University of Wisconsin, Center for Limnology

Trout Lake Field Station
Boulder Junction, WI

SEEDS National Field Trip
May 8-11, 2014
I. Summary

Nineteen undergraduate students from all across the US – three freshmen, eight sophomores, four juniors and four seniors from thirteen institutions participated in the 2014 SEEDS National Field Trip from May 8-11, 2015 at the University of Wisconsin, Center for Limnology – Trout Lake Field Station in Boulder Junction, Wisconsin. Jorge Ramos, PhD candidate at Arizona State University and SEEDS Alumni assisted Fred Abbott, ESA Diversity Program Coordinator, during the field trip. The program was led by Dr. Tim Kratz the director of Trout Lake Field Station.

Nearly all of the students in the group had never been to a field station and many of them had never been out in the field!! Working with researchers, field assistants and graduate students at Trout Lake, the students learned about the incredible science of limnology, lake ecology and fisheries science. The incredible habitat of northern Wisconsin provided the perfect setting for an unforgettable experience for those involved. They explored careers within academia, government, non-government organizations and tribal communities.

The list of participants can be found in Appendix A.

For some students from the University of Puerto Rico, this was their first experience being in such northern climate and they were able to have their first experience with snow! Being early May, our group came just in time for the ice to melt at Trout Lake and see the last remaining ice sheets come ashore.

The agenda for this trip was aimed at exploring as many aspects of limnology science as possible in two days. The field trip agenda can be found in Appendix B.

It was an enriching experience for everyone involved, but what better way to hear about the trip than the students themselves.
II. Reflections of the Field Trip Experience by Students

Journal Writing Group 1: Wendy Harmon, Yashira A. Cruz, Antonio Legarda, Christine Pardo, Patriscia Susanto

May 8th and 9th AM

“NATURE TRIVES IN A BIT OF UNTIDINESS” – TIM KRATZ

Thursday May 8th, 2014 was a very, VERY long day for the participants of the SEEDS 2014 National Fieldtrip. Between people missing their flights, to nature revealing with tornadoes on those coming from Texas, we ended up turning Wisconsin’s airport into our meet-up/hangout spot. There was ping-pong, meeting strangers during play and study sessions. After one half of the group left and the other half waited for those who got stuck on their way to Wisconsin, the last group embarked on their four hours and a half drive towards to Trout Lake Station. When the second group, which was mainly composed of the Puerto Ricans, got to the station really late or early in the mourning, we quickly realized there was a little bit of snow left on the side of the road: great surprise since it was Leslie’s and Darimars’ first time seeing it. Naturally, the scientific instinct kicked in and Darimar ended up happily reaching for it, of course, after Fred or Jorge initiated her by throwing a snow-balls at her, after that everyone just went to bed for a good night sleep.

Friday morning groups one and two were in charge of breakfast; what a breakfast!!! People woke up really early to be able to prepare such a good meal: there were pancakes, French toasts, fruit, coffee, bacon, toasts... the point is - it was very well prepared. This was the first time our group really got to interact with each other and put to practice their teamwork skills. It surprised us how well the dynamic worked, which also made us really glad because as later on Tim Kartz and Noah told us: nowadays is really important for scientists to be able to work in groups in an efficient way.

After breakfast we passed on to the conference room where Tim Kartz and Noah Lotting were waiting for us with a very welcoming attitude. Tim gave us a
presentation on Trout Lake Station’s history and three big research projects broken down into narrations. A technique we really appreciated because as he said: “science is but a story based on actual facts”. The first science story was named “Why do neighboring lakes differ?”. Through this story Tim presented the scope or perspective from which Trout lake, (as scientist from the station called themselves!) study their research sites, which is a regional one. Basically, they study specific variables in each lake, which include: altitude with relation to one another, ground-water input, water fluctuation, acid rain, algal abundance, biotic diversity and boater use and then compare them in order to figure out the causes of variation.

The second story was called “Aquatic invasives” and it covered a study on crayfish populations that were brought to one of the lakes as an introduced species. They found that as the crayfish populations go higher, plant biomass on the lake goes down. The station worked with undergraduates (something that motivated us) to do the project which consisted in modifying the crayfish population by removing them. As it turns out there is a relationship between water level and the populations’ numbers. The final story was based on “Fish woody habitat, People and climate” which was a study made to evaluate the roles of fallen trees on the lakes and the difference their removal could have on the lakes ecology. Scientists found that as wood from fallen trees was removed, the perch disappeared and bass growth rates were reduced due to a more terrestrial diet.

Our last activity for the morning was the career panel, a SEEDS tradition. The panel was composed by: Carol Warden (Outreach specialist), Gretchen Watkins (Tribal Coordinator, Wisconsin DNR), Greg Sass (Wisconsin DNR Hatchery) and our own Jorge Ramos (Arizona State University). In a nutshell, we came out of it with a list of seven main lessons our panelists gave to us:

1. Science isn’t worth it if it’s not shared. It is important to present your work both between the academic community and general public.
2. There is NO single road to success in ecology. Everyone has their own experiences but one important thing in our path is to SEEK OPPORTUNITIES.
3. Apply to positions you don’t feel confident for. You never know what might happen. According to statistics, women tend to hold back from
applying to positions because they feel they don’t meet 100% of the requirements, whereas men do ... and actually get the jobs.

4. **BE A JACK OF ALL TRADES.** Ecology is a very dynamic and interdisciplinary field. It’s best when we know a little bit about a lot.

5. **NETWORK, NETWORK, NETWORK**

6. Science is always evolving. There are constant changes, questions coming up and ecologists that are creating their own jobs.

7. Be thankful to all of those that helped you through your career and keep in touch. You never know how you could be instrumental to them or them to you in the future.

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**Journal Writing Group 2: Nicole Boone, Carla Lopez, Valeria Paz, Amber Tatum, Hamza Mian**

**May 9th PM**

During our trip to the fish hatchery it was interesting to learn how ecosystems are supported using artificial means. It looks like it would not be supportable at a larger scale but works on the small scale. It would also be interesting to see if fish that are hatched at the hatchery have any physiological difference compared to ones hatched in the wild to see if there is a difference with the high amount of fish that are stored in the pools. It was cool seeing the large musky in the stream that runs along the hatchery. Most of us could only see it when they put on the polarized glasses. There was also a geocache that we found while we are there and Valeria put a South African coin in it and took a horse. During the tour we went outside to look at the basins and it got really cold and we were all freezing!!!
After the hatchery we went to the Lac du Flambeau: Ojibwe Museum & Cultural Center. Tracy Mitchel gave us a tour of the whole museum and told us about her culture. It was interesting to see how the trip used their natural resources and that the tribe is prepared if the burring ash beetle comes they took trees to CO to incubate them so they can bring them back after the beetle is gone. It was interesting how everything was used in a sustainable manner and that it changed throughout the seasons. Preparing wild rice for their meal seems like a lot of work and soaking the birch bark to make all of their many household items and canoes. It was cool that they had all the symbols of the tribes on the roof of the building. A little girl came in the back door at the beginning of the tour saying “mommy. Mommy” that was cute and made us all laugh. By the end of the tour we were all really tired.

After dinner, we started a bonfire. For many, it was our first time making s'mores and Hamza ripped his pants. We were all cold so we were all staying close to the fire but the wood was wet so there was a lot of smoke that hurt our eyes.


May 10th AM
Saturday morning started with a fantastic breakfast made by groups 3 and 4. The breakfast consisted of scrambled eggs, toast, bacon, fruits and pancakes. Although only half the groups showed up to cook, the breakfast was still finished and it tasted wonderful.

After breakfast, the groups met up and headed off to Crystal Lake. Crystal Lake is about 3 miles away from Trout Lake Field Station. This lake used to be the clearest lake in the world and because of its high elevation and no inlets or runoffs, the lake receives all of its water from rain and snow. Yellow perch and rainbow smelt live in the lake. Rainbow smelt is an invasive species. The researchers at Trout Lake Station conducted an experiment to get rid of the rainbow smelt. They placed 6 large trampoline like membranes in the lake and inflated and deflated them to mix up the water. This heated the water up. Rainbow smelt live at a lower water temperature than yellow perch, this was thought to get rid of the rainbow smelt species. Because of a great genetic variation of the rainbow smelt, only 70% of the species was killed off from this. While being told this story, we enjoyed watching a bald eagle glide above us. We also saw deer and Great Blue Herron tracks leading into the water.

We then walked over to Big Muskellung Lake. This lake is lower in elevation, and was receiving groundwater from Crystal Lake, which is why Crystal Lake is clearer than Big Muskellung.

The researchers showed us how to determine the depth of groundwater of the water table and the chemical composition. In earlier years, they drilled holes into the ground, and placed PVC pipes with holes into the drilled wells. The water level can be measured by placing a tape measure with a weight that made a “plopping” noise when it hit the water. These were placed into these holes until the plopping noise was heard, and the depth was measured. There are many of these wells along the area between the lakes.

The groups then got back into our vans and drove to Escanaba Lake to learn about surveying fish.
Greg Sass and his colleagues had previously captured a variety of lake dwelling fish, including yellow perch, walleyes, muskies, and even a tadpole. After explaining the history of fish surveying in this lake, which began in the 1920s, Greg began to collect data for lengths, weights, sex and ages of muskies. He tagged them by utilizing their dorsal fin bones if they were large enough, and others he would cut off a bit of the tail fin. One of his colleagues, Noah, taught us how to rehabilitate stressed fish by moving them back and forth under water in order to pass water through their gills. We then began taking photographs with walleyes in our hands. They sure were squirmy; their teeth were horrific.

Our morning ended with a meal of lunch meat wraps with chips, an apple, and an M&M cookie.

Journal Writing Group 4: Darimar Dávila, Edauri Navarro, Reynalda Piaso, Jacob DeKraai

May 10th PM

The group was introduced to nutrient tracing in stream systems. It was a very interesting piece of the trip where we were introduced to the technique in an outlet of Mann Lake. A bucket of Sodium chloride with EPA approved neon die is dumped into the stream at a specific starting point and travels to an end point down the stream where a meter is placed to determine concentration or mass at that point. The die is generally for demonstration of the travel of molecules down a stream because you can visibly see the movement, but the dye is not necessary for the results. Sodium is used because it is not utilized by any of the organisms within the creek for nutrients. The sodium concentration as it moves down the stream will be monitored and the results can then be used for various calculations of physical properties like velocity of water. This technique can be used with different organic compounds to determine different biological aspects of the stream system.
After the demonstration Tim Kratz gave us a tour of the main laboratory. He showed us a room with different scientific textbooks and publications. Tim told us stories of research mishaps and mistakes made by him and others on the station. A plaque is dedicated to the accidents of researchers that more often than not should have been common sense. It’s something that we as a group feel should be incorporated into all scientific research stations. In science mistakes are made all the time and admitting and learning from them is crucial in not making the same mistake twice. Nobody is perfect and not only science, but life becomes much easier once this can be fully digested.

We absolutely loved the trip and some of the students from hotter, more tropical climates were introduced to aspects of a more northern climate like ice, snow, and cold weather! The excitement in experiencing ice on a lake for the first time for those individuals was worth the trip in itself (They even got to throw snowballs for
the first time in their lives!). We were a very diverse group with people ranging from the northern US to Puerto Rico. We were able to laugh and learn while exchanging jokes and talking semantics and similarities of our languages. This experience was incredible and these types of programs do so much for the scientific community, sparking interest unparalleled in other fields. We hope that funding for this program continues to be provided, as students who are curious and adventurous will always be excited to return and meet new people from new cultures while learning science!