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Sent: Monday, November 02, 2015 8:28 PM
To: fishlabghc@gmail.com
Subject: GHC Fish Lab Newsletter Nov. 2, 2015
Attachments: GHCC article.pdf

Hey Team,

There have been a lot of exciting things going on at the GHC Fish Lab! Below, you will learn about some of the current and upcoming opportunities to get involved with our local ecosystem.

- 1. New Volunteers!**
- 2. African Cichlids, Unknown Microbes**
- 3. Satsop Hatchery Volunteer Day, Save the Date – November 14th 8am**
- 4. Aeration Tank and Improved Dissolved Oxygen**
- 5. Fishing Season Cut Short, Thoughts from the Wild Fish Conservancy**

New Volunteers! First and foremost, we want to give a great big shout-out to the amazing volunteers who have spent their time at the GHC Fish Lab. Over the past two weeks, we have had TEN new faculty and student volunteers join our team, and altogether we have put nearly 100 volunteer hours toward maintaining our hatchery and restoring our watershed. Not only have we run our regular water quality analysis and built the aeration tank, but we have also had GHC Math Instructor Tom Kuester canoeing Lake Swano to clear the dam and remove some invasive plants.

Mr. Kuester, along with GHC Biology Instructor Tim Plagge, pre-Nursing student Laryssa Gilman, and pre-Fisheries student Joe Kalisch also banded together during a very rainy day last weekend to walk Alder Creek and remove debris. Let this serve as a reminder that when you volunteer at a hatchery, you are bound to get a little wet. Those drains in the floor are not for decoration, so make sure you bring appropriate footwear when you come to volunteer. For indoor work, rubber sole shoes will do the trick. On Saturdays, if you want to participate in the many outdoor activities, you will want to bring waterproof boots or waders if you have them. Don't forget that we are out there rain or shine, so dress for the weather and bring a raincoat!

Below is a picture of just how much water we encountered last Saturday. Shown is our adult pond, with water flowing from Lake Swano.

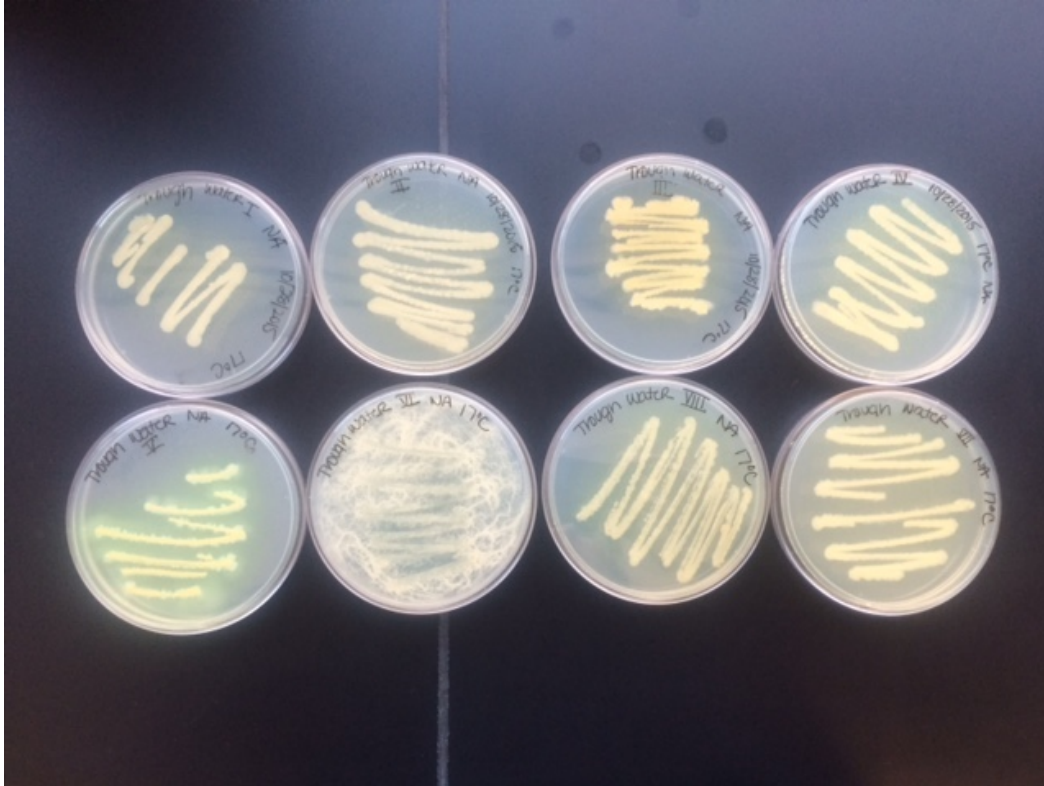


If you are interested in checking it all out or joining forces, our doors are open. You can join us on Mondays or Wednesdays at 3pm for regular water quality analysis, and Saturdays at 8am for larger projects. No need to make an appointment, just drop by and we'll show you what to do.

African Cichlids. There are some new faces at the GHC Fish Lab, and I'm not talking about the volunteers. African cichlids are a diverse group of fish from the family *Cichlidae*. They prefer warmer water, around 80F, and slightly higher pH, 7.5-9, than the fish we would see in the Chehalis River. Something remarkable about these fish is their color patterns, which make them a perfect model organism for visualizing Mendelian inheritance. Below, you can see the colors just beginning to come in on Dog, a fish from our first batch of babies. At approximately 8 weeks old, you can see the yellow body and blue dorsal fin. We are very excited to watch these colors continue to develop, and another batch of cichlid babies will be joining us soon. Come by and check out our new fishy friends!



Unknown Microbes. As if new fish weren't exciting enough, we also have new bacteria! Shown below are the first eight unknown bacteria isolated from our hatchery water by pre-Nursing student Jayme Peterson. These bacteria will be characterized by GHC Microbiology and Survey of Biology students over the next few weeks.



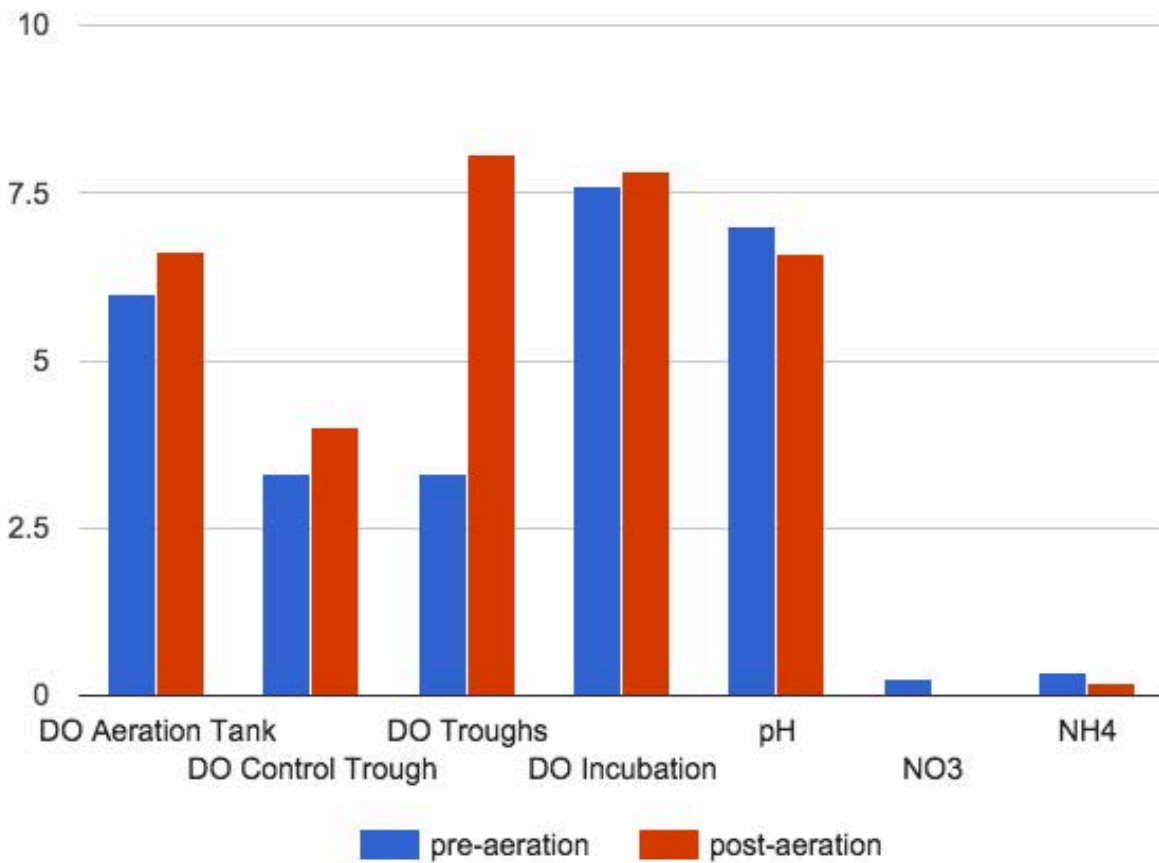
Some of the microbes have fairly distinct characteristics, giving us a little hint of what we can expect. Have you ever smelled really bad dog breath? Well the “glowing” bacteria on the bottom left smells just like it, indicating it might be a *Pseudomonas* species. Another fairly putrid smell is that of over-ripe fruit, and it is a smell currently emanating from our incubator. Smells like we might have an *Aeromonas*! It isn't just the smell, but the appearance that can give us a hint. That hairy looking bacteria in the bottom row shows a classic morphology for a *Bacillus*. Stay tuned as our students work through the biochemical assays that will help us characterize the microbiota of our water.

Satsop Volunteer Day, Save the Date – November 14th, 8am. As we wind down the preparation of our own Fish Lab, we are reaching a lull while we await the arrival of our Coho eggs. That does not mean all is quiet at the Western Washington hatcheries, in fact many are in the midst of their busy season. For

this reason, GHC Fish Lab volunteers will be heading to the Satsop Fish Hatchery on November 14th to help out, get wet, and potentially handle some fish. If you are interested in joining us, you can meet us there or meet at the college at 8am to arrange carpool with your friends. Please reply to this email if you would like to join us so I can get a preliminary head count, provide release forms, and give further instructions. All are welcome to join us!

Aeration Tank and Improved Dissolved Oxygen. The aeration tank has officially been constructed, and water has been flowing into the indoor fish troughs for the past week. Below is a graph that shows our water quality analysis before (blue), and after (red), the addition of this new intermediary between our lake and the hatchery water system.

Water Quality Analysis



On the x-axis, you can see the type of measurement taken. This includes location for dissolved oxygen such as the aeration tank, itself, a control trough that was not hooked into the new system, our indoor troughs, and the egg incubation trays. The y-axis shows the measurements in ppm, except pH which is measured in pH units. As you can see, there is no significant change to any of our values with the inclusion of the aeration tank, with the exception of our indoor troughs. Our indoor troughs are now measuring DO levels that average above 8ppm, which is suitable for raising salmon. This is nearly double the DO seen in our control trough! Congratulations to the many volunteers who contributed to the design and implementation of the aeration tank, it is a major success!

Fishing Season Cut Short, Thoughts from the Wild Fish Conservancy. Recently, the salmon fishing season had to be cut short due to low wild Coho counts. This is something that will not only affect our economy, but will affect each of us personally as well. For me, a recent transplant to the Harbor, I have already grown attached to mornings spent on the Chehalis. Admittedly, I might just be the worst fisherman ever, but I love it just the same and I am going to miss sharing that experience with my friends. My friends, in turn, will miss laughing at me when I freak out over a bobbing fishing pole. In my short time here, I have fallen in love with this community and its culture.

With the success of our aeration tank, the hard work of our volunteers, and all the fun we have been having, I can't help but think of the strength of the Grays Harbor community. If there is one thing I know about the Harbor, it is that our community can accomplish anything when working toward a common goal. While we do not know exactly why the runs were smaller than expected, there are an overwhelming number of factors that may have been involved. Whether it is the high summer temperatures, increased coliforms, the low oxygen levels, El Nino conditions in the ocean, or simply mistaken predictions and early over-fishing, there is no shortage of challenges to our salmon returns. So how do we fix it?

Ecosystems are notoriously complex, and it is up to the Grays Harbor community to ensure we are taking care of the environment that supports our families both economically and spiritually. For Jamie Glasgow, of the Wild Fish Conservancy, it is his job to use science to develop policies that will help guide us all in how to preserve and protect our salmon.

“There are those of us who are inspired by the natural grace around us. We will each do what we can, individually and collectively, to protect and restore watersheds and advocate for smart, science-based, and responsible growth and resource management. Against great odds we’ve made a lot of progress within the last decades.”

In an article about conservation, attached to this newsletter, Glasgow uses rental cars as a metaphor for how we treat our ecosystems:

“Which brings us to rental cars It’s been said that in the history of the world, no traveler has ever taken a rental car through the car wash. Renters are not invested in their rental car – it is simply a means to an end. Responsible maintenance comes with being invested. Similarly, the more the public is invested in our watersheds, the more likely they are to care for them. In that way, understanding and appreciating ecology leads to responsible stewardship. For this reason, outreach and education are fundamentally important to protecting the environment...”

We at the GHC Fish Lab agree that education and outreach are crucial to the goal of protecting our environment. On that note, come down to one of our volunteer days and see how we all can contribute to a healthier ecosystem. Let's work together to ensure we see the return of our salmon for many years to come!

Stay tuned for more updates...