

Louisiana Sea Grant College Program

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What Is Sea Grant?

Since 1968, Louisiana Sea Grant has been a major force in the state’s continuing struggle to sustainably manage, utilize and maintain its coastal areas and resources. Louisiana Sea Grant researchers have garnered fundamental knowledge of coastal resources and natural systems, and produced practical, innovative technology to support coastal businesses, communities and economies. Based at Louisiana State University, Louisiana Sea Grant draws on the state’s entire university community and a national network of Sea Grant colleges in meeting its commitment to research, education, technology transfer and advisory services.

The National Sea Grant College Program directs federal resources to pressing problems in local communities. By drawing on the experience of more than 3,000 scientists, engineers, public outreach experts, educators and students from more than 300 institutions, Sea Grant is able to make an impact at local and state levels, and to serve as a powerful national force.

Sea Grant is administered at the national level through the National Oceanic and Atmospheric Administration, but implemented at the local level – where we live and work. This unique model brings to bear the expertise of the academic community in essential but practical research and outreach activities that address society’s changing needs. Vital elements of every Sea Grant program include applied research, extension and outreach, education and communication.

Louisiana Sea Grant’s efforts not only benefit citizens of the state, but also the nation, while responding to the congressionally mandated goals of the National Sea Grant College Program.



Grand Isle Oyster Hatchery Marks 20 Years

Louisiana Sea Grant (LSG) marks 20 years of operating its oyster hatchery on Grand Isle in 2013. During those two decades, the facility has been destroyed by hurricanes twice, threatened by an oil spill, relocated once, and now awaits another relocation into a state-of-the-art building.

“Basically, my goal over the last seven years has been just keep the research focus going,” said John Supan, LSG’s oyster specialist and hatchery director. “There were three recent summers where I did all my spawning at Auburn Shellfish Laboratory on Dauphin Island because our hatchery was a wreck from hurricanes. Then the 2010 season was ruined by the Deepwater Horizon oil spill. But now we’re on a roll,” said Supan.

The hatchery was established in 1990 as a commercial operation when the natural production of oyster seed was down because of drought and low Mississippi River discharge. Gulf Shellfish Farms of Louisiana ran the facility at that time, and Supan, who was a young LSG Marine Extension agent, was loaned to them to manage the hatchery and help train oystermen in remote setting techniques.

By 1993, naturally occurring seed production had rebounded, thanks in part to a record rainfall, and the need for a commercial hatchery passed. That could have been the end of it, but when the commercial venture folded, Louisiana Sea Grant acquired the hatchery and retooled it into a research facility with Supan at the helm.

Most of Supan’s research has focused on developing a broodstock for producing triploid oysters, which have higher summertime meat yields. But he is also examining alternative oyster growing systems, including two off-bottom cultivation techniques.

One method, called a long-line system, uses mesh bags suspended in the water column on a cable attached to posts. The bags can be raised and lowered to protect oysters from predators, fouling and the effects of disasters like hurricanes. The

other system, called OysterGro, is less infrastructure intensive. It uses floating metal cages attached to pontoons.

“The systems we’re looking at are commercially used in other parts of the world,” said Supan. “People are making money with them, and they’re recovering more of the oysters they put in the water. One of my former graduate students conducted an industry survey and found, on average, only 35 percent of the oysters planted using traditional methods make it to harvest. With off-bottom culture, every oyster you put into the water you get back.”

The alternative oyster culture research is conducted at the hatchery’s demonstration farm, located adjacent to a new operations center that opened in 2012 to replace a building lost during Hurricane Katrina. The operations center provides a farm service area downstairs and living and office space upstairs for Supan and his graduate students.

Hatchery functions moved to the Louisiana Department of Wildlife and Fisheries’ (LDWF) Grand Isle Fisheries Laboratory in 2009 after being destroyed a second time. In 2005, Hurricane Katrina devastated the hatchery. Supan rebuilt, but the hatchery was razed again in 2008 by Hurricane Gustav. Construction on a new \$3 million permanent facility is scheduled to begin later this year, with hopes of



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1990 Gulf Shellfish Farms establishes the oyster hatchery because of a lack of naturally-occurring oyster seed, enters a cooperative agreement with the Louisiana Sea Grant College Program.	2005 Hurricane Katrina destroys the hatchery. Tens of millions of oyster larvae are lost to the storm.	2008 Hurricane Gustav destroys the hatchery.	2010 Deepwater Horizon oil spill disrupts hatchery operations.	2013 Construction begins on new oyster hatchery building.
1993 Natural seed production rebounds and demand for hatchery-based seed drops. Louisiana Sea Grant acquires the hatchery for research.	1993 Natural seed production rebounds and demand for hatchery-based seed drops. Louisiana Sea Grant acquires the hatchery for research.	2009 Hatchery operations resume on Grand Isle.	2009 Hatchery operations move to the LDWF Fisheries Lab.	2012 Oyster Hatchery Operations Center opens.

Hatchery Anniversary *continued*

moving-in during 2013-14.

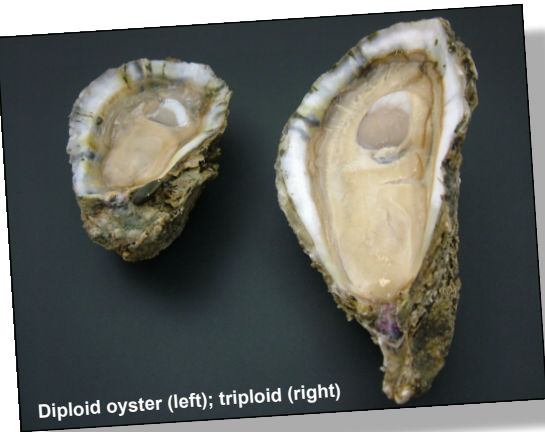
The new hatchery is funded with money from a Natural Resource Damage Assessment (NRDA) grant for projects identified as helping speed recovery following the 2010 Deepwater Horizon oil spill. The new facility will help Supan’s team remain at the cutting edge with state-of-the-art equipment for algal production, water filtration and even a seawater heater allowing the hatchery to extend its larval production beyond the current May-to-September season. The new hatchery also will be able to continue running essential equipment during tropical storms with reduced hurricane preparation and recovery times.

The seawater heater will help Supan produce more than one billion larvae annually. Some of those larvae can be used to supply commercial oyster farmers with seed through a nearly completed agreement between Louisiana State University and the Louisiana Oyster Dealers and Growers Association. Supan also plans workshops for oyster growers interested in setting up their own shore-side nurseries to cultivate seed.

Through an agreement with LDWF, the hatchery will supply half of its larval production to the state for setting in public waters. In return, Supan receives \$210,000 annually that has allowed him to hire two full-time research associates. He hopes to add a third this year.

But what sets the hatchery apart and makes it commercially appealing is its potential to produce the aforementioned triploid oysters. “For hatcheries to succeed in the Gulf, they’re going to have to produce something that nature can’t because they can’t compete during times of high natural oyster production,” said Supan.

Triploid oysters have three sets of chromosomes – unlike normal (diploid) oysters that have two – and triploids are sexually sterile. From June through November when diploid oysters are expending energy to spawn and shedding fat stores, triploid oysters remain meaty – creating a possible summer



Diploid oyster (left); triploid (right)

crop for Louisiana oyster growers.

Triploids can be created artificially in the lab by manipulating oyster chromosomes, which Supan has done, but that process is not 100 percent effective. However, chromosome manipulation can also be used to create tetraploid oysters, which have four sets of chromosomes and can sexually reproduce. When bred with diploid oysters, tetraploid oysters produce 100 percent triploid offspring. Supan’s goal is to create a broodstock line for annual triploid production.

“Alternative oyster culture and triploid production both hold promise, but I don’t see them as replacing traditional methods used by the Louisiana oyster industry,” said Supan. “Nonetheless, I do see them as augmenting natural oyster production and creating new markets for growers.”



Algae grown as oyster food

Off-bottom Oyster Culture Aided by Sea Grant Legal

Louisiana’s oyster farmers are free to experiment with different methods of growing mollusks thanks to a 2012 law that opens state-owned waters to alternative oyster culture, including off-bottom techniques.

In 2004, John Supan, Louisiana Sea Grant’s (LSG) molluscan shellfish specialist, wanted to experiment with off-bottom oyster cultivation at the program’s oyster hatchery in Grand Isle. But bureaucratic barriers stymied those efforts. “Finally, we said, ‘It looks like we need to get special authorization from the Legislature to do this.’ So, in 2005, we drafted a bill that would allow experimental mariculture operations,” said Jim Wilkins, director of LSG’s Law and Policy Program.

The legislation Wilkins and his team wrote allows experimental aquaculture on a five-acre water bottom. But even after Legislature approval, issues persisted.

“The Office of State Lands said its policy required permission from adjacent land owners before they would permit the project,” Wilkins said. So while Supan’s equipment for off-bottom culture sat idle, Wilkins’ group tried to track down who owned what land – an arduous task – and several more years passed.

They eventually decided to seek general approval for off-bottom oyster culture.

Working with attorney Larry Marino, hired by the Louisiana Department of Wildlife and Fisheries (LDWF) to coordinate the effort, and former Sea Grant law clerk Cole Garrett, now with LDWF, Sea Grant Legal helped draft language that would eventually become HB 1190. “Over the course of several months we assisted with writing the bill. Other user groups – oil and gas, the shrimping industry and others – had their input and we made revisions. Finally, we had a final draft bill, it was submitted, went through the legislative process and it was passed,” said Wilkins.

The bill was signed by Gov. Bobby Jindal on May 25, 2012.

The law establishes the use of state water bottoms for alternative oyster culture as a legal use, lays out the process for obtaining permits and allows for alternative methods of oyster culture on qualified existing leases. The Office of State Lands also dropped its provision that oyster growers obtain permission from adjacent landowners. A separate bill drafted by the LSG Law and Policy Program expands Supan’s original five-acre experimental aquaculture area to 25 acres.

Louisiana Sea Grant continues to work closely with state agencies in developing regulations so HB 1190 can be fully implemented. That work includes developing maps that identify suitable off-bottom culture locations across the state.



Demonstration farm

For more information on the oyster hatchery, visit www.laseagrant.org/research/hatchery/index.html