An Introduction to Ecosystem-Based Fishery Management

New England Fishery Management Council

New England Fishery Management Council

- The NEFMC conserves and manages fisheries through science, public participation and balancing competing interests.

- We are considering a new management model, Ecosystem-Based Fishery Management (EBFM), to better support healthy and sustainable fisheries and resources.

Why Are You Here?

- This is the first in a series of workshops to share information and gather your input.
- Explain what EBFM is and present how it could be applied to Georges Bank.
- Establish shared understanding to support productive discussions about EBFM.
- We want to hear from you.

What Are You Going to Hear About?

- Why EBFM?
- How does EBFM work?
- What are the management objectives of EBFM?
- How are catch ceilings determined?
- Potential benefits
- Challenges
- Process for getting there

The Issue

- The current Fishery Management Plans (FMPs) do not consider the role of the target fish species in the larger ecosystem
- This leads to unrealistic estimates of Maximum Sustainable Yield
- By not taking into account the role of fish as both prey and predator, the ecosystem can become unbalanced.
- This unbalance can cascade through all the fisheries in the ecosystem.

Commonly Caught Species on Georges Bank

- Acadian Redfish
- American Plaice
- Atlantic Cod
- Atlantic Halibut
- Atlantic Wolffish
- Barndoor Skate
- Clearnose Skate
- Haddock
- Little Skate
- Longhorn Sculpin
- Ocean Pout
- Offshore Hake
- Pollock
- Red Crab
- Red Hake
- Rosette Skate
- Sea Scallop
- Silver Hake
- Smooth Skate
- Thorny Skate
- White Hake
- Windowpane
- Winter Flounder
- Winter Skate
- Witch Flounder
- Yellowtail Flounder
- Atlantic Herring
- Monkfish
- Spiny Dogfish
- Black Sea Bass
- Scup
- Summer Flounder

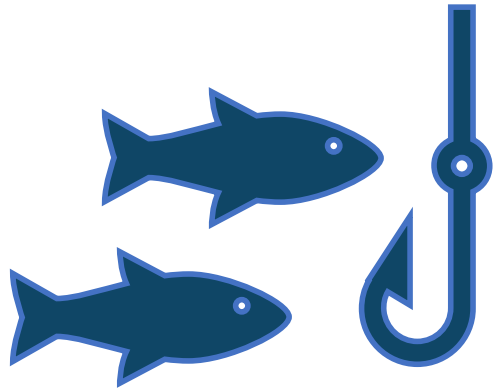
Management Council

- NEFMC
- NEFMC/ASMFC
- NEFMC/MAFMC
- MAFMC/NEFMC
- MAFMC/ASMFC

From: Draft Example Fishery Ecosystem Plan (eFEP) For Georges Bank; Table 6

Considering a New Approach

- The NEFMC is exploring options for Ecosystem-Based Fishery Management.
- In 2018, NEFMC requested a peer review of a proposed management procedure, including the models used to test that procedure.
- EBFM would allow a variety of factors -- from fishery stock status to ecosystem conditions to human dimensions -- to be considered.



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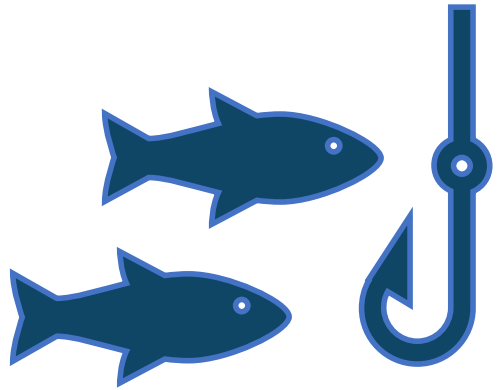
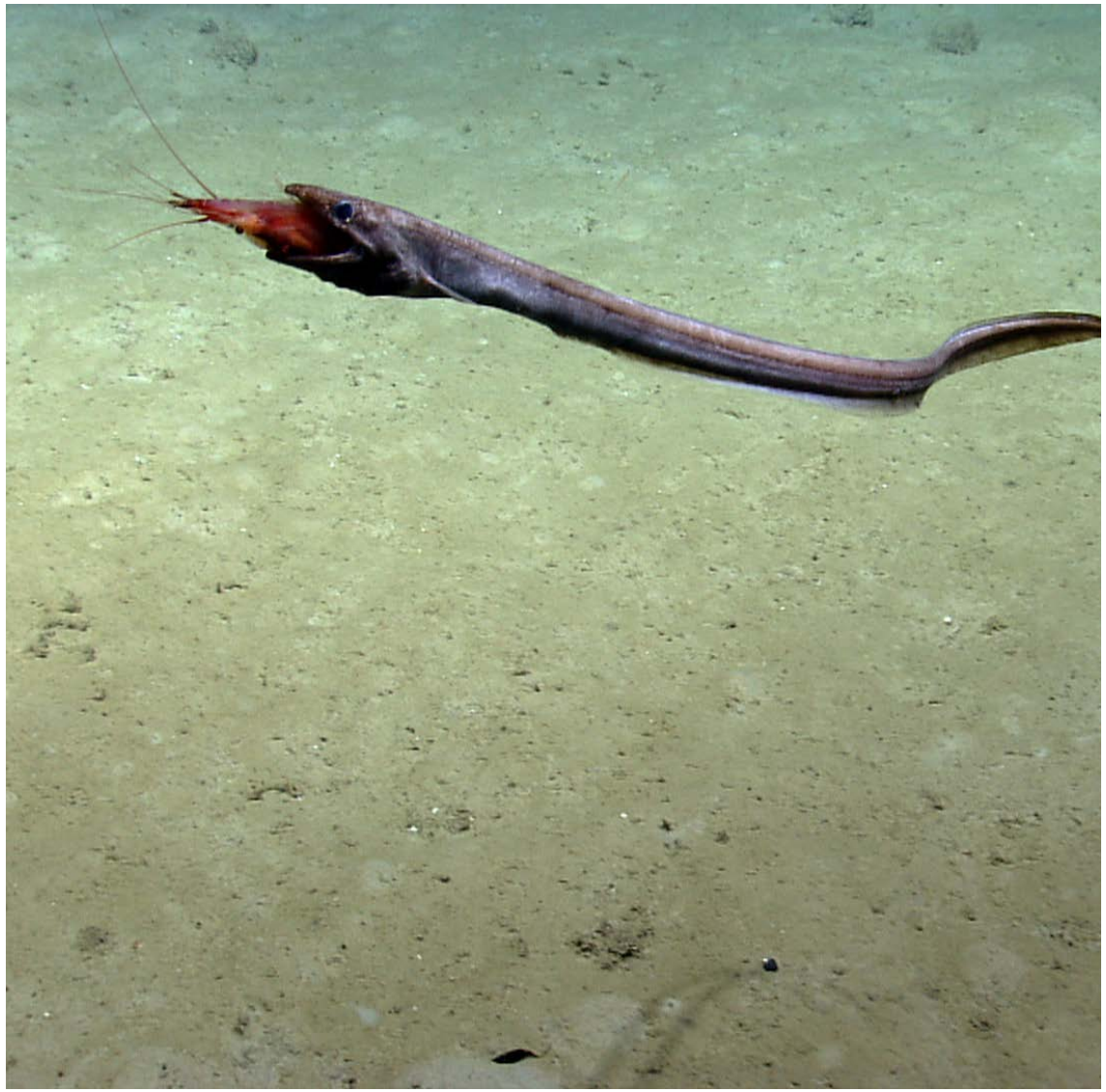


What Is EBFM?

EBFM looks at the big picture to provide safe and sustainable seafood to communities and the nation.

What Is EBFM?

EBFM considers the diverse needs and pressures on fish, fish habitat, and the food web within a geographically specific area – an ecological production unit (EPU).



What Is EBFM?

EBFM also considers the needs of fishermen, our communities, and the economy.

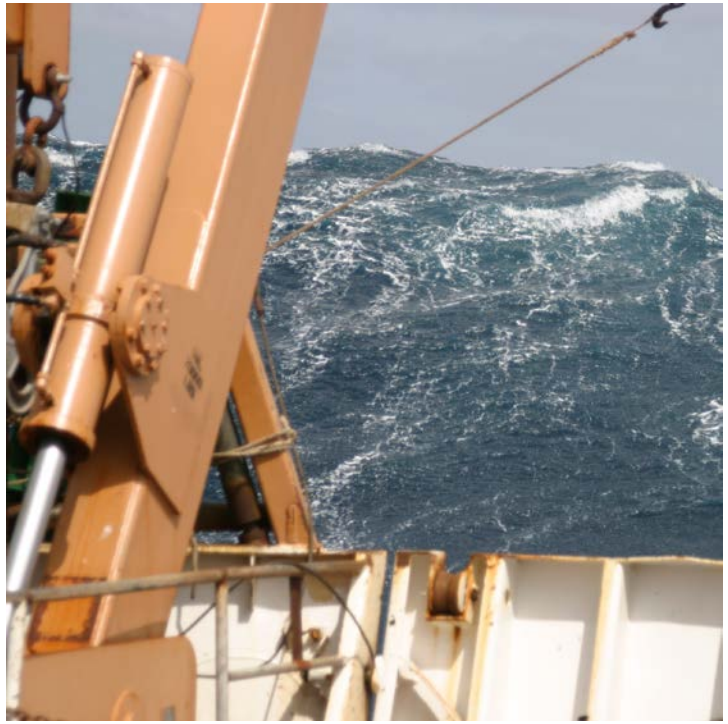
What a New Approach Might Look Like

- An example Fishery Ecosystem Plan* (eFEP) has been developed for Georges Bank.
- It illustrates how applying the proposed EBFM strategy and conceptual framework could provide information needed by NEFMC.
- The eFEP has been reviewed by NOAA scientists as well as regional research partners.

*https://bit.ly/DrafteFEP

The draft EBFM for Georges Bank* contains information on the following topics:

- Ecosystem reference points, control rules and catch limits
- Incentive-based measures
- Special priority management
- Jurisdictional authority, cooperation, and coordination
- Limited access and authorization to fish
- Fishing impact on ecosystem and spatial management
- Catch monitoring, data collection, and research
- Environmental impact statement



*Draft Example Fishery Ecosystem Plan (eFEP) For Georges Bank; Chap 9 - https://bit.ly/DrafteFEP

What Are The EBFM Management Objectives for Georges Bank?* c

1. No exceedances of catch limits
2. Minimal fishing related mortality for threatened /endangered/ protected species
3. No biomasses below floors for managed and protected species

* p.18, Draft example Fishery Ecosystem Plan for Georges Bank - https://bit.ly/DrafteFEP

What Are The EBFM Management Objectives for Georges Bank?*

4. Maintain healthy ecosystem structure > balanced predator/prey relationships

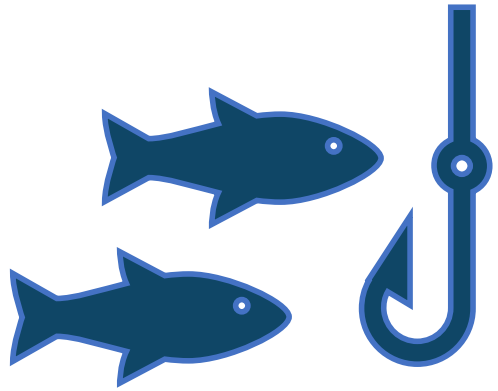
5. Maintain healthy and diverse habitats

6. Minimize the risk of long-term or permanent impacts to the ecosystem

* p.18, Draft example Fishery Ecosystem Plan for Georges Bank - https://bit.ly/DrafteFEP

What is Different About the eFEP for Georges Bank?

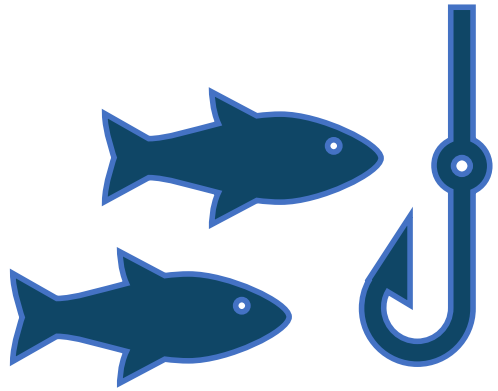
- Considers a broader range of goals, objectives, and improvements of ecosystem services than traditional FMPs
- Sets catch ceilings on groups of species that are caught together, play similar roles in the ecosystem, and whose basic biology is similar
- Harvest control rules that take interactions among predators and prey into account



From: p.3, Draft example Fishery Ecosystem Plan for Georges Bank - https://bit.ly/DrafteFEP

What is Different About the eFEP for Georges Bank?

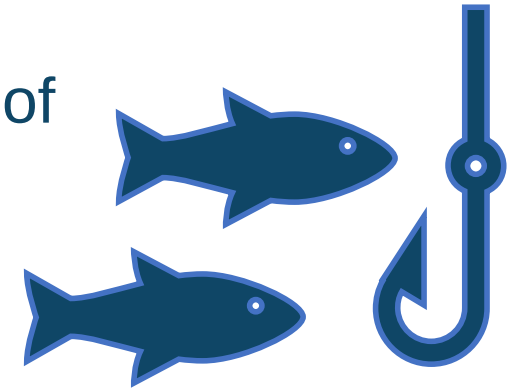
- Provides protections for individual species to prevent depletion
- More adaptive and flexible, allowing vessels to catch and land a suite of species
- The FEP accounts for the biological interactions among related stocks so the productivity of an individual stock is understood to vary with changes in relative abundance of both predators and prey



From: p.3, Draft example Fishery Ecosystem Plan for Georges Bank - https://bit.ly/DrafteFEP

What is Different About the eFEP for Georges Bank?

- Current FMPs manage **stocks** of single species to ensure that they are not fished below a level that will prevent Maximum Sustainable Yield (MSY).
  - In certain circumstances, National Standards 1* of the MSA also provides for the management of **Stock Complexes** and ecosystem components.



- An FEP would manage primarily at the **Stock Complex** level with an approach to MSY that includes the Stock Complex **and** other animals that interact with the Stock Complex.

*https://bit.ly/MagSteve_NS1

What Are The Potential Benefits Of EBFM?

EBFM has the potential to result in a more productive and robust ecosystem that benefits all stakeholders.

What Are The Potential Benefits Of EBFM?

Catch limits that are consistent with ecosystem function and benefits.

- A healthy ecosystem = more fish.
- Harvest stability and resiliency.
- More adaptability to a changing ecosystem.

What Are The Potential Benefits Of EBFM?

- More regulatory and management stability.
- Address current regulatory inconsistencies and the high costs of compliance and enforcement.
- More transparency in the decision-making process.

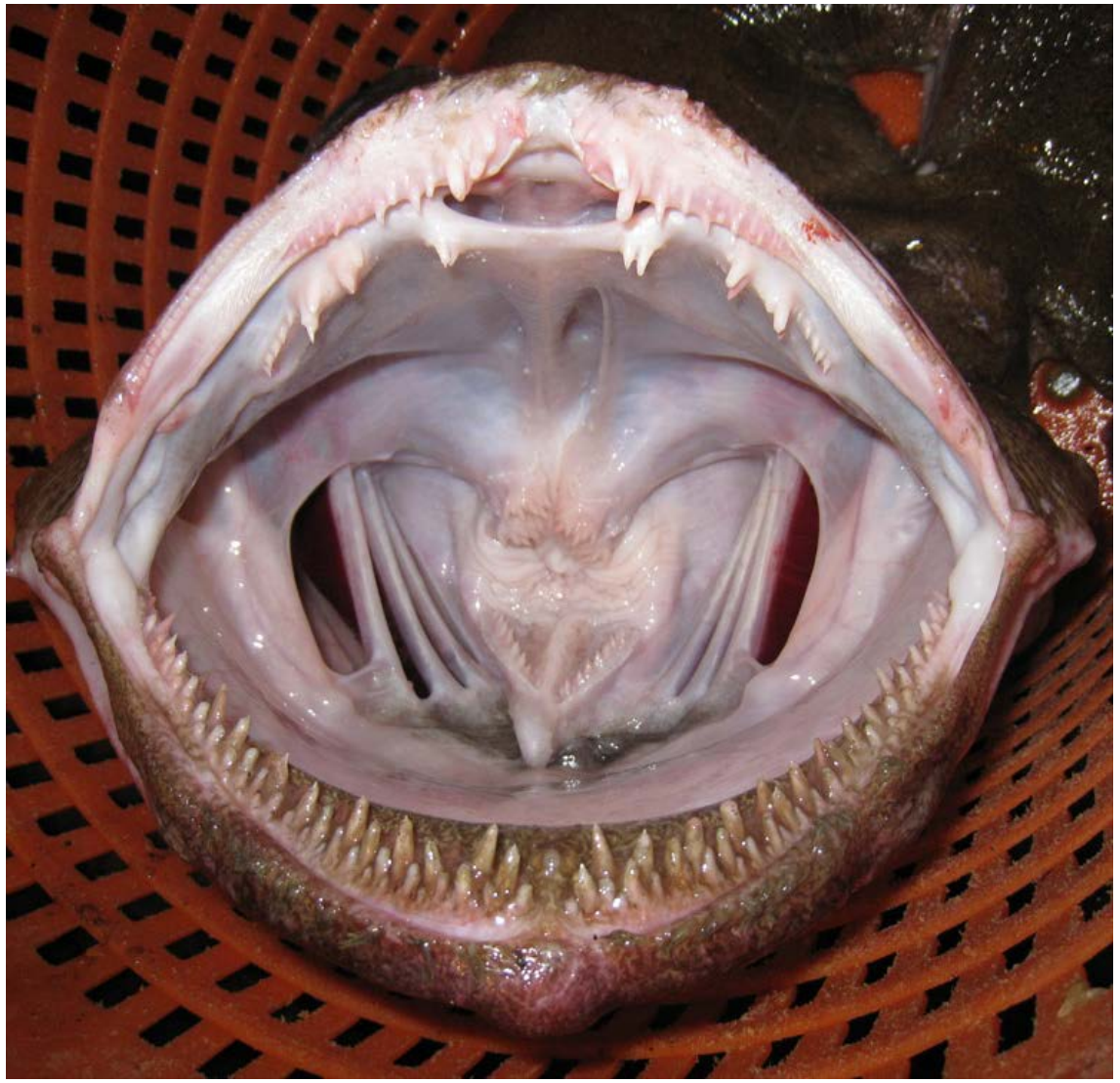
What Are The Potential Benefits Of the proposed EBFM for Georges Bank?

May allow fishermen to retain more of what they catch.

- Management by stock complex will allow fishermen to keep more of what ends up on the boats and reduce discards

What Are The Challenges And Uncertainties?

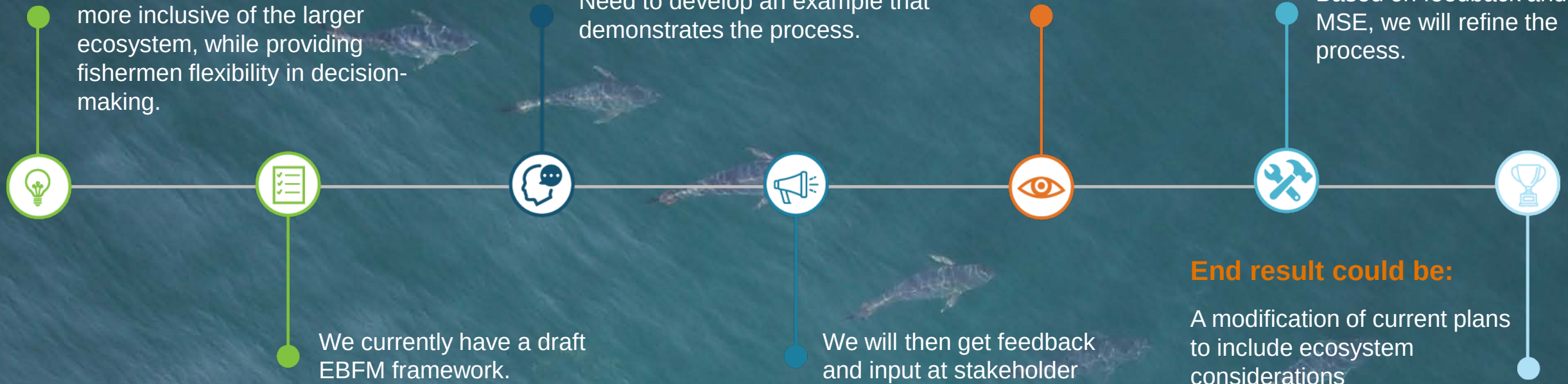
- The FEP will need to be consistent with complicated statutory and regulatory requirements.
- Changes to catch limits can be contentious which may impede adoption.



What Are The Challenges And Uncertainties?

- Understanding and balancing stakeholder objectives.
- Ensuring that the underlying models reflect the best available science

The Process For Considering Change



We started with an idea to manage fisheries in a way that is more inclusive of the larger ecosystem, while providing fishermen flexibility in decision-making.

We currently have a draft EBFM framework.

Need to develop an example that demonstrates the process.

We will then get feedback and input at stakeholder workshops.

A Management Strategy Evaluation (MSE) will be conducted

Based on feedback and MSE, we will refine the process.

End result could be:

A modification of current plans to include ecosystem considerations

OR

A Fisheries Ecosystem Plan

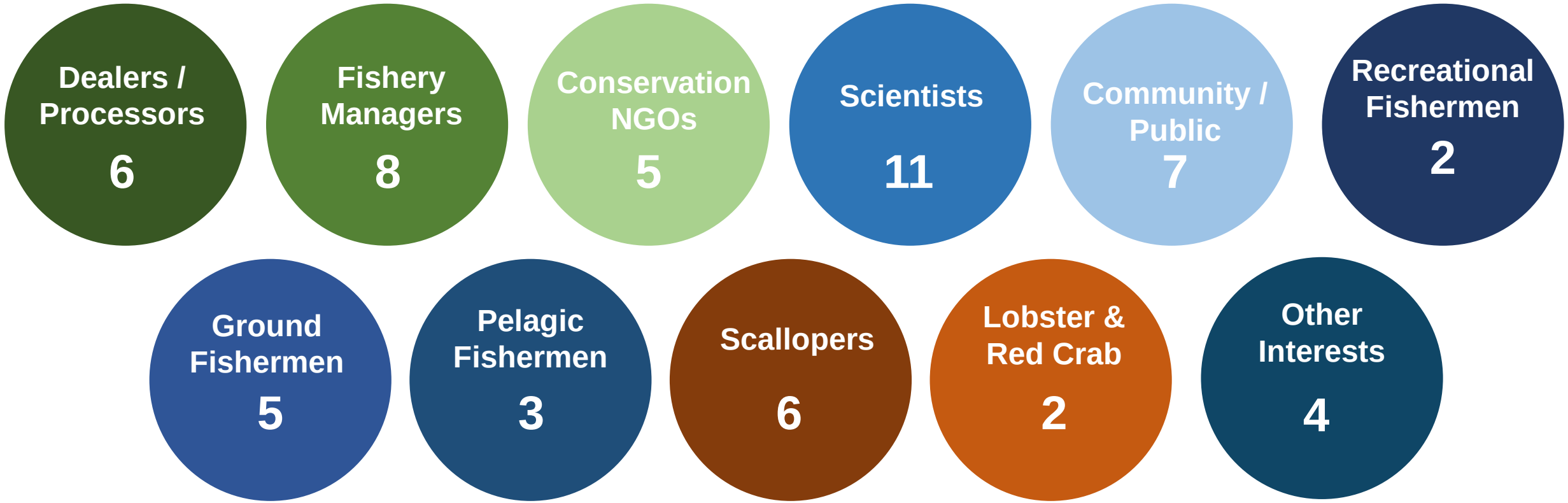
OR

An EBFM strategy for NEFMC managed species

Communications Process

- NEFMC has undertaken an ambitious communication project to engage with stakeholders on EBFM
- As part of that,154 stakeholders across multiple interests were contacted
- 59 stakeholders were interviewed to hear their thoughts and concerns
- Those findings are being used to guide this process

Stakeholder Groups Interviewed - 11



Common Themes

- Model outputs are difficult for many to understand so they don’t know what a change really means for them personally, or how a new management system would impact competition, permit structures, jurisdictional and ecosystem boundaries, or legal implications with MSA.
- Stakeholders want to collaborate on management decisions, but fear having voice minimized or lost in new process
- Questions over how choke species will be handled and multiple gear impacts to ecosystem
- Across the spectrum, stakeholders asked for a “playbook” to develop a common understanding of terms and establish a how-to guide
- Establishing data baselines and supporting collaborative research
- How will impacts from climate change impacts and offshore developments be accounted for?

Key Benefits to Communicate

- Provides more stability to the industry and the ecosystem
- Provides transparency in objectives from the decision-making process
- More reflective of and responsive to a changing ecosystem
- Allows industry flexibility to make business decisions

Stakeholder Suggested EBFM Benefits

- Support for more inclusive process and a system that produces less waste from “by-catch”
- Potential to include more social factors in decision making, as well as food web interactions
- Managing for a more stable and resilient ecosystem and more flexibility in target species among fishermen
- Inclusion of multiple stakeholders to have a voice in the process; accounting for ecosystem interactions to maximize catch while minimizing impacts
- More fish, healthier ocean environment which in theory leads to more ability for catch for community-based fishermen

Stakeholder Suggested EBFM Benefits

- Understanding food web interactions and more robust decision making
- Flatten the ’boom or bust’ cycles and provide more consistency and predictability in our fisheries
- Flexibility in fishing and a healthier ecosystem
- Being responsive to food web interactions and changes in the ecosystem
- Current management process is daunting, this may bring more accountability in management
- Flexibility in where and how fishermen fish, allows industry to be more responsive to changes in the ecosystem

Shared Stakeholder Concerns

Fear of Change

Scientists, Scallop Fishermen, Community/Public, Dealers/Processors

Legal / Regulatory / Management Hurdles

Scientists, Scallop Fishermen, ENGOs, Other Interests

Permitting

Managers, Recreational Fishermen, Dealers/Processors

Understanding of EBFM

Ground Fishermen, Recreational Fishermen, Community/Public

Data & Science Needs

Ground Fishermen, Dealer/Processors, Other Interests

Gear Conflicts

Pelagic Fishermen, Lobster Fishermen

Trust In the Science

Recreational Fishermen, Community/Public

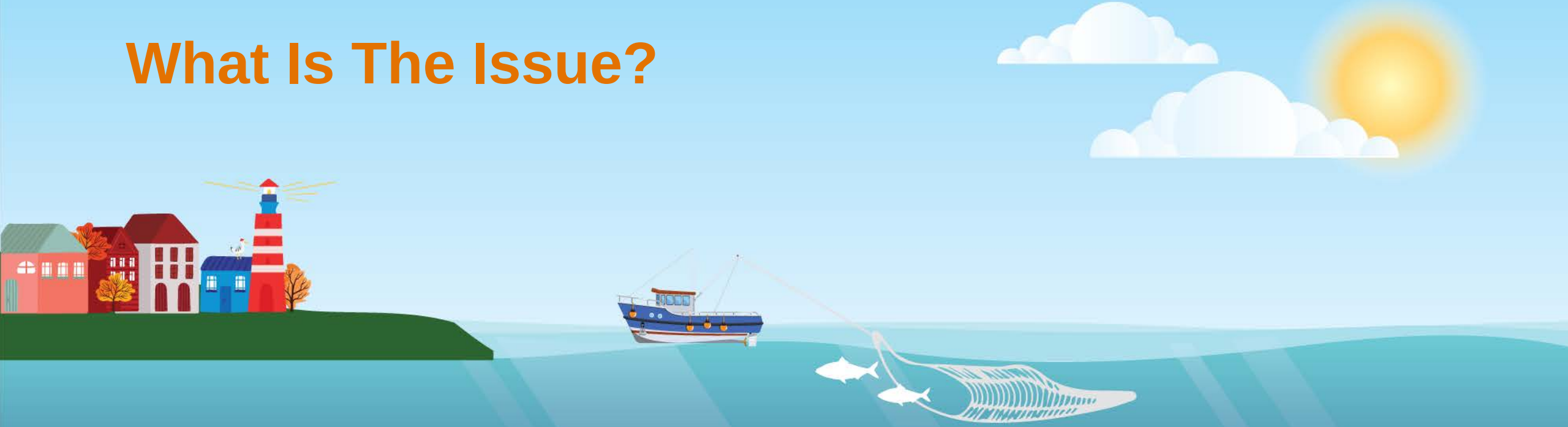
Jurisdictional Overlaps

Pelagic Fishermen, Lobster Fishermen

PLACEHOLDER FOR WORKSHOP PROCESS

- HOLD FOR OUTLINE OF THE WORKSHOP PROCESS AND WHEN/HOW TOPICS WILL BE DISCUSSED

What Is The Issue?

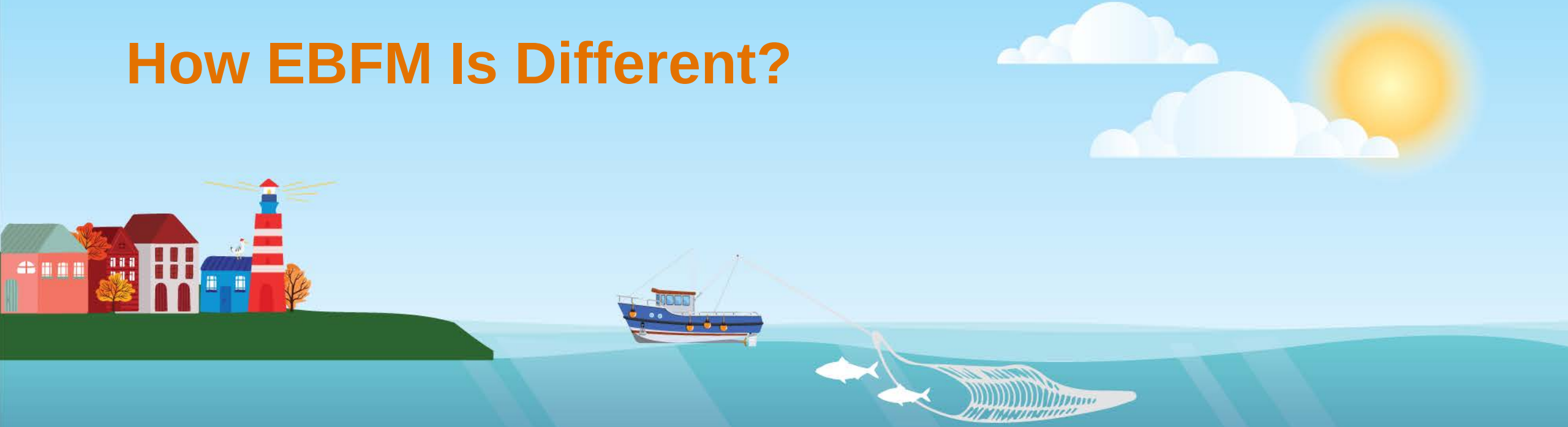


1. Most fishery management focuses on a **single** species, with little consideration for how it functions as a **predator** or **prey**.

2. The **goal has been**, identifying how many of these fish can we safely harvest and still leave enough so that we can fish in the future.

3. This **'single species'** approach does not consider how other fisheries and the larger **ecosystem** might be affected.

How EBFM Is Different?



When ecosystems and fisheries decline, so do our fishing communities. The New England Fishery Management Council's (NEFMC) goal is to create a management system that will achieve **sustainable** and **productive** fisheries and **balanced ecosystems**, while also providing greater flexibility for fishermen to choose **when** to fish, **what** to fish for, and **how** to fish.

How Does EBFM Work?

1. EBFM is specific to a defined geographic space called an **Ecological Production Unit** (EPU).

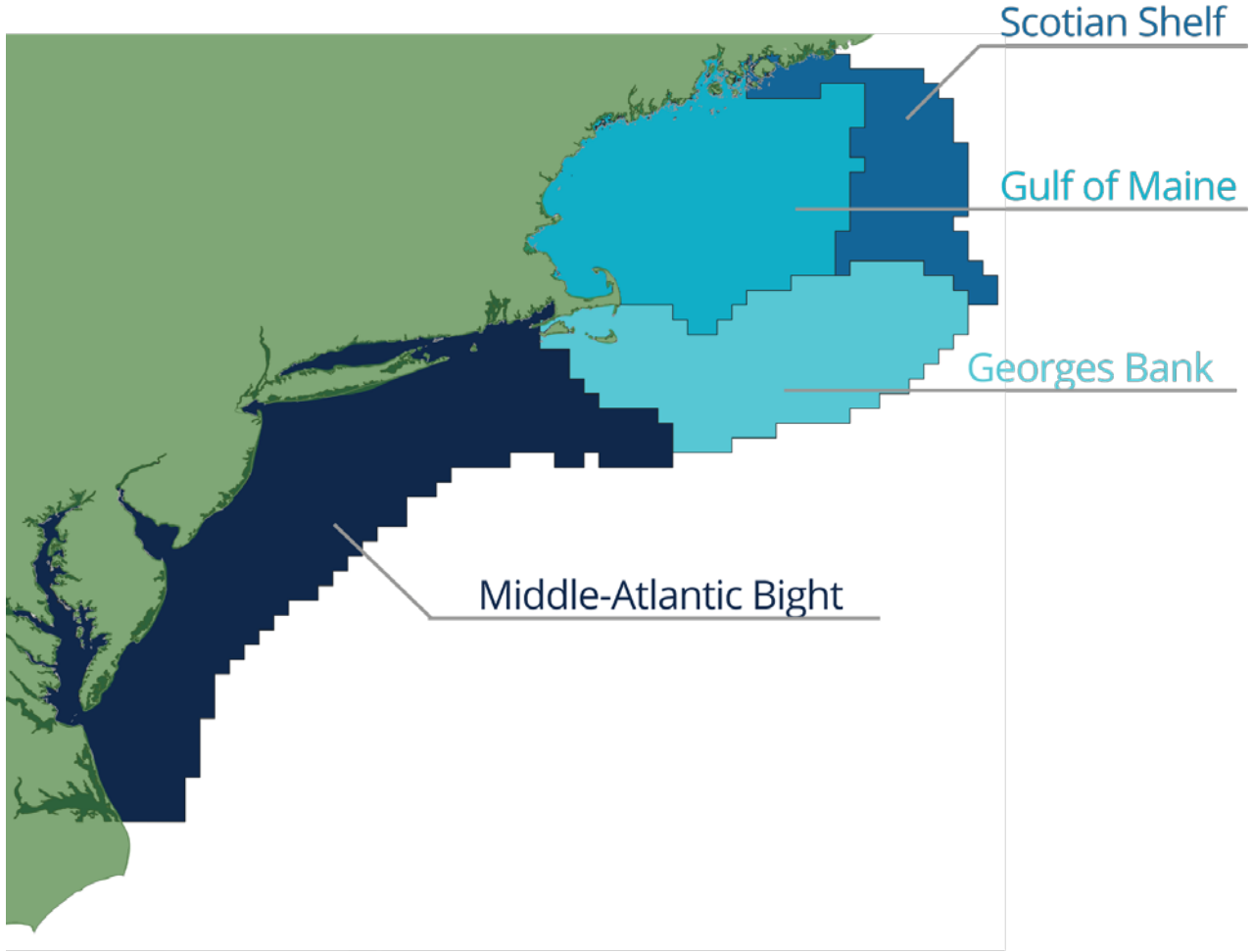
2. In EBFM, **management objectives** and multiple factors of **ecosystem health** are considered, along with **industry** input, through the NEFMC process before management decisions are made.

3. Scientists analyze these **factors** and provide advice to managers who then make decisions about **catch limits.**

What Is An Ecological Production Unit (EPU)?

Geographically specific area with unique characteristics of:

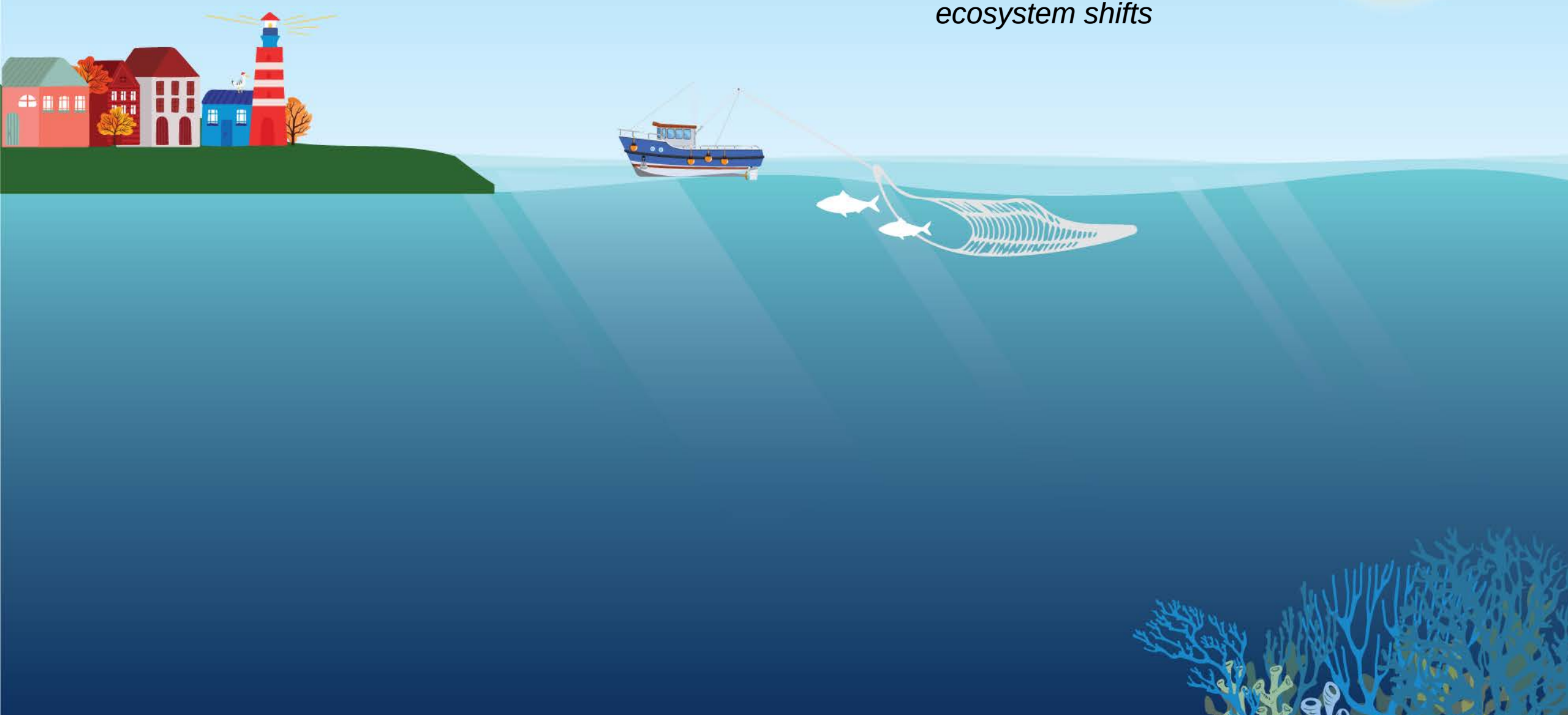
1. Physical – depth, bottom type, temperature, & circulation.
2. System Energy flow.
3. Biology – distribution of invertebrates, fish, marine mammals, sea turtles, & seabirds.
4. Fishing activity – otter trawl, longline, pot, & dredge.



BREAK

How Does EBFM Work?

Factors of ecosystem health



Climate & Weather

Weather patterns and changing climate lead to ecosystem shifts

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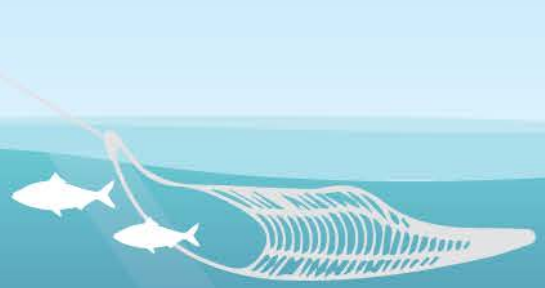

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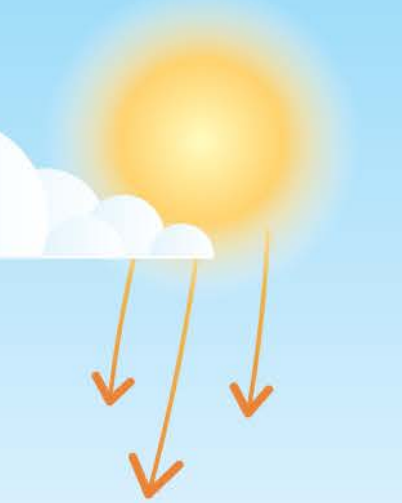
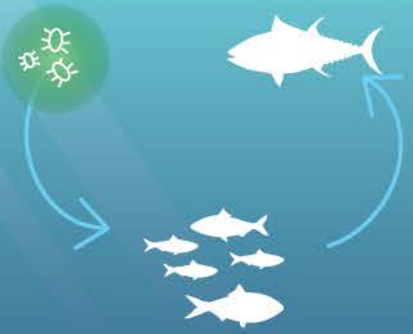
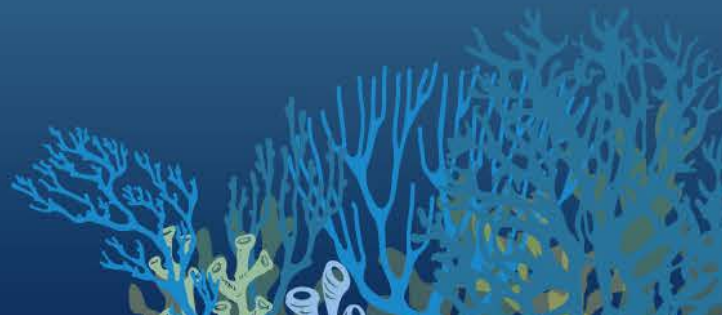




Energy flow through the ecosystem



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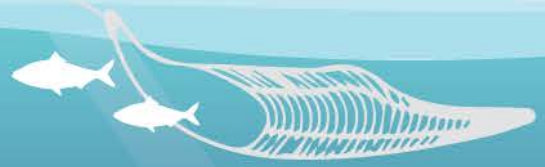
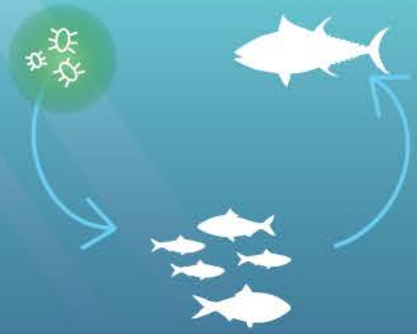
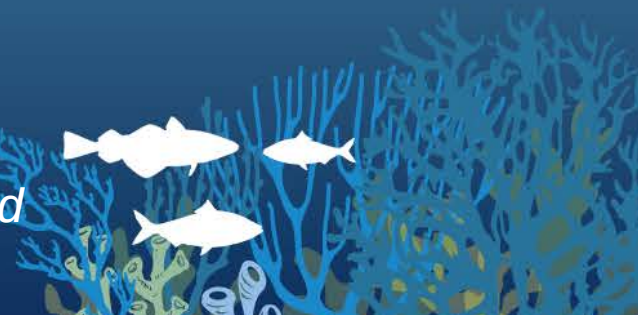




Energy flow through the ecosystem

Habitat

Healthy fish stocks need healthy habitat



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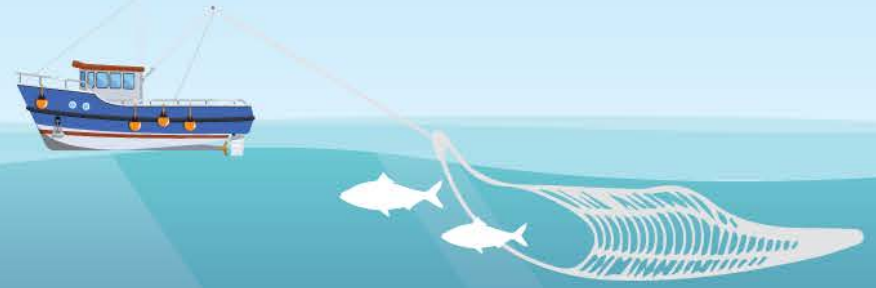
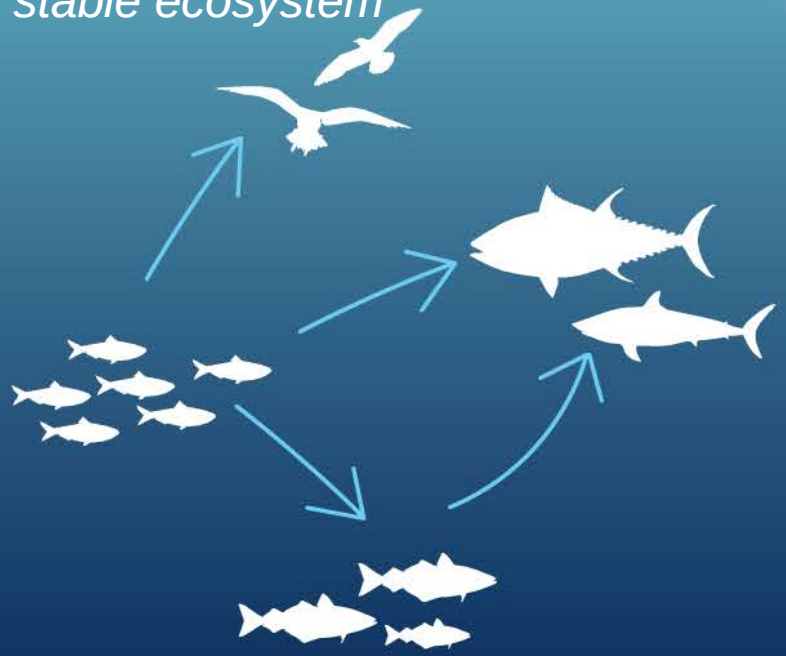
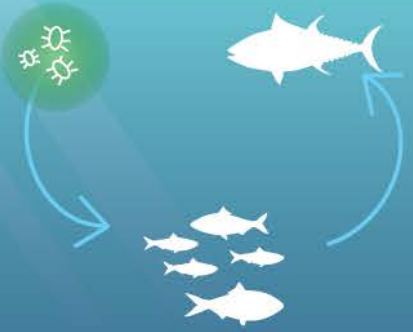


Predator & Prey

A balanced food web contributes to a stable ecosystem





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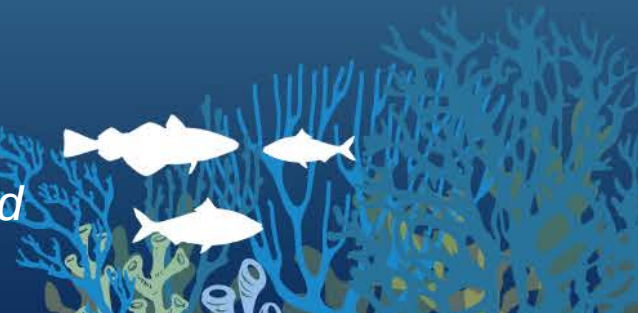

How Does EBFM Work?

Factors of ecosystem health

Fishermen, Coastal Communities, & the Economy

Economic and cultural objectives of multiple stakeholders

Climate & Weather

Weather patterns and changing climate lead to ecosystem shifts

Predator & Prey

A balanced food web contributes to a stable ecosystem

Energy flow through the ecosystem

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Catch Ceilings

Energy flow through the ecosystem

Habitat

Healthy fish stocks need healthy habitat

EBFM Catch Ceilings

After assessing the health of the ecosystem, managers will set three different types of catch limits:

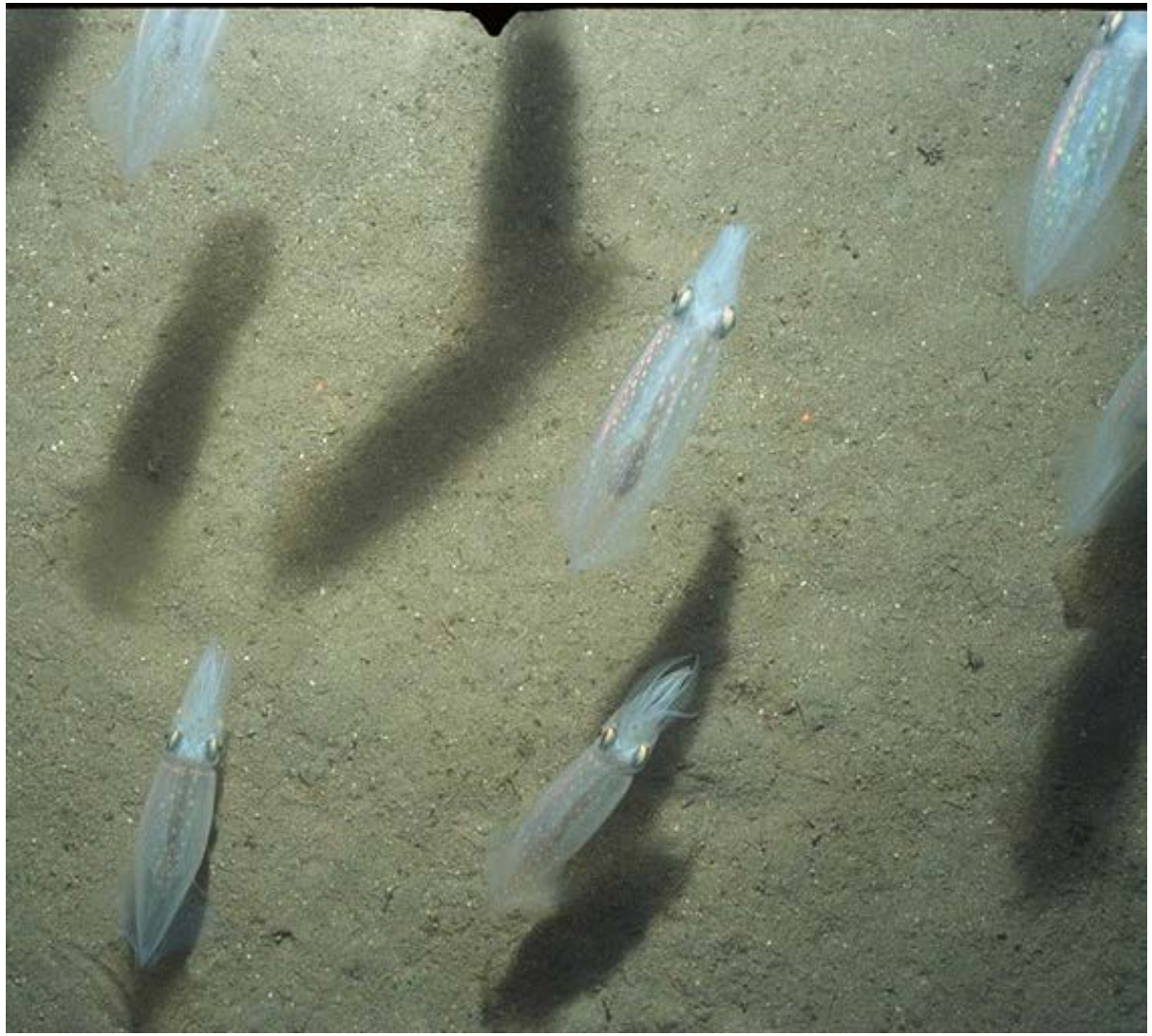
1. The Ecosystem Catch Cap
2. Stock Complex Catch Ceilings
3. Individual species Biomass Floors

What Is Your Role?

- Attend these workshops and learn about EBFM.
- Determine what **your** goals would be in a fishery managed under EBFM.
- Ask **questions** and provide **input** and **feedback**.

What Comes Next?

- After these workshops, we will begin a Management Strategy Evaluation, or MSE.
- The MSE includes stakeholders to looks at tradeoffs between multiple objectives.
- MSE includes examining model outputs under different management scenarios.



For More Information:

- NEFMC EBFM committee page
  https://bit.ly/NEFMC-EBFM
- NOAA EBFM Roadmap
  https://bit.ly/EBFM-roadmap
- NOAA State of the Ecosystem
  https://bit.ly/NOAA-Ecosystem