Halifax Harbour Water Quality Monitoring Project
Survey Summary #179

Survey Date: 11 March 2009
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_ report_179_090311.doc
Data File: HHWQMP_data _179_090311.xls
Data Return:

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

Sample Notes:

There was no data from EE3 recorded on the CTD. Probable user error.

There were spikes in the DO profiles at B2, BRB and DYC. The unedited data is plotted here, but the profiles have been edited and annotated in the data file.

A supplementary CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 1550 local time (AST).

To match the collected reference data, the presented DO values should be scaled by a factor of 1.3 (see data file cover sheet).

QA/QC samples:

Chemical Analysis

		E2-1m	
Detectable Parameter	**Units**	**Reference Sample**	**QA/QC**
Ammonia (as N)	mg/L	0.06	0.08
Total Suspended Solids	mg/L	4.9	2
Copper	ug/L	1.0	0.7
Iron	ug/L	17.0	20.0
Manganeses	ug/L	5.0	7.0
Nickel	ug/L	<0.5	0.6
Zinc	ug/L	3.0	3.0

Fecal Coliform (CFU/100ml)

Site	C6-10m	DYC-1m	PC-10m	E2-1m
Reference	22	1	81	320
QA/QC	25	5	51	580

Comments:

General: There has been moderate precipitation (31 mm) in the five days before the survey. The mean air temperatures were above or slightly below freezing, so this was probably a mix of rain and snow. The surface salinity has decreased significantly near stream inputs but overall only slightly from the previous survey. This is more evident in the Basin. There appears to be an ongoing intrusion of slightly more saline, slightly warmer shelf water that is replacing the Basin bottom water. Below about 25 m the Basin density is very uniform and lower than the density at 15 m in the Narrows. Elevated fecal coliform levels (> swimming guideline) occur primarily in surface samples in the Inner Harbour. The distribution appears displaced up Harbour with some elevated surface levels in the Narrows and Basin. This is likely a result of the brisk up Harbour winds the day of the survey. There are also elevated near-surface values in the HP section near the Tribune Head outfall.

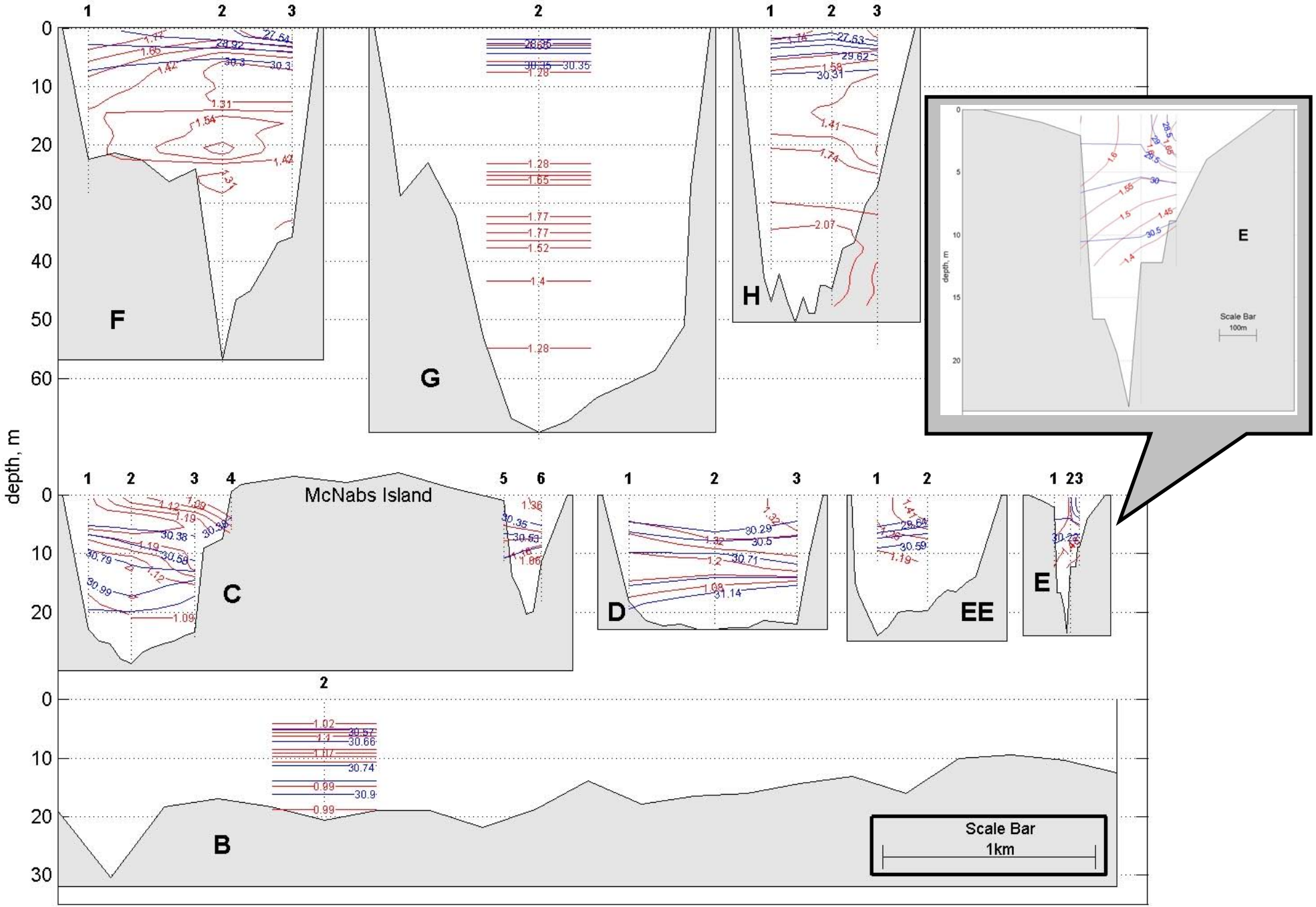
Fluorescence: The fluorescence data indicates a slight increase in phytoplankton activity with profile maximum values of about 6-7 mg/L in the Basin. Elsewhere, the profile maximums are about 3.0 mg/L or more, except at B2 in the Outer Harbour where the levels are < 2.0 mg/L.

TSS: The average TSS level is relatively low (2.9 mg/L). The levels are lower in the Outer Harbour and southern Inner Harbour.

Ammonia: The ammonia levels are moderate, with detectable concentrations (>0.05 mg/L) in all but three samples. The mean value is about 0.6 mg/L. The highest values are in the 1 m samples in the Basin and decrease below detection limits going south in the Inner Harbour to the Outer Harbour.

Metals: There are no guideline exceedences. The closest metal to guideline exceedence levels is copper, with several values at about 30% of the 2.9µg/L guideline. The highest levels occur in the 1 m samples from the central Inner Harbour north to the Basin.

Dissolved Oxygen: The dissolved oxygen data, scaled appropriately by a factor of 1.3, indicates that south of the Basin, and in the nearsurface water in the Basin, the DO concentration is 9-10 mg/L. In the Basin the deepest water is well oxygenated at just below 9 mg/L. The minimum DO is in the deeper water in the northern Basin (section H) at about 6.2 mg/L. This exceeds the class B (7.0 mg/L) guideline and is the only exceedence in the survey. In the remainder of the Basin there is a mid-water minimum (> 7.0 mg/L) at 15 to 30 m.


depth, m
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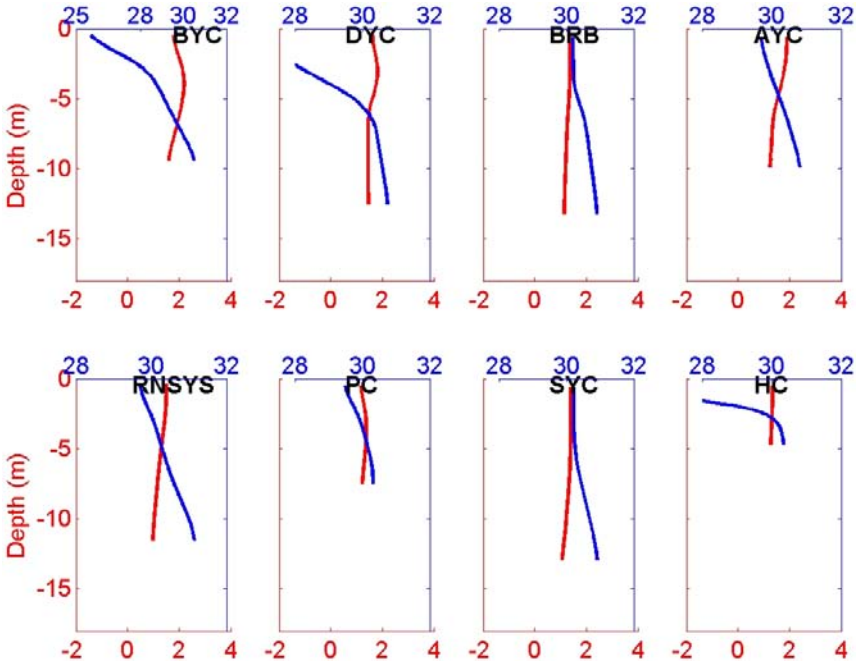
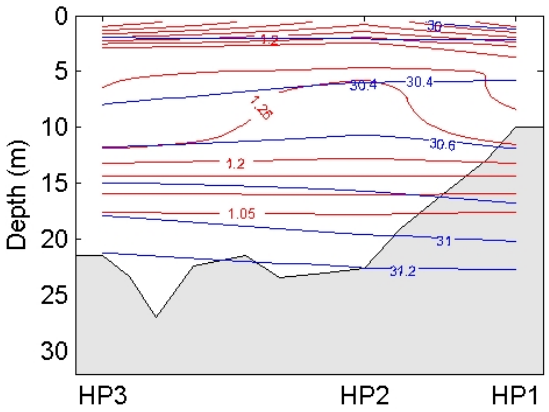
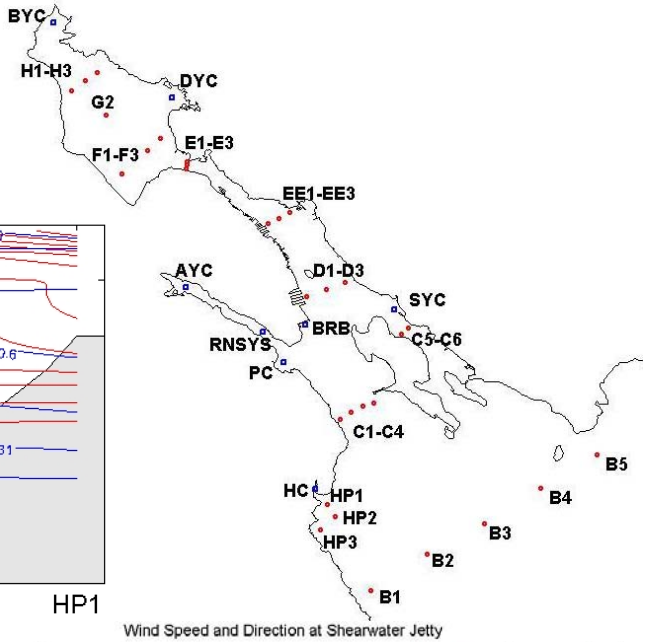
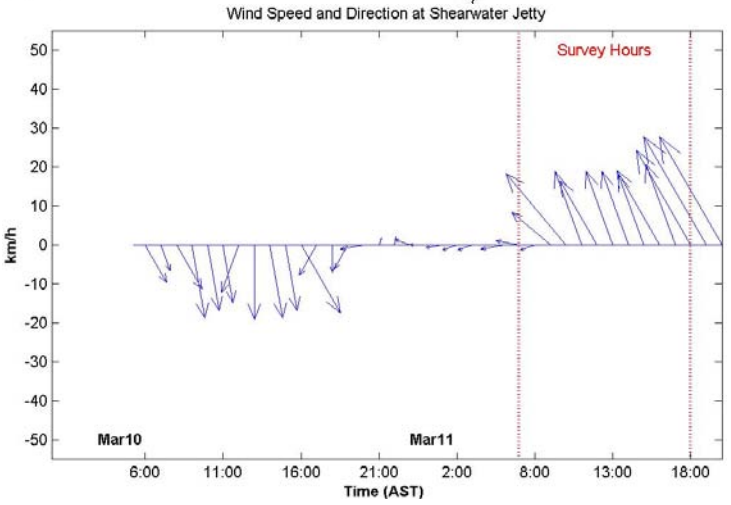
Scale Bar
1km
Scale Bar
100m

Yacht Clubs



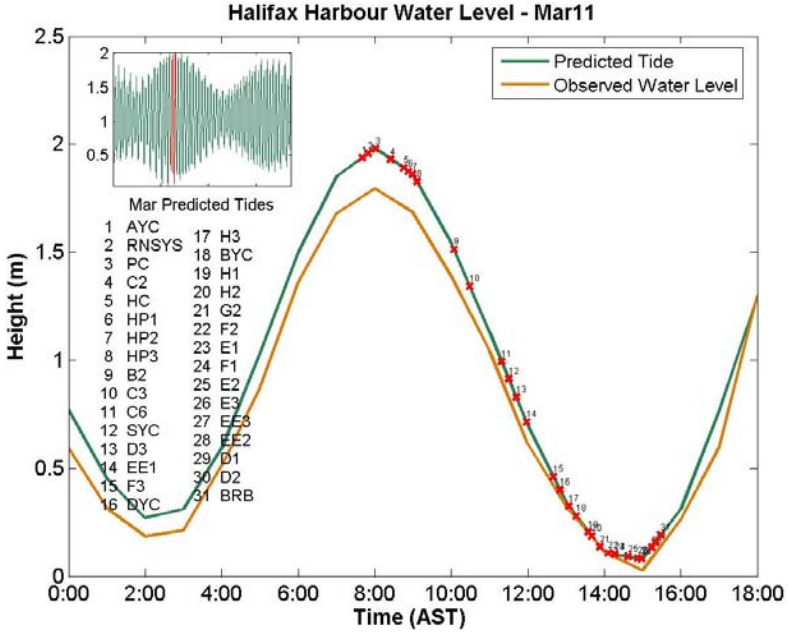


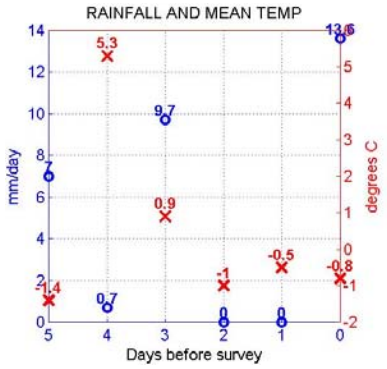


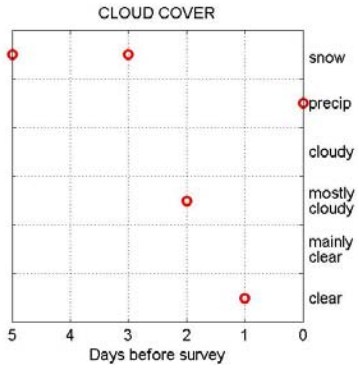


Rainfall and temperature data collected at Shearwater Autoport.

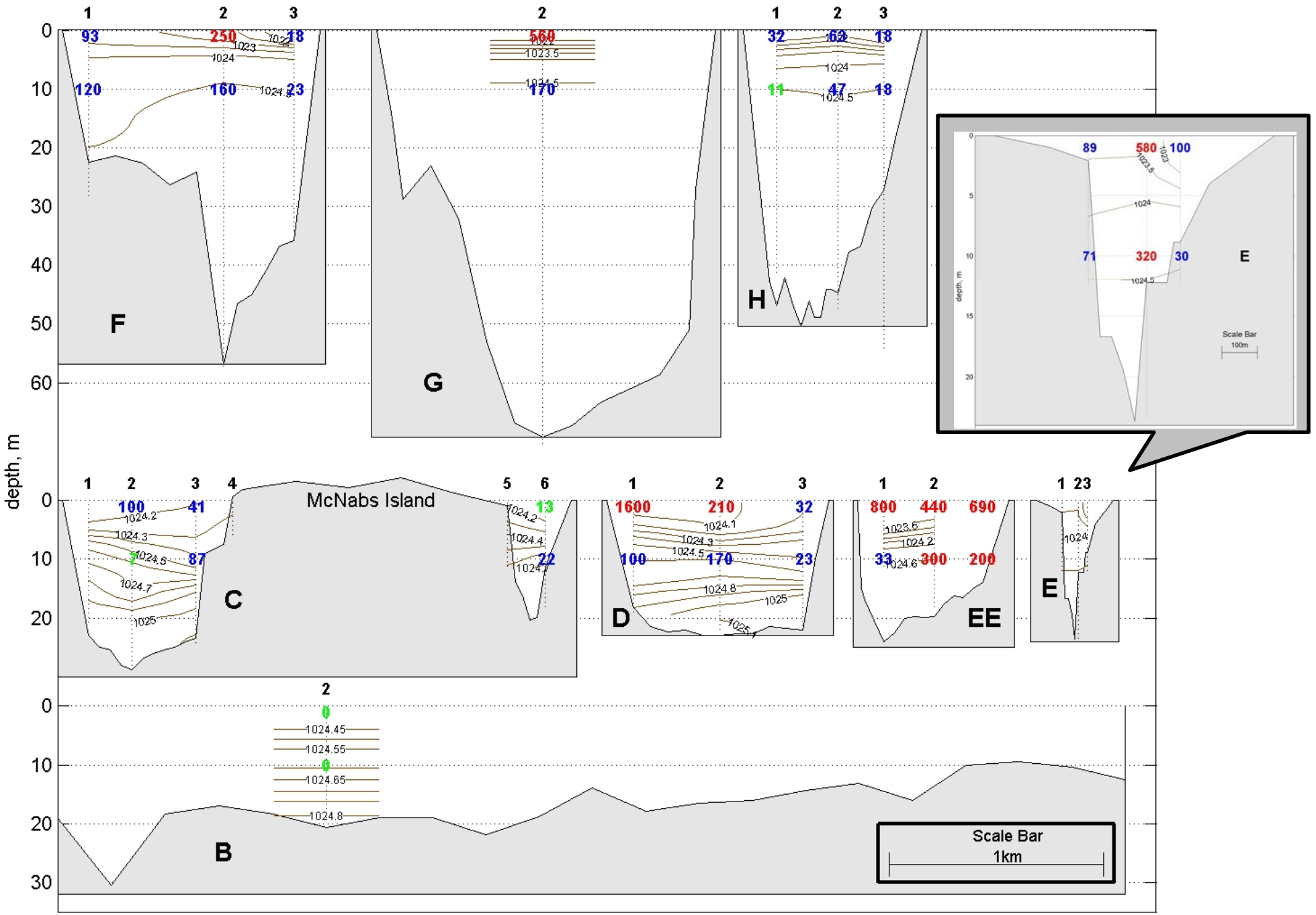
Cloud cover data collected at Shearwater Airport







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


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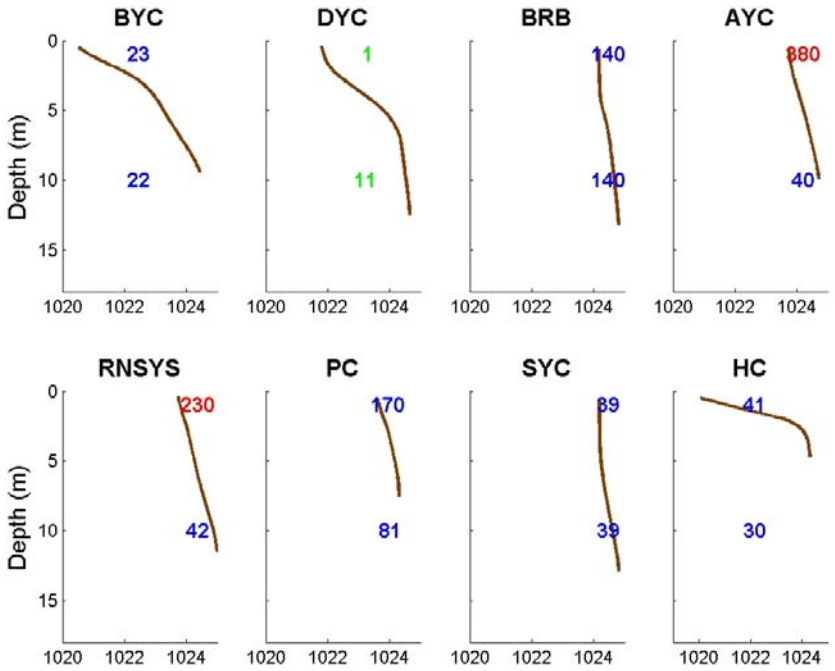
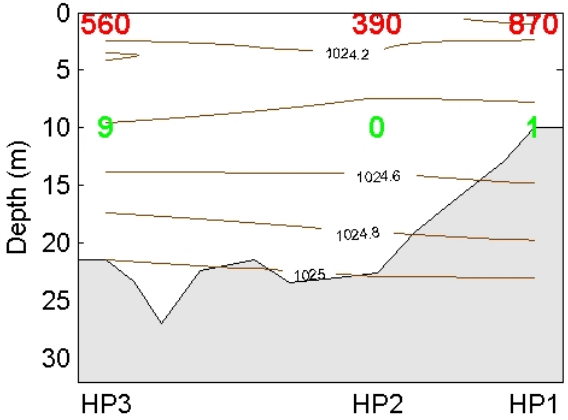
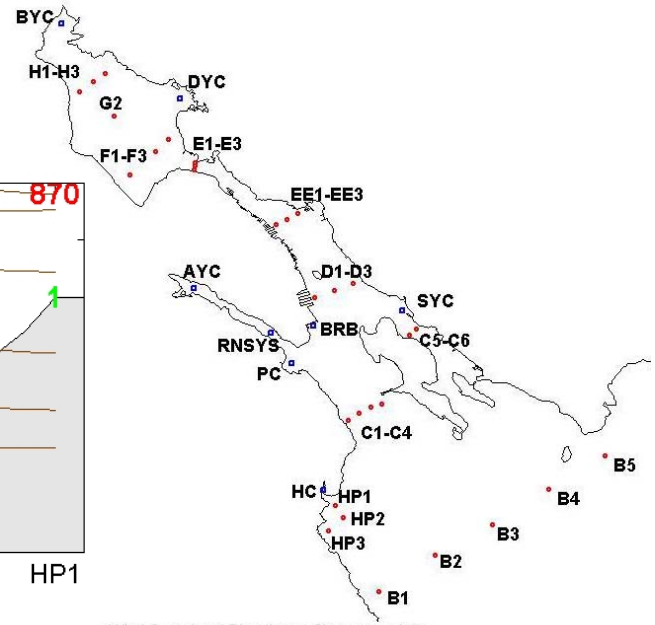
McNabs Island
Scale Bar
1km
Scale Bar
100m

Yacht Clubs







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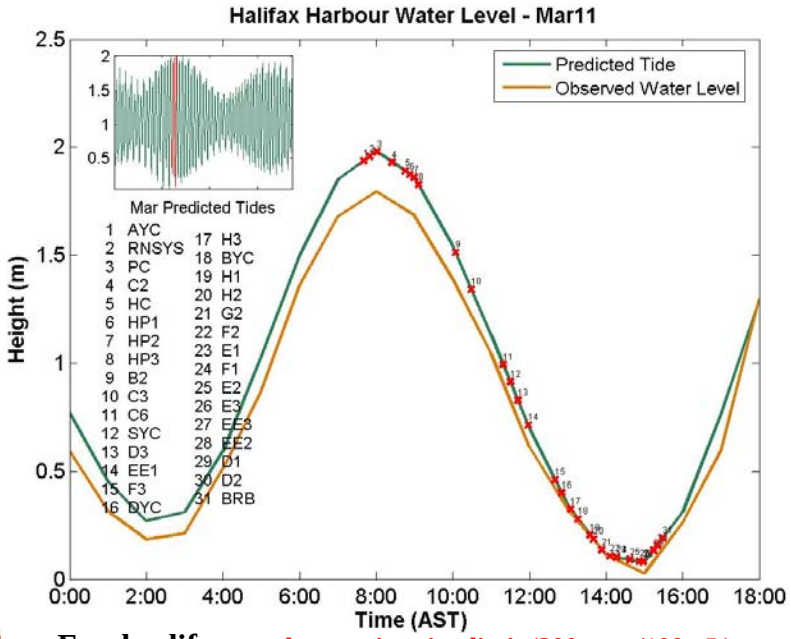
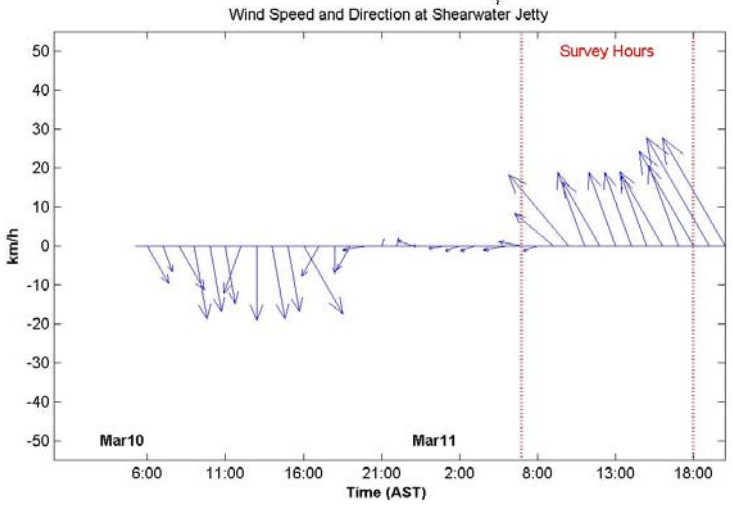
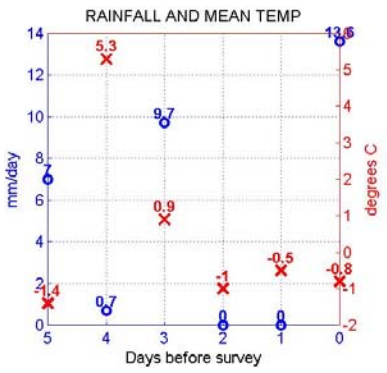
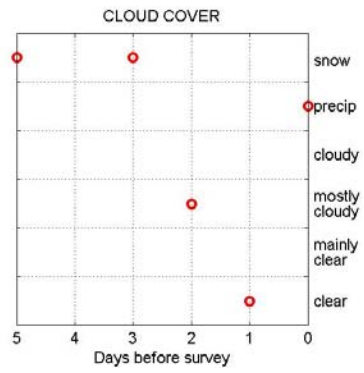


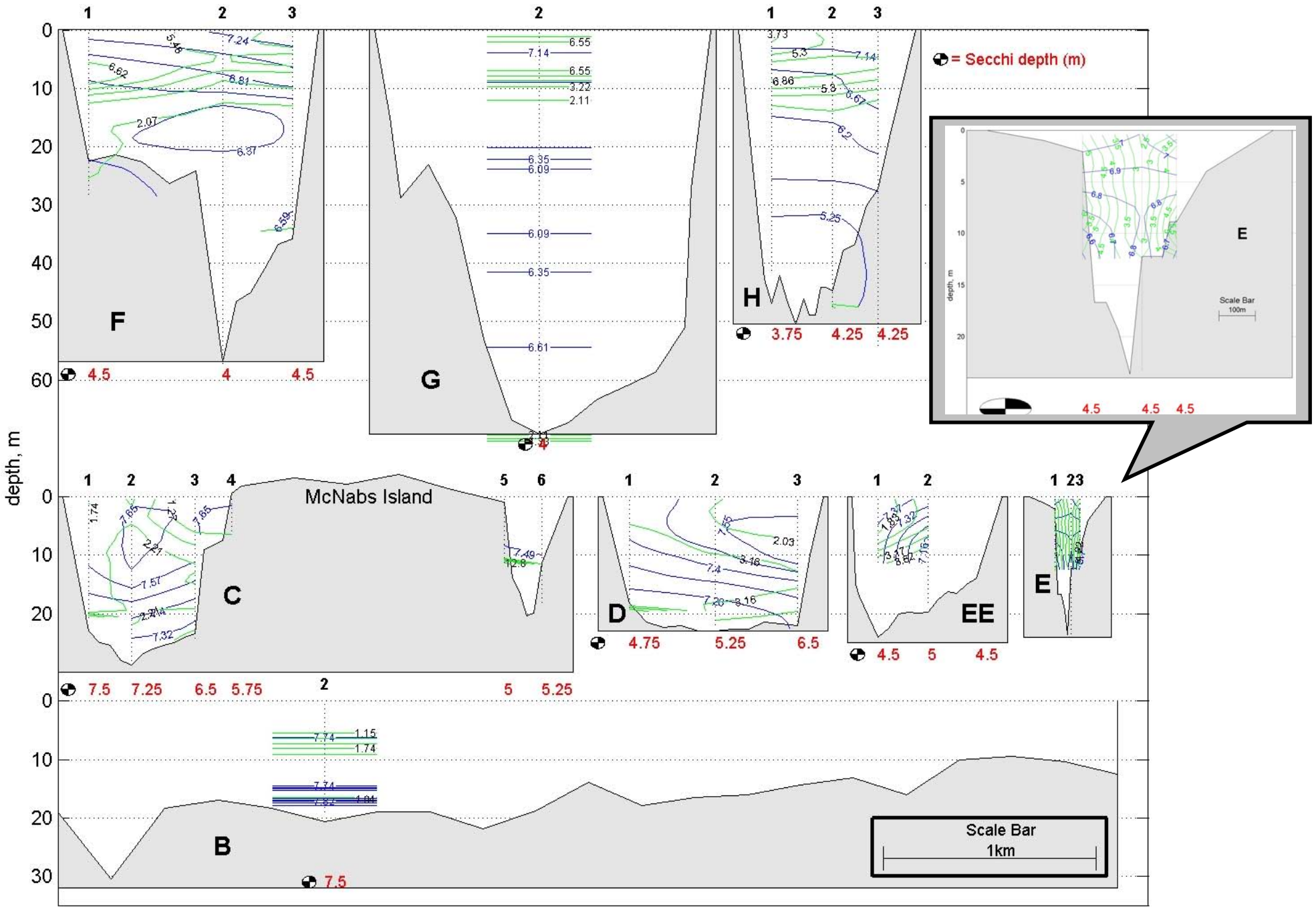






Potential Density in kg/m^3

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


depth, m
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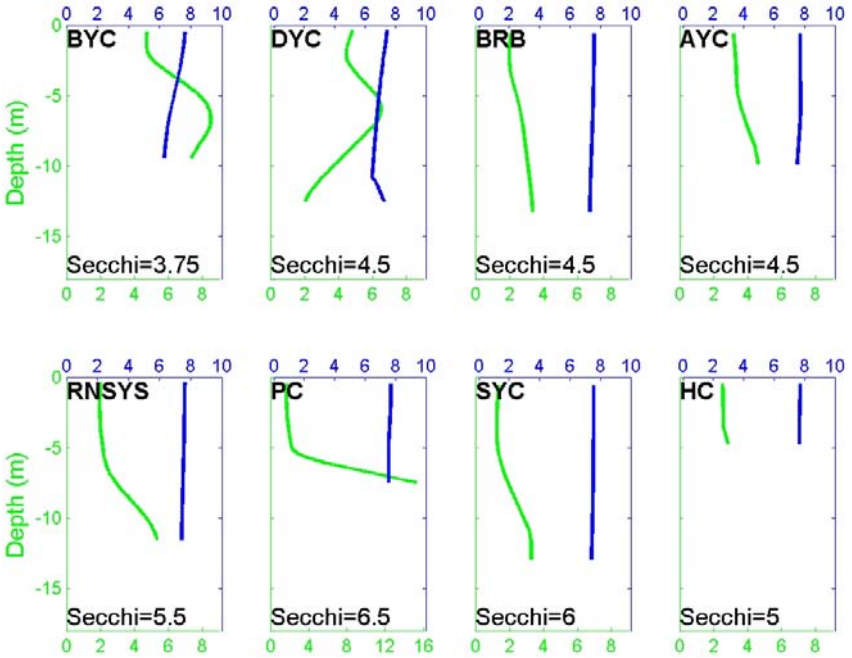

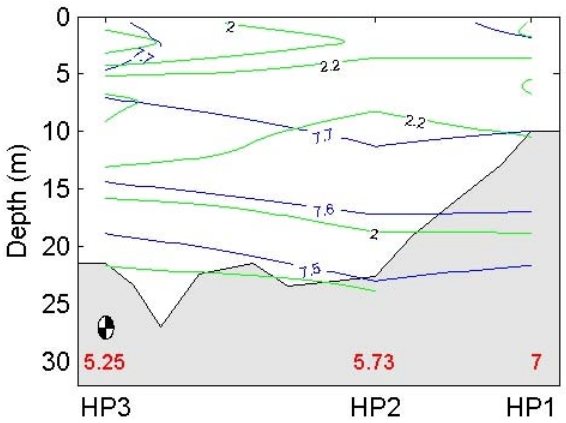

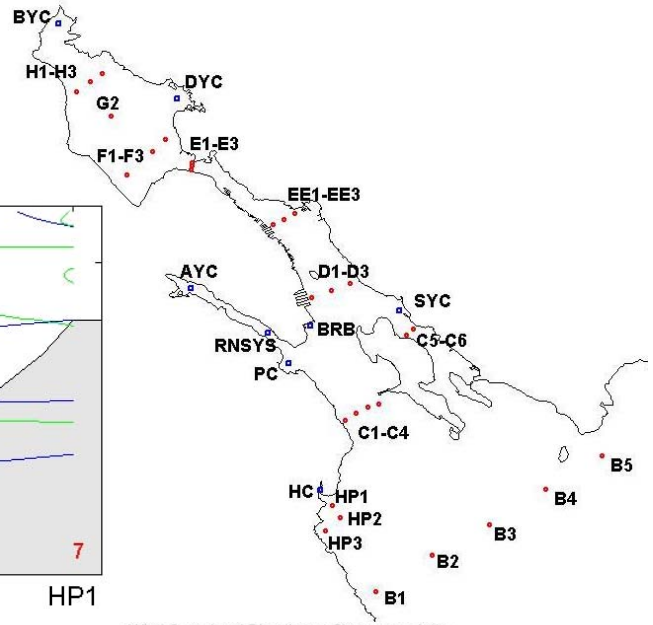

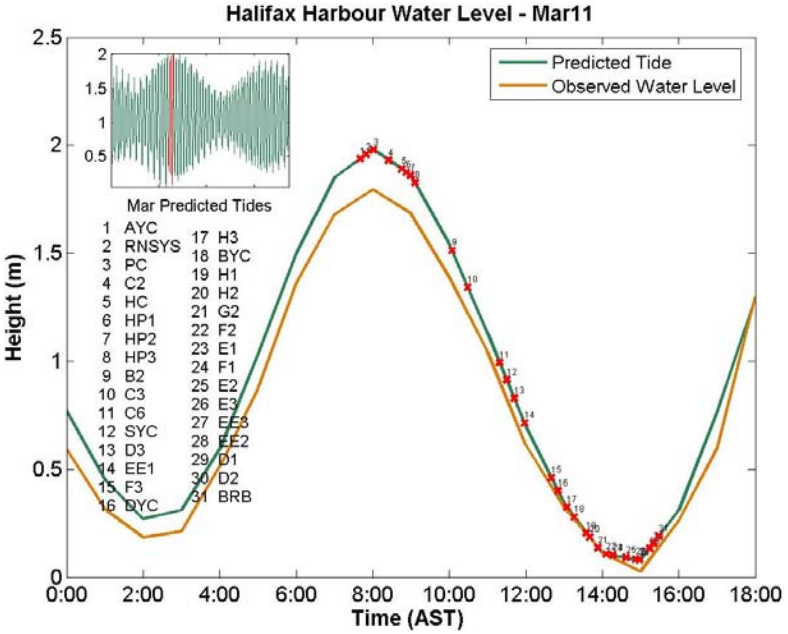

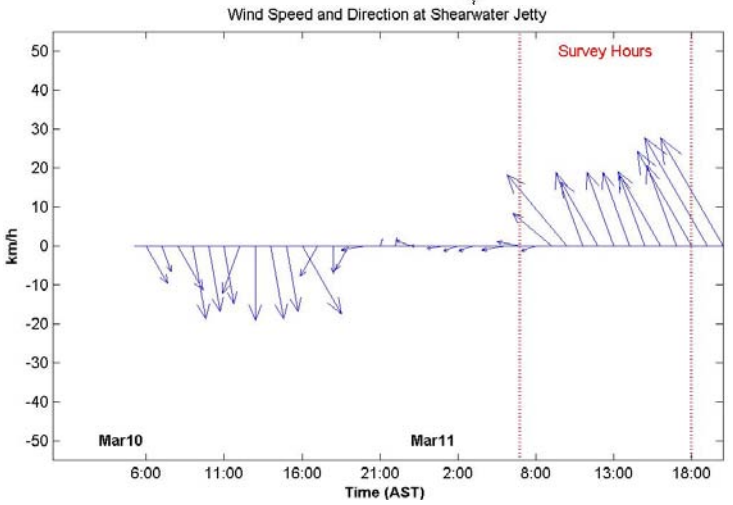

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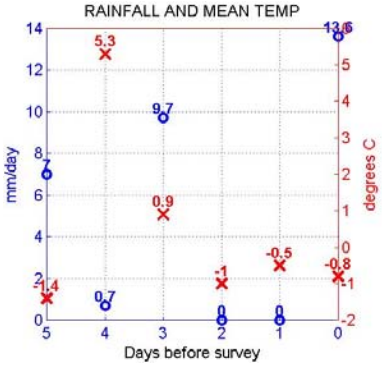
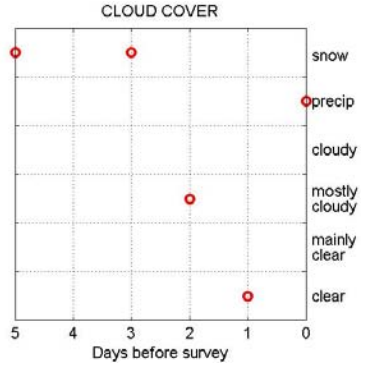
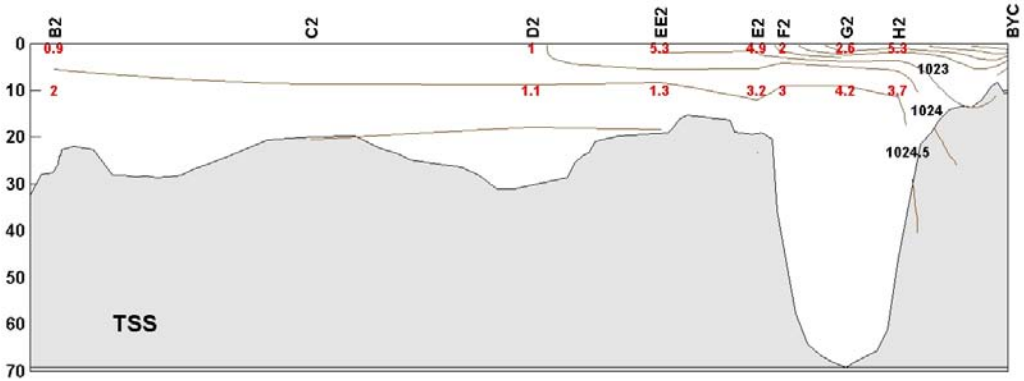
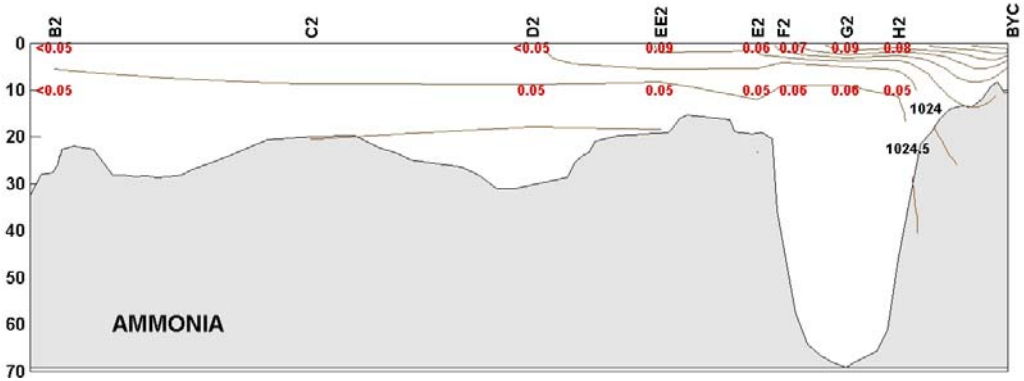




DO in mg/L **Chlorophyll in mg/m^3**





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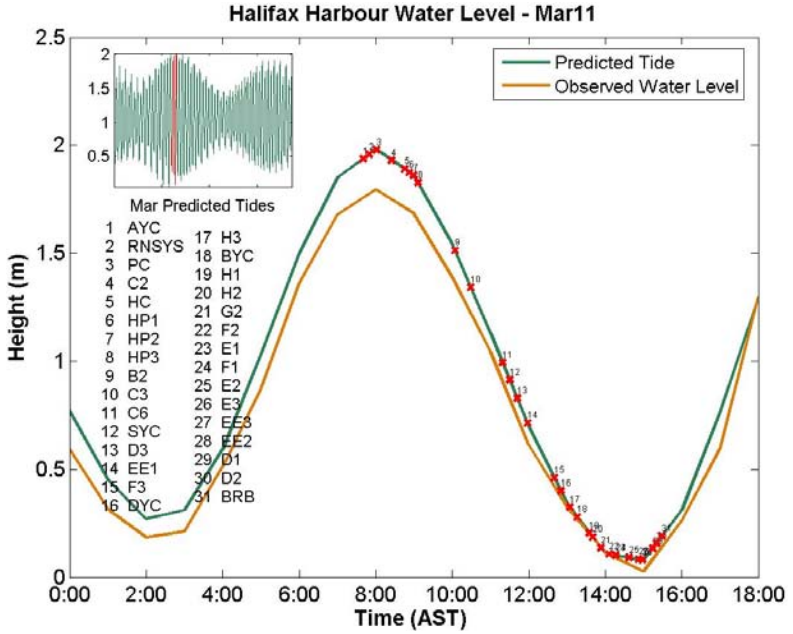
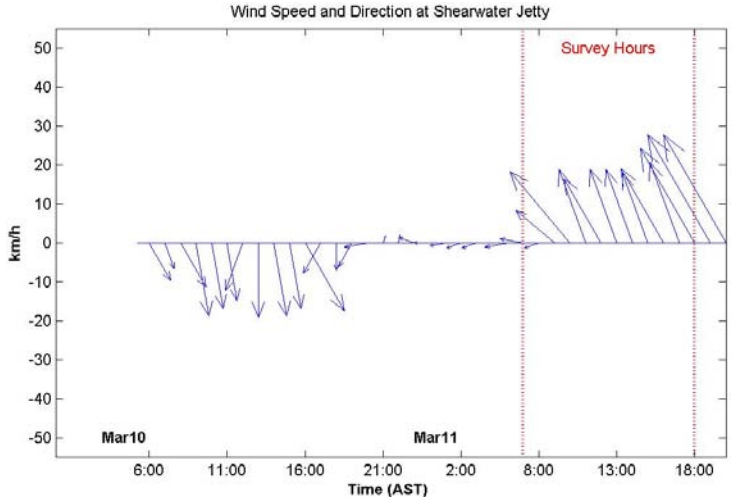
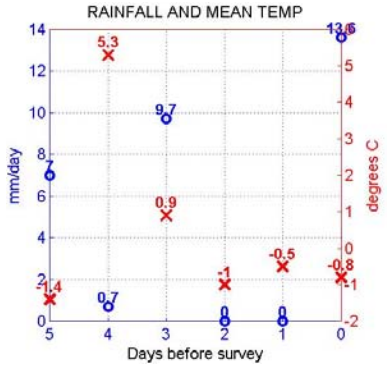
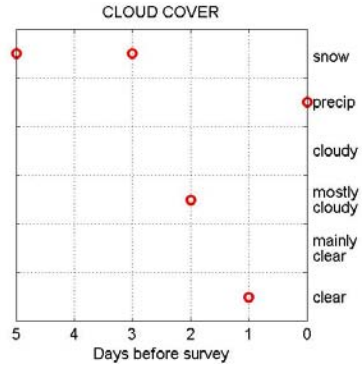
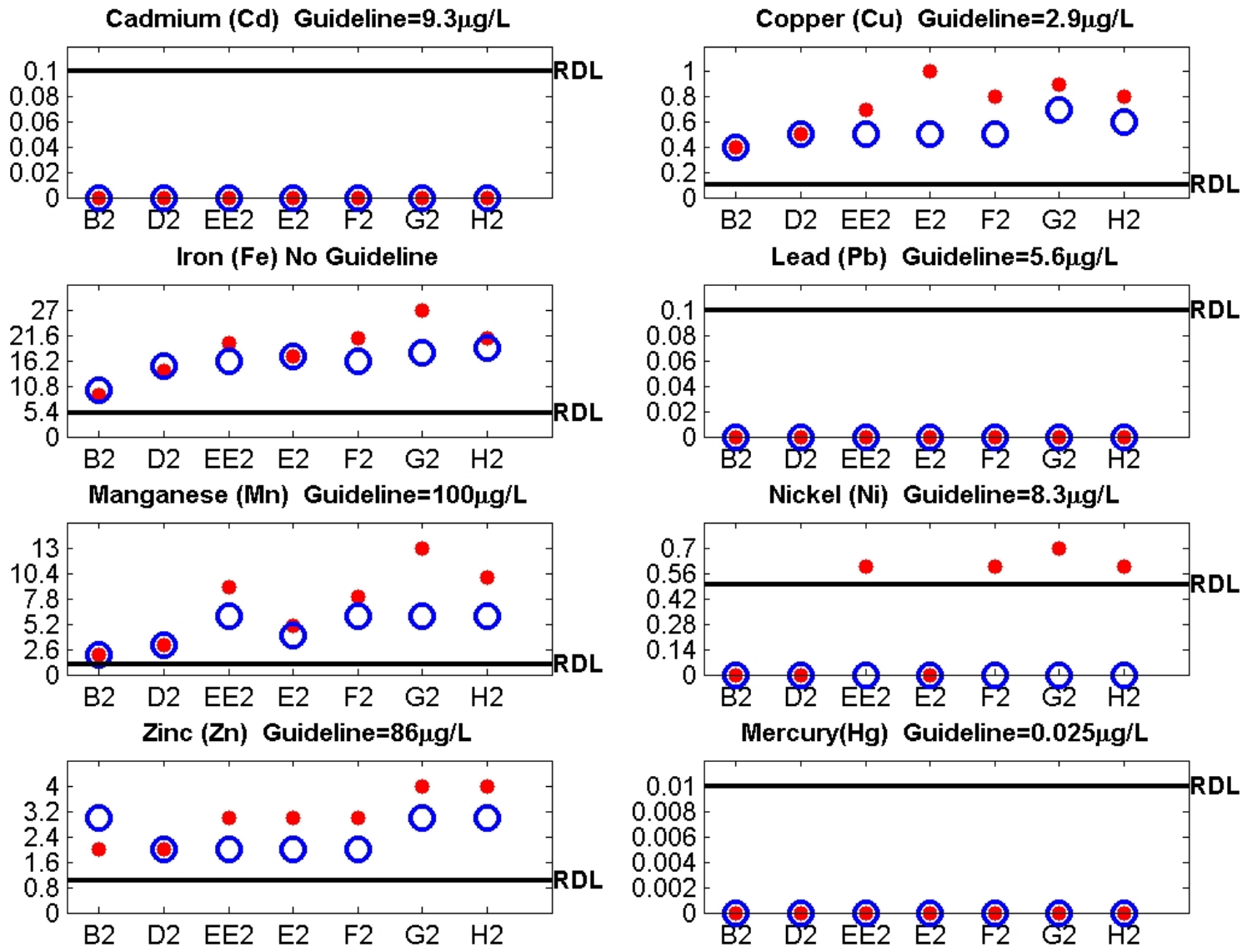
Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**










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
0.8
0.6
0.4
0.2
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Iron (Fe) No Guideline
27
21.6
16.2
10.8
5.4
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
13
10.4
7.8
5.2
2.6
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Nickel (Ni) Guideline=8.3µg/L
0.7
0.56
0.42
0.28
0.14
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Zinc (Zn) Guideline=86µg/L
4
3.2
2.4
1.6
0.8
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
LEGEND
= Ten Metre Sample
= One Metre Sample
RDL = Reportable Detection Limit

HRM Water Quality Monitoring
Fecal Coliform Summary – February 24, 2009