

# Halifax Harbour Water Quality Monitoring Project Survey Summary #136

**Survey Date:** 14 August 2007  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report136\_070814.doc  
**Data File:** HHWQMP\_data136\_070814.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 imposed by a fuel stop and laboratory constraints.

### QA/QC samples:

#### Chemical Analysis

Detectable Parameter	Units	G2 - 10m	
		reference sample	QA/QC
Ammonia (as N)	mg/L	0.12	0.11
Total Suspended Solids	mg/L	3	2
Copper	ug/L	0.3	0.3
Iron	ug/L	7	8
Manganese	ug/L	1	1
Zinc	ug/L	1	1

#### Fecal Coliform (CFU/100ml)

Site	DYC-10m	EE1-10m	BRB-10m	G2-10m
Reference	15	560	42	22
QA/QC	25	530	45	33

### Comments:

**General:** There has been moderate rain (14 mm) the day before. The strong density stratification evident in the previous survey has abated somewhat. The surface water is a little less saline, but also cooler (2-3<sup>o</sup> C). The wind has been light and mostly up-harbour for a few days, the water was very calm all day. The field notes indicate there were many patches of surface detritus and very turbid water, seemingly

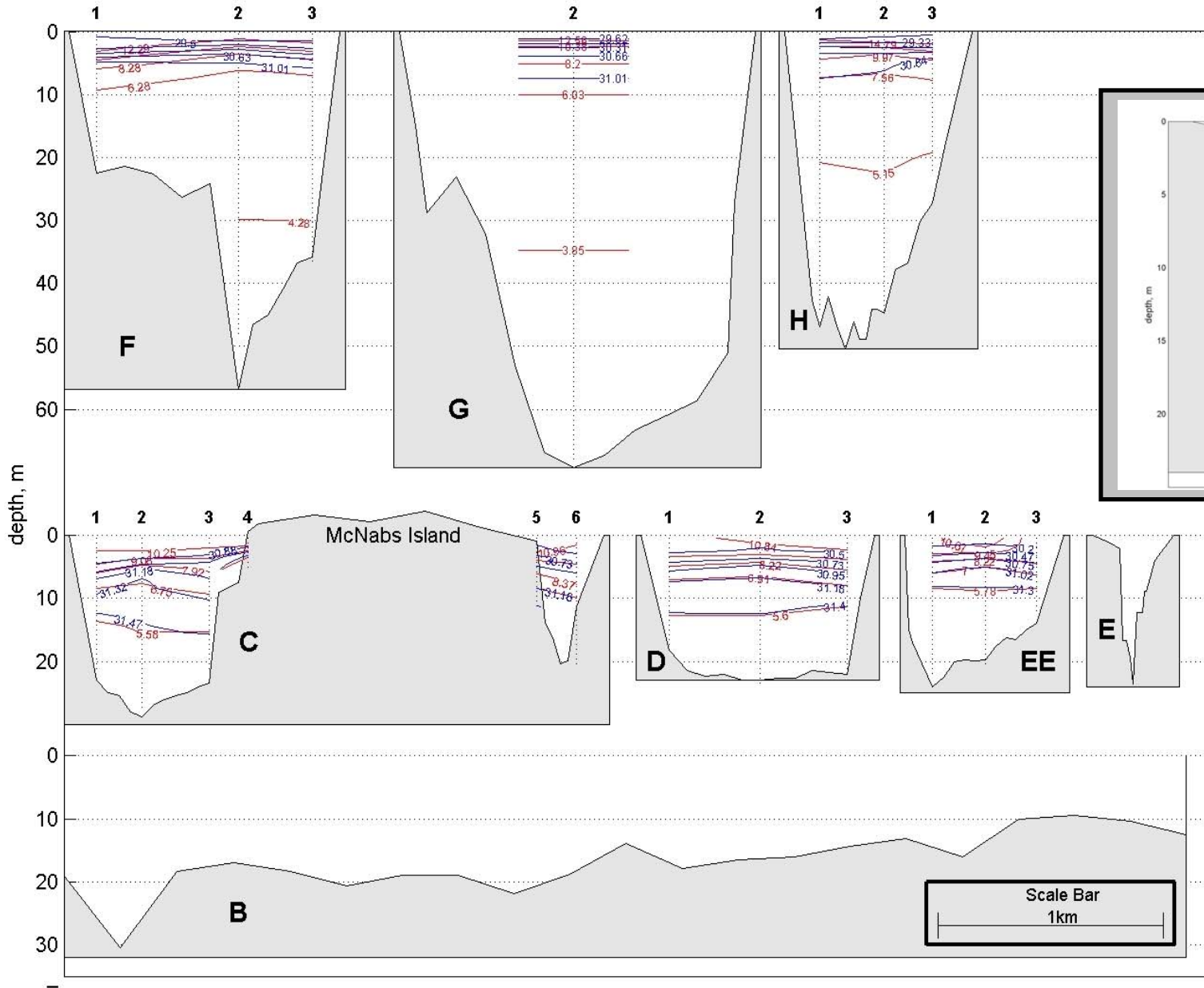
associated with convergences or fronts. The F2 sample was taken in such a patch. The edge of the feature was defined by a line of detritus of both natural (seaweed, leaves etc.) and obvious sewage-related origins. The water at BYC was also remarkably turbid. The secchi depths at these sites (2.0 and 1.25 m, respectively) were the lowest observed. The analysis of the sample at F2-1m was not particularly remarkable. It had the highest observed values of Fe, Mn, Ni and Pb, however, these were not significantly higher than other values and in no case exceeded guidelines. The TSS was the highest 1 m value observed, but was a relatively low 3 mg/L. The fecal coliform (fc) values are high everywhere between section D and section G. The highest values tend to be in the 1 m samples even in the Basin, but high values occur in the deeper samples as well. This fc distribution differs from the previous survey in the higher values at depth but overall is probably similarly caused by a combinations of strong stratification, persistent up-harbour wind, elevated source strength (rain), fog and the ongoing sewage diversion to Fairview Cove. The highest observed value at EE3-1m (22,000 cfu/100 mL) was observed to be taken in the visible plume from the Peace Pavilion outfall.

**Fluorescence:** Fluorescence at BYC is high at nearly 60 mg/m<sup>3</sup> and is relatively high elsewhere. The distributions are quite patchy. Throughout the Basin and Inner Harbour (out to section C) there are occurrences of surface values of 25-40 mg/m<sup>3</sup>. These high near surface values contribute to the perceived turbidity. At section C the maximum values have dropped into the teens.

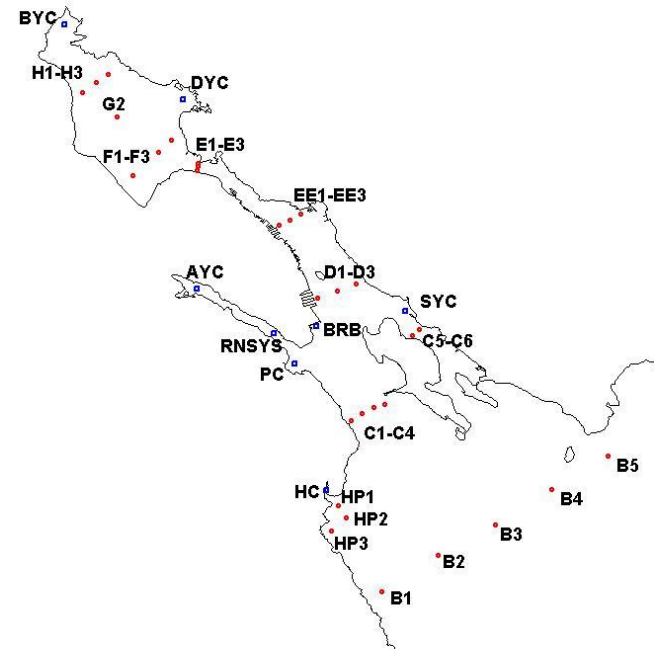
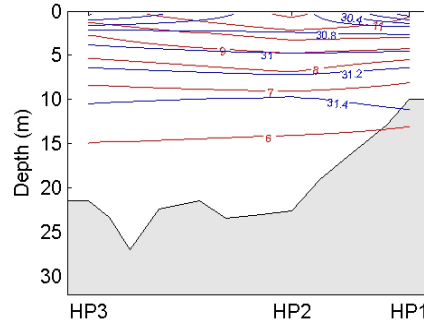
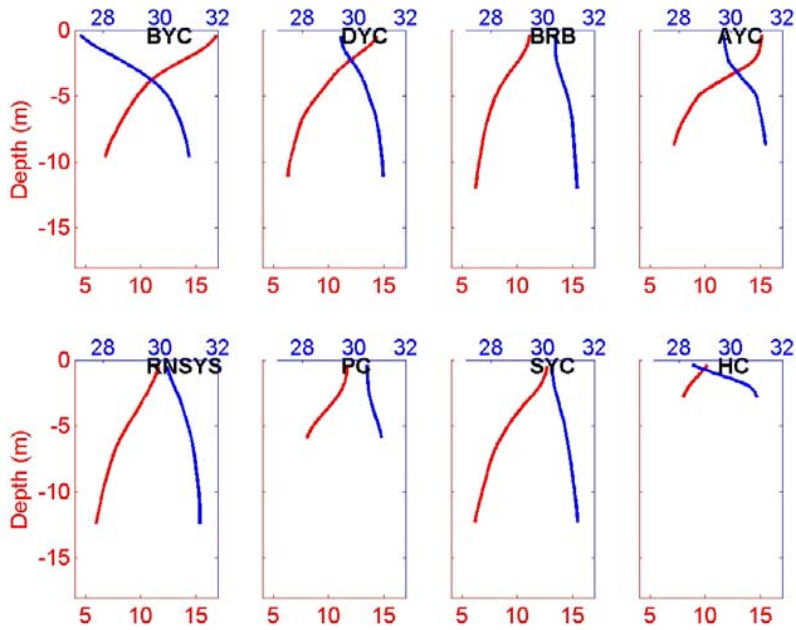
**Ammonia:** The ammonia nitrogen levels are probably higher than average. The highest surface values are in the northern Basin and the values drop nearly monotonically going out of the Harbour. The 10m values are less regular. The highest value overall is in the 10m sample in the centre of the Basin.

**TSS:** Given the observed turbidity the TSS values seem remarkably low. All values are below 4 mg/L with the 1m values in the northern Basin being 1 mg/L or less.

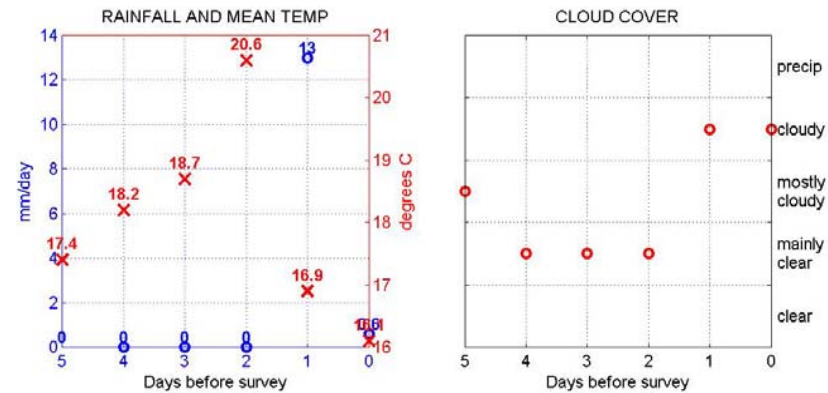
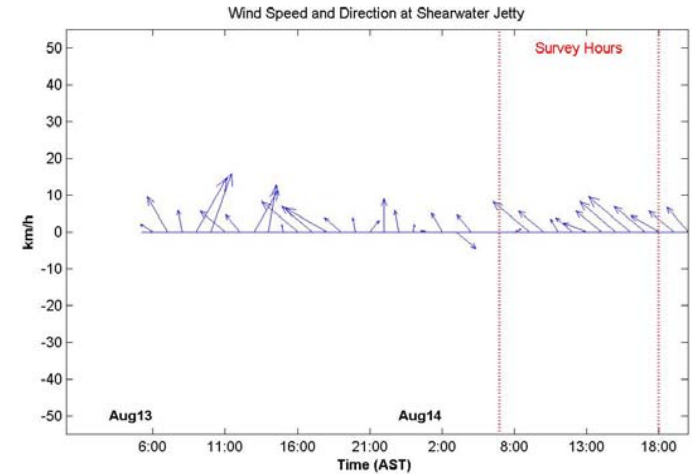
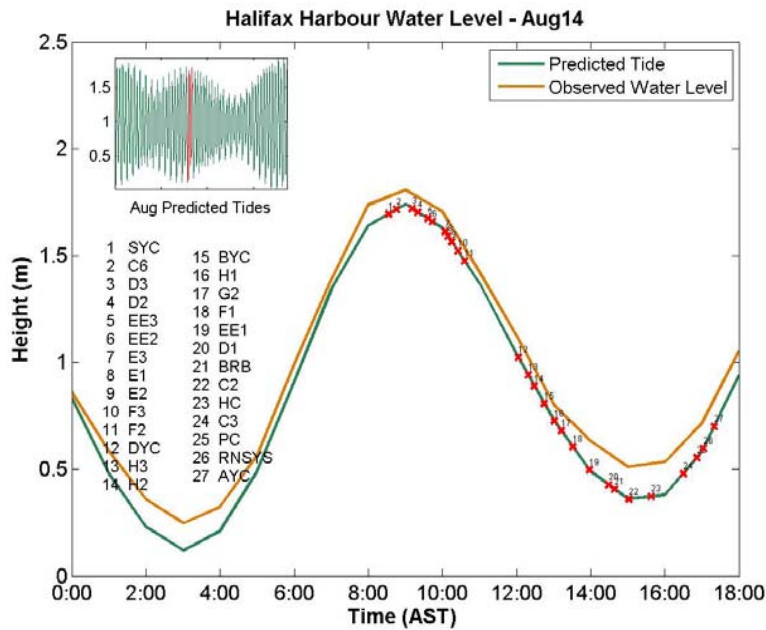
**Dissolved Oxygen:** The Dissolved Oxygen data indicate that, like the fluorescence, the pattern is quite variable, but in the Inner Harbour the water is quite well oxygenated (9-10.5 mg/L). This applies to the Basin surface water as well, however here the values decrease quite rapidly with depth, going below 9 mg/L at about 5m depth. The only values below the use specific guidelines are the deeper waters (>35 m) 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).



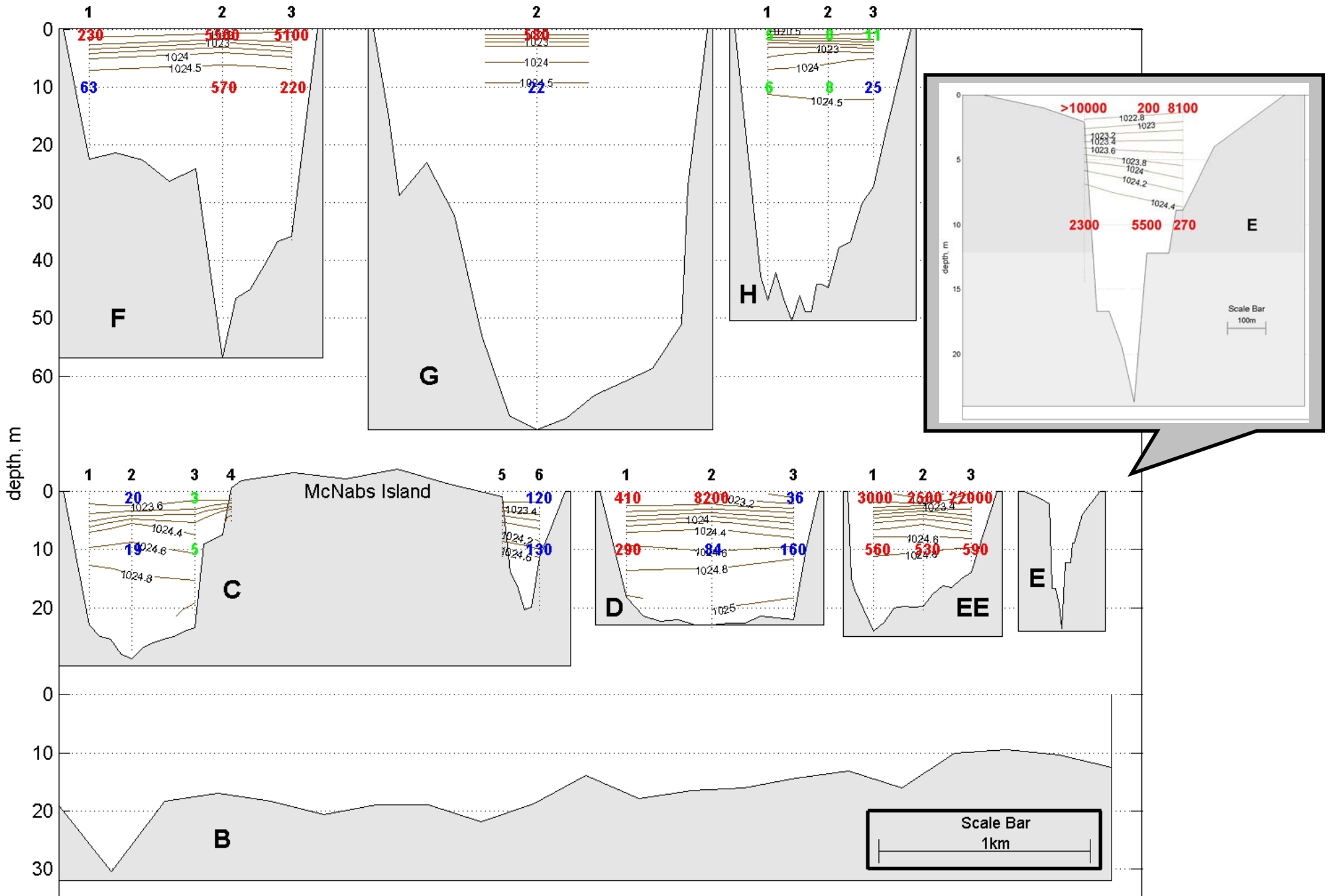
# Yacht Clubs



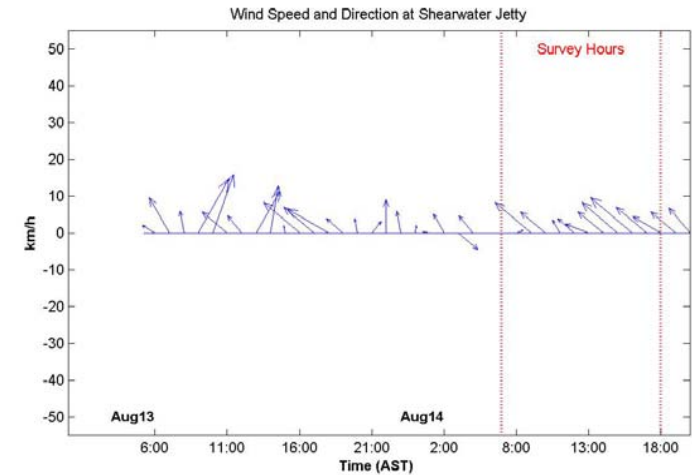
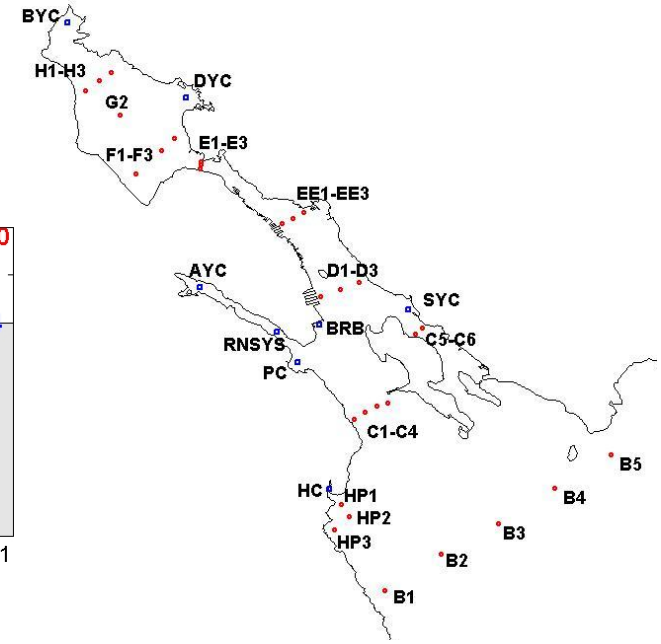
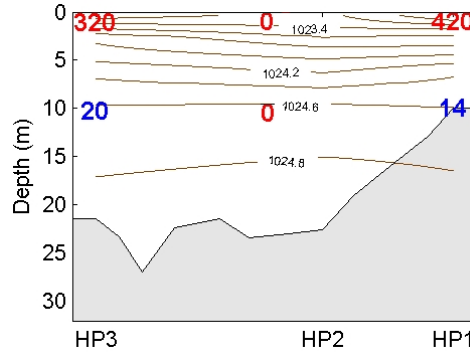
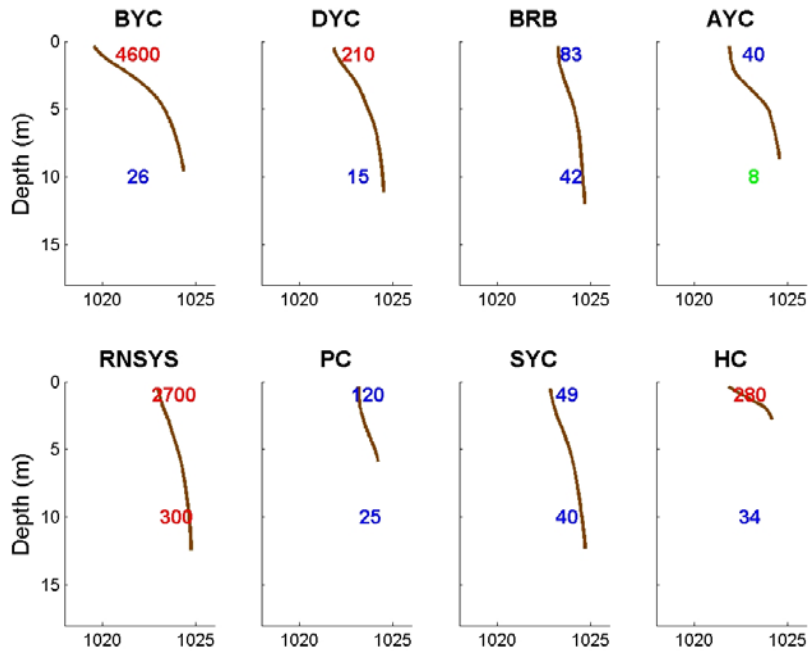
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



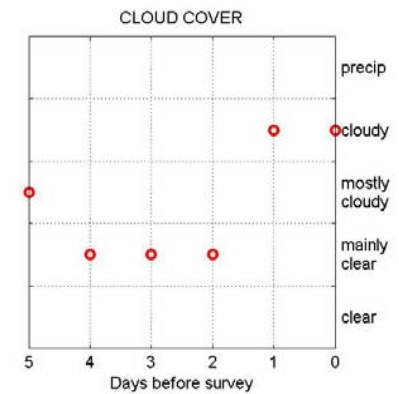
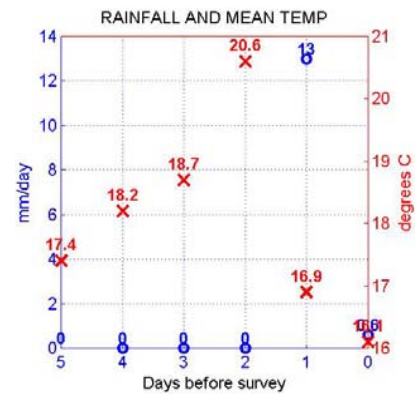
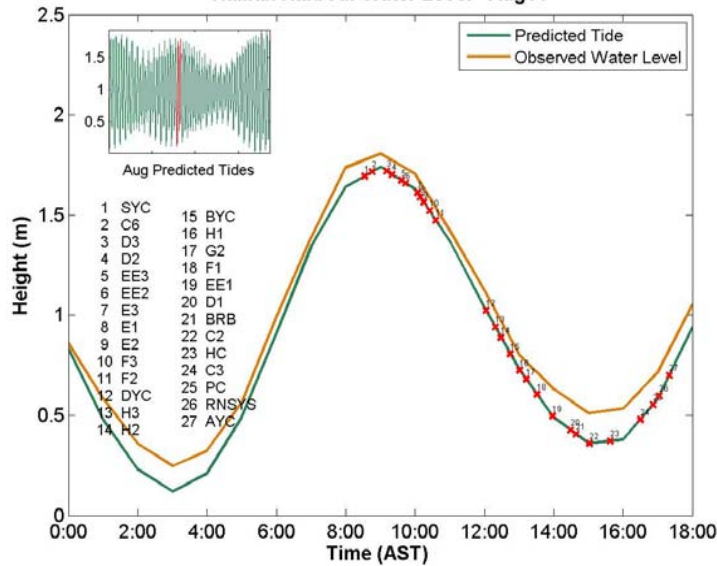
Salinity in PSU      Temperature in °C



# Yacht Clubs



Halifax Harbour Water Level - Aug14



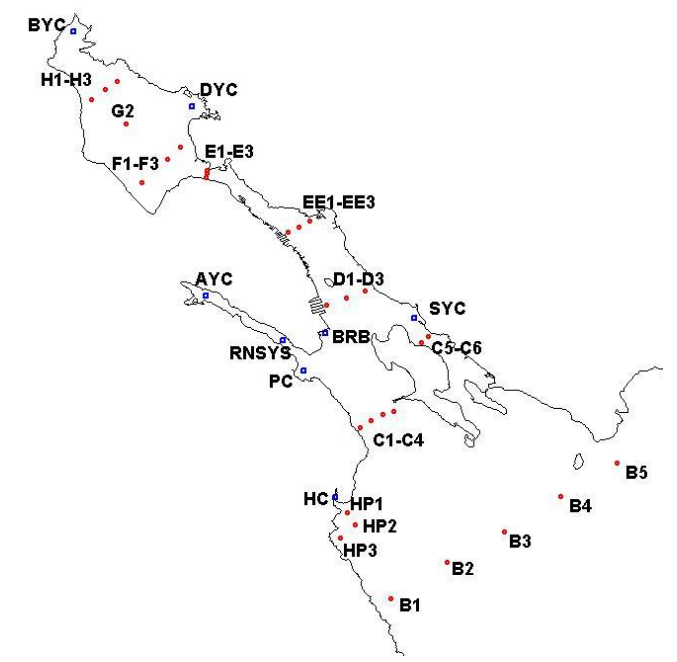
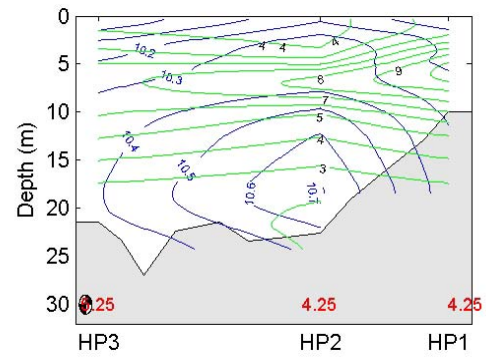
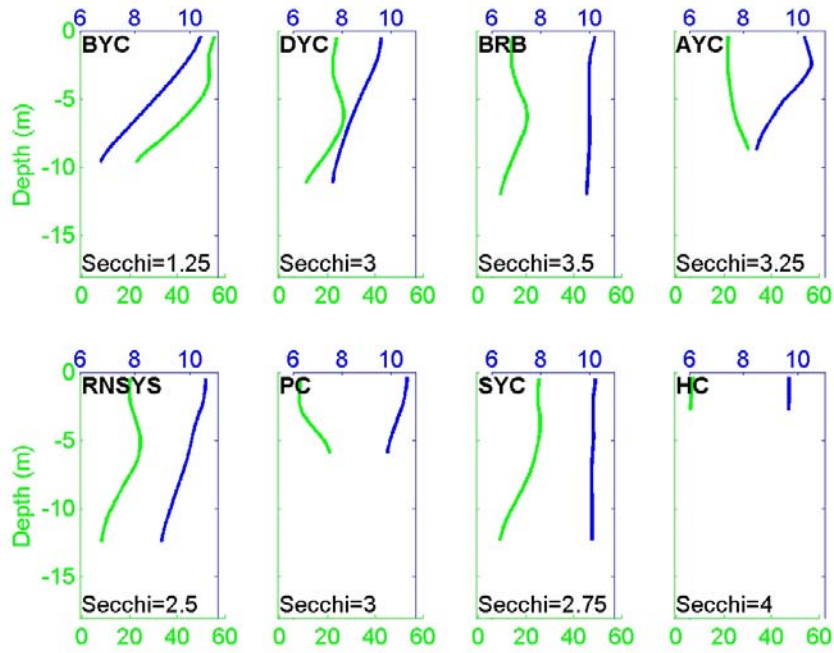
Rainfall and temperature data collected at Shearwater Autoport.  
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Potential Density in  $\text{kg/m}^3$

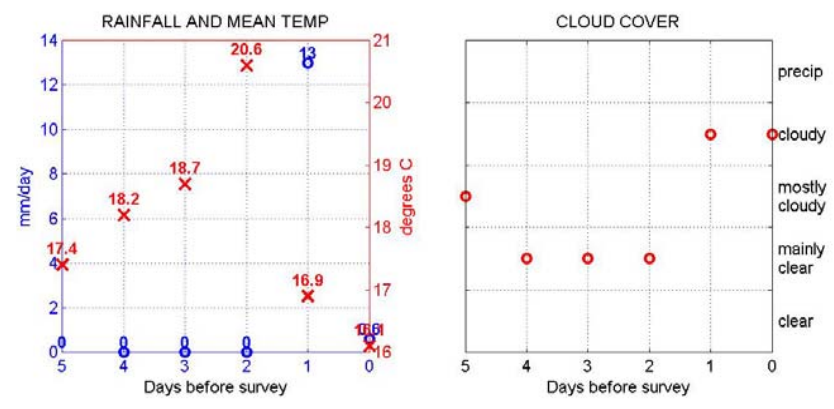
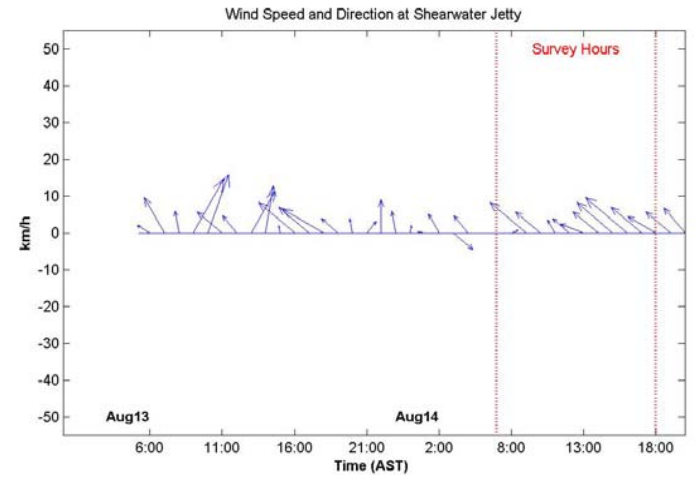
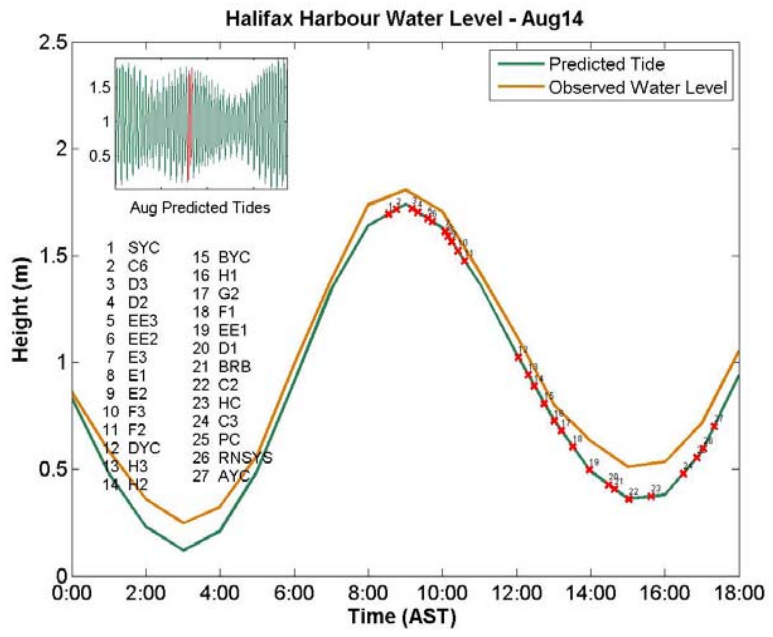
Fecal coliform: **above swimming limit (200 cfu/100mL)**  
**above shellfish limit (14 cfu/100mL)**  
below limits



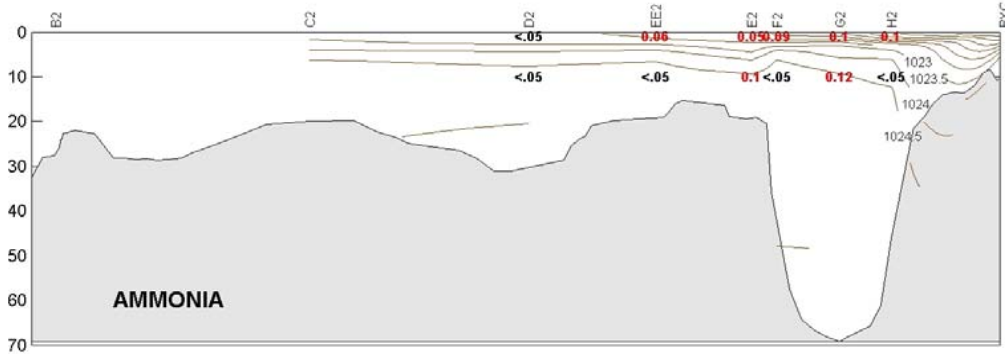
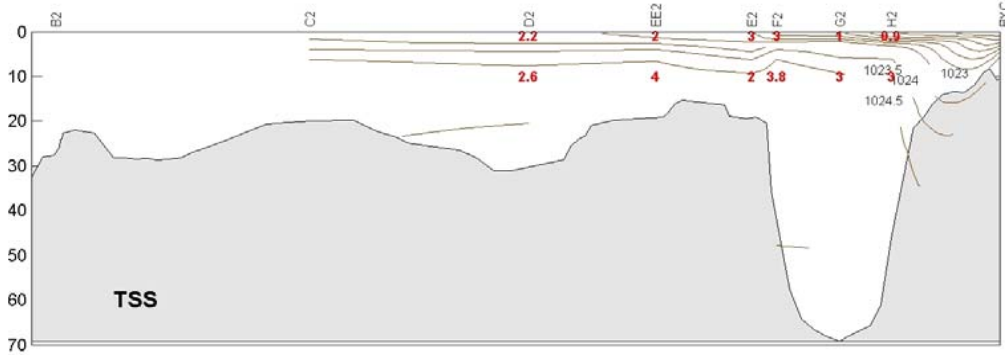
# Yacht Clubs



Rainfall and temperature data collected at Shearwater Autoport.  
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DO in mg/L      Chlorophyll in mg/m<sup>3</sup>



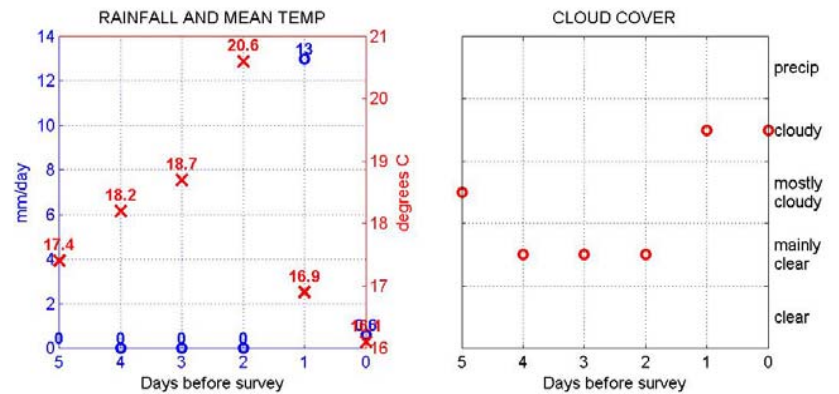
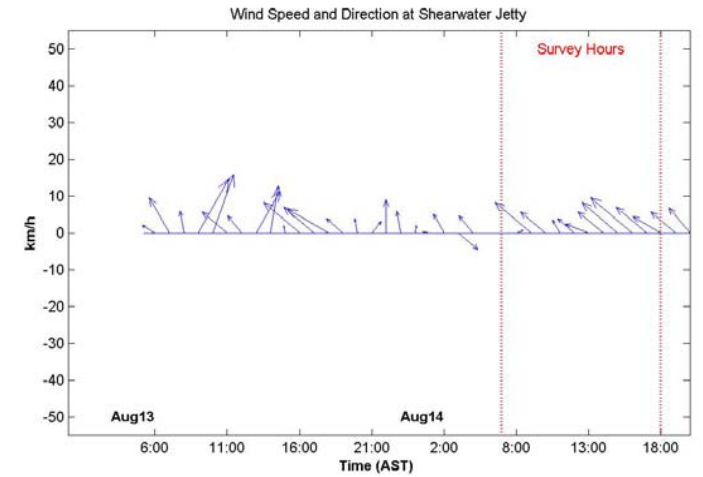
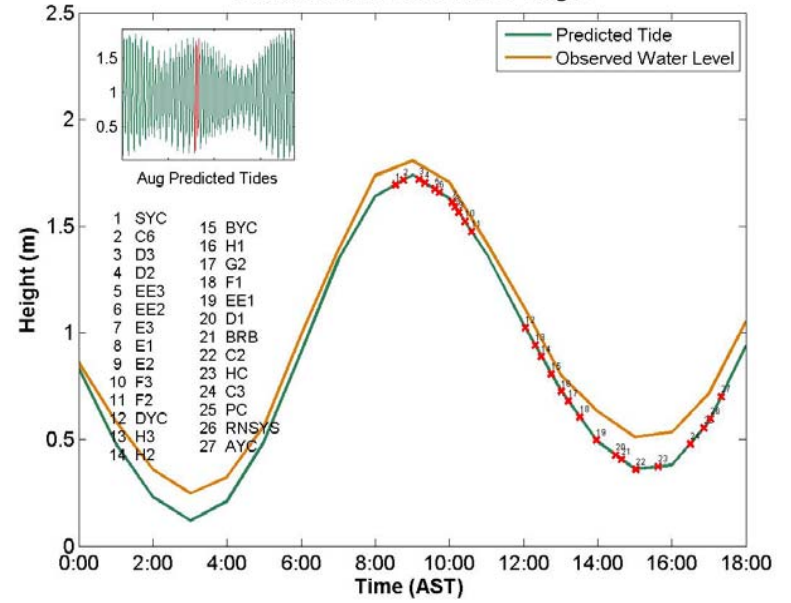
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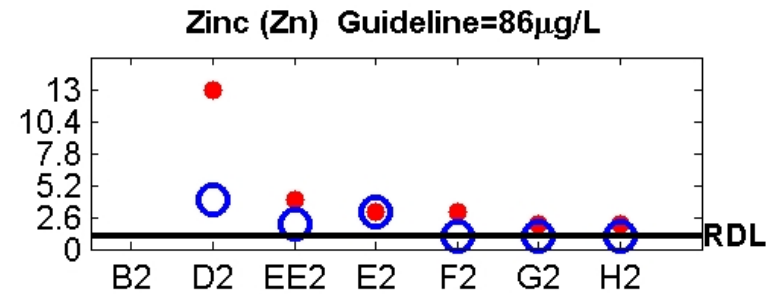
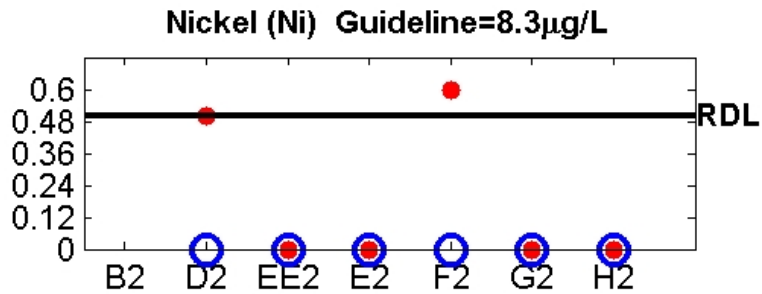
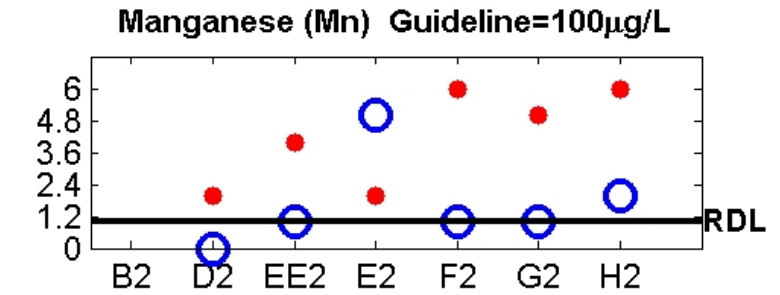
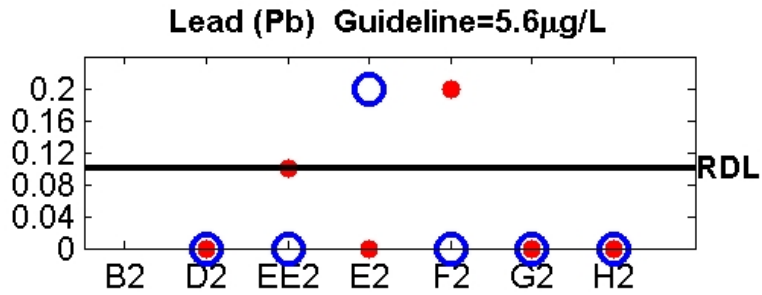
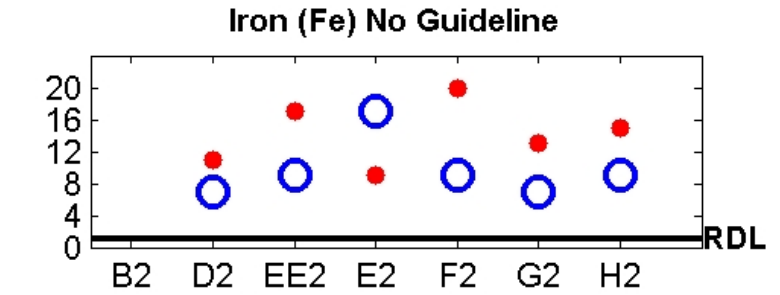
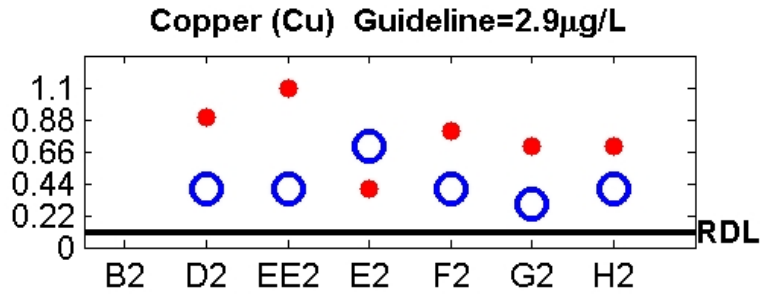
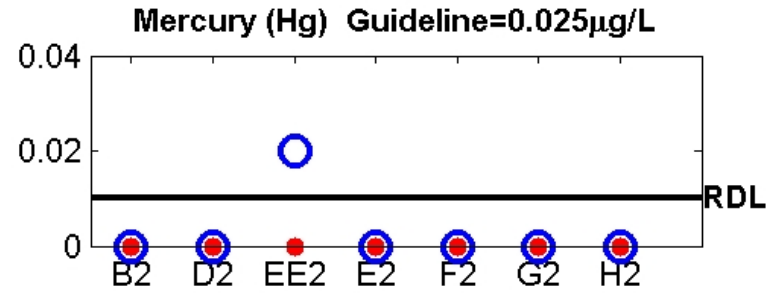
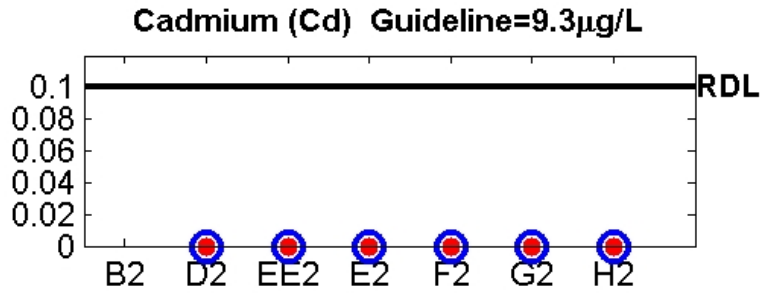
Ammonia in  $\text{mg/L}$

TSS in  $\text{mg/L}$

Halifax Harbour Water Level - Aug14







**LEGEND**  
 ○ = Ten Metre Sample  
 ● = One Metre Sample  
 RDL = Reportable Detection Limit