



FLORIDA'S OCEANS AND COASTS: AN ECONOMIC AND CLUSTER ANALYSIS

MAY 2013



Table of Contents

Preface	
List of Board Members	
Acknowledgments	
Executive Summary.....	1
Introduction.....	6
I. Economic Contribution of Florida’s Oceans	9
A. The Contribution of Ocean Resources to the Florida Economy	9
B. Contribution by Industry.....	12
C. Contribution to Coastal Metropolitan Areas.....	17
D. Employment in the Ocean Economy	21
E. Total Contribution, Including Indirect and Induced Effects.....	23
II. Ocean and Coastal Industries—A Cluster Analysis.....	26
A. Florida’s Key Ocean Legacy Industries.....	26
1. Economic Clout.....	26
2. Location of Industry Clusters.....	28
B. Overview/Discussion of Key Ocean Legacy Industries	32
1. Tourism.....	32
2. Seaports	35
a. Cargo	35
b. Cruise Lines	37
3. Marine Industry	37
a. Economic Impact of Recreational Boating	37
4. Recreation	42
5. Fishing Industry	44
a. Recreational Fishing.....	44
b. Commercial Fishing.....	44
c. Florida Marine Aquaculture	45
C. Other Industry Sectors.....	46
1. The Defense Industry in Florida	46
2. Marine Research.....	48
a. Research Funding	48
b. Ocean Observing.....	49
c. Marine Biomedical Research	51
d. Scientific Response to the Gulf Oil Spill	52
3. Renewable Energy	53
III. Methodology	54

Preface

The Florida Ocean Alliance is a nonpartisan organization dedicated to bringing together the private sector, academia, and nonprofit research organizations in Florida to protect and enhance Florida's coastal and ocean resources for continued social and economic benefits. Recognizing the interconnection of Florida to its neighbors in the Caribbean Basin, along the Gulf of Mexico, and the Atlantic Coast, the Florida Ocean Alliance is committed to positioning Florida as an international leader to integrate ocean conservation, education, and responsible economic development. Private sector members include representatives from ocean-related industries in tourism, ports, shipping, cruising, recreational and commercial fishing, and recreational boating. Other members include representatives from nonprofit research organizations, academia, the ocean research community, and public interest groups.

The Alliance serves as a clearinghouse for information on key ocean and coastal issues facing Florida. It monitors and publicizes actions related to the oceans and coasts. The Alliance focuses on outreach and educational activities for the public and policymakers, including conferences, papers on ocean and coastal policies, economic studies, and testimony to national or state agencies and commissions concerned with ocean or coastal policy. Each year the Alliance sponsors Florida Oceans Day in the State Capitol in Tallahassee.

The Alliance was formed in late 1999 and evolved from the members participating in the Florida Governor's Ocean Committee. This group recognized the vital role of coastal and ocean resources to Florida's quality of life and economic vitality in their 1999 Final Report, available at: www.dca.state.fl.us/ffcm/FCMP/Programs/prog.htm. Additional information on the Alliance is available online at www.floridaoceanalliance.org.

Florida Ocean Alliance Board Members

Steven M. Cernak (Chair)
Florida Ports Council

Michael W. Sole (Vice Chair)
Florida Power & Light Company

Karl E. Havens, Ph.D. (Secretary)
Florida Sea Grant College Program

Laura Geselbracht (Treasurer)
The Nature Conservancy

James Cantonis
Acme Sponge & Chamois, Co.

Duane E. De Freese, Ph.D.
AquaFiber Technologies Corporation

Richard Dodge, Ph.D.
Nova Southeastern University

Eric Draper
Audubon Society

Deborah Flack
FL Shore & Beach Preservation
Association

Ken Haddad
Florida Fish and Wildlife Conservation
Commission, Retired

Elaine Heldewier
Carnival Cruise Lines

Kristina Hebert
Marine Industries Association of South
Florida

Bill Hogarth, Ph.D.
Florida Institute of Oceanography

Rob Kramer
International Game Fish Association

Margaret Leinen, Ph.D.
Harbor Branch Oceanographic Institution

Kumar Mahadevan, Ph.D.
Mote Marine Laboratory

George A. Maul, Ph.D.
Florida Institute of Technology

David L. McDonald
McDonald, Miller & Coleman LLC

James F. Murley, Esq.
South Florida Regional Planning Council

John Ogden, Ph.D.
University of South Florida

Jamie Picard
Ocean Renewable Power Company LLC

Ellen Prager, Ph.D.
Earth2Ocean, Inc.

Richard M. Pruitt
Royal Caribbean Cruises Ltd.

Mitchell Roffer, Ph.D.
Roffer's Ocean Fishing Forecasting
Service

Jerry Sansom
Organized Fishermen of Florida

Anne Savage, Ph.D.
Walt Disney Parks and Resorts

Megan Stolen
Hubbs-Sea World Research Institute

Lenore Alpert, Ph.D.
(Executive Director)
Florida Ocean Alliance

Acknowledgments

The Florida Ocean Alliance gratefully acknowledges the support of Florida Sea Grant, Mote Scientific Foundation, and the Florida Institute of Oceanography for funding this initial effort to develop cluster mapping and update the economic impact of Florida's ocean and coastal industries.

The Board of Directors of the Florida Ocean Alliance has guided the development and content of this report. The research effort was led by Dr. Lenore Alpert, Executive Director of the Florida Ocean Alliance, in collaboration with Dr. William B. Stronge, who prepared the economic study. Key research assistance was provided by Angela Grooms and Dr. Brian Johnson.

Executive Summary

- Florida's coastal counties contributed over \$584 billion in gross regional product to Florida's economy in 2010, or 79% of the state's economy.
- More than 228,000 jobs in Florida are directly created by activities that use ocean resources. When indirect effects are taken into account, the number of jobs supported by ocean resources exceeds 440,000.
- In 2011, about one out of every twenty dollars' worth of Florida's gross domestic product resulted from use of the state's ocean resources.

Florida, as well as the nation, is looking for a future with low unemployment that is high in opportunity and that comes with a stable and growing economy. The oceans, coasts, and a wide variety of related industries play a critical role in this vision of Florida's future. Already, in setting national priorities, the importance of sustaining the productivity of the oceans has been recognized.¹ Specifically, these priorities advocate balancing the economic well-being of the nation derived from its oceans with the protection of the environments that provide those economic benefits. In Florida, the importance of this nexus between the state's economy and the ocean environment is of the utmost significance. Over 75 percent of the state's population resides in the 35 coastal counties that occupy only 57 percent of the land.² It is critical to maintain the productivity of the coastal oceans for the state's economy.

The Florida Ocean Alliance highlights the connection between the health of the state's economy and the oceans by completing this economic study and cluster analysis of the industries linked to the oceans and coasts. In doing so, the Florida Ocean Alliance is essentially updating and expanding sections of an earlier 2008 economic study of Florida's ocean assets, focusing on the traditional ocean industries.³ This study confines the estimation of the direct contributions of Florida's ocean industries to their impact on the coastal counties and estimates the contribution made by activities that use the ocean resources off the state's coast. As great budgetary uncertainty now exists, there are also new opportunities to explore in emerging technologies and energy. The information provided in this report will enable the state and its representatives to take full advantage of these opportunities and make the most of dwindling resources.

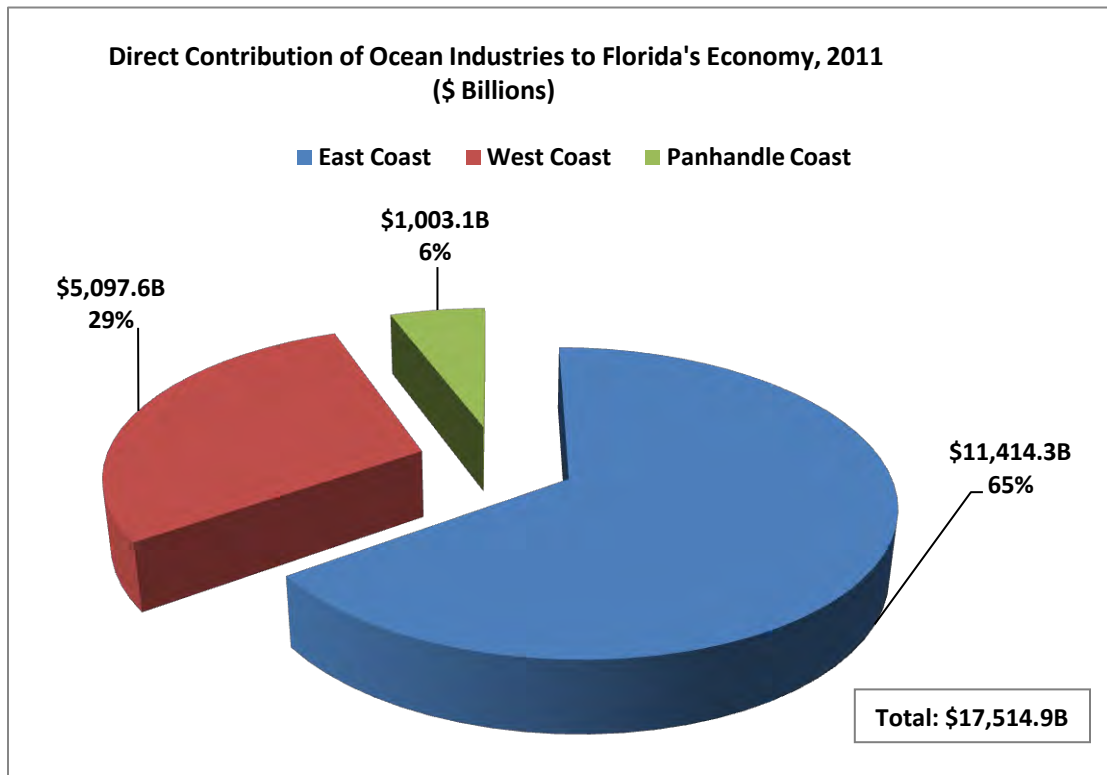
¹National Science and Technology Council, Subcommittee on Ocean Science and Technology, "Science for an Ocean Nation: An Update of the Ocean Research Priorities Plan," February 2013.

²U.S. Census Bureau, 2010 Census, cited in <http://quickfacts.census.gov>.

³Florida Oceans and Coastal Council, "Florida's Ocean and Coastal Economies Report," Prepared by Dr. Judith Kildow at Monterey Bay Aquarium Research Institute, June 2008. This update is a pilot study so is not intended to be as comprehensive as the earlier study, which relied on 2005 and 2006 datasets. We have relied primarily on 2010 and 2011 datasets and 2012 data as available.

FLORIDA'S COASTAL ECONOMY

Florida's oceans and coasts drive our economy. In 2010, Florida's coastal counties contributed over \$584 billion in gross regional product to the state's economy, or 79% of Florida's economy. The Atlantic shoreline contributed \$366 billion and the Gulf shoreline \$218 billion. The coastal economy supported more than 440,000 jobs in the state in 2011.⁴ More than 60 percent were in the tourism industry, and 20.5 percent were in ocean transportation. The ocean economy made a total contribution of more than \$35 billion in 2011. This amounted to 4.7% of the state's GDP. The total contribution was almost evenly divided between the direct contribution of \$17.5 billion and the indirect plus induced contribution of \$17.7 billion.



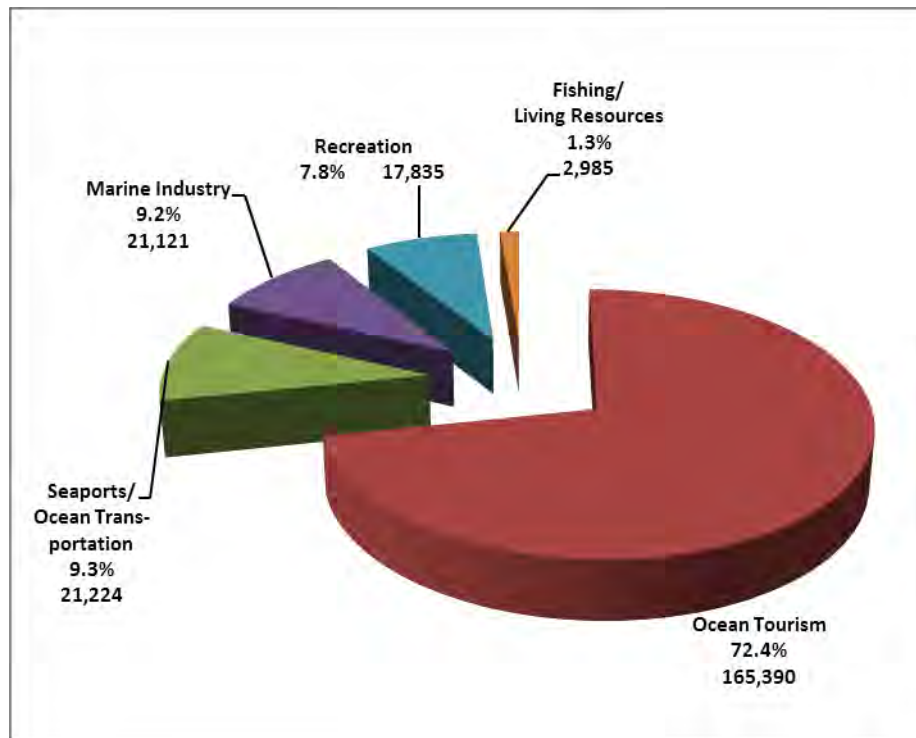
FLORIDA'S OCEAN ECONOMY

- Ocean related industries include ocean tourism, seaports and ocean transportation, the marine industry, recreation, and fishing/living resources.
- Ocean industries directly and indirectly support 6 percent of jobs in Florida.

⁴The estimates of total jobs were derived using the direct effects multipliers of the RIMS II Model. The direct effects multipliers were applied to the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) employment data, which excludes independent contractors and the self-employed.

Florida's key ocean legacy industries include over 37,000 companies along Florida's coasts that employ over 228,000 employees.⁵ The state's ocean resources directly created these thousands of jobs. More than 70 percent of the jobs in the ocean economy are in tourism. More than 60 percent of the jobs in the ocean economy are in the coastal counties along the state's East Coast, almost 30 percent are on the West Coast, and less than 10 percent are along the Panhandle Coast. In all three regions, tourism is the largest employer. Coastal transportation trails as the second largest source of ocean economy jobs along the state's East Coast, which contains the three largest cruise ports in the world and three of the top 20 container ports in the nation. The marine industry ranks as the second largest source of employment in the state's West Coast and Panhandle Coast.

Direct Employment by Florida's Ocean Industries in Coastal Counties, 2011

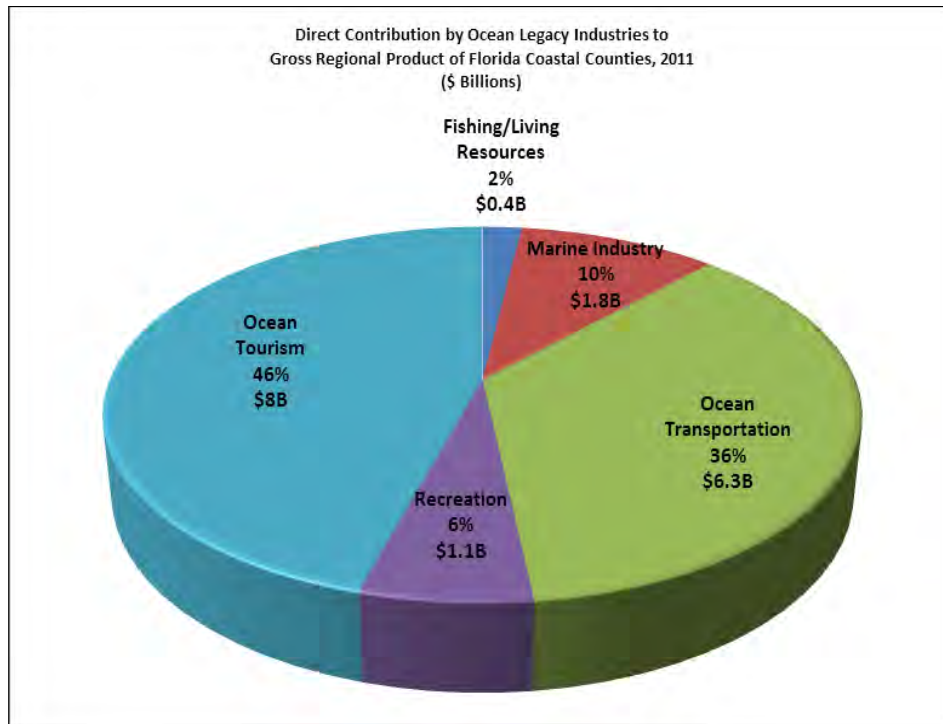


DIRECT CONTRIBUTION TO OCEAN ECONOMY

Economic activity directly created by Florida's ocean resources amounted to \$17.5 billion in 2011. Of this, \$8 billion was created by out of state ocean-oriented tourism, \$6.3 billion was created by seaports/ocean transportation and its supporting activities, \$1.8 billion was created by the marine industry, \$1.1 billion was created by ocean-oriented recreation and \$0.4 billion was created by the harvest, processing and distribution of the ocean's fishing/living resources.⁶

⁵Bureau of Labor Statistics Quarterly Census of Employment and Wages employment data, ES-202 data, 2011.

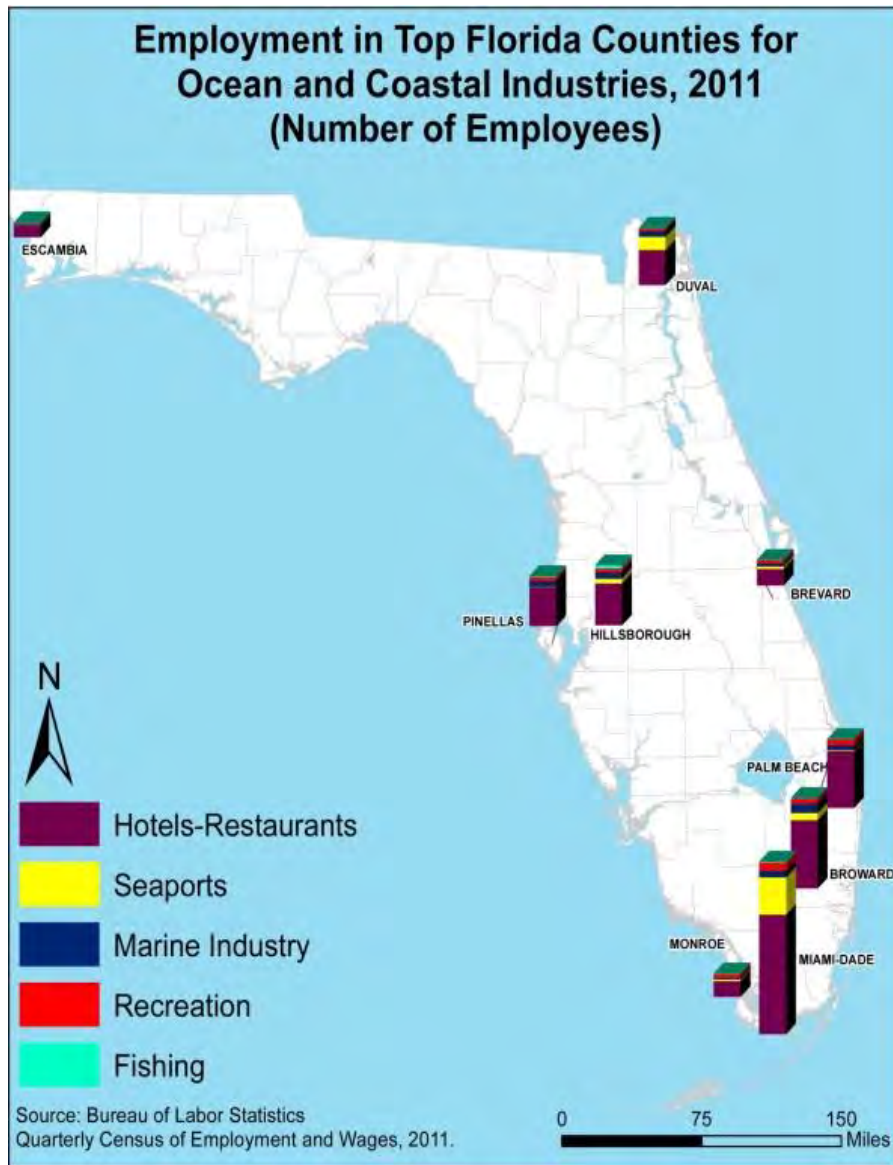
⁶Based on data from U.S. Bureau of Economic Analysis, 2010 Flash Estimates.



More than 65% of the economic activity was created along the state’s East Coast; almost 30% was created along the state’s West Coast (south from Taylor county in the Big Bend area), and a little more than 5% was created in the Panhandle region. Along Florida’s East Coast, almost three-fourths of the contribution to Gross Regional Product from ocean industries to metropolitan economies is made in Southeast Florida (Miami-Fort Lauderdale MSA, including Palm Beach and Monroe counties); another 14.2% is contributed in the Jacksonville MSA, which includes Nassau and St. John counties. Along Florida’s West Coast, more than 50 percent of the contributions to Gross Regional Product from ocean resources are made in the Tampa-St. Petersburg MSA; sizeable contributions (in excess of 10 percent) are also made in the North Port-Sarasota area (which includes Manatee County) and in the Cape Coral-Ft. Myers area. Along the Panhandle Coast, Fort Walton Beach and Panama City MSAs each account for approximately one-third of the contributions made by ocean resources to gross product; Pensacola-Santa Rosa accounts for one-fourth.

INDUSTRY CLUSTERS

A cluster analysis and mapping of industry sectors associated with the state’s oceans and coasts is an essential prerequisite to preparing Florida for future policy discussions. The distribution of employees in coastal and ocean industries is generally concentrated in the populous areas located in six major counties along Florida’s coasts—Miami-Dade, Broward, Palm Beach counties in the southeast; Pinellas and Hillsborough in the southwest; and Duval county in the northeast. Other important counties are Monroe and Escambia counties for their fishing/living resources industry and Brevard county for its recreation industry.



CONCLUSION

Sustainable oceans and coastal ecosystems are the foundation for the quality of life of Florida residents, not only necessary to attract tourists to the Sunshine State, but also integrally important to economic recovery and sustainable growth. The health and sustainability of ocean and coastal ecosystems will determine the future of Florida's recreational and commercial fisheries, recreational boating and diving, beach-related recreation, tourism, nature observation and a myriad of other natural and societal values that are collectively worth hundreds of billions of dollars a year to the state's economy.

Introduction

Florida, as well as the nation, is looking for a future with low unemployment that is high in opportunity and comes with a stable and growing economy. The ocean, coasts, and a wide variety of related industries play a critical role in this vision of Florida's future. Already, in setting national priorities, the importance of sustaining the productivity of the oceans has been recognized.⁷ Specifically, these priorities advocate balancing the economic well-being of the nation derived from its oceans with the protection of the environments that provide those economic benefits. In the recently released National Ocean Policy Implementation Plan, the oceans and coasts were described as "our Nation's most valuable resources and strongest economic drivers," with marine-related industries contributing \$258 billion in gross domestic product to the national economy and 2.8 million jobs.⁸ In Florida, the importance of this nexus between the state's economy and the ocean environment is of the utmost significance. Over 75 percent of the state's population resides in the 35 coastal counties that occupy only 57 percent of the land.⁹ Florida is an ocean state.

In this report, we highlight the connection between the health of the state's economy and the oceans by completing an economic study and cluster analysis of the industries linked to the oceans and coasts. In doing so, the Florida Ocean Alliance is essentially updating and expanding sections of an earlier 2008 economic study of Florida's ocean assets, focusing on the traditional ocean industries.¹⁰ As great budgetary uncertainty now exists, there are also new opportunities to explore in emerging technologies and energy. The information provided in this report will enable the state and its representatives to take full advantage of these opportunities and make the most of dwindling resources.

Unfortunately, the scale, diversity and economic value of Florida's ocean and coastal economies are not well known. Enterprise Florida Inc. (a public-private partnership serving as Florida's primary organization devoted to statewide economic development) has identified marine science as a "strategic area of emphasis" and "emerging technology" sector. The threads of the Florida ocean economy are woven both directly and indirectly throughout Florida's legacy industries (tourism, agriculture and construction) as well as Florida's leading industry clusters and strategic areas of emphasis recognized by Enterprise Florida Inc. These are listed below with select examples of ocean-related activities.

⁷ National Science and Technology Council, Subcommittee on Ocean Science and Technology, "Science for an Ocean Nation: An Update of the Ocean Research Priorities Plan," February 2013.

⁸ National Ocean Council, National Ocean Policy Implementation Plan, April 2013, p. 5.

⁹ U.S. Census Bureau, 2010 Census, cited in <http://quickfacts.census.gov>

¹⁰ Florida Oceans and Coastal Council, "Florida's Ocean and Coastal Economies Report," Prepared by Dr. Judith Kildow at Monterey Bay Aquarium Research Institute, June 2008. This update is a pilot study so is not intended to be as comprehensive as the earlier study by Kildow, which relied on 2005 and 2006 datasets. We have relied primarily on 2010 and 2011 datasets and 2012 data as available.

Florida Legacy Industries

- Tourism (ocean and coastal tourism, marine animal parks, marine and coastal recreation activities)
- Agriculture (aquaculture and mariculture)
- Construction (ship building, coastal construction and marine construction)

Florida Leading Industry Clusters

- Cleantech (ocean energy, efficient ship design and advanced materials)
- Life Sciences (ocean research, marine pharmaceuticals, pollution mitigation)
- Information Technology (ocean and coastal sensor development, data acquisition, data analysis, ocean and coastal monitoring, mapping and modeling).
- Aviation and Aerospace (space-earth observation systems, remote observation vehicles, advanced composite development)
- Logistics and Distribution (ocean-related wholesale trade, transportation, training, logistics and distribution).
- Defense and Homeland Security (ocean and coastal safety and security)
- Financial/Professional Services (activities in banking, insurance, and a wide range of professional services associated with coastal and ocean activities and industries).

Strategic Areas of Emphasis

- Manufacturing (advanced manufacturing of ocean and coastal related products like marine pharmaceuticals, advanced composites for ship building, marine instrumentation and even surfboards)
- Corporate Headquarters (relocation or expansion of large headquarters like SRI International)
- Emerging Technologies (material science, nanotechnology and marine science).

Because of the large scale and diversity of sectors within the Florida ocean and coastal economy, the economic data and summaries provided in this report represent a conservative estimate of the true economic value of Florida's ocean economy. It contains estimates of the contribution to the economy of Florida made by activities that use the ocean resources off the state's coast. The activities include fishing, fish processing and distribution, marine construction, ship and boat building and repair, boat dealers and other parts of the marine industry, cargo transportation, passenger transportation (including cruising), nature parks, ocean-oriented attractions and other recreation, and ocean-oriented tourism including

tourists drawn to the state's world famous beaches. There is no single industry that contains all these economic activities – to estimate the contribution of ocean resources, it is necessary to extract parts of many industries that also contain businesses that are unrelated to the ocean. In this study, we will select detailed industries that are predominantly ocean-oriented following the methodology developed for the National Ocean Economics Program (NOEP). It has gradually been extended across additional states and has benefitted from the leadership of a large team of professional economists. By following the NOEP methodology, the results in this report are comparable to the studies that have been undertaken on the contribution of ocean resources to other states, and it can be viewed as an update of a previous NOEP Study of the Florida Ocean Economy conducted several years ago.¹¹ The definitions of the sub-industries used in this report will conflict with the definitions used in some other studies that have been made of individual Florida industries. For example, this report includes only commercial fishing in the “fishing” industry; other studies may include recreational fishing also, but this activity is included in recreation in this study. The same issues might arise in studies of the economic contribution of ports, of the cruise industry and of parks. Individual studies are likely to include tourism in the industry—this study treats tourism as a separate industry.

This report begins by providing estimates of the direct contribution made by ocean industries to the gross domestic products of the metropolitan coastal counties of Florida. A later section of the report will include indirect and induced contributions –popularly called the ripple effects of the primary industries. Almost all of the East Coast of Florida lies in metropolitan statistical areas for which gross domestic product by broad industry groups are available. (Metropolitan Statistical Areas (MSAs) are groups of one or more counties which the Census Bureau determines form an independent metropolitan economy, comprise at least 50,000 people, and have a high degree of commuting among them.) The only East Coast county for which GDP estimates are not published by the US Bureau of Economic Analysis is Monroe County. Estimates have been made for this report using earnings data for the county and for the Miami MSA. GDP estimates are also available for the southern two-thirds of the West Coast of Florida, including the large Tampa-St. Petersburg MSA. Most of the Panhandle counties in the state's northwest also have gross domestic estimates. The exception is Walton County, which is included in the Crestview-Fort Walton Beach MSA, and Gulf and Franklin counties, which are very small counties that are east of Panama City. They are not included in the study. Four small counties north of the Tampa-St. Petersburg MSA are also not included, namely, Citrus, Levy, Dixie and Taylor counties. This study confines the estimation of the direct contributions of the ocean industries to their impact on the coastal counties. This is a conservative assumption because there may also be direct impacts by the interior counties in the state. For example, tourists staying in the interior counties may drive into a neighboring coastal county to partake of activities that use ocean resources.

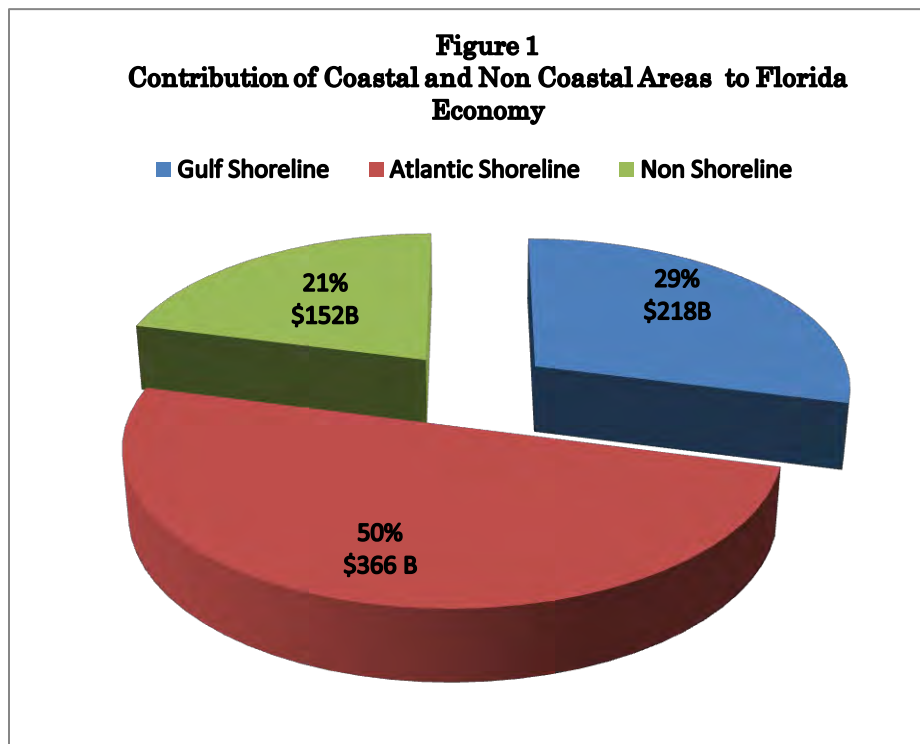
¹¹ Florida Oceans and Coastal Council, “Florida’s Ocean and Coastal Economies Report,” Prepared by Dr. Judith Kildow at Monterey Bay Aquarium Research Institute, June 2008.

I. Economic Contribution of Florida's Oceans

A. The Contribution of Ocean Resources to the Florida Economy

The ocean waters off the coast of Florida are a major engine of economic activity in the state, as well as a beautiful natural resource. The ocean provides a habitat for a variety of living resources including fish, birds and turtles. Harvesting, processing and distributing the fish create jobs and increase the level of economic activity in the state. Construction of ocean infrastructure and marinas, as well as shipbuilding and repair, are key parts of the state's marine industry which creates jobs and incomes for many Florida residents. Ocean-oriented recreation, including scenic and sightseeing transportation, sales and rentals of recreational equipment, as well as ocean parks and amusement centers, also contributes to the state's economy. Transportation along the ocean waters also creates jobs and incomes in the state, and the use of the state's beaches and other resources by out of state tourists generates a large number of jobs, supporting the well-being of many Florida families and individuals.

In 2010, Florida's coastal counties contributed over \$584 billion in gross regional product to the state's economy, or 79% of Florida's economy. The Atlantic shoreline contributed \$366 billion and the Gulf shoreline \$218 billion.¹²



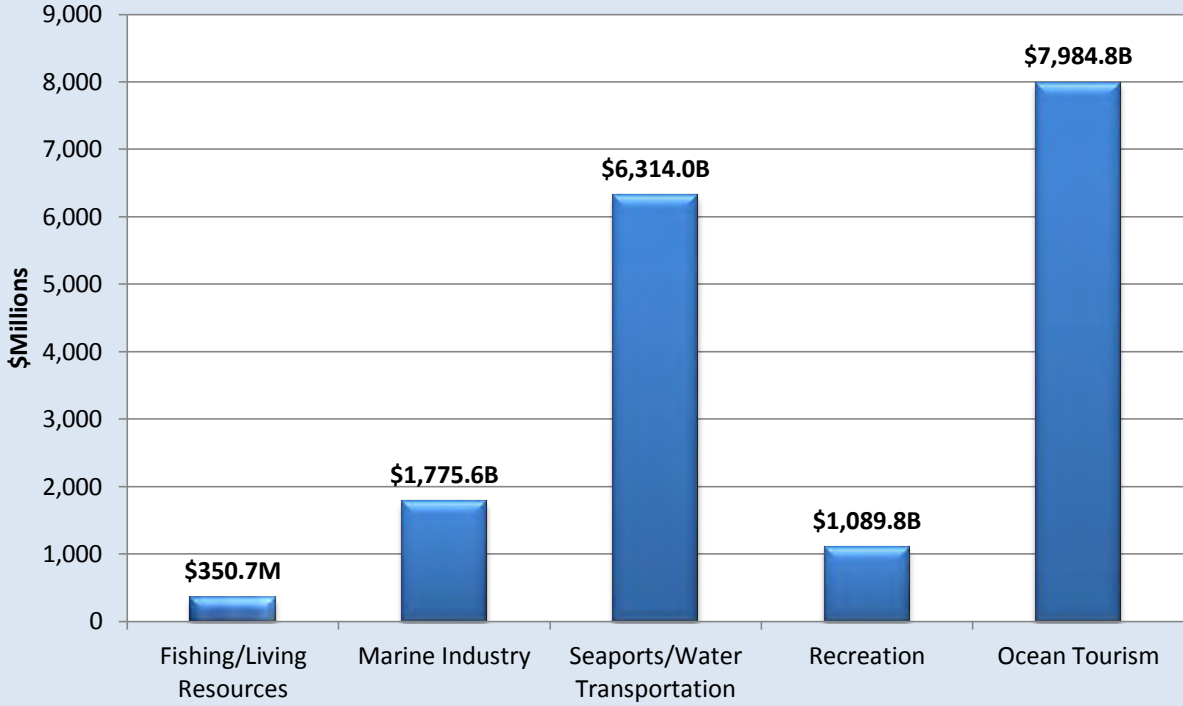
¹² Based on data from U.S. Bureau of Economic Analysis, 2010 Flash Estimates.

TABLE 1 Total Regional Values of Coastal Areas and Contribution to State Economy, 2010		
	Gross Regional Product	% FL Total
Florida Total	\$736,065,000,000	100%
Shoreline Areas	\$584,088,000,000	79%
Atlantic Shoreline	\$366,188,000,000	50%
Gulf Shoreline	\$217,900,000,000	29%
Non Shoreline	\$151,977,000,000	21%

In 2011, economic activity directly created by Florida's ocean resources amounted to \$17.5 billion (See Table 2). Of this, \$8 billion was created by out of state ocean-oriented tourism (45.6 percent), \$6.3 billion was created by ocean transportation and its supporting activities (36 percent), \$1.8 billion was created by the marine industry (10.1 percent), \$1.1 billion was created by ocean-oriented recreation (6.2 percent), and \$0.4 billion was created by the harvest, processing and distribution of the ocean's living resources (2.0 percent).

TABLE 2 Direct Contribution of Florida Ocean Resources to the Gross Regional Product of the Florida Coastal Counties, 2011 Millions of Dollar							
	Fishing/ Living Resources	Marine Industry	Seaports/Ocean Transportation	Recreation	Ocean- Oriented Tourism	Total	Percent
East Coast	142.1	1,061.3	4,163.7	673.1	5,374.0	11,414.3	65.2
West Coast	184.4	544.7	1,984.9	297.0	2,086.5	5,097.6	29.1
Panhandle	24.2	169.7	165.3	119.7	524.2	1,003.1	5.7
Total	350.7	1,775.6	6,314.0	1,089.8	7,984.8	17,514.9	100.0
Percent	2.0	10.1	36.0	6.2	45.6	100.0	

Figure 2
Contribution of Florida Ocean Resources to the
Gross Regional Product of the Florida Coastal Counties, 2011
(\$Millions)



B. Contribution by Industry

Aquaculture and fishing (in the coastal counties) contributed more than 58 percent of living resources to the gross regional product. About one-fourth was contributed by seafood processors. Seafood markets contributed 17.3 percent (See Table 3 and Figure 3).

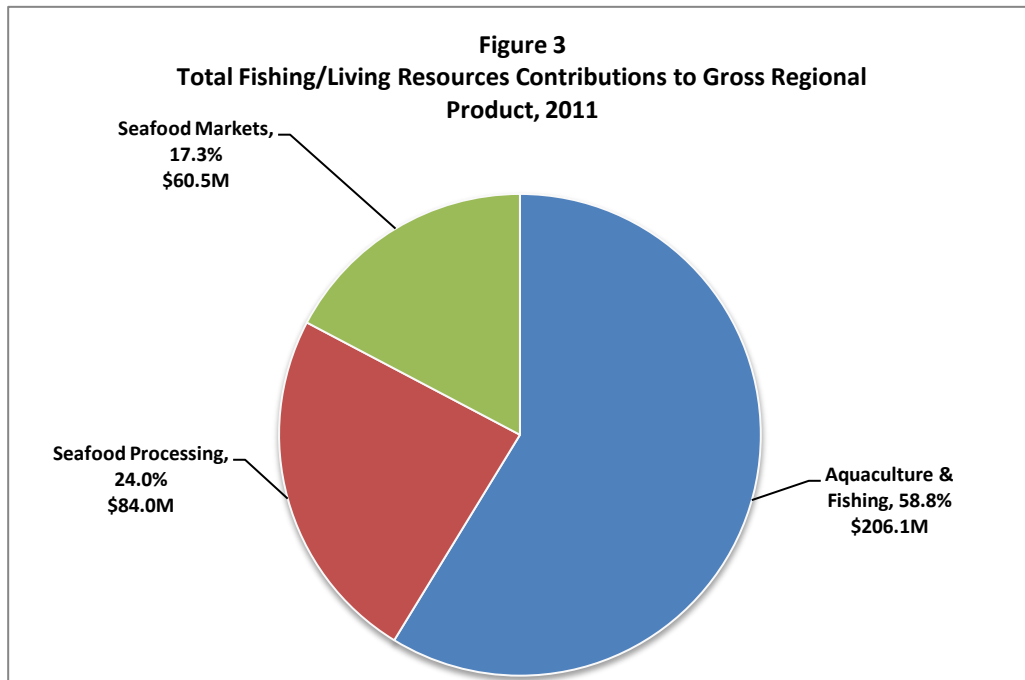


TABLE 3 Fishing/Living Resources Contribution to Gross Regional Product (Millions of Dollar)		
Industry	Amount	Percent
Aquaculture & Fishing	206.1	58.8
Seafood Processing	84.0	24.0
Seafood Markets	60.5	17.3
Total	350.6	100.0

Table 4 shows that ship and boat building and repair comprised the largest part of the marine industry (36.9 percent). Boat dealers contributed \$446.8 million to coastal regional product (25.2 percent), and marine infrastructure construction accounted for more than 20 percent. Marinas amounted to \$285.9 million (16.1 percent).

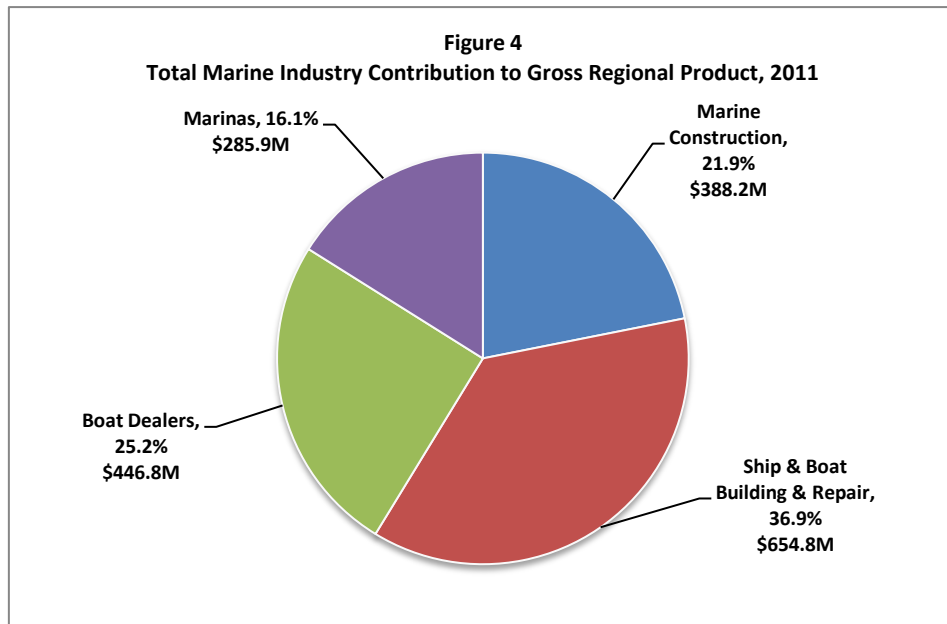


TABLE 4 Marine Industry Contribution to Gross Regional Product Millions of Dollars		
Industry	Amount	Percent
Marine Construction	388.2	21.9
Ship & Boat Building & Repair	654.8	36.9
Boat Dealers	446.8	25.2
Marinas	285.9	16.1
Total	1,775.6	100.0

Coastal water transportation contributed \$5.3 billion to gross regional product in 2011 (84.1 percent of the total contribution of ocean transportation) (See Table 5). Businesses supporting water transportation contributed an additional \$928.1 million; warehousing and storage contributed \$75.3 million.

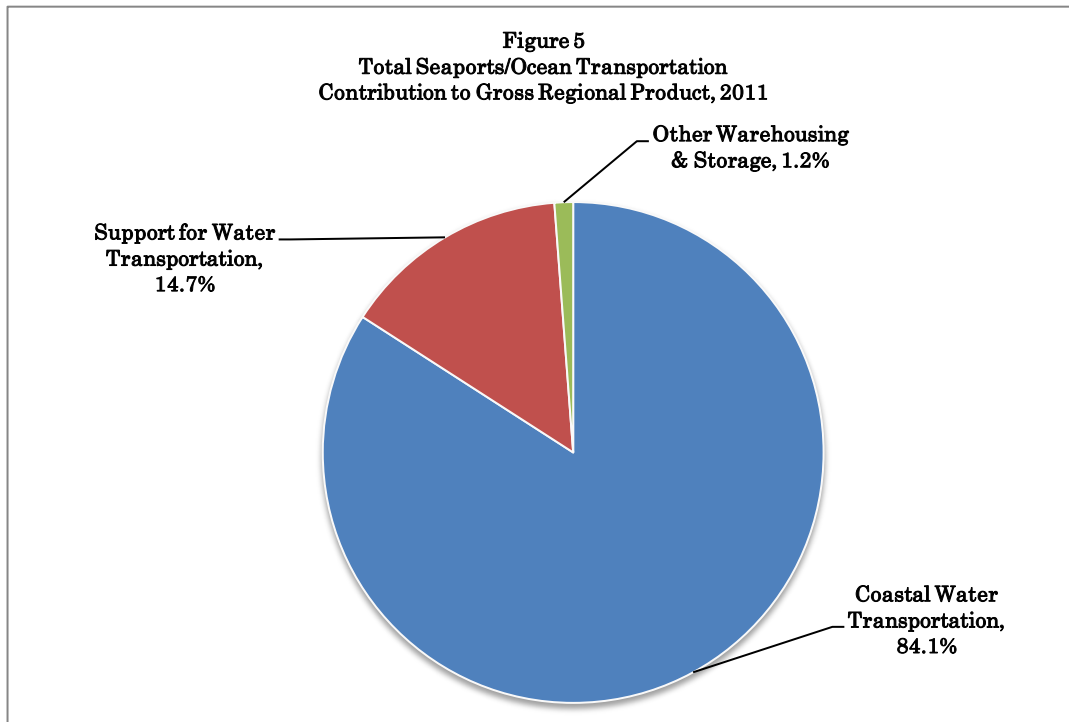


TABLE 5
Seaports/Water Transportation
Contribution to Gross Regional Product
Millions of Dollars

Industry	Amount	Percent
Coastal Water Transportation	5,310.5	84.1
Support for Water Transportation	928.1	14.7
Other Warehousing & Storage	75.3	1.2
Total	6,314.0	100.0

Ocean-oriented recreation contributed \$1,089.8 billion to gross regional product in 2011 (See Table 6). Rental of recreation goods accounted for the largest share (22 percent), with purchase of such goods accounting for an additional 5.8 percent. Amusement and recreation services accounted for 19.3 percent, and scenic and sightseeing transportation accounted for 15.5 percent. Parks, zoos and similar institutions accounted for most of the rest, with sports and recreation instruction and R.V. parks and campsites accounting for the remainder.

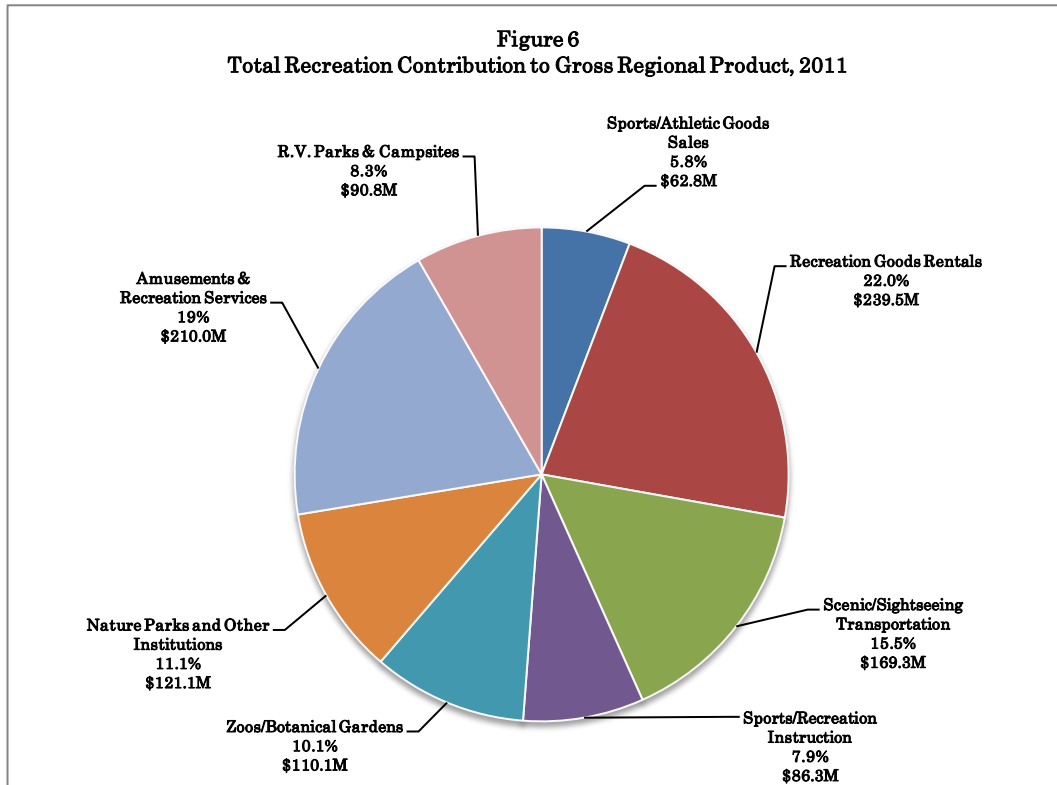


TABLE 6		
Recreation		
Contribution to Gross Regional Product		
(Millions of Dollar)		
Industry	Amount	Percent
Sports/Athletic Goods Sales	62.8	5.8
Recreation Goods Rentals	239.5	22.0
Scenic/Sightseeing Transportation	169.3	15.5
Sports/Recreation Instruction	86.3	7.9
Zoos/Botanical Gardens	110.1	10.1
Nature Parks and Other Institutions	121.1	11.1
Amusement & Recreation Services	210.0	19.3
R.V. Parks & Campsites	90.8	8.3
Total	1,089.8	100.0

Ocean-oriented tourism accounted for the largest contribution by Florida’s ocean resources to the state economy, amounting to \$8.0 billion in 2011. The accommodations industry accounted for the largest portion of this (\$5.3 billion or 65.9 percent of the total). Food services and drinking places accounted for \$2.7 billion.

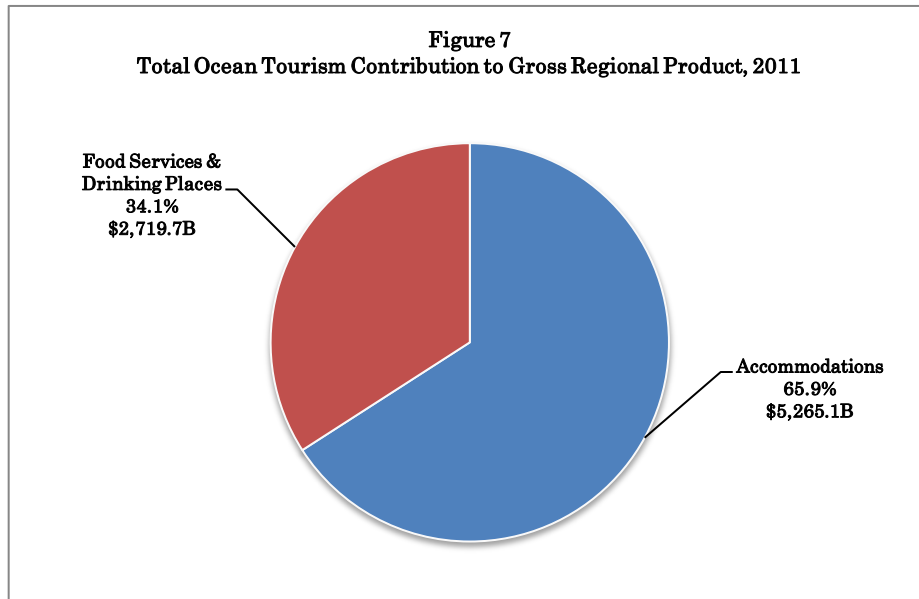


TABLE 7
Ocean Tourism
Contribution to Gross Regional Product
(Millions of Dollar)

Industry	Amount	Percent
Accommodations	\$5,265.1	65.9
Food Services & Drinking Places	\$2,719.7	34.1
Total	\$7,984.8	100.0

C. Contribution to Coastal Metropolitan Areas

More than 65 percent of the economic activity was created along the state's East Coast; almost 30 percent was created along the state's West Coast (south from Taylor county in the Big Bend area), and a little more than five percent was created in the Panhandle region (See Table 2 above). The contributions to the coastal metropolitan areas are presented in the tables below. Metropolitan Statistical Areas (MSAs) are groups of one or more counties which the Census Bureau determines form an independent metropolitan economy. Metropolitan areas comprise at least 50,000 people, and counties are grouped together if there is a high degree of commuting among them. Interdependence is based on the extent of commuting between the constituent counties. All of the counties in Florida's East Coast are parts of metropolitan areas, with the exception of Monroe County, which is included in the Miami-Fort Lauderdale MSA in the tables below.

The East Coast of Florida comprises seven MSAs (Jacksonville, Palm Coast, Deltona-Daytona, Palm Bay-Melbourne, Sebastian-Vero, Port St. Lucie-Stuart, Miami-Fort Lauderdale). Palm Coast, Deltona-Daytona, Palm Bay-Melbourne, and Sebastian-Vero contain single counties as members. Port St. Lucie-Stuart contains two counties; Jacksonville MSA contains three coastal counties (Nassau, Duval and St. Johns) and two non-coastal counties (Baker and Clay). Miami-Fort Lauderdale also contains Palm Beach County; Monroe County is included for the purpose of this study.

Estimates of Gross Regional Product (GRP) are produced by the US Bureau of Economic Analysis (BEA) for the metropolitan areas of Florida. The estimates are produced for industry aggregates, and they were scaled down to the micro industries of the ocean economy using detailed estimates of earnings and employee compensation, also produced by the US Bureau of Economic Analysis. Further detail on the methodology is provided at the end of this report.

Almost three-fourths of the contribution to Gross Regional Product made by ocean resources to metropolitan economies along Florida's East Coast are made in Southeast Florida (the Miami-Fort Lauderdale MSA, including Palm Beach and Monroe Counties). Another 14.2 percent is contributed in the Jacksonville MSA, which includes Nassau and St. John counties. The contributions made to the other metro areas are each less than 5 percent of the East Coast total. Ocean tourism is the largest industry benefitting from ocean resources, followed by water transportation in all metro areas except Palm Bay-Melbourne, where the two industries switch their ranking.

Figure 8
East Coast Total Contribution of Florida Ocean Resources to the Gross
Regional Product, 2011
(Millions of Dollar)

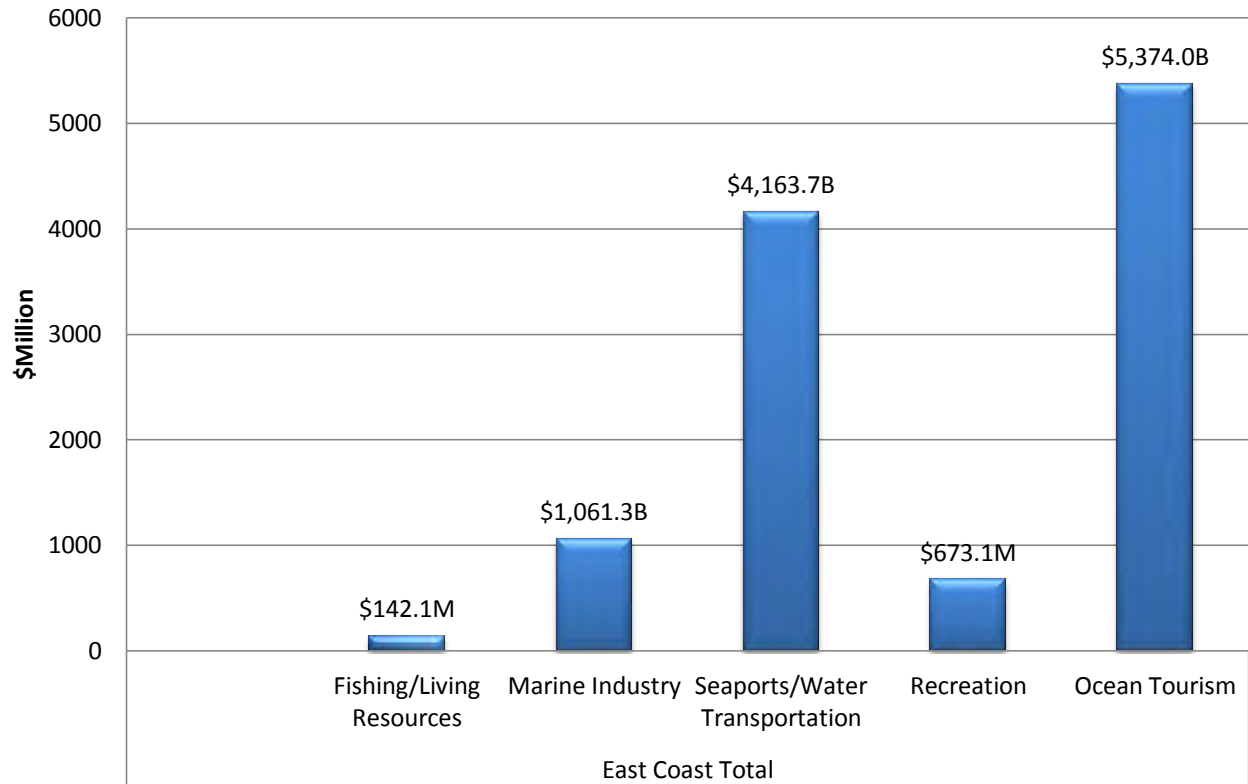


TABLE 8
2011 Contribution Of Florida Ocean Resources to the
Gross Regional Product of the Florida East Coast Metropolitan Statistical Areas (MSAs)
(Millions of Dollar)

MSAs arrayed From North to South	Fishing/ Living Resources	Marine Industry	Seaports/ Water Transportation	Recreation	Ocean Tourism	Total	Percent
Jacksonville*	25.2	217.6	646.9	63.8	666.7	1,620.2	14.2
Palm Coast-Flagler	0.0	5.3	3.2	6.8	43.7	59.0	0.5
Deltona-Daytona	1.0	70.4	7.6	27.4	173.1	279.5	2.4
Palm Bay-Melbourne	10.4	55.6	181.8	67.5	169.3	484.8	4.2
Sebastian-Vero	14.5	15.9	100.5	9.4	46.1	186.4	1.6
Port St. Lucie-Stuart	4.7	96.7	93.7	58.9	100.5	354.5	3.1
Miami -Ft. Lauderdale	86.2	599.7	3,130.0	439.3	4,174.6	8,429.9	73.9
East Coast Total	142.1	1,061.3	4,163.7	673.1	5,374.0	11,414.3	100.0
Percent	1.2	9.3	36.5	5.9	47.1	100.0	
*Includes Nassau and St. Johns counties							
** Includes Palm Beach and Monroe counties							

The West Coast of Florida comprises five MSAs (Tampa-St. Petersburg, North Port-Sarasota, Punta Gorda, Cape Coral and Naples) as well as the non-metro counties along its northern part (Taylor, Dixie, Levy and Citrus). Tampa-St. Petersburg MSA contains four counties (Hernando, Pasco, Pinellas, Hillsborough) and North Port-Sarasota contains Manatee and Sarasota counties. Punta Gorda, Cape Coral and Naples MSAs each contain a single county.

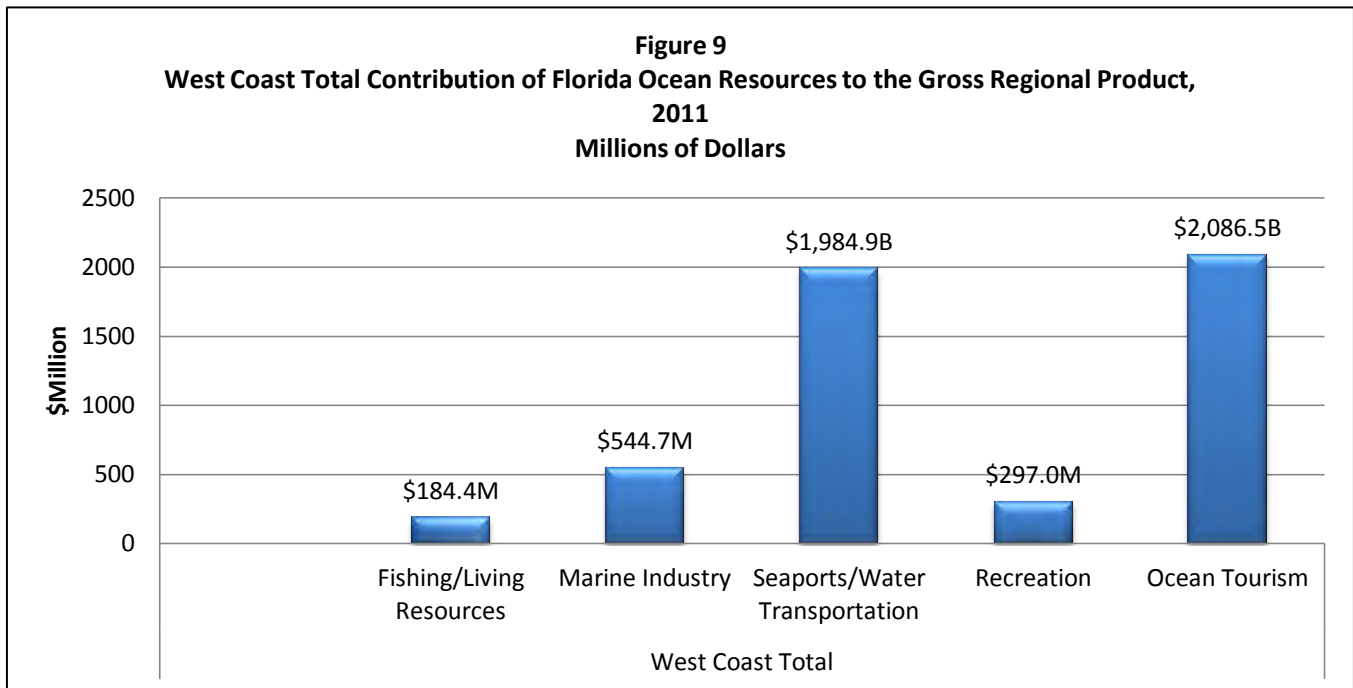


TABLE 9
2011 Contribution Of Florida Ocean Resources to the
Gross Regional Product of the Florida West Coast Metropolitan Statistical Areas
(Millions of Dollars)

MSAs arrayed From North to South	Fishing/ Living Resources	Marine Industry	Seaports/ Water Transportation	Recreation	Ocean Tourism	Total	Percent
Non-Metro North*	20.4	18.3	23.6	16.8	48.8	127.9	2.5
Tampa-St. Petersburg	120.9	336.2	859.0	121.0	1,170.0	2,607.0	51.1
North Port-Sarasota	12.1	69.4	404.1	46.4	268.7	800.7	15.7
Punta Gorda	1.0	19.2	343.9	11.8	35.6	411.5	8.1
Cape Coral- Ft. Myers	21.0	65.8	178.1	52.8	309.4	627.1	12.3
Naples	9.0	35.7	176.2	48.3	254.1	523.3	10.3
West Coast	184.4	544.7	1,984.9	297.0	2,086.5	5,097.6	100.0
Percent	3.6	10.7	38.9	5.8	40.9	100.0	

* including Taylor, Dixie, Levy and Citrus counties.

More than 50 percent of the contribution to Gross Regional Product made by ocean resources to metropolitan economies along Florida’s West Coast is made in the Tampa-St. Petersburg MSA. Sizeable contributions (in excess of 10 percent) are also made in the North Port-Sarasota area (which includes Manatee County) and in the Cape Coral-Ft. Myers area. The remaining areas, including Punta Gorda MSA, Naples MSA, and the northern non-metropolitan area make contributions of less than 10 percent. Ocean tourism is the largest industry benefitting from ocean resources, followed by water transportation in Tampa-St. Petersburg, Cape Coral-Ft. Myers, Naples and the Non-Metro North. In North Port-Sarasota and Punta Gorda, the two industries switch their ranking.

The Panhandle Coast in the state’s northwest comprises four MSAs (Pensacola-Santa Rosa, Ft. Walton Beach, Panama City and Tallahassee), as well as the non-metro counties in the east (Gulf and Franklin counties). The Pensacola MSA comprises two counties and the Tallahassee MSA comprises four counties (the coastal counties of Wakulla and Jefferson, and the larger non-coastal counties of Leon and Gadsden). Both Panama City Beach and Panama City MSAs consist of single counties, although Walton is included in the latter for the purposes of this study.

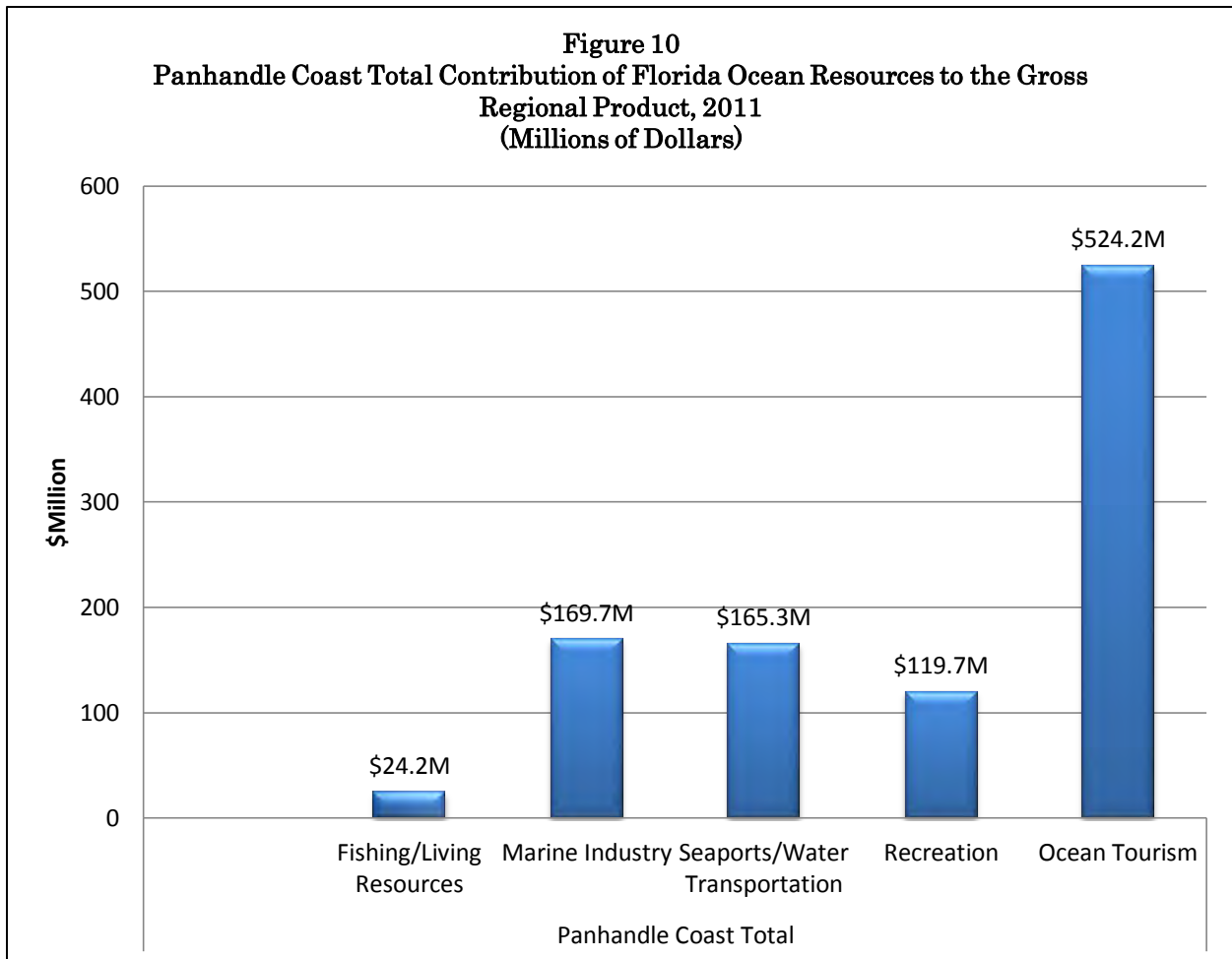


TABLE 10
2011 Contribution Of Florida Ocean Resources to the
Gross Regional Product of the Florida Panhandle Metropolitan Statistical Areas
(Millions of Dollars)

MSAs arrayed From North to South	Fishing/Living Resources	Marine Industry	Seaports/Water Transportation	Recreation	Ocean Tourism	Total	Percent
Pensacola- Santa Rosa	7.6	33.3	23.8	43.8	150.4	258.9	25.8
Ft. Walton*	6.3	38.7	33.2	34.1	211.4	323.6	32.3
Panama City	2.0	90.6	95.2	33.7	143.0	364.4	36.3
Tallahassee	1.3	2.8	0.0	3.2	9.9	17.1	1.7
Non-Metro East**	7.1	4.3	13.2	5.0	9.4	39.0	3.9
Panhandle Coast	24.2	169.7	165.3	119.7	524.2	1,003.1	100.0
Percent	2.4	16.9	16.5	11.9	52.3	100.0	
* including Walton County							
** including Gulf and Franklin counties							

Fort Walton Beach and Panama City MSAs each account for approximately one-third of the contributions made by ocean resources to gross regional product along the Panhandle Coast; Pensacola-Santa Rosa accounts for one-fourth. The contributions by the Tallahassee MSA and the Non-Metro East are each less than 4 percent. Ocean tourism is the largest industry benefitting from ocean resources in the four metro areas; water transportation is the most important in the Non-Metro Eastern area. The Marine Industry is a slightly more important beneficiary of ocean resources along the Panhandle Coast than is Water Transportation.

D. Employment in the Ocean Economy

In 2011, Floridians held 228,555 jobs that were directly created by the state's ocean resources. These jobs represent employees covered by the state's unemployment compensation law and exclude independent contractors or self-employed persons. Because individuals may hold more than one job, the 228,555 figure is probably a little larger than the number of job holders.

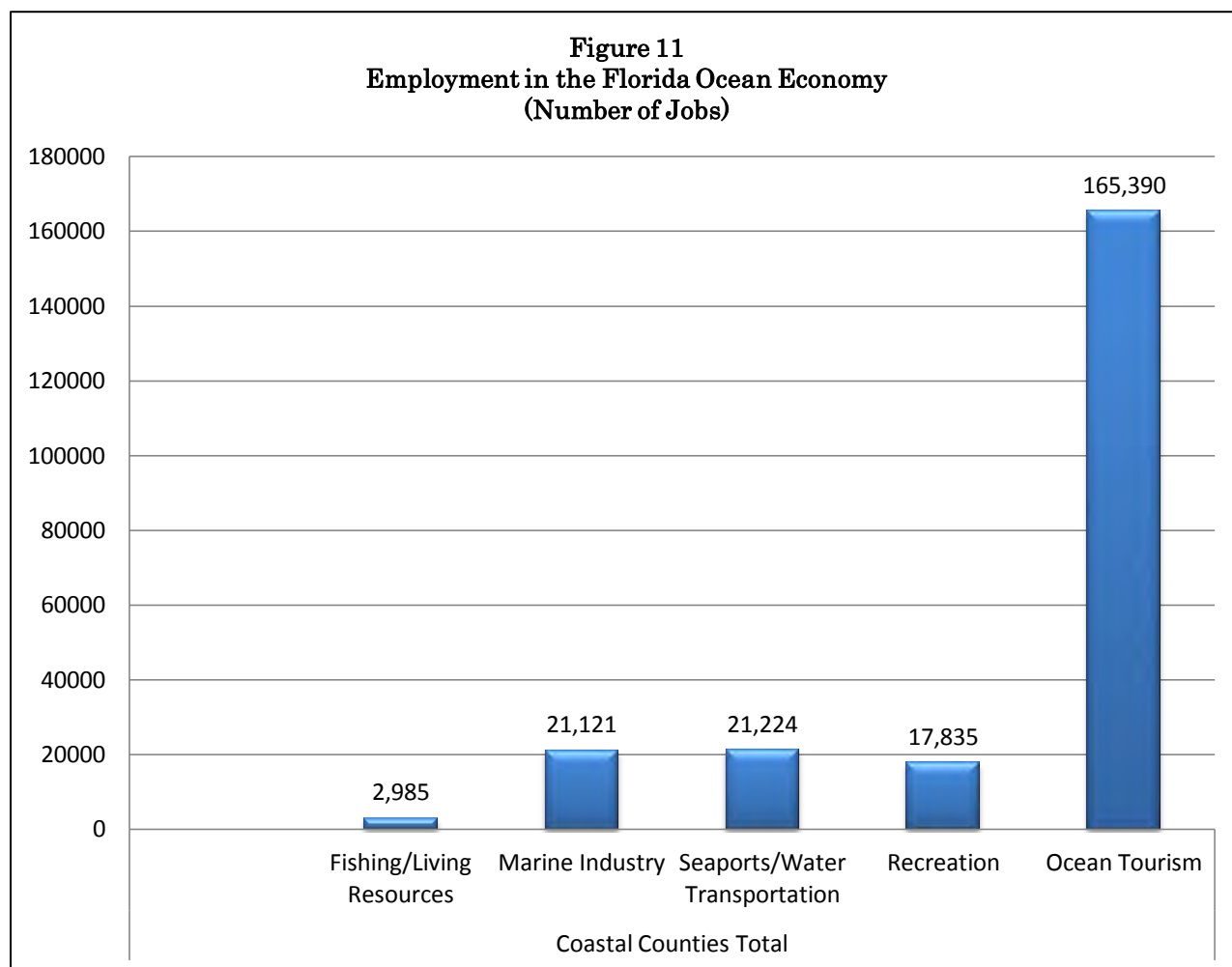


TABLE 11
Employment in the Florida Ocean Economy

Coastal Region	Fishing/Living Resources	Marine Industry	Seaports/Water Transportation	Recreation Industry	Ocean Tourism	Total	Percent
	East Coast	928	11,975	18,646	10,166		
West Coast	1,573	6,970	2,165	5,609	48,162	64,478	28.2
Panhandle	483	2,176	413	2,061	12,850	17,983	7.9
Coastal Counties	2,985	21,121	21,224	17,835	165,390	228,555	100.0
Percent	1.3	9.2	9.3	7.8	72.4	100.0	

More than 70 percent of the jobs in the ocean economy (165,390) are in tourism, defined as accommodations and food services and drinking places. Most tourism jobs in the state’s coastal counties are not part of the coastal economy. This analysis assumes that 25 percent of the jobs in food services and drinking places are ocean-related while 75 percent of the jobs in accommodations (the smallest part of the tourism industry) are treated as ocean-related. Coastal transportation and supporting activities account for 9.3 percent of the jobs in the ocean economy (21,224), and the marine industry accounts for 9.2 percent (21,121).

More than 60 percent of the jobs in the ocean economy (146,000) are in the coastal counties along the state’s East Coast; almost 30 percent (64,000) are on the West Coast, and less than 10 percent (18,000) are along the Panhandle Coast. In all three regions, more than 70 percent of the jobs are in the tourism industry. Coastal transportation is the second largest source of ocean economy jobs along the state’s East Coast which contains the three largest cruise ports in the world. The marine industry is the second largest source of employment in the state’s West and Panhandle coasts.

E. Total Contribution, Including Indirect and Induced Effects

The direct contribution of the ocean economy is supplemented by the contribution of ocean industries to the production of the industries that supply them with materials and other inputs and by the additional suppliers back along the supply chain. These are known as the indirect effects of the ocean industries. There is an additional effect as the employees in the ocean industries and the industries in the various supply chains expend their earnings, and consumer goods industries expand their production. These are referred to as the induced effects of the ocean economy. Table 12 shows the total contribution of the ocean industries to Florida GDP, including the direct, indirect and induced effects. The total and indirect and induced effects were estimated using “multipliers” obtained from The RIMS II Model of Florida produced by the US Bureau of Economic Analysis. The RIMS II Model was based on the national input-output model, based on 2002 benchmark data scaled down to Florida conditions using 2008 Florida data.

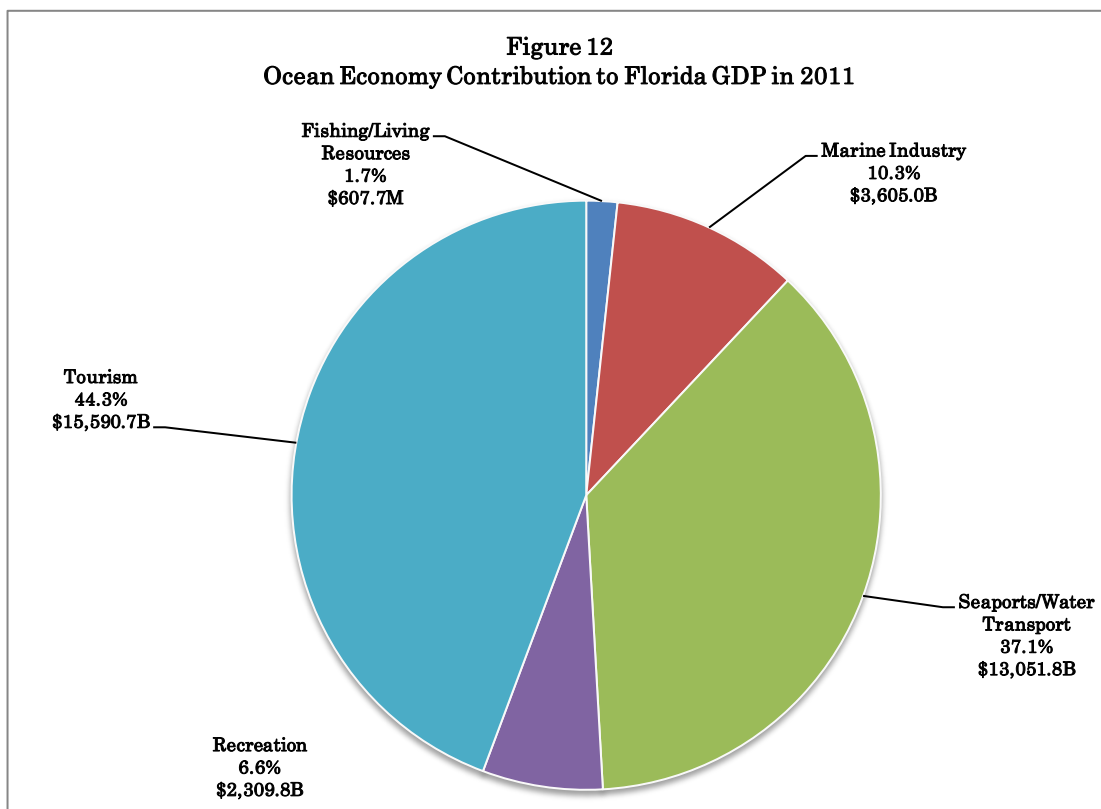


TABLE 12 Ocean Economy Total Contribution to Florida GDP in 2011 (Millions of Dollars)					
	Direct Contribution	Indirect & Induced	Total	Percent	Multipliers (Total/Direct)
Fishing/Living Resources	\$350.7	\$257.0	\$607.7	1.7	1.73
Marine Industry	1,775.6	1,829.4	3,605.0	10.3	2.03
Seaports/Water Transportation	6,314.0	6,737.8	13,051.8	37.1	2.07
Recreation	1,089.8	1,220.0	2,309.8	6.6	2.12
Ocean Tourism	7,984.8	7,605.9	15,590.7	44.3	1.95
Total	\$17,514.9	\$17,650.1	\$35,165.0	100.0	2.01
Percent	49.8	50.2	100.0		

The ocean economy made a total contribution of more than \$35 billion in 2011. This amounted to 4.7 percent of the state’s GDP. The total contribution was almost evenly divided between the direct contribution of \$17.5 billion and the indirect plus induced contribution of \$17.7 billion. The tourism industry was the largest contributor, followed by transportation. The multipliers for the various industries were similar in size (close to 2.00), except for living resources, which had a multiplier of 1.73. Recreation and transportation had the largest multipliers (2.12 and 2.07), and the marine industry and tourism had the smallest multipliers (2.03 and 1.95), other than living resources.

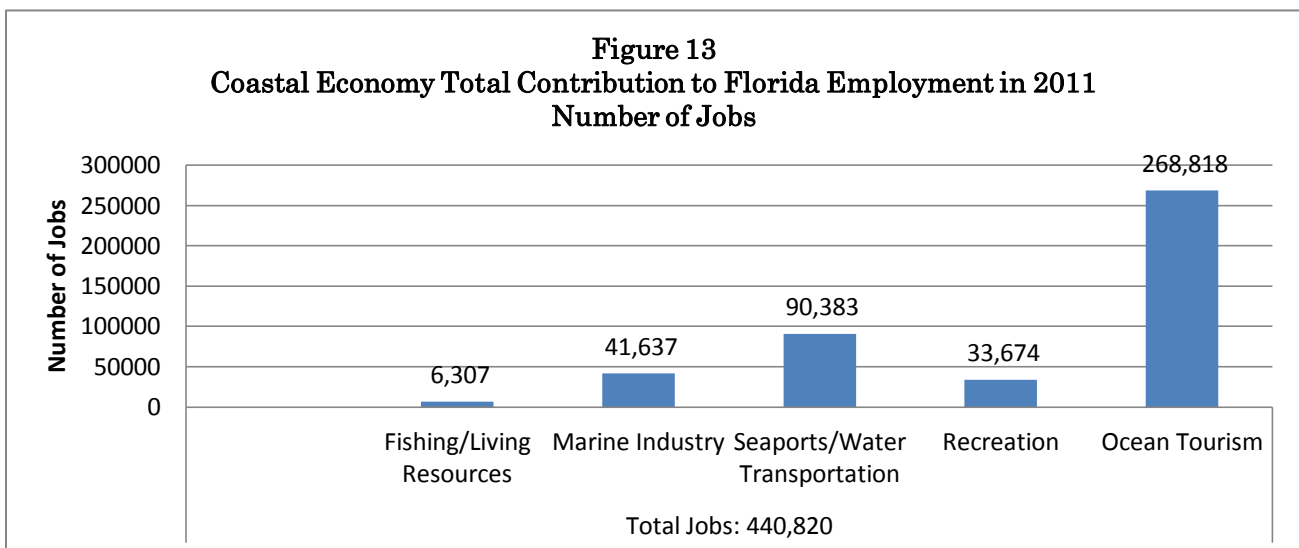


TABLE 13 Ocean Economy Total Contribution to Florida Employment in 2011 (Number of Jobs)				
	Direct	Indirect & Induced	Total	Percent
Fishing/Living Resources	2,985	3,323	6,307	1.4
Marine Industry	21,121	20,516	41,637	9.4
Seaports/Water Transportation	21,224	69,158	90,383	20.5
Recreation	17,835	15,839	33,674	7.6
Ocean Tourism	165,390	103,428	268,818	61.0
Total	228,555	212,264	440,819	100.0
Percent	51.8	48.2	100.0	

The coastal economy supported more than 440,000 jobs in the state in 2011.¹³ More than 60 percent were in the tourism industry and 20.5 percent were in ocean transportation. Development agencies of the State of Florida (Enterprise Florida Inc. and Workforce Florida Inc.) recognized the economic growth and job creation potential of Florida’s emerging “clean tech” industry cluster. Florida’s ocean and coastal industries have significant connections and alignment to the clean tech industry cluster. This creates an opportunity to highlight the State’s diverse coastal and marine industries.

The cluster analysis and mapping of industry sectors associated with the state’s oceans and coasts is an essential prerequisite to preparing Florida for future policy discussions. We begin with an overview of the key ocean legacy industries—ocean tourism (hospitality), seaports (water transportation and warehousing), marine industry (recreational boating), recreation, and fishing (living resources).

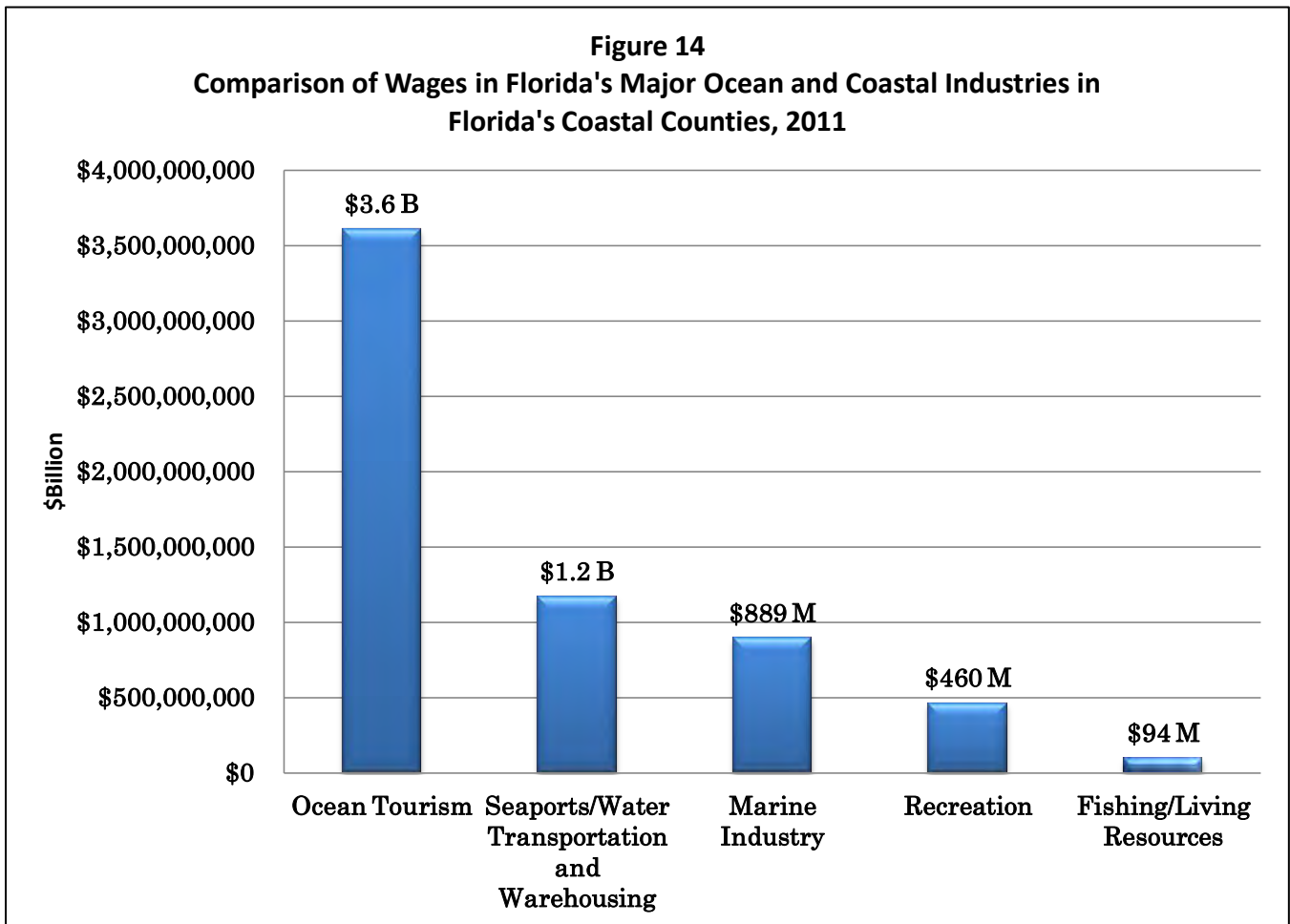
¹³ The estimates of total jobs were derived using the direct effects multipliers of the RIMS II Model. The direct effects multipliers were applied to the BLS QCEW employment data which excludes independent contractors and the self-employed.

I. Ocean and Coastal Industries— A Cluster Analysis

A. Florida’s Key Ocean Legacy Industries

1. *Economic Clout*

In 2011, Florida’s key ocean legacy industries—ocean tourism, seaports (water transportation and warehousing), marine industry (recreational boating), recreation, and fishing (living resources)—contributed over \$6.2 billion in direct wages to the state’s coastal and ocean economy. The overall impact is even greater when adding indirect and induced impacts to the direct payments. We found that 37,565 companies in these industries along Florida’s coasts employed 228,555 employees in 2011.¹⁴

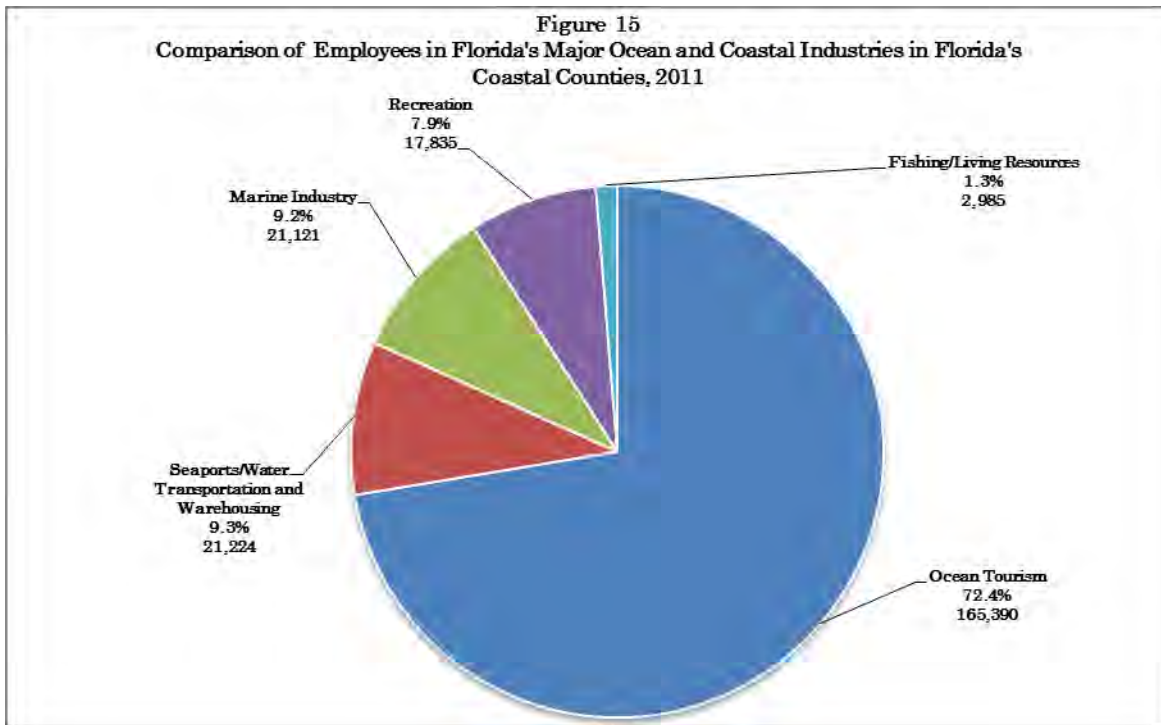


¹⁴Bureau of Labor Statistics, Quarterly Census of Employment and Wages, ES-202 data, 2011.

Table 14
Comparison of Florida's Major Ocean and Coastal Industries in Florida's Coastal Counties, 2011

Estimated Subtotals	Establishments	Percentage	Employees	Percentage	Wages	Percentage
Industries						
Tourism/Ocean	31,176	83.0%	165,390	72.4%	\$3,605,303,364	58.0%
Seaports/Water Transportation and Warehousing	715	1.9%	21,224	9.3%	\$1,165,809,688	18.8%
Marine Industry	2,295	6.1%	21,121	9.2%	\$888,627,047	14.3%
Recreation	2,960	7.9%	17,835	7.8%	\$459,964,134	7.4%
Fishing/Living Resources	419	1.1%	2,985	1.3%	\$93,681,141	1.5%
Total	37,565	100%	228,555	100%	\$6,213,385,379	100%

Among these industries, ocean tourism contributed the most wages, or \$3.6 billion, in 2011, and employed 165,390 employees. Seaports (water transportation), at \$1.2 billion in wages, and marine industries, at \$888 million, employed fewer employees at 21,000 each, but paid higher wages to those they employ. Recreation paid 17,835 employees a total of \$460 million, and the fishing industry paid 2,985 employees \$94 million.¹⁵



¹⁵ Ibid.

2. Location of Industry Clusters

The population of Florida's coastal region is higher in major metropolitan areas of the state. Not surprisingly, the distribution of employees in coastal and ocean industries is generally concentrated in these populous areas in six major counties along Florida's coasts—Miami-Dade, Broward, Palm Beach counties in the southeast, Pinellas and Hillsborough in the southwest, and Duval county in the northeast. Exceptions are the fishing/living resources industry, where Monroe and Escambia counties are in the top tier, and recreation, where Brevard is in the top tier.

Map 1

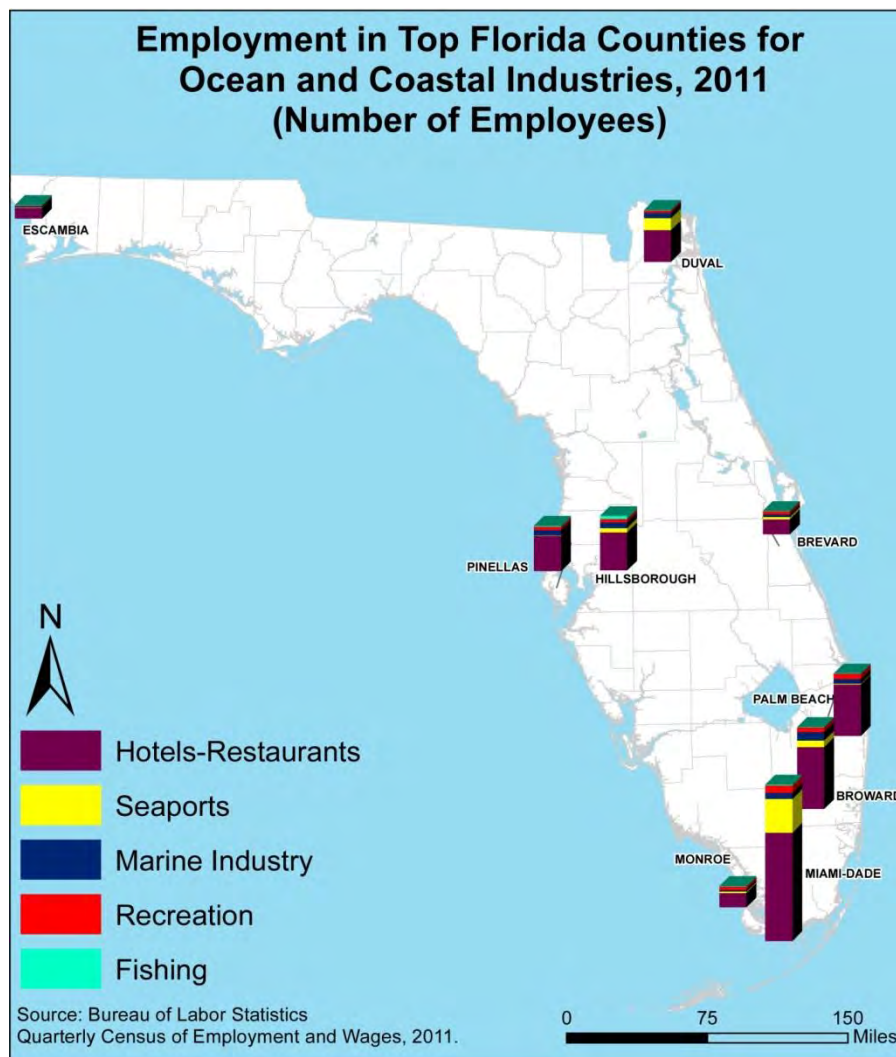


Table 15
Employment in Top Florida Counties for Ocean and Coastal Industries, 2011
(Number of Employees)

	Ocean Tourism		Seaports/Water Transportation		Marine Industry		Recreation		Fishing/Living Resources	
Counties	Rank #		Rank #		Rank #		Rank #		Rank #	
Miami-Dade	1	34,431	1	10,675	2	2,009	1	2,303	3	283
Broward	2	19,731	3	2,021	1	2,728	3	1,471	*	*
Palm Beach	3	16,355	*	*	6	1,483	2	1,621	*	*
Hillsborough	4	12,156	4	1,367	3	1,815	5	1,076	1	924
Pinellas	5	11,272	*	*	5	1,725	4	1,078	2	354
Duval	6	10,044	2	3,768	4	1,739	*	*	*	*
Monroe	*	*	*	*	*	*	*	*	4	173
Escambia	*	*	*	*	*	*	*	*	5	164
Brevard	*	*	*	*	*	*	6	1,031	*	*

**Not ranked in top tier*

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2011

The distribution of jobs among Florida’s coastal counties for each ocean legacy industry is shown in Maps 2-6. Additional cluster maps for each industry sector’s wages are shown in the Appendices. The same areas of the state generally show the highest concentration of jobs and wages for the ocean industries, albeit with some individual variation.

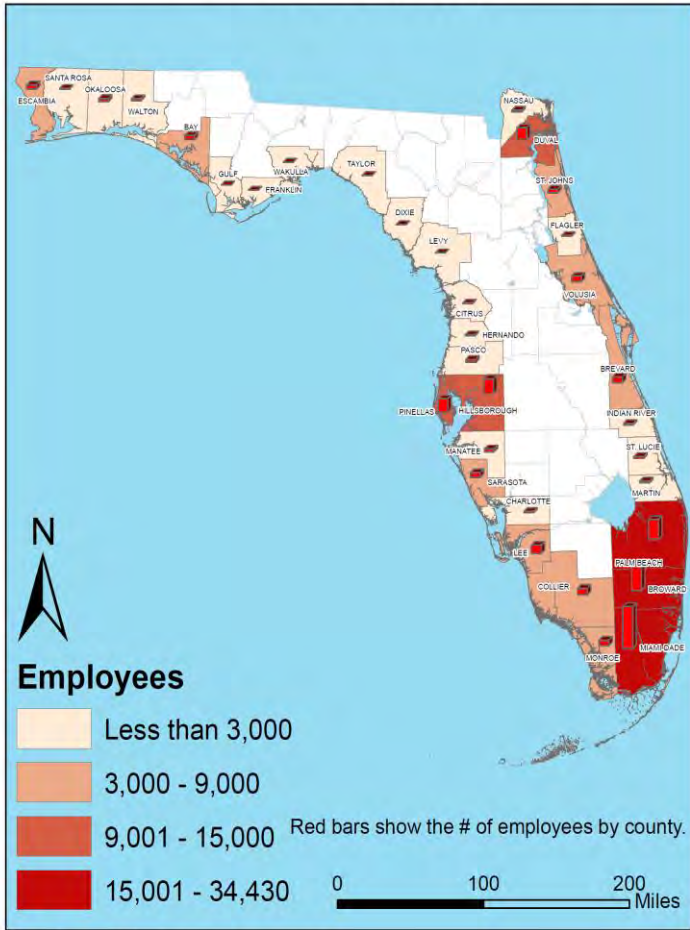
As shown in Table 15, Miami-Dade County ranks number one for employment in three sectors—ocean tourism, seaports/water transportation, and recreation. Broward County ranks number one for marine industry employment, and Hillsborough County is number one for fishing/living resources. Strong ocean industry employment for select sectors is also found in six other counties—Palm Beach, Pinellas, Duval, Monroe, Escambia and Brevard counties.

These top six counties are also ranked among the top 50 counties in the nation for their GDP ocean economy contribution in 2009 and their level of ocean-related employment in a recent study by the National Working Waterfront Network.¹⁶ Miami-Dade, Pinellas, Broward, Palm Beach, Hillsborough, and Duval counties all rank in the top half of 50 counties nationwide rated highest for their ocean-related economic contributions. Florida ranks number 2 nationally among 30 coastal states for total economic contributions of its ocean-related industries.

¹⁶Accessed at www.wateraccessus.com/econ/ Tables 7 and 8. Lee County is also ranked #50 in the list. Differences among the actual numbers from this report may be due to methodology differences in the studies, such as differing years of data and multipliers used. The study was released May 2, 2013, but used 2009 data.

Map 2

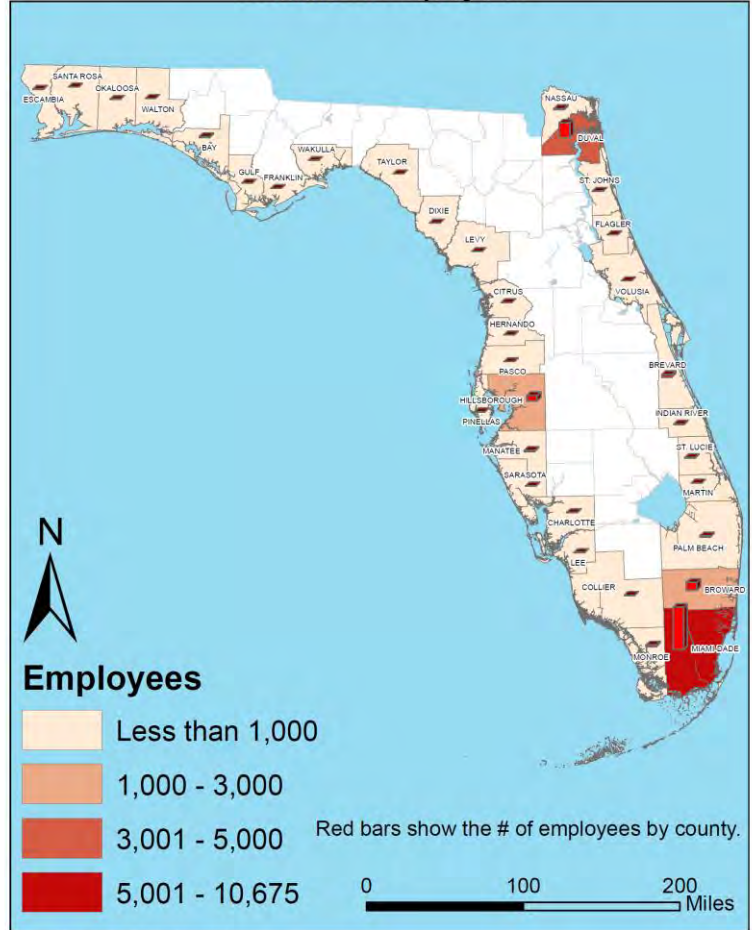
**Florida's Coastal and Ocean Tourism Industry, 2011
Number of Employees**



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2011.

Map 3

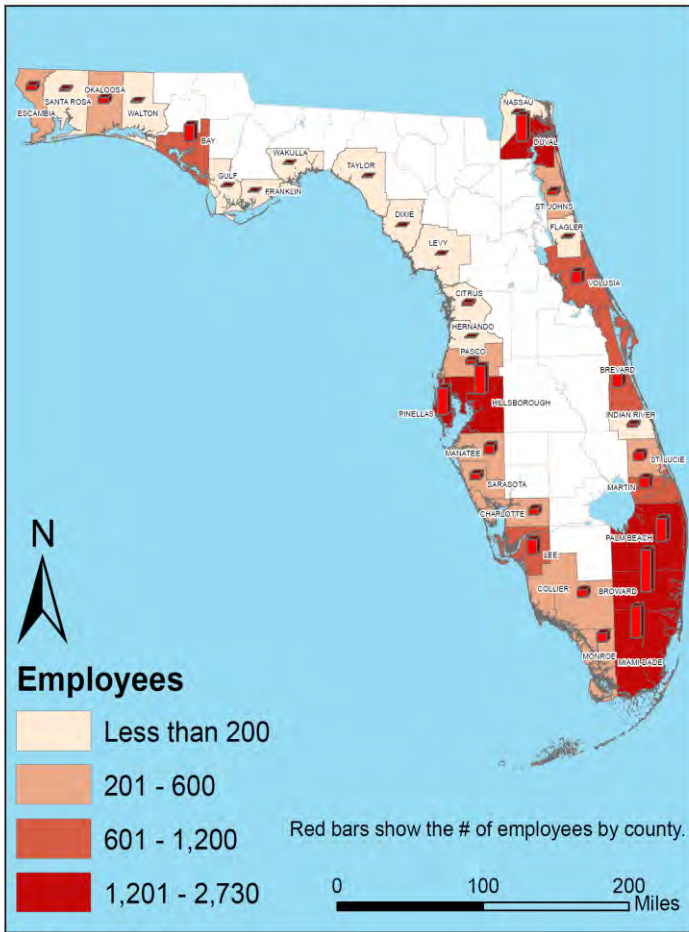
**Florida's Coastal and Ocean Transportation & Warehousing Industry, 2011
Number of Employees**



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2011.

Map 4

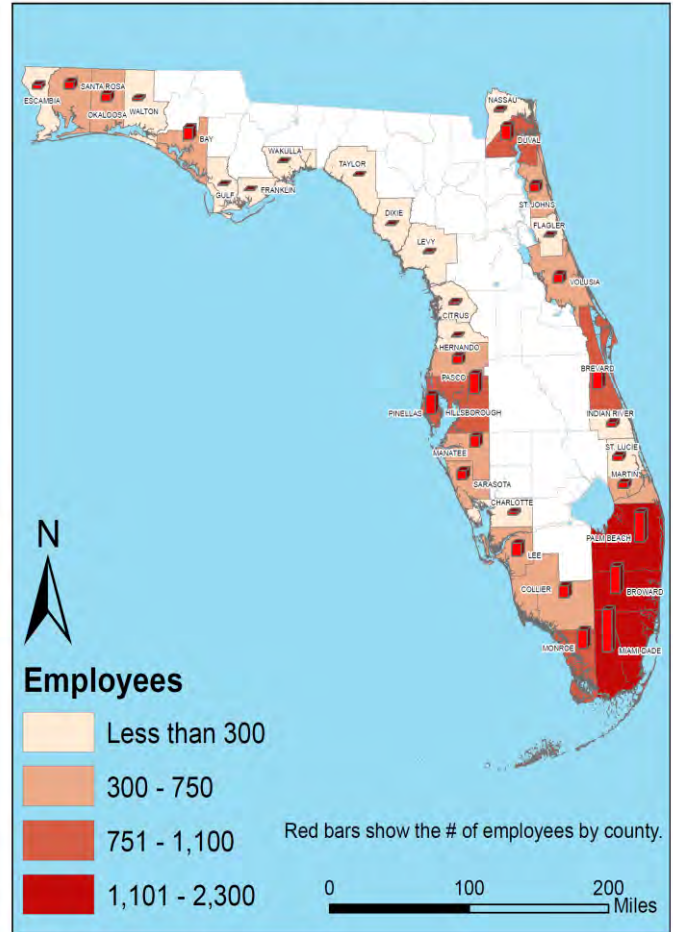
**Florida's Marine Industry, 2011
Number of Employees**



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2011.

Map 5

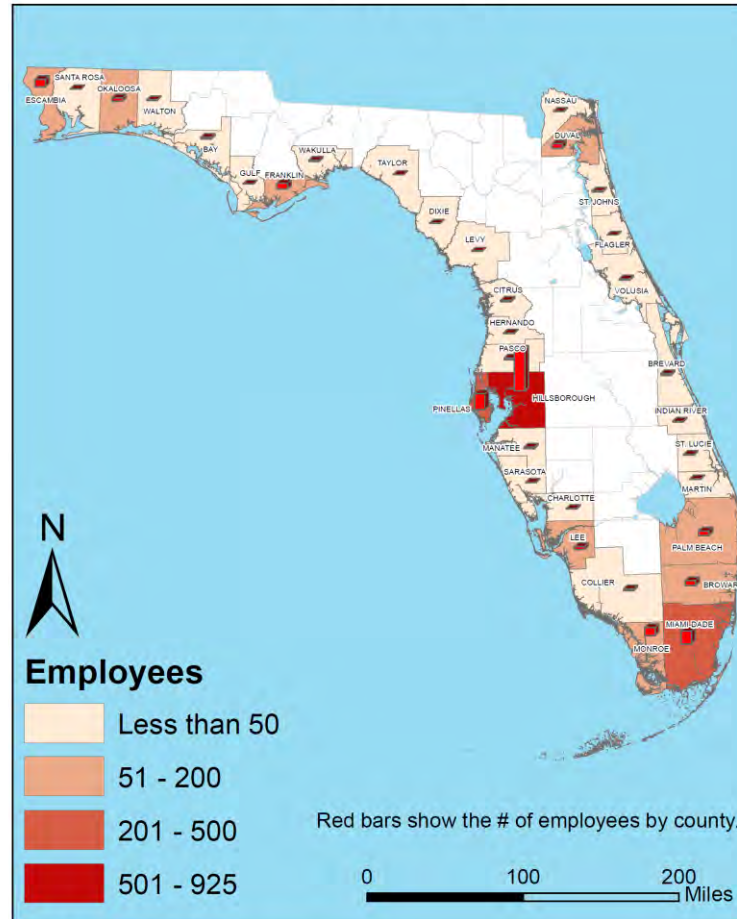
**Florida's Coastal & Ocean Recreation Industry, 2011
Number of Employees**



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2011.

Map 6

Florida's Coastal and Ocean Living Resources Industry, 2011 Number of Employees



Source: Bureau of Labor Statistics,
Quarterly Census of Employment and Wages, 2011.

It is logical to assume that since there is industry concentration in the populous areas of the state, there is room for growth for some industry sectors as Florida's population shifts into the less populated areas. This growth will obviously be limited by locations of businesses, such as in ports for marine transportation. Noteworthy are developing industries, such as renewable energy, that are not included in this analysis and that are beginning to expand in Florida.

B. Overview and Discussion of Key Ocean Legacy Industries

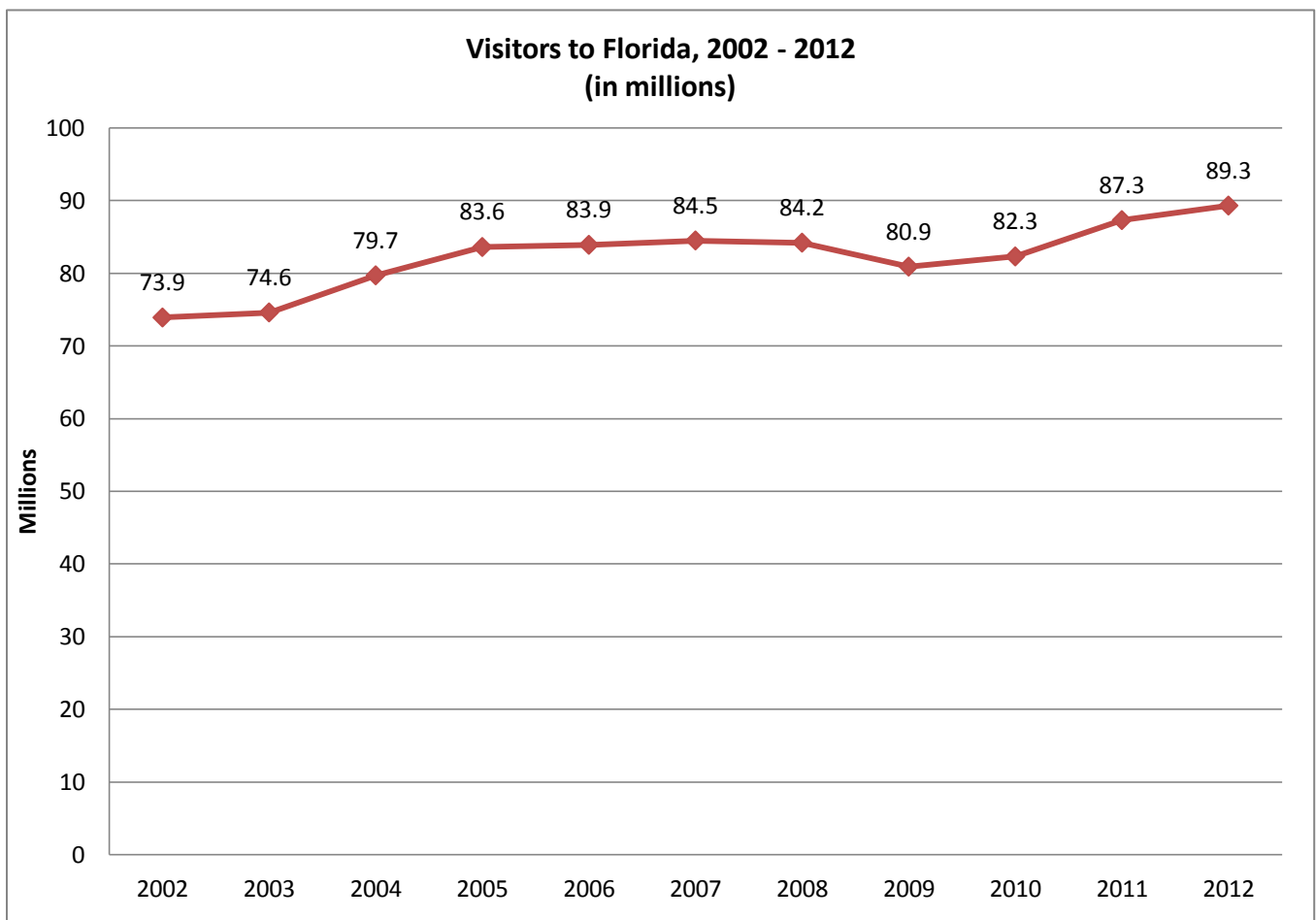
1. Tourism

Tourism is making waves for Florida's economy. The state's tourism market is no longer in decline but in recovery mode after the economic downturn of 2008. The latest numbers from Visit Florida indicate that 89.3 million tourists visited Florida in 2012. This makes 2012 a banner year, with over two million more visitors than 2011.

Tourists visit coastal areas, including over 63% who visit Orlando and its attractions. That is good news for the state’s economy, which relies on the sales tax revenues from tourism and the jobs it creates in the hospitality industry.

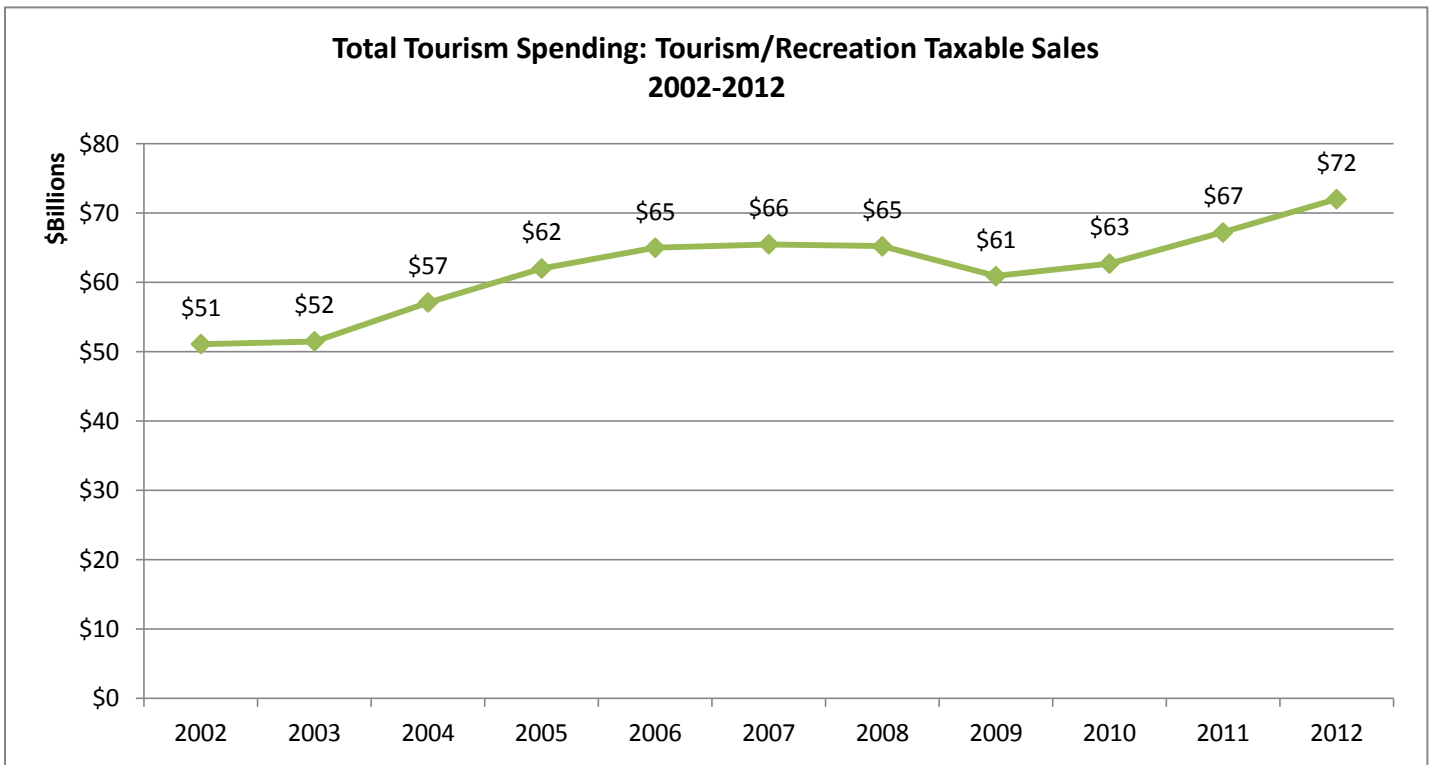
In 2011, Visit Florida reports that tourists spent \$67.2 billion in Florida, contributed \$4 billion to the sales tax coffers of the state, and employed over a million in the tourism industry. This represents nearly a quarter of the state sales tax revenue. Because this part of sales tax is paid by visitors, it does not burden Floridians with additional taxes. Visit Florida also claims that every \$1 spent on tourism results in \$258 in tourism spending and \$15 in new sales tax collections. Preliminary estimates for 2012 are \$71.8 billion in visitor spending.¹⁷ The figures below track the economic impact of visitor increases to Florida since 2002, reflecting an upward trend since 2009 in tourism visitation and spending, accompanied by increased employment in the tourism industry.

Figure 16



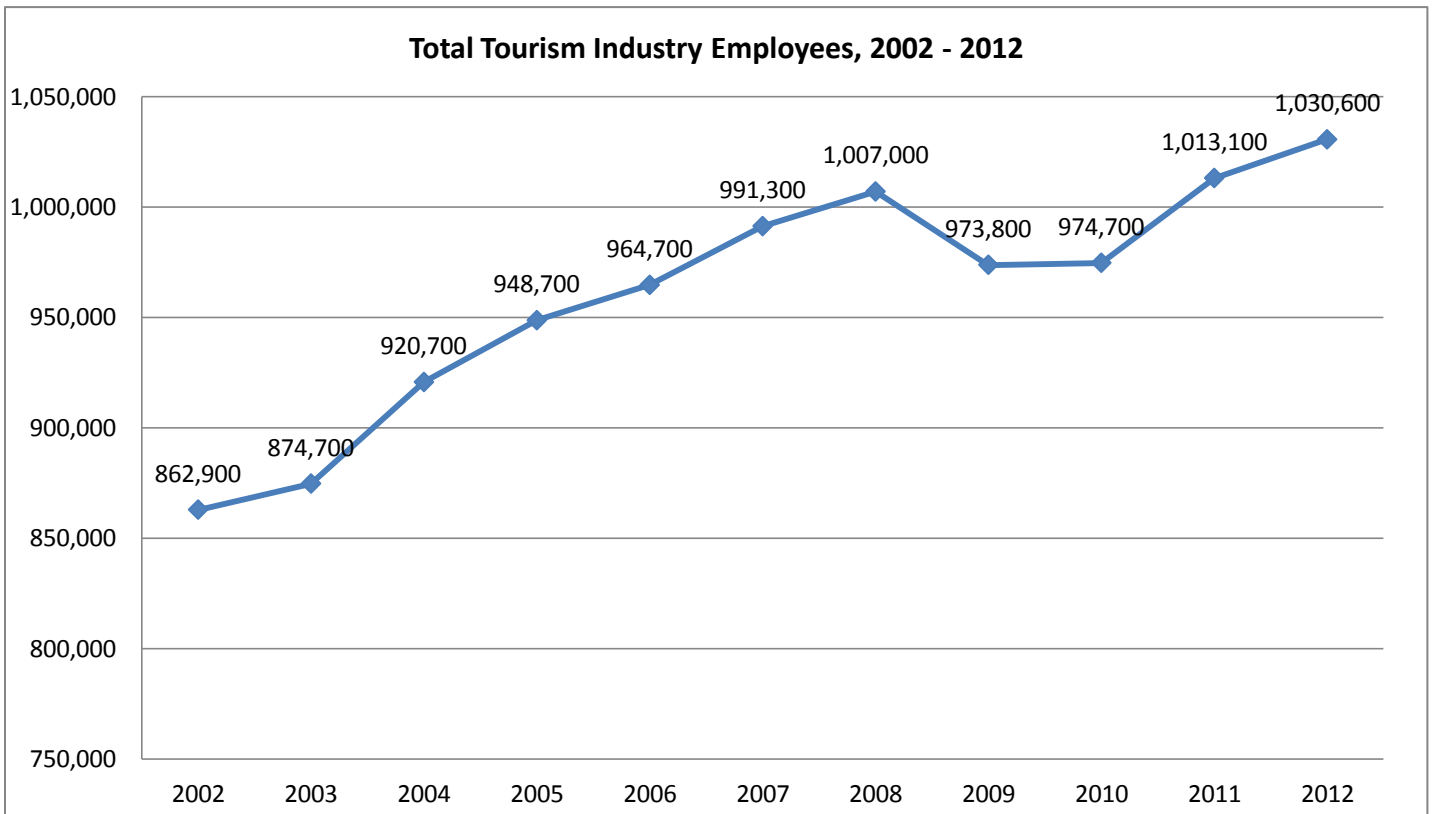
¹⁷ Visit Florida Research, 2012, accessed at www.visitflorida.org.

Figure 17



Source: Visit Florida Research, 2012, accessed at www.visitflorida.org

Figure 18



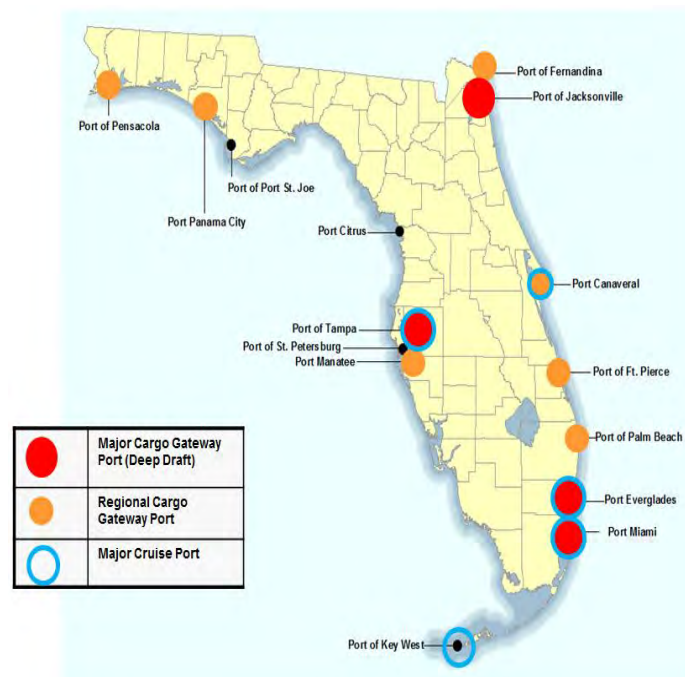
Source: Visit Florida Research, 2012, accessed at www.visitflorida.org

2. Seaports (Marine Transportation)

a. Cargo

Florida's fifteen deepwater ports are a critical part of the state's economy. The state's ranking as sixth among the nation's exporting states in 2012 reinforces this fact. Florida ports moved 100.6 million tons of cargo, with waterborne international trade valued at \$85.6 billion in 2012, slightly over half of Florida's \$162.2 billion total international trade. The exports and imports were split in waterborne international trade at \$71 billion in imports and \$90 billion in exports, resulting in a \$19 billion trade surplus. Cargo activities generated over 550 thousand direct and indirect jobs for Florida and \$90.3 billion in total economic value, including \$2.2 billion in state and local tax revenues. Key cargo ports are PortMiami, Port Everglades, JAXPORT and the Port of Palm Beach, ranking among the nation's top 20 container ports. Along with Port of Tampa, these seaports handled 87.8 million tons of cargo in FY 2012, including international and domestic cargo, which represents 87% of the state's cargo handled at all Florida ports. The national average wage for seaport-related employment is higher than the average wage, at \$54,400 annually.¹⁸

Map 7 Florida Seaports



Source: www.dot.state.fl.us/seaport/seamap.shtm

¹⁸ Florida Seaport Transportation and Economic Development Council, May 2013, The Statewide Economic Impacts of Florida Public Seaports, 2012, by Martin Associates. Florida Ports Council, "Florida Seaports: Charting Our Future, Fast Facts," 2013.

**Table 16
Economic Impact of Florida's Ports, 2011**

Seaport	# of Jobs	Economic Impact
Port Canaveral	17,000	\$2,200,000,000
Port Everglades	160,673	\$15,286,991,000
Port of Jacksonville	65,000	\$19,000,000,000
Port Manatee	24,000	\$2,380,202,000
PortMiami	207,000	\$27,000,000,000
Port of Palm Beach	2,850	\$261,000,000
Port Panama City	10,863	\$1,442,468,000
Port of Tampa	100,000	\$8,000,000,000
Total	587,386	\$75,571,480,000

**Table 17
Comparison of Cargo and Cruise Employment in Florida Ports**

Florida Ports Total	# of Jobs	Economic Impact
Cargo only	554,347	\$66,330,535,000
Cruise only	130,950	\$13,800,000,000
Total	685,297	\$80,130,535,000

Note: Totals are for cargo and cruise. Cruise ports include Port Canaveral, Port Everglades, PortMiami, and Port of Tampa. Totals for the eight ports represent 94% of the economic impact for the state's ports and 86% of employees. Data available for cruise traffic in individual ports report nearly 4 million multi-day cruise passengers per port in PortMiami, Port Canaveral, and Port Everglades for FY 2011/2012.

Sources: Florida Seaport Transportation and Economic Development Council, Florida Seaports: Charting our Future: The Five Year Florida Seaport Mission Plan, 2013-2017. Data for FY 2011/2012.
Statewide Economic Impact of Maritime Cargo Handled at Florida's Public Seaports, 2008, Port Everglades FY 2011 Commerce Report, Prepared for Florida Ports Council by Martin Associates, p. 28.
The 2009 Economic Impact of Port Canaveral, May 2010, Prepared for Florida Ports Council by Martin Associates, p. 1. Port Canaveral 2012 data provided by Roslyn Harvey.
www.pbcgov.com/crm/lwlsymposium/pdfs/presentationsportof pb.pdf (2007 data)
www.portoftampa.com
www.jaxport.com/aboutjaxport/overview/economic-impacts (2009 data)
<http://www.miamidade.gov/portofmiami/information.asp> (2009 data)
www.portmanatee.com (2009 data from Steve Tyndall and website)
www.portpanamacityusa.com (2012 data from Final Report, The Local and Regional Economic Impacts of Port Panama City, April 5, 2013, prepared by Martin Associates)
 Florida data: The Statewide Economic Impacts of Florida Public Seaports, 2012, prepared for Florida Seaport Transportation and Economic Development Council, May 2013, by Martin Associates.
The Statewide Economic Impacts of Maritime Cargo Handled at Florida's Public Seaports—2008, Final Report, March 30, 2009. Prepared for Florida Ports Council by Martin Associates, p. 4.
 Personal Communication with Bob Sharak, Cruise Lines International Association, October 2012.

b. Cruise Lines

Cruise lines are an important component of the seaports' economic impact, housing corporate and administrative offices of the top cruise lines. Florida is known as the cruise capital of the nation, ranking first in cruise industry direct expenditures, at \$6.7 billion. Florida operations generate 60 percent (or nearly 6 million) of all U.S. cruise embarkations, with nearly 14 million passengers embarking and disembarking in the state's seaports in FY 2011. This includes cruise locations at PortMiami, Port Everglades, Port Canaveral, which are the top ranked cruise ports in the nation, and Port of Tampa, ranked 6th. In 2012, the cruise lines total economic output in Florida was \$13.8 billion, about a third of the nation's cruise output. Wages and salaries contributed \$5.76 billion to the state's economy and 130,950 jobs for Floridians.¹⁹

Table 18
Economic Impact of the Cruise Industry in Florida, 2011

Direct Economic Impacts	Florida Share of US	
Direct Cruise Industry Expenditures (\$Billions)	\$6.67	35.8%
Employment	56,425	38.7%
Wages and Salaries (\$Billions)	\$2.47	39.7%
Total Economic Impacts		
Total Output (\$Billions)	\$13.80	34.1%
Employment	130,950	37.7%
Wages and Salaries (\$Billions)	\$5.76	34.9%

Source: Cruise Lines International Association (CLIA), The Contribution of the North American Cruise Industry to the United States Economy in 2011, prepared by Business Research and Economic Advisors. Personal communication with Bob Sharak, CLIA, October 2012. CLIA, Economic Benefit of the Cruise Industry in Florida (2011), figures prepared by Business Research and Economic Advisors.

3. Marine Industry

a. The Economic Impact of Recreational Boating Activity

Florida is a boating paradise and the number one destination in the nation for saltwater boating, accounting for 21% of all saltwater boating activity in the U.S. An estimated 4.2 million people participate in boating each year, with the average boater spending 30 days on the water, resulting in 22 million trips per year.

¹⁹ Cruise Lines International Association (CLIA), The Contribution of the North American Cruise Industry to the United States Economy in 2011, prepared by Business Research and Economic Advisors.

There are over a million registered boats in Florida, plus an estimated 300 thousand boats visiting annually.²⁰

The importance of recreational boating to Florida’s economy is underscored in a study by the Florida Fish and Wildlife Conservation Commission (FWC). That study found that the combined economic impact of trip and craft-related direct spending of \$9.01 billion by recreational boaters to the Florida economy in 2007 is over 97,000 jobs, \$3.1 billion in labor income, \$726 million of indirect business taxes and \$5.3 billion of value added.²¹ The Marine Industries Association of Florida estimates a total economic output of the recreational boating industry statewide at \$18.9 billion and 220,000 jobs.²² Because the FWC study only included boats registered in Florida, it overlooks expenditures by non-Florida yachts, such as international megayachts that frequent Florida waters and retrofit in local boatyards, which is significant in south Florida and other areas. (It is estimated that 1,500 megayachts visited south Florida in 2006, spending up to \$500,000 per visit.) South Florida tops the industry’s sales among the regions of the state at \$1.7 billion, followed by southwest Florida, the Tampa Bay area, and southeast Florida. Boating brings 56,000 jobs to these four regions, nearly 60% of the industry’s jobs. According to a study by the Marine Industries Association of South Florida in 2010, the tri county area of Miami-Dade, Broward, and Palm Beach counties contributed over 100 thousand jobs to the state’s economy in fiscal year 2010, with wage income over \$3 billion and nearly \$9 billion in total output. Gross retail sales of boat and motor products was \$3.5 billion statewide, with the tri county area accounting for 49% of those sales.²³

Table 19
Economic Impact of Marine Industry in Miami-Dade, Broward, and Palm Beach Counties (FY2010)

	Total Jobs	Wage Income	Total Output
Broward County	92,832	\$2,593,962,110	\$7,440,152,206
Miami-Dade County	5,476	\$195,932,393	\$540,982,000
Palm Beach County	8,931	\$334,400,500	\$923,301,392
Total Tri-County Areas	107,239	\$3,124,295,003	\$8,904,435,598

Source: Marine Industries Association of South Florida, Economic Impact of the Recreational Marine Industry—Broward, Dade, and Palm Beach Counties, Florida – 2010, pp. iv-v, pp. 11-12.

²⁰ Fish and Wildlife Conservation Commission (FWC), “Managing the Balancing Act: Recreational Boating Access and Protecting Submerged Land Resources,” 2010, accessed at www.mcatookit.org/pdf/ISLMC_10Sargent.pdf.

²¹ Florida Fish and Wildlife Conservation Commission, Florida Boating Access Facilities Inventory and Economic Study Report, August 30, 2009, p. 121.

²² Marine Industries Association of Florida, “Boating is Big Business,” 2005, adjusted through November 2008 by FWC. Accessed February 13, 2010, at http://myfwc.com/docs/AboutFWC/Economic/About_Economics_F&W_Rec2008.pdf. See also, Thomas J. Murray & Associates, “Economic Impact of the Recreational Marine Industry: Broward, Dade and Palm Beach Counties, Florida—2005,” Marine Industries Association of South Florida, Ft. Lauderdale, FL, 2005.

²³ Marine Industries Association of South Florida, Economic Impact of the Recreational marine Industry—Broward, Dade, and Palm Beach Counties, Florida—2010, pp. iv, v, 11-12.

Table 20
Impact of Recreational Boater Spending on Florida's Economy, 2007

Region	Sales	Labor Income	Value Added	Jobs
South	\$1.72 Billion	\$592 Million	\$1.01 Billion	18,095
Southwest	\$1.31 Billion	\$463 Million	\$790 Million	14,530
West Central	\$1.09 Billion	\$371 Million	\$640 Million	12,149
East Central	\$1.08 Billion	\$375 Million	\$645 Million	12,008
Southeast	\$869 Million	\$306 Million	\$528 Million	9,315
Northeast	\$642 Million	\$218 Million	\$376 Million	7,056
West Panhandle	\$559 Million	\$192 Million	\$329 Million	7,123
North Central	\$545 Million	\$181 Million	\$309 Million	7,529
Central Panhandle	\$207 Million	\$71 Million	\$120 Million	2,868
Statewide	\$9.01 Billion	\$3.10 Billion	\$5.32 Billion	97,112

Source: FWC, 2009, Appendices and Executive Summary: Florida Boating Access Facilities Inventory and Economic Study Report, p. 129, Table 3.32.

Note: The regions include some inland counties, except for the southeast and southwest regions, so this economic study involves not only coastal boating, but also boating activity on inland lakes. The south inland region is totally inland so is omitted from this chart. Totals for Florida include this inland region.

County data are not reported in the FWC study, but only regional data. Regional totals will not sum to state totals due to multipliers at regional level.

Map 8

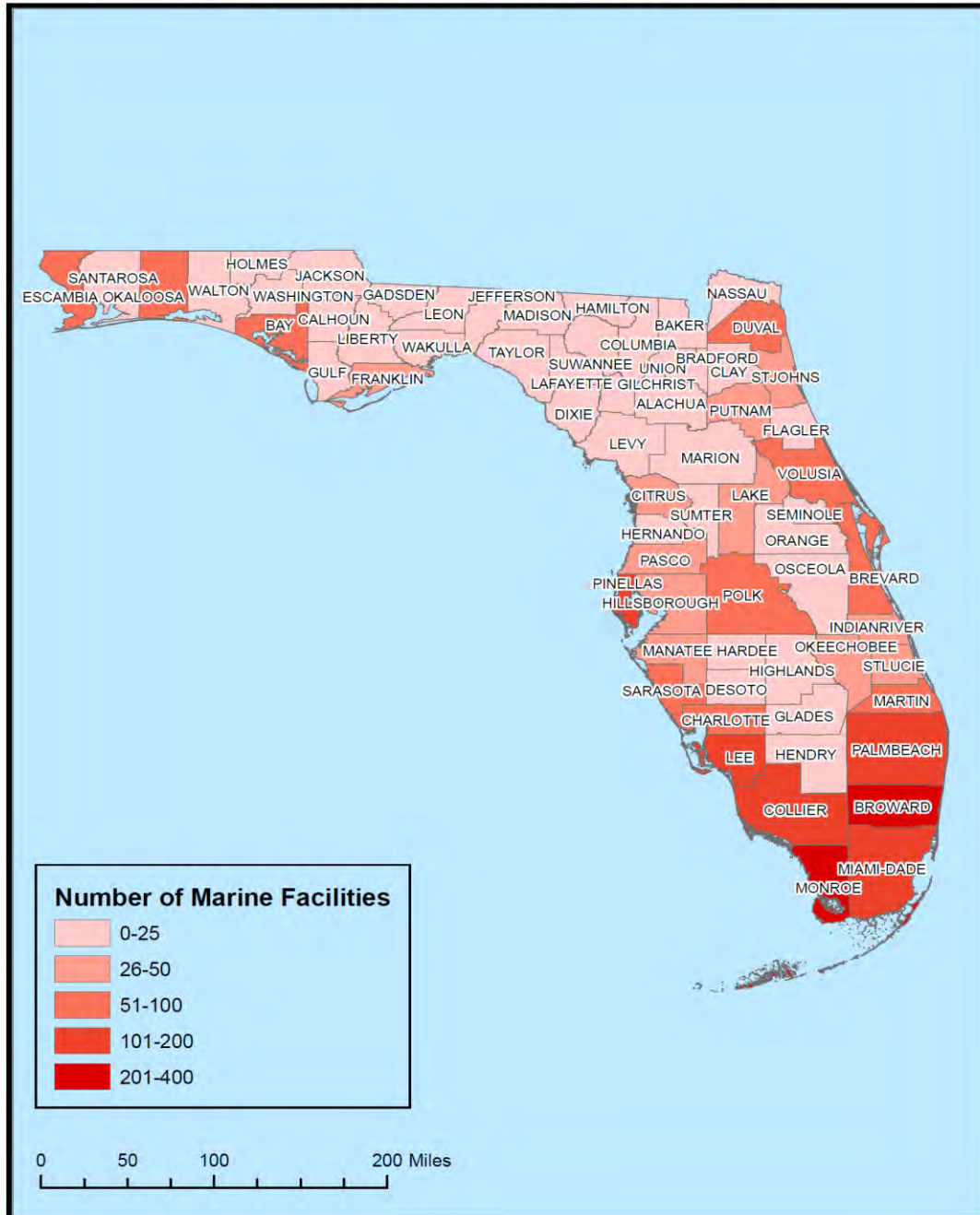
Florida Boating Regions



Source: Florida Department of Environmental Protection (FDEP), Florida Boating Access Facilities Inventory and Economic Study Report, August 30, 2009, p. 86.

Map 9

Florida Marine Facilities by County



Source: Florida Department of Environmental Protection (FDEP), Florida Boating Access Facilities Inventory and Economic Study Report, August 30, 2009, p. 86.

4. Recreation

Outdoor recreation is big business in Florida. An estimated 86.5 million visitors visited the state in 2011. The overwhelming reason for tourists visiting Florida is the appeal of recreation and leisure options that the state offers through its oceans, beaches, and parks. The state's tourism industry generated \$67.2 billion of expenditures in 2011 and more than one million jobs.²⁴ The direct economic impact of the state's park system was \$970 million to local economies in fiscal year 2010/2011 and 19,347 jobs. This economic impact included \$61 million in state sales taxes.²⁵

The array of coastal activities includes saltwater beaches, saltwater fishing, saltwater boat ramps, wildlife viewing and nature study. Surveys conducted for the Florida Department of Environmental Protection found that the top tier of activities included saltwater beach activities, wildlife viewing, and saltwater fishing for two-fifths or more of tourists and resident respondents. The table below shows the distribution of recreation activities by region of the state.²⁶ The Miami and Tampa Bay areas attract a large number of both tourists and residents alike who enjoy the region's saltwater beaches, saltwater fishing and boat ramps. These folks also participate in wildlife viewing and nature study. Other areas of the state may not have the same proportion of folks participating in these activities, but they nonetheless attract recreation participation. Those who enjoyed saltwater fishing in the state generally fished from a boat (70% of respondents), with a quarter of Florida residents using a saltwater boat ramp.²⁷ Nature-based tourism is also an important part of Florida's economy. Wildlife viewing, hunting, boating and fishing generate more than 34,000 jobs statewide, with an economic impact of \$3.2 billion.²⁸

²⁴ Outdoor Recreation in Florida: The Statewide Comprehensive Outdoor Recreation Plan, 2013, Draft Prepared for Florida Dept. of Environmental Protection by Responsive Management, pp. 3-4. Cited as SCORP hereafter. Figures are based on Visit Florida tourism rates.

²⁵ Florida State Park Economic Impact Assessment, Fiscal Year 2010-2011.

²⁶ SCORP, p. iii-iv.

²⁷ Outdoor Recreation in Florida: Survey for the State Comprehensive Outdoor Recreation Plan, 2011, Prepared for Florida Dept. of Environmental Protection by Responsive Management, pp. iii-iv, 47-49, 214-266 Tables.

²⁸ Florida Fish and Wildlife Conservation Commission (FWC), cited in SCORP, p. 4.

Table 21
 Geographic Distribution of Recreation Activities in Florida, 2011
 (% of Survey Respondents)

	Saltwater Beaches		Saltwater Fishing		Saltwater Boat Ramps		Wildlife Viewing		Nature Study	
	Tourist	Resident	Tourist	Resident	Tourist	Resident	Tourist	Resident	Tourist	Resident
Miami Area	24%	24%	27%	25%	29%	36%	20%	33%	23%	38%
Tampa Bay Area	18	31	19	30	14	25	15	26	12	24
Panama City Area	12	2	12	2	9	1	6	1	3	1
Daytona Beach Area	10	11	5	7	7	6	3	5	4	4
Cape Coral/Fort Myers Area	9	11	7	10	8	9	8	10	8	9
Jacksonville/St. Augustine Area	5	10	4	9	5	9	4	7	1	5
Melbourne/Cape Canaveral Area	7	7	4	8	3	8	3	6	5	4
Pensacola Area	6	4	5	4	2	3	3	4	2	1
Fort Pierce Area	3	3	3	4	3	5	3	3	4	3
Apalachicola Area	1	0	1	1	3	2	1	0	2	0

Note: Responses to survey from a sample of tourists and residents about where the respondent participated in select recreation activity over 12 past months.
 Source: Adapted from data Outdoor Recreation in Florida Survey for the State Comprehensive Outdoor Recreation Plan (SCORP), 2011, prepared for the Department of Environmental Protection by Responsive Management.

5. Fishing Industry

a. Recreational Fishing

Florida's bounty flows from its oceans and its 2,276 miles of tidal shoreline. Fishing continues to be a major industry in Florida. The state is known as the "fishing capital of the world" because of its record fish catches. The annual economic impact of recreational saltwater fishing in the state is \$6.9 billion based on marine anglers' expenditures of \$3.9 billion in 2011. These expenditures in turn support 65,212 jobs in Florida. This impact includes \$544 million in federal tax revenues and \$416 million in state and local tax revenues. Salaries and wages account for \$2.1 billion of the impact of saltwater fishing. The state's marine recreational fisheries and their expenditures lead the nation. There are over 2.4 million saltwater anglers in Florida, with total revenue topping \$25 million from recreational fishing license sales. The state's marine recreational anglers logged over 36 million fishing trips in 2011. Boating tops \$16.8 billion and contributes 203,000 jobs.²⁹

b. Commercial Fishing

The state's commercial fisheries are among the most important in the country, ranking second in the nation for in state sales and third in jobs. The commercial fishing industry contributed 64,744 jobs, nearly \$13 billion in sales, \$2.4 billion in income, and \$4.3 billion in value added impact. Florida's seafood industry includes commercial harvesters, seafood processors and dealers, importers, wholesalers and distributors, and retail.³⁰ Revenue for total landings is at \$157 million statewide, including \$116 million from west Florida and \$41 million from east Florida. The state's commercial licenses/permits contributed \$3.9 million to the state during the 2010/2011 fiscal year, with 10,685 licenses producing these revenues out of a total of 23,864 saltwater products licenses sold. The commercial saltwater fishing industry contributes over 100,000 jobs and over \$5.7 billion to the state's economy.³¹

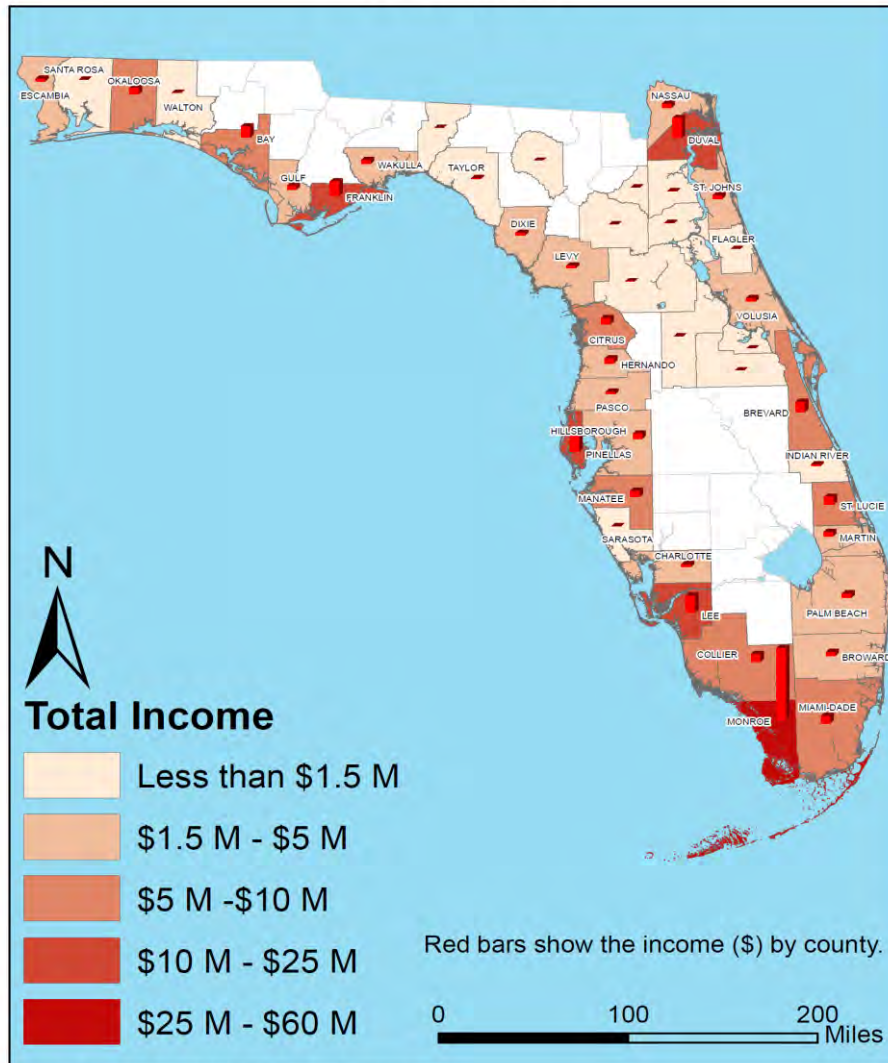
²⁹ NOAA, National Marine Fisheries Service, Fisheries Economics of the United States, 2009, NOAA Technical Memorandum NMFS-F/SPO-118, May 2011, hereafter cited as NOAA, Fisheries Economics. Florida Fish and Wildlife Conservation Commission, accessed at <http://www.myfwc.com/about/overview>. American Sportsfishing Association, Sportsfishing in American, January 2013.

³⁰ Florida Fish and Wildlife Conservation Commission, accessed at <http://www.myfwc.com/about/overview>. The economic impacts of the commercial fishing sector and seafood industry refer to the employment (full-time and part-time jobs), personal income, and output (sales by Florida businesses) generated by the commercial harvest sector and other major components of the U.S. seafood industry including processors and dealers, wholesalers and distributors, grocers and restaurants. The original source is NOAA, Fisheries Economics.

³¹ NOAA, Fisheries Economics; U.S. Fish & Wildlife Service, National Survey on Hunting, Fishing, and Wildlife Viewing, 2006 values updated through February 2011.

Map 10

Florida Commercial Fishing by County, 2011 Total Income



Source: Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, 2011

c. Florida Marine Aquaculture

Aquaculture in Florida is ranked 7th in the nation, with income of \$61.3 million for 469 farms. Ornamental fish is the largest segment, at \$32.1 million income, followed by mollusk/hard clams, at \$15.2 million. Other aquaculture (alligator, snails, frogs, etc.) produced \$6.2 million, other food fish (tilapia, sturgeon, etc.) \$3.4 million, and crustacean (shrimp, crawfish, prawn) \$2.5 million. The hard clam represents 99.9% of marine species production on leased sovereign submerged lands, located on Cedar Key, Pine Island, and Sebastian. Based upon a 2008 production year analysis, total hard clam farm gate sales (money to the grower) was

\$19 million. Of that total, the Cedar Key region/Levy County sold \$18 million, Sebastian/Indian River County about \$900,000 and Pine Island/Lee County about \$100,000.³² The combined total output impact for the state's clam growers and processors is estimated at \$53 million, with a value added impact of \$31.5 million, including \$25.3 million labor income for 606 jobs, \$4.6 million in other property income, and \$1.6 million in indirect business taxes.³³

C. Other Industry Sectors

1. The Defense Industry in Florida

The location of military facilities along Florida's coasts provides a significant boost to the state's economy. Defense-related spending contributed \$58.1 billion, or 7.5%, of Florida's gross state product in FY 2008, according to the University of West Florida's Haas Center for Business Research and Economic Development (Haas Center).³⁴ This was estimated at \$64.8 billion in 2010 and expected to reach \$67.7 billion in 2013. There was an estimated \$1.26 billion in state and local government tax spending in FY 2008. Florida ranks fourth in federal defense expenditures, at \$20.96 billion in 2008.

Defense spending accounted for 686,181 direct and indirect jobs in Florida in FY 2008. The largest proportion (37%) of defense jobs is located in northwest Florida, followed by central Florida with 30%, northeast Florida with 22%, and south Florida with 11%. Nearly all military installations are located near the coast, with eight in northwest Florida counties, three in the northeast, five in the central region, and three in the southeast. An additional three installations are in non-coastal locations. Defense jobs represent 8,262 contractors, 133,751 contracts, and \$66.3 billion of expenditures in the state's coastal counties. (See Appendix for a listing of defense contractors by county.) The study confirms that all of the state's counties benefit from defense-related spending, with at least \$4 million annual spending from the defense industry in all but three counties.

³² Florida Dept. of Agriculture and Consumer Affairs (FDACS), "Florida ranks 7th in U.S. Aquaculture Value," *Florida Aquaculture*, March 2009, no. 69, p.1. Marine species information provided by personal communication with Paul Zajicek and FDACS, "Estimating the Economic Impact for the Commercial Hard Clam Culture Industry on the Economy of Florida," Final Report, March 2009, prepared by Florida Sea Grant, UF Project #00073946.

³³ FDACS, 2009, p. 10 and Table 7, p. 19.

³⁴ Haas Center for Business Research and Economic Development (Haas Center), "Florida Defense Industry Economic Impact Analysis," Final Report, January, 2011, p. 6.

Map 11

U.S. Military Bases in Florida



The economic impact of Florida's four regions is summarized in the table below, adapted from data in the Haas Center study. The Central region has the highest concentration of jobs, followed by the Northwest and Northeast, and trailed by the Southeast region. This is reflected in the higher gross wages and gross regional product in the Central region.

Table 22
Economic Impact of Defense Industry in Florida's Regions

Region	Northwest	Northeast	Central	Southeast
#Jobs (Direct + Indirect)				
2008	178,758	162,302	226,458	118,659
2013 Estimates	168,049	146,426	201,943	110,906
Gross Wages (\$Billion)				
2008	\$3.5	\$4.1	\$6.3	\$3.2
Gross Regional Product (\$Million)				
2008	\$14,281.2	\$14,248.7	\$19,429.9	\$10,182.3
2013 Estimates	\$17,043.2	\$16,251.6	\$22,178.7	\$12,228.3

Adapted from Tables 12, 14, 16, 18 on pages 31, 37, 44, 51, Haas Center for Business Research and Economic Development (Haas Center), "Florida Defense Industry Economic Impact Analysis," Final Report, January, 2011.

2. Marine Research

a. Research Funding

The Florida Institute of Oceanography (FIO) includes nearly all the major research facilities in Florida doing research on oceans, including public and private universities and research institutes. They report that their members receive millions of dollars from federal, state, and private sources for research funding.³⁵ Its members do not include Disney in Orlando, the Florida Aquarium in Tampa, and the Pier Aquarium in St. Petersburg. There are also federal groups that have a research component in Florida, including the Environmental Protection Agency in Pensacola, the U.S. Geological Survey in St. Petersburg, NOAA Fisheries in St.

³⁵ Personal communication with Jyotika Virmani, FIO, January 2013. Partial reports to FIO show that federal sources provide \$8.9 million in funding for FIO members, state funding another \$3.7 million, and private funding the largest share at \$43.9 million

Petersburg, NOAA's Hurricane Center in Miami, NOAA's Atlantic Oceanographic and Meteorological Laboratory, and the NOAA Florida Keys National Marine Sanctuary in Key Largo.

Additionally, annual budgets for the state's marine and coastal research and education institutions were reported at \$272.5 million in FY 2007, with wages at \$154 million for nearly 3,000 employees and over 2,200 students. The total marine research funding was \$162 million at that time.³⁶ Together these research entities contribute significant funding to the state's economy. A list of specific sources that provide funding for Florida's marine research is listed in the Appendix. While we may think of marine research as academic, it also involves industry members. For example, Roffer's Ocean Fishing Forecasting Service Inc. is but one example of a combined technology and professional service company that serves both the fishing and oil/gas industries with its forecasting. SRI International, an independent non-profit research institute in St. Petersburg, Florida, is focused on marine technology development. Ocean Research and Conservation Association in Ft. Pierce, Florida, is focused on the development of innovative technologies and applied science to protect and restore aquatic ecosystems. Coil Industries, a small surfboard manufacturing company in Brevard County, Florida, has developed new composite materials and processes to build high-performance surfboards. The economic impact of surf tourism in Brevard County alone was estimated at \$21 million/year.³⁷ So there are applications of marine research to technology companies, among others.

b. Ocean Observing

The Florida Coastal Ocean Observing System (FCOOS) was established to coordinate efforts for ocean observing in Florida, as a partner with the Southeast Atlantic Regional Association and the Gulf of Mexico Regional Association that manage those efforts for ocean observing in the southeast states, splitting Florida between two regional associations. The FCOOS 18 member state network of public and private marine research institutes is developing an integrated and interdisciplinary network to address issues of climate change and weather, safety of maritime operations, natural hazards, ocean health and water quality, homeland security, public health, fisheries and other natural resources. Its goal is to provide reliable interdisciplinary observations, manage data, and formulate models to support operational forecasts. Its members are listed in the table below.

³⁶ National Oceans and Coastal Council, "Florida's Ocean and Coastal Economies Report," June, 2008, pp. 137,139.

³⁷Michael H. Slotkina, Karen Chambliss, Alexander R. Vamosia, and Chris Lindoc. 2009. "Surf Tourism, Artificial Surfing Reefs, and Environmental Sustainability." In Sustainability 2009: The Next Horizon. Gordon L. Nelson and Imre Hronszky, Eds. American Institute of Physics, NY. AIP Conference Proceedings. Vol. 1157. pp 207-220.

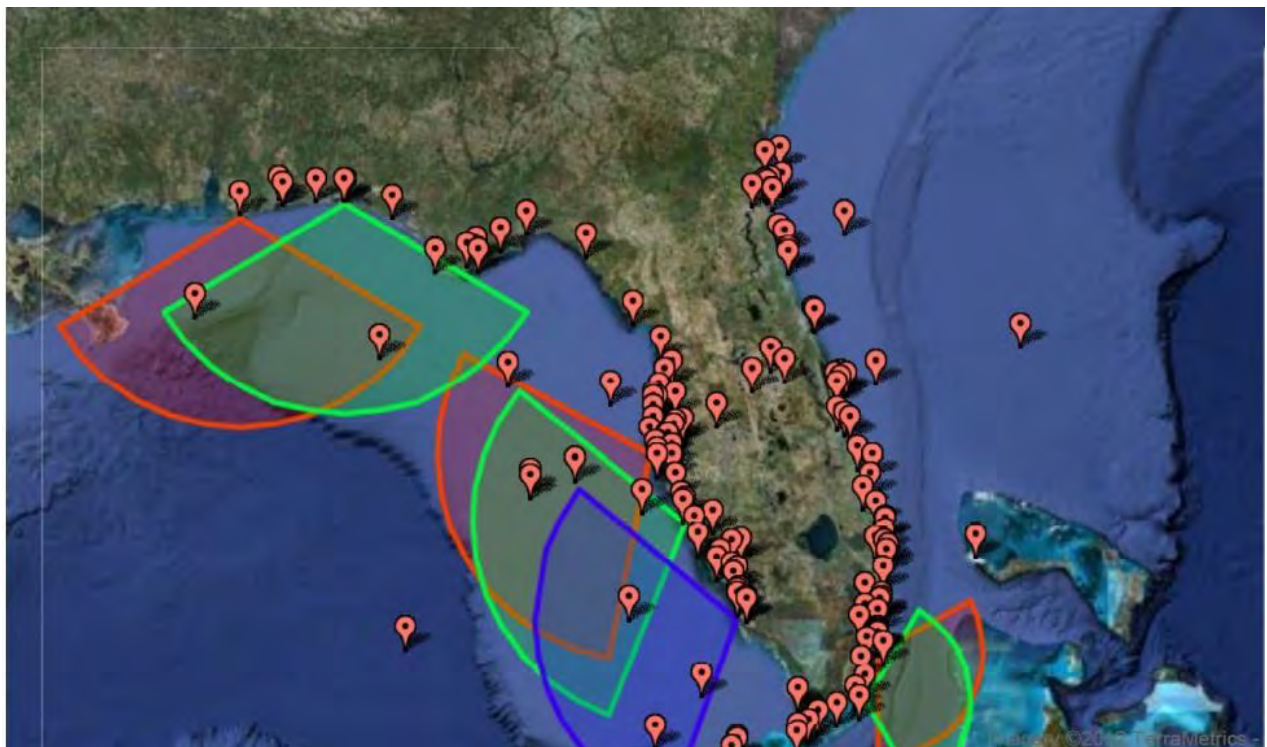
Table 23

Members of Florida's Coastal Ocean Observing System

1. University of Miami Rosenstiel School of Marine and Atmospheric Science, Miami
2. Nova Southeastern University Oceanographic Center, Dania Beach
3. University of South Florida College of Marine Science, St. Petersburg
4. Florida Atlantic University Harbor Branch Oceanographic Institution, Inc., Fort Pierce
5. Mote Marine Laboratory, Sarasota
6. Florida Institute of Technology Dept. of Marine & Environmental Systems, Melbourne
7. Florida State University Department of Oceanography, Tallahassee
8. Florida Atlantic University Department of Ocean Engineering/SeaTech, Dania Beach
9. University of Florida Civil and Coastal Engineering, Gainesville
10. Roffer's Ocean Fishing Forecasting Service, Inc., Miami
11. University of North Florida College of Computing, Engineering & Construction, Jacksonville
12. Florida International University Southeast Environmental Research Center, Miami
13. Florida Gulf Coast University Dept. of Marine and Ecological Sciences, Fort Myers
14. State of Florida Institute of Oceanography, St. Petersburg
15. Weatherflow, Inc., New Smyrna Beach
16. HARRIS Corporation, Melbourne
17. University of Central Florida Department of Biology, Orlando
18. University of West Florida, Pensacola

Map 12

Ocean Observing Sites



Source: FLCOOS Maps of Oceans Observation Locations

c. Marine Biomedical Research

Harbor Branch Oceanographic Institute (HBOI) has been researching marine biotechnology since it was established in 1984 as the research arm of SeaPharm, but is now part of Florida Atlantic University. It helps formulate marine drugs, using the ocean's natural products and the products' therapeutic potential for developing pharmaceutical drugs. The focus has been on pancreatic cancer, but the products developed may also help with other cancers, such as melanoma and colon cancers. It is also involved with sustainable production of bioactive marine natural products. HBOI's work in developing biomedical products from the ocean results in about \$4 million a year in research grants, with funding from the National Institutes of Health, NOAA, the Florida Biomedical Research Fund, and from private donations.³⁸

Mote Marine Laboratory (Mote) has also been engaged in biomedical research since 1979 and has been a leader in marine research since it was founded in 1955. Their Marine Biomedical Research Program focuses on basic and applied research working with marine organisms as laboratory animal models. Areas of interest include biochemistry, physiology, immunology, reproductive biology and embryonic development. A major research effort in the program is directed at understanding why sharks and their skate and ray relatives have a low incidence of disease, including cancer. The ultimate goal is to use results from these studies to contribute to a better understanding of health problems in higher animals, including humans, and to benefit the wild populations of the particular organisms studied. Current projects include cytotoxic factors produced by cultured shark immune cells, which can inhibit the growth of human tumor cell lines; microbial makeup of the epidermal mucus produced by stingrays in order to determine whether the mucus contains antibiotic properties that could be used in human health applications; mechanisms of cell death in normal and transformed cells treated with epigonal conditioned medium to understand preferential killing of tumor cell lines through bioactivity of factors produced by cultured shark immune cells.

The Marine Immunology Program focuses on basic and applied immunological research of marine animals, ranging from cartilaginous fishes to marine mammals. Basic research efforts contribute to a better understanding of comparative vertebrate immune function as well as phylogenetic insights into human immunity, while applied studies provide unique information helpful in assessing the immune health of wild populations of marine animals, including marine mammals, exposed to a variety of environmental stressors. Mote is an independent nonprofit organization and has seven centers for marine research, the

³⁸ Personal communication with Dr. Amy Wright, HBOI, January, 2013.

public Mote Aquarium and an Education Division specializing in public programs for all ages.³⁹

d. Scientific Response to the Gulf Oil Spill

BP pledged \$500 million for scientific research in the Gulf of Mexico following the Deepwater Horizon Oil Spill in 2010. To address the immediate needs following the spill, they released \$50 million in the first year. The Florida Institute of Oceanography (FIO) received \$10 million for Florida, and awarded the funds via a competitive grant process to 27 projects to assess the rapidly evolving biological, physical, geological, and chemical conditions in the Gulf of Mexico during 2010-2012. For the remaining \$450 million, BP and the five Gulf states established the 20 member Gulf of Mexico Research Initiative (GoMRI) to disperse the remaining funds to address the scientific challenges that the Gulf of Mexico faces from oil and other stressors. Through a competitive process, GoMRI established eight centers of excellence in the five Gulf States in 2011. Three of these centers are in Florida and collectively will bring approximately \$55 million of \$150 million into the state over a three year period. In addition to these centers, GoMRI have made a number of smaller awards to scientists in the five Gulf states.

Among the three Centers of Excellence in Florida, one is led by Florida State University (FSU), one by University of Miami (UM), and one by the University of South Florida (USF). However, Principal Investigators in these centers are from a number of institutions involved with each of these centers, so the funding reaches all parts of Florida. Some investigators are also located in other states or countries as well. The three centers are all engaged in the study of the Gulf of Mexico, the transport of oil and its impacts on the ecosystem. They include: 1) FSU = Deep Sea to Coast Connectivity in the Eastern Gulf of Mexico (DEEP-C) Consortium, with \$22 million funding for three years, (2) UM = Consortium for Advanced Research on Transport of Hydrocarbon in the Environment (CARTHE), with \$22 million funding for three years, and (3) USF = Center for Integrated Modeling and Analysis of the Gulf Ecosystem (C-IMAGE), with \$11 million funding for three years.⁴⁰

The RESTORE Act was signed into law on July 6, 2012 and funnels 80 percent of all administrative and civil penalties for the Gulf oil spill into a Gulf Coast Restoration Trust Fund. The Fund will be set up in the U.S. Treasury. FIO is the Center of Excellence for Florida (under section 1605 of the law and subsequent Congressional Record) and will award competitive grants for research. As such, FIO

³⁹ Information provided from personal communication with Kumar Mahadevan and Mote's website, www.Mote.org.

⁴⁰ Personal communication with Jyotika Virmani, Florida Institute of Oceanography, University of South Florida, February 2013.

will receive 0.5% of the RESTORE Act trust funds. Actual trust fund amounts have not been announced, but funds may be substantial.⁴¹

3. Renewable Energy

Among the marine-based sources of renewable energy, Florida has focused on the ocean's currents. Foremost among the state's efforts is the Southeast National Marine Renewable Energy Center at Florida Atlantic University in Boca Raton. The Center is working to harness the marine hydrokinetic energy of the open-ocean currents, particularly the Florida Current portion of the Gulf Stream system, as well as ocean thermal energy.

There is a broad cross section of the ocean energy industry in Florida, ranging from engineers to laboratories, universities, and private companies, and the government agencies involved in developing this industry. One example is NextEra Energy, Inc., a Florida based company in Juno Beach with subsidiaries that operate the third largest U.S. nuclear power generation fleet. As a leading clean energy company, it has more than 15,000 employees in 28 states and Canada. Their facilities have a total capacity 18.9 gigawatts. The subsidiaries also generate renewable energy from the wind and sun (NextEra Energy Resources, LLC, a wholesale electricity provider) and include Florida Power & Light Company, Florida's largest electric utility. It owns 85 wind facilities in the U.S. and Canada, co-owns and operates the world's largest solar power generating facility (Solar Generating Systems), plus owns generating plants powered by natural gas, nuclear fuel, and oil.⁴²

There are two major energy trade associations in Florida (Florida Solar Energy Industries Association and Florida BioEnergy Association, Inc.) and a host of university involvement in education and training, including the following list:

- University of South Florida - [Clean Energy Research Center](#)
- University of Florida - [Florida Institute for Sustainable Energy](#)
- University of Central Florida - [Florida Solar Energy Center](#)
- Florida State University - [Sustainable Energy Science and Engineering Center](#)
- Florida International University - [Applied Research Center](#)
- University of South Florida - [College of Marine Science](#)
- Florida Atlantic University - [Southeast National Marine Renewable Energy Center](#)
- [SeaTech Institute of Ocean and Systems Engineering](#)
- Florida Institute of Technology - [Department of Ocean Engineering](#)
- Nova Southeastern University - [Oceanographic Center](#)
- University of Miami - [Rosenstiel School of Marine & Atmospheric Science](#)
- [SRI – St. Petersburg](#)

⁴¹ [Ibid.](#)

⁴² www.NextEraEnergy.com, www.NextEraEnergyResources.com, www.FPL.com.

III. Methodology

The cluster analysis was based on a dataset from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), ES-202 data, 2011. The focus was on five ocean legacy, or traditional, industry sectors: ocean tourism, seaport/water transportation and warehousing, marine industry/recreational boating, recreation, and fishing/living resources. These were selected based on the North American Industrial Classification System (NAICS) codes that NOAA designated as constituting the “ocean economy,” included below. The NOAA guidelines for ocean industries were followed to select the relevant NAICS codes that were tracked. NAICS, which replaced the Standard Industrial Classification (SIC), is the standard classification system used by business and government to categorize economic activity of businesses.

QCEW’s data comes from quarterly tax reports by employers subject to state unemployment insurance (approximately 90% of U.S. businesses) and reports the number of establishments, total employment, and total wages. NAICS provides data on establishments, which were used as a surrogate for businesses in this study, and employment a surrogate for jobs. This study used a multiplier to calculate the data for tourism since restaurants and hotels are not used only by tourists. We extrapolated data to complete cells for missing data since CQEW suppresses data if it might reveal proprietary information on a particular business. QCEW only reports employees and wages in the ocean industries that are subject to unemployment requirements and therefore underreports actual jobs and self-employed employees. The data do not report any indirect or induced impacts of these industries, only direct impacts as reported to QCEW.⁴³

The methodology for developing the estimates of the contribution of ocean industries to gross domestic product followed five steps:

First, estimates of the number of covered wage and salary workers (“employees”) and their wages for each of the twenty industries were obtained for the 35 coastal counties in the state. These estimates were obtained from the Quarterly Census of Employment and Wages (QCEW) available from the web site of the Florida Department of Economic Opportunity.⁴⁴ It is also available on the US Bureau of Labor Statistics website.⁴⁵ The most difficult part of obtaining these data stems from the cases where the data has been withheld from publication because of concerns about confidentiality. These cases arise, most often in small counties and in small industries, when publication of estimates might enable one or more competitors to obtain specific data about a particular business establishment.

⁴³ NOAA Coastal Services Center, “Frequent Questions: Ocean and Great Lakes Jobs,” April, 2012.

⁴⁴ <http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/quarterly-census-of-employment-and-wages>

⁴⁵ www.bls.gov/cew/#databases

Withheld data was estimated for this study by averaging employment and wages over one or more neighboring coastal counties where the data are published and applying these averages to the number of establishments (which is always published) to obtain estimates of withheld employment and wages.⁴⁶

Second, estimates of wages and salaries were converted into estimates of employee compensation by multiplying by the ratio of employee compensation to wages and salaries county-wide obtained from the TABLE CA06N, produced by the US Bureau of Economic Analysis and available on their web site.⁴⁷ This added allowances for employer contributions to social security and employee pension and insurance funds, that is, fringe benefits.

Third, estimates of employee compensation were converted to estimates of labor earnings by county by industry using the table on labor earnings CA05N, produced by the US Bureau of Economic Analysis and available on their web site.⁴⁸ The ratio of earnings to employee compensation for broad industry groups was applied to the employee compensation in the ocean industries by coastal county. Where disclosure problems were encountered, published data from neighboring coastal counties were used. This adjustment added the earnings of independent contractors or the self-employed to the employee compensation of covered workers.

Fourth, the ratios of GDP to labor earnings for broad industry groups were applied to labor earnings in the ocean industries to develop estimates of the contribution to GDP by the ocean industries. GDP for the coastal metropolitan areas was obtained from the US Bureau of Economic Analysis website.⁴⁹

Fifth, estimates of the total contribution of the ocean industries were obtained using a special run of the RIMS II Model by the US Bureau of Economic Analysis. The model used 2002 data for the national technical coefficients scaled to Florida using Florida and national data for 2008. The total contributions were estimated using final demand multipliers for the various industries and the employment estimates were derived using the direct effects multipliers. The result of this estimating procedure is to include expansion in the interior counties along with the coastal counties in the indirect and induced (“ripple”) effects.

⁴⁶ Occasionally, data from the previous year or even earlier were used to make the withheld estimates

⁴⁷<http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrnd=5#reqid=70&step=30&isuri=1&7028=-1&7040=-1&7083=Levels&7031=12000&7022=54&7023=7&7024=NAICS&7025=4&7026=XX&7027=2011&7001=754&7029=55&7090=70&7033=-1>

⁴⁸<http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrnd=5#reqid=70&step=30&isuri=1&7028=-1&7040=-1&7083=Levels&7031=12000&7022=10&7023=7&7024=NAICS&7025=4&7026=XX&7027=2011&7001=710&7029=32&7090=70&7033=-1>

⁴⁹<http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrnd=5#reqid=70&step=10&isuri=1&7007=2011.2010.2009&7093=Levels&7090=70&7035=-1&7036=-1&7001=2200&7002=2&7003=200&7004=NAICS&7005=-1&7006=15980>

Ocean Economy Industry Sectors/NAICS Codes:

Living Resources/Fishing: 112511, 112512, 114111, 114112, 311711, 311712, 445220
(Fish hatcheries & aquaculture, fishing, seafood processing, seafood markets)

Marine Industries/Recreational Boating: 336612, 336611, 441222, 713930, 237990
(Marinas, boat dealers, ship building and repair, marine-related construction)

Marine Transportation and Warehousing/Ports: 483112, 483114, 488310, 488320, 488330, 488390, 334511, 4931 (Deep sea passenger transportation, coastal passenger transportation, port and harbor operations, marine cargo handling, navigational services to shipping, other support activities for water transportation, navigation guidance and nautical system/instrument manufacturing, warehousing and storage)

Recreation: 721211, 487210, 339920, 487990, 611620, 532292, 713990, 712130, 712190 (Recreational vehicle parks and campsites, scenic water tours, sporting goods, amusement & recreation services, zoos & aquaria)

Tourism: 7211 (collapsed from 721110, 721191), 722 (collapsed from 722110, 722211, 722212, 722213) (Hotels and lodging, eating and drinking places)