

The Our World Underwater Scholarship  
Society/AAUS Scientific Diving  
Internship  
Summer 2011



Hosted by Shannon Point Marine Center,  
Western Washington University



June 13<sup>th</sup>-August 18<sup>th</sup>

Final Internship Report: Jenna Walker

## Internship Objectives

The primary goal of the OWUSS/AAUS Scientific Diving Internship is to provide an intern with the experiences necessary for a future in science, diving for research, or other scientific diving related field. The intern achieves this by receiving training through an AAUS Organizational Member and completing their scientific diving certification. Located in Anacortes, Washington, Shannon Point Marine Center of Western Washington University was selected as the host site for the internship in 2011. During my stay I got to live in the dorms at the marine center with SPMC's summer 2011 REU students while working my way through the scientific diving certification.



Front entrance of SPMC



Student Housing

## **The American Academy of Underwater Sciences (AAUS)**

The American Academy of Underwater Sciences was established in order to allow scientific divers an exemption from OSHA regulations. OSHA had stated that all divers with an employer/employee relationship had to adhere to their policies, originally established for commercial diving. While the requirements and safety precautions were fitting for the hazards of commercial diving, they were not necessarily suited for scientific diving practices. After several years of appeals, AAUS was finally granted their exemption creating the model for scientific diving today.

The AAUS is well known for their diving safety record and rigorous education/training standards, standards that I became familiar with during the course of my internship. I worked through both theoretical and practical training modules before participating in scientific diving activities as required by Shannon Point. Eventually I acquired a letter of verification from SPMC's scientific diving program, recognized by all AAUS sites, allowing me to further my career in marine science with the ability to use scientific diving as a research tool.

### **AAUS Training: Diving Knowledge**

I arrived in Anacortes, Washington after a cross-country flight and three-hour bus ride, eventually making my way to Shannon Point Marine Center. There I met SPMC's Diving Safety Officer (DSO) Capt. Nate Schwarck, M.S. who immediately showed me around the facilities and diving locker. I had just missed the scientific diving course for WWU, taught during their spring quarter, and discovered that my "class" would consist of two people: Jeff, an REU student diving for abalone research and me. This made all of our summer training conveniently flexible as we were able to meet around each other's schedules.



My diving "class"

After a day of organizing gear we jumped right into AAUS knowledge reviews and first aid training. We began with the DAN Diving First Aid for Professional Divers and On-Site Neurological Assessment for Divers courses encompassing basic first aid, CPR, AED procedures, neurological exam techniques, hazardous marine life, and emergency oxygen administration (nothing breaks the ice like conducting a fake neurological exam on someone you've just met). Then we moved onto the required modules of the AAUS Scientific Diving course focusing on diving theory, physics, physiology, planning, and safety/rescue procedures. It was only after learning about everything that could possibly go wrong that Nate finally let us enter the water; my buddy and I were understandably anxious before our first dive.

### **Practical Diving Skills**

We successfully completed our skills check out and survived our introduction to the 8°C waters of the Pacific Northwest. Next on our checklist was the swim test (article 4.10 in the AAUS Standards) which everyone passed successfully. We completed other certifications in addition to AAUS's twelve required training dives, namely PADI's Advanced Open Water, Nitrox, Drysuit, and Rescue Diver. For the advanced certification I went on a night dive, a deep dive, a drift dive during a current exchange, a navigation dive locating a sea water intake system, and a search and recovery dive swimming various search patterns. The Nitrox course mostly involved math problems, dive table calculations, and learning the physics of gas partial pressures. I spent the majority of the summer in a 7mm wetsuit and didn't get drysuit certified until my last two dives (definitely a mistake, Pacific Northwest water is COLD)! But by far my most challenging experiences were all of the rescue diver training sessions. We had one pool session in which to practice skills and spent two open water dives conducting rescue scenarios including surfacing an unconscious diver from depth, lifting him onto the boat and beginning CPR/emergency oxygen administration.



Jeff and I checking Nitrox tanks at the local dive shop.

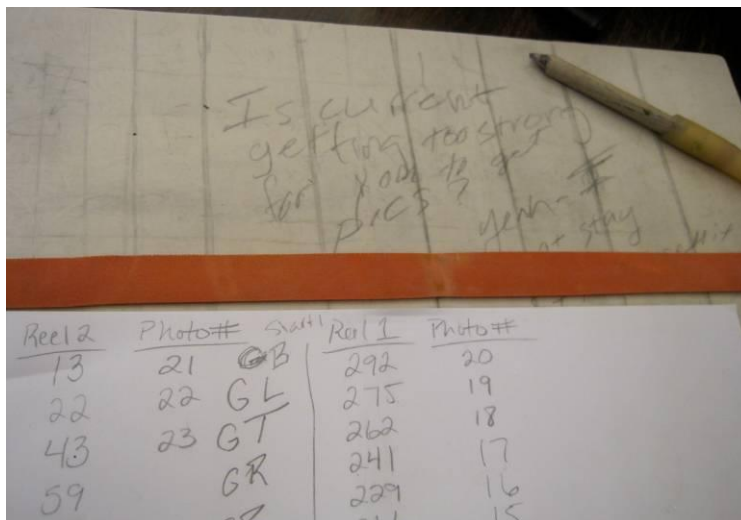
## Dive Planning

As I've alluded, the waters near Anacortes are not the friendliest of diving territories. Besides frigid temperatures, average visibility is around 3-4m and strong current systems leave average slack windows of twenty minutes between .5 kt ebb to flood tidal exchanges. Divers must be comfortable being covered head to toe in thermal protection in order to successfully complete all scientific diving tasks. Even though it was a challenging environment, I am very grateful for my experience as I feel it made me a better diver. It's one of those reassuring things that if you can make it here, you feel prepared to handle diving most anywhere.



Photo by Tessa Minicucci

Check out all that gear! This is before an organism collection.



One of our dive slates: observe the note about strong currents, we eventually had to call this dive.



## Diving for SPMC

Helping Shannon Point with their scientific diving tasks allowed me to acquire experience in a variety of diving techniques. I did organism collections for staff researchers, REU students, and community outreach tanks. We sampled surface and benthic water from the Salish Sea for water quality analysis. A CTD was retrieved and re-deployed monthly for local water profile analysis by the Washington State Department of Ecology. And finally we completed a survey of SPMC's sea water intake system for the Washington Department of Natural Resources to assess the local impacts of building the system.



Jeff with the CTD



DNR survey at low tide



Laying the same DNR transect for the underwater surveys

### **Abalone Research**

By far the star of the summer was our research with native Pinto abalone. The Puget Sound Restoration Fund (PSRF) and the Washington Department of Fish and Wildlife (WDFW) funded two days of brood stock dives where we collected solitary, reproductively isolated adult abalone for hatchery efforts. These were some of the most interesting dives we did, lots of beautiful habitat and kelp forest canopies.



*Pycnopodia helianthoides*, a helpful tool for collections

Jeff's REU project involved monitoring pinto abalone outplant sites and analyzing the accuracy of single surveys on survival rate estimates. In areas where hatchery raised juvenile abalone had been previously outplanted, six 10 m x 10 m transects were set up. We divided the plots into five 2.0 m lanes running north to south and each lane was surveyed for approximately 20 minutes at a rate of  $1.0 \text{ m}^2 \cdot \text{min}^{-1}$ . We surveyed all six sites and recorded tag number, shell length, and exposure of each abalone. We also re-surveyed one of the sites three extra times and conducted perimeter surveys. All this data went into Jeff's REU research and analysis and I got to be a team member for every single one of his abalone dives.



Photo by Erik Dinell

Here I am prepping gear for one of our surveys



Photo by Erik Dinnel

This is Paul, our advisor, describing one of the sites to us



Photo by Erik Dinell

Here we are about to descend on a site, notice the marker buoy in between us





Photo by Paul Dinnel

You can see some survey data on the slate. Here's some pinto abalone; these shells are mortalities that we found underwater, not all the tagged juveniles survived.

### **All good things must come to an end...**

The last few weeks of my internship absolutely flew by. Nate spent a lot of time talking to us about the administrative responsibilities of a DSO. We looked at the requirements of becoming a scuba instructor and the amount of work that goes into teaching the scientific diving course. I participated in one of SPMC's Diving Control Board meetings and presented a report on the scientific diving projects of that summer. My last weekend I got to meet up with the 2010 diver, Mykle Hoban, who was interning with NOAA in Washington for the summer. We met up at Keystone Jetty on a Saturday and got to go on a pretty sweet dive!



Mykle and I at Keystone



Final rinse

Eventually I had to rinse off my gear for the final time, pack up, and head back to the east coast. I had an absolutely fantastic summer and hope to return to Anacortes one day, but for now I am off to Woods Hole Oceanographic Institution where I will be diving as a field technician for some physical oceanographers!

### **Acknowledgements**

There are many people that I would like to thank, all of whom were integral members of my internship experience. Jeff Hester, for his unparalleled dive buddy support, Nate Schwarck, for his constant guidance, Dr. Paul Dinnel our abalone advisor, for his enthusiasm and love of shellfish, Josh Bouma of the PSRF, for his assistance in abalone dives and research, Director Dr. Steve Sulkin, for his endorsement of the internship at SPMC, and Gene McKeen and Karl Mueller for their boat operations support. At the Scholarship Society I would like to thank George Wozencraft, Martha Sanders, and Roberta Flanders. Funding was generously provided by AAUS and OWUSS.

Additional photos:



Photo by Erik Dinell

Here is the Fauna, an SPMC RV that served as our dive boat



Photo by Erik Dinnel

Just another typical day loading up gear

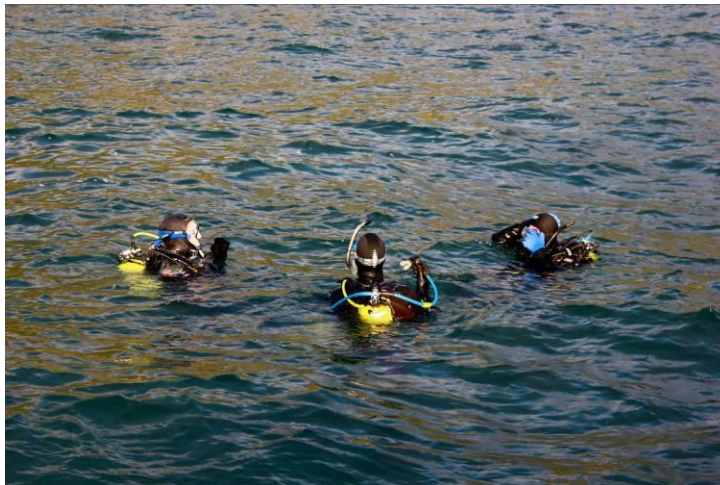


Photo by Tessa Minicucci

Here we are with Nate before our search and recovery training dive



Photo by Joe Rudko

I was spoiled at SPMC- because they hosted so many REU students I got to go on all of their trips including this ROV one!





Photo by Joe Rudko

It also meant I got to help deploy a CTD and Niskin carousel.



Photo by Joe Rudko

Walking through the boat...





This was taken just after our last dive (check out that drysuit!)



Photo by Joe Rudko

I'm sure I'll be back in the Pacific Northwest but that's all for now! Cheers!