

Hey Everybody,

First, I want to thank those of you who came to the new volunteer orientation last week. If you were unable to make it last Wednesday, here are some things you should know.

**We meet regularly for water quality analysis on Mondays and Wednesdays at 3pm, and Saturdays at 8am.

**There is PLENTY to do aside from water quality, so if you are interested in spending some time at the Fish Lab we can make arrangements. Just get in contact through FishLabGHC@gmail.com

**There is a volunteer notebook that you will need to fill out each time you volunteer. We will walk you through this your first time.

**As you all know, we will be receiving 5,000 Coho eggs from the Aberdeen Lake Hatchery in another month. The timing is not precise, in particular because the salmon are running late this year.

What does that mean, salmon are running late? Do they do that?

Region-wide, the dissolved oxygen (DO) levels in the water are quite low right now. Through communications with some of the other hatcheries, we have heard that they have ranged as low as ~1ppm, but as high as ~8ppm. The goal is to have DO at around 9ppm, and historically the Lake Swano levels have hovered around 8.5ppm. If the salmon can't get enough oxygen, they won't swim upstream to spawn.

How are we measuring DO?

There has been a lot of hands-on learning at the Fish Lab lately, for ALL of us. To start, we have been doing regular water quality analysis using our instrumentation. In addition to this, we are also monitoring the invertebrates present in the water coming through our pipes. Because our hatchery is gravity fed from Lake Swano, we get to take a look at the critters that come through as well.

Currently, there are two invertebrate species that we are monitoring. The first, *Daphnia*, are a genus of crustaceans between 1-5mm in size. These are important to note because they are not only an indicator of good water quality, but when the oxygen levels start to decrease they overproduce hemoglobin, making them turn red in color.



The second invertebrate was identified today as the phantom midge larvae, or *Chaoboridae*. (Thanks goes to Tim Plagge and his BIO160 students for the identification!) These larvae prefer standing water, feed on *Daphnia*, and thrive in low oxygen conditions.



Given these invertebrate lifestyles, anybody can get a general sense of the DO levels in the tributaries. If the *Daphnia* are present, and beige in color, then you know your water has suitable DO

to support the typical ecosystem. If they are red in color, you know your DO has dropped below the ideal levels. As the DO drops, you will begin to see more of the *Chaoboridae* in the population. If you have a population overrun with *Chaoboridae* and few *Daphnia*, you know your DO levels are too low.

If you are interested in observing these microorganisms under a microscope, drop by the Microbiology Lab between 9am-11am Monday through Thursday.

What are we doing to ensure the health of our future fish?

Last weekend during our Saturday volunteer session we got together to discuss designing a system to further oxygenate the water. Although we will not have fry in the troughs until January or February, the goal is to have a system in place to ensure our fish will always have access to healthy water. We are currently exploring ways to create an aeration tank for the water to filter through prior to moving to our indoor raceways where the fish will live.

If you have been to the hatchery, you have seen the Koi tank, filtration system, and aquaculture setup. This design, contributed by Nick Neeley, is the basis for the design of the new system. Volunteers are working this week to put it together and do some initial testing. When completed, we hope to be able to further oxygenate the water, and also have the ability to switch from an open to closed system in the event of an emergency.

Stay tuned for the next update on this project. If you are interested in what we are doing, just send an email and we'll let you know when work is being done so you can get involved. 😊

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Photo credits go to Indiana University (*Daphnia*), and University of New Hampshire (*Chaoboridae*)