



Workers processing shrimp at Dominick's Seafood,
Bayou La Batre, Alabama

The Economic Impacts of the 2010 Deepwater Horizon Oil Spill on Gulf Fisheries

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U.S. Gulf fisheries provide the nation with millions of pounds of fresh seafood each year. Substantial, high quality catches of fish have contributed significantly to the economic wellbeing of the region for decades.

Studies conducted immediately after the 2010 Deepwater Horizon oil spill (DWH) found that the disaster has caused economic harm to the region due to fishery closures and consumer-related seafood safety concerns (1). In a more recent study, the Consortium for Resilient Gulf Communities examined trends related to fish landings – catches of fish brought into port. The study confirms the short-term negative impacts of the oil spill, but also tells us a little bit about the resilience of Gulf communities when faced with such a large-scale environmental disaster.

(1) Upton, H.F. Washington, D.C.: Congressional Research Service, 2011, 7-5700, R41640

How has DWH affected fish landings?

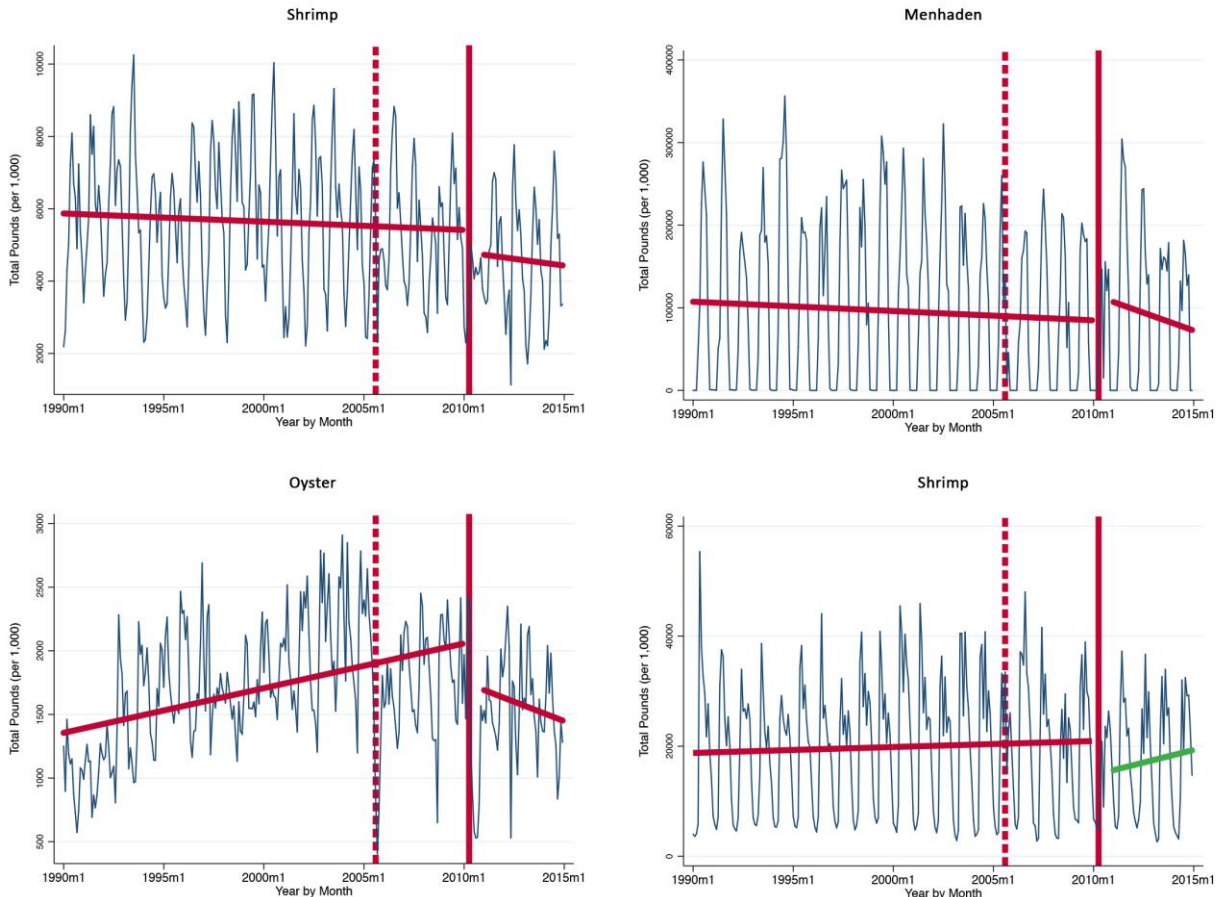
The graphs below show fish landing trends from 1990 to 2015 for four species fished regularly in the Gulf states' waters: crab, menhaden, oyster and shrimp.

The dashed red vertical line indicates Hurricane Katrina in 2005, while the red solid vertical line indicates the DWH oil spill in 2010. Each graph includes a linear trendline for all landings from 1990-2009, and a separate linear trendline for all landings 2011-2014.

A challenge with identifying the effects of DWH based solely on a trend analysis is that it is difficult to separate these effects from other factors – such as changing demand for seafood or climatic shocks – that can also affect landings. Ideally, we would like to compare observed landings following DWH to *counterfactual* landings – in other words, what landings *would have been* in the absence of DWH. While we cannot observe the true counterfactual, we use a variety of techniques from the economics literature to estimate what that counterfactual might have been.

We apply these methods to two publicly available datasets. The first dataset is from the National Oceanic and Atmospheric Administration (NOAA), which provides information on monthly landings by state. The second is from the Louisiana Department of Wildlife and Fisheries, which provides information on annual landings by basin. The Louisiana data also allow us to measure how much effort fisheries use in terms of the number of commercial fishing trips.

The graphs show crab, menhaden, oyster, and shrimp landings declined immediately following the oil spill in 2010. In 2011, peak and average landings increased for crab, menhaden, and oysters, but menhaden and oysters exhibited a declining trend more generally.



Hurricane Katrina landfall: August 29, 2005. Trendlines for 1990-2009 and 2011-2014. Landings data combined for the Gulf States. Crab species: blue, blue peeler, blue soft, deepsea golden, deepsea red, Florida stone claws, and horseshoe. Menhaden are not differentiated by sub-species in the data. Shrimp species: brown, fw, marine, other, pink, rock, royal red, roughneck, seabob, and white. Oyster species: eastern oyster. Source: NOAA Commercial Fishing Landings, Years 1990-2014.

Monthly Landings in Pounds, by Species Group (Gulf Data from NOAA)

Using the NOAA data, we applied a simple “difference-in-differences” approach to compare average landings over time in the Gulf states (which experienced the oil spill) with average landings over time in the Atlantic states (which did not experience the oil spill). Changes in overall demand for seafood may have affected both regions similarly during this time. We also controlled for differences by state and month of catch. However, we could not control for underlying biology, which might bias the results, and did not account for time trends in this model, though the results are similar across specifications.

Crab	-43%
Menhaden	-53%
Oyster	-60%
Shrimp	+47%

Changes in average Gulf states landings relative to changes in Atlantic states landings, pre- and post-spill, 1990 - 2014

What do the results say about the resilience of Gulf communities?

Our results suggest that there was a short-term drop in Gulf state landings following the 2010 oil spill. This preliminary analysis of the Louisiana data also suggests that the short-run negative impacts of the oil spill are primarily due to changes in human behavior (effort), rather than the biological effects of DWH on the species. For more information, please refer to our working paper:

Fiore, J., Bond, C., and Nataraj, S. (2016). Estimating the effects of the Deepwater Horizon oil spill on fisheries landings: A preliminary exploration. Working paper. RAND Corporation RAND Corporation, WR-1173-GMA.

Next Steps in the Study

We are collating more disaggregated data, based on logbook entries and trip ticket reports, from NOAA and from the Louisiana Department of Wildlife and Fisheries. This will enable better estimates, including more control over biological factors. We will incorporate federal and state water closures and spill extent and intensity, to examine variation in effort and catch across locations.