Unmanned Aerial Vehicles Aid Precision Agriculture … page 4

Research, Education, and Extension in the Division of Agriculture, Forestry, and Veterinary Medicine

Mississippi State University
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The arrival of autumn means different things to different people. But in the Division of Agriculture, Forestry, and Veterinary Medicine (DAFVM), it’s an exciting time of welcoming students to campus for a new academic year and of witnessing crop harvest after yet another challenging growing season.

Fall 2014 enrollment numbers broke all previous DAFVM records. This achievement demonstrates the important role our three outstanding colleges play in recruiting students to MSU. Overall division enrollment was 3,203, with 2,207 in the College of Agriculture and Life Sciences, 528 in the College of Forest Resources, and 468 in the College of Veterinary Medicine. CVM led all colleges at Mississippi State in enrollment growth with an increase of more than 8 percent.

In July, we recognized five exceptional professors with the Regions Bank-DAFVM Superior Faculty Awards. See page 29 for a list and photo of the winners.

Shortly after the close of FY14, we learned that our faculty and staff set a new record in obtaining grants and contracts. That new funding record was more than $66 million. Part of that funding relates to the use of unmanned aerial vehicles. MSU is on the cutting edge, with several scientists evaluating how this technology can be used in agricultural and forest production systems. See page 4 for some examples of this work.

While numerous DAFVM personnel are focused on classroom learning and/or research, many of our experts conduct nonclassroom teaching that takes university-based research to the field. This summer, various commodity specialists held field days across the state. These educational events included row-crop field days at the Delta Research and Extension Center in Stoneville and the North Mississippi Research and Extension Center in Verona, as well as events for cattle, muscadine, sweet potato, and ornamental-plant producers. These events have a common goal: to share information with our clients and stakeholders while demonstrating the research intended to help them be even more successful through improved profitability and sustainability.

The desire to make the best better has its roots in the motto of our 4-HYouth Development Program. With nearly 84,000 participants enrolled in 2013–14, 4-H is an inclusive, diverse, and dynamic program. Hands-on, real-world experiences in a variety of projects and personal development opportunities lay the foundation for a bright future for our state’s next generation of leaders.

We are fortunate to have strong partnerships with some of the state’s and nation’s leading promotional and commodity boards, advocacy groups, associations, and governmental organizations. We value our partnerships with all of our stakeholders because they help us work responsibly and responsibly by guiding our Extension, research, and academic activities.

We continue to make progress on construction projects in the division. The $12.2 million renovation of the necropsy laboratory at the Wise Center was completed in August and is being used by CVM faculty and staff. Also at the Wise Center, construction began on the new $3.8 million classroom building, which should be ready for use by June 2015. Design development documents are being completed on a new $7.7 million meat science and muscle biology laboratory that will be built near the Wise Center. Construction should begin in spring 2015.

Thank you for your continued interest in and support of our work in the Division of Agriculture, Forestry, and Veterinary Medicine. We hope you find the information in this issue of Mississippi LandMarks fascinating and useful.
Comparing an unmanned aerial vehicle to a magnetic resonance imaging machine may seem odd, but that is how the director of the MSU Geosystems Research Institute (GRI) sees it.

“The plant is the patient, the agronomists are the doctors, and I am the guy who works on the MRI machine,” said Dr. Robert Moorhead, GRI director and Billie J. Ball Professor of Electrical and Computer Engineering in the MSU Bagley College of Engineering.

UAVs—flying above tractors but well below manned aircraft—are the newest instruments used in precision agriculture. Mississippi State holds certificates of authorization from the Federal Aviation Administration to operate UAVs for research purposes, and Mississippi Agricultural and Forestry Experiment Station scientists have been using the remotely piloted aircraft in various studies.

FAA officials are developing regulations for the commercial use of UAVs, and Congress has set a September 2015 deadline for the agency to establish rules specifically for small, unmanned aerial systems. So far, the aerial equipment has been approved for commercial use only in a very limited capacity in the Arctic.

In the meantime, Moorhead and his GRI colleagues are working with MAFES agronomists and Extension specialists to incorporate the use of UAVs in site-specific agricultural research. Moorhead said scientists are using the aerial equipment in research related to irrigation, plant growth, nutrient management, and herbicide application.

Precision agriculture requires a number of other technologies, including remote sensing, global positioning systems, and geographic information systems, Moorhead explained. These technologies are designed to collect and analyze site-specific data that can be used to create and apply effective prescriptions for every inch of an agricultural field.

Before the advent of unmanned aircraft, remote-sensing data had to be collected with satellites, ground instrumentation, and piloted aircraft.

“UAVs now are another remote-sensing tool available to collect visual and multispectral data,” Moorhead said. “Precision agriculture is data driven, and UAV technology adds another significant layer of data for researchers and, ultimately, crop consultants and producers to assess and utilize in a meaningful way.”

In one recent study on corn plant growth, GRI personnel worked with Dr. Brien Henry, an associate professor in the MSU Department of Plant and Soil Sciences. Henry and his team planted several corn hybrids at various dates and plant densities. From March to May, they planted 20,000 to 40,000 plants per acre in fields at Starkville, Brooksville, and Verona.

They used UAVs to collect plant population data, such as emergence progress, plant heights, growth stages, plants per acre, and numbers of unfurled leaves. While Henry’s study was in its second year, this was the first time UAV technology was used to augment research on the ground.

“They were flying overhead and collecting visual and multispectral data,” Henry said. “At the same time, the ground team was analyzing the data to ensure images from above are what we were actually seeing on the ground.”

Henry said a primary goal of his research is the development of automated computer programs that can recognize individual seedlings and quickly and accurately determine plant density across a planted field. Spatially explicit maps of plant populations would allow producers to make timely and informed decisions about replanting, he explained.

UAVs are capable of flying as low as 100 feet above the ground, while small, manned aircraft must operate at elevations between 2,000 and 3,000 feet. Of course, satellites can only look down from space orbit. Clearly, a difference in altitude can impact resolutions dramatically.

Henry said UAVs can zoom in to a resolution of approximately one-eighth of an inch, while planes and satellites are limited to

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Lee Hathcock, a researcher and doctoral student with MSU’s Geosystems Research Institute, launches a Robota Triton unmanned aerial vehicle.

MSU researchers are preparing for the day when unmanned aerial vehicles, commonly known as drones, can be used commercially in agriculture.

Their size, cost, and capabilities make UAVs useful for a wide range of jobs. Some MSU researchers are already using these vehicles, and many others are examining their potential applications.

Dr. Bobby Golden, a Mississippi Agricultural and Forestry Experiment Station researcher, is one of the university’s scientists interested in using UAVs in their studies. He would like to fly a camera on a drone to get instant, aerial views of his research fields.

“It would be very nice to use one when we are scouting fields for nutrient deficiencies,” Golden said. “You could overlay a soil map of the field with an overhead view and use different camera filters to detect the color of the crop, which has the potential to indicate nutrient issues in a field.”

A flyover could identify problem spots in extremely large fields, and then researchers, crop consultants, or farmers could go to the identified areas and examine them carefully to make proper diagnoses.

“To get an aerial image now, you have to line up an airplane and wait on them to fly over your field,” Golden said. “It’s expensive, and there can be delays in getting the information.”

While capturing aerial images presents unique challenges, it can be nearly impossible to scout an entire field on foot. Scouting relies on collecting enough information from sampled areas to assume the facts are generally representative of an entire field. A flyover with a UAV would show whether the scouted area is truly representative of the entire field.

“This is an additional tool to put in the researcher’s, grower’s, or consultant’s toolbox to help make proper in-season management decisions,” Golden said.

Don Respess, MSU Extension county coordinator in Coahoma County, said he sees potential applications for UAVs in his work with producers. He compared the information gathered by soil-moisture sensors to the information that could be gathered by drones.

“I think anything we could get that would help growers by providing additional information is a good thing,” Respess explained. “Just like what we’re doing working with water sensors belowground, we could use something to look at the crop from above.”

Dr. Angus Catchot, Extension entomologist, is interested in payload potential of drones, in addition to their ability to offer a different view of a field.

“China is already using drones to make ultralow-volume insecticide applications to fields,” Catchot said. “They are easy to fly, and there are many potential uses for UAVs.”

Technology already exists to allow producers to make very specific chemical applications to their fields with farm equipment. UAVs can help them target these applications even more precisely.

“If I can take a real-time photo 100 feet over a field, upload that information to my computer and identify crop vigor issues of the field, I can quickly make an on-the-go prescription to my sprayer to put out a certain rate of farm chemical,” Catchot explained.
collecting images at resolutions of about 18 inches. Also, UAV images may be collected during bad weather, and one UAV can cover approximately 1,000 acres in an hour.

For researchers, the most critical UAV component is its payload system—the camera. Various payloads can collect both visual and multispectral images and real-time, high-definition video. The UAV and its payload offer additional advantages, as well:

- Data may be collected as a single image or mosaics showing either portions or an entire field;
- UAVs are much faster to access and less expensive than traditional aircraft used to survey fields; and
- Data from a UAV payload can be immediately downloaded to a tablet or smartphone, which allows researchers to quickly and efficiently evaluate information.

“UAV technology provides additional eyes on the field,” Henry said. “I hope that someday the technology helps producers assess and address potential stand issues quickly and accurately.”

“Precision agriculture currently encompasses a vast wealth of data-driven applications,” said Dr. Wes Burger, MAFES associate director. “These applications are built on sound research that characterizes relationships between observable phenomena and plant performance.

“Precision-agriculture research is about connecting data to decisions,” he observed. “The meaningful data within those applications helps drive every decision the farmer makes in the field.”

Burger said the goal of UAV research is to collect data that will augment and improve current management practices so farmers can boost yield, productivity, and profit while enhancing environmental stewardship.
A unique program is helping community college students transition more smoothly to MSU and is also serving as an example for other universities, community colleges, and degree programs.

In the year since MSU President Mark E. Keenum signed a two-plus-two curriculum agreement with Jones County Junior College President Jesse Smith, JCJC students have a clear course of study that will take them smoothly from junior college to MSU’s poultry science program.

The collaboration enabled the institutions to create a detailed course of study for students interested in a bachelor’s degree in poultry science. Students enrolled in the two-plus-two program follow this course of study and complete their freshman and sophomore years at JCJC without the worry that some classes might not transfer to the university.

Jessica Wells, Extension instructor in the MSU Department of Poultry Science, said there was some confusion about which classes would transfer before the agreement was established.

“Students would come to the university with credits that did not apply to our program, which cost them more time and money,” Wells said. “Now, we have a list of classes designed to keep students on track for their 4-year degree.”

In addition to guiding students at JCJC, Wells said the course of study has served as a reference for out-of-state students planning to transfer to MSU, as well as high school students looking into the field.

“This is a good recruiting tool for both MSU and Jones,” Wells said. “People are interested in the program, and, as time goes on, I believe we will see our numbers increase because of it.”

Dr. Mary Beck, MSU poultry science professor and department head, said this interest has led the university to plan more two-plus-two agreements across the state.

“We are really excited about this program and its potential for growth,” Beck said. “We are working to make it available in other community colleges, as well.”

Beck said the MSU poultry science department underwent an extensive curriculum overhaul in preparation for the first agreement. That process will make future agreements easier to establish. She plans to collaborate with other community colleges, such as Holmes Community College, East Mississippi Community College, and Hinds Community College. Her overall goal is to include all community colleges in the state.

Because poultry is Mississippi’s number-one agricultural commodity, a degree in poultry science provides numerous opportunities for students. The program offers four concentration areas that allow students to follow their interests: production systems, business management, processed products, and preveterinary medicine. Students also complete two internships for hands-on experience they need to be successful in the field.

After completing a bachelor’s degree in poultry science, graduates are prepared for jobs directly and indirectly associated with the industry and can expect 100 percent job placement. Graduates also can choose to pursue graduate or veterinary medical degrees. A high percentage of poultry science graduates who apply to veterinary school are accepted.
History radiates from the walls of Cotesworth, former home of one of Mississippi’s greatest statesmen, but the land around it also has volumes to tell visitors who want to step back in time.

Dr. Gary Jackson, MSU Extension Service director, said he sees great educational potential connected to the J. Z. George home and property, situated in the middle of a beef cattle farm just north of North Carrollton.

“As Mississippi experiences growth in agricultural and historical tourism and education, I see many connections Extension can make with this beautiful property in the center of the state,” Jackson said. “There is also a growing horticultural interest in heirloom plants and designs.”

More than 150 years ago, the Carroll County lawyer and future U.S. senator purchased the property that included a roadside inn and hundreds of acres of rolling farmland. The property remained in the family until 2013 when George’s great-granddaughter, Katharine Saunders Williams, sold the home and 5 acres to Cotesworth Culture and Heritage Center, a nonprofit organization.

Jackson said he envisions the property being used as an outdoor environmental and learning lab that would include the gardens and landscaping.

“Eventually, Cotesworth could be to heirloom horticulture what MSU’s Crosby Arboretum in Pearl River County is to nature and the environment,” he said.

Williams said she shares the desire to use the property to educate the next generation about agriculture and history. She has great pride in the legacy of her great-grandfather, and the active 81-year-old woman understands well the effort it takes to produce food for the table, as she works and manages her 800-acre beef cattle farm.

“I’ve been around farming all my life and strongly believe in the importance of family farms,” Williams said. “Young people today need to know where their food comes from, and agricultural education needs to be a big part in the future use of this farm.”

Williams has about 120 cattle with calves. She started with a purebred Brangus herd and then crossed to produce commercial cattle. She uses chicken litter to fertilize hay fields and pastures.

Her great-grandfather named the Greek Revival mansion after Cotesworth Pinckney Smith, a friend who served as a Mississippi Supreme Court chief justice. In the late 1880s, George added a six-sided library on the south lawn to house his vast collection of law books.

George was instrumental in establishing agricultural experiment stations in 1887. He served as a U.S. senator from Mississippi from 1881 until his death in 1897. When invited to furnish two statues to the U.S. Capitol’s National Statuary Hall Collection in 1931, Mississippi sent bronze statues of George and Jefferson Davis. George County is named in the statesman’s honor.

Mary Carol Miller of Greenwood serves as an officer on the board of directors for the culture and heritage center. A lifelong friend of Williams, Miller said Cotesworth is a significant part of the Highway 82 heritage corridor from Greenville to Columbus.

“Mississippi does not have many homes of this quality available for historic and educational use,” Miller said. “We are anxious to get a restoration plan in place so that we can begin our long-term objective of making it into an educational venue.”

George’s desk, where he composed much of the 1890 Mississippi Constitution, is among the select pieces of George family furnishings remaining in the home.

Lydia Chassaniol, state senator from Winona, is chair of the senate’s Tourism Committee and has been a driving force behind the cultural and heritage project in Carroll County. She originally learned about the house and its history from Williams’s husband, who was her high school history teacher.

“J. B. Williams would take classes to Cotesworth to teach us about the state’s history,” she said. “Today, it offers many educational purposes, ranging from politics and law to agriculture and even movie history, since both The Help and The Sound and the Fury were filmed there.”

Chassaniol said designating Heritage Highway 82 from Columbus to Greenville as a historic corridor will benefit every town along the 175-mile stretch across the state.

“Visitors can see unique sights all along the route, and their economic impact can benefit every town they stop in for food, fuel, or other shopping experiences,” she said.
Jared Harris hopes to guide some Pearl River Community College (PRCC) students toward a lifetime of protecting Mississippi’s natural resources.

A new partnership of the college, Mississippi State University, the U.S. Environmental Protection Agency Gulf of Mexico Program, and the U.S. Department of Agriculture allows PRCC Honors Institute students to learn about applied conservation methods that aim to improve the region’s water quality.

Harris, the coastal project coordinator for MSU’s Research and Education to Advance Conservation and Habitat (REACH) program, focuses on conservation methods that improve water quality in coastal uplands and preserve the Gulf of Mexico ecosystem. At the request of PRCC instructors, he delivers lectures and helps facilitate hands-on learning opportunities for students. Harris also plans to assist PRCC in starting a sanctioned student club.

“This is a brand-new venture,” Harris said. “We’ll teach the students how to monitor water quality on farms and land in the area. They will interact with landowners, get an up-close look at water conservation methods we use in the REACH program, and understand how those methods positively impact our coastal communities and the landowners.”

Organizers implemented the partnership during the fall 2013 semester. About 40 PRCC honors students participate in the program three times per year in the fall, spring, and summer.

REACH is a joint effort of the MSU Extension Service, Mississippi Agricultural and Forestry Experiment Station, and Forest and Wildlife Research Center. Its goal is to increase conservation strategies on the state’s agricultural land by demonstrating research-proven conservation methods. To date, 49 participating farmers and landowners with a total of 152,309 acres are enrolled in the program.

Management practices used by participants include conservation tillage, irrigation management, and surface-water capture and reuse. All of these practices help reduce erosion, aquifer depletion, soil nutrient loss, and water pollution.

Dr. Stephen Black, PRCC honors program director, said students can gain multiple benefits from the partnership. Three students per year can apply for internships with the EPA Gulf of Mexico Program, during which they can gain an in-depth understanding of environmental careers.

“We want to make our students more aware and involved in environmental issues,” Black said. “Humans affect the environment, and we want to show them how to make a positive impact. Students can also learn about different jobs and experience those professions outside the classroom.”

PRCC is developing a complete environmental program open to all students, he added. The college now offers a basic environmental science class and a basic marine science class along with the honors program.

“We hope is that we can develop our structured classes and incorporate short- and long-term projects, such as an aquatic garden, that can help students learn to be good stewards and help them discover interests they may not have realized they have,” Black explained.

“This partnership gives students a real-life look at what is going on in the state right now,” said Beth Baker, a REACH project coordinator. “They get to be proactive participants in helping resolve some of the problems we face with water quality and ecosystem sustainability. As a teaching tool, it is invaluable because students can gain perspective of how environmental issues relate directly to their own lives and become familiar with ecological processes and management practices that can alleviate those issues.”
Research conducted at Mississippi State University has shown up in cotton fields throughout the state as producers plot management strategies for their crops.

Scientists with the Mississippi Agricultural and Forestry Experiment Station and the MSU Extension Service focus extensively on evaluating seed treatments, new varieties, and seeding rates for cotton. Producer needs drive the focus of the ongoing research.

Seed treatments are a current hot topic—particularly the failure of some treatments to effectively reduce populations of thrips, which can cause major problems in Southeastern cotton fields. Dr. Darrin Dodds, Extension cotton specialist, and Dr. Angus Catchot, Extension entomologist, began studying this problem in 2013 and have continued to do so in 2014.

“We’re starting to see failures in some of our seed-treatment insecticides,” Dodds said. “That means the seed has been treated with an insecticide, but we’re still spraying for thrips afterward. Anytime you’re paying for something on the seed and still having to make foliar applications on top of it for control, nobody’s happy.

“We’ve seen a big, big shift toward imidacloprid seed treatments in cotton because our work showed they are more effective against thrips,” he added. “There are big differences showing up in the effectiveness of thiamethoxam and imidacloprid. Thrips have demonstrated increased tolerance to thiamethoxam-based seed treatments.”

In 2013, three-quarters of Delta cotton acreage were sprayed twice for thrips when seed treatments proved ineffective. This year, however, half of the Delta cotton acreage was sprayed just once.

With thrips exhibiting resistance to thiamethoxam, Extension Service and MAFES scientists are looking at other ways to control the pest. Catchot and Dr. Jeff Gore, associate research/Extension professor, along with several
other scientists, are conducting extensive research into the effect of different planting dates on thrips populations. Researchers also are looking at the impact of different preemergence herbicides on thrips pressure and cotton growth and development.

Cotton producers also gain critical management information from the official small-plot and on-farm variety trials conducted annually throughout the state, said Dr. Bobby Golden, a MAFES researcher at the MSU Delta Research and Extension Center in Stoneville.

“Seed selection is one of the most important decisions a producer will make, and now more than ever, it has to be made well in advance of planting,” Golden said. “Mississippi State is an unbiased third party conducting the trials and presenting data on how most commercially available cotton varieties perform under different environmental conditions.”

When the data is presented, MSU highlights varieties with the best yields, Golden said.

“Not every producer will be able to lay their hands on the variety that has the numerically greatest yield, but with our data in hand, they know there are five or six other varieties that performed similarly well that they can get,” Golden said.

Variety trials are performed across the state in both the Delta and Hills regions. Trials are grown on various soil types and under different irrigation conditions. In addition to plots on MAFES branch stations, researchers run several tests on producers’ farms to determine variety performance under grower-controlled management. Variety trial results can be found at mafes.msstate.edu/variety-trials/.

Another issue that MSU experts are helping growers address is rising seed prices and the need to plant seeds at the lowest rate possible. Finding the most efficient seeding rate is a significant factor in controlling production costs.

“Due to the expense of seed treatments and technology fees, most producers are stretching seed as far as they feel comfortable doing,” Dodds said.

In years past, Mississippi farmers planted an average of 55,000 cotton seeds per acre. MSU research showed that lowering the seeding rate and having fewer cotton plants in the field does not limit yield, hamper weed control, or cause other problems. Based on the university’s recommendation, growers now plant about 40,000 to 42,000 seeds per acre, and yields remain level despite the smaller number of plants, Dodds said.

“You don’t want to plant at too low a rate because, if you lose some early, you could have a poor stand,” he explained. “But we examined situations where we have 15,000 plants per acre and achieved as good a yield as when we had 60,000 plants per acre, so that gives an idea of how much flexibility there is with current varieties. Fields might look a little thin early on, but, as soon as the plants get some size and lateral growth, they look the same, and yields have stayed level.”

Visit http://www.mississippi-crops.com for more information on MSU research on cotton and other row crops.
Students in the MSU College of Forest Resources Undergraduate Research Scholars Program gain valuable, hands-on experience in the land-grant institution’s three pillars: research, teaching, and service.

The research scholars program is a crucial academic opportunity, said Dr. George Hopper, dean of the College of Forest Resources and the College of Agriculture and Life Sciences. Participating students write proposals, conduct independent research projects with faculty members, and present their results at professional conferences and at the annual MSU Undergraduate Research Symposium.

“This program puts students in the driver’s seat of their education,” Hopper said. “Students make discoveries as researchers, apply that research in the classroom setting, and share it with the broader community.”

Two undergraduate research scholars—both majoring in wildlife, fisheries, and aquaculture—recently delved into this experience. Savanna Summers, a sophomore from Senoia, Georgia, studied bobcats in northern Michigan. Katherine Abell, a senior from Madison, Alabama, assessed a science immersion program in Starkville public schools.

Summers spent her winter break setting bobcat hair snares and camera traps in the blistering cold of Michigan’s Upper Peninsula. The fieldwork provided critical insight into Summers’s study of the variation of habitat selection by bobcats in this region.

Savanna Summers captures a fawn as part of her research on habitat selection by bobcats in northern Michigan. The project examined bobcat populations in relation to prey, land cover, and roads.

Undergraduate researcher Katherine Abell surveyed sixth-grade participants in the Youth Environmental Science (YES!) program to determine its impact on positive environmental attitudes.
The basis of her project came from data collected by Dr. Jerry Belant, associate professor of wildlife ecology and management in the MSU Forest and Wildlife Research Center. Belant and Dr. Florent Bled, a research associate, were Summers’s mentors.

Summers analyzed data collected from December 2012 to March 2013 from a motion-sensitive camera survey of 64 sites in an area of approximately 150 square miles. Analyzing daily and seasonal data, she looked at the number of bobcats in the region in relation to prey, land cover, and roads. The study area was broken into smaller units called cells, with clusters of cells called neighborhood sites. Summers found that more roads at the neighborhood level meant more bobcats. Also, prey did not strongly influence the number of bobcats.

Findings from this study will provide valuable information to other researchers involved in species management. For example, results suggest that human activities along roads, such as timber harvest, might influence the number of bobcats in the area. Also, potentially greater prey abundance at some sites does not mean that this prey is more available to bobcats.

Summers, who is considering graduate school, said this program provided critical insight into what a graduate researcher might experience.

“I felt like this was a trial run for graduate school,” Summers said. “This experience shed a lot of light on this dark, intimidating cloud in the future. I was surprised how much I loved the entire process. By the end, I grew to really enjoy statistics, because statistics help you see things the human mind wouldn’t necessarily see without assistance.”

Bled saw the program as an optimal experience for the student to live and learn the scientific process.

“Undergraduate students have an ocean of opportunity in front of them,” Bled said. “Savanna studied something very specific and learned the scientific process firsthand. As a research associate, most of my time is focused on asking questions and finding answers. Sharing this process with Savanna was very interesting. She will benefit from the experience no matter what. If she chooses to engage in fundamental research, she will have the skill set needed to analyze data. If she chooses research that is more applied—managing species, for instance—she will have insight into how that process works, as well.”

While Belant sees this program as a way to instill the principles of research, learning, and service in students, he also believes it prepares them to be better professionals.

“Good research grounded in biological principles is fundamentally important,” Belant said. “Without research, the other pillars of learning and service will not be as effective long term. Only a select few earned this opportunity, and I think the program helps them gain breadth and depth of both the conduct of science and the profession as a whole. Maximizing research opportunities now will make Savanna a more effective professional down the road.”

Summers’s project goes beyond research and encompasses both teaching and service. She recently shared her results at the annual meeting of the American Society of Mammalogists and is working on a manuscript to be submitted to a peer-reviewed journal.

“Sharing her work with the scientific community is a critical piece of the puzzle,” Belant said. “As scientists, it is our responsibility to share our work, and this is definitely information worth sharing. There is little point in doing the work if it isn’t used to improve our understanding of ecology or management.”

Abell, another undergraduate research scholar, studied the environmental attitudes of past participants in the Youth Environmental Science (YES!) program, a partnership of the MSU Forest and Wildlife Research Center, MSU Extension Service, Mississippi University for Women, and Starkville School District.

Launched during the 2011–2012 academic year, YES! immerses fourth- and fifth-graders in a 5-day science curriculum based on natural resources. Leslie Burger, Extension instructor and Abell’s mentor, serves as the YES! codirector.

“The program is like a summer camp in the middle of the academic year,” Burger said. “Kids who may not necessarily have access to this type of curriculum have a chance to really dig into science. There are no barriers, like financial cost or access limitation, to their participation.”

“We looked at how effective youth conservation programs are for building environmental literacy and stewards,” Abell said. “We surveyed the students’ attitudes about the environment using an NEP survey.”

The surveys assigned an overall value called a New Ecological Paradigm (NEP) score to sixth-graders to determine their environmental attitudes 1 to 2 years after participating in the YES! program. While attitudes stayed about the same 1 year after the program, there were significant declines 2 years after participation. Students who attended two YES! sessions demonstrated more environmentally positive attitudes. These results suggest that gains from the program appear to diminish over time without reinforcement.

The research provided an ideal opportunity for Abell to combine the two academic pursuits she enjoys most.

“While my undergraduate degree is in wildlife biology, I am planning on getting my master’s degree in environmental education so I can combine my two passions: education and the environment,” Abell said.

Burger saw this program as a chance for Abell to step out of her comfort zone while engaging in an important service for the community.

“In the YES! program, and others like it, it’s important to assess the effectiveness of the program,” Burger said. “Katherine evaluated survey data to determine that effectiveness. From a conservation standpoint, it is vital to figure out how often we need interventions in order to encourage children to be more environmentally aware and invested in conservation and natural resources.”

Abell was one of a handful of undergraduate students to present her research at the Southeast Natural Resources Graduate Student Symposium. Also, she placed first in the community engagement and social sciences categories at the MSU Undergraduate Research Symposium.
When John and Paula Cormane brought their beloved dog to the MSU College of Veterinary Medicine, they could only hope that he would be able to walk back out the same doors they carried him through.

A month earlier, Dirty, an 11-year-old pit bull, began walking very unsteadily. He soon started falling over and later became unable to stand. His concerned owners, residents of Alexandria, Louisiana, took him to their local veterinarian, who then referred them to the Louisiana State University School of Veterinary Medicine.

“They were great at LSU, and it was clear they worked well with the veterinarians at Mississippi State,” said Paula Cormane. “They could give Dirty great care and were able to determine he had wobbler syndrome, but they said they didn’t perform the surgery needed to correct it. But they said Dr. Andy Shores and his team at MSU could handle it.”

It did not take any convincing for the Cormanes to make the drive to Starkville, where they met with Shores, head of neurology/neurosurgery at MSU-CVM, and his team.

“Wobbler syndrome is a neurological condition that is basically the instability of the cervical vertebrae,” Shores said. “This causes an unsteady gait and, with progression, results in the dog’s not being able to walk. It is often seen in larger breed dogs. Dirty’s condition was pretty severe, with many chronic changes. We took pressure off his spinal cord over the span of three of his cervical vertebrae to give him relief.”
The 2½-hour surgery, performed at the MSU Animal Health Center, was just the first step in getting Dirty back on his feet. Dirty then became a long-term resident at the veterinary college, as he embarked on a lengthy rehabilitation program.

Dr. Maria Perez-Hernandez, an MSU-CVM neurology/neurosurgery veterinary resident, met Dirty just 3 weeks after his surgery. Her role was to monitor and adjust the dog’s physical therapy, oversee his medications, and prevent complications from his immobility.

“This was a team effort from the start,” Perez-Hernandez said. “Dr. Simon Kornberg, also a resident, was primarily involved in the surgery and got Dirty started in his recovery, and then I worked closely with the students on the case and the rehabilitation service to make sure he was getting the best quality of care. So, many of us got the opportunity to work with Dirty.”

Perez-Hernandez, who is also certified in small-animal rehabilitation, knew the case would be tough because, in addition to recovering from surgery, Dirty was dealing with severe arthritis in his front limbs. She saw Dirty almost daily and even worked on weekends to rehabilitate him.

“We made sure he was really comfortable in his environment and that he was getting proper nutrition,” Perez-Hernandez said. “It was clear after his surgery that he was a little depressed. We encouraged him through lots of interaction with all of the students and clinicians on the case.”

Ruby Lynn Carter, a veterinary technician certified in small-animal physical rehabilitation, worked with the team to give Dirty a comprehensive rehabilitation regimen.

“Because Dirty had been off of his feet so long, we had to start him from basically nothing,” Carter said. “We put him in the infinity pool and could barely get him to move, but we didn’t give up. We continued to get him in the pool, where he didn’t have to fight gravity, and also in the quad cart. It was a long process, and it took quite some time to see any progress.”

One day while Dirty was on the aquatic treadmill, the team finally saw some movement. The aquatic treadmill relieves stress on a dog’s joints, allowing the animal to move more freely. Dirty caught on and started to move his legs a few months into his treatment.

“We would start to put food in front of him while he was on the treadmill and in the cart, and slowly, he started to move forward,” Carter said. “We were then able to take him for walks using a harness and help him learn to shift weight again using a therapy ball.”

The Cormanes were pleased with his progress, and their hope started to turn into reality.

“We would hear from the students involved in the case daily,” Paula Cormane said. “They allowed us to talk to him on the phone and would share all the notes on his progress. It was helpful and encouraging.”

Five months after his surgery, Dirty took the first steps on his own as veterinary clinicians, residents, technicians, and students lined the Animal Health Center hallway.

“It was quite the scene, and there was barely a dry eye left in the house,” Carter said. “A total of almost 40 students worked with Dirty as they completed their rotations. He really became a part of our MSU-CVM family.”

The Cormanes returned to Starkville to take Dirty home and were thrilled that he could walk out the door.

“We are so happy with the care he received, but it was so good to bring him home,” Cormane said. “It was pretty heart-wrenching when he turned to look over his shoulder at Lauren [Dabney], one of the students he spent a lot of time with. I could tell there was a bond.”

Perez-Hernandez, who has been practicing veterinary rehabilitation for 7 years, said she will remember Dirty as one of her toughest but most rewarding cases.

“He has provided all of us on the team with an exceptional learning experience,” she said. “He left not only with the ability to walk, but also a little bit of each of our hearts. We are so fortunate to have learned from him.”
The devastating April tornadoes inspired volunteers to help rebuild homes. This group came all the way from the Covenant of Grace Presbyterian Church in the Baltimore area.

Mike Skipper was on his way home from Jackson after a doctor’s appointment April 28 when a violent storm ripped a path straight for Louisville.

“I was listening to weather reports on the radio, and the storm was about 45 minutes ahead of me when it hit Louisville,” said Skipper, who is the MSU Extension county coordinator in Winston County.

The storm picked up steam as it chugged toward the southeast corner of town. At about 4 p.m., an EF4 tornado with winds topping 185 miles per hour dropped from the sky, leaving an indelible mark 36 miles long and almost a mile wide. It claimed 10 lives, destroyed homes and businesses, and proved the resiliency of a community.

By the time Skipper made it to town, the county’s well-organized emergency response already had begun. Search-and-rescue crews were in motion. Members of the Mississippi Emergency Management Agency were en route. Skipper’s Extension colleagues had locked up the office earlier that afternoon. All were safe at home.

“None of our employees had significant damage,” Skipper said. “We were thankful for that. But some of their family members did. Our secretary’s daughter’s house was completely blown away.”

After Skipper accounted for his family and coworkers, he headed straight for the county’s command center, where emergency responders met to carry out their emergency plan. In the hours immediately following the twister, Skipper assisted with the...
county’s emergency crew response, debris removal, and road openings. The entire county Extension office staff also lent a hand.

“All of us in the county office have assisted in numerous ways, and we still are,” Skipper said. “In the hours and days after the storm, we put together educational packets and distributed food and water. We did anything we could to help, and we are still providing support and information in the clean-up process.”

Extension staff and emergency responders had been trained in the Incident Command System (ICS) through the MSU Extension Center for Government and Community Development. ICS is a standardized incident management model that helps coordinate the response of government agencies and the private sector during all types of occurrences, from natural disasters to planned events.

Volunteer firefighter William Lipsey of the Nanih Waiya community was one of the responders. Soon after sending his Louisville and Kosciusko Farm Service Agency coworkers home early, he headed for home to gather chainsaws and other equipment to help clean up.

Although a pine tree limb blew through the air and landed in the road in front of him on the drive home, he still was stunned at the destruction when he reached the storm-ravaged areas.

“It really was like something out of a movie,” he said. “There were people everywhere, wandering aimlessly. Some were injured and needed help but couldn’t get anywhere. Cars were everywhere.

People had to just stop where they were because all the roads were blocked. It was miles and miles of the same thing: injured people and devastating damage.”

The first hour or two of chaos and confusion quickly became a regimented effort as county officials carried out the steps of the command system.

“Within a matter of a few hours, the county’s emergency plan had been implemented, and we had help coming from all over the state and outside the state,” Lipsey said. “I am surprised at how much got done in such a short amount of time.”

The recovery process will be long, but it will be made a little easier because of the community’s readiness.

“Our immediate response was very organized and methodical,” Skipper said. “I’m still amazed at how smoothly things went. That’s 100 percent due to the training, planning, and teamwork that occurred.

“We have come a long way, but we still have a lot to do,” he added. “There is debris that needs removing, and residents and business owners are in the process of rebuilding. Repairs to the hospital and nursing home are moving along. We’ll continue to provide outreach materials and support as long as people need it.”

By Susan Collins-Smith
Poultry growers were hit hard by the April tornadoes that caused tremendous damage on farms and killed more than a million birds in four Mississippi counties.

The Mississippi Board of Animal Health reported that 1,044,800 birds died from the tornadoes or subsequent power outages. Winston, Wayne, Newton, and Scott Counties reported 58 houses with major damage and 17 houses with minor damage.

Recognizing these enormous challenges, Winston County Emergency Management Director Buddy King requested help from the MSU Extension Service to bring together poultry growers with state and federal agency representatives to express concerns and learn about response procedures.

“We were ready to help, but this is going to be a long process,” King said. “This was the first time we had a poultry-specific meeting after a storm in the state of Mississippi. We needed to know what growers needed so the next time something like this happens, we will have a better understanding of what to do.”

“Growers just need to know which agencies need what documentation,” said Dr. Tom Tabler, the Extension poultry specialist who facilitated the meeting. “It is easy for farmers to feel like they are getting the runaround, but there is usually some method to the madness.”

Tabler said many growers had significant recovery expenses but no options for income except disaster money. Some of them may have lost their homes in addition to their poultry houses.

Organizations represented at the meeting included the Federal Emergency Management Agency, Small Business Administration, Natural Resources Conservation Service, Farm Service Agency, Mississippi Board of Animal Health, Mississippi Farm Bureau, and Mississippi Poultry Association.

Tim Hobby, a Winston County grower who attended the meeting, lost 10 broiler houses and 234,000 birds. About half of the birds arrived 4 days before the storm, and the others were placed in the houses about 2 hours before the tornado struck.

“The biggest challenges were working through the regulations, but we also had to deal with looters looking for anything they could steal,” he said. “I appreciated the meeting trying to get everyone on the same page.”

Hobby said his immediate need was debris removal. Winston County residents were asked not to burn the debris because of the risk of wildfires.

“I would need 2 miles of roadside to pile all the debris within 10 feet of the right-of-way for the county to pick up,” he said. “There was just too much for that to work.”

By late summer, Hobby was in the process of dismantling and demolishing the heavily damaged buildings to begin reconstruction of all 10 houses. His tentative completion date is June 2015.

Mike Sullivan, state executive director of the U.S. Department of Agriculture Farm Service Agency, told the growers he understood their frustrations. His farm was hit by a tornado 3 years ago.

“We are hoping that the livestock indemnity portion of the new farm bill will move along faster than it did in the old farm bill,” Sullivan said. “These tornadoes were the first time we implemented the new legislation. Unfortunately for Mississippi, but fortunately for those impacted, we have a lot of experience handling disasters.”

Sullivan encouraged farmers to keep good records of all their expenses and to take pictures along the way.

Mark Leggett, president of the Mississippi Poultry Association, said poultry companies have been responsive to growers’ immediate needs.

“Companies have been working with their growers to get them back on their feet,” Leggett said. “The new farm bill is in place and should help growers in the recovery. Still, it’s going to be a long process.”

By Linda Breazeale
"Safe Zones" Help Children Cope with Disasters

Long before the dark clouds rolled across the state April 28, the MSU Extension Service had been prepared to provide a silver lining for children displaced by disaster.

Dr. Louise Davis, Extension professor of child and family development, said safe zones were located at shelters in Tupelo and Louisville. Extension staff members with the Mississippi Child Care Resource and Referral Network oversaw these sites.

“These child-friendly spaces provide two important services: one for the children and another for their parents,” Davis said. “The children are given fun and educational opportunities to take their minds off the stress caused by the storm. The parents remain onsite and are then able to take care of paperwork and other demands caused by the disaster.”

Davis said plans for the safe zones began during the Hurricane Katrina recovery. The idea was made possible through a partnership with Save the Children, an international nongovernmental organization that primarily provides relief and support to children in developing countries.

“Save the Children developed the Child-Friendly Spaces Program and has used it all over the world,” Davis said. “We also could not provide these services without the cooperation and partnerships of the Mississippi Department of Human Services, the American Red Cross, and other agencies involved in the shelters.”

Davis said the goal is to provide child-friendly spaces for every child in an American Red Cross shelter for as long as possible.

Jamila Taylor, a field supervisor with the Resource and Referral Network, said the spaces are ideal for children from 3 to 12 years of age, but accommodations can be made for children who are not toilet trained and for older children, who could assist the staff.

“We provide each child with a shelter bag that includes activity books and other items to keep them engaged,” Taylor said. “These are very stressful experiences for everyone, and children, especially, need activities to take their minds off disasters.”

Resource and Referral Network personnel have been trained in the Child-Friendly Spaces Program and the Incident Command System, which is used for the command, control, and coordination of emergency response efforts.

“Our staff members have backgrounds in child development and are trained to support children as they cope with the fear and anxiety of being in an unfamiliar setting,” Taylor said. “While parents are busy at the shelter, children can receive attention from adults trained to help them through this traumatic time.”

Lydia Bethay, a project manager with the Resource and Referral Network, has worked in the Tupelo and Louisville shelters.

“The most striking aspects are the stories the children tell about the storm. They really don’t understand what is going on and just want to go home to familiar surroundings,” Bethay said. “We are glad to be able to provide a safe place with adults who can listen and let them experience a stress-free moment. We can tell the parents really appreciate the break, too.”
In the wake of the tornado that tore through Louisville in April, overwhelmed storm victims had to make tough choices about caring for people, property, and pets.

But one pet owner found a way to help his dog, coincidentally named Twister, when an MSU Extension Service disaster assessment team visited his property. Twister had survived the tornado but had injuries that needed immediate attention.

Dr. Brandi Karisch, an assistant Extension/research professor in the Department of Animal and Dairy Sciences and a disaster assessment team member, said the team found Twister at its last stop for the day. Twister’s owners were dealing with two lost houses and property damage caused by the tornado. They were overwhelmed by the situation.

“When we saw the dog, we immediately noticed he wasn’t putting weight on his back leg,” Karisch said. “When he stood up, we realized his leg was swollen and had a large wound. His owner didn’t have a home for himself, much less the means to give the dog proper care, so he surrendered the dog to us.”

The team contacted the Student Chapter of the Disaster Animal Response Team (SCDART) from the MSU College of Veterinary Medicine, which was volunteering in the Louisville area, to provide medical assistance to Twister. Steven Davison, a veterinary student, was one of the team members who helped get Twister the medical help that saved his leg.

“He had been through a really traumatic situation, but he was really sweet and friendly even though he was in pain,” Davison said. “Through SCDART, I’ve been trained and prepared for responding to emergencies, so I was happy to get to be of assistance in this sad situation. I gained a better understanding of how important animals are to people, and I saw that firsthand when Twister’s owner cared enough to let him go.”

Davison and the SCDART team took Twister to Dr. Fred Nabers, a veterinarian at the Animal Medical and Surgical Clinic in Louisville, to receive immediate care. Nabers sutured the wound on Twister’s leg and a wound on his tail base.

Nabers, who has practiced veterinary medicine for 38 years, said he and his staff discussed the best way to serve the community after the tornado hit.

“We thought we needed to be out in the community helping people,” Nabers said. “Then I told them, ‘People are going to be coming here with injured animals after losing their homes and needing a place to keep their pets.’ I realized we are helping people when we’re helping their animals. Someone else can run a chainsaw or pick up debris, but they may be unable to sew up a dog.”

After recovering at the clinic, Twister stayed with Nabers until there was room for him at the animal shelter operated by Louisville Animal Control.

“Twister tested positive for heartworms, but he was treated with the appropriate medications,” said Barbara Yarbrough, shelter director. “He stayed with Dr. Nabers for quite some time because we were so full and Dr. Nabers knew I didn’t have the space.”

The day Yarbrough picked up Twister from the clinic happened to be the same day a truck arrived from Grassroots Animal Rescue in Starkville.

“Twister’s feet didn’t even hit the ground at our shelter,” Yarbrough said. “He went from my truck to Grassroots’ truck. He quickly found a home and is doing great.”

By Kaitlyn Byrne
MSU Extension Service disaster assessment teams provided “boots on the ground” when agricultural landowners began the process of recovering from the devastating April 28 storms.

“These trained teams can assess immediate and long-term needs,” said Elmo Collum, an Extension disaster response coordinator. “They may discover issues that need to be addressed immediately, such as an injured animal, or they may see things that will take weeks of effort, such as fence repair.”

The Mississippi Board of Animal Health trained Extension teams to conduct these official assessments. Extension assessors submit their reports to the board and to the Mississippi Emergency Management Agency. Each team member has training in the Incident Command System.

Collum said 10 teams were deployed to Winston County after the tornado to visit agricultural property and discuss losses with farmers and landowners. The Winston County teams witnessed significant property losses, including residences, barns, poultry houses, equipment, fences, poultry, and animals.

Dr. Jane Parish, an Extension beef specialist, was part of one team making visits near Louisville after the tornado.

“I can see how it would be overwhelming for any family to begin the recovery process,” Parish said. “One farmer said, ‘I don’t even know where to begin.’ As much as anything, we wanted to make sure they knew that the county Extension office could be a helpful resource during this process.”

Officially, the team filled out disaster forms documenting losses, she added. Unofficially, they listened to stories of survival and loss. Parish said Extension’s goal is to help families recover some sense of normalcy.

“We had no idea the devastation would be so widespread. Every farm had some losses, such as missing or injured animals,” she said. “The people are dealing with so many things—the loss of their residences and family needs—then you put agricultural needs on top of that, and it was just overwhelming. We know from past disasters that it takes a long time to recover from something like this.”

To help Winston County residents with poultry, cattle, and timber recovery efforts, MSU Extension organized the state’s first Agriculture Disaster Recovery Center at the Louisville county office May 15.

More than 70 individuals who suffered losses attended the 4-hour event. Representatives from the Mississippi Board of Animal Health, Natural Resources Conservation Service, Farm Service Agency, U.S. Department of Agriculture Rural Development Administration, and Federal Emergency Management Agency were on hand to answer farmers’ questions about recovery resources.

Personnel from the Mississippi Department of Agriculture and Commerce, MSU Extension Service, Mississippi Cattlemen’s Association, Mississippi Farm Bureau Federation, Mississippi Forestry Commission, and Mississippi Poultry Association also provided information about the recovery process.

MSU Extension organized the event at the request of Winston County Emergency Management Director Buddy King, who said he hopes it will be a pattern for the future.

“While we can’t change what the tornado did, we can change how we respond in the future,” King said. “Partnering with the Extension Service to organize the center was natural because of their knowledge of agriculture and the role Extension plays in facilitating training of emergency management personnel throughout the state.”

While the Agriculture Disaster Recovery Center in Winston County may be a first, Extension Service partnerships at the local level are nothing new, said MSU Extension Director Gary Jackson.

“Extension is university-based, but our mission is to provide educational programs and other resources through our offices in every county in Mississippi,” Jackson said. “Those resources include the role our Center for Government and Community Development personnel play in emergency management training and service at emergency operations centers during emergencies.”
“Through this new collaboration, the nutrient management practices and decision support tools developed through research conducted by our scientists will help to inform the recommendations of the task force. These practices and strategies can then be delivered through educational programs by Extension Service specialists in support of state and regional nutrient-reduction goals.”

Dr. Wes Burger

This satellite image shows the region where a zone of low dissolved oxygen has been forming in the northern Gulf of Mexico at the mouth of the Mississippi River since the 1950s. Occurring primarily in the summer, this zone stretches from the Birdfoot Delta in Louisiana westward to the upper Texas coastline. This zone of low oxygen is called the hypoxic zone, or more commonly, the “dead zone.” MSU has joined a national effort to improve water quality in the Mississippi River drainage basin and address nutrient pollution and hypoxia in the Gulf of Mexico.
Off the coast of Louisiana and Texas, low oxygen levels have created a “dead zone” that threatens lucrative commercial and recreational fisheries in the Gulf of Mexico. This hypoxic zone has doubled in size since the late 1980s, and it is projected to cover around 5,000 square miles in 2014.

Agricultural runoff and treated sewage discharge in the vast Mississippi River drainage basin are primary contributors of excess nutrients—particularly nitrogen and phosphorus—that fuel the depletion of dissolved oxygen to the point where parts of the northern Gulf of Mexico cannot sustain most marine life.

Mississippi State University and 11 other land-grant universities have joined a national effort to improve water quality in the nation’s largest watershed, which covers 41 percent of the continental United States, and address nutrient runoff and hypoxia in the Gulf of Mexico.

Founded in 1997, the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force includes the U.S. Environmental Protection Agency; the U.S. Department of Agriculture; the U.S. Army Corps of Engineers; Native American tribes; and environmental, agricultural, and conservation agencies in the 12 basin states. The task force added the Land-Grant University Initiative when it recently invited university scientists and Extension specialists to share research findings and ideas to reduce water pollution.

“Mississippi State University and the other land-grant universities can provide substantive capacity in addressing nutrient management and environmental quality,” said Dr. Wes Burger, associate director of the Mississippi Agricultural and Forestry Experiment Station and the Forest and Wildlife Research Center.

“Through this new collaboration, the nutrient management practices and decision support tools developed through research conducted by our scientists will help to inform the recommendations of the task force,” he added. “These practices and strategies can then be delivered through educational programs by Extension Service specialists in support of state and regional nutrient-reduction goals.”

To reduce the size and severity of hypoxic zones in the northern Gulf of Mexico, through its Hypoxia Action Plan, the task force seeks to reduce nutrient inputs to the Gulf significantly. Achieving this goal will require nutrient management throughout the Mississippi River Basin.

Land-grant universities have the expertise to conduct baseline scientific assessments and strengthen the monitoring of water quality and nutrient loss from farm fields. Such efforts will help the task force and concerned farmers, ranchers, and other stakeholders assess progress in meeting goals related to water quality and efficient use of nutrients. Collaboration with the task force will help scientists share emerging technologies and research results across state lines, spreading success more quickly.

Mississippi State is a leader in water-quality management among land-grant universities. MSU’s water-quality research and outreach programs include the Research and Education to Advance Conservation and Habitat (REACH) program. REACH highlights successful conservation practices implemented by agricultural producers around the state and connects farmers with university experts to help them evaluate options for protecting Mississippi’s natural resources. More than 152,000 acres are currently enrolled in the program. REACH is a collaboration of MAFES, FWRC, and the MSU Extension Service.

In the Delta, Mississippi’s largest row-crop agricultural region, REACH personnel collaborate with Delta Farmers Advocating Resource Management (Delta F.A.R.M.), an organization that helps farmers with on-the-ground conservation delivery. REACH researchers document efforts to improve water quality and create outreach materials to share these findings.

The MSU-based Mississippi Water Resources Research Institute (MWRI) also emphasizes the implementation of nutrient-reduction strategies in its watershed-based planning and implementation activities. The Mississippi Department of Environmental Quality and EPA Region 4 recently designated this institute as a Center of Excellence for Watershed Management.

Mississippi is ahead of the curve when it comes to implementing agricultural management practices that improve water quality. The state is one of the first to implement vegetative drainage in agricultural ditches as part of the USDA Natural Resources Conservation Service’s Environmental Quality Incentives Program (EQIP).

“Mississippi is a leader among task force and Gulf Coast states in developing and implementing nutrient reduction strategies to protect the Gulf of Mexico,” said Richard Ingram, associate director of the MWRRRI and director of the watershed management center of excellence. “We’re a Gulf state and a Mississippi River state, so we stepped up. Around the country, our collaborative, voluntary approach is referred to as the ‘Mississippi Model’ and is a tribute to the way Mississipians work together to address our common challenges.”

In addition to Mississippi State, the Land-Grant University Initiative includes the University of Arkansas, the University of Illinois, Iowa State University, the University of Kentucky, Louisiana State University, the University of Minnesota, the University of Missouri, the Ohio State University, Purdue University, the University of Tennessee, and the University of Wisconsin.

By Vanessa Beeson
Many things have changed at Murphy Farms since Danny Murphy’s grandfather purchased the property in 1944. There are no mules, no cotton fields, and no tilling today, but the family’s commitment to preserving the land and increasing its quality has remained constant for decades.

Murphy recently received the 2014 Swisher Sweets/Sunbelt Expo Southeastern Farmer of the Year Award for Mississippi. The Canton native got his start in farming as a 6-year-old following his grandfather to the field and watching him experiment with new technologies—herbicides, a brush stripper, and a one-row cotton picker mounted on a tractor.

“He was pretty progressive, and he wanted to be efficient,” Murphy recalled. “He was always looking for different ways to do things.”

Murphy first maintained the family farming tradition as a Madison County 4-H’er. During his years in the club, Murphy was the state winner in the cotton and tractor-driving projects.

“We’ve got a little community church up here where I still go, and our Busy Bee 4-H club met there,” he said. “My grandfather offered to help me do a cotton project on 13 acres, and I still have my record book.”

Murphy’s 4-H career took him to Chicago, Illinois, and Richmond, Virginia, but what he really wanted to do was farm the home place. To do that well, he knew he needed to learn the best methods.

“I went to Mississippi State University for a degree in agronomy, and I never looked further,” he said. “I joined the FarmHouse fraternity and met a lot of people in agronomy. Jo Anne and I got married on April 27, 1974, came home from our honeymoon, and helped my father plant cotton. I graduated in May, and I’ve farmed ever since.”

Murphy and his family have implemented a variety of conservation practices to reduce erosion on their farm, which has a windblown, highly erodible loess soil and slopes of 2 to 4 percent.

“After the 1985 farm bill, there was a big push for terracing, and we terraced extensively,” he recalled. “In 1996, Roundup Ready crops became available. We didn’t cultivate the second year we used that technology, and we haven’t cultivated since. We realized we didn’t need those tillage trips, and the reduction in cultivator use reduced both erosion and fuel costs.”

Beginning in 2007, the Murphys experimented with no-till planting. They dropped cotton because corn and soybean production better fit the no-till system. They reduced their row size from 38 to 30 inches and adapted their equipment.

“As part of my work with the U.S. Soybean Export Council, we began to see calls for sustainability from our European customers,” Murphy explained. “I realized that if I was going to advocate for no-till on an international basis, I needed to do it on my own farm, and it works.”

Organic matter is an important factor influencing soil quality. Since Murphy’s early days of farming, organic matter in his fields is up from 0.75 percent to at least 2 percent—a testament to the benefits of no-till agriculture.

“No-till is a matter of mindset and accepting it’s not always going to be very pretty,” he said. “No-till is a challenge, but if my grandchildren are going to be farming 30 or 40 years from now, we need to figure out how to make it work so they can do that.”

In addition to the overfall pipes and grass waterways already installed on the farm, Murphy is looking at other conservation practices to implement, such as planting cover crops.

His understanding of current issues has made him a valued spokesman for local, state, and national organizations. Murphy is currently the chairman of the American Soybean Association and helped shape the 2014 farm bill. Murphy’s dedication to his profession has made him a valued colleague.

Ernie Flint, regional Extension specialist for the MSU Extension Service, has known Murphy since they lived at the FarmHouse fraternity as students. Flint credits Murphy’s strong character, leadership ability, community service, and farming efficiency for his recognition by Swisher Sweets/Sunbelt.

“Danny Murphy is not only an innovative farmer and leader, but a trusted agronomist,” Flint said. “I often seek his opinions on issues as detailed as a planter setting for a test plot or as complex as the debate over genetically modified crops. I always find his ideas well considered and open.

“For many years, Danny has contributed his considerable abilities and wisdom to some of the most complex issues our industry has faced,” Flint observed. “His common ways and work ethic disguise his deeper strengths. He is one of the best farmers I know.”
Generous donations from an anonymous benefactor helped Mississippi 4-H Youth Development renew its sewing instruction program and set in motion a pattern of giving for children who participate in the project.

Four years ago at the Calhoun County Fair, MSU Extension Service office associate Emily Rennie overheard some children talking about how fun it would be to know how to sew. She talked to Extension county coordinator Trent Barnett about the possibility of getting back to one of 4-H’s best-known programs.

“And the next thing you know, we’re developing a sewing program,” Rennie recalled. “Trent asked around for donations—anything to help us get this program started for the kids.”

Singer donated two sewing machines, but that was just the beginning. Barnett’s mother told someone about the donation, who told someone else . . . who turned out to be interested in supporting 4-H sewing instruction both long-term and statewide. However, there was a catch: The donor wanted to remain anonymous.

Determined to respect the benefactor’s privacy, Rennie simply said, “This person is our angel donor.”

This generous gift gave creative young people in Calhoun County 4-H the tools they need to be successful: a serger; a high-tech embroidery machine; 10 Brother Limited Edition Project Runway state-of-the-art, digital sewing machines; and fabric, thread, scissors, and trims.

At its peak, A Stitch in Time sewing club had 15 members. It now averages about six. When they meet, they all work on a variation of the same project—pajama pants, purses, pillowcase dresses, skirts, Christmas stockings, infinity scarves, and more.

“They are learning a life skill,” Rennie said. “The kids are finding out they can make a career out of sewing. They can turn a fun hobby into a way to make a living.

“They start with a pattern and a set of instructions, but there are all sorts of ways to make it their own, individual item,” Rennie added, pointing out that sewing also plays a role in the children’s creative expression. “Every time the kids show up, we see that it’s making an impact, and it’s a way for them to express themselves.”

Rennie said the anonymous donor has provided more than equipment and supplies to Calhoun County 4-H. “Every time we share a need in the community—whether it’s walker bags for the nursing homes, cough pillows for the hospital, or blankets for patients at St. Jude—our angel donor gives us the fabric and thread needed to do the service project,” Rennie said. “Our donor set in motion a pattern of giving. Our kids are following that pattern, yet making it their own.”

The MSU Extension office in Calhoun County is one of many in Mississippi revitalizing its sewing programs for both 4-H’ers and adults. A dramatic increase in requests for sewing lessons prompted the Extension Service to hire Dr. Wanda Cheek as a part-time Extension instructor in clothing and textiles. Cheek is teaching county agents with Family and Consumer Sciences responsibilities how to sew and how to share their new skills with their clients.

To help these agents keep up with the demand for sewing workshops, the Extension Service hopes to expand its Master Clothing Volunteer program. Every county needs at least one volunteer to support Extension programs, said Sylvia Clark, an Extension associate in Family and Consumer Sciences.

“Being a Master Clothing Volunteer is more than simply being an excellent seamstress,” Clark said. “We’re looking for people who have the ability to teach others, to be patient as children learn, and to communicate well.”

For more information on the Master Clothing Volunteer Program, contact Clark at (662) 325-1696.

Renewed 4-H Sewing Program Follows a Pattern of Service

By Keri Collins Lewis
1/82: Wilkinson County

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Clark Creek Natural Area in Wilkinson County features approximately 50 waterfalls, some with up to 30-foot falls.

County seat: Woodville
Population: 9,878
Municipalities: portion of Centreville, portion of Crosby (The Wilkinson/Amite county line runs through the middle of both towns.)
Commodities: timber (hardwood and pine), oil, beef cattle, soybeans, wheat, pecans
Industries: Fred Netterville Lumber Company, Big River Lumber Company, Southern Packaging Inc., GEO Specialty Chemicals
Natural resources: hardwood forests, pine plantations, farmland, rivers, lakes, wildlife

History notes: In the late 1600s through the 1700s, French, Spanish, and Anglo-American settlements sprang up along the Homochitto River, Buffalo Bayou, and Mississippi River about 40 miles south of Natchez. In 1798, Fort Adams served as the U.S. port of entry on the Mississippi before the acquisition of New Orleans. Wilkinson County became the fifth county organized in the newly formed Mississippi Territory. It is home to the first railroad in Mississippi (one of the first in the U.S.), the first standard-gauge railroad, and one of the oldest railroad office buildings standing in the United States. The county is also home to The Woodville Republican, the oldest newspaper and oldest continuously operated business in the state. Jefferson Davis’s family and boyhood home, Rosemont Plantation, and the Davis Family Cemetery are located in Wilkinson County. The Branch Banking House of the State of Mississippi is the state’s oldest existing bank building. Several historic churches and antebellum homes also stand in Wilkinson County.

Attractions: Clark Creek Natural Area, Homochitto National Forest, Rosemont Plantation, Wilkinson County Museum, African American Museum, Camp Van Dorn World War II Museum, Lake Mary, Pond Store, Woodville Historic Town Square and Historic District, Wilkinson County Park, Fort Adams, Bethel Farms, Woodville Deer and Wildlife Festival, Mississippi Blues Trail Marker, Beth Israel Cemetery

Did you know? Wilkinson County is home to many noted musicians, including classical composer William Grant Still (1895–1978), who was inducted into the American Classical Music Hall of Fame in 1999. Still was the first African American to write a major orchestral work performed by a major American orchestra, to conduct a major symphony orchestra in the U.S., to direct a major symphony orchestra in the Deep South, to conduct a major American network radio orchestra, to have an opera produced by a major American company, and to have an opera televised over a national network in the U.S.

“Wilkinson County is a unique combination of historical, cultural, and natural resources that attract people from around the world. The distinctive combination of history, culture, natural resources, landscape, and residents makes living and working here a fulfilling and rewarding experience.”

Ann Davis, MSU Extension Wilkinson County Coordinator

Editor’s note: 1/82 is a regular feature highlighting one of Mississippi’s 82 counties.
Silva Named IFT Fellow

Dr. Juan L. Silva, a professor in the Department of Food Science, Nutrition, and Health Promotion, was named a fellow of the Institute of Food Technologists (IFT), an international organization that strives to advance food science and technology in more than 100 countries.

This honor is bestowed upon IFT members for exemplary advancement, service, and inspiration in food science and technology. Nominees must be professional members of the organization for at least 15 years and must have made exceptional contributions to the field for at least 10 of those years.

Silva is a food scientist with the Mississippi Agricultural and Forestry Experiment Station. An MSU alumnus, he earned his bachelor’s and master’s degrees in chemical engineering and his doctoral degree in food science and technology. Silva is considered an international expert in food processing and food safety systems.

Keenum Appointed to USDA Board

MSU President Mark E. Keenum was appointed to a 3-year term on the board of directors of the U.S. Department of Agriculture’s Foundation for Food and Agricultural Research (FFAR). Authorized as part of the 2014 farm bill, FFAR will operate as a nonprofit corporation to solicit private donations to fund research on problems of national and international significance. Congress provided $200 million for FFAR, which must be matched by nonfederal funds as the foundation identifies and approves projects. FFAR fosters collaboration among agricultural researchers to address unmet and emerging research needs.

Keenum said the appointment strengthens agricultural research and enhances MSU’s status as a major player in national and global agricultural research efforts and activities. Research funded by FFAR will address issues including plant and animal health; food safety, nutrition, and health; renewable energy, natural resources, and the environment; agricultural and food security; and agricultural systems and technology.

Desai Wins IFT Poster Contest

Monil Desai, an MSU food science doctoral student, won first place for his presentation in the Muscle Foods Division at the Institute of Food Technologists’ Annual Meeting and Food Expo. Desai, a native of Ahmedabad, India, won for his research on ingredient technology and poultry packaging. He studied the benefits of adding vinegar to chicken retail cuts that were packaged in carbon dioxide in order to extend the product’s shelf life. Desai’s research extends the shelf life to 20 days, providing a direct benefit to producers, restaurants, and consumers.

Desai is a research assistant in the Food Chemistry and Sensory Evaluation Laboratory in the Mississippi Agricultural and Forestry Experiment Station. He earned his bachelor’s degree in food technology and his master’s degree in food science at MSU.
Lewis Wins National Leadership Award

Keri Collins Lewis, media relations manager for the MSU Office of Agricultural Communications, received the Pioneer Award from the Association for Communication Excellence (ACE).

The award is given for outstanding leadership and service in the workplace and in ACE during a member’s first 10 years of membership. ACE is a professional association for educators and communicators working in the fields of agriculture, natural resources, and life and human sciences.

Lewis has received numerous local and state awards for her work as a media relations writer. In 2013, she won the ACE Gold Award for writing for newspapers and Silver Award for her contributions to Pegasus Press. In 2014, The Progressive Farmer published her feature on an exceptional 4-H’er.

Buys Is New Health Promotion Specialist

Dr. David R. Buys is the new state health specialist for the MSU Extension Service. He will work with Extension agents throughout Mississippi to develop health-related programs focused primarily on obesity and obesity-associated diseases. Buys also plans to continue his research in nutrition, aging, and obesity with the Mississippi Agricultural and Forestry Experiment Station. One area of interest is the role communities play in health promotion.

Buys received a bachelor’s degree in sociology from Mississippi College, a master’s degree in sociology from Auburn University, and a PhD in medical sociology from the University of Alabama at Birmingham. He also earned a graduate certificate in gerontology and a master’s degree in public health from UAB, where he worked as an instructor of medicine and completed a postdoctoral fellowship in health services and outcomes research.

Rushing Hired as Plant Specialist at Coastal Plain

Dr. Brett Rushing is the new plant materials specialist at the Coastal Plain Branch Experiment Station in Newton. He will conduct research on native grasses and forages for livestock, concentrating on the needs of central Mississippi landowners and livestock producers. He also will study plant materials suitable for biomass production.

Rushing, a native of Alabaster, Alabama, holds a bachelor’s degree in biological sciences from Jacksonville State University and master’s and doctoral degrees in agronomy from MSU.

2014 Superior Faculty Awards

Regions Bank representatives joined MSU Division of Agriculture, Forestry, and Veterinary Medicine administrators to recognize winners of the 2014 Regions Bank-DAFVM Superior Faculty Awards. Pictured are (back row, from left) Walt Stephens, Regions Greenville city president; Dr. Gregory Bohach, DAFVM vice president; Samuel W. Slaughter III, Regions Starkville city president; and George Jarman, Regions Greenwood/Delta city president; (front row, from left) service award winner Dr. Diana Eubanks, CVM; Dr. Eric Dibble, accepting the research award for Dr. Jerry Belant, CFR/FWRC; Dr. Bill Epperson, accepting the teaching award for Dr. Kevin Walters, CVM; international award winner Dr. Sead Sabanadzovic, CALS/MAFES; and Extension/outreach award winner Dr. Rocky Lemus, MSU Extension.
Students and faculty in the MSU College of Agriculture and Life Sciences work to unlock the secrets of life at the most basic level, and their efforts have the potential to create an almost infinite impact. Contributions through the university’s ongoing *Infinite Impact* capital campaign can help the college extend its reach worldwide and achieve its goals.

Over the course of *Infinite Impact*, CALS specifically seeks $47 million in private gifts from alumni and friends that will benefit virtually every aspect of Mississippi State’s diverse agricultural community. These gifts will support innovative teaching efforts and groundbreaking research in areas from water conservation to food security. *Infinite Impact* will also support scientists in CALS and the Mississippi Agricultural and Forestry Experiment Station as they work to advance modern agriculture. Likewise, the campaign will help the School of Human Sciences provide a variety of programs in fashion design and merchandising, human development and family studies, and agricultural information science and education.

“Gifts for *Infinite Impact* will better position Mississippi State University and our college for the future,” said CALS Dean George Hopper. “Support for the campaign will enable us to take the science of agriculture that is developed in our state and teach it to humanity. By educating the next generation of leaders in agriculture, we can ensure our world will prosper for generations.”

*Infinite Impact* gifts can further the college’s vision through teaching, research, and Extension programs. The campaign utilizes the university’s people—renowned faculty, devoted staff, and promising undergraduate students—and works to stimulate positive changes that will spread across the globe.

Privately funded scholarships and fellowships have a powerful impact on students, offsetting financial burdens and allowing them to begin their careers with little debt. CALS is committed to providing more assistance to talented students across its disciplines. Any amount given can be awarded for scholarships annually, while gifts of at least $25,000 are needed to establish individual endowments for scholarships that can grow over time. Gifts through *Infinite Impact* can help the college attract students and produce graduates who will become innovative leaders for the future.

No single factor is more essential to quality education for dedicated students than providing outstanding professors from whom they can learn. *Infinite Impact* seeks to bring more endowed chairs and professorships to CALS, which will allow the college to maintain a superior faculty. Beyond campus, those who hold endowed faculty positions will bring greater national recognition and esteem to Mississippi State.

“In today’s competitive environment, gifts for endowed chairs and professorships are critical to recruit acclaimed academic and research leaders, who, in turn, will attract junior faculty, graduate students, and external research funds,” Hopper said. “These endowed positions can advance the university’s reputation on a global scale.”

Specifically, CALS seeks endowed chairs in agricultural marketing and agricultural leadership to advance MSU’s ability to assist nations that rely on agriculture as a primary source of revenue. Expertise in these areas, along with food safety and crop production, will enable the college to have a significant economic impact and help the world feed its growing population. With premier faculty and endowed funds, MSU can remain a leader in global food security, which is a university priority.
Within CALS, endowed positions can be established with minimum gifts of $500,000 for a professorship, $1.5 million for a department chair, and $2 million for a dean’s chair. These commitments are typically in the form of outright gifts or multiyear pledges.

Campaign funds can also be used to enhance facilities to improve and expand the educational experience at Mississippi State. CALS implements hands-on learning through laboratories, research fields, and teaching complexes to engage students and professionals. For instance, the internationally known Insect Rearing Center provides tools to educate personnel who fight yellow fever, malaria, and other insect-borne diseases, as well as those who examine insects as a protein source for animal feeds. Also, the Dorman Hall Teaching Gardens provide hands-on campus learning for students and faculty. With operating endowments established with gifts, each of these facilities can benefit students and faculty for years to come.

CALS also benefits Mississippi State with a strong lecture series, bringing to campus professionals who have experienced “real-world” success. Hosting a lecture series can be expensive because of the cost of travel, accommodations, and speakers. However, gifts through Infinite Impact will help defray the cost of a lecture series in CALS, MAFES, and the MSU Extension Service.

“There has never been a more exciting time to take part in all that is happening at Mississippi State,” said Jud Skelton, CALS director of development. “There are many ways to support our college during Infinite Impact, from outright gifts to deferred gifts, because all contributions enable donors to shape lives through Mississippi State University.”

Many opportunities exist for alumni and friends to assist the College of Agriculture and Life Sciences. For personalized assistance, contact Skelton at (662) 325-0643 or jskelton@foundation.msstate.edu; or Dees Britt, CALS assistant director of development, at (662) 325-2837 or dbritt@foundation.msstate.edu. All contributions to MSU through 2018, regardless of their designation, are part of Infinite Impact.
Signs of remembrance and hope can be seen throughout communities devastated by tornadoes that struck several Mississippi counties on April 28.

Photo by Kevin Hudson