LSU HuRRI | Hurricane Resilience Research Institute

LSU is one of six major universities (LSU, University of Miami, Texas-Tech, University of Texas-Tyler, University of Houston and University of Florida) participating in the newly formed collaborative Hurricane Resilience Research Institute (HuRRI). This Institute is a multi-state, multi-organization national center of excellence in resilience, advancing our nation's ability to mitigate, assess, predict, protect, educate and recovery from hurricanes and severe storms for the purpose of creating and sustaining resilient communities. The mission of HuRRI is to serve as the premier resource for envisioning, promoting and institutionalizing hurricane resilience culture, knowledge, solutions and tools. The main goal of HuRRI is to change the paradigm from wait-and-pay to system-wide anticipate-and-accommodate as a framework for hurricane and severe storm resilience (**http://www.uh.edu/hurri/**).

HuRRI has launched a Seed Grant Program (SGP) for collaborative projects across more than one of the 6 HuRRI Founding Institutions with each proposal required to include at least one faculty from two different institutions. LSU is participating in this SGP and will designate up to $25,000 per year for two years for LSU faculty participation in a collaborative program partnering LSU faculty with other faculty members of the five other HuRRI institutions. The LSU SGP funding is limited to junior scientists (assistant professor rank) with the budget request limited to the support of graduate students and postdoctoral fellows. Indirect costs do not apply, however fringe benefits and tuition remission do apply at standard rates. Applications have to be submitted and authorized through the LSU Office of Sponsored Programs, which will be officially submitting each application to HuRRI. Please use the LSU Sponsored Programs **Generic Budget template** for the LSU portion. These collaborative projects will not involve subcontracts or budget transfers between institutions. Awarded funds will be administered by each awarding institution.

Deadline for submission to HuRRI: May 11, 2018

Contact Associate Vice President Gus Kousoulas for more information
- **vtgusk@lsu.edu**

HuRRI | Hurricane Resilience Research Institute

SEED GRANTS PROGRAM (SGP)
2018-2019 APPLICATION FORM

PROPOSAL GUIDELINES

ELIGIBILITY. Any faculty or group of faculty from founding member institutions may submit proposals. Proposals may include external participants but external participants may not receive funding from HuRRI. ***The call is intended for collaborative projects across more than one of the 6 HuRRI Founding Institutions: each proposal must include at least 1 faculty member from 2 different institutions.***

FUNDING AMOUNT. Grants are limited to 75K total per proposal. Each institution will fund the effort provided by researchers from its own institution. This applies to Colleges and Schools for universities where funding is not centralized.

DURATION. All projects are one-year projects.

EVALUATION. A review panel that includes representatives from member institutions will evaluate proposals using the review criteria below. The Vice Presidents for Research or Deans from the Engineering Schools (or their representatives) from the member institutions will select the list of proposals that will be funded. Funding is contingent on availability of funds. Decisions will be announced prior to August 1, 2018.

- Relevance to HuRRI mission and vision
- Quality of proposed research concept and approach
- Experience and track record of investigators
- Potential for developing proposed project into externally funded research

PROPOSAL FORMAT

Applicants must submit **one PDF file** of the complete application to hurri@uh.edu by 5 pm on May 11, 2018 and to the corresponding representative for the universities of faculty PIs and co-PIs listed in the Institutional Profiles at the end of this document. Late applications will not be considered. Only proposals that meet the criteria for awards, as stated in the guidelines, will be considered and/or reviewed for funding.

I. COVER PAGE (use attached form)

II. PROPOSAL NARRATIVE

Limit to four (4) double-spaced, single-sided pages and 12-point font. The following outline should be used for the narrative portion of the proposal and is part of the 4-page limit.

- **Abstract.** Provide a brief, clear statement of the purpose and significance of the project (200 words or less, single spaced).

- **Introduction.** Emphasize the importance of the project and summarize previous research in the field. Place the major focus of the proposal in the context of HuRRI. Specify how the proposal will advance knowledge and research capacity in HuRRI.
- **Objectives**. Describe the targeted goals and expected outcomes of the project, keeping in mind the overarching goals of HuRRI.
- **Approach.** Provide details of how the research will be conducted.
- **Time Frame.** Outline the project schedule. Funds will be available for expenditure for 12 months, beginning September 1, 2018.
- **Equipment and Facilities.** Describe the equipment and facilities available for the project. Justify any equipment and facilities requested in your budget.
- **Internal and External Funding.** Summarize any prior internal and/or external funding that you have received for this area of research. Include project title, amount, sponsor, and project start and end dates.
- **Future Proposal Submissions.** Discuss your plans for future proposal submissions to external funding agencies, list potential sponsors and the timeframe for proposal submission.

  Explain how the project could be of benefit for the submission of an NSF ERC proposal.

III. CURRICULUM VITAE

- Include vitae for all professional personnel who will work on the project using NSF format. Do not exceed two pages for each individual. The curriculum vitae should list the five most significant publications that relate to the proposed research.
- Include a list of all current and pending support for each investigator, both external and internal (no page limit).

- **REFERENCES**

  1 page limit; references may be single-spaced.

- **BUDGET**

  Provide an overall budget and justification for expenditure of the HuRRI funds by general category using the attached template. Additionally, provide a budget by institution using your own institution's budget template. For universities where funding is not centralized, the budget needs to be broken down by school or college.

- **APPENDIX (Optional)**

  Include attachments or other information that is important for proposal evaluation (1 page limit).

All questions regarding this Seed Grant Program may be directed to hurri@uh.edu. Additional information about HuRRI and member universities can be found in the attachments at the end of the document.

I. COVER PAGE

PI Name:		PI Employee ID#:	
PI Department:		PI University:	
PI Email:		PI Phone:	
Co-PI Name:		Co-PI Employee ID#:	
Co-PI Department:		Co-PI University:	
Co-PI Email:		Co-PI Phone:	
Other Investigators (Include their Dept/University/Email and Phone)			
Project Title:			
Total Funds Requested:			

Select Research Area (check all that apply):

☐ Mitigation ☐ Assessment ☐ Prediction ☐ Protection ☐ Education ☐ Recovery

☐ Crosscutting (specify general area or topic):

Does this proposal involve (check all that apply)?

☐ Animals ☐ Research Involving Recombinant DNA Molecules

☐ Human Subjects ☐ Radioisotopes

If so, indicate approval status:

☐ Application submitted

☐ Application submitted and approved on _____

☐ Application has not yet been submitted

SIGNATURE:

_____ _____

Principal Investigator Date

II. OVERALL BUDGET

	Funds Requested	Other Funds	Total
SALARIES & WAGES (Identify function)			
Faculty Salaries			
Research Assistants			
Student Wages			
Non-Student Wages			
FRINGE BENEFITS			
MAINTENANCE & OPERATIONS (Example: chemicals, supplies, services, copying, postage)			
TRAVEL (May be subject to State guidelines)			
Equipment (Specify items over $1,000 each)			
TOTAL PROJECT COST			

BUDGET JUSTIFICATION: (Justify all costs other than Principal Investigator salary)

Hurricane Resilience Research Institute (HuRRI)

Executive Summary

Six (6) universities have formed the **Hu**rricane **R**esilience **R**esearch **I**nstitute (HuRRI). The University of Houston (UH), the University of Texas Tyler (UT Tyler), Texas Tech University (TTU), Louisiana State University (LSU), the University of Miami (Miami) and the University of Florida (UF) have joined forces to ***catalyze innovation*** in **M**itigation, **A**ssessment, **P**rediction, **P**rotection, **E**ducation and **R**ecovery (MAPPER) from hurricanes and severe storms (Figure 1) that define the Institute's six (6) dimensions of resilience. The recent hurricane disasters experienced in the U.S. with Harvey, Irma and Maria only confirm the dire need for this integrated and rigorous approach to hurricane resilience; especially given the prevalence of hurricanes and severe storms as the most numerous, costliest and deadliest natural disasters in recent years as shown in Figure 2. **The main goal of HuRRI is to *change the paradigm from wait-and-pay to system-wide anticipate-and-accommodate*** to save lives and reduce damage and costs associated with natural disasters.

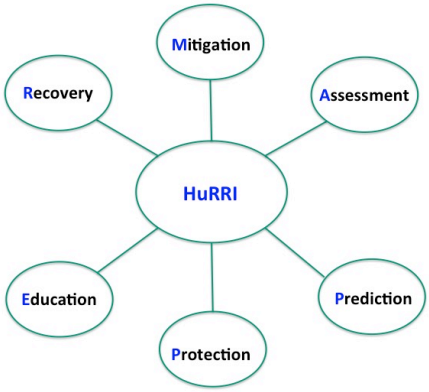

Figure 1. The Six Dimensions of Hurricane Resilience in HuRRI

The collaboration among the six institutions in this initiative is not incidental; each founding university brings unique research capacities and **significant institutional support commitments** intended to grow HuRRI within a few years into a national leader that influences hurricane policies, funding and management, and makes significant strides toward resilience of the communities affected by them, *especially those along the Gulf Coast*. Among the strengths in hurricane and severe storm engineering, science, education, policy, and technology of the founding members is the intellectual capacity in UH's collaborative research on hurricanes and severe storms; the Environment, Energy and Natural Resources Center and the Hobby Center for Public Policy at UH; the National Wind Institute at TTU; the Center for Coastal Resiliency at LSU; the Industrial Assessment Center at Miami; the TxAIRE Institute at UT Tyler; the Florida Institute for Built Environment Resilience (FIBER) and the Multihazard Research Labs at UF.

Vision

To be a national center of excellence advancing our nation's ability to mitigate, assess, predict, protect, educate, and recover from hurricanes and severe storms for the purpose of creating and sustaining resilient communities.

Mission

To serve as the premier resource for envisioning, promoting, and

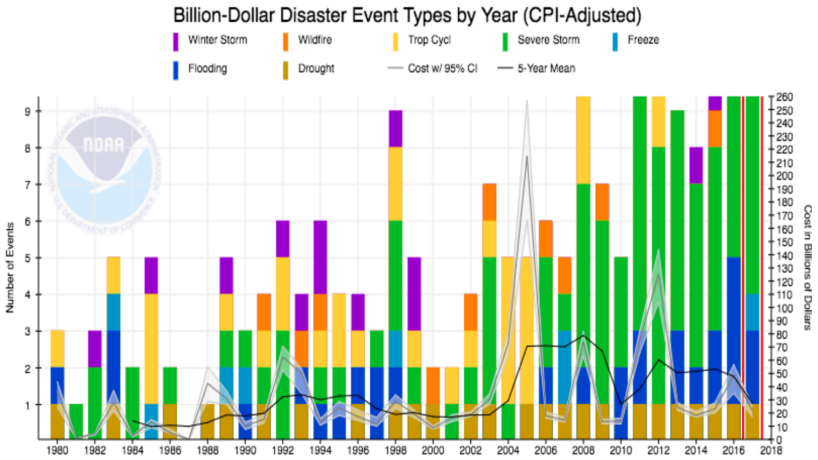

Figure 2. Billion-Dollar Disasters in the US Since 1980 (https://www.ncdc.noaa.gov/billions/time-series)

institutionalizing hurricane resilience culture, knowledge, solutions and tools.

Lessons Learned from Hurricanes Katrina, Rita, Wilma, Ike, and Sandy

Hurricane Katrina was instrumental in raising national awareness about disaster response and preparedness. It prompted testimony in the U. S. House of Representatives [1] and resulted in federal response actions towards a national preparedness goal, a national emergency communications strategy, and integration of federal search and rescue operations [2]. Unfortunately, the deleterious human condition during Katrina in New Orleans prompted uncoordinated mass evacuation during Hurricane Rita, which led to gridlock and the loss of human lives. The lessons learned from Rita highlighted the importance of coordinated emergency operations centers, the need for regional coordination of evacuations, and communication between state and local officials and systems. Winds from hurricanes Wilma and Ike tore down trees and power lines leaving millions without power for weeks. Hurricane Sandy, while not a Gulf Coast hurricane, demonstrated the strengths derived via coordinated response from the federal government but highlighted the need for coordination with local and state officials and with community members [3].

While much progress has been made in emergency response and evacuations since the 2005 hurricane season, less progress has been accomplished in lessening impacts and enhancing recoveries. In their testimony before the U. S. Senate regarding the 2017 hurricane season, FEMA [4] emphasized the need for "***simplifying recovery and reducing disaster costs, and buying down risks through preparedness and mitigation."*** This is exactly what motivates HuRRI, its framework and its proposed six dimensions for resilience referred to as MAPPER.

Mitigation

Mitigation in the HuRRI resilience framework will examine the full range of possibilities including structural and non-structural measures, green infrastructure, low impact development, densification, and intelligent sprawl. Mitigation will also aim to *harden* public and private infrastructure with particular emphasis on critical infrastructure, transportation, power, water and sewer grids and networks. Importantly, mitigation will aim to *soften* environmental consequences of hurricanes and severe storms (spills, leaks, debris management, ecosystem impacts and impacts to bays and estuaries). A critical part of the *anticipate and accommodate* strategy is to envision the planning and design of the built and natural environment such that it is more resilient to future hurricanes and other adverse weather events. This requires looking more broadly at urban and regional planning solutions, landscape design, and building design to obviate the adverse impact of hurricanes. Strategies will need to be developed for retrofitting existing buildings and civil infrastructure in much the same way as is done in seismic regions.

Assessment

Assessing "*true*" hurricane impacts in HuRRI will answer the question: *could this have been prevented?* Real-time monitoring networks, sensor systems, geo-based big data, and visualization tools will be developed to assess primary impacts (flooding, wind, and storm surge damage) and differentiate them from associated (environmental) and co-incidental impacts (economic losses). The goal of assessment in HuRRI is to learn from the past and to continually plan for a more resilient future.

Prediction

Predicting hurricanes in the HuRRI resilience context involves developing hindsight, foresight, and real-time models and simulators. The predictive tools will encompass people, systems, and infrastructure in addition to simulating storm surge, wind fields, and rainfall. Scenarios of hurricane realizations will answer "*what if?"* questions and will lead to better risk identification, risk reduction, preparedness, and mitigation.

Protection

Protection from hurricanes and severe storms in HuRRI encompasses much more than protecting the built landscape from rainfall, wind, storm surge, and tornadoes. Flood alert and flood warning, evacuation and sheltering planning, and understanding human behavior when confronted with a crisis are integral assets that, once developed and maintained, will form a critical foundation for resilient protection. Revisiting building codes and building standards and developing house-level floodproofing materials and technologies are other resilient protection examples.

Education

The chasm between knowledge about hurricane and severe storm hazards and risks and perception of safety was never more evident than in Houston during Harvey and in New Orleans during Katrina. In Houston, for example, residents on the west side of town with homes that flooded had a false sense of security and a perception of "zero risk" of flooding born out of their home's proximity to the flood protection reservoirs. Whether uninformed, misinformed, or lacking understanding of the complexity of flooding and flood risk, homeowners and their families were at a crippling disadvantage in terms of preparedness and recovery. Education in HuRRI must bridge this divide and must build well-informed communities empowered with knowledge, tools, and resources. Education for hurricane resilience in HuRRI will encompass all levels (K-20, workforce, emergency responders) and must engage educators, trainers, and instructors from both public and private sectors including NGOs.

Recovery

A true measure of resilience is the ability to recover from adverse events. Understanding of recovery after hurricanes is largely heuristic at present; quantitative measures of recovery are limited, if they exist at all. HuRRI will aim to develop systematic approaches, concepts, and measures for quantifying and modeling recovery. HuRRI will also strive to connect the development of tools to policy and re-entry plans in an adaptive and evergreen mode.

HuRRI Structure, Budget, and Timeline

The University of Houston will lead HuRRI (Dr. Hanadi Rifai, John and Rebecca Moores Professor of Civil and Environmental Engineering, is the founding Director of the Institute). HuRRI, in addition to its founding members, will invite participation from others as **Affiliates** (e.g. other Centers or Universities), **Supporters** (e.g. research sponsors), or **Collaborators** (e.g. state and local government). A Steering Committee and two Advisory Boards (Academic and Industrial) will govern HuRRI. In addition to working groups (WG) involved in the six dimensions of resilience, HuRRI will include crosscutting teams (CCT) addressing outreach, innovation and entrepreneurship, and theory-to-practice, among others. HuRRI will hold a hallmark annual workshop/conference open to the public. The Institute will launch its first call for proposals to faculty from its founding institutions in the first quarter of 2018 and annually thereafter. The six founding institutions have committed significant resources to HuRRI that will be supplemented with funding from external grants and contracts and co-operative agreements to undertake projects in hurricane resilience.

References

[1] United States Government Accountability Office (USGAO), Preparing for and Responding to Disasters, Testimony before the Subcommittee on Homeland Security, Committee on Appropriations, House of Representatives, GAO-07-395T, 2007.

[2] Homeland Security, Report to the President, The Federal Response to Hurricane Katrina, Lessons Learned, 2006.

[3] Federal Emergency Management Agency (FEMA), Hurricane Sandy, FEMA After-Action Report, 2013.

[4] Long, W. B., 2017 Hurricane Season: Oversight of the Federal Response, FEMA Testimony before Senate, October 2017.

Hurricane **R**esilience **R**esearch **I**nstitute **(HuRRI)**

Institutional Profiles

U of Houston

Institutional Leadership
Amr Elnashai, Ph. D., FREng
Vice President for Research and Technology Transfer

Institute Director
Hanadi Rifai, Ph.D., P. E., Fellow ASCE
John and Rebecca Moores Professor
Civil and Environmental Engineering

Areas of Expertise
Flood Mitigation, water quality, sustainability and resilience, materials science and engineering, nanotechnologies, data science and high performance computing, LIDAR and sensor technologies

Participating Units
Cullen College of Engineering—wind and flood engineering, vulnerability analysis, retrofitting, water contamination, supply chains, operations research
Natural Science and Mathematics—atmospheric sciences, statistics, mathematics
College of Liberal Arts and Social Sciences—social impact, history
Bauer College of Business—business interruption, market share recovery analysis, project management
Center for Advanced Computing and Data Science—simulation, data integration and mining
College of Education—education and outreach programs, agile community education, remote delivery, community engagement
Law School—land regulation, zoning, legal recovery and insurance issues
Data Science Institute—analysis and visualization of large datasets
DHS Center for Borders and Trade—security
UH Energy—all manner of energy grids
UH Health—community and population health

Illustrative Current Projects
NSF Rapid Awards Fall 2017
Hanadi Rifai, RAPID: Chemical and Microbiological Quality of Floodwaters in Houston Following Hurricane Harvey
Steven Pennings, RAPID Collaborative Research: Do mangroves provide better coastal protection than salt marshes? A Hurricane Harvey case study from Port Aransas, Texas, USA
Robert Stewart and Julia Wellner, Effects of Hurricane Harvey's extraordinary rain event on sedimentation at the tidal inlets of Galveston Bay, Texas
Jim Granato, RAPID: The Houston Region Foreclosure Study: A Panel Survey

Texas Tech University

Institutional Leadership
Joseph Heppert, Ph. D.,
Vice President for Research

Executive Director(s)
Danny Reible, Ph. D., P. E.
Donovan Maddox Distinguished Engineering Chair
Professor of Chemical Engineering
Professor of Civil, Environmental, and Construction Engineering

Participating Units

TTU National Wind Institute

Mitigation—Debris impact facility, Tornadic wind load modeling
Assessment—Debris impact facility, Tornadic wind load modeling, Thunderstorm analysis and modeling, Rapid 3-D storm path and debris assessment, Wind analysis and modeling, Lightning analysis and modeling
Prediction-- Wind analysis and modeling, Lightning analysis and modeling
Protection—Debris impact facility
Education—Debris impact facility: Construction standards education
Recovery—Rapid 3-D storm path and debris assessment group

TTU Water Research
Mitigation— Designing for resilience in drinking and waste water treatment and distribution systems and chemical and hazardous material handling, Robust water treatment technology development, Identification and development of alternative water supply options, Sustainable
Assessment— Assessing resilience of water and wastewater treatment and distribution infrastructure and chemical and hazardous material production, processing, storage and disposal facilities, Assessing hurricane-related impacts on water supply, Assessment of exposure and risks of contaminated water, soils and sediments management of water resources
Prediction-- Modeling environmental processes, Contaminant fate and behavior in the environment,
Protection— Strengthening of water treatment and distribution infrastructure and potential contamination sources and risks
Education— Training on understanding, assessing and responding to environmental risks to water supplies, Building resilience in critical water and wastewater infrastructure and hazardous material storage and disposal facilities, Sustainable management of water resources
Recovery— Corrective action technologies to respond to contamination of the natural and water-related built environment resulting from hurricane related stressors

TTU Climate/Weather Research

Mitigation—Sociological and economic impacts of severe weather, Ecological sustainment
Assessment—Climate modeling group, Mapping and remote sensing, Ecological assessment of severe weather
Prediction—Climate modeling, Mapping and remote sensing
Protection—Ecological sustainment
Education—Sociological and economic impacts of severe weather, Policy and communication
Recovery—Ecological sustainment, Sociological and economic impacts of severe weather

TTU Grid Resilience Group

Mitigation—Grid control and structure
Assessment—Novel grid sensing and analysis
Prediction—Grid failure modeling
Protection— Grid control and structure
Education—NA
Recovery—Emergency micro-grid deployment

TTU Social and Economic Impact Group

Mitigation—Bio-preparedness
Assessment—Modeling and measuring economic impact
Prediction—Modeling economic impact
Protection— NA
Education—Bio-preparedness, cybersecurity law, water and energy law, liability law
Recovery— Bio-preparedness, cybersecurity law, water and energy law, liability law

UT-Tyler

Institutional Leadership
Amir Mirmiran, Ph. D.
Provost and Vice-president for Academic Affairs and Chief Academic Officer

Executive Director(s)
Srini Kambhampati, Ph.D.
Acting Director, Office of Research and Scholarship
Professor, Department of Biology

Participating Units

Engineering
Amir Mirmiran: Ultra high performance concrete, composites for infrastructure, testing of prestressed and reinforced concrete, bridge engineering.
Javier Kypuros: Dean, College of Engineering. Autonomous controls; engineering dynamics
Torey Nalbone: hydrology, environmental engineering, air pollution
Michael McGinnis: structural engineering, structural fire engineering; applied mechanics
Gokhan Saygili: offshore foundation engineering; geohazard management; geotechnical engineering; submarine slope stability evaluation
Mena Souliman: fatigue endurance limit analysis; pavement management systems
Sathy Muthukrishnan: Vulnerability analysis, non-linear analysis of beams
Frederika Brown: energy sustainability
Melvin Robinson: Image and signal processing, pattern recognition, AI

Biology
Lance Williams: Aquatic systems and ecology
Riqing Yu: Environmental microbiology

Nursing
Danita Alfred: Assessment of emergency and disaster preparedness and nursing knowledge
Jimi Francis: Community wellness

Economics
Marco Castaneda: Health economics and economics of NGOs
Luis Guatier: applied microeconomics, environmental and development economics
Meryem Saygili: Environmental economics

Louisiana State University

Institutional Leadership
Kalliat T. Valsaraj, Ph.D., BCEEM
Vice President
Office of Research and Economic Development

Executive Director(s)
John Pardue, Ph. D.,
Elizabeth Howell Stewart Endowed Professor
Civil and Environmental Engineering

Scott Hagen, Ph.D
Professor, Civil and Environmental Engineering
Louisiana Sea Grant Laborde Chair
Director, Center for Coastal Resiliency

Areas of Expertise
Sustainability, coastal impacts, and resilience, disaster response, weather and climate, flood mitigation, wetland science, global oceanography, hypoxia, water quality, materials science and engineering (civil, coastal, environmental), data science and high performance computing, weather modeling, CERA (Coastal Emergency Risk Assessment), environmental law and policy, atmospheric science/chemistry

Participating Units (selected listing)
LA Sea Grant College Program
Center for Coastal Resiliency
Center for Computation and Technology
LSU Center for River Studies
Coastal Sustainability Studio
The Gulf Coast Research Center for Evacuation and Transportation Resiliency
Stephenson Disaster Management Institute (SDMI)

Core Faculty (from more than 100 faculty at LSU working on areas of interest)
Robert Twilley
John Pardue
Scott Hagen
J. (Ram) Ramanujam
Clint Willson
Jeff Carney
Brian Wolshon
Brant Mitchell

Illustrative Current Projects

Title	PI	Sponsor
Inland from the Coast: A multi-scalar approach to regional climate change responses	Jeff Carney	The Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine and the Robert Wood Johnson Foundation 7/1/17-6/30/18 (2 more years anticipated)
Coupling Hydrologic, Tide and Surge Processes to Enhance Flood Risk Assessments for the Louisiana Coastal Master Plan	Scott Hagen	The Water Institute of the Gulf; recent award
EESLR 2016 Dynamic sea level rise assessments of the ability of natural and nature-based features to mitigate surge and nuisance flooding	Scott Hagen	National Oceanic and Atmospheric Administration (NOAA) 9/1/16-8/31/18
Coastal SEES Collaborative Research: Changes in actual and perceived coastal flood risks due to river management strategies	Scott Hagen	NSF 1/8/15-8/31/18
Development of an optimized tide and hurricane storm surge model for the northern Gulf of Mexico (MS, AL, FL) for use with the ADCIRC Surge Guidance System	Scott Hagen	University of North Carolina. Dept. of Homeland Security 1/1/16-6/30/18

RAPID Flood Extent/Depth Data Identification, Acquisition, Cataloguing, and Processing	Scott Hagen	NSF 12/01/2016-11/30/2018
Operation of CPRA River Model	Clint Willson	Coastal Protection and Restoration Authority (CPRA) 8/1/14-7/31/2024
Assessing hurricane risk at oil infrastructure across the Gulf of Mexico Coast	Jill Trepanier	National Academy of Sciences (NAS) 9/1/16-8/31/18
Estimating the Combined Risk of Hurricane Wind and Storm Surge along the U.S. Gulf Coast	Jill Trepanier	LA Board of Regents 6/1/15-6/30/18
TETRA-II : An Experiment to Study Terrestrial Gamma Flashes and the Role of Energetic Particle Acceleration in Lightning and Severe Weather Events	Mike Cherry and Jill Trepanier	La Board of Regents ESPCOR 8/1/15-7/31/18
Integrated Approaches to Creating Community Resilience Designs in a Changing Climate	Robert Twilley	University of North Carolina. Dept. of Homeland Security 1/1/16-6/30/18
LA Sea Grant Omnibus 2014-2018	Robert Twilley	2/1/14-1/31/19; 2018-2022 pending award
Coastal SEES Collaborative Research: Changes in actual and perceived coastal flood risks due	Robert Twilley	NSF 09/01/2014-08/31/2018

to river management strategies		
Vulnerability of fuel distribution systems to hazards in coastal communities	John Pardue	University of Arkansas 5/1/15-12/31/16
RAPID: Fast Reconstruction of Flood Hydrographs in the Houston Metropolitan Area during Hurricane Harvey Based on Image Processing and In-situ Measurements	Navid H Jafari	NSF 10/17/17-9/30/18
Rapid: Collaborative Research: Tracking Hurricane Harvey's Storm Surge and Flood Sedimentation	Kam-Bui Liu	NSF 2/1/2017-11/30/2018

U of Florida

Institutional Leadership
Chimay Anumba, Ph.D., D.Sc., FREng, P.E.
Dean and Professor
College of Design, Construction and Planning

Executive Director(s)
Forrest J. Masters, Ph.D., P. E.
Associate Dean for Research and Facilities
Herbert Wertheim College of Engineering

Areas of Expertise
Water Resources Research Center (https://wrrc.essie.ufl.edu)
Center for Wetlands (https://cfw.essie.ufl.edu)
Hinkley Center for Solid and Hazardous Management (http://www.hinkleycenter.org)
Transportation Institute (https://www.transportation.institute.ufl.edu)
Center for Supply Chain Management (http://warrington.ufl.edu/centers/cscm/)
Center for Remote Sensing (http://abe.ufl.edu/research/CRS/index.shtml)
Center for Environmental Policy (https://cep.ees.ufl.edu)
Environmental Management Systems Institute (http://www.treeo.ufl.edu)
Water Institute (http://waterinstitute.ufl.edu)
Land Use and Environmental Change Institute (http://lueci.clas.ufl.edu)
Florida Climate Institute (http://floridaclimateinstitute.org/about)
Florida Institute for Built Environment Resilience (FIBER) (http://frci.dcp.ufl.edu)
Multihazard Research Labs (https://multihazard.eng.ufl.edu)

U of Miami

Institutional Leadership: Jean-Pierre Bardet, Dean and Professor, College of Engineering

Executive Director(s): Derin N. Ural, Associate Dean for Student Affairs and Professor in Practice

Areas of Expertise for Engineering: Optimization, simulation and data mining, materials and structures, water quality, UAVs, program assessment and evaluation. Additional expertise is available through other units at the University of Miami in oceanography and atmospheric sciences, urban design, health, and psychosocial impacts

Participating Units: College of Engineering, Miller School of Medicine, School of Nursing, School of Communication, School of Architecture, College of Arts and Sciences, Rosenstiel School of Marine and Atmospheric Science

Core Faculty

Derin Ural, Professor in Practice, Civil, Arch. & Environmental Engineering, and Associate Dean
Helena Solo-Gabriele, Professor, Civil, Arch. & Environmental Engineering, and Associate Dean
Antonio Nanni, Professor and Chair, Civil, Architectural and Environmental Engineering

- Optimization
  - – Dr. Hammam Alsafrjalani - evacuation
  - – Dr. Murat Erkoc – gasoline distribution, shelters, electric power restoration
  - – Dr. Ramin Moghaddass - evacuation
  - – Dr. Singiresu Rao – resource allocation for pre-hurricane planning
- Simulation and Data Mining
  - – Dr. Esber Andiroglu – smart sensors
  - – Dr. Victoria Coverstone – traffic during evaluation
  - – Dr. Mei-Ling Shyu – multimodal data mining
  - – Dr. Nazrul Shaikh – second hit
  - – Dr. Michael Swain – electric vehicle evacuation
  - – Dr. Ge-Chang Zha – hurricane wind aerodynamics and buildings
- Materials and Structures
  - – Dr. Ali Ghahremaninezhad – corrosion resistant concrete
  - – Dr. Randolf Rhode-Barbarigos – human centered computational network, small scale testing, reefs building, sonar assessments
  - – Dr. Wimal Suaris – structural retrofit
  - – Dr. Prannoy Suraneni – sustainable concrete
- Water Quality

– Dr. David Chin, Dr. Andiroglu, Dr. Joo – contaminants from hurricanes and their impacts

- Unmanned Aerial Vehicles (UAVs)

– Dr. B. Dano – use of UAVs for roof inspections, identify wind hazards, powerline inspections, and landmass erosion

- Program Assessment and Evaluation

- Dr. Vincent Omachonu – Program Evaluator

Illustrative Current Projects

Title	Award Department	Contact PI	Sponsor	Prime Sponsor
Erfri-Seed: Design for Independent Net-Zero Water Buiildings.	Civil, Architectural & Env Engineering	Englehardt, James	National Science Foundation	
Sustainable Concrete Using Seawater, Salt-Contaminated Aggregates, And Corrosive Reinforce	Civil, Architectural & Env Engineering	Nanni, Antonio	Infravation	
Center for Integration of Composites Into Infrastructure (Cici)	Civil, Architectural & Env Engineering	Nanni, Antonio	National Science Foundation	
Inspection And Monitoring of Fabrication And Construction for The West Halls River Road Br	Civil, Architectural & Env Engineering	Nanni, Antonio	Florida State University	Department of Transportation
Collaborative Research: A Human-Centered Computational Framework for Urban And Community	Civil, Architectural & Env Engineering	Rhode-Barbarigos, Landolf	National Science Foundation	
Impact of CCA-Treated Wood In The Florida Disposal Sector	Civil, Architectural & Env Engineering	Solo-Gabriele, Helena	Hinkley Center Solid/Hazardous Waste Mgt University of Florida	Florida State Department of Environmental Protection
Public Hurricane Loss Model	Electrical & Computer Engineering	Shyu, Mei-Ling	Florida International University	Florida Department of Financial Services
Fphlm Storm Surge Enhancement	Electrical & Computer Engineering	Shyu, Mei-Ling	Florida International University	Florida Department of Financial Services
University of Miami Industrial Assessment Center (MIAC)	Industrial Engineering	Asfour, Shihab	Department of Energy	
Assessment And Evaluation of Contamination In Single Stream recycling Systems Due To Broke	Industrial Engineering	Celik, Nurcin	Hinkley Center Solid/Hazardous Waste Mgt University of Florida	Florida State Department of Environmental Protection
Autonomous Unmanned Aeriel Vehicle for Two-Part Extended Search And Rescue Mission	Mechanical And Aerospace Engineering	Basalo, Ines	University of Central Florida	National Aeronautics & Space Administration
Estol Performance for Heavy Lift Transports Using Ultra-High Lift High Efficiency Co-Flow	Mechanical And Aerospace Engineering	Zha, Gecheng	Defense Advanced Research Projects Agency	
Smart Energy for the Smart Cities: the City of Coral Gables	Industrial Engineering	Celik, Nurcin	City of Coral Gables	Bloomberg Philanthropies
A Resilient South Florida	School of Architecture	Chao, Sonia		
Laboratory Measurement of Wind and Wave Forces in Extreme Winds	RSMAS	Haus, Brian		
Impact of Hurricane Irma on Biscayne Bay: Changes in Benthic Diversity in Areas Adjacent to Coastal Wetland Restoration Projects	College of Arts and Sciences, Biology	Sealey, Kathleen	College of Arts and Sciences	University of Miami
Impact of Evacuation and Other Hurricane Related Experiences on Children and Families	College of Arts and Sciences, Psychology	La Greca, Annette	College of Arts and Sciences; FIU Psychology	University of Miami
College Life After a Natural Disaster	College of Arts and Sciences, Psychology	La Greca, Annette	Collaboration with, U. of TX, TX State U., U. Puerto Rico, Santa Clara U., and UC-Santa Barbara	University of California, Santa Barbara
The Impact of Hurricane Irma on Mental and Physical Health: Consideration of Evacuation Behaviors and Geo-Demographic Factors	College of Arts and Sciences, Psychology	Timpano, Kiara	College of Arts and Sciences	University of Miami