



Kemp's Point

Volume 17, Number 1, Spring 2016

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

Weather Wizards Invade Kemp Station!

By Ankur R. Desai

"Release!" -- "Release!" -- "Release!" Professor Grant Petty of the University of Wisconsin-Madison (UW) signaled from afar, one at a time, to a group of students, standing on frozen Tomahawk Lake on a cold, windy late winter day in early March. As he did, each one let go of one helium-filled red balloon. Precisely placed cameras on the ice snapped a photo every second as the balloons lifted away in formation over the tall hemlocks at Kemp Natural Resources Station.

Did Kemp just get taken over by a clown college? Better - a class of 12 budding meteorologists!

Undergraduates, graduate students, and even two middle schoolers braved the elements over two three-day field trips to Kemp as part of a program at the Atmospheric and Oceanic Sciences (AOS) Department at UW to expose students to meteorological instrumentation and field experiments.

"Kemp is the ideal place to host a weather-camp. The 100+ acres of woods, bogs, and lakes and the lodging and lab facilities provides an ideal setting for students to design, implement, and analyze experiments about atmospheric dynamics, land-atmosphere feedbacks, and forest aerosols," noted Prof. Ankur Desai, who along with Petty co-lead the course.

Desai's lab conducts extensive micrometeorological research in the area and many of his students have passed through the buildings at Kemp. But this is first time he's gotten to bring UW students to Kemp who wouldn't normally be up here for research.



*A camera keeps track of balloons lofted by the wind.
Credit: Ankur Desai*

Ten students enrolled in an AOS course spent the semester in Madison learning about fundamental measurements in meteorology, calibrating sensors on the roof of their campus building, and wiring data loggers. Next, they jointly designed and wrote up a group experiment on the role of forest modification to air pollution, winds, and temperature. Once a plan was in place, on an early Friday morning, students crammed their equipment, aerosol sensors, meteorological stations, and radiation instruments into 4 UW fleet vehicles and drove up to Kemp.

"Of course, once we actually had to deploy the instruments, there was no shortage of hiccups, stuck bolts, and uncooperative sensors," remarked AOS undergraduate senior Tyler Wright.

Nonetheless, after the first few days, sensors were deployed and running, including an advanced surface energy balance station raised by pulleys to the top of the aluminum tower at the Lab with assistance from UW research associate, tower-climber extraordinaire, and Kemp regular, Jonathan Thom.

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Weather (From page 1)

“Hopefully, as the lake ice breaks up, these instruments will detect a change in evaporation and heating rates,” said AOS undergraduate senior Gabe Bromley, as he hoisted the ropes pulling a \$10,000 3-D wind sensor up the tower to Thom.

While the tower instruments kept an eye on the lake and forest energy balance, the goal of the red balloon experiment was to track winds above the forest by comparing the relative locations of the balloons in the two cameras, in the same way two eyes work together to provide 3-D vision.

Petty explained, “With a common reference point and frequent, high resolution images, we can reconstruct the entire wind field.”

In addition to UW-Madison students, two 7th grade students at Madison’s Velma Hamilton Middle School also participated as part of a district-wide after-school science mentoring program with UW. Desai mentored the two young students on micrometeorology. Every few hours from morning to night, they collected spot measurements of temperature, humidity, and air pressure at strategic locations of differing elevation across Kemp to test hypotheses on how wind moves air across slopes. In the evenings, they spent time talking and playing games with the college students.

“I had no idea college students could eat so many doughnuts!”

exclaimed Eve Kleiber, one of the two students, who not only had to collect measurements, but help out, like all the students, in the operation of a field camp, including grocery excursions. “You learn so much just being out in the woods, thinking about the data we collect,” added Carson Pionek, the other student, as she used her headlamp to review what she jotted on sky conditions and infrared temperatures in her field notebook, while the snow lightly fell.

After the initial experiment, the meteorological stations and energy balance tower were left at




UW-Madison undergraduates set up a tripod in the woods at Kemp. Shown left to right: Nick Vertz, Tyler Wright, Dave Mikolajczyk, Steven Fons

Kemp for the month to continue automated data collection on local climate and weather events. Students then returned in early April to conduct a final set of experiments, including the launching of a weather balloon, before packing up and heading back to Madison, with six weeks left to analyze all the data. Many of these students will soon graduate and attend graduate programs where their hands-on skills will be valuable for

future research and professional development.

“My experiment to tie a set of temperature sensors tethered to a fishing line and balloon didn’t quite work out the way I thought because of the strong winds. But we modified it, thought about using a kite instead, and ended up deploying them on the tower. Still, I hope we will have plenty of good data for our experiment,” said Skylar Williams, AOS graduate student, who came to UW after completing her undergraduate degree at the University of Oklahoma and who had never previously been to the Northwoods.

For the students, most of whom were exposed to a new environment and location, this sentiment may be the greatest learning component of the Northwoods: Learning by doing, hardiness in the outdoors, and confronting the lofty idealized goals written on paper with the complexity of the real world on the ground. We should hope all students gain these skills somewhere in their educational path. Kemp is clearly a one-of-its-kind classroom for this kind of learning.

As for those red balloons? Of course, eventually they left the camera’s field of view and drifted away, to pop somewhere aloft. Desai quipped, “The balloons gave their lives for science. But there’s nothing like directly seeing the same wind profile we derive with calculus in the classroom. This place is the epitome of the Wisconsin Idea.” 



Kemp Station Welcomes a New Face

By Tom Steele, Outgoing Kemp Superintendent

Meet Scott Bowe! Scott is the incoming superintendent at the Kemp Natural Resources Station, replacing the soon-to-be retired Tom Steele. Originally from Chippewa Falls, WI, Scott brings a wealth of experience to Kemp. He trained as a forester at UW-Madison and obtained graduate degrees from the University of Minnesota and the Virginia Technological University.

Scott comes to Kemp via the UW-Madison Department of Forest & Wildlife Ecology, where he was a professor and the state-wide forest products extension specialist. He will continue to wear his faculty and extension-specialist hats while serving as station superintendent. This is a great fit for

Kemp as it formalizes the station's strong connections to instruction and outreach. And, it is a great fit for Scott since most of his instruction and extension activities are conducted in the Northwoods.

Scott's experience at Kemp dates back to his undergraduate days in the early-1990s when he was a young, fresh, undergraduate student attending Forestry Field Camp. During his years as a campus-based faculty member, Scott taught field classes, led outreach programs and supervised graduate students at Kemp Station. Thus, he has direct, firsthand experience with Kemp Station's core mission of natural resources research, instruction and public education.



Scott moved to Kemp Station with spouse Jackie and boys Jake (Age 11) and Gage (Age 9) last summer. The family has been living in the Cabin during this transition year, enjoying all that Kemp and the Northwoods have to offer. So the next time you are on the station, be sure to swing by the office and say "hi" to Scott. 🐻

Young Adventurers!

Three fifth grade classes from the Arbor Vitae - Woodruff Elementary School (AVW) visited Kemp Station in March for Adventure Wednesday. Adventure Wednesday activities are designed to introduce young minds to active learning and a lifetime of outdoor activities and adventures. At Kemp, activities included a forestry nature hike, snowshoe baseball (best game ever), and a paper making demon-



stration showing sustainable products from our forests. AVW is an Expeditionary Learning School, where students engage in interdisciplinary projects within their community. Kemp Station welcomes the opportunity to be a part of the teaching process.



The National Ecological Observatory Network (NEON) Brings Big Data to Wisconsin's Northwoods

By Ashley Spink

Two hours before dawn, the NEON mammal trapping crew rises and makes their way to the kitchen at Kemp Station to grab coffee and breakfast before heading out for the day. Today they will be working in the Chequamegon-Nicolet National Forest, west of Minocqua, WI, one of three NEON sites in Wisconsin and upper Michigan that comprise NEON's Great Lakes Domain. The other Great Lakes sampling sites are UWSP's Treehaven and a couple of forested tracts owned by Steigerwaldt Land Services in Tomahawk; and the University of Notre Dame's Environmental Research Center (UNDERC) in Land O' Lakes, WI. While the domain office is at the UNDERC site, the mammal team uses Kemp Station as their home-away-from-home while working in the National Forest.

Upon arriving at the National Forest field site, the crew hikes out

to one of three mammal trapping plots where 100 Sherman live traps were set the previous night in a 90 x 90 meter grid. After walking all the trap lines and collecting traps that contain animals, they head back to the spot that they have set up for processing. One by one they collect data from the animals including: species, age, gender, reproductive condition and other additional measurements. Finally, every animal receives an ear tag with a unique number, so it may be identified if caught again, and is released at the point of capture. The data generated from these trapping events will allow NEON to track changes in small mammal population sizes and community structure over time. In future years, NEON mammal trapping crews will collect blood samples from trapped individuals to better assess the role of small mammals as vectors for pathogens, such as *Borrelia*, the bacteria that causes Lyme disease.

About the time that the mammal crew is finishing up and all the animals have been released, the NEON plant team is arriving and hiking out to one of thirty, 20 x 20 meter sampling plots on site. The center of the plot and each corner are



*NEON technician Crystal Willett holding a red-backed vole (*Myodes gapperi*).*

marked with PVC stakes to allow NEON technicians to track the same plants year after year for systematic data collection. The plant crew is working on documenting diversity and abundance of all plant species in these plots. They first sample within 1 meter square nested subplot areas, recording species presence and percent cover. They then work through consecutively larger areas (10 x 10 and 100 x 100 meter plots), recording plant species that were not previously found in smaller subplots until they are confident that they have documented every species in the plot. They photograph and describe any unknown species, and if possible, collect an individual from an area outside the plot for later identification. As they work, they move among large trees and woody shrubs that have been

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NEON technician Ashley Spink ready to process some mammals.



NEON (From page 4)

labeled with tags marked with a unique number. Every woody plant had previously been tagged and later, when the leaves begin to fall, they will return to collect biomass descriptors on these trees and shrubs including diameter (dbh), height, canopy area and health. The plant crew's work will allow scientists to evaluate how environmental changes influence forest plant community structure and carbon storage. At three hours before sunset, the plant

team wraps up their plant diversity work and makes their way over to the mammal grid to reset the traps for another night of mammal trapping.

At the other NEON sites, technicians are busy conducting aquatic sampling, cleaning and calibrating sensors on the instrumented tower, collecting ticks and mosquitoes for pathogen testing, observing phenology and conducting other biomass measurements like determining canopy cover through hemispherical photography and clipping above ground annual growth of non-woody plants.

All of this data and much more are being collected as part of a nationwide effort to create the first continental-scale, long-term ecological dataset available for free to the public and

scientific community. The project is in its beginning phase with at least 15 of the 20 ecoclimatic domains currently collecting data and NEON is expected to be fully operational by 2017. The data products from the NEON project will be instrumental in allowing researchers to monitor long-term changes resulting from climate change, land use change, impacts of invasive species, and much more. Data is already starting to make its way to the public portal (found at <http://data.neoninc.org/>) and much more is to come over the next 30 years. 🐛

More detail about the NEON project methods, datasets, sampling sites and citizen science efforts can be found at www.neoninc.org.



A flowering bloodroot (Sanguinaria canadensis)



NEON technicians Jill Pyatt and Ryan Adams collecting Leaf Area Index (LAI) data

Tom Steele Recognized for Contributions

In January 2016, the College of Agricultural & Life Sciences Agricultural Research Stations (ARS) recognized Tom Steele for his outstanding contributions to the ARS program. Tom supports approximately 50 research projects annually involving researchers not only from UW-Madison but many other universities all over the nation. He also oversees a very active outreach and teaching program.

Annually, Kemp hosts 10 field classes involving UW-Madison and other universities, as well as the very popular Kemp Summer Outreach Series. In 2013, Tom was a founding member of the Science On Tap Outreach Series. This 10-talk lecture series, held at the Minocqua Brewing Company, has proven to be very popular, drawing approximately 1500



people annually to listen to speakers on various natural resources subjects and other topics important to residents in northern Wisconsin. Congratulations, Tom -- it is much deserved! 🐛



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.

Most sessions are held in the Outdoor Pavilion. Attendees are advised to dress appropriately for outdoor seating and bring insect repellent. Directions to Kemp Station are available at the Kemp website.

May 14 (Saturday) 10:00 am & 12:30 pm Shiitake Workshop 2016

Session Leaders: Glen Stanosz & Scott Bowe, UW-Madison



Back for the fifth year! Join us for an introduction to Shiitake mushroom cultivation. 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 tended 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 have the skills to build your own mushroom garden. Mushroom samples will be served after the seminar to reward your efforts. First-time participants receive priority. Fee: \$5 per person payable at the session; Registration limit, each session: 15

June 9 (Thursday) 7:00 pm River Mammals and Their Response to Ecosystem Restoration

Session Leader: Bryn Evans, UW-Madison



Spend time on or near a river and you just might see one or more of the mammals that make this ecosystem home. Join us for an introduction to these semi-aquatic mammals and learn how they have responded to a specific ecosystem restoration effort. After severe degradation from historical logging, mining, dredging, and pollu-

tion, there has been a huge collaboration to restore the St Louis River Estuary, located between Duluth Minnesota and Superior Wisconsin. Bryn Evans is a graduate student from UW Madison, and she is eager to share what she's found while surveying for river otters, beavers, mink and muskrats to help answer a question about the animals that once inhabited the area -- "If you build it, they will come" pan out? See how the use of trail cameras and aerial surveys were used to detect these elusive animals and learn what these sometimes cute, sometimes mischievous creatures might tell us about the restoration efforts.

June 23 (Thursday) 7:00 pm

Insects of the Northwoods

Session Leader: P.J. Liesch, UW-Madison



Insects are the most diverse group of animals on Earth and can be found in nearly every corner of the planet. With over 20,000 insect species in Wisconsin alone, there's always something interesting to find. The Northwoods are no exception, with an abundance of fascinating insects surrounding us every day--from the dragonflies we see out on the water to the longhorned beetles clinging to our window screens. Come learn about the common insects of the Northwoods to get a better understanding of the world around us through the creatures we see every day! Found an interesting insect in the Northwoods recently? Participants are welcome to bring in specimens to learn more about them! (Appropriate for all ages)

June 30 (Thursday) 7:00 pm

The Long & Territorial Life of a Sandhill Crane

Session Leader: Michael Wheeler, UW-Madison



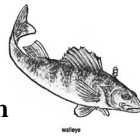
Ever wonder about the life of a sandhill crane? Wonder no more! Join UW-Madison Master's student, Mike Wheeler, for a look at one of Wisconsin's iconic bird species. These long-lived birds are able to form long-term pair bonds. Not only will breeding birds pair with the same bird year after year, but they also use the same area to nest. So what happens when the neighborhood is full? This is a question the International Crane Foundation has tried to answer with a long-term monitoring program that started in the early 1990s. Mike will share what those data have told us about survival and territory retention's role in population dynamics in sandhill cranes.



July 18 (Monday) 7:00pm

Studies of Fish In Wisconsin: Walleye Recruitment & Effects of Herbicide on Fish

Session Leaders: Jason Gostiaux & Nick Rydell, UW-Stevens Point



Why aren't there more walleye in our lakes? We want the Eurasian Watermilfoil gone, but does that herbicide harm fish populations? Join Master's candidates, Jason Gostiaux and Nick Rydell for a look at their research projects that will help answer these questions! Jason will provide an introduction to the walleye and discuss a study that began in 2014 examining why fewer walleye in local lakes are not surviving to maturity. In 2015, Nick began looking at how 2, 4-D (the herbicide used to treat Eurasian Watermilfoil) has impacted zooplankton and fish in a set of local lakes. Learn how these young scientists conduct their research and how what they learn will benefit fish management decisions in the future.

July 28 (Monday) 7:00 pm

Red-tailed Hawks & Wildlife Rehabilitation in Wisconsin

Session Leader: Jacqueline Edmunds, UW-Madison



The red-tailed hawk is a well-known raptor in Wisconsin. Join us for a look into the life history of this magnificent bird and its status in Wisconsin. Like other birds of prey, these hawks are frequently treated by wildlife rehabilitators for injuries. The Raptor Rehabilitation and Monitoring Program began in 2014 under the direction of advanced rehabilitator and Four Lakes Wildlife Center's training coordinator, Jacqueline Edmunds (M.S. Candidate, University of Wisconsin-Madison). Jacqueline is investigating survival rates and home ranges of rehabilitated Red-tailed Hawks through the use of radio-telemetry. Learn how these red-tailed hawks fared after rehabilitation and how the study will inform the field of wildlife rehabilitation.

August 15 (Monday) 7:30 pm

Explore the Night Sky

Session Leader: Kay Kreirvald, UW Space Place



Do you know how to find the Big and Little Dippers in the evening sky? Or do you ever just wonder what all those celestial bodies out there are? Here's your chance to find out! Join us for a tour of the night sky. Led by a UW Space Place specialist, the program will start with a 45 minute presentation on what constellations, planets or other objects are currently visible. Following the presentation, weather permitting, visitors will have the opportunity to view these astronomical objects through a telescope. All ages and experience levels are invited to attend.

Youth Learning Opportunities

Kemp Station is pleased to partner with the Minocqua Public Library to offer the following learning opportunities for kids! To register for the following sessions call 715-356-4437 or visit the Library on or after the registration date for each session.

June 23 (Thursday) 2:00 pm

Exploring the World of Insects

Session Leader: P.J. Liesch, UW-Madison



While small in size, insects are fascinating and play an important role in our everyday lives. Come learn about insect anatomy, ecology, and behavior through a number of hands-on activities. We'll even have a chance to view and hold live insects! Registration for this program begins June 14.

July 7 (Thursday) 6:30 pm - 8:00 pm

Evening Family Campfire Storytime

Session Leader: Scott Mackin



Join us for an evening storytime around the campfire. Bring your family and enjoy traditional folktales brought to life by professional storyteller Scott Mackin. S'mores and refreshments, too. This program is open to all ages and does not require registration.

July 14 (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. Registration for this program begins July 5.

August 2 (Tuesday) 2:00 pm

Mammals & What They Eat

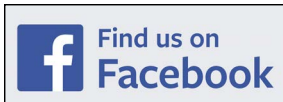
Session Leader: Chris Yahnke, UW-Stevens Point



Many different kinds of mammals live in Wisconsin. Join us for a look at these animals and learn what they eat and why! Kids will get a close up look at mammal skulls. Registration for this program begins July 25.



Kemp Natural Resources Station
9161 Kemp Road
Woodruff, WI 54568



American Pelicinid wasp (*Pelecinus polyturator*)

Last summer a friend posted a photo to Facebook with the comment that her daughter had spotted this “really cool dragonfly” and that they had never seen one like it before. Turns out, it was not a dragonfly, but an American peleciniid wasp. She was a bit startled to learn this since the critter sported what appeared to be a very large “stinger” and she had been quite close to it to take the photo --the peleciniid wasp is indeed very dangerous in appearance! There are several interesting things to know about this animal. The appendage that looks like a stinger is just a really long, jointed abdomen. This long abdomen belongs to the female of the species and measures about 2 1/2 inches -- five times the length of the rest of her body!. The males are only about one inch long. In fact, males are quite rare, so rare that the offspring of these wasps develop from unfertilized eggs -- a form of asexual reproduction called parthenogenesis. The process of egg deposition and larval development is quite intriguing. The female uses her long, jointed abdomen to probe the soil in search of the grub of the June bug. Once located,



she deposits the egg into or onto the body of the grub and her work is done. When the larva hatches, it eats the grub and then pupates in the soil, later emerging as an adult. Because the females wings are very short in comparison to the rest of her body, she is a slow flyer. She also tends to fly low. So if you encounter one of these low and slow fliers, never fear! She is just looking for June bug grubs and will do you no harm!

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