Kemp's Point

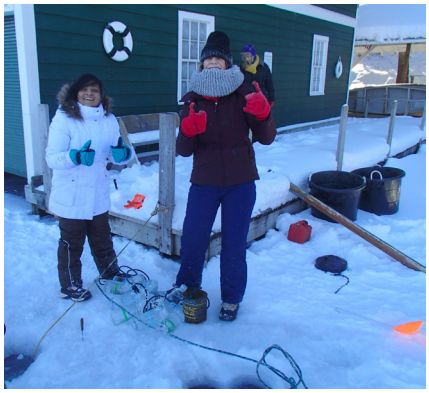
Volume 15, Number 1, Spring 2014

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

Life Under the Ice

By Emily Ebert, Maurizio Murru and Paul Engevold

In early January, nine students from the Milwaukee Institute of Art and Design (MIAD) braved the record below-zero conditions in northern Wisconsin for a nine day, in-depth look at "Life Under the Ice." On the surface, iced-over lakes are seen as dormant systems in which there is little activity. A closer look reveals a diverse world of microscopic organisms waiting to be investigated and explored. Lead by instructors Maurizio Murru and Paul Engevold, the course involved obtaining theoretical knowledge by literature review, developing hypotheses, and then testing the ideas through a self-directed, independent research project in the field. Kemp Station's resources were essential in facilitating this hands-on approach to learning for art and design students enrolled in this rigorous undergraduate course.



It was an attitude of mind over matter while collecting samples in below-zero temperatures.

Because the course concentrated on independent learning and self-direction, each student formulated their own unique hypotheses to test during their stay. MIAD's exploration of the natural world involved research topics such as horizontal distribution of abiotic and biotic factors in Lake Tomahawk; fish communities and their effects on phytoplankton and zooplankton biodiversity; zooplankton and phytoplankton abundance and species composition in lakes with similar trophic status and with different fish communities; consequences of summer disturbances, such as motorized versus non-motorized recreation, on winter lake conditions; impact of nutrient additions on phytoplankton and zooplankton biodiversity using mesocosm experiments; biomanipulation and top down control; diel zooplankton migration in lakes with differing fish communities; nutrient levels and zooplankton abundance and the effects on phytoplankton biodiversity; and, lastly, fish hatchery effects on water quality and the plankton.

The high intensity of the course encouraged students to challenge themselves. Communication Design major Manuja Waldia explained, "The momentum is really nice to start the Spring semester. The experience was truly unique. It was very intense, but very rewarding at the same time. Kemp Station is really beautiful and it was truly picturesque when we were there. It is amazing how we got so much work done in such a short amount of time. Paul and Maurizio went to great lengths to make everyone feel safe, comfortable and well fed. The short duration of the trip ensured that we did not procrastinate and were working

Whether drilling through ice, or scaling a snowy riverbank, the students retrieved their water samples expertly.

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Under the Ice .... *(From page 1)*

very productively. I truly enjoyed the trip."

During their excursion, students faced record low temperatures reaching -27°F with wind chills down to -35°F. They braved the frigid cold to drill holes and collect samples from Tomahawk Lake, Hemlock Lake, Mid Lake, Minocqua Lake, and Art Oehmcke Fish Hatchery in the first half of the week. Water samples were tested for chemical and biological components including analyzing temperature, pH, oxygen levels, and nutrient levels of phosphorus, nitrogen, and silica at various depths. Net-tows were also collected so students could later identify the microscopic flora and fauna (phytoplankton and zooplankton).

Water samples were processed and analyzed in the station's laboratories.

When the data collection was done, then the mentally exhausting work began. Each student's experiment required them to think critically about what they observed. Each piece of a puzzle needed to be assembled to tell a coherent, well thought-out story of what the student understands to be happening in their system. Relating their findings from the field work to the literature is remarkably challenging. Katelyn Haseker, an Integrated Studio Arts major, commented "Doing research at Kemp Station was one of the best experiences I have taken in my academic career so far. It really taught me to be a better student, and how to manage a large work load in a short amount of time. I think it is important as a college student to understand that with hard work comes extraordinary learning and endless possibilities. I really appreciate Kemp Station, as well, for giving students like me the opportunity to learn about science head on."

Students warm up and start putting the pieces together in the Mead Residence Hall.

Emily Ebert is a veteran on the course, returning in 2014 as a laboratory assistant. Her job was to help make order out of the chaos of conducting nine different projects all at the same time. "Naturally I was inclined to return to Kemp for the course after falling in love with the beautiful snowy scenery. The refreshing change of pace from city life was wonderful and, aside from the frigid cold, a great chance to spend time outdoors before beginning the second half of the school year. It was exciting for me to see this group of students collaborate and share in their learning experience. The girls really supported each other through the process, and we all made some great memories along the way. As both a student and now a teacher's assistant, I really loved the opportunity to work with others and discover new ways to understand the fascinating life under the ice."

Sculpture major Chloe Mackinnon summed up the entire course quite succinctly, "It was a life changing experience. I will be able to talk about it for the rest of my life."

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Scent of a Canid

By Karla Ortman

On a cold winter day in February, shortly after sunset, the dogs and I ventured out for an evening walk. Everything was typical until Sam began sniffing enthusiastically in the air and was clearly distracted by something nearby. I checked the road and snowbanks for fresh tracks of an animal – nothing. Then I looked around in the trees, since he seemed to be picking up the scent from above. That's when I noticed a dark shape high up in a nearby red maple. Silhouetted against the evening sky, I could make out that Sam had discovered a porcupine. When we stood silently in the cold, we could hear the critter chewing on the bark. It was pretty cool.

Since then, I have seen, and Sam has smelled, the porcupine multiple times, always late afternoon or early evening, up in the same tree, eating. Yes, that tree is history, but it kept the porcupine going through the frigid and snowy winter. It became a game for me – I could see the porky from some distance and it was fun to see how long before Sam would pick up the scent. And then I realized that if it hadn't been for Sam, I may not have even known the animal was up there in the first place. Perhaps I never would have noticed it, passing by oblivious.

That got me thinking about other times when the dog's power of scent got my attention. In the fall, we walked a forest trail where I enjoyed the sights, sounds and some smells of the forest – the light scent of pine and sunbaked fallen leaves – all very subtle to me. Meanwhile the dogs were going bonkers – racing from tree to tree, noses to the ground, pausing to sniff longer at the particularly interesting spots. Another time, while on a morning walk, the dogs eagerly led me to a place on the side of the road where some porcupine quills lay scattered about.

It is hard to imagine what it would be like to have such a powerful sense of smell. We humans enjoy things with a pleasant scent, but not those that are foul, and from my experience, the stinkier something is, the more attractive it is to a dog! Two things about dogs give them this enormous edge over humans in the olfactory department. The first is the number of scent-receptors present in the nose. For comparison, a human has 5 million scent-receptors, while a German shepherd has 225 million! These receptors transfer information to the brain for processing which is where the other difference exists. The percentage of a dog's brain devoted to analyzing scents is 40 times larger than that of a human.

These differences between humans and canines struck me again one day as I was driving down Kemp Road and came upon coyote pups others had reported seeing in the area. I came to a stop as the pups dashed into the woods and stopped a short distance off the road. Sam was with me in the car and the back window was down so he could see and smell these little canines. I was surprised that he did not make a sound, which is never the case when deer or turkeys are in sight. I wondered if he recognized the scent of his distant relatives.

Both pups just watched us and sniffed in our direction. Sam did the same as the pups; I, however, only watched. I was surprised by how unafraid they were. And as I watched these pups, learning what they could about us from our scents, I realized I knew very little about the life of the coyote.

Coyote pups are born in a den, very often a hole dug and abandoned by another animal, such as a badger or woodchuck. Pups are born in April and the average litter size is 5-7. Like our domestic puppies, coyote pups are playful and curious and once mobile will begin to stray and explore near the den, but will return to safety if mom issues a warning bark. Pup mortality is high, often due to predation, and 50-70% will not reach adulthood. Dad plays an important role in rearing the young, bringing food to the den for the mother and regurgitating food for the pups. By the end of summer, pups are about half grown and learn to hunt with the

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Scent .... *(From page 3)*

family, which may include yearling females. In the fall, young males will leave their parent's territory. Coyotes are full grown and sexually mature at one year of age.

Despite the high mortality rate for pups, coyotes have been successful as a species. Historically in Wisconsin, coyotes were more abundant in the south than in the north. But after extensive hunting occurred in the 1800's and early 1900's, there was a shift to a greater abundance in the north. Today they are found throughout the state; however, where the grey wolf is well established, the coyote population has declined. This is because they share the same ecological niche, competing for the same resources, and wolves kill coyotes over food and territory disputes. In areas of the country where the wolf population has declined, the coyote has filled in.

One reason the coyote has been successful as a species is because of its diet, which is highly varied and adaptable. Coyotes are predators, hunting small game such as rodents, rabbits, and grouse. But they are also scavengers because they eat carrion, like road-killed deer. Depending on the time of year and where the coyote lives, fruit, berries, insects, fish, amphibians and birds are also part of the diet. In urban areas, trash receptacles may contain a nice meal, and even cats and small dogs may become dinner for the opportunistic coyote. It is interesting to note that while other predators lost ground as humans moved into their former habitats, coyotes learned to live alongside us, taking advantage of what we have to offer.

In Wisconsin coyote territories are roughly 5-10 square miles in size. Coyotes form packs if territories are large enough and the habitat provides enough food to support a pack. In or near urban areas where territories are likely smaller, a pack may simply be a mated pair. Coyotes are most active between dusk and dawn, but may be seen hunting during the day. There are large horse pastures near my home and I have had the pleasure of watching a coyote stalk and pounce on what I imagine was a vole scrambling through the grass. Coyotes are social creatures and are known to share a meal of carrion and hunt in a pack to take down larger prey, like a deer. They also play! I once saw a small group of young coyotes romping about on a summer evening and they looked just like a group of domestic dogs at play.

Woodruff resident, Don Gauger, recently shared this trail camera photo of a coyote posturing submissively to a bobcat. The two animals met up over a deer carcass on his son's property in Iron County. Photo credit: Brian Gauger

The coyote's scientific name, *Canis latrans*, is Latin for "barking dog." The first time I heard coyotes was when our now 14-year-old dog was just a youngster. We were new to the Northwoods and it was late spring, so the windows were open in the house that night. The coyotes began yipping and yapping not too far off in the woods outside and our little dog just stared out the window into the dark, ears perked, and she didn't make a sound. I once read that coyotes are able to make themselves sound like they are present in much greater numbers than they actually are, just by their varied vocalizations. The meanings of the various yips, yelps, howls and barks are not completely understood, but likely communicate warnings and keep pack members together and pups in line.

Whether observation of a wild animal is by sound, sight, or scent, it is special and memorable. For me, our dogs are an extension of my senses, alerting me to things that I am very likely to miss. Our porcupine friend seems to have moved on from the area of the forest where we spotted it in January. The dogs and I watched the critter climb down one tree and up another once, so Sam learned to look for the animal in addition to sniffing it out. To this day, he looks up in the tree when we pass by.

Our Mission: Research, Instruction, Outreach ... and Memories

By Tom Steele

Earlier this winter I participated in a strategic planning exercise with colleagues from UW-Madison's Department of Agricultural Research Stations. Our task was to think about the future and identify opportunities, and challenges, facing off-campus research facilities.

It was a lively conversation, with lots of good ideas put forth. In the end, we identified the broad categories of research, instruction and outreach as important ways field stations contribute to the diverse programs of the College of Agricultural & Life Sciences. Interestingly, these same activities – research, instruction and outreach – have been the foundation of Kemp Station's mission for the last 50-plus years.

But as I reflect upon it now, our mission at Kemp seems more than that. Don't get me wrong, I am not discounting the importance of creating new knowledge, educating young minds or putting science to work – these are truly important and noble pursuits. But they don't fully capture the spirit of what goes on at Kemp. At the personal level, Kemp Station makes memories. Take the MIAD field class for example. (See the story beginning on Page 1.) Without a doubt, those students are going to remember their January field trip to Kemp, and the Arctic conditions that prevailed, for the rest of their lives. Or consider Collin Buntrock. Collin worked out of the station all last summer. This spring he graduates with a Masters degree in forestry. No matter where he ends up, Kemp will always be part of his history. Then there is my friend Zim. Zim attended a Shiitake mushroom workshop at Kemp last year. This spring he eagerly awaits a bumper crop of delicious mushrooms, a taste of Kemp in each bite.

As I look ahead, I see it is going to be a wonderfully busy field season at Kemp. A season full of research, instruction and outreach. And, of course, making new memories.

Maple syrup production is in full swing at Kemp Station. The tree tapping process was especially challenging this year as the forest was still blanketed with about three feet of snow. When sap is collected in buckets, a single sugar maple tree can produce anywhere from 10-14 gallons of sap. When the sap is boiled, evaporation occurs, concentrating the sap to the desired sugar content. The heating process and chemical changes give maple syrup its flavor and color.

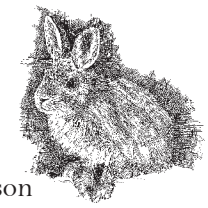
Learning Opportunities at Kemp Station

Learn about Wisconsin's natural resources at Kemp Natural Resources Station, a University of Wisconsin-Madison research and teaching facility in Woodruff. To register for a session, contact Karla at (715) 358-5667 or kemp@cals.wisc.edu. Sessions are free of charge unless noted. The complete schedule is available at www.kemp.wisc.edu.

Sessions may be held in the Outdoor Pavilion, the Fralish Library & Lounge at the Mead Residence Hall, or in the Boathouse Classroom. Directions to Kemp Station are available at the Kemp website.

May 17 (Saturday) 10:00 am
Shiitake Workshop 2014
Session Leaders: Glen Stanosz & Scott Bowe, UW-Madison

Back for the third year! Join us for an introduction to Shiitake mushroom cultivation. Green thumb not required! This hands-on demonstration will begin with a discussion of the life cycle of Shiitake mushrooms. Did you know that Shiitake mushrooms grow on logs? We will demonstrate how hardwood logs are prepared, inoculated, and cared for to grow these delicious mushrooms. Come ready to work! Participants will be asked to form an assembly line to prepare and inoculate logs that can be taken home at the end of the session. You will have an opportunity to perform each step in the Shiitake process so you will have the skills to build your own mushroom garden. Mushroom samples will be served after the seminar to reward your efforts. Registration limit: 15 (An afternoon session will be added if there is adequate demand.)



June 2 (Monday) 7:00 pm
Snowshoe Hares
Session Leader: Sean Sultaire, UW-Madison

The climate has changed dramatically in Wisconsin during the past 50 years with some areas of the state experiencing more than a 4° F increase in winter temperatures. This magnitude of change is likely to have impacts on species and habitats in Wisconsin but so far they are poorly documented. Snowshoe hares in Wisconsin are a perfect species to study the impacts of climate change on wildlife because they exist at the southern edge of their range in Wisconsin, and they are adapted to life in cold, snowy environments. Currently researchers are using detailed historic information to track the response of snowshoe hares to climate change and to understand which habitats and regions they are most likely to survive. Join UW-Madison graduate student Sean Sultaire to learn more about this research project and what it means for the future of snowshoe hare in Wisconsin.

June 16 (Monday) 7:00 pm
Dragonflies & Damselflies
Session Leader: Bob DuBois, WDNR

Learn about the dragonflies and damselflies of Wisconsin! This indoor presentation will include an introduction to the 8 families of Odonates, the basics of life history and highlights on behavior and ecology. Also learn about the Wisconsin statewide survey of these mighty fliers and how you can become involved as a citizen scientist..

June 23 (Monday) 7:00 pm
Exploring the Bog
Session Leader: Bob Wernerehl, UW-Madison

Northern Wisconsin peat bogs have a uniquely appealing and attractive quality to them. We will foray into a black spruce bog on the Kemp Station grounds and get our feet wet as we walk on a floating mat of peat moss to examine pitcher plants, sundew, wild cranberries, and sedges adapted to life in this quintessential northern habitat. Please dress appropriately for the weather. Suggested footwear includes rubber boots if you want to keep your feet dry. Another approach is to wear tennis shoes or toe shoes that can get wet and will dry quickly back at home. Consider bringing a camera, binoculars, hand lens or magnifier, sketch pad, notebook, mosquito net or bug spray. We'll take a few minutes to experience the bog in silence (except for the birds and frogs), when you can sketch or write a short poem, or explore a little on your own. (In case of poor weather Monday, the session will be held Tuesday, June 24.)

Learning .... *(From page 6)*

July 8, 9, 11 & 12
(Tuesday, Wednesday, Friday & Saturday)
9am, 11am, and 1pm
Turning Wood into Art
Session Leader: Scott Bowe, UW-Madison

Do you like wood? Do you like ink pens? If you answered yes to these questions, it stands to reason that you might like wood pens! Join Scott Bowe, Professor of Wood Products, for a hands-on demonstration of wood pen turning. Each session will last about one hour and each participant will make their own wood pen. Participants will learn the basics of wood turning, discuss common wood properties, turn and assemble a wood pen, and leave with their very own work of art. Participants should be 12 years of age or older.

July 10 (Thursday) 10:00 am and 2:00 pm
Youth Forestry (Ages 5 to 11)
Session Leader: Scott Bowe, UW-Madison

Have you ever wondered how forests grow, change, and provide all of the products we use every day? Please bring your children or grandchildren for a hands-on adventure to learn about the forests around us. We will learn how to age and measure trees. We will use leaf rubbings to produce spectacular works of art while learning to identify trees by their leaves. We will make homemade paper and learn about the science of manufacturing forest products. We will make wooden leaf necklaces to help us remember all of the important products that come from forests. This is a special program in partnership with the Minocqua Public Library. To register, please call the library at 715-356-4437 by Tuesday, July 8.

July 21 (Monday) 7:00 pm
Wild Turkeys
Session Leaders: Scott Hull & Chris Pollentier, Wisconsin DNR; Scott Lutz, UW-Madison

Wild turkeys were successfully reintroduced in southwestern Wisconsin during the mid-1970s and populations have since expanded far beyond their ancestral range and are now throughout the entire state. The distribution and abundance of turkeys is generally associated with an even mixture of forest land and open-agricultural areas. While much of the southern two-thirds of Wisconsin falls within this category, many areas across far northern Wisconsin are comprised of landscapes where forests dominate, with sparsely scattered agricultural practices and open areas. Chris Pollentier and Dr. Scott Hull of the Wisconsin Department of Natural Resources, together with Dr. Scott Lutz of the University of Wisconsin-Madison, have initiated a collaborative study to better understand the current distribution and occupancy of turkeys in heavily-forested northern Wisconsin landscapes. They will discuss the general history of wild turkeys in Wisconsin, describe the recent research on turkeys in southwest and west-central portions of the state, and share some of the initial findings from the first season of the current study in northern Wisconsin.

July 28 (Monday) 7:00 pm
Native Wild Bees
Session Leader: Rachel Mallinger, UW-Madison

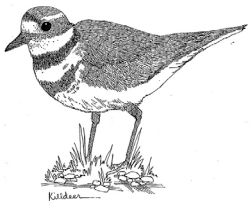
Wisconsin is home to over 500 species of native wild bees, which provide valuable pollination for both crops and wild plants. In light of declines in honey bee populations, these wild bees, and their contributions to pollination, are becoming increasingly important. Given current trends in agricultural intensification and the loss of natural bee habitat, how are these wild bee species doing? To what extent does our state's agriculture depend on their activities? In this presentation, UW-Madison graduate student Rachel Mallinger will introduce you to Wisconsin's wild bees and discuss her research on the factors affecting wild bee populations and their role in crop pollination. You will also learn about what you can do to help conserve these wild bees!

August 2 (Saturday) 9:00 am - Noon
Northwoods Algae: The Hidden Wonders of Pond Scum
Session Leader: Paul Engvold, Milwaukee Institute of Art & Design

Commonly known as "pond scum," algae have often been dismissed as a nuisance. In fact, they might be the most under-appreciated organisms on the planet! As primary producers, freshwater algae are extremely important ecologically in our lakes, ponds and rivers. When displayed under a microscopic, they are among nature's most unique, colorful, strange (and sometimes dangerous) organisms. This workshop will introduce participants to the diversity and ecology of freshwater algae with an emphasis on both the microscopic plankton and the summer "nuisance" forms in lakes and streams of the Northwoods. This two-part workshop will introduce the major groups of algae and their identifying characteristics followed by video microscope observations of live material obtained from field collections. Participants are encouraged to bring their own samples for identification. Come learn about algae!

Kemp Natural Resources Station
9161 Kemp Road
Woodruff, WI 54568

Killdeer (*Charadrius vociferus*)



The day before the April 3rd snowstorm I saw two killdeer near the Wisconsin River near McNaughton. One was flying about and the other was running along the side of the road. I first learned of this bird as a kid while on a family vacation in Door County. It became known in my family as "the bird with the broken wing." Killdeer are ground nesters and if you venture too close to the nest, you will be privy to the broken-wing display, a ploy to lure predators away from its nest. The nest is a scrape in the bare ground, about 3 inches across. After the eggs are laid, materials like stones, sticks and even bits of trash will be added around the eggs. Killdeer are shorebirds, but are more often associated with dry habitats, found in open fields or pastures, and around urban areas in golf courses, parking lots, and athletic fields. When near water, sand bars and mud flats are their preferred locale. While foraging, the bird trots in quick spurts, stopping to grab food or look around, and trots again, launching into a circling flight if startled. The killdeer diet is diverse and includes earthworms, beetles, crayfish, snails and insect larvae. Killdeer chicks are like ducks in that they can walk shortly after hatching and they imprint on their parents who teach them to find food. To see a video of two killdeer chicks huddling beneath the parent, go to www.allaboutbirds.org/guide/Killdeer and click the Video tab. While watching the video, notice the "hiccup" head-bob the parent does, a behavior done when the bird faces a predator.

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Volume 15, Number 1

Published semi-annually by the University of Wisconsin-Madison's Kemp Natural Resources Station. To receive this free newsletter or update your address contact:

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