Halifax Harbour Water Quality Monitoring Project
Survey Summary #141

Survey Date: 24 October 2007
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report141_071024.doc
Data File: HHWQMP_data141_071024.xls
Data Return:

Profile:	97%
Bacteria:	100%
Chemical:	100%
Overall:	**99%**

Sample Notes:

DYC CTD profile did not pass QAQC, potential flow problems, data deleted.

The location for QAQC sample #3 was not recorded.

A CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 17:00 local time.

QA/QC samples:

Chemical Analysis		**EE2-10m**	
Detectable Parameter	**Units**	**reference sample**	**QA/QC**
Ammonia (as N)	mg/L	0.13	0.10
Total Suspended Solids	mg/L	3.7	5/0
Copper	ug/L	1.2	0.7
Iron	ug/L	9	6
Manganese	ug/L	3	2
Zinc	ug/L	5	3

Fecal Coliform (MPN/100ml)

Site	BRB-1m	E3-1m	EE2-10m
Reference	690	610	3800
QA/QC	810	660	2900

Comments:

General: A significant rainfall (39 mm) four day before the survey has resulted in the highest sustained flow in the Sackville River in almost two months. The Harbour surface water has freshened significantly. In the Southern Basin and Narrows where there is a lens of fresher surface water. Field notes indicate visible brown (tannin?) colour at E1 in the Narrows. In the Inner Harbour, the surface water has freshened and the bottom water has become slightly more saline. Similarly, the surface temperatures remain about the same as last survey but the bottom temperatures have dropped, reflecting the effect of deeper colder, more saline shelf water. The fecal coliform values are very high in both the 1 and 10m samples throughout the Inner Harbour and Southern Basin.. The high fc values in the surface water in Basin are likely affected by the continued diversion of sewage to the Fairview Cove CSO. The elevated values are quite widespread extending southward to section B. where the values remain detectable in samples at both depths.

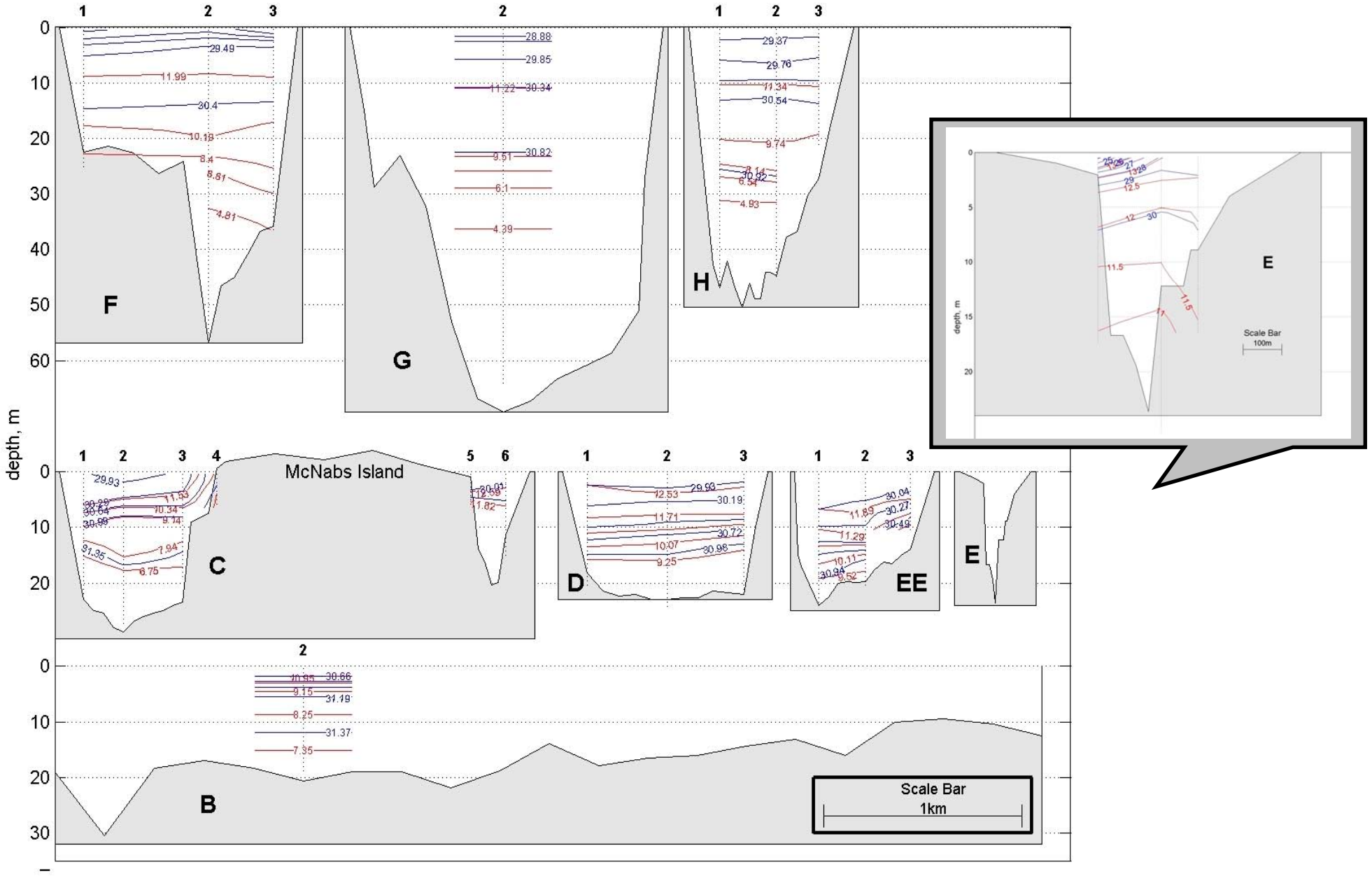
Fluorescence: Overall, the fluorescence values are everywhere similar, though slightly lower, than last survey. The values are highest (> 20 mg/L) in the northern Basin and generally drop monotonically going out of the Harbour to less than 3 mg/L out at B2. The highest values are at or near the surface.

TSS: The TSS values are notably high in the 1m sample at H2 (14 mg/L). Elsewhere the values are moderately high. The mean is approximately 4.6 mg/L.

Ammonia: The ammonia values are relatively high everywhere with no values below the 0.05 mg/L detection limit. Average values are about 0.10 or twice more typical values near the detection limit.

Dissolved Oxygen: The DO values are also similar in magnitude, though slightly lower than last survey. The surface values are generally just below 8 mg/L in the Basin and just over 8 mg/L in the Inner and Outer Harbour. While the DO values are relatively low, the only values below use specific guidelines are deeper than about 20m in the Basin. Outside of the Basin the values are relatively uniform with values at depth similar or slightly higher than surface values. The CTD measured DO value at the LOBO buoy is 7.98 mg/L compared to 6.28 mg/L measured by the buoy. The DO data is not ground-truthed, however this data was obtained with a recently factory calibrated instrument. (see DO discussion in QR#1).

Metals: The EE2-10 m had elevated levels of Copper, Lead, Nickel, Iron and Manganese, though no values were above the environmental guidelines


depth, m
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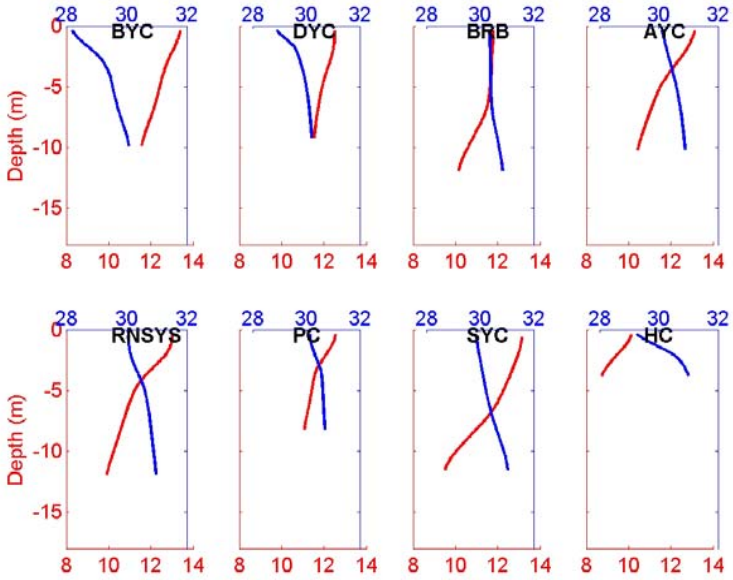
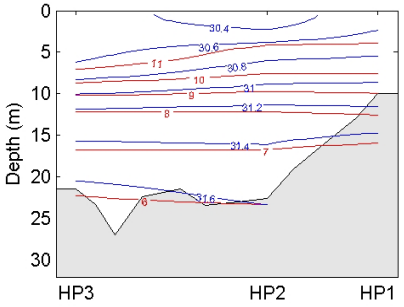
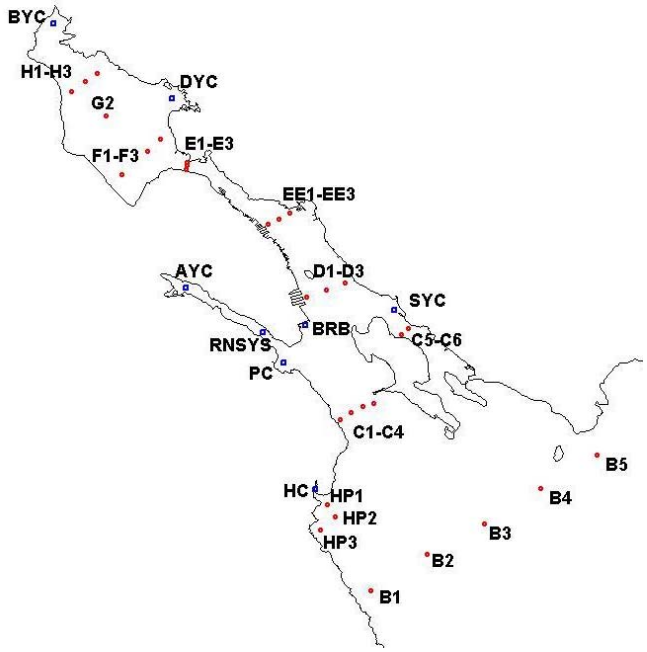
McNabs Island
Scale Bar
1km
Scale Bar
100m

Yacht Clubs

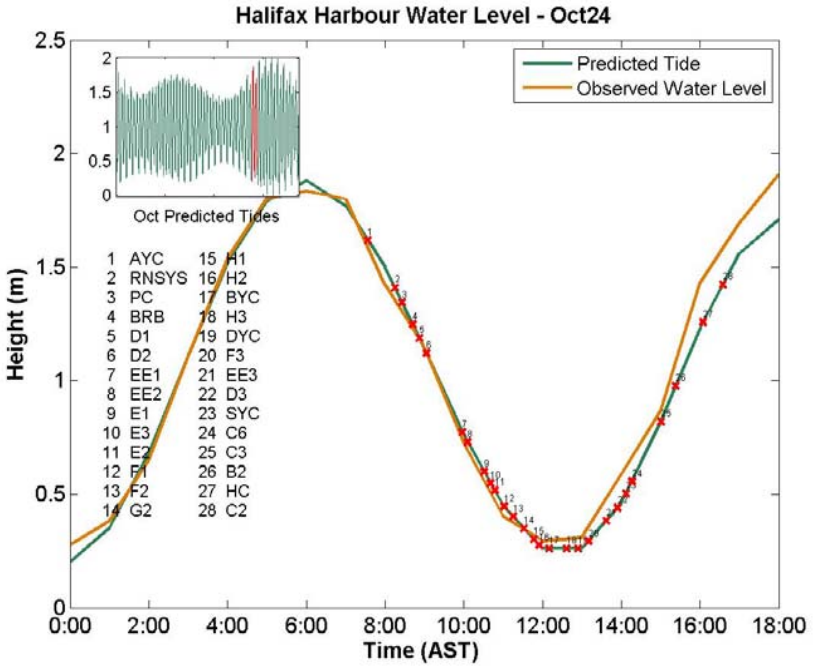


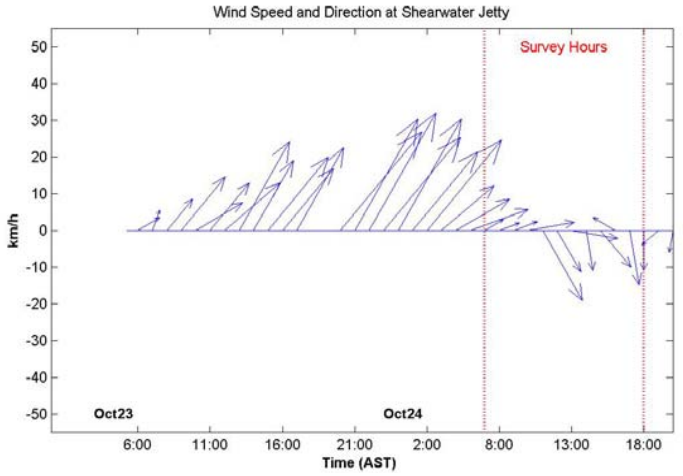


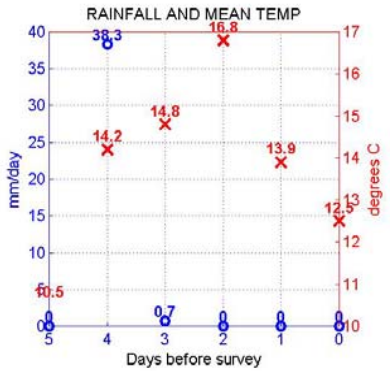


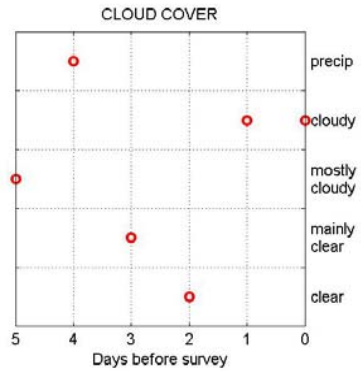
Rainfall and temperature data collected at Shearwater Autoport.

Cloud cover data collected at Shearwater Airport

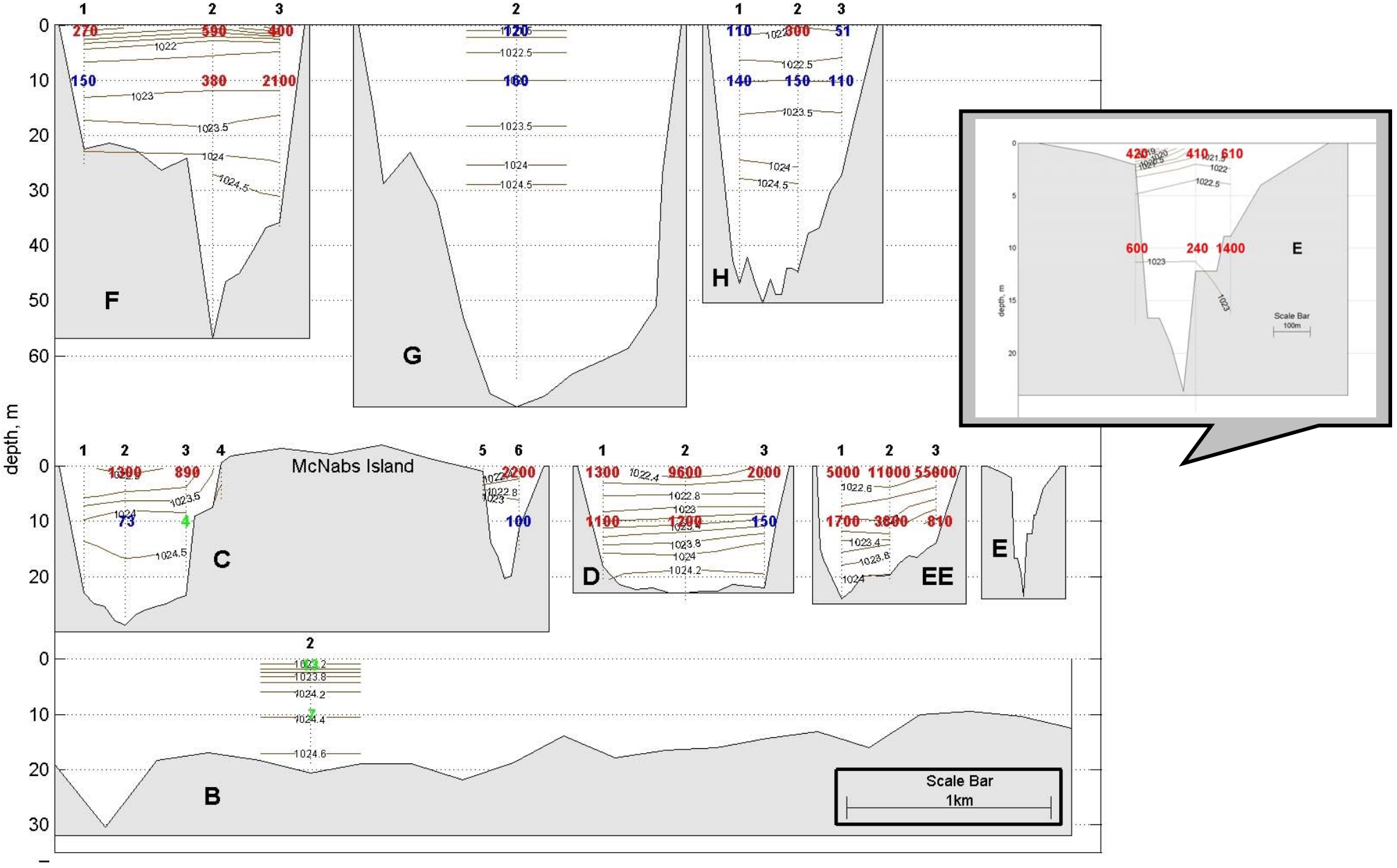








Salinity in PSU **Temperature in ^{o}C**


depth, m
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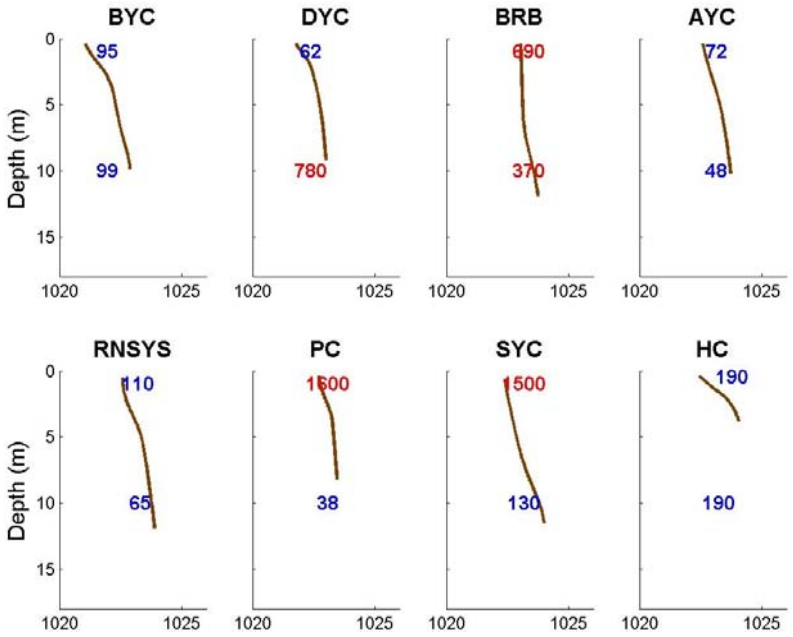
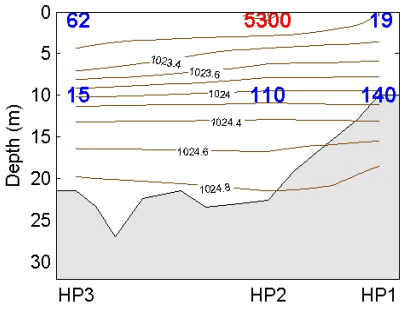
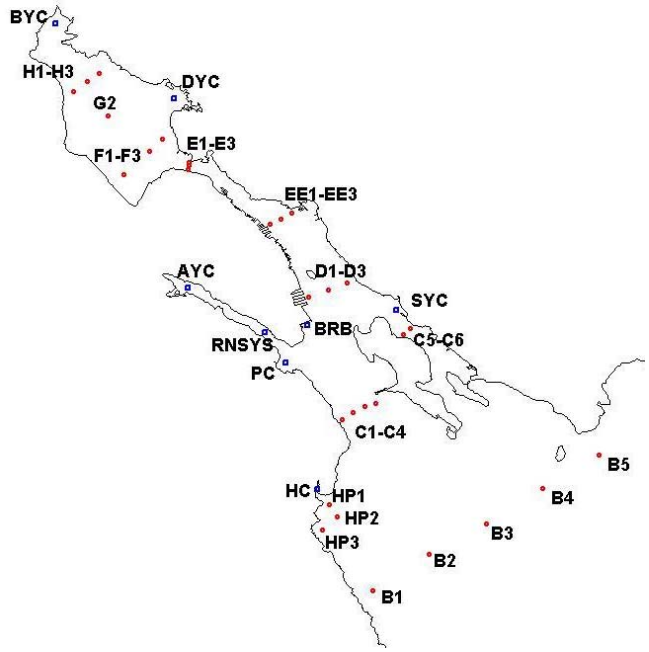
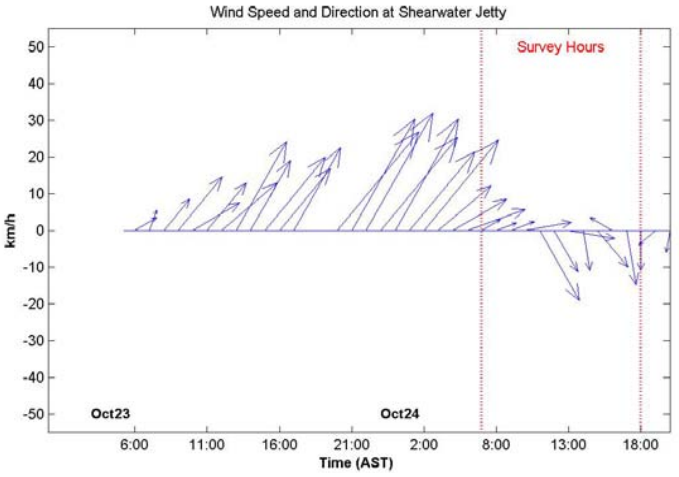
McNabs Island
Scale Bar
1km
Scale Bar
100m

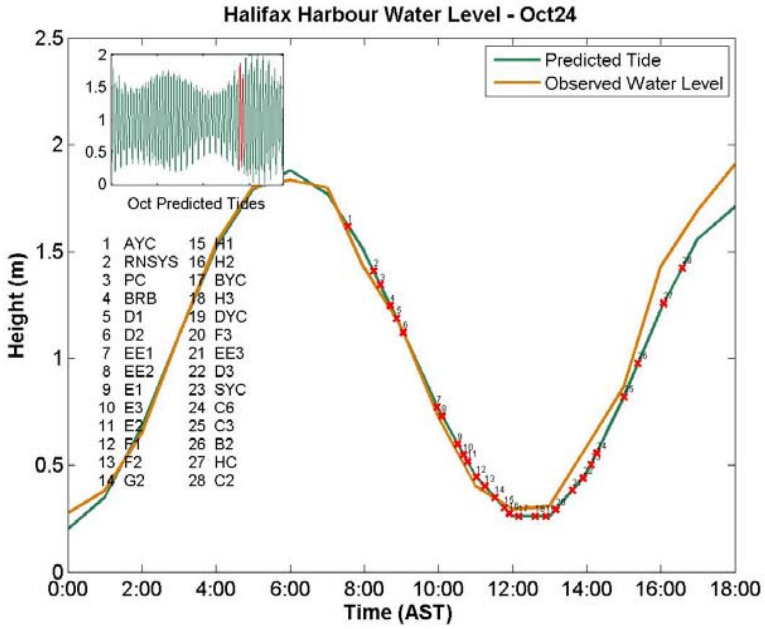
Yacht Clubs











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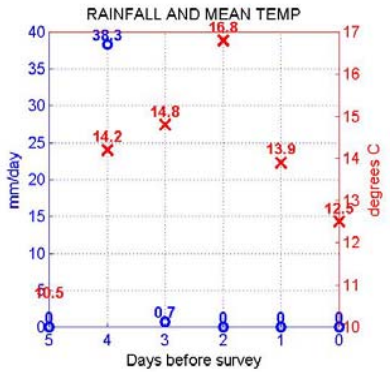
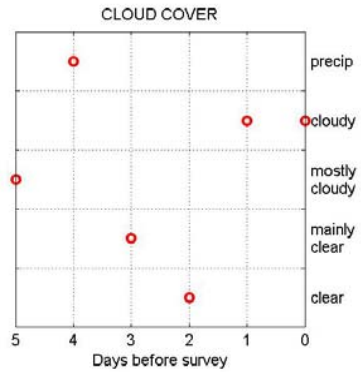
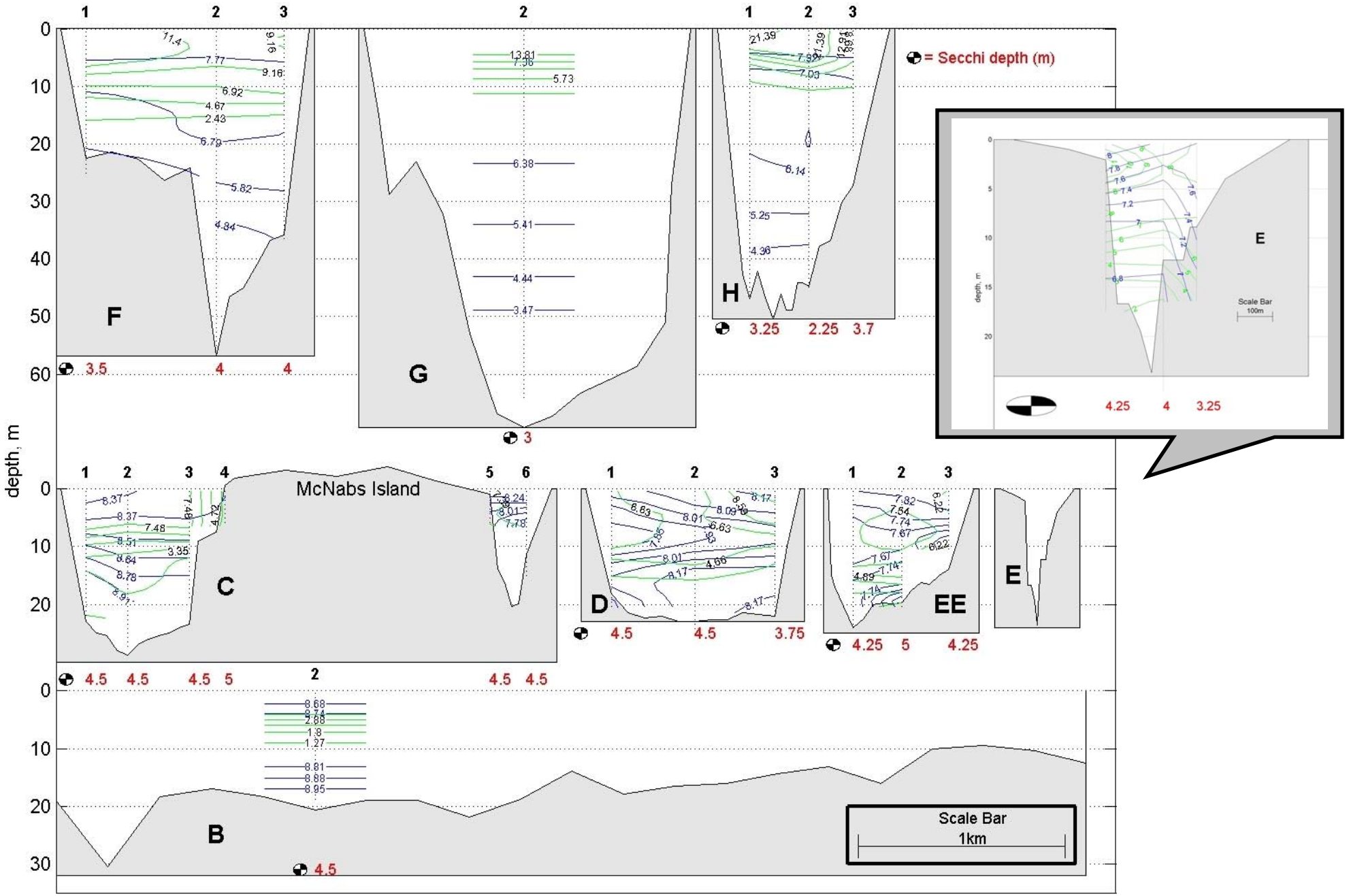




Potential Density in kg/m^3

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


depth, m
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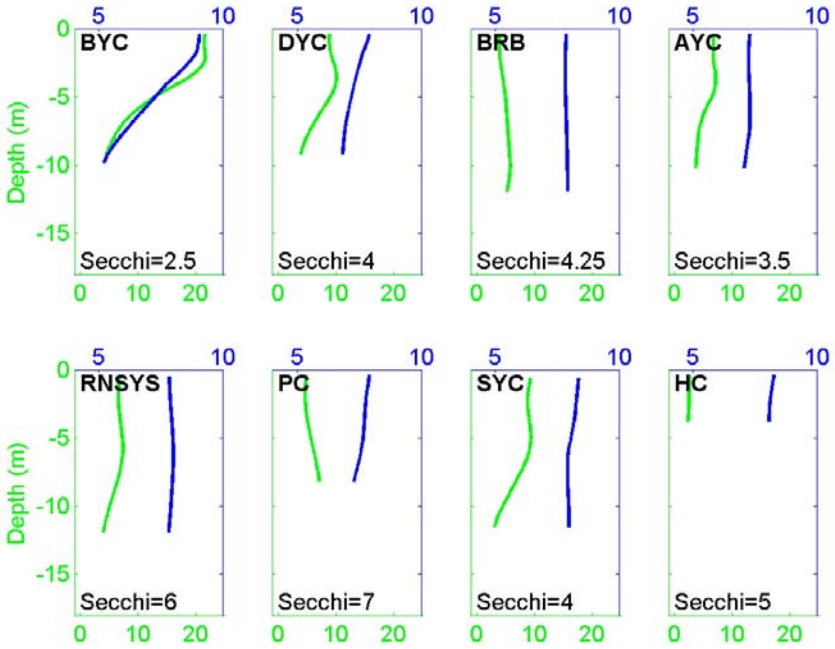

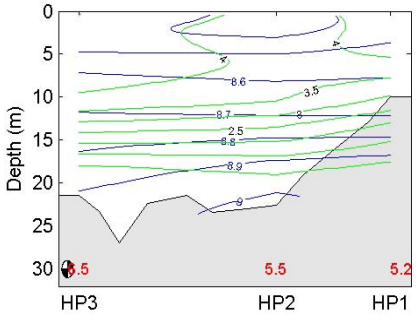

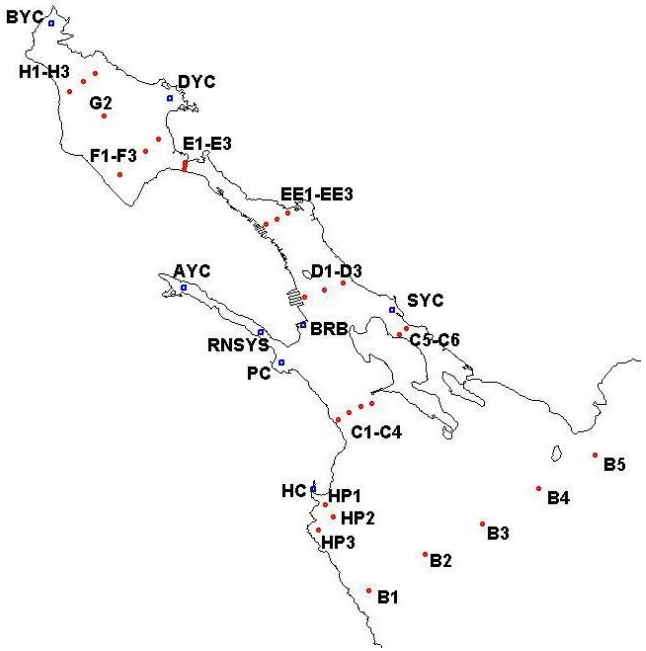

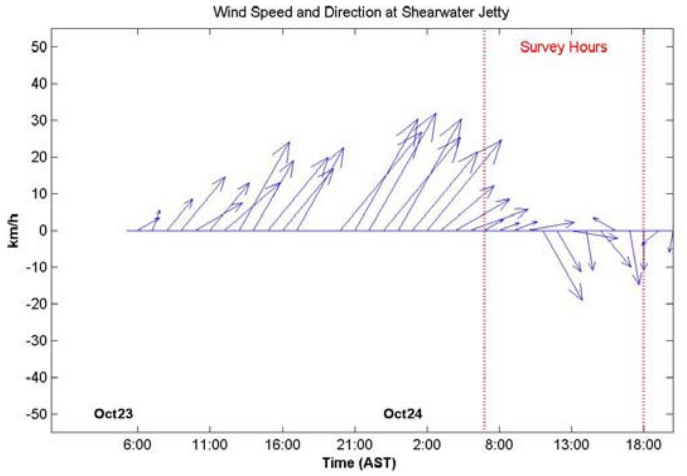

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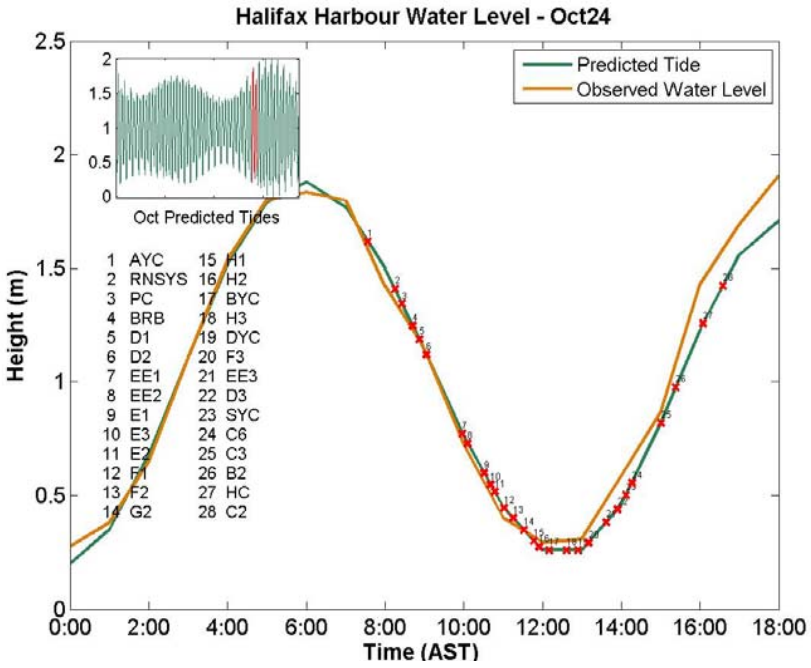
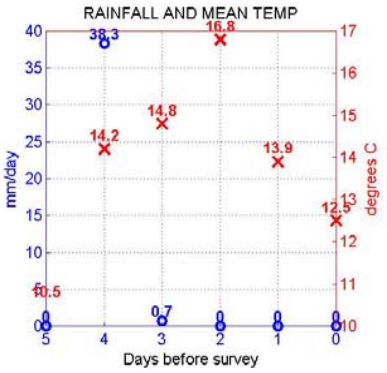
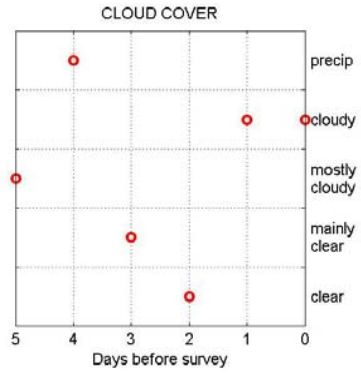
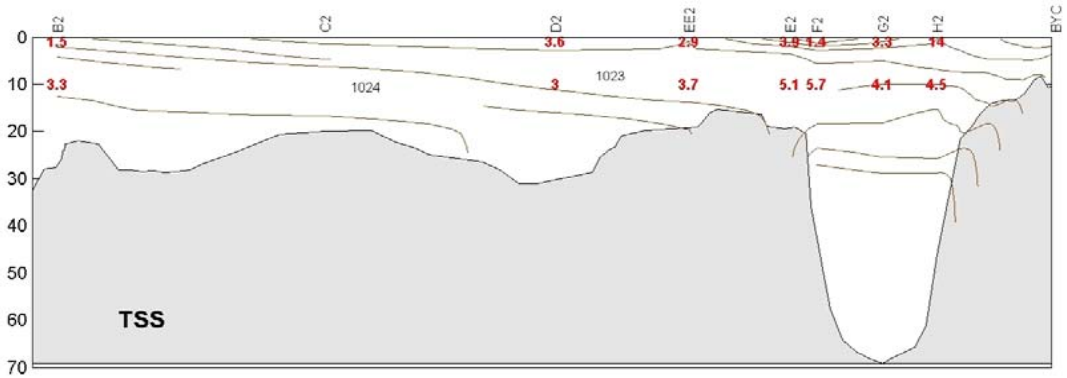
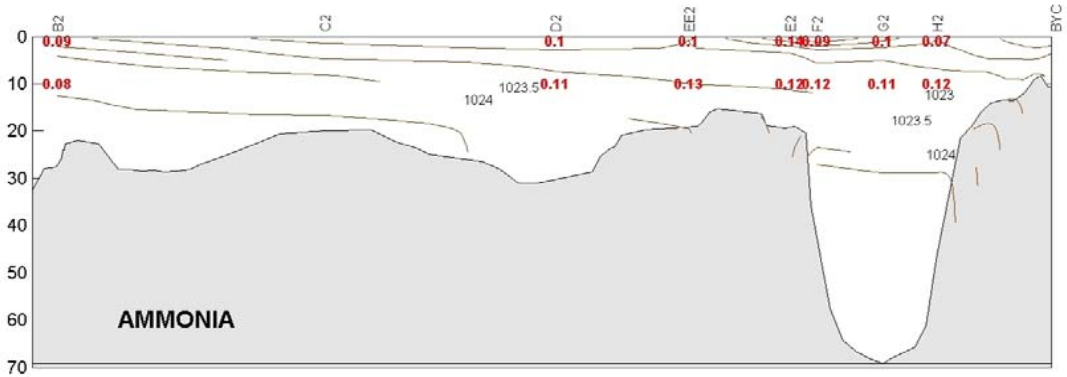


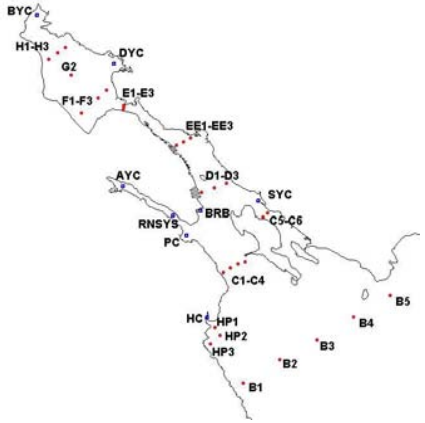




DO in mg/L **Chlorophyll in mg/m^3**







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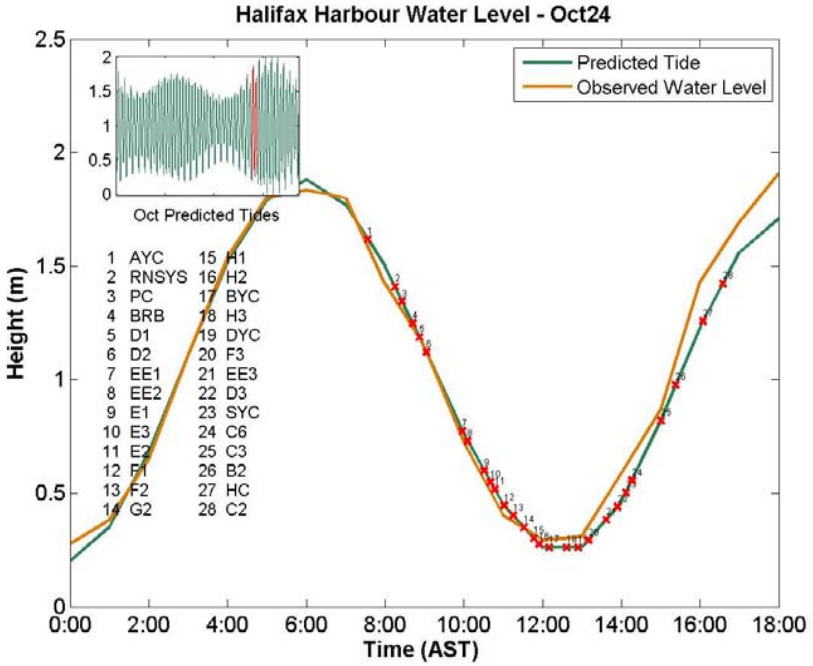
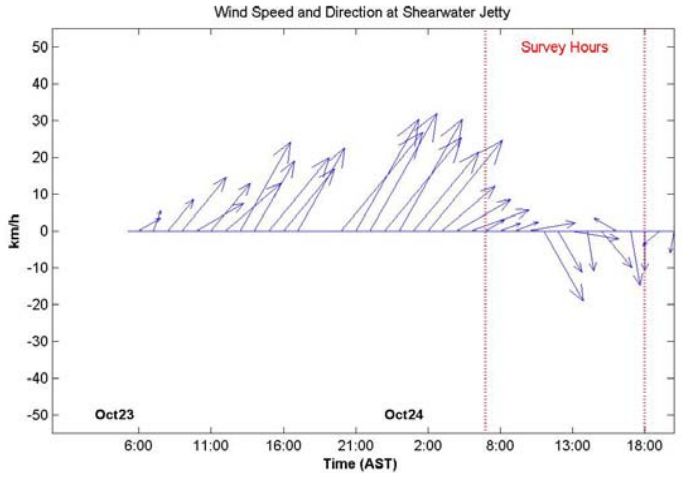
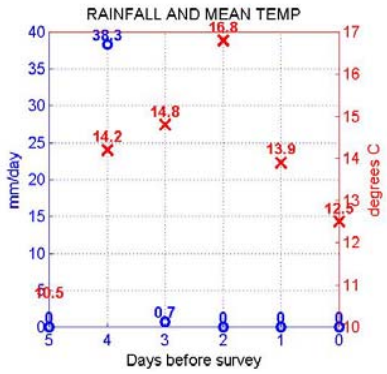
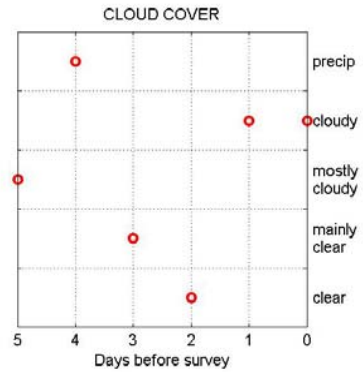
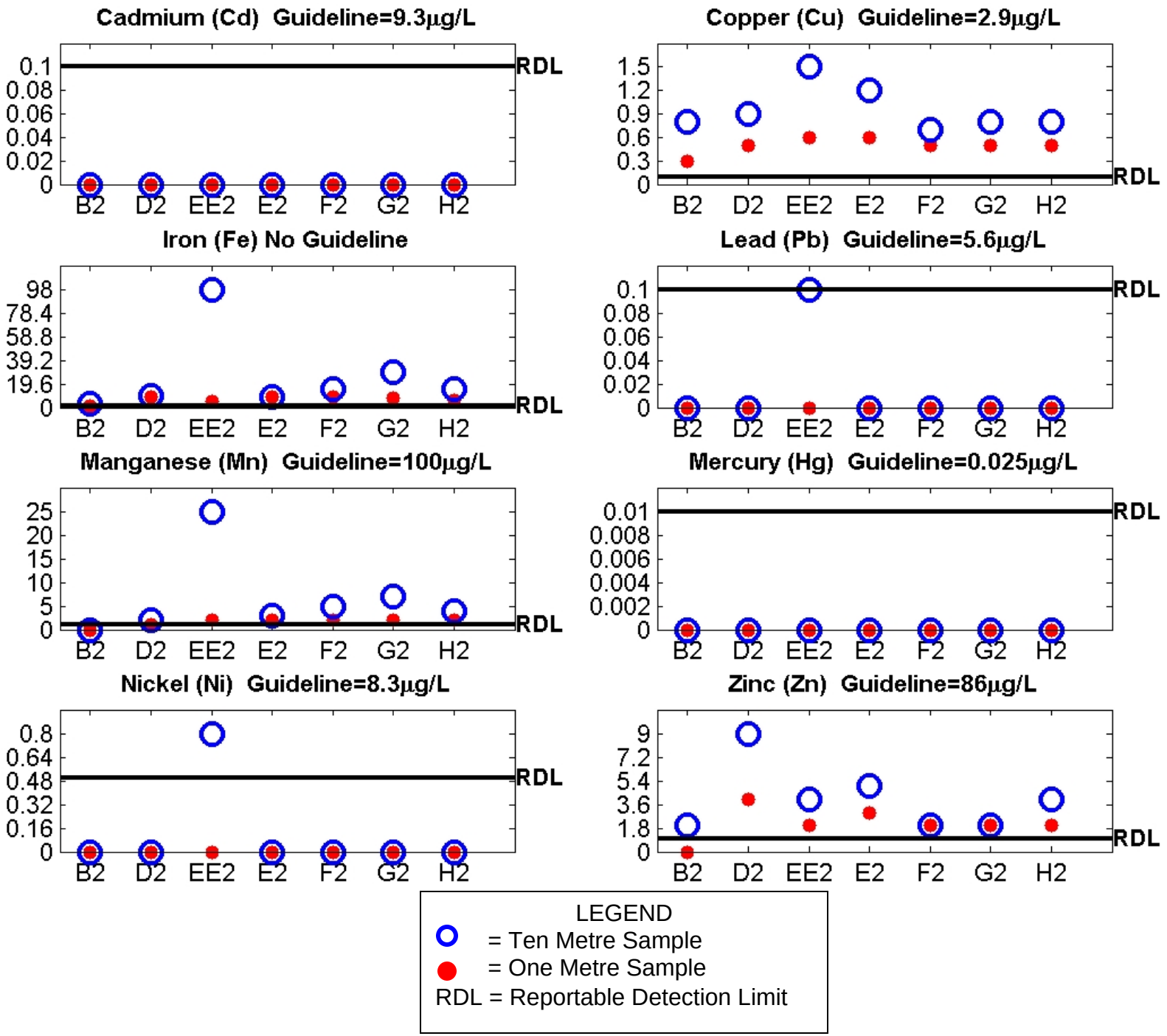
Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**










Cadmium (Cd) Guideline=9.3µg/L
0.1
0.08
0.06
0.04
0.02
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Copper (Cu) Guideline=2.9µg/L
1.5
1.2
0.9
0.6
0.3
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Iron (Fe) No Guideline
98
78.4
58.8
39.2
19.6
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Lead (Pb) Guideline=5.6µg/L
0.1
0.08
0.06
0.04
0.02
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Manganese (Mn) Guideline=100µg/L
25
20
15
10
5
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Mercury (Hg) Guideline=0.025µg/L
0.01
0.008
0.006
0.004
0.002
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Nickel (Ni) Guideline=8.3µg/L
0.8
0.64
0.48
0.32
0.16
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Zinc (Zn) Guideline=86µg/L
9
7.2
5.4
3.6
1.8
0
RDL
B2 D2 EE2 E2 F2 G2 H2
LEGEND
= Ten Metre Sample
= One Metre Sample
RDL = Reportable Detection Limit