

LOUISIANA WATER RESOURCES RESEARCH INSTITUTE

LOUISIANA STATE
UNIVERSITY

MISSION STATEMENT

The Louisiana Water Resources Research Institute is federally mandated to perform a statewide function of promoting research, education and services in water resources. To support these activities, the federal government provides annual funding for research grants and to administer the grant program. The Institute also receives state funding, partially as a match for the federal funding. The Institute also engages in contract research independent of the federal program.

Specifically, the purpose of the Institute is to; Plan, facilitate and conduct research to aid in the resolution of State and regional water problems, Promote technology transfer and the dissemination and application of research results, Provide for the training of scientists and engineers through their participation in research, Provide for competitive grants to be awarded under the Water Resources Research Act

The Institute is a multidisciplinary center for addressing water issues in the state, drawing on faculty from multiple departments and Universities. In this regard, the Institute serves as a resource for state officials who want unbiased, scientifically defensible information on how to address the State's water problems.

RESEARCH PROJECTS 2007

Resiliency of community water supplies in Louisiana's coastal zone: LWRRRI has initiated development of an extensive

spatial database on the environmental infrastructure (water treatment facilities, wastewater treatment facilities and solid waste disposal facilities) of parishes and counties along the northern Gulf Coast. The Institute is seeking partners to work together on the utilization of spatial data to predict susceptibility of community water supplies to short-term impacts from hazards (i.e., hurricane storm surge and wind damage) and longer-term impacts from global climate change and accompanying sea level rise. The "resilience" (ability to adapt to short or long-term stresses) of the community water supply is of particular interest.

Storm surge in the Louisiana coastal zone. Storm surge was responsible for most of the loss of life and property associated with Hurricane Katrina and Rita. Proposals are requested that would continue to refine the prediction of the magnitude and timing of storm surge during Hurricanes approaching coastal Louisiana. Appropriate projects may include sensitivity analysis to changes in storm track or assessing the effect on navigation channels on surge magnitude. In addition, proposals that would hindcast the mitigation of storm surge by changes in land coverage or the presence of coastal structures are particularly encouraged.

Adaptive Management of Louisiana's Water Resources. Adaptive management, a flexible decision-making process that allows for changes in actions based on changing information, has the potential to improve management of complex water resources problems facing the state and region. These include flood management, coastal restoration, mitigation of hypoxia, salt water intrusion and others. Projects are sought which propose research on adaptive management-based approaches for water problems specific to the state and region.

Total maximum daily load (TMDL) calculations in Louisiana water bodies. Deterministic simulation models utilized for TMDL calculations commonly utilize assumptions about the aquatic system including constant flow velocities, constant rates of sediment oxygen demand and other lumped parameters. This introduces a significant amount of uncertainty into the predictions of safe

loads into these water bodies. Louisiana low relief ensures that many of the rivers and bayous are subject to backwater flooding events and other hydrologic events unique to the region that are not considered in the simulation models. This introduces additional uncertainty in the model output. Proposals are sought that seek to reduce or quantify the uncertainty in making TMDL calculations in Louisiana aquatic systems. These may include new modeling approaches, modifying existing simulation models or examining the current tools utilized in TMDL development in Louisiana.

Scale-dependent behavior of hydrologic and water quality parameters.

Monitoring for degradation of water resources or changes in hydrological parameters is strongly influenced by temporal and spatial scaling of the parameters under study. For example, diurnal oxygen and pH changes can obscure long-term trends in water quality data. Studies are sought that examine scaling relationships in Louisiana water bodies. Studies may focus on hydrologic or geochemical parameters

SIGNIFICANT ACCOMPLISHMENTS

LWRRRI performance during Hurricane Katrina. LWRRRI made significant contributions during the response to Hurricane Katrina. The Institute led water sampling teams into the New Orleans area as early as September 3rd, 2005 and collected the first water quality data on floodwaters. This culminated in the first peer reviewed publication on Hurricane Katrina in the ACS journal, Environmental Science & Technology published on the web on October 12th, 2005 ([ACS Link 1: Environ. Sci. Technol.](#)), ([ACS Link 2: Environ. Sci. Technol.](#)). The results described in the paper have been widely disseminated in the media and among federal agencies responding to the cleanup. In addition to this research effort, LWRRRI provided leadership within LSU and among state researchers: facilitating researcher access to New Orleans, organizing research exchanges with the LSU Hurricane Center and documenting media contacts.

The attention on LWRRI has been particularly significant since much of the early work on the vulnerability of New Orleans to hurricanes was done within LWRRI by the previous director, Dr. Joseph Suhayda and collaborators. All of these early studies have been posted on our website (lwri.lsu.edu/1998_2002WEB.htm) and received thousands of hits immediately following the storms. (over ⇒) Continued data collection on sediments and air impacts has occurred since the floodwaters receded. We have presented and discussed the data at the National Academy of Science, American Geophysical Union, American Chemical Society (Western Region meeting in Orange County and the national meeting in San Francisco, the national Society of Environmental Toxicology & Chemistry meeting in Baltimore, and Maryland's Extreme Events conference sponsored by the Maryland Water Resources Research Institute. The initial paper from our data collection described above had the distinction of being the most downloaded paper in the journal Environmental Science & Technology in 2005, despite the fact that the paper was released in November 2005.

CURRENT FUNDING

- LWRRI State Funding \$72,171
- LWRRI USGS Program Administration 2006 \$37,180
- Hazardous Substance Research Center S&SW (HSRC) \$11,608
- Louisiana Spatial Reference Center (LSRC/C4G) \$11,608
- EPA EPSCoR/LEQSF \$258,029
- LA Board of Regents Health Excellence Fund \$120,000
- HSRC S&SW \$354,649
- CICEET-NOAA, \$250,000
- LA DEQ, \$381,000
- University of New Hampshire \$230,023

OUTREACH & EDUCATION

LWRRI Web Site – A web site is maintained to facilitate access to regional and national water information by local, state & federal organizations and agencies. Water information includes events, conferences, and meetings, LWRRI publications, and

current Louisiana environmental legislation.

LAWATER is a new portal website developed by LWRRI designed to bring together the diverse web resources dealing with water resources in Louisiana for use by water professionals, researchers, students and other stakeholders. In addition, LAWATER will be directly linked with LWRRI's digital water library project which is providing electronic copies of all of the published Bulletins from the Institute, dating back to 1966.

Web site:

<http://www.lwri.lsu.edu>

LAWATER: <http://www.lawater.lsu.edu>

Education & Training – LWRRI expended \$60,339 in student and graduate assistantships from USGS and State Funds. An additional \$113,900 was generated in funds from grants and contracts, totally \$174,239 spent on undergraduate and graduate students in FY2005-06. On average we train ten to fifteen students a year.

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