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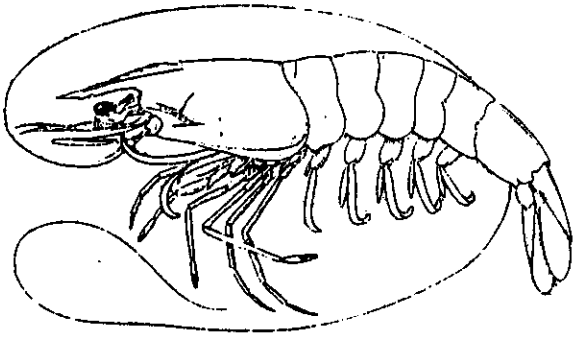
SEA GRANT PROGRAM



LAGNIAPPE

FARMERS MARKET OPENING TO FISHERMEN

The Crescent City Farmer's Market is adding seafood to the selection of products to be offered for sale at the market. The market currently allows fruit and vegetable producers an opportunity to sell high quality products directly to the public.

The market has been located at 700 Magazine Street in New Orleans for the last 3 years. It is open each Saturday morning, 12 months a year. Approximately 1000 shoppers pass through the market each Saturday morning to make purchases from 65 fruit and vegetable stalls.

The plan to expand the market to include seafood will make 8 to 10 spaces available to commercial fishermen. Market organizers require that sellers must actually produce the seafood they sell, and that the seller has the necessary licenses to sell to the public.

Processed seafood products such as picked crab or crawfish meat, shucked oysters, and filleted fish must have been processed through an approved facility. Unprocessed products such as unpeeled shrimp, softshell crabs, whole finfish, and live crabs, crawfish and oysters do not have such a requirement. Turtle meat, alligator meat, frog legs, and stone crab claws are other products of interest.

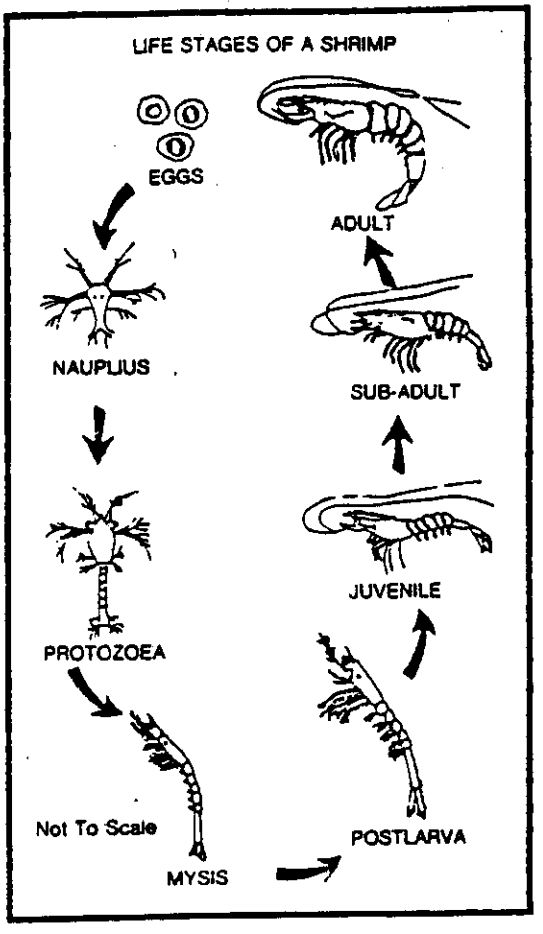
Fishermen or fish farmers interested in applying for a space in the market should call Jeff Barron, 861-5898 in New Orleans to express their interest. Each caller will receive an application and then a personal visit after the application is sent in.

Based on the established rules and the interview, selection of seafood venders is planned to be done by January 15. Oyster venders will begin sales by that date. Other seafood sales will begin the first Saturday in Lent of next year. At that time, the farmer's market will do extensive promotion to alert the public about the addition of seafood to the market.

BROWN SHRIMP BIOLOGY

Brown shrimp, scientifically known as *Penaeus aztecus*, support a large and valuable commercial and recreational fishery. What is known as brown shrimp season in inshore waters typically opens in mid to late May and extends until early July. It is well known that small (0.6 to 0.8-inch) postlarval brown shrimp more into Louisiana's estuaries most heavily in February and March where they grow to provide the shrimp for the May inshore season.

What isn't well known to most people is when and where brown shrimp spawn. Research indicates that females reach maturity at a little over 6 inches long. Spawning takes place in Gulf of Mexico waters of greater than 10 fathoms (60 feet) from spring to early summer, and year around at depths of 25 to 60 fathoms. The peak of spawning in deeper waters occurs from September to November.



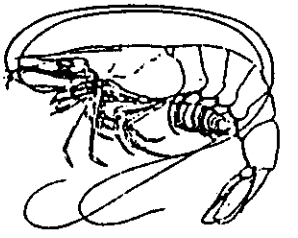
Apparently, after hatching and going through their larval stages, the postlarval brown shrimp overwinter in the Gulf of Mexico by burrowing into the bottom to await warmer temperatures. Laboratory work also shows that postlarval brown shrimp will burrow into the bottom at low temperatures.

Research also indicates that the post-larval shrimp tend to gather near the passes of the major bays, where they await late winter and early spring cold fronts. These cold fronts move large volumes of water

out of the bays. When the wind dies down, Gulf waters move back into the bays. Apparently, postlarval brown shrimp rise up off of the bottom and ride these warmer, saltier waters into the bays where they settle out and grow.

Source: *A Fisheries Management Plan for Louisiana's Penaeid Shrimp Fishery.* Louisiana Department of Wildlife and Fisheries. 1992

SHRIMP IN THE DEAD ZONE

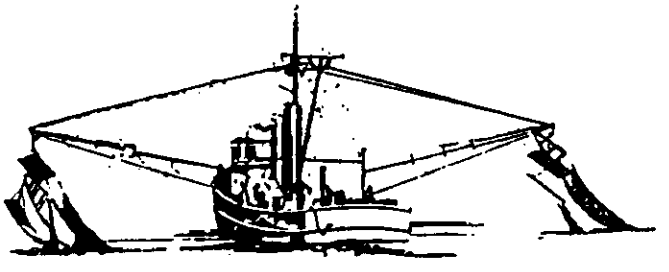


Hypoxia, a condition of very low oxygen in some waters off of coastal Louisiana (often called the dead zone), has occurred each year since at least 1985. Much has yet to be learned about the causes and effects of hypoxia. How often hypoxia has occurred and how large the area was is unknown before that year. But this has not lessened concern by fisherman and scientists over fisheries impacts from hypoxia.

Hypoxia generally occurs in bottom or near-bottom waters. Fisheries resources that use these waters, such as shrimp, are of particular concern. Previous research has shown that hypoxia will kill large and small bottom animals that are limited in their ability to move away from hypoxia. Research also indicates that shrimp depend heavily on some of these small animals for food.

Very few shrimp themselves appear to be killed by hypoxia because they can swim well enough to avoid it, but many offshore shrimpers have expressed concern that hypoxia affects the migratory and concentration patterns of shrimp.

Scientists with the National Marine Fisheries Service (NMFS) have conducted an analysis comparing offshore shrimp catches with hypoxia occurrences by zones. Cells (zones) were created by area and water depth. Data on shrimp landings were gathered by NMFS port agents from Key West, FL to Brownsville, TX. Port agents also interviewed shrimpers after trips on when, where, and how long they fished.



Landings and shrimping data in each cell were compared against areas of known hypoxia for the ten year period of 1985 to 1994. Detailed conclusions were somewhat limited by the large size of the cells, however, shrimp catches nearshore were always significantly higher than catch offshore, regardless of the amount of hypoxia. This may be due to the historical development of Louisiana's shrimping fleet which has targeted shrimp in nearshore and inshore waters.

In spite of the studies' limitations, some interesting observations could still be made from the analysis.

- Offshore shrimp catches were significantly higher near the Texas-Louisiana border compared to the area near the Mississippi River delta. Hypoxic events are greater in eastern Louisiana than western Louisiana. When the hypoxic area was large in the west, shrimp catch was lower there too.

- Highest shrimp catches were always nearshore in cells with a low percentage of hypoxic area in the cell.

- Shrimp year-class strength (size of the crop) can be different from year to year, as can the size of the hypoxic area. In spite of this, the **pattern** of shrimp catches in relation to hypoxia remained the same.

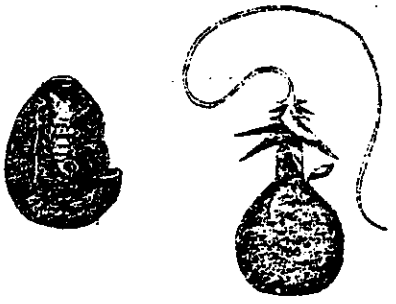
- Hypoxia seems to promote the inshore and nearshore shrimp fishery and discourage the offshore fishery by blocking the migration of shrimp from inshore to offshore waters. Low shrimp catches always occur outside (offshore) of hypoxic areas. Shrimp seem to concentrate in nearshore waters inside (landward) of the hypoxic zone. This results in concentrations of shrimpers in these areas.

Source: *Trends in Shrimp Catch in the Hypoxic Area of the Northern Gulf of Mexico.* Roger Zimmerman, James Nance, and JoAnne Williams. Proceedings of the First Gulf of Mexico Hypoxia Management Conference. 1995.

JELLYFISH STINGS

Some times of the year we get large numbers of stinging jellyfish in Louisiana waters, as most fishermen already know. While most fishermen know that the stings hurt, they don't know how a jellyfish stings.

Jellyfish have special cells called nematocysts on their tentacles which do the stinging. They use them to capture their food. When they are touched, they shoot a tube-like stinger into skin or animal that touches them. An acid poison is sent through the tube. At right are pictures of a stinging cell before and after it discharges. The thread-like tube on the right is what carries the poison.

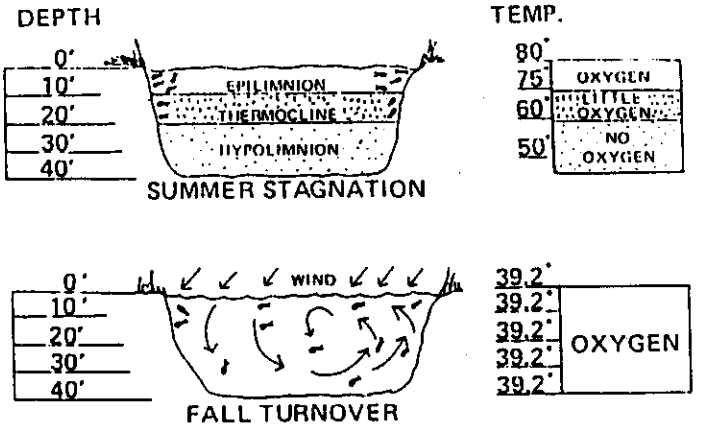


The pain of jellyfish stings can be helped by baking soda, household ammonia or unseasoned meat tenderizer. These things counteract the poison and break it down.

LAKE TURNOVER

Most freshwater fishermen that fish reservoirs, lakes and ponds are aware that during the summer, water of different temperatures will form layers (stratify) in the water body they fish in. What most fishermen aren't aware of is how these layers can dramatically affect their fishing success. The upper layer, called the epilimnion, is the warmest in the lake and rich in oxygen produced by phytoplankton (the microscopic floating plants that make water green) and to a lesser degree by wind and waves.

CYCLE OF ANNUAL WATER CONDITIONS



The bottom layer, known as the hypolimnion, is the coldest and usually holds no oxygen. What oxygen was there, has been used by fish and other animals and by decaying plants and animals on the bottom. The two layers are separated by a transitional layer called the thermocline. This layer holds some oxygen and is the layer where the greatest fall in temperature occurs.

Fish can't live without oxygen and therefore will concentrate in the epilimnion or even the shallower depths of the thermoline. It seldom makes sense for a fisherman to fish deep water in the summer in a lake that stratifies.

Wind, short of a hurricane, will seldom cause lake layers to mix in the summer. This isn't due to the temperature difference in the layers but rather to different water densities. Water is peculiar in that it is most dense and therefore heaviest, at 39.2° F. As water gets colder or warmer, it gets lighter. Denser, heavier water accumulates near the bottom of the lake; lighter water forms layers nearer the surface.

Turnover occurs in the fall when air temperatures cool the epilimnion to the same temperature (and density) as the themocline, and then finally the hypolimnion, and strong winter winds mix the waters and oxygen, top to bottom. Turnover itself, of course, can affect fishing, as fish become scattered over all depths rather than concentrated in a smaller area.

In northern areas of the United States, where lake surfaces freeze, a second period of layering occurs, with two layers instead of three, the bottom layer of which holds no oxygen. While this doesn't usually occur in Louisiana, a long cold snap with low winds will result in deeper waters temporarily being several degrees warmer than surface waters. Under these conditions, most successful fishing is done in deeper waters.

It should be pointed out that not all lakes behave the same way, nor do all lakes behave the same way year after year. Understanding the principles of stratification, and experience on a particular water body should add to a fisherman's success.

Source: *When a Lake Turns Over.* Farm Pond Harvest. Summer, 1983.

UNDERWATER OBSTRUCTION REMOVAL

Underwater obstructions are a serious hazard to all boat operators, and cost shrimpers and the Louisiana Fishermen's Gear Compensation Fund millions of dollars each year in damages to trawls. The problem of these obstructions has gotten worse rather than better, because very few are ever removed.

In an effort to reduce the number of these hazzards, the Underwater Obstruction Removal Program was created by Act 666 of the 1997 legislature. This landmark legislation was introduced by Senator Chris Ullo of Marrero at the request of the Jefferson Parish Marine Fisheries Advisory Board and the Gulf of Mexico Underwater Obstruction Clearance Coalition. The budget consists of $1.6 million in funding dedicated by the Louisiana Department of Wildlife and Fisheries from fisheries resource disaster funds made available from the federal level. The program was placed in the Louisiana Department of Natural Resources (DNR) under the administration of Program Manager Bruce Ballard.

The first obstructions removed under the program were picked up in and near Barataria Pass off of Grand Isle in October. They included a number of abandoned dredge pipes and pontoons and a sunken shrimp trawler. The coordinates of the removed objects are as follows on the next page:

Coordinates	Object
29 deg 14 min 58.84 sec 89 deg 57 min 28.53 sec	pipes and pontoons
29 deg 16 min 03.71 sec 89 deg 56 min 34.17 sec	pontoon
29 deg 15 min 37.16 sec 89 deg 56 min 04.32 sec	pipe
29 deg 14 min 34.28 sec 89 deg 56 min 22.06 sec	sunken boat

All of the items recovered had lost shrimp nets, doors and/or TEDs on them. Ballard stated that work at Grand Isle is not over. He is convinced that many obstructions were missed by the surveying method which used a side-scan sonar and a magnetometer, and that this method of locating obstructions is not worth the cost. The area will be resurveyed in November using better equipment. Ballard would also like to make more effort to get shrimpers to take him to obstruction locations. Obstructions located in November should be removed before spring.

In the meantime, Ballard is taking the show to Cameron to remove obstructions identified by surveys taken there this past summer. The work off of Cameron and the two efforts off of Grand Isle are expected to use all the money in the 1998-99 fiscal year budget which ends on June 30, 1999.

After the new fiscal year begins on July 1, Ballard plans to begin a removal program in Terrebonne Parish, followed by one somewhere east of the Mississippi River. Plans have not be made for the year after that, the final year of obstruction removal under the current funding source. Hopefully, another source of funds can be located to continue the work.

MARSHES, SEA LEVEL RISE AND SEAFOOD

FACT - Sea level is rising and in coastal Louisiana land is subsiding (sinking)

FACT - Louisiana marshlands are breaking up and eroding.

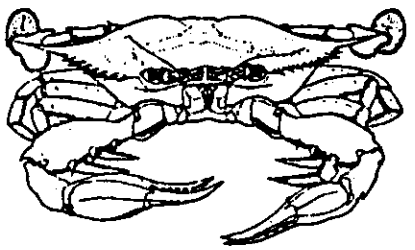
FACT - Seafood production in Louisiana has been the highest in history for the last 20 years.

QUESTION - Are these habitat changes connected to increased seafood production?

QUESTION - What will happen to seafood production if current trends in sea level rise, land subsidence, and marsh loss continue?

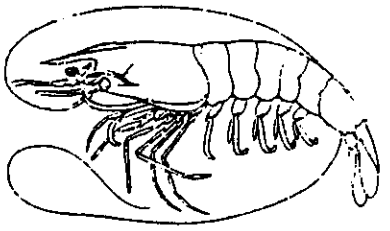
While this is a complex issue and predicting the future is always tricky, scientists are coming to general agreement on some points as research accumulates. One point of agreement is that production of predators such as blue crabs, and white and brown shrimp increases when their ability to get into marsh grass habitats increases. Previous research suggests that this occurs because these shrimp and crabs can better get at their food sources, and because marsh grasses provide protection from fish that eat them.

Biologists with the National Marine Fisheries Service's Galveston, Texas Laboratory studied this issue in a subsiding marsh near Galveston Island. Sea level rise in the area studied steadily increased from 1958 to the end of the study in 1987. In fact, it was four times as high per year at the end of the study then the beginning. The rate of subsidence was so high that the marsh couldn't build itself as fast as it was sinking resulting in a "broken marsh" like much of Louisiana has.



Biologists conducting the study used 3 square yard drop traps to sample for crabs and shrimp. Samples were taken in both flooded marsh and open water. All crabs and shrimp larger than two-tenths of an inch long in each sample were counted. The researchers also sampled the tiny worms and other animals that shrimp and crabs feed on in both habitats. Sampling was done March through December each year.

The results clearly agreed with other research done on the subject. In all months except December, the number of blue crabs found in the flooded marsh was much higher than in open water. The peak occurred in June, July, August, and September when they were 5 to 8 times more abundant in marsh than open water.



Brown shrimp, as one would expect, peaked in numbers in April and May and were 2 to 8 times more abundant in marsh than open water. White shrimp numbers peaked in August and were 39 times more abundant in the marsh than in open water. Only in October were white shrimp more abundant in open water.

Sampling of the small animals that serve as food for crabs and shrimp indicate why they preferred the flooded marsh. In every month of the year their numbers were much higher in the marsh than in open water. That shrimp and crabs fed on them was also indicated by the research. Large numbers of these small food animals built up in the winter when few shrimp and crabs were in marsh. Their number dropped rapidly in the spring and hit bottom in May when brown shrimp were most abundant. Their numbers rose somewhat after May and then bottomed out again in August and September when white shrimp were most abundant. By December, when the crabs and shrimp left the marsh, their numbers rapidly increased.

The answer to the first question is that yes indeed rising sea level and subsiding land seems to boost production of crabs and fish.

The answer to the second question is a little more speculative. Research done at LSU in the 1980's showed that as land and marsh grass becomes submerged longer and deeper, that the marsh grass begins to drown and die. Eventually these areas convert to open water. However, the researchers indicated that at low rates of submergence (lower than what we now have in Louisiana), new marsh grass grows further inland as flooded marsh dies. At high rates of submergence (such as what we now have in Louisiana), inland marsh re-establishment rates cannot keep up with marsh loss. Ultimately, this will result in lower crab and shrimp production.

Source: *Effects of Accelerated Sea-Level Rise on Coastal Secondary Production.* Roger J. Zimmerman, Thomas J. Minello, Edward F. Klima and James M. Nance. National Marine Fisheries Service. Coastal Wetlands Coastal Zone '91 Conference-ASCE. 1991.

MARINE ADVISORY BOARD NEWS

Since 1997, the Jefferson Parish Marine Fisheries Advisory Board has been attempting to get the National Oceanic and Atmospheric Administration (NOAA) to broadcast shrimp and other fishing season closures on NOAA Weather Station radio

broadcasts. The Marine Advisory Board has recently received some help on this project from the Louisiana Department of Wildlife and Fisheries (LDWF) Enforcement Division.

At the October Gulf States Marine Fisheries Commission meeting, Lt. Jeff Mayne representing LDWF, enlisted the support of the other four states in the gulf in passing a resolution that requests NOAA to begin broadcasting of season closures on the channel.

In another move, Mayne also introduced a resolution for the Gulf States Marine Fisheries Commission to request a grant from U. S. Congress to establish a fishermen's information channel on VHF radio broadcasts. If funded, this broadcast would not only cover season openings and closings, but also changes in fisheries laws and regulations.

ALLIGATORS IN LOUISIANA

The harvest of alligators in Louisiana provides an important income source for commercial fishermen in Louisiana. The state also is home to a large number of alligator farms, where alligators are raised from hatchlings to harvestable size under controlled conditions.

The state's modern wild alligator harvest began in 1972, after a number of years of closed harvest under the Endangered Species Act. In that year a limited harvest of 1,350 animals was made in Cameron Parish. In 1973, the season was extended to Vermilion Parish, and in 1975 Calcasieu Parish was opened.

By 1980, wild alligator harvest was open in 63 of the 64 parishes in the state, where it remains today. In the 1990's, the harvest has constantly been over 24,000 animals yearly . This harvest takes place during a one month period between early September and early October. Tags are allocated to harvesters based on the number of acres of suitable habitat under lease or ownership.

The average size of wild alligators harvested over the last 25 years has been very consistent at around 7 feet long. Prices paid per foot of skin have ranged from a low of $7.88 in 1975 to a high of $59.00 in 1990. Last year's average price of $18.00 per foot was the lowest since 1983. Final prices for 1998 have not yet been calculated, but are also low. Alligator meat is also very valuable. In 1997, the total value of the meat, for the first time, was higher than the value of the skins.

Alligator farming, or as it is more properly known, alligator ranching is also a big business. The number of permits issued peaked at 134 in 1991. In 1996, 81 permits were issued and over 160,000 skins were produced. Typically these operations are stocked with eggs taken from wild alligator nests. After growout, a set percentage of the animals are released back into the wild to replace what would have survived from the nests. Alligator farms are scattered throughout the state.

Farmed alligator harvest is different from the wild harvest in several ways. First, they are harvested at a smaller size, averaging about 3 ½ feet long. After 4 feet in length, alligator growth rates slow and the cost of raising the animals goes up. Besides being smaller in length at harvest, the price paid per foot of skin for farmed alligators is quite a bit less than for wild skins. Farmed skin prices averaged $15.50 per foot in 1996 compared to $25.00 for wild skins.

Most Louisiana alligator skins, whether wild or farmed are exported for processing. About 38% are processed in the United States, and 62% are exported to the countries of France (28%), Italy (17%), Singapore (10%), and Japan (7%).

FRESHWATER DIVERSION FORUM PROCEEDINGS

In December, 1997, Jefferson Parish President Tim Coulon and the Jefferson Parish Marine Fisheries Advisory Board sponsored a **Public Forum on Freshwater Diversion**. The use of river diversions to restore coastal marshes has been an issue of interest for fishermen, environmentalists, and the public for several years. Much of the debate centers around what the impact of freshwater from the river will be on marine fisheries and ecosystems. Experts at the forum discussed a wide range of subjects, including fisheries impacts, river water quality, current and planned diversions, and other marsh restoration options. The proceedings of this meeting are now available. If you would like a copy, call or write Louisiana Sea Grant Communications Office, Wetland Resources Building, Louisiana State University, Baton Rouge, LA 70803-7507, (225) 388-6448, or call or write my office in Marrero`.

USED OIL, OVERLAND FLOW, STORM DRAINS, AND YOUR WATERSHED

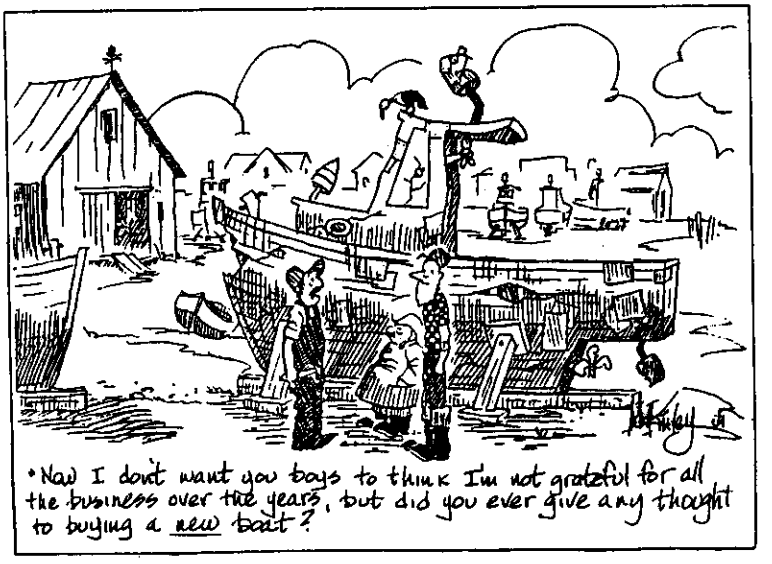
A watershed is a geographical community that includes all the humans, plants, and animals that live within the borders of a drainage basin. It also includes nonliving parts, like city streets, exposed soil, and the stormwater drainage system.

Whatever happens upstream or or upslope from you in your watershed affects you and your downstream neighbors. Anything dumped in your watershed will be carried by

overland flow and will end up in your local waterbodies. Whether you live in a coastal parish or at higher elevations, used oil and other harmful substances dumped on the ground or down a storm drain quickly find their way to a local lake or bayou with the first hard rain. These are the same lakes and bayous that you use for fishing and other recreation. For many of you, they are the source of your income. **Keep your waters clean by keeping your watershed clean.**

What You Can Do To Help

- Service your car and boat regularly to prevent oil leaks and air pollution. Recycle used motor oil and other fluids. **Don't pour used oil down a storm drain.**
- Plant vegetation on bare slopes to slow overland flow and absorb pollutants.
- Use pesticides in moderation and buy only the quantity you need for one growing season. Take any leftovers to a household hazardous waste collection event.
- Compost yard waste and use it as a ground cover and soil supplement.
- Do not pour unused household cleaning products down the drain. Take them to a household hazardous waste collection site.
- Dispose of paint and solvents at a recycling or household hazardous waste disposal site.
- Encourage your local merchants and parish government to sponsor household hazardous waste disposal events and recycling programs.



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THE GUMBO POT

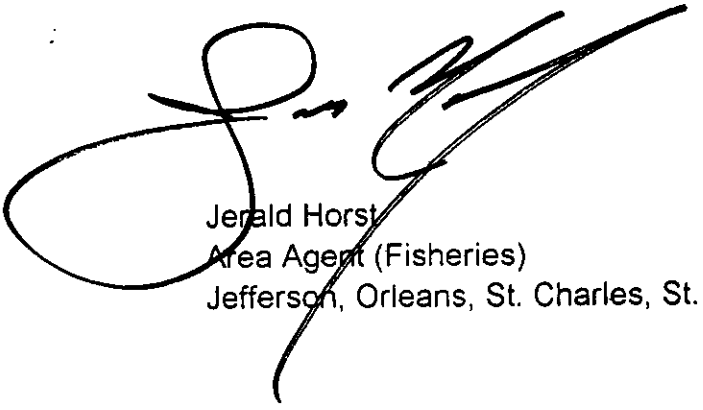
Shrimp and Mango Spinach Salad

This delightful salad has a touch of sweet, a touch of sour, and a touch of oriental. Everyone who enjoys cooking needs a zesting tool to make citrus peel zest. They are inexpensive and easy to find on the kitchen gadget rack at many grocery stores.

1¼	lb peeled shrimp tails	2	tsp grated orange rind zest
1	lb flat leaf spinach	3	tbsp orange juice
1	large ripe mango	1	tbsp grated fresh ginger root
1	medium red onion, sliced thin	¼	cup vegetable oil
4	tsp white rice vinegar	1	tbsp Asian sesame oil
			salt and pepper

Boil, drain and chill shrimp. Wash and drain spinach. Steam and tear leaves into bite-sized pieces. Peel, pit and cut the mango into thin strips. Add mango and shrimp to spinach. Place onion and 2 tbsp of vinegar in a small bowl. Smash onions in vinegar until onions are pinkish. Add to salad. Whisk orange zest, orange juice, ginger root, vegetable oil, and sesame oil into a mix. Add to salad. Salt and pepper to taste. Serve with toast. Serves 4.

Sincerely,



Jerald Horst
Area Agent (Fisheries)
Jefferson, Orleans, St. Charles, St. John