Halifax Harbour Water Quality Monitoring Project
Survey Summary #131

Survey Date: 05 June 2007
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report131_070605.doc
Data File: HHWQMP_data131_070605.xls

Data Return:

Profile:	97%
Bacteria:	98%
Chemical:	100%
Overall:	**98%**

Sample Notes:

The fecal coliform results for D1-1m were misplaced in the Lab.

The CTD data for Station F1 was missing - probable sampling error.

QA/QC samples:

Chemical Analysis		**G2 - 1m**	
Detectable Parameter	**Units**	**reference sample**	**QA/QC**
Ammonia (as N)	mg/L	0.05	<0.05
Total Suspended Solids	mg/L	4.4	8.7
Copper	ug/L	1.1	0.9
Iron	ug/L	8	9
Manganese	ug/L	4	4
Nickel	ug/L	0.5	0.5
Zinc	ug/L	2	2

Fecal Coliform (CFU/100ml)

Site	BYC-10m	C6-10m	H3-1m	G2-1m
Reference	4	56	4	16
QA/QC	1	61	690	26

Comments:

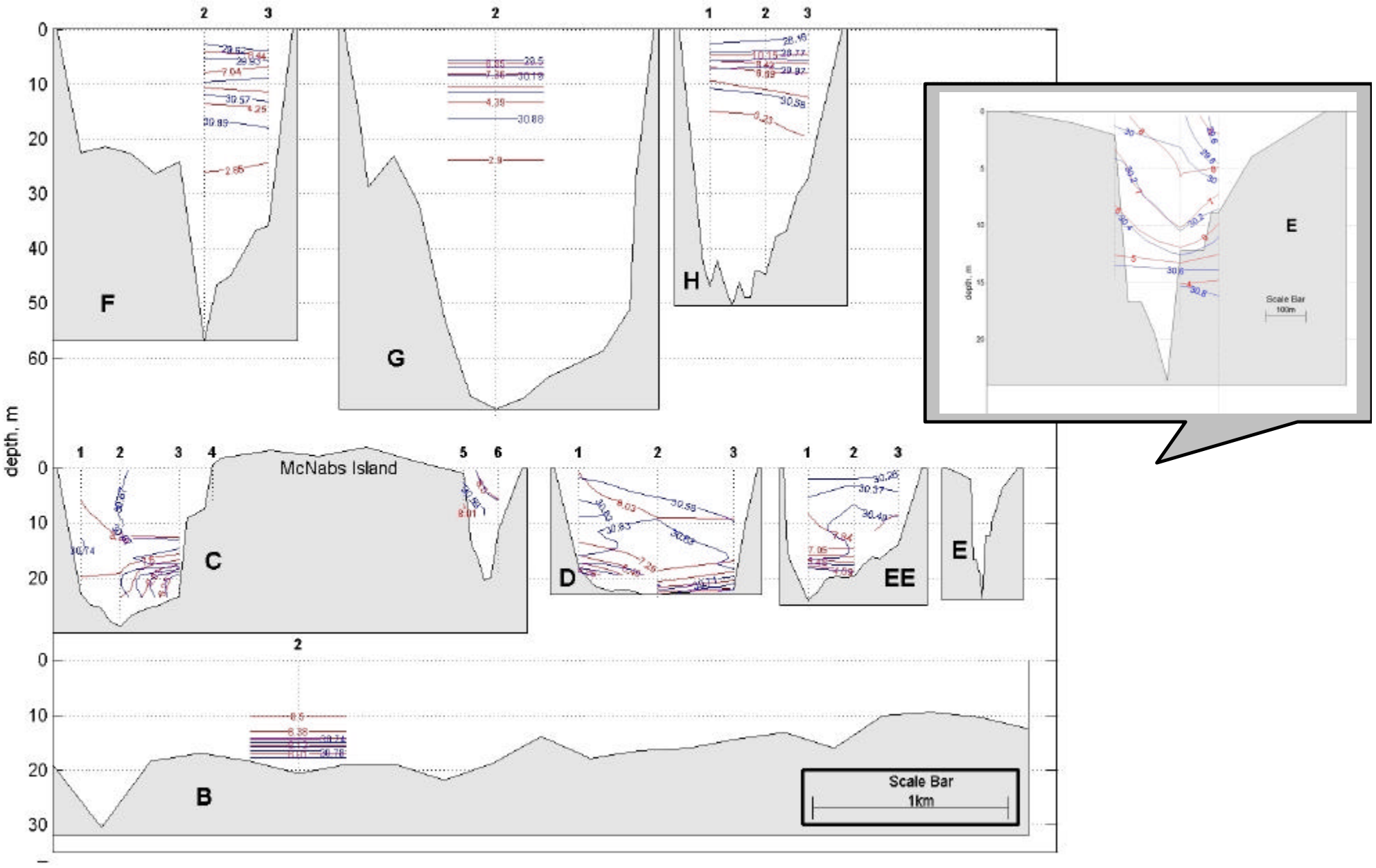
General: There has been some rainfall (16 mm) the day before the survey; however the salinity stratification is significantly less than in the previous survey. Generally throughout the Harbour, the surface salinity is higher and the bottom salinity is lower. The exception is the deep Basin, which remains relatively unchanged. Compared to the last survey, the harbour is less stratified in density everywhere with a less distinct surface layer. The fecal coliform (fc) values are generally quite high and the distribution is notably displaced up-harbour into the Narrows and southern Basin. The values are highest in the 1 m samples in the Inner Harbour and Narrows, with high 1 m values up to section F in the southern Basin. In the Basin the 10m samples are generally higher, with high values evident up to section H. This distribution is likely due to a combination of up-harbour wind, the source from the Fairview Cove outfall and estuarine circulation in the Basin. There are relatively high values of fc in both samples in Herring Cove (HC) and the 1m Sample at HP1. This is likely from the Tribune Head outfall carried by the up-cove wind.

Fluorescence: The profile maximums occur at about 10 m throughout the Basin and Inner Harbour. In the Basin and Narrows the profile maximum values are relatively high at around 20 mg/m^3. There is a maximum of around 35 mg/m^3 at station E3. Further out of the harbour the values drop until they are about 1-2 mg/m^3 at the B and C sections. In the NW Arm there are values that are similar to those in the Inner Harbour.

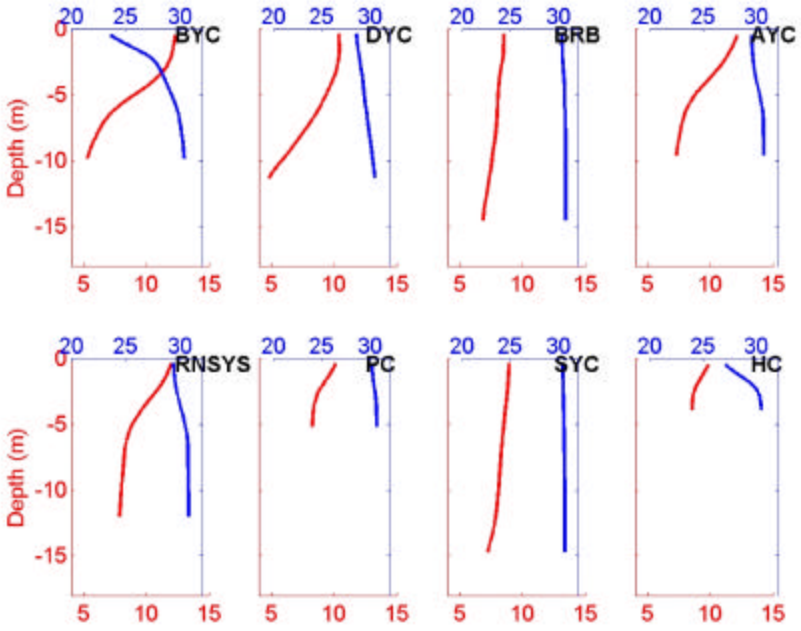
Ammonia: There are 10 of 14 detectable values, most at or just above the detection limit of 0.05 mg/L. There are higher values in the Basin with the highest level (1.4 mg/L) in the North of the Basin at the 1m sample at H2.

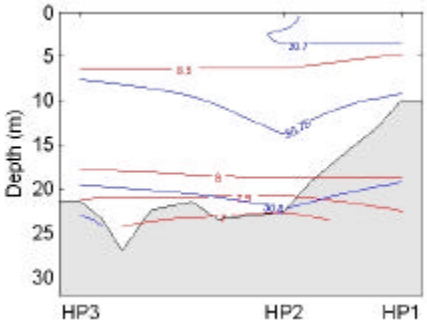
TSS: The TSS values range from 1 – 8 mg/L, with values generally decreasing going out of the harbour. The values are generally higher in the 10m sample than the 1m sample.

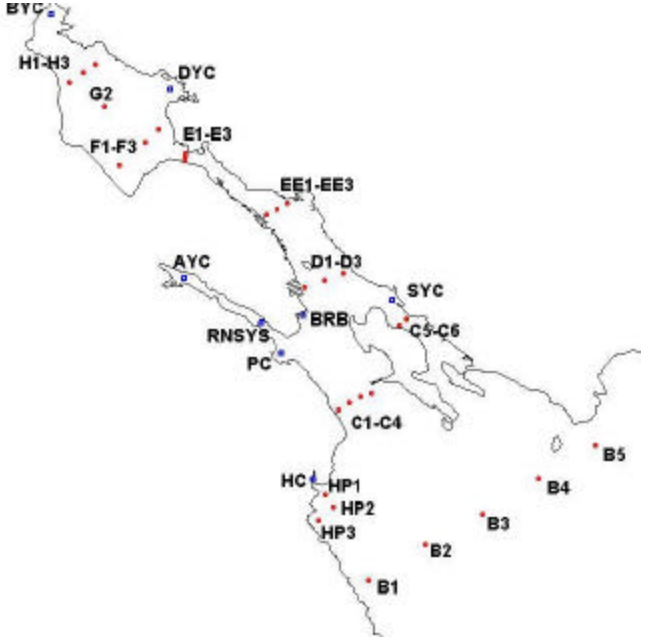
Dissolved Oxygen: The dissolved oxygen (DO) data indicate that the levels are quite uniform, ranging only from about 7.1 - 7.5 mg/L, in water <20 m in depth. The values in the deep Basin have dropped slightly to about 6.5 mg/L. The only values below applicable use specific guidelines are below 30m water depth in the Basin (< 7.0 mg/L) and in the Outer Harbour (B2) where the DO of about 7.1 mg/L is below the 8.0 mg/L criterion. The DO data is not ground-truthed and absolute values are questionable (see DO discussion in QR#1).

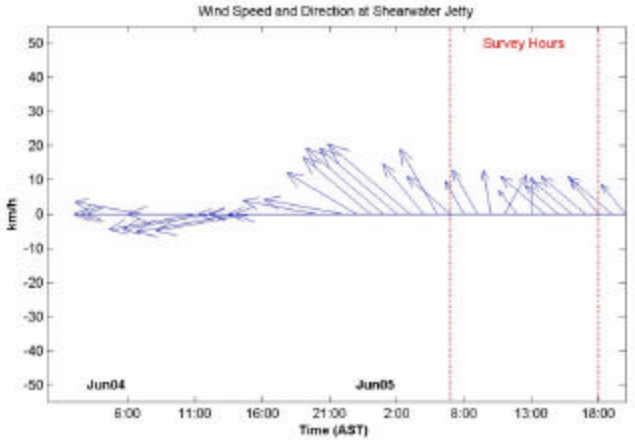

depth, m
F
G
H
E
C
McNabs Island
D
EE
E
B
Scale Bar
1km
Scale Bar
100m

Yacht Clubs



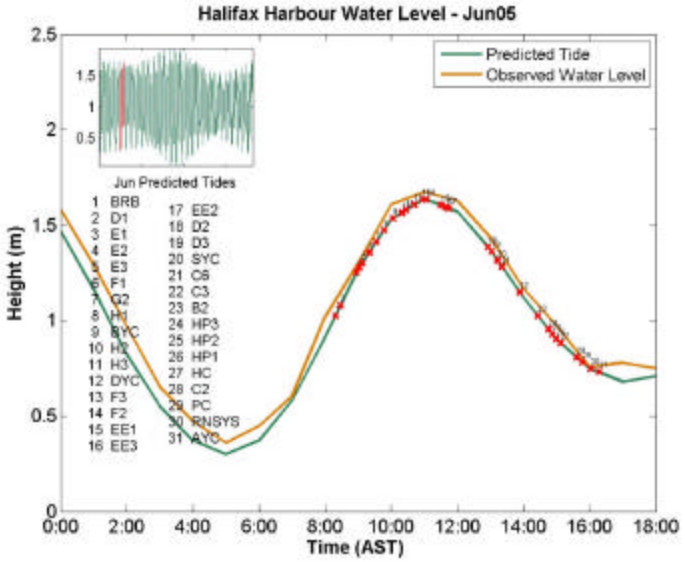


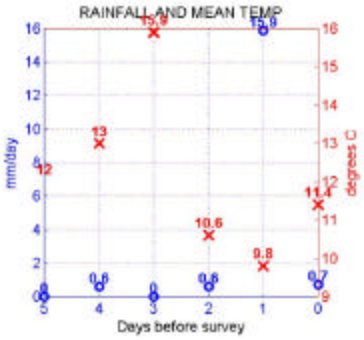


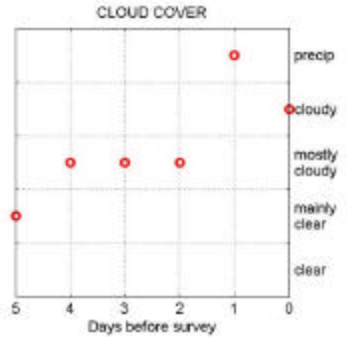


Rainfall and temperature data collected at Shearwater Autoport.

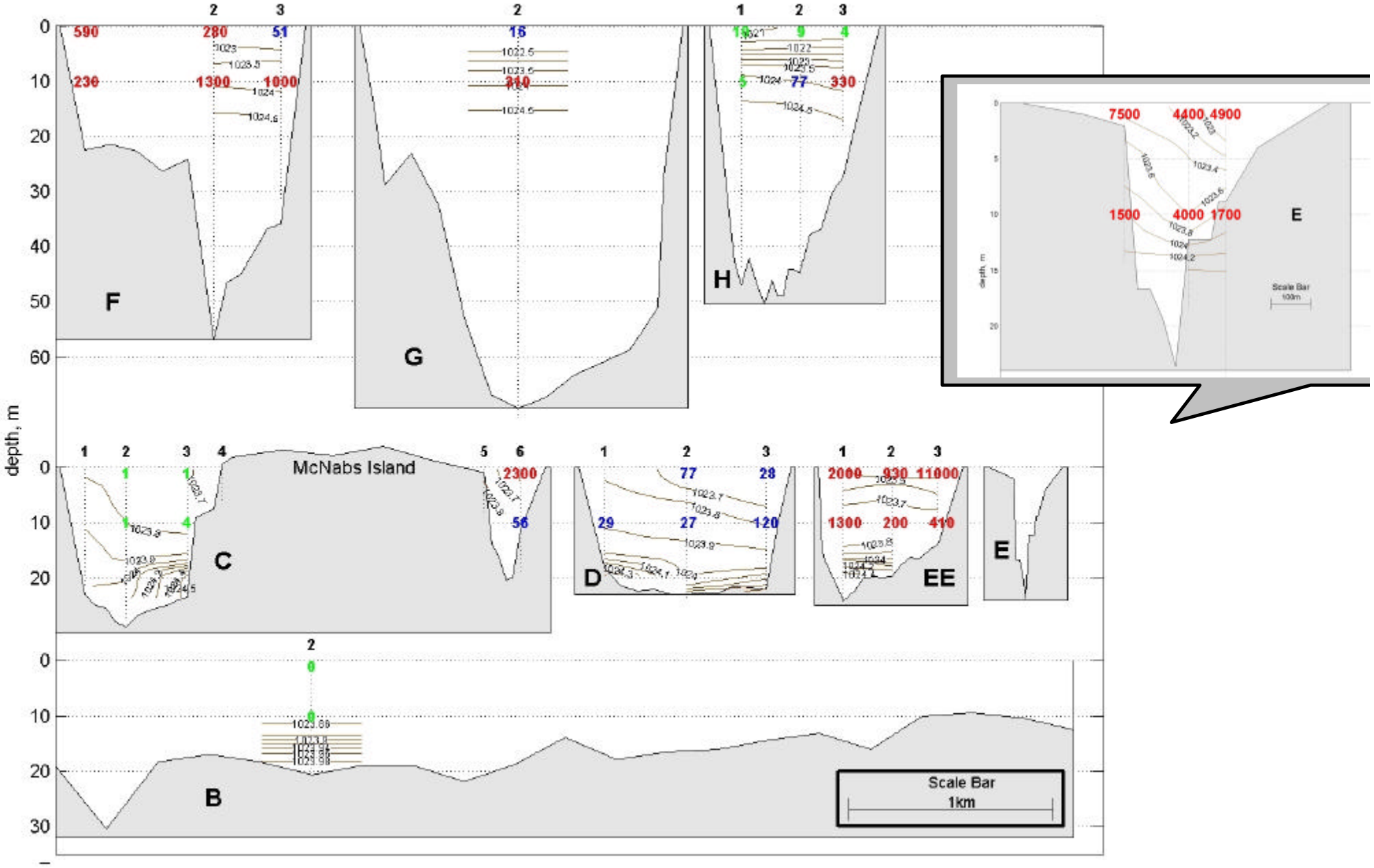
Cloud cover data collected at Shearwater Airport



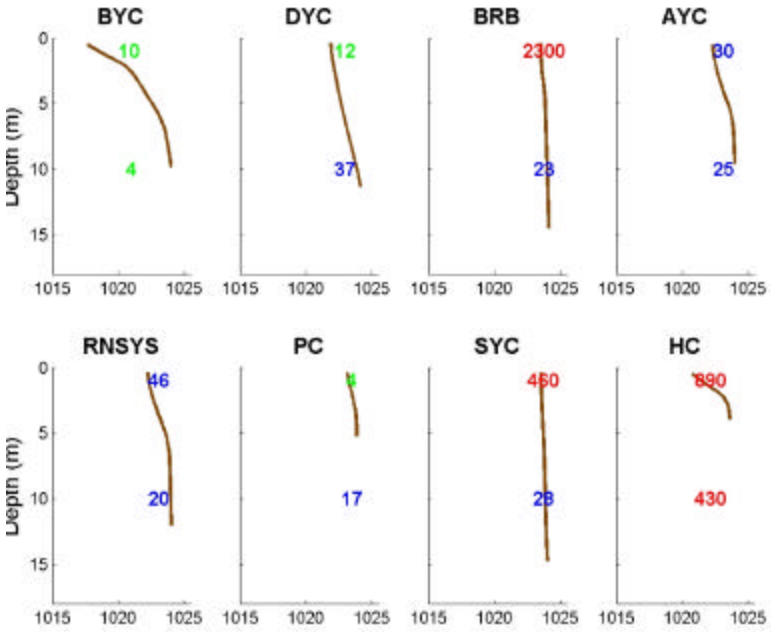


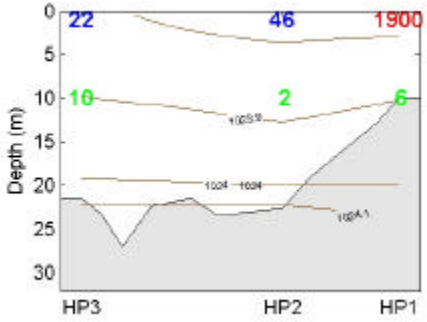


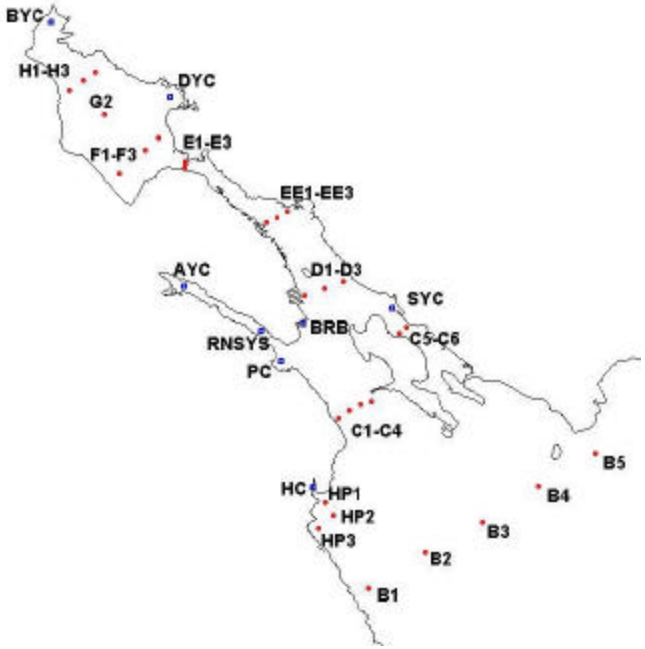
Salinity in PSU **Temperature in ^{o}C**

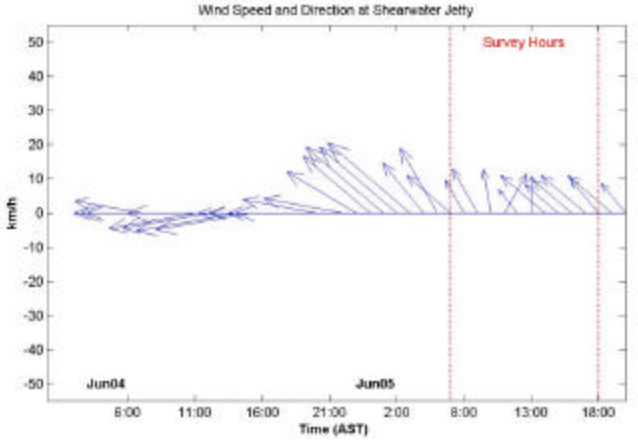

depth, m
F
G
H
E
C
McNabs Island
D
EE
E
B
Scale Bar
1km

Yacht Clubs









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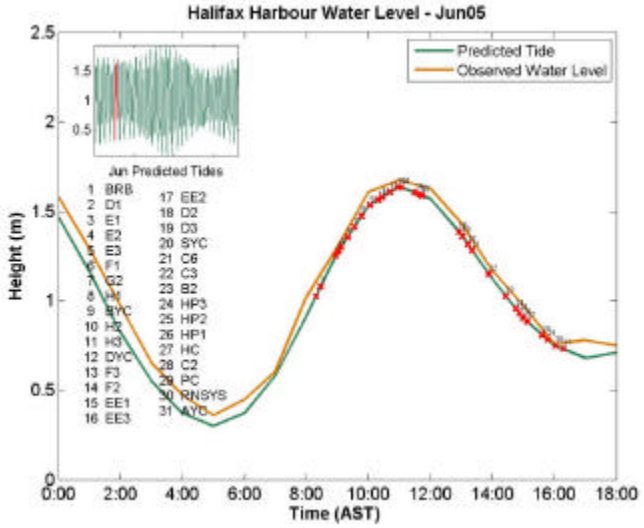
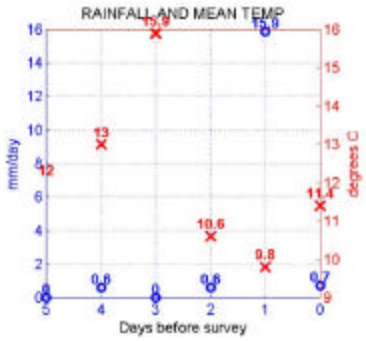
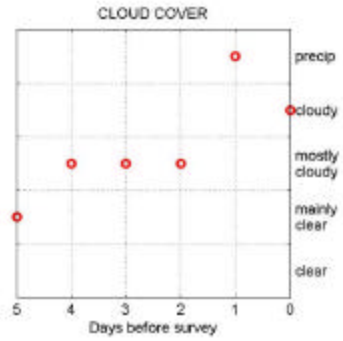
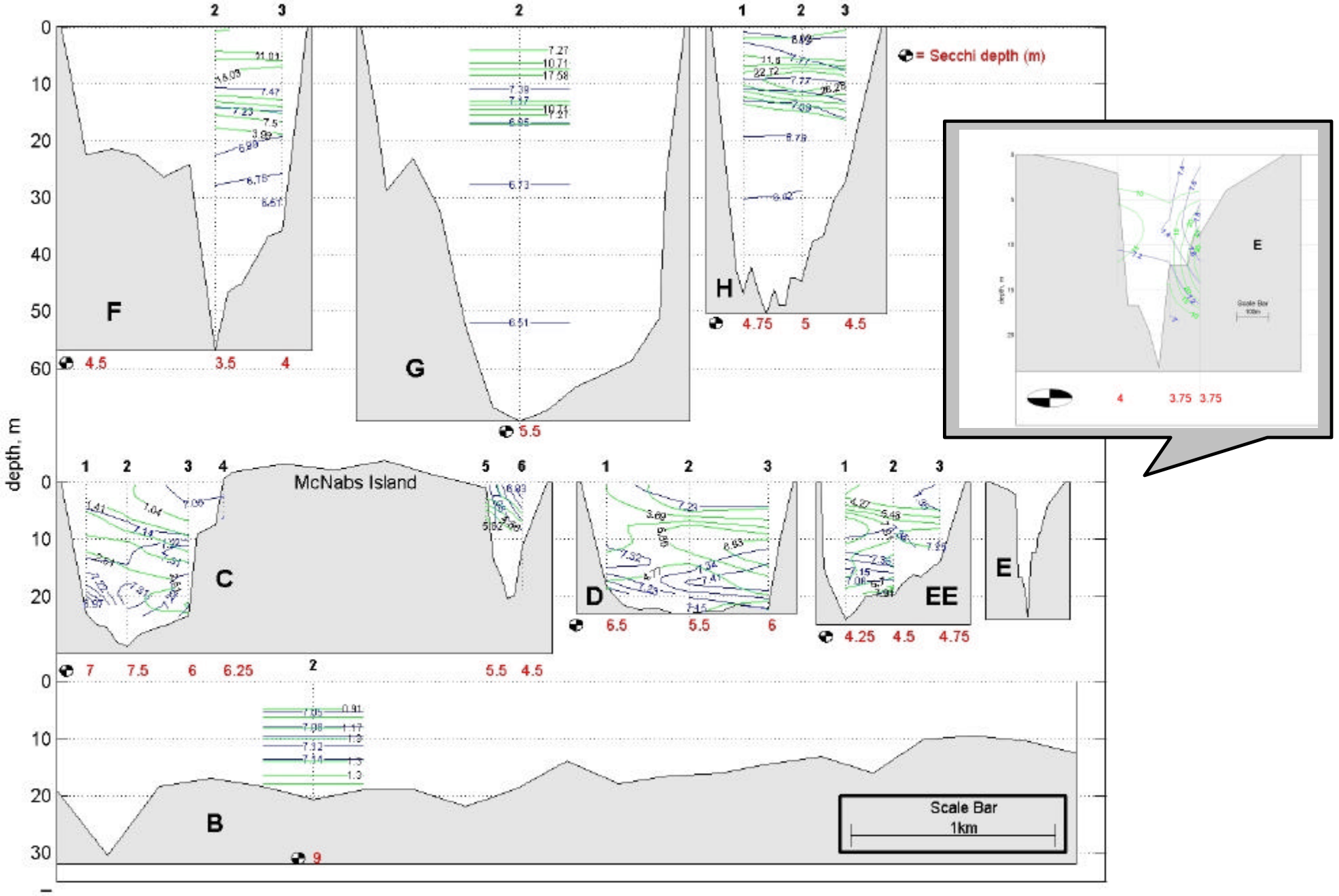






Potential Density in kg/m^3

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


= Secchi depth (m)
depth, m
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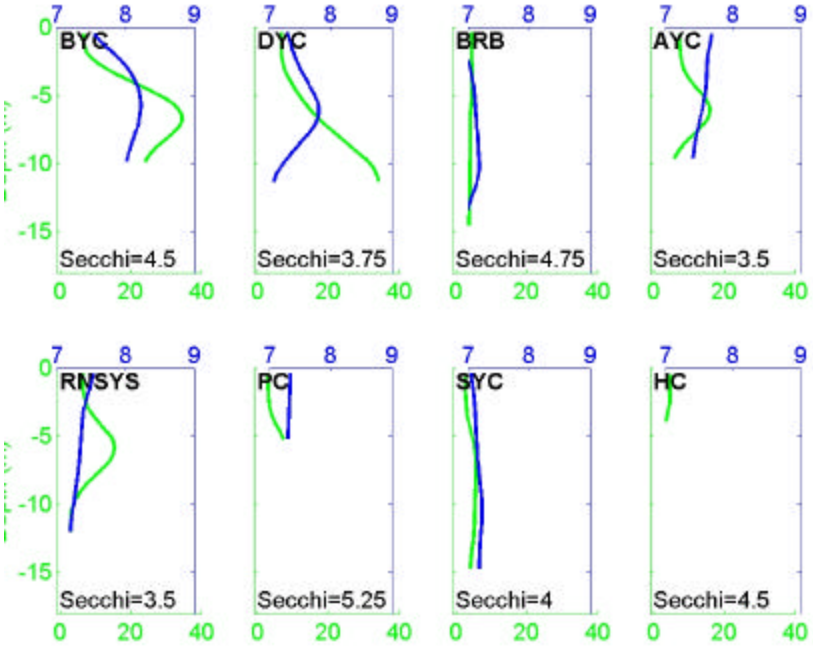
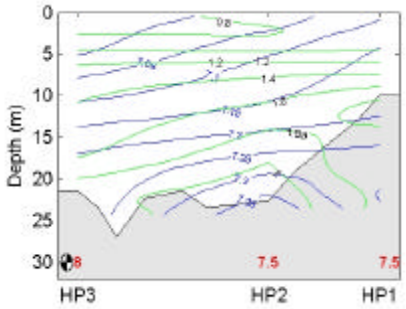
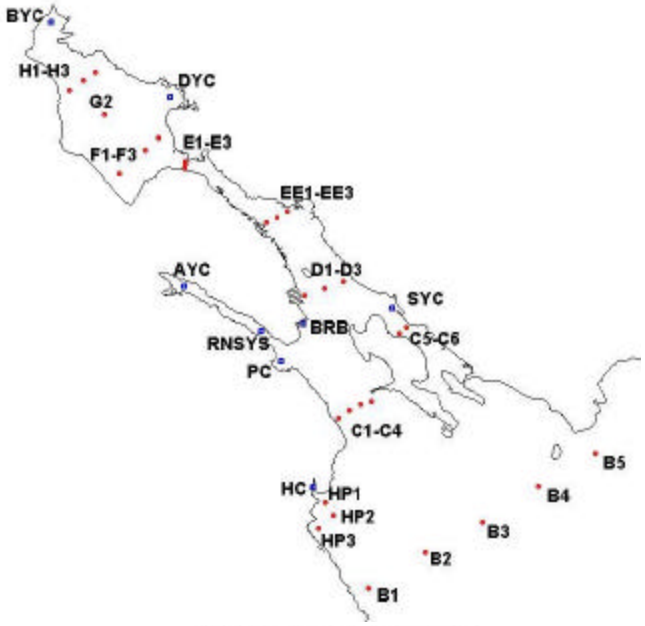
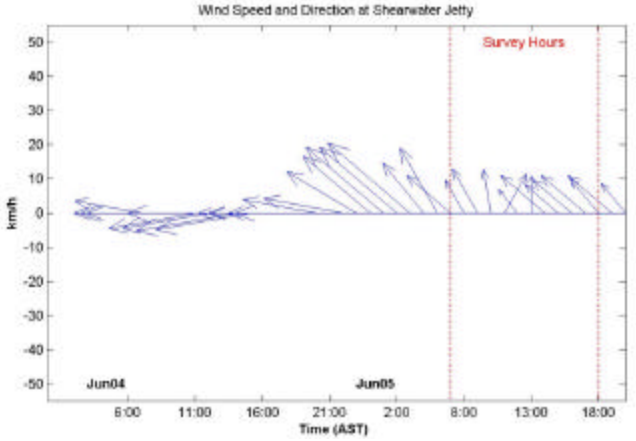
Yacht Clubs









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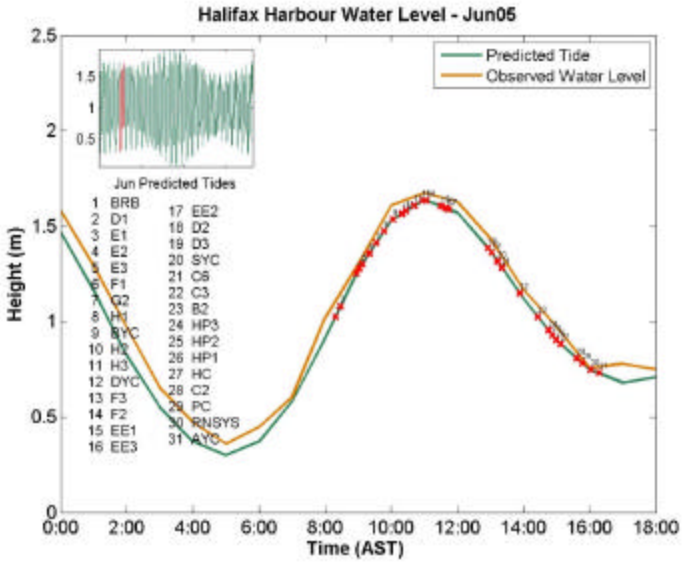
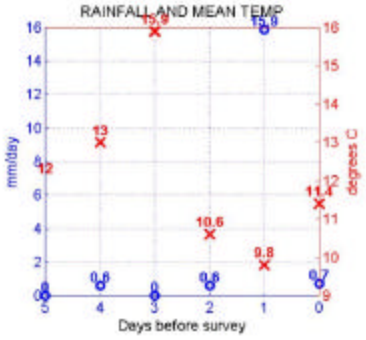
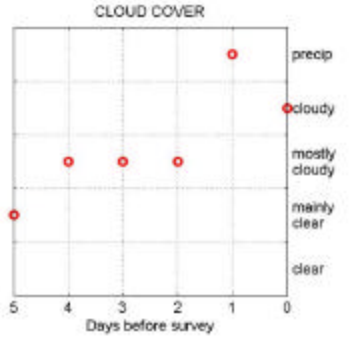
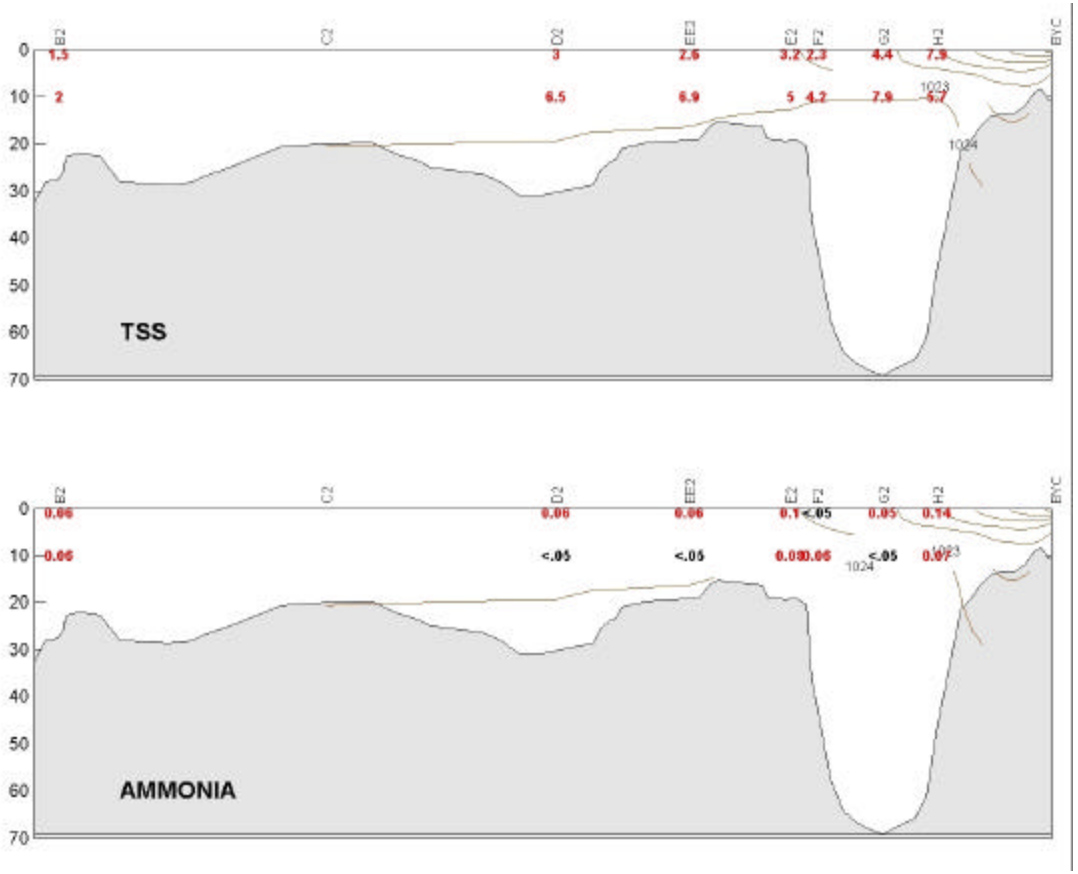






DO in mg/L **Chlorophyll in mg/m^3**



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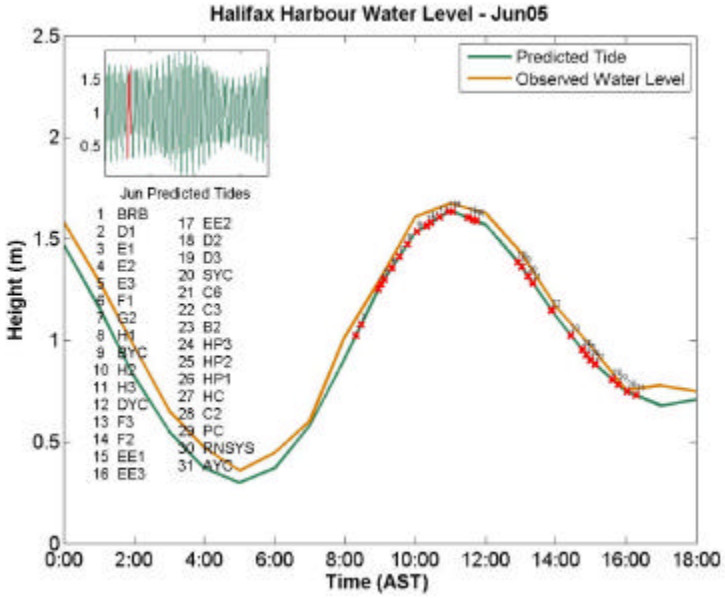
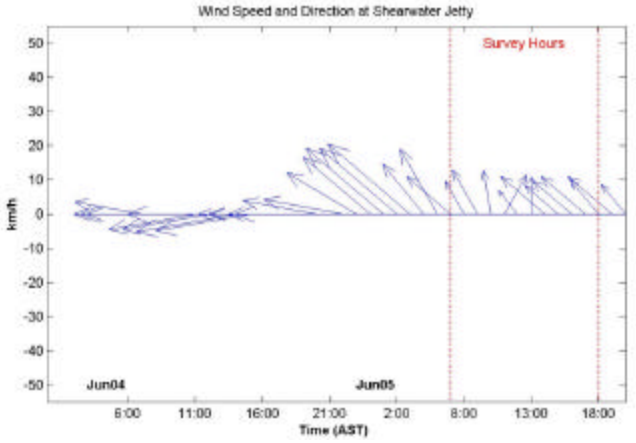
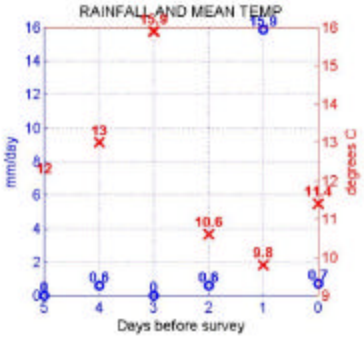
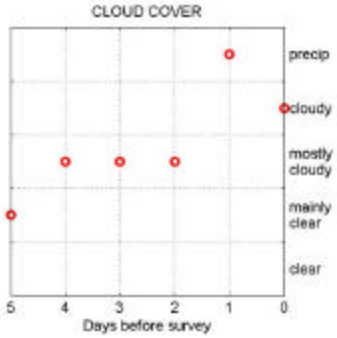
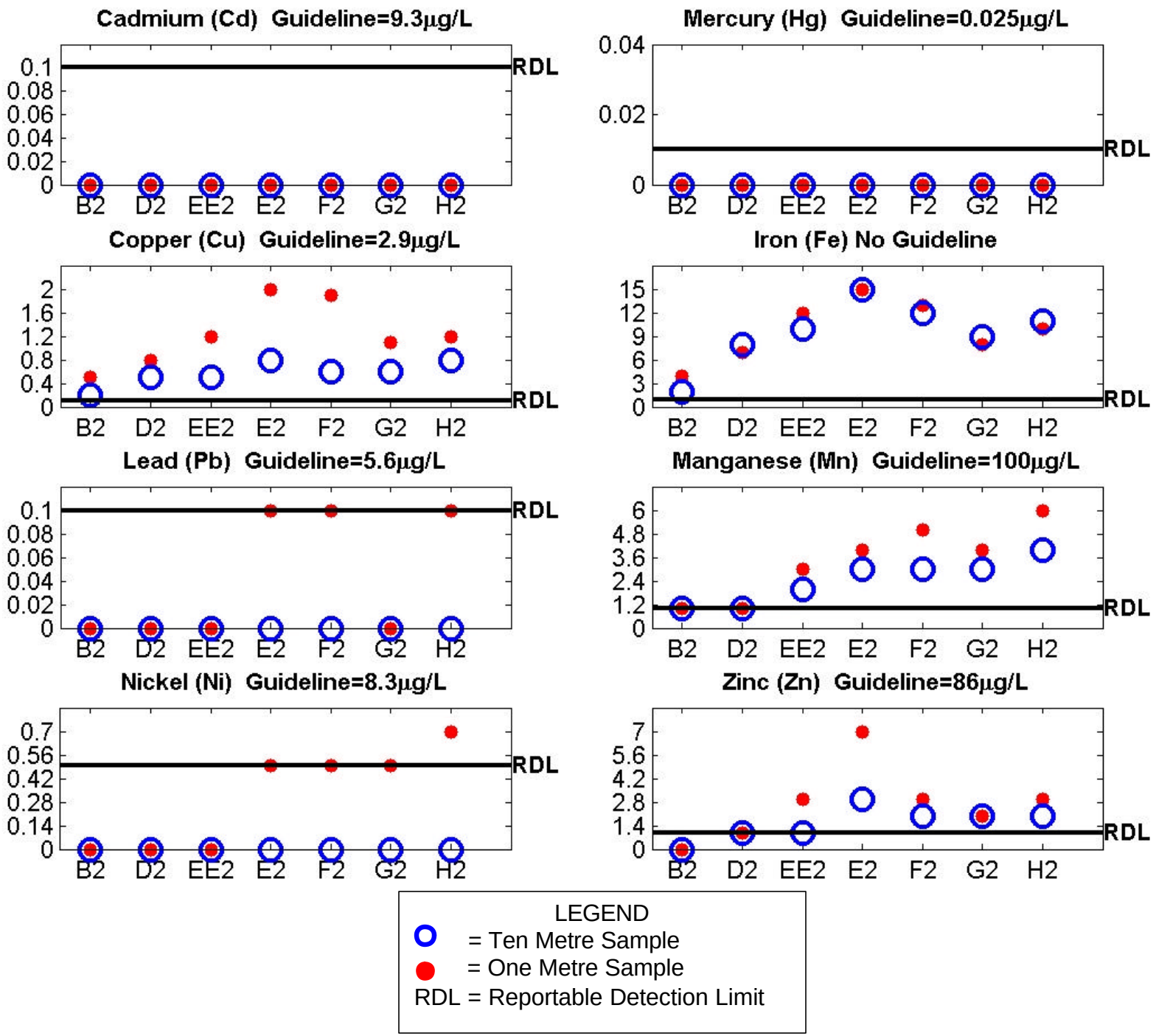








Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**


Cadmium (Cd) Guideline=9.3µg/L
RDL
0.1
0.08
0.06
0.04
0.02
0
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
1.6
1.2
0.8
0.4
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Iron (Fe) No Guideline
15
12
9
6
3
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
6
4.8
3.6
2.4
1.2
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
7
5.6
4.2
2.8
1.4
0
RDL
B2 D2 EE2 E2 F2 G2 H2
LEGEND
= Ten Metre Sample
= One Metre Sample
RDL = Reportable Detection Limit