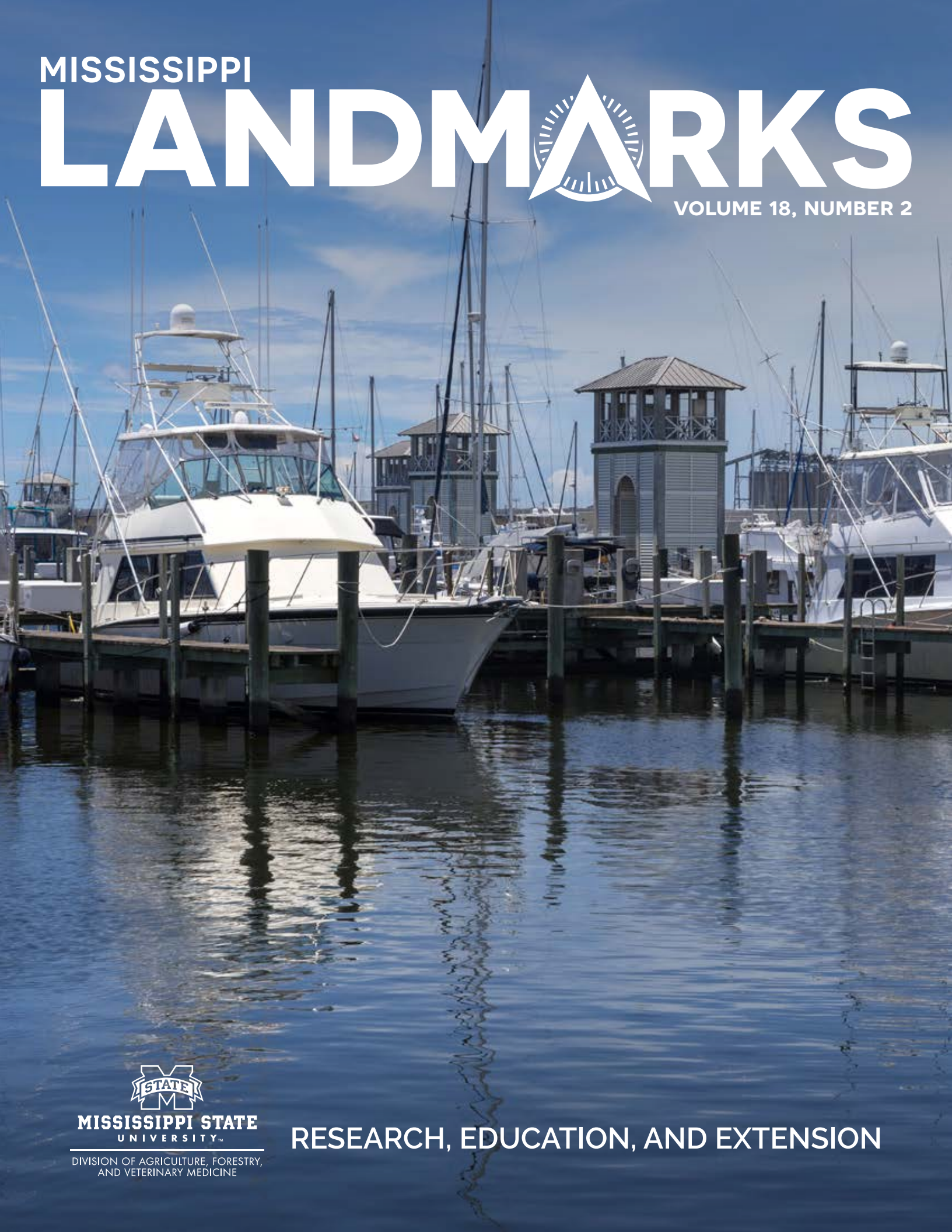


MISSISSIPPI

# LANDMARKS

VOLUME 18, NUMBER 2



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## VICE PRESIDENT'S LETTER

A new academic year has our campus buzzing with activity and excitement. The Division of Agriculture, Forestry, and Veterinary Medicine is no different, but the energy and progress in DAFVM and at all our facilities across the state is constant in all seasons.

This summer, MSU hosted high-ranking officials with the USDA Agricultural Research Service to discuss the 3-year Advancing Agricultural Research through High-Performance Computing project. This partnership will advance precision agriculture using unmanned aerial systems data to help growers improve crop production.

It is powered by the USDA supercomputer "Atlas," which is housed at the MSU High Performance Computing Collaboratory. The MSU Geosystems Research Institute makes this collaboration possible. Our faculty and staff helped make these critical meetings successful.

Several DAFVM students participated in the William A. Demmer Scholars Program this summer in the U.S. capital. They interned with agencies and nongovernmental organizations such as the U.S. Department of the Interior, U.S. Forest Service, and National Fish and Wildlife Foundation. They also took courses in natural-resources policy and visited with policymakers. I had the privilege of visiting with these students in Washington, D.C., in July.

I also was honored to take part in the Farm Foundation Round Table, a discussion forum for industry, government, and university agricultural leaders. It reminded me of the dynamic nature of our industries and how we must wisely focus on education, research, and outreach relevant to the future.

For the last 2 years, Mississippi has faced constant volatility as a result of the COVID-19 pandemic. In response, DAFVM established an interdisciplinary collective known as the Food and Agriculture Collaboratory for Transforming Supply (page 18). Our mission is to improve the resiliency and efficiency of supply chains and mitigate future disruptions.

Meeting future challenges will rely largely on continued strong investment in research and Extension (page 4). DAFVM continues to lead in research investment, as MSU ranks in the top 15 nationally in agricultural and natural-resource research. This commitment must continue for our faculty to maintain the strength of agriculture, forestry, and veterinary medicine.

Agricultural industries must constantly adapt, which makes it imperative that universities constantly assess what we teach and research. In the coming year, MSU will engage in numerous discussions about the future and what we should look like in 2030 and beyond. It's going to be exciting.

Thank you for your continued interest in everything we do.

KEITH H. COBLE  
Vice President

## CONTENTS

Volume 18 • Number 2 • October 2022



4 Investment in  
Agricultural Research  
and Extension Pays Big  
Dividends

7 Telehealth Access  
Vital for Healthy  
Mississippians

8 Fighting Hunger: MSU  
Research, Community  
Efforts Strive to Ease  
Food Insecurity

10 Studies Address  
Overfishing of  
Important Sport Fish

13 Fertilizing Wisely:  
MAFES Researchers Seek  
to Improve Fertilizer  
Efficiency

14 Vulture Culture:  
Understanding Vulture  
Habitat Can Prevent  
Aviation Mishaps

16 Protecting Pollinators  
One Plant at a Time

18 Addressing Supply Chain  
Problems Begins with  
FACTS

21 Rapid COVID-19  
Antibody Test Under  
Evaluation by FDA

22 Innovative Approach  
Uses Drones to Collect  
Insect Samples

24 Protecting a Vital  
Building Material,  
Promoting a Timber  
Industry

26 DAFVM Honors Alumni  
of the Year

27 1/82: Simpson County

28 News Notes

30 Scholarship Named for  
Mississippi State's Jolly  
Maroon Giant

ON THE COVER

Boats such as these vessels at the Gulfport Small Craft Harbor contributed to overfishing of the greater amberjack in the Gulf of Mexico. MSU is involved in a study to determine the current population of the popular sportfish (see article on page 10). (Photo by Kevin Hudson)





# Investment in Agricultural Research and Extension Pays Big Dividends

Water management and conservation are major components of maintaining the sustainability and profitability of Mississippi agriculture. Dr. Beth Baker's work with the REACH program is helping ensure wise stewardship of natural resources. (Photo by Michaela Parker)

“Mississippi State has the best researchers and Extension program in the U.S. directly addressing the growers’ needs to make them more profitable.”

DR. DENNIS REGINELLI

It is not always easy to see the results of money allocated to research and outreach, but Mississippi’s agricultural industry can look back to some major milestones and ahead to significant efforts when quantifying the value of ag investments.

Before boll weevils were eradicated in 2009, Mississippi cotton farmers spent millions of dollars a year to control them, but the pests still caused yield losses in excess of 5 percent in some years. After the eradication program began in 1997, the state invested millions to combat boll weevils, but that money spent on research and Extension efforts still pays off annually to Mississippi cotton producers.

For decades, soybean production in Mississippi was an afterthought, with the crop planted on the poorest soils and scarcely managed. In 1998, the average soybean yield across the state was just 24 bushels per acre. MSU researchers and specialists stepped in with data-backed recommendations; by 2016, soybean yields doubled to 48 bushels per acre on average. Today, Mississippi’s average per-acre soybean yield—54 bushels—is comparable to harvest productivity in the Midwest.

But MSU researchers and specialists are not content to rest on those noteworthy successes.

Today, the MSU Division of Agriculture, Forestry, and Veterinary Medicine (DAFVM) continues to lead the way in investing in agriculture. MSU ranks 14th in agricultural research and 13th in natural resource and conservation research.

But not every organization places the same priority on agricultural research and Extension that MSU does.

The U.S. Department of Agriculture Economic Research Service reports that world agricultural growth output is at its slowest since the 1960s. Although the United States led the way in agricultural research and development investment for decades, the nation’s public spending in this vital area now lags behind Brazil, India, and China.

Dr. Dennis Reginelli, executive director of the Mississippi Soybean Promotion Board, said his organization is investing \$1.7 million in Extension programs and Mississippi Agricultural and Forestry Experiment Station (MAFES) research at MSU this year from funds generated by checkoff dollars collected from soybean growers.

“This money is invested in ways to make soybean growers profitable and sustainable,” Reginelli said. “Mississippi State has the experts in research, and we come up with goals and critical areas for research.”

Reginelli said the laboratory work, field studies, and Extension efforts are each vital in helping growers stay up to date on the best practices to keep them economically competitive and environmentally sustainable.

“Mississippi State has the best researchers and Extension program in the U.S. directly addressing the growers’ needs to make them more profitable,” Reginelli said.

Water management is a primary issue of the day in modern agriculture worldwide. Mississippi producers are not as water limited as those in other parts of the country, but the resource must still be used wisely, especially the Mississippi River Valley alluvial aquifer, which is used to irrigate most of the Delta.

The Mississippi Water Resources Research Institute, which is based at MSU, supports research efforts by leveraging appropriated and competitive grant funds to find science-based solutions to pressing water issues.

“By securing this funding, we can work with scientists across the state and region to increase our stewardship of natural resources while improving yield and net returns for producers,” said Dr. Jason Krutz, director of the institute. “We are advancing the use of available technologies to improve water quality and quantity for the long-term preservation of the alluvial aquifer.”

Krutz said the institute’s charge to address state and regional water problems and to train the next generation of scientists and engineers allows the team to work with a variety of partners.

Dr. Drew Gholson, MAFES scientist, coordinator for the National Center for Alluvial Aquifer Research in Stoneville, and an Extension irrigation specialist at the MSU Delta Research and Extension Center, is one such partner. Gholson coordinates the Row-crop Irrigation Science and Extension Research (RISER) program.

“We are seeing significant savings when adding scheduling to irrigation,” Gholson said. “Every day we hold off irrigation gives us the potential to catch a free rainfall.”

RISER works with about 35 growers at a time in a 3-year process to encourage adoption of proven conservation practices. Year one is spent installing soil-moisture sensors, with Extension personnel providing data interpretation and suggesting the best water management choices for growers.



Mississippi State University has a long history of conducting research that has kept the state’s agricultural industries strong.

“We are advancing the use of available technologies to improve water quality and quantity for the long-term preservation of the alluvial aquifer.”

DR. JASON KRUTZ



Dr. Drew Gholson, coordinator of the National Center for Alluvial Aquifer Research, helps producers save water and money with his research and Extension programs to improve irrigation techniques. (Photo by Kevin Hudson)

“In year two, growers start to look at their own data and make their own decisions with Extension input,” Gholson. “By year three, their understanding of the sensors and their trust in them is way up.”

Gholson said their end goal is to encourage widespread adoption of soil-moisture sensors as a crop and irrigation management tool.

“Mississippi is one of the highest rated states for soil-moisture sensor adoption,” he said. “Irrigation efficiency has the long-term impact of preserving the alluvial aquifer.”

Reginelli said those who have adopted the practices of the RISER program have reduced their water needs by 21 percent and improved water efficiency by 36 percent.

“Producers basically made \$13 an acre profit by making these management changes,” he said.

Another example of long-term, significant investment in agricultural research is Research and Education to Advance Conservation and Habitat (REACH), a program focused on documenting the wise stewardship of Mississippi’s natural resources.

“The challenge of the future will be maintaining or enhancing agricultural production while protecting our natural resources such as soil, water, and habitat for biodiversity, as well as mitigating climate change,” said Dr. Beth Baker, the assistant Extension professor who leads the REACH program.

REACH is funded through a variety of state and federal sources with the goal of providing education, training, and on-farm research to provide demonstrations of the benefits of natural resource stewardship in working landscapes. Private land conservation has always been important, Baker said, but how stewardship is incorporated into production systems will continue to evolve as society finds ways to place economic value on ecosystem services.

“Stewardship and conservation practices that offer solutions to emerging resource concerns, especially if input costs can be reduced, are being seen as opportunities and as necessities by some producers and landowners, alongside maintaining productivity and profitability,” Baker said.

DAFVM Vice President Keith Coble said research often makes a difference when productivity slows.

“These stories make me proud of our past service to the state,” Coble said. “Our next generation of scientists continues to work to solve the next problem for our veterinary medicine, forestry, and ag sector.”

BY BONNIE COBLENTZ

# Telehealth Access

Vital for Healthy Mississippians

Mississippi faces substantial gaps in access to traditional health care. While embracing telehealth as a stopgap measure, the state has become a leader in policies related to this digital approach to medical care.

However, access to telehealth services is disproportionately limited due to issues of broadband internet access across the state. Telehealth employs digital technologies such as video and voice conferencing to allow patients to remotely connect with health-care providers.

Scientists in the Mississippi Agricultural and Forestry Experiment Station (MAFES) are investigating a path to telehealth innovations for rural Mississippians.

Dr. Will Davis, MAFES scientist and assistant professor in the Department of Agricultural Economics, leads a study to determine how local broadband access and speed influence the likelihood of people using telehealth services. His research also evaluates how factors such as age, race, gender, education, income, insurance, employment status, and availability of health care influence the use of telehealth. In addition, the team surveyed when and how often people use telehealth.

“While Mississippi doesn’t have the best access to traditional health care, it is one of the best states for telehealth policy laws,” Davis said. “If you live in a place that lacks access to traditional health care, you can use telehealth to supplement your access. In a place like Mississippi, telehealth can mean

the difference between having access to a provider or not. But to access telehealth services, one of the major components required is broadband or high-speed internet, and Mississippi has low broadband access, which makes it challenging for people to use this service.”

Researchers first conducted an online survey of citizens representative of the entire state. They also used phone interviews to reach those without broadband access.

Davis’s goal is to provide important data for medical providers, researchers, and policymakers in Mississippi who want to increase health-care access through telehealth. He said he plans to expand this research beyond Mississippi once his data analysis is complete.

“Broadband has become more popular since the start of the pandemic, so understanding basic concepts of how people access broadband will help build a foundation of knowledge to help Mississippians,” Davis said. “Broadband can affect many different facets of life, and, if Mississippians can gain adequate access to it, then broadband will positively affect people far beyond telehealth services.”

This research is sponsored by the University of Mississippi Medical Center and the National Institute for General Medical Sciences.

BY GRACE JONES • PHOTO BY DAVID AMMON



“In a place like Mississippi, telehealth can mean the difference between having access to a provider or not...Mississippi has low broadband access, which makes it challenging for people to use this service.”

DR. WILL DAVIS



# Fighting Hunger

MSU Research, Community Efforts Strive to Ease Food Insecurity

For many Mississippians, balanced, nutritious meals are hard to come by.

While people often associate food insecurity with being poor, that is not necessarily the case, said Dr. Kenya Cistrunk, Mississippi State University associate professor of social work.

“If I live in a food desert and I have money, there still might be a possibility that I’m food insecure because I live in a rural community that doesn’t have a grocery store,” Cistrunk said. “So it’s not just about having money; it’s about having the access.”

According to the U.S. Department of Agriculture, food deserts exist when rural residents must travel more than 10 miles to a grocery store, urban residents must travel more

than 1 mile to a grocery store, 20 percent or more of residents live at or below the federal poverty level, and gas stations and convenience stores are numerous. Citizens who live in the food deserts throughout the state have fewer nutritious food options, increasing their probability of chronic health conditions.

*The Hungriest State*, a four-part documentary series by the MSU Television Center, examines the issue of food insecurity in Mississippi and how residents in various communities have responded.

The series highlights the loss of a Clarksdale full-service grocery store, childhood nutrition during the pandemic, nutrition and the aging population, and the role of Mississippi’s fishing industry in the local food supply. The series also addresses the role of supply-chain issues in worsening food insecurity, which is discussed in this issue of *Mississippi LandMarks*.

“In Mississippi, we have many examples of how community members have been instrumental in addressing [food insecurity] issues that have plagued them for years,” Cistrunk said. “They’ve figured out how to collaborate and tap into their best resources.”

The MSU Extension Service is a major source of these collaborations and resources. Specialists and agents offer resources and programs aimed at improving the state’s health problems.

Alexis Hamilton, who works with the Advancing, Inspiring, Motivating for Community Health through Extension program, has helped establish a ride-share service and grocery

The Head Start program in Greenville was one of many organizations statewide that sprang into action to deliver meals to students in virtual school during the pandemic. Head Start chefs Iris Wright and Betty Venson, who got their ServSafe certification with the help of Extension training, helped deliver food. (Photo by Kevin Hudson)

“Extension has professionals to speak to every need of Mississippians. Extension offers programs and provides resources to help all Mississippians live healthy lifestyles. Our AIM for CHangE program is a prime example.”

DR. DAVID BUYS

ordering and pick-up service. Both help residents gain access to nutritious groceries.

Mari Alyce Earnest, an Extension agent in Quitman County, helped form a committee to establish a local food pantry through the Memphis-based Mid-South Food Bank. This service provides items such as canned goods, frozen meat, and peanut butter to nearly half the county’s population 4 days a month.

“Extension has professionals to speak to every need of Mississippians,” said Dr. David Buys, Extension health specialist and associate professor in the Department of Food Science, Nutrition, and Health Promotion. “Extension offers programs and provides resources to help all Mississippians live healthy lifestyles. Our AIM for CHangE program is a prime example, forming coalitions with local entities to improve access to healthier foods and provide opportunities for physical activity. There is also an Extension office within 30 minutes of every Mississippian, where they can go for information and advice about nutrition and the local resources that can improve their lives.”

Dr. Nicole Reeder and Dr. Mandy Conrad, both in the MSU College of Agriculture and Life Sciences Department of Food Science, Nutrition, and Health Promotion, have studied the effects of food insecurity on overall health and concluded that addressing the issue involves more than simply providing access to nutritious food. There is increasing evidence that food deserts negatively impact mental health, as well as physical health, said Reeder, a registered dietitian.

“Food-insecure adults are more likely to experience anxiety and depression, and food-insecure children are more likely to experience behavioral problems,” she said. “My hope is that this work helps spur new community partnerships and resource allocation in Mississippi to bring mental health services to individuals struggling with food insecurity.”

Conrad wants to provide a better understanding of risk factors specific to food insecurity and how to increase awareness and use of food access resources.

“We must understand the resources from the perspective of those who need them and know who is at risk and in need of learning about the resources,” said Conrad, a nutrition instructor and director of the Didactic Program in Dietetics.

To view *The Hungriest State*, visit the MSU TV Center website at <https://films.msstate.edu>.

The series will also air on Farmweek, a weekly television program produced by the Office of Agricultural Communications (OAC) for the Extension Service that airs on the RFD-TV and Mississippi Public Broadcasting networks. OAC news writers also supported the documentary series through a series of reports in state media.

BY SUSAN COLLINS-SMITH

# Studies Address Overfishing of Important Sport Fish

BY SUSAN COLLINS SMITH • PHOTO BY KEVIN HUDSON

Soon, researchers will know where and how many greater amberjacks live in the Gulf of Mexico and southern Atlantic Ocean.

In the Gulf of Mexico, these vigorous sport fish have been depleted because of overfishing despite a management plan aimed at increasing their numbers. MSU is part of a team of 13 institutions across eight states using new techniques to help resource managers better monitor and manage the population and movements of the commercially and recreationally important species.

“To sustainably manage any resource, you have to know the status of that resource,” said Dr. Marcus Drymon, MSU Extension Service marine fisheries specialist and member of the 18-person assessment team. “It’s the same basic idea as taking inventory of a forest. The difference is fish move around, and they are a little harder to count.”

In 2020, Congress appropriated \$9 million for the National Sea Grant College Program and the National Oceanic and Atmospheric Administration to assemble an independent team and implement this study.

“Any time you add new data sources and use new assessment techniques, you’ll get a better idea of the stock,” said Drymon, who is also a researcher and an assistant professor in the MSU Department of Wildlife, Fisheries, and Aquaculture based at the Coastal Research and Extension Center in Biloxi. “This new way of doing things will revolutionize how we assess fish stocks.”

This is the second large-scale, single-species count funded by Sea Grant. A similar team conducted a population study on red snappers, which serves as a blueprint for the greater amberjack count.

Scientists use fishermen survey data, hydroacoustics, underwater cameras, remotely operated vehicles, and environmental DNA to determine the abundance, movements, and habitat distribution of the fish.

The team relies on the local ecological knowledge of commercial and recreational fishermen. An online survey, which includes a web-based mapping tool, allows fishermen to show where amberjacks are commonly located. This information will be used to help design a sampling plan. Some fish will be tagged with reward tags worth \$250 to encourage fishermen to report catching these fish.

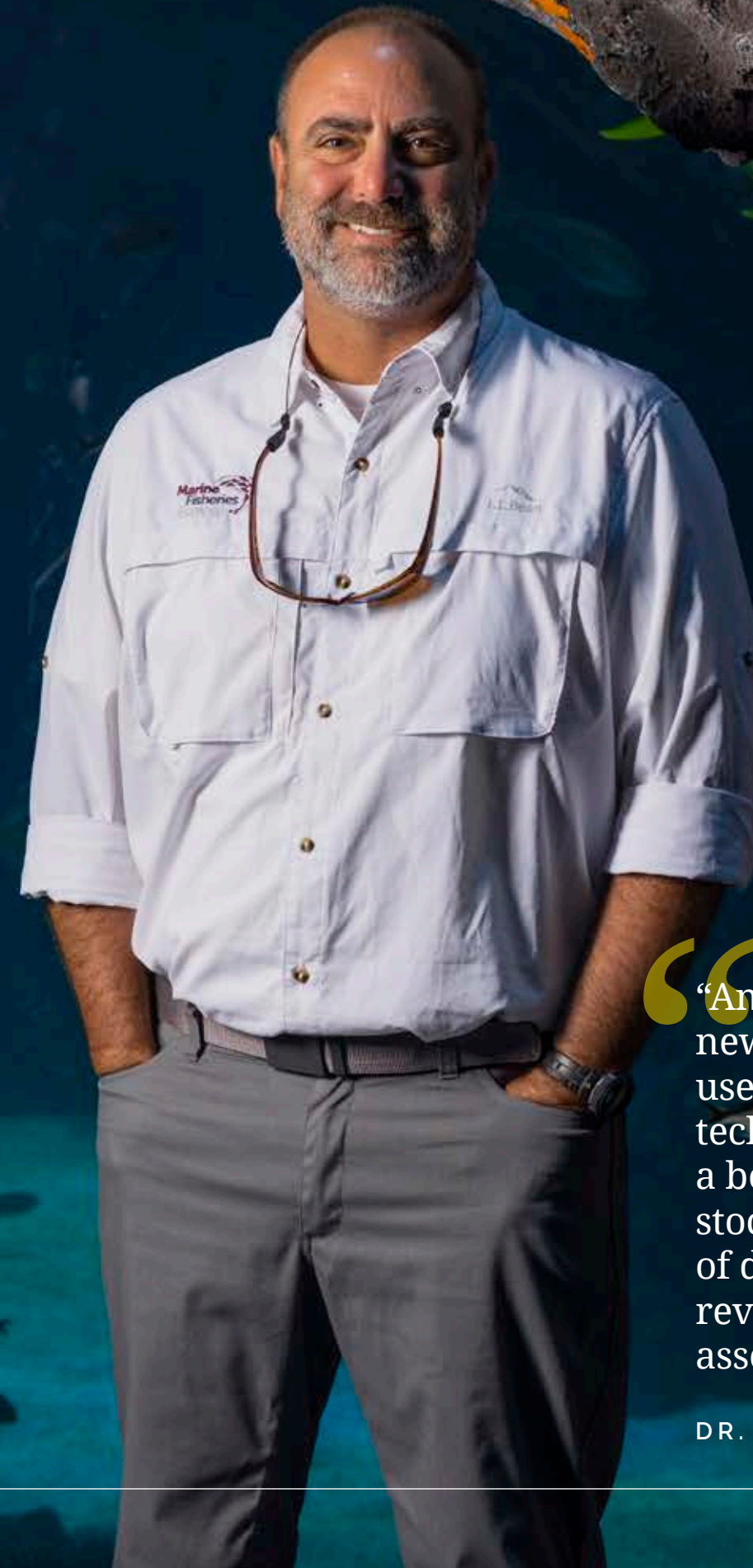
“Our use of fishermen is the most interesting part of the study design,” Drymon said. “There is so much area to target, but if we know where amberjack are more likely to occur, we can target those areas, which is a more efficient use of time, money, and effort.”

“There are mathematical techniques we can use to estimate population size based on the information we collect,” he said. “This is very much a group effort, and we need and appreciate the assistance of recreational and commercial fishermen.”

In May 2022, the team reached a milestone in the 2-year study initiated in 2021.

“We just did a calibration cruise where we deployed five or six different gear types in an area and then compared the amberjack density from each different gear type,” Drymon said. “We don’t use every gear type in every area, so this calibration cruise is the first step towards ensuring we can add estimates from each region.”

Correctly identifying greater amberjack is a challenge, which researchers plan to overcome by using environmental DNA to determine if these fish are in an area. This phase of the



“Any time you add new data sources and use new assessment techniques, you’ll get a better idea of the stock. This new way of doing things will revolutionize how we assess fish stocks.”

DR. MARCUS DRYMON



study also helps researchers test the viability of using e-DNA for future population studies.

“Identifying a red snapper is easy,” Drymon said. “There is no other fish that looks like that. But there are four different species of amberjack that look very similar. For some of them, it is very difficult to tell them apart by looking at a picture.”

E-DNA is used sparingly because of the expense and tedious methods required.

“Looking for e-DNA in the ocean is like looking for a needle in a haystack, and it’s expensive technology,” Drymon said. “It requires a very, very skilled technique and an ultra, ultra clean environment. When we do use this tool, we spend a day and a half bleaching the boat so that the e-DNA results aren’t contaminated by any amberjack that were previously on the boat.”

The team will get much more than just an abundance estimate of greater amberjack, said project leader Dr. Sean Powers, director of the School of Marine and Environmental Sciences at the University of South Alabama.

“We’re going to try to figure out how we can apply the latest technology to improve our ability to monitor fish populations in the future,” Powers said. “We will look at which technologies are the most promising and which technologies work the best.”

The research team selected by the Mississippi-Alabama Sea Grant Consortium includes geneticists, modelers, statisticians, ecologists, and oceanographers from Texas to North Carolina.

# Fertilizing Wisely

## MAFES Researchers Seek to Improve Fertilizer Efficiency

Synthetic fertilizers have been an indispensable agricultural input for more than a century, but the costs of using these vital nutrients continue to rise, in terms of both retail prices and environmental impacts.

To address increasing fertilizer expenses, as well as the impact of nitrogen run-off on rivers, streams, and oceans, Mississippi Agricultural and Forestry Experiment Station (MAFES) scientists are searching for methods to apply plant nutrients in the most precise, cost-efficient, and ecologically responsible manner.

Dr. Jagmandeep Dhillon and Dr. Amelia Fox, MAFES scientists in the Department of Plant and Soil Sciences, are exploring more efficient management of nitrogen application in corn production using remote-sensor technology.

Since the 1970s, most producers have used the “yield-goal method,” a one-size-fits-all application formula. However, this process is subject to mismanagement; about 60 percent of applied nitrogen is lost to the environment.

“Nitrogen is tricky to manage because it is affected by temperature and rainfall changes,” Dhillon said. “Additionally, nitrogen demands vary annually, and even in the same year, variations exist within the same field. To determine a plant’s precise needs, you have to ask the plant, and that is where sensor technology enters the picture.”

The team set up research sites on MAFES stations in Stoneville, Verona, and Brooksville, as well as the R. R. Foil Plant Science Research Center at MSU, to test the sensors on corn planted in diverse soil conditions. They used handheld sensors and an unmanned aerial vehicle to gather data on plant health related to nitrogen needs. Sensors measured the levels of various light waves absorbed and reflected by the plants, which indicate their health status.

“The drone collects five different wavelengths, which we refer to as VNIR (visible-near infrared) light bands,” Fox said. “Because plants absorb both blue and red light for photosynthesis, we can differentiate the health status of plants based on the image returned from the drone.”

Dhillon explained that determining optimum nitrogen rates is not a simple task because of the number of variables affecting crop demand and soil supply.

Examining these variables with high-resolution sensors has allowed the team to propose application models that use nitrogen more efficiently than the methods currently used. From the data collected, they will create algorithms to predict final grain yields and optimum nitrogen rates.

With the cost of fertilizer increasing more than 100 percent over the last year, results from this study will help producers determine where and when to apply nitrogen to reach yield goals while reducing expenses and protecting the environment.



Researchers collect light reflectance data: Camden Oglesby (right), a research associate in the Department of Plant and Soil Sciences, uses a green seeker sensor; Dr. Joey Williams, a former graduate student in that department, uses a crop circle sensor. (Photo Submitted)

BY MEG HENDERSON

# Vulture Culture

## Understanding Vulture Habitat Can Prevent Aviation Mishaps



Adrián Naveda-Rodriguez, a research associate in the Department of Wildlife, Fisheries, and Aquaculture, holds an adult black vulture.

Landfills are usually located on the outskirts, keeping odors and unsightly waste far from more populated areas. While most people keep their distance from dumps, vultures flock to them in search of abundant food.

A vulture's journey to the landfill occasionally takes it through air space also shared by civilian or military aviation, as these facilities are also located on the outskirts. Just one small bird in the wrong place at the wrong time can take down an aircraft, and vultures are relatively large, averaging 5 pounds.

MSU Forest and Wildlife Research Center scientists are exploring vulture habitats to gain a better understanding of the birds' behavior. Dr. Scott Rush, associate professor of wildlife ecology and management, and wildlife, fisheries, and aquaculture major Anna Gamblin have trapped and wing-tagged more than 540 vultures, including 30 with GPS trackers, at the Golden Triangle and Meridian landfills.

Since 2020, Rush's team, which also includes research associate Adrián Naveda-Rodriguez and master's student Jonathan Smith, have studied the birds' patterns of movement and monitored their health by measuring bacterial and blood samples to determine gender and blood chemistry, including lead levels. They recruited citizen scientists to sight and report tagged birds.

Rush explained that the amounts and fluctuations of lead levels in a bird's blood are key to understanding their food sources and activities.

This study, sponsored by the Department of Defense, was scheduled to end in summer 2022, but Rush said he hopes to continue the research as the effects of lead and other contaminants on the birds warrant further study.

"Vultures are the great cleaners of the environment, so we want to know what other chemicals they're being exposed to, where they are picking them up, and how quickly they absorb them," he said.

Although vultures are seen as dirty nuisances, they do important work for the greater ecosystem, Rush added. Roughly 300 vultures visit a landfill each day, devouring nearly 2 pounds of waste per bird.

From a management perspective, understanding the birds' behavior and physiology, as well as their flight patterns, can lead to more informed practices in population control.

"These birds can live 30 years or longer," Rush said. "We need to figure out where and on what scale to control their numbers and whether we could move them instead of eliminating them."

"Our ultimate goal is to save human lives," he added. "By better understanding vultures, we can provide suggestions to the Department of Defense and civilian airport authorities on flight patterns and timing that will allow planes and birds to share the skies."

BY MEG HENDERSON • PHOTOS BY DAVID AMMON



“Our ultimate goal is to save human lives. By better understanding vultures, we can provide suggestions on flight patterns and timing that will allow planes and birds to share the skies.”

DR. SCOTT RUSH



# Protecting Pollinators

## One Plant at a Time

**H**oneybees fly more than 55,000 miles and visit about 2 million flowers to make 1 pound of honey. However, not all flowers are nutritionally equal. A Mississippi State scientist is searching for the most beneficial plants for bee pollinators on a large scale.

Dr. Priyadarshini Chakrabarti Basu, assistant professor in the Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, is building a pollen database to catalog the nutrition profiles of more than 100 bee-pollinated North American plants. Her work, in partnership with Dr. Ramesh Sagili of Oregon State University, is funded by a \$500,000 grant from the USDA Agriculture and Food Research Initiative.

“Bee nutrition is a critical part of a thriving agricultural industry,” Basu explained. “When bees are in a state of stress, they need extra nutrition to complete the arduous task of collecting pollen.”

In fall 2021, the team of scientists, including entomology master’s student Lauren Jennings, began collecting pollen throughout the U.S. and Canada. In addition to the core team, Basu and Sagili have recruited more than 50 citizen scientists from both countries to help with collection.

The idea for building the database began with Basu’s interest in the pollination of California’s almond groves. During the harvest in California’s Central Valley, 30 billion bees are shipped to the Golden State over the course of a few weeks in January and February to pollinate enough flowers to create 700 billion almonds.

Because the bees arrive for work in a stressed state, they need extra energy for the task at hand. Planting nutrient-rich supplemental forage near the almond flowers is key



Entomology graduate student Lauren Jennings vacuums pollen from flowers.

to ensuring the bees’ preparedness to pollinate.

“The idea is to have nutritious forages available before and after the almonds bloom,” said Basu, who is also a scientist in the Mississippi Agricultural and Forestry Experiment Station (MAFES). “When bees have access to nutritious pollen and nectar when they arrive and before they are prepped to move to the next crop, they stay healthy and strong.”

Just as a salad and French fries do not have equal nutritional value for humans, not every plant provides equal nutrition for bees. The database will

list nutritional profiles of each plant, comparable to nutrition labels on food packages.

Basu and her team are working with commercial growers and beekeepers, and they are still recruiting citizen scientists to help them create well-informed habitats for bees that work with the natural landscape.

“Optimal nutrition is their first line of defense,” she said.

They have also partnered with the Natural Resources Conservation Service on publicizing the database. Team members are meeting with scientists and other interested parties to share their work in progress. Basu said she hopes to work with local residents to create a database specific to Mississippi.

“We still don’t understand everything about how bees affect the fine balance of the ecosystem,” Basu said. “Think of the other animals, birds, and insects that depend on these plants and their fruits and seeds. Providing extra support to bees will support all of us in the long run.”

BY MEG HENDERSON • PHOTOS BY DOMINIQUE BELCHER

“Think of the other animals, birds, and insects that depend on these plants and their fruits and seeds. Providing extra support to bees will support all of us in the long run.”

DR. PRIYADARSHINI CHAKRABARTI BASU



Dr. Priyadarshini Chakrabarti Basu collects data for her pollen database.

# Addressing Supply Chain Problems

Begins with FACTS

BY NATHAN GREGORY • PHOTO BY KEVIN HUDSON

Supply chain disruptions brought on by COVID-19 have lingered well into 2022, and meeting these challenges takes coordination among academic disciplines, stakeholders, and industry.

“Supply chains in Mississippi are so volatile for many reasons,” said Dr. Wes Schilling, a professor in the MSU Department of Food Science, Nutrition, and Health Promotion and interim head of the Department of Poultry Science.

“It is hard to get equipment made or have construction done due to lack of workers and prices,” he explained. “It is hard to produce products in current facilities due to trouble finding workers and limited to no availability of common food ingredients such as corn starch. There is a shortage of truckers. This makes it challenging to make food products and ship them.”

A new, interdisciplinary collaborative at Mississippi State is working to identify potential research areas dedicated to improving the resiliency and efficiency of supply chains.

Food and Agriculture Collaboratory for Transforming Supply (FACTS) is a group focused on multiple supply chain efforts. Among these initiatives are evaluating alternative supply chain structures to improve efficiency and facilitating new food entrepreneur teaching and outreach efforts.

Schilling serves as FACTS cochair, along with Dr. Kalyn Coatney, an associate professor in the Department of Agricultural Economics. Schilling and Coatney are scientists in the Mississippi Agricultural and Forestry Experiment Station (MAFES).

“The FACTS mission is to foster and leverage multidisciplinary partnerships to tackle the most pressing food, forestry, and ag-based production and distribution challenges we face today and into the future,” Coatney said. “Our group is dedicated to developing academic collaborations across disciplines and universities, sharing skills and tools with stakeholders, and building a highly skilled rural workforce through workshops and short courses.”

Schilling’s role is to help facilitate dialogue among faculty members and explore potential research opportunities that contribute to strengthening the food supply chain and solving related challenges. His background is in food science, specifically protein chemistry with an applied focus on meat products.

“One area that our lab works on relates to use of ingredients and technologies to lengthen the shelf-life of foods so that they last longer throughout the supply chain,” Schilling said. “My food science colleagues at MSU and I are well positioned to help develop methodologies to make shelf-stable food products that consumers can store for longer periods of time before they spoil due to bacterial growth and chemical reactions.

“Since food science is all of the science related to taking commodities from the farmers gate to the consumer’s table,” he added, “we are able to work with all other disciplines in agriculture to provide the safest and highest possible food quality.”

In addressing supply chain needs, the department also works extensively with the largest food sector in Mississippi: the broiler chicken industry.

“Along with others in many disciplines, we train students who can work on the meat side of the poultry industry to solve problems and make safe, high-quality products under the real-world conditions that they face,” Schilling said. “There is a shortage of food-science students in Mississippi and other states, so there are more jobs available than there are food scientists to fill those jobs. That is another challenge with supply chains, but we are looking to use research, sustainability, and workforce development to help the food industry grow and be as robust as possible.”

MSU researchers are also seeking solutions to supply-chain problems in the sector of specialty crops and small-scale agricultural production through emerging technologies. One of these is blockchain, a digital system that allows growers, distributors, and buyers to track a product’s journey easily and quickly throughout the supply chain.

MSU Extension agricultural economists Dr. Elizabeth Canales and Dr. Alba Collart have studied the adoption of

“Our group is dedicated to developing academic collaborations across disciplines and universities, sharing skills and tools with stakeholders, and building a highly skilled rural workforce through workshops and short courses.”

DR. KALYN COATNEY

blockchain applications in the food industry and explored how the technology could address some of the challenges in the supply chain for fresh produce. They examined food safety, supply-chain transparency, food loss and waste, and the need for better real-time, end-to-end traceability systems.

Canales and Collart are also part of the Open Market Consortium for Specialty Crops, a project funded by the Foundation for Food and Agriculture Research (FFAR). The goal of this project is to create market opportunities for specialty crops through an open-source, supply-demand framework that uses blockchain technology and smart contracts.

“The benefit of a blockchain platform is that it allows information to be shared between individuals in the supply chain,” Canales said. “It’s visible to the members of the network, which improves traceability efforts and transparency. We are researching farmers’ uses and preferences for technologies and online marketing platforms and their willingness to adopt this blockchain-based platform. The purpose is to make technologies accessible to small- and medium-scale producers.”

They also study the level of traceability efforts implemented by produce growers. Traceability allows products to be tracked from the field to the buyer and final consumer via the use of codes that identify products or containers leaving the farm.

“Having systems in place to track a product’s journey by digitizing and sharing that information so it is visible to the members of a supply-chain network—for example, by uploading it to a blockchain-based or other digital platform—is important to improve the efficiency of the supply chain and quickly identify issues when disruptions occur,” Canales said.

“One area that our lab works on relates to use of ingredients and technologies to lengthen the shelf-life of foods so that they last longer throughout the supply chain. My food science colleagues at MSU and I are well positioned to help develop methodologies to make shelf-stable food products that consumers can store for longer periods of time before they spoil due to bacterial growth and chemical reactions.”

DR. WES SCHILLING

Food supply chains are not the only ones being interrupted. All phases of the forestry industry are also experiencing difficulty.

“We are seeing a decline in the logging workforce and an increase in fuel cost pressure on those that remain in the industry,” said Dr. Shaun Tanger, an Extension forestry economist at the Coastal Research and Extension Center and also a member of the FACTS team. “For now, some mills are paying somewhat elevated delivery prices to cover this, but we don’t know how widespread this practice is, nor do we know if it will continue should prices for fuel continue to rise.”

Researchers in the MSU Forest and Wildlife Research Center (FWRC) are studying these issues, including efforts to reduce drive times to the mill to improve profitability in light of high fuel prices.

“We are exploring what closed or posted bridges are causing the largest increases in drive times and how much economic drag that is causing to loggers and the Mississippi economy broadly,” Tanger said. “In some cases, this will allow policy makers and the Mississippi Department of Transportation to seek funding from U.S. Department of Transportation for bridge repair.”

The FWRC is also working with the Mississippi Forestry Association to determine the capacity to expand wood-product markets within the state.

“This project will determine strategies for enticing new investment in the forest products sector in Mississippi and identifying challenges to make investing here more attractive,” Tanger said.

## Rapid COVID-19 Antibody Test Under Evaluation by FDA

“This kit will be extremely useful to determine whether individuals still maintain high levels of protective immunity so that they do not develop asymptomatic infection and transmit SARS-Cov-2 to vulnerable populations.”

DR. KEUN SEOK SEO



CVM researchers Dr. Keun Seok Seo (left), Dr. Nogi Park, and Dr. Joo Youn Park stand next to their test kit.

A n MSU College of Veterinary Medicine (CVM) research team’s patent-pending method for detecting COVID-19 antibodies is currently under evaluation by the Food and Drug Administration.

CVM researchers developed a novel method to rapidly test for COVID-19 neutralizing antibodies, providing an affordable and fast method for testing that differentiates between neutralizing and non-neutralizing antibodies.

The team is led by Dr. Keun Seok Seo, associate professor in the CVM Department of Comparative Biomedical Sciences, and includes Dr. Joo Youn Park, a research professor, and Dr. Nogi Park, a postdoctoral associate. The researchers worked with the MSU Office of Technology Management to file a patent for the invention and licensed the technology nonexclusively to MiCo BioMed USA for commercial use. The product is currently being evaluated by the FDA through clinical trials being conducted at MiCo and MSU.

Seo explained that current commercially available blood tests cannot distinguish between antibodies that neutralize COVID-19 and other nonprotective antibodies, but his test uses an innovative chimeric receptor protein that helps rapidly detect the neutralizing antibodies. The test can provide results in 15 minutes based on samples collected from a finger prick.

“This kit will be extremely useful to determine whether individuals still maintain high levels of protective immunity

so that they do not develop asymptomatic infection and transmit SARS-Cov-2 to vulnerable populations,” Seo said. “This kit also aids in determining when people need a boosting immunization.”

Jeremy Clay, director of the MSU Office of Technology Management, said the innovation has the potential to fill a significant void in the diagnostic testing market.

At MSU, Seo has been key in the university’s COVID-19 response by taking on a leadership role in the team responsible for processing COVID-19 diagnostic tests from the university’s John C. Longest Student Health Center. By processing the tests on campus, the health center’s doctors and nurses were able to deliver more timely results to patients.

The research team was recognized with an Innovation Award at the TechConnect World Innovation Conference and Expo in Washington, D.C.

“This is another great example of technology being developed at MSU that can make an immediate societal impact,” Clay said. “Receiving an Innovation Award from TechConnect is a strong recognition of the promise this invention holds, and we look forward to continuing our efforts to get this technology to market so it can be put to use in the fight against COVID-19.”

BY JAMES CARSKADON • PHOTO BY TOM THOMPSON

“While our drone sampler largely mimics the traditional process, this innovation will make collecting samples more efficient and hopefully increase profitability.”

DR. FRED MUSSER

## Innovative Approach Uses Drones to Collect Insect Samples

On a sweltering summer day 50 years ago, while sweeping soybean fields to collect insects for sampling, high-school student Gene Merkl thought to himself, “There must be an easier way to do this.”

After earning a bachelor’s degree in landscape architecture from MSU in 1977, Merkl worked across the country before becoming the pesticide safety education coordinator for the MSU Extension Service. Now, he is pursuing a master’s degree in entomology in the College of Agriculture and Life Sciences, researching ways to improve insect sampling in the field.

Merkl and his advisor, Dr. Fred Musser, a professor in the Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology and scientist in the Mississippi Agricultural and Forestry Experiment Station (MAFES), hope to ease the arduous task of walking through a field catching insects. Funded by the Mississippi Soybean Promotion Board, Merkl uses drones to collect pests in soybean fields.

After becoming a certified unmanned aerial vehicle pilot, Merkl explored various sampling methods and prototypes.

“A bug-catching drone doesn’t exist, so we created several prototypes of nets with varying weights and suspension mechanisms under the drone,” Merkl said. “We used a spring that is like a door hinge and made it where the net could extend backwards, like an arm, when it flies across a field, which forces insects to be knocked off plants into the net during sample collection.”

Once the sampling method was chosen, the team compared drone-collected samples with common sweep-net samples.

“The benefit of determining the relationship between our drone sampler and the common sweep-net sample is being able to use previous sweep-net-based research to tell farmers when they need to treat their crops based on the number of insects caught with a drone,” Musser said. “While our drone sampler largely mimics the traditional process, this innovation will make collecting samples more efficient and hopefully increase profitability since it can make sampling easier.”

Merkl and Musser plan to get crop consultants to test the technology to determine whether it is efficient and applicable enough to be farm-ready. Having consultants review and adopt this innovative sampling technique will help farmers more quickly and efficiently determine when soybean crops need treatment.

“When I started working at MSU, most of my colleagues had advanced degrees, and I felt it was important to gain the greater scope of understanding that comes with having a graduate degree,” Merkl said. “Pursuing this degree has helped me better relate to my colleagues in ways that I couldn’t before, and I am excited about introducing a new tool that can improve field work and research.”

“I have learned that you are never too old to do anything that you set your mind to,” he said. “I hope my research improves field work efficiency and that it can be built upon in future years. This is new, innovative, and important for farmers and researchers, so I would love for the research to be expanded into more areas.”

BY GRACE JONES • PHOTO BY DAVID AMMON

Gene Merkl uses a specially modified unmanned aerial vehicle to sample insects in the field.

# Protecting a Vital Building Material, Promoting a Timber Industry

From timber bridges in New York City to timber skyscrapers in Philadelphia to Walmart’s new headquarters in Bentonville, Arkansas, mass timber is changing how we think about commercial building design. Construction of U.S. buildings using this engineered wood product has increased threefold since 2019.

Cross-laminated timber (CLT), a type of mass timber, is an alternative to steel and concrete construction for large buildings. Made of prefabricated engineered wood panels, CLT cuts down on construction time, costs, and waste, while reducing a building’s carbon footprint.

Despite its many advantages, CLT does present a challenge, which is the focus of a study by Dr. Beth Stokes, an associate professor in the MSU College of Forest Resources Department of Sustainable Bioproducts.

“Once CLT is sealed in the building’s envelope, it’s protected,” she explained. “We sought to evaluate coatings that could be applied to CLT to protect it from the elements while in transport and while buildings are under construction.”

Stokes and her team in the Forest and Wildlife Research Center evaluated 39 coatings and arrived at a list of five based on optimum water repellency to evaluate outdoors against high heat, humidity, wind, rain, and other factors.

Dr. Gabrielly dos Santos Bobadilha, former sustainable bioproducts postdoctoral associate, examined coated CLT samples for damage including flaking, erosion, checking, cracking, mildew, and color change. She collaborated with a mold expert to test samples for the fungus.

“We found that transparent, water-based, alkyd/acrylic resin performed the best, with mold growth completely prevented and weight loss caused by a common fungus at 1.33 percent,” she said. “While the coating isn’t designed to withstand

long-term decay, it may offer short-term protection during transport, storage, and construction.”

While Bobadilha visually inspected the samples over the course of 3 years, she realized that a predictive computer model might do a better job of determining the service life of commercial coatings.

“We’ve uploaded our visual data into a model that determines how long coatings will last based on damage factors,” she said. “The model, which will increase in accuracy as we include more data, will hopefully be able to estimate the service life of coatings used for CLT.”

Stokes said she is most excited about how this research can help the mass-timber industry grow and improve.

“Eventually, we hope to evaluate new CLT coatings as they’re developed,” she said. “The research also helps better design CLT because you’re figuring out weaknesses. One of our goals is to use this research to help manufacturers improve CLT products.”

Collaborators include Dr. Dercilio Junior “Joe” Verly Lopes, former assistant research professor in sustainable bioproducts, and Emily White, a junior forestry major and undergraduate researcher. Dr. Grant Kirker, research forest products technologist, and Dr. Katie Ohno, research biologist, both with the USDA Forest Service Forest Products Lab; Dr. Mojgan Nejad of Michigan State University; and Dr. Sheikh Ali Ahmed from Linnaeus University in Sweden also contributed to the study.

The research was funded by the Forest Service Forest Products Lab, a U.S. Endowment for Forestry and Communities Grant, and the Forest and Wildlife Research Center.

BY VANESSA BEESON • PHOTO BY DOMINIQUE BELCHER



“Once CLT is sealed in the building’s envelope, it’s protected. We sought to evaluate coatings that could be applied to CLT to protect it from the elements while in transport and while buildings are under construction.”

DR. BETH STOKES

Dr. Gabrielly Bobadilha tests a sample of cross-laminated timber.



College of Agriculture and Life Sciences Associate Dean Darrell Sparks (right) presents the CALS Alumnus of the Year Award to Dan Batson.

## DAFVM Honors Alumni of the Year

The MSU Alumni Association honored its 2022 alumni of the year, including three graduates from colleges in the Division of Agriculture, Forestry, and Veterinary Medicine.

**The College of Agriculture and Life Sciences honored Dan Batson**, who completed bachelor's and master's degrees in ornamental horticulture in 1980 and 1982. Batson is a third-generation Bulldog and horticulturist whose GreenForest Nursery has become a model for green-industry businesses in the country. In 1983, he and his wife, Kathy, established GreenForest in Perkins, and it now comprises 180 acres with 60 full-time employees. In 2008, GreenForest was named the Stone County Mississippi Small Business of the Year. Batson has served on the boards of his local soil and water conservation district, the Stone County School District, and the Bank of Wiggins. He is a past president of the Mississippi Nursery and Landscape Association and the Southern Nursery Association. He was the 2010 Swisher Sweets Mississippi Farmer of the Year and the 2013 *Nursery Management Magazine* Grower of the Year.



College of Forest Resources Dean Wes Burger (right) presents the CFR Alumnus of the Year Award to Curtis Hopkins.

**The College of Forest Resources (CFR) honored Curtis R. Hopkins**, who earned a 1971 bachelor's degree in forestry and a 1973 master's degree in wildlife ecology. As a student, he served as the first president of the MSU student chapter of The Wildlife Society. Hopkins began his career as an assistant ranger and wildlife biologist for the U.S. Forest Service. After completing a PhD at Texas A&M, he joined Ducks Unlimited, where he held various positions before retiring as director of the Southern Region in 2013. Hopkins then became executive secretary for the Southeastern Association of Fish and Wildlife Agencies. He received the association's National Blue-Winged Teal Award, as well as The Wildlife Society's Jim McDonough Award and the Mississippi Wildlife Federation's Conservationist of the Year honor. Hopkins has served advisory roles with CFR and was named the college's Alumni Fellow in 2006.



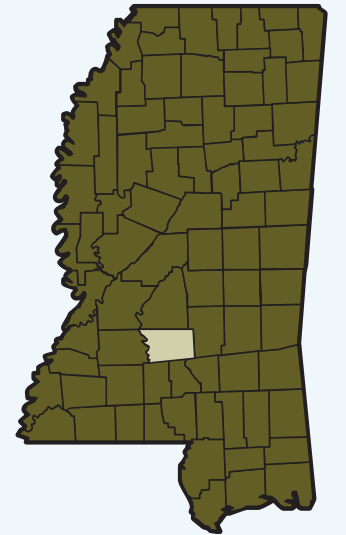
College of Veterinary Medicine Dean Kent Hoblet (right) presents the CVM Alumnus of the Year Award to Dr. Mark Akin.

**The College of Veterinary Medicine (CVM) honored Dr. Mark Akin**, who earned a bachelor's degree in animal science at Mississippi State in 1982 and completed his Doctor of Veterinary Medicine at MSU in 1986. Akin began his career in equine veterinary medicine on the thoroughbred racetracks of Maryland. During that time, he served four Kentucky Derby runners, six Preakness Stakes runners, and five Belmont Stakes runners. He later opened Akin Equine Veterinary Services, an equine ambulatory practice in Collierville, Tennessee. Akin has more than 30 years of experience in equine lameness, dentistry, and sports medicine. He is active in several veterinary and horse organizations. A loyal CVM supporter, Akin was honored as the college's Alumni Fellow in 1995.

BY ROBYN HEARN • PHOTOS BY MEGAN BEAN



The Mississippi State Sanatorium Museum in Magee focuses on one of the most trying times in the state's past: the tuberculosis epidemic. The sanatorium opened in 1918 and closed in 1976. A former staff house at the facility now serves as the museum. (Photo by Michaela Parker)



## 1/82: Simpson County

### MSU in Simpson County:

2785 Simpson Hwy. 49  
Mendenhall, MS 39114  
simpson@ext.msstate.edu  
amanda.tutor.blakeney@msstate.edu

- County seat:** Mendenhall
- Population:** 26,658
- Municipalities:** Mendenhall, Magee, D'Lo, Braxton
- Communities:** Harrisville, Pinola, Martinville, Shivers
- Industries:** agriculture, apiculture, minerals, petroleum, construction, healthcare, manufacturing, education
- Natural resources:** forest, minerals, water
- Attractions:** D'Lo Water Park, McNair Springs, Strong River, Pearl River, Ural Everett Park
- History notes:** Simpson County was organized in 1824, 7 years after Mississippi became a state. It was named for Josiah Simpson, a former Pennsylvanian who lived near Natchez, became a territorial judge, and served as a delegate to the Mississippi Constitutional Convention. At the time of its organization, Simpson County was one of the most attractive counties of the region, which contributed to its rapid population growth in the early days.
- Did you know?** Simpson County is home to B&B Burger in Mendenhall and Windham's Restaurant in Magee, which were both recognized as having the best hamburgers in Mississippi. Scenes from the movie *Oh Brother, Where Art Thou?* were filmed at Strong River in D'Lo, while scenes from *My Dog Skip* were filmed in Mendenhall.

“Simpson County is a beautiful, peaceful place that offers true Southern hospitality with a friendly atmosphere and inviting scenery. Our small-town environment, where we all know each other, is sure to please anyone. Simpson County is truly a remarkable place to raise a family.”

AMANDA T. BLAKENEY,  
MSU Extension County Coordinator

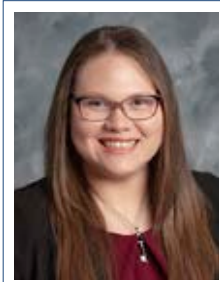
Editor's note: 1/82 is a regular feature highlighting one of Mississippi's 82 counties.

# NewsNotes



**Jackson**

Dr. Gary Jackson, who has served as director of the MSU Extension Service since 2011 and a member of the College of Agriculture and Life Sciences (CALs) faculty since 1990, has assumed the newly created position of associate vice president for outreach and engagement. Jackson is charged with strengthening and coordinating university outreach activities to better meet stakeholder needs at the local, state, national, and international levels.



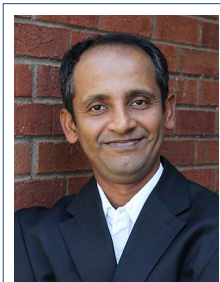
**Contreras-Correa**

Dr. Zully E. Contreras-Correa, a postdoctoral associate in the CALs Department of Animal and Dairy Sciences, earned the 2022 Young Scholar Award from the American Society of Animal Science.



**Thomasson**

Dr. J. Alex Thomasson, head of the CALs Department of Agricultural and Biological Engineering, is the 2022–23 president-elect of the Council for Agricultural Science and Technology.



**Karunakaran**

Dr. Ganesh Karunakaran, a Mississippi Agricultural and Forestry Experiment Station (MAFES) aquaculture economist and associate research professor in the Department of Wildlife, Fisheries, and Aquaculture at the Thad Cochran National Warmwater Aquaculture Center, won the Distinguished Early Career Award from the U.S. Aquaculture Society.



**Basu**

Dr. Priyadarshini “Priya” Basu, MAFES scientist and an assistant professor in the CALs Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, received the 2022 Early Career Professional Award from the Entomological Society of America, Southeastern Branch.



**Devost-Burnett**

Dr. Derris Devost-Burnett, an associate professor in the CALs Department of Animal and Dairy Sciences and MAFES scientist, was named national president-elect of Minorities in Agriculture, Natural Resources, and Related Sciences.



**Jones**

Samantha Jones is the new director of the Child Development and Family Studies Center, a unit of the CALs School of Human Sciences. She was previously a teacher and manager of the program.



**Evans**

Dr. Kristine Evans, an assistant professor in the College of Forest Resources (CFR) Department of Wildlife, Fisheries, and Aquaculture and scientist in the Forest and Wildlife Research Center, was one of three avian conservationists recognized in the western hemisphere with the Partners in Flight leadership award.



**Demarais**

Dr. Steve Demarais, the Taylor Chair in Applied Big Game Research and Instruction in the CFR Department of Wildlife, Fisheries, and Aquaculture and scientist in the Forest and Wildlife Research Center, was honored with the university’s 2022 Southeastern Conference Faculty Achievement Award.



**Tseng**

Dr. Paul Tseng, an associate professor in the CALs Department of Plant and Soil Sciences and MAFES scientist, won the 2022 Outstanding Early Career Weed Scientist Award from the Weed Science Society of America.



**Bowman**

Dr. Hunter Bowman, an Arkansas native who completed his doctorate in the CALs Department of Plant and Soil Sciences, was named rice specialist for the MSU Extension Service and MAFES scientist. Bowman has experience in crop consulting, field management, seed testing, and sales with Corteva Agriscience and Pinnacle Agriculture.



**Gholson**

Dr. Drew Gholson, a MAFES assistant professor, Extension irrigation specialist, and coordinator of the National Center for Alluvial Aquifer Research at the Delta Research and Extension Center, was named Irrigation Researcher of the Year at the 25th annual Conservation Systems Conferences.



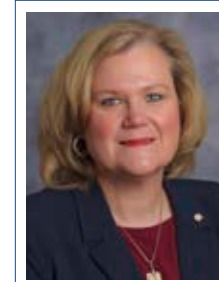
**Jones**

Dr. Daryl Jones, an MSU Extension professor in the CFR Department of Wildlife, Fisheries, and Aquaculture and coordinator of the Natural Resource Enterprises Program, was named a fellow of The Wildlife Society.



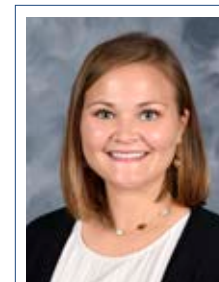
**Holliman**

Tawnya Holliman, who began working with Extension in 1996 as an agent-in-training in Bolivar County, was named regional Extension coordinator for the Coastal Mississippi Research and Extension Center. She began the role on an interim basis in 2020.



**Hand**

Theresa Hand was selected as regional Extension coordinator for the Central Mississippi Research and Extension Center. The 25-year veteran Extension agent and former Hinds County coordinator has served on an interim basis in this position since 2020.



**Raines**

Dr. Katherine Raines, a clinical pharmacist in the College of Veterinary Medicine Animal Health Center, received her diplomate in the International College of Veterinary Pharmacy. She is one of 50 diplomates in the world to reach this level of achievement in veterinary pharmacology.

# DevelopmentCorner

## Scholarship Named for Mississippi State's Jolly Maroon Giant

Alumni and friends of Mississippi State have the opportunity to support an endowed scholarship in honor of a well-known and beloved Bulldog who came to MSU to play football in 1954 and later spent almost 60 years working on behalf of the university.

Michael Hatcher, a 1982 landscape contracting graduate, established a gift to initiate the Charles E. “Charlie” Weatherly Annual Scholarship in the College of Agriculture and Life Sciences (CALs). Robert “Bob” Sisk, a teammate and classmate of Weatherly’s, also contributed to the scholarship fund.

Weatherly, known as the “Jolly Maroon Giant” during his days on the football field, joined the MSU staff in 1962 and worked in a number of capacities, including a lengthy tenure as director of development for the Division of Agriculture, Forestry, and Veterinary Medicine, until his retirement in 1997. Weatherly continued to work as senior development director emeritus for the division until 2021.

Weatherly was named MSU’s National Alumnus of the Year in 2005 and was inducted into the MSU Sports Hall of Fame in 2021.

“Charlie is quite the Mississippi State legend,” said Jack McCarty, executive director of development for the MSU

Foundation. “Through his work with the alumni association and the foundation, Charlie built countless relationships that advanced MSU. The things Charlie has done to build goodwill and camaraderie among alumni and friends is special. His work will pay dividends for the university in perpetuity.”

Hatcher, founder and chairman of Michael Hatcher and Associates in Memphis, was chosen as CALs Alumni Fellow in 2010. A native of Brookhaven, Hatcher has served as an advisory board member for the MSU Department of Landscape Architecture and as a board member of The Bulldog Club. He and his wife, Mary, live in Olive Branch. Since he founded the company in 1986, Michael Hatcher and Associates has provided career opportunities for dozens of MSU alumni.

Weatherly enrolled at Mississippi State College on a football scholarship and played end for the Bulldogs from 1954 to 1958, starting on offense and defense for 2 years. He graduated in 1959 with a degree in industrial management.

Weatherly’s name has become synonymous with alumni affairs and development at Mississippi State. He was hired as the first full-time field representative for the MSU Alumni Association and began laying the groundwork for alumni chapters. In 1967,

Weatherly poses with some of the plants growing in MSU’s Veterans Memorial Rose Garden, which he helped establish at the R. R. Foil Plant Science Research Center. Weatherly was named Master Gardener of the Year in 2015.



Weatherly (center) was honored as Mississippi State’s 2005 National Alumnus of the Year. He is pictured with former MSU President Charles Lee (left) and Keith Winfield, who was national alumni president at that time.

he became executive secretary—later known as director—of alumni affairs. He served eight MSU presidents as he guided the association. In 1987, Weatherly became coordinator of special projects for the Alumni Association and the MSU Foundation. In that role, he was instrumental in organizing MSU’s constituency-based fundraising programs, which successfully continue today.

After his retirement, Weatherly remained a dedicated fundraiser and served on the Alumni Foundation board of directors. Most importantly, he served as a mentor to the university’s next generation of development officers.

Weatherly’s family has a long tradition at Mississippi State. His father, Ernest Weatherly of Ripley, graduated in 1933 with an agriculture degree from Mississippi State Agricultural and Mechanical College before becoming a county Extension

agent in Pontotoc. The long-time development director’s two brothers, Danny and Robert, also graduated from the university.

Weatherly married his college sweetheart, the former Ellen Randolph, who earned elementary education bachelor’s and master’s degrees from MSU in 1960 and 1963. She taught at Overstreet Elementary and was later employed at MSU from 1975 to 1987. Her father, Colonel George N. Randolph, was a professor of military science and tactics and professor of history at Mississippi State College.

The couple’s three children, the late Charles R. Weatherly, Moree Elizabeth Weatherly, and Ruth Ellen Germany, all attended MSU. Their daughters obtained MSU degrees, and their son was an MSU senior at the time of his death.

BY ROBYN HEARN

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For more information on giving in support of Mississippi State University, visit the MSU Foundation website.

[msufoundation.com](https://msufoundation.com)





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Mississippi corn farmers will benefit from a fertilizer efficiency study conducted by Mississippi Agricultural and Forestry Experiment Station researchers (see article on page 13). (Photo by Kevin Hudson)

