

Halifax Harbour Water Quality Monitoring Project Survey Summary #135

Survey Date: 31 July 2007
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report135_070731.doc
Data File: HHWQMP_data135_070731.xls

Data Return:
 Profile: 97%
 Bacteria: 97%
 Chemical: 86%
Overall: 94%

Sample Notes:

A replacement CTD (Dalhousie Univ.) was used as regular CTD was out for service. Site B2 was not sampled due to time constraints associated with CTD. A 1 m sample was taken at DC. The results are as follows:

Ammonia as N (mg/L)	0.11	Lead (ug/L)	0.1
Total Suspended Solids (mg/L)	5	Manganese (ug/L)	11
Fecal Coliform (cfu/100mL)	>10,000	Nickel (ug/L)	0.5
Copper (ug/L)	1.5	Zinc (ug/L)	4
Iron (ug/L)	38		

QA/QC samples:

Chemical Analysis		G2 - 10m	
Detectable Parameter	Units	reference sample	QA/QC
Ammonia (as N)	mg/L	0.1	0.07
Total Suspended Solids	mg/L	5.6	1.6
Copper	ug/L	0.4	0.3
Iron	ug/L	7	6
Lead	ug/L	<0.1	0.6
Manganese	ug/L	1	<1
Zinc	ug/L	1	1

Fecal Coliform (CFU/100ml)

Site	EE-1m	BYC-1m	SYC-1m	EE2-10m
Reference	5400	3400	72	160
QA/QC	330	1300	59	100

Comments:

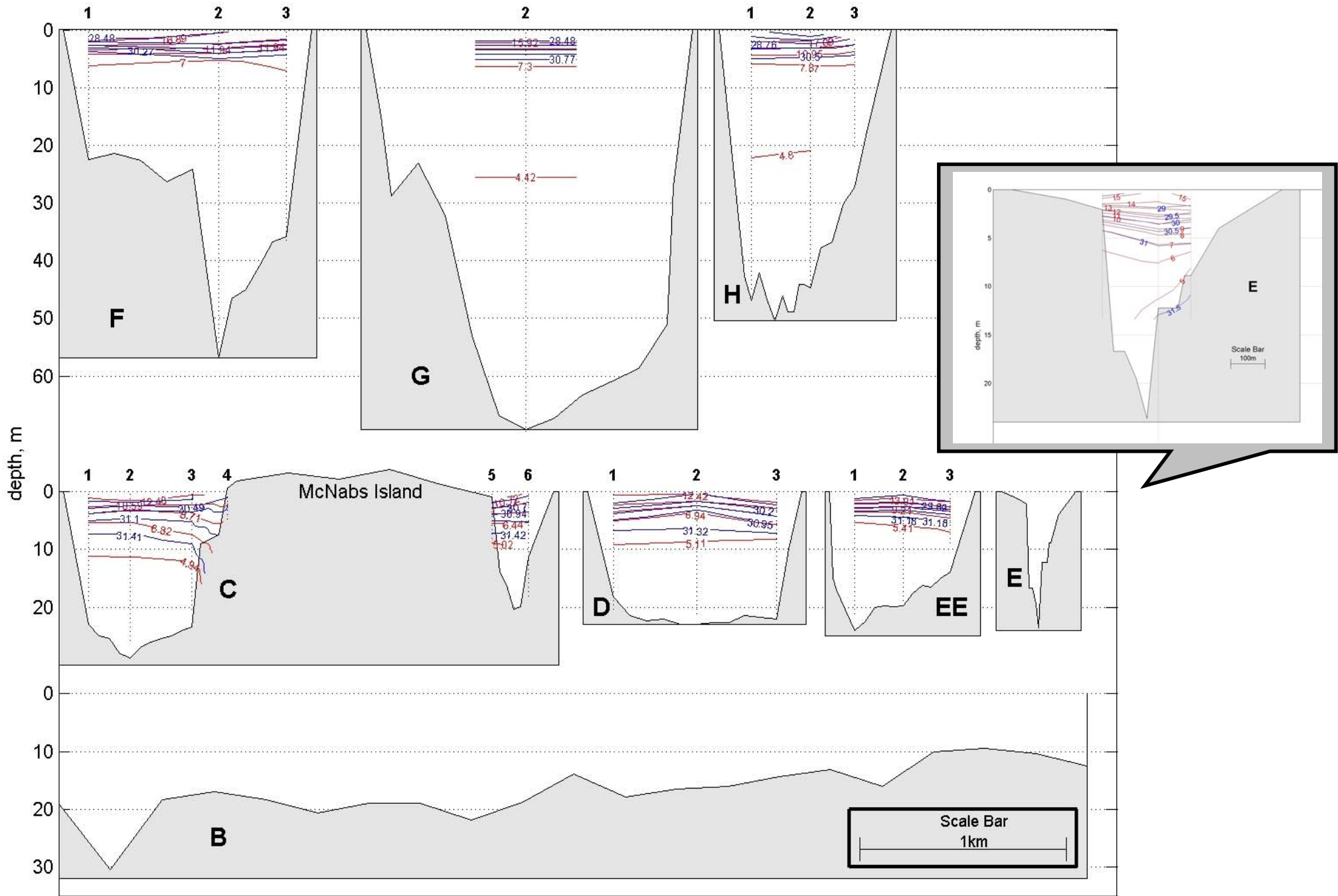
General: There was significant rainfall (25 mm), associated with moderate up-harbour wind, ending the day before the survey. The Harbour exhibits quite strong near surface salinity and temperature (density) stratification. Patches of very turbid water were observed throughout the Harbour. In the southern Basin linear “fronts”, defined by brown scum, pieces of seaweed and filamentous detritus, delineated patches of “dirty” water. One of these patches, sampled at D2, was not remarkable, except that in the 1m sample both copper and zinc were 2-3 times higher than in any other sample. Cu, Fe, Pb, Ni and Zn exhibit systematically higher than normal values, particularly in the 1m samples. No metals values exceed guidelines. The fecal coliform (fc) distribution is unusual in that high values occur in the 1m samples throughout the Inner Harbour, Bedford Basin, the NW Arm, HC and the HP sites. The out of range values in the Narrows are particularly unusual. This distribution is likely due to a combination of strong stratification, persistent up-harbour wind, source strength (rain), dense fog and the sewage diversion to Fairview Cove.

Fluorescence: There is a continued phytoplankton bloom throughout the Harbour. The maximum values are in the centre of the Basin (about 45 mg/m³), but the values remain high (> 30 mg/m³) throughout the Inner Harbour. Because of the shallow pycnocline, the profile maximums are very near surface, particularly in the Inner Harbour, where the values are nearly uniform in the top 3m. This is consistent with the visual observations of very turbid water.

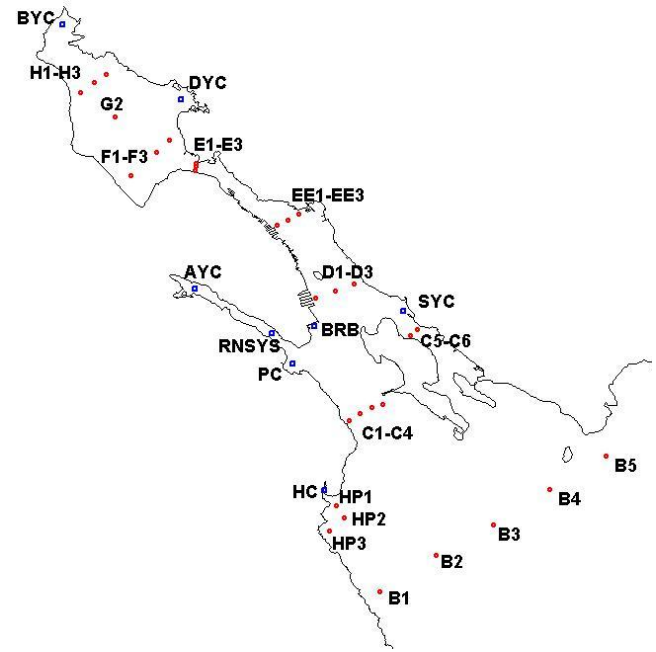
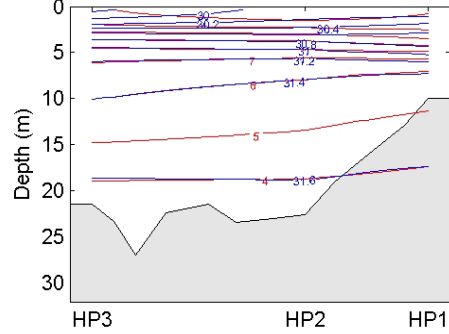
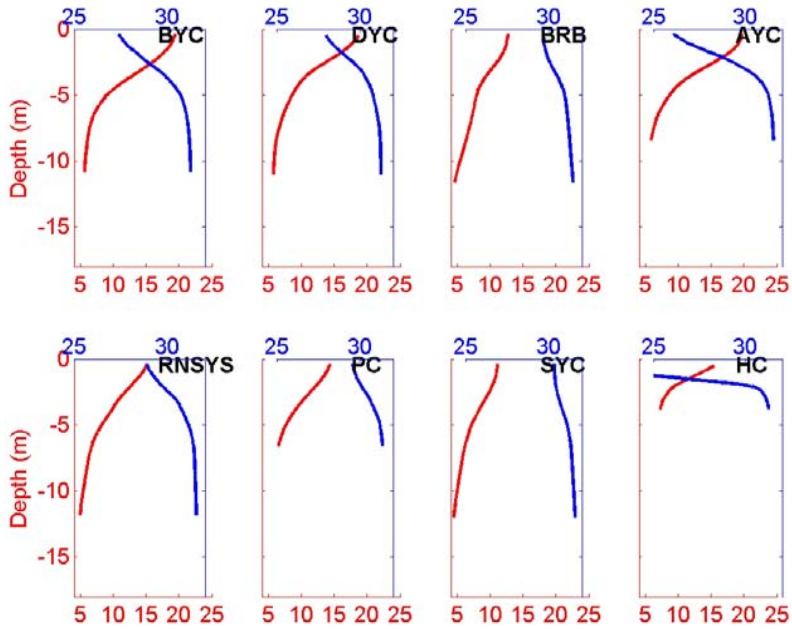
Ammonia: The ammonia nitrogen levels are relatively high, but some are below detection.. The highest values (>0.1 mg/L) occur in the 10m samples in the Basin.

TSS: The TSS values are not particularly high with only three values > 5 mg/L occurring in Narrows and southern Basin.

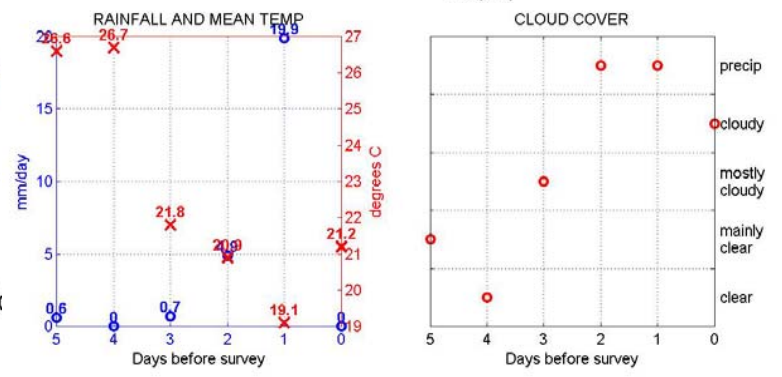
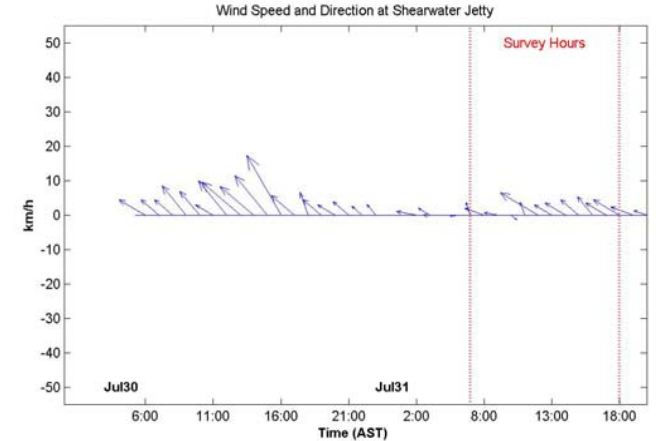
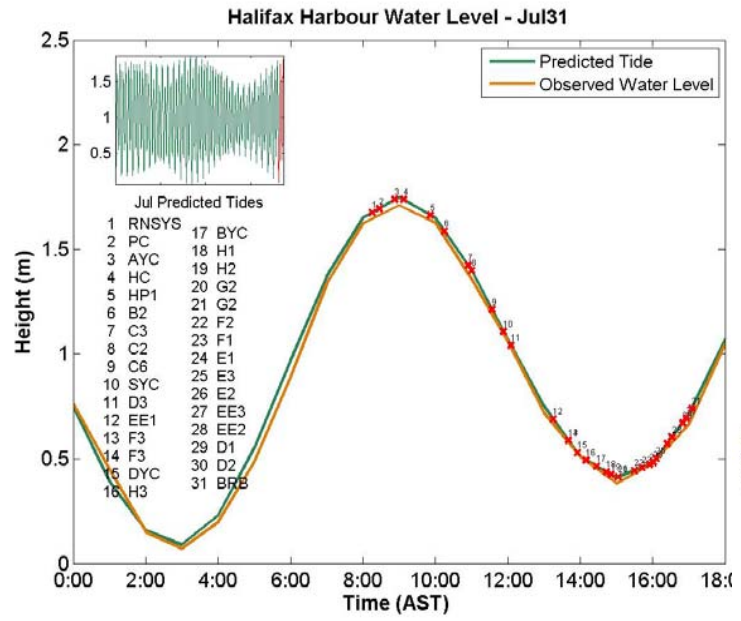
Dissolved Oxygen: The Dissolved Oxygen data indicate values of about 9 mg/L at the surface in the Basin, decreasing monotonically with depth. In the Inner Harbour the values increase with depth to about 10 mg/L. In the Outer Harbour the values are all above 10 mg/L. In the Inner Harbour the fluorescence maxima are associated with lower DO, while in the Outer Harbour (C and HP sections) the fluorescence maxima are associated with DO maxima. Photosynthesis was likely being moderated by very thick fog (visibility <15 m at times) in the Inner Harbour. The only values below the use specific guidelines are the deeper waters of the Basin. The DO data is not ground-truthed, however this data was obtained with a just factory calibrated instrument. (see DO discussion in QR#1).



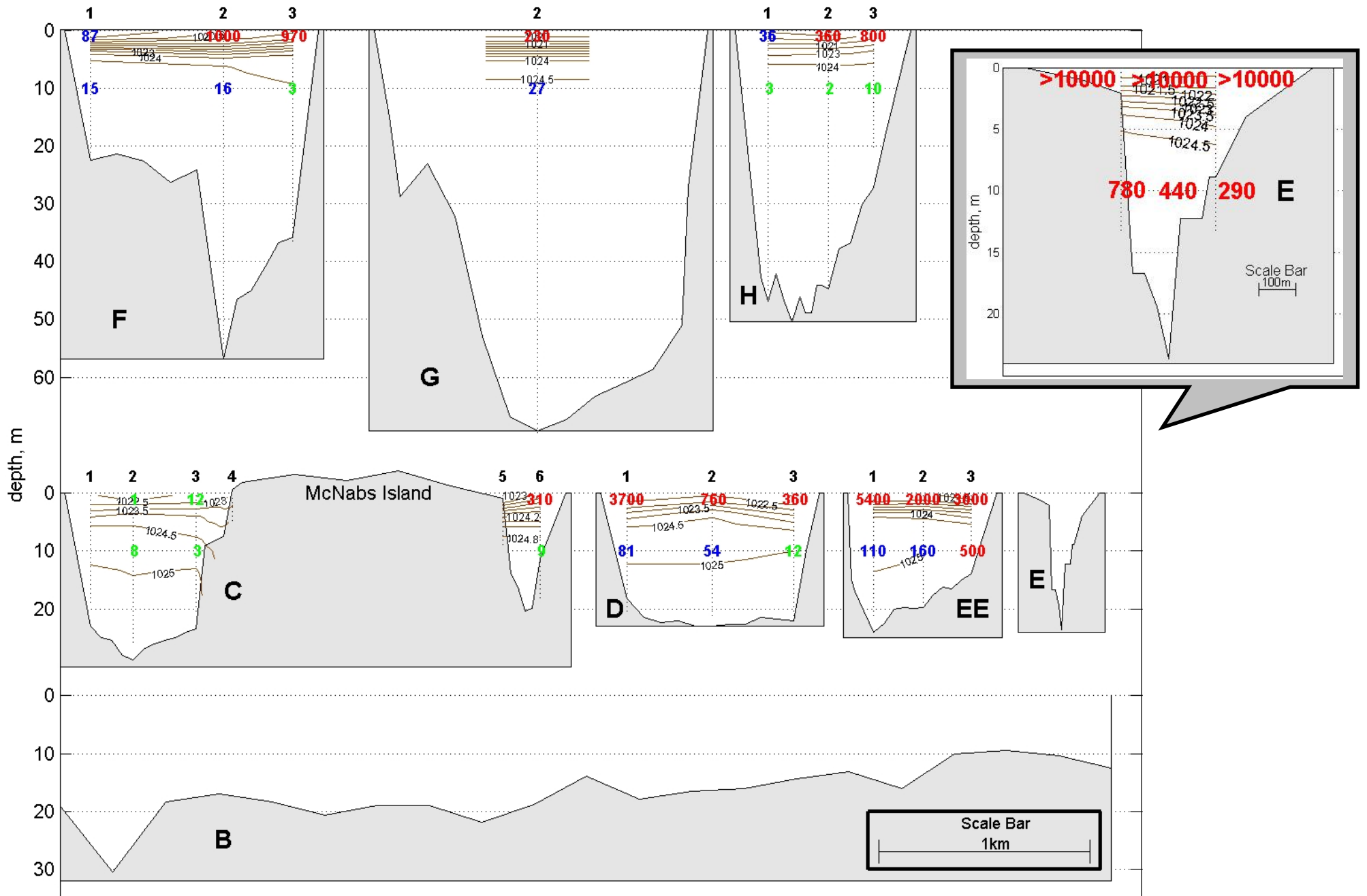
Yacht Clubs



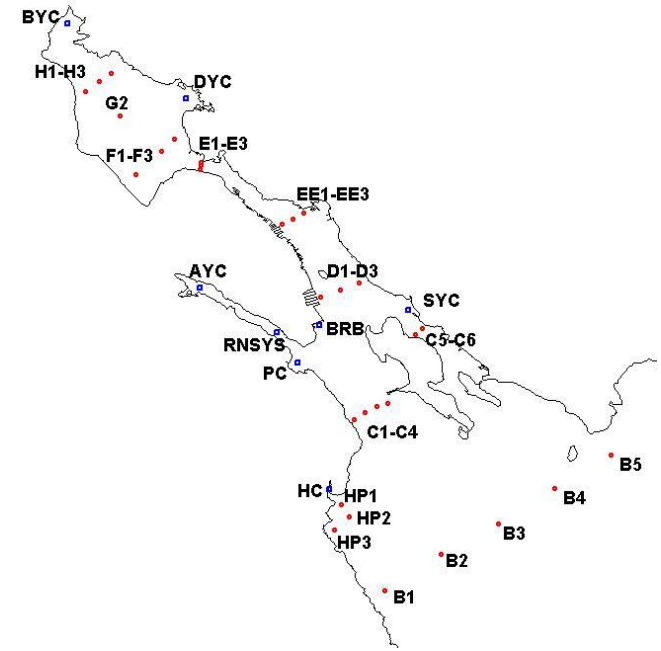
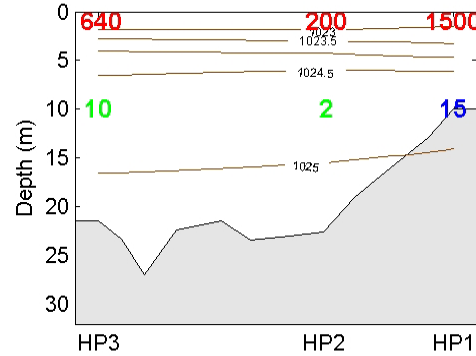
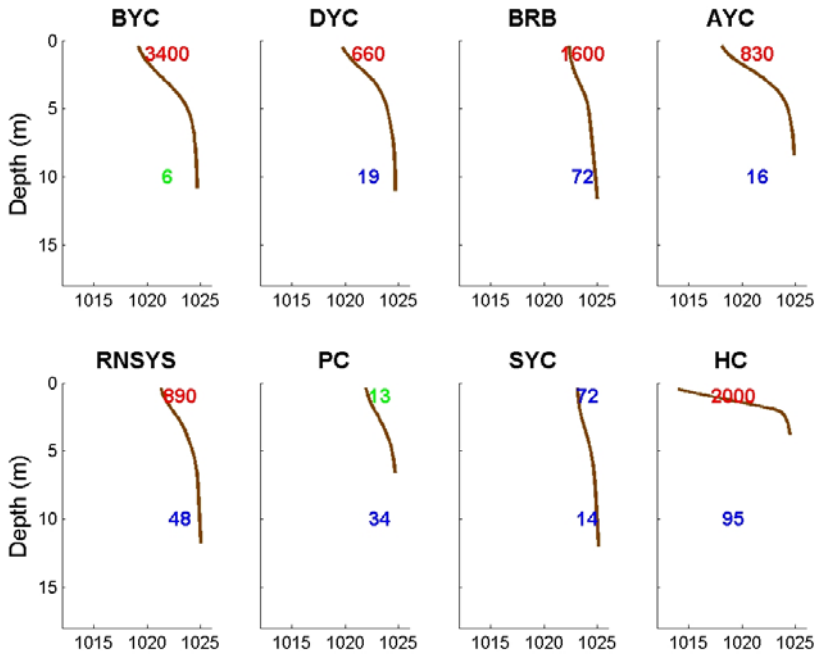
Rainfall and temperature data collected at Shearwater Autoport.
Cloud cover data collected at Shearwater Airport



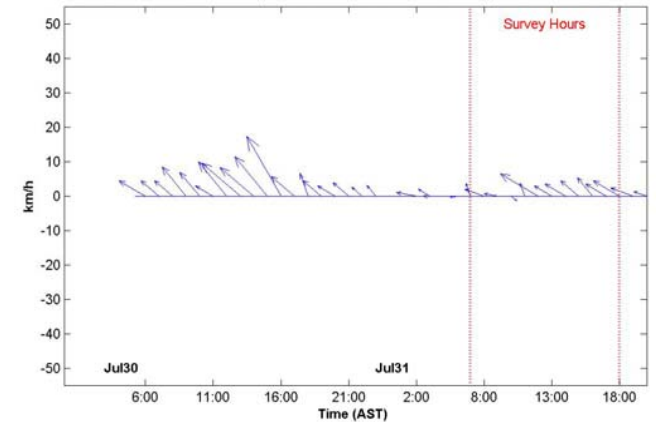
Salinity in PSU Temperature in °C



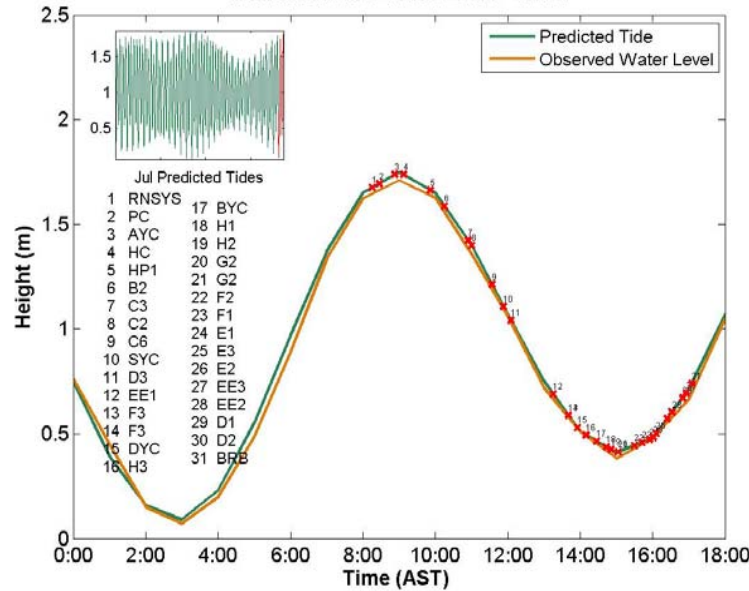
Yacht Clubs



Wind Speed and Direction at Shearwater Jetty



Halifax Harbour Water Level - Jul31

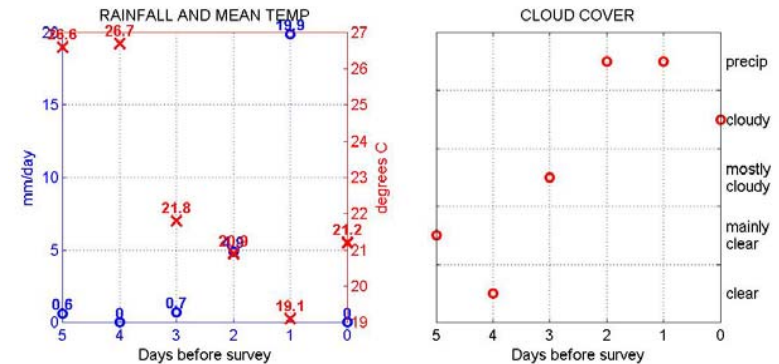


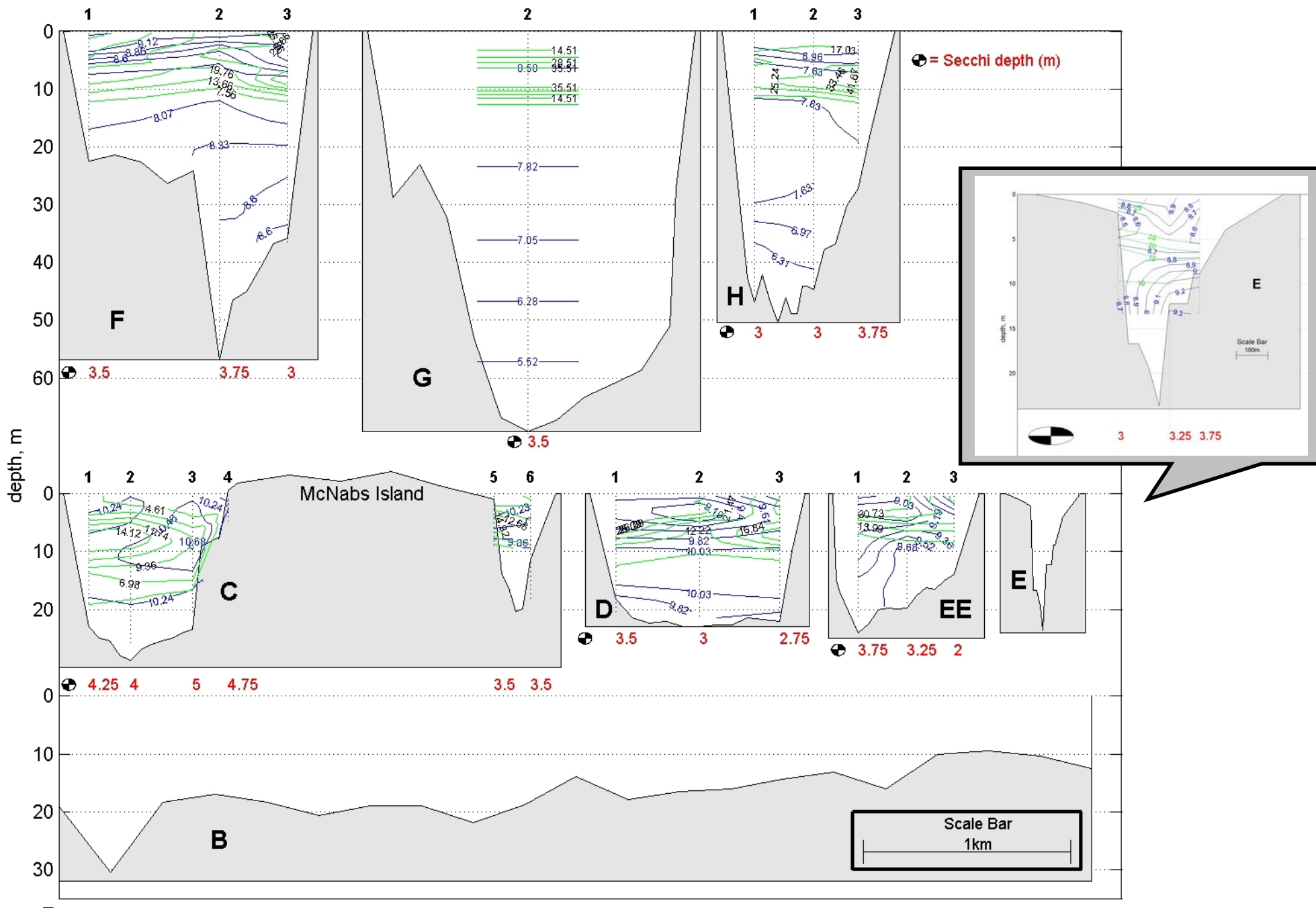
- Jul Predicted Tides
- | | | | |
|----|-------|----|-----|
| 1 | RNSYS | 17 | BYC |
| 2 | PC | 18 | H1 |
| 3 | AYC | 19 | H2 |
| 4 | HC | 20 | G2 |
| 5 | HP1 | 21 | G2 |
| 6 | B2 | 22 | F2 |
| 7 | C3 | 23 | F1 |
| 8 | C2 | 24 | E1 |
| 9 | C6 | 25 | E3 |
| 10 | SYC | 26 | E2 |
| 11 | D3 | 27 | EE3 |
| 12 | EE1 | 28 | EE2 |
| 13 | F3 | 29 | D1 |
| 14 | F3 | 30 | D2 |
| 15 | DYC | 31 | BRB |
| 16 | H3 | | |

Rainfall and temperature data collected at Shearwater Autoport.
Cloud cover data collected at Shearwater Airport

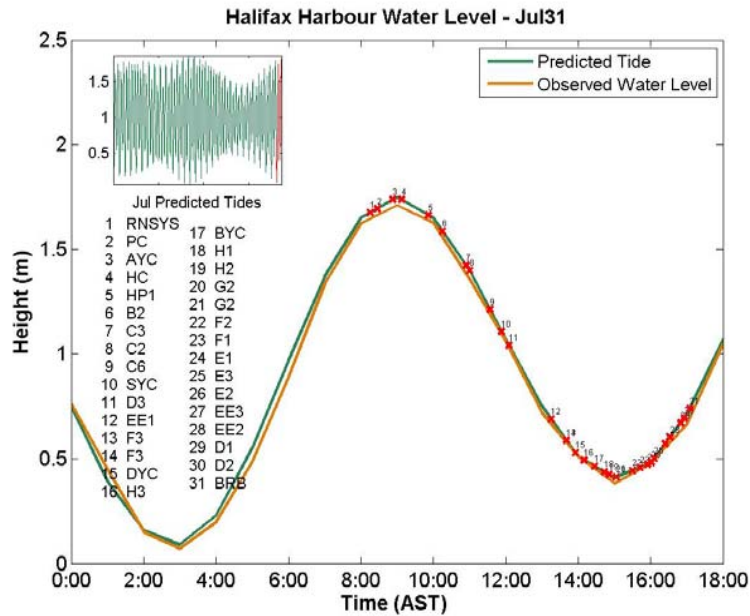
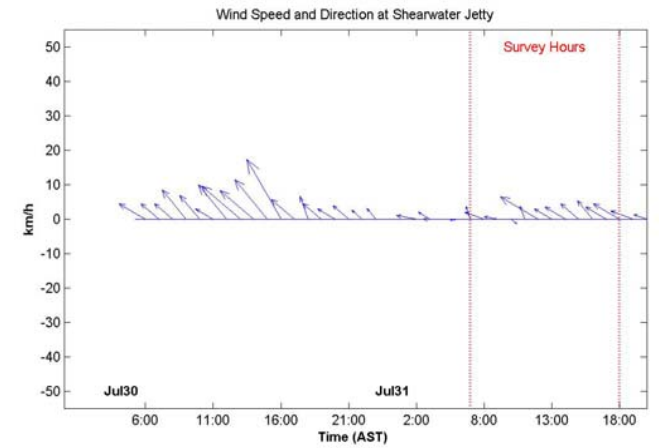
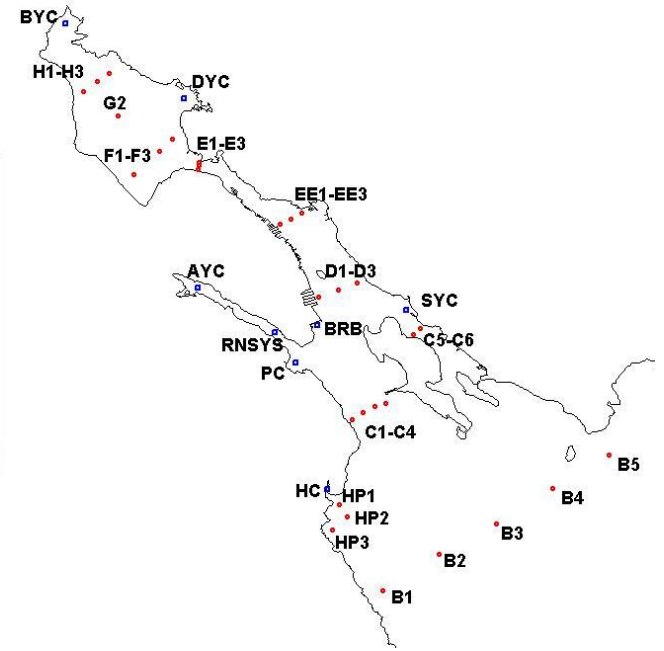
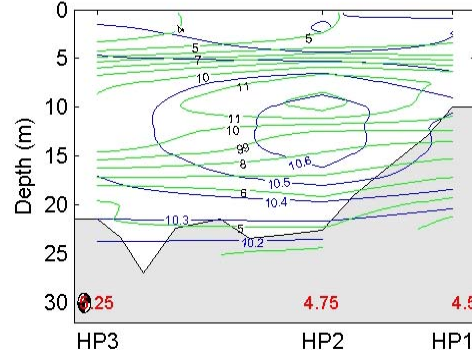
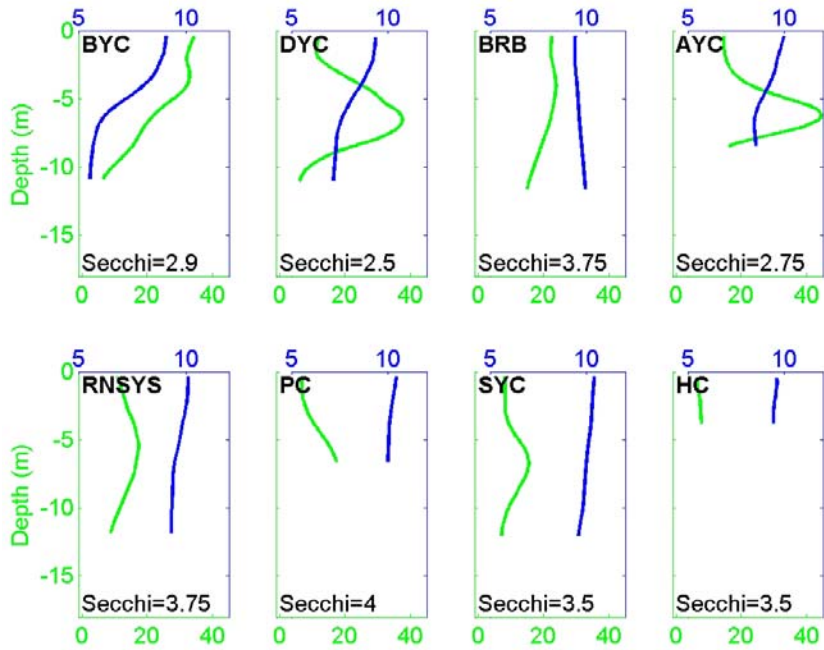
Potential Density in kg/m³

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

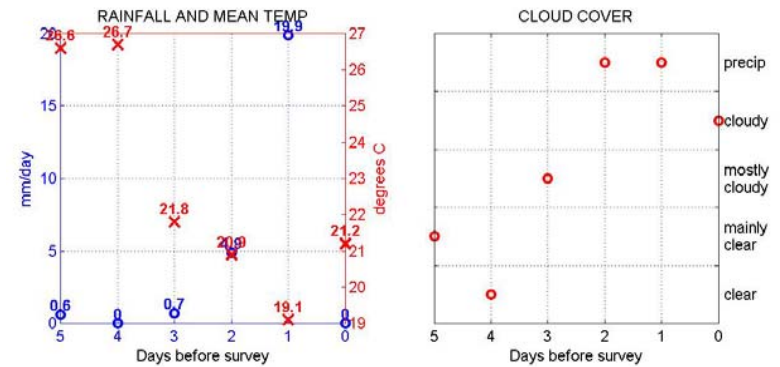




Yacht Clubs

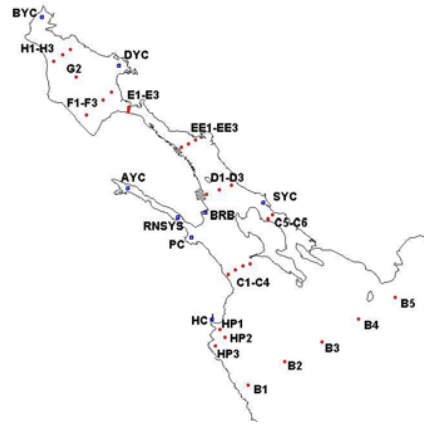
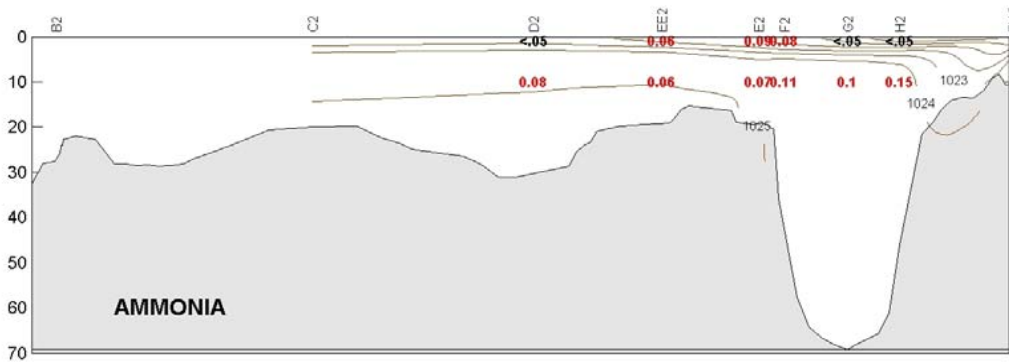
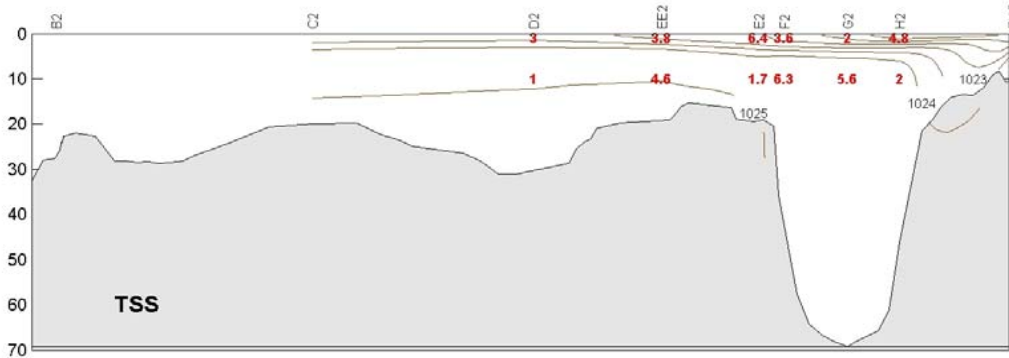


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DO in mg/L

Chlorophyll in mg/m³



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

Halifax Harbour Water Level - Jul31

