Halifax Harbour Water Quality Monitoring Project
Survey Summary #139

Survey Date: 25 September 2007
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report139_070925.doc
Data File: HHWQMP_data139_070925.xls
Data Return:

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

Sample Notes:

A CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W). The station for one of the coliform QAQC samples was not recorded.

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QA/QC samples:

Chemical Analysis

		G2 - 10m	
Detectable Parameter	**Units**	**reference sample**	**QA/QC**
Ammonia (as N)	mg/L	<0.05	<0.05
Total Suspended Solids	mg/L	7.6	7.7
Copper	ug/L	0.4	0.4
Iron	ug/L	16	14
Manganese	ug/L	5	4
Zinc	ug/L	2	2

Fecal Coliform (CFU/100ml)

Site	H1-10m	D1-1m	G2-10m
Reference	12	4400	630
QA/QC	55	2300	1400

Comments:

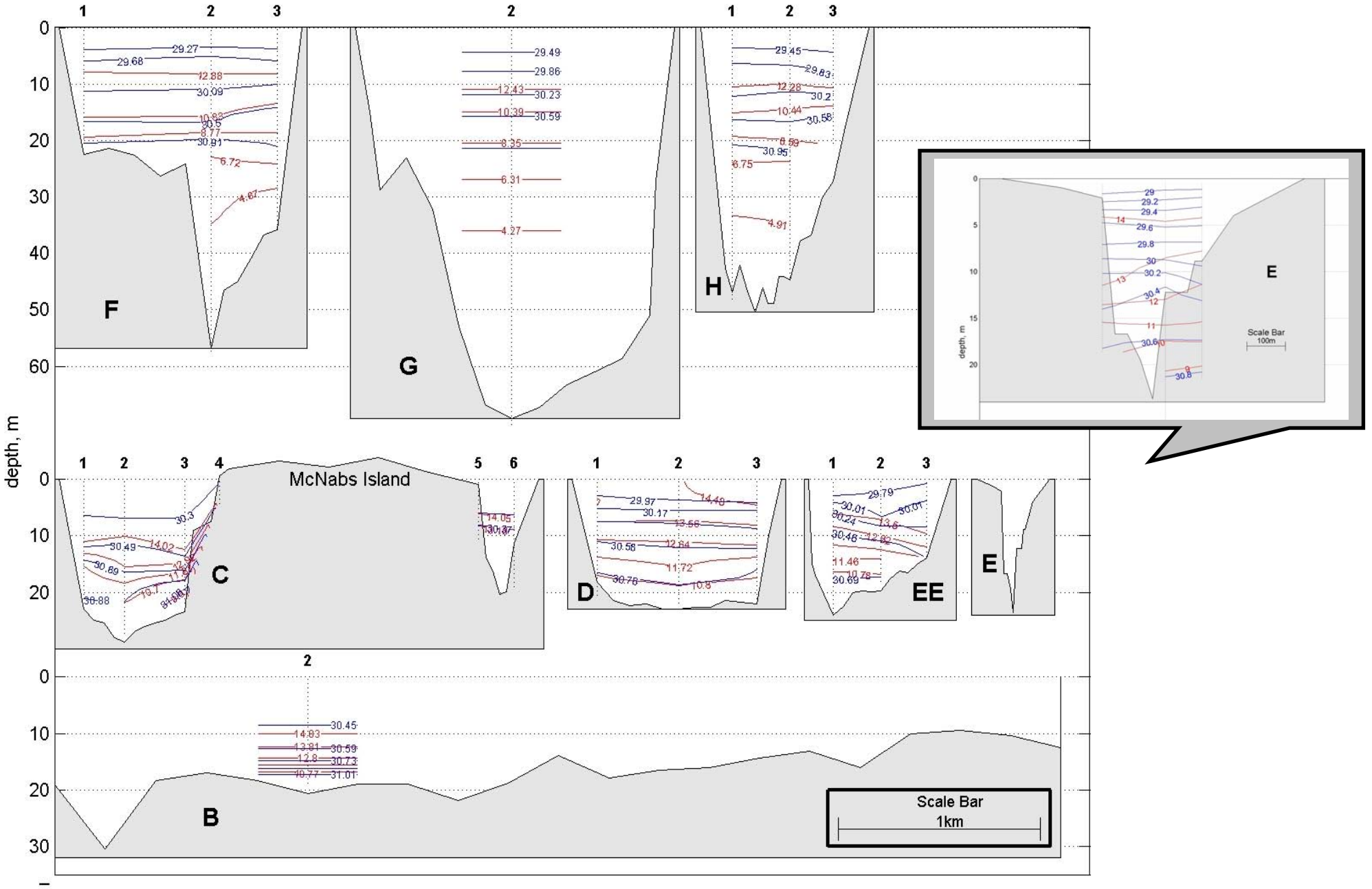
General: The weather has been dry and the Sackville River levels are quite low (0.65m). The surface salinity in Bedford Bay (BYC) is relatively high at 29.5 psu. The stratification in the harbour is moderate and quite uniform south of the Narrows. The freshest, and least dense, water in the Harbour is associated with a lens of water in the Southern Basin and Narrows (28.8 psu), This feature is relatively persistent, likely due to the sewage discharges on either side of the Narrows including the bypass to Fairview Cove. The fecal coliform (fc) values are relatively high in the Inner Harbour in both the 1 and 10m samples, suggesting vertical mixing. The horizontal distribution is centered in the Inner Harbour, with somewhat elevated levels everywhere except in the furthest out of the harbour samples at B2. There is little evidence in the fc data of "estuarine" flow, except perhaps going north at G2. The highest fc value, at the EE3-1m sample, was taken in the visible plume from the Peace Pavilion outfall. The values in Herring Cove are unusually elevated. Given the weather conditions and salinity data, this contamination is likely from the Tribune Head outfall rather than MacIntosh Run.

Fluorescence: The fluorescence values have dropped from previous surveys, but are still significant. There are profile maximum values in the Basin of 20 -25 mg/m^3. These occur at 5-6 m, but most profiles have a minor peak at the surface. In the Inner Harbour, the profile maximum values are 10-20 mg/ m^3 and drop to 2-5 mg/m^3 in Outer Harbour. These values are low, but above "background".

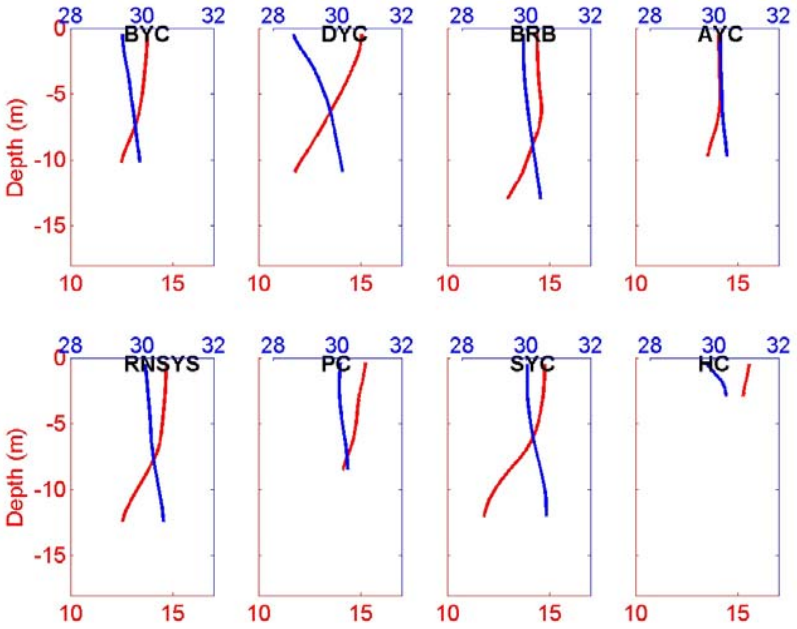
Ammonia: Levels are relatively low with only 4 of 14 values being above detection limit of 0.05, and no values above 0.07mg/L

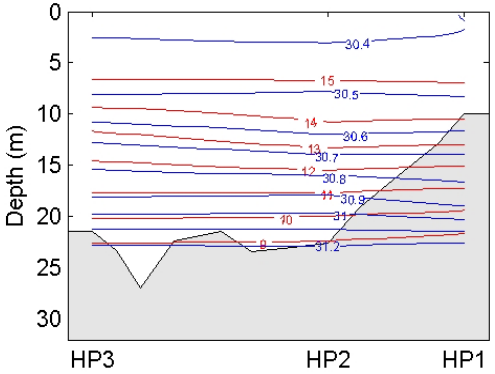
TSS: TSS is relatively high with 5 of 14 values above 5 mg/L. The highest values, as high as 9 mg/L, are in the Basin and the lowest are in the Outer Harbour at B2.

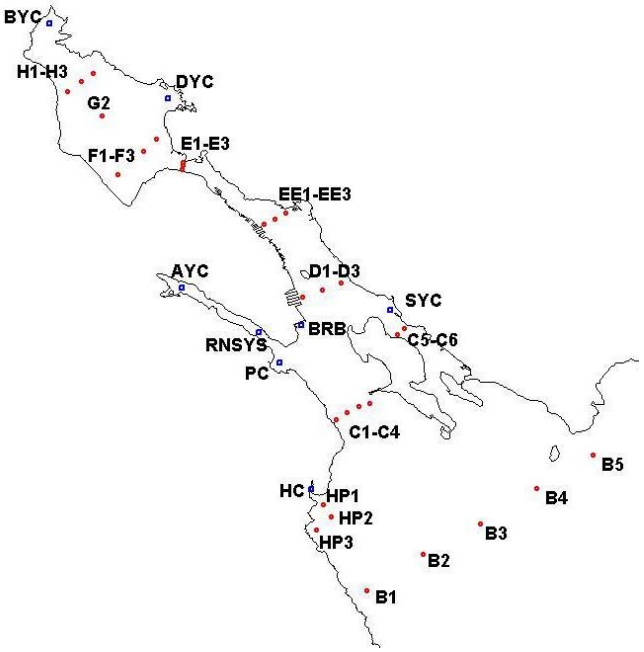
Dissolved Oxygen: Surface values in Basin are relatively high (ca.10 mg/L), but drop by 2+ mg/L in the top 10m. In the Inner Harbour, the surface DO is below 9 mg/L and decreases with depth everywhere. There is a DO minimum at section EE (surface 8.5 mg/L, bottom 6.1 mg/L). South of this, DO increase throughout the water column out to section C. In the Outer Harbour, the DO is quite uniform at about 8.1 - 8.5 mg/L. The only values below the use specific guidelines are the deeper waters (>30 m) of the Basin that are below 7 mg/L. The DO data is not ground-truthed, however this data was obtained with a recently factory calibrated instrument (see DO discussion in QR#1).


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

Yacht Clubs

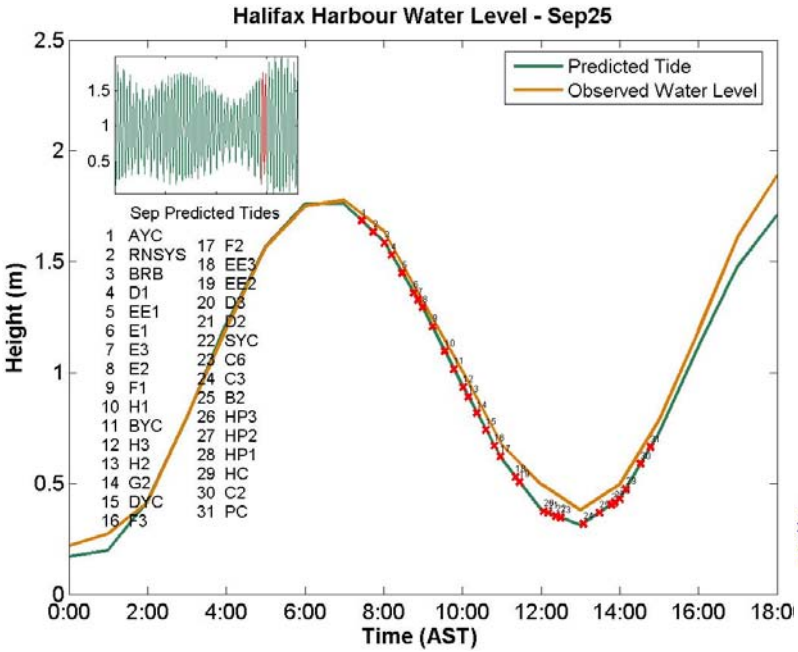


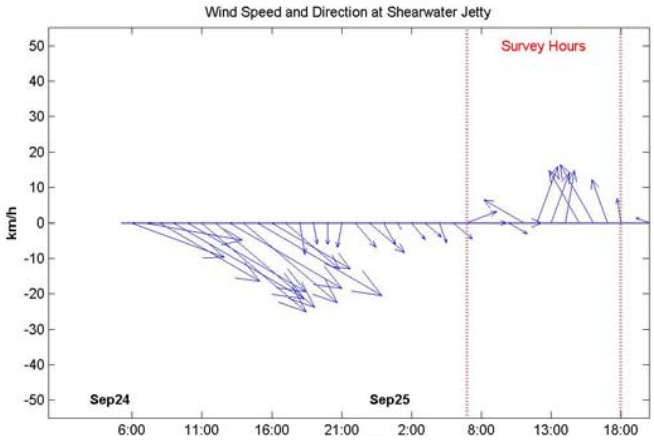


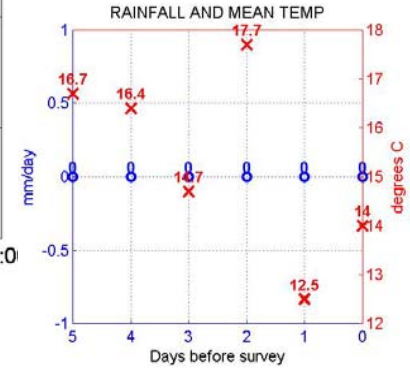


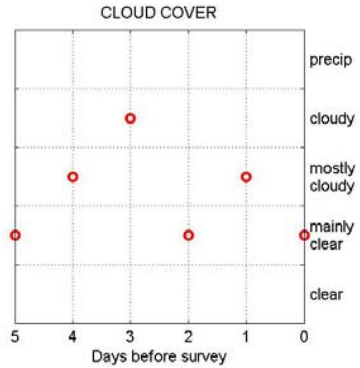
Rainfall and temperature data collected at Shearwater Autoport.

Cloud cover data collected at Shearwater Airport

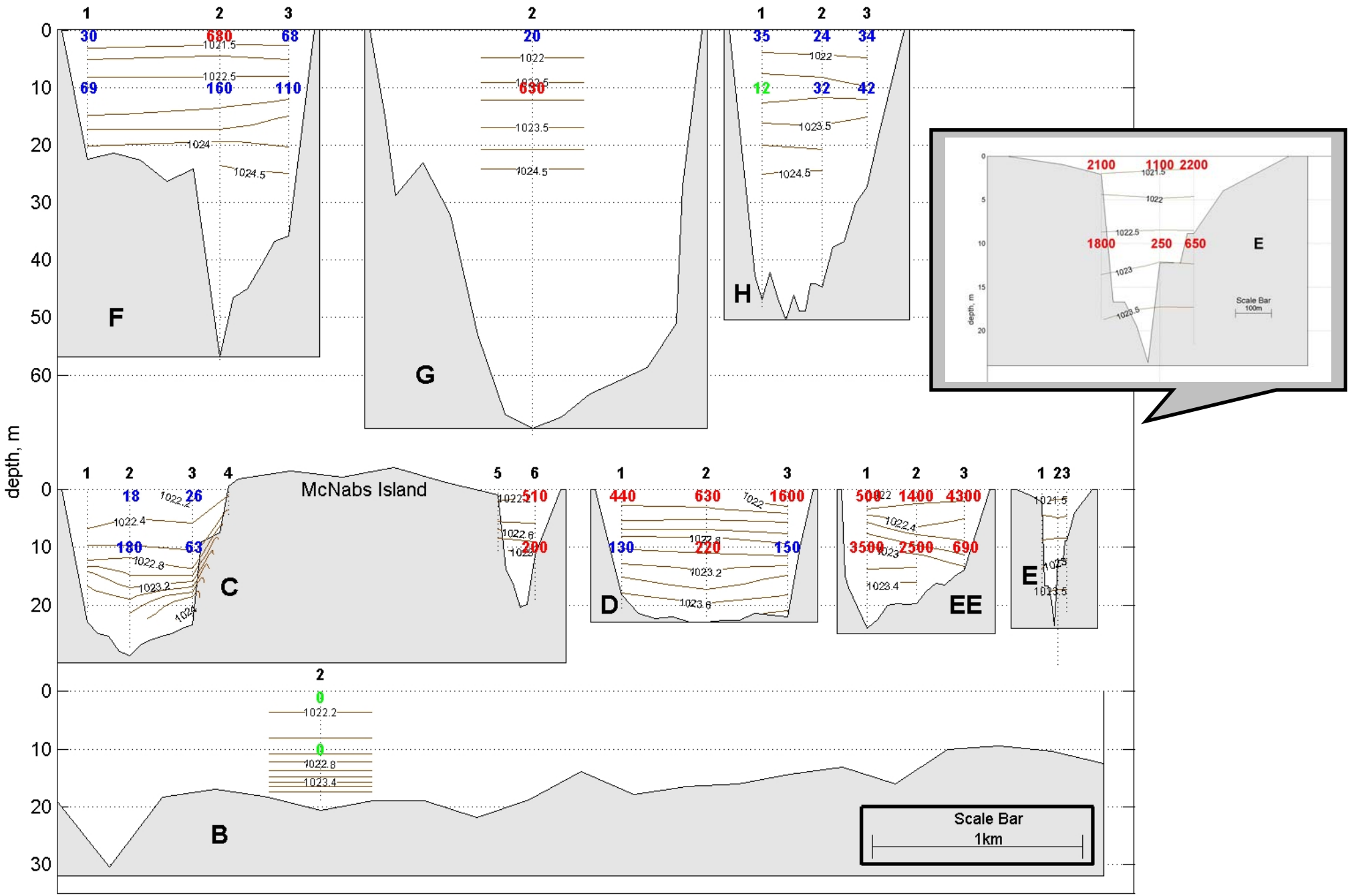








Salinity in PSU **Temperature in ^{o}C**


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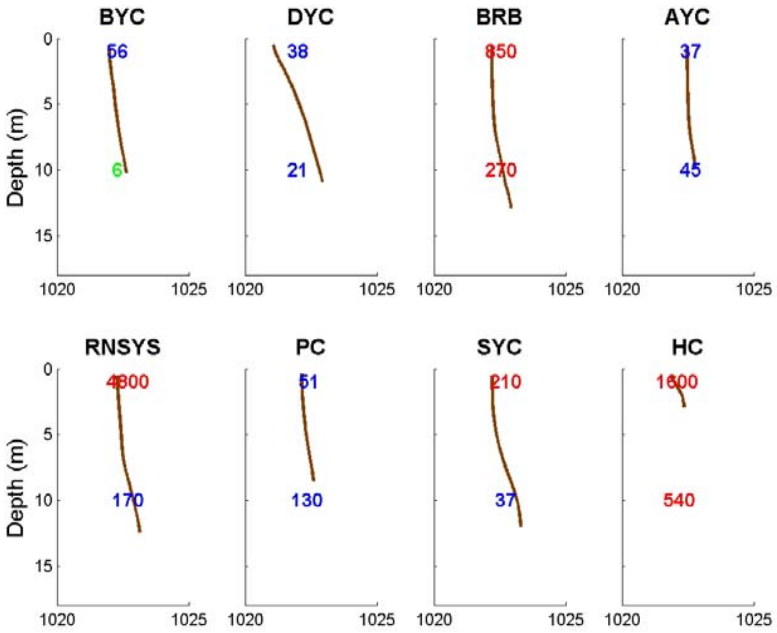
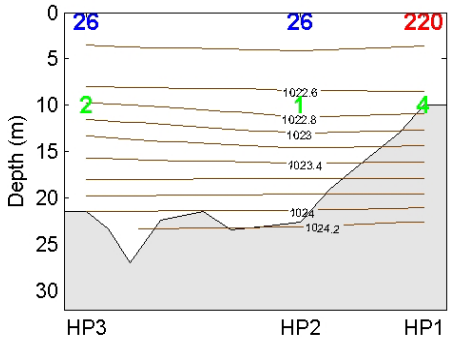
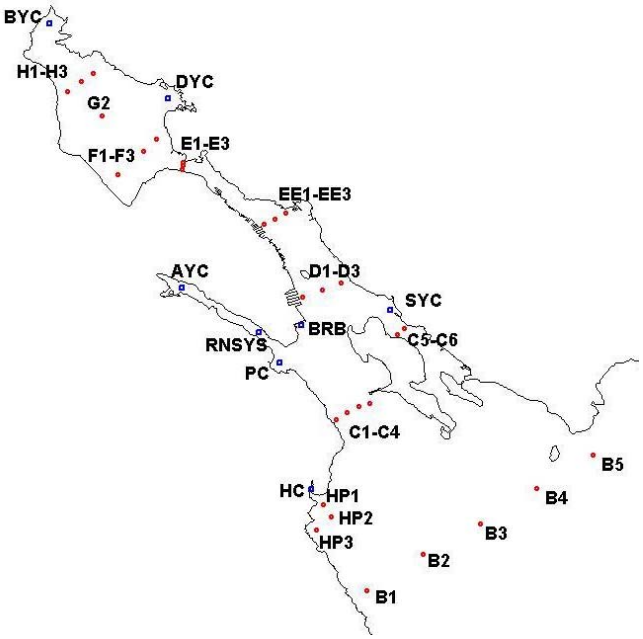
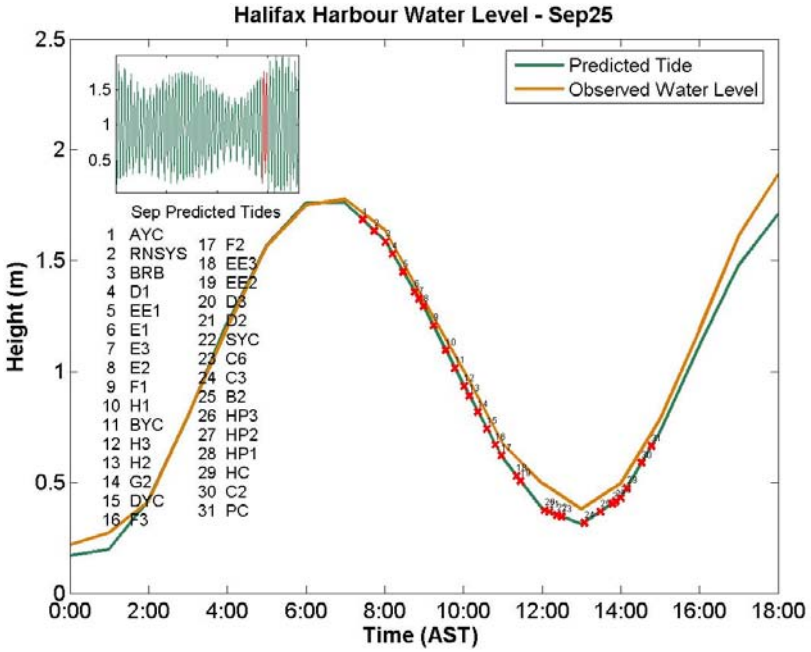
Scale Bar
1km
Scale Bar
100m

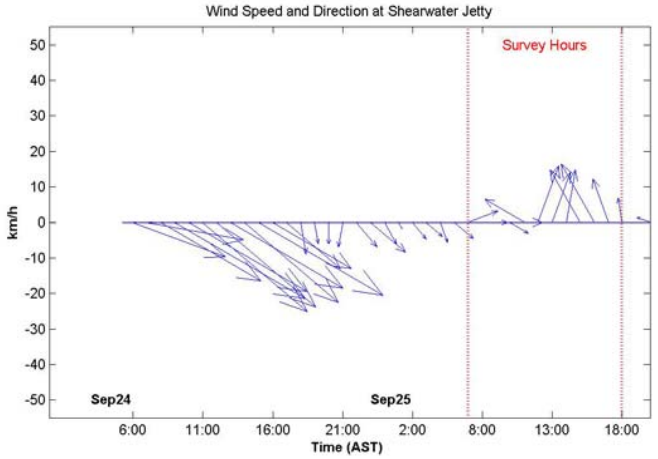
Yacht Clubs











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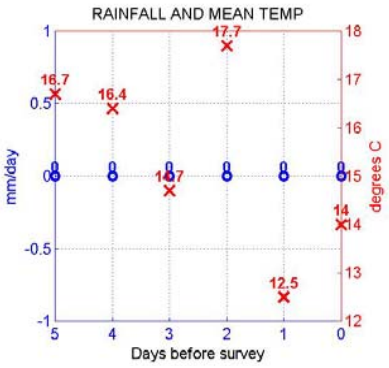
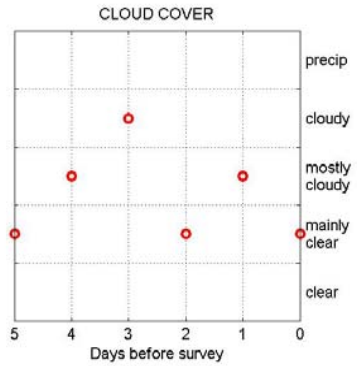
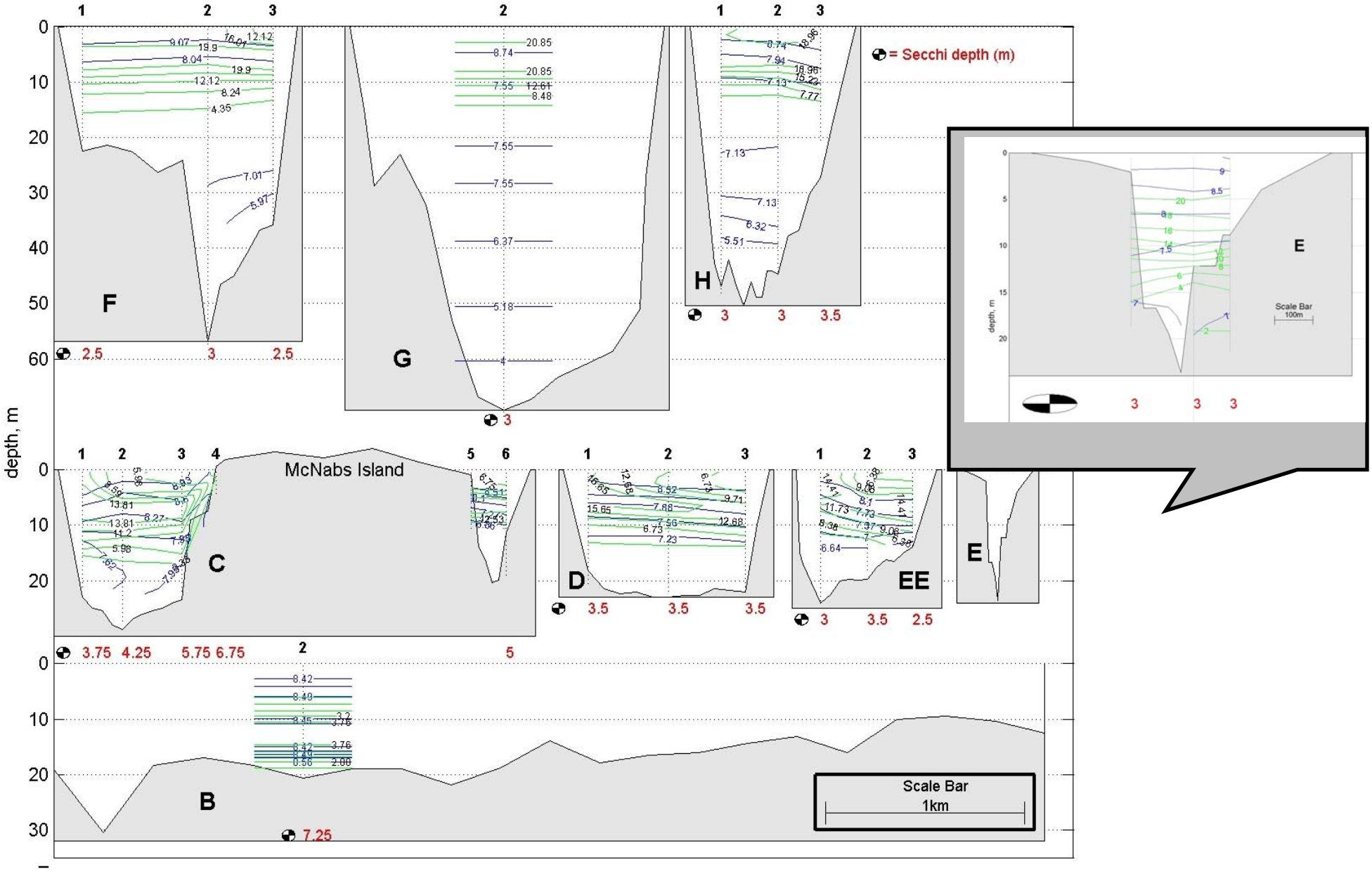




Potential Density in kg/m^3

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


depth, m
= Secchi depth (m)
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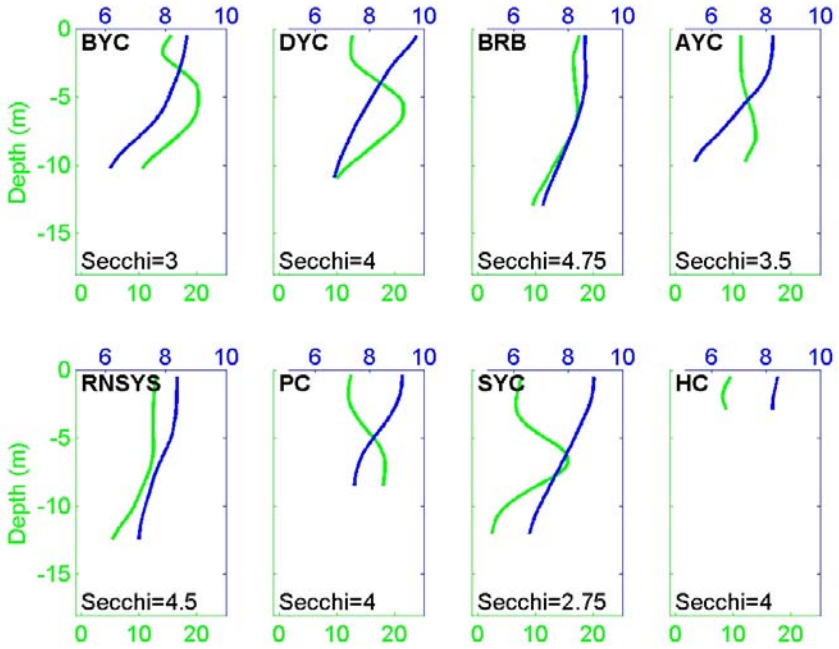
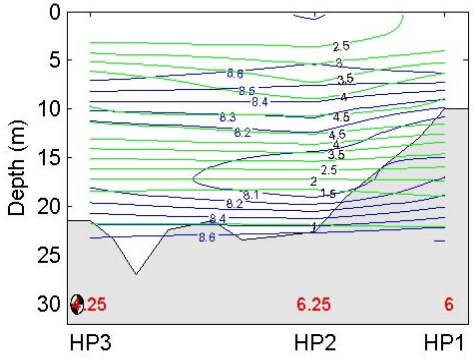
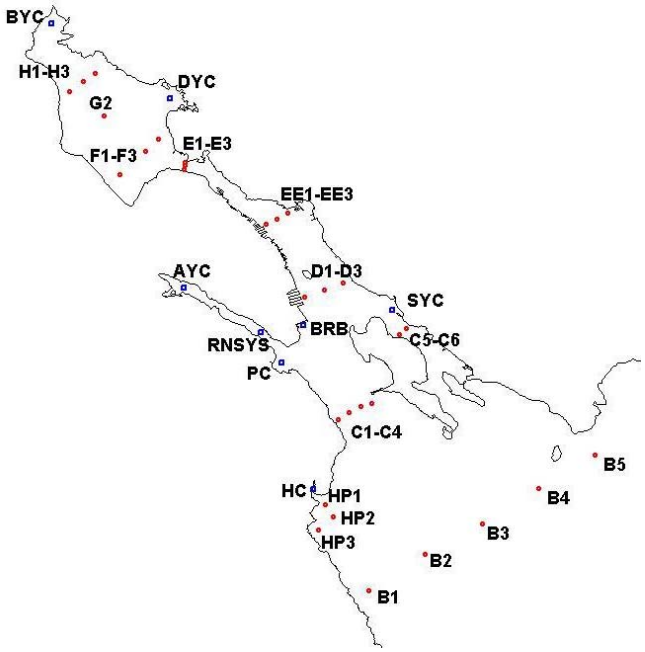
Yacht Clubs







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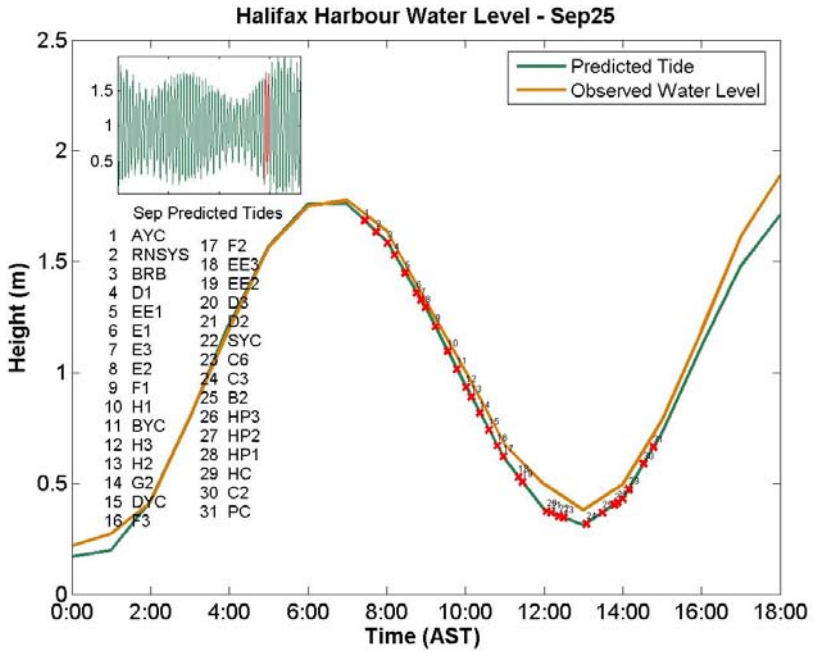
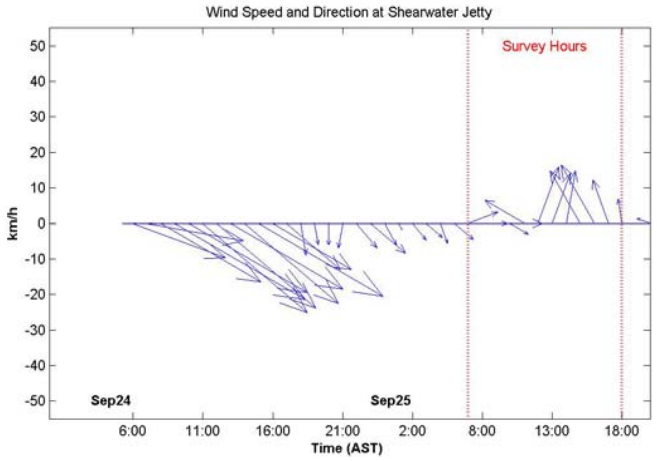
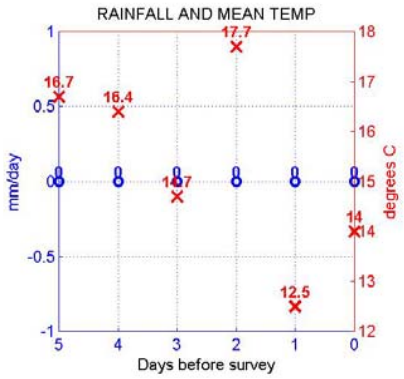
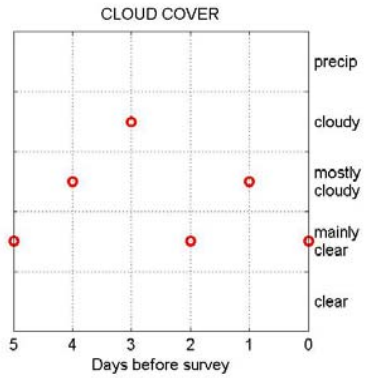
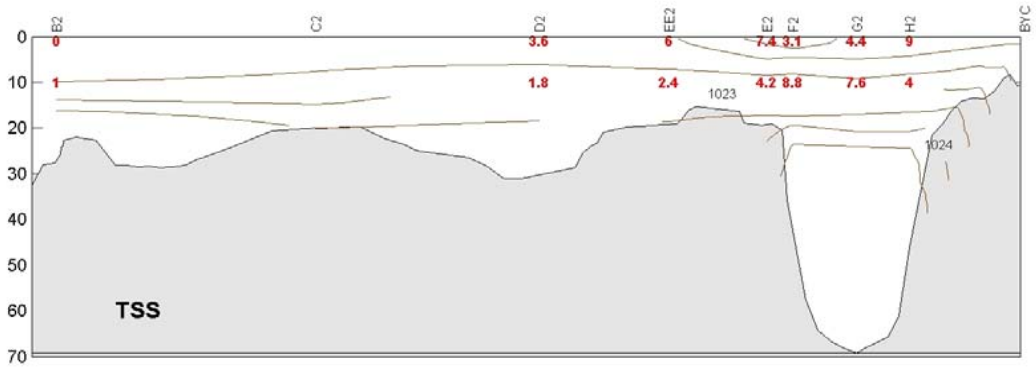


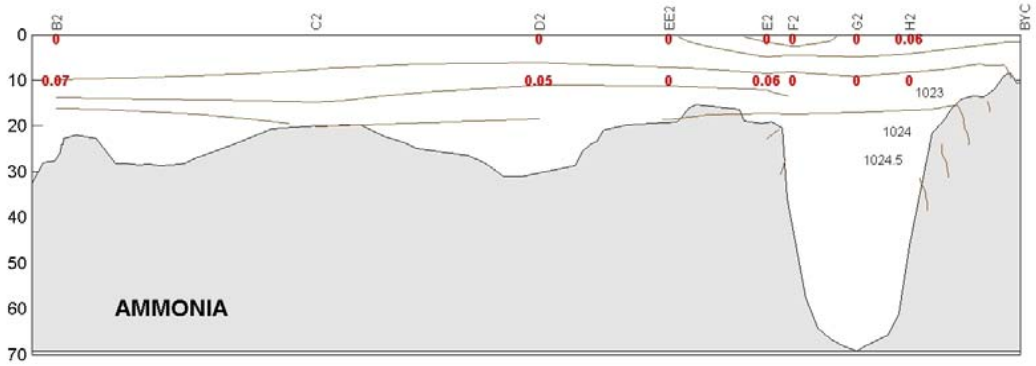


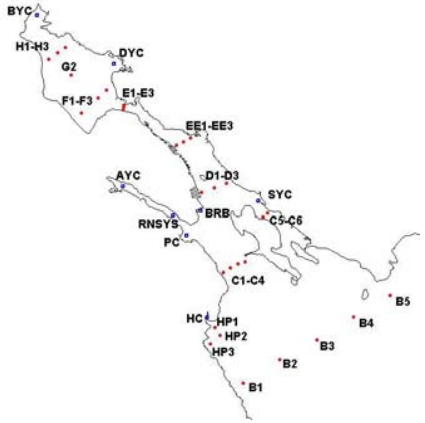




DO in mg/L **Chlorophyll in mg/m^3**







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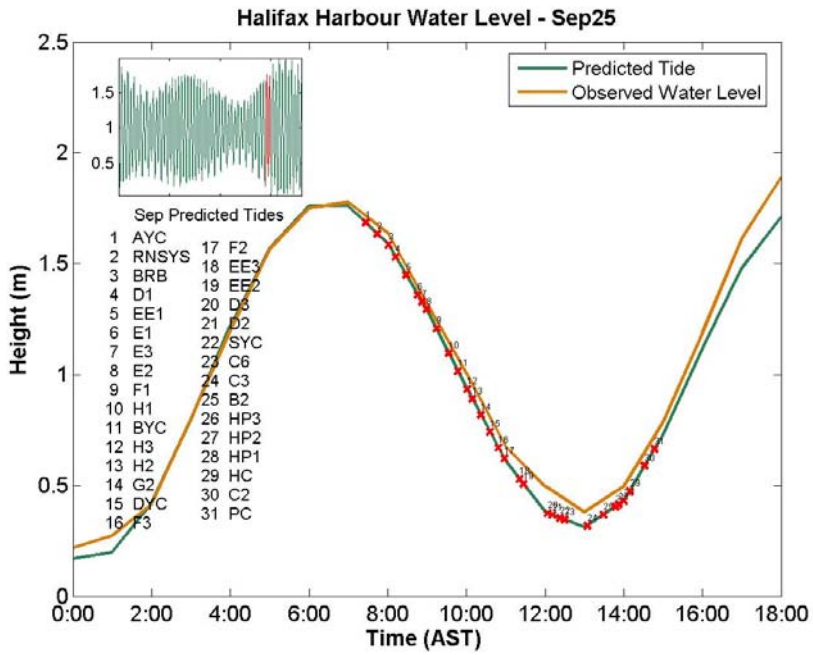
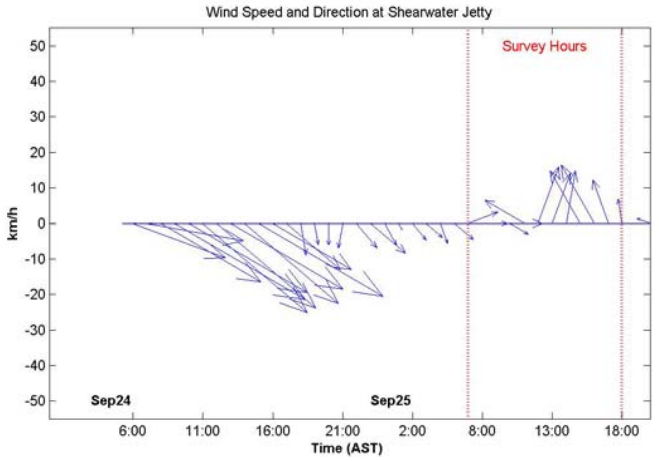
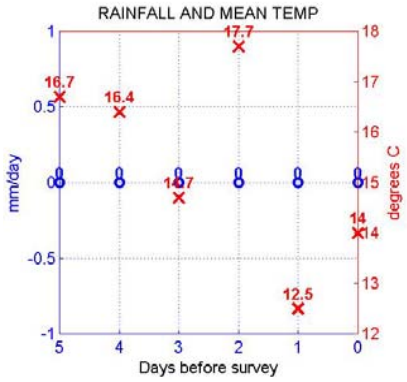
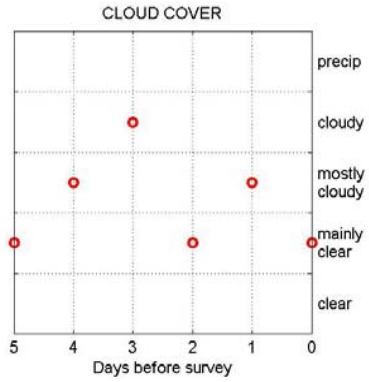
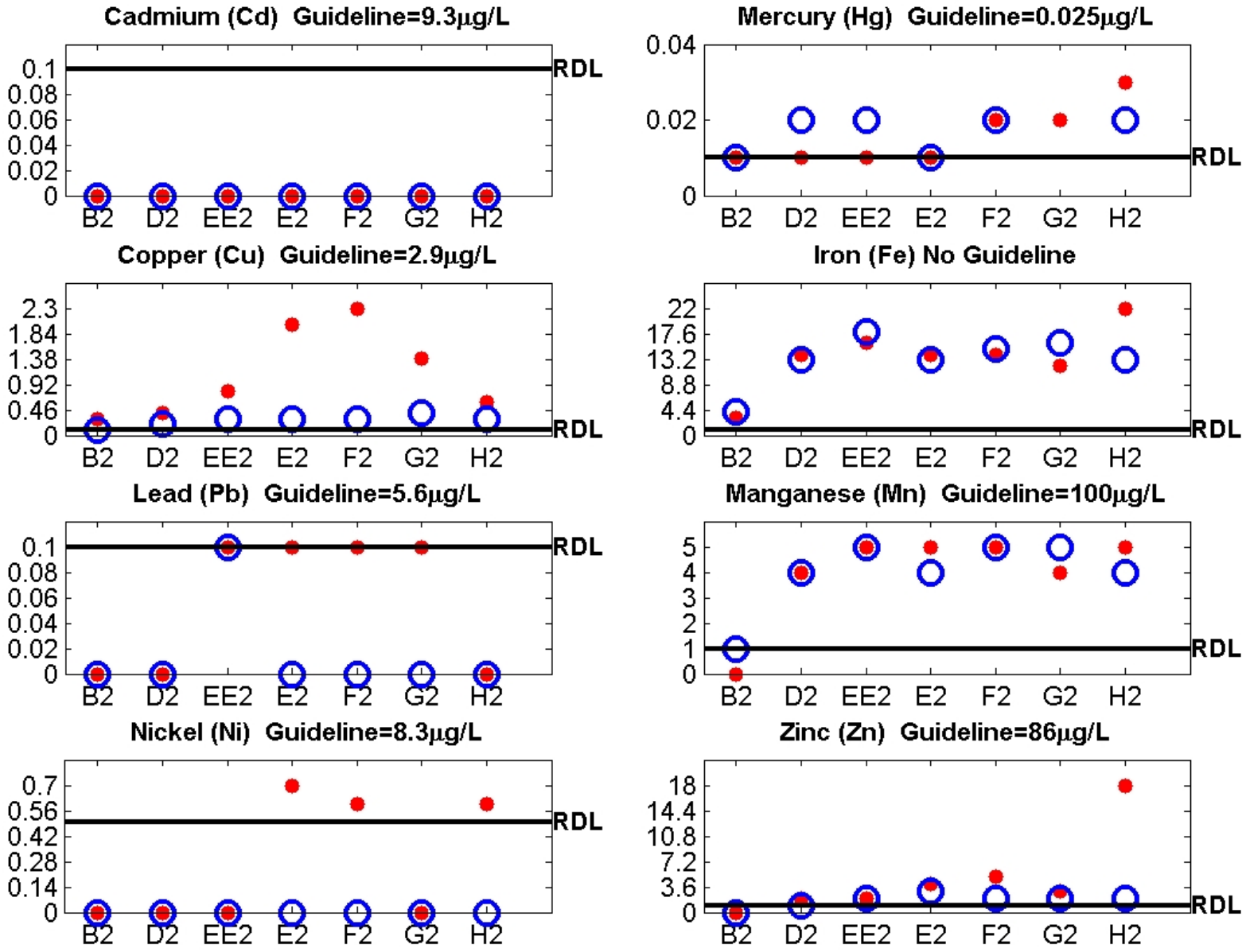








Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**


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
Mercury (Hg) Guideline=0.025µg/L
0.04
0.02
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Copper (Cu) Guideline=2.9µg/L
2.3
1.84
1.38
0.92
0.46
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Iron (Fe) No Guideline
22
17.6
13.2
8.8
4.4
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
5
4
3
2
1
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
18
14.4
10.8
7.2
3.6
0
RDL
B2 D2 EE2 E2 F2 G2 H2
LEGEND
= Ten Metre Sample
= One Metre Sample
RDL = Reportable Detection Limit