Reef Fish Extension Advisory Panel

Proceedings of the First Annual Meeting

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Many thanks to the Gulf States Marine Fisheries Commission for providing resources for this meeting, including a meeting room, audio/visual services, and refreshments. We are grateful to Angela Collins, Sarah Gibbs, and Alexis Sabine for their detailed meeting notes. Most importantly, thank you to the 12 reef fish fishery representatives who participated in our meeting.

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Executive Summary

Reef fish fisheries across the Southeastern U.S. (North Carolina through Texas, including Puerto Rico and the U.S. Virgin Islands) encompass numerous commercially valuable and recreationally important species that are inherently vulnerable to overexploitation. In the Gulf of Mexico (GoM), reef fish are managed collectively under National Oceanic and Atmospheric Administration (NOAA) Fisheries' Reef Fish Fishery Management Plan, which was implemented in 1984. Over the past four decades, reef fish management has become increasingly complex. As new research projects and stock assessments are completed, resource managers learn more about these species' biology, ecology, and stock status. With this information, they implement new management measures to ensure reef fish sustainability, resulting in a constantly evolving management framework.

Given the inherent complexity associated with reef fish management, it is critical that research findings and stock assessment results are communicated to stakeholders (fishermen) via concise, easy-to-understand materials. This unidirectional flow of information has been common practice for many years. Recently, another important type of information transfer has emerged in theory and practice: the transfer of local ecological knowledge (LEK) from stakeholders to scientists and resource managers. This knowledge is defined as a person's comprehensive understanding of the natural environment, generated through long-term interaction with the environment. With respect to reef fish fisheries, stakeholders gain LEK through years (or decades) on the water fishing for reef fish. This knowledge can significantly improve overall reef fish management processes and enable stakeholders to shape future research projects and management decisions.

Recognizing the need for continued communication to stakeholders and novel incorporation of stakeholder insight into reef fish management, the National Sea Grant Office (NSGO) awarded $2.4 million in September 2021 to a team of Sea Grant fisheries Extension specialists, university scientists, and fisheries managers known as the Regional Reef Fish Collaborative. Led by Dr. Marcus Drymon, a marine fisheries specialist with Mississippi-Alabama Sea Grant Consortium, the Collaborative is developing and implementing Extension and outreach programming related to reef fish research and management not only in the U.S. GoM, but also in the U.S. South Atlantic and U.S. Caribbean due to the similarity of reef fish species across these regions. The project's purpose is to build upon the conventional unidirectional flow of information (i.e., from research to management to stakeholder) by working directly with stakeholders on a consistent basis to identify pressing research needs and communicate those needs to the scientific and management community (i.e., from stakeholder to research and management). Specifically, the project consists of three objectives: 1) gather information using longitudinal (i.e., annual) surveys, 2) refine information during annual Advisory Panel meetings, and 3) communicate information through expanded capacity.

In summer 2022, the Collaborative conducted the first longitudinal survey to identify pressing research needs and understand stakeholder attitudes, perceptions, and beliefs regarding reef fish management. Following analysis and interpretation of the survey results, the Collaborative

planned and convened the first annual Reef Fish Extension Advisory Panel meeting. The purpose of the meeting was to discuss the topics highlighted in the first longitudinal survey to further identify and prioritize stakeholder needs and emerging issues regarding reef fish fisheries. The meeting took place in conjunction with the annual Gulf States Marine Fisheries Commission (GSMFC) meeting at the San Antonio Marriott Riverwalk in San Antonio, Texas on October 17th, 2022.

A total of 15 project team members and 12 reef fish fishery representatives attended the meeting, with 25 attending in person and two attending virtually. The project team members spanned Texas to South Carolina, and included personnel from Sea Grant programs, the University of South Alabama, and the South Atlantic and Caribbean Fishery Management Councils (SAFMC, CFMC). The reef fish fishery representatives also spanned Texas to South Carolina, with participation from Puerto Rico and the U.S. Virgin Islands. Four fishery representatives identified with the commercial sector, six with the charter-for-hire sector, one with the recreational sector, and one with state government. The meeting was open to anyone who wished to attend; other participants included personnel from the NSGO, NOAA, Gulf of Mexico Fishery Management Council (GMFMC), GSMFC, and Mississippi and Alabama state resource management agencies.

The full-day meeting was divided into a morning session and an afternoon session. The morning consisted of a mix of presentation and discussion. Sarah Gibbs and Steven Scyphers led the presentation, which primarily detailed the results of the first longitudinal survey. They paused intermittently to provide opportunities for questions from, and discussion among, the attending fishery representatives. Much of the morning's discussion focused on familiarity with, and trust in, various scientific and management entities. In particular, the survey results indicated that respondents were least familiar with, and had the least amount of trust in, Sea Grant. Many attendees (fishery representatives and project team members) offered a variety of potential explanations for these results. Additional analyses indicated that respondents who identified as more avid fishermen had a higher trust in Sea Grant than those who identified as less avid. Several fishery representatives emphasized that trust is critical, and attendees suggested a few ways to further investigate the topic of trust in future surveys. Another important topic from the morning session focused on the ways people obtain information about reef fish fisheries. The survey results indicated that respondents relied most on word of mouth, followed by YouTube and social media. Some fishery representatives pointed out that there are generational and geographical differences at play with respect to the use of these tools. The attendees generally felt that the topic of social media is complex and warrants additional exploration (i.e., exactly how are people using social media?). When asked about best ways to survey the different fishing sectors, the fishery representatives supported separating survey responses by sector. Sarah and Steven also showed some results from the Great Red Snapper Count and Great(er) Amberjack Count surveys to provide more context for the Reef Fish survey results. This prompted dialogue about the importance of managing stakeholder expectations with respect to the outcomes and implications of single-species abundance studies.

The afternoon consisted solely of discussion, which was led by Marcus. He began by asking about the value of single-species assessments to fishermen. The fishery representatives felt that it is critical to engage with all sectors on topics related to these assessments. They also felt that incorporating local ecological knowledge into these processes makes them more productive and, in turn, builds fishermen's trust in scientists and managers. Several attendees communicated the importance of efficiency and flexibility with respect to the single-species assessments. The conversation then shifted to the issues faced by reef fish fisheries. In the U.S. Caribbean, large quantities of *Sargassum* are severely impairing reef fish fisheries (and other fisheries), bait availability, and water quality. Meanwhile, the lack of *Sargassum* in the Texas portion of the U.S. GoM is detrimental and represents the loss of an entire ecosystem. Scarcity of bait is also negatively impacting reef fish fisheries across the Southeastern U.S. Other issues mentioned included pollution, water quality, red tides, hurricanes, macroalgal blooms, and climate change. The fishery representatives were adamant that these environmental factors should be incorporated into assessment processes and management decisions. Next, Marcus asked the fishery representatives how to best reach stakeholders of all sectors from the U.S. Caribbean, as well as commercial and charter-for-hire stakeholders from the entire Southeastern U.S. region, for our future longitudinal surveys. Many fishery representatives suggested specific organizations to contact. In all areas, but particularly in the U.S. Caribbean, it is critical that the fishermen trust the people who distribute the surveys.

Marcus then asked a series of questions to wrap up the meeting. The first was: do you feel like your voices and opinions are heard and acted on; if not, where is the process breaking down? The responses were wide-ranging. Some attendees felt that political pressure makes it difficult for fishermen to influence management processes. Others stated that the significant delay between science and management actions creates artificial problems with the fisheries. Some raised the ubiquitous topic of trust, saying that the disconnect between what the managers say and what the fishermen see causes a disconnect and a lack of trust. A point was made that managers must aim for equal representation across sectors throughout the decision-making process. Marcus's final question was twofold: 1) what is the single biggest problem facing the reef fish species that you fish for the most, and 2) if there was ever going to be another single-species assessment, which species should it focus on? Responses to the first part of the question included poor data quality (particularly from the recreational sector), refusal to incorporate information from fishermen into assessments, delays in assessments, lack of education among fishermen, natural disasters resulting in a lack of infrastructure, lack of habitat, habitat loss, depredation, food security, pollution, and climate change. Responses to the second part of the question included red grouper, gag, king mackerel, sharks, the U.S. Caribbean's Grouper Unit 4, queen conch, and spiny lobster.

At the conclusion of the meeting, the attending fishery representatives completed a brief survey to evaluate the meeting. All rated the meeting highly, and they appreciated the opportunity to interact with other reef fish fishery representatives and members of the Regional Reef Fish Collaborative. Ultimately, this inaugural Reef Fish Extension Advisory Panel meeting provided an enhanced understanding of the results from the first Reef Fish longitudinal survey and will shape future surveys conducted in fulfillment of the Reef Fish Extension project.

Detailed Report

Morning Session

Marcus Drymon began the meeting by asking the project team members and reef fish fishery representatives in attendance to introduce themselves. Following these introductions, *Marcus* provided background information about the Reef Fish Extension project, noting that the National Sea Grant Office set aside funding for a consortium that would be tasked with explaining the results of large-scale studies such as the Great Red Snapper Count, the South Atlantic Snapper Count, and the Great(er) Amberjack Count. He explained the broad geographical distribution of the Regional Reef Fish Collaborative (Texas to Florida in the U.S. GoM, Florida to North Carolina on the U.S. east coast, and the U.S. Caribbean) and emphasized that the issues facing reef fish fishery stakeholders in one region may be different from those in another region. *Marcus* also described the unique approach of this Collaborative, which is to reverse the typical unidirectional flow of information by asking reef fish fishery stakeholders to share with us the most pressing issues they are facing so that we can be proactive about addressing those issues.

Next, *Marcus* provided background information about our survey work thus far, noting that we have conducted an electronic survey of reef fish fishery stakeholders from across the U.S. GoM, U.S. South Atlantic, and U.S. Caribbean. He emphasized that our purpose today is to hear from the reef fish fishery representatives in attendance and obtain feedback on the results of our first survey, and that the slides in the presentation are meant to serve as conversation starters.

Following this information from *Marcus*, *Sarah Gibbs* began her presentation of the results of the first longitudinal survey, which was launched in June. She explained that this survey can be considered a limited-scope survey, and that future annual surveys will expand in scope (and include the U.S. Caribbean) based on this meeting. *Sarah* listed the overall goals of the survey: to learn about reef fish stakeholder attitudes, beliefs, and perceptions of reef fish populations and management, to learn about reef fish stakeholder satisfaction with reef fish fisheries, and to identify current research needs. She noted that the survey was conducted through Qualtrics, and an equal number of fishermen were surveyed from each state; after cleaning the data, we had a total of 1,591 responses. *Sarah* then showed the results of each survey question, as detailed below.

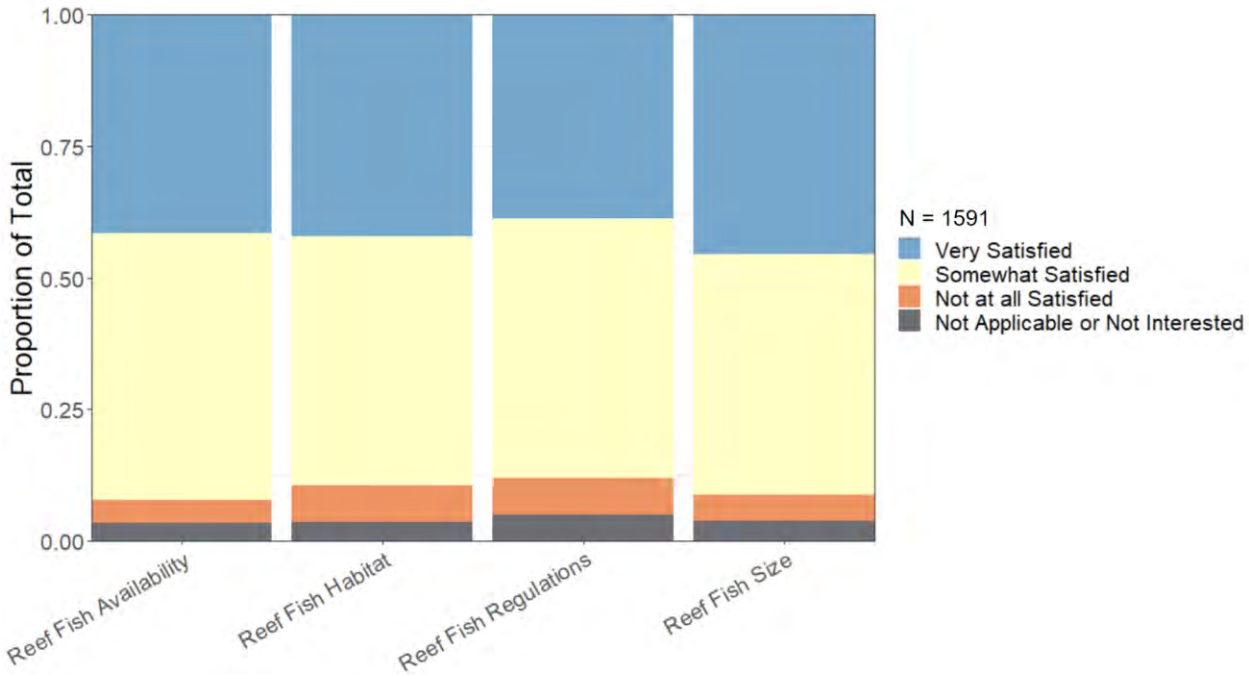
The first question was a filter question with 1,819 responses: In the context of all of your saltwater fishing, how important to you is offshore fishing for reef fish?

- Extremely important: 20.2%, 367
- Very important: 25.1%, 456
- Moderately important, 30.1%, 548
- Slightly important: 12.1%, 220
- Not at all important: 12.5%, 228 (*removed from further analysis*)

How many years have you been fishing for reef fish?

- Mean: 8.6
- Median: 5
- Min: 1
- Max: 70

How would you describe your satisfaction with availability of fish to catch, reef fish habitat, current regulations for reef fish, and size of reef fish caught?

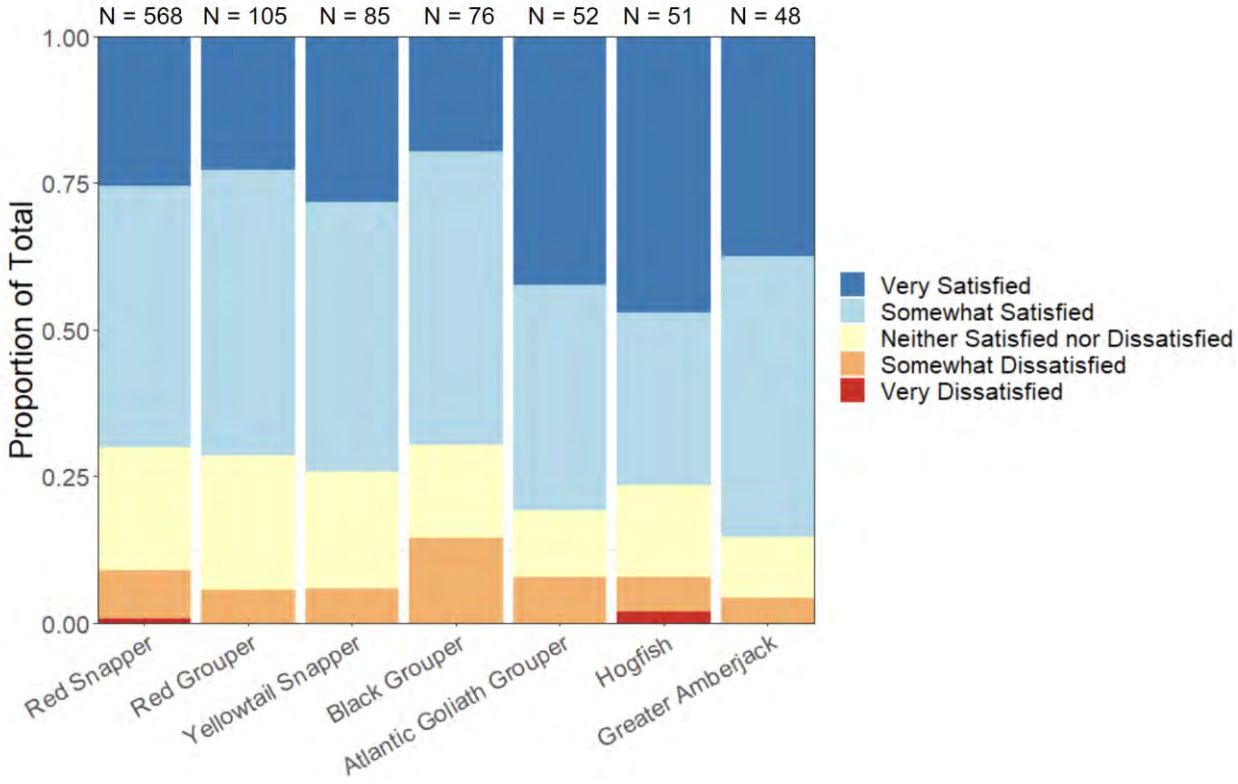


What species do you consider to be the single most important for your offshore fishing?

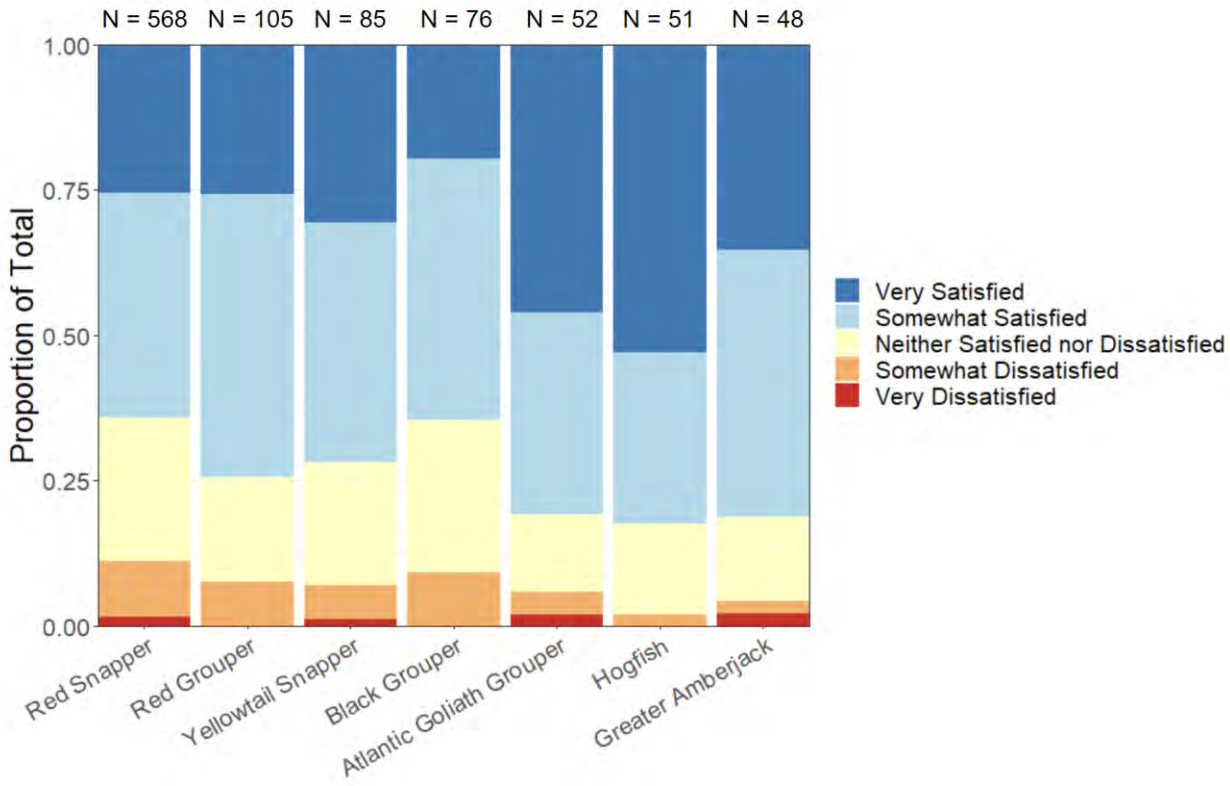
- Red snapper: 35.7%, 568
- Red grouper: 6.6%, 105
- Yellowtail snapper: 5.3%, 85
- Black grouper: 4.8%, 76
- Atlantic goliath grouper: 3.3%, 52
- Hogfish: 3.2%, 51
- Greater amberjack: 3.0%, 48

The next couple of questions focus primarily on red snapper and greater amberjack.

How would you describe your overall level of satisfaction with your most important species' population levels?



How would you describe your overall level of satisfaction with current regulations for your most important species?



Steven Scyphers paused the presentation to ask if there were any questions about the overall scope of the survey or the first series of questions, emphasizing that satisfaction is an important focus of this project.

Marcos Hanke asked about the species of reef fish included in this survey and project – are we only referring to species found on top of the reef, or are we also referring to those found farther away? *Marcus* responded that we are referring to species managed in the reef fish complex; there are about 30 reef-associated species in this management complex. He also mentioned that the survey asked about satisfaction with populations and satisfaction with regulations because it is possible to be satisfied with one but not the other; asking both questions will help us to tease out stakeholder perceptions and opinions.

Charlie Phillips asked how goliath grouper made the top seven species – catch and release? *Steven* responded that catch and release is the most likely explanation; when we consider geography, south Florida lights up. *Eric Schmidt* mentioned that there has been extensive discussion about reopening the goliath grouper fishery. However, from a charter-for-hire perspective, there is greater economic benefit associated with leaving goliath grouper in the water. *Charlie Phillips* and *Julian Magras* agreed that goliath grouper (and other large grouper, such as Nassau grouper and yellowfin grouper in the U.S. Caribbean) are nuisances that eat other species (particularly juveniles), thus negatively impacting fisheries. Therefore, some level of grouper harvest needs to take place. *Marcus* asked if there is any sort of targeted catch-and-

release fishery for these species in the U.S. Caribbean. *Marcos* stated that he participates in a goliath grouper and Nassau grouper tagging study, and although these species are increasing, they definitely have not rebounded in the U.S. Caribbean like they have in Florida.

Chris Blankenship asked if we have cross-analyzed satisfaction and the number of years fishing. *Sarah* replied that we have not done so yet, but we will in the future; other questions, such as the one about angler avidity, could play into this as well. *Marcus* mentioned that satisfaction can change over time (e.g., due to changes in regulations), and we aim to evaluate this through our longitudinal surveys.

Amy Dukes asked how the surveys were distributed, and how the audience was targeted by sector. She also asked if the same respondents will be surveyed each year, or if the audience will expand or change each year – and if the latter, how will this impact our ability to analyze responses over time? *Sarah* and *Steven* responded that we used a Q Panel with Qualtrics, a professional survey company that recruits respondents for surveys. An advantage of Qualtrics is the ability to survey without having to consider licensing requirements and access. However, Qualtrics tends to over-represent recreational fishermen and novice, or less avid, fishermen. One of our objectives today is to discuss better ways to engage with charter-for-hire and commercial stakeholders. For each subsequent survey, Qualtrics will recruit a new panel; the same individuals are not tracked through time. These surveys are treated as independent surveys through time.

Jason DeLaCruz asked about differences in responses by management zone, particularly for Florida (U.S. South Atlantic vs. U.S. GoM). *Steven* replied that the survey asked where people fish the most to capture data for each side of Florida. We treated Florida as two locations, each with 200 respondents (twice as many as each other state). We have not begun those analyses yet.

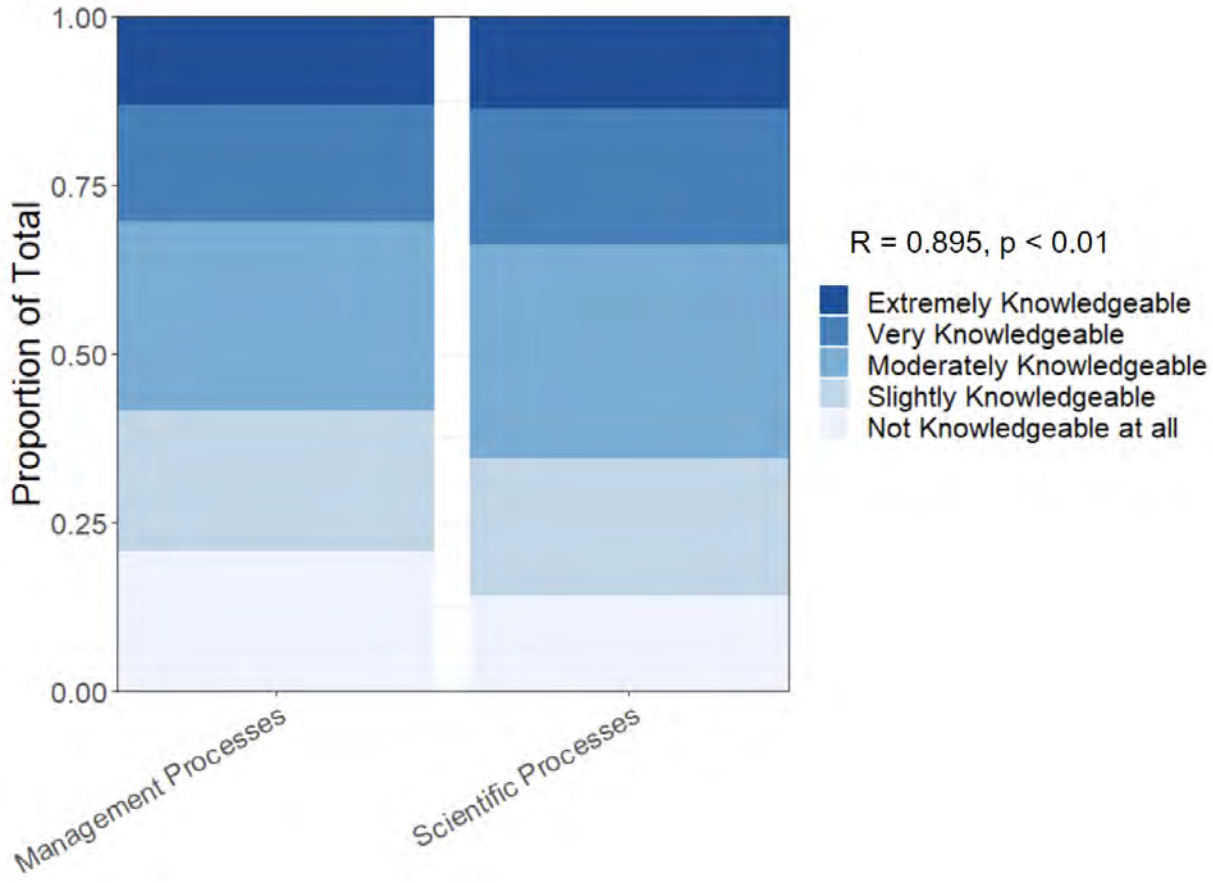
Julian asked if we contacted state natural resource managers for the survey. *Marcus* responded that each agency has different rules regarding access to fishermen contact information, so the answer is no; that said, we have been intentional in including management representatives in this project. *Julian* followed up by saying that, through working with the CFMC and the state government, he has noticed that you can capture a lot more information when you involve management representatives.

Marcos noted that it costs him $6,700 per year to simply comply with state and federal regulations (e.g., licenses, paperwork), and suggested we make a question related to this directed toward all three sectors. *Marcus* agreed that the administrative burden is increasing; we can incorporate this concept in future surveys, and we can also advance this concept as one of the significant issues faced by reef fish fisheries.

Shane Cantrell added that most of his charter-for-hire customers want to know if they are going to catch a goliath grouper or a shark, but there is no chance of catching a goliath grouper off

Texas. The presence of goliath grouper in the survey responses demonstrates the representativeness of the responses, especially compared to participation in Council meetings.

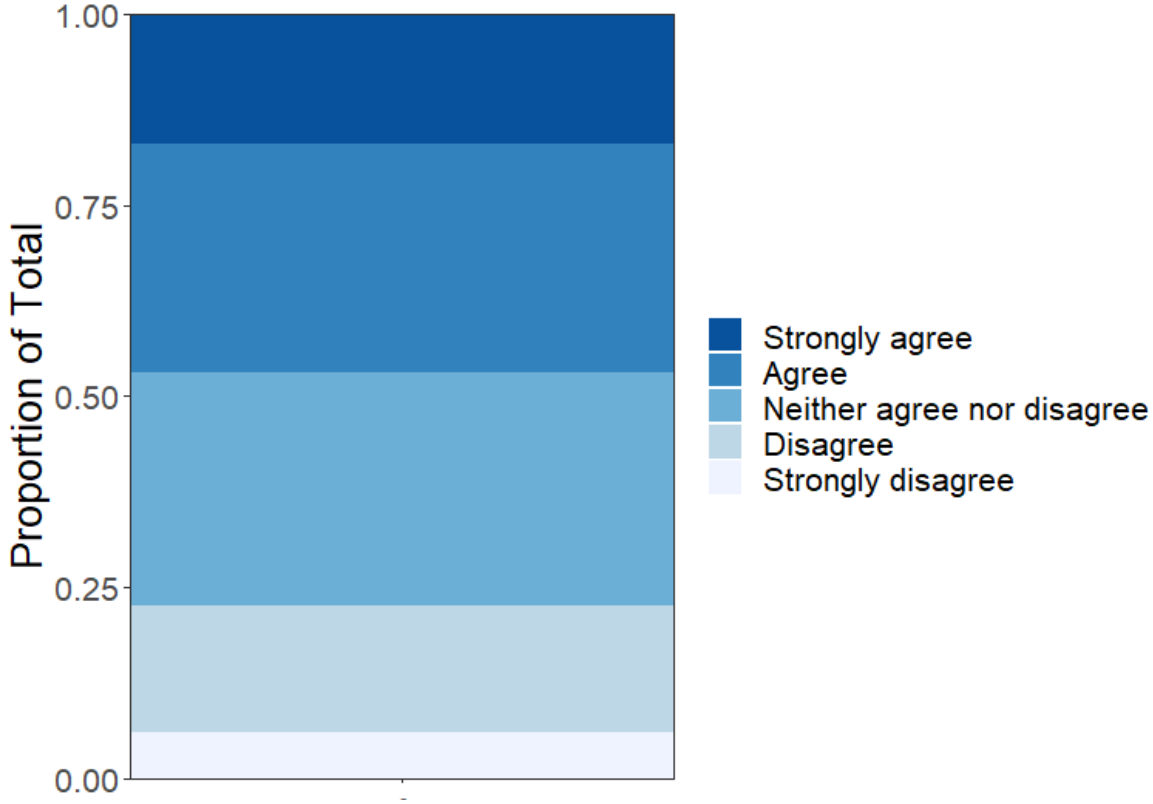
Sarah resumed the presentation with the results of the two-part question, how would you describe your overall level of knowledge on the…
… management processes involved with setting regulations for reef fish fisheries?
… scientific processes involved in assessing reef fish populations?



For both parts, less than a quarter of respondents said that they were not knowledgeable at all, and about 12% said that they were extremely knowledgeable; knowledge skews a bit toward knowledge of scientific processes. These types of knowledge are highly correlated ($R^2 = 0.895$), so respondents may not actually perceive a difference between them.

How much do you agree with the following statement?
"I feel that I am able to influence the decisions made by fisheries managers."

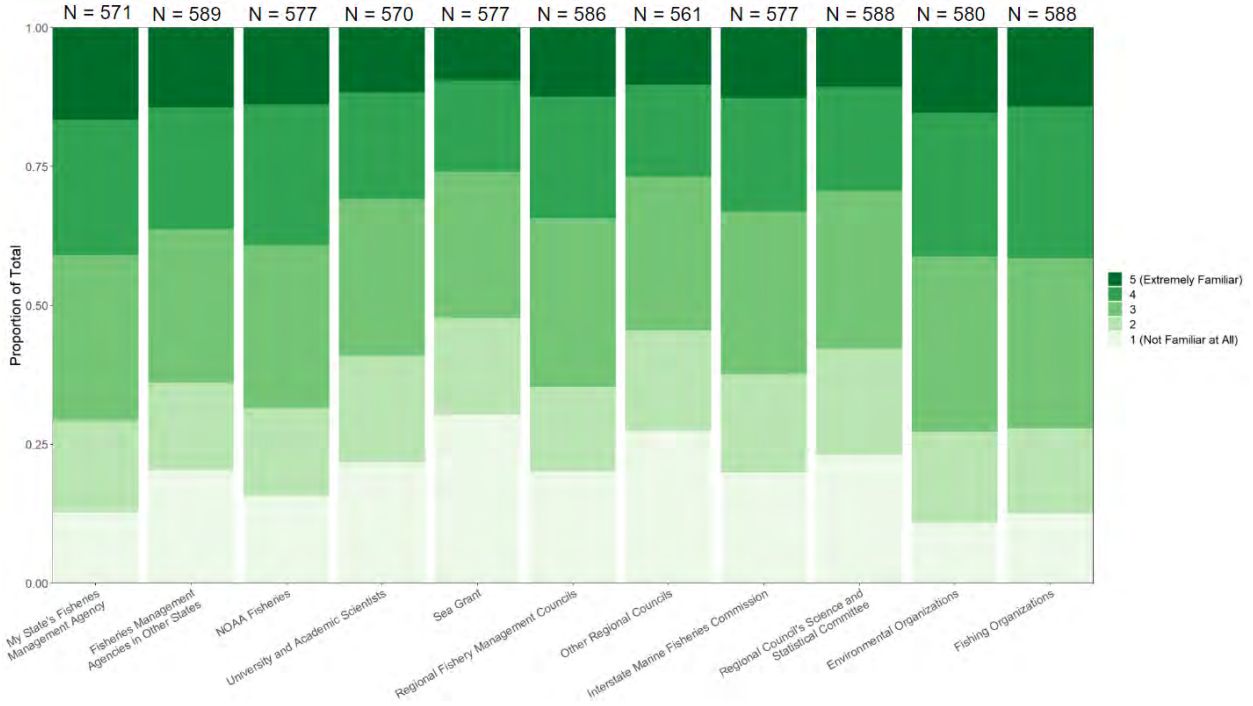
- Strongly agree: 17.0%, 270
- Agree: 29.9%, 476
- Neither agree nor disagree: 30.6%, 487
- Disagree: 16.4%, 261
- Strongly disagree: 6.1%, 97



Marcus paused the presentation to ask if this is representative of each attending fishery representative's sector. *Eric Schmidt* said absolutely not; *Shane* said that he used to feel confident that this is true but feels less confident now. Notably, both individuals routinely participate in GMFMC meetings. *Jim Brown* said that it would be interesting in the future to ask this question with respect to state vs. federal management. *Eric Schmidt* clarified that he was referring to federal management (GMFMC and NOAA Fisheries). *Eric Schmidt* has served on many advisory panels – most recently, the Data Collection Advisory Panel – and the GMFMC ignored all the Southeast For-Hire Integrated Electronic Reporting program recommendations from the panel. This is representative of his experience over the years: people will participate in GMFMC meetings, but the GMFMC ignores them, so he has lost faith in the process. *Julian* said that in the U.S. Caribbean region, fishermen are significantly more involved in the scientific and management processes now than they used to be 15 years ago. He feels that the scientists on the CFMC Scientific & Statistical Committee do listen, and it is a positive experience for the fishermen. The response categories of strongly agree or agree do reflect the situation in the U.S. Caribbean because they have the right team whose members are willing to listen. *Eric Schmidt* added that his comments were more geared toward management; he has a good

working relationship with the scientific community and finds scientists to be more approachable than managers. The GMFMC is the most unbalanced he has ever witnessed. *Marcos* said that the fishermen do not have access to the scientific data being produced. If science were produced based on questions from fishermen, in addition to questions that serve stock assessments and management, the processes would be improved. *Charlie Phillips* noted that the degree of agreement or disagreement in the above question may be species-specific; for instance, fishermen probably would not agree as strongly that they are able to influence decisions regarding red snapper (especially on the east coast). Greater amberjack, on the other hand, probably would produce high percentages and counts in the strongly agree and agree categories. *Charlie Phillips* thinks that managers do listen, but oftentimes, the outcome that stakeholders want is not an option. *Shane* offered yet another perspective; he has much more confidence in the federal process compared to the Texas state process because it is difficult to understand how Texas management works.

On a scale from 1 to 5, with 1 being “Not Familiar at All” and 5 being “Extremely Familiar,” how familiar are you with…?

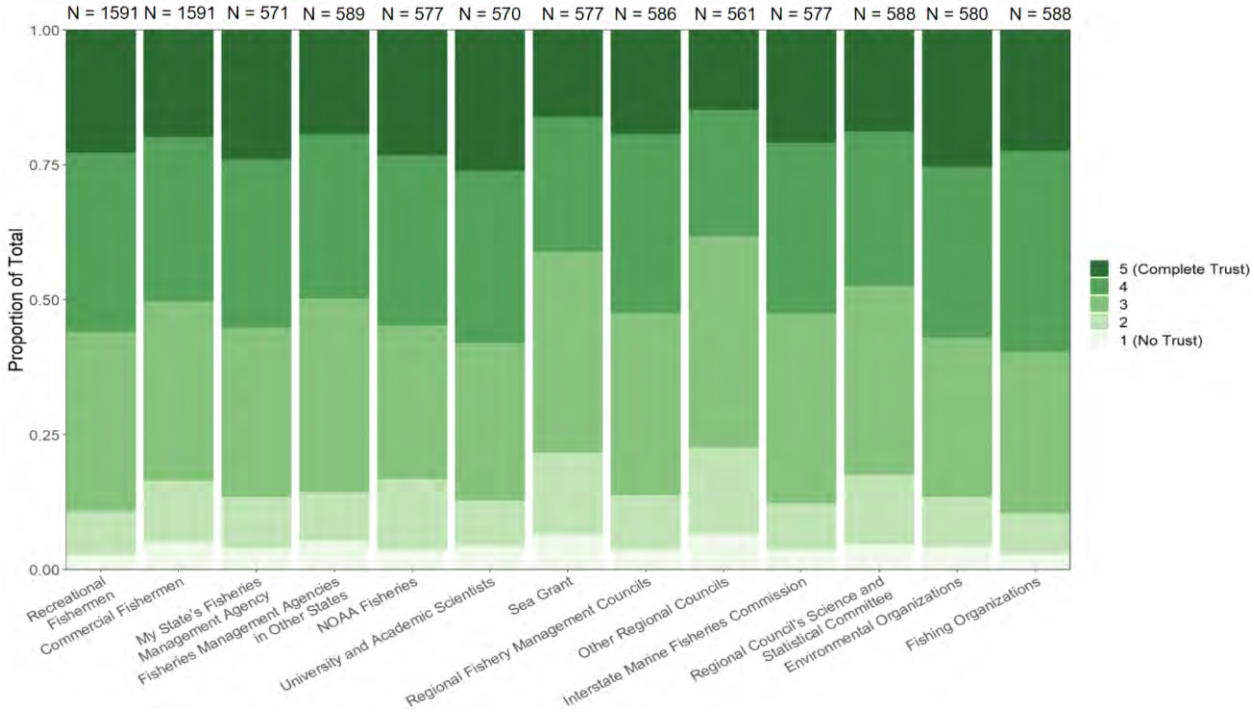


The groups people were least familiar with were “Sea Grant,” “Other Regional Councils” (i.e., Councils in other areas), and “Regional Council’s Science and Statistical Committee.” *Marcus* explained that we want to share information with stakeholders in the way that they most easily understand it. We were surprised to see that Sea Grant was so unfamiliar to respondents.

Chris Blankenship asked about the numbers – did only one-third of respondents answer this question? *Sarah* explained that each respondent was shown a random selection of four of the organizations.

Shane said that these results make sense; people should be most familiar with their own state's agency. However, he was surprised that more people are not familiar with Sea Grant, but maybe non-coastal people responded this way because they do not interact with Sea Grant. It makes sense that people would not be as familiar with organizations outside of their area. *Steven* mentioned that we have been working to unpack the unfamiliarity with Sea Grant. The lack of specificity with this label (e.g., Sea Grant vs. Florida Sea Grant) may have influenced responses, and we may do this differently in the future. *Charlie Phillips* said that it may be because Sea Grant is not part of the decision-making process. *Laura Picariello* made the point that Sea Grant personnel can be known by their Extension or university affiliation rather than Sea Grant affiliation. *Shane* noted that he was unfamiliar with Sea Grant 5 years ago except for their work with shrimpers; in the past 5 years, this has changed drastically, and lots of people seem to be familiar with Sea Grant now in Texas. *Kindra Arnesen* asked about the breakdown of respondents between the commercial vs. recreational sectors. *Marcus* reiterated that it is assumed that most of these respondents are from the recreational sector. *Kindra* stated that in her mind, Sea Grant is associated with the commercial sector; since this survey was geared toward the recreational sector, we may have missed the Sea Grant-related input from the commercial sector. *Brenda Ballard* noted that people located on the coast, near Sea Grant hubs, are more likely to know about Sea Grant than those who live inland.

On a scale from 1 to 5, with 1 being "No Trust" and 5 being "Complete Trust," how much do you trust…?

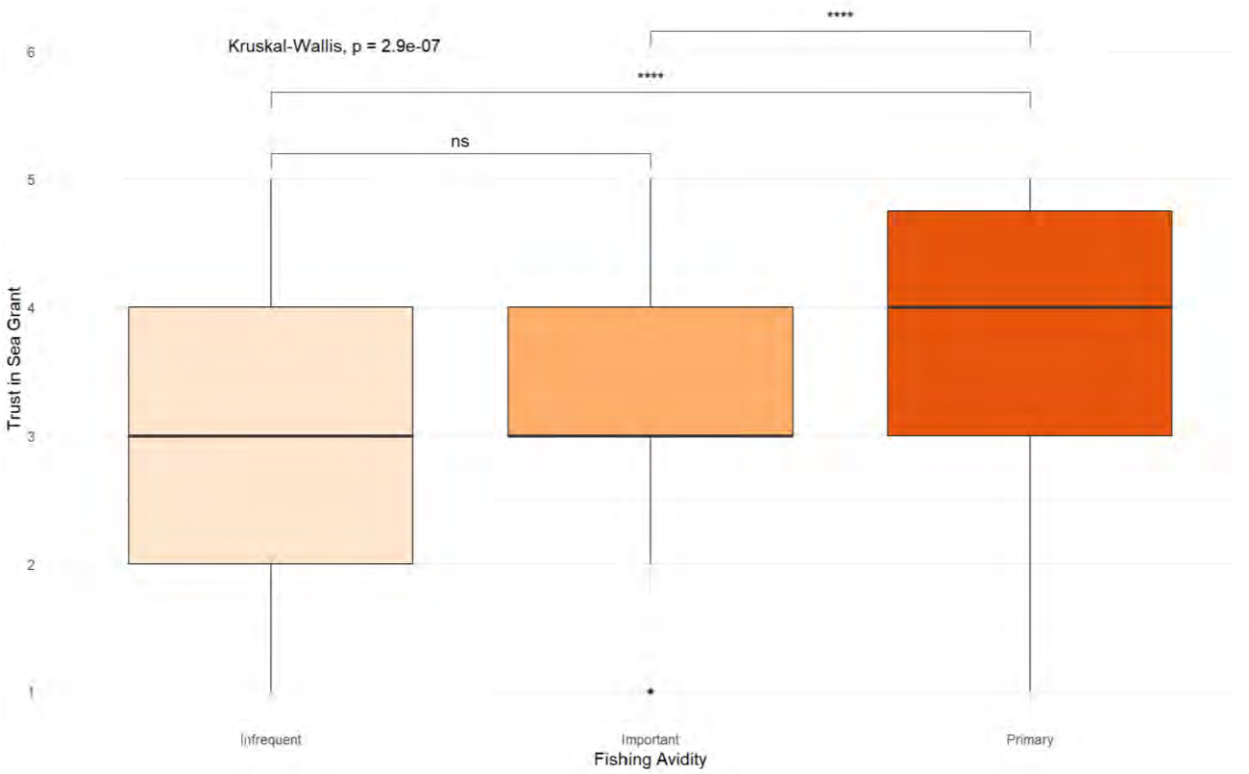


The respondents were shown the same four organizations as in the previous question. Additionally, all respondents were asked how much they trust commercial and recreational fishermen. Regardless of familiarity, respondents had a moderate level of trust. "Sea Grant" has the lowest level of trust, along with "Other Regional Councils" and "Regional Council's Science

and Statistical Committee."

Marcos said that in Puerto Rico, most Sea Grant projects are also affiliated with universities, or even with the CFMC. He thinks that in the U.S. Caribbean, Sea Grant has an elevated level of trust. *Marcus* added that this relates back to *Laura*'s comment on the past question. *Chris Barlow* stated that from his experience, he does not believe that recreational anglers know much about fisheries management or scientific processes for state or federal fisheries. *Eric Schmidt* agrees; fishermen will complain but will not attend GMFMC meetings.

Steven and *Sarah* conducted additional analyses to investigate the Sea Grant trust results.



Sarah explained that they split trust in Sea Grant by fishing avidity. Respondents who were more avid, or specialized in fishing, had a higher trust in Sea Grant. *Steven* said that this confirms some of the ideas from our earlier discussion. Regarding the previous question focused on influencing fisheries managers, when we look at that question with respect to avidity or age, we get the opposite result – as people become more engaged in the fishery, they perceive that they can influence the fishery to a lesser degree.

Nick Haddad asked if familiarity versus trust will be parsed out, since people cannot trust something that they are not familiar with at all. *Sarah* and *Steven* responded that familiarity and trust are moderately correlated (closely related) for most of the organizations on our list, meaning that the more familiar organizations tend to also be the most trusted ones.

Kendall's rank correlation	**τ**
My State's Fisheries Management Agency***	0.350
Other States' Fisheries Management Agencies***	0.380
NOAA Fisheries***	0.405
University and Academic Scientists***	0.265
Sea Grant***	0.371
My Regional Fishery Management Council***	0.400
Other Regions' Fishery Management Councils***	0.355
Interstate Marine Fisheries Commission***	0.350
My Regional Council's Science and Statistical Committee***	0.353
Environmental Organizations***	0.311
Fishing Organizations***	0.298

Notably, we did not present an option of "I'm not familiar with this" in the familiarity question. We should consider adding this in the next survey. We could also investigate these two familiarity and trust questions paired within each individual response.

Marcos added that it might have been good to ask which of the organizations people distrust. *Steven* explained that we have been equating No Trust with distrust; we could adjust this series of questions. *Laura* added that it would be interesting to understand the motivation for distrust; is it a distrust or mistrust in information or actions, decision-making, or outcomes? *Steven* asked, in the context of this whole project (stakeholder perceptions and attitudes of reef fish management), how important does the group think trust is? Should we be focusing more on trust (e.g., procedural trust, rational trust, affinity trust)? *Shane* mentioned that he trusts his state agency to do what benefits the recreational sector, but not what benefits the commercial sector. *Marcos* said that we should identify the key areas where we need trust and prioritize asking questions about those areas.

Amy asked if the respondents were continually reminded of the survey's focus on reef fish.

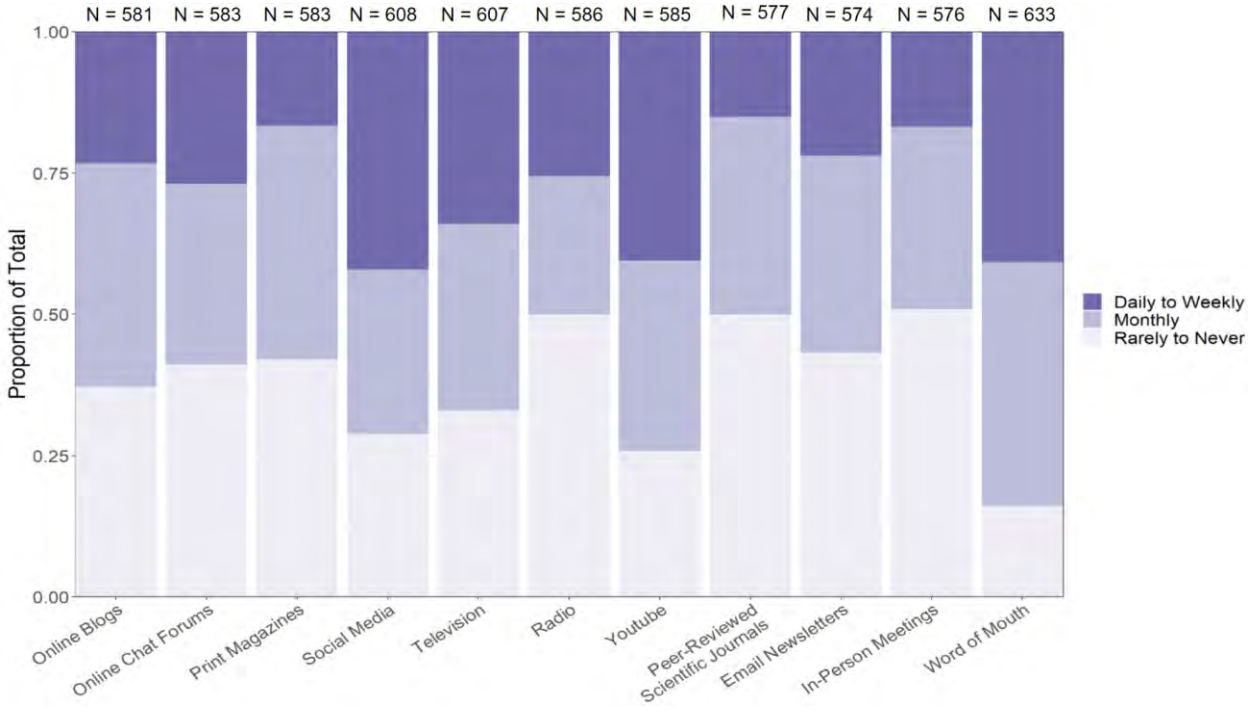
Sarah replied that these questions were general, so everyone (even if they were not reef fish fishermen) were asked these questions, but she has since filtered the responses to only show data from the reef fish fishermen.

Julian stated that, from the commercial standpoint, they try to build trust with scientists and managers. When that trust is broken, it can never be regained. For example, if there is a study on spawning aggregations, and the fishermen share their knowledge, and emergency closures are suddenly implemented, the fishermen lose trust in the managers because the information the fishermen have provided has been used against them. Understanding different levels of trust is very important. *Charlie Phillips* agreed that trust is very important; when managers set regulations that fishery stakeholders do not agree with, the stakeholders are less likely to follow the regulations. You need stakeholder buy-in for high compliance.

Scott Bannon asked about scale; since this survey encompassed such a broad geographic area, could details of responses be further broken down? From a management perspective, it is difficult to reach all sectors. One of the most significant problems is people not coming to the table. The thoughts being shared today are important. *Scott* plans to bring the trust issue back to his partners to seek ways to improve. *Marcus* replied that we are interested in satisfaction, and whether satisfaction is ephemeral or long-term.

Sarah resumed the presentation to share one more set of results from the survey.

For information on reef fish fisheries, how often do you get information from each of the following sources?



Participants were randomly shown four sources, along with “Other (Please briefly describe).”

People most frequently used Social Media, YouTube, and Word of Mouth to gain information. Some other sources mentioned included: state fisheries agency websites, fisheries regulation books, newspapers, Google searches, books, podcasts, and billboards. *Steven* said there is some measurement error here; there is zero chance that 50% of people are reading peer-reviewed scientific journals monthly. We asked some follow-up questions, and it turns out that these people were thinking of National Geographic, Scientific American, etc. We will probably skip this question next time because we are not measuring what we thought we were measuring. *Marcos* suggested that we not eliminate the question; rather, we should change the way we ask it. For example, we could add the word "academic" or "academia" to the "Peer-Reviewed Scientific Journals" phrase, or call it "Scientific-Based Publications," and make a new category for "National Geographic Articles or Similar." *Steven* agreed; much of Sea Grant's work involves translating the content of peer-reviewed publications into other forms; how science is communicated can be very important. *Marcus* added that perhaps it is not important to differentiate between peer-reviewed publications and science magazines like National Geographic.

Shane said that it is interesting that there are such high responses in each category for Social Media and YouTube. *Marcus* replied that it is helpful for us to know this when deciding how and where to disseminate information.

Charlie Phillips asked if we thought about bias among sources; for example, if you read a sportfishing magazine, it will be somewhat biased. He prefers to obtain information from fishery bulletins.

Marcos shared that, in his experience, YouTube and social media are immensely important now – not just for marketing, but as learning tools. They are helping new fishermen learn things very quickly; before the days of YouTube and Social Media, it took much longer to learn things. Having information "right there" will impact fisheries.

Shane mentioned that fishermen like himself who participate in the management process (for example, the people in this room) have greater access to reef fish fishery information than the people who took the survey.

Julian said that in the U.S. Virgin Islands, especially in St. Thomas and St. John, word of mouth is powerful. There are few fishermen who want to get involved in the management process. They would rather skip the meetings, then chat with *Julian* at the market afterward to discuss what happened. The younger generation uses social media and websites, but commercial fishermen want to be handed physical documents or have face-to-face discussions.

This marked the end of the presentation. *Marcus* reminded the fishery representatives that this was a survey that encompassed the U.S. GoM, U.S. South Atlantic, and to a much lesser extent, the U.S. Caribbean (had issues recruiting participants from the U.S. Caribbean). We intend to replicate the survey each year to see how things change over time and gauge the reasons behind the changes. Your feedback will shape next year's survey.

Shane returned to the topic of social media. He would like to know if people are absorbing the original information from the posts, or information from the comments. Most of the time, they are gaining opinions, not information and facts, from the comments. *Eric Schmidt* agrees. The Facebook page for the GMFMC has about a dozen usual suspects who consistently argue with every post, and the comments can get vitriolic and hateful. Social media can be beneficial but has a dark side. *Marcus* agrees; the GMFMC does a great job of handling those negative comments.

Amy asked if the team is looking for feedback on how to survey charter-for-hire and commercial fishermen and engage with U.S. Caribbean stakeholders. *Steven* clarified that, with respect to survey content, there are two items where we are looking for feedback. The first is, do we want or need to repeat every existing question from one year to the next, and what new questions do we want to add in future years?

Eric Schmidt asked if we plan to aggregate responses or if we will break them out by sector. *Steven* replied that we are seeking advice on this. *Eric Schmidt* said that the responses should be separated by sector because the responses would likely differ by sector. *Steven* said that we would need to know specifically how to separate the groups – fishing characteristics, geography, etc.

Steven said that the other area where we are looking for feedback is survey implementation. We know we need a more direct approach for the charter-for-hire and commercial sectors; we would like to have some discussion about pathways to do this in a representative way. *Marcus* said that it sounds like things are working well in the U.S. Caribbean regarding the management process and interactions with fishermen; if we can incorporate these aspects into the U.S. GoM and U.S. South Atlantic regions' approaches, that could be useful. *Marcos* said that the U.S. Caribbean is lacking long-term assistance and studies. Over the last 5 years, the U.S. Caribbean has suffered from major changes due to hurricanes, COVID-19, earthquakes, etc. Phone surveys and personal interviews may be good tools for surveying fishermen in the U.S. Caribbean. *Steven* explained that we budgeted for three Qualtrics surveys. We have enough time and effort from students and staff to expand the surveys, and all the Sea Grant programs involved have time and effort to assist with distribution; we just need to figure out how to do it. Phone surveys are considerably more expensive than online or in-person, so we did not include those in the budget. *Marcos* and *Julian* can assist with surveys but want and need fishing associations and students to help distribute the survey and recruit participants to respond.

Marcus said that we have had some good discussion about surveying other sectors besides recreational; we want to spend the afternoon focusing on specific reef fish-related research needs identified by fishery representatives from their respective regions. Between now and then, we will share a few other results from other surveys we have done to give more context about the trends we are seeing.

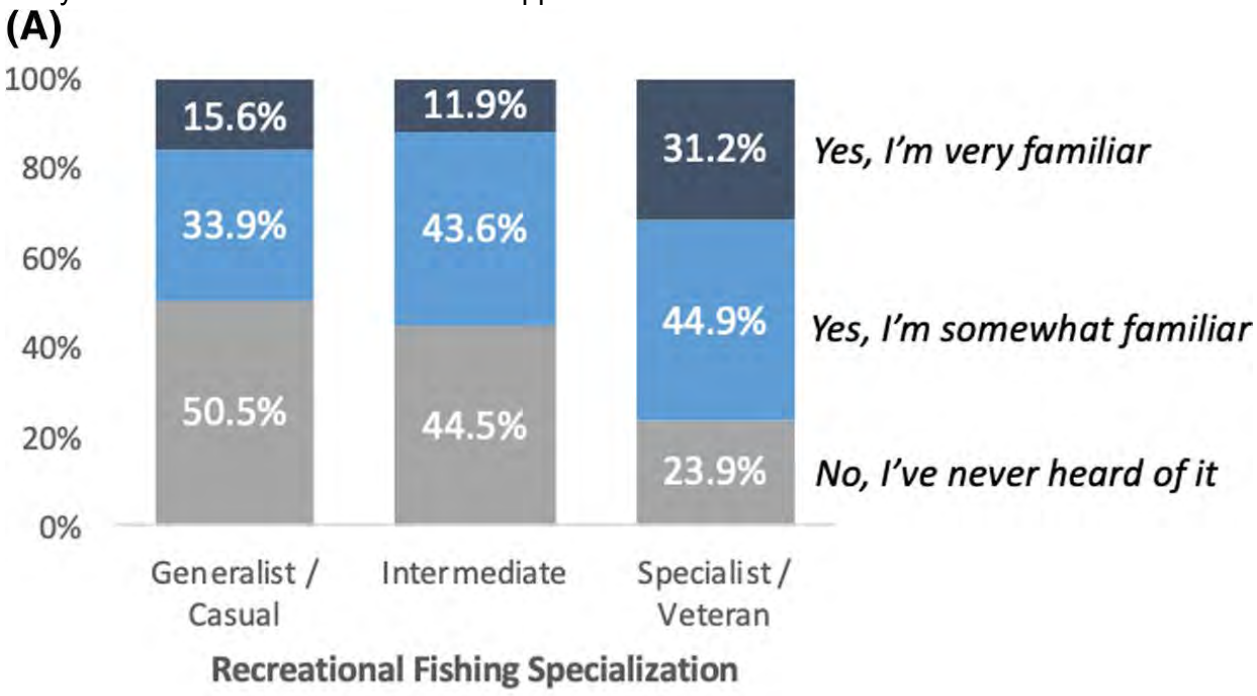
Nick mentioned the topic of social media again and mentioned that people often say they get

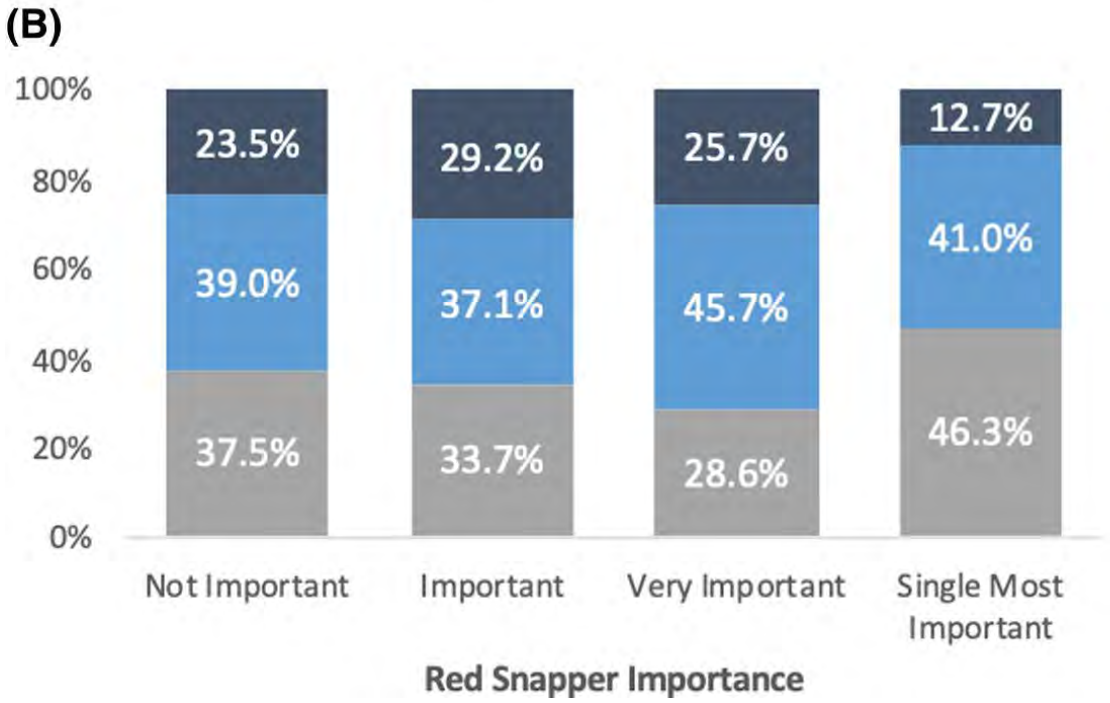
their information from social media – but what does that really mean or tell us? Facebook can be used as word of mouth and as forums. Are they posting, reading comments, or using private groups within the platform? In the GoM, some fishing groups (public and private) have over 200,000 fishermen. It is important to dig deeper into how fishermen are using social media platforms.

Kindra provided some comments about the morning discussion. Regarding separating sectors in the survey results, she agrees with *Eric Schmidt*. Surveys tend to influence regulations and quota splits, so it is vitally important that the sectors are separated in the survey results, especially considering that the commercial and charter-for-hire sectors will generally have more information and more experience than the recreational fishermen. She believes it will be easier to get information from the commercial sector than the charter-for-hire sector because the former has fewer participants.

Steven then showed some results from the Great Red Snapper Count survey conducted in 2019.

Are you familiar with the Great Red Snapper Count?

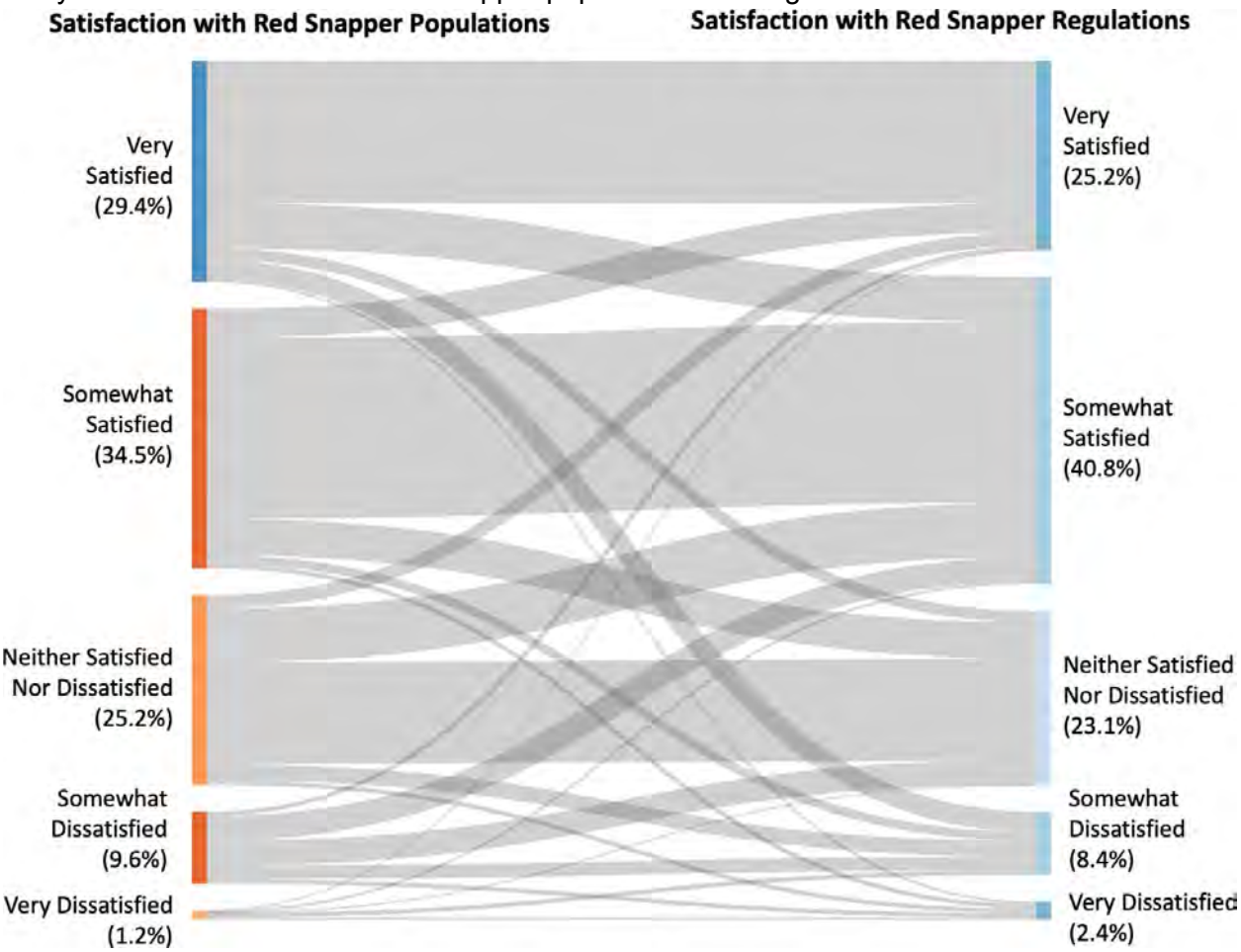




As folks were more avid about, or engaged with, recreational fishing, they were more familiar with the Great Red Snapper Count. A lot of folks were at least somewhat familiar. We see similar trends based on red snapper importance, with one big difference: among respondents who said that red snapper was their single most important species, the familiarity shrinks. This is explained by the phenomenon we discussed earlier – many of these people are the "fish once

per year" type of folks. They do not go fishing often, but when they do, they want to catch a red snapper.

Are you satisfied with current red snapper populations and regulations?



The takeaway was that satisfaction with populations and regulations was high. Timing was a factor here; the survey was conducted during the Great Red Snapper Count, before any of the results were released. It was also after the transition to more state-based management.

There have been great points about surveying the different sectors and making sure those comparisons are clear. It is also important to consider that there is a difference between doing a systematic survey and public comments. The levels of satisfaction shown in the survey results do not match those from public comments; the latter are usually considerably more negative. In this survey, we did not really look into what factors influence satisfaction (e.g., fish size, catch rate, number of fishing days, etc.).

With respect to satisfaction with regulations, *Kristina Alexander* asked if we were referring to management in federal waters or state regulations. *Steven* replied that we were simply referring to regulations in general. However, we could actually tease apart their answers to this question based on their answers to the trust question (trust in state agencies vs. state agencies) and

other questions.

Shane mentioned that it is interesting to see how many people moved two or more levels (e.g., very satisfied with populations but somewhat dissatisfied with regulations). *Steven* replied that we could try to tease that apart with additional analyses.

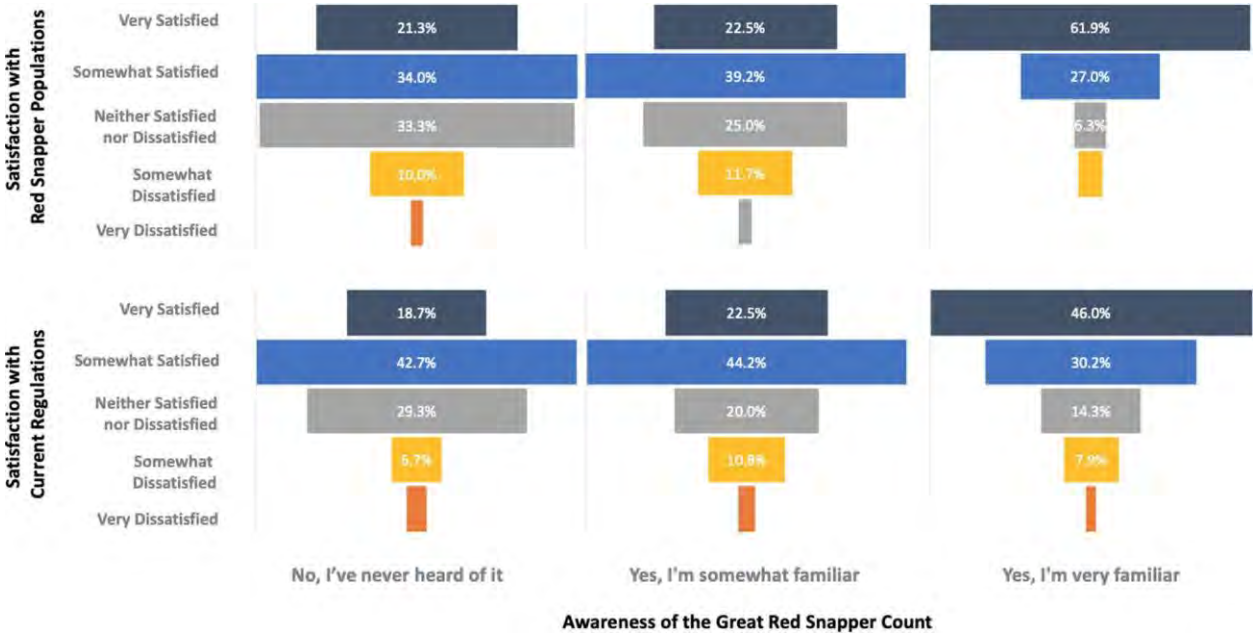
Charlie Phillips stated that fishermen had high expectations regarding the Great Red Snapper Count, but the fishermen did not receive the higher allocations they had hoped for, which has caused disconnect and dissatisfaction. *Marcus* replied that we have been directed to provide an explanation of how the Great Red Snapper Count data are being used; NOAA Fisheries is using those data, but not in a linear way that is easy to interpret. As Extension folks, that is our job. With the Great Red Snapper Count, that was one of our shortcomings. We did not foresee that need; consequently, we are very aware of it for the Great(er) Amberjack Count.

Amy added that she is glad we are talking about managing stakeholder expectations and asked if we could tease it out by looking into satisfaction by type of angler (novice vs. expert). *Steven* said that we have done those analyses; he can show them after lunch.

Eric Schmidt noted that there was a GMFMC meeting last month in Corpus Christi; during public testimony, there were about 35-40 commercial and charter-for-hire fishermen who testified that they did not want an increase in the red snapper quota because they are happy with the way it is now. *Eric Schmidt* thinks the season was a little too long (“red snapper fatigue”) and would rather have it split into two different time periods. In the northern GoM, there is localized depletion, so they did not get to use the whole season. The GMFMC voted to increase the quota anyway. This makes people jaded about the process.

Marcos asked if the survey prevented multiple responses from the same person. *Steven* replied that for the Great Red Snapper Count survey, Qualtrics Panels surveyed 1,000 people (200 per GoM state) and checked IP addresses to ensure no duplicate responses. There was no additional distribution mechanism (e.g., email-based distribution to fishing organizations). This survey, like the Reef Fish survey, leaned toward the novice side. *Marcos* suggested that we add text to the survey that explains the purpose of the survey (no promises, etc.) to avoid creating false expectations. *Steven* replied that since these surveys were conducted through our universities, they had to go through the Institutional Review Board. We had to describe the risks and benefits of taking the survey, and we had to be very clear that there were no benefits. *Marcos* clarified that the fishermen probably do not read or remember it; what he is recommending is a shorter phrase addressing the disconnect between fishermen and managers on every page of the survey. We should also create a QR code system or something to allow people to have access to all the “count” projects that apply to them; this could also help bridge the disconnect. *Marcus* agreed and noted that one of the intentions of this project is to aggregate all the findings of these single-species assessments into one place. We are also dedicated to disseminating this information in a way that is most convenient to the people who want or need it.

In addition to asking general questions about satisfaction, the Great Red Snapper Count survey also helped tease those responses apart in greater detail.

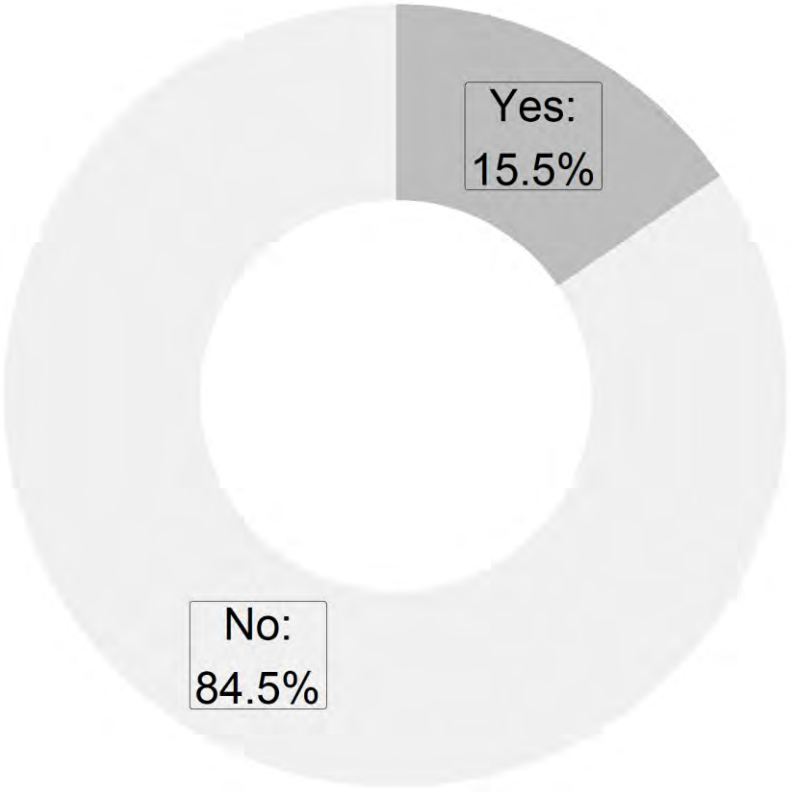


For folks who said that they had never heard of the Great Red Snapper Count, we took them down a separate path where they were directed to one of four YouTube videos about various aspects or methods of the Great Red Snapper Count, along with a control (no video). For those who were unaware, being introduced to materials about the Great Red Snapper Count increased their satisfaction. However, satisfaction varied by video; videos that were more specific had the most positive impact on satisfaction. The simpler overview video had less of a positive impact. This indicates that people want to hear about the details. We could continue to do this in the future to optimize outreach materials. *Shane* said that if stakeholders can actually see the science, that elevates their trust in the process. He is interested to see the Great(er) Amberjack Count survey results. *Steven* made the point that although we know that the respondents clicked on the video, we did not test if they had actually watched it and understood its main message. So, that was an assumption that we made; however, the positive effect in the direction we hypothesized indicates that it was a safe assumption.

Marcos asked if the survey contained any questions about the effects of COVID-19 and other stochastic events on fishing effort. *Steven* replied that we have asked effort questions, but he is not sure if we have included questions specific to COVID-19. *Marcos* said that keeping these questions in mind from the beginning could be very helpful to inform about effort changes.

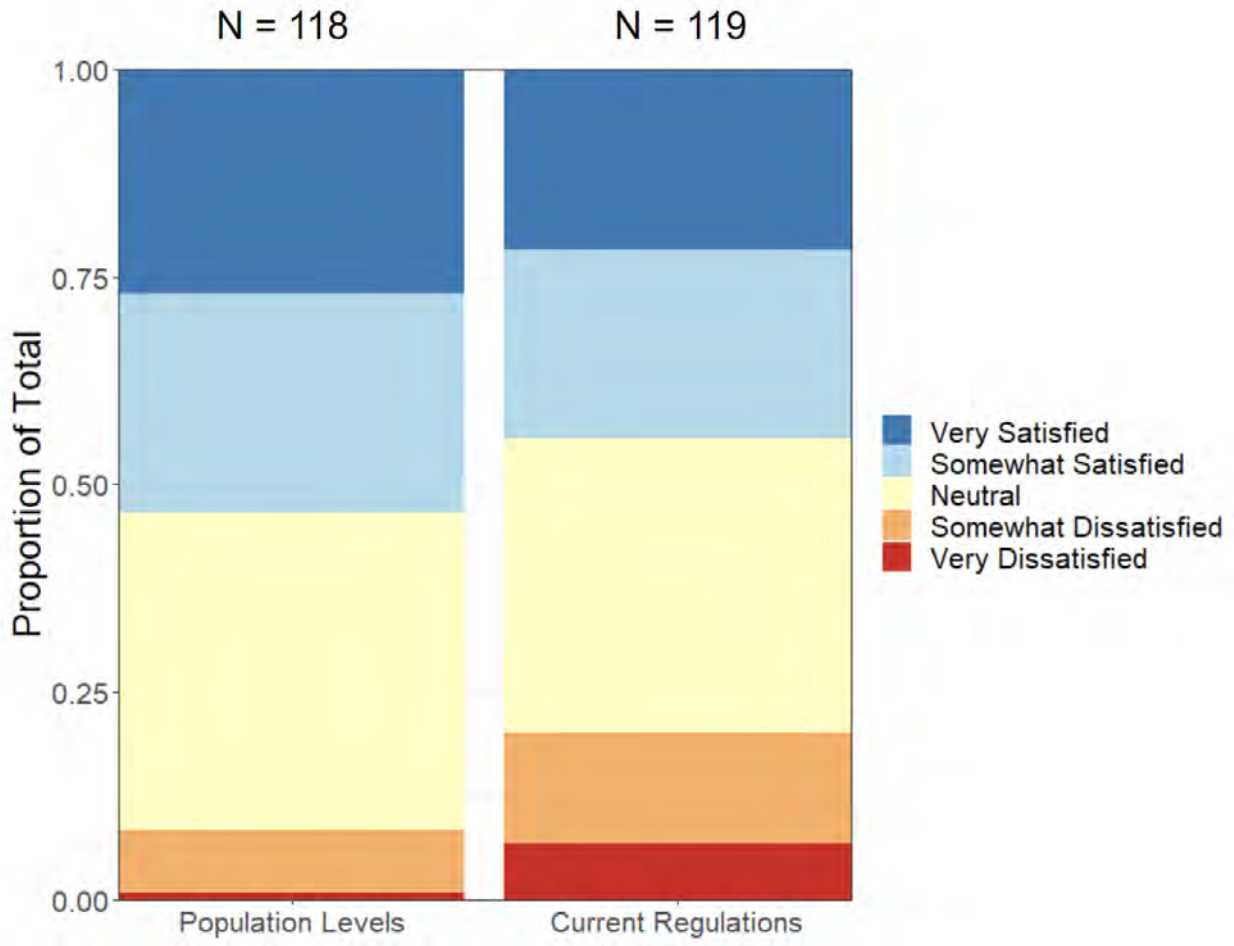
Sarah then showed some preliminary results from the Great(er) Amberjack Count survey. This was an intercept survey conducted at the Alabama Deep Sea Fishing Rodeo in July 2022. For this survey, we spoke with fishermen directly, and the survey was a 1-page paper survey that took 7-10 minutes to complete. The three questions below were only asked of fishermen who had previously fished for greater amberjack.

Have you heard of the Great(er) Amberjack Count?



An overwhelming majority said no. This project was just getting started, so it will be interesting to see if this awareness changes over time. *Marcus* clarified that if most people have not heard about this, that is an indication that we are not doing our jobs well. We want to understand if the effort we are putting forth to share information is working; if it is not, we need to try something different.

How would you describe your overall level of satisfaction with…
… greater amberjack population levels?
… current fishing regulations for greater amberjack?



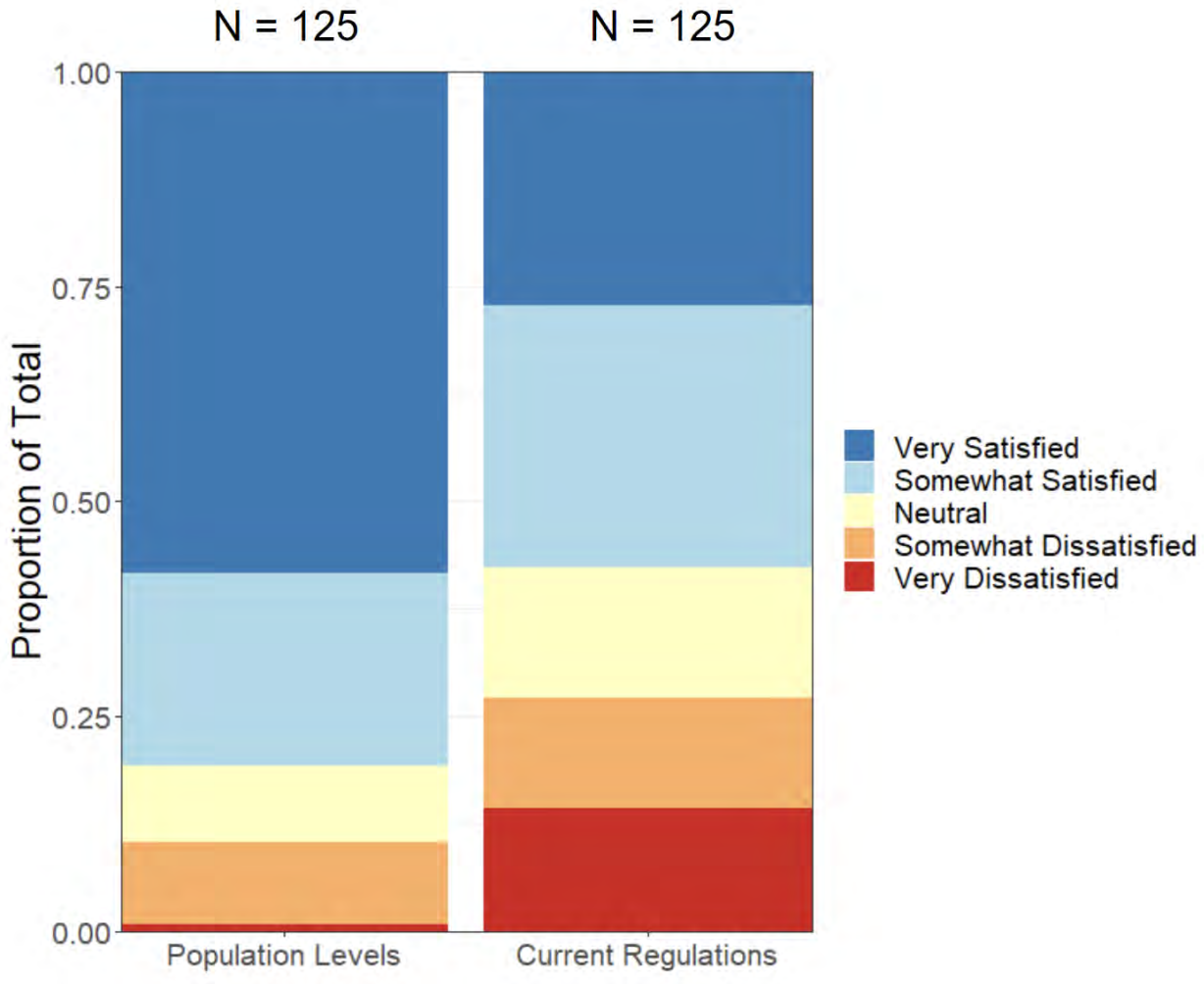
A lot of people said “Neutral,” but there was more dissatisfaction with regulations than populations.

Chris Barlow asked if people are truly thinking about population levels, or if they are confusing that with what they are actually catching; these are two totally different things. *Steven* replied that the survey asked other questions to tease this out (“availability of catch”).

Charlie Phillips asked why the Great(er) Amberjack Count was mandated, especially if the result will be a decrease in quotas. On the east coast, they are expecting to get more fish. *Shane* replied that greater amberjack is a federal waters species. Regardless of the health of the population, the dissatisfaction in management is due to constant changes in management. The size limit, bag limit, and season length have changed at each assessment; they are highly unpredictable. People are unhappy when things are always changing. Size and abundance are quite variable across the GoM. *Chris Blankenship*, who was part of the group working on the Great Red Snapper Count, clarified that the purpose of these studies is to assess population

size to better inform management – not to change quotas. If the Great(er) Amberjack Count shows that the population is in trouble, this is very important for managers to know. We are seeking stability rather than changes in quotas. *Charlie Phillips* said that this is desperately needed; the fishermen need stability. Even if they get less fish, if regulations are stable, fishermen are likely to be happier. *Eric Schmidt* said that greater amberjack has been overfished for 25 years, and has gone through a litany of regulation changes – size limits, trip limits, seasons. Next year, it will be open for 1 or 2 months. This is an example of how managers need to think about how they are doing things. The same bag of tricks is not working for this species. There is a lot of variability in abundance across the GoM. He can understand why people are dissatisfied.

How would you describe your overall level of satisfaction with…
… red snapper population levels?
… current fishing regulations for red snapper?

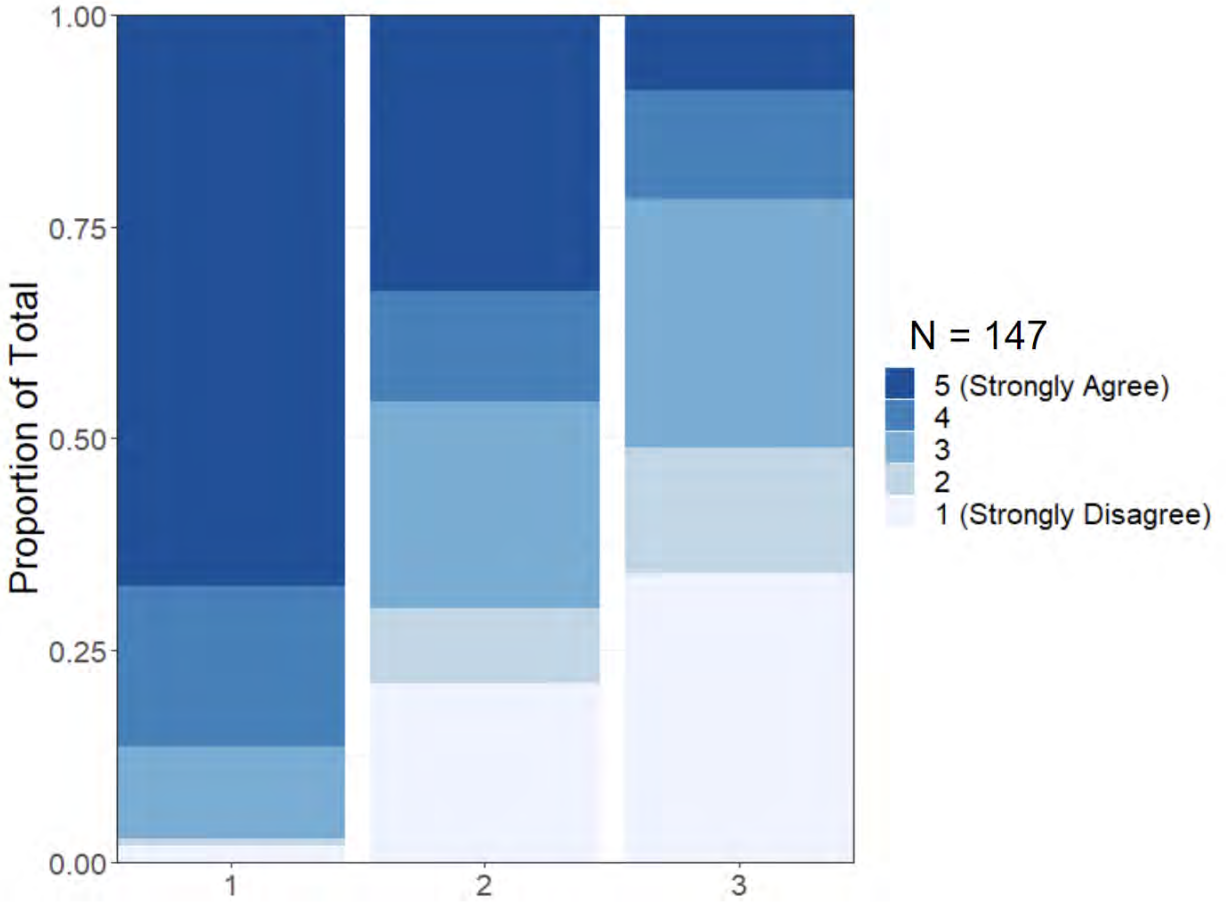


We see a big disparity between the two, with many people satisfied with population levels but dissatisfied with regulations. Most respondents were from Alabama, but the survey was open to anyone at the Alabama Deep Sea Fishing Rodeo. *Shane* said that it would be interesting to see

how this changes over time, and what the sources of dissatisfaction are. He has a hard time believing that people are dissatisfied with management of red snapper by the states. *Scott* replied that this dissatisfaction with regulations is probably related to the 2-fish limit and 4-day weekends. *Jason DeLaCruz* said that the group we surveyed in this case consists of very avid fishermen; these people are often mad and looking for a scapegoat, which could have impacted our results.

How much do you agree with the following statements?

1. I am confident that I can adapt to changes if necessary.
2. I often talk to other fishers about how they handle or prepare for and handle bad fishing years.
3. I feel that I am able to influence the decisions of fisheries managers.



Many fishermen felt that they could adapt to changes, but they did not feel like they could influence management. *Steven* said that this gets at *Jason DeLaCruz*'s point – that this is a more avid group of anglers; as they become more avid, they feel that they can influence management to a lesser extent. *Jason DeLaCruz* said that they may not individually effect change, but their advocacy groups effect change at all levels. *Sarah* mentioned that they did interview some charter-for-hire captains. *Shane* said that it is hard to connect numbers 1 and 3; if you are confident that you can adapt to changes if necessary, how are you not able to

influence the decisions of managers? This is not true. It has happened, and it has happened well. *Steven* explained that the first question is general on purpose because of all the different types of risks or stressors that fishermen face. One example of something that fishermen can adapt to is weather (e.g., windy weather). Fishermen are confident that they can do that type of adapting. When you narrow down the subject to focus on management or regulatory change, confidence plummets. *Shane* mentioned that it could also be interpreted at an individual level as, “I can’t change management to what I think it should be.”

Afternoon Session

Marcus began the afternoon session by reminding the fishery representatives of our purpose. We used a survey to determine reef fishery stakeholders’ priorities and satisfaction levels, and we spent this morning sharing those results. *Marcus* noted that we realize there are gaps in our understanding that can be filled by discussion this afternoon. He asked, what are the primary issues facing your reef fish fisheries? He mentioned that during the morning session, we heard about unmet or unrealistic expectations and that stakeholder expectations should be better defined with respect to large-scale, independent single-species assessments. He requested that the fishery representatives weigh in on the best way forward with respect to sharing the results from those assessments.

Marcos said that adding reminders to the survey forms is important, and we should also consider announcements (e.g., social media content) to increase engagement.

Marcus asked the fishery representatives from the GoM about the Great Red Snapper Count – did it meet expectations, and do you see value in doing these types of assessments in the future? *Brenda* said that the biggest factor is communication. She feels that communication is lacking as far as getting information to the people who end up taking the surveys. Information is sent via email lists or publications, but it is not reaching all the fishermen. It is important to try to get information about the Great Red Snapper Count and other projects out to the public. That is key in ensuring that the data that we receive are more accurate. It is also critical to know your audience and engage with all sectors because each sector sees things differently. Being more specific with respect to survey questions will yield a better analysis of the data, which will allow for more, and better, advice from each sector. *Shane* stated that different areas have differences between structures (e.g., oil rigs) and species (e.g., greater amberjack), and these factors need to be taken into consideration.

Charlie Phillips asked, how did you decide to study red snapper and greater amberjack – was it because NOAA’s Southeast Fisheries Science Center (SEFSC) requested these studies to fill data gaps and ensure everyone is on the same page or in the same book? He also asked, will you conduct more of these studies, and will you continue to choose study species based on information from stakeholders? If so, how will you hear that information from the stakeholders? *Marcus* replied that the widespread, uniform dissatisfaction from fishermen (“what we see on the water is not matching the assessment”) prompted the Great Red Snapper Count. He has heard

people from NOAA Fisheries saying that absolute abundance estimates for individual stocks, with low uncertainty, are a very valuable tool. He pointed out that teams of scientists, like the Great Red Snapper Count team, are able to accomplish something that NOAA Fisheries cannot due to limited resources. There is inherent value in these assessments. He would like to know, what is the value of these assessments to you (and the people in your respective sectors)? Also, how are we doing with respect to sharing the results from these projects? Lastly, to what extent does your sector wish to be involved in this process? We included more LEK in the Great(er) Amberjack Count compared to the Great Red Snapper Count.

Charlie Phillips said that when he was on the SAFMC, they were always playing catch-up on assessments and trying to get enough of them done. They were averaging 5 to 7 years between assessments, and for some species, that is way too long. If they could get some funds for assessments, that would free up people's time at the SEFSC, which could be helpful. Also, incorporating LEK is beneficial in two ways: it makes the process more efficient, and builds trust in scientists and managers due to involvement. *Shane* replied that the southeast region has the most fish and greatest number of fisheries to manage but the least amount of resources. The SEFSC will never have enough resources to handle everything, but the single-species absolute abundance studies do not fulfill SEFSC needs.

Eric Schmidt asked, where do we go from here? Now that we have completed the Great Red Snapper Count, will there be a follow-up study in 5 or 10 years, or is it a one-time deal? *Marcus* responded that there are no plans to do this in perpetuity; it was meant to be a one-time study. However, he would not be surprised if the decision-makers see enough value in it to repeat it in 5 or 10 years. The SEFSC personnel would ultimately envision periodical point estimates of absolute abundance. The data from these abundance estimates are meant to serve as a complement to the data that NOAA Fisheries already collects to supplement the SEFSC's resources. *Marcos* said that there is a professor at the University of Puerto Rico at Mayagüez, Juan J. Cruz Motta, who is working on fish species assemblages with landings and Southeast Area Monitoring and Assessment Program data. This is helping us to interpret why the data look the way they do. This is even more valuable when done periodically. *Julian* stated that in the U.S. Virgin Islands, now that they have transitioned to island-based FMPs, they need to determine the most important stock(s) in those areas (that the managers and fishermen are both interested in) and do surveys like the Great Red Snapper Count and Great(er) Amberjack Count surveys. They have 109 commercial fishermen; it is a very small fishery. They have about 300 recreational fishermen. The best way to reach these fishermen would be a hands-on survey rather than a digital or email survey. It would be optimal to work through the different associations and groups (e.g., game fishing club that represents the sportfishermen). The key is trust. To obtain the information you need, the fishermen must trust you enough to complete the survey. They are very skeptical of taking surveys.

Shane asked if there were funds allocated for using the Great Red Snapper Count survey data for the Great(er) Amberjack Count. *Marcus* responded that this was part of the plan; the archived video has some utility, and there is a cost-savings associated with this. If planned accordingly, the single-species assessments could dovetail into each other; there is a synergy

and an efficiency that could be realized. *Shane* also asked about samples (e.g., tissue samples) and the potential for starting a biological catalog; by using these and acoustic tags, we could learn more about greater amberjack habitat and depth use by season. *Marcus* replied that archived samples exist for both projects (e.g., fin clips for genetics); the project teams have been diligent about taking samples when hands are on the fish. Also, given that greater amberjack is a high-relief habitat species, we need to know more about their connectivity, movements, and migrations. To accomplish this, we are using acoustic telemetry; there are hundreds of acoustic tags being deployed on greater amberjack, and we are taking advantage of cooperative acoustic networks that span from Texas to the Carolinas. The Great(er) Amberjack Count involves a large group of people who are focused on one species; we stand to learn a tremendous amount about the species, especially considering that we knew considerably less about greater amberjack at the beginning of this project than we did about red snapper at the beginning of that project.

Charlie Phillips asked how far our research (for the Great(er) Amberjack Count) will go, and if we will turn our data over to the SEFSC so that they can run models on stock synthesis or the Beaufort Assessment Model (BAM). On the east coast, there has been a lot of conversation over the years regarding the BAM; they want to run the same model as the GoM. He wanted to know if we will have any input as to which models are run. *Marcus* replied that for the Great Red Snapper Count, all the data and methods went to review; it had to be presented to the Scientific & Statistical Committee (SSC), get vetted and approved, and ultimately be sent on to the GMFMC. When there is a research track assessment (i.e., the new Southeast Data, Assessment, and Review (SEDAR) process we have, like the one for red snapper right now), this assessment allows the flexibility to explore multiple models. The analysts have been asking for a long time about exploring different approaches, but the previous SEDAR structure did not allow for this. The new system, which consists of research track and operational assessments, will enable stock assessment scientists to take a step back and reevaluate the use of different models. *Charlie Phillips* followed up by saying that maybe the best way forward is to run several models and see how closely they align. Considering the factor of stakeholder trust, it is important to cover these bases as best we can.

Marcos added that in the U.S. Caribbean, the *Sargassum* population is a driver of change, and we should coordinate sampling (e.g., fin clips). *Shane* said that the lack of *Sargassum* in Texas has benefitted local tourism, whereas the opposite situation in the U.S. Caribbean has caused a tourism crisis. *Marcus* stated that it is difficult to hear different perspectives on *Sargassum* from different regions. There seems to be a strong linkage between the quantity and quality of *Sargassum* in an area and the health of the fish populations that depend on it (e.g., *Seriola* spp). He asked if *Sargassum* also impacts other species that are not directly associated with *Sargassum*. *Marcos* said that the U.S. Caribbean has experienced changes in target species, bait availability, and water quality (changing pH, dissolved oxygen). *Sargassum* has not just impacted its associated species and larval fishes; it has also impacted conch, octopus, lobster, and other invertebrates. For the past 5 years, he has not seen any little tunny because of poor water quality; this is just one example. He used little tunny as bait for king mackerel; that fishery is over because *Sargassum* changed everything. *Shane* mentioned that the absence of

Sargassum from the Texas portion of the GoM represents the loss of an entire ecosystem (dolphinfish, wahoo, and sea turtles, in addition to *Sargassum*-dependent species); it does not just impact a few species. *Marcos* added that the grouper and snapper spawning aggregations occur in the summer, coinciding with *Sargassum* arrival. Now, there is a "machine" of predation by jacks and other predators of the little fishes associated with *Sargassum*. *Marcus* asked about the timing of the change in *Sargassum* dynamics by region. *Eric Schmidt* only encounters *Sargassum* in the summer, generally beyond 40 fathoms; it does not come close to the beach, likely due to winds and currents. *Shane* said that he used to see large *Sargassum* mats that had to be navigated around, but now, he only sees small, scattered patches measuring a couple of square feet each, probably due to currents. *Marcos* explained that *Sargassum* arrives in the U.S. Caribbean from two sources: cold fronts in the winter (expected, natural) and an influx from the south that started to happen 11 years ago. *Marcos* offered to share *Sargassum*-related data with the Reef Fish team. *Chris Barlow* added that in Mississippi, he usually sees random patches of *Sargassum*, mostly in the summer, but he saw the largest amount he has ever seen in June 2022. There was publicity from Alabama about racks and racks of it on the beach. He had never realized that so many species of fish are associated with *Sargassum*. *Kindra* mentioned that during town hall meetings with Congressman Jared Huffman, they spoke about changes in fisheries and stocks in trouble. The first sector impacted is the commercial sector. The regulations only allow for overfished or undergoing overfishing; they do not allow for habitat loss or environmental disasters (e.g., chemical dispersants), so those factors are not part of the conversation. The focus is, instead, on effort. Habitat loss is vital for our surveys, but many people may not truly understand the question, "Is habitat loss a concern?" We may want to ask about loss of *Sargassum*, loss of estuaries, and loss of land instead.

Marcus followed up by asking about availability of baitfish (e.g., blue runner or "hardtail") by region. *Eric Schmidt* responded that in his area, once the water temperature rises above approximately 80 degrees, he usually sees large schools of round scad or "cigar minnows," threadfin shad or "threadfin," and Spanish sardines. However, in the past few years, bait has been scarce. For the past three summers, there has been a thermocline, which may be impacting the migratory patterns of the baitfish. *Shane* said that in Texas, they mostly have blue runner. For a long time, blue runner was everywhere, but now, they are difficult to find. This is creating issues with greater amberjack fishing because blue runner is the preferred bait. He is attributing this situation to water quality of the Houston and Dallas watersheds. The climate involves lots of droughts and floods, which is probably creating issues with water quality. *Kindra* said that in Louisiana, the blue runner disappeared quickly after the Deepwater Horizon oil spill, but she has seen some return in recent years. In 2017, the high Mississippi River drove bait further offshore (not just blue runner, but also Atlantic croaker and striped mullet) so that they could not be caught with a bait net. Water quality is definitely an issue with respect to bait, and environmental impacts such as chemical spills have long-term effects; if we do not identify all the key factors impacting our fisheries, then we are failing. *Kindra* is seeing a rebound in blue runner off Louisiana compared to 4 years ago, and more juvenile fishes (while shrimping) than in the past 6 to 7 years. Despite this, they are still not where they need to be. *Marcos* brought up that we need to distinguish between population size vs. catchability. He also mentioned that we need to research the baitfish that are "drivers" (e.g., little tunny, blue runner) with respect to

efficiency and catchability. *Shane* mentioned that the menhaden fishery is critically important in Texas, and that its distribution and abundance varies by year. Texas Parks and Wildlife Department (TPWD) has implemented some bait licensing requirements, indicating that baitfish are valuable and need to be protected in some capacity. *Kindra* added that the Louisiana menhaden fishery is a hot topic. The data suggest that menhaden is not overfished or undergoing overfishing. The recreational sector claims there is a gear conflict; more regulations are on the table. *Kindra* does not know if the fishery is healthy or not, but the captains say that the fishery is healthy. All fisheries should be regulated with sustainability in mind. *Julian* said that he has been fishing since 1989, and he sees that in the U.S. Virgin Islands, development and resulting coastal runoff (sediment, oil) drives baitfish away. *Sargassum* and people on jet skis also have an impact. Unfortunately, management does not deal with the people who are creating a lot of the problems. The CFMC is developing an ecosystem-based FMP to deal with some of these issues affecting the fisheries. It is always the fishermen who take the hit. *Kindra* mentioned that she agrees; the only way a fishery can be characterized at present is overfished or undergoing overfishing.

Shane said that when he has issues with water quality and runoff, he can typically fish farther offshore; however, this is not the case in the U.S. Caribbean because there are no more reefs for reef fish fishing. *Jason Stock* said that the West Florida Shelf has been experiencing red tides, hurricanes, and macroalgal blooms, all of which are impacting fishing conditions. *Kristina* added that pollution is not considered as part of the equation when assessing ecological overfishing. This could and should be brought to the Councils' attention; ecological overfishing is already conceived in law, but it has not been interpreted to include factors like pollution or the Dead Zone. *Marcos* said that the way he sees it, ecosystem-based management is opening a door for better fisheries management. Once the models are generated to identify the drivers, he would like to remind the fisheries agencies, on a recurring basis, of the impacts that are being experienced. *Eric Schmidt* mentioned that it was not until recently that the SEDAR process began integrating the impacts of red tide on stock status. Particularly bad red tides occurred in 2004 and after Hurricane Irma (2017). Although pollution is not factored into the Magnuson-Stevens Fishery Management Act (MSA), it does have a direct effect on our fisheries. There should be a provision in the MSA for federal relief because these events are becoming even more routine. *Charlie Phillips* related this conversation to climate change. Currents are changing, which is moving the *Sargassum* around differently. Some of the pollution effects are also tied into climate change. On the east coast, some species are moving north by about 100 miles every 10 years. How do we incorporate these things into management; what does management need to do in these scenarios? This is not easy, but it needs to be done. *Marcus* added that it was a long time before managers included a provision for red tide in the assessment, and that required some clever mathematics and modeling by the SEFSC. That represents a step toward managing a fishery outside of the dynamics of a single species; it is an acknowledgment that red tide impacts assessments, so it must be added in. Everyone here seems to be saying that climate, baitfish, *Sargassum*, and pollution are some of the important factors outside of fishermen overfishing (or not) that affect the abundances of reef fish. *Kristina* mentioned, to *Eric Schmidt*'s point about making red tide a fishery resource disaster, that there is a provision that allows manmade disasters, so that opens the door. However, Congress

typically must appropriate funds, so disaster relief is painfully slow. There is some legislation in the queue to improve the timeline. *Eric Schmidt* said that he has been working with the governor's office; the governor has submitted a plan for disaster relief, but it will take a very long time. People are still waiting for relief in the Florida Panhandle from Hurricane Michael. *Eric Schmidt* voiced the importance of expediting relief funds because people do not have time to wait. *Laura* said that they are about 3 years behind, and that there are over 20 fisheries disaster declarations pending in Congress; there are fisheries still waiting from 2019. *Marcos* emphasized the need to expedite the information required for recovery processes.

Marcus then turned the conversation to our difficulty with reaching stakeholders in the U.S. Caribbean. This was primarily due to shortcomings associated with Qualtrics Panels and our lack of experience working with people in that region. The fishery representatives in attendance today have said that the best way to reach U.S. Caribbean stakeholders is through the representatives of that region. As the leaders of your associations, if you could help distribute our surveys, that would greatly help us acquire responses from that area.

Sarah then displayed a spreadsheet, and *Marcus* asked the group to assist in filling it out together. *Marcos* mentioned that some of his groups include NOAA and Sea Grant personnel; he will need to coordinate with people to ensure there is no problem with using this platform to collect data. *Steven* added that the existing information on the sheet represents a starting point from things that have been mentioned today as well as some Google searching. He asked the fishery representatives to indicate inaccuracies and omissions. He also asked about overlap between groups – as in, one individual being part of multiple groups. We want to be careful not only about the results we obtain, but also the way we come across to the groups.

Jason DeLaCruz said that the Gulf Fishermen's Association is different from the Gulf of Mexico Reef Fish Shareholders' Alliance and should be removed. *Eric Schmidt* said that there are a couple of groups missing: the Florida Commercial Watermen's Conservation (Casey Streeter) and Organized Fishermen of Florida (Jerry Sampson used to be the Executive Director but has probably retired; primarily deal with state issues; *Angela Collins* knows the current Executive Director, Alexis Meschelle).

Amy said that many constituents in South Carolina are talking about information overload; they have gone from having very little to having way too much. She asked that the Reef Fish team keep this in mind when disseminating data. Concise products with more photos and fewer words are best. She also asked if we really want to target the commercial and charter-for-hire sectors; all these people are permitted, so why not work with the permit offices to get their direct contact information? *Laura* responded that federal permits are available online, but state permit information is more difficult to access. In Texas, there is a lot of fishing activity for reef fish in state waters because the state water boundary extends out to 9 miles. Also, TPWD has provided information on the charter-for-hire sector but will not provide information on the private recreational sector.

Marcus added that information overload is very important; we have been diligent in providing

short, simple messaging about different aspects of the project. He asked if there are any other U.S. South Atlantic connections to add to our spreadsheet and reiterated that we will be contacting the private recreational sector via Qualtrics Panels but need to expand our efforts to fill in gaps from the charter-for-hire and commercial sectors. We intend to reach out to the individuals at these organizations and ask them to distribute our survey. *Charlie Phillips* named the Southeastern Fisheries Association. Other organizations added to the list included the West Palm Beach Fishing Club, Port Aransas Boatmen, Inc., and Mississippi Commercial Fisheries United. *Marcos* mentioned the issue that there may be one person or 3,000 people behind each organization, and this number (and list of people) is always changing.

Steven summarized that this component of our work will require more effort after today's meeting, but we envision we will speak with the lead contact of each group to better understand what the membership looks like (number of individuals, overlap of members across organizations). If everyone in a state-based charter-for-hire organization is also a member of the National Association of Charterboat Operators, the national level may be more comprehensive, but it also may be less likely that the national level members respond. If it is a better approach to only use the state-based organizations, we may not need to explore the national level. We need to know a lot more about each organization first and see how the numbers line up. If a group has only a few members or seems to no longer be in existence, we should strike it from our list.

Chris Barlow mentioned that in Mississippi, there is little participation in charter-for-hire organizations. There may be 75 captains and about 10% participate in the organizations. If people were more aware, they might join. *Marcos* added that in terms of the data, even if you have just a few people, it is important to obtain their input anyway. *Charlie Phillips* suggested asking the information officers at the Councils and the states (e.g., Georgia's Finfish Advisory Panel); these entities will know of the smaller clubs because they deal with them on a regular basis. *Julian* added that it is important to reach out to all the different organizations and ask for their feedback on potential participation in the survey (i.e., is it worthwhile based on the number of members?). There are 109 commercial and 300 recreational fishermen in the St. Thomas and St. John area. Through the St. Thomas Fishermen's Association, you can reach the key fishermen of the fishery; with their trust in *Julian*, the survey will get done. The key is getting the correct information you are seeking, and at the same time getting information from people inside and outside of the organizations to allow for comparison.

Amy asked about ensuring the survey is balanced across sectors and regions. *Steven* responded that for the recreational sector, we wanted a balanced design across states; however, we do not need to implement that same constraint for the charter-for-hire and commercial sectors. States that have more fishing communities and businesses would provide more responses, and that would be fine. We are using some of the other existing resources (e.g., NOAA publications on fishing community profiles that give a sense of the importance of different sectors and the number of businesses that exist in an area). We can compare this information to the number of survey responses to ensure we are obtaining an appropriate number of responses. At this point, we are not concerned with obtaining too much data.

Steven mentioned that we are seeking feedback to one important question: in the context of all fishing activity throughout the year, when is the ideal time to distribute a survey? *Shane* replied that these conversations come into play for scheduling Marine Resource Education Program classes. Each region has different and overlapping seasons that are moving around, so that commercial and recreational do not always overlap. February can be a good time because people are mostly home (not fishing) and there are no big holidays. One thing to consider: the problems that people experience, and the perceptions of those problems, differ by region. We must balance the dynamic of regional differences and avoid projecting issues from one area onto another. Also, the Louisiana Charter Boat Association should be added to the list.

Marcus asked the first wrap-up question: do you feel like your voices and opinions are heard and acted on; if not, where is the process breaking down (e.g., between science and management)? *Shane* responded that for him, the breakdown occurs at the state level due to a lack of contacts. There are pressing issues that need to be resolved but cannot be. On the federal side, he can contact who he needs to contact, although the GMFMC "is what it is." Politics start coming into play in the SSC and it gets harder to make an influence. *Jason Stock* is in a high-volume fishery and is tied in at a lot of levels. He said that the science lag is so significant, and the management actions are so delayed, that artificial problems end up being created. For example, in 2016, he was asked to sit in as a stakeholder in the SEDAR working group for the red grouper stock assessment. At the time, there was a Total Allowable Catch (TAC) of 4 million pounds, but they were not even landing 2 million pounds, and yet they said they were looking at an 80% increase. They artificially changed the red grouper fishery; it essentially became an open-access fishery and many people jumped in. The stock is now choked, and allocation is through the roof. All of this happened because people were artificially led into the fishery and accessing the fishery. *Jason Stock* has seen this happen several times; if the fishermen attend the meetings in good faith, then the scientists and managers need to actually take the resulting information seriously and put it to use. In an individual fishing quota fishery, stock quality indicators can be teased out by looking at allocation price (e.g., red grouper). Every time he raises this point to the SEFSC, they present roadblocks. An economic model is the purest type of model for visualizing the quality of a stock, but the SEFSC does not look at these; this is a monumental flaw in fisheries management. *Eric Schmidt* agreed with *Jason Stock*; the snail's pace at which things get done at the Council level is a problem. For SEDAR 74, they were reviewing landings from 2017, but the fishery has changed in 4 or 5 years, meaning management measures will reflect data that are 4 or 5 years old. The timeline that it takes to evaluate recreational effort represents another issue. The Marine Recreational Information Program is days and months behind, and we do not know until after the end of the year – 3 months into the new year – whether the recreational sector exceeded their TAC. The commercial sector is very accountable, and the charter-for-hire reporting will give an even better idea. However, the delay in recreational data affects people's lives. They do not know when the red snapper season will open until a few days before the season, and customers cannot plan ahead and book trips. *Charlie Phillips* said that he witnesses a significant disconnect between what the SEFSC is saying and what the fishermen are seeing. When the bulk of fishermen are seeing one thing and the SEFSC is telling them something else, that is a huge disconnect and causes a huge issue with trust. When the SAFMC requests additional information or more

models, they say they do not have time. People need to be more closely on the same page and be able to work better together for a common answer.

Marcus asked if anyone else had any other thoughts about the point in the process when information transfer is breaking down, and where in the process the fishery representatives would like to have a louder voice if they feel they are not being heard. *Kindra* echoed some of the previous comments. At the state level in Louisiana, although she has developed some relationships with employees at Louisiana Department of Wildlife and Fisheries, the recreational sector outweighs the commercial sector when it comes to representation. The state managers work hard to ensure that they bend to other sectors' will, but when it comes to the commercial sector, they repeatedly take and penalize. This was the driving force behind *Kindra* and her husband's involvement in so many fisheries. She agrees that political pressure at the state level is a serious problem for the commercial sector, and she witnesses even greater pressure at the federal level. People should consider that the commercial sector represents 94% of America's population; this sector provides the public with access to seafood. We need to take a step back and understand that ultimately, when the commercial sector fishes, it is providing food for people. We need to ensure that everyone has equal representation and equal access. *Kindra* stated that some of the lack of participation may be simply due to sheer frustration. Sometimes, it feels like no matter how much they participate in surveys, meetings, etc., they are not as effective for their industry and consumers as they need to be. If they continue to lose participants in the commercial sector in both state and federal fisheries, at what point do they stop feeding the nation? To build a level of trust in the survey process, we should ensure that the commercial fishery has equal participation when it comes to the results; in other words, we should target the same number of participants from each sector. With respect to the commercial sector, on the federal side, the best way to do this is through NOAA Fisheries. *Kindra* asked if the survey programmers at the table have reached out to NOAA Fisheries, or if there are legal hurdles that do not allow direct contact with participants from the commercial sector. Also, with respect to the commercial sector, what problems have you run into, and have you found any viable solutions to access participants from the commercial sector to obtain the feedback that she would like to see? *Steven* said he would follow up with *Kindra* about this; we are building a spreadsheet, based on today's feedback, listing the organizations we should work through to ensure an adequate response from the commercial and charter-for-hire sectors. We would welcome feedback regarding Louisiana. With respect to working through or with NOAA Fisheries, amongst the project team, there is a lot of close collaboration with various NOAA employees (even if it is not a formal partnership). For social sciences research, there are a lot of restrictions placed on federal agencies; the biggest is the Paperwork Reduction Act, which forces NOAA Fisheries to go through lots of paperwork and delays to do surveys. Sometimes, they are simply told "no." For this reason, we would not directly partner with NOAA Fisheries to distribute the survey. However, the advice we heard today – to go through organizations and associations – is valuable. If anyone is interested in helping with that, we would love to have a follow-up chat about it.

Jason Stock added that with some of the species (e.g., gag), a lot of people do not know the facts about the fish's biology (e.g., maturity, spawning). Addressing some of the biological traits

of the species might help with the public perception of why regulations are implemented. *Marcus* agreed with this point.

Marcus requested two more pieces of information from the attending fishery representatives: 1) the single biggest problem facing the reef fish species that you fish for the most; 2) if there was ever going to be another single-species assessment, which species should it focus on?

Eric Schmidt responded that, given the events of the past 2 weeks, the biggest issue he sees is lack of infrastructure; specifically, no hotels, marinas, docks, or boats. The next single-species assessment should focus on red grouper. *Greg Mercurio* responded that the biggest issue he sees in the Florida Keys is shark depredation. He agreed that the next single-species assessment should focus on red grouper. *Jason Stock* responded that the biggest issues he sees are pollution and lack of habitat for small fishes to get big. He agreed that the next single-species assessment should focus on red grouper. *Jason DeLaCruz* responded that the biggest issue he sees is managers not taking information from professional fishermen. He agreed that the next single-species assessment should focus on red grouper, but gag is close. *Charlie Phillips* responded that the biggest issue he sees is flexibility and timeliness (getting assessments done and being nimble). He could not decide on a species for the next single-species assessment. *Shane* responded that the biggest issue he sees is climate change. He said that the next single-species assessment should focus on king mackerel; he used to catch a lot of them, but this year, has caught less than 40. *Charlie Phillips* then responded that future assessments should focus on sharks. *Chris Barlow* responded that the biggest issue he sees is a lack of artificial reefs; there are more fishermen than ever before, and the fishes are congregating in a few areas. He could not decide on a species for the next single-species assessment. *Julian* responded that the biggest issue he sees in St. John, St. Thomas, and St. Croix is food security. Their commercial fishermen feed the people of the U.S. Virgin Islands with fish; the U.S. Virgin Islands do not export. The next assessment should focus on Grouper Unit 4 (yellowfin grouper, red grouper, black grouper, and tiger grouper) or queen conch; the conch fishery is very important, particularly in St. Croix. *Julian* also responded for *Marcos*, who had to leave the meeting, that Puerto Rico would probably want to focus on spiny lobster for the next single-species assessment. They have been having a lot of issues with spiny lobster and have already had two overruns of the Annual Catch Limit (ACL), so the ACL should be revisited. *Brenda* responded that she sees two issues that need to be addressed. One is data (the recreational sector wants better data), but she realizes that the recreational fishermen themselves are part of the reason the data are not as accurate as they need to be. The second is education. She is lucky to be able to attend events like this one, where she can learn about and understand the science and management processes, but not everyone is able to do this and it is clear that some recreational anglers do not have much of an understanding at all. To improve data from recreational anglers, recreational anglers need education so that they can understand the entire process and participate in it. *Brenda* agreed with *Shane* about king mackerel; typically, she sees a lot of them, but this year, she saw none. She asked other fishermen and they said they had not seen king mackerel either. She said that future assessments should focus on sharks. It is almost impossible to stay put anywhere because the sharks are so prevalent; they have inundated her part of the GoM. *Kindra* responded that the

biggest issues she sees are climate change (wind has significantly increased off the coast of Louisiana), habitat loss (not only are they losing land in their estuaries and nurseries, but they have also lost a tremendous amount of manmade structure with the removal of decommissioned oil rigs), and regulations (constant changes by the GMFMC are having a negative impact on fisheries). She said that future assessments should focus on sharks. The increased populations of all shark species, and the need for culling, are common topics among all Louisiana sectors. *Kindra* agreed with *Brenda* about shark issues. Populations of sharks have exploded due to a readily available food source. This is something that needs immediate attention and should be considered an emergency in the GoM.

Marcus closed the meeting by thanking the attending fishery representatives for participating in the meeting and dedicating their time and effort to our project.

Meeting Effectiveness

At the conclusion of the meeting, the 12 attending fishery representatives were asked to complete a brief survey to evaluate the utility and effectiveness of the meeting. Overall, fishery representatives rated the meeting highly, with 100% agreeing or strongly agreeing that the meeting's purpose was clear, the meeting achieved the stated objectives, the meeting was a valuable use of their time, and the meeting fostered active participant involvement and interaction. With respect to meeting duration, 67% of fishery representatives agreed or strongly agreed that the meeting was the right duration. Although the remainder (33%) disagreed or were not sure, they stated that the meeting was too short rather than too long. The fishery representatives appreciated the diversity and knowledge of the participants and the unique opportunity for interaction. Several fishery representatives requested longer meetings in future years.

Appendices

Appendix A: Meeting Agenda

Reef Fish Extension
2022 Advisory Panel Meeting

AGENDA

Monday, October 17th, 2022
9 AM - 4 PM
San Antonio Marriott Riverwalk
889 East Market Street
San Antonio, TX 78205

Morning (Travis Room)

8:00 AM - 9:00 AM	Registration (*All*)
9:00 AM - 9:30 AM	Welcome & introductions (*All*)
9:30 AM - 9:45 AM	Introduction to Reef Fish Extension Project (*M. Drymon*)
9:45 AM - 10:45 AM	Results of first Reef Fish Extension survey (pt. 1) (*S. Gibbs*)
10:45 AM - 11:00 AM	*Coffee Break*
11:00 AM - 12:00 PM	Results of first Reef Fish Extension survey (pt. 2) (*S. Gibbs*)

Mid-Day

12:00 PM - 1:30 PM	*Lunch (on your own)*

Afternoon (Travis Room)

1:30 PM - 2:30 PM	Feedback and topics to explore in future Reef Fish Extension surveys (*A.P.*)
2:30 PM - 3:00 PM	*Coffee Break*
3:00 PM - 3:45 PM	Ways to survey Caribbean stakeholders, charter sector, and commercial sector (*A.P.*)
3:45 PM - 4:00 PM	Wrap Up (*All*)
4:00 PM	*Adjourn*

Evening (River Terrace Room)

5:30 PM - 7:30 PM	Gulf States Marine Fisheries Commission Reception/Dinner (*optional*)

Appendix B: Meeting Attendees

Project Team

Marcus Drymon, Mississippi-Alabama Sea Grant Consortium
Kristina Alexander, Mississippi-Alabama Sea Grant Consortium
Amanda Jargowsky, Mississippi-Alabama Sea Grant Consortium
Laura Picariello, Texas Sea Grant
Alexis Sabine, Texas Sea Grant
Dominique Seibert, Louisiana Sea Grant
Angela Collins, Florida Sea Grant
Michael Sipos, Florida Sea Grant
Nick Haddad, Florida Sea Grant
Bryan Fluech, Georgia Sea Grant
Jocelyn Juliano, South Carolina Sea Grant
Steven Scyphers, University of South Alabama
Sarah Gibbs, University of South Alabama
Ashley Oliver, South Atlantic Fishery Management Council
Alida Ortiz, Caribbean Fishery Management Council (*attended virtually*)

Reef Fish Fishery Representatives

Brenda Ballard, Texas
Shane Cantrell, Texas
Kindra Arnesen, Louisiana (*attended virtually*)
Chris Barlow, Mississippi
Jason DeLaCruz, Florida
Greg Mercurio, Florida
Eric Schmidt, Florida
Jason Stock, Florida
Charlie Phillips, Georgia
Amy Dukes, South Carolina
Marcos Hanke, Puerto Rico
Julian Magras, U.S. Virgin Islands

Other Attendees

Kelly Samek, National Sea Grant Office (*attended virtually*)
Duane Smith, National Oceanic and Atmospheric Association
Carly Somerset, Gulf of Mexico Fishery Management Council (*attended virtually*)
Dave Donaldson, Gulf States Marine Fisheries Commission
Charlie Robertson, Gulf States Marine Fisheries Commission
Eric Gigli, Mississippi Department of Marine Resources
Travis Williams, Mississippi Department of Marine Resources
Chris Blankenship, Alabama Department of Conservation and Natural Resources
Scott Bannon, Alabama Marine Resources Division
Jim Brown, Florida Commissioner

Appendix C: Meeting Photos