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Summer 2024

## South Slough National Estuarine Research Reserve Science Education Internship

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# COLLEGE OF THE ENVIRONMENT



**Internship Title:** Science/ Education team Intern

**Organization Worked For:** South Slough National Estuarine Research Reserve

**Student Name:** Hailey Thomas

**Internship Dates:** 6/18/2024-8/23/2024

**Faculty Advisor Name:** Ed Weber

**Department:** ENVS

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**STUDENT SIGNATURE** \_\_\_\_\_

*Hailey Thomas*

8/30/2024

**DATE:** \_\_\_\_\_

# **South Slough National Estuarine Research Reserve; Science/Education Internship**

## **Report**

### **Summary of job/daily activities**

This summer I had the opportunity to work in a meaningful and comprehensive internship position at the South Slough National Estuarine Research Reserve (SSNERR). I worked on many different projects and with many researchers and organizations. It was a great experience to see what alternate routes and specialties in the field of environmentalism might look like. My position was unique because I worked alternating with the education and science teams every week.

During education weeks, I worked with the Reserve Education Coordinator Jaime Belanger and other interns to facilitate science summer camps. The camps ranged in ages from 4/5-year-olds to high schoolers. The summer camps were four days long and consisted of many science and marine-based activities. We always took the kids to the Charleston Marine Life Center where we would learn about and be able to touch the local marine life and we always ended the week with an ice cream social where the kids could make ice cream sundaes and family could enjoy looking at pictures from throughout the week. Some of the many other fun activities we did with the kids included: going on many hikes, playing games, doing crafts, going tide pooling, going to the beach, going to the Coos Art Museum, going to the plastics art exhibit, banding baby purple martins, hearing from the Elakha alliance about sea otters, and even planting baby eelgrass seedlings in the ocean. Working with camp was always a big team effort to ensure all the kids were safe, well-cared for, and having fun.

During science weeks, I worked with Reserve Watershed Monitoring Coordinator Jenni Schmitt and other interns to collect hydrology, vegetation, water quality, elevation, and wildlife data throughout the estuary to assist in various restoration research and projects. This included trekking through the marsh while wearing waders and sometimes carrying heavy equipment to perform different data collection. I also did data entry which was inputting this information into Excel sheets for data analysis. I also performed QAQC (quality assurance and quality control) to ensure the data was entered correctly. Science days were typically fieldwork in the mornings and office/lab work in the afternoons. I also got to take part in a blue carbon soil core project and had the opportunity to volunteer with the Oregon Department of Fish and Wildlife and the Coquille Tribe.

### Connection to learning objectives and how they've been accomplished

#### Student Learning Agreement Objectives

“I hope to learn how to better communicate with youth when teaching them about the environment. I hope to learn more about the South Slough estuary and wetlands, and the types of benefits they provide to the environment. I hope to also learn the process of restoring a wetland and the specific ecosystems and organisms in South Slough that will be impacted. I also will be working in a lab so I hope to learn more lab etiquette.

This experience will contribute to my educational goals because it will provide me with hands-on experience working and improving my knowledge of

wetlands/estuaries and youth environmental education. It will also allow me to fulfill some credits while also gaining work experience. It will help me achieve my career goals because it will help me refine my focus when it comes to environmental studies. It will also give me valuable experience to assist me in future jobs.”

Through my internship experience this summer with SNERR, I was able to accomplish my initial learning objectives from the student learning agreement. I learned how to better communicate with youth when teaching them about the environment this summer. I found that when communicating with kids, short and simple language and directions are better, and finding environmental learning opportunities in the moment is easier for them to grasp. I also found that connecting with a kid over a common nature interest is a great way to get them to learn or talk more about the environment.

This summer I have also learned a lot about the South Slough Estuary and the benefits that it provides. The South Slough Estuary has four habitats; the uplands, the freshwater marsh, the saltwater marsh, and the mudflats, and provides many benefits to the environment and the community. The estuary protects local communities from flooding, helps clean the water to support marine life, is a vital nursery habitat for many fish, shrimp, and crabs, and provides shelter for migratory bird populations among many other things. South Slough in particular, also hosts many educational outreach programs to inform the community and other organizations about the importance of marshes and estuaries.

I have also learned a great deal about the process of restoring a wetland and have learned many of the species that will be impacted. I had the pleasure of working on a massive restoration project in Wasson Creek several times. The South Slough Estuary region was once inhabited by the Coquille tribe who took advantage of the marsh and the many benefits it provided, they would place small sticks to guide the channels where they wanted, and then when the area was settled by Europeans, the settlers drained and filled the land and planted invasive grasses to make agricultural and pasture land, they also built dikes to keep the tide from coming in. Restoration efforts at SSNERR work towards reverting the land back to a functional wetland. In Wasson Creek, physical labor coupled with machinery helped to trim the vegetation and remove invasive species, it also helped remove fish from the stream to be relocated to another stream, heavy machinery then dug out the ground and scrapped the roots of the invasive reed canary grass and ripped out trees leaving the logs to provide nutrients and create the sides of channels. Already, the lower ground has allowed the tide to flow back to where it used to be creating a much more wet ecosystem. Beaver dam analogs were also built to help slow stream flow and widen the channel. The next phase will be to replant native species and then wait 5-10 years for the natural processes to occur to revert the land back into a functioning wetland.

I have also better learned how to behave and act in a lab this summer. Safety is always the most important thing when working in a lab. Having good communication, cleaning up after yourself, and being kind are all helpful as well. I feel more comfortable in a lab setting after this internship and feel that my tidiness and attention to detail suit a lab setting. The biggest project I worked on in the lab was the blue carbon soil cores. The

cores had been taken from the marsh, sliced into disks, and labeled. In the lab we did a lot of weighing, grinding, and drying to eventually put the samples in a muffle furnace to burn off any carbon. We recorded all the weights meticulously and the data we produced will be used to calculate how much carbon the marsh stores. Saltwater marshes can store a lot of carbon and do a lot of good for the environment so it will be exciting to see the analysis when it is all complete.

This experience has also solidified my interest in working with water bodies and water ecosystems and my interest in doing more seasonal work positions. I have enjoyed getting to know Charleston and look forward to getting to know other places through more seasonal positions and working on new projects along the way.

### Connections to other classes

This experience brought up connections with ENV 303: Human Ecology and Ethics and ENV 305: Introduction to Environmental Studies II: History and Policy. The South Slough Reserve was once inhabited by the Coquille tribe and then it was used for agriculture and homesteads by settlers. The land was once managed by indigenous groups wisely and then it was drained and filled by settlers. This reflects many themes from across the United States especially in the West of settlers seeing only one use for the land which was agriculture and a monocrop. Settlers didn't acknowledge Indigenous systems of land management or knowledge. Then, eventually, the area of South Slough was purchased by the government and turned into the first National Estuarine Research Reserve in 1974. There is a system of reserves called the National Estuarine Research

Reserve System (NERRS) that was created as a part of the Coastal Zone Management Act. NERRS is managed by SSNERR's parent organization, NOAA. This reminded me of the themes we learned in ENVS 305 and reflected the growing environmental concern and efforts across the nation which were enacted through legislation. This experience and the above also reminded me of Public land conflict and collaboration.

Learning about the South Slough estuary and the functions of marshes also reminded me of themes from Introduction to Salish Sea Studies; I did a report on Snow Geese and a salt marsh that they stopped at along their migration and learned more about the diversity of marshes.

### Key experiences/stories

Throughout this internship experience at the South Slough Reserve, there have been many meaningful memories that I've created. I'd like to share some of my favorite stories and experiences.

One of my favorite experiences was when we banded baby purple martins with Joe Metzler, a retired Coast Guard, who works with fish and wildlife agencies and the community to build bird boxes and band/keep track of birds. We got to do this experience with our Dungeness camp which is for middle schoolers and they were very excited. The birds were at the perfect age to be banded and were very calm, everyone got a chance to pet the baby birds. Joe also had some very expensive binoculars and a scope set up so we could look at the birds. He told us these particular birds will make the trip down to Brazil



when it gets cold enough and there's a chance they could be spotted by other birders and be reported back to him.

Another one of my favorite memories was with the Megalops camp (7-8-year-olds) when we were at the beach near the Oregon Institute of Marine Biology. There was a small stream coming down the beach to meet the ocean, and where the water flowed the sand sunk in a bit creating a small channel. As we were all eating lunch the kids slowly got together and started building a dam. They tried various techniques and strategies and more and more people started to join in. Some of the counselors started to help and give tips. Everyone gathered sticks, sand, and rocks to support the dam effort. One of the counselors recommended they create a side channel to allow water to drain and the kids insisted it wasn't necessary. As the water built up, the dam bulged and eventually burst. Then, they tried again and made a side channel and the dam worked wonderfully, slowing the flow of the stream and widening the channel. It was a really beautiful thing to watch especially since the Reserve had just held a beaver dam analog (BDA) workshop to teach other organizations how to build them, and these kids just figured it out. It was a wonderful real-life outdoor learning opportunity and I'm very glad I got to witness it. We called it baby BDA.

Another one of my favorite experiences was the Elakha Alliance presentations. Kyle Motley, the Elakha Alliance's Coastal Community Coordinator would always visit our camp each week and give a presentation about sea otters. He would alter his presentation based on the age group of the kids and always did a fantastic job at holding their attention and keeping them interested. I also really enjoyed his presentations

because I got to learn a lot about sea otters and I learned that they are now absent from Oregon where they used to be very plentiful. There is a population up in Alaska and Washington and a population down in California but a massive gap where they used to live and now they are missing because of the fur trade. They also have one of the softest, thickest pelts I have ever felt. But, what I found most interesting about his presentations is that now in Oregon there is a massive effort for their reintroduction and a massive field has opened up with many job opportunities. It was eye-opening to me because there are so many niches and specialties within the environmental field and it is constantly expanding. It made me more closely think about my options when it comes to a career focus.

Another key experience was the aspect of community research. Charleston is a very small place but there is a community of scientists and researchers that focus on similar projects and goals. I appreciated this summer that it feels like a very warm community and they all lend a hand here and there when someone needs support on a project.

The last key memory I'd like to share is how we always ended camp with an ice cream party. Parents and siblings were always invited and the kids were always so excited. They'd pile toppings onto their sundaes and we'd look at pictures from the week as we divided up all the crafts. It was always something I looked forward to.

Review

I would absolutely recommend this experience to a future student. Working within the NOAA college-supported program offers many opportunities with many different programs. NOAA will work with the student to find a program that works for them and suits their needs. It is considerable to note however that Western Washington University does not provide any direct funding for this program so the position will likely be unpaid. I highly recommend the program with SSNERR as an education/science intern though, the wonderful people I met including my two lovely mentors and seven intern roommates, and the plentiful enriching experiences were more than enough payment. My summer with South Slough was one of the best experiences I've had to date and I could not recommend it more.

The science and education position allowed me to do a variety of work; I got to work with children, in a lab, out in the field, volunteer with partnering organizations, and attend important relevant events, all of which made the experience very engaging and fulfilling.

Working an internship during college is also important to gain experience in the field you want to join so that you can see if it's something you'll truly enjoy and excel in. I would recommend an internship experience or some type of seasonal fieldwork to anyone in college who is looking to build up their resume and dial in their career focus. It is a great opportunity to meet people, network, and build social skills.

### Internship Weekly Hours Log

Week 1: 29.25 hours

6/18: 9:00- 4:45

6/20: 8:30-4:30

6/21: 8:30-4:30

6/22: 6:30-12:00

Week 2: 25.75 hours

6/25: 8:00-2:30

6/26: 8:00-2:15

6/27: 8:00-2:00

6/28: 8:00-3:00

Week 3: 20 hours

7/1: 9:00-3:15

7/2: 9:00-1:30/2:15-3:15

7/3: 5:00-12:00/3:00-4:15

Week 4: 33.25 hours

7/8: 9:00- 2:00

7/9: 7:45- 3:00

7/10: 8:00-3:00

7/11: 8:00-3:00

7/12: 8:00-3:30

Week 5: 42 hours

7/15: 8:30-4:00

7/16: 9:45-4:30

7/17: 8:30-4:15

7/18: 8:30-4:30

7/19: 6:00-2:00

7/20: 10:00-2:00

Week 6: 41.75 hours

7/22: 8:00-4:30

7/23: 8:00-4:00

7/24: 7:00-4:00

7/25: 7:30-4:30

7/26: 8:30-3:45

Week 7: 36.5 hours

7/29: 8:00-4:00

7/30: 8:45-4:00

7/31: 8:45-4:00

8/1: 8:45-3:30

8/2: 8:45-4:00

Week 8: 39.25 hours

8/5: 8:00-4:15

8/6: 7:45- 3:15

8/7: 7:45-3:00

8/8: 7:45-4:45

8/9: 7:45-3:00

Week 9: 36 hours

8/12: 8:30-2:30

8/13: 6:00-1:00

8/14: 6:00-2:00

8/15: 8:00-4:00

8/16: 8:00-2:00/3:30-4:30

Week 10: 31.25 hours

8/19: 8:30-1:30

8/20: 8:00-12:00

8/21: 8:00-4:45

8/22: 8:30-3:30

8/23: 8:30-3:00

Total internship hours: 335 hours

## **Weekly Log**

### **Week 1: Zoea Summer Camp Training**

The summer camp interns trained together this week, we did procedural trainings and a camp overview, and we walked through the estuary and learned about its 4 habitats (uplands, freshwater marsh, saltwater marsh, and mudflats). We also learned about many of the reserve's plant, animal, and insect species and how to differentiate certain trees and ferns from one another. We tried canoeing in a large, indigenous-style (but not wooden) canoe called chmoosh. We also went tide-pooling and examined many species. We experimented with driving the camp vans, drove to all the camp/work sites, and did some of the crafts we were planning to do with the kids. This week was mostly about camp prep and getting comfortable with the area and familiar with some of its species.

This week helped me learn more about the South Slough Estuary and the benefits it provides to the environment. It is a diverse area and contains habitats for many species, including saltwater and freshwater. It is also often called a nursery because it contains many vital breeding habitats for fish, plants, and birds. I also learned more about the process of restoring wetlands, the South Slough estuary had many settlers and homesteads that altered and drained the land, a lot of restoration efforts go into connecting those broken pathways where the water used to flow by lowering the land and clearing plant material.

## Week 2: Zoea Camp (5-6 year olds)

This week was our first and youngest camp. It was mostly 5-6 year olds but we also had one 4 year old, we also had one child with autism who needed extra care and attention. We had an animal assigned for each day of camp to focus our teachings, we did related crafts, and activities, and read related stories. We also took them to the Marine Life Center, the beach, and on several nature walks. Everything we did was a science-based learning activity. We ended the week by sharing our favorite camp stories and hosting an “ice cream social” for the kids and parents.

This week taught me how to better communicate with kids. There were many learning opportunities, mostly to teach them how to respect each other and to respect nature. On our nature walks, we taught them to be careful to touch mushrooms because they might be poisonous, we taught them about nursery logs and how they contain nutrients to support plant growth, we taught them to be gentle with the endangered Western Lilies, we taught them the importance of staying on the trail to limit erosion and stay safe, and we taught them to not pick plants and to be nice to nature. This week helped me better my communication skills when talking to youth about the environment.

## Week 3: Science Team

This week we started out with the annual Western Lily survey, which is an endangered species that is only now found along the Pacific coastline from slightly north of Coos County, where I am located, to parts of northern California. Their numbers have slightly improved since their monitoring and restoration efforts include making a larger



habitat for them. Western lilies prefer boggy habitats which have greatly declined from a history of settlers altering the land for agriculture. Western lilies were also harvested for their beauty which also contributed to their decline. The survey is an important step in understanding how many lilies there are and where they are to aid in their restoration. Maps are created with the data we collected in the field.

I also participated in Wasson Creek stream clearing. There is a very large restoration project at Wasson Creek this summer to open back up some of its historic waterways. Teams have been participating in clearing the land and making it more level to allow the water to flow back in, creating new channels, constructing beaver dam analogs to assist with streamflow, and clearing streams to create a better habitat for the fish and to remove any barriers for nets that might need to temporarily remove fish during restoration. I personally worked on clearing the vegetation on the sides of the stream with a hedge trimmer to increase access, I also was removing and clearing any plant debris from the stream that might block a net or fish.

We also did Valino eelgrass monitoring and elevations this week. The 2016 marine heat wave that occurred in this area called the blob killed off a lot of the eelgrass in the area which is a very important species for many marine species. Eelgrass serves as a nursery for many shellfish, many fish also lay their eggs in eelgrass, which protects them from predators. Eelgrass also provides important ecosystem services like storing carbon which helps limit the impacts of climate change. After the marine heat wave, researchers at SSNERR started several eelgrass plots that are checked in on regularly, it is one of

their long-term projects. The eelgrass is counted and recorded as well as the species that live in them. I participated in monitoring the elevations around the plots.

#### Week 4: Megalops Camp (7-8 year olds)

Plankton olympics/ Canoe engineering challenge

Bird migration game

Sunset Beach

OIMB beach/ beaver dam analog

#### Week 5: Science Team

Toms Creek vegetation plots

Blue carbon soil core drying/ weighing/grinding

Kayak Training

RSET (Rod surface elevation table) and feldspar soil cores in Danger and Frederickson

Wasson Wildlife cameras: changed the batteries and SD cards

Data entry/ QAQC (quality assurance and quality control)

#### Week 6: Magister Camp (highschoolers) / Science Team

Sediment dynamics: feldspar/RSET

Removed monitoring from Wasson in preparation for earth-moving

Fish seining with Gary Vonderohe from the ODFW (Oregon Department of Fish and

Wildlife) in Coos Bay

Data entry, QAQC, office work

Planted eelgrass seedlings in plots with camp at Fossil Point

Bio Breakfast- breakfast with a group of biologists including guest speakers

SSNERR management commission meeting

Western Lily photo points

Week 7: Dungeness Camp (middle schoolers)

Golden/Silver Falls

Fossil Necklaces

YSI data collection and graphing

Canoe trip

Coos Art Museum

Purple Martin Bird Banding in North Spit

Week 8: Science team/ Marshfield Camp (middle schoolers)

Valino Island leveling

Soil grinding

Converting Excel files to GPS files in ArcGIS

Farmers Market

Applying to Grad School workshop

Invasive Bass electrofishing with the Coquille Tribe

Collect microplastics at the beach and create mosaic plastic art

Taxonomy shoe organization

Science Jeopardy

Week 9: Science Team

Invasive Bass shocking ODFW

South Slough 50th celebration

Blue carbon work

QAQC

Stream temp loggers

Groundwater well salinity loggers in Winchester

Week 10: Instar Camp (4th and 5th graders)

Millicoma Marsh trail

Washed ashore (plastics art exhibit)

Coos Art Museum

Fossil Necklaces

South Slough trails

Elakha Alliance presentation

Marine Life Center

Simpson Reef (we saw elephant seals)