



Hurricanes Irma and Maria Fisheries Damage Assessment: Preliminary Results for Puerto Rico

On September 6th, 2017, **Hurricane Irma** passed northeast of Puerto Rico causing damages to parts of the east and north coasts of the island. Two weeks later, on September 20th, 2017, the eye of **Hurricane Maria** (Category 4) passed through Puerto Rico, causing severe damages to the entire island. Preliminary estimates suggest that damages and forgone income to the fishing sector caused by the hurricanes amounted to **about \$20.5 million**.



Damaged facilities in Playuela, Aguadilla. Photo: Puerto Rico's Department of Natural and Environmental Resources/Daniel Matos-Caraballo

THIS STUDY

Puerto Rico's Department of Natural and Environmental Resources (DNER) with the assistance from the National Oceanic and Atmospheric Administration (NOAA) conducted a rapid assessment of the economic impacts of Hurricanes Irma and Maria in the Commonwealth of Puerto Rico. MER Consulting and HJR Reefscaping, responsible for the fieldwork, interviewed **714 commercial fishers and for-hire operators**, and **66 businesses** including fishing cooperatives and marinas. The study used a weighted average cost method to estimate the monetary damages incurred by commercial fishers, for-hire operators, fishing cooperatives and marinas.

LOCAL FISHERIES IN PERSPECTIVE

Commercial and recreational fisheries are an important source of employment, income and sustenance to many coastal communities in Puerto Rico. DNER statistics indicate that about 1,200 small-scale fishers generated about **\$10 million** in dockside revenues in 2015. Recreational fishing is a popular activity that provides food and enjoyment for residents and tourists. Despite the limited information on the recreational sector, NOAA estimated that total angler expenditures on marine recreational fishing amounted to **\$72 million** in 2011 (or \$81 million in today's dollars). Trip expenditures accounted for about **22%** of the total expenditures and durable good expenses for the remaining **78%**. For-hire fishing trip expenditures totaled **\$1.5 million** (\$1.7 million in today's dollars), private boat trip expenditures totaled **\$11 million** (\$12.4 million), and shore fishing trips totaled **\$3.5 million** (\$3.9 million). NOAA's Marine Recreational Information Program estimated that **2,350 charter trips** were taken in 2015.

Operation	Business Type	Damages (million \$)	Forgone fishing revenue (million \$)	Total economic loss (million \$)	Immediate job losses
Commercial	Commercial fishers	5.4	3.0	8.4	148
	Fishing cooperatives and seafood businesses	6.0	0.8	6.8	18
For-Hire	For-hire operators	0.6	0.7	1.3	6
	Marinas	3.4	0.5	3.9	2
Total		15.4	5.1	20.5	174

Commercial Fishing, Fishing Cooperatives and Seafood Businesses



Damaged commercial vessel over parking lot in Las Croabas, Fajardo. Photo: Puerto Rico's Department of Natural and Environmental Resources/Daniel Matos-Caraballo

DAMAGES BY OPERATION / BUSINESS TYPE

Type	Summary	Reported Damages
Commercial Fishing Operations	<p>About 71% of the 695 commercial fishers interviewed reported that they had not fished since the hurricanes hit because of miscellaneous reasons, including damage to their boats and fishing gear, power outages, lack of basic inputs such as fuel, ice and bait, and a declining customer base.</p> <p>Although most fishers reported lost or damaged fishing gear, trap fishers targeting finfish and lobster were among the most impacted. Some of these fishers reported losing in excess of 80 traps.</p> <p>About 31% of the inactive fishers indicated that they could resume fishing if they had a place to sell their catch.</p> <p>Most of the fishers who resumed fishing indicated that they neither had switched target species nor landing site.</p>	<p>Forgone Income \$3.0 M</p> <p>Vessels \$2.4 M</p> <p>Fishing Gear \$2.6 M</p> <p>Facilities \$0.2 M</p> <p>Bait \$0.1 M</p> <p>Total \$8.4 M</p>
Fishing Cooperatives, Fisher Associations, and Seafood Businesses	<p>Of the 54 businesses surveyed, all reported that their business and/or facility had been impacted by the hurricanes and 50 (93%) of them remained closed.</p> <p>Only 2 (4%) establishments stated that they were selling lower-valued species due to the hurricanes.</p> <p>The majority of establishments (83%) surveyed reported that all of their income was derived from locally sourced finfish and shellfish.</p>	<p>Forgone Income \$0.8 M</p> <p>Vessels \$1.7 M</p> <p>Fishing Gear \$0.4 M</p> <p>Facilities \$0.2 M</p> <p>Bait \$3.8 M</p> <p>Total \$6.8 M</p>

M = million

For-Hire and Recreational Fishing Businesses



Damaged sailboats in La Guancha, Ponce. Photo: Puerto Rico's Department of Natural and Environmental Resources/Grisel Rodríguez-Ferrer

DAMAGES BY OPERATION / BUSINESS TYPE

Type	Summary	Reported Damages
For-Hire Businesses (charters)	<p>More than half of the 19 for-hire operators (53%) interviewed indicated that they had not gone fishing since the hurricanes passed mainly due to vessel damage and the absence of customers.</p> <p>The majority of the for-hire operators that resumed fishing said that they neither had neither switched target species nor landing site.</p>	<p>Forgone Income \$0.7 M</p> <p>Vessels \$0.5 M</p> <p>Fishing Gear <\$0.1 M</p> <p>Facilities \$0.0 M</p> <p>Bait <\$0.1 M</p> <p>Total \$1.3 M</p>
Marinas	<p>Of the 12 marinas surveyed, 11 of them (92%) reported that their business and/or installation had been impacted by the hurricanes but only 3 of them (25%) remained closed.</p>	<p>Forgone Income \$0.5 M</p> <p>Vessels \$1.2 M</p> <p>Fishing Gear <\$0.1 M</p> <p>Facilities <\$0.1 M</p> <p>Bait \$2.1 M</p> <p>Total \$3.9 M</p>

M = million



Damaged facilities in Punta Santiago, Humacao (top); Damaged facilities in Playuela, Aguadilla (middle); Sailboat washed ashore in Sardinera, Fajardo (bottom).
Photos: Puerto Rico's Department of Natural and Environmental Resources/Luis Aníbal Padilla-Rivera