



Institute Correspondence

LOUISIANA WATER RESOURCES RESEARCH INSTITUTE
3325 Patrick F. Taylor Hall, Louisiana State University, Baton Rouge, LA 70803
225/578-4246 FAX 225/578-4945

November 7, 2016

Dear Colleague:

Proposals that address water resources priority issues for Louisiana are being sought. The Louisiana Water Resources Research Institute (LWRRI) anticipates research funds of \$92,335 being available in 2017 through its Section 104 Institutes Program, U.S. Department of Interior - Geological Survey (USGS). Information on 104(b) Annual Base Grant Program can be found at the website <http://lwrrri.lsu.edu/104b-base-grant/>. These funds are currently being sought through Congress appropriations and the final dollar amount available has not been decided. Faculty of Louisiana's colleges and universities are eligible to apply for these research funds. The start date for projects is March 1, 2017.

The proposed research should address one of the priority research needs identified on Attachment 6. Please see Attachment 6 for more details on the LWRRI Research Priorities. The proposals will be evaluated by the Institute Advisory Board and by the Director. Proposals will be funded from only those received at LWRRI from LA institutions. **Proposals are due at the Institute office on or before December 14, 2016, 5:00 PM CST.** Guidelines for preparing proposals are included in Attachment 1. Those proposals that do not comply with the guidelines will not be reviewed. Please submit an electronic copy (PDF) of the proposal to ftsai@lsu.edu.

After review of proposals by the Institute Advisory Board, those highest ranked will be funded based on budgets and total research funds available. The short deadline for proposals is due to the accelerated cycle from USGS and, as the final application package must be at USGS by January 11, 2017.

If there are any questions concerning procedures, or potential research topics, please contact the LWRRI office. Please encourage your faculty to participate in this program.

Sincerely,

Frank T.-C. Tsai, Ph.D., P.E.
Director, Louisiana Water Resources Research Institute
Professor, Louisiana State University
Department of Civil & Environmental Engineering
LWRRI Website: <http://www.lwrrri.lsu.edu/>

Attachment 1
Proposal Guidelines

Submission: Electronic copy (PDF) to: Dr. Frank T.-C. Tsai
Deadline is December 14, 2016 Louisiana Water Resources Research Institute
College of Engineering
3325 Patrick F. Taylor Hall
Louisiana State University
Baton Rouge, LA 70803

Information: For more information: Telephone (225) 578-4246
Fax (225) 578-4945
E-mail ftsai@lsu.edu

Documents to submit:

1. **Proposal containing 21 elements required** on the attached list, Attachment 2.
2. **Budget, Attachment 4 and detailed justification, Attachment 5**
3. **Cost sharing commitment letter** (2 to 1: non-federal to federal \$). This letter must be signed by your chairperson (if LSU Engineering), dean (if outside of LSU Engineering), or Authorized University Rep. (if off LSU main campus).
I will obtain additional signatures in routing the application package for officials at LSU beyond those noted above.
4. **Negotiated Indirect Rate Agreement** for your institution if not LSU main campus.

Review Procedure/Funding Information

Proposals should be for projects of 12 months in duration and typically range from \$10,000 to \$20,000 in federal funding. A 2:1 match of non-federal to federal dollars is required. Indirect costs are not allowed (Public Law 101-397, Water Research Institutes Authorization) on the Federal cost category. However, indirect costs may be used to provide part of the matching requirement, i.e., you may use the indirect costs computed for federal funds as part of the non-federal match. Indirect costs are allowed on the non-federal funds section of the budget used as match.

Selection Criteria

Technical Merit	30%	Feasibility	15%
Students' Educational Opportunity	20%	Competence of the PI	15%
Applicability to the State's Needs	15%	Technology Transfer	5%

Attachment 2
Research Proposals

The proposals shall consist of the following 21 elements. Please keep in mind that items numbered 1 through 12 will be entered in the Web form provided at the NIWR website by the institute upon selection.

1. Title. Concise but descriptive.
2. Project Type. Research.
3. Research Category (select one). Biological Sciences, Climate and Hydrologic Processes, Engineering, Ground-water Flow and Transport, Social Sciences, and Water Quality
4. Focus Categories. List a maximum of three focus categories, with the most preferred focus category first. A list of focus categories is provided in Attachment 3.
5. Keywords. Enter keywords of your choice descriptive of the work (max. 6 keywords).
6. Start Date. Enter the actual beginning date for the project. (March 1, 2017)
7. End Date. Enter the estimated end date for the project. (February 28, 2018)
8. Principal investigator(s). Provide name, academic rank, university, email address and phone number of the principal investigator(s) and co-principal investigator(s).
9. Congressional district. of university where the research is to be conducted (for example, LA-06 for Louisiana State University, Baton Rouge).
10. Abstract. Provide a brief (one-page) description of the problem, methods, and objectives (please keep in mind that this will be entered in a space provided at the NIWR website by the institute upon selection).
11. Budget Breakdown. As requested by the form (See Attachment 4)
12. Budget Justification. As requested by the form (See Attachment 5)

The document for Item 13 through 19 shall not exceed 10 single spaced pages – 12-point font and 1-inch margins.

13. Title. Please use the same title as in item 1.
14. Statement of critical regional or State water problem. Include an explanation of the need for the project, who wants it, and why.
15. Statement of results or benefits. Specify the type of information that is to be gained and how it will be used.

16. Nature, scope, and objectives of the research. Include a timeline of activities.
17. Methods, procedures, and facilities. Provide enough information to permit evaluation of the technical adequacy of the approach to satisfy the objectives.
18. Related Research. Show by literature and communication citations the similarities and dissimilarities of the proposed project to complete or on-going research on the same topic.
19. Training potential. Estimate the number and level of graduate and undergraduate students, by field or study and degree that are expected to receive training in the project.
20. Literature Citations/References (max. 2 pages)
21. Investigator's qualifications. Include a resume(s) of the principal investigator(s). No resume shall exceed two pages or list more than 15 pertinent publications.

Attachment 3
FOCUS CATEGORIES

ACID DEPOSITION
AGRICULTURE
CLIMATOLOGICAL PROCESSES
CONSERVATION
DROUGHT
ECOLOGY
ECONOMICS
EDUCATION
FLOODS
GEOMORPHOLOGICAL PROCESSES
GEOCHEMICAL PROCESSES
GROUND WATER
HYDROGEOCHEMISTRY
HYDROLOGY
INVASIVE SPECIES
IRRIGATION
LAW, INSTITUTIONS, & POLICY
MANAGEMENT & PLANNING
METHODS
MODELS
NITRATE CONTAMINATION
NON POINT POLLUTION
NUTRIENTS
RADIOACTIVE SUBSTANCES
RECREATION
SEDIMENTS
SOLUTE TRANSPORT
SURFACE WATER
TOXIC SUBSTANCES
TREATMENT
WASTEWATER
WATER QUALITY
WATER QUANTITY
WATER SUPPLY
WATER USE
WETLANDS

Attachment 4
BUDGET BREAKDOWN *

Proposed Start Date: March 1, 2017	Proposed Completion Date: February 28, 2018		
Project Number: (to be assigned by institute)			
Project Title:			
Principle Investigator (s):			
Cost Category	Federal	Non Federal	Total
1. Salaries and Wages:			
Principal Investigator(s)			
Graduate Student(s)			
Undergraduate Student(s)			
Total Salaries and Wages	\$	\$	\$
2. Fringe Benefits			
Principal Investigator(s) Fringe Benefits:			
Graduate Student(s) Fringe Benefits:			
Undergraduate Student(s) Fringe Benefits:			
Total Fringe Benefits:	\$	\$	\$
3. Tuition			
Graduate Student(s) Tuition:			
Undergraduate Student(s) Tuition:			
Total Tuition:	\$	\$	\$
4. Supplies			
5. Equipment			
6. Services or Consultants			
7. Travel			
8. Other Direct Costs			
9. Total Direct Costs			
10. Indirect Costs on Federal Share	XXXXXXXXXX		
11. Indirect Costs on Non-federal Share:	XXXXXXXXXX		
12. Total Estimated Costs	\$	\$	\$

***This form is provided for format only. Use additional sheets to incorporate the supporting information requested.**

Attachment 5
Budget Justification

Submit a detailed budget for each project number, which includes the following line items (Indicated the amount of cost sharing for each element):

1. Salaries and Wages

Identify the individuals and categories of salaries and wages, estimated hours or percentage of time, and the rate of compensation proposed for each individual of category. Other forms of compensation paid as or in lieu of wages to students performing necessary work are allowable provided that other payments are reasonable compensation for the work performed and are conditioned explicitly upon the performance of necessary work. If the rate of pay shown is higher than the current rate of pay, include an explanation.

Salaries and Wages for PIs. Provide personnel, title/position, estimated hours and the rate of compensation proposed for each individual.

Salaries and Wages for Graduate Students. Provide personnel, title/position, estimated hours and the rate of compensation proposed for each individual. (Other forms of compensation paid as or in lieu of wages to students performing necessary work are allowable provided that the other payments are reasonable compensation for the work performed and are conditioned explicitly upon the performance of necessary work. Also, note that tuition has its own category below and that health insurance, if provided, is to be included under fringe benefits).

Salaries and Wages for Undergraduate Students. Provide personnel, title/position, estimated hours and the rate of compensation proposed for each individual. (Other forms of compensation paid as or in lieu of wages to students performing necessary work are allowable provided that the other payments are reasonable compensation for the work performed and are conditioned explicitly upon the performance of necessary work. Also, note that tuition has its own category below and that health insurance, if provided, is to be included under fringe benefits).

2. Fringe Benefits

Please include the rate and amount. Include a copy of the **Rate Agreement** for your institution if not LSU main campus.

Fringe Benefits for PIs. Provide the overall fringe benefit rate applicable to each category of employee proposed in the project. Note: include health insurance here, if applicable.

Fringe Benefits for Graduate Students. Provide the overall fringe benefit rate applicable to each category of employee proposed in the project. Note: include health insurance here, if applicable.

Fringe Benefits for Undergraduate Students. Provide the overall fringe benefit rate applicable to each category of employee proposed in the project. Note: include health insurance here, if applicable.

3. Tuition

Tuition remission is allowable provided that the tuition is reasonable compensation for the work performed and are conditioned explicitly upon the performance of necessary work.

Tuition for Graduate Students. Provide personnel, title/position, and amount of tuition remission proposed for each individual.

Tuition for Undergraduate Students. Provide personnel, title/position, and amount of tuition remission proposed for each individual.

4. Supplies.

Indicate separately the amounts estimated for office, laboratory, computing, and field supplies. Provide detail on any specific item which represents a significant portion of the proposed amount. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

5. Equipment.

Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items. A detailed breakdown is required.

6. Services or Consultants.

Identify the specific project numbers for which these services would be used. List the contemplated consultants (including sub recipients), the estimated amount of time required, and the quoted rate per day or hour. State whether the consultant's rate is the same as s/he has received for similar services under other Government awards.

7. Travel.

All estimated costs should be itemized showing the number of trips required, type of trip (field, scientific meeting, or conference attendance), the destinations, the number of people traveling, the per diem, lodging rate, mileage and mileage rate, airfare (whatever is applicable), local reimbursement rates allowed by the applicant, and any miscellaneous expenses for each trip.

NOTE: All travel is to be in accordance with the established travel policy of the applicant. A copy of the applicant's travel policy may be attached.

8. Other Direct Costs.

Itemize the costs not included elsewhere; e.g., shipping, telemetry, computing, equipment-use charges, age dating, publication costs, etc. Costs for services and consultants should be included and justified under Services or Consultants (above). Provide breakdowns showing how the cost was estimated; e.g., computer time should show the type of computer, the estimated time of use, and the established rates.

9. Total Direct Costs.

Total items (1) through (8)

10. Indirect Costs on Federal Share.

Not allowed on the federal portion. Specify the indirect costs rate in the **non-Federal** column only based on the applicant's approved negotiated indirect (Facilities and Administration) cost rate agreement.

11. Indirect Costs on Non-federal Share.

Un-recovered indirect cost can be included as part of your match in the **non-Federal** column under "Indirect costs on non-federal share"

12. Total estimated Cost.

Total items (1) through (11).

Attachment 6

Research Priorities for 2017

Water resources for agriculture. Agriculture is the largest groundwater user and the third largest surface water user in Louisiana. Nearly 1,300 million gallons of water are withdrawn every day for various activities in agriculture. Water related issues that often affect agricultural productivity are irrigation approaches, water quantity, water quality, salinity, energy cost for water withdrawal, drought and climate change. LWRRI seeks proposals that address water resources issues for agriculture.

Freshwater diversion for water resources management. Freshwater diversion has been shown an effective water resources management approach by transporting surplus water to places where water is lacking. Freshwater diversion may benefit flood control, increase irrigation water, provide alternative supply for industry, reduce groundwater pumping, combat saltwater intrusion, and maintain healthy streams. Examples include Sabine River diversion and Atchafalaya River diversion in Southwest Louisiana. Other potential freshwater diversion projects include Red River diversion for Mermentau and Vermilion Basins and Arkansas River diversion for Northeast Louisiana. LWRRI seeks proposals that address beneficial uses and potential risks of freshwater diversion for industrial and irrigation needs.

Microorganisms in water distribution systems. Louisiana DHH/CDC in 2013 found *Naegleria fowleri* (brain-eating amoeba) in the treated water supply distribution system in St. Bernard and DeSoto. To date, a total of 6 Louisiana's public water systems have tested positive for *N. fowleri*. The incidents are likely to occur in distribution systems where there are low to no chlorine residuals and significant to complete nitrification. An Emergency Rule was issued by the State to require public water systems to maintain certain level of disinfectant residuals and nitrification control in the distribution systems. LWRRI seeks proposals that address potential avenues microorganisms enter distribution systems, detecting and preventing nitrification, and predicting and maintaining disinfectant residuals in the distribution systems.

Resiliency of community water supplies in Louisiana's coastal zone. LWRRI 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. Applicants are encouraged to discuss possible activities with the director prior to submission.

Adaptive management of Louisiana's water resources and floods. 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 problems facing the state and region. These include flood management, coastal restoration, mitigation of hypoxia, saltwater 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 and 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 but most desirable are studies that make both flow and chemical measurements. The overall objective of the proposed studies should be an improvement in our ability to predict degradation of water resources.

Fate and transport of spilled chemicals in riverine systems. Within Louisiana, very large volumes of chemicals are transported yearly, often involving the large riverine systems that traverse the state. There is an incomplete understanding of the fate of different processes that impact the fate of these chemicals and the hydraulic conditions which impact their fate and transport. Projects are sought which will work at the interface of chemical fate and transport and hydrological processes of large rivers.