



The Florida Senate

Interim Report 2011-102

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Committee on Agriculture

IMPACT OF DEEPWATER HORIZON OIL LEAK ON AQUACULTURE

Issue Description

The Department of Agriculture and Consumer Services (department) regulates aquaculture in Florida. This project examines possible impacts to the industry by the rupture of an offshore well south of Louisiana that gushed crude oil into the Gulf from late April until July, 2010. Background is provided on Florida aquaculture, a status is given of the effect the oil spill has had on aquaculture and the shellfish harvesters, and recommendations are given for resources the department needs to ensure continued productivity of this valuable resource.

Background

Florida Aquaculture

Aquaculture, simply defined as the cultivation of aquatic organisms, is Florida's most diverse agribusiness. The Department of Agriculture and Consumer Services' Division of Aquaculture regulates aquaculture facilities and shellfish processing plants, is responsible for opening or closing waters for shellfish harvesting to protect human health, ensures the continued productivity of oyster reefs through a restoration program and issues leases of submerged state lands for aquaculture. The division has played a key role in responding to the potential and real impacts of the oil spill along Florida's coastline.

Florida is perfectly positioned as the preeminent source of environmentally sustainable and friendly, farm-raised, filter-feeding oysters, clams and mussels. Estuaries on the Gulf and Atlantic coasts are rich in phytoplankton and have clean water and moderate temperatures that make for a long growing season that can yield marketable hard clams in a third of the time that northern growers experience.

The department manages 1.4 million acres spread over 38 shellfish management areas in accordance with the Model Shellfish Ordinance created and maintained by the Interstate Shellfish Sanitation Conference to ensure wholesome and safe shellfish are available to national and international consumers. Florida's principal molluscs are the hard clam and American oyster, although several other bivalve molluscs are being tested to diversify production.

The northern hard clam is farmed in three regions of the state to satisfy national demand for food and seed clams: Big Bend, Charlotte Harbor, and Indian River Lagoon. Production of farm-raised hard clams has grown at an almost exponential rate since 1995 when public investment occurred to retrain fishers impacted by a Constitutional Amendment that limited certain fishing gear. Between 1995 and 2007 the value of hard clams tripled from \$5.4 million to \$15.2 million. A University of Florida 2008 economic survey found that during 2007 approximately 185 million cultured hard clams were purchased by Florida wholesale dealers, producing grower revenues of \$19 million and a total economic impact of \$53 million. The growing and marketing of farm-raised hard clams to wholesale dealers, restaurants, food service buyers, retail seafood shops, and direct to consumers in and outside of Florida created a total impact that includes \$31.5 million in value added revenue, \$25.2 in labor income, \$4.6 million in property income (rents, royalties, interest, dividends, and corporate profits), \$1.6 million in indirect business taxes, and 606 jobs (full and part time).¹

¹ Florida Aquaculture Plan 2011-2012, Department of Agriculture and Consumer Services

Another valuable shellfish is the American oyster which is cultured on over 500 acres of state owned submerged lands leases. Florida harvests over 2 million pounds of oysters each year, making it one of the top oyster-producing states in the country. Ninety percent of Florida's oysters are harvested from the famous Apalachicola Bay on the panhandle coast. The bay is the largest oyster fishery in the Southeast and one of the cleanest, most productive marine ecosystems in North America.²

Offshore Drilling in the Gulf of Mexico

For more than 50 years, the Gulf of Mexico has been one of the world's most active offshore drilling areas (second to the European North Sea). The western and central sections of the Gulf of Mexico account for essentially all of the current offshore deepwater drilling in the United States, since there is a congressional moratorium on leasing activity in most of the eastern gulf and along all of the eastern and western US coasts.³ Near-shore drilling and natural gas exploration has left the sea floor punctured by and lined with metal pipelines. At least 324 off-shore spills have spewed oil into the Gulf, which is riddled with hundreds of natural fissures from which an estimated 1 million barrels of oil seep each year. Because of the natural presence of oil, the Gulf is teeming with bacteria uniquely suited to breaking down hydrocarbons. However, scientists are wondering how much petroleum the microorganisms, and the more complex creatures that depend on them, can handle.⁴

On Tuesday, April 20, 2010, BP's Deepwater Horizon drilling rig exploded in the Gulf of Mexico near Louisiana, killing 11 platform workers and injuring 17 others. On July 15, the leak was stopped by capping the gushing wellhead after it had released millions of barrels of crude oil. The spill caused extensive damage to marine and wildlife habitats in Louisiana, Mississippi, Alabama and the Florida Panhandle, as well as the gulf's fishing and tourism industries.

The Deepwater Horizon disaster has revived vivid memories of the world's worst accidental oil spill, a blowout that spewed oil for nine months, devastating marine life and covering the Texas and Mexican coasts with crude oil. The spill wiped out fishing along the Mexican coast for about two years. There are significant parallels between the two spills. Like the Deepwater Horizon spill, the Ixtoc I spill on June 3, 1979, involved the failure of a blowout-preventer device. In both cases, metal domes put over the well failed to stop the leak.⁵ Unfortunately, after the first year or two, there was little scientific follow-up on the Ixtoc spill, so long term effects of the spill on marine life and the fishing industry in the Gulf is still unknown.

Oil spewing from the Deepwater Horizon well and on the surface was treated with nearly 2 million gallons of dispersants, a standard tool in the oil cleanup business, to break up the oil offshore in hopes of preventing thick crude from wrecking delicate marshlands, mangroves and pristine beaches. The dispersants created droplets of differing densities that then floated throughout the water column, some in plumes, some in lower concentrations. Most of it was sprayed from airplanes, but the Deepwater Horizon response team also applied at least 55,000 gallons in a completely untested way — injecting it at the well's leaking riser, some 5,000 feet below the surface. No one is quite sure what kind of damage this mixture of dispersant, oil, and its constituent chemicals can do to marine organisms and ecosystems. The toxicity of the dispersant BP has used, Corexit 9500, is hotly debated. Ron Kendall, a professor of environmental toxicology at Texas Tech, believes the use of dispersants facilitate the release of toxic oil components, including benzene, a carcinogen, and toluene, which can cause neurological damage, that remain in the water.⁶ The federal government, (the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the U.S. Coast Guard and other agencies) has signed off on BP's use of dispersants as a necessary part of the company's damage-control strategy.

On September 2, 2010, another oil rig, owned by Mariner Energy Inc. exploded and burned off the Louisiana coast. Fortunately, no one was killed. Mariner Energy reported that it was able to shut down the wells connected to the oil and gas platform, averting leaks.

² www.fl-seafood.com/industry/research_reports.htm

³ <http://www.EnergyTrainingResources.com>

⁴ "Scientists Wait, Watch for Long-Term Effects of Oil Spill," Tallahassee Democrat, September 12, 2010

⁵ <http://www.blogforarizona.com>

⁶ <http://e360.yale.edu/content/print.msp?id=2302>

Affect on Harvesters and Aquaculture Operations

Oystermen in Apalachicola Bay are proud of the quality of the oysters they harvest and want to do everything possible to protect the oysters, their livelihood and their income. Apalachicola provides the state with 90 percent of its oysters. While fish can swim away from the impacted areas, the concerns are for mollusks and shrimp that are unable to evacuate the spill. A spill can devastate local fishermen by damaging equipment, disrupting operations, and closing fisheries, causing scarcities and higher prices for consumers. At this time, the department is unable to provide an assessment of impacts, because the oil did not close any of the shellfish waters. A marketing study would be required to determine the amount of sales lost due to the perception of tainted seafood, resulting in diminished demand for Gulf oysters and clams.

Many local fishermen, oystermen and shrimpers took advantage of BP's offer to provide pay in exchange for beach cleanup. In addition, BP designed and implemented the Vessels of Opportunity (VOO) program to provide local Gulf Coast boat operators an opportunity to earn money and respond to the spill by assisting with response activities, including transporting supplies, assisting wildlife rescue and deploying containment and absorbent boom.

To qualify for the program, boat operators and crew had to meet several key requirements, including completing four hours of training, passing a U.S. Coast Guard dockside examination and meeting crewing requirements based on vessel size. Vessels had to also be certified as safe. Once qualified and selected for use, a captain received a check for \$5,000. Added to that, on the days a boat was actually used under the program, the captain received \$1,200 for the use of the boat and was paid an additional \$400. The mates on the boat (often two) were paid \$200 per day. While this created an employment opportunity and a way to get local vessels on the water to attack the oil, the significant reduction in oysters being harvested had a negative impact on businesses up the line, such as processing plants and restaurants.

On July 1, 2010, the Commissioner of Agriculture announced the extension of the licensing period for the Apalachicola Bay Oyster Harvesting License. This license is required to commercially harvest oysters from the Apalachicola Bay System. Under normal circumstances, licenses for the fiscal year that begins July 1 must be obtained between May 17 and June 30, or applicants face a \$500 late fee. This action extended this year's licensing period through August 31, 2010, meaning that no late fee will be imposed until after that date. The Commissioner extended the harvesting licenses to allow the oystermen to increase their harvests and to lessen the financial burden and turmoil caused by the oil spill in the Gulf.⁷

The federal government arranged with BP on June 15 to set up a \$20 billion oil spill fund to compensate workers and business owners who have been harmed as a result of the spill. However, there has been anger that money earned doing clean-up work will be subtracted from a claim against the company.

Seafood Safety and Testing

The effects of oil on shellfish are dependent on many different factors. The three primary factors are oil type, life stage of the shellfish, and species of the shellfish. The early growth stages of shellfish are when they are most susceptible to damage by oil products. With mortality unlikely in adult shellfish, the main concern during pollution incidents would be sublethal effects. Some sublethal effects are decreased or abnormal growth, increased mucous production, damage to soft tissues, and decreased respiration rates.

The primary interest in protection of shellfish is to prevent contamination of the animals. "Uptake" of petroleum hydrocarbons takes place at all levels of water concentration, and petroleum is concentrated in the animals. Uptake and subsequent tainting of shellfish have long-term repercussions, because the fishery must be closed until the shellfish are determined to be clean. Shellfish reach a maximum body burden at which point the natural elimination process removes the petroleum at the same rate at which it is absorbed. Once the shellfish is removed from the pollutant, there is a marked decrease of the pollutant in the tissue levels with the highest percentage being removed in the first few days. Hence, immediate removal of the pollutant is of paramount importance.⁸

⁷ <http://www.doacs.state.fl.us/press/2010/07012010.html>

⁸ "What are the Effects of Oil on Marine Shellfish?," Region IV Regional Response Team (US Coast Guard & US EPA)

The Department of Agriculture and Consumer Services, Department of Environmental Protection the Florida Fish and Wildlife Conservation Commission, the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Food and Drug Administration (FDA) have continually monitored water and product samples. Strong systems by federal and state governments are in place to test and monitor seafood safety and to prohibit harvesting from affected areas, keeping oiled products out of the market.

The Florida Department of Agriculture and Consumer Services and Florida Fish and Wildlife Conservation Commission are responsible for seafood and shellfish safety to protect the health, safety, and welfare of the consuming public. The department's Division of Food Safety analyses, inspects and tests all seafood available to the Florida consumer while the Division of Aquaculture monitors wild-harvested or cultured shellfish (oysters, clams, scallops, and mussels) and opens and closes Shellfish Harvest Areas to commercial or recreational harvest. The Commission monitors seafood (fish, crabs, shrimp, and lobsters) in Florida waters.

To respond to the specific impacts of the oil spill, the department and the Florida Fish and Wildlife Conservation Commission have published a Florida Seafood Safety Plan to provide long term monitoring and analysis for the safety of Florida seafood products. The department's food safety lab can only run 80 samples per month. Under normal circumstances, that capacity would be sufficient, but with this spill hundreds of samples of both fish and shellfish will have to be tested over a long period of time, possibly years, in order to reassure the purchasing public. Some of the other states affected will need to rely upon Florida for food safety testing for a long time to come. The plan outlines the costs associated with supporting the 10-year period.⁹

Findings and/or Conclusions

The National Shellfish Sanitation Program requires Florida to have a Marine Biotoxin Contingency Plan. As part of the plan, Florida established sampling stations for collection of shellfish tissues used for toxicity testing. The Florida Plan has been reviewed by the US Food and Drug Administration and has been determined to be in compliance. These existing molluscan shellfish sampling stations will be used for the current Gulf of Mexico oil spill. Pre-event regulatory shellfish tissue samples were collected from each of these sampling stations. Samples are currently in frozen storage awaiting analyses. Tissue sampling will continue for the term of the proposal or until chemical sampling results return to background levels. To implement the response document, an average of 100 molluscan shellfish tissue samples are needed monthly for the term of the proposal.

The Department of Agriculture and Consumer Services has indicated that, after sampling, it appears that the oil spill has had no immediate impact on food safety. However, FSU scientists who have studied the spill say that the oil will likely remain in Gulf water and beaches for years. At this point, they have no idea how toxic the substances are that the oil releases.¹⁰ The Department of Agriculture and Consumer Services and the Florida Fish and Wildlife Conservation Commission, in an integrated effort with input from federal agencies, will inspect and monitor all seafood available to consumers through the Florida Seafood Safety Plan. The fundamental underpinnings of this plan are the application of objective, science-based sampling, monitoring, and analysis that will inform regulatory decision making to protect human health. This plan encompasses a 10-year time frame with a total cost due to the Deepwater Horizon oil spill event estimated to be \$59,173,014. This amount for capital costs has been submitted to BP, as illustrated in the following chart.

⁹ Florida Seafood Safety Plan, July 19, 2010

¹⁰ "FSU Experts: Oil Spill to Remain in Gulf Waters and Beaches for Years," Tallahassee Democrat, August 26, 2010

Ten-Year Cost Estimate Summary

Item	Estimated Cost
Shellfish sampling	\$4,632,331
Fish and invertebrate sampling	5,956,000
Shellfish sensory analysis	2,276,498
Seafood food safety analysis	35,521,185
Shellfish safety analysis	9,817,000
Consumer outreach	970,000
Total	\$59,173,014

The department's Division of Marketing has spent \$339,699.67 promoting Florida Safe Seafood. It received \$1.5 million from the BP Tourism Fund and has made a request to Visit Florida for \$3 million for advertising purposes.

Options and/or Recommendations

The Department of Agriculture and Consumer Service's 10-year plan for Seafood Safety is still required, even though the Deepwater Horizon Oil Well has been capped. Historically, when the department has been called upon to test food for contamination like antibiotics or other chemicals, the public has expected that the department continue testing long after the event that raised the concern subsided. The oil spill will most likely be no different. Consumers continue to ask if oil is present in seafood and if the state is testing. Without BP funding the proposed Seafood Safety Plan, the department will have a difficult time testing for all of the other substances that it is required to test for in food and test for oil too. It is recommended that the Florida Legislature support the department's request to BP by requesting that BP provide funding.