LUMCON Monitors Coastal Environments

Celebrating World Water Monitoring Day

Whether it's the waters of coastal Louisiana or the depths of the Gulf of Mexico, LUMCON is committed to monitoring marine environments. The delicate ecosystems of Louisiana's coastal marine environments require balance to preserve their health. The people of Louisiana depend on these marine environments for their livelihood and recreation. The delicate balance supporting the health of the marine environments is threatened by land loss, pollution and other human-caused disturbances. By monitoring these environments of coastal Louisiana, LUMCON keeps a close watch on this balance.

LUMCON's Environmental Monitoring System, established in 1998, collects and archives real-time meteorological and hydrographic data to provide a broad community of scientists, educators, students and the public with quality-controlled environmental data. The system consists of six stations or platforms that collect meteorological and hydrographic data. LUMCON displays real-time environmental data and also provides archived data through the web.

By providing the data free of charge, LUMCON brings coastal information to scientists, educators, students and the public. LUMCON's Environmental Monitoring program serves the scientific community by revealing long-term trends that can lead to new awareness and understanding of Louisiana's gulf coast's changing environment. These data provide the only continuous record of this kind in coastal southeast Louisiana. Scientists from the National Aeronautics Space Administration have used the data for numerical modeling as well as students from universities across the United States.

The real-time access of the data makes it useful not only to scientists and managers but to the public as well. Jason Doughty, Party Chief for C.H. Fenstermaker and Associates, checks LUMCON's website daily for wind speed, direction and water height. “Certain wind speeds are dangerous in an air boat. If it looks like the winds are high, we will plan to do an inland job. The best thing about [LUMCON’s weather website] is that it's up-to-the-minute information," said Doughty. A fly fisherman from Lafayette uses the turbidity data from LUMCON's Tambour Bay station to determine whether or not to make the drive to Cocodrie and LUMCON Security Guard, Kenneth LeCompte, uses LUMCON's salinity data from the Marine Center station to determine when fish might be biting off the back dock.

Although hurricanes are the biggest challenge for LUMCON's Environmental Monitoring System, the data provided by these stations during hurricanes are invaluable. Both the National Hurricane Center and the National Weather Service use data from LUMCON's stations in predicting hurricanes and understanding their impact. On September 1, 2008, the LUMCON Marine Center recorded wind speeds of up to 155 mph from the north just before the eye of Hurricane Gustav made landfall to the east of Cocodrie. After the eye passed the winds shifted to the south and approximately one minute later the anemometer blew completely away. Because the data were collected in real-time during the peak of the storm, this phenomenon was captured despite the later loss of the equipment. As Hurricane Ike passed 200 miles to the south of LUMCON, the Marine Center station measured record water heights in Cocodrie of up to 8 feet. This was the highest recorded water height of any storm surpassing Hurricane Rita's 7 1/2 feet.

Grants from a variety of sources including: NOAA, EPA, NASA, USGS and the State of Louisiana provided funding for the equipment and construction of the stations while operation costs have been borne by various grants and LUMCON. For more information visit http://weather.lumcon.edu.

LUMCON will be hosting "From H-2-O: a water quality workshop for teachers," from January 23 to 25, 2009, at the W. J. DeFelice Marine Center in Cocodrie, LA. Sponsored by the Barataria-Terrebonne National Estuary Program, the workshop will train teachers on the use of LUMCON's Bayouside Classroom water sampling program designed to teach water quality issues. Teachers are invited to attend as well as former participants who can attend as mentors. Selected participants will receive lodging and meals, a $300 water sampling kit, teacher resources, CEUs and much more. Teachers interested in learning more about the Bayouside Classroom program should visit: www.lumcon.edu/bayousideclassroom.

A Publication by the Louisiana Universities Marine Consortium
Message from the Executive Director
Dr. Nancy N. Rabalais

Come gather ‘round people
Wherever you roam
And admit that the waters
Around you have grown
And accept it that soon
You’ll be drenched to the bone.
If your time to it
Is worth savin’
Then you better start swimmin’
Or you’ll sink like a stone
For the times they are a-changin’.

—Bob Dylan

Change is inevitable and keeping track of change is the essence of monitoring the world around us. For 20 years, the Barataria-Terrebonne National Estuary Project has been a long-term, intensive field survey for invasive aquatic plants. This information will form a baseline critical to future tracking, control, and management of invasive species.

Dr. Nancy Rabalais

LUMCON News Vol. 8, #2  Page 2
Interns Learn Observation and Monitoring Skills

Julie Seneff, from Baton Rouge Community College, and Jorge Rodriguez from the University of Puerto Rico, have both interned at LUMCON. Seneff worked as a technician in the environmental monitoring program. Her project was focused on using environmental monitoring data to re-examine the increase in hurricanes in the Gulf of Mexico. This year LUMCON also had one high school student intern. Devin Pearis, a senior at Brookhaven Academy High School in Brookhaven, MS, works in fisheries with his father at fish hatcheries in Liberty, MS. This summer he worked with Dr. Ed Chesney learning how to maintain the areas around the ponds and helped to release fish into stocked ponds. "This is what I like to do," he said, "I am enjoying every minute, although I have only one week here." Pearis said.

LUMCON interns, no matter where they are from, all learn that LUMCON has much to offer. The internship helps students focus on their research interests and career goals. "Cocodrie is a nice little place at the end of the world, and LUMCON is a good beginning for my career, a good launching pad," said the LUMCON experience opens doors for students, Seneff said.

LUMCON is a host site for a new monitoring effort by a group of scientists from Los Alamos National Laboratory implementing a Lighting Mapping Array (LMA). LUMCON along with Nicholls State University, Louisiana State University, the Port Fourchon Authority and the Associated Branch Pilots sites will create the new dual VLF-VHF lightning geolocation array in the New Orleans area. The Los Alamos array is a project of the Laboratory Directed Research and Development entitled, "Flash before the Storm: Predicting Hurricane Intensification using LANI Lightning Data." Christopher A. Jeffrey of the Space and Remote Sensing Sciences of the Los Alamos National Laboratory in New Mexico said that the lightning observations from Hurricane Rita. The data collected and mapped indicated that this lightning detection system was sufficient to map the location of the storm's eye wall, as the burst of eyewall lightning activity coincided with the storm's rapid intensification.

The coincidence of lightning activity and intensification is consistent with the theory that intense eyewall convection can trigger hurricane intensification. Eyewall lightning activity is typically low due to the absence of supercooled water; persistent concentrations of eyewall ice crystals maintain glaciated microphysical conditions. According to the hot tower hypothesis, an intense burst of eyewall vertical convection can trigger intensification via condensational heating, vertical vorticity stretching and advection of potential vorticity into the eyewall. An hypothesis of my project is that these hot towers also produce intense eyewall lightning activity during a period of eyewall adjustment prior to re-glaciation. Thus, lightning activity, which can be remotely monitored, serves as a proxy for eyewall convection and reorganization, and is a potential indicator of rapid hurricane intensification or de-intensification (eyewall renewal), Jeffrey said.

Installed this summer, the new system helps determine the location of lightning in both the inter-cloud lightning and the cloud-to-ground lightning events that occur within several thousand kilometers. Then it transmits the data in real-time to New Orleans, LA, using RF lightning arrays, serves as a proxy for eyewall convection and reorganization, and is a potential indicator of rapid hurricane intensification or de-intensification (eyewall renewal). Jeffrey said.

Once triggered, the VLFILF channel provides a 3-D channel array output to the process of small breakdown processes while the VLFILF provides a large-scale current movement that comes from each of the processes. The goal is to combine previous long range technologies with New Mexico's short range high spatial resolution technology. This is the first system that can detect a peak at any time. This channel is also able to record continuously the VHF waveform data at each sample per second so that a detailed breakdown can be studied. The combination of the two measurements will provide us the charge amount neutralized by each process," Jeffrey said.

LUMCON News Vol.8, #2 Page 4

Lightning Revelations in the Gulf of Mexico

LUMCON News Vol.8, #2 Page 5


LUMCON News
published by the Information and Technology Department

Dr. Nancy N. Rabalais
Executive Director, Louisiana Universities Marine Consortium

Executive Board
Dr. Michael V. Martin, Chair
Chancellor, Louisiana State University and Agricultural and Mechanical College

Dr. E. Joseph Savoie, 1st Vice Chair
President, University of Louisiana at Lafayette

Dr. Stephen Hultbert, 2nd Vice Chair
President, Nicholls State University

Dr. Brooks Keel
Vice Chancellor for Research and Economic Development,
Louisiana State University and Agricultural and Mechanical College

Dr. Robert Stewart
Vice President of Research & Graduate Studies,
University of Louisiana at Lafayette

Dr. David Boudreaux
Vice President for Institutional Advancement,
Nicholls State University

Mission Statement
LUMCON strives to increase society's awareness of the environmental, economic and cultural value of Louisiana's coastal and marine environments by conducting research and education programs directly relevant to Louisiana's needs in marine science and coastal resources and serving as a facility for all Louisiana schools with interest in marine research and education.

Help LUMCON save our natural resources. Sign up at lumconnews@lumcon.edu to receive LUMCON News online.

Louisiana Universities Marine Consortium
8124 Highway 56
Chauvin, LA 70344

Non-Profit Organization
U.S. Postage
PAID
Chauvin, LA
Permit No. 119

This publication is printed on partially recycled paper.