

## **CMOP AUV-RW Cruise - R/V Forerunner Plan (Draft) – 08/02/2012**

**Purpose: To investigate the spatial and diel variability of *Mesodinium rubrum* bloom in the lower CRE using AUV and ship sampling.**

### **Personnel:**

Chief scientist: Craig McNeil (APL)

Co-CS: Ben Li (OHSU)

Missy Gilbert (OHSU)

Pete Kahn (OHSU)

Rachel Golda (OHSU)

Trina Litchendorf (APL)

Captain: Andrew Reay-Ellers (APL)

Captain: Bert (MERTS)

MERTS students

**General Timeline: After the bloom was fully developed in the main channels, preferably during neap tide, probably in late August or September (Fig. 1, Tidal chart).**

### **Day 1**

#### **R/V Inferno (small boat from APL)**

APL group deploy transponders in best location in North Channel. Transponders define the AUV playground and can't be moved easily. Usually deploy near slack, preferable. APL group will also test-run AUV.

### **Day 2**

#### **R/V Forerunner (OHSU group)**

#### **6:00-18:00 (12 hrs)**

0600: Depart Cooley Science Center

0730-0800: Arrive at MERTS, load ship and secure equipment before departure.

0800: Depart MERTS

0800-1730: Cruise duration (9.5 hours). Sampling coupled with AUV

1730-1800: Unload samples, dock in Warrenton

### **R/V Inferno (APL group)**

#### **8:00-18:00**

APL group deploy the AUV in the North Channel. The AUV line will be close to the transect stations of Forerunner. This provides data for in situ calibrations.

### **Day 3**

#### **R/V Forerunner**

#### **12:00 pm -12:00 am (12 hours)**

12:00 pm -13:00 pm: transit to the North Channel from Warrenton

13:00 pm – 10:00 pm: time-series sampling coupled with AUV in the North Channel (NC01, 02 and SAT01)

10:00 pm – 12:00 am: transit back to MERTS

#### **R/V Inferno**

The AUV will pass the Forerunner at anchor on a repeat survey and couple the time series on the Forerunner. The AUV will conduct repeat cross channel and along channel surveys, perhaps even a zig-zag up and down the channel. The transponders will be recovered at the end of day 3 or on Day 4.

### **Day 4**

Offload and drive back to Cooley Science Center/APL

**Table 1. STATIONS: (Suggested stations in bold)**

Station	Lat	Long	Description	Date
SC02	<b>46.208913</b>	<b>W123.77746</b>	<b>South Channel Transect 02</b>	<b>Day 2</b>
SC05	<b>46.192802</b>	<b>W123.85275</b>	<b>South Channel Transect 05</b>	<b>Day 2</b>
YB01	<b>46.17696</b>	<b>W123.87191</b>	<b>Youngs Bay 01</b>	<b>Day 2</b>
SC08	<b>N46.18975</b>	<b>W123.91230</b>	<b>South Channel Transect 08</b>	<b>Day 2</b>
SC11	<b>N46.21378</b>	<b>W123.95654</b>	<b>South Channel Transect 11</b>	<b>Day 2</b>
ML01	<b>N46.23671</b>	<b>W123.99881</b>	<b>Mouth Line 01 (Clatsop spit)</b>	<b>Day 2</b>
ML03	<b>N46.24501</b>	<b>W123.99933</b>	<b>Mouth Line 03</b>	<b>Day 2</b>
ML05	<b>N46.25457</b>	<b>W124.00055</b>	<b>Mouth Line 05</b>	<b>Day 2</b>
NC01	<b>N46.24100</b>	<b>W123.95650</b>	<b>North Channel 01</b>	<b>Day 2</b>
NC02	<b>N46.23500</b>	<b>W123.91230</b>	<b>North Channel 02</b>	<b>Day 2</b>
SAT01	<b>N46.23610</b>	<b>W123.87442</b>	<b>Saturn 01</b>	<b>Day 2</b>
NC01	<b>N46.24100</b>	<b>W123.95650</b>	<b>North Channel 01</b>	<b>Day 3</b>
NC02	<b>N46.23500</b>	<b>W123.91230</b>	<b>North Channel 02</b>	<b>Day 3</b>
SAT01	<b>N46.23610</b>	<b>W123.87442</b>	<b>Saturn 01</b>	<b>Day 3</b>
SAT04	46.203970	W123.757520	Saturn 04	
SAT03	46.200094	W123.939795	Saturn 03	

**Core measurements/Sample Collection:**

**Standard CTD package:** C, T, depth, altimeter, Seabird DO, Wetlabs FLNTU, Turner Cyclops PE, PAR sensor?, ADCP?

**Sample Collection:**

Hose attached to CMOP heavy CTD cage. Pump located on deck (Pacer S series electric pump)

Samples will be collected from Surface and Bottom.

Number of water samples:

Day 2: 28

Day 3: at least 12 in daytime and 4 in nighttime

Standard Sampling will include:

1. Nutrients: Ammonium, Nitrate + Nitrite, Nitrite, Silicic Acid, Ortho-Phosphate (syringe filtered, 30 ml Nalgene)
2. Total Dissolved Nutrients: Total Dissolved Nitrogen, Total Dissolved Phosphate (syringe filtered, 20 ml plastic vial)
3. Total Nutrients: Total Nitrogen, Total Phosphate (Raw water, 20 ml plastic vial)
4. Chlorophyll (GFF filter) – pump and filtration tower, duplicates
5. POC/PN (combusted GFF filter) – Use Dissolved Nutrient filters, record volume
6. DNA/RNA           4 L   (Peristaltic pump filtration, 0.2 um sterivex cartridge filter)
7. Microscopy       100 ml (PFA fixation for FISH and epifluorescent microscopy)  
                          100 ml (Lugol's fixation)
8. Flow cytometry    5 ml   (PFA fixation, liquid nitrogen flash freeze)

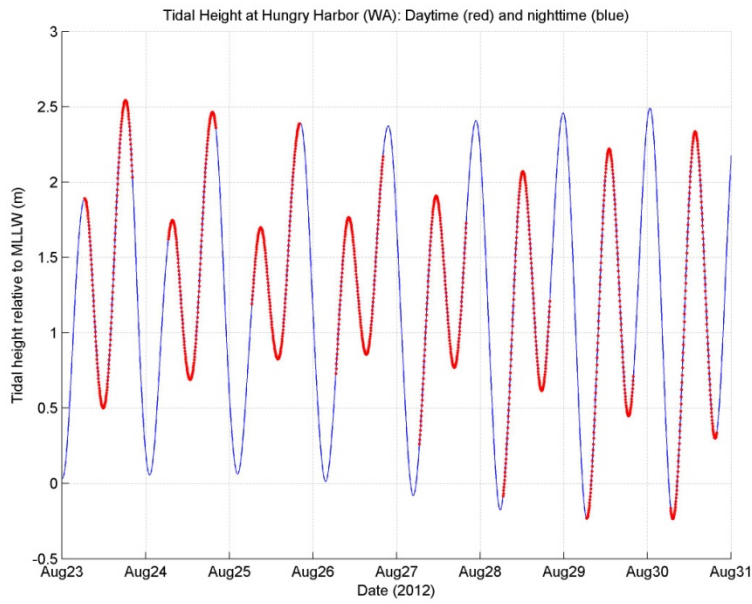
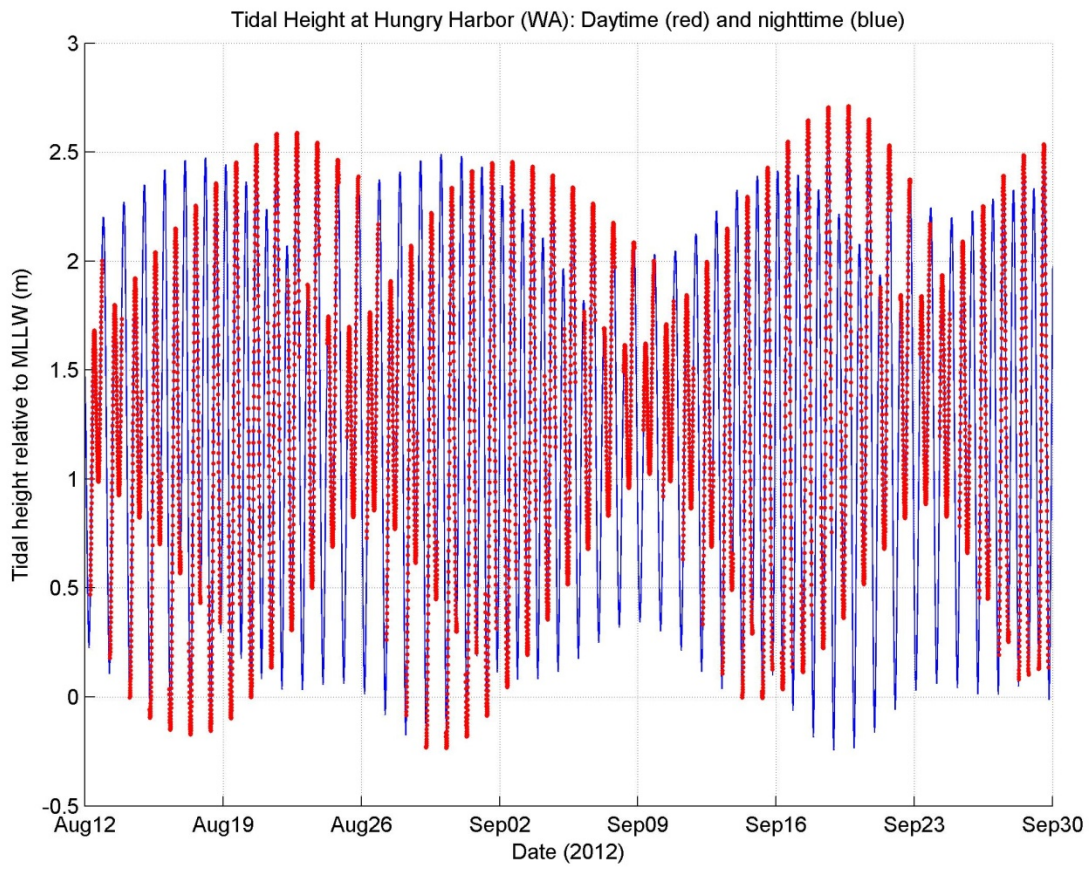
**HOTEL (four rooms in Comfort Inn)**

**Room 1: Pete and Ben**

**Room 2: Missy and Rachel**

**Room 3: Craig and Andrew**

**Room 4: Trina**



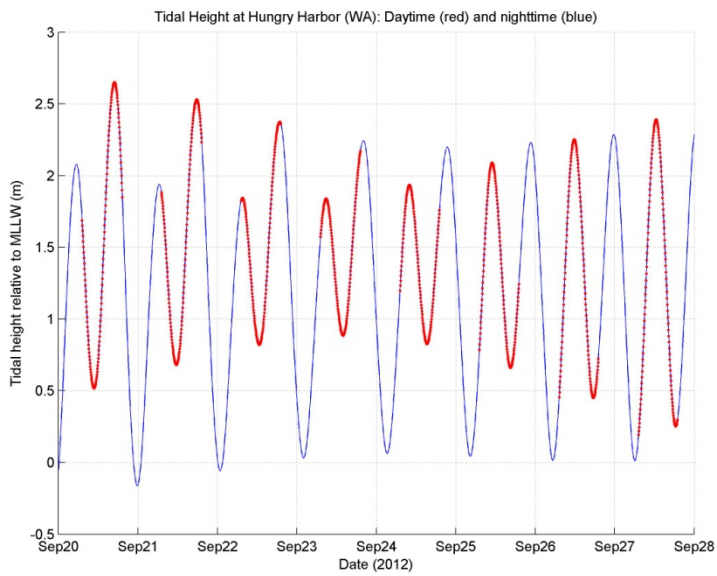
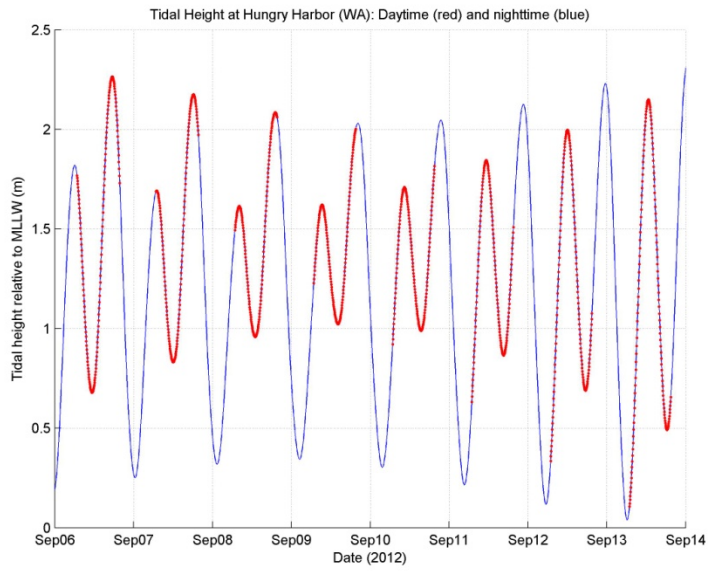


Figure 1. Tidal height at Hungry Harbor, WA with daytime in blue and nighttime in red.

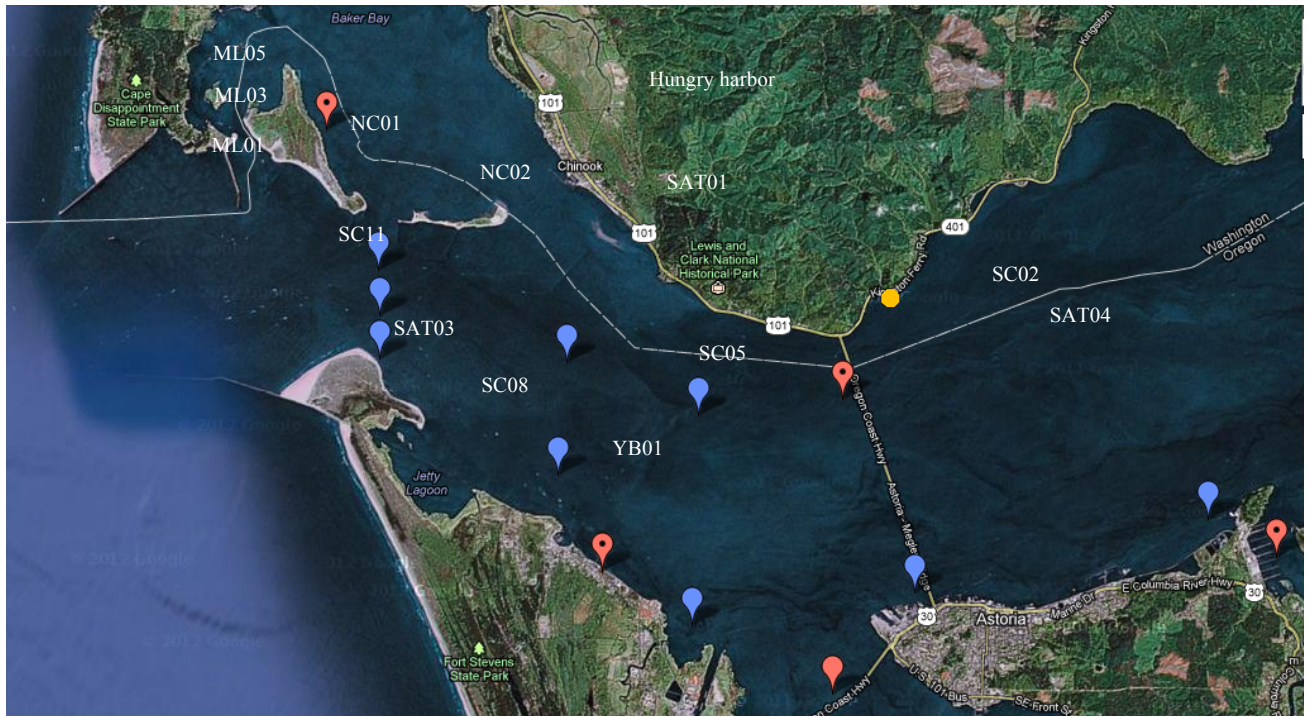


Figure 2. Location of stations listed in Table 1.