Mississippi MarketMaker Newsletter

MISSISSIPPI STATE UNIVERSITY EXTENSION

DIRECT IMPACTS OF DISASTER AND ECONOMIC EVENTS ON UNITED STATES RED SNAPPER FISHERIES

ABSTRACT

Dr. Posadas shows the long-term landings and values, and imputed dockside prices of the U.S. commercial red snapper fisheries since 1950. He developed and estimated economic models of the fisheries from 1950 to 2022. Using these models, he estimated the direct impacts of disaster and economic events on commercial landings and values.

KEYWORDS

Red snapper, United States, commercial landings, dockside values.

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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.

RED SNAPPER (*Lutjanus campechanus*)

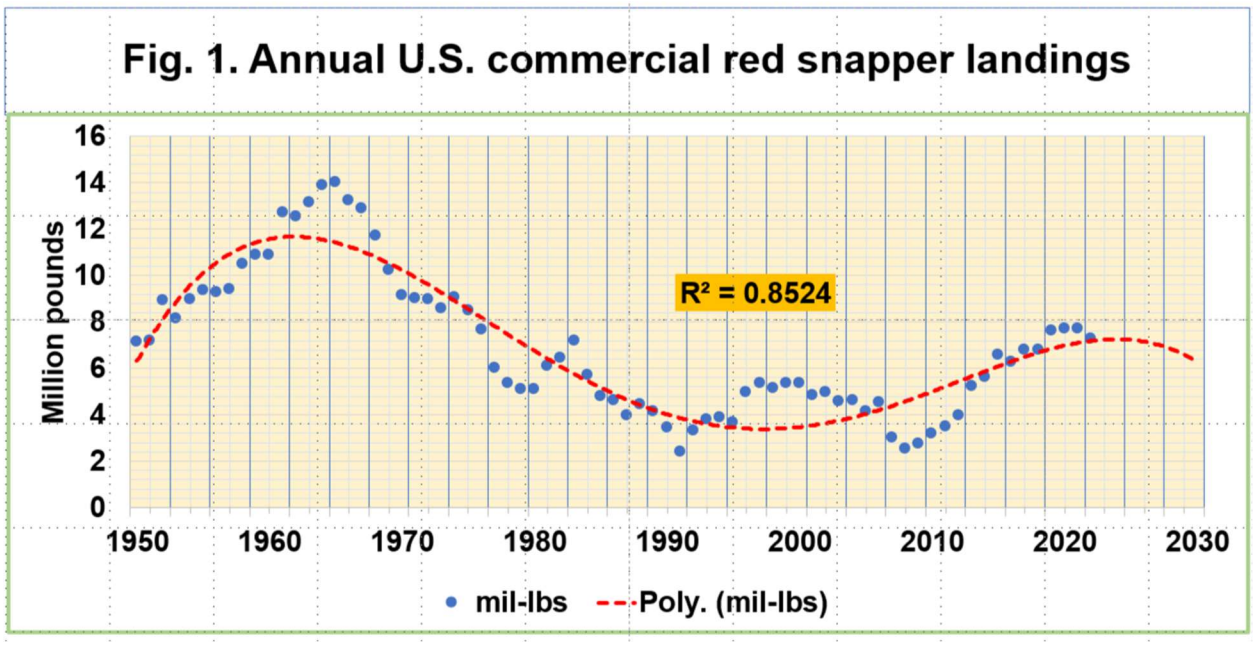
Snapper, Genuine red snapper, American reds, Spot snapper

U.S. wild-caught red snapper is a smart seafood choice because it is sustainably managed under rebuilding plans that allow limited harvest by U.S. fishermen. The Gulf of Mexico stock is not overfished. The South Atlantic stock is overfished, but the fishing rate under a rebuilding plan promotes growth.

Source: https://www.fisheries.noaa.gov/species/red-snapper.

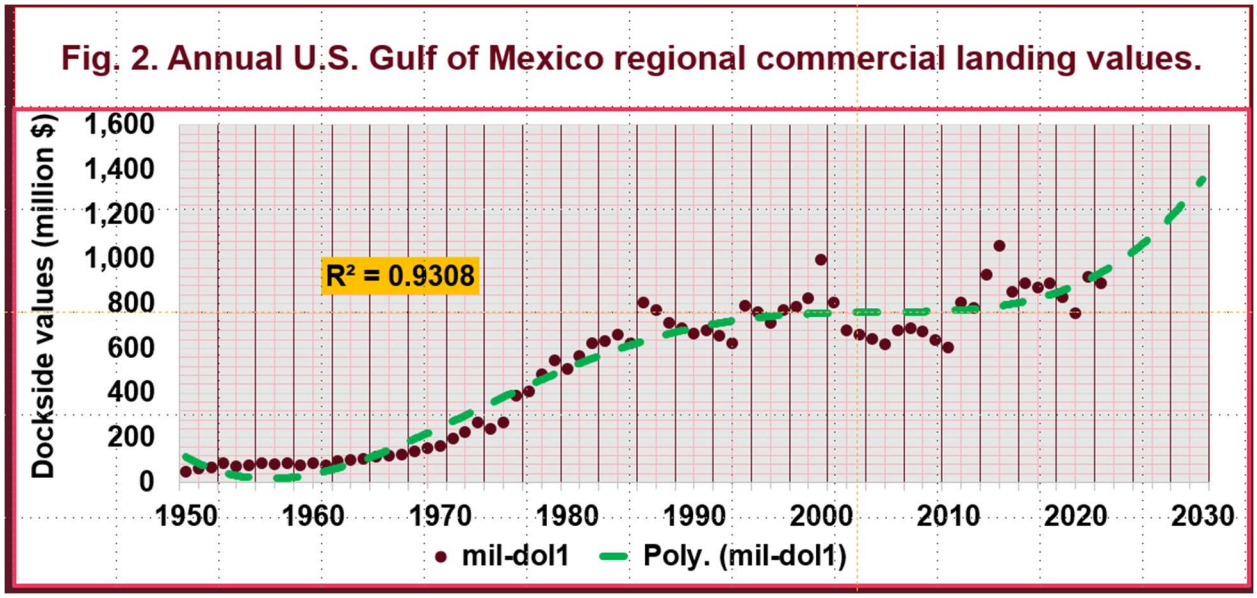
ANNUAL U.S. GULF OF MEXICO REGION TOTAL COMMERCIAL LANDINGS

- Annual United States landings are shown in Fig. 1.
- Data are from the NOAA Fisheries website and marked by blue dots.
- Landings peaked between 1959 and 1969, then dropped after that, but started to climb in 2019 to over seven million pounds.
- The red curve shows the Excel-generated polynomial trend line.



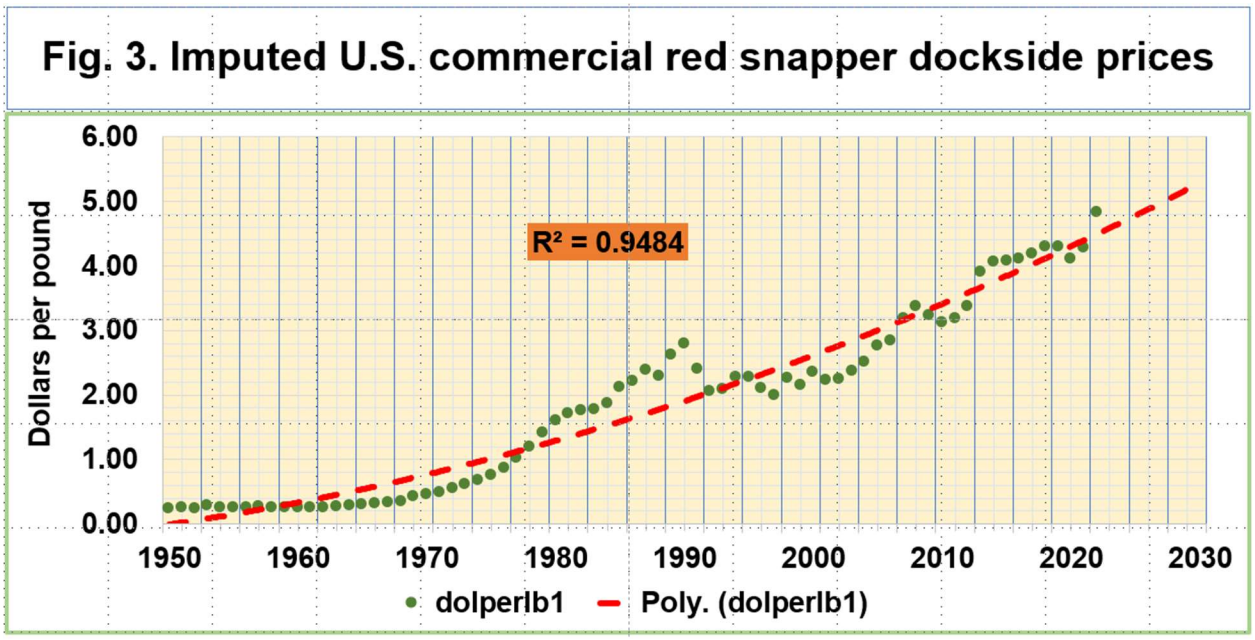
ANNUAL U.S. GULF OF MEXICO REGION TOTAL COMMERCIAL LANDING VALUES

- Annual U.S. landing values are shown in Fig. 2.
- Data are from the NOAA Fisheries website and marked by green dots.
- Landing values continued to rise and peaked in 2022 at $35 million.
- The red curve shows the Excel-generated polynomial trend line.



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

- The imputed annual U.S. dockside prices are shown in Fig. 3.
- Prices are imputed from commercial landings and landing values.
- Imputed dockside prices are marked by green dots.
- Dockside prices continued to rise and peaked in 2022 at $4.83 per pound.
- The red curve shows the Excel-generated polynomial trend line.



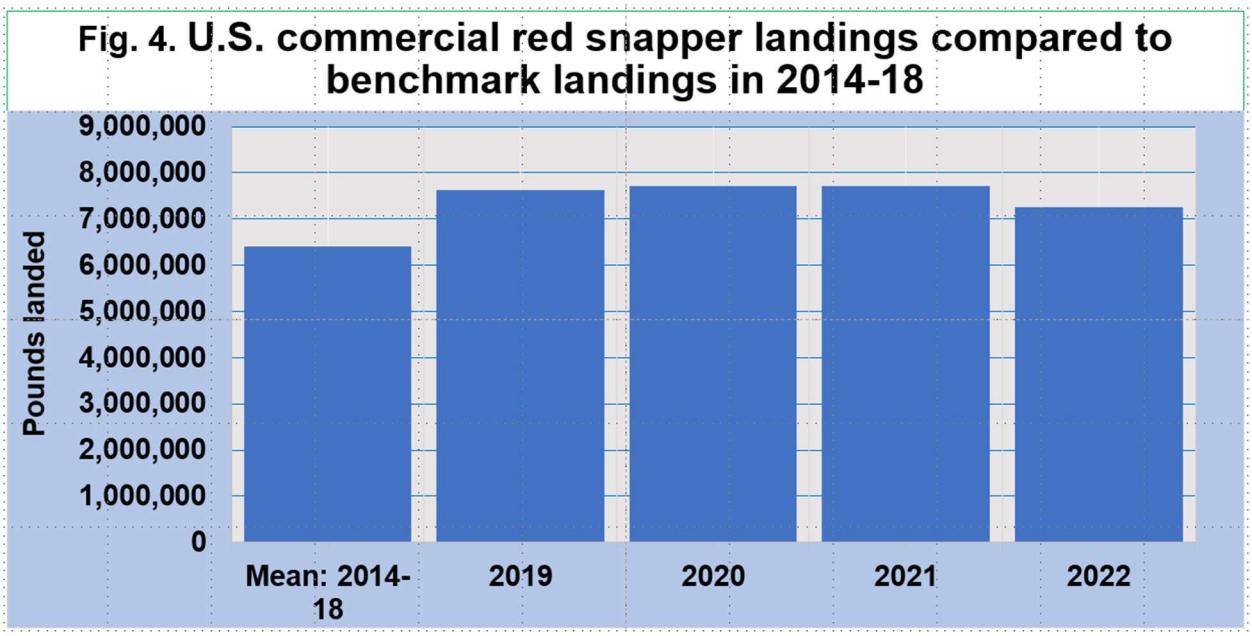
EXCEL MODEL OF COMMERCIAL FISHERIES

- 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 U.S RED SNAPPER COMMERCIAL LANDINGS

The Mean-Difference model (Fig. 4) estimates total commercial losses from 2019 to 2022 as follows:

- 2019: 0 million pounds or 0%,
- 2020: 0 million pounds or 0%,
- 2021: 0 million pounds or 0%,
- 2022: 0 million pounds or 0%.



DIRECT LOSSES ON U.S COMMERCIAL RED SNAPPER LANDING VALUES

The Mean-Difference model (Fig. 5) estimates total losses in commercial landing values from 2019 to 2022 as follows:

- 2019: $0 million or 0%,
- 2020: $0 million or 0%,
- 2021: $0 million or 0%,
- 2021: $0 million or 0%.

DIRECT LOSSES ON IMPUTED U.S. RED SNAPPER DOCKSIDE PRICES

The Mean-Difference model (Fig. 6) estimates total losses in commercial dockside prices from 2019 to 2022 as follows:

- 2019: $0 per pound or 0%,
- 2020: -$0.04 per pound or -1.1%,
- 2021: $0 per pound or 0%,
- 2021: $0 per pound or 0%.

Fig. 5. U.S. commercial red snapper landing values compared to benchmark landing values in 2014-18

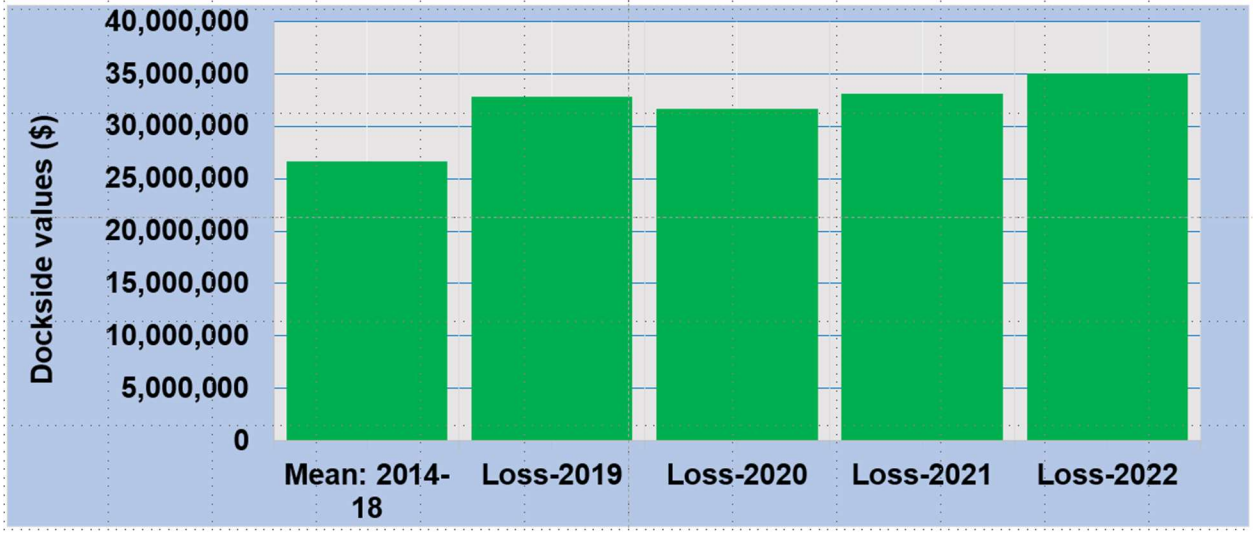
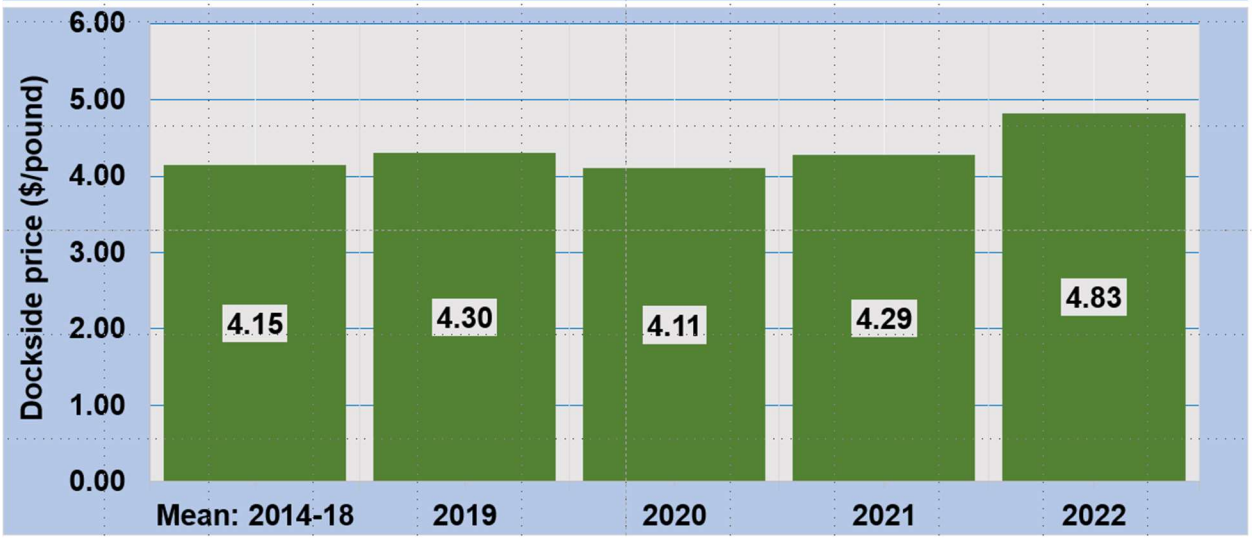


Fig. 6. Imputed U.S. red snapper dockside prices compared to benchmark dockside prices in 2014-18



ECONOMIC MODEL OF COMMERCIAL RED SNAPPER FISHERY

- The economic model of the fishery assumes that commercial landings and dockside values are determined by the year, dockside prices, unemployment rates, income growth rate, diesel prices, the occurrence of disasters, recessions, and global pandemic, imposition of fishing quota, and other variables.

- The economic 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.

- **Direct fishery losses** occur if current values are lower than the projected values.

MARGINAL EFFECTS ON RED SNAPPER COMMERCIAL LANDINGS

❖ Negative impacts on commercial landings:

- The rise in diesel prices significantly reduced commercial landings.
- Commercial landings significantly fell during recessions.
- Commercial landings tend to decline during Gulf disasters.
- The imposition of fishing quotas tends to reduce commercial landings.
- Higher unemployment rates tend to reduce commercial landings.

❖ Positive impacts on commercial landings:

- Dockside prices have positive but insignificant effects on commercial landings.
- The growth in disposable incomes tends to induce higher commercial landings.
- The Covid-19 global pandemic tends to encourage commercial fishing.

MARGINAL EFFECTS ON U.S. RED SNAPPER LANDING VALUES

- Negative impacts on commercial landings:
  - Landing values tend to fall during recessions.
  - Landing values significantly fell during the Covid-19 pandemic.
  - The imposition of fishing quotas tends to reduce landing values.
  - The rise in diesel prices significantly reduced landing values.
- Positive impacts on commercial landings:
  - Dockside prices have significant positive effects on landing values.
  - Higher commercial landings significantly raised landing values.

EFFECTS OF FISHING QUOTA ON FISHING CAPACITY

- The Gulf of Mexico red snapper individual fishing quota program was implemented in 2007 to reduce over-capacity and eliminate derby fishing conditions in the commercial fishery. The five-year review of the program reveals that the number of vessels and fishing trips declined by 17% and 29%, respectively.
- Source: The Gulf of Mexico Red Snapper IFQ Program: The First Five Years. Juan J. Agar, Jessica A. Stephen, Andy Strelcheck, and Assane Diagne. Marine Resource Economics. Vol. 29, No. 2 (June 2014), pp. 177-198.

SUMMARY, LIMITATIONS, AND IMPLICATIONS

- The rise in diesel prices significantly reduced commercial landings.
- Commercial landings significantly fell during recessions.
- Landing values significantly fell during the Covid-19 pandemic.
- The rise in diesel prices significantly reduced landing values.
- Dockside prices significantly enhanced landing values.
- Higher commercial landings significantly raised landing values.
- The imposition of fishing quotas significantly increased dockside prices.