

Halifax Harbour Water Quality Monitoring Project Survey Summary #171

Survey Date: 17 December 2008
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report171_081217.doc
Data File: HHWQMP_data171_081217.xls

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 07:48 local time.

To match the collected reference data the presented DO values should be scaled by a factor of 1.4 (see comparison in data file).

QA/QC samples:

Chemical Analysis

| Detectable Parameter | Units | E2-1m | |
|-------------------------|-------|---------------------|-------|
| | | Reference Sample | QA/QC |
| Ammonia (as N) | mg/L | 0.11 | 0.12 |
| Total Suspended Solids | mg/L | 2.3 | 1.7 |
| Copper | ug/L | 1.1 | 1.1 |
| Iron | ug/L | 20.0 | 19.0 |
| Manganese | ug/L | 6.0 | 7.0 |
| Nickel | ug/L | 0.5 | 0.6 |
| Zinc | ug/L | 6.0 | 5.0 |

Fecal Coliform (CFU/100ml)

| Site | C6-10m | DYC-1m | PC-10m | E2-1m |
|-----------|--------|--------|--------|-------|
| Reference | 5 | 51 | 110 | 72 |
| QA/QC | 18 | 61 | 100 | 87 |

Comments:

General: There has been approximately 80 mm of rain in the five days before the survey. Overall the Basin is similarly salinity stratified to the previous survey, except the strong freshwater signal in the southern Basin and Narrows is no longer present. The Inner Harbour has increased in salinity stratification (surface fresher and bottom more saline) but the Outer Harbour (B2) is quite well mixed. There are scattered fecal coliform levels that exceed the swimming guidelines, most of these are relatively close to CSO's or outfalls, suggesting the effects of overflow or bypass. This is consistent with the recent heavy rain.

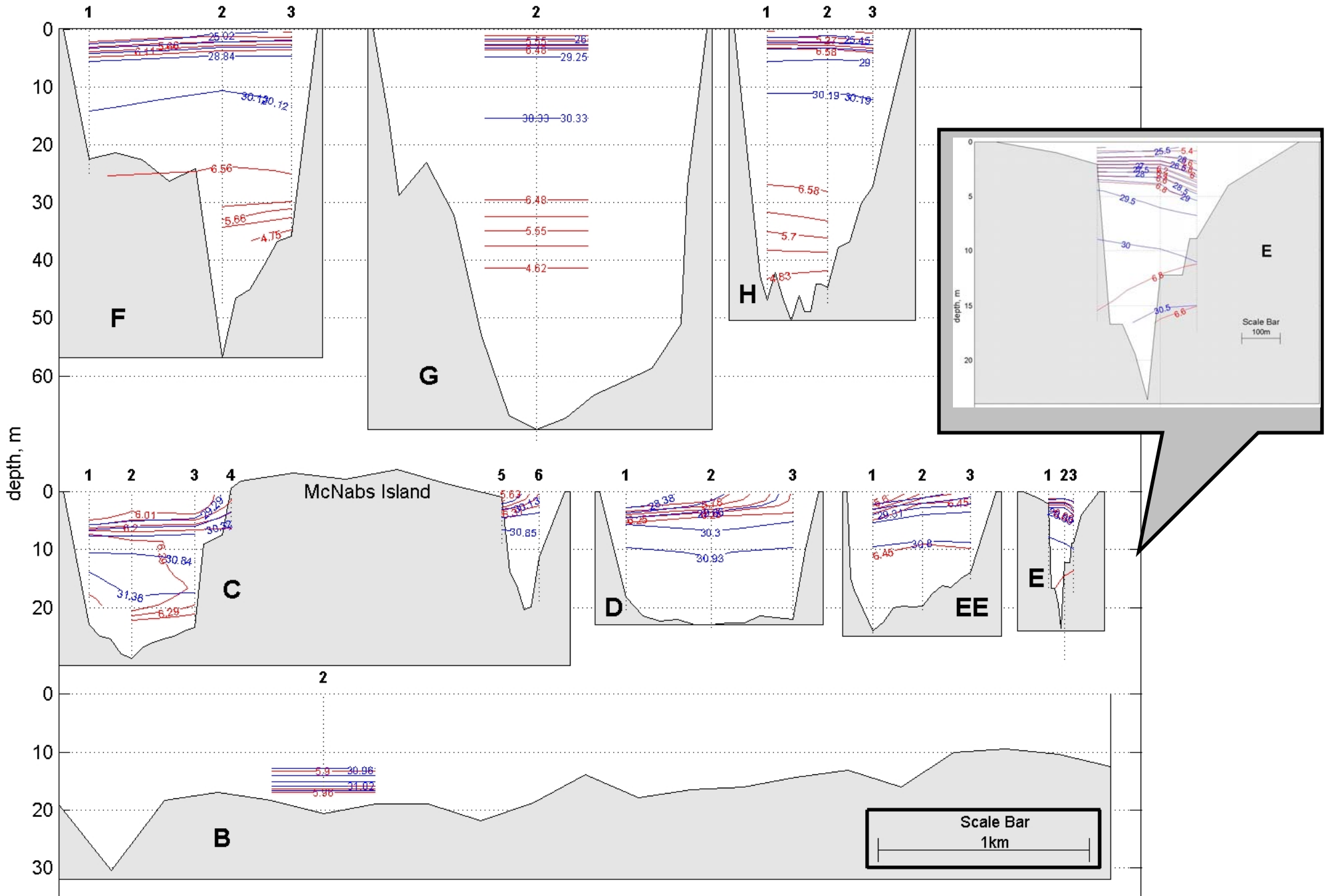
Fluorescence: The fluorescence data indicates very low phytoplankton activity. Levels are less than 5 mg/m³ in the Basin decreasing going out of the harbour to < 2 mg/m³ in the Outer Harbour. This is close to "background (minimum) levels.

TSS: The TSS levels are relatively low with all values 5 mg/L or less (mean 2.6 mg/L). With some exceptions the values tend to decrease from the Basin to the Outer Harbour.

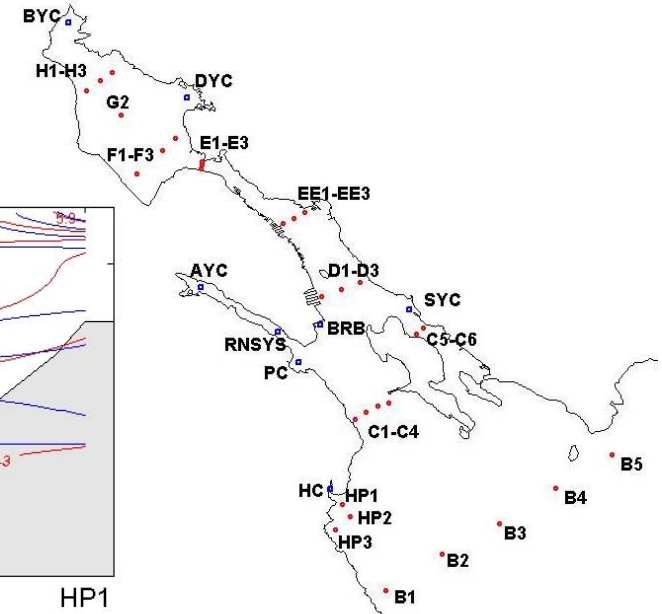
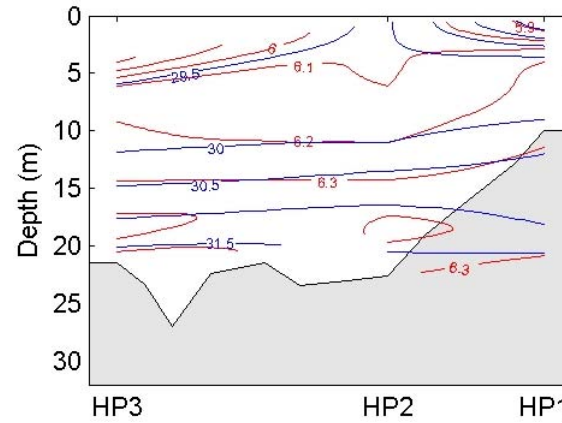
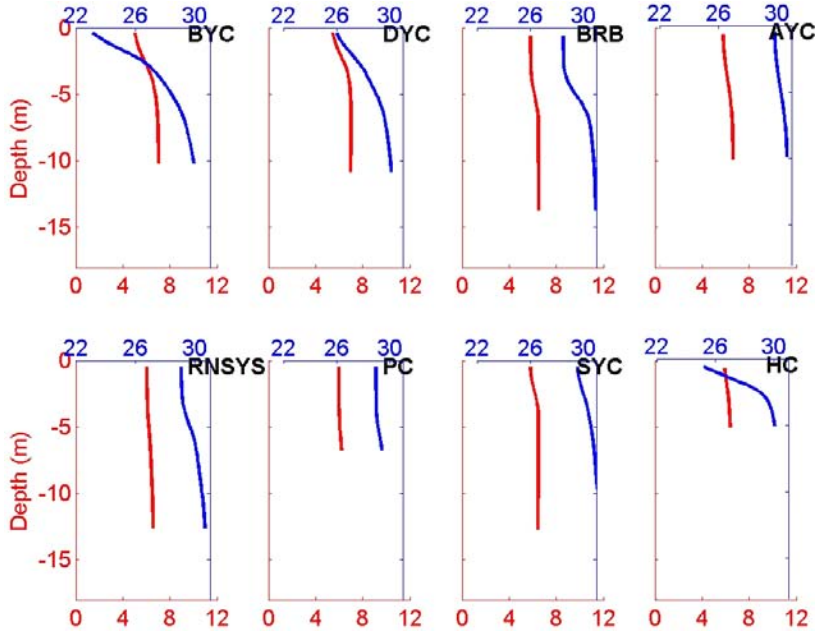
Ammonia: The ammonia levels are generally moderate with a mean value of about 0.08 mg/L. There does not appear to be a coherent spatial pattern except that the samples in the Outer Harbour (B2) are lowest with undetectable levels (<0.05 mg/L).

Metals: There are no guideline exceedences. The concentrations closest to guideline exceedence are several copper values that are about 40% of the 2.9 ug/L guideline.

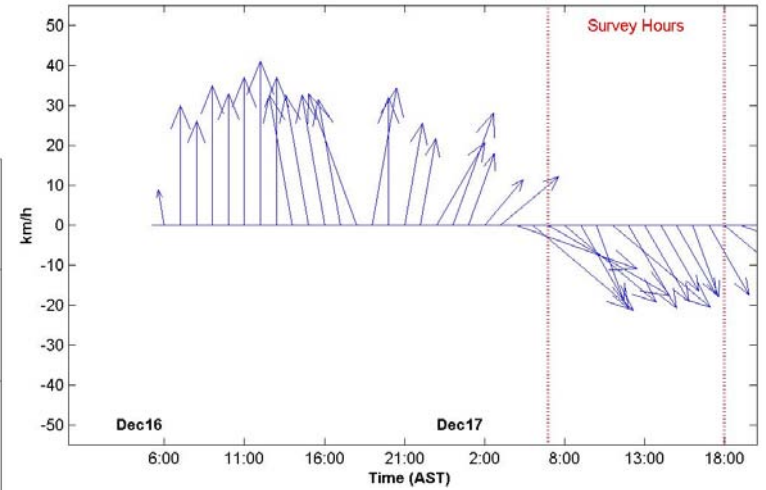
Dissolved Oxygen: There is a strong near surface DO gradient in much of the Harbour, perhaps a function of the persistent brisk winds before and during the survey. The data processing routine misses this somewhat at some sites underestimating the DO at the surface. The dissolved oxygen data, scaled appropriately by a factor of 1.4, indicates that the surface DO levels are quite uniform and greater than 9.0 mg/L everywhere in the Harbour. The levels generally decrease with depth. Outside the Basin the minimum concentrations remain > 8.5 mg/L. The only guideline exceedence is the class SB (7.0 mg/L) guideline in the deeper water of the Basin. The scaled value in the deepest basin is about 4.0 mg/L. The YSI/scaled Seabird values are slightly lower than both the LOBO and BBPMP values.



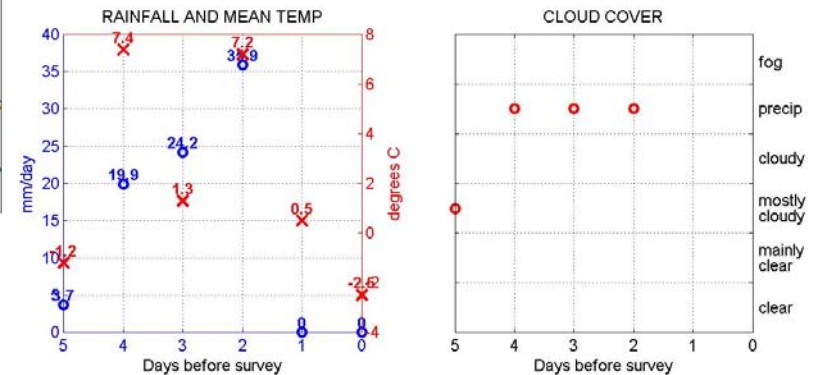
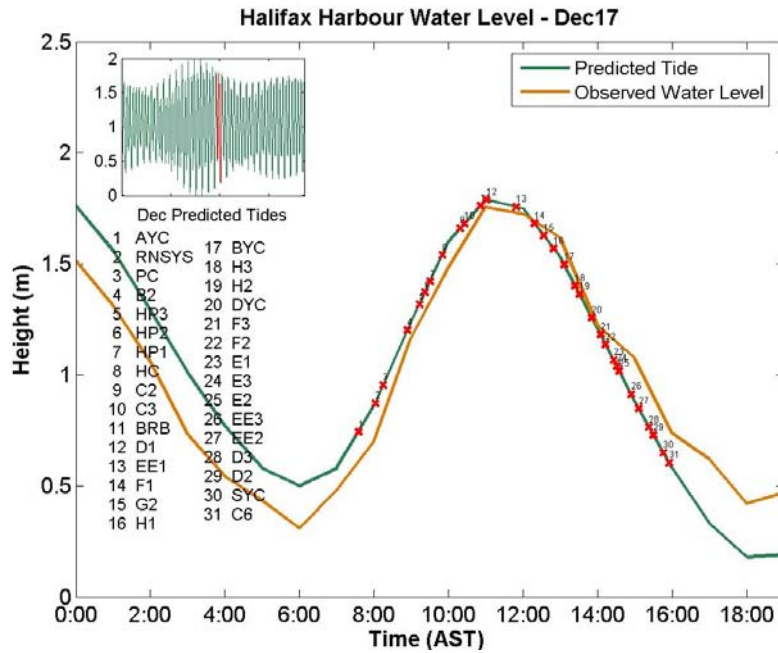
Yacht Clubs



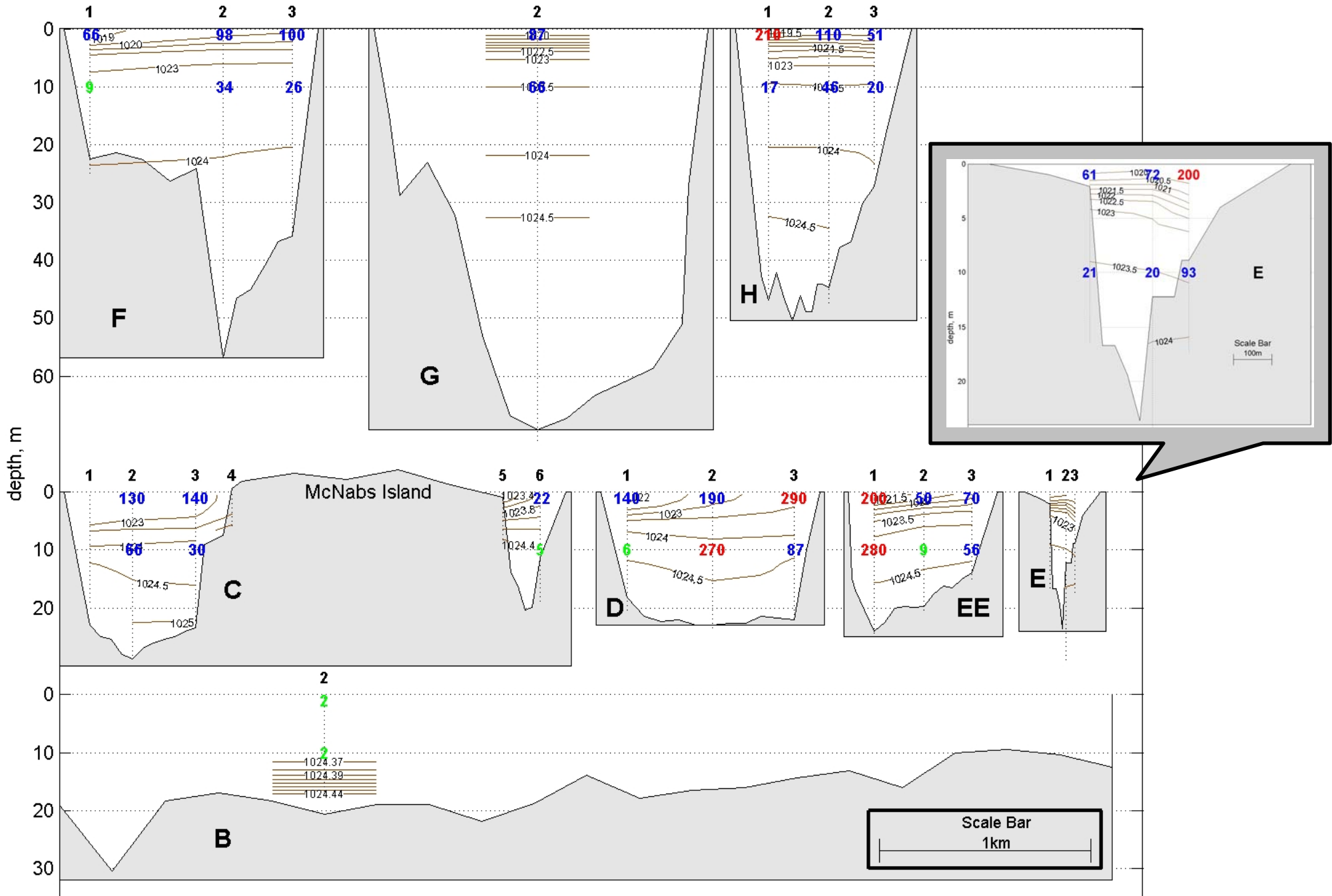
Wind Speed and Direction at Shearwater Jetty



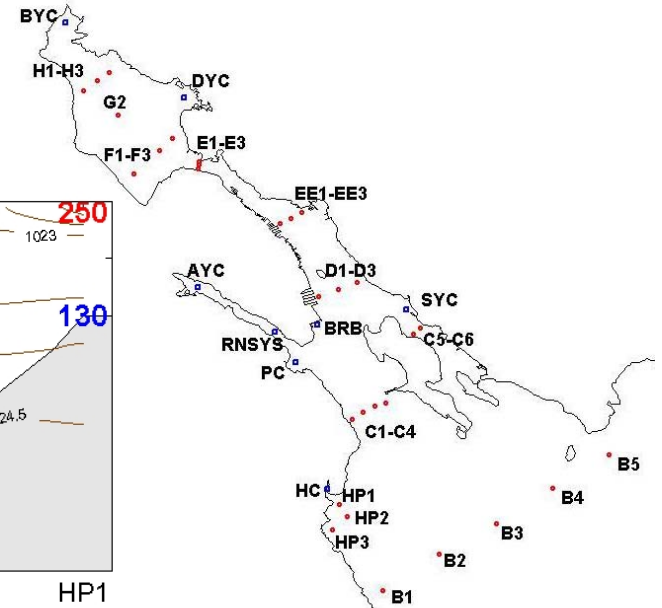
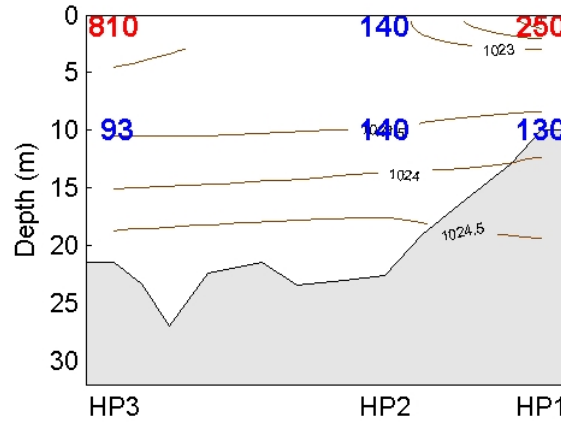
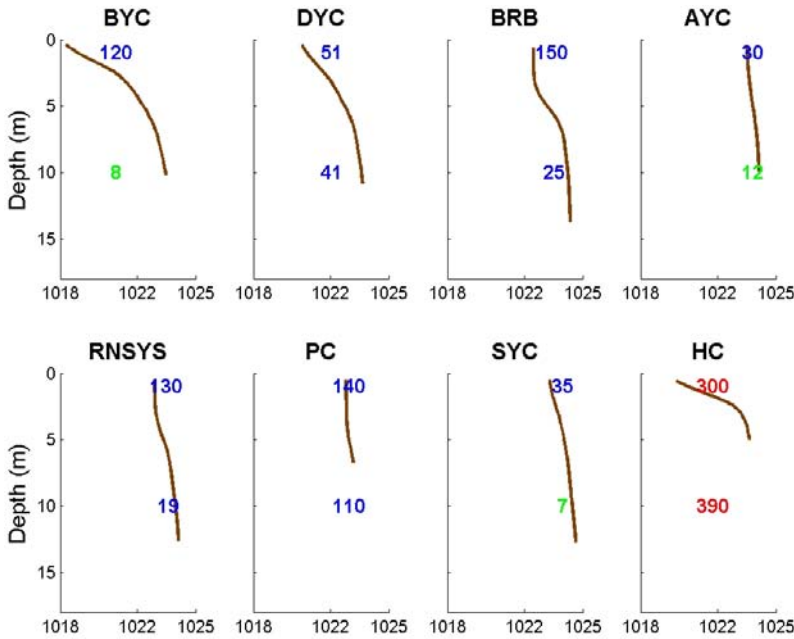
Rainfall and temperature data collected at Shearwater Autoport.
Cloud cover data collected at Shearwater Airport



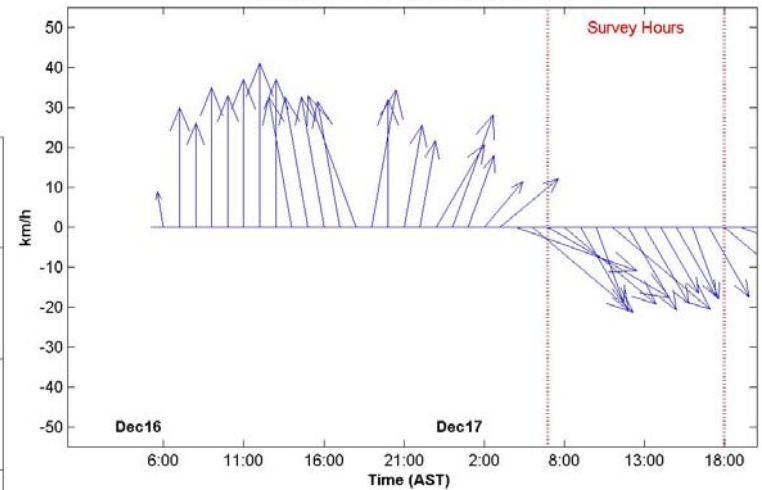
Salinity in PSU Temperature in °C



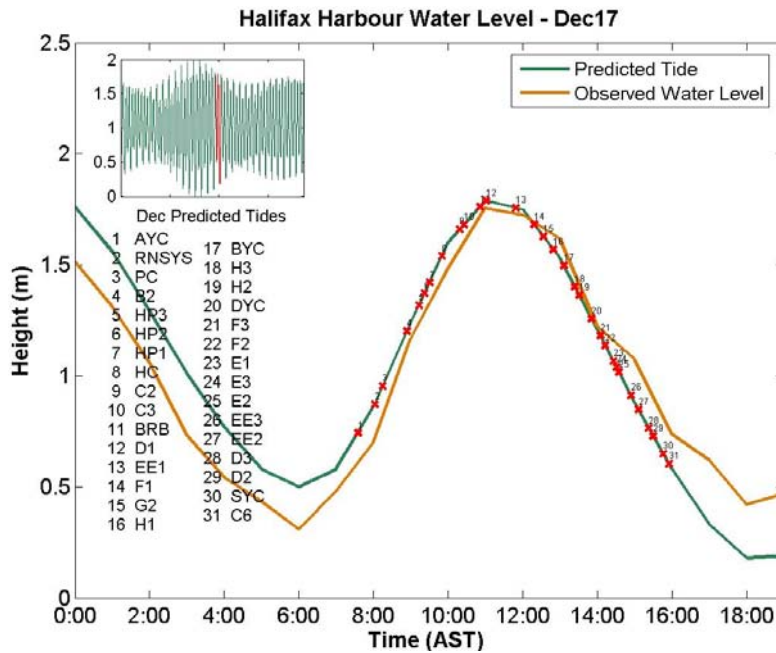
Yacht Clubs



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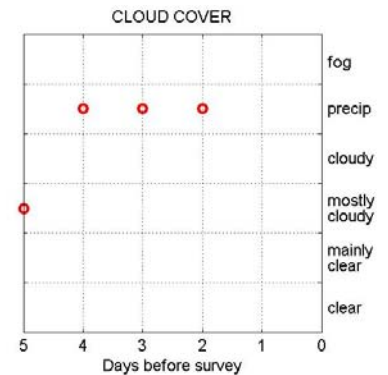
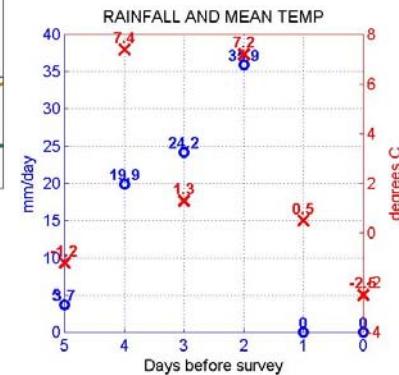


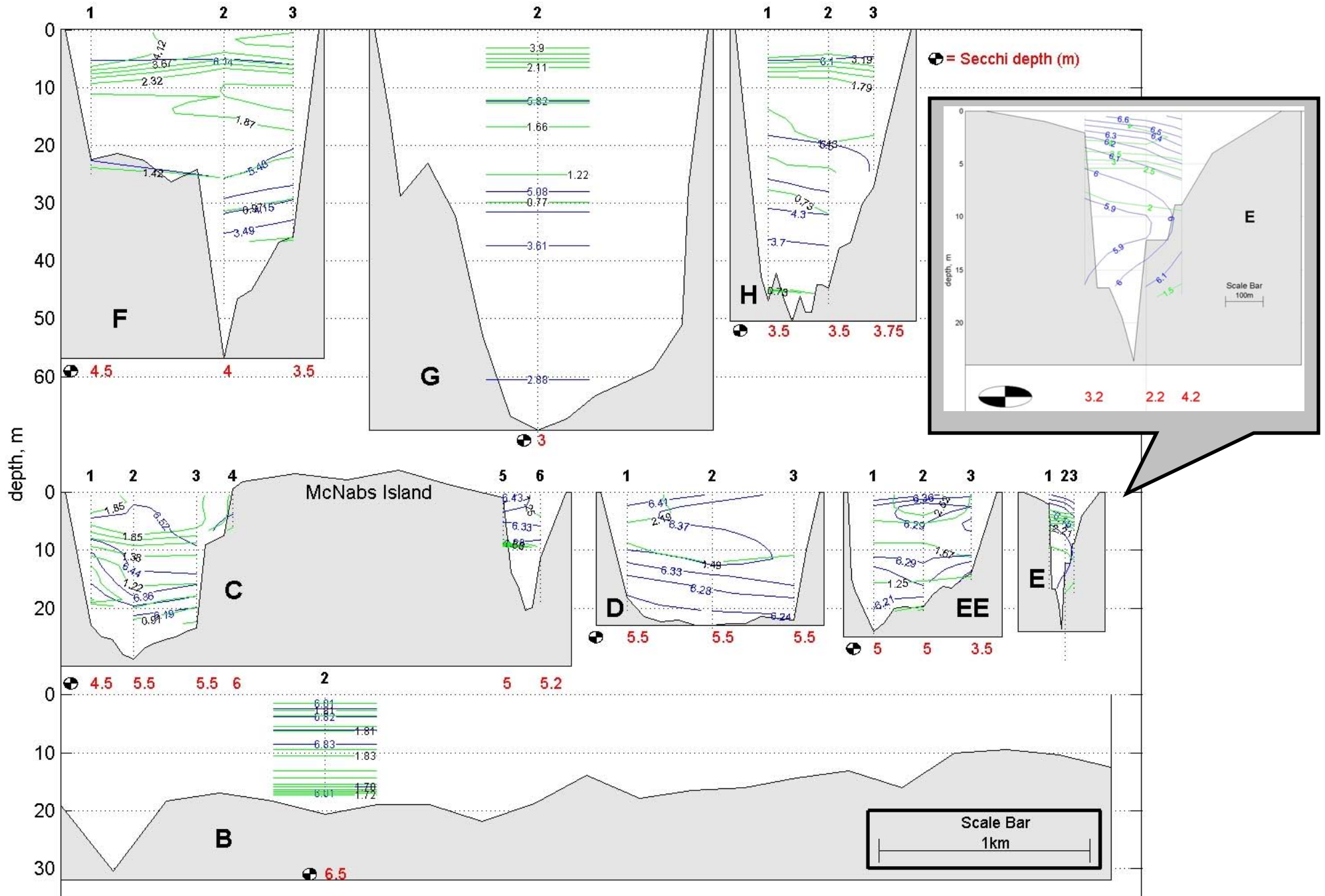
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Cloud cover data collected at Shearwater Airport



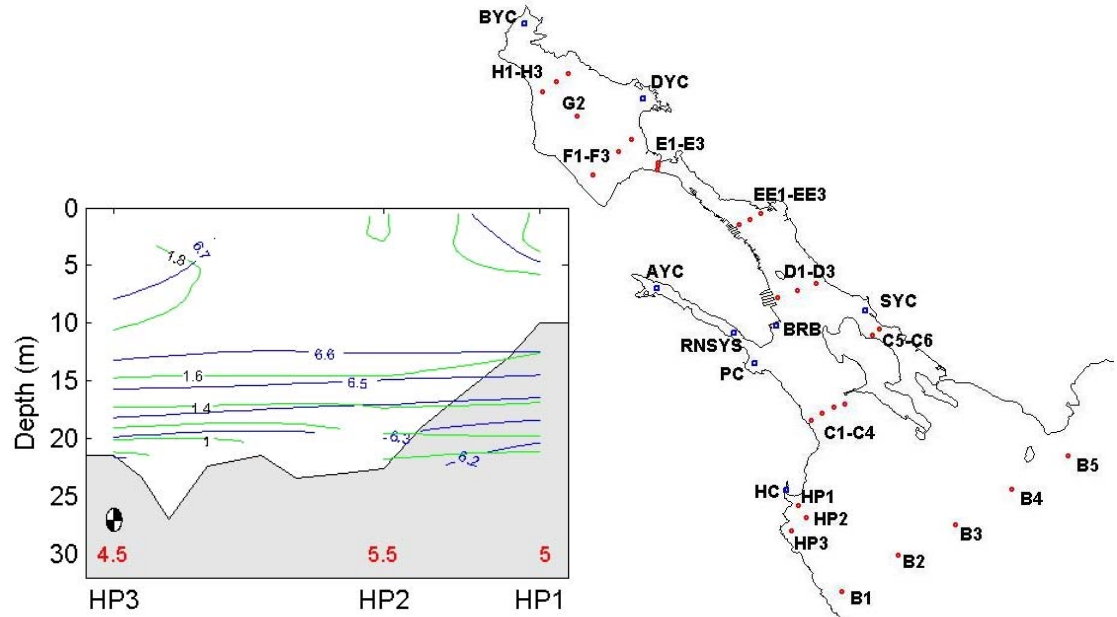
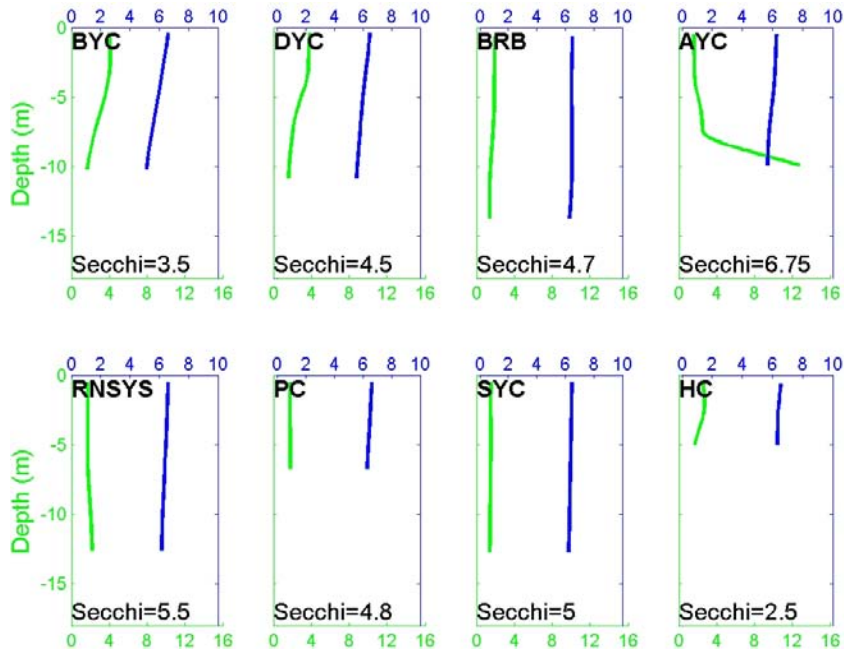
Potential Density in kg/m^3

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

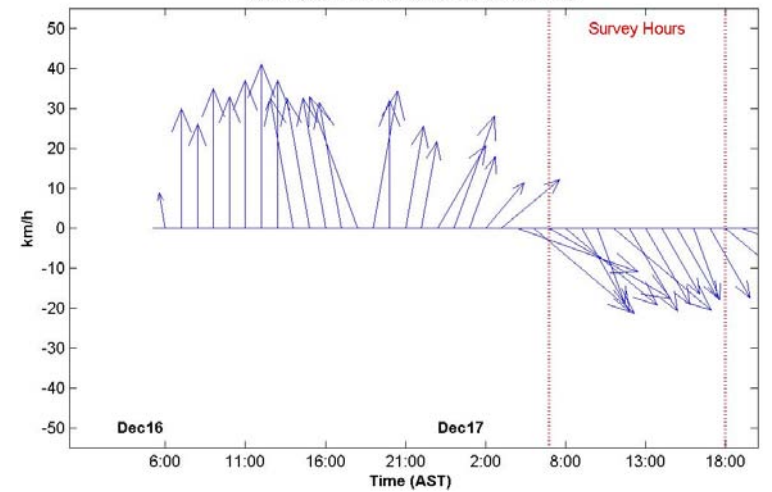




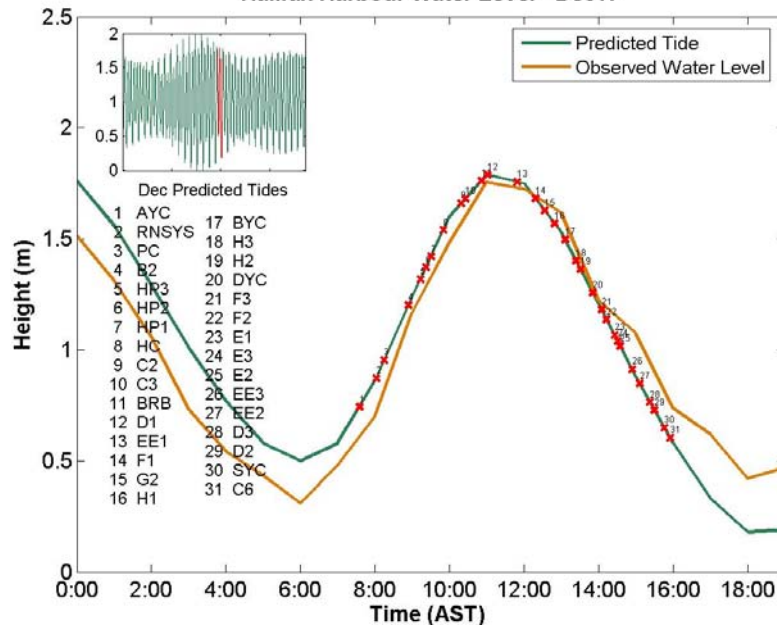
Yacht Clubs



Wind Speed and Direction at Shearwater Jetty



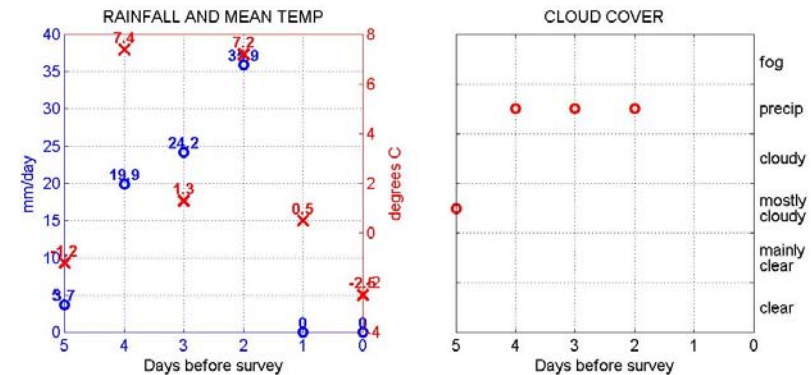
Halifax Harbour Water Level - Dec 17



Dec Predicted Tides

| | | | |
|----|-------|----|-----|
| 1 | AYC | 17 | BYC |
| 2 | RNSYS | 18 | H3 |
| 3 | PC | 19 | H2 |
| 4 | B2 | 20 | DYC |
| 5 | HR3 | 21 | F3 |
| 6 | HP2 | 22 | F2 |
| 7 | HP1 | 23 | E1 |
| 8 | HC | 24 | E3 |
| 9 | C2 | 25 | E2 |
| 10 | C3 | 26 | EE3 |
| 11 | BRB | 27 | EE2 |
| 12 | D1 | 28 | D3 |
| 13 | EE1 | 29 | D2 |
| 14 | F1 | 30 | SYC |
| 15 | G2 | 31 | C6 |
| 16 | H1 | | |

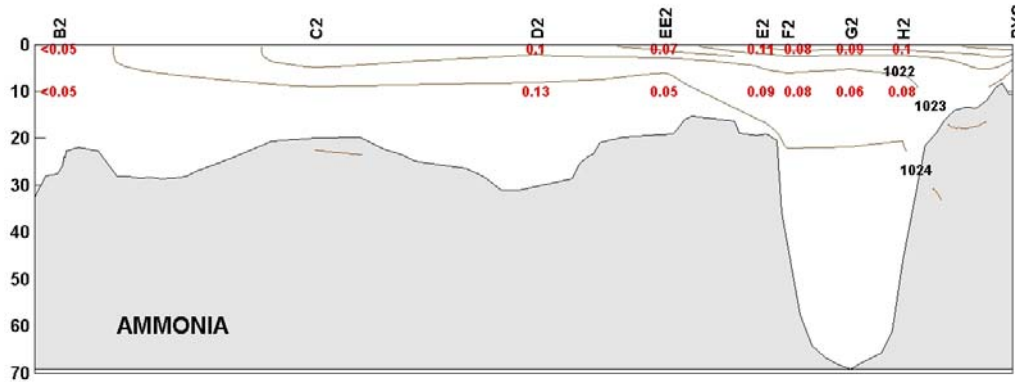
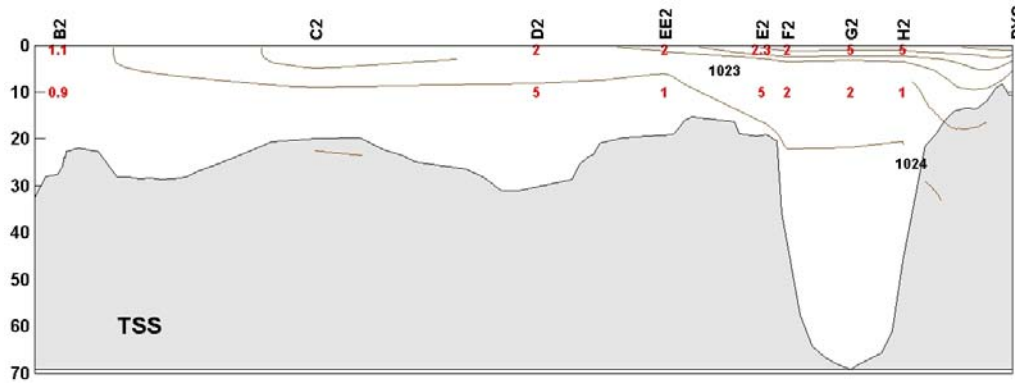
Rainfall and temperature data collected at Shearwater Autoport.
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DO in mg/L

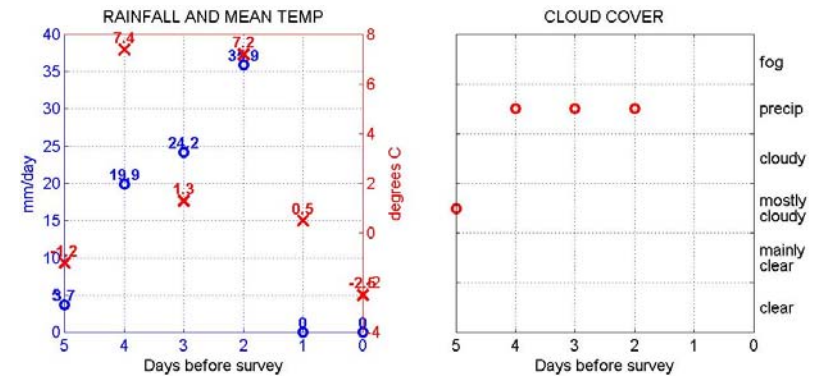
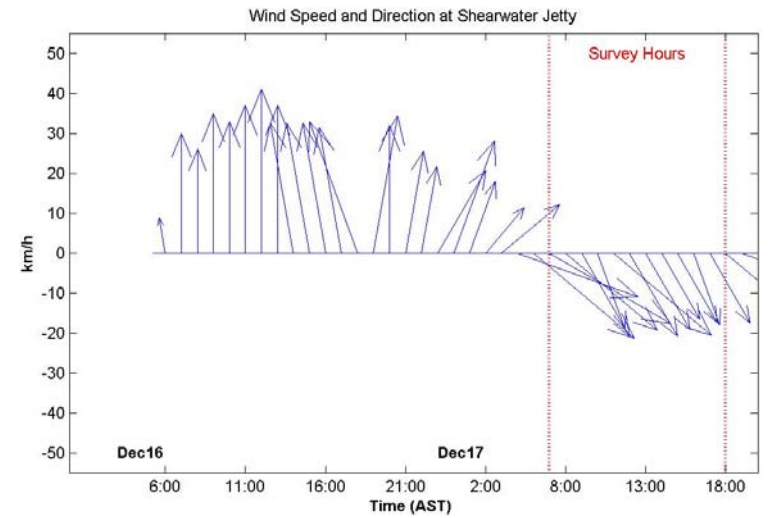
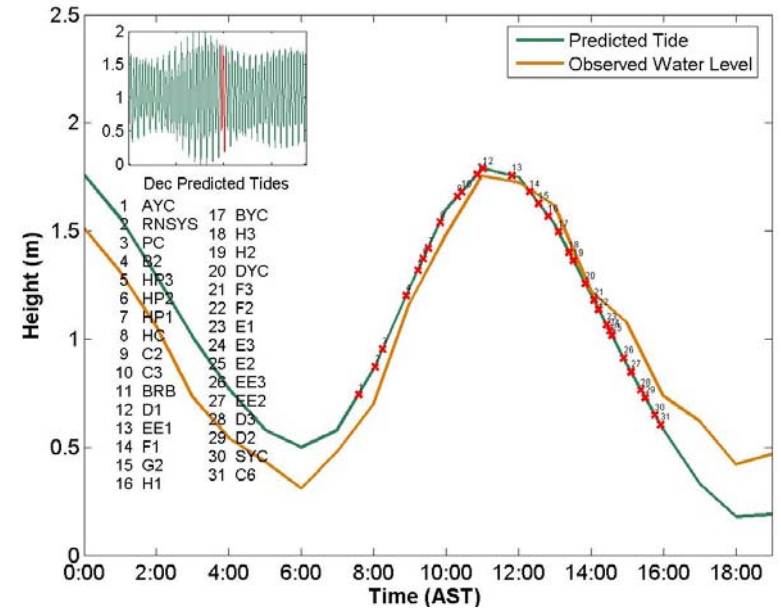
Chlorophyll in mg/m³

CHEMISTRY



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Cloud cover data collected at Shearwater Airport

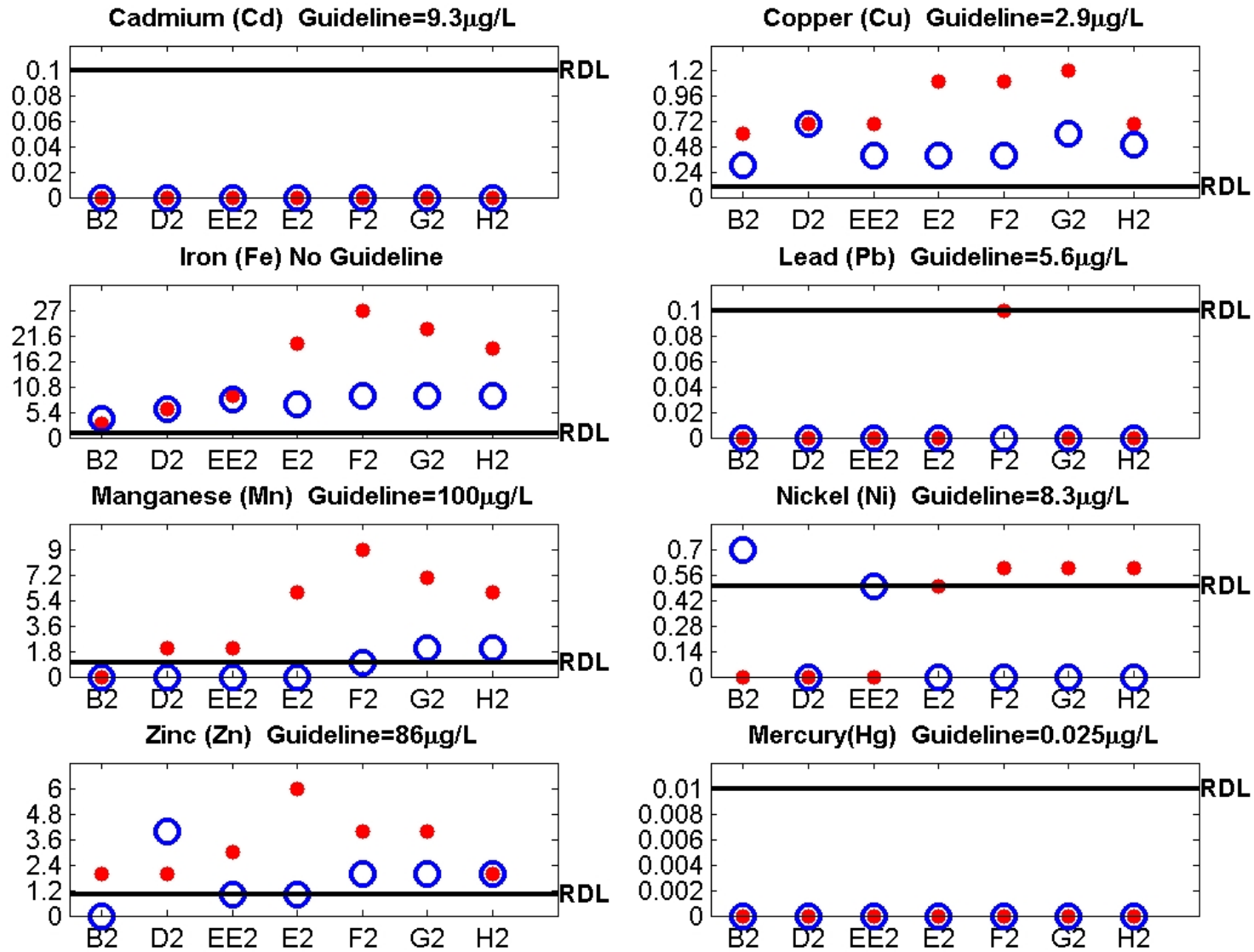
Halifax Harbour Water Level - Dec17



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

HRM Water Quality Monitoring

Fecal Coliform Summary – December 17, 2008

