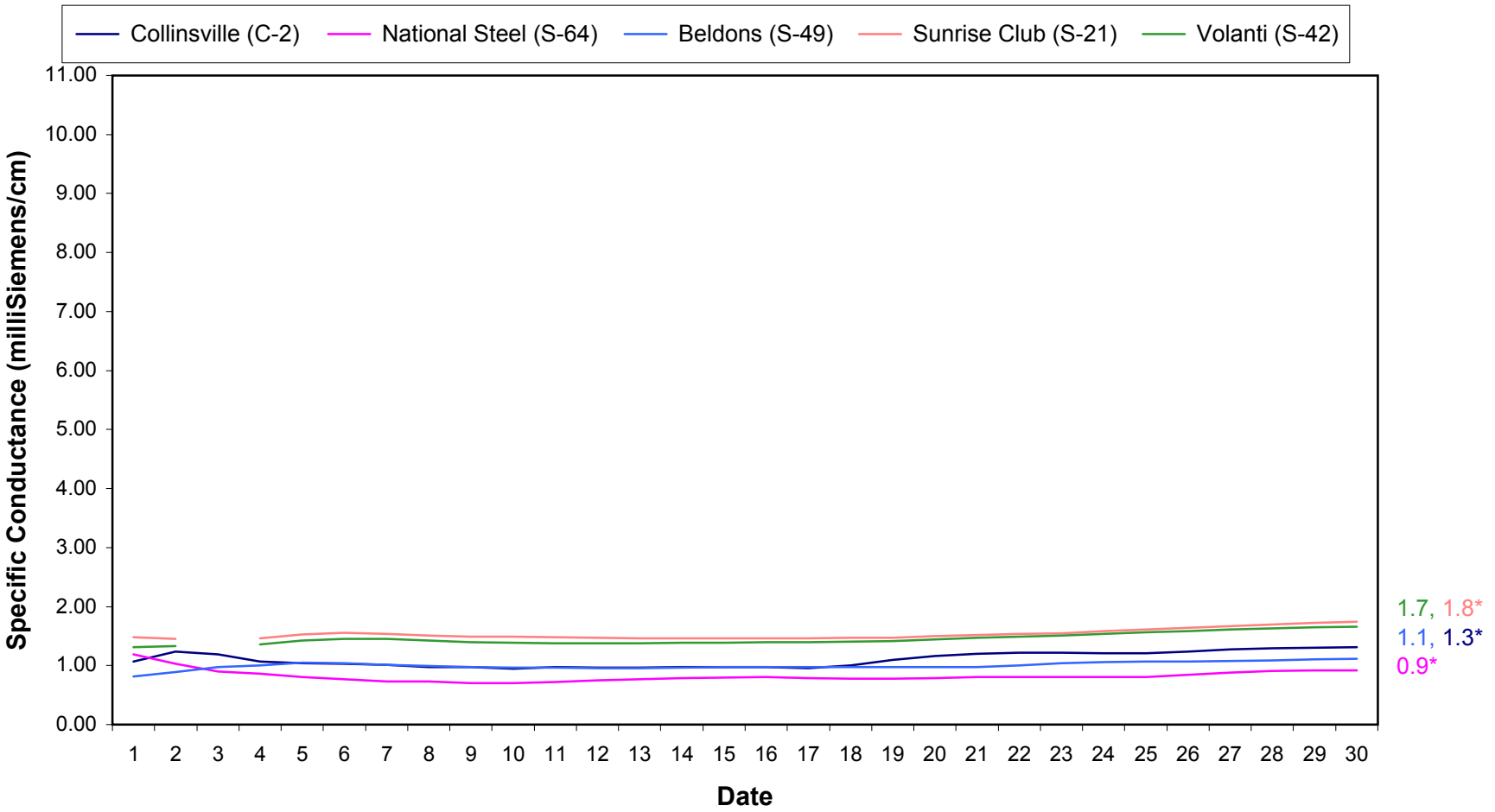


* = monthly mean specific electrical conductance at high tide in milliSiemens/cm.

* * = stage data did not pass QA/QC

Figure 4. Suisun Marsh Calendar Month Progressive Mean of the Specific Conductance at High Tide April 2001

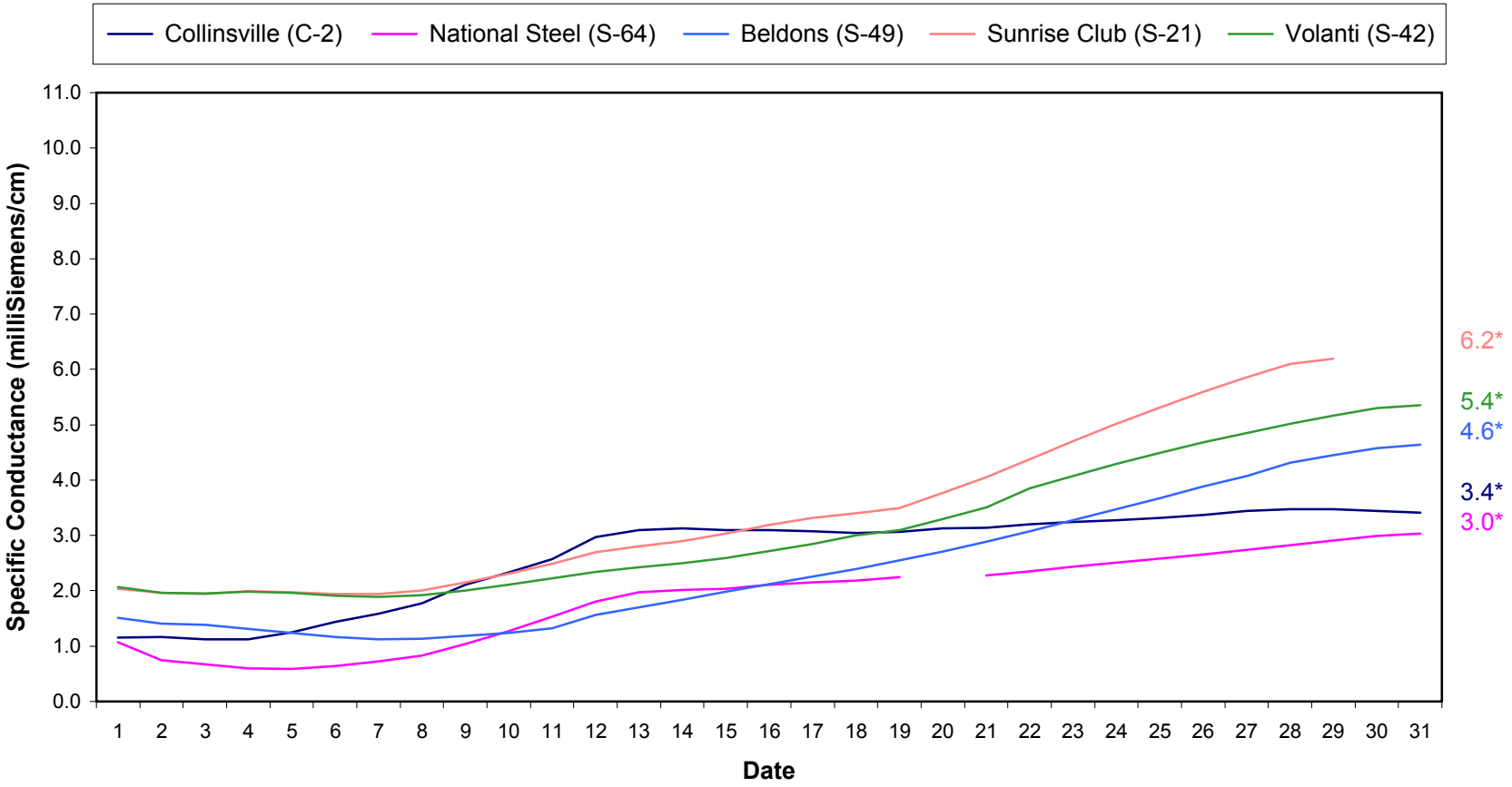
Standard = 11.0 mS/cm



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

Figure 5. Suisun Marsh Calendar Month Progressive Mean of the Specific Conductance at High Tide May 2001

Standard = 11.0 mS/cm



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

Figure 6. Daily Net Delta Outflow Index For January - May 2001

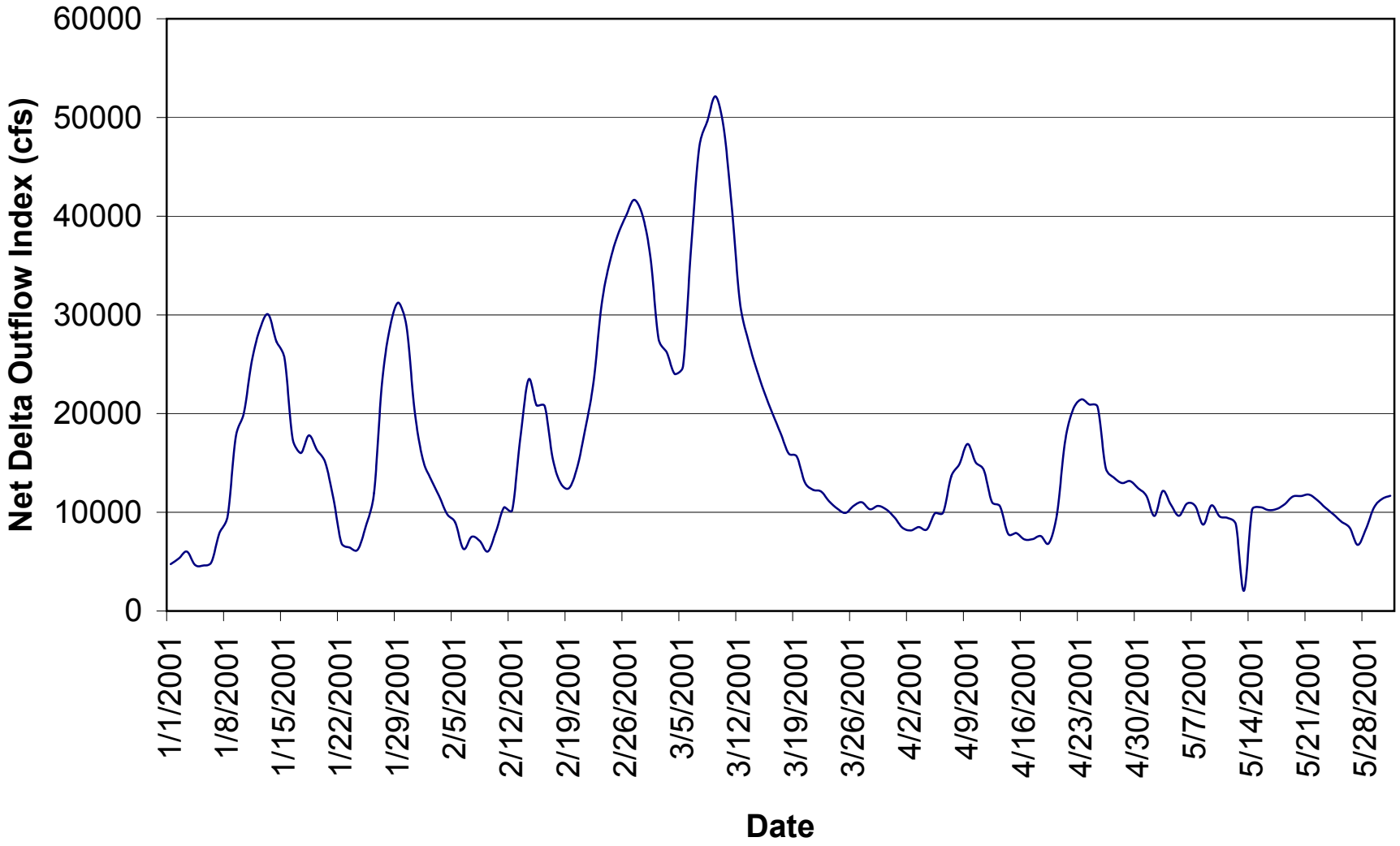
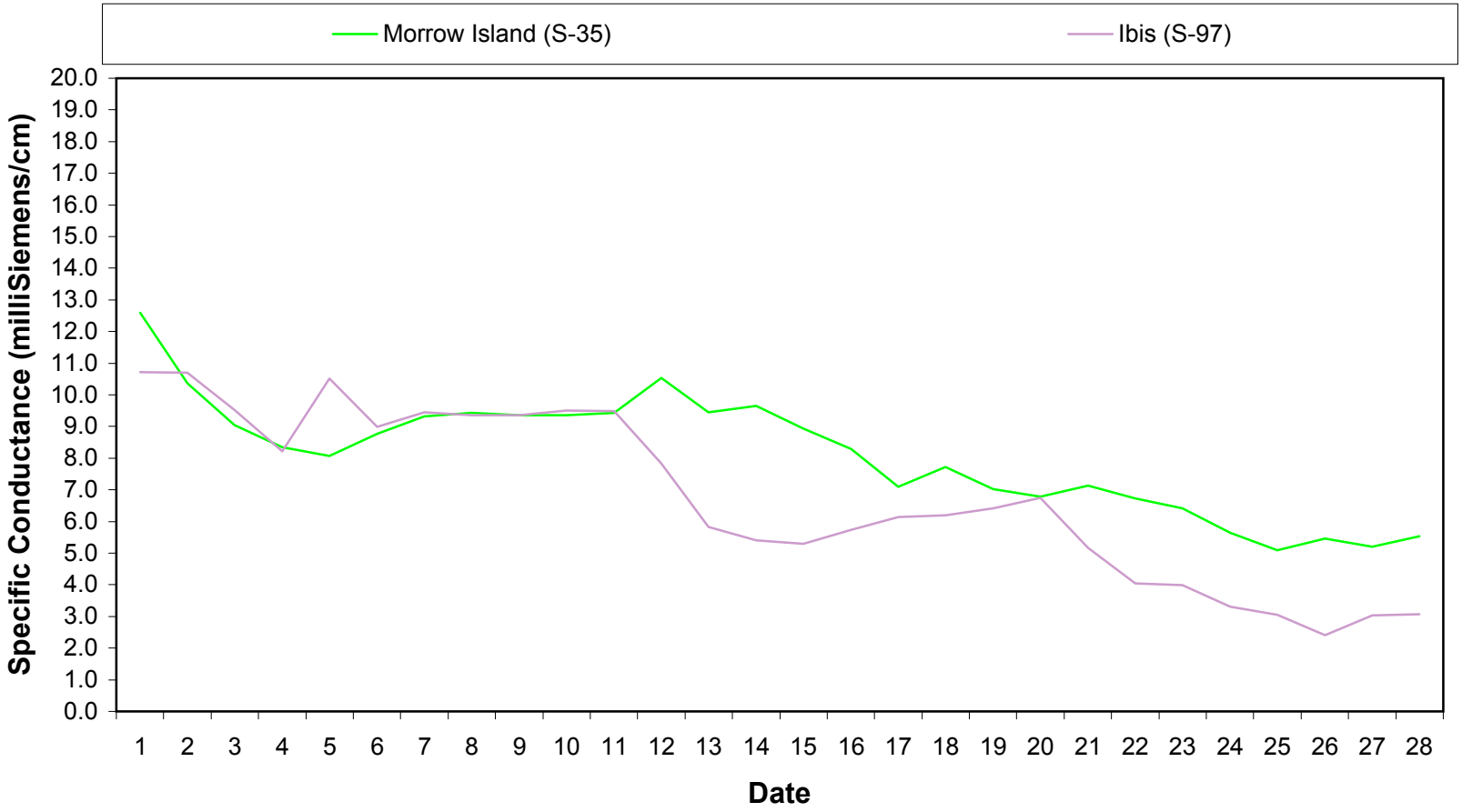


Figure 7. Suisun Marsh Mean Daily High Tide Specific Conductance at Monitoring Stations S-35, S-97 and Mallard Island January 2001

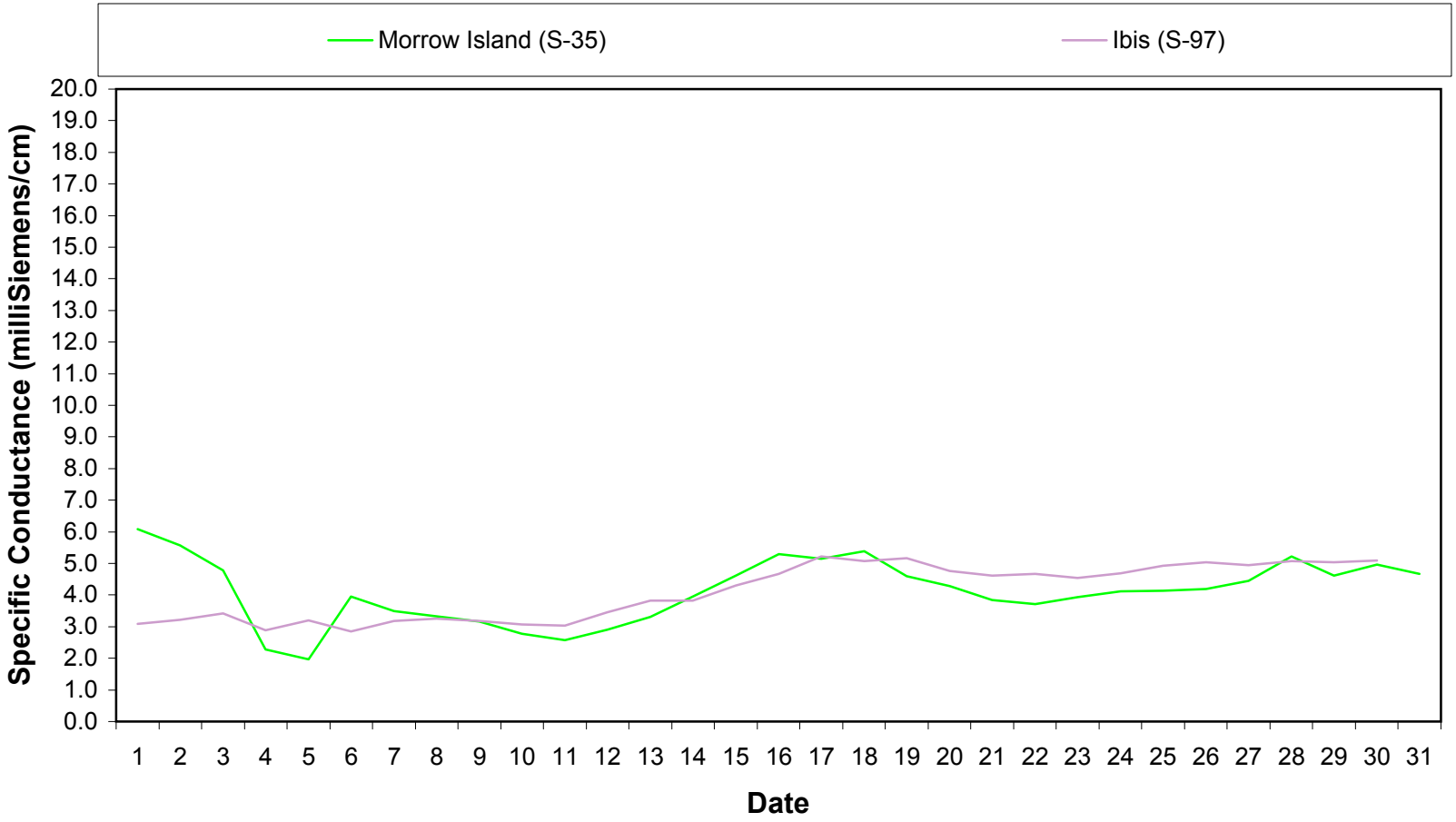
* = Mallard Island station data used to represent conditions at Chipps and VanSickle Islands.

Figure 8. Suisun Marsh Mean Daily High Tide Specific Conductance at Monitoring Stations S-35, S-97 and Mallard Island February 2001



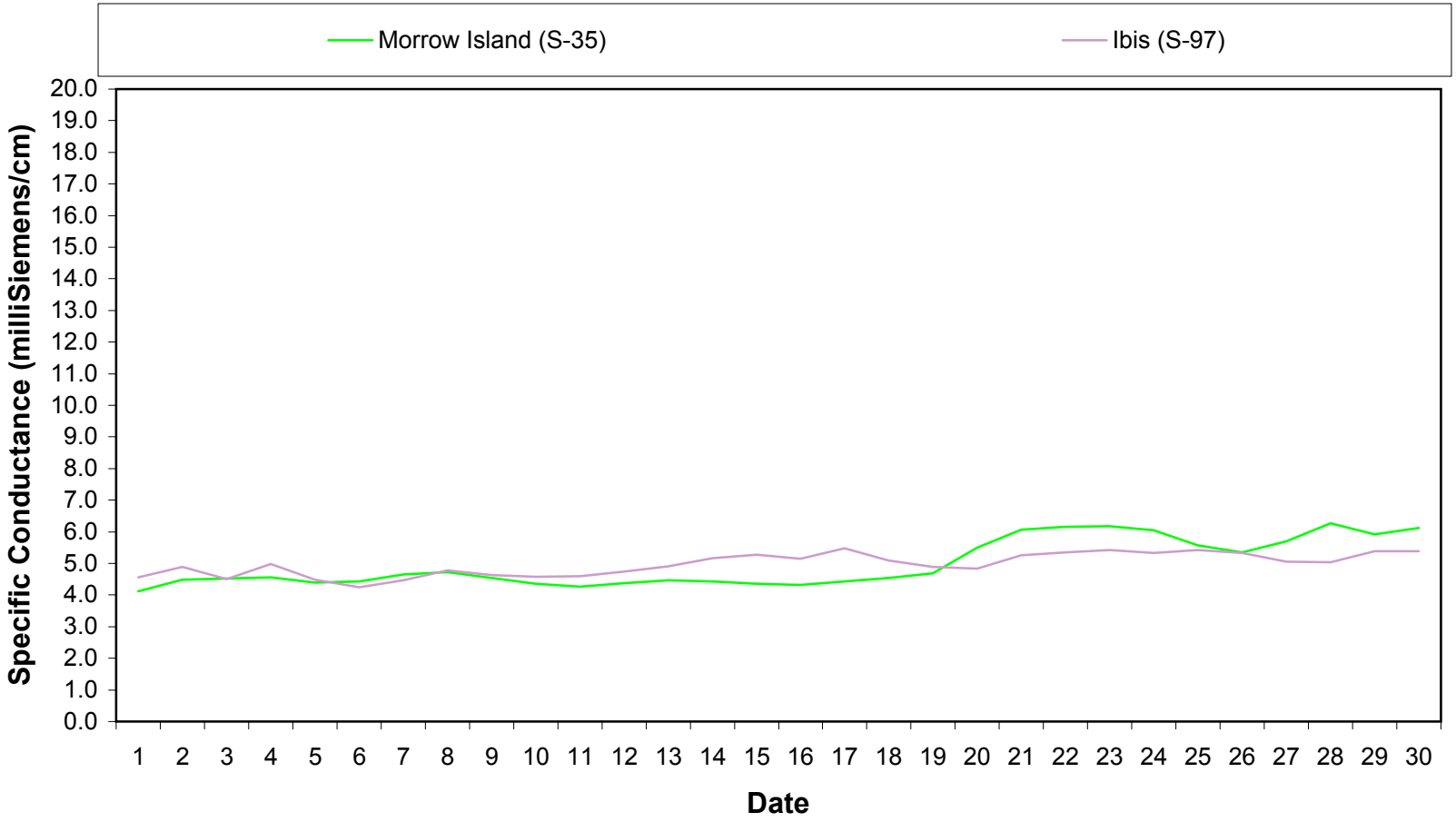
* = Mallard Island station data used to represent conditions at Chipps and VanSickle Islands.

Figure 9. Suisun Marsh Daily Mean High Tide Specific Conductance at Monitoring Stations S-35, S-97 and Chipps & Van Sickle Islands March 2001



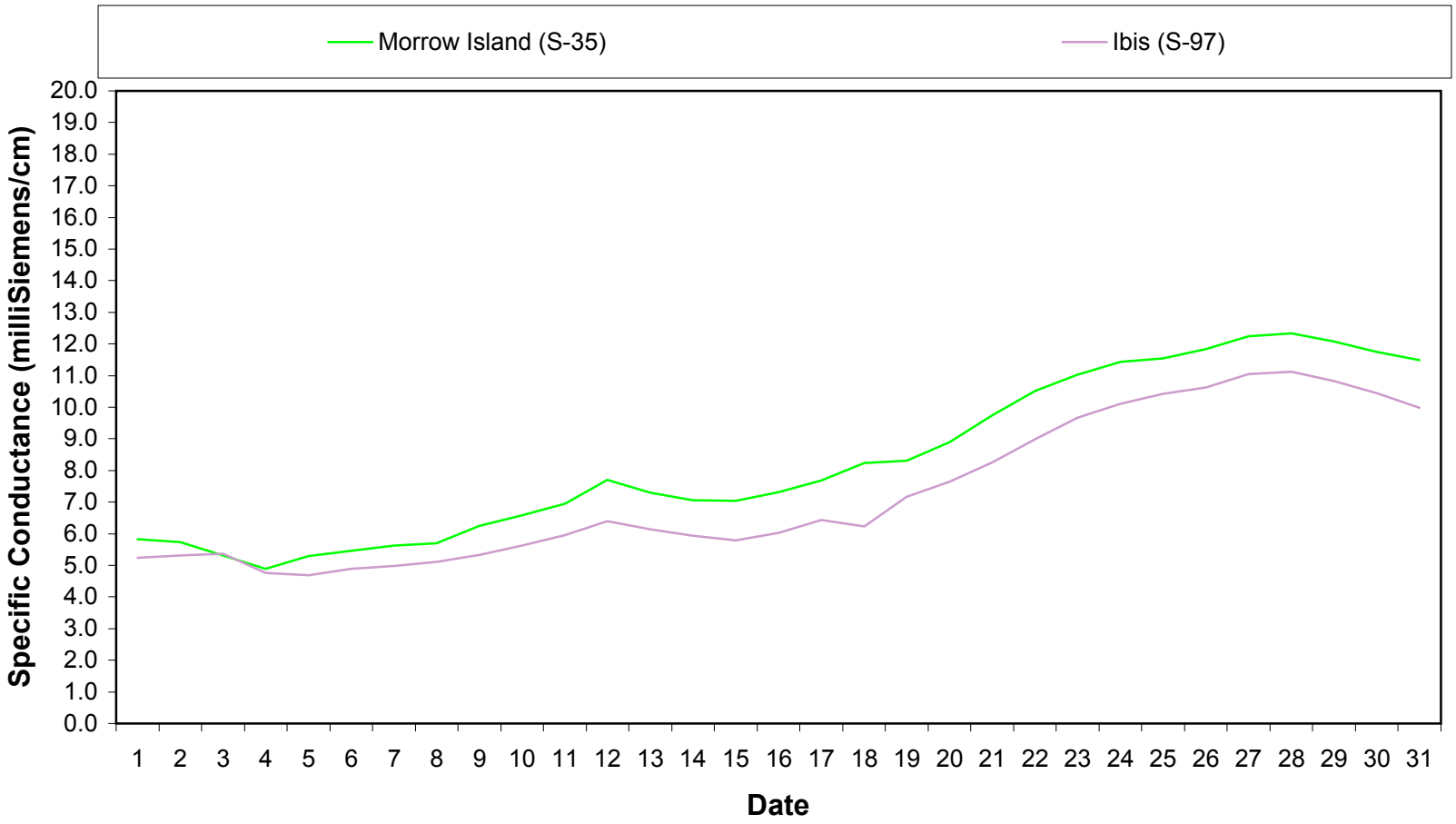
* = Mallard Island station data used to represent conditions at Chipps and VanSickle Islands.

Figure 10. Suisun Marsh Daily Mean High Tide Specific Conductance at Monitoring Stations S-35, S-97 and Mallard Island April 2001



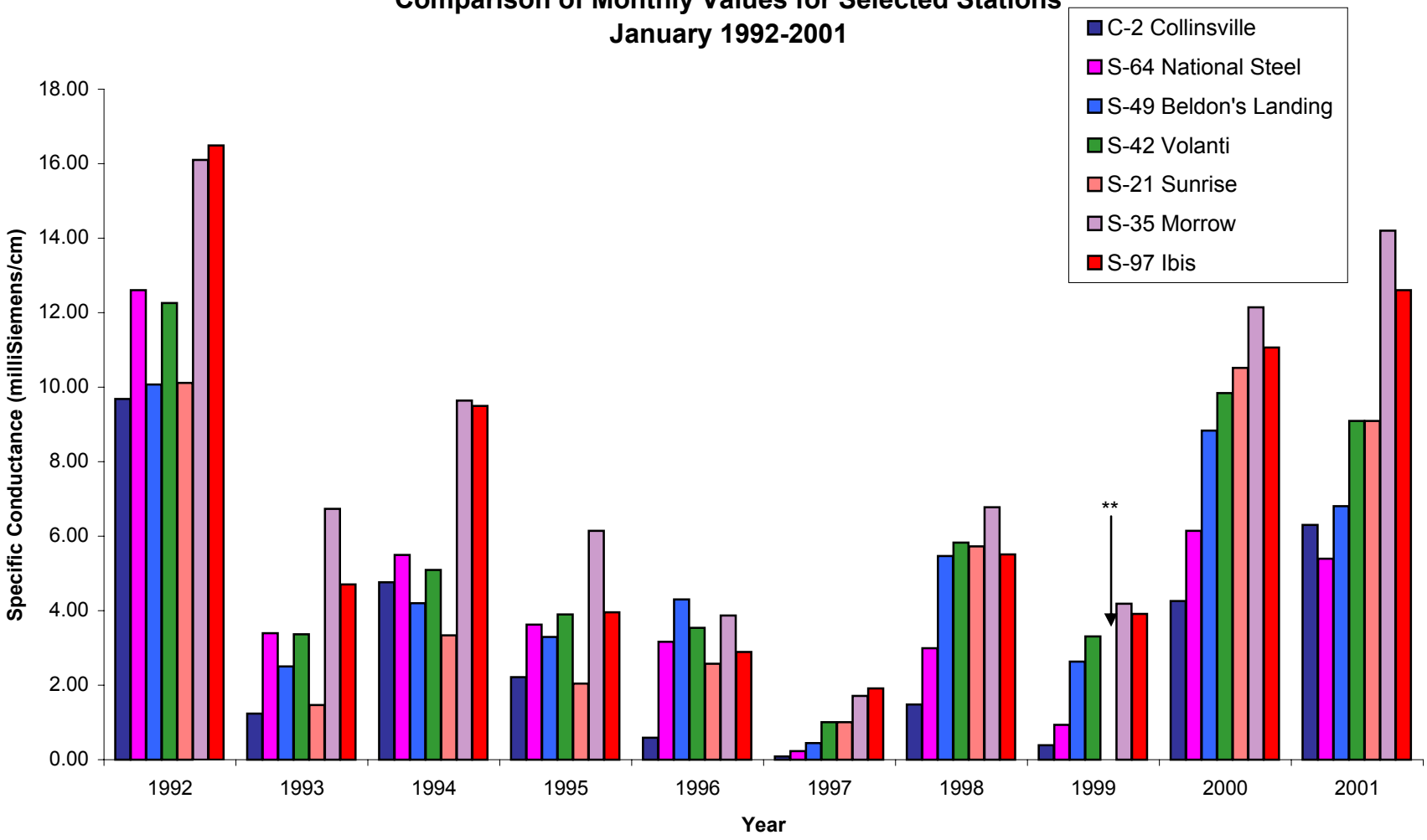
* = Mallard Island station data used to represent conditions at Chipps and VanSickle Islands.

Figure 11. Suisun Marsh Daily Mean High Tide Specific Conductance at Monitoring Stations S-35, S-97 and Mallard Island May 2001



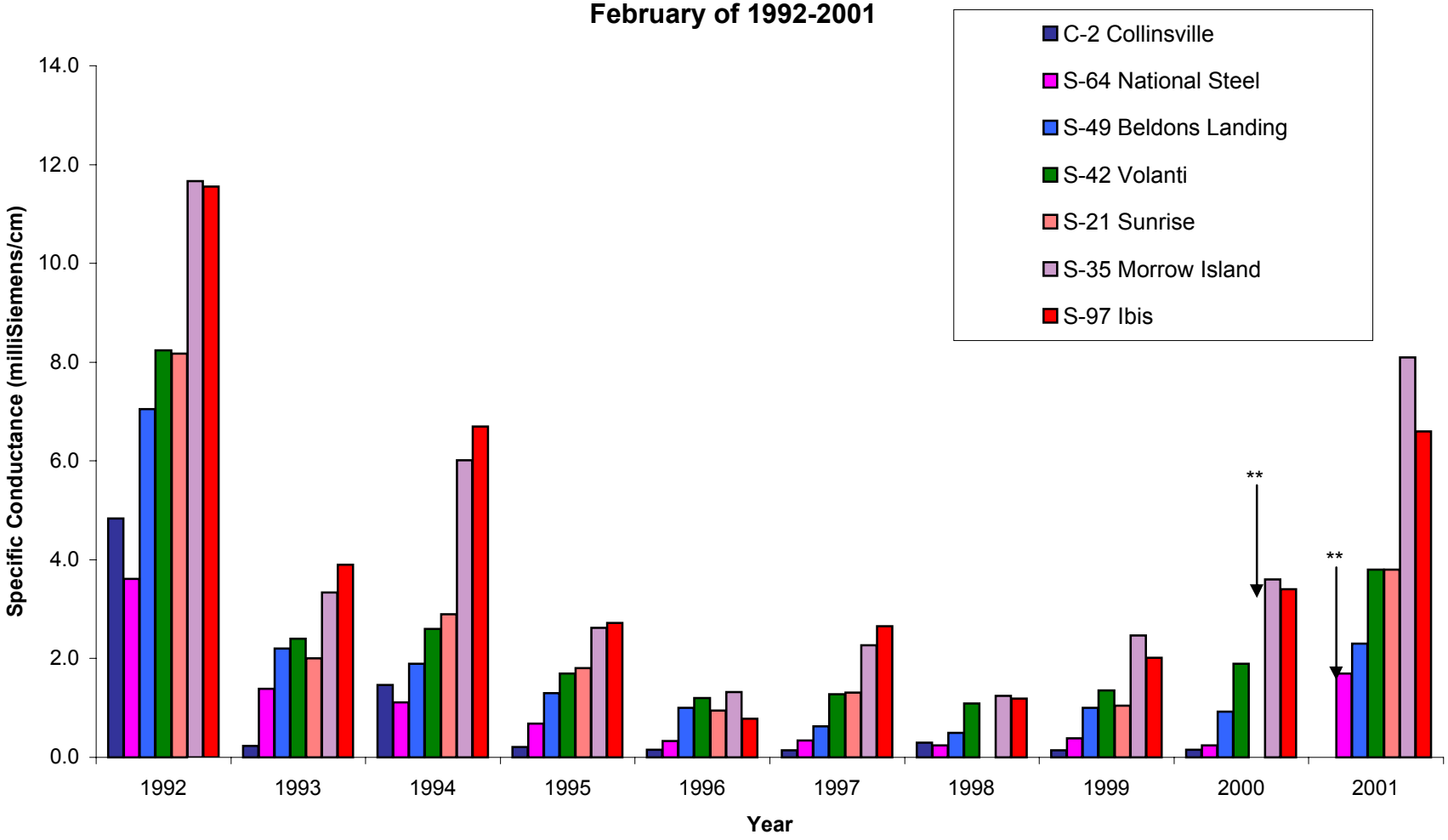
* = Mallard Island station data used to represent conditions at Chipps and VanSickle Islands.

Figure 12. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations January 1992-2001



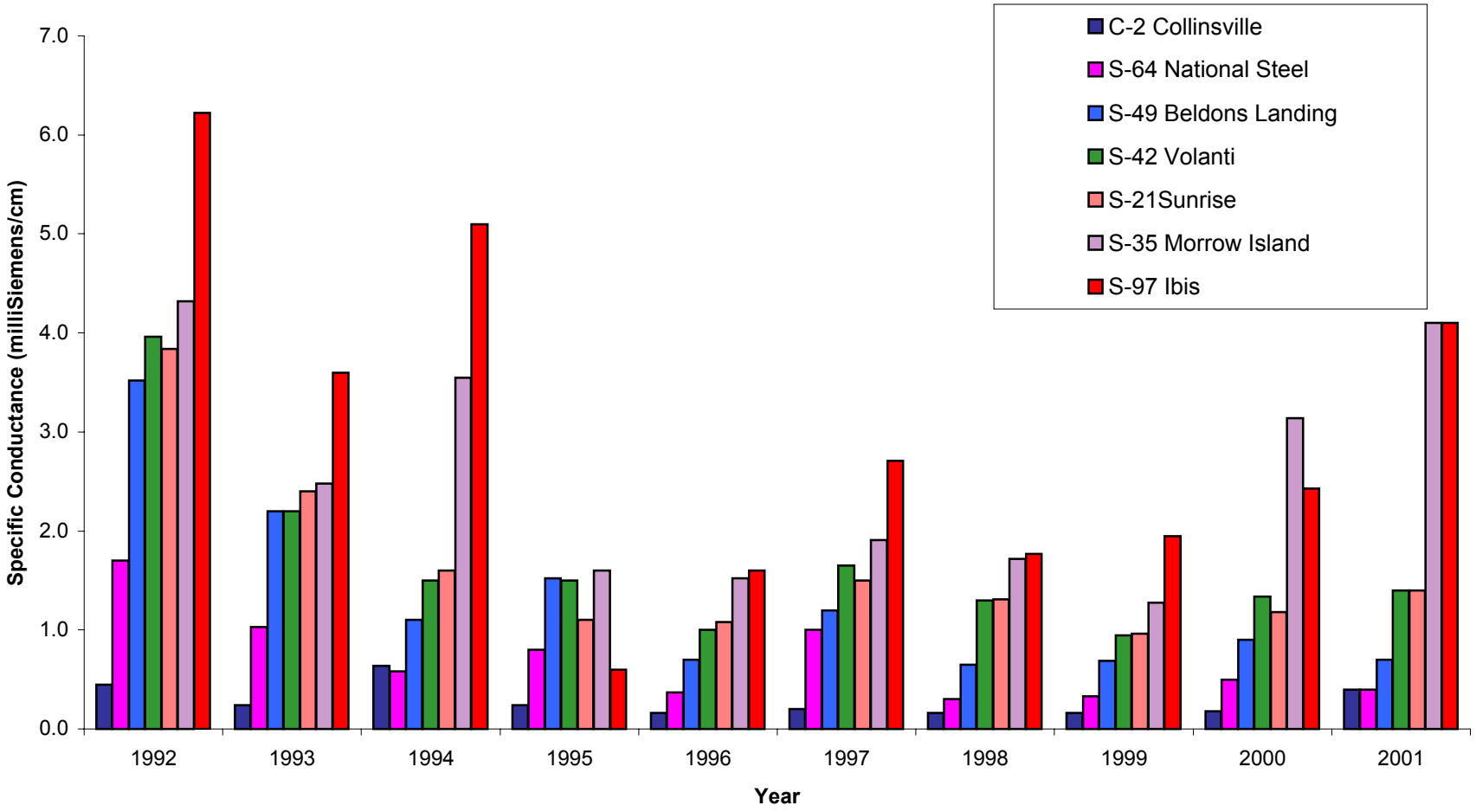
** = beginning in 2000.
*** = data not available.

Figure 13. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations February of 1992-2001



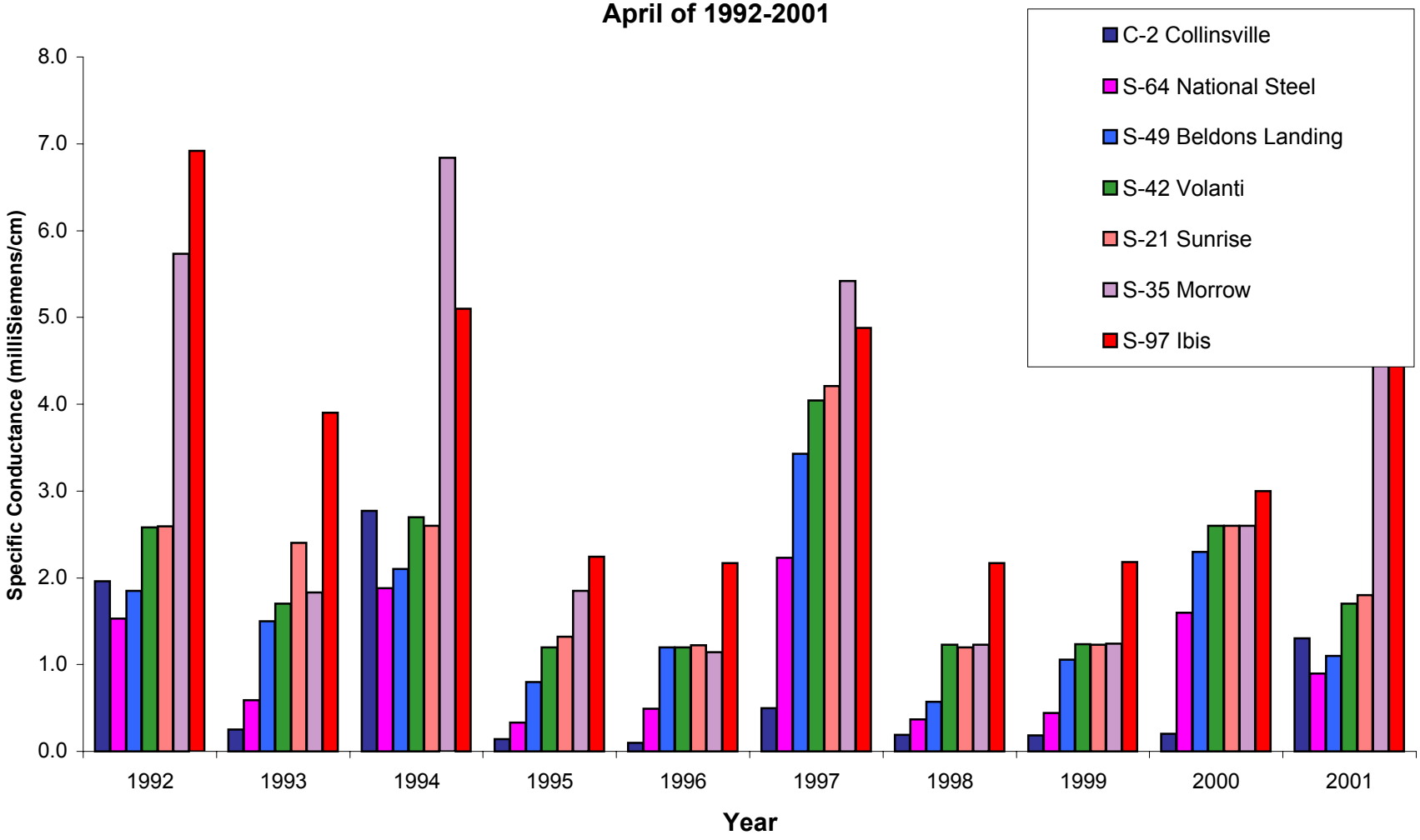
** = beginning in 2000.
*** = data not available.

Figure 14. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations March of 1992-2001



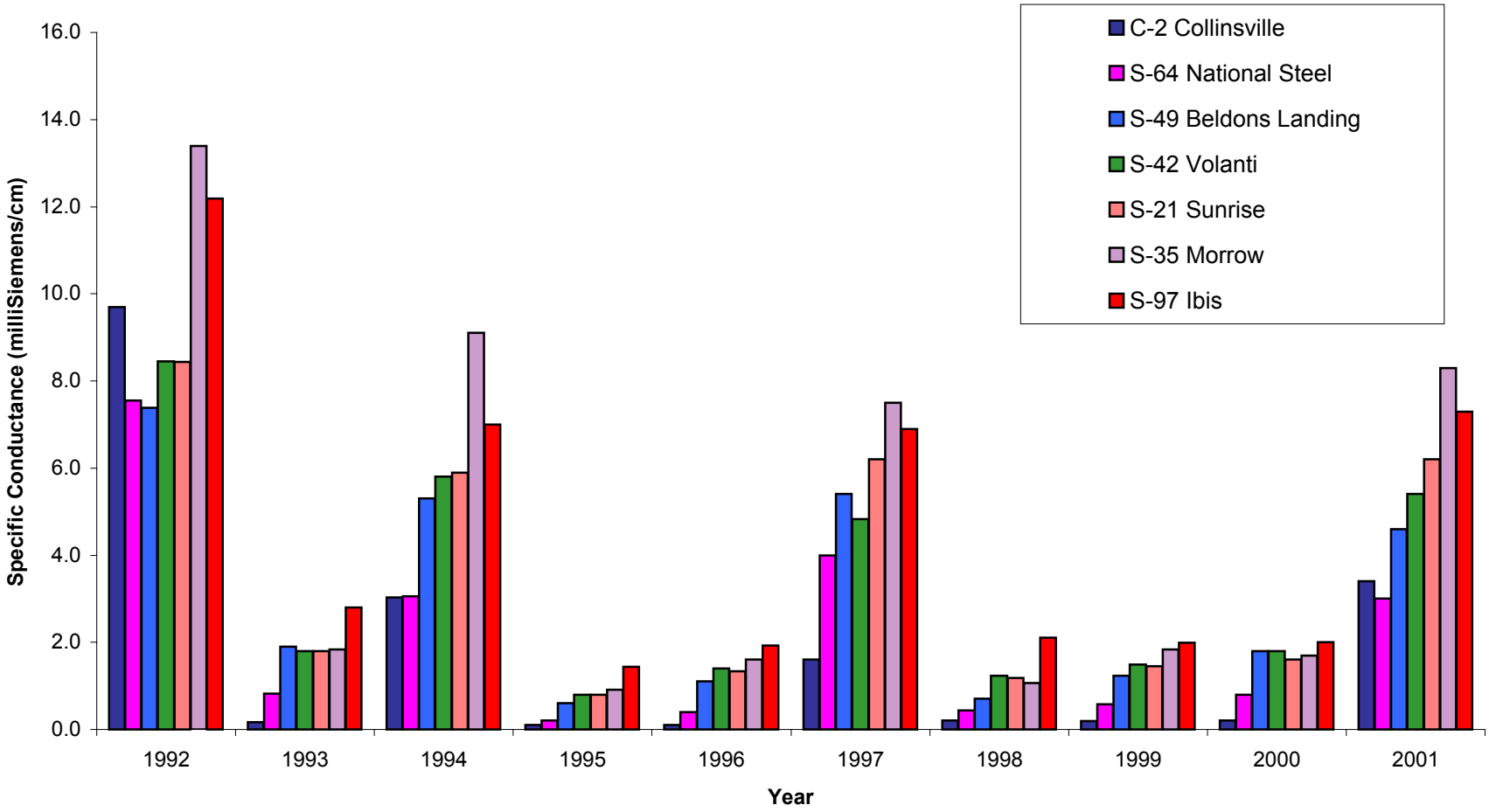
** = beginning in 2000.

Figure 15. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations April of 1992-2001



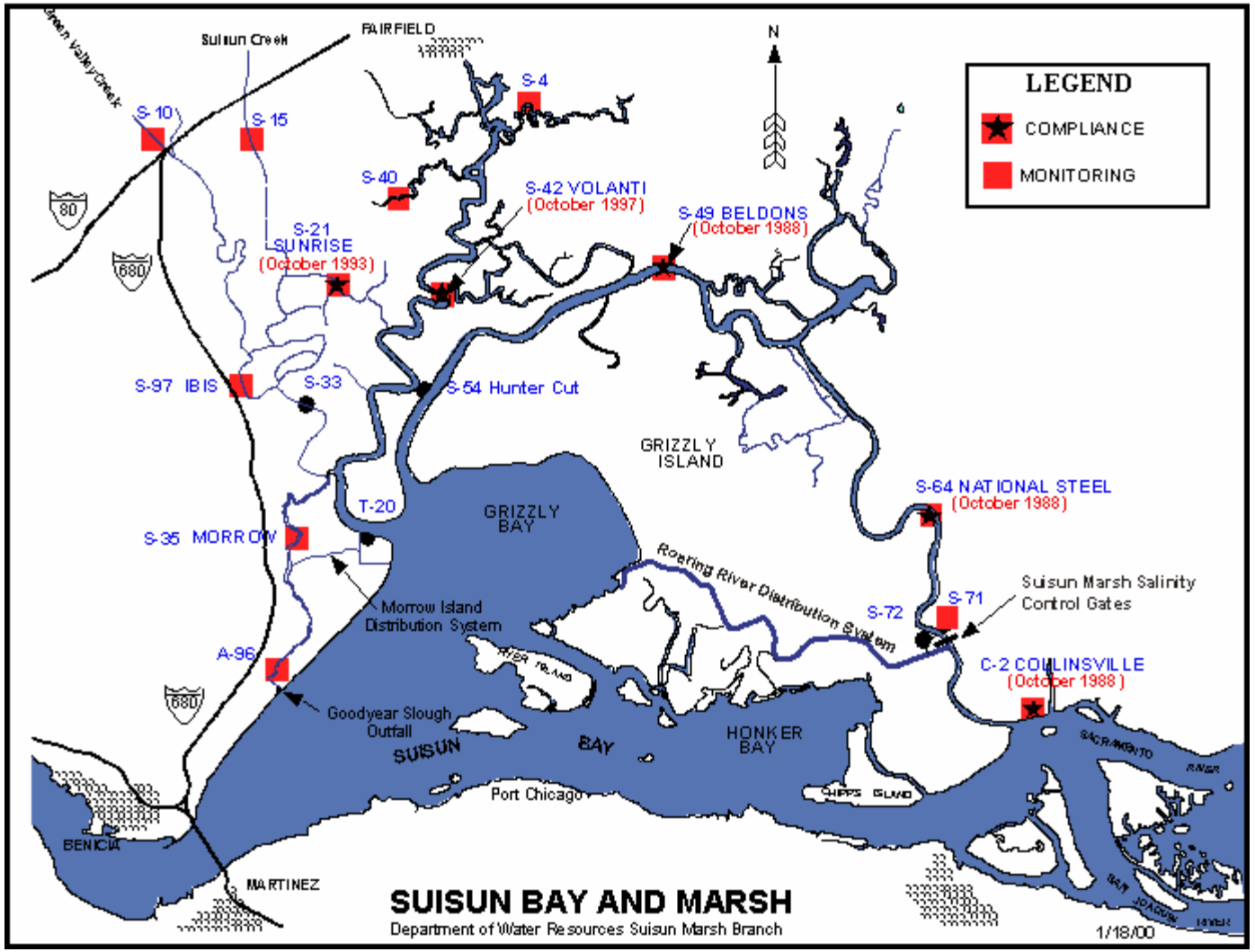
** = beginning in 2000.

Figure 16. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations May of 1992-2001



** Beginning in 2000.

Figure 17


LEGEND
COMPLIANCE
MONITORING
N
FAIRFIELD
Suisun Creek
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
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