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South Atlantic Fisheries Management Council Citizen Science Program
Stakeholder Assessment Report #1:
Citizen Science Program Evaluation Interview Report

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Introduction

This report summarizes findings from interviews with key members of the South Atlantic fishing community. The purpose of the interviews was to begin the process of establishing baseline levels of knowledge about, confidence in, and trust in the citizen science process of collecting data to inform fisheries resource management. The plan was to use the interview findings to design a wide-scale survey regarding citizen science that could be disseminated more broadly to this community. Results from the wide-scale survey would establish a solid baseline for future comparisons to assess changes in knowledge and attitudes among program participants as the program evolves. The interview findings are proving to be helpful for that purpose. However, they also serve as an initial stakeholder assessment for the citizen science program and have numerous implications for program design.

In summary, the interview data show that:

- *Scientists need to be convinced that citizen science projects have sound designs and that their data are truly needed;
- *Managers need to be convinced that scientists will use citizen science data; and
- *Fishermen need to be convinced that scientists and managers will use the data.

In addition, the concept of using citizen science to inform fisheries management needs to be considered in light of a pessimism about the resource and whether anything can be done about it, especially among fishermen.

Methods

A total of 18 individuals were interviewed: Six fisheries scientists, six fisheries resource managers, and six commercial/recreational fishermen. These individuals were selected from among a group of names suggested by members of the SAFMC Citizen Science Operations Committee, Council members, and Council staff. In general individuals were chosen who had been suggested by multiple recommenders. The final selection of interviewees was made by Rick Bonney, Julia Byrd, and Nick Smillie with the assistance of operations committee member Scott Baker. The project was submitted to the Institutional Review Boards (IRBs) of Cornell

University and the College of Charleston and received exemptions from full review by both institutions.

Potential interviewees were contacted by email and asked if they would be willing to participate in an anonymous 30–45-minute survey that would take place via Zoom and be recorded to facilitate data analysis. All 18 individuals agreed to be interviewed. Interviews took place from October through December 2021 (scientists and managers) and in March 2022 (fishermen).

The interviews were annotated and summarized by Rick Bonney in April and May 2022. Per the research design and IRB approvals, all interviewees remain anonymous, and only Rick Bonney, Nick Smillie, and Julia Byrd have access to the interview recordings.

An initial draft of the interview findings was sent to all 18 interviewees in Mid-May 2022. None of the interviewees returned any editorial comments.

Results

All of the interviewees were highly experienced, and nearly all were very familiar with the SAFMC, the stock assessment process, and how data are used to inform management decisions.

The six scientists are all mid- to late-career. Four of them are associated with NOAA's Southeast Fisheries Science Center, and two are university faculty. Five are men and one is a woman. All of them are very to extremely familiar with the stock assessment process and how data are used to inform management decisions. Most of them have participated in the process directly.

The six managers are also all mid- to late career. Three of them are associated with state agencies, and one is associated with NOAA. The other two have spent many years in varied capacities with SAFMC. Four of the managers are men and two are women. All of them are very to extremely familiar with the stock assessment process and how data are used to inform management decisions. Most of them have participated in the process directly.

Most of the six fishermen have been fishing essentially all their lives. Three are commercial fishermen, two are charter boat captains, and one is a recreational fisherman. All are men. All but one are very to extremely familiar with the stock assessment process and how data are used to inform management decisions. Most of them have participated in the process to some extent, as all have been involved with the SAFMC in some capacity, some for many years.

Health of the southeastern US fishery:

Opinions on the health of the southeastern US fishery varied. Most of the scientists pointed out that the question needs to be answered by species and location, with some fisheries doing well

but many faring very poorly. Two stated that reef fishes in particular are overfished and suffering serious population losses. One stated that many populations are dropping off for unknown reasons, and another stated that reduction of discards is critical to rebuilding some stocks.

Like scientists, most of the managers noted that the question needs to be answered by species and by location, with some fisheries doing well and some very poorly. However, managers tended to feel that fish stocks are doing better than scientists feel they are, especially species that are most actively managed. One stated that overall fisheries are doing well, one said that some species are more abundant than they ever have been, and one said that while managed species are doing well, we really don't know about the rest. Two managers said that some species are likely overfished but that many populations are probably suffering for other reasons, including poor recruitment and climate change. Two stated that recreational fishermen are having an outsized impact on the fishery with sophisticated gear making it easy to catch fish, and that the recreational sector needs more accountability, including collection of more data about what recreational fishermen are catching.

Fishermen's opinions on the health of the South Atlantic Fishery were almost universally pessimistic—they are gloomy about the state of the ocean and its fish populations. Only one, a charter boat captain, felt that overall fisheries are in good shape, and mentioned that while some species are struggling, many have better populations now than they have for 30 years. This person also noted, however, that technology now allows fishermen to essentially extirpate some species.

The remainder of the fishermen used terms like “depleted resources” and “depressing,” and one stated that he was doing less and less fishing because catching fish is getting harder and harder. Two of them mentioned that some species, such as Spanish Mackerel and Red Snapper, are coming back, but that groupers are doing very poorly. Two of them mentioned that assessments are not timely. One of them is very concerned about discards, especially from recreational fishermen. One said that when he talks to fishermen his age, he ends up crying.

Availability of data to support fisheries management decisions:

Scientists tended to feel that sufficient data are available to support fisheries management decisions, especially for species that receive stock assessments. Two individuals clearly felt that sufficient data are available. A third said that while currently available data are probably sufficient, more data would likely lead to better decisions. Another individual stated that answering the question is challenging but that data issues are not the biggest challenge for management, while another said that we may not have all the data we need, particularly with regard to discards. Only one scientist strongly felt that more data are needed.

Managers were unequivocal that more data are needed to support fisheries management decisions. Four of them stated flatly that much more data is needed for nearly all species, with

one elaborating that managing fisheries on existing data is like “trying to run a Porsche on a lawnmower engine.” A fifth wasn’t sure but mentioned that “scientists say we don’t have enough.” Only one manager said that we have enough data for some species.

Fishermen mostly do not feel that the data currently available are sufficient for making management decisions. Four said outright that far more data are needed; one of these stated that scientists rely too much on modeling and another said that scientists and managers need to obtain more data from fishermen, as they are the experts on the water.

The other two fishermen were more optimistic about the amount of currently available data, although both said that the data are sufficient because statisticians can do amazing things with the data they are given. While one said that he thought managers were using the best available science, the other said he wasn’t sure the data were very accurate, although they are better than they used to be.

Familiarity with citizen science:

All scientists were familiar with citizen science, but they were not particularly engaged with the practice. One scientist had worked with REEF data and another had worked with fishermen to monitor red tide, but the other four had not engaged with citizen science projects or their data.

Managers were more involved in citizen science than were scientists, with three having directly participated. All three individuals had participated in tagging programs; one of them also was involved with SAFMC’s FISHstory, and another had contributed to the SAFMC Release Project and also had tested descending devices for an unidentified project.

Fishermen were the most engaged with citizen science, with five of the six individuals having participated in some way. One had done some fish tagging. Two others had contributed data to the SAFMC Release project, and two have advised council staff on development of SAFMC Release and FISHstory.

Familiarity with SAFMC’s Citizen Science Program:

All scientists were at least passingly familiar with the SAFMC Citizen Science Program. Three of them knew about its goals and objectives; two of these had advised on current projects. None of the scientists, however, were familiar with the list of research priorities that the SAFMC believes could be addressed by citizen science data.

In contrast, except for the individual who had advised on FISHstory and the one who had contributed to SAFMC Release, managers did not seem to know many specifics about the SAFMC Citizen Science Program. And like scientists, none of the managers were aware of the list of research priorities that the SAFMC believes could be addressed by citizen science data.

As stated above, four of the fishermen were involved with SAFMC's citizen science program. Two have contributed data to the SAFMC Release project, and two have advised council staff on development of SAFMC Release and FISHstory. Only one individual, the recreational fisherman, was familiar with the SAFMC citizen science research priorities. He said they are a bit broad, perhaps representing a "fairytale world."

Support for Citizen Science and SAFMC's Citizen Science Program:

All six of the scientists were generally supportive of citizen science, with significant caveats/conditions. Four of them discussed the critical need for sound project design to ensure its utility. Most also were worried about sampling bias, which may or may not be related to project design. One stated that "logbook data have concerning trends compared with data from observers." Two scientists stated that citizen science may work better with recreational fishermen than with commercial fishermen, one saying that "the job of fishermen is to catch fish, not to report data." One of these suggested validating citizen science data through covert observers, while another said that while carefully collected citizen science data should be used, having observers on boats would be a better data-collection method. One scientist stated that expectations for citizen science data should not be set very high, and only one seemed to have no major concerns about citizen science data.

Managers seemed to be somewhat more optimistic about a role for citizen science than are scientists. Four of them said that fishermen would be able to collect a great deal of useful data.

Concerns did arise, however. Two managers mentioned the need for having realistic expectations for data—for example, it might be hard to get consistent, non-biased landings data, but information on parameters such as temperature, range extensions, and life history studies would be fairly easy to obtain. Another manager mentioned that getting information on age sampling could be difficult. One manager said that it will be hard to keep fishermen interested, particularly if it seems that the data are not being used. Several mentioned the issue of needing to come up with data collection that interferes as little as possible with fishing. One stated "it's easy to put carcasses in a freezer. It's a lot harder to stop your on-the-water activities to record something." Finally, one stated that he didn't think that scientists would use self-reported data.

Fishermen did not seem particularly optimistic about the utility or uptake of citizen science. One individual thought that in general fishermen-collected citizen science data will be good enough to use, and does not see how fishermen would be able to "game the system"—they wouldn't know what data to submit to do so. However, this individual was not certain that fisheries scientists will want or use the data. Another agreed that scientists may not believe the data and that even if they do, the information won't be useable in the models that scientists use. This individual thought that citizen science should be primarily for outreach, focusing on collecting information that scientists are not already getting. A third individual stated that while

he fully supports citizen science, he doesn't think that scientists will use the data because the information can't be validated.

Two fishermen feel that commercial fishermen mostly won't participate. Some will feel that they don't have the time and/or will be worried that their data will lead to more regulations and closures. Others will not want to give out their locations or will be challenged to participate: "The majority barely know where to get their bait, let alone use an app."

Only one individual, the recreational fishermen, was familiar with the SAFMC citizen science research priorities. He said that they are a bit broad, perhaps representing a "fairytale world." This same person also said that fishermen will think one of two ways: "Don't give [scientists] any data," or "Tell scientists there are fish everywhere." For this reason, this fisherman was concerned that citizen science won't really work.

Conclusions:

The mission of the SAFMC Citizen Science Program is to advance science and to increase trust, one project at a time. Determining the success of the program will require measuring whether science is advancing, and trust is increasing among fisheries scientists, fisheries managers, and fishermen over time.

The purpose of this research was to gather information to inform development of a wide-scale survey to determine baseline measures of knowledge about, confidence in, and trust in the citizen science process among members of the fisheries community. This baseline can be used as a marker to establish changes in knowledge, confidence, and trust as the program grows and matures.

The data from the interviews reported here will clearly inform development of a survey. Several take-aways emerge.

*The survey will need to reach younger and less experienced individuals in all categories. Younger and more recently trained scientists and managers are likely to be more familiar with citizen science and its possibilities than the individuals interviewed so far. In addition, younger fishermen may not be as pessimistic about the future of the fisheries as are fishermen who have been on the water for decades.

*Questions about the health of the fishery will be challenging to ask because of the huge variability in fisheries health across species and locations. The survey will probably attempt to ask ranking questions for species assemblages.

*Questions about data availability should be fairly straightforward, although the survey may need to include some definitions.

*Questions about familiarity with citizen science in general and with the SAFMC citizen science program more specifically will probably need to include references to specific projects or types of projects.

*Questions about support for citizen science and the SAFMC Citizen Science Program will need to provide an opportunity for participants to write out their thoughts if desired.

The interview results also offer some directions for project and program design. They show that opportunities to increase knowledge, confidence, and trust abound, at least for this older audience in fact, it's clear that the Citizen Science Program will require some heavy lifting. In particular, a lot more education will be needed for all of the audiences – scientists, managers, and fishermen - to demonstrate how citizen science is being carefully designed and used in a variety of management applications in fisheries and beyond. And project recruitment is likely to be a major issue considering the general pessimism of fishermen about the fate of the resource and the likelihood that data they collect will actually be used.

These results suggest that significant investment into the SAFMC Citizen Science Program will be required if it is to be successful in meeting its mission. The initial successes of the Program, however, coupled with the enthusiasm of fisheries managers and the general support of scientists, suggests that such investment would be well worth making.