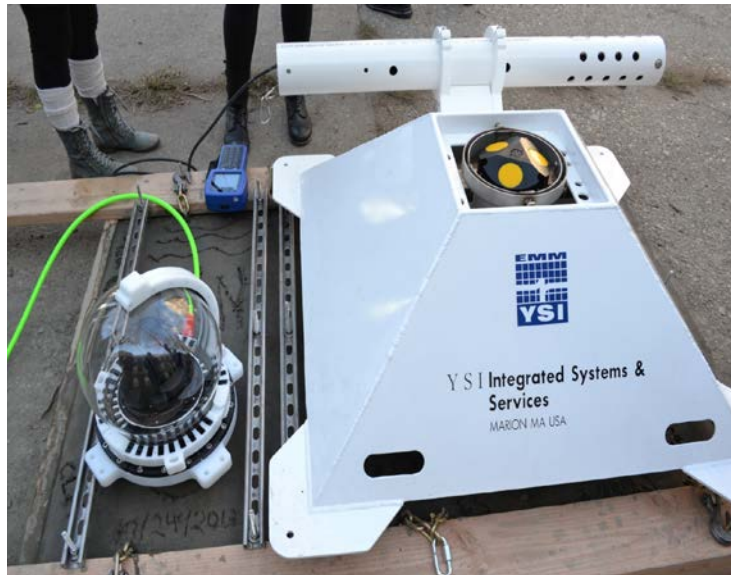


# Harbor Monitoring Platform

## Oyster Restoration

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## Abstract

Can a harbor monitoring platform be built and used to gather the correct data for a newly built oyster reef? A harbor monitoring station is one single place where you can gather water quality data and view what is going on down below the water using the camera. We will use a YSI *Inc.* EVO2 Water Quality Monitoring Sonde, to gather data and a SonTek Argonaut-SR multi-beam Doppler water velocity monitoring sensor, to study water currents the camera that used is a Wild Goose Imaging Clean Sweep 2 pan-tilt-zoom with self-cleaning.

## Introduction

Water is a very important substance in our lives and has been for a very long time. The goal of this project is to support the restoration of our water to what it once was in order to generate oysters the harbor. Oysters have historically been an important organism in the harbor and have become rarer in more recent years. This project is attempting to help restore the harbor to what

it once was. With this the placement of additional live oysters in the select locations in the harbor

### Materials

Materials	Quantity	use
Note book	1	For note taking
gloves	1 pair	For changing out the YSI
Wild Goose Imaging HD54-PTZ-Clean Sweep 2 pan-tilt-zoom self-cleaning underwater camera system	1	The camera needed to look below the water's surface
YSI Inc. EVO2 Water Quality Monitoring Sonde	2	To test water quality parameters
Xylem Inc. SonTek Argonaut-SR multi-beam Doppler water velocity monitoring sensor.	1	To measure the water velocity

## Procedures

### Installing the Harbor Monitoring Platform

- Transport concrete slabs from the back of the school to experiment location
- Use a pulley to lift concrete slabs up from the ground and place in the truck.
- Drive the concrete slabs over to the Yankee Pier and place the balloons on them
- Use the boat with the Crain to lower the blocks into the water to a location where so they can remain afloat in the water and are easier to move.
- Once the concrete slabs are lowered into the selected spot in the oyster reef, connect the existing cords to the Wild Goose Imaging HD54-PTZ-Clean Sweep 2 pan-tilt-zoom self-cleaning underwater camera system.
- The EXO2 Water Quality Monitoring Sonde and Xylem Inc. SonTek Argonaut-SR multi-beam Doppler water velocity-monitoring sensor.
- The YSI MUST BE CONNECTED UNDERWATER. This will make calibrating easier and is suggested by YSI Inc.

## Procedures for switching out YSI from Science Platform

- A scuba diver will go out first to bring up the take out YSI From under the water to be pulled on the boat
- The boat must drive out from the sea wall else at the beach, and to oyster reef with the Science Platform
- The scuba diver must be told to retrieve the YSI and bring the YSI to the boat.
- Once the scuba diver is out of the water, they will give the YSI to people on the boat and then switch the YSI
- The YSI must be disconnected from the cord and put in its storing case until the next time it is needed
- The undeployed YSI will be connected to the cord and with its storage casing taken off be ready to be brought down underwater
- Lastly, the scuba diver will bring the YSI underwater and put it back into its casing.

## Calibration

### Calibration set up

For correct results, carefully rinse the EXO calibration cup with filtered water, and then rinse with a small amount of the calibration Standard for the sensor you are going to calibrate. Once done throw away the standard rinse, and refill the calibration cup with fresh calibration standard to the fill line. For the smaller sensors fill it to the second, for the bigger ones fill it to the first. And last tighten the calibration cup you can do this for the following Conductivity PH and Turbidity

### Calibrating pH

To calibrate pH Select the 3-point option to calibrate the pH probe using the three calibration standards. The 3-point calibration method assures maximum accuracy because you're using all calibrations solutions. Pour the correct amount of pH solution starting with pH 4.00 the 7.00 and then the 10.00

### Calibrating conductivity

Place the correct amount of conductivity solution in an EXO calibration cup and carefully submerge the probe into the solution; Make sure the standard is above the vent holes on the conductivity sensor. Rotate and move the sonde up and down to remove any bubbles from the cup. In the Calibrate menu, select Conductivity, and then a second menu will appear offering the options for calibrating conductivity. Enter the value of the standard used during calibration.

Once done then Click "Start Calibration". Look at the readings under the categories Current and Pending data, once stable, clicks apply to accept the calibration.

### Calibrating Dissolved Oxygen

Place the sonde with sensor into either saturated air or saturated water making sure there are no water droplets on DO sensor. Place sensor into calibration cup containing about 1/8 inch of water with the sonde vented by the loose threads of the cup. Do not seal the cup to the sonde. In the Calibrate menu, select ODO and then select ODO %. Click the one point calibration and enter the standard value. Click "start calibration" look the readings under Current and Pending data points once stable click apply to accept the calibration.



## Locality

The location will be on Governors Island. The HMP will be placed at the GI oyster restoration site, Buttermilk channel. The proposed exact location of HMP is :

40.687506, -74.013606



### **Observations and results**

Building the platform is possible with the right materials and measurements. In order to accommodate all parts of the platform experiment must be 35-5/8" wide and wise 50-5/8" long. A 100' long cord must reach from the platform to the data station is. On Saturday 5/17/14 the procedures for submerging the platform was tested and, with the help with harbor schools CTE vessel opps and scuba divers was successfully placed in the water.

### **Conclusions**

The final design developed for the HPM is suitable for reaching and monitoring the oyster reef down below in the water. It is dimensionally correct. The selected site works because it is accessible via the beach and convenient to the Harbor School.

## Bibliography

Experimental Restoration of an Intertidal Oyster Reef in Wellfleet,  
Project Work Plan for Wellfleet Harbor Oyster Spawning Project, April 2011  
RESTORING GULF OYSTER REEFS, June 2012  
OYSTER RESTORATION RESEARCH PROJECT (ORRP) FINAL TECHNICAL REPORT (2009-2012)  
Harbor Monitoring Platform (HMP) 2013

## Annexes

Typically used in calibrations for NYCDEP. More detailed descriptions may be found at [www.exowater.com](http://www.exowater.com)

YSI Part #	Calibration Solutions (1 pint of each used for each calibration)
607200	Calibration Standard, Turbidity, 124 FNU (1 gallon)
603169	Calibration Standard, Conductivity, 50,000 uMhos/cm (1 box of 8-1pint bottles)
603824	Calibration Standard, pH Buffer, Assorted Case (2 ea. Pints of 4, 7, 10)

YSI Part #	Anti Fouling (used as needed, typically 2-3 or more months per application)
599521	EXO2 Saltwater/coastal anode guard weight (installs on antifouling sonde guard)
599867	Anti-fouling copper screens for conductivity/temperature sensor (2)
599595	EXO Saltwater anode kit (installs in sensor port)
616189	Copper tape for water quality sondes and sensors provides biofouling protection and extends deployments
599673	EXO2 Wiper brush assembly kit
	D Batteries