Real Time Water Quality Date for Monitoring Ocean Acidification

Bay Center: The Bay Center pCO2 unit is working in concert with temperature (T), salinity (S) and pH sensors, providing real time aragonite saturation state (Ωa) values (Figure 1). The water is pulled from the port by Ekone Oyster's intake, allowing hatchery/setting site operators to use the data to determine when to fill and treat their tanks. The next steps are to link up the computer to OSU so it can be further quality controlled and ported to the NANOOS portal.

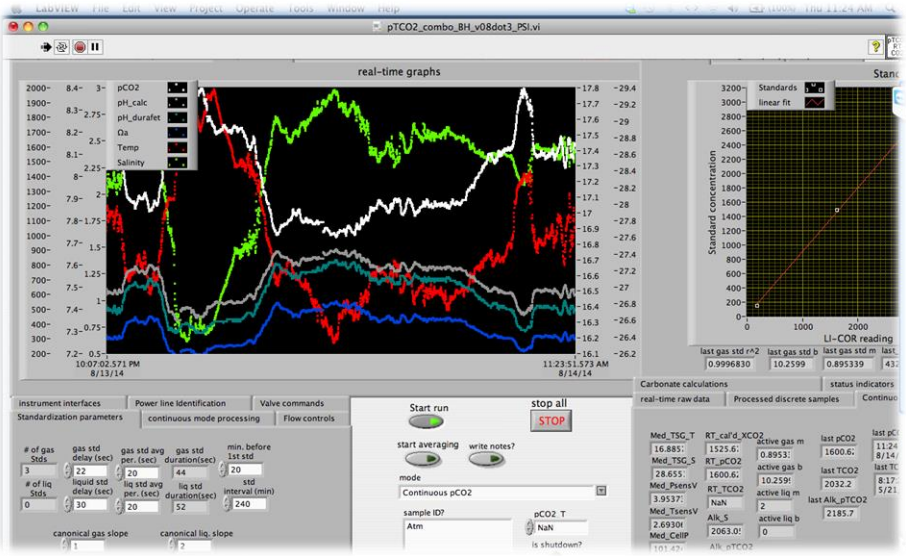

Figure 1. Real time carbon chemistry, temperature and salinity values at Bay Center.

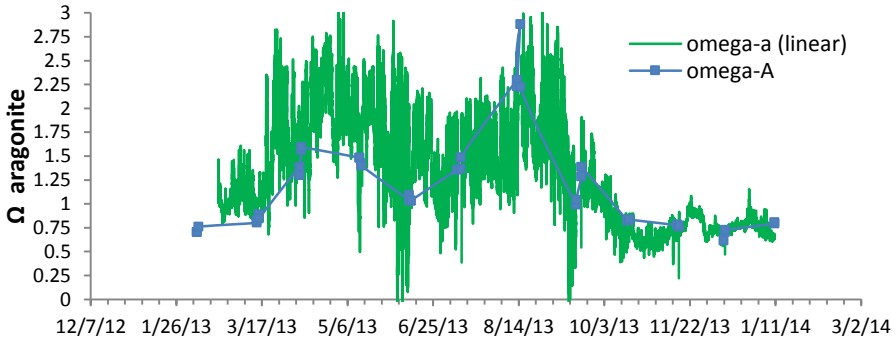

Figure 2. Spencer Cove Ω aragonite from spot samples and back calculated values based on pH, salinity and spot samples.

Nahcotta: The site at Jolly Roger is still up and running and available online, for hatchery and setting operations in the area (Figure 2). This site provides the best long term data set. Burke Hales of OSU and PSI's Andy Suhrbier are working on summarizing and publishing the data. Results indicate that prolonged increases in temperature and pH values coincide with increased natural Pacific oyster set in Willapa.

Lummi: Data collection has resumed at the Lummi hatchery, after a brief hiatus. On-the-wall pH, T, S and dissolved oxygen (DO) data is used daily for monitoring waters entering the hatchery. Intake T, S, DO, pH, chlorophyll (Chl) and turbidity values are continuously recorded and downloaded monthly at the pump house. Based on these water quality data, the intake line was cleaned, providing a boost to pH values entering the hatchery. Prior to cleaning, the drop in pH from intake to the hatchery had been as steep as 0.5 pH units! After removing tunicates and mussels from the ½ mile long intake line, a pH drop has been undetectable. The hatchery is purchasing a Honeywell Durafet III pH unit for inside the hatchery.

Tokeland: Instrument and sample collection has been consistent and will provide an excellent oceanic influence data set to be compared with Bay Center and Nahcotta sites. Data is downloaded monthly but is not displayed in real time.

Spencer Cove: Water quality testing has concluded for PSI at Spencer Cove, south Puget Sound. A final report to Seattle Shellfish was provided in June 2014. Over a year's worth of T, S, DO, pH, Chl, turbidity and carbon chemistry values were collected and summarized. Aragonite saturation state (Ωa) was back calculated using deployed water quality instruments and carbon chemistry spot samples. The effort provided an understanding of diel, tidal and seasonal water quality trends.