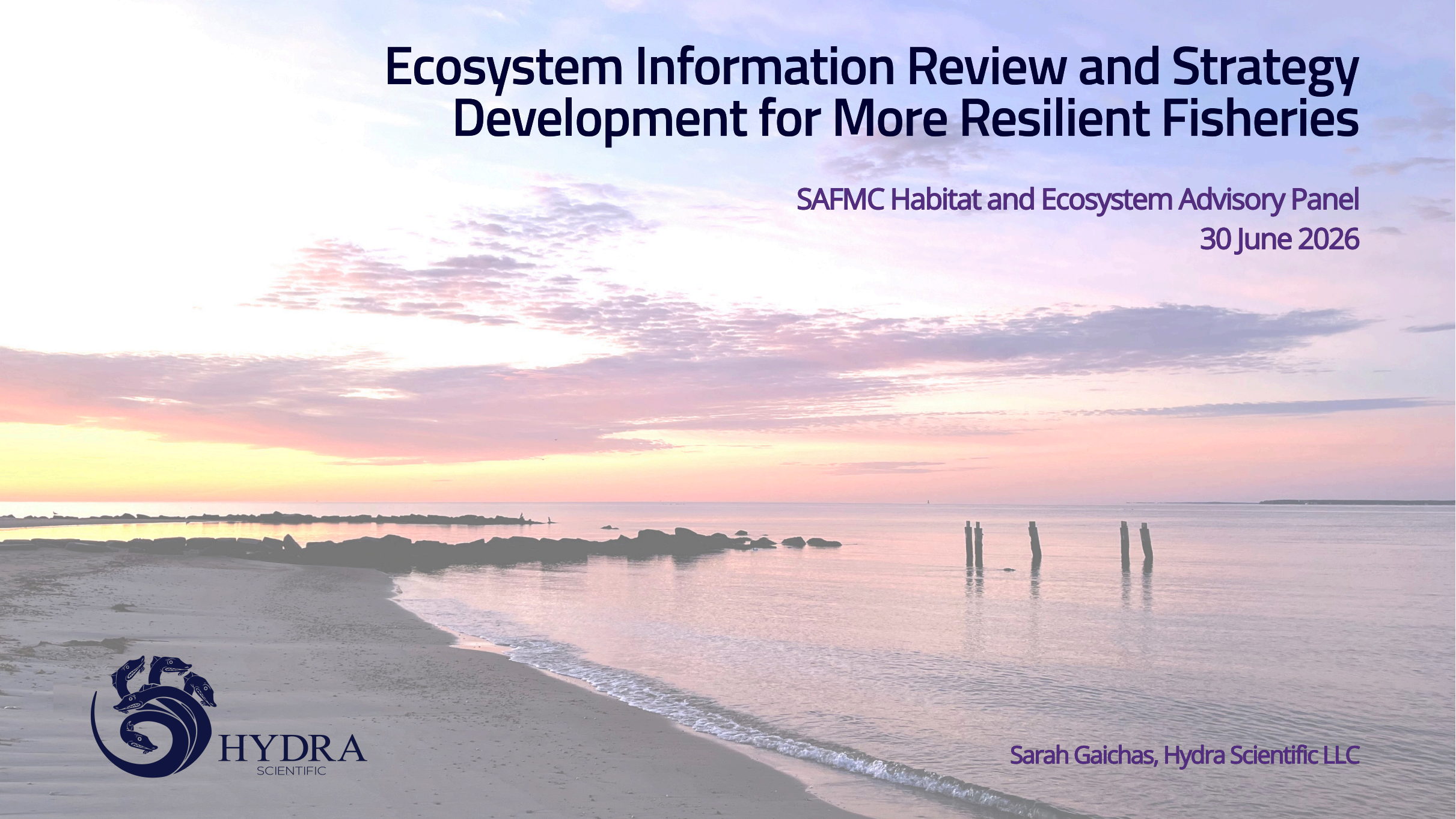
Ecosystem Information Review and Strategy Development for More Resilient Fisheries

SAFMC Habitat and Ecosystem Advisory Panel

30 June 2026



HYDRA SCIENTIFIC

Sarah Gaichas, Hydra Scientific LLC

Project Overview: Objectives

1) Review the different types of ecosystem data and information including data products and decision-support tools (e.g. Ecosystem Status Reports, Climate Vulnerability Assessments, risk assessments) currently available to the regional management councils and evaluate how they are used in council management processes;

2) Identify opportunities and methods for incorporating identified ecosystem information into SAFMC management processes, including inter-jurisdictional management decision-making processes, and identify practical requirements for successful implementation (e.g. data quality, frequency of information updates, regional council process consistency, implementation timelines); and

3) Identify opportunities to continue to expand cooperative, constituent-engaged data collection and research to improve the available ecosystem information in the South Atlantic region (e.g., study fleets, cooperative research, citizen science).

Key Questions for the HEAP

Opportunities for incorporating ecosystem information into SAFMC Management Processes: Aligning EFH Policies with ecosystem indicators

- Are the current indicators identified appropriately aligned with Habitat Policies?
- Do you see any challenges with using the current information?
- Are the potential indicators identified appropriate?
- Can you suggest different indicators to monitor progress on habitat policy objectives?

Prototype Ecosystem Indicators:

- Do the indicators make sense? Are they clearly explained?
- Can you forsee any uses for a spatial indicator of bottom temperature?

Opportunities to expand cooperative data collection:

- Can cooperative research or citizen science validate model-derived habitat (bottom temperature) indicators?
- Can you suggest other information to be collected by fishery participants or the public?

Project Update: Objective 1

Review the different types of ecosystem data and information including data products and decision-support tools (e.g. Ecosystem Status Reports, Climate Vulnerability Assessments, risk assessments) currently available to the regional management councils and evaluate how they are used in council management processes

Literature search: *Complete*

- August 2025-February 2026
- Council documents (policy guidance documents, FMPs/FEPs)
- Data products (Ecosystem Status Reports, Climate Vulnerability Assessments)
- Peer-reviewed literature

All 8 Councils, including SAFMC, plus selected others

Presented Tool and Use summary at the Ecosystem Data Workshop 15 January

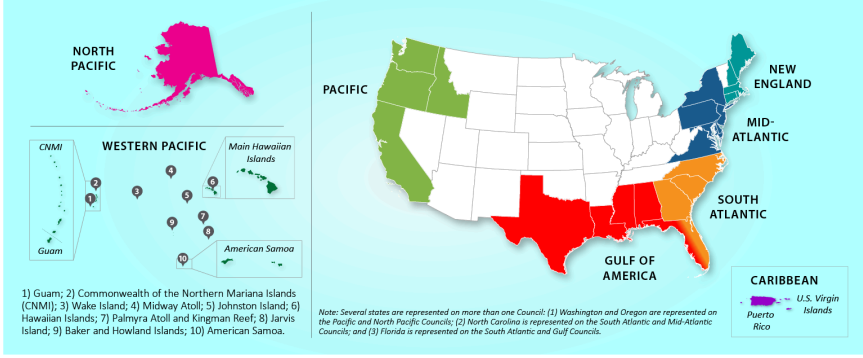
Semi-structured interviews: *Complete*

- Key Council staff invited (2-4 per region)
- Interviews December 2025-January 2026:
  - Review/validate/update data products and uses of record from lit review
  - Successes and challenges with current information and processes?
  - What might be done differently to better meet Council objectives?

35 Contacted, 15 Interviewed + 5 Correspondence
7/8 Councils participated

Final Report updated to incorporate April SSC comments and posted online

Learning from the Councils: Diverse Ecosystem Approaches



1. FMP/Indicator-Based (North Pacific, Pacific, Mid-Atlantic, New England)

- High-value, data-rich stocks with complex assessments
- Annual ecosystem reports, indicators can inform assessments
- Risk tables and uncertainty frameworks integrate ecosystem considerations
- Non-regulatory Fishery Ecosystem Plans (FEPs) provide actionable pathways

2. FEP/Geography-Based (Western Pacific, Caribbean)

- Human community connections to complex and data-limited fisheries
- Place-based ecosystem or fishery management plans serve as operational management documents
- Co-developed with stakeholders reflecting distinct regional conditions
- Ecosystem considerations embedded in management structure

3. Developing Approaches (South Atlantic, Gulf)

- Recreational fishery dominance with fewer assessments relative to managed species
- Species-based FMPs with expanding ecosystem integration
- South Atlantic links Essential Fish Habitat with ecosystem efforts
- Gulf developing Fishery Ecosystem Issues as action-oriented framework

Common Management Concerns

Forage Fish: Multiple Councils have implemented protections for unmanaged forage species or developed harvest control rules accounting for ecosystem services.

Climate Change: All regions are addressing rapid ecosystem changes. Data-rich systems with long-term ecosystem reporting have experienced unexpected stock collapses, highlighting the need for climate-ready management approaches.

Common Challenges

Complexity of Ecosystem Information: Council staff emphasize the need to provide information in "digestible packets," with clear linkages to management processes and decisions.

Resource constraints: Even data-rich regions identify capacity limitations for integrating ecosystem information into management.

Stakeholder perceptions: In some regions, considering ecosystem information is viewed as only increasing restrictions, rather than expanding opportunities.

Successful Practices

Iterative Co-Development: Ecosystem reports have been restructured with Council feedback in several regions, enhancing report utility. Most FEPs emphasize collaborative development of problem statements, analyses, conceptual models, model scenarios, and indicators with fishers, managers, and scientists.

Risk-Based Frameworks: North Pacific, Pacific, New England, Mid-Atlantic, and Caribbean are developing or have implemented indicator-based risk assessments to adjust catch advice and/or to support strategic decisions.

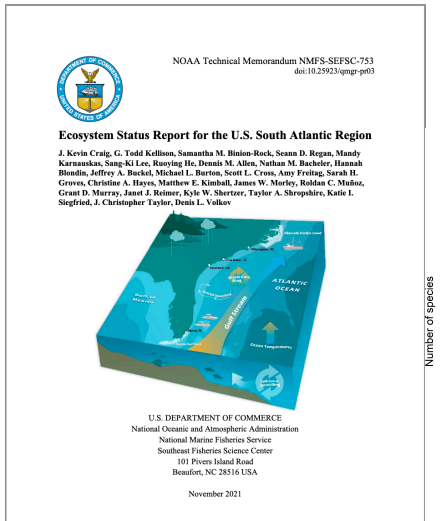
Actionable FEPs: “Action modules” (North Pacific), “Initiatives” (Pacific), “Fishery Ecosystem Issues” (Gulf), and the EAFM approach in the Mid-Atlantic provide structured pathways from fishery ecosystem plans to management action for specific, Council-selected issues.

Multi-scale Ecosystem Information: Regular reporting at the ecosystem scale provides context for decisions and familiarity with ecosystem data. Stock-specific ecosystem reports link environmental drivers to individual stock productivity for use in stock assessment and catch specification. A structured dialogue process between ecosystem and stock assessment scientists is producing similar stock-level information in the Pacific.

SAFMC Unique Strengths

- Habitat-Ecosystem Integration: Explicitly links EFH policies with ecosystem approaches through comprehensive policy statements
- Citizen Science: Proactive incorporation of participatory data collection
- Existing Products: Recent Ecosystem Status Report, fish Climate Vulnerability Assessment, and fishing community CVA provide ready-to-use information
- Modeling Investments: The regional food web model is poised to address Council questions

The South Atlantic's combination of habitat focus, existing ecosystem tools, and commitment to stakeholder engagement provides a strong foundation for advancing ecosystem-based fishery management in ways responsive to the region's unique challenges and opportunities.


NOAA Technical Memorandum NMFS-SEFSC-753
doi:10.25923/qmgr-pr03

Ecosystem Status Report for the U.S. South Atlantic Region

J. Kevin Craig, G. Todd Kellison, Samantha M. Binion-Rock, Seana D. Regan, Mandy Karnauskas, Sang-Ki Lee, Ruoying He, Dennis M. Allen, Nathan M. Bacheler, Hannah Blondin, Jeffrey A. Buckel, Michael L. Burton, Scott L. Cross, Amy Freitag, Sarah H. Groves, Christine A. Hayes, Matthew E. Kimball, James W. Morley, Roldan C. Muñoz, Grant D. Murray, Janet J. Reimer, Kyle W. Shertzer, Taylor A. Shropshire, Katie I. Siegfried, J. Christopher Taylor, Denis L. Volkov

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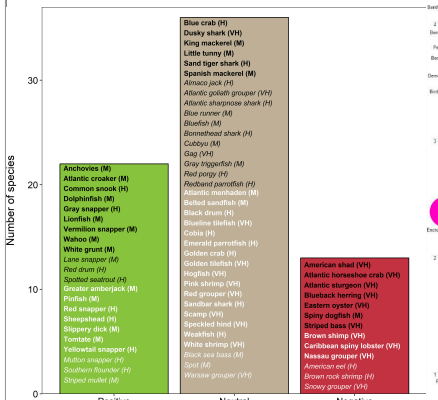
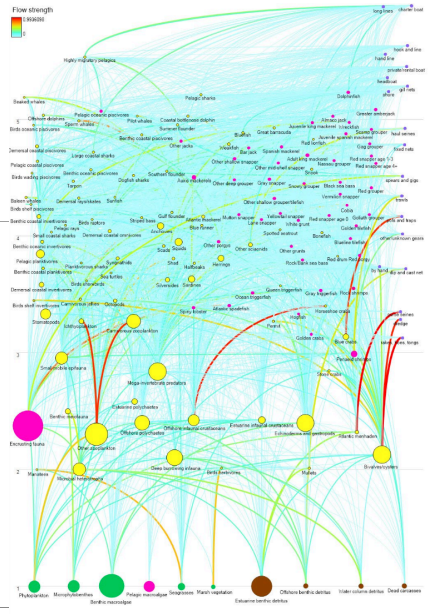
November 2021





Preliminary Recommendations for SAFMC

- Hybrid Approach: Given mix of data-rich and data-limited stocks across diverse habitats, combining aspects of successful practices from different Councils has more potential than adopting a particular Council's ecosystem approach
- Leverage Existing Products: Align indicators from the South Atlantic ESR with objectives in EFH policy documents and CVA results to evaluate whether an integrated risk assessment framework could be developed
- Formalize Action Process: Consider a process to develop explicit ecosystem initiatives or issues (similar to Pacific, North Pacific, Gulf) to move from planning to tangible management actions on priority topics
- Update Reporting Frequency: Work toward more regular ecosystem reporting focused on Council-derived objectives and associated indicators produced with streamlined automation processes developed for the Caribbean ESR
- Expand CVA Use: Consider climate vulnerability information in management processes where characterizing uncertainty is important (SSC ABC decisions)
- Explore Novel Approaches: Evaluate multispecies management strategies using the existing food web model, considering both commercial yield and recreational fishing opportunity objectives

Project Update: Objective 2

Identify opportunities and methods for incorporating identified ecosystem information into SAFMC management processes, including inter-jurisdictional management decision- making processes, and identify practical requirements for successful implementation (e.g. data quality, frequency of information updates, regional council process consistency, implementation timelines)

Review of 3+ years of Council actions

- Classify management decisions by data needs and process timelines
- List decisions linked or potentially linked to ecosystem information
- Recommend practical further uses of ecosystem information

Alignment of EFH/FEP policies and indicators

Prototype indicators from global sources

Catch specification

- Climate vulnerability consideration in current SAFMC risk policy?
- Utility of ecosystem profiles or risk tables used in other regions?
- Discussed options at SSC meeting in April

Novel approach: food web based multispecies MSE

- Outline Council decision points
- Highlight use of existing resources

Draft SAFMC Options report outlining these opportunities and methods posted online

Alignment of EFH/FEP policies and indicators

Given the Council emphasis on habitat issues, habitat FMPs and other policy documents were reviewed along with current ecosystem data products to evaluate “quick wins” aligning objectives and current indicators, and identifying where data from citizen science programs might augment existing indicator data products.

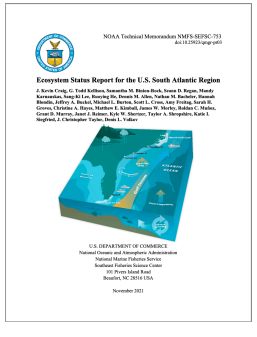
Summary Results:

- Food Web Policy: 5 of the 9 policies have potential indicators with high feasibility, 2 have moderate feasibility, and only 2 have low or unknown feasibility. Research information needs are already partially addressed by existing CVA and ESR indicators, and by current MSE efforts.
- Climate and Fisheries: current ESR indicators directly address policy statements. Gaps related to species distribution shifts and forecast conditions could be filled with existing information. Collaborative Council and NOAA review of current indicators should prioritize a subset for refinement and annual updates.
- Existing ESR indicators for SAV, coastal habitat attributes, land use and ocean economy align with SAV policy. However, comprehensive SAV indicators and research would require dedicated effort from multiple partners.

Available Indicators

Ecosystem Status Report (ESR): a document summarizing ecosystem information for a particular region, spanning physical, biological, economic, and social information.

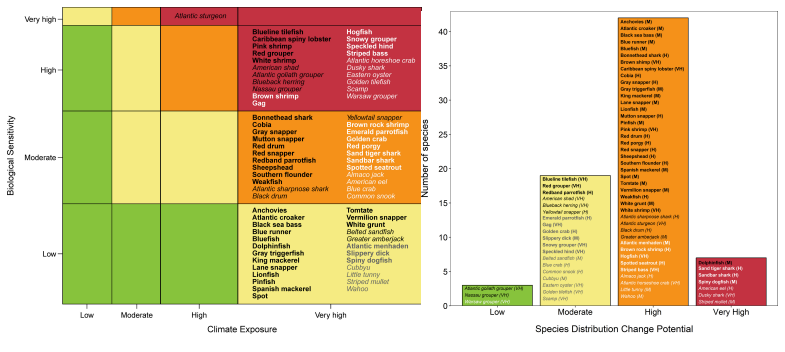
- Indicators are presented and interpreted in the context of historical trends and current status relative to any known reference points.
- Trends and status of indicators can contribute to risk assessment at the ecosystem or stock level.
- Also known as State of the Ecosystem (SOE) or Ecosystem Considerations reports.



Source: South Atlantic ESR

Climate Vulnerability Assessment (CVA): an evaluation of vulnerability to projected climate conditions based on standard metrics of sensitivity and exposure appropriate to the species, habitat, or community being assessed.

- In addition to detailed narratives of risks faced by each species, habitat, or community, CVA outputs include a ranking of risk across species, habitats, or communities within a region, facilitating risk assessment.
- CVA has been applied to marine fish and invertebrates, marine fish and invertebrate habitats, marine mammals, and fishing communities.



Source: Craig et al. 2025

Alignment of EFH/FEP policies and indicators: Food Webs and Connectivity Policy (1)

SAFMC Food Web and Connectivity Policy Objectives and Current Indicators

Policy	Brief Policy Description	Indicators Outlined in the Policy	Available Indicators	Potential Indicators	Potential Indicator Feasibility
Forage Fisheries	Consider forage impacts on predator productivity when setting catch limits	Forage stock abundance and dynamics for important forage by FMP (Appendix A)	Forage fish (menhaden) abundance and estuarine crab and shrimp landings	Add food web estimated trends for aggregate forage	High: use current food web model
Prey Importance	Classify important prey as ecosystem component species	Mass, occurrence, and degree of overlap among multiple predators	Average percent prey in diet by FMP (Appendix A)	Diet analysis to estimate prey mass, occurrence, and degree of overlap among multiple predators	Unknown, dependent on quality of existing food habits data
Food Web Indicators	Consider food web targets and thresholds for management action	Not listed	Mean Trophic Level	Estimate from food web model	High: use current food web model
Food Web Connectivity	Account for migratory species interactions across otherwise separate food webs	Not listed	None	Potentially from spatial food web model	Moderate: requires spatial update to food web model
Trophic Pathways	Maintain diverse (bottom up and top down) energy pathways	Diversity of energy pathways	None	Estimate from food web model	High: use current food web model

Alignment of EFH/FEP policies and indicators: Food Webs and Connectivity Policy (2)

SAFMC Food Web and Connectivity Policy Objectives and Current Indicators

Policy	Brief Policy Description	Indicators Outlined in the Policy	Available Indicators	Potential Indicators	Potential Indicator Feasibility
Food Web Models	Use food web models in multiple decision contexts where appropriate	Not listed	None	Identify desirable food web states and estimate from food web model	High: use current food web model, pending Council ecosystem objectives
Ecosystem Component Species	Definition: otherwise unmanaged species important to achieving ecosystem management objectives	Not listed	None	Use indicators for Prey Importance	High: aggregate indicators available
Invasive Species	Account for invasive species impacts in management actions	Lionfish predation on and competition with other reef species	None	Analysis of lionfish diet, distribution and abundance, potentially add to food web model	Moderate: published lionfish diet studies exist, requires abundance data and model update
Contaminants	Consider human health and food web impacts	Not listed	None	Potentially from seafood safety monitoring	Low: published contaminant studies have limited spatial scope

Alignment of EFH/FEP policies and indicators: Food Webs and Connectivity Policy

SAFMC Food Web and Connectivity Research Needs and Current Indicators

Research	Available Indicators	Potential Council Actions	Potential Action Feasibility
Climate Impacts on Productivity	CVA, Recruitment of Economically Important Species, Coral Bleaching	Prioritize and tailor to species based on CVA	Moderate: resource intensive depending on priority species
Offshore Habitats for Estuarine Species	Surface and Bottom Temperature, FL Current Transport, Gulf Stream Position, Upwelling, Primary Productivity, Ocean Acidification	Prioritize and tailor existing indicators to species based on CVA	Moderate: resource intensive depending on priority species
Role of Forage Species	Forage fish (menhaden) abundance and estuarine crab and shrimp landings	Habitat specific managed species diet	Unknown, dependent on quality of existing food habits data
Fix Data Gaps	None	Ensure full use of ESR and CVA data, prioritize data for Citizen Science collection	Mixed: will vary by application
Overarching Risks	CVA, Community CVA, Sea Level Rise, FL Current Transport, Gulf Stream Position, Upwelling	Consider FMP level risks to refine and align existing indicators with management	High: existing CVA and ESR applied by FMP
Species Risk Assessments	CVA	Clarify additional factors to build on CVA	Moderate: depends on additional factors needed
MSEs	Peterson et al 2025	List/provide model code, inputs, and outputs across analyses	High: central repository for existing models
Ecosystem Reference Points	None	Develop objectives before reference points	Moderate: requires Council objectives to test literature ELRPs
Essential Fish Habitat	Wetlands and Forests, SAV, Oyster Reefs, Coral Demographics and Bleaching, Nearshore, Offshore Hard Bottom, and Coral Reef Fish Diversity and Abundance	Prioritize and tailor existing indicators to EFH and HAPC	High: many ESR indicators align with habitats

Alignment of EFH/FEP policies and indicators: Climate Variability and Fisheries

SAFMC Climate Variability and Fisheries Policy Objectives and Current Indicators

Policy	Brief Policy Description	Indicators Outlined in the Policy	Available Indicators	Potential Indicators	Potential Indicator Feasibility
Collaboration	Work across jurisdictions with multiple organizations and stakeholders	Species distribution shifts	None	Latitudinal and depth shifts for all or individual species	High: available on DisMAP website
Climate Indicators	Develop and present climate indicators annually	Climate, ecological, social, and economic trends and status, environmentally driven fishery trends	5 Climate, 13 Physical, 5 Habitat, 4 Low and 6 Upper Trophic Level, 8 Fishery, Social, and Economic indicator categories	Review and refine existing before considering additional indicators	High: prioritize available indicators for refinement
Tradeoffs	Consider increased uncertainty and changing productivity in management	Uncertainty and stock productivity	Biomass and Recruitment of Commercially Important Species, Shrimp, Crab, and Oyster landings	Short term ocean forecasts including uncertainty, MSE with changing productivity	Moderate: resources required to integrate regional ocean forecasts and uncertainty in MSE
Precautionary	Apply precautionary principle under uncertain future climate conditions	Not listed	None	Short term ocean forecasts including uncertainty	Moderate: resources required to process regional ocean forecasts
New Fisheries	Manage new fishery development to avoid negative EFH impacts	Not listed	None	Landings of currently unmanaged species	Moderate: resources required to compile information from multiple sources

Alignment of EFH/FEP policies and indicators: Climate Variability and Fisheries

SAFMC Climate Variability and Fisheries Research Needs and Current Indicators

Research	Available Indicators	Potential Council Actions	Potential Action Feasibility
Climate Impacts on Productivity	CVA combined with many ESR indicators	Prioritize and tailor existing indicators to species based on CVA	Moderate: resource intensive depending on priority species
Climate Impacts in Assessments	ESR indicators need refinement for assessment application	Prioritize and tailor existing ESR indicators to assessments based on CVA	Moderate: resource intensive depending on priority species
3D Estuarine-Coastal-Ocean Observations	Surface and Bottom Temperature, FL Current Transport, Gulf Stream Position, Upwelling	Add ocean model reanalysis products (GLORYS) to existing indicators	High: apply methods and code developed in other regions
Climate Robust MSE	Peterson et al 2025	Consider standard climate scenarios in all MSEs	High: develop simple climate scenarios as robustness tests
Socioeconomic Impacts and Fishery Responses	CVA, Community CVA, Sea Level Rise, FL Current Transport, Gulf Stream Position, Upwelling	Prioritize and tailor existing indicators	High: existing CVA, Community CVA, and ESR indicators
Offshore Habitats for Estuarine Species	Surface and Bottom Temperature, FL Current Transport, Gulf Stream Position, Upwelling, Primary Productivity, Ocean Acidification	Prioritize and tailor existing indicators to species based on CVA	Moderate: resource intensive depending on priority species

Note that an example of indicator development for the “3D Estuarine-Coastal-Ocean Observations” research priority is reviewed next under Prototype Indicator Development.

Alignment of EFH/FEP policies and indicators: Marine Submerged Aquatic Vegetation

SAFMC Submerged Aquatic Vegetation Policy Objectives and Current Indicators

Policy	Brief Policy Description	Indicators Outlined in the Policy	Available Indicators	Potential Indicators	Potential Indicator Feasibility
Monitoring	Monitoring is needed for assessment and management	SAV distribution and shifts, water quality	SAV extent and % change	Same indicator with more comprehensive data in space and time	Low-Moderate: depends on multiple states resources and coordination
Planning	Establish goals, objectives, measures of success	Not listed	SAV extent and % change, Coastal salinity	Change in SAV distribution; habitat depth, sediment, light penetration, salinity, and wave energy	Mixed: depends on water quality information availability
Management	Review existing human activity rules, water quality standards, and restoration guidelines	Not listed	Coastal salinity, Stream flow, Nutrient loading, Coastal and Urban land use	Habitat disturbance indicators (dredging, construction, bottom contact from boating and fishing)	Low-Moderate: resource intensive to collate information from many local sources
Education and Enforcement	Analyze and communicate benefits of SAV protection, evaluate current enforcement	Not listed	Total ocean economy	Commercial and Recreational landings and value for SAV dependent species	High: subset of information from current indicators

Alignment of EFH/FEP policies and indicators: Marine Submerged Aquatic Vegetation

SAFMC Submerged Aquatic Vegetation Research Needs and Current Indicators

Research	Available Indicators	Potential Council Actions	Potential Action Feasibility
Standardize Mapping Protocols	None	Collaborate with partners to design and implement regional surveys	Moderate: resource intensive proces
EFH GIS Database	SAV areal coverage and % change based on existing data	Expand Council EFH and HAPC maps	Moderate: resource intensive process
Evaluate Water Quality	Stream Flow, Nutrient Loading, Precipitation and Drought	Prioritize existing indicators for further refinement	Moderate-High: may need additional indicators for water clarity
Drivers of SAV Loss	SAV, Stream Flow, Nutrient Loading, Precipitation and Drought, Sea Level Rise, Storms and Hurricanes, Primary Productivity, Human Population, Coastal Land Use	Prioritize existing indicators for further refinement	High: many potential indicators for SAV drivers exist
Restoration Efficacy	None	Collaborate with partners	Moderate: resource intensive process
Climate Impacts on SAV	SAV, Surface and Bottom Temperature, Primary Productivity, Ocean Acidification	Consider habitat climate vulnerability assessment	Moderate: resource intensive process

Prototype Ocean Indicators

The feasibility of developing ocean indicators from global and regional ocean physics datasets for SAFMC habitat or other decisions was evaluated using methods developed for the Northeast U.S. shelf.

Regional ocean models and global ocean models already provide both hindcasts and forecasts of ocean temperature and salinity for the South Atlantic.

- NOAA MOM6 model (https://psl.noaa.gov/cefi_portal/)
- Copernicus ocean reanalysis (https://data.marine.copernicus.eu/products)

NEFSC has developed code to derive indicators from these data sources for the region north of Cape Hatteras. The code has been modified to derive prototype indicators for the South Atlantic region.

2024 NEFSC SOE Report: Number of days at scallop-stressing bottom temperature in 2023

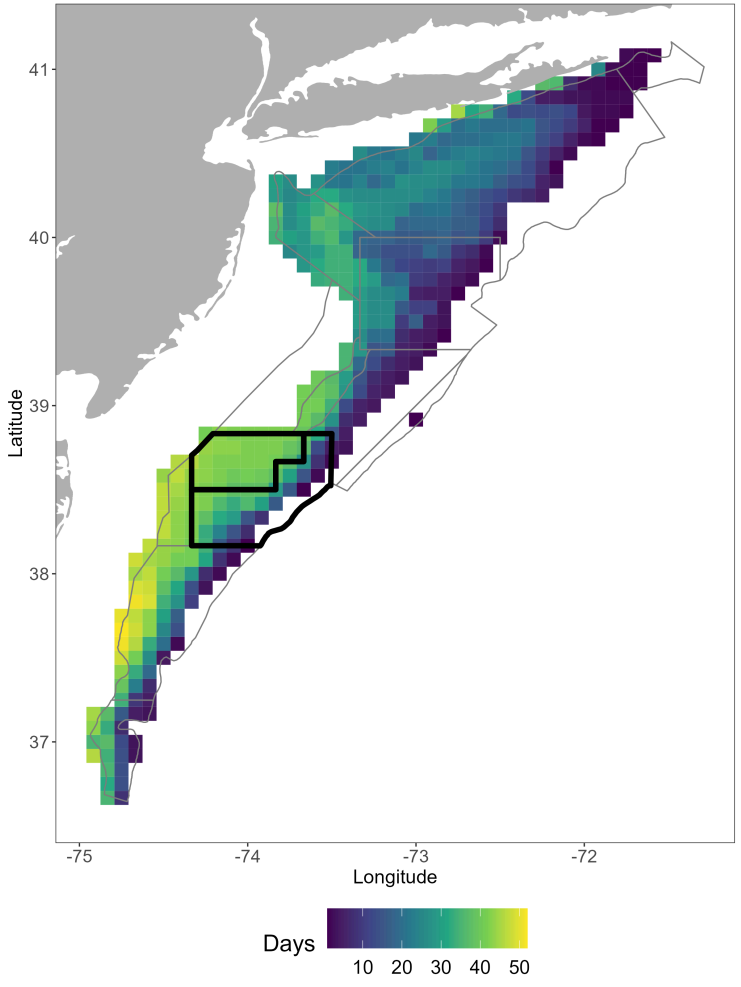


Image courtesy Joseph Caracappa, NEFSC

Prototype Ocean Indicators: what do they add?

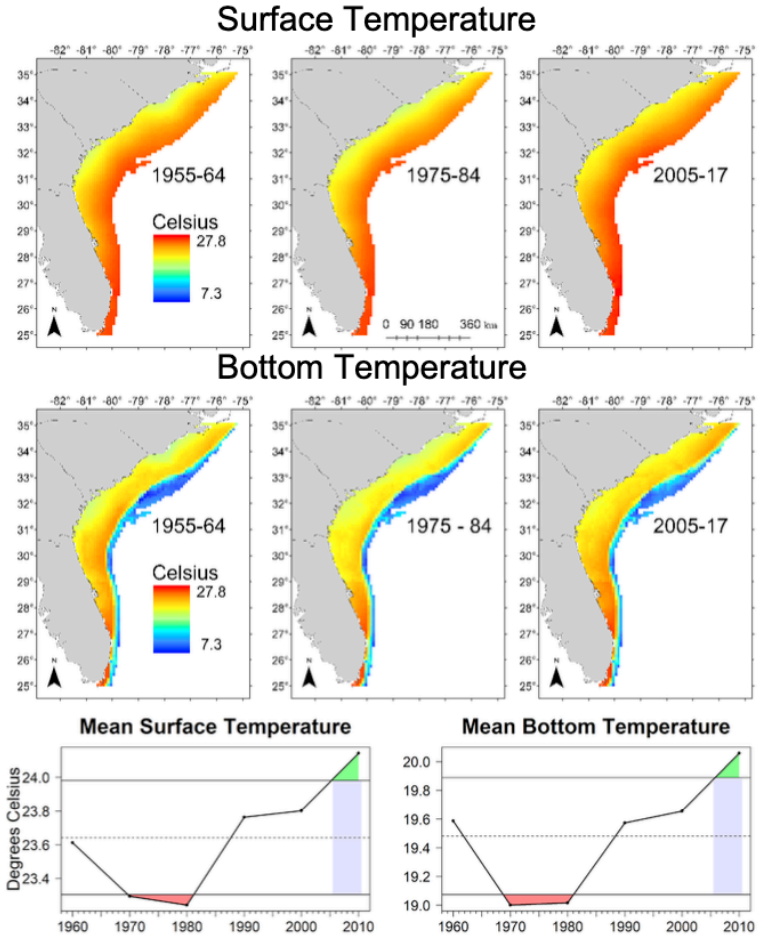


Figure 4.3. Decadal temperatures derived from the NCEI Ocean Database. Top two rows show distributions of surface and bottom temperatures in the South Atlantic for three decades. Bottom row shows mean temperature for each decade (1955 – 1965 through 2005 – 2017). Note the different scales on the y-axes.

Ocean surface and bottom temperature indicators are already included in the South Atlantic ESR

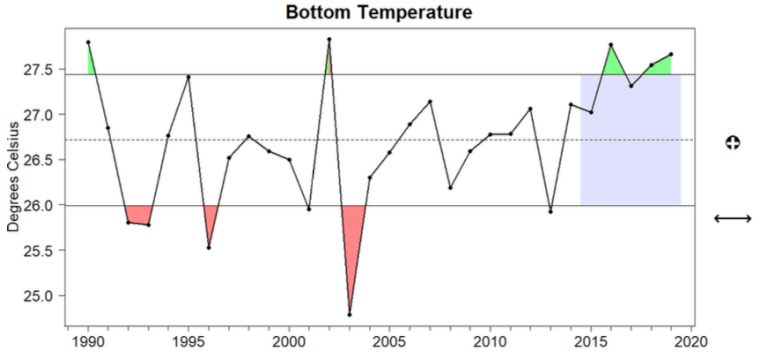


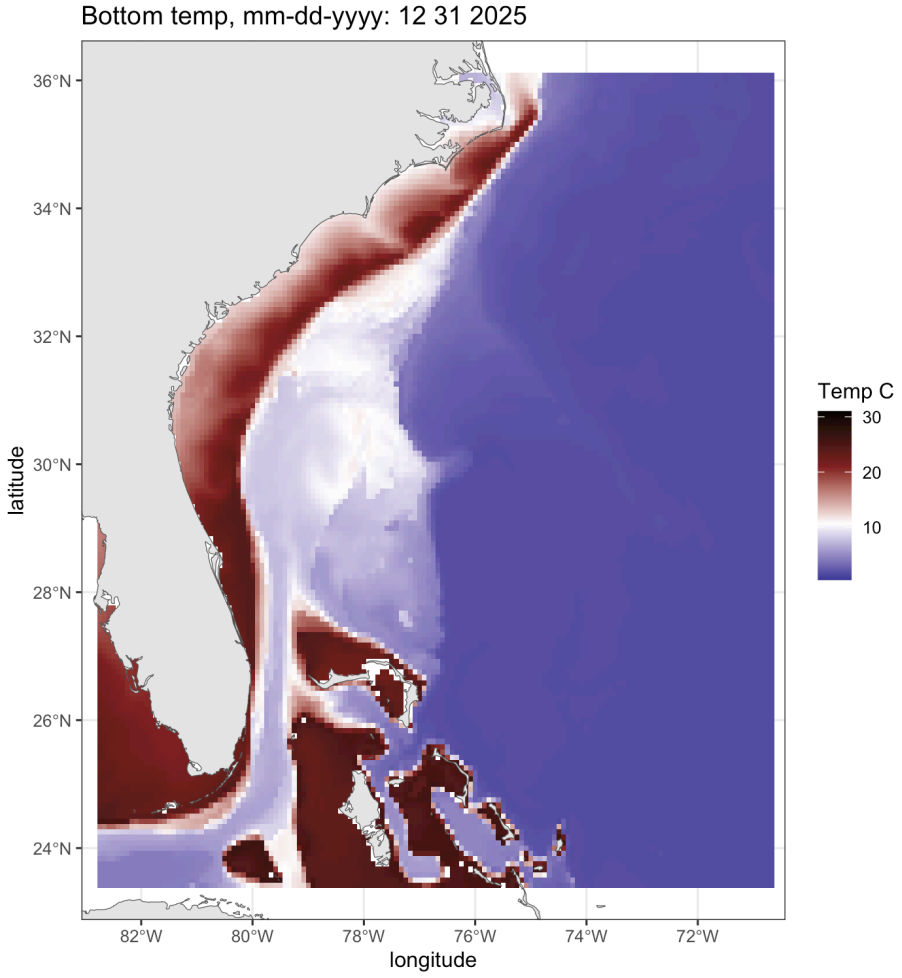
Figure 4.2. Mean annual (April to September) bottom temperature from shipboard surveys in the U.S. South Atlantic.

The objective is to produce maps and time series indicating where and when bottom temperature conditions approach or exceed stressful levels relevant to particular species ranging from corals to targeted fish species.

Stressful temperature levels for key species would need to be determined from literature or other studies if unknown.

Prototype Ocean Indicators: Source information

A single day's bottom temperature information



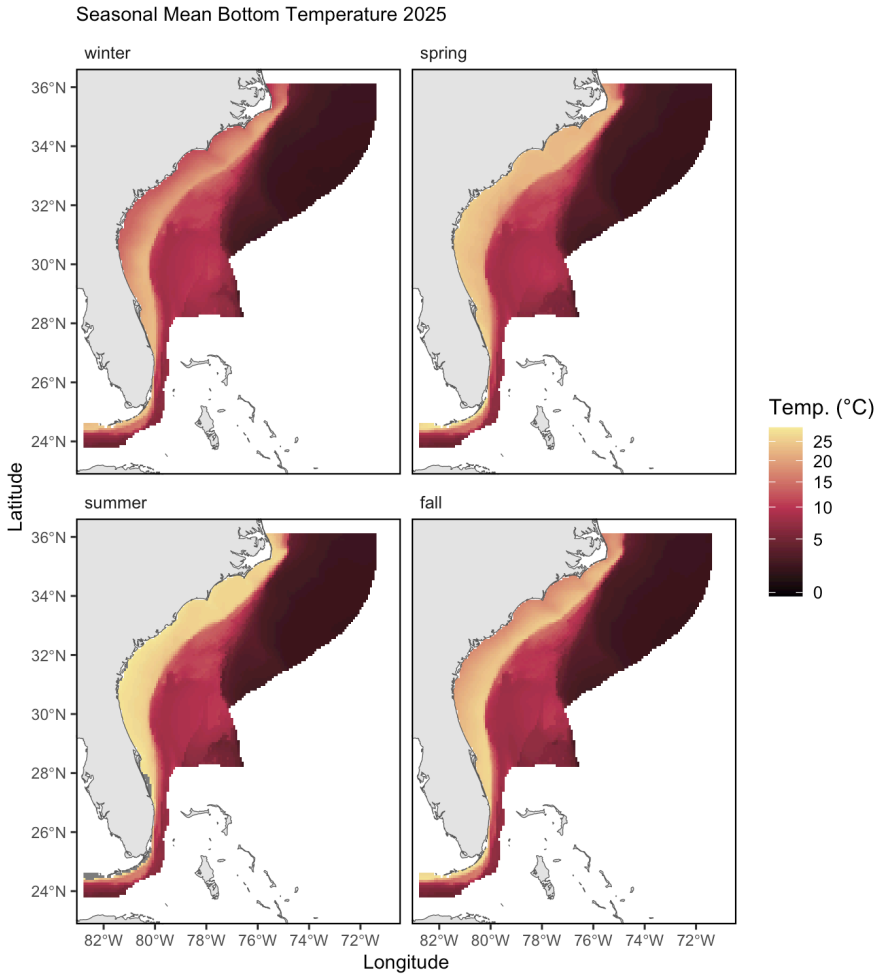
The Global Ocean Physics Reanalysis (GLORYS) brings worldwide observations into an ocean physics model. Observations are from satellites, ships, and fixed locations.

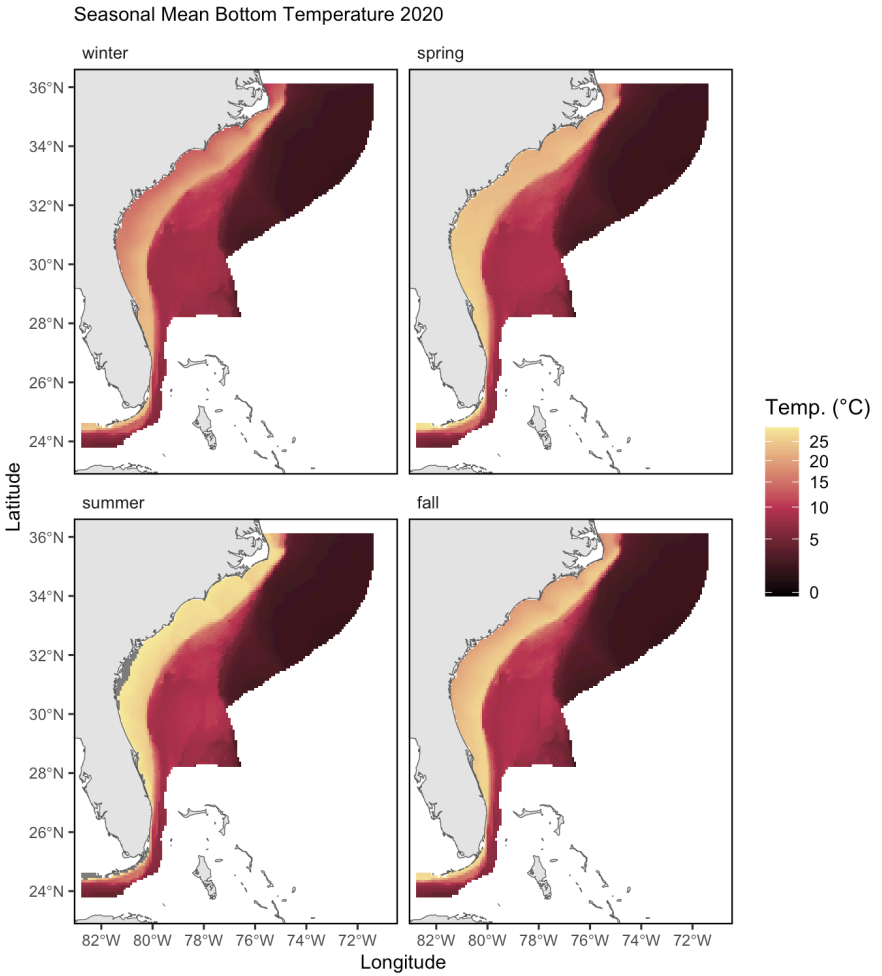
Information from 1993-May 2026 is currently included, with updates approximately each month.

"This product includes daily and monthly mean files for temperature, salinity, currents, sea level, mixed layer depth and ice parameters from the top to the bottom. The global ocean output files are displayed on a standard regular grid at 1/12° (approximatively 8 km) and on 50 standard levels."

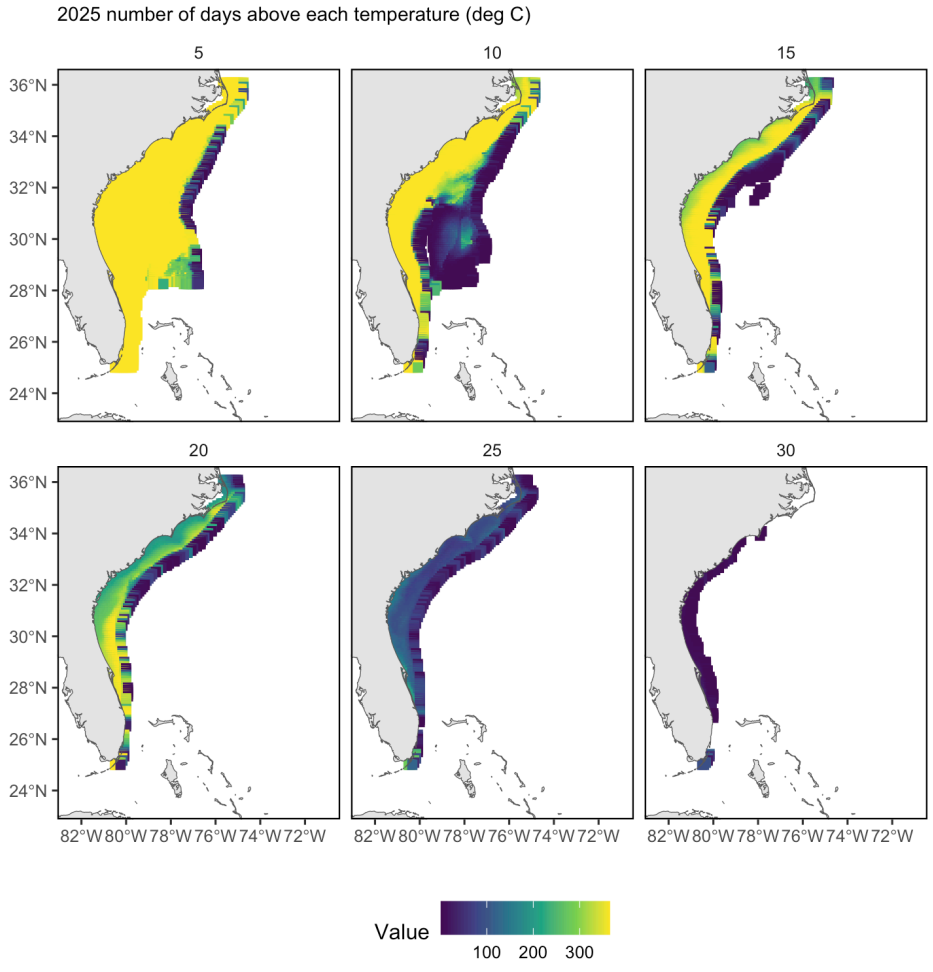
Citation: Jean-Michel L, Eric G, Romain B-B, Gilles G, Angélique M, Marie D, Clément B, Mathieu H, Olivier LG, Charly R, Tony C, Charles-Emmanuel T, Florent G, Giovanni R, Mounir B, Yann D and Pierre-Yves LT (2021) The Copernicus Global 1/12° Oceanic and Sea Ice GLORYS12 Reanalysis. Front. Earth Sci. 9:698876. doi: 10.3389/feart.2021.698876

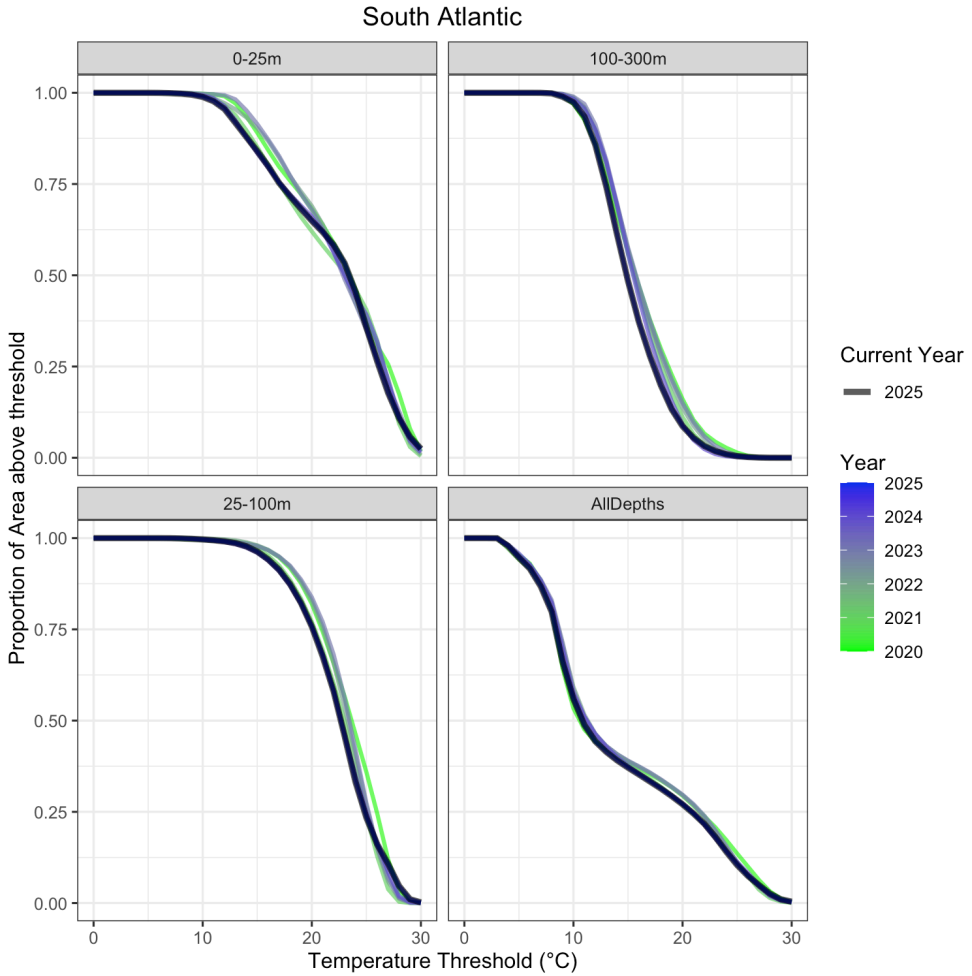
Prototype Ocean Indicators: Average seasonal bottom temperature each year





Prototype Ocean Indicators: Number of days or amount of area exceeding stressful temperature





Project Update: Objective 3

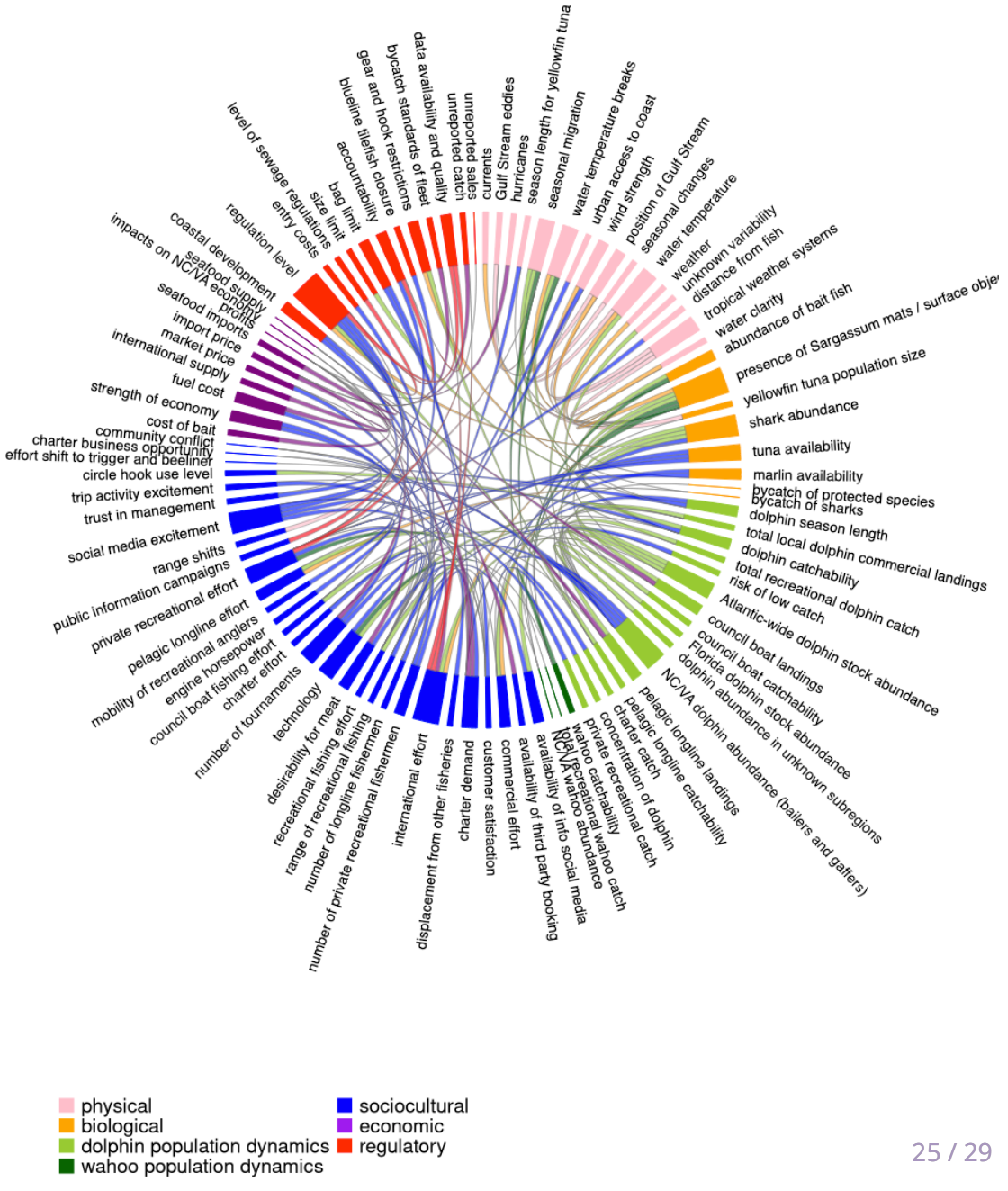
Identify opportunities to continue to expand cooperative, constituent-engaged data collection and research to improve the available ecosystem information in the South Atlantic region (e.g., study fleets, cooperative research, citizen science).

Review existing SAFMC Citizen Science efforts

Prioritize potential cooperative data collections based on the analysis of SAFMC management processes most likely to benefit from ecosystem information noted under the previous objective, and outline opportunities for expansion to collect this priority data

https://safmc.net/citizen-science/dolphin-wahoo-participatory-workshops/

https://safmc-shinyapps.shinyapps.io/NCVA_DolphinWorkshops2020/

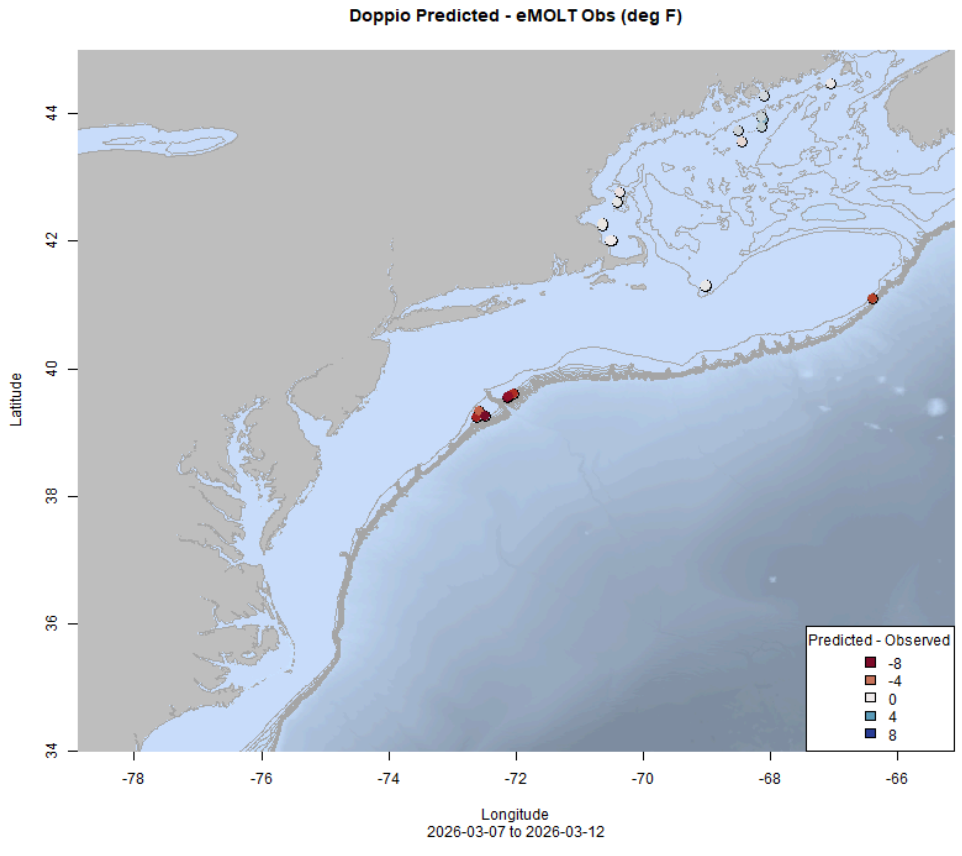


Integration with Citizen Science

One potential extension of existing South Atlantic cooperative data collection could be ocean temperature observations for comparison with regional or global ocean data products such as MOM6 and GLORYS.

Comparisons of vessel-collected temperature with model assimilated temperature can identify where improvements can be made to models as well as provide more direct information for management in near-real time.

The Northeast U.S. eMOLT (Environmental Monitors on Lobster Traps and Large Trawlers) program regularly compares bottom temperature data collected aboard fishing vessels with regional ocean model bottom temperature predictions, highlighting both areas of agreement and areas where measurements and model predictions diverge.



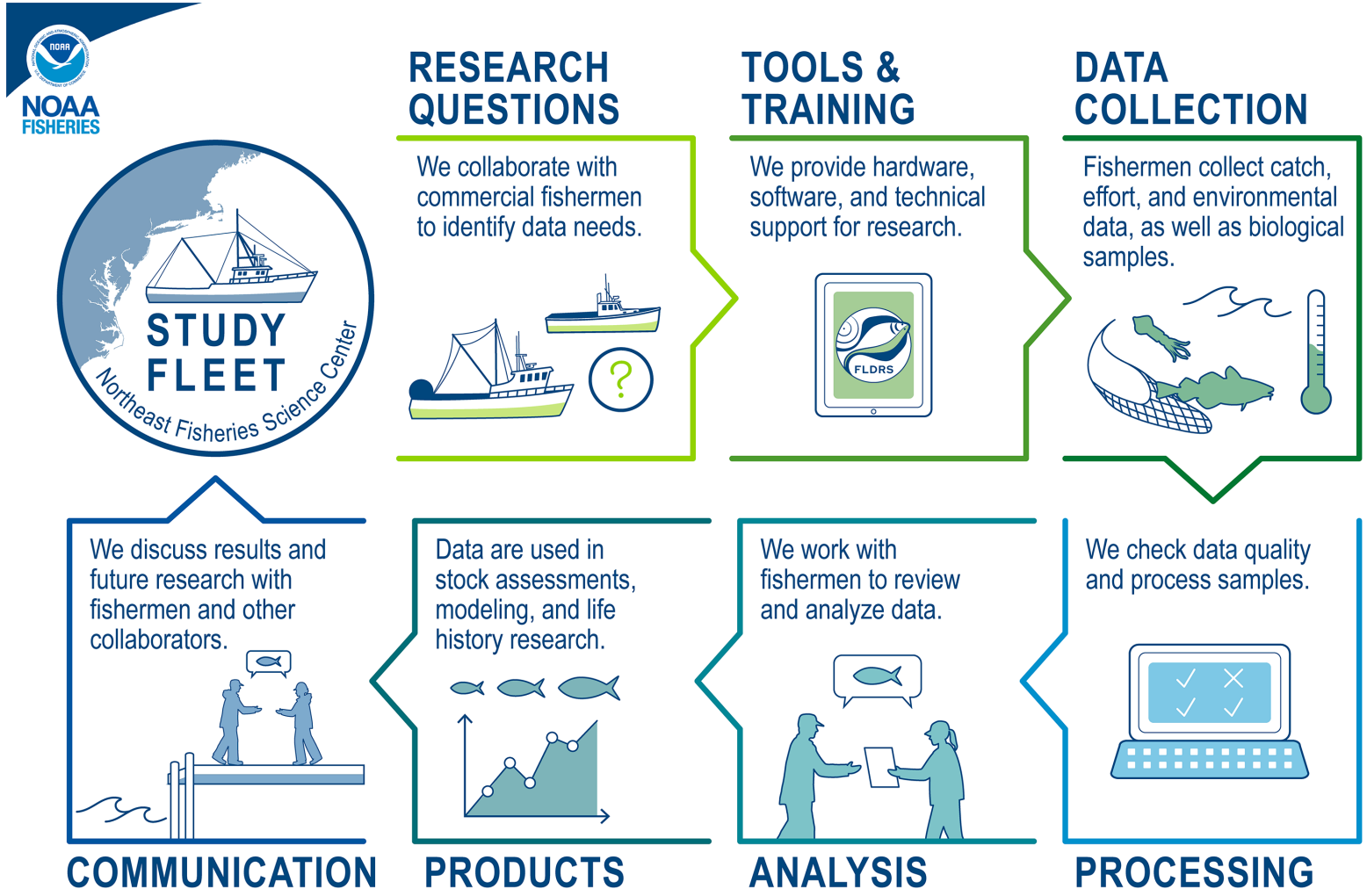
Source: weekly eMOLT update email, George Maynard, eMOLT coordinator

Cooperative Research

Multiple cooperative research programs exist in the Southeast. A study fleet could collect data for ecosystem indicators.

Data collected by vessels participating in the NEFSC study fleet program have been used in species distribution modeling, biological studies, evaluation of potential ocean industry user conflicts, and as supporting data for stock assessment.

This program also collects oceanographic indicators which are directly associated with haul level catch data, allowing analysis of habitat associations.



Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/science-data/cooperative-research-northeast

Deliverables and Schedule

Project duration ~1 year, with regular Project Oversight Team updates

- **31 October 2025:** Interim Report on all Councils data products and approaches to Project Oversight Team for feedback and revision
- **31 January 2026:** Draft Report on all Councils data products and approaches to Council and Presentation at Ecosystem Data Gaps Workshop
- **30 April 2026:** Draft Report on Pathways for Integrating Ecosystem Information and Prototype Ocean Indicators to SSC and Council Committees for feedback and revision
- **31 July 2026:** Final Report and summary for South Atlantic Bite to Council
- **September 2026:** Present all project results at Council meeting

Discussion and Questions for the HEAP

Opportunities for incorporating ecosystem information into SAFMC Management Processes: Aligning EFH Policies with ecosystem indicators

- Are the current indicators identified appropriately aligned with Habitat Policies?
- Do you see any challenges with using the current information?
- Are the potential indicators identified appropriate?
- Can you suggest different indicators to monitor progress on habitat policy objectives?

Prototype Ecosystem Indicators:

- Do the indicators make sense? Are they clearly explained?
- Can you forsee any uses for a spatial indicator of bottom temperature?

Opportunities to expand cooperative data collection:

- Can cooperative research or citizen science validate model-derived habitat (bottom temperature) indicators?
- Can you suggest other information to be collected by fishery participants or the public?