

***Economic Sectors  
Targeted  
by the  
Mississippi-  
Alabama  
Sea Grant  
Research, Extension,  
Education,  
and Outreach  
Programs***



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*This publication was funded by the Mississippi State University Extension Service and the Mississippi-Alabama Sea Grant Consortium through the U.S. Department of Commerce's National Oceanic and Atmospheric Administration under award NA10OAR4170078. It is MSU Extension Publication 2846 and Mississippi-Alabama Sea Grant Publication MASGP-14-007.*

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# *Economic Sectors Targeted by the Mississippi-Alabama Sea Grant Research, Extension, Education, and Outreach Programs*

## **Introduction**

Sea Grant, an organization with a history of working closely with water-dependent industries, has documented many examples where research, education, extension, and outreach (REEO) programs have increased private-sector economic activity, including the creation or expansion of businesses and jobs. Yet, there has not been a systematic survey in the Gulf region to assess the full scope of these impacts. This preliminary study provides general information about the benefits the region's industries have gained from REEO efforts sponsored by the Gulf of Mexico Sea Grant Programs. The study is a critical first step in conducting a future systematic assessment of the economic benefits resulting from these programs.

The Mississippi-Alabama Sea Grant Consortium (MASGC 2014) has four focus areas: (1) Environmental Literacy and Workforce Development, (2) Healthy Coastal Ecosystems, (3) Resilient Communities and Economies, and (4) Sustainable Fisheries and Aquaculture. This publication uses the North American Industry Classification System (NAICS 2014) to identify U.S. industries targeted by MASGC research, education, extension, and outreach efforts during the past decade.

These industries are defined in terms of their long-term economic contributions to the regional economy. Their contributions are measured in terms of sales (output impacts) and employment (job impacts). Each industry is unique and exhibits different economic characteristics as measured by the size of its annual economic contributions to the state. The long-term sales values and employment impacts for each of these industries, if available, are reported in this publication.

Based on these numbers, a forthcoming publication will provide estimates of the marginal economic impacts of selected MASGC-REEO projects on the Gulf industries. These estimates will include the creation of additional economic output, jobs, and incomes arising from expenditures on goods and services needed to successfully complete each project. The initial marginal impacts estimation procedure will provide an analysis of the first level of economic impacts of MASGC-REEO projects.

As with the agricultural sector, research and development investment is a major economic driver of pro-

ductivity growth (Wang 2014). However, new technology will not generate its intended economic impacts if producers or households do not adopt it. The second level of marginal economic impact is an estimation of new output, additional jobs, and increased income created when water-dependent industries adopt new technology as a result of Sea Grant REEO projects. These projects are funded with the expectation that results may lead to significant improvements in technical processes that benefit businesses adopting them. Such benefits might include lower production costs, higher productivity, better product quality, higher gross revenues, and increased net profits. However, the marginal impacts are extremely difficult to measure due to the confidentiality of the private business decisions and the indefinite time lags between project completion and decision-making.

There is almost no secondary data that links business decisions to adopt new technology with participation in Sea Grant-funded projects. We must rely on primary surveys to tease out any possible linkages between the project results, private business decisions, and associated marginal economic impacts. Another option involves "simulation analysis" to compare economic performance in scenarios with and without REEO programs.

Economic impact analysis cannot capture all the economic benefits of the MASGC-REEO projects to individual households, specific communities, and the entire region. Farrow et al. (2013) compiled an inventory of Sea Grant projects by showing estimates of the economic benefits resulting from each project. Primary surveys are needed to estimate the individual users' economic valuation of the usefulness of the Sea Grant programs to their households or business operations.

Marginal economic benefits can be measured by observing changes in consumption decisions involving certain economic goods and services among private households in each community or region served by Sea Grant REEO projects. Primary surveys are also needed to estimate the individual valuations of the benefits received by these households.

# Description of U.S. Economic Sectors and Industries

The U.S. industries and economic sectors were identified through the North American Industry Classification System (NAICS 2014). Each industry or sector was identified with a NAICS code and an industry or sector name. The most recent economic indicators about these industries or sectors were compiled from various secondary sources or estimated by using economic impact analysis. The most current economic indicators include total sales impacts and total job or employment impacts, which were mostly estimated under an IMPLAN (MIG 2014) platform. In some cases, the direct employment or job impacts were compiled using the Economic Modeling Specialists (EMSI 2014) software and data for the states of Alabama and Mississippi.

These economic indicators provide the benchmarks for estimating the marginal economic impacts of each MASGC-REEO project conducted in the region. These economic values represent the upper limit of the market impacts of these economic sectors.

## ***Sustainable Fisheries and Aquaculture***

Under the focus area “sustainable fisheries and aquaculture,” the following industries were identified as the initial target beneficiaries of REEO projects conducted or funded by the MASGC: (1) commercial fishing, (2) seafood processing, (3) seafood wholesaling, (4) seafood retailing, (5) marine aquaculture, and (6) live-bait dealers. MASGC (2014) uses its research, outreach, and education capabilities to improve the safety of seafood, educate consumers on choosing nutritious and sustainable products, and expand sustainable practices for seafood harvest and aquaculture production.

### **Commercial Fishing**

The commercial fishing industry corresponds to code 114111 or “finfish fishing,” code 114112 or “shellfish fishing,” and code 114119 or “other marine fishing” in the North American Industrial Classification System (NAICS 2014). These industries include establishments primarily engaged in the commercial catching or taking of finfish, shellfish, and other marine animals from their natural habitat.

Annual estimates from NOAA Fisheries (2014) showed that the commercial-fishing industry generated total sales impacts of \$76.2 million in Alabama and \$79.6 million in Mississippi in 2012 (Figure 1). During the same year, the Alabama commercial-fishing sector created 1,562 jobs, while the Mississippi sector created 1,576 jobs (Figure 2).

The Mississippi-Alabama Sea Grant Extension Program (MASGEP) conducts several REEO projects tar-

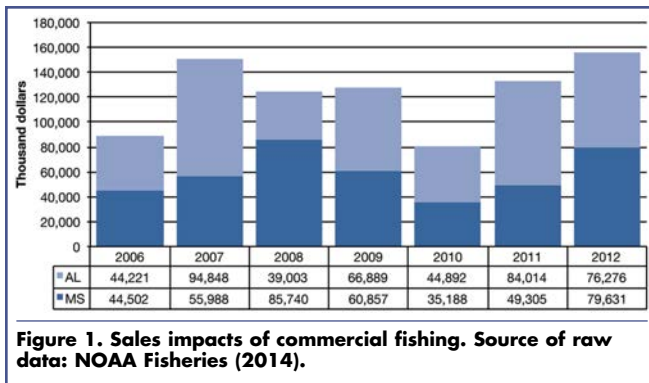
Weisbrod and Weisbrod (2014) defined an economic impact analysis as an attempt to estimate the change in economic activity in a specified region caused by a specific business, organization, policy, program, project, activity, or other economic event. The study region includes Alabama and Mississippi.

Output impacts, expressed in dollars for the year specified by the user, are gross sales by businesses in the economic region affected by an activity. Employment impacts are expressed as a mix of both full-time and part-time jobs. The total economic impact is the sum of direct, indirect, and induced impacts. Direct effects are the economic impacts that occur in the sector where the expenditure was initially made. Indirect impacts result from changes in economic activity of other industrial sectors that supply goods or services to the sector being evaluated. Induced impacts are the result of personal consumption expenditures by industry employees.

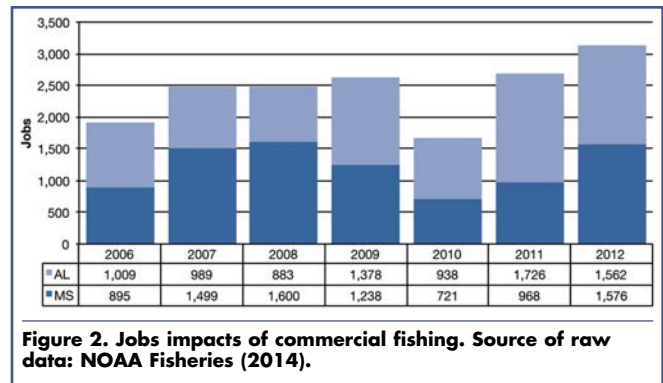
getting the commercial-fishing industry. For example, MASGEP faculty and staff offer technical and marketing information to commercial fishermen through workshops, websites, social media networks, and mailed and online newsletters. In collaboration with the other Gulf states, the MASGEP and Mississippi State University Coastal Research and Extension Center (CREC) received 4 years of funding from the Gulf States Marine Fisheries Commission (GSMFC) in 2011 to promote MarketMaker as an online marketing tool for seafood products harvested by commercial fishermen. Together with the other shrimp-harvesting states, Mississippi and Alabama completed the Technical Adjustment Assistance to more than 848 commercial shrimp fishermen (Kemper and Rainey 2014).

### **Seafood Processing**

The seafood-processing industry primarily corresponds to NAICS (2014) codes 311711 or “seafood canning” and 311712 or “fresh and frozen seafood processing.” The seafood canning industry comprises establishments primarily engaged in (1) canning seafood, including soup and marine fats and oils; and (2) smoking, salting, and drying seafood. Establishments known as floating factory ships that are engaged in gathering and processing seafood into canned products are included in this industry. The fresh and frozen seafood-processing industry comprises establishments primarily engaged in (1) eviscerating fresh fish by removing heads, fins, scales, bones,



**Figure 1. Sales impacts of commercial fishing. Source of raw data: NOAA Fisheries (2014).**



**Figure 2. Jobs impacts of commercial fishing. Source of raw data: NOAA Fisheries (2014).**

and entrails; (2) shucking and packing fresh shellfish; (3) manufacturing frozen seafood; and (4) processing fresh and frozen marine fats and oils.

Based on NOAA Fisheries (2014) estimates, the seafood-processing industry generated total sales of \$126.1 million in Alabama and \$101.6 million in Mississippi in 2012 (Figure 3). During the same year, the Alabama seafood-processing industry created 1,971 jobs, while Mississippi created 1,333 jobs (Figure 4).

From 1999–2007, MASGEP and CREC in cooperation with the Mississippi Department of Marine Resources-Seafood Technology Bureau (MDMR) conducted a collaborative research and outreach program on oyster postharvest processing systems in the Gulf region. Until 2007, when a seafood scientist/specialist position became vacant or no longer associated with MASGEP, faculty and staff conducted the Hazard Analysis Critical Control Points (HACCP) workshops for seafood-processing plants in the region and other nearby states. In 2011, MASGEP and CREC received 4-year funding from the GSMFC to promote MarketMaker as an online marketing program for seafood products processed by plants in the region. CREC also received funding to assess the economic impacts of recent natural and technological disasters on seafood processors.

### Seafood Wholesaling

The seafood-wholesaling industry corresponds to NAICS (2014) code 424460 or “fish and seafood mer-

chant wholesalers.” This industry comprises establishments primarily engaged in the merchant wholesale distribution of fish and seafood (except canned or packaged frozen).

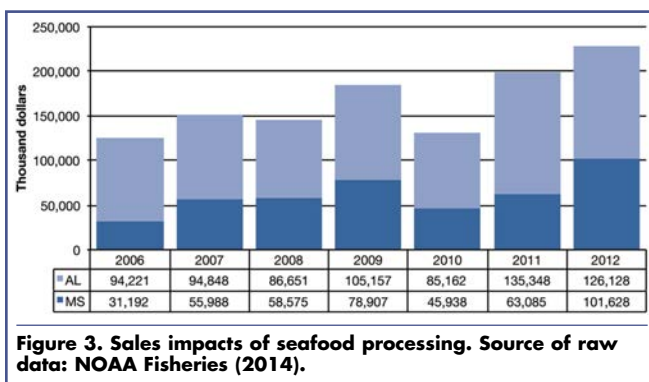
Estimates of annual sales and employment impacts of the seafood-wholesaling industry made by NOAA Fisheries (2014) from 2006–2012 are shown in Figures 5 and 6. In 2012, Alabama created total sales impacts of \$7.6 million and provided employment to 159 workers. In Mississippi, this industry created \$11.5 million in sales and generated employment for 123 workers.

MASGEP and CREC received 4-year funding in 2011 from the GSMFC to promote MarketMaker as an online marketing program for products handled by seafood-wholesaling establishments in the region. CREC also received funding to assess the economic impacts of recent natural and technological disasters on seafood wholesalers.

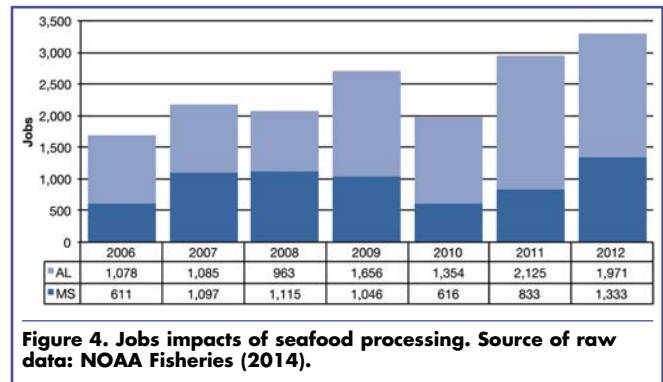
### Seafood Retailing

The seafood-retailing industry consists of the fish and seafood markets and seafood restaurants. Fish and seafood markets correspond to NAICS code 445220. This industry comprises establishments primarily engaged in retailing fresh, frozen, or cured fish and seafood products.

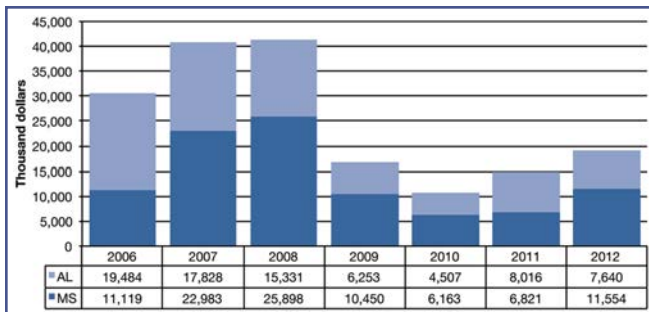
NAICS (2014) has two designations for seafood restaurants: code 722110 or “full-service restaurants” and NAICS code 722211 or “limited-service restau-



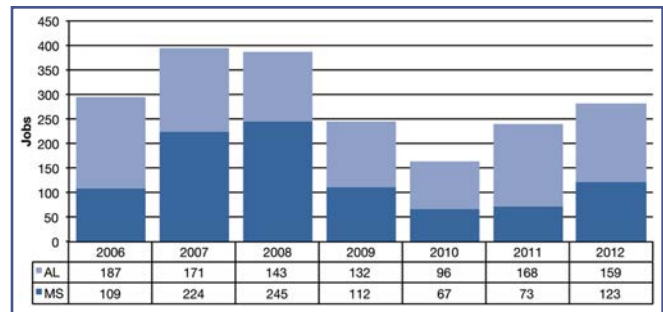
**Figure 3. Sales impacts of seafood processing. Source of raw data: NOAA Fisheries (2014).**



**Figure 4. Jobs impacts of seafood processing. Source of raw data: NOAA Fisheries (2014).**



**Figure 5. Sales impacts of seafood wholesaling. Source of raw data: NOAA Fisheries (2014).**



**Figure 6. Jobs impacts of seafood wholesaling. Source of raw data: NOAA Fisheries (2014).**

rants.” Full-service restaurants are establishments primarily engaged in providing food services to patrons who order and are served while seated and pay after eating. Limited-service restaurants are primarily engaged in providing food services, except snack and nonalcoholic beverage bars, where patrons generally order or select items and pay before eating.

Annual sales and employment impacts of the seafood-retailing industry from 2006–2012 are shown in Figures 7 and 8, as compiled from NOAA Fisheries (2014) website. These estimates indicate a 2012 sales impact of \$200.2 million and an employment impact of 6,072 jobs in Alabama. The retail industry generated \$175 million in sales and created 5,466 jobs in Mississippi.

In 2011, the MASGEP and CREC received 4-year funding from the GSMFC to promote MarketMaker as an online marketing program for seafood products sold by fish markets and served by seafood restaurants in the region. CREC also received funding to assess the economic impacts of recent natural and technological disasters on seafood markets and restaurants.

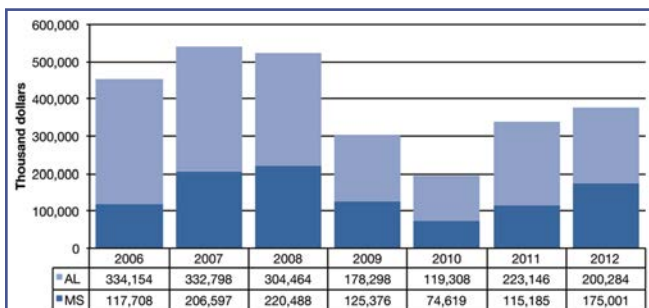
### Marine Aquaculture

Marine aquaculture is included in NAICS (2014) code 112511 or “finfish farming and fish hatcheries,” code 112512 or “shellfish farming,” and code 112519 or “other aquaculture.” Finfish farming and fish hatcheries comprise establishments primarily engaged in farm-raising finfish and/or hatching fish of any kind.

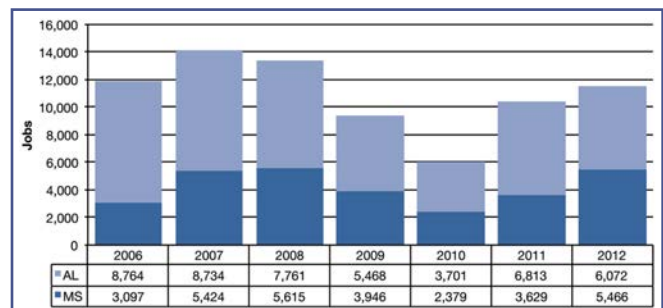
Other aquaculture comprises establishments primarily engaged in farm-raising aquatic animals, except finfish and shellfish, and/or farm-raising aquatic plants. Alligator, algae, frog, seaweed, or turtle production is included in this industry. Shellfish farming comprises establishments primarily engaged in farm-raising shellfish.

There are no available time-series data on these specific aquaculture industries that can be compiled from EMSI (2014). NOAA Fisheries (2014) does not publish time-series data on state-specific marine aquaculture production and farm-gate values.

From 2000–2004, MASGC staff and contractors conducted a pilot demonstration cage culture of marine fish species in the Mississippi Sound. Between 2000 and 2009, MASGEP developed economic models assessing the economic feasibility and potential economic impacts of the commercial offshore aquaculture production systems in the Gulf of Mexico and Southern California. Since 2010, MASGC and Auburn University scientists have conducted experimental trials on oyster aquaculture in both nursery and grow-out phases. MASGC provided funding in 2010–2012 for marine aquaculture research that developed an engineered multitrophic approach to minimizing effluent impacts from marine recirculating aquaculture systems. At present, Mississippi State University and the University of Southern Mississippi are collaborating to promote marine aquaculture in the state and the Gulf region.



**Figure 7. Sales impacts of seafood retailing. Source of raw data: NOAA Fisheries (2014).**



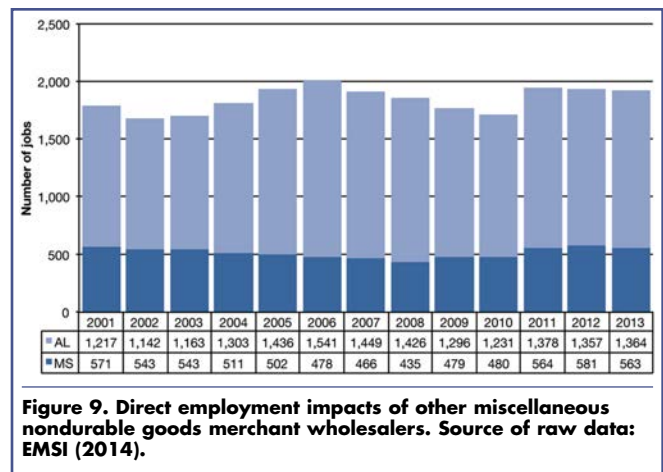
**Figure 8. Jobs impacts of seafood retailing. Source of raw data: NOAA Fisheries (2014).**

## Live Bait

Live-bait merchant wholesalers are included in NAICS (2014) code 424990, “other miscellaneous nondurable goods merchant wholesalers.” This industry comprises establishments primarily engaged in the merchant wholesale distribution of nondurable goods.

The annual direct employment impacts of this industry from 2001–2013 are shown in Figure 9, as compiled from EMSI (2014). The total direct employment created by this industry in the two states reached 1,927 jobs in 2013. This number does not include the indirect and induced number of jobs associated with direct employment.

Auburn University explored the production of marine baitfish species in 2006–2010. MASGC provided funding for the following marine baitfish aquaculture research projects: (1) live marine baitfish opportunities when produced in saline water of the Alabama Black Belt, 2006–2008; and (2) the interaction of salinity and temperature on growth of native and



**Figure 9. Direct employment impacts of other miscellaneous nondurable goods merchant wholesalers. Source of raw data: EMSI (2014).**

nonnative shrimp species cultured in Alabama, 2008–2010. CREC also received funding to assess the economic impacts of recent natural and technological disasters on live-bait dealers.

## Resilient Communities and Economies

Under the focus area on “resilient communities and economies,” the following industries were identified as the preliminary target beneficiaries of REEO projects conducted or funded by the MASGC: (1) working waterfronts, (2) commercial marinas, (3) charter boats for hire, (4) saltwater recreational fishing, (5) wildlife watching, (6) coastal restoration, and (6) ship building and repair. Cutting-edge research in the areas of climate change, coastal processes, energy efficiency, hazards, stormwater management, and tourism is the basis for MASGC (2014) work with local communities regarding resilience. The MASGC (2014) team works with growing coastal populations to apply the best available scientific knowledge to coastal issues, such as increased demands on resources and vulnerability to coastal storms.

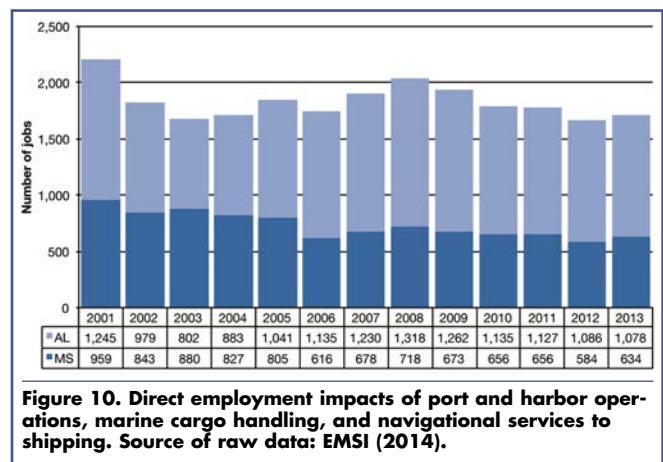
### Working Waterfronts

Working waterfronts are included in the NAICS (2014) code 488310 or “port and harbor operations,” code 488320 or “marine cargo handling,” and code 488330 or “navigational services to shipping.” Port and harbor operations comprise establishments primarily engaged in operating ports, harbors, or canals. Marine cargo handling comprises establishments primarily engaged in providing stevedoring and other marine cargo-handling services, except warehousing. Navigational services to shipping comprise establishments primarily engaged in providing navigational services to shipping, including marine salvage establishments.

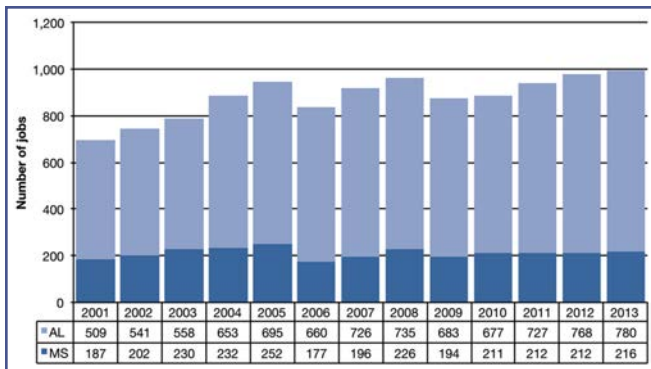
Annual direct employment impacts of working waterfronts from 2001–2013 are shown in Figure 10, as compiled from EMSI (2014). There were 1,712 primary jobs created by this industry in the two states in 2013. This number does not include the number of indirect and induced jobs associated with this industry.

The MASGC (2014) website describes the working waterfront program as follows:

“MASGC provides education and outreach to the community regarding issues surrounding the working waterfront, such as coordinating the Alabama Water Access Study Committee created by the Alabama Legislature in 2008. MASGC also funds research projects to learn more about working waterfronts in the region.”



**Figure 10. Direct employment impacts of port and harbor operations, marine cargo handling, and navigational services to shipping. Source of raw data: EMSI (2014).**



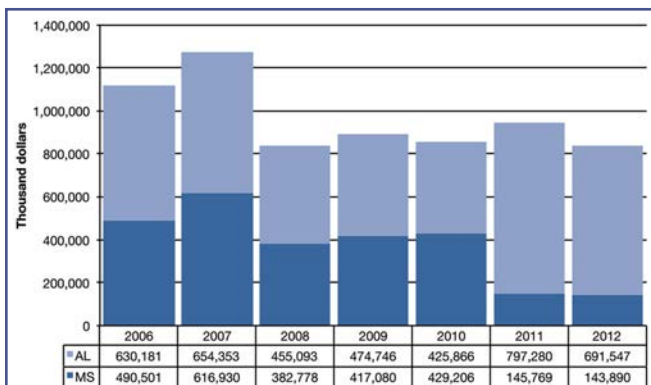
**Figure 11. Direct employment impacts of marinas. Source of raw data: EMSI (2014).**

### Commercial Marinas

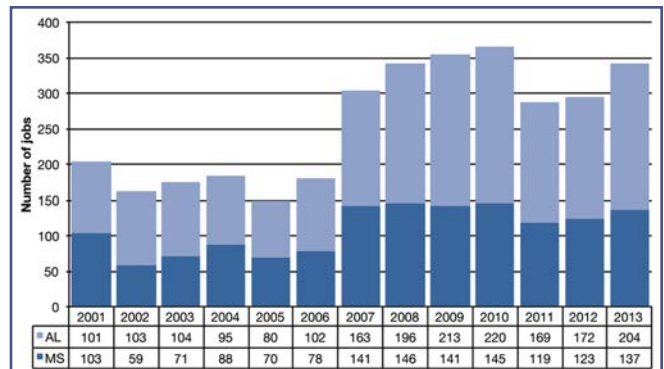
Commercial marinas are included in the NAICS (2014) code 713930. This industry comprises establishments, commonly known as marinas, that are engaged in operating docking and/or storage facilities for pleasure craft owners, with or without one or more related activities, such as retailing fuel and marine supplies and repairing, maintaining, or renting pleasure boats.

The annual direct employment impacts of commercial marinas from 2001–2013 are shown in Figure 11, as compiled from EMSI (2014). This industry generated 996 direct jobs in the two states in 2013, excluding indirect and induced jobs.

MASGEP reached out to commercial marinas in Mississippi and Alabama to participate in the Clean Marina Program. The MASGC (2014) website describes the this program as follows: “The Alabama-Mississippi Clean Marina Program assists marina, boatyard, and yacht club operators to protect the resources that provide their livelihood: clean water and fresh air.” CREC also received funding to assess the economic impacts of recent natural and technological disasters on commercial marinas.



**Figure 13. Sales impacts of recreational fishing. Source of raw data: NOAA Fisheries (2014).**



**Figure 12. Direct employment impacts of scenic and sightseeing water transportation. Source of raw data: EMSI (2014).**

### Charter Boats for Hire

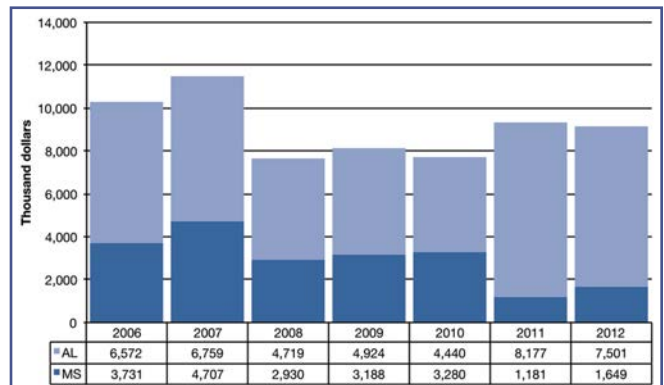
Charter boats are included in the NAICS (2014) code 487210 or “scenic and sightseeing transportation, water.” This industry comprises establishments primarily engaged in providing scenic and sightseeing transportation on water. The services provided are usually local and involve same-day return to place of origin.

The annual direct employment impacts of charter boats for hire from 2001–2013 are shown in Figure 12, as compiled from EMSI (2014). There were 341 primary jobs created by this industry in the two states in 2013. This number does not include the number of indirect and induced jobs associated with this industry.

In 2011, the MASGEP received 4-year funding from the GSMFC to promote MarketMaker as an online marketing program for charter boats for hire in the region. CREC also received funding to assess the economic impacts of recent natural and technological disasters on charter boats for hire.

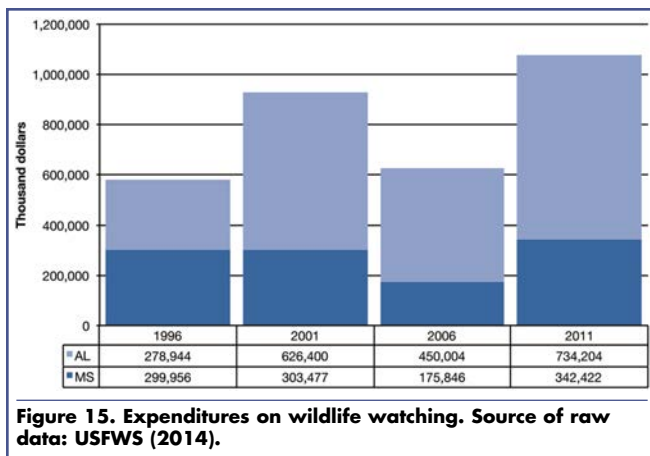
### Saltwater Recreational Fishing

NOAA Fisheries (2013) puts marine recreational expenditures into these categories: for-hire trips, private boat trips, shore trips, and durable equipment expendi-



**Figure 14. Employment impacts of recreational fishing. Source of raw data: NOAA Fisheries (2014).**





**Figure 15. Expenditures on wildlife watching. Source of raw data: USFWS (2014).**

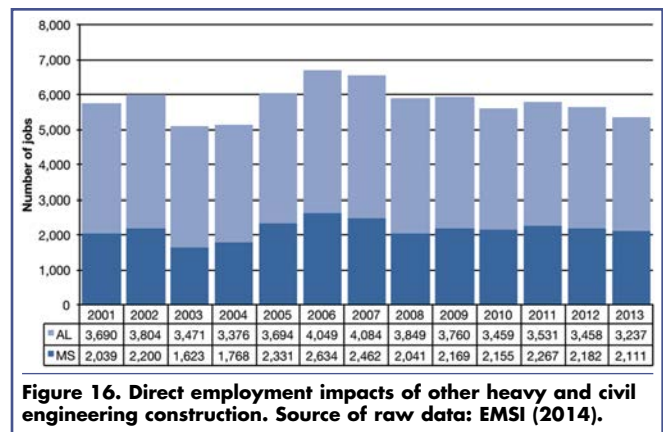
tures related to marine recreational fishing. Estimates made by NOAA Fisheries (2014) showed that saltwater recreational fishing generated total sales impacts of \$691.5 million in Alabama and \$143.9 million in Mississippi (Figure 13). During the same year, Alabama saltwater recreational fishing created 7,501 jobs, while Mississippi’s industry created 1,649 (Figure 14).

### Wildlife Watching

USFWS (2013) defines wildlife watching as observing, photographing, and feeding fish or wildlife. There are two types of wildlife-watching activities: away from home and around the home. Away-from-home wildlife watching is defined as taking trips or outings of at least 1 mile from home for the primary purpose of observing, feeding, or photographing fish and wildlife. Around-the-home wildlife watching is done within 1 mile of home and involves one or more of these activities: (1) closely observing or trying to identify birds or other wildlife, (2) photographing wildlife, (3) feeding birds or other wildlife, (4) maintaining natural areas of at least ¼ acre where benefit to wildlife is the primary concern, (5) maintaining plantings where benefit to wildlife is the primary concern, or (6) visiting parks and natural areas for the primary purpose of observing, feeding, or photographing wildlife.

Expenditures on wildlife watching are shown for the two states in 5-year intervals from 1996–2011 (Figure 15). Wildlife watchers spent approximately \$734.2 million in Alabama and \$342.4 million in Mississippi in 2011. These values do not include the indirect and induced impacts associated with these expenditures.

MASGC funded a research project in 2007 to evaluate the economic impacts of coastal birding festivals in Alabama and Mississippi. CREC funded a Mississippi coastal birding study in 2007–2010.



**Figure 16. Direct employment impacts of other heavy and civil engineering construction. Source of raw data: EMSI (2014).**

### Coastal Restoration

Coastal restoration is included in NAICS (2014) code 237990 or “other heavy and civil engineering construction.” This industry comprises establishments primarily engaged in heavy and engineering construction projects, excluding highway, street, bridge, and distribution-line construction. The work performed may include new work, reconstruction, rehabilitation, and repairs. Specialty trade contractors are included in this group if they are engaged in activities primarily related to engineering construction projects, excluding highway, street, bridge, distribution-line, oil and gas structure, and utilities building and structure construction. Construction projects involving water resources (for example, dredging and land drainage and development of marine facilities) and projects involving open space improvement (for example, parks and trails) are included in this industry.

The annual direct employment impacts of this industry from 2001–2013 compiled from EMSI (2014) are shown in Figure 16. This industry created 5,348 primary jobs in the two states in 2012. This number does not include indirect and induced jobs associated with this industry.

MASGC (2014) describes the coastal restoration program through the use of living shorelines to control shoreline erosion as follows:

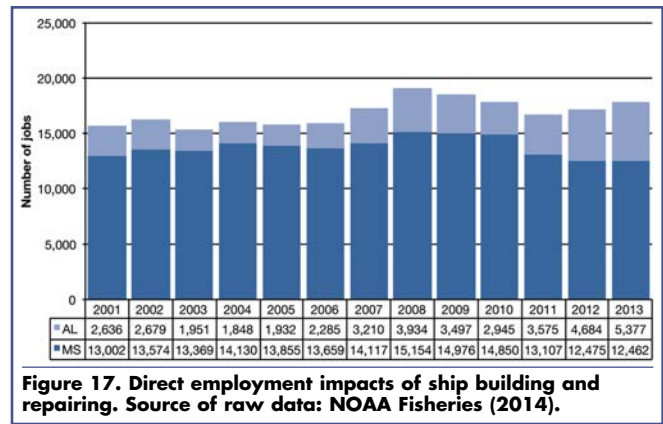
“Through research, education, and outreach, MASGC works to discover and share current information about living shorelines. MASGC-funded scientists are evaluating the effectiveness of different types of living shorelines and are creating ways to help people decide which option would work best for them. The members of the MASGC outreach team research rules and regulations related to building living shorelines.”

In 2014, MASGEP received funding to create a living shoreline suitability model for Mobile Bay, Alabama. In 2012, MASGEP received funding from NOAA and the Mobile Bay National Estuary Program to publish a living shoreline policy and model ordinance report for coastal Alabama.

## Ship Building and Repair

Ship building and repairing is included in the NAICS (2014) code 336611. This industry comprises establishments primarily engaged in operating shipyards. Shipyards are fixed facilities with dry docks and fabrication equipment capable of building watercraft suitable or intended for uses other than personal or recreational. Activities of shipyards include ship construction, repair, conversion, and alteration, as well as production of prefabricated ship and barge sections and specialized services, such as ship scaling.

Figure 17 shows the annual direct employment impacts of this industry from 2001–2013 as compiled from EMSI (2014). This industry created 17,839 core jobs in the two states in 2013. This number does not include indirect and induced jobs associated with this industry.



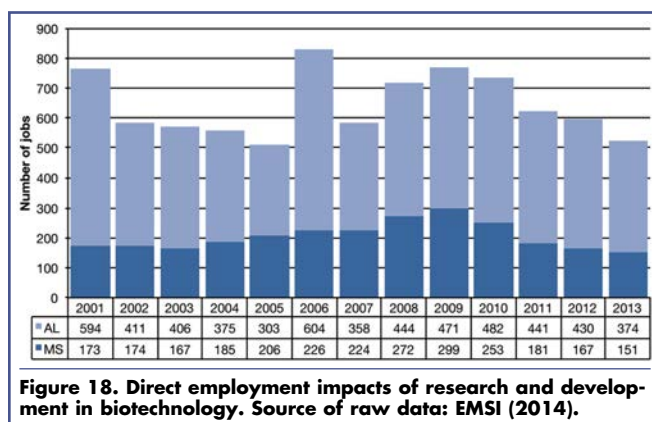
**Figure 17. Direct employment impacts of ship building and repairing. Source of raw data: NOAA Fisheries (2014).**

## Healthy Coastal Ecosystems

Under the focus area “healthy coastal ecosystems,” the following industries were identified as the target beneficiaries of REEO projects conducted or funded by the MASGC: (1) research and development in biotechnology; (2) research and development in the physical, engineering, and life sciences; and (3) research and development in the social sciences and humanities. MASGC (2014) research projects and outreach activities related to healthy coastal ecosystems include working with resource managers and providing them with the tools they need to make management decisions. Some of those tools include research, data, scientific models, and best management practices.

### Biotechnology

NAICS (2014) code 541711 is “research and development in biotechnology.” This industry comprises establishments primarily engaged in conducting biotechnology research and experimental development, which involves the study of the use of microorganisms and cellular and biomolecular processes to develop or alter living or nonliving materials. These efforts may result in development of new biotechnol-



**Figure 18. Direct employment impacts of research and development in biotechnology. Source of raw data: EMSI (2014).**

ogy processes or in prototypes of new or genetically altered products that may be reproduced, utilized, or implemented by various industries.

Figure 18 shows the annual direct employment impacts of this industry from 2001–2013 as compiled from EMSI (2014). This industry created 525 essential jobs in the two states in 2013. This number does not include indirect and induced jobs associated with this industry.

### Physical, Engineering, and Life Sciences

NAICS (2014) code 541712 is for “research and development in the physical, engineering, and life sciences.” This industry comprises establishments primarily engaged in conducting research and experimental development—excluding biotechnology research and development—in agriculture, electronics, the environment, biology, botany, computers, chemistry, food, fisheries, forests, geology, health, mathematics, medicine, oceanography, pharmacy, physics, veterinary medicine, and other allied subjects.

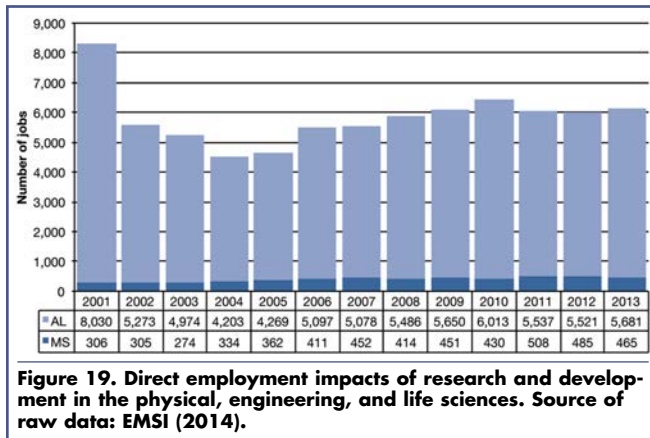
The annual direct employment impacts of this industry from 2001–2013 as compiled from EMSI (2014) are shown in Figure 19. This industry created 6,146 primary jobs in the two states in 2013. This number does not include indirect and induced jobs associated with this industry.

MASGC funded numerous research and development projects in the physical, engineering, and life sciences. In the long term, these projects could generate economic benefits to the commercial and recreational marine industries on the Gulf Coast. Three of the projects were completed in 2013: (1) development of sea level rise adaptation planning, procedures, and tools using NOAA sea level rise impacts viewer; (2) a decision support toolkit for the functional design of structures in living shorelines; and (3) development of marine mammal stranding and identification/viewing smartphone apps for the Southeast.

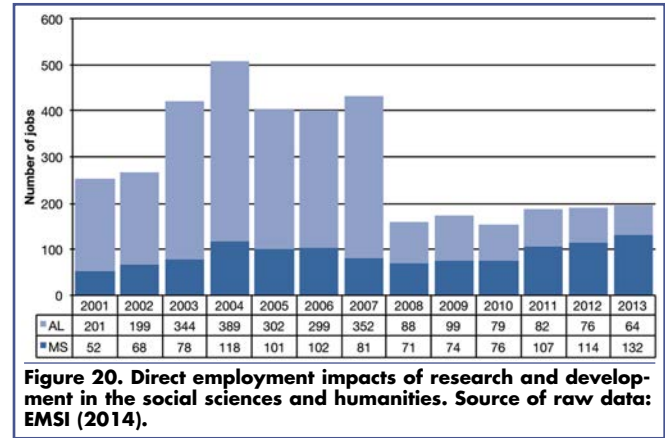
## Social Sciences and Humanities

NAICS (2014) code 541720 is for “research and development in the social sciences and humanities.” This industry comprises establishments primarily engaged in conducting research and analyses in cognitive development, sociology, psychology, language, behavior, economic, and other social sciences and humanities.

Figure 20 shows the annual direct employment impacts of this industry from 2001–2013 as compiled from EMSI (2014). This industry created 196 core jobs in the two states in 2013. This number does not include indirect and induced jobs associated with this industry.



MASGC funded several research and development projects in the social sciences and humanities. In the long run, these projects are expected to generate economic benefits to the commercial and recreational marine industries on the Gulf Coast. Some of the recent projects were completed in 2013: (1) ecosystem services provided by Gulf of Mexico habitats—tools, valuation, and application; (2) determining the factors contributing to human-dolphin interactions in a long-term resident inshore bottlenose dolphin community; and (3) measuring the relative financial vulnerability of municipal governments to tropical disaster risk.



## Environmental Literacy and Workforce Development

Under the focus area “environmental literacy and workforce development,” five industries are the beneficiaries of REEO projects conducted or funded by the MASGC: (1) other justice, public order, and safety activities; (2) administration of air and water resource and solid-waste management programs; (3) administration of general economic programs; (4) regulation of agricultural marketing and commodities; and (5) household sector.

The MASGC (2014) website states that environmental literacy and workforce skills in science, technology, engineering, mathematics, and other disciplines related to coastal resources are important to the populations that Sea Grant serves. These skills advance cutting-edge research, promote sound resource management, and maintain a globally competitive workforce.

### Other Justice, Public Order, and Safety Activities

NAICS (2014) code 922190 is for “other justice, public order, and safety activities.” This industry comprises government establishments primarily engaged in public order and safety with the exception of courts, police protection, legal counsel and prosecution, correctional institutions, parole offices, probation offices, pardon boards, and fire protection. These agencies

include the general administration of public order and safety programs. Government establishments responsible for the collection of statistics on public safety also are included in this industry.

There are no available time-series data on this industry that can be compiled from EMSI (2014). MASGC conducted or funded several research and development projects related to other justice, public order, and safety activities. In the long run, these activities are expected to generate economic benefits to the commercial and recreational marine industries on the Gulf Coast. Some of the recent projects that were completed in 2013 or are currently ongoing include the following: (1) climate community of practice; and (2) Gulf of Mexico coastal resilience—methods, data, and web-based mapping applications to inform coastal communities on the risks of sea level rise.

### Air and Water Resource and Solid Waste Management

NAICS (2014) code 924110 is for “administration of air and water resource and solid waste management programs.” This industry comprises government establishments primarily engaged in one or more of the following: (1) administration, regulation, and enforcement of air and water resource programs; (2) administration and regulation of solid waste manage-

ment programs; (3) administration and regulation of water and air pollution control and prevention programs; (4) administration and regulation of flood control programs; (5) administration and regulation of drainage development and water resource consumption programs; (6) administration and regulation of toxic waste removal and cleanup programs; and (7) coordination of these activities at intergovernmental levels.

There are no available time-series data on this industry that can be compiled from EMSI (2014). An example of a research project funded by MASGC is entitled “decreasing nitrate-N loads to coastal ecosystems with innovative drainage management.”

### General Economic Programs

NAICS (2014) code 926110 is for “administration of general economic programs.” This sector comprises government establishments primarily engaged in the administration, promotion, and development of economic resources, including business, industry, and tourism. Included in this industry are government establishments responsible for the development of general statistical data and analyses and promotion of the general economic well-being of the governed area.

There are no available time-series data on this industry that can be compiled from EMSI (2014).

### Agricultural Marketing and Commodities

NAICS (2014) code 926140 is for “regulation of agricultural marketing and commodities.” This sector comprises government establishments primarily engaged in the planning, administration, and coordination of agricultural programs for production, marketing, and utilization, including educational and promotional activities. Included in this industry are government establishments responsible for regulating and controlling the grading and inspection of food, plants, animals, and other agricultural products.”

There are no available time-series data on this industry that can be compiled from EMSI (2014). Examples of activities conducted or funded by MSGC for this industry include the following: (1) program administration, (2) Mississippi-Alabama Sea Grant Outreach Program, and (3) MASGC Educational

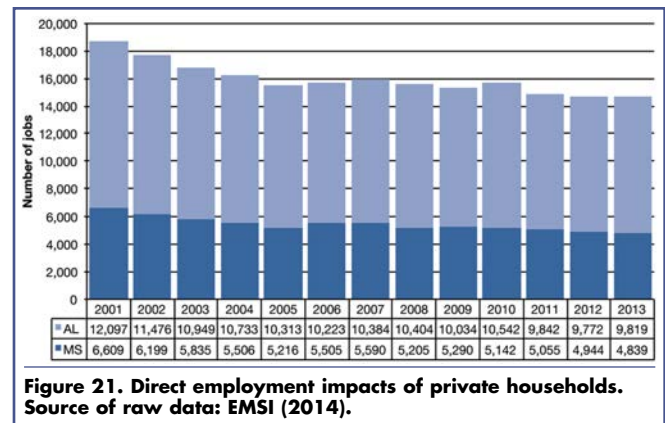
Efforts at the J.L. Scott Marine Education Center, the Dauphin Island Sea Lab, and the Environmental Studies Center.

### Household Sector

The household sector is defined in NAICS (2014) code 814110 or “private households.” This industry comprises private households primarily engaged in employing workers on or about the premises in activities primarily concerned with the operation of the household. These private households may employ cooks, maids, nannies, butlers, and outside workers, such as gardeners, caretakers, and other maintenance workers.

Figure 21 shows the annual direct employment impacts of this industry from 2001–2013 as compiled from EMSI (2014). This industry created 14,658 essential jobs in the two states in 2013. This number does not include indirect and induced jobs associated with this industry.

Research and development investments in Sea Grant projects are expected to create some intended impacts on production, consumption, and saving decisions made by private households. The link between research results and household decision-making processes are the various Sea Grant extension programs. Extension has a vital role in disseminating and enhancing the rates of adoption of new technology and practices by coastal households.



## Summary and Implications

This publication identified some of the U.S. industries initially served by the previous research, extension, education, and outreach programs of the Mississippi-Alabama Sea Grant Consortium during the past decade. Additional economic sectors will be added to this compilation as new information becomes available. This new information will be taken from annual and final reports of Sea Grant projects that will be conducted in the future.

Initial industries targeted by the Mississippi-Alabama Sea Grant Consortium during the past decade were grouped under four focus areas. Under “sustainable fisheries and aquaculture,” the following industries were listed: (1) commercial fishing, (2) seafood processing, (3) seafood wholesaling, (4) seafood retailing, (5) marine aquaculture, and (6) live-bait dealers.

The “healthy coastal ecosystems” focus area includes (1) research and development in biotechnology; (2) research and development in the physical, engineering, and life sciences; and (3) research and development in the social sciences and humanities.

Under “resilient communities and economies,” these industries were identified: (1) working waterfronts, (2) commercial marinas, (3) charter boats for hire, (4) saltwater recreational fishing, (5) wildlife watching, (6) coastal restoration, and (6) ship building and repair.

Under the focus area “environmental literacy and workforce development,” five industries were identified: (1) other justice, public order, and safety activities; (2) administration of air and water resource and solid waste management programs; (3) administration

of general economic programs; (4) regulation of agricultural marketing and commodities; and (5) household sector.

The long-term data on the economic contributions of the targeted industries to the regional economy of Alabama and Mississippi were compiled from various secondary sources. The time-series economic indicators consist of the annual sales and employment impacts of each sector served by Sea Grant projects. In some cases, only the direct employment impacts were available for compilation. When assessing the initial economic impacts on the U.S. industry or economic sectors by Sea Grant projects, these time-series economic indicators set the upper limits to the annual impacts that these projects can generate.

There is a pressing need to adequately measure the significant contributions of Sea Grant projects to targeted U.S. industries or economic sectors. Principal investigators and project managers should consider developing robust theoretical frameworks and primary survey procedures when designing and evaluating the long-term economic impacts and economic benefits associated with each proposed project. These performance measures can be evaluated by project staff and/or outside evaluators.

The industries identified in this publication can be examined to perform the initial marginal economic impact analysis of Sea Grant projects. The annual level of expenditures and number of personnel can be compiled by economic sector served. The ratio of investments in Sea Grant projects to economic impacts in the relevant industries annual represents the first level of impacts in these sectors.

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**Publication 2849**

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director