

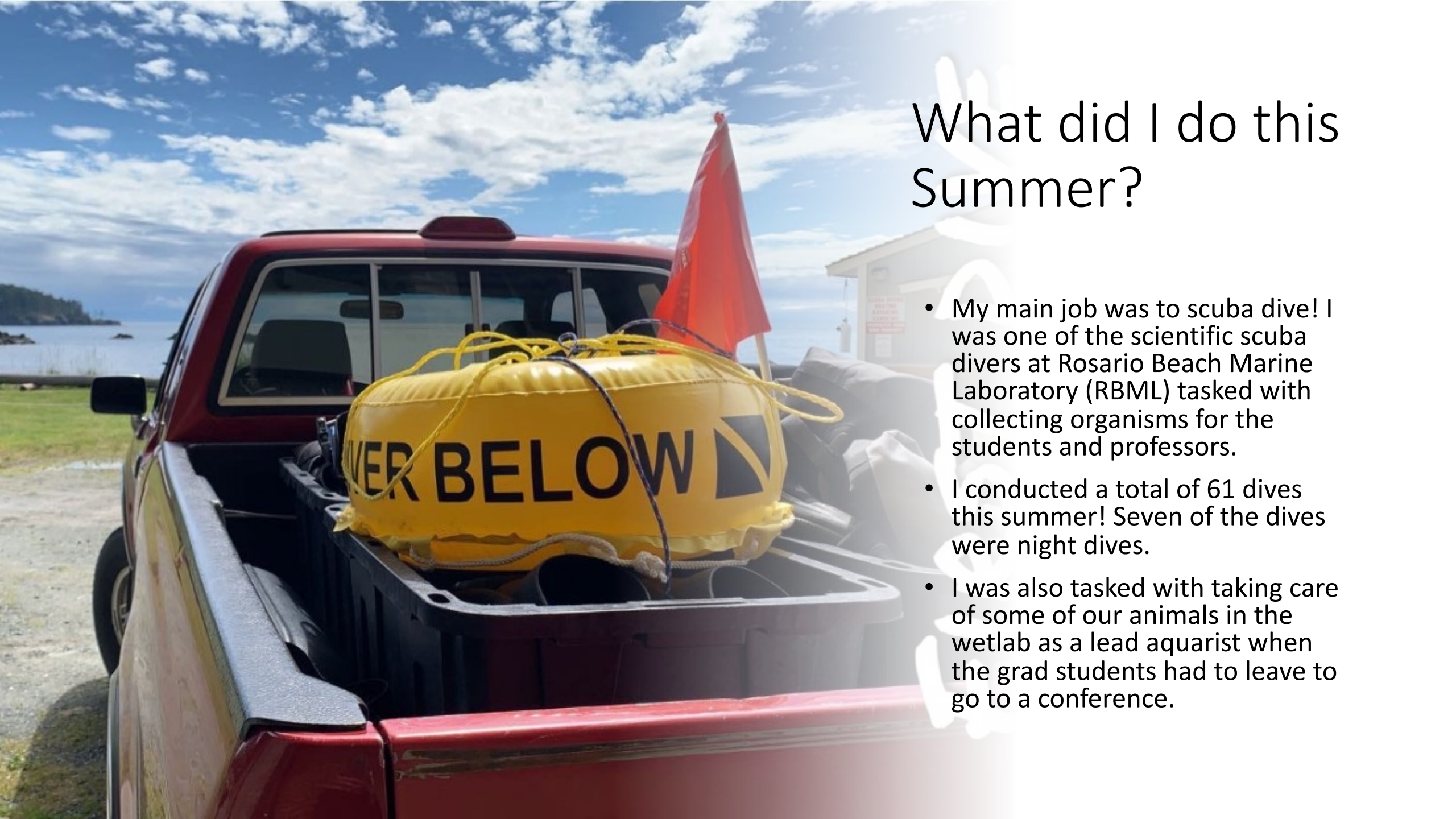


Summer 2022 Rosario Beach Marine Lab

Emily Stone

What did I do this Summer?

- My main job was to scuba dive! I was one of the scientific scuba divers at Rosario Beach Marine Laboratory (RBML) tasked with collecting organisms for the students and professors.
- I conducted a total of 61 dives this summer! Seven of the dives were night dives.
- I was also tasked with taking care of some of our animals in the wetlab as a lead aquarist when the grad students had to leave to go to a conference.



Making Connections!

- Dr. Jim Nestler
(Dive Safety Officer (DSO) & Sea Cucumber Specialist)



- Dr. Kirt Onthank
(Octopus Specialist)



- Joe and Tabitha Mangiafico! (Fellow divers who do Young of the Year rockfish counts)





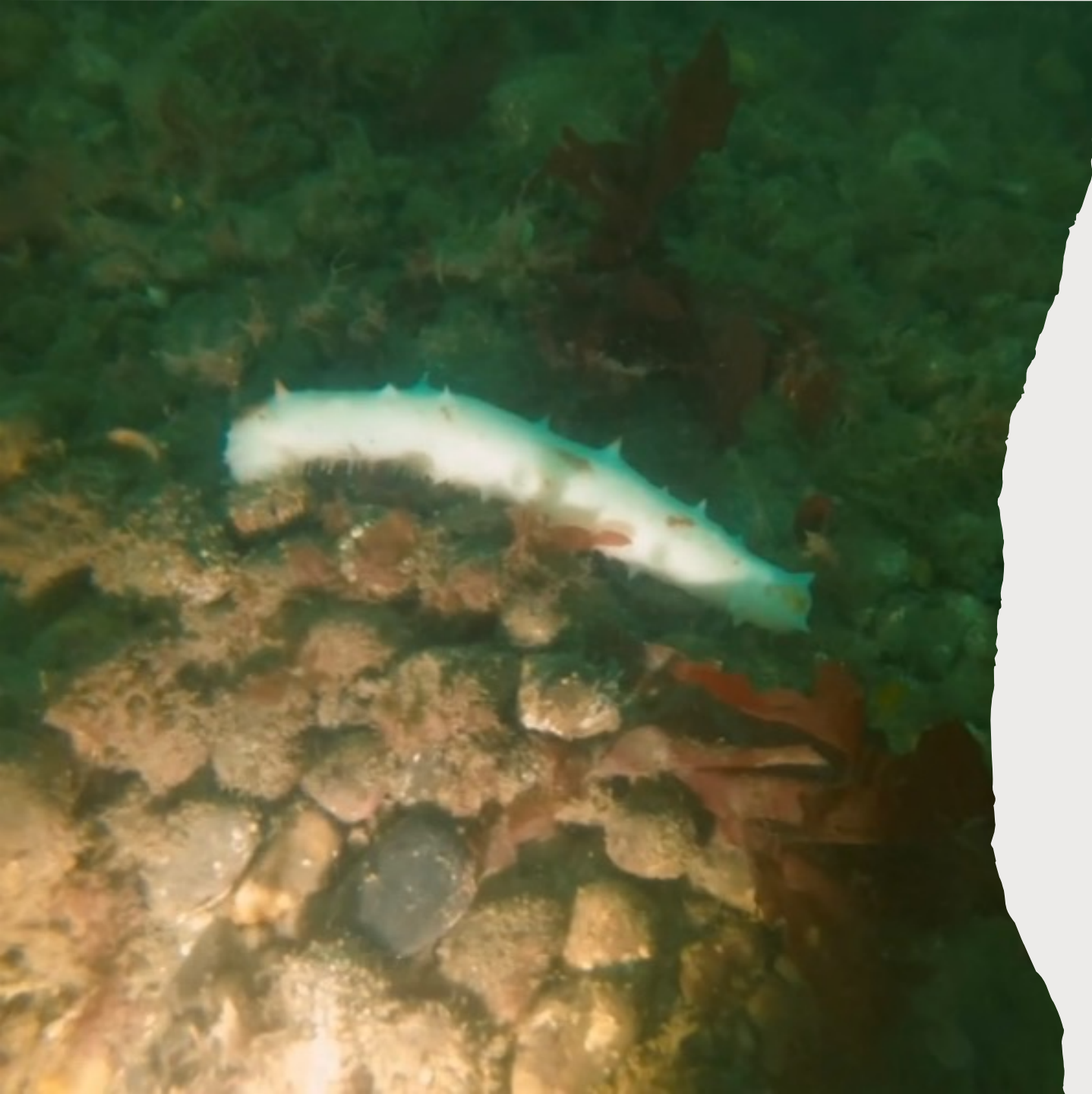
Solid color morph

California Sea Cucumber (*Parastichopus californicus*)

- One of the three main projects I helped with was collecting data on the California Sea Cucumber. We dove to collect size, color morph (solid, piebald), and skin condition (mucus, peeling, wasting, etc.) data on over 150 cucumbers for a grad student who was studying wasting disease in sea cucumbers at RBML.
- Luckily, we found very few cucumbers who showed signs of wasting disease that is ravaging other echinoderms.



Piebald color morph



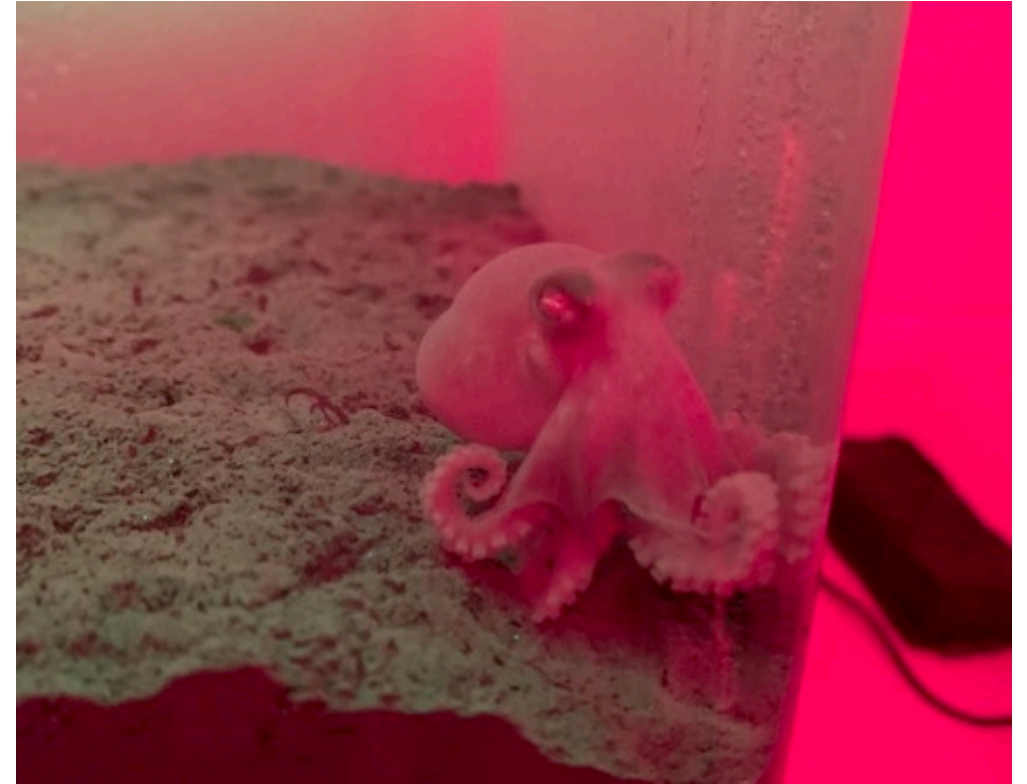
California Sea Cucumber (*Parastichopus californicus*)

- On one diving excursion to scout for more sea cucumbers, we came across an incredibly rare sight. Jim Nestler, the sea cucumber specialist, claimed he had never seen such a cucumber in his 25 years of diving in this area. He was ecstatic to find this specimen – as was I.

(An albino California Sea Cucumber!)

Muusoctopus leioderma

- The second project I was involved in was for a grad student studying the burrowing behaviors of the smooth-skinned octopus (one of only two known burrowing octopus species).
- Finding these little octopuses can be tricky! They live on soft, muddy bottoms and are nocturnal. Thus, we had to dive exclusively at night to collect them! They can be found reliably in Burrows Bay but finding them is only half of the job. Once you find them, you have to catch them quickly because they are incredibly fast burrowers.
- We used Ziplock bags to transport the octopuses from the ocean floor to the lab!
- Octopuses cannot see red light, so to mimic dark environments red tank lights were used.



More pictures of *Muusoctopus leioderma*



Finding one in the wild!



Releasing octopuses back into the wild

Octopus rubescens

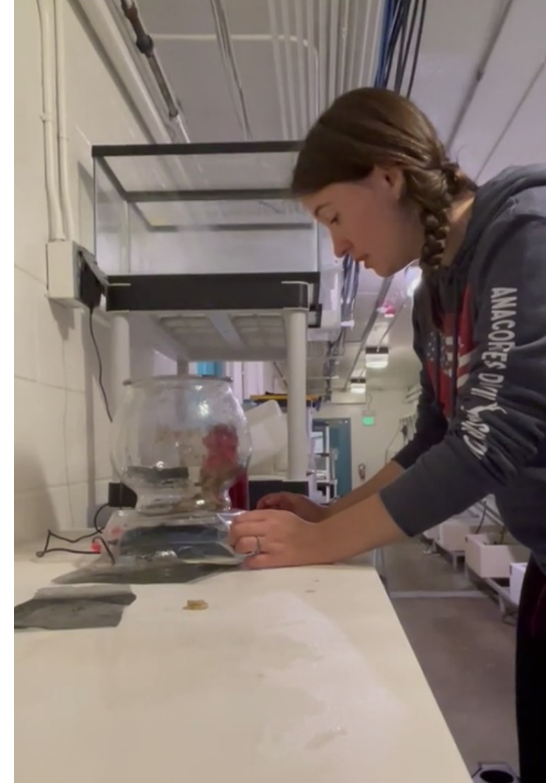
- The last big project I was involved in was for a grad student studying the effect of ocean acidification on the RNA replication and expression in the ruby octopus.
- We did many dives to collect these octopuses in Admiralty Bay. This bay is known to have hundreds of glass bottles that serve as dens for these octopuses.
- This summer was a record high for egg-bearing females according to Dr. Onthank – who has been collecting octopuses in this bay for years.
- To find the octopuses, we would use flashlights to peer into bottles. If we saw suckers inside the bottle, we knew there was an octopus in there! However, before collecting the bottle and octopus, we would first do our best to make sure that it was not a female with eggs. Unfortunately, we did collect a few females with eggs, but we promptly returned them to the Bay upon discovering eggs (some were even hatching when we brought them ashore).



More Ruby Octopus Pictures!



Transferring octos from glass bottles to red bottles for transport



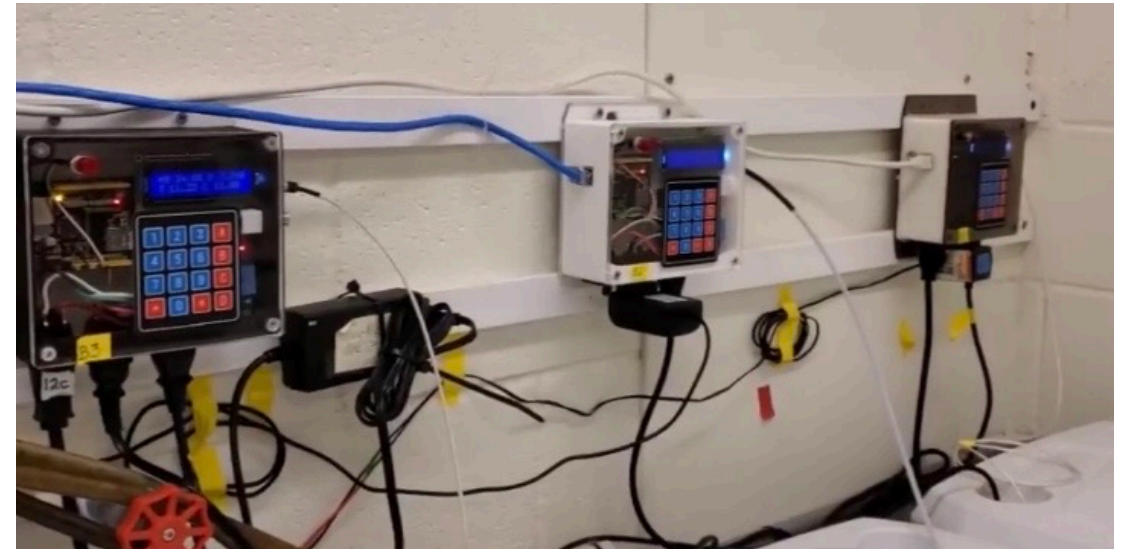
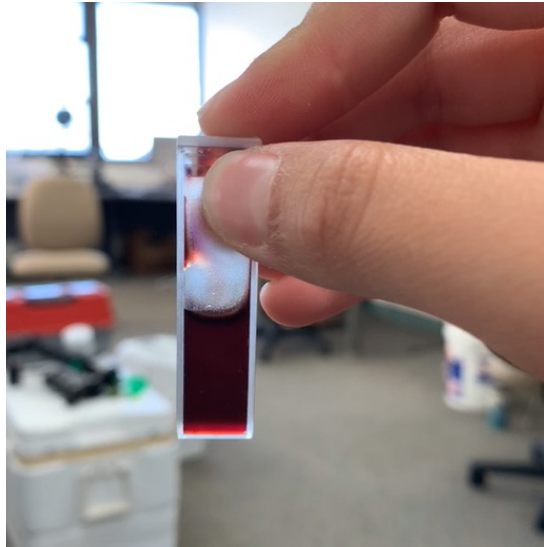
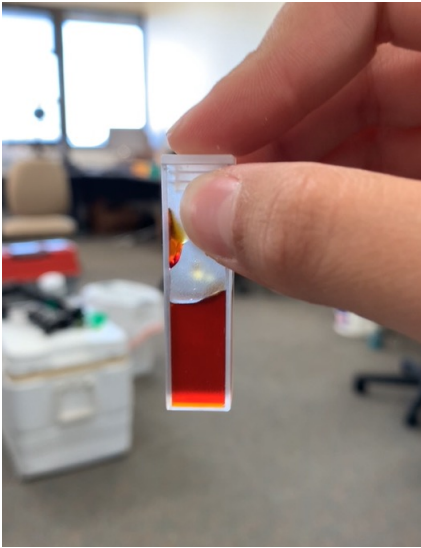
Weighting and sexing each octopus



Releasing into individual tanks

Ocean Acidification Lab

- Alkalinity and pH samples were taken daily of the tanks holding the red octopuses. Titrations and absorbencies were taken, respectively, to double-check that the monitors in each tank were calibrated correctly.



- Parameters were controlled using computers Dr. Onthank and his grad student designed. Each tank was connected to its own computer and monitored daily.

Abalone!

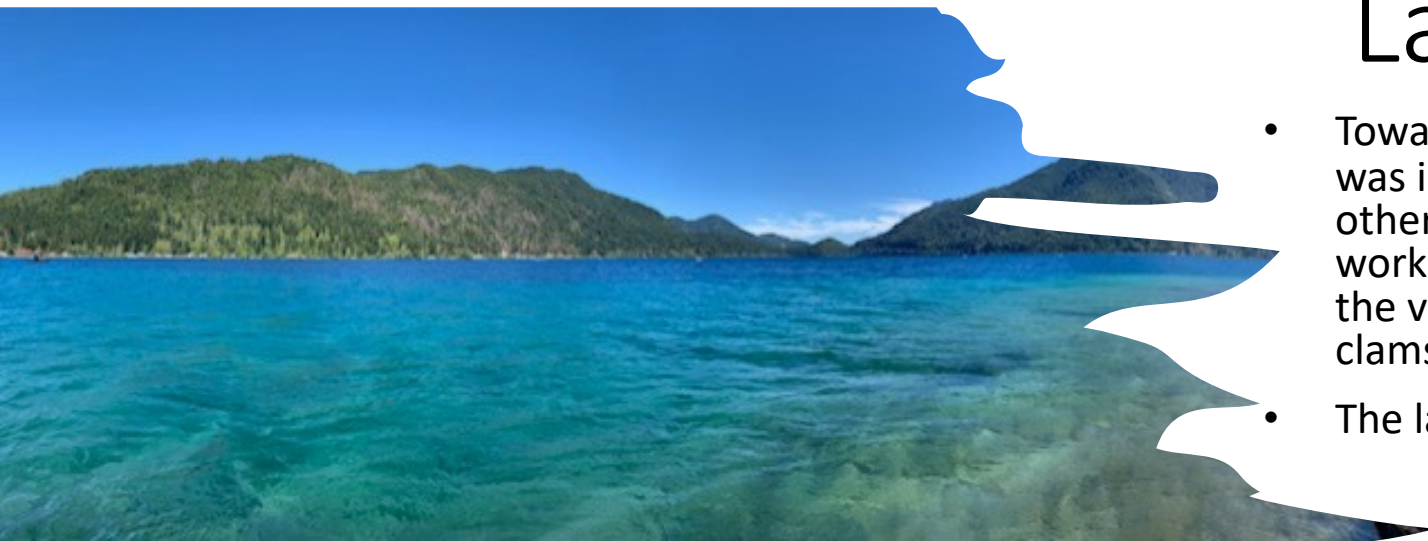
- Another project I helped with was done by a visiting high school teacher. Her research investigated the consumption of abalone (an endangered mollusk) by red octopuses. She acquired all of the juvenile abalones from a hatchery. They have been trying to release juveniles back into the wild – but have seen low recovery rates. They think that the red octopus might be eating them. We helped feed each octopus a selection of different food (snails, crabs, and abalone) and recorded which prey item they preferentially preyed upon.
- This is one we found in the wild – which is also very rare!





Lake Crescent

- Towards the end of the summer, another opportunity arose! I was invited by Dr. David Cowles to accompany him and three other students and our DSO to Lake Crescent! Dr. Cowles was working closely with the local fish and wildlife office to assess the vulnerability of Lake Crescent to invasive species such as clams, mussels, and snails.
- The lake was insanely beautiful, with a visibility of 60+ feet.





Lake Crescent

- We had three days to scour the lake in search for any sign of these invasive organisms. Unfortunately, we did find at least one invasive clam species, the Asian Clam (*Corbicula fluminea*). It was pretty sad to see how many of these clams have been introduced into this isolated lake and how they are impacting the native species of mussels – who were much fewer in population density. In the picture, you can see the siphons of the invasive clams. If I had to estimate how many we found, it would be in the millions!!!

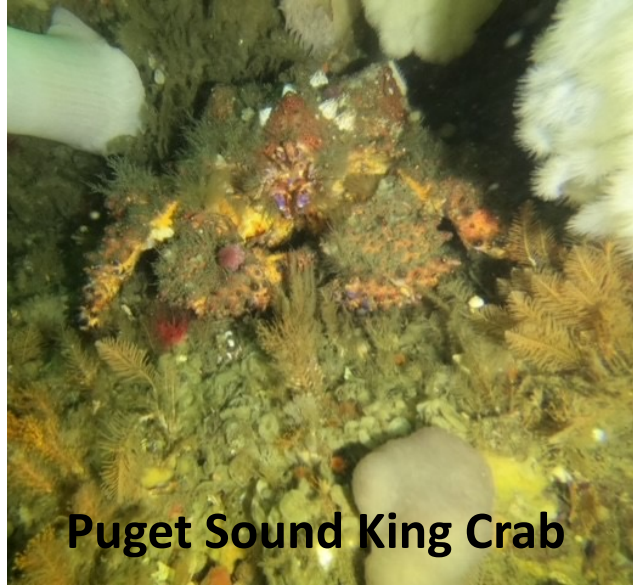
Orcas...

- Another insane experience I had while in Washington was during a dive on “The Fingers” (a site off of Possession Point). We were boating out to the dive site when Tabitha shouted “whales!” Dr. Verde cut the engines and we all looked around. In the distance was a pod of Orcas – more specifically, Transient pod 37 A.
- It was my first time ever seeing wild orcas and they put on a show since they were breaching and tail-slapping! We watched in awe for around 15 minutes until they went underwater and headed up the pass (or so we thought). We then got ready for our dive (in the opposite direction of where we had last seen the whales).
- We (four divers) were 3/4^{ths} through the dive when we heard a very loud and high-pitched shriek and we all looked at each other wondering if someone was screaming. Once we all gave the “okay” sign we realized what we were hearing. The Orcas! They had changed direction and headed down the pass toward us. The shrieks were getting louder and louder so we all hugged the wall and looked around anxiously. I hit record on my GoPro and randomly aimed it around. This is what I caught.....

Rose Star



Puget Sound King Crab



Solaster Star



**Vermilion
Star**



Other notable organisms!



Slime Stars

Sea Pen



Other notable organisms!



Leopard Nudibranch



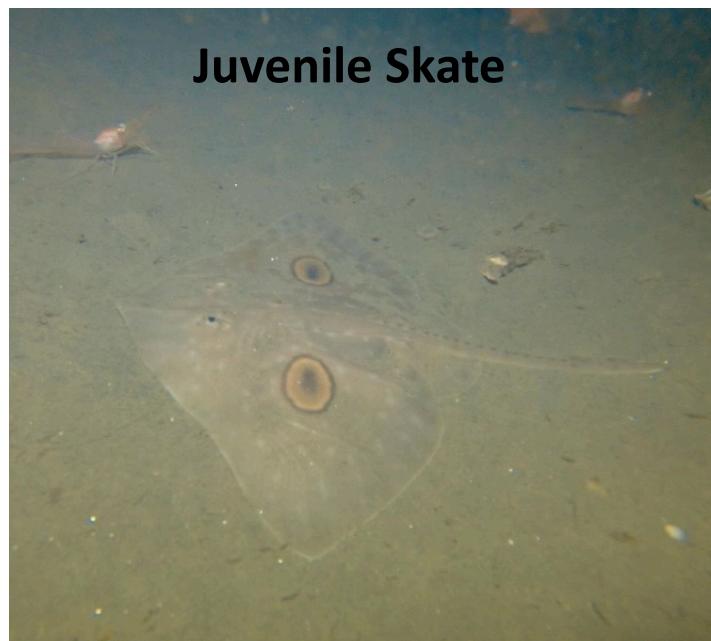
Clown Nudibranch



Juvenile Wolf Eel



“Elsie May” the Elephant Seal



Juvenile Skate



Wild bird

Picture I took of my dive buddy vs. Picture
she took of me





Thank You Quahog Bay Conservancy!

- With the financial aid from this scholarship, I was able to have the best summer of my life thus far. I learned so much about life in the Pacific Ocean. I am so incredibly grateful for the opportunity QBC afforded me. I was able to make some great connections and enhance my diving skills. I feel much more confident in my skills as a scientific scuba diver, and I am ready for my next adventure!