

RESEARCH MATTERS



Adaptive Biology of Oysters

Nick Coxe, left, and Lauren Swam measure oysters at Grand Isle, Louisiana.

Examining Oyster Population Tolerance to Salinity, Increasing Water Temperature and Hypoxia

Hidden beneath the turbid waters of Louisiana's estuaries, the eastern oyster thrives, creating productive reefs and supporting a valuable industry. For many decades, Louisiana has led the nation in the production of oysters, typically accounting for over 30% of the nation's landings and over 50% of the landings in the Gulf of Mexico.

Changing water quality, including changes in salinity patterns, increasing inshore hypoxic events and increasing water temperatures across the estuaries, impact available areas where oysters thrive and may shift prime zones for production and areas available for restoration. While oysters are known to have a high tolerance to changing water quality conditions, identifying populations tolerant to these shifting conditions and tolerance thresholds are necessary to support management, inform restoration strategy and identify production zones now and in the future.

A series of studies involving Danielle Marshall (RNR), Drs. Megan La Peyre (RNR/USGS), Sandra Casas, Jerome La Peyre (Animal Sciences), Brian Callam (RNR/Sea Grant) and Morgan Kelly (Biological Sciences), as well as colleagues from Texas A&M University-Corpus Christi and Auburn University, are exploring the responses of geographically distinct oyster populations from across Texas and Louisiana to changing water quality. Several populations of oysters were collected from reefs located in areas experiencing differing water quality conditions and spawned at the Michael C. Voisin Oyster Hatchery in Grand Isle, Louisiana, and the Auburn University Shellfish Hatchery in Dauphin Island, Alabama.

Progeny of the different populations are being exposed to extreme salinities, high temperatures and extended hypoxic events to determine their mortality rates. Responses can help identify tolerance thresholds, and differences among populations can help identify populations for selective breeding. For example, graduate student Lauren Swam's (M.S., La Peyre) studies explore the tolerance of four unique Louisiana oyster populations to low and high salinity. Identifying populations more likely



Aquaculture grow out cages located at the Michael C. Voisin oyster hatchery.

to survive and grow in lower salinity conditions would provide a valuable broodstock for Louisiana restoration and oyster production. Similarly, graduate student Nicholas Coxe (M.S., La Peyre) is examining the survival of four gulf coast oyster populations in response to extended hypoxic events.

Identification and development of oyster broodstock resilient to current and future water quality conditions (i.e., low salinities, high water temperatures and increased hypoxia) could play an important role in increasing production of oysters (e.g., through development of broodstock for aquaculture support of the industry) and supporting successful restoration efforts. ■



DIRECTOR'S COMMENTS



Allen Rutherford

Welcome to the LSU School of Renewable Natural Resources! The past year has been challenging, at best. Even in the face of COVID-19 and multiple natural disasters, we continued to expand our research and extension programs to achieve national and international prominence. Our research and extension faculty continue to excel in competing for grants and contracts from a diverse range of federal, state and private partners.

Since March 2020, we have had to alter our curriculum due to the COVID-19 outbreak. At that time, we transitioned most of our in-person classes to an online format. We have consistently urged RNR students to take part in experiences that suit their interests and support their professional career goals. Integral to all our programs have been hands-on experiences that, we feel, help students connect with activities beyond the traditional classroom. We urge students to participate in internships, independent research, local and national conferences, and community-oriented activities. Given the current health concerns, we examined what we could continue to do safely. In response, we continued most of our historic teaching

activities by creating smaller laboratory classes, doing fieldwork closer to campus and creating virtual field experiences.

While we altered all aspects of our teaching, research and extension programs, our students, faculty and staff responded admirably. Reinventing our standard practices created a physical and mental challenge. Students and faculty adjusted well to the online format. Graduate students' field and laboratory research were drastically altered; still, they adapted. The staff effectively moved our administrative operations to their homes, but work continued. Research projects continued to be funded; manuscripts continued to be submitted; students defended their theses and dissertations. While everything was more complicated and no one loved the situation, all seemed to rise to the occasion. This is a tribute to the character of our School. Anticipating widespread vaccine adoption, LSU is committed to in-person teaching in the fall 2021 semester, and we look forward to returning to some sense of normalcy.

We still face global natural resource challenges that range from climate change to resource sustainability. Water pollution and eutrophication continue to create problems for downstream users. The potential for climate change to alter biodiversity and land-use changes associated with increasing population densities will continue to stress natural resources worldwide. These, and other natural resource challenges, require a well-trained professional workforce for the foreseeable future. We believe that the School is uniquely positioned to train the next generation of natural resource professionals.

In previous messages, I have bemoaned our infrastructure issues. However, we were recently informed that state funds were allocated to replace the roof, the heating and cooling system, and the building's chemical hoods. Unfortunately, because the ceilings will be removed to replace the climate control ductwork, we must vacate the building for about nine months. Relocation of our teaching and research laboratories and classrooms will present a challenge, but we will appreciate the updated building once the renovations are completed.

Despite these current challenges, there are many reasons to be optimistic about the future of all RNR programs. We have faced many challenges over the years and have always emerged better for the experience. As always, we solicit your help in making potential students aware of the unique opportunities we offer and your continued financial support. If you have any questions, comments or would like to come by to visit, please feel free to contact me.

Exciting things are happening in the LSU School of Renewable Natural Resources!

Stay safe, and we will see you soon!

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FACULTY NEWS

Nyman Receives Award from Coalition to Restore Coastal Louisiana

The Coalition to Restore Coastal Louisiana named RNR faculty member Dr. Andy Nyman and 11 others as recipients of CRCL 2020 Stewardship Awards. Because of COVID-19, Nyman anticipates receiving the award at a banquet later in 2021. According to the CRCL website (<https://www.crcl.org/>), "Every year the Coalition to Restore Coastal Louisiana is proud to honor individuals and organizations demonstrating extraordinary commitment to the coast with CRCL Coastal Stewardship Awards. These awards are CRCL's highest form of recognition for those who go above and beyond for our coast. CRCL's Coastal Stewardship Awards recognize individuals and groups that have made significant contributions to the conservation and restoration of Louisiana's coastal wetlands." Nyman has worked with Louisiana's coastal restoration program since the 1990s and has authored or co-authored over 80 peer-reviewed publications addressing wetland loss, soils, vegetation, wildlife, fish, hydrology and nutrient dynamics. ■

Dr. Romain Lavaud Joins RNR Faculty

Dr. Romain Lavaud joined RNR in November 2020 as an assistant professor of research. Lavaud's research focuses on the effects of environmental variability on the physiology, ecology and energy budgets of marine organisms, particularly oysters, in the Gulf of Mexico. Lavaud secured his undergraduate and graduate degrees at the University of Western Brittany in Brest, France, and earned his Ph.D. in 2014 studying the physiology and ecology of great scallops along European coasts.



Lavaud joined RNR as a postdoctoral researcher in 2014. His research focused on the development of a dynamic energy budget model for the eastern oyster that included the effect of changing salinity. He later worked for Fisheries and Oceans Canada and for the University of Québec at Rimouski, Canada, before moving back to Louisiana. Lavaud's research on bioenergetics of marine organisms and dynamic energy budget theory allows him to model and predict the response of shellfish, fish and algae to changes in their environment; to better understand ecosystem functions; to identify carrying capacity; and to quantify the effect of aquaculture on ecosystems. Since joining RNR, Lavaud received funding from the South-Central Climate Adaptation Science Center to develop model predictions for oyster production potential from Texas to Louisiana under various climate change scenarios. ■

WELCOME BACK TO RNR, DR. ROMAIN LAVAUD!

School of Renewable Natural Resources Research Matters - Spring 2021

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The LSU AgCenter and LSU provide equal opportunities in programs and employment.



GO FORTH AND BOTANIZE

Members of the Botany Club gathered for a field day on a longleaf savannah, one of the most biologically diverse ecosystems in the South.

RNR students have founded a new student organization, the Botany Club! The Botany Club at LSU (<https://botanyofrnr.webador.com/>) is a student chapter of the Botanical Society of America dedicated to the exploration of botany, volunteer work and land stewardship. While many students are engaged in plant-related studies across campus, limited exchange occurs across LSU colleges and departments. Though founded by Renewable Natural Resources students, current Botany Club membership represents students from the departments of Horticulture, Entomology, Coastal Environmental Science and Biological Sciences. Interest in plants serves as the sole requirement to join; all majors are welcome!

The Botany Club offers opportunities for students interested in any aspect of plants to explore, learn and gain hands-on

BOTANY CLUB OFFICERS:

- President:** Csanyi Matusicky
- Vice President:** CeCe Berryman
- Social Media Manager:** Jaden Cuti
- Secretary:** Amy Burke
- Treasurer:** Chris King
- Faculty Advisor:** Dr. Chris Reid



Qu'est-ce que c'est? Members of the Botany Club prepare to kill tallow trees to restore native prairie.

experience beyond the classroom. Some of the club's first accomplishments included planting trees for Arbor Day, application of herbicides to Chinese tallow trees and other woody encroachers on a coastal prairie remnant and cleaning the native plant garden at the Louisiana Department of Wildlife and Fisheries headquarters. Upcoming plans

include several botanizing field trips, more habitat stewardship work, and promoting greater use of native plants in campus and community landscaping. ■

OVERALL
TOP SLIDESHOW PRESENTERS

1ST

Kathryn Davis

Natural Resource Ecology & Management

AGRICULTURE 1ST

Kathryn Davis

Natural Resource Ecology & Management

AGRICULTURE 1ST

**Jenna Cheramie
and Jessica Bonin**

Natural Resource Ecology & Management

LSU DISCOVER DAY 2020

On April 27 and 28, 2020, the seventh LSU Discover Day undergraduate symposium provided a forum for undergraduate students from any major to share their research and creative works in a virtual event. More than 100 intrepid undergraduate students braved the frontier of remotely presenting their research online!

CONGRATULATIONS TO THESE TOP-SCORING PRESENTERS AT DISCOVER DAY 2020!

Tiger Chapter Ducks Unlimited Honored as National Collegiate Champion

For the third year in a row, the Tiger Chapter Ducks Unlimited, sponsored by the LSU School of Renewable Natural Resources, secured the national champion designation out of over 115 U. S. collegiate Ducks Unlimited chapters. In 1986, the Tiger Chapter became the first collegiate chapter in the U.S. to host a collegiate fundraising event, and since that time, the chapter annually hosts one event or more. ■



Tiger Chapter Ducks Unlimited officers are Tucker Ryan, co-chair; Sophia Abbott, chair; and Brody Lukens, co-chair. The chapter has over 20 active members, down somewhat because of COVID-19 restrictions. Drs. Luke Laborde and Kevin Ringelman serve as chapter advisors.

Timber Tigers Year in Review

This past year, the LSU Student Chapter of the Society of American Foresters, also known as the Timber Tigers, excelled in bringing joy to the community during difficult times. In August 2020, Hurricane Laura detrimentally affected many areas of Louisiana, with a majority of the damage due to high winds that left fallen trees on many homes. As a young crew of student forestry professionals, the Timber Tigers spent time volunteering in Lake Charles removing fallen trees and debris from homes. The Timber Tigers connected with some incredible, resilient people throughout the cleanup. The Timber Tigers also demonstrated technical forestry skills to families at Arbor Day, which was hosted by the LSU AgCenter Botanic Gardens at Burden. It was a beautiful day spent educating children about the benefits of taking care of the environment and renewable natural resources. To top off a great year, the Timber Tigers spent a weekend camping, hiking and kayak fishing at Toledo Bend State Park to celebrate.

The chapter held meetings every other week. Several industry representatives and representatives from the U.S. Forest Service served as guest speakers. Occasionally, the students met around picnic tables, but usually they met online. Finally, the annual Christmas tree sale was a success. ■



Ty Price, Chloe Crawford and Savannah Stokley teach a future conclave competitor how to use a crosscut saw at Arbor Day. The annual Southern Forestry Conclave was cancelled two years in a row, but the University of Tennessee is ready to host it in March 2022. LSU last hosted the Forestry Conclave at the LSU AgCenter Botanic Gardens at Burden in 2018.

Xi Sigma Pi Honor Society Member Wins Regional Award Again

Members of RNR's chapter of Xi Sigma Pi, a national forestry honor society, secured multiple awards based on their academic accomplishments, extracurricular activities and leadership achievements. Christian Mallett won the 2020 Xi Sigma Pi Outstanding Sophomore award, given to a RNR junior in the habitat/forest management options. At the regional level, Kathryn Kahil, an RNR senior, won the 2020 Xi Sigma Pi Scholarship for the West Central Region. This is the third year in a row that members of the LSU chapter won this prestigious award, given to a Xi Sigma Pi member in a region that comprises eight universities. LSU continues building an impressive record, winning more than half of the awards in recent years. Past LSU winners are:

- 2002: Benjamin Hogue
- 2004: Angela Secott
- 2006: Matthew Reed
- 2009: Ian Stone
- 2010: Lauren Smith
- 2014: Kasie Dugas
- 2015: James Donovan (second place)
- 2016: Parker White (second place)
- 2018: Mason Leblanc
- 2019: Cameron Toerner
- 2020: Kathryn Kahil



Christian Mallett won the 2020 Xi Sigma Pi Outstanding Sophomore award presented by LSU RNR.



Kathryn Kahil won the 2020 Xi Sigma Pi Scholarship for the West Central Region of the U.S.

All RNR students with an interest in forestry and a minimum 3.0 GPA (for undergraduate students) or 3.5 GPA (for graduate students) are eligible for membership. The current officers of Chapter Nu of Xi Sigma Pi are Charles Pell (forester), Kathryn Kahil (ranger), and Cameron Toerner (fiscal agent). Dr. Quang Cao is the faculty advisor. ■

MISCELLANEOUS STUDENT AWARDS

RNR senior **Kali Eiftmann** received an A. Wilbert's Sons Research Internship for the research project titled, "Using Botanical Ingredients to Control Ball Moss on Ornamental Plants." She is working with Drs. Zhijun Liu and Heather Kirk-Ballard. The project evaluates how plants and their chemical arsenals control ball moss in an effort to identify an effective treatment with environmentally safe botanical ingredients. ■

Grace Rosseau was awarded the A. Wilbert's Sons Research Internship to conduct the project, "Bark Water Vapor Conductance Associations with Stress Tolerance in Louisiana Tree Species" with Dr. Brett Wolfe. ■

Caleb Taylor, a graduate assistant in the La Peyre Coastal Ecology Lab, was awarded a Sea Grant Knauss Fellowship for 2021 following graduation. The fellowship is open to those interested in learning more about the policies impacting marine and coastal resources, and fellows live and work in Washington, D.C. for the executive branch or legislative branch

of the federal government for one year. Caleb landed a position with the U.S. committee on the marine transportation system (CMTS) as a policy advisor for the executive director. The CMTS serves as a federal interagency committee for the purpose of assessing the adequacy of the marine transportation system with other modes of transportation and other uses of the marine environment. The CMTs also work to coordinate, improve coordination of, and make recommendations regarding federal policies that impact the marine transportation system. ■

2020-2021 RNR SCHOLARSHIPS

Undergraduate Student Scholarships

| Award | Student |
|--|----------------------------|
| Ann Reiley Jones Scholarship | Julianne Lamy |
| Billy W. Weaver Scholarship | Christian Mallett |
| Edmond B. Burns Scholarship | Katherine Allen |
| F. O. Bateman Memorial Scholarship | Andrew Guidry |
| Forestry, Wildlife, and Fisheries Alumni Association | Michael Johnson |
| Forestry, Wildlife, and Fisheries Alumni Association | Emily Munch |
| Forestry, Wildlife, and Fisheries Alumni Association | Jordan Mouton |
| Hunter Barrilleaux Memorial Scholarship | Amy Burke |
| Jerry W. Netterville Jr. Scholarship | Hayley Jackson |
| Laborde Leadership Scholarship | Emily Munch |
| Louisiana Land Explorer Corporation Scholarship | Nicole Torres |
| Paul Y. Burns Scholarship | Jackson Martingayle |
| Pauline Bateman Stanley Scholarship | Alexia Lagrone |
| Richard P. Sivicek Undergraduate Scholarship | Emma Hamilton |
| Thomas Plein Scholarship | Tucker Ryan |
| William A. Knight Forestry Scholarship | Abby Ligon |
| William A. Knight Forestry Scholarship | Acy Hendrix |
| William A. Knight Forestry Scholarship | Alex Rhodes |
| William A. Knight Forestry Scholarship | Alyssa Lirette |
| William A. Knight Forestry Scholarship | Amaya Blakeley |
| William A. Knight Forestry Scholarship | Andrew Hermes |
| William A. Knight Forestry Scholarship | Arianna Rioux |
| William A. Knight Forestry Scholarship | Carly Othling |
| William A. Knight Forestry Scholarship | Catherine Etheridge |
| William A. Knight Forestry Scholarship | Charles Hebert |
| William A. Knight Forestry Scholarship | Daphne Wyble |
| William A. Knight Forestry Scholarship | Emma Perrault |
| William A. Knight Forestry Scholarship | Gabrielle Arquette-Overman |
| William A. Knight Forestry Scholarship | Gwyneth Alexander |
| William A. Knight Forestry Scholarship | Heather Ann Collier |
| William A. Knight Forestry Scholarship | Jack Hanks |
| William A. Knight Forestry Scholarship | Jordyn Kretchmer |
| William A. Knight Forestry Scholarship | Kevin Quinet |
| William A. Knight Forestry Scholarship | Kirsten Sanguinetti |
| William A. Knight Forestry Scholarship | Lily Bolin |
| William A. Knight Forestry Scholarship | Lucas Rot |
| William A. Knight Forestry Scholarship | Marie-Pascale Delahoussaye |
| William A. Knight Forestry Scholarship | Regina Grill |
| William A. Knight Forestry Scholarship | Taylor Kinchen |
| Louisiana Forestry Foundation Scholarship | Skylar Bueche |
| Louisiana Forestry Foundation Scholarship | Jaden Cuti |
| Louisiana Forestry Foundation Scholarship | Jessica Francisco |
| Louisiana Forestry Foundation Scholarship | Kathryn Kahil |
| Louisiana Forestry Foundation Scholarship | Chris King |
| Louisiana Forestry Foundation Scholarship | Chris Lambert |
| Louisiana Forestry Foundation Scholarship | Julianne Lamy |
| Louisiana Forestry Foundation Scholarship | Christian Mallet |

Graduate Student Scholarships

| Award | Student |
|--|--------------------|
| Barbara M. Edison Scholarship | Amanda Barbato |
| Ben and Pauline Stanley Excellence Award for Outstanding M.S. Student | Lauren Swam |
| Ben and Pauline Stanley Excellence Award for Outstanding Ph.D. Student | Elizabeth Bonczek |
| Carlos E. Kays Scholarship | Alessandra Bresnan |
| Clark M. Hoffpauer Scholarship for RNR Graduate Students | Scott Graham |
| Charles W. Bosch Jr. Louisiana Wildlife Federation Waterfowl Scholarship | Dylan Bakner |
| John Barton Sr. Scholarship | Catrina Terry |
| Richard P. Sivicek Graduate Scholarship | Colleen Walsh |

Les Voyageurs

Les Voyageurs are a carefully selected group of 16 students from the College of Agriculture who represent the college and LSU in recruitment, alumni, and development activities.

Selectees

- Caley Hoff
- Natalie Lafont
- Ty Price

Students learn to become certified prescribed burners

In southern pine ecosystems, controlled burns improve habitat for wildlife while reducing wildfire risk. The students in Dr. Niels de Hoop's class learned this through hands-on exercises at the Bob R. Jones Idlewild Research Station near Clinton. Students must thread their plans through just the right weather parameters to encourage succulents and other wildlife food while avoiding damage to the overstory trees. Management plans must also minimize the effects of smoke to neighbors and the traveling public while also limiting the air pollution effects of the smoke. This is accomplished by matching the right tract to the right weather conditions. Thus, like airplane pilots, prescribed burners must become amateur weather predictors. The end goal of the class is to have all students earn their Prescribed Burner – Forestland certification, which is issued by the Louisiana Department of Agriculture and Forestry. ■



Students in RNR 4032, Forest Fire Control and Use, learn to read fire weather forecasts to match the right tract to the right day. On March 5, 2021, they burned this long, narrow 25-acre tract with the knowledge that a 90-degree wind shift was coming. They used this knowledge to burn the tract safely and efficiently. Pictured are, left to right, Haigan Hancock, Scott Sicard, Jessica Francisco, Helen Cressy, Chloe Crawford, Emmie Busch, Emily Munch, Csanyi Matusicky, Chris King, Zachary Mendheim and graduate student Jon Oliver (front). Out patrolling the fire line are Emily Crowder, Jaden Cuti, Jaimie Gallagher, Preston Gurry, Ty Price and David Willis.



Zachary Mendheim, Bo Myers, Chris King and Christian Mallett consult a map after lighting the initial backing fire. Both classroom knowledge and experience are required to become certified prescribed burners.



On November 17, 2020, Dr. Ashley Long's wildlife class and Dr. Niels de Hoop's timber harvesting class combined forces to burn a mature pine stand that had never been burned. This tract is normally too wet in the spring to burn effectively. Here the students admire the relatively hot burn of a yaupon understory. A Louisiana Department of Agriculture and Forestry airplane patrolled overhead to ensure safety.



RNR's Dr. Julie Lively traveled to Japan and Thailand in January 2020 to study selected aquaculture and fisheries activities as well as other local agriculture examples. This served as the final trip of the LSU AgLeadership Program before Lively graduated with the Class XVI in February 2020. Members of Leadership Class XIV (all from Louisiana) pose in a sugarcane field in Thailand, where they learned from local farmers about their equipment and best management practices.

RESEARCH

Lively Receives \$1.5 Million Grant to Improve Bycatch Reduction Devices

RNR's Dr. Julie Lively was recently awarded a \$1.5 million grant to find and develop better bycatch reduction devices (BRDs) for the commercial shrimp industry in the Gulf of Mexico. The study constitutes part of a larger National Oceanic and Atmospheric Administration (NOAA) restoration project and a joint effort with Texas Sea Grant.

The primary goal of the project is the reduction of commercial shrimp trawl fishing pressure on finfish populations to restore fish affected by the Deepwater Horizon oil spill. An additional goal is improved efficiency of BRD technologies to increase shrimp retention, decrease cost and incentivize use. ■

RNR Co-hosts Workshop on Coastal Forested Wetlands

In cooperation with the Pontchartrain Conservancy, RNR co-hosted the four-part Louisiana Coastal Forest Workshop as a virtual conference in October 2020. The workshop included presentations and discussion of management, restoration, policy and scientific advances in coastal forested wetlands. This event was part of the ongoing engagement between RNR researchers and the broader community of forested and coastal wetlands and included contributions from scientists across the region, local and national policy and NGO professionals, and local wetland managers. All four days of the workshop were streamed live to Facebook and are archived for viewing on the RNR Facebook page. ■

Forested Wetlands Observatory Established

RNR faculty members Drs. Richard Keim and Andy Nyman are leading the establishment of a new observatory as part of a first-of-its-kind public-private partnership. The LSU AgCenter recently established a wetland mitigation bank in Iberville Parish in which forested wetlands previously converted to row crop agriculture will be restored back to forested wetlands. The restoration consists mainly of reestablishing the forest and restoring the hydrological conditions that existed prior to drainage for row crops. The restoration will be accompanied by establishment of an observatory where researchers will evaluate efficacy of restoration treatments and simultaneously use those treatments to test hypotheses about how forested wetlands function. The observatory will serve as an important teaching and extension resource where students and natural resource professionals can observe forested wetland management, ecology and hydrology. ■

Keim Serves on Science Advisory Groups for Climate and Water

Dr. Richard Keim is serving as a member of the scientific advisory group to the Louisiana Climate Initiatives Task Force, advising on greenhouse gas balances of forests and wetlands. The advisory group is reviewing policies and by February 2022 will recommend new policies to help Louisiana reduce net greenhouse gas emissions. Keim also serves as a core science team member for the Sustainable Rivers Program (SRP), a national cooperative project between the U.S. Army Corps of Engineers and The Nature Conservancy focused on the development of ecologically improved management plans for water-control structures on rivers. The specific task of this team is to develop tools to improve water management of the Atchafalaya Basin Floodway, which is important as a flood control project and for its ecological values derived from being the largest remaining river swamp in the U.S. ■

Cellulose Nanomaterials and Their Emerging Applications in Industrial Products



Cellulose nanomaterials (CNMs) are a new class of cellulose particles being developed for applications once thought impossible for cellulosic materials.

(CNMs). CNMs are the next generation of forest-based products with applications in composites, electronics, hydrogels, food products, paints, cements and industrial fluids.

Controlling the flow of matter (i.e., rheology) with rheological modifiers, plays a key role in many fluid and gel-based industrial processes. The physical properties of cellulose nanomaterials have recently emerged as a way that may effectively control the flow of many fluids and gel-based applications, including:

- Multicomponent ink formulation for 3D printing of biomedical, electronic and other emerging devices
- Fluid formation for drilling oil and gas wells as well as enhanced oil recovery
- Cement formulation for stabilizing oil wells and construction
- Food ingredients for suspending, thickening and gelling agents
- Compositions for coatings, cosmetics and personal care products as thickening agents.

Development of suitable rheology modifiers for these applications can help industry develop high performance products and enhanced production processes.

The potential of CNMs as rheological modifiers has not been completely explored yet, and there are still large opportunities in this area. Future research and development on rheological modification using CNMs in a broader range of industrial sectors can lead to new fluid/material advances and add significant value to our valuable forest resources. ■

Dr. Qinglin Wu is conducting research and development work on using cellulose nanomaterials in various industrial applications. Cellulose, one of the world's most abundant, natural and renewable biopolymer resources, is widely present in trees and plants. In the cell walls of wood and plant cells, cellulose molecule chains connect with each other to form larger units known as elementary fibrils, which are packed into larger units called microfibrils. These microfibrils can be broken down into nanosized materials, known as cellulose nanomaterials



Two-thirds of prairie wetlands are now surrounded by crops.

Ringelman Lab Studies Effects of Cropping Practices on Waterfowl Broods in Prairie Potholes

Catrina Terry (M.S.; Ringelman) is studying how duck broods use wetlands that are embedded in highly-cropped landscapes in North Dakota and South Dakota. The prairies produce the majority of dabbling ducks that winter in Louisiana, and this is a priority landscape for wetland conservation. However, more than two-thirds of prairie wetlands are now surrounded by crops, which has the potential to reduce wetland quality and overall duck production. Terry is using an unmanned aerial vehicle equipped with a thermal imaging camera to count duck broods on wetlands embedded in agricultural landscapes.

In addition, she is studying duckling food abundance by collecting invertebrate samples from wetlands and is also working with collaborators at the University of New Orleans to estimate the amount of pesticides that drain into these wetlands from nearby crop fields. The overall goal is to evaluate which factors affect duck production on wetlands surrounded by crops so managers can make better decisions on how prioritize wetland protection and restoration. Over the summers of 2019 and 2020 Terry sampled 209 wetlands and detected 180 broods. ■



A Blue-winged Teal brood. Over the summers of 2019 and 2020 Catrina Terry sampled 209 wetlands and detected 180 broods.

Vlosky Delivers Keynote Address in Sri Lanka

Dr. Rich Vlosky, director of the Louisiana Forest Products Development Center, delivered a keynote address at the 25th Silver Jubilee International Forestry and Environment Symposium 2021. The annual symposium is organized by the Department of Forestry and Environmental Science at the University of Sri Jayewardenepura in Sri Lanka. Vlosky's presentation focused on the use of wood-based energy in developing countries. ■



This Common Yellowthroat died after colliding with a window at the Student Union. This species is one of the most common casualties, with over 50 records in the past three years. Photo by Jordan Mouton

Mitigating Bird Strikes at the LSU Library

Thanks to a grant from LSU Student Sustainability Fund (SSF), RNR junior Jordan Mouton and a team of RNR undergraduates and graduate students applied over 1,000 window decals to the LSU library. Mouton and RNR faculty member Dr. Phil Stouffer received support of the SSF and library Dean Stanley Wilder after documenting hundreds of bird mortalities on the LSU campus, with a large proportion at the library. The decals from Bird's Eye View are specially made to scatter light within wavelengths birds detect but humans do not, allowing a small decal to disrupt the reflection from a large panel of glass.

Mouton and Stouffer's grant was awarded in spring 2020, but campus closure stalled decal application until September. Following a marathon session to apply the decals, the team has been continuing to monitor the building for dead birds. Unfortunately, some mortality has still been occurring, but Mouton and Stouffer will need a more formal analysis to compare 2020-21 data with previous years. The SSF grant also supports much greater monitoring efforts than in previous years, so researchers are recovering birds that may have previously been undetected because they may have been kicked into the bushes or consumed by the feral cats that plague campus. Only after adjusting for the increased sampling can the effect of decals be evaluated objectively.

Most mortality occurs during spring and fall migration. For example, 86 birds were found across campus in September and October of 2020 but only 19 from November through January 2021. Following data



Jordan Mouton uses a template to align decals on the fourth floor of the library. The decals on the windows to her right are designed to make a reflective glow visible to birds that would otherwise would not perceive the windows. Photo by Phil Stouffer

collection in spring 2021, Mouton and Stouffer will analyze data from the library for two migration periods before and after decals. The long-term goal of the project is to mitigate the risk across campus, which will likely involve not just decals but landscaping and design considerations.

Data are being compiled on the citizen science database iNaturalist, where they are visible at <https://www.inaturalist.org/projects/lsu-bird-window-collision-monitoring-project>. Carcasses are deposited at the LSU Museum of Natural Science, where they are available for additional study. ■

LSU | College of Agriculture

SCHOOL OF RENEWABLE NATURAL RESOURCES

With a student enrollment of over 320 (undergraduate – 271; graduate – 50), the School of Renewable Natural Resources is the second-largest department in the LSU College of Agriculture! We need alumni and donors more than ever to help maintain high academic and professional standards, and to prepare our graduates with real work experiences.

You can help. We need guest speakers, field trip and research sites, internship opportunities and jobs for our students. We also need your financial support, large or small, to support scholarships for our students. This support is particularly important in light of tuition increases resulting from dramatic cuts in state funding for higher education. Endowed chairs and fellowships help us recruit and retain faculty to accommodate increased enrollment and expand our course and research offerings.

Join: The SRNR/FWF Alumni Association and the College of Agriculture Alumni Association. Information on both organizations is available on our website, www.rnr.lsu.edu.

Prospective students: The LSU School of Renewable Natural Resources offers bachelor's degrees in natural resource ecology and management with nine areas of concentration:

- Forest Resources Management***
- Wildlife Habitat Conservation and Management***
- Forest Enterprise***
- Ecological Restoration***
- Conservation Biology***
- Wetland Science***
- Wildlife Ecology**
- Fisheries and Aquaculture**
- Pre-Vet Wildlife/Wildlife and Fisheries**

* Accredited by the Society of American Foresters

Interested in being part of the School of Renewable Natural Resources?

Your future starts here:
www.rnr.lsu.edu/academics/welcome.htm



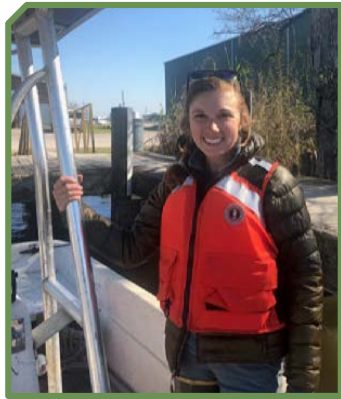


GRADUATE NEWS

MS STUDENTS



Andrew (Andy) Byers (M.S.; Dr. Collier) will be studying wild turkey population ecology.



Aylette Liford (M.S.; Dr. King/Nyman) is studying avian communities in natural and restored marshes.



Alex Dopkin (M.S.; Dr. Ringelman) will be using trail cameras to study the duck nest predator community in southwest Louisiana.



Lee Potter (M.S.; Dr. Xu) is conducting aquatic biogeochemistry research with a focus on carbon transport and transformation in the Mississippi-Atchafalaya River system.



Alexandra Eisley (M.S.; Dr. Wolfe) is studying drought tolerance in bottomland hardwood forest trees.



Nicholas Coxe (M.S.; Dr. La Peyre) will examine potential differences in physiology and survival between different oyster populations and ploidies when exposed to hypoxia and high temperature.



Garrett Rhyne (M.S.; Dr. Stouffer) will be studying migratory connectivity in Swainson's Warblers across their breeding range.



Allyssa Oune (M.S.; Dr. Tiersch) will develop methods for cryopreservation of early life stages of the California sea hare (*Aplysia californica*).



Jacob Olichney (M.S.; Dr. Blazier) is exploring the physiological processes that affect tree growth and mortality trends in forests comprised of single versus multiple species of tree overstory.



Eliza Stein (M.S.; Dr. Taylor) is studying diet in Common Nighthawks with DNA metabarcoding in relation to the effects of fire frequency and annual cycle.

PHD STUDENTS



Mohammad Shayan (Ph.D.; Dr. Wu) will be working on biodegradable polymers.



Nick Gaspard (Ph.D.; Dr. Nyman) is examining intertidal oyster population dynamics in coastal Louisiana.



Joe Youtz (Ph.D.; King/Nyman) is studying habitat relationships and distributions of secretive marshbirds in coastal Louisiana.



School of Renewable Natural Resources/ Forestry, Wildlife and Fisheries Association Goes Virtual

In spite of a COVID-19, the LSU SRNR/FWF Alumni Association had a record year, with 102 paid memberships and member contributions of \$6,455. Members contributed \$3,165 to the RNR Excellence Fund, which is used to pay for scholarships, awards and travel expenses for both undergraduate and graduate students. Twenty-six alumni purchased combined memberships to the SRNR/FWF Alumni Association, LSU College of Agriculture Alumni Association and LSU Alumni Association, obtaining communications and membership perks from all three organizations. We are very grateful for this partnership, which translates into additional support and resources from the College and University for our school.

Science Thursday has continued via Zoom and resulted in participation by alumni around the world. We enjoyed a diverse group of speakers and topics and welcome and need your participation. These speakers included

- Dr. Andy Nyman, “Constructing wetlands at elevation predicted to be intertidal in 20 years delays, rather than extends, wetland benefits”
- Dr. Richard Keim, “The future of coastal forests in Louisiana”
- Dr. Sabrina Taylor, “The effects of the Deepwater Horizon oil spill on Seaside Sparrows and Marsh Rice Rats
- Miss Emma Reid, “In the blind — The traditions of waterfowl hunting in Louisiana”
- Dr. Megan La Peyre, “Love ’em or hate ’em, oysters are shucking amazing”
- Ms. Katie Percy, “The Prothonotary Warbler, a migratory songbird connects forested wetlands across continents”

President Craig Gothreaux and President-elect Rachel Villani hosted the annual general meeting of the SRNR/FWF Alumni Association via Zoom on Thursday, April 22 at 6 p.m. Agenda items included our Director’s report, treasurer’s report, new inductions into the SRNR Hall of Fame, and election of officers. Please consider volunteering for a position as an at-large board member. It is not necessary to live in the Baton Rouge area.

The SRNR/FWF Alumni Association is accepting dues and contributions for 2021 on the SRNR website or directly at this link: <https://lsu-srnraa.square.site/>

Renewal announcements will be distributed by email in March and will be included by mail in this issue of Research Matters. We suggest donations of \$10 for basic dues; \$100 for the LSU SRNR/FWF Alumni Association, LSU College of Ag Alumni Association and LSU Alumni Association combined membership; and \$1,000 for a Director’s Club membership. Your contribution in any amount is both needed and greatly appreciated. We are here to help our students and engage our alumni.

We wish to congratulate and thank Hayley Jackson, School of Renewable Natural Resources alumni coordinator. Hayley graduates in May with a B.S. degree in natural resource ecology and management with a concentration in wildlife ecology. She is a great and dependable asset to our group. Watch for emails from our new coordinator, Zoe Schwaller, a freshman at SRNR.

We anxiously await the return of in-person meetings; we will do so as soon as it is safe and when meetings can be conducted in compliance with LSU and Louisiana Department of Health Guidelines. We will continue to provide an option to participate via Zoom for those alumni for whom it is inconvenient to participate in person. ■

Diane Sustendal Labouisse Endows Graduate Scholarship at SRNR

Ducks Unlimited Inc. received a gift from Diane Sustendal Labouisse for the endowment of an annual graduate-level scholarship at the LSU School of Renewable Natural Resources to be known as the John Peter Labouisse III/Ducks Unlimited Inc. Scholarship.

John Peter Labouisse III was the longest serving volunteer of the New Orleans Ducks Unlimited Committee. Labouisse served as a valued member of the DU general membership, sponsor and major donor committees, and at the time of his death was recognized as a Life Sponsor of DU with over 40 years of service and contributions to wetlands and waterfowl conservation efforts.

The amount of the scholarship shall be a minimum of \$2,000 per semester or \$4,000 per year. At least one award will be provided to a full-time graduate student in good standing in the LSU School of Renewable Natural Resources. Preference shall be given to students who have volunteered for DU through a collegiate, general membership or sponsor chapter and who are pursuing a course of study focused on waterfowl, wetland management or wetland ecology. Recipients of the scholarship shall be selected by the School of Renewable Natural Resources Scholarship Committee, with approval of the vice president of agriculture. ■

Richard P. Sivicek Makes Multiple Donations to RNR

RNR alumnus Richard P. Sivicek (B.S.F. ’69) made several gifts to the School of Renewable Natural Resources over the last year. Rich has an interesting story; he was born and raised in Chicago, Illinois, but as a young man he had a keen interest in forestry and decided to go south, ending up at LSU. Sivicek graduated from RNR (then Forestry) in 1969 with a degree in forestry. While his career went in a different direction, he still considers forestry his passion and has generously decided to give back to the School.



Sivicek endowed the Richard P. Sivicek Undergraduate Scholarship, the Richard P. Sivicek Graduate Scholarship and has made a generous contribution to completely refurbish the RNR computer laboratory. The undergraduate scholarship will be awarded primarily based on the degree of financial need, with preferential consideration to students concentrating in fisheries and aquaculture or wetland science.

Recipients of the graduate scholarship must be full-time graduate students studying fisheries and aquaculture in the school and have a minimum grade point average of 3.0. Consideration will be given to students pursuing a master’s degree, with financial need as a consideration for selection.

Sivicek’s donation to the computer laboratory will allow for an extensive update of our current infrastructure and will be named in his honor. With this donation, we will be able to reconfigure the laboratory and purchase new state-of-the-art computer equipment.

Sivicek always wanted a master’s degree in fisheries, but between family obligations and the military draft, he never realized his dream. He has since focused on helping students achieve their goals. During his career, he worked for Georgia-Pacific in Mississippi, worked construction in Chicago and spent 22 years with the police department in a Chicago suburb. Donations like these greatly enhance our ability to train the next generation of natural resource professionals. ■

WE WANT TO HEAR FROM YOU!

The alumni news is compiled and written by Luke Laborde. We are continuously working to update and manage our alumni files and database. We welcome information on promotions, career changes, passings and other important life events from all alumni. If you have any news items or address changes that you would like to share, please e-mail Luke at llabor2@lsu.edu

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IN MEMORIAM

Lt. Col. Bobby G. Blaylock, USAF, Ret. (B.S.F. '56)

Bobby Blaylock, age 87, died Oct. 13, 2020 in Madison, Mississippi. He spent his childhood years in Duckhill, Mississippi, then moved with his parents to Baton Rouge. He graduated from University High in 1951 and went on to study forestry management at LSU, graduating in 1956. While at LSU he taught himself to fly through a local crop-dusting operation and once bought and rebuilt his own aircraft. In 1955, he married Virginia Lee McKean and they shared 63 years of marriage prior to her death in 2018. He began his United States Air Force career in 1956 and flew several jets, including the F-86, F-84, O-1, F-100 and F-104. He served his country in Vietnam earning two Silver Stars, five Bronze stars, three Distinguished Flying Crosses and numerous merit awards. After 22 years of service in the Air Force, he retired and began working in construction and as a project manager for the Presbyterian Church of America. He enjoyed hunting, fishing and craft hobbies as well as being a lifelong LSU Tiger fan.

Donald Beauchamp Fisher (B.S.F. '64)

Don Fisher of Highlands, North Carolina, was born on Sept. 22, 1941, and died on May 9, 2020. A native Virginian, Don loved life on the family farm in Northumberland County. Always intrigued with various forms of nature, Don would cultivate his many interests of the land and would grow beautiful vegetable and flower gardens. He furthered his knowledge of the farms' timberlands through his studies in forestry at LSU, his beloved alma mater. While at LSU, Don participated in ROTC, subsequently enlisting in the United States Marine Corps, where he attained the rank of sergeant. As a forester, he rendered tremendous service to Union Bag Corporation and later to International Paper, working primarily out of Brunswick and Southampton Counties, Virginia. His services included wood procurement and land management and eventually real estate sales of land and timber. He looked forward to every 10-hour day working in the forests for 36 years. Later, with his wife, Betty, he pursued his real estate license, practicing for several years before retiring again in 2018. Don served as worship elder at the Franklin, Virginia Presbyterian Church. His travel ranged from canoe trips on the Cullasaja and Tuckaseegee Rivers to ocean and river cruises to explore the world.

Alphas E. Herrington (B.S.F. '48)

Al Herrington died on April 29, 2020, in Camden, Arkansas. He was born on Feb. 15, 1926, in Bastrop, Louisiana, and played high school football, baseball and basketball at Springhill High School. He attended LSU, where he worked at the LSU dairy to fund his education. In the summers he first worked at, and later ran, remote logging camps in the Rocky Mountains near Coeur d'Alene, Idaho. He graduated with a degree in forestry in 1948. He was first hired by the Arkansas Forestry Commission but soon found a job with International Paper Company and moved to Camden to begin what would become a 35-year career. At IP, he managed millions of acres of timberland. He retired at age 59 and enjoyed the next 35 years in the woods running landlines, marking timber and managing land for family and friends. Al took his family on summer vacations (all by car) to 48 states, and he enjoyed every minute of the scenery, history and outdoors. He remained active physically for almost all of his 94 years. He was a deacon and Sunday school teacher at Maul Road Church of Christ. He is survived by his wife of 70 years, Dorothy Herrington of Camden.

Lloyd Edward "Laddie" Lind (B. S. Fisheries '93)

Laddie Lind, 52, passed away on Aug. 29, 2020, in New Orleans after a long illness. Laddie was born in New Orleans on Oct. 2, 1967, and attended Christian Brothers, Jesuit High

School and Louisiana State University. During his time at LSU he earned his B.S. degree in fisheries. Laddie was a real estate agent and worked for Brunings, Tropical Isle, Carr Stone and The Stone Center. He was an avid fan of LSU football and the New Orleans Saints.

Michael Day McCoy (B.S.F. '63)

Michael McCoy, a resident of New Roads, Louisiana, for over 50 years, passed away from COVID-19 on Nov. 16, 2020, at the age of 80. Michael grew up in Houston and graduated from Bellaire High School. He went on to earn a B.S. in forestry from Louisiana State University, where he was a member of Sigma Chi fraternity. Later in life, he graduated from the LSU Banking School of the South, and also earned a master's degree in secondary science education. He completed his military service as an officer in the Louisiana National Guard. Michael was a professional forester with the Texas Forest Service in Conroe and Lufkin, Texas. After moving to Louisiana, he worked for several years at Georgia Pacific Corporation and also as a part-time Pointe Coupee Parish deputy sheriff with the boat patrol and with firearms instruction. He was with the Bank of New Roads, now Regions Bank, for 19 years. In the final years of his work, he became a professional secondary science educator in East Baton Rouge and Pointe Coupee Parish schools, retiring in 2002. He volunteered with the Boy Scouts of America and trained the Pointe Coupee Parish 4-H forestry team for state competitions. His interests included wildlife, hunting and fishing, art, photography and travel.

Clyde McGee Norton (B.S.F. '56)

Clyde Norton was born in Guntown, Mississippi. Raised in a Methodist household in Neshoba County, he was an Eagle Scout and excelled at baseball. He attended Mississippi State University and then LSU to study forestry. After graduation, he served in the U. S. Army and was honorably discharged with rank of captain after both active and reserve officer duty. In the 1960s, Clyde and his wife, Thelma, made their way to Oakdale, Louisiana, where he earned a role with the Roy O. Martin Lumber Company. Clyde partnered with the Martins for more than 43 years. He oversaw the growth and business transitions at two plants, Dura-Wood Treating (Alexandria) and Colfax Creosoting Company (Pineville). Clyde was a leader in the railroad and utility industries, serving on national boards. Leisure time for Clyde meant golf, hunting or fishing with friends and his children. In Clyde's final years, he and Thelma moved to Rogers, Arkansas, where Clyde was a member of Pinnacle Country Club and Central United Methodist Church.

Cultus Owen Pearson Sr. (B.S.F. '51)

Cultus Pearson Sr., 94, of Lacombe, Louisiana, passed away on Feb. 2, 2020. Cultus was born May 28, 1925, in Caesar, Mississippi, and was a resident of Lacombe for almost 70 years. A World War II veteran, he served in the Army infantry in the South Pacific, receiving a Bronze Star for his valor. He returned from the service to finish his last year of high school, where he met his lifelong love, Frances Davis, to whom he was married over 70 years. After Cultus graduated from LSU with a degree in forestry, he and his wife moved to Lacombe to raise their family, which quickly grew to nine children. Cultus and Frances ran a general store and gas station in Lacombe that later became a full-service Exxon station. An avid outdoorsman, he built and sold fiberglass pirogues and 18-foot lake skiffs. He ran crab traps and shed soft-shell crabs until he was 70. Known as the "Crab Man of Lacombe," he continued to boil and sell crabs from his home until the age of 90. A civic leader and innovator, Cultus worked with researchers from LSU to develop the first indoor crab shedding system and was a charter member of the Louisiana Crab Task Force. Cultus was the first fire chief of Lacombe. He served

on the St. Tammany Planning Commission, and he was a St. Tammany Country League President (the local youth baseball and softball organization). He served as Boy Scout Cub master, PTA president, softball coach and member of the First Baptist Church of Lacombe. Cultus and Frances were honored as king and queen of the Lacombe Crab Festival Cookoff, and, in 2011, as Citizens of the Year.

Frank Alwin Roth II (B.S.F. '70, M.S. Forestry '72)

Frank Roth, II, age 72, passed away at home on Aug. 15, 2020, after a long battle with Parkinson's disease. He was born Oct. 16, 1947, in Baton Rouge and grew up there. He earned a bachelor's and master's in forestry from Louisiana State University, where he met and married Beverly Tye Roth. He was a veteran, serving as a second lieutenant in the United States Army from 1972-74, before continuing his education and earning a doctorate in Forestry from Stephen F. Austin State University in 1980. He had a long career in forestry research and extension, teaching and consulting while living in Selma, Alabama, and later in Hope, Arkansas. He mentored many of today's foresters through 4-H and teaching and was a leader for many years in the National 4-H Forestry Invitational. He was a Boy Scout leader, a Kiwanian for over 30 years, and a staff member for Kairos Prison Ministry and Episcopal Cursillo weekends. Later in life, he was ordained as an Episcopal priest and served at Saint Mark's in Hope, Arkansas, and Saint Matthias, Tuscaloosa, Alabama. He retired in 2013 and continued to serve frequently with Kairos Prison Ministry. He was a devoted, lifelong LSU Tiger fan since boyhood, a traveler always planning his next adventure, and a lifelong learner.

Rev. William Howard Walker Jr. (M. S. Fisheries '67)

The Rev. Bill Walker, Jr., 77, of Erie, Pennsylvania, passed away peacefully on Sept. 8, 2020. He was born in Chicago on Jan. 28, 1943. Bill loved learning and teaching. He graduated from Elmhurst College with a Bachelor of Science degree in biology, then earned a master's in fisheries from Louisiana State University. He completed his formal education with a Ph.D. in Philosophy from the University of Pittsburgh, specializing in environmental biology, and a Master's in Divinity from the Pittsburgh Theological Seminary. He was an ordained minister of the Presbyterian Church for 26 years, during which time he was pastor of the Sykesville Presbyterian Church in Wrightstown, New Jersey. One of his proudest accomplishments was the creation of the MANNA project, where volunteers picked up leftover fresh food from grocery stores, restaurants and farms, and delivered them daily to food pantries and those in need in the Wrightstown area. He served as a chaplain for the fire and police departments at Ground Zero in New York City after 9/11. Bill dedicated his life to improving other people's lives.

Paul Harris White (B.S.F. '50)

Paul White was born March 10, 1928, in Tallulah, Louisiana, and died on June 15, 2020 in Shreveport, Louisiana. Paul grew up on the farm and loved the land and being outdoors. He graduated from Sicily Island High School in 1945 and from LSU in 1950, earning a B.S. degree in forestry. In July 1950, he married the love of his life, Mary Lou Mount. He entered the U.S. Armed Forces in November 1950, serving as a U.S. Army sergeant and combat construction foreman in the Korean War. He and Mary Lou lived in Monroe, Louisiana, for 67 years, working first for United Gas and later for Riverwood Paper Company. After retirement, he and Mary Lou formed a small realty company and sold real estate together for many years. He had his own small farm near Alto, Louisiana. He loved horses, hunting, fishing, golf, gardening, sports and especially the LSU Tigers and New Orleans Saints. Paul was a Deacon at College Place Baptist Church, where they were active members over 60 years. Paul and Mary Lou moved to Shreveport in 2020.