

# SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL



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## MEMORANDUM

Date: May 29, 2015

TO: South Atlantic Fishery Management Council

FROM: Chip Collier, SAFMC Staff

SUBJECT: Trip and Effort Description in the Rock Shrimp Fishery

Council requested staff to work with industry to analyze additional information from the trip ticket and other databases to determine the number of vessels that potentially fish in depths associated with the eastern boundary of the HAPC extension and re-analyze the catch data from 2013 and 2014. Trip-level information was provided for 17 vessels that accounted for greater than 90% of the South Atlantic rock shrimp landings from 2013 and 2014. Catch information was analyzed based on trip ticket data with reported depths greater than or less than 200 feet. The fishermen that reported catch from the deeper depths could potentially fish depths on the eastern boundary of the HAPC extension in Coral Amendment 8.

Of the 17 vessels, 11 fished in depths greater than 200 feet although not all vessels fished in depths greater than 200 feet both years. The average trip length was longer (16 days) for vessels fishing in depths greater than 200 feet compared to the trip length (13 days) for vessels fishing in depths 200 feet and less. Fishermen typically make three tows per night and a tow lasts about three hours based on discussions at the April 2015 Shrimp and Deepwater Shrimp AP meeting.

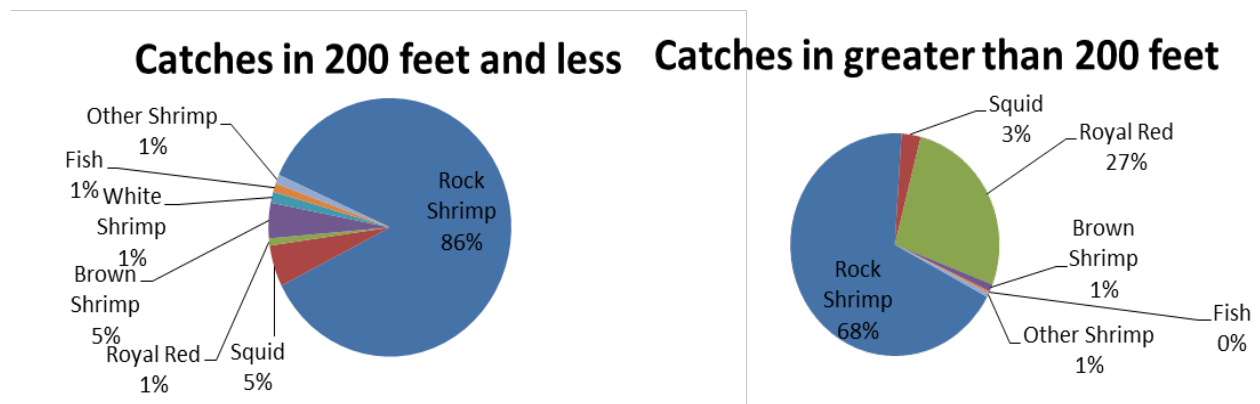
The rock shrimp catch reported for these vessels were combined from 2013 and 2014 to allow for comparison of the two years without displaying any confidential information (**Table 1**). The landings in 2013 accounted for 66% of the summed two years, while the landings in 2014 accounted for 35%. In both years the percentage of the total landings remained similar for trips that fished in depths greater than 200 feet. The percentage of total landings from depths less than or equal to 200 feet dropped from 44% in 2013 to 13% in 2014. This percentage shift was likely due to a drop in effort in the number of trips reporting fishing in depths 200 feet and less (42 in

2013 to 13 in 2014). The number of trips reporting depths greater than 200 feet was similar in both years (15 in 2013 and 18 in 2014). In this analysis, a trip counted as two different trips if they reported catching rock shrimp in depths that fell in the two different categories. For these trips, the days fishing for counted the total days fished and not the number of days fishing at a certain depth. This double counting could not be corrected with the current data available.

**Table 1.** Percent of landings and number of trips in depth greater than or less than 200 feet based on trip level information from 17 vessels.

Depth	% of Combined 2013/2014 Landings		Number of Trips	
	2013	2014	2013	2014
<=200 feet	44%	13%	42	13
>200 feet	22%	22%	15	18

In addition to the rock shrimp, fishermen reported all sold catch and this catch should also be considered when analyzing the landings. On some of the trips, fishermen targeted royal red shrimp and rock shrimp on the same trip and the number of days targeting each species could not be determined. Depth in the royal red shrimp fishery was generally greater than 1,000 feet and minimal rock shrimp landings were reported at these depths. Rock shrimp catches were generally reported in depths less than 400 feet and minimal royal red shrimp were reported at these depths. Because there was some overlap and days could not be attributed to certain targeted catch, the dataset was not limited to likely rock shrimp depths. Rock shrimp was the majority of the sold catch in depth greater than and less than 200 feet (**Figure 1**). For catches in



**Figure 1.** Percent of landed catch (lbs) in 2013 and 2014 rock shrimp fishery for trips reporting fishing in depths less than or equal to 200 feet and trips reporting fishing in depth greater than 200 feet.

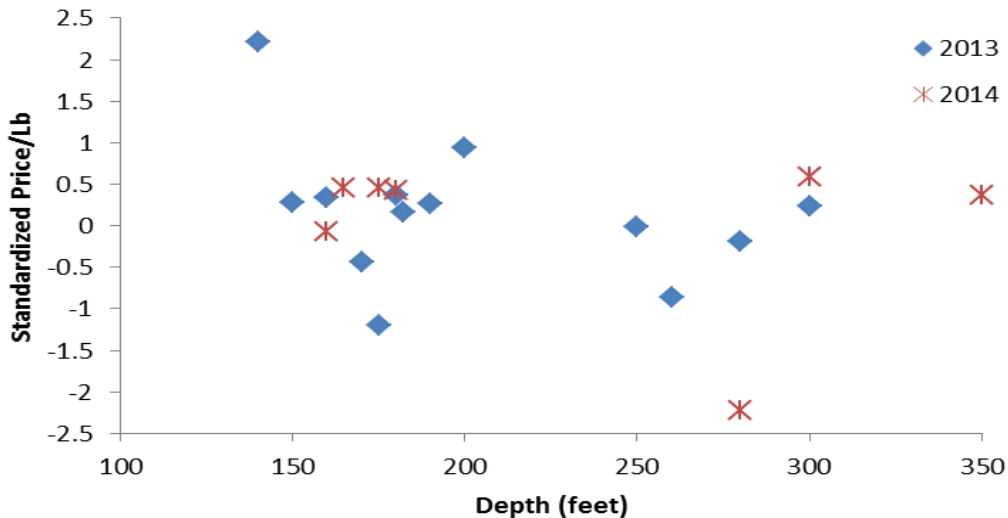
reported depths 200 feet and less, brown shrimp and squid (excluding rock shrimp) were the only two species that accounted for greater than 2% of the landed catch by weight. For catches in reported depths greater than 200 feet, royal red shrimp accounted for 27% of the landed catch by weight.

The price per pound of shrimp can vary due to size and tracking the price per pound of the shrimp might give an indication of where the largest shrimp were located. This was attempted

by plotting standardized price per pound over depths fished for the 276 trips with trip level information (**Figure 2**). Prices were standardized to prevent any issues with confidentiality and enable yearly comparisons. Standardization was done by first calculating a mean and standard deviation of the price per pound for each depth. The formula used for standardization was:

$$\text{Standardized Price/Lb} = \frac{(\text{price at depth} - \text{mean price})}{\text{StdDev}}$$

No depth related pattern was evident in the average price per pound.



**Figure 2.** Standardized rock shrimp price per pound for 17 vessels plotted over depth. Price per pound was standardized to prevent issues with confidentiality. Zero is the mean price per pound for each year.

Trip Ticket Effort and VMS Effort

In this analysis, the data are based on VMS points for vessels moving between two and four knots and were detected along the eastern edge of the proposed closure in Coral Amendment 8. The current VMS ping rate is every 30 minutes and tows in the area lasting less than 30 minutes might not be detected. A vessel was considered in the area if at least one VMS point occurred in the area.

Based on a three hour tow time with two pings per hour and three tows per night, it can be expected that 18 pings would be detected per night fishing. If fishermen are out on average of 16 days for trips in greater than 200 feet, then it is likely that fishing occurred on at least 12 nights. For a total trip it could be expected that a vessel would have 216 pings per vessel per trip while fishing. On some trips, the fishermen left the area and went inshore or further offshore to target royal red shrimp.

In 2013 and 2014, a total of 233 VMS points were detected from 11 different vessels (**Table 2**). Seven of the vessels had tows in the area in 2013 and five vessels had tows in the area in 2014. The vessels detected in the area were detected on 1 to 14 days over the two years. Five of the vessels had less than five points in the potentially closed area over the two years. Three vessels were detected in the area over 30 times and no vessel had greater than 80 points. If a vessel was detected in the area, the average number of points that occurred in the area for days with at

least one detection in the area was 3.3 detections per day with a maximum average number of 6.7 detections per day. The greatest number of VMS points detected in the area on a given day was 16 VMS points. The average number of detections was higher in 2014 compared to 2013. Because the average only includes positively identified days in the area, it biases the average number of pings to a higher average. Another way to consider points per day would be to total the number of days fished for fishermen that reported depths greater than 200 feet. Using this information the average number of points per day in the area was less than 0.5 pings per day. This estimate biases the average number of pings to a lower average because fishermen may switch to targeting rock shrimp in shallower water or targeting royal red shrimp in deeper water and effort fished at different depths cannot be apportioned. The likely range of average pings per day per vessel within the eastern boundary of the proposed closed area in Coral Amendment 8 is between 0.4 and 4.6 pings per day or 12 to 138 minutes. The average number of pings in the area will vary among vessels.

**Table 2.** Rock Shrimp VMS points from 2013 and 2014 detected along the eastern edge of the area closing in Coral Amendment 8. Detection is based on at least one VMS point being inside the proposed closed area. Vessel day refers to at least one detection for a vessel on a calendar day.

Year	Total Points inside area	Number of Vessel Days in Area	Number of Days Reported for Trips > 200 feet	Avg # Points in Area/Days Reported	Avg # Points in Area/Days Observed in Area	Maximum Number of Points in Area/Day
2013	122	47	257	0.5	2.6	9
2014	111	24	261	0.4	4.6	16
Overall	233	71	518	0.4	3.3	16