

# Halifax Harbour Water Quality Monitoring Project

## Survey Summary #147

**Survey Date:** 15 January 2008  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report147\_080115.doc  
**Data File:** HHWQMP\_data147\_080115.xls

**Data Return:**  
 Profile: 65%  
 Bacteria: 100%  
 Chemical: 100%  
**Overall: 84%**

### Sample Notes:

The CTD DO sensor was removed for unscheduled service - there is no DO data.  
 The CTD profile for E2 is missing, the reason is uncertain, probable operator error.  
 The HP2 profile data plotted here is incorrect, but the data file has been corrected.  
 A CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 15:08.

### QA/QC samples:

Chemical Analysis		H2 - 1m	
Detectable Parameter	Units	reference sample	QA/QC
Ammonia (as N)	mg/L	0.08	0.08
Total Suspended Solids	mg/L	2.4	2
Copper	ug/L	0.3	0.6
Iron	ug/L	10	9
Lead	ug/L	<0.1	0.1
Manganese	ug/L	2	2
Nickel	ug/L	<0.5	0.6
Zinc	ug/L	2	4

### Fecal Coliform (MPN/100ml)

Site	F3-10m	H1-1m	D1-1m	H2-1m
Reference	270	25	190	82
QA/QC	340	210	360	36

### Comments:

**General:** There has been significant rainfall /melt event (rainfall >30 mm, mean daily temperatures 3-5 °C) three to five days before the survey. This has resulted in an overall freshening of the harbour surface water. However, the salinity distribution is complicated. The freshest water in the harbour is in a lens in the southern Basin and Narrows. There is also saltier water with potential density of >24.7  $\sigma$  at depths > 15 m in the Narrows and Inner Harbour. Water of this density occurs only below 33 m at section F in the Southern Basin. This implies an intrusion of this denser water into the deeper Basin, perhaps displacing the less dense surface water down harbour. The effect of this is not seen in the Outer Harbour (B2) where the density distribution is essentially uniform and the bacteria counts are below detection. There is also a down-harbour wind that could be pushing surface water toward the Narrows. 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 in the surface water on the Halifax side of the harbour are relatively low, in fact lower than the 10m levels. Elsewhere, the concentrations are moderate and the distributions are more “normal” than in previous surveys, where the concentrations were quite vertically uniform. The values tend to be higher in the 1 m samples in the Inner Harbour and in the 10 m samples in the Basin, though the pattern is not very strong.

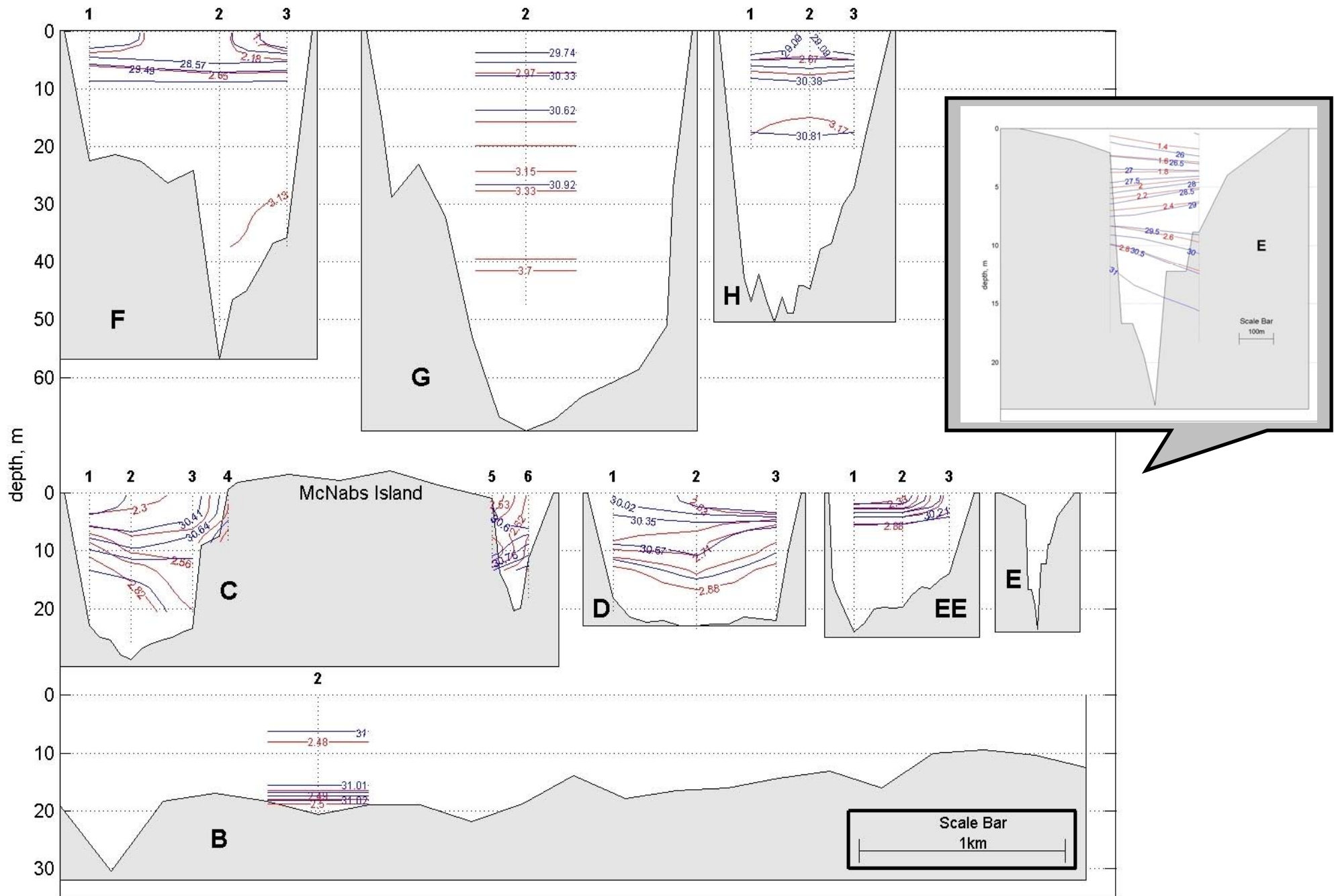
**Fluorescence:** The fluorescence values are low, everywhere below 2 mg/m<sup>3</sup>. There are slight maximums at about 10 m or less.

**TSS:** TSS values are relatively low (mean 3.7) with values as high as 7.7 mg/L. There is no coherent spatial distribution.

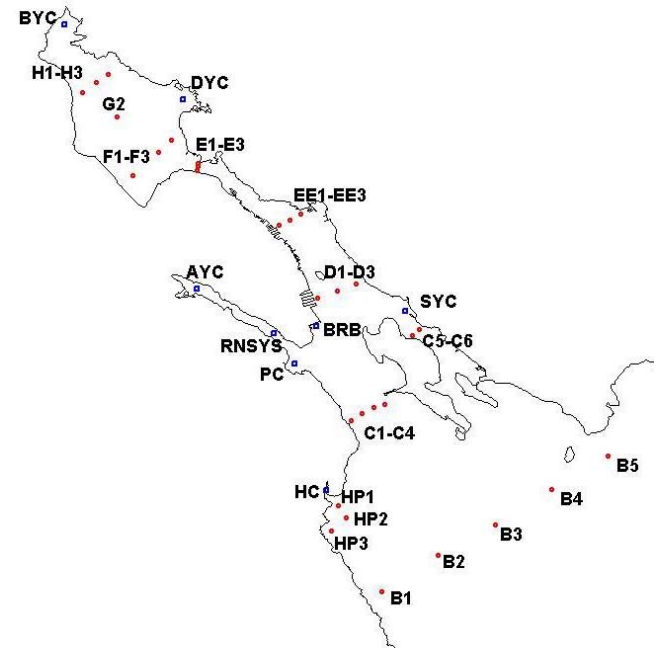
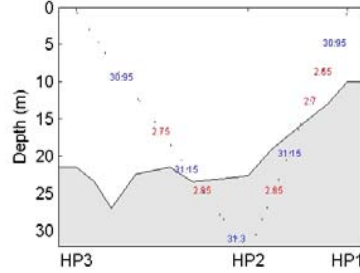
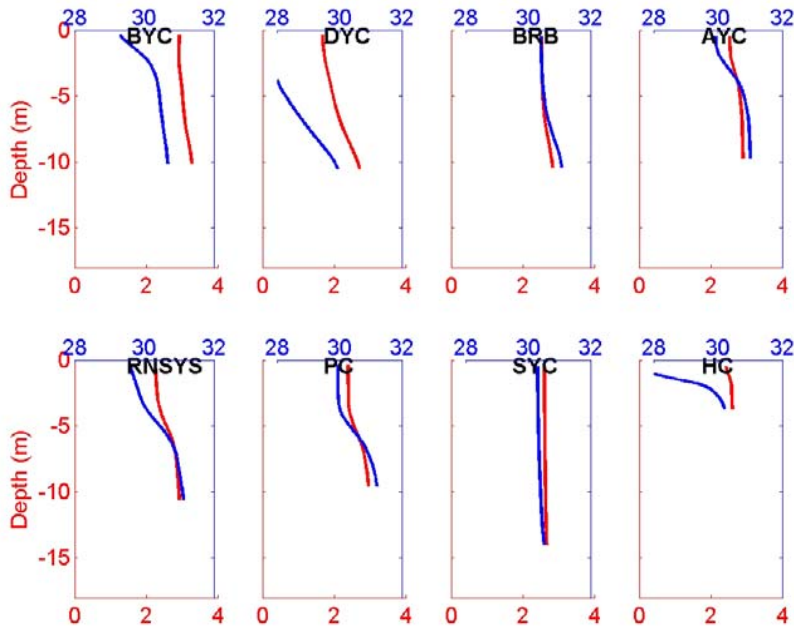
**Ammonia:** The ammonia values in the harbour are slightly elevated above the detection limit of 0.05 mg/L. The mean value is 0.8 mg/l. Two highest values (0.17 and 0.11 mg/L) are associated with the freshwater lens at sections EE and E. The levels are below detection at site B2, in the Outer Harbour.

**Metals:** There are no metal guideline exceedences. The metal closest to guideline concentrations is copper with a max value near 50% of the 2.9 ug/L guideline and typical values 25% of the guideline.

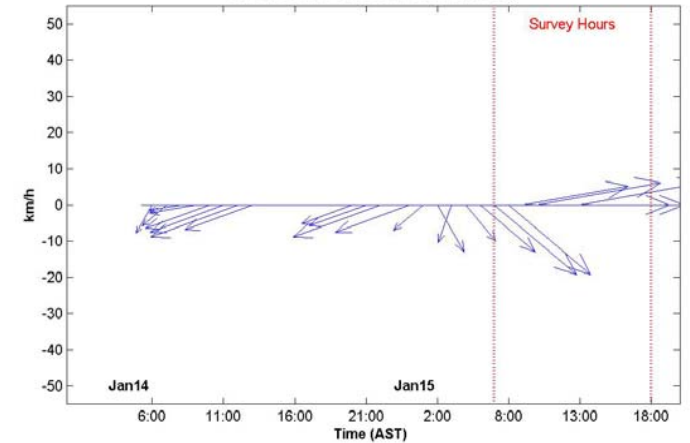
**Dissolved Oxygen:** There was no DO sensor on the CTD. The DO levels measured by the Lobo buoy in the Northwest Arm was about 9.3 mg/L and the levels from the BBPMP taken near Station G2 the day before were approximately 10.0 mg/L at 1 m and 5.3 mg/L at 60 m.



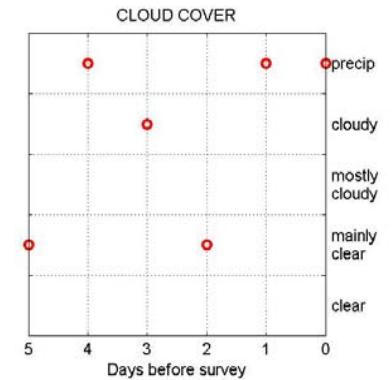
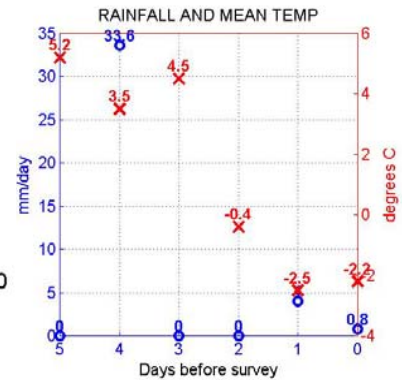
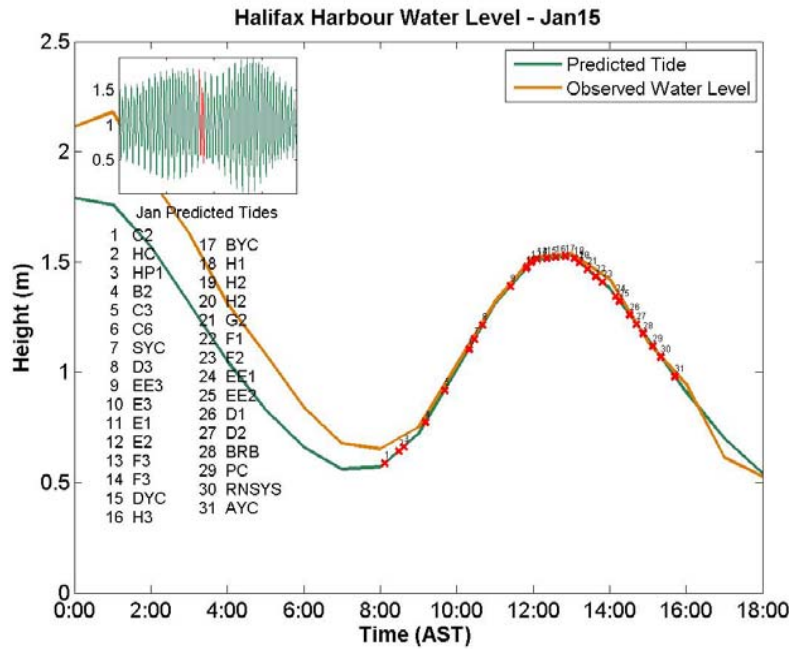
# Yacht Clubs



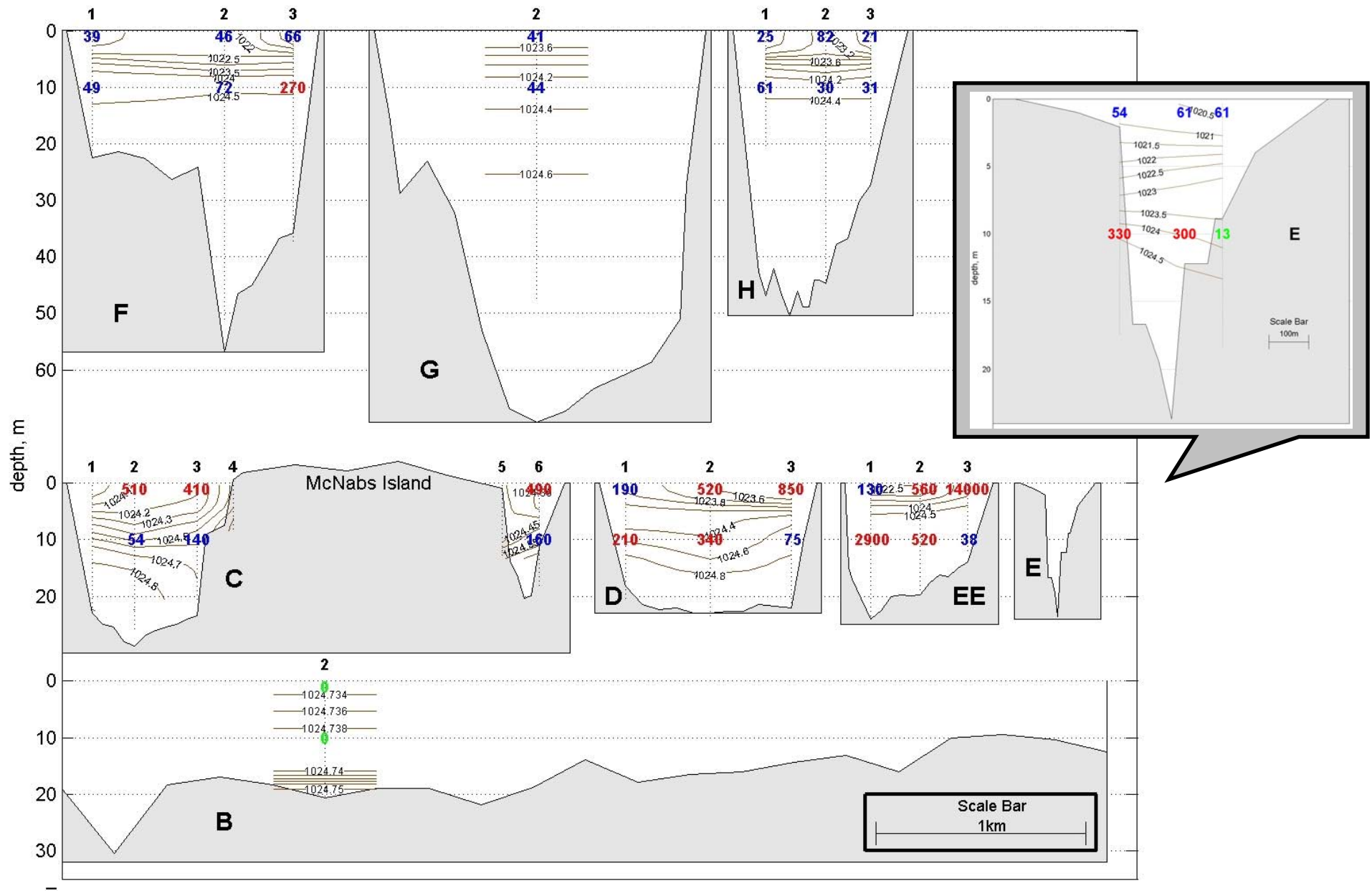
Wind Speed and Direction at Shearwater Jetty



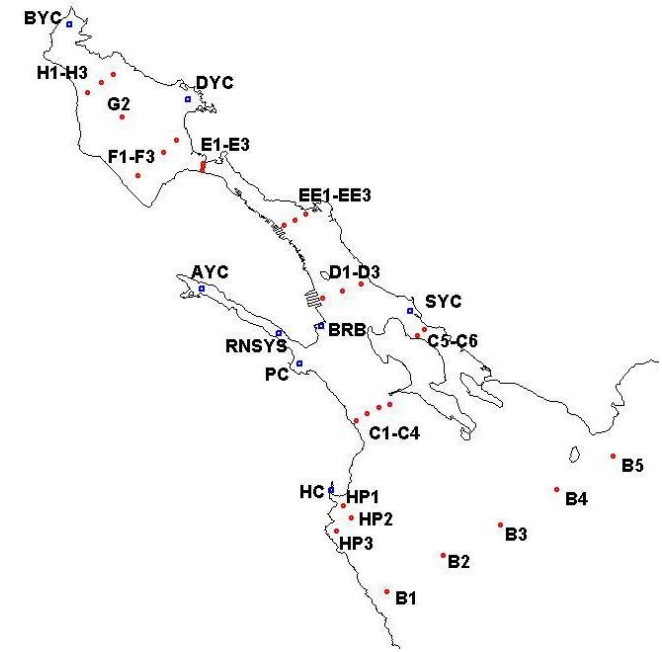
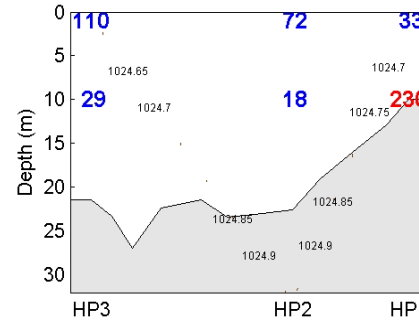
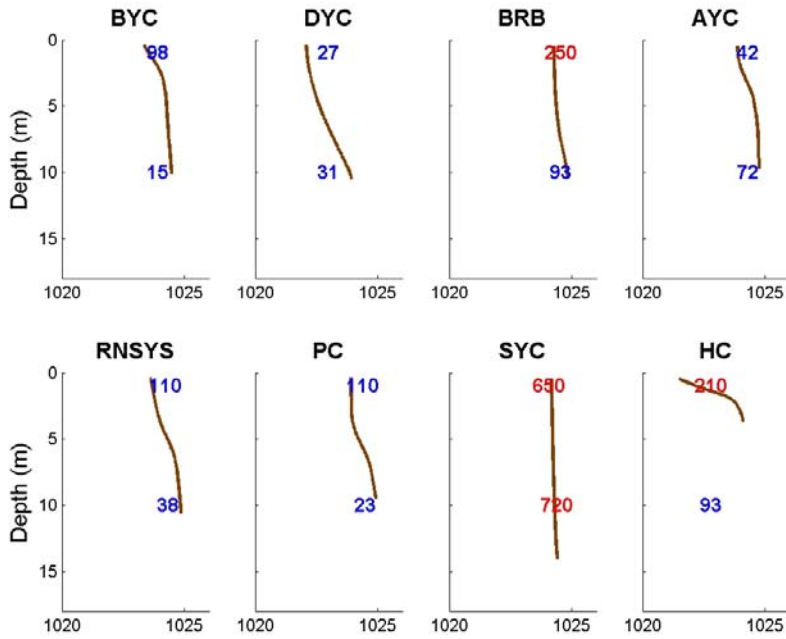
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



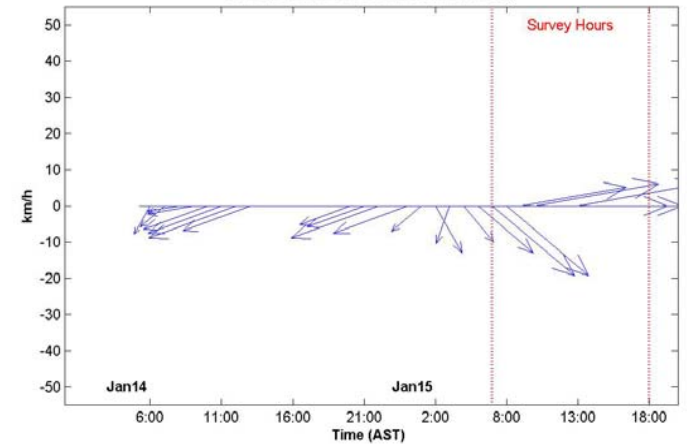
Salinity in PSU      Temperature in °C



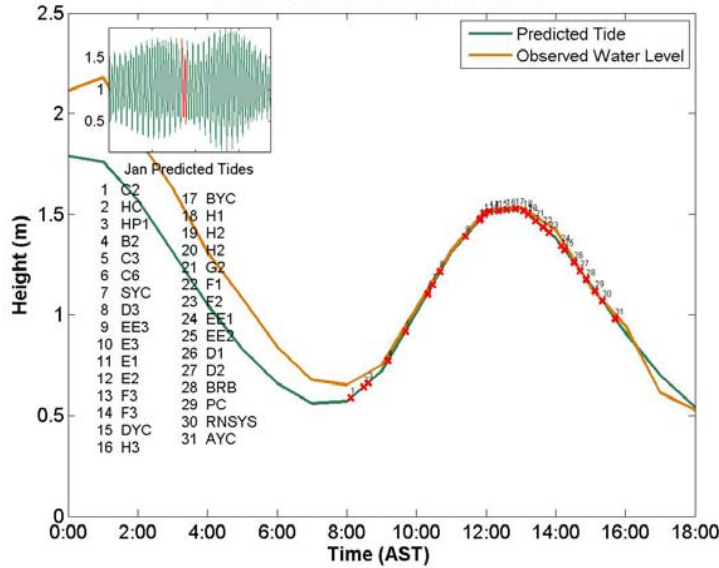
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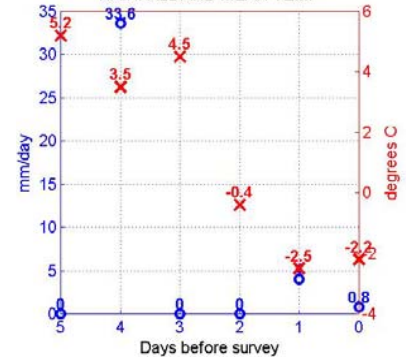
Halifax Harbour Water Level - Jan15



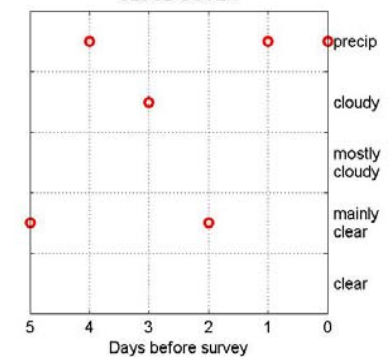
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Cloud cover data collected at Shearwater Airport

RAINFALL AND MEAN TEMP

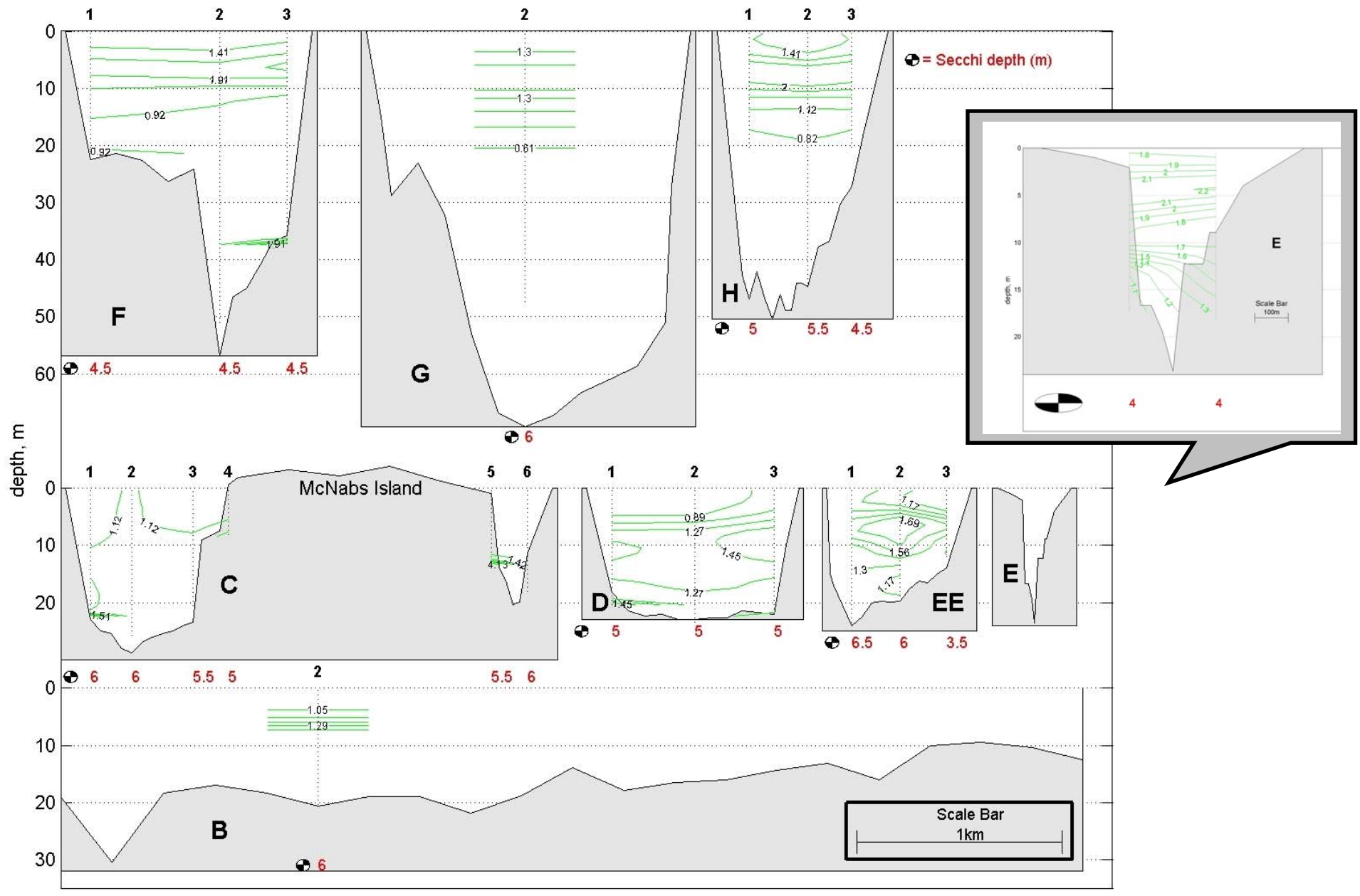


CLOUD COVER

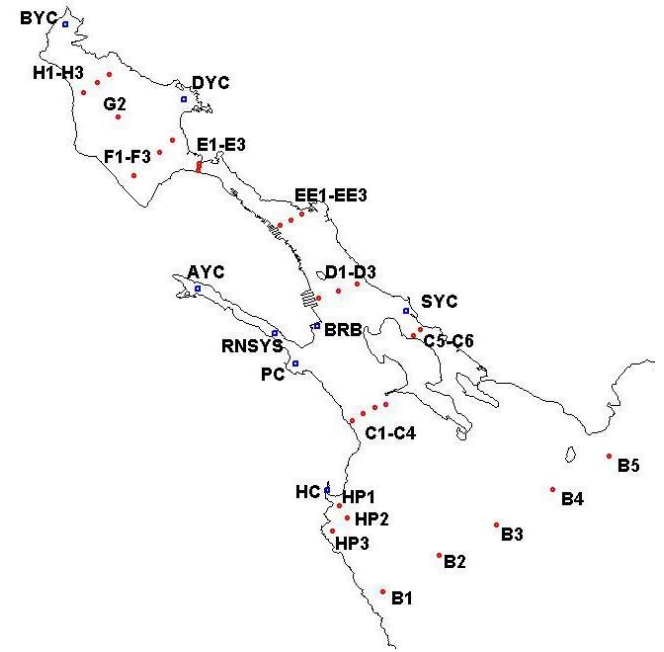
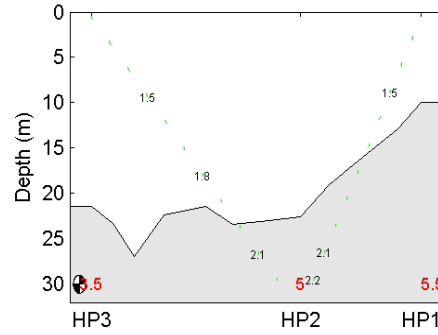
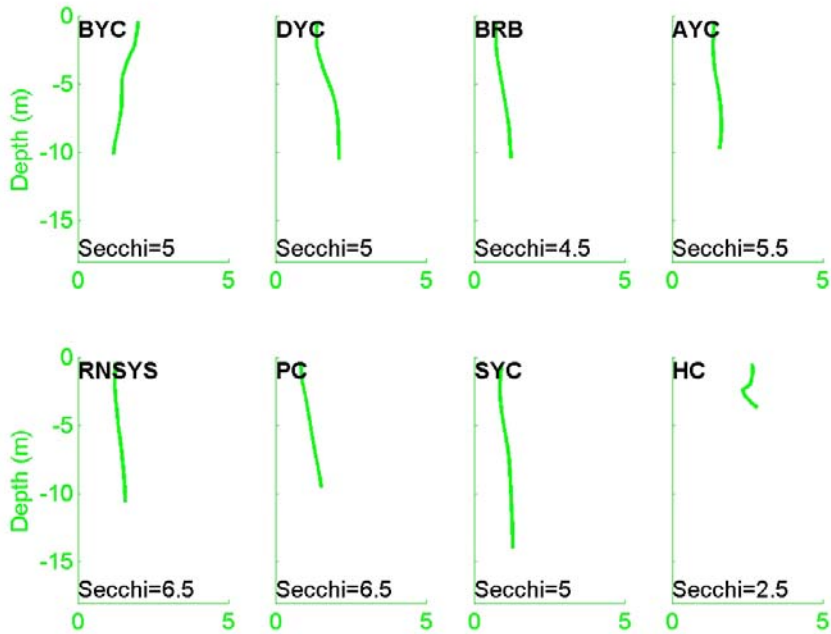


Potential Density in  $\text{kg/m}^3$

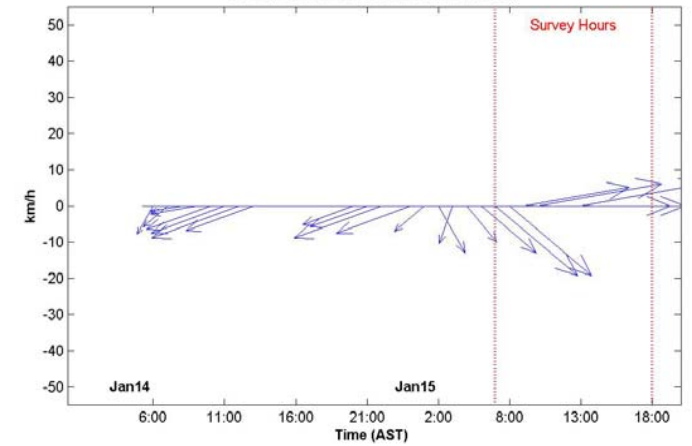
Fecal coliform: above swimming limit (200 mpn/100mL)  
 above shellfish limit (14 mpn/100mL)  
 below limits



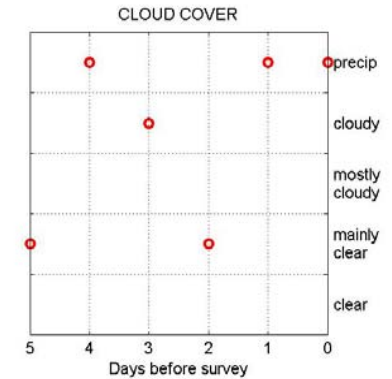
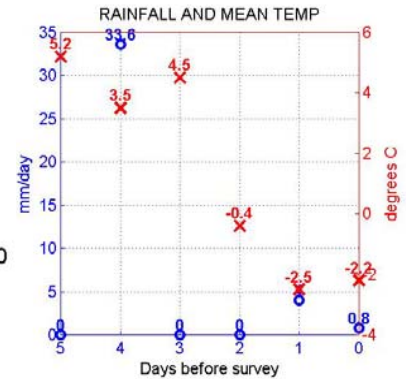
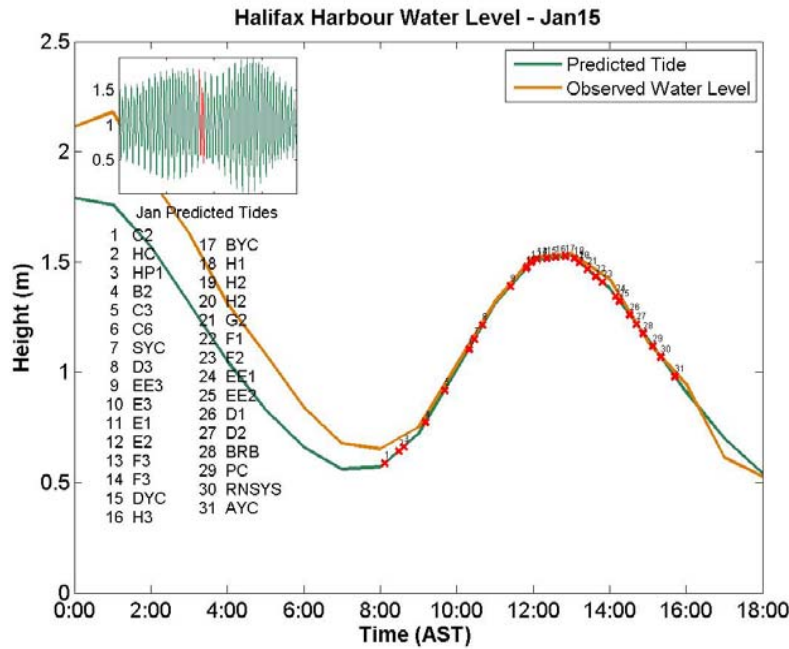
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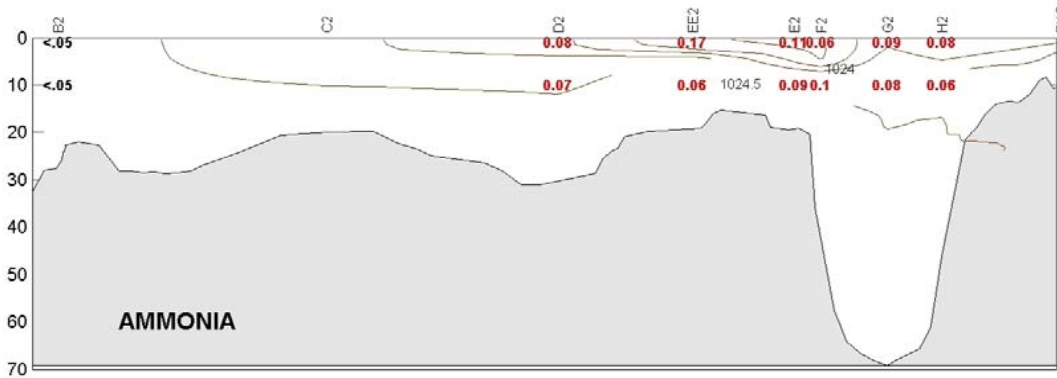
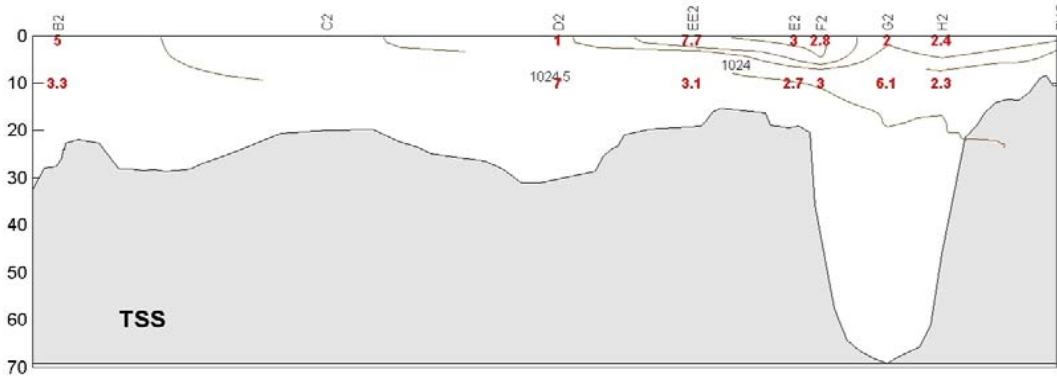
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



DO in mg/L

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

CHEMISTRY



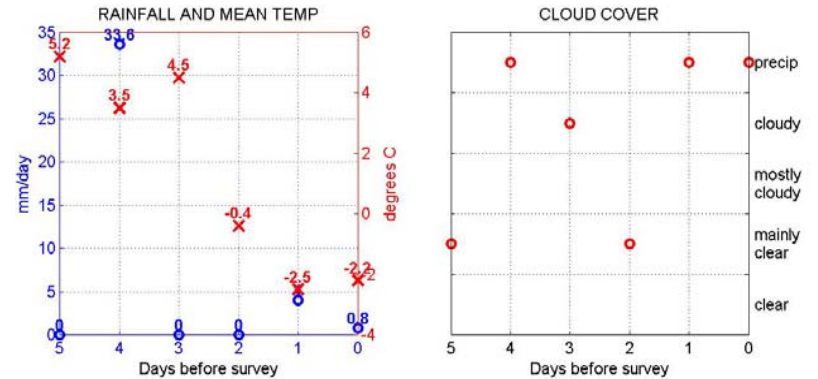
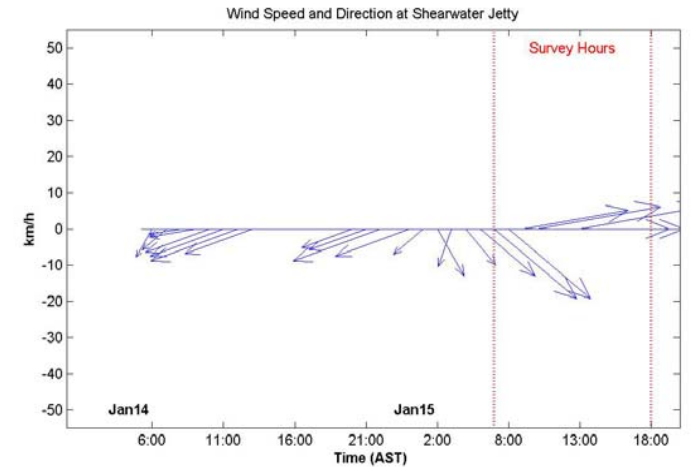
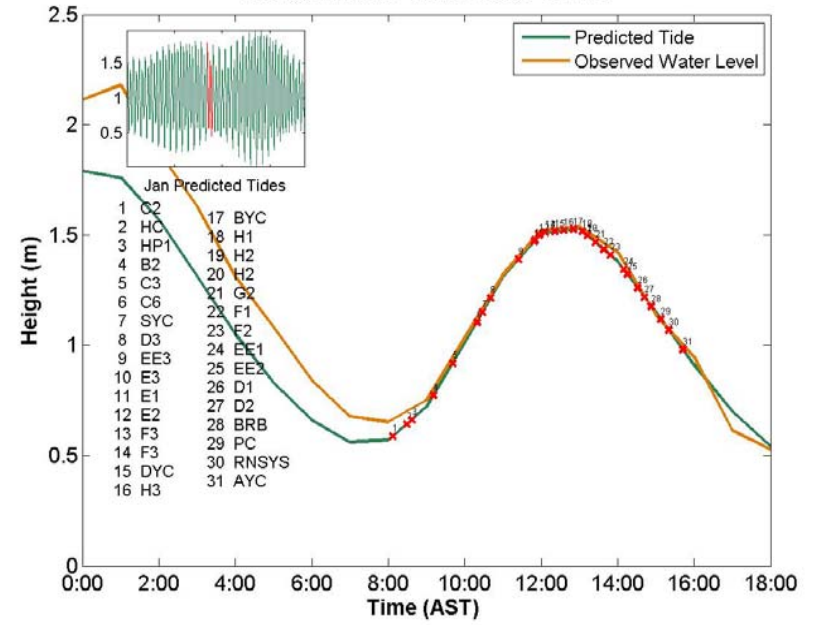
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Potential Density in  $kg/m^3$

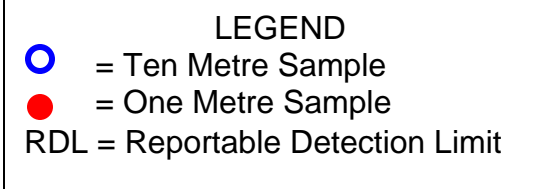
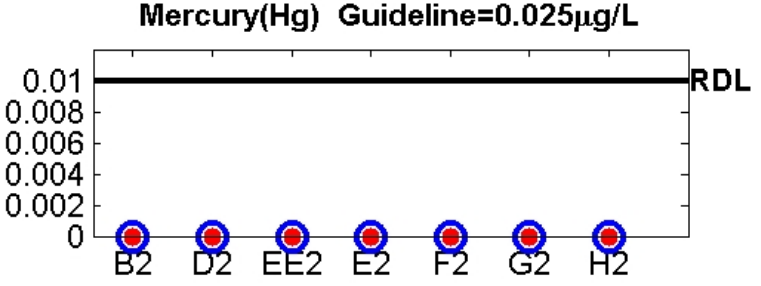
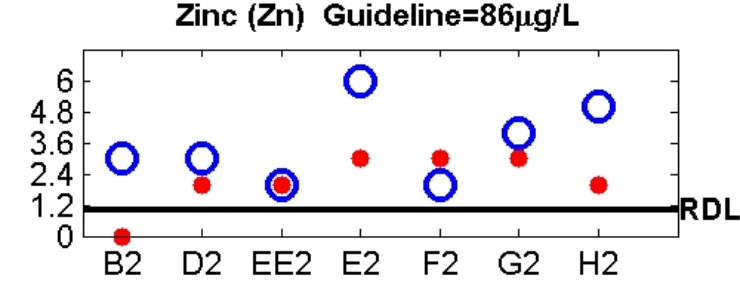
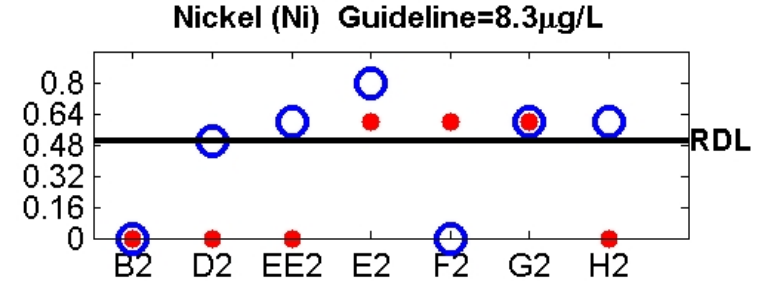
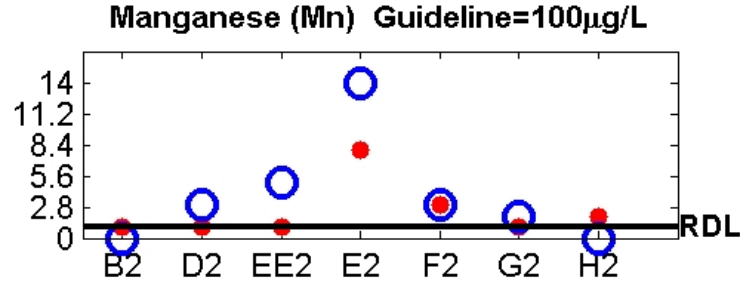
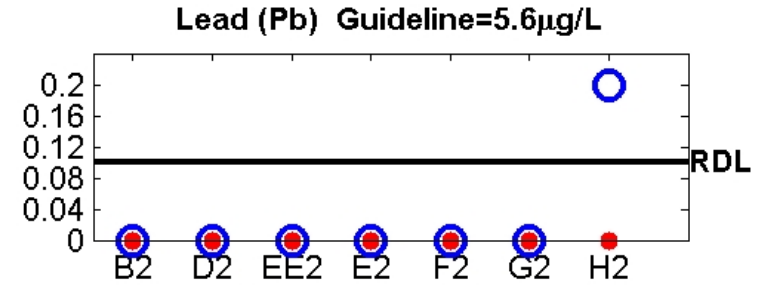
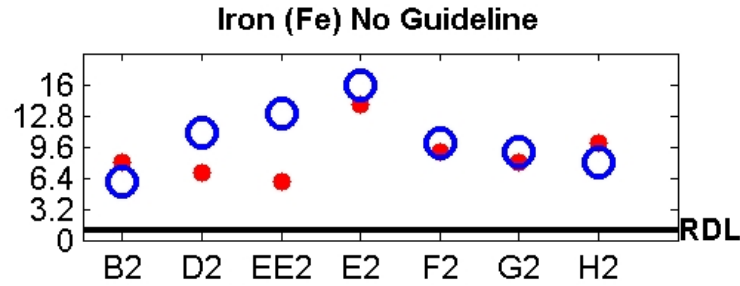
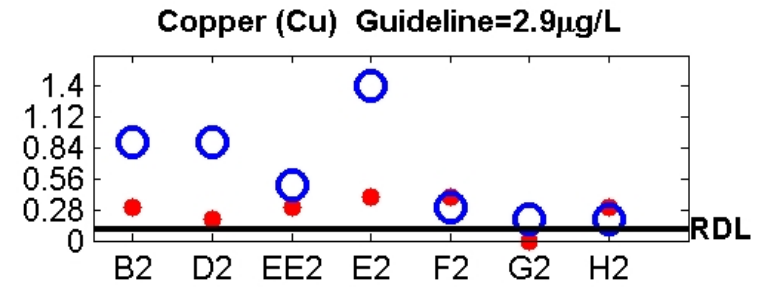
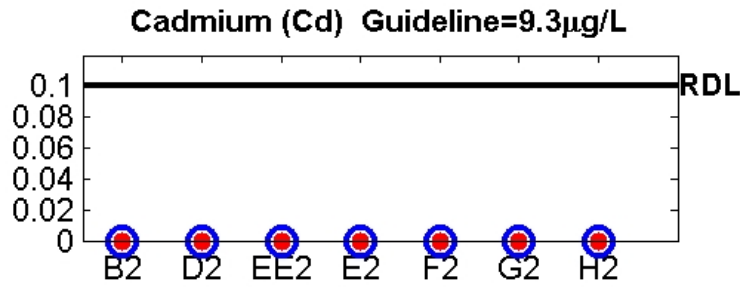
Ammonia in  $mg/L$

TSS in  $mg/L$

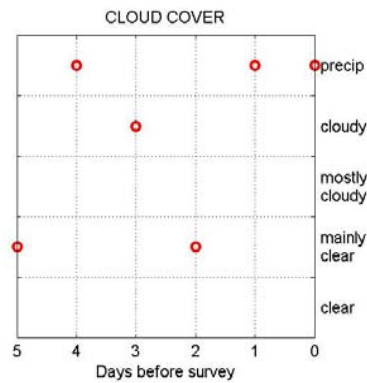
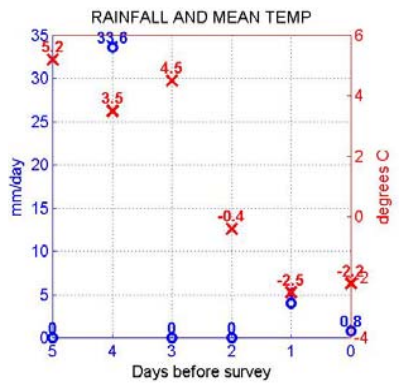
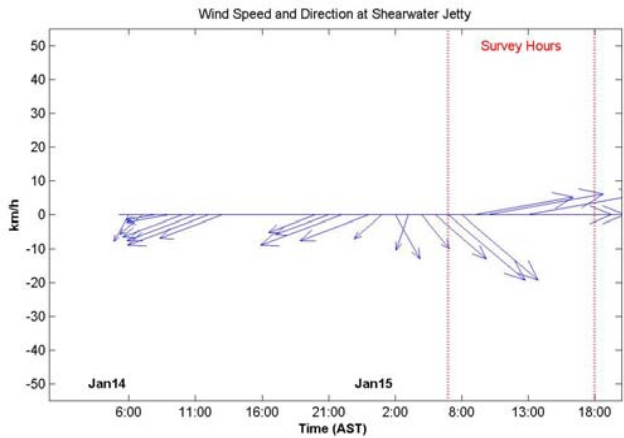
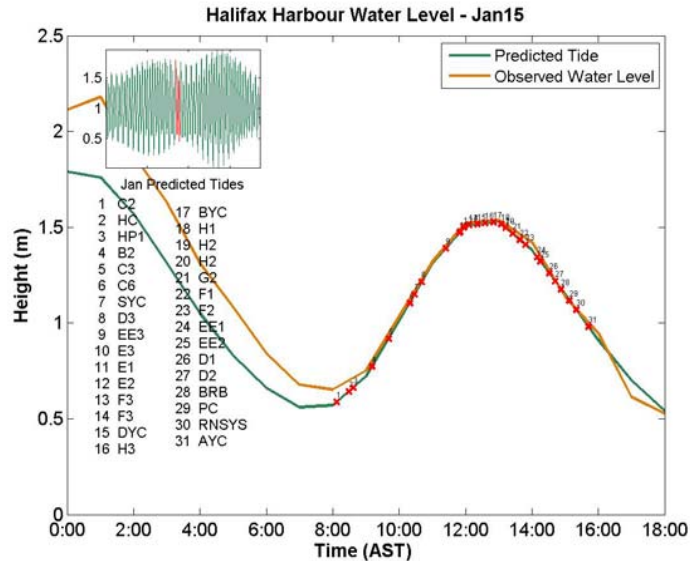
Halifax Harbour Water Level - Jan15



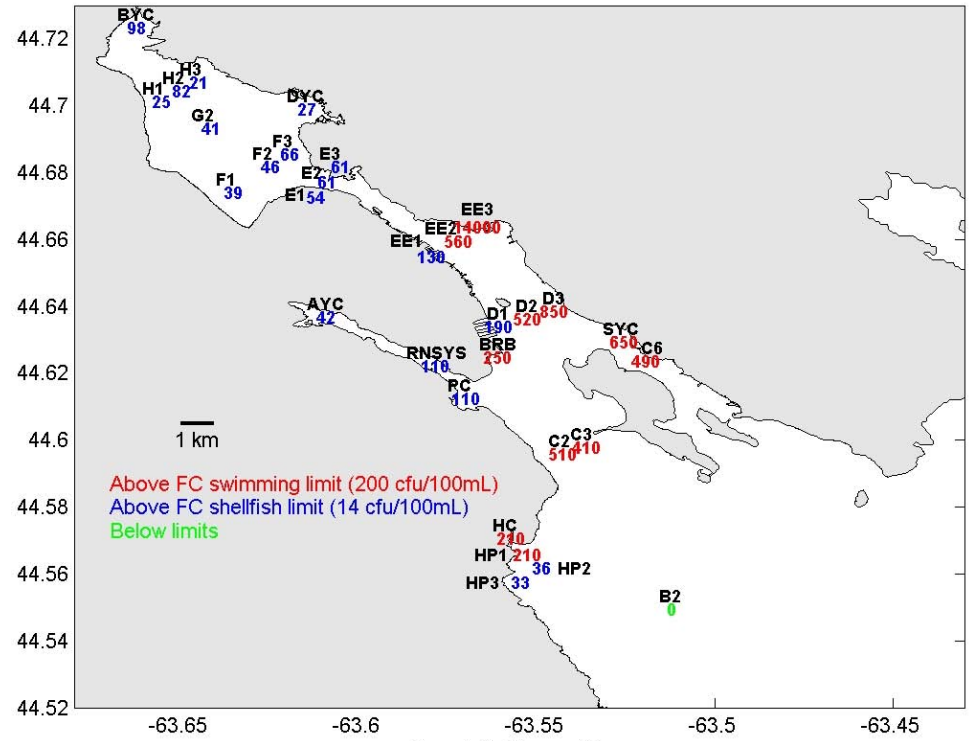




**FECAL COLIFORM  
SUMMARY**



Fecal Coliform 1 m



Fecal Coliform 10 m

