

# Biological Review of the 2020 Texas Closure

Report to the Gulf of Mexico Fisheries Management  
Council

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## **Introduction**

In 1981, the Gulf of Mexico Shrimp Fishery Management Plan (FMP) was implemented with the primary objective to increase the yield of brown shrimp harvested from Texas offshore waters. Since then, various aspects of the Texas closure management measure have been analyzed and reported on by scientists at the Southeast Fisheries Science Center (SEFSC). This report contains an overview of selected effects of the 2020 Texas closure and will be presented by the SEFSC to the Gulf of Mexico Fishery Management Council (GMFMC) at the March/April 2021 meetings.

## **Background**

The Shrimp FMP regulates fishing for brown shrimp in the Exclusive Economic Zone (EEZ) off the coast of Texas. Provisions in the Shrimp FMP prohibited brown shrimp fishing from the coastline to 200-miles off Texas during the periods: May 22-July 15, 1981; May 26-July 14, 1982; May 27-July 15, 1983; May 16-July 6, 1984; and May 20-July 8, 1985. In 1986-1988 only the portion of the EEZ from 9 to 15-miles was closed to fishing. In 1986, the area was closed May 10-July 2, while in both 1987 and 1988, Texas offshore waters were closed from June 1-July 15. In 1989, the 200-mile closure again went into effect and has remained in effect each year since that time. Closure periods were: June 1-July 15, 1989; May 15-July 8; 1990; May 17-July 6, 1991; May 15-July 6, 1992; May 15-July 6, 1993; May 13-July 7; 1994; May 15-July 15; 1995; June 1-July 15; 1996; May 15-July 15, 1997; May 15-July 8, 1998; May 15-July 15, 1999; May 11-July 5, 2000; May 15-July 8, 2001; May 15-July 15, 2002, May 15-July 15, 2003, May 15-July 15, 2004, May 15-July 15, 2005, May 15-July 10, 2006.

Since 2006, the Closure period has consistently occurred from May 15 to July 15 each year. State of Texas regulations, implemented in 1960, prohibited shrimp fishing in the territorial sea off Texas during these same periods, with the exception of allowing white shrimp fishing from the beach out to 4 fathoms. In 1990, however, state law prohibited all shrimping activities including the 4-fathom daytime fishery. This closure has been in effect during each of the subsequent closures (1991-present).

The management objectives of the Texas closure regulation (as specified in the Shrimp FMP) are to increase the yield of brown shrimp and eliminate the waste of the resource caused by discarding undersized shrimp caught during a period in their life cycle when they are growing rapidly. The objective of the 1960 through 1980 Texas territorial sea closures was to ensure that a substantial portion (>50%) of the shrimp in Gulf waters had reached 65 tails/pound or 112 mm in length by the season's opening. Thus, this temporary closure of the offshore fishery from mid-May to mid-July each year results in larger shrimp to the fishery and subsequently a higher market value.

National Marine Fisheries Service (NMFS) port agents, as well as state trip ticket systems in Louisiana, Mississippi, Alabama, and Florida, collect shrimp statistics on the catch, effort, and fishing location of shrimp vessels operating in the Gulf of Mexico. These data provide information on the species, size and location of capture, as well as information on the catch rates and fishing effort of the vessels in the fleet. In addition,

the electronic logbook program collects detailed data on fishing location and effort for the offshore fishing fleet (Gallaway, et al., 2003).

## Recruitment

Postlarval brown shrimp begin entering estuaries in Texas and western Louisiana in mid-February and continue through July, depending on environmental conditions. Several “waves” of postlarvae may enter the estuaries throughout the spring. Peak recruitment usually occurs from February through early April. A wide array of environmental and biological factors affects the fate of these young shrimp. Research has identified salinity, temperature, and water height as important primary environmental factors affecting the survival, growth and abundance levels of subsequent offshore shrimp populations. The amount of usable nursery area for juvenile and subadult brown shrimp appears to be related to the distribution of favorable salinities ( $\geq 10$  ppt) as well as to the tidal water height in interior marshes. Bay water temperatures exceeding 60° F in April and May are also favorable for above average shrimp production, with optimal growth occurring after 68° F.

In 2020, during the peak recruitment period, air temperatures for Texas and western Louisiana coastal counties were above average. Record high average temperatures were recorded in Texas during March. February and March exhibited below average rainfall. During April, however, precipitation was near average for Texas and above average for western Louisiana coastal counties.

Our environmental model predicted an above average production for Texas offshore waters. The model uses Galveston air temperature during mid-April (the key component), rainfall during early March, and bay water height during late April and early May. Model inputs for Galveston air temperature and water height were above average during the specified time periods, while rainfall was below average. These components are additive in the model, thus higher values indicate higher catch.

The Galveston Bay Bait Index, consistently our most reliable estimate of subsequent brown shrimp production off the Texas coast for more than five decades, is derived from monitoring the Galveston Bay bait shrimp fishery during late April through mid-June. Sampling was not conducted in 2020 due to COVID-19 restrictions. Subsequently, a prediction was not made for the offshore brown shrimp catch for the western Gulf of Mexico for 2020.

Catch information from Louisiana inshore and offshore fisheries in May is used to estimate total production for the biological year from May through April. Using 2020 May catch data in our Louisiana Model, we predict a harvest of 21.3 million pounds for Louisiana west of the Mississippi River for the 2020-2021 season. This is below the historical average of 30.5 million pounds.

In summary, the 2020 Environmental Model predicts above average production for Texas offshore waters. Whereas the Louisiana catch rates indicate a below average brown shrimp yield of 21.3 million pounds this season from west of the Mississippi River to the

Texas-Louisiana border. Overall, the western Gulf of Mexico should expect an annual brown shrimp production of approximately 40.6 million pounds during the 2020-2021 season, which is below the 1960-2012 long-term historical average of 56.0 million pounds for the two-state area.

### **Texas Fishing Trends**

In Texas bays, from May through August 2020, 257,162 pounds of brown shrimp were landed in inshore Texas waters. This represents a below average value relative to the historical inshore catches for this period since the closure began in 1981 (1981-2011 average was 4.2 millions pounds). Further, the monthly catches in 2020 were not equally distributed among months - August accounted for most of the Texas inshore catch during the four-month period (at 70.1%).

Offshore landings during May through August 2020 was 9.39 million pounds, with 4.5 million pounds (94.0%) of the catch landed in the July through August period. The total catch for this period represents a below average level when compared to catch values since EEZ closures were initiated in 1981 (1981-2011 average was 13.6 millions pounds). During the July through August 2020 period only about 1.5% of the landed shrimp were in the > 67 count size category (Figure 1).

### **Texas Shrimp Landings by Region**

The distribution of shrimp landings in Texas ports was examined to determine if changes in shrimp landings at the various ports had occurred since the initial closure in 1981. In previous years, the May through August Texas shrimp catch was summarized by port of landing. Beginning in 2020, shrimp landings data come from state reported Trip Tickets (i.e., from dealer reported landings and no longer from NMFS port agent interviews). Since landed catch is typically only reported on Trip Tickets using a county code, and not with a port code (as was the case with NMFS port agent interviews), the May through August Texas shrimp catch is now being summarized across the three Texas regions (lower, middle and upper Texas) and no longer by port of landing.

Figure 2 shows the proportion of landings by lower Texas ports (including Aransas, Nueces, Port Isabel, and Brownsville ports), middle Texas coast ports (including Brazoria, Port Lavaca, Matagorda, Palacios and Seadrift ports), and upper Texas ports (including Aransas, Nueces, Port Isabel and Brownsville ports). Among the three regions, upper Texas had the highest percentage of landings (47.1%), compared to 27.8% and 25.0% for the middle and lower Texas regions, respectively. Upper and lower Texas regions experienced a slight decrease in landings relative to last year, whereas the proportion of landings in the middle Texas region was slightly higher this year (27.8% > 12.3%).

### **White Shrimp Catch off Texas**

For the twenty-ninth consecutive year, the 0-4 fathom white shrimp fishery off Texas has been closed in conjunction with the Texas closure. Following the 2020 closure, most of

the offshore white shrimp landed in July were in the 15-20 count size range (Figure 3). This year 638,538 pounds of white shrimp were landed in offshore Texas waters during July, which is greater than the historic average landings, from 1980-2019 (444,408 pounds). Most of the offshore Texas white shrimp landed in August were in the 15-20 count size range (Figure 4). The 2020 offshore white shrimp landings in August (371,226 pounds) were lower than the historic average landings for August (725,659 pounds), from 1980-2019.

## References

Berry, R. and K. Baxter. 1969. Predicting brown shrimp abundance in the northwestern Gulf of Mexico. FAO Fish. Rep. 57(3): 775-798.

Gallaway, B. J., J. G. Cole, L. R. Martin, J. M. Nance, and M. Longnecker. 2003. Description of a simple electronic logbook designed to measure effort in the Gulf of Mexico shrimp fishery. North American Journal of Fishery Management: 23: 581-589.

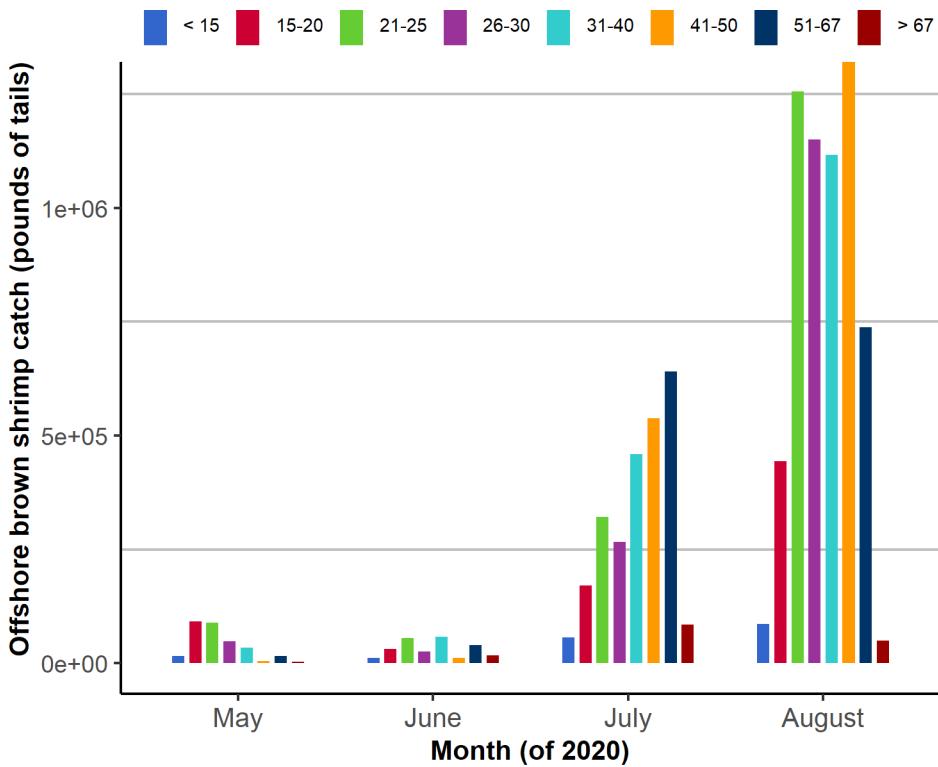


Figure 1. Size composition of brown shrimp catch from offshore Texas, May-August 2020.

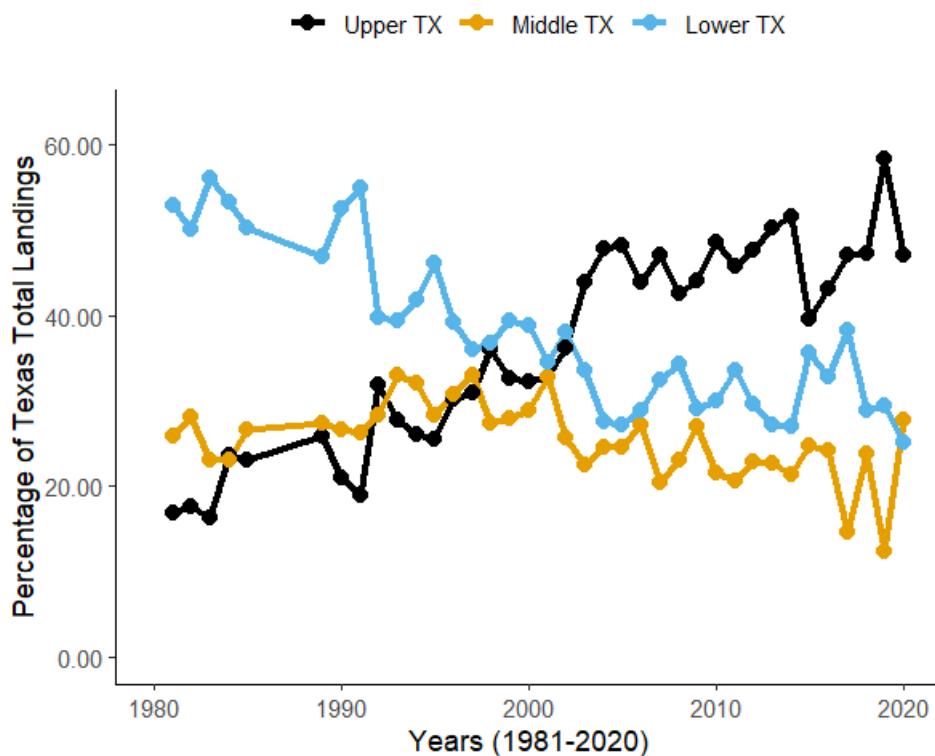


Figure 2. Proportion landed by region (upper, middle and lower Texas ports), from May and August (1981-2020).

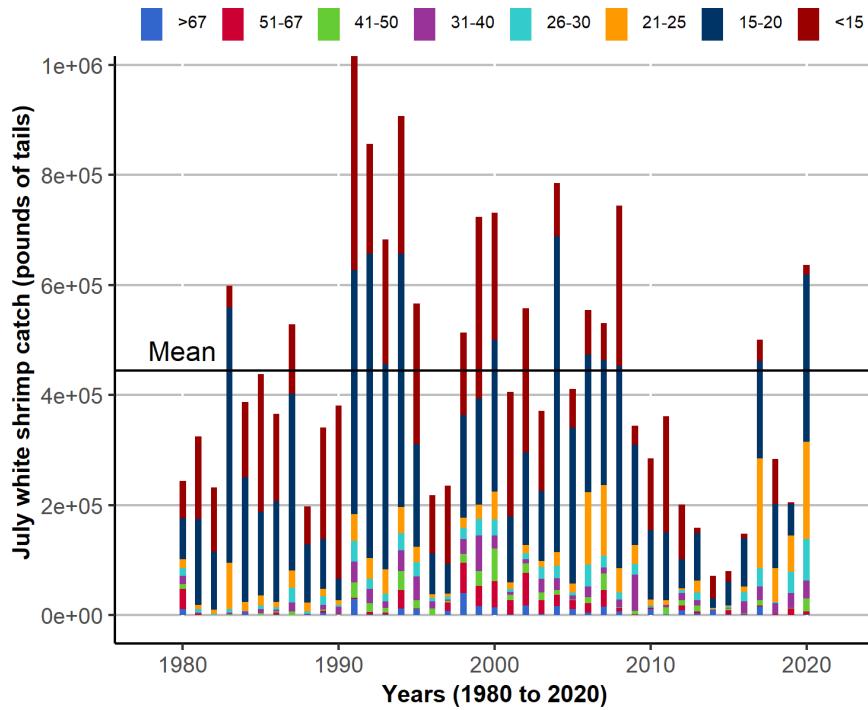


Figure 3. Size composition of Texas July offshore white shrimp catch, 1981-2020

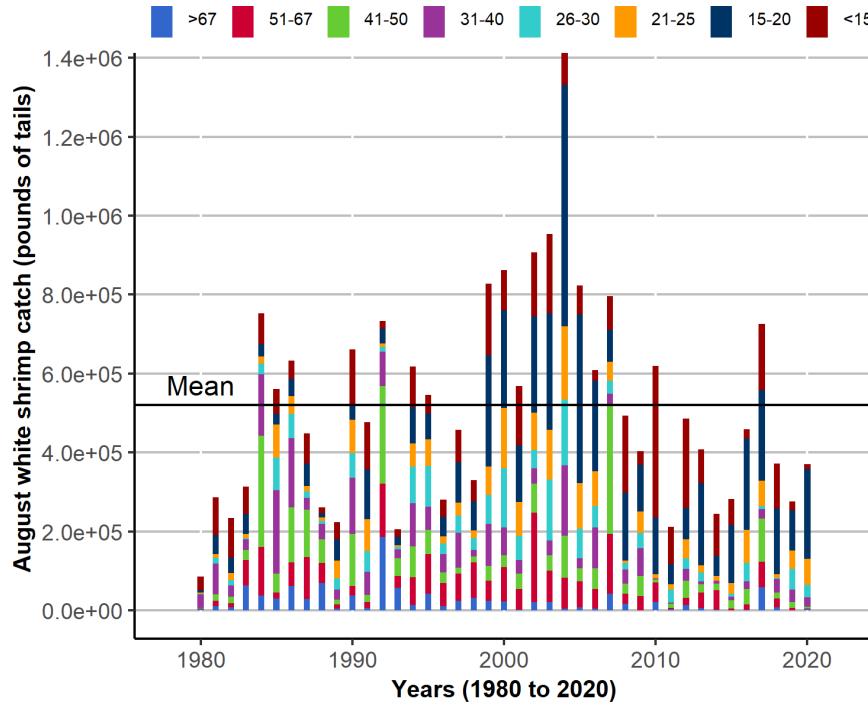


Figure 4. Size composition of Texas August offshore white shrimp catch, 1981-2020