

From the Eye of the Storm: Science in the Wake of Hurricane Katrina

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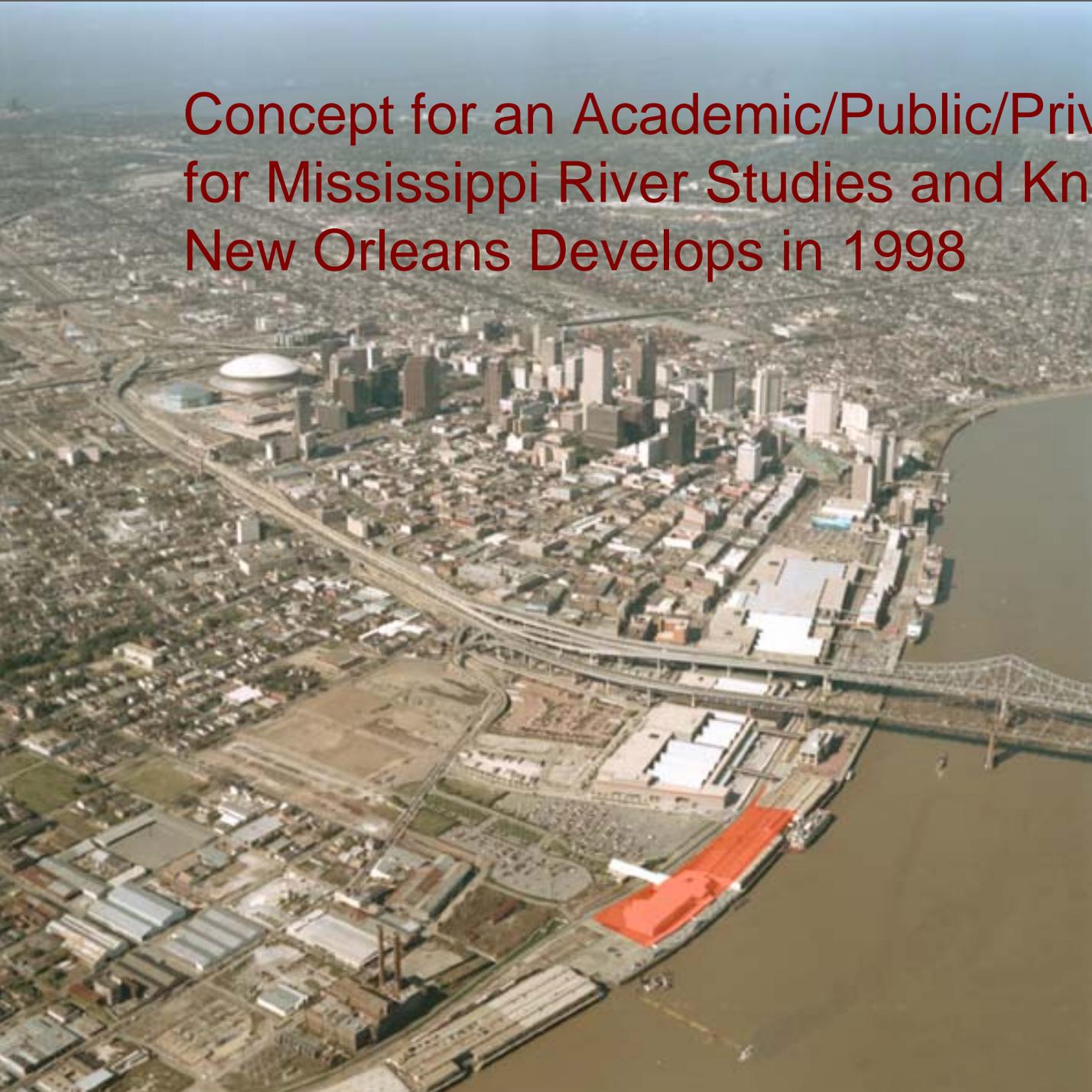
<http://www.cbr.tulane.edu/>

<http://kerrn.org>

Tulane/Xavier Center for Bioenvironmental Research

- Inter-, multi-, and transdisciplinary research
- Major strengths such as Programs in Systems Biology and Translational Research; River - Coastal Studies; Arts and the Environment
- Established collaborations between Schools of Arts and Sciences, Engineering, Medicine, Public Health, Pharmacy, Architecture and Law in a major research university and an historically black university

Concept for an Academic/Public/Private Center
for Mississippi River Studies and Knowledge in
New Orleans Develops in 1998



RIVER
SPHERE



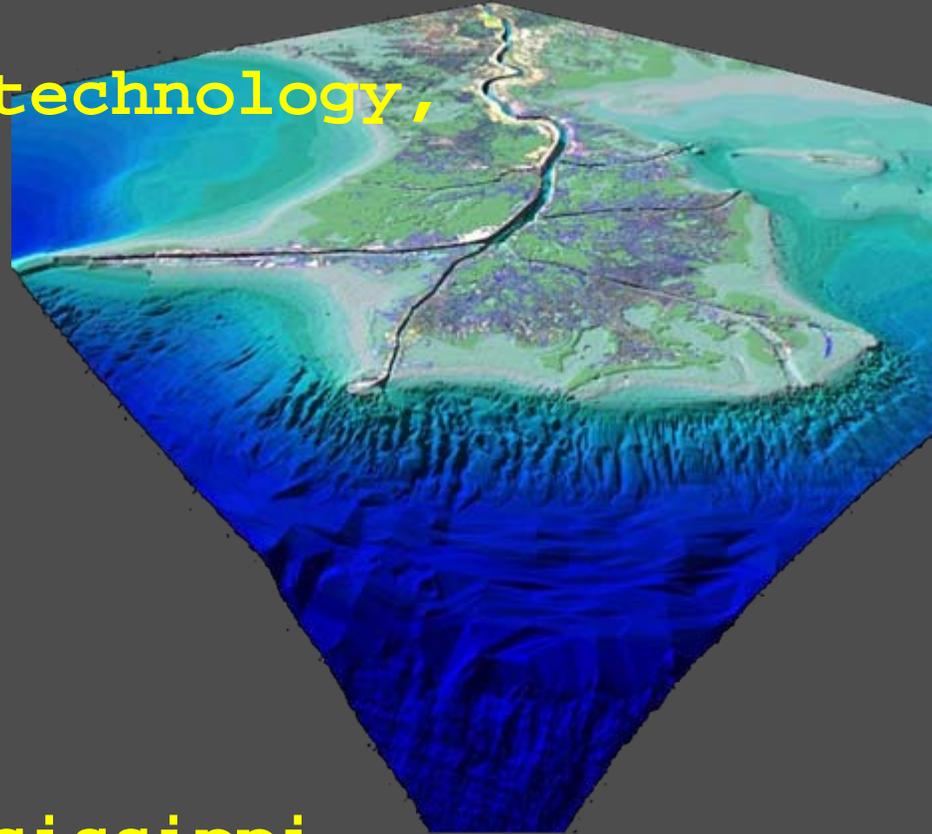
Tulane
University

RiverSphere is a Tulane University
place
for art, science, and technology,

about rivers,

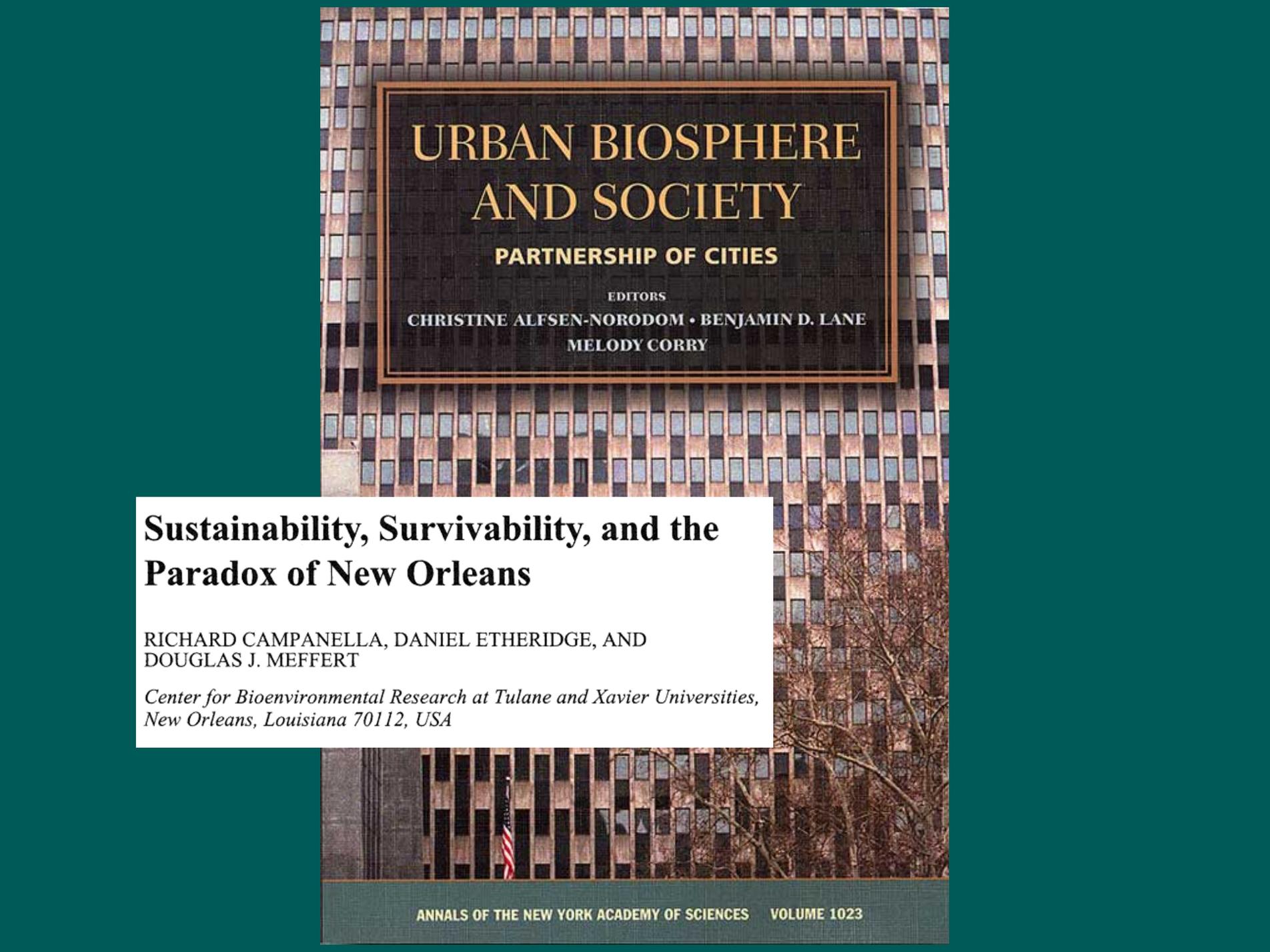
for river communities,

*on the New Orleans Mississippi
river front.*



**RIVER
SPHERE**





URBAN BIOSPHERE AND SOCIETY

PARTNERSHIP OF CITIES

EDITORS

CHRISTINE ALFSEN-NORODOM • BENJAMIN D. LANE
MELODY CORRY

Sustainability, Survivability, and the Paradox of New Orleans

RICHARD CAMPANELLA, DANIEL ETHERIDGE, AND
DOUGLAS J. MEFFERT

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Not just a dot on a map or a line in a database—but a home with a family.



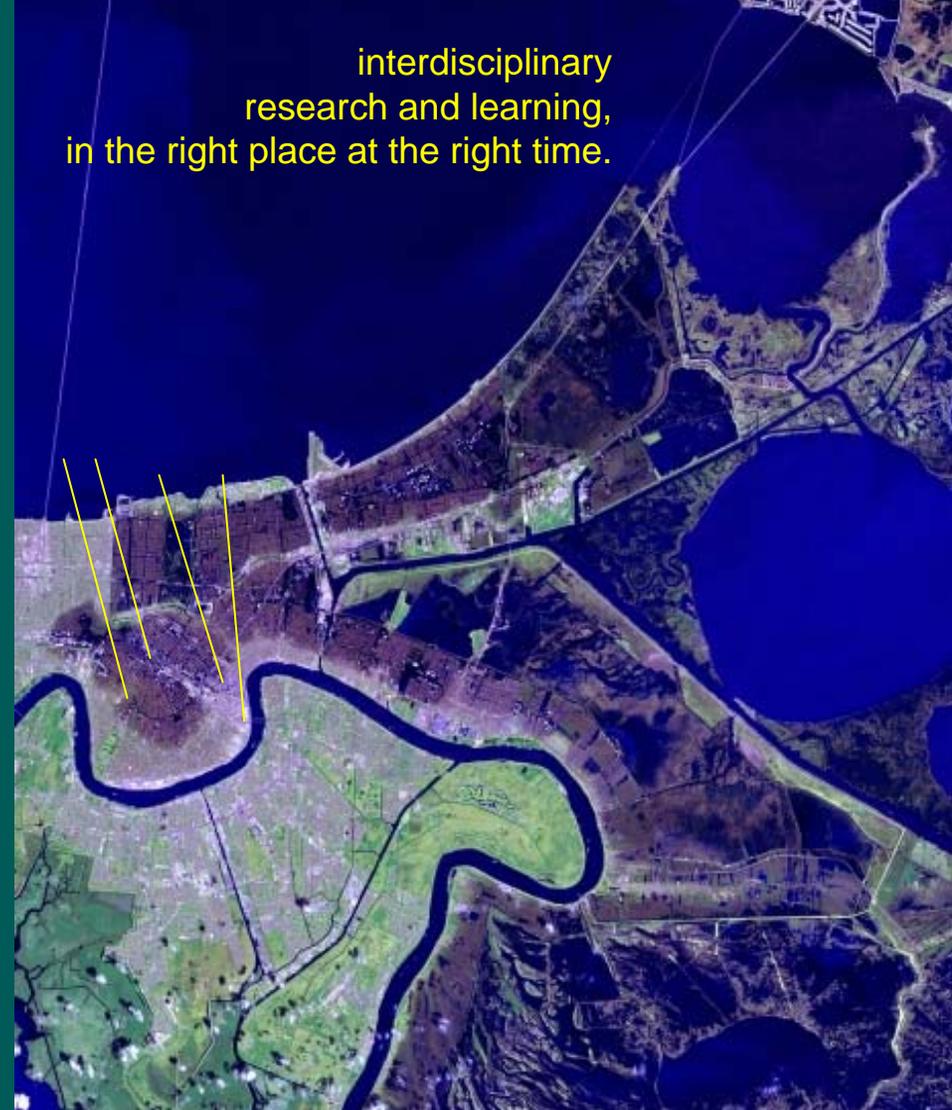
Photo credit: Associated Press

Katrina Environmental Research and Restoration Network (KERRN)



Greater New Orleans, April 24, 2005

interdisciplinary
research and learning,
in the right place at the right time.



Same Area, September 6, 2005

HEALTH & ENVIRONMENTAL RESEARCH

J. BENNETT JOHNSTON BUILDING





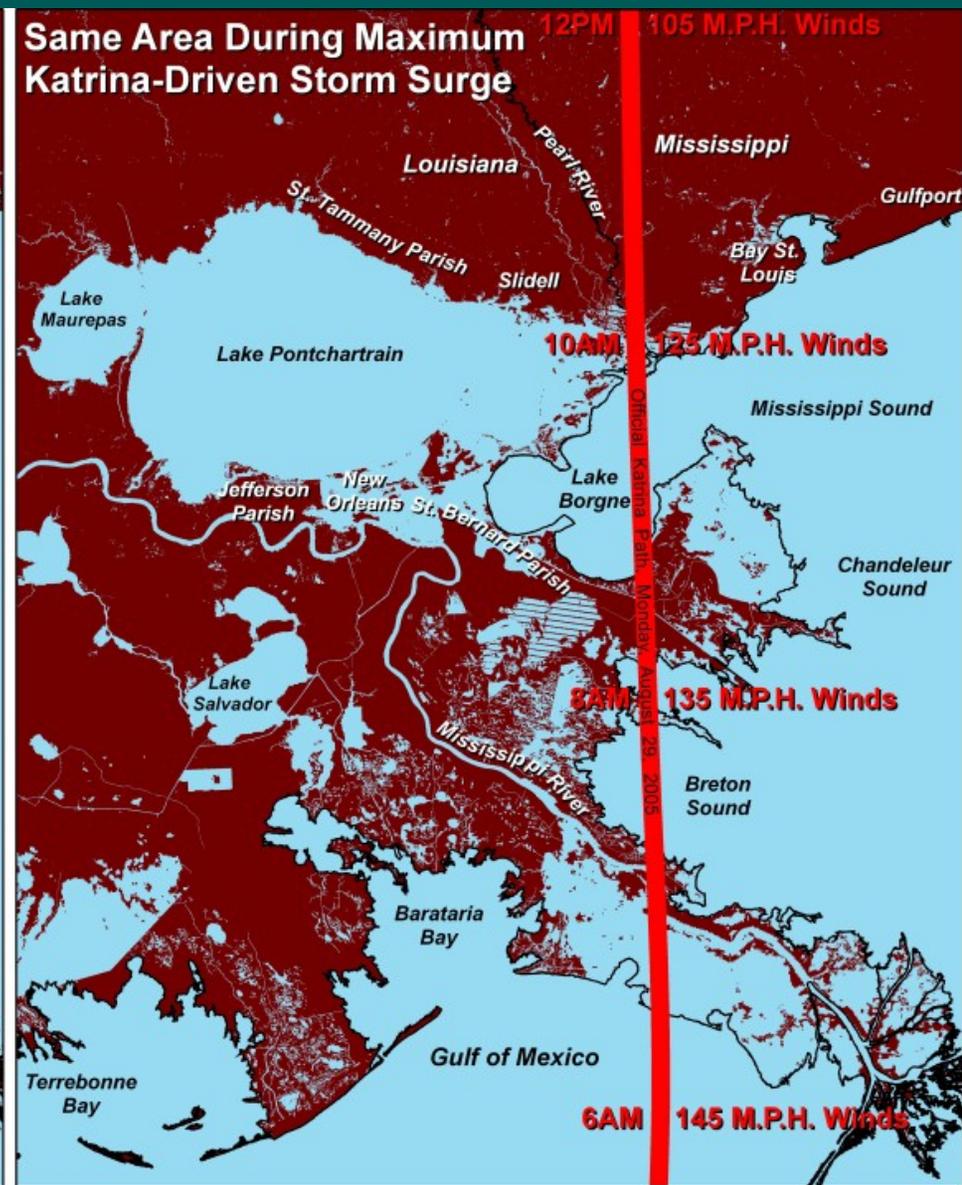
HEALTH & ENVIRONMENTAL RESEARCH

TON BUILDING

TOURIST
STOP

J. BENNETT JOHNSTON BUILDING





Map and analysis by R. Campanella, CBR (excerpted from *Geographies of New Orleans: Urban Fabrics Before the Storm*, due out 2006)
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THE START OF KERRN*

- Network conceived and proposed to NSF in September
- Research and program team started to populate New Orleans in mid October
- Started to rehab labs and core facilities in mid November. KERRN funded early November
- *Katrina Environmental Research and Restoration Network (kerrn.org)



KERRN MEMBER INTERESTS

- Human and Social Systems (49)
- Geoscience and Coastal Systems (24)
- Built Systems and Engineering (21)
- Interdisciplinary/Humanities (5)
- Biological and Ecological Systems (25)
- Human and Public Health (23)

Katrina Environmental Research and Restoration Network (*kerrn.org*)

- Centralized information source for research plans, outcomes and ideas
 - Virtual brainstorming
- Network of skills and interests
 - Matching research needs and skills
- Nucleating center or coordination node
 - Investigators from regional to international
- Facilitate communication between investigators
 - Web based
 - Face to face meetings

RESULTS OF WORKSHOP HELD IN NEW ORLEANS NOVEMBER, 2005

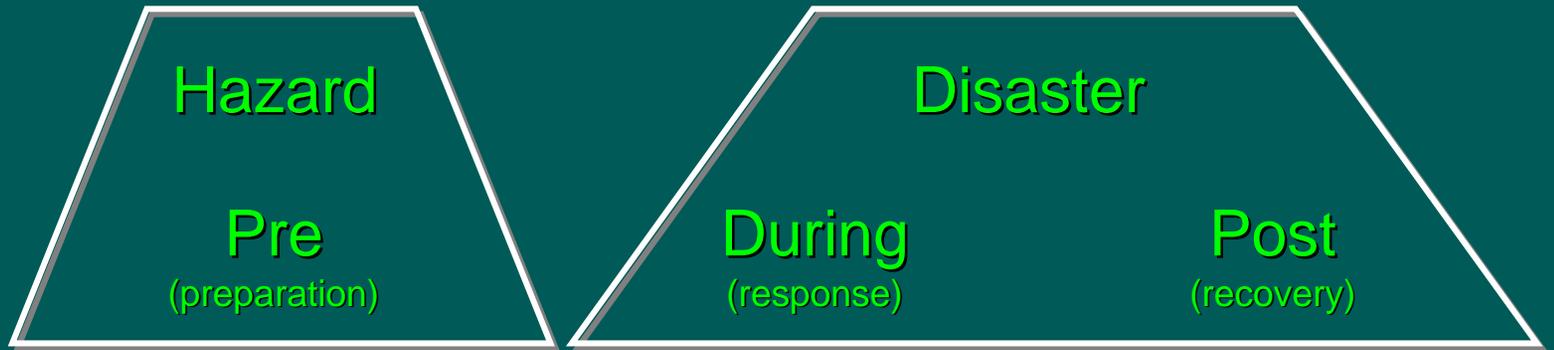


Science and Engineering Changing in the Academy and Region

- Tulane integrates science and engineering in the School of Science and Engineering
- School of Science and Engineering collaborates with University of New Orleans College of Engineering
- State Levee Board(s) (Engineering) integrating with Coastal Restoration Authority (Science) into single entity

What we learned as practicing scientists

- Be portable and redundant
 - Lap tops
 - Portable hard drives
 - Alternate email accounts
 - Reagents in liquid nitrogen when possible
 - Materials with collaborators, when possible
 - Get your kids to teach you to text message



Scientist

Data	backup onto portable storage devices and bring off-site	continue collection / analysis / sharing	restore and append onto existing infrastructure
Operations	power down critical equipment, store experiments in nitrogen	maintain / monitor status of stored experiments	restore electrical equipment and transfer experiments
Research	define remote setup location for continuation of research activities	coordinate and activate remote research location	de-activate remote location, transfer new data, foster interdisciplinary collaborations
Personnel	establish alternative communication / collaboration channels (e-mail, web, mobile phone, shared online resources)	activate and maintain alternative communication / collaboration channels	resume, re-establish original modes of communication

3 dump sites in Orleans Parish illustrate the magnitude of Katrina's destruction

MOUNTAINS OF DEBRIS



STAFF PHOTO BY JENNIFER ZDON

This mountainous dump at West End in New Orleans is one of three sites where 167,000 cubic yards of storm debris has been collected so far in Orleans Parish. Since the cleanup effort began Sept. 26, more than 1,500 trucks have been registered to do the work, along with 977 pieces of heavy equipment.

- 30 million cubic yards managed by USACE between 9/05-12/31/05
- Integrated Waste Management: 1) source reduction, 2) reuse, 3) recycling, 4) treatment, 5) disposal (**requires science at the table well in advance of a disaster**)



Coastal Restoration



Deconstruction



Composting

MOLDS ARE PREVALENT IN NEW ORLEANS

MOLDS FOUND POST KATRINA

*Aspergillus, Penicillium,
Wallemia, Cladosporium,
Alternaria, Aspergillus, Fusarium,
Trichoderma*

(Trichoderma, a common soil
organism was most common.
Stachybotrys, the “sick building” mold
was not found)

*Analysis of her own home by
Tulane mycologist, Dr. Joan
Bennett in ANYAS, Jan-Feb 06*



What are the big science challenges

- Application of science to rebuilding and re-inhabiting a city (the science of rebuilding)
- Exploring and understanding the interface of the built and natural environments
- Principles for creating resilient and sustainable urban ecosystems

TO CREATE AN URBAN ECOSYSTEM

- Collaboration between natural sciences and engineering,
- But then the big step to social, behavioral sciences and economics
- And finally the huge step to the arts and humanities
- All needed to inform policy

New Orleans and Surrounding Area as a Model Ecosystem

- Like it or not, we are a natural laboratory
- Scientists, engineers, architects and urban planners from around the world are coming to study the region (e.g. satellite center for Japanese teams)
- City-wide consortium (lab without walls) committed to working smart
- New Orleans region is a focus for world wide student involvement and education in all aspects of science and society