October 1, 2025

Ms. Julia Byrd, Citizen Science Program Manager

South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
North Charleston, SC 29405

RE: Updates to the SAFMC Citizen Science Research Priorities

Dear Ms. Byrd,

Environmental Defense Fund (EDF) appreciates the opportunity to provide comments on the development of new research priorities for the South Atlantic Fishery Management Council's (SAFMC) Citizen Science Program. The Citizen Science Program has demonstrated its value in advancing both fisheries science and stakeholder engagement, creating a strong foundation for collaborative data collection that strengthens management decisions. Notably, the integration of citizen science working papers[1] into SEDAR 90 for red snapper illustrates the program's growing credibility and impact—showcasing how volunteer-driven data can meaningfully contribute to stock assessment processes and improve the scientific basis for management.

As the Citizen Science Operations and Projects Advisory Panels (AP) consider priorities to guide the next phase of program development, we encourage a forward-looking approach that both builds on past successes and strategically addresses persistent data gaps. In particular, we believe there is a unique opportunity for citizen science to complement traditional monitoring programs and fill critical information needs in oceanographic models, stock assessments, and ecosystem-based management frameworks across the South Atlantic region. As the program continues to evolve, we encourage the APs to set research priorities that both fill pressing stock assessment gaps and position the program to support fisheries in an era of rapid environmental change. Our comments aim to support the continued growth of the Citizen Science Program, highlight its demonstrated successes, and recommend research priority areas where citizen science contributions could be especially impactful.

Toward Climate-Ready Fisheries[2], a roadmap for our nation's fisheries developed by EDF and dozens of collaborators, provides a helpful guide and key recommendations that are directly relevant to SAFMC's citizen science work, including:

- Advance technological and collaborative solutions for data collection and research.
- Promote transparency and effective communication.
- Develop a robust understanding of climate impacts and a vision for change.

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[1] Byrd, Julia, Cao, Jie, Rocco, Alex and Chip Collier. Length frequencies for South Atlantic Red Snapper from the FISHstory project. SEDAR90-DW-16. SEDAR, North Charleston, SC. 15 pp.; Byrd, Julia, Withers, Meg, Curtis, Judd and Chip Collier. 2025. Summary of the SAFMC Release Project for SEDAR 90. SEDAR90-DW-17. SEDAR, North Charleston, SC. 20 pp.

[2] EDF Roadmap: Toward Climate-Ready Fisheries. https://www.edf.org/content/toward-climate-ready-fisheries

- Optimize the management process to be more responsive, adaptive, and proactive.

Grounded in these principles, we recommend the following priority areas for citizen science research (aligned with the 2023 approved research priorities document), which are further detailed in a 2024 report, *Citizen Science to Support Climate-Ready Management of United States Fisheries*[3].

High-resolution ocean data collected from fishing vessels

Oceanographic conditions—such as temperature, salinity, dissolved oxygen, and pH—are changing rapidly due to climate and human land use changes. These changes have major implications for fish distribution, stock productivity, and ecosystem health. Most oceanographic data are collected through buoys, Argo floats, or satellites, which result in large data gaps in coastal subsurface waters. Fishing activity is perfectly situated to resolve this gap and fishing vessels serve as ideal platforms to collect continuous, fine-scale oceanographic data in areas that may otherwise remain unmonitored. Integrating such data into models can improve both climate and extreme weather forecasting and stock assessments. Opportunities include:

- Equip commercial and recreational fishing vessels with sensors (temperature, oxygen, pH, perhaps salinity, depth profiles), especially in understudied areas or deeper water. The eMOLT[4] program is an example of this in practice in the Northeast.
- Establish a Fishing Vessel Ocean Observing Network[5] (FVON) in the South Atlantic to broaden geographic regions or depths supporting the basis for EBFM and adaptive monitoring.

Length and weight data collected by commercial and recreational fishermen to improve stock assessments

Stock assessments require detailed information on the catch, abundance, and life history of fishes. The completeness and accuracy of this information is critical to ensure that stocks are being exploited sustainably, particularly as rapid environmental changes reshape key demographic processes including growth, recruitment, maturity and fecundity. Citizen science has the potential to fill data gaps to improve stock assessments, making them more robust to uncertainties and better equipped to provide adaptive management advice. Opportunities include:

- Monitor growth rates, maturity schedules, fecundity, etc., along with environmental gradients (temperature, depth). As stock assessments often assume stationary parameters, these shifts could reduce bias/improve forecasts.
- Monitor (or collection) larval fish or invertebrates (i.e., plankton net tows, settlement plates) to better understand connectivity, recruitment, stock structure.

[3] Citizen Science to Support Climate-Ready Management of United States Fisheries. https://library.edf.org/AssetLink/rt4ch86ocgyo466wm5io038370et6w36.pdf
[4] https://www.emolt.org/
[5] https://www.fvon.org/

Observations of rare, redistributing, or invasive species

There is a substantial opportunity for citizen science to contribute to our understanding of where species occur, and to detect climate-driven species redistribution and shifts in ecosystem structure. Identifying species range shifts is a priority for adaptive fisheries management to inform fishery allocations. Opportunities include:

- Citizen scientists (fishermen, divers, recreational) reporting observations of species outside of their historical ranges (with verification).
- Expand long-term tracking and tagging programs to understand shifts in species distributions and migration patterns

Specimen collection for surveilling climate-induced disease and environmental toxins

Climate change is increasing the prevalence and geographic range of marine diseases, harmful algal blooms (HABs), and toxicant accumulation (e.g., mercury, ciguatoxins) in marine organisms. These phenomena can directly affect fish population health, fishery yields, and public safety. For instance, rising water temperatures can facilitate the spread of pathogens or toxins that lead to fish kills or human illness from seafood consumption. Yet, routine monitoring for these hazards is limited in many regions due to cost and geographic coverage. Citizen science presents a unique opportunity to gather specimens and observations at scale, especially in remote or under-sampled areas. Opportunities include:

- Regular specimen collection (tissue, fin, etc.) to monitor disease incidence, parasite loads, algal toxins (e.g., HAB toxins) in fish and shellfish.
- Link disease and toxin indicators to environmental/climate data (e.g., water temperature, nutrient loads).

Surveys of ecosystem indicators

Fishery managers are continuously working towards ecosystem-based fisheries management, which considers not just individual species but also habitat conditions, food web dynamics, and biodiversity trends. Ecosystem indicators—like predator-prey dynamics, species richness, habitat quality, and trophic structure—are essential for evaluating system resilience. Citizen scientists can contribute valuable observations and samples that help track these complex indicators at ecosystem scales. Opportunities include:

- Conduct eDNA sampling by citizen scientists.
- Conduct community surveys denoting climate impacts to habitat, food sources, infrastructure, predator-prey dynamics, etc.
- Implement passive acoustic monitoring in essential fish habitat areas using data loggers on private vessels.
- Conduct rapid deployment of citizen sampling to monitor the impacts of HABs, heatwaves, or other extreme events (e.g. mass mortality of fish and wildlife on beaches).

Information on changes in fishermen behavior and perceptions

Fishermen behavior—such as changes in fishing locations, gear use, target species, and effort—responds dynamically to shifting environmental, biological, and market conditions.

Understanding these adaptive behaviors is critical to projecting fishing pressure, economic resilience, and management effectiveness under changing environmental conditions. Fishermen also have experiential knowledge of environmental changes and species dynamics, which is often overlooked. Capturing this human dimension through citizen science can improve socioeconomic modeling and inform more adaptive policy decisions. Opportunities include:

- Acquire information on how fishermen are shifting their total effort, fishing grounds, seasons, gear, or catch portfolios.
- Gather information on the perceptions of fishermen regarding climate change impacts to contextualize socio-economic outcomes and design appropriate and effective management responses and public outreach campaigns.

Data on the response of markets and supply chains

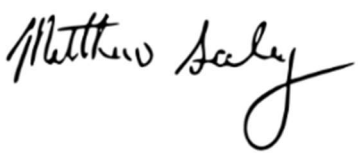
Climate-driven changes in fish abundance, seasonality, and geographic distribution can disrupt the seafood supply chain, impacting fishermen, processors, markets, and consumers. These disruptions can lead to economic losses, changes in seafood availability, and shifts in consumer behavior. However, most fisheries science efforts focus on the biological system, with less investment into how the seafood economy adapts. Citizen science can help fill this gap by monitoring market trends, supply changes, and local food access, which are essential for supporting coastal community wellbeing. Opportunities include:

- Conduct assessments of seafood availability, catch changes, impacts of regulations on seafood production, shifts in market price, and access to seafood in various communities.
- Monitor and record seafood sales, market venues, consumer access, etc.

In summary, the SAFMC Citizen Science Program has already demonstrated that it can deliver high-quality, management-relevant data. By aligning future research priorities with both immediate stock assessment needs and the principles of climate resilience, the program will be even better positioned to support sustainable fisheries and resilient ecosystems.

Thank you again for your leadership and commitment to advancing this program. EDF looks forward to seeing the continued growth of citizen science in the South Atlantic and to working with you to ensure that these efforts provide lasting benefits to fisheries, communities, and ecosystems.

Sincerely,



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