

**DIRECT IMPACTS OF DISASTER AND ECONOMIC EVENTS ON GULF TOTAL
COMMERCIAL LANDINGS AND DOCKSIDE VALUES AND PRICE**

ABSTRACT

This presentation summarizes the direct impacts of disaster and economic events on the Gulf of Mexico commercial fishing industry. Economic models were developed and estimated for regional commercial landings from 1950 to 2022. These models estimated the direct impacts of disaster and economic events on commercial landings. The NOAA Fisheries data on commercial fishing are reported in pounds and dollars per year. Dockside prices are imputed from dockside values and commercial landings.

KEYWORDS

Gulf of Mexico region, commercial landings, dockside values, and prices.

SUGGESTED CITATION

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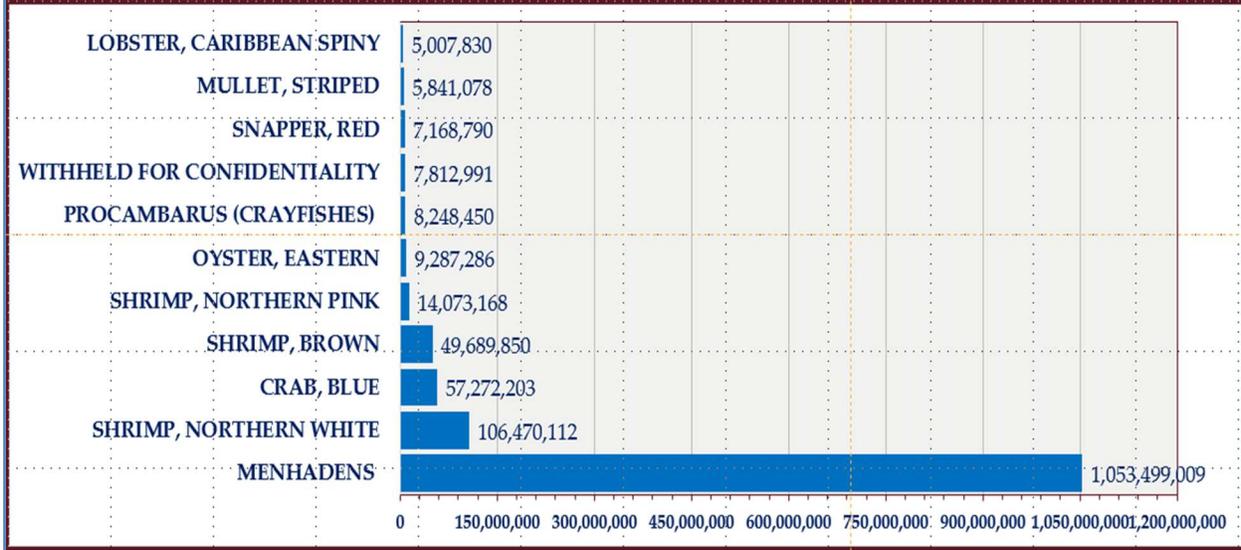
LET US START OUR MODELING EFFORT!

- What happens to commercial landings and values during disastrous events such as major hurricanes?
- Do economic events such as recessions and trade wars affect commercial landings?
- The global pandemic disrupted markets, reducing sales, employment, incomes, and expenditures.
- Rising diesel prices influenced fishing decisions.
- Landings and dockside values have been compiled from NOAA Fisheries' website since 1950.

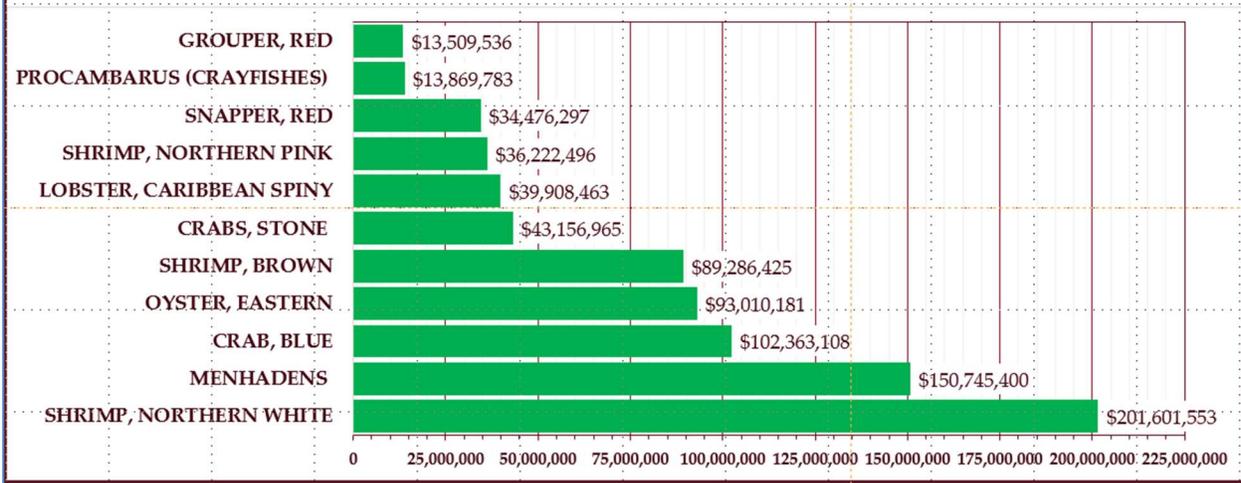
U.S. GULF OF MEXICO MOST LANDED AND HIGHLY VALUED COMMERCIAL SPECIES



MOST LANDED SPECIES COMMERCIALY HARVESTED IN THE GULF OF MEXICO REGION EXCEEDING FIVE MILLION POUNDS IN 2022

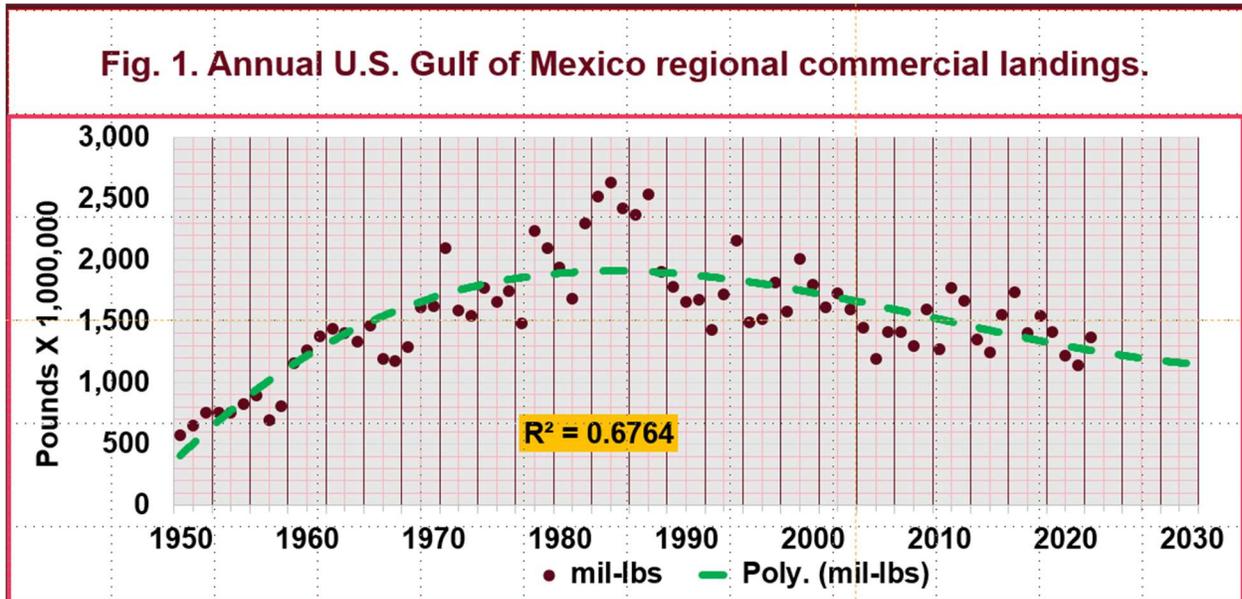


MOST VALUED SPECIES COMMERCIALY HARVESTED IN THE GULF OF MEXICO REGION EXCEEDING TEN MILLION DOLLARS IN 2022



ANNUAL U.S. GULF OF MEXICO REGION TOTAL COMMERCIAL LANDINGS

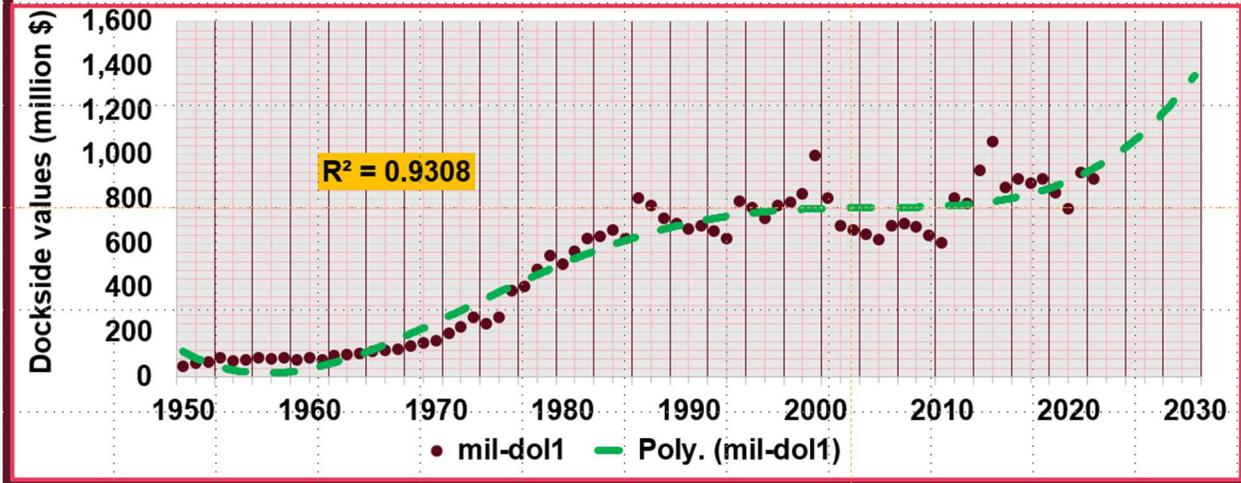
- Annual Gulf landings are shown in Fig. 1.
- Data are from the NOAA Fisheries website and marked by maroon dots.
- Total landings peaked in the mid-1980s, declined in the 1990s and 2000s, and have fluctuated around 1.4 billion pounds per year.
- The green curve shows the Excel-generated polynomial trend line.



ANNUAL U.S. GULF OF MEXICO REGION TOTAL COMMERCIAL LANDING VALUES

- Annual Gulf landing values are shown in Fig. 2.
- Data are from the NOAA Fisheries website and marked by green dots.
- Total landing values rose to the mid-1980s, reaching peaks in 2000 (\$997 million) and 2014 (\$1.06 billion), averaging \$0.891 million since 2025.
- The green curve shows the Excel-generated polynomial trend line.

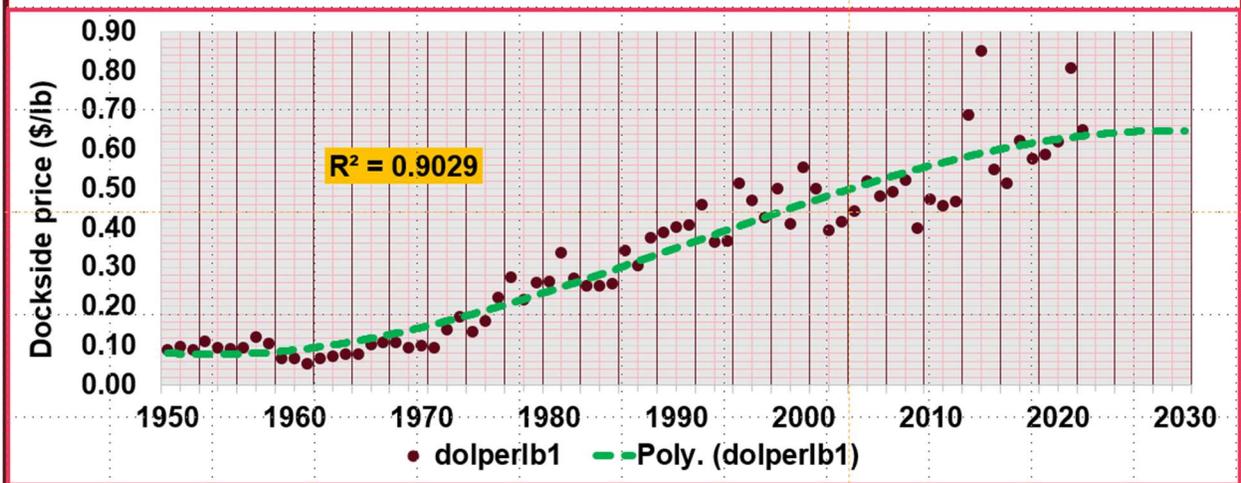
Fig. 2. Annual U.S. Gulf of Mexico regional commercial landing values.



ANNUAL U.S. GULF OF MEXICO REGION IMPUTED DOCKSIDE PRICES

- Annual Gulf dockside prices are shown in Fig. 3.
- Price data are imputed from landing values and landings and marked by green dots.
- Average dockside prices rose over time, reaching a peak of \$ 1.87 per pound in 2021.
- The green curve shows the Excel-generated polynomial trend line.

Fig. 3. Annual U.S. Gulf of Mexico regional imputed dockside prices.



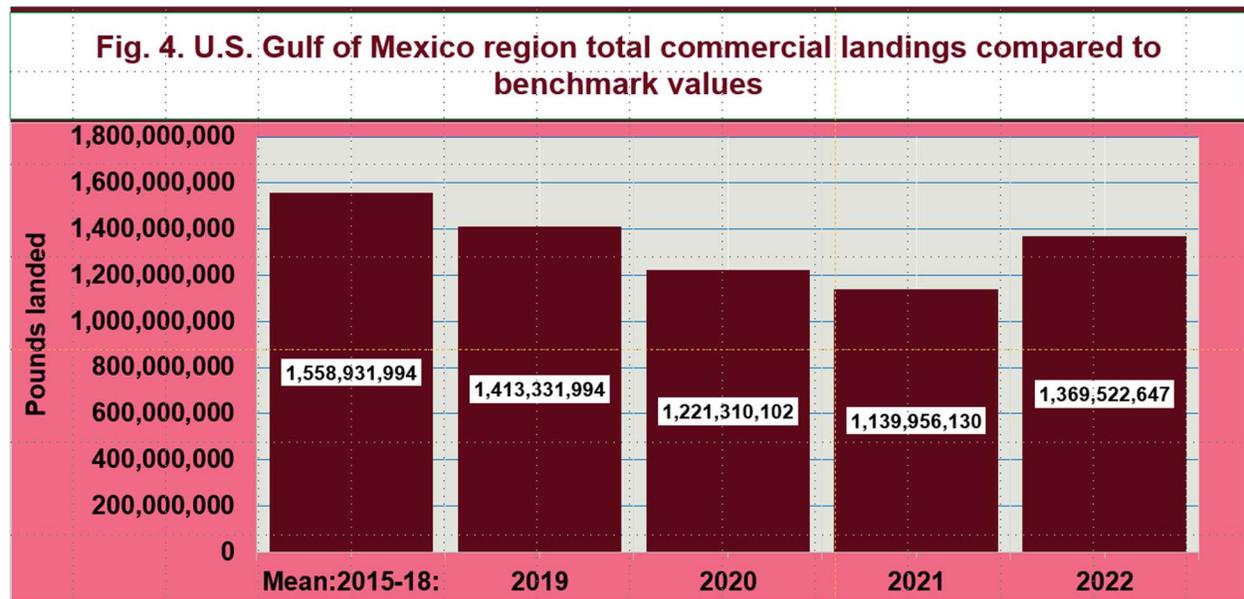
EXCEL MODEL OF COMMERCIAL FISHERIES

- An approach to estimating the direct fishery losses is to compare the current landings, dockside values, and prices to previous years' benchmarks.
- The benchmark years are from 2014 to 2018.
- **Direct fishery losses** occur if current values are lower than the benchmark values.
- Direct fishery losses are measured in pounds, dollars, and percentages.

DIRECT LOSSES ON GULF TOTAL COMMERCIAL LANDINGS

The economic model shown in Fig. 4 estimates total commercial losses from 2019 to 2022 as follows:

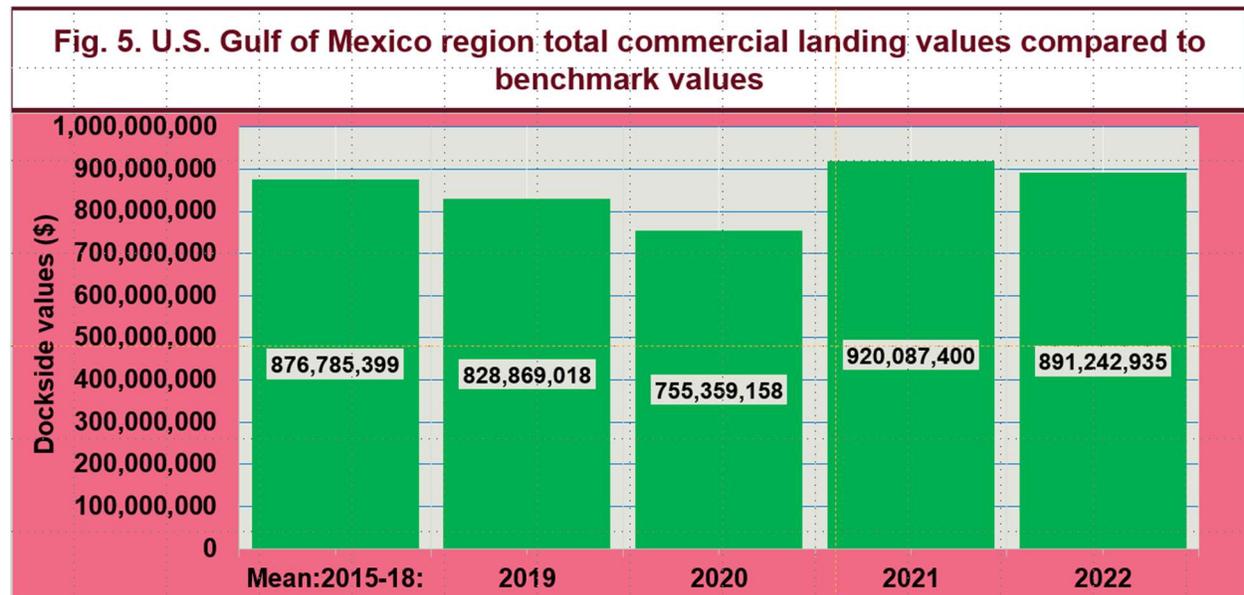
- 2019: -145.6 million pounds or -9%,
- 2020: -337.6 million pounds or -22%,
- 2021: -418.9 million pounds or -27%,
- 2022: -189.4 million pounds or -12%.



DIRECT LOSSES ON GULF TOTAL COMMERCIAL LANDING VALUES

The economic model shown in Fig. 5 estimates total losses in commercial landing values from 2019 to 2022 as follows:

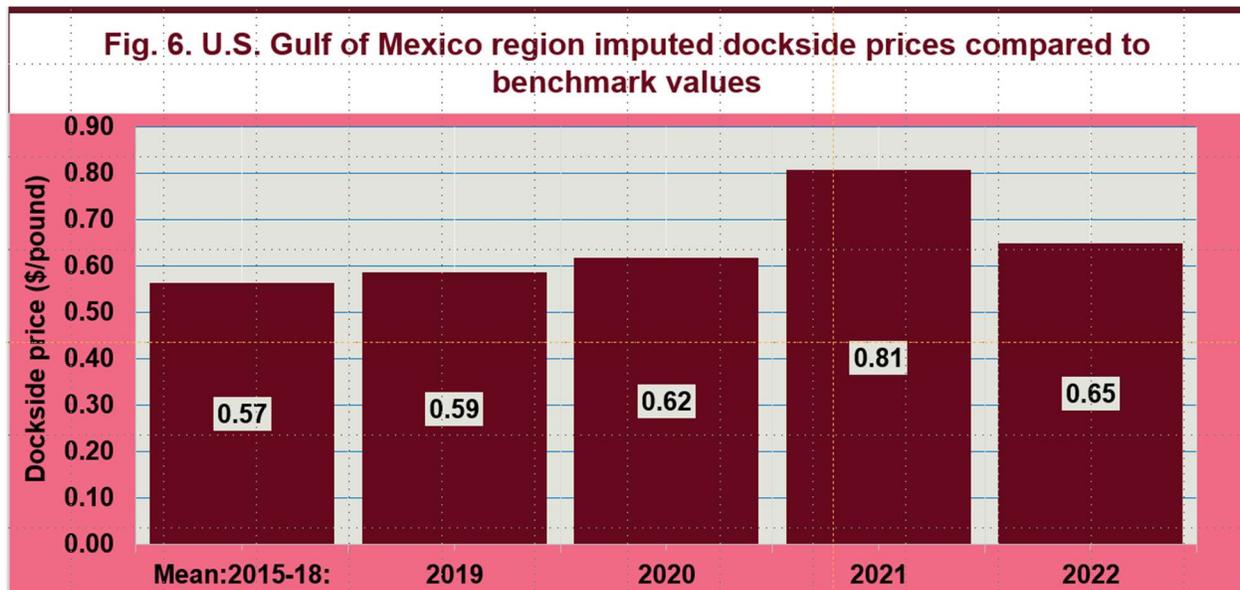
- 2019: \$47.9 million or -5%,
- 2020: \$121.4 million or -14%,
- 2021: \$0 million or 0%,
- 2022: \$0 million or 0%.



DIRECT LOSSES ON GULF IMPUTED DOCKSIDE PRICES

The economic model shown in Fig. 6 estimates total losses in commercial dockside prices from 2019 to 2022 as follows:

- 2019: \$0 per pound or 0%,
- 2020: \$0 per pound or 0%,
- 2021: \$0 per pound or 0%,
- 2022: \$0 per pound or 0%.

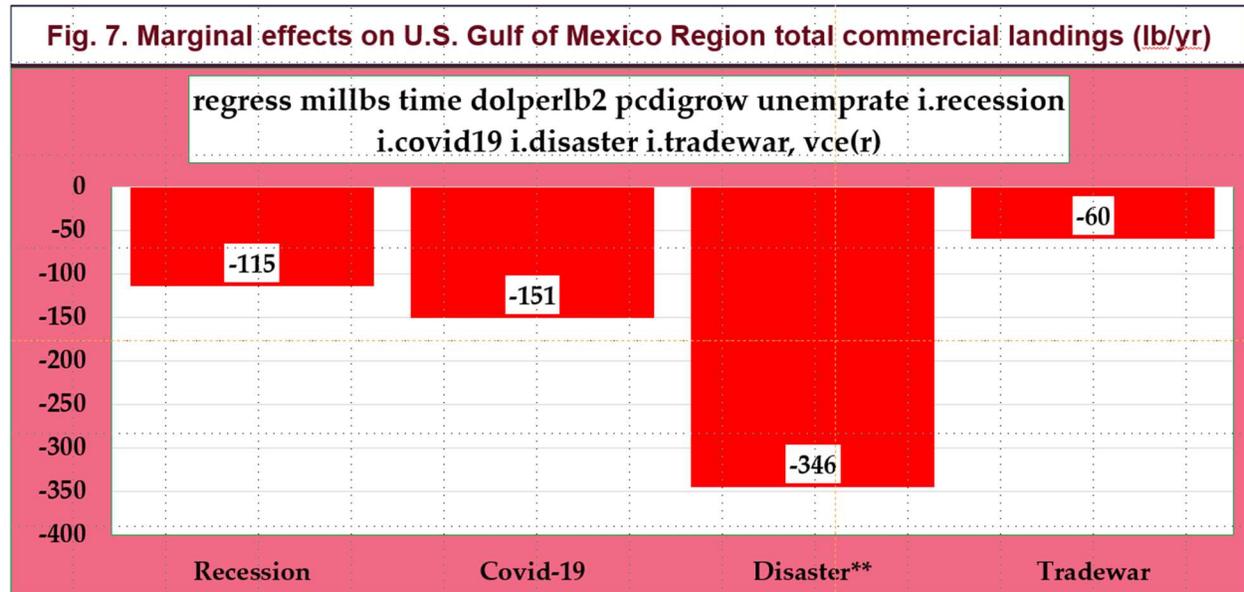


ECONOMIC MODEL OF GULF TOTAL COMMERCIAL LANDINGS

- The Ordinary Least Squares (OLS) model of commercial fishing consisted of the following dependent variable:
 - Commercial landings (lb/yr),
- The OLS model assumes that variations in commercial landings can be explained by several measurable economic, environmental, biological, and technical factors.
- The OLS model was estimated using the robust variance procedure of STATA-18.
- The variation inflation factor was calculated to detect the possible presence of multicollinearity.
- The marginal impacts of disaster events were computed using the margins procedure.
- The OLS model of commercial fishing (lb/yr) assumed that the following variables could explain it:
 - year,
 - real dockside prices (\$/lb),
 - recession,
 - trade war, pandemic, and Gulf natural disasters (1 or 0),
 - unemployment rate,
 - real diesel prices and per capita disposable income (%), and
 - other variables.
- **Direct fishery losses** occur if current values are lower than the projected values.

MARGINAL EFFECTS ON GULF TOTAL COMMERCIAL LANDINGS

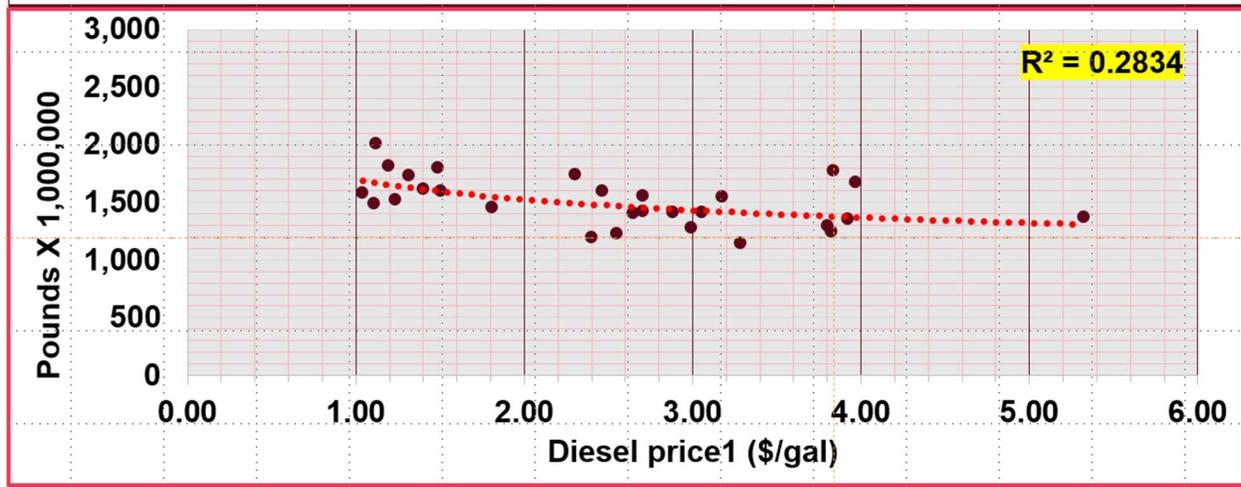
- The marginal impacts on Gulf commercial landings are shown in Fig. 7.
- Commercial landings tend to fall during recessions.
- The Covid-19 global pandemic seemed to have discouraged commercial landings.
- Commercial landings considerably declined during the Gulf disasters.
- The China-US trade war discouraged commercial landings.



MARGINAL EFFECTS ON GULF TOTAL COMMERCIAL LANDINGS

- The scatter diagram in Fig. 8 shows declining total commercial landings when diesel prices increase.
- However, when real diesel prices were added to the economic model, the marginal impacts on total Gulf commercial landings were not significantly associated with rising diesel prices, disasters, the COVID-19 pandemic, and trade wars.
- OLS results show that imputed dockside prices and time significantly negatively affected total Gulf commercial landings.

Fig. 8. Scatter diagram between total commercial landings and diesel price



SUMMARY, LIMITATIONS, AND IMPLICATIONS

- This presentation provides detailed information about the impacts of disaster and economic events on the U.S. Gulf of Mexico commercial fishery.
- It includes a description of the modeling effort and the results of the economic models.
- Falling commercial landings led to higher imputed dockside prices and rising landing values.
- Economic events such as recessions adversely affected commercial landings.
- The Covid-19 global pandemic seemed to have discouraged commercial landings.
- Gulf disasters discouraged commercial landings.
- Rising diesel prices seemed to have negatively influenced fishing decisions.