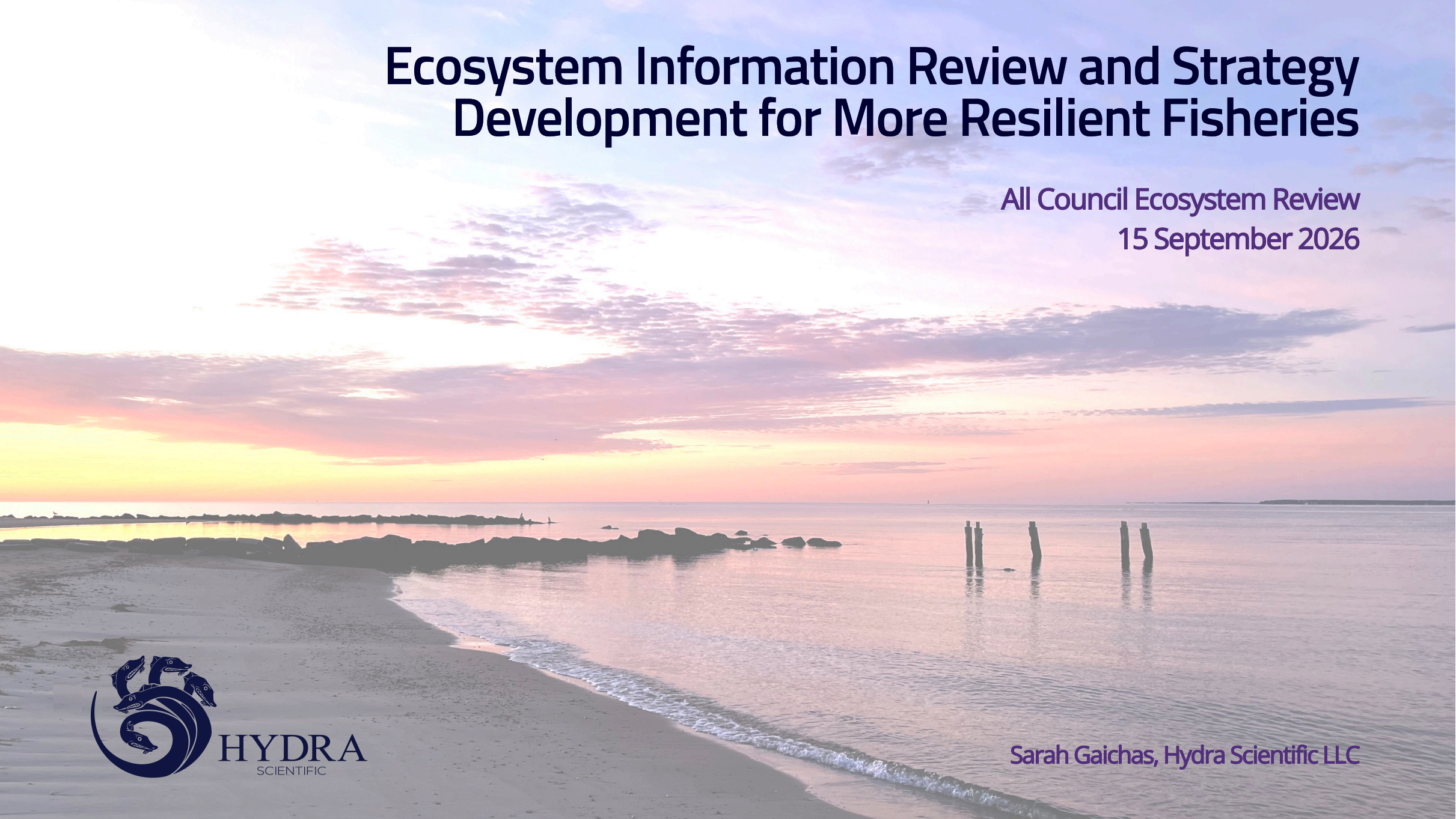
Ecosystem Information Review and Strategy Development for More Resilient Fisheries

All Council Ecosystem Review
15 September 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).

Methods: 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:

- 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

Final Report posted online

Semi-structured interviews:

- 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

Results Obj 1:

Diversity

A range of latitudes,

ecology,

human communities,

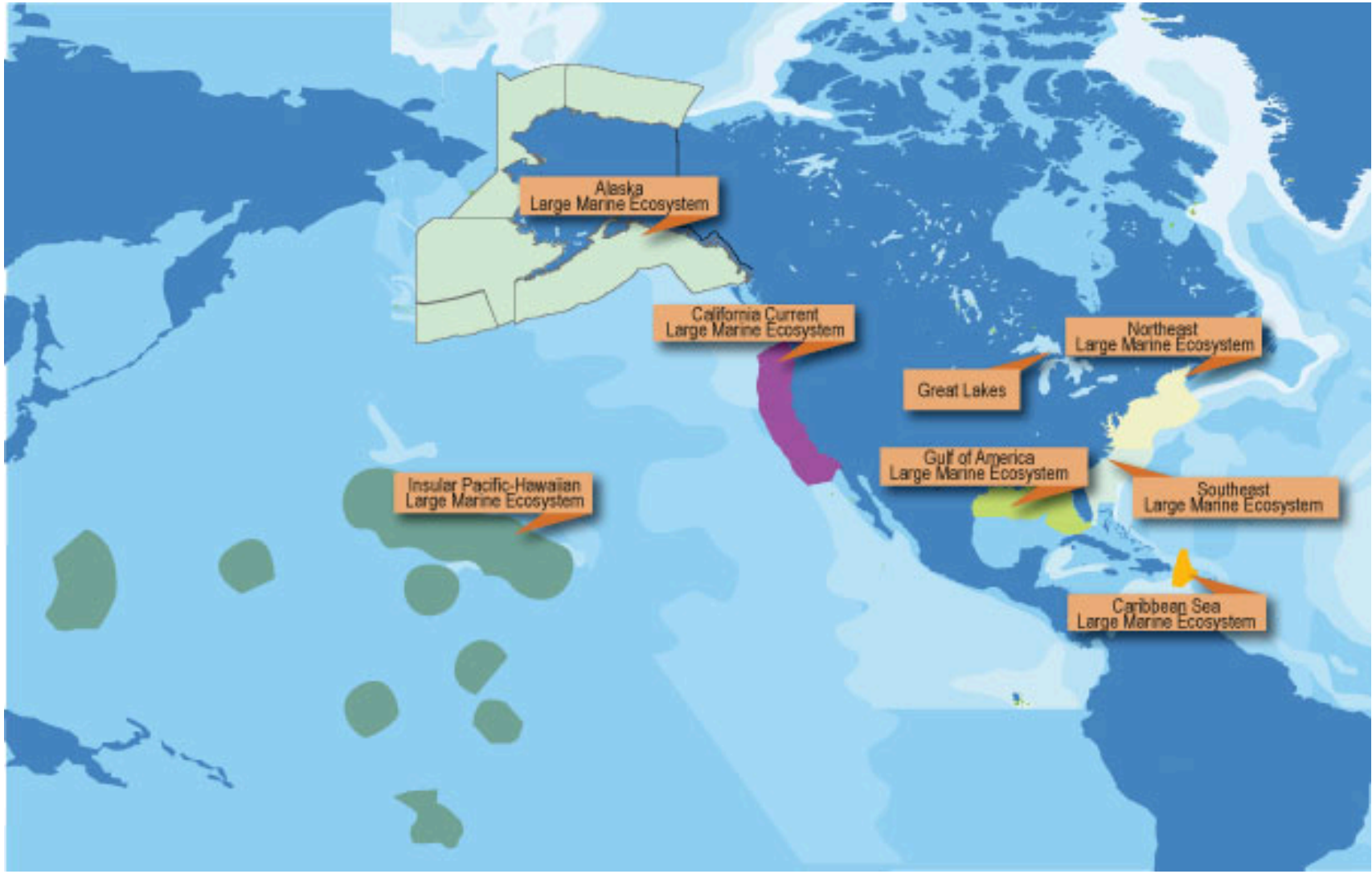
fisheries,

data availability,

resources,

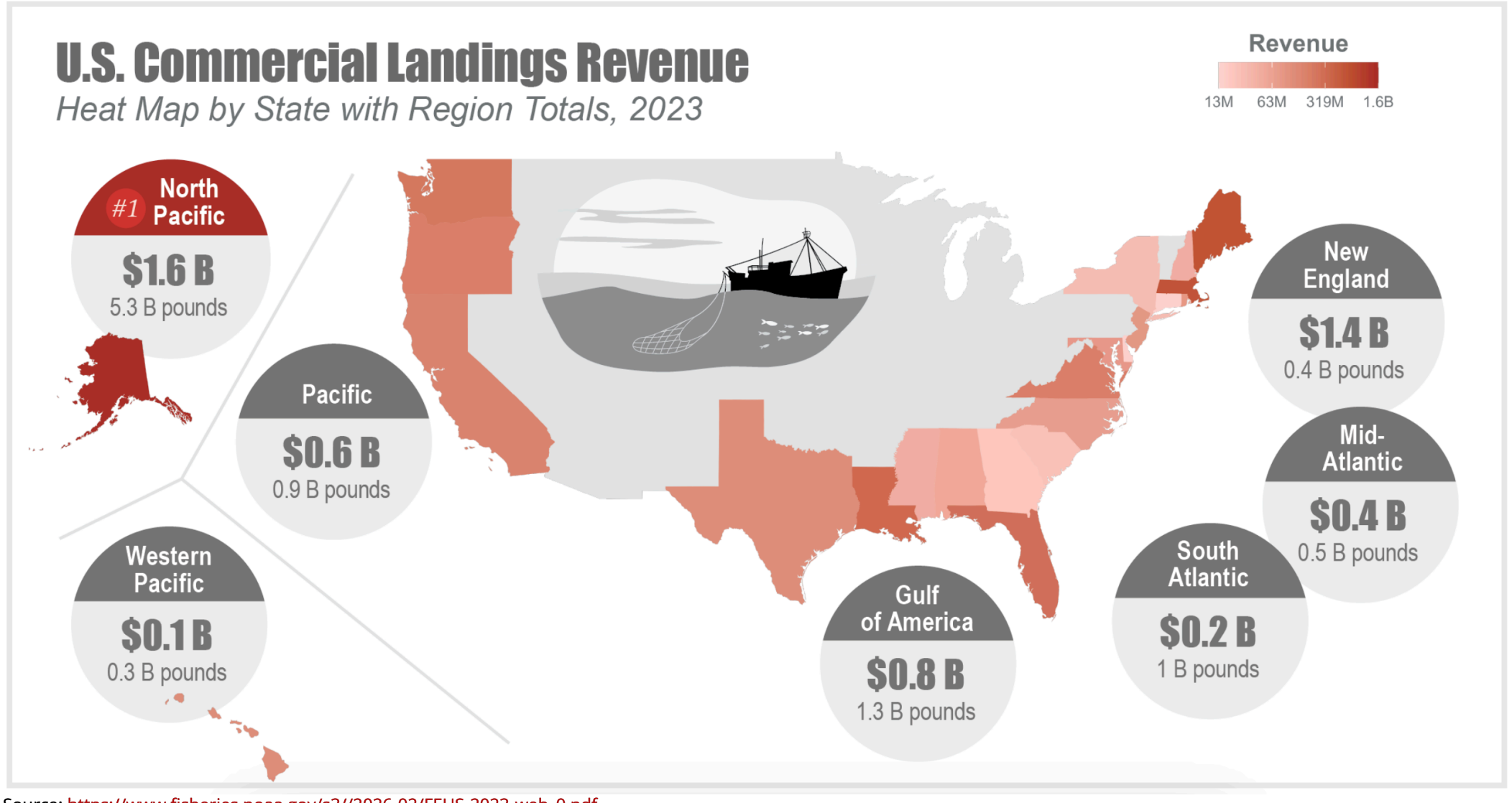
and issues →

range of approaches.



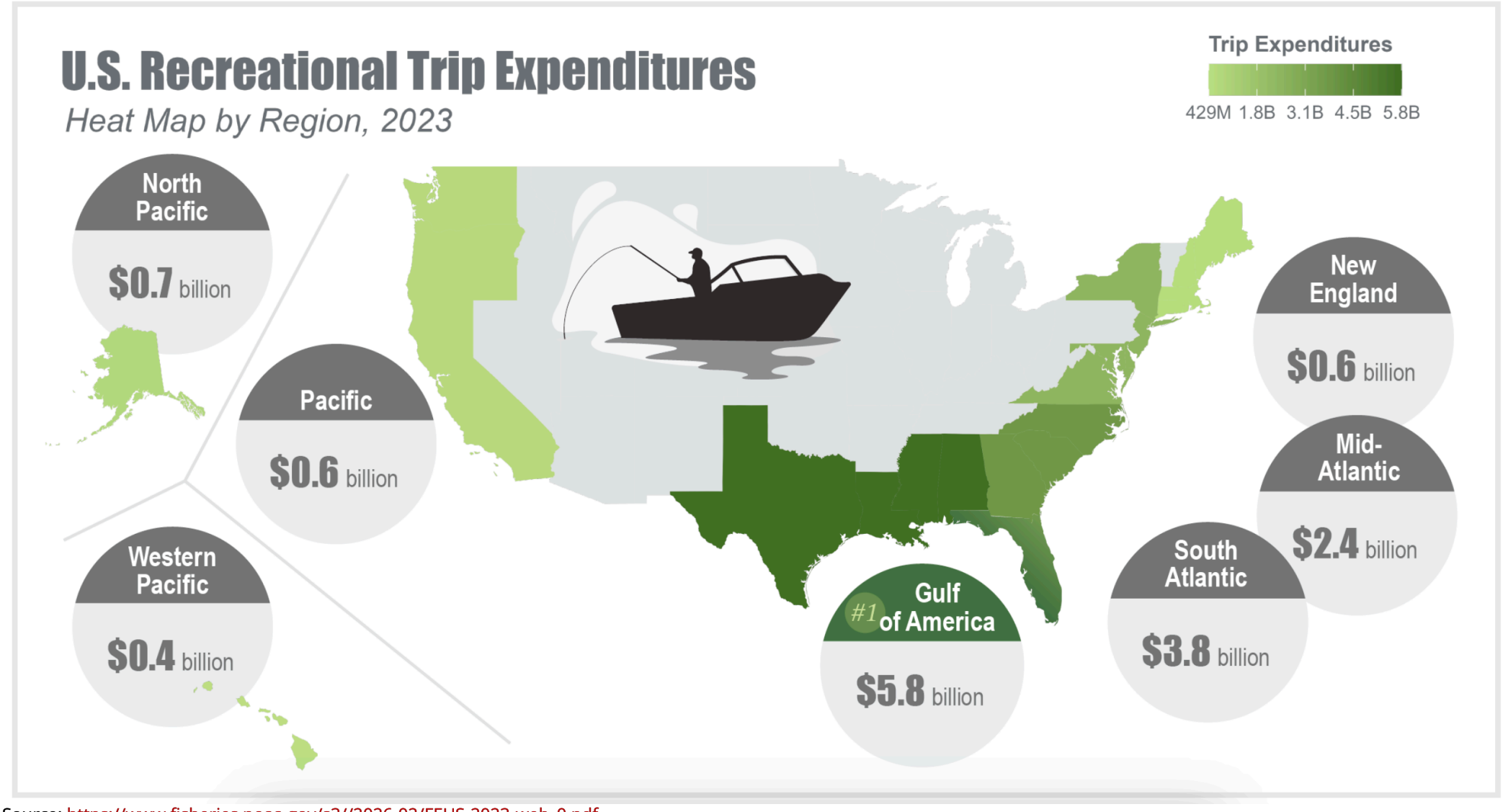
Source: https://ecowatch.noaa.gov/about

Diversity: Commercial Fisheries



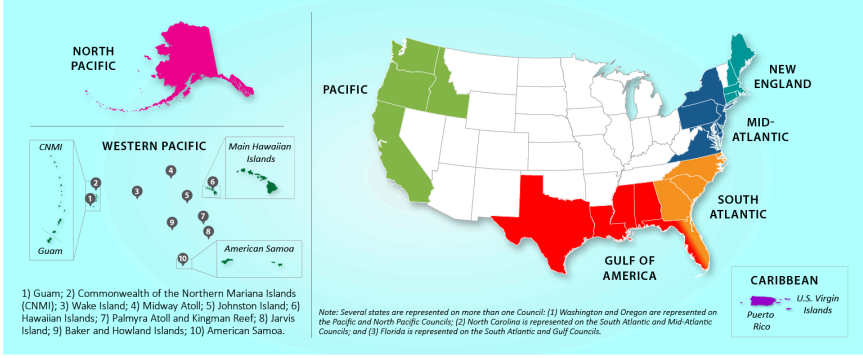
Source: https://www.fisheries.noaa.gov/s3//2026-02/FEUS-2023-web_0.pdf

Diversity: Recreational Fisheries



Source: https://www.fisheries.noaa.gov/s3//2026-02/FEUS-2023-web_0.pdf

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

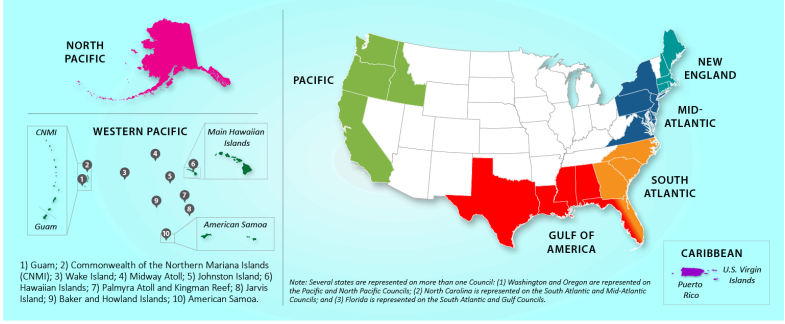
2. FEP/Geography-Based (Western Pacific, Caribbean)

- 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

Results: Objective 1



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-production of processes and products: Learn by doing, refine and adjust over time

Risk-based methods: Adaptable to many decision processes, risk as a "two way street"

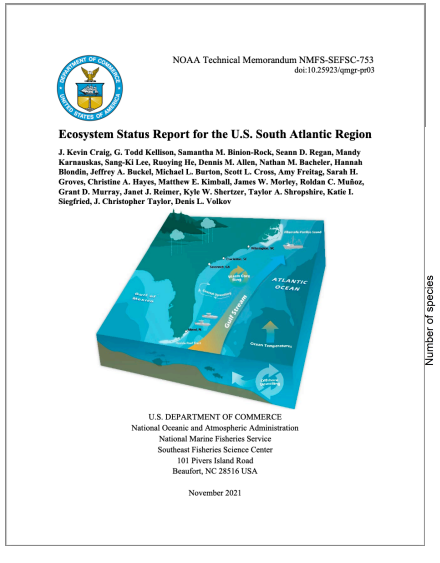
Actionable ecosystem plans: Address management issues in digestible packets too!

Multi-scale ecosystem information: Regular reporting of agreed key indicators increases familiarity and basis for action

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

Strong foundation for advancing ecosystem-based fishery management tailored 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, Seann 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

U.S. DEPARTMENT OF COMMERCE
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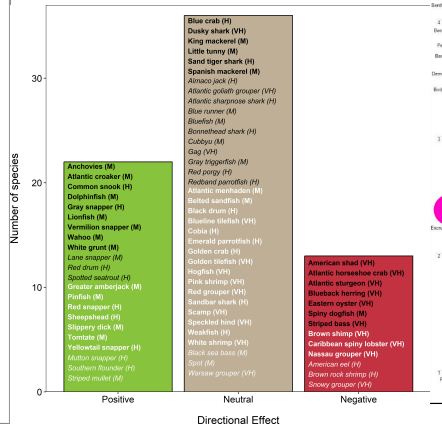
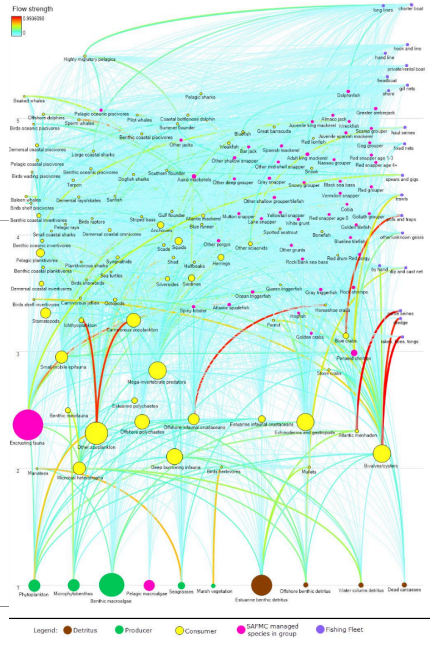
November 2021

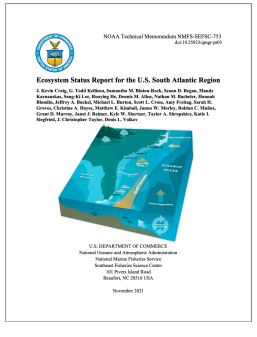




Available Indicators: South Atlantic

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

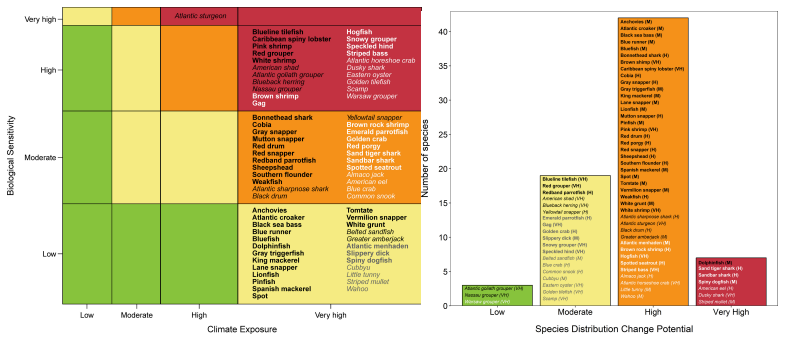
- Indicators are presented and interpreted in the context of historical trends and current status relative to any known reference points.
- Trends and status of indicators can contribute to risk assessment at the ecosystem or stock level.
- Also known as State of the Ecosystem (SOE) or Ecosystem Considerations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

Key Recommendation

Develop a structured process for ecosystem-based decision making

The FEP loop is an interpretation of adaptive management as applied to Fishery Ecosystem Planning. Reprinted from Levin et al. 2018, Fig. 1

This process can address any of the "easy wins" as well as big picture issues (climate impacts on multiple stocks, discard concerns, balancing diverse stakeholder objectives) as prioritized by the Council

Pathways for Action in other Councils

How to choose what to do first? Have a menu of issues to address (could include the above or others); Council reviews and prioritizes the list; For each issue use the process laid out by the Council; such as…

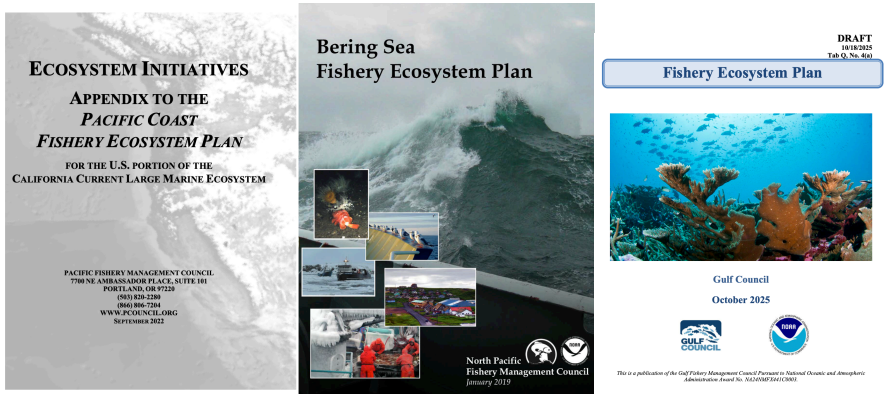
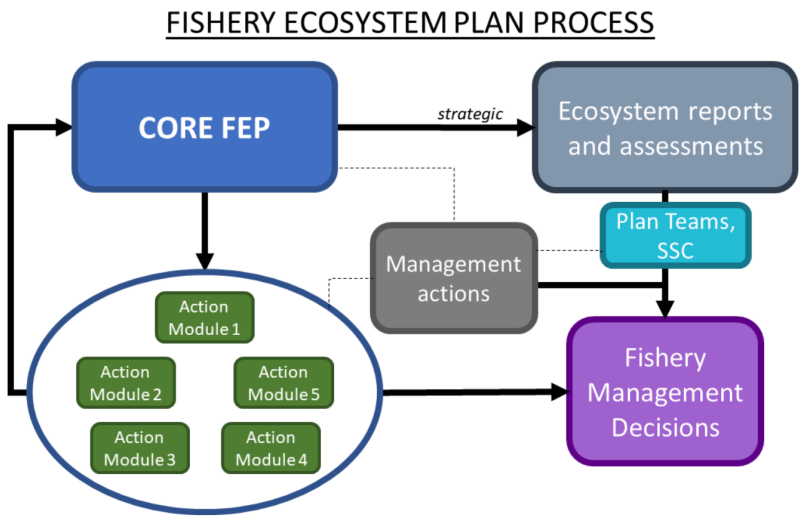


Figure 3-2 Feedback among the Core BS FEP, individual Action Modules, and the management process



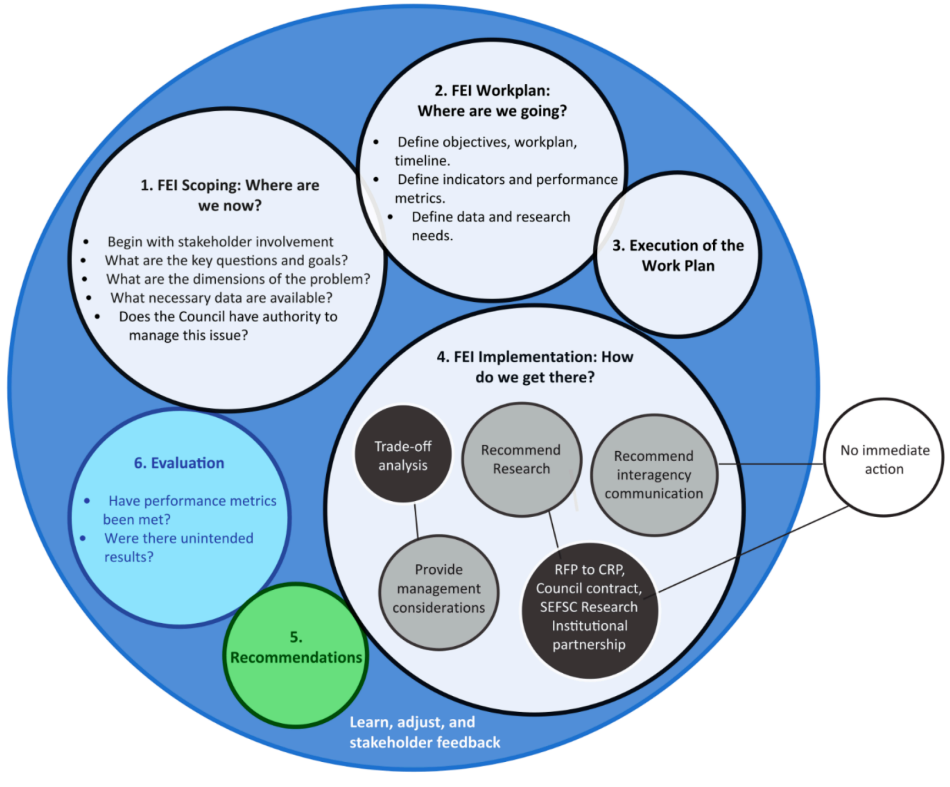


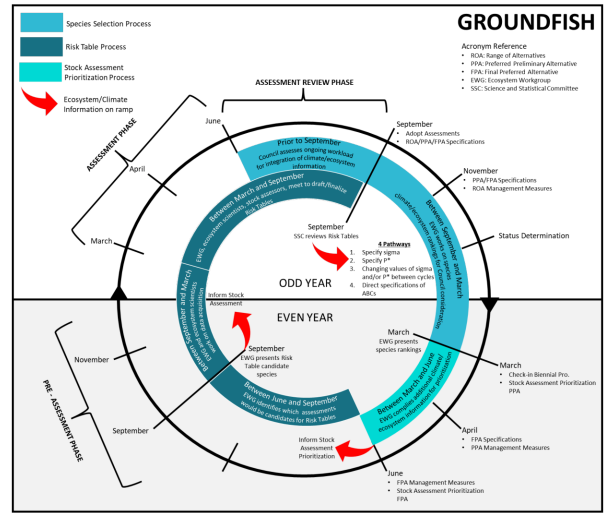
Figure 3.3.1 The FEI Loop – a structured, adaptive process for investigating individual FEIs (revised May 2025).

Sources: Pacific FEP and Initiatives Appendix, Bering FEP, Draft Gulf FEP

Example Pathways for Action: Pacific

The Pacific Council FEP specifies goals and objectives as well as “ecosystem initiatives” that focus on priority actions. The Council annually reviews and updates its list of potential actions.

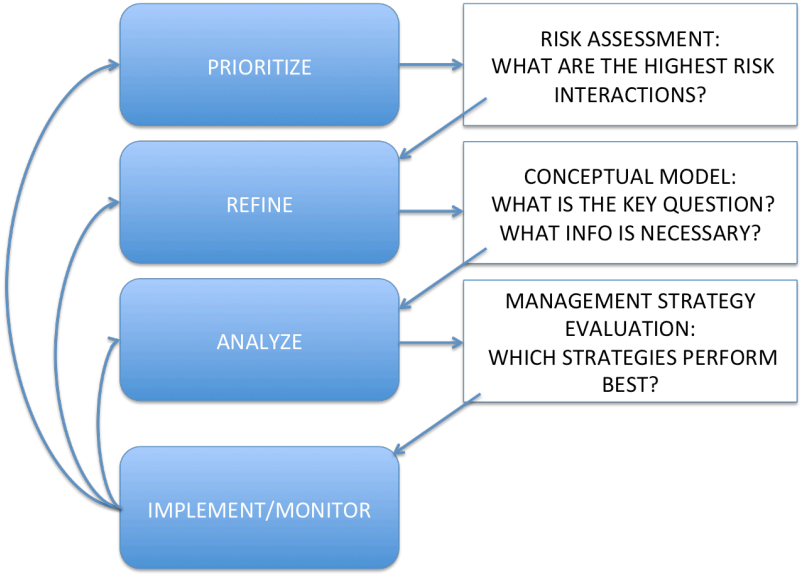
- FEP Initiative 1 prohibited directed fishing on currently unexploited, unmanaged forage fish in the region
- FEP Initiative 2 reviewed the ESR and made recommendations to better inform the Council of both ecosystem processes and the potential use of this information in management
- FEP Initiative 3 evaluated potential impacts of climate change and identified ways to improve flexibility and responsiveness of management
- FEP Initiative 4 Ecosystem and Climate Information for Species, Fisheries, and FMPs, is developing the risk-based framework for use in the Council’s catch specification process

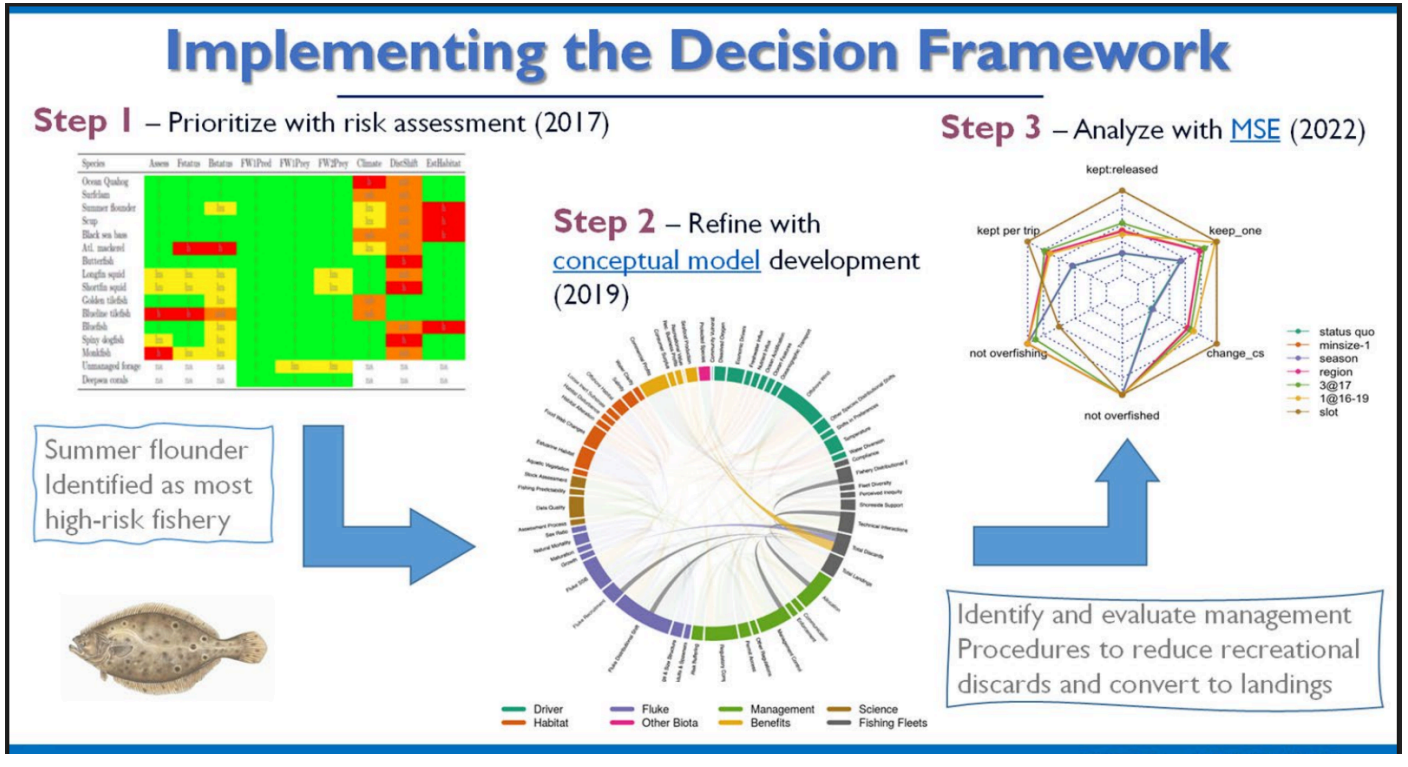


Initiative 4 developed conceptual models of catch specification processes under the Coastal Pelagics, Groundfish, and Salmon FMPs, highlighting the timing of each step in the process and specific points where ecosystem information could be brought in. The structured process for developing the stock assessment risk table has enhanced communication between ecosystem and assessment scientists, and is highlighted as a key success of FEP Initiative 4.

Example Pathways for Action: Mid Atlantic

Mid-Atlantic EAFM framework from 2019 EAFM Policy Document:



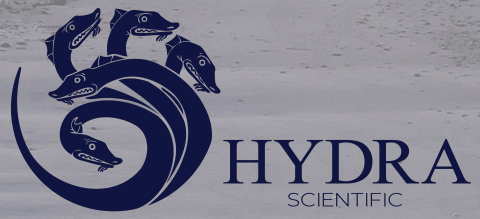


MAFMC updates the Risk Assessment every year, and recently reviewed, updated, and added risk elements and indicators. The MSE resulted in multiple options for improving angler welfare without changing stock status, as well as a multispecies recreational demand model now used to set recreational fishery specifications.

See Gaichas et al. 2016, Muffley et al. 2021; Implementation slide courtesy Brandon Muffley

Thoughts? Questions?

Thank you!



Slides at https://sgaichas.github.io/HSpresentations
Contact: sgaichas@hydrascientificllc.com