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Lagniappe

Sea Grant LOUISIANA

EXTENSION PROGRAMS
Agriculture and Forestry
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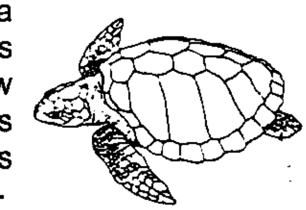
4-H Youth Development

March 3, 2003, Volume 27, No. 3

LAST CHANCE

Attached to both last month's and this month's newsletters are forms to renew your free subscription to LAGNIAPPE. If you do not renew your subscription either by surface mail or by e-mail, you will be **REMOVED** from the mailing list. We encourage you, if possible, to subscribe to receive the newsletter by e-mail. You will get the newsletter faster, the cost in tax dollars is lower, and we can guarantee continued service. For our Lafourche and Terrebonne readers, last month's renewal form had an incorrect e-mail address. If you want to renew your subscription electronically, the correct e-mail address is on this renewal form.

KEMP'S RIDLEY SEA TURTLE NEST COUNT



After a 13% decline in the number of Kemp's ridley sea turtle nests on Mexican beaches in 2001, the number of nests got back on the track of steady increases, reaching a new record of 6,436 nests. Mature female Kemp's ridley sea turtles nest 2 to 3 times each per season. This species of turtle nests almost exclusively on Mexican beaches, with the largest concentration being at Rancho Nuevo. The number of hatchlings (baby turtles) produced has increased from a low of 32,921 in 1983 to 405,544.

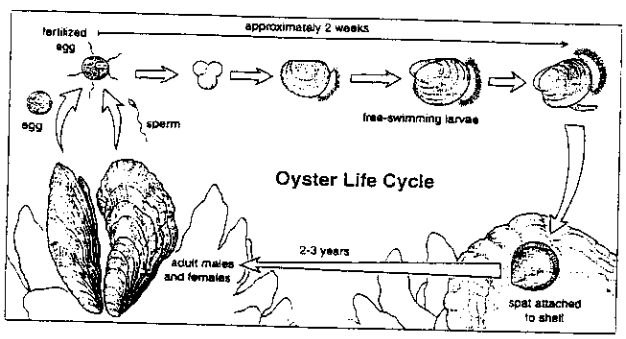
YEAR	NO. OF NESTS	YEAR	NO. OF NESTS
1978	924	1991	1178
1979	954	1992	1275
1980	868	1993	1241
1981	897	1994	1562
1982	750	1995	1930
1983	746	1996	2080
1984	798	1997	2387
1985	702	1998	3845
1986	744	1999	3640
1987	737	2000	6277
1988	842	2001	5442
1989	888	2002	6436
1990	992		

In 1947, an estimated 40,000 Kemp's ridleys arrived in one mass nesting event. By the mid-1980s, nest numbers had declined to 702. The turtle's decline was primarily due to the collection of eggs on the beaches and the killing of the adults for meat and other products. Additional deaths were also caused by accidental catch in shrimp trawls. The decline in numbers of Kemp's ridley sea turtles brought on the mandatory use of TEDs in shrimp trawls in an effort to save it.

Sources: Personal Communication with Stewart Leon, U.S. Fish and Wildlife Service, and *Report on the Mexico/United States of America Population Restoration Project for the Kemp's Ridley Sea Turtle, Lepidochelys Kempii, on the Coasts of Tamaulipas and Veracruz, Mexico.* Gladys Porter Zoo. U.S. Fish and Wildlife Service. 2002.

CHESAPEAKE OYSTER DILEMMA

The oyster industry in Chesapeake Bay has fallen and it can't get up. As recently as 1982, Maryland issued nearly 5,300 licenses to fishermen, producing an average of 2,500,000 bushels of oysters a year. This year they will be lucky to land 50,000 bushels. Virginia is in worse shape. They have sunk from more than 4,000,000 bushels to 20,000 bushels. Almost all of Maryland's production comes from harvests from wild reefs, with only small amounts from private leases. Before diseases destroyed Virginia's oyster industry, most of its production came from oysters grown on private leases.



Chesapeake Bay oyster harvests have been decimated by oyster diseases, MSX beginning in the late 1950s and Dermo in the 1980s. Some observers feel that the fishery for the native Atlantic and Gulf Coast oyster *Crassostrea virginica* is near the end of its rope. Says Pete Jenson, former head of fisheries for the Maryland Department of Natural Resources (MDNR) "This could be the year that we declare the economic extinction of the Chesapeake Bay oyster fishery."

This is in spite of millions of dollars that have been spent to restore reproducing populations of native oysters. The Virginia Marine Resources Commission has constructed oyster reefs. MDNR has developed oyster sanctuaries and managed harvests to reserve stocks. Neither approach has solved the problem. In salinities below 12 parts per thousand, oysters can survive for more than 4 years, but not reproduce successfully. At higher salinities, the oysters can spawn, but they die rapidly due to the diseases MSX and Dermo.

U.S. Congress established the Oyster Disease Research Program to develop strains of disease-resistant native oysters. Several strains of oysters resistant to one or the other disease have been developed, but getting resistance to both MSX and Dermo in the same oyster has been the trick. Some wild oysters are also developing resistance to diseases, but the process of genetic change is very, very slow. In the meantime, reefs are collapsing because not enough oysters are surviving to build shell faster than the reefs are falling apart.

The option that holds the most short-term promise and is also the most controversial is introducing an entirely different species of oyster, the Chinese oyster, *Crassostrea ariakensis*. Tests comparing the growth and survival of the two species in Virginia, and later in North Carolina show the Chinese oyster more able to resist diseases than the eastern oyster and also able to grow faster and larger than the native. The Chinese oysters used in the tests were chemically sterilized so that they could not reproduce and spread uncontrolled.

The results of the Virginia tests showed that at low-salinity sites, 14% of the Chinese oysters died and at high-salinity sites, 15% died. At low-salinity sites, 81% of the native oysters died and at high-salinity sites, all of them died. During the summer months, 100% of the native oysters were infected with diseases, mostly with heavy infections. For Chinese oysters, infections were 0-28%, mostly with light infections.

Chinese oysters also grew faster at all salinities. After one year, Chinese oysters averaged 3.9 inches in length at low salinities, 5.0 inches at medium salinities, and 5.6 inches at high salinities. Native eastern oysters averaged 2.9 inches, 3.4 inches, and 3.0 inches at low, medium and high salinities. It should be pointed out that since the Chinese oysters were sterilized they could put all their energy into growth, rather than using some for reproduction, as the native oysters did.

Introduction of the Chinese oyster has been strongly supported by many commercial fishermen (locally called watermen) and seafood dealers. The state of Maryland has until recently resisted discussion of introduction of the non-native oyster. Some scientists have also expressed concerns. Will the Chinese oyster resist other predators? Will it build reefs? Will it reproduce so well that it becomes a fouling problem? How will it interact in the food chain with creatures that feed on oysters? Will other diseases attack the oyster? Will it displace what is left of native oysters?

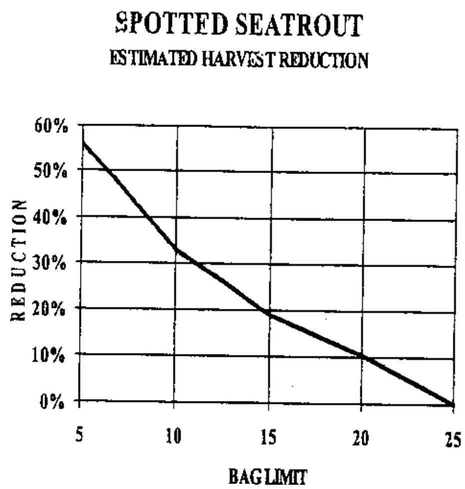
The answer to the last question does not concern Larry Simns, President of the Maryland Watermen's Association. "We've lost our oyster," says Simns. He expressed little patience with more studies and the use of sterile Chinese oysters. He states that fertile Chinese oysters need to be introduced now, to save what is left of the oyster industry.

Because of the ecological concerns on one hand and the demands of the Chesapeake Bay oyster industry on the other, the National Academy of Science (NAS) has been commissioned to assess the ecological and environmental issues of introducing the Chinese oyster into the bay. The NAS report is due by August, 2003. Whatever their findings, they will have implications for Louisiana, as only the Chesapeake Bay can produce as many oysters in the eastern U.S. as Louisiana.

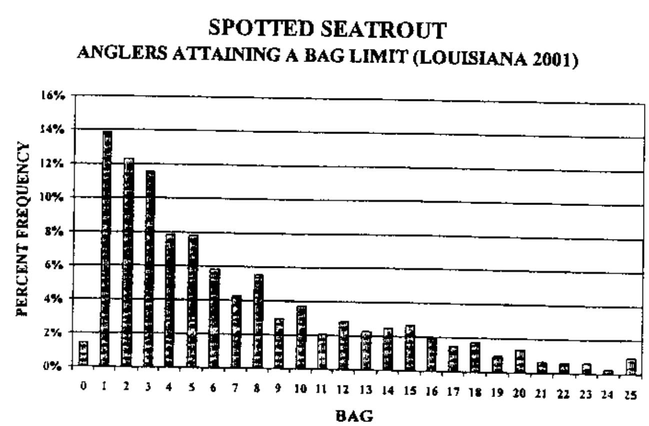
Source: *Crisis and Controversy: Does The Bay Need a New Oyster?* Merrill Leffler. Chesapeake Quarterly. Volume 1, Number 3. Fall 2002. Maryland Sea Grant College.

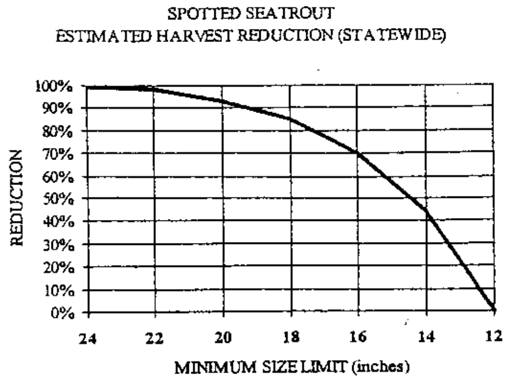
BIGGER TROUT – IS IT WORTH IT?

In recent years, some interest has developed in Louisiana in changing the management of speckled trout to produce larger fish. The only way that fisheries managers can create a system that produces larger fish is by reducing the death rate (mortality) so that more fish survive and have longer to grow.



Deaths from natural causes take the majority of fish and fisheries managers can only reduce this natural mortality by allowing fish to be harvested before natural causes take them. However, this does not grow bigger fish. To grow larger average-sized fish, the fisheries biologist is pretty much reduced to increasing the minimum legal size and/or reducing the daily bag limit. The question is how much of a change would be needed to make a difference. The graph on the left illustrates how reductions in the daily bag limit for speckled trout would reduce the total harvest. The dark diagonal line indicates that a reduction in the bag limit from 25 to 20 would result in a 10% reduction in harvest, a 15 fish bag limit would result in less than a 20% reduction, and so forth. These numbers surprise most anglers. Even a reduction to a 5-fish bag limit would only reduce harvest by about 55%. The reason is that very few fishermen catch their limits. The graph on the right shows what anglers catch per trip. Only one percent catch their 25-fish limit. Less than 5% catch 20 or more fish. About 60% of the angler trips result in a catch of 5 or less speckled trout. This means that to affect the average angler's catch, the cuts would have to be deep.

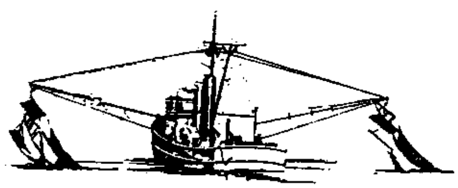




The graph on the left shows how increasing the minimum size limit reduces harvest. Following the diagonal lines from right to left shows that increasing the minimum size from 12 inches to 16 inches would reduce harvest statewide by 70%. It should be remembered that much of the reduction in harvest will be of slower-growing male fish that will never grow to reach the increased size limit before predation, disease and harsh weather kill them. Any estimated reductions in harvest are based on fishing mortality remaining the same. If people spend more time on the water to catch a limit or more people fish, the reduction in harvest will not take place and fishing mortality will increase. Therefore, no net benefit (larger fish) would occur from the regulation change.

Data Source: Louisiana Department of Wildlife and Fisheries

SHRIMPER HEARINGS



Louisiana's offshore artificial reef program is one of the most successful in the U.S. The program recycles offshore oil and gas platforms for its reef materials. One of the reasons that the program is a success is that it was built with the help of shrimpers. At public meetings in 1987, offshore shrimpers identified areas in which artificial reefs would not interfere with shrimping. This kept conflicts to a minimum. The coordinators of the reef program are again looking for shrimpers' help. State legislation passed in 2002 requires that the program be reviewed and that recommendations be made for change. Public hearings will again be held for shrimpers to identify areas that are used by shrimp trawlers and that should not have artificial reefs placed in them. The times and places of the meetings are as follows:

<u>6 p.m., March 25</u>
Belle Chasse Auditorium
8398 Hwy 23
Belle Chasse, LA

<u>6 p.m., March 26</u>
LSU AgCenter Office
511 Rousell St
Houma, LA

<u>6 p.m., March 27</u>
Larose Civic Center
307 E. 5th St
Larose, LA

<u>6 p.m., April 1</u>
Vermilion LSU AgCenter Office
1105 W. Port St
Abbeville, LA

Attendance by offshore shrimpers at these meetings is very important.

NEW T.E.D. RULES ANNOUNCED

The National Marine Fisheries Service (NMFS) has announced new rules for the use of turtle excluder devices in shrimp trawls effective August 21. The rules for Gulf of Mexico waters include the following:

- Requiring the use of either the double-cover flap TED or an opening of 71 inches in offshore waters.

- Requiring that hooped hard TEDs can only be used in inshore waters. These TEDs must have a minimum inside horizontal width of 35 inches and an inside vertical height of 30 inches on the front hoop, and a clearance between the bars and the front hoop of 20 inches.

- Requiring the use of grids with minimum outside dimensions of 32 inches by 32 inches.

- Prohibiting the use of the Jones TED.

- Requiring the use of a brace bar on weedless TEDs.

- Requiring accelerator funnels to have a 44-inch horizontal opening on the 44-inch TED and a 71-inch opening on the 71-inch and the double cover flap TEDs.

- Requiring bait shrimpers to use TEDs in states where the bait shrimpers can fish for food shrimp from the same vessel that they catch bait shrimp with.

- Requiring tow time restrictions for try nets of 12 feet or less.

MERCURY AND HEART ATTACK RESEARCH

Much of the concern about mercury levels in Gulf of Mexico fish a year and a half ago focused on the effects of high levels of mercury on unborn children. More recently, the theory has been aired that high mercury levels in adult humans are linked to heart attacks. Results from two studies released in the same edition of the New England Journal of Medicine have produced conflicting results on the heart disease issue.

One study was conducted in eight European countries and Israel. They divided the middle-aged men in the study into two groups — 684 who had a heart attack and 724 who had not. Their health histories and tobacco and alcohol use were studied. Since mercury accumulates in body fat and toenails, samples of each were taken from the men. The results showed that the 20% of the men with the highest mercury levels were 2.16 times more likely to suffer a heart attack than the 20% with the lowest mercury levels. However, the study also found that men who ate few fish had lower levels of omega-3 fatty acids and were more at risk of heart attacks. Mercury in humans comes most often from eating fish with high mercury levels.

In the other study, 33,737 toenail clippings were taken from male health care professionals, 40-75 years old, with no history of heart disease or cancer. Follow-up on the men found that 470 of them later had some form of heart disease. Age and smoking were accounted for to eliminate their effects. The results showed no association between mercury exposure and risk of heart disease.

Although the studies produced different results, both groups of researchers encouraged fish consumption for most people, as the risks from mercury are outweighed by the benefits produced by having fish in diets. Oily fish species, with high levels of omega-3 fatty acids, offer the most benefits.

Sources: *Mercury, Fish Oils, and the Risk of Myocardial Infarction.* Eliseo Guallor & others. The New England Journal of Medicine. Volume 347:1747-1754, Number 22. November 28, 2002. *Mercury and the Risk of Coronary Heart Disease in Men.* Kazuko Yoshizawa & others. The New England Journal of Medicine. Volume 347:1755-1760, Number 22. November 28, 2002.

WHERE DOES MERCURY COME FROM?

Mercury is present in trace concentrations in all rocks, minerals, soils, and sediments. The largest natural sources of mercury are from movement from the earth's surface into the air, volcanic and geyser emissions, wind and water erosion from soils and rocks, and evaporation from natural water bodies. They amount to 6-13 million pounds per year. Anthropogenic (human-caused) releases are higher, perhaps as high as 66 million pounds. Most anthropogenic releases into the atmosphere come from the burning of coal and garbage and other wastes. The table below shows 1997 Environmental Protection Agency figures for the sources of mercury releases in the United States.

Source	Emission (tons/year)	Percent of Total
Coal-fired power plants	52	33
Municipal waste combustors	30	19
Commercial/industrial boilers	28	18
Medical waste incinerators	16	10
Hazardous waste combustors	7	4
Other combustion sources	5	3
Total Combustion Sources	138	87
Chlor-alkali plants	7.1	4.5
Portland cement	4.8	3.1
Other manufacturing sources	3.9	2.5
Total Manufacturing Sources	15.8	10.0
Area Sources	3.4	2.2
Other Sources	0.9	0.8
Total Mercury Emissions	158	100

Typical coal burned in a power plant only has 0.1 part per million (ppm) mercury in it, similar to the mercury concentration of soil. But, because of the large amount of coal burned to produce electricity, mercury emissions from power plants are the number one source of release. The burning of oil products releases much less mercury. Typical crude oil produced and processed in the U.S. has one-tenth as much mercury as coal, at 0.01 ppm. Utility fuel oil, such as that burned by power plants, has an average of 0.0007 ppm mercury, and U.S. gasolines contain 0.0005 to 0.0015 ppm mercury.

Once mercury is in the atmosphere, weather patterns can move it around the world. In the atmosphere, it slowly changes its chemical form and attaches to airborne particles, particularly soot, and falls with them to land and water surfaces. Also, some mercury in the atmosphere dissolves in the water vapor in clouds and falls to earth in rainfall.

Most mercury that ends up in humans comes from eating fish. However, not all mercury that is deposited or discharged into the sea can enter the food web, in fact, most cannot. Mercury occurs in three basic forms in the marine environment: metallic (elemental) mercury, inorganic mercury compounds, and organic mercury compounds (mostly methylmercury). Methylmercury is most easily absorbed by living animals, although smaller amounts of inorganic mercury can also enter the food chain. Methylmercury is formed by bacteria that live in water and sediments, but only from dissolved mercury. Conditions favoring methylmercury formation include low oxygen levels, low pH, and high amounts of organic matter (dead plant and animal remains).

In marine food webs, phytoplankton (microscopic plants) absorbs both inorganic mercury and methylmercury from the water. Zooplankton (microscopic animals) that feed on the phytoplankton absorbs more of the methylmercury than the inorganic mercury. Fish and other marine animals that feed on the zooplankton again absorb more of the methylmercury than inorganic mercury. They are also able to get rid of more of the inorganic mercury than methylmercury from their bodies.

At each step in the food chain, the mercury accumulation becomes greater. This is why predator fish at the top of many links in the food chain often have higher mercury levels than fish near the bottom part of the chain. Also, old long-lived fish tend to have higher levels because their long life has allowed them more time to accumulate it. Research shows that mercury in both marine and freshwater fish comes from what they eat rather than from the water around them.

Source: *Fates and Effects of Mercury from Oil and Gas Exploration and Production Operations in the Marine Environment.* J.M. Neff. Battelle Memorial Institute. Prepared for the American Petroleum Institute. July, 2002.

OFFSHORE DRILLING & MERCURY IN FISH

In 2000 and 2001, the *Mobile Register* newspaper in Mobile, Alabama, published an extensive series of articles revealing the presence of high levels of mercury in the flesh of some Gulf of Mexico fish. Additionally, the articles made the case that one of the main sources of mercury in the Gulf of Mexico was the offshore oil and gas drilling industry. Drilling muds, used in all drilling operations, contain some mercury at levels controlled by the Environmental Protection Agency (EPA). Mercury is most often present in sulfide impurities as part of the original barite ore. Used drilling muds may be legally discharged into offshore waters, to be dispersed by water currents. These discharged muds are what the *Mobile Register* said were much of the source of the mercury in the fish that they tested. High levels of mercury in human diets have been linked to retarded mental development in humans before birth, and possibly to heart disease and other problems in adults.

In response, researchers conducted a study of six offshore drilling sites in the Gulf: Main Pass Block 299, Main Pass Block 288, Mississippi Canyon Block 499, Ewing Bank 963, Green Canyon 112, and Eugene Island 346. Depths ranged from 195 to 1,807 feet. The researchers took seabed sediment samples from areas within 325 feet, from 325-800 ft, and from over 1.8 miles away from each drilling site for analysis.

The samples were analyzed for barium as well as mercury. Almost any barium found would have to have come from discharged barite in drilling muds. If samples with high mercury also had high barium levels, the mercury would likely come from drilling discharges. The results did indeed show that higher levels of mercury were found in connection with high barium levels, indicating that drilling discharges were the source of this mercury. Calculations showed that the mercury levels were below the maximum levels allowed by EPA for barite.

Mercury as an element, however, cannot be absorbed by animals and enter the food chain. It must be converted to methylmercury. The conversion process in marine sediment is complex, and the best conditions for methylmercury formation are acidic, with low oxygen, low dissolved sulfides, and high levels of organic matter, the partially decayed remains of plants and animals. The results of this study show that even though the levels of total mercury in the samples near drilling sites is 4-10 times higher than that found in the samples taken from over 1.8 miles away, the levels of methylmercury are not higher, and in fact, are sometimes lower.

The conclusion was that while mercury was indeed being introduced into the Gulf by drilling discharges, the argument that this mercury ends up as methylmercury, the form that finally ends up in animals is "certainly weak based on the results of this study." They also concluded that drilling discharges do not create an environment that is favorable to the conversion of mercury to methylmercury.

Source: *Concentrations of Total Mercury and Methylmercury in Sediment Adjacent to Offshore Drilling Sites in the Gulf of Mexico. Final Report to the Synthetic Based Muds (SBM) Research Group.* J. H. Trefry, R. P. Trocine, M. L. McElvaine, and R.D. Rember. Florida Institute of Technology. October 25, 2002.

SEAFOOD PROCESSOR TRAINING MEETINGS

The LSU AgCenter's Department of Food Science is sponsoring two meetings of interest to seafood processors in April. Both will be held on the LSU campus in Baton Rouge. The first one, on April 22, is the **Sanitation Control Procedures Training Program.** According to LSU AgCenter seafood technologist Jon Bell, this program can reduce problems in plants and extend shelf life of product, so it is a moneymaker. A complete agenda and registration form can be found on the internet at www.lsuagcenter.com/seafood/scp_trainingschedule.htm. The registration fee is $90.

The second program is **Basic HACCP for Processing Fish and Fisheries Products.** Bell says that being HACCP-certified is required by law to process seafood, or any other food items. This program is longer, covering three days, April 23-25. Attendance at all three days is required to be certified. The schedule and registration from can be found at www.lsuagctr.com/seafood/haccp_trainingschedule.htm. The registration fee is $160.

Anyone with more questions can contact Jon Bell at 225/578-5190 or jonbell@agctr.lsu.edu.

UNDERWATER OBSTRUCTION LOCATIONS

The Louisiana Fishermen's Gear Compensation Fund has asked that we print the coordinates of sites for which damage has been claimed in the last two months. The coordinates are listed below:

Loran Sites

26622	46979	CAMERON
28108	46855	TERREBONNE
29080	46955	ST BERNARD
26581	46377	CAMERON
28495	46851	LAFOURCHE
29009	46916	ST BERNARD

Lat. & Long. Sites

29 18.775	89 48.851	JEFFERSON
29 21.468	89 37.325	PLAQUEMINES
29 37.231	90 07.961	JEFFERSON
29 37.450	90 10.241	LAFOURCHE
29 11.328	90 00.987	JEFFERSON
29 16.407	89 57.218	JEFFERSON
29 30.828	90 07.411	JEFFERSON
29 34.367	89 35.344	ST BERNARD
29 43.630	89 31.680	ST BERNARD
29 45.052	89 48.914	PLAQUEMINES
29 56.310	98 50.320	ST BERNARD
28 55.882	89 25.803	PLAQUEMINES
29 06.954	90 39.914	TERREBONNE
29 18.790	89 49.670	JEFFERSON
29 22.836	90 02.873	LAFOURCHE
29 29.197	92 20.737	LAFOURCHE
29 30.366	89 29.413	ST BERNARD
29 33.639	89 31.146	PLAQUEMINES
29 39 935	92 54.146	CAMERON
29 44.579	89 36.266	ST BERNARD
29 48.049	91 55.642	VERMILION
30 06.441	89 31.594	ORLEANS
30 09.716	89 27.514	ORLEANS

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THE GUMBO POT

Baked Shrimp

This delicious dish really lets the taste of shrimp shine. It is simple and quick to prepare too. Don't leave out the nutmeg. Three slices of bread will provide about 1½ cups of bread crumbs. The soft bread crumbs will toast on top of the dish delightfully.

2	lbs medium or large shrimp tails
1	stick margarine
1½	tsp salt
½	tsp black pepper
¼	tsp red pepper
4	tsp flour
¼	tsp nutmeg
2	cups half & half
2	egg yolks, beaten
4	tbsp sherry
1	cup grated colby & monterey jack cheese
1½	cups soft bread crumbs
	paprika

Coat the bottom and sides of a 13½ X 8½ inch glass baking dish with 1 tablespoon of margarine. Spread shrimp one layer deep in baking dish and sprinkle salt and pepper evenly over the shrimp. In a medium saucepan, melt the rest of the margarine. Add the flour and nutmeg and stir over medium heat to blend. Gradually add half & half. Whisk while adding. After the sauce has thickened, add beaten egg yolks and whisk. Mix in the sherry and heat one more minute. Spread mixture evenly over the shrimp. Sprinkle cheese over the shrimp and top with bread crumbs. Sprinkle with paprika and bake 20-25 minutes. Serves 4.

Sincerely,

Jerald Horst
Associate Professor, Fisheries