

New England Fishery Management Council
Deep-Sea Coral Amendment
Stakeholder Workshop

Canyon and slope coral zones
New Bedford, MA
March 13-14, 2017

What are deep-sea corals?

- Deep-sea corals are animals, related to anemones and jellyfish
- They live in cold, deep-waters (at least 25 fathoms/50 m, typically deeper)
- Unlike tropical corals that have symbiotic algae in their tissues, deep-sea corals are active feeders
- Some types, sea pens in particular, are found in soft bottom, but many species need to attach to boulders and rocky ledges

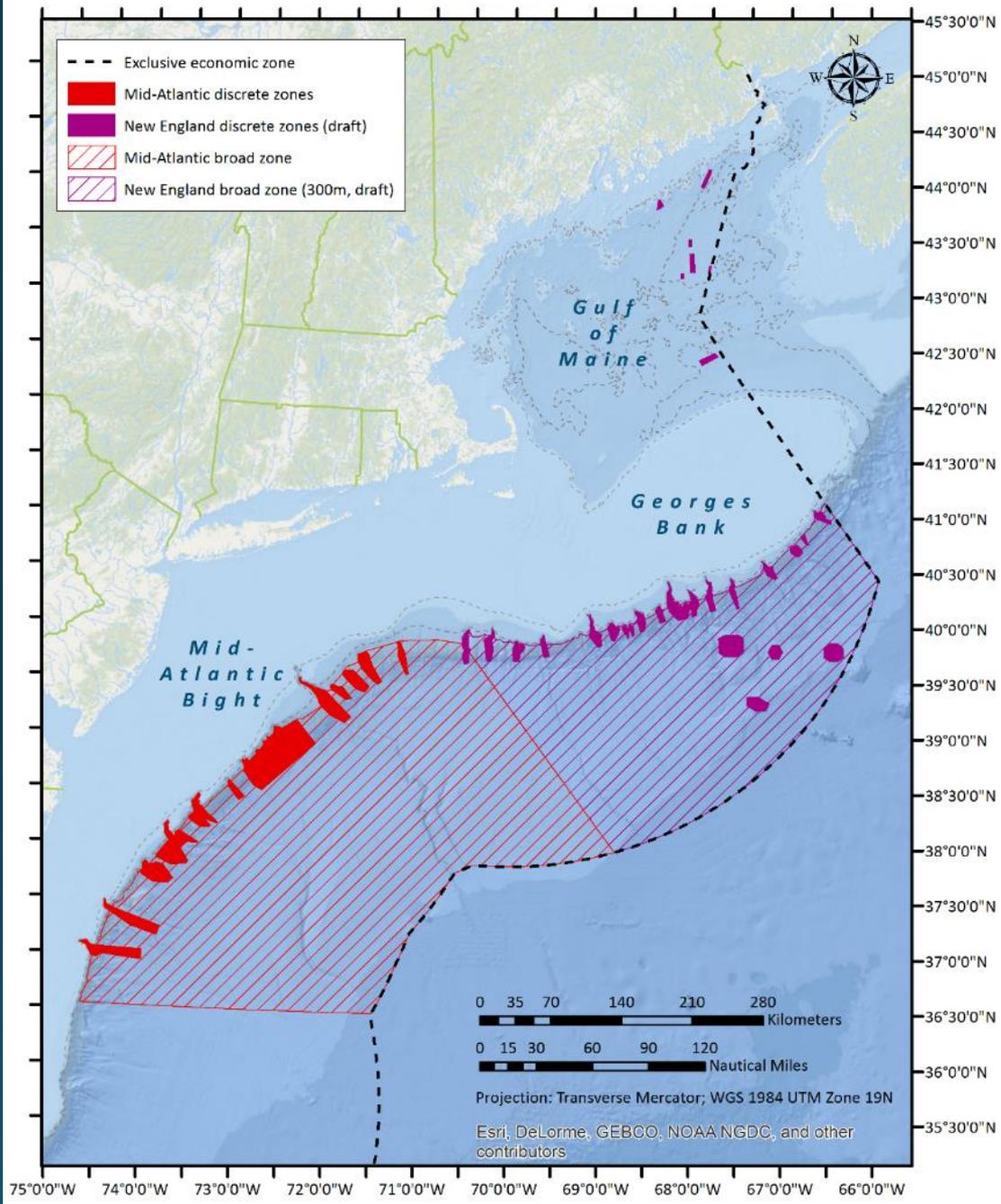


Upper image: A sea fan (*Paramuricea*) in Nygren Canyon
Lower image: A large black coral and sea fans (*Paramuricea*) in Oceanographer Canyon
Images courtesy of NOAA Okeanos Explorer Program, 2013 Northeast U.S. Canyons Expedition.

Deep-sea coral management along the Atlantic coast

Mid-Atlantic region: MAFMC management areas (red) in canyon/slope region extending out to edge of EEZ (effective January 2017)

New England region: NEFMC amendment (currently under development) is considering management areas (purple) in shelf/slope region and in the Gulf of Maine



Management authority

- When the Magnuson-Stevens Act was reauthorized in 2007, a provision was added that allows Councils to take discretionary action to protect deep-sea coral habitats
 - While many corals provide habitats for fishes, including species managed by the Councils, the discretionary authority allows Councils the flexibility to decouple coral conservation measures from Essential Fish Habitat or bycatch-related authorities in MSA
 - This is important in the context of precautionary management as some corals occur in deep and remote waters beyond the distribution of managed stocks and fisheries (e.g., on the New England seamounts)
- NOAA's National Marine Fisheries Service drafted national guidance on implementing the discretionary provisions in 2014
 - Per the guidance, Councils may develop measures that apply to any fishing, including fishing managed under other federal fishery management plans (e.g., those developed by another Council), or state-regulated fishing authorized in the EEZ (e.g., the lobster fishery)

Why protect coral habitats?

- Deep-sea corals provide habitat for fishes and for other invertebrates
- Many coral species are physically fragile and susceptible to entanglement with fishing gear.
- Their very slow growth rates mean that recovery from damage takes many years
- Thus, a precautionary management approach is appropriate to prevent future impacts in areas that are currently unfished



Clockwise from upper left: skate on wall of Atlantis Canyon, shrimp among corals in Hydrographer Canyon, hake and red crab along the slope between Heezen and Nygren Canyons. Images from 2013 Northeast U.S. Canyons Expedition.

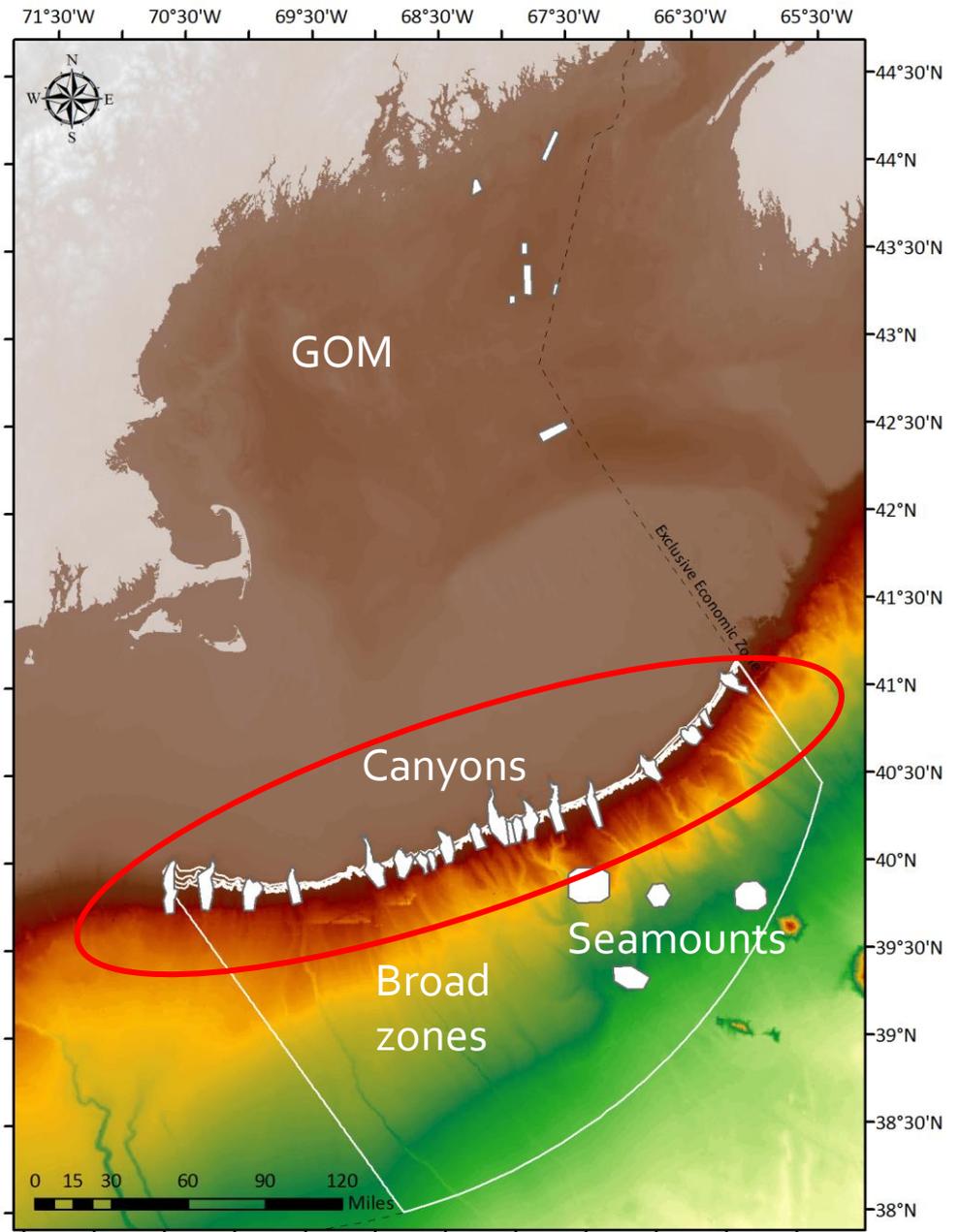
New England Fishery Management Council amendment problem statement:

The Council is utilizing its discretionary authority under Section 303(b) in MSA to identify and implement measures that reduce, to the extent practicable, impacts of fishing gear on deep sea corals in New England. This amendment contains alternatives that aim to identify and protect concentrations of corals in select areas and restrict the expansion of fishing effort into areas where corals are likely to be present.

Deep sea corals are fragile, slow-growing organisms that play an important role in the marine ecosystem and are vulnerable to various types of disturbance of the seafloor. At the same time, the importance and value of commercial fisheries that operate in or near areas of deep sea coral habitat is recognized by the Council. As such, measures in this amendment will be considered in light of their benefit to corals as well as their costs to commercial fisheries.

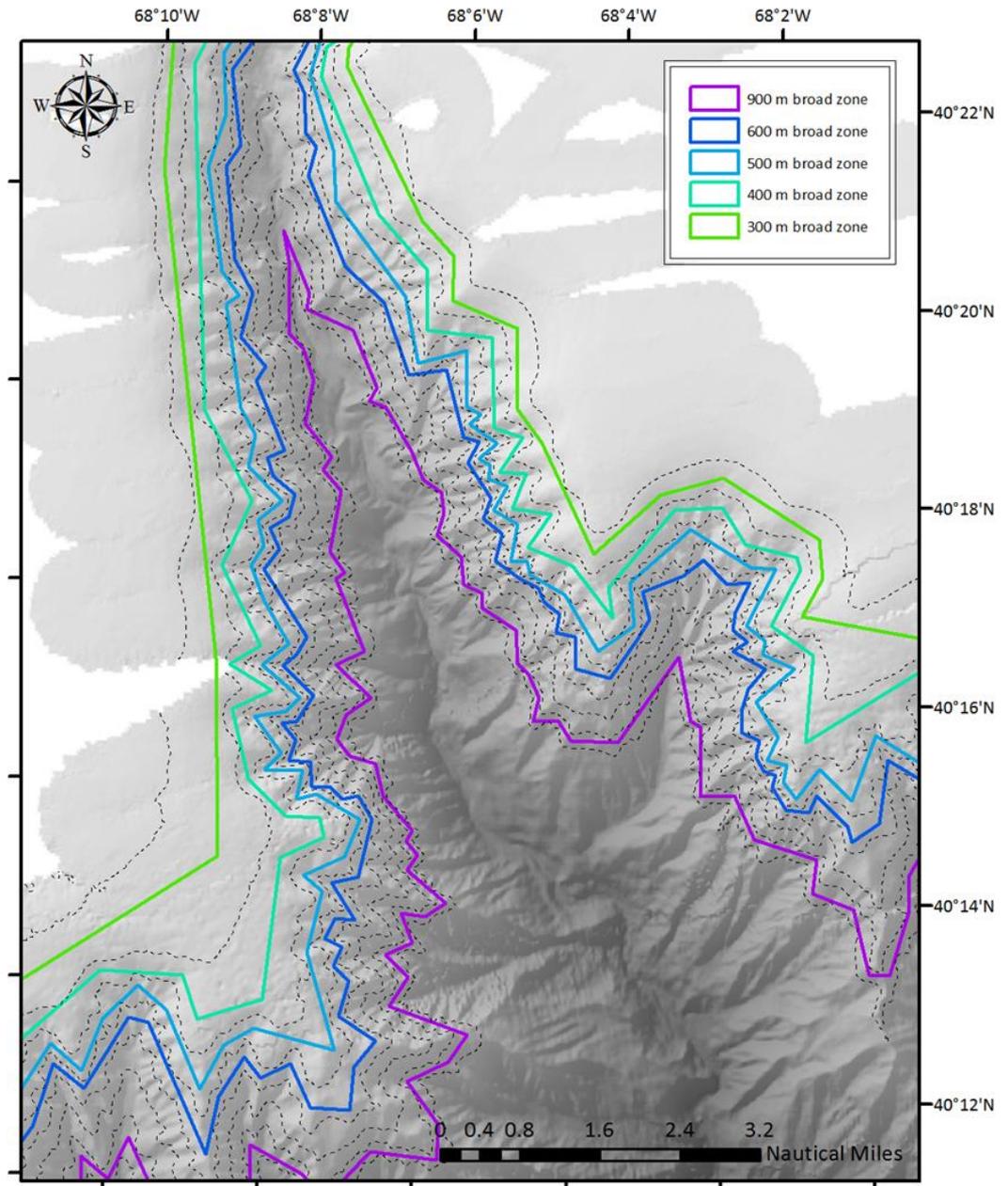
NEFMC deep-sea coral zone alternatives

- Broad zones: large areas based on 300m, 400m, 500m, 600m, 900m depth contours extending to EEZ boundary
- Canyons: 20 areas
- Seamounts: Bear, Retriever, Physalia, Mytilus
- GOM: Mt. Desert Rock, Outer Schoodic Ridge, Linden Kohl Knoll, Jordan Basin (114 fathom bump, 118 fathom bump, 96 fathom bump, central Jordan Basin)



Broad zone boundaries

- Based on depth contours (note that 900 meters is not shown here).
- First, identify Target depth contour
- Then, simplify contour using point removal tool so that boundary is with 100 meters of target (50 meters on either side)
- Still very complex boundaries, especially for deeper contours



Map created November 16, 2016 NEFMC Habitat Plan Development Team

Gear restrictions being considered

- **Prohibit fixed and mobile bottom-tending gears.** Gears that do not contact the seabed would be allowed.
 - Sub-option: exempt the red crab fishery from bottom-tending gear restrictions
 - Sub-option: exempt other trap fisheries from bottom-tending gear restrictions
- **Prohibit mobile bottom-tending gears only.** This approach would prohibit the use of mobile bottom-tending fishing gears in deep-sea coral zones, but would allow the use of fixed gears and any gears that do not contact the seabed.
- **Transiting** across coral zones would be allowed.
 - Vessels may transit the coral zones provided bottom-tending trawl nets are out of the water and stowed on the reel and any other fishing gear that is prohibited in these areas is onboard, out of the water, and not deployed. Fishing gear would not be required to meet the definition of “not available for immediate use” in 50 CFR § 648.2.

Deep-sea corals of New England

- Four major groups: stony corals, soft corals, and black corals, and sea pens
 - Vary in terms of biology, distribution, habitat requirements
- Black corals occur along the continental margin south of Georges Bank in very deep water, but not in the Gulf of Maine
- Species richness is greater in the canyon/slope region vs. the Gulf of Maine
- Some species were documented for the first time in New England during recent scientific expeditions (2013-2015)
- New England corals are mostly colonial, but not reef building

Types of corals that occur in the New England region



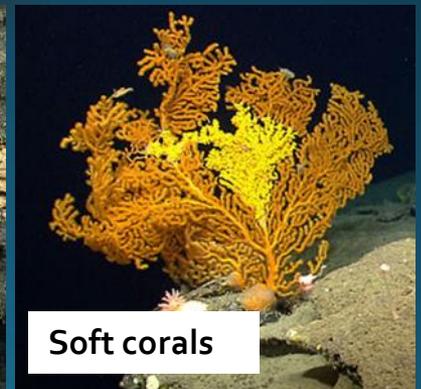
Sea pens



Stony corals



Black corals



Soft corals

What do we know about fishing gear impacts on corals?

- Coral characteristics make them inherently vulnerable to damage
 - Slow growth, branching structure, brittle/easily broken, limited dispersal capabilities
- Scientific studies have documented negative impacts of fishing gears on corals in many parts of the world
 - Most studies address trawl interactions; less work on fixed gears
- Coral bycatch does occur in New England
 - Since 2013, the Northeast Fishery Observer Program has collected samples when bycatch occurs to verify coral identifications
 - Most interactions are in the Gulf of Maine (vs. the canyons/continental slope)
 - While these data indicate that coral/gear interactions are occurring, we can't use them to estimate bycatch rates at the fleet level

Evaluating impacts to deep-sea corals

For each management zone:

- Assess the occurrence of corals and likely coral habitats:
 - Water depth, known occurrence of corals, and area of high slope
 - Only a small portion of each zone has been studied, so seafloor terrain data are used to assess where coral habitats are likely to occur
- Consider fishing activities and gears used:
 - Vessel trip reports, satellite vessel monitoring systems, at-sea observer, and industry observations and surveys
 - Seeking additional industry observations to refine our understanding of fishing practices
- Considering the vulnerability of corals to gears fished in the zone, what conservation benefits might be achieved by excluding fishing from the zone?

Estimating revenue in offshore coral zones

Jordan Basin, Lindenkohl Knoll (also south of Georges Bank)

- Analysis is based on vessel trip reports (2010-2015)
 - Revenue by gear type and species
 - Number of trips and permits by gear type
 - Percent revenue by owner
- Lobster revenue, trips, and permits are scaled up by 26% to account for the fact that not all vessels submit VTRs
- Spatial data associated with VTRs is generally a single point location, which is supposed to be the center of fishing on a trip
 - In some cases, these points are obviously inaccurate. These types of errors lead to effort/revenue being inferred to the wrong location.
 - Even if the point is generally accurate, in reality, effort is distributed around the point. A model was developed to assign revenue from each trip in the VTR data to concentric rings around the point.
 - Alternate approach for lobster trap gear in canyon/slope region relies on information from an ASMFC survey about depth fished to distribute revenues spatially

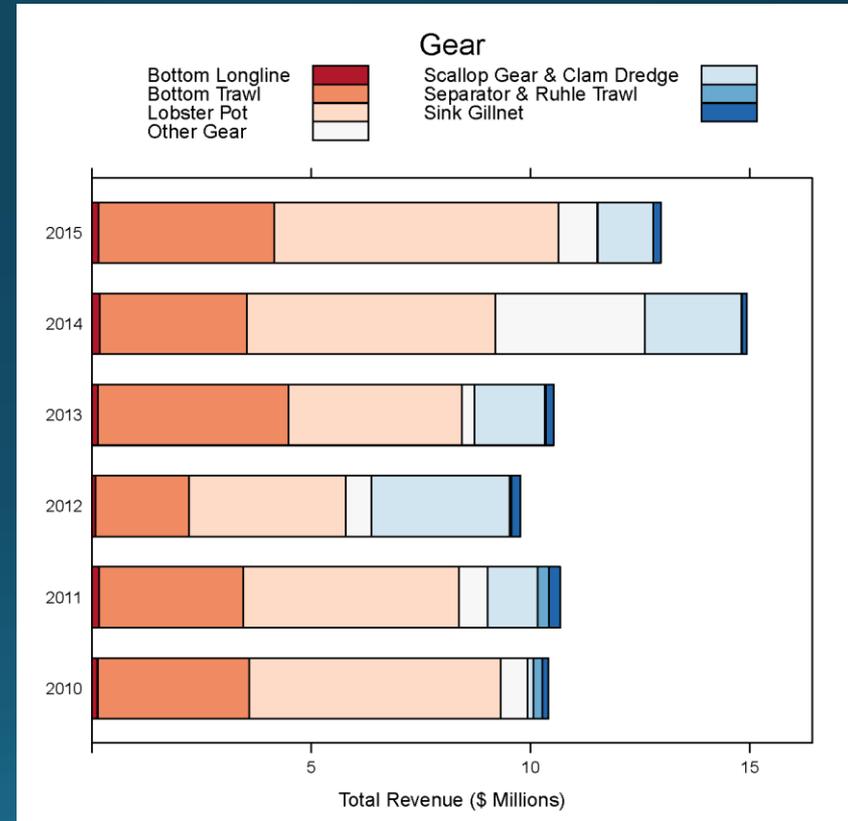
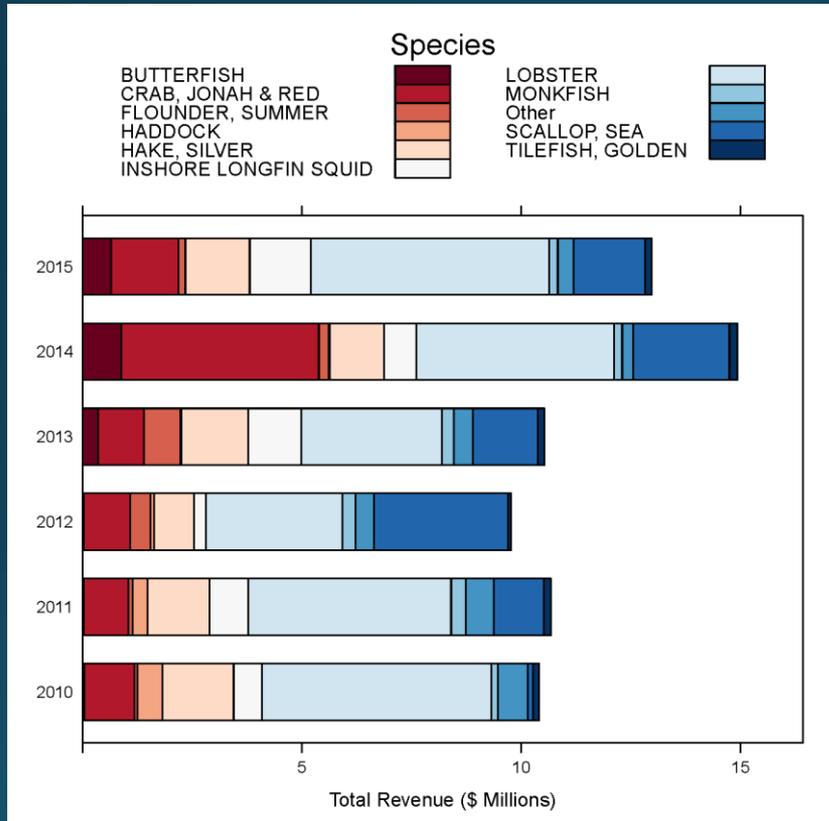
Social/community impacts

- Consider the general social impacts to fisheries of area closures (ability to adapt, displaced effort, gear conflicts in open areas, long-term though uncertain benefits to fisheries if ecosystem improves and resource productivity increases)
- Consider how recent fishery revenues in a zone or group of zones have been are distributed amongst communities
 - What are the demographic characteristics of those communities and their dependence on fishing?
 - Need to ensure that community data are non-confidential when reporting data by year/gear/port – at least three vessels selling to at least three dealers
- Also consider non-use/existence value of corals

Revenue by gear and species

Example: 300 meter broad zone

Year



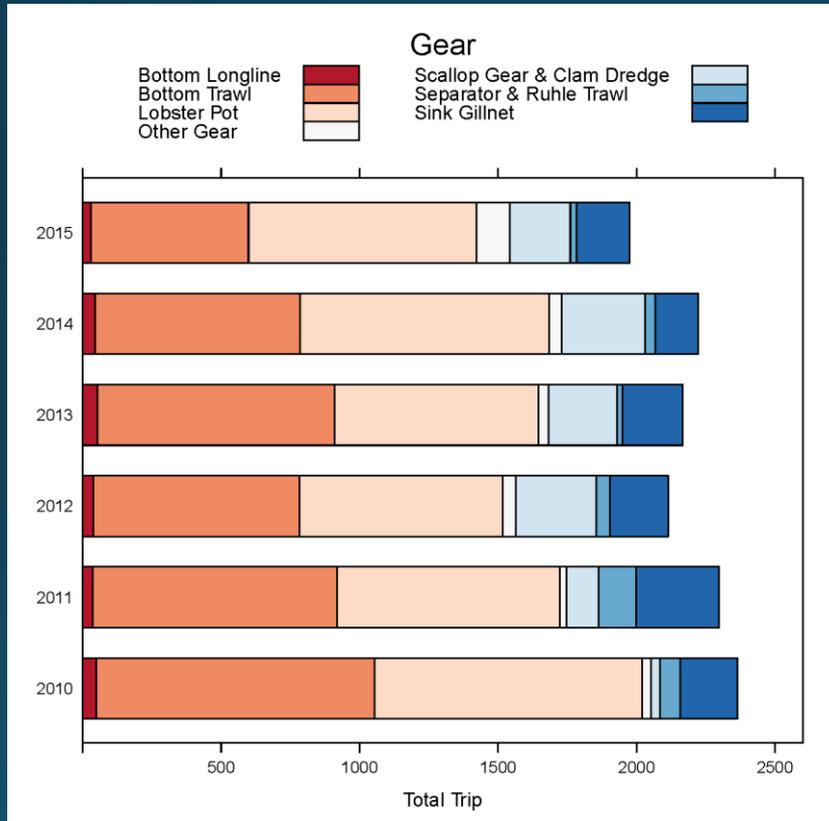
Revenue, millions of dollars

***Lobster revenues scaled up by 26% to account for vessels that do not report via VTR*

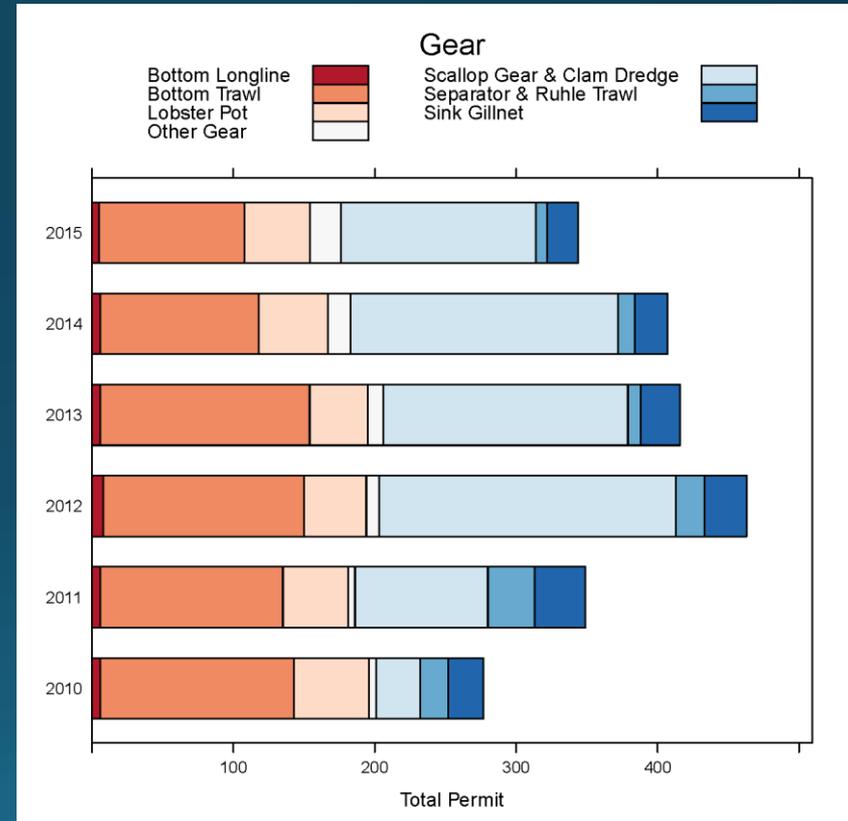
Trips and permits by gear type

Example: 300 meter broad zone

Year



Total trips



Total permits

Landings attributed to fishing with VTR, 300 meter coral zone.

State/Region/Port	Landings Revenue 2010-2015		Total Permits**
	Total \$	Average \$	
Massachusetts	\$41.3M	\$8.3M	477
North of Cape			52
Gloucester	\$1.6M	\$0.3M	36
Other	\$0.1M	\$0.0M	****
Cape & Islands	\$8.5M	\$1.7M	50
South of Cape			420
New Bedford	\$30.6M	6.1M	394
Other	\$0.5M	\$0.1M	****
Rhode Island	\$19.0M	\$3.8M	118
Newport	\$9.3M	\$1.9M	19
Point Judith	\$4.1M	\$0.8M	96
Tiverton	\$1.5M	\$0.3M	3
Other	\$4.1M	\$0.8M	****
New York	\$2.7M	\$0.5M	31
Montauk	\$2.5M	\$0.5M	****
Other	\$0.2M	\$0.0M	****
Virginia	\$1.8M	\$0.4M	110
Connecticut	\$1.3M	\$0.3M	25
New Jersey	\$1.2M	\$0.2M	58
North Carolina	\$0.2M	\$0.0M	48
Maine	\$0.0M	\$0.0M	3
Other*	\$1.7M	\$0.3M	13
Total	\$69.3M	\$13.9M	665***

*Includes confidential state(s); **Total permits, 2010-2015; ***Total is less than the sum of the states, because permits land in multiple ports and states; ****Not calculated, less than or equal to state or regional total. Source: VTR data analysis.

Workshop attendees

- Which fisheries are represented? Who are other attendees?
- *To be updated when registration list is finalized.*

Amendment timeline

- April 14: Habitat Committee reviews workshop outcomes and recommends preferred alternatives
- April 18-20: Council selects preferred alternatives
- May: Public hearings/comment period
- Early June: Committee reviews written and hearing comments, recommends any updates to preferred alternatives
- June 20-22: Council takes final action on coral amendment
- Summer/fall: Amendment submission and rulemaking
- 2018: Implementation

Questions?