Conference Program/Abstracts

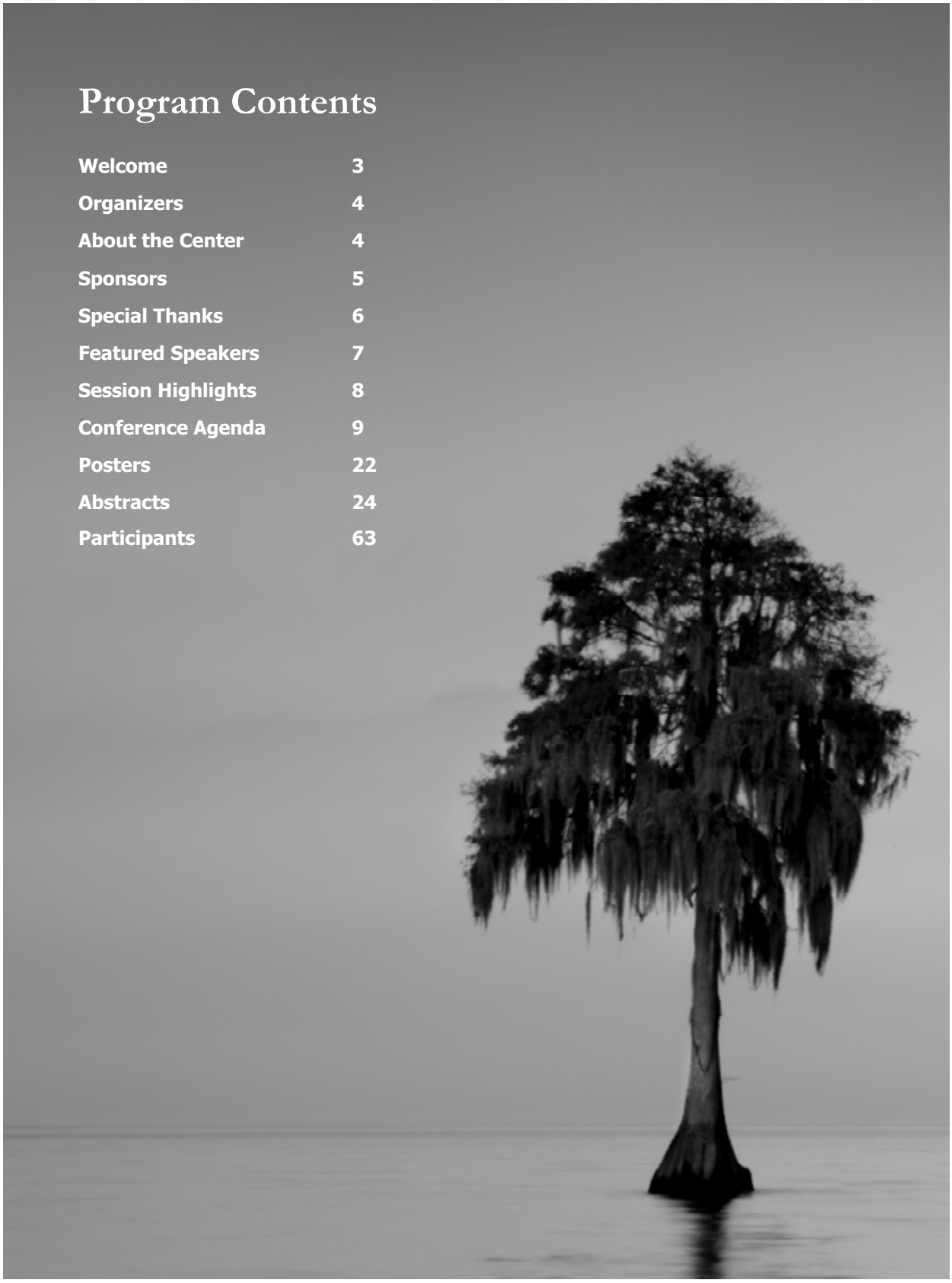
CNREP 2010

Challenges of Natural Resource Economics & Policy

3rd National Forum on Socioeconomic Research in Coastal Systems

May 26 - 28 **New Orleans**

Program Contents



Welcome!

Welcome to New Orleans and thank you for joining us for *CNREP 2010: Challenges of Natural Resource Economics and Policy: The Third National Forum on Socioeconomic Research in Coastal Systems.*

When last we met during *CNREP 2007*, the Gulf coast was still in the early stages of recovery from the record 2005 hurricane season. The socioeconomic work highlighted at that meeting, and the collaborations that were formed for future research and outreach activities, were instrumental in developing many of the post-hurricane assessment and response programs that are currently in place around the Gulf. Today, the region again confronts challenges that transcend state boundaries with the explosion and sinking of the Deep Water Horizon platform and the subsequent oil spill.

While the long-run environmental and economic impacts of the Horizon spill remain largely unknown at this point, the timing of *CNREP 2010* provides social scientists interested in coastal and marine issues with a unique opportunity. By sharing our current research and outreach expertise, and using the forum to once again organize for future collaboration, we can help satisfy a growing need for science-based information in the region. In short, your collective expertise in the areas of natural resource economics and policy is once again positioned to answer the critical questions facing the Gulf States and the nation. We are confident that our respective professions will rise to the occasion.

We hope that you will enjoy the *CNREP 2010 Forum*, that you will find it professionally and personally rewarding, and that you will be able to take from the meeting a better understanding of the important economic and policy issues of our day. Once again, we welcome you to New Orleans, and extend to you our best wishes for a productive and enjoyable conference.

Sincerely,

Rex H. Caffey
CNREP 2010 Conference Co-Chair

Richard F. Kazmierczak, Jr.
CNREP 2010 Conference Co-Chair

About the Cover: Titled "Inevitable," this image of the iconic Louisiana Bald Cypress and its implied battle against both nature and the actions of man is the work of coastal resident and Louisiana native David Chauvin. www.DavidChauvinPhotography.com

Conference Organizers

Conference Co-Chairs

Rex Caffey, Ph.D., Professor and Director, Center for Natural Resource Economics & Policy, LSU AgCenter and Louisiana Sea Grant, Department of Agricultural Economics & Agribusiness, LSU
Richard F. Kazmierczak, Jr., Ph.D., Professor of Resource Economics and Director of Graduate Studies, Center for Natural Resource Economics & Policy, Department of Agricultural Economics and Agribusiness, LSU Agricultural Center.

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James G. Wilkins, J.D., Director of Legal Advisory Service, Center for Natural Resource Economics & Policy, Louisiana Sea Grant Law and Policy Program

About the Center

The Center for Natural Resource Economics & Policy (CNREP) was established in January 2004 to coordinate the activities of resource economists and policy professionals at LSU and other institutions in the southeastern US. The center functions as a research and extension cooperative, providing a focal point for social scientists by organizing and marketing their efforts to those agencies seeking the socioeconomic information required to fully evaluate new environmental programs and projects.

To learn more about CNREP go to: www.cnrep.lsu.edu

Sponsors

The Center for Natural Resource Economics and Policy wishes to thank the following sponsors for their cooperation and generous support of *Challenges of Natural Resource Economics and Policy, the 3rd National Forum on Socioeconomic Research in Coastal Systems*:

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SERA 30 Southern Natural Resource Economics Committee
http://nimss.umd.edu/homepages/home.cfm?trackID=6576

W2004: Marketing, Trade, and Management of Aquaculture & Fishery Resources
http://nimss.umd.edu/homepages/home.cfm?trackID=11456

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Special Thanks

It is with great appreciation that we recognize the following individuals for their support, guidance, and assistance in preparing for this conference:

William B. Richardson, Chancellor, LSU Agricultural Center
Chuck Wilson, Executive Director, Louisiana Sea Grant College Program
Paul Coreil, Extension Director and Associate Vice Chancellor, LSU Agricultural Center
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Gail Cramer, Professor and Head, LSU Department of Agricultural Economics & Agribusiness
Katie Lea, Assistant to the Director, Louisiana Sea Grant College Program
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Jerome Zeringue, Deputy Director, Coastal Protection and Restoration Authority of Louisiana
Garret Graves, Director, Louisiana Office of the Governor, Coastal Activities
Cynthia Duet, Deputy Director, Louisiana Office of the Governor, Coastal Activities
Jay Ritchie, Social Sciences Coordinator, Northern Gulf Institute
Janet Haselmaier, Professional Staff, Northern Gulf Institute
Joe Cancienne, Project Manager, Tetra Tech Inc.
Shirley Laska, Director, Center for Hazard Assessment Response and Technology, UNO
Kris Peterson, Center for Hazard Assessment Response and Technology, UNO
Scott Wilson, USGS National Wetland Research Center
Cheryl Broadnax, Marine Fisheries Habitat Specialist, NOAA Restoration Center
Harry Luten, Regional Sociologist, Environmental Studies Program, Minerals Management Service
Terry McTigue, Deputy Director, NOAA Center for Coastal Monitoring and Assessment
Margaret Davidson, Director, NOAA Coastal Services Center
Kerry ST. Pe, Director, Barataria-Terrebonne National Estuary Program
Ryan Bourriaque, Assistant Planner, Cameron Parish Planning & Development
Alex Miller, Economist, Gulf States Marine Fisheries Commission
Hans G. Vogelsong, Associate Professor, Dept. of Recreation and Leisure Studies, East Carolina University
Sherry Larkin, Associate Professor, Food and Resource Economics Dept., University of Florida
Laila Racevskis, Assistant Professor, Food and Resource Economics Dept., University of Florida
Lucila Cobb, Brown and Caldwell, Inc.

Graduate Students:
Arun Adhikari, Tyler Mark, Narayan Nyaupane, Hua Wang, Cristian Nedelea, Gnel Gabrielyan, David Maradiaga, Sachin Chintawar, Cheikhna Dedah, Michelle Savolainen, Hiroki Uematsu, Mahesh Pandit, Chase Edwards, and Huabo Wang

Featured Speakers

Plenary Session (Thursday May 27th)

Coastal Community Vulnerability
Parallel Perspectives from the Gulf of Mexico and Alaska

Abby (Asbury) Sallenger
Dr. Abby Sallenger is an oceanographer who received his B.A. in Geology and Ph.D. in Marine Science from the University of Virginia. He is the former Chief Scientist of the U.S. Geological Survey's Center for Coastal Geology and presently leads the USGS storm impact research group, investigating how the coast changes during extreme storms. His narrative nonfiction book *Island in a Storm* has been featured in the New York Times and on NPR's Morning Edition. In 2007, Abby received the "Shoemaker Award for Lifetime Achievement in Communications" that "honors a USGS scientist who demonstrates great skill in presenting complex concepts to non-technical audiences." In 2009, he received a "Special Award in Oceanography" from the 2009 National Hurricane Conference "for revolutionizing the study of hurricane impacts." Dr. Sallenger's presentation will address the dynamic history of coastal landscapes and communities in the northern Gulf of Mexico and the potential implications of a warming climate.

Gunnar Knapp
Dr. Gunnar Knapp is a Professor of Economics at the University of Alaska Anchorage Institute of Social and Economic Research, where he has worked since receiving his Ph.D. in Economics from Yale University in 1981. For the past 29 years, he has researched and taught about Alaska's economy and the management of Alaska's natural resources, particularly the state's fisheries. He is widely known in the seafood industry for his research on wild salmon markets, the effects of competition with farmed salmon on the Alaska wild salmon industry, and the dramatic changes in the seafood industry associated with globalization, the growth of aquaculture, and the adoption of "rights-based" systems for the management of wild fisheries. Dr. Knapp's presentation will focus on potential impacts and policy issues associated with climate change and what they might mean for Alaska's coastal communities and resource-based industries.

Lunch Session (Thursday May 27th)
Washed Away: The Invisible People of Louisiana's Wetlands

Don Davis
Dr. Davis is a geographer. His undergraduate B.A. was completed at California University, Hayward. His Ph.D. in Geography with a minor in Marine Science is from Louisiana State University. For seventeen years Dr. Davis was on the faculty at Nicholls State University in Thibodaux, Louisiana. In 1990 he joined LSU's research faculty, until his retirement in 2009. While at LSU he worked in the Center for Coastal, Energy, and Environment Resources for three years. In 1993 he became the Administrator for the state's Oil Spill Research and Development Program. Don's professional career has focused on investigating various human/land issues in Louisiana's wetlands. In this regard, he has written or co-authored numerous papers on these topics. Currently, he is involved in projects related to restoring Louisiana's wetlands and understanding the wide array of human impacts on this environment. In addressing this challenge he has just published: *Washed Away: The Invisible People of Louisiana's Wetlands*. His address will focus on the people involved in the economic transformation of Louisiana's near sea-level marshes and swamps.

Session Highlights

SERA-30 Southern Natural Resource Economics Committee

The triennial CNREP conference will once again be held in conjunction with the annual meeting of the USDA Southern Extension and Research Association (SERA-30) committee. This information exchange working group integrates research and extension programs related to natural resource economics. A total of six SERA 30 sessions will be held from Thursday, May 27 to Friday May 28.

W2004 Multistate Project: Marketing and Management of Aquaculture and Fishery Resources

The CNREP 2010 conference will host a multi-state meeting of aquaculture and fisheries economists that will focus on the marketing, trade, and management issues found in various aquaculture and fishery resources in the U.S. and around the world. Emphasis will be placed on the analysis of emerging and innovative technologies, the role of property and stakeholder rights, the spatial organization of management, markets and infrastructure, and market coordination and integration. A total of six W2004 sessions will be held from Thursday, May 27 to Friday May 28.

Perspectives of Coastal Changes and Resilience from Alaska and Louisiana Community Citizens

Engaged citizens of several Louisiana communities (Point au Chien, Isle de Jean Charles, Dulac and Grand Bayou Village) will dialogue with several representatives of coastal communities on the northern slope of Alaska , Prince William Sound and Newtok. Discussion will include the similarities of risks and the ways in which communities are addressing them including building resilience and adaptation from a coastal, historied perspective (Track 2A, Thursday, May 27).

MMS Socioeconomics Forum

The Minerals Management Service (MMS) is coordinating a series of sessions highlighting principal investigators of socioeconomic research projects it has funded in the past decade. Selected contributors from these sessions will assist in identifying themes for a potential edited book highlighting the historical impact the off-shore oil and gas industry has had on communities and their economies in the Gulf of Mexico region (Tracks 2B and 2C, Thursday, May 27 and Tracks 2B and 2C, Friday May 28).

Understanding Fisheries Management

Commercial and recreational fishermen have becoming increasingly critical of state and federal fisheries management. In some cases, criticism arises from a lack of targeted outreach on the rationale and mechanics of specific policy actions. This session will focus on revision of the publication "Understanding Fisheries Management." An expert panel convened by Sea Grant legal and marine extension faculty will provide updates and lead a discussion on the biological, economic, and legal contributions needed for the third revision of this fisheries extension publication (Track 2D, Friday May 28).

The Horizon Oil Spill: Economic Assessment and Extension Challenges

This session will feature a moderated discussion of the status and challenges of economic research and extension in the wake of the Deep Water Horizon Oil Spill. While it is still too early to know the full range of economic implications of the Horizon incident, the session provides an opportunity to explore strategies for conducting economic impact assessment and the delivery of potential disaster assistance programs for coastal stakeholders in the Gulf of Mexico region (Track 3C, Friday May 28).

Conference Agenda

Wednesday, May 26, 2010	
1:00 pm to 5:30 pm Arcade	**Registration Desk Open**
1:00 pm to 5:30 pm Esplanade	**Speaker Resource Room Open**
1:00 pm to 5:30 pm Evangeline	**Poster/Display Set-Up**
3:00 pm to 5:00 pm Royal Conti	**W2004 Business Meeting**
6:00 pm to 9:00 pm Bourbon Balcony Suite Room 3175	**CNREP 2010 Opening Reception and Conference Social** Be sure to join us on Wednesday evening, May 26th for the CNREP 2010 Opening Reception and Conference Social. This event will be an opportunity to socialize with other participants while enjoying a variety of hor'dourves and complimentary beverages. The reception will take place in the Royal Sonesta's premier balcony suite overlooking the Bourbon street. This reception is sponsored by the LSU Center for Natural Resource Economics & Policy.
Thursday, May 27, 2010	
7:00 am to 5:30 pm Arcade	**Registration Desk Open**
7:00 am to 5:30 pm Esplanade	**Speaker Resource Room Open**
7:00 am to 12:00 pm Evangeline	**Poster Set-Up**
7:00 am to 8:30 am Foyer	**Breakfast Buffet**
8:30 am to 10:15 am South Ballroom	**CNREP 2010 Plenary Session** **8:30 Welcome and Opening Announcements** Rex H. Caffey, Director, LSU Center for Natural Resource Economics & Policy Paul Coreil, Vice Chancellor and Director, LSU Agricultural Center Charles A Wilson, Executive Director, Louisiana Sea Grant College Program **9:00 Coastal Community Vulnerability:** **Parallel Perspectives from the Gulf of Mexico and Alaska** Abby (Asbury) Sallenger, U.S. Geological Survey's Center for Coastal Geology Gunnar Knapp, University of Alaska Anchorage Institute of Social and Economic Research
10:15 am to 10:30 am Foyer	**Coffee Break**

Thursday, May 27, 2010 **10:30am to 12:00pm** Bienville **Moderator:** Tracie Sempier Mississippi-Alabama Sea Grant Consortium	**Track 1A** **Resiliency and Coastal Communities** **Towards a Resilient Coast and Resilient Communities**, Michele Deshotels, Louisiana Office of Coastal Protection and Restoration **The Role of Social Capital In Coastal Communities' Resilience to Climate Change**, Jordan W. Smith, Dorothy H. Anderson, Roger L. Moore, North Carolina State University **Assessing Coastal Community Resilience**, Tracie Sempier, LaDon Swann, Steve Sempier, Mississippi-Alabama Sea Grant Consortium; Rod Emmer, Louisiana Sea Grant College Program **Mapping vulnerability to climate change in the US South**, Jasmine Waddell, Oxfam America
Thursday, May 27, 2010 **10:30am to 12:00pm** South Ballroom **Moderator:** Kristina Peterson UNO-CHART University of New Orleans	**Track 2A** **Perspectives of Coastal Changes and Resilience:** **Alaska and Louisiana Community Citizens** *(sponsored by NOAA Coastal Services Center)* **Panel Discussion** Faith Gemmill, Arctic Village, Alaska Patience Faulkner, Prince William Sound, Alaska Elizabeth Tom, Newtok Community, Alaska Stanley Tom, Newtok Community, Alaska Teresa Dardar, Pointe aux Chennes, Louisiana Albert Naquin, Isle de Jean Charles, Louisiana
Thursday, May 27, 2010 **10:30am to 12:00pm** Bourbon **Moderator:** Jack Isaacs Louisiana Department of Wildlife and Fisheries	**Track 3A** **Economics of Recreational Fisheries** *(a W2004 affiliated session)* **Determining Efficient Management Strategies for the Recreational Red Snapper Fishery Gulf of Mexico**, Wade Griffin and Richard Woodward, Texas A&M University **Economic Aspects Associated with Large Ship Artificial Reefs**, William L. Huth University of West Florida; Ash Morgan, Appalachian State University **WTP for Artificial Reefs in Florida by Three Diverse Stakeholder Groups**, Kristen Lucas, Sherry L. Larkin and Charles M. Adams, University of Florida **2009 Economic Survey of the Recreational For-Hire Fishing Sector in the U.S. Gulf of Mexico**, Michelle A. Savolainen, Rex H. Caffey, CNREP, Louisiana Sea Grant, and Louisiana State University Agricultural Center; Matthew A. Freeman, CNREP and Louisiana Sea Grant

Thursday, May 27, 2010 **10:30am to 12:00pm** Royal Conti **Moderator:** Tina Willson CNREP and University of Wyoming	**Track 4A** **Economics of Coastal and Water-Based Recreation** *(a SERA 30 affiliated session)* **How a Random Utility Model can Assist in Recreational Policy: The Case of Public Boat Ramp Investments in Lee County Florida** Michael Thomas, Florida A&M University; Frank Lupi, Michigan State University; David Harding, Florida Fish and Wildlife Conservation Commission **The Value of Public Access to Great Lake Beaches**, Feng Song, Frank Lupi and Michael Kaplowitz, Michigan State University **Wind Turbines and Coastal Recreation Demand**, Craig Landry and Tom Allen, East Carolina University; Todd Cherry and John Whitehead, Appalachian State University **An Economic Valuation of the Recreational Fisheries in Sardis and Grenada Lakes**, Clifford Hutt, Kevin Hunt, Leandro Miranda and Steve Grado, Mississippi State University
Thursday, May 27, 2010 **12:00pm to 1:30pm** North Ballroom	**Lunch** **Washed Away: The Invisible People of Louisiana's Wetlands** Don Davis, Louisiana Sea Grant College Program
Thursday, May 27, 2010 **1:30pm to 3:00pm** Bienville **Moderator:** Ryan Bourriaque Cameron Parish Planning and Development	**Track 1B** **Capacity and Planning in Coastal Communities** *(sponsored by Cameron Parish)* **Coastal Community Hazard Mitigation and Community Rating System of NFIP** Craig Landry and Jingyuan Li, East Carolina University **Perceptions of 'The Wolf at the Door': Preliminary Findings On Changing Capacities Among Local Officials in the Coastal Zone**, Carla Norris-Raynbird Bemidji State University, MN; Joel Devalcourt, University of New Orleans **Scenario-Based Studies to Focus Planning in Coastal Regions**, Scott Thomas, Stetson Engineers, Inc. and Division of Earth and Ecosystem Sciences, Desert Research Institute **Transportation Issues and Concerns for Evacuation in Rural Coastal Counties of the Northern Gulf of Mexico**, Jaydeep Chaudhari, Janelle Booth, Jared Ye and David Kack, Western Transportation Institute, Montana State University-Bozeman

Thursday, May 27, 2010 **1:30pm to 3:00pm** South Ballroom **Moderator:** Kristen Strellic Minerals Management Service	**Track 2B** **Understanding the Changing Economic Impact of the Oil and Gas Industry in the Gulf of Mexico Region: Lessons from the Past to Improve Coastal Communities in the Future** *(sponsored by Minerals Management Service - MMS)* **Panel Discussion** Mark Henry, Professor Emeritus, Department of Applied Economics and Statistics, lemson University David Hughes, Professor, Department of Applied Economics and Statistics, Clemson University J. Matthew Fannin, Assistant Professor, Department of Agricultural Economics and Agribusiness, Louisiana State University Agricultural Center Kristen Strellic, Minerals Management Service
Thursday, May 27, 2010 **1:30pm to 3:00pm** Bourbon **Moderator:** Sherry Larkin University of Florida	**Track 3B** **Capacity Reduction and Distribution in Fisheries** *(a W2004 affiliated session)* **Dynamics of Permit Transfers in Alaska Salmon Fisheries**, Gunnar Knapp, Institute of Social and Economic Research, University of Alaska Anchorage **Thinking Through Catch Share Programs: Lessons Learned About Property Rights and Institutional Design from the New Zealand Rock Lobster Experience**, Tracy Yandle, Emory University **Assessing Technical Efficiency Implications of Capacity Reduction Programs: A Study of Vessel Buyouts in California**, Aaron T. Mamula, Santa Cruz Lab, Southwest Fisheries Science Center, NOAA Fisheries; Trevor C. Collier, University of Dayton; Janet Mason, Pacific Grove Lab, Southwest Fisheries Science Center, NOAA Fisheries **Experiments in the Lobbying Activity of Fishers with Heterogeneous Preferences**, Matthew A. Freeman, CNREP and Louisiana Sea Grant; Christopher M. Anderson, University of Rhode Island
Thursday, May 27, 2010 **1:30pm to 3:00pm** Royal Conti **Moderator:** James Henderson CNREP and Mississippi State University	**Track 4B** **Role of Weather on Resource Use** *(a SERA 30 affiliated session)* **Impacts of Media Coverage of Coastal Weather Events on Attendance Levels at Northern Gulf State Parks**, Kimberly Morgan and James S. Harris, Mississippi State University **Valuing Weather Information Networks: Changes in Frost Damage and Mitigation Costs from Diminished Resolution**, Jeffrey Mullen and Jennifer Kuhr, University of Georgia

	Factors Affecting Adoption of Cover Crops and Its Effect on Nitrogen Usage Among U.S. Farmers, Gnel Gabrielyan, Sachin Chintawar and John Westra, CNREP and Louisiana State University Agricultural Center
3:00pm to 3:30pm Foyer	**Coffee Break**
Thursday, May 27, 2010 **3:30pm to 5:00pm** Bienville **Moderator:** Doug Daigle CREST Louisiana State University	**Track 1C** **Planning and Recovery in Coastal Communities** **New Orleans and Venice: Coastal Cities at Risk**, John W. Day, Jr. and Doug Daigle, Louisiana State University **Hurricane Evacuation Behavior in Florida: The Impact of Location and Within Season Experience on the Evacuation Choice**, Daniel Solis, University of Miami; Michael Thomas, Florida A&M University; David Letson, University of Miami **Role of Public Transportation and School Buses in the Resiliency of Rural Coastal Communities**, Jaydeep Chaudhari, Janelle Booth, Jared Ye and David Kack, Western Transportation Institute, Montana State University-Bozeman **Economic Recovery of Commercial and Recreational Fishing Fleets Following Natural Disasters**, Benedict Posadas, Mississippi State University
Thursday, May 27, 2010 **3:30pm to 5:00pm** South Ballroom **Moderator:** Harry Luton Minerals Management Service	**Track 2C** **Understanding the Changing Social Impact of the Oil and Gas Industry in the Gulf of Mexico Region: Lessons from the Past to Improve Coastal Communities in the Future** ***(sponsored by Minerals Management Service - MMS)*** **Panel Discussion** Troy Blanchard, Associate Professor, Department of Sociology, Louisiana State University Carson Mencken, Professor, Department of Sociology, Baylor University Bob Gramling, Professor, Department of Sociology, University of Louisiana Lafayette Craig Forsyth, Professor and Head, Department of Criminal Justice, University of Louisiana Lafayette Harry Luton, Minerals Management Service
Thursday, May 27, 2010 **3:30pm to 5:00pm** Bourbon **Moderator:** Walter R. Keithly, Jr. CNREP and Louisiana State University	**Track 3C** **Marketing and Health Impacts of Fisheries** ***(a W2004 affiliated session)*** **Oyster Demand Adjustments to Counter-Information and Source Treatments in Response to Vibrio vulnificus**, O. Ashton Morgan, John C. Whitehead, Appalachian State University; Gregory S. Martin, Northern Kentucky University; William L. Huth and Richard Sjolander, University of West Florida

	Consumer Preferences for Wild Caught and Farm Raised Seafood: A Comparison Across Species and Consumer Residence States, Kelly Davidson, NOAA and University of Hawaii; Minling Pan, NOAA Pacific Islands Fisheries Science Center; Wuyang Hu and Devi Poerwanto, University of Kentucky **Educational Differences in Recreational Fisherman Behavior Regarding Seafood Consumption Advisories**, O. Ebenezer Ogunyinka and David R. Lavergne, Socioeconomic Research and Development Section, Louisiana Department of Wildlife and Fisheries **A Bioeconomic Model for Managing Harvest Size/Mercury Contamination Tradeoffs in King Mackerel**, Tina M. Willson; CNREP and University of Wyoming; Richard F. Kazmierczak, Jr, CNREP and Louisiana State University Agricultural Center
Thursday, May 27, 2010 **3:30pm to 5:00pm** Royal Conti **Moderator:** Laila Racevskis University of Florida	**Track 4C** **Southern Extension and Research Activity 30 (SERA 30)** **Business Meeting and Project Discussion**
Thursday, May 27, 2010 **5:00pm to 6:30pm** Evangeline	**Poster Viewing** Enjoy a complimentary beverage or two while viewing the CNREP 2010 posters during the manned poster session.
Thursday, May 27, 2010 **6:30pm to 8:30pm** Begue's Restaurant	**CNREP 2010 Dinner-Social** Begue's Restaurant in the Royal Sonesta Hotel has been reserved for the CNREP 2010 Dinner-Social to be held on Thursday night, May 27th, from 6:30 to 8:30pm. The banquet will feature an expansive seafood buffet. Tickets for the banquet are $30 per person while space exists (there is a limit of 80 seats).
Thursday, May 27, 2010 **6:30pm to 8:30pm** Bourbon Balcony Suite (Room 3175)	**Graduate Student Dinner-Social** All graduate students attending CNREP 2010 are invited to attend a casual meet-and-greet social to be held in the Bourbon Balcony Suite (Room 3175) from 6:30 to 8:30 pm. Enjoy a light complimentary dinner before heading out on the town to explore the city.

Friday, May 28, 2010	
7:00 am to 3:00 pm Arcade	**Registration Desk Open**
7:00 am to 3:00 pm Esplanade	**Speaker Resource Room Open**
7:00 am to 8:30 am Ballroom Foyer	**Continental Breakfast**
Friday, May 28, 2010 **8:30am to 10:00am** Bienville **Moderator:** Terry McTigue NOAA Center for Coastal Monitoring and Assessment	**Track 1A** **Valuing Coastal Services and Restoration** **Freshwater Management and Estuary Value**, Christopher S. Burkart and William L. Huth, University of West Florida **Cost-Efficacy in Wetland Restoration Projects in Coastal Louisiana**, Joy Merino, National Marine Fisheries Service, Southeast Fisheries Science Center, Estuarine Habitats and Coastal Fisheries Laboratory; C. Aust, CNREP and Louisiana State University Agricultural Center; D. Johnson, IAP World Services; Rex H. Caffey, CNREP, Louisiana Sea Grant and Louisiana State University Agricultural Center **Assessing the Benefits of Levees: An Economic Assessment of U.S. Counties with Levees**, Ezra Boyd, Louisiana State University Geography & Anthropology; Sandy Rosenthal, Executive Director, Levees.org **Gap Analysis Application to Personal Value Estimate**, Cristina Carollo and Dave Reed, Florida Institute of Oceanography; Rebecca J. Allee, NOAA
Friday, May 28, 2010 **8:30am to 10:00am** South Ballroom **Moderator:** Shirley Laska, University of New Orleans	**Track 2A** **Participatory Action Research (PAR) Forum** **Participatory Action Research**, Rosina Philippe, Grand Bayou Village; Kristina Peterson, UNO-CHART, University of New Orleans **Using PAR for Mitigating Coastal Storm Risk: Partnering with a Community's Economic Development Committee**, JoAnne DeRouen, George Wooddell and Bob Gramling, University of Louisiana at Lafayette **Using PAR for Community Participation in Ecosystem Resiliency**, Matthew Bethel and Emily Danielson, University of New Orleans; John Troutman, Louisiana Office of Coastal Protection and Restoration; Marco Giardino, NASA Stennis Space Center; Maurice Phillips, Community of Grand Bayou, Louisiana
Friday, May 28, 2010 **8:30am to 10:00am** **Bourbon** **Moderator:** Terrill Hanson Auburn University	**Track 3A** **Aquaculture Production and Management** *(a W2004 affiliated session)* **The Impact of Catfish Imports on the U.S. Wholesale and Farm Sectors**, Andrew Muhammad, USDA Economic Research Service; Sammy J. Neal, USDA National Agricultural Statistics Service; Terrill R. Hanson, Auburn University ; Keithly G. Jones, USDA Economic Research Service

	Measuring Technical Efficiency Using Bayesian Method: The Case of Catfish Farming Industry, Adam Bouras, Felix Edoho and Emmanuel Ajuzie, Lincoln University; Aloyce Kaliba, Southern University and A&M College **Estimation of Catfish Production Function Using Cross-Sectional Survey Data**, Aloyce R. Kaliba, Southern University and A&M College; David Bouras, Lincoln University
Friday, May 28, 2010 **8:30am to 10:00am** Royal Conti **Moderator:** Dan Petrolia CNREP and Mississippi State University	**Track 4A** **Assessing the Economic Impacts of Restoration** *(a SERA 30 affiliated session)* **Recreational Impacts of Coastal Restoration Projects**, Joseph Berlin, URS Corp. **Preventing Land Loss in Coastal Louisiana: Estimates of WTP and WTA**, Daniel R. Petrolia, Mississippi State University; Tae-Goun Kim, Korea Maritime University **Non-market Valuation of Coastal Environment: Uniting Political Aims, Ecological and Economical Knowledge**, Linus Hasselström, Enveco Environmental Economics Consultancy, Ltd; Cecilia Håkansson, Swedish University of Agricultural Sciences; Katarina Östberg, KTH Royal Institute of Technology **The Lower St. John's River Basin Management Action Plan: Assessing Agricultural, Local Government and Environmental Perspectives**, Laila Racevskis, Tatiana Borisova and Jennison Kipp, University of Florida
10:00am to 10:30am Foyer	**Coffee Break**
Friday, May 28, 2010 **10:30am to 12:00pm** Bienville **Moderator:** Melissa Trosclair Daigle CNREP and Louisiana Sea Grant Law and Policy Program	**Track 1B** **Approaches to Managing Coastal Wetlands and Restoration** **Spatial Economics of the Louisiana Wetland Mitigation Banking Industry**, Ryan Bourriaque, Cameron Parish Planning and Development; Rex Caffey, CNREP, Louisiana Sea Grant and Louisiana State University Agricultural Center **Reimagining 2005: The Economic Value of Southeastern Louisiana's Wetlands in Terms of Surge Protection**, Don L. Coursey and Megan Milliken, University of Chicago **A Multiparty Approach to Inventory and Valuation of Ecosystem Services in the Coastal Zone of the Gulf of Mexico**, David W. Yoskowitz and Carlota Santos, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University-Corpus Christi **Aligning Methods for Incorporating Ecosystem Services into Evaluation and Monitoring of Wetland Restoration Projects: Policy Implications, Available Approaches and Research Needs**, Anthony Dvarskas, NOAA Office of Response and Restoration

Friday, May 28, 2010 **10:30am to 12:00pm** South Ballroom **Moderator:** Troy Blanchard Louisiana State University	**Track 2B** **Socio-Economic Dimensions of the Energy Industry on the Coastal Economy I** *(sponsored by Minerals Management Service - MMS)* **Mitigation of the Human Dimensions of Spills in Coastal Louisiana: Collaboration Between NOAA's Office of Restoration and Louisiana Sea Grant**, Heather Ballestero, Coastal Response Research Center, University of New Hampshire; Mimi Becker, Natural Resources and Environmental Policy, University of New Hampshire; Nancy Kinner, Coastal Response Research Center Co-Director, University of New Hampshire **Oil and Gas Employment and Population in Louisiana**, Troy Blanchard, Department of Sociology, Louisiana State University **On the Development of a Community Resiliency Index**, Nina Lam and Margaret Reams, Department of Environmental Sciences, Louisiana State University **Estimating Labor Force and Fiscal Modules for Coastal Louisiana Economies: Extension of the COMPAS Modeling Framework**, Arun Adhikari and J. Matthew Fannin, CNREP and Louisiana State University Agricultural Center
Friday, May 28, 2010 **10:30am to 12:00pm** **Bourbon** **Moderator:** Christopher Liese Southeast Fisheries Science Center NOAA Fisheries	**Track 3B** **Status and Dynamics of the Coastal Fishing Industry** *(a W2004 affiliated session)* **Marine Managed Areas Improve Human Well-being**, Giselle Samonte-Tan and Xuanwen Wang, Conservation International **Economic Status, Performance, and Impacts of the Gulf of Mexico Shrimp Fishery in 2008**, Christopher Liese, Southeast Fisheries Science Center, NOAA Fisheries; Jack Isaacs, Louisiana Department of Wildlife and Fisheries; Alex Miller, Gulf States Marine Fisheries Commission **Observing and Explaining the Dynamics of Coastal Fishing Communities: An Application to Ports in Northern California**, Cameron Speir, National Marine Fisheries Service; Caroline Pomeroy, California Sea Grant; Jon G. Sutinen, University of Rhode Island; Cynthia J. Thomson, National Marine Fisheries Service **Game Theoretical Models of Effort and Lobbying in a Heterogeneous CPR Setting**, Matthew A. Freeman, CNREP and Louisiana Sea Grant; Christopher M. Anderson, University of Rhode Island

Friday, May 28, 2010 **10:30am to 12:00pm** Royal Conti **Moderator:** John Westra CNREP and Louisiana State University Agricultural Center	**Track 4B** **Valuing Ecosystem Services** *(a SERA 30 affiliated session)* **Willingness to Pay for Environmental Improvements in the Presence of Warm Glow**, Matthew Interis, Mississippi State University; Timothy C. Haab, The Ohio State University **Working Towards an Ecosystem Service Valuation Standardization**, Pamela Kaval, University of Waikato, New Zealand **WTP for Red Tide Prevention, Mitigation, and Control Strategies in Florida**, Sherry L. Larkin, Charles M. Adams, University of Florida; John Whitehead, Appalachian State University **Preferences for Timing of Wetland Loss Prevention in Louisiana**, Ross Moore, Daniel R. Petrolia, Mississippi State University; Tae-goun Kim, Korea Maritime University
Friday, May 28, 2010 **12:00pm to 1:30pm** North Ballroom	**Lunch** **Presentation of IAAEM MS Thesis Award**
Friday, May 28, 2010 **1:30pm to 3:00pm** Royal Conti **Moderator:** James Wilkins CNREP and Louisiana Sea Grant Law and Policy Program	**Track 1C** **Policy Aspects of Coastal Zone Use** **Access to State Resources in the Atchafalaya Basin under Louisiana Law**, Melissa Trosclair Daigle, Louisiana Sea Grant Law and Policy Program **Serving Coastal Managers: Insights from NOAA's 2010 National Survey of Coastal Resource Managers**, Chris Ellis, NOAA Coastal Services Center **Legal Issues in Sea Level Rise Adaptation**, James Wilkins, Louisiana Sea Grant Law and Policy Program **How a Navigation Channel Contributed to Most of the Flooding of New Orleans During Hurricane Katrina**, Ivor van Heerden, Louisiana State University
Friday, May 28, 2010 **1:30pm to 3:00pm** South Ballroom **Moderator:** J. Matthew Fannin, CNREP and Louisiana State University Agricultural Center	**Track 2C** **Socio-Economic Dimensions of the Energy Industry on the Coastal Economy II** *(sponsored by Minerals Management Service - MMS)* **Social and Environmental Implications of OCS Oil and Gas Development**, John Weiss, Industrial Economics, Inc. **Social Vulnerability, Population Change, and Disaster: Examining the Nexus Following Hurricanes Katrina and Rita**, Tim Slack, Candice A. Myers and Joachim Singelmann, Louisiana State University and Louisiana State University Agricultural Center

	Fuzzy Set Profiling and Community Analysis Techniques, Mark Schafer, Louisiana State University and Louisiana State University Agricultural Center **Measuring Fiscal Health of Local Coastal Government Economies: Implications for Economic and Disaster Resiliency**, John D. Barreca and J. Matthew Fannin, CNREP and Louisiana State University Agricultural Center
Friday, May 28, 2010 **1:30pm to 3:00pm** Bienville **Moderator:** Chuck Adams University of Florida	**Track 3C** **The Horizon Oil Spill:** **Economic Assessment and Extension Challenges** This session will feature a moderated discussion of the status and challenges of economic research and extension in the wake of the Deep Water Horizon Oil Spill. While it is still too early to know the full range of economic implications of the Horizon incident, the session will provide a sounding board for preliminary methodologies for economic impact assessment and emerging disaster assistance programs for coastal stakeholders in the Gulf of Mexico region.
Friday, May 28, 2010 **1:30pm to 3:00pm** Bourbon **Moderator:** Michael Dunn CNREP and Louisiana State University Agricultural Center	**Track 4C** **Resource and Environmental Economics** *(a SERA 30 affiliated session)* **Sustaining Florida's Forest Ecosystems: Potential Effects of County and Municipal Ordinances**, Terry Haines, U.S. Forest Service **Valuing New Zealand Native Bird Existence for Conservation**, Pamela Kaval, University of Waikato, New Zealand **The Economic Impact of Cogongrass on Private, Non-Industrial Forest Owners in Florida**, Nandkumar Divate, Michael Thomas, Florida A&M University; David Harding, Florida Fish and Wildlife Conservation Commission; Moses Kairo and Oghenekome U. Onokpise, Florida A&M University **Income, Inequality, and Criteria Air Pollutants in the Cama Counties**, Hillary Huffer, East Carolina University
3:00pm to 3:30pm Foyer	**Coffee Break**
Friday, May 28, 2010 **3:30pm to 5:00pm** South ballroom **Moderator:** Mark Davis Tulane Institute on Water Resources Law and Policy	**Track 1D** **More Than An Amenity** Water is one of the elemental forces that have shaped our planet and human development. Too much or too little of it can be the difference between growth and decline; between success and failure; and between how cultures develop. This is certainly true in Louisiana. The evolution of water as a defining resource in Louisiana was the subject of a two day conference at Tulane Law School in April. This session will build on key themes raised at that conference and consider the role of water in shaping the future of our state.

	Panel Discussion Irys Allgood, Assistant Attorney General (Louisiana) Marco Cocito Monoc, Director of Regional Initiatives, Greater New Orleans Foundation Ann Yoachim, Program Manager, Tulane Institute on Water Resources Law and Policy Mark Davis, Senior Research Fellow and Director, Tulane Institute on Water Resources Law and Policy
Friday, May 28, 2010 **3:30pm to 5:00pm** Bienville **Moderator:** Stephanie Showalter Mississippi-Alabama Sea Grant Legal Program	**Track 2D** **Understanding Fisheries Management** For almost twenty years, the Mississippi-Alabama Sea Grant Program's publication "Understanding Fisheries Management," currently in its second edition has been educating and informing fisheries stakeholders on the federal fisheries management process. A third revision of this seminal publication is currently underway to address the 2007 amendments to the Magnuson-Stevens Fisheries Management Act and subsequent regulatory changes. This session, moderated by the Mississippi-Alabama Sea Grant Legal Program, will convene an expert panel to provide updates on the biological, economic, and legal contributions to the third edition and solicit feedback and suggestions for additional changes.
Friday, May 28, 2010 **3:30pm to 5:00pm** **Royal Conti** **Moderator:** Aloyce Kaliba CNREP and Southern University and A&M College	**Track 3D** **Aquaculture Production and Management** *(a W2004 affiliated session)* **Moderator: Aloyce Kaliba, Southern University and A&M College** **Crawfish Farmer Adoption of Best Management Practices and Participation in the Environmental Quality Incentives Program**, Narayan P. Nyaupane and Jeffrey M. Gillespie, Louisiana State University Agricultural Center **An Evaluation of the Cost and Effectiveness of Commercial Oyster Aquaculture in the Chesapeake Bay as a Nutrient Control Strategy**, Alex Miller, Gulf States Marine Fisheries Commission; Kurt Stephenson, Darrell Bosch, Department of Agricultural and Applied Economics, Virginia Tech; Dan Kauffman, Virginia Seafood Agricultural Research and Extension Center, Virginia Tech; Bonnie Brown, Department of Biology, Virginia Commonwealth University **Economic Impact of Processing Crawfish Offal in Louisiana**, Aloyce R. Kaliba and Calvin R. Walker, Southern University and A&M College
Friday, May 28, 2010 **3:30pm to 5:00pm** Bourbon **Moderator:** Tyler Mark CNREP and Louisiana State University Agricultural Center	**Track 4D** **Environmental and Energy Analysis** *(a SERA 30 affiliated session)* **Risk Preference and Human Capital: What Do They Say about Adoption of Cost-Share Conservation Programs**, Hiroki Uematsu and Ashok K. Mishra, Louisiana State University Agricultural Center **Biological Control of Arundo donax along the Rio Grande [River]: Benefit-Cost, Per-Unit Cost, and Impact Analysis of Potential Water Saved**, Emily Kaye

	Seawright, Texas AgriLife Research; M. Edward Rister, Texas A&M University, Texas AgriLife Research; Ronald D. Lacewell, Texas A&M University, Texas AgriLife Research, and Texas AgriLife Extension Service; Dean A. McCorkle, Texas A&M University and Texas AgriLife Extension Service—College Station; Allen W. Sturdivant, Texas A&M University and Agricultural Research and Extension Center—Weslaco; John A. Goolsby and Chenghai Yang, USDA Agricultural Research Service **Energy Crop Production in the Mississippi Delta and the Environmental Implications**, Tyler Mark, Paul Darby and Jeremy D'Antoni, CNREP and Louisiana State University Agricultural Center **Carbon Offset Payments and Spatial Biomass Supply in Arkansas: Implications of Pine and Switchgrass**, Aaron Smith, Michael Popp and Lanier Nalley, University of Arkansas
Friday, May 28, 2010 **6:00 pm** Bourbon Balcony Suite Room 3175	**CNREP 2010 Closing Reception**

Posters

Evaluating the Effects of Hurricane Katrina and Rita on Employment of Oil and Gas Industries of OCS Parishes in Louisiana
Arun Adhikari, J. Matthew Fannin and Ashok K. Mishra, CNREP and Louisiana State University Agricultural Center

Resolution 60: An Evaluation of the Louisiana Coastal Zone Boundary
Seth Bagwell, Louisiana Sea Grant Law and Policy Program

Coastal Louisiana Parishes: Trends and Signs of Recovery in Shrimp Industry from Hurricane Katrina and Rita in 2005
Latika Bharadwaj and David Lavergne, Louisiana Department of Wildlife & Fisheries

Cameron Parish Recovery Status
Ryan Bourriaque, Cameron Parish Planning and Development

Assessing the Benefits of Levees: An Economic Assessment of U.S. Counties with Levees
Ezra Boyd, Louisiana State University Geography and Anthropology; Sandy Rosenthal, Executive Director, Levees.org

A Novel Approach for Estimating Hurricane Damages to Coastal Fishing Infrastructure
Rex Caffey, CNREP, Louisiana Sea Grant, and Louisiana State University Agricultural Center; Richard F. Kazmierczak, CNREP and Louisiana State University Agricultural Center

The Benefits of Municipal Compost in Coastal Areas Experiencing Land Loss
Simone Cifuentes, Louisiana Sea Grant Law and Policy Program

Determinants of Private Wetland Investments in Coastal Louisiana using a Double Hurdle Model
Cheikhna Dedah, Richard F. Kazmierczak, Jr. and Walter R. Keithly, Jr.; CNREP and Louisiana State University Agricultural Center

Valuing Wetlands Where Water is Scarce: The Case of Wyoming
Kristiana Hansen, Tina Willson and Roger Coupal, University of Wyoming

Importance of Hunting, Fishing, and Wildlife-Associated Recreation to the Mississippi Economy
James Henderson, Mississippi State University

Elmer's Island: Controversy, Confusion, and Classification
S. Beaux Jones, Louisiana Sea Grant Law and Policy Program

Legal Issues Concerning Hydrokinetics in Louisiana Rivers
Duncan Kemp, Louisiana Sea Grant Law and Policy Program

Rainfall Effects in Soybeans Yield Probability Densities in Louisiana Coastal Counties
David Maradiaga, Aude L. Pujula, Hector O. Zapata, Louisiana State University Agricultural Center, Michael R. Dicks, Oklahoma State University

Economic Analysis of Tillage and Nutrient Best Management Practices in the Ouachita River Basin, Louisiana
Augustus Matekole, Louisiana Department of Health and Hospitals, John Westra, CNREP and Louisiana State University Agricultural Center

Economic Implications of Producing Cellulosic Biomass Feedstocks in the El Campo, Texas Area
Will McLaughlin, Texas AgriLife Research and Texas AgriLife Extension Service; M. Edward Rister, Ronald D. Lacewell, Texas A&M University; Larry L. Falconer, Texas A&M University Research and Extension; Juerg M. Blumenthal, William L. Rooney, Texas A&M University; Allen W. Sturdivant, Texas AgriLife Research and Extension; Dean McCorkle, Texas AgriLife Extension

Local Economic Impacts of Coastal Hazards on Public Agencies
Kimberly Morgan, Mississippi State University

Analyzing the Cost of Harvesting and the Economic Structure of Florida Grouper Fishery
Cristian Nedelea and Richard F. Kazmierczak; CNREP and Louisiana State University Agricultural Center

Environmental Kuznets Curve for Water Pollution at the Global Level: A Semiparametric Analysis
Krishna Paudel and Mahesh Pandit; CNREP and Louisiana State University Agricultural Center

Analyzing FST termite control options in Louisiana
Krishna Paudel, Mahesh Pandit and Michael Dunn; CNREP and Louisiana State University Agricultural Center

Heterogeneous Evacuation Responses to Storm Forecast Attributes
Daniel Petrolia, Mississippi State University; Terrill R. Hanson, Auburn University; Sanjoy Bhattacharjee, Mississippi State University

Community Economic Recovery Following Natural Disasters
Benedict Posadas, Amanda K. Seymour, Benedict A. Posadas, Jr., Sidney K. Massey; Scott A. Langlois, Randy Y. Coker and Christine E. Coker, Mississippi State University

Congestion Effects in the Location Choice of Gulf of Mexico Shrimpers
Tao Ran, CNREP and Louisiana Sea Grant, Walter R. Keithly, Jr., CNREP and Louisiana State University; Richard F. Kazmierczak, Jr., CNREP and Louisiana State University Agricultural Center

The Role of InSAR Satellite Surveying and Remote Sensing in the Determination of Coastal Subsidence: A tool for Land Managers and Levee Districts
Jason Shackelford, John Chance land Surveys, Richard Buren, FUGRO NPA

The Role of InSAR Satellite Surveying and Remote Sensing in the Determination of Groundwater withdrawal and recharge in Haynesville Shale Area
Jason Shackelford, John Chance land Surveys, Richard Buren, FUGRO NPA

Incorporating Time and Risk Considerations In the Selection of Coastal Restoration Projects
Hua Wang, CNREP and Louisiana State University Agricultural Center

Abstracts

Adhikari, Arun
J. Mathew Fannin
Ashok. K. Mishra
CNREP and Louisiana State University Agricultural Center

Evaluating the Effects of Hurricane Katrina and Rita in Employment of Oil and Gas Industries of OCS Parishes in Louisiana: A Shift Share Approach

Two of the deadliest hurricanes in the history of the United States; Katrina and Rita, made a landfall less than a month apart in 2005 and are responsible for thousands of lives and billions of dollars of damage in Louisiana. These hurricanes had strong impacts on economies and employment in the affected areas. There were many incidences of mass layoffs and increase in unemployment rates after these hurricanes. We will be evaluating the impacts of these hurricanes in employment of oil and gas industries of OCS parishes of Louisiana. Oil and gas industries in Louisiana are considered as one of the most revenue generating industry and accounts for more than 7 billion dollars in 2006 (MMS Report). These impacts can be examined by shift share analysis by decomposing the changes into various effects. Shift share analysis is a statistical tool/technique which decomposes a region's sectoral growth for a given period of time into three effects: share change or national growth effects, industry-mix or mix change effects, and shift change or regional shift effects (Hoover, 1971). Since it is expected that a change of any spatial unit is not independent of the change of its neighboring units, a spatial weight matrix is developed based on the contiguity of the parishes and the matrix was then row standardized. We apply the spatial weight matrix approach by Nazara and Hewings (2004) and compare results and interpretation to traditional shift share on the employment data right after Hurricanes Katrina and Rita in OCS parishes of Louisiana.

Adhikari, Arun
J. Mathew Fannin
CNREP and Louisiana State University Agricultural Center

Estimating Labor Force and Fiscal Modules for Coastal Louisiana Economies: Extension of the COMPAS Modeling Framework

The general objective of our research is to model heterogeneity for purposes of improving accuracy in regional economic modeling. This study aims to develop a model to forecast different expenditure demands in the fiscal module of Louisiana Community Impact Model (LCIM) using alternative procedures that are capable of increasing the performance over traditional COMPAS estimators. Specifically, this will be performed through the use of alternative regional econometric estimators in Community Policy Analysis System (COMPAS) models. The specific objective includes modeling the fiscal module (four major categories of expenditure; public service, public works, general government and health and welfare) of LCIM for all parishes of Louisiana to compare the performance between spatial and non spatial estimators that takes into account heterogeneity.

Bagwell, Seth
Louisiana Sea Grant Law and Policy Program

Resolution 60: An Evaluation of the Louisiana Coastal Zone Boundary

Senate Concurrent Resolution 60 of the 2009 regular session of the Louisiana Legislature requested the Coastal Protection and Restoration Authority (CPRA) to conduct a "science based study of the adequacy of the current inland boundary of the coastal zone of Louisiana to meet the state's current and future needs to manage, protect and restore its coastal resources." This comes almost thirty years after Louisiana's Coastal Zone Management Program received federal approval in 1980. The resolution recognized what an important role coastal zone management plays in protecting Louisiana's wetlands and the significant cost savings achieved by protecting wetlands as opposed to restoring them once they are lost. However, significant changes, including deterioration of Louisiana's coast, numerous hurricanes, increasing data concerning climate change and sea level rise, and improved understanding of storm patterns, spurred the senate to determine whether or not the coastal zone boundary was still properly configured to adequately and efficiently fulfill the State's coastal management needs. As part of this study, CPRA was to consider the legal framework of the coastal zone management program, scientific information (salinity, storm surge, types of wetlands, etc.), important economic activities, and cultural resources. Furthermore, the senate requested that CPRA suggest changes to the location of the boundary and the laws, rules, and policies of the program, as necessary. The delineation of the inland boundary of the coastal zone is very significant in that areas within the boundary are subject to increased regulation, such as coastal use permitting. On the other hand those areas may also get access to certain funds for coastal protection, and parishes in the coastal zone have the power to establish their own local coastal management programs. From the State's point of view, it wants to ensure that the boundary extends inland enough to provide for sufficient management but excludes areas in which activities do not normally affect the natural resources of the coast. This poster will display a map of the current coastal zone and a list of parishes included in the zone. The poster will also track the progress and content of any bills related to the coastal zone boundary that are circulating through the legislature. I will include a brief description of the two major provisions of the coastal zone management program (coastal use permitting and federal consistency) and a brief description of other coast related programs with a map depicting the boundaries of each program.

Ballestero, Heather
NOAA Coastal Response Research Center
Mimi Becker
Nancy Kinner
University of New Hampshire

Mitigation of the Human Dimensions of Spills in Coastal Louisiana: Collaboration Between NOAA's Office of Response and Restoration and Louisiana Sea Grant

Garnering intra-agency collaboration between the National Oceanic and Atmospheric Administration's Office of Response and Restoration (NOAA OR&R) and NOAA Sea Grant agents provides a liaison between federal responders and extension personnel who live and work in coastal regions. The pilot project location selected was Louisiana because they often lead the U.S. in the number and volume of oil and chemical spills, creating potentially contentious human dimensions issues (e.g., resource valuation, risk communication, disruption to subsistence, social impacts). The goal of this project was to develop a spill notification protocol between OR&R and Louisiana Sea Grant to have Sea Grant agents provide coastal residents, who are dependent upon natural resources, information about spill response and restoration. This was done by developing a protocol to enhance communication between local Sea Grant and OR&R personnel as one way to help mitigate the socioeconomic effects of spills in U.S. coastal regions by adding a local perspective into the national Incident Command System. The protocol consisted of OR&R notifying Sea Grant agents of a spill via email and the agents deciding how to disseminate the information to constituents. This protocol was used successfully in two spills (Grand Isle and Mississippi River at New Orleans, June and July, 2008). This pilot project can be applied nationally to coastal states to mitigate some negative human dimension issues.

Barreca, John D.
J. Matthew Fannin
CNREP and Louisiana State University Agricultural Center

Measuring Fiscal Health of Local Coastal Government Economies – Implications for Economic and Disaster Resiliency

The state of Louisiana has been hit by several severe hurricanes in recent years, and these disaster events have placed a financial burden on parish budgets. As such, local governments have been compelled to bear various cleanup and recovery costs in the short and long term. Therefore, this research sought to evaluate the factors that drive the variation in the financial health of local governments in Louisiana. We used econometric methods to estimate the effect of selected macroeconomic indicators on the financial health of local governments. To examine the effect macroeconomic indicators of local government financial health, nine financial ratios were generated using data from county financial statements. These ratios came from the categories of profitability, liquidity, capital structure, and performance. Two methods were developed to regress each of these ratios against selected economic and demographic indicators, including GDP, assessed valuation, hurricane damage, and lagged or initial values of the ratio being examined. The first method was a double-log random effects model, and the second method was an ordinary least squares model, which used the change over time in each of the variables as the parameters. Both methods found the damage variable to have a significant negative effect on county government financial health, supporting our hypothesis.

Berlin, Joe
URS Corp

Recreational Impacts of Coastal Restoration Projects

Coastal restoration projects, such as freshwater diversions, are expected to have an impact on recreation. The primary recreational activities affected are fishing and hunting, which are consumptive activities. A significant amount of recreational fishing data has been accumulated from prior projects at Caernarvon and Davis Pond. Less data is available regarding hunting and other activities. Some of this data was presented to focus groups of experts and stakeholders to determine the likely impact on recreation from larger coastal restoration projects. The output of the focus groups was used to estimate the potential economic benefits of several coastal recreation projects based upon impacts on recreation. The factors that impact recreation include access points, the size of the area impacted, the species of recreational fish sought, and the flexibility of recreational users in adjusting their activities.

Bethel, Matthew
Emily Danielson
University of New Orleans
John Troutman
Louisiana Office of Coastal Protection and Restoration
Marco Giardino
NASA Stennis Space Center
Maurice Phillips
Community of Grand Bayou, Louisiana

Using PAR for Community Participation in Ecosystem Resiliency

This project is investigating the feasibility and benefit of integrating geospatial technology with traditional ecological knowledge (TEK) of an indigenous Louisiana coastal population to assess the impacts of current and historical ecosystem change to community viability. The primary goal is to provide resource managers with an accurate, cost-effective, and comprehensive method of assessing ecological change in the Gulf Coast region that can benefit community sustainability. Using Remote Sensing (RS), Geographic Information Systems (GIS), and other geospatial technologies integrated with a coastal community's TEK to achieve this goal, our objectives are to determine (1) a method for producing vulnerability/sustainability mapping products for an ecosystem-dependent livelihood base of a coastal population that results from physical information derived from RS imagery and supported, refined, and prioritized with TEK, and (2) to demonstrate how such an approach can engage both affected community residents and others who are interested in healthy marshes to understand better marsh health and ways that marsh health can be recognized, and the cause of declining marsh determined and improved. TEK relevant to the project objectives collected to date includes: changes in the flora and fauna over time, changes in environmental conditions observed over time such as land loss, a history of man-made structures and impacts to the area,

as well as priority areas of particular community significance or concern. This TEK field data collection campaign utilized 'Collaborative Field Work' based on Participatory Action Research (PAR) methods where TEK is used in scientific studies to locate study sites, obtain specimens and data, and interpret field observations and results. Sampling sites have been identified within the study area and scientific field data collection has occurred to measure marsh vegetation health characteristics. This data is being analyzed for correlation with satellite image data acquired concurrently with field data collection. Resulting regression equations are applied to the image data to produce estimated marsh health maps. Instruments used in field data sampling to date include; FieldScout CM 1000 Chlorophyll Meter (relative chlorophyll content), LI-COR Leaf Area Index-2000 Plant Canopy Analyzer (relative biomass measurement), Ocean Optics VNIR Field Spectroradiometer (spectral reflectance from 400 to 1100nm), and HP iPAQ with GPS and ArcPad GIS Software (allows for field data entry tied to GPS located sampling sites overlaid on image maps). Historical image datasets of the study area have been acquired to understand evolution of land change to current conditions. Image processing procedures have been developed for these datasets and applied to produce maps that detail land change in the study area at time intervals from 1963 to 2009. This information is being combined with the TEK and scientific datasets in a GIS to produce mapping products that will provide the following information to the coastal restoration decision making process: 1) What marsh areas are most vulnerable, and 2) what areas are most significant to the sustainability of the community.

Bharadwaj, Latika
David Lavergne
Louisiana Department of Wildlife and Fisheries

Coastal Louisiana Parishes: Trends and Signs of Recovery in Shrimp Industry from Hurricane Katrina and Rita in 2005

U.S. consumption of shrimp as a share of fish and shellfish consumption has steadily grown from 17% to 25% from 1996 to 2005**.** U.S. was also the top shrimp importer in 2006. In Louisiana, **s**hrimp accounts for 10% of average landings of fisheries. In terms of monetary value, the average value of shrimp landed over the past half-century has been estimated at around $75.8 million and represents more than half the average value of fisheries landed in the state of Louisiana. However, several factors such as rising fuel costs, declining dockside prices, increasing shrimp imports and decrease in landings due to hurricanes damages in 2005 and 2008 have been affecting Louisiana seafood industry. The poster is part of an ongoing project analyzing impact of Hurricane Katrina and Rita in 2005 on dealers and fisherman working in Louisiana shrimp industry. Data are available since 2000 from Louisiana trip ticket program conducted by the Fisheries division of the Louisiana's Department of Wildlife and Fisheries. The trip ticket data is merged with individual species data, parish data and dealer information to arrive at comprehensive dataset for each year. Hence, this poster presents: (1) participation rates of dealers in key Louisiana parishes in shrimp industry over a 7-year span from 2001-2007, (2) volume and value of shrimp bought by dealers from 2000-2007, (3) comparison of prices, value and quantity of shrimp harvested in key parishes before and after the hurricane.

Blanchard, Troy
Department of Sociology, Louisiana State University

Migration Response to Employment Growth: The Case of Employment Change in the Oil and Gas Industry and the Rate Net Migration in the Gulf Coast Region

Economic development researchers have a long standing interest on the association between job growth and the well-being of community residents. An important aspect of this line of study is the degree to which new jobs are filled by local residents or generates inmigration of workers seeking new employment opportunities. In this paper, we apply this line of inquiry to the analysis of employment growth in the oil and gas industry in Louisiana Parishes. Using enhanced employment data from the 2000-2004 County Business Patterns, population data from the U.S. Census Bureau Population Estimates program, and IRS migration flow data, we examine the link between employment growth in the oil and gas sector and migration. We develop age and sex specific migration rates for Gulf Coast counties and parishes using forward survival techniques and perform a shift-share analysis to identify the component of migration change that is unique to each parish. We then model the results from the shift-share analysis using employment change data and other key covariates of migration. Our findings point to a relationship between employment change in the oil and gas sector and population growth.

Bouras, Adam
Felix Edoho
Emmanuel Ajuzie
Lincoln University
Aloyce Kaliba
Southern University

Measuring Technical Efficiency Using Bayesian Methods: The Case of Catfish Farming Industry

In the past several years, efficiency analysis in the catfish industry has received considerable attention in the aquaculture economics literature. The methodology used by these studies focused mostly on either stochastic frontier technique or on Data Envelopment Analysis. There has been little effort to employ other statistical methods in examining different economic conditions in the industry. In order to provide for diversity, this study uses the Bayesian method to analyze the level of technical efficiency in the catfish farming industry. Additionally, a regression analysis based on Tobit model is used to analyze socio-economic factors contributing to variability in the level of technical efficiency of catfish farms. The data used in this paper are based on a survey conducted by the Aquaculture and Fisheries Center at the University of Arkansas at Pine Bluff. Results show that technical inefficiency is a major factor contributing to variability in the production of catfish. Results from the Tobit model indicate that the size of the farm and the experience of the catfish famer play a crucial role in explaining technical efficiency of catfish farms.

Bourriaque, Ryan
Cameron Parish Planning and Development
Rex Caffey
CNREP, Louisiana Sea Grant and Louisiana State University Agricultural Center

Spatial Economics of the Louisiana Wetland Mitigation Banking Industry

Wetland mitigation banking has become prevalent in many states across the US, with the number of banks increasing 780% from 1992 to 2005. Louisiana led the nation in the total number of banks in 2006 with 96. Despite rapid growth associated with this industry, economic data in regards to the market for wetland mitigation bank transactions has been lacking. Mitigation bank transactions were collected (n=165) for the period 1997 through 2006 from the Louisiana Department of Natural Resources and the US Army Corps of Engineers New Orleans District. Data were evaluated for economic, spatial, temporal, and other descriptive characteristics. Average credit price for the period was $6,382, three to seven times lower than prices of wetland mitigation credits in states adjacent to Louisiana. Evidence of bimodal price trends prompted analysis of market segregation. Wetland credit prices ranged from $4,000-$20,000 for coastal mitigation credits and from $3,000-$10,000 for non-coastal mitigation credits. A modified hedonic regression model was developed using spatial econometric and statistical software. Twenty-three variables were evaluated for their influence as price determinants, with 11 factors chosen in the final model (Adj. R2 = .69). Parallel sub-models were developed for coastal and inland markets with marginal effects estimated for significant and continuous variables. Major drivers of credit price included sales volume, proximity to population centers, time, and rural land values. Competition within a particular market (watershed) had a positive influence on price, an indication that demand is exceeding supply in this infant market. Findings and recommendations from this study could prove beneficial to policy advisors, bank sponsors, as well as prospective investors in the industry.

Bourriaque, Ryan
Cameron Parish Planning and Development

Cameron Parish Recovery Status

Cameron Parish is a very rural parish situated along the Gulf of Mexico in Southwest Louisiana. Although Cameron is the largest parish in the state of Louisiana land area wise, its population is not as comparable. The 2008 population estimate from the US Census Bureau has the total number of residents of Cameron Parish at 7,238. This number resulted in an estimated 25% decrease in overall population for the parish due to Hurricane Rita a mere three years prior. The Parish has also experienced a visible shift in population from the lower part of the Parish to the northern part of the parish as a result of the 2005 hurricane. The communities of Grand Lake and Hackberry have experienced growth as a residual from the storm event and citizens wishing to relocate further inland. Hurricane Ike made landfall in the early morning hours of September 13, 2008, and confirmed the fears of many Cameron Parish residents. For the second time in three years, the parish was inundated with flood waters from a storm event. The storm surge fluctuated along the Cameron coastline from 15-18 feet in the Johnson Bayou and Holly Beach area to 12-15 feet in downtown Cameron. Properties in the northern portion of the Parish who had never previously been inundated suffered 8-10 foot storm surges in the Hackberry and Big Lake areas. The recorded maximum peak winds for the parish were recorded at 92 mph at Johnson Bayou. Moving westward along the coast, peak winds remained in the 80-90 mph range. Maximum sustained winds for the Parish were from 55-70 mph. Standing flood waters remained throughout the southern part of the Parish for weeks following the storm event. Suffice to say, although Ike was a devastating storm, the benchmark set by Rita was thankfully not surpassed. It is with these two storm incursions that Cameron Parish must adapt both the way it does business and the basic day to day living of its residents. Coastal restoration and protection have always been prevalent to this coastal parish with over 70 miles of coastline, habitable cheniers, and bountiful marshes, but the Parish must now also focus on storm events and the vulnerability resulting thereto. Cameron's economic identity is tied to these functions and values of the marshes. Economic integrity for the parish has perpetually been based in oil and gas exploration and the companion service industries related thereto. The lifeblood of the parish is centered around quick deepwater access via the Calcasieu Ship Channel and sufficient docking areas for the service industries located along the Cameron Loop. The rural parish also had thrived as a fishing community for many generations. Cameron has long been one of the major seafood ports in the nation and remains a significant processor for menhaden. Even with the storm event of 2005, a three year average (2004-2006) for seafood port tonnage ranked Cameron 4th for the entire Gulf Coast. Although redeveloping this distressed Parish is a daunting task, funding sources have been pooled to implement a comprehensive recovery effort including housing, economic development, fisheries, and coastal restoration. It would be the intent of this presentation to provide status updates on many of the efforts of this recovering Parish.

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Assessing the Benefits of Levees: An Economic Assessment of U.S. Counties with Levees

A list of U.S. counties with levees, compiled from a FEMA National Flood Insurance Program database, was used to examine the distribution and economic conditions of the U.S. population living in counties with levees. This analysis provides empirical insight into the long running debate regarding human settlement in floodplains that have been modified by levees and related flood reduction structures. From the onset, the

data provided by FEMA shows an interesting and illustrative fact: US counties with levees, which account for only 28% of all counties in the country and only 37% of the total US land area, are home to 55% of the US population. In 2004, a majority of Americans, over 156 million citizens, resided in these counties. This simple fact suggests the influence of a strong "pull factor," that is social and/or economic benefits that encourages migration to and settlement within these counties. To examine one possible "pull factor," 2000 Census SF3 data tables were used to compare the economic productivity and well-being of the population that live in the counties with levees and the population that lives in the counties without levees. It was found that on average per capita income is $1,500 greater in the counties with levees, that total productivity was $650 billion greater in the counties with levees, and that the poverty rate was 2% lower in the counties with levees. Additionally, it is estimated that US counties with levees contributed $70 billion in excess tax revenue for 1999, a contribution that greatly outweighs the flood related costs for that year. A case study examined the population and economy of Louisiana, and considered the costs associated with levee failures and storm surge flooding during Hurricane Katrina in the context of the economic benefits provided by the affected people and industries. Located in a state characterized by low incomes, metropolitan New Orleans, where incomes are close to the nation average, illustrates many of the benefits that make coastal floodplain ecosystems among the most valuable type of ecosystem. Considered the worst and most expensive engineering disaster since Chernobyl, the unprecedented flooding in 2005 caused an estimated $100 billion in damages. However, the public's cost associated with this disaster is greatly outweighed by the benefits provided by the area's numerous large and small ports, access to offshore oil and gas, and bountiful seafood harvests. For example, the $149 billion in Federal royalties from OCS oil and gas is just one economic benefit that the nation has obtained from the affected region.

Burkart, Christopher S.
William L. Huth
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Freshwater Management and Estuary Value

Estuarine systems support extensive biological resources that respond to the flow of freshwater from inland. Each estuary has its own collection of resource tradeoffs, complicating the management of upstream water flow. It is important that policymakers have information on all sources of value in a watershed in order to make efficient decisions about freshwater management. Competing sources of value include quantity and quality of fisheries output, hydroelectric power, recreation, municipal water supplies, and cooling capacity for power plants. The Apalachicola-Chattahoochee-Flint (ACF) river basin in the southeastern United States carries water that serves all of the above activities. The allocation of water resources in this watershed has been contentious for decades, with no sign of resolution between the three states involved: Alabama, Florida, and Georgia. Solutions to optimal management of freshwater require detailed information on individual sources of value within the watersheds and estuaries concerned. Apalachicola Bay is located at the outflow of the ACF river basin; its main stream, the Apalachicola River, is the confluence of the Chattahoochee and Flint rivers. One of the first steps toward a more complete view of watershed values is an understanding of the tradeoffs between freshwater inflows and fishery harvest. Apalachicola Bay supports an economically valuable fishery; the focus of this paper is on the influence of bay water quality on the highest-valued species in the fishery: oysters, shrimp, clams, and crabs, with an aim towards modeling additional value streams associated with the watershed, such as recreation and hydropower. At the northern reach of the Apalachicola watershed, Lake Seminole provides recreational value. The lake is a reservoir created by a dam that generates hydroelectric power. With multidimensional value and artificial control of flow at one point (the dam) this watershed appears promising ground for an examination of multiple tradeoffs associated with freshwater flows. Data is drawn from several sources. For later analysis at the watershed level, flow data from measurements taken at two locations, U.S. Geological Service gage stations at Chattahoochee, Florida and Sumatra, Florida will be used. To make comparisons Army Corps of Engineers data is available on inflow, outflow, lake elevation, and hydropower generation at Woodruff Dam. The U.S. National Marine Fisheries Service (NMFS) and Florida Fish and Wildlife Commission both provide monthly landing data for finfish and shellfish in the bay. The National Estuarine Research Reserve System, a partnership of the U.S. National Oceanic and Atmospheric Administration and several states, makes available data on a variety of marine water quality and weather observations. This preliminary paper will work with NMFS and NERR data only. The perspective provided by this study is expected to contribute to the ongoing policy debate surrounding water resource allocation in the Apalachicola-Chattahoochee-Flint river basin, with future work focusing on incorporating the value of power generation and recreational activity in the watershed.

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A Novel Approach for Estimating Hurricane Damages to Coastal Fishing Infrastructure

This poster describes a novel approach for developing coastal infrastructure damage estimates in the wake of hurricanes and tropical storms. Commercial fisheries infrastructure values are appraised using revenue-based and market-based methods and then integrated via GIS with ADCIRC-based simulation data on maximum wind speed and storm surge heights. Physical damage functions are then applied to generate economic estimates of infrastructure losses at the firm-level to parish-level, depending on data availability. This approach was used to document fisheries infrastructure damages following Hurricanes Katrina and Rita in 2005, and Hurricanes Gustav and Ike in 2008. To date, the technique has provided the economic basis for

more than $250 million in federal fisheries recovery funds for Louisiana alone. The specificity of the estimates, in most cases to the firm level, has been a welcome addition to the state and federal agencies tasked with the development of rapid and objective methods for post-storm damage assessment and recovery funding allocation.

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Dave Reed
Florida Institute of Oceanograph
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Gap Analysis Application to Personal Value Estimate

Scientists and resource managers recognize that an effective Ecosystem-based Management strategy is based on the best available science. To achieve protection and restoration and to allow ecosystems to function properly and be beneficial to people, it is necessary to have a good understanding of the available information and gaps in data. This is both a need and a challenge. Determining the availability and quality of data is a lengthy and cumbersome process; incorporating environmental data into economic analysis to value coastal and marine ecosystem services has been rarely attempted. Here we discuss the steps taken to move in this direction. The Gulf of Mexico Alliance promotes the integration of environmental sustainability and economic development activities at a regional scale. The Gulf Geospatial Assessment of Marine Ecosystems (GAME) project is one of the Alliance's Ecosystem Integration and Assessment team's endeavors to promote better decision making through ecosystem data management. GAME provides a key step towards determining data availability and information gaps for ecosystem assessment. GAME's goal is to identify and catalog existing priority coastal, estuarine, nearshore and offshore Gulf habitat-related information. This data discovery phase, together with the development of online tools to share and visualize data, allows coastal resource managers to access the necessary information on ecosystems, their processes, and functions to support them in their decision making activities. GAME staff has identified and cataloged physical, biological, geological, chemical, and socioeconomic metadata from several sources around the Gulf. Here, we emphasize that the information stored in the GAME Catalog is valuable to further economic analysis in the coastal zone. Gulf GAME can be used as a tool to define the baseline understanding of ecosystem structure, health, and functions necessary to identify ecosystem services. Having this tool in place allows for better informed management decisions. In 2009 the Florida Fish and Wildlife Conservation Commission published a report titled "Florida boating access facilities inventory and economic study including a pilot study for Lee County". This study evaluated the direct and indirect sales, employment, and wages/salaries generated by 2,756 recreational boating facilities in Florida. The study shows that through the use of econometric models decision makers can estimate the demand for access to boating sites. Destination site characteristics (protected areas, seagrass, artificial reefs…) were incorporated in the models as GIS data. We take this study a step further and investigate how information availability or lack of data can affect the results in estimating the personal value for users. We will show preliminary results from the GAME gap analysis of geospatial data for core habitat data layers and other layers of interest for the boating study. We will overlay our gap analysis with several boating facilities and destination sites on the West coast of Florida to demonstrate how available data can influence the estimate of personal values for recreational boaters.

Chaudhari, Jaydeep
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Role of Public Transportation and School Buses In the Resiliency of Rural Coastal Communities

Coastal communities of the Northern Gulf of Mexico along the Interstate 10 (I-10) corridor from Florida to Louisiana are predominantly rural and are under constant threat of hurricane, flood, and heavy rainfall almost every fall. During recent natural disasters such as the devastating hurricanes Katrina and Rita in 2005, people in coastal communities required mass evacuation and other major emergency transportation services. When evacuation occurs, rural coastal communities are at high risk and difficult to evacuate in a timely manner due to larger geographical areas, low density, and limited resources such as alternate modes of transportation, food, fuel, lodging, and medical facilities. Public transportation can be a successful partner in accomplishing the four tasks of emergency management planning: (1) mitigation, (2) preparedness, (3) response, and (4) recovery. The objective of this study is to evaluate the emergency preparedness of public transportation in selected rural coastal communities in the North Gulf region. The evaluation focuses on what role public transportation and school districts can play in the event of an emergency evacuation and how adequately they are prepared. The survey conducted for this evaluation indicated that rural transit systems had become successful partners in complex, multi-agency emergency operations. Rural transit systems had also fulfilled their assigned role within their own local emergency management operations. However, this role was largely limited to the 'preparedness' activity of emergency management—evacuating people out of the danger/hurricane zone by responding to specific requests. Best management practices were incorporated into current rural evacuation practices in the North Gulf Coast Region, which might have been impacted and influenced by the evacuation experience during hurricanes Katrina and Rita. However, certain shortfalls have been identified in the areas of: (1) communication; (2) employee issues; and (3) inadequate finances that need to be addressed for community resiliency. School buses also proved to be effective resources in evacuations, but disadvantages exist that may limit their usefulness. Lessons learned from this evaluation may be utilized in improving rural evacuation practices.

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Transportation Issues and Concerns for Evacuation in Rural Coastal Counties of the Northern Gulf of Mexico

The coastal communities of the Northern Gulf of Mexico (NGM), which stretches from Florida to Louisiana, are predominantly rural and are under the constant threat of hurricanes each fall. In the last five years, deadly hurricanes such as Katrina, Rita, Ivan, and others have required mass evacuations and other major emergency transportation services to be deployed. The rural transportation network is a major component of a larger, multimodal system that is critical for mobility of people, goods and services. Rural roads have a larger role in evacuation than is currently recognized. According to '*Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study',* the Gulf Coast transportation infrastructure is essential for the mobility of people and commodities on a domestic and international scale. Some of the most vital sea ports in the United States, including Houston-Galveston, South Louisiana, and New Orleans, are located in this region. In addition, approximately two-thirds of all U.S. oil imports are conveyed through the area. This region has important air, rail, highway, and transit networks. Thus, it is necessary to understand the dynamics of rural transportation networks to understand rural evacuation issues in the NGM. The objective of this study is to evaluate the use of rural transportation infrastructure in the NGM evacuation operations. A survey of the communities in the NGM was conducted to analyze the current state of rural evacuation practice, including the use and efficiency of evacuation tools, evacuee flow and traffic volume levels on evacuation routes, evacuation preparation, and associated evacuation issues and barriers. The survey indicated that, on average, 20% of evacuees were moving from urban areas to other urban areas, 38% were termed urban to rural, 12% were rural to urban, 28% were rural to rural, and the remaining 2% were described as "other" (e.g., moving to shelters). Thus, around 66% (38% + 28%) of evacuees were moving to rural communities during evacuations in the NGM. The results clearly show that significant population surges occurred from urban areas to rural communities which create challenges to manage evacuation operation for county, state, and federal administrations following an urban disaster. The survey also identified that traffic jams and blockages were noticed due to unexpected and spontaneous evacuation on two-lane rural roads for the most recent evacuation. Limited health and roadside amenities were weaknesses for rural communities in serving evacuees. For example, evacuees consume fuel, food, water, and sanitation resources while traveling to or through rural areas, which may be a threat to limited resources of small rural communities. Further, issues such as lack of workforce, lack of operating budget, funding restrictions to provide service, and inadequate or limited roadside amenities essential for evacuees could hamper evacuation operations. Thus, it is indeed necessary to reevaluate the emergency management policies and planning from the urban to rural evacuation surge perspective rather than focusing on urban hot spots to manage limited resources efficiently and effectively.

Cifuentes, Simone Karla
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The Benefits of Municipal Compost in Coastal Areas Experiencing Land Loss

Wetlands in the United States have been ceded way for urban, agricultural, and residential development. Naturally, wetland loss is balanced by various cyclical wetland-building processes. Today, land is being lost at a far greater rate than it is being replaced; that loss is threatening the sustainability of the entire ecosystem. Land loss has varied in degree across Louisiana's hydrologic basins, from 0.1 square miles (64 acres) annually in the Atchafalaya Basin in 1997 to 11.1 square miles (7,104 acres) annually in the Barataria. The causes of Louisiana's wetland loss are well documented as being the result both natural and human-induced impacts. Upriver, dams and levees built in the name of flood protection impede nutrients and sediment from re-depositing in the delta, preventing the wetlands' ability to regenerate and leaving those living downstream more exposed and susceptible to flooding. In 2005, we witnessed firsthand the disastrous effects of a diminishing coastline on hurricane protection as 80% of New Orleans sat underwater and the greater Gulf Coast lay devastated. If the problem continues unabated, the affects will not only be felt by vulnerable residents of coastal areas but also the greater fishing and oil industries which depend on a vital coast. Coastal cities like New Orleans can institute composting programs to generate soil with which to combat wetland loss while simultaneously reducing waste removal costs and creating green jobs. According to the EPA, yard trimmings and food residuals together constitute 26% of the U.S. municipal solid waste stream and another 25-40% comes from construction and demolition (C&D) waste. In the mid 1990s, many states and municipalities across the country statutorily banned yard trimmings from landfills and began encouraging backyard composting. Additionally, a growing number of American cities are initiating municipal compost programs on a greater scale, ranging from strictly yard and C&D waste to all-inclusive programs including post-consumer food scraps and soiled cardboard products. In San Francisco, 58% of the total households currently have compost pick up services. By 2009, San Francisco, one of the most developed recycling and composting systems in the country, diverted 72% of its solid waste stream from landfills. Mayor Newsom's Mandatory Construction and Demolition Debris Recovery Ordinance, adopted in 2006, which created a mandatory program for the composting of mixed construction and demolition debris is credited as the major contributing factor to the high rate of recycling. "By requiring builders to recycle debris from construction projects, we were able to divert tens of thousands of new tons of material away from the landfill." Given the vast amount of building going on in New Orleans, there should be sufficient material to fuel such an ordinance here. Municipal composting sites in Louisiana could be placed in outlying areas insulating the cities as wetlands are reconstructed outward. Constructed wetlands reduce surface flow velocities, retain

sediments, and remove or transform nutrients or contaminants, improving water quality in downstream waters. High fat and fried contents of Southern diet may possibly affect the quality of the soil compost created and its effects in wetland ecology. Furthermore, higher levels of meat in compost create more noxious odors and attract more vermin thus making the enterprise susceptible to NIMBY, nuisance attacks in the permitting process.

Coursey, Don L.
Megan Milliken
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Reimagining 2005: The Economic Value of Southeastern Louisiana's Wetlands in Terms of Surge Protection

How would the damages and losses sustained in New Orleans during the 2005 hurricane season been different had Louisiana committed to coastal restoration in any of the five previous decades? The purpose of this paper is to answer this question through counterfactual analysis and ascertain the economic relationship between coastal wetlands (defined loosely to include the web of coastal barrier islands, bald cypress swamps, and estuaries) and the economic damage/cost of tropical storm/hurricane surges. We will imagine hypothetical scenarios in which at different periods of time (1965, 1975, 1985 and 1995) the United States and Louisiana not only had the extremely accurate foresight that a Katrina-like hurricane was going to occur in 2005, but also the political and economic will to commit to expansive coastal restoration in SE Louisiana. Because it extends beyond the scope of our analysis, we will not choose a particular type of wetland restoration method, but more loosely assume that our restoration method has a 100% success rate resulting in an appropriate percentage of wetland creation for each decade period. Based on these different levels of restoration for each decade scenario, we will derive the statistical equation for the total expected damages versus avoided damages from storm surge per hectare of wetlands. Using these values we can find the marginal value of per unit area of coastal wetlands. Unlike prior studies on the value of coastal wetlands in terms of storm protection, we will limit the scope of our work to Southeastern Louisiana and limit economic damages and losses to only those imposed by the 2005 hurricane season. By contextualizing our study within the 2005 hurricane season, we hope to offer a more explicit policy argument for the use of soft engineering techniques of wetland restoration as a coastal protection measure.

Daigle, Melissa Trosclair
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Access to State Resources in the Atchafalaya Basin under Louisiana Law

In August 2006, the United States District Court for the Western District of Louisiana handed down its decision in *Parm v. Shumate*, a case concerning the law of trespass as it relates to the bank of the Mississippi River. Under Louisiana law, the bank (area between ordinary low tide and ordinary high tide) is a private thing subject to public use. In the *Parm* case, the main issue at stake was what constituted "public use." The plaintiffs in the case were arrested for trespass when they were found fishing and hunting on waters of the Mississippi River that flooded and covered private land that was classified as a bank of the river. According to the court, public use is "limited to activities that are incidental to the navigable character of the Mississippi River, and its enjoyment as an avenue of commerce," and fishing and hunting did not classify as a public use. This case resulted in an outcry from many in the fishing and hunting community and has been used by private landowners as a way to keep others from boating, fishing, or hunting on flooded banks of navigable rivers. However, there are other cases that classify fishing and hunting as public uses that are allowed on the banks of navigable rivers and streams. Part of this is based on confusion as to the application of the Public Trust Doctrine, under which certain lands, waters, and living resources are held by the State in trust for the benefit of all. This doctrine applies whether land is publically or privately owned. At the same time, it instills in the State the duty and responsibility to manage those things that are classified as Public Trust Assets. By allowing landowners to exclude the public from fishing on banks flooded by navigable waters, the state risks failing in its duty to protect and manage the living assets of the public trust. Cases such as *Parm* have far-reaching consequences, especially in areas of the Atchafalaya Basin, where disputes between property owners and fishermen have been increasing. The Basin carries with it its own set of unique facts, such as the issue of ordinary high and ordinary low water marks in an enclosed area of regulated water flow. Case law, much of which serves as an example of the existing confusion in the courts as to the applicability of the Public Trust Doctrine, has led to fear in many commercial fishermen that they will have no where to fish – and thereby no way to support their families. This presentation will examine the impact Louisiana laws, jurisprudence, and the Public Trust Doctrine on the ability to hunt and fish on Louisiana waters, with specific focus on the Atchafalaya Basin.

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Minling Pan
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Consumer Preference for Wild Caught and Farm Raised Seafood: A Comparison across Species and Consumer Residence States

Over the years, United States seafood consumption has steadily increased. Over a ten-year period (1998 to 2008), total per capita consumption of seafood increased from 14.9 pounds to 16.0 pounds, a 7.38 percent increase. The US ranks third in seafood consumption behind China and Japan, and US seafood consumption is projected to continue to increase. To meet the growing demand, 84 percent of seafood is imported from foreign sources. Yet over half of imported seafood is farm-raised, as aquaculture production is rising and wild catch remains stable globally. With farm-raised products representing such a large portion of the seafood supply, it is important to investigate how production methods affect consumer preference. The

objective of this study is to examine consumer preference toward farm-raised vs. wild-caught fish and evaluate the importance of preference-related attributes across species. The study compares preferences for different species of fish across two distinct states (Hawaii vs. Kentucky) to measure the impact of cultural and geographical differences in consumer preference based on residence. The survey first investigates consumer awareness concerning production methods and the labeling of farm-raised seafood. Additionally, the questionnaire addresses food safety and nutrition, environmental concerns (water/habitat pollution, disease, and overfishing), cultural traditions, taste and preferences on product forms, consumption patterns, and consumer demographics. Fifteen respondents in Hawaii and seventeen in Kentucky completed face-to-face surveys in a pilot study conducted to test the clarity of the survey and the selected attributes. Preliminary results from the pilot study will be presented followed by a discussion for improving the analysis for further research. The research will be expanded using a combination of mailing and face-to-face surveys in each state. Results from the final study will help producers target markets and assist policymakers in facilitating and promoting the aquaculture and seafood industry.

Davis, Mark
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More Than an Amenity

Water is one of the elemental forces that have shaped our planet and human development. Too much or too little of it can be the difference between growth and decline; between success and failure; and between how cultures develop. It has always been so and remains so today though not always in ways that our laws, policies and expectations are well tuned to deal with. Changing climates, dwindling fresh water supplies, and shifting demands are bringing renewed attention to how our water resources are managed—and how they perhaps should be. This places water at the intersection of law and policy; science and technology; and culture, economics and environmental stewardship. Putting these issues into both focus and context was the aim of Bound by Water, a summit held at Tulane Law School on April 9 and 10, 2010. The summit featured some of our nation's most eminent experts on water law, policy, and management as well as lawyers, policy makers, planners, resource users, advocates, and others with an interest in how water management affects their community, business, or future. This presentation will summarize some of the highlights of this summit with a special emphasis on how emerging water law and policy issues might bear on broader natural resource economics and policy challenges.

Day, Jr., John W.
Doug Daigle
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New Orleans and Venice: Coastal Cities at Risk

The situations of New Orleans and Venice provide a telling case study of coastal cities facing similar challenges from global trends such as climate change and sea-level rise. Both were founded at strategic locations in near river deltas, both have developed through historic, systemic modifications of hydrology and elevation. Both are cultural landmarks that are also key economic assets for their countries and regions, which are pursuing or at least planning high-tech engineering efforts to ensure their survival. The differences between the two are also informative, particularly in terms of scale – the scale of their problems, possible solutions, and the national investments that will be necessary to implement those solutions. Unlike New Orleans, Venice is not located near a large river delta with significant supplies of sediment. The MOSES Project of large hydraulic gates being constructed to close off the Venetian Lagoon during high tide events is one of the largest projects of its kind. Its effectiveness, as well as its impacts on the lagoon and nearby estuaries, is uncertain in the face of projected sea-level rise. Plans for New Orleans are somewhat uncertain at this point. Post-Katrina efforts have focused on repair of the levee system damaged by the storm. Restoration of degraded coastal wetlands and barrier islands in surrounding parishes has long been considered essential to the city's long-term survival. But the Louisiana Master Plan and other proposals envision larger levee systems, and hydraulic gates or similar barriers across the Rigolets, and potentially within the city itself, that would block storm surge into Lake Pontchtartrain. A key question for Louisiana is whether and to what degree the state will attempt to follow the Dutch system of barriers and fastlands. The prospects of both cities will be impacted and partly determined by global trends – not only climate change, but rising energy costs, as well as their effects on national economic health. In a scenario of economic contraction and potential energy scarcity, how will decisions be made about the protection of cultural, economic, and natural assets? Such decisions have traditionally been political ones, but the political context of the last half-century was formed by cheap energy and expanding, ongoing economic growth. If this context is changing, what models and approaches can and should be utilized to ensure the sustainability of coastal cities like New Orleans and Venice in a time of potential economic and environmental uncertainty? Projections of sea-level rise pose the greatest threat to both cities – but their abandonment is not likely to be accepted by their respective countries, or the world. The models of ecological engineering, i.e. utilization of natural energy systems, and the valuation of environmental services in fiscal planning, provide partial answers. Application of these approaches to the specific conditions, problems, and opportunities for both cities will help clarify their prospects.

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Determinants of Private Wetland Investments in Coastal Louisiana using a Double Hurdle Model

Coastal wetland loss has been a major problem in Louisiana, exceeding 1.2 million acres over the last century alone. Although federal, state, and local efforts have attempted to combat this loss from a public perspective, little has been done to encourage private landowners to restore and maintain their coastal wetland properties. The main objective of this paper is to investigate the factors that influence private landowners to invest in coastal wetland restoration and maintenance activities in Louisiana. The landowners are assumed to make their investment decisions in a sequential two-step process: First, landowners decide whether or not to invest in wetland restoration and maintenance. Second, landowners decide how much to invest in wetland restoration and maintenance activities. Therefore, a double hurdle model was used to analyze the data collected from a random sample of 75 private landowners in coastal Louisiana. Results from the first hurdle of the model indicate that property-specific factors such as the current use, location and the distance from the shoreline, and landowners' attitudes toward wetland restoration and maintenance, and their participation in coastal restoration programs influence landowners' decisions to invest in costal wetland restoration and maintenance activities. Results from the second hurdle of the model show that property size, income, risk aversion, and whether a landowner receives public investment assistance are important determinants for the level of investments that the landowners will make.

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George Wooddell
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Using PAR for Mitigating Coastal Storm Risk: Partnering with a Community's Economic Development Committee

The small coastal community of Delcambre, Louisiana experienced extensive flooding from storm surge with hurricane Rita in 2005 and again with hurricane Ike in 2008. Beginning in the months following hurricane Rita, members of the community began the process of home elevation, and in many ways the community has become the poster child for non-structural mitigation (any type of mitigation that does not involve the building of levees). Our research involved working with a local economic development group to study non-structural mitigation. We employed Participatory Action Research, a method by which researchers and those they study enter into a partnership to identify the best way to study a problem and make sure that the results of the research make a difference to those who were studied. The economic development committee knew that many in the community had elevated their homes, but were uncertain as to how many had elevated, how many had abandoned their property, and what consequence the mitigation measures taken would have to the community as a whole. We went to work in the summer of 2009 cataloging all of the houses in Delcambre. As we investigated further it became evident that the geography of flooding associated with Hurricanes Rita and Ike was more complex than we initially thought and there appeared to be distinct patterns of mitigation. The mitigation breaks out into 5 categories: 1) vacant/abandoned (70 houses); 2) occupied with no mitigation (420 houses); 3) elevated on piers or pilings to a height that allows living space, similar to a carport, under the house (59 houses); 4) elevated on piers or pilings, but not to the extent that there is living space under the house (219 Houses); 5) elevated in a fashion that uses a mound of soil either as the total or partial elevation strategy (63 houses). There are an additional 20 houses that are under construction/restoration. If we count abandonment as a mitigation strategy (and we have had home owners tell us it is) then 411 or 49% of all houses in Delcambre have initiated some form of non-structural mitigation. The account of how this has and is happening will come out of this project.

Deshotels, Michele M.
Louisiana Office of Coastal Protection and Restoration

Towards a Resilient Coast and Resilient Communities

Louisianans live on the largest river delta system in North America and one of the largest in the world. Louisiana's coastal chenier plain is the largest in North America and the 3rd largest in the world. Communities in Louisiana have historically settled on the highest ground, which is most often the land next to the bayous and rivers, land formed by sediment deposited by overflow. In Louisiana, we don't go "down to the river", we go "up to the river". In parish after parish in Louisiana, the highest ground is the land immediately adjacent to the river or bayou. And on the southwest coast, the cheniers, the narrow strips of ridges surrounded by marsh and paralleling the Gulf waters, are the highest ground. In both cases, this highest ground was built by water. This means that the planning, science, and engineering framed elsewhere for a different landscape may be insufficient, even incorrect, for Louisiana. Best practices that move people and communities away from the rivers and water may actually be moving them into harm's way. Clearly, Louisiana needs planning tools, that allow existing communities, many of which have been here for hundreds of years, to take into account this unique landscape in their planning, while considering how best to protect their natural resources, infrastructure, economy, culture and heritage. Land use planning, land use ordinances, elevating residences and businesses, are all components of non-structural protection practices that contribute to resilient communities. Recognizing that successful development of such for Louisiana would require a coast-wide approach, as well as resources beyond the current capacity of many municipalities and parishes, the Coastal Protection and Restoration Authority is supporting the development of the natural hazard mitigation and natural resource protection components of the Land Use Toolkit as they relate to coastal and riverine communities in Louisiana. Specific work products will include not only the natural hazard

and natural resource modules of the Land Use Toolkit, but also a best practice manual. The best practice manual will assist communities with evaluating the usefulness of different types of codes and ordinances for their own geographical/environmental settings.

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Michael Thomas
Florida A&M University
David Harding
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The Economic Impact of Cogongrass on Private, Non-industrial Forest Owners in Florida

Cogongrass (Imperata cylindrica (L.) Beauv.) has become a major problem for many landowners, land managers, foresters, and governmental agencies since its introduction into the southeastern United States. Cogongrass' tendency to form dense, persistent and expanding stands allows it to displace other vegetation. Its abundant biomass prevents recruitment of other plants and changes the properties of the litter and upper soil layers. Cogongrass is spreading and invading new areas all over the country, and is now considered by many as one of the biggest weed threats presently facing forestland owners. Because this weed can burn hotter than native species, it can increase the damage to timber during wildfires. There is also concern that successfully established cogongrass can suppress growth of seedlings of native plants in the forest including important tree species. However, in spite of the extensive damage caused by this invasive plant, little is known about its economic impact to forest owners or regional economies. A survey of non-industrial private forest owners in Florida was conducted to document the economic impact of cogongrass on forest inventory, regeneration and productivity. These impacts were measured as both lost timber inventory (actual and potential), reduced forest-dependent activities and any costs related to the control and/or removal of cogongrass. These direct losses were then applied to an economic input/output model to determine their indirect and induced effects to the economy at large.

Dvarskas, Anthony
National Oceanic and Atmospheric Administration

Aligning Methods for Incorporating Ecosystem Services into Evaluation and Monitoring of Wetland Restoration Projects: Policy Implications, Available Approaches and Research Needs

Coastal restoration activities can have a range of economic impacts and benefits, including job creation, recreational use, and enhancement/preservation of ecological services. Some of these benefits are more readily quantified in monetary terms than others; it may be more straightforward, for example, to quantify the increased number of visitors to a restoration site and model their expenditures than to enumerate the monetary value of increased nutrient cycling or water filtration in a restored salt marsh. The ecological services are more indirectly related to human activities than the recreational activities. Determining and quantifying the full economic benefits (both recreational and ecological) of coastal and wetland restoration is an important area of investigation for the purposes of policy formulation. By developing a consistent framework for assessing the full economic benefits of potential wetland restoration projects, policymakers and resource managers can improve the prioritization process and assist in ensuring that the project providing the greatest overall benefit to the public is selected. Such values could also assist in determining the credit companies undertaking restoration activities at wetlands should receive, whether in a compensation, mitigation, or market trading context. NOAA's Damage Assessment, Remediation, and Restoration Program (DARRP) has been involved in evaluating the loss of ecological services in its work with Habitat Equivalency Analysis at oil spills, vessel groundings, and contaminated sites. DARRP also has enumerated the loss of human use at these locations to determine the compensation required for the public. In other settings, different approaches have been used to quantify mitigation requirements, develop ecological credits, or assess the overall value of ecosystems. Development of a more uniform strategy for incorporating ecosystem services valuation into assessment and monitoring of restoration projects could facilitate project selection and better delineate data collection requirements, regardless of the reason for seeking the restoration (e.g., natural resource damage assessment, mitigation requirements, trading credits). Construction of such a framework will require collaboration across Federal agencies, non-Federal agencies, and NGOs and involve cross-disciplinary research between ecologists, economists, anthropologists, and others. This paper will discuss the approaches that have been used to quantify ecosystem services arising from wetland restoration, ongoing research and activities looking into analysis of wetland restoration ecosystem services, potential components of a framework or tool that could account for ecosystem services at wetland restoration sites, drawing from existing tools, and research needs for development of such a tool.

Ellis, Chris
NOAA Coastal Services Center

Serving the Coastal Manager: Insights from NOAA's 2010 National Survey of Coastal Resource Managers

The NOAA Coastal Services Center's primary initiatives address those issues considered most important to coastal managers—including coastal hazards, resilient communities, competing land and water use, and information access to support sound, informed decision-making. In an effort to assess both customer satisfaction and to better understand the important issues affecting the coastal management community, the Center sponsors a survey every three years to gather such information. Respondents represented an array of management entities, including the state offices of coastal management programs and departments of

natural resources (or equivalent agencies), as well as managers of national estuarine research reserves, Sea Grant college programs, national estuary programs, allied programs, and nonprofit and nongovernmental organizations. This is the fifth such survey, the first of which was administered in 1996. The most recent survey discussed herein was Web-based, conducted to determine opinions on data and information priorities of the nation's coastal management community. This discussion will highlight survey findings on a variety of topics. Topics include priority coastal management issues, expressed needs for social science tools and support, desired data layers for geographic information system products, and other related decision-support tools and technical assistance. Information will be presented primarily from a national perspective, with select, notable points from various regional U.S. geographies. The 2010 Coastal Resource Management Customer Survey report will soon be available on the NOAA Coastal Services Center's Web site at www.csc.noaa.gov/survey/.

Freeman, Matthew A.
CNREP and Louisiana Sea Grant
Christopher M. Anderson
University of Rhode Island

Experiments in the Lobbying Activity of Fishers with Heterogeneous Preferences

The National Marine Fisheries Service reported in 1999 that of the 158 fish stocks with a "known" status, 46% are classified as below the level required for a Long Term Potential Yield (LTPY). Improvement of the LTPY of fish stocks will require both an evaluation of existing regulations for the utilization of those resources as well as implementation of new management plans that can effectively improve stock status. However, management plans from the Regional Fishery Management Councils are subject to lobbying efforts. Using a common pool resource (CPR) setting modeled after fisheries, this experimental research incorporates two user groups that differ based on the externality they generate. Presented with a proposed cap on individual effort, users are then able to lobby to change the cap. By examining the experimental results for potential free-riding and the way in which free-riding discourages the lobbying of other users, we provide information on how lobbying activity of fishers with heterogeneous preferences might prove problematic for proposed policies.

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Christopher M. Anderson
University of Rhode Island

Game Theoretical Models of Effort and Lobbying in a Heterogeneous CPR Setting

Extraction from a common pool resource (CPR), such as a fishery, can lead to socially inefficient and undesirable outcomes as a result of appropriation problems. Through regulation of the CPR, users may achieve a more profitable and socially efficient outcome. Feeny et al. (1996) delve into some of the assumptions made by traditional CPR models and how use of those assumptions provides an incomplete framework to guide fishery policy. In the theoretical models we develop, we relax two of those assumptions: CPR users are homogeneous and are unable to create, or influence, management of the resource. Regarding resource sustainability, we observe some positive outcomes with regards to lobbying, dependent on whether groups act cooperatively or non-cooperatively.

Gabrielyan , Gnel
Sachin Chintawar
John Westra
CNREP and Louisiana State University Agricultural Center

Factors affecting Adoption of Cover Crops and Its Effect on Nitrogen Usage among U.S. Farmers

Increasing environmental concerns, population, and change in preferences of consumers towards healthier foods, agronomic practices have aliened to provide not only food and fiber, but also sustainable practices beneficial to the environment. Cover cropping is one type of technology increasingly being adopted by producers of multifunctional agriculture. Cover crops provide a range of benefits, both private and public. In this paper we identify factors affecting farmers' choice to adopt cover crops. We examine the impact on nitrogen use from adopting cover crops and the resultant decrease in input costs. Using a two-stage approach that incorporates endogeneity of adoption of cover crops in nitrogen management, we conclude that farmers adopting cover crop technologies, increase production efficiency and significantly decrease nitrogen fertilizer use, as hypothesized by Smith (2002). Previous literature suggests that soil organic carbon (C) and nitrogen (N) concentrations can be conserved or maintained by reducing losses from mineralization and erosion, and by sequestering atmospheric CO2 and N2 in the soil using no till systems with cover crops (Sainju et al. 2001). Herein lie our four research objectives: 1) Identify determinants of cover crop adoption 2) Analyze how N management varies by farm relative to adoption or nonadoption of this technology 3) Understand the change in the probability of adoption of cover crops due to farm, regional and operator characteristics by non adopters and 4) Estimate the change in intensity of decrease in N use by those who adopted cover crops due to farm regional and operator characteristics. To address our first two objectives, we develop a two-stage simultaneous equation model where the first stage provides information on the factors affecting adoption of cover crops using a probit model. To better understand the effects of cover crops on the amount of N used by farmers we use a left censored Tobit model and incorporate the adoption of cover crop as an endogenous variable. Further, we test for endogeneity using the Smith and Blundell (1986) test by checking for exogeneity (i.e., whether cover crops affect N management). To estimate the intensity of the effect of adoption of cover crops, we investigate the impact of adoption on the amount of N used by farmers who have already adopted and those who switched to using cover crops using the McDonald and Moffitt (1980) decomposition of the marginal effects. Over time, increases in agricultural efficiency, as

measures by prices, have bought about an increase use of marginal lands in production of agricultural goods. Given these conditions, adopting cover crops had a significant impact on the amount of N applied to fields and consequently decrease input costs. Farmers with more diverse operations (as measured by number of crops cultivated), and those more highly- educated, appeared to perceive the gains from adopting this technology. Farms using cover crops used less external N and had lower nutrient management costs associated with their farming operations. Farming operations with livestock were less likely to use cover crops. Farms situated in traditional agricultural areas of Midwest, or those with large operations in the Delta, were less likely to use cover crops; perhaps due to labor or time constraints associated with the fall harvesting or spring planting that may not be compatible with cover crop use. From our analysis one can conclude that increased efficiency measures by farmers who adopt a technology like cover crops tend to decrease N fertilizer, as hypothesized by Smith (2002).

Griffin, Wade
Richard Woodward
Texas A&M University

Determining Efficient Management Strategies for the Recreational Red Snapper Fishery in the Gulf of Mexico

Red snapper (RS) stock in the Gulf of Mexico (Gulf) has been assessed as overfished and undergoing overfishing (SEDAR 7). In an effort to rebuild the RS stocks, the Gulf of Mexico Fishery Management Council with the National Marine Fisheries Service have enacted several regulations including: a maximum total allowable catch (TAC) split between the commercial and recreational fishermen, closures, size limits, bag limits for recreational fishermen, and individual fishing quota (IFQ) for commercial. The objective of this paper is to improve upon existing bioeconomic analyses by making three important extensions to the analysis that has been done to date: (1) we include in the bioeconomic model the for-hire recreational RS fishery, (2) we explore the impact of recreational RS management strategies (MS) on all reef fish fisheries, and (3) we determine the most efficient MS for recreational RS in the Gulf. Biologists are primarily concerned with setting regulations so that a fish stocks are not overfished and rebuilding of overfished stocks will occur. Economists typically are concerned with combining inputs in such a way that will harvest fish in the most economically efficient way to maximize economic surplus. Our analysis uses the General Bioeconomic Fishery Simulation Model (GBFSM) which includes shrimp, red snapper, vermilion snapper, and all other reef fish, as well as, all major vessel types that harvest these species as directed catch or as bycatch (discards). We examine 2,816 management strategies (MSs) that are a combination of TAC, bag limits, size limits and opening date in the Gulf RS recreational fishery. Data envelopment analysis (DEA) is used to estimate a production possibility frontier, where the two outputs are fish stock and economic surplus. The efficiency rate is calculated for each MS. Results indicate that the gains or loses from changing RS recreational MSs are considerably reduced when taking into account their effect on all reef fish. Results also indicate that efficient MSs in the east Gulf are different from those that are efficient in the west Gulf. A "one size fits all" is not the best approach for the managing the recreational RS fishery in the Gulf.

Haines, Terry K.
U. S. Forest Service

Sustaining Florida's Forest Ecosystems: Potential Effects of County and Municipal Ordinances

A range of local enactments in Florida potentially affect forest land retention and sustainability. An analysis of county and municipal ordinances was conducted using the electronic database of county and municipal codes compiled by the Municipal Code Corporation. The database comprises enactments in about 80 percent of county and 60 percent of municipal jurisdictions in the State. A series of keyword searches in the multiple code search option was used to identify pertinent code. A classification system was established for compiling and analyzing the codes. Local ordinances related to zoning, land use, tree protection, and water quality and wetlands protection were found to have the greatest implications for forest integrity. The primary influences were requirements for the use of the State's voluntary guidelines for forest management, (silvicultural best management practices), and the State's more specific guidelines for forest operations in wetlands. Tree protection, and development-related code often exempt traditional forest management from environmental assessments, mitigation, and permit requirements provided silvicultural best management practices are implemented. However, several stipulations are enumerated in addition to the use of the State's guidelines in many localities. Most often the property must be classified as agricultural land for ad valorum taxes and otherwise qualify as a bonafide forest use as determined by local officials for exemption. In addition, the property must not be converted to others uses upon harvest to be eligible for exemption. The potential effect of zoning in retaining forestland is varied. Some jurisdictions' codes promote retention of forest land in response to development pressures while others limit or prohibit traditional forest management in urban interface land use districts.

Hansen, Kristiana
Tina Willson
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Valuing Wetlands Where Water is Scarce: The Case of Wyoming

Wyoming, the third driest state in the US, is not an area that most would associate with wetlands. However, wetlands play a crucial role in the environmental health of the state. Although Wyoming contains proportionately less wetland area than the national average, the relative scarcity of wetlands in the state renders the services they provide all the more important. Wetlands improve water quality by filtering

sediments and nutrients. They also reduce erosion and stabilize stream banks and downstream flow volume. Wetlands provide important habitat for migratory waterfowl, shorebirds, and fish, some of which are threatened or endangered. Virtually all wildlife species in Wyoming utilize the state's wetlands at some point during their life cycle. Through the ecosystem services they provide, wetlands are closely linked with key sectors of the Wyoming economy: energy, agriculture, and recreation. For example, they have the potential to reduce the ecological impacts of energy and agriculture. Their continued health is also crucial to Wyoming's ability to provide the tourism and recreational opportunities so important to the state's image and economy. Despite their ecological and economic importance, Wyoming's wetlands must compete with energy and rural residential development, and are threatened by climate change. Heightened awareness of the economic and environmental importance of the ecosystem services that wetlands provide has led to increased interest in protecting them. The Wyoming Statewide Comprehensive Outdoor Recreation Plan and the State Comprehensive Wildlife Conservation Strategy identify wetland protection and conservation as a priority. Additionally, the Wyoming Water Development Commission is in the process of developing a methodology for incorporating environmental and recreational water uses into its water basin planning process. GPS technology and more sophisticated modeling techniques as well as greater computational power have made it feasible to implement protections. This poster is based on an upcoming extension bulletin to inform the public about the services that Wyoming wetlands provide and how economists value these services. We describe the types of wetlands that prevail in Wyoming and illustrate their distribution throughout the state. We discuss the functions and services that these wetlands provide and the motivation for determining their economic value. This is followed by an overview of the common economic valuation techniques used by economists to value ecosystem services. We conclude with an overview of the wetland valuation studies that have been undertaken in Wyoming and the Rocky Mountain west more generally and directions for future work.

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Non-market Valuation of Coastal Environment : Uniting Political Aims, Ecological and Economic Knowledge

The EU Water Framework Directive (WFD) requires coastal water quality to be classified according to ecological indicators. In this paper, non-market valuation is used to estimate the value of improving the water quality status according to this classification, investigating if this type of holistic political-ecological measure can be related to and valued in monetary terms by the general public. The paper focuses on eutrophication effects, such as bad sight depth, a decrease of bladder wrack stands and algae mats. These water quality elements affect recreational use of coastal areas. Relating to recreational use, two other environmental attributes are addressed – algae blooms and protection of marine areas in terms of e.g. restrictions for boat traffic. The restrictions scenario is also holistic in terms of several imposed restrictions, as well as tightly linked with existing policy. Conducting valuation studies based on a policy-determined measure might be beneficial for decision-makers but also for research e.g. in terms of data availability. Regarding Benefit Transfers (BT), requirements of WFD imply that water quality indicators in different areas are likely to be widely available. This means that results from a valuation study in one area can be transferred to a different area without needing additional ecological data. This paper presents results from two valuation studies on marine areas in Sweden, one on the east coast and one on the west coast. Web based surveys were applied, including both choice experiment (CE) and contingent valuation (CV) questions. The areas are similar in many ways: both of them are close to large cities and important for recreation, and both of them have a mix of permanent residents and visitors. Also in terms of use, environmental problems and causes for these, as well as potential actions for improvement, the areas are similar. It can be concluded that these holistic politically defined measures seem to work well as a basis for economic valuation. From a BT perspective, the results are promising. The willingness to pay (WTP) estimates are similar between the two areas, especially for the CV questions. Hence transfer of WTP estimates between the two areas seems reasonable. However, if the WTP functions are transferred, rather than the WTP estimates, the validity of the BT is better for the CE questions than for the CV questions. It is worth noticing that not only the level of water quality improvement influences the respondents WTP, but also the original water quality status. This suggests that knowledge of the original water quality status is important when BT is applied. Concerning distributional issues especially one finding is worth a further investigation. That is, respondents who have a non-Swedish origin seem to have different preferences compared to respondents who do not. In Sweden, to our knowledge, no valuation study has considered ethnical aspects in their analysis. Since about 10 percent of the Swedish population have a non-Swedish origin it should be of interest to further look into this groups preferences for natural resources.

Henderson, James E.
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Importance of Hunting, Fishing, and Wildlife-Associated Recreation to the Mississippi Economy

Hunting, fishing, and wildlife-associated recreational activities generate an impressive amount of economic activity in Mississippi. According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 1.1 million people spent $1.1 billion on trips and equipment purchases in Mississippi while participating in hunting, fishing or other forms of wildlife-associated recreation. These expenditures, while impressive, are only a component of the total economic impact that Mississippi's wildlife and fisheries resources generate for the state's economy. Each dollar spent on wildlife-associated recreation generates additional economic activity in other sectors of the Mississippi economy. These indirect and induced effects occur as other sectors provide goods and services as a response to the initial economic activity generated by wildlife and fisheries related recreation. This project utilizes an input-output analysis to quantify the total economic contribution that hunting, fishing, and wildlife-associated recreation have on the Mississippi economy. An input-output model of the Mississippi economy was constructed using the latest IMPLAN software and database. IMPLAN is a computerized modeling and database system used for constructing regional economic accounts and input-output tables. The IMPLAN model uses a 440 sector input-output transactions table to quantify multiplier effects resulting from activity in one or more sectors as demand flows generate responses from other supporting sectors of the economy. Expenditures for hunting, fishing, and wildlife viewing from the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for Mississippi serve as the primary source of direct effect estimates. The demand shock resulting from wildlife and fisheries related recreation will be molded to produce estimates of indirect and induced effects. These will be summed to generate a total effect for fishing, hunting, and wildlife viewing. Quantifying the economic contribution of Mississippi's wildlife and fisheries resources will result in increased awareness of the economic value of this natural resource and a greater appreciation of its importance to the Mississippi economy.

Huffer, Hillary
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Income, Inequality, and Criteria Air Pollutants in the Cama Counties

Socioeconomic factors have long been incorporated into environmental research to examine the effects of human dimensions on coastal natural resources. Boyce (1994) proposed that inequality is a cause of environmental degradation and the Environmental Kuznets Curve is a proposed relationship that income or GDP per capita is related with initial increases in pollution followed by subsequent decreases (Torras and Boyce, 1998). To further examine this relationship within in the CAMA counties, the emission of sulfur dioxide and nitrogen oxides, as measured by the EPA in terms of tons emitted, the Gini Coefficient, and income per capita were examined for 1999. A quadratic regression was utilized and the results did not indicate that inequality, as measured by the Gini Coefficient, was significant to the level of criteria air pollutants within each county. Additionally, the results did not indicate the existence of the Environmental Kuznets Curve. Further analysis of spatial autocorrelation using ArcMap 9.2, found a high level of spatial autocorrelation among pollution emissions indicating that relation to other counties may be more important to the level of sulfur dioxide and nitrogen oxide emissions than income per capita and inequality. Lastly, the paper concludes that further Environmental Kuznet Curve and income inequality analyses in regards to air pollutant levels incorporate spatial patterns as well as other explanatory variables.

Huth, William L.
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Ash Morgan
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Economic Aspects Associated with Large Ship Artificial Reefs

The USS Oriskany and the USS Vandenberg were the most recent large ships that were intentionally sunk to create artificial reefs. Large ships as reefs are unique in that in addition to the obvious fishery economic activity they also generate diving economic activity. Research is presented that documents the economic activity generated by the Oriskany after its sinking off of Pensacola in 2007 and the Vandenberg after its sinking off of Key West in 2009. In both instances, a travel cost model is used to estimate the diving demand for the large ship artificial reefs. For the Vandenberg results are presented both prior to the sinking event (stated preferences) and after the sinking event (revealed preferences). Expected diving pressure shift from natural to artificial reef is measured as well. For the Oriskany, the economic valuation result from sinking another large ship nearby is developed and the economic impact of the ship settling deeper is measured as well. Finally policy implications for large ship reefing are suggested based on the economic valuation results and recommendations for additional research are made.

Hutt, Clifford
Kevin Hunt
Leandro Miranda
Steve Grado
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An Economic Valuation of the Recreational Fisheries in Sardis and Grenada Lakes

Sardis and Grenada lakes are the most heavily used of four large flood-control reservoirs in north-central Mississippi. Recently termed the "Arc of Slabs" by In-Fisherman magazine, these reservoirs have been receiving an increased amount of effort from non-resident and non-local Mississippi anglers in recent years because of their notoriety as producers of large white and black crappies. This study was initiated to determine trip characteristics, trip expenditures, resultant economic impacts, and consumer surplus of anglers utilizing Sardis and Grenada lakes. Access point creel surveys were conducted over 12-month periods on

each lake (March 2006 to February 2007 on Sardis Lake and March 2007 to February 2008 on Grenada Lake) to estimate the annual number of angling activity days on each lake, and recruit anglers to participate in a mail survey to collect detailed trip expenditure data for economic impact assessments (EIAs) and contingent valuation models (CVMs). EIAs were generated from a statewide model using Impact Analysis for Planning (IMPLAN) software to determine the economic impacts of resident and non-resident anglers the state economy. Consumer surpluses were estimated in SAS using probit models of data collected from a dichotomous choice contingent valuation question. Anglers made 55,314 trips to Sardis Reservoir and 33,207 to Grenada Reservoir. Total economic impacts were estimated to be $16.94 million on Sardis Reservoir, and $5.65 million on Grenada Reservoir supporting 235 and 151 full-and part-time jobs, respectively. Total consumer surplus was estimated to be $11.89 million and $4.47 million on Sardis and Grenada Reservoirs, respectively. Total economic value was estimated at $28.82 million and $10.12 million for Sardis and Grenada Reservoirs, respectively. These estimates provide a measure of the benefits of these fisheries to the both the economy of Mississippi, and the anglers that utilize them. However, these are likely conservative estimates of the annual economic value of these reservoirs as this study was conducted during a period of drought when water levels were extremely low, and angler effort was considerably depressed as a result. Resource managers should keep these estimates in mind when making future decisions on the use and management of these, and similar reservoirs in the southeast United States.

Interis, Matthew G.
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Timothy C. Haab
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Willingness to Pay for Environmental Improvements in the Presence of Warm-Glow

Andreoni (1990) coined the phrase "warm-glow" which refers to a "good feeling" one gets from contributing to what one perceives as a good cause. One might reasonably assume that many types of private contributions to environmental improvements, for example picking up litter, recycling, or cutting down on greenhouse gas emissions, could result in the contributor experiencing a warm-glow effect as a result of his actions. We conduct a stated preference survey of Ohio adults (sample size 859) and elicit willingness to pay for a decrease in a Fuel Index, how much they would be willing to give to a carbon offsetting organization (e.g. TerraPass), and a rating of their environmental self-image, which we use as a proxy for warm-glow. The Fuel Index attempts to capture aggregate effects of different economy-wide fuel mixes (percentage use of ethanol, diesel, gasoline, etc.) in terms of strain on natural resources, risk to human health, and environmental damage. Measurement of self-image was guided by the psychological and marketing literature, and was measured on a scale, 0-10. In a previous paper, we estimated that if a respondent contributes to a carbon offsetting organization he will on average give himself a self-image rating after he contributes that is one half point higher than before he contributes. We also estimated that for each dollar of contribution, a respondent rates his image roughly 14% of a point higher. In the current paper, we use these estimates to calculate willingness to pay for a decrease in the Fuel Index under three different hypotheses regarding warm-glow: (1) there is no warm-glow, (2) warm-glow depends only upon whether or not the respondent is willing to contribute, and (3) warm-glow depends upon the amount the respondent contributes. We find that, depending upon the hypothesis regarding warm-glow, which consequently affects the model used to calculate willingness to pay, estimates of value of environmental change can differ significantly. We discuss implications for warm-glow and value estimation, including how warm-glow might differ in a hypothetical situation (saying you would do something "good") and a real situation (actually doing something "good"), how payment mechanism (e.g. a tax which people must pay) might crowd out warm-glow effects, and implications of collinearity of warm-glow and contribution under hypothesis (3) above.

Jones, S. Beaux
Louisiana Sea Grant Law and Policy Program

Elmer's Island: Controversy, Confusion, and Classification

This project began after the State of Louisiana issued a press release asserting ownership over the land known as "Elmer's Island" and declaring it open to the public. Elmer's Island is a barrier spit (commonly referred to as an "island") comprising about 1700 acres (pre-2005 hurricane season) on the west side of Caminada Pass from Grand Isle in Jefferson Parish. The land is accessible by one road, and it was believed that a local family (the Elmer family) owned the road and thus had control over the beachfront property. For decades the Elmer family allowed recreational visitors to use the property for a small fee, but in 2001 after the death of Jim Elmer, the family closed the property to the public. Following the State declaring the property as their own on December 15, 2008, several newspapers articles were written discussing the situation and it was clear that the Elmer family disagreed with the State's claim. The State opened the Elmer's Island Wildlife Refuge on July 4, 2009 and on August 28, 2009 Charles Elmer sued the State on this matter. This project was undertaken by Louisiana Sea Grant Law & Policy Program (LSGLPP) to better understand the situation surrounding the Elmer's Island. LSGLPP conducted research on the merits of the State's ownership of the property, the modalities of their acquisition, the history of the property, the merits of Charles Elmer's lawsuit, and the regulations currently in place at Elmer's Island. The research centers on the legal classification of different sections of the island and how Louisiana law distinguishes between land belonging to the State and land susceptible to private ownership. Publicly accessible beaches in Louisiana are a rarity, but they are extremely important to coastal protection and recreational uses. The State's handling of the

Elmer's Island property has been praised by some and criticized by others. This project, although relatively narrow in focus, sought to better understand and educate the public on Louisiana's plan for protecting and conserving its valuable coastline. The poster at CNREP will also discuss alternative solutions such as the proposed Caminada Headlands State Seashore.

Kaliba, Aloyce
Southern University and A&M College
David Bouras
Lincoln University

Estimation of Catfish Production Function Using Cross-Sectional Survey Data

A production function describes a mapping from quantities of inputs to quantities of outputs as generated by a production process. It is a quantitative or mathematical description of the various technical production possibilities faced by a firm, an industry, or an entire economy for all combinations of inputs. The production function presupposes technical efficiency and states the maximum output obtainable from every input combination. Empirically, production functions are commonly estimated using time series data. Time series data are expensive to collect and due to time lag involved in data collection may not portrays existing technology. We use non-linear mixed models and simulation techniques to estimate production functions, marginal product of inputs and elasticity of input demand for different catfish farm size using cross-sectional survey data. This is to account for farm size and extension service received. Results indicate that extension contacts increased marginal product of all inputs. Small farms face inelastic input demand that can be attributed to limited bargaining power. Improved extension service will improve technical efficiency and should be directed more to small farms.

Kaliba, Aloyce
Calvin R. Walker
Southern University and A&M College

Economic Impact of Processing Crawfish Offal in Louisiana

Louisiana is the largest producer of crawfish in the United States. Industry experts estimate that Louisiana accounts for more than 85% -of the U.S.'s total production. Crawfish acreage has continued to increase, from approximately 16,000 hectares in the mid-1970s to more than 65,000 hectares in recent years, which is more than 13% increase. The annual harvest is over 46 million kilograms. Since only 85% of crawfish is edible, Louisiana produces more than 39 million kilograms of peeling from wastes (offal) annually. In addition, Louisiana crawfish industry is faced by marketing problems. The live crawfish shelf life dictates harvesting schedules, marketing plans and limits regional and national distribution. Moreover, increased imports of frozen processed tail meat and whole boiled crawfish, have depressed domestic crawfish price. Processing of crawfish offal will increase profit margins for the industry and increase the crawfish shelf life. This will increase the scope of crawfish marketing. Farmers and processor would have greater control of their products, and processing of offal will increase the competitiveness of the Louisiana's crawfish industry. Economic impact of crawfish offal processing is estimated using input-output model. Results indicate that processing the offal would increase the industry profit margin by 15% and create more than 200 jobs in Louisiana. There is a need for the state to create incentives to attract private capital in crawfish offal processing.

Kaval, Pamela
Matthew Roskruge
University of Waikato

Valuing New Zealand Native Bird Existence for Conservation

New Zealand is considered by some as the world's seabird capital; it is also home to many native forest birds found nowhere else in the world, hence, the preservation of native bird species is a biodiversity priority. While several New Zealand studies have placed a value on recreation, very few have placed a value on native birdlife. In this study, we make a contribution to this deficiency in the literature. During December 2007 and January 2008, telephone surveys were used to randomly sample Waikato, New Zealand residents. The purpose of the surveys was to determine whether respondents valued native bird conservation programmes in their area. We elicited the contingent valuation approach to determine the value in terms of their willingness-to-pay to support regional conservation initiatives aimed at protecting, or restoring, native bird populations. Results indicated that local birdlife was regarded positively by residents and that they were in favour of local conservation and restoration initiatives. 86% of respondents were willing-to-pay an annual addition to their rates (taxes) to support these initiatives. Conservatively, the value of native bird conservation in the region was approximately $13 million (2008 NZ$). Willingness to support these initiatives depended strongly on income, ethnicity and age. The positive willingness-to-pay for additional regional rates for local birdlife conservation suggests that there could potentially be an underinvestment in birdlife conservation in the Waikato region, and that regional bodies could draw upon local funding, as opposed to relying on central government funding, to support these initiatives.

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Working Towards an Ecosystem Service Valuation Standardization

According to the Millennium Ecosystem Assessment (2005), over the last half of the 20th century, humans have been rapidly and extensively affecting ecosystems and their services, resulting in substantial and irreversible biodiversity losses, while attempting to meet worldwide demands for the basic human needs of food and shelter. Therefore, it is not only important to conduct ecosystem service valuations for the sake of the services, but also because of their rapid and extensive losses. However, the process of calculating ecosystem service values is complicated and there are currently no valuation standards. As a result, researchers not only use different methods to calculate values, but they also focus their valuations on different services. Many researchers are using the benefit transfer technique to value ecosystem services, but the lack of consistency in the studies may result in benefit transfer studies that may be biased. In this study, a summary of the methods commonly used for the valuation of ecosystem services, as well as the ecosystem services that were valued, was conducted. From this, recommendations for conducting ecosystem service valuation studies were created.

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Legal Issues Concerning Hydrokinetics in Louisiana Rivers

For years, mankind has harnessed energy from water sources. However, traditional hydropower methods such as dams have wreaked environmental havoc while taking a backseat to the exploration and use of fossil fuels. By contrast, hydrokinetics, the use of moving water as a means for energy production, presents to our country and our region an alternative source of clean, renewable energy. More specifically, the introduction of in-stream hydrokinetic turbines into major rivers and tributaries presents a very promising source of pollution-free electricity. These turbines operate under water, where pressure from the river flows through the turbine and creates energy. In-stream turbines are distinct from tidal turbines, which are used in oceans and gulfs and are already produced on an international scale. By contrast, because the technology and the market is relatively new, in-stream technology presents an industry that will provide clean electricity while potentially bolstering the local economy. It is estimated that if such a technology could be utilized on a large scale, it could provide electricity to millions of homes. In fact, a few companies such as Free Flow Power and Hydro Green Energy have acquired preliminary permits from the Federal Energy Regulatory Commission (FERC) and are planning to use these turbines in the Mississippi and Atchafalaya Rivers as soon as this summer. Although this technology seems a very common sense alternative to our energy woes, several obstacles may impede companies from realizing their objectives. Among such legal concerns is the federal regulatory process, which falls under the jurisdiction of FERC but is also subject to the approval of many other agencies, including the U.S. Army Corps of Engineers, the U.S. Coast Guard and the U.S. Fish and Wildlife Service. Moreover, companies seeking to employ this technology must adhere to state regulations and water-bottom laws, as well as any private property issues that may arise. Finally, many existing state and federal projects, such as diversions and coastal restoration, could impede this industry. This poster will outline the federal and state regulatory process and Louisiana state property laws concerning the introduction to in-stream hydrokinetic turbines to major rivers in Louisiana.

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Dynamics of Permit Transfers in Alaska Salmon Fisheries

Fisheries management systems based on transferable permits or quotas have been adopted in numerous fisheries worldwide. Permit or quota transfers may result in changes over time in the distribution of where permit or quota holders live, which may in turn have important economic and social consequences for communities and regions. Where permit and quota holders live may affect where fish are landed and processed, where vessels are home-ported, where fishing income is spent, where fishing crew are hired, and the extent to which communities are (and perceive themselves as) fishing communities. There has been relatively little theoretical or empirical analysis of inter-regional transfers of fishing permits or quotas: why they occur and how they affect the regional distribution of permit and quota holders over time. This paper examines this topic for Alaska's limited entry salmon fisheries, for which more than three decades of data allow detailed analysis of permit transfers and the regional distribution of permit holders. Our analysis suggests that as fisheries become more profitable, the relative economic advantages of living close to the fisheries decline, increasing the share of non-local residents among buyers willing to pay the market price for permits, and reducing the long-run equilibrium share of permits held by local residents. This leads to a conflict between two important policy goals: increasing fishery profitability and maintaining local participation in fisheries—particularly in rural regions where alternative economic opportunities are limited.

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On the Development of a Community Resilience Index

Despite abundant literature in social-ecological resilience, hazards, and vulnerability, there is yet a convincing approach to quantify and measure community resilience. This is partly due to the many different definitions ofresilience, which is often confused with similar concepts such as vulnerability, sustainability, and adaptability, and partly due to the need to consider indicators from both the natural and human systems. In this paper, we propose a general framework for measuring community resilience. We then apply the framework to population data from Louisiana at the Parish level and to the mail return data in New Orleans after Katrina at the census tract level. Multivariate statistical analytical techniques, including K-means cluster analysis, factor analysis, and discriminant analysis, were applied to derive a composite index of community resilience. Initial results are promising, but further refinements of the index are needed to make it more applicable and easily applied. The development of a meaningful and yet practical resilience index will help identify aspects of activities that will increase or decrease resilience, thus would serve as a useful tool for sustainable planning and management.

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Wind Turbines and Coastal Recreation Demand

With energy price levels and volatility on the rise, more communities and local power companies are considering wind farms. Wind farms are collections of numerous wind turbines (ranging from around a dozen to one hundred) placed on large contiguous land tracts within the landscape to generate electrical power. While the upfront capital costs can be significant, variable costs associated with maintenance and distribution are relatively small and fairly stable. As prices for oil, coal, and gas rise, wind energy becomes economically viable. Wind power is also attractive due to its ability to provide long-term price stability for electric power. North Carolina has ample wind energy potential, but the harvesting of wind energy is not without some potential drawbacks. Wind farms, with their imposing towers and whirling turbines, can create a visual dis-amenity. This potential for negative impact is exacerbated by the fact that some of the places with the highest wind energy potential, such as mountaintops and coastal waters, are distinguished by their scenic vistas. Diminution of these vistas could affect the everyday welfare of local people and inhibit tourism and recreation. We examine the impact of coastal wind projects on recreation and tourism using survey data on beach visitation and site choices. A joint revealed and stated preference recreation demand model allows us to estimate average annual consumer surplus for beach visitors from 16 NC CAMA counties, as well as how surplus might change with coastal wind projects at all major beach destinations. The average beach visitor plans to take 19.9 beach trips next year; this number is reduced to 18.7 with wind farms present at all 31 major beach destinations in North Carolina. Preliminary results suggest that annual consumer surplus for beach visitation is $2393, and this surplus would be reduced to $2232 under the wind farm scenario, a loss of about 7%. The impact on local economies, however, in terms of tourist expenditures and economic activity, would likely be minimal. A subsample of conjoint data is used to estimate individual willingness-to-pay to avoid seeing wind turbines at various distances from the beach, both in the sound and ocean. We employ visualization products on the internet in order to measure the influence of coastal wind farms on beach site selection. We find no influence of wind farms in the coastal sounds (at distances of 1 and 4 miles out) on recreation demand. For ocean wind farms, we find evidence of aversion to wind farms 1 mile out, but not four miles out. Average willingness-to-pay to avoid ocean wind farms one mile from the shore is between $60 and $80 per trip. Beach congestion is found to have no effect on site choice. We find evidence of aversion to parking fees; the average respondent is willing to pay around $8 in additional travel costs to avoid a $1 increase in parking fees.

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Coastal Community Hazard Mitigation and Community Rating System of NFIP

Hazard mitigation measures can include programs to inform people about potential hazards, plans that promote disaster preparedness, regulations designed to limit vulnerability though building or other standards, projects that reduce the likelihood or extent of hazard, and flood insurance. Many of these measures have elements of local public goods, in that they provide benefits for an entire community and agents in the community are not excluded once they have been made available. Little empirical evidence exists to shed light on what factors influence the establishment of local hazard mitigation projects. One objective of this study is to provide such evidence through an examination of patterns in Community Rating System (CRS) scores across a panel of 230 National Flood Insurance Program (NFIP) communities between 2002 and 2008 in North Carolina. The researcher will test a number of hypotheses to explain why some local governments adopt hazard mitigation but others do not. Ultimately, the results will forge a better understanding of community decision making at the multi-jurisdictional scale, as related to natural hazards. The decision to examine community mitigation behavior at the multi-jurisdictional scale is based on the fact that NFIP community divisions include towns, city, and county designations. The dependent variable is the annual CRS

score or annual mitigation credit points. The 14 explanatory variables are organized under three broad categories: environmental risk, economic, social. An ordered probit model will be used for a major portion of the analysis. The parameter vector and associated standard errors are obtained by Maximum Likelihood Estimation (MLE). We are interested in the influence of every factor on community hazard mitigation decisions as reflected in CRS scores. Since its inception, NFIP has been marked by a lack of participation at the individual level. Communities can enroll in the program by agreeing to manage development in flood prone areas, but this does not guarantee that individuals will opt for purchase once flood insurance is made available. Subsequent legislation created flood insurance requirements for federally-backed mortgages on parcels in Special Flood Hazard Areas and created a system to promote community hazard mitigation projects and more closely align insurance premiums with risk – the CRS. This study which examines the community mitigation behavior at the multi-jurisdictional scale separates the population of the city and town from the county. Our analysis will provide information on determinants of community participation in CRS, which should prove useful for evaluation of the CRS program and policies to improve its effectiveness. Through an improved understanding of factors that motivate hazard mitigation, state governments and FEMA can better encourage participation in the CRS and similar programs in order to provide for better protection from natural hazards. .

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WTP for Artificial Reefs in Southwest Florida by three Diverse Stakeholder Groups

Artificial reef systems have been shown to be an important destination for the marine recreational boating industry, as well as for the for-hire commercial sector (i.e., six-pack charter vessels, guide boats, party/head boats, and dive charters). These reefs are used primarily for both fishing and diving. To determine the economic value of deployment and monitoring programs, surveys were completed by private boat owners (N = 2,702), for-hire business owners (N = 213), and for-hire patrons (N = 604) on their artificial reef use in Southwest Florida (i.e., Lee, Charlotte, Sarasota, Manatee, Hillsborough, and Pinellas Counties). Respondents were also asked a discrete choice willingness-to-pay (WTP) question that used a trust fund payment vehicle (the four fee levels were randomized across respondents) and ascertained their level of certainty regarding their choice. The level of support for supplement artificial reef funding for the fee levels proposed ranged from 45% of private boat owners to 65% of for-hire clients, however, private boat owners were surer of their decision to support than for hire clients. By comparison, 53% of for-hire operators would support the proposed additional fee they evaluated and a staggering 94% of supporters were "very sure" of their support. Responses are used to estimate the non-market values of each user group for these reef areas, determine the relative importance of factors that explain respondents WTP, and provide advice to program managers that need to justify continued public investment in such programs.

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Economic Status, Performance, and Impacts of the Gulf of Mexico Shrimp Fishery in 2008

The commercial penaeid shrimp fishery in the Gulf of Mexico is the most important fishery in the southeast region from an economic perspective. In Federal waters, the fishery is managed under the Gulf of Mexico Shrimp Fishery Management Plan, and there has been a moratorium on permits to harvest shrimp in federal waters since 2006. In inshore and near-shore waters, the fishery is managed by each State. In 2009, two extensive, Gulf-wide economic surveys were conducted in order to collect 2008 data. The Gulf States Marine Fisheries Commission surveyed inshore vessels, and the National Marine Fisheries Service surveyed the federally permitted fleet. For the first time, consistent economic data is available that encompasses the entire commercial shrimp fishery in the Gulf of Mexico. In this paper, we extrapolate the results from both surveys (and other sources) to the full population of Gulf shrimpers. We present and discuss the economic status and performance of the fishery as a whole and the impact on the regional economy and employment. We also explore economic heterogeneity within the fleet and among States. The fishery is facing a range of difficulties that together are threatening the short-term and long-term economic viability of the industry. Nonetheless, the Gulf shrimp fishery is a major industry in the southeast region, accounting for much employment and other significant impacts.

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WTP for Red Tide Prevention, Mitigation, and Control Strategies in Florida

Red tides are blooms of Karenia brevis algae that have killed marine animals, caused respiratory distress in humans, and reduced tourism throughout the Gulf of Mexico and South Atlantic region. While a variety of strategies exist to prevent, control and or mitigate the negative effects of blooms (and many have been implemented around the world), the suggested use of some strategies in Florida has faced severe opposition. Opposition is strongest among representatives of the tourism sector that fear the collateral environmental damage that some strategies could cause. To determine the potential acceptance of alternative strategies to address red tides in Florida, over 1,000 surveys were completed by residents of coastal counties that have

been most affected by red tides. The questionnaire included three dichotomous choice contingent valuation questions to assess and compare their preferences for each type of strategy: prevention (i.e., fertilizer tax that would improve general water quality but not necessarily eliminate red tides), mitigation (i.e., one-time payment for access to a real-time beach conditions reporting service that has been implemented in some areas and contains information on numerous indicators), and control (i.e., biological or chemical applications). The strategies were randomized for order and price level and respondents were asked a follow-up questions to assess both their level of certainty regarding their choice and how they would be affected by the implementation of each (e.g., whether they maintain a landscape, how often they visit coastal beaches and their opinion of biological or chemical controls for any purpose). Preliminary results show the strongest support for the general prevention strategy suggesting that preserving overall water quality is more important than targeted strategies for coastal residents. The responses will be used to explain respondents' overall preference across strategies as well as the factors that affect each. Results can be used to help summarize public opinion, inform policy makers, guide future extension efforts, and evaluate specific programs intended to address the potentially harmful effects of red tide events in Florida.

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Community Resiliency in the Gulf of Mexico Region: Understanding the Socioeconomic Implications of the Oil and Gas Industry on Communities in the Gulf Coastal States

Social scientists seeking to understand the social implications of the energy sector have focused on the effect of initial waves of rapid economic expansion on socioeconomic well-being. The oil and gas industry in the Gulf of Mexico Region is unique in that it is an industry that has existed in the region for over a century and is characterized by multiple cycles of expansion and contraction. Given the variable nature of the industry in the Gulf of Mexico Region, the resilience of communities becomes a core issue for understanding how economic volatility may impact local populations. Community resilience is defined as the capacity of a community to manage economic and social change, such as labor market expansion or contraction in the oil and gas sector. Highly resilient communities are better equipped to handle the challenges posed by expansion and contraction in the industry, such as migration and changes in income for families. Prior studies have identified a number of factors contributing to community resilience, such as social capital, dense social networks, and the presence of local business owners. The purpose of this panel is identify key aspects of community resiliency for coastal communities that are involved in the oil and gas industry and highlight how this line of study relates to recent industry trends.

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Assessing Technical Efficiency Implication of Capacity Reduction Programs: A study of vessel buyouts in California

This paper discusses methods for and the importance of measuring efficiency implications of fisheries management policy. The current analysis is undertaken in the context of a capacity reduction program aimed at retiring vessels from the California multi-species groundfish trawl fishery. Our guiding research questions are: Did capacity reduction have a measurable impact on output efficiency of the fleet? and, Can we determine whether the vessel reduction had implications for efficiency at the vessel level? We use a basic stochastic frontier model to estimate the technical efficiency of the harvesting sector in this fishery. This approach, because it assigns an efficiency score to each vessel, is capable of decomposing policy impacts into fleet effects and vessel effects. In the evaluation of a vessel buyback program this amounts to asking, *what portion of the change in harvesting efficiency can we attribute to individual behavioral changes as opposed to fleet restructuring?* Although we conduct our estimations with data from the West Coast Limited Entry Trawl Buyback Program of 2003, generalizations of this approach to other policy instruments will also be discussed.

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Rainfall Effects in Soybeans Yield Probability Densities in Louisiana Coastal Counties

It is often argued that in crop insurance premium rating the determination of an accurate measurement of crop yield risk is essential for crop insurance contracts. Crop yield distribution is a tool for crop risk management that is particularly valuable for rating crop insurance contracts. The traditional steps in estimating a crop yield density function have been: 1) filtering the yield data (when using time-series data), 2) choosing a density function and 3) the inclusion of additional variables (e.g., inputs, weather and prices). Nevertheless, in reviewing the vast and continuous literature, it becomes clear that the focus or we would say the "debate" has been so far around the type of distribution to use (e.g., parametric or nonparametric methods) and little emphasis has been given to the impact of environmental variables on empirical crop yield distributions when weather is, as underlying by Nadolnyak, Vedenov and Novak, AJAE, 2008 "the major contributing factor to crop productivity." It is interesting to notice that most of the studies that have taken into account weather variables have included what we will characterize as long-term effect weather events (shocks) like El Niño and la Niña (e.g., Ker and McGowan, JARE, 2000). To our best knowledge, besides

Kaylen and Koroma, RAE, 1991, there is no study that has tried to determine the impact of environmental variables such as monthly rainfall or temperature on empirical crop yields distributions using historical data. Therefore, this paper sheds light on this issue along with the following objective. To compare the effect of monthly rainfall across South Louisiana counties to illustrate the effect of random factors on soybeans yield probability density functions and probability estimates. The empirical analysis uses historical (time-series) county soybeans yields and rainfall data for Louisiana and nonparametric (kernel) density methods. This analysis proposes that an improvement in measuring the real crop yield risk can be gained by estimating probability distributions conditional on monthly rainfall during the growing season (April-October). Thus, farm decisions taken in part for crop insurance protection level, future farm enterprise selection and diversification, and other vital parts of the farm business plan can be enhanced.

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Energy Crop Production in the Mississippi Delta and the Environmental Implications

The increase in oil prices from 2006 through 2008 and concurrent increases in commodity prices raise several interesting questions for the Delta. In 2007, Delta producers witnessed significant increases in corn prices. This created an interesting situation in the Delta where cotton's stagnant prices over the past ten years have led traditional cotton growers to increase corn plantings. For example, in Arkansas, Louisiana, and Mississippi the planted acres of cotton from 2006 to 2007 dropped by 26, 47, and 46 percent respectively (USDA, 2009a). The decrease in cotton acres for these states was replaced almost entirely with corn acres. This ability for producers to switch indiscriminately between crops was made possible by the passage of the Federal Agriculture Improvement and Reform Act (FAIR). This allowed producers in the Delta to capitalize on unusually high prices driven in part by the increased demand for biofuels. Producers are receiving farm program payments from eligible crops even after switching production to higher valued crops. This dynamic shift in land allocations is changing the face of the Delta Agricultural landscape. The objective of this paper is to examine the impact of changing crop acreages on soil erosion and water demands of the Delta. In the first phase soil erosion is examined. The scenario examined takes into consideration the entire Delta region, investigating soil erosion and water demand for years 2005 and 2009. To account for soil erosion, the Revised Universal Soil Loss Equation is used to estimate the soil erosion of the base case of 2005 and to estimate the soil loss after significant changes to the crop mix in the region has changed in 2009. In the second phase water demand for the region is examined by using the water requirements for each of the primary row crops in the Delta.

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Economic Analysis of Tillage and Nutrient Best Management Practices in the Ouachita River Basin, Louisiana

The Ouachita River Basin (ORB) in northeastern Louisiana accounts for almost 50 percent of the state's agricultural production. In the Cabin-Teele Sub-watershed, within the ORB, the alkaline soils are naturally low in organic matter and deficient in nitrogen so that producers occasionally over apply nitrogen fertilizer. Moreover, because the soils are poorly drained there are drainage ditches throughout the fields and along field borders. The abundance of ditches enhances the outflow of nutrients and sediments into adjacent waterbodies. This study evaluated and compared the net economic benefits of tillage and nutrient management practices at addressing specific sediment and nutrient criteria reductions; nitrogen, phosphorus and sediment reductions individually, and concurrently (reducing all three simultaneously) in Cabin-Teele Sub-watershed. Simulated results showed that reduced tillage, nitrogen management (nitrogen fertilizer application), and conservation tillage were cost-effective in helping reduce nutrient and sediment losses in Cabin-Teele sub-watershed despite the prevalence of poorly drained soils.

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Economic Implications of Producing Cellulosic Biomass Feedstocks in the El Campo, Texas Area

The economic and financial competitiveness of cellulosic biofuels is significantly impacted by feedstock production and logistics cost, which are estimated to constitute 35-50 percent of the total production cost of cellulosic biofuels. Feedstock logistics encompass all of the operations required to grow, harvest, and transport the feedstock, including any intermediate and final on-site storage, and guarantee that the delivered feedstock meets required specifications. These logistical costs make up such a large portion of the biofuels production cost due to the large amounts of capital, labor and variable inputs required to perform these operations in a timely manner and because of the amount of acreage needed to supply an economically-viable conversion facility. This research examines the economic implications of a new biofuels industry in the El Campo, Texas area by determining the capital, labor and inputs required to supply a hypothetical 30 million gallon per year bioenergy conversion facility with a continuous flow of cellulosic biomass feedstocks (including high-energy sorghum, switchgrass, and other alternatives, e.g., wood chips). Production, harvesting, transporting, and storage are assumed to be conducted by a business entity

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independent of the conversion facility. A bi-weekly linear programming model is used to assess the most economical production-harvest-transport-storage system, incorporating the calculations of enterprise budgeting, capital budgeting, and corresponding annuity equivalent estimates to determine the supply chain costs. The IMPLAN input-output system will be used to estimate the broader economic effects of this proposed production system on the local, state and national economies. Input-output analysis will evaluate the effects of capital expenditures associated with the startup phase, and the annual impacts associated with the business after the startup phase. Economic impacts will be measured as the difference between existing agricultural production and the cellulosic biomass feedstock alternative. This is a case study of a model intended to have potential for use in other geographical regions.

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Cost-efficacy in Wetland Restoration Projects in Coastal Louisiana

The Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) provides one of the largest sources of U.S. funding for wetland restoration. A preliminary economic analysis of the CWPPRA program questioned the program's selection of cost efficient wetland restoration projects and recommended a more rigorous statistical analysis of the data (Aust 2006). We conducted an analysis to determine what available variables, such as wetland loss, influence CWPPRA project selection for funding. We found that the program was selecting cost-effective projects overall, but observed a recent trend for the program to select more expensive barrier island projects. We present possible justifications for funding these projects despite the higher cost/benefit and suggest more information on the benefits and results of barrier island restoration is needed. This paper will help participants of this restoration program and others in evaluating how projects are developed, evaluated and selected for funding. As few papers have been written on this large restoration program, we believe this analysis provides a useful overview of the programs foundation.

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An Evaluation of the Cost and Effectiveness of Commercial Oyster Aquaculture in the Chesapeake Bay as a Nutrient Control Strategy

The Chesapeake Bay states continue to struggle to achieve the water quality goals set out in the Chesapeake Bay Agreement. Although policy efforts to combat eutrophication focus on reducing nutrient loads at point and nonpoint sources, Chesapeake Bay nutrient reduction goals can be partially achieved by increasing the assimilative capacity of the ecosystem to remove nutrients from ambient waters (a.k.a. nutrient assimilation services). The filtering capacity of the native oyster, *Crassostrea virginica*, is a widely recognized means of enhancing nutrient assimilation. Thus, oyster aquaculture has the potential to increase removal of nutrients from the ambient environment by increasing the numbers of oysters cultivated and harvested from the Bay. Expansion of commercial aquaculture in Chesapeake Bay is limited by cultural, financial, and use constraints. Increased oyster production and a corresponding increase in water quality services might be forthcoming if oyster aquaculturists received financial compensation for the nutrient removal services they provide. Based on newly published estimates of nutrient content of cultivated oysters, we developed a firm level bio-economic simulation model to estimate the amount of compensation needed by a commercial oyster aquaculture firm to expand oyster aquaculture production. The model estimates nutrient credit prices (expressed in dollars per pounds) needed to achieve a target rate of return for an oyster aquaculture investment under given parameters including projected or recorded oyster growth, mortality, nutrient levels, and input prices. The amount of compensation needed is interpreted as the cost of providing nutrient removal services via oyster aquaculture. Simulations were conducted under a variety of production and input cost scenarios for representative cage and float oyster aquaculture production systems employed in Chesapeake Bay. Under many conditions, results indicate that marginal oyster aquaculture operations can remove nutrients from ambient waters often at costs comparable with nonpoint and point source nutrient control technologies. Under contemporary realistic production and cost scenarios, a representative oyster aquaculture cage and float enterprise in the Bay would provide nutrient removal services for less than $30.00 per pound of nitrogen (N). The cost to remove nutrients through aquaculture is comparable to nutrient control costs from agricultural BMPs and municipal wastewater treatment plants. In almost all scenarios modeled, oyster aquaculture removes nutrients from Bay waters at a lower overall cost than most urban nonpoint source controls (generally accepted to range from $200 - $3,000 per pound of N). Given the current extent of commercial oyster aquaculture in the region, the total magnitude of nutrient removal services that presently can be provided is modest. Although we demonstrate that oyster aquaculture can serve as a relatively low cost nutrient removal service, we identified significant challenges that exist in creating payments, and thus demand, for nutrient assimilation services.

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Preferences for Timing of Wetland Loss Prevention in Louisiana

In April of 2007 the Louisiana Governor signed *Louisiana's Comprehensive Master Plan for a Sustainable Coast*, which details the state's plan for restoring and sustaining the Louisiana coast. This document details the State of Louisiana's position on what steps must be taken to sustain its coast, which has lost 1.2 million acres since the 1930's and is, at present, losing 15,300 acres annually. A substantial portion of this land loss is in Louisiana's wetlands. The benefits of preventing further loss of wetlands include storm damage mitigation, providing recreational opportunities, and protecting valuable ecosystems. The Coastal Wetlands Planning, Protection and Restoration Act authorized federal funds for projects designed to restore, maintain, and prevent the future losses of wetlands, and more will soon be implemented. Federal and State governments have already begun to prevent the future loss of wetlands, but the perception of these efforts by the public is important for the continued progress of these projects. Another issue that has arisen over recent years is what type of land loss prevention projects should be used to maintain coastal Louisiana. The two primary types of projects that are being compared are rapid land-building, which build wetlands rapidly through dredging and provide benefits quicker, and more natural methods such as river diversions, which take a longer time period to prevent losses of wetlands and provide benefits further into the future. Both approaches have benefits and drawbacks depending on why one desires the wetlands to be maintained. The objective of this paper is to provide estimates of the value that residents of Louisiana place upon the prevention of projected future wetland loss. In addition to providing estimates of the public's willingness to pay for these projects, this paper identifies the motivating factors that contribute to public support of the prevention of projected future wetland loss. This is accomplished through analysis of public preference among three proposals. The first option, the "short run" proposal, is for the prevention of future wetland loss that will begin in 2015 and maintain current levels of wetlands through 2050. The next option, the "long run" proposal, is for the prevention of future wetland loss that will begin in 2035 and maintain current levels of wetlands through 2185. The final option presented is for no action to be taken to prevent future wetland loss. This analysis shows which option between long run projects (which take longer to implement and provide benefits farther into the future), short run projects (where benefits are obtained sooner but do not last as long), and no action is preferred. Also, it shows which factors and the magnitude of those affects on ones decision between the three options. Responses for the preference of respondents between the three proposals showed that 71.3 percent preferred the short run proposal, 6.86 percent preferred the long run proposal, and 22.01 percent chose no action. Most respondents were willing to support some form of prevention of wetland loss.

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Impacts of Media Coverage of Coastal Weather Events on Attendance Levels at Northern Gulf State Parks

Recreational park location and amenities, weather conditions, water quality, temperature, wind, and seasonality were expected to impact the daily fees collected by public parks that are used to support these taxpayer-funded facilities. Numerous anecdotal reports have attributed the publication of numerous press articles and widespread media attention concerning coastal weather events as a primary contributing factor in reducing demand for coastal recreational activities, regardless of the actual environmental conditions at a specific site. The overall goal of the study is to estimate the impact of adverse weather events and media coverage of adverse weather on attendance at publicly funded recreational facilities. States parks located in two study regions were included: (1) Pensacola, FL: Tarkiln Bayou, Perdido Key, Big Lagoon; and (2) Greater New Orleans, LA: Bayou Signette, St. Bernard, Grand Isle. Monthly visitor data were collected July 2001 through September 2008 from state recreational parks located within the regions of Pensacola, FL and Greater New Orleans, LA. Park attendance was measured as number of vehicles that paid admission fees (managers assumed two persons per car). News articles were collected using NewsLibrary.com service and searched for two keyword phrases: "hurricane and state park" and "storm and tourism and state park". Articles that included these phrases during each month for 5-6 local newspapers were noted per study area. Weather events (flash floods, coastal floods, hail, heavy surf, high winds, hurricane, lightning, storm surge, thunderstorm, tornado, tropical storm winds) that resulted in financial property damages were indicated. (Sources: National Climatic Data Center stations at Pensacola, FL and New Orleans, LA international airports.). Monthly and annual dummies included to account for seasonal visitation trends (base = December 2001). A multiple regression model was estimated for each of the two study regions to assess the relationships between weather events and media publications on monthly park attendance. For the Greater New Orleans, LA area, 82% of the variation in monthly attendance levels recorded by park managers was explained by model variables. Only a weak negative relationship existed between weather events and park visitation, although the relationship was not statistically significant. When keywords appeared in newspapers at least once monthly, a negative and statistically significant decline in average monthly attendance was revealed, resulting in an average decrease of 5,761 visitors that represented approximately $103,698 in lost annual revenues. For the Pensacola, FL region, 75% of the variation in monthly attendance levels recorded by park managers was explained by model variables. A negative and statistically significant relationship between adverse weather events and park visitation resulted in an average 4,659 fewer visitors per month where extreme weather occurred, which represented approximately $83,862 in lost annual revenues. Only a weak negative and statistically insignificant decline in average monthly attendance when keywords appeared

in newspapers was estimated. These findings are expected to improve decision-maker awareness of those factors that significantly impact recreational attendance levels linked to adverse weather events; in particular, the impacts on public park revenues by unanticipated and unintended public response to news media.

Morgan, Kimberly
Mississippi State University

Local Economic Impacts of Coastal Hazards on Public Agencies

Public agencies located within coastal communities incur fiscal and managerial responsibilities before, during and after the occurrence of natural hazards, such as tropical storms, hurricanes, hail, algal blooms and water pollution. The overall study goal was to determine what type of budgeting process is used in the case of a natural hazard event. A survey of city and county managers was conducted to determine what sort of planning activities are undertaken BEFORE coastal hazards such as harmful algal blooms, hurricanes/tropical storms, tornados and flooding occur. In order to describe importance of planning activities, respondents were asked about specific actions taken during and immediately after Hurricane Gustav impacted their county. Respondents were asked to identify any outside agencies that they interact with in these same three periods that provide personnel, equipment or financial support. Responses were solicited from sixteen counties located within the Northern Gulf region that had been directly impacted by Hurricane Gustav in 2008. The Florida Survey Research Center was contracted to conduct telephone interviews using trained executive interview specialists. County managers representing Terrebonne, Plaquemines and St. Tammany parishes in Louisiana; Escambia, Bay and Okaloosa counties in Florida; Baldwin and Mobile counties in Alabama; Harrison and Jackson counties, MS; and Galveston County, TX provided completed interviews. On average, respondents had served nearly eight years as county managers and had more than 14 years experience in county governance positions. Total operating budgets for the most recent fiscal year averaged over $222M and ranged from $120-$360M across counties. For those county managers that provided estimates of internal staff time and budget allocations during and after Hurricane Gustav, planning activities required one to 100 percent of available personnel and finances. Between three and ten counties interacted with at least one outside agency during and after Gustav, with the majority of outside support arriving in the form of either personnel and/or equipment. The majority of external financial support was received from the Governor's office and the Federal Emergency Management Agency. In an effort to provide linkages between coastal county needs and university research and outreach programs, respondents were asked to describe specific needs related to coastal hazard public management issues. Responses included requests for faster mitigation of post-recovery issues, economic valuation of wetlands as storm surge protection, provision of public announcements and brochures, and the need for "continuity of operations planning for medium/small sized businesses," such as churches, restaurants and stores. This information will be analyzed and presented alongside existing literature to evaluate the economic impacts of coastal hazards on public facilities and managers, local residents, and taxpayers, and, to determine an appropriate method to assess the effects of, and prepare for, future adverse environmental events.

Morgan, O. Ashton
Appalachian State University
John C. Whitehead
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Gregory S. Martin
Northern Kentucky University
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University of West Florida
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Oyster Demand Adjustments to Counter-Information and Source Treatments in Response to *Vibrio vulnificus*

This research builds upon a pilot-study paper that we presented at CNREP 2007. In this latest ongoing research, a contingent behavior analysis is developed to quantity the effect of both negative and positive information treatments and post harvest processes (PHP) on demand for oysters. In an extension to the pilot study, the sample population is stratified over six oyster consuming states; namely California, Texas, Louisiana, Mississippi, Florida, and Georgia. Our survey is administered to a panel group via a commercial survey vendor. In terms of our demand shifters and to quantify the effects of both treatments on oyster consumer behavior, respondents are first presented with a hypothetical press release regarding a recent local human mortality event associated with consuming raw oysters. Within the news release article, the gender and age of the deceased individual is varied so we can test whether there is a systematic difference in consumer responses based on the correlation between respondent gender and age and that of the deceased individual. Next, the potential welfare-mitigating effects of two counter-information treatments are examined. These treatments include the current Interstate and Shellfish Sanitation Conference (ISSC) *Vibrio vulnificus* brochure or fact sheet and a researcher-created video; both providing the individual with the pertinent facts regarding *Vibrio vulnificus* and consumer health risks. At this stage of the survey, the role of source credibility on consumer behavior is also examined in the panel framework by varying the source of counter-information treatments. Specifically, we consider whether source credibility matters in reassuring consumers of the safety of consuming oysters following a health scare event by varying the source of the information treatments in four ways; (1) the ISSC; (2) the Federal Drug Administration (FDA); (3) the American Shellfish Foundation (a not-for-profit entity); and (4) a no source control group. Results from the treatment stage will reveal the most effective combination of treatment and source in reassuring consumers of oyster safety following a health scare event. Finally, we investigate the impact of PHP oyster treatments on consumer behavior following an oyster-related health scare event, and measure respondents' willingness to pay for a treated oyster to mitigate consumption risks.

Muhammad, Andrew
USDA Economic Research Service
Sammy J. Neal
USDA National Agricultural Statistics Service
Terrill R. Hanson
Auburn University
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USDA Economic Research Service

The Impact of Catfish Imports on the U.S. Wholesale and Farm Sectors

The primary objective of this study was to assess the impact of catfish imports and tariffs on the U.S. catfish industry, with particular focus on the USITC ruling on Vietnam in 2003. Given the importance of Vietnam to the U.S. market, it was assumed that catfish import prices would increase by 35% if the maximum tariff is imposed on catfish from Vietnam. Given the tariff, domestic catfish prices at the wholesale level would increase by $0.06 per lb, and farm prices by $0.03 per lb. Processor sales would increase by 1.66%. Total welfare at the wholesale level would increase from $69.2 million to $71.7 million, an increase of about 3.63%, and processor and farm revenue would increase by 4.4% and 5.8%, respectively. These results represent the greatest possible benefit and suggest modest gains for the U.S. catfish industry.

Mullen, Jeffrey
Jennifer Kuhr
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Valuing Weather Information Networks: Changes in Frost Damage and Mitigation Costs from Diminished Resolution

Weather information is, and will continue to be, an important input into management decisions of many human activities. The value of weather information depends critically on its accuracy. In the agricultural sector, accurate weather information can be used to improve decisions regarding planting date and crop choice, as well the timing and rates of pesticide, fertilizer and irrigation applications. Accuracy, however, is a function of the spatial resolution of the information. At the national level, the National Weather Service (NWS) is charged with the responsibility of weather monitoring and recording. The NWS is the lead forecasting outlet for the nation's weather and supplies more than 25 different types of reports, warnings and weather watches (Paz and Hoogenboom, 2008). The weather information provided by the NWS, however, has limited application to agricultural and other natural resource management. This is because the detailed weather records are collected at airport locations characterized by extensive runways and large concrete structures. To broaden the information base and enhance the resolution of weather information, many states augment the NWS with state-funded networks of weather stations. For example, the Georgia Automated Environmental Monitoring Network (GAEMN) produces weather products for application to a variety of activities, especially agriculture, natural resource management. The weather data generated by the GAEMN is made available to the public through the web at www.georgiaweather.net. This web site offers many different calculators, including growing degree-days, chilling hours, water balance, soil temperature, heating degree-days, cooling degree-days, rainfall, and average temperature (Hoogenboom, 2003). The GAEMN network is also used to predict frosts, an application that is especially valuable to producers of high-value horticultural crops such as blueberries and peaches. Operating and maintaining weather stations to record accurate weather information can be expensive. Recent and projected budgetary cuts in states across the country have the potential to affect the operations of weather information networks designed to assist agricultural and natural resource management. This paper develops a new methodology for estimating the value of weather information networks focusing on the costs incurred when the resolution of the network is diminished. The fundamental concept underlying our methodology is that farmers develop frost management strategies based on the actual weather experiences of their own farm. To implement those strategies, however, they rely on forecasts from weather information networks. For each field, there are 4 possible outcomes related to a frost prediction: 1) The network predicts a frost and no frost occurs, what we call a "Type A Error"; 2) the network predicts no frost and a frost occurs, what we call a Type B Error; 3) the network predicts a frost and a frost occurs; and 4) the network predicts no frost and no frost occurs. Using the current network resolution, we develop spatial probability maps for Type A and Type B errors through hind-casting. We then systematically reduce the resolution of the network by removing a weather station, and generate a new set of spatial probability maps. By comparing the probability of making a Type A error under the different network resolutions, we generate an estimate of the expected value of frost mitigation costs that would be undertaken unnecessarily. By comparing the probability of making a Type B error under the different network resolutions, we generate an estimate of the expected value of frost damage that would have been avoided.

Nedelea, I. Cristian
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Analyzing the Cost of Harvesting and the Economic Structure of Florida Grouper Fishery

Public regulation of multispecies fishery is imposed to prevent overexploitation of fish resources. However, unknown technical and economic interrelationships among different species make the efficient management and regulation of fisheries difficult. In light of this, analyzing the individual firm's technology and costs in a multispecies fishery allows regulators to design more effective output regulations. Florida grouper fishery offers a case in which regulations were imposed with only partial knowledge of the technical and economic interrelationships within the fishery. These regulations may affect, and be affected by, the cost of harvesting and the economic structure of the grouper fishing industry. The overall goal of this study is to investigate the technical economic structure of the Florida grouper fishery and suggest ways in which managers can design economically efficient management policies. Specifically, the study will: (1) estimate a multioutput cost function to characterize the harvesting process in Florida grouper fishery; (2) analyze the estimated cost

function to determine the technical and economic interactions within the fishery; and (3) based on the outcomes of the previous objectives, suggest economically preferred strategies for optimal management of Florida grouper fishery. In this study we use the translog cost function, which is a flexible functional form that has been frequently used to analyze input demand and the underlying technological structure of production. Two important characteristics of technology that we want to test with respect to the Florida grouper fishery are input-output separability and non-jointness in inputs. Data used for analysis is trip-based logbook information obtained from a sample of Florida grouper fishing vessels. The data include information on landings per species, gross trip revenue, trip costs, and the number of days spent fishing. The cost variable used in this analysis consists of the aggregated expenditures on fuel, labor and miscellaneous items. Three input prices were used as independent explanatory variables in the analysis: price of fuel, price of labor and an aggregate price for the other miscellaneous inputs. In addition to input prices, the outputs used in the cost function include the harvest levels of red grouper, gag grouper, other grouper, and other species. The existence of jointness-in-inputs and non-separability between inputs and outputs suggests that resource management should be based on multiproduct production theory, and that explicit recognition of the economic interactions among species should be incorporated in any regulatory process. The cross-price elasticities of input demands showed substitution relationships between input pairs, implying that imposed regulation on the single input will be compensated for by increases in the other inputs. Furthermore, model results showed apparently substantial economies of scope, especially between red grouper and most of the other species in the grouper fishery, product specific economies of scale and multiproduct economies of scale. The technical and economic interrelationships inferred from this study suggest that individual species regulation can generate economic inefficiency by inducing nonoptimal input and output mixes.

Norris-Raynbird, Carla
Bemidji State University, MN
Joel Devalcourt,
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Perceptions of 'The Wolf at the Door': Preliminary Findings On Changing Capacities Among Local Officials in Coastal Zone Parishes

Prior to the hurricanes of 2005, research was conducted among local officials in coastal parishes in Louisiana examining several dimensions of capacity related to coastal zone management. A follow up study is currently underway to assess potential changes in capacity since the experiences of Katrina, Rita, Ike and Gustav. In the first phase of this study, twenty-seven person to person interviews were carried out in summer of 2009 with parish Presidents and local Coastal Zone Managers. Preliminary data not unexpectedly shows change to organizational structure, personnel and 'saavy' among local officials. An interesting finding that has emerged is the quandary many respondents find themselves in – knowing that new regulations are mandated, yet not knowing how to manage a resistant constituency in the implementation of them. This paper discusses the collision of changing attitudes and practices with stalwart resistance to change in local communities, the potential effects of hurricane 'saavy' in local decision makers and perceived opportunities for 'good' and 'bad' coastal management decisions and actions.

Nyaupane, Narayan P.
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Crawfish Farmer Adoption of Best Management Practices and Participation in the Environmental Quality Incentives Program

Agriculture has been considered as a significant contributor of non-point source pollution in cases where proper management practices have not been implemented. Louisiana, as the largest crawfish producing state, has more than 1,600 crawfish farms with an area of 184,000 acres in crawfish production. In recent years, environmental quality has become one of the major research focuses in the United States. Louisiana farmers are voluntarily encouraged to adopt Best Management Practices (BMPs), which are considered to have significant positive impacts both on the environment and, in some cases, to the economic performance of a farm. In addition, the Environmental Quality Incentives Program (EQIP) offers financial and technical support to eligible farmers in constructing and managing some of those BMPs. The major objectives of this study are to determine the factors affecting adoption of BMPs using count data analysis, and to estimate the relationship of farm characteristics with EQIP participation. A mail survey based on Dillman's Total Design Method was sent to 770 Louisiana crawfish producers in Fall, 2008. Eighteen BMPs eligible to receive NRCS cost share funding through EQIP were selected for the study. A brief description of each BMP was provided and the farmers were asked whether they had adopted the BMP on their farm. In the case of EQIP participation, the following question was asked "Have you participated in any government cost-sharing programs such as the Environmental Quality Incentives Program (EQIP) while implementing a BMP?" This question was followed by another question: "If you answered "yes" to above question, for which of the following BMPs are you receiving a cost share?" Listed were all 18 BMPs. In spite of four contacts via first-class mail, the adjusted response rate achieved was 15%. A negative binomial model using count data was used to analyze the adoption of their BMPs and a probit model was used to analyze EQIP participation. Preliminary results show that the farmers rotating crawfish with other crops, having more business contacts to the NRCS personnel, and those having a college degree are the greater participants in the EQIP. Farmers

producing under a cash lease are negatively inclined toward EQIP participation. On the other hand, the count data analysis shows that farm size, age of the producer, and double-cropping of crawfish with rice have significant positive relationships with producers' BMP adoption decisions. Farmers realizing higher percentages of farm-income from crawfish show a negative inclination toward BMP adoption.

Ogunyinka, O. Ebenezer
David R. Lavergne
Socioeconomic Research and Development Section, Louisiana Department of Wildlife and Fisheries

Educational Differences in Recreational Fisherman Behavior Regarding Seafood Consumption Advisories

A recreational fisherman health advisory study was recently conducted in Louisiana which was funded by the Louisiana Department of Health and Hospitals. An objective of the study was to examine the recreational fishermen's awareness of fish consumption advisories and to determine the effectiveness of the advisories. The report indicated that a majority (72%) of the respondents had less than a college degree education and 28% of respondents had a college or post-graduate degree. The report also identified twelve (12) components of seafood consumption advisories which fishermen reported they have seen, heard and read about. The top three components identified were warnings on mercury contamination in fish, warnings saying "do not eat raw shellfish" and warnings telling them to avoid long-term consumption of certain fish. While this study clearly identified different educational levels among respondents and important components of seafood consumption advisories, it does not address the question on how level of education might have influenced fisherman's response to the advisories after seeing, hearing or reading about them. This presentation will identify the linkages between the recreational fishermen's behavior in response to seafood consumption advisories and level of education. Data obtained from the 2008 Louisiana recreational fisherman health advisory survey will be used for the analysis. It will include a graphical display of the distributions of the seafood consumption warnings for each educational level reported by the fishermen. The results are expected to reveal that there exist different behavioral responses among fishermen's educational groups and the components of seafood consumption advisories. It will also have implications for the formulation of future seafood consumption advisories.

Paudel, Krishna
Mahesh Pandit
Michael Dunn
Louisiana State University Agricultural Center

Analyzing FST Termite Control Options in Louisiana

Many methods are available to analyze rank ordered data. We used spectral analysis to identify the most preferred option of Formosan Subterranean Termites (FST) control as ranked by Louisiana homeowners. Respondents were asked to rank four termite control methods from the most preferred option to the least preferred option. Spectral analysis of both complete and partial ranked data indicates that the most preferred termite control choice is a relatively cheap ($0.13 per square foot) option of a liquid treatment. Multinomial logit analysis indicated that survey location, household pre-tax income, and knowledge of FST determined Louisiana homeowners' ranking pattern choices.

Paudel, Krishna
Mahesh Pandit
Louisiana State University Agricultural Center

Environmental Kuznets Curve for Water Pollution at the Global Level: A Semiparametric Analysis

We estimated an environmental Kuznets curve relationship between water quality and per capita GDP income for countries around the world for the time period 1983-2000. We used social capital variables as explanatory variables in addition to GDP income. However, these variables were discrete whereas income was a continuous variable. We followed recent development in semiparametric economics literature to address continuous and discrete variables in the semiparametric regression model. We found that water quality income relationship is not always an inverted U-shape. It depends on year of data analyzed and pollutant studied. Our analysis shows that pollution and income relationship is better modeled using a semiparametric technique.

Peterson, Kristina
UNO-CHART, University of New Orleans

Perspectives of Coastal Changes and Resilience from Alaska and Louisiana Community Citizens

Engaged citizens of several Louisiana communities, Point au Chien, Isle de Jean Charles, Dulac and Grand Bayou Village will dialogue with several representatives of coastal communities on the northern slope of Alaska and Prince William Sound, Newtok. Discussion will include the similarities of risks and the ways in which historied communities are addressing them including building resilience and adaptation.

Petrolia, Daniel R.
Mississippi State University
Terrill R. Hanson
Auburn University
Sanjoy Bhattacharjee
Mississippi State University

Heterogeneous Evacuation Responses to Storm Forecast Attributes

This paper investigates the variation in the effects of key storm forecast factors on hypothetical evacuation decisions collected from a mail survey using a random-effects probit model with heterogeneity. Results indicate that once heterogeneity is accounted for, wind speed and landfall time are the only two significant storm forecast attributes. Further, through the use of interaction terms between the forecast attributes and individual-specific indicators, the impact of the forecast factors were found to vary significantly across race, gender, the presence of disabled persons, and geography.

Petrolia, Daniel R.
Mississippi State University
Tae-Goun Kim
Korea Maritime Institute

Preventing Land Loss in Coastal Louisiana: Estimates of WTP and WTA

A dichotomous-choice contingent-valuation survey was conducted in the State of Louisiana (USA) to estimate compensating surplus (CS) and equivalent surplus (ES) welfare measures for the prevention of future coastal wetland losses in Louisiana. Valuations were elicited using both willingness to pay (WTP) and willingness to accept compensation (WTA) payment vehicles. NPV of welfare estimates were very sensitive to discount rates, but were estimated in the neighborhood of $9,000 for CS (WTP) and $21,000 for ES (WTA). The results of a probit model using a Box-Cox specification on income indicate that the major factors influencing support for land-loss prevention were the perceived hurricane protection benefits (positive), environmental and recreation protection (positive), distrust of government (negative), age (positive), and race (positive for whites).

Philippe, Rosina
Grand Bayou Village
Kristina Peterson
UNO-CHART, University of New Orleans

Participatory Action Research

Participatory Action Research (PAR) has been used with several coastal communities in Southeast Louisiana for disaster long-term recovery, planning, and vulnerability analysis and to determine measures of resilience. It is a non-traditional approach that partners resources with local citizens for problem solving. A core value in PAR is building a relationship with participants to share as equal partners their observations, knowledge and experience. PAR has been used in coastal communities elsewhere around the world with relative success. Philippe will examine from the community's perspective the usefulness of PAR as a tool for accomplishing the community's goals and vision. Peterson and Philippe will share how PAR provides the benefit of helping to promote interdisciplinary dialogue, thus providing a better understanding between the collaborators on a project. Peterson will share how utilizing PAR involves changing our research methods as well as adjusting the way we interact with communities and citizens. This presentation will discuss the method of participatory action research and how it can be used to strengthen outcomes of coastal agencies, researchers and communities.

Posadas, Benedict C.
Amanda K. Seymour
Benedict A. Posadas, Jr.
Sidney K. Massey
Scott A. Langlois
Randy Y. Coker
Christine E. Coker
Mississippi State University

Community Economic Recovery Following Natural Disasters

The Center for Urban Rural Interface Studies (CURIS) was established in 2005 to address sustainable development and disaster preparedness needs in rural communities. The CURIS Region includes 20 counties and parishes in four of the five coastal states bordering the Gulf of Mexico, Louisiana, Mississippi, Alabama, and Florida. Because of the location, these states experience a wide range of natural disasters from the more common, hurricanes and tornadoes, to the extremely rare, earthquakes along the New Madrid fault. Natural disasters have caused serious damages to the nation's coastal communities, especially the recent hurricanes in the Gulf of Mexico, Ivan, Katrina, Rita, Gustav and Ike. The expedited path to economic recovery is foremost in the priorities among the local leadership and business sector of rural counties and parishes affected by recent natural disasters. This poster presents a suggested approach in measuring community economic recovery following natural disasters. The economic variables to be used in measuring the economic recovery of counties and parishes will include variables describing the community human capital, economic output and tax revenues, business sector, and private construction. The sectoral economic variables and the sources of data included in the proposal are as follows: population, labor force and graduation rates from the Bureau of Census; personal income from County Business Patterns; private building permits and valuations from the Bureau of Census; Government sector: retail sales, tax collections from state tax commissions; Business sector: number of business establishments from County Business Patterns; annual payroll and number of employees from County Business Patterns.

Posadas, Benedict C.
Mississippi State University

Economic Recovery of Commercial and Recreational Fishing Fleets Following Natural Disasters

The results of the economic assessment conducted after Hurricane Katrina indicated massive devastation of the Mississippi commercial and recreational fishing fleets. Almost one-half of the 1,030 resident commercial fishing boats and vessels operating in the state participated in the damage assessment in 2005 and 2006. Among the 100 charter boats for hire operating in the state when Hurricane Katrina landed, 42 operators participated in the survey. The decision to remain or leave the industry - commercial or recreational fishing - was very crucial to these participating boats or vessels. About 87% of participating commercial boats or vessels and 69% of the participating charter boats reported damages associated with Hurricane Katrina. Using the 2006 and 2007 databases on licenses issued by the Mississippi Department of Marine Resources to resident commercial and recreational boats and vessels, the decision to remain or leave the industry by the participating boats and vessels was determined. It was postulated that the economic decision to stay or leave the commercial fishing or charter boat for hire industry was influenced by several factors as follows: Dependent variables: LIC2007 = buy or did not buy license in 2007, LIC2006 = buy or did not buy license in 2006; Independent variables: CRAB = bought crab license, OYSTER = bought oyster license, SHRIMP = bought shrimp license, FISH = bought fish license, LVBAIT = bought livebait license, CHARTER = bought charter boat license, TOTDAM = total damages due to Katrina, INSURE = insurance proceeds when Katrina landed, SBALOAN = outstanding SBA loan when Katrina landed, OTHLOAN = other outstanding loans when Katrina landed, FEET = boat length, CREW2004 = number of crew in 2004, CREWNOW = number of crew after Katrina, SALES2004 = gross sales in 2004, SALESLOST = percent of 2005 sales lost due to Katrina, HANCCO = located in Hancock County, HARRCO = located in Harrison County, and JACKCO = located in Jackson County.

Ran, Tao
Walter R. Keithly
Richard. F. Kazmierczak
CNREP, Louisiana Sea Grant, Louisiana State University, and Louisiana State University Agricultural Center

Congestion Effects in the Location Choice of Gulf of Mexico Shrimpers

Location choice is one of the most important short-run decisions made by commercial fishermen. Although the recreational literature gives extensive consideration to the influence of congestion on site selection, few studies have considered the influence of congestion tolerance on site selection in the commercial fishing sector. This study uses logit model to analyze the congestion effects in the Gulf of Mexico shrimp fishery. Individual trips taken in each year between 1995 and 2004 are analyzed. Endogeneity due to the correlation between unobserved site characteristics and congestion variable is fixed by using contract mapping and instrumental variables suggested in a study concerning recreational fishery. The results show that, different from most studies in recreational fishery, congestion at certain site in commercial fishery might attract fishers to go to that site first, probably due to the concept that congestion implies abundance of catch at the site. It is not until the congestion level reaches certain point that the negative effect of it sets in. A better and updated understanding of congestion effects in commercial fishery should aid the implementation of management tools such as area closures.

Samonte, Giselle
Xuanwen Wang
Conservation International

Marine Managed Areas Improve Human Well-being

Traditionally Marine Managed Areas (MMAs) have been established to achieve ecological goals (e.g. protect endangered species, increase fish populations); yet increasingly social, economic and cultural objectives are being incorporated into MMA planning. An understanding of the resulting socioeconomic and governance effects is, therefore, vital for maximizing benefits and minimizing costs. A socioeconomic and governance survey was conducted in 36 coastal communities adjacent to 11 MMAs involving 2,386 households in four tropical developing countries: Belize, Fiji, Ecuador, and Panama. Six hypotheses were tested to demonstrate the socioeconomic and governance effects of marine managed areas. The statistical results show that MMA beneficiaries are more positive on their economic and health situations, are likely to have more diversified livelihoods, stronger perceptions of non-monetary benefits, and are more likely to know the rules and regulations associated with MMAs. This project under the Marine Management Area Science Program of Conservation International demonstrates the human well-being effects of MMAs and the potential benefits of these efforts worldwide. An overarching benefit of these effects is greater social resiliency to environment and economic disturbances.

Savolainen, Michelle A.
Rex H. Caffey
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2009 Economic Survey of the Recreational For-Hire Fishing Sector in the U.S. Gulf of Mexico

Decadal economic surveys of the recreational for-hire (RFH) fishing sector in the U.S. Gulf of Mexico were conducted in 1989, 1999, and 2009. These surveys gauge the economic health and impact of the RFH sector by collecting data about a respondent's primary vessel, typical trip, hurricane impacts, business cost structure, perception of his fishing organization, and opinion about policy and management issues. We present an update of the 2009 survey, which is currently being administered via postal, internet, and intercept surveying to respondents in Texas, Louisiana, Mississippi, Alabama, and West Florida. Survey design and methods will be discussed.

Schafer, Mark
Ashley Barras
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Fuzzy Set Profiling and Community Analysis Techniques

In this paper we present the conceptual framework behind using fuzzy-set principals to guide the development of targeted community profiles and a comparative analysis of the impact of the oil and gas industry, broadly defined, on diverse communities in the Gulf of Mexico Region. Fuzzy-set analysis builds upon the principles of case-based comparative analysis rooted in the methods of induction first proposed by John Stuart Mills and then elaborated and systematized in qualitative comparative analysis by Charles Ragin in The Comparative Method (1989). While qualitative comparative analysis allows only for comparisons across cases with binary representation across a range of case-based conditions defined in terms of set membership (i.e., each case is either "fully in" or "fully out" of the set of all cases with a particular characteristic), fuzzy-sets allow for partial membership in sets of conditions, including outcomes. Hence, this approach makes it possible to conduct rigorous comparative analysis across any number of cases, from a handful to over 100. Our presentation will contain the following components. First, we will describe the basic principals of fuzzy-set analysis. Second, we will present elements of parish profiles that have been developed utilizing fuzzy-set principles. Third, we will draw from these profiles to present an exploratory parish-level fuzzy-set analysis in Louisiana. Fourth, we will compare our objectives and findings to those of the conventional, quantitative analysis, and discuss relative advantages and disadvantages of the fuzzy-set approach. Sixth, we will ways of synthesizing fuzzy-set principles with quantitative approaches, both ways of using fuzzy-set concepts to sharpen quantitative estimates and ways of using principles in quantitative analysis to sharpen case-based comparative analysis.

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USDA Agricultural Research Service

Biological Control of *Arundo donax* along the Rio Grande [River]: Benefit-Cost, Per-Unit Cost, and Impact Analysis of Potential Water Saved

The Rio Grande serves as the international divide between Texas and Mexico, and flows into the Gulf of Mexico at its terminus. In recent years, the Rio Grande Basin has been invaded by *Arundo donax*, an invasive weed that consumes large quantities of water. Water flow and availability have become of increasing concern to the bottom four counties of Texas, known as the Lower Rio Grande Valley (i.e., the Valley). The invasion of this high-water-using plant has attracted the attention of the United States Department of Agriculture—Agricultural Research Service (USDA—ARS). In an effort to increase water supply to the Valley and aid in border security, the USDA—ARS is in the process of investigating and releasing biological control agents to mitigate the growth of the plant. The reduced level of *Arundo* infestation as a result of the release of these agents is anticipated to save water in the Rio Grande Basin, facilitating increased water supply to the region. The economic analyses performed in this paper include the (a) valuation of water for agriculture in the Valley, (b) benefit-cost of saving water from using the biological control program, (c) per-unit cost of saving water, and (d) an economic and employment impact analysis to the region from the water saved. Further, sensitivity analyses are performed to account for variation in *Arundo* agricultural water use, effectiveness of control agents, replacement species' water use, *Arundo* expansion rate after control, value of water, and the cost of the biological control program. The benefit-cost analysis revealed a return ranging from $4.38-8.81 due to the saved water for every public dollar invested in the biological control program. Further sensitivity analyses yielded positive benefit-cost ratios in all but one scenario (where the amount of water consumed by *Arundo* was 2.00 acre-feet and the value of water was $50/ac-ft). Additionally, the program has a per-unit cost of saving water comparable to water conservation programs currently in use in the Valley. The economic impact analysis of pre-production and pre-farm-gate processes, using IMPLAN, further revealed a range of $9 to $18 million annually in economic output and 197 to 351 jobs associated with the increase in gross revenues due to the control of *Arundo donax* for the year 2025. Thus, the results of these analyses indicate positive economic results for the Lower Rio Grande Valley from the *Arundo donax* biological control program.

Sempier, Tracie
LaDon Swann
Steve Sempier
Mississippi-Alabama Sea Grant Consortium
Rod Emmer
Louisiana Sea Grant College Program

Assessing Coastal Community Resilience

With growing development and increasing population numbers, coastal communities are thinking about how they can better withstand and recover from future disasters. Local decision makers, planners, and resource managers are concerned about reducing both immediate impacts and long-term economic losses from coastal storms. One tool to assist communities in identifying their vulnerabilities is a self-assessment Resilience Index which determines a baseline for future planning. The Coastal Resilience Index is a tool communities use to examine how prepared they are for storms and storm recovery. To complete the Index, community leaders, floodplain and emergency managers, coastal engineers and other local decision makers assemble a meeting and use the tool to guide discussion about their community's resilience to coastal hazards. The purpose of the Index is to provide a simple, inexpensive method for community leaders to perform a self-assessment of their community's resilience to coastal hazards. The Index allows communities to use existing knowledge, data,

and studies to examine their resiliency in terms of critical infrastructure, transportation, community plans and agreements, mitigation measures, business plans, and social systems. Experienced local planners, engineers, floodplain managers and/or administrators can complete the self-assessment in less than two hours. The Resilience Index reveals challenges and obstacles the community should address prior to the next storm season and where the community's attention and resources may best serve the community to prepare for coastal hazards. The Resilience Index and methodology will not replace a detailed study. However, it will provide a quick analysis that can benefit the community by encouraging community leaders to seek further consultation and more in-depth analysis in specific areas identified by the self-assessment tool. By completing the self-assessment multiple times over the course of a few years, communities can determine if they have been making progress in building or retaining their resiliency. The Resilience Index is for use within the community and not to be used to compare one community to another. The Resilience Index has been pilot tested in sixteen coastal communities in Louisiana, Mississippi, Alabama, Florida, and Texas. The input collected in the pilot tests was used to refine the Index. The final version of the Index will be shared with additional communities throughout the Gulf of Mexico. Local Sea Grant extension agents and others will work with interested communities to facilitate the completion of the community self-assessment or give the Index to communities to complete on their own. In addition to the assistance provided by extension agents, a mapping tool has been developed to help communities visualize the location of critical infrastructure and facilities, assisting them in answering questions on the Resilience Index. This tool is easily accessible via a web browser and compliments the Index. The Resilience Index is a joint venture initiated by Louisiana Sea Grant and Mississippi-Alabama Sea Grant Consortium and has region-wide support through the NOAA Coastal Storms Program and the Gulf of Mexico Alliance Community Resilience Priority Issue Team.

Stephanie Showalter
Mississippi-Alabama Sea Grant Legal Program

Understanding Fisheries Management

Fisheries management is a complex and, at times, confusing mix of scientific, legal, economic, and political decisions. Fisheries managers strive to maintain fish stocks at sustainable levels while also enabling a viable fishing industry. Unfortunately, it is not always possible to fully achieve both goals. When harvests are restricted, commercial and recreational fishermen are often critical of federal and state management decisions. Some of this criticism is due to a misunderstanding of the legal framework governing fisheries management and how scientific and economic information is generated and incorporated into the process. For almost twenty years, the Mississippi-Alabama Sea Grant Program's publication "Understanding Fisheries Management," currently in its second edition, has been educating and informing fisheries stakeholders on the federal fisheries management process. A third revision of this seminal publication is currently underway to address the 2007 amendments to the Magnuson-Stevens Fisheries Management Act and subsequent regulatory changes. This session, moderated by the Mississippi-Alabama Sea Grant Legal Program, will convene an expert panel to provide updates on the biological, economic, and legal contributions to the third edition and solicit feedback and suggestions for additional changes.

Slack, Tim
Candice A. Myers
Joachim Singelmann
Louisiana State University

Social Vulnerability, Population Change, and Disaster: Examining the Nexus Following Hurricanes Katrina and Rita

This study explores the relationship between place-based social vulnerability and post-disaster population change in the U.S. Gulf Coast Region following Hurricanes Katrina and Rita. Drawing on county-level data from the U.S. Census Bureau, we develop a regional index of social vulnerability and use spatial regression analysis examine how its various dimensions are related to population change in the wake of the storms. Our results show that places characterized by greater proportions of disadvantaged populations, housing damage, and, to a lesser degree, more densely built environments were significantly more likely to experience population loss following the hurricanes. Our results also show that these relationships were not spatially random, but rather exhibited significant geographic clustering. We conclude with a discussion of the implications of these findings for future research and public policy.

Smith, Aaron
Michael Popp
Lanier Nalley
University of Arkansas

Carbon Offset Payments and Spatial Biomass Supply in Arkansas: Implications of Pine and Switchgrass

With climate change legislation likely, producers and policy makers need information to make informed decisions. An existing Arkansas crop model is modified to add pine as a dedicated carbon sequestering crop with existing markets and switchgrass as a hypothetical biofuel feedstock. A life cycle assessment (LCA) method is used to estimate the greenhouse gas (GHG) emissions of the most common production practices for the six largest crops in Arkansas (corn, wheat, cotton, rice, soybeans and sorghum) and the less traditional crops of switchgrass and pine. Included are GHG emissions standardized in their carbon equivalents (CE) embedded within the inputs (herbicides, pesticides, fuel, and fertilizers) used in crop

production as well the carbon sequestered in soils and lumber produced. The objectives of this study are to i) quantify the net carbon footprint (emissions minus sequestration) by traditional and alternative crops; ii) to estimate the effects of policy changes on cropping patterns, GHG emissions, and net returns; and iii) to provide a spatial estimate of biomass supply under varying hypothetical biomass prices and carbon offset payment scenarios. This is achieved by using a county level profit maximization model in conjunction with historical acreage, water availability, yield, input and output price information. The model estimates profitability and resource use (fuel, labor, irrigation water and agricultural chemicals / plastics) to capture producer behavior as a baseline for policy comparisons. Modeling of pine and switchgrass as land use alternatives to traditional agriculture on crop, hay and pasture allows analysis of policy goals of curtailing GHG emissions (or increasing GHG sequestration) and/or increasing renewable fuel feedstocks. By modeling carbon offset payments at varying carbon prices for GHG sequestration beyond the baseline, the model predicts how producers would respond by either curtailing GHG intensive crop production or adding pine to their crop mix. Further, should biofuel become a reality, a sensitivity analysis on biomass prices allows determination of biomass supply from switchgrass, corn stover, and/or pine residue. Overall, model comparisons of the baseline with policy alternatives across a spectrum of carbon offset and biomass prices should reveal information about likely county level cropping pattern, agricultural income, GHG emissions / sequestration and biomass supply changes. In summary, this research provides information about relative GHG emissions across land use choices as well as expected producer responses to carbon offset and biomass price changes. Initial model results suggest that both pine and switchgrass enter land use with varying and significant implications for traditional crop production at modeled price levels of $35 to $55 per dry ton of baled switchgrass and $15 to $30 per ton of carbon. 2007 crop production technology and 2007 crop price expectations for traditional crops as well as 2006 to 2009 average stumpage prices for pine were used.

Smith, Jordan W.
Dorothy H. Anderson
Roger L. Moore
North Carolina State University

The Role of Social Capital In Coastal Communities' Resilience to Climate Change

The potential impacts of global climate change have captured the attention of citizens, policy makers, industry, and the scientific community. The impacts of global climate change are projected to be especially severe for low-lying coastal areas due to higher probabilities of inundation attributable to sea-level rise and storm surge. Sea-level rise will result in altered local economies, degradation of built infrastructure, and fragmented natural habitats. While the impacts to coastal communities will be broad, these areas are not all equally equipped to adapt to change and mitigate impacts. This presentation develops a conceptual model for understanding how and why the adaptive capacities of coastal communities vary. Drawing from a diverse array of literature from the natural sciences (e.g., complex and adaptive socio-ecological systems, resilience) and the social sciences (e.g., concepts of place, social capital), we contend that coastal communities' resilience is affected by social, economic, and environmental contexts. Specifically, we argue that coastal areas' adaptive capacity is limited by two types of dependencies—economic and social-psychological. Economic dependencies occur through coastal communities' reliance upon specific natural resource based economic sectors (e.g., fishing, recreation, etc.) that are highly vulnerable to changing climatic variations. Social-psychological dependencies are defined by community members' cognitive and emotional attachments to occupations and geographic locations. We contend these dependencies limit communities' adaptive capacities. We also present the hypothesis that the types and stocks of social capital within coastal communities affect if, and how, coastal communities mitigate the negative consequences of dependence. Social capital is presented as a resource that can, depending on its type, either exacerbate or alleviate the effects of shifting economic, social, and ecological regimes. More explicitly, we suggest coastal communities with high stocks of bridging social capital can better mitigate the impacts resulting from changing climatic conditions. This occurs because bridged social ties give access to resources and opportunities that exist both outside of the immediate community and across scales (i.e., ties to and resources available from federal, private, and non-governmental actors). Conversely, we contend coastal communities with high stocks of bonding social capital may be less resilient to changing climatic conditions because bonding ties can impose strict social norms that discourage change and limit the pools of financial, human, and natural capital available to be used in efforts to solve collective problems. In sum, the conceptual model presented in this presentation suggests economic and social-psychological dependencies as well as social capital are important factors that influence if and how coastal cities and communities can adapt to the changing socioeconomic and ecological contexts which result from climate change.

Solis, Daniel
University of Miami
Michael Thomas
Florida A&M University
David Letson
University of Miami

Hurricane Evacuation Behavior in Florida: The Impact of Location and Within Season Experience on the Evacuation Choice

This study analyzes the determinants of household hurricane evacuation choice for a sample of 1,355 households in Florida. This study contributes to the literature by accounting for two issues normally neglected in previous studies. First, we account for regional variability by selecting households from two distinctive geographical areas in Florida (i.e., SE and NW Florida). In addition, we analyze within season viabilities by

evaluating the household evacuation behavior for four hurricanes that impacted Florida during the 2005 season. To reach our goal, a set of probit models are developed to analyze the impact of studied socioeconomic, geographical, and time variables, and to compute their marginal effect on influencing household evacuation. In general our empirical results suggest that households living in risky environments (mobile home and flooding areas) are more likely to evacuate. In addition, households with children and those who have experienced the threat of a hurricane also display higher probabilities to evacuate. In contrast, homeowners and households with pets are less likely to evacuate than their counterparts. Presently, it appears that the source of forecast information and the relative importance of media origin are not significant factors to the evacuation decision, yet Lindall et. al. (2005) assert that social interaction is important. While this research is inconclusive, the importance of information in the process of deciding to incur a large expense (evacuate) while facing an uncertain event (hurricane) is certainly complex and should be the subject of further study. Regional differences in propensity to evacuate are clearly demonstrated, with households in SE Florida less likely to evacuate than those in NW Florida. This knowledge could prove helpful to policy makers in allocating their evacuation efforts in the future. Looking across storms within SE Florida, a level of sophistication emerges. Household experience with hurricanes prior to the 2005 season proved a positive influence on evacuation and may be contrary to the anecdotal evidence of evacuation fatigue. WILMA, while a more powerful storm than KATRINA (as a SE event), was less threatening to the SE region because of its eastward path, removing the danger of ocean flooding. Households responded to this storm by evacuating at lowers rates than they did KATRINA and by showing less concern about the danger of flooding. Thus, further research should try to incorporate, as an explanatory variable in explaining evacuation behavior, people's expectations on the potential impact of a storm on their surroundings. It is also important to indicate that the results obtained in the estimated models may be a useful tool to identify the willingness to evacuate for broad demographic groups. This information may help emergency managers to target resources more efficiently focusing not only on those individuals with higher risk but also on those groups with lower probabilities to evacuate. Nevertheless, further research is needed to test the validity of the model and its variability across different geographical areas.

Song, Feng
Frank Lupi
Michael Kaplowitz
Michigan State University

The Value of Public Access to Great Lake Beaches

The Great Lakes are a defining coastal natural resource for the upper Midwest of the United States. Publicly accessible Great Lakes beaches provide important recreational opportunities to residents of the area, attract people from across the country, and support local and state economies. These beaches are also subject to various threats, including diminution of water quality and quantity, environmental harms, and encroachment due to natural and human causes. Increasingly, values for beach uses are of great interest to local, state, and regional managers and public policy makers as they try to make better informed resource decisions. This paper reports estimates of the recreational use values of Great Lakes beaches using a travel cost model. Our work contributes to the literature in several ways. First, we enhance the understanding of the economic values of Great Lake beaches by providing a detailed valuation study in which beach characteristics and water quality factors are specifically taken into account. Currently, only a few studies report economic values for Great Lake beaches (e.g., the multi-site studies by Sohngen *et al.* 1999 and Murray and Sohngen 2001, and the single-site study by Shaikh, 2005). Compared with previous studies that only model beach visitors' choice among small geographic subsets of Great Lake beaches (smaller than 15), we capture a broad range of substitution possibilities by including nearly 600 beaches or all publicly accessible beaches in Michigan (which happens to be over half of all Great Lakes beaches). Second, the valuation results are useful in benefit-transfer analysis for other freshwater beaches which is important given the scarcity of this kind of information. Third, these results can be used to facilitate public land use decisions, cost-benefit analysis of improving water quality programs and/or compensation for environmental accidents. A two-level nested-logit Random Utility Model is employed to describe an individual's choice of one recreational site among all public Great Lakes beaches in Michigan. Beach sites are arranged into a nest by their respective Great Lake. The trip data were obtained from a 2006 statewide survey of people that had visited a Great Lakes beach in the past year eliding 1,212 people with trips in the analysis. The variables that affect the indirect utility derived from a particular site are the travel cost and site quality variables, which include beach length, days of beach advisory, and days of beach closure in 2006. The advisory and closure variables are publicly announced information for beaches with closures or advisories due to water contamination. The model shows that Michigan residents' choices of which Great Lakes beach to visit are significantly influenced by characteristics such as the cost of accessing the beach (negative effect, $p<0.0001$), the length of the beach (positive effect, $p<0.001$), and the number of beach closure days in the previous year (negative effect, $p<0.002$). The economic value of access to a beach depends on the site's characteristics, but values for trips to particular beaches range from $37 to $58 per trip. Scaling up the values reveals substantial recreation values for access to Michigan's Great Lakes beaches, with access to Lake Michigan beaches being worth over one billion dollars annually.

Speir, Cameron
National Marine Fisheries Service
Caroline Pomeroy
California Sea Grant
Jon G. Sutinen
University of Rhode Island
Cynthia J. Thomson
National Marine Fisheries Service

Observing and Explaining the Dynamics of Coastal Fishing Communities: An Application to Ports in Northern California

This paper analyzes changes in the spatial distribution of fishing activity among ports in a multi-species fishery. Fishing trips, participating boats, and ex vessel revenue have all experienced steep declines over the past 30 years in the fishing industry in north-central California. We examine the extent to which fishing ports in the region have fared differently. Have all ports have been affected equally by this sector-wide decline? If not, why not – what factors make one port better able to support commercial fishing than another? In this paper we first identify and rank ports based on changes in fishing activity over time. Second, we explore some explanations as to why we might expect different levels of fishing activity, including stock abundance conditions that vary over space, fishing regulations, supply chain issues (concentration of receivers or processors, idiosyncratic issues such as a sudden loss of a major receiver), and local policies (including port infrastructure investments). We propose three processes that may effect the distribution of fishing activity across ports and test for their presence in the northern California fishery. The first process is economic agglomeration. Models of economic geography predict that as total fishing activity declines, activity may aggregate in a few larger ports so that fishing related services (e.g. fuel, bait, ice) have enough business to survive. The second process is changes in the distribution of fish stocks. Changes in relative abundance may give some ports an advantage if they are located near the increased fishing opportunity. The third process is inter-port competition. Municipalities may compete for fishing business by upgrading facilities. For evidence of the three processes we plot the relative share of fishing activity (in terms of fishing trips, ex vessel revenue, and landings) by port over time to see 1) whether larger ports gain a larger share of fishing activity over time, 2) whether certain geographic regions or species-specific fisheries gain a larger share of fishing activity over time, and 3) whether there are changes in relative share between ports in close geographic proximity. We also calculate rank correlation statistics to characterize the degree of change in relative share between ports and Gini coefficients to characterize the degree of concentration of fishing activity. Given the significant decline in overall fishing activity, we would expect significant changes in the distribution of fishing activity among ports. Our preliminary results, however, indicate a remarkable level of persistence in the distribution of fishing activity. We discuss the implications of these results for the resilience of fishing communities.

Strellic, Kristen
(moderator)
Minerals Management Service

Understanding the Changing Economic Impact of the Oil and Gas Industry in the Gulf of Mexico Region: Lessons from the Past to Improve Coastal Communities in the Future
Moderator: Kristen Strellic, Minerals Management Service

The evolution of the oil and gas industry in the Gulf of Mexico region has been shaped by many forces both within and outside of its control. Natural disasters (e.g. hurricanes) and man-made disasters (e.g. oil spills) have created challenges and opportunities for the industry to re-invent itself over the decades to meet world-wide demand for its products. Further, macro-economic shocks such as the energy crisis of the 1970s and tax policies of the 1990s have created boom and bust economic cycles that still exist with us today. The local communities along the coast that provide the labor force and the support infrastructure for this industry have attempted to be resilient along this economic roller coaster. The purpose of this panel is identify the key themes that drive the economic effects of this industry on the coastal economies from historical observation of those affected and how past lessons from the boom and bust cycle of the industry can be used to improve the resiliency of these communities in the future.

Thomas, Michael
Florida A&M University
Frank Lupi
Michigan State University
David Harding
Florida Fish and Wildlife Conservation Commission

How a Random Utility Model can Assist in Recreational Policy: The Case of Public Boat Ramp Investments in Lee County Florida

In 2008 there were nearly 1 million registered recreational boaters in Florida and in 2007 nearly 25% of all boating related trips involved launching a trailered boat from a publically available ramp (US Coast Guard, 2008; Florida Fish and Wildlife Conservation [FWC], 2009). Lee County accounts for roughly 3% of all ramp-based boating trips (FWC, 2009). With hundreds of thousands of boating trips from dozens of publically accessible ramps, Lee County planners need analytical tools to understand demand and consumer surplus to assist them in evaluating new and enhanced launch facilities. The objectives of the paper are to: (1) Estimate the demand for marina access public boat ramps in Lee County, Florida; (2) Relate demand to ramp characteristics and to characteristics of on-the-water sites; (3) Use the demand model to value ramp and on-the-water site characteristic; and (4) Assess the present value of the social benefits of potential ramp investment opportunities facing Lee County planners. To accomplish this, we developed a model of recreational demand that allowed for the presence of multiple possible substitute sites. The model was specified as a nested-logit random utility model (RUM) where boaters choose a combination of publically accessible ramp and on-the-water destination with a nest for ramps and a nest for the water sites available from each ramp. Data on boater's ramp and water site choices came from a 2007 statewide web-survey of registered boaters. Data included trip origin and ramp/water-site destinations for each trip along with travel and time costs incurred. On-the-water travel costs were a function of boat type and size. Ramp

characteristics (launch fees, parking area and condition, amenities such as restrooms, etc,) were obtained from a new state-wide ramp inventory. Water site definitions and characteristics came from a state GIS database. Water sites were defined as 12 minute polygons having the average characteristics of the GIS grids within the polygon. A total of 71 water sites (polygons) were available from each of the 35 Lee County ramps. The estimated nested-logit model parameters were highly significant (McFadden R-squared=0.28). Travel costs were significant and negative. The nesting parameter was significantly less than one indicating the nesting structure was appropriate. Significant and positive ramp characteristics included: parking area, parking lot condition, and an index of developed facilities. Significant and positive water-site characteristics included: marine protection zones and mean water depth. Negative characteristics included: manatee protection zones and grids that were more distant from any ramp. The values for access to each of the ramps were computed and the values per trip to a specific ramp were $30-$35. The model was also applied to three potential scenarios: adding an additional access point, improving an access point by enlarging the parking lot, and removing an access point. Social benefits were aggregated by combining per-choice occasion benefits with total trips to Lee County and ranged from $4 to $17 million dollars.

Thomas, Scott
Stetson Engineers, Inc. and
Division of Earth and
Ecosystem Sciences
Desert Research Institute

Scenario-based Studies to Focus Planning in Coastal Regions

This presentation discusses methods of scenario-based analysis as a means to focus socio-economic and biophysical research and planning for managing coastal regions over the long term. Scenarios for plausible futures can be used by planners to provide a context for multi-disciplinary and integrative planning. The process includes 1) soliciting stakeholder input regarding trends and critical uncertainties; 2) developing scenarios (alternative models of change) based on perceived driving forces and recognized uncertainties; 3) specifying spatial allocations and temporal moments of change (alternative futures); and 4) evaluating these futures in terms of resources valued by stakeholders such as biodiversity, hydrology, transportation, air quality, energy development, tax base, and visual aesthetics. Identifying, mapping and analyzing the resources of interest by value system within an ever-changing land use distribution allows for more informed decisions by land managers. Examination of regional scenarios enables planners to analyze the implications of change at larger scales than is typically done, and it contributes to decision-making by considering how pending options play-out in multiple futures. The presentation examines scenario case studies in coastal California and the Southwest United States and discusses the benefits and challenges associated with various methods for obtaining stakeholder input, developing scenarios, and presenting the implications of change related to various futures.

Uematsu, Hiroki
Ashok K. Mishra
Louisiana State University
Agricultural Center

Risk Preference and Human Capital: What Do They Say about Adoption of Cost-Share Conservation Programs

The Environmental Quality Incentives Programs (EQIP) endorses adoption of environmentally benign farming practices on working farm land by offering a cost-share to participants (Lambert, et al., 2006). By adopting conservation practices through EQIP, farmers receive financial and technical assistance. Even though farmers could still choose to adopt conservation practices without participating in EQIP, the cost-share and technical assistance provided by EQIP reduces risks associated with the adoption. This sets up a stage for an interesting natural experiment because adoption of any conservation practices endorsed by EQIP is always made less risky when adopted through EQIP. But fully understanding and taking advantage of the risk reduction made possible by EQIP entails transaction costs (e.g., gathering information about EQIP, how to apply, abiding by contract terms once application is approved), which could be perceived differently by different individuals depending on the amount of human capital, among other factors. The effect of risk attitude on technology adoption is often found negative in literature—risk-averse individuals are less likely to adopt technologies (Marra, et al., 2003). An exception is Koundouri et al. (2006) who found that risk-averse farmers are more likely to adopt irrigation technology in order to mitigate production risk in the case of water scarcity. Although adoption of a new technology almost always entails risks, risk-averse individuals are more likely to adopt the technology when the technology, once implemented, is expected to be risk-reducing. An important missing factor in the above discussion, however, is human capital as it can play an important role in the process through which potential adopters accumulate information on which their final adoption decision is based. It is possible that individuals with the same risk preference may exhibit very different adoption behaviors depending on the amount of human capital they possess. Given the same risk averseness, more educated individuals would be more willing to and capable of seeking detailed information about the technology they consider adopting or the government programs they consider participating in to reduce uncertainty associated with adoption/participation. On the other hand, since less educated individuals would be relatively less able to gather, screen and assess information relevant to potential risks associated with the technology/government program, an optimal behavior for them would be not to adopt/participate to simply avoid risk. If this is the case, human capital can be a decisive factor in explaining the effect of risk

attitude on technology adoption and government program participation. Could it be the case that more educated risk-averse farmers are more likely to apply to and participate in government subsidy programs such as EQIP while less educated risk-averse farmers are less likely to do so? If so, farmland owned by less educated farmers are less likely to be operated with conservation practices, thereby creating a gap between farmlands operated by more and less educated farmers in terms of environmental quality. We propose to empirically estimate the impact of risk preference and human capital on the adoption of cost-share conservation program. We will use the 2008 Agricultural Resource Management Survey (ARMS) to conduct our analysis.

van Heerden, Ivor
Louisiana State University
G. Paul Kemp
National Audubon Society

How a Navigation Channel Contributed to Most of the Flooding of New Orleans During Hurricane Katrina

As a consequence of levee failures during Hurricane Katrina 85 percent of greater New Orleans was flooded, 1,500 lives were lost and approximately 400,000 were left homeless. Flooding levels within the three main bowls were strikingly different with the St Bernard polder, having the highest average ground elevation, experiencing flood levels 11 feet above sea level. Three separate investigations into the levee failures have been concluded; the state of Louisiana's 'Team Louisiana'; the National Science Foundation funded Independent Levee Investigation Team (ILIT); and the US Army Corps of Engineers (USACE) self study Interagency Performance Evaluation Taskforce (IPET). None of these studies conclusively determined why the St Bernard polder flooded so deeply, although Team Louisiana suggested that early failure of the Mississippi River Gulf Outlet (MRGO) levees due to front side wave attack an hour before landfall set the stage for the entire flooding of St Bernard Parish. Detailed wave and hydrodynamic modeling reveals that front side wave attack before landfall caused extensive breaching of the MRGO levees; that the wide eroded width of the MRGO navigation channel enhanced wind-wave development; and, that the MRGO was a very efficient conduit of surge water into the heart of the city. Assessing the risks associated with major public construction and natural system altering projects is essential while these are still in the conceptual planning phase. The lessons of the man-made catastrophe known as Katrina are strong testament to under-elevating the risks, especially in a dynamic environment such as coastal Louisiana.

Waddell, Jasmine
Oxfam America

Mapping Vulnerability to Climate Change in the US South

Oxfam America worked with the Hazards and Vulnerability Research Institute at the University of South Carolina to commission a series of social vulnerability maps for thirteen states in the US South. In the Oxfam report, *Exposed*, 75% of the variance for social vulnerability to four hazards associated with climate change--drought, flooding, hurricane force winds, and sea level rise--was explained by eight variables: wealth, age, race, ethnicity, rural, special needs populations, gender and employment. The overlay of social vulnerability, a static demographic assessment, with the dynamic potential for hazards associated with climate change is crucial information for emergency preparedness and regional planning. The presence of 'black spots' on the overlaid maps indicates that there is a high incidence of disasters historically and that there is high social vulnerability as defined by the social vulnerability index, SoVI. The 'black spots' are concentrated on the southern coast and MS delta region of Louisiana which indicates both a high incidence of social vulnerability and climate change related hazards here. In order for effectively manage the living people resources in these geographic areas, federal state and local policies must be developed which respond to vulnerability in addition to resiliency. Vulnerability and resiliency are not two sides of the same coin, and both are critical for effective coastal policy. The implications of this knowledge about social vulnerability to hazards associated with climate change are very practical. This information is designed to create systems which can respond to the specific needs which result from a disaster. The needs of a community with low social vulnerability are different than those for a community with high social vulnerability and the systems developed and supported by public money should reflect this. The information from this report focuses on people, and not property value; therefore, the information can be used to develop systems for people-focused emergency management in the face of climate related disaster.

Wang, Hua
CNREP and Louisiana State University Agricultural Center

Incorporating Time and Risk Considerations in the Selection of Coastal Restoration Projects

In the wake of the 2005 hurricane season, coastal restoration policy in Louisiana has begun to integrate infrastructure protection with habitat restoration. Whereas previous efforts have been habitat-centric, this integration introduces a new, parallel benefits construct which focuses on rapid land building. This poster provides the background and conceptual framework for an economic research project that will examine the cost-efficacy of coastal restoration alternatives under a wide range of time and uncertainty assumptions. One focus of the project will be to develop comprehensive comparisons of the comparative costs and benefits of proposed freshwater diversions and RLB projects that are currently under consideration.

Weiss, John
Jason Price
Robert Unsworth
Industrial Economics, Inc.
Peter Meffert
U.S. Department of the Interior

Social and Environmental Implications of OCS Oil and Gas Development

The Minerals Management Service undertakes a regular process of developing five-year programs for leasing areas on the outer continental shelf, primarily for the purpose of oil and gas exploration and development activities. As part of this process, MMS assesses the net benefits of these activities to inform decisions regarding where and when to permit oil and gas development activity. In particular, MMS must attempt to properly account for the range of environmental and social externalities that additional OCS development (under the five-year program) would impose on society, but must do so with due regard for the externalities associated with incremental energy-related activities that would occur in the absence of the program. With the possibility of increased offshore oil and gas development activity emerging as an important issue in the context of both energy security and potential Congressional action on greenhouse gas regulation, the need for a careful examination of externalities, as part of the current and all subsequent five-year planning processes, is increasingly acute. To address this need, MMS is developing a new "offshore environmental cost model" that will be appropriately detailed in its coverage of relevant costs, while also maintaining a high degree of transparency, ease of use, and future adaptability and expandability. This presentation will provide background on the need for and the general approach to the assessment of social and environmental externalities in the OCS leasing context. The presentation will then address the important initial question of which externalities are or are not appropriate or necessary to capture in the model, taking into account varying perspectives on "significance" as well as the credibility of assessment methodologies and underlying quantification and valuation data. Recognizing both the challenge of developing a model that can accurately estimate long-term costs in a dynamic and evolving energy marketplace and the wide range of interests that can be expected to examine the model's assumptions and results with a critical eye, the presentation will also address the important role that transparency and effective communication will play in gaining acceptance of the model as a robust tool that will enhance agency decision making.

Wilkins, James G.
Louisiana Sea Grant Law and Policy Program

Legal Issues in Sea Level Rise Adaptation

Scientists are observing sea level rise throughout the world and communication of the phenomenon has made us more aware than ever of the constant threat natural hazards pose to human life and property. Coastal areas are particularly vulnerable, especially in light of current climate science's predictions for accelerated sea level rise in coming decades. Some state and local governments are attempting to prepare for sea level rise by instituting hazard mitigation measures that restrict where and how development may occur. These measures can raise legal issues such as takings challenges from property owners. Takings challenges can deter state and local governments from instituting land use planning and zoning measures necessary to help ensure the long-term sustainability of coastal communities. However, research shows that courts are more likely to uphold restrictions on private property when they are designed to protect public safety and indeed governmental entities may, in the long run, incur more liability when their actions, or failure to act, increases injury from natural hazards. Plaintiffs seeking to recover damage awards from governments will have to overcome sovereign immunity in some jurisdictions and immunity for administrative agency discretionary functions. Advancing knowledge, data and technology for accurately predicting hazardous events and vulnerable areas will make it more and more difficult for governments to avoid responsibility for hazard planning, and will impose a higher duty to protect people from known or foreseeable hazards.

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A Bioeconomic Model for Managing Harvest Size/Mercury Contamination Tradeoffs in King Mackerel

Mercury contamination of consumable marine fish stocks is a growing public health concern. At the current time, however, no pre-harvest methods are used to control the amount of contaminants that reach fish consumers. Given that mercury bioaccumulates in fish, contamination can vary significantly by size and/or age class. This suggests that directed, size-based harvest management could potentially lead to public health improvements by limiting the amount of mercury that reaches consumers. Intuitively, this approach might require the harvesting of younger, smaller fish with the goal of allowing older, larger fish to serve as both a breeding stock and contaminant sink. The development and analysis of an empirical bioeconomic model for king mackerel, a mercury plagued species, is used to investigate these issues. The biological component was based on a traditional age-structured, multiple cohort population dynamics model, while the economic component accounted for the total revenues and costs generated by the commercial harvest of king mackerel. A unique contribution of this research is the linking of species-specific mercury concentration information with the bioeconomic model of the commercial king mackerel fishery. Growth curves were used to relate fish length to age, thus providing the backward linkage into the population dynamics model. Estimations from a study by McMichael and Adams (2007) were used to quantify the relationship between king mackerel size/age and mercury concentration. The average mercury concentration for all commercially caught king mackerel was then calculated by linking the relationship between age and mercury concentration

with the catch output of the bioeconomic model. The model was used to explore the potential for shifting fishing pressure away from larger, more contaminated fish towards smaller, less contaminated fish with the expectation that such a change would lead to significantly lower consumer exposure to fish-borne mercury. The results demonstrate the potential for reducing the amount of mercury that reaches consumers by altering the age composition of the commercially marketed catch. Furthermore, it is even possible for this to occur without seriously impacting either commercial catch or the long-run stability of the biomass stock. However, reductions in mercury came at the price of reduced fishery profits and losses in the net present value of the fishery, highlighting that some tradeoffs are necessary. The results indicate that a harvesting slot limit could effectively reduce the mercury concentration that reaches consumers, and when catches remain around historical levels, can also preserve the stock if incidental catch of oversized fish is low. If incidental catch of oversized fish was high enough, there could be a negative impact on biomass, jeopardizing the status and stability of the stock. The minimization of incidental catch is also necessary to limit financial losses to the commercial fishermen.

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Thinking Through Catch Share Programs: Lessons Learned About Property Rights and Institutional Design from the New Zealand Rock Lobster Experience

When considering whether and how to implement a catch share program, it is important to consider the long-term effects this policy option has on the fishery and those who work in the fishery. By carefully considering how the catch share policy is designed, participants can help craft a regime that will better meet their and the fishery's needs. After presenting a case study of ITQs (a form of catch share) in the New Zealand rock lobster fishery, this paper uses property rights bundles and dimensions to provide a theoretical lens to better understand the dynamics created by the this approach. The paper then presents "lessons learned" and raised issues for participants to consider when designing catch share regimes including: institutional design, how property rights are characterized, and conflicts between catch share rights and other forms of regulation and property rights.

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A Multiparty Approach to Inventory and Valuation of Ecosystem Services in the Coastal Zone of the Gulf of Mexico

The inventorying and valuation of ecosystem services (ES) is much further along in the terrestrial and inland environments of the United States then it is along its coasts. For the coastal region of the Gulf of Mexico, the gap in knowledge and work being conducted is even greater. However, that has begun to change and within the last few years there has been significant progress made on closing this gap. Multiple federal, state, and local agencies as well as non-governmental organizations have begun devote serious attention to the Gulf Coast as it relates to ES. While on the surface it may seem that the parties are working independently on the same issues, in fact there is a significant amount of collaboration, especially given the size of the region. This paper: 1) Illustrates the multiple approaches that are taking place in the Gulf to inventory and value ES; and 2) Proposes a means to continue the cooperation that already exists, even as interest in the use of ES for decision making increases in the region, and as collaboration between many more parties becomes difficult. There are two, of many, examples that demonstrate the effort being made to inventory and value ES around the Gulf. First is the US EPA's significant endeavor in Tampa Bay as one of its pilot studies in the Ecosystem Services Research Program (ESRP). This multi-year effort has brought together ecologists, biologists, and economists in order to inventory and value ES in the Tampa Bay region and develop decision support tools. Secondly, the Gulf of Mexico Alliance (GOMA), in its Governors' Action Plan II, has identified the need for work to be done on ES in five of the six priority areas. These issue teams have identified the need to work together and both federal and state agencies as well as academic institutions are part of the process. Several federal agencies including NOAA, EPA, USACE, DOI, and NASA have devoted significant resources to see that the work plan of the alliance is done. This is a state led process and each of the five states has a stake in each one of the priority areas. Cutting across the efforts described above is the Gulf of Mexico Ecosystem Services Collaboratory (GOMESC). The goals of GOMESC are to promote the incorporation of ES and their values in resource management decisions. While the collaboratory itself is not conducting work on ES, its members are in many of the projects supported by the EPA, GOMA or other entities. As work on ES continues to grow in the region the GOMESC may provide the vehicle by which multiple parties continue to communicate and collaborate.

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