MARINE ADVISORY

A Review of the Texas Seafood Industry

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Introduction

This is the most recent in a series of publications that began eight years ago with the goal of providing an objective analysis of the seafood industry for decision makers within the seafood industry, the businesses serving the commercial fisheries and policy makers at the local, state and federal levels. The purpose of this report is to examine the status of the Texas seafood industry from an industrywide perspective.

Initially, Texas is compared against the entire domestic seafood industry. Such a comparison contains the least detailed review of conditions, but puts this state in perspective with the nation's other seafood-producing states. As an intermediate step between a national review and an examination of landings and value at the state level, a gulfwide assessment is made. This component of the report considers the composition and landed value of the catch, first by major product category and then by state. Finally, each major element of the Texas seafood production base is discussed.

Data Sources

The information used to assess industry conditions comes from various published works of two agencies charged with managing living marine resources: the National Marine Fisheries Service and the Texas Parks and Wildlife Department. The National Marine Fisheries Service publishes an annual compendium of fisheries-related data in a document called **Fisheries of the United States**. Various issues spanning some 18 years were used to assess the impact of the Texas industry on the national seafood picture.

Cross sectional, time series data (i.e., landings and ex-vessel value categorized by major product category, state, or other parameters through time) used to position Texas within the Gulf of Mexico fisheries were provided by the Research Manage-ment Division at the Southeast Fisheries Center in Miami, Fla., which is part of the National Marine Fisheries Service. Some information may be unavailable from resource management organizations and agencies because of disclosure concerns. Such is the situation within the Gulf of Mexico menhaden fishery. The species typically is harvested for meal and oil, but because so few firms are involved in the harvest of this species, no data are presented. In general terms, however, adding the menhaden harvest would boost certain state's total fisheries landings. In some instances the addition of menhaden would virtually double a state's harvest. However, menhaden are harvested for their ingredients, requiring a process of pressing and drying. Generally when a raw material must undergo steps such as these to convert it to its ultimate market form, the price paid to producers is a small fraction of the price paid by the end user. Such is the case with menhaden, a species that is landed in enormous quantities, but with a fairly small landed value. Though it may boost a state's landings by 90 percent, landed value increases by something on the order of just several percentage points, depending upon the state.

Information about Texas seafood production comes from **Trends in Texas Commercial Fishery Landings, 1972-1994**, an annual publication of the Coastal Fisheries Division of the Texas Parks and Wildlife Department. Landings data reported in this publication utilize the round weight market form for all products except oysters, which are reported on a meat weight basis, with the weight of the shell not considered.

Fisheries data are frequently reported using different market forms of the same product. Resource managers interested in long-term trends typically want data expressed in live weights to quantify harvests on a biomass basis. Conversely, many reports tracking changes in market size for items like shrimp frequently express these quantities on a heads-off basis.

The shell-on, headless form accounts for approximately 60 percent of the weight of a penaeid shrimp. Thus, two reports prepared for different audiences using different market forms of the same data set, could report shrimp landings that vary by 40 percent. Therefore, it is important to understand the market forms used in such reports.

As stated previously, unless otherwise noted, landings of shrimp, finfish and crabs are expressed on a round weight basis, while landings of oysters are expressed on a meat weight basis.

The collection, validation and management of cross-sectional time series data are not trivial tasks. Therefore, a certain amount of lead time is required before such data can be released. While such data are essential to proper resource management and a host of supplementary uses (such as this report), the financial commitment to collect and manage such information seems to be shrinking. The ultimate effect of fewer resources is longer lead times. Thus, the most current information used in this report is 1994.

Texas' Role in the National Seafood Industry

In the 16-year interval between 1979 and 1994, annual U.S. seafood landings have averaged 7.6 billion round weight pounds with an average dockside value of $2.8 billion. The top ten seafood-producing states in descending order are: Alaska, Louisiana, Virginia, California, Mississippi, Massachusetts, North Carolina, Washington, Maine, and Florida (Table 1). During the same 16-year interval, average annual landings from Texas amounted to 99.2 million round weight pounds, or about 1.5 percent of the nation's average annual landings. Texas ranks 14th in seafood production,

Table 1. Hierarchical State Rankings by Production and Landed Value for the Interval 1977—1994

| State	Average Landings (1,000s)	Rank	State	Average Value (1,000s)	Rank
Alaska	2,580,793.1	1	Alaska	933,766.3	1
Louisiana	1,476,732.6	2	Louisiana	259,615.1	2
Virginia	660,518.4	3	Massachusetts	240,744.6	3
California	483,077.4	4	Texas	184,995.3	4
Mississippi	322,205.1	5	California	180,976.6	5
Massachusetts	309,672.1	6	Florida	169,876.1	6
North Carolina	222,225.4	7	Maine	129,049.8	7
Washington	202,080.6	8	Washington	115,678.2	8
Maine	198,296.3	9	Virginia	93,241.6	9
Florida	181,486.6	10	New Jersey	75,362.4	10
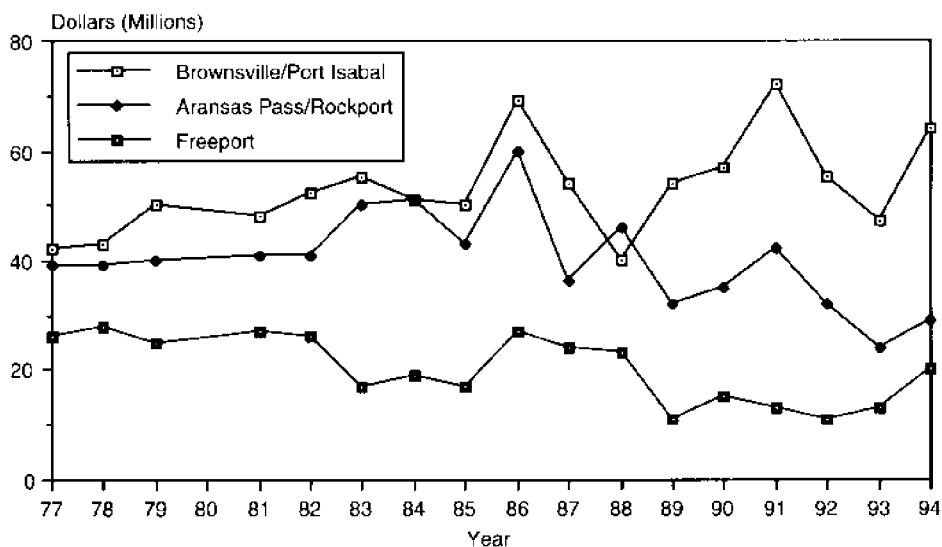
Figure 1. Trends in Annual Ex-Vessel Values of Major Texas Fishing Ports.

Table 2. Five Year Average (1990 —1994) Gulfwide Production and Ex-Vessel Value By Major Product Category

Product Category	Pounds	Value	Pct. Pounds	Pct. Value
Food Finfish	175,457,371	148,338,759	37.0%	23.0%
Oysters	15,883,239	35,656,743	3.3%	5.5%
Shrimp	209,605,299	395,238,664	44.2%	61.4%
Crabs & Lobsters	73,705,919	64,819,965	15.5%	10.1%
Total	474,651,828	$644,054,131	100.0%	100.0%

about the median slot among the other 29 seafood producing states.

When each state is ranked by **landed value** of the catch, however, the hierarchy changes, and Texas ascends to fourth in prominence nationwide. With an average, annual landed value of $185 million, 6.8 percent of total domestic value is attributable to Texas. The primary reason for the disparity between the contribution that production and ex-vessel value makes to national totals is the fact that Texas seafood production is heavily skewed toward large, valuable shrimp harvested from the Gulf of Mexico. One quarter of all domestic shrimp landings and 33¢ out of every dollar's worth of shrimp landed in the United States comes from Texas.

Gulf shrimp is also the reason why virtually all Texas ports (e.g.,Port Arthur, Galveston, Freeport, Aransas Pass-Rockport, and Brownsville-Port Isabel) are annually among the nation's top 30 most valuable commercial fishing ports. Brownsville-Port Isabel was among the top 5 most valuable ports in seven of the last 18 years, and among the top 10 in all but one year. Since 1989, Brownsville-Port Isabel has been the most valuable fishing port south of New Bedford, Mass., and the two Alaskan ports of Dutch Harbor and Kodiak. Aransas Pass-Rockport has ranked within the top 10 most valuable ports in 13 of the last 18 years. One relative newcomer to "major port status" is Palacios. In 1993, that port was ranked 31st, with a landed value of $15.1 million. One year later, landed value was up to $24.5 million, and Palacios became the third most valuable port in Texas, right behind Galveston, and edging out Freeport for the 25th most valuable port in the country. The landed values for Brownsville-Port Isabel, Aransas Pass-Rockport, and Freeport — those ports that are continuously listed in **Fisheries of The United States** — are presented in Figure 1.

A final impact of large, offshore shrimp dominating Texas' production base is a high unit ex-vessel price paid. In fact, among the top 10 valuable seafood-producing states, the aggregate unit price paid to commercial fishermen in Texas is the highest, at $1.87 per pound. This ex-vessel price is six times the national average and twice that of Florida, which is the second highest state among the top 10 (93¢ per pound), in aggregate unit price.

There are three primary reasons for such a high ex-vessel price. First, shrimp (along

with lobsters) are considered "luxury" products and can command higher prices than other protein sources. Second, large shrimp dominate the catch. While Texas shrimp processors can and do add value to these shrimp in a variety of ways (i.e., peeling, breading, cooking, or combinations thereof) once sorted by size, much of the raw, shell-on, headless pack is sold "as is," suggesting that the Gulf of Mexico adds the most "value" to the product. Finally, since Gulf shrimp fishermen remove the heads at sea, the catch is landed in a market form that the consumer can readily use (shell-on, headless). Thus, producers receive a significant proportion of the ultimate retail price.

Texas' Role in the Gulf of Mexico Seafood Industry

In moving from a national to a regional perspective, more detail about landings and ex-vessel value is necessary. This is best accomplished by collapsing fairly detailed cross-sectional, time series data into meaningful, understandable information that highlights the size and composition of the seafood industry across the Gulf states. Within all ecological systems a certain amount of annual variability is inevitable. Fisheries are no exception and harvests fluctuate from year to year. Given this inherent variability, perhaps discussing each year's landings and ex-vessel values separately would be the most accurate method, but the primary objective of this section is to detail the components of the commercial fishing industry gulfwide in "snapshot" fashion. To assess the relative importance of major product categories and states, a five-year average of both landings and ex-vessel value was used. Although the choice of a time interval is somewhat arbitrary, this interval represents both some banner years, as well as some best forgotten.

Production and Landed Value by Major Product Category

On average, the five Gulf states (only the west coast of Florida is considered here) collectively produce 474 million round weight pounds of seafood, worth $644 million (excluding menhaden) (Table 2, Figure 2). Shrimp is the predominant fishery in the Gulf states, and shrimp fishermen produce 210 million pounds of shrimp worth $395 million at the boat level. Shrimp accounts for 44 percent of commercial sea-
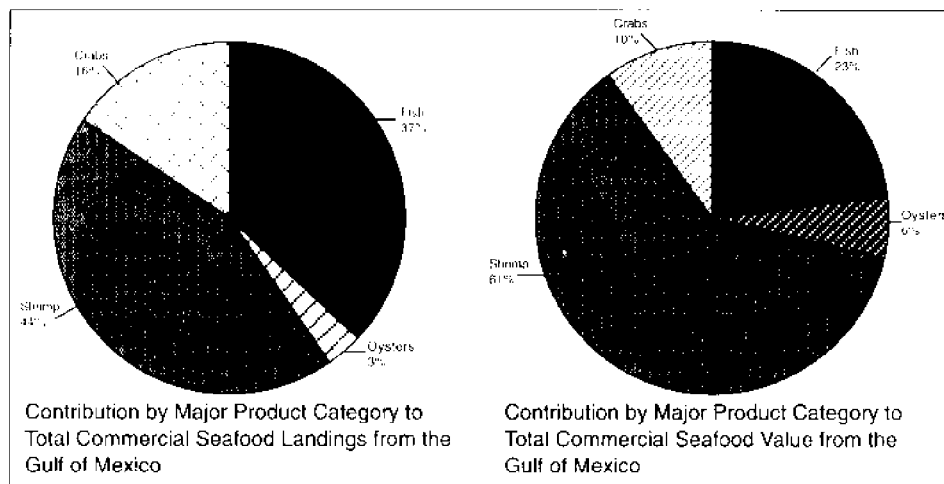

Contribution by Major Product Category to Total Commercial Seafood Landings from the Gulf of Mexico

Contribution by Major Product Category to Total Commercial Seafood Value from the Gulf of Mexico

Figure 2. Five-year Average (1990-1994) Gulfwide Production and Ex-vessel Value by Major Product Category

Table 3. Five-Year Average (1990—1994) Gulfwide Production and Ex-Vessel Value By State

| State | Landings | | Ex-Vessel Value | |
	Pounds	Percent	Value	Percent
Texas	98,744,445	20.8%	191,852,130	29.8%
Louisiana	220,558,658	46.5%	251,378,412	39.0%
Mississippi	20,454,398	4.3%	24,421,644	3.8%
Alabama	21,326,595	4.5%	37,384,228	5.8%
Florida	113,567,732	23.9%	139,017,717	21.6%
Total	474,651,828		$644,054,131	

Individual State Contributions to Gulf States Seafood Landings

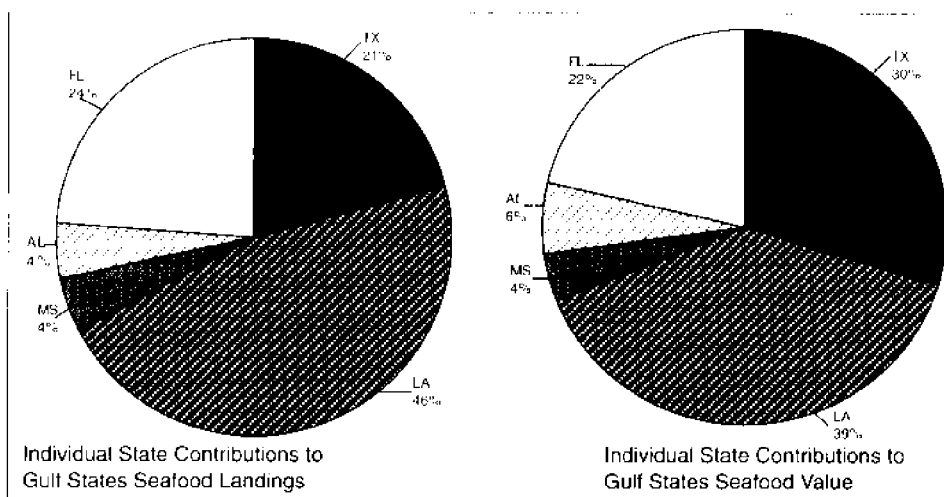Individual State Contributions to Gulf States Seafood Value

Figure 3. Five-year Average (1990-1994) Gulfwide Production and Ex-vessel Value by State

food landings in the Gulf, but because of its high unit value, shrimp is responsible for 61 percent of total Gulf landed value.

Production and Landed Value by State

On the basis of production, Louisiana is the major seafood-producing state in the Gulf, with average production of 221 mil-

lion pounds, worth $251 million, per year. Texas ranks third behind Florida in production, but second among the five Gulf states in landed value (Table 3, Figure 3).

A Detailed Examination of Shrimp Production and Value

Texas and Louisiana are responsible for an average of 81 percent of the Gulf shrimp
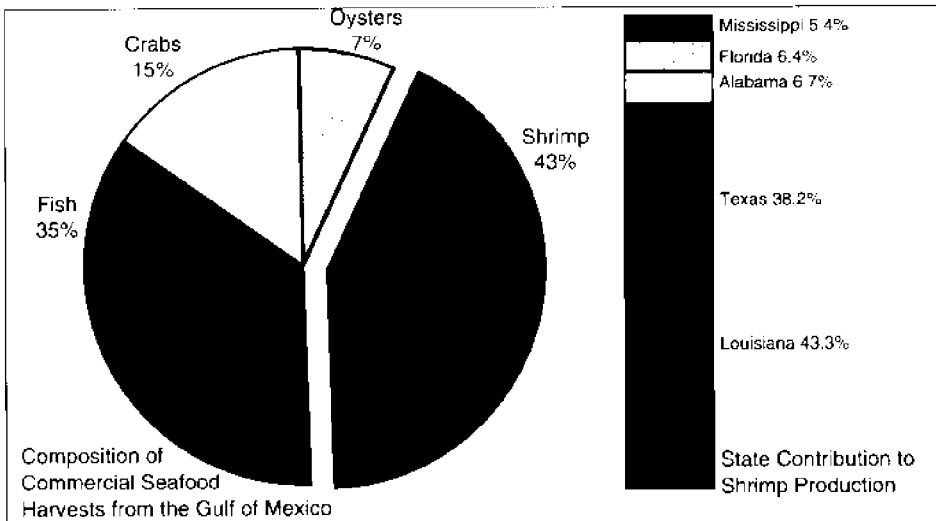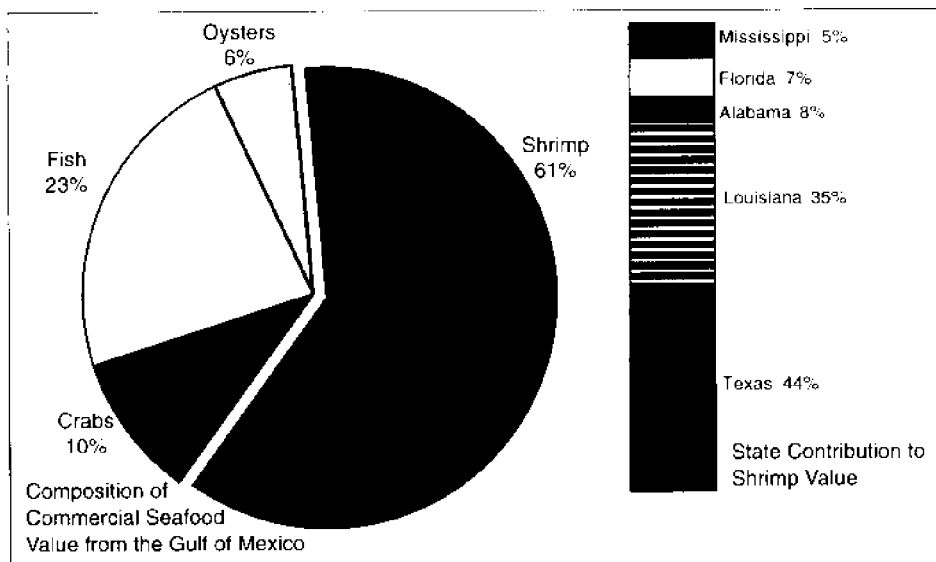
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Figure 4. Contribution Made by Each State to Gulfwide Shrimp Production

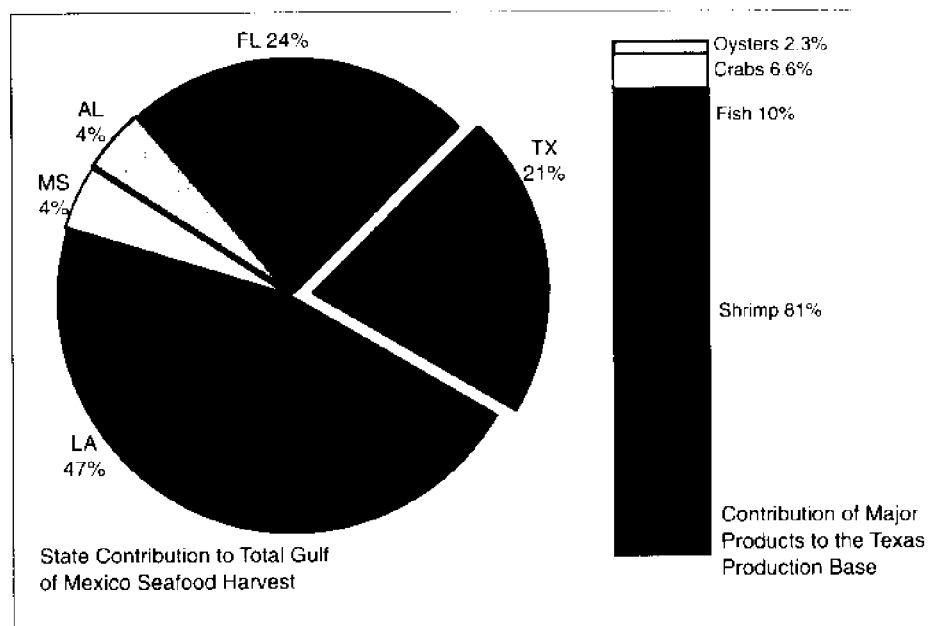Figure 5. Contribution Made by Each State to Gulfwide Ex-vessel Shrimp Value

Figure 6. Annual Average Components of the Texas Seafood Production Base by Major Product Category (1990-1994)

Table 4. Contribution Made by Each State to Gulfwide Shrimp Production

State	Pounds	Percent Pounds
Texas	80,106,423	38.2%
Louisiana	90,830,581	43.3%
Mississippi	11,240,291	5.4%
Alabama	14,016,008	6.7%
Florida	13,411,995	6.4%
Total	209,605,298	100.0%

Table 5. Contribution Made by Each State to Gulfwide Ex-Vessel Shrimp Value

State	Value	Pct. Value
Texas	173,212,513	43.8%
Louisiana	139,298,308	35.2%
Mississippi	21,285,286	5.4%
Alabama	32,492,000	8.2%
Florida	28,950,556	7.3%
Total	$395,238,663	100.0%

Table 6. Contribution Each Major Product Category Makes to Total Seafood Production from Texas

Product Category	Pounds	Percent Pounds
Food Finfish	9,866,453	10.0%
Oysters	2,264,003	2.3%
Shrimp	80,106,423	81.1%
Crabs and Lobsters	6,507,566	6.6%
Total	98,744,445	100.0%

Table 7. Contribution Each Major Product Category Makes to Total Landed Value of Seafood Production from Texas

Product Category	Value	Percent Value
Food Finfish	11,068,769	5.8%
Oysters	4,773,665	2.5%
Shrimp	173,212,513	90.3%
Crabs and Lobsters	2,797,183	1.5%
Total	$191,852,130	100.0%

harvest per year. Louisiana fishermen produce an average of about 91 million round weight pounds of shrimp, or 43 percent of the total Gulf shrimp catch, while the Texas shrimp harvest averages 80 million pounds (38 percent) (Table 4, Figure 4).

Although Louisiana lands about 10 million more pounds of shrimp than Texas, the composition of the catch varies significantly between the two states. While the majority of the Texas shrimp harvest occurs offshore, most of the Louisiana catch is taken from inshore waters, suggesting a catch comprised of smaller, less valuable shrimp. The large shrimp produced off Texas result in an average annual landed value of $173 million, which is $33 million **more** than the Louisiana shrimp harvest (Table 5, Figure 5).

Between 1990 and 1994, Texas fishermen annually produced an average of 98.7 million round weight pounds of seafood worth and average of $192 million. Texas accounted for 21 percent of the landings (Table 6, Figure 6) and 30 percent of the ex-vessel value (Table 7, Figure 7). Shrimp is the kingpin in the Texas seafood economy, accounting for an average of 81 percent of the total seafood production and 90 percent of the landed value. Food finfish production averaged 9.8 million round weight pounds between 1990 and 1994, comprising 10 percent of Texas' average annual landings. Crabs accounted for an yearly average of 6.5 million round weight pounds and oysters accounted for an average of 2.3 million meat weight pounds.

With the exception of Florida, shrimp is the single biggest contributor to the production base and landed value of every Gulf state. Although much smaller in both production and landed value, Mississippi and Alabama resemble Texas in terms of the contribution made by major product category.

It has been stated repeatedly that shrimp is the keystone of the Texas seafood industry. Gulf shrimp accounts for 65 percent of the state's landings and 81 percent of the total landed value.

Unlike virtually all other fisheries in North America, penaeid shrimp are an an-

Figure 7. Average Annual Components of the Value of the Texas Seafood Production Base by Major Product Category (1990-1994)

nual crop. This means that shrimp complete their life cycle within 12 to 16 months. Shrimp spawn offshore and the free-floating larvae are washed into the coastal bays during late winter. While in the bays, shrimp mature and grow, particularly as the water warms. In the summer, shrimp begin their migration back into the Gulf of Mexico. Once in the Gulf, shrimp grow rapidly. It is generally recognized that ecological conditions within the coastal bay complex determine annual abundance. Perhaps the best evidence of this phenomenon is a review of two consecutive years: 1966 and 1967. Over the last 34 years, Texas shrimp production has averaged roughly 50 million pounds (shell-on, headless market form). In 1966, just 26 million pounds were produced, roughly half of the average landings. But in 1967 shrimp production was 65 million pounds, a record that has yet to be broken. Apparently, the right combination of tides, water temperature and rainfall coincided at a critical time in 1967 and production soared.
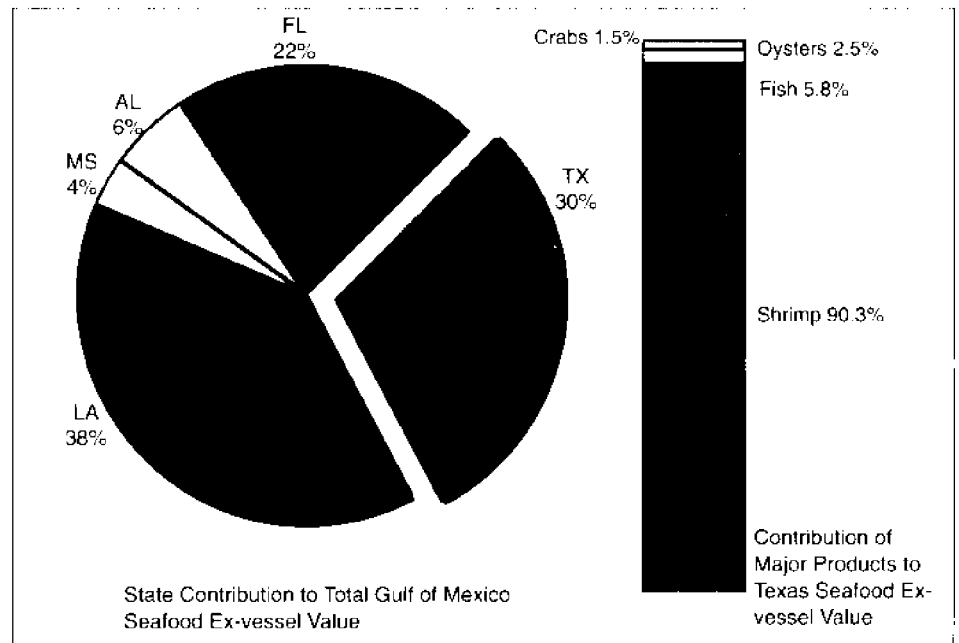
Between 1978 and 1994 Texas shrimp production averaged 81.3 million round weight pounds, valued at an average of $166 million (Table 8, Figure 8). Gulf shrimp production accounts for 78 percent of average annual shrimp landings, but because larger-sized, more valuable shrimp are harvested, Gulf shrimp comprises 87 percent of total landed shrimp value.

In a fishery where the unit ex-vessel price is several dollars per pound and the

price is dependent upon the size of the shrimp, changes in the composition of the harvest, changes in the general prices offered to shrimp fishermen, or combinations thereof, can have an enormous effect on landed value. In 1991, for example, landings increased by 4 million round weight pounds over 1990, but landed value jumped by $21 million. A review of conditions at that time suggests that ex-vessel prices were **slightly** above those from 1990. However, the larger contributor to the boost in shrimp value was the composition of the catch. In 1991, a greater proportion of large shrimp were landed due to favorable ecological conditions in the bays. On the other hand, in 1994 production was 2.6 million round weight pounds below 1993, but landed value was almost $50 million above 1993. In this case, the prices offered were substantially higher than those in 1993. Prices were as high as a dollar above 1993 levels in some count sizes.

Of course, high unit prices are good news for producers, but a significant concern for processors who must balance their need for raw materials — most of which is produced in the third quarter of the year — against demand and the inevitable softening of prices. Because shrimp prices constantly fluctuate, most shrimp processors utilize various techniques to minimize the impact of fluctuating inventory values, including breading (so that less than a pound of shrimp goes into a pound of breaded product), peeling (which returns a higher

Table 8. Annual Production (round weight) and Ex-Vessel Value of Shrimp from the Coastal Bay Complex and the Gulf of Mexico

| Year	Bay Pounds	Bay Value	Gulf Pounds	Gulf Value	Total Pounds	Total Value
78	13,382,594	12,610,935	70,744,100	118,370,000	84,126,694	130,980,935
79	15,222,051	17,206,893	52,430,700	135,135,000	67,652,751	152,341,893
80	14,849,248	16,899,083	59,048,400	123,144,200	73,897,648	140,043,283
81	13,252,254	11,391,201	82,478,000	153,928,600	95,730,254	165,319,801
82	14,273,722	18,589,274	56,611,900	157,342,300	70,885,622	175,931,574
83	18,083,548	24,630,735	53,910,200	146,813,100	71,993,748	171,443,835
84	22,228,738	22,276,082	68,007,600	157,254,200	90,236,338	179,530,282
85	16,282,468	15,322,221	65,958,000	146,060,500	82,240,468	161,382,721
86	20,451,442	24,304,774	76,552,500	203,805,400	97,003,942	228,110,174
87	23,691,910	27,270,813	69,810,900	158,679,700	93,502,810	185,950,513
88	19,381,233	22,017,450	60,673,700	144,898,300	80,054,933	166,915,750
89	13,445,939	13,014,598	63,055,500	131,074,800	76,501,439	144,089,398
90	22,713,723	29,531,200	64,397,600	136,831,600	87,111,323	166,362,800
91	21,920,324	27,037,364	69,188,600	160,622,400	91,108,924	187,659,764
92	19,657,281	25,680,193	57,201,000	123,968,300	76,858,281	149,648,493
93	18,497,507	19,812,108	55,117,800	111,187,300	73,615,307	130,999,408
94	20,933,008	32,684,806	50,059,500	148,044,400	70,992,508	180,729,206
Avg.	18,133,352	$21,192,925	63,249,765	$144,538,829	81,383,117	$165,731,755
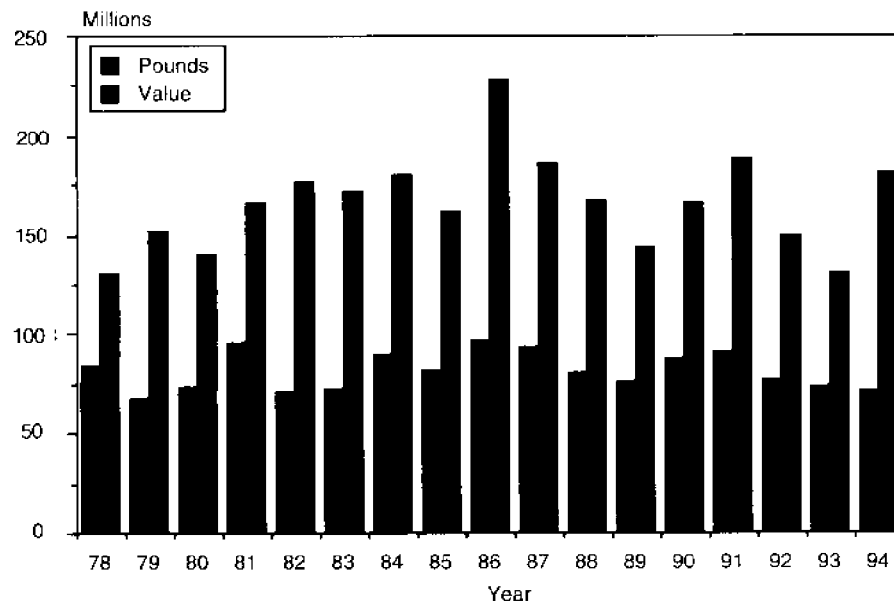
Figure 8. Annual Landings (round weight) and Ex-vessel Value of Shrimp

gross margin) and other custom processing services that allow "niche" marketing. New markets, such as the retail food sector, also benefit the processor who, in conjunction with the retailer, can market shell-on, headless shrimp that is comprised of two count sizes, thereby creating a "customized" price point for a given trading area.

Oysters

The Texas oyster harvest is comprised of production from public reefs and leased bay bottom. Oyster season on the public reefs opens November 1 and lasts until the end of March. In addition to open and closed seasons, which are determined by the Texas Parks and Wildlife Department, an additional regulatory structure is in place that seeks to protect public health. Therefore, even though oyster season is in progress, the Texas Department of Health may close selected bays, or parts thereof, if bacterial indicators reach threshold levels. Once these indicator organisms fall below trigger values, the water bodies are reopened for harvesting. Although leaseholders can work their leases year-round, they must still abide by public health mandates.

Between 1978 and 1994, annual oyster production averaged 3.2 million pounds of meats per year, with an average ex-vessel value of $5.8 million (Figure 9 [note the scale change from Figure 8]). Favorable conditions in 1983 resulted in a record 8 million pound harvest worth a record $11.3 million. In 1994, the most recent year on record, 4.6 million pounds of meat were landed with a value of $7.9 million.

An average of 72 percent of all Texas oysters are harvested from Galveston Bay (Table 9). An important contributing factor to such a large percentage is the existence of leaseholds. These leaseholds are only available in Galveston Bay and allow the leaseholder to harvest from private reefs. San Antonio Bay is the second-most important oyster-producing water body within the coastal bay complex, with landings accounting for roughly 17 percent of the statewide total.

Blue Crabs

The blue crab harvest is a distant second to shrimp in weight and value, averaging roughly 8 million pounds each year and worth an average of $3 million (Figure 10). The ex-vessel value is relatively low compared against most seafood products from Texas, but because much of the blue crab harvest is cooked and picked — as opposed to being sold live — processors must factor in meat yield, processing charges and current market prices in determining how much to pay fishermen. The meat yield from the whole crab is about 14 percent, so for every 1¢ increase in the price paid for live weight crabs, the meat price increases by about 7¢. Even so, the price paid to crab producers has been increasing over time, reaching a recorded high at 59¢ per pound in 1994.

Virtually all blue crabs (99.7 percent) are harvested from the coastal bay complex (Table 10). The crab harvest is more evenly distributed than the oyster harvest, with San Antonio Bay, on average, responsible for 28 percent of annual statewide landings.

Food Finfish

Food finfish is the smallest of the major seafood categories, contributing an average of 3.3 million pounds (round weight), worth $3.1 million annually (Figure 11). Aside from shrimp, food finfish are the other major product category harvested from both the coastal bay complex and the Gulf of Mexico. But unlike shrimp, the species targeted in the coastal bay complex and the Gulf are different. Between 1972 and 1982, black drum, sheepshead and flounder averaged just 26 percent of the bay finfish catch. However, once the 1981 ban on the commercial harvest of red drum and spotted sea trout went into effect, black drum, sheepshead, and flounder comprised 92 percent of the annual, average catch. Roughly 30 percent of finfish produced in the coastal bay complex comes from the Laguna Madre. Almost 40 percent of the Texas finfish harvest comes from the Gulf of Mexico, but the composition of Gulf harvests — 60 percent snapper and grouper — boosts the proportion of landed value to 58 percent of total finfish value (Table 11). Because of these dominant species, the computed ex-vessel price per pound for Gulf finfish is generally about twice that of the bay finfish catch.
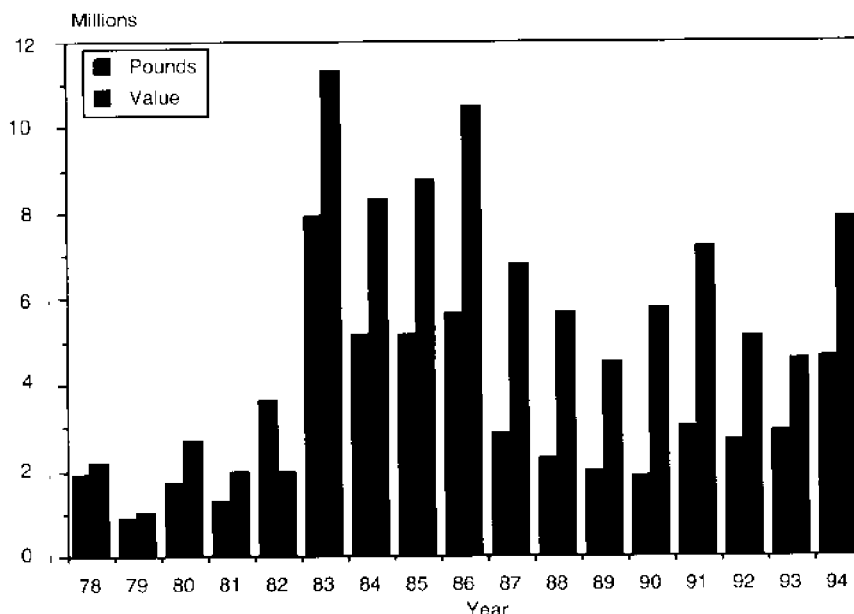

Figure 9. Annual Landings (meat weight) and Ex-vessel Value of Oysters

Table 9. The Contribution Individual Water Bodies Make to Average Oyster Production and Ex-Vessel Value (1978-1994)

Water Body	Landings		Ex-Vessel Value	
	Pounds	Percent	Dollars	Percent
Gulf of Mexico	0	0.0%	0	0.0%
Sabine Lake	59	0.0%	116	0.0%
Galveston Bay	2,352,221	72.1%	4,366,514	74.5%
E. Matagorda Bay	8,869	0.3%	15,070	0.3%
Matagorda Bay	234,346	7.2%	396,645	6.8%
San Antonio Bay	543,241	16.6%	864,712	14.8%
Aransas Bay	116,946	3.6%	209,746	3.6%
Corpus Christi Bay	53	0.0%	185	0.0%
U. Laguna Madre	41	0.0%	116	0.0%
L. Laguna Madre	8,734	0.3%	7,706	0.1%
Total	3,264,510		$5,860,810	

Table 10. The Contribution Individual Water Bodies Make to Average Blue Crab Production and Ex-Vessel Value (1978-1994)

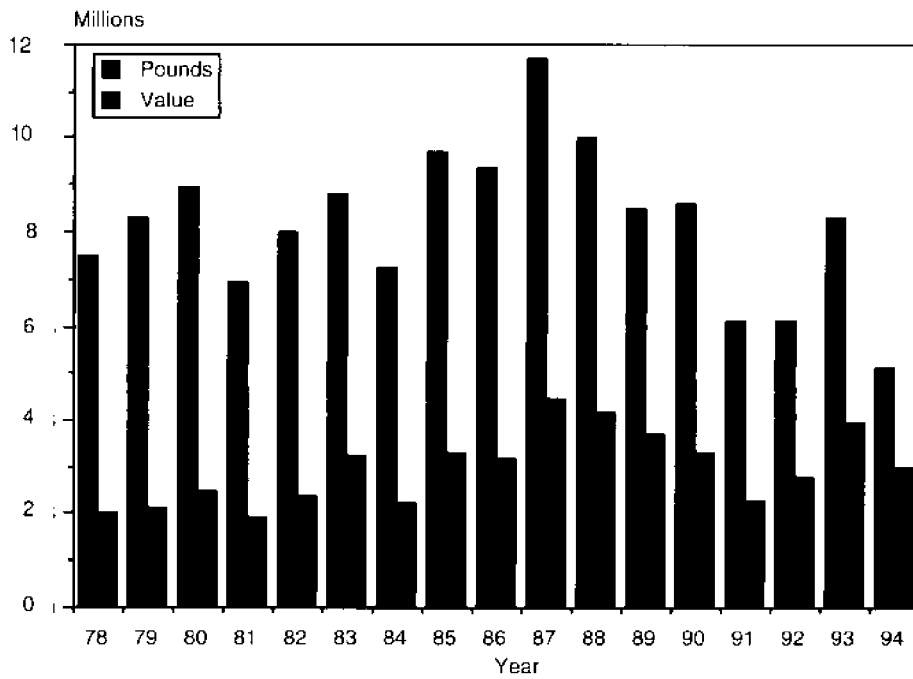| Water Body	Landings		Ex-Vessel Value	
	Pounds	Percent	Dollars	Percent
Gulf of Mexico	26,235	0.3%	11,076	0.4%
Sabine Lake	552,829	6.7%	210,631	7.1%
Galveston Bay	1,846,147	22.5%	726,503	24.4%
E. Matagorda Bay	207,589	2.5%	62,869	2.1%
Matagorda Bay	949,243	11.6%	388,716	13.1%
San Antonio Bay	2,339,568	28.5%	778,985	26.2%
Aransas Bay	1,649,811	20.1%	551,419	18.6%
Corpus Christi Bay	313,826	3.8%	137,686	4.6%
U. Laguna Madre	78,236	1.0%	34,282	1.2%
L. Laguna Madre	235,308	2.9%	69,710	2.3%
Total	8,198,791		$2,971,878	

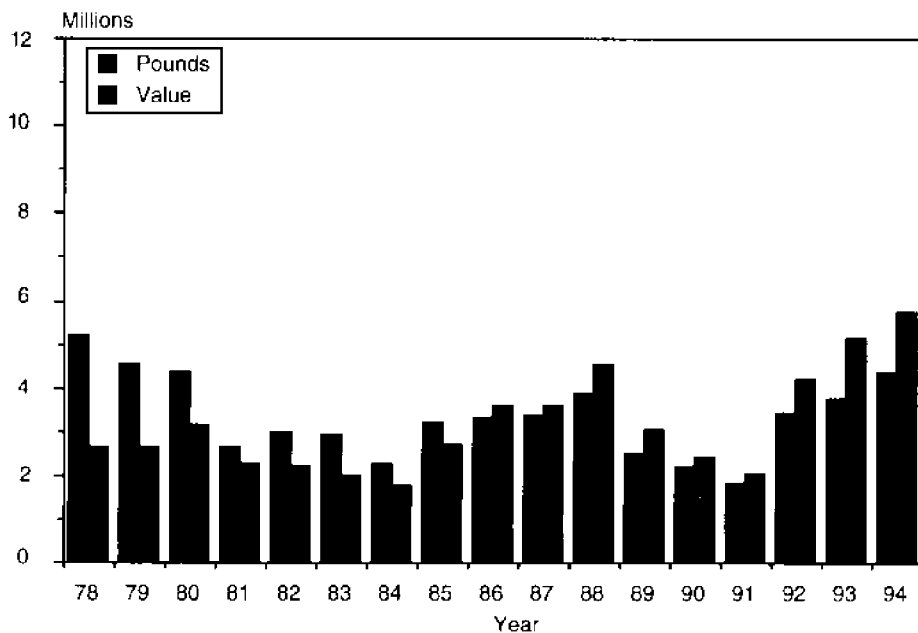Figure 10. Annual Landings (round weight) and Ex-vessel Value of Blue Crabs

Figure 11. Annual Landings (round weight) and Ex-vessel Value of Food Finfish

Table 11. The Contribution Individual Water Bodies Make to Average Food Finfish Production and Ex-Vessel Value (1978—1994)

Water Body	Landings		Ex-Vessel Value	
	Pounds	**Percent**	**Dollars**	**Percent**
Gulf of Mexico	1,288,582	38.6%	1,841,388	58.2%
Sabine Lake	4,018	0.1%	3,504	0.1%
Galveston Bay	396,051	11.9%	192,346	6.1%
E. Matagorda Bay	11,005	0.3%	9,000	0.3%
Matagorda Bay	58,685	1.8%	29,918	0.9%
San Antonio Bay	63,254	1.9%	49,274	1.6%
Aransas Bay	159,889	4.8%	128,978	4.1%
Corpus Christi Bay	359,109	10.8%	233,567	7.4%
U. Laguna Madre	513,270	15.4%	356,958	11.3%
L. Laguna Madre	484,877	14.5%	319,372	10.1%
Total	3,338,740		$3,164,305	

The Impact of Ceasing Freshwater Inflows to Conserve Sharply Reduced Municipal Water Supplies

Availability of adequate fresh water is a common, cyclical concern in South Texas. While releases of fresh water are mandated in the regional water plan, such releases cease when reservoirs reach certain threshold levels in deference to conservation for municipal (human) uses. Yet throughout the discussion about shrimp, reference has been made to the fact that ecological conditions such as water temperature, salinity in the bays, and the availability of food determine annual abundance. Obviously, one concern stemming from the lack of rainfall and thus the ending of fresh water releases is the effect this will have on the commercial shrimp harvest.

Shrimp landings data for Corpus Christi Bay suggest that fresh water — either too much or too little — may be less important than other parameters in shrimp production. Between 1972 and 1994, shrimp landings from Corpus Christi Bay have averaged 1.8 million pounds (round weight), with a standard deviation of 915,000 pounds (Table 12, Figure 12).

The two production peaks within this 23-year time series occurred in 1984 and 1992. In 1984, supplies of fresh water were so tight that the City of Corpus Christi implemented a stringent mandatory water rationing program whereby a two-person household was allotted only 6,000 gallons per month. Shrimp production that year in Corpus Christi Bay was 3.9 million pounds, the maximum annual harvest in 23 years. Eight years later in 1992, the abundance of freshwater in Corpus Christi Bay made the headlines. From February through July of that year, salinity of Corpus Christi Bay averaged about 2.5 parts per thousand — about one-tenth of the long term average (29 parts per thousand) — which was fresh enough to water livestock. Yet 3.7 million pounds of shrimp were harvested in 1992, the second largest harvest in 23 years.

As a normal course of their life history, shrimp must tolerate salinity variations as they move between a brackish coastal bay complex and the open Gulf of Mexico. A review of these landings data makes it difficult to use freshwater, or the lack thereof, as the sole parameter for determining annual abundance. If anything, landings data suggest that annual shrimp abundance results from the interplay among the parameters of:

- Spawning stock in the Gulf of Mexico;
- Favorable conditions for allowing the post larval shrimp spawned offshore to wash into the coastal ay complex;
- The availability of food for these post larval and subadult shrimp;
- Bay water temperature; and
- Salinity.

Table 12. Annual Shrimp Landings from Corpus Christi Bay (round weight pounds)

| Year	Brown & Pink	White	Other	Total
72	51,842	324,846	0	376,688
73	396,221	873,026	0	1,269,247
74	150,052	292,026	0	442,088
75	482,839	461,076	0	943,915
76	397,220	410,269	0	807,489
77	738,572	567,956	0	1,306,528
78	910,075	521,680	0	1,431,755
79	1,166,697	1,052,891	0	2,219,588
80	1,469,014	400,763	0	1,869,777
81	1,149,681	336,542	0	1,486,223
82	708,245	400,062	0	1,108,307
83	1,1135,421	466,130	0	1,601,551
84	2,393,305	1,511,141	0	3,904,446
85	1,404,056	274,707	0	1,678,763
86	993,964	611,059	0	1,605,023
87	1,309,794	764,332	0	2,074,126
88	981,943	463,379	0	1,445,322
89	895,123	88,119	0	983,242
90	1,976,752	1,344,956	0	3,321,708
91	2,415,302	990,209	331	3,405,842
92	2,441,301	1,238,485	0	3,679,786
93	1,526,056	675,493	0	2,201,549
94	2,007,885	421,509	0	2,429,394
Avg.	1,178,320	630,029	14	1,808,363
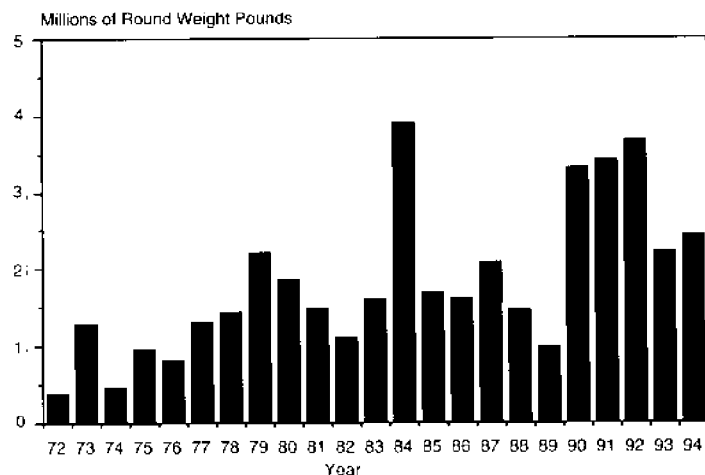
Figure 12. Annual Shrimp Landings from Corpus Christi Bay (round weight pounds)

Summary and Conclusions

The intent of this report has been to encapsulate a variety of cross-sectional, time series information to present a sketch, or profile, of the Texas seafood industry and examine how Texas fits into the national and regional fisheries economy.

Texas ranks fourteenth in production, but fourth among all states in the landed value of the catch. Texas seafood production comprises about 1.5 percent of domestic seafood landings (for both food and industrial uses), but 6.8 percent of total domestic ex-vessel value. The primary reason for the disparity between landings and ex-vessel value is fact that seafood production is heavily skewed toward large, valuable shrimp harvested from the Gulf of Mexico. One-fourth of all domestic shrimp landings and 33¢ out of every dollar's worth of shrimp landed in the United States come from Texas.

Not surprisingly, several ports along the coast are among the highest valued commercial fishing ports in the country. Historically, Brownsville-Port Isabel and Aransas Pass-Rockport have been among the top ten most valuable fishing ports nationwide. Brownsville-Port Isabel is easily the most valuable fish port in the Gulf, and eclipsed only by New Bedford, Massachusetts and the two Alaskan ports of Dutch Harbor and Kodiak. Palacios is a rising star among the nation's fish ports, currently ranked twenty-fifth.
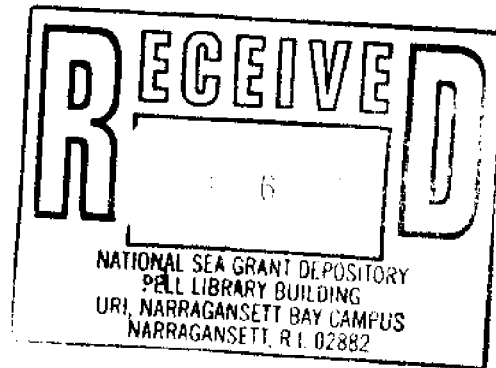
Gulfwide, Texas fishermen produce 20 percent of the seafood harvest, but 30 percent of the catch. Gulf shrimp dominates the Texas seafood production base, accounting for 66 percent of landings but 81 percent of ex-vessel value.

Galveston Bay is easily the state's most valuable commercial estuary, on average producing nine million pounds of seafood, valued at $11 million. Importantly, the coastal bay complex is much more valuable than the landings data suggest, because penaeid shrimp spend a portion of their life cycle within the protection of the coastal bay systems. Estuarine conditions are key to the annual abundance of shrimp, but no single parameter can be used to predict a given year's harvest.

While shrimp dominates the Texas seafood economy, oysters harvested in the Galveston Bay complex have taken on additional prominence nationwide as oyster production from Chesapeake Bay production has declined. Much of the crabs harvested along the central coast are airfreighted to Baltimore, capturing peak market windows when Chesapeake Bay production tails off in the colder months.

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