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LANDMARKS

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DIVISION OF AGRICULTURE,
FORESTRY, & VETERINARY MEDICINE

RESEARCH, EDUCATION, AND EXTENSION

MISSISSIPPI LANDMARKS

Mississippi LandMarks is published quarterly by the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

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VICE PRESIDENT'S LETTER

More Mississippians are living away from the farm than in any other time in the state's history. As our population becomes more urban, we often hear that people are disconnected from agriculture and, therefore, do not value it as

they once did. In response, we humbly submit these facts: We all eat food, wear clothes, live in homes constructed with forest products, and use some sort of transportation. Everyone in the world depends on agriculture for some aspect of daily life, and we are thankful for the Mississippi producers who work to provide our food, fiber, and fuel.

We also are proud to play our part in helping those producers leverage the latest scientific discoveries to help them remain efficient, sustainable, and profitable. Preliminary estimates for the 2017 crops indicate agriculture continues to contribute more than \$7 billion to the state's economy. Several commodities saw gains over 2016, including poultry, soybean, and cotton.

Part of our work with producers includes the annual Row Crops Short Course, which took place in December at The Mill in Starkville. Top experts spoke on a variety of issues facing the 676 agricultural producers, crop consultants, landowners, and Extension agents who attended. Armed with this information, they will be better able to navigate the challenges of the 2018 growing season.

This course is an example of the support Division of Agriculture, Forestry, and Veterinary Medicine units provide farmers throughout the year, from researchers developing new strategies to improve the state's vast fields of row crops to Extension agents working with farmers' markets to promote locally grown produce. Another example is research that addresses corn planting density (see page 4). Perhaps most importantly, we educate the next generation of leaders to ensure future success (see several articles in this issue of *Mississippi LandMarks*).

One of the most important characteristics of the people who work in and support DAFVM is commitment. The commitment of our various partners sustains our work, as does the long-term dedication of our scientists, faculty members, and professional staff. In February, we were pleased to recognize Dr. Normie Buehring, whose MSU career in the Mississippi Agricultural and Forestry Experiment Station lasted more than 45 years, at the annual Producer Advisory Council meeting in Verona at the North Mississippi Research and Extension Center. Dr. Buehring's perseverance on behalf of Mississippi row-crop producers is just one example of the type of devotion that has enabled MSU to be both the People's University and the state's flagship research university. We congratulate him on his retirement!

GREGORY A. BOHACH

CONTENTS

Volume 14 • Number 1 • April 2018



4 Row-Spacing
Modifications in
Corn Improve Yields

6 Microplastics
Research Initiates
a Greener Future

8 Teaching Children
About Animals and
Veterinary Careers

10 Helping Repopulate
Black Bears in
Mississippi

12 Genetic Markers
Identified to Predict
Bull Fertility

14 4-H'er and Mom
Learn Together

16 New Meat Science
Building Will
Enhance Research

17 Longtime DAFVM
Vice President
Passes Away

18 New Online Program
Integrates Agriculture
and Business

20 Students Sample
Extension and
Research Careers

24 Geospatial
Technologies Change
Forestry Capabilities

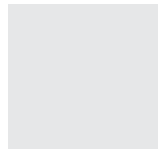
27 1/82: Winston
County

28 News Notes

30 Forestry Foundation
Supports Mass-
Timber Designs

..... ON THE COVER

Lauren Bryant is an 11-year-old 4-H'er in Tippah County. See her story on page 14.
(Photo by Russ Houston)





ROW-SPACING MODIFICATIONS

in Corn Improve Yields

Photo by Brien Henry

Corn research in the Mississippi Agricultural and Forestry Experiment Station (MAFES) has led to a breakthrough in producing larger yields.

Dr. Brien Henry, a professor in the College of Agriculture and Life Sciences Department of Plant and Soil Sciences, leads a team of researchers on various projects related to corn production. Their most recent involves reducing row spacing.

Typical spacing between rows of corn in Mississippi is 38 inches. While reducing the row spacing to 19 inches, the team doubled the distance between corn plants within a planted row. The modifications improved corn yield by approximately 10 percent this year on a 20-acre trial plot Henry shares with

“The bottom line on all of these projects is helping the producer. If we can find ways to improve corn production, save money, reduce irrigation, preserve soil resources, reduce risk, or farm more effectively, I feel like we are doing our job.”

DR. BRIEN HENRY

collaborators at the MAFES R. R. Foil Plant Science Research Center.

“For a standard-planted corn population like 35,000 plants per acre, by doubling the number of planted rows, you double the distance between plants within a given planted row,” Henry said. “We are trying to determine an optimal plant spacing within a field for yield, so we varied our corn populations by evaluating treatments of 25,000, 35,000, 45,000, 55,000, and 65,000 plants per acre for both 38- and 19-inch row configurations.”

This year, planting 45,000 plants per acre on 19-inch spacing yielded the best results, he said.

“Corn likes to be spaced out within the row,” Henry explained. “We suspect that the improvement in plant spacing



Dr. Brien Henry (left) and MSU agronomy students Will Swann and Joey Williams stand near the 20-acre trial plot used in the row-spacing study at the R. R. Foil Plant Science Research Center. (Photo by Lindsay Pace)

allows for more water, light, and nutrients per plant. We hit almost 300 bushels per acre at 45,000 plants per acre using narrow row spacing. These were some of our highest plot yields of all time, and we didn't irrigate once."

Henry collaborated with Dr. Normie Buehring, senior research agronomist at the MAFES Northeast Mississippi Branch Experiment Station, along with agronomy graduate students and researchers in the MSU Geosystems Research Institute (GRI).

Buehring designed equipment that flattens corn fields but cuts furrows every few feet to allow for exact spacing between plants with the assistance of GPS units. GRI personnel flew unmanned aircraft systems with cameras that recorded aerial views and data.

"Some of the details of field prep, planter configuration, and plant arrangement are tedious," Henry said. "With overhead drone images, we can show producers what we did and why, and they can make an informed decision that works on their operation. Seeing these research plots from above does a fantastic job of extending our results to the producers."

Graduate student Joey Williams assisted Henry with the project while conducting his own research on drought-tolerant

and short-season corn hybrid varieties. With both projects, he found planting corn early can improve yield significantly.

"In 2016 and 2017, by planting at each of our MAFES research stations in the last week of March instead of the last week in April, we added \$145 worth of profit per acre," Williams said.

The challenge of narrow rows and early planting is the likelihood of wet fields in March. Early-season drainage issues necessitate extra field preparation, Henry said.

"Our Midsouth corn production system is unique," he said. "We have to get water off the field, so furrows that facilitate drainage are needed, especially in flatter, Delta-like planting systems."

Henry's row-spacing project is funded by MAFES, the Mississippi Corn Promotion Board, and industry collaborators.

"The bottom line on all of these projects is helping the producer," Henry said. "If we can find ways to improve corn production, save money, reduce irrigation, preserve soil resources, reduce risk, or farm more effectively, I feel like we are doing our job."

BY NATHAN GREGORY

MICROPLASTICS RESEARCH

Initiates a Greener Future



Amanda Sartain, Extension program assistant, records data from a study of microplastic pollution found in water and sand samples from the Gulf Coast.

It might only be the size of a pea, but it threatens the Gulf of Mexico.

Microplastics are minute pieces of plastic material—no larger than 5 millimeters in diameter—that occur in either primary or secondary forms. Primary microplastics are manufactured at a small size and may come from products like beaded face wash or toothpaste. Secondary microplastics result from the breakdown of larger plastic products.

While at a coastal cleanup event in 2015, Dr. Eric Sparks, a coastal ecology specialist for the MSU Extension Service, and Caitlin Wessel, Dauphin Island Sea Lab PhD candidate, ran a small-scale, citizen-science study to determine the amount of microplastics along Mississippi beaches.

“Pretty much every piece of plastic ever made still exists in our environment,” Sparks said. “I’d say we have somewhere between two and 40 microplastics for every liter of water we’ve collected.”

Wessel said 99 percent of her samples have contained microplastics.

“I think once more people realize that plastics don’t just go away, we’ll see people make an effort to decrease their use of plastics or dispose of them properly so that they don’t end up in the environment,” Wessel said.

After the study began in 2015, it garnered attention from the Gulf of Mexico Alliance, an organization that funds projects that maintain the viability of the gulf by connecting state and

“The bulk of our research is finding out how big of a problem microplastics are. Where are they coming from? What are the hot spots?”

DR. ERIC SPARKS

federal environmental agency partners with researchers. Through the related Gulf Star Program, Sparks and his team received a 2-year grant to expand their microplastics investigation. The study officially began in January 2017 and will continue through the end of 2018.

In the first 9 months, efforts centered on training and producing educational background material for partner agencies with the help of a project team. The team then trained personnel at 13 partner agencies, such as the Texas State Aquarium and the Texas Parks and Wildlife Department. The partners—ranging from Corpus Christi, Texas, to Key Largo, Florida—organize and train citizen scientists within their respective communities.

Citizen scientists collect 1-liter samples of water and bags of sand that are processed using simple counting and separation techniques. They record their findings, which Sparks and other scientists use for ongoing data collection.

“The bulk of our research is finding out how big of a problem microplastics are,” Sparks said. “Where are they coming from? What are the hot spots?”

To facilitate training partners and participants, Amanda Sartain, Extension program assistant and marine debris specialist, develops teacher workshop materials, general guidebooks for students, and project-specific guidebooks for sampling and processing.



Dr. Eric Sparks, assistant Extension professor in the Department of Wildlife, Fisheries, and Aquaculture based at the Coastal Research and Extension Center, prepares to analyze a bag of sand collected from the Mississippi coast.

“This project brings everybody together,” Sartain explained, “and it’s amazing, because one person can’t change the world, but a lot can happen if you can get everybody to jump on the bandwagon. It’s very powerful what people can do when they’re passionate about changing something.”

Sparks said that studying the environmental effects of microplastics is the next step for microplastic research.

“It’s a personal interest of mine to do whatever we can to help the coast,” Sparks said. “If raising awareness about microplastics is the way to do that, I’m all for it.”

BY LINDSAY PACE • PHOTOS BY KEVIN HUDSON



Megan Pratt, a fourth-year student in the College of Veterinary Medicine Class of 2018, introduces her pet to students at Saltillo Elementary School.

Animals in **FOCUS**

Teaching Children About Animals and Veterinary Careers

MSU College of Veterinary Medicine (CVM) employees and volunteers have been lending their pets to a new program that helps children learn while fostering an understanding of the veterinary profession.

Animals in Focus strengthens elementary-aged students' understanding of proper animal care and the human-animal bond. A goat, a snake, a pot-bellied pig, and several dogs have visited classrooms across the state since the program's inception in 2014.

"Our goals are to help children understand that animals have value by teaching them about animal care and giving the children a chance to interact with an animal one-on-one," said Dr. Kimberly Woodruff, director of the shelter medicine program and assistant clinical professor in the CVM Department of Clinical Science. "When people form relationships with animals, it fosters a respect for animals that helps change attitudes that contribute to pet overpopulation and related issues. It's also a good way to introduce children to veterinary careers."

In 2016, organizers taught 25 lessons in classes, after-school programs, and other community events throughout the state. Each visit offers unique lessons on how to care for and safely interact with the animal.

"We focus a lot on caring for animals and try to emphasize how animals help people," Woodruff said. "One of our lesson plans focuses on dogs with jobs. Teaching kids about service animals is a good way to demonstrate positive relationships with animals."

Using lessons with animals is an exciting way to supplement the school curriculum, she added.

"Once a student understands how to care for an animal, we can parallel that back to making healthy decisions for themselves," Woodruff said. "For example, we can teach the students about



Hailey Deichmann, an animal health technician with the CVM Department of Clinical Sciences, chats with teachers and students about her puppy.

proper nutrition for dogs and the importance of exercise, and that provides a fun way to teach them about these things in their lives."

Scientists also know children who interact with pets in the classroom on a regular basis have improved attendance, self-esteem, social interactions, and emotional control.

"Pets in the classroom can enhance a child's learning experience like nothing else can," said Christina Loftin, director of Animals in Focus and a veterinary technician at the college. "Animals have a special capability of putting children at ease while increasing students' self-awareness and emotional well-being."

In fall 2016, the program began making semimonthly visits to Palmer Home for Children in Columbus. Organizers usually take two or three dogs during each visit, focusing on one age group at a time. Students from elementary to high school participate in the program.


"We've definitely seen a positive impact on the children," Woodruff

said. "They look forward to our visits and their time to interact with the animals. They really seem to bond with the animals that we bring, especially the ones that visit them most regularly. One of the houses at the Palmer Home has even acquired their own dog, with the children doing most of the care."

Pam Abrams, director of education at Palmer Home, said the program has been a wonderful addition for their students.

"This program provides excellent learning opportunities through fun, hands-on activities," Abrams said. "We've toured the vet school, walked dogs at the humane society, learned to 'suture' wounds, and so much more. We all look forward to Fridays when the group visits our campus."

BY SUSAN COLLINS-SMITH •
PHOTOS BY TOM THOMPSON

A close-up photograph of a woman with dark, curly hair, wearing a grey zip-up hoodie and white gloves, gently holding a small black bear cub. The cub is lying on a light-colored cloth. In the background, another person wearing blue pants and a watch is partially visible. The setting appears to be a natural, outdoor environment with dry grass and twigs.

“As our knowledge increases, our aim is to provide reliable scientific data to guide future black-bear management strategies statewide, as well as achieve a deeper understanding of the ecology and behavior of black bears and carnivores in general.”

MARIELA GANTCHOFF

Mariela Gantchoff, a PhD student in the College of Forest Resources, studies large-scale movements of black bears.

HELPING REPOPULATE

Black Bears in Mississippi

Examining the recolonization of black bears in Mississippi provides a valuable research opportunity for MSU graduate students working toward understanding the conservation process.

Mississippi is the natural home of two subspecies: the American black bear in the northern third of the state and the Louisiana black bear in the southern two-thirds. Overharvest and land conversion to agriculture decimated this once-abundant species to an approximate population of just 12 bears in 1932.

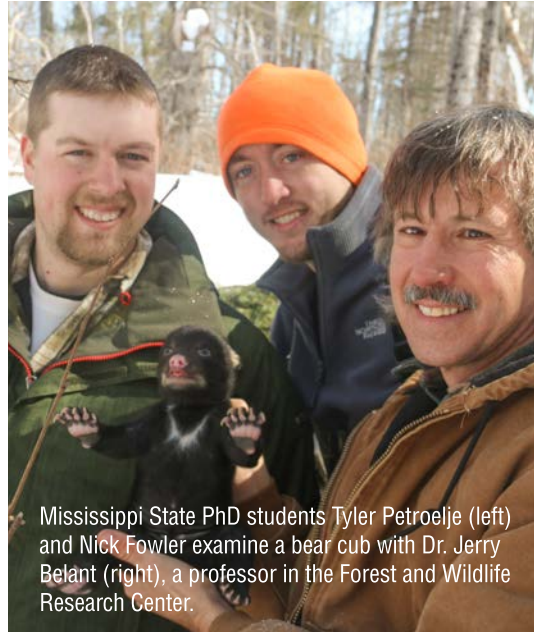
Today, researchers are sure the number of bears has grown drastically, as habitat has received increased protection and bears have dispersed from populations in neighboring states. However, there is no official count on the state's black-bear population.

As part of her doctoral dissertation in the MSU College of Forest Resources, Argentina native Mariela Gantchoff developed a regional connectivity model to predict large-scale bear movements across the landscape.

"This model doesn't try to predict the movement of individual bears but rather their movements as a population using a probabilistic approach," Gantchoff said. "Bears in Mississippi occur in low densities and inhabit the Delta and coastal portions of the state; as their density increases, they will start expanding into other suitable areas of the state, but the dispersal paths are unknown."

"My model highlights areas that facilitate movement between protected areas," said Gantchoff, whose degree focuses on wildlife ecology and management. "As our knowledge increases, our aim is to provide reliable scientific data to guide future black-bear management strategies statewide, as well as achieve a deeper understanding of the ecology and behavior of black bears and carnivores in general."

The Mississippi Black Bear Project began in 2008 as a cooperative research program between the MSU Forest and



Mississippi State PhD students Tyler Petroelje (left) and Nick Fowler examine a bear cub with Dr. Jerry Belant (right), a professor in the Forest and Wildlife Research Center.

Wildlife Research Center (FWRC) and the Mississippi Department of Wildlife, Fisheries, and Parks. The main goal is to understand black bear recolonization in Mississippi, as well as the reproductive ecology of females, den site selection, and overall population growth.

"I'm fascinated by carnivore research and intend to continue to pursue it as I advance my career as a conservationist," said Gantchoff, who has been involved with the project since 2014. "I prefer to focus on how carnivores respond to resources in the environment and the species they coexist with—including how they relate to humans—and

helping understand how we can share the same landscapes and achieve long-term coexistence."

Dr. Jerry Belant, an FWRC wildlife, fisheries, and aquaculture professor, studies the recolonizing black-bear populations in Mississippi and Missouri, as well as the stable, high-density black-bear population in Michigan. Missouri is several years ahead of Mississippi in bear conservation.

"This multistate approach gives us a great opportunity to make comparative studies and look at factors that can influence populations," Belant said. "We're looking at multiple factors that influence space and habitat uses of black bears to determine where we expect they will be in the future and how they will get there."

Belant said half of large carnivore species worldwide are threatened with extinction, and 80 percent face population declines. Louisiana black bears have recently been removed from the U.S. endangered species list, but the animals are still listed as endangered in Mississippi.

"This is a unique opportunity to study the recolonization and recovery of a large carnivore species, along with the human perspective, including human-bear conflicts and social acceptance of the species," Belant said.

BY BONNIE COBLENTZ • SUBMITTED PHOTOS

GENETIC MARKERS



Identified to Predict Bull Fertility

these fertility biomarkers has significant potential not only for beef and dairy cattle production, but also for human health.

“Sperm factors play a part in infertility cases for couples, as well,” Blanton said. “Understanding the role of fertility markers in cattle can have a direct impact on the success rate of in vitro fertilization in humans.”

“Improving reproductive efficiency will lower livestock production costs and reduce or eliminate time lost by failed pregnancy attempts,” Memili said. “Tests could eliminate young bulls from breeding programs, saving producers time and money.”

Producers commonly use sperm from high-quality bulls to artificially inseminate cattle.

“In the United States, about 70 percent of dairy cows are bred by artificial insemination, but only about half of these procedures result in a full-term pregnancy,” he said.

Researchers will now develop testing kits for technicians to evaluate semen quality and predict bull fertility.

“We need to look at cell structure and function, evaluating levels of sperm proteins and RNAs and other factors,” he said. “The goal is to differentiate between good fertility and best fertility.”

“Our success rests on the shoulders of previous research by some outstanding students and researchers,” he said. “To our knowledge, this is the first study that identifies the differences in certain protein content of sperm from bulls with reliable high versus low fertility phenotype.”

BY LINDA BREAZEALE • PHOTOS BY BETH WYNN

Mississippi Agricultural and Forestry Experiment Station researchers are taking advantage of generations of fertility studies and advanced technologies to delve into genetic markers to predict bulls’ potential breeding success.

“Some bulls produce plenty of sperm with high motility (movement) and morphology (shape), but their fertility is still low,” said Dr. Erdoğan Memili, a professor of animal and dairy sciences in the MSU College of Agriculture and Life Sciences. “We suspect molecular defects that are not detectible through traditional methods.”

Memili and his research team have spent years developing an integrated approach to the study of genetics in bull sperm to predict bull fertility. Despite extensive reproduction studies, little is known about how protein levels influence sperm DNA structures and gene expression related to bull fertility.

Dr. John Blanton, head of the Department of Animal and Dairy Sciences, said this research identified three specific proteins that contribute to pregnancy success rates: Protamine1, Histone 3, and Testis Specific Histone 2B. Better understanding

“Improving reproductive efficiency will lower livestock production costs and reduce or eliminate time lost by failed pregnancy attempts. Tests could eliminate young bulls from breeding programs, saving producers time and money.”

DR. ERDOĞAN MEMILI



Dr. Erdoğan Memili (standing) leads a team of researchers seeking to develop a genetic test kit that can be used to identify bulls with the best fertility. He is pictured with Dr. Erika Menezes, a postdoctoral research fellow from Brazil.



Lauren Bryant is a third-generation 4-H'er who participates in many youth-development activities with her mother, Leigh Bryant (left).

FAMILY TRADITION

4-H'er and Mom Learn Together

You might say it was inevitable that Lauren Bryant would at least try 4-H.

Her father's family has been active in the MSU Extension Service 4-H Youth Development Program for two generations. And she has attended 4-H events since she was a toddler.

Now, the 11-year-old is showing her own livestock and participating in various 4-H activities through the Extension Service in Tippah County.

"Lauren is a third-generation 4-H'er," explained her mother, Leigh Bryant. "Her granddad and her daddy were both 4-H'ers."

At 8 years old, Lauren Bryant began showing dairy cows. She also shows chickens and participates in poultry judging, shooting sports, and 4-H Project Achievement Day.

"I've been in 4-H since I was born, really," she said. "Since I've been doing projects, I've had a lot of fun and met a lot of new people and learned a lot of new things."

This year, she added horses to her livestock projects. To help prepare for shows, she participated in the 4-H Winter Classic, a 3-month series of informal horse shows aimed at allowing 4-H'ers to try new riding classes and develop their skills. After two shows a month and a lot of practice, she won the show's award for most improved participant.

"That was a surprise," she said. "It was pretty exciting, but I was a little shocked."

Although her family always had horses, she had never worked with them. As she trained with 13-year-old Little Bit during home practice sessions and at the Winter Classic, her confidence and trust with the horse grew. She got faster and discovered the riding classes that suit them both.

"When she first started, she just led the horse around," Leigh Bryant said. "When she got in the saddle, she started out at a trot, and now she's up to a lope. She has done a bit better, but she has a long way to go."

Leigh Bryant is trying out 4-H along with her daughter. A Louisiana native, she was not involved in the organization as

a child and began learning more about it when her daughter wanted to get involved.

"I knew nothing about 4-H until I moved to Tippah County," she said. "Growing up, my parents owned their own business, and we lived in the city. I have always loved animals, but we never had any because my family's schedule didn't allow us to

devote the time that animals need."

Leigh Bryant said she is up for anything her daughter wants to try and enjoys learning along with the girl.

"Anything she wants to do, I say, 'Yes, we'll try that,'" the mother said. "I'm eager to learn, and I think 4-H has helped me just as much as it's helped Lauren. The longer we do this, the more we learn. We've learned things like how to tell the age of a horse by its teeth."

Leigh Bryant also loves that 4-H is a family-oriented program that teaches her daughter hands-on life skills through age-appropriate projects.

"4-H livestock projects are a good way to teach children responsibility," she said. "With animals, they depend on you for their care. They must be fed twice a day, every day. They have to be exercised and groomed for shows. You can't push that responsibility off on someone else. Of course, she has help with some tasks, but she participates even if she can't do it on her own."

Connie Walker, Extension 4-H agent in Tippah County, said she has enjoyed being a part of the Bryants' 4-H experience.

"It's been great to watch Lauren improve and Leigh become a part of this organization," Walker said. "I am proud to have them represent our program."

BY SUSAN COLLINS-SMITH •
PHOTO BY RUSS HOUSTON

“4-H livestock projects are a good way to teach children responsibility. With animals, they depend on you for their care. They must be fed twice a day, every day. They have to be exercised and groomed for shows. You can't push that responsibility off on someone else.”

LEIGH BRYANT



New Meat Science Building

Will Enhance Ongoing Research

Continued expansion of Mississippi Agricultural and Forestry Experiment Station (MAFES) research facilities will soon reach another milestone with the opening of the Meat Science and Muscle Biology Laboratory.

State bond funding helped launch construction of the \$8 million project in 2016. Students and researchers will occupy the new 15,000-square-foot building, located in front of the MSU College of Veterinary Medicine, for the first time in summer 2018.

MAFES engineer David Howell said the state-of-the-art facility will enhance Experiment Station meat-production research.

“We will have several classes in the building, but it is more of a research facility rather than a teaching facility,” Howell said. “We do have one classroom in the building that has 36 seats. Other rooms include holding pens, a harvest room, a demonstration room adjacent to the classroom and separated by a glass wall, several freezer and cooler rooms, a test kitchen, and a value-added lab.”

MAFES is seeking funds to renovate Ballew Hall, which formerly housed the lab. Preplanning for that project is tentatively scheduled for 2019.

Another ongoing state-funded project for MAFES just east of the meat science lab is a new Department of Animal and Dairy Sciences building. Construction for the \$14 million facility began in 2017. Groundbreaking for a \$13 million state-funded Department of Poultry Science facility is scheduled for 2018.

Meat research is conducted by Animal and Dairy Sciences and the Department of Food Science, Nutrition, and Health Promotion at MSU. Meat products from research activities are sold to the public at the MAFES Sales Store.

BY NATHAN GREGORY

Retired Division Vice President Passes Away

A longtime vice president for the MSU Division of Agriculture, Forestry, and Veterinary Medicine passed away on February 4. Dr. R. Rodney Foil, who retired from Mississippi State in 1999 after 30 years as an administrator, was 83 at the time of his death.

At MSU, Foil also served as head of the Department of Forestry and dean of the School of Forest Resources. He was associate director of the Mississippi Agricultural and Forestry Experiment Station (MAFES) before being named director in 1978. MAFES research prospered during his years of leadership. He was named DAFVM vice president in 1986.

“Dr. Foil was an excellent administrator, an outstanding mentor, and a strong supporter of Mississippi agriculture, forestry, and natural resources,” said Dr. Gregory A. Bohach, the current DAFVM vice president. “He helped lead the division through lean times and through some really good times. The division, the university, and the state were better because of his expertise, dedication, and efforts. We will miss him, but his legacy will remain and be positive in the years ahead.”

“Dr. Foil was a leader’s leader, highly respected for his advice and counsel to administrators throughout the land-grant system,” said Dr. George M. Hopper, dean of the College of Forest Resources and the College of Agriculture and Life Sciences and director of MAFES and the Forest and Wildlife Research Center. “He was an iconic figure in forestry, natural resources, and agriculture throughout the nation. We will miss his wisdom, steadfastness, and support.”

The Bogalusa, Louisiana, native was a faculty member for 11 years at Louisiana State University before coming to MSU. He received bachelor’s and master’s degrees from LSU and was a doctoral graduate of Duke University.

Foil served on advisory committees under three secretaries of agriculture and as a member of the Joint Committee on Agricultural Research and Development of the Department of State. Recognized nationally, he was one of seven scientists selected by the National Academy of Sciences to participate in a 2-year oversight review of proposed new regulations governing the management of national forests.

Foil was instrumental in the formation of the Council for Agricultural Research, Extension, and Teaching (CARET) in 1982. CARET is a grassroots advocacy group designed to help better coordinate land-grant missions.



Rosalind and Rodney Foil

Foil garnered a long list of academic and professional honors. He was recognized for his contributions by the Society of American Foresters, Mississippi Seedsmen Association, MSU College of Veterinary Medicine, and LSU School of Forestry and Wildlife Management, among others.

After his retirement, Foil went on to serve the Cooperative State Research, Education, and Extension Service (CSREES) for the U.S. Department of Agriculture. He oversaw the CSREES Initiative for Future Agriculture and Food Systems, and he served as chair of the CSREES Board of Agriculture. In 2004, he was among the first individuals to be inducted into the CSREES Hall of Fame.

The MAFES R. R. Foil Plant Science Research Center, known by many as North Farm, is part of Foil’s legacy at MSU. It comprises approximately 750 acres, including 550 acres of tillable land for a variety of research projects in a diverse agricultural community.

He also will be remembered for the Rosalind and Rodney Foil Teamwork Award, which is given for exemplary collaborative efforts in the division. It is awarded each year to an individual or group to recognize contributions to meeting the missions and goals of the university and DAFVM. The award recognizes those who go beyond the short-term self-interests of their units to forge alliances with colleagues in other units.

New ONLINE PROGRAM

Integrates Agriculture and Business

MSU's new online graduate degree program, the Master of Agribusiness Management (MABM), will help prepare graduates for the innovative thinking required for success in the global agribusiness industry.

As an interdisciplinary degree between the College of Agriculture and Life Sciences and the College of Business, the MABM combines the technical aspects of agricultural economics with finance, management, and marketing skills.

This diverse academic discipline grooms students for advanced careers in agriculture and food systems, including retail, forestry, farm production, agricultural lending, product marketing, and food manufacturing and distribution.

"Agribusiness is a fast-growing, complex global industry with ever-changing technologies and environmental concerns," said Dr. Keith Coble, head of the MSU Department of Agricultural Economics. "What differentiates our program from others is that we emphasize the intuitive understanding and practical applications of quantitative, statistical, and economic techniques necessary to successfully address challenges unique to the world food system."

Dr. Angelica Williams, director of the distance MABM program and agricultural economics instructor, said recipients of this degree will be able to make substantial impacts on global food and agribusiness firms.

"They will gain a global perspective on agribusiness as we examine marketing analysis and strategies involved in the international agricultural trade," she explained.

The MABM has been offered in a traditional campus setting for several years. Discussions began last spring about the possibility of also offering it online.

"While collaborating on the traditional MABM program, we formed a solid working relationship with the College of Business," said Coble. "Because the College of Business already offers a high-quality online program, it was a natural progression to work with them to deliver the MABM online."

MSU President Mark E. Keenum, himself an MSU agricultural economics graduate, said Mississippi State's award-winning online programs offer students the same level of high-quality instruction and guidance as traditional classroom settings on campus, with the added benefit of enhanced flexibility needed by working professionals.

"I'm very pleased that we're adding the Master of Agribusiness Management program as an online option," he said. "I believe it will be an asset benefiting our students—wherever they live and work. And thanks to the reach of technology, this program serves to further expand Mississippi State's commitment to having a global impact as we connect with students internationally."

Keenum, a former undersecretary of the U.S. Department of Agriculture and the current chairman of the Foundation for Food and Agriculture Research, noted that MSU's teaching, service, and research support Mississippi's \$7.5 billion agricultural and forestry industries, as well as the nation's agricultural sector, estimated to generate more than \$212 billion in 2017.

"I'm very proud of Mississippi State's multifaceted work to address our world's greatest challenge: feeding a global population expected to grow to nearly 10 billion by 2050," he said. "That means the world's farmers will need to produce some 70 percent more food than we do today. Our students in programs like the Master of Agribusiness Management program are the future leaders who will have to develop innovative solutions to feed, clothe, and fuel the world."

More information is available at www.distance.msstate.edu/mabm.

BY JONI SEITZ • PHOTO BY LINDSAY PACE

Agribusiness management graduate students Jon-Vincent Holden (left), Skyler De Regt, and Pate DeMuth visit with Dr. Angelica Williams, director of the Master of Agribusiness Management distance program.



“Agribusiness is a fast-growing, complex global industry with ever-changing technologies and environmental concerns. What differentiates our program from others is that we emphasize the intuitive understanding and practical applications of quantitative, statistical, and economic techniques necessary to successfully address challenges unique to the world food system.”

DR. KEITH COBLE

MAKING CONNECTIONS

Students Sample Extension and Research Careers

The MSU Extension Service introduced a new program this year to help college students understand how Extension works in the lives of Mississippians, as well as the careers it offers.

The Extension Apprenticeship Program recruits juniors and seniors pursuing technical degrees at public, state-funded universities. Selected students whose interests match Extension's educational program areas are paired with specialists to introduce them to the organization's professional opportunities.

"Our goal is to help these students understand the relationship between research and Extension education programs through experiential learning opportunities," said Dr. Marina Denny, an assistant professor in the School of Human Sciences responsible for Extension staff and program development.

Eight students participated in the 2017 summer session. They spent 12 weeks at MSU with Extension specialists, designing, conducting, and evaluating their individual studies in multiple areas from community health to agriculture. After returning to their home institutions, they continued to work with mentors to develop research posters and papers to present at industry-related events.

Brittany Bowman, a Virginia Tech graduate with a bachelor's in dairy science, worked with Extension dairy specialist Dr. Amanda Stone of the Department of Animal and Dairy Sciences to teach dairy farmers how to test milk for pathogens on the farm to improve management practices. She also evaluated farmers' willingness to incorporate this technology into their current practices.

While Bowman knows Extension through the support they provide her family's beef-cattle farm and her summer as an intern in a county office, the apprenticeship gave her a different perspective.



Katelin Hyman (left), a senior in ag business at the University of Arkansas, worked with Dr. Brandi Karisch, assistant Extension/research professor in the Department of Animal and Dairy Sciences, and other beef cattle faculty in a study to quantify the influences that prompt producers to choose one marketing method over another.

"This experience helped me see how research and Extension education makes real impacts on Mississippi dairy farmers," Bowman said. "I've considered Extension careers before, but this experience showed me I have a true passion for Extension."

Mattie Helen Dunlap, a senior psychology major at MSU, conducted an equine-assisted learning study during the Summer Outdoor Adventures Program designed to help at-risk foster children develop social skills and self-awareness.

"I never considered working with children before this summer," said Dunlap, who was unfamiliar with Extension until the apprenticeship. "But this experience has been wonderful. I enjoyed watching these kids gain respect and kindness for others and themselves by working with horses."

Other apprenticeship projects included mapping the effect of various shoreline erosion control methods with QGIS software, investigating water quality benefits of cover crops, using cool-season grasses as cover crops, and measuring the environmental benefits of a rice production system incorporating sustainable management practices.

The apprenticeship program is funded for 31 months through a grant from the U.S. Department of Agriculture National Institute of Food and Agriculture under the Agriculture and Food Research Initiative – Education and Literacy Initiative and the Research and Extension Experiential Learning for Undergraduates Fellowships Program. Another eight students will be recruited for 2018.

BY SUSAN COLLINS-SMITH •
PHOTOS BY MARINA DENNY



Dr. Eric Sparks, assistant Extension professor in the Department of Wildlife, Fisheries, and Aquaculture, instructs Gillian Palino on the preparation and use of traps for a ghost-crab study. Palino is a senior in environmental engineering at the University of Florida. One of her apprenticeship program activities was assisting with living shoreline evaluations.



Mia-Yang Ponter applies a neck brace to rural medical scholar Zachary Poindexter of Starkville, Mississippi. (Photo by Kevin Hudson)

Rural Medical Scholars Learn About Patient Issues

High-school students in the Rural Medical Scholars Program learn about the academic demands and work life of family-practice physicians. But students in the 2017 class also experienced first-hand what doctors' patients go through.

Mia-Yang Ponter, a University of Alabama-Birmingham student studying public health and psychology, designed a project that simulated illnesses and injuries common among Mississippians in the same age group as the students. Students chose the conditions they wanted to learn more about.

Simulated conditions included diabetes, tracheotomies, broken arms, obsessive-compulsive disorder, and vision impairment from diabetic complications. Students received goggles to mimic vision deficiencies and neck braces that post-tracheotomy patients wear.

"Most of the students were excited to wear the neck brace and goggles," Ponter said. "But when it was over, they admitted it was much harder to complete than they anticipated. When I got their feedback, it was clear to me that they were more empathetic and compassionate."

Ponter had three main goals: to create empathy; to help students understand the importance of mental health in overall health; and to increase awareness of biases, stigmas, and difficulties people with these conditions experience.

"This project reinforced my desire to work in health promotion and primary care," she said. "Effective behavioral health interventions to address the high rate of risk factors that contribute to the onset of chronic conditions, like diabetes and heart disease, are crucial in preventing future disease development."

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to report illegal transport and release of live wild hogs.

A young man with a beard, wearing a maroon shirt, an orange safety vest, blue jeans, and a camouflage cap, stands in a forest. He is holding a handheld GPS device with a screen showing a map. A compass is attached to his belt. The background is a dense forest with sunlight filtering through the trees.

The WOODS Go WIRELESS

Geospatial Technologies
Change Forestry Capabilities

Adam Lindsey, a forestry student from Hattiesburg, Mississippi, uses a GPS unit to record the location of an inventory plot.

From maps and compasses to laptop computers, modern mapping technologies have changed the way foresters work.

MSU forestry majors still learn to navigate the woods with maps and compasses in their summer field sessions. However, the geographic information system (GIS) and global positioning system (GPS) skills they learn open doors for them in the industry.

Dr. David Evans, Sharp Professor of Forestry in the College of Forest Resources, discussed how new technologies have changed the field.

“When I was in graduate school, we didn’t have GPS,” Evans said. “All of my original field research was done using maps and compasses. GIS, or the use of geospatial data sets for analysis, was in its infancy; we relied on aerial photos to create maps. GIS didn’t take off until the development of technologies that utilized satellite images, such as NASA’s 1972 Landsat program.”

Suddenly, researchers had access to comprehensive images that covered thousands of square miles. These images, although lower in resolution, were cheaper and taken more frequently than aerial photographs.

“This boom in geospatial data allowed researchers to compare images of the same area from different time periods, to get ideas of changing forest composition and structure,” Evans explained.

Evans first used GPS in his research with the U.S. Forest



John Griffin, a forestry student from Jackson, Mississippi, uses a clinometer to measure tree heights.

“GPS allows us to map boundaries in the field, inspect locations for endangered wildlife, and navigate hard-to-find areas. Further, we can even determine the exact positions of specific trees.”

DR. DAVID EVANS

Service in the early 1990s. Since then, GPS has proved to be a pivotal tool for foresters.

“I obtained a GPS unit and set out to determine how well we could navigate to forest inventory plots,” Evans said. “GPS allows us to map boundaries in the field, inspect locations for endangered wildlife, and navigate hard-to-find areas. Further, we can even determine the exact positions of specific trees.”

Using GPS data, GIS allows scientists to ask large-scale questions about the forests they manage.

“What sort of forestlands are out there? With GIS, we are able to easily answer that question,” Evans said.

Dr. Randy Rousseau, Forest and Wildlife Research Center scientist and Extension Service specialist, uses GIS and GPS in his research on the American chestnut, a tree on the brink of extinction due to the chestnut blight fungus. The technologies allow foresters to study those trees through the years.

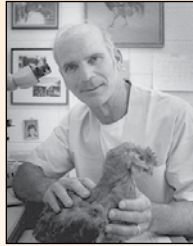
“GPS allows us to locate specific genotypes and individual trees during stand selection,” Rousseau said. “As we look through natural stands in Mississippi for American chestnut trees, we can mark any specimens we find with GPS coordinates.

“Those individuals will be placed in a conservation bank and included in future biotechnology work to keep the species from going extinct,” he explained. “Thus, GPS allows us to go back to those trees for continued use and observation.”

BY SARAH BUCKLEITNER •
PHOTOS BY LINDSAY PACE

A Legacy of Research Excellence

Propels MSU Graduate to Prestigious Gates Cambridge Scholarship



DR. BRUCE GLICK

- Eminent classical immunologist
- MSU Poultry Science professor (1955-1986) and 2014 Mississippi Poultry Hall of Fame honoree
- Pioneer in understanding avian immune systems and development of antibodies



DR. G. TODD PHARR

- Glick-trained graduate student (1984-1988)
- MSU-CVM associate professor in the Department of Basic Sciences (1998-present)
- Immunology professor and avian physiologist



DR. XIU-FEND (HENRY) WAN

- Pharr-trained graduate student (1998-2002)
- MSU-CVM professor and lab director in the Department of Basic Sciences (2009-present)
- Systems biology and influenza expert



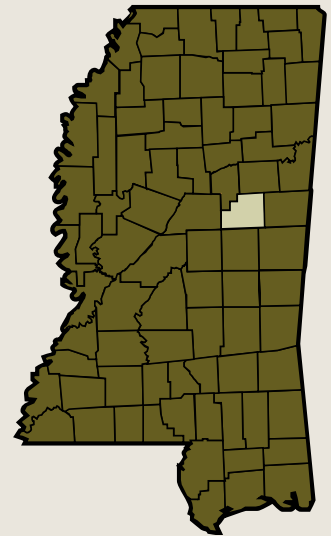
LUCAS FERGUSON

- Wan-trained high school and undergraduate researcher in the College of Agriculture and Life Sciences (2012-2017)
- First MSU recipient of Gates Cambridge Scholarship
- Plans to pursue a career in computational modeling

Ferguson began his research career while a student at the Mississippi School for Math and Science through a shadowing program at the MSU College of Veterinary Medicine. He continued to work in Wan's lab while pursuing a double-major in microbiology and biochemistry. Ferguson was the lead author of three articles published in peer-reviewed international medical journals, two in *Virology* and one in *Journal of Virology*. His work with Wan also led to a 6-week research program at the Jiangsu Academy of Agricultural Sciences in Nanjing, China. As a Gates Cambridge scholar, this 2017 MSU graduate will pursue a Master of Philosophy degree in the Department of Pathology at St. John's College, University of Cambridge, England.



The Strand Theatre, in downtown Louisville, is a historic movie theater that now serves as an art and music venue. (Photo by Kevin Hudson)



1/82: Winston County

MSU in Winston County:

460 Vance Street
Louisville, MS 39339
(662) 773-3091

County seat: Louisville

Population: 18,934

Municipalities: Louisville

Communities: Noxapater and Nanih Waiya

Commodities: cotton, corn, soybean, small grains, cattle, poultry, forestry

Industries: Choctaw Glove and Safety Company, Custom Air, Georgia Pacific Chip Mill, Hewlett Industries, Louisville Industries, Polo Custom Products, Rives and Reynolds Lumber Company, Southern Conveyers and Metalworks, Taylor Machine Works, Temtco Steel, Wells Church Furniture, Winston Plywood and Veneer, Yarbrough Wood Products

Natural resources: wildlife, fishing, hardwood forests, and pine plantations

Attractions: Hamill Spring, Nanih Waiya Wildlife Management Area, Legion State Park, Tombigbee National Forest, Lake Tiak-O-Khata, Sam D. Hamilton National Wildlife Refuge, Nanih Waiya Historical Site, Red Hills, Cotton Gin Festivals, MSU John W. Starr Memorial Forest

History notes: The American Heritage “Big Red” Fire Museum is located in Louisville. It features a collection of restored antique fire equipment and fire engines. The Strand Theatre, in downtown Louisville, is a historic movie theater that now serves as an art and music venue. Louisville native Carl Jackson plays an annual Christmas concert at the theater to raise money for the building restoration.

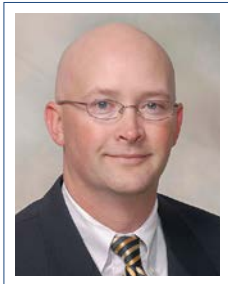
Did you know? Winston County is famous for producing Division I coaches. Mark Hudspeth, former head football coach at the University of Louisiana at Lafayette, is now Mississippi State’s associate head coach. Others include Andy Kennedy, former Ole Miss men’s basketball coach; Van Chancellor, former Ole Miss women’s basketball coach; and Matthew Mitchell, University of Kentucky women’s basketball coach.

“When you visit Winston County, you will see the beauty in the rolling hills with pine plantations, cattle, and some row crops scattered across the landscape. The friendliness of the people and the desire to rebuild a great community after the April 28, 2014, tornado is why this community will prosper for years to come.”

DENNIS REGINELLI, MSU Extension County Coordinator

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

NewsNotes



Strickland

Dr. Bronson Strickland, a wildlife, fisheries, and aquaculture Extension professor, has been named the St. John Family Endowed Professor of Wildlife Management in the College of Forest Resources (CFR). Strickland has led a wide-ranging educational program in applied wildlife science since he joined the

faculty in 2006. In the last 5 years, he has participated in more than 70 workshops, assisting landowners with improved game management. Additionally, he has been awarded more than \$2 million in external grants and has produced 22 peer-reviewed publications. Strickland, who holds a research appointment in the MSU Forest and Wildlife Research Center (FWRC), codirects the Deer Ecology and Management Laboratory, one of the nation's premier deer-management research units. The endowed professorship was established by MSU alumni Drew and Kathy St. John of Madison, Mississippi, who are lifelong wildlife enthusiasts and conservationists. Strickland earned his bachelor's degree in wildlife biology from the University of Georgia and a master's in range and wildlife management from Texas A&M University. He earned a PhD in 2005 in forest resources with a concentration in wildlife ecology from MSU.



Cosgrove

Creating Healthy Indoor Childcare Environments, part of the MSU Extension Healthy Homes Initiative, won national and regional awards at the National Extension Association of Family and Consumer Sciences annual meeting. This team effort is headed by project

leader **Susan Cosgrove**, a family resource management agent based in Newton County. The team award also recognized Dr. David Buys, Extension state health specialist and researcher in the Mississippi Agricultural and Forestry Experiment Station; county Extension agents Lanette Crocker of Wayne County, Brooke Knight of Jones County, and Patty Swearingen of Lauderdale County; and Jessica Heap, childcare licensure official with the Mississippi State Department of Health (MSDH). The Childcare Environments program is a workshop series that offers training to childcare providers and continuing education credit required for licensure. Extension and

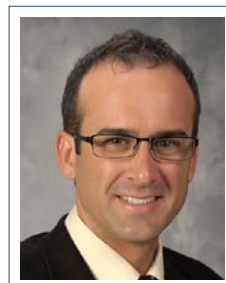
the MSDH Office of Childcare Licensure sponsor the series. These workshops teach early-childhood teachers and center directors to better provide safe and clean environments for young children.



Seale

Dr. Dan Seale is the inaugural James R. Moreton Fellow in Sustainable Bioproducts in the College of Forest Resources. This endowed position was established by Moreton, a 1956 mechanical engineering alumnus. After a career in banking as founder and CEO of First Federal Savings and Loan, Moreton

moved into the industrial access mat business. Access mats are used to provide temporary roadways and work platforms during construction of powerlines, roads, bridges, pipelines, and oil fields. Seale has extensively researched methods of testing mat timbers and billets, including quantifying mat strength and stiffness and extending mat longevity. Support from the Moreton family will further enhance this work. Seale also serves as the Warren S. Thompson Professor of Wood Science and Technology. He earned bachelor's and master's degrees in agricultural economics from MSU, followed by a PhD in applied economics from Clemson University.

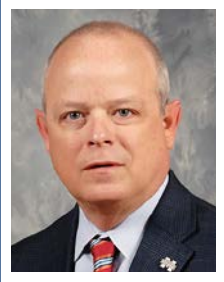


King

Dr. Jonas King, an assistant professor in the Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, is one of seven national recipients of the second annual New Innovator in Food and Agriculture Research Award from the Foundation for Food and Agriculture Research. King's

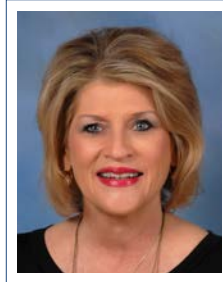
research seeks to develop new nucleic-acid-based technologies to detect and identify insect pests and viral pathogens that pose threats to food security and forest health. King conducts research in the Mississippi Agricultural and Forestry Experiment Station (MAFES) and teaches courses in the MSU College of Agriculture and Life Sciences (CALs). The new innovator program supports promising scientists who demonstrate a commitment not only as food and agricultural innovators, but also as student mentors. King earned bachelor's and master's

degrees from the University of Mississippi and a PhD from Vanderbilt University. Before joining MSU in 2015, he served as a postdoctoral fellow at the Johns Hopkins Bloomberg School of Public Health and at the USDA Foreign Disease-Weed Science Research Unit.

**Evans**

Dr. Marion W. "Will" Evans, head of the Department of Food Science, Nutrition, and Health Promotion, received the Sarah Mazelis Award for outstanding performance by a health-education practitioner at the American Public Health Association annual meeting. Evans, who also was recently named a Fellow of the Southeastern Conference Academic Leadership Development Program, developed a new graduate certificate program in clinical health promotion and wellness coaching, pending approval by the Mississippi Board of Trustees of State Institutions of Higher Learning. Evans is a master-certified health-education specialist and a certified wellness practitioner. He earned his bachelor's degree from Indiana University and his master's and PhD degrees from the University of Alabama. He received a doctor of chiropractic degree from Logan University. Evans previously served as executive vice president and provost of the University of Western States

in Portland, Oregon; dean of academics at the U.S. Sports Academy in Alabama; and director of wellness initiatives at Parker University in Dallas, Texas. Evans served as a private chiropractor in Alabama for 17 years, providing health education to improve the lives of community members and spearheading an effort to enact nonsmoking regulations.

**Webb**

Anita Webb, Scott County coordinator for MSU Extension, received the 2017 Distinguished Service Award from the National Association of County Agriculture Agents. This award is given to agents who have more than 10 years of service in Cooperative Extension and have exhibited excellence in the field of Extension education. Webb has served 28 years with MSU Extension, working in the 4-H, agriculture, and family and consumer science areas. Her background in farming and conservation/resource management serves her well as she works with farmers, landowners, and other clients in the county. Webb works closely with forestry, Healthy Homes, family-resource management, leadership development, and youth programs. She was instrumental in establishing the farmers' market in Forest. Webb is president of the Mississippi Association of County Agricultural Agents.



Two MSU faculty members were honored during the Mississippi Board of Trustees of State Institutions of Higher Learning's annual Diversity Awards ceremony. Dr. Linda T. Coats, a professor in the College of Education, and Dr. Brittany S. Moore-Henderson, community outreach veterinarian for the College of Veterinary Medicine, were recognized for their impact in advancing diversity and encouraging understanding and respect. Coats's multicultural educational framework has propelled her research on African American students and teachers, and provided insights to improve classroom teaching to facilitate greater learning from minority students. Known for her strong desire to reach underserved and minority students with information that might lead them to pursue higher education, Moore-Henderson works with the Veterinary Education and Training through Community Outreach program to expose local students to the veterinary field. Pictured are IHL Trustee Shane Hooper (left), DAFVM Vice President Gregory Bohach, Moore-Henderson, Coats, MSU President Mark Keenum, and CVM Dean Kent Hoblet.

DevelopmentCorner



MSU senior architecture students Maxwell J. “Max” Wilson of Spring Hill, Tennessee (left), and Shelby G. Christian of Vancleave, Mississippi, discuss their proposal with Mississippi Forestry Association Executive Vice President J. Tedrick Ratcliff Jr. (Photo by Russ Houston)

Mississippi Forestry Foundation SUPPORTS INNOVATIVE MASS-TIMBER DESIGNS

In December 2017, 18 architecture students in the MSU College of Architecture, Art, and Design presented master plan and building proposals for a forestry and wildlife outreach center in Mississippi’s largest urban natural area.

The student projects were part of MSU assistant professor Jacob A. “Jake” Gines’s introduction to mass timber studio course supported by the Mississippi Forestry Foundation (MFF), the fundraising arm of the Mississippi Forestry Association.

In 2016, the MFF created the Timber Innovations for Mississippi Buildings Reimagined Fund to assist the School of Architecture in educating students on the value and benefits of building with wood through the design of a proposed state-of-the-art wood structure for public outreach and education.

In 2017, the MFF committed \$50,000 for continued work with the College of Architecture, Art, and Design and the College of Forest Resources (CFR). Of this amount, \$37,500 benefits the School of Architecture’s fourth-year studio course planned for five separate semesters. Another \$12,500 supports the CFR Department of Sustainable Bioproducts’ Advancement Fund, assisting with travel, research, conference participation and hosting, and other activities that further work in the areas of cross-laminated timber and mass-timber-related technology.

As part of Gines’s mass-timber studio course, nine student teams each designed a state-of-the-art forestry and wildlife outreach center to be built on the Fannye Cook Natural Area, a 2,700-acre site along the Pearl River in Flowood. Named for the



MSU senior architecture students Barnes Brown (second from left) of Franklin, Tennessee, and Patrick T. Greene (second from right) of Southaven, Mississippi, received first place for their forestry and wildlife outreach center master plan and building proposal. Congratulating them are Dr. Rubin Shmulsky (left), head of the CFR Department of Sustainable Bioproducts; Jacob Gines (center); and Ratcliff. (Photo by Allison Matthews)

late Mississippi pioneer conservationist and scientist, the natural area is owned by nonprofit Wildlife Mississippi.

In their project proposals, students were required to use mass-timber building technologies as the primary structural system. Water management, energy and forestry conservation, and promotion of physical wellness in terms of outdoor activity also were top design priorities.

MFA Executive Vice President J. Tedrick Ratcliff Jr. thanked the class of students for working together on a project that will help promote mass timber as a viable option for construction in Mississippi and enhance the value of forests and forest products to our state.

Gines praised the students for putting in a tremendous amount of work for the project focused on mass timber as a renewable, locally sourced construction material.

“The School of Architecture is proud to be at the forefront of construction education,” Gines said. “We want to be leaders of mass timber in Mississippi, and I believe that starts here at Mississippi State University. We are thankful for the support of the Mississippi Forestry Foundation in providing funding for this architecture studio and being advocates for the wonderful work our students have done and will continue to do.”

To learn more about supporting student projects like this, contact Jeff Little with the MSU Foundation at (662) 325-8151 or jlittle@foundation.msstate.edu.

BY SASHA STEINBERG

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The university's Guide to Giving and Real Estate Guide to Giving are available at <http://www.msufoundation.com>.



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MSU officials met with USDA Agricultural Research Service (ARS) representatives, including ARS Administrator Chavonda Jacobs-Young. Collaboration with scientists at federal agencies, such as USDA-ARS, leverages the resources of MSU and its federal partners in ways that advance shared priorities. Pictured are Vice President David Shaw (left), MSU Office of Research and Economic Development; Ellen Harris, ARS Southeast associate area director; Simon Liu, ARS associate administrator; MSU President Mark Keenum; Jacobs-Young; Dr. Deborah Brennan, ARS Southeast area director; Dr. Sharon Drumm, ARS chief of staff; Archie Tucker, ARS Southeast associate area director; and Vice President Greg Bohach, MSU Division of Agriculture, Forestry, and Veterinary Medicine. (Photo by Megan Bean)

