
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: November 2002

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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 November 2002 (Table 1). Compliance with channel water salinity standards was determined for each compliance station by comparing November mean high-tide specific conductance (SC) with their respective standards. The standard for the **eastern** compliance stations(i.e. C-2, S-64, S-49) was **15.5** millisiemens per centimeter (mS/cm) and the **western** compliance stations(i.e. S-42, S-21) was **16.5** mS/cm during November 2002. 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.

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

Delta Outflow

Low Delta outflow occurred in November 2002 (Figure 3). The monthly mean Net Delta Outflow Index (NDOI) for November is listed below:

Month	Mean NDOI (cubic feet per second)
November	7,486

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 November 2002 is listed below:

Month	Total Rainfall (inches)
November	3.79

Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during November 2002 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
November 1 – 6	Operating	Installed	Open
November 7 – 30	Operating	Installed	Closed

During the first week of November 2002, the Fall 2002 fish passage study was in the last phase with gates operating full-bore and boat lock open. Thereafter, gate operations resumed normal to control salinity in the marsh.

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 ranged between 8 mS/cm and 13 mS/cm at the start of November (Figure 1). However, the two monitoring stations recorded salinity level between 17.0 mS/cm and 19.0 mS/cm (Figure 2). Even though Delta outflow continued to be low during November and prior month, all compliance and monitoring stations salinity levels were below November standard of 15.5 mS/cm for the eastern marsh and 16.5 mS/cm for the western marsh; therefore all stations were in compliant.

Channel water salinity conditions in the Marsh were mainly driven by SMSCG operations and precipitation during November 2002. Salinity levels at the early half of November were stable at all compliance stations, except S-64 which had a non-threatening steady rise during the first 10 days of the month (Figure 1) in salinity due to boat lock being in an open mode. It appears that salinity level at S-64 increased about 1 mS/cm per week with boat lock gates being in an open mode. However, with the initial onset of precipitation on November 7 and subsequent on and off rainfall lasting until November 13, 2002, salinity levels at all compliance and monitoring stations in the marsh decreased and remained low thereafter for the remaining month. The drop in salinity levels is more apparent at the compliance stations than the two monitoring stations (Figures 1 and 2).

Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for November 2002 were compared with means for those months during the previous nine years (Figure 4).

Means at all compliance and monitoring stations for November 2002 were similar to that of November 1997, and end of month salinity levels at all compliance stations were lower than previous 3 years conditions (i.e. 1999 – 2001). S-35 monitoring station monthly means appears to be at similar levels to that of 1994, 1996, 1997, 1999, 2000, and 2001.

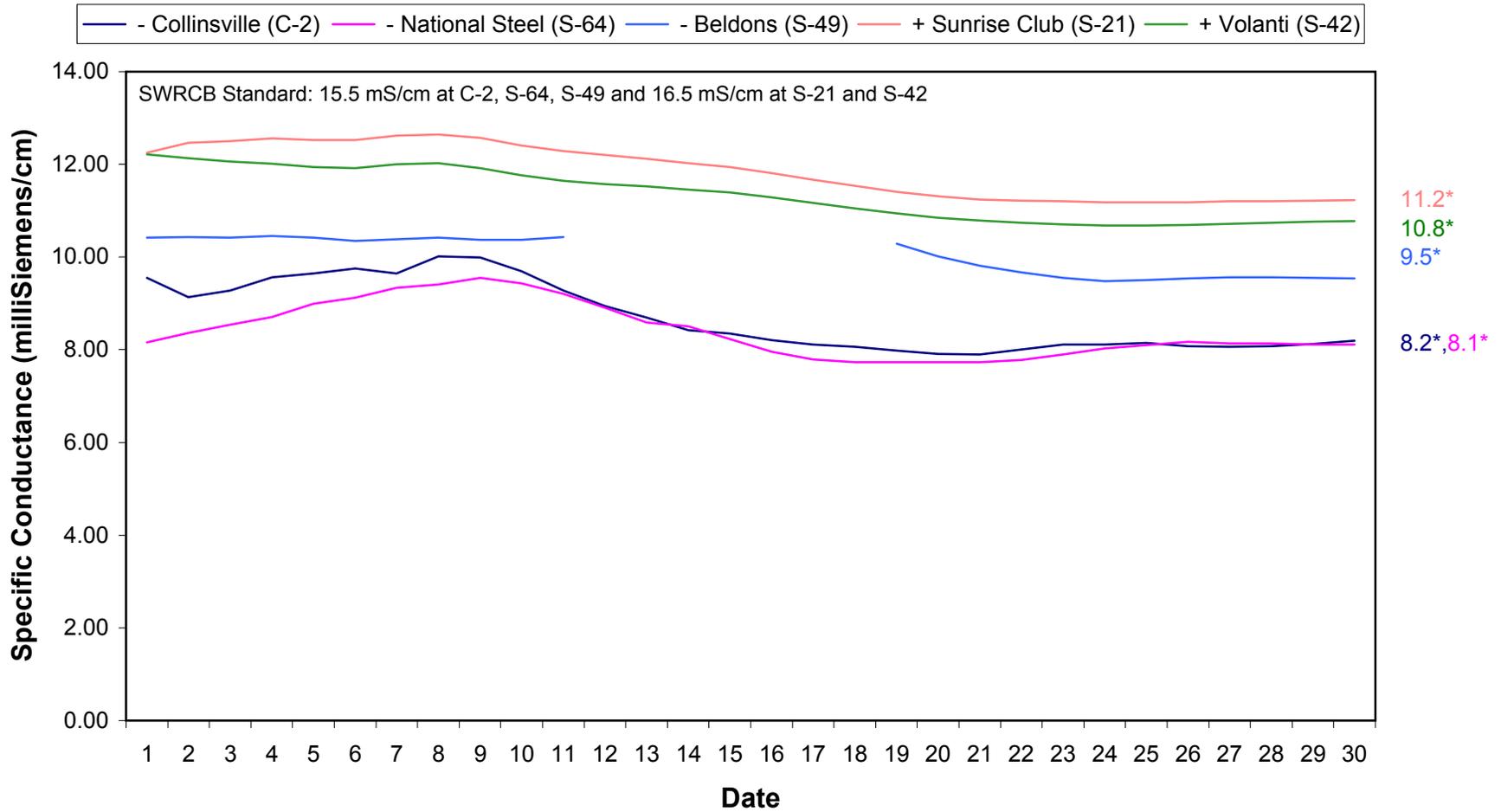
Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****November 2002**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	8.2	15.5	Yes
S-64	8.1	15.5	Yes
S-49	9.5	15.5	Yes
S-42	10.8	16.5	Yes
S-21	11.2	16.5	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 November 2002



**Figure 2. Suisun Marsh Daily Mean High-Tide Specific Conductance
at Stations S-35 and S-97
November 2002**

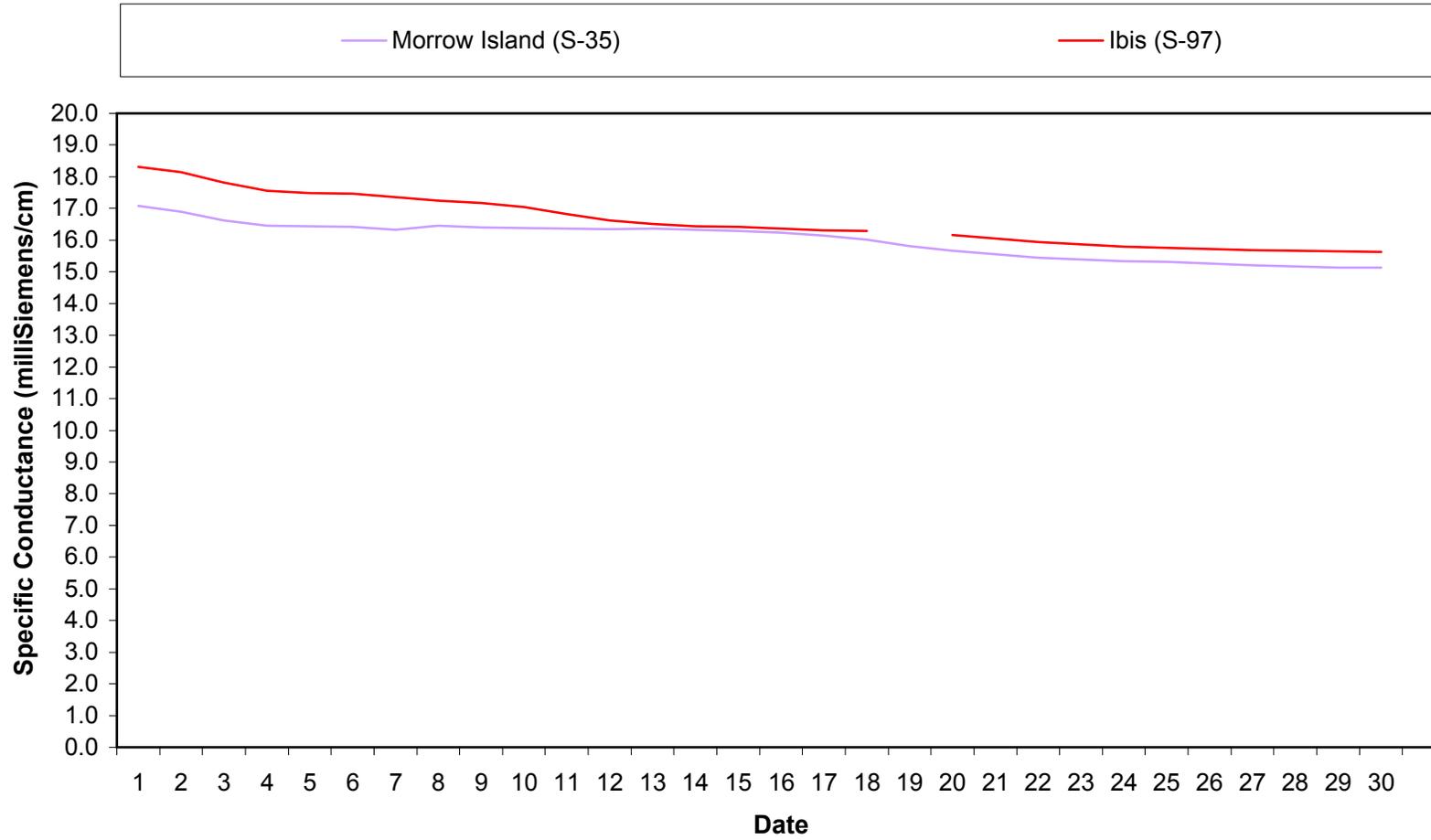
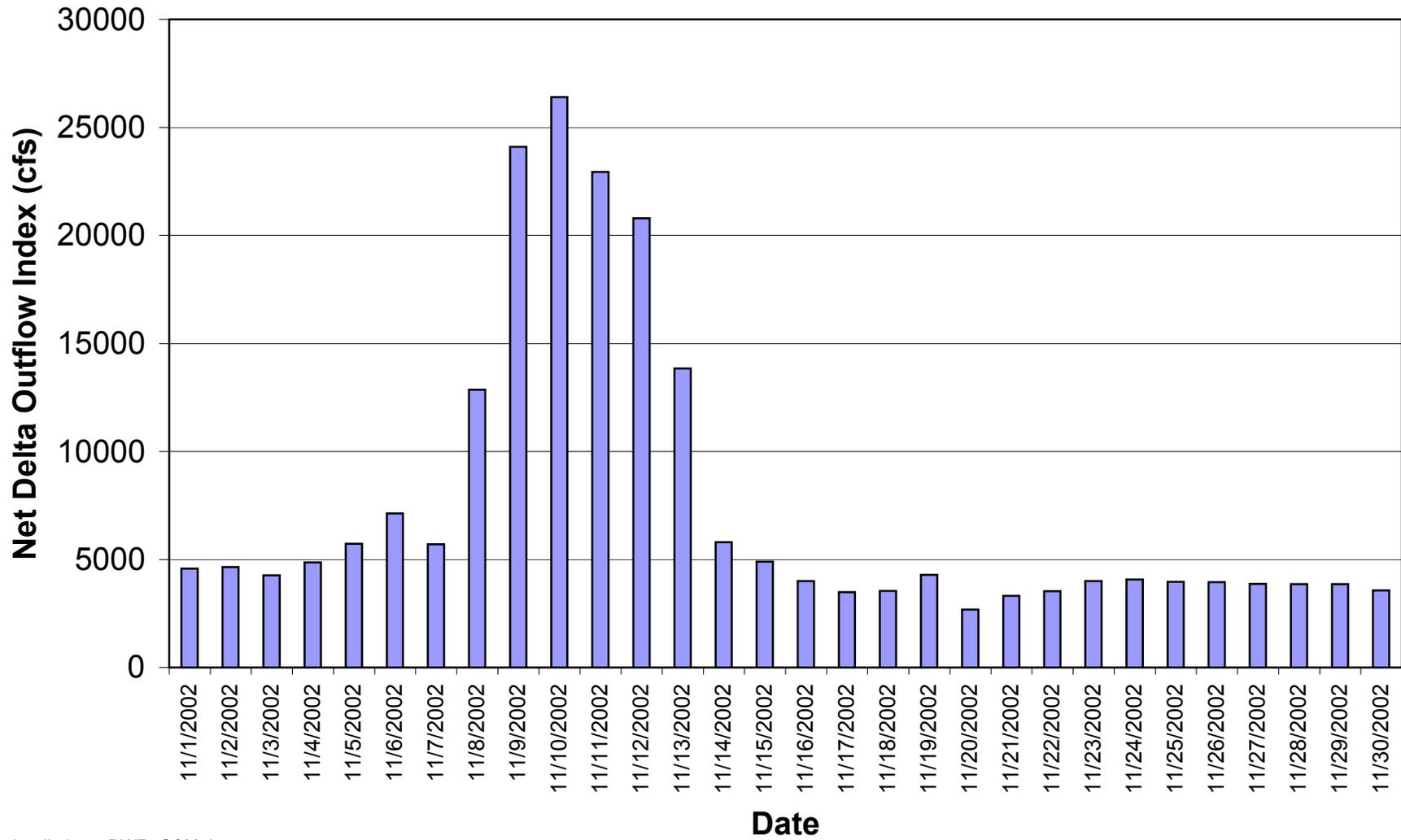
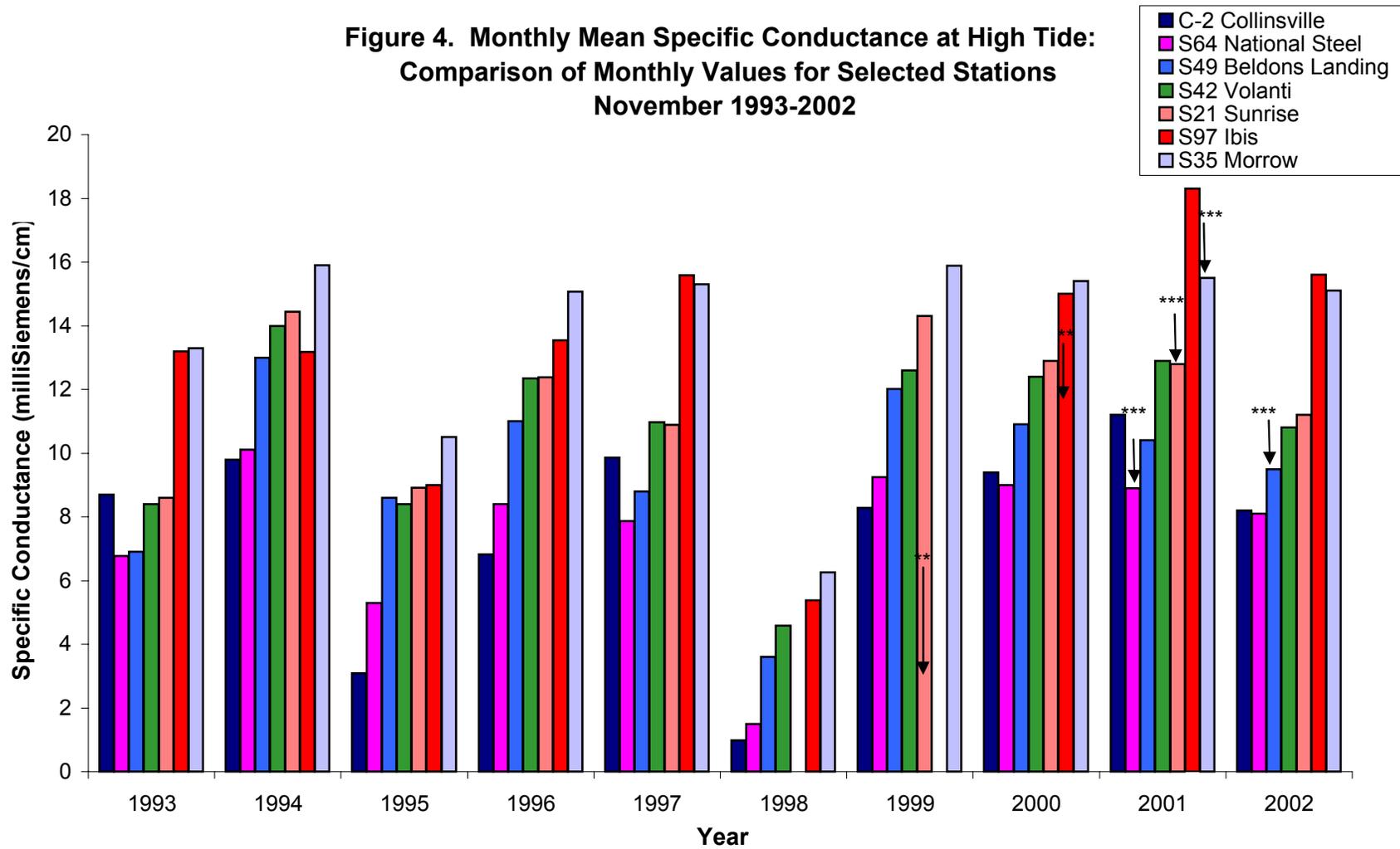


Figure 3. Daily Net Delta Outflow Index For November 2002*



*preliminary DWR, O&M data

**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
November 1993-2002**



Note that certain stations do not reflect the actual end pdm.
 ** Data was not obtained due to powder problems at the station.
 *** Some data not obtained due to equipment malfunction.

Figure 5

