

Halifax Harbour Water Quality Monitoring Project

Survey Summary #150

Survey Date: 26 February 2008
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report150_080226.doc
Data File: HHWQMP_data150_080226.xls

Data Return:
 Profile: 86%
 Bacteria: 97%
Chemical: 100%
Overall: 93%

Sample Notes:

The DO sensor has been returned to the CTD. There were stability issues affecting some of the DO data (see cover sheet in data file). DO profiles from PC, B2, C4, EE3 and E3 are plotted here but have been removed from the data file.

The data from the CTD for station E2 was missing from the instrument, probable user error.

DYC was not sampled due to ice.

A CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 07:57.

Additional bacteria samples were taken in the NW Arm. This data is reported under separate cover (see notes in data file).

A supplemental sample (FC, TSS and BOD₅) was taken in a visible boil (1 m) and detritus patch over the Halifax STP outfall (44 39.248 N, 63 34.402W). FC = 240 cfu/100 mL, TSS = 4.0 mg/L and BOD₅ = <5.0 mg/L.

QA/QC samples:

Chemical Analysis		EE2 - 10m	
		Reference Sample	QA/QC
Ammonia (as N)	mg/L	<0.05	0.05
Total Suspended Solids	mg/L	3.3	1.6
Copper	ug/L	0.5	0.6
Iron	ug/L	2	7
Manganese	ug/L	<1	5
Nickel	ug/L	<0.5	0.6
Zinc	ug/L	<1	3

Fecal Coliform (CFU/100ml)

Site	C3-1m	HC-10m	BYC-1m	EE2-10m
Reference	11	13	4	10
QA/QC	6	8	2	12

Comments:

General: A combination of freshwater input and intrusion of saltier denser water has resulted in an increase in harbour stratification. There is water denser than the Basin bottom water in the Inner Harbour, suggesting potential for an intrusion into the Basin. The commissioning of the Halifax sewage treatment plant is continuing. The sub-sewershed connections have been completed but “debugging” of the treatment process, including disinfection, is ongoing. Overall the bacteria levels are quite low. The only values above swimming limits on the Halifax side are at the site nearest the STP outfall. On the Dartmouth side there are relatively high values from the Ferry terminal south to SYC.

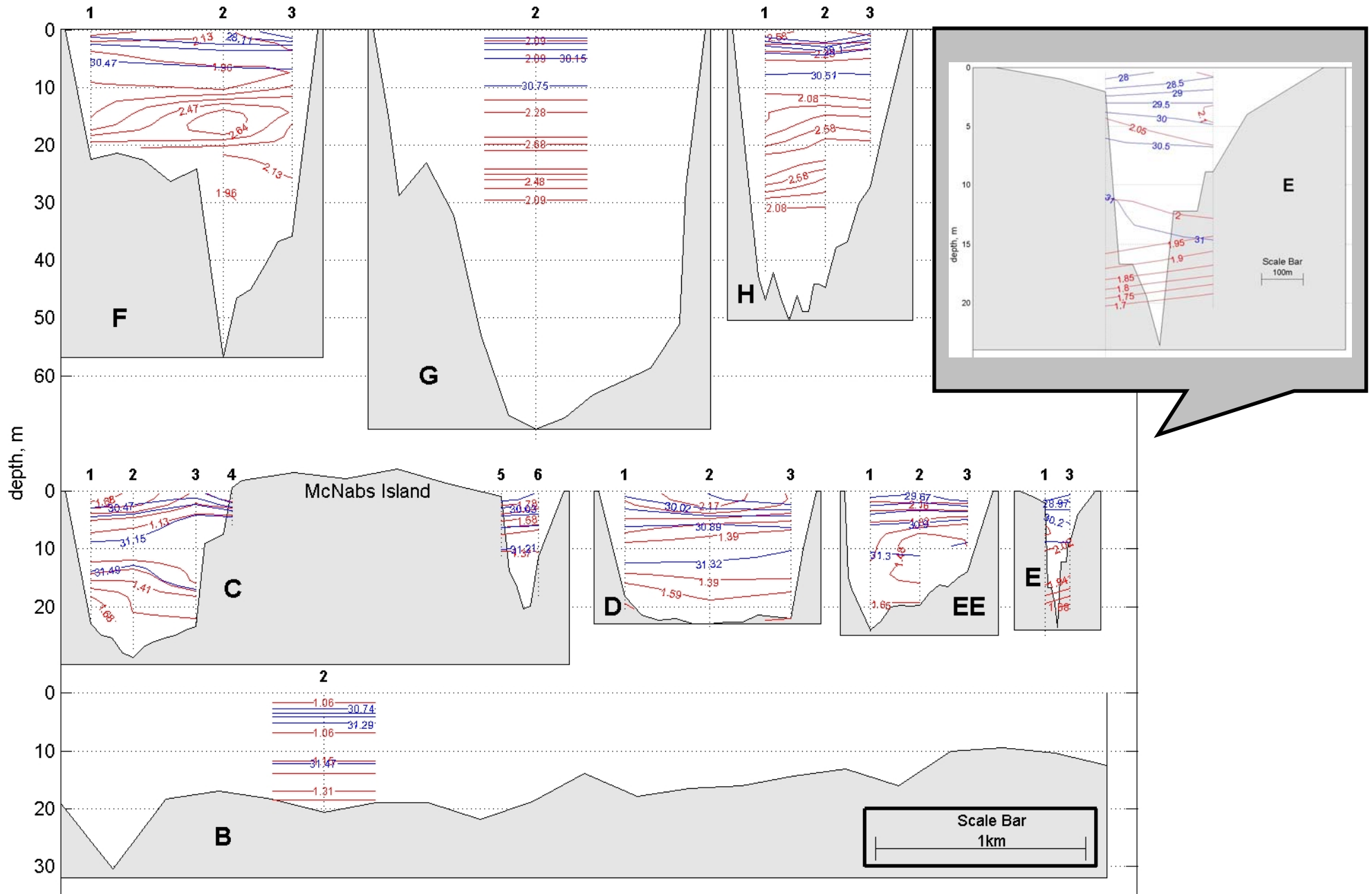
Fluorescence: The spring bloom seems to have begun. In the Basin the profile max levels are about 8 mg/m³. These drop to 2-3 mg/m³ in the Inner Harbour and to < 1.2 mg/L (background) in the Outer Harbour.

TSS: TSS values are low (mean 3.7 mg/L) without an obvious coherent distribution.

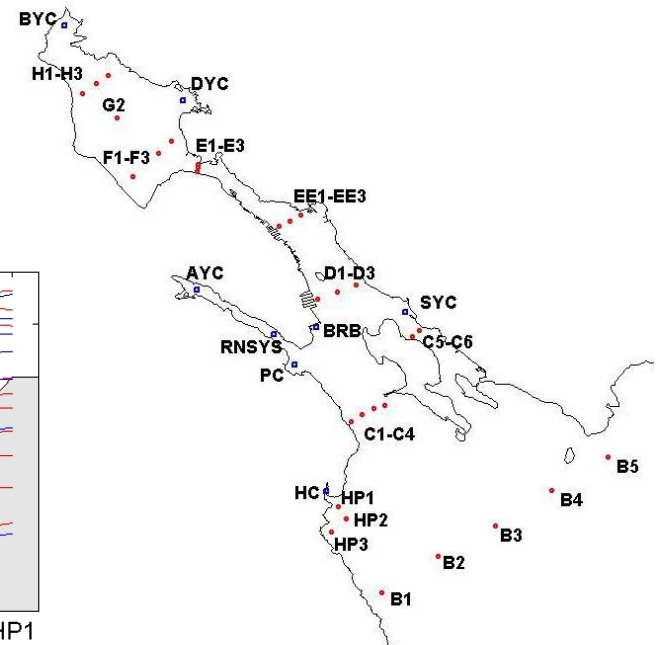
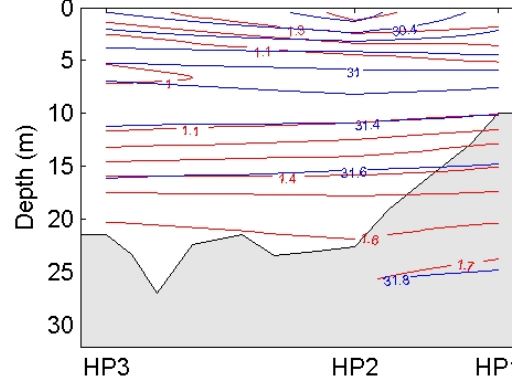
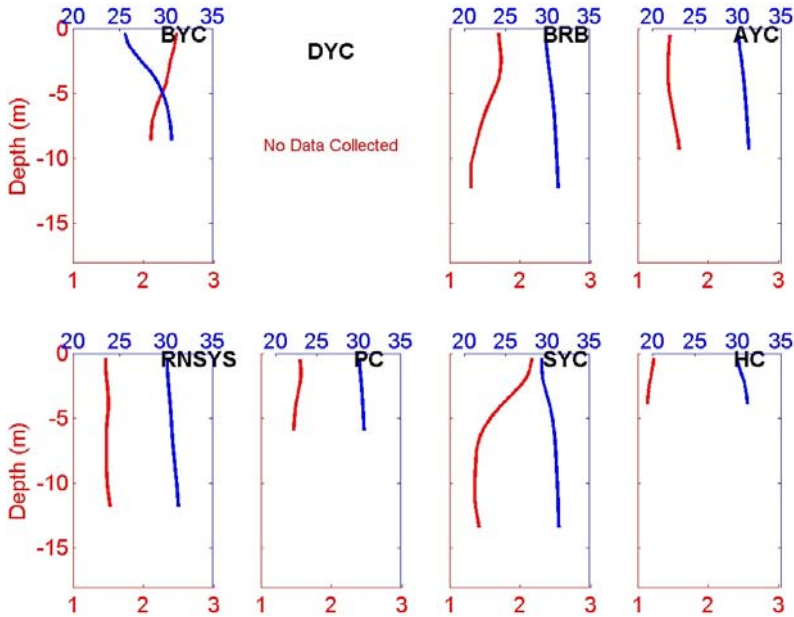
Ammonia: Eight of fourteen samples were below the detection limit (0.05 mg/L) and the overall mean value is 0.4 mg/L. The detectable values were all in the 1 m samples in the Inner Harbour and Basin.

Metals: The mercury guideline of 0.025 ug/L is exceeded in two samples (B2-1 m and D2-10 m). Remarkably, 13 of 14 samples had detectable levels (> 0.01 ug/L) of mercury. There is also a copper guideline exceedence at B2-10 m.

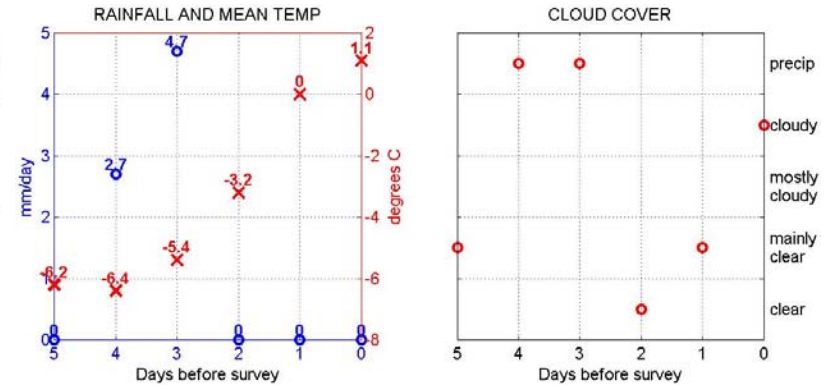
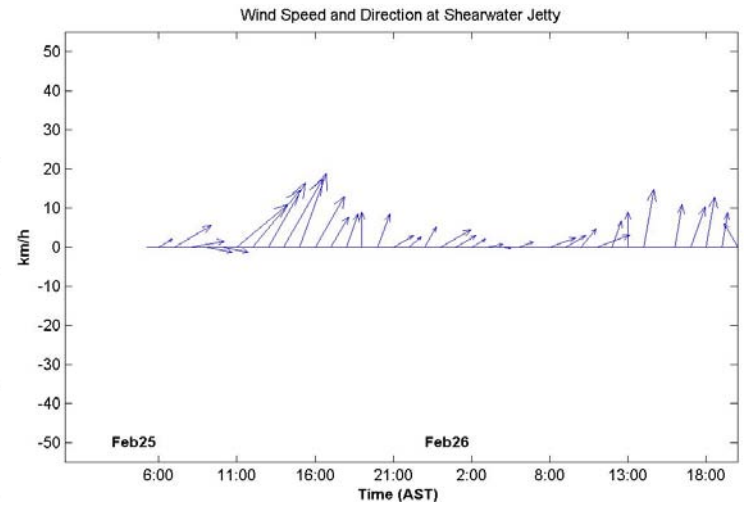
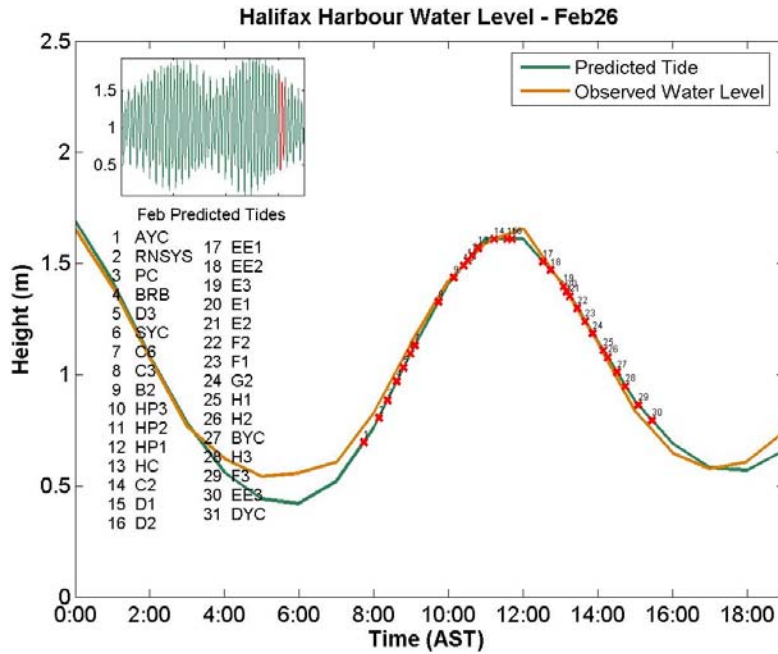
Dissolved Oxygen: It appears that there is a thin layer of very well oxygenated water near the surface throughout the Harbour (11.5 – 12.0 mg/L) underlain by much less well oxygenated water (generally 7.0- 8.0 mg/L). This surface layer is not well resolved by the standard processing techniques (see notes in the data file) in some of the profiles and is artificially missing on many of the section contour plots. This suggests surface spatial gradients that may not be real. The DO guidelines are generally met. There are values slightly below the 7.0 mg/L guideline in the deeper water of section C, and the more usual guideline exceedence in the deep water of the Basin, though at 6.7 mg/L the deep water is just barely below the 7.0 mg/L guideline. The data is relatively consistent with the LOBO data (9.9 mg/L) and the BBPMP data taken the following day (11.8 mg/L at 1m and 10 mg/L at 60 m).



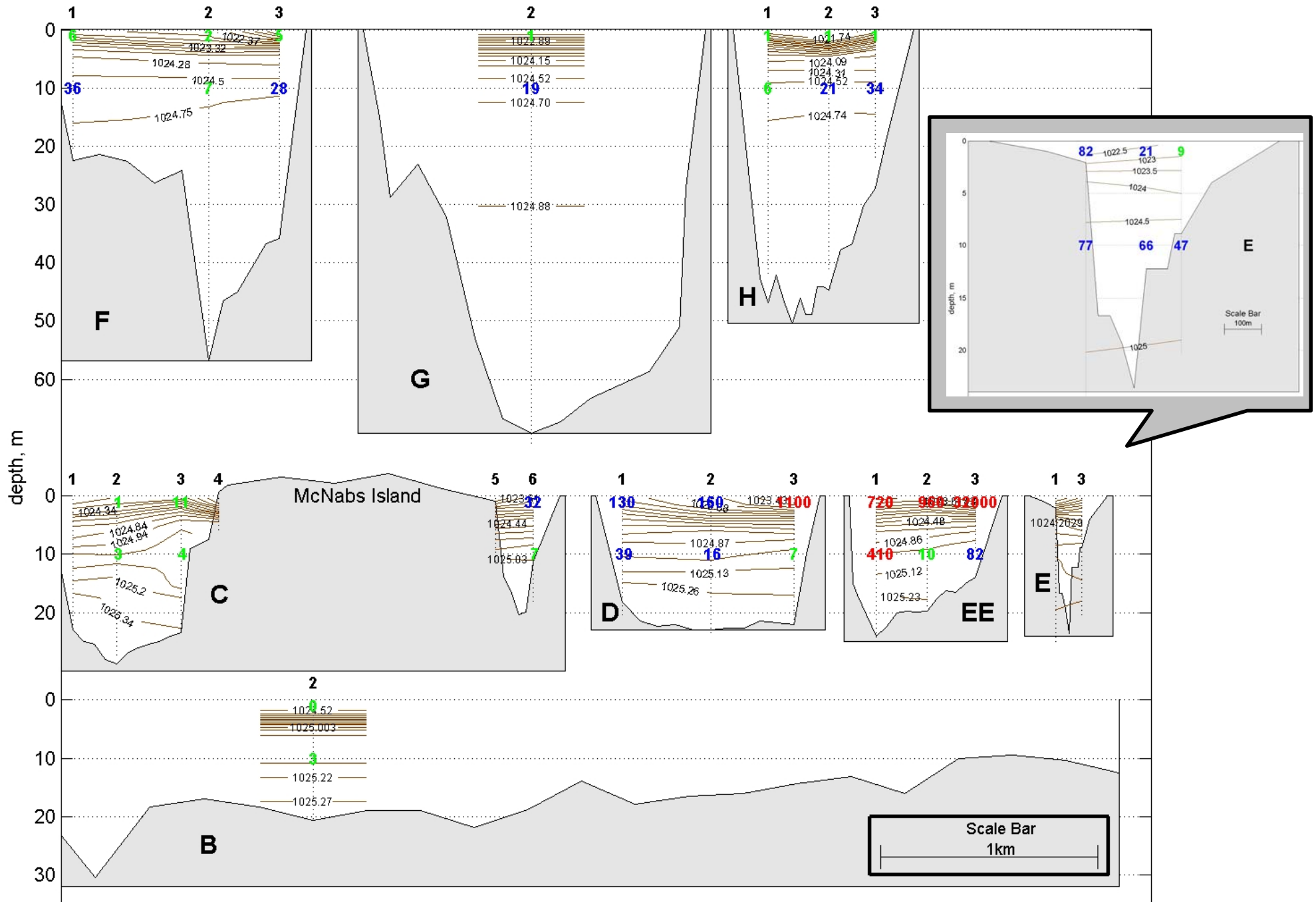
Yacht Clubs



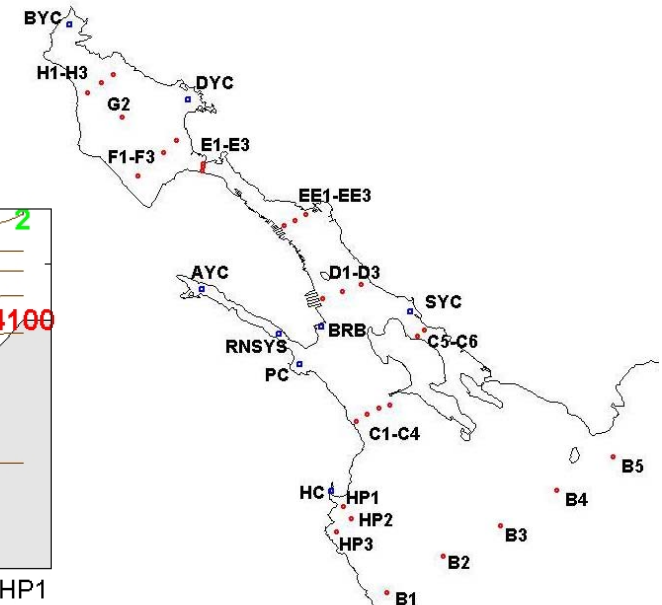
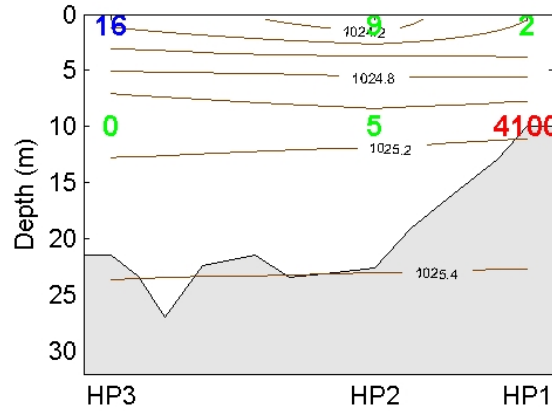
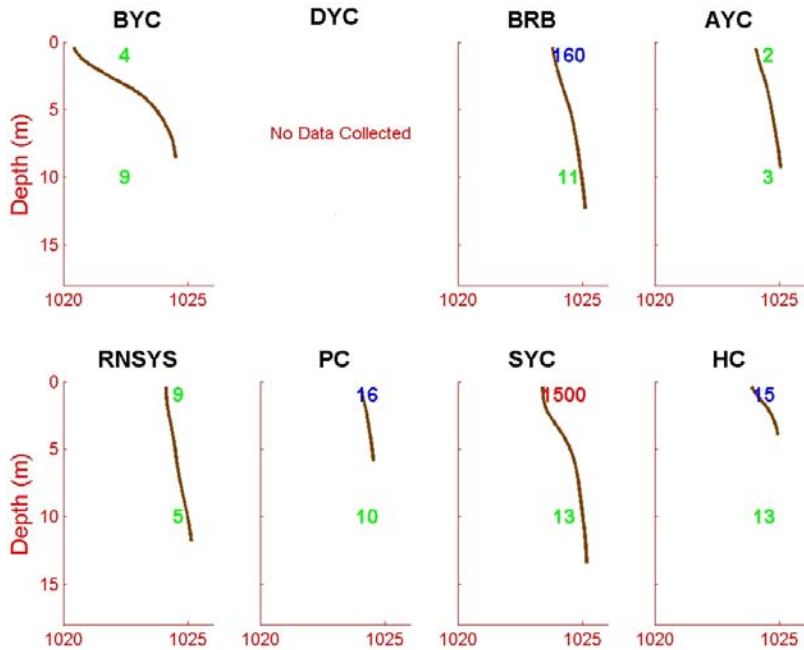
Rainfall and temperature data collected at Shearwater Autoport.
Cloud cover data collected at Shearwater Airport



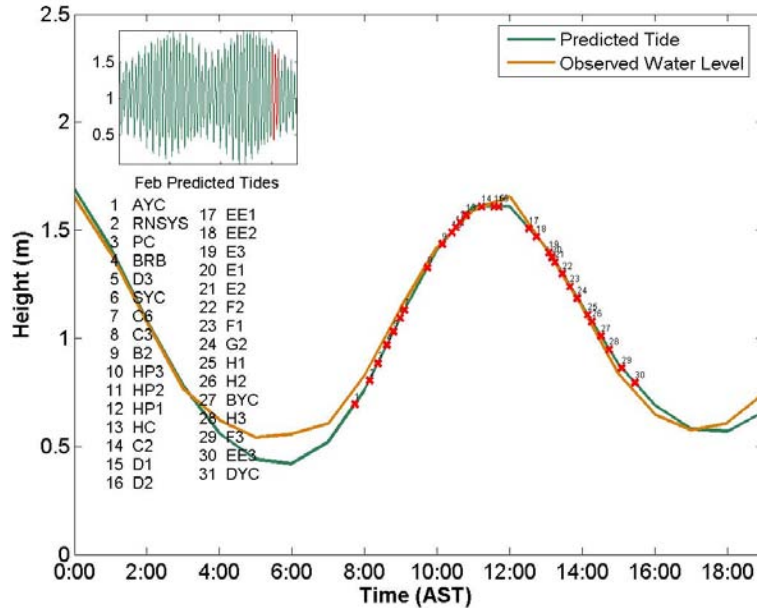
Salinity in PSU Temperature in °C



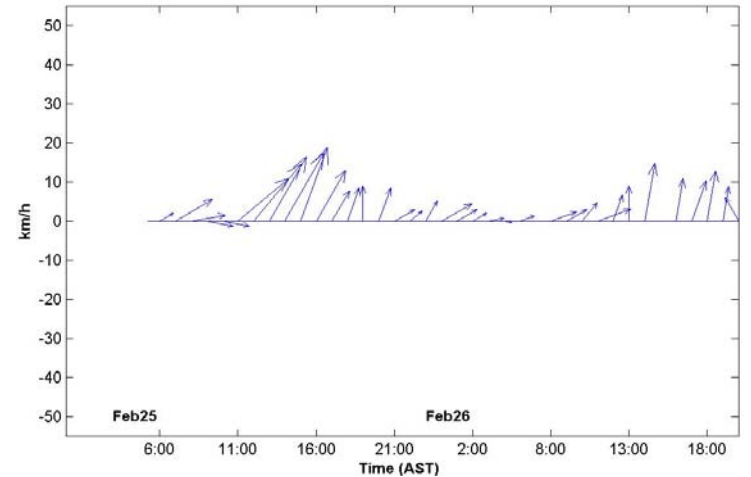
Yacht Clubs



Halifax Harbour Water Level - Feb26



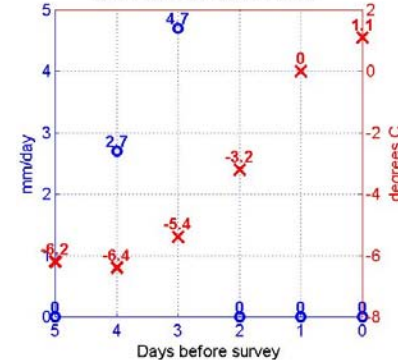
Wind Speed and Direction at Shearwater Jetty



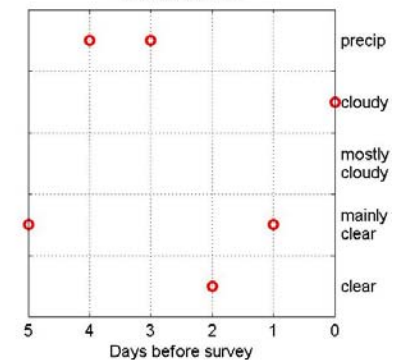
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RAINFALL AND MEAN TEMP

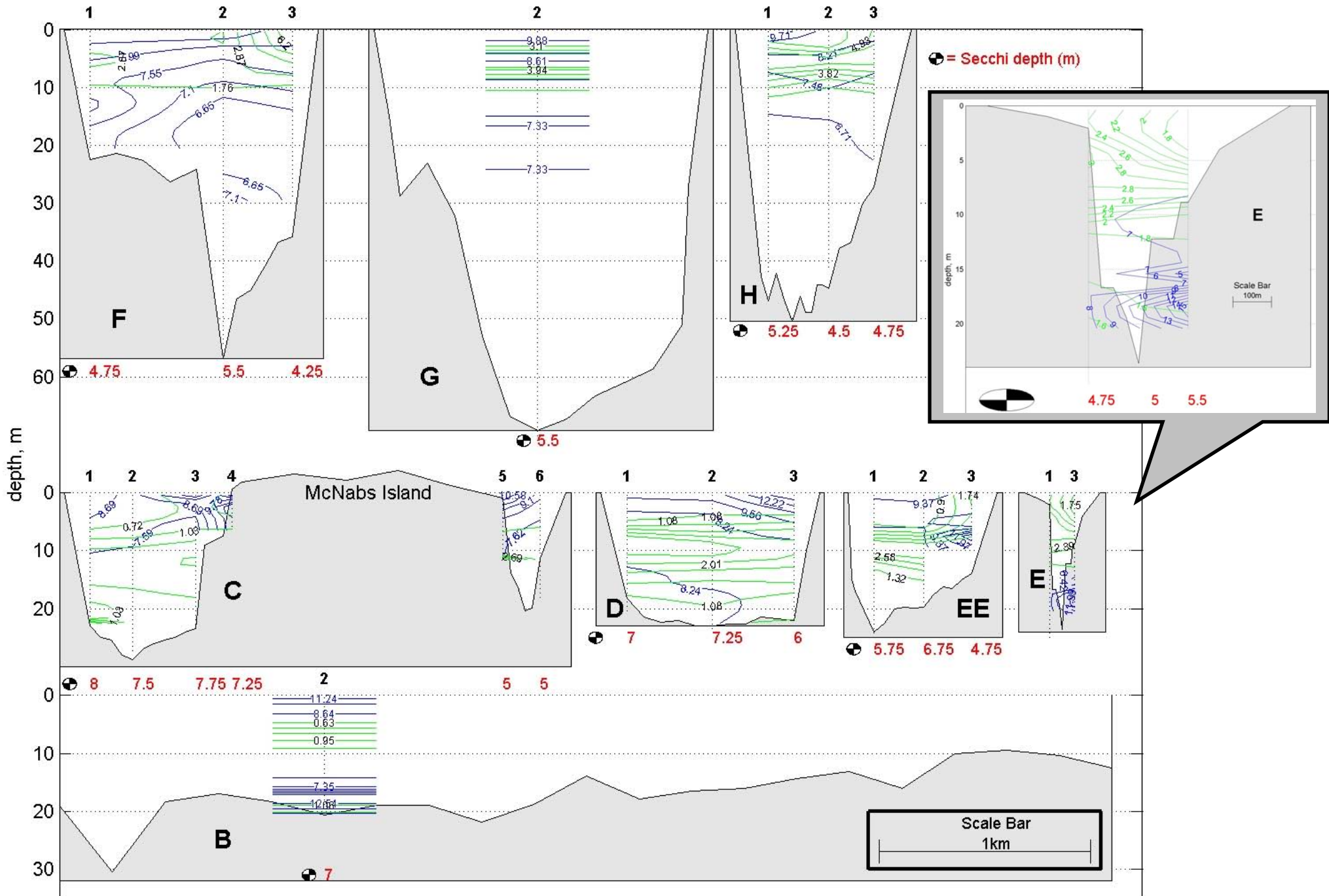


CLOUD COVER

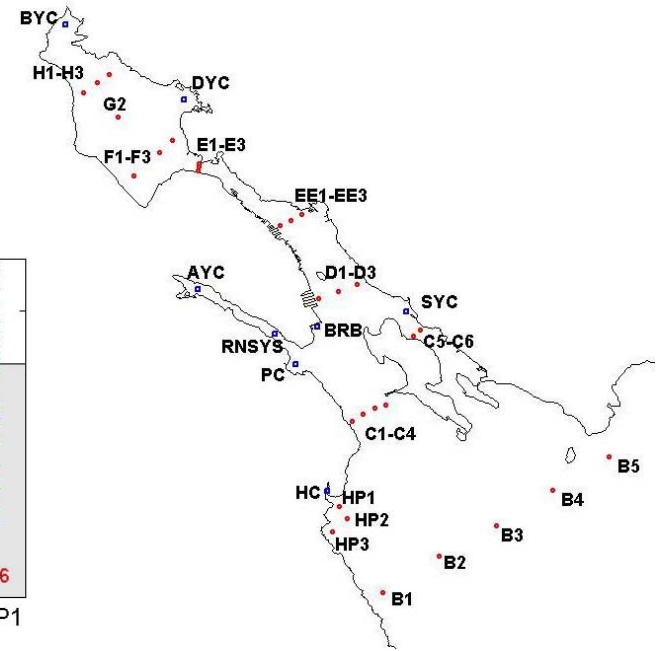
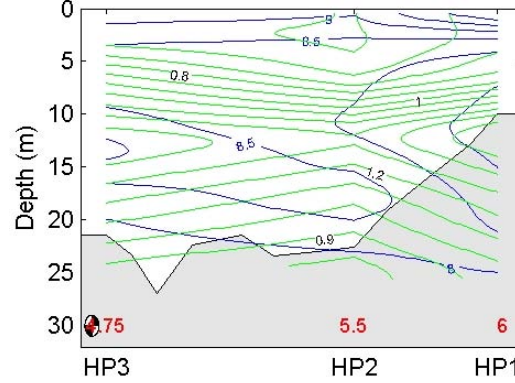
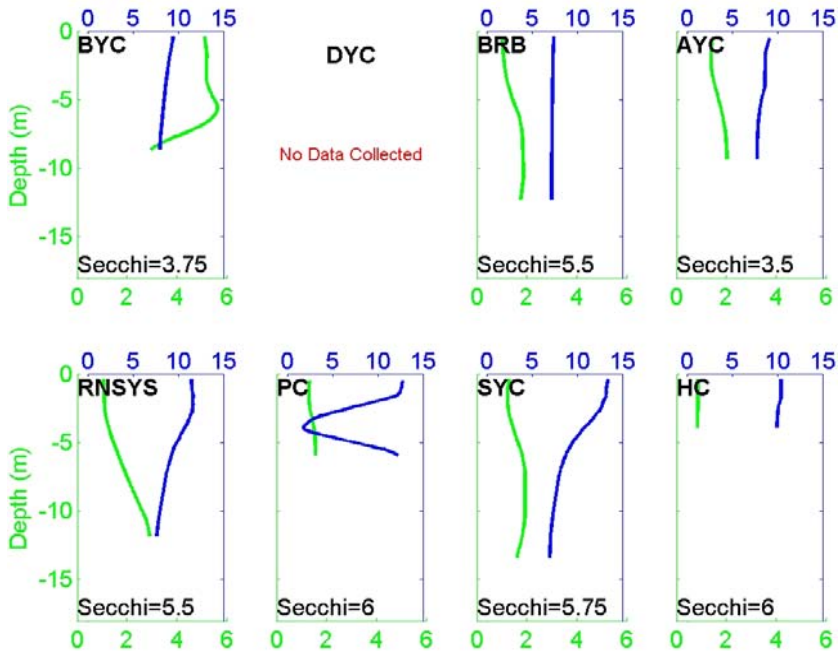


Potential Density in kg/m³

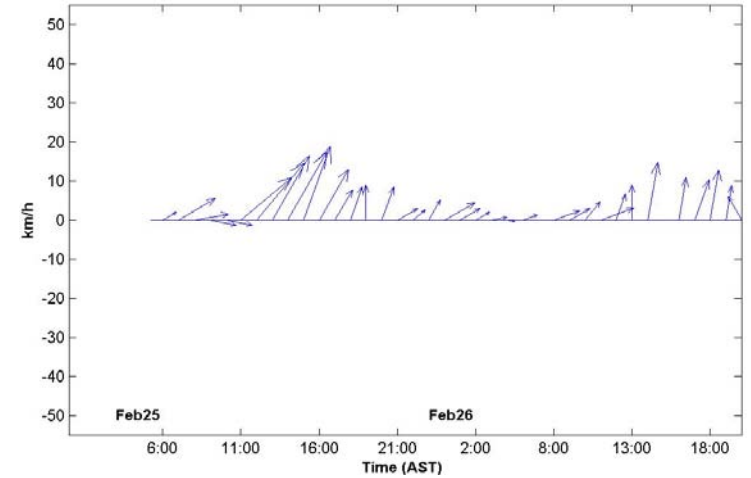
Fecal coliform: **above swimming limit (200 mpn/100mL)**
above shellfish limit (14 mpn/100mL)
 below limits



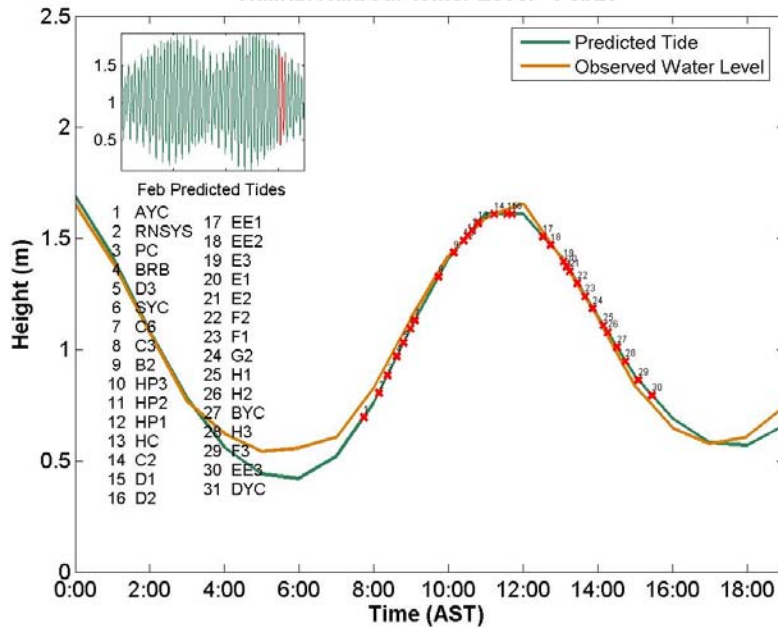
Yacht Clubs



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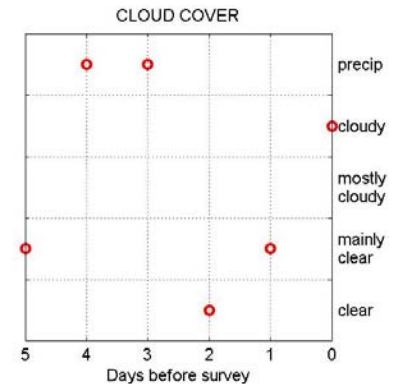
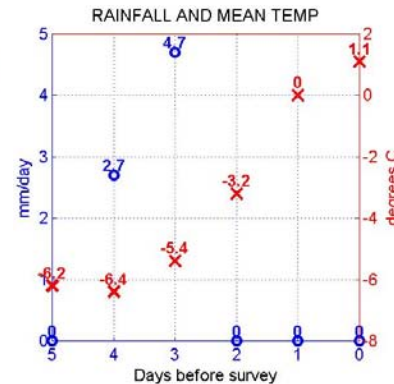
Halifax Harbour Water Level - Feb26



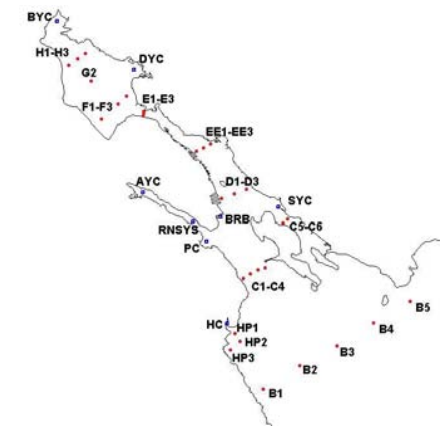
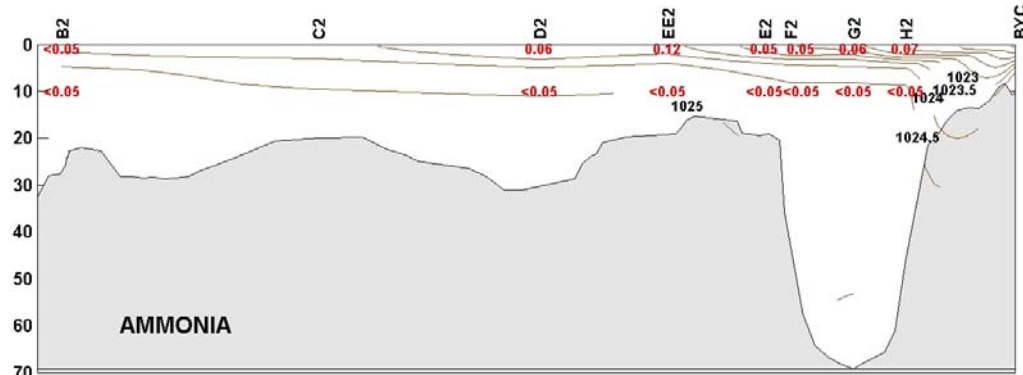
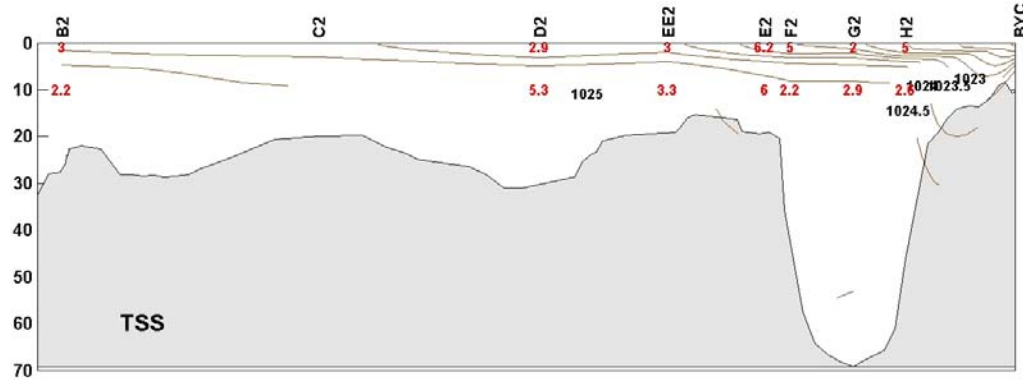
Rainfall and temperature data collected at Shearwater Autoport.
Cloud cover data collected at Shearwater Airport

DO in mg/L

Chlorophyll in mg/m³



CHEMISTRY



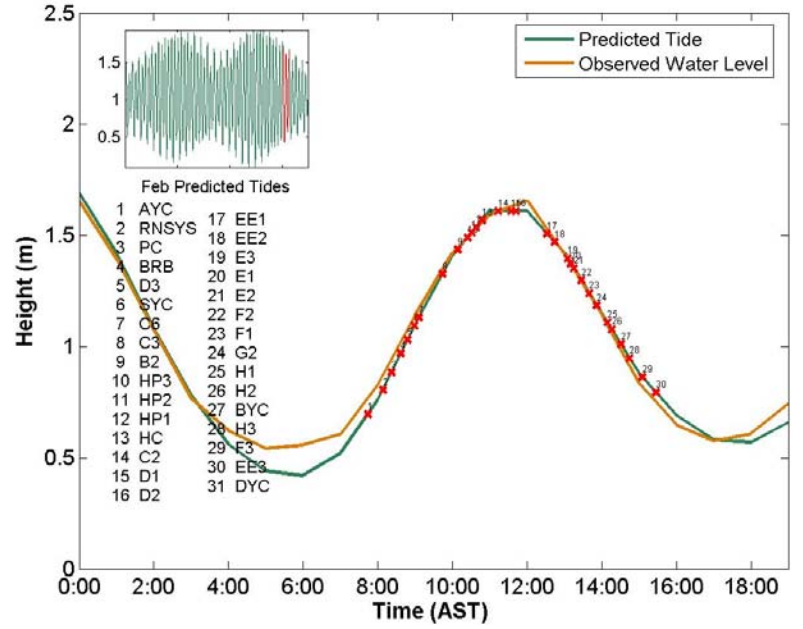
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Potential Density in kg/m^3

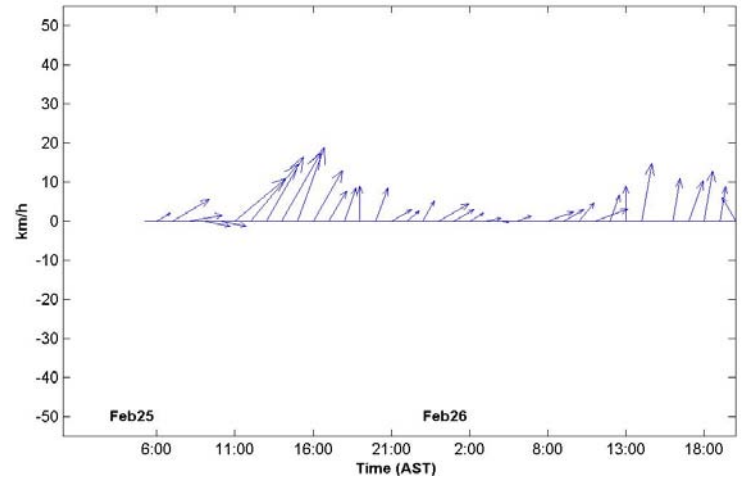
Ammonia in mg/L

TSS in mg/L

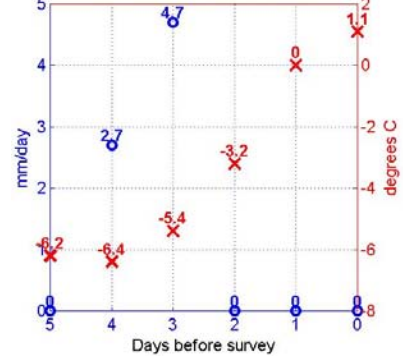
Halifax Harbour Water Level - Feb26



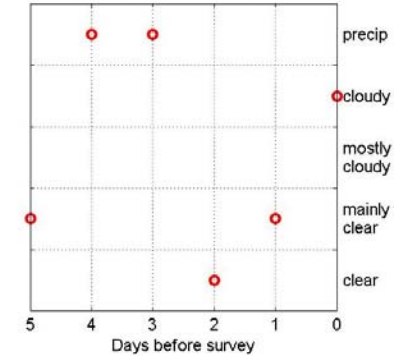
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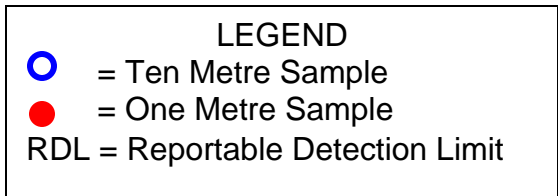
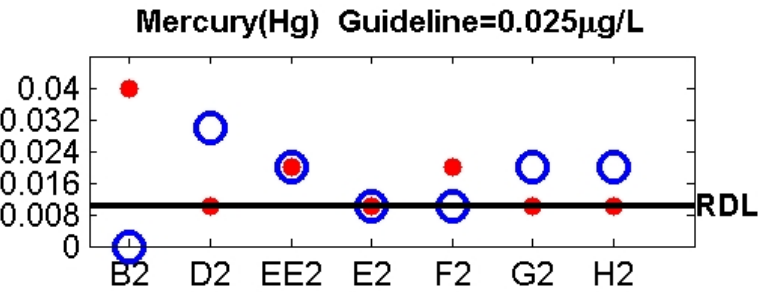
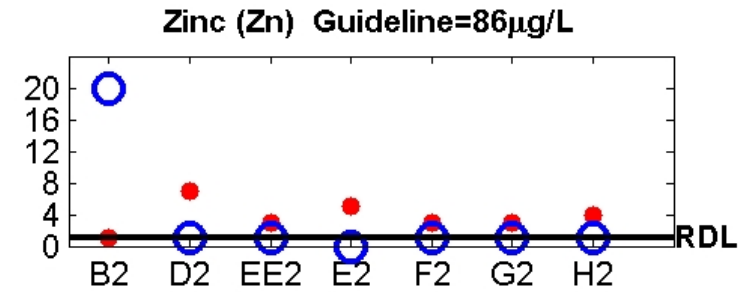
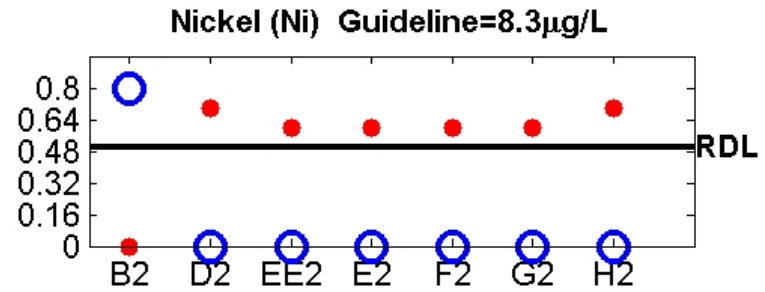
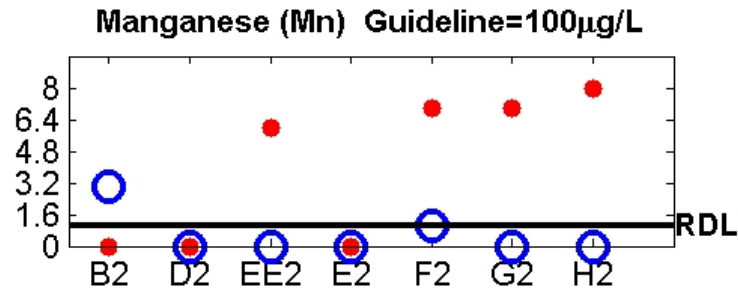
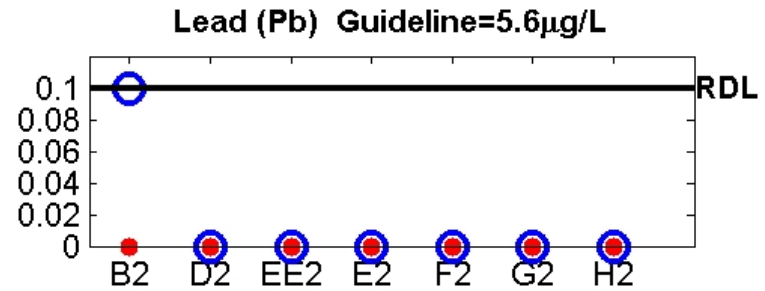
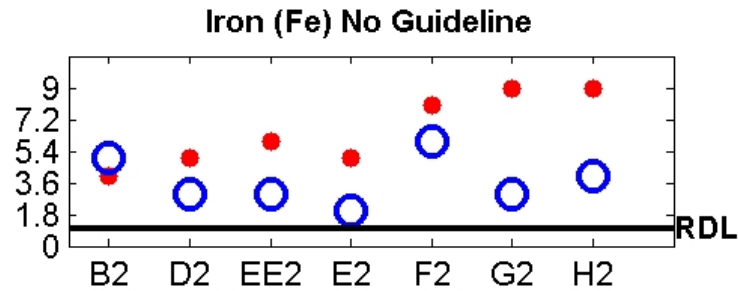
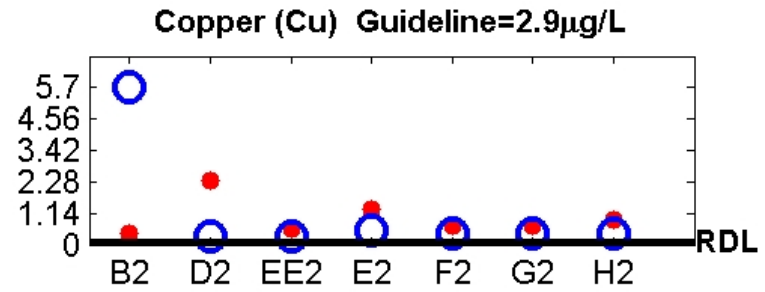
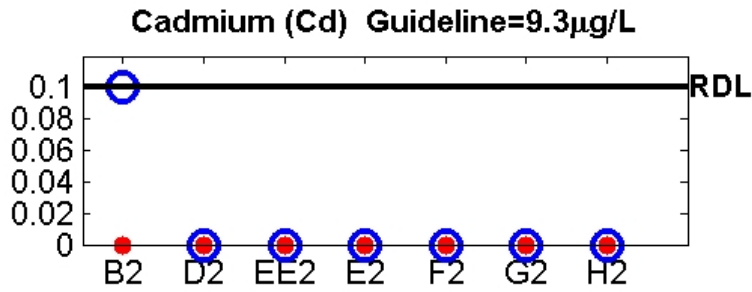


RAINFALL AND MEAN TEMP



CLOUD COVER





HRM Water Quality Monitoring

Fecal Coliform Summary – February 26, 2008

