

## Halifax Harbour Water Quality Monitoring Project Survey Summary #124

**Survey Date:** 28 February 2007  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report124\_070228.doc  
**Data File:** HHWQMP\_data124\_070228.xls

### Data Return:

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

### Sample Notes:

Alternate BYC coordinates (ice): 44° 42.984'N, 63° 39.916'W  
 The QA/QC sample for metals was apparently misplaced by lab, no values reported.  
 Supplemental sample taken at Fairview Cove (44° 39.906'N, 63° 37.834'W):

TEST	1m sample	10m sample	TEST	1m sample	10m sample
Coliform	>10000	66	Iron	24	197
TSS	4	57	Lead	0	1.1
Ammonia	0.33	0.11	Manganese	8	10
Cadmium	0	0	Nickel	0.5	0.8
Copper	1	2.4	Zinc	3	11

### QA/QC samples:

Chemical Analysis		D2 - 10m	
Detectable Parameter	Units	reference sample	QA/QC
Ammonia (as N)	mg/L	0.08	0.08
Total Suspended Solids	mg/L	1.4	3

### Fecal Coliform (CFU/100ml)

Site	HP3-1M	HP3-10M	HP1-10M	D2-10M
Reference	53	130	740	170
QA/QC	41	81	1	240

### Comments:

**General:** There has been no precipitation in the five days before the survey, and the average air temperature has generally been at or below the freezing point. It appears that there has been little or no natural freshwater input into the Harbour. The very

saline, well mixed conditions evident in the previous survey have continued and in this survey, conditions are even more uniform. There is less than 0.5 PSU variation in the surface water between the head of the Basin (BYC) and the Outer Harbour (B2). Likewise the temperature is uniform with less than a degree variation in the top 20 m throughout the Inner Harbour and Basin. The Outer Harbour is slightly cooler, but by less than half a degree. The deeper Basin is barely stratified, compared to normal. There is only a 0.6 PSU and 3 °C difference from top to bottom in the deepest part of the Basin. Remarkably, there is only a 0.2 sigma total vertical potential density difference at this site. The fecal coliform (FC) values are low except in the centre of the Inner Harbour (D and EE sections). Here they are relatively low but perhaps slightly higher than last survey. According to field notes, EE3 (4500 cfu/100mL) was in the visible plume from the Peace Pavilion outfall. As with the previous survey, the FC values at PC and RNSYS are high, rather than one or the other.

**Fluorescence:** Fluorescence values are a bit higher than last survey, with profile maximums of almost 5-6 mg/m<sup>3</sup> in the Basin (west side) to just over 3-4 mg/m<sup>3</sup> in the Outer Harbour. Secchi depths are about 2 m less than previous survey.

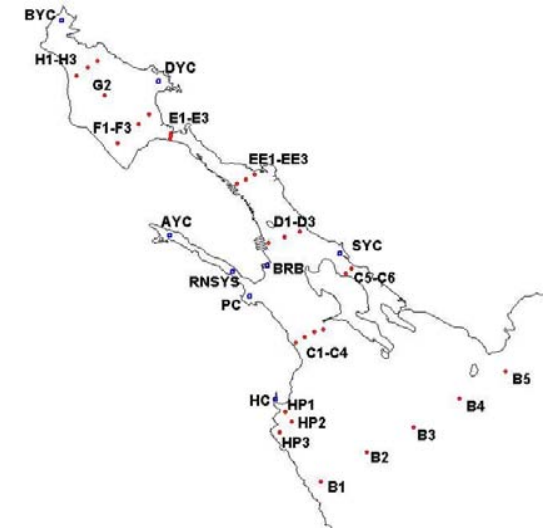
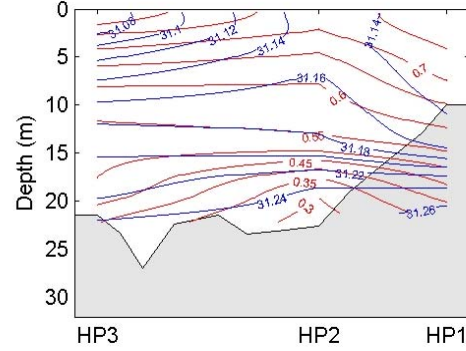
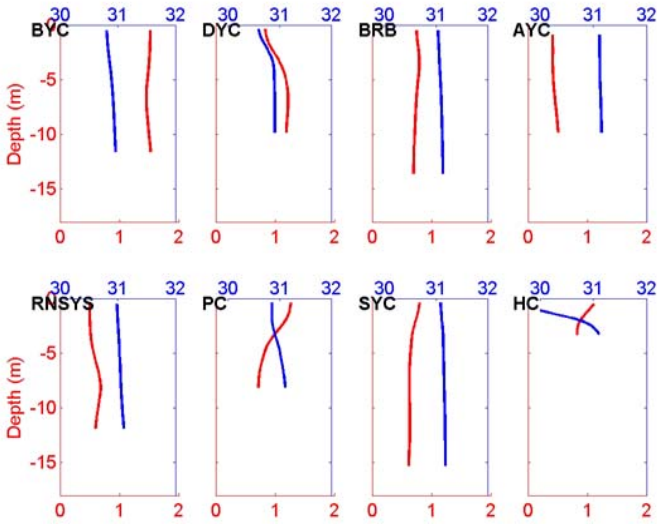
**Ammonia:** There are detectable levels (> 0.05 mg/L) of ammonia in all samples. The highest levels in regular samples are at the surface in the narrows (0.15 mg/L) and at section H at the head of the Basin (0.16 mg/L). These values are both associated with slightly less dense water masses, resolved only because of the otherwise uniform ambient conditions. The supplemental site near the Fairview Cove CSO showed elevated ammonia (0.33 mg/L) due to the bypass discharge occurring there. This may be the source of the elevated ammonia, at least in the Narrows. This is consistent with the high coliform levels observed in the 1m Narrows samples.

**TSS:** The TSS values are similar to the values recorded last survey (< 5.8 mg/L) and there is no obvious pattern.

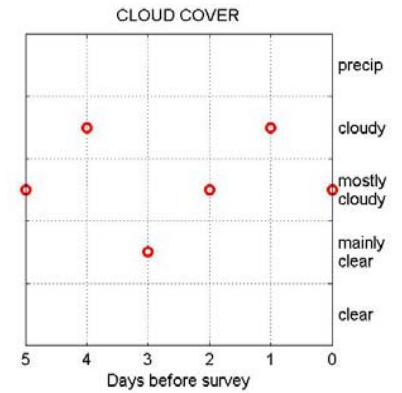
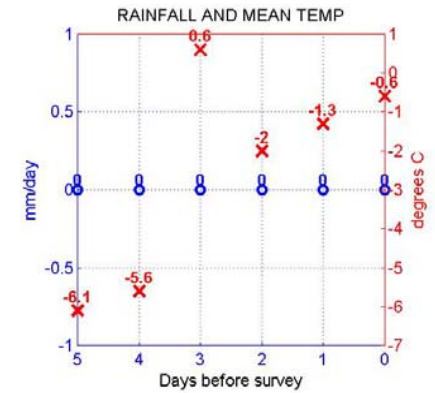
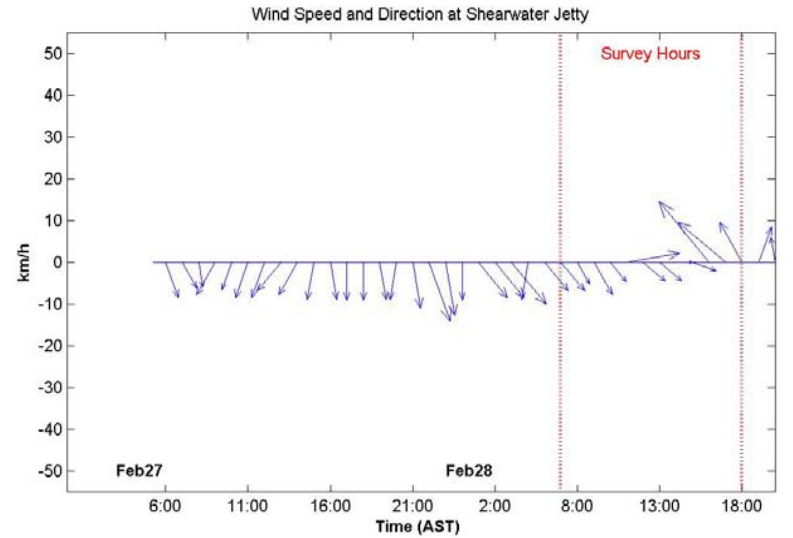
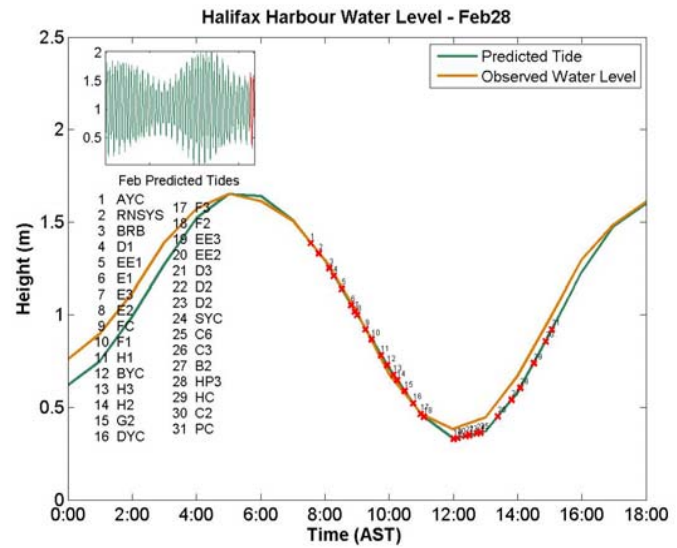
**Dissolved Oxygen:** The dissolved oxygen (DO) data is almost vertically uniform in the top 20m. The data indicate these values vary from about 7.8 mg/L in the Basin to about 8.5 mg/L in the Outer Harbour. The Basin bottom water has increased to about 3.5 mg/L, from 2.3 mg/L, since last survey. The only area below applicable guidelines is the Basin bottom water (< 7.0 mg/L). The DO data is not ground-truthed and absolute values are questionable (see DO discussion in QR#1).



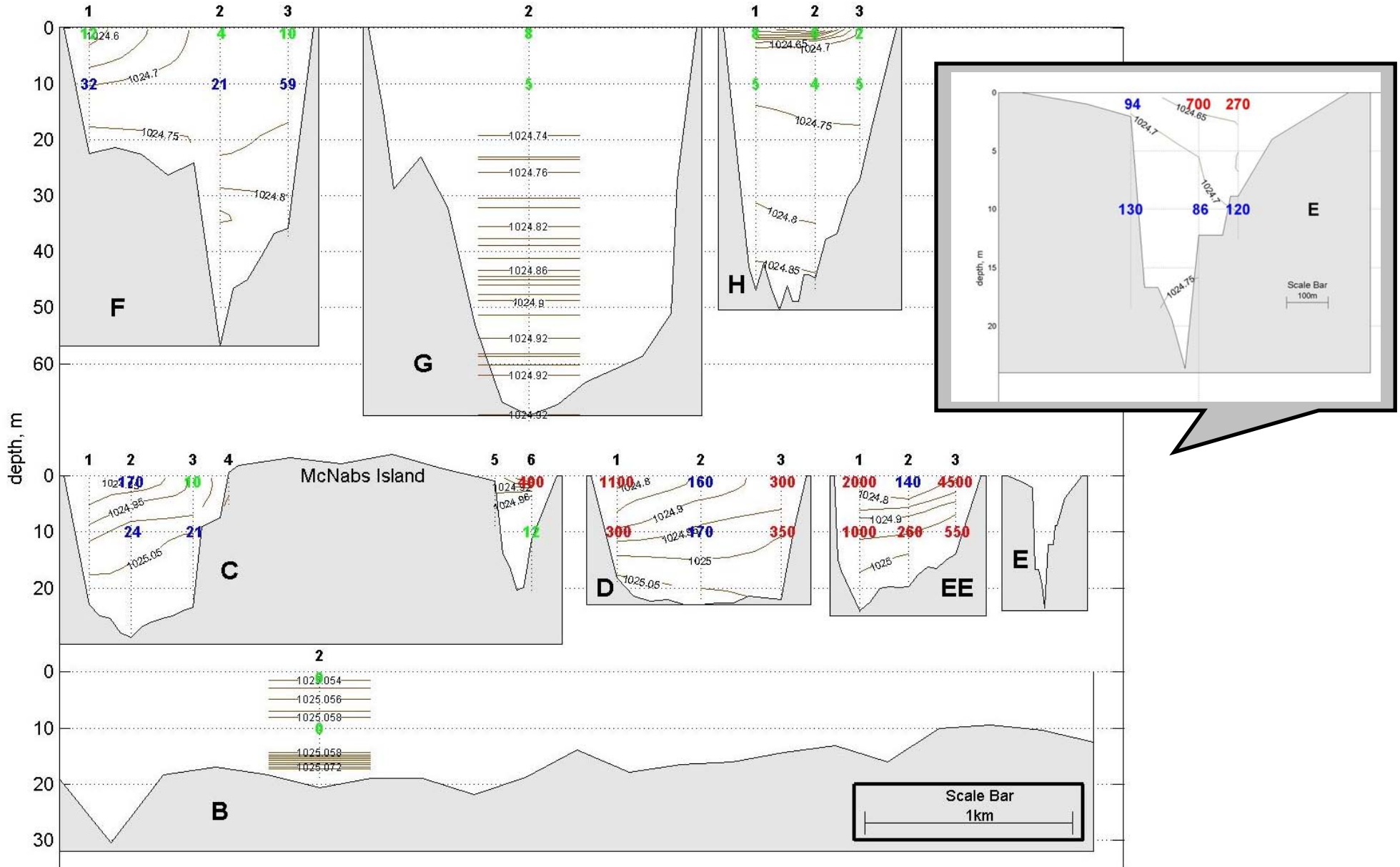
# Yacht Clubs



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

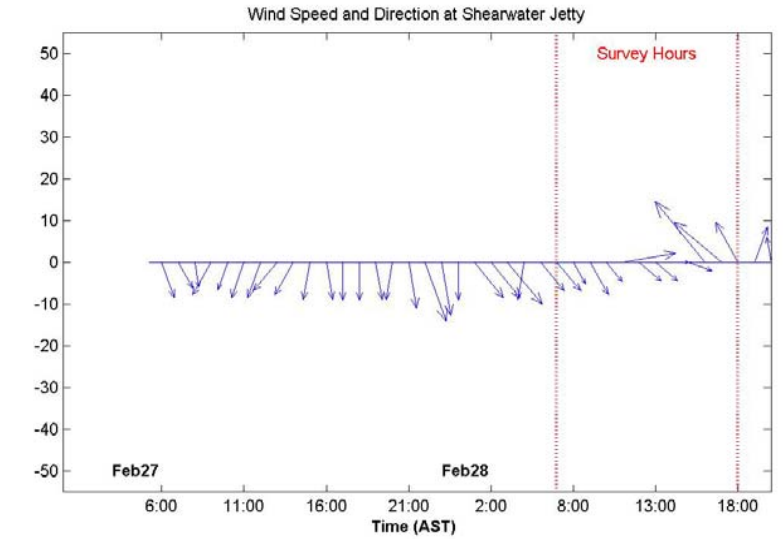
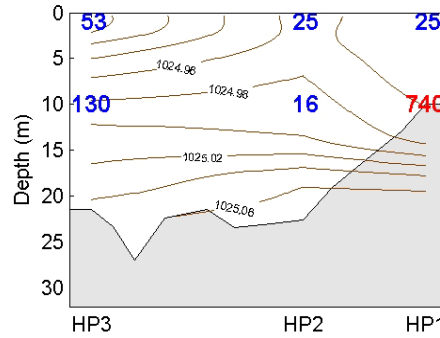
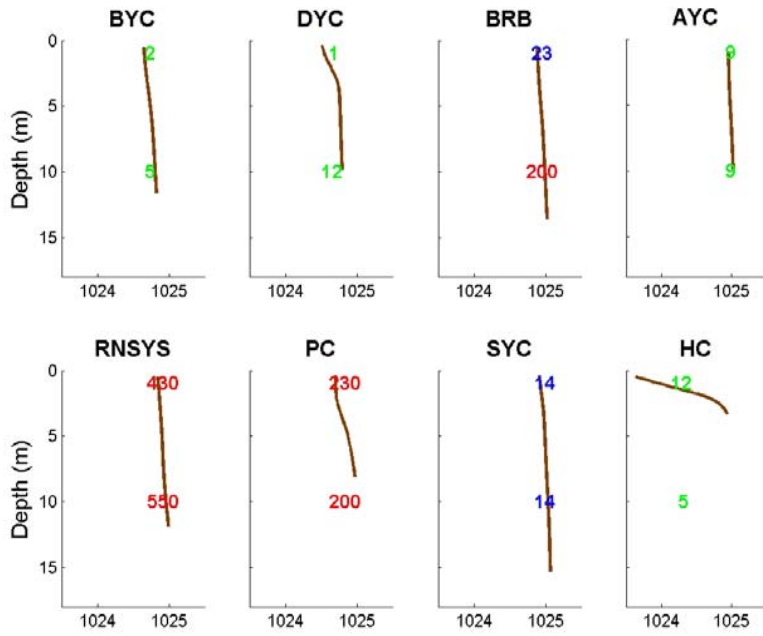


Salinity in PSU      Temperature in °C

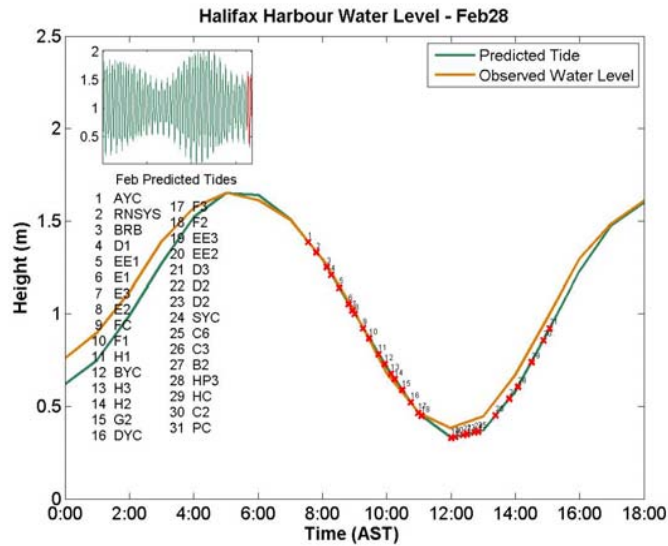




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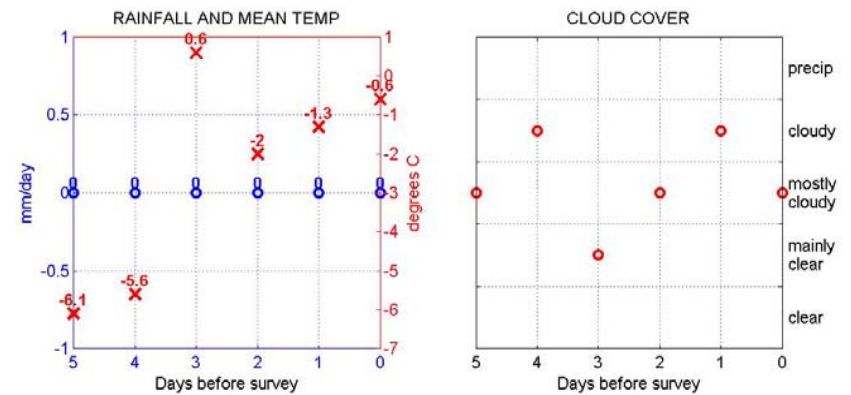


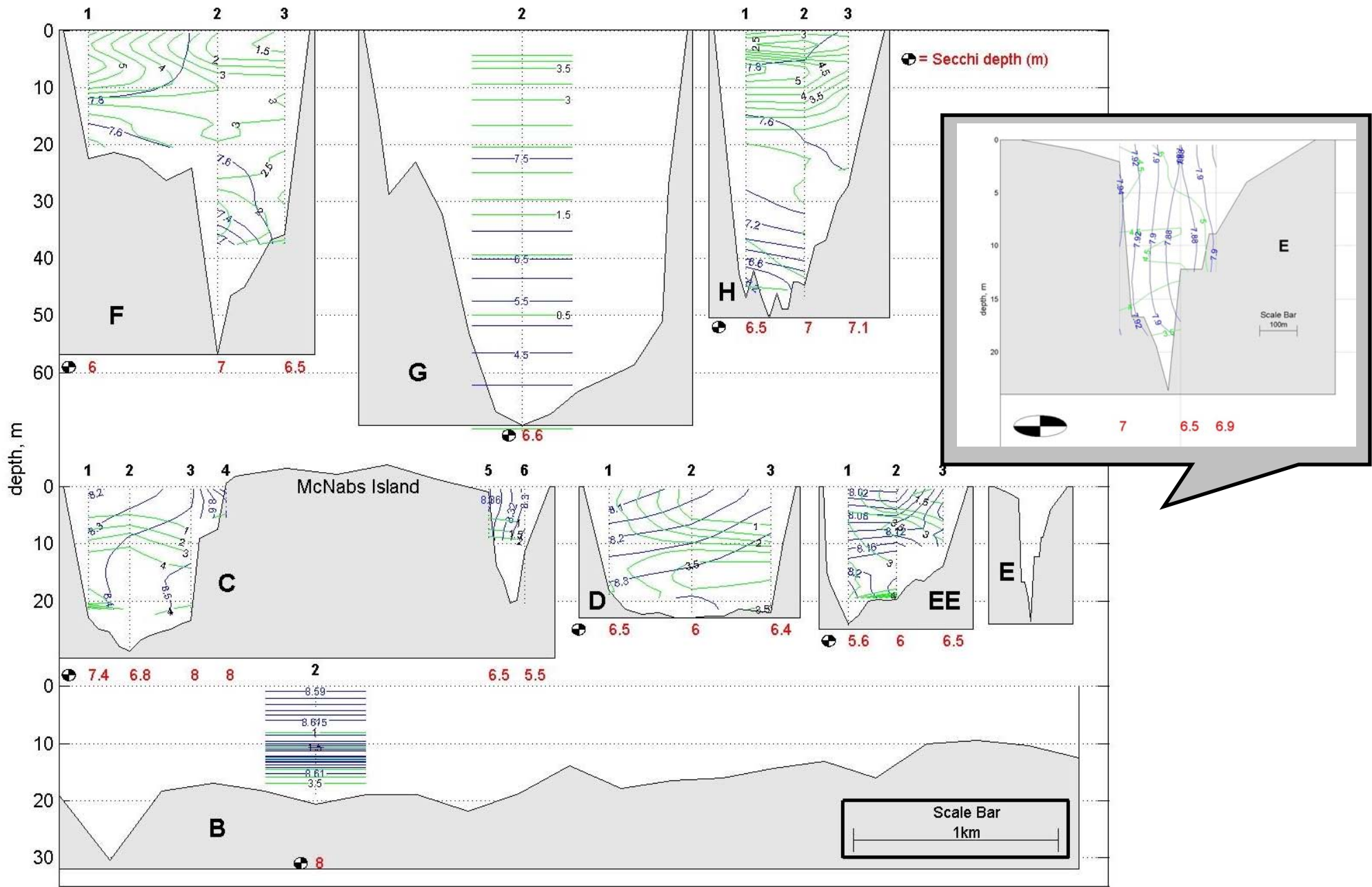
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



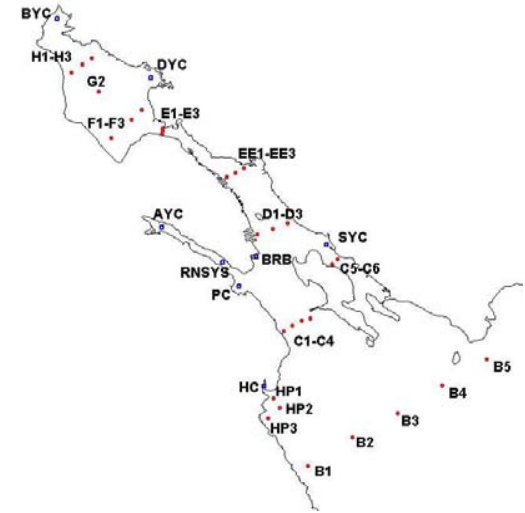
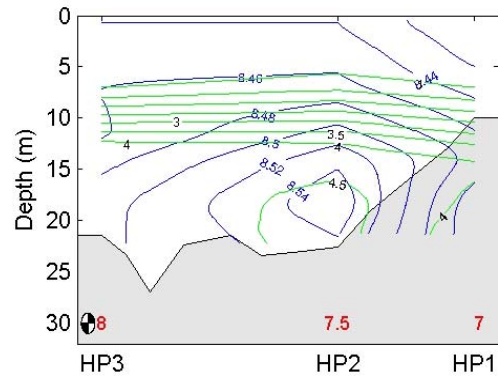
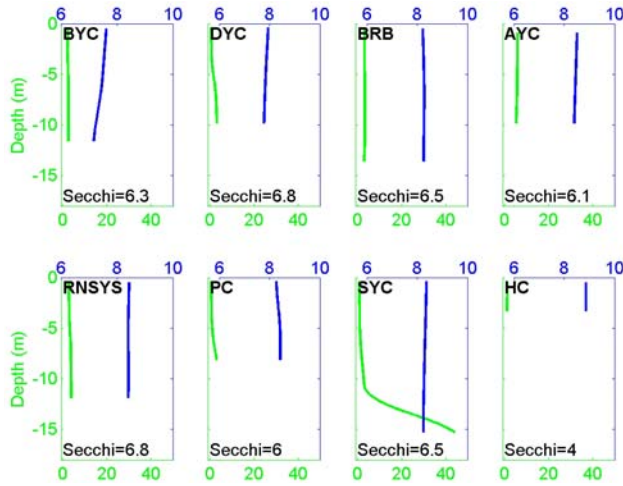
Potential Density in  $\text{kg/m}^3$

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

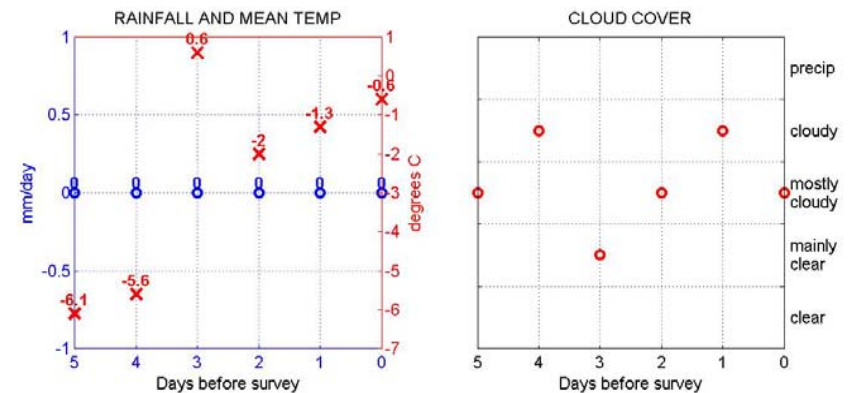
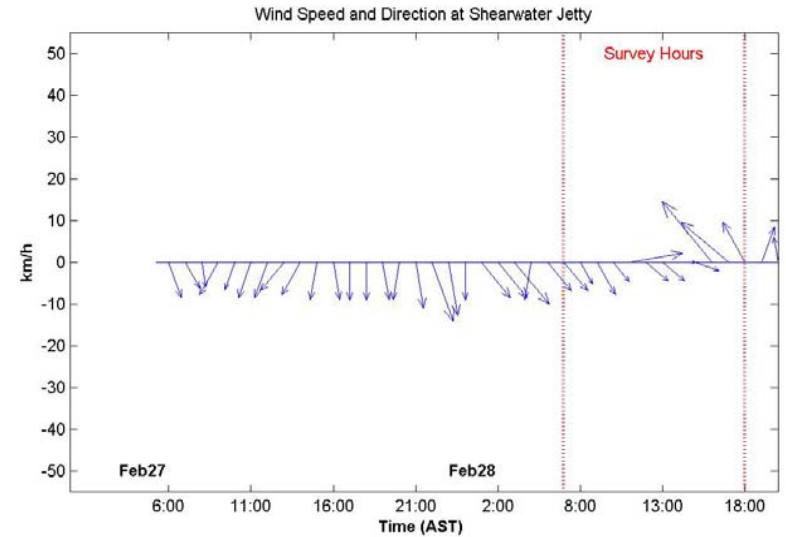
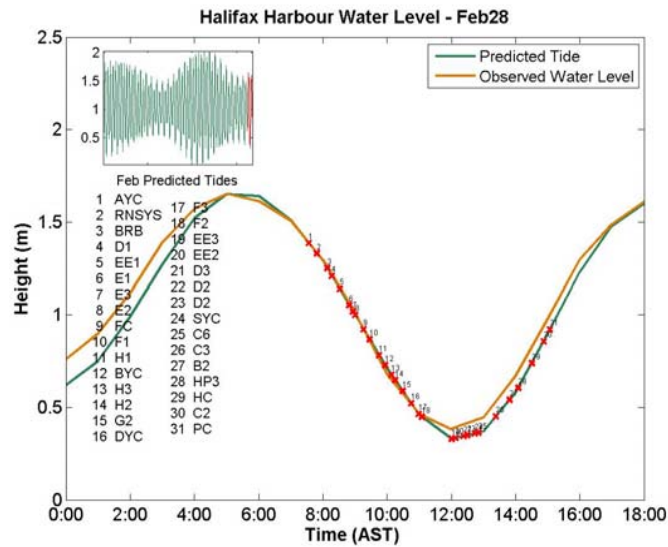




# Yacht Clubs

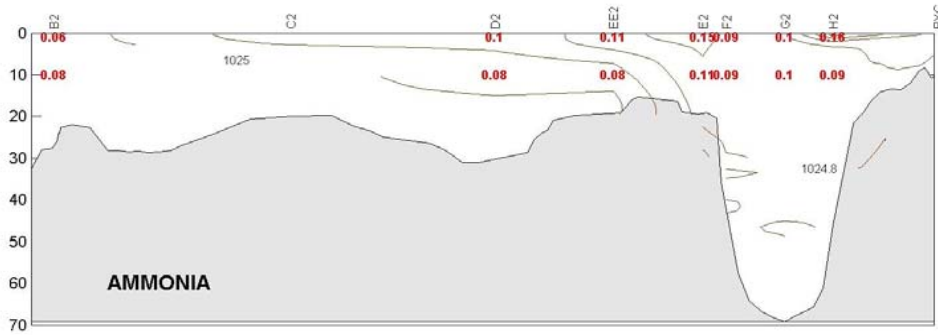
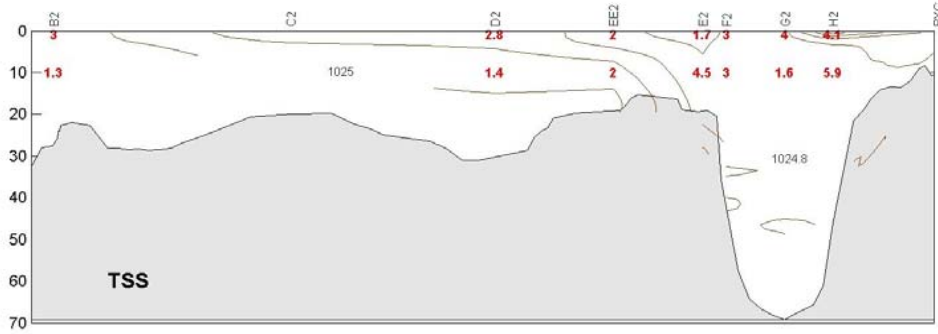


Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



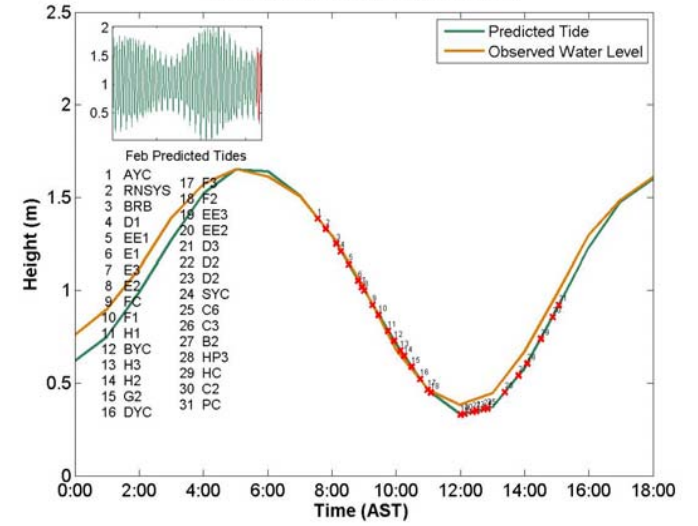
DO in mg/L

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

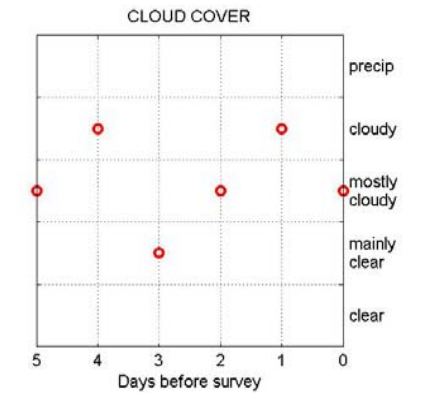
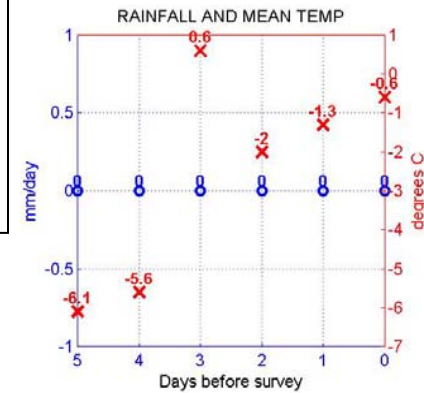
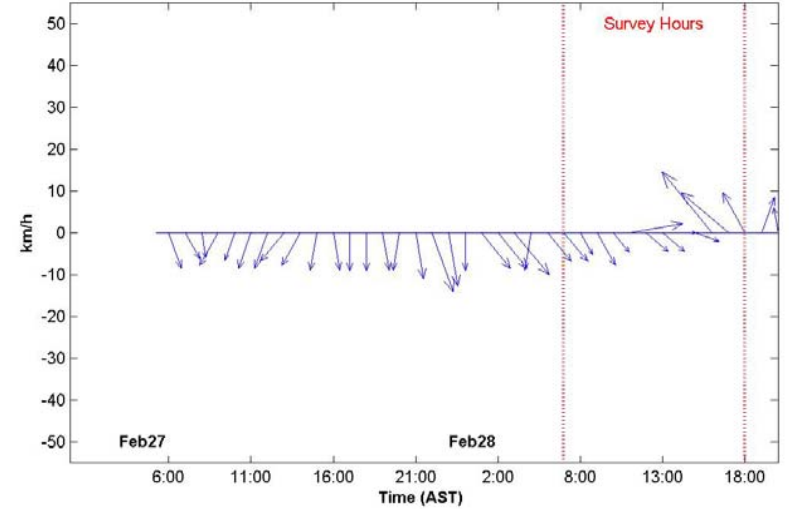


Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport

Halifax Harbour Water Level - Feb28



Wind Speed and Direction at Shearwater Jetty

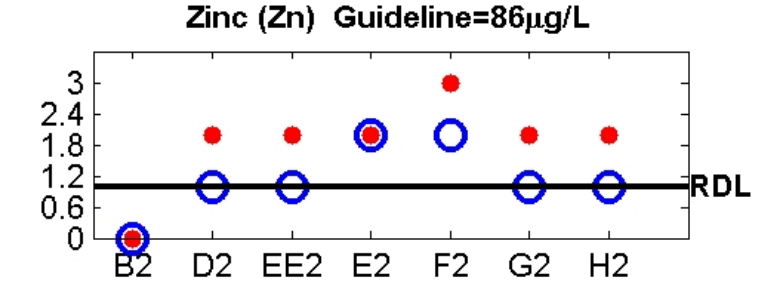
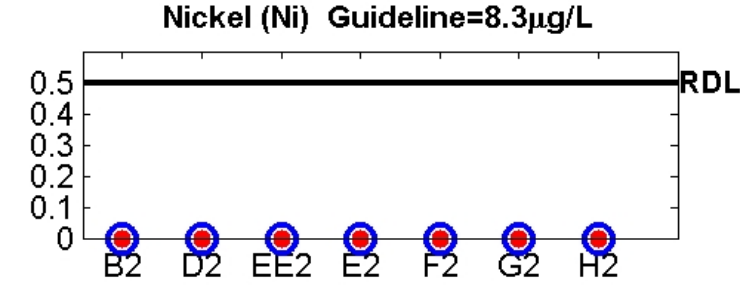
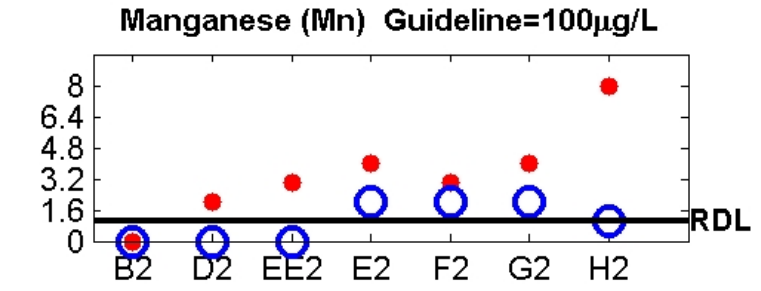
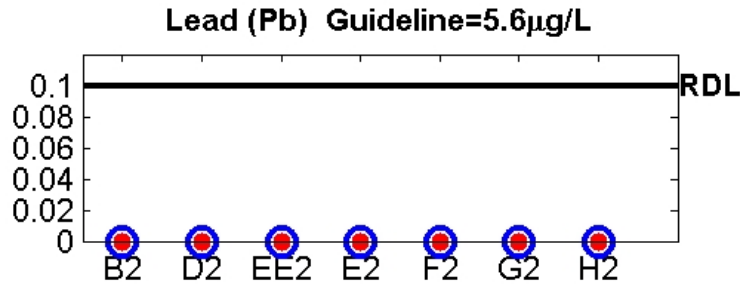
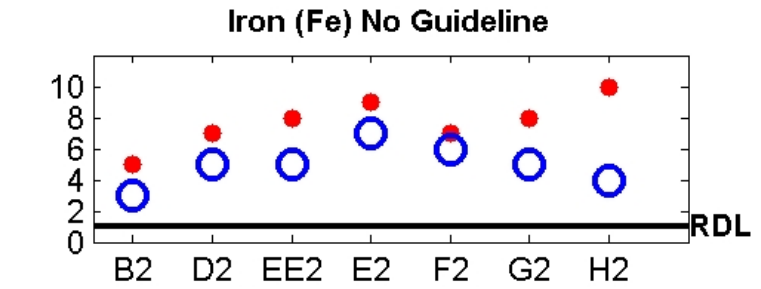
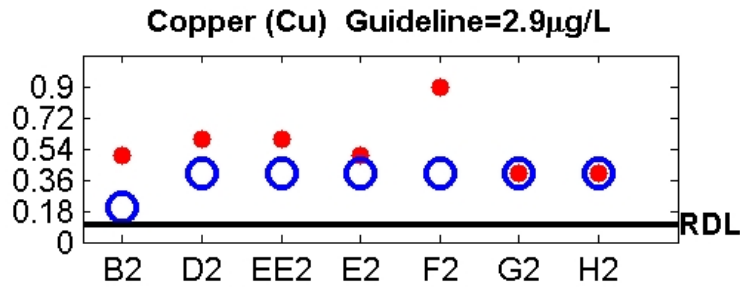
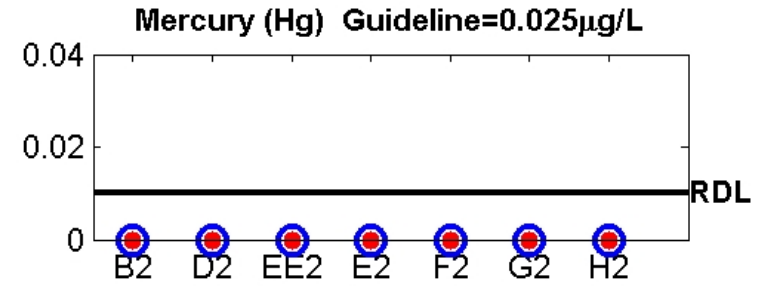
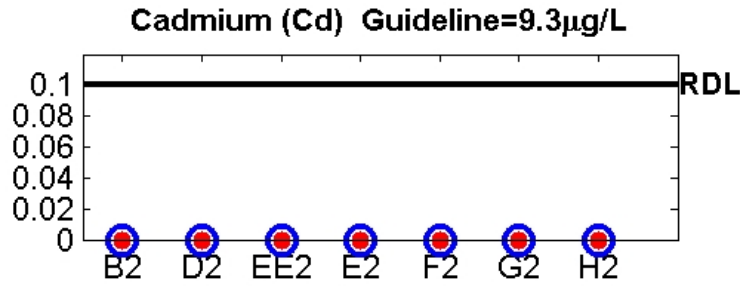


Potential Density in  $kg/m^3$

Ammonia in mg/L

TSS in mg/L





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