

End of Year Fish Lab Newsletter, July 7, 2016

Happy Summer!

This year has been a wild ride for the GHC Fish Lab, and it seems to have gone by so fast! One year ago I stood with Joe and Nick in a run down building, primarily used for storage, and wondered what the heck I had gotten myself into. Today, that building is an operational hatchery run by an awesome group of student, faculty, staff, and community volunteers.



We have come far in our first year, and in this end of year newsletter I am focusing on the future. The attached newsletter is full of pictures, exciting announcements, and insight into where the Fish Lab has taken several of our students. Here is a sneak preview:

- **Our salmon have been released!** So many pictures of volunteers who were able to release, and sometimes name, their own set of fish. If you read the newsletter for the pictures, this one is for you.
- **Funding from the Rose Foundation for Communities and the Environment will support more education opportunities through the Fish Lab.** Our first round of Research Assistants are hired and have started work, check out the projects they will be working on this summer.

- **What are the volunteers doing this summer?** Volunteering at the Fish Lab was the first step, but how are we transitioning our volunteers into STEM careers?
- **Thank you! It's time to roll the credits.** I am incredibly grateful for all the support we received this year! There are so many people who have contributed to the Fish Lab, and they all deserve recognition.



**We released the salmon!!** And you can still visit them at Alder Creek. Hikers, dog walkers, students, faculty, and staff have all reported back that the ~4600 coho salmon we released last month are alive and thriving.

The decision to release was complex, a mix of Flow Index calculations and weighing the risks of moving the fish to the outdoor troughs considering the high temperatures and low dissolved oxygen Lake Swano experienced last year.

In the end, the best way to release a healthy stock was to do a fry plant in Alder Creek. To enhance the educational value, and give every participant the opportunity to play a role in the release, we provided everybody with a jar of fish to release to the designated areas. Pictures included throughout this newsletter include many of our participants releasing their fish.



A special thanks goes out to Christie Barchenger, Director of Science Education for the Historical Seaport, who joined us for the release and took several of the pictures for this newsletter. (Note: she took all the nice focused ones, credit for the blurry haphazard ones goes to me)



## **Exciting new projects funded by the Rose Foundation for Communities and the Environment.**

I am incredibly excited to announce that the GHC Fish Lab has been awarded a grant from the Rose Foundation, which will significantly enhance and add to the hands-on ecology education opportunities available to GHC students and our community.

The funded proposal, *Environmental Stewardship via Ecology-Based Internships and Community Education*, will provide the funds necessary to create the GHC Fish Lab Summer Research Program that will run three consecutive years, beginning this summer. This program will provide paid research assistantships to participants who will be gaining experience working on science projects directly related to the health of the Chehalis River Basin. These projects will be mentored by GHC instructors and collaborators who are experts in a variety of scientific fields, and participants will be guided through the process by attending a Research Methods course.



If you are interested in seeing what our Fish Labbers accomplish this summer, **you are welcome to attend their scientific poster presentations on August 17<sup>th</sup> at 5:30pm, Rm 4141 in the Schermer building at GHC.** See below for a list of mentors and projects.

In addition to these opportunities, the grant will fund the implementation of a geocache challenge on the Lake Swano trail, and the development of corresponding educational materials for use in K12 settings. I am, personally, excited to be a test subject as our team begins work on the geocache this summer. The education materials will be developed during next year's program under the mentorship of Christie Barchenger at the

Historical Seaport, and if you have met Christie you know you can expect great things!

As though these projects weren't enough excitement, our John Smith Aquaculture Building is undergoing renovations this summer! Keith Penner, of GHC Campus Operations, has been putting together plans and a strategy to repair and reinforce our infrastructure. Work has already begun, and we expect it will be ready for Erik Sandgren's art students to begin work on their fisheries murals this Fall. My gratitude goes to GHC Campus Ops for keeping our hatchery alive!

Projects/Mentors for the first GHC Fish Lab Summer Research Program include:

**Mr. Todd Bates, Geocache Challenge.** This ecology challenge will be the basis of educational materials that will be sent to K12 schools, and posted to the Grays Harbor College website in efforts to educate and raise awareness about the Lake Swano model watershed, Fish Lab, and Natural Resources programs. Plans are to have ten sites progressively placed along the main Lake Swano Trail with associated riddles or questions, each leading to the next site. Participants will incorporate the use of a GPS receiver and their knowledge of the temperate rainforest ecosystem that is found in our basin.



Mr. Bates is an instructor at Grays Harbor College in the Forest Technology program. During his eight years at GHC he has taught numerous classes in forest management and conservation along with general education classes in environmental science and mathematics. After receiving his Bachelors of Science degree from



University of California Berkeley, Mr. Bates was a professional forester for the Idaho Department of Lands and the Washington Department of Natural Resources for 18 years prior to beginning his teaching career. He obtained his Masters degree in 1998 in Forest Management, which has aided in the development of various research projects in natural resource management to benefit student learning and skill development.

**Dr. Amanda Lyn Gunn, Salmon Genetics and Stream Microbiome.** Well that's me. I earned my doctorate in Molecular Biology and Genetics at City of Hope Medical Center where my research was primarily focused on cancer development and treatment from a molecular perspective. From there, I began dabbling in plant-based vaccine design and integrating undergraduate students into my research plans. I have always been fascinated by the smaller things: the microbes, the genes, and the molecules, which is why I teach Microbiology along with survey courses in Biology and Chemistry at GHC.



When I fell in love with Grays Harbor about two years ago, I decided to find a way to shift my research interests to accommodate the interests and needs of our students and community. From that, the Fish Lab began. For the past year I have been volunteering my time managing the college's hatchery and creating hands-on ecology training for students who are interested in learning more. Several months ago, I had the opportunity to write a grant to create a summer research program to bring the next level of opportunities to our students. I am so excited to be working with my team this summer on salmon genetics/immunology and characterizing the stream microbiome. I am grateful to the Rose Foundation for funding this project, along with the other mentors who have agreed to spend their summer working with students and providing a greater variety of opportunities here at GHC.



**Mr. Anthony Odell, Analysis and Characterization of Algae in the Chehalis River Basin.** My name is Anthony Odell. I am a Research Analyst Lead at the University of Washington's Olympic Natural Resources Center. I am the coastal sampling coordinator for the Olympic Region Harmful Algal Bloom (ORHAB) partnership. My core role with ORHAB is to coordinate several tribes',

state agencies', and volunteers' monitoring efforts of harmful algal blooms along Washington's outer coast. Training and outreach are also large components of my position.

I have recently begun collaboration with the Grays Harbor College Biology department and have taken up lab and office space in the new Schermer Instructional Building. As a part of this collaboration with GHC, I would like to take on summer interns to investigate the basic oceanographic parameters and phytoplankton assemblage, marine to fresh water, of the Chehalis River Basin. The benefits of this scientific investigation would be to gain new insight in the variation of species of the organisms responsible for primary productivity of the Harbor. Along with the pure research aspect of the study, current hot topics like nutrient load (pollutants vs natural), pH (ocean acidification and climate change), and hypoxia (dead zones) could be looked at as well. I think not only would this be interesting and exciting work, but could also benefit the many stakeholders in the many natural resources industries around Grays Harbor.

**Mr. Timothy Plagge, Salmon Genetics and Amphibian Diversity.**

My name is Tim Plagge, I am currently a biology instructor at GHC and I will be participating in the summer internship program here at Grays Harbor College as a mentor. My background is in general biology, with a focus in organismal biology. I received my Bachelors of Science in biology at Alma College in Michigan, and my Masters of Science in biology at Eastern Michigan University. I have been involved in education ever since and have taught a variety of courses, including general biology, marine biology, zoology, human anatomy & physiology, organismal biology, environmental science and marine biology. I will be mentoring a student during this first summer on a project involving the genetics of Salmon in the Grays Harbor watershed. There is a possibility of working with an additional student on a project involving the diversity of amphibians in Alder Creek.



**Fish Labbers... Where are they now?** Over the past year, we have had around 60 volunteers join us in the Fish Lab. While some just wanted to check things out, others wanted to visit our fish, and a solid group of GHC students just kept coming back. These volunteers learned how to manage our small

hatchery, analyze water quality, maintain our trail system, and when they were confident in their skills they began peer-mentoring other students. They participated in working field trips to the Satsop Springs and Lake Aberdeen facilities, and spent countless hours reading primary scientific literature. They identified microbes, investigated vaccines, and ran bioinformatics on genes that have gone suspiciously uncharacterized in coho salmon.

With our building under construction, you might worry that they (like me) are experiencing empty hatchery syndrome. What are our volunteers doing without a hatchery?!

Although some are taking a well-deserved break over the summer, others have decided to take their science into the laboratory. This year I didn't just get to raise fish, I got to raise a top-notch batch of Research Assistants. I am so proud of them all, so I asked each of them to write a few words about what they will be working on over the summer.



Allow me to present our Senior Fish Labbers...

Fish Labbers hired as Research Assistants with funding from the Rose Foundation for Communities and the Environment:



**April Bacongco.** My name is April Bacongco, and I've been going to Gray Harbor College since 2013. I started going to college not knowing my passion. Since I had experience working as a caregiver I thought going for nursing would be the best idea. After finishing my prerequisites I met Dr. Gunn, which helped open more doors for my future career. I started involving myself at the Fish Lab and realized I've spent more time doing this than volunteering at the hospital. I enjoyed working in the lab and getting involved with the environment. I want to

be part of something where I can make a difference. Working at Fish Lab made me understand why it's such an important thing in our ecosystem. I participated in feeding the salmon, monitoring water quality, and maintaining the yard and the trails. Not only have I contributed my time at the Fish Lab, I've also gone to the Satsop Springs and Lake Aberdeen facilities. I also help monitor bird mortalities through COASST, collecting data and identifying their species. This internship will help me gain the experience that I need to pursue my career and open more doors for a future job. *April will be working with Mr. Odell to characterize the algae at the mouth of the Chehalis River Basin.*

**Joe Kalisch.** My name is Joe Kalisch, and I am pursuing a career in fish health, focusing in genetics and pathology. I have been volunteering with the GHC Fish Lab for over a year now, and have been involved every step of the way, which has led me to a senior volunteer position. I am participating in the research program because it will allow me to get hands on training in a career that I am interested in and prepare me for future opportunities. In the Fall, I will begin working toward my Bachelors of Science at the Evergreen State College. After that, I am considering entering graduate school at Oregon State University. *Joe will be continuing the work he started last summer to characterize immunity related genes in coho salmon, along with working with Mr. Plagge on an amphibian identification project. Materials for the genetics project are being provided by the Grays Harbor Marine Resource Committee.*

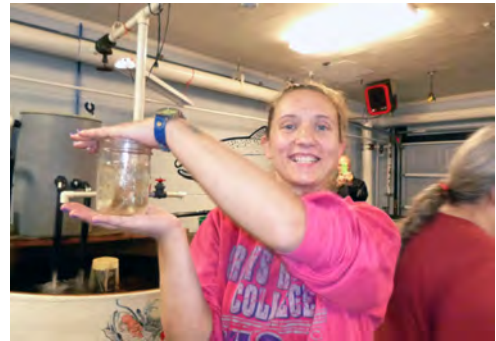


**Zachariah Miller.** My name is Zach Miller. I am 31 and have been interested in science since I was about 7 years old. I have loved science pretty much my whole life. Working for the Fish Lab and working on this scientific grant project was something I was meant to do. My career goal is to one day become a nurse practitioner, owning a clinic. Along with a minor in chemistry or microbiology. My previous involvement in



the Fish Lab was through microbiology at Grays Harbor College. This was a very interesting and exciting class where I got to do hands on scientific projects and documentation. The reason I would like to participate in this program is because I love the outdoors and hands on projects especially having to do with nature and science. I am looking forward to creating an opportunity for people of all science interest and levels to enjoy a treasure hunt about and for science. *Zach will be working with Mr. Bates to develop a geocache challenge on the Lake Swano trail system.*

**Olivia Nicholson.** My name is Olivia Nicholson, I am a current Running Start student from Aberdeen High School and am going on to start my senior year. Since 5th grade I have strived to become a marine biologist and work in the field. I was extremely excited to get the opportunity to work in the Fish Lab and Hatchery at the college and have volunteered there by helping raise fish, testing water, and other miscellaneous projects. I'm eager to participate in this internship opportunity because it will not only give me experience in the field, it will bring me one step closer to my dream job. *Olivia will be working with Mr. Odell to characterize the algae at the mouth of the Chehalis River Basin.*



**Jeff Richardson.** I have no idea what I want to do after I graduate. The world is too big to set my mind on one thing. I need to see it all, before I can decide what I will be. I think that this internship will be an excellent opportunity to preview the world of scientific research, and be stepping stone to further opportunities in science. *Jeff will be*

*working with Dr. Gunn to characterize the microbiome of the juvenile salmon habitat in Alder Creek.*

**Samantha Richardson.** This is my second year at GHC and I am working towards my Associate's of Pre-Nursing and am planning on transferring to



UW to earn my Bachelor's in Medical Technology. I would like to become a certified Medical Technologist and to work at Virginia Mason Hospital in Seattle. I previously began volunteering in the Fish lab when I became interested to see what a hatchery was like, and later began painting murals on the walls. I would like to participate in this internship because it will help me prepare for my future career in the lab. *Sam will be working with Dr. Gunn to characterize the microbiome of the juvenile salmon habitat in Alder Creek.*

New Fish Lab volunteers who will also be contributing to these projects:



**Jordan Haney.** My name is Jordan Haney, I am a new student at Grays Harbor College. I will be studying biological sciences, and will follow the Associate in Science- Transfer Track 1 in efforts to obtain a Bachelor's Degree in Biochemistry. *Jordan will be working with Mr. Plagge to identify amphibians on the Chehalis River Basin.*

**Alexander Islas.** I am a natural resources major. I mainly want to work on Anthony's project because I really like the more hand on experiments and I want to get a more in depth feel for how research is run. I plan on continuing on for the new bachelors in forest management here and because that will take a few more years, maybe I could continue to help out. *Alex will be working with Mr. Odell to characterize the algae at the mouth of the Chehalis River Basin.*

**Lynne Scamman.** My intended major is marine ecology. I want to do this project to gain knowledge about Grays Harbor's ecosystem, and I plan to pursue my degree at Evergreen State. *Lynne will be working with Mr. Odell to characterize the algae at the mouth of the Chehalis River Basin.*



Fish Labbers who will be gaining experience off campus this summer:

**Meg Lavoie.** Meg's first real biological experience was working on a Fish Lab bacteriology project last winter. During this project, she was able to identify several of

the bacteria found in Alder Creek, and realized this might just be a career she wants pursue. She is already off to Nevada for the summer where she is participating in the University of Nevada, Las Vegas, Mechanisms of Evolution REU program. Meg is working with Dr. Hedlund to collect samples from the Great Boiling Springs. The main goals for her project include understanding denitrification, which microbial groups can respire N<sub>2</sub>O, and then possibly identify those denitrifiers. *Meg applied, and was accepted, to the summer research program AND was admitted as a transfer to the B.S. Biology program at UNLV.*



**Malia Marks.** I have been working one-on-one with Dr. Gunn to design a vaccine for *Flavobacterium psychrophilum*, a bacteria that causes cold water disease in salmon. The project requires us to clone an extracellular protein from the bacteria. In the process of looking for the perfect target, we came across many proteins of unknown function. We did some 3-D modeling on one and have identified its most likely shape and function. The progress that we've made is absolutely astounding to me; four months ago, I'd never have dreamed of doing any research before grad school, but here I am as a high school Junior, contributing to the scientific and local communities! *Malia is spending her summer in South America, but will return in the Fall to continue her project and take her first college-level Biology course.*

**Thank you.** Over the past year, **2,062 volunteer hours were contributed to the Fish Lab.** In addition to the volunteers, campus staff, local organizations, and the community contributed to making it what it is today. Thank you to everybody who showed up, and showed support this year!

*Volunteers, including students, faculty, staff, and community members, who joined us in the Fish Lab this year are listed below. Please excuse spelling errors, names were pulled from the hand-written log book.*



April Bacongco  
Christie Barchenger  
Aliss Barre  
Jon Botsford  
Shy Catlin  
Jenny Causey  
Darby Cavin  
Lacey Dahlstrom  
Maria Deditius  
Zack Deditius  
Brady Dier  
Steven Dobrosky  
Steven Dover  
Nicole Franks  
Steve Franks  
Abigail Giacomia  
Albert Giacomia  
Laryssa Gilman  
Micaela Golia  
Randy Houk

Frank Gordon  
Brady Green  
Amanda Gunn  
Stephanie Holland  
Arzalia Houk  
Kathy Kaires  
Joe Kalisch  
Tom Kuester  
Meg Lavoie  
Roneathe Lee  
Tom LePage  
Margaret Lynn  
Erik Machowek  
Malia Marks  
Nate McKinney  
Amy McMillan  
Zach Miller  
Diane Muir  
Ronan Murphy  
Nick Neeley

Cassie Nylander  
Janet Parker  
Natalie Peterson  
Anita Plagge  
Olivia Nicholson  
Tim Plagge  
Chris Portmann  
Mikaela Richardson  
Sam Richardson  
Clara Roush  
Helen Roush  
Adrienne Roush  
"Grandma" Roush  
Alex Seta  
Anne Marie Sheppard  
Collin Stone  
Kasia Tugagga  
Maxwell Vega  
Kyle Vordahl  
Timm Wheeler

*None of this would be possible without the support from the Grays Harbor College staff and administrators. The following people have been incredibly patient with me as I stumbled through this year. They have taken the time to teach me, train me, and show me how things work. For every smile, and for every lesson, thank you for your kindness and support!*



**The GHC E-Team:**

Kristy Anderson  
Ed Brewster  
Laurie Clary  
Jason Hosenev  
Darin Jones  
Sandy Lloyd  
Barbara McCullough  
Keith Penner

**The entire amazing GHC Business/Financial Offices, and in particular:**

Judy Bennett  
Jackie Blumberg  
Barb Dyer  
Aleta Fuhrer  
Penny James  
Kathee Katainen

**Campus Operations:**

Matt Crollard  
Lance James  
Randy Karnath  
Chris Macht  
Rick McGuire  
Travis Obias  
Janet Parker  
Dave Smith  
And all their work studies!

**The fabulous team at  
TRiO:**

Jeannette Green  
Amy McMillan  
Michelle Roos  
Julie Skokan  
Chance Stewart

**Let us not forget:**

Maureen Espedal  
Mike Kelly  
Lisa Krause  
JEB Thornton  
Sandy Zelasko

**Laboratory support:**

Michael Auckland  
Kathy Kaires

**Media Support:**

Jane Goldberg  
Rich Wenke

*There are also organizations that have taken us in, educated us, funded us, and provided support when we most needed it.*



**Aberdeen PUD**, especially Rick Sandger and Kyle Scott

**Grays Harbor College Foundation**, lead by Jan Jorgenson, PJ Daugherty's astounding organizational skills, along with the generous donors who have contributed to the Fish Lab and Watershed Fund

**Rose Foundation for Communities and the Environment**, Kevin Hendricks and Tim Little have been amazing to work with!

**Aberdeen Stream Team and Clean Stremes and Memes**, in particular Joshua Francy and Jared Figlar-Barnes

**Grays Harbor Historical Seaport**, I predict amazing science education in the future with Brandi Bednarik and Christie Barchenger on board

**Satsop Springs Fish Rearing Facility**, Steve Franks has been an awesome mentor to our volunteers

**Chehalis Basin Fisheries Task Force**, particularly Lonnie Crumley, Steve Franks, Frank Gordon, and Terry Nielson

**Grays Harbor Marine Resource Committee**, and especially Lorena Maurer, who are providing funds for our genetics project

**WA Department of Fish and Wildlife**, the Lake Aberdeen Hatchery has provided mentorship and support above and beyond. Keith Burns, Ken Isaakson, Eric Roos, along with Randy Aho in the District Office

**Chehalis Basin Partnership**, what would we do without Kirsten Harma?

**Wild Iron Outdoors**, including Kyle Vordahl and Nate McKinney who show up, pitch in, and work hard



I can't say it enough... Thank you!