



Rebuilding Mississippi's Oyster Reefs

A publication of the Mississippi Department of Marine Resources – Fall 2009

Spring 2009 Shell Cultch Plant

During the spring from March through June, oysters begin to spawn and oyster larvae are looking for a place to settle down and find a home. In the Mississippi Sound when water temperatures reach 25°C or 71°F, oysters begin to spawn. After 2 to 3 weeks swimming around, the larvae seek a place to attach, preferably oyster shells or limestone, where they become spat. In these warm fertile waters it takes an oyster anywhere from 18 to 22 months to reach the legal 3-inch size.

The Mississippi Department of Marine Resources Shellfish Bureau began the spring cultch plant on April 21st and ended on May 27, 2009. A low-level limestone plant was spread out over Pass Christian Reef and the tonging grounds. In these areas, 14,330 cubic yards of limestone were spread over 292 acres. Additionally, 21,003 cubic yards of oyster shells were planted over 283 acres at Pass Marianne Reef and St Joe's Reef.



During this time, the Conservationist relayed 50 sacks of seed and sack oysters from Heron Bay to St. Joe's Reef and began cultivating reefs with bagless dredges to create more substrate for

oyster larvae to settle on. Funding for these cultch plants were awarded by NOAA's Emergency Disaster Recovery Program I & II.

MDMR Oyster Monitoring Program

The MDMR monitors the condition of Mississippi's oyster reefs. Information collected on size distribution, mortality, predator occurrence and spat set densities helps oyster scientists in managing this valuable resource.

The commercially important oyster reefs across the coast that are sampled are shown in (*Mississippi Oyster Reefs*). Additional samples are also taken to provide data for specific events, i.e. shell plantings, newly productive areas,

spat sets, and evidence of spawning. Sampling is performed using two separate methods:

1. one-minute oyster dredge pulls; and
2. random square meter dive samples.

Method 1 consisted of all reef material and marine organisms collected in a small sample oyster dredge during a one-minute pull. If the sample volume is more than 3 gallons, the sample is evaluated for both a 3-gallon volume and total volume. For Method 2, up to

20 random square meter samples are collected by Underwater divers from individually selected oyster reefs in approved or conditionally approved waters. All reef material and marine organisms obtained by both sampling methods are bagged, labeled and delivered to the laboratory for evaluation. The number of live oysters and dead oysters with the two valves still intact
continued on page 2

Trivia

The average 3-inch oyster filters about 50 gallons of water a day.

continued from cover –

MDMR

Oyster Monitoring Program

in each sample is listed. The total length of each oyster is measured with calipers from the end of the umbo (hinge end) to the farthest edge of the shell. The percentage of spat (1/16-1 inch), seed (1-2 inch), juvenile (2-3 inches), and marketable (>3 inches) oysters is determined for each sample. Oyster predators when present are counted. Water salinities and temperatures are recorded at the surface and bottom at each sampling site.

Between November 2007 and October 2008, a total of 62 one-minute dredge samples were taken. An example of the data analysis for dredge tows is shown in (Oyster lengths found in the square meter). Data from dredge samples allows the manager to assess the condition of the reef through size frequency distribution of the oysters collected. Size frequency distribution is the number of oysters of each size. Square meter sampling is a method of estimating total oyster production on a reef. A total of 94 square meter samples were taken from commercial oyster reefs in the Western Mississippi Sound. Information from this sampling method can be useful to compare years and as an aid in setting sack limits.

Trivia

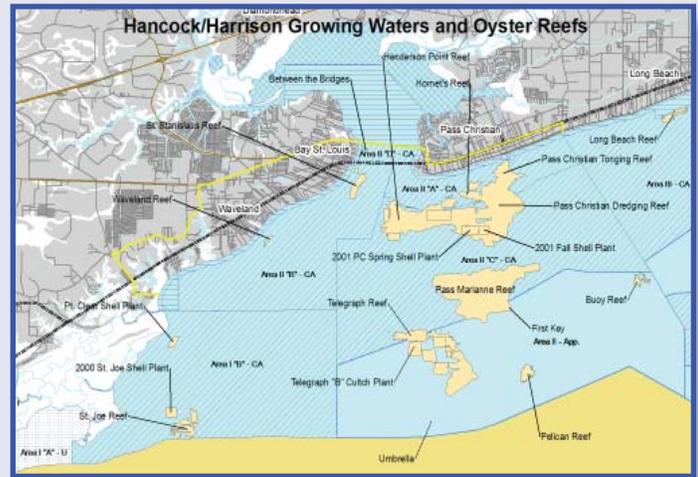
The record for shucking oysters is held by Frenchman Marcel Lesoille, who shucked 2,064 oysters in one hour.

New Oyster Refrigeration Standards

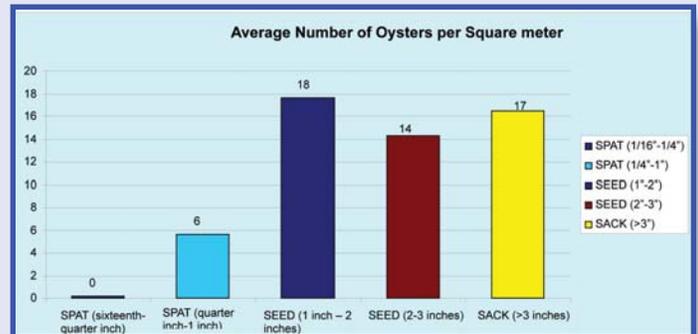
The Interstate Shellfish Sanitation Conference (ISSC), which is made up of representatives from the seafood industry, state regulators and federal regulators, came together in agreement on new *Vibrio parahaemolyticus* control measures. For the summer months when oysters are harvested where water temperature exceeds 80°F, those oysters shall be under the new *Vibrio parahaemolyticus* control measures. In Mississippi, the water temperature exceeds 80°F in May or June and drops below 80°F in September or October. The new control measures are as follows:

1. The shellstock must be placed under refrigeration within 5 hours of initial harvest. The harvester must either reach a dock where refrigeration is available or install a refrigerated unit on the boat.
2. If the harvester is unable to refrigerate the oysters within the 5-hour time limit, the oysters will then be labeled "For Cooking Only" or the oysters may be sent to a facility that uses post-harvest processing for oysters.
3. Or the growing areas in that state may be closed and no harvesting will take place.

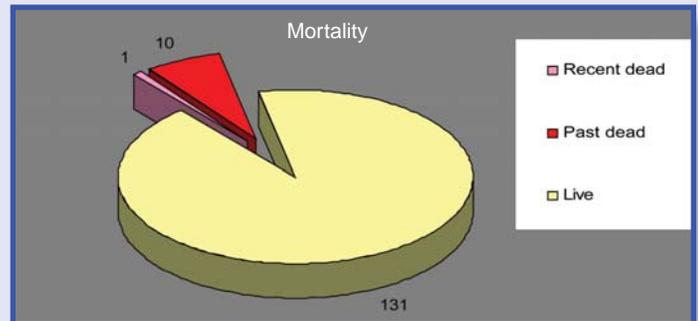
Additional refrigeration standards are in the works for the entire Gulf of Mexico to reduce *Vibrio vulnificus* illnesses. These standards are scheduled to be in place by May 2010. For more information, visit the FDA Web site at www.cfsan.fda.gov



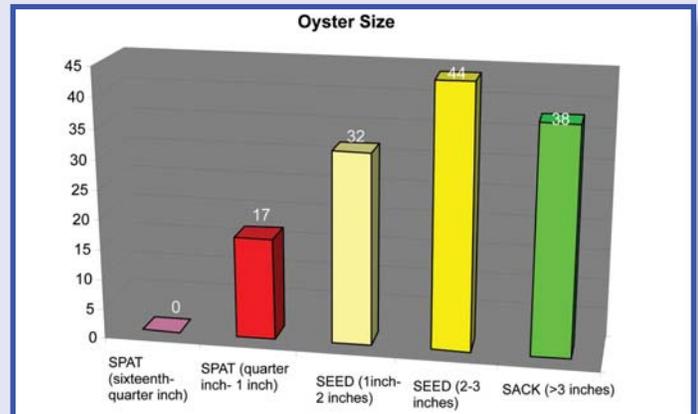
Mississippi Oyster Reefs



Oyster lengths found in the square meter



Amount of live versus dead oysters found in a sample



Oyster lengths found in the one-minute dredge tows

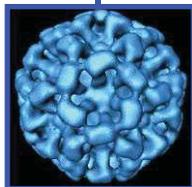
REEF	NUMBER OF SAMPLES	MEAN # OF OYSTERS/SAMPLE	REEF IN ACRES	ESTIMATED SACKS/REEF	ESTIMATED SACKS/ACRE	NUMBER OF MARKETABLE OYSTERS
Pass Christian	40	3.8	3641	185,417	51	151
Telegraph	20	0.8	1273	13,738	10.8	16
Pass Marianne	20	2.8	2420	91,408	37.8	56
St. Joe	20	5.4	250	18,211	72.8	108

Number of marketable sacks of oysters on reefs in 2007

Some Helpful Guidelines for a Safe Harvesting Season

Recent media attention to seafood has led to an increase in the public's awareness and a number of misconceptions about the safety of eating seafood. Food-borne illness is not limited to seafood but is a common concern to all food industries. The MDMR has many programs, policies, and standards in place to help ensure that all of Mississippi's commercially harvested and processed seafood is safe for consumers. Biological research, commercial inspections, health risk assessments, and the continuous monitoring of current regulations help to ensure seafood safety.

The local seafood industry works very hard to follow MDMR's strict harvesting and sanitary procedures, such as daily sanitation of all surfaces exposed to seafood during harvesting and processing. To avert bacterial contamination, clean oyster sacks are required. In addition, the proper use and disposal of required marine sanitation devices (MSD) on all commercial and recreational oyster fishing boats is crucial in preventing reef closures and an unwelcomed economic burden to the seafood industry. When a vessel is actively harvesting shellfish, all human wastes must be contained within an approved MSD on board to protect oyster growing waters from becoming contaminated with human pathogens. Also, all oyster vessels are encouraged to obtain a sanitary harvesting kit including disposable gloves, toilet paper, hand sanitizer, and waterless hand wash on board during harvesting.



We all play a critical role in ensuring the safety of our seafood. One of the most common occurring food-borne illnesses is known as norovirus. This group of viruses causes "stomach flu" like symptoms or gastroenteritis (GAS-tro-enter-I-tis) in people. Primary sources of norovirus infections are eating or drinking contaminated food or liquids. The symptoms include nausea, vomiting, diarrhea, and stomach cramping, which are usually brief, lasting between one to two days. Commercial fishermen and employees of seafood processing facilities should not handle seafood if they have been experiencing symptoms of norovirus.

The incidence of illness attributed to seafood can be minimized with public outreach programs focusing on seafood-borne illness prevention strategies. The nutritional benefits of shellfish far outweigh the safety concerns, and when harvested and handled properly, shellfish are as safe to eat as any other source of protein.

References

- Interstate Shellfish Sanitation Conference. 1997. *Evaluation Standards*. In: *Interstate Shellfish Sanitation Program Handbook*. Interstate Shellfish Sanitation Conference.
- National Food Safety Database. Consumer Tips for Handling Seafood Safely. Prepared by Robert J. Price, August 1990.
- National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, revised 2001.
- New England Fisheries Development Association. *Seafood Safety*. 1990.
- US Food & Drug Administration. If You Eat Raw Oysters, You Need to Know... July 1995.
- U.S. FDA/CFSAN. The Norwalk Virus Family [WWW document]. URL <http://vm.cfsan.fda.gov/~mow/chap34.html>
- US FDA. "Vibrio vulnificus." *Bad Bug Book*. January 1992.

Questions & Answers

Question ~ How long can an oyster live?

Answer ~ An oyster can live 20-30 years, depending on the species. Sometimes they can live longer depending on the body of water and the algae it consumes.

Question ~ How long does it take an oyster to grow?

Answer ~ A Pacific oyster takes 2 years to reach market size of 2½ - 3 inches. Kumamotos take about 5 years. Olympias take at least 4 years to reach just a single inch. Belons, depending on the location can take over 5 years. Atlantic oysters grow more slowly and take on average 6-7 years. Warm water oysters from the Gulf of Mexico can reach 4 inches in less than 9 months, with most of the 3" marketable oysters taking about 18-24 months.

Question ~ Are oysters male or female?

Answer ~ Oysters are Hermaphrodites, meaning they "switch" between male and female over the course of their life. They mostly start as males, and can switch a number of times, depending on what is needed. There is no way of telling male oysters from females by examining their shells. While oysters have separate sexes, they may change sex one or more times during their life span. The gonads, organs responsible for producing both eggs and sperm, surround the digestive organs and are made up of sex cells, branching tubules and connective tissue.

Question ~ How do oysters reproduce?

Answer ~ The males "spawn" when the water reaches a certain temperature, usually above 68°-70°F, depending on the species. Females generally spawn when the water is just a tad less warm than the males. A male discharges about 50 million sperm a "pop," with the female slightly higher in the number of eggs. In the wild, the rate of survival for an oyster to reach an inch is about one in 25,000 fertilized eggs.

Question ~ How do oysters eat?

Answer ~ Oysters are filter feeders, meaning they pump water through their body by opening and closing their shell. A mature oyster can filter over 50 gallons of water a day. This is what creates the difference in flavor and finish. Oyster flavor comes from the algae oysters filter, the depth it's grown as well as the amount of salt in the water it filters.

Question ~ What about pearls?

Answer ~ The pearl is farmed, usually in the South China Sea, but not from an oyster we consume. It is a completely different species called the Rock Oyster, *Crassostrea malagrina*, and is only farmed for pearl-culturing purposes. A ¼-inch pearl takes almost 10 years to grow in nature, but in a controlled environment can be accomplished in about a third of the time. Pearls do occur in nature, but are extremely rare in the cold-water oysters we consume. A pearl starts out as a grain of sand that gets trapped inside the oyster and gets covered in calcium as a defense mechanism.

Southern Oyster Drill – *Stramonita haemastoma*

Have you seen this animal? This is the southern oyster drill, also known as a conch or snail. These animals can be devastating to oyster reefs by eating the small young oysters called spat. They open the oyster by drilling a small hole with their radula, which is similar to a rasp, and then digest the meat. Drills are found throughout the Gulf of Mexico. Drills lay egg casings that change from creamy yellow with eggs to purple after the eggs hatch. They prefer salty water above

15 parts per thousand (ppt), but can tolerate fresher water down to 8 ppt. Drills do not like cold water and stop feeding at about 54°F. If you find drills or their egg casings in your catch do not throw them back. Put them in a bucket and properly dispose of them on shore. You can also scrape off the casings or destroy the meat with a knife. Hermit crabs use discarded drill shells as their homes and should not be mistaken for drills.



Oyster Drill Egg Casing



Oyster Drill Egg Casing



Southern Oyster Drill – *Stramonita haemastoma*

Oyster Season Recap

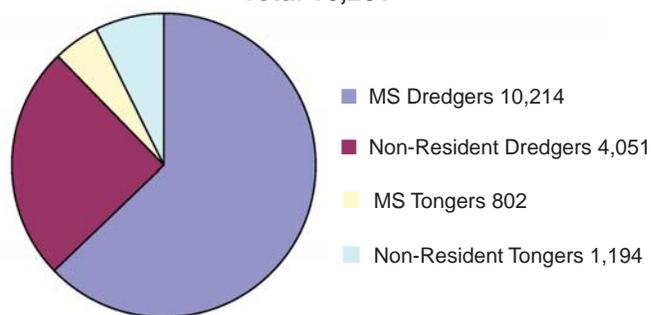
Oyster Season began Sept 25, 2008

and ended on March 17, 2009. The total

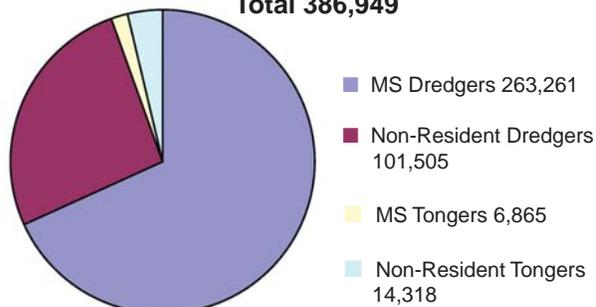
harvest was 385,949 sacks of oysters

harvested from 16,261 boat trips.

Number of Boat Trips – Oyster Season 2008-2009
Total 16,261



Number of Sacks Harvested by Gear Type
Oyster Season 2008-2009
Total 386,949



Trivia

A baby oyster is called a spat.

Fuel efficiency for boats

Boating has become an expensive undertaking these days with the fluctuating fuel cost. For those that fish for a living, this is not a luxury but a necessity. Rising fuel costs put some fishermen in jeopardy of losing their livelihood. Whatever your boating use is, fuel efficiency is important.

Check your knowledge on fuel efficiency. Try to answer the following questions.

1. Cleaning the trash from your boat saves on fuel.

True or False

True – Cleaning the trash and unnecessary baggage on your boat will decrease the weight of the boat and in turn decrease the drag. This includes everything from old fishing gear to unnecessary anchors. It is surprising how much weight some boats have to lose. Also, remember to take along only the items you need on your trip and leave the extra baggage at home.

2. Cleaning the marine growth off the bottom of your boat saves on fuel. True or False

True – The same concept applies here. Growth on the bottom of your boat such as barnacles causes drag, which uses more fuel. Try to clean the bottom of your boat as often as you can.

3. You should only replace your propeller if it breaks.

True or False

False – Having a chipped or chewed up propeller means that it will not work as efficiently as it should and in turn uses more fuel. Inspect your propeller often. If it looks bad, consider having it repaired or replaced. Even if it is just chipped, you should have it repaired as soon as possible.

4. When traveling on open water it is best to:

a. Travel at an average speed

b. Travel at a speed that sets your boat on an even plane

c. Travel at full speed for less time traveled

B – Get to know your boat and figure out the speed needed to get your boat on an even plane. Maintaining this speed for the duration of your travel uses less fuel and decreases the drag of the boat.

5. When towing your boat with your vehicle, you should:

a. Travel the speed limit

b. Travel 5 miles over the speed limit

c. Travel under the speed limit

C – The slower you travel, the better. Since your engine is working harder to pull the boat, it will definitely use more fuel to do so.

Try to travel a few miles under the speed limit to decrease the pressure on your engine. The slower the better, but not too slow, some areas do have minimum speed limits.

It is important to do regular maintenance such as changing fuel and oil filters and tune-ups on your boat engine. Your boat engine will have to work much harder if the system is not maintained, causing your engine to consume more fuel. Also, try not to idle the engine. This wastes fuel, and it takes less fuel to restart your boat.



Oysters Mosca

Mosca's Restaurant, New Orleans, La.

4 dozen Mississippi Gulf oysters
1 cup bread crumbs
1 stick butter
1 large onion, chopped
½ bulb garlic

½ teaspoon thyme
¾ teaspoon oregano
2 tablespoons parsley
¼ tablespoon red pepper
Salt & pepper to taste

Sauté butter, onions & garlic; add other seasonings. Add oysters and sauté until they begin to curl. Stir in bread crumbs. Add oyster liquid if needed. Place in baking dish. Sprinkle with Parmesan cheese. Bake 20 minutes in preheated 350 degree oven. Serve with hot French bread and a salad. Enjoy!

Recipe submitted by Corky Perret
Originally published in MDMR Seafood South Mississippi Style recipe book

Trivia

After spending the first part of its life floating freely through the ocean, a young oyster will cement itself to a rock or other hard surface, never to travel again.

A female oyster can produce 100 million eggs during one breeding season.



Mississippi Department of Marine Resources

1-800-374-3449 or 228-374-5000

Oyster hotline 228-374-5167

www.dmr.ms.gov

State of Mississippi

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