5-7-2003

Little Venice Water Quality Monitoring 2002 Annual Report

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7 May 2003

Fred McManus
US-EPA, Region IV
Wetlands Branch
61 Forsyth St.
Atlanta, GA 30303-8960

Re: Little Venice Water Quality Monitoring 2002 Annual Report

Dear Mr. McManus:

This letter serves to transmit the Little Venice Water Quality Monitoring 2002 Annual Report as per our EPA Agreement #X994621-94-0. This report consists of this letter along with corresponding table and figures.

Project Background

This report includes cumulative water quality and bacteriological data from 9 stations within the Little Venice subdivision collected during the period of record May 2001 – December 2002 (Fig. 1). Water was collected weekly for bacteriological analysis by SYNAGRO for enumeration of fecal coliform and enterococci (counts per 100 ml). Field parameters collected weekly at both the surface and bottom of the water column at each station include salinity (psu), temperature (°C), and dissolved oxygen (DO; mg l^{-1}). Water quality parameters monitored weekly at each station include total nitrogen (TN), total phosphorus (TP), and chlorophyll *a* (CHLA; µg l^{-1}). Monthly monitoring at each station included the dissolved nutrients nitrate+nitrite (NO_x), nitrite (NO_2), nitrate (NO_3), ammonium (NH_4), inorganic nitrogen (DIN), soluble reactive phosphate (SRP), and silicate ($Si(OH)_4$). Concentrations for all of these variables are reported in ppm unless noted otherwise. In addition, monthly deployment of ISCO autosamplers at rotating sites were programmed to collect 12 samples per day over a 2 day period. These samples were

analyzed for TN and TP. Hydrolab datasondes accompanied the autosamplers to measure and log temperature, salinity, DO, and pH on an hourly basis.

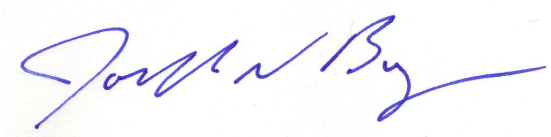
Results

Figures 2-10 show bacterial counts for the canal stations for the complete period of record. The FL state standard for single counts of fecal coliforms in bathing waters is 800 counts/100ml while the EPA recommended standard for enterococci is 104 counts/100ml. Fecal coliform counts exceeded the FL state standard 0 times while enterococci counts exceeded EPA recommended standards 48 times over the period of record. One of the most interesting aspects of the bacteriological data is the growing evidence of a seasonal cycle in enterococci numbers.

Figures 11-19 show time series of TN, TP, CHLA, salinity, and DO at all stations. The heads of the canals generally have the highest TN, TP and CHLA (Fig. 20) and lowest DO (Fig. 21). State of Florida Rule 62-302.530, for Class II marine waters specifies that DO "shall never be less than 4.0" mg l^{-1}. To date there have been 397 surface DO and 438 bottom DO values below the State standard. As to nutrient criteria, there is no standard for Florida marine waters. However, State of Florida Rule 62-02.300(13), F.A.C. states that "particular consideration shall be given to the protection from nutrient enrichment of those presently containing very low nutrient concentrations: less than 0.3 milligrams per liter total nitrogen or less than 0.04 milligrams per liter total phosphorus." Therefore, these benchmarks are included in the TN and TP graphs for illustrative purposes only.

If you have any questions about the content of this report, please do not hesitate to contact me at 305-348-4076, boyerj@fiu.edu or Ron Jones at 305-348-6472.

Sincerely,



Ronald Jones, Ph.D.
Director and Professor

Joseph N. Boyer, Ph.D.
Associate Scientist

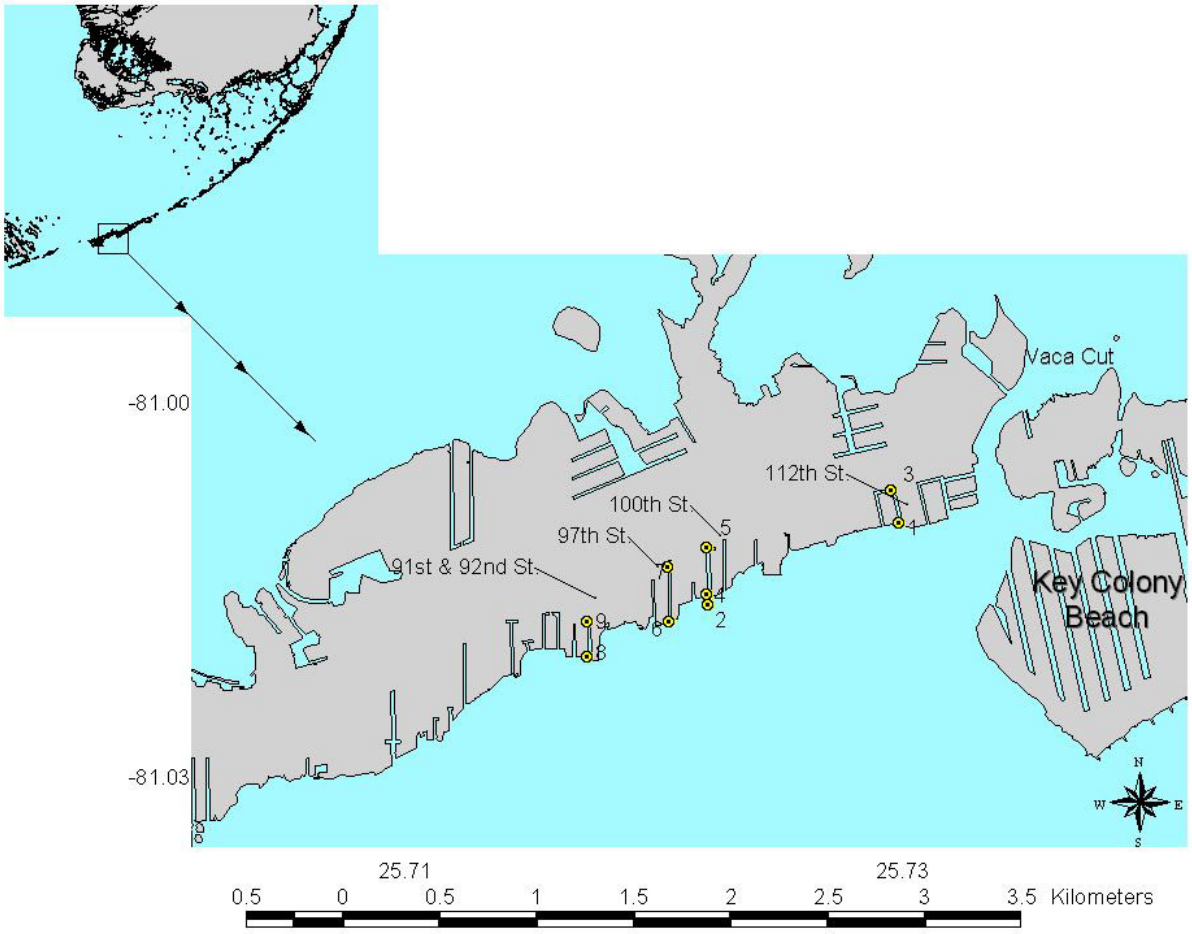

Vaca Cut
-81.00
-81.03
112th St
100th St
97th St
91st & 92nd St
Key Colony
Beach
N
W
E
S
25.71
25.73
0.5 0 0.5 1 1.5 2 2.5 3 3.5 Kilometers

Figure 1.

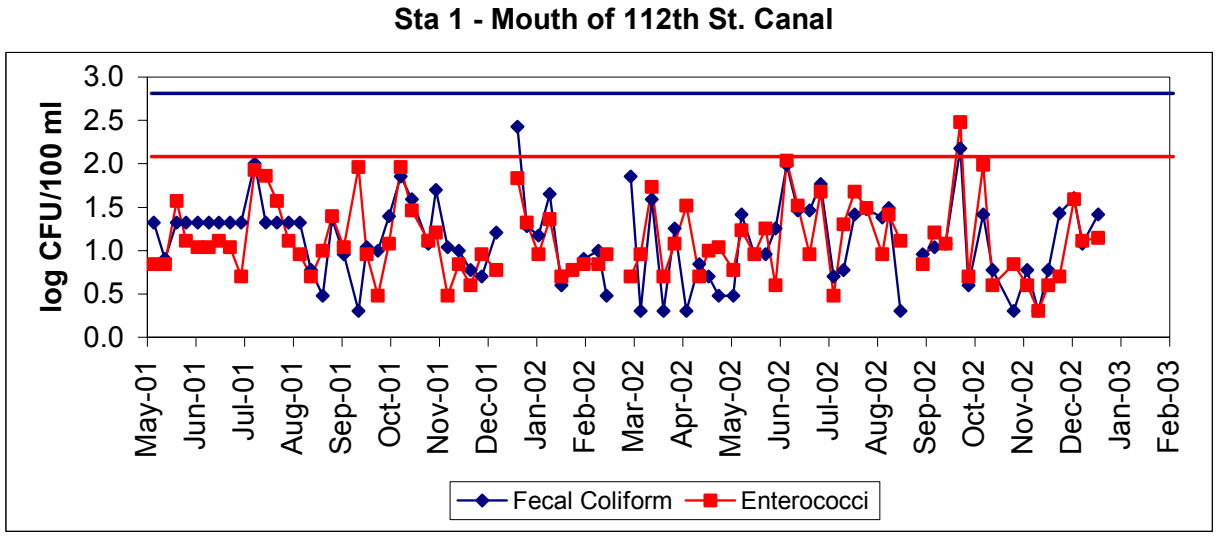


Figure 2

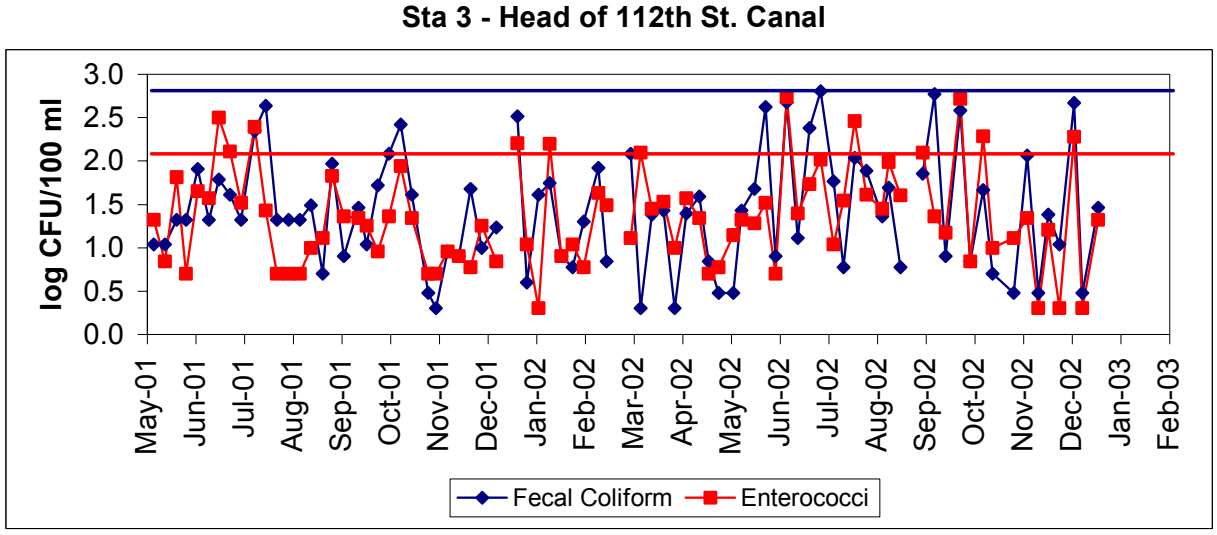


Figure 3

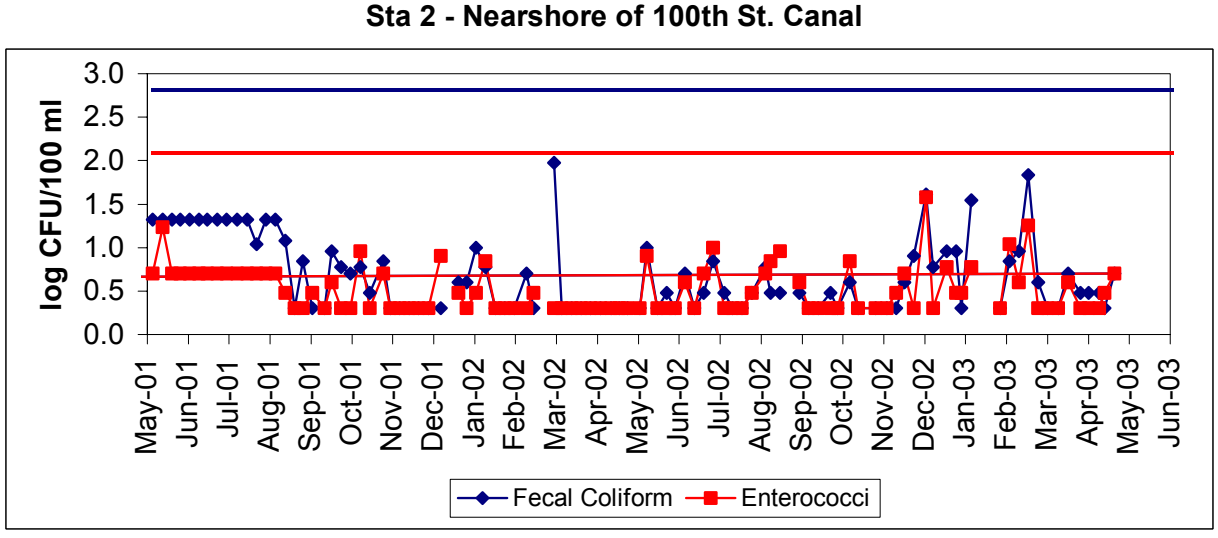


Figure 4

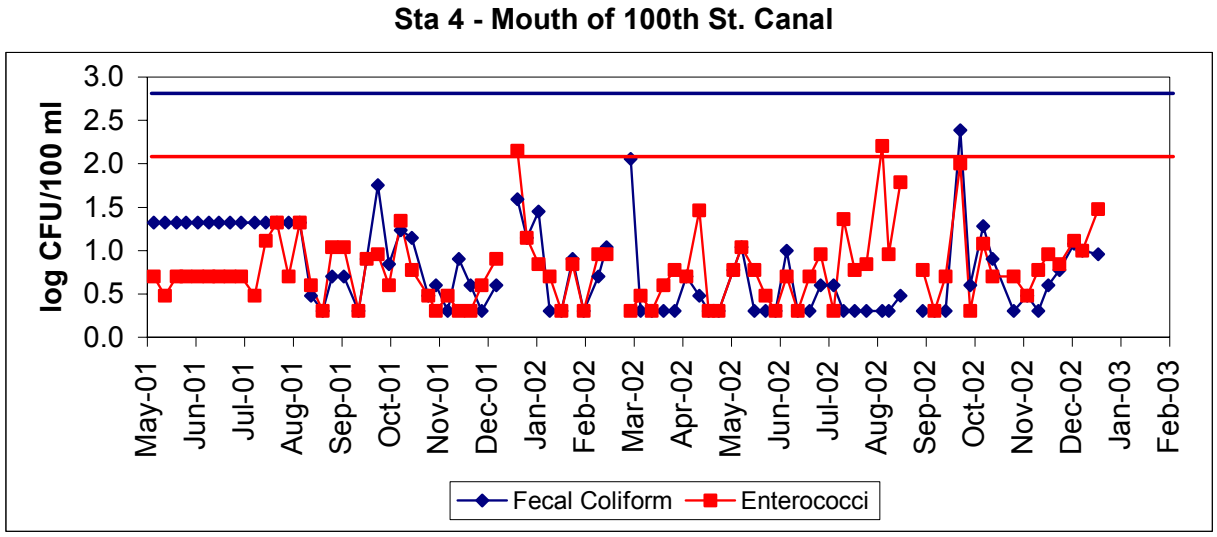


Figure 5

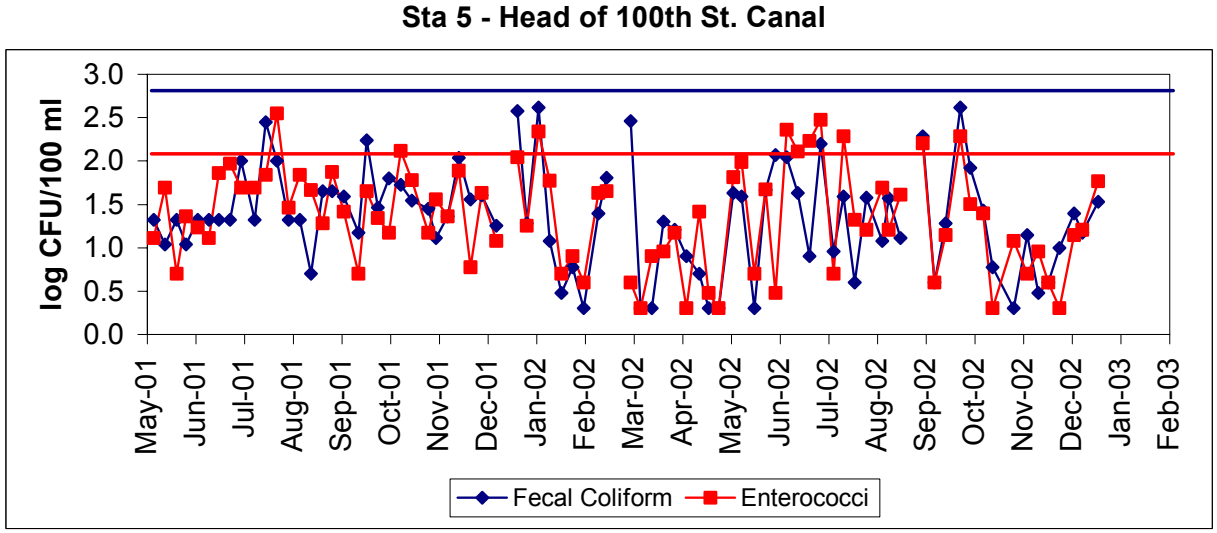


Figure 6

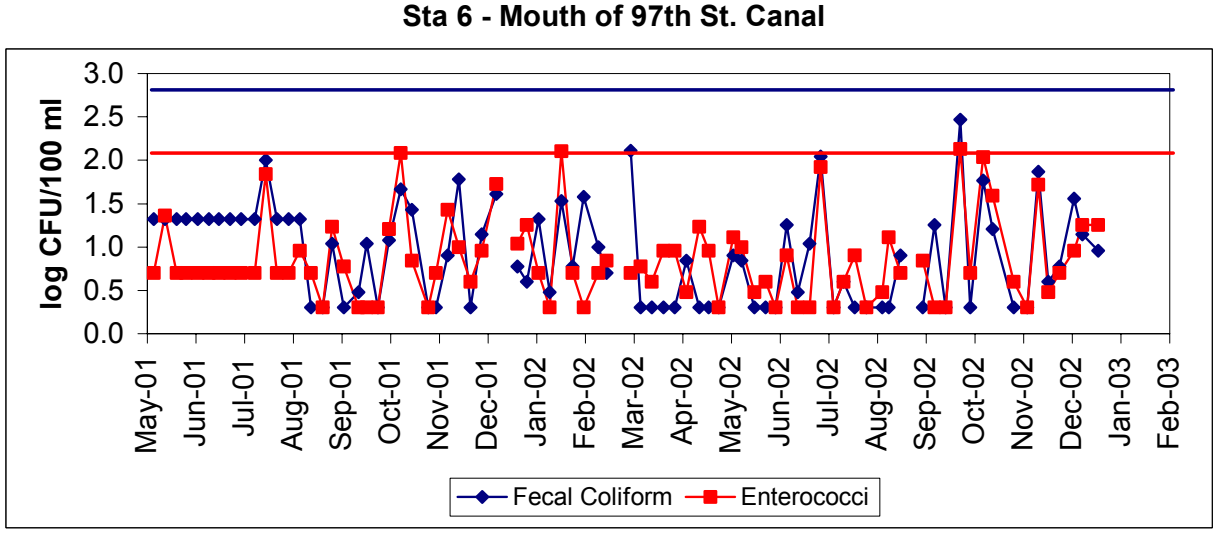


Figure 7

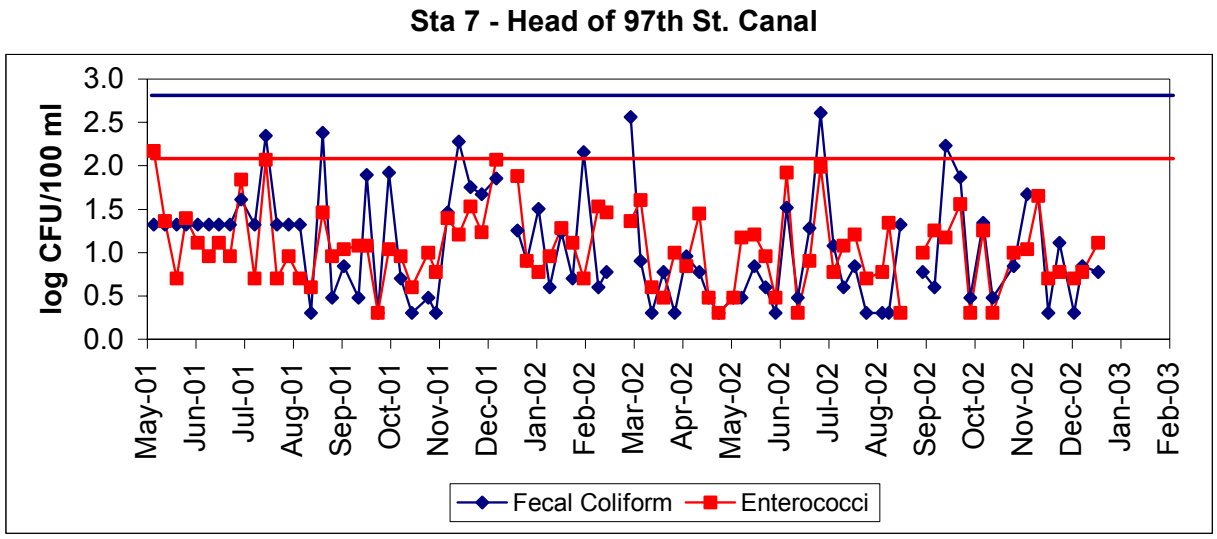


Figure 8

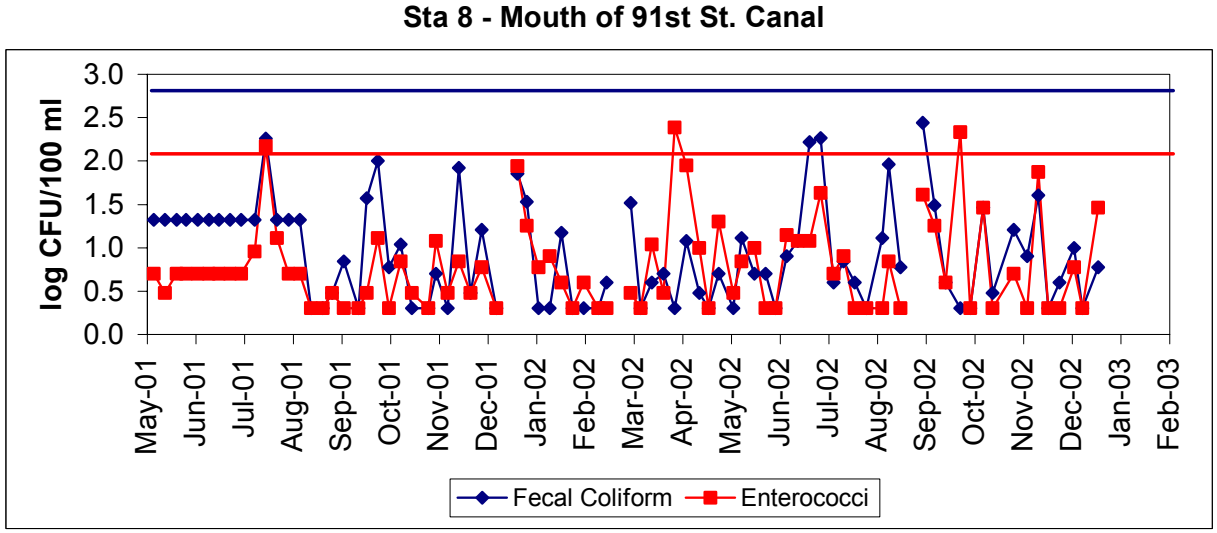


Figure 9

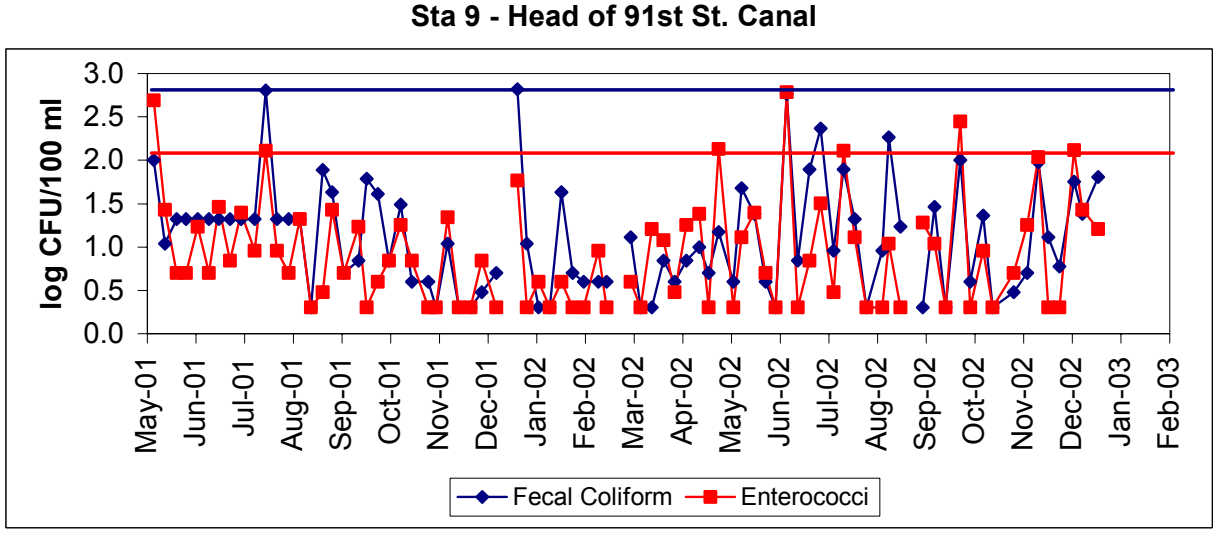


Figure 10

Sta. 1 - Mouth of the 112th Street Canal

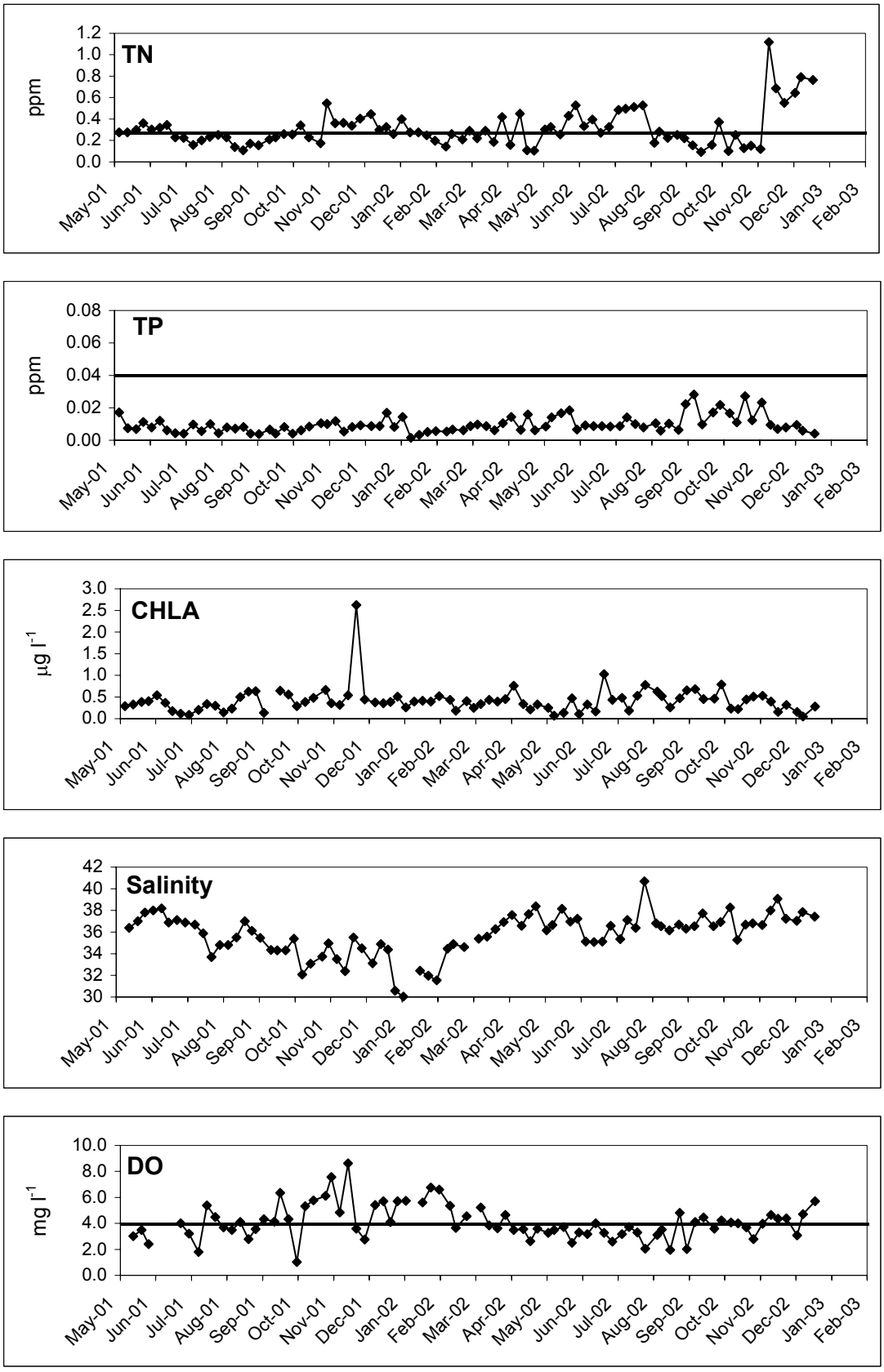


Figure 11

Sta. 3 - Head of the 112th Street Canal

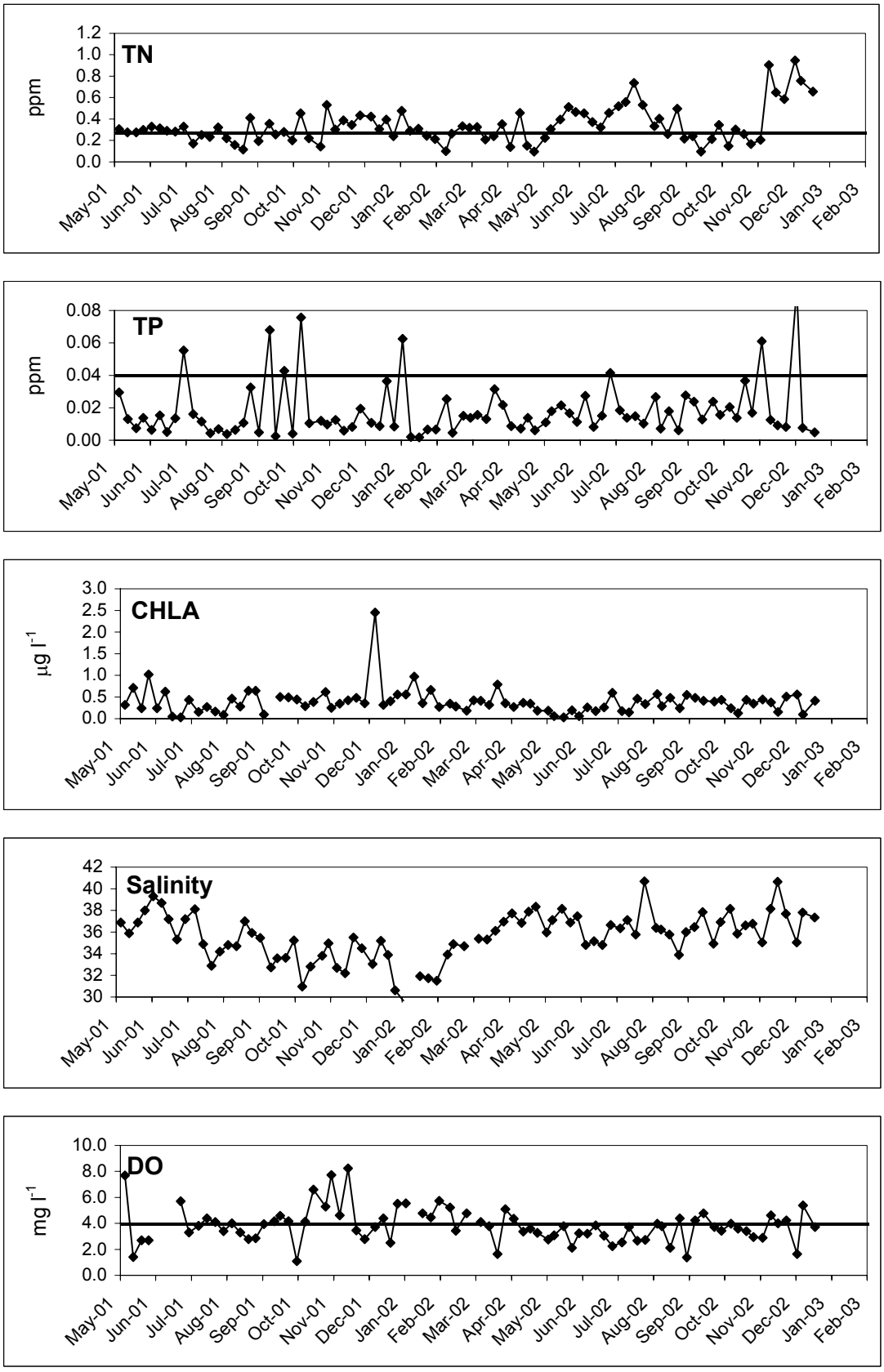


Figure 12

Sta. 2 - Nearshore of the 100th Street Canal

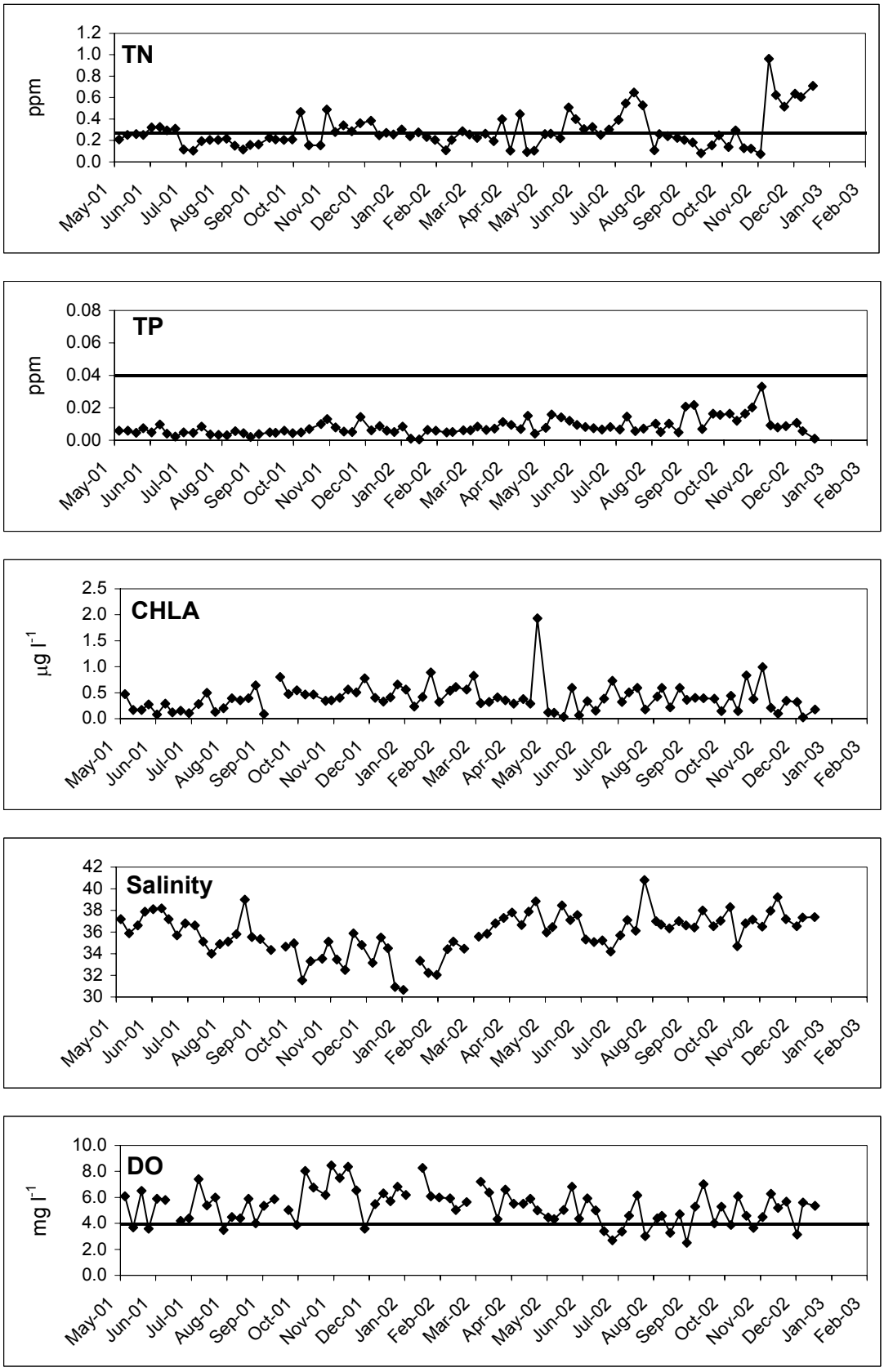


Figure 13

Sta. 4 - Mouth of the 100th Street Canal

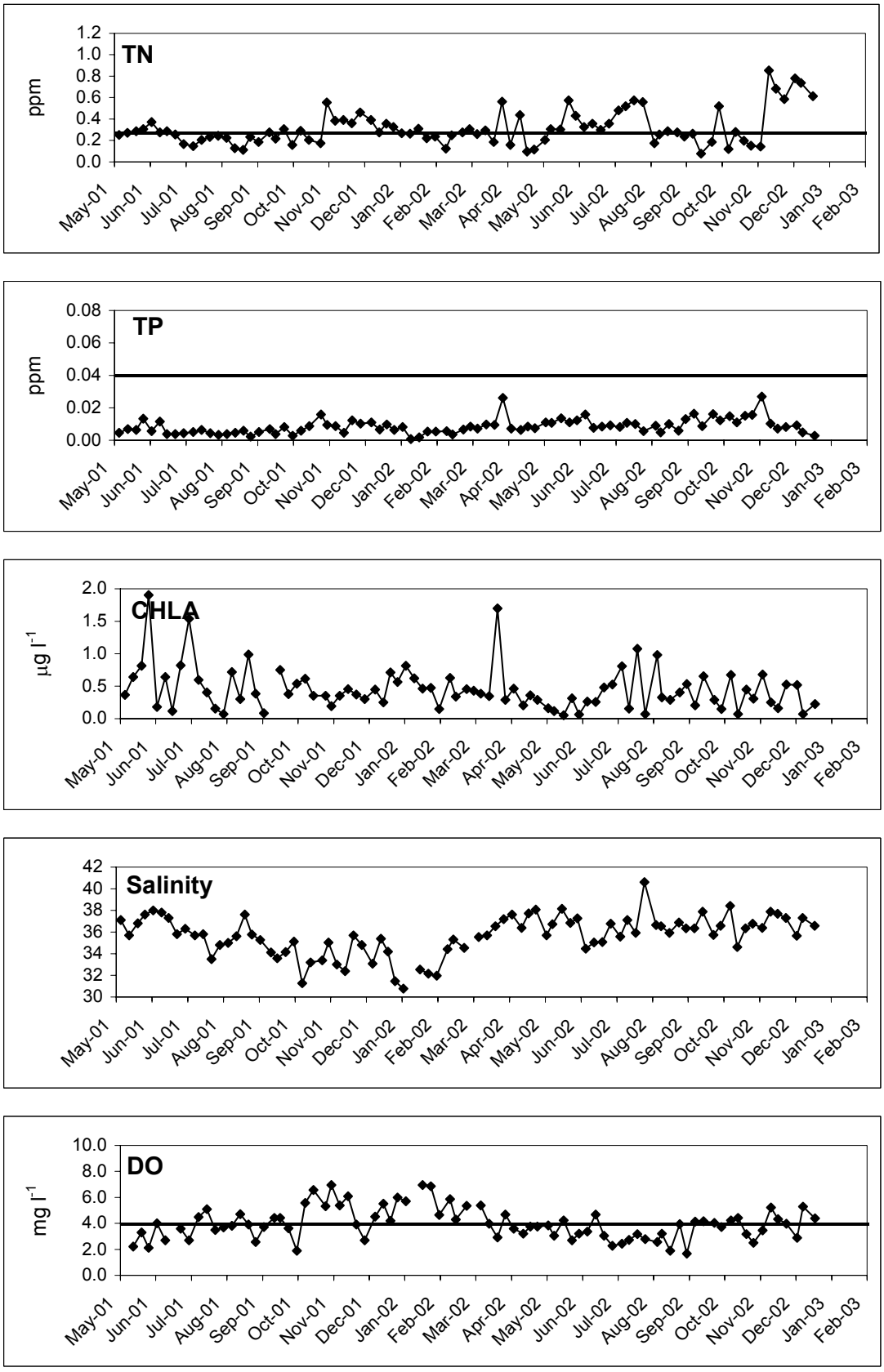


Figure 14

Sta. 5 - Head of the 100th Street Canal

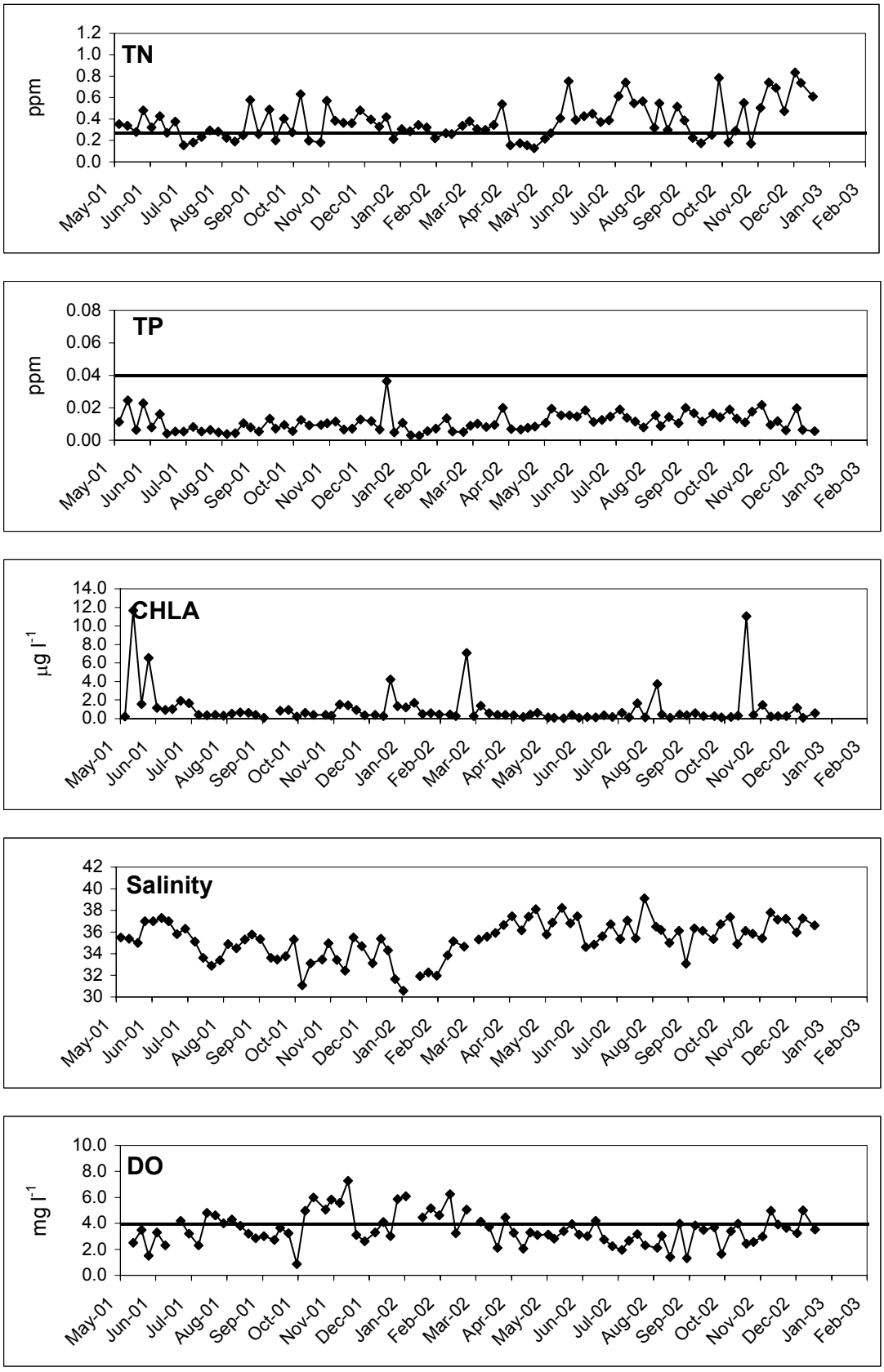


Figure 15

Sta. 6 - Mouth of the 97th Street Canal

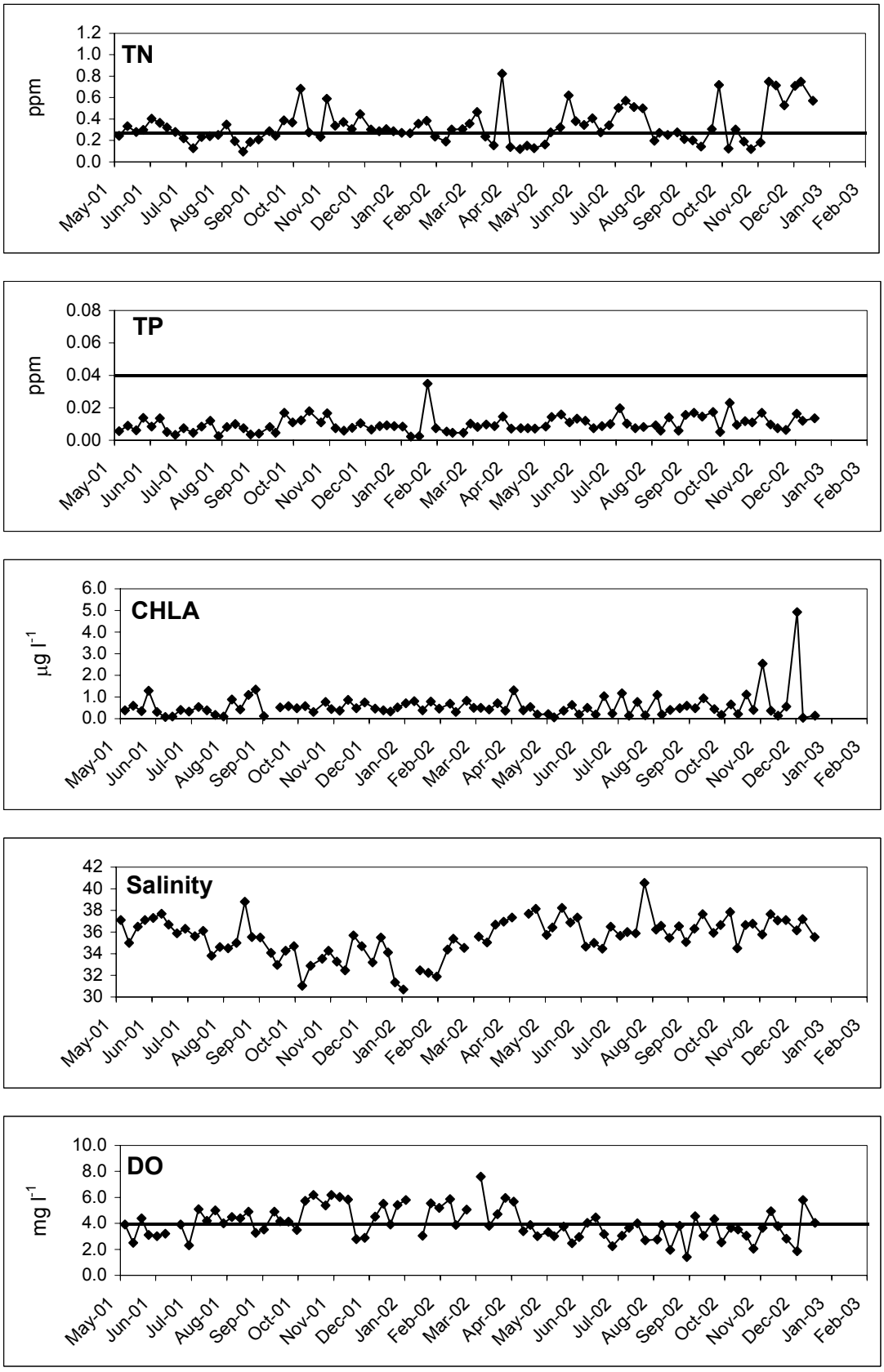


Figure 16

Sta. 7 - Head of the 97th Street Canal

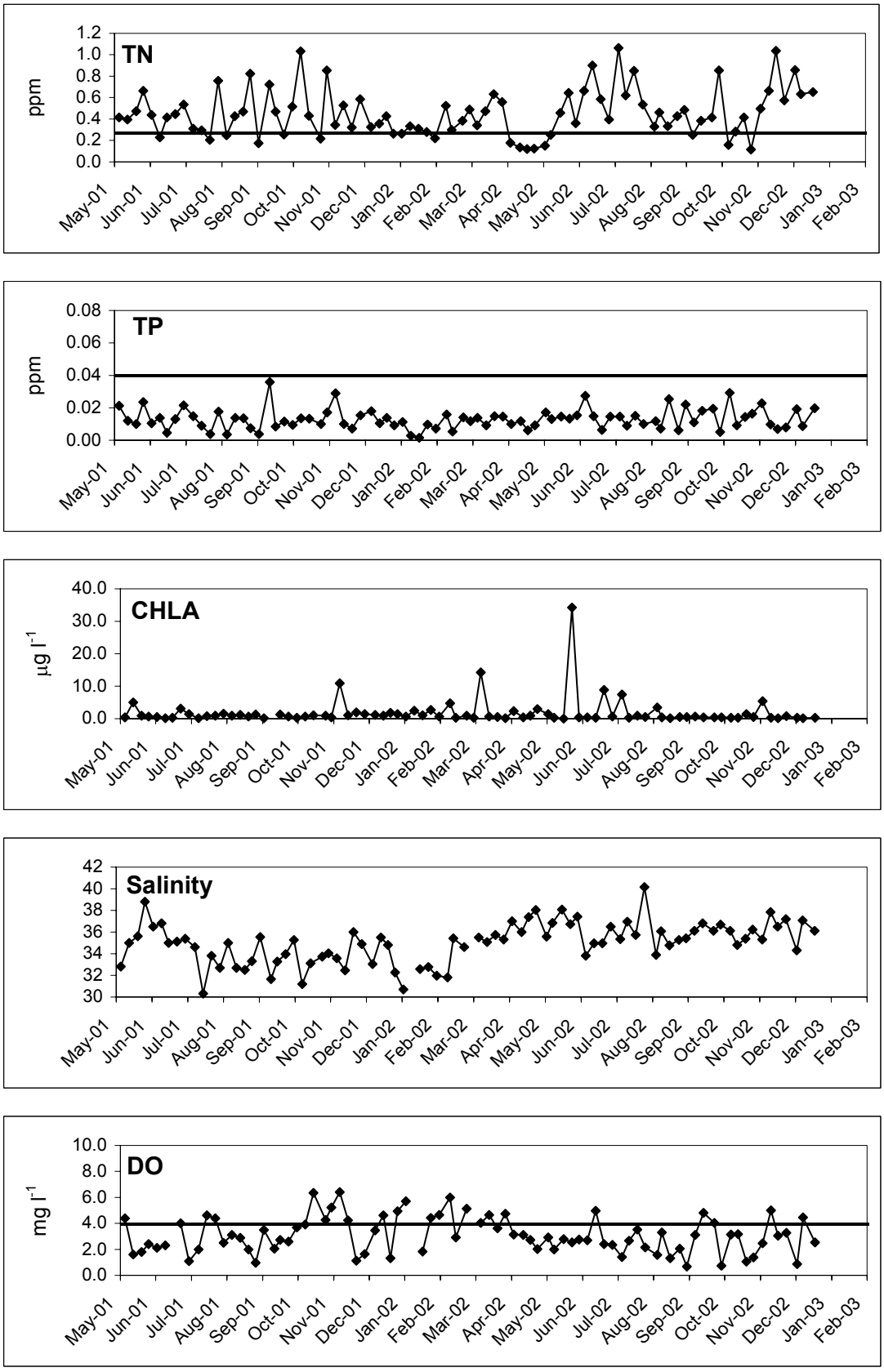


Figure 17

Sta. 8 - Mouth of the 91st Street Canal

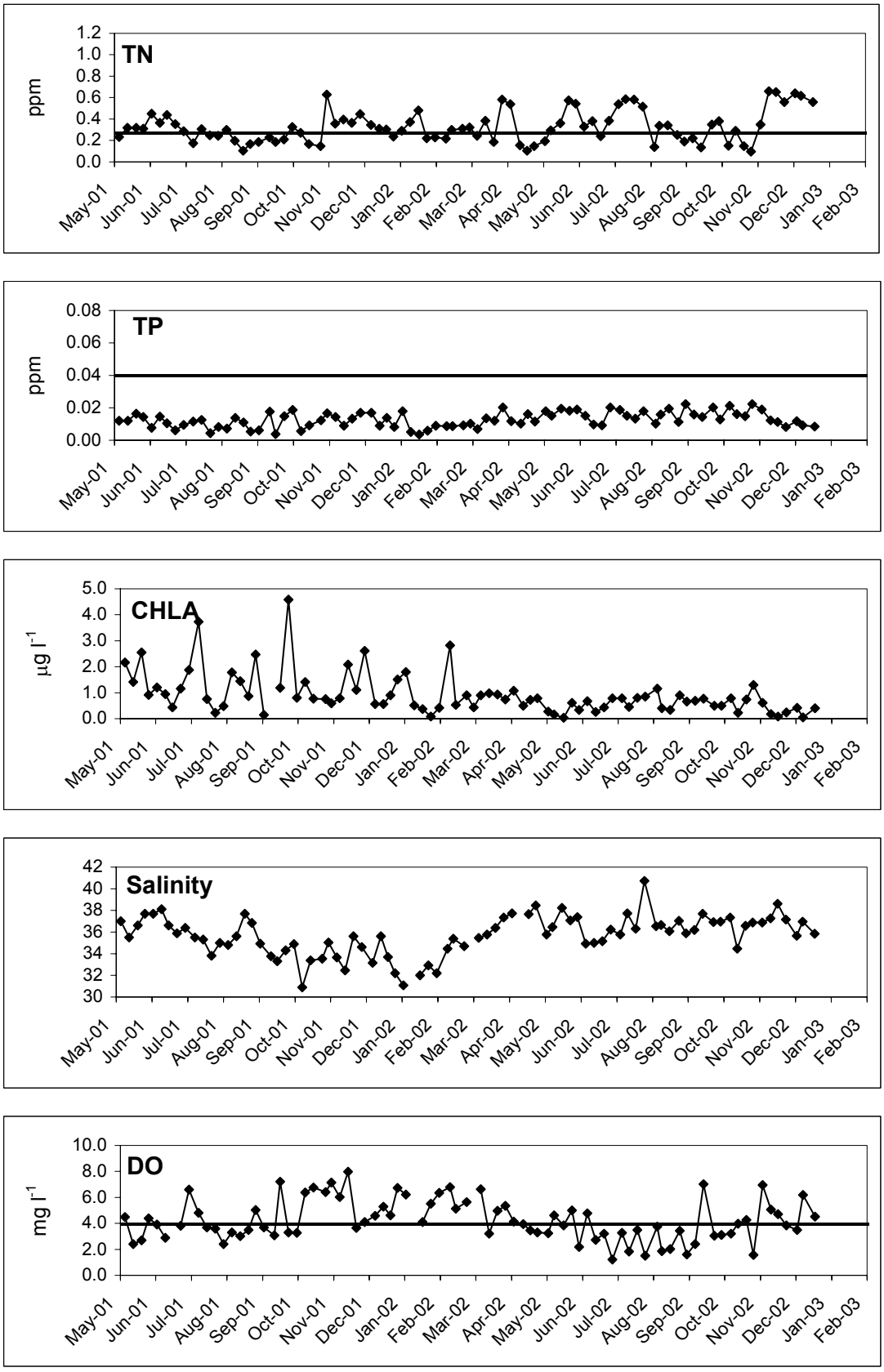


Figure 18

Sta. 9 - Head of the 91st Street Canal

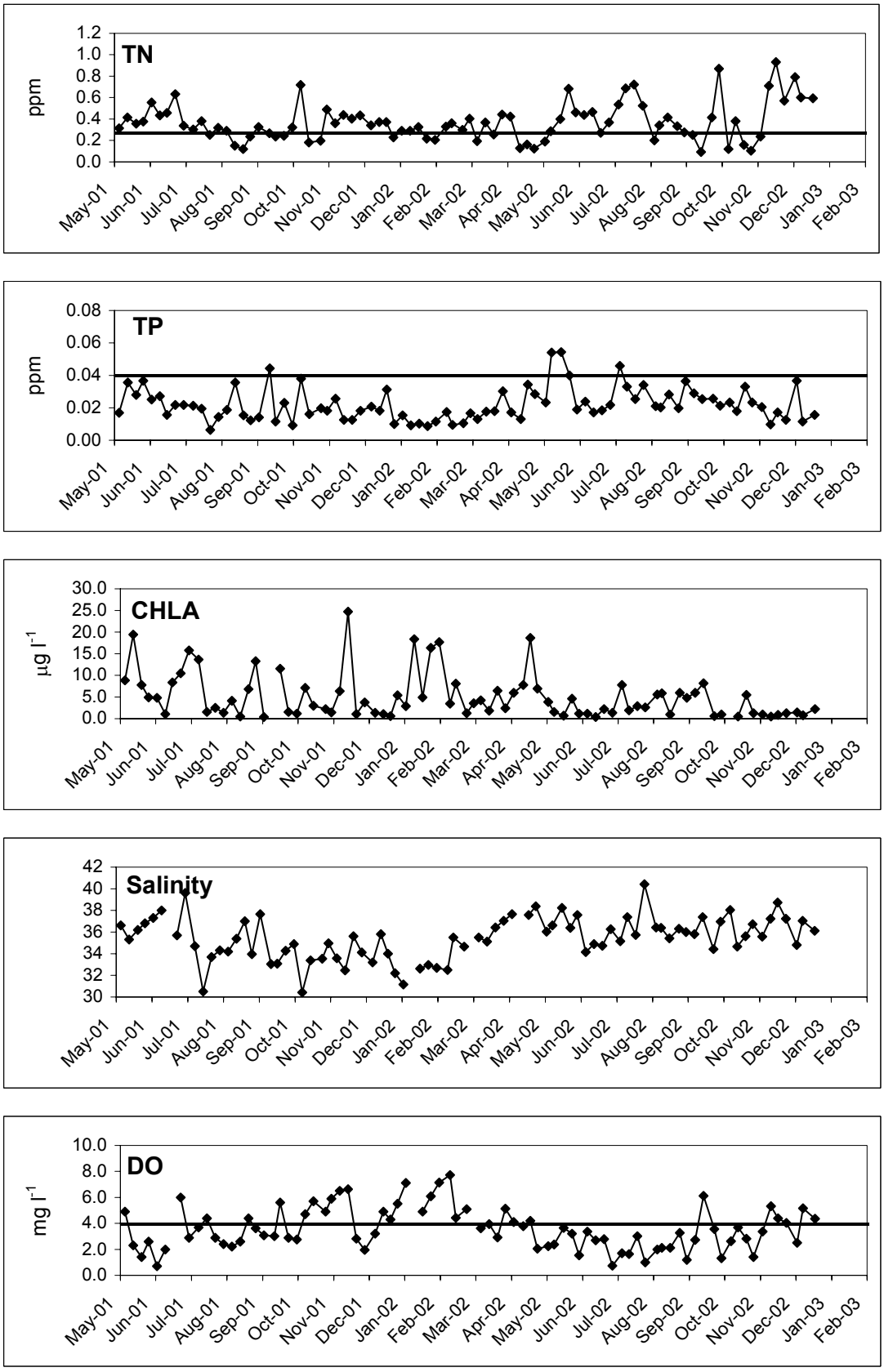


Figure 19

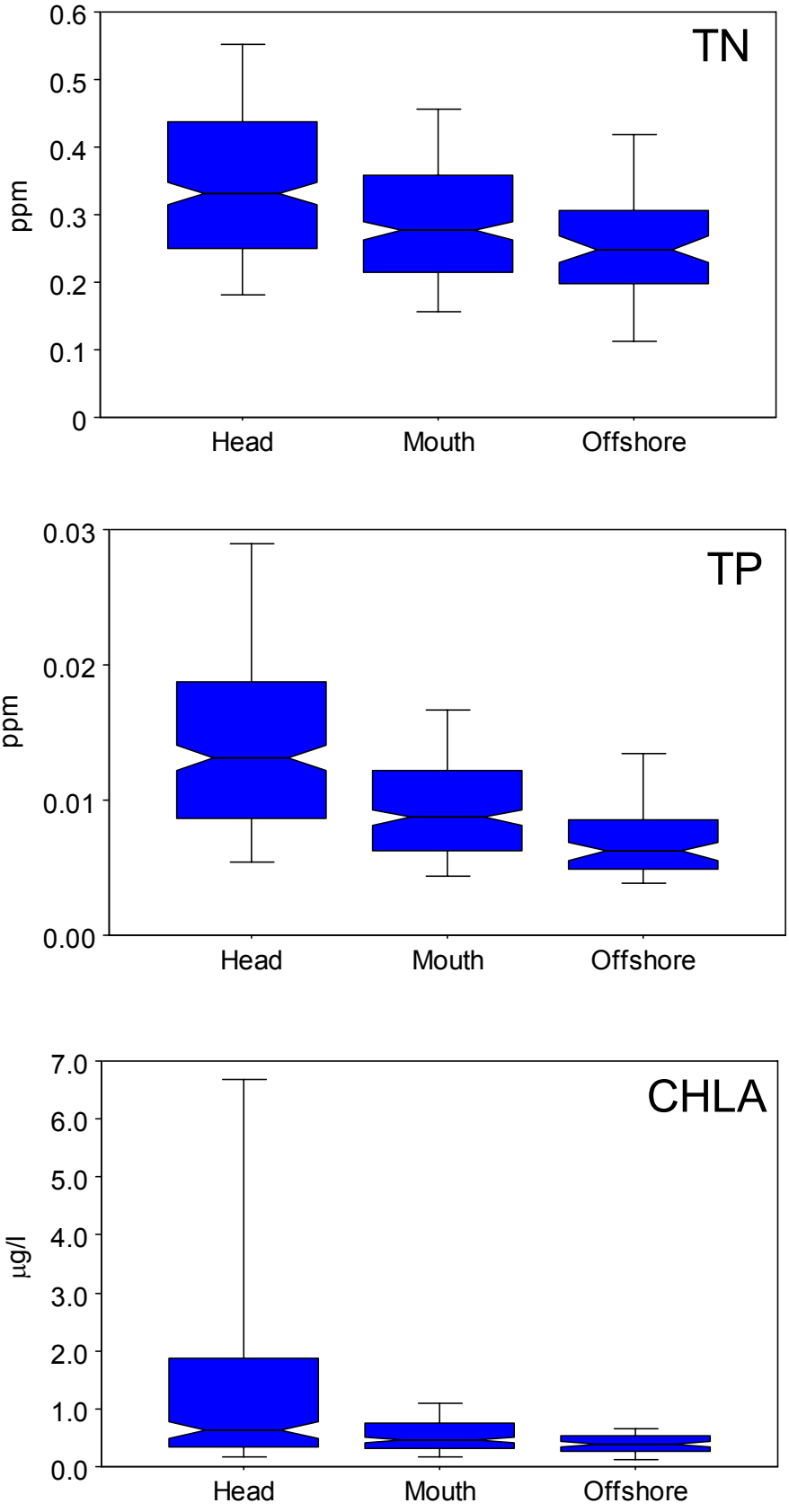
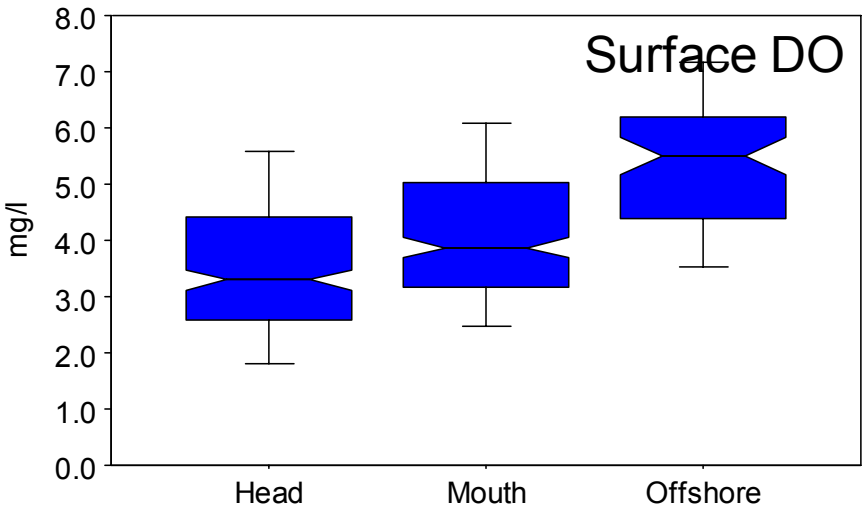

TN
ppm
0.6
0.5
0.4
0.3
0.2
0.1
0
Head
Mouth
Offshore
TP
ppm
0.03
0.02
0.01
0.00
Head
Mouth
Offshore
CHLA
µg/l
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Head
Mouth
Offshore

Figure 20


Surface DO
mg/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Head
Mouth
Offshore

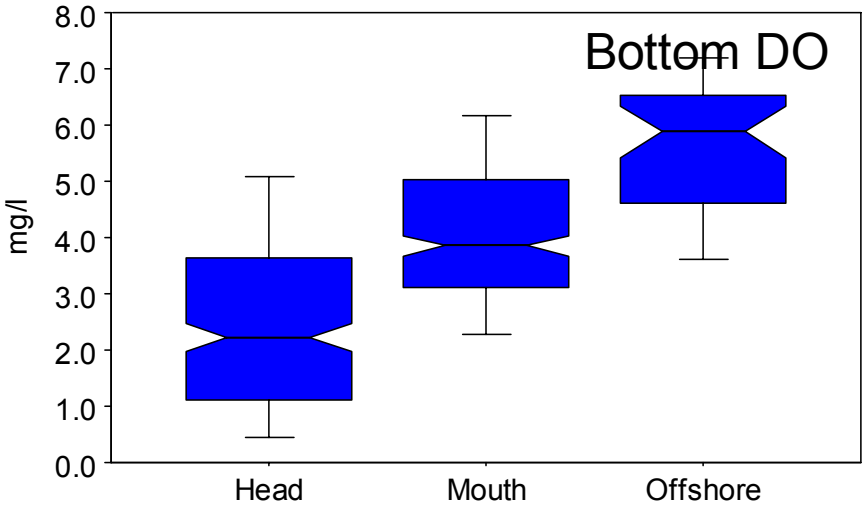

Bottom DO
mg/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Head
Mouth
Offshore

Figure 21