

# Halifax Harbour Water Quality Monitoring Project Survey Summary #181

**Survey Date:** 8 April 2009  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report181\_090408.doc  
**Data File:** HHWQMP\_data181\_090408.xls

**Data Return:**

Chemical: 100%  
 Bacteria: 100%  
 Profile: 97%  
**Overall: 99%**

**Sample Notes:**

The time of the samples at D2 is approximate. There is no CTD from this site due to exclusion by ship traffic.

In most of the Harbour there is a steep near surface DO gradient. The automated processing routines underestimate the surface DO by up to 0.5 mg/L at many sites.

There is no LOBO data for comparison as the buoy was out of the water for service.

To match the collected reference data, the presented DO values should be scaled by a factor of 1.4 (see data file cover sheet)

**QA/QC samples:**

Chemical Analysis		E2-1m	
Detectable Parameter	Units	Reference Sample	QA/QC
Ammonia (as N)	mg/L	<0.05	<0.05
Total Suspended Solids	mg/L	5.9	7.4
Cobalt	ug/L	0.2	0.2
Copper	ug/L	0.9	0.9
Iron	ug/L	16.0	17.0
Manganese	ug/L	10.0	9.0
Nickel	ug/L	0.9	0.9
Zinc	ug/L	4.0	3.0

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

Site	C6-10m	DYC-1m	PC-10m	E2-1m
Reference	500	780	470	990
QA/QC	600	470	310	4500

**Comments:**

**General:** The weather since the previous survey has been wet. There is a very strong freshwater signal in the Basin (particularly the east side) and the Inner Harbour. There is also the beginning of temperature stratification, but the vertical temperature gradient remains relatively small. Overall, the harbour is relatively strongly density stratified. This represents a major change from the previous survey. The fecal coliform levels are high nearly everywhere, except in the Outer Harbour (B2), with only a few samples just below the swimming limit. Interestingly perhaps, these lower values are in the 10m samples along the western side of the Narrows and Basin and along the east side of the Inner Harbour.

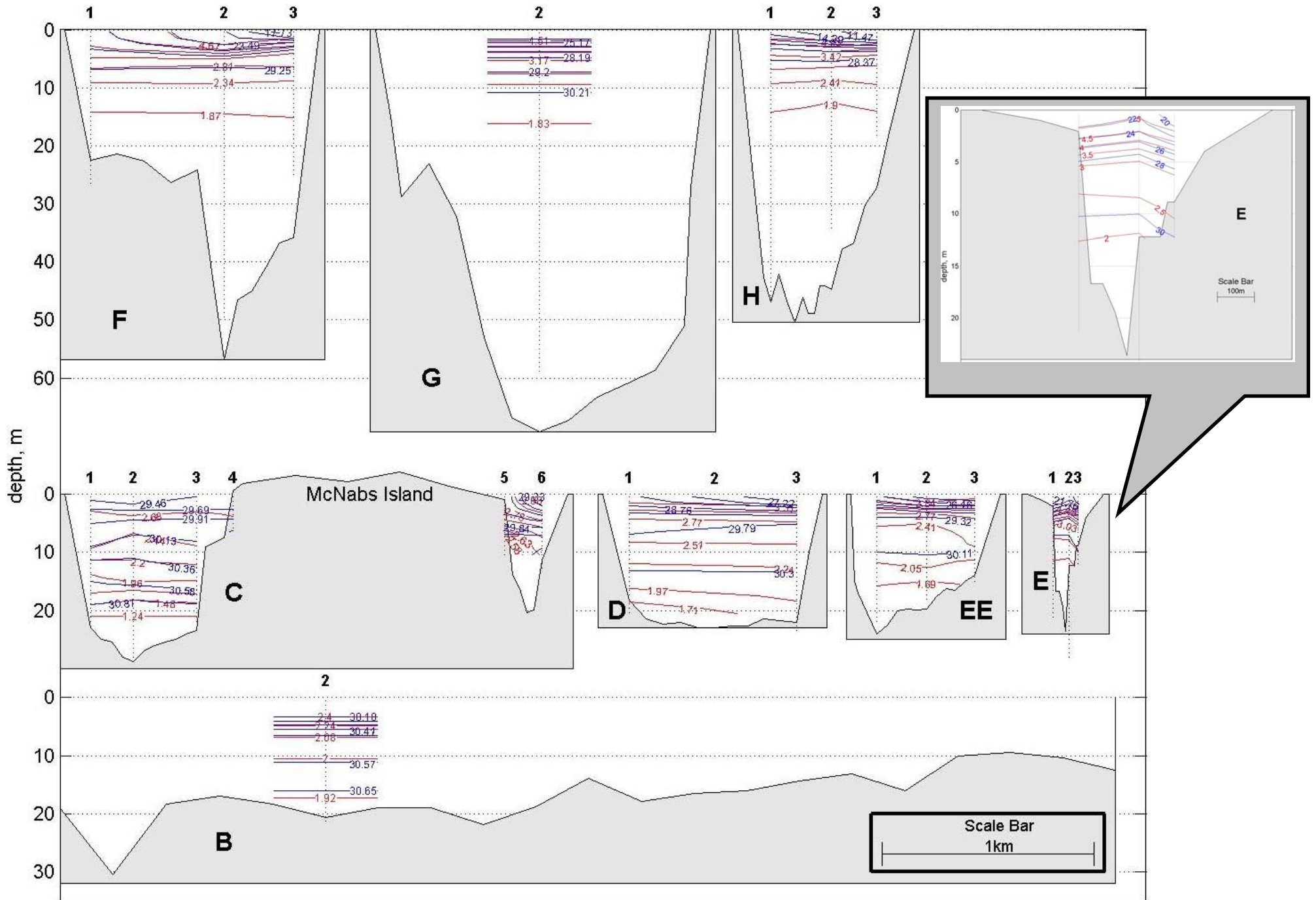
**Fluorescence:** There continues to be significant fluorescence levels of 18 – 25 mg/m<sup>3</sup> at a depth of 5-10 m everywhere, except at B2 in the Outer Harbour. Here the values are close to 10 mg/m<sup>3</sup> throughout the water column.

**TSS:** The average TSS level is moderate (6.0 mg/L). The distribution of values values > 6 mg/L seems to be centered in the southern Basin. In the 1m samples it extends throughout the Basin and south to section EE. In the 10m samples it includes the Narrows (E) and southern Basin (F).

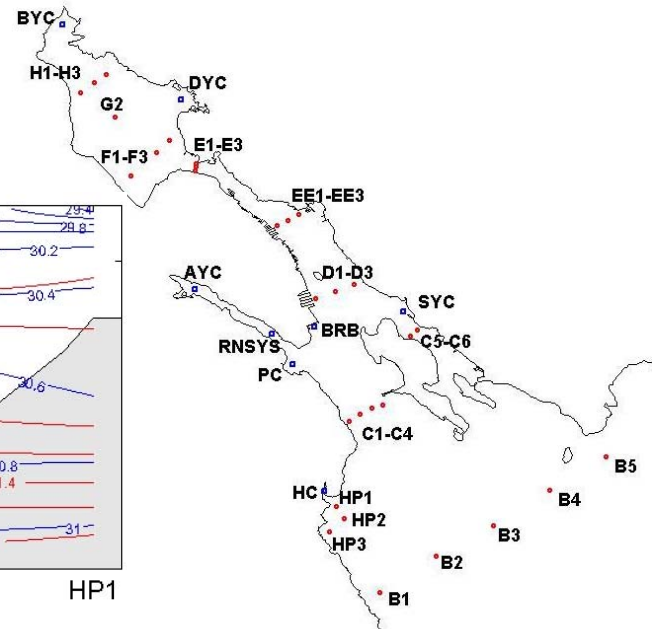
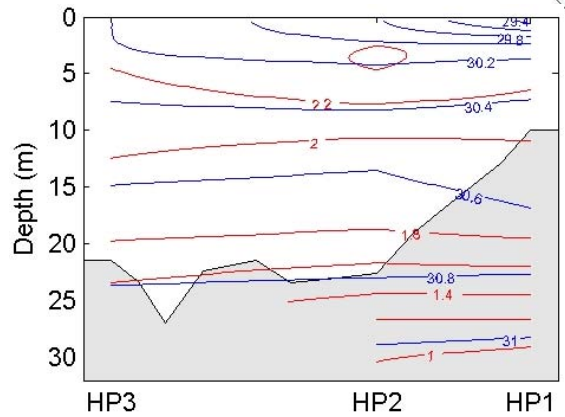
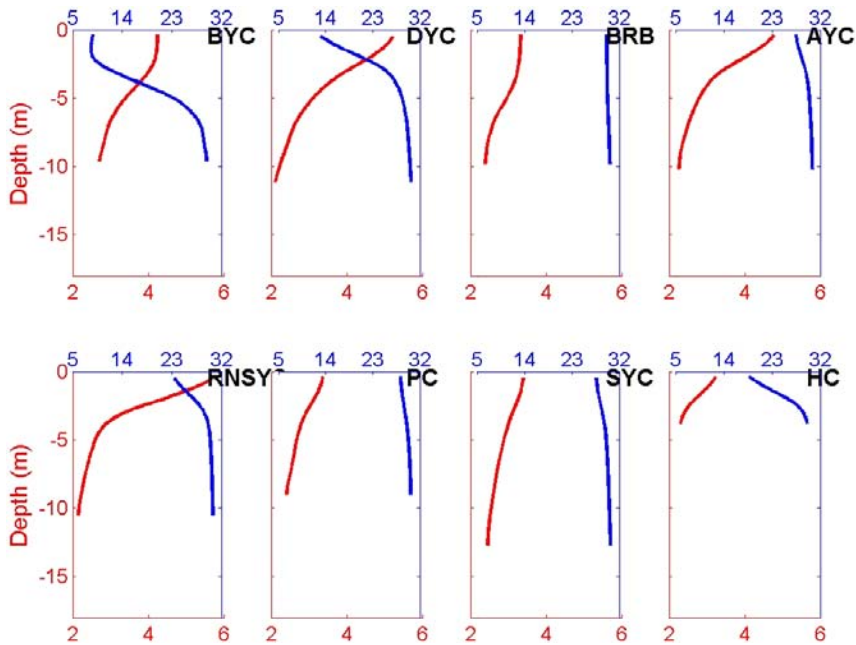
**Ammonia:** The ammonia levels are low, with detectable concentrations (>0.05 mg/L) in only four samples. The highest value (0.09) mg/L) is in the H2-1m sample, perhaps associated with fresh water.

**Metals:** There are no guideline exceedences. The closest metal to guideline exceedence levels is copper, with several 1 m values at about 50% of the 2.9 µg/L guideline. Unusually, the H2-1m sample has the highest observed levels for several metals, including mercury. This may be associated with freshwater.

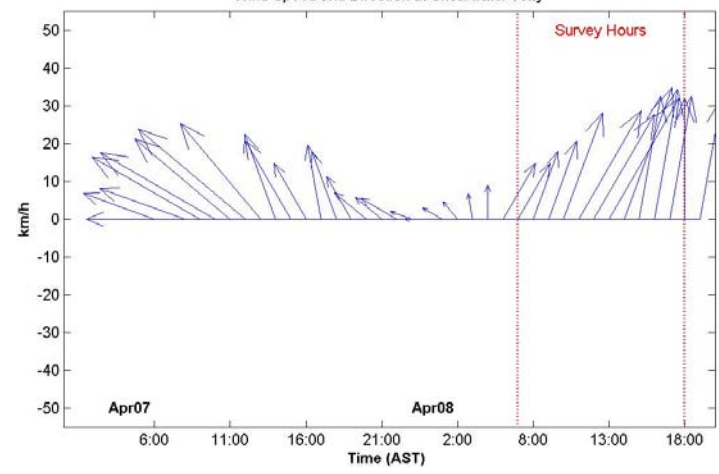
**Dissolved Oxygen:** The dissolved oxygen data, scaled appropriately by a factor of 1.4, indicates that the DO levels are everywhere quite high and relatively uniform. The near surface water is everywhere about 11 mg/L. In all water shallower than 20m the DO is greater than 10 mg/L. In the deepest water of the Basin the DO drops somewhat to just under 9.0 mg/L. There were no guideline exceedences observed.



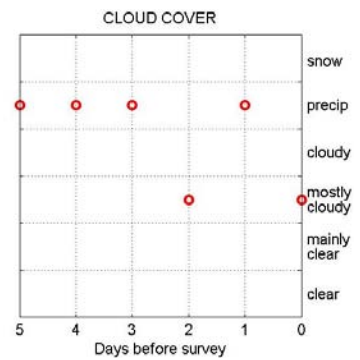
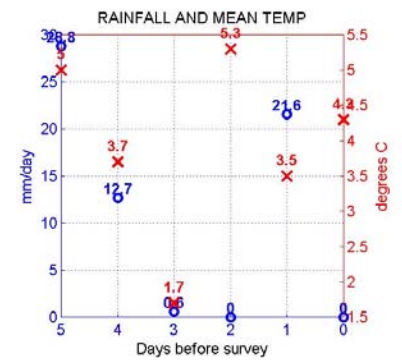
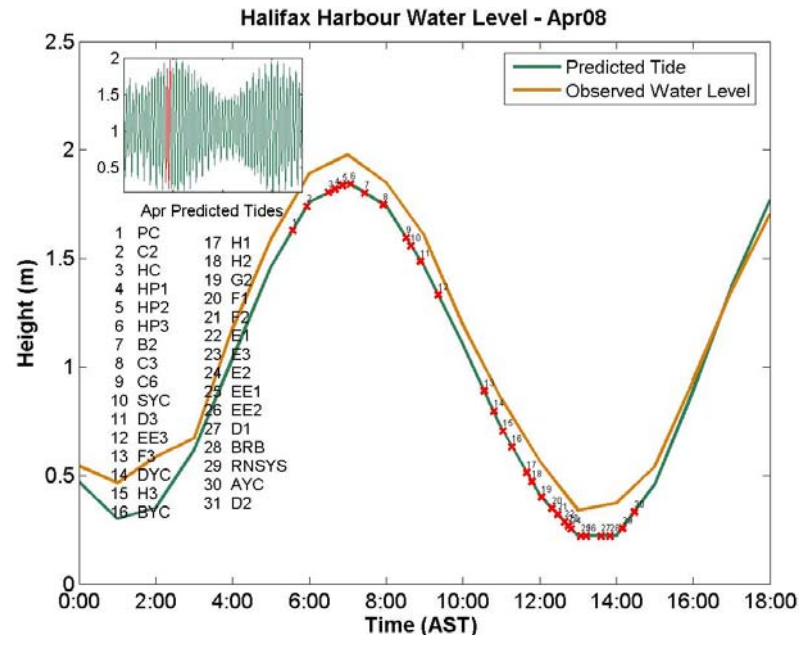
# Yacht Clubs



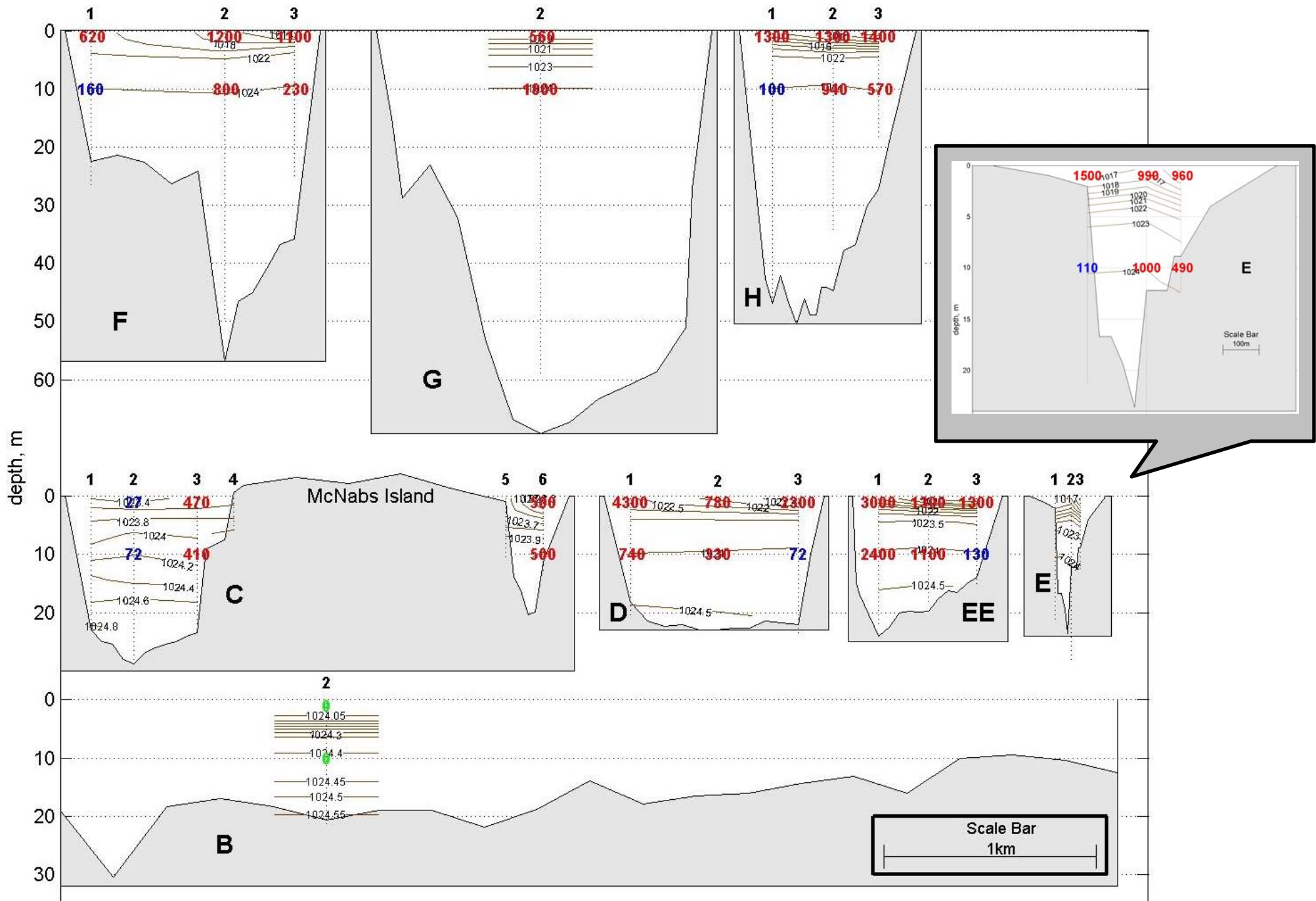
Wind Speed and Direction at Shearwater Jetty



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

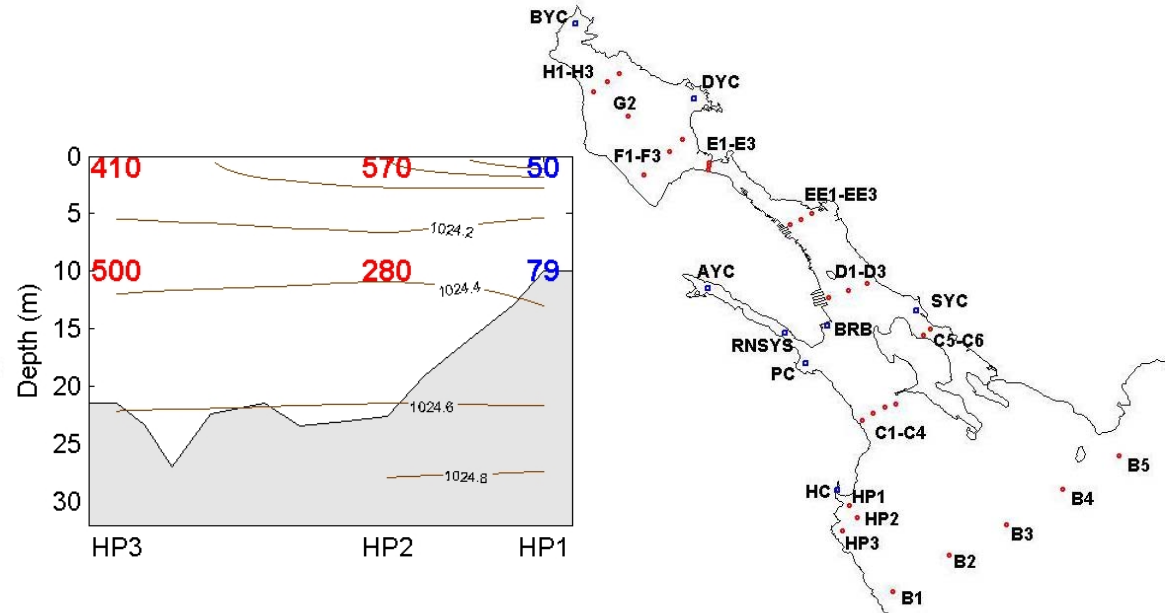
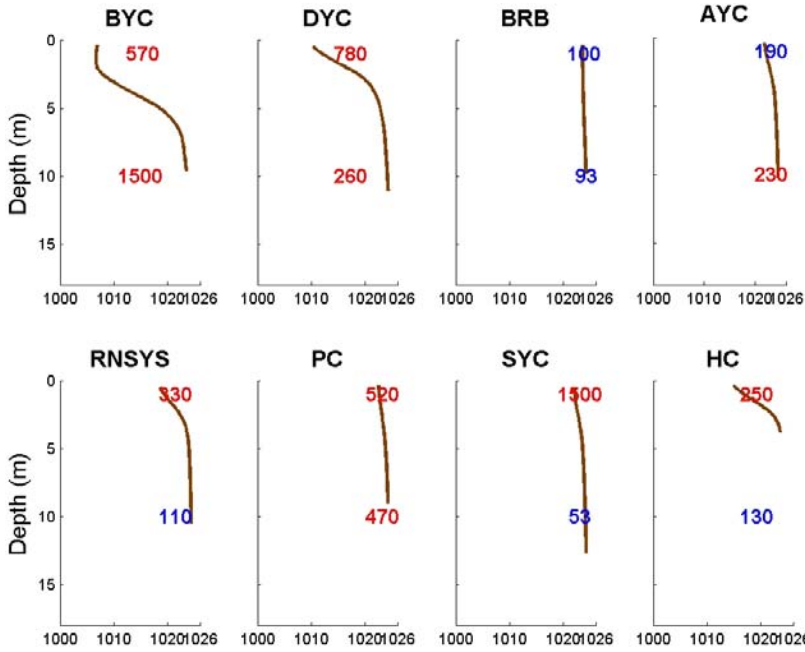


Salinity in PSU      Temperature in °C

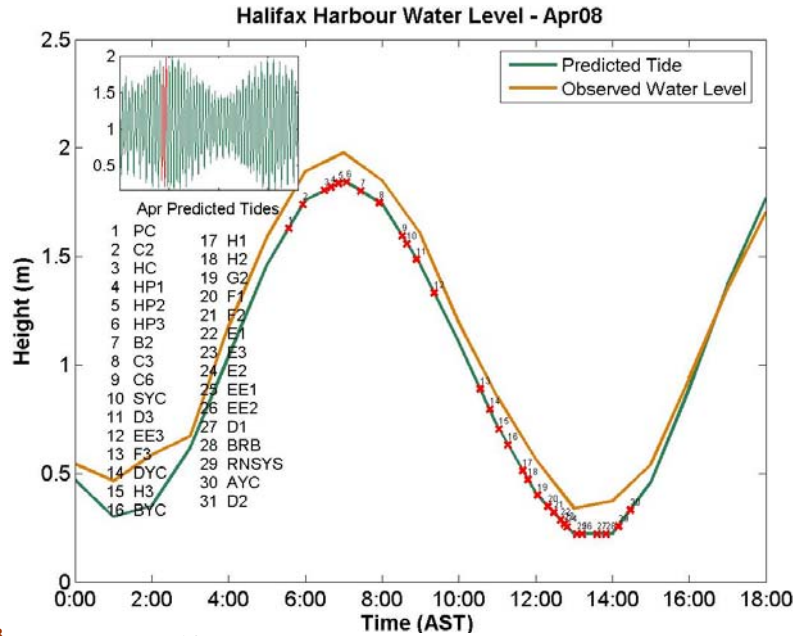




# Yacht Clubs

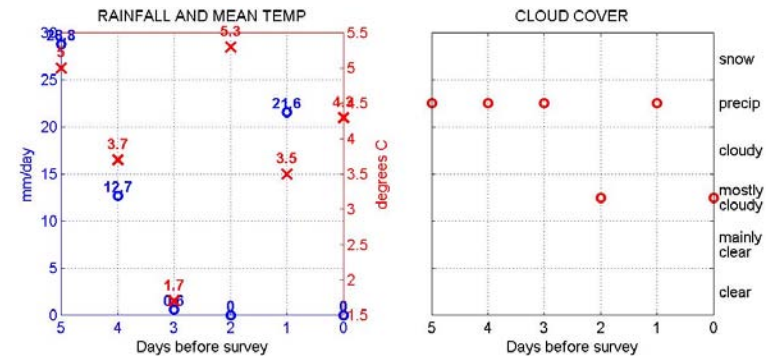
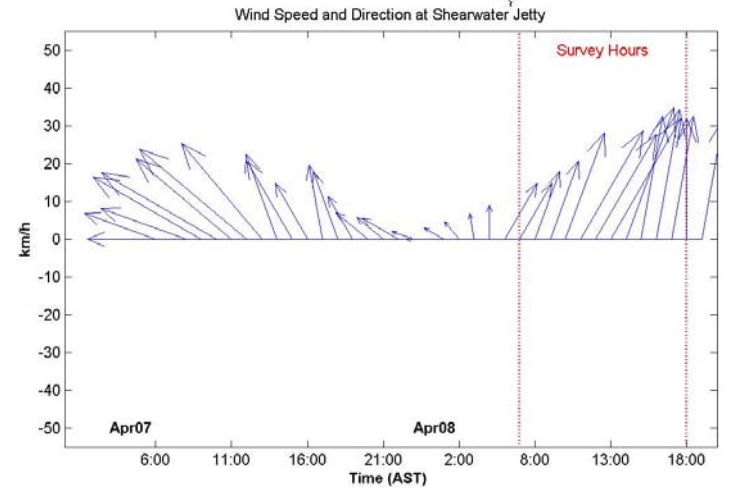


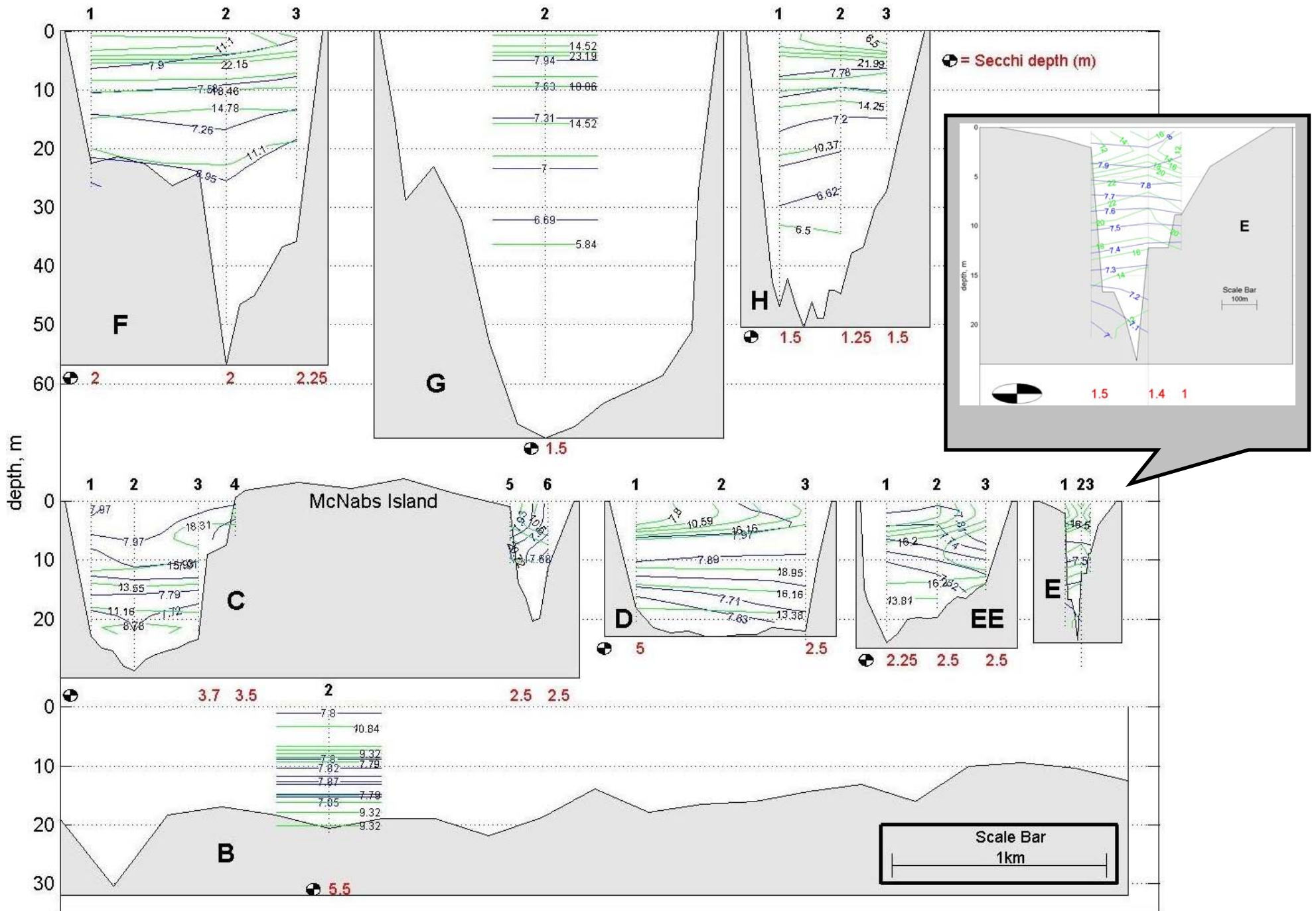
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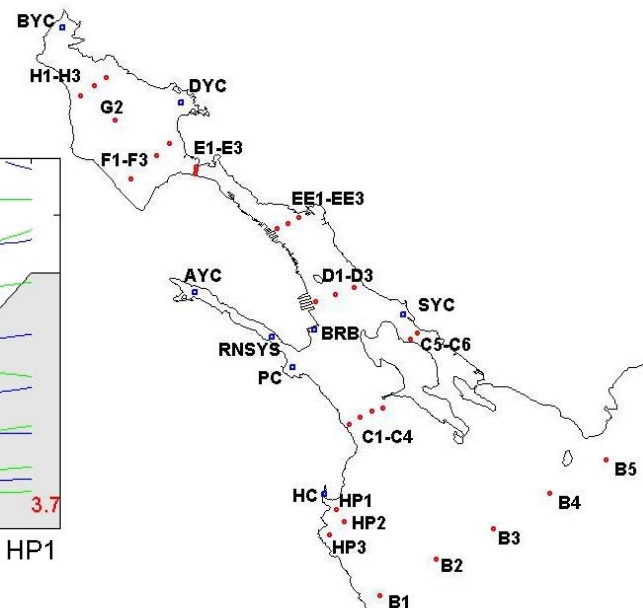
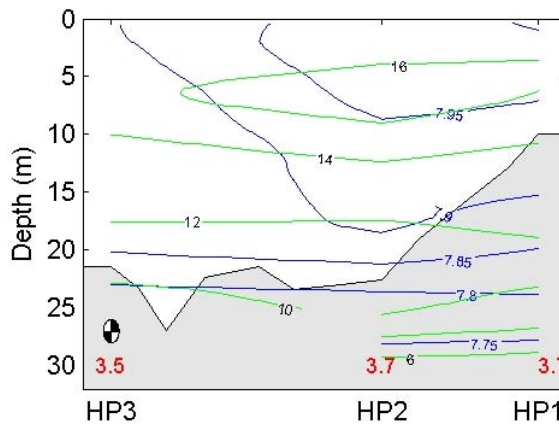
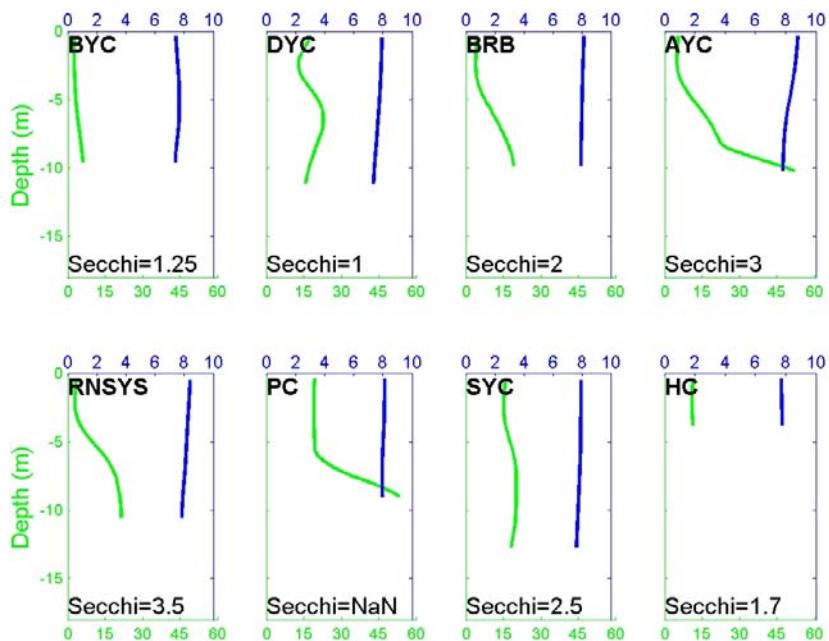
Potential Density in kg/m³

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

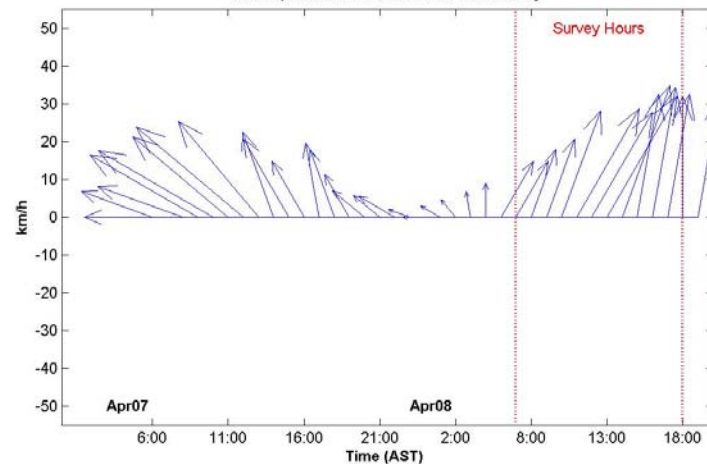




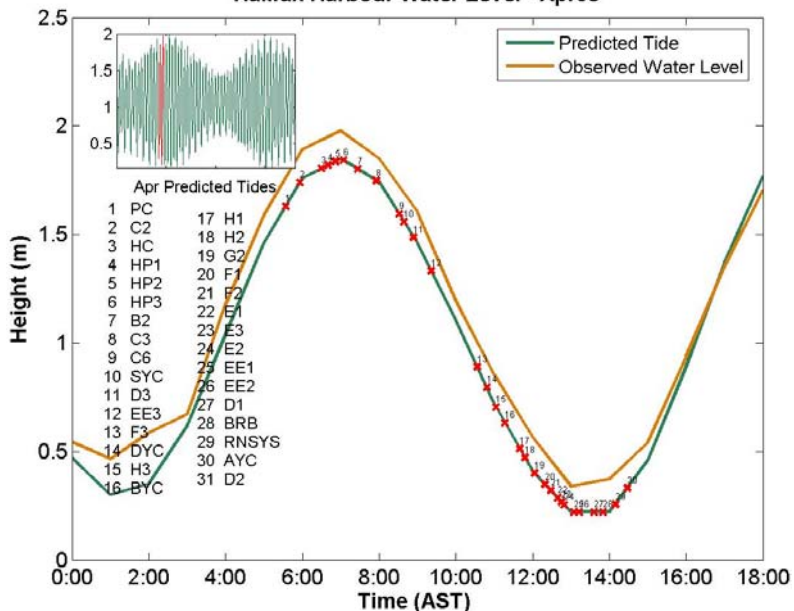
# Yacht Clubs



Wind Speed and Direction at Shearwater Jetty



Halifax Harbour Water Level - Apr08



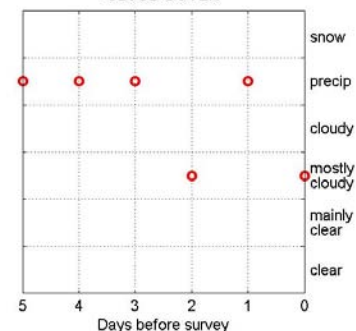
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RAINFALL AND MEAN TEMP



CLOUD COVER

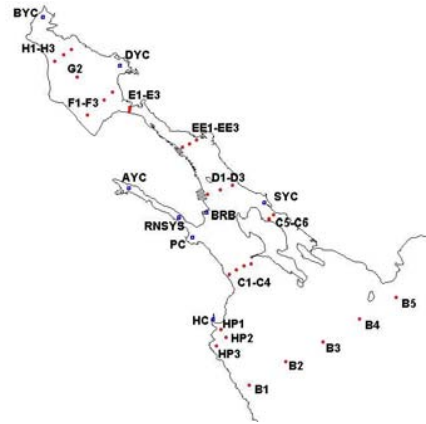
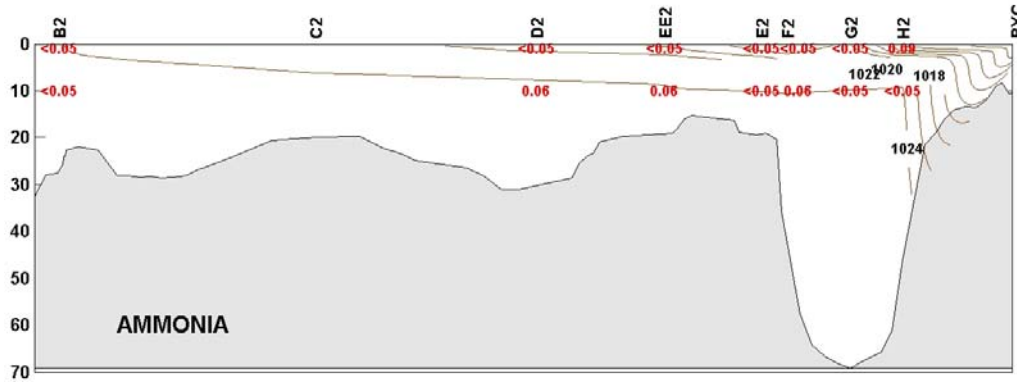
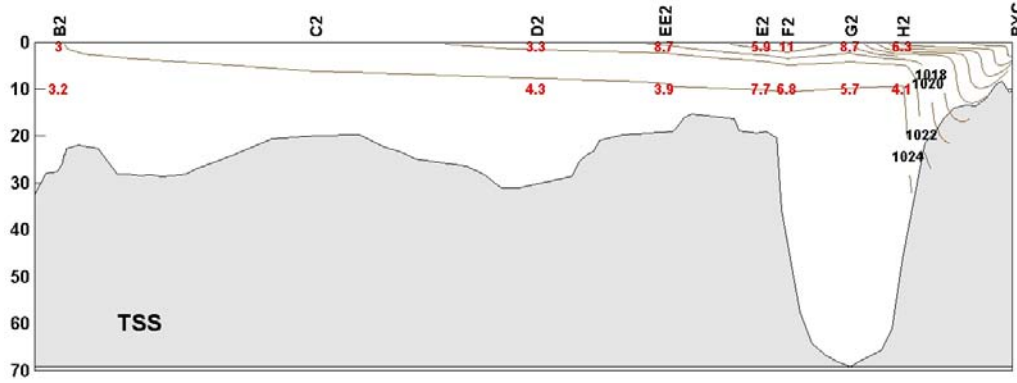


DO in mg/L

Chlorophyll in mg/m<sup>3</sup>



CHEMISTRY



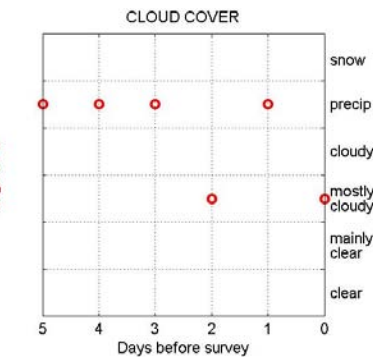
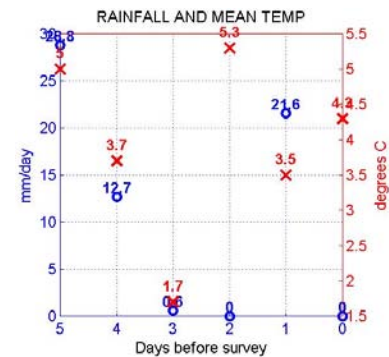
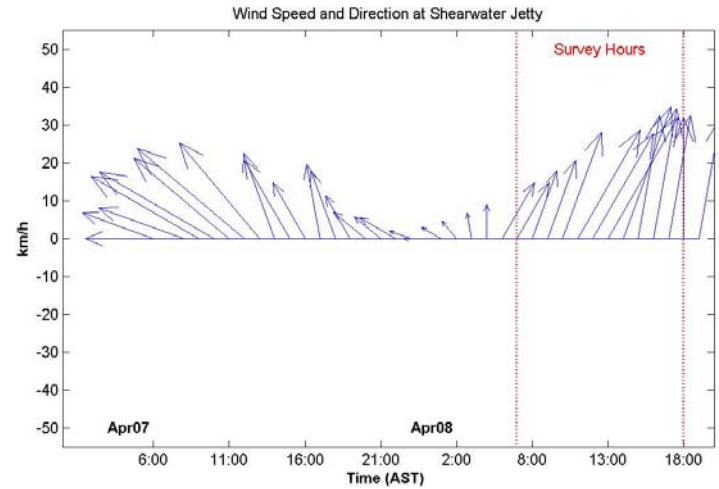
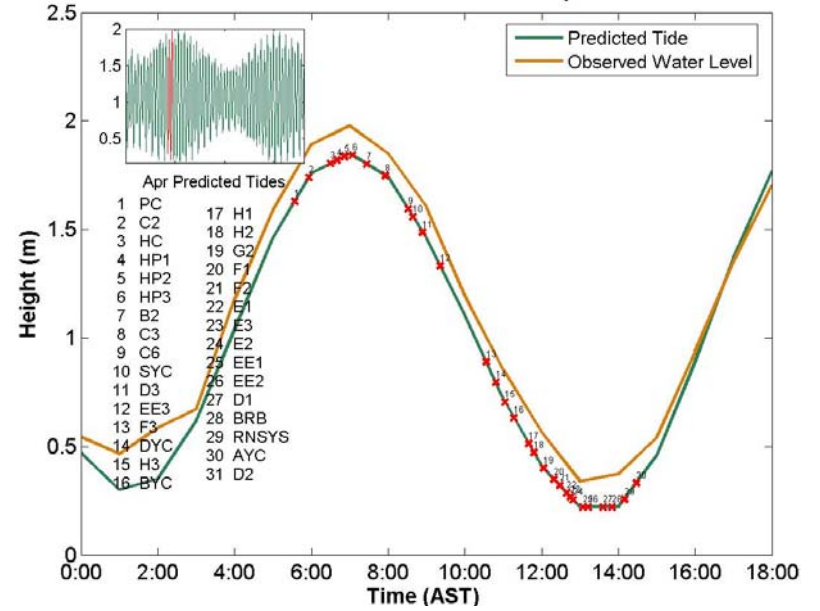
Rainfall and temperature data collected at Shearwater Autoport.  
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Potential Density in  $\text{kg/m}^3$

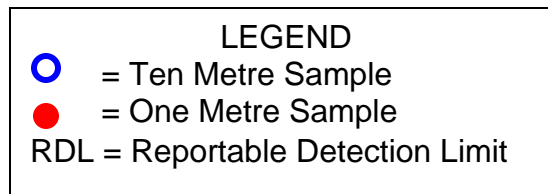
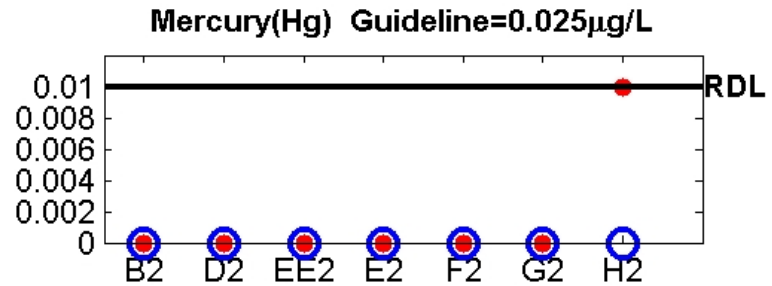
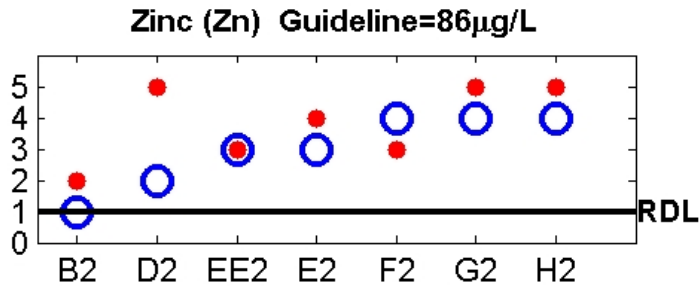
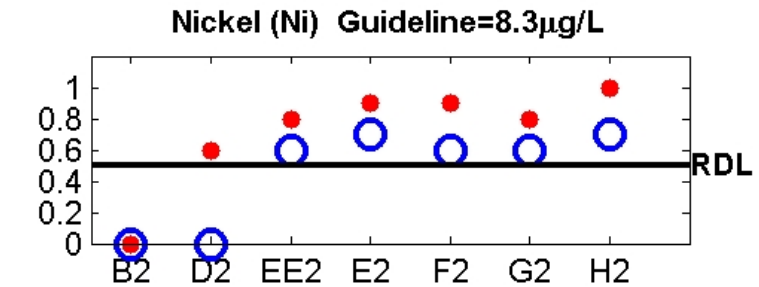
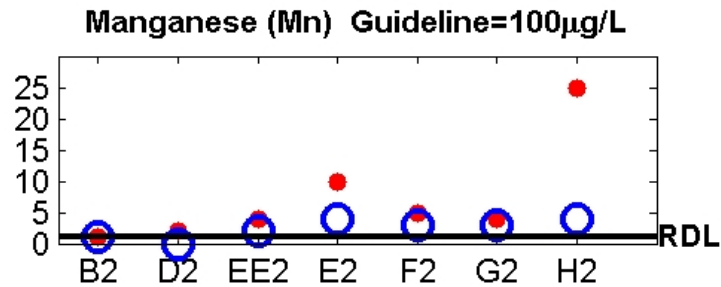
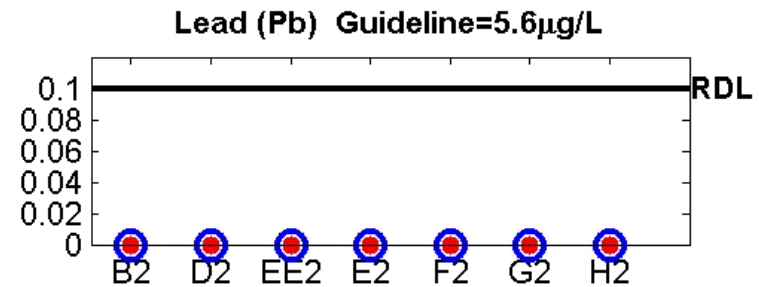
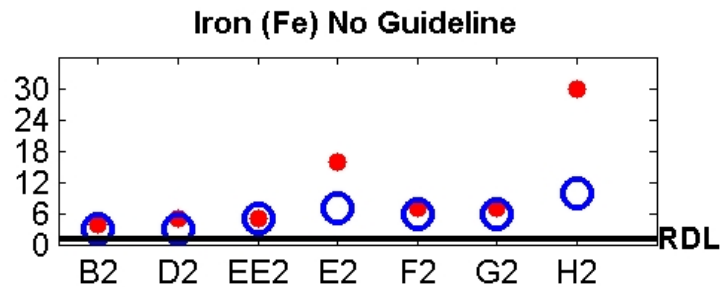
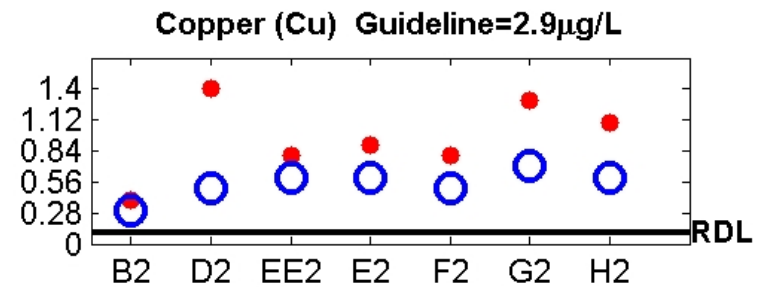
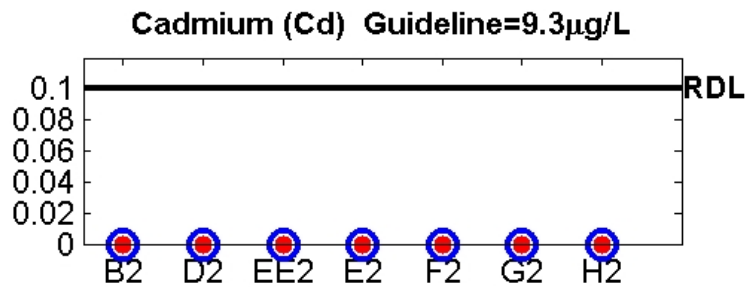
Ammonia in  $\text{mg/L}$

TSS in  $\text{mg/L}$

Halifax Harbour Water Level - Apr08

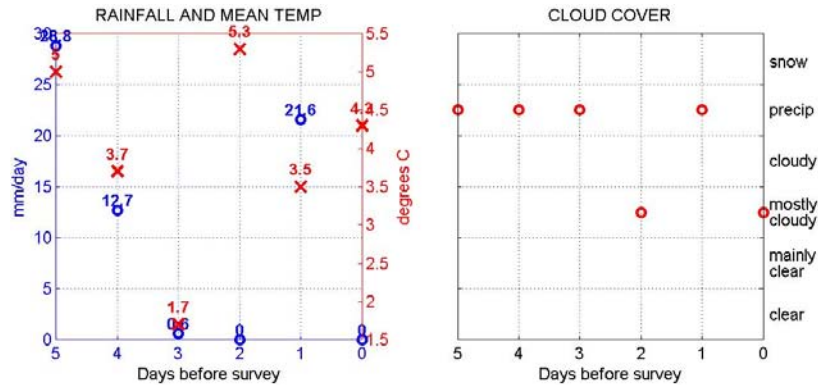
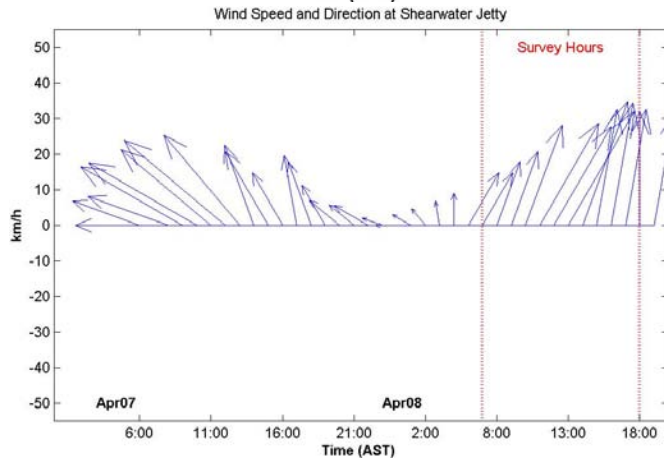
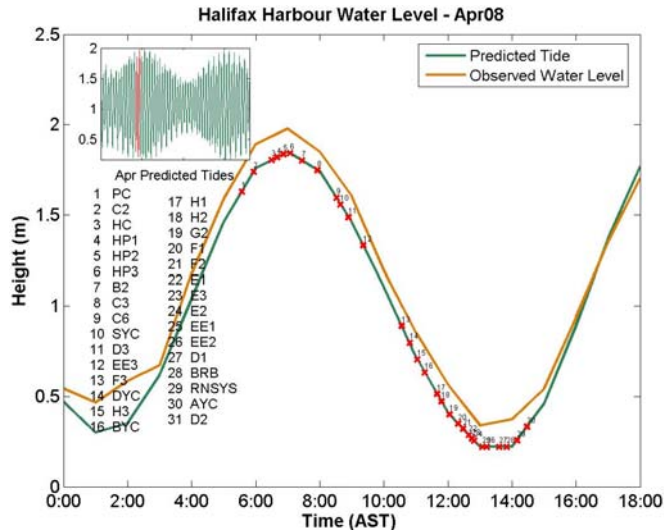




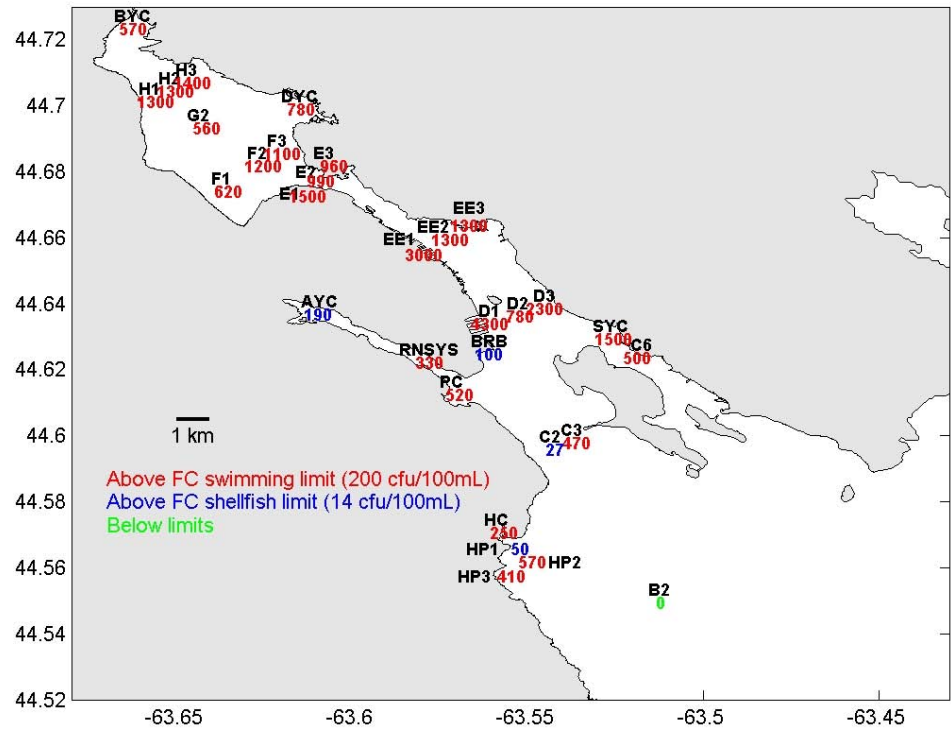


# HRM Water Quality Monitoring

## Fecal Coliform Summary – April 8, 2009



Fecal Coliform 1 m



Fecal Coliform 10 m

