

# Halifax Harbour Water Quality Monitoring Project

## Weekly Summary #103

**Survey Date:** 06 June 2006  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report103\_060606.doc  
**Data File:** HHWQMP\_data103\_060606.xls

**Data Return:**

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

**Sample Notes:**

There were several stations (BYC, C2, C3, HC, PC and RNSYS) where the CTD showed irregular signals during stabilization. The data appears valid and has been left in both the report and data files, but should be used with circumspection.

**QA/QC samples:**

Chemical Analysis		G2- 10m		
Detectable Parameter	units	reference sample	QA/QC	Dup
Ammonia (as N)	mg/L	0.05	0.08	NA
Total Suspended Solids	mg/L	3	5	4

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

Site	BRB-1m	C6-1m	B2-1m	G2-10m
Reference	750	28	6	68
QA/QC	66	72	4	18

**Comments:**

**General:** Significant rain in the five days before this survey (52.2 mm in total) has seemingly resulted in a strong freshwater signal in the southern Basin and Narrows. This signal is significantly stronger than that in the northern Basin. The surface water in the remainder of the Harbour has freshened by about 1PSU following the intrusion of more saline shelf water reported last week.

There is a construction-related diversion of the Duffus St. outfall to the Fairview Cove storm overflow. At the time of this survey this may not have started, or if it

had, the diversion was partial and/or sporadic. The exact diversion schedule is not known. This is a potential source of the fresher water in this area. This discharge could result in a strong surface signature because of the relatively low mixing in Fairview Cove, compared to the Narrows, where the discharge normally occurs. Alternately, there could be up-harbour surface flow due to the moderate up-harbour winds and/or density flow driven by the freshwater lens.

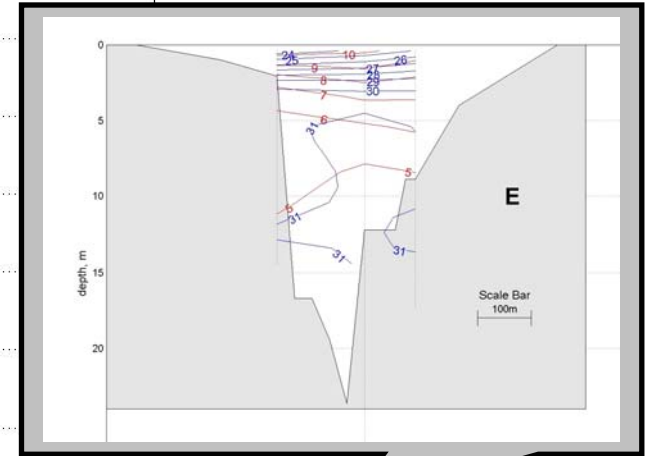
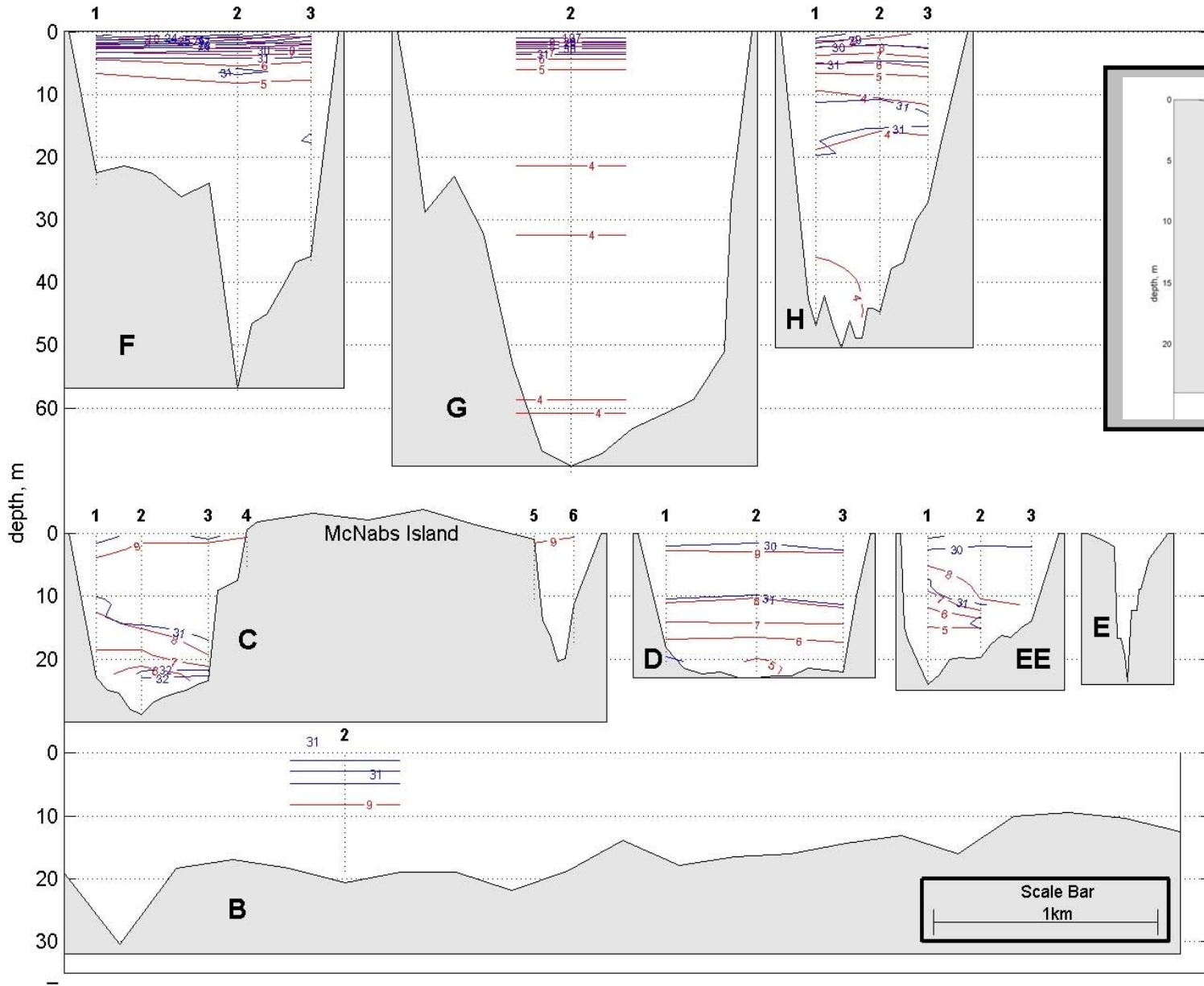
The coliform concentrations are very high in the surface water in the Inner Harbour and quite a bit lower in the 10m samples. The high surface values continue up into the Basin. This mimics the freshwater distribution. The intrusion reported last week was of water of similar or slightly greater density than the existing Basin bottom water. The intrusion doesn't seem to have replaced the bottom water directly, but rather mixed with intermediate and bottom water resulting in nearly uniform conditions in all parameters, including oxygen, below approximately 20- 30m. The minimum oxygen value (4.7 mg/L) is not at the bottom, but occurs at a depth of about 60 m.

**Fluorescence:** The maximum profile values are 25-26 mg/m<sup>3</sup> at about 3-5 m at sections E and F (Southern Basin and Narrows). The values are slightly lower in the centre of the Basin (about 16 mg/m<sup>3</sup> at G2) and recover to 22-26 mg/m<sup>3</sup> at section H. The max values drop monotonically from the Narrows to the Outer Harbour, at levels about 1.5 – 2 times higher than last week.

**Dissolved Oxygen:** The data indicates that the surface values decrease monotonically from just over 10 mg/L at the head of the Basin, to 7.8 mg/L in the Outer Harbour (B2). The vertical gradients are quite strong in the Inner Basin and become more vertically uniform going out of the Harbour. The profile is essentially uniform at B2. With the intrusion, the DO in the Basin bottom water has increased to around 5 mg/l, which is still below the 7 mg/l class SB guideline. The only other values below applicable guidelines are at B2, where the class SA guideline is 8.0 mg/L. The DO data is not ground-truthed and absolute values are questionable (see DO discussion in QR#1).

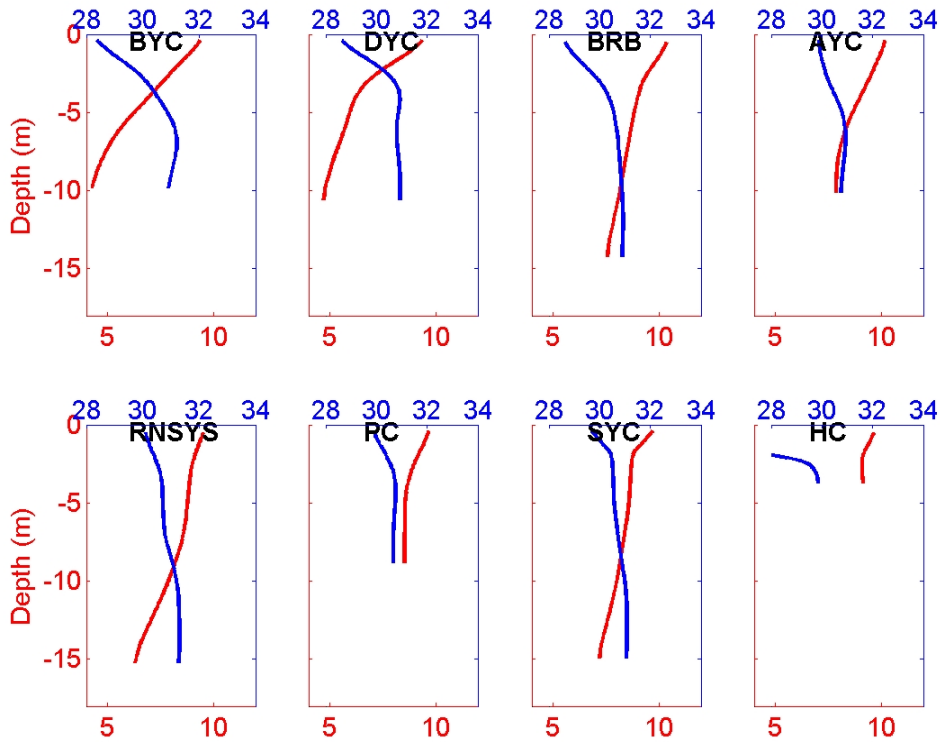
**TSS:** There are some relatively high (>10 mg/L) TSS values but there is no significant pattern.

**Ammonia:** The ammonia nitrogen values are relatively low. Half the values are below detection (0.05 µg/L) and the remaining values are only slightly higher (all < 0.08 µg/L). There does not appear to be a significant pattern.

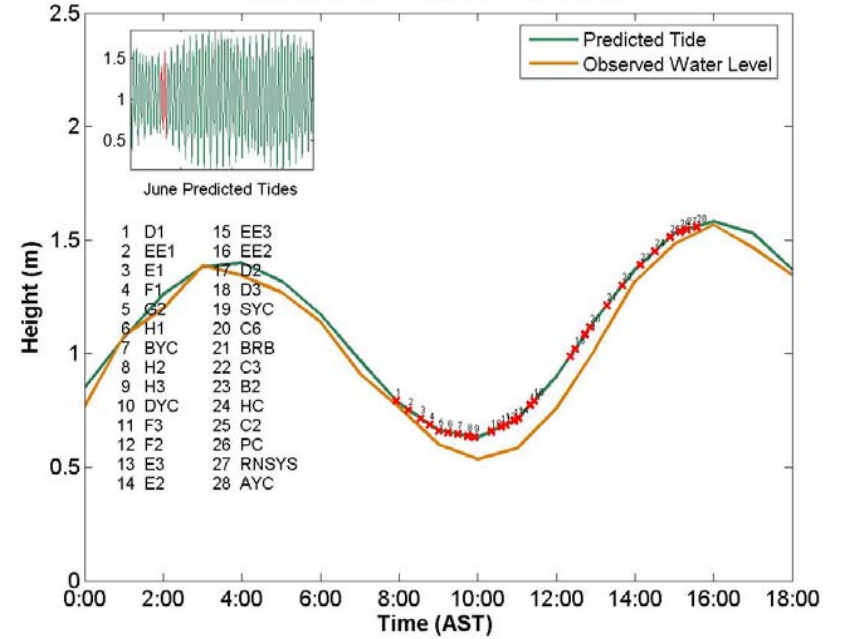


Unless otherwise labeled:  
 - salinity contour interval is 1 PSU  
 - temperature contour interval is 1°C.

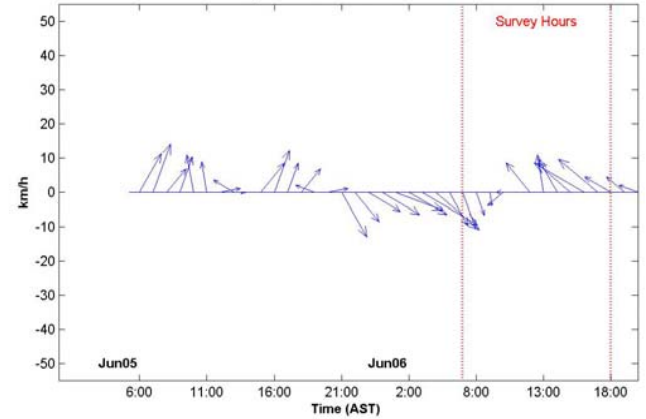
# Yacht Clubs



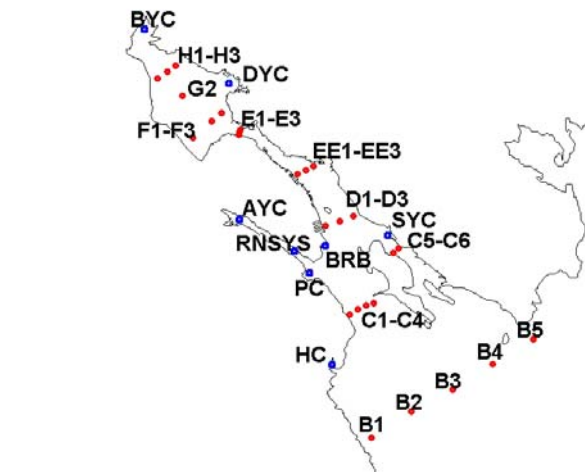
Halifax Harbour Water Level - Jun06



Wind Speed and Direction at Shearwater Jetty



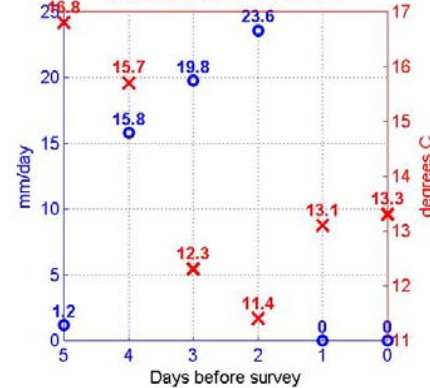
Weather data collected at Shearwater Autoport.



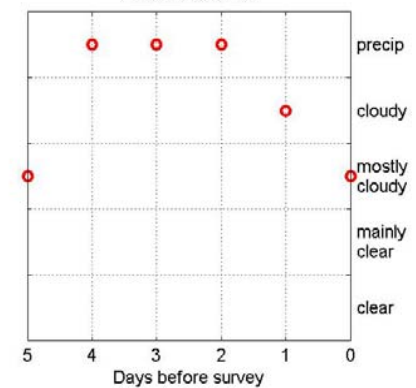
Salinity in PSU

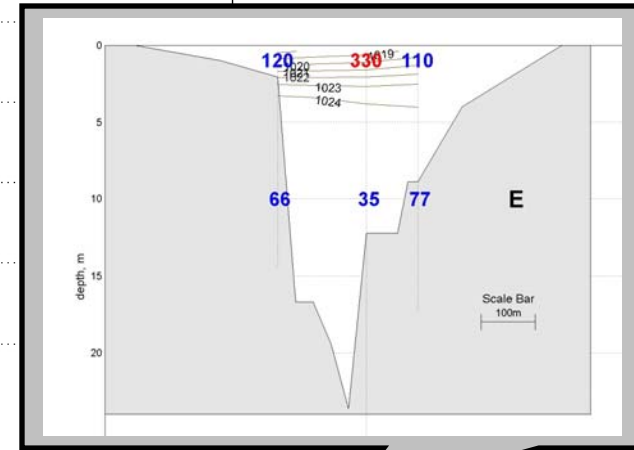
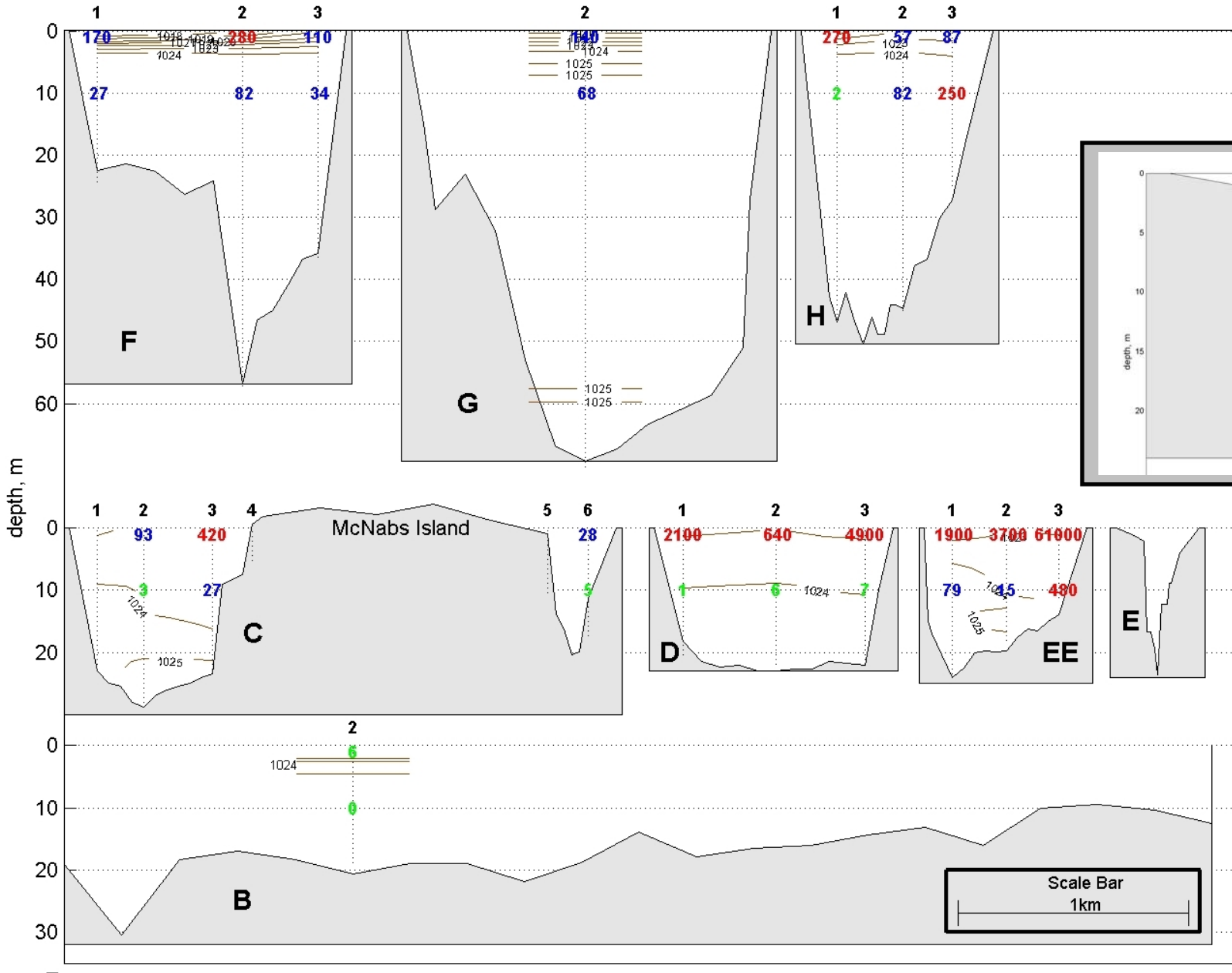
Temperature in °C

RAINFALL AND MEAN TEMP



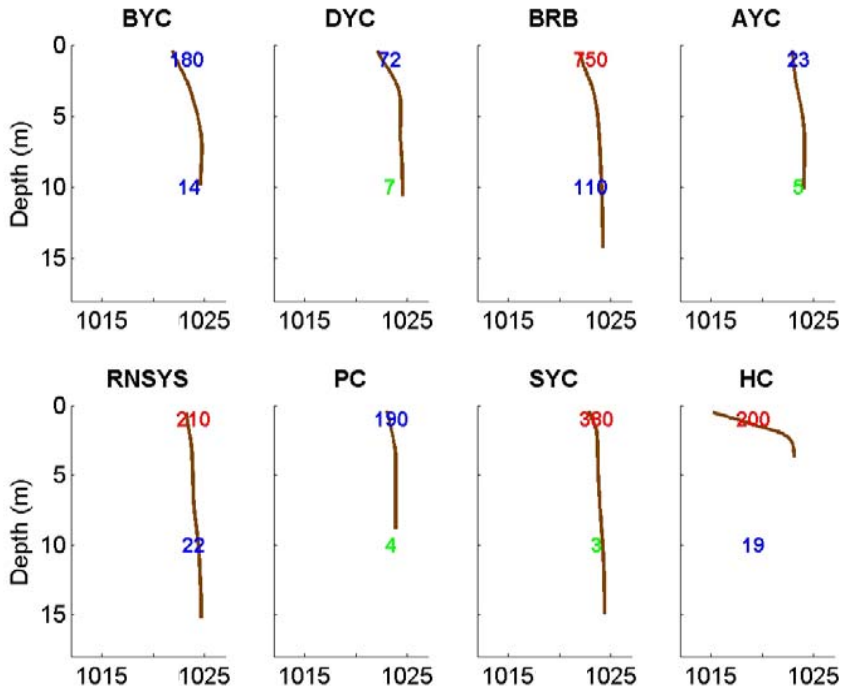
CLOUD COVER



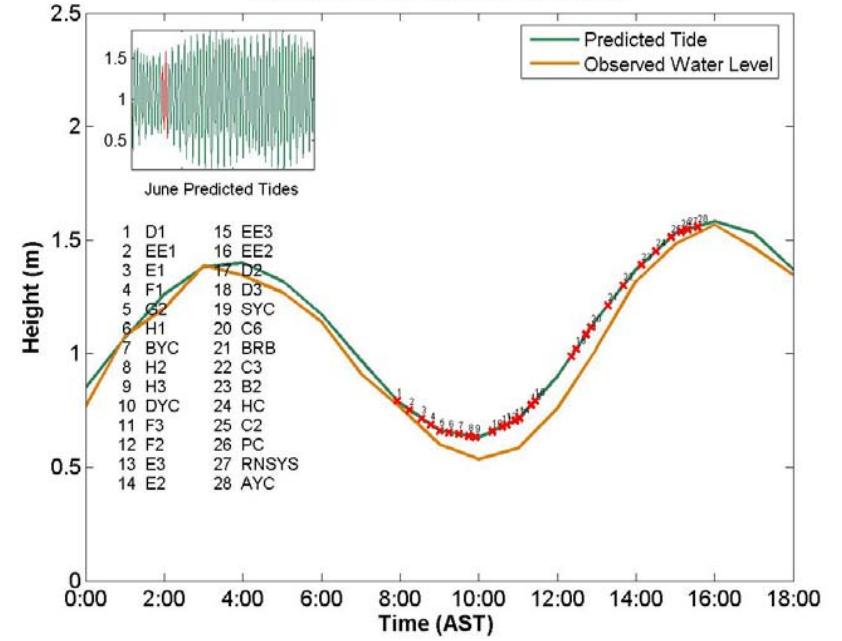


Unless otherwise labeled:  
 - **density** contour interval is 0.5 kg/m<sup>3</sup>

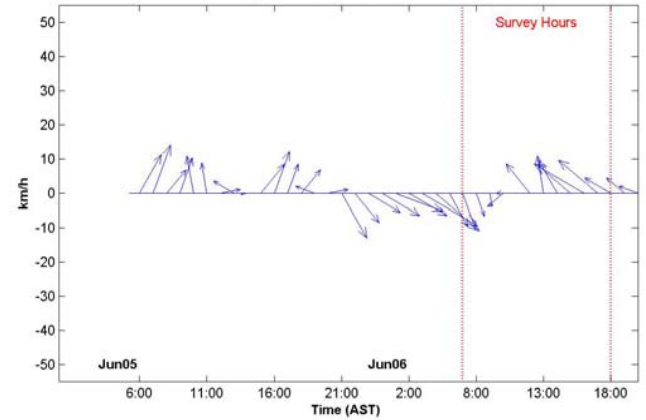
# Yacht Clubs



Halifax Harbour Water Level - Jun06

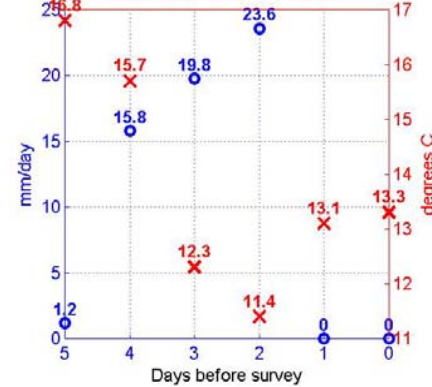


Wind Speed and Direction at Shearwater Jetty

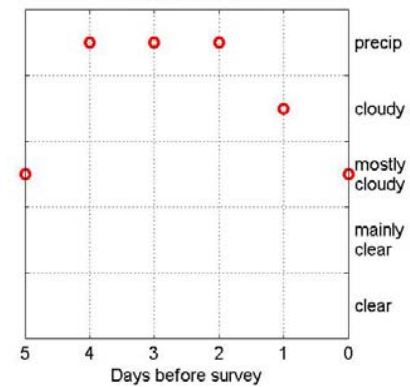


Weather data collected at Shearwater Autoport.

RAINFALL AND MEAN TEMP

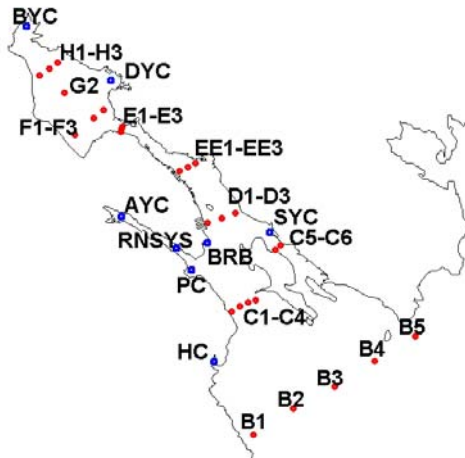


CLOUD COVER

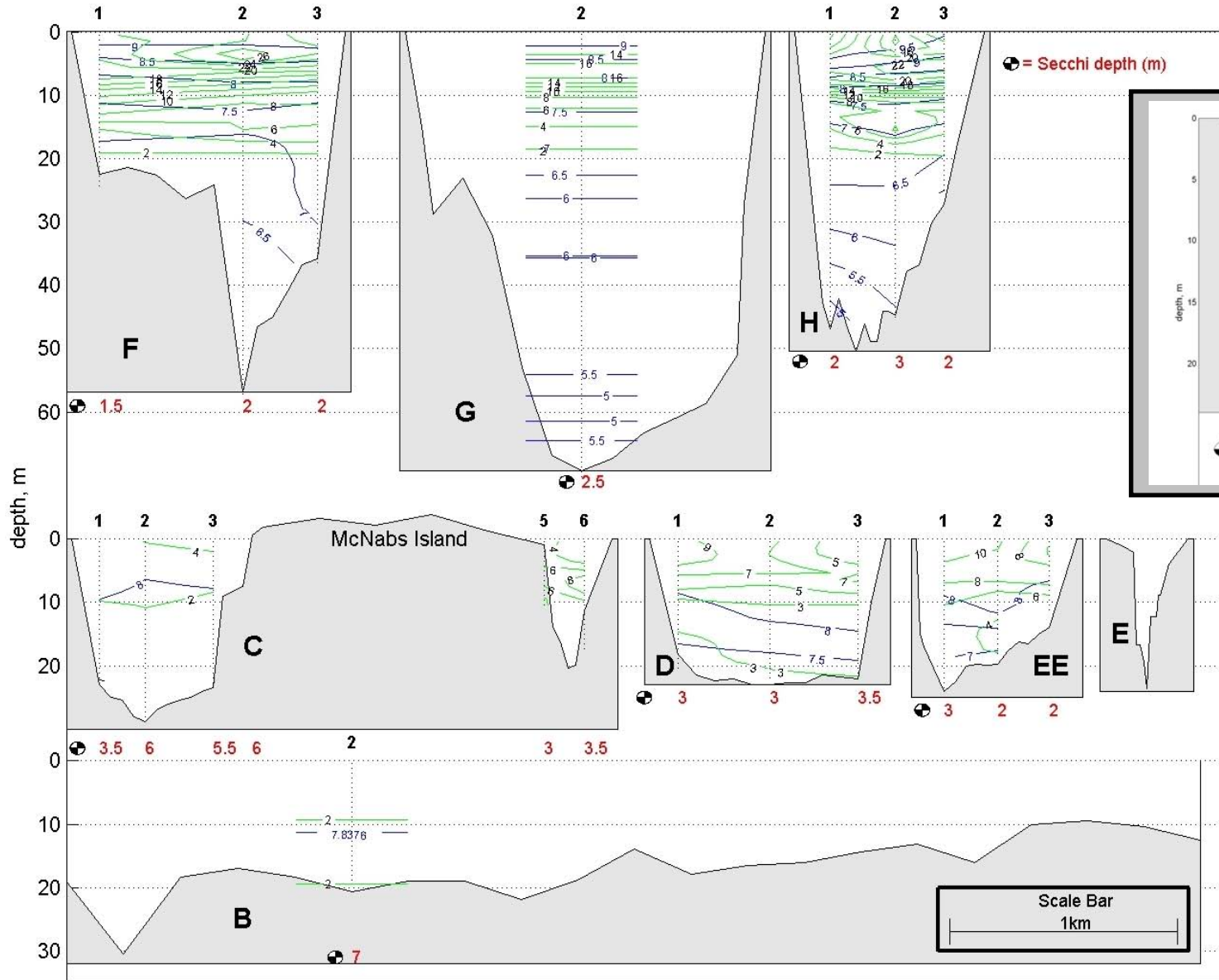


Potential Density in kg/m<sup>3</sup>

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

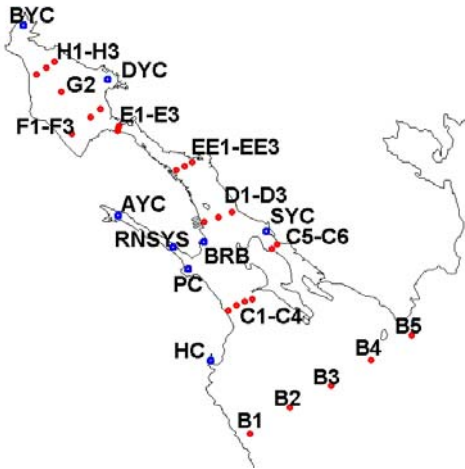
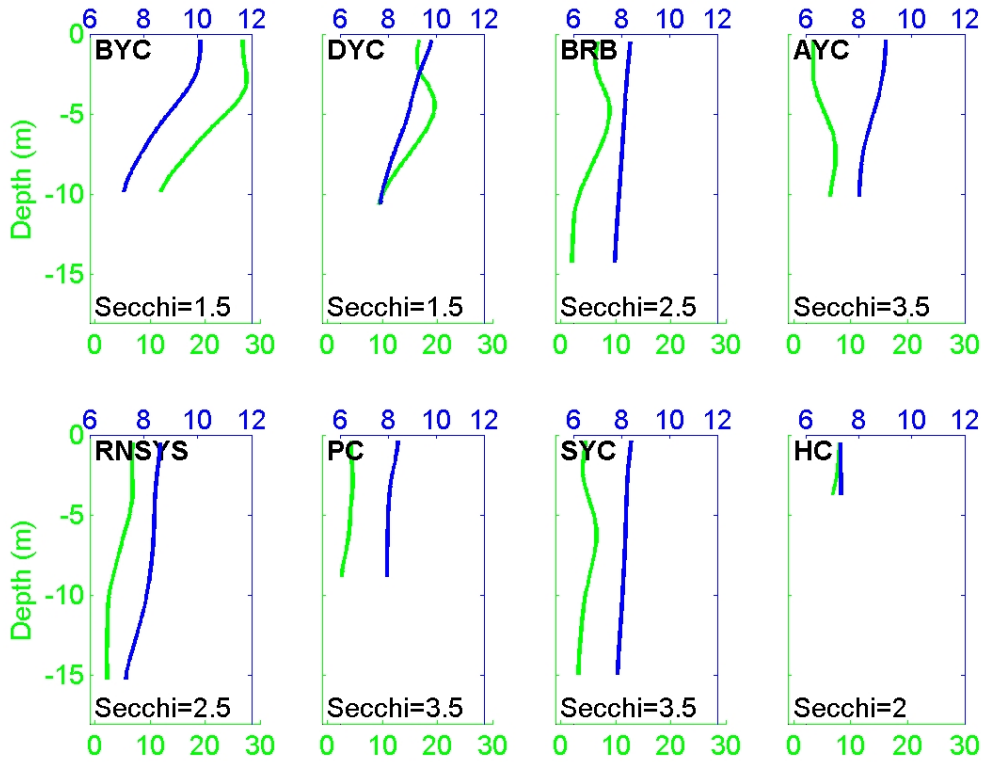






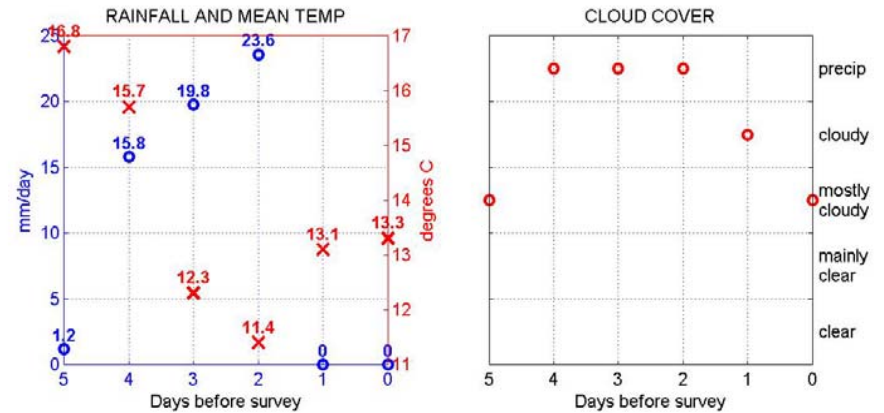
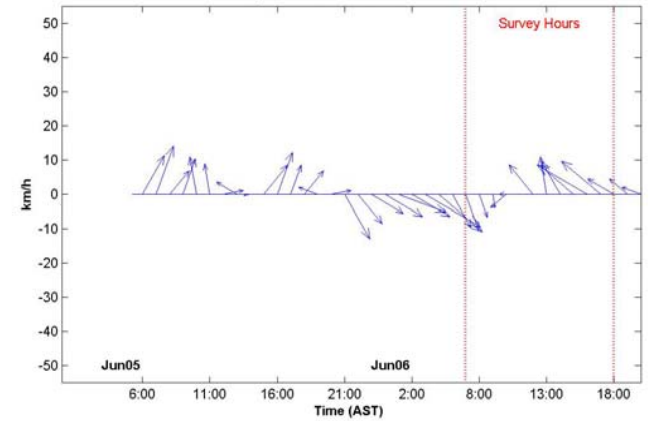
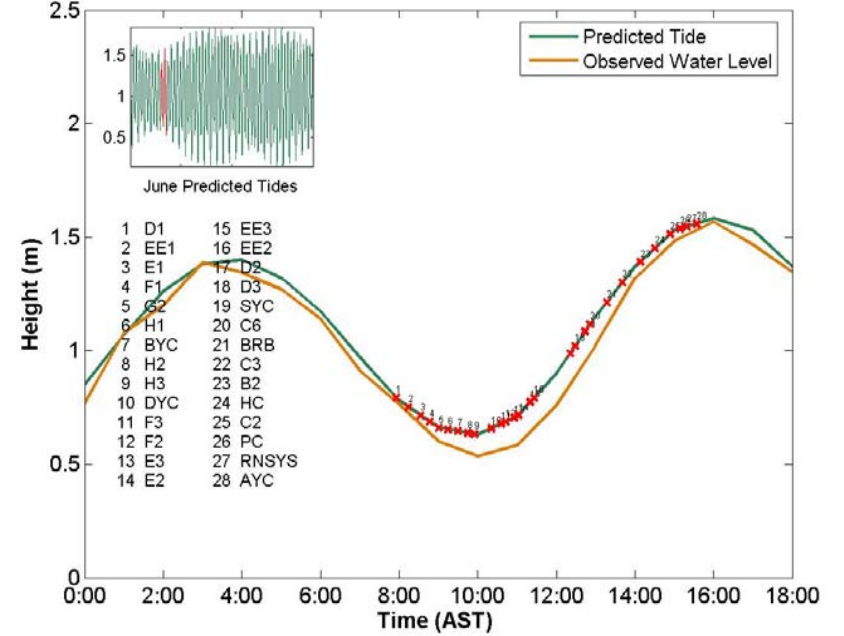
Unless otherwise labeled:  
 - **dissolved oxygen** contour interval is 0.5 mg/L  
 - **chlorophyll** contour interval is 2 mg/m<sup>3</sup>.

# Yacht Clubs

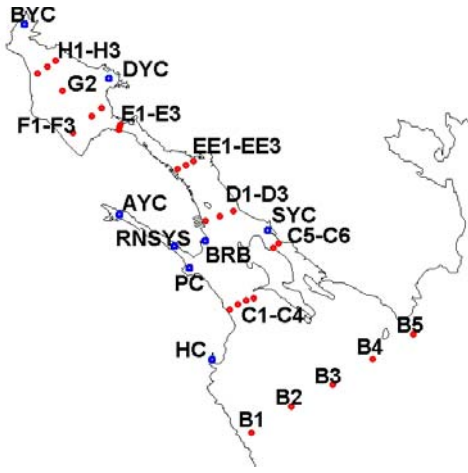
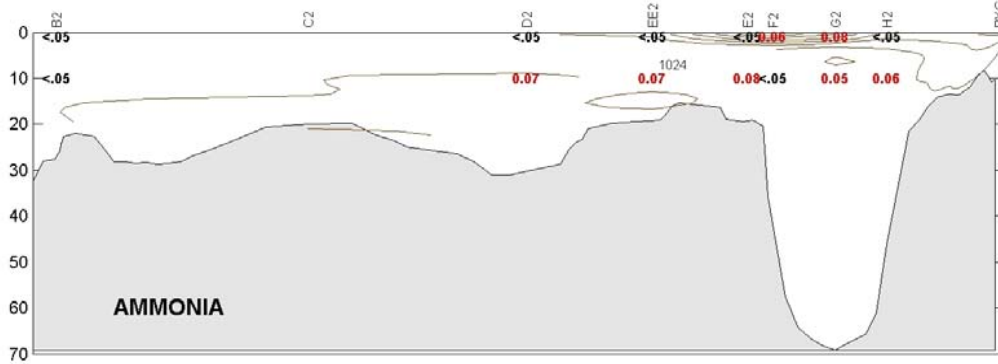
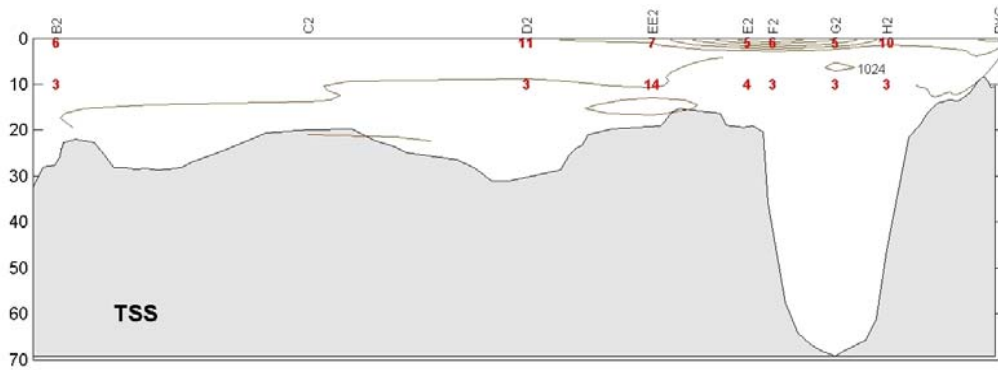


Weather data collected at Shearwater Autoport.

# Halifax Harbour Water Level - Jun06



CHEMISTRY



Weather data collected at Shearwater Autoport.

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

Ammonia in  $\text{mg/L}$

TSS in  $\text{mg/L}$

Halifax Harbour Water Level - Jun06

