Halifax Harbour Water Quality Monitoring Project
Survey Summary #168

Survey Date: 05 November 2008
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report168_081105.doc
Data File: HHWQMP_data168_081105.xls
Data Return:

Chemical:	100%
Bacteria:	98%
Profile:	100%
Overall:	**100%**

Sample Notes:

A supplementary CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 15:30 local time.

The G2-10m and QAQC3 coliform samples were damaged in transit.

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

QA/QC samples:

Chemical Analysis

		D2 – 10m	
Detectable Parameter	**Units**	**Reference Sample**	**QA/QC**
Ammonia (as N)	mg/L	0.11	0.09
Total Suspended Solids	mg/L	2	2
Copper	ug/L	0.5	0.5
Iron	ug/L	15	6
Manganese	ug/L	2	1
Zinc	ug/L	2	2

Fecal Coliform (CFU/100ml)

Site	H3-10m	HP3-1m	D2-10m
Reference	7	700	310
QA/QC	7	16	300

Comments:

General: The Harbour remains relatively well mixed, but is significantly more stratified and less uniform than last survey. This is due primarily to fresher surface water in the Basin and more saline bottom water in the mid to outer Harbour. The water temperature has changed only slightly. The Halifax sewage treatment plant (STP) is shut down, but the outfall is operating. The fecal coliform levels reflect this and are quite high in the Inner Harbour. The maximum values are in the Halifax side of the EE section, closest to the STP. There are also coliform levels in excess of swimming guidelines in the 1 m samples at both HP1 and HP3, in the vicinity of the Tribune Head outfall.

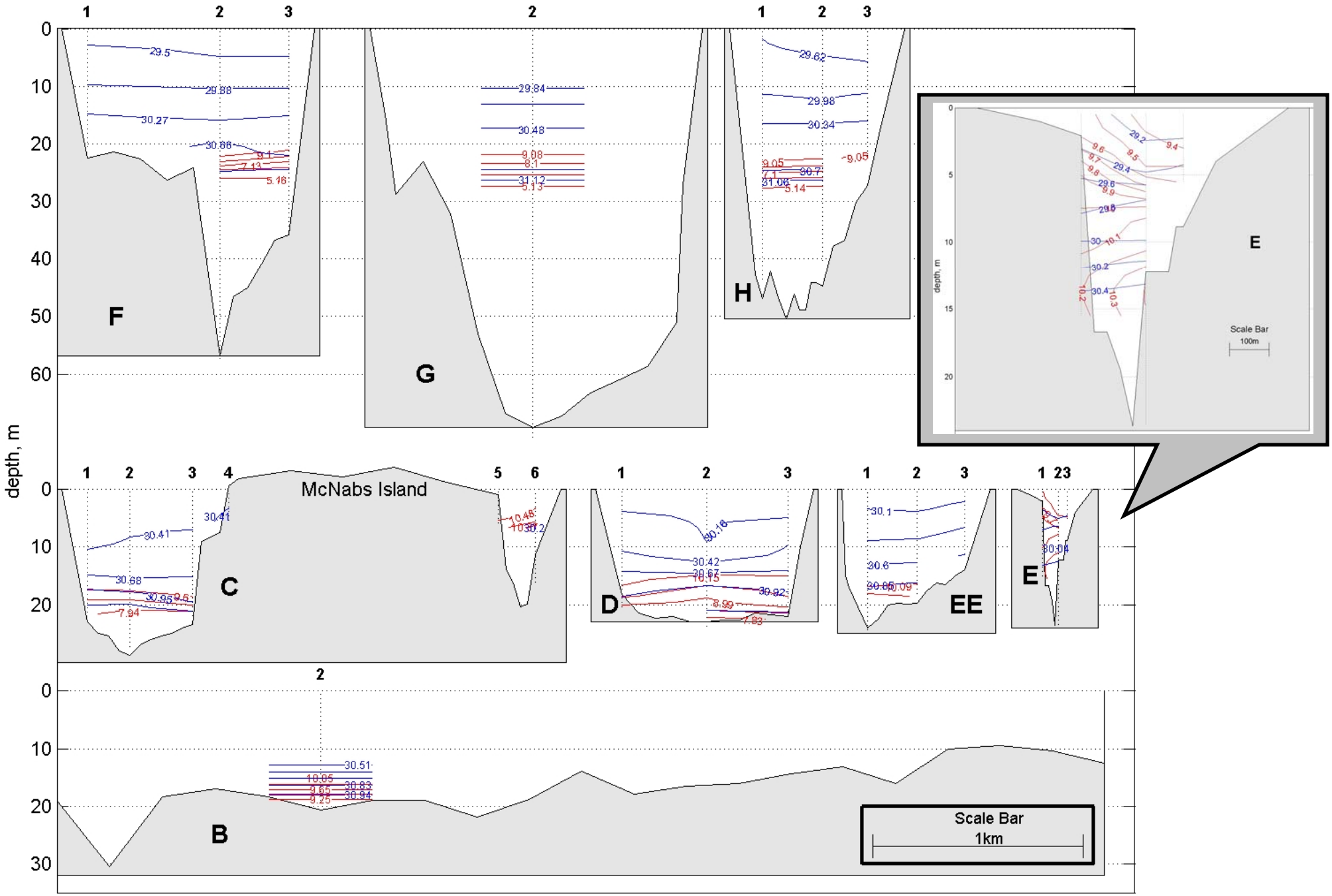
Fluorescence: There is continued low level phytoplankton activity. Profile maximum fluorescence levels in Bedford Basin are between 10-20 mg/m^3. These levels drop to about 5 mg/m^3 in the Outer Harbour.

TSS: The TSS levels are relatively low with all values less than 5 mg/L (mean 2.0 mg/L). The highest values are in 10 m samples. The water transparency, as reflected in the secchi depths, is also quite high.

Ammonia: The ammonia levels are relatively moderate with most samples having detectable concentrations (>0.05 mg/L) and a mean value of 0.07 mg/L. There appears to be a small minimum in the southern Basin.

Metals: There are no guideline exceedences. The closest to exceedence is mercury with a maximum concentration of about 80% of the guideline in the 1 m samples at EE2. There are several samples at about 50% of the copper guideline.

Dissolved Oxygen: The dissolved oxygen data, scaled appropriately by a factor of 1.3, indicates that the surface DO levels are highest in the Basin (> 9.0 mg/L). Elsewhere the surface levels are quite uniform at > 8.0 mg/L and decrease slightly with depth to just under 8.0 mg/L. The DO in the deep water of the Basin (> 25 m) is relatively high and quite uniform at > 6 mg/L. The only guideline exceedence is the class SB (7.0 mg/L) guideline in the deep Basin water.


depth, m
F
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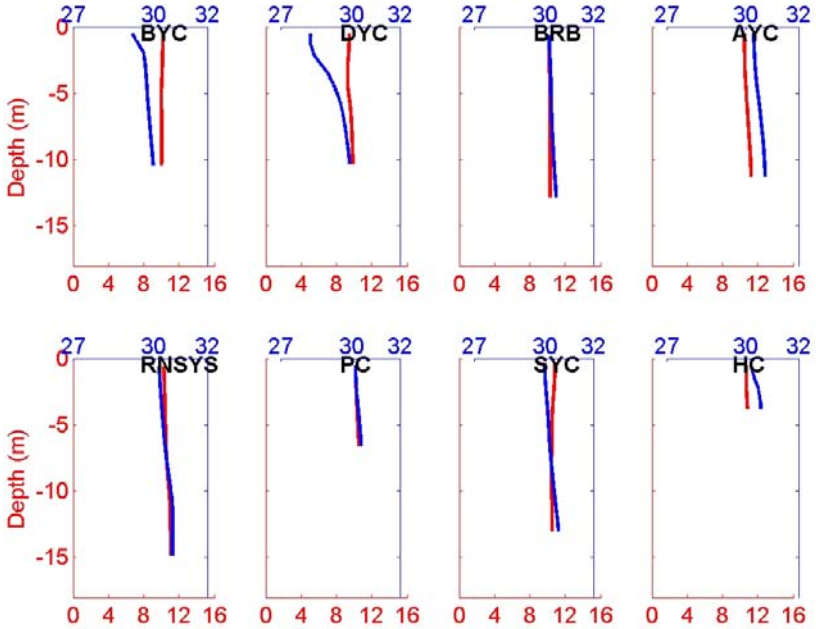
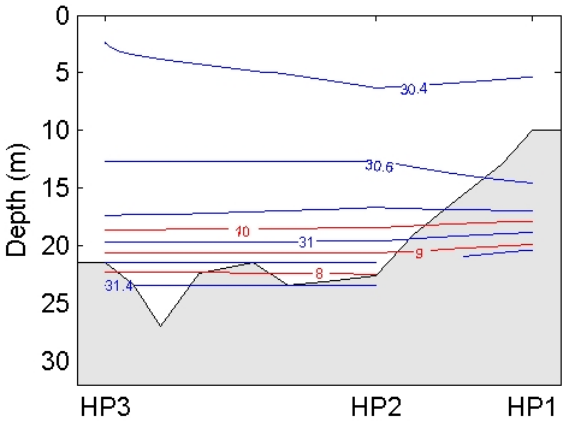
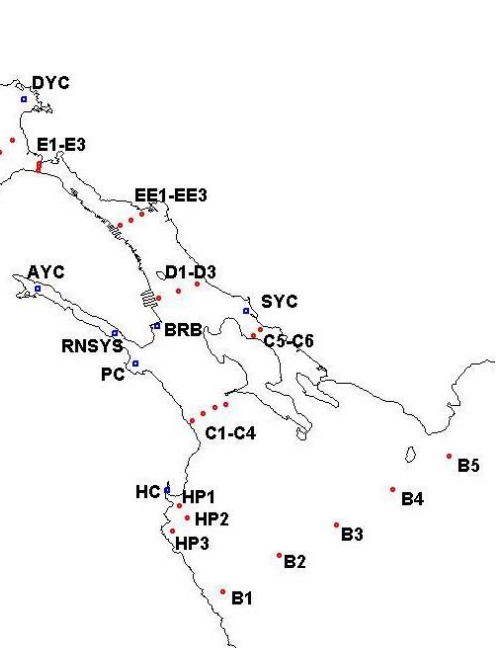
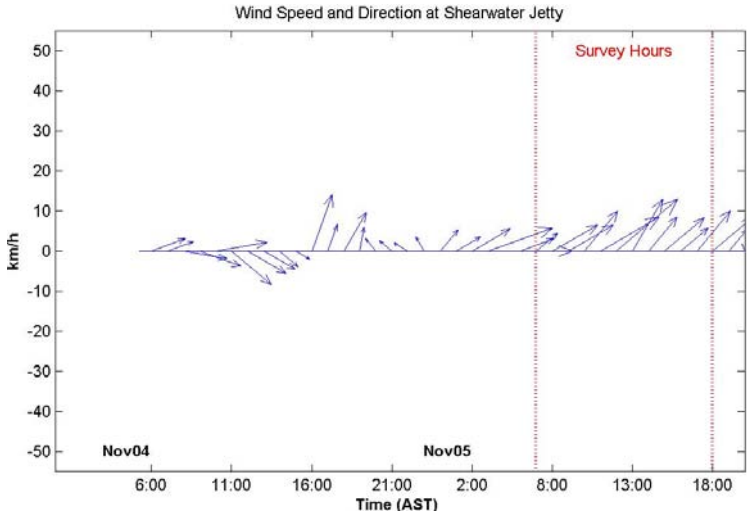
C
McNabs Island
D
EE
E
B
Scale Bar
1km
Scale Bar
100m

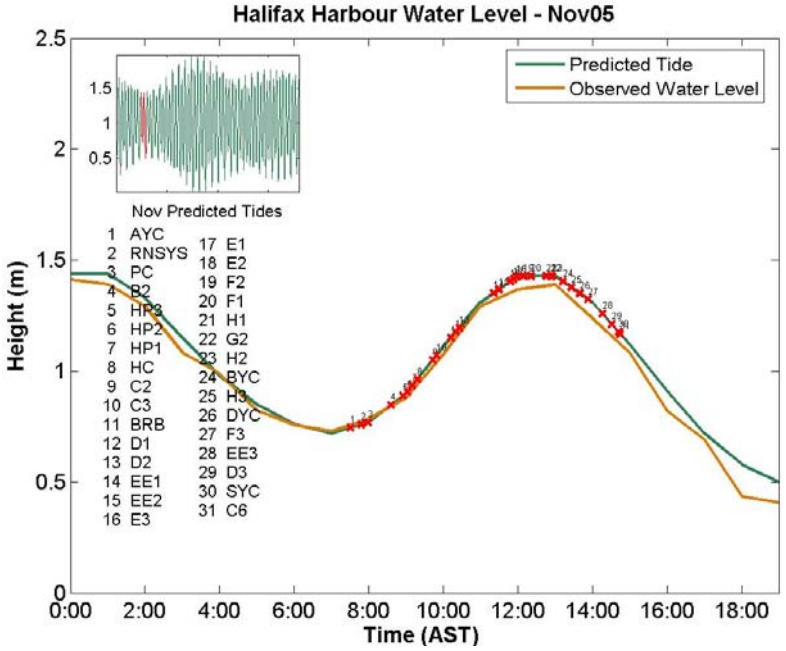
Yacht Clubs

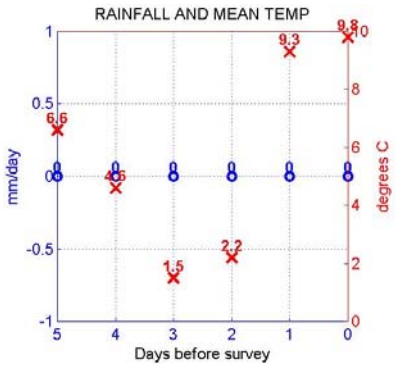


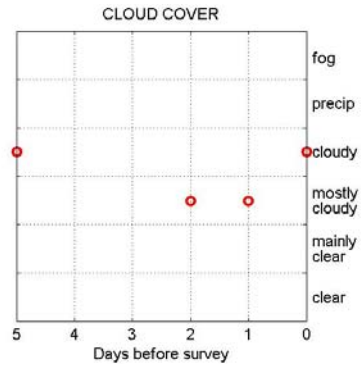








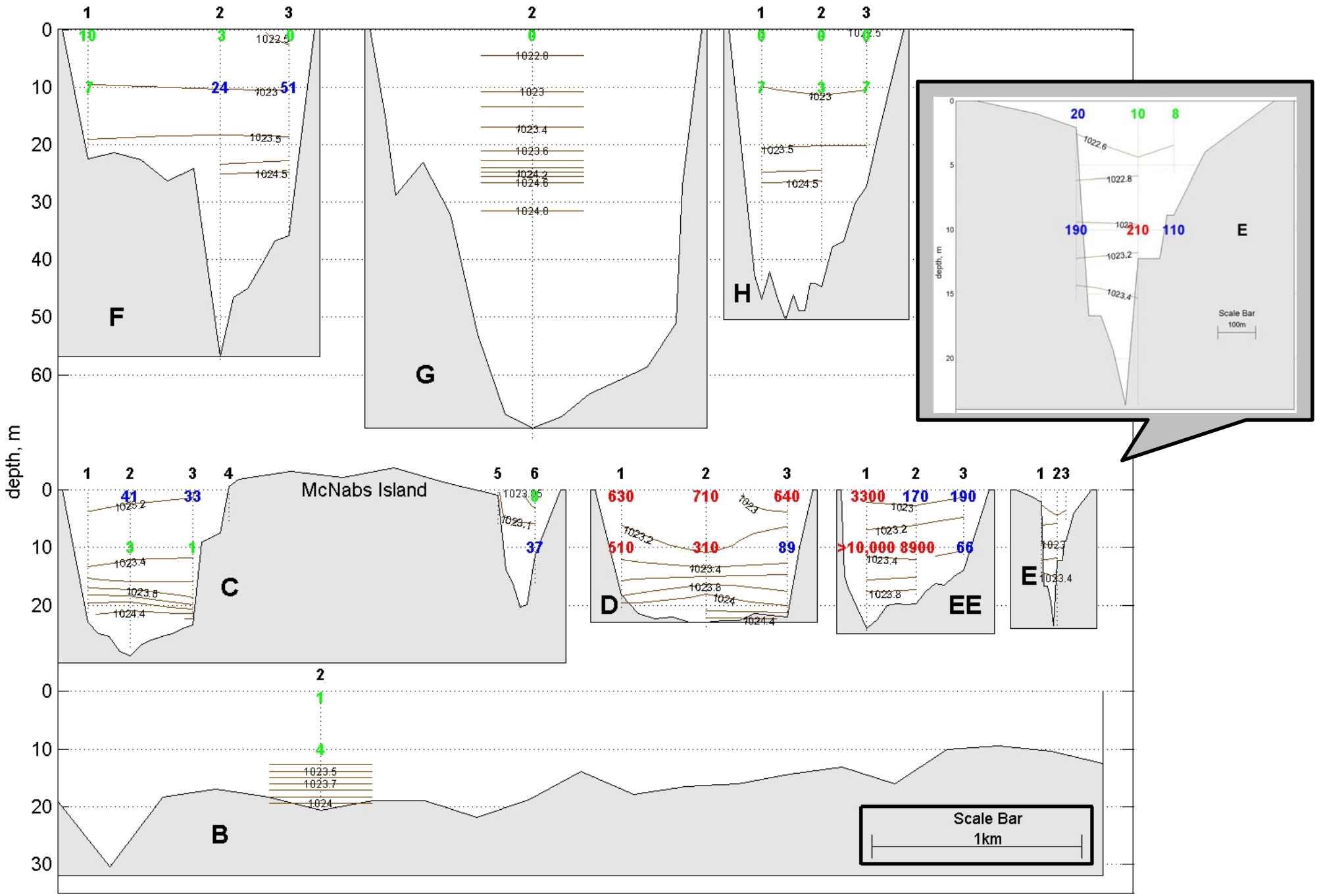




Rainfall and temperature data collected at Shearwater Autoport.

Cloud cover data collected at Shearwater Airport

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


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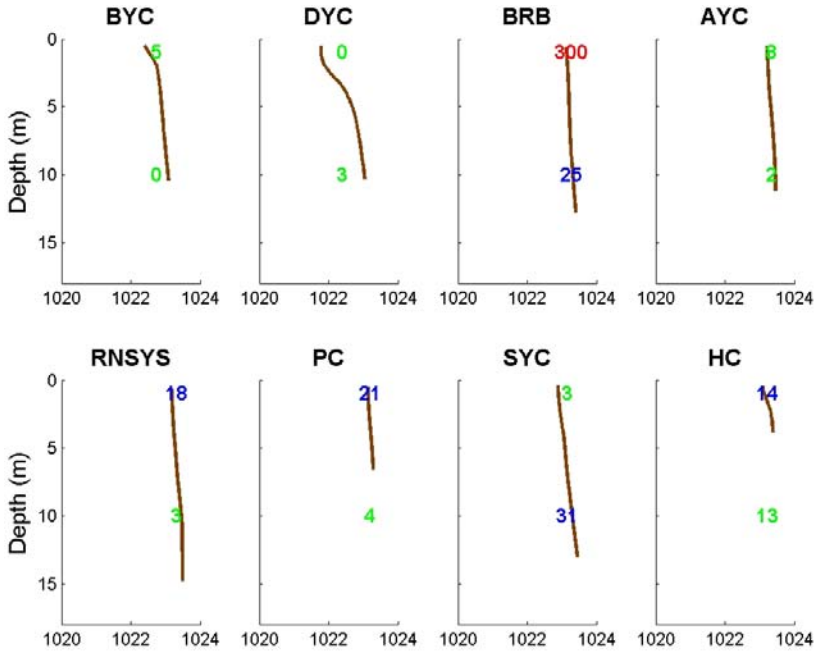
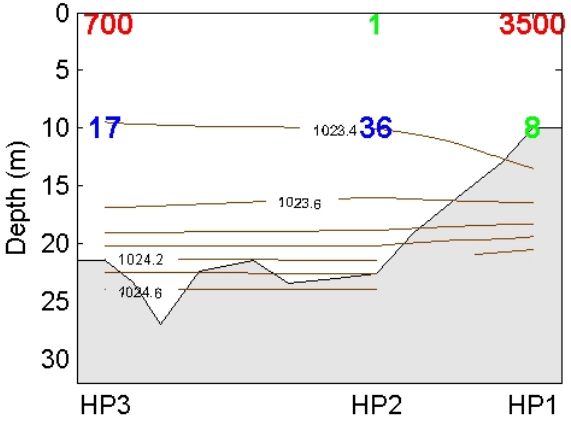
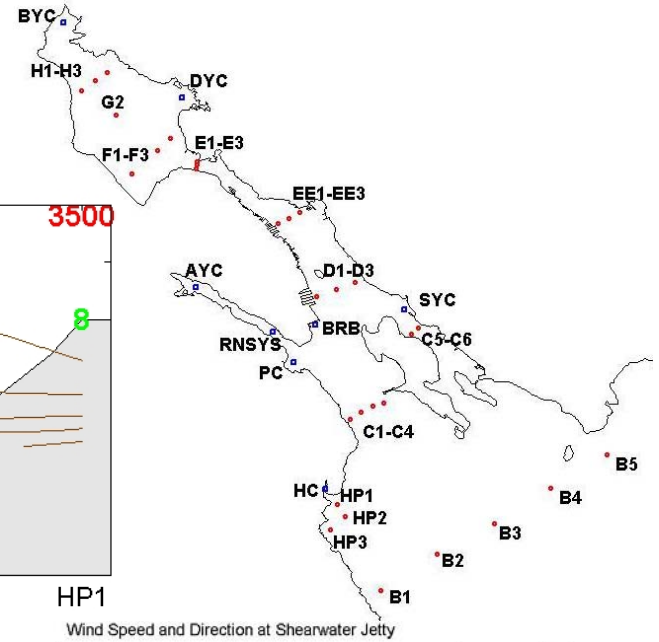
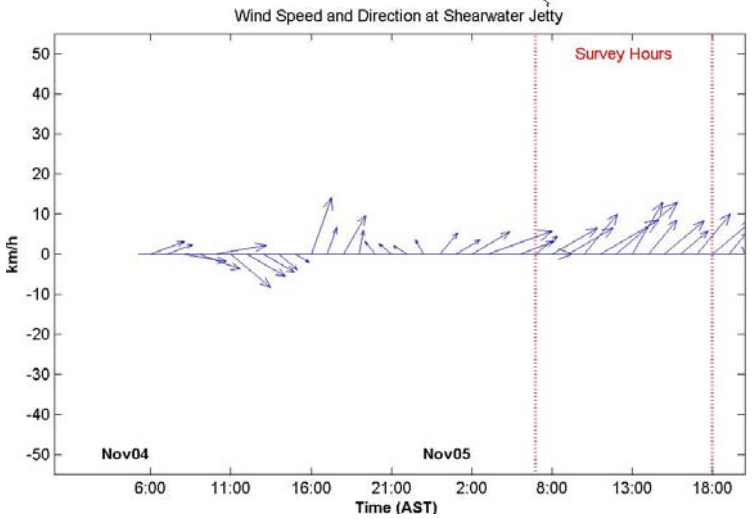
B
Scale Bar
1km
Scale Bar
100m

Yacht Clubs









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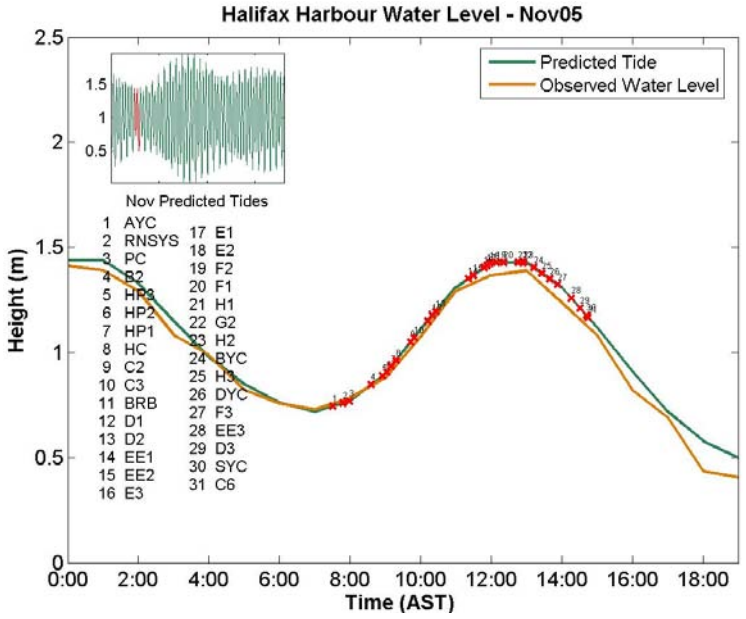
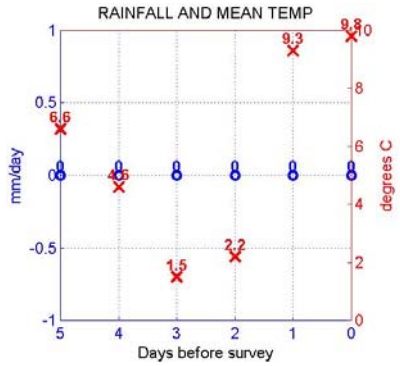
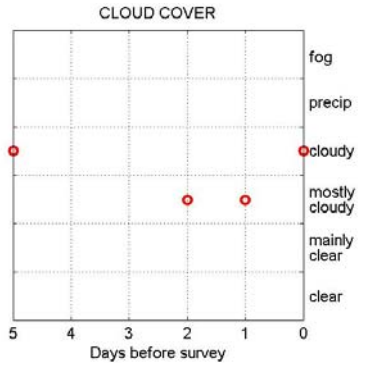
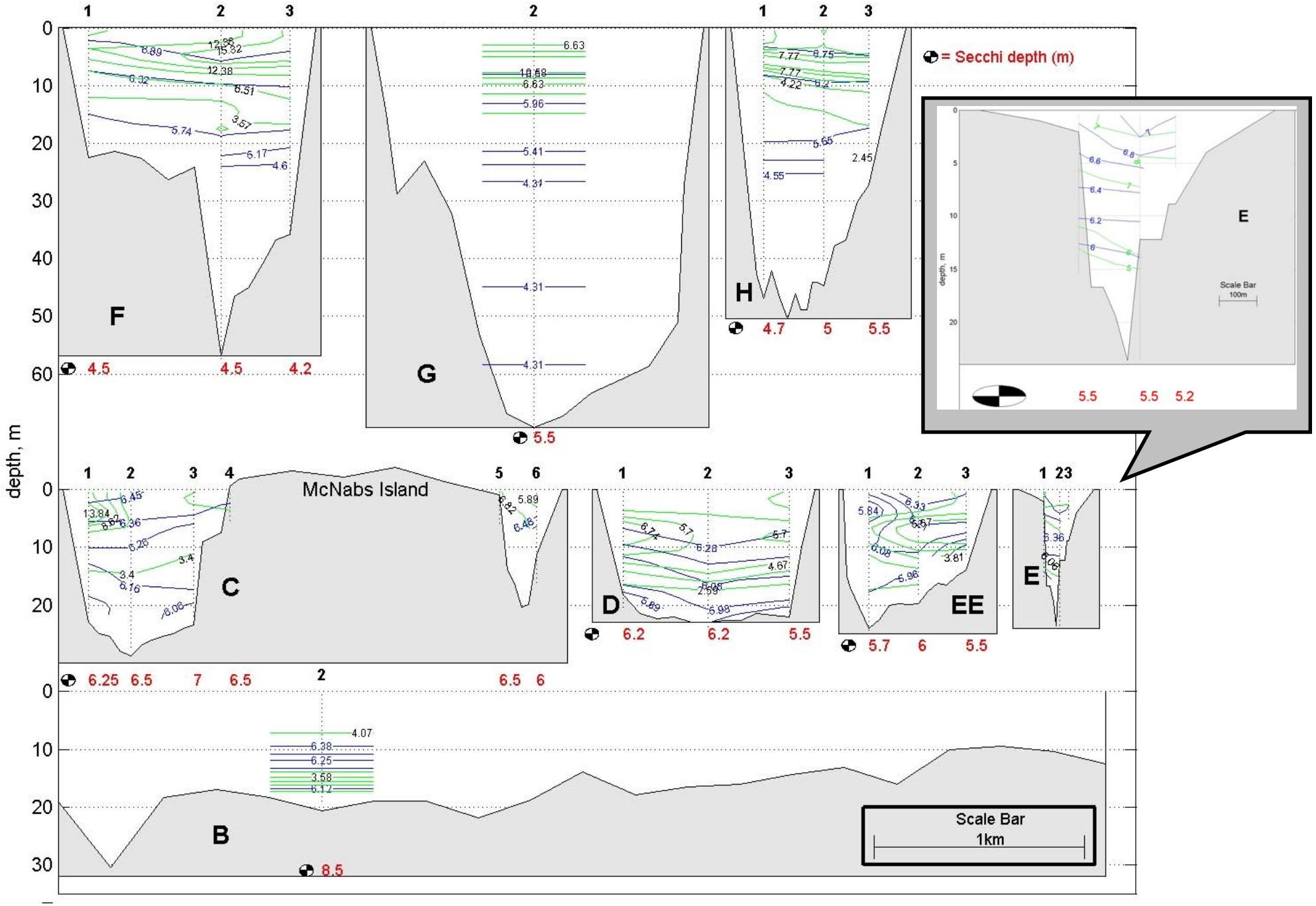






Potential Density in kg/m^3

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


depth, m
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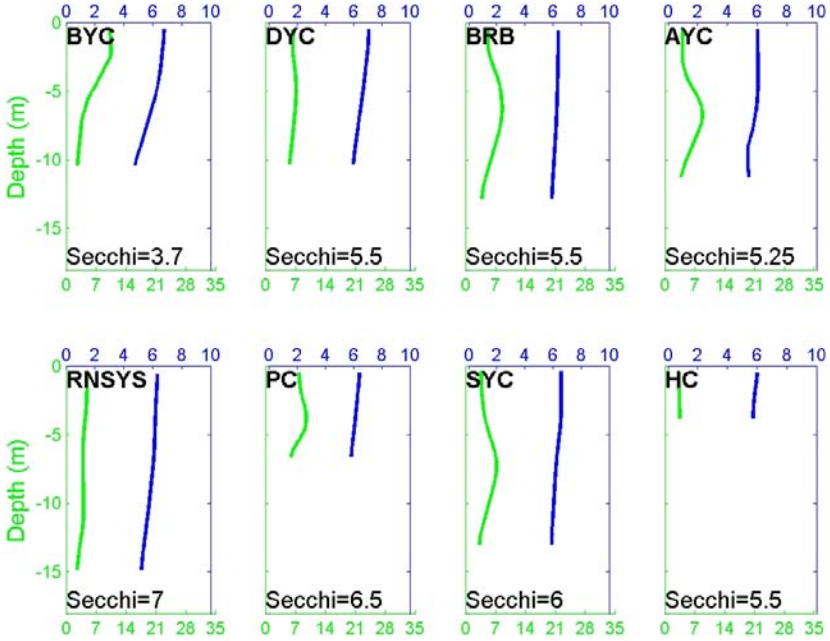
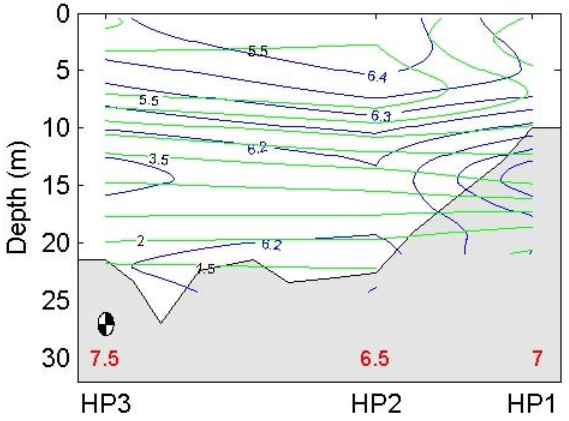
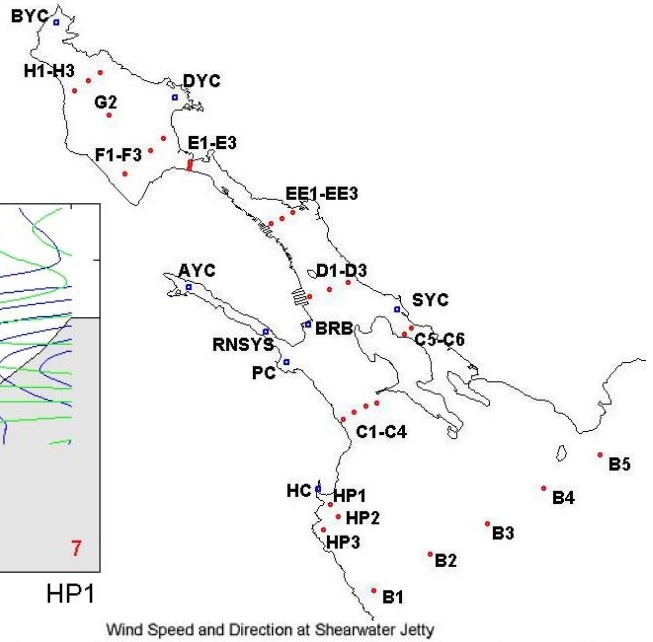
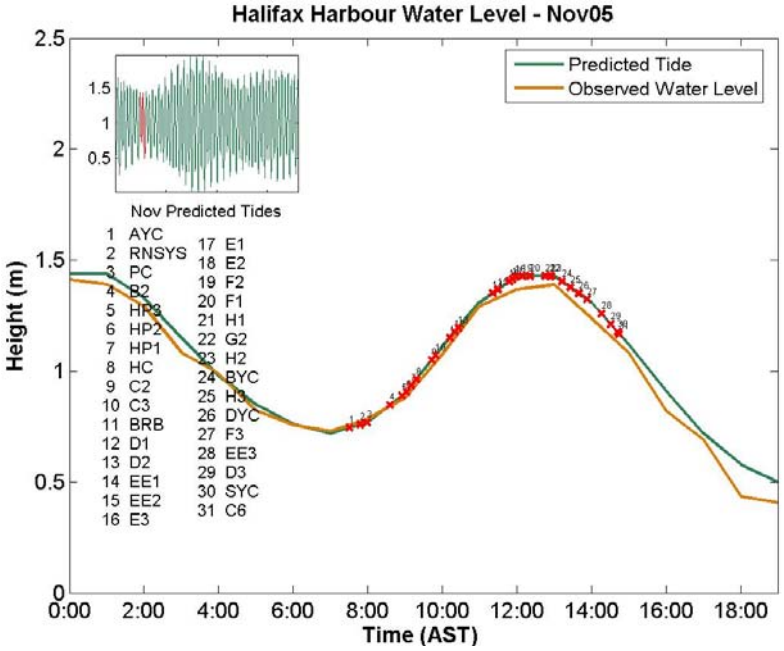
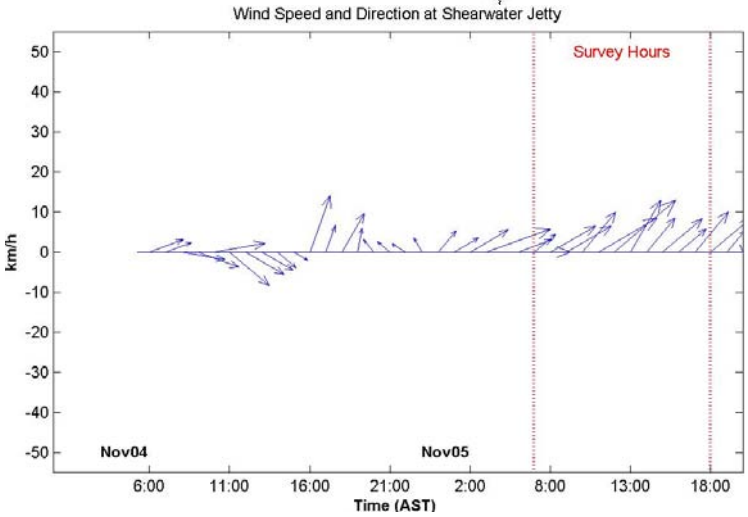
Yacht Clubs











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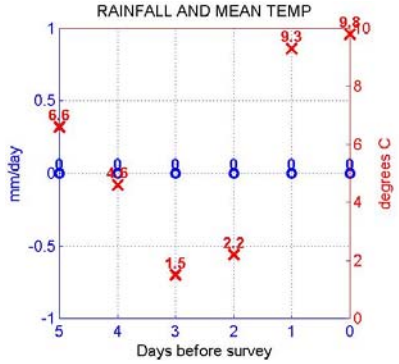
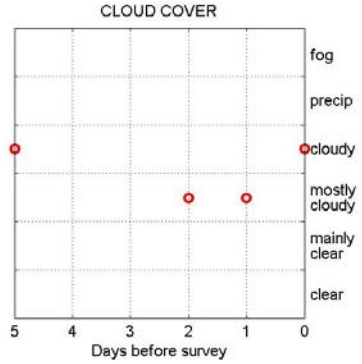
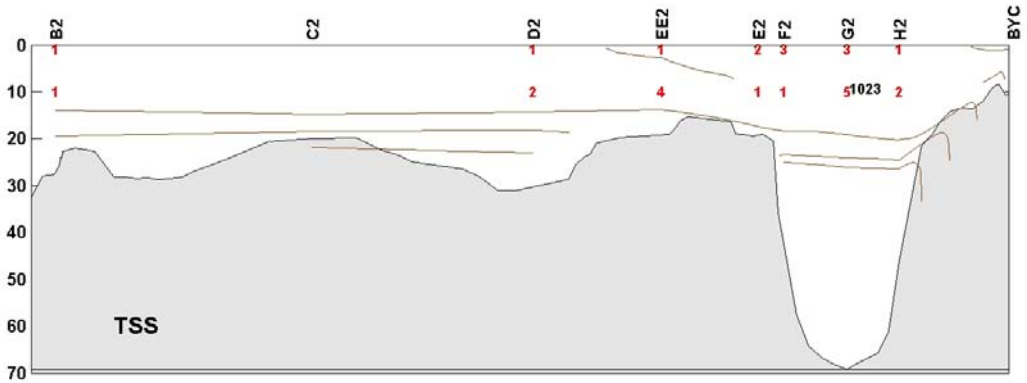
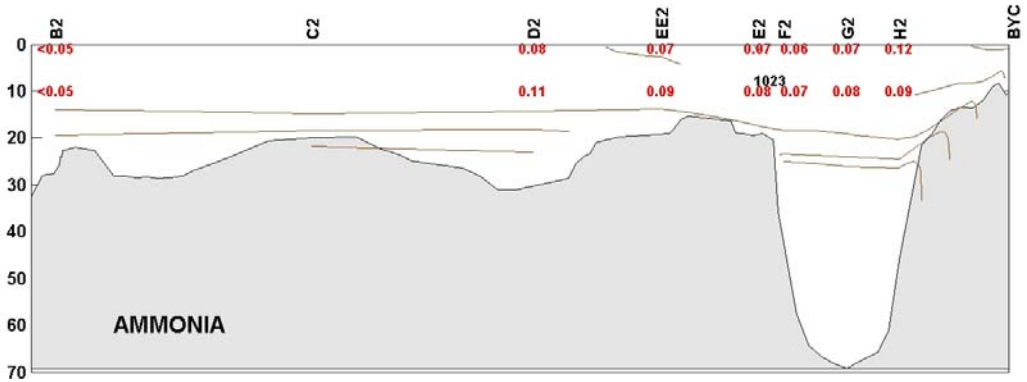




DO in mg/L **Chlorophyll in mg/m^3**





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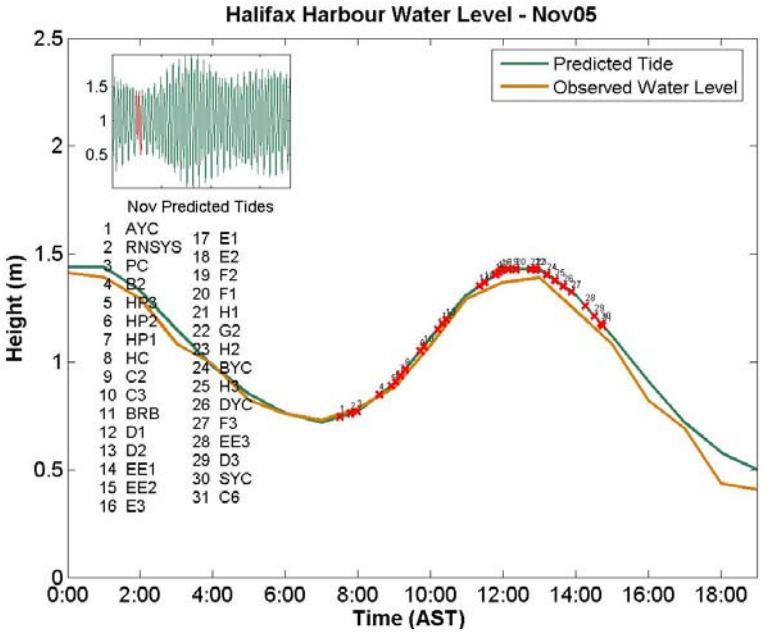
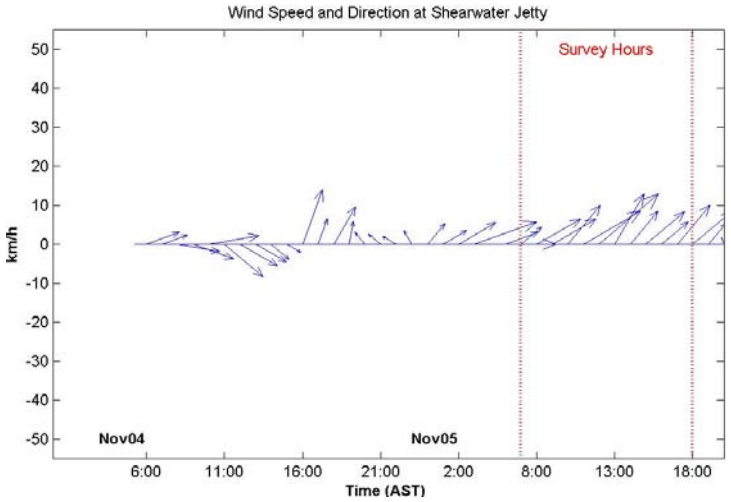
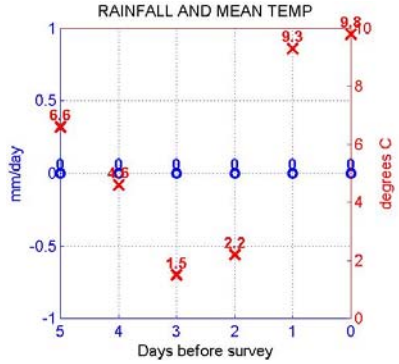
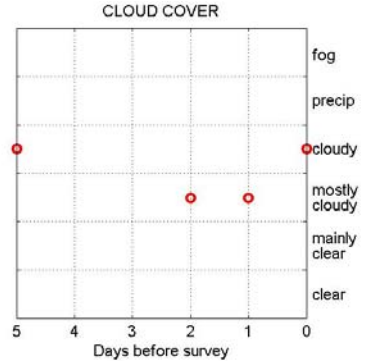
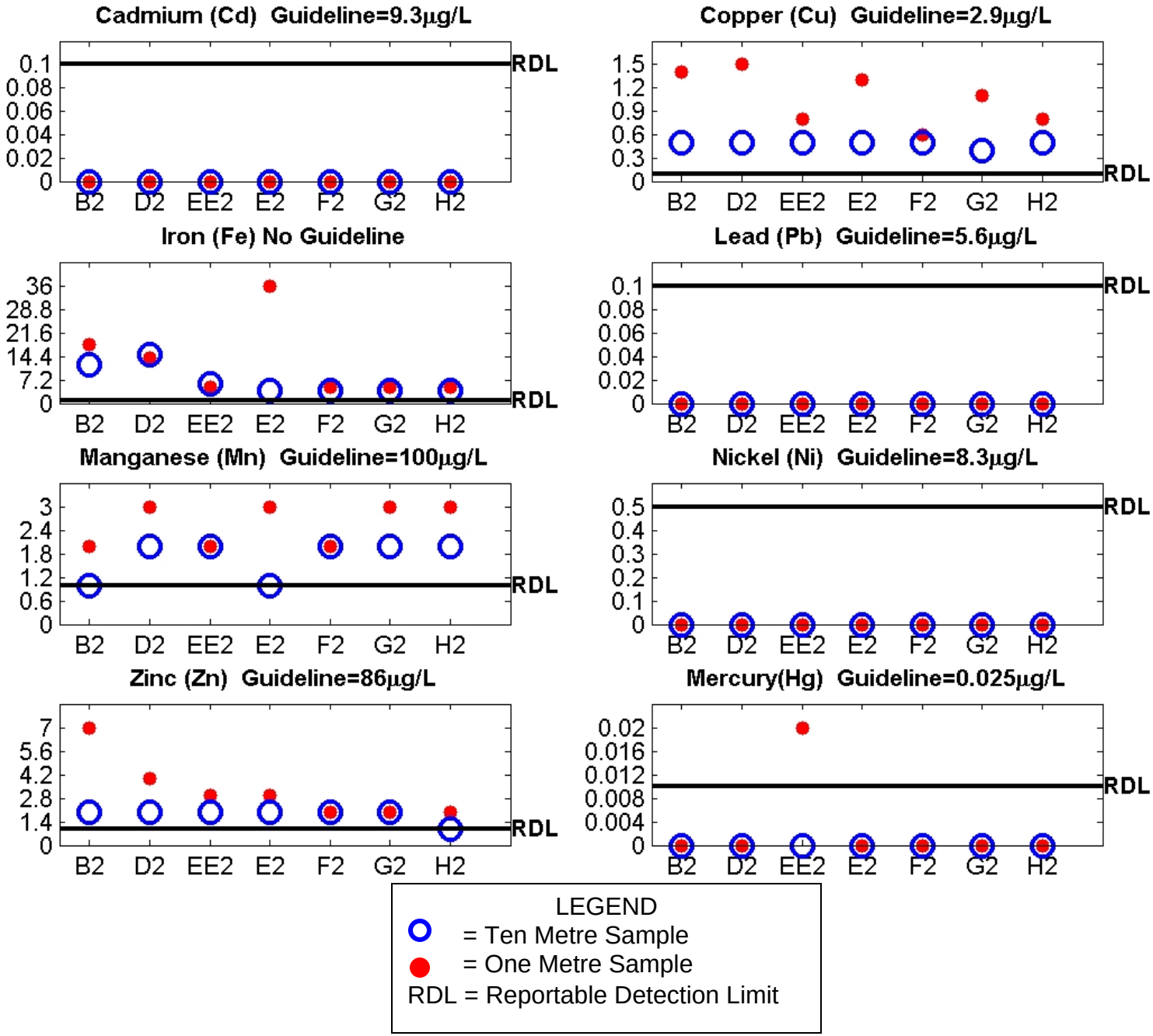








Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**


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
36
28.8
21.6
14.4
7.2
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
3
2.4
1.8
1.2
0.6
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Nickel (Ni) Guideline=8.3µg/L
0.5
0.4
0.3
0.2
0.1
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Zinc (Zn) Guideline=86µg/L
7
5.6
4.2
2.8
1.4
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Mercury(Hg) Guideline=0.025µg/L
0.02
0.016
0.012
0.008
0.004
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 – November 5, 2008