The economic significance of the Gulf of Mexico related to population, income, employment, minerals, fisheries and shipping

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An Economic Overview of Selected Industries Dependent Upon The Gulf of Mexico

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Introduction

The Gulf of Mexico represents an important source of natural resources to the economy of the United States. The Gulf exists as an immense economic reservoir, from which a number of important marine-related industries and user groups extract tangible and intangible economic value. Some of the industries directly or indirectly dependent on the Gulf ecosystem include coastal development, coastal recreation and tourism, merchant shipping, offshore oil and gas production, hard mineral mining, recreational boating, and commercial fisheries. The economic values derived from the Gulf resources by these industry sectors benefit not only the economies of the communities and states adjacent to the Gulf, but also those located throughout the remainder of the United States. However, a rapidly growing coastal population and industrial base are placing increasing demands on the natural resources contained with the Gulf. Resource managers are becoming increasingly aware of the need to aggressively manage the resources of the Gulf in a sustainable manner. Such management strategies will better ensure marine-related user groups and industries have future access to the natural resources of the Gulf of Mexico.

The purpose of this paper is to provide a brief overview of the economic values and activities derived from the utilization of natural resources within the Gulf of Mexico by U.S. industries. The paper is not intended to be an exhaustive assessment of the all the previously mentioned marine-related industries in the Gulf region, but rather to provide trends and magnitudes of economic values derived from Gulf of Mexico resources by some key industries. The industries addressed included:

Petroleum and Minerals Extraction
Commercial Fishing
Commercial Seafood Processing
Marine Sport Fishing
Merchant Shipping / Cruise Industry Activity
Maritime Vessel Construction
Marine Recreational Activities

The following discussion draws heavily from a previously published article by Adams, Hernandez and Cato (2005). Where possible, this discussion provides more recent data and trends on the economic values associated with the industries listed above.

Petroleum and Minerals Extraction

The infrastructure for oil and gas production in the Gulf of Mexico, includes oil refineries, petrochemical and gas processing plants, supply and service bases for offshore oil and gas production units, platform construction yards, pipeline yards, and other industry-related installations. This infrastructure is most highly concentrated in the coastal regions of Louisiana and eastern Texas, and to a lesser degree, along the southern half of the Texas Gulf Coast and east of Louisiana as far as Mobile, Alabama.

The oil and gas industry is influenced by domestic and international factors, and has endured dramatic changes over the last thirty years. International finances, political decisions, and actions, as well as changes in domestic consumer demand for petroleum-based fuels have been important in fomenting these changes. Recent proposed lease sales off the Florida coast, as well as proposed liquid natural gas loading facilities in the Gulf, have drawn attention to the environmental and economic values of the Gulf coastal areas in uses other than oil and gas production. The potential impact to the other natural resources from expanded oil and gas development activities is of vital interest. Balancing these environmental concerns with the economic and national security benefits associated with increased offshore oil, gas, and mineral production is of utmost concern to resource managers and public policy-makers within the region.

Since the early 1990s, oil and gas production within the Louisiana and Texas state offshore regions, the major US Gulf of Mexico production area, have followed diverging patterns [U.S. Department of Energy]. Oil production from the state offshore regions declined from 25.6 million barrels in 1992 to 14.5 million barrels in 2003. Louisiana produced the largest share of oil in the region. In contrast, oil production in the federal offshore region increased from 299 million barrels in 1992 to 569 million barrels in 2003. Total production of oil from the region increased from 325 million barrels in 1992 to 580 million barrels in 2003 (**Figure 1**).

While oil production within the state and federal offshore Gulf regions exhibited a long term upward trend in production volume, gas production within the same area has been volatile, and exhibited a downward trend since 1997. Gas production increased from 4.85 trillion cubic feet (tcf) in 1992 to 5.29 tcf in 1997. Gas production then fell steadily (with the exception of 2001) to 4.63 tcf in 2003 (**Figure 2**).

The total value of offshore natural gas production increased from $8.5 billion in 1992 to $25.1 billion in 2003, following a decline to about $15.1 billion in 2002. The total value of offshore oil production in the region increased from $6 billion in 1992 to $16.7 billion in 2003. The combined total value of oil and gas production from the offshore state and federal regions of the Gulf of Mexico during 2003 totaled about $42 billion (**Figure 3**).

Commercial Fishing

The commercial fishing industry represents an important component of the total economic value derived from the utilization of the Gulf of Mexico large marine ecosystem. The commercial fishing industry in the Gulf harvested 1.4 billion pounds (whole weight) of fishery products during 1992, which were valued at $652 million dockside (value received by the vessel or boat upon offloading to a first handler shore-side) [U.S. Department of Commerce (1)]. Gulf landings have exhibited a somewhat erratic trend since 1992 (**Figure 4**). Landings peaked at 2.2 billion pounds in 1994, then remaining between 1.5 and 2.0 billion pounds through 2003,when landings totaled 1.6 billion pounds. Total dockside value has remained somewhat steady from 1992-2003, averaging $735 million over the 12-year period. Dockside value totaled $652 million in 1992, peaked at $911 million during 1992, then fell to $683 million during 2003.

Landings and Dockside Value

Between 1992 and 2003, the commercial fishing industry in the Gulf of Mexico has accounted for approximately 21 percent of the U.S. seafood landings and about 18 percent of the total US dockside value for fishery landings (**Figure 5**). Gulf landings and value represented 15 and 18 percent, respectively, of the US total in 1992. By 2003, the respective shares had increased to 17 and 20 percent [U.S. Department of Commerce (1)].

Louisiana is the leading state in the Gulf region in terms of landings volume (**Figure 6**). Louisiana landed 1.2 billion pounds of fishery products in 2003, a volume which greatly exceeds that landed by any other Gulf state (menhaden, a finfish useful for industrial purposes, dominates the Louisiana landings). Landings for the other states during 2003 were as follows: Mississippi (213 million pounds), west coast of Florida (79 million pounds), Texas (96 million pounds), and Alabama (25 million pounds). During 1992-2003 period, Louisiana and Mississippi landings increased, Florida landings decreased, and landing for both Texas and Alabama stayed about the same.

The total nominal dockside value for Mississippi, Alabama, and the west coast of Florida increased during the 1992-2003 period, while the value for Texas increased and Louisiana remained virtually the same (**Figure 7**). Between 1992 and 2003, total nominal dockside value for commercial fisheries landings in the Gulf region increased by approximately 5 percent. During this period, the dockside value for Texas decreased by 7 percent. In contrast, dockside value for Mississippi, Alabama, and the west coast of Florida increased by 53, 8, and 11 percent, respectively.

Mexico and Cuba are two other nations that utilize the fisheries resources of the Gulf of Mexico. Although data revealing the exact amount of Mexican and Cuban fishery landings specifically attributable to the Gulf of Mexico are not readily available, these landings are thought to be significant. Each country possesses fishing fleets that are designed to fish the near-shore waters for high valued species, such as reef fish, shrimp, and spiny lobster. This near-shore fleet became even more important to Cuba as the

Soviet fisheries subsidizations were removed beginning in 1992 and the fisheries management program was subsequently restructured.

Vessels and Boats

The commercial fishing fleet in the Gulf of Mexico is extremely diverse. The harvesting sector is comprised of thousands of craft exhibiting a wide range of sizes, construction types, gear types, and harvest technologies. The Gulf fleet is composed of large open-water shrimp trawlers, purse seiners and long liners outfitted with large freezer holds that make them capable of staying at sea for weeks at a time. In addition, there exists an even larger number of small, near-shore craft that utilize smaller crews and ice holds. These smaller vessels take much shorter trips. Both near shore and open-water craft utilize a wide range of gear types and electronic sophistication.

The Gulf fleet is composed of "vessels" (documented craft greater than 5 net tons of displacement) and "boats" (less than 5 net tons) [U.S. Department of Commerce (1). Louisiana has the largest fleet of both vessels (2,084) and boats (8,874). Florida also has a large fleet of both vessels (1,934) and boats (4,438). The numbers reported for Florida, however, include craft home-ported from both coasts. Thought data for Texas is not available, the total number of vessels and boats for Mississippi and Alabama are 1,365 and 1,775, respectively. A total 20,470 craft were registered within the Gulf region (excluding Texas) during 2002, representing approximately one-third of the nation's entire commercial fishing fleet. Some vessels and boats move around the Gulf region as commercial seasons, weather, and species availability change. In addition, craft registered outside the Gulf periodically move into the region to fish. The values presented above do not account for this movement by the regional fleet.

For some fisheries in the Gulf region, the harvesting sector is considered to be overcapitalized in terms of number of craft and the collective fishing power they posses. This essentially suggests that there is too much investment capital in the production sector of the fishery for it to be operated at maximum economic efficiency, when both private and public economic factors are considered. Recent regulatory and market changes have impacted the number of craft operating in the Gulf region. For example, the number of boats has decreased in the Gulf region due to increased restrictions on the use of near-shore entangling nets. More recently, the number of shrimp trawlers has reportedly decreased due to declining dockside prices and increasing fuel costs. Also, changes in regulations that place further restrictions on allowable gear types, harvest seasons, trip limits and overall harvest quotas are purported to have reduced the numbers of craft operating in the Gulf. The numbers of craft may decrease even more if regulations designed to reduce fishing effort become more stringent and the U.S. seafood market becomes even more dominated by relatively low-cost seafood products.

Major Ports

There were 18 commercial ports in the Gulf region where the volume or dockside value of the seafood offloaded exceeds 10 million pounds or $10 million, respectively, during 2003. The top ten ports (ranked in terms of dockside value) account for one half of the total volume and dockside value for the Gulf (**Table 1**). Four of these ports are in Louisiana, three are in Texas, one in Mississippi, one in Alabama, and one in Texas. The leading port in terms of volume and value is Empire-Venice, LA. The volume offloaded at this port is exceeded only that reported for Dutch Harbor-Unalaska, AK. The value is exceeded only by four other ports in the U.S. [U.S. Department of Commerce (1).

Table 1. Major ports in the Gulf State, 2003

	Pounds Offloaded (lbs)	Dockside Value ($)
Empire-Venice, LA	400.0	50.8
Dulac-Chauvin, LA	39.4	42.3
Key West, FL	15.8	38.4
Brownsville-Port Isabel, TX	17.9	35.9
Galveston, TX	18.6	32.7
Bayou La Batrie, AL	18.5	30.8
Port Arthur, TX	17.5	30.1
Golden Meadow-Leeville, LA	25.5	29.1
Gulfport-Biloxi, MA	17.4	26.8
Cameron, LA	259.0	25.1

Units of one million.

Seafood Processing and Wholesaling

The Gulf region contains a quarter of the U.S. seafood processing plants and wholesaling establishments. The processors generate approximately one-fourth of the total value of the domestic processed fisheries products. The majority of the processing plants are located in Louisiana and Florida (**Figure 8**). Since 1992, the number of processing plants has decreased in every state within the Gulf region. The numbers of processing plants in Louisiana and Florida decreased by approximately 50 percent in each state.

In contrast to the overall decline in the number of processing facilities, the nominal value of processed fishery products has increased (**Table 2**). The total value of processed fishery products in the Gulf region increased from $1.0 billion in 1992 to $1.3 billion in 2003, and increase of 30 percent. The volume of processed fishery products increased by 11%, having decreased steadily since 1999 [U.S. Department of Commerce (1,2)].

Table 2. Volume and value of Gulf region processed fishery products, 1992-2003.		
	Pounds (lbs)	Processed Value ($)
1992	892	1008
1993	1045	992
1994	1189	1064
1995	896	1149
1996	896	1062
1997	1159	1433
1998	1000	1496
1999	1184	1566
2000	1051	1636
2001	1045	1513
2002	1049	1373
2003	989	1298
Units of one million.		

The seafood distribution system in the Gulf region is comprised of a complex network of marketing agents and purveyors. Almost 900 seafood wholesaling establishments were found in the Gulf region during 1992 (**Figure 9**). Of this total, over 40 percent were found in Louisiana. However, since 1992 the number of wholesaling establishments in the region has decreased by almost 40 percent. Virtually all of this contraction has occurred in Louisiana, where the number of establishments decreased by 70 percent between 1992 and 2003. A reduction in the number of wholesaling facilities in Texas and Florida has also occurred. These numbers only refer to primary seafood wholesaling facilities, and do not account for other types of seafood marketing agents, such as those establishments strictly associated with seafood shipping, brokering, and retailing activities.

Although shrimp account for a large portion of the total processed fisheries products value, a wide range of species and product forms are processed in the Gulf region. These some species produced in near-shore aquaculture facilities, such as hard clams and oysters. Some product forms are of local significance. For example, Florida is noted for products such as smoked fish and mullet roe. In addition to fisheries products obtained from the Gulf of Mexico, finfish and shellfish obtained from other regions of the nation, as well as foreign sources, are utilized by Gulf region processors. The Gulf processing and wholesaling industry serves as an important component of product distribution in the U.S. seafood market.

The seafood processing and wholesaling sector also serves as an important source of employment to coastal communities within the Gulf region. In 1992, approximately 13,000 persons were employed annually by these sectors within the Gulf states (**Figure**

10). The majority of employment is associated with the processing sector. These industries serve as an important employment base for many coastal communities, many of which are economically undiversified with few employment alternatives for the local population. However, the employment associated with seafood processing and wholesaling has been declining in the Gulf region. Employment increased from 12,600 in 1992 to about 16,000 in 1995. Employment increased further to almost 17,200 in 1999, but has been declining since. The level of employment in 2002 was almost 15 percent lower than reported for 1999. This has occurred simultaneously with the decline in the number of relatively more labor intensive processing plants.

Marine Sport Fishing

Economic Activity

Marine sport fishing represents an additional regional industry of importance which owes it existence to the Gulf of Mexico ecosystem. The marine sport fishing industry represents an important source of jobs and earnings for many coastal communities, as well as a source of recreational activities for many coastal residents and tourists. The economic impact associated with marine sport fishing is manifested in terms of sales, earnings, jobs, business taxes, and other measures of economic activity (American Sportfishing Association). Retail sales associated with marine sport fishing in the Gulf of Mexico have been estimated to be in excess of $4.3 billion annually (**Table 3**). These expenditures contribute over $2.1 billion in wages and salaries, and create over 87,000 full-time equivalent jobs. Comparable estimates indicate that the economic activity associated with marine sport fishing in the Gulf of Mexico is greater than that in any other federal Regional Fishery Management Council area in the U.S. Among the Gulf region states, the marine sport fishing industry in the entire state of Florida generates more retail sales expenditures and jobs than all other states combined.

Table 3. Economic activity from marine sport fishing in the Gulf region, 2001

State	Retail Sales	Economic Output	Wages & Salaries	Jobs	Sales & Fuel Taxes	State Income Tax	Federal Income Tax
Texas	622	1328	339	13322	39	NA	56
Louisiana	410	746	179	7786	23	4	27
Mississippi	50	98	23	1003	4	1	2
Alabama	236	464	110	5477	13	4	11
Florida	2987	5432	1482	59418	172	NA	240
Total	4305	8068	2133	87006	251	9	336

Units of 1 million (except Jobs, which is expressed in individual jobs).

These economic activity estimates do not include values associated with other types of marine boating activities that are not associated with sport fishing.

Numbers of anglers and trips

The total number of marine sport fishing anglers and trips for the U.S. (excluding Texas) is estimated via the Marine Recreational Fishery Statistics Survey as administered by the National Marine Fisheries Service [U.S. Department of Commerce (1)]. Information for Texas anglers is collected through a separate survey done just for that state [Texas Parks and Wildlife Department]. The Gulf of Mexico region had 9.1 million anglers, who took 34.4 million trips during 2003. The Gulf region accounts for approximately two-thirds of the total number of trips and anglers in the entire Gulf of Mexico and South Atlantic region. More trips were taken by more participants in the Gulf region than in any other regions of the United States (**Table 4**). Florida accounts for the largest share of marine sport fishing anglers (70 percent) and reported trips (80 percent). Louisiana reported more saltwater trips than both Mississippi and Alabama combined. Comparable estimates for Texas trips are not readily available.

Of the total number of participants in marine sport fishing activities in the Gulf region, approximately half were non-residents. These non-residents represent an important source of new revenue for the economies of many coastal communities in the Gulf region. A large portion of the economic activity associated with marine sport fishing as shown in Table 3 is due to non-resident expenditures. These expenditures represent additional dollars to the local economy, which in turn are spent and re-spent by local businesses. The economic impact to coastal economies can be substantial.

Table 4. Marine sport fishing anglers and trips in the Gulf and other U.S. regions, 2003

Region	Anglers			Trips
	Non-Residents	Residents	Total	
Gulf Region				
Florida	3111	3378	6489	27453
Alabama	214	310	524	1500
Louisiana	204	806	1010	4271
Mississippi	48	212	260	1177
Texas	69	791	860	N/A
Total Gulf	3646	5497	9143	34401
South Atlantic	1898	1767	3665	12915
Other	2292	3731	6023	36495
Total US	7836	10995	18831	83811

Units of one thousand. Florida data reflect both coasts.

Of the total number of trips taken by marine sport fishing anglers in the Gulf region during 2003, 61 percent were taken by private/rental boats. In addition, 31 percent of trips were taken from shore-side locations, such as beaches, bridges, or piers. The remaining 8 percent were taken from charter boats / vessels [U.S. Department of Commerce (3)].

Merchant Shipping / Cruise Industry Activity

Merchant Shipping

Waterborne commerce represents yet another major industry that is directly associated with and dependent upon the Gulf of Mexico. Major shipping lanes exist in the Gulf, as well as the protected Intra-coastal Waterway system. Waterborne commerce generates economic activity in coastal communities via the associated maritime port facilities. These facilities provide and important source of employment for many small and large coastal communities.

The volume and value of waterborne commerce has been increasing in the Gulf region (**Figure 11**). The volume and value of water freight has increased since 1998. The total volume (imports and exports combined) has increased from 547 million short tons in 1998 to 596 million short tons in 2003 (U.S. Department of Transportation). The nominal value of these shipments has increased from $101 billion to $152 billion in the same period. In 2003, imports represent a larger share of the total tonnage (73 percent) and a larger share of the nominal value (66 percent).

Maritime shipping is significant along the Mississippi River corridor into the Gulf. Most of this activity along the entire Mississippi River (93 percent) occurs between Baton Rouge, LA and the Gulf. Seventy percent of all U.S. waterborne commerce ton-miles of shipping and 60 percent of all petroleum and petroleum products shipped via waterborne means occur in the Gulf. Recent increases in waterborne commerce transportation in the Gulf have been over twice the national average.

Cruise Industry Activity

Limited information is available for describing the economic activities associated with the cruise ship industry (U.S. Department of Transportation). Within the Gulf region, Tampa, Galveston, and New Orleans are the most important cruise ship ports (**Table 5**). During 2003, approximately 835,000 passengers departed from Tampa on 217 cruise trips. That same year, approximately 754,000 and 725,000 passengers departed on cruise ships from Galveston and New Orleans, respectively. Significantly fewer numbers of passengers departed from Gulfport, MS and Houston.

Table 5. Cruise ship passenger and trips for the Gulf of Mexico ports, 2003		
Port	Number of Passengers	Trips
Galveston	754,364	203
Gulfport	27,574	4
Houston	25,638	8
New Orleans	725,439	176
Tampa	834,945	217
Units of individual passengers and trips.		

Maritime Vessel Construction

A number of shipyards exist in the Gulf region which are actively engaged in producing vessels intended for the commercial, maritime industry. Other manufacturers produce vessels and boats intended for the recreational industry, but this sector of the industry is not addressed. The commercial shipyards within the Gulf region include those identified as major, second-tier, small, aluminum, and inactive/occasional shipbuilders. Of these categories, the most active during the 2000-2003 period has been the aluminum shipbuilders, followed closely by second-tier and small shipbuilders (**Figure 12**). During this period, the number of vessels constructed declined from 150 in 2001 to 116 during 2003 (Colton). A declining trend was seen for most types of shipbuilders.

The sales associated with commercial shipbuilding in the Gulf region during 2001 was reported to be $2.2 billion, which represented 56% of the total sales of the U.S. industry (LECG, 2002). These sales created economic impacts of $4.0 billion within the U.S. economy, created approximately 54,000 jobs, and generated $3.4 billion in personal incomes. Within the Gulf region, Louisiana accounted for the largest share of sales (45 percent), economic impacts (38 percent), job creation (38 percent), and personal incomes (38 percent) (**Table 6**).

Table 6. Economic activity associated with commercial shipyards in the Gulf, 2001.				
State	Sales	Economic Impact	Jobs	Personal Incomes
Alabama	276	513	6967	439
Florida	202	473	6359	404
Louisiana	969	1515	20756	1295
Mississippi	386	616	8430	527
Texas	333	853	11437	729
Total	2166	3970	53950	3394
Units of one million dollars (except jobs that are given as total jobs created).				

Marine Recreational Activities

The broadly defined coastal tourism industry offers a wide range and variety of marine-related recreational activities. These activities are enjoyed by a residents and non-residents within all the Gulf region states. Marine recreational activities include beach visitation, swimming, snorkeling, surfing, personal watercraft use, kayaking, scuba diving, and many others. A recent study by U.S. Department of Commerce, National Ocean Service, identified 19 activities, including marine sport fishing (Leeworthy and Wiley, 2001). The study estimated the percent of the total U.S. population that participated in one or more of these activities, and in what state that participation occurred. Of the U.S. coastal states, Florida had the largest participation rate (10.7 percent), indicating that 10.7 percent of the U.S. population participated in a marine recreational activity in Florida (both coasts). Participation rates for other Gulf states in the study included Texas (3.0 percent), Alabama (1.2 percent), Louisiana (1.1 percent), and Mississippi (0.9 percent). The total number of participants within the Gulf region states was estimated to be 34.7 million individuals. Unfortunately, no comprehensive studies exist that provide insight into the economic values associated with each of the various types of marine recreational activities, by Gulf state. However, participation by individuals who do not live with the coastal county corridor generates true economic impact to those coastal counties. Leeworthy and Wiley (2001) found that across all activity types and U.S. states, 37 percent of participants did not reside in the coastal county(s) where the activity occurred. Though the actual economic impact magnitude is not known, that such economic impact occurs is without question.

Summary

The Gulf of Mexico serves as a reservoir of economic value upon which many marine-related industries within the region are dependent. Some of these industries are engaged in the physical extraction of resources for commercial purposes (i.e., oil / gas, commercial fishing), while others simply utilize the Gulf as entity from which recreational (boating, beach visitation, ecotourism, diving) or logistical (merchant shipping, ports/marinas) value can be obtained. Though not directly addressed in this paper, the Gulf of Mexico is a natural resource that draws people, increasing the pace of coastal development as people wish to live and work in the close proximity to the water, beaches, and estuaries. The economic values associated with the many marine-related industries and activities are significant. A single study providing the overall economic value associated with the Gulf of Mexico has not yet been conducted, though this paper provides economic snapshots of several such key industries and activities. Many others have not been addressed. Increasing demands for the coastal and marine resources provided by the Gulf of Mexico calls for a need for more effective resource management. Only through a better awareness of the changes uses of the Gulf of Mexico, and the economic values associated with these uses, will resource managers, coastal developers, and individual users be able to make wise decisions that will ensure the sustainable utilization of this truly unique natural resource.

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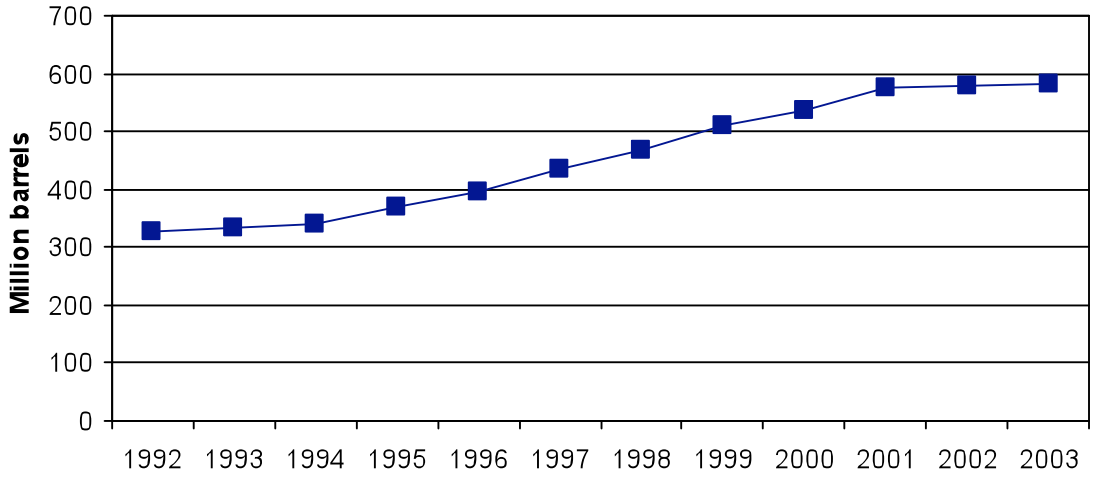

Figure 1. State and federal oil production offshore Louisiana and Texas, 1992-2003

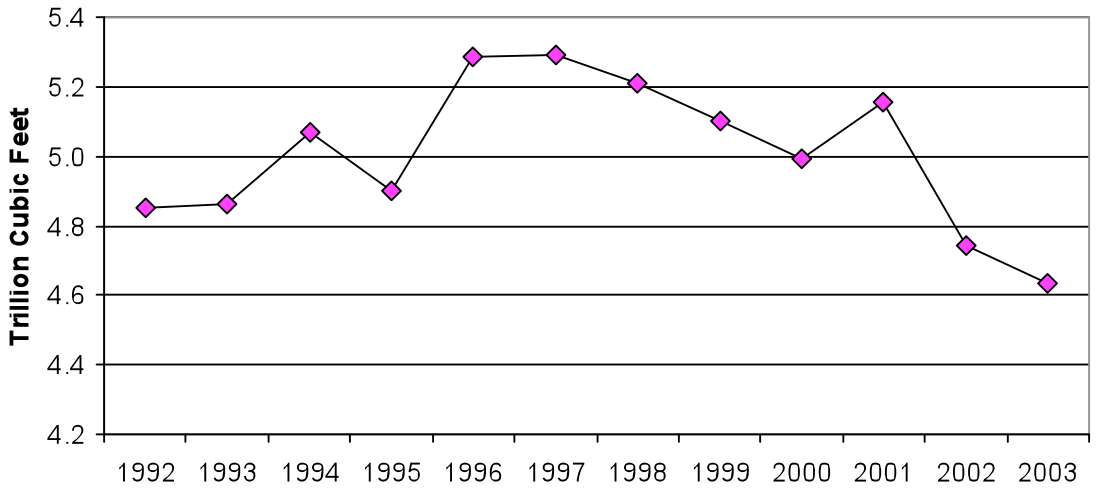

Figure 2. State and federal gas production offshore Louisiana and Texas, 1992-2003

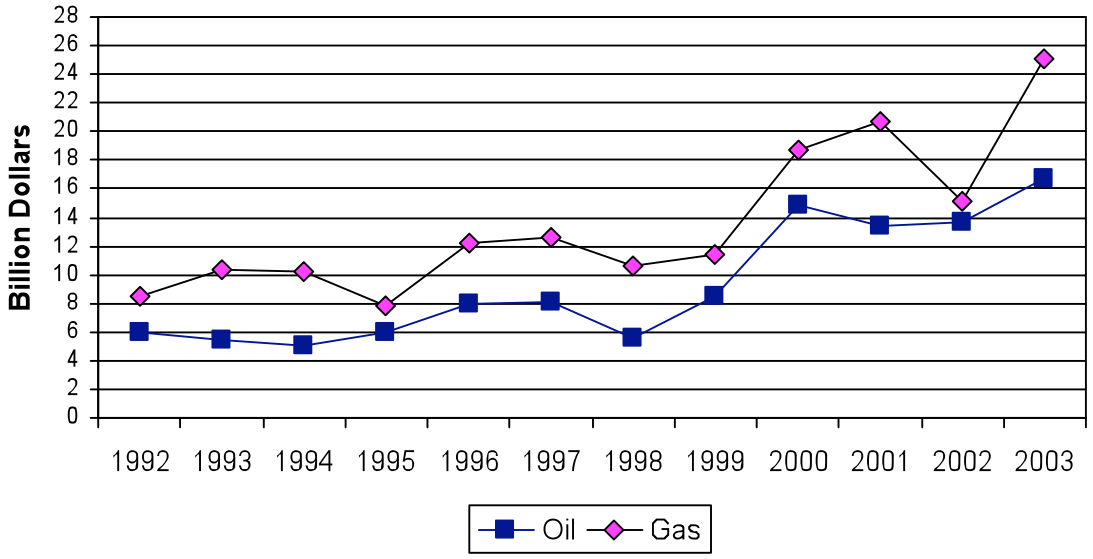

Figure 3. Oil and gas production values for Louisiana and Texas, 1992-2003

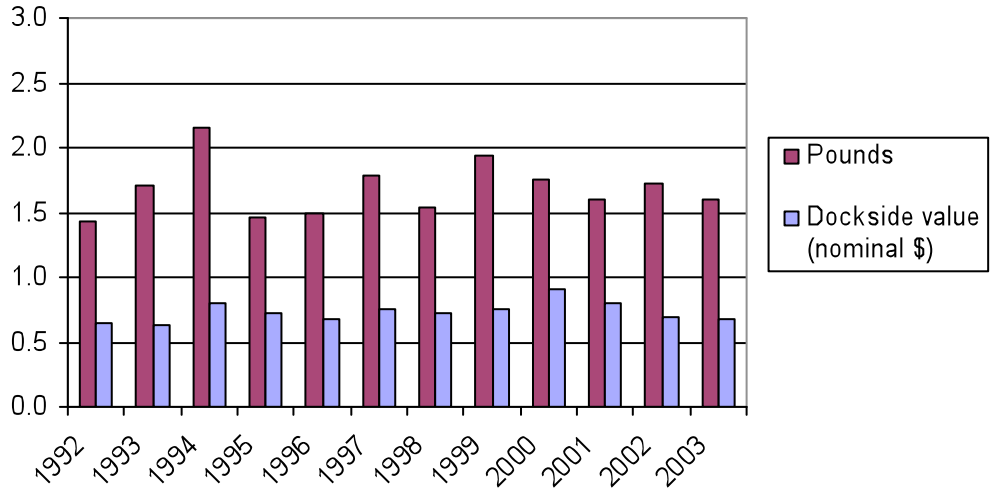

Figure 4. Commercial fisheries landings and nominal dockside value for the Gulf of Mexico, 1992-2003

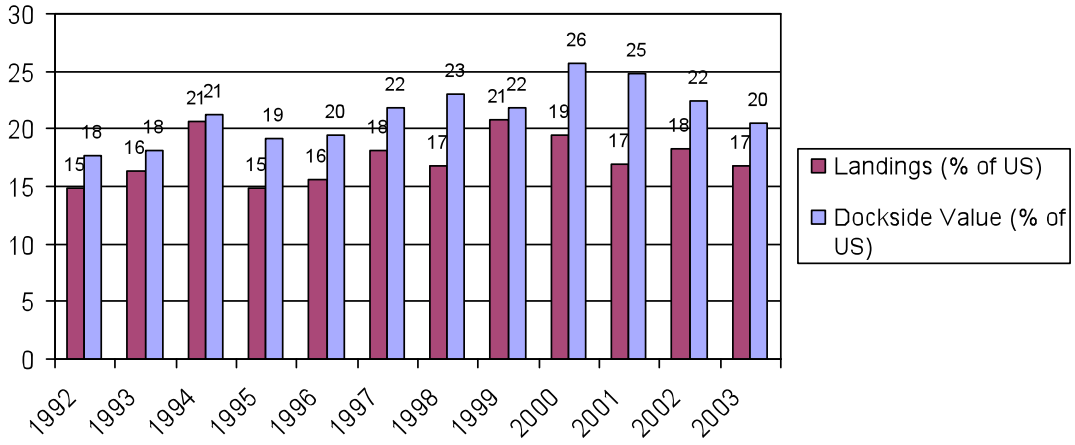

Figure 5. Gulf of Mexico commercial fisheries landings and values as a percent of total U.S.

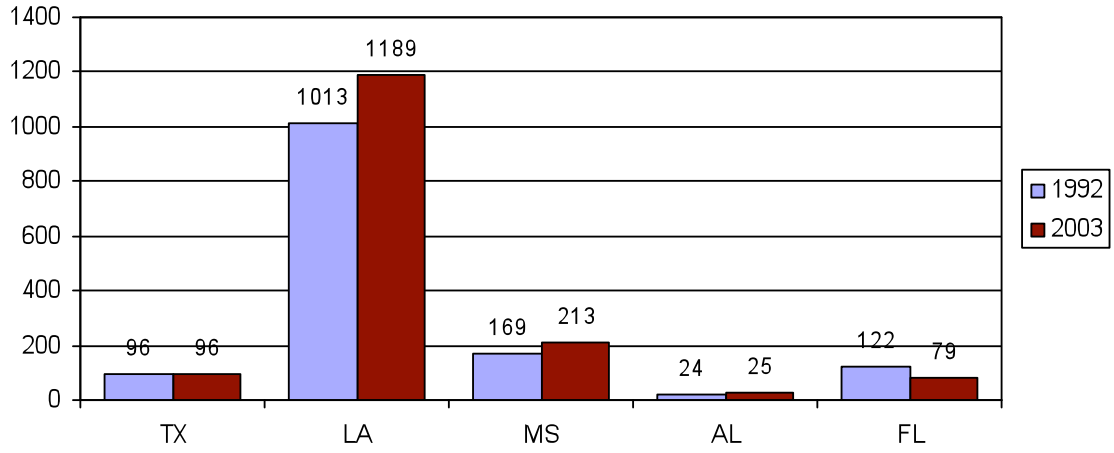

Figure 6. Commercial fisheries landings for the Gulf state, 1992 and 2003

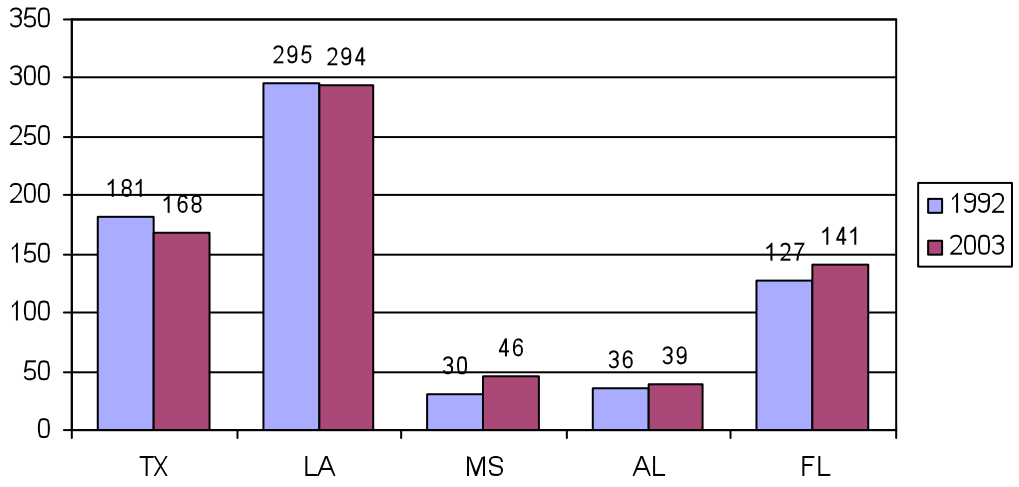

Figure 7. Commercial fisheries dockside value for the Gulf states, 1992 and 2003

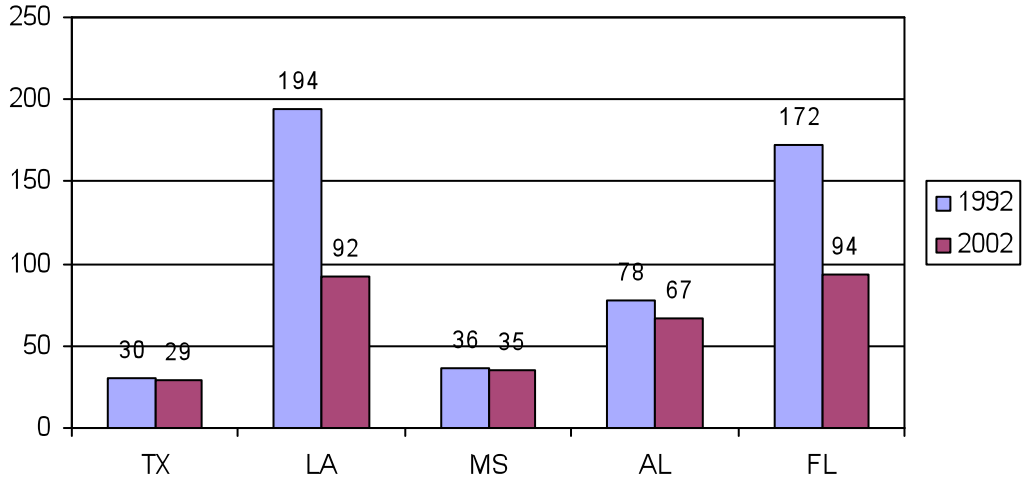

Figure 8. Seafood processing plants in the Gulf states, 1992 – 2002

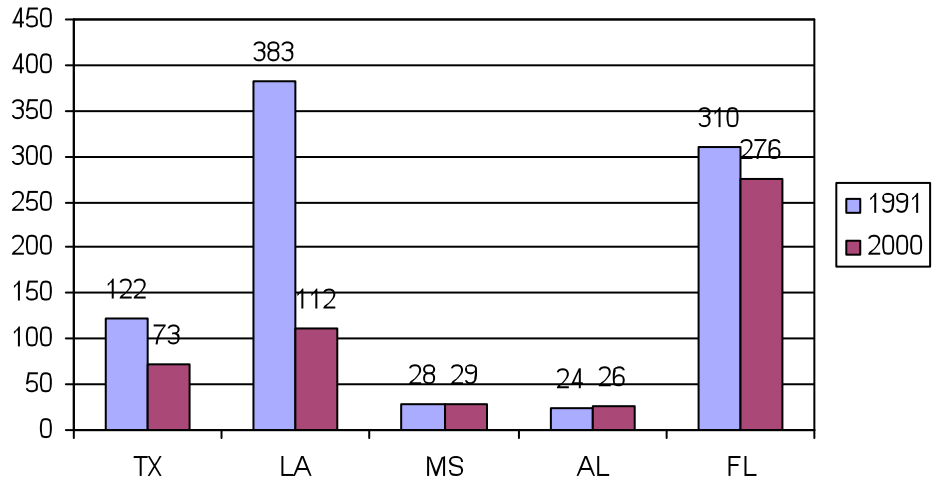

Figure 9. Seafood wholesaling establishmnets in the Gulf states, 1992-2002

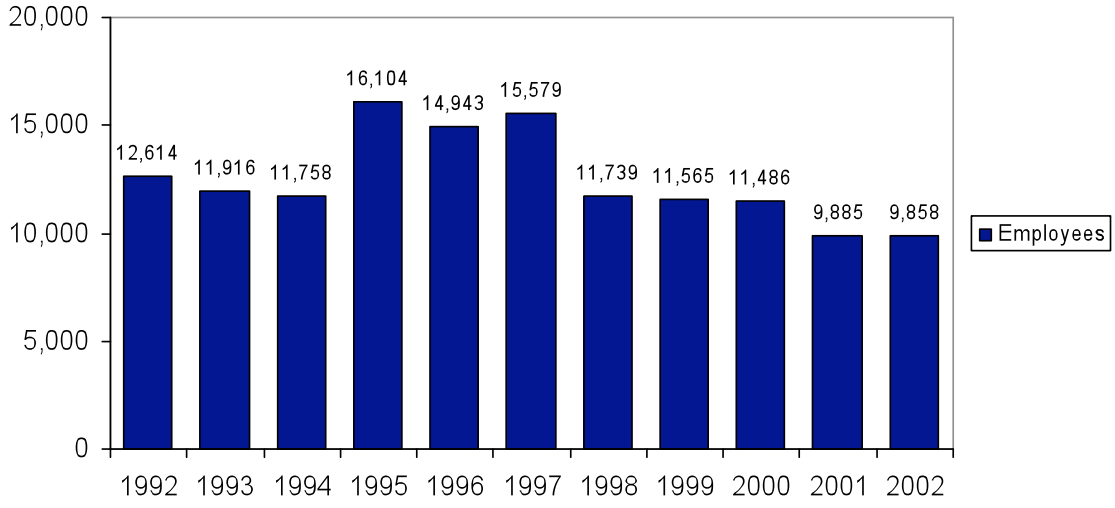

Figure 10. Annual employment associated with seafood processing/wholesaling in the Gulf states, 1992-2002

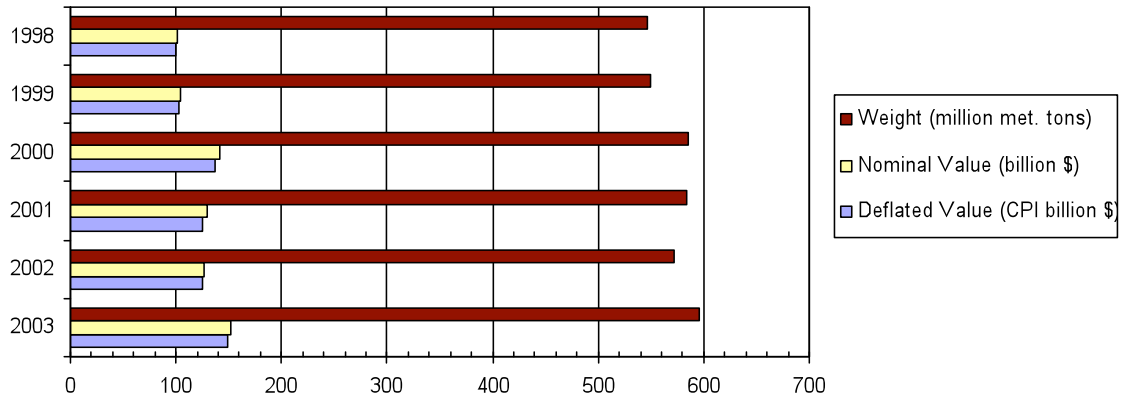

Figure 11. Waterborne commerce (imports and exports combined) for the Gulf Coast district, 1998-2003

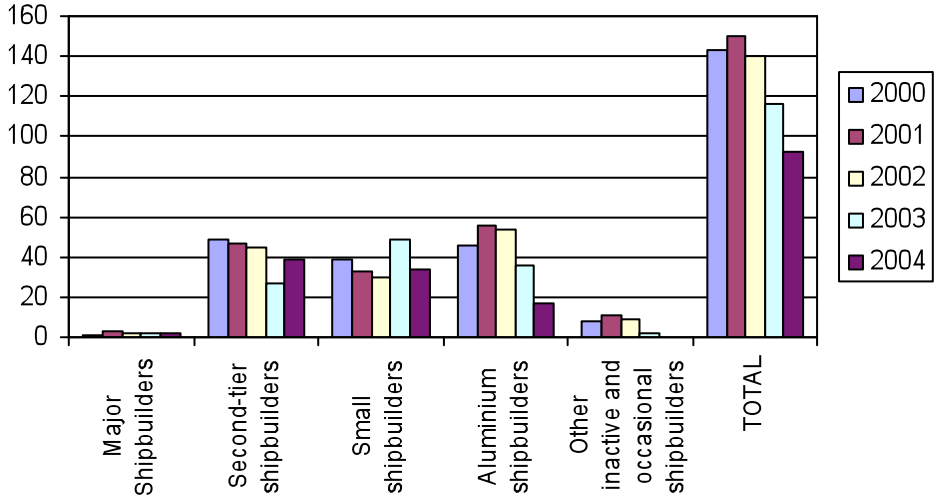

Figure 12. Numbers of commercial ships constructed by Gulf region shipyards, 2000-2004