MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

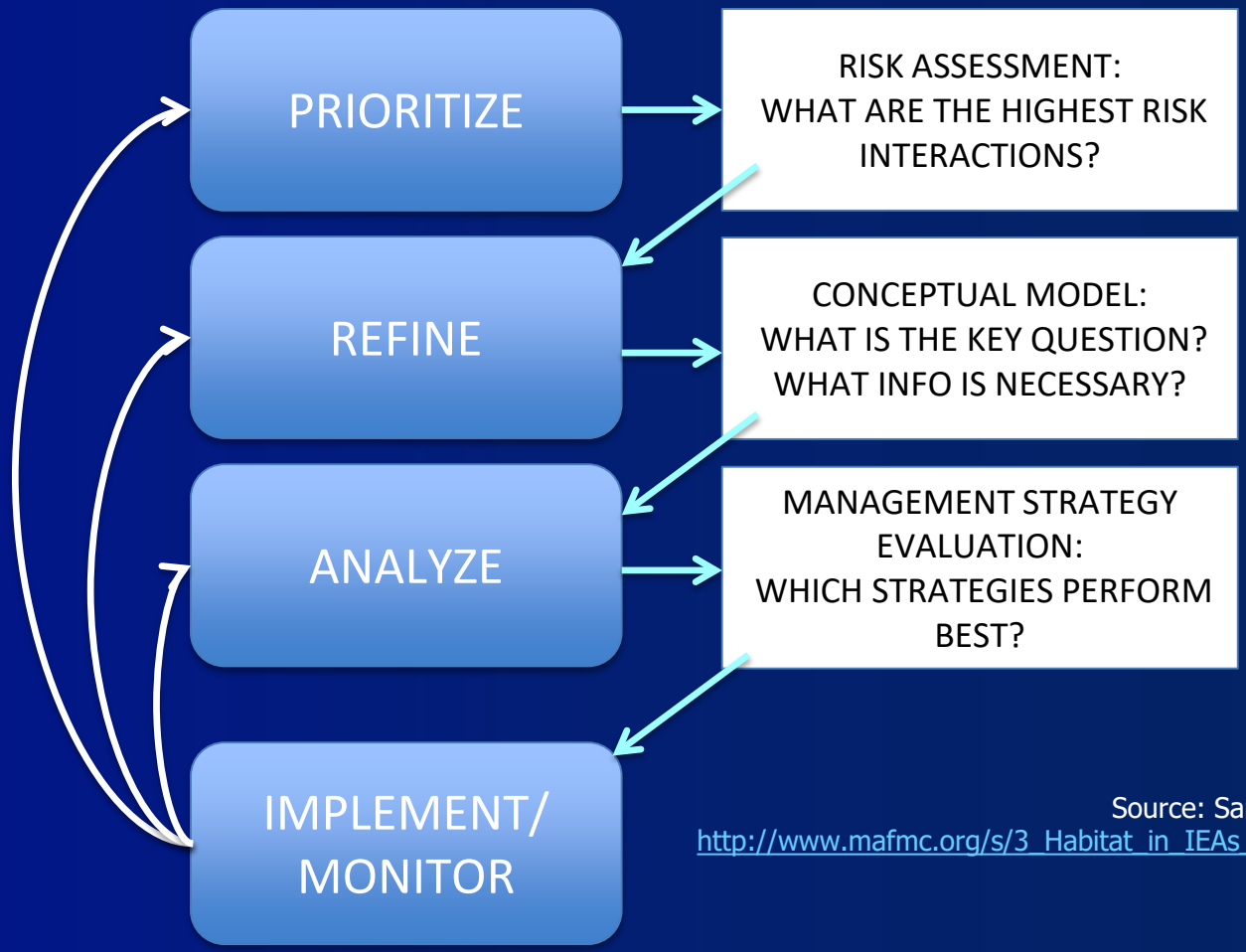
EAFM Summer Flounder Conceptual Model: Background, Development, and Outcomes

Annapolis, MD

December 10, 2019

Council EAFM Decision Framework

- Part of 2016 EAFM guidance document
  - Goal of incorporating species, fleet, habitat and climate interactions into management
- Developed a strategic, deliberative and structured process
  - Planning tool to help Council transition and incorporate EAFM approaches
  - Not an end to itself



Source: Sarah Gaichas, http://www.mafmc.org/s/3_Habitat_in_IEAs_Gaiches.pdf

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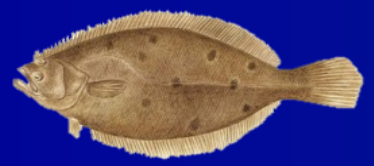
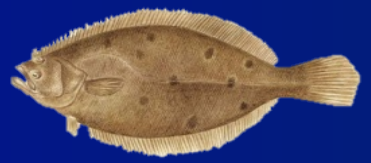
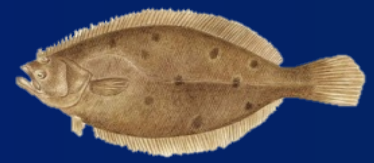
Step 1: Prioritize → RISK ASSESSMENT: WHAT ARE THE HIGHEST RISK INTERACTIONS

- Given limited resources, develop highest priority ecosystem considerations
- **Risk Element** - aspect that may threaten achieving the biological, economic, or social objectives that the Council desires from a fishery
  - Ecological
  - Economic
  - Social
  - Food Production
  - Management
- Evaluated at the:
  - Species level
  - Species and sector level
  - Ecosystem level
- Evolves and updated – new science, data and priorities

Risk Assessment Prioritization

- Use the single species prioritization approach and to pilot the development of a summer flounder conceptual model

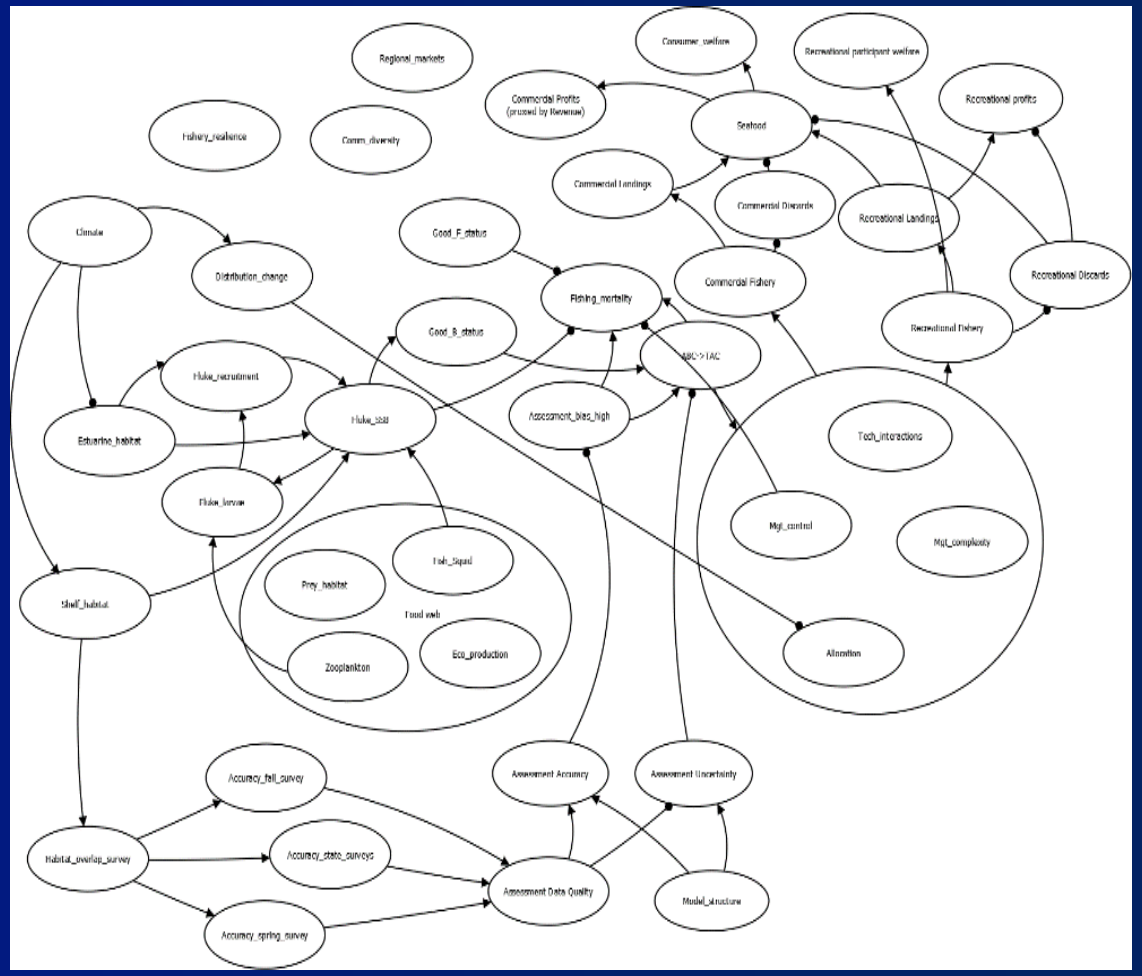
- Settled on summer flounder for following reasons:
  - **High Utility** – lots of management issues, high interest, direct applicability
  - **True EAFM issue** – fishery issues, economic and job considerations, allocation
    and other management challenges , climate drivers, distribution shifts
  - **Data Rich** – extensive data sets, benchmark assessment, economic MSE analyses

Step 2: REFINE →

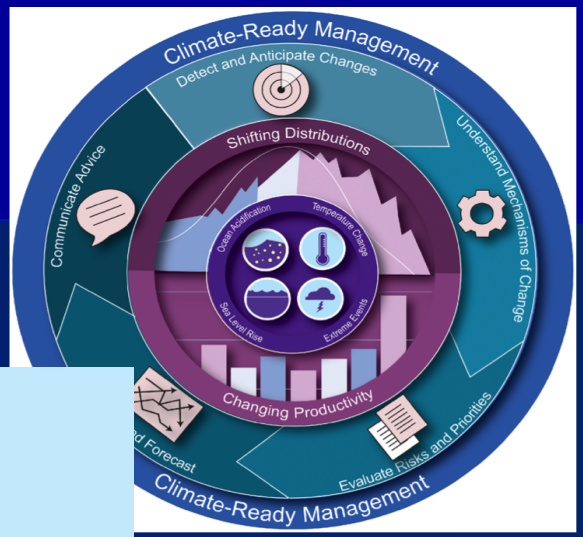
CONCEPTUAL MODEL:
WHAT IS THE KEY QUESTION?
WHAT INFO IS NECESSARY?

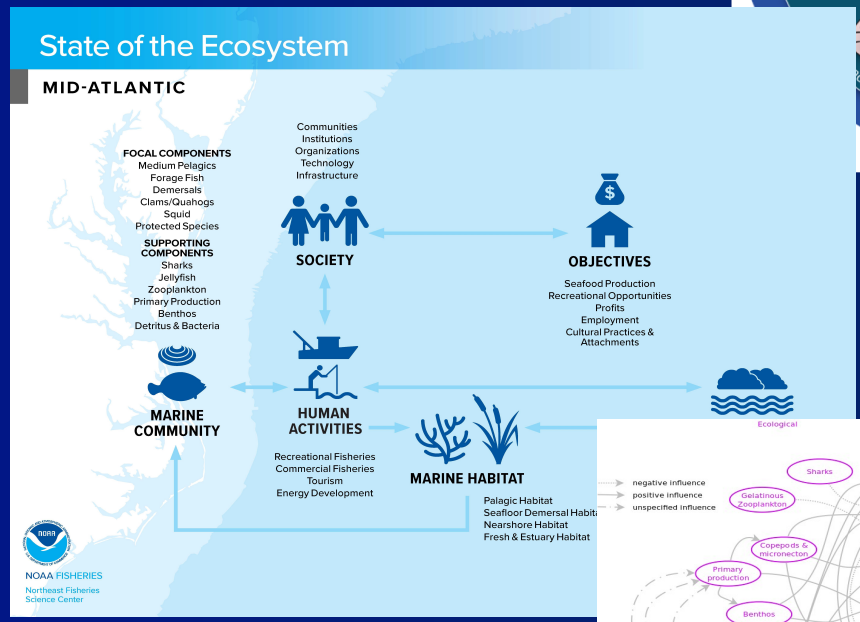
- Begin conceptual model development
  - Built to address high-risk factors and specific management questions
  - Connections and relationships throughout the system to account for interactions and unexpected effects
  - Not conducting a stock assessment or other comprehensive analysis

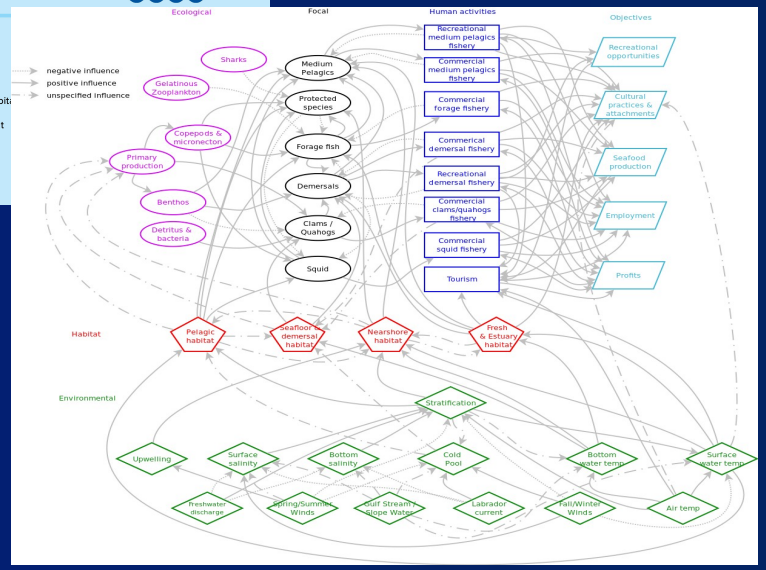


Using a conceptual model?

- Visually communicate relationships
- Ensure key relationships are accounted for
- Generating further questions and identifying research priorities
- Specify roles and links for quantitative models and MSE







Summer flounder conceptual model used for all

Summer Flounder Conceptual Model

- Potential outcomes identified by Council
  - Identify data availability and needs
  - Identify key ecosystem relationships associated with risk factors
  - Develop 10 management questions that could be answered with model and available data

Conceptual Model Workgroup

- Diverse group of experts across disciplines
- Members:
  - Greg Ardini – GARFO/APSD
  - Jeff Brust - NJDFW
  - Jessica Coakley – Council staff
  - Kiley Dancy – Council staff
  - Geret DePiper* – NEFSC/Social
  - Sarah Gaichas* – NEFSC/Ecosystem
  - Emily Gilbert – GARFO/SF
  - Doug Lipton – NMFS/Headquarters
  - Jason McNamee – RIDMF
  - Brandon Muffley* - Council staff
  - Rob O'Reilly – Council/Demersal Chair
  - Danielle Palmer – GARFO/PR
  - Charles Perretti – NEFSC/Pop Dy
  - Kirby Rootes-Murdy - ASMFC
  - Mark Terceiro – NEFSC/Pop Dy
  - Mike Wilberg – U. Maryland/SSC
  - Dustin Colson Leaning – ASMFC
  - Emily Keiley – GARFO/SF

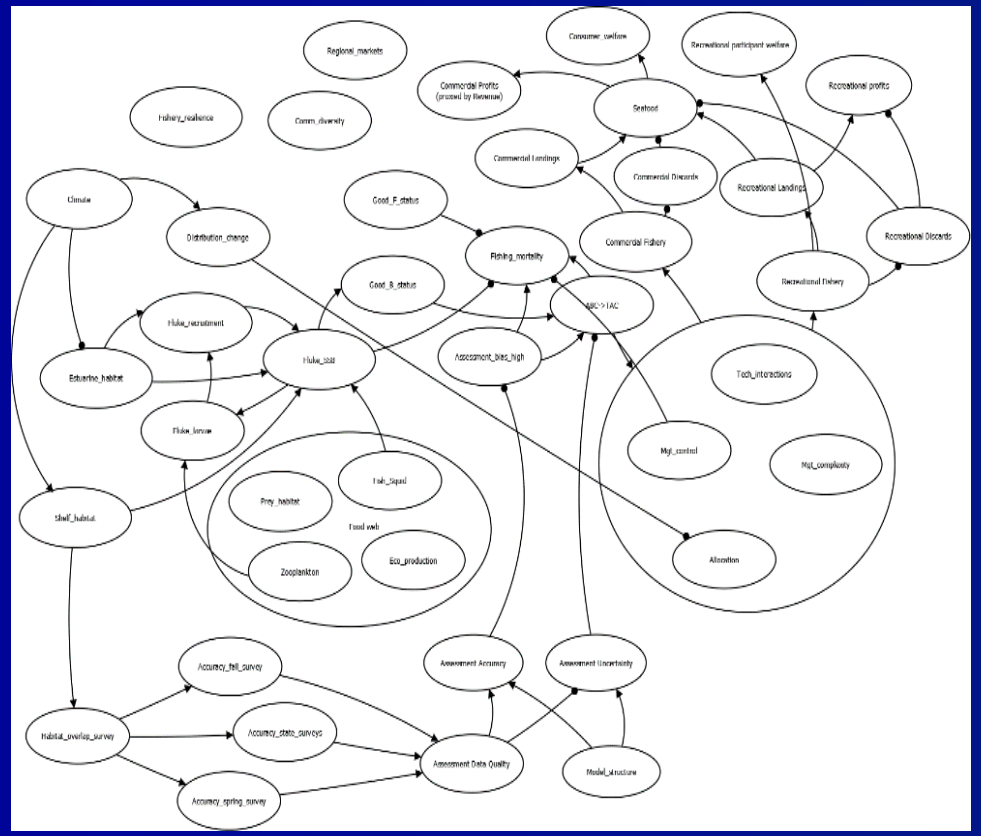
  * Lead support and/or technical staff
- Met via webinar 6 times throughout 2019

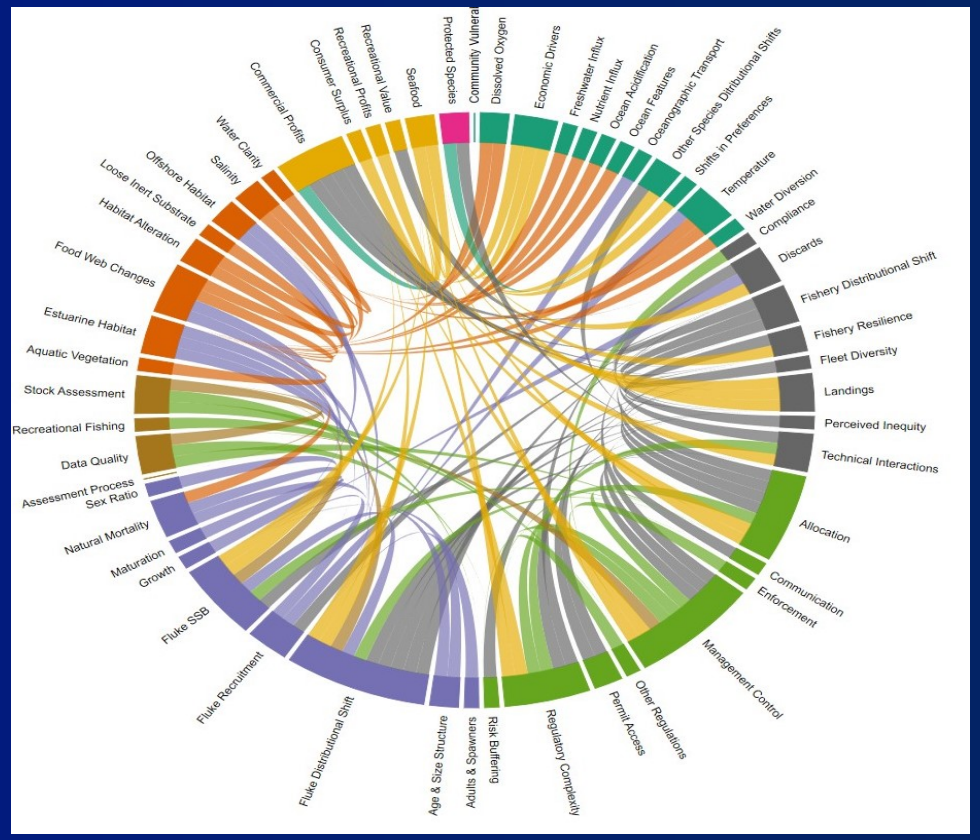
Workgroup Model Development Process

- Established sub-groups – Physical Environment and Human Dimension
- Began to develop and build out conceptual model per sub-group
  - Identified key elements that are drivers/have influence on high risk elements
    - Elements linking models
    - Documenting justification for inclusion and linkages
    - Data availability (Y/N) and if yes, documentation
  - Full workgroup then review and identify cross-linkages, data sources

Workgroup Model Development Process

- Once elements finalized, development of visualization tools





- Possible draft management questions for each high risk element

Model Development Process

- Draft model, data elements and management questions presented to EOP Committee
  - Offered feedback and recommendations for wg consideration
    - Ex. Inclusion of offshore wind risk factor and associated ecosystem elements; risk factor definitions
- Outcomes of November 13 EOP meeting
  - Finalized conceptual model, ecosystem elements, and data tables
  - Prioritization of management questions
    - Identifies Council's management goals and objectives
    - Ecosystem issue, consideration and relationships
    - Scopes out next step - MSE

Prioritized Management Questions

1. How does utilizing recreational data sources at scales that may be inappropriate for the data source (e.g., MRIP data at the state/wave/mode level) affect management variability, uncertainty, and fishery performance? Evaluate the impact of that variability and uncertainty and its use in the current conservation equivalency process on recreational fishery outcomes.
2. What are the mechanisms driving summer flounder distribution shift and/or population range expansion? What are the biological, management, and socioeconomic implications of these changes? Identify potential management and science strategies to help account for the impacts of these changes.
3. Evaluate the biological and economic benefits of minimizing discards and converting discards into landings in the recreational sector. Identify management strategies to effectively realize these benefits.

Go to conceptual model

Step 3: ANALYZE → MANAGEMENT STRATEGY EVALUATION: WHICH STRATEGIES PERFORM BEST?

- Comprehensive analysis to address management question(s) identified in Step 2
- Utilizes simulation models with available data to evaluate ecosystem interactions and the impacts and trade-offs of different management strategies
- Iterative and stakeholder driven process

Step 4: IMPLEMENT/ MONITOR

Meeting Goals and Outcomes

- Provide any feedback on conceptual model and supporting documents
- Determine if continuing EAFM structured decision framework
- If so, select priority management question
  - In 2020, begin to address management question through an MSE