

King County's Remote Automated Marine Water Quality Program

The Sonde and the Fury

Presentation Outline

- Program Goals
- Equipment/Sensors
- Water Quality Station Locations/Installation
 - Seattle Aquarium
 - QMHYC/Dockton Park
 - Quartermaster Harbor Entrance Buoy
 - Dredging/Construction Monitoring
- Quality Control
 - Monthly Routine Maintenance/Calibration
 - Biofouling

Project Goals

- Collect high-frequency water quality data in Puget Sound for the evaluation of natural variability on tidal, daily, and monthly time scales.
- Supplement King County's monthly Marine Ambient Offshore Program.
- Water quality monitoring during construction projects.
- Provide near real-time water quality and meteorological data to the scientific community/public.

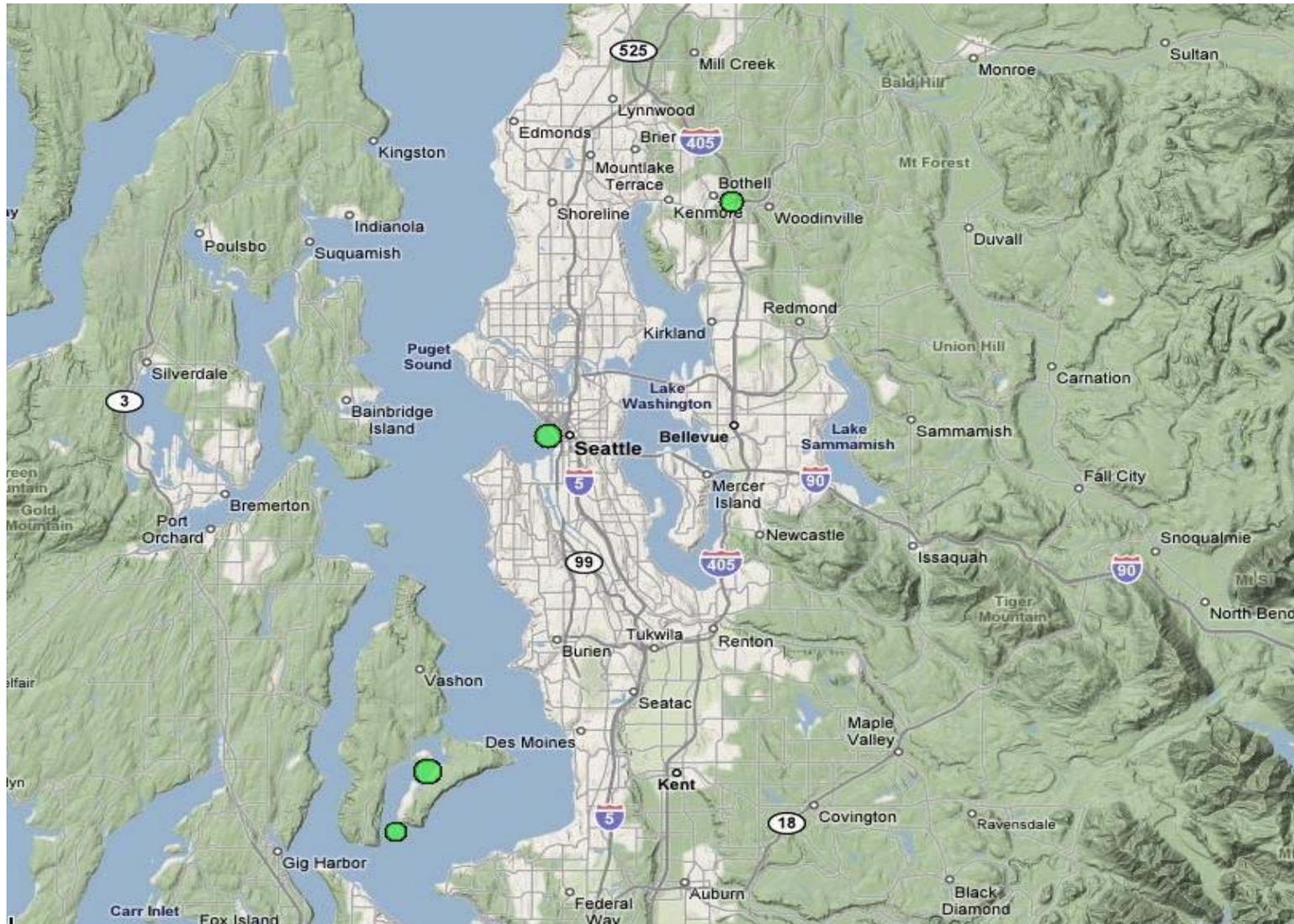
Capital Purchase

- Four YSI Econet Data Systems
 - Includes datalogger, cell phone modem and antenna, all SDI-12 communications.
- Four Visala Weather Stations
 - air temperature
 - relative humidity
 - barometric pressure
 - wind speed and direction
 - rainfall
- 18 YSI 6600 V2 Sondes
 - Includes temperature and conductivity and depth sensors
- 18 Optical Probes for each parameter
 - dissolved oxygen
 - fluorescence (chlorophyll)
 - turbidity
- 18 pH Probes
- 5-50' Cables, 3-100' Cables
- Some installation hardware

YSI 6600 V2 EDS Sensor Specifications

Sensor	Range	Resolution	Accuracy
Temperature (C)	-5 to 50	0.01	+/- 0.15
Conductivity (mS/cm)	0 to 100	0.001 to 0.1	+/- 0.5% of reading
Salinity (PSS)	0 to 70	0.01	0.1
Depth (m)	0 to 61	0.001	+/- 0.12
Dissolved Oxygen (mg/L)	0 to 50	0.01	+/- 0.1
Turbidity (NTU)	0 to 1,000	0.1	0.3
pH	0 to 14	0.01	+/- 0.2
Chlorophyll (ug/L)	0 to 400	0.1	Detection Limit – 0.1

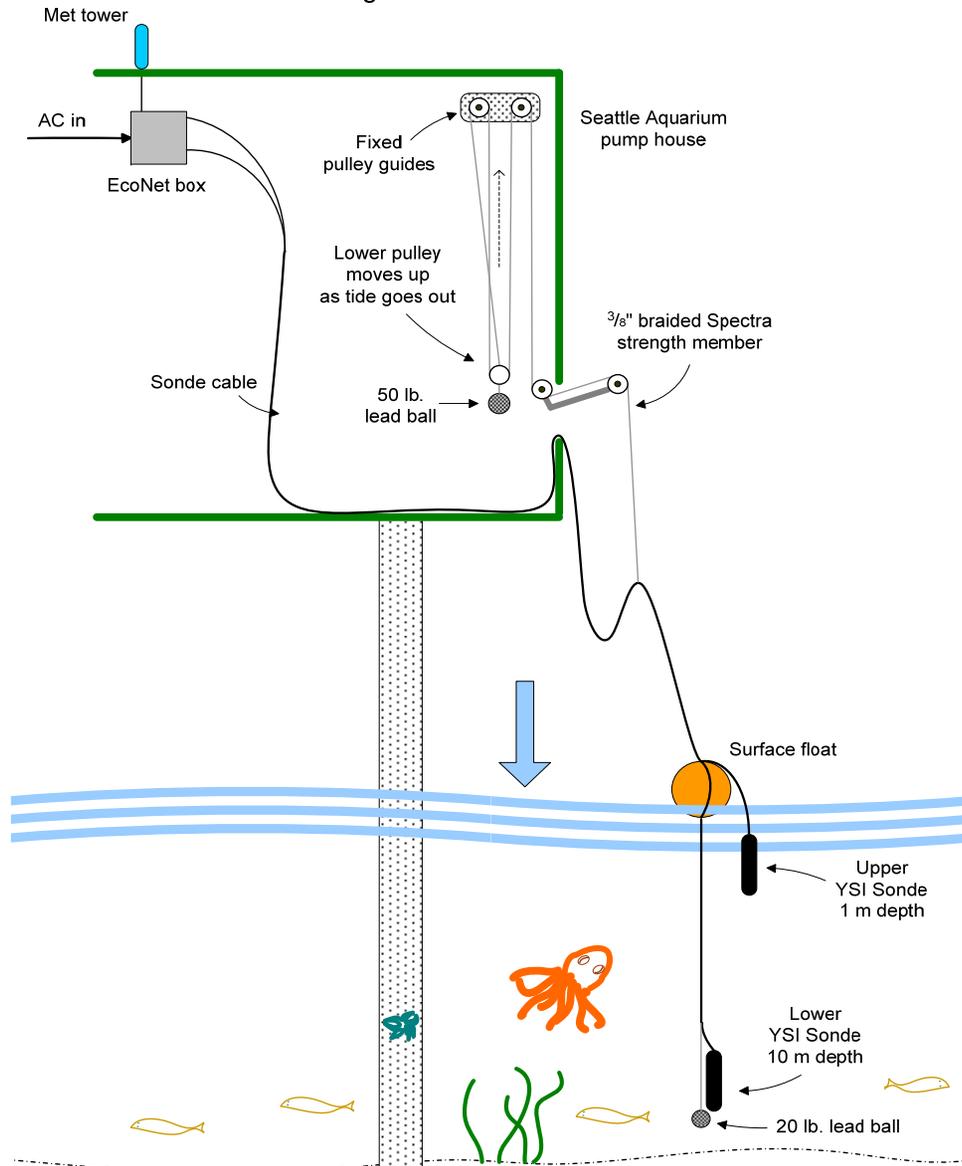
Locations



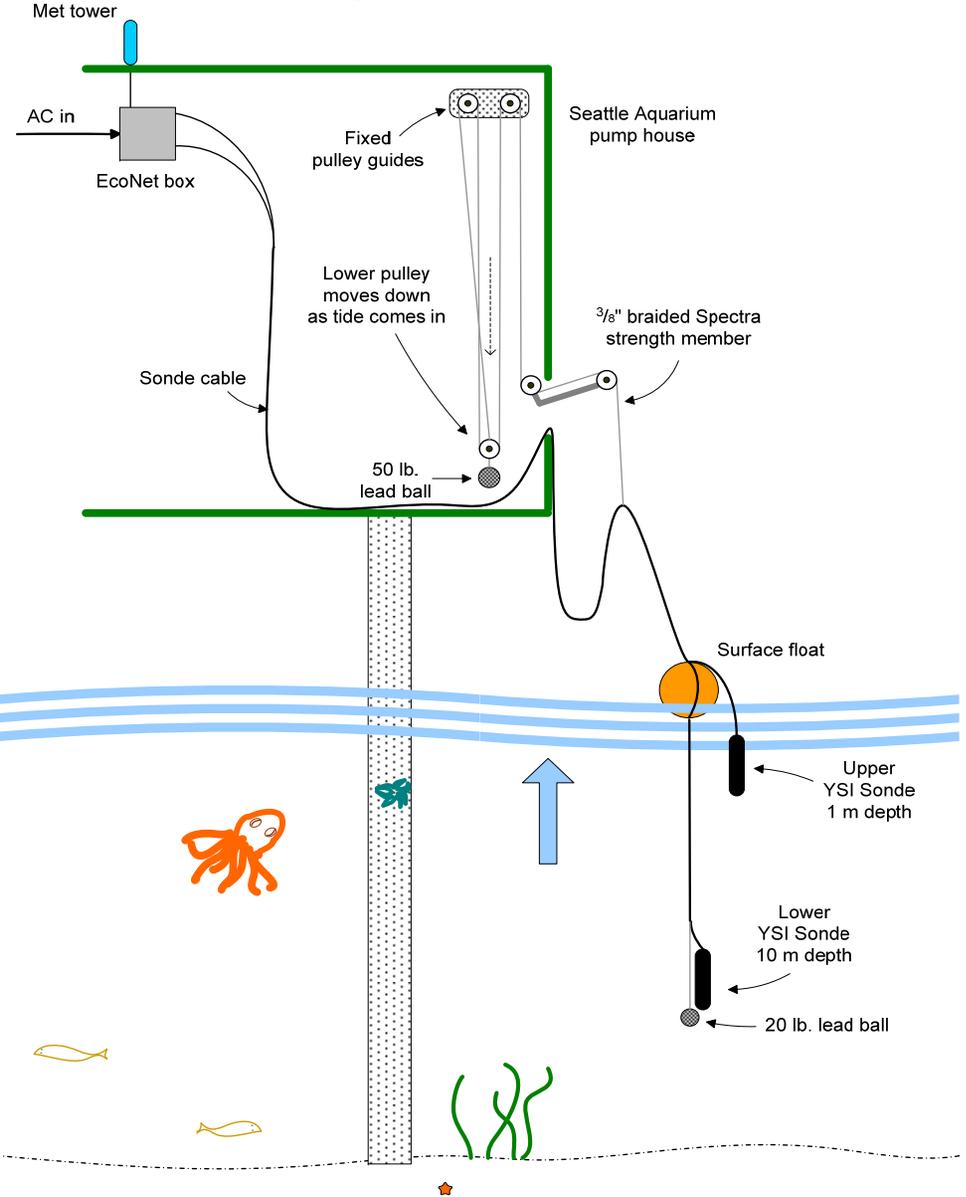
Seattle Aquarium



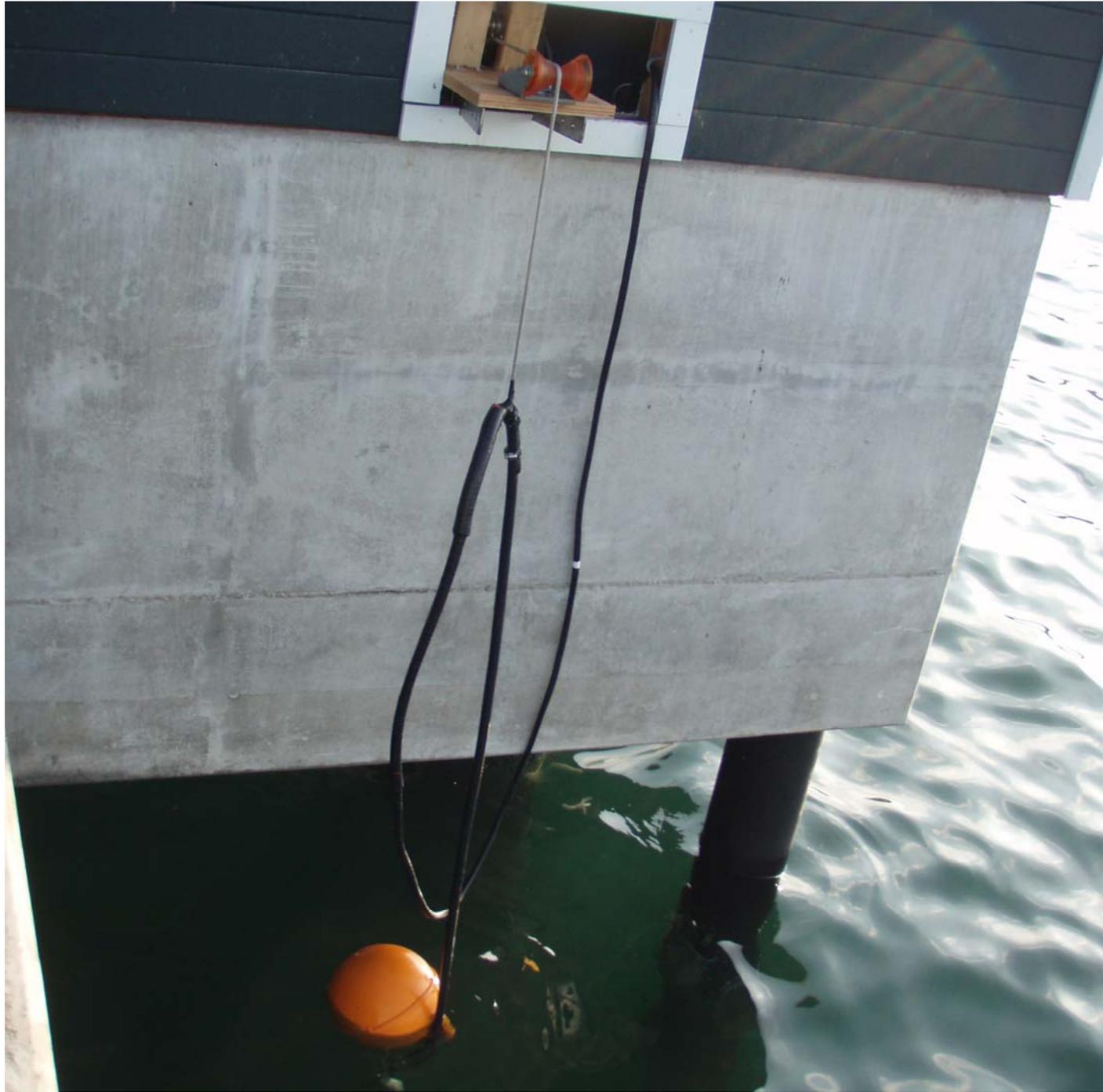
Seattle Aquarium YSI Buoy Design
at Low Tide
~King Co. Environmental Lab~



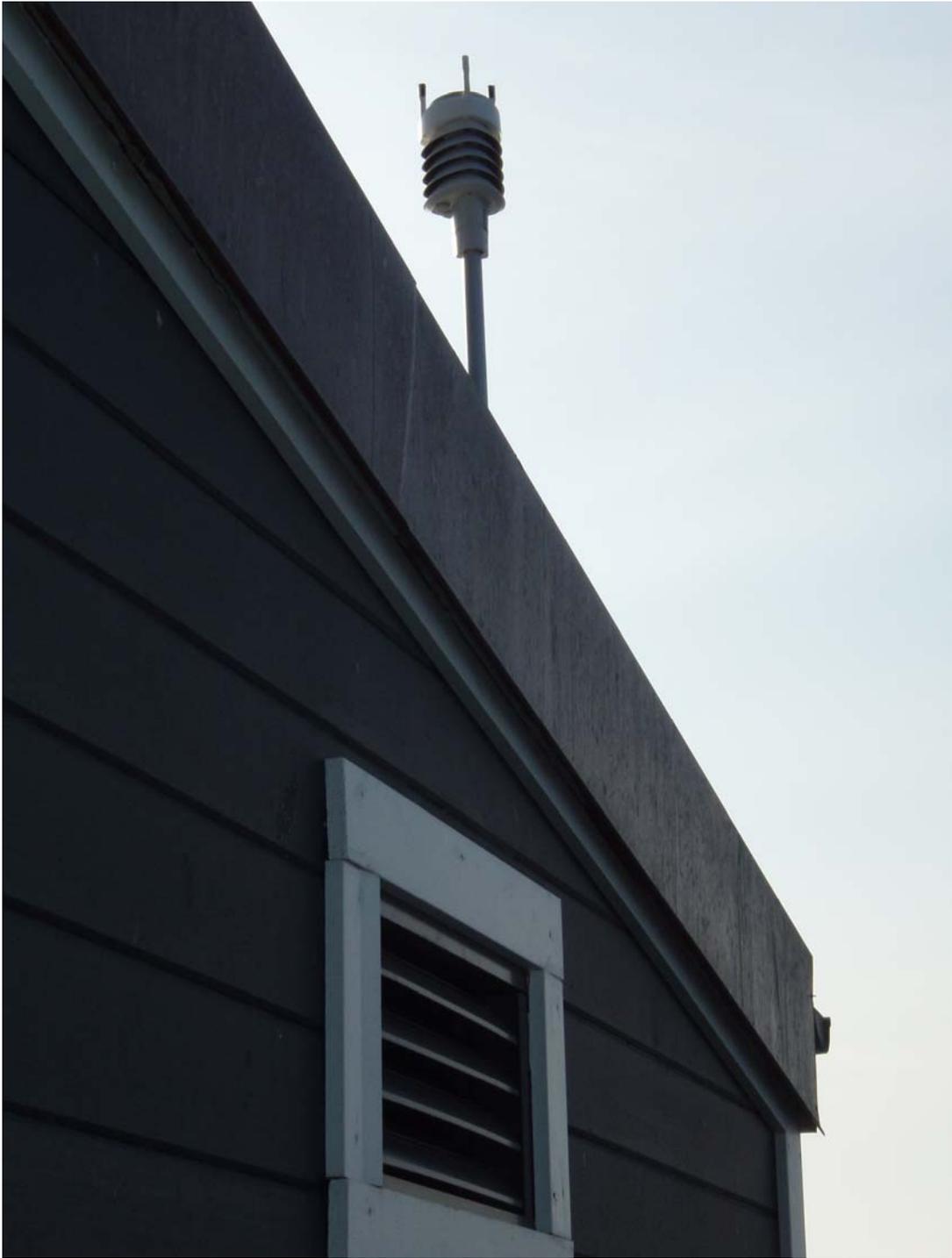
Seattle Aquarium YSI Buoy Design
at High Tide
~King Co. Environmental Lab~

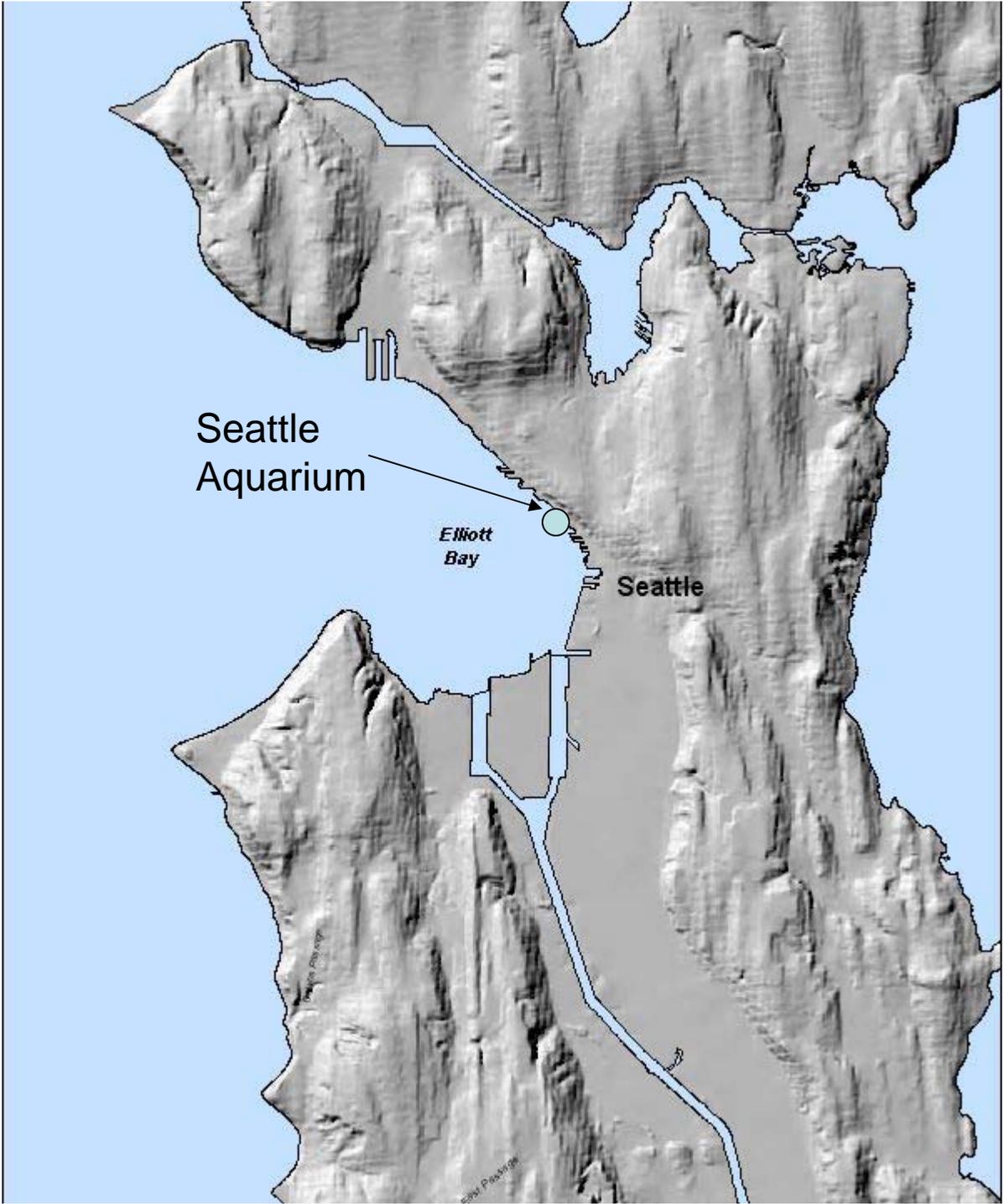












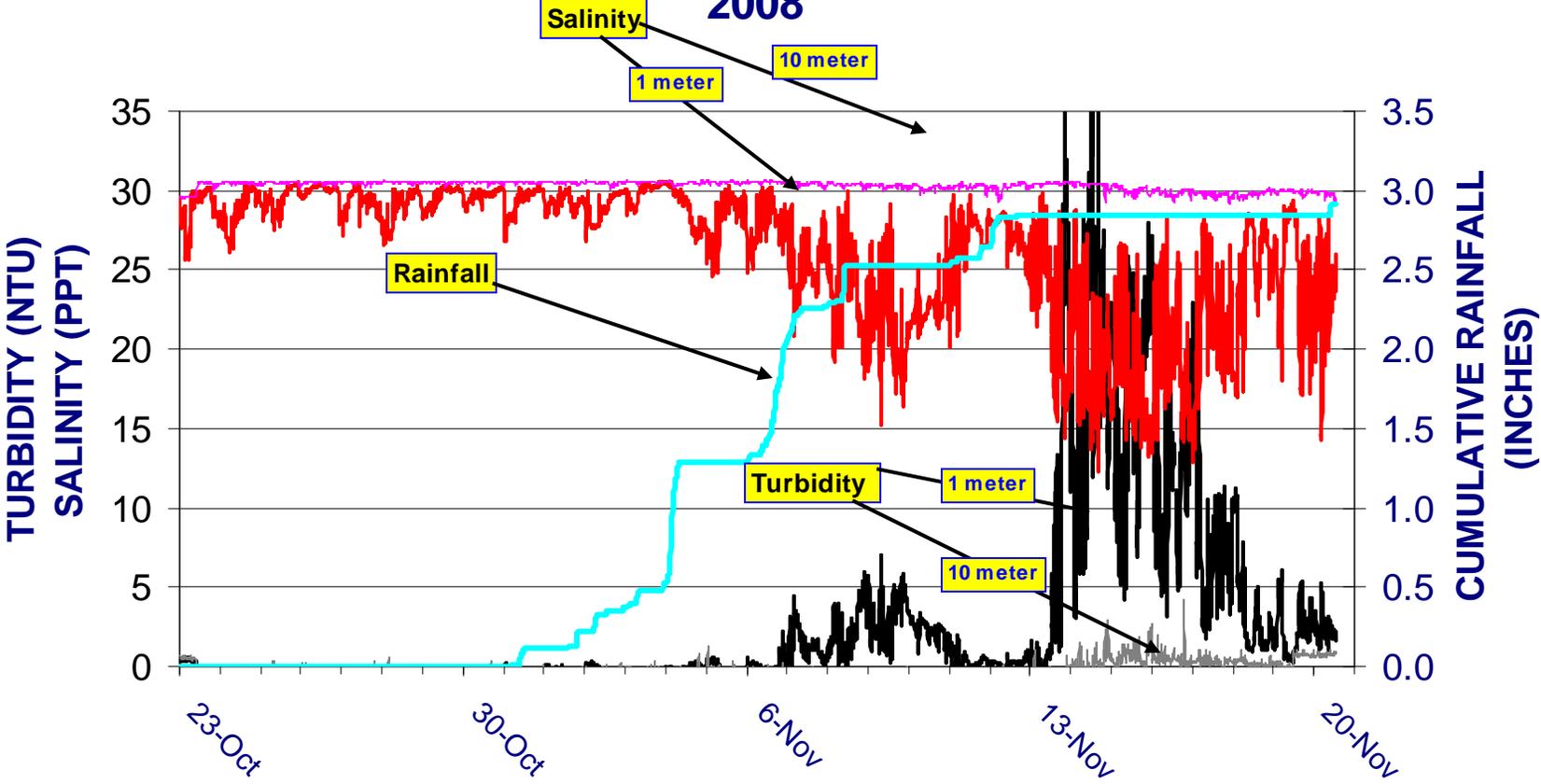


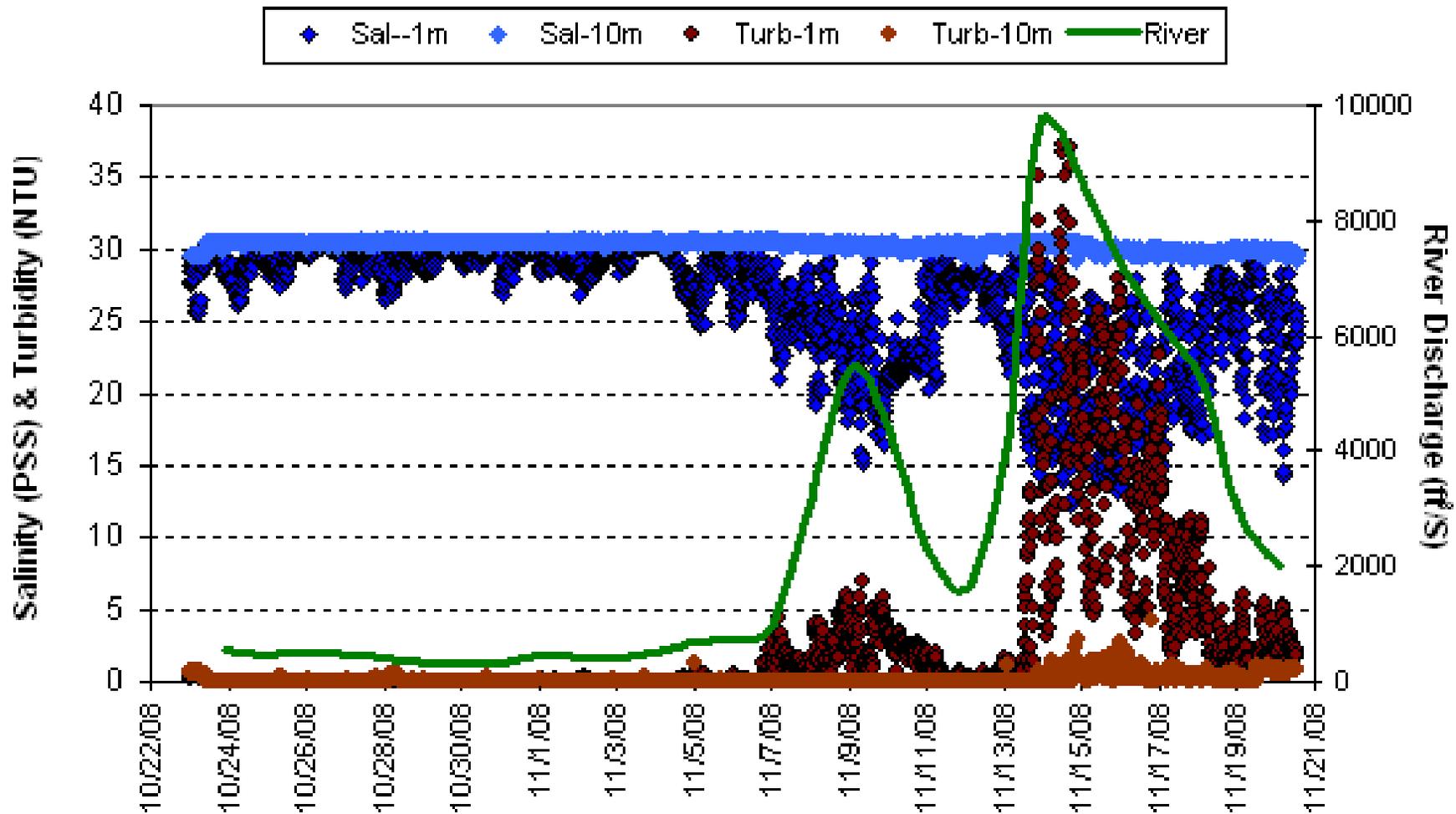
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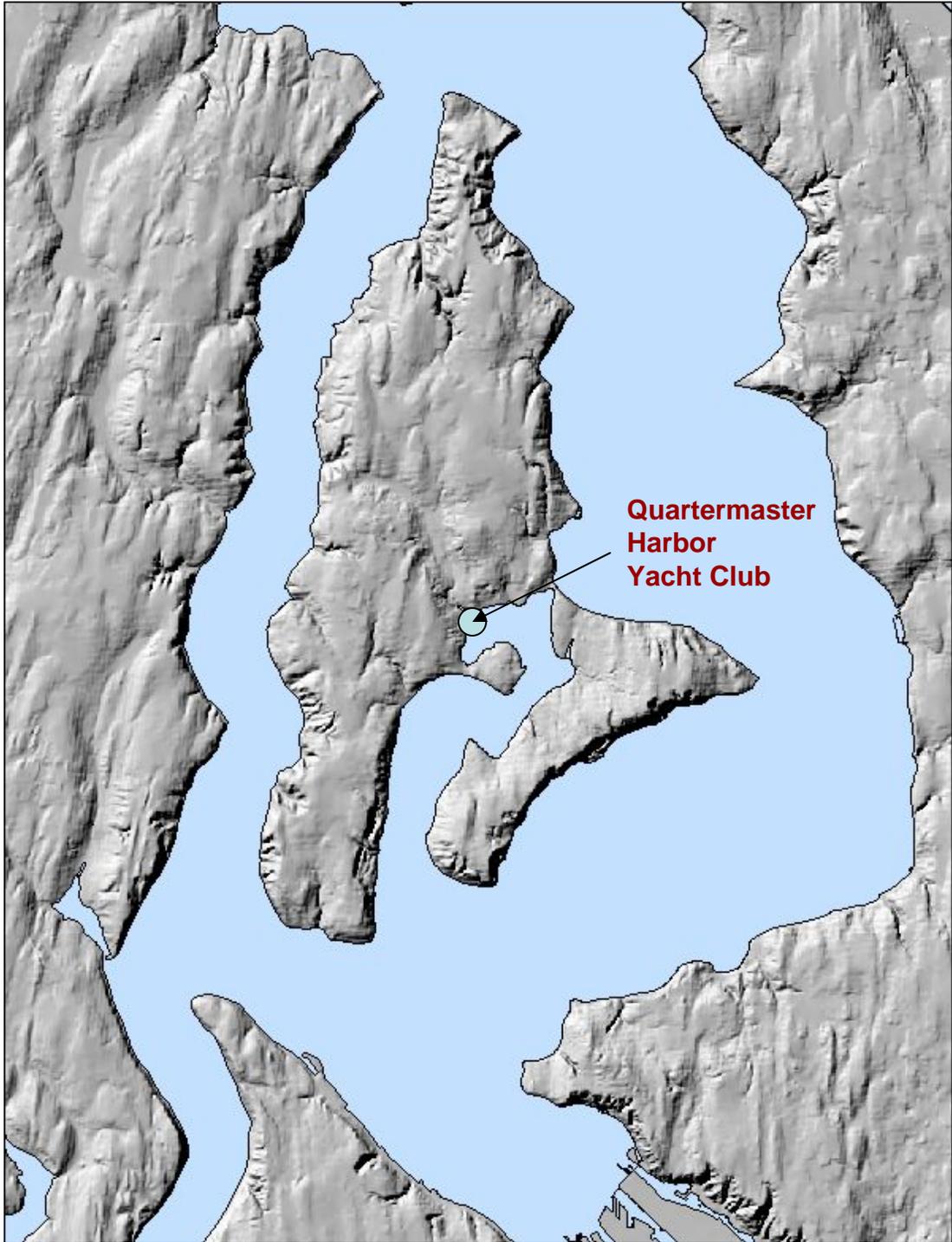


SEATTLE AQUARIUM - DUWAMISH STORM INFLUENCE

2008

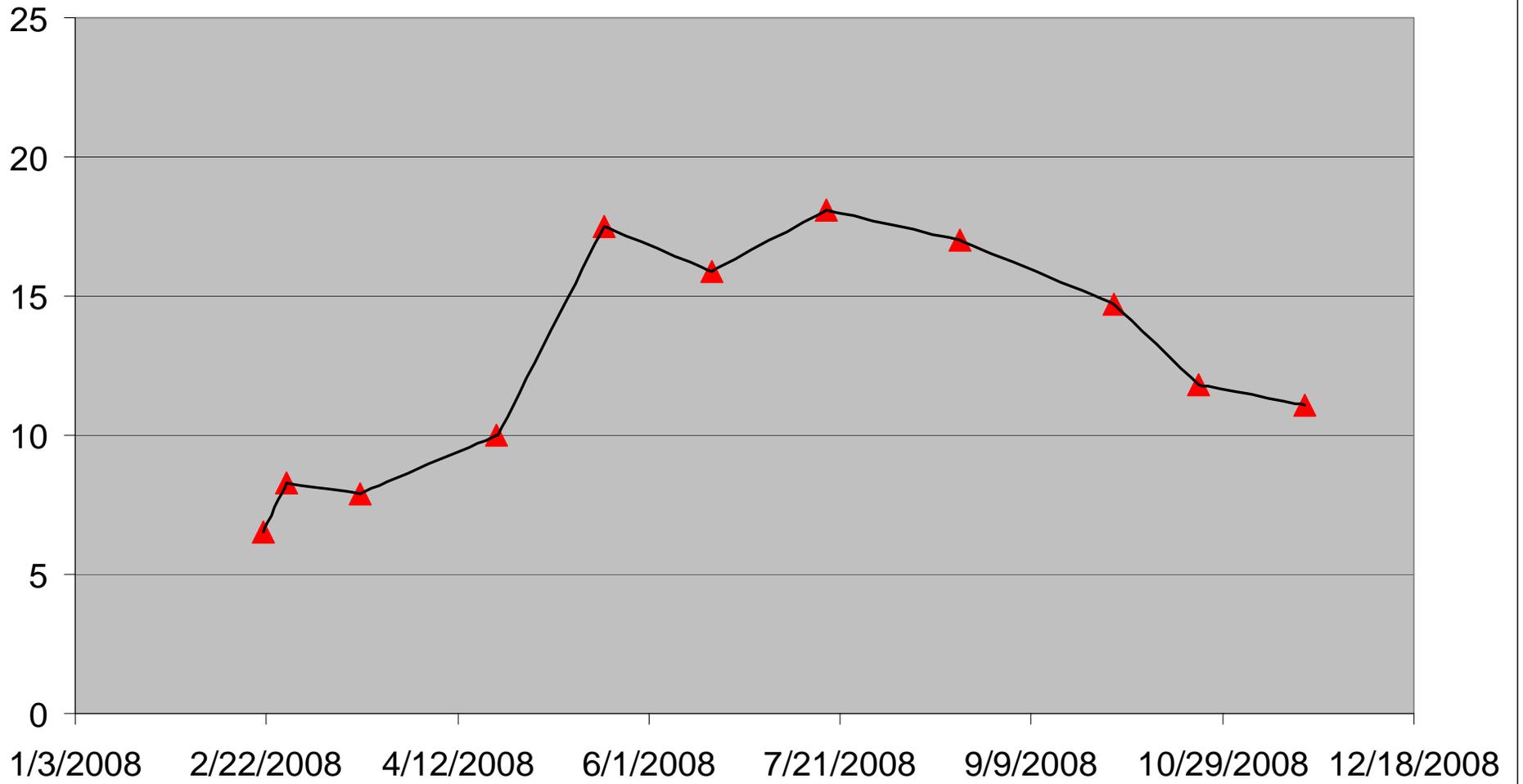




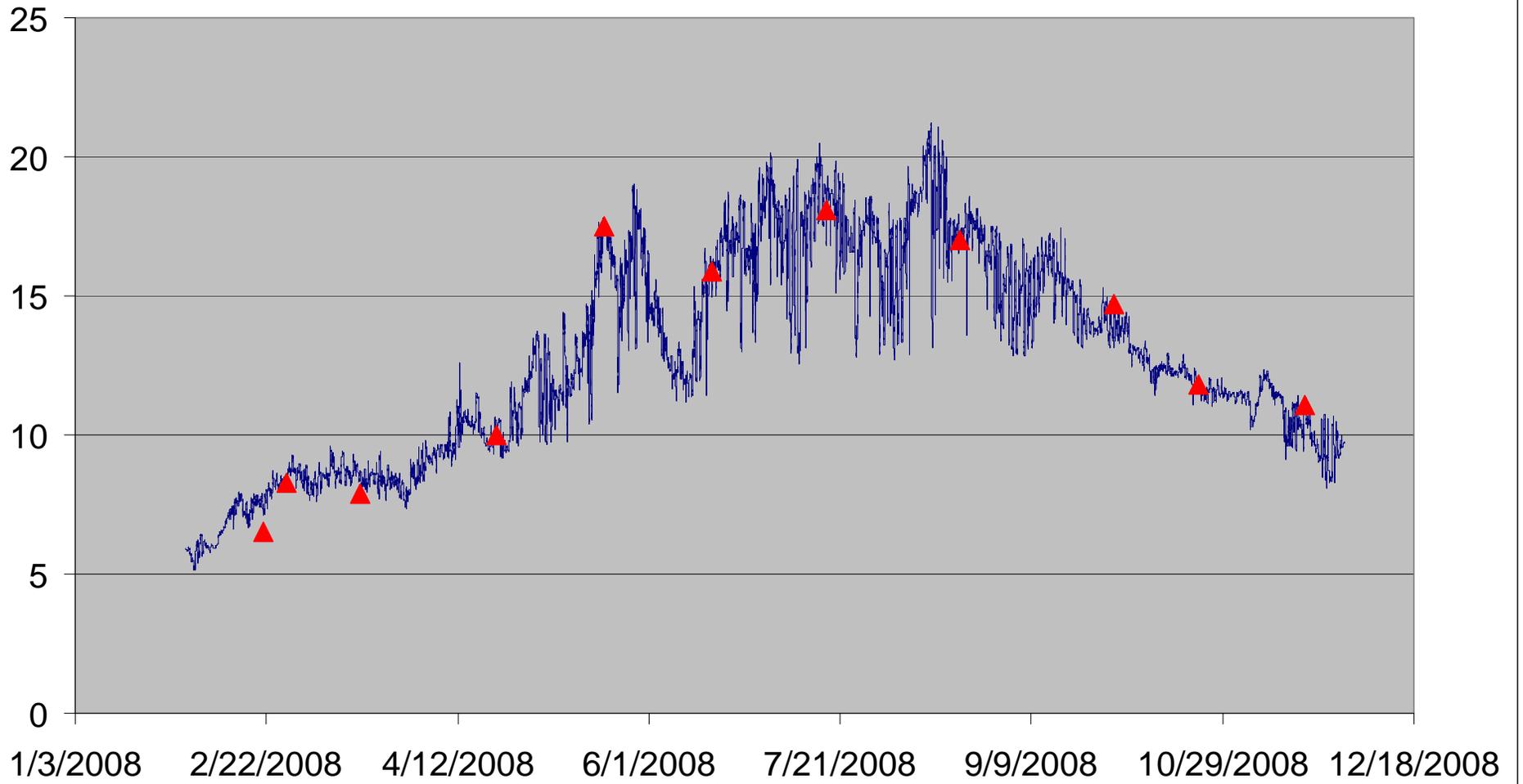




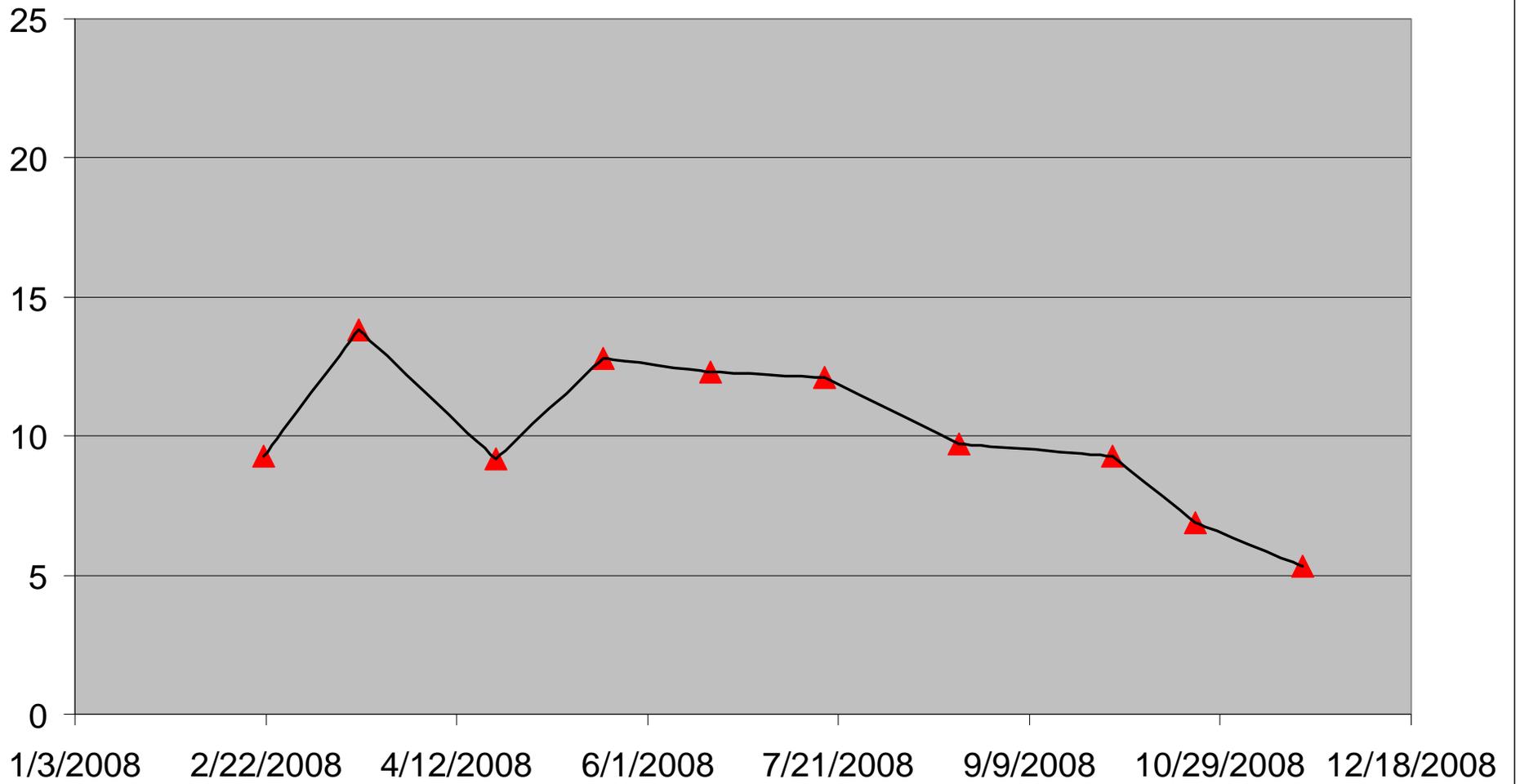
QMHYC Marina Monthly Temperature



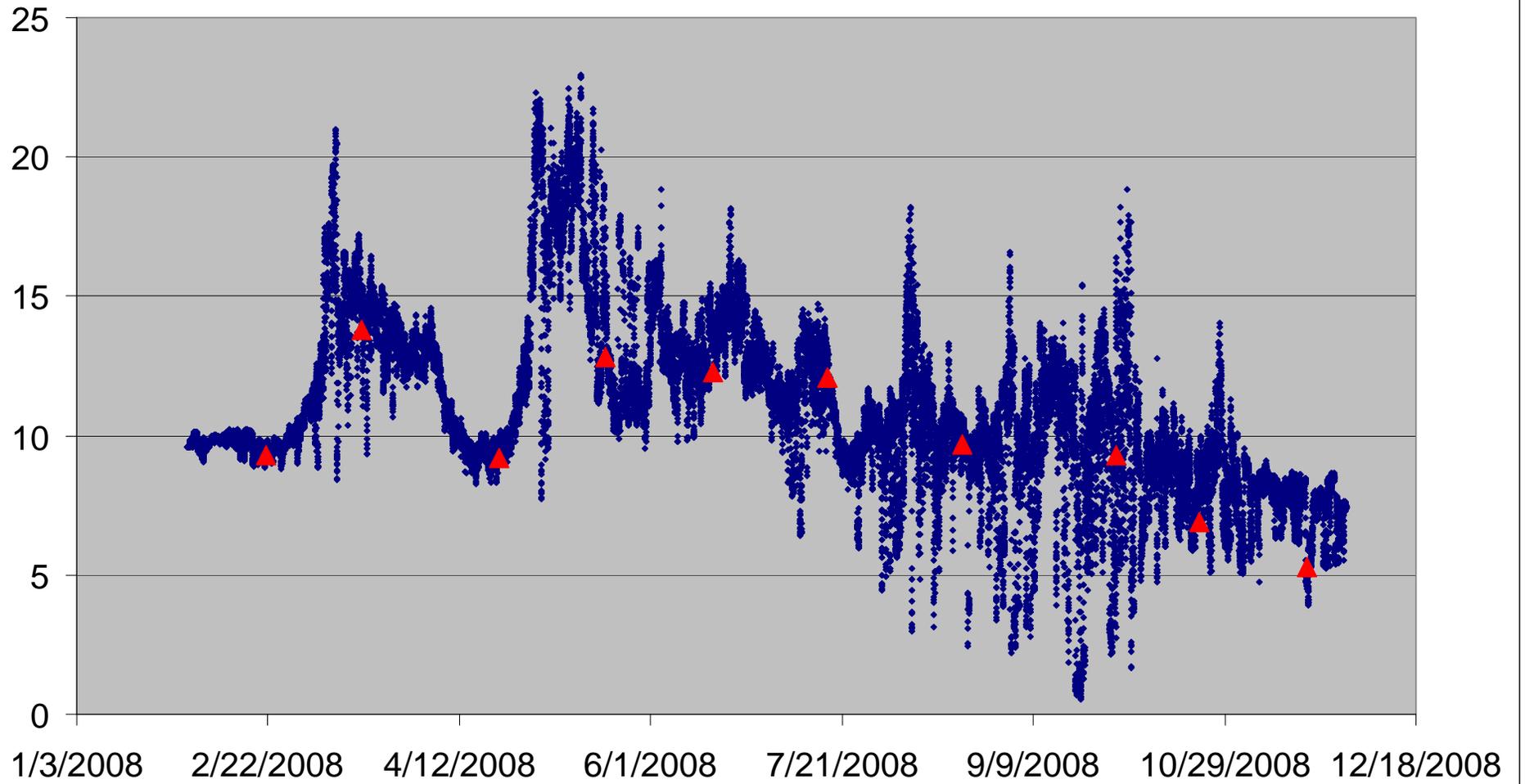
QMHYC Marina Temperature



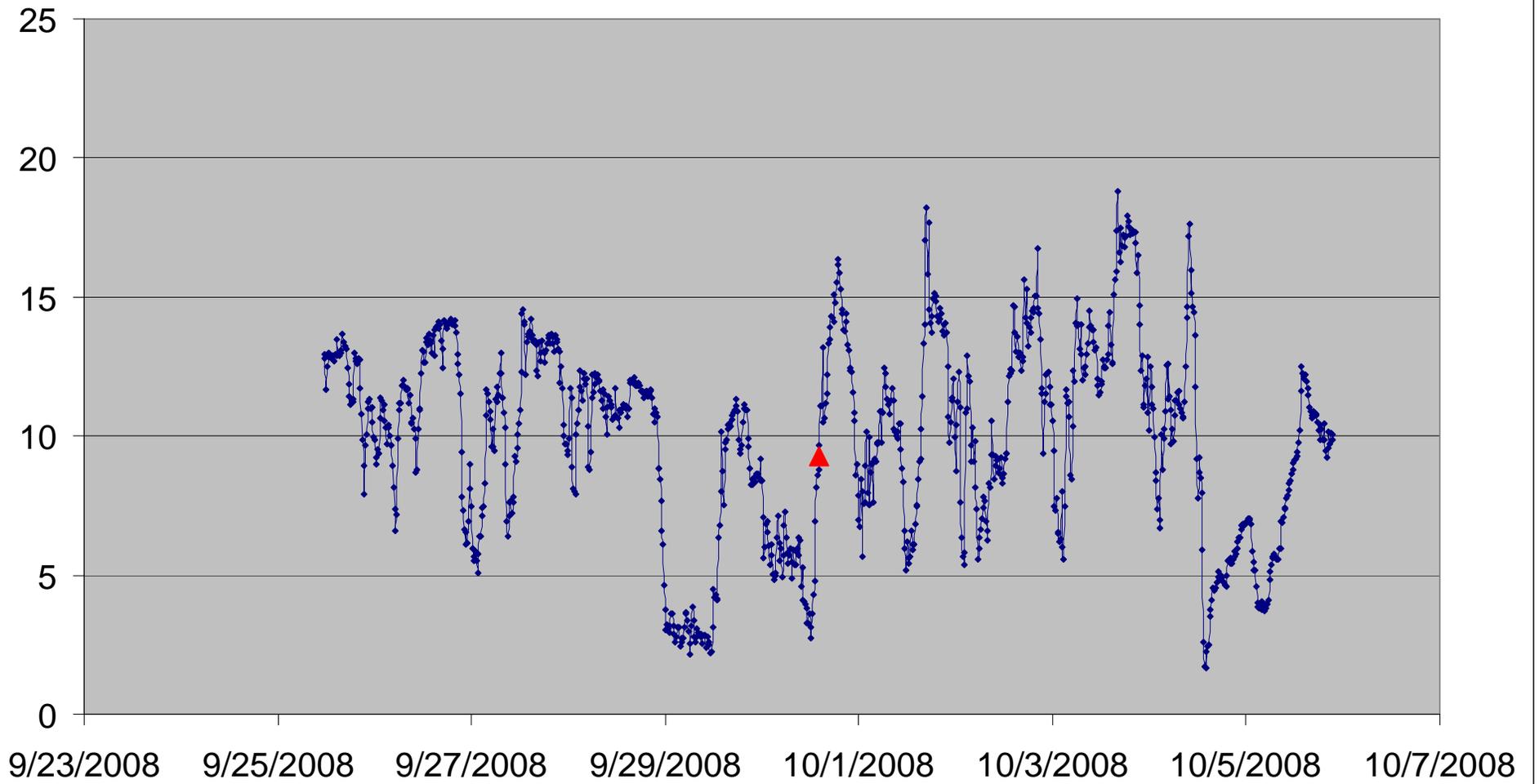
QMHYC Marina Monthly Dissolved Oxygen

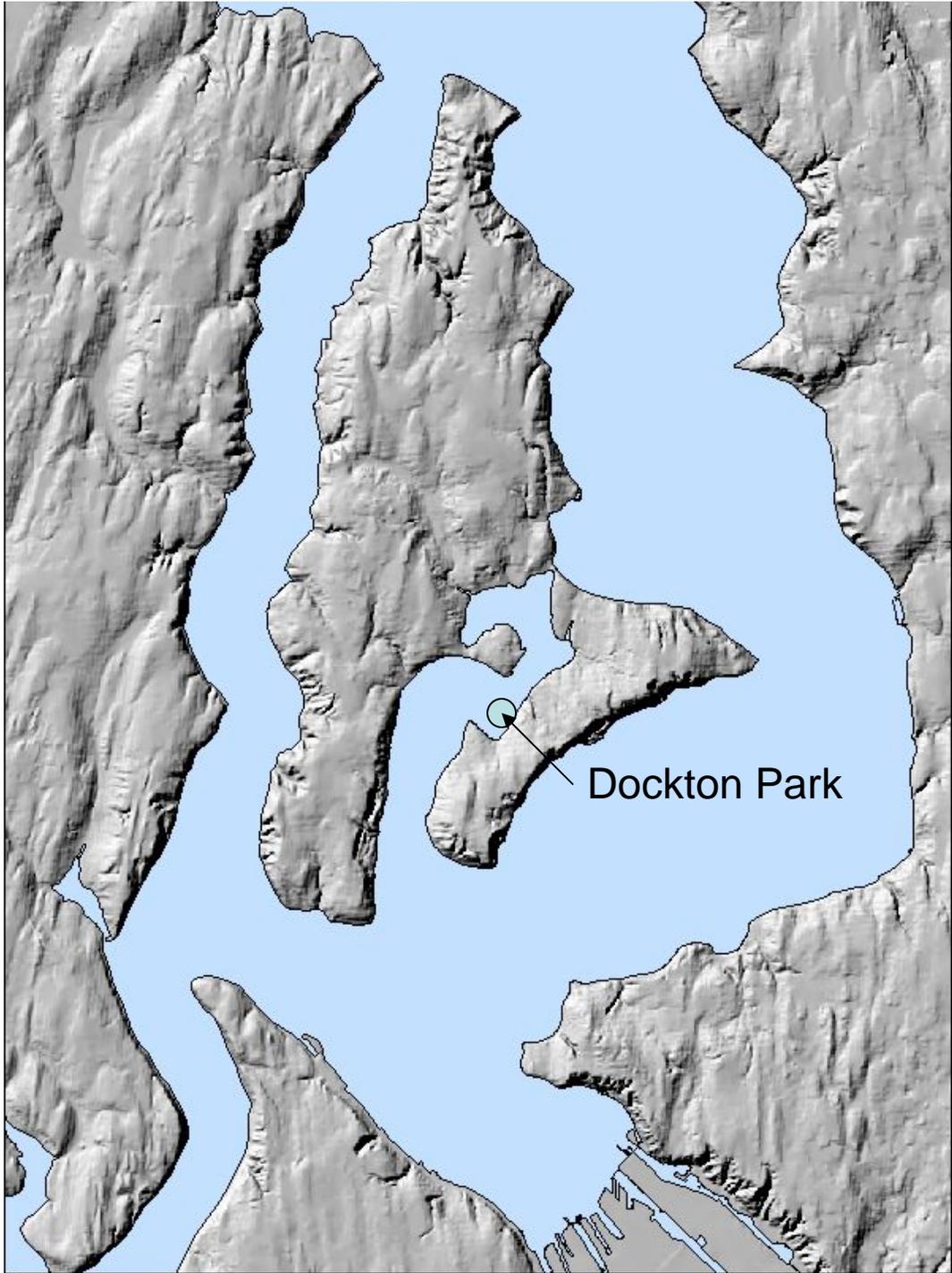


QMHYC Marina Dissolved Oxygen



QMHYC Marina Dissolved Oxygen

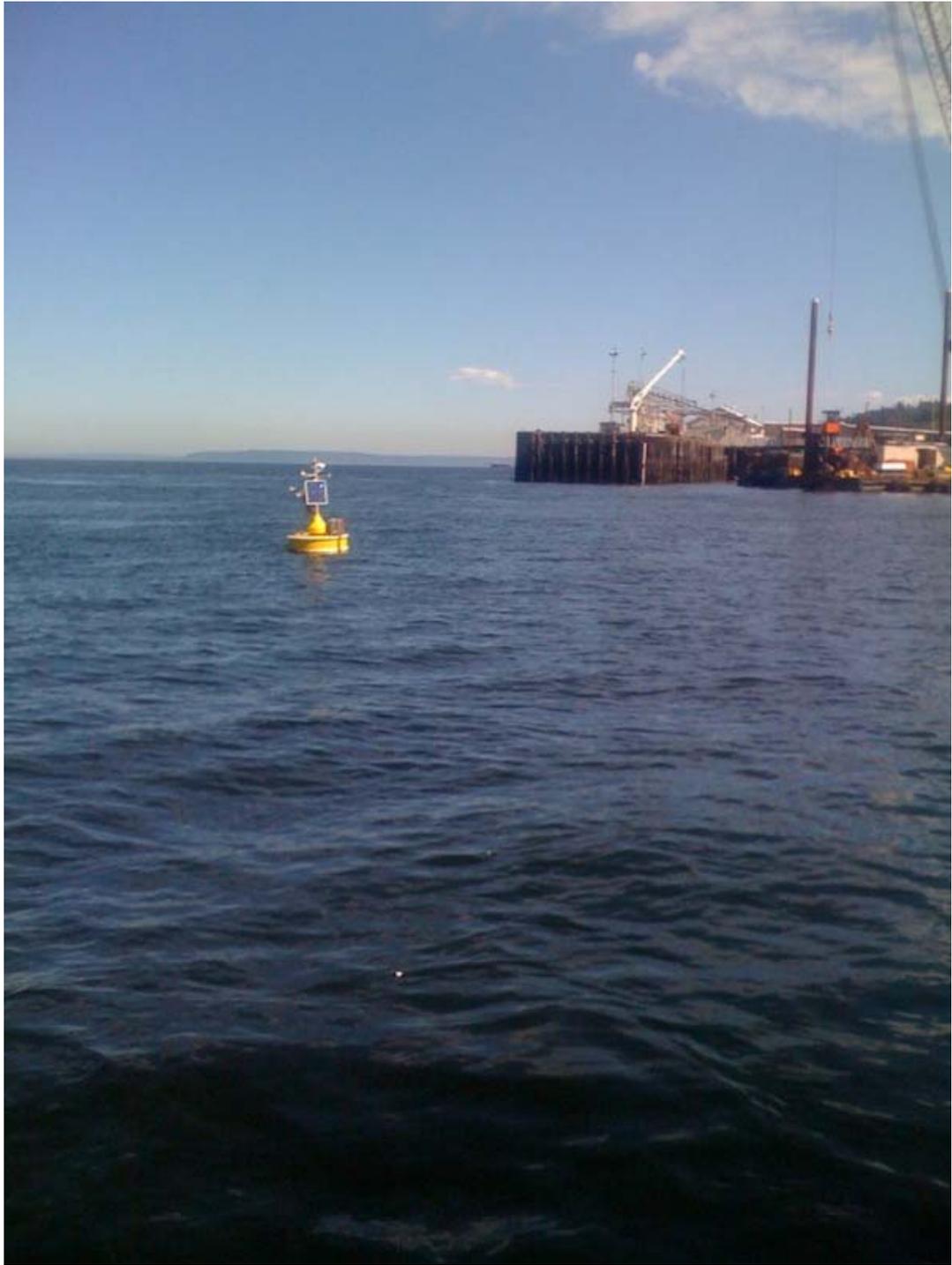


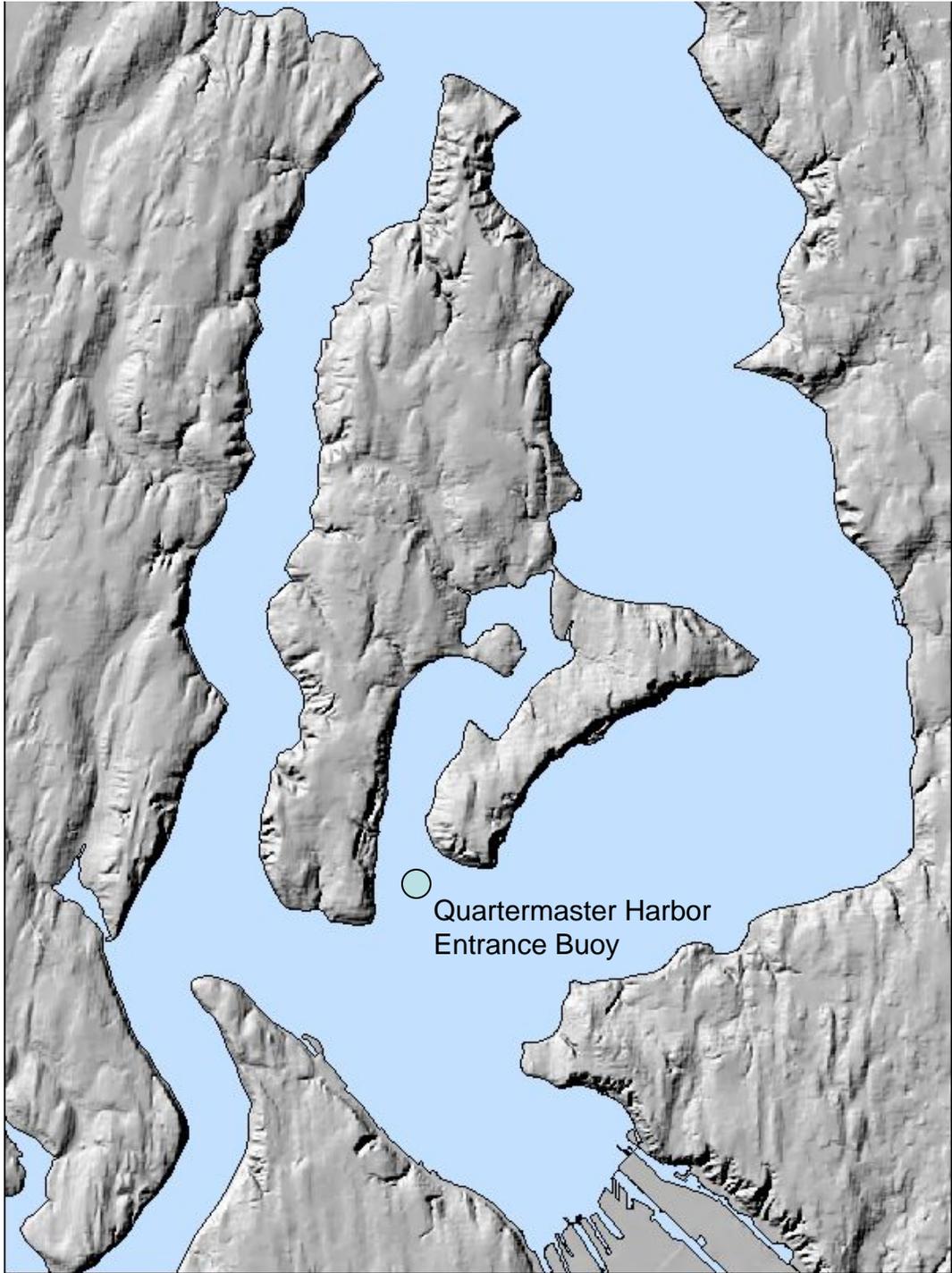


Dockton Park



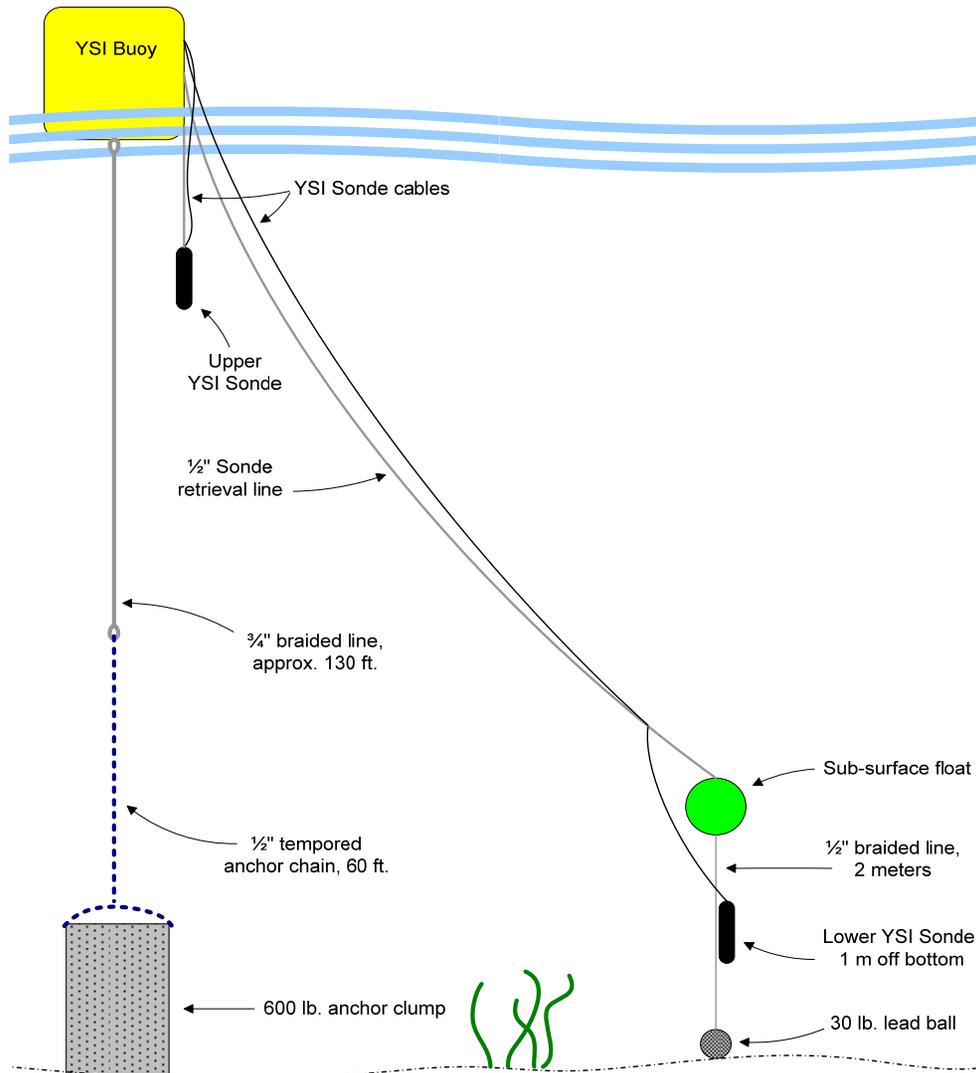






○ Quartermaster Harbor Entrance Buoy

Q. M. Harbor YSI Buoy Design
~King Co. Environmental Lab~

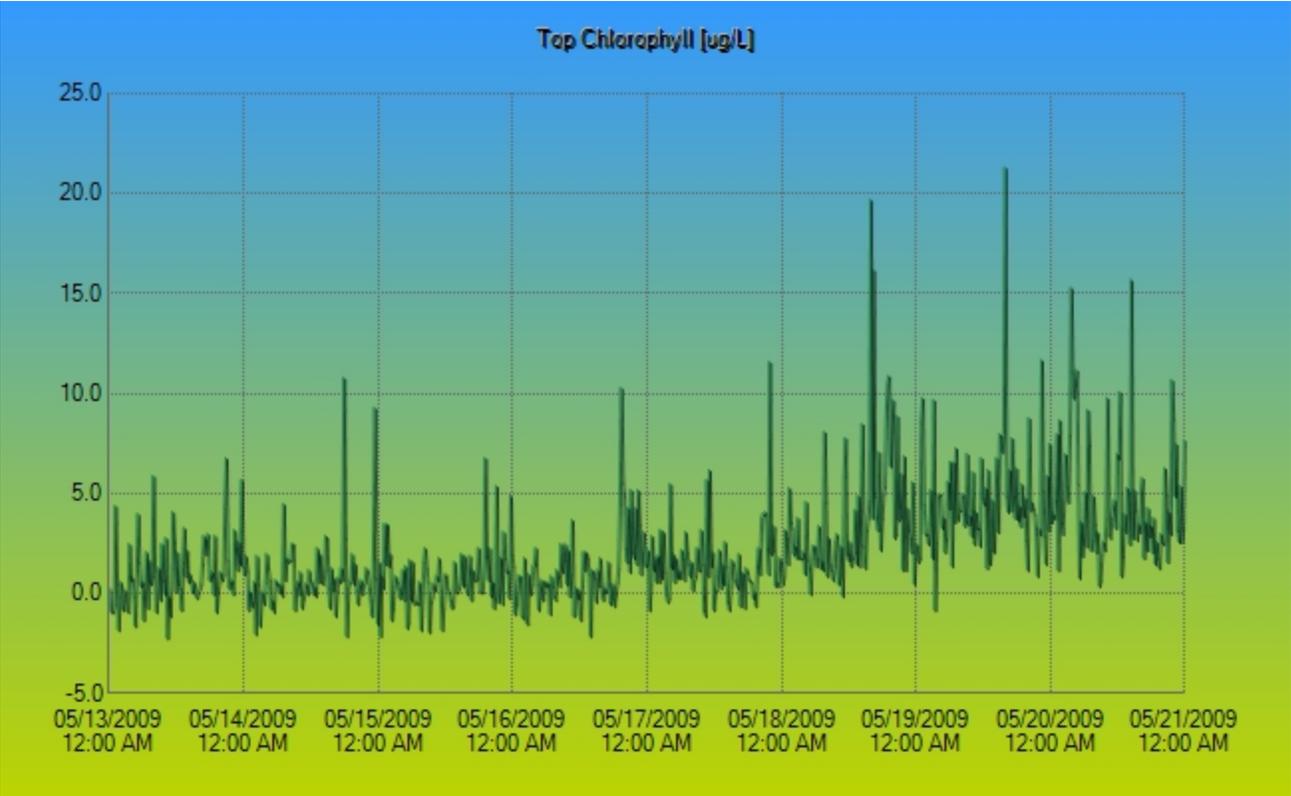


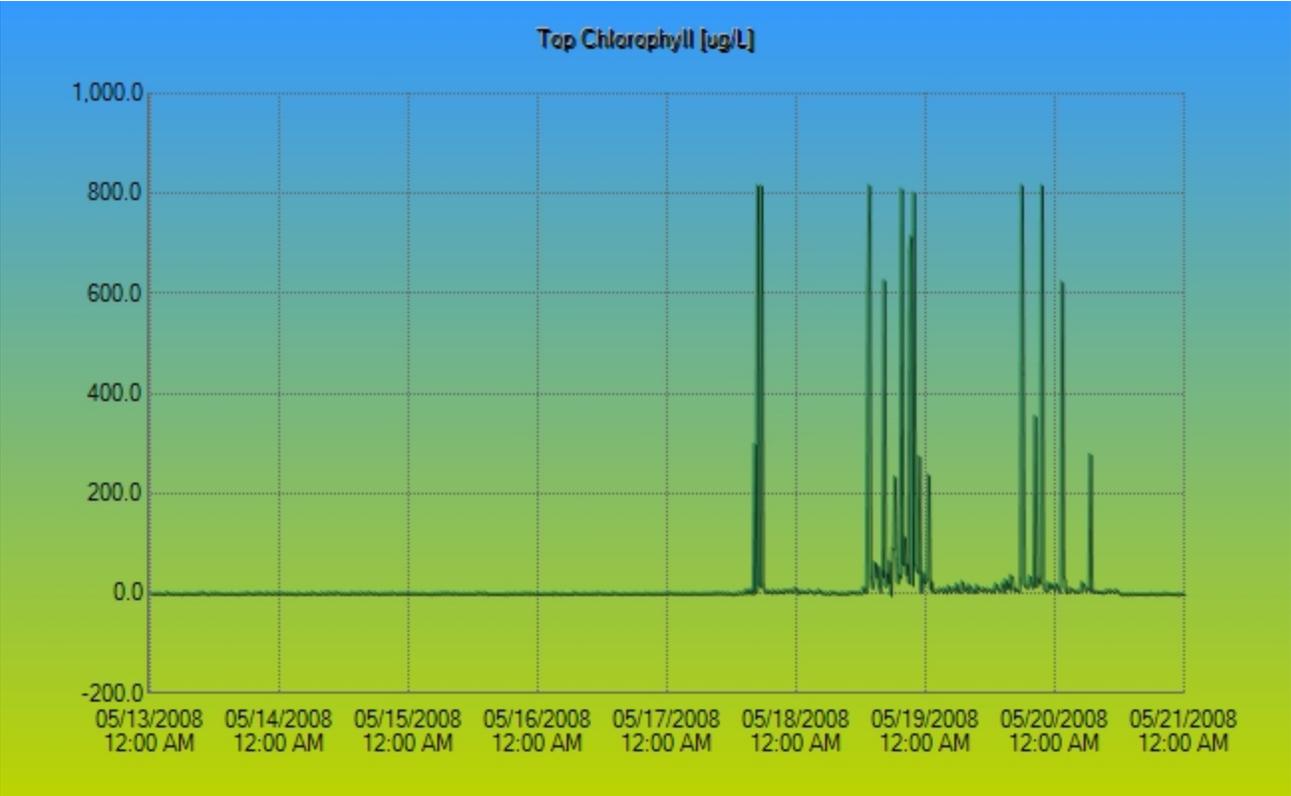
Quality Control

- Bi-annual
 - Temperature and Salinity Calibration using in-Situ Seabird CTD
- Monthly
 - Pre-deployment in-house pH, dissolved oxygen, turbidity, chlorophyll and depth calibration and check standards.
 - Post-deployment end checks of all parameters.

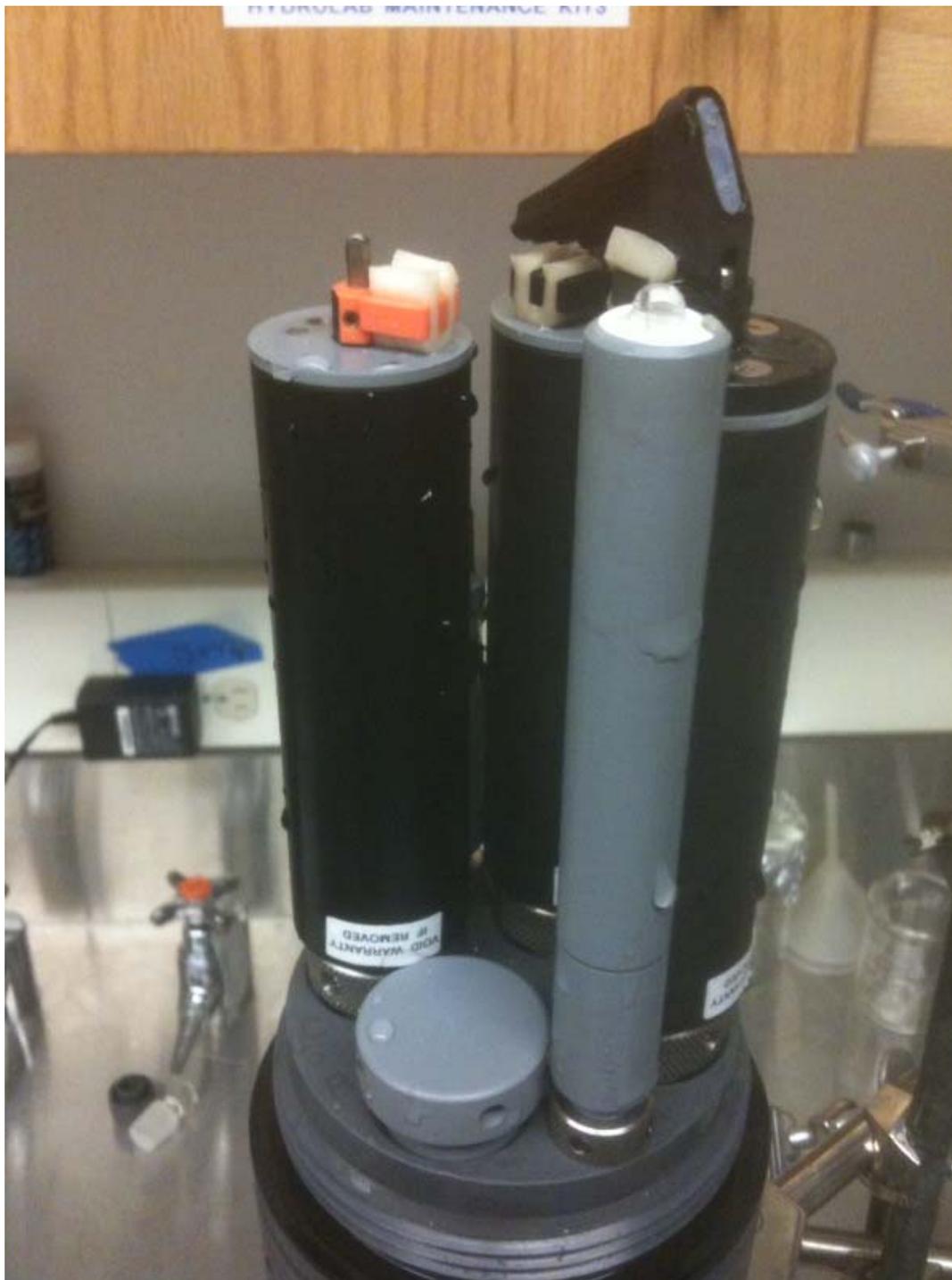
Biofouling







HYDRAULIC MAINTENANCE KIT







Caprellidae amphipods

