

THE UNIVERSITY OF MISSISSIPPI

FIELD STATION

"Nature's Laboratory at Ole Miss"

SPRING / SUMMER 2011

Despite all the good things that spring brings, this year has seen it bring many severe storms, including tornados, in the Oxford area and elsewhere.

Luckily, the Field Station has escaped any damage, but unfortunately our senior staff assistant, Linda Williams, lost her home to falling trees and water damage.

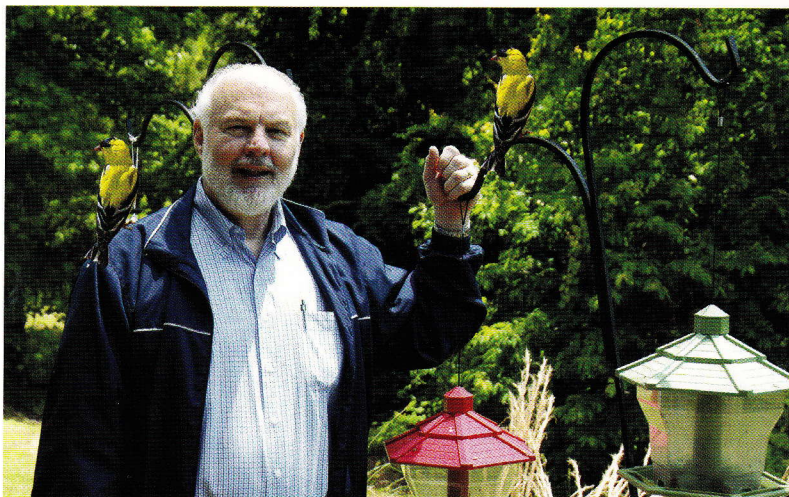
Spring is also graduation time, and we salute Rani Menon, who completed her Ph.D. in biology (Dr. Marge Holland, adviser) based on work at the Field Station. She now has a postdoctoral position at Texas A&M.

Spring has also seen the return of butterflies and birds. In fact, the butterflies seemed to appear before the plants were ready for them. For the first time, I put out birdfeeders near my window when we had a few inches of snow staying on the ground

and was quickly rewarded, especially by the appearance of migratory species moving through, such as goldfinches and rose-breasted grosbeaks. Try it!

In the spring, we also enjoy visits by numerous school groups taking field trips. This relationship with teachers and schools is growing, and we are proud to contribute to the learning process. We are also very grateful to the gang at the National Sedimentation Laboratory for their tremendous help with larger school groups.

— *Ray Highsmith*



STAFF

Dr. Ray Highsmith
Executive Director
ray@olemiss.edu

Mr. Mark Baker
Resident Director
jbaker@olemiss.edu

Dr. Ikhlas Khan
Research Professor & Coordinator for
Natural Products Research at the Center for
Water & Wetland Resources
ikhan@olemiss.edu

Dr. Abbas Ali
Senior Research Scientist
Center for Water and Wetland Resources
aali@olemiss.edu

Dr. James Anderson
Research Scientist, Center for Water &
Wetland Resources
jandersn@olemiss.edu

Dr. Rita Moraes
Research Associate Professor, Center for
Water & Wetland Resources
rmoraes@olemiss.edu

Ms. Sumithra Weerasooriya
Research & Development Botanist
srweeras@olemiss.edu

Ms. Michelle Edwards
Assistant to the Executive Director
Marketing & Business Development
edwardsm@olemiss.edu

Mr. Graham Green
Network Administrator
ggreen@olemiss.edu

Ms. Sarah Lovett
Manager of Project Resources
smholter@olemiss.edu

Mr. David Mathis
Water Systems Coordinator

Ms. Linda Williams
Senior Staff Assistant
lechols@olemiss.edu

STAFF ANNOUNCEMENTS

Dr. Jim Anderson attended the Annual IFA Conference and Annual Fire Ant CoP Member Meeting in Galvston, Texas April 4-7. While there, he presented a paper on *Development of an ant counter for foraging assays or monitoring ant activity*. The convention had 30 presentations and 16 posters. Next year's convention will be April 16-19 in Nashville, Tenn.

Congratulations Dr. Ray Highsmith, who was appointed to the Mississippi Water Resources Research Board and to the University of Mississippi Research Board.

Dr. Rita Moraes is spending two weeks in her native country of Brazil to attend meetings and be a guest speaker at EMBRAPA's National Environment meeting in Sao Paulo. She is scheduled to give two presentations on medicinal plants. One highlights medicinal plants as a source of natural pesticides, and the other is part of a workshop for an ongoing project to study the biodiversity of Brazil's Caatinga region. The Caatinga region comprises more than 10 percent of Brazil's territory. It is a xeric shrubland and thorn forest, which consists primarily of small, thorny trees, cacti, thick-stemmed plants, thorny brush and arid-adapted grasses. Although it is an arid landscape, many annual plants grow, flower and die during the brief rainy season.



Donor Information:
Friends of the Field Station Account
UM Foundation, P.O. Box 249
University, MS 38677

RESEARCH SPOTLIGHT : INFRASOUND

Can you hear me now? Most research conducted at the UM Field Station centers around something biological, something living, such as plants or animals, but that is not the case with the latest group of researchers. They are studying sound. The university's Jamie Whitten National Center for Physical Acoustics has constructed a sensor array at the UM Field Station to conduct infrasound research.

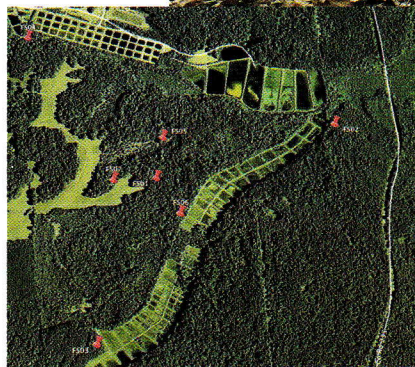
Infrasound is very low frequency sound, well below the range of human hearing, that travels long distances. Natural infrasound sources include volcanoes, hurricanes and tornados (pretty relevant research considering the weather patterns that have been whipping up all the tornados in the South this spring, and the hurricane season getting started). Manmade sources of infrasound include large explosions, sonic booms and machinery such as wind turbines or engines. "Infrasonic signals can be detected from hundreds to even thousands of kilometers from their source," says Dr. Eric Friemark, research associate at NCPA.

Why study infrasound? "The interest in infrasound is two-fold," Friemark explains. "On the one hand, the propagation of infrasound through the atmosphere depends critically on the temperature and winds in the various layers of the atmosphere so that information about the atmospheric state can be obtained from infrasonic signals received from distant sources. On the other hand, infrasonic signals can be used to monitor infrasonic sources safely from great distances."

Research at NCPA addresses several specific applications, including verification of compliance with the Comprehensive Nuclear Test Ban Treaty, the monitoring of natural hazards such as hurricanes



Setting up infrasound sensor at the Field Station



Aerial photo of the UM Field Station. Red arrows show sensor locations.

and tornados, and the determination of the winds associated with the upper atmospheric tides.

The seven solar-powered sensors were developed by researchers at NCPA and are arranged in an array designed to acquire signals in a range of different infrasound frequencies. The information gathered by the sensor array is downloaded on-site about every two weeks. The array is being used to acquire signals of interest and as a "test bed" for newly-developed equipment, false alarm reduction algorithms, wind noise mitigation schemes and infrasound propagation models. The Field Station was selected as an ideal site due to its proximity to NCPA, allowing researchers ready access to the array, and because of its tree cover which provides a wind shield at infrasonic frequencies.

Field Station director Ray Highsmith said, "One of the fun things about being at the Field Station is seeing the great range of activities that can be done here by scientists. Also, the continual development of new technologies is pretty amazing. I certainly would not have thought it possible to monitor hurricanes in the Caribbean or Gulf or verify test-ban treaties from a patch of cattails at the Field Station."

Field Work: Dr. Rich Buchholz, Biology 350

Dr. Rich Buchholz is no stranger to the UM Field Station. His NSF grant-funded Avian Research Facility that studies parasites and mate selection in wild turkey hens is located here. For three weeks in April, his Biology 350 class (Mammalogy) also worked on research at the Field Station as part of their curriculum. I had the opportunity to ask him about this class and their research, and he graciously agreed to a little Q & A.



Students checking the mammal traps

(ME) Who takes BISC 350 (Mammalogy)?

(RB) Mammalogy (BISC 350) is a biology elective. The only pre-requisite is one year of Introductory Biology, but the class is limited to 21 students (the number that can fit into two vans for field trips) and is so popular that usually only juniors and seniors are able to get in. Most of the students have an affinity for a particular mammal group and want to learn more about them. Others take the course to round out their training for a career in conservation or wildlife management.

(ME) Tell me about the project the students have going on at the Field Station:

(RB) The students are learning how to set up and monitor a trap array. There are 50 traps set up and they are checked by the students daily. The traps tell us which rodent species are present, but will also give us a population estimate for each. The students are developing skills such as species iden-

tification, measurement, marking and the use of capture/recapture data for population modeling.

(ME) How often is this class taught and what is done with the data the students collect?

(RB) The course is taught in the spring semester of odd-numbered years (e.g. 2011, 2013, etc). I have taught four times previously, and we've seen interesting changes in the small mammal community at our study site at the field station. Habitat succession is occurring whereby what was open grass has been colonized by pines. As a result we're catching more deer mice and woodland voles than we used to.

(ME) What is the benefit of field work for students?

(RB) Many biology departments at universities across the U.S. have eliminated "whole organism" courses such as Mammalogy, especially when they involve field work. These courses are usually small in size, are a lot of work for the instructors, and some schools worry about the cost and potential liability of taking students to field sites. In some cases, administrators at those schools feel that field courses are "old-fashioned" science and mistakenly believe that lab work is "better" than field work. Also today's students have spent less time outdoors as children and they have unreasonable fears about nature and exposure to wild animals.

I teach my students that Mammalogy has applied relevance to everything from agricultural crop production to disease epidemics. They learn, for example, how our response to the SARS epidemic was hindered by our lack of understanding of the biology of civets (an Asian family of carnivores). They also learn how today's mammalogists use modern technologies such as DNA sequencing and satellite transmitters to answer both theoretical and applied questions. The field work is essential for the students to develop confidence in applying their skill sets to real-world scenarios. I don't expect that many of them will become professional mammalogists, but I'm sure that they will have a lifelong interest and appreciation of mammal biodiversity.

■ Michelle Edwards, UMFS

National Center for Natural Products Research

The UM Field Station is very fortunate to enjoy a partnership with the National Center for Natural Products Research. Directed by Dr. Larry Walker and located in the Thad Cochran Research Center, the NCNPR is internationally acclaimed for its work in the field of medicinal plant research. About 120 researchers from diverse scientific disciplines from microbiology to plant pathology are on staff at NCNPR. Their mission is to find and develop new pharmaceuticals and agricultural products from natural resources: plants, animals and microbes. The scientists are deeply involved in each step of the process; “from seed to clinical trials” is how Dr. Ikhlas Khan, assistant director of the center, phrases the research.

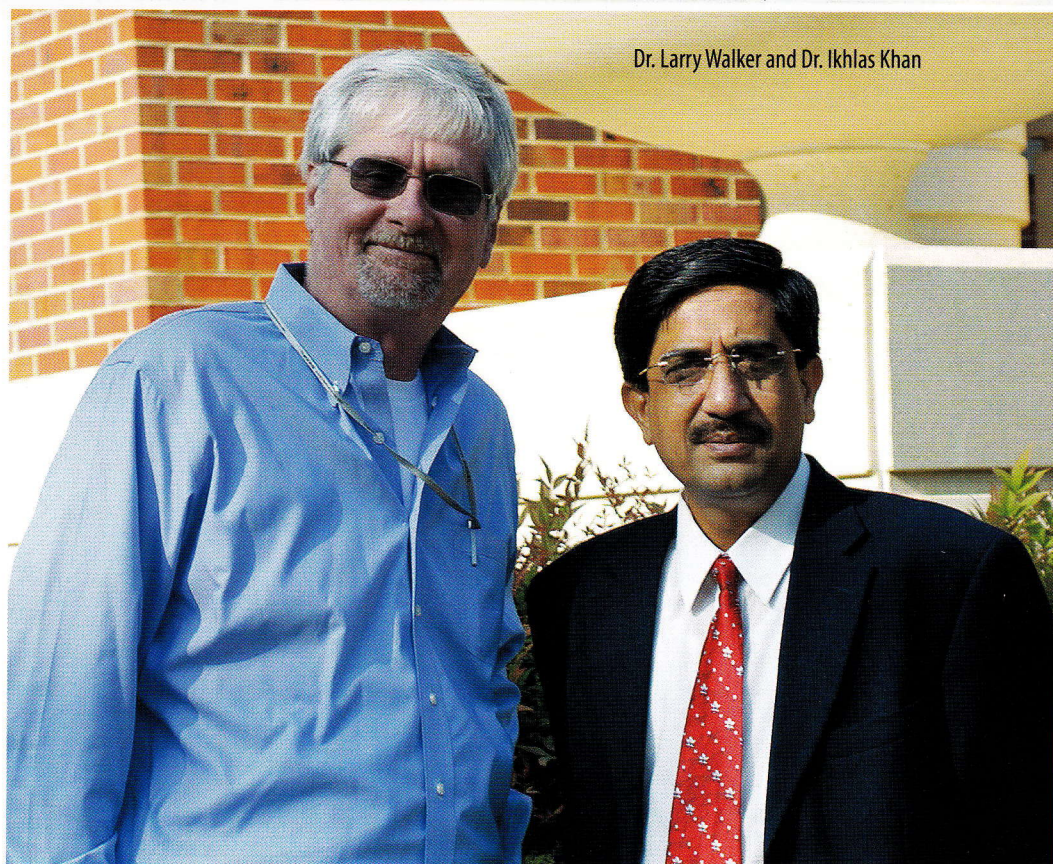
Khan also has an appointment as research professor and coordinator for Natural Products Research at the Field Station’s Center for Water and Wetland Resources. “The Field Station seeks to develop partnerships with campus units as well as government agencies,” said Dr. Ray Highsmith, Field Station director. “Because of NCNPR’s strong affiliation with the U.S. Department of Agriculture’s Agricultural Research Service, we accomplish both goals with this partnership. We couldn’t ask for a better arrangement. We really appreciate all that Dr. Khan and his staff and colleagues do at and for the Field Station.”

Medicinal plants are Khan’s area of expertise. Born in Amroha, India, Khan received both his bachelor’s and master’s degrees from Aligarh Muslim University in Aligarh, India. He earned his doctorate in pharmacy from the Institute for Pharmaceutical Biology in Munich and joined the UM faculty in 1988. His primary research interests in-

clude analytical fingerprinting for standardization of herbal products and bio-analytical approaches to improvement of product quality and safety. Khan is an internationally recognized expert in this field with more than 300 publications and awards too numerous to list here.

The Oxford International Conference on the Science of Botanicals, which Khan founded, celebrated its 10th anniversary April 11-14 at UM.

A growing number of scientists from the Natural Products Center are utilizing the Field Station’s facilities for their research. Three are involved this summer although Khan says this number is likely to increase as new projects are developed. “The center and the Field Station have such a synergistic partnership,” Khan said. “Our missions overlap, and in this overlap there is a great opportunity to help each other and further these important fields of research. I look forward to a mutually beneficial and prolific partnership for many years to come.”



Dr. Larry Walker and Dr. Ikhlas Khan

VISITORS PAGE



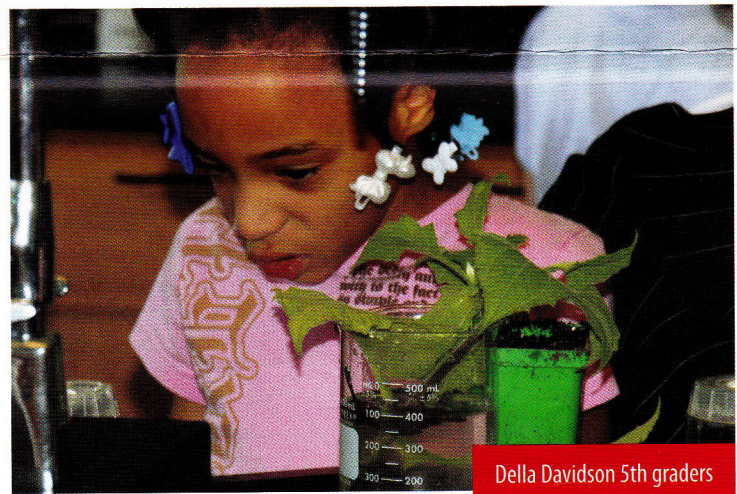
Envirothon



Della Davidson 5th grade and Dr. Martin Locke



Della Davidson 5th graders

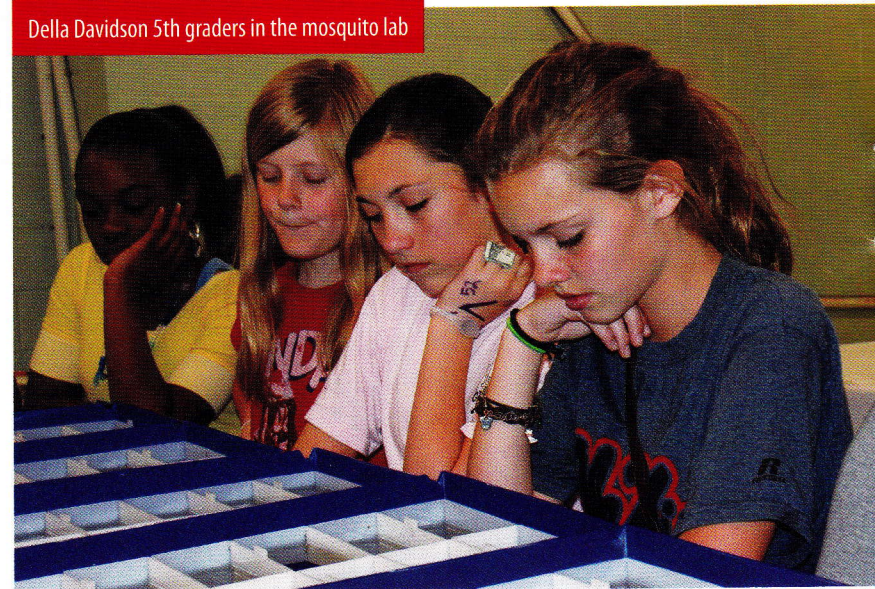


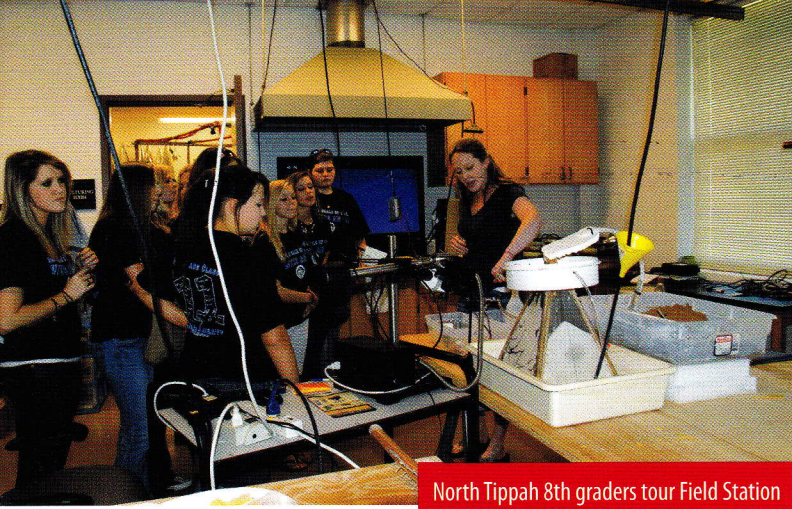
Della Davidson 5th graders

Della Davidson 5th graders in the mosquito lab



Lafayette Elementary 2nd grade class

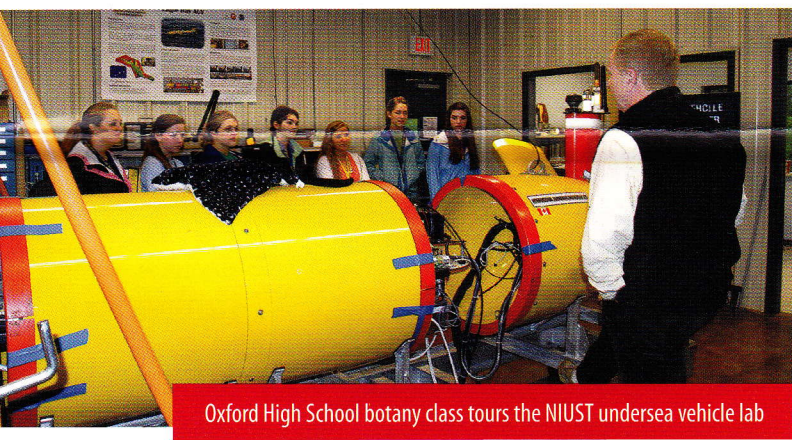




North Tippah 8th graders tour Field Station



Dr. Kuszmaul's GE 421 Senior design class



Oxford High School botany class tours the NIUST undersea vehicle lab



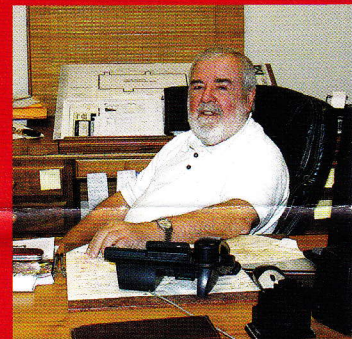
Water Vally 2nd grade gifted class

For more photos, check our new UM Field Station flickr page at: <http://www.flickr.com/photos/umfieldstation/>

NEIGHBORS

When Dr. Luther Knight, the first UM Field Station director, faced the daunting task of converting the newly acquired Field Station property from a commercial minnow farm and swamp into a research facility, one of the first people he called on for help was Jerry White, a neighbor and owner of Oxford Sand Co. Jerry, an Oxford native, left the grocery business and purchased the company that specializes in masonry sand and ready-mix concrete 35 years ago. Oxford Sand Co. remains a family business that employs his two sons, Keith and Kirk, and approximately 25 to 30 other workers.

“Dr. Knight was working with a bushhog and a tractor and not getting a whole lot done, so he called us to help him”, Jerry said with a laugh. “We worked about 10 years, mostly in the summer when it was dry enough, combining the smaller ponds into larger ones and working on levees.” Jerry’s company also did the site prep for the research and office building complex at the Field Station and made the roads that lead to them. Thankfully, he continues to be on call when we need him. Resident director Mark Baker said “ Jerry’s who I call when I get in a bind. I’m glad he’s our neighbor.”



Jerry White

“One thing that has become obvious as we do these articles on our neighbors is the important role that many of them played in getting the Field Station established, helping develop it and continuing to help when needed” said Ray Highsmith, Field Station director. “It’s both humbling and a source of great pride.”



FIELD STATION

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