Halifax Harbour Water Quality Monitoring Project
Survey Summary #143

Survey Date: 21 November 2007
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report143_071121.doc
Data File: HHWQMP_data143_071121.xls

Data Return:

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

Sample Notes:

Extra bacteria sampling was done in the NW Arm – see notes in data file.
A CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 0800 local time.

QA/QC samples:

Chemical Analysis

		EE2 - 1m	
Detectable Parameter	**Units**	**reference sample**	**QA/QC**
Ammonia (as N)	mg/L	0.13	0.1
Total Suspended Solids	mg/L	2	6
Copper	ug/L	1.5	1.4
Iron	ug/L	45	13
Lead	ug/L	0.1	<0.1
Manganese	ug/L	14	3
Nickel	ug/L	0.6	0.6
Zinc	ug/L	4	5
Mercury	ug/L	0.02	0.02

Fecal Coliform (CFU/100ml)

Site	BRB-10m	H1-1m	HP1-1m	EE2-1m
Reference	77	25	1200	90
QA/QC	24	26	360	66

Comments:

General: The commissioning of the Halifax STP is ongoing. The relatively wet weather noted in the previous report continued until 5 days (14.5 mm of rain) before the survey. The water has continued to cool somewhat (1-2 degrees). The north wind on the day of the survey has apparently caused local upwelling in the Northern Basin, bringing warmer, saltier mid level water to the surface in spite of the continued high Sackville River flow. A lens of fresher water persists in the Narrows in spite of the (probable) operation of the Duffus St. pumping station. The bacteria levels are significantly lower than in the previous survey but the distribution shows some similarities, and are different compared to some long established patterns. Notably, the levels in the Basin are quite uniform both vertically and horizontally as opposed to the relatively familiar pattern of higher vales in the 10 m samples in the Southern Basin. The rest of the distribution is unremarkable but for the Northwest Arm and Eastern Passage that have unexplained high values.

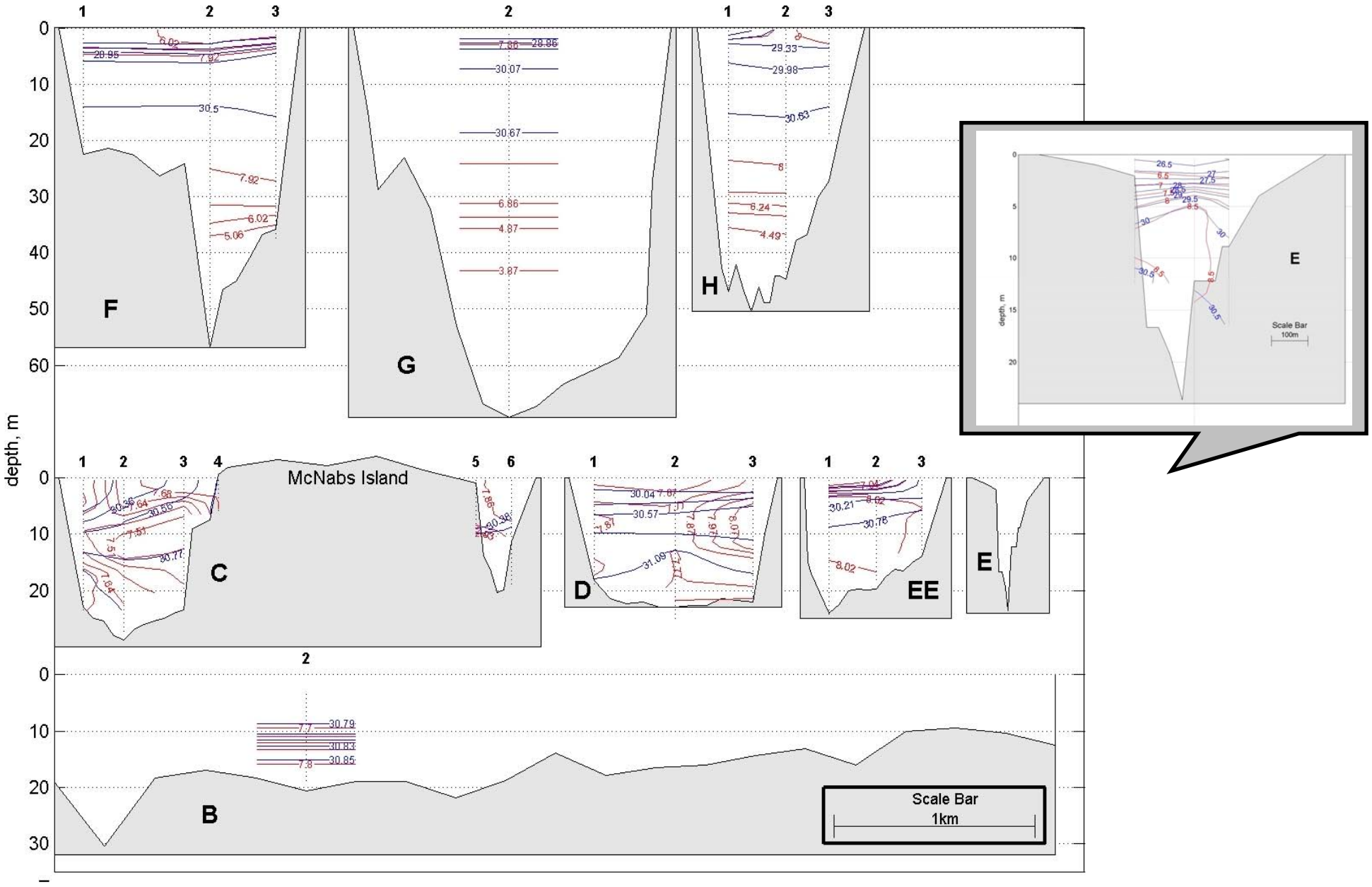
Fluorescence: The fluorescence has dropped from last survey's high values to near background levels. The highest values, about 4 mg/m^3, are in the Narrows and Southern Basin, with levels elsewhere of 2-3 mg/m^3.

TSS: TSS values are relatively typical (a mean of approximately 3.9 mg/L). There is not a clear pattern.

Ammonia: The ammonia values are somewhat high (mean approximately 0.076 mg/L), most everywhere. The values are above the detection limit (0.05 mg/L) everywhere but the Outer Harbour (B2).

Metals: Unusually, there were three copper values and two mercury values that exceeded the Harbour Task Force guidelines. Both metals were high in the one metre sample at B2 in the Outer Harbour. Both mercury values were 0.44 ug/L, over 17 times the guideline and the only values above the 0.01 ug/L detection limit.

Dissolved Oxygen: The DO levels remain relatively high and similar to, but more vertically uniform than the previous survey. The only levels below the use specific guidelines are in the Basin bottom water (below 20 m) with a minimum of about 1.45 mg/L. The DO data is not ground-truthed, however this data was obtained with a recently factory calibrated instrument. (see DO discussion in Quarterly Reports). LOBO DO = 7.7 mg/L, CTD DO = 8.4 mg/L.


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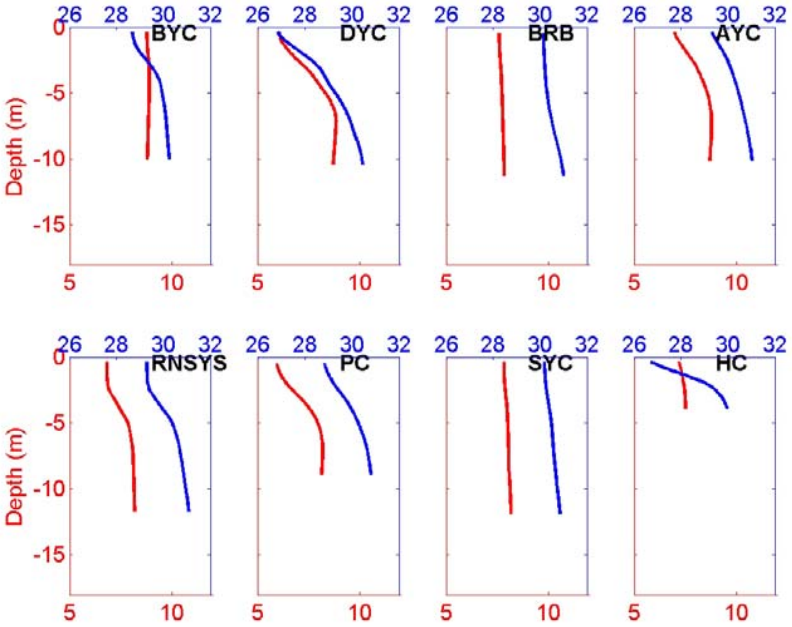
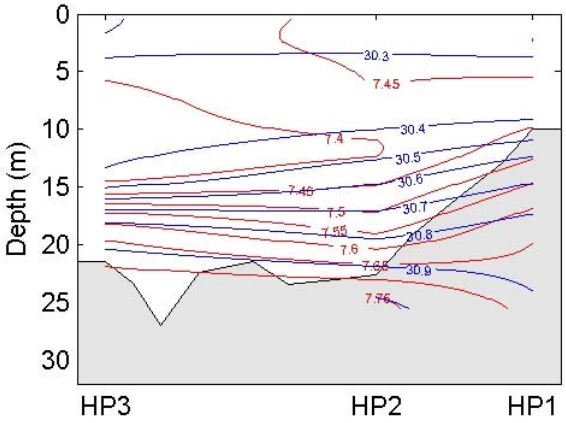
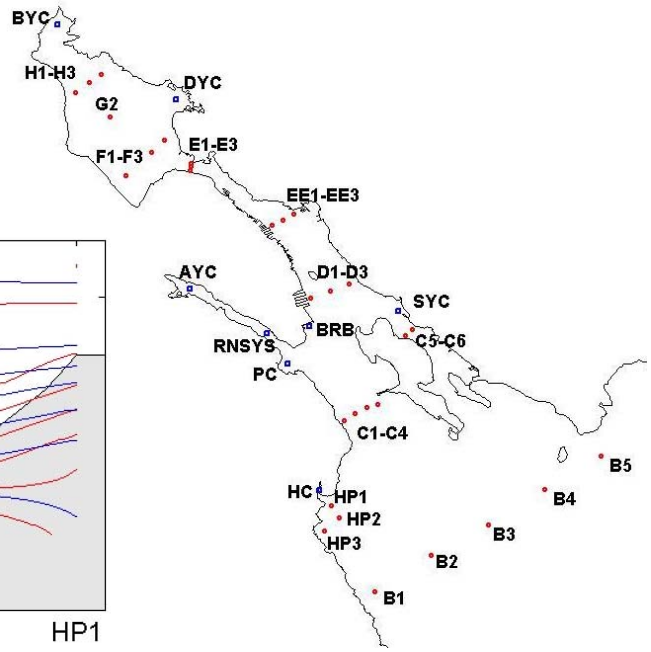
McNabs Island
Scale Bar
1km
Scale Bar
100m

Yacht Clubs

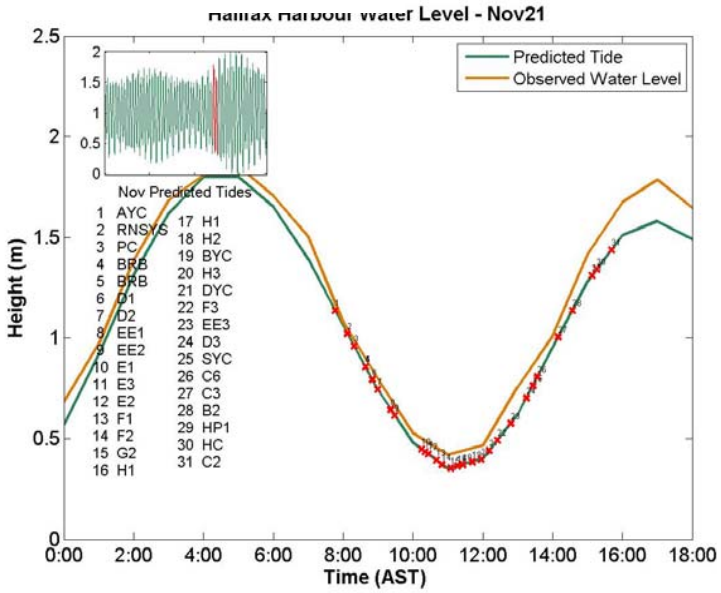


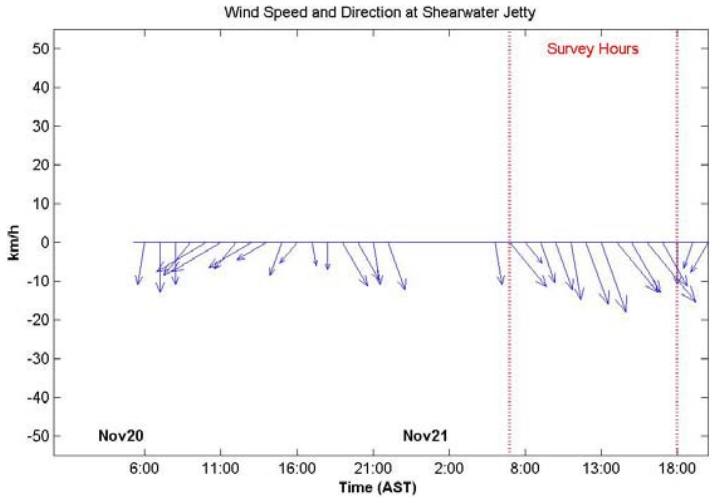


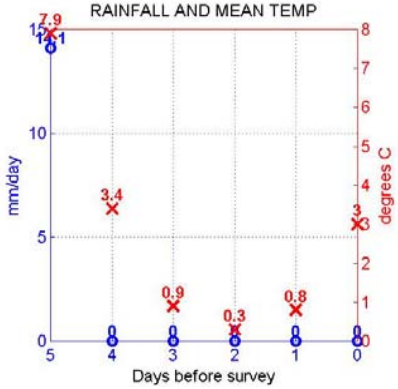


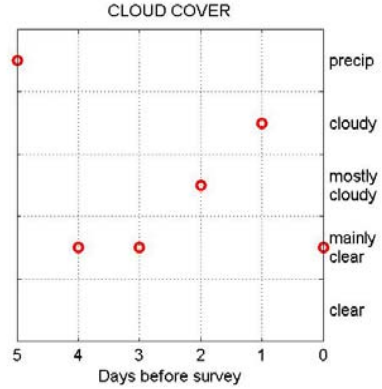
Rainfall and temperature data collected at Shearwater Autoport.

Cloud cover data collected at Shearwater Airport

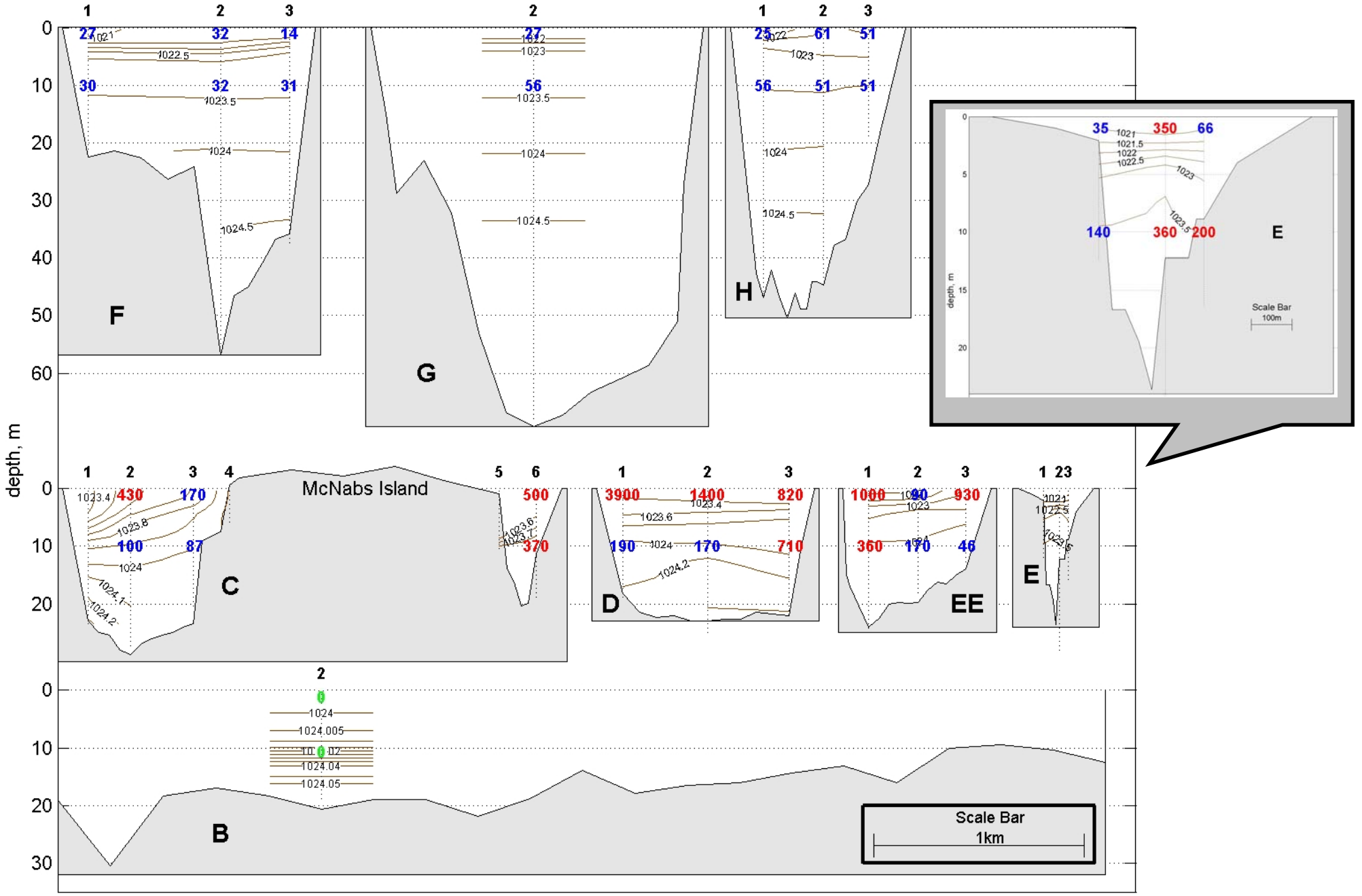








Salinity in PSU **Temperature in ^{o}C**


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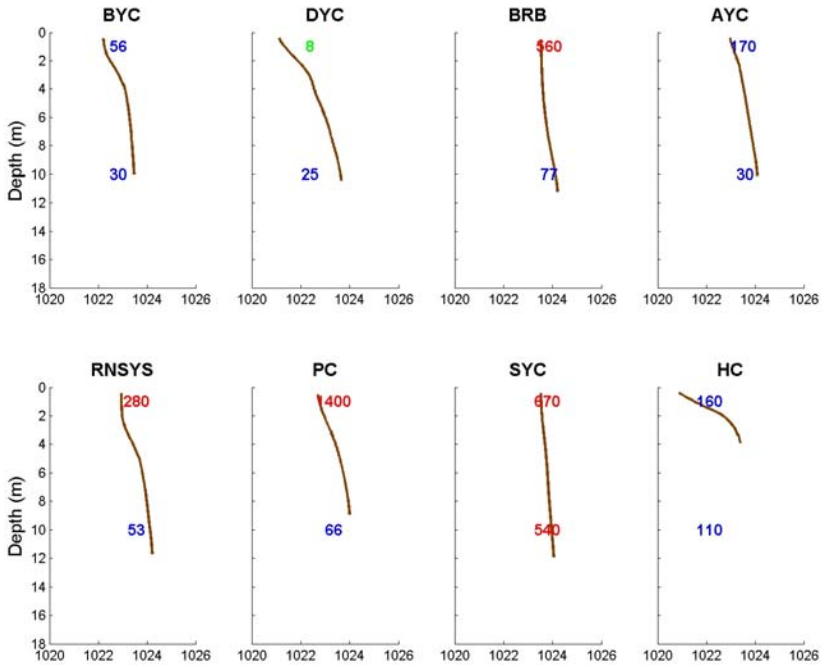
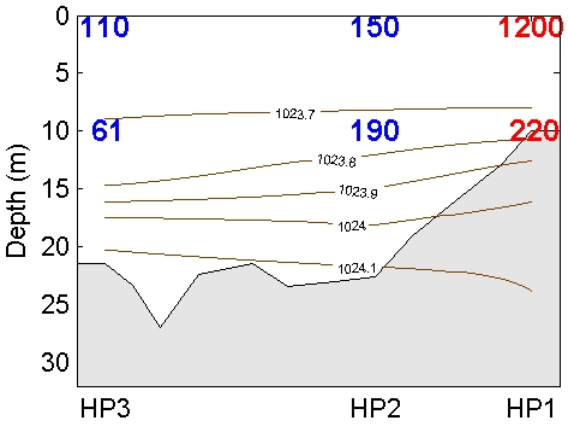
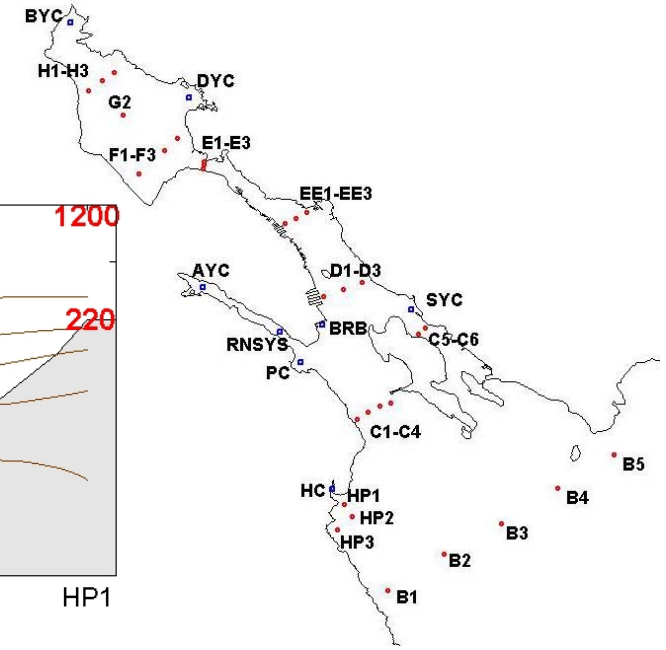
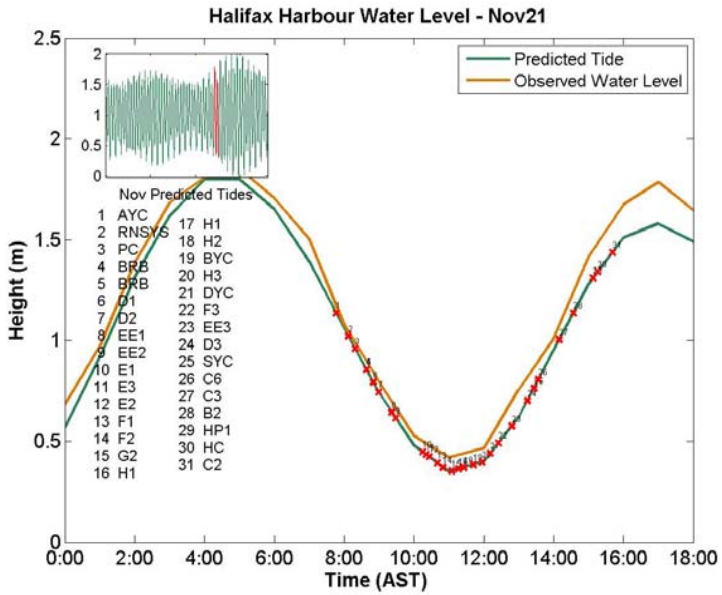
Scale Bar
1km
Scale Bar
100m

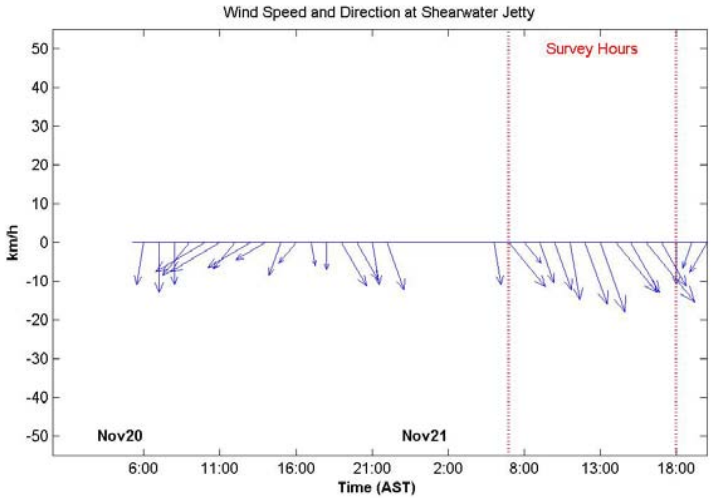
Yacht Clubs

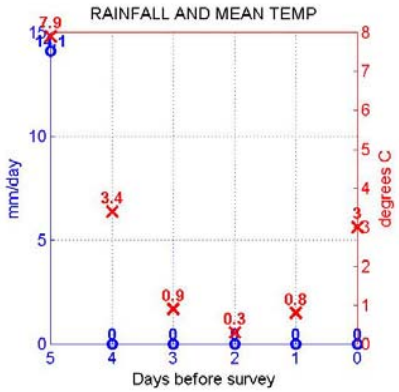


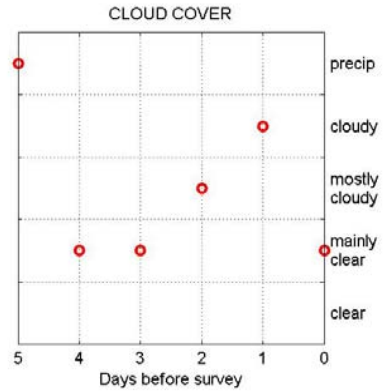










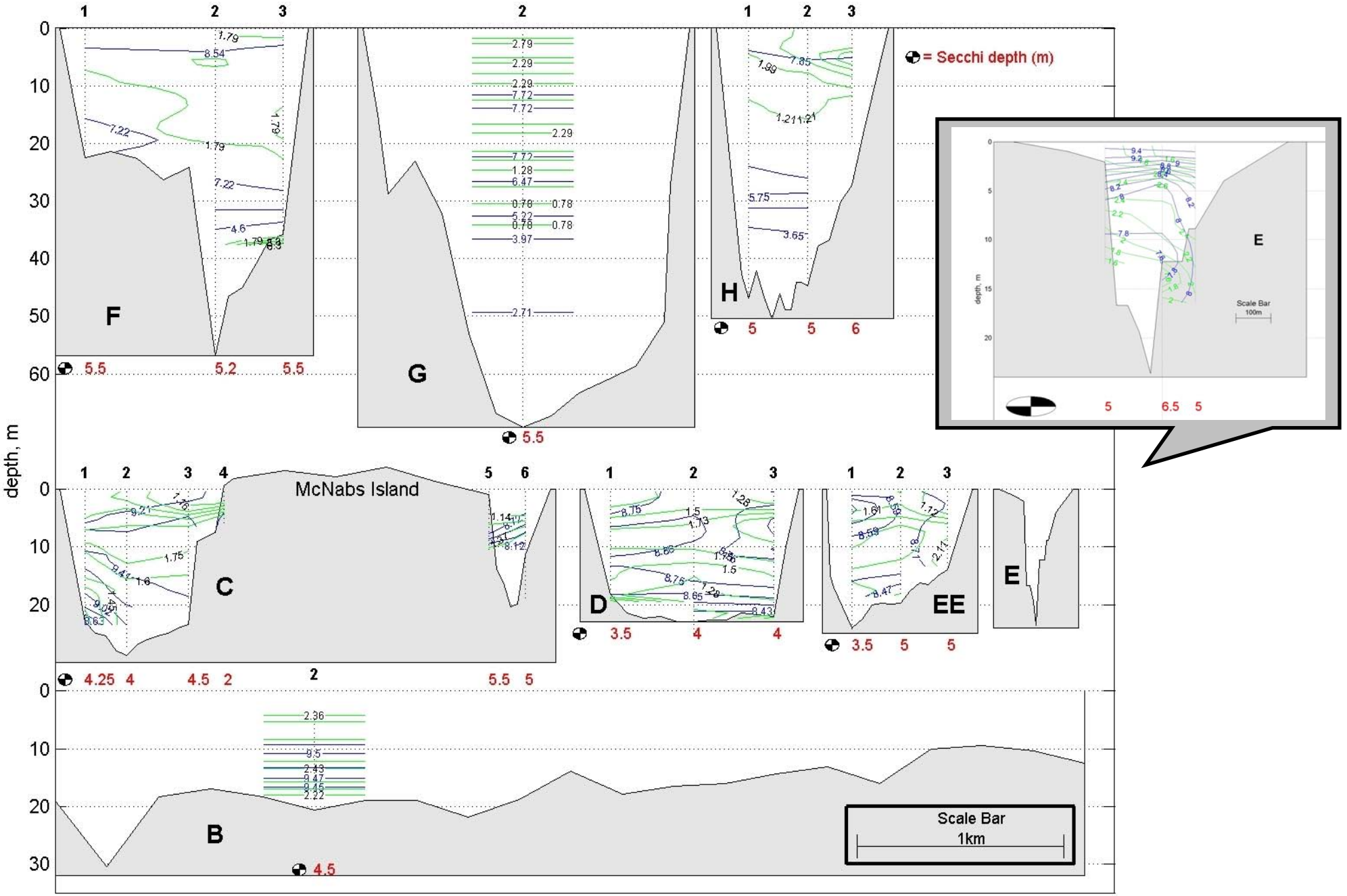


Rainfall and temperature data collected at Shearwater Autoport.

Cloud cover data collected at Shearwater Airport

Potential Density in kg/m^3

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


= Secchi depth (m)
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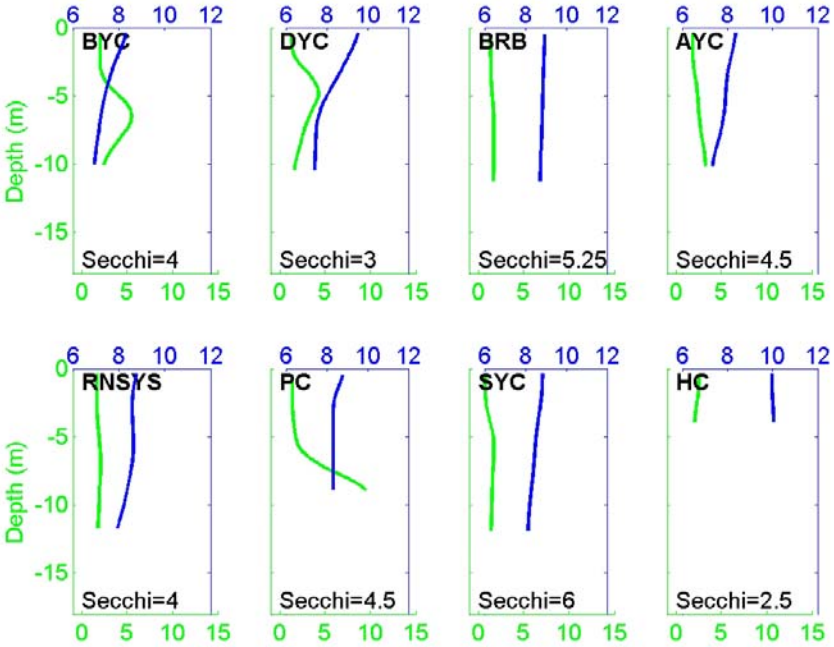

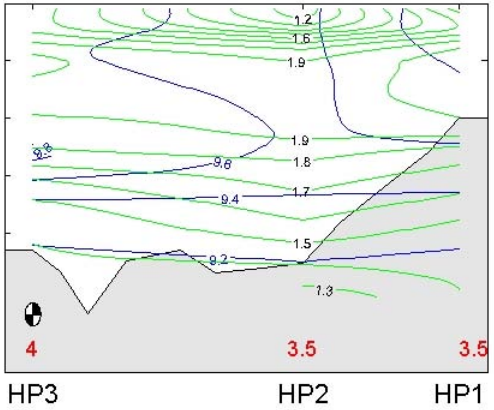

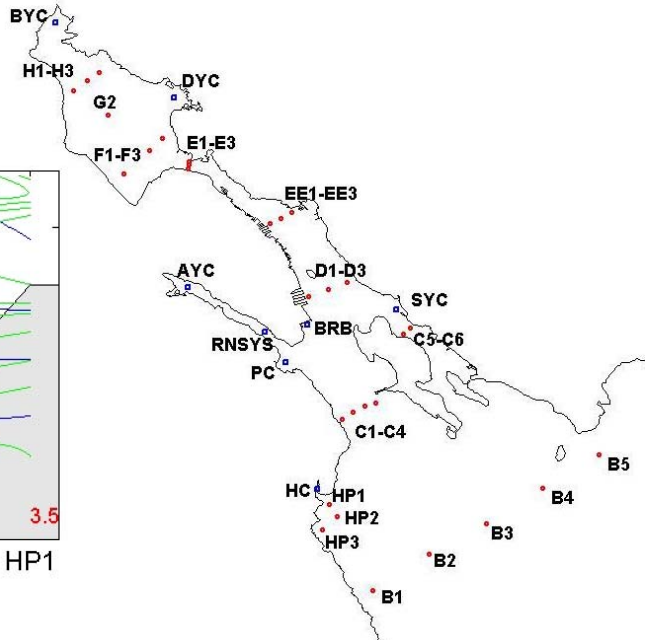

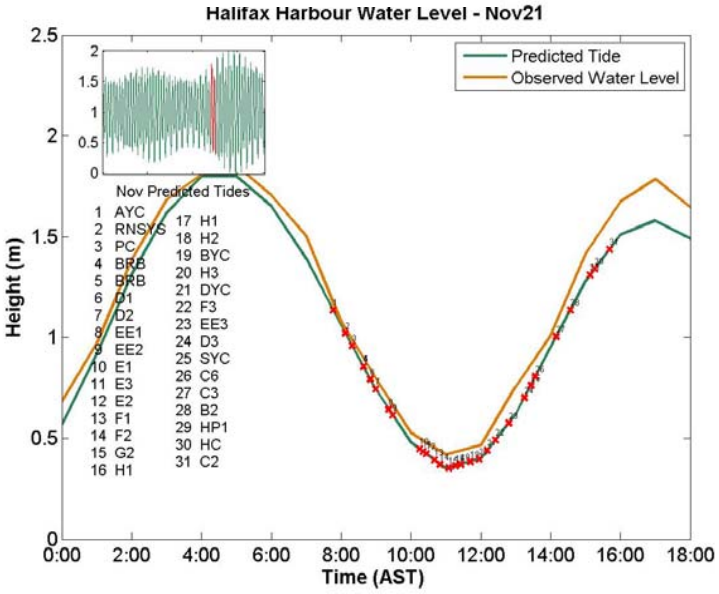

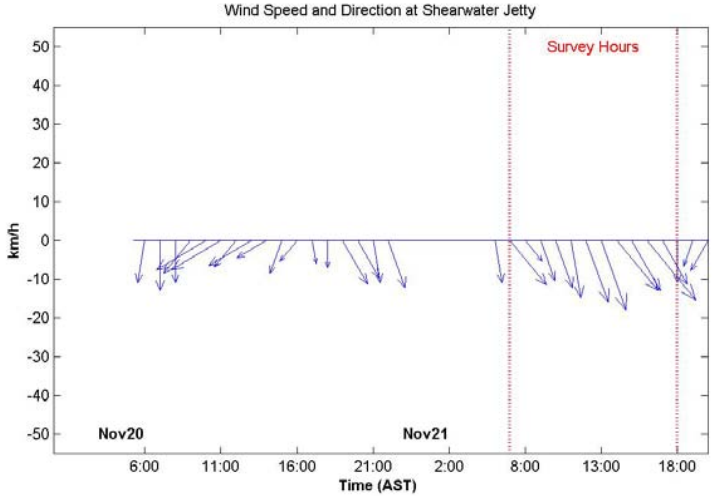

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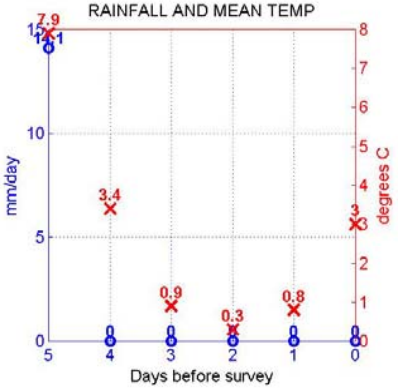
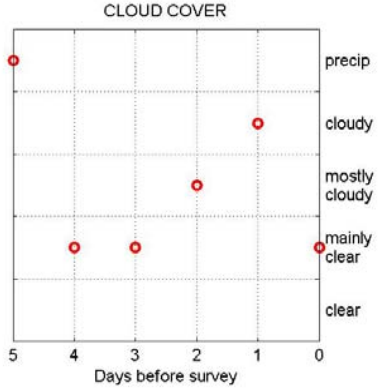
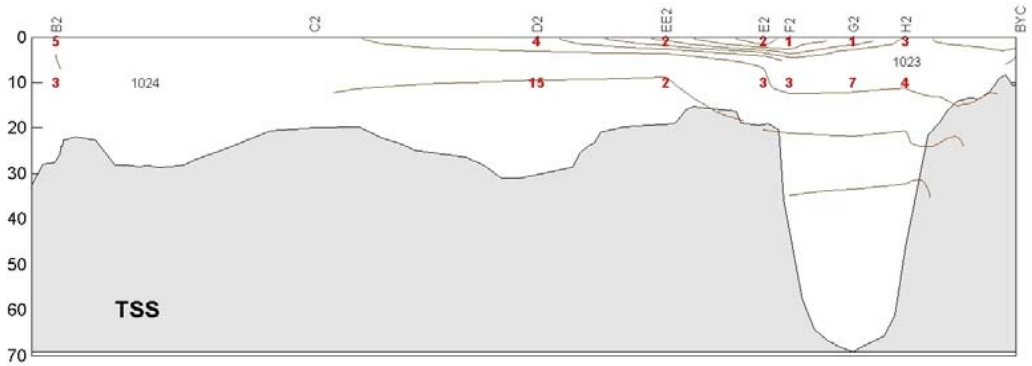
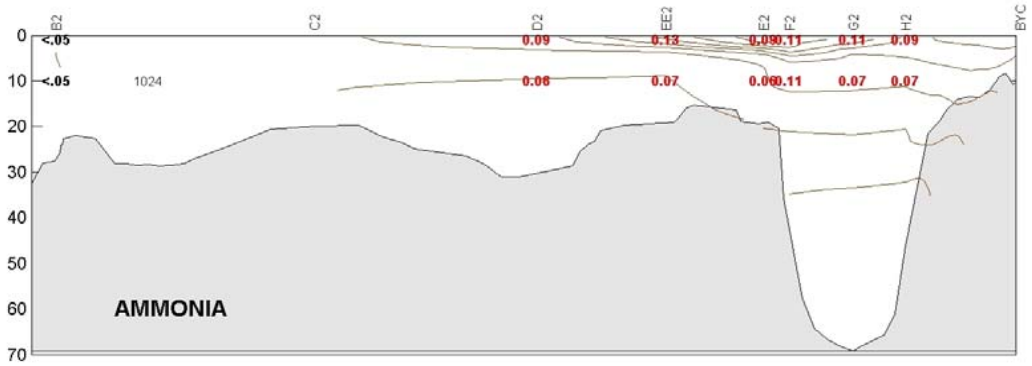




DO in mg/L **Chlorophyll in mg/m^3**





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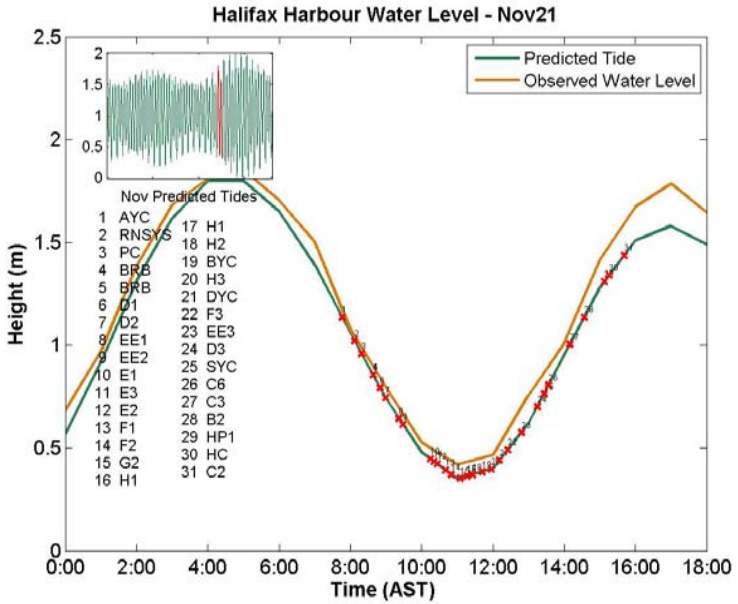
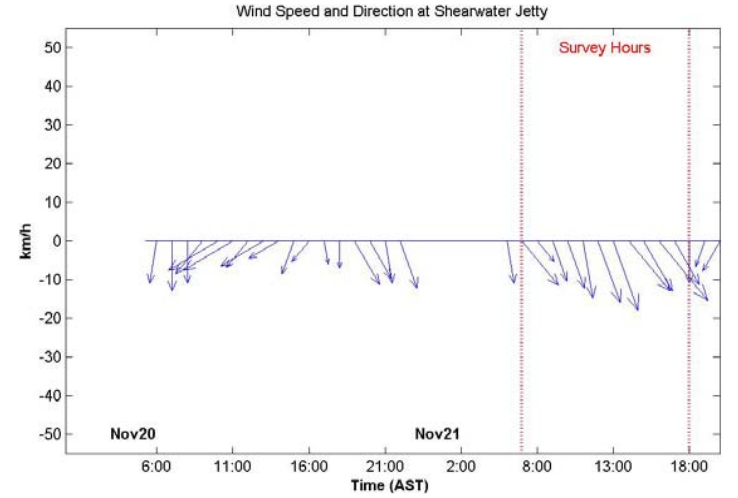
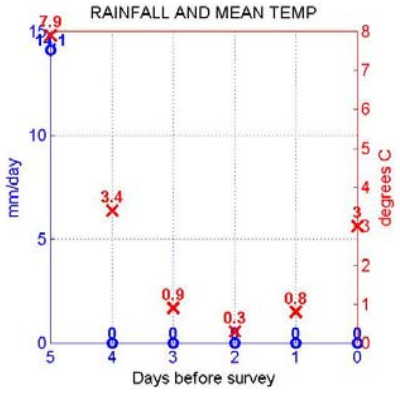
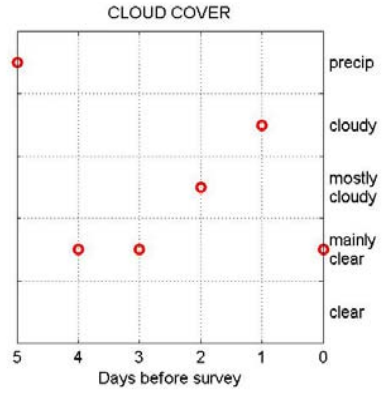
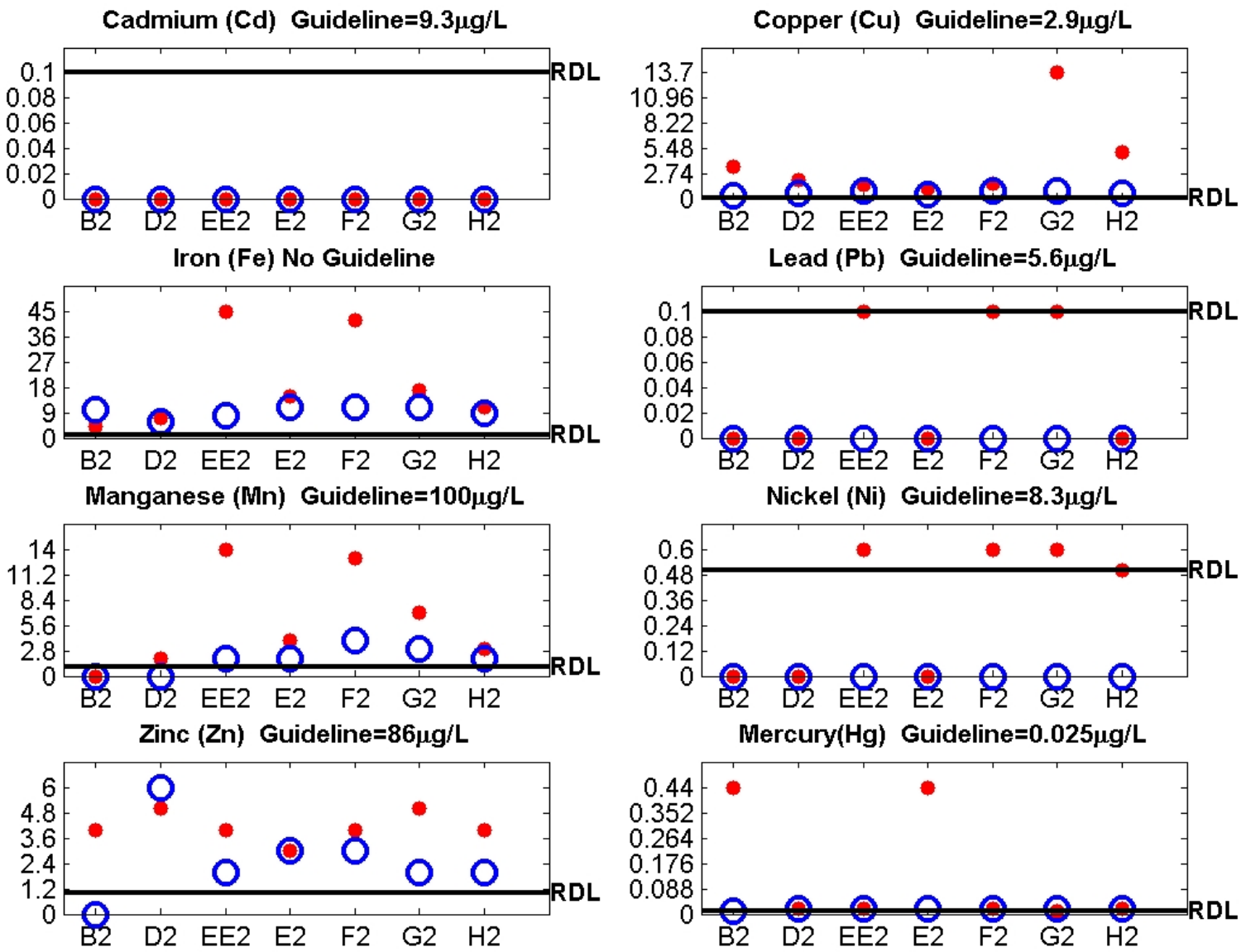
Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**










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
13.7
10.96
8.22
5.48
2.74
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Iron (Fe) No Guideline
45
36
27
18
9
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
14
11.2
8.4
5.6
2.8
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Nickel (Ni) Guideline=8.3µg/L
0.6
0.48
0.36
0.24
0.12
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Zinc (Zn) Guideline=86µg/L
6
4.8
3.6
2.4
1.2
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Mercury(Hg) Guideline=0.025µg/L
0.44
0.352
0.264
0.176
0.088
0
RDL
B2 D2 EE2 E2 F2 G2 H2
LEGEND
= Ten Metre Sample
= One Metre Sample
RDL = Reportable Detection Limit