Halifax Harbour Water Quality Monitoring Project
Survey Summary #148

Survey Date: 30 January 2008
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report148_080130.doc
Data File: HHWQMP_data148_080130.xls
Data Return:

Profile:	67%
Bacteria:	100%
Chemical:	100%
Overall:	**85%**

Sample Notes:

The CTD dissolved oxygen sensor was removed for repair. A YSI handheld DO probe was used for DO measurements at 1 m. These are reported in the data file.

A CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 08:07.

Sites BYC and DYC were not accessible due to ice, samples were relocated. The coordinates are in the data report.

Additional bacteria samples were taken in the NW Arm. This data is reported under separate cover.

QA/QC samples:

Chemical Analysis

		B2 – 10m	
Detectable Parameter	**Units**	**reference Sample**	**QA/QC**
Ammonia (as N)	mg/L	0.08	<0.05
Total Suspended Solids	mg/L	6	7.1
Copper	ug/L	0.6	0.1
Iron	ug/L	2.0	1.0
Zinc	ug/L	8.0	2.0

Fecal Coliform (MPN/100ml)

Site	D1-10m	H3-1m	E3-1m	B2-10m
Reference	300	45	610	7
QA/QC	710	92	93	6

Comments:

General: The harbour remains relatively weekly stratified, except for a fresher water signature in the northern Basin. There is a hint of an intrusion, as there is bottom water of similar density to the Basin bottom water throughout the Harbour. This water does not have a strong signal in the Narrows, however there is still a relatively strong density gradient between the Narrows and the Basin mid-water. Based on BBPMP DO data the DO at 60 m in the Basin has increased by over 1.0 mg/L suggesting additional intrusion after the previous survey. The commissioning of the Halifax sewage treatment plant is continuing. The sewage source location and level of treatment are quite variable as sewersheds are connected and equipment is brought on-line. The bacteria levels are moderate, with perhaps somewhat less than "normal" vertical variation. There is no definitive effect of the Halifax STP. Notable are relatively high levels in the surface water in the Outer Harbour (C and B sections), perhaps explained by persistent down-harbour winds the day before..

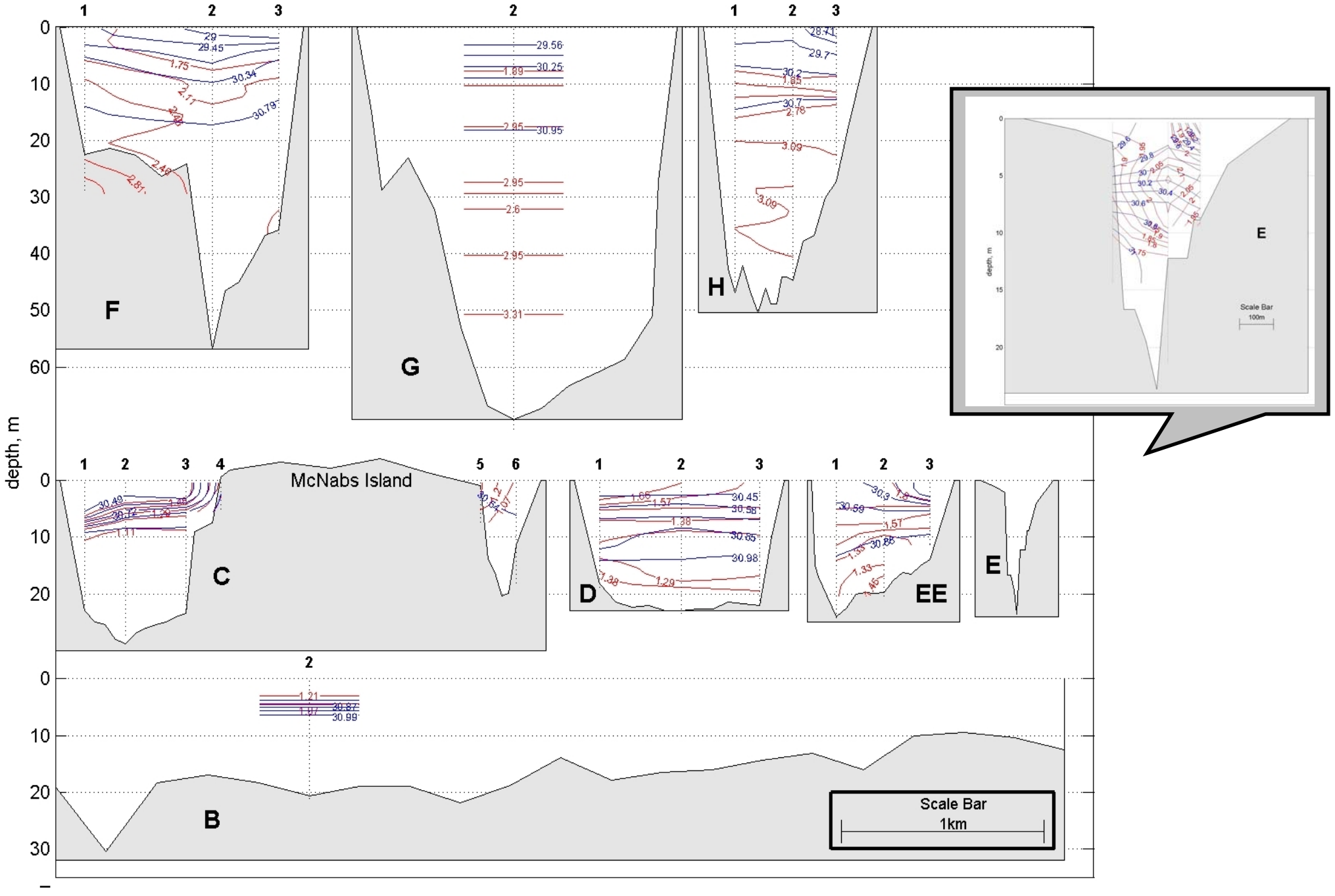
Fluorescence: The fluorescence values are low, generally below 2 mg/m^3. The higher values are in the Basin.

TSS: TSS values are moderate (mean 7.1 mg/L) with quite a bit of spatial variability and values as high as 12.0 mg/L. There is no coherent spatial distribution.

Ammonia: The ammonia values in the harbour are slightly elevated above the detection limit of 0.05 mg/L. The mean value is 0.6 mg/L, with 4 of 14 measurements below the detection limit. The values tend to be slightly higher in the Basin.

Metals: There are no guideline exceedences. Unusually, the closest to exceedence is mercury for which there were two detectable values. The concentration at E2-1m was 0.02 ug/L that is 80% of the 0.025 ug/L guideline.

Dissolved Oxygen: There was no DO sensor on the CTD. The 1 m YSI measurements indicate relatively uniform values generally between 9.0-10.0 mg/L. The levels increase somewhat in the Outer Harbour (section C and beyond) to 10.0-11.0 mg/L. Consistently, the DO levels measured by the LOBO buoy in the Northwest Arm was about 9.6 mg/L and the levels from the BBPMP, taken the same day near Station G2, were approximately 10.7 mg/L at 1 m, and 6.4 mg/L at 60 m.


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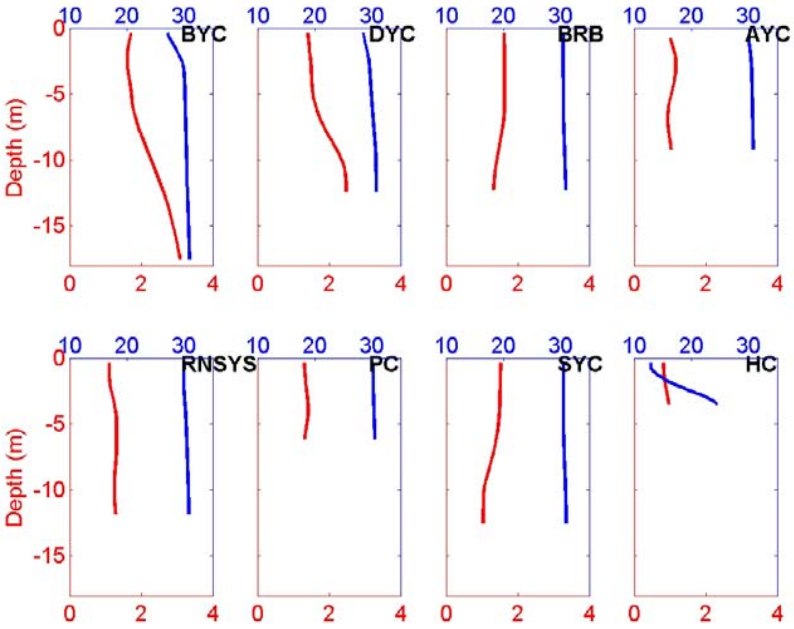
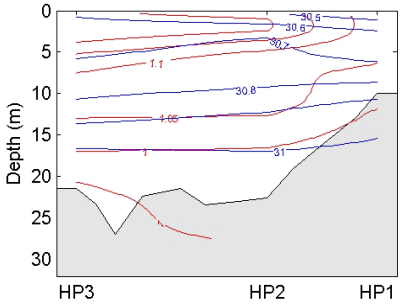
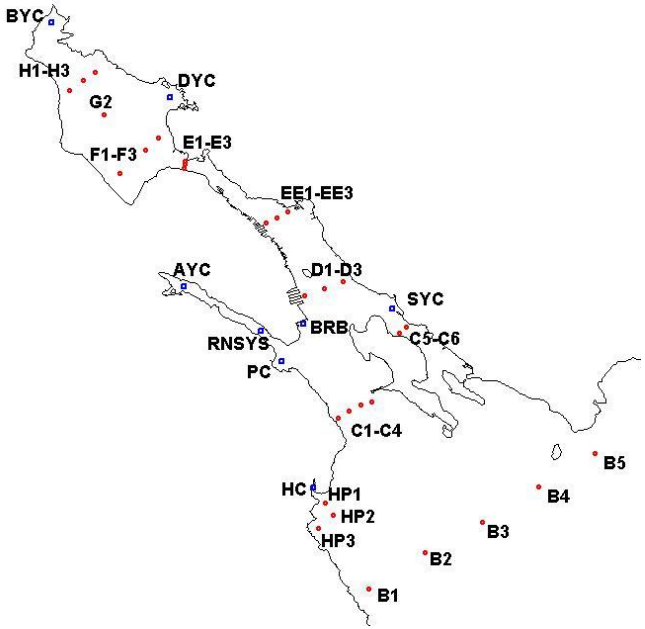
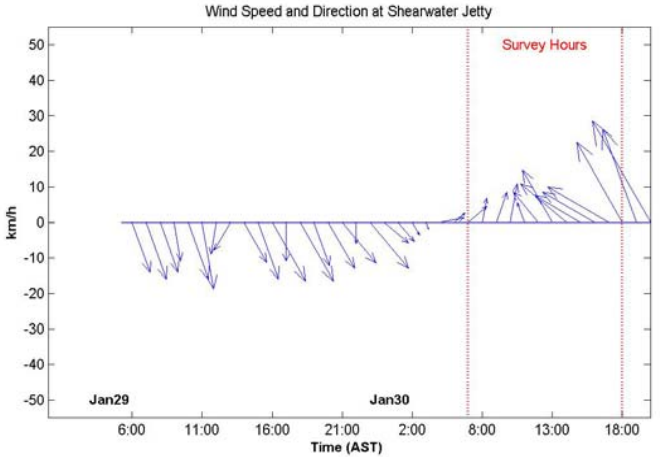
C
McNabs Island
D
EE
E
B
Scale Bar
1km
Scale Bar
100m

Yacht Clubs



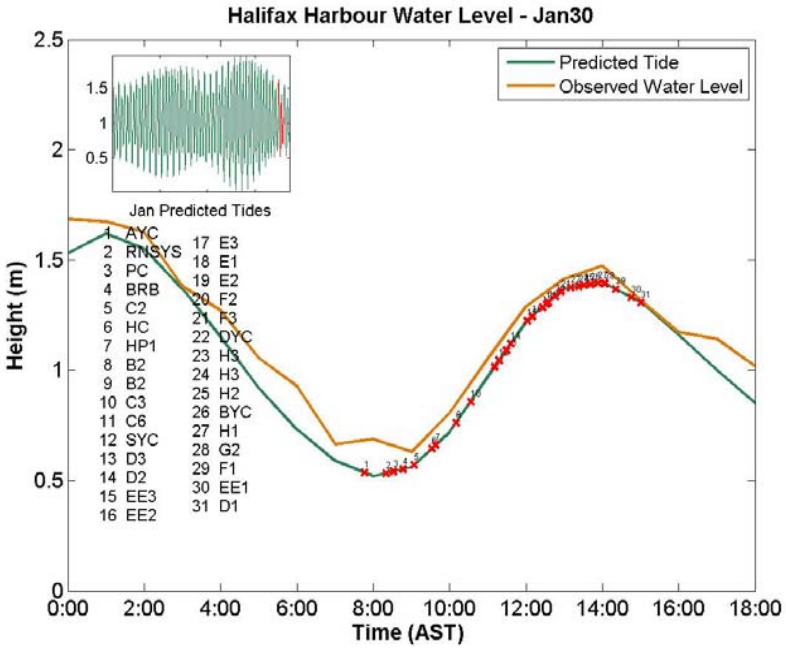


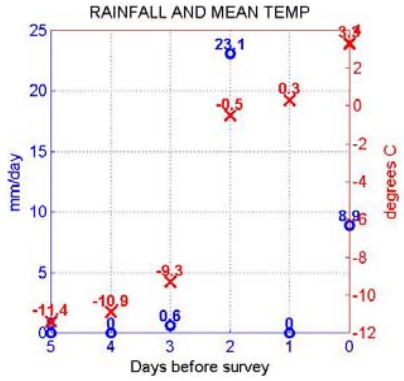


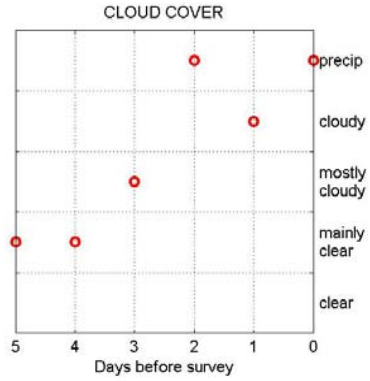


Rainfall and temperature data collected at Shearwater Autoport.

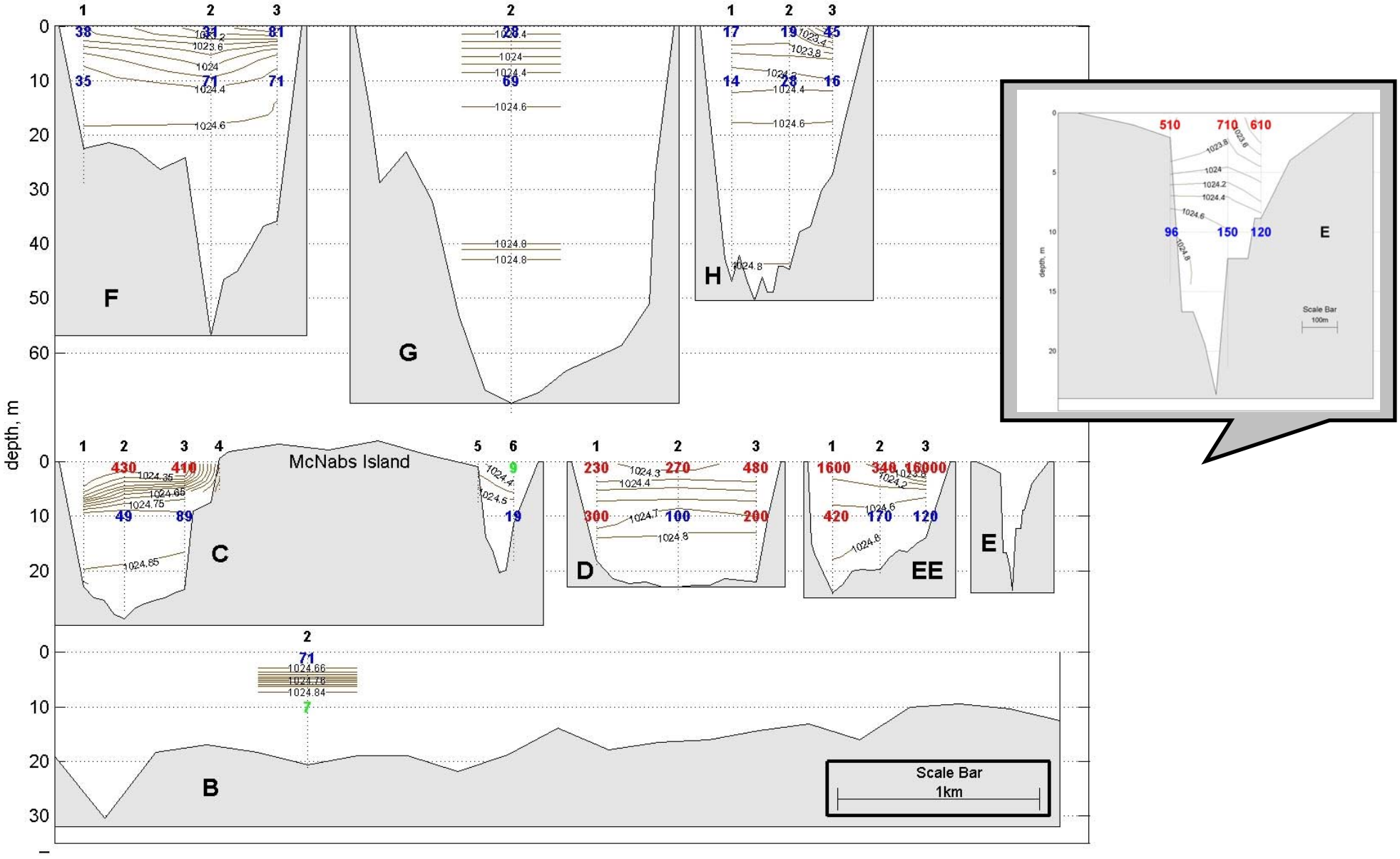
Cloud cover data collected at Shearwater Airport



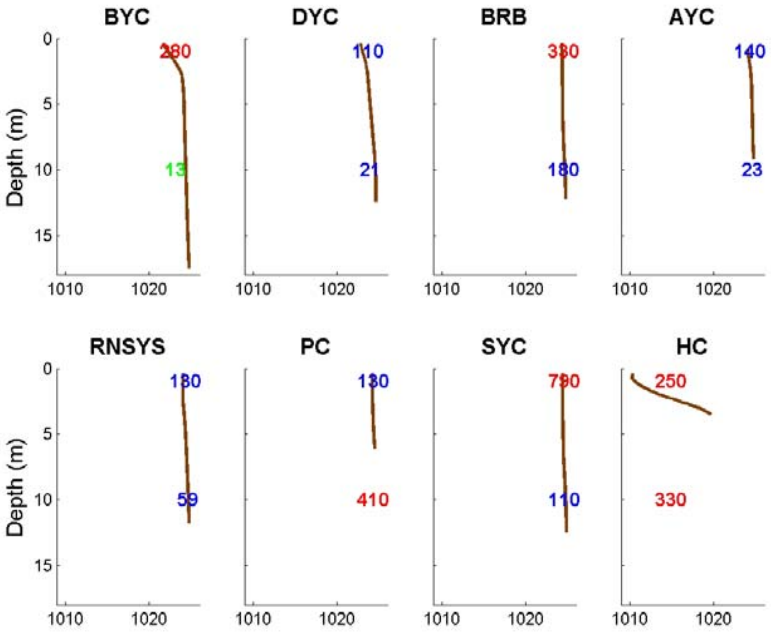


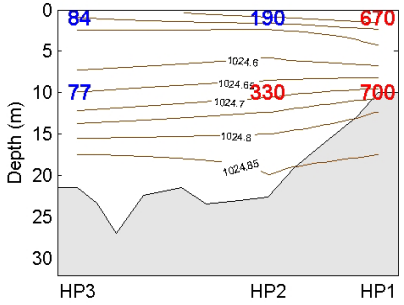


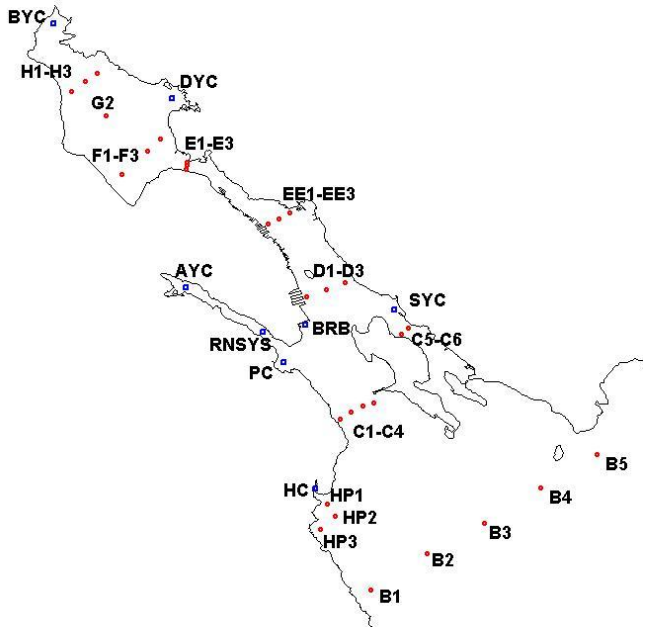
Salinity in PSU **Temperature in ^{o}C**

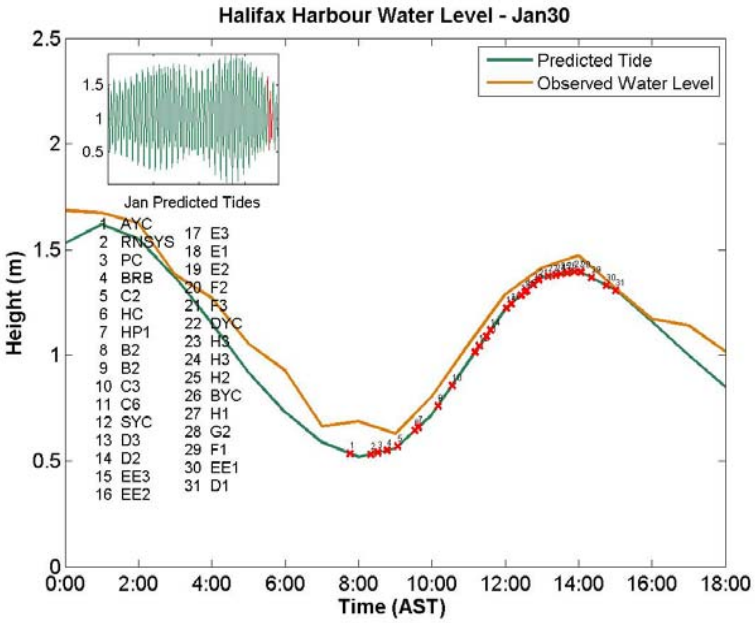

depth, m
F
G
H
C
McNabs Island
D
EE
E
B
Scale Bar
1km
510 710 610
96 150 120
Scale Bar
100m

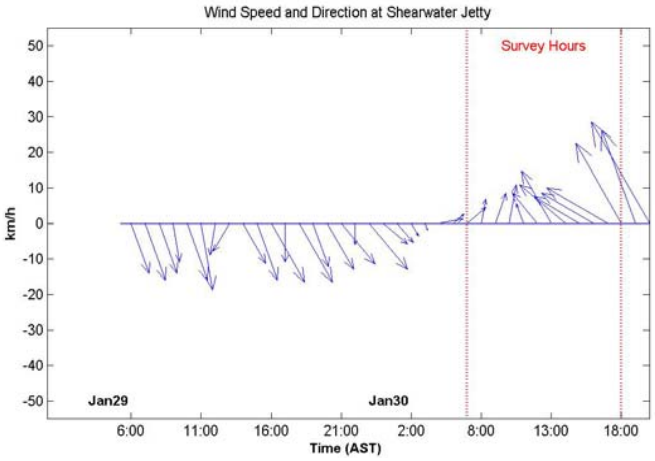
Yacht Clubs

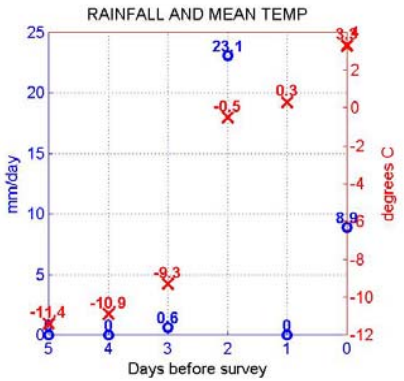


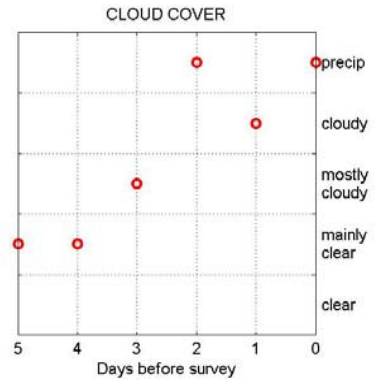










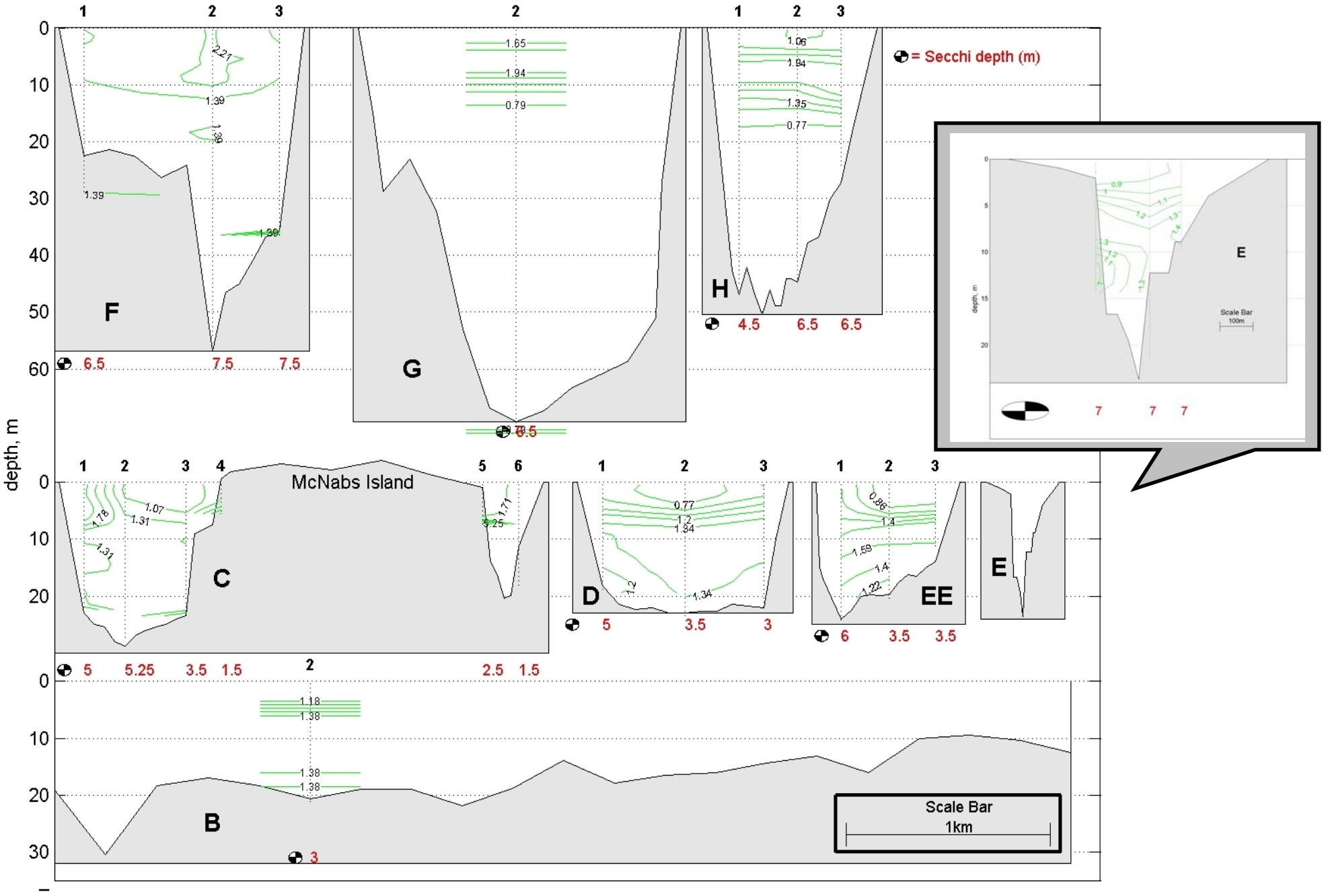


Rainfall and temperature data collected at Shearwater Autoport.

Cloud cover data collected at Shearwater Airport

Potential Density in kg/m^3

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


= Secchi depth (m)
depth, m
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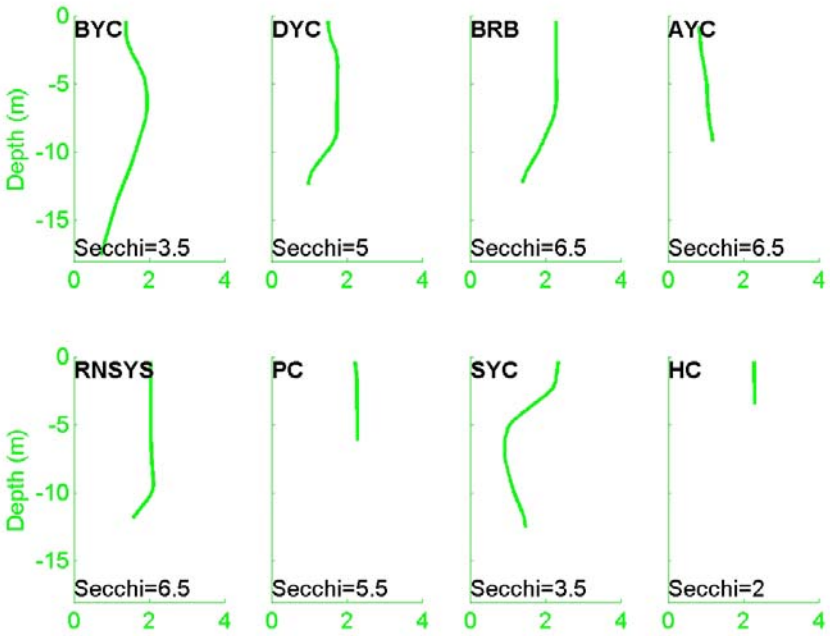
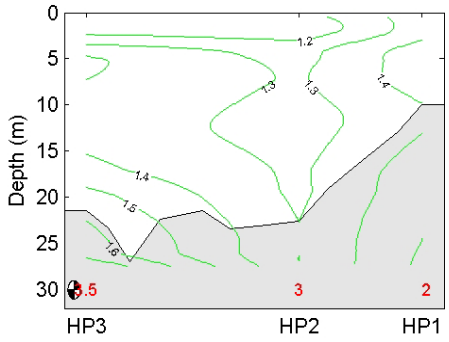
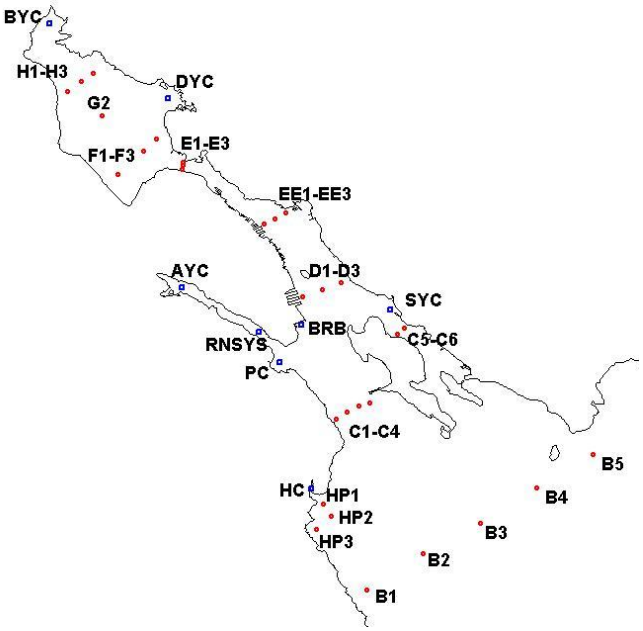
Yacht Clubs







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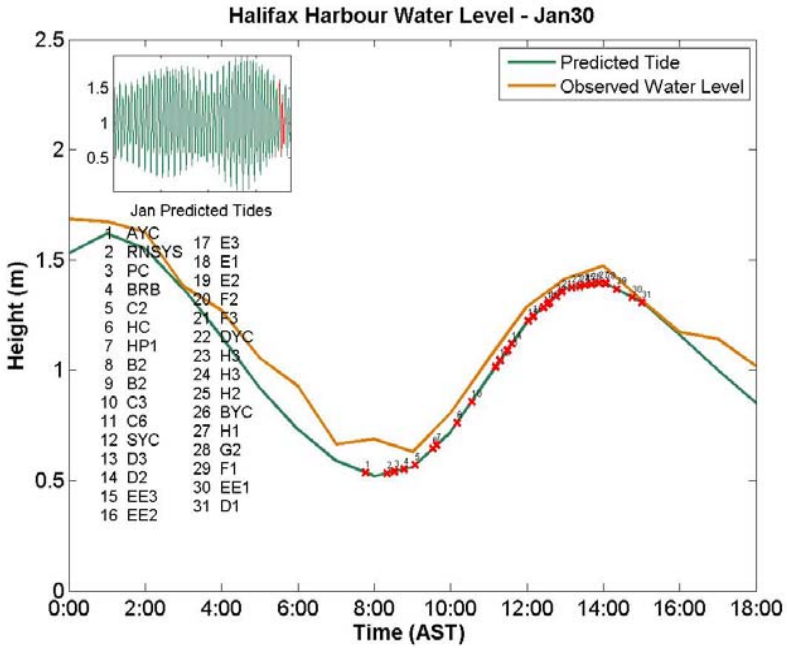
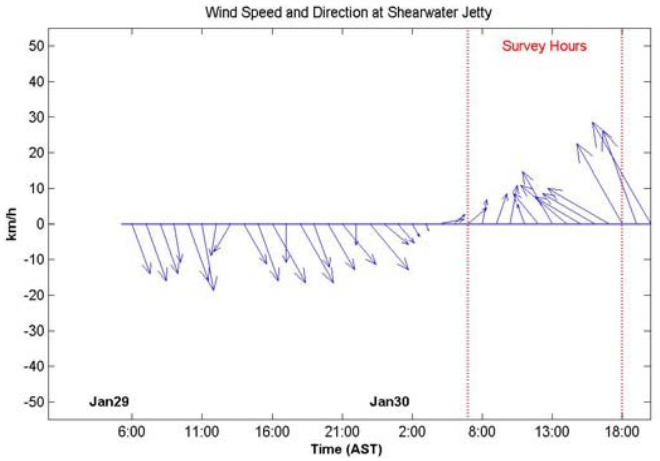
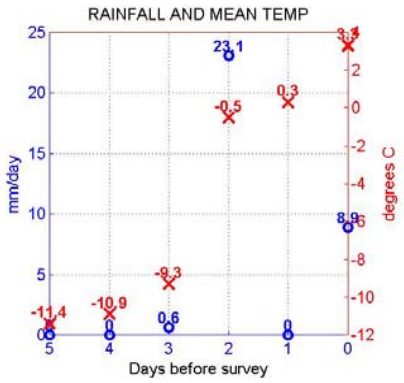
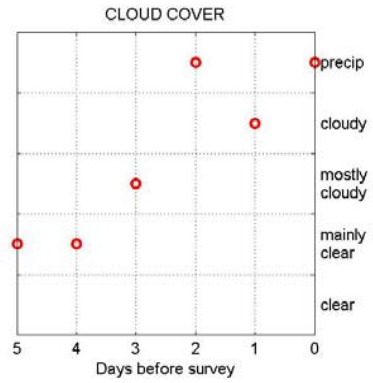
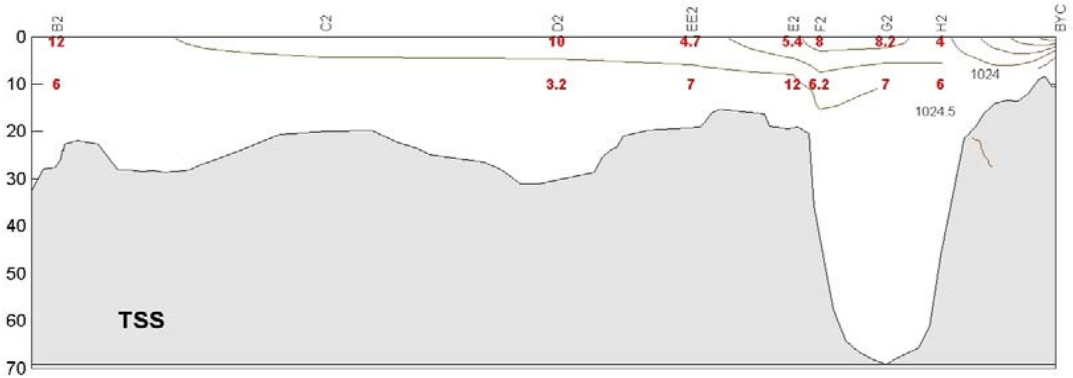


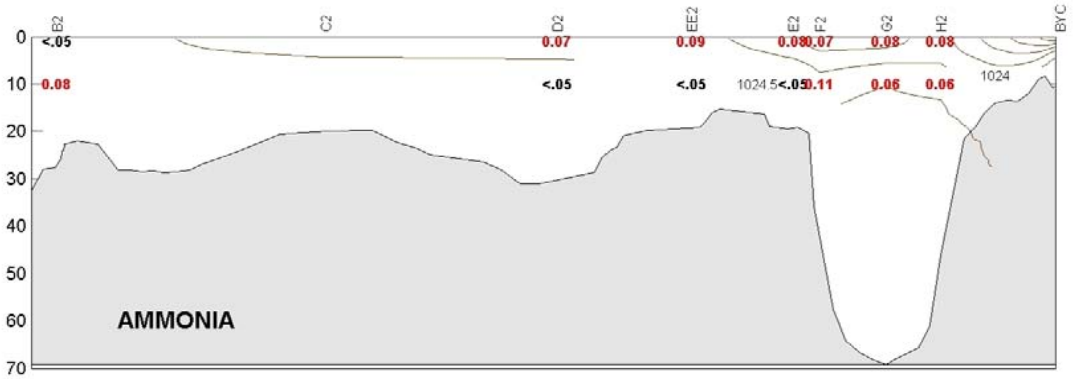


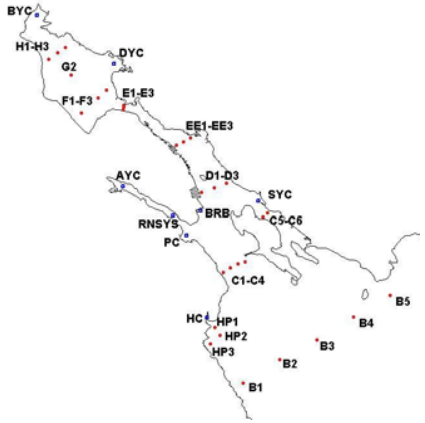




DO in mg/L **Chlorophyll in mg/m^3**



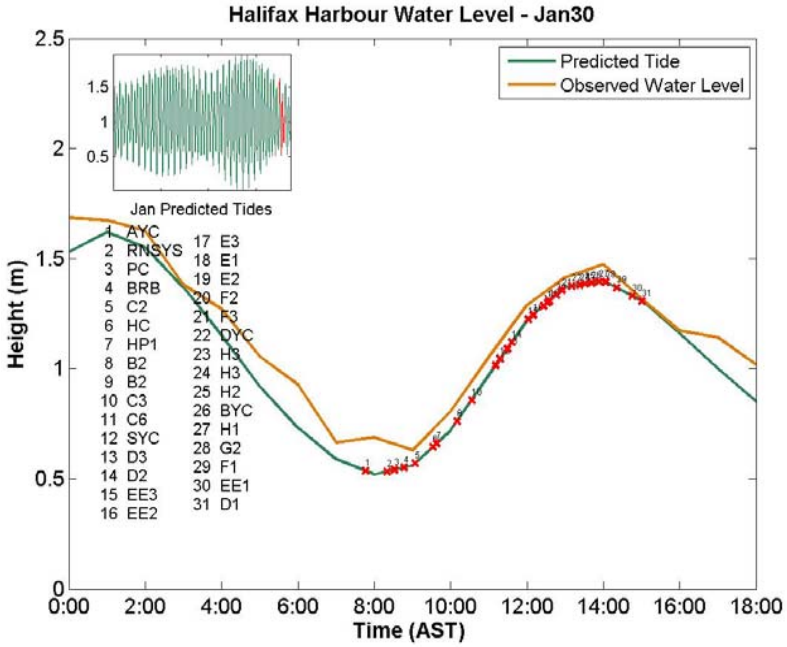


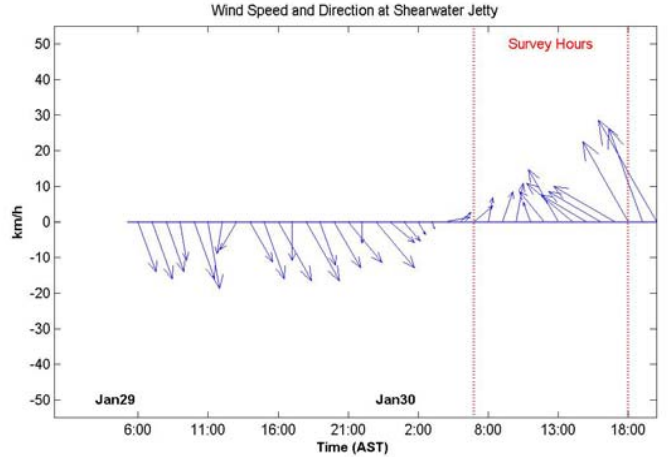


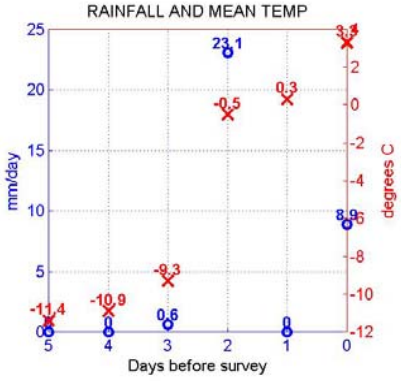
Rainfall and temperature data collected at Shearwater Autoport.

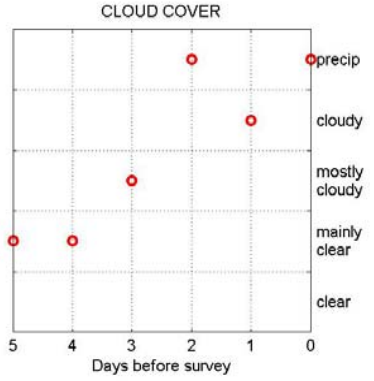
Cloud cover data collected at Shearwater Airport

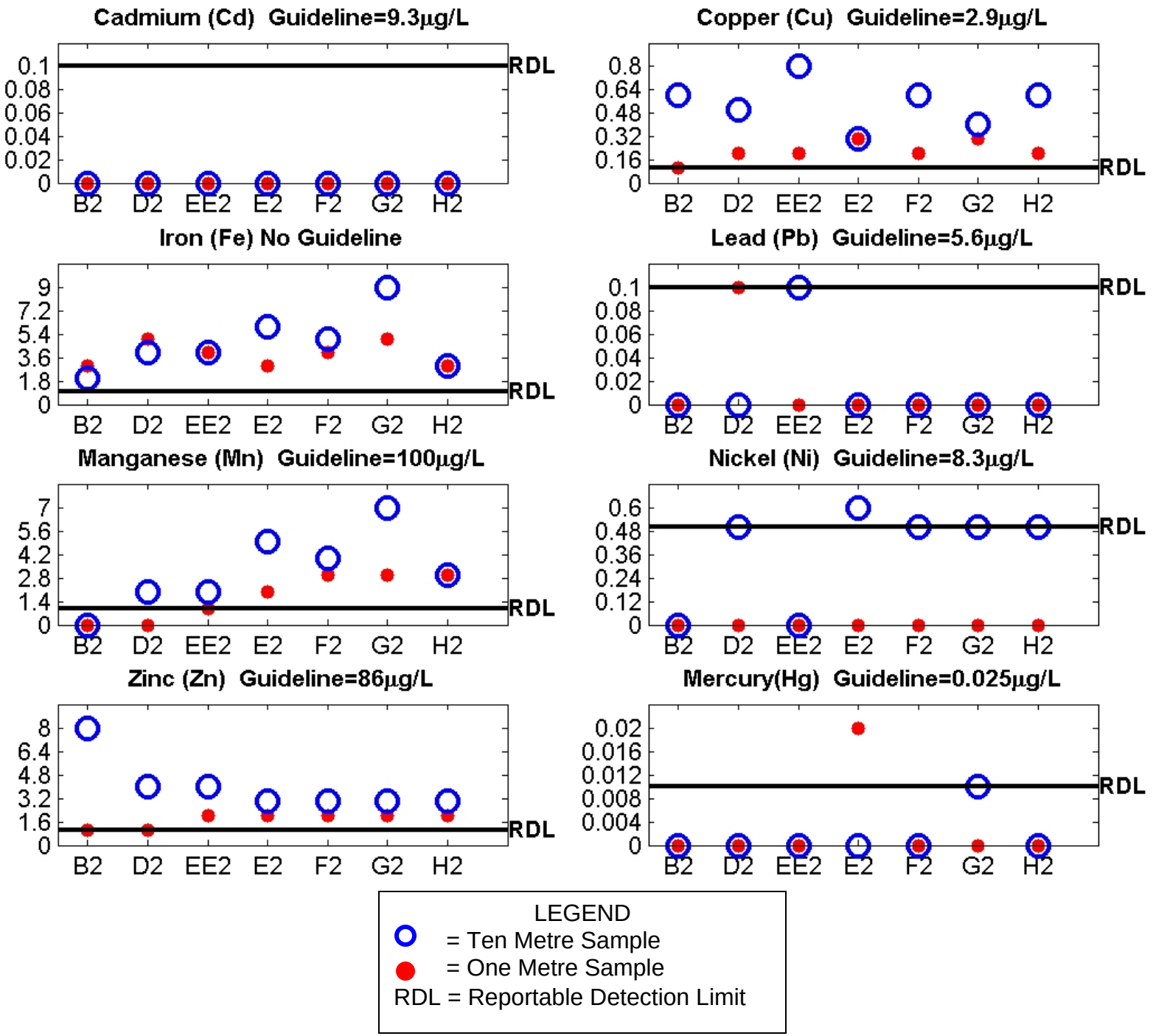
Potential Density in kg/m^3 **Ammonia in mg/L** **TSS in mg/L**










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
0.8
0.64
0.48
0.32
0.16
0
RDL
B2 D2 EE2 E2 F2 G2 H2
Iron (Fe) No Guideline
9
7.2
5.4
3.6
1.8
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
7
5.6
4.2
2.8
1.4
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
8
6.4
4.8
3.2
1.6
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

Harbour Water Quality Monitoring Program
Report 148;January 30, 2008

FECAL COLIFORM SUMMARY