## Rosario Beach Marine Laboratory

#### 5/4/2021 to 8/11/2021



#### What did I do this summer?

1. Lead Aquarist

#### 2. Scientific Diver In-Training

3. Water Quality Analyst



#### Lead Aquarist

As the Lead Aquarist, I oversaw and maintained...

- $\stackrel{\scriptstyle \wedge}{\scriptstyle \sim}$  30 individual octopus aquariums
- $\gtrsim$  30-gallon sea anemone aquarium
- $\gtrsim$  60-gallon Pacific Northwest touch aquarium
- % 60-gallon purple shore crab aquarium
- $\stackrel{\scriptstyle \scriptstyle \leftarrow}{\scriptstyle \sim}$  60-gallon bivalve aquarium



#### Meet the Octopus!



"Muus Octopus" *Muusoctopus leioderma* 

Collected in Burrows Bay, WA Fun fact! They burrow in the sediment "Giant Pacific Octopus" Enteroctopus dofleini

Collected in Admiralty Bay, WA Fun fact! Largest species of octopus "Ruby Octopus" *Octopus rubescens* 

Collected in Admiralty Bay, WA Fun fact! Found denning in glass bottles

#### What were the Octo's fed?

#### Purple shore crabs, savory & manila clams, and the occasional scallop



All the crabs and bivalves were collected locally during low tide and kept in their own aquaria

#### What I learned as Lead Aquarist

- ightarrow The importance of keeping a scheduled feeding
- $m \AA$  How to ID, sex, and weigh octopus
- ightarrow Monitoring normal vs. abnormal behaviors
- m invert Problem solving skills when seawater systems fail
- $\stackrel{\scriptstyle }{\scriptstyle \sim}$  How to keep different marine organisms happy



Male Muus octopus, pictured is the hectocotylus

#### Scientific Diver In-Training

This summer I completed 71 dives!

Number of Scientific Dives: 46, 10 were night dives and 13 were boat dives

Number of Personal Dives: 24, dives were with MMA alumni and NOAA divers

I also did the Eye-to-Eye Shark Dive at Point Defiance Zoo

On June 30<sup>th</sup> I completed my 100<sup>th</sup> dive!

#### What Projects did I participate in?



Transect dives at Driftwood Park

I helped collect density and bottle preference data of *O. rubescens* 

Collected *Muusoctopus* at night in Burrows Bay We collected them by "hunting" them with flashlights

Collected clown nudibranchs at Sare's Head

Assisted grad student, Jefferson Humbert, with camera deploying dives and octopus collection dives

Deployed glass bottles at Driftwood Park and Beverly Beach to promote denning for *O. rubescens* 

Deployed PVC housing at Driftwood Park to promote selective size denning for *O. rubescens* 

Possession Point Ferry Dive, 7/4/2021

PC: Tabitha Jacobs-Mangiafico



Sunflower sea star, *Pycnopodia helianthoides* Wolf eel, *Anarrhichthys ocellatus*  Female Kelp Greenling, Hexagrammos decagrammus

#### More Camera Project Info



Example of tagged *O. rubescens* when shown under UV light

Part of Jefferson Humbert's research project included collection of *O. rubescens* Octopus were transported to the lab, where they were weighed and sexed I observed and assisted with injecting a fluorescent plastic elastomer tag This tag allows for individual ID of *O. rubescens* 

This tag also allows for observation of *O. rubescens* in the field using the camera system J. Humbert designed

### Water Quality Analyst

During the Spring portion of my time, I was responsible for an Ocean Acidification (OA) project supervised by Dr. Trueblood

The *O. rubescens* collected during the transect were placed in OA aquariums

Daily water samples were taken for pH and salinity of the aquariums

Weekly water samples were taken for alkalinity to get pCO<sub>2</sub>

The aquariums were treated with 1000  $pCO_2^*$  or 1800  $pCO_2^{**}$ 

The purpose was to collect and compare blood chemistries between OA treated and control *O. rubescens* 



O. rubescens in OA treatment aquarium

\*1000 pCO<sub>2</sub> was the control matching local conditions \*\* 1800 pCO<sub>2</sub> was the experimental for increased ocean acidity

#### Water Quality Analyst



Spectrophotometer, Daily

Used to determine spec pH (SpH) samples for OA aquariums Salinity probe is used to determine each aquariums salinity

Data collected from SpH and salinity is run through  $\ensuremath{\mathsf{R}}$ 

This "spits out" the actual pH of the seawater in each aquarium



#### Titration Machine, Weekly

Used to determine the alkalinity of each OA aquarium Data collected from titration is also run through R This "spits out" the "ideal numbers" needed to regulate the OA aquariums All the target data ("ideal numbers") were inputted into each OA aquarium

**Boat Operator** 

This summer I also had the opportunity to operate various boats for divers and for undergraduate research projects







#### Friday Harbor Field Trip

participated in the Friday Harbor trawl, at 1500 feet, with Dr. Cowles' Marine Biology class on 7/15/2021



Vessel captained by a Mainer!





Interesting organisms collected and brought back

Spotted ratfish, Hydrolagus colliei

#### Trips to Point Defiance Zoo and Seattle Aquarium

I participated in behind-the-scenes tours with the Dive Safety Officers (DSO) at both Aquariums

I learned the ins and outs of being a DSO and aquarist



At Point Defiance, I participated in the Eye-to-Eye Shark dive which promotes conservation of these amazing creatures

# Thank you!

I really appreciate your support regarding my summer internship at the Rosario Beach Marine Laboratory! I learned a lot this summer, improved my diving skills, and became a more confident scientist and diver.





Baby O. rubescens under dissection scope

Baby *O. rubescens* under dissection scope





O. rubescens escaping transport bottle

Juvenile Muusoctopus post weighing