#### Trout Study Continues on Calcasieu Lake

Jody Callihan reminds anglers in southwestern Louisiana to release any speckled trout they catch bearing a yellow tag. The animals are part of his ongoing doctoral research in LSU's Department of Oceanography and Coastal Sciences that seeks to better understand the movements and habitat use of adult spotted sea trout in the Calcasieu Lake system. In May, Callihan released 51 specks with surgically implanted transmitters and placed 50 telemetry receivers throughout the estuary to record the unique signals from each tagged fish.

"We know a little bit about their movements from conventional tagging studies, but these types of studies are rather limited in that we only have two data points for each fish where it was released and where it was captured and know nothing about what happened in between," Callihan said. "The acoustic telemetry approach we're using is a high-resolution technique that allows quasi-continuous tracking of individual fish. From this we can discern individual movement patterns at a variety of spatial and temporal scales and quantify habitat use."

The study will continue until at least May 2009, but preliminary results from May through September 2007, based on data from 31 fish, show four distinct behavior patterns:

1. Limited home range: Twelve fish stayed in one localized region, within a roughly threeto-six-square-mile area.

2. Transient behavior: Five fish moved widely throughout the entire system on relatively short time scales. "Some fish moved from one end of the lake to the other (15 to 20 miles) over the course of one to two weeks," Callihan

said. "One possible explanation is that these were mostly smaller fish and they may have been chasing shifting prey aggregations of shrimp and small forage fish."

3. North to south shift over summer: These fish were found in the natural oyster reef complex in Turners Bay in May and June. Callihan believes that decreased salinity, caused by 15-plus inches of rain during May through June, drove these fish to the southern end of the lake where salinity was higher in proximity to the Gulf of Mexico.

4. Movement offshore or to the southern portion of Calcasieu Ship Channel during summer: Three fish moved offshore, including one of the largest in the study – a 7-pound female. "It will be interesting to see if these individuals return to the lake to spawn in the spring," Callihan said. "This will provide important insight into the stock structure of spotted sea trout."

The project is funded by the Louisiana Department of Wildlife and Fisheries (LDWF) through Federal Aid in Sport Fish Restoration from the U.S. Fish and Wildlife Service. It is also part of the Louisiana Cooperative Marine Sport Fish Tagging Program. Fish for the study were caught by volunteer anglers, including members of the Coastal Conservation Association (CCA) and Hackberry Rod and Gun. Kevin Savoie, area agent for the Southwest Region for Louisiana Sea Grant and the LSU AgCenter, helped tag fish, scout receiver sites and make the public aware of the project. He is excited about what Callihan's work may reveal about this prized, yet understudied sport fish.

#### Freshman Levee School Class Graduates

Flood protection in Louisiana is on a new course following the completion of the first session of "Levee School."

Seventy levee board officials, emergency management administrators, floodplain managers and representatives of state and federal agencies completed the pilot Flood Protection and Ecosystem Restoration Professional Development Program, held Nov. 27-29 in Baton Rouge. Sponsoring the Levee School program were the Louisiana Sea Grant College Program, LSU AgCenter, Louisiana Department of Transportation and Development and Louisiana Department of Natural Resources.

"The 2005 hurricane season demonstrated that levee boards and emergency management agencies need a variety of tools to help them do their jobs," said Charles "Chuck" Wilson, Louisiana Sea Grant executive director. "Flood control is more than levees. It's a complex subject that requires a system-wide approach. Louisiana's universities have the capability to bring together levee boards and experts in



Levee School participants consistently gave the program high marks in their review of the three-day workshop. The freshman class also indicated what topics they would like to see added to the program

"This is really a great project that was asked for by local fishermen," Savoie said. "Over the years, Calcasieu Lake has been both a mecca for speckled trout anglers and a hotbed for management controversies. In the last decade, gillnet fishing has been phased out, charter fishing has grown and recreational fishing has boomed. Concerns by some charter and recreational fishermen have been the impetus for creel reductions from 25 to 15 fish daily, of which only two fish of 25 inches or greater per day are allowed.

"According to the best available scientific data from LDWF," Savoie continued, "the stocks are healthy and these changes were unnecessary. This study will hopefully help offer some insight into some unanswered questions about movements within the Calcasieu estuary, and if these fish are only a small part of a much larger population that includes fish in the near-shore waters of the Gulf of Mexico.'

In October, 24 additional fish were tagged and released, and Callihan said he plans to tag and release another 60 in the spring. The transmitters have a battery life of about one year.

Three tagged trout have been caught so far. Fish in the study are marked just below the dorsal fin with a yellow tag labeled "LSU reward; please release." Fishermen are asked to release the fish alive as soon as possible and to call 1-800-891-3977 to report capture date, location, tag number and body length. Anglers will receive a free program hat and T-shirt and be entered into a lottery for cash prizes up to \$500.

a variety of flood control fields to build and

The three-day Levee School was the first

flood protection

and ecosystem

restoration.

plans are for

participants to

return annually

for one-day

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education

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Current

step in providing a professional development

program to assist public agencies, including

levee boards and districts, in fulfilling their

statutory and fiduciary responsibilities in

maintain a premier protection system."



Louisiana Sea Grant College Program Sea Grant Building • Baton Rouge, LA 70803-7507

# COASTAL CLIPS





Louisiana Sea Grant College Program Louisiana State Universit Sea Grant Building Baton Rouge, LA 70803-7507 Charles A. Wilson,

Executive Director Editors: Roy Kron, Paula Ouder. Art: Robert Ray

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# COASTAL CLIPS

Coastal Clips is a quarterly publication of the Louisiana Sea Grant

#### Researcher's Warning Helps Save Lives in Bangladesh

detailed map of Bangladesh, hand Carried around the world four years ago, launched a chain of events that may have saved thousands of lives when Cyclone Sidr, a Category 4 storm, roared ashore from the Bay of Bengal near the border of India and Bangladesh on Thursday, November 15.

Hassan Mashriqui received the map of his native country from his father-in-law who traveled to Louisiana for a family visit. An assistant extension professor of coastal engineering with Louisiana Sea Grant and the LSU AgCenter, Mashriqui had successfully used the Advanced Circulation (ADCIRC) model to predict storm surge from hurricanes in the Gulf of Mexico since 2003. As work in the Gulf progressed, he decided to develop models for Bangladesh and neighboring countries.

"We scanned the map as soon as we got it," recalled Mashriqui, and the "Bay of Bengal Cyclone Surge Modeling Program: Use of Supercomputer Technology and GIS for Early Warning" program was born.

Bangladesh has two peak cyclone seasons – one in May and one in November. The nation is particularly vulnerable to storms because of its dense population and low-lying geography. It has suffered catastrophic loss of life in the past. In late April 1991, Cyclone Gorky claimed at least 138,000 lives. Cyclone Bhola killed as many as 500,000 in November 1970 in what is regarded as one the worst natural disasters of the 20<sup>th</sup> century.

Fast forward to 2007 – Mashriqui became aware of Cyclone Sidr the Monday evening before the storm hit while reviewing information from the U.S. Navy-Air Force Joint Typhoon Warning Center at Hawaii. Ironically, he was preparing to leave Baton Rouge that Wednesday for a hurricane conference in Florida. Mashriqui contacted a Navy officer who told him that the Indian government had been notified but that he did not think the information was taken seriously.

"When I noticed the track, I called my family in Dhaka, the capital, to see if they were aware of the approaching storm. This was three days before landfall," Mashriqui explained.

His brother said they had heard about a tropical depression in the bay, but that it



Hassan Mashriqui shows the storm surge model he developed for Cyclone Sidr.

was "no big deal." In reality, Sidr had reached Category 3 strength with winds of at least 111 mph.

Realizing that people had not been properly warned, Mashriqui located Iftekhar Rhouf, an LSU accounting freshman from Bangladesh whose father is the director of Food and Disaster Management in the Bangladesh Ministry of Food and Disaster Management – the Bangladesh equivalent of the U.S. Federal Emergency Management Agency. Mashriqui told the student to have his father check his email immediately.

In response, Abdur Rhouf telephoned Mashriqui at home on Tuesday and said, "Your track looks scary. What does it mean?" and asked for information that he could take to the secretary of his department. Mashriqui had already begun running storm surge models on the LSU supercomputer, "SuperMike," on nodes that were cleared for him in anticipation of the impending disaster. Mashriqui assured Rhouf that he would

forward his data as soon as it was ready. He worked until midnight preparing models, which take the computer two or three hours each to run.

The next day, en route to Tampa, Mashriqui worked on the storm track. He accessed SuperMike from his hotel at noon. By 3 p.m. he completed predictions on where the storm would land and how much surge it could generate. He emailed the official at 4:45 p.m. CST on Wednesday. In Bangladesh, it was 4:45 a.m. on Thursday – about 12 hours before Sidr would slam the coast.

"I didn't feel good," Mashriqui said. "I expected there would be dead by the tens of thousands. I didn't sleep the rest of the

Mashriqui predicted a storm surge as high as 12 feet and associated flooding that might reach 20 to 50 miles inland. His information helped officials decide how and where to evacuate before the storm. After



#### Cyclone . .

#### Continued from page one

the storm passed, he provided hindcasting to guide aid and rescue efforts to locations that had been hardest hit.

"I actually thanked my father-in-law the other day for bringing me the map," Mashriqui said. "I also thank the managers of the LSU supercomputing system. If anything in the chain of information would have broken, my attempt would have failed. Luckily, everything fell into place. LSU has one of the nation's

leading hurricane research centers when it comes to knowledgeable people and computing power."

The death toll from Sidr is estimated to be at least 3,500 – tragic, and more than twice the number of dead from Hurricane Katrina – but significantly fewer then in past cyclones. Mashriqui wants to ensure that Bangladesh scientists and emergency planners gain the same predictive powers that save lives in the Gulf of Mexico. While they have the ability to track and forecast

tropical cyclones, they do not have the tools or training to predict storm surge. Mashriqui plans to participate in upcoming seminars with government officials and to help them access the supercomputing power they will need to generate their own models.

"This will save lives. Furthermore, this is a chance for the United States to make a powerful, positive statement in a Muslim country." Mashriqui said.

Information on Mashriqui's work is available online at www.stormsurge.lsu.edu/. •

#### Sea Grant Assists European Documentary

Louisiana environs and the people who work to conserve them will be the subject of a 52-minute documentary to air on French television in early 2008.

Paris-based reporter/director Ania Szczepanska and videographer Robert Iseni spent two weeks traveling the coast, interviewing experts and trekking through wildlife refuges for the program Sentinelles de la *Nature* (*Guardians* of *Nature*), which will be broadcast on TF1, Ushuaia TV, the National



David Bourgeois prepares to take documentary filmmakers Ania Szczepanska and Robert Iseni on a tour of the Louisiana marsh

Geographic Channel and various other foreign stations.

"The goal of our program is to show places, regions or countries of the world, with special regard to their natural resources, beauty and the human interventions implemented to save and preserve them," Szczepanska said. "For each sequence, we go and meet scientists, site guards, naturalists and other enthusiasts involved in protection and preservation. We chose Louisiana because we wanted to show something

positive about this state - not only the impacts of Katrina and Rita."

Before their arrival, the filmmakers were assisted by Louisiana Sea Grant Communications Manager Roy Kron and Editor Paula Ouder, who helped the pair make contact with relevant subjects. A current and a former LSG affiliate will be featured in the documentary.

David Bourgeois, associate area agent with LSG and the LSU AgCenter, took Szcz-

> epanska and Iseni on a day-long boat tour in and around the Pointe-aux-Chenes Wildlife Management Area in Terrebonne Parish. He shared his personal and professional insights, as well as the sights, sounds and tastes of a Louisiana marsh.

> "They wanted to film more and more of the birds, fish and even some jellyfish underwater," Bourgeois said. "I shucked some fresh oysters I picked for them. The highlight of the day was when Ania and Robert conducted an interview sitting on a dead oak tree log on Bayou Point au Chenes. It was soft and muddy and they both got covered with mud."

The next day, Bourgeois arranged a filming with teachers and students from Montegut Middle School planting native trees for the Coastal Roots program. LSG's recently retired invasive

species coordinator Marilyn Barrett-O'Leary, who continues to work on invasive species issues as an independent project manager, also is scheduled to appear in the documentary. Szczepanska said she was impressed with Barrett-O'Leary's ability to thoroughly explain the threat posed by some non-native flora and fauna and feels viewers will learn a great deal from the segment.

Barrett-O'Leary and James Seales from the Louisiana Department of Wildlife and Fisheries took the journalists on a boat tour

of Caddo Lake in north Louisiana to learn about the invasive plant, giant salvinia.

"I was delighted that French television was interested in some of Louisiana's conservation efforts," Barrett-O'Leary said. "It demonstrates that they recognize that conservation issues are global. Our shrinking planet is important, and we must all make an effort to conserve water and biota for present and future generations." •

#### **Bui Named New** Extension Agent

Thu Bui is the new Marine Extension agent in St. Mary, Iberia and Vermilion parishes for Louisiana Sea Grant and the LSU AgCenter.

"Thu is resourceful and makes a great addition to Sea Grant," said Rex Caffey, LSG Extension leader. "She grew up in a fishing family. She's worked in the fishing industry. And being fluent in Vietnamese, she'll help Sea Grant

> better serve the Vietnamese fishing community." Bui earned a

> Bachelor of Science degree in biology from Louisiana State University. She served as assistant director for Gulf South Inc. n Intracoastal City and as an interpreter and

bookkeeper for two fishing vessels.

"I'm excited about the opportunity to work with the fishing community in this new role," said Bui. "I want to provide fishermen with programs that help them make the best decisions possible."

Bui can be reached at 337/828-4100, ext. 300, or tbui@agcenter.lsu.edu.

#### A Different Perspective on Sustainable Communities

Two devastating coastal zone events - the 2004 Indian Ocean tsunami and Hurricane Katrina – are providing a New Zealand researcher invaluable lessons in natural hazards planning.

In September, Bruce Glavovic, an associate professor at Massey University, completed his fifth trip to the Gulf of Mexico coast following the 2005 hurricane season. "Initially, I thought I could complete my interviews along the Gulf coast in one 30-day trip in January 2006," said Glavovic. "But I found myself coming back four more times to capture the 30,000-foot view of recovery efforts."

Aided by Louisiana Sea Grant/LSU AgCenter Disaster Programs Coordinator Pat Skinner during his most recent visit, Glavovic completed interviews with officials, academics and others grappling with post-

Katrina recovery in Louisiana and Mississippi. "I'm interested in individuals' stories about their own experiences and their views

### Wetland Lab on the Horizon

Students from kindergarten through graduate school may have a living wetlands laboratory available to them on LSU's Baton Rouge campus in the near future.

Plans are in the works to dredge Campus Lake, located just north of South Stadium Drive. As part of that project, about a third of the eight-acre lake site would be developed as a wetland to naturally filter the runoff entering the water body. Louisiana Sea Grant has pledged funding to help create a wetland education center at the location.

"A living wetland laboratory on campus would have a broad impact," said Charles "Chuck" Wilson, LSG executive director. "It would strengthen the research infrastructure

of many LSU departments, provide university students with hands-on education and research opportunities, and give K-12 students a place to learn about coastal restoration and stewardship."

Project proponents Charles Lindau and John Day, Department of Oceanography and Coastal Sciences, and Ron Delaune, Wetland Biogeochemistry, will enlist the aid of Pam Blanchard of the Coastal Roots Program to cultivate the wetland. Through Coastal Roots, students in grades 4-12 establish plant nurseries at their schools and grow native seedlings that are used in wetland restoration projects. Coastal Roots was established by LSG and is now under the LSU Department of Educational

One NOAA' Exemplified by Sea Grant/NMFS

Sea Grant is known for utilizing the power of the network. Nearly three years ago the Louisiana program extended that network reach by offering work space to a local office of the National Marine Fisheries Service.

"Co-locating two NOAA programs under one roof was just the first step in creating collaborative opportunities and the synergy we envisioned between Sea Grant and the Damage Assessment, Remediation, and Restoration Program," said Charles "Chuck" Wilson, LSG executive director. "We recognized the potential to work together

on research and involve students in mutual Prior to occupying space in the Sea Grant "I really feel NOAA Fisheries is getting

coastal restoration and oil spill projects." building, NOAA's Damage Assessment, Remediation, and Restoration Program was housed in the business incubator facility at LSU. John Rapp, marine habitat resource specialist, was the NOAA contact. the most out of this arrangement," Rapp said. "Sea Grant has provided the infrastructure we needed to be an effective small office. And the communication – exchanging information and ideas - is strengthening both programs. We're working together on our common







Bruce Glavovic

about recovery challenges, opportunities and lessons. I'm not looking for a formal or official organizational viewpoint, I am intrigued by personal insights," he said.

Among those interviewed were Sea Grant/ AgCenter Extension agent Mark Schexnayder, Extension leader Rex Caffey and Jim Wilkins, LSG Law and Policy Program director.

The purpose of Glavovic's research is to understand how to build sustainable, hazardresilient communities and make practical development recommendations after completing a comparative analysis of the experiences in the Indian Ocean and Gulf of Mexico. Part of the focus will be on the roles land use planning and coastal management can play in building sustainable communities.

"Hopefully, my work will contribute to the ongoing recovery efforts and future planning and hazard mitigation in coastal communities here and elsewhere," he said.

Theory, Policy & Practice and the Center for Plant, Environmental and Soil Sciences.

"It's been about 30 years since Campus Lake was dredged," said Lindau. "Currently, the lake is only 12 to 15 inches deep. After the dredging, it will be six feet at its deepest. The wetland area will help in preventing the lake from re-silting. It also will help with overall water quality." Wetlands filter runoff by slowing water flow and allowing silt, sediment and contaminants to settle out before the runoff reaches a larger water body.

A start date for the project has yet to be set, as additional funding is needed. Delaune said once work begins, it will take at least two years to complete.

objectives and that's made easier by being down the hall from each other.'

That collaboration includes Sea Grant and the Restoration Program supporting a research project on the effects of a Hurricane Katrina-related oil spill in brackish intertidal marsh. Also, Rapp provides input on Sea Grant programming as a member of the LSG Advisory Council.

"This effort is helping reinforce the concept of one NOAA," said Wilson. "Hopefully, this Sea Grant/NOAA model will take root and be utilized at programs throughout the country." •

#### Hydroacoustics May Aid Fisheries Managers

Six and a half feet of water isn't deep, but in the murky marine environment of Barataria Bay, such shallow waters do an excellent job of concealing what lies beneath. Is there a bounty worthy of the area's most infamous resident, pirate Jean Laffite, or just a scattering of fish?

Traditional sampling techniques to determine fish populations, such as traps and nets, can result in faulty conclusions by fisheries managers because they only provide a twodimensional view of the water column. "Knowing the distribution and biomass of fishes in an estuary is critical for effective ecosystem management," said

Charles "Chuck" Wilson, Louisiana Sea Grant executive director With LSU researcher Kevin Boswell, Wilson set out to give fishery managers another tool horizontal hydroacoustics – to estimate shallow water fish

populations. "Hydroacoustics has been

used to survey fish resources in rivers and deep-water systems, but it hasn't been used much in water

depths less than 5 meters (about 16.5 feet)," said Boswell. "Our research focused on ultrashallow waters of 2 meters (6.5 feet) or less."

One of the first steps in the study was designing and implementing a portable, stable platform that would securely support the

transducer equipment on hard reefs as well as muddy bottoms. What was developed can be easily deployed by a single person in a small boat.

Once the equipment was set up in the field, experiments were conducted to determine how much unwanted "noise" the



equipment would detect. What the team found was little backscattering. Next came actual use of the equipment to determine abundance of fish in the estuary.

"What we got was a good picture of fish biomass at a range of up to 30 meters

(98 feet)," said Boswell. "Some conditions such as wind and waves can reduce the range. On average, the range was 15 to 20 meters (50 to 65 feet).

"Of course, this equipment won't tell you what type of fish it's detecting, but you can determine abundance and distributional patterns

of biomass. Hydroacoustics can provide noninvasive, high- quality spatio-temporal data for large areas, and reduce the need for other sampling methods. It looks like it will make a good fisheries management tool."

Boswell plans to mount the hydroacoustic equipment to a slownoving, remote-controlled vehicle n the near future and put it through another battery of tests "The stationary platform provides only a view of what's in the water at that specific location. A moving platform would allow you to get a broader picture of an even larger area," he said.

He and Wilson recently published a paper about their study in the August 2007 edition

of Estuaries and Coasts (Vol. 30, No. 4). Matthew Wilson with SonarData Ply Ltd. of Australia was a co-author of the paper, titled "Hydroacoustics as a Tool for Assessing Fish Biomass and Size Distribution with Discrete Shallow Water Estuarine Habitats in Louisiana." •

## New White Shrimp Prediction Model Developed

Fisheries managers use a number of tools to predict future seafood abundance and to ensure a species isn't overharvested. For Louisiana white shrimp, there are a variety of models used to forecast annual landings, but each model has its faults.

"Accounting for the variability in fish landings is one of the most frustrating problems facing fisheries managers," said Louisiana Sea Grant researcher Hamady Diop. "This is especially true for



Hamady Diop

the Louisiana white shrimp fishery. Inshore landings have ranged from a low of 21.9 million pounds in 1978 to a high of 59.8 million pounds in 1986. This high variability in shrimp landings is a common characteristic across the globe and it presents a challenge in developing predictive models."

Diop, an assistant professor of economics at Southern University in Baton Rouge, with colleagues Walter Keithly, Richard Kazmierczak and Richard Shaw at LSU, set out to develop a better white shrimp model using the best elements of other models.

"We developed a three-equation model for predicting shrimp abundance and subsequent catch based on lagged lifestage counts and environmental parameters such as temperature, river discharge, salinity and cumulative wetland loss," Diop said. "This strategy allowed us to examine the full impact of environment or biological shocks on various life stages."

When Diop plugged historical environmental and sampling data into his model, it accurately predicted actual Louisiana white shrimp landings from 1970-1997. "I can't stress the significance of that outcome," said Rex Caffey, Louisiana Sea Grant Extension leader and with the Center of Natural Resource Economics at the LSU AgCenter.

"The importance of this model is its capability to better determine potential harvests," said Caffey. "It will provide fisheries managers with a more robust instrument for managing the white shrimp fishery."



