

Halifax Harbour Water Quality Monitoring Project Survey Summary #191

Survey Date: 28 June 2010
Nature of Survey: Complete Survey
Report File (this document): HHWQMP_report191_100628.doc
Data File: HHWQMP_data191_100628.xls

Data Return:
 Chemical: 71%
 Bacteria: 87%
 Profile: 61%
Overall: 74 %

Sample Notes:

Sites F1, F2, G2 and H1 were missed due to access exclusion for military ships in the Harbour for Navy 100th Anniversary.

The DO sensor on the CTD experienced progressive failure during the survey. There is no useable DO data. The data is plotted here but is deleted from the data file.

A supplementary CTD cast was taken at the LOBO buoy location (44.6291 N, 63.5915 W) at 1509 local time (ADT).

QA/QC samples:

Chemical Analysis

Detectable Parameter	Units	E2-1m	
		Reference Sample	QA/QC
Total Suspended Solids	mg/L	5.2	4.4
Copper	ug/L	2.8	0.6
Iron	ug/L	10	5
Lead	ug/L	0.2	0
Manganese	ug/L	3	2
Zinc	ug/L	7	4

0 = Not Detected

Bacteria (cells/100ml)

Fecal Coliform	Site	C6-10m	DYC-1m	PC-10m	E2-1m
	Reference	6	310	17	19
QA/QC		22	510	2	36
Enterococci	Reference	1	49	0	0
	QA/QC	1	70	6	1

0 = Not Detected

Comments:

General: In spite of light rainfall in the 5 days before the survey and moderate (25.2 mm) rainfall on the day of the survey the freshwater signal in the harbour is very weak. The salinity is between 30-31 PSU everywhere except at the surface at head of the Basin (section H and BYC) and in Herring Cove. The salinity in the Basin deep water is similar to that at the bottom throughout the harbour. There is moderate vertical temperature variation of about 6° C in most of the harbour. In the Basin the variation is in excess of 10 ° C. The coldest water in the harbour remains in the bottom of the Basin. Overall the density stratification is moderate throughout the harbour. The bacteria levels are somewhat elevated with four stations (EE1-1m, EE2-10m, D1-10m and BRB-1m) in the Inner Harbour exceeding one or both of the fecal coliform or enterococci swimming guideline. There are also above swimming values at DYC-1m and in the NW Arm at RNSYS-1m and PC-1m. Other water quality parameters (below) also appear elevated in sections D and E.

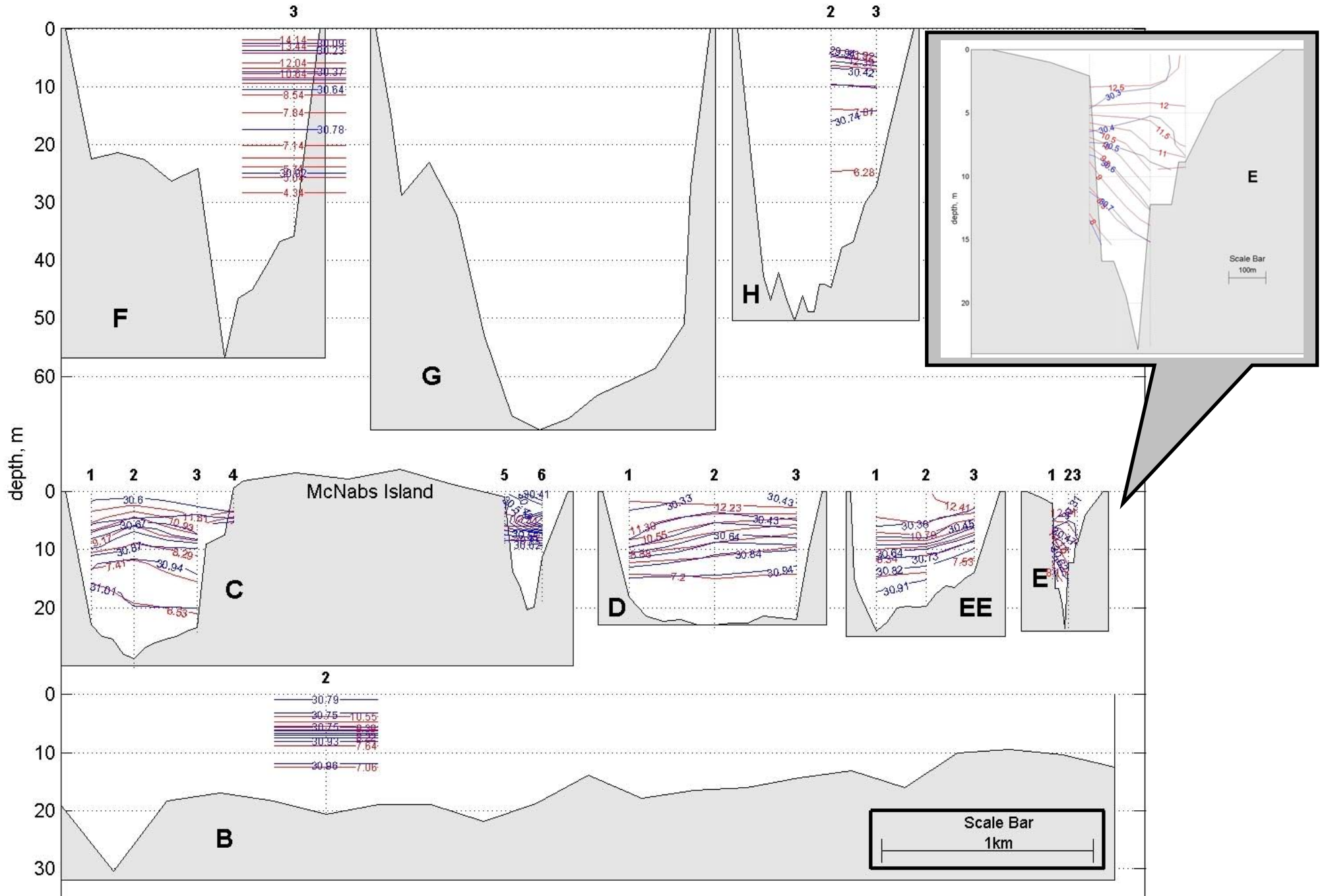
Fluorescence: The fluorescence data indicates a decrease in phytoplankton activity from the survey conducted three days before. The maximum values are near surface (< 3m) in the Inner Harbour (section D), at about 24 mg/m³. The maximum values drop somewhat in the Basin and more dramatically (to 4-7 mg/m³) in the Outer Harbour (HP and B sites). This distribution is tracked in the secchi depth readings that are higher than in the previous survey but still quite low; 2.2-2.5m at section D.

TSS: The average TSS levels are moderate (4.5 mg/L). There are several relatively higher values in the Inner Harbour, including a value of 11 mg/L at EE2-1m.

Ammonia: The ammonia levels are unusual in that all but three values are below detection (0.05 mg/L) but the three detectable levels are relatively high with the maximum value of 0.25 mg/L at EE2-1m.

Metals: There were guideline exceedances for each copper (2) and mercury (3). These were just over the applicable guidelines. Interestingly, the B2-1m sample was high for both metals and also showed relatively high, but below guideline, values for lead and zinc.

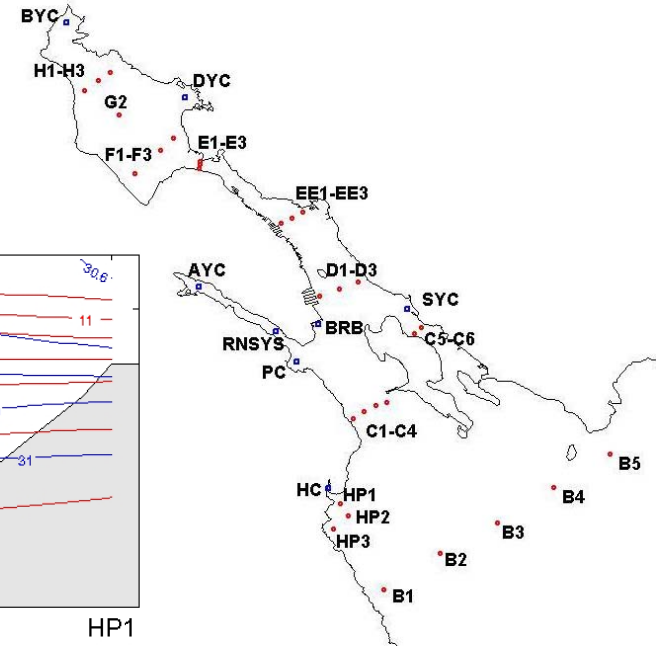
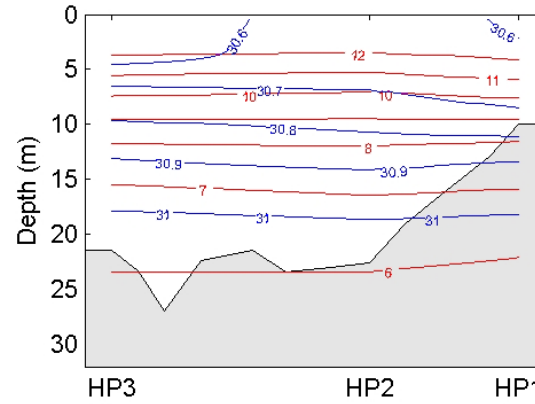
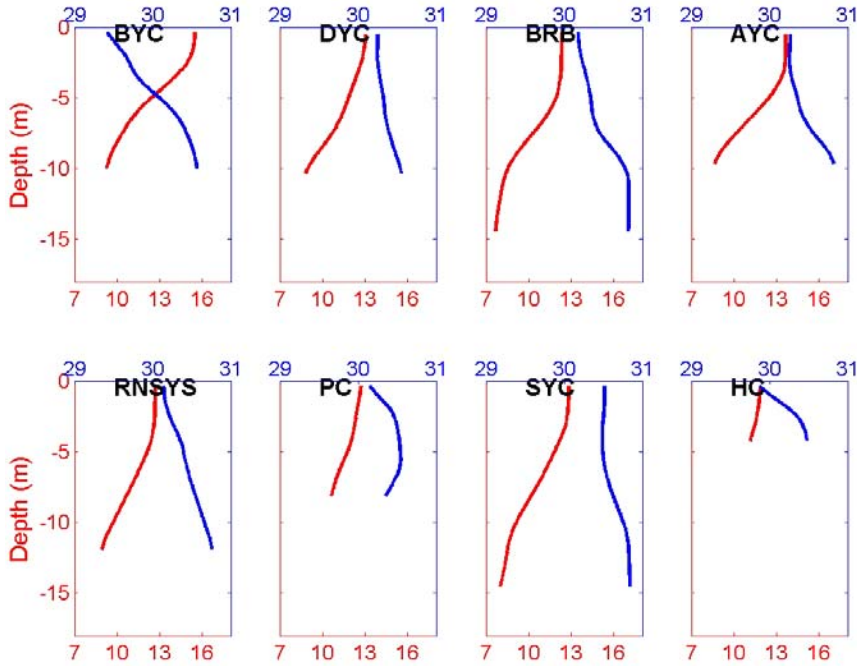
Dissolved Oxygen: There is no CTD dissolved oxygen data this survey. The YSI surface measurements (see data file) indicate that the dissolved oxygen at the surface (8.2-12.0 mg/L) is above applicable guidelines. The data collected by the BBPMP (see data file) on 30 June, indicates that the DO at the bottom of Bedford Basin remains high at above 8.0 mg/L.



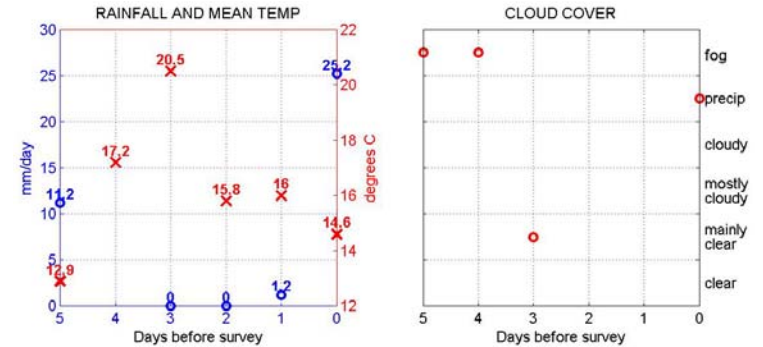
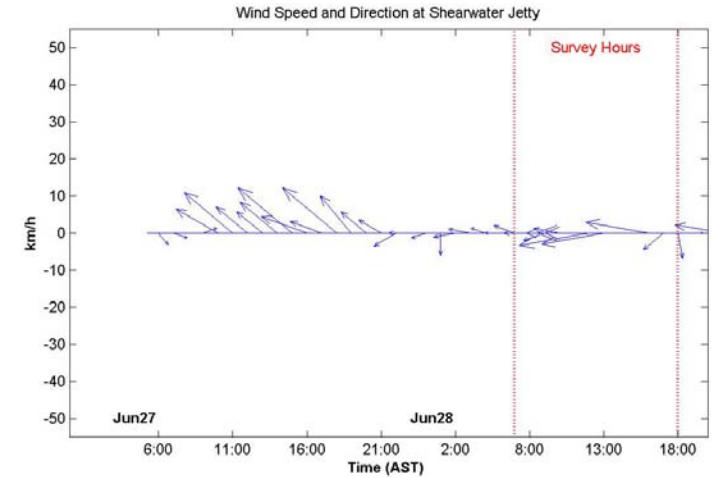
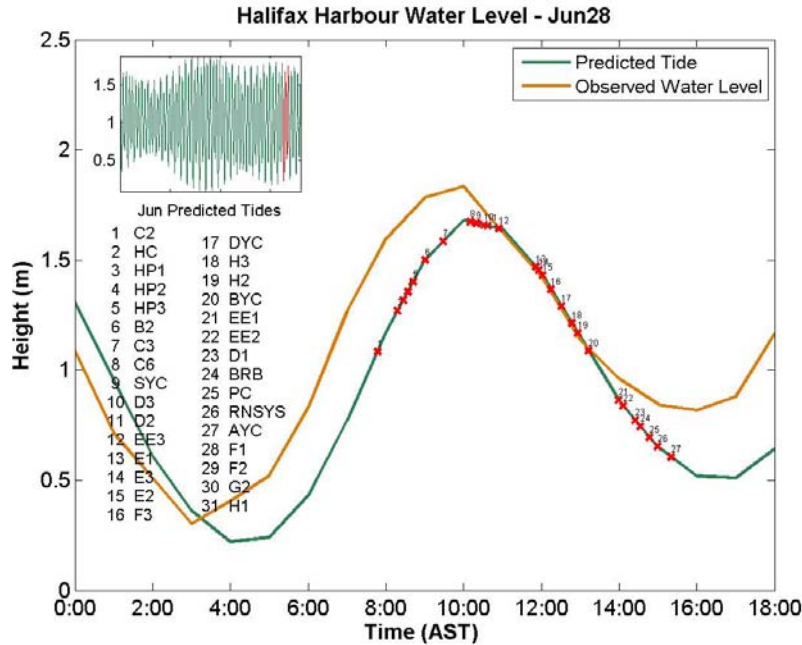
Yacht Clubs

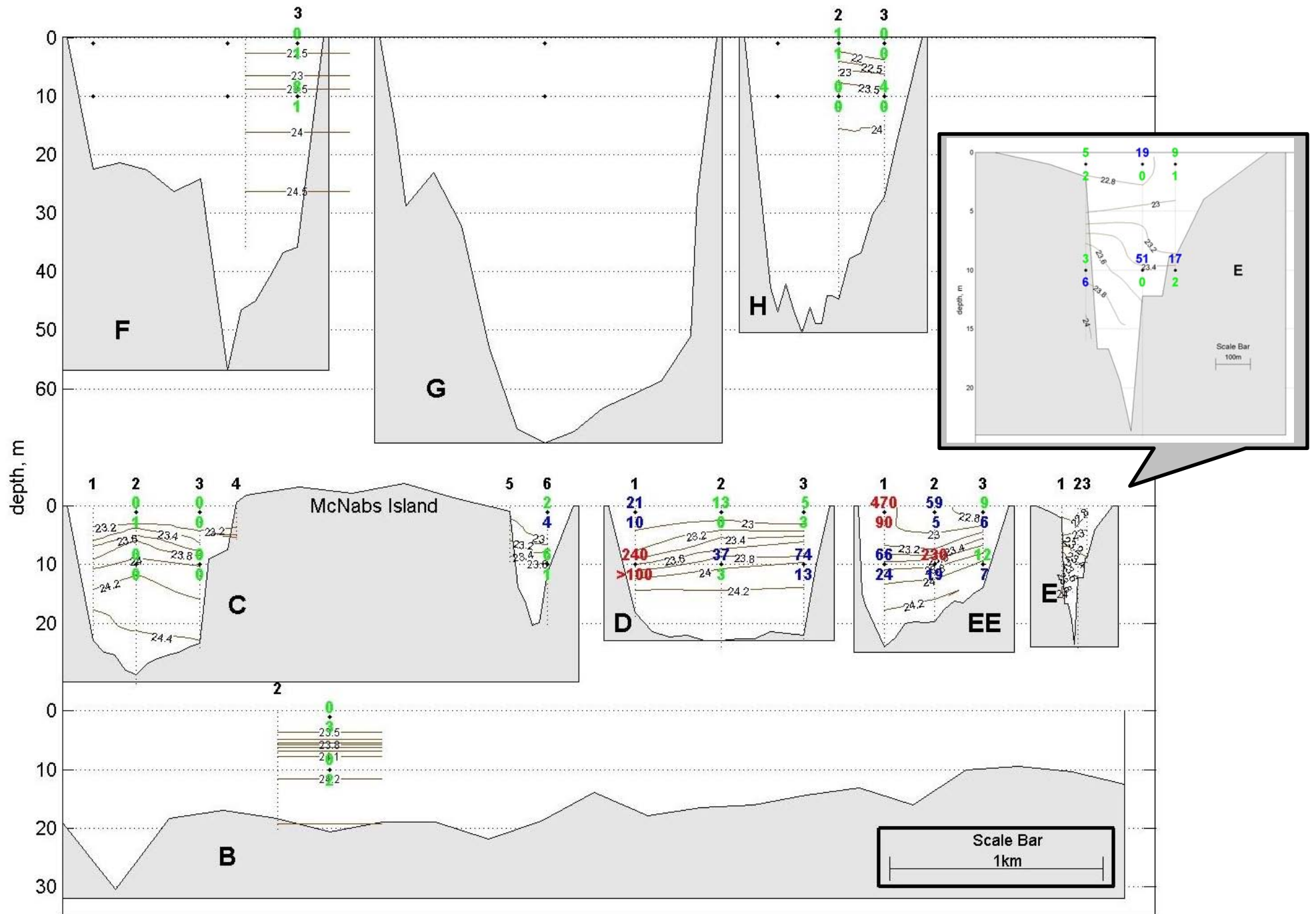
Salinity in PSU

Temperature in °C

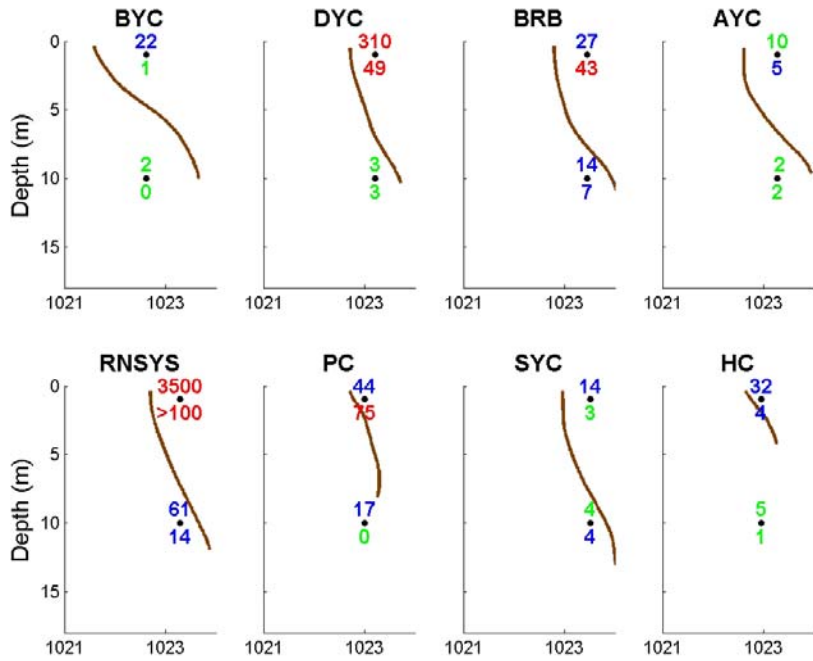


Rainfall and temperature data collected at Shearwater RCS.
Cloud cover data collected at Shearwater Airport

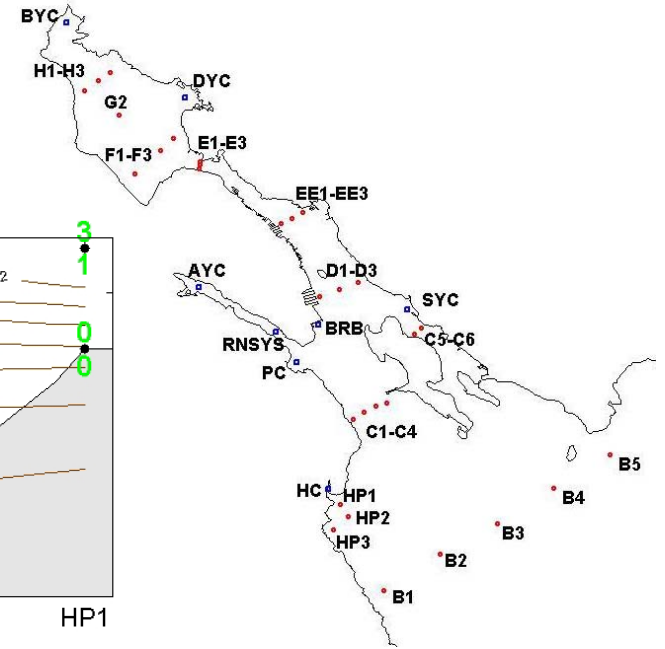
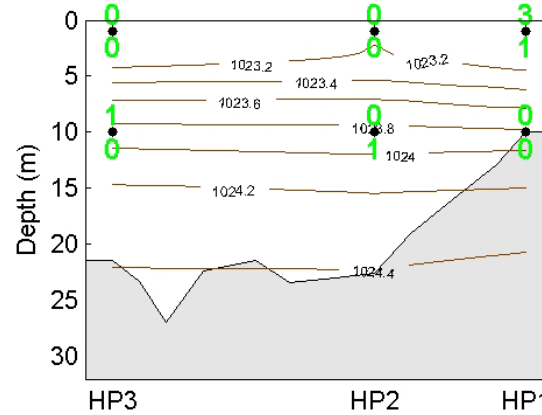




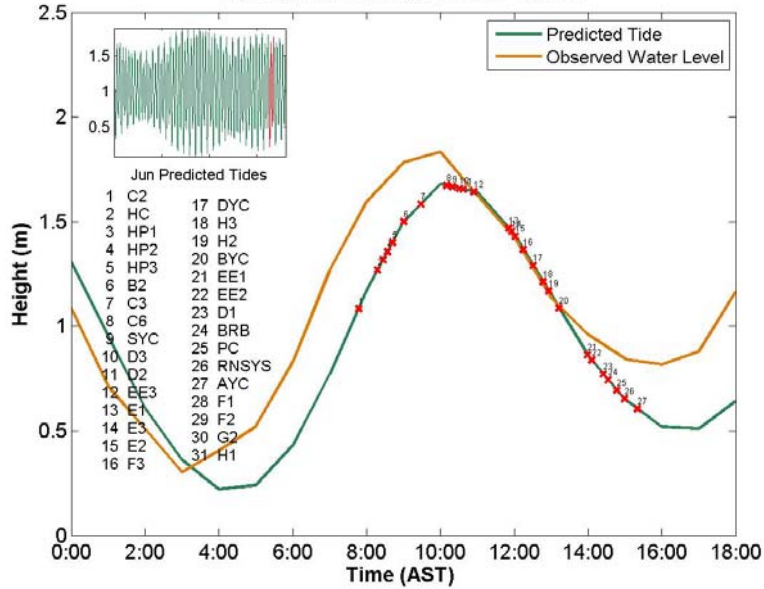
Yacht Clubs



Potential Density in kg/m³

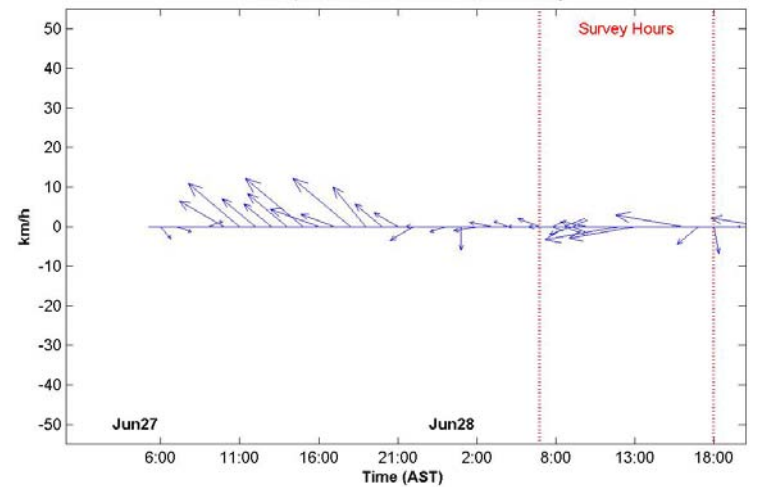


Halifax Harbour Water Level - Jun28

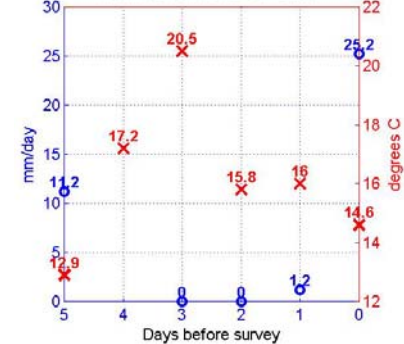


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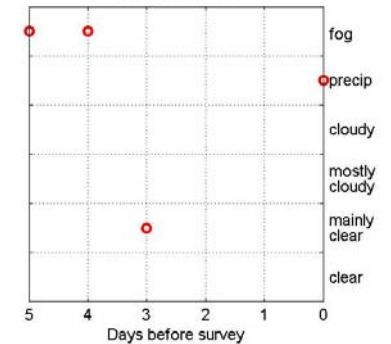
Wind Speed and Direction at Shearwater Jetty



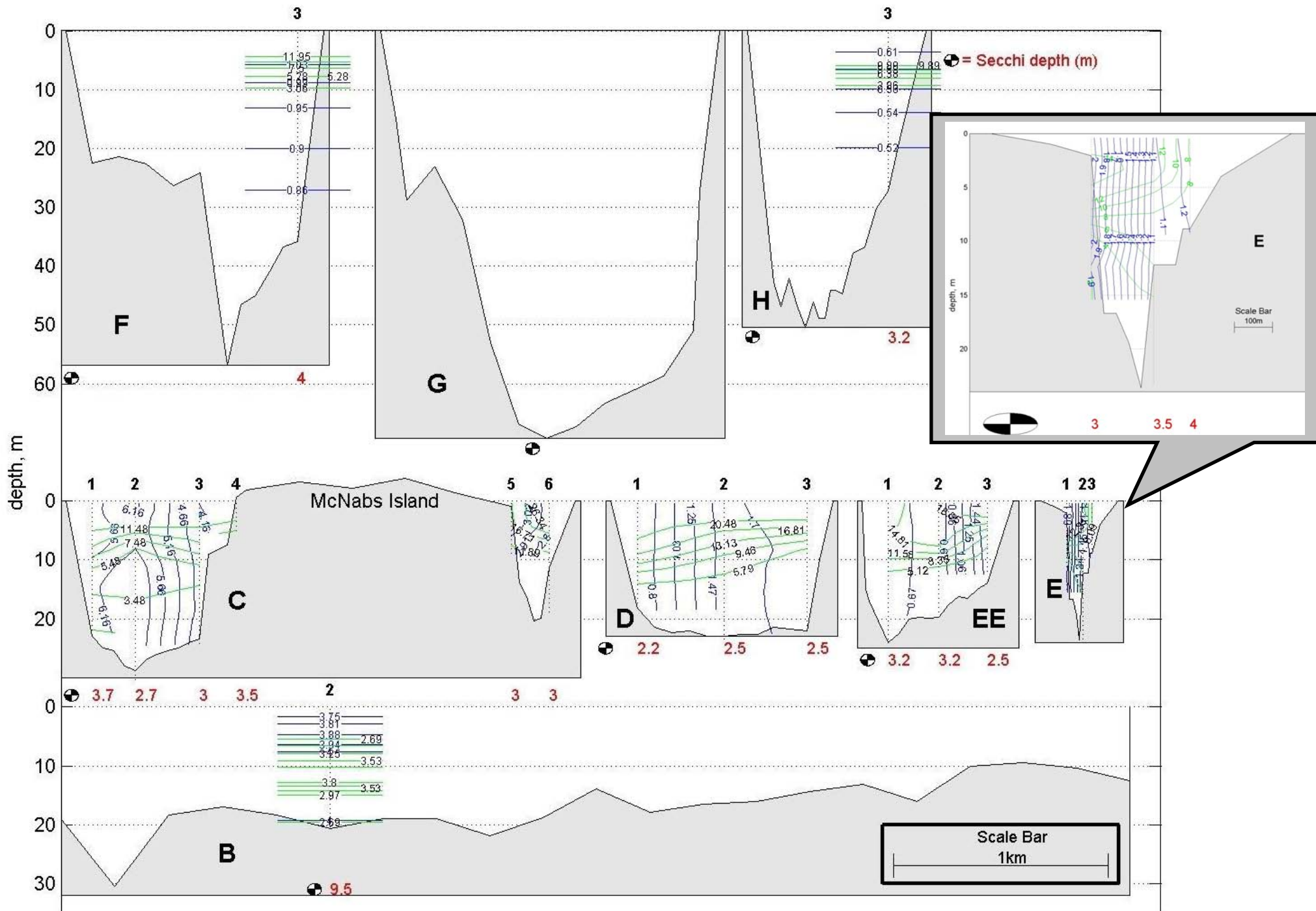
RAINFALL AND MEAN TEMP



CLOUD COVER



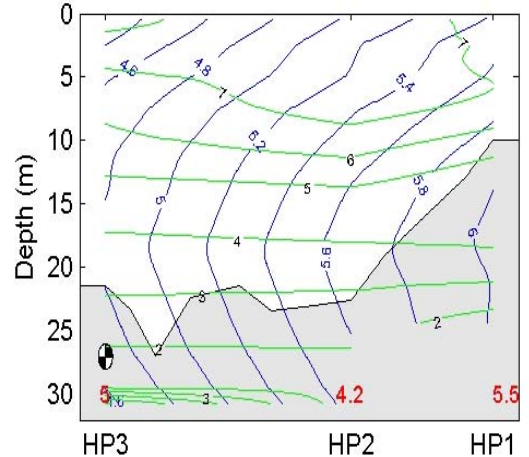
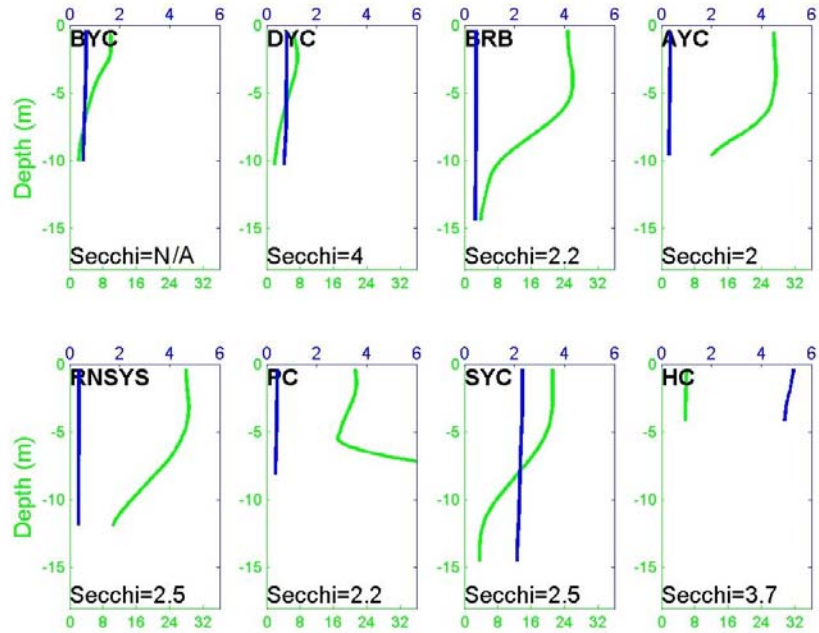
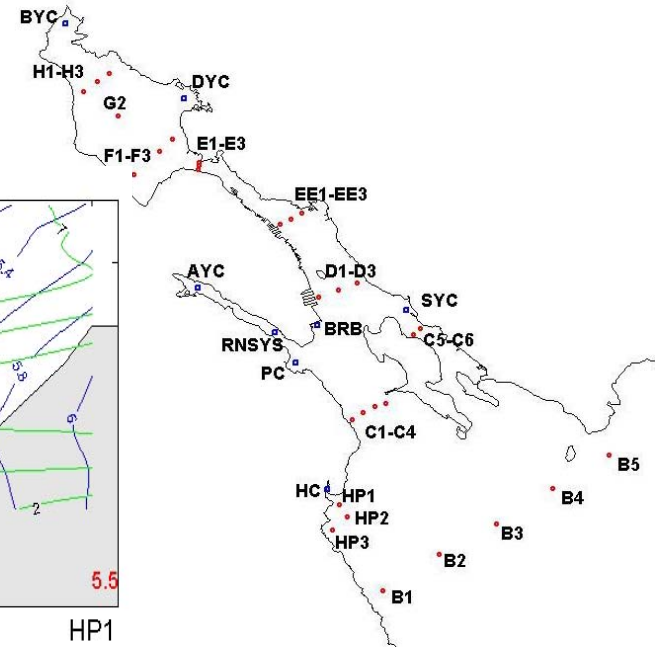
Fecal Coliform ● Above swimming limit 200 MPN/100mL
Enterococci ● Above shellfish limit 14 MPN/100mL
● Below limits 35 CFU/100mL 4 CFU/100mL



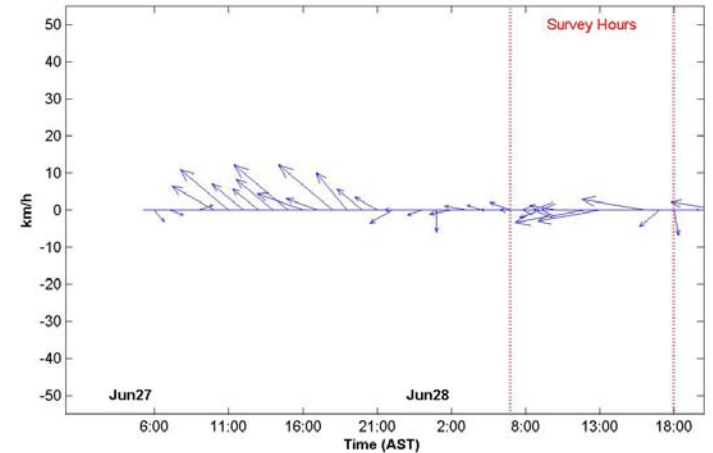
Yacht Clubs

DO in mg/L

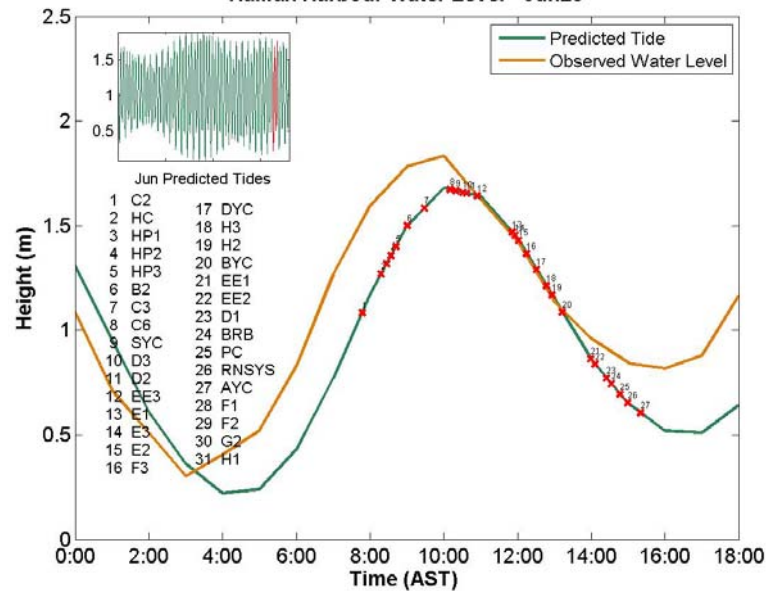
Chlorophyll in mg/m³



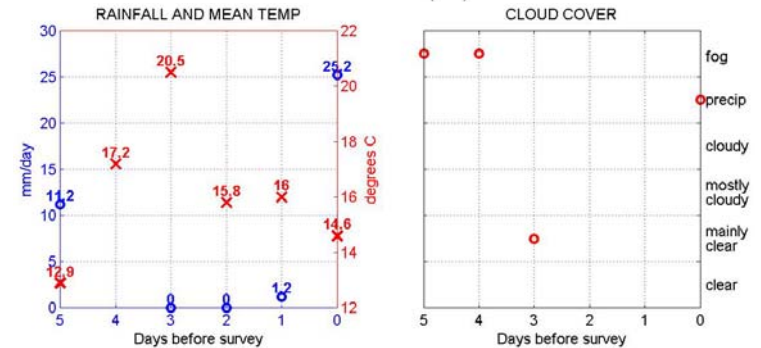
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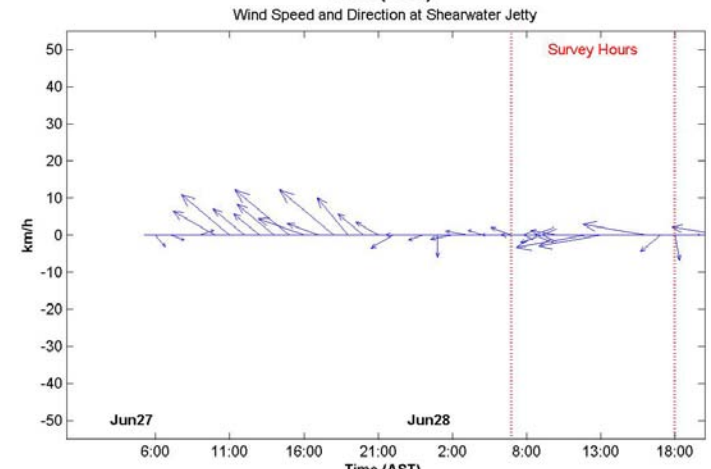
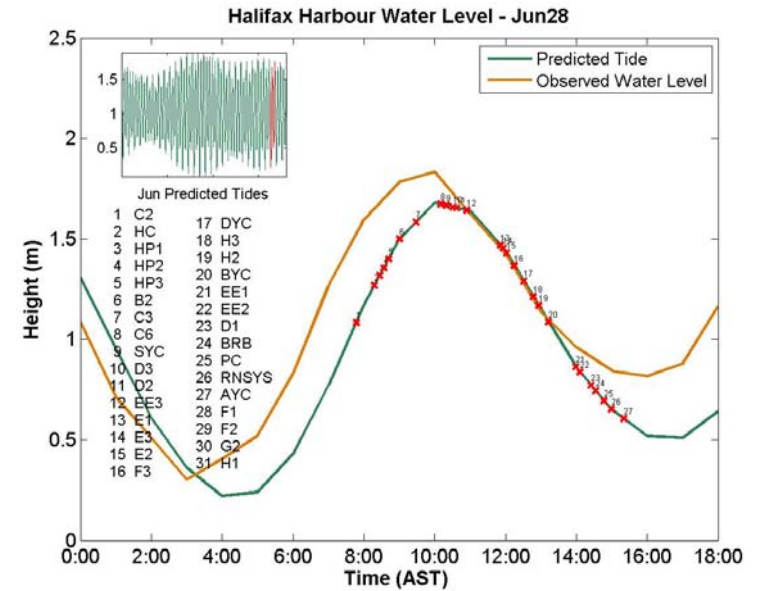
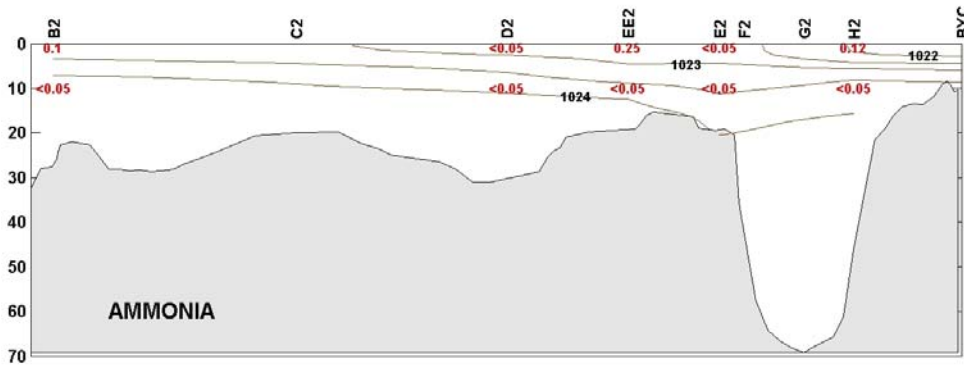
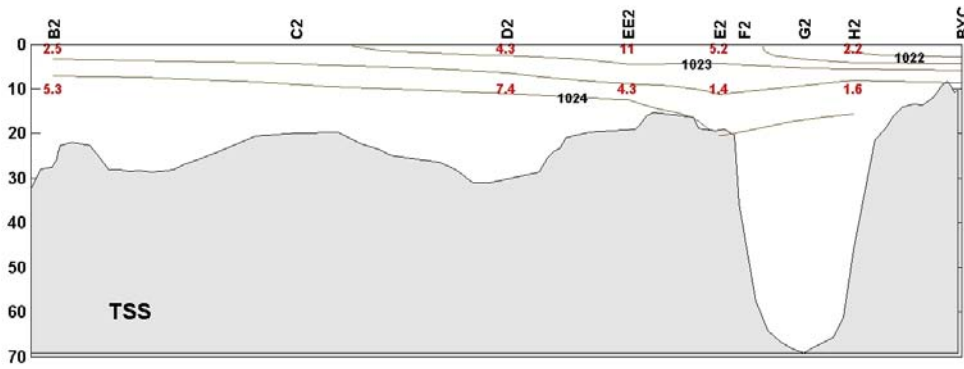


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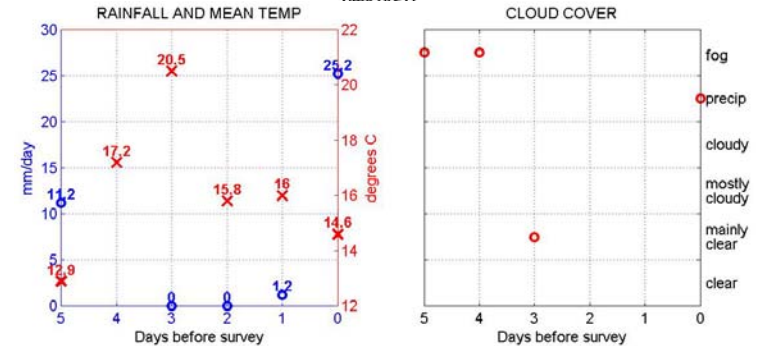


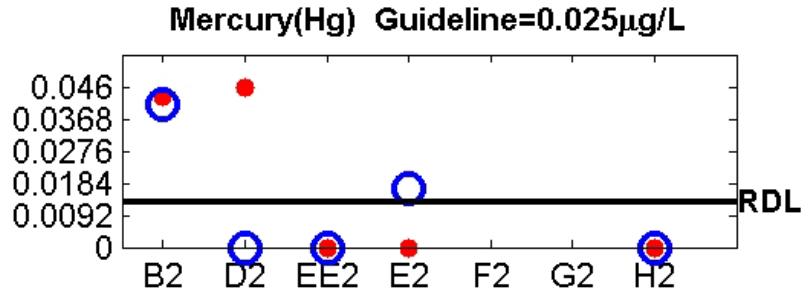
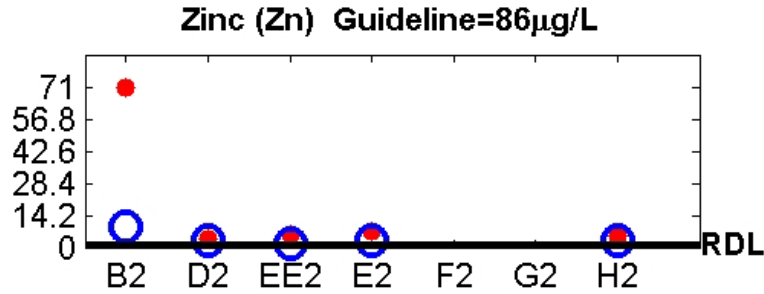
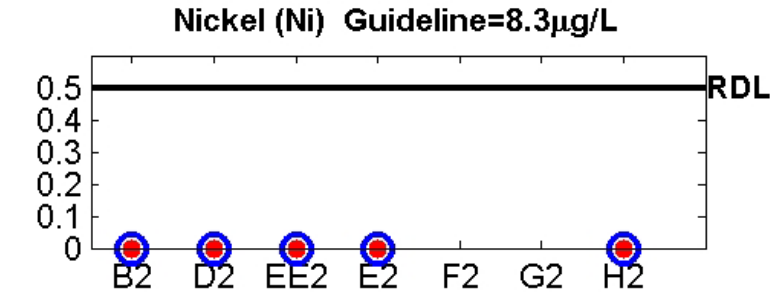
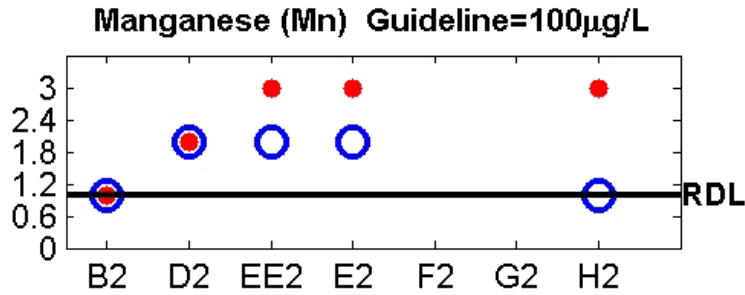
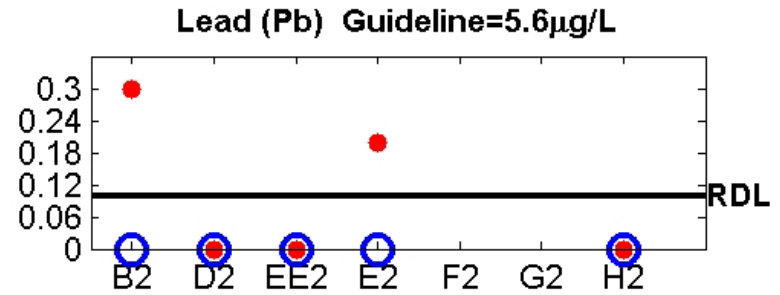
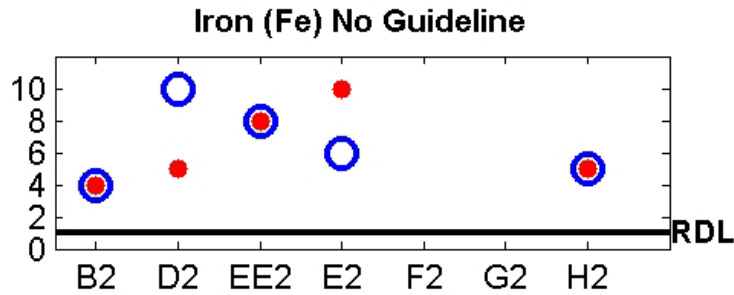
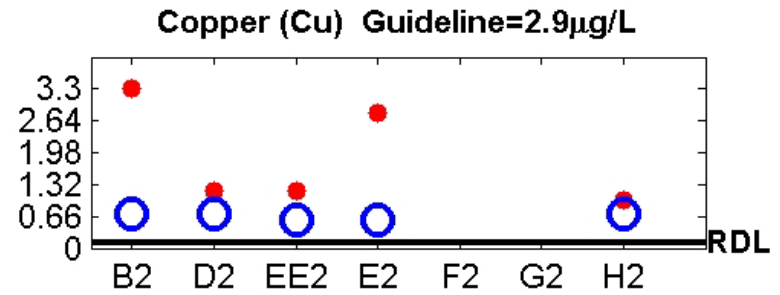
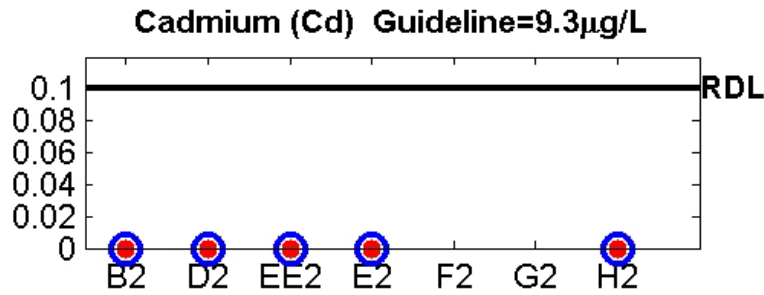
Rainfall and temperature data collected at Shearwater RCS.
Cloud cover data collected at Shearwater Airport





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○ = Ten Metre Sample
● = One Metre Sample
 RDL = Reportable Detection Limit
 0 = Not Detected

HRM Water Quality Monitoring Bacteria Summary – June 28, 2010

