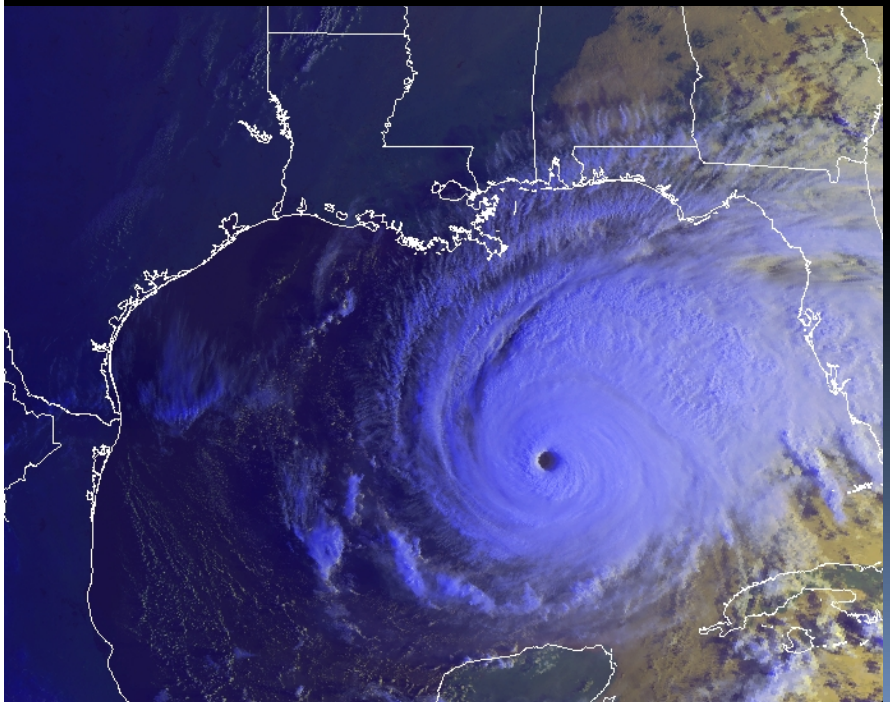
OIL SPILL RESEARCH AND DEVELOPMENT OPPORTUNITIES

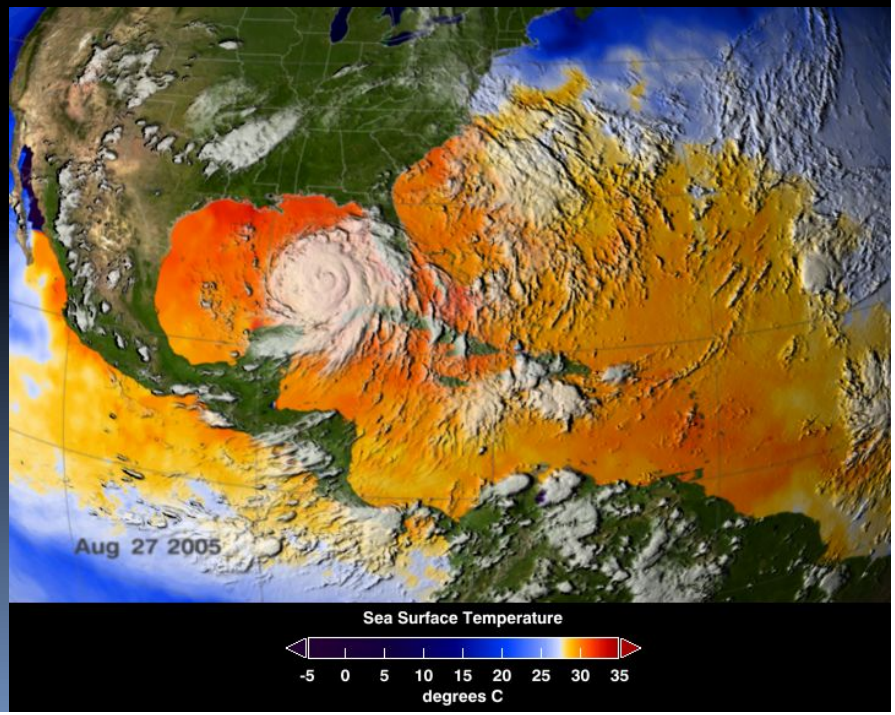
NSF/EPSCoR Oil Spill Conference, 1-2 Nov, New Orleans

BoR Post Hurricane Forum 2006

'Science Recovery and Discovery: Role of Higher Education in Securing a Sustainable Future'

3-4 April 2006





VIEWPOINT

Social-Ecological Resilience to Coastal Disasters

W. Neil Adger,[1]* Terry P. Hughes,[2] Carl Folke,[3] Stephen R. Carpenter,[4] Johan Rockström[5]

Social and ecological vulnerability to disasters and outcomes of any particular extreme event are influenced by buildup or erosion of resilience both before and after disasters occur. Resilient social-ecological systems incorporate diverse mechanisms for living with, and learning from, change and unexpected shocks. Disaster management requires multilevel governance systems that can enhance the capacity to cope with uncertainty and surprise by mobilizing diverse sources of resilience.

stable, to a more realistic viewpoint aimed at sustaining and enhancing the capacity of social-ecological systems to adapt to uncertainty and surprise.

Coastal Hazards and Resilience

SCIENCE, 27 August 2005

'Social and ecological vulnerability to disasters and outcomes of any particular extreme event are influenced by buildup or erosion of resilience both before and after disasters occur. Resilient social-ecological systems incorporate diverse mechanisms for living with, and learning from, change and unexpected shocks.'

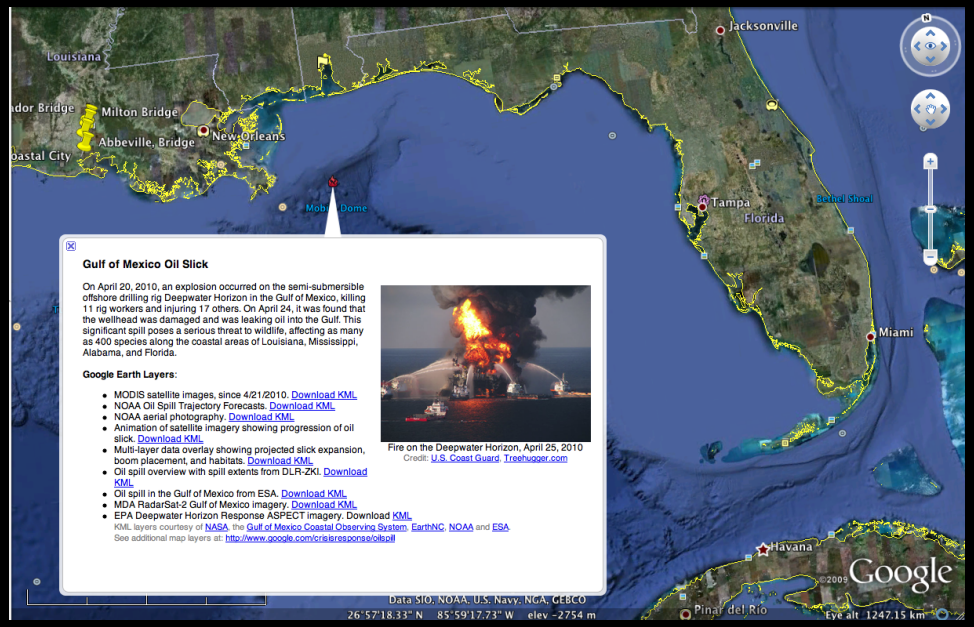
The environment has three interacting aspects: the natural environment, the build environment, and the social environment. These are interconnected in such a way that policies and practices originating in one will inevitably affect the others and, ultimately, people's health, safety, and well-being. A responsible posture, therefore, should be characterized by environmental stewardship - a holistic approach that delivers progress in full, as opposed to disembodied increments that amount to marginal change or merely the illusion of progress. "

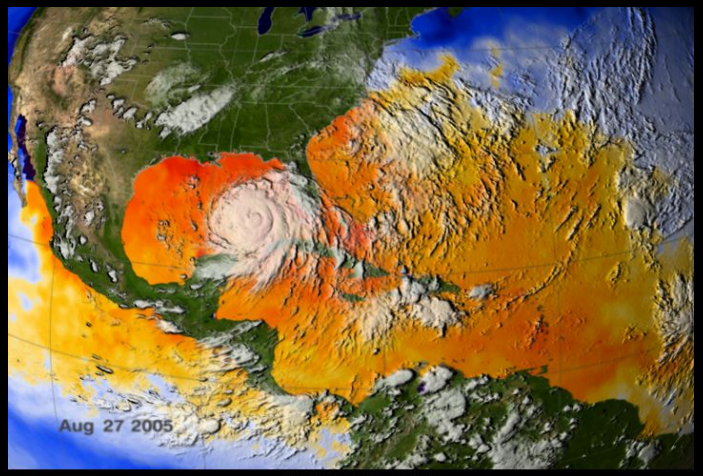
Rebuilding the Unity of Health and the Environment
Roundtable on Environmental Health Sciences, Research and Medicine
Institute of Medicine of the National Academies

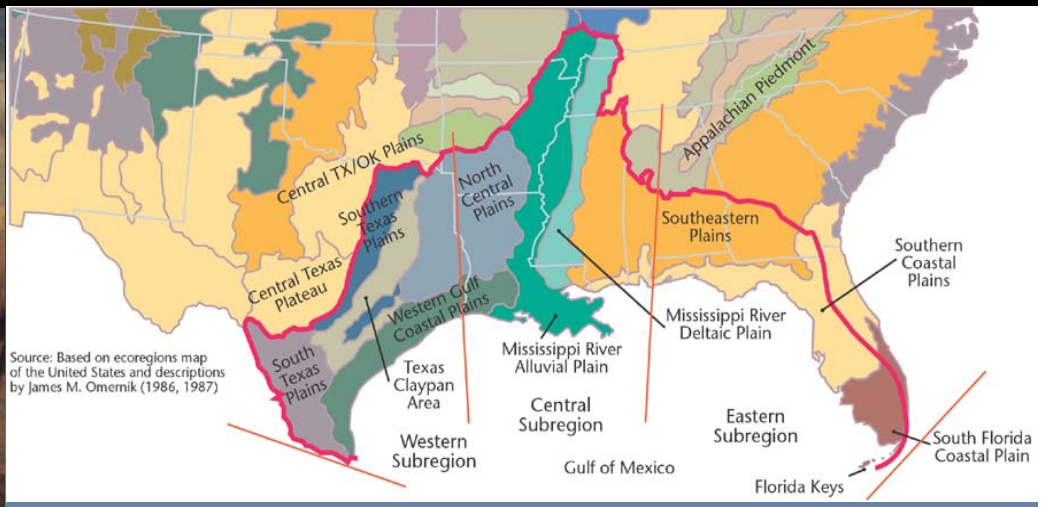
INSTITUTIONAL Commitment: Higher Education should Promote Learning and Adaptation - reduce Vulnerabilities (break the cycle):

- Organize knowledge in higher education to address society problems - greater systems analysis and evaluation;
- Science and engineering that can go from diagnostics to forecasting to prescription –Good Government Depends on Good Science
- Translation of information and knowledge into public policy – planning and implementation – community planning;
- Metrics of tradeoffs – accounting systems that link the natural, economic and social benefits – engineering and regional planning;
- Improve Institutional Knowledge to promote Learning and Adaptation of Society - ADAPTATIONS are critical to REDUCING VULNERABILITY;

Collaborative Scientific Research Opportunities Relative to the Gulf Oil Spill





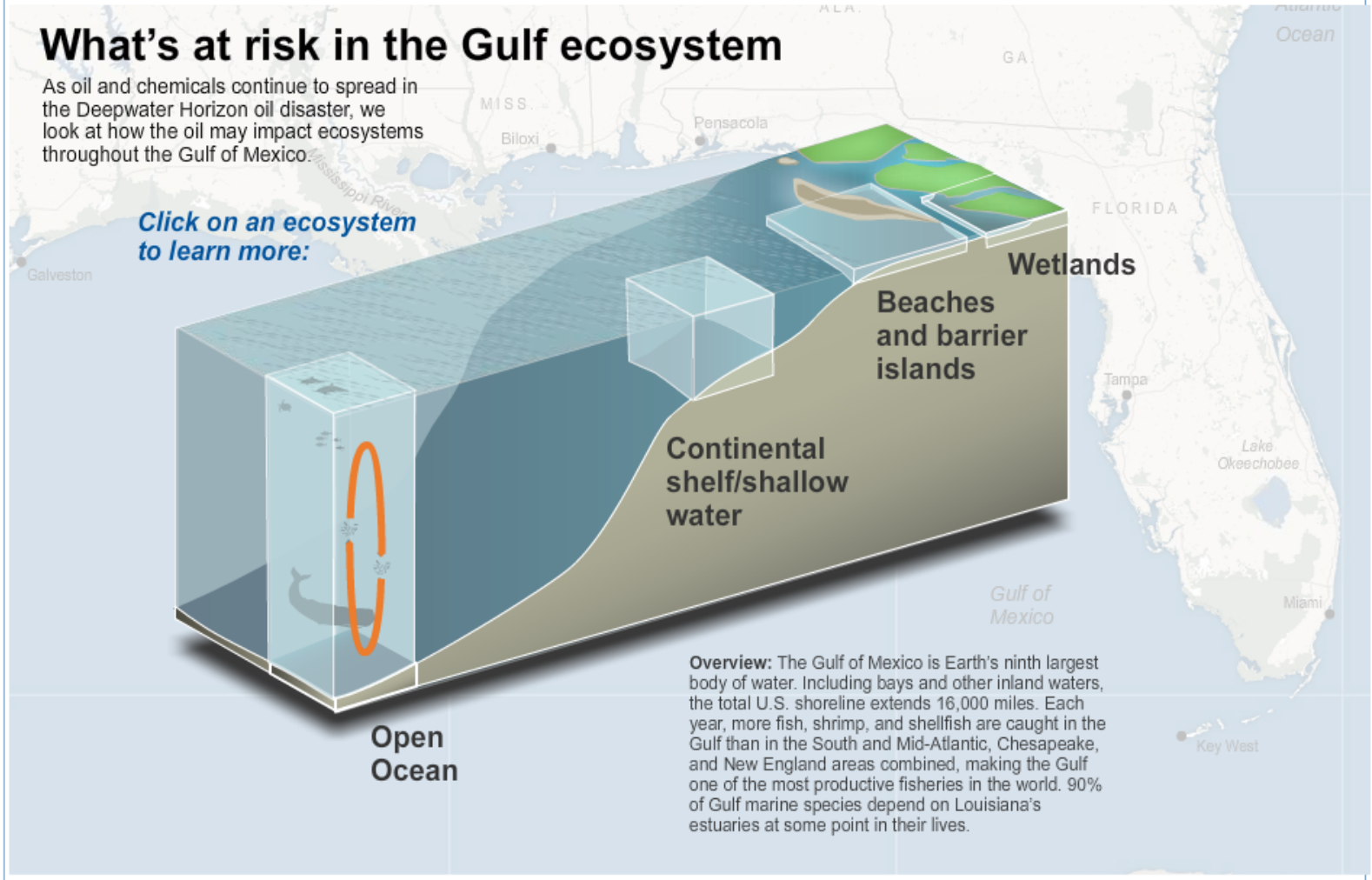


Environmental impacts of the oil spill on the Gulf

Environment and recreation | Gulf photos | Spill tracker/Numbers | Wildlife habitats

Gulf ecosystems in peril

Click habitat for more information.



Sources: Environmental Protection Agency, World Wildlife Fund, Audubon, National Oceanic and Atmospheric Administration, Woods Hole Oceanographic Institute, Tagging of Pacific Predators and U.S. Fish and Wildlife

By David M. Evans, Julia Schmalz, Dave Merrill. Elizabeth Weise, Katie Randazzo, Sean Connolly and Joshua Hatch, USA TODAY

Spill's Effects Underwater

Efforts are under way to keep the oil spill in the Gulf of Mexico from reaching birds, mammals and critical shoreline habitats, but some marine biologists worry about the effects of the oil slick and the use of chemical dispersants on life underwater. "Dispersants tend to be toxic in and of themselves but may be the lesser of two evils," said Jacqueline Savitz, a senior scientist at Oceana, a nonprofit environmental group.

IMPACT ON SEA LIFE

Brown pelicans and other seabirds often dive into the oil because the slick makes the water look calmer. If they are coated in oil, they will be unable to regulate their temperatures, leading to hyperthermia.

Plankton, tiny immobile organisms at the base of the food chain, can be killed by chemically dispersed oil.

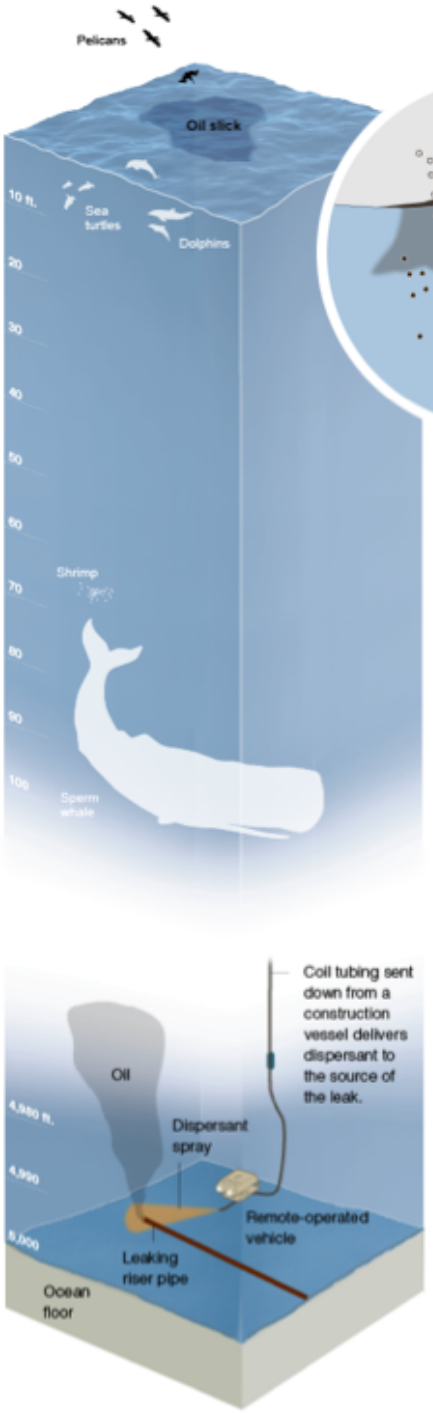
All four species of **sea turtles** in the gulf are threatened or endangered. Some have already washed up ashore, and with numbers already low, it would be harder to rebuild the population.

Dolphins, which often follow boats to play, have been following response crews, getting near the slicks.

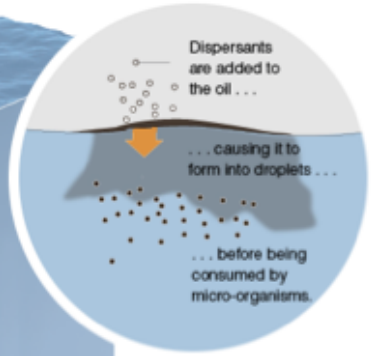
Shrimp and other shellfish are more vulnerable to oil and chemical dispersants because they are stationary, while some adult fin fish populations may be mobile.

Fish larvae are most at risk. **Bluefin tuna**, now spawning near the spill, are of particular concern. The Gulf of Mexico is one of only two nurseries in the world for bluefin tuna.

Sperm whales, which spend most of their time diving for prey, may come up in the slick as they reach the surface to breathe.



Dispersants On the Surface

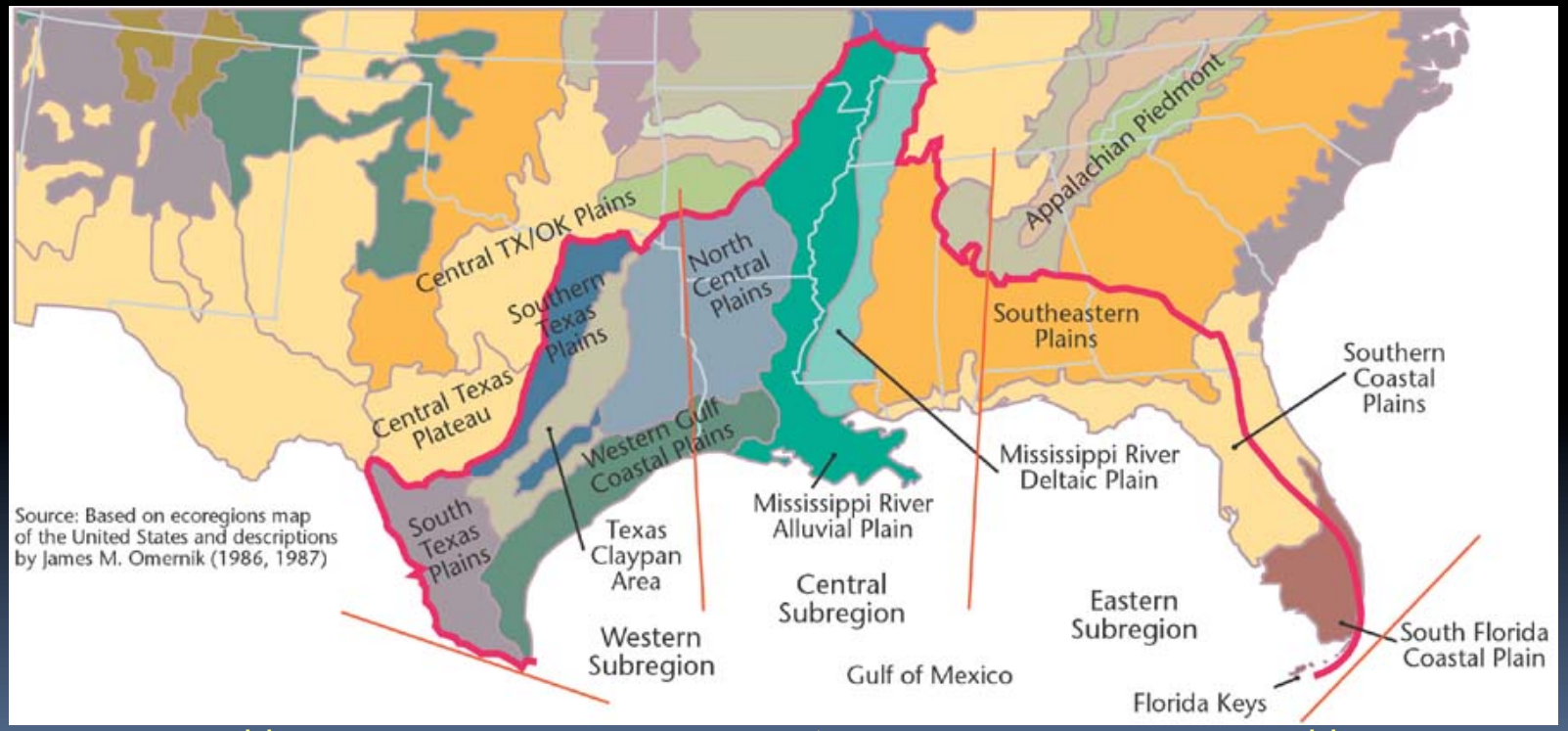


Chemicals are being sprayed onto the slick by aircraft to speed up the natural dispersion of oil. Dispersed oil is spread by waves and wind in surface waters, where many marine animals live.

Dispersants at the leak

BP officials said they were injecting dispersants into the oil as it flows from the well. Engineers hope the chemical, though usually used on the water surface, will break up the oil before it rises. Though the full environmental impact is unknown, there is less biological life to affect at this depth.

Hypothesis Testing – Disasters across Geomorphic Settings – From deltaic muds to sandy beaches



Warm temperate

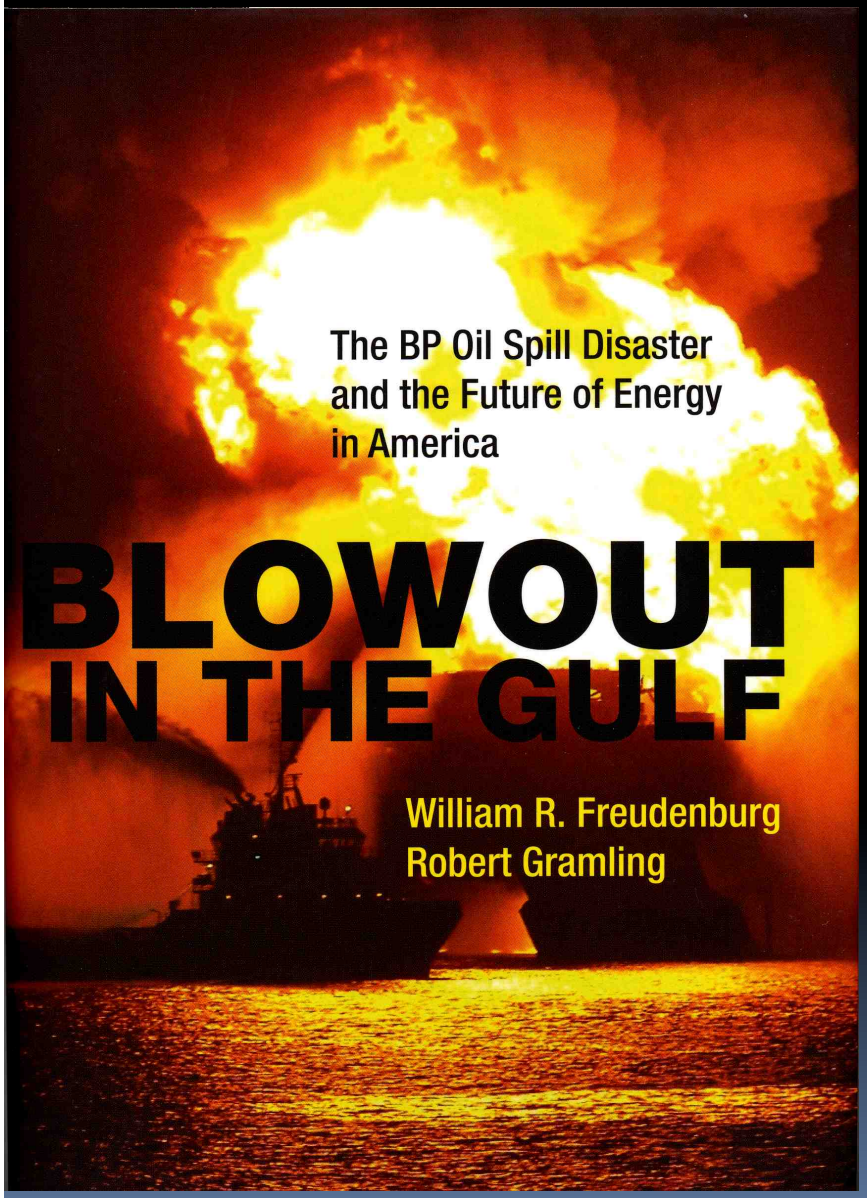
sub-tropical

drier ⟷ wet ⟷ drier

Types of Science

Type	Purpose	Sample Questions Addressed
Response – funded by the Responsible Party	Inform operational decisions made by responders for a specific incident.	-Where is the oil? - Where will it go? -What will it harm? - What can be done to mitigate?
Natural Resource Damage Assessment – funded by the Responsible Party	To support a restoration claim by proving injury and pathway, and quantifying the amount of restoration needed. Studies must support the specific injury/restoration strategy developed.	-What was injured, where, and how severely? -How long will it take to recover? -What can be done to restore or replace the injured resource while it recovers? - How much restoration is needed to balance the losses?
Research – funded by a variety of public and private sources	Improve understanding for future spills, increase understanding of natural systems and how they respond to perturbation.	-What are the long-term, system level effects on GOM? - What are the thresholds and mechanisms of toxicity in certain species? - How can we better predict oil movement in GOM?

1. Grants vs Contracts
2. Know your AGENCY
3. Intellectual Property – Knowledge – University Standards



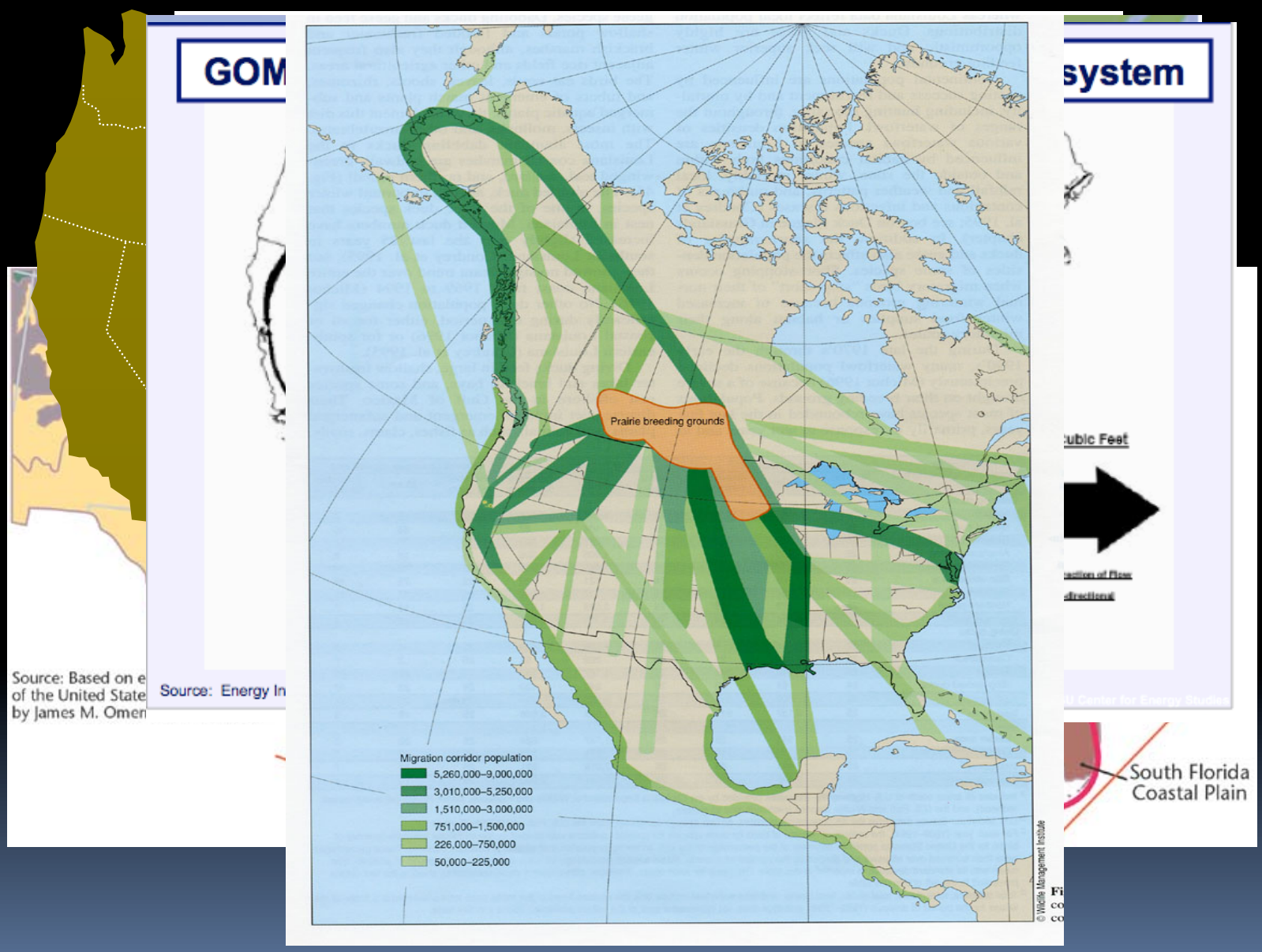
1. Interdisciplinary Research
2. NSF –University - Reflects Organized Knowledge
3. Transformative Knowledge to solve Complex Problems
4. Fragmented University – Is the University an Institution adequate in Structure and Function to lead this type of Knowledge development
5. Basic vs Applied Approaches – Solving Problems – Pasteur Quadrant
6. Institute/Centers for Research vs Academic Unit Structure – Horizontal Approaches

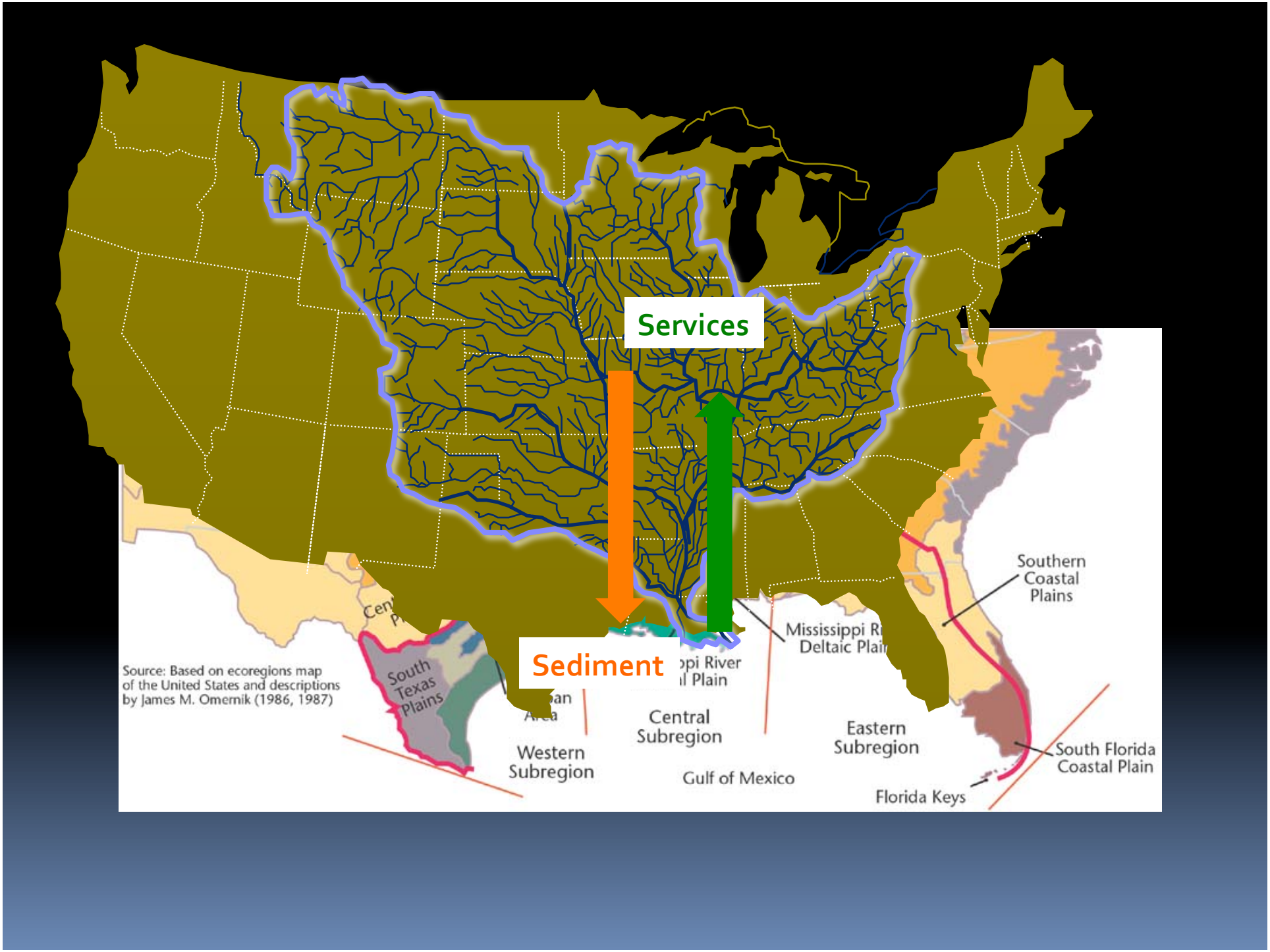
Cross Cutting Themes of Oil Spill Conference

- Data Sharing – Analysis – Synthesis - Knowledge
- Cyber-enabled Research and Discovery
- Ecosystem level exposure risks, impacts, and possible prediction capabilities?
- DISCOVERY – DIVERSITY - DISCIPLINARY
- Longitudinal – Long Term Research– Cumulative vs Comparative Approaches

Cross Cutting Themes of Oil Spill Conference

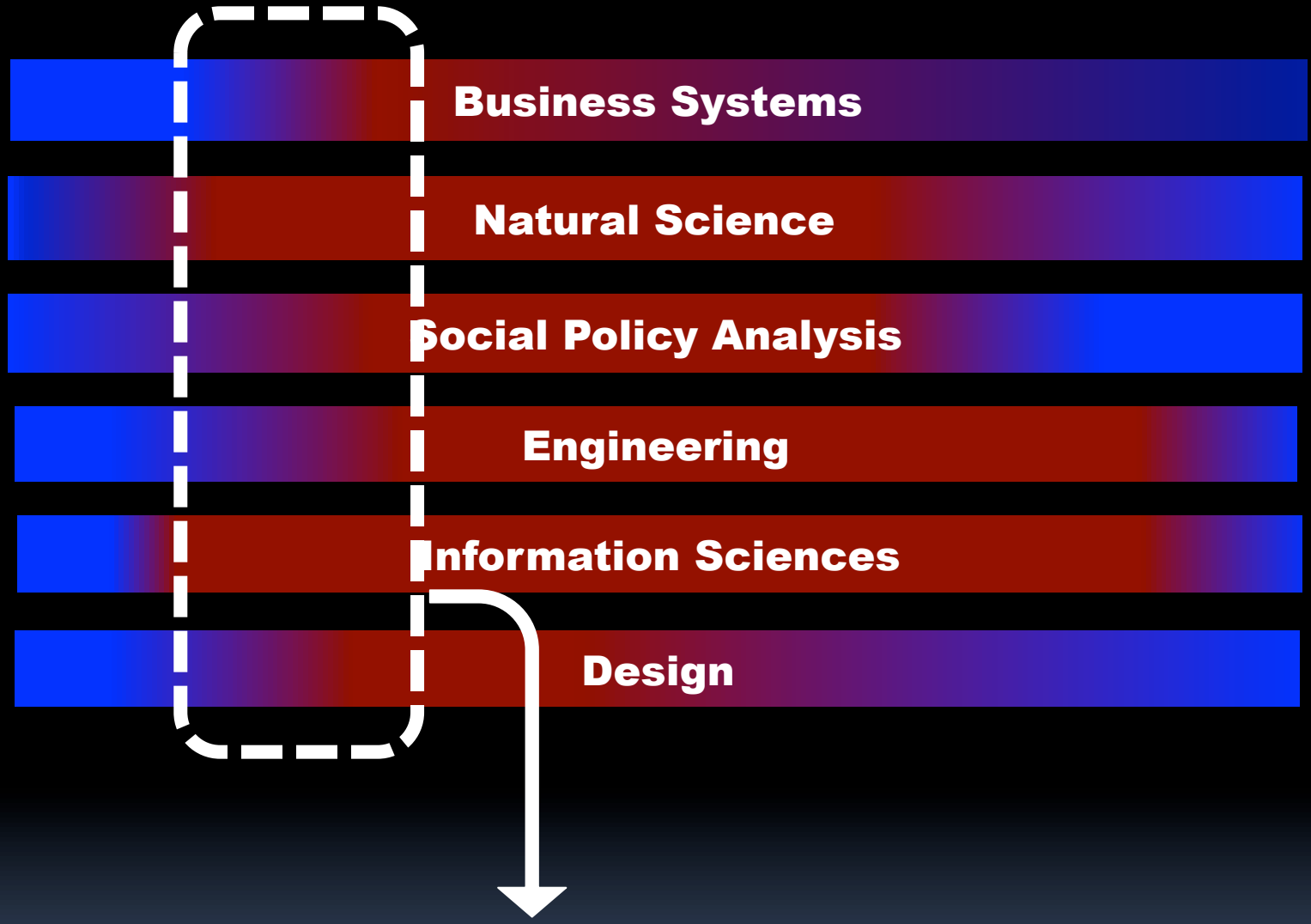
- Data to Knowledge
- Understanding Complexity of natural, built and social systems
- Virtual Research Organization – Regional Research Capacity – Consortia Formation
- How we organize ourselves across disciplines – views from the Participants?


GOM
system
Prairie breeding grounds
Migration corridor population
5,260,000–9,000,000
3,010,000–5,250,000
1,510,000–3,000,000
751,000–1,500,000
226,000–750,000
50,000–225,000
Source: Energy In
South Florida
Coastal Plain


Services
Sediment
Source: Based on ecoregions map of the United States and descriptions by James M. Omernik (1986, 1987)
South Texas Plains
Western Subregion
Central Subregion
Gulf of Mexico
Eastern Subregion
Southern Coastal Plains
South Florida Coastal Plain
Florida Keys

A System

of complex risks



Requires a System

of solutions

BoR Post Hurricane Forum 2006
'Science Recovery and Discovery: The Role of Higher Education in Securing a Sustainable Future'

Objectives of the Forum

1. **Leveraging Place - embrace** our cultural, socioeconomic and physical setting to create new ideas of how natural and humans systems adapt to coastal hazards.

2. **Leveraging Challenges – capitalize** on disasters to develop new paradigms as to how to rebuild more secure and sustainable communities.

3. **Leveraging Knowledge - transcend** traditional research disciplines and knowledge transfers to find solutions for societal needs.

4. **Leveraging Investments – utilize** funding opportunities to strengthen the capacity of higher education to advance knowledge and solve problems (rebuild capacity).

Integrated Systems for a Sustainable Future - Topics

A. Environmental Systems -
Infrastructure – Natural and managed ecosystems- assessment & restoration
Ecosystem Restoration and Protection - levees, wetlands and barrier islands
Environmental Quality - air, water, soil resources - Assessment & Forecasting

B. Engineered/Built Systems -
Infrastructure –Assessment and Rehabilitation, Optimize Transportation
Flood Assessment and Control, Waste Management,
Economic Impact and Development; Finance and Insurance; Forecasting
Energy Related Industries - Assessment, Rehabilitation and Optimization

C. Social Systems -
Historical analysis and human perceptions,
Preparedness, Policies to reduce hazards; Forecasting attitudes & behavior
Social Equity in restoration and preparedness,

D. Health Systems -
Infrastructure - Assessment and Rehabilitation, Forecasting needs
Environmental Health; Public Health and Emergency Care; Preparedness
Health system networks, and equity; Research and Development

E. Information Systems -
Technology and Communications; System modeling and forecasting, Data Mgt
LONI and Computational Technologies - Economic development
Disaster Response and Preparedness - decision support systems

Engineering Aspects and the Transport and Fate of Spilled Oil

Coastal and Ocean Environments:
Damage, Remediation and Recovery

Human Communities:
Disaster Management, Sustainability and Health

Economics, Policy and Decision Support Systems

GULF RESEARCH INSTITUTE

LSU LOUISIANA STATE UNIVERSITY

THE UNIVERSITY of NEW ORLEANS

Tulane University

UNIVERSITY of LOUISIANA Lafayette

GULF RESEARCH INSTITUTE FOR A RESILIENT LOUISIANA

A Collaborative GRI Proposal

Louisiana State University
Tulane University
University of Louisiana at Lafayette
University of New Orleans

On May 24, 2010, BP announced a commitment of up to $500 million for the Gulf of Mexico Research Initiative (GRI) to study the impact of the Deepwater Horizon incident and its associated response on the environment and public health.

The Deepwater Horizon incident and its cascading consequences in Louisiana have once again reinforced the interdependencies among the state's ***energy***, ***economic***, and ***environmental*** resources, and how tightly Louisiana's very way of life is linked to these interdependencies. The incident has also made clear the need for a collaborative research effort to advance our understanding of the impacts of the spill and how best to utilize the outcomes of research to inform every aspect of decision- and policy-making in order to operate in the deepwater environment in a safe, responsible and productive manner.

The **Gulf Research Institute for a Resilient Louisiana (GRI-RL)** proposes that BP immediately allocate $175 million of the $500 million that they have proposed for research relating to the Deepwater Horizon incident**,** directly to Louisiana to enable the implementation of the **GRI for a Resilient Louisiana**. The initial $175 million for Louisiana would be allocated as recommended by the Coastal Sustainability Consortium Executive Council in order to implement projects under three thematic areas identified within this Proposal.

As such, the research team will study the following immediately relevant thematic areas:

Theme 1. Energy and Environment: The current massive oil spill is the largest in the Gulf of Mexico, exceeding 140 million gallons as of July 1, 2010. This research theme will explore the impact of the spill on Louisiana's coastal ecosystems and the environment. It will enhance our understanding of the impacts of various remediation methodologies on our natural and built environments. The outcomes of this research will inform future approaches to mitigation, monitoring, and remediation, as well the long-term strategic development of a sustainable Louisiana coastline.

Theme 2. Health and Society: The Deepwater Horizon incident has impacted the communities that have yet to fully recover from the effects of hurricanes Katrina, Rita, Gustav and Ike, further deepening the issues of physical, occupational and mental health of those vulnerable populations. This research theme will explore the impact of the spill on at-risk communities and populations. The outcomes will enhance our understanding and shape the most effective public health approaches to meet immediate needs and to manage incidents in the future.

Theme 3. Safety and Policy: Louisiana has historically supported the energy needs of the nation, and will continue to do so in the future, by hosting this industry in its coastal communities. This research theme will explore risk mitigation, workforce development, safety training, and emergency management issues related to both public and private sector organizations that will be necessary to operate within the post-Deepwater Horizon regulatory environment. The outcome of this research will inform future approaches and strategies related to economic, organizational, and workforce development necessary for Louisiana to continue to lead the nation in responsible, safe, and productive 21st century deepwater drilling.

As such, the research team will study the following immediately relevant thematic areas:

Theme 1. Energy and Environment: The current massive oil spill is the largest in the Gulf of Mexico, exceeding 140 million gallons as of July 1, 2010. This research theme will explore the impact of the spill on Louisiana's coastal ecosystems and the environment. It will enhance our understanding of the impacts of various remediation methodologies on our natural and built environments. The outcomes of this research will inform future approaches to mitigation, monitoring, and remediation, as well the long-term strategic development of a sustainable Louisiana coastline.

RESEARCH QUESTIONS:

1. What are the optimal research, monitoring and remediation strategies to ensure the most effective and rapid recovery possible?

2. What are the transport mechanisms, fate and effects of oil, gas and dispersants in the deep sea, the coastal shelf, estuaries and coastal wetlands?

3. What are the acute and chronic impacts of oil, gas and dispersants in relevant environments and ecosystems?

4. How do we sustain the barrier islands and marshes necessary for the restoration and protection of Louisiana's coastal economies, ecologies, and communities?

5. How can natural resources be managed to minimize vulnerability and maximize resiliency of Louisiana coastal ecosystems exposed to acute and chronic disturbances?

6. How does Louisiana develop a long-term, diversified energy profile?

Theme 1. Energy and Environment: Subthemes -

Ecological Impacts - Understanding the effects of the 2010 oil spill on the coastal ecosystem requires an understanding of the fate of oil; dispersants and oil-dispersant mixtures in sediments; longevity and degradation in the water column; and the effects of natural gradients in salinity and water quality on these processes; as well as the influence of other remediation strategies, such as sediment addition.

Cleanup and Restoration Methods – The research activities concentrating on cleanup of oil-contaminated environmental media will utilize both xenobiotic and natural mechanisms for the removal of oil. A tiered effort is planned that will expand knowledge of the chemical, biological, and physical aspects of both the oil that has been transported over vast distances, potentially altered from dispersant dosing, and the potential application of cleanup methodologies that will be effective, yet minimize ecosystem damage.

Environmental Fate and Transport of Oil Spill-Derived Chemicals – The recent oil spill provides a unique situation in which very complex and not well understood conditions, particularly associated with deep-water operations, have converged to challenge the current knowledge concerning the fate of both the oil and chemicals associated with the response.

Theme 1. Energy and Environment: Subthemes -

Development of Improved Response Technologies – Past work on response methods is actually tailored toward shallow fields as compared to the deepwater conditions associated with the Deepwater Horizon Spill. Efforts by the research team will also be oriented toward the investigation of improved response technologies that can be utilized in the field or through some form of stand-off technology.

Development of Scientifically Sound Post-Oil Spill, Long-Term Coastal Restoration Methods – As mentioned previously, Louisiana for some time has been studying and implementing plans to both restore and protect its valuable coastline. These efforts are complex due to the many critical factors that must be considered to develop effective solutions.

As such, the research team will study the following immediately relevant thematic areas:

Theme 2. Health and Society: The Deepwater Horizon incident has impacted the communities that have yet to fully recover from the effects of hurricanes Katrina, Rita, Gustav and Ike, further deepening the issues of physical, occupational and mental health of those vulnerable populations. This research theme will explore the impact of the spill on at-risk communities and populations. The outcomes will enhance our understanding and shape the most effective public health approaches to meet immediate needs and to manage incidents in the future.

RESEARCH QUESTIONS:

1. What is the impact of the oil spill on the health of affected populations, including the on-the-ground workforce and the community at large?

2. What are the most effective public health approaches to post-disaster mental health services among diverse population groups in oil spill impacted communities?

3. How and what do individuals learn about disasters?

4. What factors contribute to community resilience and long-term sustainability in Louisiana Gulf Coast communities affected by the oil spill?

Theme 2. Health and Society: Subthemes -

Impact of the oil spill on the health of populations and workers?
The approach to this question is a systematic assessment of contaminants in environmental media, exposure pathways and associated health outcomes using both the National Research Council risk analysis model and direct human health monitoring and surveillance.

Public health approaches to post-disaster mental health services in impacted communities?
Prior research on natural and technological disasters has shown that mental health and ancillary impacts from these events are substantial and can persist over the long term. Moreover, there is substantial heterogeneity in access to and use of support services to ameliorate these impacts.

How and what do individuals learn about disasters?
The extensive disaster literature supports the proposition that there is a fundamental difference between the ways natural and technological disasters affect communities.

Factors contributing to community resilience and long-term sustainability in communities.
The communities most impacted by the ongoing BP Horizon oil spill are rural communities with deep roots in place, a close relationship to the environment they exist in, and a resulting unique way of life.

As such, the research team will study the following immediately relevant thematic areas:

Theme 3. Safety and Policy: Louisiana has historically supported the energy needs of the nation, and will continue to do so in the future, by hosting this industry in its coastal communities. This research theme will explore risk mitigation, workforce development, safety training, and emergency management issues related to both public and private sector organizations that will be necessary to operate within the post-Deepwater Horizon regulatory environment. The outcome of this research will inform future approaches and strategies related to economic, organizational, and workforce development necessary for Louisiana to continue to lead the nation in responsible, safe, and productive 21st century deepwater drilling.

RESEARCH QUESTIONS:

1. How can the impacts and specific responses to oil spills be integrated most effectively with broader goals for Louisiana's coastal restoration and local, regional, state and multi-state coastal master plan implementation?

2. What steps can and should be taken to minimize safety risks and environmental impacts of offshore oil and gas development, particularly in the deep sea?

3. What are the economic impacts and cross-sector consequences of the oil spill to the state of Louisiana, the region and the nation?

4. What factors determine the responses of organizations and institutions to the oil spill?

5. How do we retool Louisiana's current and emerging energy industry workforce to be productive in the changing regulatory and technological environment?

6. What are the emergency planning, preparedness and response requirements to continue viable drilling operations in the deepwater environment?

Theme 3. Safety and Policy: Subthemes -

The creation of sustainable, policy-consistent, and integrated local, state, and regional coastal master plans. This project will develop a multi-stakeholder partnership that includes relevant state and federal agencies, universities and research institutes, and NGOs in order to integrate energy exploration and oil spill response with near- and long-term coastal restoration.

Enhancing systematic safety through risk management technologies through the development of systems that (a) identify hazards in risk management regimes, (b) minimize supply chain disruptions, and (c) enhance economic efficiency and performance..

Modeling economic impacts and cross-sector consequences of disruptions in Louisiana. Creation of a permanent multi/cross-sector impact analysis team that is comparable, but more permanent, to the current Louisiana Business Emergency Operations Center (LABEOC) activities.

An examination of organizational structure flexibility and change in response to disasters. This research will identify, define, and characterize public, private and non-profit agencies responses to disaster events.

Designing a roadmap for economic and workforce re-development: Creation of comprehensive, flexible, and adaptable strategies for energy workforce development that recognize increasingly important demographic changes (i.e., "graying of the workforce), educational and technological changes, energy technology and production changes, and general industry operating changes.

Enhancing emergency management policy and practice for viable drilling operations. The current oil spill crisis has exposed significant emergency management policy design flaws. This research program is designed to develop and analyze response performance metrics, and improve multi-sector response and communication across multiple governmental levels (local, parish, state, federal), non-governmental organizations (universities, foundations, etc.), and private corporations.

Management Plan for the Gulf Research Institute for a Resilient Louisiana (GRI-RL)

- The Gulf Research Institute for a Resilient Louisiana will be housed within the Coastal Sustainability Consortium (CSC) to manage funds established by BP to promote research and development in oil spill response and recovery.

- The Consortium (www.coastalsustainability.org) was established under a Memorandum of Understanding among four major research universities in the state of Louisiana with expertise in coastal issues: Louisiana State University A&M (LSU), Tulane University, the University of Louisiana – Lafayette (ULL) and the University of New Orleans (UNO).

- The policies and procedures of the Consortium are set by an Executive Council consisting of high-level research administrator from each of the four research universities, a representative from the Louisiana Office of Coastal Protection and Restoration and a representative from the U. S. Army Corps of Engineers. Additional members may be added from other private, state and/or federal agencies in support of the mission of the Consortium.

- The technical and scientific objectives of the Consortium are met through the efforts of a Technical Council comprised of leading scientists in coastal issues from each of the four universities. Other public and private Louisiana universities may join the Consortium by becoming Affiliate Members. Each Affiliate Member institution is entitled to a representative on the Technical Council. In addition, the Affiliate Members meet annually to elect one representative to the Executive Council.

- To support the thematic research areas, this management plan recommends to the Executive Council that three subcommittees representing these three thematic research areas be formed under the Technical Council and that the head of each subcommittee serve on the Technical Council.

Coastal Sustainability Consortium

BP Funds

CSC External Advisory Board

CSC Executive Council

GRI Director

External Review Panels – Merit Based Proposal Review

CSC Technical Council

UL Lafayette Technical Committee

BOARD OF REGENTS – EPSCoR Program

Executive Summary: Collaborative Scientific Research in Relation to the Gulf Oil Spill

General Conference Organization.

Funded by NSF EPSCoR and the Board of Regents Support Fund,

LA EPSCoR and the Board of Regents will host a research conference related to research priorities and collaborative opportunities born of the Gulf oil spill.

The one-and-a-half-day conference, to be held in New Orleans on November 1-2, will include four major components: an opening plenary session, 4 breakaway strands that will be continuous throughout the conference, summary reports on the four breakaway strands, and an evening poster session/reception.

The overriding purpose of the Conference is to promote and sustain interdisciplinary, collaborative research in areas related to the Gulf oil spill and its aftermath.

Conference goals are:

- **Identify collaborative research opportunities within and across the four broad strands;**
- **Facilitate connections and planning for research partnerships;**
- **Publish conference proceedings to document partnership opportunities and highlight results;**
- **Explore funding for collaborative research opportunities.**

REGENTS

Monday, November 1, 2010				
7:00-8:00	Registration & Poster Set-up; Continental Breakfast			
8:00-10:00	Welcome & Opening Plenary: Research Consortium Leaders: Gulf States Oil Release Public Health & Environmental Consortium – Edward Trapido (LSUHSCNO), Scott Lillibridge (Texas A&M); Gulf Oil Research Program – Chris D'Elia (LSU), Nancy Rabalais (LUMCON), Robert Gagosian (WHOI); MS/AL Sea Grant – Ladon Swann; Northern Gulf Institute – Mike Carron, David Shaw; Louisiana Sea Grant – Chuck Wilson; Coastal Sustainability Consortium – Luann White			
10:00-10:15	Break			
Breakaway Sessions Facilitators will guide discussions throughout the sessions, summarize Day 1 discussions during the first session on Day 2, and provide, along with selected panelists, a summary report of the breakaway at the end of the Conference; NSF program officers will participate in discussions throughout the Conference	**Engineering Aspects and the Transport and Fate of Spilled Oil** Facilitator: Sandi Fury, Chevron (Twilley) Lou Thibodeaux, LSU (Carver) NSF Program Officer: Deborah Smith, NSF Ocean Drilling Program Geoffrey Prentice, Division of Chemical, Bioengineering, Environmental & Transport Systems	**Coastal and Ocean Environments: Damage, Remediation and Recovery** Facilitator: Steve Lohrenz, USM (Twilley) Denise Reed, UNO (Twilley) Andy Nyman, LSU (Carver) Paul _____, EPA (Twilley) or Al Arnedariz, EPA Region 6 (Meffert) NSF Program Officer: Phillip Taylor, NSF Division of Ocean Sciences Bette Loiselle, NSF Division of Environmental Biology	**Human Communities: Disaster Management, Sustainability and Health** Facilitator: Jay Grimes, USM (Carver) Steve Picou, USA (Lea) NSF Program Officer: Myron Gutman, NSF Social Behavioral & Economic Sciences Directorate Brian Humes, NSF Social & Political Sciences	**Economics, Policy and Decision Support Systems** Facilitator: Sara Ortwein, ExxonMobil Development (Meffert) Sally Sleeper, RAND (Meffert) NSF Program Officer: Andrew Feltenstein, NSF Economic, Decision & Management Sciences Scott Barclay, NSF Social & Political Sciences
10:15-12:30 Overviews of Collaborative Research Across the Topic Area: 20-minute overviews from each of four panelists, with	Panel: Bhaskar Aura, UNO (Whittenburg) Ning Zhang, McNeese (Woolman) Balaji Ramachandran,	Panel: Mark Zappi, ULL (Twilley) John Pardue, LSU (Carver) Raj Boopathy, Nicholls (Benoit) Russ Beard, National Coastal	Panel: Shirley Laska, UNO (Whittenburg) Luann White, Tulane (Meffert) Janet Rami, SUBR (Mensah)	Panel: Joseph Mason, LSU (Carver) Ramesh Kolluru, ULL (Twilley) Don Epley, USA (Lea) Mitchell Crusto, Loyola

REGENTS

Types of Science

Type	Purpose	Sample Questions Addressed
Response – funded by the Responsible Party	Inform operational decisions made by responders for a specific incident.	-Where is the oil? - Where will it go? -What will it harm? - What can be done to mitigate?
Natural Resource Damage Assessment – funded by the Responsible Party	To support a restoration claim by proving injury and pathway, and quantifying the amount of restoration needed. Studies must support the specific injury/restoration strategy developed.	-What was injured, where, and how severely? -How long will it take to recover? -What can be done to restore or replace the injured resource while it recovers? - How much restoration is needed to balance the losses?
Research – funded by a variety of public and private sources	Improve understanding for future spills, increase understanding of natural systems and how they respond to perturbation.	-What are the long-term, system level effects on GOM? - What are the thresholds and mechanisms of toxicity in certain species? - How can we better predict oil movement in GOM?

Funding Sources (NRDA): Responsible Party, Federal Trustees, State Trustees

BP is responsible party

Federal Trustees: NOAA, USFWS, EPA

State Trustees: OCPR, LDWF, DEQ (LOSCO, DNR)

Funding Sources: NGO, Foundations, NSF RAPID,

VIEWPOINT

Social-Ecological Resilience to Coastal Disasters

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Social and ecological vulnerability to disasters and outcomes of any particular extreme event are influenced by buildup or erosion of resilience both before and after disasters occur. Resilient social-ecological systems incorporate diverse mechanisms for living with, and learning from, change and unexpected shocks. Disaster management requires multilevel governance systems that can enhance the capacity to cope with uncertainty and surprise by mobilizing diverse sources of resilience.

stable, to a more realistic viewpoint aimed at sustaining and enhancing the capacity of social-ecological systems to adapt to uncertainty and surprise.

Coastal Hazards and Resilience

Table 1. Examples of local- and regional-scale actions to enhance resilience in social-ecological systems exposed to abrupt change.

Elements of vulnerability	Local action	National and international action
Exposure and sensitivity to hazard	Maintenance and enhancement of ecosystem functions through sustainable use Maintenance of local memory of resource use, learning processes for responding to environmental feedback and social cohesion	Mitigation of human-induced causes of hazard Avoidance of perverse incentives for ecosystem degradation that increase sensitivity to hazards Promotion of early warning networks and structures Enhancement of disaster recovery through appropriate donor response
Adaptive capacity	Diversity in ecological systems Diversity in economic livelihood portfolio Legitimate and inclusive governance structures and social capital	Bridging organizations for integrative responses Horizontal networks in civil society for social learning

SCIENCE, 27 August 2005

Science for Rebuilding Coastal Louisiana

Natural Science

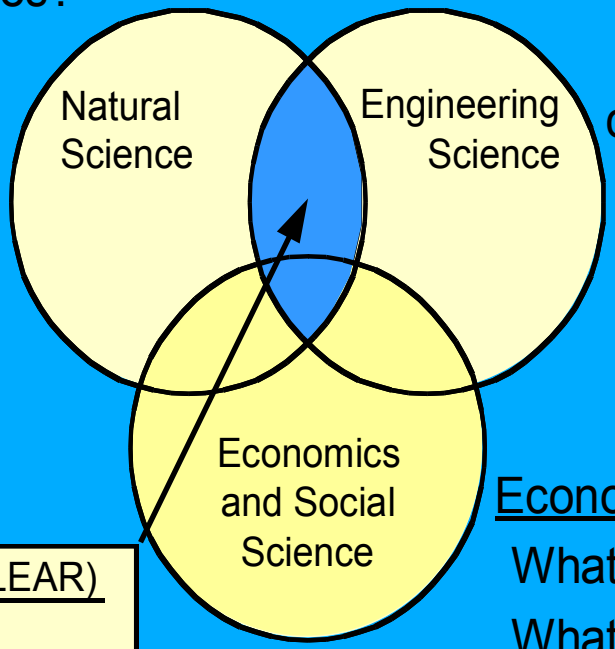
Driving processes?

What is status, trends in natural systems?

Engineering

What can we do?

How and at what cost?



Economic Analysis

What is at stake?

What opportunities exist (risks/benefits)?

Applied Science (CLEAR)

What is feasible?

How is/will it perform?