

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The top bulb has a dark blue cap, and the bottom bulb has a light blue cap.

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*Hurricanes Katrina and Rita: Fishing and Aquaculture
Industries—Damage and Recovery*

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Abstract. Hurricanes Katrina and Rita struck the center of commercial and recreational fishing along the Gulf of Mexico coast, which produces 10% of the shrimp and 40% of the oysters consumed in the United States. Initial losses to seafood production from Katrina were estimated at \$1.1 billion for Louisiana and may exceed \$200 million for Alabama, exclusive of infrastructure; Mississippi losses are comparable to those of Alabama. Additional damages from Hurricane Rita may bring Louisiana losses to nearly \$2 billion. This report summarizes damage assessments and recovery efforts.

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Hurricanes Katrina and Rita: Fishing and Aquaculture Industries — Damage and Recovery

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Summary

Hurricanes Katrina and Rita struck the center of commercial and recreational fishing along the Gulf of Mexico coast, which produces 10% of the shrimp and 40% of the oysters consumed in the United States. Initial losses to seafood production from Katrina were estimated at \$1.1 billion for Louisiana and may exceed \$200 million for Alabama, exclusive of infrastructure; Mississippi losses are comparable to those of Alabama. Additional damages from Hurricane Rita may bring Louisiana losses to nearly \$2 billion. This report summarizes damage assessments and recovery efforts, and will be updated as warranted to incorporate new information.

Hurricane Katrina struck the U.S. Gulf Coast on August 29, 2005, causing widespread flooding and significant property and infrastructure damage to the fishing and aquaculture industries in Louisiana, Mississippi, and Alabama. A total of 15 major fishing ports, 177 seafood processing facilities, 1,816 federally permitted fishing vessels, and more than 13,000 state-permitted fishing vessels were located in the region initially affected by Katrina. Katrina earlier brushed across the Florida Keys, causing damage there as well. On September 24, 2005, Hurricane Rita struck near the border between Texas and Louisiana, causing further damage in eastern Texas and western Louisiana.

The number of fishing vessels beached, sunk, damaged, or otherwise lost has not yet been determined; other vessels are trapped in back bays by debris that blocks shipping channels. For fishermen who did not lose their vessels, recovery may be mitigated somewhat as many fishermen are traditionally opportunistic, adaptable, and highly mobile, moving vessels to avoid catastrophe, shifting deliveries among ports as stocks move or prices offered by processors change as well as changing gear and refitting vessels to exploit different stocks at different times of the year. Unlike oysters, which likely suffered significant mortality, fish and crustacean populations may have suffered minimal increased mortality due to the hurricanes. In addition, marketability of catch appears little affected by contamination from storm runoff or consumer concerns about such. However, persistent high fuel costs could have a significant effect on the economic

viability of the more fuel-consumptive sectors of domestic seafood production (e.g., shrimp trawling) relative to imported seafood. Damage to processing facilities and disruption of former market-dealer relationships will add to recovery time and alter broader seafood markets and product availability.

Shrimp. Commercial shrimpers fishing out of or delivering to Alabama, Mississippi, and Louisiana ports account for almost half of all U.S. shrimp production. Katrina destroyed or severely damaged shrimp boats and shrimp processing and storage facilities throughout this area during this, the peak harvesting season; other vessels are beached or trapped by debris blocking shipping channels. Rita extended the damage to western Louisiana and eastern Texas. How much of the processing capacity and how many vessels might be salvageable is still being determined. For shrimp, the Louisiana Department of Wildlife and Fisheries estimates the 12-month potential loss at dockside at more than \$81 million, with 12-month potential production losses at the retail level at almost \$540 million.¹ An undetermined number of shrimpers may have drowned trying to ride out the storm aboard their vessels, but information is not yet available to document these fatalities. Millions of pounds of unrefrigerated shrimp at damaged processing plants must be disposed; the Coast Guard reportedly has approved ocean disposal of this waste.

Prior to Katrina, this segment of the U.S. fishing industry had been declining due to competition from less-expensive foreign imports and among domestic harvesters, since domestic capacity is much greater than necessary to efficiently harvest the resource. In addition, shrimp trawling is very fuel consumptive and rising fuel costs make shrimp trawling increasingly uneconomical; some shrimpers who survived Katrina and Rita may find it difficult to resume fishing because of high fuel costs. Additional impediments to shrimping are the underwater obstacles that foul and damage shrimp trawls; hurricane debris will provide many new obstacles (i.e., “hangs”), and storm surges may have moved former obstacles to new, uncharted positions.² The National Marine Fisheries Service (NMFS) has promulgated a temporary rule allowing shrimp trawlers to use limited tow times as an alternative to turtle excluder devices through October 24, 2005.³ Some shrimp fishermen in the affected areas have refloated beached vessels and are readying vessels to resume fishing; some may relocate to other ports along the Gulf coast.

Oysters. With the decline of oyster harvest from the Mid-Atlantic region, the Gulf Coast has been providing most of the domestic oyster harvest. Oyster beds and vessels along the Gulf Coast were extensively damaged, if not totally destroyed, by siltation and contamination related to Katrina. Molluscan shellfish (oysters, clams, and mussels) beds in Louisiana and Mississippi are closed to harvesters. For oysters, the Louisiana Department of Wildlife and Fisheries estimates the direct loss of available resource at more than \$205 million and the 24-month potential loss at dockside at almost \$45 million, with 24-month potential production losses at the retail level at almost \$300 million,

¹ Louisiana Dept. of Wildlife and Fisheries, *Preliminary Analyses of Economic Losses Caused by Hurricane Katrina to Louisiana’s Fisheries Resources* (Sept. 7, 2005), 6 p. (Hereafter “Louisiana Analyses”)

² Louisiana’s Underwater Obstruction Removal Program estimates between \$600 to \$15,000 to remove a single obstruction.

³ 70 *Fed. Reg.* 56593-56595, Sept. 28, 2005.

assuming oyster mortality at 99% based on the size and strength of Katrina.⁴ While the Louisiana Department of Wildlife and Fisheries estimated oyster reef rehabilitation costs would exceed \$860 million,⁵ a Gulf Oyster Task Force more recently estimated the cost for restoration of oyster beds and infrastructure for the entire affected area at more than \$400 million⁶ and the Gulf Oyster Industry Council said it would cost more than \$335 million.⁷ Authorities estimate that restoration of public oyster reefs in Mississippi would cost \$72 million and take several years to complete.⁸ By mid-September, Alabama public health officials were reporting that oyster mortalities appeared to be less than anticipated.⁹ In early October, the Louisiana Oyster Task Force estimated that Louisiana oyster growers might recover to 50% of annual production by the end of 2005.¹⁰ Because of extensive hurricane-related pollution and related contamination concerns, oysters in areas affected by Katrina may not be harvestable for an undetermined period.

Spiny Lobster. In the Florida Keys, an estimated one-fourth to one-half of all commercial spiny lobster traps were tangled or destroyed by the passage of Katrina. About 600 individuals are licensed to fish for spiny lobster in this area, and account for about 80% of Florida's lobster harvest.

Other Fisheries. The Louisiana Department of Wildlife and Fisheries estimates the 12-month potential losses at dockside for crab (\$12.3 million), menhaden (\$44.6 million), other saltwater fish (\$11.8 million), and freshwater fish (\$190,000), with 12-month potential production losses at the retail level for crab (\$82 million), menhaden (\$93 million), other saltwater fish (\$79 million), and freshwater fish (\$1.3 million).¹¹ Relative to the menhaden fishery, Omega Protein's facilities at Moss Point, MS, sustained considerable damage, with potential production losses in annual revenue estimated at almost \$25 million plus infrastructure damages totaling about \$15 million.¹²

Processor and Dealer Infrastructure. Coastal seafood dealers and processors suffered damage from flooding, with many anticipated to be total losses. Flooding destroyed docks, electrical systems, and costly machinery and processing equipment (e.g., compressors, motors, peelers, conveyors). Estimated repair times range from as little as

⁴ Louisiana Analyses, p. 1.

⁵ Ibid., p. 2.

⁶ *Headlines*, Seafood.Com News (Sept. 19, 2005).

⁷ IntraFish Media, *\$335 Million to Rebuild Gulf Coast Oyster Industry* (Sept. 19, 2005), 2 p.

⁸ Office of Marine Fisheries, *Preliminary Assessment of Mississippi Marine Resources*, Mississippi Department of Marine Resources (Sept. 19, 2005), 7 p. (Hereafter "Mississippi Assessment.")

⁹ IntraFish Media, *Scientists Check Fish to Measure Hurricane's Toxic Impact*, Associated Press (Sept. 19, 2005), 2 p.

¹⁰ Ben DiPietro, *Louisiana Oyster Output to Drop to 40%*, IntraFish Media (Oct. 4, 2005), 2 p.

¹¹ Louisiana Analyses, p. 1.

¹² Personal communication from Rick Schillaci, Director of Gulf Operations, Omega Protein, Sept. 14, 2005.

a few weeks to as much as a year, depending on the availability of power, clean water, and functional sewer systems, as well as the response of insurers and the availability of replacement equipment. In some areas, smaller dealers sell fresh product to larger local processors, delaying the reopening of the smaller dealers until the larger processors can resume work.¹³ Laitrim Machinery, a major manufacturer of shrimp peeling, grading, and cooking equipment, reports that its main factory in Harahan, LA, a suburb of New Orleans, sustained only minor damage, and has resumed operations.¹⁴ In Mississippi, about 95% of the 62 seafood dealers have been destroyed or so severely damaged that commercial fishermen are unable to sell their catch or buy fuel or ice.¹⁵ In Bayou La Batre, AL, two major shrimp processors anticipate their operations will recover to near full capacity by October 31, 2005.

Aquaculture. Mississippi catfish operations appear to have suffered little damage from the storm; some lost power, but high winds and other factors contributed to no significant loss of fish. High winds and waves in large ponds caused some levee damage from erosion. A major concern for catfish and crawfish operators is the loss of their New Orleans market, as this was a significant market for their products. Louisiana catfish and crawfish producers apparently avoided damage to their operations as most were outside the affected areas. Preliminary Louisiana aquaculture product and infrastructure losses have been estimated for turtles (\$7.4 million for 2005; \$5 million for 2006), alligators (\$11.4 million for 2005; \$3.8 million for 2006); oysters (\$34 million for 2005; \$33.8 million for 2006), and other species (\$1.9 million for 2005; \$0.8 million for 2006) for a total projected aquaculture loss of \$54.6 million (2005) and \$43.5 million (2006) for Louisiana.¹⁶

Recreational Fishing. Damage to small boats and charter craft has been extensive; however, information is still sketchy on how this sector may have been affected. The Louisiana Department of Wildlife and Fisheries estimates the 12-month retail value of lost sales resulting from the potential disruption of recreational fishing activities at almost \$200 million.¹⁷ Artificial reefs have not yet been inspected to determine the extent of possible damage. However, the system of buoys marking the artificial reef off Grant Isle, LA, has not responded since Katrina hit and may be damaged beyond repair; replacement costs are estimated to exceed \$500,000.¹⁸ In Mississippi, all fishing piers in the three coastal counties were either totally destroyed or so damaged that they are unsafe to use.¹⁹

¹³ Alabama Marine Resources Division, *Preliminary Assessment of Alabama's Seafood Industry following Hurricane Katrina* (Sept. 7, 2005), 3 p.

¹⁴ *Headlines*, Seafood.Com News (Sept. 15, 2005).

¹⁵ Mississippi Assessment, p. 7.

¹⁶ C. Greg Lutz, aquaculture specialist, AgCenter, Louisiana State University, Baton Rouge, LA, Sept. 3, 2005.

¹⁷ Louisiana Analyses., p. 1.

¹⁸ *Ibid.*, p. 6.

¹⁹ Mississippi Assessment, p. 4.

Fishery Management. The NMFS facility at Pascagoula, MS, sustained significant damage.²⁰ The Gulf of Mexico Fishery Management Council meeting originally scheduled for September 12-16 in New Orleans was postponed until October and moved to St. Petersburg, FL; other meetings have been postponed or rescheduled. The Mississippi Department of Marine Resources' office in Biloxi was extensively damaged, with data, documents, records, and reports lost.²¹ It is unknown what effect the hurricane and related events, including pollutant runoff, may have on fish and shellfish stocks. Inshore nursery areas could have been disrupted. Although the hypoxic "dead zone" off the mouth of the Mississippi River normally dissipates at this time of year, it might be displaced or altered in size, due to increased river discharge. Management measures may need to be reviewed to assess their adequacy in protecting fish and shellfish stocks if any stocks are determined to have been significantly harmed by Katrina-related events.

Seafood Consumers. While some fish and shellfish from the Gulf may disappear from the market, extensive domestic and imported seafood alternatives remain. There could be some increase in price as retailers adjust to different products and suppliers. The price of oysters may be more affected than other seafood products, because of less opportunity for substitution of similar items. However, some shrimp and oysters are still being produced in unaffected parts of the Gulf. In addition, fishermen are moving quickly to resume fishing with those vessels that were relatively undamaged. The U.S. Food and Drug Administration (FDA) is working with state and local officials to visit seafood processors, packagers, and transporters in the affected area to determine if stored product caught prior to the hurricane is safe. Although Alabama processors report a supply of stored shrimp that will be marketed, the FDA is not aware of any seafood caught prior to the hurricane from the affected areas that has entered the commercial marketplace since the hurricane.²²

Disaster Assistance. On September 9, 2005, Secretary of Commerce Carlos M. Gutierrez declared a fishery failure in the Gulf of Mexico, a necessary precursor for federal fishery disaster assistance.²³ The affected area includes the Florida Keys and along the Gulf Coast from Pensacola, FL, to the Texas border. A similar declaration was issued after Hurricane Rita on October 4, 2005, for coastal areas of the Gulf of Mexico from Louisiana and west towards Galveston, TX.²⁴ Fishery disaster assistance is provided primarily through two authorities — §312(a) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1861a(a)) and §308 of the

²⁰ Photographs of damage were available at [<http://www.nmfs.noaa.gov/pascagoula.htm>] on Sept. 7, 2005.

²¹ Mississippi Assessment, p. 1.

²² U.S. Food and Drug Administration, *FDA Hurricane Katrina Recovery Update: Seafood Availability and Safety*, Bulletin 2 (Sept. 12, 2005, and subsequent updates), available at [<http://www.cfsan.fda.gov/%7Edms/fsdisas2.html>], on Oct. 12, 2005.

²³ A press release was available at [http://www.commerce.gov/opa/press/Secretary_Gutierrez/2005_Releases/September/Katrina%20Economic%20Recovery%20Effort.htm]]

²⁴ [<http://www.nmfs.noaa.gov/docs/05-126%20Texas%20Disaster%20Release%20v5%2010-04-05.pdf>], on Oct. 12, 2005.

Interjurisdictional Fisheries Act (16 U.S.C. §4107). These NMFS programs are further detailed at [<http://sero.nmfs.noaa.gov/grants/fda.htm>] and [http://www.nmfs.noaa.gov/mb/financial_services/disaster.htm]. Aquaculture loss may be covered under the U.S. Department of Agriculture's Noninsured Crop Disaster Assistance Program, with details at [<http://disaster.fsa.usda.gov/nap.htm>]. On the private front, various fishermen's groups and associations from other regions and nations have announced special funds and programs to assist Gulf of Mexico fishermen.

Capacity Reduction. Distress in the commercial shrimp industry presents a potential opportunity for a capacity reduction program to remove vessels and licenses permanently from the fleet. Such a program might be funded as part of disaster relief and could provide both compensation for damages for those who decide to sell their licenses and vessels as well as reduction in competition to those who may decide to resume shrimping. A summary of NMFS capacity reduction programs can be found at [http://www.nmfs.noaa.gov/mb/financial_services/buyback.htm].

Habitat Concerns. Contaminants from runoff and hydrocarbon spills are expected to cause fish kills and losses of crustacean and molluscan species in nearshore areas. Reported contaminant sources include seven major oil spills from refineries or tank farms that total 6.7 million gallons,²⁵ releases from 25 major sewage treatment centers and many smaller ones, and runoff from countless fuel storage tanks and household and industrial chemical stores (antifreeze, bleach, acids, alcohols, etc.).²⁶ In addition, increased nutrients in storm runoff have the potential to stimulate harmful algal blooms in offshore waters. Water masses containing debris are reportedly moving eastward into Florida coastal waters; no information is available to determine the extent these waters may be transporting contaminants. The storm surge from Hurricane Katrina scoured the bottom of bays and river systems, suspending large amounts of organic anoxic sediments; the resulting drop in dissolved oxygen caused massive fish kills.²⁷ On September 19, 2005, a group of Louisiana commercial fishermen filed a class-action lawsuit seeking unspecified damages from oil companies for suspected damage to fisheries.²⁸ The NOAA research vessel *Nancy Foster* is working off the Gulf Coast to study the effects of Hurricane Katrina on marine resources and the ecosystem. The State of Florida is also testing offshore waters southwest of Panama City. In addition, NOAA has chartered a private shrimp trawler to assist sampling for any evidence of toxic contamination and pathogens. Initial test results showed no elevated levels of oil contamination in Atlantic croaker; results of tests on shrimp and oysters were not yet available.²⁹

To date, there is no estimate of losses to the extensive and unique habitat provided by seagrass beds along the Louisiana coast in Breton and Chandeleur Sounds. Marine mammals, turtles, fish, and migratory waterfowl depend on these seagrass beds.

²⁵ [<https://www.mmrs.fema.gov/news/publichealth/2005/sep/nph2005-09-14.aspx>], on Sept. 19, 2005.

²⁶ Louisiana Analyses, p. 6.

²⁷ Mississippi Assessment, p. 4.

²⁸ "Fishermen File Suit over Oil Damage from Katrina," *Houma Today*, Sept. 20, 2005.

²⁹ [http://www.st.nmfs.noaa.gov/hurricane_katrina/water_sediment_survey.html], on Oct. 12, 2005.