

# Lagniappe



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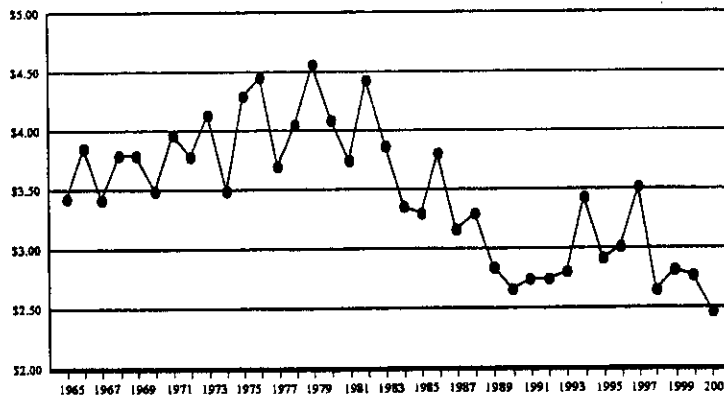
September 2, 2002

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## SHRIMP OPTIONS

The shrimp industry of the Gulf and South Atlantic states is easily the region's most valuable commercial fishery, but it is financially stressed. While some years are better than others, the long-term trend in prices has been downward. Texas A & M University Extension Service economists and biologists have studied the current conditions facing the shrimp industry and reviewed suggestions on how the industry can compete in the market with shrimp imports.

The scientists focused their study on the Texas offshore shrimp industry, as standardized data was available for this fishery for a longer period of time. This fleet catches primarily brown shrimp. Catches and prices were reviewed over a 37 year period. Biologically, the shrimp stocks are healthy, but since local weather patterns, such as rainfall and temperature, play such a large role in the size of each year's crop, yearly harvests could be off of the long-term average by a large percentage.



Prices on the other hand were not. The graph on the left shows what has happened to the price per pound received by shrimpers. The figures are adjusted (to 1982 dollars) to remove the effects of inflation. Looking at the big picture is even more dismal.

In the year 2000, Texas shrimpers had (as did Louisiana shrimpers) a large catch of shrimp, the fourth-best year (in pounds) in the 37-year period. But even with the near record catch, after inflation was removed, the real value of the catch didn't come up to the 37-year average. In fact, it was only 19<sup>th</sup> best.



In 2001, things fell apart. The Texas offshore shrimp harvest was 25% below the 37-year average, ranking 35<sup>th</sup> out of 37 years. The deflated value was nearly 47% below the average, making the 2001 harvest, by far, the lowest in the last 37 years.

Facing such low shrimp prices, trawlers have very few cost-cutting options. Economic study of the Texas offshore shrimp fleet from 1986 through 1997 showed that it cost them 98 cents to catch a dollar's worth of shrimp. Most of the expenses are in crew shares, fuel, repairs, and gear and are difficult to reduce.

Meanwhile, world production of warm-water shrimp has boomed, increasing from 1.8 billion pounds (shell-on, headless) in 1979 to 4.3 billion pounds in 1999. The table on the right shows, that while wild-capture shrimp harvests are still largest, the biggest growth in world production has been in aquaculture shrimp rather than wild-capture. The column on the right shows the percentage of the total that is from aquaculture. As a percentage of world total shrimp production, growth in shrimp aquaculture was rapid until 1992, then leveled off, although total world shrimp supplies continued to increase.

Worldwide Production of Tropical Shrimp

Year	Shell-on, Headless Pounds			Percent Cultured
	Capture	Aquaculture	Total Supplies	
1979	1,773,416,673	88,072,110	1,861,488,783	4.7%
1980	1,804,307,202	99,875,718	1,904,182,919	5.2%
1981	1,702,061,594	123,080,079	1,825,141,673	6.7%
1982	1,794,246,977	155,604,248	1,949,851,225	8.0%
1983	1,787,352,626	197,509,347	1,984,861,973	10.0%
1984	1,841,473,910	239,339,432	2,080,813,342	11.5%
1985	2,050,588,216	296,782,173	2,347,370,389	12.6%
1986	2,157,141,578	444,073,748	2,601,215,325	17.1%
1987	2,102,309,049	686,417,911	2,788,726,960	24.6%
1988	2,135,543,073	801,477,038	2,937,020,112	27.3%
1989	2,006,452,142	863,014,994	2,869,467,136	30.1%
1990	2,034,144,847	935,179,947	2,969,324,795	31.5%
1991	2,145,651,918	1,157,905,145	3,303,557,063	35.1%
1992	2,139,891,113	1,237,293,679	3,377,184,791	36.6%
1993	2,063,872,657	1,178,313,148	3,242,185,805	36.3%
1994	2,278,169,882	1,237,160,320	3,515,330,202	35.2%
1995	2,237,239,967	1,323,777,990	3,561,017,957	37.2%
1996	2,356,067,858	1,335,178,744	3,691,246,602	36.2%
1997	2,508,452,056	1,390,439,131	3,898,891,187	35.7%
1998	2,548,422,069	1,493,166,774	4,041,588,843	36.9%
1999	2,735,697,548	1,570,763,304	4,306,460,851	36.5%

In the U.S., the amount of shrimp consumed has tripled between 1980 and 2001, yet U.S. shrimp harvests have remained about the same. All of the increased consumption has come from imports. The U.S.-produced share of U.S. consumption dropped from 43% in 1980 to 12% in 2001.

Before imports became so dominant, seafood dealers could be reasonably sure of making a profit if they bought shrimp during the fairly short seasons when they were plentiful and held them until the off-season. This has changed. With the flood of imports, dealers have no way of knowing the quantity of shrimp moving into the U.S. Also changed by imports, are the availability of certain count sizes which aquaculture shrimp tend to be harvested in.

The report says that one of the surest ways of measuring the impact of imported shrimp is by checking the amount of shrimp held in cold storage. In 1980, almost 3 months worth of shrimp were held in cold storage at year's end. This amount has

steadily dropped to just 2½ weeks of shrimp supplies in 2001. **Shrimp have become available worldwide with just a telephone call. Holding shrimp from peak domestic seasons for later sales has become both unnecessary and risky.**

Many factors affect where shrimp go in the world market besides demand. Tariffs can make shrimp more expensive in one country and push them toward another. The European Union, the world's second largest shrimp market, has tariffs, some as high as 20%, on shrimp imports into Europe. The U.S. has no shrimp import tariffs.

Currency exchange rates between countries are also very important. A change in the value of one country's money against another's can make shrimp more or less expensive, and make it more profitable to send them to a certain country. A strong U.S. dollar attracts imports. Finally, food safety issues and rules can affect where shrimp are shipped. This year, chloramphenicol, a banned antibiotic, was found in shrimp imported to Europe. When faced with zero tolerance in Europe for chloramphenicol residues, shippers moved shrimp shipments to the U.S.

One positive note is that shrimp are now being consumed in larger amounts in more countries. In 1988, about two-thirds of the world's production was used by the U.S., the European Union and Japan. By 1999 that figure has slipped to 58%. Some of this decline was certainly due to a poor Japanese economy, but it is clear that shrimp demand elsewhere in the world is also increasing.

The authors of the paper considered several options to increase the profitability of the Texas shrimp industry. They did not feel that sending the vessels to more days at sea was an option, as the vessels are near their maximum level now. Reducing expenses would be difficult because most of the expenses are demanded by operation of the vessels. Reducing the number of vessels in the fleet, to attempt to increase the catch of the remaining vessels, would not, they felt, necessarily increase the efficiency of the remaining vessels. The use of individual transferable quotas (ITQs) as a management tool to increase profitability was also ruled out.

The most likely way, the authors decided, to improve the economic condition of the shrimp industry would be to "niche-market" U.S. wild-caught shrimp as a superior product that can command a higher price. They point to evidence that wild-caught shrimp, **properly handled on board and in the processing plant**, have a noticeably better flavor than pond-raised shrimp. Speculation is that either the diet or the higher salinity waters that wild shrimp are captured from gives them their flavor.

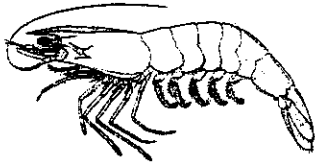
They suggest designing a quality assurance program for tow times, on-board handling, and processing plant operations to produce a consistently high quality product.

These shrimp would receive a "**Wild Harvest**" quality label. Marketing of this product would focus on that part of the food industry interested in natural, additive-free foods.

Source: *A Review of Current Conditions in the Texas Shrimp Industry, an Examination of Contributing Factors, and Suggestions for Remaining Competitive in the Global Shrimp Market.* Michael G. Haby, Russell J. Miget, Lawrence L. Falconer, and Gary L. Graham. Texas Cooperative Extension Sea Grant College Program. July, 2002.

## SHRIMP STOCK ASSESSMENT REPORT

At the July 31 meeting of the Gulf of Mexico Fishery Management Council Shrimp Advisory Panel, National Marine Fisheries Service (NMFS) biologist Jim Nance gave an assessment report on the biological health of shrimp stocks for the Gulf of Mexico region. Nance's report used data from the 42-year period, 1960 through 2001.



Brown shrimp landings in the five Gulf states peaked in 1990 at 103.4 million pounds (headless weight), white shrimp landings were greatest in 1986 at 70.7 million pounds, and pink shrimp topped out at 19.1 million pounds in 1980. After 1990, brown shrimp bottomed out at 66.3 million pounds in 1997, the lowest level since 1975. They increased to 96.8 million pounds in 2000. Landings fell to 88.6 million pounds in 2001, but this was still above the average catch.

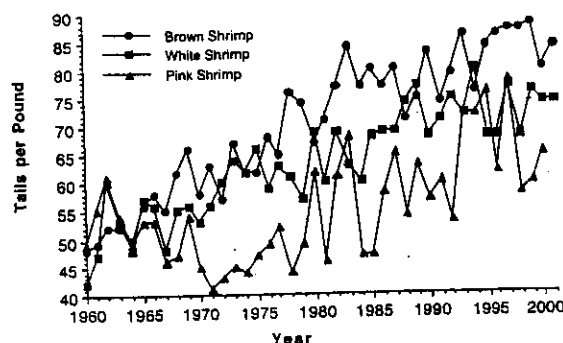
White shrimp catches declined rapidly from 1986 to 1989 and stayed at these lower levels until 1998, when they increased to 54.8 million pounds. In 2000, the white shrimp catch increased to 69.9 million pounds, then dropped to 53.2 million pounds last year. Only the record 1986 landings were higher than the average of these four years. Pink shrimp landings dropped from 1980 until they hit a low of 6.1 million pounds in 1991. They showed an increase until 1985, then dropped again to their prior levels.

Shrimp fishing effort (fishing pressure) for brown and white shrimp increased steadily from 1960 through 1987, then began to slide downwards. Shrimping effort is now at a level slightly higher than 1976-85. Effort on pink shrimp stayed about the same from 1960 to 1985, declined from 1986 to 1992, then increased for 5 years before declining again.

The shrimp catch per unit of effort (CPUE), as measured in pounds caught per day, generally declined slowly for all three species from 1960 to the late 1980s, then in general increased until the present. It should be noted that CPUE can change greatly

from year to year. The CPUE in 2000 was the best in 36 years. Brown shrimp CPUE in 2000 was the highest since 1985. Both numbers dropped in 2001, brown shrimp slightly, but white shrimp by 40%.

Average count sizes landed have steadily increased for 42 years. This strong trend towards catching shrimp at smaller sizes holds true for all three species, as the graph on the right shows. Average count (tails) for white shrimp went from about 50/lb in the early 1960s to the mid-70s/lb in recent years. Brown shrimp went from under 55/lb to over 80/lb. Pink shrimp have had the least decline in average size.



Several years ago, U.S. Congress passed a law requiring that NMFS set a standard for overfishing for all species under management. To meet the law, NMFS set overfishing indexes for numbers of parent shrimp. As long as the estimated number of parent shrimp for that species is above the index number, the species is not considered overfished.

Parent stock shrimp for brown shrimp is the number of 7 month old and older shrimp during the November-February period. For white shrimp, it is the number of 7 month and older shrimp during May-August. Pink shrimp parent stock is defined as the number of 5 month old and older shrimp during the July-June period.

For 2001, the number of parent brown shrimp was 250 million, well over the overfishing index number of 125 million. For white shrimp, the 2001 parent stock number was over 900 million, compared to the index number of 330 million adults. Parent shrimp numbers for pink shrimp were 120 million and the index number is 100 million. All three species were above their overfishing index number, although pink shrimp were fairly close.

Source: *Stock Assessment Report 2001. Gulf of Mexico Shrimp Fishery.* James M. Nance. National Marine Fisheries Services, Galveston Laboratory. June, 2002.

## COMMERCIAL FISHING VESSEL SAFETY MEETINGS

LSU AgCenter Marine Advisor Mark Schexnayder is sponsoring two September meetings on commercial fishing vessel safety issues. A Vietnamese language interpreter will assist at one of the meetings. Vessels 79 feet or more in length, built after

September 15, 1991, will have to provide and post stability instructions by October 1. By April 1 of next year, most of these vessels will have made some structural modifications to some of their rear cabin doors. Schexnayder also says that a good deal of confusion exists on inspection issues for the life rafts required by law to be carried on the vessels. This topic will be discussed, as well as the newly passed requirements for federal water commercial shrimp vessel permits. Schexnayder says that permit applications will be provided at the meetings. Also present will be National Marine Fisheries Service representatives to answer questions on current TED rules and Louisiana Department of Wildlife and Fisheries officials to answer fisheries rules questions.

Meeting times and locations are as follows:

**Vietnamese Language Interpreter Assisted Meeting  
Monday, September 16, 2002**

10:00 a.m.

Jefferson parish Westbank Regional Library  
2751 Manhattan Blvd, Harvey.

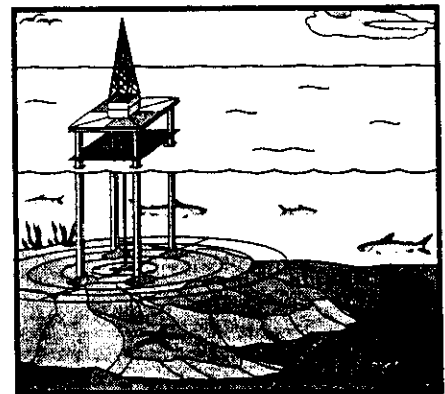
**English Language Only Meeting  
Thursday, September 19, 2002**

10:00 a.m.

Jefferson Parish Westbank Regional Library  
2751 Manhattan Blvd, Harvey

**ISLANDS OF LIFE OR ISLANDS OF CONTAMINATION?**

Offshore oil and gas platforms have been called "Islands of life" in a barren sea. Their fish-attracting powers are so great that out-of-production rigs are often moved to certain sites and toppled over to create artificial reefs. However, in a recent series of articles on mercury in the Gulf of Mexico by Ben Raines, staff reporter with the *Mobile Register* newspaper, these same platforms have been referred to as "Islands of intense contamination." The subject of mercury, mercury pollution and effects of mercury on human health is a controversial and complex one.



Mercury is a natural element that can neither be created nor destroyed, but only moved around. Mercury above certain levels in humans is toxic, affecting the nervous system and slowing development of children that have been exposed to it in the womb. Very high exposure can cause birth defects. Mercury is everywhere in the environment. Some is released naturally by erosion and evaporation from the land and sea, and some is released by humans, primarily by the burning of coal and to a lesser de-

gree, oil and gas. Mercury as an element can be absorbed in only small amounts by living creatures. It can however, be converted by a certain type of bacteria, under certain conditions, to a compound called methylmercury, which can be absorbed by living creatures, and increase in concentration as it moves up the food chain.

Raines began reporting on mercury in Gulf of Mexico fish and fish consumers in July, 2001. He had flesh from selected fish tested for mercury and also had hair samples from Gulf Coast residents who eat fish at least once a week tested. Some of the tests yielded high results. In a December 30, 2001 Article, Raines referred to offshore rigs as "islands of intense contamination." By April 14, his writings placed some offshore platforms on par with Superfund sites. Through July 12, 2002, Raines and other *Mobile Register* staff reporters have written 45 articles on mercury.

Raines maintains that oil and gas rigs use mercury-laden materials when drilling and are an unusually dangerous source of mercury pollution, one that is largely overlooked by regulators. To support his position, he refers to the Gulf of Mexico Offshore Operations Monitoring Experiment, commonly called GOOMEX, which was funded by the U.S. Minerals Management Service (MMS). He calls the three rigs used in the study "representative" and said that two of them had mercury levels in the sediments that were "many times higher than levels of uncontaminated sediments."

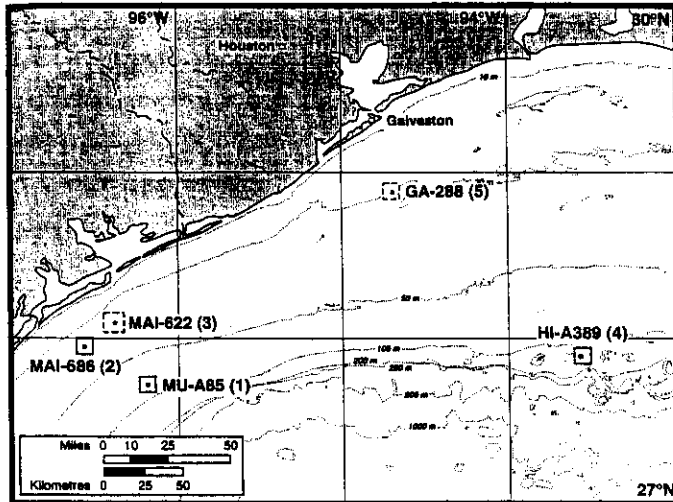
Raines said that this same rig also produced fish and shrimp samples that were up to 5 times higher in mercury than samples from the least contaminated rig and he says that this is "an indication that the mercury could be working its way up the Gulf's food chain." From the data from this rig he concludes "the potential dangers of mercury pollution may be magnified due to the number of commercial and recreational fisheries intimately tied to the rigs, which make up the largest artificial reef system in the world". Currently over 4,000 oil and gas platforms stand in the northern Gulf.

He adds that "scientists have tested only a handful of Gulf rigs, but it's apparent that the processes that caused the contamination at those rigs are standard within the industry." He says that the oil industry dumps over a billion pounds of mercury-contaminated sediment into the Gulf each year. Raines maintains that even under newer, stricter U.S. Environmental Protection Agency (EPA) rules, 1,000 pounds of mercury could be dumped from Gulf platforms each year.

Raines says that "the contamination at the rigs could prove to be much more dangerous to humans than contamination at many Superfund sites." He adds that even if fish spend part of the year near a rig, they could become contaminated, citing tests in Lavaca Bay, Texas that indicated that shrimp and oysters absorbed high levels of methylmercury from contaminated areas in weeks.

Further inspection of the GOOMEX study provides some clarification, however. The platforms selected for the GOOMEX study are not representative of the over 4,000 rigs in the Gulf. The scientists who conducted the GOOMEX study, and published their

results in the peer-reviewed *Canadian Journal of Fisheries and Aquatic Sciences*, selected these particular platforms because they were thought to be most likely to have high levels of contaminants. These platforms would be most likely to show the effects, if there are any, to long-term exposure to discharges, spills and leaks.



The study began with five platforms, but was quickly reduced to the three that were thought to be most likely to show exposure problems. All of the platforms in the study had been in operation at least 10 years to allow any potential problems to build up, and they were located in the western Gulf, away from Mississippi River discharges, which could affect test results.

Normally, drilling muds, which include barite, that in turn contains traces of mercury, are discharged in near-surface waters, so they are dispersed over a wide area and diluted. In order to protect nearby sensitive areas, this was not allowed for two of the platforms in the study. Platform HI-A389, with 6 wells, was near the East Flower Gardens, which has the northernmost coral reefs in the Gulf of Mexico. MU-A85 with 18 wells was near Baker Bank, one of the many 'lumps' off of the Texas/Louisiana coast and as such, a prime fishing area. For both of these platforms, drilling muds and cuttings were required to be piped to near the bottom before release. These were the platforms that showed the highest mercury levels in their nearby sediments.

In four cruises over a 1½-year period in 1993-94, MMS made 720 sediment analyses from near the 3 platforms. Mercury levels from platform MAI-686 ranged from 0.0 to 0.1 parts per million (ppm). At MU-A85, the range was 0.0 to 0.3 ppm, and at HI-A389 they ranged from 0.0 to 3.5 ppm. Sixteen analyses (all from HI-A389) of the 720 were over the 0.71 ppm quality guideline set for mercury in sediments by EPA. The 16 samples all came from sites repeatedly sampled on 4 cruises.

It is difficult to extrapolate these test results of sediment concentrations to being on par with Superfund sites. With the low numbers of samples above the alert level, it is also difficult to accept that the sediments as a whole under this platform are dangerously polluted and even more difficult to extrapolate the results to all of the 4,000+ platforms in the Gulf of Mexico. EPA monitoring indicates that Gulf of Mexico sediments, even with all of the platforms present, tend to be lower in average mercury concentrations than averages worldwide: 0.05 – 0.15 ppm compared to 0.1 – 0.3 ppm.



At **The Mercury Forum**, a May, 2002 symposium on methylmercury in the northern Gulf, Jerry Neff with the Battelle Memorial Institute presented figures on mercury discharges into the Gulf by the offshore oil and gas industry. Battelle conducts scientific research for government and industry, and was hired by the American Petroleum Institute for this issue. He said that in 2001, discharges were 346 pounds from approximately 900 wells drilled, much less than the 1,000 pounds reported in newspaper articles. He compared this to the estimated 112,600 pounds of mercury deposited in the Gulf each year, primarily from the air and rivers. The Mississippi River alone is estimated to deliver 48,500 pounds of mercury to the Gulf annually, according to Neff.

During the four GOOMEX cruises, 847 tissue samples were also collected from species taken within 328 feet of platforms and outside of 9840 feet from platforms, and compared to each other for mercury concentrations. Mercury in the tissues of fish and shrimp was similar and low, from both the near and far sampling areas from the platforms. Species collected from the near sites of HI-A389 did show slightly higher concentrations of mercury in their livers and soft tissues than those from the far sites.

Neff stated at the symposium that mercury concentrations in sediments near most platforms studied is at or near natural levels of 0.1 ppm and rarely over 0.5 ppm. He added that mercury in drilling mud is in a very stable, insoluble form. Therefore, it is very difficult for bacteria to absorb and convert it to methylmercury, the form that accumulates in the food chain.

Lucy Querques Denett, Acting Director of MMS, also weighed in on the issue. In letters to the *Times Picayune* and *Mobile Register* editors in January, 2002, she accused the papers of inaccurate reporting and "as a result, the public was provided serious misinformation on a matter concerning public health that could lead to unwanted negative socio-economic impacts to local citizens and industries." She went on to state that "to date there has been no indication that any mercury found in sediments around any platform has entered the food chain and accumulated in fish tissues." She said that implying mercury pollution from oil and gas drilling in the Gulf is simply not true.

Future actions should reduce some of the uncertainty over the mercury situation in the Gulf. MMS is funding extensive sediment studies at more oil and gas platforms. The National Marine Fisheries Service is beginning a large fish flesh sampling program. They are planning to sample for mercury at least 1,200 estuarine fish, 350 reef fish and 400 migratory fish. Also, in late May, President Bush formed a task force under the National Science and Technology Council to look at the whole mercury issue. The task force results will be used by the administration to develop policies on mercury monitoring, research and control.

Sources: *Gulf Rigs: Islands of Contamination*. Ben Raines. Mobile Register, 12/30/01. *Rig Shrimp Test High for Mercury*. Ben Raines and Bill Finch. Mobile Register, 1/27/02. *Mercury Contamination at Some Rigs on Par with Superfund Sites*. Ben Raines. Mobile Register, 4/14/02.

*Mercury in the Environment: Oil and Gas Sources.* Jerry Neff. Presented at The Mercury Forum: Assessing Methylmercury the Northern Gulf Environment, May 20-21, 2002. *Gulf of Mexico Offshore Operations Monitoring Experiment, Final Report. Phase 1: Sublethal Responses to Contaminant Exposure.* Mahlon C. Kennicutt II, editor. US. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region. September, 1995. *Geochemical Patterns in Sediments near Offshore Production Platforms.* M.C. Kennicutt II, P. N. Boothe, T. L. Wade, S. T. Sweet, R. Rezak, F. J. Kelly, J. M. Brooks, B. J. Presley, D. A. Wisenbug. *Canadian Journal of Fisheries and Aquatic Sciences.* 53:2554-2566 (1996). Letters to the Editor, from Lucy Querques Denett, Acting Director, Minerals Management Service. *Times Picayune and Mobile Register Newspapers* January, 2002.

## FEDERAL SHRIMP VESSEL PERMIT

The long-expected requirement for shrimp vessel permits for federal waters has been put in place. Beginning September 7, applications for the new commercial shrimp vessel permit will be accepted. By December 6, 2002, all vessels must have the permit to harvest shrimp from the federal waters of the Gulf of Mexico. To apply for a permit, the owner or operator of a vessel should contact:

Permits Office, NMFS Southeast Region  
9721 Executive Center Dr. N.  
St. Petersburg, FL 33702  
Phone: 727/570-5326

Information that must be provided includes the vessel's name, hull identification number, hull type, gross tonnage, net tonnage, and state registration or U.S. Coast Guard (USCG) documentation number; name, address, telephone number, and other identifying information of the applicant; any other information concerning the vessel, gear characteristics, principal fisheries engaged in, or fishing areas, as specified on the application. In addition, a copy of the vessel's valid USCG certificate of documentation or, if not documented, a copy of its valid state registration certificate are required with each application.

Completed applications must be submitted at least 30 days before the date that the applicant wants the permit to be effective. After December 6, shrimping will not be allowed in federal waters unless the vessel has the permit, so applicants should not delay. The fee is \$50 and all permits will be mailed to the vessel owner, even if the applicant is an operator. Permits will not be issued if any unpaid violation penalties exist. The permit is a one-year permit, unless it is revoked or suspended, or the vessel is sold. However, application for renewal is only required every 2 years, with automatic renewal taking place in the off years. Vessel owners whose permit is expiring will be mailed a notification about 2 months before expiration.

## NUTRIA CONTROL PROGRAM APPLICATIONS AVAILABLE

The Louisiana Department of Wildlife and Fisheries (LDWF) has announced that applications to participate in the Coastwide Nutria Control Program are now available. The program will pay four dollars per nutria tail turned in to check stations by participating trappers and hunters. The goal of the program is to raise the annual harvest of nutria to 400,000. The program will run during the open trapping season, November 20 to March 31. The applications for the program are now available on the internet at two different websites. Those interested may download the form from [www.nutria.com](http://www.nutria.com) or [www.wlf.state.la.us](http://www.wlf.state.la.us). The form includes an instruction page on how to complete the application, as well as a W-9 form for tax purposes. Applications may also be obtained from the LDWF coastal area field offices in Baton Rouge, New Orleans, New Iberia, Lake Charles, Rockefeller, and Bourg. They are available from the LSU AgCenter Extension offices, as well.

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### THE GUMBO POT

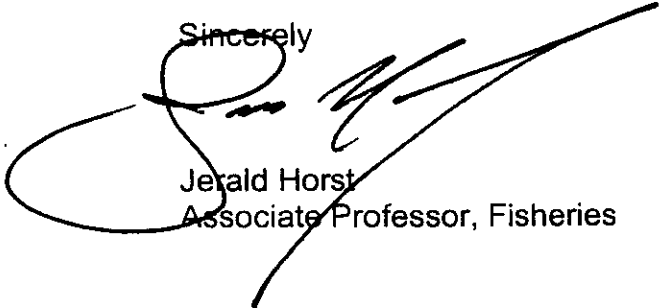
#### Canned Seafood Dip

If you lived in central or northern Louisiana in the 1950s or 1960s, fresh Gulf of Mexico seafood was hard to come by, so people ate a lot more canned seafood. Since then, imports have really beat up on the domestic seafood canning industry, and better refrigeration and transportation have made fresh seafood more available than ever. I still enjoy canned seafood, probably out of nostalgia, and cook with some of the old recipes. This one tastes very good and is not so stiff that it breaks the crackers during serving.

- |   |                                      |   |                 |
|---|--------------------------------------|---|-----------------|
| 1 | 4½-oz can shrimp                     | 3 | oz cream cheese |
| 1 | 6-oz can lump crabmeat               | 4 | tbsp sherry     |
| 1 | can condensed cream of shrimp soup   |   | crackers        |
| 1 | can condensed cream of mushroom soup |   |                 |

Drain shrimp and crabmeat. Chop the shrimp into small pieces. Heat the soups and cream cheese in a saucepan until smooth and creamy. Add the seafood and sherry and cook on medium for 5 minutes. Serves 10 as hors d'oeuvres.

Sincerely



Jerald Horst  
Associate Professor, Fisheries