



Kemp's Point

Volume 20, Number 2, Fall 2019

News from the University of Wisconsin-Madison's Kemp Natural Resources Station

Knowledge Quest at Wisconsin Insect Fest

By Nathan Andrews, Age 8, with an assist from Mom

When I heard there was an Insect Fest in our area, I could not believe my ears! The UW Madison Entomology Department was coming to search for insects at Kemp Station, as well as teach classes and labs about insects, and I was invited! I was a little nervous walking in, but everyone there was super welcoming and friendly, talked to me a lot, answered my hundreds of questions, and showed me so many things, I barely know where to start with my story. I am still excited just thinking about it.

As you may have guessed, I LOVE bugs, so the Insect Fest was amazing for me in many ways. It was even more fun because all of the teachers and professors loved bugs too! The first thing I noticed was that I had some of the same books they had on display. That was fun to see, especially the beetle book I had requested for my birthday -- I knew right away this was going to be right up my alley. There was even another beetle lover, Dr. Dan Young, who had a really cool Coleoptera license plate on his car. If you don't already know, Coleo (koleos) means sheath and ptera means wings, which refers to the beetle's hardened and modified front wings that protect their more vulnerable back wings. I learned that from Dr. Dan ... I hope I got that right!

I learned many insect orders, but I will need to see them a few more times to get it to all stick in my head. I do remember Diptera (true flies), Odonata (dragonflies & damselflies), and Lepidoptera (butterflies & moths). There were about 20+ more orders I don't remember that also have some of my favorite insects in them, so I guess I have a little more studying to do. I figure I may know them all by the time I'm 12.

There were so many fun activities that went along with the classes that I really don't have a favorite, they seemed to all be my favorite at the time. Dr. Bieneke

Bron showed me how to drag for ticks. She let me try it too, and I found some on my drag. We learned about differ-

ent sicknesses and diseases that can be spread by mosquitoes and ticks. I did better on the tick quiz than Mom did, but Mom makes me check for ticks every night and now I understand why.

We looked for insects inside and under decaying logs -- this had to do with different microclimates which was a new word to me. Kemp Station's Karla Ortman helped me look in many of these microclimates. We went prepared with small metal levers for digging and hand lenses for viewing. We didn't find many bugs at that time, but we did find some salamanders that possibly had eaten the bugs, you know the food chain! Speaking of the food chain, when I found a small bug in my broccoli the other day, I knew from the classes that it probably had more protein per gram than a steak. I still like steak better, but the bug didn't bother me in the least, I just kept eating!

Another favorite activity was using different kinds of nets and containers to capture insects. I do this a lot at home, but I learned some new tools and techniques at the Insect Fest. One fun technique was black lighting for bugs at night. Between light stations in the woods, I found one of my favorite insects, a dobsonfly. PJ Liesch, who was awesome answering many of my questions, also showed me a Mercury Vapor light. I had to wear

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Insect Fest (Continued from Page 1)

sunglasses because it was so bright. We saw a lot of moths and caddisflies that night.

Dr. Sean Schoville helped me understand the importance of scientists sometimes having to study insects after they were dead, so I didn't get so upset if one died, but that part was a little rough on me. I have since been able to study many insects under a microscope at home, and I have also made my own pinned collection. In fact, one of the labs was teaching the proper collection techniques, pinning, and labeling of specimens. Now I can show my friends and family the difference between different insects too! My mom is no longer as nervous around bugs, as I teach her more and more about how cool they are and what they do for our world, how they benefit humans and other animal and plant life. She also says she is going to go broke on my home science lab gear and books, but I think she likes it too.



In this photo, "...I was looking at the cocoon of a moth while also deciding what gear to use for the next part of my nighttime bug search. I liked learning all the new techniques and tools. I wanted to stay all night, but Mom said I needed to go home to sleep before classes the next morning." In the photo on the front page, "... I was learning how to pin a cicada and a Dobson fly like a professional entomologist. Dr. Dan and Craig Brabant both helped me. I now have my own pinned collection at home."

We learned about the role of insects in forensic science from Patrick Dunn, which was very interesting. Some people didn't want to get too close, but it was good information to know. I was super excited when Dr. Susan Paskewitz joined me on a side tour looking for dragonfly naiads during this lab. We had all walked a nice hike into the woods for the forensics, which also put the lakefront close for our naiad search. We found quite a few, some further up the banks than we had expected. On that same hike, Hannah Fenelon, aka Feni, also took time to look at insects with me, and we talked about some of the books I read and videos I watch to learn more

about them. After Insect Fest was over, Dr. Susan sent me some difficult questions that made me think more about dragonfly health, population, and reproduction cycles. She really makes me think about things I hadn't previously considered.

It was fun feeding mosquito larvae to some guppies in Dr. Shawn Steffan's class on aquatics and marshlands. Then he took us on a walk, and we were all able to walk on a floating bog! It was so exciting, as I had always wanted to see a carnivorous pitcher plant, and not only were there hundreds, but they were even flowering. We were able to see some carnivorous sundew plants as well, right along the water's edge. I could feel the bog move and wiggle under our feet — everything about it was amazing. We even saw a parasitized Horn Tailed Caterpillar. The BioBlitz (see box below) was a blast, and I am so lucky to have had the opportunity to go. I feel very appreciative to everyone who was there and to everyone who took the time to help me learn. I think I am more bug crazy now than ever, after the Insect Fest! 🐛

The Great Wisconsin Bug Hunt

In addition to breakout activities, the Wisconsin Insect Fest featured the "Great Wisconsin Bug Hunt"—a 24-hour arthropod BioBlitz that ran from 5 PM Friday to 5 PM Saturday. Participants joined entomologists and fellow insect enthusiasts to see how many different arthropods could be observed at the Kemp station in a single day. This included light trapping after sundown. UW-Madison's PJ Leisch is still working on an "official" tally, but based on the working list, he estimates 500 different species from the BioBlitz. This tally includes over 100 different species of flies and 200+ species of moths!



A Research Recap, 2019

By Karla Ortman

The cooling temperatures and pretty fall colors signal the end of another summer field season at Kemp Station. September and October are still busy months, with various class groups visiting for field trips, researchers finishing up field work, and natural resource professionals gathering for meetings. While the official numbers have not yet been calculated, I suspect 2019 will go down as a record year in terms of the use of Kemp, particularly with regard to research. Let's take a brief look at some of the studies that took place this year.

The field season at Kemp began with a focus on birds. Christopher Roelandt, a graduate student at the University of Michigan, returned for his third field season at Kemp Station to collect blood samples from American woodcock. Night after night Chris deployed mist nets and played a recording of a male American woodcock to lure in the male birds. Once captured, physical measurements of the bird were recorded, a small blood sample collected and the bird was banded. One goal of Chris's research is to develop a simple field method to assess habitat quality based on the body condition of the birds living there. This will assist wildlife managers with land management decisions related to this popular game bird. To read more about Chris' study, see the Spring 2018 issue of *Kemp's Point*.

Kemp Station was home base this spring and summer for technicians working with Drew Fowler, a Research Scientist with the Wisconsin DNR who specializes in waterfowl. The techs were collecting data on ring-necked ducks. The goal of this study is to better understand the habitat associations and spatial distributions that influence nest success of breeding ring-necked ducks in Wisconsin. This research will contribute toward habitat management and harvest decisions of this species of duck within the state. One technician piloted a drone to search for and monitor nests with the use of

a thermal camera. Birds were also captured, marked and banded. *The lower left photo shows technicians Megan Brown, Brett Leach, Kelsey Smith, and Logan Hennlich (left to right), at a field site logging data about a captured duck.*

As soon as the ice was out on the lakes in spring, the folks from the Wisconsin Cooperative Fishery Research Unit at UW-Stevens Point arrived, and from late-April into September they made good use of Kemp. It was a common site to see fyke nets laid out to dry in the grassy area by the Station's carpenter shop or to find techs processing samples in the lab. Research Scientists Dan Dembrowski and Giancarlo Coppolo along with a fleet of technicians spent days and nights collecting study samples from various area lakes. Topics of study include the population dynamics and demographics of walleye and



warm water fishes in natural lakes of northern Wisconsin, the temporal stability of adult muskellunge populations, and the influence of pan fish removals on walleye populations. Often these studies are in collaboration with other agencies, like the Wisconsin DNR, UW-Madison's Center for Limnology and the US Geological Survey. Projects evaluate population fluctuations, the factors that impact the fluctuations, and determine what factors are within the control of resource managers. Survey methods for the projects include fyke net surveys, mark-recapture with integrated transponder tags, boat electrofishing and clover-leaf traps to

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Research... (Continued from Page 3)

remove competitor and predator species of fish from study lakes. The results of the studies will inform resource managers on sustainable recreational fishery management. The upper left photo on the previous page shows two fishery technicians on a study boat with a fyke net used for sampling.

While many of the scientists and technicians live at Kemp Station throughout the field season, some come and go,

staying for a few nights while they deploy instrumentation and gather data. One such person is Isabelle George, a Research Specialist at UW-Madison's Department of Plant Pathology in the lab of Dr. Richard Lankau. Isabelle explains that plants rely on microbial partnerships for essential processes, including nutrient acquisition and drought tolerance. Her group is studying a possible third option – can trees gain tolerance to new climates by changing their associations with microbial partners in their roots? To help answer this question, they have established a study site at Kemp Station with plots that have constructed ambient or reduced rainfall shelters. Under these shelters, they have transplanted tree seedlings that have been inoculated with soil microbe communities from six different locations in Wisconsin. They will follow these tree seedlings throughout the growing season and into the following years, collecting data on survivorship, growth, and stress such as disease or herbivory. *Isabelle is shown in the top photo at the field site recording data.*

Another “come and go” crew was from UW-Madison's Department of Entomology, in the lab of

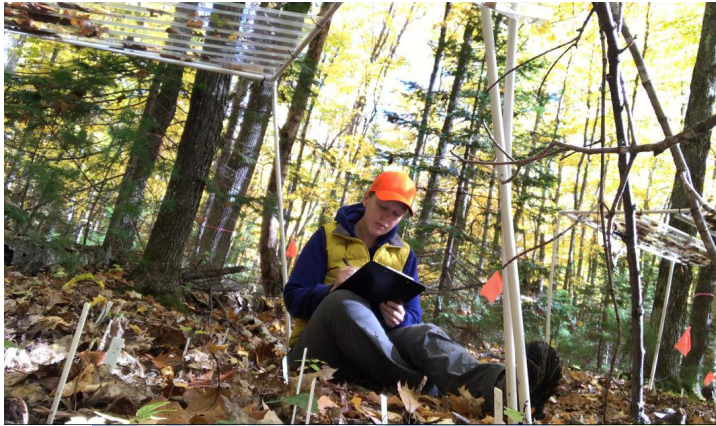
Dr. Shawn Steffan. Cranberries are a valuable Wisconsin crop, with many growers located in the northern half of the state. Elissa Chasen, Molly Bidwell, and Ellen Koch came to Kemp on multiple visits to do the insect sampling for Dr. Steffan's study in which cranberries are treated with insecticides according to very specific phenological timings. They keep track of temperature data, run models of insect development, and then advise the farmers to apply chemicals at timings that are likely to be most effective for insect control. According to Steffan, “It's a matter of exploiting the biology of the insect to get more ‘bang’ out of each pesticide ‘buck.’” *The lower left photo shows one of the insect cages placed in cranberry beds used to trap and collect cranberry pest species.*

Other researchers come for just one visit during the field season, like Dr. Janelle LaMontagne, who returned for her 7th year to Kemp with her students to collect data. Dr. LaMontagne was featured in the Fall 2018 issue of *Kemp's Point*. She studies the spatial and temporal patterns of seed production in white spruce, particularly near the southern range limit of this species. In 2012 she established sites with over 300 tagged trees that she

revisits annually. In addition to assessing reproductive patterns in white spruce, she has been examining tree mortality and recovery from a spruce budworm outbreak that impacted trees at some of our sites.

Another “one visit” researcher was Sam Reed, a National Science Foundation Graduate Research Fellow at the University of Minnesota in their Department of Forest Ecology. This summer Sam worked within the Managed Old-Growth Silviculture Study and the University of Wisconsin Flambeau Gap Experiment, studying how canopy gaps and deer browse influence earthworm density, abundance, and species diversity. From this data, he

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Research... (Continued from Page 4)

will determine how each of these disturbances influences the resulting vegetation in both the understory and overstory. This work is meant to provide insight into how disturbances interact and cause degradation of a forest both now and in the future. *In the lower right photo on page 4, Sam displays a handful of invasive nightcrawlers, collected during one of his samplings.*

Kemp Station is home to both individual and teams of researchers on a variety of timelines – days, weeks, and months at a time....they stay for the full field season, or they come and go throughout the season. Another dimension to this timeline is the number of years involved in a research project – it could be just one year, that is, one field season, or it could be many years and many field seasons.

This year a unique “one field season” project made Kemp Station its home base, a project known as CHEESEHEAD. The acronym stands for Chequamegon Heterogeneous Ecosystem Energy-balance Study Enabled by a

covariance flux tower on an unnamed pond near the WLEF-TV tall tower in Park Falls, WI. The tower measures exchanges of carbon, water, and heat between the lake and the atmosphere. (Photo by Loren White) Below, The King Air airplane flies past the WLEF-TV tall tower to compare their measurements of carbon dioxide, water, and heat exchange. (Photo: Ankur Desai)



High-density Extensive Array of Detectors and is headed by UW-Madison Professor of Atmospheric and Oceanic Sciences, Ankur Desai. Desai has come to Kemp Station each year since 1999 when he was a graduate student at the University of Minnesota. Over these years, his visits involved the atmospheric instrumentation on the 1,400-foot WLEF-TV tower in Park Falls that gather data on humidity, temperature, and gases like carbon dioxide and methane. But this year, a variety of scientists from multiple universities and agencies from the United States and Germany came together with a multitude of towers, instrumentation, and data collection methods to perform intensive data collection within a 10x10 km area of the forest by the WLEF-TV tower. More than 35 scientists circulated through Kemp Station, some staying only a night or two, with others staying the full study period.

In the photo above, UW-Madison's Jonathan Thom and Brian Butterworth canoe out to the floating eddy

On the other end of the spectrum from the one year intensive CHEESEHEAD project is NEON, the National Ecological Observatory Network. The NEON project is a 30 year, continental scale project aimed at understanding the causes of environmental changes and ecological ramifications of these changes. The project focuses on three dimensions of change – climate, land use, and invasive species – and explores four general areas of ecological response, including biodiversity, biogeochemistry, hydrology, and infectious diseases. Since 2015 NEON

field techs have utilized Kemp Station as a home away from home, as they travel to and from the study sites where they perform plant surveys, small mammal trapping, and tick and insect surveys. Read more about the NEON project in the Spring 2016 issue of *Kemp's Point*.

Kemp Station has a virtual revolving door, especially between April and August. Many people come and go; they study a variety of topics, in a multitude of ways. Kemp Station provides a place where all the scientists, in so many disciplines, can come together, not only to work and rest, but also connect and learn about what the other is studying and how. Connections are made and relationships develop. Ideas spark and new projects become reality. And before we know it, the next field season is here again. 🐼



Kemp Profile: Eliceo Ruiz

Hometown: Guadalajara Jalisco, México.

Educational background and current area of study:

I studied Agronomy Engineering at the University of Guadalajara and will complete my undergraduate degree after defending my thesis this year. In the last couple of years, I have been working on projects for the University of Guadalajara, the National Institute of Forestry, and the Agricultural and Livestock (INIFAP) at México in the areas of forest science in relation to climate change, forest ecology, forest fires and biometry. This summer I was working on the UW-Madison CHEESEHEAD project while at Kemp Station.

How is your research funded?

CHEESEHEAD (Chequamegon Heterogeneous Ecosystem Energy-balance Study Enabled by a High-density Extensive Array of Detectors) is funded by the National Science Foundation (NSF).

What questions does your field research answer?

Forests are one of the major carbon sinks that play an important role in climate change. Our goal is to quantify the exchange of CO₂ and allocation of carbon. One way we are doing this is by measuring the growth of different parts of trees



such as roots, leaves, stem, fruits, etc., in representative tree species in the Northern forest. This data is useful for calculating Net Primary Productivity (NPP) of the forest, to be further linked to weather, ecosystem energy balance, and other attributes.

Describe a typical day of fieldwork:

We had different phases and routines during the project, but for the most part my day started with a good breakfast and a cup of coffee before traveling to our study sites. We traveled approximately 50 minutes to reach the study areas in the Chequamegon-Nicolet National Forest. We

normally visited on average 3 to 5 plots per day, but that number varied depending on the objective and type of measurements we had to make. In total we had 41 sites to measure and take samples. The first phase consisted of establishing the centers of the sites with the species and number of trees of interest. Once we arrived at a plot, the first thing we did was set the radius in square meters in a circular area in which we gathered samples and measurements; we labeled and identified the trees to later take measurements of DBH and height of each tree inside the radius. We took soil samples with a “soil profile sampler” on each plot and later, in the lab, separated the roots from the soil

before processing the soil sample. This first phase took us about two months. During this phase we also had to take a couple of leaf samples rounds from the top of the trees, which was done with an air gun. This part of the project took more time because it was difficult to get what we were looking for. A good amount of time was spent in the lab processing samples — taking photos of conifers

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Profile... (Continued from Page 6)

shoots (*photo shoot set up in Kemp lab is shown in photo above*), scanning leaf by leaf and needle by needle the broadleaf and conifers samples, which was tedious but satisfactory at the same time. For the third phase, we had to go through the 41 sites again to get leaf area index readings with the “LAI – 2000.” At each plot, we took 12 readings in two 5-meter transects that were oriented from NE to SW and NW to SE. On some the days during this process we were required to camp in order to take measurements during sunset and sunrise.

What challenges did you face working on this project?

One of the first challenges we encountered was finding a way to measure the biomass of root growth within a given space over a period of time. We developed a method where we filled a bag with clean soil and placed it in the hole, occupying the same space as the soil we had removed. The intent was to return at the end of the study period to evaluate the roots grown in this clean soil. Unfortunately, when we returned, we found bags damaged by the wildlife and human activities. Another challenge, was obtaining leaf samples, representing new growth, from the top of the trees. We were not always successful – we could spend 20 minutes or up to two or three hours sampling from one tree, depending on the luck of our shots with the air gun! (*Eliceo is shown using the air gun in the photo on page 6.*) Finally, we had difficulty with the weather. To take our LAI measurements we had to make sure to have ample light to get consistent readings. Instead of dealing with sunny or rainy days, we chose to camp in order to use the light at sunset and sunrise.

What have you enjoyed most working on this project?

The main thing I enjoyed was being surrounded by forest and a great lake each day, doing what I love. I also had the good fortune of having a great friend, colleague and teacher, Trevor Iglinski, who taught me the tree and plant species, as well as the different types of local ecosystems. I also enjoyed meeting people from different parts of the world and cultures, who also taught me a lot about forestry and other related disciplines. I have shared good times with the CHEESEHEAD crew, a great team of people who supported me throughout the season. I enjoyed being at Kemp Station for several reasons. One reason is the unique “cabin-research” style that I loved, as it awakens your curiosity in nature and motivates you to continue to learn more about it. Another reason is the events that took place at Kemp, related to natural sciences, such as the tour to see aquatic plants, the insect festival, the fungus festival, among others, and I was fortunate to attend several of these events. 🍄

Wildlife Mini-Symposium Saturday, February 15, 2020



You are invited to attend a mini-symposium at Kemp Station on Saturday, February 9, 9:00 am to Noon. The event will be held at the Connor Forestry Center.

Graduate students from UW-Madison’s Forest & Wildlife Ecology Department studying with Dr. Tim Van Deelen will give short talks about their research. Most of the research topics are grounded in Wisconsin or the Great Lakes region, but a few students work in distant regions like Borneo.

Your participation and conversation with the students is welcome and appreciated. No registration is required!

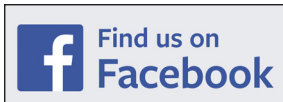


Fun with Fungi

This year’s “All Things Fungi” Festival was enjoyed by all who attended. The event began Friday evening with an introductory session on mushroom identification. More than 50 people participated in the Saturday morning foray and post-foray identification discussion (*shown above with Drs. Dan Lindner and Tom Volk*). Dr. Volk presented on the “Seven Deadly Sins of Fungi” which was followed by various break out sessions exploring the microscopic world of fungi; fermentation and kitchen preparations; tree rot; and build-your-own grow-at-home oyster mushroom kits. The variety of fungi collected at Kemp Station is always amazing to see.



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Star-nosed Mole (*Condylura cristata*)

My knowledge of moles stems mainly from my grandma's on-going battle with them in the yard around the farm house. She set dangerous looking plunger style traps where she saw "mole working" in the lawn. I don't think I have ever seen a common mole, the species Gramma was after. However, one day this summer I saw a star-nosed mole! It was dead and in the road, which surprised me as in my mind, moles live mostly underground and would not be crossing a road. It turns out the star-nose is more active on the surface than other mole species, using runways through vegetation. This guy also is most common in areas where the soil is moist, like wetlands, but also where drainage is poor, so some forests would qualify. Interestingly, where this mole was found, the habitat type does not match the preference — perhaps the mole was relocating?? Regardless, they are pretty fascinating creatures, due largely to the star-like appendage at the tip of its nose. The fleshy appendage is covered with thousands of touch receptors that allow the animal to find food. It forages both underground in the soil, and underwater. Its unique ability to eject air bubbles while swimming enables it to smell underwater. This critter also holds the title of fastest eating mammal — it can find and consume a prey item in less than one quarter of a second. Amazing. Eating various insects and earthworms found in the soil, the mole's underground tunnel system will often lead to water, like a small pond, where it will emerge from land and continue its underwater foraging. Built like a fat sausage, this mole has larger front feet which serve it well both for digging and swimming. There are some incredible videos on-line of the star-nosed mole in action. I encourage you to check out one in particular at <https://www.nationalgeographic.com/news/2017/04/star-nosed-mole-touch-pain-senses/>.

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