



FISHERIES ECOSYSTEM PLAN FOR THE GULF OF MEXICO MID-TERM PROJECT SUMMARY

Presented to:

Ecosystem Technical Committee,
Gulf of Mexico Fisheries Management Council

Presented by:

LGL Ecological Research Associates, Inc.

10 September 2021

SUMMARY OF WORK PRODUCTS

1. Case studies and lessons learned from Fishery Ecosystem Planning

- Draft completed September 3, 2021

2. Mid-Term Project Summary

- PowerPoint Presentation, 09/10/21 to ETC; October 2021 Council Meeting

3. Summary Report on Stakeholder Mapping, Engagement, Mental Modelling, Community Engagement Meetings & Key Indicators

- Summary Project Report, 10/15/2021

4. Fishery Ecosystem Plan

- Draft FEP document and beta visualization dashboard
- 12/15/2021

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GULF OF MEXICO FISHERY ECOSYSTEM PLAN PROPOSED MISSION STATEMENT

“To provide a framework for integrating ecosystem science into the Council's decision making for long term ecological and socioeconomic sustainability of Gulf of Mexico resources”.

Proposed by the Ecosystem Technical
Committee (ETC), March 2020

FEP guidance must be actionable

SUMMARY REPORT EFFORT TO DATE

- FEP case studies from other regions (Heyman)
- Stakeholder mapping and mental modeling (Scyphers)
- Defining subregions of the Gulf of Mexico (Gallaway)
- Indicators and data visualization dashboard (Putman)
- Initial guidance on FEP

NATIONAL POLICY BACKGROUND

1871, Congress established the U.S. Commission of Fish and Fisheries. The Fish Commission (as it became known) had the mandate to determine if there had been diminution in the Nation's food-fishes and if so, to determine the causes and evaluate the need for protective or precautionary measures. The same year, The Fish Commission established what became known as the Northeast Fisheries Science Center, primarily to examine the problem and causes of declining fish stocks in the North Atlantic. Marine ecosystem research has expanded and evolved over the next 100+ years.

1969, The National Environmental Policy Act (NEPA) was enacted, providing regulatory teeth for the inclusion of ecosystem considerations in all development activities (including roads, bridges, buildings, oil and gas development, etc.) and new regulations. NEPA requires that all federal agencies use "a systematic, interdisciplinary approach that will ensure the integrated use of the natural and social sciences in any planning and decision making which may have an impact on the human environment". NEPA is intended to "encourage productive and enjoyable harmony between (hu)man(s) and environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of (hu)man(s); to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality."

1970, Congress established the Environmental Protection Agency (EPA). The EPA and the regulations it was designed to enforce have also played an important role in the gradual institutional development supporting ecosystem management.

1972, The Coastal Zone Management Act, Marine Mammal Protection Act, and Clean Water Acts were all passed.

NATIONAL POLICY BACKGROUND

1973, The Endangered Species Act of 1973 was created to protect animals and plants that were in danger of becoming extinct.

1976, the Magnuson-Stevens Act was enacted providing the framework for modern marine fisheries management in the U.S. The Act extended the nation's offshore jurisdiction to 200 nautical miles, called for an end to overfishing, and established eight regional fishery management councils (RFMCs, also to be referred to herein as Council(s) designed roughly to correspond with the boundaries of Large Marine Ecosystems (LMEs). RFMCs were directed to rebuild and manage each region's marine fisheries for optimum yield (OY). The RFMCs have primarily enacted management efforts through single species fisheries management plans within their region. However, Councils have gradually begun to incorporate ecosystem level processes into their management efforts.

1987, NMFS released the *NMFS Program Development Plan for Ecosystems Monitoring and Fisheries Management*. The plan directed Councils to maintain capacity to meet the demands of existing management processes but to recognize the inherent complexities of ecosystem-based management. Councils were directed to develop ecosystem models that include physical, ecological, and human systems to provide context for fisheries and protected species management. The plan stated that the models should be used to expand and direct existing research and data collection efforts to generate a more holistic understanding of the complexity surrounding the Nation's fisheries. To this end, the plan called for better integration of fisheries research and data collection efforts among the NOAA components, other Federal and state agencies, and academia.

NATIONAL POLICY BACKGROUND

1996, the Magnuson-Stevens Act was amended and renamed the Sustainable Fisheries Act. The amended Act brought heightened attention to ecosystem-based fishery research and management. The Act introduced the need to define and conserve essential fish habitat. The Act also redefined OY as the amount of fish which: “will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems”. The Ecosystems Principles Advisory Panel (EPAP) was established through the Act and was tasked with developing recommendations for applying ecosystem principles into fishery management, including habitat concerns. The EPAP determined that EBFM should be implemented by gradually replacing existing Fishery Management Plans (FMPs) with Fishery Ecosystem Plans (FEPs).

2001, NOAA established an Ecosystem Approach Task Force. The Task Force identified five core actions deemed essential for developing useful FEPs, including, (1) enhanced communication and cooperation within and across federal and state fishery management agencies; (2) delineation of geographic and other key parameters of marine ecosystems; (3) preparation of goals and objectives for managing living marine resources under the ecosystem paradigm; (4) formulation and application of indicators for gauging the status of marine ecosystems; and (5) examination and selection of socioeconomic data suitable for evaluating management tradeoffs.

2004, the Bush administration released, *An Ocean Blueprint for the 21st Century* (U.S. Commission on Ocean Policy 2004). The Blueprint identified the natural role of the RFMCs in administering the ecosystem approach and providing additional guidance for FEPs. The Blueprint suggested that FEPs should consider ecosystem components and their interrelationships including human dimensions, coastal and marine habitats, protected species, species assemblages that were not exploited (e.g., forage fish) and external environmental influences, such as pollution.

NATIONAL POLICY BACKGROUND

2005, an *ad hoc* ecosystem working group was convened by scientists and managers at NOAA Fisheries. The group objective was to formulate guidance to Councils for incorporating ecosystem concepts and principles into the fishery management process, specifically through Fishery Ecosystem Plans (FEPs).

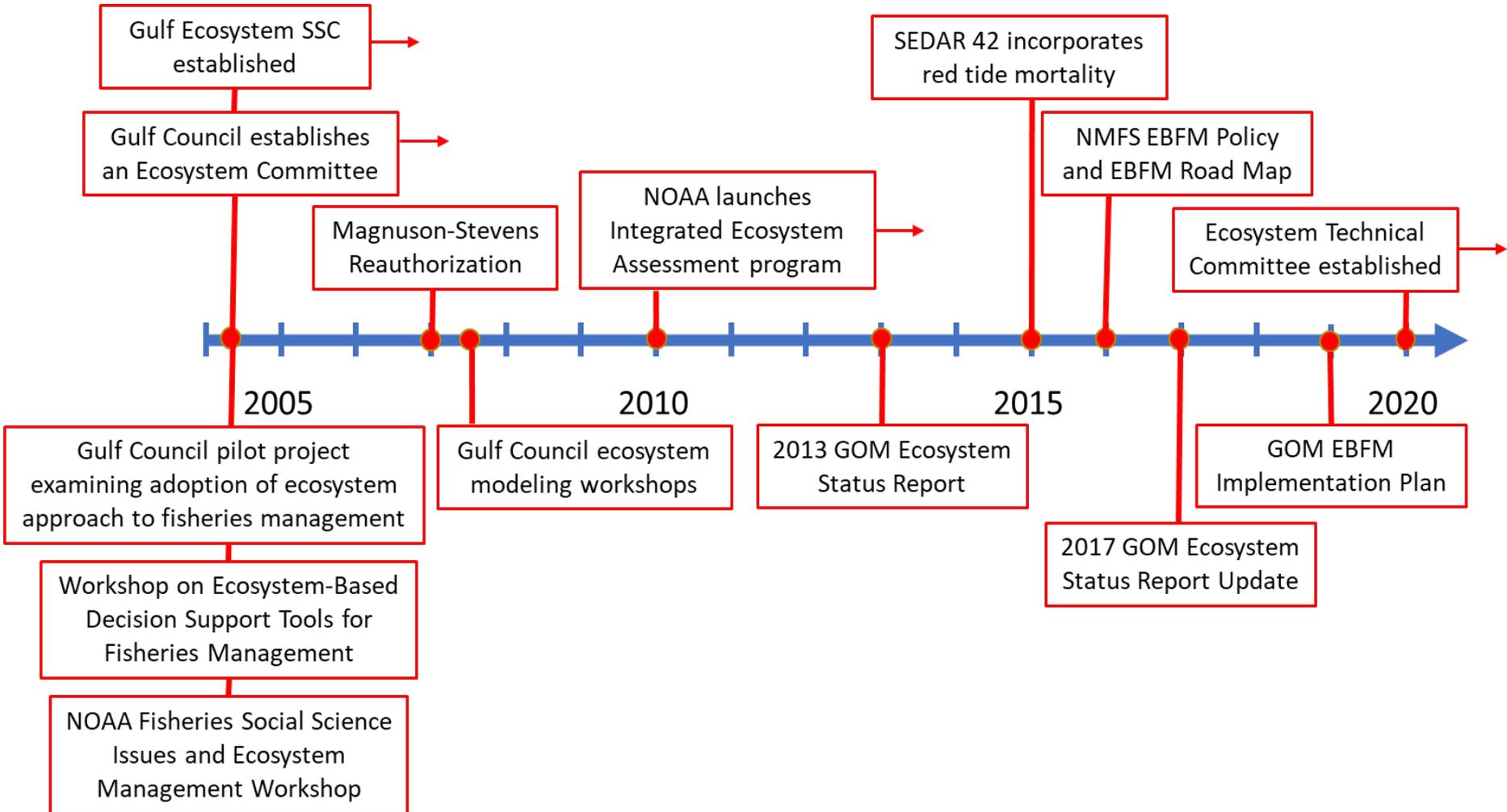
2007, Congress enacted the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act. The Act acknowledged that several Councils had demonstrated significant progress in integrating ecosystem considerations into fisheries management using existing legislation. The Act also called for a study that addressed “the state of the science for advancing the concepts and integration of ecosystem considerations in regional fishery management.”

2010, NOAA Fisheries launched the Integrated Ecosystem Assessment (IEA) program to augment scientific understanding of marine ecosystems and the potential application of such understanding to fishery management issues around the nation. Subsequent to its inception, the program has undertaken work in five regions as it plays a key role in refining and implementing federal ecosystem-based fishery management policy.

2016, NOAA officially released an EBFM Policy and EBFM Roadmap to help the regional Councils further incorporate EBFM into their management efforts (NMFS 2016a; 2016b). According to this guidance, the plans are based on the following six actions or guiding principles: (1) implementation of regional ecosystem-level planning, (2) advancement of understanding regarding ecosystem processes, (3) prioritization of vulnerabilities and risks among the nation’s marine ecosystems, (4) the exploration and addressing of management trade-offs with respect to a given ecosystem, (5) incorporation of ecosystem considerations into management advice, and (6) the maintenance of resilient marine ecosystems around the nation.

GULF OF MEXICO FEP DEVELOPMENT HISTORY

GOM EBFM DEVELOPMENT TIMELINE



SITUATION ANALYSIS

- Existing legislation and guidance are presently available to implement EBFM in the Gulf.
- EBFM has already been incorporated in many aspects of Council's process and decision-making; much more is possible.
- The primary challenge for the GMFMC is to institutionalize and formalize processes to incorporate EBFM considerations into all Council decisions.
- The process will be slow and incremental, and must be strategic, prioritizing actions adaptively, achieving attainable goals quickly, and having a long-term strategy in place.
- While some action can be taken presently, FEP development and implementation will take dedicated resources, financial and human.



Council staff with
existing workload

Oh, just one more thing. . .

Fishery Ecosystem Plan

CONFRONT UNCERTAINTY

“Confront uncertainty. Once we free ourselves from the illusion that science or technology, if lavishly funded, can provide a solution to resource or conservation problems, appropriate action becomes possible.”

Bob Johannes (1978)

STAKEHOLDER MAPPING, ENGAGEMENT, MENTAL
MODELLING, AND COMMUNITY ENGAGEMENT

(SEE PRESENTATION BY STEVEN SCYPHERS)

Summary report on stakeholder mapping, engagement, mental modelling, community engagement meetings & key indicators

Possible next steps...

1. Define the processes for gathering stakeholder input at three levels
 - Ethnographic interviews
 - Conceptual modelling and Participatory workshops
 - Web-based survey (e.g., Something's Fishy)
2. Select Focal FEIs for testing
3. Conceptual modeling interviews with 1-2 key informants for several FEI's to help clarify and define the FEI
4. Possible participatory workshops for FEIs (shrimp? red snapper?)

INDICATORS AND VISUALIZATION DASHBOARD SUMMARY

(SEE PRESENTATION BY NATHAN PUTMAN)



Geospatial Visualization for the Fisheries Ecosystem Plan (FEP)



Project Plan

July 05, 2021-January 17,2022



DISCOVERY PHASE:

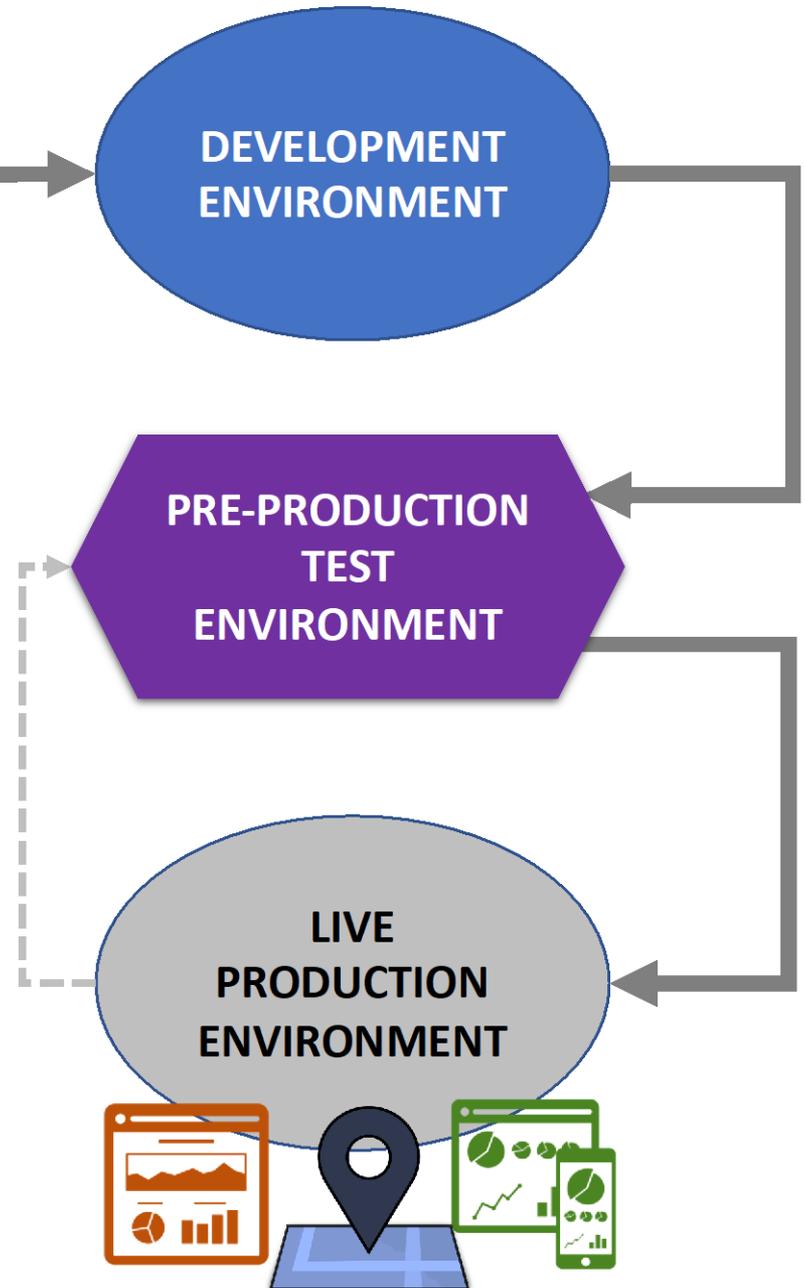
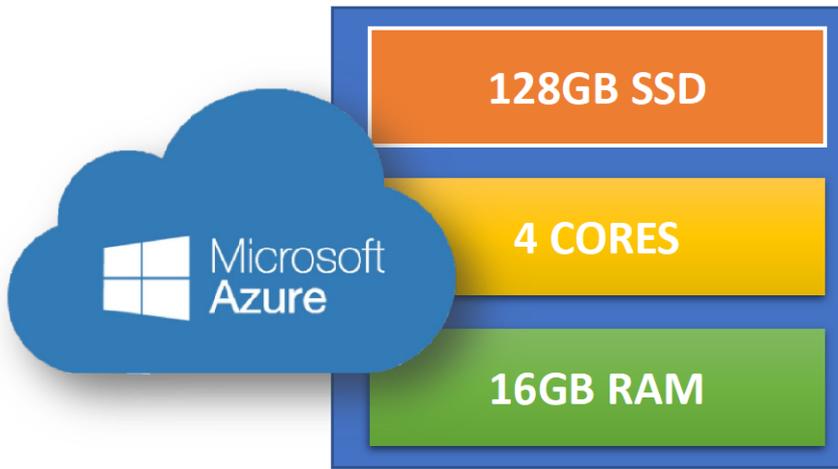
July-October 2021

THEI is working closely with LGL ERA’s project managers and team members to discuss and capture the aims and requirements of the project aims.

DEVELOPMENT PHASE:

October 2021-January 2022

THEI will provide the design, development, and implementation of situational-awareness visualizations derived from a set of indicators provided by the LGL ERA team, representing current and potential environmental scenarios of the Gulf of Mexico.



VIRTUAL MACHINE DEDICATED TO VISUALIZATIONS

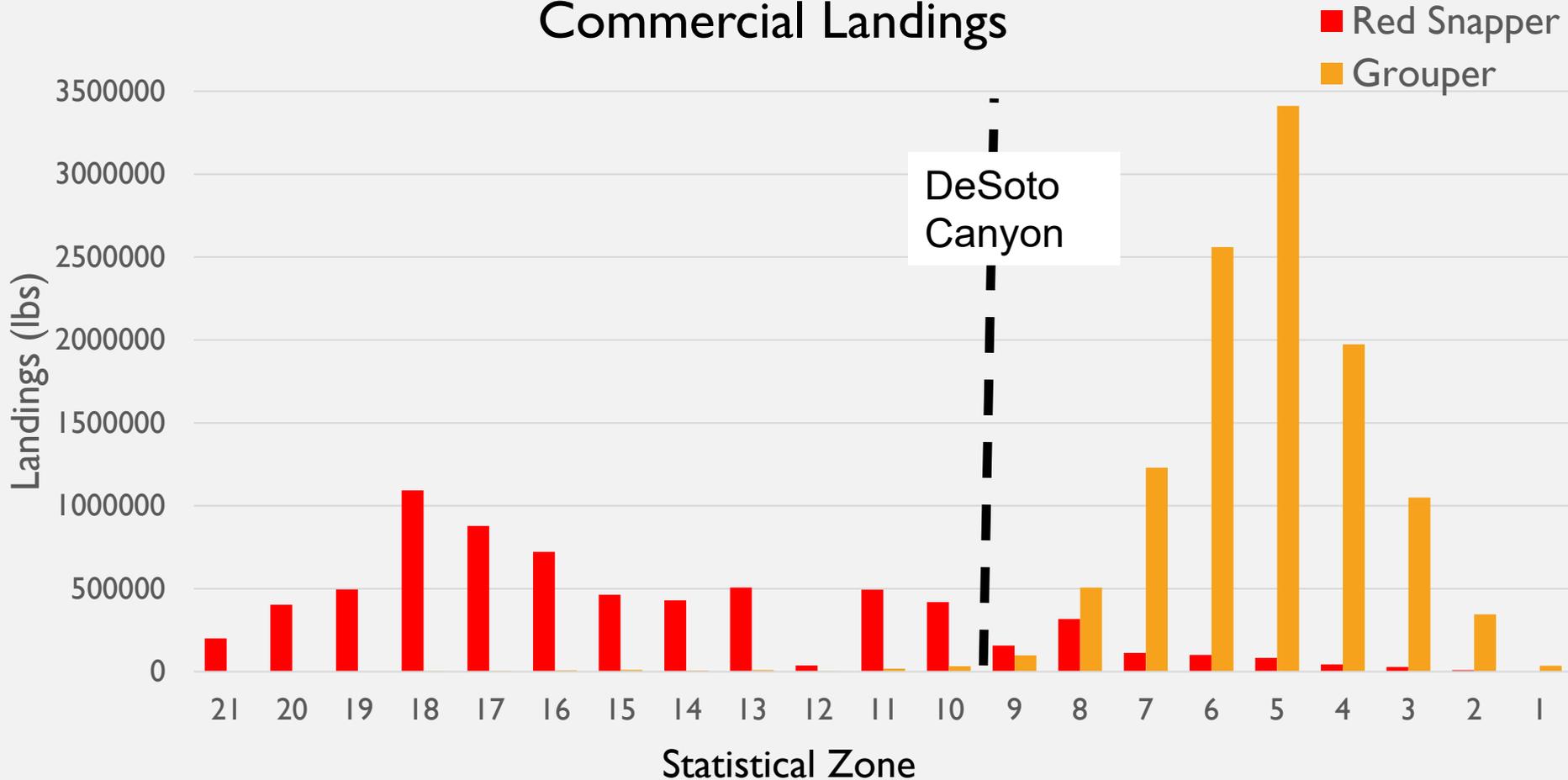
SUBDIVIDING THE GULF
TO FACILITATE MANAGEMENT

(SEE PRESENTATION BY BENNY GALLAWAY)

- From Ward (2017) the influence of the Mississippi River ends at DeSoto Canyon
- Further subdivision of the eastern Gulf may be appropriate, with the Southwest Florida Neritic zone as an additional ecosystem division

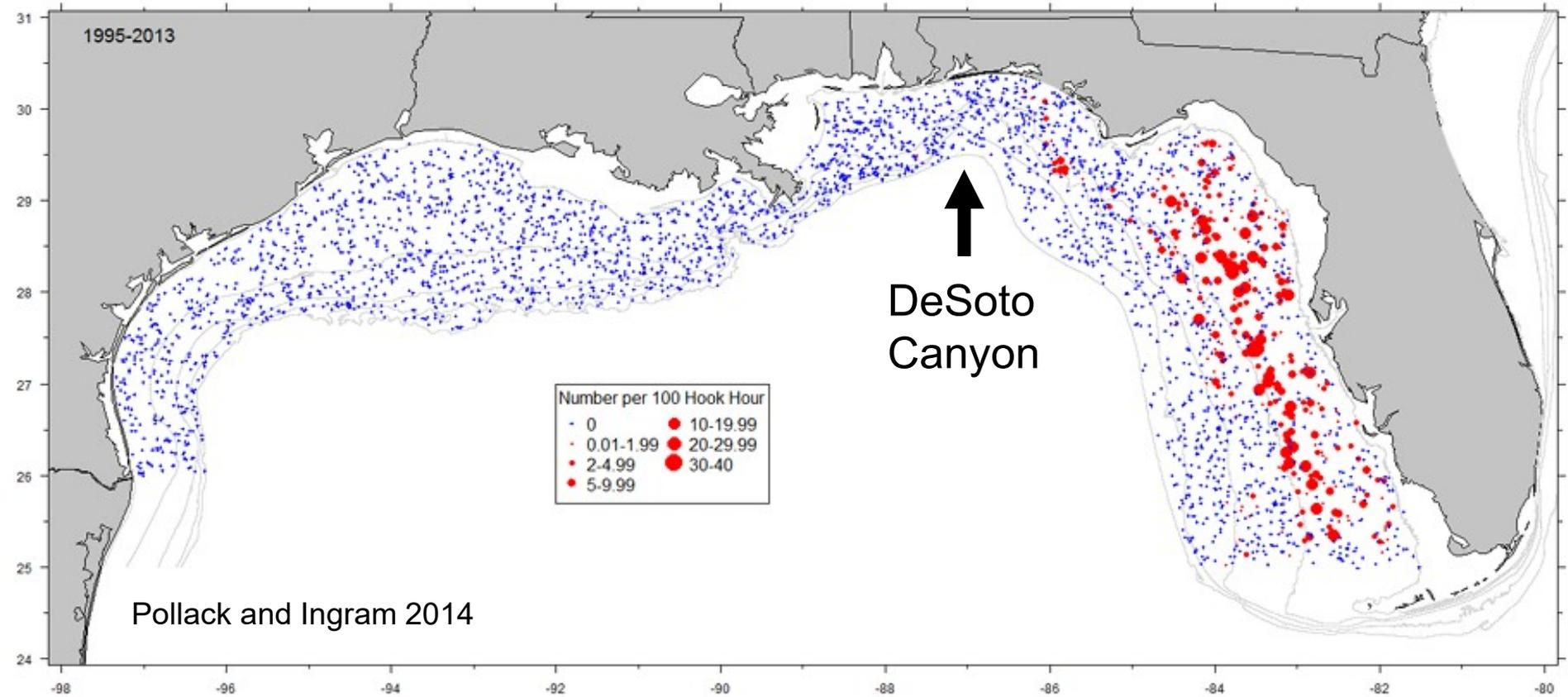


Commercial Landings



Mean landings from the NMFS Self-Reported Commercial Coastal Logbook of Red Snapper, Red Grouper, and Gag between 1992 and 2016

Red Grouper Bottom Longline CPUE



FISHERY ECOSYSTEM ISSUES (FEI)

CONCLUSION BASED ON EFFORT TO DATE

Guidance documents, case studies, indicator selection, stakeholder engagement and mental modelling

All pointed to the same conclusion:

To be actionable, FEPs must focus on appropriate subregional scales and issues we call

FISHERY ECOSYSTEM ISSUES

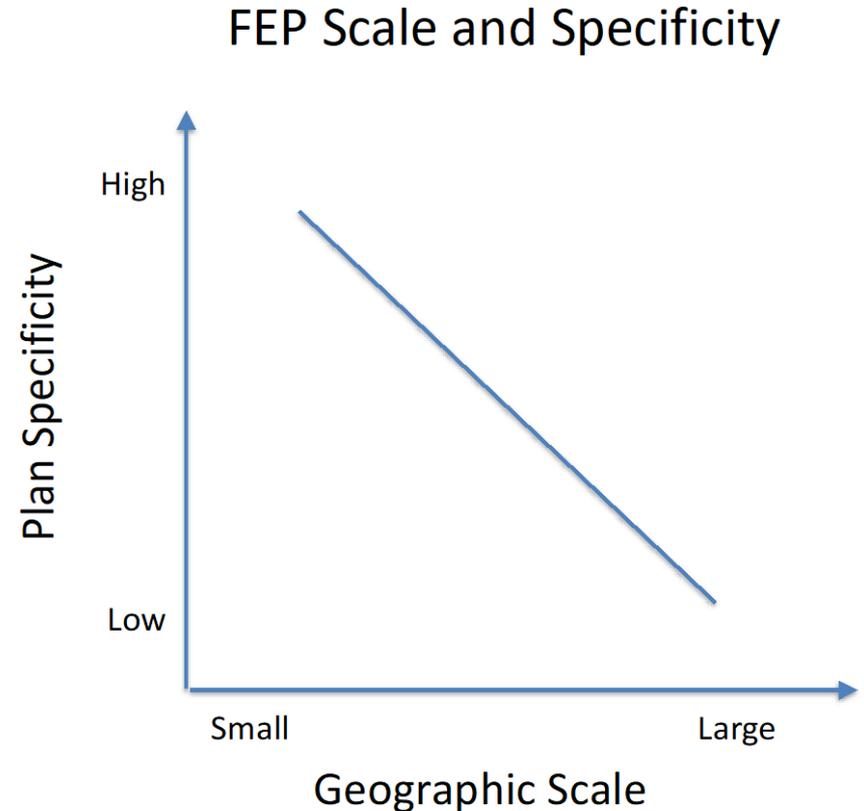


Figure : The definition of Fishery Ecosystem Plans varies along a continuum between generality and specificity. At one end of the spectrum, FEPs are considered generic planning tools. At the other end of the spectrum, FEPs are considered specific, placed-based plans and processes that guide specific management decisions regarding specific ecosystem issues.

FISHERY ECOSYSTEM ISSUES (FEI)

Fishery: A fishery is a system that consists of linked biophysical and human subsystems with interacting ecological, economic, social, cultural and institutional elements (Essington et al. 2016).

Ecosystem: A geographic area or system that includes all of the biotic and abiotic system components and their interactions.

Issue: An important topic or problem that can be developed and considered iteratively and could potentially be resolved through debate or discussion.

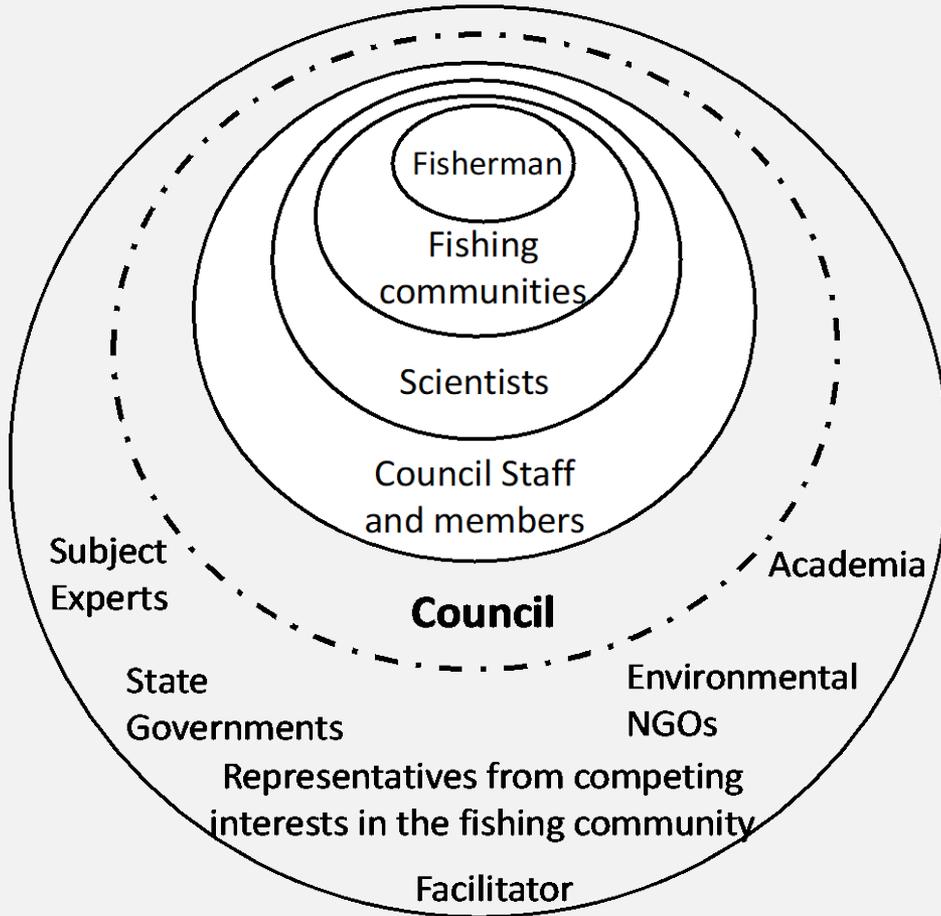
FISHERY ECOSYSTEM ISSUES

FEIs: can serve as the operational unit, or focal scale for Fishery Ecosystem Planning

FEIs: occur within the confines of a conceptual model of a fishery ecosystem that includes the biophysical, human and institutional components and their interactions.

FEIs: are generally conceived of by experienced and active fishermen based on their own observations.

FEI PARTICIPATION



FEI definition can evolve as additional stakeholders are added, and the specificity of the definition increases.

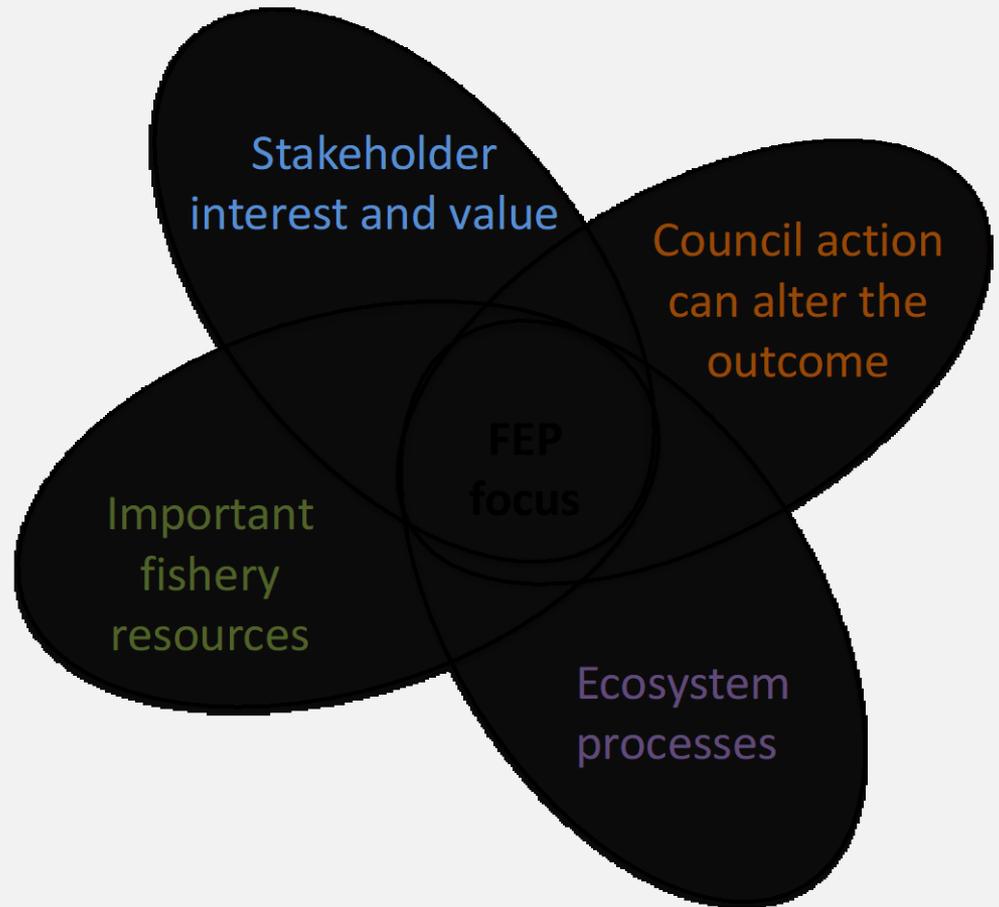
FEI DEFINITIONS SHOULD INCLUDE

- The name(s) of the person(s) that conceptualized the FEI
- A specific species, fishery or fisheries
- A geographically defined area of concern
- A clear management issue of high concern
- A timeframe that includes the history and potential future scenarios
- A gear type or set of gear types
- Biophysical ecosystem description and drivers
- Anthropogenic influences and drivers
- Definition of relevant stakeholders and their interests
- Description of the institutional and governance environment (i.e., beyond the Council and including state, local, national or foreign governments), non-profit organizations, private businesses, academics or others that will influence or control the outcome.
- Indicators
- A range of management recommendations.

FEI SELECTION AND PRIORITIZATION

Council will be faced with various potential FEIs and limited resources to address them. FEIs should only be selected for action if all criteria are met.

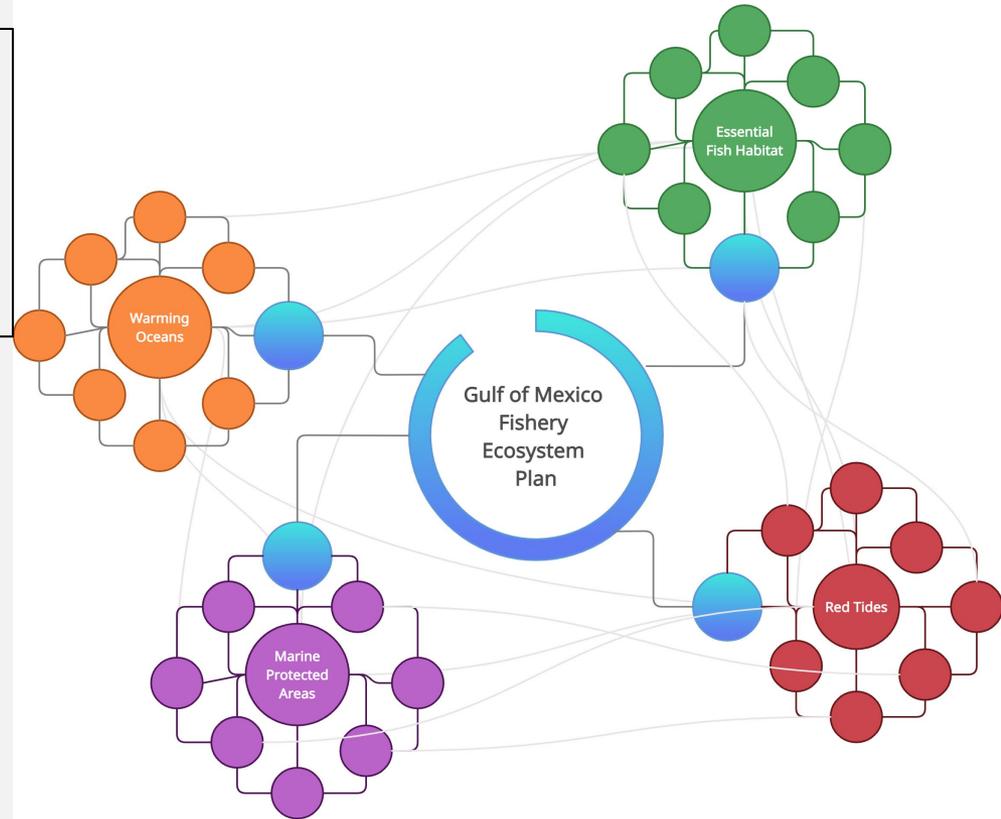
Decision trees (support tools) under development can be used to help Council prioritize, select and “run” focal FEIs



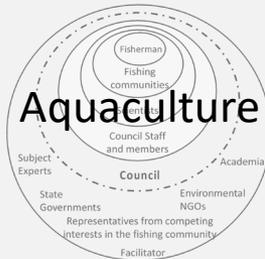
FEI DEVELOPMENT, SELECTION, PRIORITIZATIN, INSTITUTIONAL HOME, PROCESSES

- SPECIFIC GUIDANCE ON PROCESS IS THE FOCUS OF THE NEXT PHASE OF THIS PROJECT

Structured processes, regular meetings,
routine updates and prioritization of
current issues

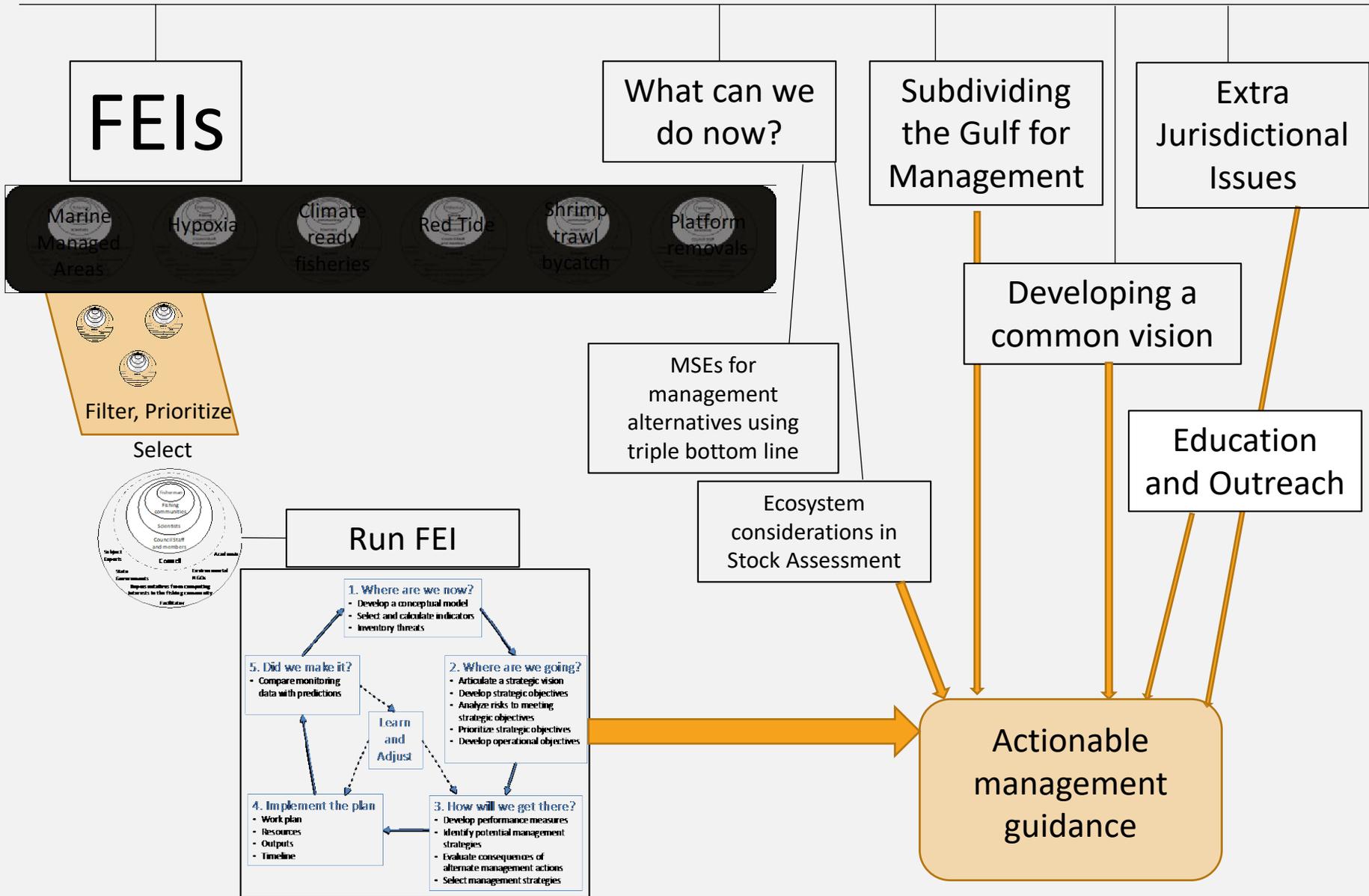


FEI EXAMPLES



Multiple FEIs could run simultaneously

FEP Umbrella



QUESTIONS?