The Gulf of Mexico Fishery Management Council gathered information from anglers on vermillion snapper. Information was solicited through the Councils Something's Fishy tool which asks stakeholders if they have noticed anything "fishy" about the stock in recent years. This initiative aims to gather information from active fishermen on trends or strange things that the scientists and managers may not have observed. It expands the types of information gathered during the stock assessment process and allows for a better understanding of what is happening of the water. Comments were collected using a web-based tool that was advertised via press release, social media, and through the Council's website.

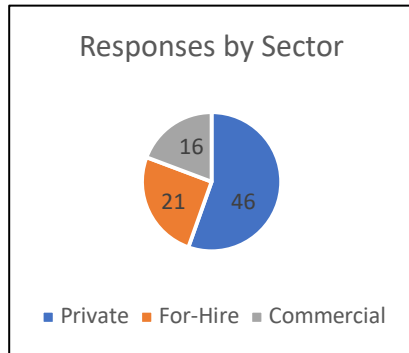Sixty-three responses were received between November 1 and December 14, 2019. A majority of respondents identified as private anglers (Figure 1). Respondents self-selected their association with the fishery and were not limited to a singular response. Respondents who identified as state guides were counted as private anglers.

Respondents self-selected the general location where their observation was made. They were not limited to a singular response and often identified multiple locations. A majority of observations were made off the coast of the Florida panhandle, Alabama, and from eastern Texas (Figure 2).

Figure 1: Number of responses by sector

Responses were analyzed manually and using automated sentiment analysis to determine if they indicated positive, negative, or neutral trends in the vermillion stock.
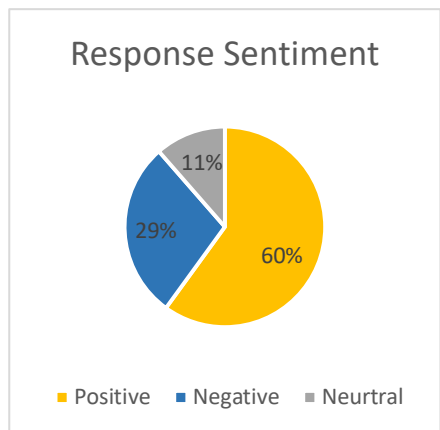
Manual analysis found that most comments indicated a positive trend in stock health. (Figure 3). Anglers noted that the stock has been continuously healthy for years and that stocks may be healthier than ever. Anglers also said they're seeing larger vermillion snapper in deep waters and that vermillion snapper are moving into shallower waters than then have been historically. Anglers that indicated negative trends in abundance speculated that vermillion snapper are being outcompeted by triggerfish and red snapper. They also noted that juveniles are being found in lionfish stomachs and that dolphin depredation is especially harmful to vermillion snapper. It was said that fishing effort is shifting to vermilion snapper because of unhealthy grouper stocks, short seasons for other species, and increased commercial pressure because IFQ program does not include them. Finally, anglers mentioned that red tide and the Deepwater Horizon oil spill may have displaced local vermilion populations.
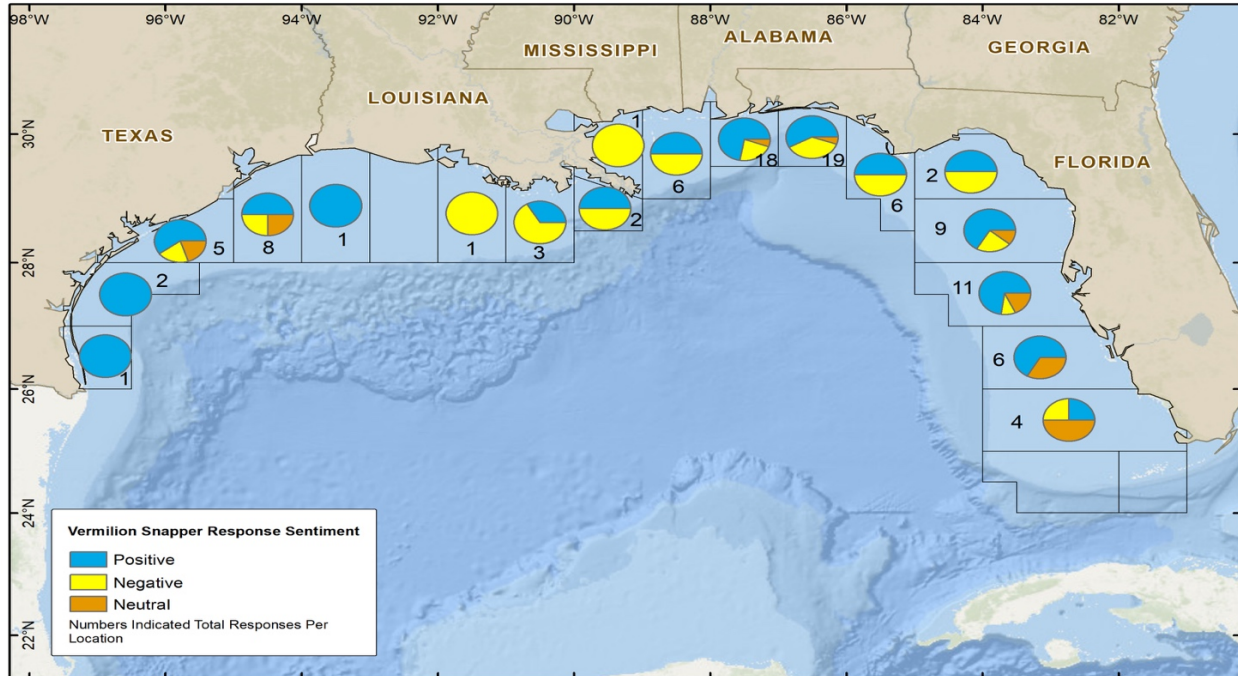
Figure 2: Responses by sentiment

Figure 3: Responses by sentiment and area

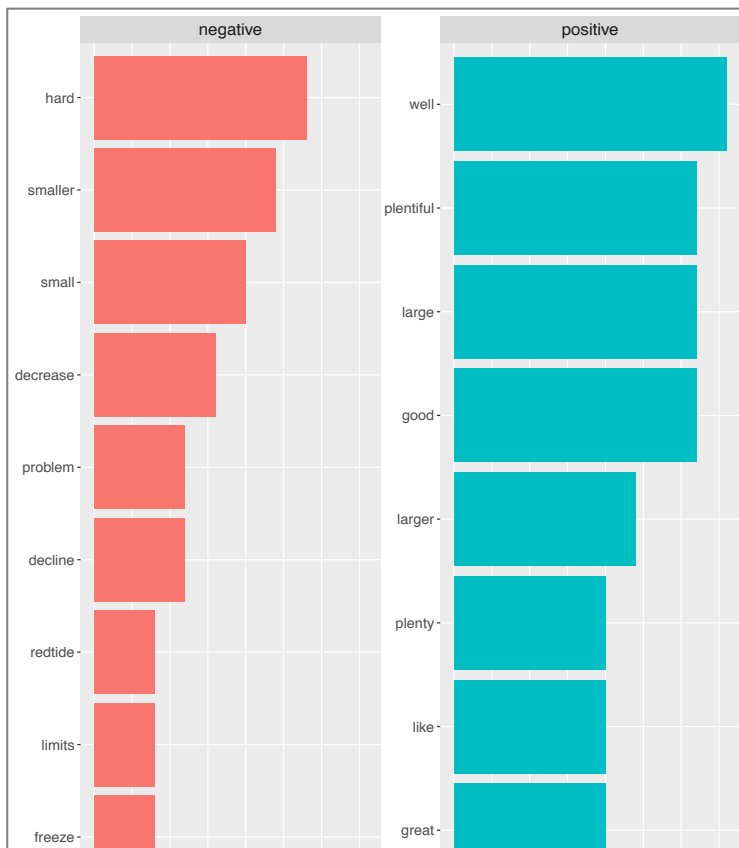Responses were also analyzed using automated sentiment analysis run with R statistical software. Words in each comment were compared to an existing sentiment library. These libraries categorize words into positive, negative, or neutral sentiment. Positive words get a score of +1, negative words get a score of -1, and neutral words get a score of zero. The progam scores every word in each comment and then averages those word scores to for the individual comment. Comments have that an average sentiment above 0 will be considered a positive comment, a negative comment will have an average sentiment score less than 0, and a neutral comment will have an average sentiment score of 0. To present this information, a histogram shows how many comments got a particular sentiment value. Comments that are scored to be negative would appear as bars on the left of zero on the graph,

Figure 4: Most frequent words contributing to comment sentiment identified by automated sentiment analysis

comments that are scored to be positive would appear as bars on the right of the graph, and comments that are scored to be neutral would appear in the direct center of the graph. For vermilion snapper, this analysis showed a minor trend towards positive comments. The positive words that occurred most frequently were well, plentiful, large, good, and plenty. The negative words that occurred most frequently were hard, smaller, small, decrease, and problem. This could indicate that anglers are generally seeing more fish and larger fish while some anglers are experiencing a decline in average size and catch rate.

Manual and automated sentiment analysis produced similar results. Both indicated a slightly positive trend in perception of stock abundance.
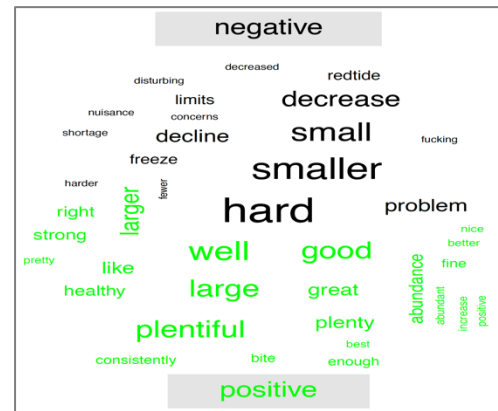

Figure 5: Word Cloud showing relative frequency of positive and negative words