

**2009-2010
MASGC Annual Report**



October 2010

**February 1, 2009 – January 31, 2010 Annual Report
Table of Contents**

Introduction	4
Program-Level Impacts:	6
I. Award Reporting	8
Award Number: NA05OAR4171184	8
MASGC Project #EX-9	8
Award Number: NA06OAR4170204	12
MASGC Project #M/GOMR-1	12
Award Number: NA07OAR4170510	15
MASGC Project #A/O-31 , (Program Management Report).....	15
CSP Award NA07OAR4170520 Mini Grant Program Reporting.....	18
Closed Projects for NA07OAR4170510.....	18
MASGC Project # R/MG/CSP-04:	18
MASGC Project # R/MG/CSP-06:	21
MASGC Project # R/MG/CSP-02-PD	22
Open Research Projects for NA07OAR4170510	22
MASGC Project # R/MG/CSP-03:	22
MASGC Project # R/MG/CSP-05:	24
MASGC Project # R/MG/CSP-07:	24
MASGC Project # R/MG/CSP-08:	25
MASGC Project # R/MG/CSP-09:	26
MASGC Project # R/GOMR-04:	27
MASGC Project # R/MG/CSP-11:	28
MASGC Project # R/MG/CSP-12:	28
Award Number: NA07OAR4170511	30
MASGC Project # R/MG/BR-01M	30
Award Number: NA09OAR4170334	32
MASGC Project # E/O-77-Knauss	32
Award Number: NA10OAR4170022	32
MASGC Project # E/O-78-Knauss	32
Award Number: NA11OAR417XXXX (NO AWARD NUMBER YET)	32
MASGC Project # E/O-80-Knauss	32
Award Number: NA08SEC4690053	33
MASGC Project # E/O-76	33
Award Number: NA10NMF4630080	34
MASGC Project # M/RP-1	34
Omnibus Award	35
Award Number: NA06OAR4170078	35
Ongoing Core Education and Outreach Projects for NA06OAR4170078	35
MASGC Project # ED-12 (08-09):	35
MASGC Project # A/L-4:	39
MASGC Project # A/O-1:	42
Closed Core Omnibus Research Projects for NA06OAR4170078.....	50
MASGC Project # R/AT-7	50
MASGC Project # R/CEH-28	52

MASGC Project # R/SP-18	55
Open Core Omnibus Research Projects for NA06OAR4170078	57
MASGC Project # R/CCD-14:	57
MASGC Project # R/CEH-27:	59
MASGC Project # R/SP-19:	61
MASGC Project # R/SP-20:	62
Closed Program Development Projects for NA06OAR4170078	63
MASGC Project # R/AT-9-PD:	63
MASGC Project # R/CCD-15-PD:	65
MASGC Project # R/CCD-18-PD:	68
MASGC Project # R/CEH-30-PD:	68
MASGC Project # R/SP-21-PD:	70
MASGC Project # R/MG/CSP-02-PD:	73
Open Program Development Projects for NA06OAR4170078	73
MASGC Project # R/CCD-11-PD	74
MASGC Project # R/CEH-31-PD	75
MASGC Project # R/CCD-22-PD	75
Omnibus Award	76
Award Number: NA10OAR4170078	76
Ongoing Core Education and Outreach Projects for NA10OAR4170078	76
MASGC Project # A/O-32 (10-13):	76
MASGC Project # E/O-79 (10-13):	78
Open Core Omnibus Research Projects for NA10OAR4170078	79
MASGC Project # R/CCD-19:	79
MASGC Project # R/CCD-20:	79
MASGC Project # R/CCD-21:	80
MASGC Project # R/CEH-32:	80
MASGC Project # R/SP-23:	81
MASGC Project # R/GOMR-04:	81
Open Program Development Projects for NA10OAR4170078	82
MASGC Project # R/CEH-33-PD:	82
MASGC Project # R/CCD-23-PD:	82
Open Sea Grant Aquaculture Program Projects for NA10OAR4170078	82
MASGC Project # A/O-34:	82
MASGC Project # R/AT-10:	83
MASGC Project # R/SP-24:	83
Mini-Grant Programs for NA10OAR4170078	84
MASGC Project # A/O-33:	84
MASGC Project # R/MG/BR-15M	84
II. Program Metrics:	85
A. Management Metrics:	85
a. Staff Composition	85
a. Management team	85
Program Development Projects	86
Leveraged Funds	87
Leveraged Funds chart reported	87

Leveraged Funds Managed by MASGC.....	87
Leveraged Funds Influenced by MASGC.....	87
List of Partnerships.....	91
Awards and Honors.....	97
Output Metrics:.....	99
Focus Area Metrics.....	99
Communication Metrics.....	99
Extension and Legal Events.....	100
Education Metrics.....	101
K-16.....	101
Students Supported.....	101
Omnibus Research Metrics.....	102
Performance Measures.....	103
Economic (market and non-market) benefits derived from projects.....	103
Focus Area: Healthy Coastal Ecosystems.....	106
Focus Area: Hazard Resilience in Coastal Communities.....	109
Focus Area Safe and Sustainable Seafood Supply.....	115
Focus Area: Sustainable Coastal Development.....	117
Focus Area: Healthy Coastal Ecosystems.....	120
National Performance Measures Totals.....	122
(1) <i>Economic (market and non-market) benefits derived from SG activities</i>	128
(2) <i>Tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management.</i>	131
(3) <i>Coastal communities (and counties) that have adopted or implemented hazard resiliency practices</i>	133
III. Impacts Summary:	142
New 2010 Impacts.....	142
Program-Level Impacts:.....	142
Project Impacts:.....	143
Revised Old Impacts:.....	150
Old Impacts From Projects Covered In This Report:.....	150

February 1, 2009 – January 31, 2010 MASGC Annual Report

Introduction

Founded in 1972, the Mississippi-Alabama Sea Grant Consortium (MASGC) is an organization of nine universities and laboratories supporting scientific research, education, and outreach programs that foster the conservation and sustainable development of coastal and marine resources in Alabama and Mississippi. Coordinated by a central administrative unit in Ocean Springs, Mississippi, the Consortium members include Auburn University, Dauphin Island Sea Lab, Jackson State University, Mississippi State University, The University of Alabama, The University of Alabama at Birmingham, The University of Mississippi, The University of Southern Mississippi, and the University of South Alabama. The Consortium has an extension program with offices in Biloxi, Mississippi and Mobile, Alabama and a legal program located at The University of Mississippi in Oxford, Mississippi.

Mission

MASGC enhances the value and sustainability of the nation's ocean and coastal resources through university-based research, education and outreach programs. In other words:

Science Serving Coastal Alabama and Mississippi.

Vision

MASGC will serve as one of the region's leading enterprises in addressing urgent and long-term needs in ocean and coastal resource management using ecosystem-based approaches through sound science, education and outreach excellence.

Values

MASGC's values include using objective scientific discovery to improve coastal management policies and practices; sustainably developing small coastal communities; sustainably using the natural environment; serving residents and communities; collaborating with others to address coastal issues; and meeting marine educational needs for current and future generations.

Objectives

Objectives of the MASGC program include working with organizations interested in the sustainability of coastal resources, promoting strategic assets of the program and its quality pool of investigators, and integrating programmatic efforts with those of research and education institutions to produce greater benefits for the coastal communities being served. The key to achieving results is in our approach of effective partnering, efficient management of program resources, and making prudent investments in program development.

Areas of Focus

MASGC has four focus areas: Healthy Coastal Ecosystems, Sustainable Coastal Development, Safe and Sustainable Seafood Supply, and Hazard Resilience in Coastal Communities.

This annual report summarized the activities and accomplishments of the Mississippi-Alabama Sea Grant College Program from February 1, 2009 through January 31, 2010.

Program-Level Impacts:

Program Impacts:

February 1, 2009 – January 31, 2010 Report

Impact 1:

GOAL: Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

PERFORMANCE MEASURE: Number of extramural dollars applied to research and outreach that addresses Gulf of Mexico regional priorities.

TITLE: Gulf of Mexico Research Plan guides regional research initiative

RELEVANCE: The four Gulf of Mexico Sea Grant College programs coordinated the development of the Gulf of Mexico Research Plan (GMRP), which is a regional plan to identify, prioritize and address research needs. No current plan existed, and this plan bridges the gap between national research planning and local research plans. The plan helps groups mobilize to address regional needs through collaborative RFPs and partnerships.

RESPONSE: The GMRP effort included an examination of more than 100 existing strategic plans, administration of a survey that had more than 1,200 responses and development of five regional workshops. More than 200 organizations participated in the process. A Planning and Review Council guides this effort.

RESULTS: Several groups that fund research in the Gulf of Mexico developed a joint RFP to address priorities identified in the GMRP. The regional research initiative partners (Environmental Protection Agency Gulf of Mexico Program, NOAA's Northern Gulf Institute, Texas Sea Grant, Louisiana Sea Grant, Mississippi-Alabama Sea Grant Consortium, Florida Sea Grant) supported approximately \$1.4 million in research and outreach that addressed the GMRP-identified theme: Sea level change, subsidence and storm surge.

RECAP: Through cooperating with partners across the Gulf of Mexico, the Gulf Sea Grant Programs successfully developed the Gulf of Mexico Research Plan and began addressing the research needs identified in the plan.

Impact 2:

GOAL: Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

PERFORMANCE MEASURE: Number of extramural dollars applied to research and outreach that addresses Gulf of Mexico regional priorities

TITLE: Gulf of Mexico Research Plan referenced as a key document for addressing regional needs

RELEVANCE: The four Gulf of Mexico Sea Grant College programs coordinated the development of the Gulf of Mexico Research Plan (GMRP), which is a regional plan to identify, prioritize and address research needs. No current plan existed, and this plan bridges the gap between national research planning and local research plans. The plan helps groups mobilize to address regional needs through collaborative RFPs and partnerships.

RESPONSE: The GMRP effort included an examination of more than 100 existing strategic plans, administration of a survey that had more than 1,200 responses and development of five regional workshops. More than 200 organizations participated in the process. A Planning and Review Council guided this effort.

RESULTS: Due to the success of the GMRP including active engagement with groups across the region the Gulf of Mexico Research Plan is being used by at least 14 different groups that are incorporating the priorities into their strategic planning and RFPs. In addition, the plan has been discussed as an important reference at meetings held by White House Council on Environmental Quality, Environmental Protection Agency, Gulf of Mexico Hypoxia Working Group, Gulf of Mexico Alliance and Gulf Coast Ocean Observing System.

RECAP: The Gulf of Mexico Research Plan was developed based on input from the broad Gulf of Mexico research community, which is now implementing the priority needs.

I. Award Reporting

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA05OAR4171184**

MASGC Project #EX-9

Time period: 10/01/05 - 03/31/10 **Project Closed**

Award Title: Fisheries Extension Enhancement - Strategies to Engage the Asian Constituency.

Accomplishments and outcomes from this award:

1. WASI: On June 29-30, 2006, Mr. Nguyen participated in training to become a Wild American Shrimp Incorporated (WASI) product certification instructor. He then spent several weeks instructing shrimp processing plant workers on the product quality standards which need to be achieved in order for a product to receive the WASI label. These efforts resulted in a marketing advantage for domestically-produced shrimp and a concomitant benefit for fishermen and processors stemming from premium prices paid for high-quality shrimp. Because a high percentage of the processing plant workers in the region are Vietnamese, Mr. Nguyen's knowledge of the language and culture proved invaluable in these efforts.
2. Electronic Logbook Program: The overall goal is to develop direct measures of fishing effort that could replace modeled estimates of effort that had historically been used by the regulatory agencies to monitor red snapper bycatch in the shrimping industry. The program designed and implemented a shrimp effort and catch logbook program through voluntary agreement with randomly-selected vessels in the Gulf fishing fleet. A vessel tracking system using dedicated Global Positioning System (GPS) transponders was also developed and deployed on selected vessels operating in the Gulf. Data from the logbook program, GPS monitoring and observers will be integrated with data obtained from observers to evaluate existing bycatch and fishing mortality estimates. Seventy-four shrimp vessels in Mississippi and Alabama are now participating in this program. Mr. Nguyen located specific vessels, assisted in hardware installation and maintenance, and replaced memory modules when the vessels visited port to unload and pick up supplies.
3. Gear research and Technology Transfer: In partnership with Texas Sea Grant and the Gulf and South Atlantic Fisheries Foundation, Inc., work continued to promote the use of energy-efficient trawl gear in the Gulf shrimp fishery. A demonstration was conducted on a Mississippi vessel, the F/V Independent, using Sapphire™ trawl webbing and a fuel-flow monitor to document a two gallon per hour fuel savings compared to traditional nylon webbing. As a result of this work, ten other boat owners switched to the new gear. Thirty new prototype bycatch reduction devices (BRDs) were provided to shrimp vessels in Mississippi and Alabama to assist with the transition mandated by the National Marine Fisheries Service when new regulations regarding BRD use went into effect on

May 18, 2009. Over 400 dockside demonstrations were conducted to show fishermen how to comply with federal and state fishery management regulations while minimizing production losses and downtime. At the request of the Ocean Conservancy office in Austin, Texas, Mr. Nguyen translated a brochure from English into Vietnamese which described the new gear being used in the fishery. Texas Parks and Wildlife distributed this in conjunction with the Emergency Disaster Relief Program following Hurricane Ike.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

Mr. Peter Nguyen, who was employed through this project, continues his work as a Project Manager within the Mississippi-Alabama Sea Grant Outreach Program providing educational programming for the Vietnamese-American community in the northern Gulf of Mexico region. Mr. Nguyen's proficiency in the Vietnamese language and familiarity with the Vietnamese culture has facilitated the establishment of an effective extension program which primarily engages members of the fishing and seafood industries in Mississippi and Alabama. Specific program elements include but are not limited to: fishing gear research and technology transfer; an electronic logbook program for shrimpers; product quality improvement; enhanced business reporting and record-keeping; increased familiarity of and compliance with fishing regulations; and cross-cultural integration among various sectors of the waterfront community.

In order to become more proficient in the methodologies employed in Extension programming and to become better networked with his peers in the Gulf region, Mr. Nguyen received In-Service Training at the Mississippi State University Annual Conference in Starkville, Mississippi November 6 – 8, 2006, and attended a Louisiana Sea Grant meeting "Fisheries in Transition" February 27 – 28, 2007 in Baton Rouge, Louisiana as well as the Gulf Sea Grant Regional meeting in Biloxi, Mississippi March 13 – 15, 2007. He attended the Seafood Science & Technology Society of the Americas 33rd Annual Meeting in New Orleans, Louisiana October 26-28, 2009. He also attended the regularly scheduled spring and fall meetings of the Gulf State Marine Fishery Commission at various locations throughout the Gulf states.

With support provided by this project, Mr. Nguyen has established a model outreach program which targets a previously under-served segment of the coastal population in the northern Gulf of Mexico. His work has become an integral part of the overall Mississippi-Alabama Sea Grant Outreach Program and will continue his employment as part of that project to foster continuity and to utilize the extensive network of contacts Mr. Nguyen has established under the support provided here.

Project Impacts:

2008 Report

Themes: Fisheries, Seafood Science and Technology

Title: Sea Grant helps NOAA Fisheries manage the Gulf of Mexico shrimp fishery.

Statement: Seventy-four shrimp vessels based out of Alabama and Mississippi are participating in the electronic logbook program providing detailed information on effort in the fishery.

Impact: Fishery managers now have access to new information on when, where and for how long fishermen use specific areas in the Gulf, which can improve the management of shrimp populations.

2010 Report (updated impact from 2008 report)

FOCUS AREA: Safe and Sustainable Seafood Supply

GOAL: A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

PERFORMANCE MEASURE(S): Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.

TITLE: Electronic Logbook Program provides fishery managers with effort data

RELEVANCE: Estimates of effort that had historically been used by the regulatory agencies to monitor red snapper bycatch in the shrimping industry have been proven to be inaccurate.

RESPONSE: A vessel tracking system using dedicated Global Positioning System (GPS) transponders was developed and deployed on selected vessels operating in the Gulf. Data from the logbook program, GPS monitoring and observers will be integrated with data obtained from observers to evaluate existing bycatch and fishing mortality estimates.

RESULTS: NOAA Fisheries and state regulatory agencies use direct measures of fishing effort to monitor red snapper bycatch in the shrimping industry.

RECAP: Seventy-four vessels are providing detailed information through the vessel tracking system leading to better and more effective management of the Gulf of Mexico shrimp fishery.

POINT OF CONTACT: David Burrage, daveb@ext.msstate.edu

2010 Report

FOCUS AREA: Safe and Sustainable Seafood Supply

GOAL: A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

PERFORMANCE MEASURE(S): Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.

TITLE: Energy-efficient trawl gear saves fishermen money

RELEVANCE: For Gulf shrimp trawlers, fuel costs are a major operating expense. Individual Gulf shrimp trawlers consume between 50,000-80,000 gallons of diesel per year. Reducing operating expenses through reductions in fuel consumption will improve vessel profitability, thus buoying an industry struggling to compete with imports and high fuel prices.

RESPONSE: In partnership with Texas Sea Grant and the Gulf and South Atlantic Fisheries Foundation, Inc., work continued to promote the use of energy-efficient trawl gear in the Gulf shrimp fishery. We were able to document a 2-gallon-per-hour fuel savings by using Sapphire™ trawl webbing compared to traditional nylon webbing. As a result of this work, 10 other boat owners switched to the new gear.

RESULTS: Fishermen save money in operating expenses.

RECAP: Eleven vessels are saving a conservative estimate of \$45,000 per year (\$30 per day average) in fuel costs.

POINT OF CONTACT: David Burrage, daveb@ext.msstate.edu

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA06OAR4170204**

MASGC Project #M/GOMR-1

Time period: 06/01/06 - 05/31/11

Award Title: Gulf of Mexico Marine Research and Information Needs and Planning.

SMART Objectives:

By 2013, MASGC will partner with 20 federal, state and local programs to fund \$4 million in extramural regional research priorities identified in the Gulf of Mexico Research Plan to address hazard and climate resilience and water-quality issues.

Accomplishments and outcomes from this award:

1. Synthesized input from five workshops that had almost 300 people in attendance and produced 261 high-priority research topics and 251 non-research topics
2. Identified 5 broad research topic areas that emerged as top tier regional priorities. The broad topic areas include:
 - Connectivity of habitats and habitats to resources
 - Ecosystem health indicators
 - Freshwater input and hydrology
 - Sea level change, subsidence, and storm surge
 - Water quality and nutrients
3. Synthesized 17 research priorities that supported the broad topic areas or were highly rated by survey respondents, workshop participants, and others
4. Provided customized research priorities to the six Gulf of Mexico Alliance Priority Issue Teams as they developed their next five year action plan and produced a customized report of sea level rise and climate priorities to support CSCOR's work in the region
5. Formally presented GMRP work at 6 meetings
6. 13 groups are using the GMRP in their strategic planning process and include:
 - Florida Sea Grant College Program
 - Gulf of Mexico Alliance
 - Louisiana Sea Grant College Program
 - Mississippi-Alabama Sea Grant Consortium
 - Mississippi River/Gulf of Mexico Watershed Nutrient Task Force
 - NASA
 - NOAA Center for Sponsored Coastal Ocean Research (CSCOR)
 - NOAA Gulf Coast Services Center
 - Northern Gulf Institute
 - Southeast Aquatic Resource Partnership
 - Southern Association of Marine Laboratories
 - Texas Coastal Coordination Council
 - Texas Sea Grant College Program

7. Project was nominated by two separate groups (NASA and NOAA CSC) for the Gulf Guardian award, however the project did not receive the award
8. Released a draft strategic plan that is available at:
<http://masgc.org/gmrp/report.htm>. The draft plan contains:
 - The plan (16 pages)
 - Appendices
 - a. Planning and Review Council Membership (2 pages)
 - b. Results from the Strategic Plan Analysis (3 pages)
 - c. Gulf of Mexico Research and Information Needs Survey (22 pages)
 - d. Gulf of Mexico Research and Information Needs Survey Results (82 pages)
 - e. Affiliation of Gulf of Mexico Research Plan Workshop Participants and Facilitators (5 pages)
 - f. Gulf of Mexico Research Planning State Workshop Reports (145 pages)
 - g. Synthesis of Non-Research Topics Discussed at Regional Workshops (21 pages)
 - h. Comments Received by Constituents via E-mail (3 pages)
9. The Gulf of Mexico Research Plan was released in September 2009 both electronically and via hardcopy.
 - a. Over 700 people received announcements regarding the GMRP via email and numerous others received announcements via press releases and listservs.
 - b. Y people requested copies of the GMRP and a total of W hardcopies have been disseminated as of March 2010.
10. An additional group (Mobile Bay National Estuary Program) indicated that they will include GMRP priorities in their planning process, which brings the total number of organizations that are directly using the GMRP to 14.
11. The regional research initiative resulted in two regional research projects funded by seven partners (EPA Gulf of Mexico Program, NOAA's Northern Gulf Institute, Texas Sea Grant, Louisiana Sea Grant, Mississippi-Alabama Sea Grant Consortium, Florida Sea Grant). The projects focus on modeling climate change and hazards and understanding takings laws pertaining to sea level rise. These projects address GMRP –identified priorities.
12. The GMRP was presented at:
 - c. Gulf of Mexico National Estuary Programs' regional meeting in Mobile, Alabama.
 - d. Coastal Zone Management with the West Coast Regional Plan (poster)
 - e. National Sea Grant Regional Coordinators meeting (May 2009)
 - f. Invited to III Workshop on Coastal Ecosystems of the Gulf of Mexico and Caribbean Sea June 23~ 26, 2009, Mérida, Yucatan, Mexico (cancelled due to Swine Flu)
13. The four Gulf of Mexico Sea Grant programs cited the GMRP and other regional strengths when they applied for were selected to participate in the EPA National

Ecosystem Services Partnership workshop. Less than 40% of applicants were selected.

14. The four Gulf of Mexico Sea Grant College Programs jointly submitted a NOAA Restoration Center Partnership Application to address regional priorities identified in the GMRP—status pending.

Project Completion Report: No completion reports have been filed during this reporting period.

Project Impacts:

2009 Report

Themes: Infrastructure

Title: Gulf of Mexico Research sponsors implement Sea Grant-funded regional research plan

Statement: The Gulf of Mexico Research Plan (GMRP) was used by 13 state and regional groups to develop their strategic plans. In addition, the GMRP results were used by NASA's Research Opportunities in Space and Earth Sciences program for a \$4 million RFP. NASA personnel indicated the plan saved \$100,000. Similarly, the Northern Gulf Institute incorporated the GMRP priorities into their most recent \$4.5 million RFP. Finally, the GMRP and Gulf of Mexico Alliance priorities were used to develop a \$1.2 million regional climate and resiliency RFP funded by Florida Sea Grant College Program, Louisiana Sea Grant College Program, Mississippi-Alabama Sea Grant Consortium, NOAA Northern Gulf Institute, Texas Sea Grant College Program, USEPA Gulf of Mexico program.

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA07OAR4170510**

MASGC Project #A/O-31, (Program Management Report)

Time period: 07/01/07 - 09/30/11

Award Title: Coastal Storms Program Gulf of Mexico Pilot Cooperative Agreement.

SMART Objectives:

- 1. Annually, beginning in 2011, 100 state and local emergency managers, floodplain managers and other public hazard personnel working in the coastal areas of the five Gulf States will obtain storm information through customized Web portals and social-networking sites.*
- 2. By 2011, 15 coastal communities in Alabama, Mississippi and Louisiana will identify weaknesses in their resilience by completing the Coastal Community Resilience Index.*
- 3. By 2012, two coastal communities in Mississippi or Alabama will incorporate sea level rise data into their comprehensive and/or hazard mitigation plans.*

Accomplishments and outcomes from this award:

1. Pilot tested the Resilience Index in six communities in the project area (MS, AL, and LA) from June 2008-April 2009.
2. Created the GulfStorms website portal with storm information for five states as a resource for the public in the week leading up to Hurricane Gustav. Partnered with the NOAA Regional Team and the Gulf of Mexico Alliance Resilience Team to determine appropriate links to post on the portal.
3. Developed the framework for the StormSmart Coasts Network including approximately 100 pages of information to help coastal decision makers find and share the latest information on how to protect their communities from storms, floods, sea level rise, and climate change.
4. Developed the state of Mississippi pages of the StormSmart Coasts Network. Identified points of contact and gained buy-in from state leads for other state pages (AL, TX, LA, and FL).
5. Created a CSP Advisory Council composed of members across MS, AL, and southeastern LA. Council members provide guidance to the CSP Outreach Coordinator in helping to reach the cooperative agreement objectives.
6. Completed a small grants competition with two categories of funding. Eight projects were selected after rigorous letter of intent and full proposals were reviewed by both peer and external reviewers.
7. Received a NOAA Engagement Grant to expand the functionality of the StormSmart Coasts Network by creating a hazards and resilience social networking site for internal NOAA participants in the Gulf of Mexico.
8. Pilot tested the Resilience Index in ten additional communities in the Gulf region (FL, AL, MS, LA, and TX) from May 2009-February 2010. A total of 16 communities have completed the pilot test. The final version of the Resilience Index can be found here: <http://masgc.org/ri>.

9. Developed the Critical Facilities Tool to compliment the Resilience Index for the states of Mississippi and Alabama. This online visualization tool allows local governments to access the location of their critical infrastructure and facilities as part of the Resilience Index self assessment. Users can print version specific to their municipality or county. (www.csc.noaa.gov/criticalfacilities)
10. Developed the state pages from Florida, Alabama, Mississippi, Louisiana, and Texas on the StormSmart Coasts Network. (<http://stormsmartcoasts.org>) Each Gulf state now has their own customized page with information for coastal decision makers on how to protect their communities from storms, floods, sea level rise, and climate change.
11. Developed StormSmart Connect as a companion to the StormSmart Coasts Network. This is a place for local decision makers and coastal resource managers to connect, communicate, and collaborate using a professional networking interface. Users can create groups, post shared documents, photos, and video, send invitations to events, and post updates to online forums. (<http://stormsmartconnect.org>)
12. Worked with Mississippi and Alabama partners to begin the production of the Homeowners Handbook to Prepare for Natural Hazards. The Mississippi handbook is scheduled for printing in July 2010. The electronic copy of this handbook can be found at: <http://masgc.org/coastalstorms>.
13. Conducted a Social Network Analysis of the Gulf of Mexico Coastal Storms Program (CSP) which consisted of a survey targeted at CSP partners. This was the pre-survey and a post-survey will be conducted after another year of program implementation.
14. Managed eight projects that were awarded funding through the small grants competition. These project reports will be submitted separately. An overview of the projects can be found at: <http://masgc.org/coastalstorms/smallgrants> .
15. Developed, beta tested, and conducted user interviews for NOAA Nexus. This professional networking site was created for internal NOAA participants in the Gulf of Mexico as part of a NOAA Engagement grant. (<http://noaanexus.org>)

Project Completion Report: No completion reports have been filed during this reporting period.

Project Impacts:

2010 Report

FOCUS AREA: Hazard Resilience in Coastal Communities

GOALS: Community capacity to prepare for and respond to hazardous events

PERFORMANCE MEASURE: Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices.

TITLE: StormSmart Connect online networking site connects coastal resource managers and local decision makers

RELEVANCE: Although coastal communities may be in close proximity with one another, they are unaware of how their neighbors are addressing the challenges of sea-level rise and coastal storms.

RESPONSE: The StormSmart Connect site was created as a response to the need for increased collaboration and communication among local decision makers in regards to planning for long-term resilience.

RESULTS: Twelve coastal communities were trained in how to navigate the online networking site. Four of these communities created a group for their municipality to post updated resources for coastal residents. The site is used for sharing information regarding the Community Rating System, for locating the latest news on storm events and policy, and coordination of local outreach events. Communities that usually do not contact one another about issues such as Community Rating System points and requirements are now helping each other to be successful in the program. These communities are sharing notes, documents, participating in forums and advertising information for their residents through the site, which allows for a broader distribution of hazards-related information which can save lives and reduce the insurance rates of homeowners through participation in the program.

RECAP: Coastal communities that previously did not discuss their storm preparation plans are now regularly sharing resources on storm preparation and recovery through a social networking site designed for local decision makers and coastal resource managers.

POINT OF CONTACT: Tracie Sempier, tracie.sempier@usm.edu

FOCUS AREA: Hazard Resilience in Coastal Communities

GOAL: Community capacity to prepare for and respond to hazardous events.

PERFORMANCE MEASURE: Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices.

TITLE: Sea Grant helps coastal communities assess their resilience to future storm events

RELEVANCE: As the number of people moving to the Gulf coast increases, so does the risk of exposure to flooding, hurricanes and other storm-related events. Although experience has shown that more homes and people located in the floodplain equals more exposure and potential for people to be in harm's way, many coastal residents are complacent when asked about their preparation for the coming storm season.

RESPONSE: Recognizing that communities need support and assistance in determining their risk and resilience, the Resilience Index was created as a self-assessment tool to provide community leaders with a simple and inexpensive method of predicting if their community will reach and maintain an acceptable level of functioning and structure after a disaster.

RESULTS: The Resilience Index was completed by 16 coastal communities in Florida, Alabama, Mississippi, Louisiana and Texas. These communities assessed their strengths and vulnerabilities prior to future storm events. Two communities have applied for a grant to address one of the vulnerabilities they identified in the Index.

RECAP: A self-assessment Resilience Index was pilot tested in 16 communities and vulnerabilities to future storms were identified.

POINT OF CONTACT: Tracie Sempier, tracie.sempier@usm.edu

CSP Award NA07OAR4170520 Mini Grant Program Reporting

Closed Projects for NA07OAR4170510

MASGC Project # R/MG/CSP-04:

PI: John Hosey

Title: Faith Community Preparedness and Resilience Project.

Time Period of this project: 05/01/09 – 04/30/10

SMART Objectives:

By 2011, at least 25 Mississippi coastal religious leaders and mental health providers will increase their abilities to help others prepare for and respond to coastal hazards.

By 2012, at least 45,000 Gulf Coast residents will implement best-management practices on storm preparation, natural hazard mitigation, flood prevention and post-disaster recovery.

Accomplishments and outcomes from this project:

1. 2009 Mental Health Summit and Preparedness Health Fair
Provided sessions and educational materials for 320 participants. Coastal Hazards and Disaster Preparedness were highlighted through-out the Summit.
2. Two CISM Classes (Critical Incident Stress Management)
MSCIDTF trained 48 participants in Individual and Groups Crisis Intervention. The participants included mental health clinicians, clergy, first responders and social workers that work for disaster recovery and community services organizations across the coast.
3. Community Disaster Preparedness and Coastal Hazards Education Events
MSCIDTF collaborated with local and state agencies (American Red Cross, Lutheran Episcopal Services of Mississippi, Coastal Family Health, MS Center for Non-Violence and others) to promote community disaster awareness. It is estimated that about 3500 residents received disaster preparedness materials through our efforts in MS coastal communities.
4. Church Disaster Coordinators (CDC)
MSCIDTF provided training for 5 CDC in high risk African American communities. These coordinators were provided basic intervention skills, an introduction to emergency management procedures, and information on preparing their church congregation and area community for coastal hazards.
5. Katrina Interfaith Remembrance - August 2009
MCIDTF Planned and hosted the fourth anniversary remembrance of Hurricane Katrina at the Church of the Redeemer in Biloxi. An estimated 200 people participated in this time of Interfaith prayer, meditation and remembrance.
6. 2009 Katrina Recovery Summit - February, 2009
MCIDTF convened a recovery summit to discuss issues related to Hurricane Katrina recovery and to educate on the importance of preparedness for potential

- hurricanes in the upcoming hurricane season. There were 250 participants.
7. Critical Incident Stress Management Classes (CISM)
MSCIDTF held two CISM classes in 2009 to train local disaster response, clergy and professional counselors in Individual and Groups Crisis Intervention and Peer Group Support. The classes awarded 48 total certificates and offered 26 hours of continuing educational credits for professionals.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to MASGC:

Disaster preparedness education was an essential role of MSCIDTF in fulfilling the requirements for this grant. John Hosey and Alice Graham worked in partnership with faith based organizations, community partners and other non-governmental agencies across the MS Gulf Coast to provide preparedness materials and education for residents regarding coastal hazards. This effort included participation in community events, conferences, local churches and crisis intervention training events hosted by MSCIDTF.

The Mental Health Summit was held on May 20-21 at the MS Gulf Coast Coliseum and Convention Center. The event featured four plenary sessions and 26 breakout sessions. The goals of the Summit were 1) provide up to 13 hours of continuing education for mental health professionals, social workers, nurses and many others who require CEU's for their state licensure. 2) encourage collaboration and networking between participants to identify potential partnerships and assets discovery 3) bring attention to the needs around preparedness for potential coastal hazards. 4) develop new skills and understanding around treating trauma victims.

The Summit saw 325 participants gather for this two day event. Summit participants included mental health clinicians, social workers, clergy, first responders, educators and community leaders from various places across the United States. Jamie Aten, PhD and Sharon Topping, PhD, (co-investigators) presented "Essentials of Faith Community Hazard Preparedness". This session brought awareness to participants on the need to facilitate collaboration between religious leaders and mental health professionals to enhance faith community hazard resiliency. (Please see attached program for complete details and sessions).

The Primary/Mental Health Collaborative is A bi-monthly meeting for sharing information on direct services, projects and research that address primary/mental health needs and to encourage development of partnerships and services that are affordable, accessible, and culturally appropriate. MSCIDTF provided coastal hazard educational and preparedness materials for participants at each of these meetings. Hosey, Aten and Topping presented several presentations that encouraged participants to develop disaster preparedness plans for themselves and for their organizations.

Partnerships developed through this collaborative worked together on several local projects to educate citizens on disaster preparedness. One example of the collaborative effort was a joint effort at the national Crimes Victim Rally held on the Biloxi Town Green on April 18. The fair atmosphere featured 20 booths that distributed various information about community services and education. MSCIDTF distributed over 200 booklets and fliers designed for school age children on disaster preparedness information and another 300 pamphlets to adults. MSCIDTF also participated in partner community

health fairs, email blitz and community related rally's to disseminate disaster preparedness materials as a part of its membership in the Homeland Security's "Get Ready" program.

One priority issue for coastal residents and small business is the need to build or provide retrofit options for resilient building practices. MSCIDTF served on the management team for the MS Coast Resilient Home Building Conference that was held in conjunction with the annual MS Coast Home and Garden Expo at the MS Coast Coliseum and Convention Center on April 18-19, 2010. Though the date of the event fell outside the required reporting period of this report. The work involved in putting this together took place within the specified time frame.

The Conference featured a scaled model of a home built to resilient specification. There was also educational credits awarded to professionals in the home building industry (e.g. architects, city planners and inspectors). More than 2000 people attended the Home and Garden Expo where the scale home was exhibited and 58 professionals earned CEU's by participating in classes held at the event site.

John Hosey, M.Div, Jamie Aten, PhD., and Sharon Topping, PhD presented at the MS Counseling Association's Annual Conference (October 03, 2009) on "The Clergy/Clinician Collaborative: Building Community Care Partnerships. Drs. Jamie Aten. Sharon Topping and Rev. John Hosey are also working on a book that will assist communities of faith to prepare for and respond to the emotional and spiritual effects of disasters and crisis events in their church and community. Several articles will be submitted to professional journals regarding the Clergy/Clinician Collaborative Partnership over the course of the coming months.

In addition to these events, Alice M. Graham, PhD has initiated an effort to develop congregation disaster coordinators in six African American congregations. These participants are learning the basics about disaster preparedness, response and recovery to better assist their members and community. These disaster coordinators were also recommended by their pastors as persons who would be helpful in assisting the pastor in identifying congregants who may have mental health needs. We are also developing relationships with Hispanic and Vietnamese clergy and congregations through attendance at worship services and through providing disaster preparedness information, training for crisis intervention and offering specialized training and retreats for clergy.

John Hosey is also providing leadership on the state and regional level serving as the Emotional and Spiritual Care Committee Chair for the MS Voluntary Organizations Active in Disaster (MSVOAD) and as the Treasurer and Committee Chair for Emotional and Spiritual Care for the South MS VOAD. The SMVOAD membership (28 non-profit disaster response organizations) meets on a monthly basis to collaborate, communicate, coordinate and cooperate around disaster preparedness, response and recovery for the lower six counties of South MS.

Finally, the grant enabled MSCIDTF to conduct two Crisis Intervention classes for community leaders, first responders, mental health professionals and clergy. The classes offered certificates in Individual and Groups Crisis Intervention using the International Critical Incident Stress Foundation (ICISF) model for Critical Incident Stress Management (CISM). The cumulative total of awarded certificates was 48, with up to 26 credits offered for professional development credit.

The following is the Completion report summary of progress that was submitted to NIMS:

Disaster preparedness education was an essential role of MSCIDTF in fulfilling the requirements for this grant. MSIDTF worked in partnership with faith based organizations, community partners and other non-governmental agencies to provide preparedness materials and education for coastal residents regarding coastal hazards. This effort included participation in community events, conferences, local churches and crisis intervention training events hosted by MSCIDTF. Preparedness education was disseminated at the following events:

The Mental Health Summit - 340 participants

The Primary/Mental Health Collaborative - 200

The National Crimes Victim Rally - 250

"Get Ready" - 1500

The MS Coast Resilient Home Building Conference - 4500

Congregation disaster coordinators - 15

Crisis Intervention classes - 85

Other Local organizations and faith groups - 600

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-06:

PI: Emily Sommer

Title: Three Television Programs on Storm Resiliency for Alabama/Mississippi Gulf Coast

Time Period of this project: 06/01/09 – 05/31/10

SMART Objectives:

By 2012, more than 10,000 homeowners will adopt at least two recommendations to minimize structural damage to their home and outbuildings from tropical storms.

By 2012, at least 45,000 Gulf Coast residents will implement best-management practices on storm preparation, natural hazard mitigation, flood prevention and post-disaster recovery.

Accomplishments and outcomes from this project:

1. Met with WKRG and major contributors
2. Wrote scripts and timelines
3. Videoed
4. Edited
5. Aired 3 programs, 7/20/09, 8/10/09, 8/17/09. 96,000 viewers per program
6. Produced and distributed 400+ DVDs
7. Presentations:
 - a. Gulf of Mexico Alliance Community Resilience Team – 8/4/09
 - b. NOAA Coastal Storms Program Annual Meeting – 5/5/10

- c. NOAA Sea Grant Site Review – 6/9/10
8. Nominations:
 - a. Peabody Award
 - b. Media Award – Association of State Flood Plain Managers
9. City of Mobile trains commissions using DVDs – 7/10
10. Alabama Real Estate Commission approved 6-hour continuing education course using DVD

Project Completion Report: A completion report is on file. The accomplishments were used as the summary of progress for this report that was submitted to NIMS

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-02-PD

PI: Kimberlyn Prentice

Title: 2009 Community Hurricane Preparedness Fair.

Time Period of this project: 05/01/09 – 04/30/10

This project is reported in the section for the award NA06OAR4170078 since it was funded as a PD project for that award. [Follow this link to the project report.](#)

Open Research Projects for NA07OAR4170510

MASGC Project # R/MG/CSP-03:

PI: James Fannin

Title: Decision Support to Local Governments in Budget Planning Under Coastal Risk.

Time Period of this project: 05/01/09 – 10/31/10

SMART Objectives:

By 2012, 20 local decision makers will be able to identify best practices and recommendations for improving risk communication in coastal communities based on strengths and weaknesses in the current system and characteristics of specific communities in the coastal population.

Accomplishments and outcomes from this project:

1. Completed financial health assessment of selected Southeast Louisiana parishes including measurements for liquidity, leverage and profitability from audited financial statements of parish governments.
2. Estimated the expected value of losses to selected Southeast Louisiana parish

- governments for emergency operations and storm debris removal based on the probability of a sustained wind tropical event over one year, four years, , 20 years, and 50 years.
3. Evaluated how expected losses over single and multi-year time periods would impact financial health indicators of a selected case study parish (Tangipahoa Parish).

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts:

2010 Report

FOCUS AREA: Hazard Resilient Coastal Communities

GOAL: Community capacity to prepare for and respond to hazardous events.

PERFORMANCE MEASURE: Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices

TITLE: Parish saves \$1.3 million using financial health analysis coupled with storm cost predictions

RELEVANCE: Local governments are typically unaware of how their financial condition has changed after paying the costs of emergency operations and clean-up and debris removal from tropical storm events. Poor financial health can inhibit a local community from investing in infrastructure and resources to grow as well as constrain the community from financially preparing for the next tropical storm event. Measuring the expected cost of future natural disasters helps local government decision makers better identify proper levels of emergency funds and insurance-like tools their community needs to be more financially resilient to the next tropical natural disaster.

RESPONSE: This project measured the financial health of selected Southeast Louisiana parish governments using common accounting financial indicators and compared each community's financial health against accepted financially healthy "rules of thumb" levels before and after Hurricane Katrina. Next, an estimate of the one-, four-, 20-, and 50-year expected costs of a tropical storm and hurricane were estimated for a case study parish (Tangipahoa) and selected Southeast Louisiana parishes. The expected costs used historical cleanup debris removal costs for recent storms combined with parish-level probabilities of sustained winds from a tropical event. Coupling these results allowed researchers and parish decision makers to identify cost saving opportunities.

RESULTS: The results of the analysis were used by Tangipahoa Parish to save \$1.3 million in interest expenses.

RECAP: A \$20,000 project that examined the financial health of parishes and coupled it with probability of potential storm-related costs resulted in a cost savings of \$1.3 million in Tangipahoa Parish. Additional parishes will be provided similar assistance in year two of this project.

POINT OF CONTACT: Matt Fannin, mfannin@agcenter.lsu.edu

MASGC Project # R/MG/CSP-05:

PI: Renee Edwards

Title: Hurricanes, Institutional Procedures, and Information Processing (HIPIP):
Engagement with Decision-Makers and Coastal Residents

Time Period of this project: 06/01/09 – 11/30/10

SMART Objectives:

By 2012, 20 local decision makers will be able to identify best practices and recommendations for improving risk communication in coastal communities based on strengths and weaknesses in the current system and characteristics of specific communities in the coastal population.

Accomplishments and outcomes from this project:

1. Interviewed 25 government officials, media representatives, and scientists about hurricane-related communication in order to identify difficulties and recommendations for improving it.
2. Surveyed 514 residents in Southeastern Louisiana about knowledge, decision-making, information sources, confidence, and experiences concerning hurricanes.
3. Found that 80% of residents have a “well-developed plan for hurricane season” and an evacuation plan.
4. Gulf Coast residents scored 84%, “B,” on a hurricane knowledge test
5. Greater knowledge is associated with less willingness to evacuate for Category 1 and 3 storms.
6. 41% are familiar with Louisiana’s “Get a Game Plan” campaign.
7. Television and radio are judged the most useful sources of hurricane-related information followed (in order) by the internet, family members, friends, and newspapers.
8. Anxiety about hurricanes is associated with a greater likelihood of evacuating for Category 1, 3, and 5 storms, and when mandatory orders to evacuate exist.
9. Evacuating for a storm in the past is positively related to planning for a hurricane and willingness to evacuate for hurricanes.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-07:

PI: Wei Wu

Title: The impact of accelerated sea level rise on tidal marshes and storm surge.

Time Period of this project: 06/01/09 – 12/31/10

SMART Objectives:

By 2011, one integrated simulation model of SLAMM and ADCIRC in the Pascagoula River Basin to predict salt-marsh distribution and areal extent under accelerated sea-level rise will be used by two city governments and the Mississippi Department of Marine Resources for climate planning.

Accomplishments and outcomes from this project:

1. Geo-referenced 1957 black and white high-resolution aerial photograph. The accuracy is within one pixel.
2. Applied unsupervised, supervised and expert-knowledge classification approaches on 2006 Quickbird image to derive the map of different types of tidal marshes. The overall accuracy is 66.15%.
3. Took sediment samples at intertidal freshwater marsh and brackish marsh in the lower Pascagoula River Basin;
4. Ran radioisotope analysis on the sediment samples at the tidal freshwater marsh and determined its vertical accretion rates as 4.2 ± 1.3 mm/year by fallout radionuclides (^{210}Pb);
5. Ran the most updated SLAMM model (version 6) using the local vertical accretion rates derived and most accurate elevation data from LiDAR to predict the spatial distribution of tidal marshes under climate change and accelerated sea level rise by 2100. The areas of the salt marshes would increase, while the areas of the brackish marshes and the tidal freshwater marshes would decrease.
6. Studied the impact of spatial resolutions of digital elevation data on the predictions of spatial distribution of tidal marshes by applying the most updated SLAMM model. The use of higher resolution elevation data resulted in smaller areas of tidal freshwater marsh and brackish marsh compared to lower resolution elevation data in 2100.
7. Submitted the ADCIRC model to Sequoia, a supercomputer, to simulate the storm surge under the current scenario of spatial distribution of tidal marshes.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-08:

PI: Matthew Bethel

Title: Development of New Geospatial Technology/Traditional Ecological Knowledge Derived Information Tools for the Restoration of Ecosystem-Dependent Livelihood Bases of Coastal Communities.

Time Period of this project: 06/01/09 – 08/31/10

Accomplishments and outcomes from this project:

1. Constructed a detailed land change analysis for the study area, and developed a historical land change mapping methodology for coastal areas using a variety of high-resolution remotely sensed datasets
2. Developed a methodology for producing traditional ecological knowledge (TEK) based mapping products, and demonstrated a means by which such qualitative information can be converted into mapping products that are more suitable for inclusion into the existing restoration decision-support system.
3. Applied methods of traditional ecological knowledge (TEK) and geospatial dataset integration
4. Developed associated marsh health variability and community-based observed change and restoration priority maps

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-09:

PI: Beth Ousley

Title: Mitigating Coastal Hazards Risks through Community Education/Outreach to Facilitate Participation in NFIP's Community Rating System.

Time Period of this project: 07/01/09 – 12/31/10

SMART Objectives:

By June 2012, three communities will become more disaster resilient by implementing the National Flood Insurance Program's Community Rating System.

Accomplishments and outcomes from this project:

1. One of the seven targeted jurisdictions, Stone County, has submitted an application to participate in the Community Rating System of the National Flood Insurance Program.
2. Strong relationships have been established with the members of the CHOST group and the floodplain management community within the State.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts:

2010 Report

FOCUS AREA: Hazard Resilience in Coastal Communities

GOAL: Community capacity to prepare for and respond to hazardous events

PERFORMANCE MEASURE: Number of coastal communities and citizens who adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events.

TITLE: South Mississippi is building hazard-resilient communities

RELEVANCE: South Mississippi often is exposed to extensive storm systems resulting in flooding and other damage to personal and public property, as well as other natural and manmade hazards. By improving the planning, response and recovery policies and procedures for a range of potential hazards, communities can develop more hazard resilience, utilize resources more effectively and efficiently and return to a normal way of life more quickly following a disaster.

RESPONSE: The Southern Mississippi Planning and Development District is working with local officials to increase knowledge and awareness of best management practices for hazard resilience and the benefits of implementing the specific activities of the Community Rating System. The Coastal Hazards Outreach Strategy Team is an ideal strategic planning team to help with the implementation of Community Rating System (CRS) activities.

RESULTS: Since this project was initiated, two coastal Mississippi counties (Stone and Hancock) have applied for the CRS program, and one additional county (Jackson) is considering an application to participate. One of these three counties is among the jurisdictions targeted for the Sea Grant project. Clearly, understanding of the benefits of CRS participation has been enhanced through outreach and education.

RECAP: Through education and outreach, the Southern Mississippi Planning and Development District is working with jurisdictional officials, floodplain managers, elected officials and the general public to heighten awareness of the need to become more hazard-resilient and to assist officials in applying to or enhancing their participation in the CRS program and its recommended activities.

POINT OF CONTACT: Beth Ousley, bousley@smpdd.com

MASGC Project # R/GOMR-04:

PI: Charlene LeBleu

Title: Enhancement of Bioretention to Promote Civic Hydrology and Sustainability for Coastal Cities through Innovative Planning, Design, and Engineering of Stormwater Management, Utilization and Control.

Time Period of this project: 07/01/09 – 06/30/10

Accomplishments and outcomes from this project:

1. verification of existing conditions
Existing conditions of project area urban space and stormwater runoff were verified by measurements and calculations.
2. Community charrette
A public design Charrette to be conducted for the purpose of receiving ideas and suggestions to inform development of leading edge concepts accommodating Downtown Mobile's challenges with stormwater as well as the City's opportunity for realization of a "green streets" initiative.
3. case study analysis
The project team researched current case studies of municipalities that incorporate "green streets" into their stormwater regulations. Policies and designs were noted.

4. site analysis
Site examinations included location & maps, neighborhood context, size and zoning, legal information, natural physical features, man made features/ infrastructure, historic/ human/ cultural, circulation of streets, roads, alleys, sidewalks, and plazas, utilities, sensory and climate.
5. Design test
Design test included measurements of spatial proportions, human scale and material applications.
6. scenario development
Graduate student studio developed 14 different scenarios for the project site
7. concept plans
Graduate student studio developed 14 different concept plan

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-11:

PI: Rhonda Price

Title: Coastal Community Resilience Team Development of a State Specific Homeowner's Handbook to Prepare for National Hazards.

Time Period of this project: 10/01/09 – 09/30/10

SMART Objectives:

By 2012, at least 45,000 Gulf Coast residents will implement best-management practices on storm preparation, natural hazard mitigation, flood prevention and post-disaster recovery.

Accomplishments and outcomes from this project:

1. Technical partners and Review Team was formed for both MS and AL
2. Technical Writer was hired for MS
3. MS Home Owner's Handbook went to print on July 5, 2010

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-12:

PI: Jarryl B. Ritchie

Title: Enhancing the Coastal IQ Survey: Measuring Knowledge and Attitudes of Gulf Coast Residents.

Time Period of this project: 10/01/09 – 09/30/10

SMART Objectives:

By 2012, 20 local decision makers will be able to identify best practices and recommendations for improving risk communication in coastal communities based on strengths and weaknesses in the current system and characteristics of specific communities in the coastal population.

Accomplishments and outcomes from this project:

No accomplishments have been filed during this reporting period.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA07OAR4170511**

MASGC Project # R/MG/BR-01M

Time period: 10/01/07 - 09/30/10

Award Title: Mini-Grant Program Leading to Bycatch Reduction of Bottlenose Dolphins in the North Central Gulf of Mexico.

SMART Objectives:

By 2011, five charter boat captains will adopt improved mitigation strategies leading to the reduction of fishery interactions with bottlenose dolphins.

By 2012, 15 charter boat captains and 1,000 private fishermen will adopt improved fish handling techniques to improve survival of regulatory discards of red snapper and other recreationally important species.

Accomplishments and outcomes from this award:

2. Developed partnerships in the Destin, Florida and Orange Beach, Alabama areas to foster education and outreach on issues regarding dolphin interactions with recreational fishing.
3. Established a presence in the marine mammal stranding network and began to develop a strong volunteer team.
4. Conducted interviews with for-hire fishing boat captains to develop a baseline estimate of the extent of dolphin-interaction problems, and established a means of gathering incidence reports.
5. Conducted first-hand observations of four Gulf Coast fishing piers to ascertain the frequency of dolphin interactions and associated factors.
6. Determined that fishing interactions at the active fishing piers occurred on 18% of days.
7. Observed 19 sport fishing trips to offshore reefs and determined the frequency of dolphin interactions for this limited sample was 16%.
8. Determined that the dolphin depredation rate of hooked fish at all observed offshore fishing spots was 9% based on observations at 100 reef fishing spots during the project performance period up to January 31, 2009.
9. Conducted coastal photo-identification surveys to develop a sighting history of local dolphins; determined that most dolphins seen at the Gulf fishing pier in Fort Walton Beach, FL are also known residents of the Destin East Pass area.
10. Discovered that some dolphins venture along the coastline and frequent the fishing pier in Pensacola, FL as well the Fort Walton Beach pier, a distance of 53 km.
11. Updated findings: observed dolphin interactions on 17 of 52 deep-sea trips (34%) with the majority involving scavenging of discards; saw fishing interactions at fishing piers on 14 of 81 separate visits (~17%).
12. Determined that dolphins depredated hooked fish during deep-sea fishing on 7.7% of observations at 272 reef fishing spots, and scavenging occurred at 13.2% of spots.

13. Continued coastal photo-identification surveys to identify resident dolphins: found that many dolphins move regularly between Destin and Pensacola and make visits to the fishing piers – only a few dolphins around the piers engage in depredation of catch.
14. Have not found evidence that fishing interactions are a common cause of death of beach-cast stranded dolphins in this region.
15. Photos of dolphins around fishing boats suggest that many animals have had encounters with fishing lines, evidenced by linear scars on the bodies and amputated dorsal fin tips.

Project Impacts: None for this reporting period

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA09OAR4170334**

MASGC Project # E/O-77-Knauss

Time period: 02/01/09 - 01/31/10

Award Title: Dean John A. Knauss Marine Policy Fellowship Program - (2009) Melissa Pratt-Zossoungbo

Project complete. The Knauss fellow, Melissa Pratt-Zossoungbo submitted the final questionnaire.

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA10OAR4170022**

MASGC Project # E/O-78-Knauss

Time period: 02/01/10 - 01/31/11

Award Title: Dean John A. Knauss Marine Policy Fellowship Program - (2010) Anne Marie LeBlanc Eich

Project in progress. Anne Marie is currently working on her fellowship. No reports have been filed.

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA11OAR417XXXX (NO AWARD NUMBER YET)**

MASGC Project # E/O-80-Knauss

Time period: 02/01/11 - 01/31/12

Award Title: Dean John A. Knauss Marine Policy Fellowship Program - (2011) Andrew Thomas Coleman.

Andrew has not started her project yet. He is scheduled to start February 2011.

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA08SEC4690053**

MASGC Project # E/O-76

Time period: 1/01/09 - 12/31/11

Award Title: B-WET: Shifting Baselines: Watershed Connections to Landscape Changes.

This project is counted as leveraged funds. There is no project page in NIMS to report Accomplishments and Progress, but Metrics, Impacts and Performance Measures are counted for this project.

SMART Objectives:

By 2013, more than 1,000 community action group members will apply the concept of shifting baselines in their role as advocates of habitat restoration and sustainable fishing.

Accomplishments and outcomes from this award:

1. Realized recruiting difficulties beyond initial expectations.
2. Identified partners in state departments of education and educational consulting organizations with whom to continue developing partnerships between project staff and school superintendents.
3. Confirmed resources to be used in teacher training.
4. Reviewed oral history dvd to be used in teacher training.
5. Recruited two seventh grade science teachers and school teams.
6. Confirmed Advisory Board membership and planned teleconference meeting for February 2010.
7. Planned and scheduled initial workshop for two confirmed teams for March 2010.
8. Scheduled Shifting Baselines Institute June 28-July 1, 2009.

Project Impacts: None for this reporting period

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA10NMF4630080**

MASGC Project # M/RP-1

Time period: 9/01/10 - 08/31/14

Award Title: Enhancing Community-based Habitat Restoration in the Gulf of Mexico through Science and Assessment.

This project is counted as leveraged funds. There is no project page in NIMS to report Accomplishments and Progress, but Metrics, Impacts and Performance Measures are counted for this project.

This project is new. No reports have been filed.

There will be a management report and sub-award reports for this project.

Omnibus Award

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA06OAR4170078**

Time period: 02/01/06 - 08/31/11

Award Title: 2006-2011 Omnibus Program / Mississippi-Alabama Sea Grant Consortium.

Projects:

Ongoing Core Education and Outreach Projects for NA06OAR4170078

MASGC Project # ED-12 (08-09):

PI: Sharon Walker

Title: Educational Efforts at the J.L. Scott Marine Education Center, the Dauphin Island Sea Lab, and the Environmental Studies Center.

Time Period of this project: 2/1/04 – 7/31/10

SMART Objectives:

- 1. By 2013, at least 40,000 young and adult learners will benefit from their educators' increased content knowledge in the four focus areas, and 180 scientists will gain an enhanced understanding of how children learn through workshops and institutes that emphasize the focus areas.*
- 2. During 2010-2013, at least 150 educators who attend content knowledge workshops will teach content derived from Sea Grant's focus areas.*
- 3. During 2010-2013, approximately 50,000 pages will be downloaded from the COSEE:CGOM Web site, and 20 revised and/or new lesson plans relevant to the four focus areas will be placed on the site annually*
- 4. During 2010-2013, pre-college students will enhance their environmental literacy while participating in inquiry-based educational programs and field trips in the three MASGC Informal Education Centers, and participation in the programs will increase by 12 additional groups annually from a 2008 baseline of 268 groups (61-MEC, 102-ESC, and 105-DISL).*
- 5. During 2010-2013, public visitation will increase by 300 guests annually at the three MASGC Informal Education Centers, with a 2008 baseline of approximately 4,000 at the MEC, 71,000 at the DISL, and 5,000 at the ESC.*
- 6. From 2010 through 2013, one hundred and fifty additional underserved and underrepresented students and teachers will participate in all Sea Grant educational activities/programs, going from a baseline of 400 to 550.*

7. *Three external (non-NOAA) and two internal (NOAA) new education collaborations will be developed collectively during 2010 through 2013 by the three MASGC Informal Education Centers.*

Accomplishments and outcomes from this project (2009 only):

Environmental Studies Center Component

1. One-hundred twenty-four (124) educators were involved in professional development in corporation with the Alabama Department of Conservation and Natural Resources, Auburn University Marine Education and Research Center, Mobile Area Water and Sewer Service, Mobile County Public Schools Technology Department, and Week's Bay National Estuarine Research Reserve.
2. Two-hundred nineteen (219) structured, field-trip programs involving a total of 17,375 precollege students were conducted, of which approximately 55% were from underserved and underrepresented populations.
3. Evaluation data for Project SEA ICE indicate that the two-tailed t-test for pre- and posttests was significant at the 0.05 level of confidence.
4. Total visitation of 25,886 by all stake holders was documented for this granting period.
5. Three scientists were engaged in the PD programs for teachers and/or the structured field trips for precollege students.
6. ESC public and school outreach efforts included two open house days, two astronomy programs, and classroom visitations. A total of 5,840 participants were involved in these events.
7. Science Fairs: The ESC organized and conducted the 2009 Mobile County Public Schools District Science Fair, which involved 162 middle and high school students.
8. Two presentations for the public were conducted during the report period.

Marine Education Center Component

9. One hundred thirty-five educators were involved in PD in MS via the COSEE:CGOM Online Institute (July-21 participants); the GLOBE Workshop (July-23 participants); NOAA-Ocean Exploration (October-8 participants); NOAA-Office of Exploration (OE) and Formal and Informal Environmental Education (FIEE) (June-25 participants); COSEE:CGOM Marine Technology Society (October-19 participants); and COSEE:CGOM/Southern Association of Marine Educators (SAME) (November-39 participants). It should be noted the GLOBE, OE, and FIEE Workshops were implemented by Dr. Shelia Brown and did involve MASGC funding.
10. Twenty-four structured field trips and/or Sea Camp programs were conducted, involving a total of 1,524 precollege students.
11. Evaluation data for the 12 of the 14 MEC-Coastal Science Camps (CSI) were significant at the 0.05 level of confidence; two CSI groups left early due to weather and did not take the posttests. All pre- and posttests for informal and formal educators were at the 0.01 or 0.05 levels of confidence.
12. Total visitation of 6,990 by all audiences was documented as attending the MEC during this granting period.

13. Nine scientists and/or educators were engaged in PD programs for educators (formal and informal).
14. The MEC was involved in the following festivals: Peter Anderson (2x), Celebrate the Gulf, Earth Day, and the Wooden Boat Show, involving 14,100 members of the public.
15. Science Fair-Region VI involved 534 (419 elementary and 115 secondary) students (not counted in 5B or 6B), from Harrison, Jackson, Hancock, George, and Stone Counties.
16. Sixteen presentations were conducted during this grant period by Drs. Walker (9) and/or Kastler (7). One publication was prepared by Dr. Jessica Kastler and accepted by Science Activities: Classroom Projects and Curriculum Ideas.
17. The NOSB—Hurricane Bowl was implemented in February at the GCRL-MEC in Ocean Springs. Fifteen teams, representing 11 different high schools and four states (MS, AL, LA, and FL). Long Beach High School—Team A from Long Beach, MS won first place. These students advanced to the national competition finals, conducted at the Smithsonian Institution—National Museum of Natural History-Sant Ocean Hall in April 25-27, 2009 in Washington, D.C.. Commeaux High School from Lafayette, LA won the Sportsmanship Award.
18. The GCRL and its Marine Education Center (MEC) as a Coastal Ecosystem Learning Center (CELC) participated in a “Distance Learning,” National Ocean Policy Listening Forum in Ocean Springs on October 10, 2009 with 37 attendees. The primary facility from which this Listening Forum was “down-linked” was the Aquarium of the Americas in New Orleans, LA.

Dauphin Island Sea Lab component

19. A total of 126 formal and informal educators were involved in 6 PD workshops held at DISL during the grant period (The Delta, Sharks and Rays, COSEE:CGOM, Marine Applications of Science and Technology (2 sessions), Coastal Connections, Learning Ocean Science through Ocean Exploration). Of these 41 received graduate credit through the University of West Alabama. Approximately 400 CEUs were awarded.
20. The 6 PD opportunities included participation by 24 research scientists.
21. Evaluation data for PD workshops indicated a significant increase in content knowledge (paired t-test: $p < 0.0001$, $n = 99$, 2 tailed).
22. A total of 225 field trip classes involving 8660 K-12 students were conducted during the school year spanning this grant period. Additionally, 239 school-age children participated in DISL-DHP’s summer programs and high school class.
23. Pre and post-test assessments indicated a significant increase in content knowledge by visiting students (paired t-test: $p < 0.0001$, $n > 1000$, 2 tailed test).
24. Total visitation for the Estuarium during this grant period was 69,424. Estuarium-based field trip programs and boardwalk talks for the public reached an additional 255 individuals over 14 separate events.
25. DISL’s traveling marine science classroom, the BayMobile traveled to 54 schools and 27 unique events reaching and estimated 13,894 students and members of the public. Outreach events included festivals such as Earth Day (2 separate locations), Ocean Commotion, Delta Woods and Waters, Kids Day in Bienville,

- Bellingrath Gardens' Kids Cruise, events at libraries, and DISL's annual open house, Discovery Day.
26. DISL-DHP staff members participated as judges in local, regional and Alabama State Science Fair. Additionally, staff served as a judge in Baldwin County's Coastal Kids Quiz. Sea Grant funds also supported attendance by one student in DISL-DHP's summer high school class in marine science.
 27. Six presentations were given by DISL-DHP staff at regional and national meetings (NMEA, SAME, NSTA, ASTA, NGI).
 28. In conjunction with other Gulf CELCs and using a new video-conferencing center, DISL's Estuarium, a Coastal Ecosystem Learning Center (CELC) hosted a local forum for participation in the National Ocean Policy Listening Session held under the direction of the EPA's Gulf of Mexico Program. Additionally, DISL-DHP participated as a learning site in the 'kick-off' day for Alabama's distance learning program, ACCESS, hosting 16 students on site and reaching approximately 125 students at remote sites.

Project Completion Report: No completion reports have been filed during this reporting period. This project continues on NOAA Award NA10OAR4170078, MASGC Project Number E/O-79

Project Impacts: None for this reporting period.

MASGC Project # A/L-4:

PI: Stephanie Showalter

Title: National Sea Grant Law Center.

Time Period of this project: 9/1/06 – 1/31/10

Accomplishments and outcomes from this project:

1. Ran successful national grant competition and funded eleven high-quality legal research and outreach projects. Funded projects are ongoing and those outcomes and accomplishments will be detailed in the completion report.
2. Successfully launched new scholarly publication, The Sea Grant Law and Policy Journal and hosted the Journal's first annual symposium. The March 2008 symposium and subsequent June 2008 Journal issue focused on Coastal Resiliency. 27 people, including speakers, attended the March symposium.
3. Published four issues of The SandBar, the Law Center's quarterly legal newsletter, thereby increasing knowledge and awareness of ocean and coastal legal issues around the country.
4. Published two issues of The Sea Grant Law and Policy Digest.
5. Provided 156 subscribers of the Ocean and Coastal Case Alert with monthly email alerts (12 total) containing summaries and links to new ocean and coastal law cases.
6. Eleven organizations (7 Sea Grant programs, 1 state agency, 3 non-profit organizations) received tailored legal research (upon request) on a variety of topics including aquaculture, fisheries management, and local government zoning authority through the Law Center's Advisory Service.
7. Published and distributed Volunteer Liability for use by beach clean-up coordinators and coastal managers when organizing events utilizing volunteers.
8. Published and distributed Facing Uncertainty: Local Governments and the Precautionary Principle, increasing understanding of the authority of local governments to incorporate the precautionary principle into their decision-making processes.
9. Ran successful mini-grant competition and funded seven high-quality legal research and outreach projects, including a unique project with Maine Sea Grant which led to the award of four additional mini-grants.
10. Hosted the second annual Sea Grant Law and Policy Journal Symposium in March 2009. The symposium and subsequent June 2009 Journal issue focused on Water Quantity. 22 registrants and 7 speakers attended 5.5 hours of presentations on local, state, and regional responses to water quantity issues across the country.
11. Published four issues of The SandBar, the Law Center's quarterly legal newsletter, thereby increasing knowledge and awareness of ocean and coastal legal issues around the country.
12. Published two issues of The Sea Grant Law and Policy Digest.
13. Provided 211 subscribers of the Ocean and Coastal Case Alert with monthly email alerts (12 total) containing summaries and links to new ocean and coastal law cases.
14. Ten organizations (5 Sea Grant programs, 3 federal agencies, 2 non-profit

organizations) received tailored legal research (upon request) on a variety of topics through the Law Center's Advisory Service.

15. Published and distributed Offshore Renewable Energy: A Regulatory Primer to provide Sea Grant extension agents and coastal managers with an introduction to the major federal laws and regulations governing renewable energy development offshore and coastal state authority under those laws.

Project Completion Report: No completion reports have been filed during this reporting period.

Project Impacts:

2008 Report

Themes: Invasive Species, Infrastructure

Title: Research and Outreach on Ballast Water Regulatory Regime

Statement: The Law Center's white paper entitled Michigan's New Ballast Water Regime: Navigating the Treacherous Waters of States' Rights, Federal Preemption, and International Commerce has had immediate impact in the Great Lakes shipping community. The white paper was widely distributed in the region prompting numerous media articles and presentations by Minnesota Sea Grant, the requesting organization. Without the white paper, each interested party (state and federal agencies, businesses, non-profit organizations, etc.) would have been forced to compile the legal information and policy analysis on their own. Thousands of dollars, both public and private, and hundreds of hours were saved.

2008 Report

Themes: Ecosystems and Habitats, Infrastructure

Title: Legal Research on Proposed Hawaiian Bounty Program

Statement: The Hawaii Department of Business, Economic Development, and Tourism sought information about the contract and liability issues surrounding the development of a reward program for recovery of derelict fishing gear. The Law Center concluded that the liability concerns were misplaced as the state should be immune from most suits and the reward program would not result in contractual relationships. According to the requesting individual, our research "helped dispel what seemed to have been 'an urban myth.' This myth was a roadblock to implementing a major marine debris retrieval program." The agency expects to receive funding in 2008 to finally implement the reward program.

2008 Report

Themes: Fisheries, Infrastructure

Title: Wild American Shrimp Lobbying Request, Infrastructure

Statement: Wild American Shrimp, Inc. requested information on lobbying restrictions and 501(c)(3) organizations and recipients of federal funds after a few members of the Board of Directors raised concerns regarding conflicts of interest. The Law Center wrote a summary of the restrictions and provided some IRS guidance on individual lobbying activities. The research dispelled the concerns of those members and stopped them from removing the members with perceived conflicts from the Board.

2009 Report

Themes: Infrastructure, Marine and Aquatic Science Literacy, Digital Oceans

Title: Legal research included in congressional ICOOS Act

Statement: In June 2005, the Law Center prepared an advisory request memo for Ocean.US regarding tort liability issues associated with development of the U.S. Integrated Ocean Observing System (IOOS). Later that year, the Law Center prepared a follow-up memo regarding federal representation on the boards of the IOOS Regional Associations (RAs). These memos analyzed the legal basis for the concern of Ocean.US and others about the inability of agency personnel to be members of formal IOOS decision-making bodies and the potential liability of employees of RA if they were not considered federal employees. In 2009, Congress passed the ICOOS Act. The act contained an immunity provision for employees of RA and authorized the participation of federal employees in RAs. The Law Center's research contributed to the inclusion of that language in the final bill by confirming the importance of such language and providing the bill's supporters with much-needed written analysis.

2009 Report

Themes: Fisheries, Ecosystem and Habitat, Coastal Communities and Economies, Marine and Aquatic Science Literacy

Title: Legal research results in formation of new marine reserve/protected area

Statement: Through the 2007 Grant Competition, the Law Center funded an investigation into whether Port Orford, Oregon could develop a community-based fishery management system. The Project Team recommended four options the community could pursue, including nominating two areas off Port Orford for inclusion in Oregon's proposed Marine Reserve network. On September 28, 2008, the project team submitted a local proposal for a marine reserve/marine protected area, the Redfish Rocks Research Reserve, under Oregon's statewide marine reserve planning process. The Oregon Ocean Policy Advisory Council recommended that Redfish Rocks move forward as a pilot marine reserve. Governor Theodore Kulongoski's 2009-2011 recommended budget includes funds to support initial implementation of Redfish Rocks.

MASGC Project # A/O-1:

PI: David Burrage

Title: Mississippi-Alabama Sea Grant Outreach Program.

Time Period of this project: 2/1/06 – 1/31/10

SMART Objectives:

1. After participating in Legal Program Continuing Legal Education short courses on wetlands during 2010-2013, 15 of 60 attendees will apply their new knowledge of wetland ecosystems, the regulatory framework for those ecosystems and innovative policies to improve management decisions.

1. By 2013, 200 additional residents will achieve Mississippi Master Naturalist certification by the Mississippi State University Extension Service. The Master Naturalists will contribute 4,000 volunteer hours. They will promote environmental stewardship within their community through educational activities, projects, and demonstrations. A similar program will be initiated in Alabama.

2. By 2013, at least 10 nature tour operators will adopt sustainable viewing practices and promote stewardship of healthy ecosystems on the Alabama and Mississippi Gulf Coast.

3. Annually between years 2010-2013, at least 10,000 tourists to Alabama's Gulf coast will be educated by nature tour operators who participate in nature tourism workshops about the species and habitats of the Northern Gulf of Mexico and their role in providing clean air and water, safe food and storm resilience.

1. By 2013, the Mississippi Coastal Restoration and Habitat Committee will enhance coastal restoration efforts through the sharing of knowledge regarding suitable project locations and alternative restoration techniques. Twenty-five acres of priority habitats will be restored.

2. By 2013, over 10,000 linear feet of shoreline on public and private land in Mississippi and Alabama will be protected using alternative erosion control strategies.

3. By 2013, 20,000 linear feet of stream banks on degraded waterways in Mississippi and Alabama will be restored to increase storm buffering capacity and ecosystem services. Stream restoration training will be given to 20 county planners and 50 natural resources managers.

4. By 2013, ten homeowners will utilize living shoreline techniques to control erosion on their property, protecting a total of 30 acres of shoreline.

6. By 2012, the number of oyster gardeners in Alabama will increase from 30 to 45 and annual production will be 10,000 oysters.

7. By 2013, at least 70 property owners participating in water quality programming will adopt at least one new best management practice in order to conserve water and protect water quality as determined by three month follow-up surveys.

1. By 2012, the state of Alabama will adopt two management techniques and/or incentive programs to protect working waterfront access for businesses, as recommended by the Alabama Waterfront Access Study Committee.

3. By 2011, three tools identified on the "Accessing the Alabama and Mississippi Coast" website, which provides just-in-time educational information to stakeholders regarding coastal access options, will be adopted by local governments, private landowners, or coastal user.

1. By 2013, a streamlined permitting process for homeowners who choose a more sustainable shoreline protection alternative structure will be created. Homeowners will be aware that all projects are site-specific and that living shorelines might not be the best erosion control alternative based on economics, ecological sustainability, or site suitability.

2. By 2011, at least five marinas in Alabama and Mississippi will meet established best management practices necessary to join the Clean Marina program.

1. By 2011, at least 50 area decision makers will become familiar with smart growth practices outlined by the State of Alabama's Non-point Education for Municipal Officials (NEMO) program guidelines. By the end of NEMO workshops, 40 attendees will have increased their knowledge of nonpoint source pollution issues and smart growth practices as measured by pre/post testing.

1. By 2013, two start-up nature tourism businesses will be created in coastal Alabama or Mississippi through technical support and training in science and business.

2. Four existing nature tourism businesses will each increase their profitability by \$2,500 annually during the 2010-2013 time frames due to Sea Grant technical support.

3. By 2013, a MASGC-supported reporting system will allow municipalities and counties on the Alabama and Mississippi Gulf Coasts to annually track the economic impact of nature tourism.

1. By 2012, three bait dealers in Mississippi and/or Alabama will report an increase of 100 shrimp per delivery surviving to be sold live.

1. Shrimpers in Mississippi and Alabama will save \$100,000 in operating costs during the 2010-2013 time frame through 1) the use of fuel-saving gear, 2) better use of BRDs and TEDs, 3) more efficient use of catch preservatives, and 4) increased knowledge of and compliance with state and federal fishery management regulations.

1. Annually during 2010-2013, employees from 15 seafood processing plants will become Hazard Analysis Critical Control Point (HACCP) certified leading to a savings of \$1,000 per plant.

2. By 2013, 300 new and existing seafood processing plant employees will improve their knowledge, skills and abilities about sanitation control procedures.

1. During 2010-2013, more than 3,000 constituents will each incorporate/adopt at least five new fishing techniques or management guidelines in their operations.

1. By 2013, 5,000 people will access information through MASGC outreach and education programs on seafood nutrition and sustainable fishing practices, and 250 of them will apply the information to their seafood purchases.

2. By 2013, four city or county attorneys in Mississippi and/or Alabama will have completed a disaster audit to improve coastal hazard resiliency.

3. After participating in Legal Program Continuing Legal Education short courses on flood insurance during 2010-2013, 13 of 60 attendees will apply their new knowledge of laws and regulations governing coastal floodplain development, developing case law and innovative policies to improve coastal resiliency.

2. By 2012, two new scholastic aquaculture/aquascience programs will be initiated in middle or high schools in Alabama and/or Mississippi, which will report 10 participating students continuing their education beyond their senior year.

8. *By 2013, over 100,000 Mississippi and Alabama residents will increase their understanding of coastal and marine resource issues. As a result, 25,000 will adopt at least one new practice leading to improved stewardship of the coastal environment.*

Accomplishments and outcomes from this project (2009 Only):

1. Seventeen new Master Naturalists received training. Four of the 2009 class and 10 more members of the 2008 class were certified in 2009. 910 volunteer hours of service were provided reaching more than 4,100 clients. (SMART goal: By 2013, 200 additional residents will achieve Mississippi Master Naturalist certification by the Mississippi State University Extension Service. The Master Naturalists will contribute 4,000 volunteer hours. They will promote environmental stewardship within their community through educational activities, projects, and demonstrations. A similar program will be initiated in Alabama.)
2. During 2009, over 100 dockside demonstrations were conducted to show fishermen how to comply with federal and state fishery management regulations while minimizing production losses and downtime. In addition, there were many office visits by fishermen who needed help to correctly fill out the new federal fisheries reporting forms which are now required in several Gulf of Mexico fisheries. (SMART goals: Shrimpers in Mississippi and Alabama will save \$100,000 in operating costs during the 2010-2013 time frame through 1) the use of fuel-saving gear, 2) better use of BRDs and TEDs, 3) more efficient use of catch preservatives, and 4) increased knowledge of and compliance with state and federal fishery management regulations. . During 2010-2013, more than 3,000 constituents will each incorporate/adopt at least five new fishing techniques or management guidelines in their operations.
3. 563 subscribers received information on recent court cases and legal developments in the Gulf of Mexico through the four issues of Water Log, the legal newsletter of the Mississippi-Alabama Sea Grant Consortium, produced by the Mississippi-Alabama Sea Grant Legal Program.
4. Nine local government attorneys received information on preparing for emergencies at Mississippi-Alabama Sea Grant Legal Program's "Are Your Ready?: What Local Government Lawyers need to know about Emergency Preparedness." Continuing Legal Education Course (June 26, 2009). (SMART goal: By 2013, four city or county attorneys in Mississippi and/or Alabama will have completed a disaster audit to improve coastal hazard resiliency.)
5. On October 30, 2009, the Mississippi-Alabama Sea Grant Legal Program hosted a Continuing Legal Education seminar on Post-Katrina recovery legal issues. Twenty-six registrants and six speakers participated. Attorneys received 6.0 continuing legal education credits, including ethics, for attending. (SMART goal: After participating in Legal Program Continuing Legal Education short courses on wetlands during 2010-2013, 15 of 60 attendees will apply their new knowledge of wetland ecosystems, the regulatory framework for those ecosystems and innovative policies to improve management decisions.)
6. Published and distributed "Protecting Instream Flows in Mississippi." Report was commissioned by the Mississippi Department of Fisheries, Wildlife, and Parks, which intends to use the information to assist personnel in charting a course for

future action.

7. 51 Oyster Gardeners grew 45,000 oysters for restoration
8. Hosted 2 training workshops for new oyster gardeners
9. Developed www.oystergardening.org and produced 12 issues of MASGP 09-005-01 through 12 (SMART goal: By 2012, the number of oyster gardeners in Alabama will increase from 30 to 45 and annual production will be 10,000 oysters.)
10. Hosted teacher workshop on incorporating aquaculture/aquascience in curriculum (SMART goal: By 2012, two new scholastic aquaculture/aquascience programs will be initiated in middle or high schools in Alabama and/or Mississippi, which will report 10 participating students continuing their education beyond their senior year.)
11. Facilitated acceptance and delivery of two greenhouses to K12 Aquaculture programs valued at \$2,700 including a new program at Monroe County High School (Monroe County AL) (SMART goal: By 2012, two new scholastic aquaculture/aquascience programs will be initiated in middle or high schools in Alabama and/or Mississippi, which will report 10 participating students continuing their education beyond their senior year.)
12. Under the leadership of MASGC, the Alabama Waterfront Study Committee developed recommendations to the Alabama Legislature. Three public meetings across the state of Alabama gathered public input on these recommendations.
13. MASGC Extension Program produced and delivered an interim report to the Alabama Legislature of the activities of the Alabama Waterfront Study Committee. (SMART goals: By 2012, the state of Alabama will adopt two management techniques and/or incentive programs to protect working waterfront access for businesses, as recommended by the Alabama Waterfront Access Study Committee. By 2011, three tools identified on the “Accessing the Alabama and Mississippi Coast” website, which provides just-in-time educational information to stakeholders regarding coastal access options, will be adopted by local governments, private landowners, or coastal user.)
14. Sixty-four nature tourism businesses have been identified in Baldwin and Mobile counties on Alabama’s Gulf Coast. At least ten nature tour operators have been identified on the Mississippi Gulf Coast.
15. Three “Business of Nature” workshops were conducted in Baldwin County, Alabama. Sixty-two participants learned about the economic impact of nature tourism, and the value of good stewardship practices on Alabama’s Gulf Coast.
16. Three “Nature of the Coast” workshops were conducted in Orange Beach, Alabama. 119 participants in the hospitality and service professions learned about the habitats and species of Alabama’s Gulf Coast and were introduced to existing nature tour operators conducting guided tours.
17. One Dolphin SMART training session was held in Orange Beach, Alabama, with 21 nature tour operators being trained, and to date, 2 operators gaining recognition as Dolphin SMART businesses.
18. The framework and program study guide for a “Coastal Nature Guide Certification” program was created.

19. A Tourism Summit was conducted in Gulf Shores, Alabama introducing the Nature Tourism Initiative to 225 participants. (SMART goals: By 2013, at least 10 nature tour operators will adopt sustainable viewing practices and promote stewardship of healthy ecosystems on the Alabama and Mississippi Gulf Coast. Annually between years 2010-2013, at least 10,000 tourists to Alabama's Gulf coast will be educated by nature tour operators who participate in nature tourism workshops about the species and habitats of the Northern Gulf of Mexico and their role in providing clean air and water, safe food and storm resilience. Four existing nature tourism businesses will each increase their profitability by \$2,500 annually during the 2010-2013 time frames due to Sea Grant technical support.)
20. Approximately 100 high school students participated in the Mobile County Grasses in Classes program. Students learned about wetland ecosystems and participated in area restoration efforts.
21. Facilitated acceptance and delivery of supplies and plants to Grasses in Classes programs.
22. Grasses in Classes participants restored 1.5 acres of marsh with native vegetation.
23. Coordinated and facilitated committee meetings for the Eight Mile Creek Watershed Management plan.
24. Coordinated and facilitated quarterly meetings for the Coastal Alabama Clean Water Partnership.
25. Over 100 4th grade students learned about watersheds, water pollution, and other related issues at the first annual Mobile Water Festival.
26. Approximately 50 citizens and community leaders attended an environmental workshop in Prichard. Participants toured area environmental projects and learned how to get involved in watershed planning efforts.
27. Twenty-one participants received HACCP certification as a result of three training sessions conducted by the Outreach Program. (SMART goals: Annually during 2010-2013, employees from 15 seafood processing plants will become Hazard Analysis Critical Control Point (HACCP) certified leading to a savings of \$1,000 per plant. . By 2013, 300 new and existing seafood processing plant employees will improve their knowledge, skills and abilities about sanitation control procedures.)
28. During 2009 the Outreach Program produced:
 - 13 peer-reviewed publications (6 published and 7 in review)
 - Five technical reports
 - Two brochures
 - Eight fact sheets
 - Two posters
 - One book chapter
 - One DVD
 - Three handbooks
 - Four electronic publications
 - Five newsletters (two monthly and three quarterly)
 - 22 web pages (From February 2009 to January 2010, 186,857 people visited the MASGC website (masgc.org) and viewed 270,905 pages, showing a 24-percent increase in visitors and a 27.5-percent increase in

page views.)

- 52 newspaper columns
- 42 press releases
- 52 media placements
- Five progress reports, annual reports and strategic plans
- 36 formal presentations to various audience totaling 2,020 client contacts
- 26 workshops on various topics with 777 participants
- One course for college credit
- 60 articles in partner agency newsletters

(SMART goal: By 2013, over 100,000 Mississippi and Alabama residents will increase their understanding of coastal and marine resource issues. As a result, 25,000 will adopt at least one new practice leading to improved stewardship of the coastal environment.)

Project Completion Report: No completion reports have been filed during this reporting period. This project continues on NOAA Award NA10OAR4170078, MASGC Project Number A/O-32

Project Impacts:

2009 Report

Theme: Fisheries, Coastal Communities and Economies

Title: Sea Grant reduces operating costs for Mississippi and Alabama shrimpers

Statement: Research and technology transfer regarding the use of Sapphire™ trawl webbing has shown that shrimpers can reduce fuel consumption between one and two gallons per hour by switching to the new webbing. This work was done in collaboration with the Gulf and South Atlantic Fisheries Foundation, Inc. and Texas Sea Grant. In 2008, eleven boats adopted the practice leading to conservative estimates of over \$75 per day savings per boat. Assuming that each boat is working 200 days per year, this equates to a savings of \$165,000 per year. As diesel fuel prices increase, the savings increase proportionately.

2009 Report

Theme: Ecosystems and Habitats, Fisheries, Aquaculture, Seafood Science and Technology, Marine and Aquatic Science Literacy

Title: Volunteers raise 59,000 oysters for restoration

Statement: Through the Outreach Program's continued involvement in the Oyster Gardening Program in Mobile Bay, gardeners increased production of restoration oysters by 70%. Thirty-four gardeners each grew 1,700 oysters for planting on restoration reefs, for a total of 59,000 oysters.

2009 Report

Themes: Coastal Communities and Economies, Urban Coast, Marine and Aquatic Science Literacy

Title: Sea Grant Nature Tourism Initiative teaches dolphin cruise operators sustainable viewing practices

Statement: Dolphin viewing tours on Alabama's Gulf Coast are the largest sector of the nature tourism industry in Baldwin and Mobile County. Approximately 100,000 tourists pay for these excursions annually. The Nature Tourism Initiative, in partnership with NOAA's Office of National Marine Sanctuaries and NMFS, the Whale and Dolphin Conservation Society and the Dolphin Ecology Project trained 21 dolphin tour operators to promote responsible stewardship of wild dolphins in coastal waterways through the Dolphin SMART program. One recognized Dolphin SMART tour operator has reported teaching 15,000 Gulf Coast tourists sustainable viewing practices.

2010 Report

FOCUS AREAS: Healthy Coastal Ecosystems

GOAL: Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas.

PERFORMANCE MEASURE: Number of stakeholders who use ecosystem-based approaches in the management of land, water, and living resources in coastal areas as a result of Sea Grant activities.

TITLE: Certified Master Naturalists provide 910 volunteer hours of training to over 4,100 coastal residents

RELEVANCE: Mississippi and Alabama face major challenges in managing fisheries, rehabilitating coastal wetlands, protecting coastal water quality and maintaining stable shorelines. Although covering a relatively small geographic area, the coastal region is one of the fastest growing in the United States. Year after year, more pressure will be put on our beaches, wetlands, fisheries and the health of our coastal and marine environment.

RESPONSE: A 40-hour adult volunteer education course was conducted once a week for seven weeks. The course was taught in a classroom setting and out in the field. The class was taught by extension agents, professors, state and federal resource managers, and other professionals. There were presentations on ecology, natural history, water quality and habitats and ecosystems of Mississippi. Dr. Chris Boyd is the Program Director for the Mississippi Master Naturalist Program hosted by the Mississippi State University Extension Service.

RESULTS: The volunteers have conducted a variety of research, educational and outreach projects over the last two years, such as helping with conference and workshop registration, education booths and events like Bugfest at the Crosby Arboretum, Mullet Festival at Scranton Nature Center, and Mississippi Sandhill Crane Cranefest, MSU Extension tree giveaways, dune restoration projects, share the beach program, water quality testing and various natural resources presentations.

RECAP: Volunteer programs increase environmental literacy and expand Outreach Program capabilities in restoring and protecting coastal ecosystems.

POINT OF CONTACT: Chris Boyd, cboyd@ext.msstate.edu

2010 Report

FOCUS AREA: Healthy Coastal Ecosystems

GOAL: Restored function and productivity of degraded ecosystems.

PERFORMANCE MEASURE: Number of stakeholders who use ecosystem-based approaches in the management of land, water and living resources in coastal areas as a result of Sea Grant activities.

TITLE: Water quality is improved in Mobile Bay due to volunteer Oyster Gardening Program

RELEVANCE: The anthropogenic impact on estuarine ecosystems has led to a decline in total acreage of habitat. Estuarine ecosystems, such as salt marshes and other wetlands, seagrass meadows, oyster reefs and tidal basins physically protect coastlines, provide essential habitat and filter nutrients and other pollutants that degrade water quality and adversely affect ecosystem health. Estuaries provide critical habitat for numerous species of commercially and recreationally important waterfowl, migratory birds, marine mammals and sea turtles. The decreased area and fragmentation have led to a decline in the essential ecological benefits provided by these habitats.

RESPONSE: Through two training workshops and a variety of media outlets, 51 oyster gardening sites representing 62 oyster gardeners produced 45,000 oysters for restoration and enhancement of degraded sites in Mobile Bay.

RESULTS: Water quality was improved when coastal residents invested 510 volunteer hours raising 45,000 oysters. These oysters filter fed up to 4 gallons per hour, equal to 6.5 Olympic swimming pools per day. Oyster gardener volunteers created 2.2 acres of habitat. Juvenile oysters stocked at a rate of 5 oysters/m² allowing 40 percent mortality, to arrive at the Alabama Marine Resources Division's recommended oyster density of 3 adults/m².

RECAP: Volunteer programs increase environmental literacy and expand outreach program capabilities in restoring and protecting coastal ecosystems and restore 2.2 acres of oyster reef per year.

POINT OF CONTACT: PJ Waters, waterph@acesag.auburn.edu

2010 Report

FOCUS AREA: Sustainable Coastal Development

GOAL: Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.

PERFORMANCE MEASURE: Number of coastal communities and businesses that have adopted/implemented sustainable – economic and environmental – development practices and policies (e.g., land-use planning, working waterfronts, energy efficiency, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities.

TITLE: Nature-tourism workshops result in implementation of sustainable practices

RELEVANCE: Alabama and Mississippi visitors and residents are becoming more environmentally literate and recognize the importance of low-impact tourism on diverse natural habitats. There are expanding opportunities to create new ecotourism jobs and improve the profitability of existing ecotourism businesses, especially in coastal areas. A 2007 survey of guests to Baldwin County, conducted by Gulf Shores/Orange Beach Tourism, revealed that more than 400,000 (approx. 30 percent) tourists indicated they participated in activities that focused on wildlife and the environment. That number is up from 24 percent participating in 2006. Current data indicates that at least 64 nature-tourism businesses are in operation in Baldwin and Mobile counties. Dolphin tour companies are the largest sector, with 30 businesses conducting bottlenose dolphin viewing tours aboard 34 vessels, along Alabama's Gulf Coast.

RESPONSE: Three Business of Nature workshops were conducted in Baldwin County,

Alabama. Sixty-two participants learned about the economic impact of nature tourism and the value of good stewardship practices on Alabama's Gulf Coast. One Dolphin SMART training session was held in Orange Beach, Alabama, with 21 nature-tour operators being trained about natural behaviors of dolphin in the wild and sustainable viewing practices.

RESULTS: Three nature tour operators who participated in the Business of Nature workshops and training sessions taught at least 16,000 tourists sustainable wildlife viewing practices and promoted stewardship of healthy ecosystems on the Alabama Gulf Coast.

RECAP: The outreach program provided life-long learning programs that enhance understanding of coastal and ocean environments and promote stewardship of healthy ecosystems to people of all ages.

POINT OF CONTACT: Joanne McDonough, jmcdonough@GulfShores.com

Closed Core Omnibus Research Projects for NA06OAR4170078

MASGC Project # R/AT-7

PI: Todd French

Title: Conversion of Seafood Processing Waste into Triglycerides a Biodiesel Feedstock.

Time Period of this project: 2/1/08 – 1/31/10

SMART Objectives:

By 2011, one novel technique will be used to depolymerize chitin in seafood waste for biodiesel production by the seafood industry.

Accomplishments and outcomes from this project:

1. Screening-tested oleaginous microorganisms *Cryptococcus curvatus*, *Rhodococcus opacus* and *Rhodotorula glutinis*, by growing on nitrogen limited media with 50 g/l of *n*-acetylglucosamine. The optimal oleaginous microorganism was tested to be *Cryptococcus curvatus* in light of the cell growth.
2. The nitrogen-limited and phosphorus limited media were tested for the growth and lipid accumulation of *Cryptococcus curvatus* with *n*-acetylglucosamine as sole carbon and energy source.
3. The cell mass of *Cryptococcus curvatus* grown on both nitrogen-limited and phosphorus limited media with 50 g/l of *n*-acetylglucosamine reached 19.4 g/l and lipid content in the cells could reach up to 28.4%.
4. The cell mass of *Cryptococcus curvatus* grown on 60 g/l of *n*-acetylglucosamine under constant pH in a fermentor of 14 L, approached 22.3 g/l .
5. The shrimp processing waste could be acid-hydrolyzed and produced glucosamine. To date, the yield of glucosamine reached 18.8%.
6. Determined that acetylglucosamine, the product of acid hydrolysis of shrimp processing waste, was excellent carbon and energy sources for the growth of

Cryptococcus curvatus, the oleaginous microorganism which can produce oil as feedstock for the biodiesel production.

7. Determined that the addition of glycerol to N-acetylglucosamine-grown cells of *C. curvatus* will accumulate additional triglycerides.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

Phase I: Screening test of oleaginous microorganisms for the conversion of shrimp processing waste to lipid.

Shake flask experiments were conducted on the lipid production by oleaginous microorganisms (OM), *C. curvatus*, *R. opacus*, and *R. glutinis*, growing on nitrogen limited media with 50g/l of the shrimp shell component N-acetylglucosamine (Nacg).

Result showed that all the OMs grew on Nacg but no lipid accumulation occurred before the exhaustion of Nacg. The cell mass of *C. curvatus* and *R. opacus* reached a max value 18.4 g/l and 3.4 g/l within 71.7 h and 55.1 h, respectively, when the Nacg was depleted. The cell mass of *R. glutinis* increased to 5.2 g/l within 196.6 h. However, the lipid content of *C. curvatus* increased to 28.4% of the dry cell mass (CDM) after the depletion of Nacg. The fatty acid profiles of the lipid in *C. curvatus* was 2.3% C14:0, 29.5% C16:0, 2.4% C16:1, 7.7% C18:0, 36.9% C18:1 and 16.9% C18:2.

Based on the cell mass concentration and degradation of Nacg, *C. curvatus* was selected from the 3 tested OMs.

Phase II. The conversion of shrimp processing waste to lipid by *Cryptococcus curvatus*

Shake flask experiments were conducted on the lipid production by *C. curvatus* growing on phosphorus limited media with 50 g/l of Nacg and various C/P ratios.

When *C. curvatus* was grown on 50 g/l of Nacg and with a C/P ratio of 193, the Nacg was depleted at 71 h, CDM concentration approached 19.4 g/l, lipid content was 5.9% and then the lipid in the cells increased and reached 22.5% of the CDM.

The maximum cell production from 50 g/l of Nacg was not affected by the phosphate concentration until the C:P ratio reached 387:1.

Experiments were conducted in a fermentor with a working volume of 14 L under constant pH. Sixty g/l of Nacg was added initially as the carbon and energy sources. The growth of *C. curvatus* in the fermentor reached a max point within 72 h and having a [cell mass] of 22.3 g/l. Lipid content in the cells approached 14.7%.

Phase III Conversion of shrimp processing waste to glucosamine

Optimization of the acid hydrolysis of shrimp processing waste (SPW) was conducted. SPW obtained from the seafood process facility in Biloxi was freeze-dried, grinded and sieved in the size range of 40 to 60 mesh. The processed SPW was pretreated with the 72% (w/w) H₂SO₄ at 4°C for 24 h or on the thermal control shaker at 30°C and 120 RPM. The SPW was then hydrolyzed with about 10% (w/w) H₂SO₄ at 97°C for 4 h or 121°C for 1 h. After the neutralization, the hydrolysate was collected by filtration or centrifuge.

Results showed that the pretreatment with 72% (w/w) H₂SO₄ on the thermal control shaker at 30°C and 120 RPM had a higher yield of Nacg than at 4°C for 24 h. Hydrolysis with 10% of H₂SO₄ at 97°C for 4 h and 121°C for 1 h did not show a difference. In

hydrolysis product, the concentration of Nacg reached 4.7 g/l with a total yield of Nacg of 13.3%.

Phase IV Evaluation of the kinetic growth rate and yield for *C. curvatus* grown on Nacg.

The growth rate for *C. curvatus* grown on Nacg in shake flask experiments was calculated to be 0.22 h⁻¹. However, when parameters such as DO and pH were controlled the net specific growth rate increased to 0.25 h⁻¹. The yield of cells per g of Nacg was found to be 0.363 g of cells/g of Nacg.

Phase V Oil production from glycerol via *C. curvatus* grown on Nacg.

In this investigation, the *C. curvatus* grown on Nacg were tested for the production of triglycerides from glycerol as a feedstock for biodiesel production. In the experiments, the *C. curvatus* was first grown with Nacg as the carbon and energy source at 30°C for 60 h. Then, *C. curvatus* was harvested and transferred to a fresh nitrogen-free media with glycerol as the carbon and energy source for oil production. The temperatures, yeast extract and the initial concentration of glycerol were evaluated for max oil production from glycerol. Addition of yeast extract enhanced the lipid production. Among the evaluated temperatures of 30, 35 and 40°C, 35°C was optimal for lipid production from glycerol by the *C. curvatus* grown Nacg. At 35°C and with addition of 50 g•L⁻¹ of glycerol and 0.1 g•L⁻¹ of yeast extract, cell mass increased from initial 5.17 g•L⁻¹ to 12.46 g•L⁻¹ at 96 h, and lipid content in the cells also increased from initial 5.5% to 25.95%. The lipid production by *C. curvatus* also increased with the increase in the initial glycerol concentration. The major fatty acids of the generated lipids were C16:0 (40%), C16:1 (3%), C18:0 (10%), C18:1 (39%), C18:2 (5%).

Outreach and Education

The results of this investigation have been presented to a couple of our industrial biofuels partners. Interest levels are very high but more information is needed. This information will come with additional studies. The data generated from this study will also be incorporated into a brand new course entitled Bioprocess Engineering.

Project Impacts: None for this reporting period

MASGC Project # R/CEH-28

PI: Ruth Carmichael

Title: Use of stable isotope ratios to link wastewater sources to effects on shellfish and human health.

Time Period of this project: 2/1/08 – 1/31/10

SMART Objectives:

By 2010, links between sewage treatment plants and fisheries and human health will be used by the Alabama Department of Public Health as one criterion for opening of oyster reefs in south Mobile Bay, Alabama.

Accomplishments and outcomes from this project:

Research

1. We combined FDA measurements of traditional bacterial (fecal coliform) and newer viral (MSB) indicators with measurements of N stable isotopes in wastewater sources, receiving waters, and tissues of sentinel bivalves (*C. virginica*) transplanted at locations, varying in proximity to the WTP on McDuffie Island in Mobile Bay. WTP effluent imparted a characteristically light $\delta^{15}\text{N}$ value (-3.78‰), which was conveyed to particles in the water and oysters. Stable isotope ratios increased with distance from the outfall as effluent was diluted by Bay water. Similarly, MSB and coliforms in oyster tissues were highest at sites closest to the outfall. MSB concentrations were significantly correlated with $\delta^{15}\text{N}$ values, suggesting MSB was a better indicator of wastewater influence than coliforms.
2. We measured potential wastewater-driven changes on shellfish habitat (DO), food supply (nutrient and chl *a* concentrations), and biology (growth and survival through time). Nutrient concentrations were highest near the WTP outfall, but food supply (chl *a*) did not follow nutrients potentially due to greater shading near the WTP outfall (coal terminal). Oyster growth and survival did not change with proximity to the WTP outfall.
3. We determined rate (in terms of change in isotope ratio through time) at which waste-derived organic particles were assimilated into tissues and shell of transplanted hatchery-reared oysters. We compared these data to changes in MSB and fecal coliform concentrations measured by the USFDA among sites and through time. MSB and coliforms appeared in oyster tissues within 10 days, while stable isotope ratios took 6-8 weeks to reach equilibrium.
4. We quantified variation in dilution of WTP discharge due to differences in hydrology and level of WTP processing, by sampling relative to the McDuffie Island WTP and three other nearby WTPs. We discovered that high flow WTP facilities may release effluent with isotopically lighter N forms. Higher flow rates corresponded to higher ammonium concentrations, suggesting flow through each facility mediated processing time (time for coupled nitrification-denitrification reactions, particularly nitrification of ammonium to nitrate-nitrite).
5. We concluded the following: 1) Stable isotope and microbial indicators affectively detected wastewater exposure even when wastewater-specific changes in food resources and oyster growth or survival were not measurable, 2) because seasonal conditions, proximity to a facility, and WTP processing can alter magnitude and concentration of indicators, each indicator should be used in context and with defined endpoints (specific knowledge of the values in contaminated vs. uncontaminated samples; controls), and 2) no single indicator functioned best under all environmental conditions, hence, the most effective application for management purposes should include use of multiple indicators (particularly MSB and stable isotope ratios) that are appropriate to the conditions of interest.

Extension

6. We shared data with public health officials at the FDA (and NOAA) who used our data to further develop their tests for alternative indicators of wastewater exposure. FDA partners presented a portion of our data at the Northeast Shellfish Sanitation Association meeting in Providence, RI, and findings were referenced in the DRAFT FDA guidance document entitled, “Minimum Dilution of Wastewater

Treatment Plant Effluent Discharges Required to Ensure the Safety of Molluscan Shellfish”.

7. We maintained a publicly accessible webpage (2 sections; in current and past projects) dedicated to the project and application of project outputs, and we published and archived metadata via the NOAA National Coastal Data Development Center.
8. We prepared a “SeaBriefs” summary (2007) and assisted with writing a “SeaBriefs” article (2010) for MS-AL Sea Grant.

Education

9. We trained 2 MS students (1 was funded as an NGI intern in Y1 and volunteered on this project in Y2) and 2 technicians (1 each year) to sample WTP effluent, water, environmental attributes, and oysters, process stable isotope samples and prepare them for analysis. Each MS student learned to present a poster and/or talk at a scientific meeting. One student completed an MS thesis based on this work. Another student (not funded by this project) incorporated a portion of the data into their PhD Thesis; both graduated in May 2010. Subsequently, the MS student is pursuing acceptance to the PhD program in the Graduate School of Oceanography at the University of Rhode Island. The PhD student was working at the National Marine Fisheries Service in Pascagoula, MS, but recently accepted a Post-doc position at the Dauphin Island Sea Lab. This project was instrumental in furthering their careers.
10. We shared data with the general public (with focus on K-12 audience) at DISL’s annual Discovery Day in Y1 and Y2, with the general community via a total of 3 oral presentations and two webpages, and with students, other researchers and managers via oral and poster presentations at regional, national and international meetings, seminars, a DRAFT USFDA guidance document entitled, “Minimum Dilution of Wastewater Treatment Plant Effluent Discharges Required to Ensure the Safety of Molluscan Shellfish”, and a guest lecture.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

We have completed the field work, laboratory analyses, data analysis and writing for the primary aspects of the scope of work. We have secondary area of research that developed out of the proposed scope of work (additional supplemental findings), for which we are still finalizing data analysis and writing.

Year 1

Science—We successfully teamed with the U.S. FDA on Dauphin Island to determine whether WTP discharge affected growth and survival of shellfish or their safety for human consumption. Oyster growth and survival did not change with proximity to WTP outfall. WTP effluent, however, imparted a characteristically light $\delta^{15}\text{N}$ value (-3.78‰), which was conveyed to SPM and transplanted oysters. Stable isotope ratios in SPM and oysters increased with distance from the outfall as effluent was diluted by Bay water. Similarly, MSB and coliforms in oyster tissues were highest at sites closest to the outfall. MSB concentrations were significantly correlated with $\delta^{15}\text{N}$ values, suggesting MSB was a better indicator of wastewater influence than coliforms. Our data

demonstrate that, used in combination, N stable isotope ratios and MSB are potentially powerful indicators of wastewater exposure for shellfish.

Outreach and education—This research involved training and outputs by two master students (one of which was an NCI-funded intern in Summer 2008), a technician, and contributions of several other graduate students at DISL. We shared data through two poster presentations at one regional and one international meeting as well as at our annual DISL Discovery Day and other community outreach events. This research and the founding collaboration with USFDA resulted in 4 additional research proposals and development of a Memorandum of Understanding for future collaborations between DISL and USFDA. *Details of these activities are provided below.*

Year 2

Science—We expanded our dataset by sampling N and C stable isotope ratios in influent and effluent from four wastewater treatment plants (WTP), which differ in level of processing. We compared WTP data to stable isotope ratios in transplanted oysters and native biota at each outfall and up to 400m away from each outfall. We completed data analysis and writing for the first year of study, and a majority of the second year. A manuscript was completed and submitted to the FDA for formal review and submittal to *Estuaries and Coasts* later this summer. A manuscript is still in development from Y2 data. Findings were referenced in the DRAFT USFDA guidance document entitled, “Minimum Dilution of Wastewater Treatment Plant Effluent Discharges Required to Ensure the Safety of Molluscan Shellfish”.

Outreach and education—This research involved training and outputs by two master students (one who served as a volunteer in Y2, and one who completed his thesis based on this work in Spring 2010) and a technician. Data collected as part of this study was also used by a PhD student at USA/DISL in his dissertation, which was completed in Spring 2010.

We shared data through 1 oral presentation at an international meeting, a display our annual DISL Discovery Day, 2 oral presentations at professional seminars, a DRAFT USFDA guidance document entitled, “Minimum Dilution of Wastewater Treatment Plant Effluent Discharges Required to Ensure the Safety of Molluscan Shellfish”, and 1 guest lecture to graduate level students from the University of South Alabama. This research and the founding collaboration with USFDA resulted in 1 additional research proposal and enhanced or prompted several new lines of study at DISL/USA. Specifically, this work served as a model for collaborative study that formalized a Memorandum of Understanding and Graduate Research joint program between DISL and the USFDA on Dauphin Island. We currently have 4 fully funded students who will participate in this start-up program in 2010, and the program has been approved for two additional years of funding.

Project Impacts: None for this reporting period.

MASGC Project # R/SP-18

PI: Eric Hoffmayer

Title: Use of passive acoustics to identify and characterize spotted seatrout spawning habitat in two Mississippi estuaries.

Time Period of this project: 2/1/09 – 4/30/10

SMART Objectives:

By 2011, spawning habitat for spotted seatrout in two Mississippi estuaries will be identified, characterized and uniquely managed by Mississippi Department of Marine Resources.

Accomplishments and outcomes from this project:

1. Determined the appropriate sampling sizes for the grids within our sampling areas.

2. Compiled all available habitat data for the Biloxi and Grand Bay sampling areas. Based on bi-weekly sampling during late spring and summer, documented the relative size and location of spawning aggregations of spotted seatrout within Biloxi and Grand Bay sampling areas.

Compared relative size and locations of spotted seatrout spawning locations within Biloxi and Grand Bay sampling areas during 2008-2009 to better understand the inter-annual spatial variability in spawning aggregation location selection.

Deployed long-term acoustic recording systems at two known spawning aggregations in Biloxi and Grand Bay systems.

Compared temporal variability associated with spawning aggregation behaviors in Biloxi and Grand Bay sampling areas.

Statistically analyzed both passive acoustic and long-term acoustic recording systems data.

Compared the results of this study conducted in two Mississippi bay systems to the results of a previous study conducted in Tampa Bay, Florida.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

We have made significant progress on our research project entitled, “Use of Passive Acoustics to Identify and Characterize Spotted Seatrout Spawning Habitat in Two Mississippi Estuaries,” during the last two years. To date, we hired personnel to work on the project, purchased all necessary equipment, compiled available habitat data for each study area, established the sampling zones and grid protocol, completed two years of a passive acoustic survey, collected long-term acoustic data on two known spawning aggregations, and completed all data analyses.

The field season commenced in May 2008, and weekly sampling was conducted from May to August, 2008-2009. Weekly sampling consisted of randomly selecting six grids within each selected zone. Within each grid, four sampling locations were selected based on the available substrata within the grid. At each of the 24 sampling locations, water temperature, salinity, dissolved oxygen, depth, current speed, habitat type, and GPS location were recorded. Using a hydrophone and a digital recorder, a 60-second acoustic track was recorded, and the presence, size (1-2, 3-5, small aggregation, and large aggregation), and relative location (boat on top of, close by, within auditory distance) of

spotted seatrout spawning sounds were documented. All field recordings were reviewed by ear in situ as well as in a controlled laboratory setting. Selected recordings have been sent to colleagues (seatrout acoustic experts) for verification.

In 2009, two long-term acoustic recording stations (LARS) were deployed at known spotted seatrout spawning aggregations in Biloxi and Grand Bay. These LARS recorded 30 seconds of sound every five minutes from 4 pm to 4 am. They were deployed in early June and were retrieved in late September. These LARS provided critical information on the temporal variability of the spawning aggregation behavior.

A digital database was created and all field data sheets were transcribed into the database. All data has been checked for data quality control on a monthly basis. Two copies of the digital database, as well as the field data sheets, are maintained at the Gulf Coast Research Laboratory in Ocean Springs, Mississippi. These data have also been imported into ArcGIS 9.0 for spatial analysis and visual representation. Maps containing data have been generated for the two bay systems depicting the occurrence, estimated size, and distance from sampling location for male spotted seatrout courtship sounds. All statistical analyses including t-tests, chi-square analysis, and stepwise logistic regression have been completed.

Throughout the study, we collaborated with resource managers at the Mississippi Department of Marine Resources (MDMR) and the Grand Bay National Estuarine Research Reserve (NERR) to compile all available habitat data within the Biloxi and Grand Bay sampling areas. This habitat data was utilized in selecting sampling locations within the grids of the two bay systems. Spotted seatrout spawning habitat data from our mobile passive acoustic surveys have also been provided to both MDMR and Grand Bay NERR managers and staff. In addition, we have met with our colleagues at Florida Fish and Wildlife Research Institute (FWRI) during 2009 and 2010 to discuss the project's results and to compare the Mississippi data to their data collected from Tampa Bay, Florida.

We recently presented a paper at an acoustic symposium at the Annual Meeting of the American Ichthyological and Herpetological Society Meeting in Providence, Rhode Island on July 7-12. We have completed a webpage highlighting our project, and are in the process of posting this page on the Gulf Coast Research Laboratory website.

Project Impacts: None for this reporting period.

Open Core Omnibus Research Projects for NA06OAR4170078

MASGC Project # R/CCD-14:

PI: Latif Kalin

Title: An Interdisciplinary Assessment of Population Growth and Development impacts on the Fish River Basin Coastal Community.

Time Period of this project: 02/01/08 – 01/31/11

SMART Objectives:

By 2011, one watershed-scale water-quality model to quantify the impact of land use/cover changes in Fish River, Alabama, will be used by the Alabama Department of Environmental Management to rapidly assess the River's Clean Water Act § 303d status.

Accomplishments and outcomes from this project:

1. **GIS:** Land use/cover (LULC) maps for the years 1995, 2001, and 2008 are developed from remote sensing (Landsat TM) imageries and aerial photographs. The trend in LULC changes from 1995 to 2001 and from 2001 to 2008 are analyzed using these developed LULC datasets.
2. **GIS:** We found that LULC conversion is mainly from pasture to urban residential and commercial.
3. **Water Quality:** We identified 12 sites that are suitable to take water quality samples to analyze for N, P, and TSS levels. ISCO automated samplers were installed at 4 sites to take storm flow samples, with grab samples taken from other sites.
4. **Water Quantity:** We installed pressure transducers at 10 of the water quality sampling sites to measure water stage at 15-min intervals; one site has a USGS gage and another is not suitable for flow measurements. During each storm we measure flow discharge, which will be regressed against stage to develop rating curves to eventually develop flow hydrographs at each site.
5. **Modeling:** SWAT model was setup for the Fish River watershed and successfully calibrated for flow using the 1992 National Land Cover Data (NLCD).
6. **Best Management Practices:** Literature review on identifying best management practices (BMP) that would be suitable for the study site and for the constituents we are studying (N, P, TSS) is completed. We are working on identifying the BMPs that are currently in place in the study area.
7. **Outreach:** The bulk of the outreach activities will be happening during the final year of the project. In this first year we developed some contacts to do a workshop in Fairhope, AL.
8. **GIS:** We finished accuracy assessment of the developed LULC maps. Accuracy above 80% is achieved in each of the 1995, 2001 and 2008 LULC maps.
9. **Water Quality:** We completed water quality sampling and most of the lab analysis (total 353 samples). Although analyses still are ongoing, preliminary results show substantial increase in TP and moderate decrease in NO₃ levels from mid 1990s to 2008.
10. **Water Quantity:** Stage discharge curves have been developed for each sampling site by regressing stage levels with the measured flow discharge values. The stage levels, which we still keep recording at the sampling sites every 15-min, have then been converted into flow time series.
11. **Modeling:** SWAT model was successfully calibrated and validated for N, P and TSS using 1992 LULC data. Model predicted changes in water quality with good accuracy with 2008 LULC data.
12. **Best Management Practices:** A draft document (50 pg.) on the policies and best practices suitable for water quality management in the Weeks Bay has been prepared. Once it's reviewed by all the PIs, it will be final.

13. Outreach: We developed contacts in the city of Fairhope, AL to present data to support an upgrade stormwater regulations and bring these new BMP/ stormwater regulations up for public vote (November 2010). A workshop will be presented in September or October 2010 (date to be decided by the stakeholders in July 2010) to assist Fairhope in promoting the new stormwater regulations and reinforce a positive public opinion for the new stormwater BMPs to become development standards and not just options. Impacts to be measured and reported after completion of the workshop.

Project Completion Report: No completion reports have been filed during this reporting period

Project Impacts: None for this reporting period.

MASGC Project # R/CEH-27:

PI: Julia Cherry

Title: Effects of fire on water quality, plant production, and biogenic accretion in a *Juncus roemerianus* dominated marsh

Time Period of this project: 02/01/08 – 07/31/10

SMART Objectives:

By 2012, two natural resource managers will incorporate prescribed burning of salt marshes into their management plan based on MASGC-supported research.

Accomplishments and outcomes from this project:

1. Established 18 experimental plots at one of three spatial locations (low, mid, and high marsh) along 6 transects.
2. Collected pre-burn sampling indicating that edaphic conditions do vary among low, mid, and high marsh locations.
3. Determined that porewater pH was significantly greater in the high marsh (6.46 ± 0.06) than in the mid or low marsh (6.21 ± 1.8 and 6.22 ± 0.02 mm, respectively).
4. Determined that *Juncus roemerianus* stem densities are significantly greater in the low marsh (706.7 ± 75.2 no/m²) than in the high marsh (511.7 ± 55.4 no/m²).
5. Determined that vertical accretion was significantly greater in the low marsh (15.4 ± 2.5 mm) than in the mid or high marsh (5.2 ± 1.8 and 2.4 ± 0.4 mm, respectively) in the first two months, most likely due to sedimentation from Hurricanes Gustav and Ike.
6. Conducted a low intensity prescribed burn (200-300°F) of experimental plots in collaboration with U.S. Fish and Wildlife Service and MS Department of Marine Resources staff.
7. Collected post-burn sampling indicating that fire significantly reduced aboveground biomass of *Juncus roemerianus* ($F_{1,8} = 1.86$, $p = 0.005$) by 82%, 68%, and 40% in the low-, mid-, and high-marsh plots, respectively.
8. Tested for fire effects on biomass recovery, which revealed that burned plots

- failed to fully recover aboveground biomass relative to controls one year post-burn.
9. Discovered that location within marsh affected biomass recovery after fire, with burned mid- and high-marsh plots recovering aboveground biomass more slowly than low-marsh plots, and burned high-marsh plots producing less belowground biomass than mid- or low-marsh plots.
 10. Documented that vertical accretion was not affected by fire, but rather the sustained impact of hurricane sediment inputs from 2008, which were significantly greater in the low-marsh than mid- or high-marsh ($F_{2,63} = 5.59$, $P < 0.001$).
 11. Determined environmental gradients of increasing porewater ammonium, decreasing porewater orthophosphate, decreasing biomass production, and decreasing accretion from low-marsh to high-marsh.
 12. Assessed management implications of research findings, which suggest that timing of fire relative to recent tropical storms may influence marsh recovery, location and elevation of marsh may result in a gradient of fire impacts within a marsh.
 13. Provided outreach and education opportunities to one graduate student, nine undergraduate students, and 77 undergraduate students enrolled in “Wetland Plant Ecology” at the University of Alabama.
 14. Presented one poster and four oral presentations of our findings at regional or national meetings.

Project Completion Report: No completion reports have been filed during this reporting period

Project Impacts:

2010 Report

FOCUS AREA: Healthy Coastal Ecosystems

GOAL: Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

PERFORMANCE MEASURE: Number of stakeholders who use ecosystem-based approaches in the management of land, water, and living resources in coastal areas as a result of Sea Grant activities.

TITLE: Hurricane and fire interactions inform management plans for prescribed burning

RELEVANCE: Habitat degradation has decreased ecological services provided by coastal ecosystems and has altered their resiliency to climate change. Research on storm and fire impacts, which are predicted to increase in frequency or intensity with climate change, can inform resource managers on methods strategies to sustain coastal ecosystems.

RESPONSE: Since 2008, Sea Grant researchers have been working with Grand Bay National Estuarine Research Reserve partners to assess the interactive effects of prescribed fire and hurricanes on a black needlerush marsh. This approach permits examination of multiple-factor interactions that influence ecological processes and ecosystem sustainability.

RESULTS: In this study, high marsh areas were more vulnerable to fire than other marsh areas because they accumulated highly combustible wrack after hurricanes, and the plants were slower to recover following a fire. This study was the first to document fire effects in a Grand Bay marsh, and it will serve as a baseline for an emerging research program on marsh fires. Stewardship Program managers are using the study to refine prescription plans for burning on state lands and to minimize risks to potentially vulnerable high marsh areas.

RECAP: Fires and hurricanes affect plant production and sediment accretion differently, with responses varying by location within the marsh. When developing research programs and fire prescriptions, managers will consider the location and elevation within a marsh, as well as the presence of wrack along potentially more vulnerable high marsh boundaries.

POINT OF CONTACT: Julia Cherry, julia.cherry@ua.edu

MASGC Project # R/SP-19:

PI: R. Douglass Watson

Title: The Crustacean Molt-Inhibiting Hormone Receptor and Induction of Molting in Blue Crabs (*Callinectes sapidus*)

Time Period of this project: 02/01/08 – 01/31/11

Accomplishments and outcomes from this project:

1. Expressed separately the candidate MIH receptor and the ligand binding domain of the candidate receptor in *Drosophila* S2 cells.
2. Cloned an isoform of the crustacean hyperglycemic hormone (CHH) from extra-eyestalk tissues of the blue crab (*Callinectes sapidus*).
3. Trained Ph.D. student, Hsiang-Yin Chen.
4. Published one paper (Nakatsuji, Lee, and Watson (2009) Crustacean molt-inhibiting hormone: structure, function, and cellular mode of action. *Comp. Biochem. Physiol. A* 152: 139-148). A second manuscript is currently under review at *General and Comparative Endocrinology*.
5. Presented poster (Crustacean Molt-Inhibiting Hormone Receptor and Induction of Molting in Blue Crabs, *Callinectes sapidus*) at *2008 Bays and Bayous Symposium*, 28-29 October 2008, Biloxi, MS.
6. Began studies designed to detect and quantify binding kinetics of recombinant MIH to the recombinant receptor using BIACORE 2000 instrumentation.
7. Developed methods for assessing intracellular Ca^{++} levels in *C. sapidus* molting glands (Y-organs).
8. Initiated *in vivo* testing of the candidate MIH receptor blocker.
9. Trained two graduate students: Hsiang-Yin Chen (Ph.D. student) and Anna Pendleton (M.S. student).
10. A manuscript submitted during 2008 was accepted for publication and is now *in press*: Zheng, J., Chen, H.-Y., Choi, C.-Y., Roer, R.D., and Watson, R.D. (2010) Molecular cloning of a putative crustacean hyperglycemic hormone (CHH) isoform from extra-eyestalk tissue of the blue crab (*Callinectes sapidus*), and

- determination of temporal and spatial patterns of CHH gene expression. Gen. Comp. Endocrinol. (*in press*). A second manuscript was submitted for publication: Chen, H.-Y. and Watson, R.D. Changes in intracellular calcium concentration in crustacean (*Callinectes sapidus*) Y-organs: Relation to the hemolymphatic ecdysteroid titer. J. Exp. Zool. (submitted).
11. Presented poster with published abstract (Effect of Eyestalk Ablation in the Blue Crab (*Callinectes sapidus*) on Intracellular Calcium in Y-Organ Cells and the Hemolymphatic Ecdysteroid Titer) at the Society of Integrative and Comparative Biology Annual Meeting.

Project Completion Report: No completion reports have been filed during this reporting period

Project Impacts: None for this reporting period.

MASGC Project # R/SP-20:

PI: D. Allen Davis

Title: The interaction of salinity and temperature on growth of native and non-native shrimp species cultured in Alabama.

Time Period of this project: 02/01/08 – 01/31/10

Accomplishments and outcomes from this project:

1. The PIs carried out five different acclimation bioassays at different temperatures and salinities with two species of shrimp (*Litopenaeus vannamei* and *Farfantepenaeus duorarum*) at the E.W. Shell Fisheries Research Station in Auburn and Claude Peteet Mariculture Center in Gulf Shores, Alabama. Bioassays revealed that *L. vannamei* was more sensitive to temperature changes under 20 degrees Celsius with post-larvae of varying ages.
2. Our recirculating system at E.W. Shell was modified to add the control of temperature to independent research systems and growth trials were initiated.
3. The PIs participated in the January 2009 meeting of the Alabama Inland Shrimp Producers Association and shared information gained thus far from this study with Alabama shrimp producers.

Project Completion Report: No completion reports have been filed during this reporting period

Project Impacts:

2010 Report

FOCUS AREA: Safe and Sustainable Seafood Supply

GOAL: A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

PERFORMANCE MEASURE(S): Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new

fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.

TITLE: Sea Grant helps shrimp farmers improve shrimp survival following acclimation of post-larvae to low salinity ponds

RELEVANCE: When post-larvae (PL, baby shrimp) are moved from the nursery to low-salinity conditions of the ponds for growout, poor survival is often observed. PL are a significant expense, and if the quantity surviving is not known, ponds cannot be properly managed. Improved acclimation techniques were required to increase survival and subsequently improve management and profit margins.

RESPONSE: Research results are being transferred to local farmers with regards to improving on-site acclimation of post-larval shrimp. Alabama producers are now more aware of the effects of shifting temperature and salinity and their effects on shrimp survival. Increased awareness has resulted in better survival during the production season, allowing farmers to increase their production at harvest from an average of 2,500-2,700 pounds/acre a couple of years ago to greater than 3,000 pounds/acre in 2009 or 10- to 20-percent increase in production. This resulted in \$84,000 savings.

RECAP: Mississippi-Alabama Sea Grant improved acclimation techniques utilized by inland shrimp farmers in Alabama, thus increasing survival and production of shrimp at harvest.

POINT OF CONTACT: Allen Davis, davisda@auburn.edu

Closed Program Development Projects for NA06OAR4170078

MASGC Project # R/AT-9-PD:

PI: Asim Bej

Title: Development of an isothermal nucleic acid test with lateral flow detection for *Vibrio vulnificus*.

Time Period of this project: 02/01/08 – 07/31/09

Accomplishments and outcomes from this project:

1. This project includes the investigation of a relatively new approach of the detection of *V. vulnificus* in shellfish thereby falls within the category of method development for seafood safety.
2. Unlike the real-time PCR amplification detection of the human pathogens in shellfish, the Isothermal DNA amplification or thermostable helicase-dependent DNA amplification (tHDA) is a relatively new technology and required us to implement extensive optimizations to establish a reproducible detection of the targeted *vvhA* gene. We have designed and extensively tested several primer sets to achieve a set of reliable primer for the detection of *V. vulnificus* targeting the *vvhA* gene.
3. The isothermal tHDA reaction parameters were optimized so that “false-negative” or “false-positive” outcome has been avoided.

4. The specificity of the primers has been tested on other bacterial species.
5. The process has been tested on the shellfish samples spiked with *V. vulnificus*.
6. The performance of isothermal DNA amplification process has been evaluated using different types of template DNA (boiled, sonicated, kit-purified and PCR amplified).
7. The results showed that complex DNA template and very high molecular weight DNA fragments hindered the isothermal amplification or affected the thermostable helicase enzyme performance.
8. In this method, primer designing criteria was found to be robust and same criteria may be used for different genes in other pathogens.
9. The method has been successfully tested on oysters. The detection sensitivity (~500 cfu) was higher than real-time Taqman PCR method of detection (<10 cfu) of this pathogen in oysters, which we developed and published several papers in the past. Therefore further optimization of the method is necessary for higher sensitivity of detection. Perhaps oyster tissue is inhibitory to thermostable helicase enzyme, which needs to be tested.
10. It can be suggested, depending upon the results, that the failure of this method to detect target genes may be attributed to the complexity of the template DNA. Otherwise, all other reaction parameters and criteria including reagents work well.
11. The ODLF detection system has been tested and found to be easy to use, but further optimization may be necessary before recommended for industry use.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

The Mississippi Alabama Sea Grant-supported Program Development fund (R/AT-9-PD) project includes the development of a *challenging and new approach of alternative DNA amplification* for the detection of *Vibrio vulnificus* pathogen in shellfish using a thermostable *DNA helicase* enzyme. This approach is referred as tHDA. Unlike traditional PCR or real-time Taqman/SYBR Green I PCR method, isothermal amplification approach a targeted gene is amplified at a constant temperature therefore may not require a thermocycler instrument, which is often expensive. The isothermal tHDA approach is in its infancy therefore required for us to engage an extensive reaction optimization process. We have selected the *Vibrio vulnificus hemolysin (vvhA)* as the ideal target gene; designed and tested a number of primer sets for robust isothermal tHDA amplification to achieve an approximately 91-100 bp amplicon. Different types of template DNA (boiled, purified, sonicated) were used to assess the efficiency of this method. The reaction temperature was set at constant 60°C or 62°C as optimized for different primer sets. The T_m values for the primers have been optimized to 64-68°C, GC content between 40-60%, and the sequence length for each primer between 22-26 nucleotides. The primers that provided us the optimum amplification results are as follows: F-vvh785: 5'-TTCCAACCTCAAACCGAACTATGAC-3' (25 nt; T_m = 66°C); R-vvh876: 5'-GTTGAGTTTCACGCCCATCTCAAAT-3' (26 nt; T_m = 62.6°C). The size of the amplicon is ~91 bp.

The results from the optimization experiments showed reliable detection of a minimum of ~300 copies of the targeted gene on pure DNA. The reliable detection limit

was 10^3 cfu of *V. vulnificus* in pure cultures. The protocol has been tested on 5 h enriched oyster tissue homogenate spiked with *V. vulnificus* and the detection limit was ~ 500 cfu of initial microbial inoculums.

The on-demand lateral flow (ODLF) detection system using the biotin-labeled primers and a FITC-labeled probe internal to the amplicon for a gel electrophoresis-independent detection of the amplicon has been successfully tested. The ODLF system is rapid and easy to use. However further optimization seems required to establish the effectiveness, robustness and reproducibility of this approach for the detection of *V. vulnificus* in oysters before transferring the technology to the oyster industry and a biotechnology company. Also, this detection device may increase the cost for each assay.

It is expected that isothermal amplification using tHDA approach will offer competition to the relatively expensive real-time Taqman/SYBR Green I-based PCR assays therefore will challenge the biotechnology industry to provide a cheaper solution for the detection of the human pathogens in post-harvest shellfish. Moreover, the HDA amplification method using the thermostable helicase enzyme and without the need for a thermocycler makes it superior to other isothermal amplification methods such as strand-displacement-amplification (SDA), or rolling circle amplification (RCA). The isothermal amplification using the tHDA approach is expected to offer the seafood industry and processing place a DNA-based method alternative to the real-time PCR for the detection of *V. vulnificus* in shellfish that is affordable, reliable and relatively easy to adopt. As a consequence, this method may be adopted by food industry in detecting other food-borne pathogens. Moreover, this HDA technology might be coupled with microarray technology to show the multiplex capability for detection of different species of *Vibrio* in food samples.

Rapid and reliable detection using novel molecular methodology will reduce *V. vulnificus* related disease outbreaks and incidences, thereby protect consumer health and help seafood industry a steady-state economic benefit resulting from consumer confidence.

Project Impacts: None for this reporting period.

MASGC Project # R/CCD-15-PD:

PI: Wei Wu

Title: Will climate change cause wetland loss on the Mississippi Gulf Coast more than upland land use / land cover change within the next century.

Time Period of this project: 05/01/08 – 01/31/10

Accomplishments and outcomes from this project:

1. Predicted upland LULC change in the lower Pascagoula River Basin and generated the maps of the change vulnerabilities and the LULC in 2030, 2050 and 2100. By 2100, the urban areas were predicted to double ($+65 \text{ Km}^2$) compared to 1996, the agricultural land was predicted to decrease by 40 Km^2 , while the forests were predicted to decrease by 25 Km^2 .

2. Modeled river flow under the scenarios of the predicted LULC change and climate change. River flow would decrease by 1% with LULC alone, decrease by 2% with changing climate alone, and decrease by 2% from 1.06×10^8 to 1.04×10^8 m³/month with LULC and climate changes.
3. Simulated the spatial distributions of the tidal marshes under the scenarios of the predicted A1B minimum to maximum sea level rise and changes of freshwater inputs for every decade from 2020 to 2100. Generally, the areas of the salt marshes would increase, while the areas of the brackish marshes and the tidal freshwater marshes would decrease.
4. Determined that the freshwater change driven by upland LULC and climate changes could play a similarly important role as the sea level rise in predicting spatial distribution of tidal marshes.
5. Conducted a preliminary analysis on the changes of carbon sequestration rates (one of the most important ecosystem services provided by tidal marshes) due to the distribution and area changes of the tidal marshes by the end of the century. The increase in the carbon sequestration rates in the salt marshes cannot offset the decreases due to the loss of brackish marshes, so the overall carbon sequestration rates would decrease.
6. Studied the impact of spatial resolutions of digital elevation data on the predictions of spatial distribution of tidal marshes by applying the most updated SLAMM model. The use of higher resolution elevation data resulted in smaller areas of tidal freshwater marsh and brackish marsh compared to lower resolution elevation data in 2100.
7. Took sediment samples in the tidal freshwater marsh and brackish marsh in the lower Pascagoula River Basin and processed the sample in the tidal freshwater marsh using radioisotope analysis for determination of vertical accretion rates of the sediment. The accretion rate was estimated to be 4.2 mm/year for the tidal freshwater marsh.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

I intend to link the spatial distribution of coastal wetlands with upland hydrological processes and seaward sea level rise in this project.

I first examined the historical LULC change (1996-2001) based on the existing LULC maps (NOAA Coastal Service Center). I applied multi-layer preceptor neural network to model the probabilities of the major land transitions simultaneously (forest-urban, forest-agriculture, wetland-agriculture, agriculture-forest, barren-forest, agriculture-barren) based on their common drivers: distance to road, to streams, to current urban area, to coastline, elevation, aspect and slope. After testing the derived transition probabilities were reasonable, I applied them to project the LULC further to 2100. By 2100, the urban areas were predicted to double (+65 Km²) compared to 1996. The agricultural land was predicted to decrease by 40 Km², while the forests were predicted to decrease by 25 Km².

Next I applied a basin-scale hydrological model Soil and Water Assessment Tool (SWAT, Arnold et al. 1998) to predict how the changes in LULC, coupled with changes in precipitation and temperature (IPCC, 2007¹), affected river flow. The simulation

results showed that 1) river flow would decrease due to increasing evapotranspiration from elevated temperature despite that precipitation would increase; 2) the changing climate would play a more important role than LULC change in regulating hydrological cycles (i.e., evapotranspiration and river flow). The change in evapotranspiration would be negligible with the LULC change alone, while evapotranspiration would increase by 25.5% from 53.0 mm/month to 66.4 mm/month with changing LULC and climate. In terms of river flow, it would decrease by 1% with LULC alone, decrease by 2% with changing climate alone, and decrease by 2% from 1.06×10^8 to 1.04×10^8 m³/month with LULC and climate changes. The seemingly small 2% decrease of river flow could actually support 42% of the people's water use in the basin.

I then applied Sea Level Rise Affecting Marsh Model (SLAMM, version 6) (Park et al. 1986, Armentano et al. 1988, Clough et al. 2010) to simulate the impact of sea level rise on the distribution of the tidal marshes based on the changes of salinity gradients which were determined by sea levels and freshwater inputs. I considered A1B sea level rise scenarios (IPCC, 2007²). The regional subsidence rate I used was 0.34 mm/year (Keim et al. 2008). The historical trend of sea level rise was set to 1.8 mm/year according to Burdin (1990), and the horizontal marsh erosion rate was 3 m/yr based on the data at Grand Bay close by. I used the general vertical accretion rates (3.2 mm/year for salt marsh and brackish marsh and 4.0 mm/year for intertidal freshwater marsh). The SLAMM simulation results showed that the areas of the salt marshes would increase, while the areas of the brackish marshes and the tidal freshwater marshes would decrease generally. It seemed that the freshwater inputs could play a similarly important role as the sea level rise. The mean sea level rise with 33% freshwater reduction would bring a reduction of 6146 ha of brackish marsh and an increase of 3970 ha of salt marsh, and the maximum sea level rise with 2% reduction in freshwater inputs would result in a similarly reduction of 6389 ha of brackish marsh and a similarly increase of 3030 ha of salt marsh.

I also conducted a preliminary research on the changes of ecosystem services of the tidal marshes focusing on carbon sequestration rates. The analysis based on the carbon data in the Georgia marshes (Craft et al. 2009) showed that the increase in the carbon sequestration rates in the salt marshes cannot offset the decreases due to the loss of brackish and tidal freshwater marshes, so the overall carbon sequestration rates would decrease.

I finally examined the impact of spatial resolution of digital elevation data on the predictions of spatial distributions of tidal marshes. I have studied three different elevation maps with 30-meter (USGS), 10-meter (USGS) and 5-meter resolutions (LiDAR-derived) respectively. The use of higher resolution elevation data resulted in smaller areas of tidal freshwater marsh and brackish marsh compared to lower resolution elevation data in 2100. 10-meter resolution elevation data generated the smallest area of salt marshes and largest area of open water (inland and estuarine) while the LiDAR-derived elevation data generated largest area of salt marsh and second-to-largest open water area. Even though the spatial distribution of different types of tidal marshes were different among the three elevation map, the difference between the 30-meter and 10-meter resolution elevation maps was much smaller compared to LiDAR-derived elevation data.

This is a program development project without components of outreach.

Citation list is on file with MASGC and is available upon request.

Project Impacts: None for this reporting period.

MASGC Project # R/CCD-18-PD:

PI: Colette Boehm

Title: Charter Fishing Customer Profile Survey – Phase I.

Time Period of this project: 07/01/09 – 06/30/10

SMART Objectives:

By 2012, an analysis of for-hire fisheries clientele will result in the implementation of new marketing strategies to target underutilized marketing channels.

Accomplishments and outcomes from this project:

1. Online survey and PRIZM™ study are complete.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

The purpose of this project is to gather demographic and psychographic data on the current charter fishing customer. Major changes in both fishing regulations and in U.S. demographics and travel patterns are proving challenging for the Alabama Gulf Coast fishing fleet. Having a baseline of this type information can provide a crucial step toward the economic sustainability of this sector of the recreational fishing industry by providing insights for additional, targeted marketing efforts.

The first step in the project was the development of a database of current customers. To create this, the CVB gathered customer data from charter captains and booking agents, as well as tournament entrant data. This information was used in two ways:

- 1) An online survey was conducted to determine motivations, likes and dislikes of our current customers.
- 2) A PRIZM™ study was conducted to create a “profile” of current customers and identify geographic areas where similar customers live.

The combination of these two sets of data will be used to determine message and pinpoint marketing efforts to reach others with the same interests and profile.

Project Impacts: None for this reporting period.

MASGC Project # R/CEH-30-PD:

PI: Behzad Mortazavi

Title: Nitrogen Removal via Denitrification in Weeks Bay, AL.

Time Period of this project: 04/01/09 – 02/28/10

SMART Objectives:

By 2013, one new building project in Mississippi or Alabama will incorporate constructed marshes into their landscape design to serve as a natural filter of nitrogen contained in storm water.

Accomplishments and outcomes from this project:

1. Measured the benthic fluxes of nitrogen and phosphorus to the water column monthly during a year. Preliminary analyses indicate that the system is a minor sink for nitrogen through denitrification.
2. Through collaborative efforts with the Weeks Bay national estuarine research reserve staff we have determined the Net Ecosystem Metabolism for the system.
3. Several regional presentations have been made by Ashley Riggs (MS student at the University of Alabama) so far and a presentation at the Annual Meeting of the Ecological Society of America will be made in August of 2010.
4. Our goal was to use this proposal as a springboard for building long-term collaboration amongst researchers at University of Alabama and the Dauphin Island Sea Lab. We have established close collaborations with Drs Sponseller and Edmonds at UA and have submitted a proposal to examine nitrogen cycling in Alabama streams to the Alabama Water Resources Research Institute. This proposal was funded and allowed us to expand on geographic range for examining nitrogen cycling in Alabama waters. (Proposal title: Understanding the role of denitrification as a mechanism for nitrogen (N) removal along a river continuum in central Alabama, http://awrri.auburn.edu/grants/2009_Sponseller.pdf).

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

We received \$9,964 from SeaGrant. The goal of the proposed research was to better understand how ecological and biogeochemical processes in Alabama coastal ecosystems may act to reduce N delivered from upstream systems. Excess nitrogen input is recognized as the primary factor responsible for eutrophication (Mobile Bay National Estuary Program, 2008) and examining denitrification, a natural process that can remove this “pollutant” and reduce its impact on our coastal waters, is beneficial to our State. Ashley Riggs, a MS student in my group, has measured the benthic fluxes of nitrogen and phosphorus on a monthly time scale for a year during the lifespan of this grant. The data collected is being used for her thesis, which will be submitted to the University of Alabama in December of 2010. She has examined the contribution of denitrification in removal of nitrogen from Weeks Bay. Preliminary results suggest that denitrification in Weeks Bay is of minor importance and therefore controlling the input of nutrients and specifically nitrogen to the system will have to be carefully controlled. In addition, we have established a collaborative effort with the Weeks Bay managers and are using their monitoring data for determining gross primary production, ecosystem respiration and net ecosystem metabolism. Preliminary data shows that net ecosystem production is similar

to that determined for Weeks Bay by Caffrey (2004) for data collected during 1995-2000. Ashley Riggs' results have been presented at multiple regional meetings so far and will be presented in August of 2010 at the Annual Ecological Society of America meeting in Pittsburgh.

Caffrey, J. (2004) Factors Controlling Net Ecosystem Metabolism in U. S. Estuaries. *Estuaries*, Vol. 27, pp. 90-101.

Project Impacts: None for this reporting period.

MASGC Project # R/SP-21-PD:

PI: Kevin Dillon

Title: Characterizing individual and seasonal variation in tissue-specific C, N, and S stable isotope ratios of spotted sea trout, *Cynoscion nebulosus*, in support of proposals to use stable isotope data to quantify trophic pathways to sport fish.

Time Period of this project: 02/01/08 – 07/31/09

Accomplishments and outcomes from this project:

1. C and N isotope data for *Cynoscion nebulosus* from the proposed stations show that standard deviations of isotopic values for individuals collected at the same site were typically <0.5 per mil for C and between 0.02 and 1.1 per mil for N
2. The overall range between sites was 8 per mil for C (-16.4 to -24.4 per mil) and nearly 5 per mil for N (11.5 to 16.1 per mil).
3. Overall, the same samples did group well and evident trends are observed in both C and N isotopes from the upper to the lower estuary with a lower fish C value observed nearshore where terrestrial source inputs are high and a higher C value (less negative) measured in fish from Ship Island where marine derived organic matter should dominate C inputs.
4. Back Bay C isotope values ranged from -18.6 to -23.8 per mil for *C. nebulosus*, however this is known spawning area and the high range observed may be due to fish coming from the upper bay to spawn.
5. The East Ship Island site also showed higher variability in carbon isotopic values relative to most stations (-16.4 to -20.0) although this site was still clearly different in isotopic signature from other sites. Fish collected at Ship Island were all larger (range 1160 to 1500 g wet weight, average = 1340 ± 120, n=22) than all the fish collected at other sites (range 95 to 997 g WW, average = 355 ± 220 SD, n=126) and likely represents ontogenic migration of individuals from different inshore habitats.
6. The average stable C isotope values indicate that fish from East Ship Island showed the most reliance on marine carbon (87%).
7. Fish from most stations the lower bays and upper Mississippi Sound reflected between 54 - 78% marine carbon while fish from an upper Back Bay site showed the highest proportion of terrestrial carbon (64%).
8. The nitrogen data suggest that offshore (East Ship) population occupies a higher

- trophic level than fish collected in the Bays, particularly fish collected from Davis Bayou. Alternatively, all fish collected could occupy the same trophic level and the observed differences in N are a result of different nitrogen sources for primary producers found at the nearshore and offshore stations.
9. The stable isotopic signature of *C. nebulosus* liver samples was similar to results from white muscle for both $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$. The relationship between lipid-corrected $\delta^{13}\text{C}$ data from liver samples and data for muscle displayed a nearly 1:1 relationship. However, while $\delta^{15}\text{N}$ also showed a linear trend between liver and muscle, liver showed more of a depletion bias compared to muscle. This bias increased with overall enrichment of $\delta^{15}\text{N}$.
 10. Isotopic ratios of carbon for *C. nebulosus* in coastal Mississippi ranged from -26 to -16 per mil with an overall mean suggestive of a stronger influence of pelagic primary production on diet of *C. nebulosus* across sites. The least enriched samples were collected in small embayments and the most enriched were collected at the Barrier Islands.
 11. Nitrogen stable isotope ratios ranged from 11.3 to 16.1 per mil and there was a clear inshore to offshore pattern of enrichment as with carbon, which is consistent with increases in trophic level as fish increase in size and migrate offshore.
 12. There was much overlap of isotope signatures between sites but the separation of small embayments from the barrier islands was detectable for both carbon and nitrogen suggesting that the seasonal spatial pattern is robust to within site variability and occurs at a temporal scale larger than the tissue isotopic turnover rate.
 13. The results demonstrate the utility of stable isotope analysis for quantifying the trophic role of *C. nebulosus* in coastal Mississippi. Yet, they also demonstrate that this trophic role changes spatially, temporally, and ontogenetically in predictable ways that must be incorporated into ecosystem studies. The trophic role of *C. nebulosus* is not static but dependent on habitat and fish size. *Cynoscion nebulosus* are known to display minimal movement prior to maturation (Hendon et al. 2002), and this suggests that the observed patterns in trophic role are related more to habitat variability than opportunistic behavior.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

A total of 187 individual *C. nebulosus* were captured in 2007 and 2008 from ten sites (Figure 1, Table 1). All fish were captured between May and October with relatively even coverage across month with the exception of September, which yielded only 3 fish. Fish ranged in size from 212 to 622 mm TL but average TL by site was between 250-350 mm TL with the exception of fish collected near the Barrier Islands. The mean $\delta^{13}\text{C}$ across all sites was -21.4 with a standard deviation of 1.6 suggesting a general trend towards feeding on carbon sources of a marine origin. The system wide standard deviation was generally similar to the within-site standard deviation, but close to the within-site maximum. The mean $\delta^{15}\text{N}$ across all sites was 13.9 with a standard deviation of 1.1 suggesting *C. nebulosus* are feeding at a trophic level of 2-3. As with

$\delta^{13}\text{C}$ the overall standard deviation is within the range of within-site variability but towards the high end of the range.

Both isotopes examined showed a statistically significant trend across both sites ($\delta^{13}\text{C}$ ANOVA, $F_{9,161} = 2.61$, $p=0.008$; $\delta^{15}\text{N}$ $F_{9,161} = 3.44$, $p<0.0001$) and sample month ($\delta^{13}\text{C}$ ANOVA, $F_{5,161} = 7.35$, $p<0.0001$; $\delta^{15}\text{N}$ $F_{5,161} = 9.29$, $p<0.0001$). Post hoc analysis indicated a significant difference between marsh-associated sites such as Graveline, Davis bayou, Bayou Portage, and Dupont; and fish captured near the Barrier Islands (Figure 2a). There was considerable overlap between more open-water sites in Mississippi Sound (Bayou Caddy and Oyster Reefs), Marsh Lake, and Back Bay with both marsh-associated sites and Barrier Island sites, but the open-water sites were closer in isotopic signature to marsh associated sites. In terms of months, June, July, and August were statistically different from October but this difference was confounded with site differences as most fish captured in October were from the Barrier Islands (Figure 2b). There was also a small but significant linear trend in both $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ with fish size (Figure 3). The isotopic signature of *C. nebulosus* showed an inshore-to-offshore and summer to fall enrichment trend that is probably driven by fish migration offshore as they mature. Fish in the offshore zone in the fall are likely feeding at a higher trophic level on a diet more influenced by marine carbon sources such as phytoplankton.

The stable isotopic signature of *C. nebulosus* liver samples was similar to results from white muscle for both $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$. The relationship between lipid-corrected $\delta^{13}\text{C}$ data from liver samples and data for muscle displayed a nearly 1:1 relationship (Figure 4a). However, while $\delta^{15}\text{N}$ also showed a linear trend between liver and muscle, liver showed more of a depletion bias compared to muscle (Figure 4b). This bias increased with overall enrichment of $\delta^{15}\text{N}$.

Isotopic ratios of carbon for *C. nebulosus* in coastal Mississippi ranged from -26 to -16 per mil with an overall mean suggestive of a stronger influence of pelagic primary production on diet of *C. nebulosus* across sites. The least enriched samples were collected in small embayments and the most enriched were collected at the Barrier Islands. Nitrogen stable isotope ratios ranged from 11.3 to 16.1 per mil and there was a clear inshore to offshore pattern of enrichment as with carbon, which is consistent with increases in trophic level as fish increase in size and migrate offshore. There was much overlap between sites but the separation of small embayments from the barrier islands was detectable for both carbon and nitrogen suggesting that the seasonal spatial pattern is robust to within site variability and occurs at a temporal scale larger than the tissue isotopic turnover rate. A comprehensive understanding of *C. nebulosus* position in the coastal food web will require sampling over a broad spatial and temporal scale, but patterns are detectable so stable isotope data have utility for understanding trophic relationships in this species.

The focus of this study has been a comparison of spatial and temporal variability to individual variability to discern if relevant patterns are detectable. The results demonstrate the utility of stable isotope analysis for quantifying the trophic role of *C. nebulosus* in coastal Mississippi. Yet, they also demonstrate that this trophic role changes spatially, temporally, and ontogenetically in predictable ways that must be incorporated into ecosystem studies. The trophic role of *C. nebulosus* is not static but dependent on habitat and fish size. *C. nebulosus* are known to display minimal movement prior to maturation (Hendon et al. 2002), and this suggests that the observed

patterns in trophic role are related more to habitat variability than opportunistic behavior. Such distinctions are important for understanding the ecosystem role of a sportfish and further more comprehensive study is needed in order to understand the impact of habitat on *C. nebulosus* production in coastal Mississippi.

Project Impacts: None for this reporting period.

MASGC Project # R/MG/CSP-02-PD:

PI: Kimberlyn Prentice

Title: 2009 Community Hurricane Preparedness Fair.

Time Period of this project: 05/01/09 – 04/30/10

Accomplishments and outcomes from this project:

1. The event was scheduled, organized, advertised, and held as planned on May 30, 2009. The anticipated accomplishment was to disseminate emergency information to the greatest number of people possible in order to help the public prepare for the upcoming Hurricane Season. Fortunately, the 2009 season did not contain any devastating storms. Those who attended the fair had access to a wide variety of information relative to logistical preparation, safeguarding family information, contact information before, during, and after an event, and new insurance information.

Project Completion Report: A completion report is on file. The following is the Completion report summary of progress that was submitted to NIMS:

The 2009 Hurricane Preparedness Fair was planned for and held on May 30, 2009. The event was well-advertised and attended. Presentations were given by key officials on the regional and state levels regarding safety and ways to prepare for the Hurricane Season. The announcements for the event included a banner in the gateway marquee on Highway 90/Washington Avenue, mailouts, print media, and the use of five (5) billboards. In addition to presentations and educational booths, the event included the distribution of personal inventory software and flashdrives for emergency planning. Following the event, key staff in various public and private agencies assembled for a workshop to build communication and coordination efforts related to future hurricane seasons.

Project Impacts: None for this reporting period.

Open Program Development Projects for NA06OAR4170078

MASGC Project # R/CCD-11-PD

PI: Michael Robinson

Title: Gulf Coast Design and Development Lab.

Time Period of this project: 2/1/07 – 4/30/09

SMART Objectives:

By 2013, a minimum of two communities in Alabama or Mississippi will implement strategies leading to working waterfront access protection.

Accomplishments and outcomes from this project:

1. The Project Team prepared information for the Dauphin Island Strategic Plan submitted by Five E's Unlimited.
2. The Project Team attended all public meetings associated with the development of the Dauphin Island Strategic Plan.
3. The Project Team participated in the Dauphin Island Strategic Plan Charette as a team leader and as participants.
4. The Project Team helped prepare the strategic plan final document: "Final Report and First Five Years of Implementation Recommendations", October 15, 2007.
5. The Project Team research resilience along the Gulf Coast, and prepared papers and presented them at several conferences.
6. The Project Team began the first phase of the strategic plan implementation process with a study of the community's number one goal: "Expand commercial development to revitalize the Dauphin Island economy."
7. The Project Team attended and presented at several town meetings on commercial development of the "village business district."
8. The Principle Investigator offered three design studios in the landscape architecture program that focused on the development potential of the public beach area.
9. The project team developed a strategic resilience plan for Dauphin Island
10. Designed and layed-out a publication of all the work done under this grant including the final redevelopment plan.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts:

2009 Report

Themes: Coastal Communities and Economies, Urban Coast

Title: Planners, community members design town's growth

Statement: The development of Dauphin Island's long-term strategic plan was supported by MASGC. Implementation of the plan has led to the creation of new businesses on the east end of the island (general store and trolley), development of a central business district and working waterfront overlay zone.

MASGC Project # R/CEH-31-PD

PI: Hyun Jung Cho

Title: Habitat Suitability Index for Submerged Aquatic Vegetation of the Mississippi Coast.

Time Period of this project: 2/1/09 – 1/30/10

SMART Objectives:

By 2013, Mississippi Department of Marine Resources, the Nature Conservancy, and additional three fisheries/resource management/scientist groups will use the SAV Habitat Suitability Index model as one of their restoration and conservation planning tools.

Accomplishments and outcomes from this project:

This is a new project, no reports have been filed.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

MASGC Project # R/CCD-22-PD

PI: Roberta Arena Swann

Title: D'Olive Watershed Management Plan.

Time Period of this project: 12/1/09 – 11/30/10

SMART Objectives:

By 2013, a minimum of two communities in Alabama or Mississippi will implement strategies leading to working waterfront access protection.

Accomplishments and outcomes from this project:

This is a new project, no reports have been filed.

Project Completion Report: No completion report have been filed during this reporting period.

Project Impacts: None for this reporting period.

Omnibus Award

Institution/Grantee: University of Southern Mississippi/Mississippi-Alabama Sea Grant Consortium

Award Number: **NA10OAR4170078**

Time period: 02/01/10 - 01/31/14

Award Title: 2010-2013 Omnibus Program / Mississippi-Alabama Sea Grant Consortium.

Projects:

This award is new. No projects have submitted reports. The following is an outline of future reports expected for next period.

Ongoing Core Education and Outreach Projects for NA10OAR4170078

MASGC Project # A/O-32 (10-13):

PI: Dave Burrage

Title: Mississippi-Alabama Sea Grant Outreach Program.

Time Period of this project: 02/01/10 – 01/31/13

SMART Objectives:

- 1. By 2013, the Mississippi Coastal Restoration and Habitat Committee will enhance coastal restoration efforts through the sharing of knowledge regarding suitable project locations and alternative restoration techniques. Twenty-five acres of priority habitats will be restored.*
- 2. By 2013, over 10,000 linear feet of shoreline on public and private land in Mississippi and Alabama will be protected using alternative erosion control strategies.*
- 3. By 2013, 20,000 linear feet of stream banks on degraded waterways in Mississippi and Alabama will be restored to increase storm buffering capacity and ecosystem services. Stream restoration training will be given to 20 county planners and 50 natural resources managers.*
- 4. By 2013, ten homeowners will utilize living shoreline techniques to control erosion on their property, protecting a total of 30 acres of shoreline.*
- 6. By 2012, the number of oyster gardeners in Alabama will increase from 30 to 45 and annual production will be 10,000 oysters.*
- 7. By 2013, at least 70 property owners participating in water quality programming will adopt at least one new best management practice in order to conserve water and protect water quality as determined by three month follow-up surveys.*
- 1. By 2012, the state of Alabama will adopt two management techniques and/or incentive programs to protect working waterfront access for businesses, as recommended by the Alabama Waterfront Access Study Committee.*

3. By 2011, three tools identified on the “Accessing the Alabama and Mississippi Coast” website, which provides just-in-time educational information to stakeholders regarding coastal access options, will be adopted by local governments, private landowners, or coastal user.

1. By 2013, a streamlined permitting process for homeowners who choose a more sustainable shoreline protection alternative structure will be created. Homeowners will be aware that all projects are site-specific and that living shorelines might not be the best erosion control alternative based on economics, ecological sustainability, or site suitability.

2. By 2011, at least five marinas in Alabama and Mississippi will meet established best management practices necessary to join the Clean Marina program.

1. By 2011, at least 50 area decision makers will become familiar with smart growth practices outlined by the State of Alabama’s Non-point Education for Municipal Officials (NEMO) program guidelines. By the end of NEMO workshops, 40 attendees will have increased their knowledge of nonpoint source pollution issues and smart growth practices as measured by pre/post testing.

1. By 2013, two start-up nature tourism businesses will be created in coastal Alabama or Mississippi through technical support and training in science and business.

2. Four existing nature tourism businesses will each increase their profitability by \$2,500 annually during the 2010-2013 time frames due to Sea Grant technical support.

3. By 2013, a MASGC-supported reporting system will allow municipalities and counties on the Alabama and Mississippi Gulf Coasts to annually track the economic impact of nature tourism.

1. By 2012, three bait dealers in Mississippi and/or Alabama will report an increase of 100 shrimp per delivery surviving to be sold live.

1. Shrimpers in Mississippi and Alabama will save \$100,000 in operating costs during the 2010-2013 time frame through 1) the use of fuel-saving gear, 2) better use of BRDs and TEDs, 3) more efficient use of catch preservatives, and 4) increased knowledge of and compliance with state and federal fishery management regulations.

1. Annually during 2010-2013, employees from 15 seafood processing plants will become Hazard Analysis Critical Control Point (HACCP) certified leading to a savings of \$1,000 per plant. 2. By 2013, 300 new and existing seafood processing plant employees will improve their knowledge, skills and abilities about sanitation control procedures.

1. During 2010-2013, more than 3,000 constituents will each incorporate/adopt at least five new fishing techniques or management guidelines in their operations.

1. By 2013, 5,000 people will access information through MASGC outreach and education programs on seafood nutrition and sustainable fishing practices, and 250 of them will apply the information to their seafood purchases.

2. By 2013, four city or county attorneys in Mississippi and/or Alabama will have completed a disaster audit to improve coastal hazard resiliency.

3. After participating in Legal Program Continuing Legal Education short courses on flood insurance during 2010-2013, 13 of 60 attendees will apply their new knowledge of laws and regulations governing coastal floodplain development, developing case law and innovative policies to improve coastal resiliency.

2. *By 2012, two new scholastic aquaculture/aquascience programs will be initiated in middle or high schools in Alabama and/or Mississippi, which will report 10 participating students continuing their education beyond their senior year.*

8. *By 2013, over 100,000 Mississippi and Alabama residents will increase their understanding of coastal and marine resource issues. As a result, 25,000 will adopt at least one new practice leading to improved stewardship of the coastal environment.*

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # E/O-79 (10-13):

PI: Chris Snyder

Title: Educational Efforts at the Scott Marine Education Center, the Dauphin Island Sea Lab, and the Environmental Studies Center.

Time Period of this project: 02/01/10 – 01/31/13

SMART Objectives:

1. *By 2013, at least 40,000 young and adult learners will benefit from their educators' increased content knowledge in the four focus areas, and 180 scientists will gain an enhanced understanding of how children learn through workshops and institutes that emphasize the focus areas.*

2. *During 2010-2013, at least 150 educators who attend content knowledge workshops will teach content derived from Sea Grant's focus areas.*

3. *During 2010-2013, approximately 50,000 pages will be downloaded from the COSEE:CGOM Web site, and 20 revised and/or new lesson plans relevant to the four focus areas will be placed on the site annually*

4. *During 2010-2013, pre-college students will enhance their environmental literacy while participating in inquiry-based educational programs and field trips in the three MASGC Informal Education Centers, and participation in the programs will increase by 12 additional groups annually from a 2008 baseline of 268 groups (61-MEC, 102-ESC, and 105-DISL).*

5. *During 2010-2013, public visitation will increase by 300 guests annually at the three MASGC Informal Education Centers, with a 2008 baseline of approximately 4,000 at the MEC, 71,000 at the DISL, and 5,000 at the ESC.*

6. *From 2010 through 2013, one hundred and fifty additional underserved and underrepresented students and teachers will participate in all Sea Grant educational activities/programs, going from a baseline of 400 to 550.*

7. *Three external (non-NOAA) and two internal (NOAA) new education collaborations will be developed collectively during 2010 through 2013 by the three MASGC Informal Education Centers.*

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

Open Core Omnibus Research Projects for NA10OAR4170078

MASGC Project # R/CCD-19:

PI: Robert Kroger

Title: Decreasing Nitrate-N Loads to Coastal Ecosystems with Innovative Drainage Management Strategies in Agricultural Landscapes.

Time Period of this project: 02/01/10 – 01/31/12

SMART Objectives:

By 2013, 5000 acres of agricultural production in the Mississippi Delta will have controlled drainage structures implemented in primary aquatic systems adjacent to the agricultural landscape.

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/CCD-20:

PI: Kevin Dillon

Title: Characterizing Stormwater Nitrogen Inputs To Mississippi's Coastal Waters: A Landscape Approach.

Time Period of this project: 02/01/10 – 01/31/12

SMART Objectives:

By 2013, two state or local agencies in Mississippi will use newly developed isotope analysis of nitrogen loading estimates from stormwater runoff and wet deposition (rainfall) for planning purposes.

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/CCD-21:

PI: Latif Kalin

Title: Identifying Flood Generating Areas in 8-Mile Creek Watershed through a Novel Approach.

Time Period of this project: 02/01/10 – 01/31/12

SMART Objectives:

By 2013, the City of Prichard Planning and Zoning Board will utilize HEC-HMS watershed model to implement new planning ordinances within the 8-Mile Creek Watershed in Mobile County, Alabama.

By 2013, 20 people will use HEC-HMS watershed model as a tool to assess areas suitable for development in a way that minimizes impacts of flooding.

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/CEH-32:

PI: Hugh MacIntyre

Title: Residence Time as a Factor Controlling HABs and Fecal Coliform Bacteria in Little Lagoon, AL.

Time Period of this project: 02/01/10 – 01/31/12

SMART Objectives:

By 2013, representatives of local sewage utilities, agricultural extension service and managers from the city of Gulf Shores, Alabama will be able to identify the most probable sources of nutrients and fecal coliform bacteria in Little Lagoon in Baldwin County, Alabama.

By 2013, an integrated model of residence time and water quality in Little Lagoon will be used by representatives of Alabama Departments of Environmental Management and Conservation and Natural Resources to formulate management decisions.

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/SP-23:

PI: William Walton

Title: Oyster Farming in Alabama: Identifying Most Viable Practices.

Time Period of this project: 02/01/10 – 01/31/12

SMART Objectives:

By 2013, at least two shellfish farmers each with annual minimum gross sales of \$25,000 will be established in coastal Alabama.

By 2013, at least 200 individuals will be able to identify at least three differences between coastal shellfish aquaculture and other forms of aquaculture.

Accomplishments and outcomes from this project:

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/GOMR-04:

PI: Stephanie Showalter

Title: Implications of Takings Law on Innovative Planning for Sea Level Rise in the Gulf of Mexico.

Time Period of this project: 02/01/10 – 01/31/12

SMART Objectives:

By 2013, 175 local attorneys, planners, and officials along the Gulf Coast will have received a minimum of 525 hours of continuing education credit on the current state of regulatory takings doctrine and its impact on innovative planning for sea level rise.

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

Open Program Development Projects for NA10OAR4170078

MASGC Project # R/CEH-33-PD:

PI: Mark Peterson

Title: Fish and invertebrate community structure and food-web dynamics in tidal creeks in an anthropogenically fragmented, coastal landscape.

Time Period of this project: 5/10/10 – 4/30/11

SMART Objectives:

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/CCD-23-PD:

PI: Bret Webb

Title: Improving Wave Height Prediction During Barrier Island Overtopping.

Time Period of this project: 8/01/10 – 7/31/11

SMART Objectives:

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

Open Sea Grant Aquaculture Program Projects for NA10OAR4170078

MASGC Project # A/O-34:

PI: William Walton

Title: Sea Grant Aquaculture Extension 2010: Farming the Fertile Crescent: Intensification of Oyster Culture in the Northern Gulf of Mexico.

Time Period of this project: 10/01/10 – 09/30/13

SMART Objectives:

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/AT-10:

PI: Covadonga Arias

Title: Sea Grant Aquaculture Research Program 2010: Eliminating Human-pathogenic *Vibrio vulnificus* from Gulf Coast Oysters with High Salinity Depuration.

Time Period of this project: 10/01/10 – 09/30/12

SMART Objectives:

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

MASGC Project # R/SP-24:

PI: Reginald Blaylock

Title: Sea Grant Aquaculture Research Program 2010: An Engineered Multi-Trophic Approach to Minimizing Effluent Impacts from Marine Recirculating Aquaculture Systems.

Time Period of this project: 10/01/10 – 09/30/12

SMART Objectives:

Accomplishments and outcomes from this project:

Project Completion Report:

Project Impacts:

Mini-Grant Programs for NA10OAR4170078

MASGC Project # A/O-33:

PI: Tracie Sempier

Title: 2010-2013 NOAA Coastal Storms Program for the Gulf of Mexico Region (CSP II).

Time Period of this project: 08/01/10 – 07/31/11

This project is a continued effort from a previous award. [Click here to report of previous work related to this project.](#)

Note that there will be reports for the mini-grants associated with this project as well as a management report from continued efforts.

There will be a management project number and there will be sub-award reports for this project.

SMART Objectives:

- 1. Annually, beginning in 2011, 100 state and local emergency managers, floodplain managers and other public hazard personnel working in the coastal areas of the five Gulf States will obtain storm information through customized Web portals and social-networking sites.*
 - 2. By 2011, 15 coastal communities in Alabama, Mississippi and Louisiana will identify weaknesses in their resilience by completing the Coastal Community Resilience Index.*
 - 3. By 2012, two coastal communities in Mississippi or Alabama will incorporate sea level rise data into their comprehensive and/or hazard mitigation plans.*
- Accomplishments and outcomes from this project:*

Project Completion Report:

Project Impacts:

MASGC Project # R/MG/BR-15M

Title: Mini-Grant Program: Enhancing Bottlenose Dolphin Conservation in the Southeast United States: Research on Human-Dolphin Interactions.

Time Period of this project: 09/01/10 - 08/31/11

Note that there will be reports for the mini-grants associated with this project.

There will be a management project number and there will be sub-award reports for this project.

- II. Program Metrics:
 A. Management Metrics:
 a. Staff Composition

FTEs (Full Time Employees = 12 man months) Devoted to Sea Grant			
Sea Grant Staffing	# of Individuals	# of FTEs funded by Sea Grant \$	# of FTEs funded by Non-Sea Grant \$ (including match)
Administrative	5	2.99	0.48
Communications	2	2.00	0
Extension	20	3.21	5.77
Education	12	1.66	1.73
Research (PIs, co-PIs, Students--not including Fellowships)	110	17.32	9.03
TOTAL	149	27.18	17.01

- a. Management team

Mgmt. Team Member	Position	FTEs devoted to Sea Grant
LaDon Swann	Director	0.60
Stephen Sempier	Deputy Director	1.00
Loretta Leist	Research Coordinator	1.00
Devaney Cheramie	Fiscal Officer	0.75
Melissa Schneider	Communications Coordinator	1.00
Tracie Sempier	Coastal Storms Program Coordinator	1.00
David Burrage	MS Extension Program Leader	0.90
Jody Thompson	AL Extension Program Leader	0.33
Stephanie Showalter	Legal Program and Asst. Dir. Outreach	0.15
Niki Pace	Research Council, Legal Program	1.00
Sharon Walker	Director of Education	0.20
Kay Bruening	Executive Support Associate	1.00

Program Development Projects

Project Title	PI	Federal Funds	Matching Funds
R/MG/CSP-02-PD 2009 Community Hurricane Preparedness Fair	Kimberlyn Prentice, City of Ocean Springs	\$5,920	\$5,550
R/CCD-18-PD Charter Fishing Customer Profile Survey – Phase I	Colette Boehm Alabama Gulf Coast Convention & Visitors Bureau	\$8,500	\$0
R/CEH-30-PD Nitrogen Removal via Denitrification in Weeks Bay, AL	Behzad Mortazavi University of Alabama	\$9,964	\$5,472
R/CEH-31-PD Habitat Suitability Index for Submerged Aquatic Vegetation of the Mississippi Coast	Huyn Jung Cho Jackson State University	\$51,862	\$23,682
R/CCD-22-PD D'Olive Watershed Management Plan	Roberta Arena Swann Mobile Bay National Estuary Program	\$17,250	\$8,625

Leveraged Funds

Leveraged Funds chart reported

	Number or Amount	
Leveraged Funds (managed by SG)	\$173,827.00	Publications and Misc. Income - \$506 CSP - DMR - \$54,121 NOAA - Office of Educ - BWET - \$99,200 NOAA -CSP -Social Networking Site - \$20,000
Leveraged Funds (influenced by SG)	\$1,777,579.00	
Volunteer Hours	5849	

Leveraged Funds Managed by MASGC

Purpose/Project ID	Source	Amount Managed
MASGC - Publication Sales	Various Publication Sales	\$ 206
MASGC	HRCC Annual Meeting	\$ 300
A/O-31 Coastal Storms Program	MS Dept of Marine Resources - GOM	\$ 54,121
A/O-31 Coastal Storms Program (Buck Sutter)	NOAA	\$ 20,000
E/O -76 B-WET	NOAA Office of Education	\$ 99,200
	TOTAL	\$ 173,827

Leveraged Funds Influenced by MASGC

Purpose/Project ID	Source	Amount Influenced
O-1 MASGC Outreach/Extension Program - Joanne McDonough	AL Gulf Coast Convention & Visitors Bureau	\$ 5,000
O-1 MASGC Outreach/Extension Program - Peter Nguyen	Peter Nguyen salary	\$ 38,400
O-1 MASGC Outreach/Extension Program - Christian Miller	Mobile Bay NEP	\$ 12,500

Leveraged Funds Influenced by MASGC Continued

Purpose/Project ID	Source	Amount Influenced
O-1 MASGC Outreach/Extension Program	USDA - MS Master Naturalist Program	\$ 5,000
O-1 MASGC Outreach/Extension Program	Center For Urban Rural Interface Studies	\$ 37,579
O-1 MASGC Outreach/Extension Program	Maine SG	\$ 2,640
L-4 Legal Program - Stephanie Showalter	UM Law School	\$ 8,000
EOE Engagement pilot - Nutrient/Hypoxia (Stacy Ray)	NOAA- Office of Education	\$ 146,912
EOE Engagement pilot- Climate Resiliency (Matthew Capps)	NOAA- Office of Education	\$ 146,912
EOE Engagement pilot- Communications (LaDonna Hinesley)	NOAA- Office of Education	\$ 146,912
EOE Engagement pilot - GulfQuest Education Director	NOAA- Office of Education	\$ 58,764
ED-12 Education Program	NOAA - Office of Education	\$ 150,000
E/O -76 B-WET Program @ MEC - 1 year	NOAA Office of Education	\$ 150,000
Support for Regional Competition (GOM Regional Research Initiative)	EPA	\$ 100,000
Support for Regional Competition (GOM Regional Research Initiative)	NGI	\$ 75,000
A/O-31 Coastal Storms Program (Tracie Sempier)	EPA - GOM	\$ 299,619
R/MG/CSP-06 - CSP Project (Emily Sommer) Three Television Programs on Storm Resiliency for Alabama/Mississippi Gulf Coast	WKRG/City of Orange Beach	\$ 62,725

Leveraged Funds Influenced by MASGC Continued

Purpose/Project ID	Source	Amount Influenced
R/MG/CSP-10 - CSP Project (Charlene LeBleu) Enhancement of Bioretention to Promote Civic Hydrology and Sustainability for Coastal Cities through Innovative Planning, Design, and Engineering of Stormwater Management, Utilization and Control.	CADC Seed grant	\$ 2,000
R/MG/CSP-04 - CSP Project (John Hosey) Faith Community Preparedness and Resilience Project	Sponsors and Fees	\$ 13,891
R/MG/CSP-04 - CSP Project (John Hosey) Faith Community Preparedness and Resilience Project	Community Grant	\$ 10,000
R/CEH-28 Omnibus Research Project (Ruth Carmichael) Use of stable isotope ratios to link wastewater sources to effects on shellfish and human health	USFDA	\$ 175,000
R/CEH-28 Omnibus Research Project (Ruth Carmichael) Use of stable isotope ratios to link wastewater sources to effects on shellfish and human health	USA - Tuition Waiver	\$ 5,500
R/CEH-28 Omnibus Research Project (Ruth Carmichael) Use of stable isotope ratios to link wastewater sources to effects on shellfish and human health	DISL	\$ 10,000

Leveraged Funds Influenced by MASGC Continued

Purpose/Project ID	Source	Amount Influenced
R/SP-18 Omnibus Research Project (Eric Hoffmayer) Use of passive acoustics to identify and characterize spotted seatrout spawning habitat in two Mississippi estuaries	MS Tideland Trust	\$ 99,725
R/SP-19 Omnibus Research Project (R. Douglass Watson) The Crustacean Molt-Inhibiting Hormone Receptor and Induction of Molting in Blue Crabs (<i>Callinectes sapidus</i>)	UAB	\$ 3,000
	TOTAL	\$ 1,777,579

List of Partnerships

Federal

1. Apalachicola National Estuarine Research Reserve
2. Barataria-Terrebonne National Estuary Program
3. Federal Emergency Management Agency
4. Grand Bay National Estuarine Research Reserve
5. Minerals Management Service
6. Mobile Bay National Estuary Program
7. NASA Stennis Space Center
8. National Parks Service, Gulf Islands National Seashore
9. National Sea Grant Office
10. NOAA
11. NOAA Aquaculture Program
12. NOAA Coastal Services Center
13. NOAA Coastal Storms Program
14. NOAA EOE Engagement Pilot Program
15. NOAA Fisheries Office of Protected Species, Dolphin SMART Program
16. NOAA Fisheries Southeast Science Center
17. NOAA Gulf of Mexico Regional Team
18. NOAA MEXUS-Gulf Program
19. NOAA National Marine Fisheries Service, Pascagoula Office
20. NOAA National Weather Service
21. NOAA Office of Coastal and Resource Management
22. NOAA Office of Education
23. Rookery Bay National Estuarine Research Reserve [FL]
24. The Assembly of Sea Grant Extension Program Leaders
25. U.S. Air Force Hurricane Hunters
26. U.S. Army Corps of Engineers
27. U.S. Coast Guard Marine Safety Office, Mobile, Alabama
28. U.S. Department of Agriculture, Natural Resources Conservation Service
29. U.S. Environmental Protection Agency
30. U.S. Fish and Wildlife Service
31. U.S. Food and Drug Administration Gulf Coast Seafood Laboratory
32. U.S. Geological Survey, Center for Coastal and Watershed Studies
33. U.S. Senator Jeff Session's (AL) Office
34. U.S. Senator Richard Shelby's (AL) Office
35. Weeks Bay National Estuarine Research Reserve

Regional

36. Coast Transit Authority
37. Coastal Hazards Outreach Strategy Team (CHOST)
38. COSEE - Central Gulf of Mexico, University of Southern Mississippi
39. Gulf Coast Services Center
40. Gulf of Mexico Alliance
41. Gulf of Mexico Fishery Management Council

42. Gulf of Mexico Ocean Observing System (GCOOS)
43. Gulf of Mexico Program
44. Gulf States Marine Fisheries Commission
45. NOAA Gulf of Mexico Regional Collaboration Team
46. Northern Gulf Institute
47. Southern Shrimp Alliance

Local & State

State

48. Alabama Association of State Floodplain Managers
49. Alabama Coastal Management Program
50. Alabama Cooperative Extension System
51. Alabama Department of Conservation and Natural Resources, Coastal Programs
52. Alabama Department of Conservation and Natural Resources, Division of Wildlife & Fisheries
53. Alabama Department of Conservation and Natural Resources, Marine Resource Division
54. Alabama Department of Conservation and Natural Resources, State Lands Division
55. Alabama Department of Education
56. Alabama Department of Environmental Management
57. Alabama State Docks
58. Alabama Working Waterfront Coalition
59. Florida Department of Environmental Protection, Florida Coastal Management Program
60. Florida Department of Health
61. Florida Fish & Wildlife Research Institute
62. Geologic Survey of Alabama
63. GulfQuest, National Maritime Museum of the Gulf of Mexico [AL]
64. Louisiana Coastal Protection and Restoration Authority, Office of Coastal Protection and Restoration
65. Louisiana Department of Natural Resources, Coastal Restoration
66. Louisiana Governor's Office of Homeland Security and Emergency Preparedness
67. Mississippi Department of Education
68. Mississippi Department of Environmental Quality
69. Mississippi Department of Insurance
70. Mississippi Department of Marine Resources
71. Mississippi Department of Marine Resources, Coastal Programs
72. Mississippi Department of Marine Resources, Fisheries
73. Mississippi Department of Marine Resources, Grand Bay NERR
74. Mississippi Department of Transportation
75. Mississippi Emergency Management Agency
76. Texas Commission on Environmental Quality
77. Texas General Land Office
78. Texas Parks and Wildlife Department

Local & State

Local

79. Baldwin County Board of Education
80. Baldwin County Emergency Management
81. Bayou LaBatre Municipal Wastewater Treatment Facility [AL]
82. City of Bay St. Louis [MS]
83. City of Biloxi [MS]
84. City of D'Iberville [MS]
85. City of Fairhope [AL]
86. City of Gautier [MS]
87. City of Gulf Shores [AL]
88. City of Long Beach [MS]
89. City of Lucedale [MS]
90. City of Mobile, Mayors Office [AL]
91. City of Moss Point [MS]
92. City of Ocean Springs [MS]
93. City of Orange Beach [AL]
94. City of Pascagoula [MS]
95. City of Pass Christian, [MS]
96. City of Picayune [MS]
97. City of Poplarville [MS]
98. City of Waveland [MS]
99. City of Wiggins [MS]
100. Clifton C. Williams Wastewater Treatment Facility [AL]
101. Dauphin Island Municipal Wastewater Treatment Facility [AL]
102. Fairhope Municipal Wastewater Treatment Facility [AL]
103. George County [MS]
104. Grand Bayou [LA]
105. Hancock County [MS]
106. Harrison County [MS]
107. Harrison County Soil and Water Conservation District
108. Jackson County [MS]
109. Jackson County Emergency Management
110. Jackson County Harbor Master
111. Mobile Area Water and Sewer System [AL]
112. Mobile County Board of Education
113. Okaloosa County Environmental Council [FL]
114. Pearl River County [MS]
115. South Mississippi Environmental & Agricultural Coordination Organization (SMEACO)
116. Stone County [MS]
117. Town of Bayou La Batre [AL]
118. Town of Dauphin Island [AL]

Non-Governmental Organizations

119. Alabama Math Science Technology Initiative
120. American Red Cross

121. American Red Cross, South Central Mississippi Chapter
122. Audubon Bird Sanctuary, Dauphin Island, AL
123. Chicago Zoological Society
124. Choctawhatchee Audubon Society, Niceville, FL
125. Choctawhatchee Basin Alliance, Mattie Kelly Environmental Institution
126. Coastal Family Health, Children's Health Fund
127. Dauphin Island Chamber of Commerce
128. Dauphin Island Parks and Beach Board/Fort Gaines [AL]
129. Dolphin Ecology Project
130. Emerald Coast Wildlife Refuge, Destin, FL
131. Extension Disaster Education Network
132. Friends of Bon Secour National Wildlife Refuge
133. Foundations for the Mid South
134. Gulf of Mexico States Accord
135. GulfQuest
136. Interfaith Disaster Task Force
137. Islands of Perdido Foundation
138. Memorial Behavioral Health
139. Mississippi Charter Boat Captains Association
140. Mississippi Coastal Conservation Association
141. National Alliance of Vietnamese American Service Agencies
142. National Maritime Museum of the Gulf of Mexico
143. Pascagoula River Audubon Center
144. SmartHome Alabama
145. South Mississippi Voluntary Organization Active in Disasters (SM-VOAD)
146. Southern Regional Educational Service Agency
147. The Gulf and South Atlantic Fisheries Foundation, Inc.
148. The Nature Conservancy
149. The Ocean Conservancy
150. United Jewish Communities
151. Whale and Dolphin Conservation Society

International

152. Centro de Investigación y Estudios Avanzados Unidad Mérida (CINVESTAV)
153. Instituto de Ecología A.C. (INECOL)

Industry/Business

154. Alabama Fish Farming Center, Greensboro, AL
155. Alabama Gulf Coast Convention & Visitor's Bureau
156. Alabama Inland Shrimp Producers Association, AL
157. Ameripure Processing Company, Franklin, LA
158. Barge, Waggoner, Sumner & Cannon, Inc. [AL]
159. Bayou La Batre Chamber of Commerce
160. BioHelix Corporation, Beverly, MA
161. Blueurchin Consulting
162. Bosarge Boats & Dockside Seafood

163. Category X Coastal COnsulting
164. Claude Peteet Mariculture Center, Gulf Shores, AL
165. Coast Electric Power Association
166. Coastal Designs, Inc.
167. Computer Sciences Corporation
168. Distinctive Products, Inc.
169. Distinctive Properties
170. Distraction Fishing Charters, Orange Beach, AL.
171. Downtown Mobile Alliance [AL]
172. Gollott and Sons Seafood
173. grassroots, Inc.
174. Greene Prairie Aquafarm, Boligee, AL
175. Laura Bowie COnsulting
176. LGL Ecological Research Associates
177. Mississippi Gulf Fishing Banks, Inc.
178. Mobile Area Chamber of Commerce [AL]
179. New Florida Girl Fishing Charters, Destin, FL.
180. Odom's Fish Farm, Eutaw, AL
181. Organized Seafood Association of Alabama
182. Piedmont Green Building Solutions [AL]
183. Roll-A-Way
184. Schneider Insurance Company
185. Simpson Strong-Tie
186. Smart Coast
187. Southern Mississippi Planning and Development District
188. Southeast Engineering Consultants, Inc.
189. WKRK (Channel 5, Mobile, AL)

Academic Institutions

School Systems

190. Baldwin County School System (AL) Sea, Sand & Stars Science and Nature Center
191. Biloxi Public School District
192. Mobile County Public School System [AL]
193. Ocean Springs School District

Secondary Schools

194. Blackburn Middle School
195. Navarre High School, Marine Science Center [FL]
196. Oneonta High School [AL]

Universities

197. Auburn Marine and Extension Research Center
198. Auburn University
199. Dauphin Island Sea Lab
200. Gadsden State Community College
201. Harte Research Institute for Gulf of Mexico Studies

202. Louisiana State University
203. Mississippi State University
204. Northwest Florida State College, Niceville, FL.
205. St. Stanislaus College
206. Texas A&M University at Corpus Christi
207. The University of Alabama
208. The University of Alabama at Birmingham
209. The University of Mississippi
210. The University of Southern Mississippi
211. University of Central Florida
212. University of New Orleans
213. University of South Alabama
214. University of West Florida

Sea Grant Programs

215. Florida Sea Grant
216. Georgia Sea Grant
217. Hawaii Sea Grant
218. Louisiana Sea Grant
219. Minnesota Sea Grant
220. North Carolina Sea Grant
221. South Carolina Sea Grant
222. Texas Sea Grant Program
223. Wisconsin Sea Grant

Awards and Honors

Awards

1. The Environmental Studies Center's Sea Grant-sponsored program, Project SEA ICE, has been selected as an award winner in the Environmental Education Association of Alabama's (EEAA) 2010 Best Environmental Education Programs in Alabama (BEEP) Awards. [ED-12, David Lloyd Scott]
2. The Dauphin Island Strategic Plan project was one of three finalists for the International Association of Public Participation (IAP2) Project of the Year Award (2008) [R/CCD-10-PD, Jeffery Collier]
3. Kay Bruening won the Outstanding Staff Award from The University of Southern Mississippi Gulf Coast for her role in providing support to the university. This award goes to employees of the university for an exceptional commitment to teamwork; possess a superior commitment to continuous quality improvement; and make contributions beyond those expected and required. [M/PA-1, Kay Bruening]

Honors

4. Environmental Education Association of Alabama - Best Environmental Course or Curriculum, Desiree Bishop, January 24, 2010. [ED-12, Desiree Bishop]
5. Assisted with a Science Project for a St. Patrick Catholic High School Student Steven Denning. Biloxi, Mississippi. His project "Can Oysters Save the Coast" won first place at local, regional and state Science and Engineering Fairs. [O-1, Steven Denning]
6. Assisted with a Science Project for a St. Patrick Catholic High School Student Steven Denning. Biloxi, Mississippi. His project "Can Oysters Save the Coast" won the Mississippi Department of Marine Resources, Excellence in Marine Environmental Science Award. February, 2009. [O-1, Steven Denning]
7. Invited presentation at B-WET National Conference: J.A. Kastler, S. Walker. 2009. Shifting Baselines, Watershed Connections to Landscape Change: A Learning Community Centered on Meaningful Watershed Educational Experiences. Oral Presentation highlighting map use, at B-WET Conference Washington, DC, July 14-16, 2009. [E/O-76, Jessica Kastler]
8. Michael Stieber, a graduate student in the history department at the University of South Alabama and an archaeologist for the University of South Alabama's Center for Archeological Studies, was awarded

the Chad Smith Student Travel Grant worth \$310 for his presentation at the North American Society for Oceanic History, Steamship Historical Society of America and National Maritime Historical Society's Annual Conference, which took place May 13-17 in Vallejo, Calif. His presentation was titled, "Using Oral Histories of Waterfront-Related Pursuits in Bayou La Batre, Alabama, to Explain the Declining Industry." [R/CCD-16-PD Michael Stieber]

9. 22nd Annual National Environmental Law Moot Court Competition top 9 of 84 teams.
Ole Miss Environmental Law Moot Court team with David Case. The team performed exceptionally well, and made it all the way to the semi-finals. [L-4, Stephanie Showalter]

Nominations

10. Nominated for Peabody Award [R/MG/CSP-06, Emily Sommer]
11. Nominated for Media Award – Association of State Flood Plain Managers [R/MG/CSP-06, Emily Sommer]

Output Metrics:

Focus Area Metrics

Number or Amount

Cumulative Clean Marina Program -- Certifications	5*
HACCP -- Number of people with new certifications	19**
Acres of degraded ecosystems restored as a result of Sea Grant activities	3.7‡
Resource managers who use ecosystem-based approaches in the management of land, water, and living resources in ocean, coastal and Great Lakes areas as a result of Sea Grant activities	2‡‡

*Reported by: Christian Miller (O-1)

**Reported by: Bob Becker (O-1)

‡Reported by: PJ Waters for oyster reef restoration and the grasses to classes work (O-1)

‡‡Reported by: Matthew Bethel (R/MG/CSP-08)

Communication Metrics

Publications were counted and automatically input by the National Sea Grant Library. A list will be provided at a later date.

Extension and Legal Events

Meetings, workshops and events details

Project and PI or Program	Number of Events	Number of Participants
R/MG/CSP-08 Ousley	1	25
R/MG/CSP-02-PD Prentice	1	75
R/CSP/MG-04Hosey	6	871
CSP Management	4	150
Legal Program	1	22
Education Program	12	246
Extension Program	26	777
TOTAL	51	2166

Presentations details

Program	Number of Events	Number of Participants
Jessica Kastler (E/O-76, B-WET Program)	3	330
Steve Sempier (M/GOMR-1, Regional)	3	120
Tracie Sempier (A/O-31, CSP)	17	712
Stephanie (L-4, Legal)	3	165
Education Program	22	855
Extension Program	36	2020
sub total	84	4202
extension presentations by researchers	16	587
TOTAL	100	4789

NIMS entry table:

	Number or Amount
SG-Sponsored/Organized Meetings, Workshops and Conferences	51
Attendees in SG Meetings/Workshops	2166
Public or Professional Presentations	100
Attendees at Public or Professional Presentations	4877

Education Metrics

K-16

	# of New Students	
Total K-12 Students Reached through Educators	7420	
Total Number of Curricula Developed	43	

Students Supported

Category	# of new students	# of continuing students	# of Degrees Awarded
Knauss Fellowship	1		
Industry Fellowship	0	0	
NMFS/SG Fellowship	0	0	
State Fellowship	0	0	
Sea Grant Supported MS/MA/JD Graduate Students	8	7	3
Sea Grant Supported PhD Graduate Students	6	3	0
TOTAL	15	10	3

Omnibus Research Metrics

Metrics for 2009 Research Competition: This chart includes relevant data from the regional research initiative competition.

Stage	Number of Proposals	Number of Institutions Involved	Number from Home Institution
Pre-Proposals Submitted	52	34	16
Full-Proposals Submitted	19	19	6
Proposals Funded	7	12	2

Performance Measures

The following is the uncondensed Performance Measures as reported to MASGC by project. To see a copy of the final data that was submitted to NSGO [click here](#).

Economic (market and non-market) benefits derived from projects

2/1/2009 - 1/31/10 Actual

Project and PI	Type of Report	Economic Benefit	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/ Licenses
R/SP-20 Davis	Progress	MASGC sponsored research on acclimation techniques and temperature tolerances of Pacific white shrimp has Improved survival at harvest. An increase in production of 300 lbs / acre (industry wide average of 2700 lbs/ acre to 3000 lbs/ acre) due to better survival has an estimated value of \$84,000 dollars (80 acres * 300 lbs/ acre*3.50 lb).	\$84,000	0	4	0	10	0

Economic 2/1/2009 - 1/31/10 Actual Continued

Project and PI	Type of Report	Economic Benefit	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/ Licenses
Extension	Ongoing	New greenhouses for Monroe County (AL) High School	\$2,700					
Extension	Ongoing	Energy-efficient trawl gear	\$45,000					
Total			131700	0	4	0	10	0

Economic Continued
2/1/10 - 1/31/11 Anticipated

Project and PI	Type of Report	Economic Benefit	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/ Licenses
CSP-03 Fannin	Progress	Interest Expenses saved by Tangipahoa Parish Govt.	\$1,300,000	0	0	0	0	0
R/SP-20 Davis	Progress	Further MASGC sponsored research is expected to continue to improve survival and production of Pacific white shrimp reared in inland saline waters of west Alabama from 3000 lbs/acre to 3500 lbs/acre. If production can improve by 500 lbs / acre in the next year it would be an estimated value of \$140,000 (80 acres * 500 lbs /acre * \$3.50 / lb)	\$140,000	0	4	0	10	0
Total			1440000		4		10	

Focus Area: Healthy Coastal Ecosystems

Number of tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management.

Project number and PI	Type of Report	Tool, Technology, or Information Service	2009 Actual (2/1/2009 - 1/31/2010)		2010 Anticipated (2/1/2010 - 1/31/2011)	
			Developed	Used	Developed	Used
CSP-08 Bethel	Progress	Traditional Ecological Knowledge-based mapping products	Y	N	Y	Y
CSP-08 Bethel	Progress	Integrated Marsh Vulnerability Restoration Decision-Support GIS	Y	N	Y	Y
CSP-10 LeBleu	Progress	Green Streets/ Green Infrastructure Toolbox	Y	N	N	Y
CSP-03 Fannin	Progress	Financial Health Model for Local Governments	Y	N		Y
CEH-27 Cherry	Progress	Large- Scale Disturbance Effects Accretion Model (Developed in 2009; refined during, and use anticipated in, 2010)	Y	N	Y	Y
CEH-27 Cherry	Progress	Marsh Wrack Fire Hazard Plan (Developed 2009 through 2010; anticipated use in 2010)	Y	N	Y	Y
R/SP-18 Hoffmayer	Completion	Grand Bay and Biloxi Bay Benthic Habitat Maps	Y	N		

Focus Area: Healthy Coastal Ecosystems – Tool, technologies... Continued

Project number and PI	Type of Report	Tool, Technology, or Information Service	2009 Actual (2/1/2009 - 1/31/2010)		2010 Anticipated (2/1/2010 - 1/31/2011)	
			Developed	Used	Developed	Used
R/SP-18 Hoffmayer	Completion	Spotted Seatrout Spawning Habitat Maps	Y	N		
R/CEH-28 Carmichael	Completion	Refined understanding of indicator function and use for MSB, FC, and SI indicators separately and in tandem; in particular use of alternative and standard indicators together for ecological and human health risk detection and determination of how seasonal conditions, proximity, and WTP processing alters indicator functions. We provide two primary tools/services; Data on wastewater indicator function: 1) for a combination of multiple indicators at different temporal and spatial scales, and 2) under different WTP processing conditions. Outputs are currently used by USFDA and DISL/USA.	Y	Y		Y
R/CCD-15-PD Wu	Completion	Predicted maps of coastal wetlands in lower Pacagoula River Basin using best available information including LiDAR-derived elevation data and local vertical accretion rates determined by fallout radionuclides (⁷ Be, ¹³⁷ Cs and ²¹⁰ Pb) under different scenarios of accelerated sea level rise and climate change by 2100.	Y	N	N	Y

Focus Area: Healthy Coastal Ecosystems – Tool, technologies... Continued

Project number and PI	Type of Report	Tool, Technology, or Information Service	2009 Actual (2/1/2009 - 1/31/2010)		2010 Anticipated (2/1/2010 - 1/31/2011)	
			Developed	Used	Developed	Used
R/MG/CSP-07 Wu	Progress	Predicted maps of tidal marshes based on the most accurate LiDAR-derived elevation data and local accretion rates determined by by fallout radionuclides (⁷ Be, ¹³⁷ Cs and ²¹⁰ Pb) under different scenarios of climate change, upland land use/land cover change and accelerated sea level rise by 2100.	Y	N	N	Y
R/MG/CSP-07 Wu	Progress	Predicted maps of storm surge under current and predicted future scenarios of spatial distribution of tidal marshes by 2100.	N	N	Y	Y
R/MG/BR-01A Shippee (Dolphin)	Progress	Assessment methods for determining depredation events and fisheries interactions by bottlenose dolphins with deep-sea sport fishing activities	Y	Y	Y	Y
R/GOMR-1 S. Sempier	Ongoing	Gulf of Mexico Research Plan	Y	Y	Y	Y
Extension	Ongoing	Electronic logbooks for Gulf shrimpers	N	Y	N	Y

Summary:

Actual (02/1/09 – 1/31/10) number of tools, technologies, information services that are used: 4

Anticipated (02/1/10 – 1/31/11) number of tools, technologies, information services that are used: 13

Focus Area: Hazard Resilience in Coastal Communities

Number of Resiliency Training and/or Technical Assistance Provided and Coastal Community Hazard Resiliency Improved

Project and PI	Completion or Progress Report	Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
				2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
R/CCD-11-PD Robinson	Progress	Dauphin Island, AL	Mobile County	3		Y	Y
R/MG/CSP-07 Wu	Progress	Gautier, MS	Jackson County	0	1	N	Y
CSP-08 Bethel	Progress	Grand Bayou, LA	Plaquemines Parish	1	1	N	Y
CSP-09 Ousley	Progress	Lucedale, MS	George County	1	1+	N	Y
CSP-09 Ousley	Progress	Wiggins, MS	Stone County	1	1+	N	Y
CSP-09 Ousley	Progress	Poplarville, MS	Pearl River County	1	1+	N	Y
CSP-09 Ousley	Progress	Picayune, MS	Pearl River County	1	1+	N	Y

Focus Area: Hazard Resilience in Coastal Communities... Continued

Project and PI	Completion or Progress Report	Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
				2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
CSP-04 Hosey	Completion	MS Gulf Coast	Harrison County Jackson County Hancock County	20	4	Y	Y
CSP-05 Edwards	Progress	Southeastern LA	Southeastern Louisiana Parishes: Washington Parish Tangipahoa Parish St. Tammany Parish St. John the Baptist Parish Orleans Parish St. Charles Parish Jefferson Parish St. Bernard Parish Plaquemines Parish	0	1		

Focus Area: Hazard Resilience in Coastal Communities... Continued

Project and PI	Completion or Progress Report	Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
				2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
CSP-05 Edwards	Progress	State of LA	Louisiana Coastal Parishes: Plaquemines Parish St. Bernard Parish Orleans Parish Jefferson Parish St. Charles Parish St. John the Baptist Parish St. Tammany Parish Washington Parish Tangipahoa Parish Cameron Parish Vermilion Parish Iberia Parish St. Mary Parish Terrebonne Parish LaFourche Parish	0	1		

Focus Area: Hazard Resilience in Coastal Communities... Continued

Project and PI	Completion or Progress Report	Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
				2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
CSP-11 Price	Progress	Waveland/Bay St. Louis, MS	Hancock County	1	2	N	
CSP-11 Price	Progress	Pass Christian/Long Beach/Gulfport/Biloxi, MS	Harrison County	1	2	N	
CSP-11 Price	Progress	Ocean Springs/Moss Point/Pascagoula, MS	Jackson County	1	2	N	
CSP-03 Fannin	Progress	Tangipahoa Parish, LA	Tangipahoa Parish	1	1	N	Y
CSP T. Sempier	Ongoing	BiloxiMS	Harrison County	2	2	N	Y
CSP T. Sempier	Ongoing	Cameron Parish, LA	Cameron Parish	1	1	N	Y
CSP T. Sempier	Ongoing	Orange Beach, AL	Baldwin County	1	1	N	Y
CSP T. Sempier	Ongoing	Pascagoula, MS	Jackson County	2	3	N	Y
CSP T. Sempier	Ongoing	Pass Christian, MS	Harrison County	2	2	N	Y
CSP T. Sempier	Ongoing	Cedar Key, FL	Levy County	1	1	N	Y

Focus Area: Hazard Resilience in Coastal Communities... Continued

Project and PI	Completion or Progress Report	Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
				2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
CSP T. Sempier	Ongoing	Marco Island, FL	Collier County	1	1	N	Y
CSP T. Sempier	Ongoing	Sarasota, FL	Sarasota County	1	1	N	Y
CSP T. Sempier	Ongoing	Town of Ft. Myers Beach, FL	Lee County	1	1	N	Y
CSP T. Sempier	Ongoing	Steinhatchee, FL	Taylor County	1	1	N	Y
CSP T. Sempier	Ongoing	Millville, FL	Bay County	1	1	N	Y
CSP T. Sempier	Ongoing	Ocean Springs, MS	Jackson	1	1	N	Y
CSP T. Sempier	Ongoing	Bay St Louis, MS	Hancock County	1	1	N	
CSP T. Sempier	Ongoing	D'Iberville, MS	Harrison County	1	1	N	
CSP T. Sempier	Ongoing	Gautier, MS	Jackson County	1	1	N	
CSP T. Sempier	Ongoing	Gulfport, MS	Harrison County	1	1	N	

Focus Area: Hazard Resilience in Coastal Communities... Continued

Project and PI	Completion or Progress Report	Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
				2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
CSP T. Sempier	Ongoing	Long Beach, MS	Harrison County	1	1	N	
CSP T. Sempier	Ongoing	Waveland, MS	Hancock County	1	1	N	

Summary (as submitted in NSGO table, note that the numbers are not the same due to the re-organization of the final table as instructed by NSGO to properly count the number of trainings organized by county):

Actual (02/1/09 – 1/31/10) number of communities that have adopted or implemented hazard resiliency practices: 4

Anticipated (02/1/10 – 1/31/11) number of communities that have adopted or implemented hazard resiliency practices: 23

Focus Area Safe and Sustainable Seafood Supply

Number of fishers, consumers and seafood industry stakeholders who modify their practices using knowledge gained in fisheries sustainability, seafood safety, and the health benefits of seafood.

Number of partners modifying practices

Project and PI	Type of Report	2009 Actual # 2/1/2009- 1/31/2010	2010 Anticipated # 2/1/2010- 1/31/2011	Comments
R/SP-20 Davis	Progress	8	15	Shrimp farmers in west Alabama and Texas have modified their stocking and acclimation techniques based on information obtained in this proposal. It is anticipated that further refinement of acclimation techniques will occur in the final year of this project and as results are disseminated shrimp producers in other states (Texas, Florida, South Carolina, etc) will also benefit.
R/CEH-28 Carmichael	Completion	2	0	Outputs are currently used by USFDA and DISL/USA. Many more endusers will adapt and apply project outputs as data are shared through manuscripts publication in next one to two years.
R/MG/BR-01A Shippee (Dolphin)	Progress	5	7	Sport fishing operators that have learned about dolphins from this research and understand the benefits of these animals as a resource to their customers; as societal and as ecotourism values

Focus Area Safe and Sustainable Seafood Supply, Number of partners... Continued

Project and PI	Type of Report	2009 Actual # 2/1/2009- 1/31/2010	2010 Anticipated # 2/1/2010- 1/31/2011	Comments
R/AT-9-PD Bej	Completion	0	2	The private biotechnology company, <i>BioHelix, Corp.</i> , Beverly, MA (www.BioHelix.com) and AmeriPure Oysters, Franklin Louisiana are expected to evaluate the methodology for adoption.
Total		15	24	

Number of fishers/partners using new techniques

Project and PI	Type of Report	2009 Actual # 2/1/2009- 1/31/2010	2010 Anticipated # 2/1/2010- 1/31/2011	Comments
R/MG/BR-01A Shippee (Dolphin)	Progress	5	10	Following completion of final analysis; expect that results will convince many sport anglers to adopt suggested practices to avoid conflicts with bottlenose dolphins when fishing.
Extension	Ongoing	11	20	Energy efficient trawl gear
Total		16	30	

Focus Area: Sustainable Coastal Development

Number of communities that have adopted or implemented sustainable development practices and policies

Project: R/CCD-11-PD Robinson (Progress)

2/1/2009 - 1/31/10 Actual: 1 community

1. Dauphin Island, AL

Comments:

2/1/10 - 1/31/11 Anticipated: 0

Comments:

Project: R/CCD-15-PD Wu (Completion)

2/1/2009 - 1/31/10 Actual: 0

Comments:

2/1/10 - 1/31/11 Anticipated: 1 community

1. Pascagoula, MS

Comments: Will deliver the predicted maps of upland land use/land cover and tidal wetlands under accelerated sea level rise and climate change to the land managers to assist their decision making in land planning

Project R/MG/CSP-07 Wu (Progress)

2/1/2009 - 1/31/10 Actual: 0

Comments:

2/1/10 - 1/31/11 Anticipated: 2 communities

1. Pascagoula, MS
2. Gautier, MS

Comments: It is anticipated that the predicted maps of spatial distribution of tidal marshes and storm surge will be used by the city and state governments to facilitate their decision making in land planning, flood-zone management and emergency/hazard response through meetings and outreach workshops. The specific target communities for the delivery and applications of the products are Cities of Pascagoula and Gautier in the lower Pascagoula River Basin.

Project R/MG/CSP-08 Bethel (Progress)

2/1/2009 - 1/31/10 Actual: 0

Comments:

2/1/10 - 1/31/11 Anticipated: 1 community

1. Grand Bayou, LA

Comments:

R/MG/CSP-10 LeBleu (Progress)

2/1/2009 - 1/31/10 Actual: 0

Comments:

2/1/10 - 1/31/11 Anticipated: 1 community

1. Mobile, AL

Comments:

A/O-31 CSP Management T. Sempier (Ongoing)

2/1/2009 - 1/31/10 Actual: 2 communities

1. Fairhope, AL
2. Daphne, AL

Comments: resilient home build completed through SmartHome Alabama project

2/1/10 - 1/31/11 Anticipated: 2 communities

1. Unknown, AL
2. Unknown, AL

Comments: not sure which communities will be next but anticipate SmartHome Alabama project will do an additional 2 communities

O-1 Extension Program, Working Waterfront Plan/ Alabama Waterfront Access, Jody Thompson (Ongoing)

2/1/2009 - 1/31/10 Actual: 0

Comments:

2/1/10 - 1/31/11 Anticipated: 2 communities

1. Unknown, AL (Mobile County)
2. Unknown, AL (Baldwin County)

Comments: Working Waterfront Plan/ Alabama Waterfront Access. Potential candidates are Dauphin Island, AL and either Orange Beach, AL or Gulf Shores, AL

Summary:

2/1/2009 - 1/31/10 Actual: 3

1. Dauphin Island, AL
2. Fairhope, AL
3. Daphne, AL

2/1/10 - 1/31/11 Anticipated: 9

1. Pascagoula, MS
2. Pascagoula, MS
3. Gautier, MS
4. Grand Bayou, LA
5. Mobile, AL
6. Unknown, AL
7. Unknown, AL
8. Unknown, AL (Mobile County)
9. Unknown, AL (Baldwin County)

Focus Area: Healthy Coastal Ecosystems

Number of coastal communities that have restored degraded ecosystems as a result of Sea Grant activities.

Project: R/MG/CSP-08 Bethel (Progress)

2/1/2009 - 1/31/10 Actual: 0

Comments:

2/1/10 - 1/31/11 Anticipated: 1

1. Grand Bayou, LA

Comments:

O-1 Extension Program, (Ongoing)

2/1/2009 - 1/31/10 Actual: 3 communities

1. Weeks Bay Reserve, AL
2. Mobile County
3. Baldwin County

Comments:

2/1/10 - 1/31/11 Anticipated: 6 communities

1. Pritchard, AL
2. Chickasaw, AL
3. Mobile, AL
4. Mobile County, AL
5. Baldwin County, AL
6. Jackson County, AL

Comments:

Summary:

2/1/2009 - 1/31/10 Actual: 3

1. Weeks Bay Reserve, AL
2. Mobile County
3. Baldwin County

2/1/10 - 1/31/11 Anticipated: 7

10. Grand Bayou, LA
11. Pritchard, AL
12. Chickasaw, AL
13. Mobile, AL
14. Mobile County, AL
15. Baldwin County, AL
16. Jackson County, AL

This section is an exact copy of what was submitted by email to NOAA for the annual report. The information is the same as above, this serves as a record of what the final file looked like.

National Performance Measures Totals

Focus Area	Performance Measures		2009 Actual (\$/)\$ - 2/1/2009- 1/31/2010	2010 Anticipated (\$/)\$ - 2/1/2010- 1/31/2011	Program Comments
ALL	<u>(1) Economic (market and non-market) benefits derived from Sea Grant activities</u>	Economic benefit	\$131,700	\$1,440,000	
		Businesses created	0	0	
		Businesses retained	4	4	
		Jobs created	0	0	
		Jobs retained	10	10	
		Patents/Licenses	0	0	

National Performance Measures Totals Continued

Focus Area	Performance Measures		2009 Actual (#/\$) - 2/1/2009- 1/31/2010	2010 Anticipated (#/\$) - 2/1/2010- 1/31/2011	Program Comments
HCE	(2) <u>Number of tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management</u>		4	13	
HRCC	(3) <u>Number of coastal communities that have adopted or implemented hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events</u>		4	23	

National Performance Measures Totals Continued

Focus Area	Performance Measures		2009 Actual (#/\$) - 2/1/2009- 1/31/2010	2010 Anticipated (#/\$) - 2/1/2010- 1/31/2011	Program Comments
SSSS	(4) Number of fishers, consumers and seafood industry stakeholders who modify their practices using knowledge gained in fisheries sustainability, seafood safety, and the health benefits of seafood	Number of stakeholders modifying practices	15	24	Projects/Pis: R/SP-20, Davis (Actual: 8, Anticipated: 15) R/CEH-28, Carmichael (Actual:2, Anticipated: 0) R/MG/BR-01A, Shippee (Actual: 5, Anticipated: 7) R/AT-9-PD (Actual: 0, Anticipated: 2)

National Performance Measures Totals Continued

Focus Area	Performance Measures		2009 Actual (#/\$) - 2/1/2009- 1/31/2010	2010 Anticipated (#/\$) - 2/1/2010- 1/31/2011	Program Comments
SSSS	(4) Number of fishers, consumers and seafood industry stakeholders who modify their practices using knowledge gained in fisheries sustainability, seafood safety, and the health benefits of seafood	Number of fishers using new techniques	16	30	Projects/Pis: R/MG/BR-01A, Shippee (Actual: 5, Anticipated: 7) O-1, Program Extension (Actual: 0, Anticipated: 2)

National Performance Measures Totals Continued

Focus Area	Performance Measures		2009 Actual (#/\$) - 2/1/2009- 1/31/2010	2010 Anticipated (#/\$) - 2/1/2010- 1/31/2011	Program Comments
SCD	(5) Number of coastal communities that have adopted or implemented sustainable (economic and environmental) development practices and policies (e.g., land-use planning, working waterfronts, energy efficiency, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities		3	9	<p>Actual:</p> <ol style="list-style-type: none"> 1. Town of Dauphin Island, AL (Project R/CCD-11-PD, Robinson) 2. City of Fairhope, AL (CSP Project, T. Sempier) 3. Daphne, AL (CSP Project, T. Sempier) <p>Anticipated:</p> <ol style="list-style-type: none"> 1. City of Pascagoula, MS (Project R/CCD-15-PD, Wu) 2. City of Pascagoula, MS (Project CSP-07, Wu) 3. City of Gautier, MS (Project CSP-07, Wu) 4. City of Grand Bayou, LA (Project CSP-08, Bethel) 5. Mobile, AL (Project CSP-10, LeBleu) 6. Unknown at this date (CSP Project, T. Sempier) 7. Unknown at this date (CSP Project, T. Sempier) 8. Unknown at this date community from from Baldwin County, AL from AL Working Waterfront Access Plan, (Project O-1, MASGC Extension) 9. Unknown at this date community from from Mobile County, AL from AL Working Waterfront Access Plan, (Project O-1, MASGC Extension)

National Performance Measures Totals Continued

Focus Area	Performance Measures		2009 Actual (#/\$) - 2/1/2009- 1/31/2010	2010 Anticipated (#/\$) - 2/1/2010- 1/31/2011	Program Comments
HCE	(6) Number of coastal communities that have restored degraded ecosystems as a result of Sea Grant activities		3	7	<p>Actual:</p> <ol style="list-style-type: none"> 1. Weeks Bay Reserve, AL (Project O-1, MASGC Extension, grasses to classes) 2. Mobile County oyster reefs, AL (Project O-1, MASGC Extension) 3. Baldwin County oyster reefs, AL (Project O-1, MASGC Extension) <p>Anticipated:</p> <ol style="list-style-type: none"> 1. Grand Bayou, LA (Project CSP-08, Bethel) 2. Community of Pritchard (Project O-1, MASGC Extension) 3. Community of Chickasaw (Project O-1, MASGC Extension) 4. City of Mobile (Project O-1, MASGC Extension) 5. City of Moss Point, MS in Jackson County (Project O-1, MASGC Extension) 6. Mobile County oyster reefs, AL (Project O-1, MASGC Extension) 7. Baldwin County oyster reefs, AL (Project O-1, MASGC Extension)

(1) Economic (market and non-market) benefits derived from Sea Grant activities

Economic Benefit	2009 Actual (2/1/2009 - 1/31/2010)						2010 Anticipated (2/1/2010 - 1/31/2011)					
	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/Licenses	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/Licenses
MASGC sponsored research on acclimation techniques and temperature tolerances of Pacific white shrimp has Improved survival at harvest. An increase in production of 300 lbs / acre (industry wide average of 2700 lbs/ acre to 3000 lbs/ acre) due to better survival has an estimated value of \$84,000 dollars (80 acres * 300 lbs/ acre*3.50 lb). (R/SP-20, Davis)	84000		4		10							

(1) Economic benefits Continued

Economic Benefit	2009 Actual (2/1/2009 - 1/31/2010)						2010 Anticipated (2/1/2010 - 1/31/2011)					
	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/Licenses	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/Licenses
New greenhouses for Monroe County (AL) High School, MASGC was instrumental in obtaining donation of greenhouses for use by school district, creating savings for County (O-1, MASGC Extension)	2700											
Energy-efficient trawl gear (O-1, Extension, Burrage)	45,000											
Interest Expenses saved by Tangipahoa Parish Government (CSP-03, Fannin)							1300000					

(1) Economic benefits Continued

Economic Benefit	2009 Actual (2/1/2009 - 1/31/2010)						2010 Anticipated (2/1/2010 - 1/31/2011)					
	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	Patents/Li censes	Economic benefit (\$)	Businesses created	Businesses retained	Jobs created	Jobs retained	
Further MASGC sponsored research is expected to continue to improve survival and production of Pacific white shrimp reared in inland saline waters of west Alabama from 3000 lbs/acre to 3500 lbs/acre. If production can improve by 500 lbs / acre in the next year it would be an estimated value of \$140,000 (80 acres * 500 lbs /acre * \$3.50 / lb)							140000		4		10	

(2) Tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management.

Tool, Technology, or Information Service	2009 Actual (2/1/2009 - 1/31/2010)		2010 Anticipated (2/1/2010 - 1/31/2011)	
	Developed	Used	Developed	Used
Traditional Ecological Knowledge-based mapping products (CSP-08, Bethel)	Y	N	Y	Y
Integrated Marsh Vulnerability Restoration Decision-Support GIS (CSP-08, Bethel)	Y	N	Y	Y
Green Streets/ Green Infrastructure Toolbox (CSP-10, LeBleu)	Y	N	N	Y
Financial Health Model for Local Governments (CSP-03, Fannin)	Y	N		Y
Large- Scale Disturbance Effects Accretion Model (Developed in 2009; refined during, and use anticipated in, 2010) (CEH-27, Cherry)	Y	N	Y	Y
Marsh Wrack Fire Hazard Plan (Developed 2009 through 2010; anticipated use in 2010) (CEH-27, Cherry)	Y	N	Y	Y
Grand Bay and Biloxi Bay Benthic Habitat Maps (R/SP-18, Hoffmayer)	Y	N		
Spotted Seatrout Spawning Habitat Maps (R/SP-18, Hoffmayer)	Y	N		
Refined understanding of indicator function and use for MSB, FC, and SI indicators separately and in tandem; in particular use of alternative and standard indicators together for ecological and human health risk detection and determination of how seasonal conditions, proximity, and WTP processing alters indicator functions. We provide two primary tools/services; Data on wastewater indicator function: 1) for a combination of multiple indicators at different temporal and spatial scales, and 2) under different WTP processing conditions. Outputs are currently used by USFDA and DISL/USA. (R/CEH-28, Carmichael)	Y	Y		Y
Predicted maps of coastal wetlands in lower Pacagoula River Basin using best available information including LiDAR-derived elevation data and local vertical accretion rates determined by fallout radionuclides (7Be, 137Cs and 210Pb) under different scenarios of accelerated sea level rise and climate change by 2100. (CCD-15, Wu)	Y	N	N	Y

(2) Tools, technologies,... Continued

Tool, Technology, or Information Service	2009 Actual (2/1/2009 - 1/31/2010)		2010 Anticipated (2/1/2010 - 1/31/2011)	
	Developed	Used	Developed	Used
Predicted maps of tidal marshes based on the most accurate LiDAR-derived elevation data and local accretion rates determined by by fallout radionuclides (7Be, 137Cs and 210Pb) under different scenarios of climate change, upland land use/land cover change and accelerated sea level rise by 2100. (CSP-07, Wu)	Y	N	N	Y
Predicted maps of storm surge under current and predicted future scenarios of spatial distribution of tidal marshes by 2100. (CSP-07, Wu)	N	N	Y	Y
Assessment methods for determining depredation events and fisheries interactions by bottlenose dolphins with deep-sea sport fishing activities	Y	Y	Y	Y
Gulf of Mexico Research Plan	Y	Y	Y	Y
Electronic logbooks for Gulf shrimpers	N	Y	N	Y

(3) Coastal communities (and counties) that have adopted or implemented hazard resiliency practices

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
EXAMPLE: Ocean City, MD	Worcester County	1	3	N	Y
City of Orange Beach, AL 1. Resiliency Index Pilot, Project CSP (T. Sempier)	Baldwin County, AL	1	1	N	Y
Millville, FL 1. Resiliency Index Pilot, Project CSP (T. Sempier)	Bay County, FL	1	1	N	Y
Cameron Parish, LA 1. State of Louisiana (Project CSP-05, Edwards) 2. Resiliency Index Pilot, Project CSP (T. Sempier)	Cameron Parish, LA	1	2	N	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
Marco Island, FL 1. Resiliency Index Pilot, Project CSP (T. Sempier)	Collier County, FL	1	1	N	Y
Town of Lucedale, MS 1. Project CSP-09 (Ousley)	George County, MS	1	1	N	Y
Hancock County, MS 1. MS Gulf Coast (Project CSP-04, Hosey)	Hancock County, MS	7	2	Y	Y
City of Waveland, MS 1. Project CSP-11 (Price) 2. CSP CHOST (T. Sempier)	Hancock County, MS	2	3	N	
City of Bay St. Louis, MS 1. Project CSP-11 (Price) 2. CSP CHOST (T. Sempier)	Hancock County, MS	2	3	N	
Harrison County, MS 1. MS Gulf Coast (Project CSP-04, Hosey)	Harrison County, MS	6	1	Y	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
City of Long Beach, MS 1. Project CSP-11 (Price) 2. CSP CHOST (T. Sempier)	Harrison County, MS	2	3	N	
City of Gulfport, MS 1. Project CSP-11 (Price) 2. CSP CHOST (T. Sempier)	Harrison County, MS	2	3	N	
City of Biloxi, MS 1. Project CSP-11 (Price) 2. CHOST, Project CSP (T. Sempier) 3. Resiliency Index Pilot, Project CSP (T. Sempier)	Harrison County, MS	3	4	N	Y
City of Pass Christian, MS 1. Project CSP-11, (Price) 2. CSP CHOST, (T. Sempier) 3. CSP Resilience Index Pilot, (T. Sempier)	Harrison County, MS	3	4	N	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
City of D'Iberville, MS 1. CSP CHOST (T. Sempier)	Harrison County, MS	1	1	N	
Iberia Parish, LA 1. State of Louisiana Project CSP-05 (Edwads)	Iberia Parish, LA	0	1		
City of Gautier, MS 1. CSP CHOST (T. Sempier) 2. Project CSP-07 (Wu)	Jackson County, MS	1	2	N	Y
Jackson County, MS 1. MS Gulf Coast (Project CSP-04, Hosey)	Jackson County, MS	7	1	Y	Y
Moss Point, MS 1. Project CSP-11 (Price)	Jackson County, MS	1	2	N	
City of Pascagoula, MS 1. Project CSP-11 (Price) 2. Project R/CCD-15 (Wu) 3. CSP CHOST (T. Sempier) 4. CSP Resilience Index Pilot (T. Sempier)	Jackson County, MS	3	6	N	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
City of Ocean Springs, MS 1. CSP Resilience Index Pilot (T. Sempier) 2. CSP CHOST (T. Sempier) 3. Project CSP-02-PD (Prentice) 4. Project CSP-11 (Price)	Jackson County, MS	3	3	N	Y
Jefferson Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	Jefferson Parish, LA	0	2		
LaFourche Parish, LA 1. State of Louisiana Project CSP-05 (Edwads)	LaFourche Parish, LA	0	1		
Town of Ft. Myers Beach, FL 1. CSP Resilience Index Pilot (T. Sempier)	Lee County, FL	1	1	N	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
Cedar Key, FL 1. CSP Resilience Index Pilot (T. Sempier)	Levy County, FL	1	1	N	Y
Town of Dauphin Island, AL 1. Project R/CCD-11-PD (Robinson)	Mobile County, AL	3		Y	Y
Orleans Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	Orleans Parish , LA	0	2		
Town of Poplarville, MS 1. Project CSP-09 (Ousley)	Pearl River County, MS	1	1	N	Y
City of Picayune, MS 1. Project CSP-09 (Ousley)	Pearl River County, MS	1	1	N	Y
City of Grand Bayou, LA 1. Project CSP-08 (Bethel)	Plaquemines Parish, LA	1	1	N	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
Plaquemines Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	Plaquemines Parish, LA	0	2		
City of Sarasota, FL 1. CSP Resilience Index Pilot (T. Sempier)	Sarasota County, FL	1	1	N	Y
St. Bernard Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	St. Bernard Parish, LA	0	2		
St. Charles Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	St. Charles Parish, LA	0	2		

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
St. John the Baptist Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	St. John the Baptist Parish, LA	0	2		
St. Mary Parish, LA 1. State of Louisiana Project CSP-05 (Edwads)	St. Mary Parish, LA	0	1		
St. Tammany Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	St. Tammany Parish, LA	0	2		
Town of Wiggins, MS 1. Project CSP-09 (Ousley)	Stone County, MS	1	1	N	Y

(3) Coastal communities (and counties)... Continued

Name of Coastal Community	County of the coastal Community	Number of Resiliency Training/Tech Assistance provided		Community hazard resiliency improved (e.g., changes in zoning ordinances)? (Y/N)	
		2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)	2009 Actual (2/1/2009 - 1/31/2010)	2010 Anticipated (2/1/2010 - 1/31/2011)
Tangipahoa Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads) 3. Project CSP-03, Fannin	Tangipahoa Parish, LA	1	3	N	Y
Steinhatchee, FL 1. CSP Resilience Index Pilot (T. Sempier)	Taylor County, FL	1	1	N	Y
Terrebonne Parish 1. State of Louisiana Project CSP-05 (Edwads)	Terrebonne Parish, LA	0	1		
Vermilion Parish 1. State of Louisiana Project CSP-05 (Edwads)	Vermilion Parish, LA	0	1		
Washington Parish, LA 1. Southeastern Louisiana Project CSP-05 (Edwads) 2. State of Louisiana Project CSP-05 (Edwads)	Washington Parish, LA	0	2		

III. Impacts Summary:

Impacts

New 2010 Impacts

Program-Level Impacts:

Impact 1

FOCUS AREA: Programmatic Impact

GOAL: Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

PERFORMANCE MEASURE: Number of extramural dollars applied to research and outreach that addresses Gulf of Mexico regional priorities.

TITLE: Gulf of Mexico Research Plan guides regional research initiative

RELEVANCE: The four Gulf of Mexico Sea Grant College programs coordinated the development of the Gulf of Mexico Research Plan (GMRP), which is a regional plan to identify, prioritize and address research needs. No current plan existed, and this plan bridges the gap between national research planning and local research plans. The plan helps groups mobilize to address regional needs through collaborative RFPs and partnerships.

RESPONSE: The GMRP effort included an examination of more than 100 existing strategic plans, administration of a survey that had more than 1,200 responses and development of five regional workshops. More than 200 organizations participated in the process. A Planning and Review Council guides this effort.

RESULTS: Several groups that fund research in the Gulf of Mexico developed a joint RFP to address priorities identified in the GMRP. The regional research initiative partners (Environmental Protection Agency Gulf of Mexico Program, NOAA's Northern Gulf Institute, Texas Sea Grant, Louisiana Sea Grant, Mississippi-Alabama Sea Grant Consortium, Florida Sea Grant) supported approximately \$1.4 million in research and outreach that addressed the GMRP-identified theme: Sea level change, subsidence and storm surge.

RECAP: Through cooperating with partners across the Gulf of Mexico, the Gulf Sea Grant Programs successfully developed the Gulf of Mexico Research Plan and began addressing the research needs identified in the plan.

Impact 2

FOCUS AREA: Programmatic Impact

GOAL: Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

PERFORMANCE MEASURE: Number of extramural dollars applied to research and outreach that addresses Gulf of Mexico regional priorities

TITLE: Gulf of Mexico Research Plan referenced as a key document for addressing regional needs

RELEVANCE: The four Gulf of Mexico Sea Grant College programs coordinated the development of the Gulf of Mexico Research Plan (GMRP), which is a regional plan to

identify, prioritize and address research needs. No current plan existed, and this plan bridges the gap between national research planning and local research plans. The plan helps groups mobilize to address regional needs through collaborative RFPs and partnerships.

RESPONSE: The GMRP effort included an examination of more than 100 existing strategic plans, administration of a survey that had more than 1,200 responses and development of five regional workshops. More than 200 organizations participated in the process. A Planning and Review Council guided this effort.

RESULTS: Due to the success of the GMRP including active engagement with groups across the region the Gulf of Mexico Research Plan is being used by at least 14 different groups that are incorporating the priorities into their strategic planning and RFPs. In addition, the plan has been discussed as an important reference at meetings held by White House Council on Environmental Quality, Environmental Protection Agency, Gulf of Mexico Hypoxia Working Group, Gulf of Mexico Alliance and Gulf Coast Ocean Observing System.

RECAP: The Gulf of Mexico Research Plan was developed based on input from the broad Gulf of Mexico research community, which is now implementing the priority needs.

Project Impacts:

Impact 3

FOCUS AREA: Hazard Resilience in Coastal Communities

GOALS: Community capacity to prepare for and respond to hazardous events

PERFORMANCE MEASURE: Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices.

TITLE: StormSmart Connect online networking site connects coastal resource managers and local decision makers

RELEVANCE: Although coastal communities may be in close proximity with one another, they are unaware of how their neighbors are addressing the challenges of sea-level rise and coastal storms.

RESPONSE: The StormSmart Connect site was created as a response to the need for increased collaboration and communication among local decision makers in regards to planning for long-term resilience.

RESULTS: Twelve coastal communities were trained in how to navigate the online networking site. Four of these communities created a group for their municipality to post updated resources for coastal residents. The site is used for sharing information regarding the Community Rating System, for locating the latest news on storm events and policy, and coordination of local outreach events. Communities that usually do not contact one another about issues such as Community Rating System points and requirements are now helping each other to be successful in the program. These communities are sharing notes, documents, participating in forums and advertising information for their residents through the site, which allows for a broader distribution of hazards-related information which can save lives and reduce the insurance rates of homeowners through participation in the program.

RECAP: Coastal communities that previously did not discuss their storm preparation plans are now regularly sharing resources on storm preparation and recovery through a social networking site designed for local decision makers and coastal resource managers.

POINT OF CONTACT: Tracie Sempier, tracie.sempier@usm.edu

MASGC PROJECT NUMBER: A/O-31

Impact 4

FOCUS AREA: Hazard Resilience in Coastal Communities

GOAL: Community capacity to prepare for and respond to hazardous events.

PERFORMANCE MEASURE: Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices.

TITLE: Sea Grant helps coastal communities assess their resilience to future storm events

RELEVANCE: As the number of people moving to the Gulf coast increases, so does the risk of exposure to flooding, hurricanes and other storm-related events. Although experience has shown that more homes and people located in the floodplain equals more exposure and potential for people to be in harm's way, many coastal residents are complacent when asked about their preparation for the coming storm season.

RESPONSE: Recognizing that communities need support and assistance in determining their risk and resilience, the Resilience Index was created as a self-assessment tool to provide community leaders with a simple and inexpensive method of predicting if their community will reach and maintain an acceptable level of functioning and structure after a disaster.

RESULTS: The Resilience Index was completed by 16 coastal communities in Florida, Alabama, Mississippi, Louisiana and Texas. These communities assessed their strengths and vulnerabilities prior to future storm events. Two communities have applied for a grant to address one of the vulnerabilities they identified in the Index.

RECAP: A self-assessment Resilience Index was pilot tested in 16 communities and vulnerabilities to future storms were identified.

POINT OF CONTACT: Tracie Sempier, tracie.sempier@usm.edu

MASGC PROJECT NUMBER: A/O-31

Impact 5

FOCUS AREA: Hazard Resilience in Coastal Communities

GOAL: Community capacity to prepare for and respond to hazardous events

PERFORMANCE MEASURE: Number of coastal communities and citizens who adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events.

TITLE: South Mississippi is building hazard-resilient communities

RELEVANCE: South Mississippi often is exposed to extensive storm systems resulting in flooding and other damage to personal and public property, as well as other natural and manmade hazards. By improving the planning, response and recovery policies and procedures for a range of potential hazards, communities can develop more hazard resilience, utilize resources more effectively and efficiently and return to a normal way of life more quickly following a disaster.

RESPONSE: The Southern Mississippi Planning and Development District is working with local officials to increase knowledge and awareness of best management practices for hazard resilience and the benefits of implementing the specific activities of the Community Rating System. The Coastal Hazards Outreach Strategy Team is an ideal strategic planning team to help with the implementation of Community Rating System (CRS) activities.

RESULTS: Since this project was initiated, two coastal Mississippi counties (Stone and Hancock) have applied for the CRS program, and one additional county (Jackson) is considering an application to participate. One of these three counties is among the jurisdictions targeted for the Sea Grant project. Clearly, understanding of the benefits of CRS participation has been enhanced through outreach and education.

RECAP: Through education and outreach, the Southern Mississippi Planning and Development District is working with jurisdictional officials, floodplain managers, elected officials and the general public to heighten awareness of the need to become more hazard-resilient and to assist officials in applying to or enhancing their participation in the CRS program and its recommended activities.

POINT OF CONTACT: Beth Ousley, bousley@smpdd.com

MASGC PROJECT NUMBER: R/MG/CSP-09

Impact 6

FOCUS AREA: Hazard Resilient Coastal Communities

GOAL: Community capacity to prepare for and respond to hazardous events.

PERFORMANCE MEASURE: Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices

TITLE: Parish saves \$1.3 million using financial health analysis coupled with storm cost predictions

RELEVANCE: Local governments are typically unaware of how their financial condition has changed after paying the costs of emergency operations and clean-up and debris removal from tropical storm events. Poor financial health can inhibit a local community from investing in infrastructure and resources to grow as well as constrain the community from financially preparing for the next tropical storm event. Measuring the expected cost of future natural disasters helps local government decision makers better identify proper levels of emergency funds and insurance-like tools their community needs to be more financially resilient to the next tropical natural disaster.

RESPONSE: This project measured the financial health of selected Southeast Louisiana parish governments using common accounting financial indicators and compared each community's financial health against accepted financially healthy "rules of thumb" levels before and after Hurricane Katrina. Next, an estimate of the one-, four-, 20-, and 50-year expected costs of a tropical storm and hurricane were estimated for a case study parish (Tangipahoa) and selected Southeast Louisiana parishes. The expected costs used historical cleanup debris removal costs for recent storms combined with parish-level probabilities of sustained winds from a tropical event. Coupling these results allowed researchers and parish decision makers to identify cost saving opportunities.

RESULTS: The results of the analysis were used by Tangipahoa Parish to save \$1.3 million in interest expenses.

RECAP: A \$20,000 project that examined the financial health of parishes and coupled it with probability of potential storm-related costs resulted in a cost savings of \$1.3 million in Tangipahoa Parish. Additional parishes will be provided similar assistance in year two of this project.

POINT OF CONTACT: Matt Fannin, mfannin@agcenter.lsu.edu

MASGC PROJECT NUMBER: R/MG/CSP-03

Impact 7

FOCUS AREAS: Healthy Coastal Ecosystems

GOAL: Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas.

PERFORMANCE MEASURE: Number of stakeholders who use ecosystem-based approaches in the management of land, water, and living resources in coastal areas as a result of Sea Grant activities.

TITLE: Certified Master Naturalists provide 910 volunteer hours of training to over 4,100 coastal residents

RELEVANCE: Mississippi and Alabama face major challenges in managing fisheries, rehabilitating coastal wetlands, protecting coastal water quality and maintaining stable shorelines. Although covering a relatively small geographic area, the coastal region is one of the fastest growing in the United States. Year after year, more pressure will be put on our beaches, wetlands, fisheries and the health of our coastal and marine environment.

RESPONSE: A 40-hour adult volunteer education course was conducted once a week for seven weeks. The course was taught in a classroom setting and out in the field. The class was taught by extension agents, professors, state and federal resource managers, and other professionals. There were presentations on ecology, natural history, water quality and habitats and ecosystems of Mississippi. Dr. Chris Boyd is the Program Director for the Mississippi Master Naturalist Program hosted by the Mississippi State University Extension Service.

RESULTS: The volunteers have conducted a variety of research, educational and outreach projects over the last two years, such as helping with conference and workshop registration, education booths and events like Bugfest at the Crosby Arboretum, Mullet Festival at Scranton Nature Center, and Mississippi Sandhill Crane Cranefest, MSU Extension tree giveaways, dune restoration projects, share the beach program, water quality testing and various natural resources presentations.

RECAP: Volunteer programs increase environmental literacy and expand Outreach Program capabilities in restoring and protecting coastal ecosystems.

POINT OF CONTACT: Chris Boyd, cboyd@ext.msstate.edu

MASGC PROJECT NUMBER: O-1

Impact 8

FOCUS AREA: Healthy Coastal Ecosystems

GOAL: Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

PERFORMANCE MEASURE: Number of stakeholders who use ecosystem-based approaches in the management of land, water, and living resources in coastal areas as a result of Sea Grant activities.

TITLE: Hurricane and fire interactions inform management plans for prescribed burning

RELEVANCE: Habitat degradation has decreased ecological services provided by coastal ecosystems and has altered their resiliency to climate change. Research on storm and fire impacts, which are predicted to increase in frequency or intensity with climate change, can inform resource managers on methods strategies to sustain coastal ecosystems.

RESPONSE: Since 2008, Sea Grant researchers have been working with Grand Bay National Estuarine Research Reserve partners to assess the interactive effects of prescribed fire and hurricanes on a black needlerush marsh. This approach permits examination of multiple-factor interactions that influence ecological processes and ecosystem sustainability.

RESULTS: In this study, high marsh areas were more vulnerable to fire than other marsh areas because they accumulated highly combustible wrack after hurricanes, and the plants were slower to recover following a fire. This study was the first to document fire effects in a Grand Bay marsh, and it will serve as a baseline for an emerging research program on marsh fires. Stewardship Program managers are using the study to refine prescription plans for burning on state lands and to minimize risks to potentially vulnerable high marsh areas.

RECAP: Fires and hurricanes affect plant production and sediment accretion differently, with responses varying by location within the marsh. When developing research programs and fire prescriptions, managers will consider the location and elevation within a marsh, as well as the presence of wrack along potentially more vulnerable high marsh boundaries.

POINT OF CONTACT: Julia Cherry, julia.cherry@ua.edu

MASGC PROJECT NUMBER: R/CEH-27

Impact 9

FOCUS AREA: Healthy Coastal Ecosystems

GOAL: Restored function and productivity of degraded ecosystems.

PERFORMANCE MEASURE: Number of stakeholders who use ecosystem-based approaches in the management of land, water and living resources in coastal areas as a result of Sea Grant activities.

TITLE: Water quality is improved in Mobile Bay due to volunteer Oyster Gardening Program

RELEVANCE: The anthropogenic impact on estuarine ecosystems has led to a decline in total acreage of habitat. Estuarine ecosystems, such as salt marshes and other wetlands, seagrass meadows, oyster reefs and tidal basins physically protect coastlines, provide essential habitat and filter nutrients and other pollutants that degrade water quality and adversely affect ecosystem health. Estuaries provide critical habitat for numerous species of commercially and recreationally important waterfowl, migratory birds, marine mammals and sea turtles. The decreased area and fragmentation have led to a decline in the essential ecological benefits provided by these habitats.

RESPONSE: Through two training workshops and a variety of media outlets, 51 oyster gardening sites representing 62 oyster gardeners produced 45,000 oysters for restoration and enhancement of degraded sites in Mobile Bay.

RESULTS: Water quality was improved when coastal residents invested 510 volunteer hours raising 45,000 oysters. These oysters filter fed up to 4 gallons per hour, equal to 6.5 Olympic swimming pools per day. Oyster gardener volunteers created 2.2 acres of habitat. Juvenile oysters stocked at a rate of 5 oysters/m², allowing 40 percent mortality, to arrive at the Alabama Marine Resources Division's recommended oyster density of 3 adults/m².

RECAP: Volunteer programs increase environmental literacy and expand outreach program capabilities in restoring and protecting coastal ecosystems and restore 2.2 acres of oyster reef per year.

POINT OF CONTACT: PJ Waters, waterph@acesag.auburn.edu

MASGC PROJECT NUMBER: O-1

Impact 10

FOCUS AREA: Safe and Sustainable Seafood Supply

GOAL: A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

PERFORMANCE MEASURE(S): Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.

TITLE: Energy-efficient trawl gear saves fishermen money

RELEVANCE: For Gulf shrimp trawlers, fuel costs are a major operating expense. Individual Gulf shrimp trawlers consume between 50,000-80,000 gallons of diesel per year. Reducing operating expenses through reductions in fuel consumption will improve vessel profitability, thus buoying an industry struggling to compete with imports and high fuel prices.

RESPONSE: In partnership with Texas Sea Grant and the Gulf and South Atlantic Fisheries Foundation, Inc., work continued to promote the use of energy-efficient trawl gear in the Gulf shrimp fishery. We were able to document a 2-gallon-per-hour fuel savings by using Sapphire™ trawl webbing compared to traditional nylon webbing. As a result of this work, 10 other boat owners switched to the new gear.

RESULTS: Fishermen save money in operating expenses.

RECAP: Eleven vessels are saving a conservative estimate of \$45,000 per year (\$30 per day average) in fuel costs.

POINT OF CONTACT: David Burrage, daveb@ext.msstate.edu

MASGC PROJECT NUMBER: EX-9

Impact 11

FOCUS AREA: Safe and Sustainable Seafood Supply

GOAL: A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

PERFORMANCE MEASURE(S): Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.

TITLE: Sea Grant helps shrimp farmers improve shrimp survival following acclimation of post-larvae to low salinity ponds

RELEVANCE: When post-larvae (PL, baby shrimp) are moved from the nursery to low-salinity conditions of the ponds for growout, poor survival is often observed. PL are a significant expense, and if the quantity surviving is not known, ponds cannot be properly managed. Improved acclimation techniques were required to increase survival and subsequently improve management and profit margins.

RESPONSE: Research results are being transferred to local farmers with regards to improving on-site acclimation of post-larval shrimp. Alabama producers are now more aware of the effects of shifting temperature and salinity and their effects on shrimp survival. Increased awareness has resulted in better survival during the production season, allowing farmers to increase their production at harvest from an average of 2,500-2,700 pounds/acre a couple of years ago to greater than 3,000 pounds/acre in 2009 or 10- to 20-percent increase in production. This resulted in \$84,000 savings.

RECAP: Mississippi-Alabama Sea Grant improved acclimation techniques utilized by inland shrimp farmers in Alabama, thus increasing survival and production of shrimp at harvest.

POINT OF CONTACT: Allen Davis, davisda@auburn.edu

MASGC PROJECT NUMBER: R/SP-20

Impact 12

FOCUS AREA: Sustainable Coastal Development

GOAL: Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.

PERFORMANCE MEASURE: Number of coastal communities and businesses that have adopted/implemented sustainable – economic and environmental – development practices and policies (e.g., land-use planning, working waterfronts, energy efficiency, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities.

TITLE: Nature-tourism workshops result in implementation of sustainable practices

RELEVANCE: Alabama and Mississippi visitors and residents are becoming more environmentally literate and recognize the importance of low-impact tourism on diverse natural habitats. There are expanding opportunities to create new ecotourism jobs and improve the profitability of existing ecotourism businesses, especially in coastal areas. A 2007 survey of guests to Baldwin County, conducted by Gulf Shores/Orange Beach Tourism, revealed that more than 400,000 (approx. 30 percent) tourists indicated they participated in activities that focused on wildlife and the environment. That number is up from 24 percent participating in 2006. Current data indicates that at least 64 nature-tourism businesses are in operation in Baldwin and Mobile counties. Dolphin tour companies are the largest sector, with 30 businesses conducting bottlenose dolphin viewing tours aboard 34 vessels, along Alabama's Gulf Coast.

RESPONSE: Three Business of Nature workshops were conducted in Baldwin County, Alabama. Sixty-two participants learned about the economic impact of nature tourism and the value of good stewardship practices on Alabama's Gulf Coast. One Dolphin SMART training session was held in Orange Beach, Alabama, with 21 nature-tour operators being trained about natural behaviors of dolphin in the wild and sustainable

viewing practices.

RESULTS: Three nature tour operators who participated in the Business of Nature workshops and training sessions taught at least 16,000 tourists sustainable wildlife viewing practices and promoted stewardship of healthy ecosystems on the Alabama Gulf Coast.

RECAP: The outreach program provided life-long learning programs that enhance understanding of coastal and ocean environments and promote stewardship of healthy ecosystems to people of all ages.

POINT OF CONTACT: Joanne McDonough, jmcdonough@GulfShores.com

MASGC PROJECT NUMBER: O-1

Revised Old Impacts:

Revised from 2008 Report, Project EX-9:

Impact 13

FOCUS AREA: Safe and Sustainable Seafood Supply

GOAL: A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

PERFORMANCE MEASURE(S): Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.

TITLE: Electronic Logbook Program provides fishery managers with effort data

RELEVANCE: Estimates of effort that had historically been used by the regulatory agencies to monitor red snapper bycatch in the shrimping industry have been proven to be inaccurate.

RESPONSE: A vessel tracking system using dedicated Global Positioning System (GPS) transponders was developed and deployed on selected vessels operating in the Gulf. Data from the logbook program, GPS monitoring and observers will be integrated with data obtained from observers to evaluate existing bycatch and fishing mortality estimates.

RESULTS: NOAA Fisheries and state regulatory agencies use direct measures of fishing effort to monitor red snapper bycatch in the shrimping industry.

RECAP: Seventy-four vessels are providing detailed information through the vessel tracking system leading to better and more effective management of the Gulf of Mexico shrimp fishery.

POINT OF CONTACT: David Burrage, daveb@ext.msstate.edu

MASGC PROJECT NUMBER: EX-9

Old Impacts From Projects Covered In This Report:

1. **2008 Report**

Themes: Fisheries, Seafood Science and Technology

Title: Sea Grant helps NOAA Fisheries manage the Gulf of Mexico shrimp

fishery.

Statement: Seventy-four shrimp vessels based out of Alabama and Mississippi are participating in the electronic logbook program providing detailed information on effort in the fishery.

Impact: Fishery managers now have access to new information on when, where and for how long fishermen use specific areas in the Gulf, which can improve the management of shrimp populations. [EX-9] (Revised this report)

2. **2008 Report**

Themes: Invasive Species, Infrastructure

Title: Research and Outreach on Ballast Water Regulatory Regime

Statement: The Law Center's white paper entitled Michigan's New Ballast Water Regime: Navigating the Treacherous Waters of States' Rights, Federal Preemption, and International Commerce has had immediate impact in the Great Lakes shipping community. The white paper was widely distributed in the region prompting numerous media articles and presentations by Minnesota Sea Grant, the requesting organization. Without the white paper, each interested party (state and federal agencies, businesses, non-profit organizations, etc.) would have been forced to compile the legal information and policy analysis on their own.

Thousands of dollars, both public and private, and hundreds of hours were saved. [L-4]

3. **2008 Report**

Themes: Ecosystems and Habitats, Infrastructure

Title: Legal Research on Proposed Hawaiian Bounty Program

Statement: The Hawaii Department of Business, Economic Development, and Tourism sought information about the contract and liability issues surrounding the development of a reward program for recovery of derelict fishing gear. The Law Center concluded that the liability concerns were misplaced as the state should be immune from most suits and the reward program would not result in contractual relationships. According to the requesting individual, our research "helped dispel what seemed to have been 'an urban myth.' This myth was a roadblock to implementing a major marine debris retrieval program." The agency expects to receive funding in 2008 to finally implement the reward program. [L-4]

4. **2008 Report**

Themes: Fisheries, Infrastructure

Title: Wild American Shrimp Lobbying Request, Infrastructure

Statement: Wild American Shrimp, Inc. requested information on lobbying restrictions and 501(c)(3) organizations and recipients of federal funds after a few members of the Board of Directors raised concerns regarding conflicts of interest. The Law Center wrote a summary of the restrictions and provided some IRS guidance on individual lobbying activities. The research dispelled the concerns of those members and stopped them from removing the members with perceived conflicts from the Board. [L-4]

5. **2009 Report**

Themes: Infrastructure, Marine and Aquatic Science Literacy, Digital Oceans

Title: Legal research included in congressional ICOOS Act

Statement: In June 2005, the Law Center prepared an advisory request memo for Ocean.US regarding tort liability issues associated with development of the U.S. Integrated Ocean Observing System (IOOS). Later that year, the Law Center prepared a follow-up memo regarding federal representation on the boards of the IOOS Regional Associations (RAs). These memos analyzed the legal basis for the concern of Ocean.US and others about the inability of agency personnel to be members of formal IOOS decision-making bodies and the potential liability of employees of RA if they were not considered federal employees. In 2009, Congress passed the ICOOS Act. The act contained an immunity provision for employees of RA and authorized the participation of federal employees in RAs. The Law Center's research contributed to the inclusion of that language in the final bill by confirming the importance of such language and providing the bill's supporters with much-needed written analysis. [L-4]

6. **2009 Report**

Themes: Fisheries, Ecosystem and Habitat, Coastal Communities and Economies, Marine and Aquatic Science Literacy

Title: Legal research results in formation of new marine reserve/protected area

Statement: Through the 2007 Grant Competition, the Law Center funded an investigation into whether Port Orford, Oregon could develop a community-based fishery management system. The Project Team recommended four options the community could pursue, including nominating two areas off Port Orford for inclusion in Oregon's proposed Marine Reserve network. On September 28, 2008, the project team submitted a local proposal for a marine reserve/marine protected area, the Redfish Rocks Research Reserve, under Oregon's statewide marine reserve planning process. The Oregon Ocean Policy Advisory Council recommended that Redfish Rocks move forward as a pilot marine reserve. Governor Theodore Kulongoski's 2009-2011 recommended budget includes funds to support initial implementation of Redfish Rocks. [L-4]

7. **2009 Report**

Themes: Infrastructure

Title: Gulf of Mexico Research sponsors implement Sea Grant-funded regional research plan

Statement: The Gulf of Mexico Research Plan (GMRP) was used by 13 state and regional groups to develop their strategic plans. In addition, the GMRP results were used by NASA's Research Opportunities in Space and Earth Sciences program for a \$4 million RFP. NASA personnel indicated the plan saved \$100,000. Similarly, the Northern Gulf Institute incorporated the GMRP priorities into their most recent \$4.5 million RFP. Finally, the GMRP and Gulf of Mexico Alliance priorities were used to develop a \$1.2 million regional climate and resiliency RFP funded by Florida Sea Grant College Program, Louisiana Sea Grant College Program, Mississippi-Alabama Sea Grant Consortium, NOAA

Northern Gulf Institute, Texas Sea Grant College Program, USEPA Gulf of Mexico program. [M/GOMR-1]

8. **2009 Report**

Theme: Fisheries, Coastal Communities and Economies

Title: Sea Grant reduces operating costs for Mississippi and Alabama shrimpers

Statement: Research and technology transfer regarding the use of Sapphire™ trawl webbing has shown that shrimpers can reduce fuel consumption between one and two gallons per hour by switching to the new webbing. This work was done in collaboration with the Gulf and South Atlantic Fisheries Foundation, Inc. and Texas Sea Grant. In 2008, eleven boats adopted the practice leading to conservative estimates of over \$75 per day savings per boat. Assuming that each boat is working 200 days per year, this equates to a savings of \$165,000 per year. As diesel fuel prices increase, the savings increase proportionately. [O-1]

9. **2009 Report**

Theme: Ecosystems and Habitats, Fisheries, Aquaculture, Seafood Science and Technology, Marine and Aquatic Science Literacy

Title: Volunteers raise 59,000 oysters for restoration

Statement: Through the Outreach Program's continued involvement in the Oyster Gardening Program in Mobile Bay, gardeners increased production of restoration oysters by 70%. Thirty-four gardeners each grew 1,700 oysters for planting on restoration reefs, for a total of 59,000 oysters. [O-1]

10. **2009 Report**

Themes: Coastal Communities and Economies, Urban Coast, Marine and Aquatic Science Literacy

Title: Sea Grant Nature Tourism Initiative teaches dolphin cruise operators sustainable viewing practices

Statement: Dolphin viewing tours on Alabama's Gulf Coast are the largest sector of the nature tourism industry in Baldwin and Mobile County. Approximately 100,000 tourists pay for these excursions annually. The Nature Tourism Initiative, in partnership with NOAA's Office of National Marine Sanctuaries and NMFS, the Whale and Dolphin Conservation Society and the Dolphin Ecology Project trained 21 dolphin tour operators to promote responsible stewardship of wild dolphins in coastal waterways through the Dolphin SMART program. One recognized Dolphin SMART tour operator has reported teaching 15,000 Gulf Coast tourists sustainable viewing practices.

11. **2009 Report**

Themes: Coastal Communities and Economies, Urban Coast

Title: Planners, community members design town's growth

Statement: The development of Dauphin Island's long-term strategic plan was supported by MASGC. Implementation of the plan has led to the creation of new businesses on the east end of the island (general store and trolley), development of a central business district and working waterfront. [R/CCD-11-PD]

MASGP-10-025
Annual Report (Internal) 2010