

**2008-2009
MASGC Annual Report**



September 2009

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2008-2009 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, 2008 through January 31, 2009.

Program Level Impacts and Performance Measures:

Program Impacts:

2009 Report

Themes: Infrastructure, Marine and Aquatic Science Literacy

Title: Gulf of Mexico Regional Collaboration Improves constituent engagement:

Statement: The National Oceanic and Atmospheric Administration (NOAA) Gulf of Mexico Regional Collaboration Team (GoMRCT) hosted an Extension, Outreach and Education (EOE) Workshop on Aug. 12-13, 2008, in Mobile, Ala. More than 80 leaders of NOAA extension, outreach and education efforts attended this event. The workshop focused on improving constituent engagement and included these topics: NOAA's Science Advisory Board's EOE recommendations; participation in NOAA's Engagement Test; How to use Joint Fact Finding to improve engagement; best practices on the integration of research, extension, outreach and education; best practices on Gulf of Mexico EOE. To see results of this workshop please visit:

<http://masgc.org/eoeworkshop>. The workshop led to the formation of a Climate and Resiliency Engagement Panel (C-REP) for the NOAA Gulf of Mexico Regional Collaboration Team and an Engagement Working Group.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided applied by managers in decision-making: 1

1. The Aquaculture Network Information Center (AquaNIC) continues to be the most widely used aquaculture web site in the world (<http://aquanic.org>); currently ranked in the top 14% of all web sites.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of new forecast capabilities developed: 1

1. MASGC is providing outreach and extension support and gathering stakeholder input for the development of a web based sea level rise projection tool through a joint NOAA-USGS Sea Level Rise Pilot project that focuses on Mississippi and Alabama.

Number of new forecast capabilities developed applied to use: 1

1. Over forty people provided input on the development of the sea level rise tool and expressed interest in receiving the tool after it is released. Many of these people are natural resource managers, emergency managers, planners, and others who are concerned about coastal infrastructure. They intend to use the tool(s) that are released as a part of this pilot project.

Number of tools and services provided: 1

1. MASGC is taking the lead in developing a NOAA climate and resilience social networking site for the Gulf of Mexico. It will improve internal communications among NOAA employees and between NOAA employees and constituents in the Gulf of Mexico.

Number of tools and services provided applied by managers in decision-making: 1

1. The Aquaculture Network Information Center (AquaNIC) will be the most widely used aquaculture web site in the world (<http://aquanic.org>) and will move into the top 10% of all web sites.

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 - 09/30/09

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

Accomplishments and outcomes from this award:

1. MASGC Extension personnel, including Peter Nguyen, the Vietnamese coordinator, assisted LGL Ecological Research Associates to expand the Gulf-wide use of electronic logbook technology by the offshore shrimping fleet and assist in studies related to the electronic logbook.
2. Mr. Nguyen has worked extensively through meetings and one-on-one contact to ensure that those involved in the Gulf seafood industry are aware of regulatory changes and technological advances which are relative to them.
3. Increased cooperation among fishermen, the scientific community and fishery regulatory agencies is being achieved.

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

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.

Performance Measures:

Actual Performance Measures for this reporting period (10/1/07 – 9/30/08):

None reported, these are included in MASGC Project O-1

Anticipated performance measures for the next reporting period (10/1/08 – 9/30/09):

None.

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

Award Number: NA06OAR4170125
(MASGC Project #ED-18)

Time period: 06/01/06 - 05/31/09

Award Title: Facilitating the Gulf of Mexico Alliance (GOMA) Environmental Education through the Employment of an Education and Outreach Coordinator.

Accomplishments and outcomes from this award:

2006

1. GOMA Environmental Education Coordinator (EEC) was hired, the Environmental Education Network (EEN) was formalized with working committees and grants were written.
2. The EEC began participating in a number of local, regional, and national committees, educational venues, and work groups. Partnership activities among formal and informal Gulf educators are increasing.

2007-2008

3. The EEC coordinated the EEN toward the accomplishment of the nine education actions Alliance Governors' Action Plan: four actions completed, initiation of four actions, and steps toward the final action addressing funding by continuing to pursue grant opportunities.
4. Alliance EEN Underrepresented Populations Working Group initiated pilot projects, monthly communication, and will be developing a website in 2008 and conference for 2009.
5. The EEC has coordinated efforts to establish an Alliance EEN website. First steps included a listserv, partnership with NOAA's Northern Gulf Institute (NGI), and storyboarding session to develop the website anticipate for launch December 2008.
6. The EEC at DISL, through grants from EPA Gulf of Mexico Program and NGI, coordinated a four phase pilot public awareness campaign utilizing community-based social marketing. The draft strategy was available in May 2009.
7. The EEC at DISL secured a NOAA Coastal Services Center grant which, in part, is used to support existing and future Alliance EEN actions to include the website, EEN partners, EEN travel, and competitive grants.

2008

8. The EEC has worked with Gulf state environmental educators to gather input toward the next GOMA Action Plan 2009-2014 which will set regional priorities among the five states. This plan was implemented June 2009.

Project Completion Report: Completion report is on file.

Project Impacts:

2009 Report

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

Title: Network connects environmental educators throughout Gulf

Statement: The organization of informal and formal educators around the five U.S. Gulf Coast states has been initiated. This network is facilitating the development, transfer, sharing, implementation of various environmental education related actions. Roughly 300 people have participated in EEN-related communications and activities. A number of partnerships have been fostered as a result of GOMA involvement.

Performance Measures:

Actual performance measures for this reporting period (6/1/08 – 5/31/09):

Number of tools and services provided: 3

1. The coordinator that was supported by this project facilitated the Gulf of Mexico Alliance Environmental Education Priority Issue Team
2. The Gulf of Mexico Alliance Environmental Education Network, through the USGS NWRC, has launched a Gulf regional clearinghouse (online library) for environmental education. A companion regional website is under development which will target Gulf formal and informal educators. The resource, www.gulfallianceeducation.org was launched April 2009.
3. GOMA Environmental Educator's Network (EEN) Listserve

Number of tools and services provided applied by managers in decision-making: 1

1. The coordinator's work was directly applied and used to further Gulf of Mexico Alliance Environmental Education Priority Issue Team activities.

Anticipated performance measures for the next reporting period (6/1/09 – 5/31/10):

Number of tools and services provided: 2

1. The Gulf of Mexico Alliance Environmental Education Network, through the USGS NWRC, has launched a Gulf regional clearinghouse (online library) for environmental education. A companion regional website is under development which will target Gulf formal and informal educators. The resource, www.gulfallianceeducation.org was launched April 2009.
2. GOMA Environmental Educator's Network (EEN) Listserve

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.

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)

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.

Performance Measures:

Actual Performance Measures for this reporting period (3/1/08 – 2/28/09):

Number of tools and services provided: 2

- 1. A draft Gulf of Mexico Research Plan was released and used by multiple groups to identify and set research priorities.
- 2. Customized reports of research priorities that supported Gulf of Mexico Alliance Priority Issue Teams was sent to each team and a customized report on sea level rise and climate change was sent to NOAA’s CSCOR office that is doing work in the region.

Number of tools and services provided applied by managers in decision-making: 1

- 1. The draft Gulf of Mexico Research Plan were used to create customized reports for agencies and used by managers and research sponsors. These groups 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, and Texas Sea Grant College Program.

Anticipated performance measures for the next reporting period (3/1/09 – 2/28/10):

Number of tools and services provided: 2

1. The final Gulf of Mexico Research Plan will be unveiled during this year and
2. An implementation plan will also be released.

Number of tools and services provided applied by managers in decision-making: 2

Both of the documents will be used by managers:

1. The final Gulf of Mexico Research Plan will be released in 2009
2. An implementation plan will also be released in 2009.

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

Award Number: NA07OAR4170048
(MASGC Project #A/O-30)

Time period: 02/01/07 - 01/31/09

Award Title: Gulf of Mexico Marine Debris Project, 2007.

Accomplishments and outcomes from this award:

1. Marine debris Web site received 42,588 hits from January 2007-October 2007 according to 449 Internet sources.
2. The Mississippi-Alabama Sea Grant Consortium worked with Louisiana Sea Grant to print and distribute about 10,000 bookmarks, 10,000 fish ruler stickers, 16,000 brochures and 500 posters with information about the Web site to promote its use. The items were distributed to bait and tackle shops, marine stores, libraries, fishing rodeo attendees, coastal cleanup participants and at other locations in Alabama, Mississippi and Louisiana.
3. Presentations were made and items distributed to advertise website.
 - a. Presentation about the marine debris website to the ADEM Annual NPS Conference 1/24/07 – 250 people.
 - b. Flyers regarding the marine debris website were distributed at:
 - i. Wild American Shrimp Certification Workshop 2/7/07 -30 people
 - ii. Posted at West Marine, Mobile, AL 2/13/07
 - iii. Mobile Boat Show, 3/2007 – approx. 200 people
 - c. Fish Tapes were distributed at the MS Coastal Cleanup 2007 in Ocean Springs, Biloxi and Long Beach, 9/15/07, 225 tapes.
4. A public service announcement was aired on local radio stations and reached an estimated minimum of 500,000 people several times. Ads also were placed in Mississippi Sportsman and Louisiana Sportsman magazines reaching a potential audience of 210,000 fishing enthusiasts. Paid advertising on radio station Web sites, the WLOX (Biloxi television station) site and rodnreel.com also brought visitors to the site.

Project Completion Report: Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures: None for this reporting period

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

Award Number: NA07OAR4170510
(MASGC Project #A/O-31)

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

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

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.

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

Project Impacts: None for this reporting period

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 3

The coastal storms program has developed three tools that will allow various levels of government (e.g. state, city) understand their vulnerability and identify methods to increase resilience:

1. The StormSmart Coasts Network provides a platform for emergency managers, city and county officials and others to share information and resources.
2. The Resilience Index is a tool for communities to use to identify their resilience to storms.

3. In partnership with the NOAA Regional Team and Gulf of Mexico Alliance, Sea Grant created a Gulf Storms web portal for residents in five Gulf states to quickly access important information regarding preparation for storm events and short-term recovery. The site received approximately 5,680 hits between the months of August and September when Hurricanes Gustav and Ike threatened the coast.

Number of tools and services provided applied by managers in decision-making: 1

1. Resilience Index-pilot test feedback suggests communities are using this tool as a way to begin resilience discussion amongst community decision makers

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 4

This include three videos that will be produced and broadcast by a local TV station that helps residents understand the risks associated with living on the coast of Mississippi and Alabama (will be on project number R/MG/CSP-06). They are:

1. “Wind and Water” (focus on Hurricanes, Storms and Impacts on Coast)
2. “Water Runs Down Hill” (focus on Watersheds)
3. Hedging Our Bets” (focus on Storms and Insurance)
4. The StormSmart Coasts Network allows coastal resource managers a place to share ideas and information regarding storms, flooding, sea level rise, and climate change. This network is currently under development before wide distribution.

Number of tools and services provided applied by managers in decision-making: 5
(These will ultimately be reported on project numbers R/MG/CSP-02 to R/MG/CSP-10)

1. Resilience Index
2. StormSmart Coasts website-still under development but will be implemented in the coming year

Products from the small grants program including:

3. Potential for financial risk analysis
4. Best practices for risk communication, and
5. Community Rating System manual will be used by managers in decision-making.

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 - 04/30/10

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

Accomplishments and outcomes from this award:

1. Developed partnerships in the Destin, Florida and Orange Beach, Alabama areas to foster education and outreach on issues regarding dolphin interactions with recreational fishing.
2. Established a presence in the marine mammal stranding network and began to develop a strong volunteer team.
3. 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.
4. Conducted first-hand observations of four Gulf Coast fishing piers to ascertain the frequency of dolphin interactions and associated factors.
5. Determined that fishing interactions at the active fishing piers occurred on 18% of days.
6. Observed 19 sport fishing trips to offshore reefs and determined the frequency of dolphin interactions for this limited sample was 16%.
7. 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.
8. 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.
9. 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.

Project Impacts: None for this reporting period

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. Outreach efforts assist fishery managers in educating the public about protection of wildlife and fishery resources.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 3

1. Angler surveys designed to assess public experience and sentiments about dolphin interactions with sport fishing will assist outreach efforts to develop appropriate educational materials.

2. Outreach displays in key locations to inform the public about marine wildlife issues.
3. Educational programs aimed at informing anglers about potential mitigation strategies to avoid incidentally feeding discarded fish to dolphins and preventing dolphin depredation.

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

Award Number: NA08OAR4170331
(MASGC Project # E/O-74-Knauss)

Time period: 02/01/08 - 01/31/09

Award Title: Dean John A. Knauss Marine Policy Fellowship Program - (2008)
Rochelle Plutchak

Project complete. The Knauss fellow, Rochelle Plutchak submitted the final questionnaire.

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

Award Number: NA08OAR4170332
(MASGC Project # E/O-75-Knauss)

Time period: 02/01/08 - 01/31/09

Award Title: Dean John A. Knauss Marine Policy Fellowship Program - (2008) Staci Lewis

Project complete. The Knauss fellow, Staci Lewis submitted the final questionnaire.

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

Award Number: NA09OAR4170034
(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 in progress. Melissa is currently working on her fellowship. No reports have been filed.

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

Award Number: NA10OAR417XXXX (NO AWARD NUMBER YET)
(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.

Anne Marie has not started her project yet. She is scheduled to start February 2010.

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 new, no reports have been filed.

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 – 1/31/10

Accomplishments and outcomes from this project (2008 only):

- 1) Three-hundred and sixteen (316) formal and informal educators were involved in Professional Development Programs, specifically (MEC-33 pre- and inservice COSEE:CGOM-10 (two for graduate credit, one for undergraduate credit, and six for CEU credits) teachers and FLEXE:GLOBE-23 (two for CEU credits); DISL-198 participants with 111 teachers receiving graduate credit and 87 formal and informal educators not receiving credit; and ESC-98 teachers (note: the ESC's PD Workshops were implemented in corporation with the DISL, Auburn University Marine Education and Research Center, Mobile Bay National Estuary Program, Alabama Department of Conservation and Natural Resources, and Mobile Regional Science Fair). These programs varied from one day to three weeks in length.
- 2) Three-hundred and fifty-two (352) structured, field-trip programs, (27-MEC, 12-DISL, 313-ESC) trips, involving a total of 27,270 precollege students (1,521-MEC; 7,738-DISL, and 18,011-ESC); these 352 programs varied in duration from three hours to one month (it should be noted the one, one-month program is represented by the residential, Summer Discovery Hall Program [DISL] and involved 21 of the 27,270 students; these 21 students were represented geographically as: AL-10, AR-1, CO-1, FL-1, GA-2, KY-1, and TN-5).
- 3) **MEC** evaluation data during this grant period for select programs revealed significance at the 0.01 level of confidence for 14 of the MEC's 18 Coastal Sciences Camps [using a 2-tailed t-tests]. For the MEC's six 2008 Sea Camp Programs involving 19 different classes, there was one 6-7 year old class whose pre- and posttests were not significant. A second class of 6-7 year-old students'

pre- and posttests were significant at the 0.05 level. The remaining 17 classes were significant at the 0.01 level. The Likert-scale data for the participants attending the Coastal Sciences Camps revealed the following values: 83% Very Valuable, 14 Valuable, 2% Average Value, and 1% Limited Value.

DISL – The two-tailed t-test for pre- and posttests was significant at the 0.01 level of confidence for the COSEE:CGOM/SAME Two-Day Workshop. This Workshop included a mix of informal and formal educators. Overall, the participants believed the Two-Day workshop was valuable. Approximately 48% of the participants related the workshop as Very Valuable; 31% rated it as Valuable; 20% rated it as Average Value; and 1% rated as Limited or Very Limited Value. The written comments were generally positive and included comments such as: “The presentations were very captivating and have sparked my interest in the subject matter” and “Demonstrations of experiments, hands on activities were fun and easy to add to classroom lessons.” Negative comments focused on the need for more time and more hands on activities. Overall the participants agreed that the Two-Day Workshop was relevant and useful to their work and to the general public.

For the pre and posttests for the other teacher PD Workshop, i.e., Sharks and Rays, Delta, Beaches, and Birds were all significant at the 0.01 level of confidence. Neither of the pre- and posttests for the Marine Applications of Science and Technology (MAST)-PD Workshops were significant.

For staff members who administered pre- and posttests, for the select DISL student programs, the 5th, 6th, and 8th grade groups; results were significant at the 0.01 level; the 10th grade group data were significant at the 0.05 level, and the 12th grade data were not significant. There were no data available for the 7th, 9th, or 11th grade groups.

ESC – For Project SEA ICE, the two-tailed t-test for pre- and posttests was significant at the 0.05 level of confidence.

- 4) Visitation by 98,303 guests at the MEC (2,305—note: limited public due to *Hurricane Katrina* destroying the MECA facility in Biloxi, MS), the DISL (70,356), and the ESC (25,642) was documented for this granting period.
- 5) Nineteen scientists (12-MEC; 3-DISL; and 4-ESC) were engaged in the PD programs for teachers and/or the structured field trips for precollege students.
- 6) BayMobile Outreach provided experiential learning opportunities in 37 AL counties and involved 8,736 K-12 students in schools and libraries and 8,015 additional members of the general public at special events. The MEC’s On The Road program provided instruction for 355 precollege students at two elementary schools (Pineville and Stone) in MS and 141,095 public through festivals and special events in 2008 (see pages 27-31 for listing of these festivals/events).
- 7) The 2008 NOSB-Hurricane Bowl involved 16 teams from 12 different schools and a total 184 participants within MS, AL, the Panhandle of FL, and LA. Specifically, this annual event had 75, tenth-twelfth grade students, 19 coaches, approximately 30 family members, and approximately 60 volunteers participating.

- The 2008 winners were: 1st Place – Long Beach High School, Long Beach, MS Team A; 2nd Place – Navarre High School, Navarre, FL; 3rd Place – Niceville High School, Niceville, FL; 4th Place – Okaloosa-Walton College Collegiate High School, Okaloosa, FL; 5th Place – Long Beach High School, Team B, Long Beach, MS; and Sportsmanship Award – Navarre High School, Navarre, FL.
- 8) Science Fairs-The MS-Region VI Science and Engineering Fair involved 417 students with 312 first-sixth graders in Classes I and II, 48 seventh and eighth graders in Class III, and 67 ninth through twelfth graders in Classes IV and V. At the AL State Science and Engineering Fair, the “best” project in marine and aquatic sciences is selected. The Class V student having developed the project is awarded a scholarship to attend the DISL-Discovery Hall Program annually.
 - 9) Thirty-six presentations (14 with published abstracts; seven presentations not having a published abstract; and 15 outreach presentations).
 - 10) Likert-scale (attitudinal) evaluation instruments were administered to three different audiences: i.e., former teachers participating in MASGC Education Efforts, these teachers’ students who had also participated in programs offered at one of the three Informal Centers, and college science majors. These data were analyzed and the abridged findings were:
 - a) Sixty-three teachers were asked to complete this survey and 37 responded (58.7%). The responding teachers-believe the MASGC programs are beneficial to their students; want their students to be involved in “science in action;” they did not make any recommendations to improve the program; and 91.3% of the respondents believed there was enough time for the activities;
 - b) Three hundred forty-seven students were asked to complete this survey of which 139 (40%) responded. These student survey results documented that overall, the students perceived their experiences with the MASGC programs increased their interest in science and the environment; the students did not make any recommendations for program improvement; and there was adequate time for program activities.
 - c) College Science Student Surveys (87 science majors completed the surveys). Of this number, 53 were biology majors, 19 were chemistry majors, nine were physics majors, and six were geology/Earth science majors. These findings revealed 72.4% of the respondents indicated they had participated in science-related field trips during their precollege years, only 1/3 of the respondents had participated in at least one of three MASGC Education Efforts’ programs. Other field trips were to other zoos, museums, and/or aquariums. The respondents who attended any of the three MS-AL Sea Grant Informal Centers were overall positive concerning the experience. However, when asked about the primary reason they chose to major in a science field, the MASGC programs were not listed. Instead, having family members in science fields was listed more than any other reason. Other reason included a positive experience with a teacher or teachers, a positive experience in a

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 15

1. COSEE:CGOM Summer Institutes
2. Traveling exhibits (BayMobile via DISL and On The Road via MEC)
3. National Ocean Science Bowl
4. Professional development programs for 316 MS and AL teachers.
5. General public programs (98,303 people)
6. Precollege students in structured programs (27,270 people)
7. Presentations at special events and festivals (149,110 people)
8. Developed new exhibitry (Seafood safety as it relates to oyster restoration, harvesting and *Vibrio sp.* and “Underwater Exploration” highlights the need for healthy oceans and the exploration of the deep sea)
9. Summer Sea Camp (MEC)
10. Coastal Sciences Camp (MEC)
11. Special Enrichment Activities in Coastal Ecology (SEA ICE at ESC)
12. Coastal Birdlife – The Lure of Gaillard Island (ESC)
13. Wild Adventures at the ESC
14. Summer programs at Dauphin Island Sea Lab
15. High School Summer Course Dauphin Island Sea Lab

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 12

1. COSEE:CGOM Summer Institutes
2. Traveling exhibits (BayMobile via DISL and On The Road via MEC)
3. National Ocean Science Bowl
4. Professional development programs for 316 MS and AL teachers.
5. General public programs (98,303 people)
6. Precollege students in structured programs (27,270 people)
7. Presentations at special events and festivals (149,110 people)
8. Summer Sea Camp (MEC)
9. Coastal Sciences Camp (MEC)
10. Special Enrichment Activities in Coastal Ecology (SEA ICE at ESC)
11. Summer programs at Dauphin Island Sea Lab
12. High School Summer Course Dauphin Island Sea Lab

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 agencies, 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.

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.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 3

1. *Advisory Service* – The Advisory Service is a non-advocacy legal research service available to the Sea Grant community and its constituents. Eleven organizations requested information through the Advisory Service in 2008.
2. *Ocean and Coastal Case Alert* – Monthly email list serve that provides summaries and links to recent ocean and coastal law cases. As of January 15, 2009, the Case Alert had 156 subscribers.
3. *SandBar* – Quarterly legal newsletter containing articles on ocean and coastal legal developments in courts and legislatures around the country with 1,044 subscribers.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 4

1. Advisory Service
2. Ocean and Coastal Case Alert
3. SandBar
4. *Online Training Modules* – In 2010, the Law Center plans to begin developing online training modules for use by Sea Grant extension agents and coastal managers seeking background information on such legal topics as the public trust doctrine and local government authority.

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

Accomplishments and outcomes from this project (2008 Only):

1. Twenty-seven people received Mississippi Master Naturalist certification. Participants gave 81 hours of volunteer service to 1,902 clients increasing knowledge of natural sciences by about 42% among participants according to pre-test post-test surveys.
2. The Mississippi Coastal Roots program was initiated to work with individual schools to grow native plants in containers which will be used in coastal restoration projects.
3. A Living Shoreline Workshop was conducted in Panama City, Florida and attended by 112 researchers, engineers, regulatory agents, state and federal agency representatives, homeowners, and city and county officials.
4. Seventy-four Gulf of Mexico shrimp vessels based in Mississippi and Alabama are now participating in the Electronic Logbook program.
5. 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.
6. A Sea Grant Advisory Subcommittee to the Gulf States Marine Fisheries Commission was formed. During the first subcommittee meeting in Key Largo, Florida in October, 2008 the committee made formal recommendations to the Commission on the topics of artificial reefs and mercury in seafood.
7. Outreach personnel participated on the steering committee and made several presentations at the Mississippi-Alabama Bays and Bayous Symposium 2008.
8. Over 400 fishermen learned about the proper use of venting tools to increase the survivability of regulatory discards in the recreational reef fish fishery.
9. Submitted report entitled “Opportunities for Protecting Instream Flows in Mississippi” to Mississippi Department of Wildlife, Fisheries, and Parks. Department personnel will use the report to support proposals for legislative and permitting changes to Mississippi water use policies.
10. The state of Alabama passed a joint resolution to create the Alabama Waterfront Access Study Committee, to develop recommendations on incentive-based tools and techniques to preserve Alabama’s working waterfronts.
11. Hosted Basic Teacher Workshop for Aquaculture/Aquascience Programs in K12 and hosted Advanced Teacher Workshop for Aquaculture/Aquascience Programs in K12.
12. Facilitated acceptance and delivery to K12 Aquaculture programs and leveraged \$76,000 in donated fish and equipment.
13. The program trained 23 seafood processing employees and 9 Mississippi seafood regulators in FDA Seafood HACCP principles.
14. The Outreach Program produced two quarterly newsletters, “Water Log” and “Sea Briefs”, and one monthly newsletter, “Gulf Coast Fisherman”, which

- provided information to increase knowledge and awareness of marine and coastal issues in the Gulf of Mexico region.
15. The River Delta Marina in Mobile County, Alabama was certified as a “Clean Marina.”
 16. The MASGC Web site was redesigned to improve ease of use and appearance. From June 2008 through January 2009, there were 140,808 visitors to the site and 196,144 page views.
 17. More than 400 people, including 150 presenters, shared cutting-edge coastal science information, research and outreach and took part in networking opportunities at the 2008 Mississippi-Alabama Bays and Bayous Symposium.
 18. Forty-two nature tourism businesses have been identified in Baldwin and Mobile counties on Alabama’s Gulf Coast.
 19. Six nature tourism businesses have been signed up as new Industry Partners with the AGCCVB
 20. Twenty-one dolphin cruise operators were trained in the Dolphin SMART program. Training sessions were conducted through a partnership with NMFS, MASGC, ADCNR Coastal Section, WDCS, DEP and the AGCCVB. One operator has reached recognition status and taught approx. 15,000 Gulf Coast tourists sustainable viewing practices of wild bottlenose dolphin in 2009.
 21. Six Business of Nature workshops were conducted in Baldwin County, Alabama providing nature tourism development and marketing, business planning, and training of the habitats and keystone species of the North Central Gulf of Mexico. Seventy nature tour operators, researchers, scientists, county and state agency representatives, and city officials.
 22. A Business of Nature web page was added to the AGCCVB website to educate nature tour operators about the ecology and economic social importance of habitats and keystone species of the North Central Gulf of Mexico.

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

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.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Economic Benefits (In Dollars): \$165,000

Energy saving gear technology was transferred to shrimpers. 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 total savings of \$165,000 per year. As diesel fuel prices increase, the savings increase proportionately.

Number of tools and services provided: 15

1. Monthly newsletter "Gulf Coast Fisherman"
2. Energy saving gear technology transfer to shrimpers
3. Master Naturalist training and certification
4. "Living Shorelines" workshops and training
5. Quarterly newsletter "Water Log"
6. "Navigating the National Flood Insurance Program" brochure adapted for EDEN network and eXtension
7. Quarterly newsletter "Sea Briefs"
8. The MASGC Web site was redesigned to improve ease of use and appearance of the site. The redesign included the addition of tracking software.
<http://www.masgc.org>
9. Expand the use of electronic logbook technology by recruiting 74 shrimp vessels
10. Master Naturalist program trained 27 individuals
11. DolphinSMART training for 32 tour operators

12. “Business of Nature” workshops and training
13. Business of Nature resource web page
14. Creature Cards
15. The Nature of the Coast brochure

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 18

1. Monthly newsletter “Gulf Coast Fisherman”
2. Energy saving gear technology transfer to shrimpers
3. Master Naturalist training and certification
4. Quarterly newsletter “Sea Briefs”
5. Quarterly newsletter “Water Log”
6. Continuing Legal Education courses on emergency preparedness, hurricane insurance and wetlands law and policy
7. Hurricane Preparedness Handbooks (2)
8. Fact sheet “Building Green: What Does it Mean” developed and published
9. Electronic logbook program
10. MASGC website
11. “Business of Nature” workshops and training
12. Business of Nature resource web page
13. Creature Cards
14. Dolphin SMART training
15. The Nature of the Coast brochure
16. Interactive nature tourism map
17. Boater’s marine map and best practices for marine navigation guide
18. Due to Sea Grant efforts, the state of Alabama passed a joint resolution to create the Alabama Waterfront Access Study Committee, to develop recommendations on incentive-based tools and techniques to preserve Alabama’s working waterfronts.

Closed Omnibus Projects for NA06OAR4170078

MASGC Project # R/CEH-24

PI: Just Cebrian

Title: Evaluating the role of restored black needlerush marsh (*Juncus roemerianus*) as a buffer of anthropogenic eutrophication of coastal systems: an isotope enrichment approach.

Time Period of this project: 2/1/06 – 8/31/09

Accomplishments and outcomes from this project:

1. Monitored growth and documented the health and ecological integrity of the restored marshes.
2. Quantified the role of those marshes as filters of human-induced nutrient pollution

3. Participated in numerous workshops for managers, lectures for college students and presentations for the general public about this project
4. Determined the effects of freshwater and nutrient pulses on health of *Juncus* in the restored plots.
5. Quantified nutrient allocation patterns in the *Juncus* present in restored plots.
6. Demonstrated anthropogenic inputs cascade up the food web in restored marsh systems.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period

Performance Measures: None for this reporting period.

MASGC Project # R/CEH-25

PI: Jinx Campbell

Title: The Diversity and Role of Root-Associated Fungi in Saltmarsh and Seagrass Plants and Implications for Restoration Success.

Time Period of this project: 2/1/06 – 1/31/09

Accomplishments and outcomes from this project:

1. Field collections were completed and were analyzed for mycorrhizae using morphology and biochemical and molecular methods.
2. Tested the three most abundant saltmarsh species for probiotic effects of commercial VAM inoculant, no significant mycorrhizal associations were found at 2-6 months after inoculation.
3. Probed metrics to evaluate plant condition and growth, density and biomass were found to be most responsive to changes. Other metrics were less pronounced, but are important to aid in describing the changes in the plants.
4. 24 Teachers were trained on saltmarsh plants and growing protocols for Grasses-in-Classrooms activities with the MEC mini-camp. Three feature articles were released on the project featuring Master's student Melissa Pratt-Zossoungbo
5. 12 junior high students were trained on saltmarsh plants with the MEC CSI mini-camp. One feature articles were released featuring Melissa Pratt-Zossoungbo MS, currently Knauss Fellow.
6. Two publications were submitted on Melissa's Master's research; both were accepted for publication and are in press.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of jobs created: 1

1. MASGC supported research on improving methods for growing and planting marsh plants has allowed local researchers to start a native marine and marsh plant nursery to supply healthy plants to the local Department of Marine Resources and other groups interested in restoration. This has created two part-time positions for nursery technicians.

Economic Benefits (in dollars): \$130,000

The amount that DMR is paying to grow plants for restoration of Deer Island.

Number of tools and services provided: 2

1. Developed protocols for growing saltmarsh plants in Mississippi
2. Developed technique: commercially available inoculant was incorporated into the growing protocols of the Mississippi Native Coastal Plants Nursery to enhance plant growth.

Number of tools and services provided applied by managers in decision-making: 1

1. Protocols are used in Center for Plant Restoration to determine propagation success of a given amount of seeds.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

None.

MASGC Project # R/SP-14

PI: Stephen Szedlmayer

Title: Reproductive Behavior, early life history, and interspecific interactions of gray triggerfish, *Balistes capricus*, from the Northeastern Gulf of Mexico.

Time Period of this project: 2/1/06 – 7/31/08

Accomplishments and outcomes from this project:

1. These studies showed a unique spawning behavior where gray triggerfish formed harem groups and showed extensive parental care.
2. Our descriptions of early stage laboratory-reared gray triggerfish will aid in the identification of wild-caught larvae.
3. The recruitment studies showed that gray triggerfish spend long periods in the pelagic environment and recruit in the fall to benthic habitat in the northern Gulf of Mexico.
4. We showed competitive interactions between red snapper and gray triggerfish in field removal and laboratory growth experiments. These competitive interactions could lead to negative effects on red snapper on artificial reefs that have aggressive gray triggerfish.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. Our descriptions of early stage laboratory-reared gray triggerfish will aid in the identification of wild-caught larvae.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

None.

MASGC Project # R/SP-15

PI: Stephen Watts

Title: Sea Urchins are Improved Candidates for Aquaculture and Biomedical/Ecotoxicological Models.

Time Period of this project: 2/1/06 – 1/31/09

Accomplishments and outcomes from this project:

1. The sea urchin life cycle can now be completed in 100% artificial seawater.
2. We have identified and cultured the diatom *Amphora sp.* that can serve as a primary food source during the transition following metamorphosis. This diatom will support growth until the urchin reaches 1 to 1.5 mm diameter (Powell et al. 2005a). After this time, the urchins are fed a mixed-taxa green algae biofilm with its associated mucilage. Most excitingly, preliminary results suggest that we may be able to rear both larvae and early juveniles in the absence of live diets (this proposal).
3. We have successfully fertilized gametes from lab-reared sea urchins (F2 generations). These F2 represent the first generation of sea urchins derived from adults fed formulated feeds and reared exclusively in synthetic seawater in our laboratory.
4. We have developed a small scale recirculating salt water raceway system capable of housing up to 224 individual sea urchins for nutritional studies, and have recently developed a state-of-the-art closed-cycle recirculating system to house an additional 360 individuals (using DROP filter technologies developed at LSU). To date, the nutritional parameters examined using this system include carbohydrates, phospholipids, and calcium. These experiments were initiated with 5mm diameter sea urchins (smallest urchins ever fed formulated feeds) and represent some of the first nutritional studies on urchins of this size.
5. We have developed a feed pelleting process that is feasible and commercially applicable (Ziegler feeds is working with our laboratory to refine the pelleting process). Because these pellets are cold-extruded we are able to maintain critical micronutrients that might otherwise be destroyed in the typical cooked extrusion pelleting process.
6. We have identified several key nutrients that (a) promote high rates of growth and survivorship of sea urchins in the laboratory at levels that exceed field populations, (b) enhance the production and color of the sea urchin gonad, and (c) advance physiological responses in sea urchins that are analogous to responses in humans, strongly supporting the further development of the sea urchin as a biomedical model (Powell et al., 2005b; Jones et al., 2005).

7. The roe produced by urchins fed our formulated diets was evaluated for commercial quality and taste by a commercial buyer. Three of the seven diets tested produced gonads from the commercial North Atlantic species *Strongylocentrotus droebachiensis*, that the buyer identified as marketable quality with good taste and color. This represents some of the first successful taste test data on *S. droebachiensis* roe from urchins fed a formulated feed and sets the stage for roe enhancement for both on- and off-shore aquaculture.
8. Through a collaboration with USGS at Corpus Christi (Dr. Marion Nipper). We determined that the diet of the parental urchins affected the response of the offspring (embryos and larvae) to reference toxicants, indicating that parental nutrition must be standardized to make meaningful evaluations of environmental toxicants when using animal bioassays.
9. We have developed a valid and reliable laboratory procedure that, for the first time, allows for high quality research to determine dietary nutrient requirements. This system allows for the assay of the effects of toxic materials in sea water on gametes and embryos, and the effects of toxic materials and nutrient deficiencies in the maternal diet on ova quality and embryonic development, and can be used in the determination of environmental limits.
10. Introduced sea urchins into the classroom in several high schools and science centers in Alabama.
11. We are capable of commercializing several aspects sea urchin production in onshore locations. This has the potential to minimally impact the coastal environment while having a positive economic impact on coastal communities negatively impacted by declining fisheries.
12. We presented these findings at the Society for Integrative Biology meeting in January 2008, Aquaculture America in Orlando, 2008, and the North American Echinoderm Conference 2008, Melbourne Florida.
13. Defined new parameters for assessing sea urchin health using the immune response.
14. Identified a potential predator species in high intensity culture systems and proposed methods for its control.

Project Completion Report: Project Completion Report is On File

Project Impacts:

Themes: Aquaculture

Title: Inland sea urchin farming enhanced by Sea Grant research

Statement: Researchers have developed nutritionally complete feeds and recirculating artificial sea water systems that result in high growth and survival of sea urchins in inshore culture facilities. Urchins (*Strongylocentrotus droebachiensis*) fed on these feeds yield high quality “uni” gonads for the sushi market according to buyers that have taste tested the product. Systems and techniques developed in the lab allow researchers to culture sea urchins from egg to egg in artificial sea water systems.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Number of new products discovered: 2

1. Aquaculture system capable of growing sea urchins and
2. High quality sea urchins that are used for the sushi market.

Number of tools and services provided: 1

1. Developed the process to create semi-purified and purified dry pelleted feeds with desired physical properties that support somatic and gonad growth better than that obtained with natural diets.

Number of tools and services provided applied by managers: 1

1. Ziegler feeds is working with our laboratory to refine the pelleting process

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

None.

Open Omnibus 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: 02/01/08 – 01/31/10

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.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09): None

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of new products discovered: 1

1. The triglycerides produced by the oleaginous microorganisms from the shrimp processing waste could be used for the production of biodiesel.

MASGC Project # R/CCD-14-7:

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 – 01/31/10

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.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09): None

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 1

1. Researchers developed an interdisciplinary approach comprised of geographic analysis, longitudinal water quality analysis, management practices analysis, and watershed modeling to detect the effect of land use/cover changes, especially urbanization, on the water quality/quantity of the Weeks Bay Estuary. The Mobile Bay National Estuary Program (MBNEP) will use the results of this study in developing their future strategic plans.

Number of tools and services provided applied by managers in decision-making: 2

1. The City Government Managers from Fairhope, AL and Foley, AL will attend and learn to use a minimum of five new LID applications tailored to the Fish River watershed.
2. The Mobile Bay National Estuary Program (MBNEP) will use the results of this study in developing their future strategic plans.

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 – 01/31/10

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.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09): None

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of new forecast capabilities developed: 2

1. Anticipate ability to predict the stimulatory effect of burns on plant productivity and biogenic accretion in *Juncus roemerianus* marshes.
2. Anticipate the ability to forecast the extent to which prescribed burning removes unwanted debris deposited in marshes following severe storms.

Number of new forecast capabilities developed applied to use: 2

The transfer of information from experimental observations and model development to NERRs and USFWS managers:

1. to evaluate management plans for prescribed burns in *Juncus roemerianus* marshes and
2. to consider implementation of prescribed burning to remove debris following natural disasters.

Number of tools and services provided: 3

1. Curricula will be developed for K-12 students
2. Curricula will be developed for University of Alabama students
3. Curricula will be developed for NERR Coastal Training Program (CTP) workshops.

Number of tools and services provided applied by managers in decision-making: 1

1. CTP workshops will provide results and management recommendations to inform coastal decision-makers and resource managers of successful restoration and management techniques.

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: 02/01/08 – 01/31/10

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

2. We measured potential wastewater-driven changes on shellfish habitat (DO) and food supply (nutrient and chl *a* concentrations). 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).
3. We measured variation in shellfish growth and survival through time. Oyster growth and survival did not change with proximity to WTP outfall.
4. 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 FDA among sites and through time. MSB and coliforms appeared in oyster tissues by ~10 days, while stable isotope ratios took 6-8 weeks to reach equilibrium.
5. We began quantifying 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. This work is in progress, but we have observed differences in stable isotope ratios in WTP effluent relative to hydraulic residence time.

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.
7. We maintained a publicly accessible webpage dedicated to the project and have begun preparing metadata.
8. We prepared a “SeaBriefs” summary for MS-AL Sea Grant.

Education

9. We trained 2 MA students (1 as an NGI intern) and 1 technician to sample WTP effluent, water, environmental attributes, and oysters, process stable isotope samples and prepare them for analysis. Each student presented a poster at a scientific meeting
10. We shared data with the general public (with focus on K-12 audience) at DISL’s annual Discovery Day and via two community presentations, with other researchers and managers at the National Shellfisheries Association meeting in Providence, RI (NSA; poster presentation), and with regional endusers at the “Bays and Bayous” Symposium (poster presentation).

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. Indicator of shellfish exposure to wastewater using stable isotopes

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):
None

MASGC Project # R/SP-18:

PI: Eric R. Hoffmayer

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

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

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.
3. 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.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09): None

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 2

Findings of this study will be used to improve the management of the Mississippi coastal ecosystem. Data collected for this project will be incorporated into:

1. benthic habitat maps and will be used to develop
2. spotted seatrout spawning habitat maps within Biloxi Bay and Grand Bay.
Existing benthic habitat data will be combined with benthic habitat data gathered from this project to produce a better detailed map of the available substrata within the two sampling areas.

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 – 01/31/10

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, Bioloxy, MS.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09): None

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number or new products discovered: 1

1. Researchers published a review of significant progress made in understanding the structure, function, and cellular mode of action of crustacean molt-inhibiting hormone (MIH), and described key areas anticipated for future research. Research on MIH has the potential to provide the conceptual and methodological underpinnings for development of methods to induce molting in crustaceans, a benefit to the soft crab industry and to consumers of seafood. We have developed and will test the efficacy of a blocker of the candidate molt-inhibiting hormone receptor. If the blocker proves effective, we anticipate it could be used to induce molting in blue crabs (*Callinectes sapidus*). The methods may be widely applicable to other crustacean species.

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: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided applied by managers: 1

1. Researchers are transferring research results to local farmers with regards to improving on-site acclimation of post-larval and juvenile shrimp. Alabama producers are now more aware of the effects of shifting temperature and salinity and their effects on shrimp survival. Increased education and awareness has resulted in better survival during the production season.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of new forecast capabilities developed: 1

1. Temperature and salinity data acquired on native shrimp species in this study will contribute to modeling growth and survival of native populations in coastal areas.

Closed Program Development Projects for NA06OAR4170078

MASGC Project # ED-19-PD:

PI: Hyun Jung Cho

Title: Development of Field Guide Resources for Aquatic Plants of the Mississippi Coast.

Time Period of this project: 03/01/08 – 08/31/09

Accomplishments and outcomes from this project:

Research:

1. Developed a website of aquatic plants of the Mississippi coast.
2. Developed a book of aquatic plants of the Mississippi coast.

Education:

3. Five JSU undergraduate students participated in field surveys, specimen sorting, and book editing work.
4. Three JSU graduate students learned about wetland habitats with associated plants using the resources produced from the project.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 2

1. Web-based and
2. Hard copy field guide of aquatic plants on the Mississippi coast were produced.

Number applied by managers in decision-making: 2

1. Web-based and
2. Hard copy field guide of aquatic plants on the Mississippi coast will be use.

MASGC Project # R/AT-8-PD:

PI: Mark T. Hamann

Title: Assessment of Supercritical CO₂ Inactivation of Oysters Associated Bacteria.

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

Accomplishments and outcomes from this project:

1. It was established that SC CO₂ is effective at inactivating *Vibrio sp in vitro* (*V. fisherii* was used as a model for *Vibrio* spp in this case). Here a 6-log reduction was observed. It was also established that SC CO₂ had a potent effect of several other bacterial isolates sharing some basic biochemical characteristics of pathogenic *Vibrio strains* (based on our 16S rRNA sequencing experiment these might be *Shewanella* spp (confirmation in progress); in this case, SC CO₂ induced a complete inactivation of these isolates (minimum 7 log reduction).
2. It was also established that SC CO₂ is effective at reducing the load of bacteria present in the gut of oysters. It was established that exposing oysters to CO₂ at 100bar and 37°C for 30 minutes and at 172 bar and 60°C for 60 minutes induced 2-log and 3-log reductions in the Aerobic Plate Count respectively. The decrease in the microbial load as a result of treatment with SC CO₂ was found to be significant (P=0.002).
3. Oysters seemed to be able to survive CO₂ treatment. Though a release of adductor muscles from the shell was noted in oysters treated at 172 bar and 60°C for 60 minutes; this was not the case for oysters treated at milder conditions (100bar and 37°C for 30 minutes). Few oysters treated at 100bar and 37°C for 40 minutes and maintained in a small glass vessel was able to survive for up to 10 days
4. A blinded study allowing sensory analysis of treated vs. untreated oysters was also completed and no significant change in the physical appearance, smell, or texture was recorded

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of new products discovered: 1

1. This project to improve seafood safety through using supercritical carbon dioxide to control *Vibrio* levels in oysters without compromise to the fresh/raw appearance, texture and odor. This successful technology has been licensed to a new startup company called Triton Biopharma (tritonbiopharma.com), which has made progress in regard to negotiations with seafood and other industries like Kraft foods to apply this new method of increasing the safety of seafood products on a commercial scale.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

None.

MASGC Project # R/CCD-16-PD:

PI: Gregory Waselkov

Title: Preserving Oral Histories of Waterfront-Related Pursuits in Bayou La Batre.

Time Period of this project: 03/15/08 – 01/31/09

Accomplishments and outcomes from this project:

1. The project has accomplished the goals set out by obtaining professionally filmed interviews of at least 10 participants in the seafood industries of Bayou La Batre, Alabama. These filmed interviews will form a permanent contribution to the oral history of that community and will be accessible to the general public, scholars, and filmmakers.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. A compilation of 13 interviews of members and leaders of the fishing and seafood industry in Bayou La Batre was edited and produced to highlight the history of the industry for use in educational settings and for public viewing.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 1

1. Short clips of selected interviews will be on display at the USA Archaeology museum, once it opens in 2010. We plan to distribute the videotaped interviews along with the associated interview logs in the USA Archives for public access.

MASGC Project # R/CCD-17-PD:

PI: C. Kinnon Phillips

Title: A Proposal for Branding the Gallis Project for Optimal Success.

Time Period of this project: 05/01/08 – 06/30/08

Accomplishments and outcomes from this project:

1. Created and provided a conceptual umbrella to maximize understanding of the Gallis resiliency program
2. Conducted survey research on the goals and desired achievements of the Gallis resiliency program among all stakeholders to develop an identity and name for the program. Research methodology based on review of results of Gallis issue area workshops.
3. Designed and created logo, name and tagline for the program – “interCHANGE”

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures: No Performance Measures for This Reporting Period

MASGC Project # R/CEH-29-PD:

PI: Hyun Jung Cho

Title: *Ruppia maritima* Restoration using Seedlings in Bayou Cumbest, Grand Bay National Estuarine Research Reserve, Mississippi.

Time Period of this project: 04/01/08 – 09/30/09

Accomplishments and outcomes from this project:

Research:

1. Determined the effects of stratifications (cold, dry, cold-dry, scarification) on viability and germination of *Ruppia maritima* seeds.
2. Determine the effectiveness of seeds/seedling transplanting methods for restoring *R. maritima* in the field.
3. Developed a protocol to collect, transport, sort, pre-treat, and germinate wigeongrass seeds and to provide a summary for each step’s success likelihood.

Education:

4. Three JSU undergraduate students participated in seed collection, seed sorting, and germination studies.
5. Two JSU graduate students participated in seedling transplanting and monitoring.
6. A JSU student, Jonathan Jones, stayed and worked with P. Biber at GCRL during a period of 7/2 – 7/23/2008. He helped maintain the greenhouse *Ruppia* and transplant them in the field to test the survival of peat pot-planted plants using different soil types.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. This project developed a protocol to collect, transport, sort, pre-treat, and germinate wigeongrass seeds and to provide a summary for each step's success likelihood.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided used by managers: 1

1. Developed protocol can assist in restoration projects that require wigeongrass.

MASGC Project # R/SP-17-PD:

PI: Ronald Phelps

Title: Live Marine Baitfish Opportunities when produced in Saline Waters of the Black Belt Region of Alabama.

Time Period of this project: 09/01/06 – 11/30/08

Accomplishments and outcomes from this project:

1. A survey of bait dealers in MS and AL collected information on species sold, retail prices and seasonal demand. This helped establish the current observed "demand" at about 4.3 million shrimp (retail median price = \$0.25 each) and 0.74 million bullminnows (retail median price = \$0.275 each) per year in MS and AL. However, since sales are widely thought to be limited by supply, these volumes probably reflect supply constraints rather than the limits of demand.
2. Eleven auctions of live bait were conducted. This allowed a determination of the latent demand and price-revenue relation for bullminnows FOB origin during four weeks in the fall of 2007. It also provided useful insights into wholesale market constraints and bait dealer business practices. We determined that revenues would be about the same for bullminnows sold for \$0.08 or \$0.15 each, though sales volumes would be about double for the former.
3. Bullminnows were successfully spawned and grown in the saline waters of private farms in the Alabama Black Belt. They were then transported to the coast without mortalities at a loading rate of 1 lb/gal of water using the low salinity water available in the area. One cooperating producer eventually sold over 44,000 fish to bait dealers on the Alabama coast. This demonstrated the biological, logistical, and marketing feasibility of growing marine bait inland away from major hurricane threats and then transporting them to the coast.
4. Trapping effectiveness was evaluated using two styles of traps and different commercially-available baits. A plastic-mesh trap designed like the traditional minnow trap was found to be a practical and economical style for use on

cooperating farms. Trapping remains a challenging area for additional research as an effective alternative to seining or draining a pond.

5. Wild-caught spot fingerlings (<2") were brought to maturity in 12 months and successfully induced-spawned. Wild-caught mullet and pinfish fingerlings were cultured to bait-size (4-5") under hatchery conditions. Pinfish were brought to maturity and successfully induced-spawned.

Project Completion Report: Project Completion Report is On File

Project Impacts:

2008 Report (updated in 2009)

Themes: Aquaculture, Coastal Communities and Economies

Title: Sea Grant facilitates inland commercial production of live marine baitfish for Gulf markets

Statement: Sea Grant researchers evaluated several new marine baitfish species with potential for inland production using the unique saline groundwaters of the Black Belt region of Alabama. Researchers assessed production technologies applicable to large-scale commercial culture systems including broodstock collection and handling, natural and induced spawning methods, fry nursing, multi-phase growout, inventory management, and partial-harvesting techniques. Several growers adopted some of these technologies and participated in marketing trials at various locations on the Gulf coast. Inland bait producers have made nearly \$6,000 in pond-bank sales of bullminnows to dealers participating in marketing trials, which in turn have generated an estimated total of \$12,000 in retail sales of marine baitfish associated directly with this project. Cultured baits will continue to provide income and employment opportunities, and will complement management strategies for natural populations (e.g. shrimp and by-catch species).

2009 Report

Themes: Aquaculture, Coastal Communities and Economies

Title: Sea Grant cultivates supply chains, social networks for sustaining a farm-raised marine baitfish industry

Statement: Taking the perspective that a successful industry must consider the preferences and concerns of all stakeholders, Sea Grant researchers have established networks between 2 growers, 2 management agencies (MRD and DMR), 4 wild-catchers, 4 distributors and 38 bait dealers to ascertain supply-chain business practices, identify opportunities and address constraints that confront a sustainable farm-raised marine baitfish industry. Anticipation is high among bait dealers and fishermen regarding the prospects for cultured live baits that are available off-season and in a wider range of desired sizes and species relative to wild supplies. Finally, researchers helped a private company secure second-phase funding of \$300,000 from the USDA Small Business Innovation Research (SBIR) program to pursue commercialization of marine baitfish.

Performance Measures:

Actual Performance Measures for this reporting period (2/1/08 – 1/31/09):

Economic Benefits (in dollars): \$12,000

To date, additional farm income on the order of several thousand dollars has been generated in the Black Belt region, and retail sales of approximately \$12,000 have been generated on the Alabama coast, along with an undetermined amount of indirect and induced economic impacts associated with the increase in sportfishing resulting from the increase in bait availability.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):
None

MASGC Project # R/SP-22-PD:

PI: Sean Powers

Title: Using Stable Isotopes to Explore Trophic Connectivity in Sharks in the Northern Gulf of Mexico.

Time Period of this project: 03/01/08 – 07/31/09

Accomplishments and outcomes from this project:

1. Determined carbon and nitrogen isotope values for liver and muscle tissue from sharpnose sharks sampled east and west of Mobile Bay, and noted both seasonal and geographical variation in those values.
2. Determined stable isotope values of carbon and nitrogen for several other species of shark in the northern Gulf of Mexico and will compare diet as indicated by those values to published accounts of diet from gut content analysis.

Project Completion Report: Project Completion Report is On File

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. This project measured stable isotope values of carbon and nitrogen in tissues of sharpnose sharks as a means of defining trophic position and carbon source, data which can be incorporated into ecosystem based fishery management plans.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided applied by managers in decision-making: 1

1. When completed, these data will have the potential to be incorporated into ecosystem models, which will form the basis of ecosystem based fishery management plans.

Open Program Development Projects for NA06OAR4170078

MASGC Project # R/AT-9-PD:

PI: Asim K. 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. The **R/AT-9-PD** is a program development fund that 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*.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided: 1

1. A novel isothermal DNA amplification using a thermostable helicase enzyme has been developed and optimized for the detection of *V. vulnificus* in shellfish. This will improve capabilities to identify if a *Vibrio* pathogen is in seafood products.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided applied by managers in decision-making: 1

1. Upon completion of the final stage testing of the novel isothermal DNA amplification using a thermostable helicase enzyme, it is expected that the seafood industry will review the process, try and then transfer it to the biotechnology industry.

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

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

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.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of tools and services provided applied by managers in decision-making: 1

1. A Strategic Plan has been adopted by the Town of Dauphin Island and used to determine priorities for FEMA and other actions by the town.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of tools and services provided: 1

1. A Report on the Strategic Resilience Plan for Dauphin Island will be produced. Planners and designers have researched the ecologies of barrier islands; have reviewed the movement of Dauphin Island over the last one hundred and seventy-five years; and have concluded that the west-end housing must have their development rights transferred into the Maritime Forest core of the island. The team has produced a plan for the development of approximately 560 housing units

on the core island, along with working waterfront and commercial uses, including a first class hotel and conference center.

Number of tools and services provided applied by managers in decision-making: 2

1. The Strategic Plan for Dauphin Island will help the Mayor and City Council make decisions about the future development of the island for many years to come.
2. The Strategic Resilience Plan for Dauphin Island will help the Mayor and City Council make decisions about the future development of the island for many years to come.

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 – 10/31/09

Accomplishments and outcomes from this project:

1. Predicted LULC change in the lower Pascagoula River Basin and generated the maps of the change vulnerabilities and the LULC in 2030, 2050 and 2100;
2. Modeled river flow under the scenarios of the predicted LULC change and climate change;
3. Simulated the 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;
4. 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.

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

Project Impacts: None for this reporting period.

Performance Measures:

Actual performance measures for this reporting period (2/1/08 – 1/31/09):

Number of new forecast capabilities developed: 4

1. Development of LULC change model in the lower Pascagoula River Basin,
2. Forecast of river flow under the scenarios of changing LULC and climate in the lower Pascagoula River Basin,
3. Prediction of the distribution of the tidal marshes under accelerated sea level rise in the lower Pascagoula River Basin changing freshwater inputs, and
4. Preliminary analysis of the changes in ecosystem services provided by the tidal marshes in the lower Pascagoula River Basin.

Number of tools and services provided: 2

1. The maps of the predicted LULC in 2030, 2050 and 2100 based on historical land transition trend;
2. The maps of the predicted distributions of the tidal marshes for every decade from 2020 to 2100 under accelerated sea level rise and changing freshwater inputs.

Anticipated performance measures for the next reporting period (2/1/09 – 1/31/10):

Number of new forecast capabilities developed: 2

1. Development of the probability distribution for the river flow predictions under changing LULC and climate
2. Improvement of the predictions for the tidal marsh distributions applying more precise LiDAR elevation data and marsh accretion rates.

Number of new forecast capabilities developed applied to use: 1

1. The predicted distribution of the tidal marshes will be applied to forecast storm surge under accelerated sea level rise.

Number of tools and services provided: 1

1. Improved maps of the distributions of the tidal marshes in the lower Pascagoula River Basin.

Number of tools and services provided applied by managers in decision-making: 2

1. The improved map of the predicted distributions of the tidal marshes for every decade from 2020 to 2100 under accelerated sea level rise and changing freshwater inputs will be used by land, flood-zone, emergency, water quality, marine resource and conservation managers.
2. Application of the maps of the predicted LULC in 2030, 2050 and 2100 based on historical land transition trend

The land maps produced by this project can be used as the basis for predicting storm surge under sea level rise, assessing water quality, evaluating possible changes in wildlife habitat, including the changes of habitat of fish juveniles and the subsequent economic consequences, so they are potentially useful for emergency managers, Mississippi Departments of Environmental Quality or Marine Resources, wildlife and wetland conservation organizations (especially in prioritizing the protection goals with limited resources), and fishery industry.

MASGC Project # R/SP-21-PD:

PI: Kevin S. 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 dominates 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.

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

Project Impacts: None for this reporting period.

Performance Measures: None this reporting period

Additional new impacts from old projects not covered in this report:

MASGC Project: R/ER-50-PD (07/01/00 – 09/30/02)

PI: Thomas P. Cathcart (MSU)

CoPI: Peter O. Melby (MSU)

and

MASGC Project: R/CEH-18-PD (09/01/04 – 08/31/05)

PI: Peter O. Melby (MSU)

Co-PI: Tom Cathcart (MSU)

Associate PI: Tichard Harkess (MSU)

2009 Report

Themes: Ecosystems and Habitats, Marine and Aquatic Science Literacy, Coastal Natural Hazards

Title: 26-mile beach restoration project based on MASGC research

Statement: MASGC funded a pilot project to restore a three-acre section of beach on the Mississippi coast. Due to the success of this project, the researchers are restoring 26 miles of hurricane-damaged coastal beach in Harrison County through a \$100,000 grant from the U.S. Army Corps of Engineers. In addition 310 community volunteers provided more than 700 volunteer hours toward the restoration project by planting 7,000 lower beach emergent plants and 3,500 sea oats, saw palmetto, small cabbage palms, wax myrtle, and pines in the upper beach.

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	2.60	0.79
Communications	2	2.00	0
Extension	11	3.32	1.53
Education	11	1.66	0.73
Research (PIs, co-PIs, Students--not including Fellowships)	76	15.35	8.44
TOTAL	105	24.93	11.49

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	0.50
Melissa Schneider	Communications Coordinator	1.00
Tracie Sempier	Coastal Storms Program Coordinator	1.00
David Burrage	MS Extension Program Leader	1.00
Stephanie Showalter	Legal Program and Asst. Dir. Outreach	1.00
Sharon Walker	Director of Education	0.20
Kay Bruening	Executive Support Associate	1.00

b. Program Development Projects

Project Title	PI	Federal Funds	Matching Funds
ED/19-PD Development of Field Guide Resources for Aquatic Plants of the Mississippi Coast	Hyun Jung Cho Jackson State University	9,999	7,242
R/AT-8-PD Assessment of Supercritical CO ₂ Inactivation of Oysters Associated Bacteria	Mark T. Hamann University of Mississippi	14,996	9,134
R/AT-9-PD Development of an Isothermal Nucleic acid Test with Lateral Flow Detection for <i>Vibrio vulnificus</i>	Asim K. Bej University of Alabama at Birmingham	10,000	5,437
R/CCD-15-PD Will Climate Change Cause Wetland Loss on the Mississippi Gulf Coast More Than Upland Land Use/Land Cover Change Within the Next Century	Wei Wu University of S. Mississippi	10,000	5,000

c. Leveraged Funds

Project	Source	Amount	Years
MASGC – Administration Publications	Various	\$ 206	1
MASGC – Administration Marine Scholars	Exxon	\$ 5,000	1
A/O-31 Coastal Storms Program	MS Dept of Marine Resources – Gulf of Mexico Alliance Resilience Team	\$24,600	1
Gulf of Mexico Alliance - Education Coordinator-ED-18	NOAA Northern Gulf Institute	\$ 48,333	1
	EPA Gulf of Mexico Program	\$ 50,000	1
	NOAA Coastal Services Center	\$263,333	1
Use of Stable Isotope Ratios to Link Wastewater Sources to Effects on Shellfish and Human Health - R/CEH-28	FDA – time & sample processing	\$23,000	1
	USA – Student Tuition Waiver	\$ 5,000	1
	DISL – Use of DISL data sondes	\$10,000	1
Assessment of Depredation by Bottlenose Dolphins in the Northwest FL and AL Sport Fishery – R/MG/BR-01	Sea World Busch Gardens Conservation Fund	\$12,434	1
	Emerald Coast Wildlife Refuge	\$ 5,000	1
	Choctaw Basin Alliance	\$ 5,000	1
	University of Central FL, Biology Dept.	\$ 5,000	1
MASGC Outreach Program – Legal, Extension, and Communications	University of Minnesota/Texas Cooperative Extension	\$ 6,000	1
MASGC Outreach Program – Legal, Extension, and Communications	USDA – MS Master Naturalist Program Curriculum Development	\$ 4,973	1
MASGC Outreach Program – Legal, Extension, and Communications	MSU – School Seedling Nursery Program for Habitat Restoration	\$ 1,600	1
MASGC Outreach Program – Legal, Extension, and Communications	Mississippi-Alabama Bays and Bayous Symposium – sponsors/booths and registrations	\$ 52,550	1
MASGC Outreach Program – Legal, Extension, and Communications	Mobile Bay National Estuary Program – Facilitating a Land Trust for Coastal Alabama	\$ 4,140	1
MASGC Outreach Program – Legal, Extension, and Communications	Gulf of Mexico Extension, Outreach and Education Workshop	\$ 10,000	1
MASGC Outreach Program – Legal, Extension, and Communications	AL Gulf Coast Convention and Visitors Bureau – Office space Nature-based tourism program	\$ 5,000	1
MASGC Outreach Program – Legal, Extension, and Communications	Christian Miller - 1/2 time paid by Mobile Bay NEP and the AL Clean Water Partnership	\$ 25,000	1
Development of Field Guide Resources for Aquatic Plants of the MS Coast – ED-19-PD	University Scholars Program		
	Gulf of Mexico Alliance Environmental Education	\$ 2,500 \$ 7,600	1 1

National Sea Grant Law Center - L-4	UM Law School – Compensation for PI’s Teaching	\$ 1,000	1
The Diversity and Role of Root-Associated Fungi in Saltmarsh and Seagrass Plants and Implications for Restoration Success – R/CEH-25	RAND Gulf Policy Institute – Student Salary	\$ 10,000	1
	DMR Tidelands – Plant Nursery for Tidal Marsh Restoration	\$ 50,000	1
	DMR Tidelands – Technician for Plant Nursery	\$ 25,000	1
Sea Urchins are Improved Candidates for Aquaculture and Biomedical Ecotoxicological Models – R/SP-15	Texas A & M Lab support	\$ 75,000	1
	Zeigler Corporation – feed ingredients	\$ 4,000	1
MASGC Education Efforts – DISL	NOAA – Northern Gulf Institute	\$161,500	1
Assessment of Population Growth and Develop. Impacts on the Fish River Basin Coastal Community – R/CCD-14	Mobile Bay National Estuary Program	\$ 20,000	1
Gulf Coast Design and Development Lab - R/CCD-11-PD	Auburn – DI Design and Development Lab	\$ 7,000	1
The Interaction of Salinity and Temperature on Growth of Native and Non-native Shrimp Species Cultured in Alabama – R/SP-20	Alabama Agriculture Experiment Station, Hatch/Multistate Funding Program	\$ 50,000	1
	NOAA National Sea Grant Program – Developing New Aquaculture and Business Opportunities with Marine Shrimp in West Alabama	\$417,795	1

d. List of Partnerships

Federal

1. Apalachicola National Estuarine Research Reserve
2. Barataria-Terrebonne National Estuary Program
3. Bon Secour National Wildlife Refuge
4. Charlotte Harbor National Estuary Program
5. Flower Garden Banks National Marine Sanctuary
6. Galveston Bay Estuary Program
7. Grand Bay National Estuarine Research Reserve
8. Gulf Islands National Seashore, National Park Service
9. Minerals Management Service
10. Mission-Aransas National Estuarine Research Reserve
11. Mobile Bay National Estuary Program
12. NASA Stennis Space Center
13. National Marine Educators Association
14. National Marine Fisheries Service, Pascagoula Office
15. National Marine Fisheries Service, Southeast Regional Office
16. National Park Service, Jean Lafitte National Historical Park and Preserve
17. National Parks Service, Gulf Islands National Seashore
18. National Science Foundation
19. National Science Teachers Association
20. National Sea Grant Association
21. National Sea Grant Office
22. Naval Meteorology and Oceanography Command
23. NOAA / AOML (Miami)
24. NOAA Center for Coastal Fisheries and Habitat Research
25. NOAA Coastal Services Center
26. NOAA Fisheries Office of Protected Species, Dolphin SMART Program
27. NOAA Fisheries Southeast Science Center
28. NOAA Fisheries, Marine Fisheries Initiative Program (MARFIN)
29. NOAA Flower Garden Banks National Marine Sanctuary
30. NOAA Gulf of Mexico Regional Team
31. NOAA MEXUS-Gulf Program
32. NOAA National Marine Fisheries Service
33. NOAA National Marine Fisheries Service, Galveston
34. NOAA National Marine Sanctuary Program
35. NOAA National Weather Service
36. NOAA Office of Applied Research
37. NOAA Office of Coastal and Resource Management
38. NOAA Office of Education
39. NOAA Restoration Center
40. NOAA Southeast Fisheries Science Center
41. NOAA Special Projects Office
42. Rookery Bay National Estuarine Research Reserve [FL]

43. U.S. Army Corps of Engineers
44. U.S. Coast Guard Marine Safety Office, Mobile, Alabama
45. U.S. Commission on Ocean Policy
46. U.S. Congressman Gene Taylor's (MS) Office
47. U.S. Congressman Jo Bonner's (AL) Office
48. U.S. Department of Agriculture, Cooperative State Research, Education, and Extension Service
49. U.S. Department of Agriculture, Experiment Station, Stoneville, Mississippi
50. U.S. Department of Agriculture, Natural Resources Conservation Service
51. U.S. Environmental Protection Agency
52. U.S. FDA Seafood Laboratory, Dauphin Island, Alabama
53. U.S. Fish and Wildlife Service, Aransas National Wildlife Refuge Complex
54. U.S. Fish and Wildlife Service, Daphne Field Office [AL]
55. U.S. Fish and Wildlife Service, Mississippi Sandhill Crane National Wildlife Refuge
56. U.S. Food and Drug Administration Gulf Coast Seafood Laboratory
57. U.S. Food and Drug Administration, New Orleans, LA
58. U.S. Geological Survey, Center for Coastal and Watershed Studies
59. U.S. Geological Survey, Coastal Wetlands Planning, Protection and Restoration Act
60. U.S. Geological Survey, National Wetlands Research Center
61. U.S. Minerals Management Service
62. U.S. Naval Oceanographic Office
63. U.S. Navy
64. Weeks Bay National Estuarine Research Reserve

Regional

65. Alaska Ocean Observing System (AOOS)
66. Caribbean Regional Association (CaRA)
67. Central Gulf Ocean Observing System (CenGOOS)
68. COSEE - Alaska, University of Alaska
69. COSEE - Central Coordinating Office, University of Rhode Island
70. COSEE - Central Gulf of Mexico, University of Southern Mississippi
71. COSEE - Coastal Trends, Horne Point Lab, University of Maryland
72. COSEE - Great Lakes, The Ohio State University
73. COSEE - Lawrence Hall of Science; University of California, Berkeley
74. COSEE - Networked Ocean World (NOW), Rutgers University
75. COSEE - New England, New England Aquarium
76. COSEE - Ocean Learning Communities, University of Washington
77. COSEE - Ocean Systems, University of Maine
78. COSEE - Pacific Partnerships, Oregon Institute of Marine Biology, University of Oregon
79. COSEE - SouthEast, South Carolina Sea Grant
80. COSEE - West, University of Southern California
81. Great Lakes Ocean Observing System (GLOOS)
82. Gulf Coast Geospatial Center (USM)
83. Gulf Coast Ocean Observing System Education and Research Council

84. Gulf Coast Services Center
85. Gulf of Mexico Alliance
86. Gulf of Mexico Coastal Ocean Observing System
87. Gulf of Mexico Environmental Education Network
88. Gulf of Mexico Fishery Management Council
89. Gulf of Mexico Ocean Observing System (GCOOS)
90. Gulf of Mexico Program
91. Gulf States Marine Fisheries Commission
92. Houston-Galveston Area Council
93. Mid-Atlantic Coastal Ocean Observing System Regional Association (MACOORA)
94. NOAA Gulf of Mexico Regional Collaboration
95. Northeast Regional Association Coastal Ocean Observing System (NERACOOS)
96. Northern California Coastal Ocean Observing System (CeNCOOS)
97. Northern Gulf Institute
98. Northwest Association of Networked Ocean Observing System (NANOOS)
99. Pacific Islands Ocean Observing System (PacIOOS)
100. Southeast Coastal Ocean Observing System Regional Association (SECOORA)
101. Southern California Coastal Ocean Observing System (SCCOOS)
102. Southern Shrimp Alliance

Local & State

State

103. Alabama Association of State Floodplain Managers
104. Alabama Coastal Nonpoint Pollution Control Program
105. Alabama Cooperative Extension System
106. Alabama Department of Conservation and Natural Resources, Coastal Programs
107. Alabama Department of Conservation and Natural Resources, Division of Wildlife & Fisheries
108. Alabama Department of Conservation and Natural Resources, Marine Resource Division
109. Alabama Department of Conservation and Natural Resources, State Lands Division
110. Alabama Department of Education
111. Alabama Department of Environmental Management
112. Alabama Forestry Commission
113. Alabama State Docks
114. Alabama State Lands, Coastal Section
115. Alabama State Port Authority
116. Alabama Working Waterfront Coalition
117. Alabama-Mississippi Clean Marina Program
118. Fisherman's Disaster Relief Program [MS]
119. Florida Department of Education
120. Florida Department of Environmental Protection, Florida Coastal Management Program
121. Florida Fish & Wildlife Research Institute
122. Florida Marine Science Educators Association Board (Historian)
123. Louisiana Coastal Protection and Restoration Authority Implementation Team

124. Louisiana Department of Education
125. Louisiana Department of Education, Louisiana Science Teachers Association
126. Louisiana Department of Environmental Quality
127. Louisiana Department of Natural Resources
128. Louisiana Department of Natural Resources, Coastal Restoration
129. Louisiana Department of Wildlife and Fisheries
130. Mississippi Cooperative Extension Service
131. Mississippi Department of Education
132. Mississippi Department of Environmental Quality
133. Mississippi Department of Marine Resources
134. Mississippi Department of Marine Resources, Coastal Programs
135. Mississippi Department of Marine Resources, Coastal Resources Management Program
136. Mississippi Department of Marine Resources, Fisheries
137. Mississippi Department of Marine Resources, Grand Bay NERR
138. Mississippi Department of Wildlife, Fisheries, and Parks
139. Mississippi Marine Debris Task Force
140. Mississippi Office of Secretary of State
141. South Florida Water Management District
142. Texas Commission on Environmental Quality
143. Texas Council for Environmental Education
144. Texas General Land Office
145. Texas Parks and Wildlife Department
146. Texas Parks and Wildlife Department Coastal Fisheries Division
147. Yazoo Mississippi Delta Joint Water Management District

Local & State

Local

148. Baldwin County Board of Education
149. Baldwin County Emergency Management
150. Baldwin County Planning and Zoning Department [AL]
151. City of Biloxi [MS]
152. City of Corpus Christi Water Department [TX]
153. City of Foley [AL]
154. City of Gautier [MS]
155. City of Gulf Shores [AL]
156. City of Mobile, Keep Mobile Beautiful Program [AL]
157. City of Moss Point [MS]
158. City of Ocean Springs [MS]
159. City of Orange Beach [AL]
160. City of Pascagoula [MS]
161. City of Pass Christian, [MS]
162. Coastal Alabama Clean Water Partnership
163. Collier County Planning Department
164. Harrison County Soil and Water Conservation District
165. Hillsborough County High School Science

166. Jackson County Board of Supervisors [MS]
167. Mobile Area Water and Sewer System [AL]
168. Mobile Bay National Estuary Program [AL]
169. Mobile County Board of Education
170. Mobile County Environmental Studies Center [AL]
171. Okaloosa County Environmental Council [FL]
172. Pascagoula River Basin
173. Pinellas County Department of Environmental Management
174. South Alabama Regional Planning Commission [AL]
175. South Mississippi Environmental & Agricultural Coordination Organization (SMEACO)
176. South Mobile County Education Foundation
177. St. Tammany Parish Engineering Department
178. Tampa Bay Estuary Program
179. Town of Bayou La Batre [AL]
180. Town of Dauphin Island [AL]

Non-Governmental Organizations

181. 4-H
182. Alabama Clean Marina Partnership
183. Alabama Coastal Foundation
184. Alabama Fisheries Association
185. Alabama Math Science Technology Initiative
186. Alabama Partners Against Litter
187. Alabama Water Watch Association
188. AL-MS Clean Marina Program
189. Aquarium of the Americas [New Orleans, LA]
190. Aquatic Nuisance Species Taskforce [AL and MS]
191. Armand Bayou Nature Center
192. Audubon Bird Sanctuary, Dauphin Island, AL
193. Audubon Nature Institute
194. Bayou La Batre Chamber of Commerce
195. Bayou Preservation Association
196. Centers for Ocean Sciences Education Excellence
197. Chicago Zoological Society
198. Choctawhatchee Audubon Society, Niceville, FL
199. Choctawhatchee Basin Alliance, Mattie Kelly Environmental Institution
200. Coastal America
201. Coastal Conservation Associations (AL, MS)
202. Conservancy of Southwest Florida
203. Crystal Springs Preserve
204. Dauphin Island Chamber of Commerce
205. Dauphin Island Parks and Beach Board/Fort Gaines [AL]
206. Dog River Clear Water Revival
207. Earth Gauge Initiative
208. Eastern Shore Art Center

209. Emerald Coast Wildlife Refuge, Destin, FL
210. Environmental Education Network
211. Extension Disaster Education Network
212. Florida Museum of Natural History
213. Friends of Dauphin Island Sanctuary
214. Galveston Bay Council
215. Galveston Bay Foundation
216. Galveston Bay Information Center
217. Galveston Historical Foundation
218. Gulf of Mexico Fisheries Management Council
219. Gulf of Mexico Foundation
220. Harris County Watershed Protection Group
221. J.L. Scott Marine Education Center
222. Jackson County Chamber of Commerce
223. Joint Ocean Commission Initiative
224. Junior Anglers and Hunters of America, Inc.
225. Junior League of Mobile
226. Lake Pontchartrain Foundation
227. Land Trust for the Mississippi Coastal Plain
228. Louisiana Public Broadcasting System
229. Marine Science Graduate Student Organization
230. Marine Technology Society
231. Maritime & Seafood Industry Museum [MS]
232. McWane Science Center
233. Meridian Institute
234. Mississippi Charter Boat Captains Association
235. Mississippi Coast Audubon Society
236. Mississippi Museum of Natural Science
237. Mobile Bay Audubon Society
238. Mobile Botanical Gardens
239. Monterey Bay Aquarium
240. National Alliance of Vietnamese American Service Agencies
241. National Environmental Education Foundation
242. National Fish and Wildlife Foundation, Inc.
243. National Mississippi River Museum and Aquarium
244. Nueces River Authority
245. Ocean Springs Chamber of Commerce
246. PACERS, Inc
247. Pascagoula River Audubon Center
248. RAND (Research and Development) Corporation
249. Solutions To Avoid Red Tide, Inc. (START)
250. South Alabama Regional Planning Commission
251. South Baldwin Chamber of Commerce
252. Southeastern Wildlife Conservation Group
253. Southern Association of Marine Educators
254. Southern Association of Marine Labs

255. Spitfire Strategies
256. Suncoast Earth Force
257. Texas Marine Education Association
258. Texas State Aquarium
259. The Aquarium of the Pacific
260. The Artist Boat, Inc.
261. The FL Aquarium-regional
262. The Gulf and South Atlantic Fisheries Foundation, Inc.
263. The Hatfield Marine Science Center
264. The National Marine Sanctuary Foundation
265. The Nature Conservancy
266. The Nature Conservancy of Alabama
267. The Nature Conservancy of Michigan
268. The Nature Conservancy of Mississippi
269. The Pier Aquarium
270. The Shedd Aquarium
271. The Texas State Aquarium
272. Walter Anderson Museum of Art
273. Weedon Island Preserve
274. Weeks Bay Reserve Foundation
275. Wolf Bay Watershed Watch

International

276. The Veracruz Aquarium, Mexico

Industry/Business

277. 1620 AM (Country Radio Station, Pensacola, FL)
278. Alabama Fish Farming Center, Greensboro, AL
279. Alabama Gulf Coast Area Chamber of Commerce
280. Alabama Gulf Coast Convention & Visitor's Bureau
281. Alabama Inland Shrimp Producers Association, AL
282. Alabama Seafood Association
283. Ameripure Processing Company, Franklin, LA
284. Aquaculture Systems Tech, LLC
285. Biodiesel Magazine
286. BioHelix Corporation, Beverly, MA
287. Bon Secour Fisheries
288. Bosarge Boats & Dockside Seafood
289. Busch Gardens Tampa Bay
290. Chevron Refineries
291. Claude Peteet Mariculture Center, Gulf Shores, AL
292. Degussa Corporation [AL]
293. Distraction Fishing Charters, Orange Beach, AL.
294. Exxon Mobil Corporation
295. FishingLouisiana.com
296. Five E's Unlimited of Seattle, Washington
297. Gollott and Sons Seafood

298. GothicArch Greenhouses
299. grassroots, Inc.
300. Greene Prairie Aquafarm, Boligee, AL
301. Hattiesburg American
302. LGL Ecological Research Associates
303. Mississippi Business Journal
304. Mississippi Gulf Fishing Banks, Inc.
305. Mississippi Power
306. Mobile Area Chamber of Commerce [AL]
307. Mobile Bay Oyster Gardening Program
308. Mobile Press Register
309. Naples Daily News
310. Nature Coast Environmental Education, Inc.
311. New Florida Girl Fishing Charters, Destin, FL.
312. Ocean Springs Chamber of Commerce [MS]
313. Ocean Springs Record
314. Odom's Fish Farm, Eutaw, AL
315. Organized Seafood Association of Alabama
316. Ship Island Excursions
317. Smart Coast
318. Sun Herald, Biloxi
319. The Bellwether Group
320. The FORUM (industrial association of Harris Deville and Associates)
321. Tilapia, INC
322. TNI Consultants LLC
323. Volkert & Associates
324. Walmart
325. Wild American Shrimp Incorporation
326. WKRG (Channel 5, Mobile, AL)
327. WLOX (television station, Biloxi, MS)
328. Zeigler Bros., Inc.

Academic Institutions

School Systems

329. Baldwin County School System (AL) Sea, Sand & Stars Science and Nature Center
330. Mobile County Public School System [AL]

Secondary Schools

331. Alma Bryant High School [AL]
332. Auburn High School
333. Baldwin County Middle School
334. Booker T Washington Middle School
335. Citronelle High School [AL]
336. Clarke School of Math & Science [Mobile County, AL]
337. Daphne High School [AL]
338. Elberta Middle School [AL]

339. Fairhope High School [AL]
340. Florala High School
341. Gulf Coast High School
342. Harrison County High School
343. Jefferson County International Baccalaureate School [AL]
344. Leroy High School
345. Moss Point High School [MS]
346. Parker High School [AL]
347. Pascagoula High School [MS]
348. Robertsdale High School
349. Stewart Middle Magnet School
350. Vigor High School [AL]

Junior Colleges

351. Lone Star College, Kingwood
352. Mississippi Gulf Coast Community College [MS]

Universities

353. Auburn Marine and Extension Research Center
354. Auburn University
355. Dauphin Island Sea Lab
356. Gadsden State Community College
357. Harte Research Institute for Gulf of Mexico Studies
358. Jackson State University
359. Louisiana State University
360. Louisiana University Marine Consortium
361. Mississippi Academy of Sciences
362. Mississippi State University
363. Mississippi State University, Coastal Research and Extension Center
364. Mississippi State University, Geo Resources Institute
365. Mississippi University for Women
366. Mote Marine Laboratory
367. Nicholls State University
368. North Carolina State University
369. Northwest Florida State College, Niceville, FL.
370. Oregon State University
371. Rutgers University
372. Texas A&M University
373. Texas A&M University at Corpus Christi
374. Texas A&M University at Galveston
375. The Smithsonian Institution-National Museum of Natural History-Sant Ocean Hall
376. The University of Alabama
377. The University of Alabama at Birmingham
378. The University of Alabama at Huntsville
379. The University of Florida
380. The University of Mississippi

381. The University of Rhode Island
382. The University of Southern Mississippi
383. University of Central Florida
384. University of Georgia
385. University of Houston - Clear Lake
386. University of New Orleans - Pontchartrain Institute for Environmental Sciences
387. University of North Carolina at Wilmington
388. University of South Alabama
389. University of South Florida
390. University of Texas
391. University of Texas-Marine Science Institute

Sea Grant Programs

392. Delaware Sea Grant
393. Florida Sea Grant
394. Georgia Sea Grant
395. Hawaii Sea Grant
396. Illinois-Indiana Sea Grant
397. Louisiana Sea Grant
398. Maine Sea Grant
399. Minnesota Sea Grant
400. North Carolina Sea Grant
401. Puerto Rico Sea Grant
402. South Carolina Sea Grant
403. Texas Sea Grant Program
404. Washington Sea Grant

e. Awards and Honors

Awards

1. Project: ED-12, “Educational Efforts at the Scott Marine Education Center, the Dauphin Island Sea Lab, and the Environmental Studies Center.”
PI, Sharon Walker was awarded the Southern Association of Marine Educators—
Outstanding Resource Award on November 14, 2008.
2. Project ED-18, “Facilitating the Gulf of Mexico (GOMA) Environmental
Education Priorities through the Employment of an Education and Outreach
Coordinator”
Coastal America Partnership Award was received by The Florida Department of
Environmental Protection, Office of Environmental Protection for their Learning
in Florida’s Environments Program (LIFE). The Gulf of Mexico Alliance
Environmental Education Network was listed as a partner in this award and
received recognition.

Nominations:

3. Project: R/SP-15, “Sea Urchins are Improved Candidates for Aquaculture and
Biomedical/Ecotoxicological Models”
Project was one of 20 semifinalists for the “Alabama Launchpad”. This is a
Business Plan competition out of the Alabama governor’s office.

B. Communication Metrics
a. Publications List (print and electronic)

Technical Reports:

1. Bowling, T. 2006. Hawai'i Boating and Water Safety Program Workbook and Teachers Manual Question. (MASGP 06-042) [O-1]
2. Bowling, T. and S. Showalter. 2008. Legal Protections for Coastal Environments and Resources in Michigan (MASGP 08-007-07) [L-4]
3. Bowling, T. 2008. New Jersey's Public Access Regulations (MASGP 08-007-09) [L-4]
4. Bowling, T. 2008. Rebuilding of Non-grandfathered Coastal Structures (MASGP 08-007-06) [L-4]
5. Bowling, T. 2008. Seafood Liability Issues for Charter Boat Captains (MASGP 08-007-08) [L-4]
6. Cho, H.J. and May. 2006. Geospatial Modeling Approach for Prediction of Potential SAV Habitat Increase with Restoration Efforts. *Proceedings of the 20th Coastal Society* 43-47 [R/CEH-23-PD]
7. Cho, H.J., J.H. Young, and May. 2006. Temporal variation in depth distribution of coastal submerged vegetation. *Proceedings of the 2007 ESRI User Conference* 14pp. http://gis.esri.com/library/userconf/proc06/papers/papers/pap_1760.pdf [R/CEH-23-PD]
8. Comyns, B. C. Rakocinski, M. Peterson, P. Grammer, and A. Shiller. 2008. Use of Otolith Microchemistry of Spotted Seatrout to Identify Stock Source-Areas, Reveal Population Movements, and Determine Interannual Variability in Regional Patterns of Otolith Signatures in Mississippi Coastal Waters. (MASGP 08-030) [R/CEH-14]
9. Gonzalez, J., Johnson, L. 2005. Managing Hull Transport of Invasive Aquatic Species. (MASGP 05-050) [L-3].
10. Sempier, S. and M. Schneider. 2008. Gulf of Mexico Research Planning Survey Results. MASGC-08-007. [M/GOMR-1]
11. Sempier, S. and M. Schneider. 2008. Gulf of Mexico Strategic Plans with Links to the Ocean Research Priorities Plan Themes and Priorities. MASGC-08-006. [M/GOMR-1]
12. Sempier, S.H., K. Havens, R. Stickney, D.L. Swann, and C. Wilson. 2008. Gulf of Mexico Research Plan. MASGP Number 08-023. [M/GOMR-1]
13. Showalter, S. 2008. Minnesota Lobbying. (MASGP 08-007-04) [O-1]
14. Showalter, S. and T. Bowling, 2008. *Terrapin Run* Decision: Are Comprehensive Plans Binding? (MASGP 08-007-03). [L-4]
15. Showalter, S. 2008. Aquaculture Facilities in Federal Waters (MASGP 08-007-12). [L-4]
16. Showalter, S. 2008. Federal and State Penalties for Illegal Stocking of Fish (MASGP 08-007-02) [L-4]
17. Showalter, S. NERACOOS Legal Questions (MASGP 08-007-01) [L-4]
18. Showalter, S. 2008. Sea Grant Director Letters to Congress (MASGP 08-007-04) [L-4]

19. Showalter, S. 2008. State Agency Immunity from Federal Antitrust Laws (MASGP 08-007-16). [L-4]
20. Showalter, S. 2008. State Registration of Aquaculture Facilities in Federal Waters (MASGP 08-007-11) [L-4]

Proceedings and Symposia:

1. Schneider, M. 2008. Bays and Bayous Symposium Proceedings. MASGP-08-024. [O-1]

Brochures, fact sheets, posters, etc.:

Brochures

1. Burrage, D. 2008. Mississippi Tide Tables. Mississippi State University Extension Service Publication 850. MASGP -08-019. Mississippi State University, Mississippi State, Mississippi. [O-1]
2. Nolan, G. K. and C. A. Boyd. 2008. Mississippi Master Naturalist Brochure. [O-1]
3. Schnieder, M., Parry, N., Ouder, P. 2007. Marine Debris (MASGP 07-016) [A/O-30]
4. Sempier, S. 2008. Public Comment Period Open for the Gulf of Mexico Research Plan. Distributed at the Bays and Bayous Symposium and other venues. [M/GOMR-1]

Fact Sheets

5. Bowling, T. 2008. Announcement of Regulatory Development: EPA Promulgates Final Rule on Water Transfers (June 2008), MASGP 08-007-05. [L-4]
6. Pabody, C. 2008. West Indian Manatees: Protection and Conservation. MASGP-08-015. [O-1]
7. Schneider, M. 2008. MASGC one-pager. MASGP-08-029. 2008. [O-1]
8. Schneider, M. and T. Sempier. 2009. Coastal Resilience Index Fact Sheet. MASGP-09-006. 2009. [O-1]
9. Showalter, S. 2008. APHIS Restrictions on Interstate Movement of Fish in the Great Lakes Region. MASGP 08-007-13. [L-4]
10. Showalter, S. 2008. Congress Passes Clean Boating Act (August 2008), MASGP 08-007-10 [L-4]
11. Wallace, R. 2008. Gulf Shrimp Landings and Effort Down. (MASGP 08-010-01) [O-1]
12. Wallace, R.K., Phillip Waters, 2008. Scott Rikard. Oyster Hatchery Techniques. SRAC 4302 [O-1]
13. Yokel, Lee. 2006/2007. "Gulf of Mexico – A National Resource" [ED-18]

Educational Posters

14. Boyd, C. A. 2008. Mississippi Master Naturalist Program (Poster). [O-1]
15. Boyd, C. A. and S. A. Douglas. 2008. Mississippi Master Naturalist Program Training and Development. (poster) [O-1]
16. McDonough, J, 2008 Creature Cards [O-1]
17. Shippee, Steve. 2008. *Do you know this dolphin?* [R/MG/BR-011]
18. Shippee, Steve. 2008. *Fishing-gear related injuries: Entanglement is no fun!* [R/MG/BR-011]

Peer-reviewed journal articles, book chapters (Published)

1. Bucolo, P., Sullivan, M., Zimba, P. 2008. Effects of Nutrient Enrichment on Primary Production and Biomass of Sediment Microalgae in a Subtropical Seagrass Bed. (CHECK JOURNAL NAME etc) (MASGP 08-032) [R/CEH-13].
2. Cho, H.J. and May. 2006. An Initial Restoration Tool for Submersed Aquatic Vegetation. *National Wetland Newsletter* 28(6): 10-12 and 20. (MASGP 08-036) [R/CEH-23-PD]
3. Cho, H.J. and May. 2008. Short-term spatial variations in the beds of *Ruppia maritima* (Ruppiaceae) and *Halodule wrightii* (Cymodoceaceae) at Grand Bay National Estuarine Research Reserve, Mississippi. *Journal of Mississippi Academy of Sciences* 53(2-3): 133-145. (MASGP 08-033) [R/CEH-29PD]
4. Gibbs, V.K., S.A. Watts, A.L. Lawrence and J.M. Lawrence. 2009. Dietary phospholipids affect growth and production by the juvenile sea urchin *Lytechinus variegatus*. *Aquaculture*. 292, 95-103. [R/SP-15]
5. Hammer, H.S., B. Hammer, S.A. Watts, A.L. Lawrence and J.M. Lawrence. 2006. The effect of dietary protein and carbohydrate concentration on the biochemical composition and gametogenic condition of the sea urchin, *Lytechinus variegatus*. *J. exp. Mar. Biol. Ecol.* 334, 109-121. [R/SP-15]
6. Hammer, H.S., S.A. Watts, R. Desmond, A.L. Lawrence and J.M. Lawrence. 2006. The effect of dietary protein concentration on the consumption, survival, growth and production of the sea urchin *Lytechinus variegatus*. *Aquaculture* 254, 483-495. [R/SP-15]
7. Jennings, N.A., L. Pezzementi, A.L. Lawrence and S.A. Watts. 2008. Acetylcholinesterase in the sea urchin *Lytechinus variegatus*: characterization and developmental expression in larvae. *Comp. Biochem. Physiol. B* 149, 401-409. [R/SP-15]
8. Lawrence, J.M., Xueben Cao, Yaqing Chang, Ping Wang, Y. Yu, A.L. Lawrence and S.A. Watts. 2009. Temperature effect on feed consumption, absorption, and assimilation efficiencies and production of the sea urchin *Strongylocentrotus intermedius*. *J. Shellfish Research* 28(2), 389-395. [R/SP-15]
9. Mulvaney, T. Instream Flows and the Public Trust. 2009. *Tulane Environmental Law Journal*. 22: 315-377. [O-1]
10. Nakatsuji, T., C.-Y. Lee, and R.D. Watson. (2009) Crustacean molt-inhibiting hormone: structure, function, and cellular mode of action. *Comparative Biochemistry and Physiology A* 152:139-148. (MASGP 08-031) [R/SP-19]
11. Showalter, S. 2007. *Increasing Accountability through Mandatory ID Systems for Non-Native Species*. *Aquatic Invaders, The Digest of the National Aquatic Nuisance Species Clearinghouse*, Vol. 18(1-2), pp. 8-11. [L-4]
12. Showalter, S. and D. Bergeron. 2008. *Second State Proposes Ballast Water Discharge Permit*. *Great Lakes Seaway Review*, Vol. 37(1), pp. 6-11. [L-4]
13. Walker AK and Campbell J. 2009. First records of the seagrass parasite *Plasmodiophora diplantherae* from the north-central Gulf of Mexico. *Gulf and Caribbean Research* 21: 63-65. [R/CEH-25]
14. Watts, S.A., M. L. Powell, A. L. Lawrence, J. M. Lawrence. 2007. Sea Urchin Culture -- Emerging Species Yields Roe; Supports Medical Modeling,

Environmental Testing. Global Aquaculture Advocate. Jan/Feb. pp. 22-24.
[R/SP-15]

Peer-reviewed journal articles, book chapters (In Press)

15. Boyd, C. A., P. L. Chaney, C. E. Boyd, and D. B. Rouse. 2008. Distribution of Ground Water Suitable for Use in Saline-Water Aquaculture in Central and West Central Alabama. *Journal of Applied Aquaculture*: submitted for review [O-1]
16. Boyd, C. E., C. A. Boyd, and S. Chainark. In press. Chapter 8. Shrimp Pond Soil and Water Quality Management. In: Alday, Victoria (Editor). *The Shrimp Book*. Nottingham University Press, Nottingham, United Kingdom [O-1]
17. Burrage, D. (accepted for publication Sept. 4, 2008). Addressing Ethnic Change in the Northern Gulf of Mexico Seafood Industry. *Journal of Extension* [On-line] Submission 08080IAW. [O-1]
18. Burrage, Dave, 2008, Addressing Ethnic Change in the Northern Gulf of Mexico Seafood Industry. *Journal of Extension*. (accepted for publication Sept. 15, 2008). [EX-9]
19. Cho, H.J., P. Biber, and C. Nica*. (In press). The Rise of *Ruppia* in Seagrass Beds: Changes in coastal environment and research needs. Chapter (In) *Environmental Quality*. Nova Science Publishers, Inc. Hauppauge, NY. [R/CEH-29-PD]
20. Jones, W.T, M.L. Powell, V.K. Gibbs, H.S. Hammer, J.M. Lawrence, J. Fox, A.L. Lawrence and S.A. Watts. (in press). The effect of dietary selenium on weight gain and gonad production in the sea urchin *Lytechinus variegatus*. *J. World Aqua*. [R/SP-15]
21. Mahmoud, B. & Burrage, D. (accepted for publication Dec. 16, 2008). Inactivation of *Vibrio parahaemolyticus* in pure culture, whole live and half shell oysters (*Crassostrea virginica*) by X-ray. *Letters in Applied Microbiology – LAM - 2008-1840.R2* [O-1]
22. Pratt Zossoungbo, M., Biber, P.D., (in press). Inoculation and colonization of four saltmarsh species with vesicular-arbuscular mycorrhizal fungi. *Restoration Ecology*. [R/CEH-25]
23. Pratt Zossoungbo, M., Biber, P.D., (in press). Mycorrhizal fungal associations with four salt marsh species. In Columbus, F. (ed.) *Saltmarsh Environments*, Nova Science Publishers, Inc. [R/CEH-25]

Videos, CDs, DVDs, MP3s, software, and other non-print formats:

1. Schneider, M. 2008. Bays and Bayous Symposium Proceedings. CD. MASGP-08-022. [O-1]
2. Shippee, S. 2008. *Assessing dolphin interactions with sport fishing*. Video presentation describing research study observations and mitigation ideas. www.youtube.com/watch?v=2sWUioBlUik [R/MG/BR-01A]

Handbooks, manuals and guides:

1. Bowling, T. *Facing Uncertainty: Local Governments and the Precautionary Principle*, MASGP 08-020. [L-4]
2. Bowling, T. *Volunteer Liability*, MASGP 08-008. [L-4]

3. Mulvaney, T. and Park, A. Opportunities for Protecting Instream Flows in Mississippi. MASGP 08-007-14. Oxford, Mississippi. Prepared for Mississippi Department of Wildlife, Fisheries, and Parks. [O-1]

Electronic Publications

Ocean and Coastal Case Alert, monthly email notification service, 11 alerts, 156 subscribers. Project L-4.

- Ocean and Coastal Case Alert* February 2008, Clemons, J. (MASGP 08-002-02)
- Ocean and Coastal Case Alert* March 2008, Clemons, J. (MASGP 08-002-03)
- Ocean and Coastal Case Alert* April 2008, Clemons, J. (MASGP 08-002-04)
- Ocean and Coastal Case Alert* May 2008, Clemons, J. (MASGP 08-002-05)
- Ocean and Coastal Case Alert* June 2008, Clemons, J. (MASGP 08-002-06)
- Ocean and Coastal Case Alert* July 2008, Clemons, J. (MASGP 08-002-07)
- Ocean and Coastal Case Alert* August 2008, Clemons, J. (MASGP 08-002-08)
- Ocean and Coastal Case Alert* September 2008, Clemons, J. (MASGP 08-002-09)
- Ocean and Coastal Case Alert* October 2008, Clemons, J. (MASGP 08-002-10)
- Ocean and Coastal Case Alert* November 2008, Clemons, J. (MASGP 08-002-11)
- Ocean and Coastal Case Alert* January 2009, Clemons, J. (MASGP 09-002-01)

The Sea Grant Law and Policy Journal, 2 issues, Project L-4

The Sea Grant Law and Policy Journal, Volume 1, Issues 1-2 (MASGP 08-016-01).

The Sea Grant Law and Policy Digest, Volume 7, Issues 1-2 (MASGP 08-018).

Thompson, J. 2008. "National Flood Insurance Program."

http://www.extension.org/pages/Floods:_National_Flood_Insurance_Program [O-1]

Burrage, D. 2008. "Gulf Coast Fisherman" (copy of newsletter)

<http://msucare.com/newsletters/gulf/index.html> [O-1]

Theses, dissertations

1. Melissa Pratt-Zossoungbo. 2008. Mycorrhizal Fungal Associations With Salt Marsh Species *Juncus roemerianus*, *Spartina alterniflora*, *Schoenoplectus robustus*, And *Schoenoplectus americanus*. MS Thesis, USM/Coastal Sciences [R/CEH-25]

Newsletters, periodicals

1. Boyd, C. A. 2008. Volume 1, Issue 1. Mississippi Master Naturalist Newsletter. <http://coastal.msstate.edu/enviest.html> [O-1]
2. Waters, P. (Monthly newsletter) MASGC -09-005-01 Oyster Gardening on Mobile Bay January [O-1]

The SandBar (4 issues) 1,044 subscribers

The SandBar, Volume 7, Issues 1, April 2008, Bowling, T. (MASGP 08-004-01) [L-4]

The SandBar, Volume 7, Issues 2, July 2008, Bowling, T. (MASGP 08-004-02) [L-4]

The SandBar, Volume 7, Issues 3, October 2008, Bowling, T. (MASGP 08-004-03) [L-4]

The SandBar, Volume 7, Issues 4, January 2009, Bowling, T. (MASGP 08-004-04) [L-4]

Sea Briefs (4 issues)

Winn, V. Spring 2008. *Sea Briefs*. MASGP-08-011-01.

<http://www.masgc.org/sbonline/spring08/index.htm>. [O-1]

Winn, V. Summer 2008. *Sea Briefs*. MASGP-08-011-02.

<http://www.masgc.org/sbonline/summer08/index.htm>. [O-1]

Bowie, L. Fall 2008. *Sea Briefs*. MASGP-08-011-03.

<http://www.masgc.org/sbonline/fall08/index.htm> [O-1]

Bowie, L. Winter 2008. *Sea Briefs*. MASGP-08-011-04.

<http://www.masgc.org/sbonline/winter08/index.htm> [O-1]

Gulf Coast Fisherman, monthly newsletter by Dave Burrage (12 issues)

Newsletter is also distributed by posting on the Internet

<http://msucare.com/newsletters/gufl/index.html> and by e-mail.

Gulf Coast Fisherman, Burrage, D. February 2008 (MASGP 08-001-02) [O-1]

Gulf Coast Fisherman, Burrage, D. March 2008 (MASGP 08-001-03) [O-1]

Gulf Coast Fisherman, Burrage, D. April 2008 (MASGP 08-001-04) [O-1]

Gulf Coast Fisherman, Burrage, D. May 2008 (MASGP 08-001-05) [O-1]

Gulf Coast Fisherman, Burrage, D. June 2008 (MASGP 08-001-06) [O-1]

Gulf Coast Fisherman, Burrage, D. July 2008 (MASGP 08-001-07) [O-1]

Gulf Coast Fisherman, Burrage, D. August 2008 (MASGP 08-001-08) [O-1]

Gulf Coast Fisherman, Burrage, D. September 2008 (MASGP 08-001-09) [O-1]

Gulf Coast Fisherman, Burrage, D. October 2008 (MASGP 08-001-10) [O-1]

Gulf Coast Fisherman, Burrage, D. November 2008 (MASGP 08-001-11) [O-1]

Gulf Coast Fisherman, Burrage, D. December 2008 (MASGP 08-001-12) [O-1]

Gulf Coast Fisherman, Burrage, D. January 2009 (MASGP 09-001-01) [O-1]

Water Log Mulvaney, T. (quarterly newsletter) Oxford, Mississippi. Newsletter is distributed by mail, e-mail, and on-line at <http://www.olemiss.edu/orgs/SGLC/MS-AL/waterlog.html> [O-1] (4 issues)

Water Log, Volume 27, Number 4. Showalter, S. February 2008. (MASGP 07-003-04) [O-1]

Water Log, Volume 28, Number 1. Showalter, S. May 2008. (MASGP 08-003-01) [O-1]

Water Log, Volume 28, Number 2. Showalter, S. August 2008. (MASGP 07-003-02) [O-1]

Water Log, Volume 28, Number 3. Mulvaney, T. November 2008. (MASGP 07-003-03) [O-1]

Program reports (annual/biennial, strategic and implementation plans)

1. Leist, L. 2008. 2007-2008 MASGC Annual Report (internal use), MASGP 08-026 [M/PA-1].
2. Roberson, W. National Sea Grant Law Center 2008 Annual Report, MASGP 09-019 [L-4]
3. Schneider, M. 2009. 2007-2008 Annual Report. MASGP-09-012. 2009. [O-1]
4. Showalter, S. National Sea Grant Law Center 2007 Annual Report, MASGP 08-019 [L-4]

Miscellaneous document types, i.e. radio scripts, Power Points, workshop summaries, topical Websites (summary/abstract and URL), other educational materials not listed above:

Power Points

COSEE Online Institute, 6 PowerPoint presentations[ED-12]:

1. Carron, M. *Applications of GIS in Oceanography*
2. Kastler, J. *An Introduction to the Gulf of Mexico*
3. Osborne, T. *Marine Debris in the Gulf of Mexico*
4. Shipp, R. Shipp, *Farming the Sea*
5. Showalter, S. *Coastal Resiliency*
6. Spranger, M. *Environmental Stewardship*

Poster

7. Schneider, M. 2008. 2010 John A. Knauss Marine Policy Fellowship. Poster. [O-1]

Press releases

8. McDonough, J. 2009 Dolphin SMART workshop set [O-1]
9. McDonough, J 2009 Nature workshops for tourism are planned [O-1]
10. McDonough, J 2009 Coastal “Business of Nature” workshops offered [O-1]
11. McDonough, J 2009 Workshop aims to save sea turtles [O-1]
12. McDonough, J 2009 Alabama Dolphin Tour Operators Get SMART [O-1]
13. McDonough, J 2008 Dolphin SMART Program recognizes first participant in Coastal Alabama [O-1]
14. McDonough, J 2008 Dolphin SMART Tourism Initiative Helps Dolphin Watching Tours Get SMART [O-1]
15. McDonough, J 2008 Local Dolphin Watching Industry Looks to Self Regulate [O-1]
16. Schneider, M. 2009. Scientists studying human-dolphin interactions. [O-1]
17. Schneider, M. 2009. Innovative class uses sea urchins to spawn learning. [O-1]
18. Schneider, M. 2009. \$300,000 NOAA grant to develop science programs in schools. [O-1]
19. Schneider, M. 2008. Sea Grant requests pre-proposals for 2010-20011 research funding cycle. [O-1]
20. Schneider, M. 2008. [Regional Effort Offers Funding for Natural Hazards and Climate Change Resiliency Research.](#) [O-1]
21. Schneider, M. 2008. Volunteers grow thousands of oysters for restoration. [O-1]
22. Schneider, M. 2008. Students honor retired Biloxi teacher who inspired them 40 years ago. [O-1]
23. Schneider, M. 2008. Hundreds share information about coastal issues, resources. [O-1]

24. Schneider, M. 2008. Mulvaney joins Mississippi-Alabama Sea Grant Legal Program. [O-1]
25. Schneider, M. 2008. People asked to comment on Gulf of Mexico Research Plan. [O-1]
26. Schneider, M. 2008. Coastal symposium set for Tuesday, Wednesday. [O-1]
27. Schneider, M. 2008. Bays and Bayous to offer continuing education credits. [O-1]
28. Schneider, M. 2008. NOAA team focuses on ways to better serve customers. [O-1]
29. Schneider, M. 2008. Coastal symposium's early registration extended until Oct. 15. [O-1]
30. Schneider, M. 2008. Nature tourism initiative helps dolphin-watching tours get SMART. [O-1]
31. Schneider, M. 2008. More than 150 presenters to offer wealth of coastal knowledge. [O-1]
32. Schneider, M. 2008. Education, community action added to symposium agenda. [O-1]
33. Schneider, M. 2008. Web portal offers comprehensive storm information. [O-1]
34. Schneider, M. 2008. Abstract deadline extended for Bays and Bayous. [O-1]
35. Schneider, M. 2008. Sea Grant Law Center publishes new journal. [O-1]
36. Schneider, M. 2008. Sempier to coordinate Coastal Storm Program outreach in Gulf. [O-1]
37. Schneider, M. 2008. Project to create biofuel from shrimp parts. [O-1]
38. Schneider, M. 2008. Mobile County marina recognized for dedication to water quality. [O-1]
39. Schneider, M. 2008. Survey shows how nature festivals nurture economies. [O-1]
40. Schneider, M. 2008. River Delta Clean Marina designation. [O-1]
41. Schneider, M. 2008. Presenters invited to participate in coastal symposium. [O-1]
42. Schneider, M. 2008. Coastal research symposium set for Oct. 28-29 in Biloxi. [O-1]
43. Schneider, M. 2008. Wallace retires from Auburn, Sea Grant. [O-1]
44. Schneider, M. 2008. Hundreds participate in Gulf of Mexico research planning workshops. [O-1]
45. Schneider, M. 2008. Master Naturalist Program to be offered. [O-1]
46. Schneider, M. 2008. Sea Grant awards research funding. [O-1]
47. Schneider, M. 2008. Plutchak receives marine policy fellowship. [O-1]
48. Schneider, M. 2008. Lewis receives marine policy fellowship. [O-1]

Websites

48. Gulf of Mexico Research Plan: <http://masgc.org/gmrp/index.htm> [M/GOMR-1]
49. Gulf Storms: www.masgc.org/gulfstorms [A/O-31]
50. Storm Smart Coasts: stormsmartcoasts.org [A/O-31]
51. GOMAEEN Listserv
52. Gulf of Mexico Education: www.gulfofmexicoeducation.org – [ED-18]
53. National Sea Grant Law Center,
<http://www.olemiss.edu/orgs/SGLC/lawcenterhome.htm>
54. Marine Education Center:
<http://www.usm.edu/gcrl/mec/index.php?PHPSESSID=0e6e4c1882443be2b63a40ea066cae29> [ED-12]

55. Environmental Studies Center:
<http://www.mcpss.com/?DivisionID=2141&DepartmentID=1990&ToggleSideNav=ShowAll> [ED-12]
56. Dauphin Island Sea Lab Estuarium: <http://estuarium.disl.org/> [ED-12]
57. MSU Coastal Research and Extension Center:
<http://www.msstate.edu/dept/crec/crec.html> [O-1]
58. Auburn Marine Extension and Research Center: www.allearn.info/aumerc [O-1]
59. Mississippi-Alabama Sea Grant: <http://masgc.org> [O-1]
60. Bays and Bayous Symposium: <http://www.masgc.org/page.asp?id=208> [O-1]
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Newspaper columns

During the reporting period, 56 newspaper columns were submitted to the Mobile Press Register and Gulf Coast Newspapers. (52, one/week from the Extension staff)

The number 56 includes the following:

1. Bacteria by Jody Thompson (January 22, 2009)
2. Keeping Your Pond Up by P.J. Waters (January 15, 2009)
3. The Last Harvest by P.J. Waters (December 2, 2008)
4. Muddy Waters by Jody Thompson (November 10, 2008)
5. Role of Alkalinity in a Pond by P.J. Waters (October 13, 2008)
6. Water Conservation by Jody A. Thompson (October 10, 2008)
7. Alabama Coastal Cleanup 2008 by Jody A. Thompson (September 17, 2008)
8. Weeding Your Pond by P.J. Waters (September 8, 2008)
9. Xeriscaping by Jody A. Thompson (August 27, 2008)
10. Grass Carp by P.J. Waters (August 21, 2008)
11. Wetlands by Jody A. Thompson (August 8, 2008)
12. Liming Your Pond by P.J. Waters (August 4, 2008)
13. The Dead Zone by Jody A. Thompson (July 15, 2008)
14. Stocking a Pond by P.J. Waters (July 7, 2008)
15. Overusing Fertilizer by Jody A. Thompson (June 18, 2008)
16. Working Waterfront Legislative Updates by Jody A. Thompson (June 06, 2008)
17. Honeybee Gardens by Jody A. Thompson (May 23, 2008)
18. Weed Identification by P.J. Waters (May 20, 2008)
19. StreamSide Buffers by Jody A. Thompson (April 30, 2008)
20. Watersheds by Jody A. Thompson (April 16, 2008)
21. Restore the Bay Through Oyster Gardening by P.J. Waters (April 9, 2008)
22. Americorps by Jody A. Thompson (April 4, 2008)

- 23. Oxygen Levels by P.J. Waters (March 28, 2008)
- 24. Oyster Gardening by P.J. Waters (March 14, 2008)
- 25. Biological Weed Control by P.J. Waters (February 29, 2008)

b. Publication Summary Table:

Category	# of Pubs
Technical Reports.	20
Proceedings, Symposia.	1
Brochures, Fact Sheets, etc.	18
Books & Monographs.	0
Peer-reviewed journal articles, book Chapters.	23
Videos, CDs, DVDs, MP3s, Software and other non-print formats.	2
Maps, Charts, Atlases.	0
Handbooks, Manuals, Guides.	3
Electronic Publications.	15
Theses/Dissertations.	1
Newsletters/ Periodicals.	26
Program Reports (Annual/Biennial, Strategic and Implementation Plans)	4
Bibliographies, Directories	0
Miscellaneous Document Types, i.e. posters, radio scripts, conference papers/Power Points, workshop summaries, topical websites(abstract and URL), other educational materials not listed above .	75
Media Placements.	143
TOTAL	331

C. Extension and Legal Events
 MASGC Annual Report Form

Event	Number of Events	Total Number of Participants or Estimated Number of Viewers/Audience Members
SG-Sponsored meetings, workshops and conferences	17	1,739
Radio interviews	8	Unknown
TV appearances	11	Unknown
Public presentations	278	22,439
Displays or event exhibits	20	143,923
Volunteer hours	NA	561
Continuing Education Unit credits provided	17	346

NIMS Entry Chart:

Number of SG-sponsored or Co-sponsored Meetings, Workshops, and Conferences	Number of Participants or Estimated Number of viewers
Number of SG-Sponsored/Organized Meetings, Workshops and Conferences.	17
Number of Attendees in SG Meetings/Workshop.	1,739
Number of Radio Interviews.	8
Number of TV Appearances.	12
Number of Public Presentations.	2968
Number of Attendees at Presentations.	166,362
Number of Volunteer Hours.	561

D. Education Metrics
a. K-16

(K-16) Professional development for educators	Elementary school	Middle school	High school
Number of professional development sessions (workshops, institutes NOT for college credit)	7	11	12
Number of attendees at professional development sessions	54	94	130
Number of students reached through educators (NOTE: if you do not have an actual count then estimate based on 25 students per class.)	1850	2,587	4120
Number of curricula developed	1	12	29

Courses for College Credit	Number
Number of courses taught (for credit, college level)	29
Number of students/participants in courses	59

Advisory (state standards, national standards)	Number
Number of consultations	5

Informal education/free choice learning professional development for adult learners	Number
Number of attendees at professional development sessions	471

Programs for Children and Families	Number
Number of camps, programs, activities, clubs, etc.	90
Number of attendees	4,642
Number of class trips	313

b. Students Supported

Category	# of new students	# of continuing students	# of Degrees Awarded
Knauss Fellowship	2		
Industry Fellowship	0	0	
NMFS/SG Fellowship	0	0	
State Fellowship	0	0	
Sea Grant Supported MS/MA/JD Graduate Students	16	14	11
Sea Grant Supported PhD Graduate Students	6	3	4
Sea Grant Supported Undergraduate Students	6	13	
High School Students*	4	3	
Volunteer Students	11	1	
TOTAL	45	34	15

E. Research Metrics
 a. Omnibus Metrics

Sea Grant runs a biennial Omnibus competition. A competition was not held in 2008. The following data is from our 2007 competition:

Stage	Number of Proposals	Number of Institutions Involved	Number from Home Institution
Pre-Proposals Submitted	30	14	10
Full-Proposals Submitted	18	12	4
Proposals Funded	9	8	2

b. NSI Metrics

Stage	Number of Proposals	Number of Institutions Involved	Number from Home Institution
Pre-Proposals Submitted	8	8	1
Full-Proposals Submitted	1	2	0
Proposals Funded	0	0	0

c. Recruiting Talent

Core Project Statistics

Status	Number of Projects	Number of PIs and co-PIs	Number of Institutions	Regional/Multi-program
Continued from previous award year	6	14	5	1
New	17	41	15	0

NSI Project Statistics

Status	Number of Projects	Number of PIs and co-PIs	Number of Institutions	Regional/Multi-program
Continued from previous award year	0	0	0	0
New	0	0	0	0

III. Impacts and Performance Measure Summary:

Impacts

New 2009 Impacts

1. **2009 Report**

Themes: Infrastructure, Marine and Aquatic Science Literacy

Title: Gulf of Mexico Regional Collaboration Improves constituent engagement:

Statement: The National Oceanic and Atmospheric Administration (NOAA) Gulf of Mexico Regional Collaboration Team (GoMRCT) hosted an Extension, Outreach and Education (EOE) Workshop on Aug. 12-13, 2008, in Mobile, Ala. More than 80 leaders of NOAA extension, outreach and education efforts attended this event. The workshop focused on improving constituent engagement and included these topics: NOAA's Science Advisory Board's EOE recommendations; participation in NOAA's Engagement Test; How to use Joint Fact Finding to improve engagement; best practices on the integration of research, extension, outreach and education; best practices on Gulf of Mexico EOE. To see results of this workshop please visit: <http://masgc.org/eoeworkshop>. The workshop led to the formation of a Climate and Resiliency Engagement Panel (C-REP) for the NOAA Gulf of Mexico Regional Collaboration Team and an Engagement Working Group. [**Program Level Impact, M/PA-1**]

2. **2009 Report**

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

Title: Network connects environmental educators throughout Gulf

Statement: The organization of informal and formal educators around the five U.S. Gulf Coast states has been initiated. This network is facilitating the development, transfer, sharing, implementation of various environmental education related actions. Roughly 300 people have participated in EEN-related communications and activities. A number of partnerships have been fostered as a result of GOMA involvement. [**ED-18**]

3. **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]

4. **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]

5. **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]

6. **2009 Report**

Themes: 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, EX-9]

7. **2009 Report**

Themes: 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]

8. **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. [O-1]

9. **2009 Report**

Themes: Aquaculture, Coastal Communities and Economies

Title: Sea Grant cultivates supply chains, social networks for sustaining a farm-raised marine baitfish industry

Statement: Taking the perspective that a successful industry must consider the preferences and concerns of all stakeholders, Sea Grant researchers have established networks between 2 growers, 2 management agencies (MRD and DMR), 4 wild-catchers, 4 distributors and 38 bait dealers to ascertain supply-chain business practices, identify opportunities and address constraints that confront a sustainable farm-raised marine baitfish industry. Anticipation is high among bait dealers and fishermen regarding the prospects for cultured live baits that are available off-season and in a wider range of desired sizes and species relative to wild supplies. Finally, researchers helped a private company secure second-phase funding of \$300,000 from the USDA Small Business Innovation Research (SBIR) program to pursue commercialization of marine baitfish. [R/SP-17-PD]

10. **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. [R/CCD-11-PD]

11. **2009 Report**

Themes: Ecosystems and Habitats, Marine and Aquatic Science Literacy, Coastal Natural Hazards

Title: 26-mile beach restoration project based on MASGC research

Statement: MASGC funded a pilot project to restore a three-acre section of beach on the Mississippi coast. Due to the success of this project, the researchers are restoring 26 miles of hurricane-damaged coastal beach in Harrison County through a \$100,000 grant from the U.S. Army Corps of Engineers. In addition 310 community volunteers provided more than 700 volunteer hours toward the restoration project by planting 7,000 lower beach emergent plants and 3,500 sea oats, saw palmetto, small cabbage palms, wax myrtle, and pines in the upper beach. [R/ER-50-PD, R/CEH-18-PD, from old projects not covered in this report]

Revised Old Impacts:

12. **2008 Report (updated in 2009)**

Themes: Aquaculture, Coastal Communities and Economies

Title: Sea Grant facilitates inland commercial production of live marine baitfish for Gulf markets

Statement: Sea Grant researchers evaluated several new marine baitfish species with potential for inland production using the unique saline groundwaters of the Black Belt region of Alabama. Researchers assessed production technologies applicable to large-scale commercial culture systems including broodstock collection and handling, natural and induced spawning methods, fry nursing, multi-phase growout, inventory management, and partial-harvesting techniques. Several growers adopted some of these technologies and participated in marketing trials at various locations on the Gulf coast. Inland bait producers have made nearly \$6,000 in pond-bank sales of bullminnows to dealers participating in marketing trials, which in turn have generated an estimated total of \$12,000 in retail sales of marine baitfish associated directly with this project. Cultured baits will continue to provide income and employment opportunities, and will complement management strategies for natural populations (e.g. shrimp and by-catch species). [R/SP-17-PD]

Old Impacts From Projects Covered In This Report:

13. **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]

14. **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]

15. **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]

16. **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]

17. **2008 Report**

Themes: Aquaculture

Title: Inland sea urchin farming enhanced by Sea Grant research

Statement: Researchers have developed nutritionally complete feeds and recirculating artificial sea water systems that result in high growth and survival of sea urchins in inshore culture facilities. Urchins (*Strongylocentrotus droebachiensis*) fed on these feeds yield high quality “uni” gonads for the sushi market according to buyers that have taste tested the product. Systems and techniques developed in the lab allow researchers to culture sea urchins from egg to egg in artificial sea water systems. [R/SP-15]

Performance Measures

Performance Measures actual for this reporting period (2/1/08 – 1/31/09)

Performance Measure 1: Economic and societal benefits (return on investment) derived from the discovery and application of new sustainable coastal and ocean products; i.e. aquaculture, marine natural products, health, pharmaceuticals

Number of new products discovered: 3

1. Aquaculture system capable of growing sea urchins [R/SP-15]
2. High quality sea urchins that are used for the sushi market. [R/SP-15]
3. This project to improve seafood safety through using supercritical carbon dioxide to control *Vibrio* levels in oysters without compromise to the fresh/raw appearance, texture and odor. This successful technology has been licensed to a new startup company called Triton Biopharma (tritonbiopharma.com), which has made progress in regard to negotiations with seafood and other industries like Kraft foods to apply this new method of increasing the safety of seafood products on a commercial scale. [R/AT-8-PD]

Number of new products discovered applied to use: 0

Number of jobs created: 1

1 job: MASGC supported research on improving methods for growing and planting marsh plants has allowed local researchers to start a native marine and marsh plant nursery to supply healthy plants to the local Department of Marine Resources and other groups interested in restoration. This has created two part-time positions for nursery technicians.

Economic Benefits (in dollars): \$307,000

\$165,000: Energy saving gear technology was transferred to shrimpers. 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 total savings of \$165,000 per year. As diesel fuel prices increase, the savings increase proportionately.

\$130,000: The amount that DMR is paying to grow plants for restoration of Deer Island.

\$12,000: To date, additional farm income on the order of several thousand dollars has been generated in the Black Belt region, and retail sales of approximately \$12,000 have been generated on the Alabama coast, along with an undetermined amount of indirect and induced economic impacts associated with the increase in sportfishing resulting from the increase in bait availability.

Performance Measure 2: Cumulative number of coastal, marine, and Great Lakes issue-based forecast capabilities developed and used for management, i.e. climate change,

extreme natural events, pollution, invasive species, and use of land and other resources indicators:

Number of new forecast capabilities developed: 4

1. Development of LULC change model in the lower Pascagoula River Basin [R/CCD-15-PD]
2. Forecast of river flow under the scenarios of changing LULC and climate in the lower Pascagoula River Basin [R/CCD-15-PD]
3. Prediction of the distribution of the tidal marshes under accelerated sea level rise in the lower Pascagoula River Basin changing freshwater inputs [R/CCD-15-PD]
4. Preliminary analysis of the changes in ecosystem services provided by the tidal marshes in the lower Pascagoula River Basin. [R/CCD-15-PD]

Number of new forecast capabilities developed applied to use: 0

Performance Measure 3: Percentage/number of tools, technologies and information services that are used by NOAA partners/customers to improve ecosystem-based management.

Number of tools and services provided: 56

1. The Aquaculture Network Information Center (AquaNIC) continues to be the most widely used aquaculture web site in the world (<http://aquanic.org>); currently ranked in the top 14% of all web sites. [M/PA-1]
2. The coordinator that was supported by this project facilitated the Gulf of Mexico Alliance Environmental Education Priority Issue Team [ED-18]
3. The Gulf of Mexico Alliance Environmental Education Network, through the USGS NWRC, has launched a Gulf regional clearinghouse (online library) for environmental education. A companion regional website is under development which will target Gulf formal and informal educators. The resource, www.gulfallianceeducation.org was launched April 2009. [ED-18]
4. GOMA Environmental Educator's Network (EEN) Listserv [ED-18]
5. A draft Gulf of Mexico Research Plan was released and used by multiple groups to identify and set research priorities. [M/GOMR-1]
6. Customized reports of research priorities that supported Gulf of Mexico Alliance Priority Issue Teams was sent to each team and a customized report on sea level rise and climate change was sent to NOAA's CSCOR office that is doing work in the region. [M/GOMR-1]
7. The StormSmart Coasts Network provides a platform for emergency managers, city and county officials and others to share information and resources. [A/O-31]
8. The Resilience Index is a tool for communities to use to identify their resilience to storms. [A/O-31]
9. In partnership with the NOAA Regional Team and Gulf of Mexico Alliance, Sea Grant created a Gulf Storms web portal for residents in five Gulf states to quickly access important information regarding preparation for storm events and short-term recovery. The site received approximately 5,680 hits between the months of

- August and September when Hurricanes Gustav and Ike threatened the coast. [A/O-31]
10. Outreach efforts assist fishery managers in educating the public about protection of wildlife and fishery resources. [R/MG/BR-01M]
 11. COSEE:CGOM Summer Institutes [ED-12]
 12. Traveling exhibits (BayMobile via DISL and On The Road via MEC) [ED-12]
 13. National Ocean Science Bowl [ED-12]
 14. Professional development programs for 316 MS and AL teachers. [ED-12]
 15. General public programs (98,303 people) [ED-12]
 16. Precollege students in structured programs (27,270 people) [ED-12]
 17. Presentations at special events and festivals (149,110 people) [ED-12]
 18. Developed new exhibitry (Seafood safety as it relates to oyster restoration, harvesting and *Vibrio sp.* and “Underwater Exploration” highlights the need for healthy oceans and the exploration of the deep sea) [ED-12]
 19. Summer Sea Camp (MEC) [ED-12]
 20. Coastal Sciences Camp (MEC) [ED-12]
 21. Special Enrichment Activities in Coastal Ecology (SEA ICE at ESC) [ED-12]
 22. Coastal Birdlife – The Lure of Gaillard Island (ESC) [ED-12]
 23. Wild Adventures at the ESC [ED-12]
 24. Summer programs at Dauphin Island Sea Lab [ED-12]
 25. High School Summer Course Dauphin Island Sea Lab [ED-12]
 26. *Advisory Service* – The Advisory Service is a non-advocacy legal research service available to the Sea Grant community and its constituents. Eleven organizations requested information through the Advisory Service in 2008. [L-4]
 27. *Ocean and Coastal Case Alert* – Monthly email list serve that provides summaries and links to recent ocean and coastal law cases. As of January 15, 2009, the Case Alert had 156 subscribers. [L-4]
 28. *SandBar* – Quarterly legal newsletter containing articles on ocean and coastal legal developments in courts and legislatures around the country with 1,044 subscribers. [L-4]
 29. Monthly newsletter “Gulf Coast Fisherman” [O-1]
 30. Energy saving gear technology transfer to shrimpers [O-1]
 31. Master Naturalist training and certification [O-1]
 32. “Living Shorelines” workshops and training [O-1]
 33. Quarterly newsletter “Water Log” [O-1]
 34. “Navigating the National Flood Insurance Program” brochure adapted for EDEN network and extension [O-1]
 35. Quarterly newsletter “Sea Briefs” [O-1]
 36. The MASGC Web site was redesigned to improve ease of use and appearance of the site. The redesign included the addition of tracking software. <http://www.masgc.org> [O-1]
 37. Expand the use of electronic logbook technology by recruiting 74 shrimp vessels [O-1]
 38. Master Naturalist program trained 27 individuals [O-1]
 39. DolphinSMART training for 32 tour operators [O-1]
 40. “Business of Nature” workshops and training [O-1]

41. Business of Nature resource web page [O-1]
42. Creature Cards [O-1]
43. The Nature of the Coast brochure [O-1]
44. Developed protocols for growing saltmarsh plants in Mississippi [R/CEH-25]
45. Developed technique: commercially available inoculant was incorporated into the growing protocols of the Mississippi Native Coastal Plants Nursery to enhance plant growth. [R/CEH-25]
46. Our descriptions of early stage laboratory-reared gray triggerfish will aid in the identification of wild-caught larvae. [R/SP-14]
47. Developed the process to create semi-purified and purified dry pelleted feeds with desired physical properties that support somatic and gonad growth better than that obtained with natural diets. [R/SP-15]
48. Indicator of shellfish exposure to wastewater using stable isotopes [R/CEH-28]
49. Web-based field guide of aquatic plants on the Mississippi coast [ED-19-PD]
50. Hard copy field guide of aquatic plants on the Mississippi coast [ED-19-PD]
51. A compilation of 13 interviews of members and leaders of the fishing and seafood industry in Bayou La Batre was edited and produced to highlight the history of the industry for use in educational settings and for public viewing. [R/CCD-16-PD]
52. This project developed a protocol to collect, transport, sort, pre-treat, and germinate wigeongrass seeds and to provide a summary for each step's success likelihood. [R/CEH-29-PD]
53. This project measured stable isotope values of carbon and nitrogen in tissues of sharpnose sharks as a means of defining trophic position and carbon source, data which can be incorporated into ecosystem based fishery management plans. [R/SP-22-PD]
54. A novel isothermal DNA amplification using a thermostable helicase enzyme has been developed and optimized for the detection of *V. vulnificus* in shellfish. This will improve capabilities to identify if a *Vibrio* pathogen is in seafood products. [R/AT-9-PD]
55. The maps of the predicted LULC in 2030, 2050 and 2100 based on historical land transition trend [R/CCD-15-PD]
56. The maps of the predicted distributions of the tidal marshes for every decade from 2020 to 2100 under accelerated sea level rise and changing freshwater inputs. [R/CCD-15-PD]

Number of tools and services provided applied by managers in decision-making: 9

1. The coordinator's work was directly applied and used to further Gulf of Mexico Alliance Environmental Education Priority Issue Team activities. [ED-18]
2. The draft Gulf of Mexico Research Plan were used to create customized reports for agencies and used by managers and research sponsors. These groups 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, and Texas Sea Grant College Program. [M/GOMR-1]
3. Resilience Index-pilot test feedback suggests communities are using this tool as a way to begin resilience discussion amongst community decision makers [A/O-31]
 4. Protocols are used in Center for Plant Restoration to determine propagation success of a given amount of seeds. [R/CEH-25]
 5. Ziegler feeds is working with our laboratory to refine the pelleting process [R/SP-15]
 6. Researchers are transferring research results to local farmers with regards to improving on-site acclimation of post-larval and juvenile shrimp. Alabama producers are now more aware of the effects of shifting temperature and salinity and their effects on shrimp survival. Increased education and awareness has resulted in better survival during the production season. [R/SP-20]
 7. Web-based field guide of aquatic plants on the Mississippi coast [ED-19-PD]
 8. Hard copy field guide of aquatic plants on the Mississippi coast [ED-19-PD]
 9. A Strategic Plan has been adopted by the Town of Dauphin Island and used to determine priorities for FEMA and other actions by the town. [R/CCD-11-PD]

Performance Measures anticipated for the next reporting period (2/1/09 – 1/31/10)

Performance Measure 1: Economic and societal benefits (return on investment) derived from the discovery and application of new sustainable coastal and ocean products; i.e. aquaculture, marine natural products, health, pharmaceuticals

Number of new products discovered: 2

1. The triglycerides produced by the oleaginous microorganisms from the shrimp processing waste could be used for the production of biodiesel. [R/AT-7]
2. Researchers published a review of significant progress made in understanding the structure, function, and cellular mode of action of crustacean molt-inhibiting hormone (MIH), and described key areas anticipated for future research. Research on MIH has the potential to provide the conceptual and methodological underpinnings for development of methods to induce molting in crustaceans, a benefit to the soft crab industry and to consumers of seafood. We have developed and will test the efficacy of a blocker of the candidate molt-inhibiting hormone receptor. If the blocker proves effective, we anticipate it could be used to induce molting in blue crabs (*Callinectes sapidus*). The methods may be widely applicable to other crustacean species. [R/SP-19]

Number of new products discovered applied to use: 0

Number of jobs created: 0

Economic Benefits (in dollars): 0

Performance Measure 2: Cumulative number of coastal, marine, and Great Lakes issue-based forecast capabilities developed and used for management, i.e. climate change, extreme natural events, pollution, invasive species, and use of land and other resources indicators:

Number of new forecast capabilities developed: 6

1. MASGC is providing outreach and extension support and gathering stakeholder input for the development of a web based sea level rise projection tool through a joint NOAA-USGS Sea Level Rise Pilot project that focuses on Mississippi and Alabama. [M/PA-1]
2. Anticipate ability to predict the stimulatory effect of burns on plant productivity and biogenic accretion in *Juncus roemerianus* marshes. [R/CEH-27]
3. Anticipate the ability to forecast the extent to which prescribed burning removes unwanted debris deposited in marshes following severe storms. [R/CEH-27]
4. Temperature and salinity data acquired on native shrimp species in this study will contribute to modeling growth and survival of native populations in coastal areas. [R/SP-20]
5. Development of the probability distribution for the river flow predictions under changing LULC and climate [R/CCD-15-PD]

6. Improvement of the predictions for the tidal marsh distributions applying more precise LiDAR elevation data and marsh accretion rates. [R/CCD-15-PD]

Number of new forecast capabilities developed applied to use: 4

1. Over forty people provided input on the development of the sea level rise tool and expressed interest in receiving the tool after it is released. Many of these people are natural resource managers, emergency managers, planners, and others who are concerned about coastal infrastructure. They intend to use the tool(s) that are released as a part of this pilot project. [M/PA-1]
2. The transfer of information from experimental observations and model development to NERRs and USFWS managers to evaluate management plans for prescribed burns in *Juncus roemerianus* marshes [R/CEH-27]
3. The transfer of information from experimental observations and model development to NERRs and USFWS managers to consider implementation of prescribed burning to remove debris following natural disasters. [R/CEH-27]
4. The predicted distribution of the tidal marshes will be applied to forecast storm surge under accelerated sea level rise. [R/CCD-15-PD]

Performance Measure 3: Percentage/number of tools, technologies and information services that are used by NOAA partners/customers to improve ecosystem-based management.

Number of tools and services provided: 54

1. MASGC is taking the lead in developing a NOAA climate and resilience social networking site for the Gulf of Mexico. It will improve internal communications among NOAA employees and between NOAA employees and constituents in the Gulf of Mexico. [M/PA-1]
2. The Gulf of Mexico Alliance Environmental Education Network, through the USGS NWRC, has launched a Gulf regional clearinghouse (online library) for environmental education. A companion regional website is under development which will target Gulf formal and informal educators. The resource, www.gulfallianceeducation.org was launched April 2009. [ED-18]
3. GOMA Environmental Educator's Network (EEN) Listserve [ED-18]
4. The final Gulf of Mexico Research Plan will be unveiled during this year [M/GOMR-1]
5. An implementation plan will also be released. [M/GOMR-1]
6. "Wind and Water" (focus on Hurricanes, Storms and Impacts on Coast) [A/O-31]
7. "Water Runs Down Hill" (focus on Watersheds) [A/O-31]
8. "Hedging Our Bets" (focus on Storms and Insurance) [A/O-31]
9. The StormSmart Coasts Network allows coastal resource managers a place to share ideas and information regarding storms, flooding, sea level rise, and climate change. This network is currently under development before wide distribution. [A/O-31]
10. Angler surveys designed to assess public experience and sentiments about dolphin interactions with sport fishing will assist outreach efforts to develop appropriate

- educational materials. [R/MG/BR-01M]
11. Outreach displays in key locations to inform the public about marine wildlife issues. [R/MG/BR-01M]
 12. Educational programs aimed at informing anglers about potential mitigation strategies to avoid incidentally feeding discarded fish to dolphins and preventing dolphin depredation. [R/MG/BR-01M]
 13. COSEE:CGOM Summer Institutes [ED-12]
 14. Traveling exhibits (BayMobile via DISL and On The Road via MEC) [ED-12]
 15. National Ocean Science Bowl [ED-12]
 16. Professional development programs for 316 MS and AL teachers. [ED-12]
 17. General public programs (98,303 people) [ED-12]
 18. Precollege students in structured programs (27,270 people) [ED-12]
 19. Presentations at special events and festivals (149,110 people) [ED-12]
 20. Summer Sea Camp (MEC) [ED-12]
 21. Coastal Sciences Camp (MEC) [ED-12]
 22. Special Enrichment Activities in Coastal Ecology (SEA ICE at ESC) [ED-12]
 23. Summer programs at Dauphin Island Sea Lab [ED-12]
 24. High School Summer Course Dauphin Island Sea Lab [ED-12]
 25. Advisory Service [L-4]
 26. Ocean and Coastal Case Alert [L-4]
 27. SandBar [L-4]
 28. *Online Training Modules* – In 2010, the Law Center plans to begin developing online training modules for use by Sea Grant extension agents and coastal managers seeking background information on such legal topics as the public trust doctrine and local government authority. [L-4]
 29. Monthly newsletter “Gulf Coast Fisherman” [O-1]
 30. Energy saving gear technology transfer to shrimpers [O-1]
 31. Master Naturalist training and certification [O-1]
 32. Quarterly newsletter “Sea Briefs” [O-1]
 33. Quarterly newsletter “Water Log” [O-1]
 34. Continuing Legal Education courses on emergency preparedness, hurricane insurance and wetlands law and policy [O-1]
 35. Hurricane Preparedness Handbooks (2) [O-1]
 36. Fact sheet “Building Green: What Does it Mean” developed and published [O-1]
 37. Electronic logbook program [O-1]
 38. MASGC website [O-1]
 39. “Business of Nature” workshops and training [O-1]
 40. Business of Nature resource web page [O-1]
 41. Creature Cards [O-1]
 42. Dolphin SMART training [O-1]
 43. The Nature of the Coast brochure [O-1]
 44. Interactive nature tourism map [O-1]
 45. Boater’s marine map and best practices for marine navigation guide [O-1]
 46. Due to Sea Grant efforts, the state of Alabama passed a joint resolution to create the Alabama Waterfront Access Study Committee, to develop recommendations on incentive-based tools and techniques to preserve Alabama’s working

- waterfronts. [O-1]
47. Researchers developed an interdisciplinary approach comprised of geographic analysis, longitudinal water quality analysis, management practices analysis, and watershed modeling to detect the effect of land use/cover changes, especially urbanization, on the water quality/quantity of the Weeks Bay Estuary. The Mobile Bay National Estuary Program (MBNEP) will use the results of this study in developing their future strategic plans. [R/CCD-14]
 48. Curricula will be developed for K-12 students [R/CEH-27]
 49. Curricula will be developed for University of Alabama students [R/CEH-27]
 50. Curricula will be developed for NERR Coastal Training Program (CTP) workshops. [R/CEH-27]
 51. Findings of this study will be used to improve the management of the Mississippi coastal ecosystem. Data collected for this project will be incorporated into benthic habitat maps [R/SP-18]
 52. Benthic habitat maps and will be used to develop spotted seatrout spawning habitat maps within Biloxi Bay and Grand Bay. Existing benthic habitat data will be combined with benthic habitat data gathered from this project to produce a better detailed map of the available substrata within the two sampling areas. [R/SP-18]
 53. A Report on the Strategic Resilience Plan for Dauphin Island will be produced. Planners and designers have researched the ecologies of barrier islands; have reviewed the movement of Dauphin Island over the last one hundred and seventy-five years; and have concluded that the west-end housing must have their development rights transferred into the Maritime Forest core of the island. The team has produced a plan for the development of approximately 560 housing units on the core island, along with working waterfront and commercial uses, including a first class hotel and conference center. [R/CCD-11-PD]
 54. Improved maps of the distributions of the tidal marshes in the lower Pascagoula River Basin. [R/CCD-15-PD]

Number of tools and services provided applied by managers in decision-making: 19

1. The Aquaculture Network Information Center (AquaNIC) will be the most widely used aquaculture web site in the world (<http://aquanic.org>) and will move into the top 10% of all web sites. [M/PA-1]
2. The final Gulf of Mexico Research Plan will be released in 2009 [M/GOMR-1]
3. An implementation plan will also be released in 2009. [M/GOMR-1]
4. Resilience Index [A/O-31]
5. StormSmart Coasts website-still under development but will be implemented in the coming year [A/O-31]
6. Potential for financial risk analysis [A/O-31]
7. Best practices for risk communication [A/O-31]
8. Community Rating System manual will be used by managers in decision-making. [A/O-31]
9. The City Government Managers from Fairhope, AL and Foley, AL will attend and learn to use a minimum of five new LID applications tailored to the Fish River watershed. [R/CCD-14]

10. The Mobile Bay National Estuary Program (MBNEP) will use the results of this study in developing their future strategic plans. [R/CCD-14]
11. CTP workshops will provide results and management recommendations to inform coastal decision-makers and resource managers of successful restoration and management techniques. [R/CEH-27]
12. Short clips of selected interviews will be on display at the USA Archaeology museum, once it opens in 2010. We plan to distribute the videotaped interviews along with the associated interview logs in the USA Archives for public access. [R/CCD-16-PD]
13. Developed protocol can assist in restoration projects that require wigeongrass. [R/CEH-29-PD]
14. When completed, these data will have the potential to be incorporated into ecosystem models, which will form the basis of ecosystem based fishery management plans. [R/SP-22-PD]
15. Upon completion of the final stage testing of the novel isothermal DNA amplification using a thermostable helicase enzyme, it is expected that the seafood industry will review the process, try and then transfer it to the biotechnology industry. [R/AT-9-PD]
16. The Strategic Plan for Dauphin Island will help the Mayor and City Council make decisions about the future development of the island for many years to come. [R/CCD-11-PD]
17. The Strategic Resilience Plan for Dauphin Island will help the Mayor and City Council make decisions about the future development of the island for many years to come. [R/CCD-11-PD]
18. The improved map of the predicted distributions of the tidal marshes for every decade from 2020 to 2100 under accelerated sea level rise and changing freshwater inputs will be used by land, flood-zone, emergency, water quality, marine resource and conservation managers. [R/CCD-15]
19. Application of the maps of the predicted LULC in 2030, 2050 and 2100 based on historical land transition trend [R/CCD-15]

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