

# Halifax Harbour Water Quality Monitoring Project

## Survey Summary #187

**Survey Date:** 26 August 2009  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report187\_090826.doc  
**Data File:** HHWQMP\_data187\_090826.doc

**Data Return:**  
 Chemical: 100%  
 Bacteria: 100%  
 Profile: 100%  
**Overall: 100%**

### Sample Notes:

A supplementary CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 15:53 local time (AST).

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

Detectable Parameter	Units	E2-1m	
		Reference Sample	QA/QC
Ammonia (as N)	mg/L	0.08	0.08
Total Suspended Solids	mg/L	2.8	4.2
Copper	ug/L	1.0	1.0
Iron	ug/L	16.0	11.0
Lead	ug/L	0.1	0.1
Manganese	ug/L	3.0	2.0
Zinc	ug/L	5.0	4.0

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

Site	C6-10m	DYC-1m	PC-10m	E2-1m
Reference	81	18	34	2100
QA/QC	120	18	23	3300

### Comments:

**General:** There has been a large rainfall event (54 mm) three days before the survey, with slight additional precipitation in the intervening days. However, the only significant freshwater signature is adjacent to certain freshwater sources, e.g. BYC,

DYC and RNSYS. The surface salinity is quite uniform, varying gradually from 30.1 in the centre of the Basin to almost 31.0 in the Outer Harbour at B2. The surface temperature is about 16° C in the northern basin dropping only just under 14 ° C in the Outer Harbour. The difference between the surface and 20 m is everywhere 5-7 ° C. Overall, the density stratification is moderate. The fecal coliform levels are very high in the Southern Basin and Northern Inner Harbour in both the 1 and 10m samples. This distribution may be influenced by the brisk up harbour winds on the day of the survey. The wind is also likely a factor in the high 1 m values at HP1 and RNSYS sites often affected by the Tribune Head and Chain Rock outfalls, respectively.

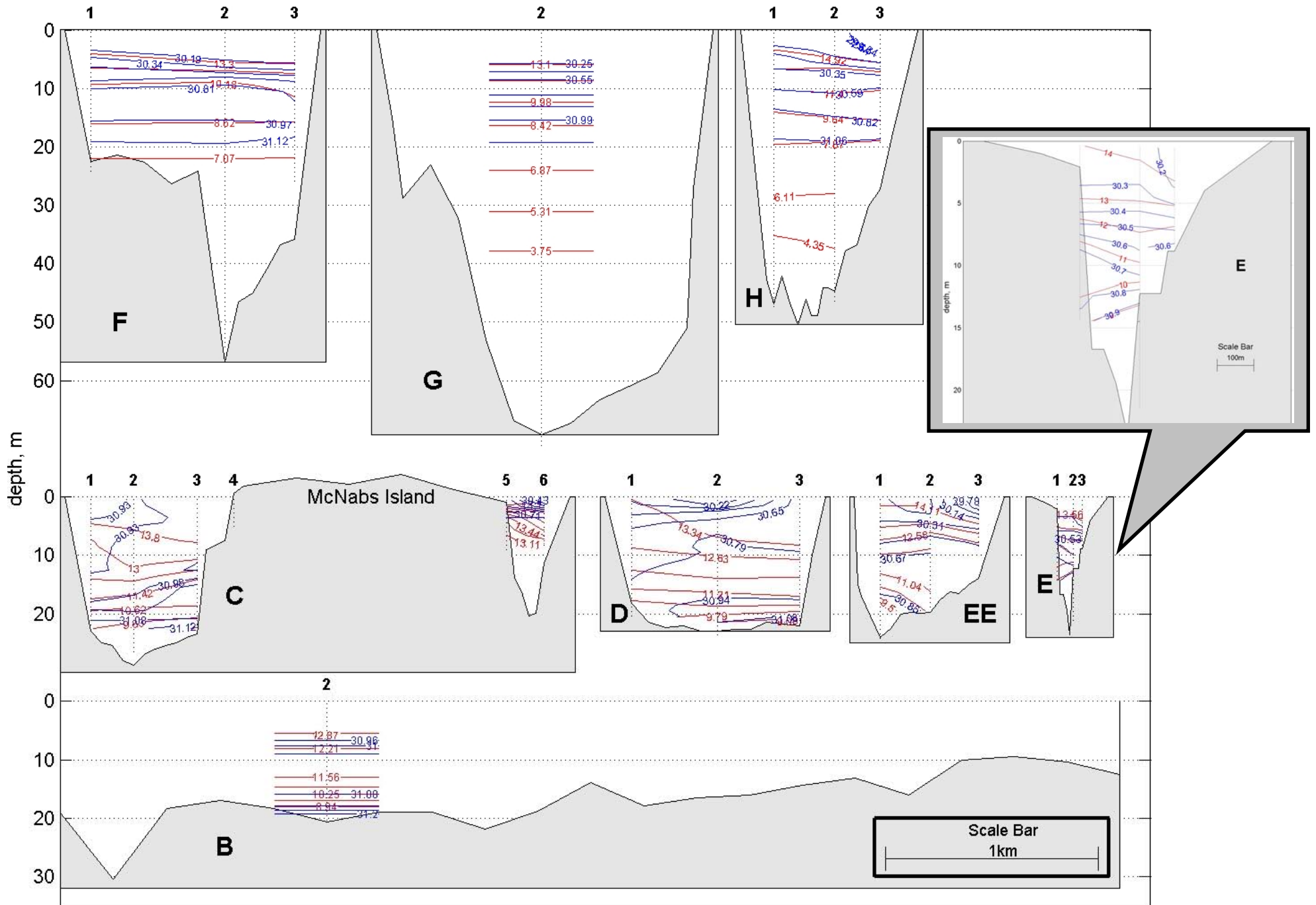
**Fluorescence:** The fluorescence levels are moderate with relatively shallow profile maximums and significant activity extending to the surface. This corresponds to relatively low secchi disk readings everywhere. The maximum levels in the Basin are about 20-30 mg/m<sup>3</sup>. The levels decrease going out of the harbour to about 4 mg/m<sup>3</sup> at B2 in the Outer Harbour.

**TSS:** The average TSS levels are relatively low (3.8 mg/L). Most values higher than average are in the Narrows and Basin.

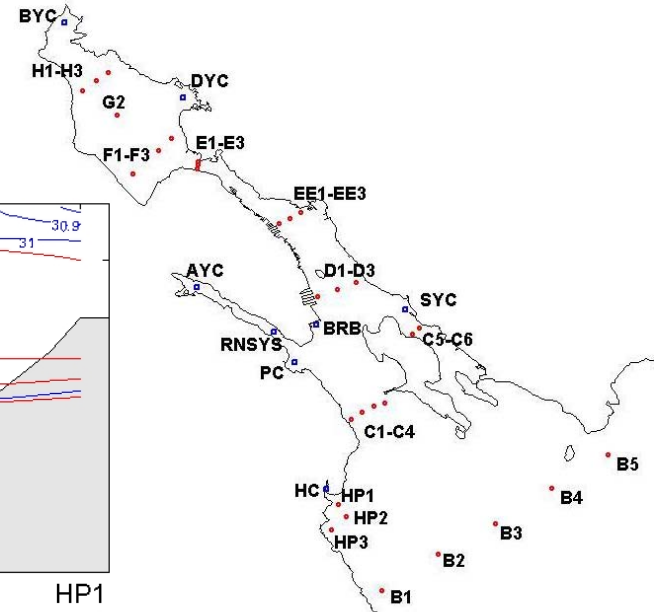
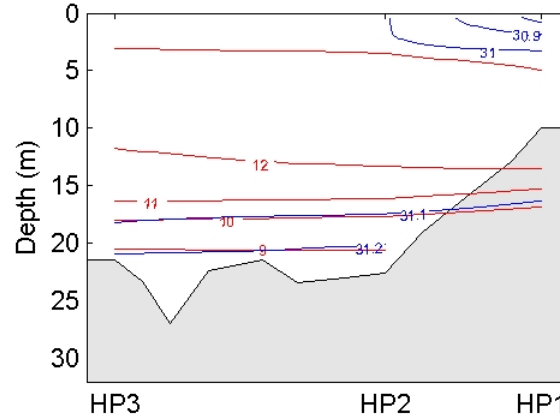
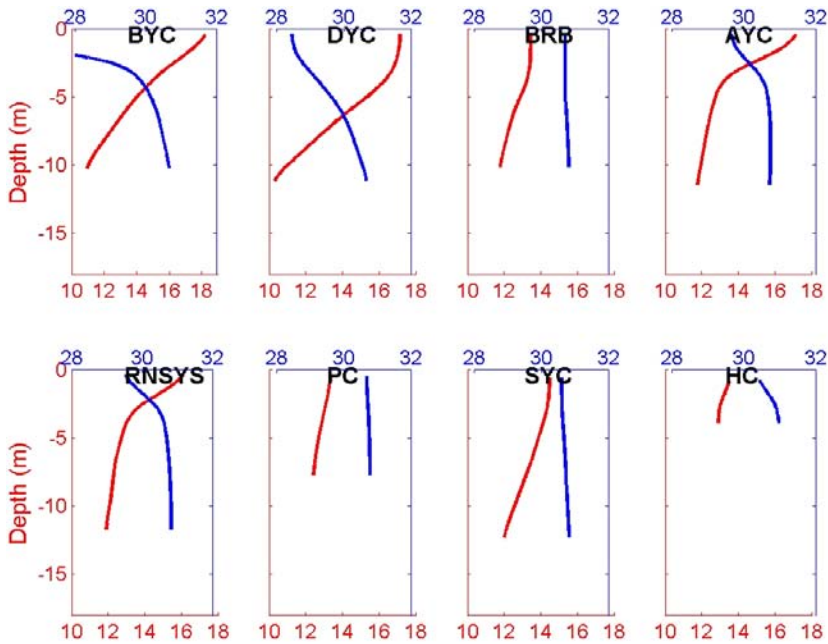
**Ammonia:** The ammonia levels are moderate (mean 0.7 mg/L) with detectable levels in all but one sample. The highest values (up to 0.12 mg/L) are in the 10m samples in the Northern Inner Harbour and Southern Basin.

**Metals:** There are no guideline exceedences. The metal closest to guideline exceedence is copper with one sample at almost 50% of the 2.9 µg/L guideline.

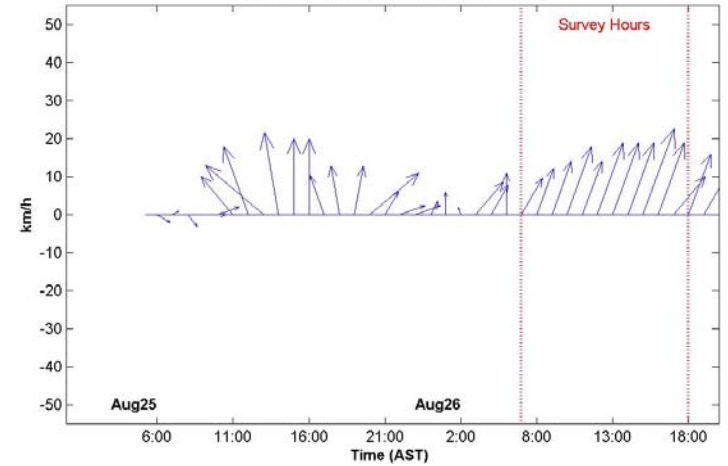
**Dissolved Oxygen:** The dissolved oxygen data, scaled appropriately by a factor of 1.4, indicates that the surface DO levels are very uniform and relatively high at about 9.5 to 10 mg/L, slightly higher in the Northern Basin. In the Inner Harbour the levels at the bottom are about 1 mg/L lower. By section C the concentrations are vertically uniform. The pattern reverses in the Outer Harbour where at B2 the bottom water is more oxygenated than the surface water. The Basin bottom water is quite oxygen poor at about 3 mg/L. This is below the applicable 7.0 mg/L guideline and represents the only guideline exceedence observed.



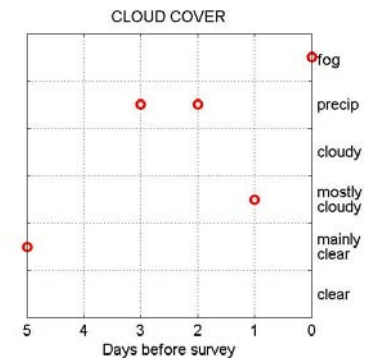
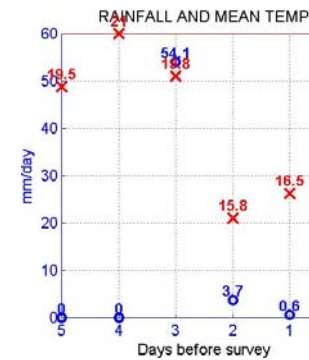
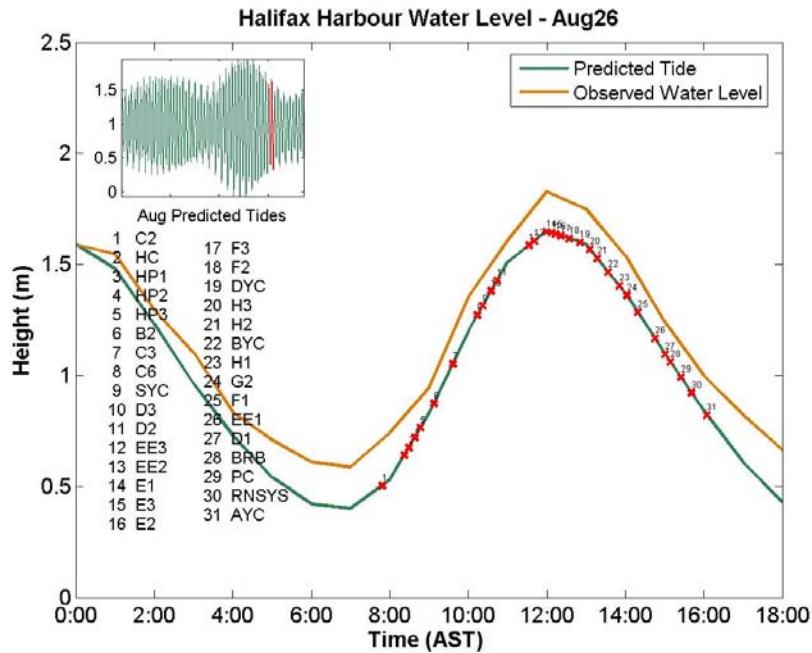
# Yacht Clubs



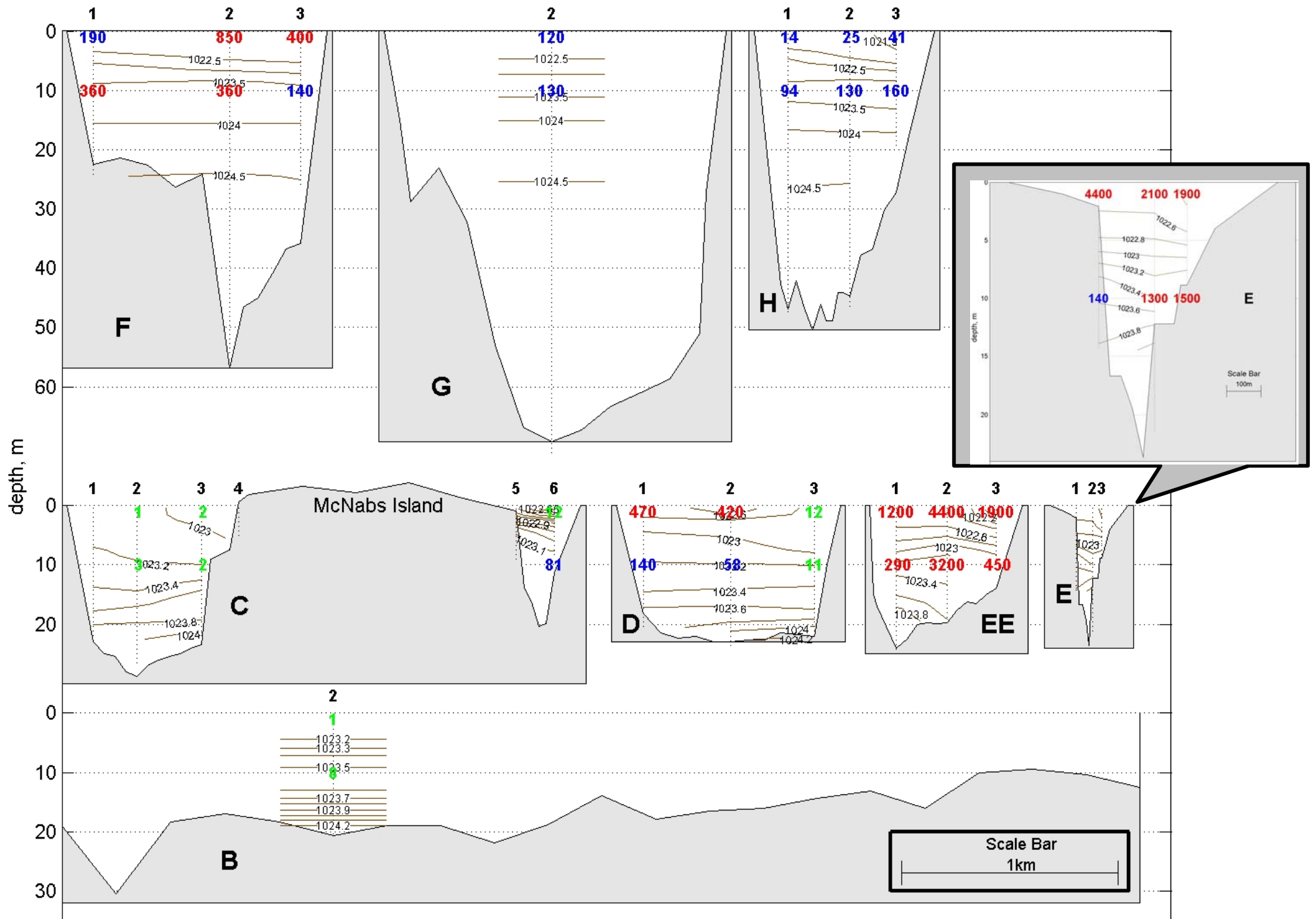
Wind Speed and Direction at Shearwater Jetty



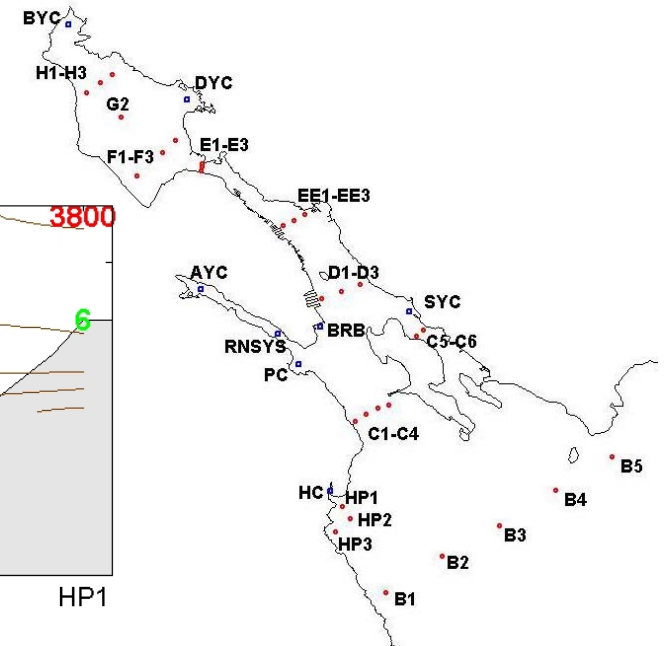
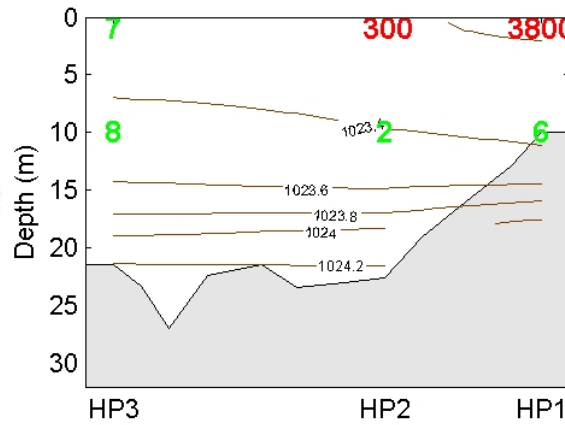
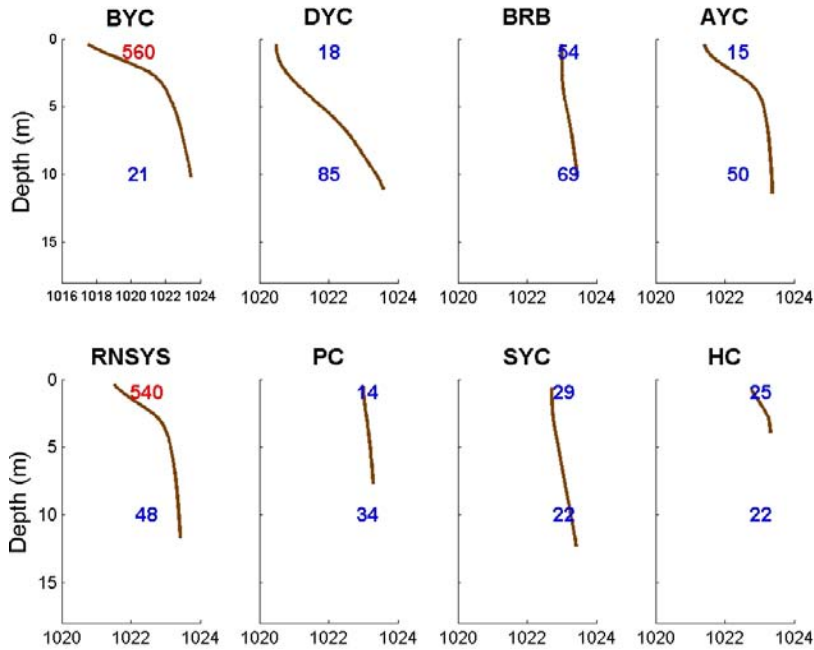
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



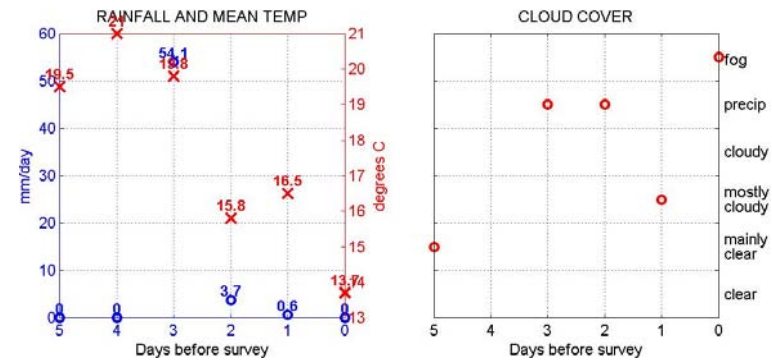
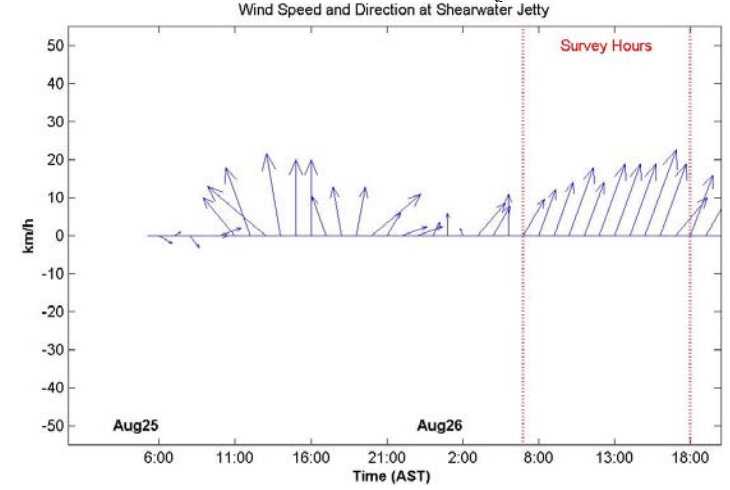
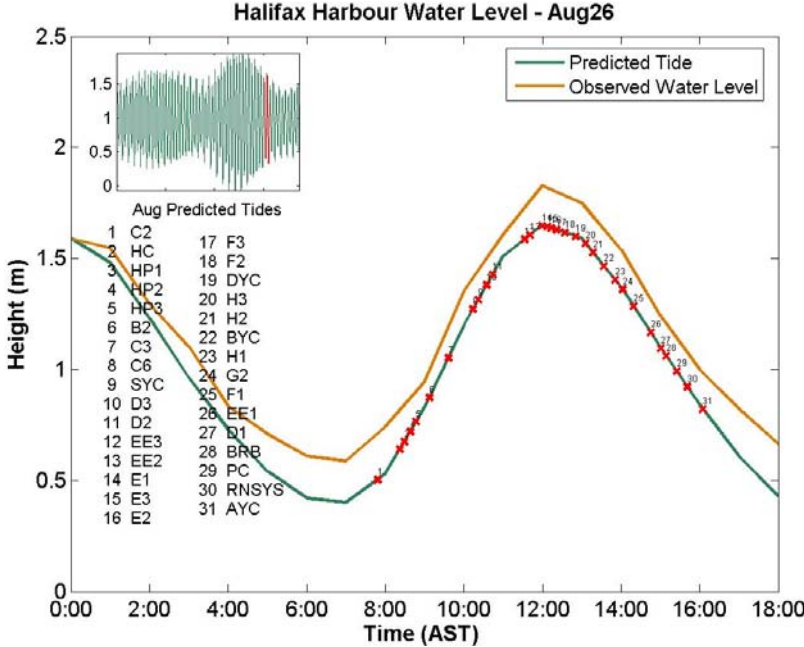
Salinity in PSU      Temperature in °C



# Yacht Clubs



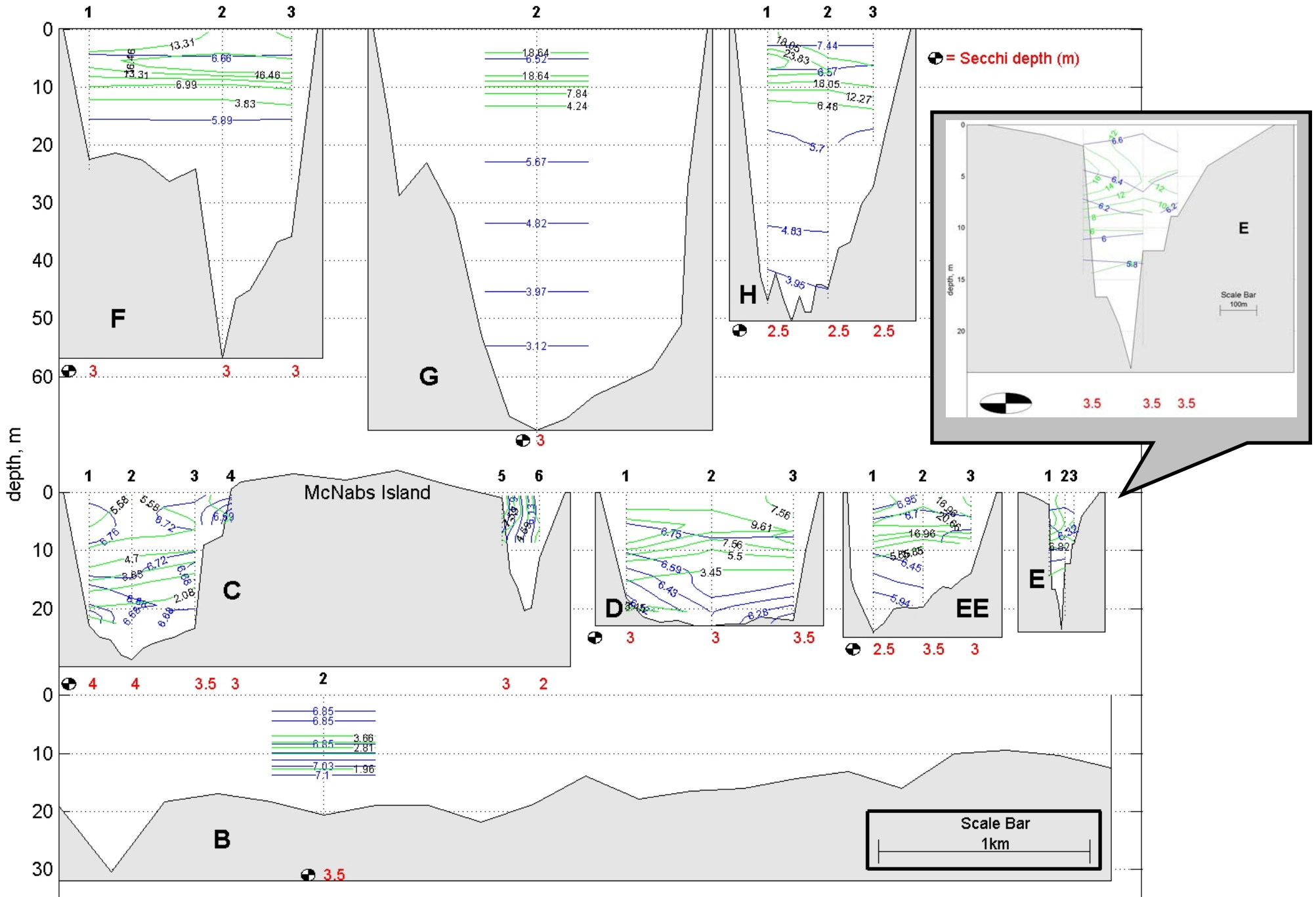
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



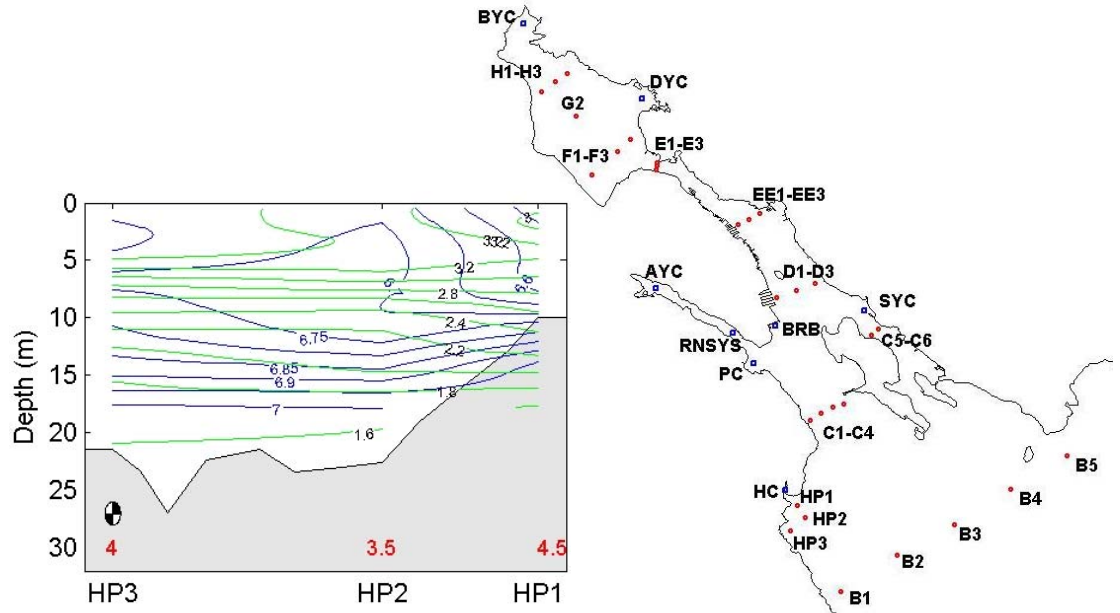
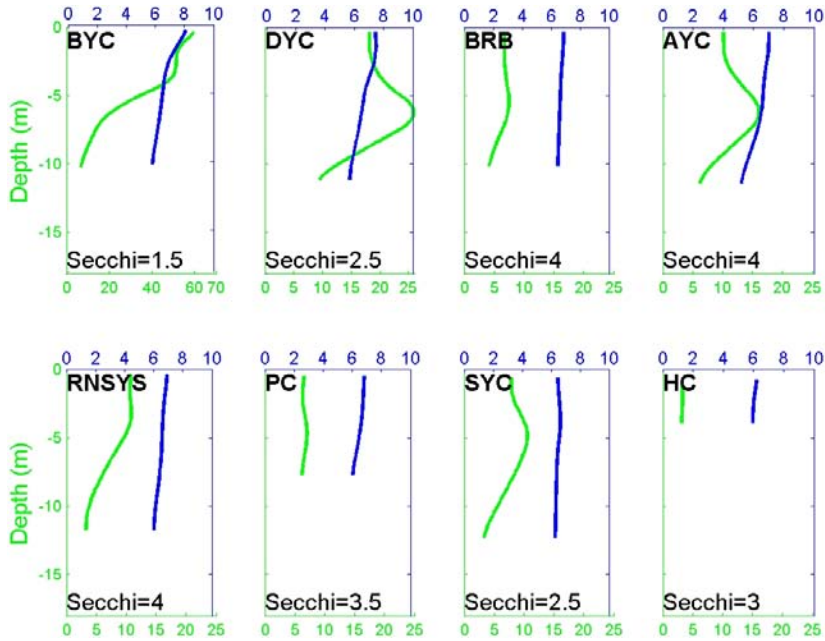
Potential Density in kg/m<sup>3</sup>

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

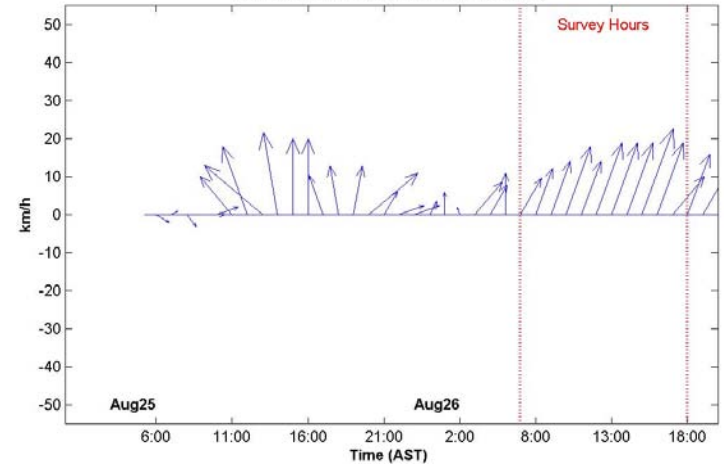




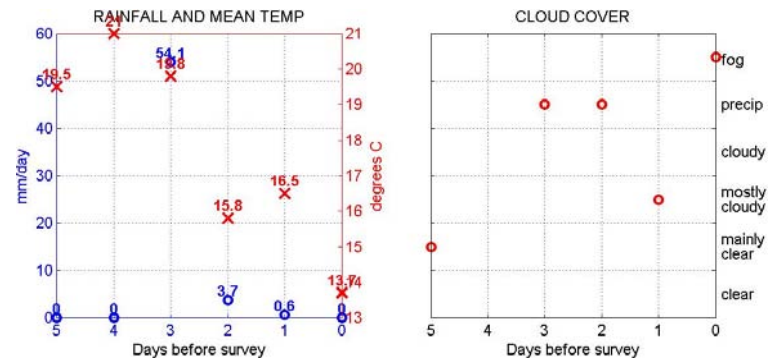
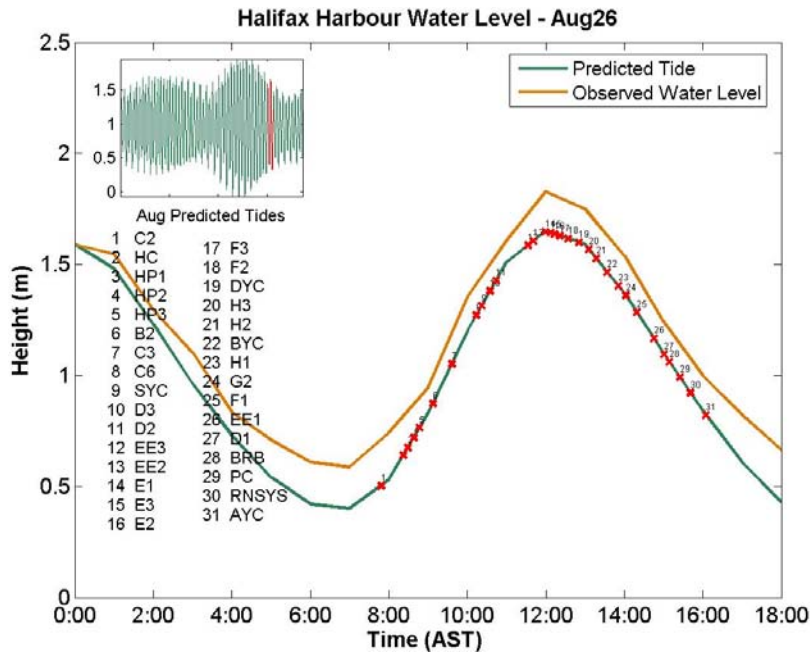
# Yacht Clubs



Wind Speed and Direction at Shearwater Jetty



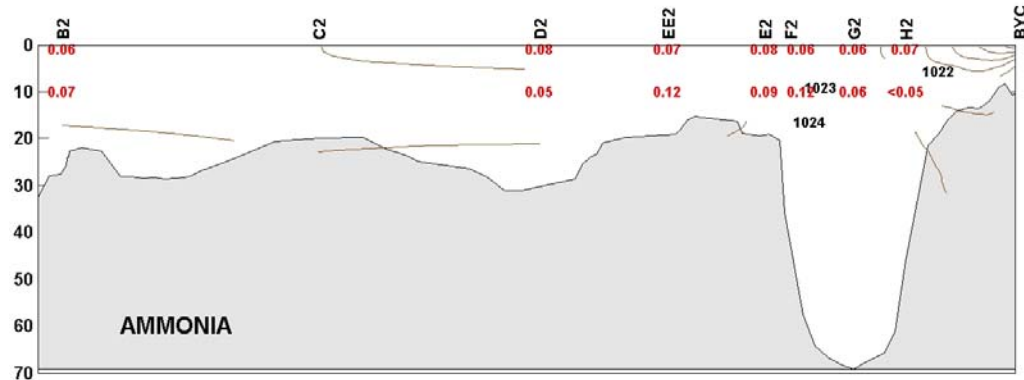
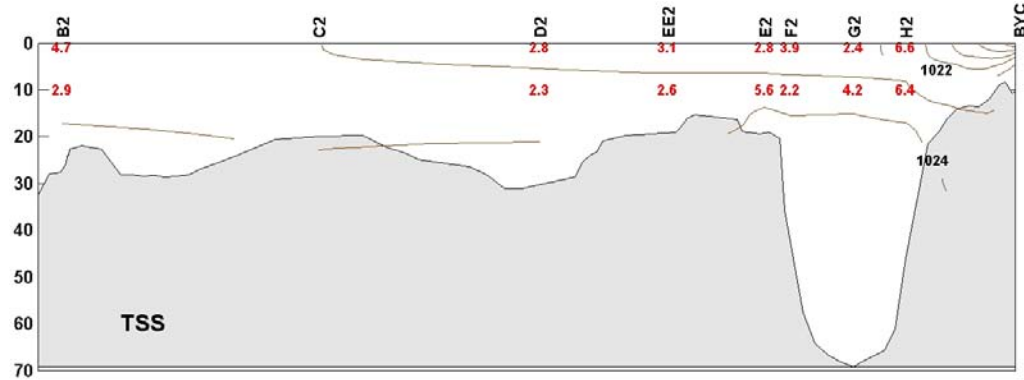
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



DO in mg/L

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

CHEMISTRY



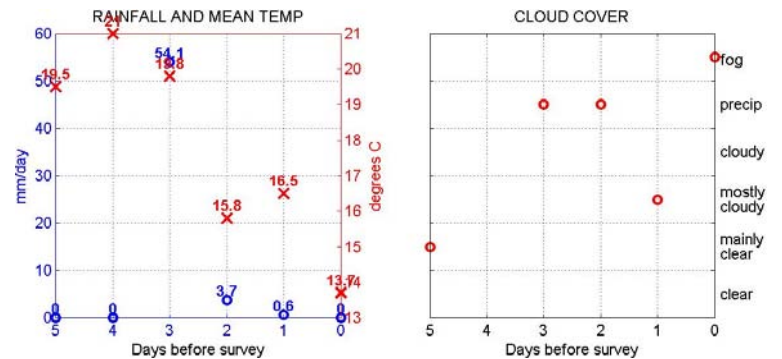
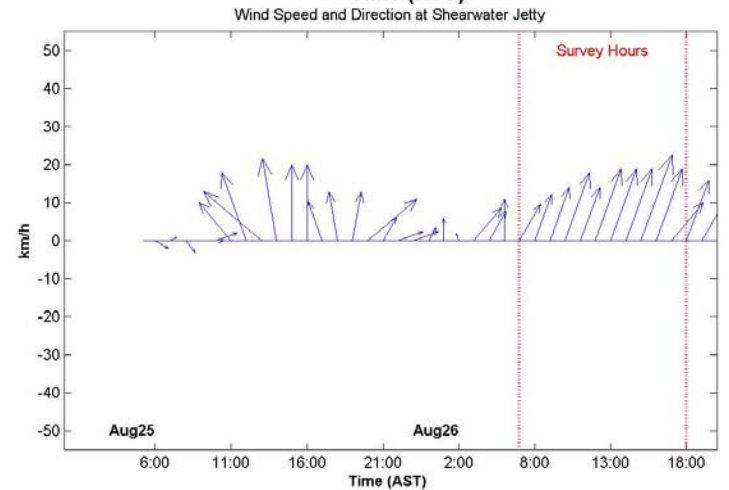
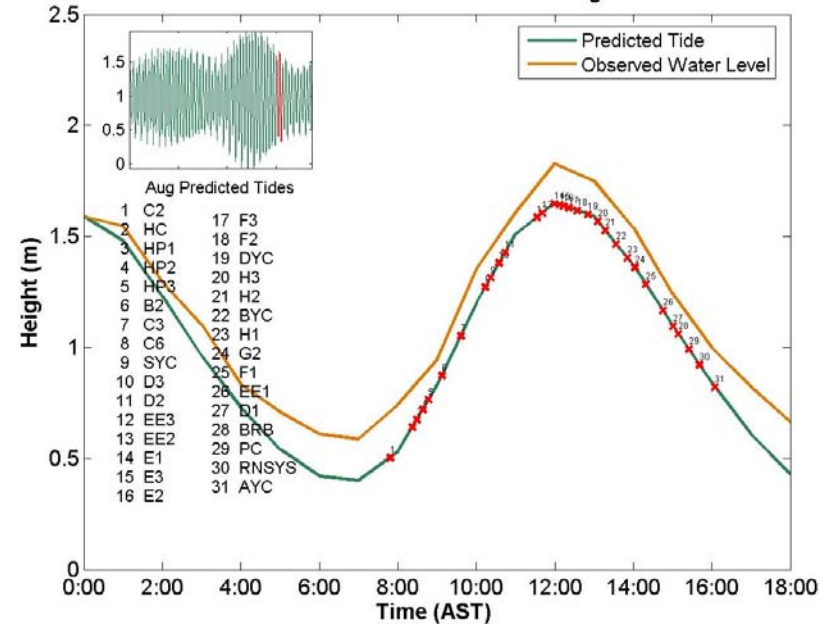
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport

Potential Density in  $\text{kg/m}^3$

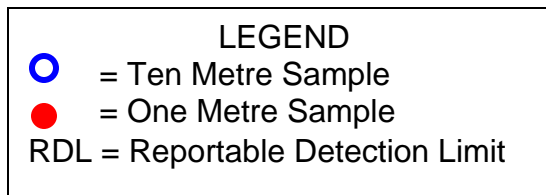
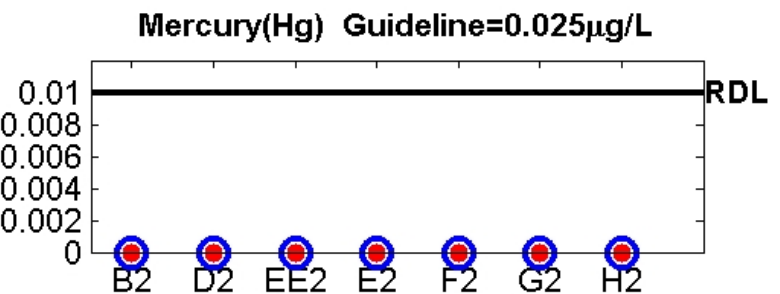
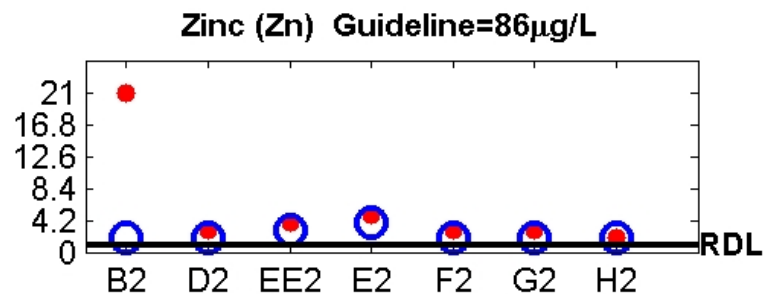
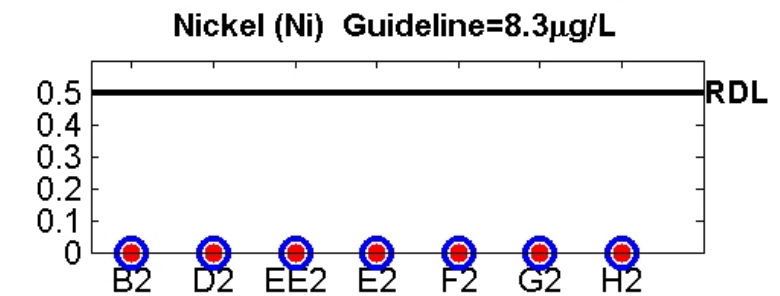
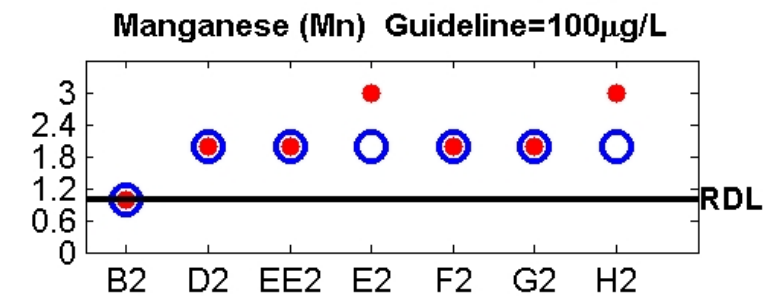
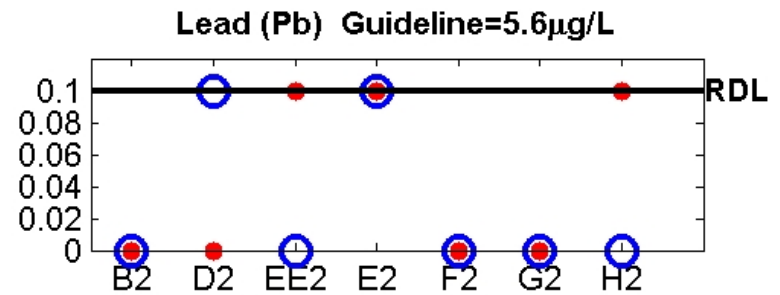
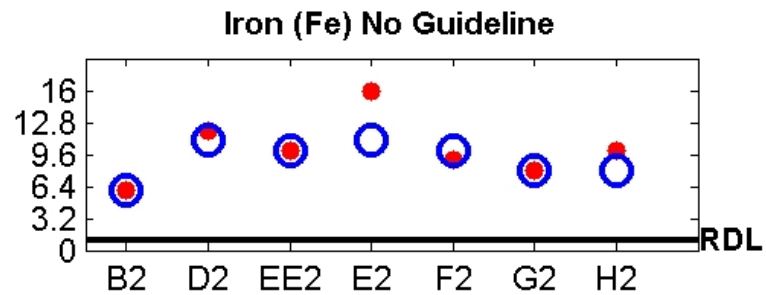
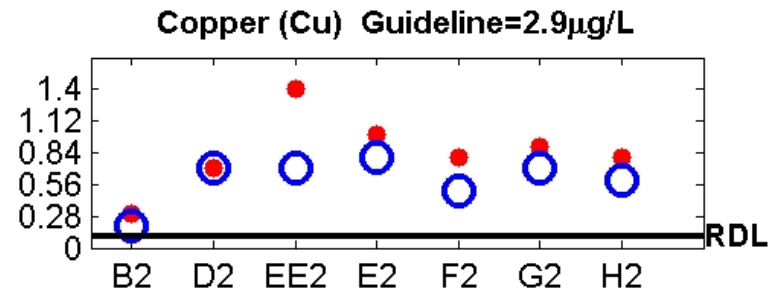
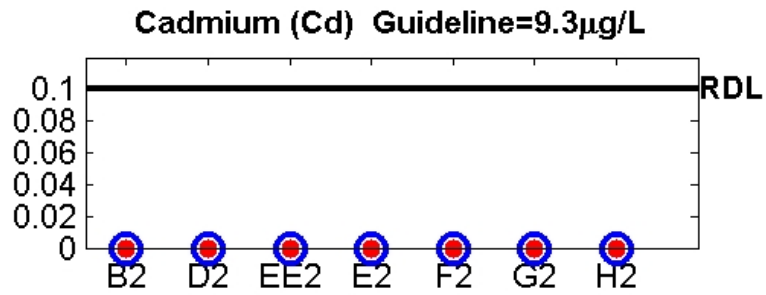
Ammonia in mg/L

TSS in mg/L

Halifax Harbour Water Level - Aug26



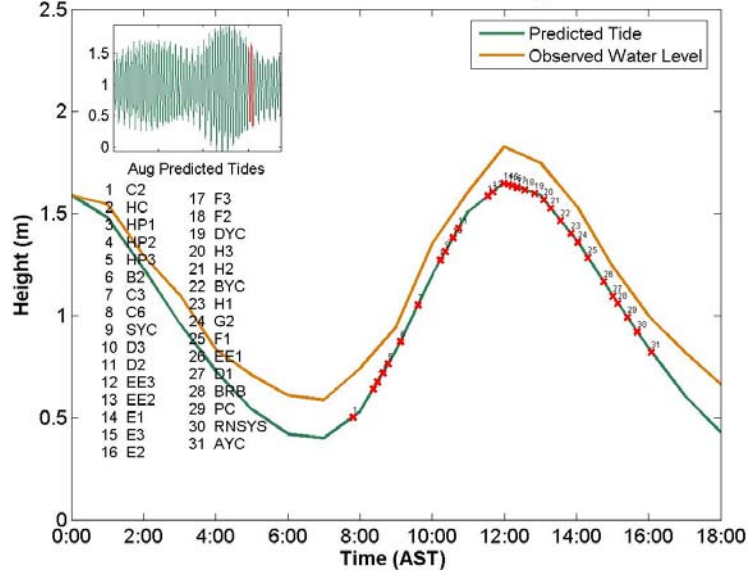




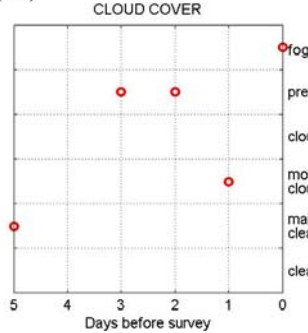
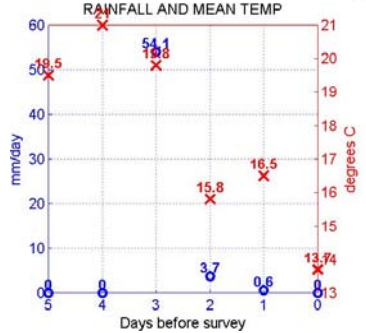
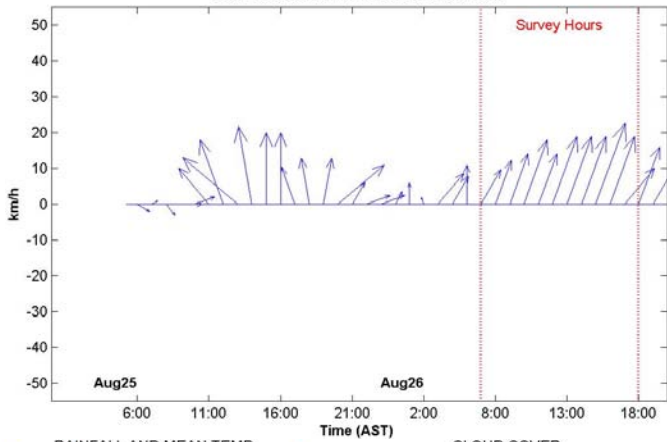
# HRM Water Quality Monitoring

## Fecal Coliform Summary – August 26, 2009

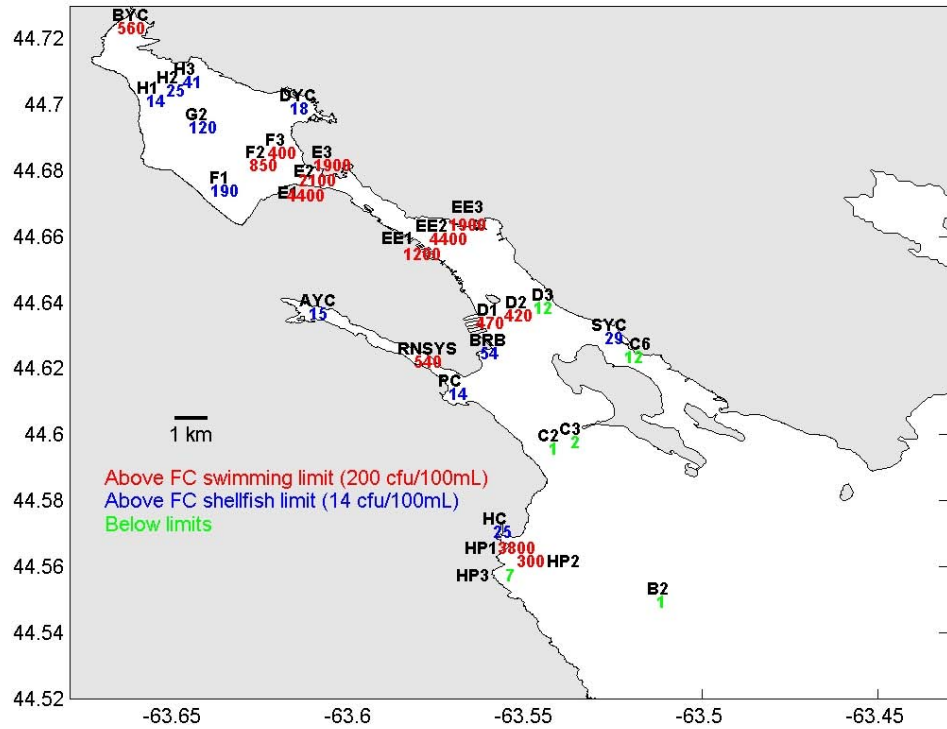
Halifax Harbour Water Level - Aug26



Wind Speed and Direction at Shearwater Jetty



Fecal Coliform 1 m



Fecal Coliform 10 m

