**Summit Program**

State of the Gulf of Mexico Summit 2006  
Omni-Bayfront Hotel, Corpus Christi, Texas  
March 28-30, 2006

---

**Day 1 - Tuesday, March 28, 2006 - Governance, Catastrophic Events and Gulf Sustainability**

11:45 AM  **Governors' Luncheon - Sponsored by Shell Oil Company**

12:00 PM  **Welcome**
- Dr. Robert R. Furgason, Director, Harte Research Institute
- Dr. Flavius Killebrew, President, Texas A&M University-Corpus Christi
- Mr. John D. White, Chairman, Board of Regents, Texas A&M University System
- Governor Rick Perry, State of Texas
- Gobernador Eugenio Hernández Flores, State of Tamaulipas
- Mr. John Hofmeister, President, Shell Oil Company

1:30 PM  **Governors Panel on Catastrophic Events and Gulf of Mexico Sustainability - Sponsored by BP**
 Governor Rick Perry, presiding
- Mr. Michael Reddin, Vice President, BP

Alabama Gov. Bob Riley  
Campeche Gob. Jorge Carlos Hurtado Valdez  
Florida Gov. Jeb Bush  
Louisiana Gov. Kathleen Blanco  
Mississippi Gov. Haley Barbour  
Quintana Roo Gob. Félix González Cantu

Tamaulipas Gob. Eugenio Hernández Flores  
Texas Gov. Rick Perry  
Veracruz Gob. Fidel Herrera Beltrán  
Yucatán Gob. Patricio Patrón Laviada

2:30 PM  **Impacts of Catastrophic Events on the Environment**
- Dr. Gerhard Kuska, White House Council on Environmental Quality

Mr. Steve McCraw, Director, Texas Office of Homeland Security  
Ms. Karen Gautreaux, Deputy Secretary, Louisiana Department of Environmental Quality  
Mr. Phil Bass, Director, Office of Pollution Control, Mississippi Department of Environmental Quality

3:15 PM  **Break - Sponsored Texas Parks & Wildlife Department**

3:30 PM  **Keynote Presentations:**
- Introduction by Dr. Sylvia Earle, Explorer-in-Residence, National Geographic Society and Chair, Harte Research Institute Advisory Council
- Admiral James Watkins, Co-Chair, Joint Ocean Commission Initiative
- The Honorable Leon Panetta, Co-Chair, Joint Ocean Commission Initiative

4:15 PM  **Gulf of Mexico Sustainability Programs**
- Vice Admiral Conrad Lautenbacher, NOAA, Administrator

**Presentation of Gulf of Mexico Alliance Plan**
- Ms. Colleen Castille, Secretary, Florida Department of Environmental Protection

**Panel Discussion on Initiatives Related to Gulf of Mexico Issues**
- Mr. Stephen Johnson, U.S. EPA, Administrator
- Dr. Antonio Díaz de León (Director General, Dirección General de Política Ambiental e Integración Regional y Sectorial)
- Ms. Kameran Onley, Assistant Deputy Secretary, U.S. Department of the Interior
- Sr. Lorenzo Rosenzweig, Director General, Fondo Mexicano para la Conservación da la Naturaleza
- Ms. Kathleen Hartnett White, Chair, Texas Commission on Environmental Quality
**Summit Program**

State of the Gulf of Mexico Summit 2006  
Omni-Bayfront Hotel, Corpus Christi, Texas  
March 28-30, 2006

**Day 2 - Wednesday, March 29, 2006 - Economy and Public Health**

**Panel 1**  
**Economy of the Gulf of Mexico**  
Dr. James Cato, Chair (Director, Florida Sea Grant Program and Senior Associate Dean & Director, School of Natural Resources & Environments, University of Florida)

8:00 AM  
Introduction of Topic and Panel

**Panel 1-A: The Changing Ocean and Coastal Economy of the Gulf of Mexico**

8:10 AM  
The Ocean and Coastal Economy:  
· What the Information Can Tell Us  
· Why it is Important to Know the Nature, Size, and Implications for the Future  
  Dr. Judith Kildow (University of California - Monterey Bay)

8:30 AM  
Population and Growth Pressures & Comparisons to the U.S. Ocean and Coastal Economy  
Dr. Charles Colgan (University of Southern Maine)

8:50 AM  
The Importance of Non-market Values in the Ocean and Coastal Economy  
Dr. Linwood Pendleton (University of California-Los Angeles)

9:10 AM  
Questions and Discussion

9:30 AM  
Break - Sponsored by Kerr McGee

**Panel 1-B: Industry Performance in the Gulf of Mexico Region**

10:00 AM  
U.S. Gulf of Mexico Based Industry  
Dr. Charles Adams (University of Florida)

10:20 AM  
Mexican Gulf of Mexico Based Industry Sectors  
Dr. David Yoskowitz (Texas A&M University-Corpus Christi)

10:30 AM  
Productive Value of the Gulf of Mexico  
Dr. David Yoskowitz (Texas A&M University-Corpus Christi)

10:50 AM  
Questions and Discussion

**Panel 1-C: The Socioeconomic Importance of the Gulf of Mexico to Mexico and the Potential to Develop as a Major Economic And Political Region**

11:00 AM  
The Importance of Social and Economic Factors in Planning, Environmental Impact Assessment, and Management in the Mexican Gulf of Mexico States  
Dr. Cuauhtemoc Leon Diez (CONABIO, Sec. of Environment and Natural Resources, Mexico)

11:15 AM  
The Importance of Foreign Trade, Investment, and Finance in the Economic and Environmental Sustainability of the Mexican Gulf of Mexico States  
Mr. Raul Rodriguez (Former Managing Director and CEO, North American Development Bank)
## Summit Program

State of the Gulf of Mexico Summit 2006  
Omni-Bayfront Hotel, Corpus Christi, Texas  
March 28-30, 2006

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Organizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 AM</td>
<td>The Political Economy of the Gulf of Mexico as a Region</td>
<td>Dr. Terry McCoy (University of Florida)</td>
</tr>
<tr>
<td>11:45 AM</td>
<td>Questions and Discussion</td>
<td></td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Lunch with Speaker - Sponsored by ExxonMobil</td>
<td>Mr. Ruben Bonilla, Chairman, Port Commission, Port of Corpus Christi</td>
</tr>
<tr>
<td></td>
<td>Public Health of the Gulf of Mexico</td>
<td>Dr. Jay Grimes (Provost, The University of Southern Mississippi, Dean, College of Marine Sciences, Director, Gulf Coast Research Labs)</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>Introduction to Topic and Panel</td>
<td></td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Risks from Chemical Pollution (mercury)</td>
<td>Mr. Spencer Garrett, Director (National Seafood Inspection Laboratory, NOAA)</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Risks from Pathogens</td>
<td>Dr. Andy De Paola (Gulf Coast Seafood Laboratory, U.S. Food and Drug Administration)</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>Risks from Toxins</td>
<td>Dr. Fred Kopfler (Senior Environmental Scientist, Gulf of Mexico Program)</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>Break - Sponsored by Amerada Hess</td>
<td></td>
</tr>
<tr>
<td>4:00 PM</td>
<td>Communicating Public Health Risks</td>
<td>Dr. Clifford Houston, Associate Vice President (Educational Outreach, The Herman Barnett Distinguished Professorship in Microbiology &amp; Immunology, The University of Texas Medical Branch)</td>
</tr>
<tr>
<td>4:30 PM</td>
<td>Questions and Discussion</td>
<td></td>
</tr>
<tr>
<td>6:30 PM</td>
<td>Reception - Solomon P. Ortiz International Center, Port of Corpus Christi</td>
<td>Tours aboard the Ocean Survey Vessel Bold</td>
</tr>
</tbody>
</table>

### Day 3 - Thursday, March 30, 2006 - Environment and Governance

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Organizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 AM</td>
<td>Introduction of Topic and Panel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Panel 3-A: Restoring Coastal Ecosystems – Back From the Storms</td>
<td></td>
</tr>
<tr>
<td>8:10 AM</td>
<td>Harmful Algal Blooms</td>
<td>Dr. Tracy Villareal (University of Texas Marine Science Institute)</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Dead Zone</td>
<td>Dr. Nancy Rabalais (Louisiana Universities Marine Consortium)</td>
</tr>
<tr>
<td>8:50 AM</td>
<td>Northern Gulf Habitats</td>
<td>Dr. Robert Twilley (Louisiana Sate University)</td>
</tr>
</tbody>
</table>
Summit Program

State of the Gulf of Mexico Summit 2006
Omni-Bayfront Hotel, Corpus Christi, Texas
March 28-30, 2006

9:10 AM Coral Reefs and Tropical Coasts
Dr. Jorge Herrera (CINVESTAV – IPN, Unidad Mérida)

9:30 AM A Smarter Way Back
Dr. Bill Walker (Mississippi Department of Natural Resources)

9:50 AM Break - Sponsored by Valero Energy Corporation

Panel 3-B: Restoring Gulf Fisheries – After the Storms

10:30 AM Introduction of Topic and Panel:

10:40 AM The State of the Fishery Today
Dr. Rex Caffey (Associate Professor, Louisiana State University)

11:00 AM New Opportunities to Address Old Problems
Dr. Lee Anderson (University of Delaware/ NOAA)

11:30 AM Gulf Response
Mr. Robin Riechers (Chair of Gulf Fisheries Council and Director of Fisheries Policy TPWD)

11:45 AM Discussions and Questions

12:00 PM Lunch with Speaker - Sponsored by Apache Corporation
Dr. Michael Orbach (Director, Duke Marine Laboratory)

Panel 4 Collaborative Governance of the Gulf of Mexico
Dr. Richard McLaughlin, Co-Chair, (Endowed Chair for Coastal and Marine Policy and Law Harte Research Institute for Gulf of Mexico Studies)
Dr. Biliana Cicin-Sain, Co-Chair, (Director, Gerard J. Mangone Center for Marine Policy, University of Delaware; Co-chair, Global Forum on Oceans, Coasts, and Islands)

1:45 PM Introduction of Topic and Panel

2:05 PM International Case Studies of Collaborative Ocean Governance
Dr. Biliana Cicin-Sain (Director, Gerard J. Mangone Center for Marine Policy, University of Delaware; Co-chair, Global Forum on Oceans, Coasts, and Islands)

2:25 PM Collaborative Governance in Mexico
Dr. Antonio Díaz de León (Director General, Dirección General de Política Ambiental e Integración Regional y Sectorial)

2:45 PM Private Industry and Regional Governance
Mr. Paul Kelly (Executive Vice President, Rowan Offshore and Member of the U.S. Ocean Commission)

3:05 PM Gulf of Mexico Alliance – Improving Regional Governance Among the Five U.S. Gulf States
Mr. Gary Lytton (Environmental Administrator Rookery Bay National Estuarine Research Reserve)

3:25 PM Questions and Discussion

3:45 PM Adjournment
Special thanks to the attending governors, our sponsors, speakers, and panelists.
PROCEEDINGS OF THE
STATE OF THE
GULF OF MEXICO
SUMMIT
2006

CORPUS CHRISTI, TEXAS
28-30 MARCH 2006

John W. Tunnell, Jr. and Quenton R. Dokken, Editors

Harte Research Institute for Gulf of Mexico Studies
Texas A&M University-Corpus Christi
6300 Ocean Drive
Corpus Christi, Texas 78412

HRI website: www.hri.tamucc.edu
GulfBase website: www.gulfbase.org

SUGGESTED CITATION:

November 2006
THANK YOU SPONSORS

PLATINUM

GOLD

SILVER

BRONZE

SPECIAL THANKS TO
Mr. Luke Corbett and Mr. William Bradford,
Co-Chairs of the Summit 2006 Development Committee.
TABLE OF CONTENTS

4
Executive Summary

6
Harte Research Institute for Gulf of Mexico Studies

7
Harte Research Institute for Gulf of Mexico Studies Advisory Council

8
Summit Program Overview

9
Summit Panels
1. Economy of the Gulf of Mexico
2. Public Health of the Gulf of Mexico
3. Environment of the Gulf of Mexico
4. Collaborative Governance of the Gulf of Mexico

10
Summit Program

12
Panel Overviews and Abstracts

30
Gulf of Mexico Alliance

31
Ed Harte- Founder of the Harte Research Institute for Gulf of Mexico Studies

32
Gulf Guardian Awards

34
Summit Panelists Bios


The first State of the Gulf of Mexico Summit 2006 was hosted by the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University-Corpus Christi and held during 28-30 March 2006 in Corpus Christi, Texas. The three-day Summit was attended by approximately 450 invited guests from the United States and Mexico. Day one focused on governance, catastrophic events, and Gulf sustainability and included numerous leaders of state and federal government. Days two and three were organized into four panels with topics on Gulf of Mexico economy and public health during the second day and the environment and governance on the third.

Day One started with a governor’s luncheon sponsored by Shell Oil Company and welcome addresses by Dr. Robert Furgason, Director, Harte Research Institute for Gulf of Mexico Studies, Dr. Flavius Killebrew, President, Texas A&M University-Corpus Christi, Texas Governor Rick Perry, Tamaulipas Governor Eugenio Hernandez Flores, and Mr. John Hofmeister, President, Shell Oil Company. Following the luncheon, Summit Co-Host, Texas Governor Rick Perry, chaired a Governor’s Panel on Catastrophic Events and Gulf of Mexico Sustainability with Louisiana Governor Kathleen Blanco, Tamaulipas Governor Eugenio Hernandez Flores, and Veracruz Governor Fidel Herrera Beltran. The Governor’s Panel was sponsored by BP. A following session on Impacts of Catastrophic Events on the Environment had speakers from the White House, Texas, Louisiana, and Mississippi. The keynote presentation was introduced by Dr. Sylvia Earle and given by Admiral James Watkins, Chair of the U.S. Ocean Commission, who set the stage and tone of coastal and ocean sustainability for the Summit. He was followed by Vice Admiral Conrad Lautenbacher, NOAA Administrator, who outlined and explained Gulf of Mexico federal sustainability programs. In closing the first day's program, Ms. Colleen Castille, Secretary, Florida Department of Environmental Protection, presented and released the Gulf of Mexico Alliance Action Plan, and a final panel with U.S. and Mexico leaders discussed Gulf of Mexico Initiatives. That evening, EPA Administrator Mr. Stephen Johnson, along with EPA Gulf of Mexico Program representatives, presented the annual Gulf Guardian Awards.
Day Two began with a morning panel session on the Economy of the Gulf of Mexico, chaired by Dr. Jim Cato, Director, Florida Sea Grant Program, and Senior Associate Dean and Director, School of Natural Resources and Environments, University of Florida. With eight panelists, the economic session was divided into three subpanels covering: 1) The Changing Ocean and Coastal Economy of the Gulf of Mexico; 2) Industry Performance in the Gulf of Mexico Region; and, 3) The Socioeconomic Importance of the Gulf of Mexico and the Potential to Develop as a Major Economic and Political Region. In the afternoon, a panel session on Public Health of the Gulf of Mexico was chaired by Dr. Jay Grimes, Provost, University of Southern Mississippi, Dean, College Marine Sciences, and Director, Gulf Coast Research Labs. With four panel members, subjects ranged from risks of chemical pollution (mercury), pathogens, and toxins, as well as communication of public health risks. In the evening there was a reception at the Port of Corpus Christi, Solomon P. Ortiz International Center, and tours of the new EPA Ocean Survey Vessel Bold.

Day Three began with a panel session in the morning on the Environment of the Gulf of Mexico chaired by Dr. Larry McKinney, Director, Coastal Fisheries Division, Texas Parks and Wildlife, and co-chaired by Dr. Bill Walker, Mississippi Department of Natural Resources and Mr. Richard Newell, White House Council of Economic Advisors. The environment panel had eight speakers divided into two topical areas, one on Restoring Coastal Ecosystems-Back from the Storms and another on Restoring Gulf Fisheries-After the Storms. The fourth panel, and final session of the Summit, covered Collaborative Governance for the Gulf of Mexico. This panel was chaired by Dr. Richard McLaughlin, Endowed Chair of Coastal and Marine Policy and Law, Harte Research Institute for Gulf of Mexico Studies and co-chaired by Dr. Biliana Cicin-Sain of the University of Delaware and Global Ocean Forum. The session had four speakers with topics on international case studies, collaborative governance in Mexico, private industry and regional governance, and the Gulf of Mexico Alliance.

This first State of the Gulf of Mexico Summit was considered a grand success, bringing together leaders of state and federal government from the U.S. and Mexico, industry, conservation, community, and academia. Although major attention was focused on the Gulf of Mexico due to the destruction caused by hurricanes in 2004-2005, the Summit brought new focus and attention on the need for cooperative and collaborative efforts to insure the long-term sustainable use and conservation of the Gulf of Mexico.

In addition to excellent regional and some national and international coverage of the Summit, a 30-minute video was produced by the Teaching and Learning Network for airing on national TV networks during the fall of 2006 (Voices of Vision-A Unifying Effort: Sustaining the Gulf of Mexico). These proceedings are available on the Harte Research Institute website at http://www.hri.tamucc.edu in PDF format, and most of the panelists Power Points are available there also for those who desire information beyond the abstracts in these proceedings.

The Governor of Tamaulipas, Mexico, Gobernador Eugenio Hernandez Flores, will be hosting another Gulf of Mexico Summit in Tampico during 14-15 June 2007, focusing on Gulf issues in Mexico.

The next State of the Gulf of Mexico Summit, hosted by the Harte Research Institute, is planned for 2009.
In September 2000, a $46 million endowment was given by Mr. Edward H. Harte, a philanthropist and former publisher of the Corpus Christi Caller-Times, to establish the Harte Research Institute (HRI) for Gulf of Mexico Studies at Texas A&M University-Corpus Christi. The State of Texas provided an additional $18 million to build a facility to house HRI. A 28-member Advisory Council of national and international figures was formed, and planning meetings have been held in the USA, Mexico, and Cuba. Building construction started in spring 2003, and the building was dedicated in November 2005. Several early projects underway since the Institute’s endowment are: exploratory Gulf expeditions (Veracruz reefs; Pulley Ridge, Florida; northwest Cuba); biodiversity of the Gulf of Mexico; Gulf of Mexico GIS; and GulfBase, a Gulfwide research website. HRI will also produce a 50-year update of the publication commonly known as “Bulletin 89”: Gulf of Mexico - Its Origin, Waters, and Marine Life (U.S. Fish and Wildlife Service 1954). It will be expanded from one volume to seven, including geology, physical oceanography, chemical oceanography, biota, human issues, ecosystem-based management, and economics.

It is the vision of the Harte Research Institute for Gulf of Mexico Studies to be a research center of excellence providing international leadership in generating and disseminating knowledge about the Gulf of Mexico ecosystem and its critical role in the economics of the North American region. HRI encourages a tri-national responsibility and approach to understanding the Gulf of Mexico ecosystem, including the United States, Mexico, and Cuba. It promotes excellence and innovation in interdisciplinary scientific research, public policy initiatives, and education and outreach. To this end, cooperation and collaboration with Gulf and tri-national partners will be a hallmark of HRI activity as the Institute will work to support and advance the long-term sustainable use and conservation of the Gulf of Mexico.
HARTE RESEARCH INSTITUTE ADVISORY COUNCIL

Harte Research Institute Advisory Council, which includes leaders of marine science, academia, business and industry from the US, Mexico, and Cuba, was established to provide guidance to the development of the Institute’s vision, mission, and operation.

Dr. Sylvia A. Earle
Chair, HRI Advisory Council
Explorer-in-Residence, National Geographic Society, and Deep Ocean Exploration and Research

Dr. Homero Aridjis
Poet, Novelist, Journalist
President, Grupo de los Cien Internacional, A.C.
Former Mexican Ambassador to Switzerland and The Netherlands

Ms. Katharine Armstrong
Rancher, Consultant

Mr. William B. Baker
Manager, Ecological Resources, Reliant Energy Inc.

Mr. William Bradford
Former Chair, Dresser Industries
Former CEO, Halliburton

Mr. Eugenio Clariond Reyes
Chief Executive Officer, Grupo IMSA

Ms. Catherine Nixon Cooke
Consultant, Author

Mr. Luke R. Corbett
Former CEO, Kerr McGee Corporation

Mr. Jean-Michel Cousteau
President, Ocean Futures

Mr. John Flicker
President, National Audubon Society

Mr. Joseph Fitzsimons
Commissioner, Texas Parks & Wildlife Commission
Attorney, Law Office of J.B.C. Fitzsimons

Mr. Guillermo García Montero
Director, Acuario Nacional de Cuba

Mr. Terry D. Garcia
Executive Vice President, National Geographic Society

Mr. Bryon Griffith
Director, EPA Gulf of Mexico Program

Dr. David E. Guggenheim
Consultant, Conservation Policy and Science

Dr. Eric W. Gustafson
President, U.S. Mexico Chamber of Commerce

Mr. Will Harte
Harte Family Representative
Philanthropist

Mr. C. Ray Hayes
Vice Chancellor for Financial Affairs,
University of Alabama System

Mr. Alejandro Junco de la Vega
Newspaper Publisher, El Norte, Reforma, Palabra Y Mural

Dr. Björn Kjerfve
Dean, College of Geosciences, Texas A&M University

Dr. Kumar Mahadevan
Executive Director, Mote Marine Laboratory

Mr. Patrick F. Noonan
Chairman Emeritus, The Conservation Fund

Dr. John Ogden
Director, Florida Institute of Oceanography

Mr. Raul Rodriguez
Chairman, World Affairs Council

Mr. Andrew Sansom
Executive Director, International Institute for Sustainable Water Resources, Texas State University

Mr. Thomas Theriot
Manager, Safety, Health and Environment,
ExxonMobil Production Company

Dr. Alberto M. Vázquez de la Cerda
Admiral (Retired), Mexican Navy
Professor, Instituto Oceanográfico,
Instituto de Ingeniería Universidad Veracruzana

Mr. Don Walsh
President, International Maritime, Inc.
Oceanographer, Trieste Pilot
The State of the Gulf of Mexico Summit 2006 brought together leaders of government, industry, education, science, and conservation to publicly address and present the “state” of the Gulf of Mexico. Thoughtful, well-developed strategies are critical to ensure the future of the Gulf for generations to come. Through attendee participation, we focused on the Gulf of Mexico by:

- Spotlighting the economic, environmental, and public health susceptibilities due to catastrophic and manmade events
- Discussing strategic policies and programs dedicated to ensuring a sustainable future
- Developing the foundation for collaboration and partnerships that promote long-term viability

Attendee insights and vision were considered invaluable to ensure the sustainability of this dynamic treasure, one of the greatest natural resources on Earth. Only by working together will this vision become a reality.
SUMMIT PANELS

Four panel topic areas considered the condition of the Gulf of Mexico following the hurricanes of recent years and the challenge of recovery facing the Gulf of Mexico Community. The question of “How do we plan for and implement a recovery strategy that reduces the potential for negative impact and increases the potential for achieving sustainability?” guided the discussions.

PANEL 1 • ECONOMY
The societies of the Gulf of Mexico community are founded upon a diverse and dynamic economy. Economic security for the individual is based upon jobs and business opportunities. Economic resources and environmental quality are cornerstones of the quality of life achievable by the individual. Environmental challenges cannot be successfully dealt with without economic resources.

An analysis of historic growth in the coastal area and a projection of its future growth give insight into environmental management challenges of the future. Projecting future growth and the resulting changes in land use patterns throughout the Gulf of Mexico watershed are critical to establishing resource management strategies that will be effective in creating a sustainable economy and environment.

PANEL 2 • PUBLIC HEALTH
Degraded habitats pose both pathogenic and chemical threats to human health. These threats to human health will increase with continued degradation of the natural environment and growth of coastal populations. Initiation and application of best management practices can slow or curb this degradation.

PANEL 3 • ENVIRONMENT
Population growth and the consumption of natural resources (biological and mineral) unavoidably alter habitats and ecosystem dynamics. To achieve sustainability, habitats that remain functioning and productive, human impacts must be planned for and managed in a science-based regional ecosystem framework. Chemical and mechanical processes of the atmosphere and waters of the Gulf of Mexico inseparably link diverse habitats into the regional ecosystem. To be effective, environmental management must occur on a larger regional scale.

PANEL 4 • REGIONAL GOVERNANCE
Atmospheric and oceanic processes are continuous, unfettered by geographical or political boundaries; consequently, the ecosystem of Gulf of Mexico cannot be governed as segregated areas defined by jurisdictional boundaries of local, state, and national governments. In the absence of a formal regional governance structure for the Gulf of Mexico, a voluntary collaborative regional management mechanism is needed to achieve the most effective ecosystem management strategy.

PANEL LEADERSHIP
Economy of the Gulf of Mexico- Jim Cato, Chair (8 panelists)
Public Health of the Gulf of Mexico- Jay Grimes, Chair (4 panelists)
Environment of the Gulf of Mexico- Larry McKinney, Chair, Bill Walker, Co-Chair, Richard Newell, Co-Chair (7 panelists)
Collaborative Governances of the Gulf of Mexico- Richard McLaughlin, Chair, Biliana Cicin-Sain, Co-Chair (3 panelists)
SUMMIT PROGRAM

DAY 1 TUESDAY, MARCH 28, 2006
Governance, Catastrophic Events and Gulf Sustainability

11:45 AM Governors’ Luncheon - Sponsored by:

12:00 PM Welcome
Dr. Robert R. Furgason, Director, Harte Research Institute
Dr. Flavius Killebrew, President, Texas A&M University-Corpus Christi
Mr. John Hofmeister, President, Shell Oil Company
Mr. John White, Chairman, Board of Regents of the Texas A&M University System
Governor Rick Perry, State of Texas
Gobernador Eugenio Hernández Flores, State of Tamaulipas
Mr. Michael Reddin, Vice President, BP

1:30 PM Governors Panel on Catastrophic Events and Gulf of Mexico Sustainability - Sponsored by:
Governor Rick Perry, presiding
Mr. Michael Reddin, Vice President, BP
ATTENDING GOVERNORS:
Texas Governor Rick Perry
Tamaulipas Gobernador Eugenio Hernández Flores
Louisiana Governor Kathleen Blanco
Veracruz Gobernador Fidel Herrera Beltrán

2:30 PM Impacts of Catastrophic Events on the Environment:
Dr. Gerhard Kuska, White House Council on Environmental Quality
Mr. Steve McCraw, Director, Texas Office of Homeland Security
Ms. Karen Gautreaux, Deputy Secretary, Louisiana Department of Environmental Quality
Mr. Phil Bass, Director, Office of Pollution Control, Mississippi Department of Environmental Quality

3:15 PM Break - Sponsored by:

3:30 PM Keynote Presentations:
Introduction by Dr. Sylvia Earle, Explorer-in-Residence, National Geographic Society, and Chair, Harte Research Institute Advisory Council
Admiral James Watkins, Co-Chair, Joint Ocean Commission Initiative

4:15 PM Gulf of Mexico Sustainability Programs
Vice Admiral Conrad Lautenbacher, NOAA, Administrator
Presentation of Gulf of Mexico Alliance Plan
Ms. Colleen Castille, Secretary, Florida Department of Environmental Protection
Panel Discussion on Initiatives Related to Gulf of Mexico Issues
Mr. Stephen Johnson, U.S. EPA, Administrator
Dr. Antonio Díaz-de-León, Director General, Dirección General de Política, México, SEMARNAT
Ms. Kathleen Hartnett White, Chair, Texas Commission on Environmental Quality
Ms. Kameron Onley, Assistant Deputy Secretary, U.S. Department of the Interior
Sr. Lorenzo Rosenzweig, Director General, FMCN, Mexico
Mr. Richard Green, EPA Regional Administrator

5:30 PM Special Presentations and Media Opportunities

6:30 PM Gulf Guardian Awards Dinner - EPA Gulf of Mexico Program
Mr. Bryon Griffith, Director, Gulf of Mexico Program
Mr. Stephen Johnson, U.S. EPA Administrator
Sponsored by Summit 2006 Sponsors

DAY 2 WEDNESDAY, MARCH 29, 2006
Economy and Public Health

PANEL 1 • ECONOMY OF THE GULF OF MEXICO
Dr. James Cato, Chair (Director, Florida Sea Grant Program and Senior Associate Dean & Director, School of Natural Resources & Environments, University of Florida)

8:00 AM Introduction of Topic and Panel

PANEL 1A • THE CHANGING OCEAN AND COASTAL ECONOMY OF THE GULF OF MEXICO
8:10 AM The Ocean and Coastal Economy: What the Information Can Tell Us. Why it is Important to Know the Nature, Size, and Implications for the Future
Dr. Judith Kildow (Director, National Oceans Economic Program and Professor, California State University-Monterey Bay)

8:30 AM Population and Growth Pressures & Comparisons to the U.S. Ocean and Coastal Economy
Dr. Charles Colgan (Associate Director, USM Center for Business and Economic Research and Professor, University of Southern Maine)

8:50 AM The Importance of Non-market Values in the Ocean and Coastal Economy
Dr. Linwood Pendleton (Associate Professor, University of California-Los Angeles)

9:10 AM Questions and Discussion

9:30 AM Break - Sponsored by:

PANEL 1B • INDUSTRY PERFORMANCE IN THE GULF OF MEXICO REGION
10:00 AM U.S. Gulf of Mexico Based Industry
Dr. Charles Adams (Professor, University of Florida and Marine Economist Specialist, Florida Sea Grant)

10:20 AM Mexican Gulf of Mexico Based Industry Sectors
Dr. David Yoskowitz (Associate Professor, Texas A&M University-Corpus Christi)

10:30 AM Productive Value of the Gulf of Mexico
Dr. David Yoskowitz (Texas A&M University-Corpus Christi)

10:50 AM Questions and Discussion

PANEL 1C • THE SOCIOECONOMIC IMPORTANCE OF THE GULF OF MEXICO TO MEXICO AND THE POTENTIAL TO DEVELOP AS A MAJOR ECONOMIC POLITICAL REGION
11:00 AM The Importance of Social and Economic Factors in Planning, Environmental Impact Assessment, and Management in the Mexican Gulf of Mexico States
Dr. Cuauhtemoc León Diez (CONABIO, Secretary of Environment and Natural Resources, Mexico)
11:15 AM The Importance of Foreign Trade, Investment, and Finance in the Economic and Environmental Sustainability of the Mexican Gulf of Mexico States
Mr. Raul Rodriguez (Chairman, North American Center for Transborder Studies, Arizona State University)

11:30 AM The Political Economy of the Gulf of Mexico as a Region
Mr. Terry McCoy (Professor, University of Florida)

11:45 AM Questions and Discussion

12:00 PM Lunch with Speaker – Sponsored by: ExxonMobil
Ruben Bonilla, Jr., Chairman, Port Commission for Port of Corpus Christi

PANEL 2 • PUBLIC HEALTH OF THE GULF OF MEXICO
Dr. Jay Grimes (Provost, The University of Southern Mississippi, Dean, College of the Marine Sciences, Director, Gulf Coast Research Labs)

1:30 PM Introduction to Topic and Panel

2:00 PM Risks from Chemical Pollution (mercury)
Mr. Spencer Garrett (Director, National Seafood Inspection Laboratory, NOAA)

2:30 PM Risks from Pathogens
Dr. Andy DePaola (Gulf Coast Seafood Laboratory, U.S. Food and Drug Administration)

3:00 PM Risks from Toxins
Dr. Fred Kopfler (Senior Environmental Scientist, EPA Gulf of Mexico Program)

3:30 PM Break – Sponsored by: Hess

4:00 PM Communicating Public Health Risks
Dr. Clifford Houston (Associate Vice President Educational Outreach, The Herman Barnett Distinguished Professorship in Microbiology & Immunology, The University of Texas Medical Branch)

4:30 PM Questions and Discussion

6:30 PM Reception: Solomon P. Ortiz International Center, Port of Corpus Christi
Tours aboard the EPA Ocean Survey Vessel Bold
(Transportation provided from Omni-Bayfront Hotel to the Port of Corpus Christi)

DAY 3 THURSDAY, MARCH 30, 2006
Environment and Governance

PANEL 3 • ENVIRONMENT OF THE GULF OF MEXICO
Dr. Larry McKinney, Chair, (Director, Coastal Fisheries Division, Texas Parks & Wildlife Department)
Dr. Bill Walker Co-Chair (Mississippi Department of Natural Resources)
Mr. Richard Newell Co-Chair (White House Council of Economic Advisors)

8:00 AM Introduction of Topic and Panel

PANEL 3A • RESTORING COASTAL ECOSYSTEMS – BACK FROM THE STORMS
8:10 AM Harmful Algal Blooms
Dr. Tracy Villareal (Associate Professor, University of Texas Marine Science Institute)

8:30 AM Dead Zone
Dr. Nancy Rabalais (Executive Director, Louisiana Universities Marine Consortium)

8:50 AM Northern Gulf Habitats
Dr. Robert Twilley (Director, Wetland Biogeochemistry Institute, Louisiana State University)

9:10 AM Coral Reefs and Tropical Coasts
Dr. Jorge A. Herrera-Silveira (Professor, Center for Research and Advanced Studies-National Polytechnical Institute (CINVESTAV-IPN), Unidad Mérida)

9:30 AM A Smarter Way Back
Dr. Bill Walker (Executive Director, Mississippi Department of Natural Resources)

9:50 AM Break – Sponsored by: Valero

PANEL 3B • RESTORING GULF FISHERIES – AFTER THE STORMS

10:30 AM Introduction of Topic and Panel

10:40 AM The State of the Fishery Today
Dr. Rex Caffey (Associate Professor, Louisiana State University)

11:00 AM New Opportunities to Address Old Problems
Dr. Lee Anderson (Professor Marine Policy, University of Delaware IPA Policy Analyst, Office of Policy, NOAA)

11:30 AM Gulf Response
Mr. Robin Riechers (Chair of Gulf Fisheries Council and Director of Fisheries Policy TPWD)

11:45 AM Discussions and Questions

12:00 PM Lunch with Speaker – Sponsored by: Apache

2:05 PM Gulf of Mexico Alliance – Improving Regional Governance Among the Five U.S. Gulf States
Mr. Gary Lytton (Director, Rookery Bay National Estuarine Research Reserve, Environmental Administrator, Florida Department of Environmental Protection)

2:25 PM International Case Studies of Collaborative Ocean Governance
Dr. Billiana Cicin-Sain, Co-Chair, (Director, Gerard J. Mangone Center for Marine Policy and Professor, University of Delaware and Co-Chair, Global Forum on Oceans, Coasts, and Islands)

2:45 PM Private Industry and Regional Governance
Mr. Paul Kelly (Executive Vice President, Rowan Offshore and Member of the U.S. Ocean Commission)

3:05 PM Questions and Discussion

3:45 PM Adjournment
The Gulf of Mexico (GOM) is the ninth largest body of water in the world. It is located at the southeastern corner of North America and is bordered by five states of the United States to the north (Florida, Alabama, Mississippi, Louisiana and Texas); six states of Mexico to the west and south (Tamaulipas, Veracruz, Tabasco, Campeche, Yucatan and Quintana Roo); and the island nation of Cuba to the southeast. The marine shoreline stretches 3,540 miles from Cape Sable to the tip of the Yucatan, covers 236 miles of Cuban shoreline and accounts for one-third of the coterminous U.S. coastline. The GOM is recognized as one of the six large marine ecosystems (LMEs) of the coterminous U.S.; marine scientists and experts have written extensively about its principal components. The GOM coastal counties produced 16.5% of the employment, 13.5% of wages and 14% of the Gross State Product of the nation’s coastal counties in 2003. From 1990 to 2000, the GOM increased its share of the U.S. ocean economy. The GOM creates billions of dollars annually in both market and non-market values from such activities as beach-going, fishing and bird-watching. The GOM states contribute about 13% of Mexico’s national economic activity. Important Mexico economic sectors are shrimp, oil and gas production and tourism. The total productive value for the GOM for just four sectors could be as high as $121 billion.

This panel was convened to provide new and updated information about the economy of the GOM. While several papers and book chapters in previous years have described some economic components of the GOM, this is the first organized effort to provide a more comprehensive analysis of the economic value of the entire GOM using all known sources of data. The intent is to develop a solid baseline of economic information and to build upon this baseline in future years so that trends in various economic sectors of the GOM of Mexico can be tracked and analyzed. The importance of social and economic factors in planning environmental impact assessment in Mexico is covered, along with the importance of foreign trade, investment and finance in the economic and environmental sustainability of Mexico. Finally, an analysis is presented of how the GOM is faring as a transnational community in trade, investment flows, transportation networks and other factors that can create a bridge or create a barrier between geographic regions.

This overview was prepared from the draft papers being prepared for the conference and the data should be considered preliminary. For more detail please contact the panel members listed below along with an abstract of the information contained in their paper and presentation.
In order to build and sustain both the economy and environment of the GOM, information is needed about changes in both the economy and environment that supports the economy. The relatively new National Ocean Economics Program (NOEP) provides time series information that tracks changes in human uses and activities in the coastal zone. These include growth and decline of ocean-dependent industries, productivity of coastal resources, population dynamics and changing housing patterns, and even estimates of the non-market environmental values of recreational and natural assets. The NOEP describes two separate, yet overlapping market economies tied to the oceans: the coastal economy and the ocean economy. The coastal economy includes all super sectors according to the Bureau of Economic Analysis North American Industry Classification System (NAICS) categories, for coastal counties, watershed counties and inland areas of each coastal state, e.g., all economic activities in coastal areas supporting coastal populations, not just coastal dependent. The ocean economy, on the other hand includes six industrial sectors, customized by taking an ocean slice of the NAICS industrial categories for ocean dependent industries including 1) maritime transportation, 2) ship and boat building and maintenance, 3) living marine resources, 4) offshore minerals, 5) coastal construction and 6) coastal tourism and recreation.

- The U.S. coastal counties ringing the GOM measure approximately 47,428 square miles, or a little more than 7% of the total area of all U.S. coastal counties. Yet, in 2004, with only a little more than 7% of the land, the GOM coastal counties produced 11% of the employment, 9% of wages and 10% of the Gross State Product (GSP) of the nation’s coastal counties. To put this in perspective, America’s coastal counties represent between 70% and 80% of the nation’s total economy.
- Based on 2004 data, Texas had the largest portion of the GOM coastal economy, at 43% of employment, 49% of wages, and 49% of GSP. Mississippi had the smallest portion, at 2.5% of employment, 2% of wages, and 2% of GSP.
- Florida and Louisiana made up the largest portions of GOM ocean economy.
- Florida had 53% of employment, 47% of the wages, and 40% of the ocean economy, while Louisiana had 19% of the employment, 22% of wages and 31% of GSP for the Gulf states.
- Alabama made up the smallest portion of 2004 GOM ocean economy at 4% of employment, 3% of wages and 4.3% of GSP.

The composition of the Gulf of Mexico ocean economy differs in important ways from that of the U.S. ocean economy. The GOM ocean economy has a larger share of employment in tourism and recreation, construction, and ship and boat building than does the U.S. ocean economy. The GOM has a much larger proportion of its ocean economy (measured as Gross State Product) in minerals, as would be expected. The GOM has a smaller share of its ocean economy employment in transportation but a larger share of its GSP in transportation. Thus, a number of key sectors of the U.S. ocean economy are concentrated in the Gulf of Mexico. In 2003, the GOM accounted for more than a quarter of the U.S. ocean economy employment, slightly less of wages and slightly more of GSP. Combined, the construction, living resources, minerals, and ship and boat building sectors in the GOM support more employment that any other sector of the U.S. Marine construction in the GOM accounts for more than half of national employment in that sector. The proportion of U.S. wages and GSP in the GOM in 2003 was also substantial in both construction and minerals.

- The GOM ocean economy employed nearly 571,000 people, and paid wages of more than $13.5 billion in 2003. The ocean economy contributed more than $33 billion to the region’s GSP.
- The largest sector in all three measures is tourism and recreation, which is true in other coastal states and the U.S. as a whole. Tourism and recreation comprises 70% of employment in the ocean economy but only 40% of the contribution to GSP.
- In contrast, the minerals sector, which is overwhelmingly the oil and gas exploration and production industry, comprises only 3% of employment but more than 26% of GSP.
- The transportation sector is similar to the mineral sector in that the share of employment (12%) is substantially exceeded by the share of GSP (19%). Eating and drinking places, not surprisingly, is the largest industry in terms of employment, while oil and gas exploration and production is the largest industry in terms of GSP.
- Over the period from 1990 to 2000, the GOM increased its share of the U.S. ocean economy overall from 22.5% of employment to 26.2% of employment, and from 21.7% of GSP to nearly 28% of GSP. The GOM share of national ocean economy employment increased in construction, living resources, ship & boat building, and transportation. The Gulf’s share of employment in minerals was largely unchanged, while the share of tourism and recreation employment grew slightly.
- The GOM share of national ocean economy GSP increased in all sectors except transportation, where the GOM share decreased slightly. The high proportions of employment and GSP in the national ocean economy sectors other than tourism and recreation lead to the conclusion that the Gulf is the industrial heartland of the U.S. ocean economy.
Florida and Texas rank among the nation’s top five destinations for Americans that swim, fish, dive and enjoy beaches, coastal wetlands and shores. Florida’s coast (including the Atlantic) is the most visited in the nation with more that one in ten Americans visiting in 2000. Texas was fifth with more than six million visitors. The other GOM states attracted about two million visitors.

- Beach going and swimming dominate coastal recreational activities in the GOM, with just under 60 million participants and 49 million visitor days from Texas through Alabama in 2000. Florida (both coasts) had 171 million beach days and 161 million swimming days.
- Bird watching created 37 million visitor days and more than 65 million days involving photography from Texas through Alabama. Florida (both coasts) had 78 million visitor days and about 97 million photography days.
- Fishing (38 million visitor days) and boating (28 million visitor days) also generated impacts in Texas and Louisiana; similar data for Florida (both coasts) were 56 million fishing visitor days and about 47 million visitor boating days.

The non-market value of coastal recreational is more difficult to determine. Non-market values represent the value visitors place on the marine resources they use, beyond what they have to pay to access these resources. Some studies have been done that allow the estimation of some non-market values for recreational activities in the GOM.

- In 2005 dollars, beach use from Texas to Alabama likely generated from $1 billion to $3 billion in non-market environmental value; and the value for the Florida GOM coast is estimated to have ranged from $1.2 billion to just under $3 billion.
- The economic non-market value of wildlife viewing from Texas to Alabama is estimated to have ranges from just under $1 billion to over $3.7 billion; the amount for the Florida GOM coast was from about $1 billion to $3.7 billion.
- The value of coastal and recreational fishing for the same regions was estimated to be from $2.2 to $3.8 billion (Texas through Alabama) and $1.7 to $2.8 billion (Florida GOM coast).

Inadequate data exist to make even approximate estimations of the value of other coastal activities. More economics studies, using consistent methodologies, are needed to cover more coastal recreational activities and to estimate non-market values for the activities for the GOM as a region.

For the United States:
- The overall GOM economy has expanded more rapidly than the U.S. economy for the last 30 years; most of the growth has concentrated in coastal counties.
- Based on historical patterns, employment in the GOM coastal counties will reach 9.2 million in 2010, 28 million in 2050 and 113 million by 2100.
- GOM oil and gas reserves are a key economic asset. Offshore oil production climbed to a peak in the early 1970s, then another peak in the mid-1980s, then grew steadily throughout the 1990s, reaching 568 million barrels in 2000. In contrast, natural gas production has been relatively stable since the late 1970s.

For Mexico:
- The GOM states of Mexico contribute about 13% of Mexico’s national economic activity.
- Nearly 30% of the Mexico coastline is formed by the GOM states.
- The population of the GOM states is about 14 million, an increase of 16% in the last ten years; population in the coastal communities of the states has increased 94% during the same time period.
- More that 80% of oil production and 90% of natural gas production in Mexico comes from the Gulf of Mexico.
- Tourism is one of the most important sources of foreign income. Twenty-three percent of the national total tourist accommodations are in the GOM states.
- The highest economic growth is in the north and central states of Veracruz and Tamaulipas; the highest population growth is in the south-central region.

For Cuba, the third bordering country of the GOM, data are not available.

This paper focuses on economic, business and some industrial sectors of Mexico and the U.S. The sectors are roughly equivalent to those outlined in the National Ocean Economic Program (which covers only the U.S.). Similar data are not available for Cuba, the third bordering country of the GOM.

For Mexico:
- “More that 80% of oil production and 90% of natural gas production in Mexico comes from the Gulf of Mexico.”

For the United States:
- “Seven of the top 10 U.S. ports are located in the Gulf of Mexico.”
• The GOM is a major resource for U.S. fishery production. In 2003, landings were 1.6 billion pounds valued at $685 million dockside. Louisiana is the leading state with 43% of the GOM value. Many fisheries in the GOM are overcapitalized. Landings and values have declined since the mid-1980s.

• The number of marine recreational anglers in the GOM has increased from about 2 million in 1981 to about 4 million in 2003.

• Seven of the top 10 U.S. ports are located in the GOM. In 2004, the volume of cargo trade through GOM ports was 592 million metric tons, accounting for about half the U.S. total. Houston is the most significant cargo port; Tampa, Galveston and New Orleans are the most significant cruise ship ports.

• A number of shipyards exist in the GOM; however the number of ships being built has declined in recent years.

• Coastal-related tourism is significant in the GOM. Florida ranks first among all U.S. states in travel spending with 12% of the national total and Texas ranks third (6%).

• Total gross state product for the GOM states was $1.2 trillion in 2002. Texas contributed about 48% and Florida about 32% of the total. The overall economic activity in the GOM states tends to run in the opposite direction of the U.S. business cycle.

THE PRODUCTIVE VALUE OF THE GULF OF MEXICO

The Gulf of Mexico (GOM) is often referred to as the most productive body of water in the U.S. As pointed out in other sections of this panel, many economic values and the data to generate these values do not exist. However, a first start is to generate a value for the U.S. and Mexico GOM states, using four sectors in 2003: oil and gas production; port/shipping activity; tourism; and fisheries. The productive value, as defined for the purposes of this study, is the market value of the resources extracted from the GOM. In the case of tourism and port operations it is the value of the services generated as a result of the proximity to the GOM.

“The Gulf of Mexico is often referred to as the most productive body of water in the U.S.”

If the price of oil is allowed to rise to current levels ($57 per barrel; March 2006) from 2003 levels ($28.50) then the total productive value of the Gulf would increase to $171.85 billion, everything else held constant. To better put in context the figures that have been calculated, the second productive value of $171.85 billion:

• Is greater than the Gross Domestic Product (GDP) of Chile, Peru, Finland, and Venezuela

• The GOM would rank 47th out of 230 countries in terms of GDP

• It would be 17% of Mexico’s GDP

• It would be 1.5% of U.S. GDP

There are many attributes that are unique to the Gulf and if they were to disappear could not be replaced. What is the value of that? It is intended that the values that have been provided in this paper are a starting point for discussion but much more work needs to be done. Inclusion of non-market values and a better understanding of the interconnectedness between the ecology and economy would be a logical next step in a more exhaustive study valuing the GOM.

THE IMPORTANCE OF THE SOCIAL AND ECONOMIC FACTORS IN PLANNING, ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT IN THE MEXICAN GULF OF MEXICO STATES

Differences exist between the socioeconomic and biophysical characteristics of the U.S. and Mexico and their institutional capability to respond to natural phenomena or environmental problems in the GOM. Observing the social response to hurricanes provides an example of how the U.S. and Mexico might respond to environmental problems in the GOM. Three fundamental principles provide the background for the analysis: 1) why has the social response to environmental problems in the GOM been different than the response to hurricanes?; 2) people are responsible for “natural disasters,” by placing their social and economic systems in locations that can be impacted by nature and environmental conditions; 3) using the concept of medical diagnosis, it is possible to estimate and measure how the GOM has been affected by environmental conditions, how it has been treated and how it has responded. Several general conclusions can be made.

• The institutional ability of the U.S. and Mexico to respond to hurricanes appears weak; the ability to respond to environmental disasters may be worse because they sometimes occur silently and gradually.

• The cooperation between the U.S. and Mexico relating to weather phenomena could serve as a model for cooperating to predict and solve environmental problems; these problems are currently occurring and have not been recognized as critical to date.

• Both the U.S. and Mexico need more capability to practice risk management relating to environmental conditions of the GOM.
Mexico's economic evolution over the past twenty years reveals many contrasts. On one hand, remarkable achievements in terms of stability; on the other, meager results overall in growth, social cohesion and convergence of income and development levels. It would seem that Mexico has not fully capitalized on twelve years of NAFTA and macroeconomic stability.

Despite progress in combating extreme poverty, the country is increasingly fractured between those who have benefited from two decades of market-oriented policies and those who have not; between those who crave for entrenchment and blame current economic policies for every imaginable predicament, and those who suggest that much more has to be done along the same policy lines pursued since the 1980’s.

The bottom line is that either Mexico comes up with a new consensus, or failed scripts from the past might become again the roadmap to the future. In the context of rapidly-growing competition from the likes of China, there is a need for the nation to refocus and attain a sense of urgency.

As in all trade blocks in the world, there is a rapid trend in North America toward regional economic integration. In 1980, a third of the three NAFTA countries’ foreign trade was intra-regional; today it represents close to 60%. These internal flows grow at unprecedented rates and their composition changes substantially along the way.

However, convergence is not simply a by-product of integration. The wage and per capita income gaps between Mexico and the United States have not subsided. Regional integration has not brought about convergence between the countries and within Mexico — Mexico’s north and south are increasingly diverging. To close income gaps, improve social conditions and foster competitiveness, price stability and trade openness are necessary but not sufficient factors; additional wide-ranging economic reforms are needed.

The U.S.-Mexico relationship is one of historical and current contrasts. Nowhere else in the world do two realities as different as these -- and yet so interdependent and mutually influenced -- cohabit. These realities require new ways to manage them that, mindful of history, recognize global economic, social and demographic trends, unimaginable in the recent past. A new vision for North America is clearly needed. This includes the shared ecosystems in the Gulf of Mexico. The Harte Research Institute can contribute to this process by providing a bridge between science & public policy, and promoting consideration of Gulf issues in the bilateral federal and state ministerial & congressional agendas.

This paper presents an assessment of the GOM as an integrated transnational community. The underlying question is whether the GOM functions as a barrier separating or a bridge uniting the coastal regions of the countries that share the GOM. Are trade and investment flows, transportation networks, demographic shifts, inter-governmental collaboration and civil society inter-action knitting the GOM territories of the United States and Mexico across the Gulf? Where does Cuba, the third Gulf nation, fit into a Gulf community?

The original impetus for this research, first undertaken in the mid-1990s, was implementation of the North American Free Trade Agreement, which promised to define a new era in U.S.-Mexico relations. Now a decade later it is appropriate to assess the extent to which the changes expected have in fact occurred. The historical record provides little evidence that the territory of the Gulf in fact constituted an integrated transnational region defined by clear separation from surrounding territory and independence of the coastal territories that make it up. Subsequent analysis of the region’s current configuration paying particular attention to economic flows across the Gulf following implementation of the North American Free Trade Agreement (NAFTA) and inter-governmental cooperation provides only fragmentary evidence that the region is evolving into a transnational community. Particularly problematic in this regard is the anomalous status of Cuba as a GOM state in the absence of normal relations with the United States. The major findings of the analysis of developments in the GOM since NAFTA went into effect at the beginning of 1995 are:

- Although trade and investment flows between the United States and Mexico have increased dramatically, the GOMs relative share of economic exchange between the two NAFTA partners has remained roughly constant. This suggests that the GOM border has not emerged as an alternative to the increasingly congested land border.
- Efforts to build inter-governmental collaboration between the United States and Mexican GOM states have met with only modest success.
- Neither in their overall bilateral relationship nor in GOM relations has U.S.-Mexican relations evolved toward a transnational community. The events of 9/11 and U.S. emphasis on strengthening homeland security have complicated bilateral relations and cross border flows. In this regard, the GOM border region has not been as contentious as the land border.
- The anomalous status of Cuba hampers realization of a transnational community across the GOM. The United States and Cuba do not maintain full diplomatic relations. Mexico and Cuba do, and Mexico is an important trade and investment partner of Cuba with much of the trade flowing across the GOM. In spite of its 40-year comprehensive economic embargo against Cuba, the United States in recent years has also become an important trading partner with agriculture exports shipped out of U.S. GOM ports to the island.
At the beginning of the 21st century, humankind had good reason to marvel at the many advances the United States has made in scientific understanding and development of technology. Large, focused R&D programs have tapped the power of the atom, placed men on the moon, fully sequenced genomes of living organisms, and placed powerful yet inexpensive computers on the desktops of public schools and homeowners. The average human life span in developed nations has increased to over 80 years, and diseases such as polio and smallpox that once ravaged our nation are either gone or greatly diminished on Earth. Clearly, phenomenal discoveries and applications have occurred in our lifetime.

Concomitant with these enormous societal strides, the final decades of the last century witnessed extensive pollution of coastal oceans, massive declines in fisheries, die-off of many marine species, record outbreaks of waterborne diseases, and enormous growth and development of coastal regions. Cholera continues to be pandemic and there is evidence that links it to climate change. In 1997 and 1998, large outbreaks of Vibrio parahaemolyticus disease occurred in the United States, resulting from consumption of raw Gulf of Mexico oysters colonized with these marine bacteria. Worldwide, enteric disease continues to be a serious problem and 870,000 children die annually from rotavirus infections. In the midst of enormous technological advances, the United States is still burdened with problems associated with population growth and waterborne diseases that cause loss of human life, economic hardship, and disruption of stable ecosystems.

The Gulf of Mexico is a major tourist destination; as pointed out by Linwood Pendleton in Panel 1, “Florida and Texas rank among the nation’s top five destinations for Americans that swim, fish, dive and enjoy beaches, coastal wetlands and shores.” The other GOM states also attract large numbers of tourists annually, and in Mississippi alone tourism was estimated to be a $6.35 billion industry in 2005. Following Hurricane Katrina many people came to the Gulf Coast to help in the rescue and recovery efforts and thousands of these individuals are going to take up permanent residence in Alabama, Mississippi and Louisiana. Clearly, coastal resources are a major attraction and they must be monitored and managed so as to protect public health.

Panelists in the public health section discussed topics ranging from chemical pollution and seafood borne diseases associated with the Gulf of Mexico to the effective communication of risk to the public. Jay Grimes opened the panel with a brief overview of the U.S. Commission on Ocean Policy and its position on oceans and human health. He also provided an overview of a 2005 conference that focused on “Connecting the Gulf of Mexico and Human Health.” Spencer Garrett presented an overview of seafood safety with a focus on methylmercury in the GOM. Andy DePaola discussed the management of pathogen risks to humans from consumption of seafood, with a focus on vibrio diseases. Fred Koppfler provided an overview of environmental health issues related to seafood borne diseases, harmful algal blooms, and chemical toxins in seafood. The public health panel concluded with a presentation from Clifford Houston on effective risk communication.

All of the panelists stressed the importance of understanding the issues. If there is no understanding, there is no hope for mitigation. Understanding comes from basic research, and mitigation capability comes from applied research and technology development. Trends and linkages are the products of long-term monitoring, observation, and interpretation. Clearly, the health of the GOM and those who use the GOM rely upon continued investment in the research enterprise. If we as a nation expect to understand and mitigate linkages between oceans and human health, there must be a reaffirmation of our commitment, as a nation, to fundamental research on the oceans and our aquatic resources – and the GOM is an integral part of this commitment. Our economic strength, social stability, and national security will require no less.

“The Gulf of Mexico annually yields more finfish, shrimp and shellfish than the south and mid-Atlantic, Chesapeake and New England areas combined.”
The University of Southern Mississippi and the Mississippi-Alabama Sea Grant Consortium hosted a workshop entitled Connecting the Gulf of Mexico and Human Health at the university’s Gulf Park campus in Long Beach, MS on May 4, 5, and 6, 2005. The purpose of the workshop was to follow up on human health related findings and recommendations of the U.S. Commission on Ocean Policy (USCOP). The meeting began with an overview by USCOP Commissioner Frank Muller-Karger. Dr. Muller-Karger discussed the findings of the Watkins Commission, with an emphasis on Chapter 23 – Connecting the Oceans and Human Health.

Dr. Juli Trtanj next presented an overview of NOAA’s new Oceans and Human Health Initiative, including the OHH Centers of Excellence, and the Distinguished Scholars Program. The remainder of the meeting focused on the two main aspects of oceans and human health – natural products and diseases. Ten brief topical talks were presented on these two aspects, followed by detailed discussions in two break out sessions. Dr. Amy Wright, Harbor Branch Oceanographic Institution, chaired the presentations and discussions on natural products, and Dr. Jay Grimes, The University of Southern Mississippi, chaired the presentations and discussions on diseases. The natural products break out group discussed four topics: unique opportunities for bio-product discovery in the Gulf of Mexico (GOM); collaborations with Mexican scientists; creation of a GOM communications network; and a regional response to the President's Ocean Action Plan and the Congressional OHH Act. Recommendations made by this group focused on these four topics.

The diseases break out group discussed three main areas: educational needs and opportunities; better methods for the detection of pathogens and integration of such monitoring with ocean observing systems; and the concept of a GOM ecosystem in which indigenous pathogens play an integral role. Eight recommendations were made by this group, all focusing on these three topics. Both break out groups concluded that both scientific meetings and public information forums need to occur on a regular basis, in order to better inform all stakeholders about issues relating to the GOM and human health.

Methylmercury is a toxic substance that must be discussed. Many consumers are confused and want to know what fish are safe to eat. This presentation describes current seafood safety issues and risk analysis triad concepts; identifies conclusions resulting from several mercury in fish investigations; and, highlights NOAA's current and future research activities on mercury in fish.

Seafood safety issues are limited to few species, probably less than 10% of the 500 species currently found on the U.S. market. The vast majority of seafood illness outbreaks and cases that were reported are related to ciguatoxin, scombrototoxin, and eating raw molluscan shellfish. The Centers for Disease Control and Prevention and the National Academy of Sciences have confirmed the aforementioned seafood risk profile and have concluded that the risk is negligible.

The issue of mercury in fish represents a persistent public health risk. Consumers are concerned about two things: (1) Is this fish safe to eat? (2) Who should I trust to tell me so? This issue has been the subject of scientific controversy and consumer confusion. Because of the on-going scientific, political, and public debate on the subject, the Office of the President’s National Science and Technology Council (NSTC) convened a Federal Interagency Working Group on Methylmercury. Using the Gulf of Mexico as a study area, the group determined the current state of knowledge and the future needs of the mercury issue relative to sources, cycling, fate, chemical forms, concentration and regional distribution, human risk characterization for exposure and risk mitigation. The group also recommended a structure and process to address the mercury in fish issue through the State/Federal Interagency EPA Gulf of Mexico Program.

There have been other sentinel studies dealing with the mercury in fish issue. One conducted by the National Academy of Sciences established a reference dose for mercury in fish based upon a Faroe Islands Study. The concerns associated with that review relate to conclusion pathway transparency, confounding results due to consumption of whale meat containing mercury and PCBs, and statistical treatment separation of those confounders. Other concerns focused on the Avon Longitudinal Study of Parent and Children (ALSPAC).

The ALSPAC study included 14,000 matched mother/child pairs. It included diet history and child testing, but it did not show the abnormalities indicated by the Faroe Islands Study, which the NAS reference dose is premised.

Current NOAA research addressing the mercury issue include: a contract to NAS/IOM to improve risk communication issues relative to mercury in fishery resources; an agency-wide integrated research and monitoring program addressing the NSTC recommendations relative to tracking mercury sources; ecosystem risk characterizations; human risk characterizations;
Pathogens of elevated public health significance can emerge abruptly due to their rapid multiplication, which accelerates evolution and selection of more robust and virulent pathogens. Diverse seafood species are produced and harvested in aquatic environments where microbial composition and ecology differs greatly from foods produced on land.

Food processing innovations, consumption patterns, population shifts and even bioterrorism are human activities influencing seafood safety.

Evidence is mounting that ballast discharge from cargo ships may be responsible for the international dissemination of pathogens and major outbreaks. For example, contamination of finfish and oysters in Mobile Bay in 1991 with toxigenic Vibrio was linked to ballast discharge. Both seafood and ballast water V. cholerae isolates were indistinguishable from the clinical strains from Latin America using a variety of molecular typing methods. Also, the largest V. parahaemolyticus outbreak in US history occurred in Galveston Bay, TX in 1998 from a new clone of the O3:K6 serotype that emerged in Asia in 1996. This pandemic has since spread to international port cities in Europe, South America and Africa. The lack of a systematic ballast discharge monitoring program in most countries precludes conclusive linkage of this pandemic to ballast discharge. Additionally, the National Shellfish Sanitation Program has no controls for ballast discharge.

Unprecedented climate change appears to be expanding pathogen ranges. For example, the seasonality of V. vulnificus has expanded in recent years. Historically, 90% of oyster-associated V. vulnificus illnesses have occurred between April and October. Since 2002, however, November has been the leading month for illnesses (20/112 cases). Severe storms or droughts influence bacterial ecology and often increase exposure of humans to the marine environment. In Mississippi there was a spike in the number of V. vulnificus wound infections and deaths after Hurricane Katrina.

Fortunately, new technology and information to address microbial hazards is progressing at an unprecedented pace. Integration of new technologies and their application toward risk management will be essential to stem the challenges presented by emerging pathogens in the food supply.

ENVIRONMENTAL HEALTH ISSUES ASSOCIATED WITH THE USE OF THE GULF OF MEXICO AND ITS NATURAL RESOURCES

Frederick C. Kopfler, U.S. EPA, Gulf of Mexico Program, kopfler.fred@epa.gov

In 1989, the Gulf of Mexico Program convened a group of environmental public health specialists from the gulf state agencies and the federal government and academia to identify the public health issues associated with utilization of the waters and natural resources of the Gulf of Mexico and to recommend strategies to address them. The following four issues were identified:

- Illnesses associated with consumption of raw molluscan shellfish
- Illnesses associated with primary contact recreation in coastal waters
- Effects of exposure to harmful algal bloom biotoxins
- Potential exposure to toxic substances in Gulf seafood

These have continued to be the issues of concern to the state and federal agencies that comprise the Gulf of Mexico Program partnership.

Because oysters are often eaten raw, this was judged the highest risk to public health of the issues listed above. Vibrio vulnificus is a microorganism that occurs naturally in warm marine waters such as those in the Gulf of Mexico and can cause severe illness in people with compromised immune systems and liver disease. Because they are naturally occurring, preventing illness is best accomplished by proper handling of the shellfish and education of the consumers at risk.

The five Gulf State area of the Gulf of Mexico is comprised of 94 coastal/estuarine watersheds. In these 94 watersheds, 455 bodies/segments of water along the Gulf coast have been reported as pathogen impaired. These impairments cause numerous seasonal closures of shellfish growing waters and the exceedance of standards for recreational coastal waters.

Gymnodinium breve is the dinoflagellate that causes red tide, the most common harmful algal bloom in the Gulf. The consequences of red tide include human respiratory irritation and shellfish poisoning due to the brevetoxin produced by the organisms.

After evaluating the occurrence of a full suite of chemical contaminants in Gulf seafood, it was decided that mercury appeared to be the only contaminant that could be consistently detected in samples collected gulf-wide.
Communicating Public Health Risks

Clifford Houston, University of Texas Medical Branch, chouston@utmb.edu

Populations along the Gulf of Mexico have been the victim of major hurricanes, particularly during the 2005 season. The negative impact on public health precipitated by these natural disasters has been significant. Strategies must be developed to structure and disseminate a “Risk Communication Plan” in an effort to lessen the health risks to the public. This communication plan should be broad in scope and have two essential components: I) health communication objectives; and, II) risk communication objectives. Health communication consists of preventing disease and promoting good health behaviors. Risk communication includes informing the public by: a) identifying the hazard, b) explaining the situation, and c) providing information about health effects.

The following questions must be asked before developing a communications plan:

1. WHY will information be communicated?
   • To inform about the risk of exposure to pathogens?
   • To inform about other environmental risks?
   • To inform because of a risk to food supply/water supply?

2. WHAT will be communicated?
   • The pathogens and their symptoms and the needed course of action?
   • Environmental exposures and their symptoms and the needed course of action?
   • Level of risk: high, medium, low?

3. WHERE will the communication be disseminated?
   • Which communities will be informed?
   • Will some information be disseminated to states whose residents most likely are tourists to the affected areas?

4. HOW will message(s) be communicate?
   • What resources will be used to communicate information? Television, governors’ announcements, at schools, conferences, etc.?
   • Who are the best people to deliver these messages?

5. WHEN will communication(s) occur?
   • Initial communication?
   • At what intervals will information be disseminated?
   • What will trigger the need for a communication?

6. WHO are the stakeholders:
   • Public.
   • Elected officials/local governments.
   • Community leaders.
   • Business owners.
   • Medical Personnel.
   • Public Health entities.
   • Tourists.
   • Educators.
   • Universities.
   • Remember special populations: language differences, special needs, illiterate, etc.

Things to Remember about a Risk Communication Plan:
A. The broader and more developed the communications plan the better prepared you will be.
B. The MESSAGE:
   • Should be clear, short and consistent.
   • Should create memorable sound bites.
   • Can include a good graphic worth a 1000 words.
   • Should be honest.
C. Different messages are for different audiences

Categories of Communications should include:
• Internal professional/staff
• External Professional I community
• Public communication

The information gathered from research and interviews based on the previously mentioned points should be used to develop an action plan tailored to stakeholders and facility needs. In addition, one must determine the activities needed to implement the risk communication plan. Finally, a follow-up evaluation is recommended to measure the effectiveness of the risk communication strategy. The results from the evaluation can be used to modify future actions.
The Gulf of Mexico is a dynamic “large marine ecosystem” that encompasses some 1.5 million square kilometers bordered by the United States, Mexico and Cuba. The Gulf’s margin is dominated by shallow bays, estuaries and coraline shelves that include some 38% of its bottoms and a relatively extensive continental shelf and slope. The Gulf is primarily sedimentary in origin and exhibits vast expanses of undulating soft mud bottoms, especially to the north. Emergent features like the Flower Gardens bank, the northern most coral reef in the continental U.S., punctuate these bottoms throughout the Gulf and transition into carbonate banks and coral reefs to the south. These physical features define the framework for a unique ecosystem often referred to as the “American Mediterranean”.

The hydrology of the Gulf is defined by the outflow of the Mississippi River in the north and the inflow of the Gulf Stream from the south. Both have tremendous influence on the ecological health and productivity of the Gulf. Some 64% of the freshwater inflow into the Gulf originates from the Mississippi River as it drains 41% of the continental United States. The Gulf Stream’s counterclockwise transit of the Gulf and resulting interactions with coastal margins, the Mississippi outflow and that of other rivers, along with its influence on climatic conditions acts as an integrator across the broad expanse of waters through which it swirls and eddies.

All of these factors combine to support a highly productive ecosystem, one of the most productive in the world. Commercial fisheries annually yield over 1.5 billion pounds. Shrimp are the predominant species and can account for 68% of total U.S. landings. Oyster production can exceed 24 million pounds and account for 70% of U.S. total landings. The recreational fishery is a significant economic factor with over 4 million anglers and accounting for more that 40% of recreational finfish harvest in the U.S. The Gulf of Mexico annually yields more finfish, shrimp and shellfish than the south and mid-Atlantic, Chesapeake and New England areas combined. Because it is transitional between temperate and tropical regions, including elements of both, the Gulf is as diverse as it is productive. It is a major transit route for migratory songbirds moving between the Americas each season and the southern terminus of North America’s central flyway for migratory waterfowl, seabirds and wading birds that annually winters around the Gulf - about 75% of all those traversing the U.S. From whooping cranes to humming birds the diversity and abundance of birdlife is unequalled elsewhere in the subtropical world. Over 400 species of shelled mollusks can be found along the extensive beaches of the Gulf. More than can be found on any other U.S. shore. Some 200 kinds of reef fishes can be found on the Flower Gardens. The benthic communities of the northern mud and sand bottom are among the best developed and diverse in the world and the coral reefs of the south and east host a diverse and complex community.

The underpinning for this extraordinary productivity and biodiversity is an extensive complex of ecologically diverse habitats dominated by emergent wetlands in the north, extensive seagrass meadows and mangroves along eastern and western margins intermixed with coral reefs trending to the south. Coastal wetlands in the Gulf exceed 5 million acres and account for about half the U.S. mainland total. Adjacent uplands and coastal watersheds contribute significantly to ecosystem health and function of these wetlands. Adjacent marine bottoms are dominated by extensive benthic communities punctuated by hard banks in the north and coral reefs in the south, contributing significantly to the biodiversity of the region.

The Gulf of Mexico faces increasing challenges in maintaining ecosystem health and function so vital to assuring its future productivity and biodiversity. All of the countries surrounding the Gulf are experiencing a rapidly expanding population and accompanying economic development. A 40% increase in population (reaching 61.4 million) is expected by 2025. Oil and gas production in both nearshore and deeper waters of the Gulf continues to expand as do port facilities, the petrochemical industry and other industries necessary to support the economic needs of the region. The loss of habitat to coastal development in response to a growing population, the diversion of freshwater inflows from estuaries to meet the demands of that growth, and diminished water quality due to wastewater discharges and pollution resulting from it stress even the “large marine ecosystem” called the Gulf of Mexico.

Indicators of that stress are manifest in many ways. Coastal erosion is a significant problem as each year 40 to 60 square miles of Louisiana wetlands disappear. Some 60% of Texas shoreline is eroding. In Florida more than 20,000 acres of its mangroves have disappeared. The Everglades are threatened because of the diversion of freshwater to agricultural and municipal needs. Four of the five states responsible for the greatest surface water discharge of toxic chemicals include the Gulf states of Alabama, Louisiana, Mississippi and Texas. A hypoxic “dead zone”, primarily caused from nutrient overloading, annually forms in the Gulf off the Mississippi River that can expand to as much as 20,000 square kilometers. The numbers of harmful algal blooms like “red tides” and “brown tides” have increased and threaten both marine communities and coastal residents.
Perhaps nothing has brought home the implications of these environmental insults more than the aftermath of the horrific hurricane season of 2005 (a record fifteen hurricanes) and especially Katrina and Rita. Hurricanes are a natural phenomena integrated into the functioning of a healthy Gulf ecosystem. Shallow coastal habitats have evolved to absorb the high energy impacts generated by these storms and equilibrium can quickly return to the system. However, anthropogenic influences have diminished even this large marine ecosystem’s resilience and its ability to return to those levels of ecosystem health and productivity that might otherwise be anticipated. The hurricanes vividly illustrated what the loss of healthy coastal wetlands mean to moderating erosion and storm surge and has brought into focus water quality concerns, as well as, the diversion and manipulation of freshwater resources in these areas.

Hurricanes Katrina and Rita had a profound and devastating impact on the Gulf’s commercial shrimp fishery. Many boats were lost and shore-based facilities destroyed along with a significant part of the processing infrastructure. High fuel prices and foreign imports compound the economic woes of the fishery.

Panel members summarized our current knowledge of a broad range of environmental issues that face us in the Gulf of Mexico including habitat loss, water quality, coastal development and fisheries. A special fisheries panel was convened to assess the current status of the Gulf’s shrimp fishery. Panelists were asked to present a broad stroke assessment of these issues and their implication to ecosystem health and function. Further, they were asked to assess the impacts of the hurricanes on the resources that were the focus of their respective presentations and provide their perspectives as to what lessons we might learn.

Dr. Robert Twilley, Louisiana State University, presented on the coastal habitats of the northern Gulf and the impact of the most active hurricane season on record, 2005. Noting the damage to both natural and social systems of the region Dr. Twilley offered a perspective on the restoration process. If restored properly, these parts of the Gulf region will develop new paradigms as to how coastal communities deal with risks and hazards of the coastal landscape.

Dr. Jorge A. Herrera-Silveira, CINVESTAV-IPN Unidad Mérida, rounded out the perspective on Gulf habitats with his focus on southern coastal habitats. Several hurricanes struck Mexico in 2005 Bret, Emily, Gert, Jose, Stan and Wilma. Dr. Herrera-Silveira focused on the impact of hurricane Wilma on the Mexican coast which hammered the coast of Quintana Roo near Cancun with hurricane force for almost 25 hours. The loss of coastal habitat, primarily mangroves, greatly exacerbated erosional and storm surge impacts in the storm’s path just as experienced in the northern Gulf. The sustained nature of the storm greatly amplified those impacts.

Dr. Bill Walker, Executive Director Mississippi Department of Marine Resources, amplified Dr. Twilley and Dr. Herrera-Silveira in his presentation of a “Smarter Way Back”. Although he focused on recovery efforts in Mississippi the approach has broad application throughout the Gulf. The key to success being the inclusion of the broadest range of stakeholders in devising recovery plans and incorporating lessons learned from the impact of the storms. It is clear from both presentations that consideration for protecting natural infrastructure like wetlands pays dividends for coastal communities. Doing so not only will help mitigate storm surge and erosional impacts of coastal storms but also preserve ecosystem function and health that are key to the economic health of the Gulf.

Dr. Nancy Rabalais, Executive Director of Louisiana Universities Marine Consortium, summarized the state of the “Dead Zone”, a persistent area of hypoxic waters that forms annually off the mouth of the Mississippi River. Dr. Rabalais presented the most current information on factors contributing to occurrence of the zone and it effects. She and her colleagues have also examined the relationships between tropical storm activity and hypoxia on the Louisiana continental shelf. The goal of this work is to better ecological forecasting in the Gulf and enhance predictions of longer-term climate change scenarios.

Dr. Tracy Villareal, University of Texas marine Science Institute, summarized the status of harmful algal blooms (HAB) in the Gulf. He noted that the Gulf has seen some of the most complex HAB problems on the planet, ranging from brown tides to red tides to ciguatera. Dr. Villareal considered the role of humans in the apparent increase in both severity and frequency of HAB’s.

A special fisheries panel was organized to assess the state of Gulf fisheries following the storms. It was clear from the presentations that the destruction of both the fisheries fleet and infrastructure that supports it was extensive and perhaps unprecedented in U.S. commercial fisheries history. Panel discussion focused on the point that while devastating, the situation does represent an opportunity to “reinvent” the Gulf fisheries and address issues like over-capitalization. The opportunity might also exist to try new approaches to management that would better assure a profitable future for the industry.

Dr. Rex Caffey, Louisiana Sea Grant, provided a post-hurricane look at the state of the fishery in the Gulf of Mexico. He provided a summary that showed the impacts of the storms in the region and also highlighted the longer-term impacts of imports on the fisheries of the Gulf. Preliminary infrastructure damage from the storms was estimated to be as high as $1 billion. In summary, Dr. Caffey indicated that the stocks will recover.
in the short-term, but expected that the commercial fisheries would have a slow recovery and that the long-term pressures from imports and higher operating costs may continue to place economic pressures on the industry.

Dr. Lee Anderson, University of Delaware, summarized the status of the current individual fishing quota guidelines that are in developmental stages within the National Marine Fisheries Service. He gave a brief history of individual quota systems and the key considerations that need to be addressed when developing quota systems. Lastly, Dr. Anderson outlined how the reauthorization of Magnuson Stevens addresses some of the issues in developing individual fishing quota systems.

Mr. Robin Riechers, Chairman, Gulf of Mexico Fishery Management Council, provided a discussion regarding the future of fisheries in the Gulf of Mexico. Using red snapper as an example, he presented the history of management and the direction towards more sustainable fisheries through the use of input controls instead of output controls. Mr. Riechers went on to discuss the real challenges in that the management agencies face in the aftermath of the storms, such as determining the short- and long-term impact on recreational and commercial fishing effort. Lastly, he emphasized the need for ecosystem based management strategies and greater flexibility at the local management level.

**PANEL 3 ABSTRACTS:**

**HARMFUL ALGAL BLOOMS AND THE GULF OF MEXICO**

Tracy A. Villareal, University of Texas at Austin Marine Science Institute, tracy@utmsi.utexas.edu

The Gulf of Mexico is home to a great diversity of tropical and temperate species. There is extensive exploitation of both mineral and biological resources superimposed on a nutrient-poor sea that receives flow from the third largest river in the world. As a result, it has some of the most complex harmful algal bloom (HAB) problems on the planet. In Florida alone, over 60 HAB species have been identified. Local dynamics are influenced by regional differences in the Gulf’s hydrography and climatology. The HAB consequences include respiratory effects, fish kills, finfish and shellfish toxicity, eutrophication, anoxia, benthic mortalities and seagrass shading.

Economic impacts in the Gulf can be substantial. Individual HAB events can exceed the U.S. average by tens of millions of dollars annually. There is considerable debate as to the role humans play in the global increase in severity and frequency of HABs. The potential perturbations include nutrient eutrophication, sea surface temperature changes, and habitat alteration.

Three HAB examples highlight their diverse nature, the difficulty in identifying causes, and the complexity of management options. *Karenia brevis* has an offshore origin, kills fish, and is a significant public health threat via shellfish consumption and respiratory problems. Blooms can cover thousands of square kilometers, and may be indirectly linked to Saharan dust inputs. The historical record supports an increase in bloom frequency/intensity since the European colonization. An extensive infrastructure monitors and closes shellfish beds before toxic product is marketed. *Gambierdiscus toxicus*, a tropical coral reef dinoflagellate, produces toxins that are concentrated in fish and cause the disease ciguatera. It has no known ecosystem manifestation. Ciguatera is the dominant finfish toxicity in the world, is the single greatest U.S. medical cost related to HABs, and has no commercial means of detection. It is highly episodic and potentially lethal. Toxins can be transported hundreds of kilometers by migrating fish. The disease has been known for centuries. Finally, small, picoplanktonic microalgae in the genera *Aureoumbra* and *Synechococcus* cause dense blooms that can shade seagrasses and negatively impact ecosystems without obvious toxin production and with no known human health impacts. *Aureoumbra* was unknown prior to a sustained 8-year bloom in the Laguna Madre of Texas. Together, these three blooms types span the range of open coastal ocean, coral reefs, and coastal bays and lagoons.

These are complex problems in oceanography and biology. Future studies need to target human impacts on the ocean, including sea surface temperature changes and their resulting changes in current structure and species ranges, eutrophication, food-web alterations, ballast water transport, and introduction of structures that add substrate or modify circulation. Much of the basic biology of key HAB species remains unknown but is critical for understanding how these species bloom and impact the ecosystem.
NUTRIENTS, HURRICANES, & GULF OF MEXICO HYPOXIA
Nancy N. Rabalais, Louisiana University Marine Consortium, nrabalais@lumcon.edu

A response in many coastal waters to increased nutrient input and eutrophication is the formation of oxygen depleted waters. Oxygen depletion may also occur as a response to increase organic loading from other sources, or result from changes in physical conditions, such as water circulation. More and more of the world's coastal waters are becoming hypoxic and/or anoxic or the severity is worsening where the condition exists now.

Hypoxia, or the ‘Dead Zone’, occurs seasonally, typically beginning in late spring carrying through to fall, while hurricane season in the Gulf of Mexico stretches from June to October, overlapping the occurrence of hypoxia. The strongest factor related to the size of the hypoxic area is the flux of nitrate-N from the Mississippi and Atchafalaya Rivers. Plus, a stratified water column must be present for hypoxia to form and persist. Tropical storms and hurricanes, depending on their size, strength, speed of transit, and proximity to areas of low oxygen, variably affect the hypoxic conditions. Although some tropical storm weather events provide for the mixing of stratified layers, others provide little or no relief from hypoxia. Most mixing events are temporary, but the time to formation of new hypoxic water masses differs. The combination of wind intensity and direction, distance of storm path from the hypoxic area as well as the speed, persistence and duration of the storm all affect the distribution and severity of hypoxia. Global climate change scenarios predict increasing storm frequency and severity for the Gulf of Mexico. Better knowledge of existing tropical storm dynamics with hypoxia will assist ecological forecasting of hypoxia in the Gulf and predictions of longer-term climate change scenarios. Hypoxia, or the ‘Dead Zone,’ in the northern Gulf of Mexico occurs in the spring/summer coinciding with hurricane season. While the strongest factor related to the size of the hypoxic area is the flux of nitrate-N from the Mississippi and Atchafalaya Rivers, a stratified water column must be present for hypoxia to form and persist. Tropical storms and hurricanes, depending on their size, strength, speed of transit, and proximity to areas of low oxygen, variably affect the hypoxic conditions.

RISK, RESILIENCY AND RESTORATION: POST-HURRICANE PRINCIPLES OF COASTAL ECOSYSTEM REHABILITATION
Robert R. Twilley, Louisiana State University, rtwilley@lsu.edu

The Gulf coastal landscapes of Texas, Louisiana, Mississippi, Alabama and Florida have long been landscapes of rich natural resources and some of the most notable wetland resources in North America and the world. This region is also the site of one of the strongest increases in population density in the last several decades. Adaptation by ecological and social systems in the Gulf region provides insights into how coastal communities in the US will face increased challenges to sustainable development in the midst of a changing climate. Now the stakes are higher as the people of coastal Louisiana and south Florida deal with one of the most active hurricane seasons on record, with both regions experience the wrath of two storms; Katrina hitting both regions followed by Rita to southwestern Louisiana and Wilma to southeastern Florida. For coastal Louisiana, the struggle is not only rebuilding the vast natural resources of the Mississippi River delta, but also the social systems that have been devastated by both hurricanes. The damage to natural and social systems in south Florida were not as intensive, but still significant to the long-term planning concerning risks. Both regions are dealing with the challenge of promoting the resiliency of both natural and social systems by providing necessary resources. If restored properly, these parts of the Gulf Region will develop new paradigms as to how coastal communities deal with risks and hazards of the coastal landscape. But they are developing this rebuilding process in a political environment of great urgency, which requires even greater commitment to a few fundamental principles of what are the uncertainties of integrating protection and restoration of the ecological-social landscape within 50-yr time horizons that include a changing climate.
MANGROVES AND CORAL REEFS OF THE GULF OF MEXICO:
MANAGEMENT ACTIONS
Jorge A. Herrera-Silveira, Center for Research and Advanced Studies-National
Polytechnical Institute (CINVESTAV-IPN), jherrera@mda.cinvestav.mx

The economy and quality of life in several coastal communities of the Gulf of Mexico (GOM) are intricately tied to the mangroves and coral reefs resources that exist there. However, increasing land development, pollution, recreational use and commercial activities are continuing to threaten the sustainability of these resources. To better manage these important assets, it is necessary to develop research and management with an ecosystem-based view. In order to do so, the U.S.A., Mexico and Cuba must identify the condition of the mangroves and coral reef ecosystem under a similar framework, which should favor the establishment of monitoring programs. Mangrove forests and soft/hard coral serve as nursery areas or critical habitat for many commercial, rare, threatened or endangered species. However, coastal development has resulted in increased pressure on mangroves and coral reefs, and their degradation is evident. Decline in mangroves and coral reefs has resulted in an increased concern for the loss of biodiversity and adverse economic impacts to communities along the coast. In response to the habitat degradation, U.S.A., Mexico and Cuba have implemented different protective measures, including regulatory techniques such as planning, zoning, or permitting, and non-regulatory conservation techniques. Other approaches used to protect, and in many cases improve these habitats have been through restoration efforts and development of comprehensive regional restoration strategies. Some of the main challenges for the sustainable management of mangroves and coral reefs in the GOM habitat characterization and monitoring programs. To accomplish these, a multi-national working group could form a partnership strategy with international, federal, state and private funding. As a unified group, the three countries should develop scientifically and economically defensible guidelines and prioritize the research and management actions on mangroves and coral reefs. The GOM, as a large marine ecosystem, needs a regional ecosystem-based approach and a long-term management program through regional cooperation to create infrastructure and institutional ability, to implement international agreements, to enforce national environmental laws, to fund conservation policies, and to implement ecological zoning programs responsible for regulating coastal activities. Further studies are required on coastal ecosystems recovery, vulnerability, and resiliency, especially in response to climate change consequences, and hurricane impacts. If no actions and joint programs are implemented in the near future, GOM coastal conditions could be very unhealthy, environmental services will be poor, and ecosystem uses and values reduced.

“Though estimates continue to be refined, preliminary reports generated in the spring of 2006 from Alabama, Mississippi, and Louisiana place the total economic damage to fisheries infrastructure at $700 - $1.3 billion.”

A SMARTER WAY BACK
William W. Walker, Executive Director, Mississippi Department of Marine Resources, bill.walker@dmr.state.ms.us

Hurricane Katrina was no lady when she visited Mississippi. She slammed ashore on August 29, 2005, as the single greatest natural disaster ever in the history of the United States and completely devastated the region commonly known as Coastal Mississippi. Homes, buildings, roads, and infrastructure that completely survived Hurricane Camille in 1969 were totally destroyed by Katrina. In Hancock County, the cities of Bay St. Louis and Waveland were obliterated. Gulfport and Biloxi were extensively damaged, as were Ocean Springs, Pascagoula, and Moss Point in Jackson County. The nation watched to see how the people of Coastal Mississippi would respond. Would we whine and complain “woe is me” to all around us and seek handouts from the feds and the state and whoever else would listen? Would we simply feel sorry for ourselves and sit on our hands and wait for others to restore order to the chaos? No, as our Governor Haley Barbour likes to say, the folks of Coastal Mississippi “hitched up their britches and set about helping themselves and their neighbors to clean up the mess and to start the rebuilding process!”

Within weeks of “the storm,” as Katrina will forever be known, Governor Barbour assembled over a hundred planners from all over America and abroad, city and county leaders, and other stakeholders for a six-day Mississippi Renewal Forum which produced potential rebuilding designs for each of the eleven cities of Coastal Mississippi. The Governor formed a Commission on Recovery, Rebuilding, and Renewal and charged them with continuing the work of the forum emphasis not on returning to where we were before Katrina, but to build a renewed Coastal Mississippi better than it has ever been.

The renewal process has begun. It will be long and expensive, but in the end Coastal Mississippi will indeed be much more than it has ever been, a better place to live, work, and visit.
THE STATE OF THE NORTHERN GULF OF MEXICO FISHERY IN THE WAKE OF HURRICANES KATRINA AND RITA
Rex Caffey, Louisiana State University Agricultural Center, rcaffey@agctr.lsu.edu

In August and September 2005, the northern Gulf of Mexico was decimated by the winds and flood surge associated with Hurricanes Katrina and Rita. The commercial seafood industry, already on the decline for a number of reasons, was further crippled as a result of damage to vessels, docks, processors, and the distribution sector. Even those fishermen who were able to fish immediately after the hurricanes experienced problems selling the product due to the decimation of the distribution sector and the paucity of local customers. Reliable estimates of economic damage to fisheries infrastructure have been difficult to quantify, as many of the fishermen, dealers, and processors were geographically displaced and unavailable for interviewing purposes. Though estimates continue to be refined, preliminary reports generated in the spring of 2006 from Alabama, Mississippi, and Louisiana place the total economic damage to fisheries infrastructure at $700 - $1.3 billion. This wide range reflects the varying approaches utilized in these calculations and the early stages at which preliminary estimates were derived.

Following each storm, federal disaster declarations of regional fisheries “failure” were issued by U.S. Commerce Secretary Carlos Gutierrez. These declarations initiated a sequence of events that ultimately resulted in more than $118 million in recovery funds authorized by Congress in June 2006. The extent to which this aid will mitigate or compound the existing crisis depends largely on how failure is defined. Clearly, the storms’ tremendous impact on coastal infrastructure has resulted in the economic failure of an unprecedented number of commercial fishing ventures. It is also true that many of those businesses were already on the brink of commercial failure because of rising fuel costs and declining output prices. In contrast, the fish stocks themselves have proven resilient, with harvests for certain species significantly higher than pre-storm levels. For many in the shrimp fishery, however, Katrina and Rita may signal a threshold beyond which it will be impossible to recover given current market forces. For this reason, and to address negative externalities associated with incidental bycatch, effort-reduction measures were featured in many of the initial aid packages. Although such measures were not included in the final aid package, the storms themselves have reduced fishing capacity to a level that no effort-reduction program could have achieved in such a short period of time. How long capacity will remain at this new equilibrium will be determined by a number of factors, including dockside prices, fuel costs, post-storm fisheries abundance, and the speed and specifics through which emergency assistance funding is ultimately disbursed.

HURRICANE RECOVERY IN THE CONTEXT OF FISHERIES MANAGEMENT OR FISHERIES MANAGEMENT IN THE CONTEXT OF HURRICANE RECOVERY
Lee G. Anderson, University of Delaware, Office of Policy, NOAA, lgafish@cms.udel.edu

Hurricane disaster assistance policy for fisheries is a very complex issue. Participants are in need of short and medium term financial assistance and in some cases there may be a need for reconstruction assistance. However, these programs should be developed and executed in a responsible and far-sighted manner to ensure the sector’s long-term sustainability. To be specific, restored fishing capacity in most fisheries should generally not exceed the levels that existed prior to the disaster – and in some places capacity should even be reduced. There are inherent conflicts in hurricane recovery in fisheries and fisheries management. The object of fisheries management is to control harvests so as to maintain healthy stocks and provide a sustainable source of food and jobs. This means that it is necessary to control, directly or indirectly, the number of boats and/or how they are used. Keeping fishing effort in balance with what local fish stocks are capable of sustaining will help guarantee the continued productivity of the region’s fisheries, so that future generations can rely on them for food and income. The object of disaster assistance in fisheries is to accomplish two different goals: Provide short run assistance and get the industry up and running again. But the latter job works in exactly the opposite direction as fisheries management. It is very important to insure that very necessary task of providing relief does not spill over in ways that will make the job of fisheries management that much worse. To go one step further, there have been calls for buybacks and limited access fisheries management programs for many fisheries in the Gulf going back way before the hurricanes. While these are very complicated issues, it would be wise to consider them as part of an overall plan to provide assistance to redevelop a healthy and sustainable fishery in the Gulf of Mexico.
There are many challenges facing Gulf of Mexico fisheries and fisheries management as the region looks beyond 2005-06. Hurricanes Katrina and Rita caused major interruptions and changes to the fisheries infrastructure in the Gulf of Mexico. In looking beyond the hurricane impacts, Gulf fisheries continue to face economic pressures from decreasing real prices and increasing costs of production. Utilizing red snapper as a case study, traditional regulatory measures using input controls (bag limits, size limits, closures) reduce the efficiency of fishers in an attempt to restrain fishing mortality within desired levels. This typically leads to ever tightening restrictions as stocks rebuild and fishers become more efficient. Management recognizes the need to move towards more incentive based management systems and away from measures which make industry inefficient. Limited entry or individual quota based systems are designed to provide ownership incentives to the fishers as well as restore efficiencies at the harvest level. The Gulf of Mexico Fishery Management Council has continued to show movement towards these incentive based systems and towards multi-species management which in the long-run should provide sustainable fisheries in the Gulf region. In addition to a shifting philosophy from traditional management measures towards incentive based management strategies, management should help the fishery explore other strategies, like community shares or fish cooperatives, that can return efficiencies to the system. The ability of management to meet the goals of sustainable fisheries will require input from a wide variety of stakeholders and needs the vision to look beyond past history and the traditional methods of managing fisheries.

The Gulf of Mexico has been seriously impacted by a combination of human activities on land, along the coasts, and in the ocean. These activities cause a variety of environmental and economic threats including losing critical habitat, degrading water quality, increasing coastal erosion, introducing invasive species, depleting fish stocks, and other problems. Traditionally, these issues have been managed and governed in isolation by individual administrative entities with jurisdiction over the activities. Little formal cooperation or collaboration across local, state, tribal, federal, and international boundaries has taken place.

In recent years, ecosystem-based management (EBM), which considers the cumulative impacts on the entire ecosystem, is being advocated as a preferred model. Successful EBM requires cross-jurisdictional management goals and collaborative governance mechanisms as opposed to focusing on specific jurisdictions and sectors within an ecosystem.

The purpose of convening this panel was to examine the current state of collaborative governance efforts in the Gulf of Mexico and to suggest methods of improving cooperation in the future. This overview is a summary of the presentations made by panel members.

Richard McLaughlin described the tangible benefits offered by collaborative governance such as enhanced management of transboundary marine resources, reduced administrative cost and effort, harmonization of goals and enforcement, and improved political relations. However, he pointed out that collaboration should not be viewed as an end point, but only a means to an end. Collaborative governance can be improved by applying the following actions. First, the approach used should be tailored...
Gary D. Lytton focused his remarks on the important contributions to collaborative governance made by the Gulf of Mexico Alliance and the Governors’ Action Plan. He described the history of the Gulf Alliance, the role of community meetings held throughout the Gulf Region, and the Alliance’s efforts to build a regional partnership among the five U.S. Gulf of Mexico States. He summarized the Governors Action Plan and its goal of accomplishing eleven priority actions within the next 36 months. Finally, he discussed the next steps that will be taken by the Alliance to move the Governor’s Action Plan forward.
BUILDING AN ALLIANCE FOR THE GULF: FORGING PARTNERSHIPS BETWEEN LOCAL COMMUNITIES AND STATE AND FEDERAL AGENCIES

Gary D. Lytton, Rookery Bay National Estuarine Research Reserve, Florida Department of Environmental Protection, gary.lytton@dep.state.fl.us

The presentation focuses on the collaborative process involved in establishing the Gulf of Mexico Alliance. Initiated in June 2005, the Alliance is a regional partnership of local, state and federal interests working together to develop and implement a recovery plan for the Gulf of Mexico. A summary of the process is presented, including a brief overview of the linkages to the Ocean Commission Report, the U.S Ocean Action Plan, and the participation of the five Gulf states, Mexico, the White House and key federal agencies. The involvement of local communities around the Gulf rim is discussed in detail.

The Alliance’s recovery plan was released during the first day of the Summit Conference. Key issues and challenges in establishing the Alliance and developing the recovery plan are presented, including:

- the role of leadership
- the catastrophic storms of 2005
- the importance of economics and public health issues
- community workshops designed to inform and engage local citizens
- establishing an infrastructure to support the Alliance

Priority actions to implement the recovery plan will be reviewed.

TOWARD INTEGRATED NATIONAL OCEAN POLICY: COMPARATIVE PERSPECTIVES FROM 16 NATIONS AND 4 WORLD REGIONS

Biliana Cicin-Sain, University of Delaware, bcs@udel.edu

While most coastal nations of the world already have a variety of sectoral policies in place to manage different uses of the ocean (such as shipping, fishing, and oil and gas development), it has only been in the last decade that coastal nations have undertaken concerted efforts to articulate and implement an integrated vision for the governance of ocean areas under their jurisdiction—to harmonize existing uses and laws, to foster sustainable development of ocean areas, to protect biodiversity and vulnerable resources and ecosystems, and to coordinate the actions of the many government agencies that are typically involved in oceans affairs. This is a very encouraging development, responding, as it does, to the reality of serious conflicts of use in most 200-mile national ocean zones and to the prescriptions articulated in both the Law of the Sea and in the 1992 Earth Summit (given the interrelationship among uses and processes in the coast and ocean, ocean and coastal governance must be “integrated in content and precautionary and anticipatory in ambit”).

This presentation will discuss initial findings from a cross-national study involving 16 nations and 4 world regions carried out by the author in collaboration with scholars and government officials in each nation/region. The initial work points to thorny issues in ocean governance, and suggests some general lessons that may be applied in the development of international guidance on national ocean policy formulation and implementation.

(Nations included in the study are: Australia, Brazil, Canada, China, India, Jamaica, Mexico, New Zealand, Norway, Philippines, Portugal, Russian Federation, United Kingdom, United States, and Vietnam. Regions include: Europe, South Pacific, Africa, and East Asia).

PRIVATE INDUSTRY AND REGIONAL GOVERNANCE

Paul Kelly, Rowan Offshore and Member of the U.S. Ocean Commission poulkelly@aol.com

In terms of economic value, ocean-related industry activities, including marine transportation, offshore oil and natural gas, fisheries, tourism and recreation, and real estate development, contribute over $4.5 trillion when coastal counties are included, fully half the nation’s GNP, accounting for more than 60 million jobs. A substantial part of this has its source in the Gulf of Mexico region where there is even further potential economic value in new uses of the ocean such as alternate sources of energy, aquaculture and bioprospecting.

We all realize, however, that these quantifiable contributions are just one measure of the value of our oceans and coasts. Many even more important attributes cannot be given a price tag, such as life support, cultural heritage and the aesthetic value of the ocean which draws us with its intrinsic power to relax, rejuvenate and inspire. Private industry recognizes that any failure to properly manage human activities that affect the oceans and coasts, compromising their ecological integrity, diminishes our ability to fully realize their potential, and eventually will cost us jobs and revenues putting the future contributions we can make to the nation at risk. Therefore, private business must be involved in working with all stakeholders in setting a course to achieve both economic and environmental sustainability in the Gulf of Mexico. Industry is scoring some successes in this regard and has the capability of doing more.
The Gulf of Mexico Alliance is a partnership, initiated in 2004, of the states of Alabama, Florida, Louisiana, Mississippi, and Texas, intent on significantly increasing regional collaboration to enhance the ecological and economic health of the Gulf of Mexico. The Bush Administration’s U.S. Ocean Action Plan (USOAP) recognizes the leadership that the five Gulf States have demonstrated in forming the Alliance and calls for the increased integration of resources, knowledge, and expertise to address regional priorities. The Alliance has identified five issues that are regionally significant and can be effectively addressed through increased collaboration at the local, state and federal levels. The following priorities represent an initial focus for action through the Alliance:

- Water quality for healthy beaches and shellfish beds;
- Wetland and coastal conservation and restoration;
- Environmental education;
- Identification and characterization of Gulf habitats; and,
- Reductions in nutrient inputs to coastal ecosystems.

In addition, the hope is that the Gulf of Mexico Alliance can serve as a forum for effective bi-national regional collaboration with the six Mexican Gulf States – Tamaulipas, Veracruz, Tabasco, Campeche, Yucatan, and Quintana Roo. To this end, the Alliance currently coordinates closely with the Gulf of Mexico States Accord and this Action Plan proposes several activities to be implemented in partnership with the Mexican Gulf States.

The Gulf of Mexico Alliance strongly emphasizes actions that support current recovery and rebuilding efforts, while increasing the resilience of Gulf communities from future hurricanes and other coastal hazards. The recovery efforts provide the opportunity for an ecologically-sound and well planned recovery that will result in a stronger Gulf Coast. The Action Plan presents a suite of activities that will further the recovery and rebuilding effort and ensure that our collective response to the next inevitable hurricane will be faster, more effective and better coordinated.
Thirteen federal agencies have committed to actively support the Gulf of Mexico Alliance. This Federal Workgroup, coordinated by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA), will:

- Support regional leadership of the five Gulf states;
- Supplement Gulf Coast recovery and rebuilding efforts in a coordinated manner;
- Provide local resource managers with state/federal data and decision-support tools; and,
- Build upon existing partnerships in the Gulf, including the non-regulatory EPA Gulf of Mexico Program.

The Governor’s Action Plan for Healthy and Resilient Coasts was “rolled out” on 28 March 2006 at the Gulf of Mexico Summit by Secretary Colleen Castille, Florida Department of Environmental Protection. The three-year Action Plan lays out the steps for the Alliance to move forward during 2006-2009. It is available at the Gulf of Mexico Alliance website: www.dep.state.fl.us/gulf/default.htm.
The Gulf of Mexico Program (GMP) Partnership developed the Gulf Guardian awards as a way to recognize and honor the businesses, community groups, individuals, and agencies that are taking positive steps to keep the Gulf healthy, beautiful and productive. The Gulf Guardian Award exemplifies what the Gulf of Mexico Program is all about innovative solutions that come about when we pool resources and look for creative ways to positively impact our quality of life and economic well being.

The partnership of the Gulf of Mexico Program seeks to improve the environmental health of the Gulf in concert with economic development. The Gulf Guardian Awards are an important way to recognize these valuable efforts. There are many companies, organizations, and individuals in the Gulf States that are “Gulf Guardians.” The GMP Partnership believes they should be awarded for their stewardship of this national resource from which we all derive so much benefit.

The first Gulf Guardian Award winners were recognized in 2000. Every year since, a first, second and third place award are given in six categories: Business, Civic/Non-Profit Organization, Partnerships, Youth/Education, Individual, and Government. All 18 winners in six different categories receive an impressive marble and glass memento, press coverage on their project, and recognition by their peers. First place winners receive a professional three-minute video about their project or efforts.
2005* AWARD WINNERS

1ST PLACE WINNERS

Youth Education Category: West Florida Regional Planning Council/Bay Area Resource Council (Eleanor Godwin and Glen Griffith)

Partnership Category: Mobile Bay NEP/Gulf Coast Research Laboratory (Harriet Perry and David Yeager)

Business Category: Mississippi Power, Plant Jack Watson (Cynthia Simmons)

Civic/Nonprofit Organization: Les Reflections du Bayou (Susan Terrebonne and Glen Terrebonne)

Individual Category: James H. Davis (Project: Sunny Beaches’ New Frontier)

Government Category: Pinellas County Board of County Commissioners (Ronnie Duncan)

2ND PLACE WINNERS

Youth Education Category: J.S. Robinson Elementary School/ Suncoast Earth Force (Chequittea Lumpkins and Judy Der)

Partnership Category: USFWS Southwest Regional Office, Ecological Services (Pat Burchfield)

Business Category: Florikan ESA (Ed Rosenthal and Betty Rosenthal)

Civic/Nonprofit Organization: Sunny Beaches (Deborah Fisher and Judge Joe Gonzales)

Individual Category: Dawn Rebarchik (Gulf Coast Research Laboratory)

Government Category: Southwest Florida Water Management District (Melissa Roe)

3RD PLACE WINNERS

Youth Education Category: Weeks Bay National Estuarine Research Reserve (Margaret Sedlecky and Megan Anderton)

Partnership Category: Grand Bay National Estuarine Research Reserve (Dr. Bill Walker)

Business Category: Mississippi Power, Pinebelt Division (Dale Gaston and Flinda Hill)

Civic/Nonprofit Organization: Alabama Coastal Foundation (Angela Montgomery and Barry P. Vittor)

Individual Category: William S. “Corky” Peret

Government Category: City of Clearwater (Heather Faessler)

* Due to the devastating, northern Gulf hurricanes, the 2005 Gulf Guardian Awards were postponed from giving in fall 2005 to the Summit in March 2006.
DR. CHARLES M. ADAMS
Professor, University of Florida and Marine Economist Specialist,
Florida Sea Grant

Dr. Chuck Adams is a native Texan originally from the Houston area. He graduated from Texas A&M University in 1976 with a BS degree in Fisheries Science. He received his MS from Texas A&M in Agricultural Economics in 1978, and his PhD in Food and Resource Economics from the University of Florida in 1984. He serves as the Marine Economics Specialist for the Florida Sea Grant College Program and is Full Professor in the Food and Resource Economics Department, University of Florida. His extension and applied research interests focus on economics of marine fisheries management, valuation of marine-dependent industries, financial feasibility of marine aquaculture systems, seafood demand and market analysis and economics associated with change in coastal aquatic habitats.

DR. LEE G. ANDERSON
Professor Marine Policy, University of Delaware and IPA Policy Analyst,
Office of Policy, NOAA

Dr. Lee Anderson is a Professor of Economics and Marine Studies at the University of Delaware. He is also currently working part time in the Office of Policy of NOAA Fisheries. He is a member of the Ocean Studies Board of the National Research Council and he is President Elect of the North American Association of Fishery Economists. He has received grants from the National Science Foundation, Sea Grant, National Marine Fisheries Service, Food and Agricultural Organization, United States Agency of International Development, and the Inter-American Development Bank. In 1993 he was awarded the Rosenstiel Award for Contribution to Ocean Science for his theoretical and applied work on individual transferable quotas. His current work deals with simulation models, design and implementation of ITQ programs, the economics of fishing in time and space, and marine reserves.

DR. REX H. CAFFEY
Associate Professor, Louisiana State University

Dr. Rex Caffey received his Bachelor of Science degree in Agribusiness from Louisiana State University in 1988. He later returned to LSU for graduate degrees in Resource Economics (M.S. 1994) and Fisheries Science (Ph. D. 1998). For the past 8 years Dr. Caffey has coordinated the state-wide extension program in Coastal Resources for the LSU AgCenter and the
Louisiana Sea Grant College Program. Dr. Caffey is an Associate Professor in the LSU Department of Agricultural Economics where he also serves director of the newly-established Center for Natural Resource Economics and Policy (CNREP). The primary goal of CNREP is to foster the interaction of social scientists on research and extension projects related to natural fisheries, wetlands, wildlife, and soil and water resources.

DR. JAMES C. CATO
Director, Florida Sea Grant Program and Senior Associate Dean & Director, School of Natural Resources & Environments, University of Florida

Dr. Jim Cato is Senior Associate Dean, Director of the School of Natural Resources and Environment, Director of the Florida Sea Grant College Program and Professor of Food and Resource Economics at the University of Florida. He received B.S. and M.S. degrees from Texas Tech University, was a resource economist with the Economic Research Service of the U.S. Department of Agriculture from 1969 to 1973, and completed a Ph. D. in Food and Resource Economics at the University of Florida in 1973. In 2005, he was appointed to the Florida Ocean and Coastal Council which is charged with developing marine and coastal research priorities for the State of Florida.

DR. BILIANA CICIN-SAIN
Director, Gerard J. Mangone Center for Marine Policy and Professor, University of Delaware and Co-Chair, Global Forum on Oceans, Coasts, and Islands

Dr. Biliana Cicin-Sain is Director of the Gerard J. Mangone Center for Marine Policy and Professor of Marine Policy at the University of Delaware, and Editor-in-Chief of the international journal Ocean & Coastal Management. Her main interest in recent years has been integrated coastal and ocean management, both in the United States and around the world. She is a founder of the Marine Affairs and Policy Association and the Ocean Governance Study Group in the U.S. Internationally, she has been a pioneer in the forging of cross-national collaboration in marine policy, especially on research and education. In 2002, she was appointed as a scientific advisor to the U.S. Commission on Ocean Policy.

DR. CHARLES S. COLGAN
Associate Director, Center for Business and Economic Research and Professor, University of Southern Maine

Dr. Charles Colgan is a consultant with the National Ocean Economics Program. He is a Professor of Public Policy and Management in the Edmund S. Muskie School of Public Service at the University of Southern Maine (USM). Dr. Colgan is the Chair of the Muskie School’s PhD Program in Public Policy and is a Senior Research Associate in the USM Center for Business and Economic Research. His long term economic forecasts are used by the Maine Department of Transportation and the Economic Development Districts of Maine. Prior to joining the University of Southern Maine, he served in the Maine State Planning Office, was State Economist, and Director of Natural Resource and Economic Policy. He received his B.A. from Colby College and received his Ph.D. in economic history from the University of Maine.

DR. ANDREW DEPAOLA
Gulf Coast Seafood Laboratory, U.S. Food and Drug Administration

Dr. Andy DePaola began his career with FDA in 1978 where he has established a world class research program on the ecology, growth, survival and methodology of pathogenic vibrios at the Gulf Coast Seafood Laboratory on Dauphin Island, AL. His research accomplishments include the discovery of the Latin American strain of *Vibrio cholerae* in Mobile Bay, development and integration of molecular methods such as DNA probes and real time PCR into the nation’s seafood safety programs. Currently, he is assisting the World Health Organization and Food and Agricultural Organization in preparation of risk assessments for pathogenic vibrios in seafoods.
DR. ANTONIO J. DÍAZ-DE-LEÓN
Director General, SEMARNAT, Mexico

Dr. Antonio Díaz-de-León is the Regional Coordinator of the Project “Integrated Management of the Large Marine Ecosystem of the Humboldt Current” (GEF/UNIDO) developed jointly with the governments of Peru and Chile. A researcher at the Instituto Nacional de Ecología (INE) and commissioned to the Colegio de México, he is also an Invited Professor at the Centro de Investigación y Estudios Avanzados (CINVESTAV del IPN), the Centro Interdisciplinario de Ciencias Marinas (CICIMAR del IPN), the Universidad Iberoamericana (Campus Centro–Golfo), the Instituto de Investigaciones Económicas UNAM, and at the Facultad de Economía UNAM. Dr. Díaz-de-León is also an International Consultant on the environment, development, oceans and fisheries, and a Senior Partner of the Marine Resources Assessment Group Ltd. (MRAG London). During his time as President of the Instituto Nacional de la Pesca, he designed and made the new version of the “Carta Nacional Pesquera 2000” (National Fisheries Letter, 2000), the only public integrated regulation instrument today, published on August 17 and 28 of the year 2000, in the Federal Official Diary and presented to the nation by the President of the Republic.

DR. E. SPENCER GARRETT
Director, National Seafood Inspection Laboratory, NOAA

Dr. Spencer Garrett serves as Director of the National Seafood Inspection Laboratory in Pascagoula, Mississippi, which is recognized as a premier seafood public health and information transfer center and provides scientific services to the National Oceanic and Atmospheric Administration/National Marine Fisheries Service’s Seafood Inspection and Certification Program. He has received national and international recognition for his strong scientific, technical and administrative abilities in developing, executing, and evaluating complicated food safety, quality, and food hygiene programs. He serves as his Agency’s representative on the Interagency Mercury Working Group of the Executive Office of the President’s Office of Science and Technology. He currently serves as the North American Representative on the Board of Directors of the International Association of Fish Inspectors and currently serves on the prestigious National Advisory Committee on Microbiological Criteria for Foods. He presently serves as his agency’s representative to the National Academy of Science “Food Forum” and the Interagency Committee on Human Nutrition and is his Agency’s principle spokesperson on seafood safety issues.

DR. D. JAY GRIMES
Provost, University of Southern Mississippi, Dean, College of the Marine Sciences, Director, Gulf Coast Research Labs

Dr. Jay Grimes was named Provost in 2002 after having served as Dean of the College of Marine Sciences from 1997-2002. A microbiologist, Dr. Grimes earned his PhD from Colorado State University in 1971 and both his master’s and bachelor’s degrees in biology from Drake University. His career has included academic appointments at the University of Wisconsin-LaCrosse, the University of Maryland and the University of New Hampshire. While at New Hampshire, he also served as Director of the University’s Sea Grant College Program (1987-1990) and Director of the Jackson Estuarine Laboratory (1989-1990). Dr. Grimes serves on numerous national and international committees, boards and panels, most notably the Board of Governors for CORE, and the Ocean Studies Board for NRC/NAS.

DR. JORGE A. HERRERA-SILVEIRA
Professor, Center for Research and Advanced Studies-National Polytechnical Institute (CINVESTAV IPN), Unidad Mérida

Dr. Jorge Herrera-Silveira is a marine biologist specializing in primary productivity and biogeochemical processes of coastal ecosystems. He has studied limiting factors of primary productivity in the coastal ecosystems of the Yucatan Peninsula, including coral reefs, mangroves, seagrasses, salt marshes and coastal lagoons. His research focus is on the ecology of coastal primary producers, nutrient dynamics in aquatic ecosystems, and biotic and abiotic factors that influence space and temporal primary productivity patterns. He is an active participant in research related to environmental impact, water quality, eutrophication and harmful algal blooms monitoring programs, biological indicators and restoration of aquatic ecosystems, such as mangroves and seagrasses. Dr. Herrera participates in the activities of the Program on Processes and Coastal Management of the Department and coordinates and teaches several graduate courses. He has published numerous papers in journals and peer-reviewed conference proceedings and 11 book chapters.
DR. CLIFFORD W. HOUSTON
Associate Vice President Educational Outreach, The Herman Barnett Distinguished Professorship in Microbiology & Immunology, The University of Texas Medical Branch

Dr. Clifford Houston holds the Herman Barnett Distinguished Professorship in Microbiology and Immunology, in the Department of Microbiology and Immunology at The University of Texas Medical Branch. He has sponsored summer science camps for middle and high school students and summer research programs for high school students while also providing similar programs for graduate students. Additionally, he has sponsored science education workshop, for K-12 teachers and conducted inquiry-based biotechnology workshops for secondary science teachers. In addition to his extensive background in the sciences, his thorough leadership serving as Vice President for Educational Outreach, Dr. Houston has worked extensively with undergraduate and graduate students. He is highly qualified at motivating students from diverse backgrounds to pursue course work, college degrees, and ultimately enter the workforce in science, technology, engineering and mathematics.

PAUL L. KELLY
Executive Vice President, Rowan Offshore and Member of the U.S. Ocean Commission

Mr. Paul Kelly is Senior Vice President of Rowan Companies, Inc., with responsibility for special projects and government and industry affairs. Rowan is a major provider of international and domestic offshore contract drilling and helicopter services. Mr. Kelly represented the oil service/supply industry on the U.S. Secretary of Interior’s Outer Continental Shelf Policy Committee during the past four administrations. He has also served as a member of the U.S. Coast Guard’s National Offshore Safety Advisory Committee (NOSAC). He has appeared on behalf of industry in numerous congressional and federal agency hearings dealing with offshore oil and gas issues. He currently serves on the Ocean Research Advisory Panel (ORAP) under the National Ocean Partnership Program. Most recently he was appointed by President Bush to serve on the U.S. Commission on Ocean Policy, the first commission of its kind in over 30 years tasked with examining the major issues affecting America’s coasts and oceans. Mr. Kelly holds a B.A. (Political Science) degree from Yale University and a J.D. degree from Yale Law School.

DR. JUDITH T. KILDOW
Director, National Oceans Economic Program and Professor, California State University-Monterey Bay

Dr. Judith Kildow holds the James W. Rote Distinguished Professorship with the Division of Science and Environmental Office at California State University at Monterey Bay. Prior to her appointment in 2003, she served as a faculty member in the MIT Department of Ocean Engineering for 26 years where she taught and did research on coastal and ocean management issues. She was also a member of the Research Faculty at both the University of Southern California Wrigley Institute for Environmental Studies, and the Gund Institute for Ecological Economics and The Rubenstein School of Environmental and Natural Resources at The University of Vermont. She has served on numerous federal and state commissions, National Academy of Sciences panels, and boards of directors. She received her Ph.D. in International Relations and Science Policy from The Fletcher School at Tufts University and her BA degree from Grinnell College.

DR. FRED KOPFLER
Senior Environmental Scientist, EPA Gulf of Mexico Program

Dr. Fred Kopfler is a native of Louisiana. After a two year post-doctorate at the U.S. Department of Agriculture’s Protein Pioneering Laboratory in Philadelphia, PA, he worked at the US Public Health Laboratory at Dauphin Island, AL, investigating the pesticide and trace metal contaminants in shellfish. When the U.S. EPA was formed, he became one of the charter employees and moved to Cincinnati, OH, where he worked until 1989 on the health effects of chemical contaminants and disinfection by-products in drinking water. In 1989 he joined the newly formed Gulf of Mexico Program with offices at Stennis Space Center in Mississippi. At the EPA’s Gulf of Mexico Program he has worked on public health issues associated with the use of the Gulf’s waters and its seafood products including chemical contaminants of seafood, sewage pollution of shellfish growing waters and recreational waters, and harmful algal blooms.
**DR. CUAUHTÉMOC LEÓN DIEZ**  
CONABIO, Secretary of Environment and Natural Resources, Mexico

Dr. Cuauhtémoc León Diez holds a Bachelors degree in oceanography and a Masters degree in marine ecology. His special areas of interest include territorial planning, environmental impact assessment and coastal management. Prior to joining LEAD-Mexico as the Academic Director, he was involved in the design of the University’s Environmental Program, which included the curriculum review and research strategies at University of Baja California. He has been working in multi-disciplinary research teams with an emphasis in social sciences since 1989. At LEAD Cuauhtémoc León is responsible for coordinating, adapting and designing the national training sessions. Recent research is linked with regional coastal management approaches at the Gulf of California and Gulf of Mexico.

**GARY LYTTON**  
Director, Rookery Bay National Estuarine Research Reserve, Environmental Administrator, Florida Department of Environmental Protection

Mr. Gary Lytton has served as Director of the Rookery Bay National Estuarine Research Reserve in Naples, Florida, since 1990. He is responsible for administration and supervision of the 110,000 acre Reserve, working with over thirty on-site employees involved in research, education, and coastal stewardship. Current priority efforts at the Reserve include watershed restoration; technical training for Environmental Learning Center promotes public awareness and involvement in coastal stewardship. He also serves as the state’s Regional Administrator for Aquatic Preserves in Southwest Florida, supervising field offices and staff in Tampa Bay, Charlotte Harbor and Estero Bay. Mr. Lytton received his academic training in Biology and Marine Science at Virginia Polytechnic and State University, and at the University of South Florida in Tampa, where he was involved in field and laboratory studies investigating the effects of thermal effluents on fish populations in Tampa Bay.

**DR. TERRY MCCOY**  
Professor, University of Florida

Dr. Terry McCoy is a Professor of Latin American Studies and Political Science and the Director of the Center’s Latin American Business Environment Program (LABEP). He received his Ph.D. from the University of Wisconsin in 1969. He is also Associate Director of the Center for International Business Education and Research (CIBER) in the College of Business Administration. His current research focuses on the Latin American business environment. Recent publications include studies on the impact of economic globalization on the Caribbean, the prospects for continued economic reform in Latin America and the significance of the Free Trade Area of the Americas for Florida. McCoy teaches a graduate business course on the Latin American Business Environment and an upper level undergraduate course on the International Politics of Latin America.

**DR. LARRY MCKINNEY**  
Director, Coastal Fisheries Division, Texas Parks & Wildlife Department

Dr. Larry McKinney has served as the Texas Parks and Wildlife Director of Coastal Fisheries and the Senior Director of Aquatic Resources since 1986. His responsibilities are broad in range and include such areas as natural resource issues, water policy, coastal fisheries, assessment of freshwater inflows to estuaries, wetland conservation and restoration, endangered species conservation, and other issues related to the ecological health of Texas aquatic ecosystems. Dr. McKinney received his Ph.D. from Texas A&M University in 1976 and was a Research Associate and Instructor at Texas A&M University at Galveston from 1977 to 1980. Dr. McKinney was also the Director of the Texas Environmental Engineering Field Laboratory in Galveston from 1980-1986, Co-Chair and presenter at the 1996 International Symposium on Aral Sea - Water Quality Issues and Solutions in the Newly Independent States (formerly the USSR) of Central Asia, and President of the Texas Academy of Science from 2002 to 2003. He has published numerous articles in Texas Parks and Wildlife Magazine concerning the state of bays, rivers, and springs.

**DR. RICHARD J. MCLAUGHLIN**  
Endowed Chair for Coastal and Marine Policy and Law, Harte Research Institute for Gulf of Mexico Studies

Dr. Richard McLaughlin was named Endowed Chair for Coastal and Marine Policy and Law at the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University-Corpus Christi in June 2005. From 1987-2005, Dr. McLaughlin was Professor of Law and Ray and Louise Stewart Lecturer at the University of Mississippi School of Law. As Director of the Mississippi-Alabama Sea Grant Legal Program from 1987-99, he provided legal research and advice on a wide range of Gulf of Mexico issues to state officials and coastal constituents. In 2000, as Co-Principal Investigator and Interim Director, he successfully led the effort to obtain a $2 million grant from NASA to establish the National Remote Sensing and Space Law Center at the University of Mississippi School of Law.
DR. RICHARD G. NEWELL  
White House Council of Economic Advisors

Dr. Richard Newell is senior economist with the Council of Economic Advisors, on leave from his position as Senior Fellow at Resources for the Future (RFF). Dr. Newell is currently focusing on the economic analysis of policy design and performance, with a particular interest in technological change and incentive-based policy. His research applications encompass a range of environmental and natural resource issues, including energy efficiency, climate change, air pollution, valuation of costs and benefits over time, and fishery management. He has served as an adviser to state and federal agencies; international, business, and environmental organizations; and private firms. He is a member of the American Economics Association, the Royal Economic Society, the Association of Environmental and Resource Economics, and the European Association of Environmental and Resource Economics. He has a Ph.D. in Public Policy from Harvard University, a M.P.A. from Princeton University’s Woodrow Wilson School, and a B.S. in Materials Engineering and a B.A. in Philosophy from Rutgers University.

DR. LINWOOD PENDLETON  
Associate Professor, University of California-Los Angeles

Dr. Linwood Pendleton is currently an Associate Professor at the UCLA School of Public Health, Department of Environmental Health Sciences, Program in Environmental Science and Engineering. Prior to joining UCLA in the Spring of 2004, Dr. Pendleton was an assistant professor of Economics, International Relations, and Environmental Studies at the University of Southern California and an assistant professor of Economics and Finance at the University of Wyoming. His current research focuses on the economics of environmental goods and services, especially those in the coastal zone. In addition to the Ocean Economics Program, Dr. Pendleton also is a researcher on two other major projects that all seek to better inform policymakers about coastal and marine non-market values. Dr. Pendleton received a B.S. in Biology (with a chemistry minor) from the College of William and Mary, an M.A. in Biology from Princeton University (for studies in tropical ecology), a Masters of Public Administration from Harvard’s Kennedy School of Government, and a Doctor of Forestry and Environmental Studies in Natural and Environmental Resource Economics from the School of Forestry and Environmental Studies at Yale University.

DR. NANCY N. RABALAIS  
Executive Director, Louisiana Universities Marine Consortium

Dr. Nancy Rabalais is Executive Director and Professor at the Louisiana Universities Marine Consortium. Her research interests include the dynamics of hypoxic environments, interactions of large rivers with the coastal ocean, estuarine and coastal eutrophication, environmental effects of habitat alterations and contaminants, and science policy. Dr. Rabalais is an American Association for the Advancement of Science Fellow, an Aldo Leopold Leadership Program Fellow, a Past President of the Estuarine Research Federation, a National Associate of the National Academies of Science, and past Chair of the Ocean Studies Board of The National Academies. She received the 2002 Bostwick H. Ketchum Award for coastal research from the Woods Hole Oceanographic Institution and several research and environmental awards for her work on the causes and consequences of Gulf hypoxia. She obtained her B.S. and M.S. in Biology from Texas A&I University, and her Ph.D. in Zoology from The University of Texas at Austin.

ROBIN RIECHERS  
Chair of Gulf Fisheries Council and Director of Fisheries Policy, Texas Parks and Wildlife Department

Mr. Robin Riechers is Texas Parks and Wildlife Department’s science and policy director for its Coastal Fisheries Division. He has been working in fisheries management and policy for over 16 years with the Texas Parks and Wildlife Department. He currently is the Director of the Science and Policy Branch for the Coastal Fisheries Division, which is responsible for designing and developing research programs and management strategies to insure the long-term sustainability of the coastal resources of Texas. Mr. Reichers has served on many state and federal advisory panels dealing with fishery management issues and currently serves as the Texas Coastal Fisheries representative on the Gulf of Mexico Fishery Management Council. His primary research activities have focused on the research and evaluation of the human dimension aspects of both the recreational and commercial fisheries of Texas. Recent emphasis has been in the development of license management programs for the inshore commercial shrimp, commercial crab and commercial finfish fisheries, which were the first comprehensive limited entry programs in Texas fisheries.
RAUL RODRIGUEZ
Chairman, North American Center for Transborder Studies, Arizona State University

Mr. Raul Rodriguez, until recently served as CEO and Managing Director of the North American Development Bank (NADBank), capitalized and governed equally by the United States and Mexico for the purpose of financing infrastructure and providing technical assistance and training for community development along the U.S.-Mexico border. Prior to joining the NADBank, he was Executive Director of the Mexican Foreign Trade Bank; Mexico’s Trade Commissioner in Canada during the NAFTA negotiation; and Secretary of Economic Development for the Mexican border State of Tamaulipas. Over the past 30 years, Mr. Rodriguez has developed a broad range of international relationships with business and government leaders. He has been involved in funding and project development of basic infrastructure, employment, environmental, health, and education programs. He excels in building public-private links and partnerships.

DR. ROBERT R. TWILLEY
Director, Wetland Biogeochemistry Institute, Louisiana State University

Dr. Robert Twilley is professor in the Department of Oceanography and Coastal Science and director of the Wetland Biogeochemistry Institute at Louisiana State University. Most of Dr. Twilley’s research has focused on coastal wetlands both in the Gulf of Mexico, throughout Latin America, and in the Pacific Islands. He was recently selected as Distinguished Professor in Louisiana Environmental Studies at LSU. His current focus is developing ecosystem models, coupling natural and social system science with engineering, to forecast the rehabilitation of coastal and wetland ecosystems as Principal Investigator of the Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) program. In addition, he is working with NSF programs (NCED and FCE/LTER) to develop ecogeomorphic framework for coupled morphodynamic and ecosystem models. Developing a coastal systems and society program is part of his present responsibility as Associate Vice Chancellor for Research and Economic Development at LSU.

DR. TRACY A. VILLAREAL
Associate Professor, University of Texas Marine Science Institute

Dr. Tracy Villareal received his bachelors and masters degrees from Texas A&M University and his Ph.D. at the University of Rhode Island before taking the position Associate Professor at the University of Texas Marine Science Institute. Dr. Villareal specializes in phytoplankton ecology research. He has two major research areas: the autecology of the oceanic species that represent the largest known phytoplankton, and harmful algal blooms along the Texas coast. Dr. Villareal’s lab uses both field and laboratory studies to understand phytoplankton community responses.

DR. BILL WALKER
Mississippi Department of Natural Resources

Dr. Bill Walker is Executive Director of Mississippi Department of Marine Resources. Dr. Walker’s research interests include fate and effects of pesticides/toxins in natural environments, bioassay evaluations (bioaccumulation, food chain transfer, sub-lethal effects), and toxic/carcinogenic responses in small fish species. Dr. Walker has published over 40 peer-reviewed articles and made over 100 national and regional presentations.

DR. DAVID W. YOSKOWITZ
Associate Professor, Texas A&M University-Corpus Christi

Dr. David Yoskowitz is an Associate Professor of Economics in the College of Business at Texas A&M University-Corpus Christi and a partner in the consulting firm Cynergy Insight, LLC. His research has involved the evaluation of water markets in the Southwestern United States as well as the interaction of business and the environment. He is currently heading a study on valuing multiple ecological assets in the northwestern Gulf of Mexico region. Prior to his current appointment he was on the faculty at Texas A&M International University and Texas Tech University.
The founder of the Harte Research Institute for the Gulf of Mexico, Ed Harte, has made a challenge: “Make a difference.” Edward H. Harte’s generous gift of $46 million to Texas A&M University-Corpus Christi for the establishment of the Harte Research Institute for Gulf of Mexico Studies goes to show he is willing to make significant and enduring sacrifices so that others may benefit in the long-term. This was not the first time the former owner of the Corpus Christi Caller-Times newspaper and Harte-Hanks Publishing had made significant strides to be a steward of the environment. In the mid-1980s, Harte and his brother Houston, added 66,000 acres to Big Bend National Park by donating their ranch at the foothills of the Rosillos Mountains. It is this sort of generosity that made him an undisputed champion of conservation. He was appropriately named “A Man for All Seasons” by accepting the Harvey Weil Sportsman Conservationist Award in 2004. Through his activities in habitat protection, drilling regulation, and institutional work, he has created a legacy that will leave South Texas and the world a better place. With regard to habitat protection, Mr. Harte made major contributions in encouraging and lobbying for the purchase and protection of Mustang Island State Park and Padre Island National Seashore. With respect to drilling, Mr. Harte convened a citizens’ group to set limits on offshore oil and gas drilling in Corpus Christi Bay, which became the first municipal regulations of drilling in the country, and a model for future state and federal standards. He also made major contributions to the leadership and management of the National Audubon Society, from the 1960s through the 1990s, including serving as its chairman of the board.

In addition to environmental contributions, Mr. Harte and his wife have given gifts in excess of $20 million to charities and other organizations, including a gift to establish the Performing Arts Center at Texas A&M University-Corpus Christi.