



New England Fishery Management Council

50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

February 8, 2018

Ms. Kelly Hammerle
Chief, National Oil and Gas Leasing Program
Development and Coordination Branch
Leasing Division, Office of Strategic Resources
Bureau of Ocean Energy Management
45600 Woodland Road, Mailstop VAM-LD
Sterling, VA 20166

Dear Ms. Hammerle:

Please accept these comments from the New England Fishery Management Council (Council) regarding the 2019-2024 Draft Proposed National Oil and Gas Leasing Program (DPP). While the Council recognizes the importance of domestic energy development and energy security, we recommend that the North and Mid-Atlantic Planning Areas be deleted from the 2019-2024 five-year plan. Leasing and development of these areas exposes living marine resources and fishing communities to too great a risk of significant damage.

On June 29 and August 15 of last year, the Council sent letters summarizing our concerns. Our most recent letter is attached. The comments below reiterate these concerns and include additional remarks on the development of the Programmatic Environmental Impact Statement (PEIS). We assume that the 2019-2024 PEIS will be similar to the 2017-2022 PEIS (BOEM 2016a).

The Council has sole or primary management jurisdiction over 28 marine fishery species¹. Commercial and recreational fisheries are important sources of economic benefits along the entire Atlantic coast. These industries provide significant benefits to the nation, including contributions to our nation's food security. As the world's population continues to increase these renewable food resources and the employment opportunities they provide will grow in importance. If future benefits of these activities are to be realized, energy development must minimize risks to marine species and existing human uses.

We cannot overemphasize the need for BOEM to actively engage affected fishermen and their communities throughout the development of the five year program. From our experience these individuals and their industry associations are highly engaged in these issues and want to provide BOEM with detailed information on their fishing practices, including which locations are important to them and why. At minimum, BOEM's efforts should include open listening sessions in fishing ports as well as direct and targeted contact with industry associations to seek more detailed feedback. BOEM should work with the Regional Fishery Management Councils, the

¹ Atlantic cod, haddock, pollock, white hake, Acadian redfish, Atlantic wolffish, ocean pout, Atlantic halibut, winter flounder, American plaice, witch flounder, windowpane flounder, yellowtail flounder, monkfish, winter skate, little skate, smooth skate, thorny skate, barndoor skate, rosette skate, clearnose skate, silver hake, red hake, offshore hake, Atlantic herring, Atlantic sea scallop, Atlantic salmon, Atlantic deep-sea red crab

Atlantic States Marine Fisheries Commission, and state marine resource agencies on outreach prior to any public meetings. While talking to commercial and recreational fishermen is the best way to understand their operations, the Councils and NMFS can also assist BOEM in identifying which fisheries operate in specific locations, including which ports these vessels are based in. Fishing effort maps and community data on the Northeast and Mid-Atlantic Ocean data portals are a good starting point for these investigations but should be supplemented with more detailed information. BOEM's renewable energy program has developed extensive best management practices for outreach and coordination with the fishing industry, and the oil and gas program should adopt these BMPs wherever possible.

Our concerns regarding oil and gas development fall into five categories. First, we are concerned about direct displacement of fishing due to survey or extraction activities occurring in offshore environments. Second, sensitive, deepwater benthic habitats in the Atlantic OCS overlap hydrocarbon assessment units. These habitats, which are essential to many deep-sea species as well as some commercially-exploited stocks, could be substantially impacted by extraction activities. Third, we are concerned that sounds produced by oil and gas surveys and drilling operations will harm living marine resources and cause changes in distribution or abundance of these resources that will in turn affect fishing operations. Fourth, infrastructure development to support an Atlantic oil and gas industry could harm nearshore fish habitats which must be fully considered. Finally, there is a risk of chronic leaks and or catastrophic discharge events from oil and gas extraction and transport. Such spills have long-term adverse effects on marine ecosystems, and cascading effects on human activities that would jeopardize both vulnerable species and the commercial and fishing industries, as well as coastal tourism opportunities, which are important to all east coast states.

Most North and Mid-Atlantic Hydrocarbon Assessment Units (BOEM 2016b) overlap important fishing grounds, and others lie just offshore of these grounds. For example, the inshore boundary of the Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Core AU is within just 5 to 10 miles of where fishing activities occur, namely trawling, trapping, and longlining for whiting, squid, red crab, lobster, Jonah crab, monkfish, butterfish, and tilefish. Survey and extraction activities could directly displace fishing vessels, and some fishing operations would not be economically viable if forced to move to less productive or more distant fishing grounds. Georges Bank is of particular concern as it is an important fishing area for groundfish, scallops, clams, lobster, and other marine species. The Atlantic sea scallop fishery has annual dockside revenues of more than one-half billion dollars and a much larger regional and national economic impact. A significant fraction of these revenues is generated from Georges Bank scallop beds.

The Council also is concerned about the effects of extraction activities on fish and their habitats. Within the North and Mid-Atlantic Planning Areas, the Council has designated essential fish habitat (EFH) for all 28 of the species it manages. The Mid-Atlantic Council has designated EFH for the species under their jurisdiction, and the National Marine Fisheries Service identifies EFH for Atlantic highly migratory species. Additional NOAA trust resources managed solely by the Atlantic States Marine Fisheries Commission (e.g. American lobster) do not have formally designated EFH, but important habitat areas are described in their fishery management plans. In terms of New England species, Georges Bank and locations close to shore tend to be important habitats for a larger number of species, with somewhat fewer commercially important species occurring in deeper waters. However, in aggregate, species managed by the New England Council rely on habitats from the coastline out to the base of the continental slope, with one species, deep-sea red crab, occurring on the New England seamount chain as well. The Council's Omnibus Essential Fish Habitat Amendment 2 (NEFMC 2017a) updated all of our EFH

designations. The amendment was recently approved by NMFS and will be implemented in spring 2018.

The Council has also designated habitat areas of particular concern (HAPC) which should receive particular attention as BOEM is assessing the potential effects of oil and gas development. The shallower oil and gas assessment units on Georges Bank overlap the northern edge of the bank, which is a habitat area of particular concern for juvenile Atlantic cod. There are also nearshore and inshore habitat areas of particular concern for cod in the Great South Channel/Nantucket Shoals region and along the coasts of RI, MA, NH, and ME. Both the Georges Bank and Gulf of Maine cod stocks are in rebuilding plans and therefore are more vulnerable to environmental disturbances than healthier stocks. Given the importance of protecting nearshore fish habitats, we agree with the exclusion of areas along the Atlantic coast within 25 nm from shore (Option 3). In addition, the Council has identified 11 canyons or canyon complexes and two seamounts as habitat areas of particular concern for our deep-water species, as a result of the presence of deep-sea coral habitats in those locations. The Council's designated HAPCs are shown on Map 1.

From a fishery management perspective, deep-sea corals are important as components of fish habitat, but they are also recognized as a conservation target in their own right. The assessment units along the shelf break overlap deep-sea coral habitats that occur in both the canyons and on the open slope. Because deep-sea corals are fragile and very slow growing, recovery from anthropogenic impacts will be extremely slow. All three Atlantic coast regional fishery management councils have designated areas to highlight important coral habitats and restrict fishing from these areas to protect them from damage. On January 30, 2018, the New England Council voted to restrict almost all bottom-contact fishing from a depth of 600 meters along the shelf break out to the EEZ boundary. This action was taken through the Council's Deep-Sea Coral Amendment (NEFMC 2017b). A similar area is already in place in the Mid-Atlantic. The New England and Mid-Atlantic Council's deep-sea coral protection zones are shown on Map 2. Deep-sea coral habitats are identified on Map 3.

In the past, major canyons were withdrawn from oil and gas exploration and development. These withdrawals should be reinstated (Option 2) and additional areas considered. Such deepwater benthic communities, including coral and sponge habitats, are widespread throughout New England and the Mid-Atlantic, occurring along the continental slope beginning as shallow as 200-300 meters and extending to over 2000 meters. In addition to the canyons and slope, corals and other structure-forming deepwater animals occur on the seamounts and in coastal and offshore areas of the Gulf of Maine (see Map 3). Chemosynthetic (seep) communities are found at the base on the continental slope. We suggest that the withdrawal areas in New England should be expanded to include additional deepwater habitats identified in our Deep-Sea Coral Amendment. BOEM should work closely with NOAA's Deep-Sea Coral Research and Technology Program to understand precisely where these habitats occur. There are similarities between these habitats and deepwater benthic communities identified in the Gulf of Mexico. The 2017-2022 PEIS references required mitigation measures for leases in the Gulf of Mexico, including separation distances between discharge locations/anchor areas and deepwater benthic communities. Similar restrictions should be considered in the North and Mid-Atlantic areas. Furthermore, similar to the Gulf of Mexico, other features of the North Atlantic Planning Area might warrant specific exclusion from development. For example, Cashes and Jeffreys Ledges in the Gulf of Maine seem to be analogous to topographic banks identified in the Gulf of Mexico Planning Area. Both of these areas are designated HAPCs.

While we are not responsible for the management of highly migratory fishes, seabirds, sea turtles, and marine mammals, they are essential components of the marine ecosystem upon which fishery resources depend. These species occur along the shelf break and in other waters throughout the North and Mid-Atlantic Planning Areas. Particular attention should be given to assessment of impacts on threatened and endangered species, including the North Atlantic Right Whale.

As detailed in our earlier letter, we are concerned that sounds produced by oil and gas surveys and drilling operations will have negative impacts on living marine resources. As BOEM is aware, the science on the effects of these sounds on living marine resources is not conclusive, and there are many gaps in our collective knowledge (Hawkins et al. 2015, which builds on a 2012 BOEM workshop summarized by Normandeau 2012). However, scientific uncertainty in the magnitude of and biological mechanisms behind these impacts should not be used as a rationale for downplaying this issue in either impacts assessment or decision-making. Because it is difficult to extrapolate the results of existing studies to species and sound types not specifically examined (Popper and Hastings 2009, Hawkins et al. 2015), BOEM should be very precautionary when authorizing sound generating activities, and should encourage additional research that is regionally-specific. While we appreciate the logistical difficulties of tracking the long-term effects of sound exposure on specific populations of animals in the field, such challenges should not preclude a rigorous attempt to estimate long-term and cumulative effects. BOEM should consider the potential cumulative and long-term effects of sound exposure at population levels when drafting the PEIS. Regardless of whether population-level or long-term effects on the resource can be demonstrated, localized declines in abundance or availability of fish could nonetheless negatively affect fishing fleets.

Construction and operations of onshore or nearshore facilities needed to support oil and gas development of the Atlantic OCS also could impact fish and their habitats. Because the oil and gas resources on the Atlantic coast are not currently developed, the new five-year plan and PEIS should thoroughly explore what sorts of facilities would be required, and where they might be located. For example, would pipelines be required to convey oil and gas to onshore facilities? Or are floating production, storage, and offloading facilities more likely? Which ports are suitable for use as staging areas or offloading facilities? Will harbors need to be deepened to accommodate oil and gas related ship traffic? While there is substantial coastal development along the Atlantic coast, it seems that the Atlantic would be considered a “frontier area” with respect to oil and gas development. The 2017-2022 PEIS indicates that development of such frontier areas is a significant undertaking. If leasing is authorized in the North and Mid-Atlantic planning areas, BOEM must work closely with NMFS and the fishery management councils to evaluate and mitigate, when necessary, impacts of development on both nearshore and offshore marine habitats.

The 2017-2022 PEIS describes ecosystem components such as fishery resources and EFH or commercial and recreational fisheries at a very high level. This is somewhat frustrating as the biological and human components of marine ecosystems are extremely nuanced and complex. Further, when evaluating impacts, those impact producing factors (e.g. noise, vessel traffic, discharges) that BOEM has determined to have no impacts, or only negligible or minor impacts, are relegated to summary tables in an appendix to the EIS (BOEM 2016c). While these summary tables are a useful way to convey information in a succinct and readable format, they do not provide a thorough discussion of how such conclusions were reached. Discriminating between minor and moderate impacts in particular seems to be somewhat subjective, and fisheries constituents would disagree with the assessment that oil and gas-related impact producing factors have only minor effects on fish and fisheries, as concluded in the 2017-2022 PEIS. Vessel

discharges, noise, and the placement of structures offshore will have at least some measures of unavoidable impacts on fish, EFH, and commercial and recreational fisheries.

BOEM should review fishery-dependent and independent data to understand the possible effects of leasing and development on fisheries and fishery resources. It is essential that BOEM use the most up to date information possible when evaluating the existing fishery uses along the Atlantic coast. The DPP cites NMFS 2015 (although this citation seems to be absent from the reference section), but more recent data are available^{2,3}. Current data are critical as fisheries and fishery resources are dynamic, and management is constantly adapting to address changes in resource status. The 2017-2022 PEIS makes the general assumption that fishery resources are abundant or increasing, but unfortunately that is not universally true. In some cases, when stocks are rebuilt or biomass increases, harvest levels can rise, while in other instances updated biological assessments indicate that certain species are struggling and need attention to aid their recovery. In either case, negative impacts associated with oil and gas development are of concern to the Council.

As BOEM considers the value of fisheries in development of the PEIS, it is important to recognize the interconnected nature of the resources and industries throughout the New England and Mid-Atlantic regions. As examples, scallops caught off NJ are landed in New Bedford, MA, and squid captured along the shelf break south of Georges Bank are landed in Point Judith, RI. Many species extend from the Gulf of Maine to Cape Hatteras. While states and ports specialize in certain products and methods of harvest, the fisheries economy is regional and should be viewed as such. The impacts analysis in the PEIS cannot separate the fish and fishery impacts associated with activities in the North and Mid-Atlantic Planning Areas.

The 2017-2022 PEIS considers climate change as an overarching issue that would operate synergistically with impact producing factors related to oil and gas development to affect marine ecosystems. This is appropriate, and analyses in the 2019-2024 PEIS should do the same. The 2019-2024 PEIS should also include a regionally-specific discussion of climate-mediated effects when appropriate. The proposed program document should put potential oil and gas production in context with the amount of electricity that might be generated from renewable sources, and should also consider likely increases or decreases in demand over the possible lifecycle of and oil or gas project, which could be 40 to 70 years.

An inherent risk with hydrocarbon development is the possibility of a catastrophic discharge event. As was done for the 2017-2022 PEIS, these events should be evaluated as a potential impact producing factor associated with oil and gas development. While we agree with BOEM that such events are rare, they are possible, as evidenced by the Deepwater Horizon blowout in the Gulf of Mexico. The PEIS should explain what safeguards are in place to minimize the possibility of large discharge events like Deepwater Horizon. The 2017-2022 PEIS refers generally to such measures, but clearer references to safety regulations would be very useful to readers. Weather conditions in the northwestern Atlantic can be extreme, and it seems likely that such conditions would increase the risk of spills during oil transport and drilling as compared to some other regions of the United States. Also, although CDEs are likely rare, pulling them out of the impacts analysis for each ecosystem component and into a separate section minimizes the

² National Marine Fisheries Service. 2017. Fisheries Economics of the United States, 2015. U.S. DOC, NOAA Tech. Memo. NMFS-F/SPO-170, 147p. http://www.st.nmfs.noaa.gov/Assets/economics/publications/FEUS/FEUS-2015/Report-Chapters/FEUS%202015-AllChapters_Final.pdf.

³ National Marine Fisheries Service. 2016. Fisheries of the United States 2016. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2016. Available at: <https://www.fisheries.noaa.gov/feature-story/fisheries-united-states-2016>.

very serious and potentially severe nature of the impacts associated with a large discharge event. Even if CDEs are highly unlikely, it is exactly these risks that are most concerning to fishery stakeholders.

The Gulf of Maine is one of the fastest warming bodies of water on earth, and we are already seeing evidence of changes in the Northeast Shelf Ecosystem⁴. Given these changes, renewable energy development may be a better focus area for the Atlantic coast at this time. While wind and other renewable projects may still have impacts on fisheries, the risks appear to be fewer. Actions to prioritize renewable energy and decrease reliance on non-renewable resources will reduce the likelihood of negative ecological impacts on our ocean resources, and thereby support the human communities that depend on them.

In conclusion, we strongly encourage BOEM to remove the North and Mid-Atlantic Planning Areas from consideration in the 2019-2024 plan. We are particularly concerned about leasing in the North Atlantic Planning Area as it has the greatest degree of overlap with the fisheries and species we manage. We look forward to working with BOEM to ensure responsible development of domestic renewable energy resources on the Atlantic OCS.

Sincerely,

A handwritten signature in black ink, appearing to read "John F. Quinn". The signature is fluid and cursive, with a long horizontal stroke at the end.

Dr. John Quinn
Council Chairman

cc:

Chris Moore, Executive Director, Mid-Atlantic Fishery Management Council
Robert Beal, Executive Director, Atlantic States Marine Fisheries Commission
Greg Waugh, Executive Director, South Atlantic Fishery Management Council

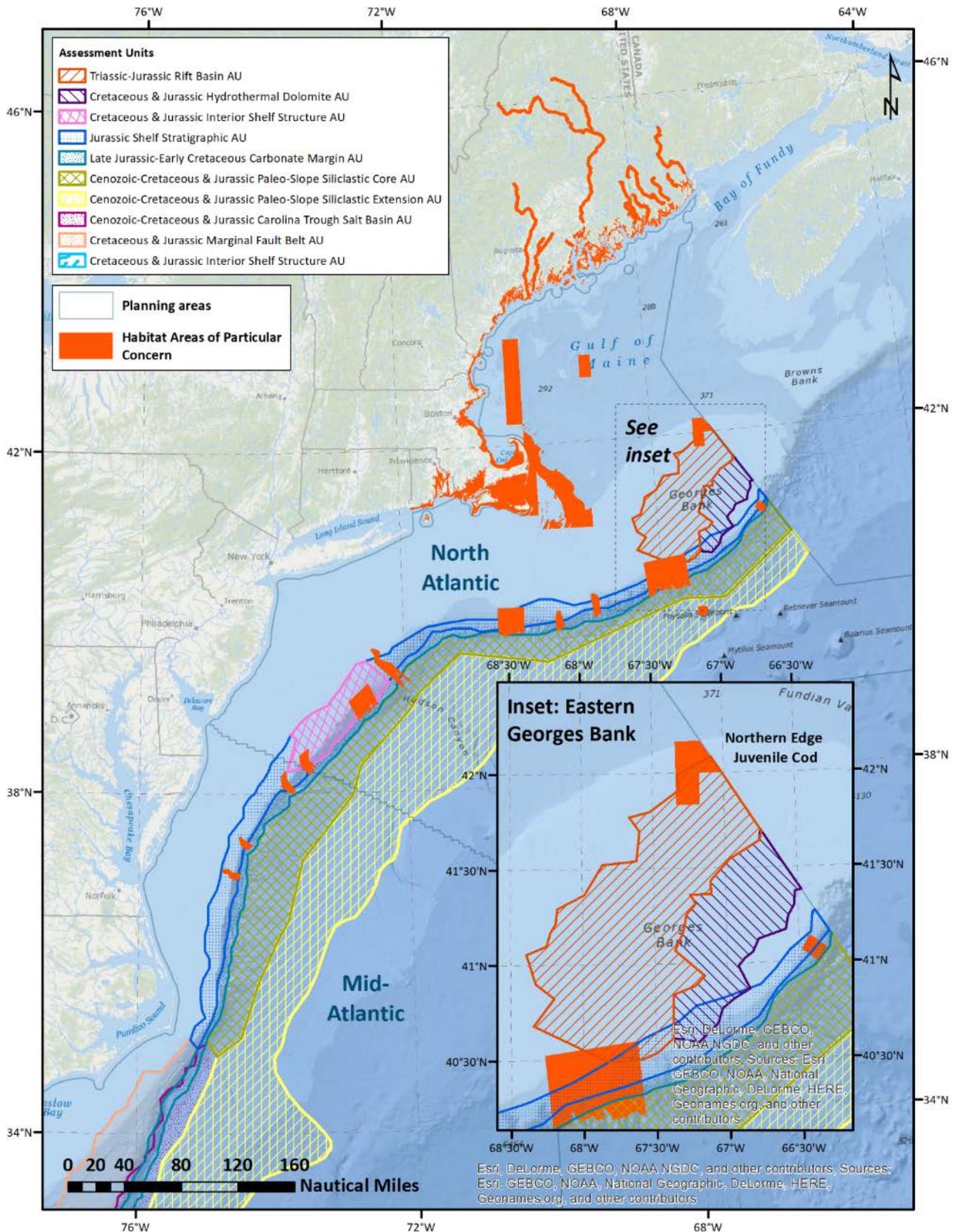
Attachment – August 15, 2017 Letter from NEFMC to Kelly Hammerle

⁴ See <https://www.nefsc.noaa.gov/ecosys/current-conditions/> for a detailed condition report for the Northeast Shelf Ecosystem.

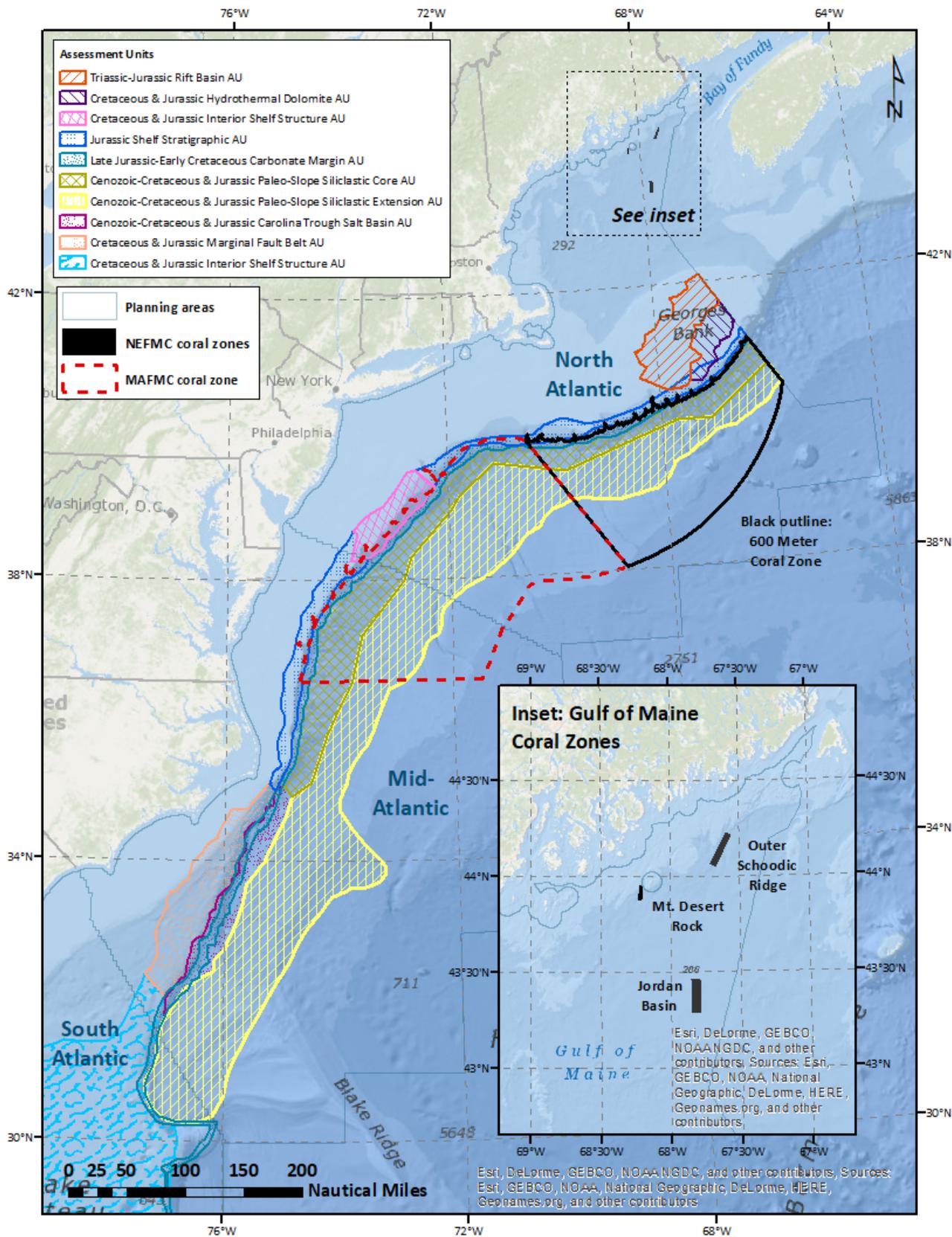
References

- BOEM (2016a). 2017-2022 OCS Oil and Gas Leasing Program Final Programmatic EIS. Volume I: Chapters 1-6. OCS EIS/EA BOEM 2016-060. 360p.
- BOEM (2016b). Inventory of Technically and Economically Recoverable Hydrocarbon Resources of the Atlantic Outer Continental Shelf as of January 1, 2014. OCS Report BOEM 2016-071. 58p.
- BOEM (2016c). 2017-2022 OCS Oil and Gas Leasing Program Final Programmatic EIS. Volume II: Appendices A-J. OCS EIS/EA BOEM 2016-060. 578p.
- Hawkins, A. D., A. E. Pembroke and A. N. Popper (2015). "Information gaps in understanding the effects of noise on fishes and invertebrates." *Reviews in Fish Biology and Fisheries* 25(1): 39-64.
- NEFMC (2017a). Omnibus Essential Fish Habitat Amendment 2, Including Draft Final Environmental Impact Statement and Regulatory Impact Review. Volumes I-VI plus appendices. Available at <http://www.nefmc.org/library/omnibus-habitat-amendment-2>.
- NEFMC (2017b). Draft Omnibus Deep-Sea Coral Amendment, Including a Draft Environmental Assessment. Available at <http://www.nefmc.org/library/omnibus-deep-sea-coral-amendment>
- Normandeau Associates, I. (2012). Effects of Noise on Fish, Fisheries, and Invertebrates in the U.S. Atlantic and Arctic from Energy Industry Sound-Generating Activities. A Workshop Report for the U.S. Dept. of the Interior, Bureau of Ocean Energy Management. Contract # M11PC00031: 72.
- Popper, A. N. and M. C. Hastings (2009). "The effects of human-generated sound on fish." *Integrative Zoology* 4(1): 43-52.

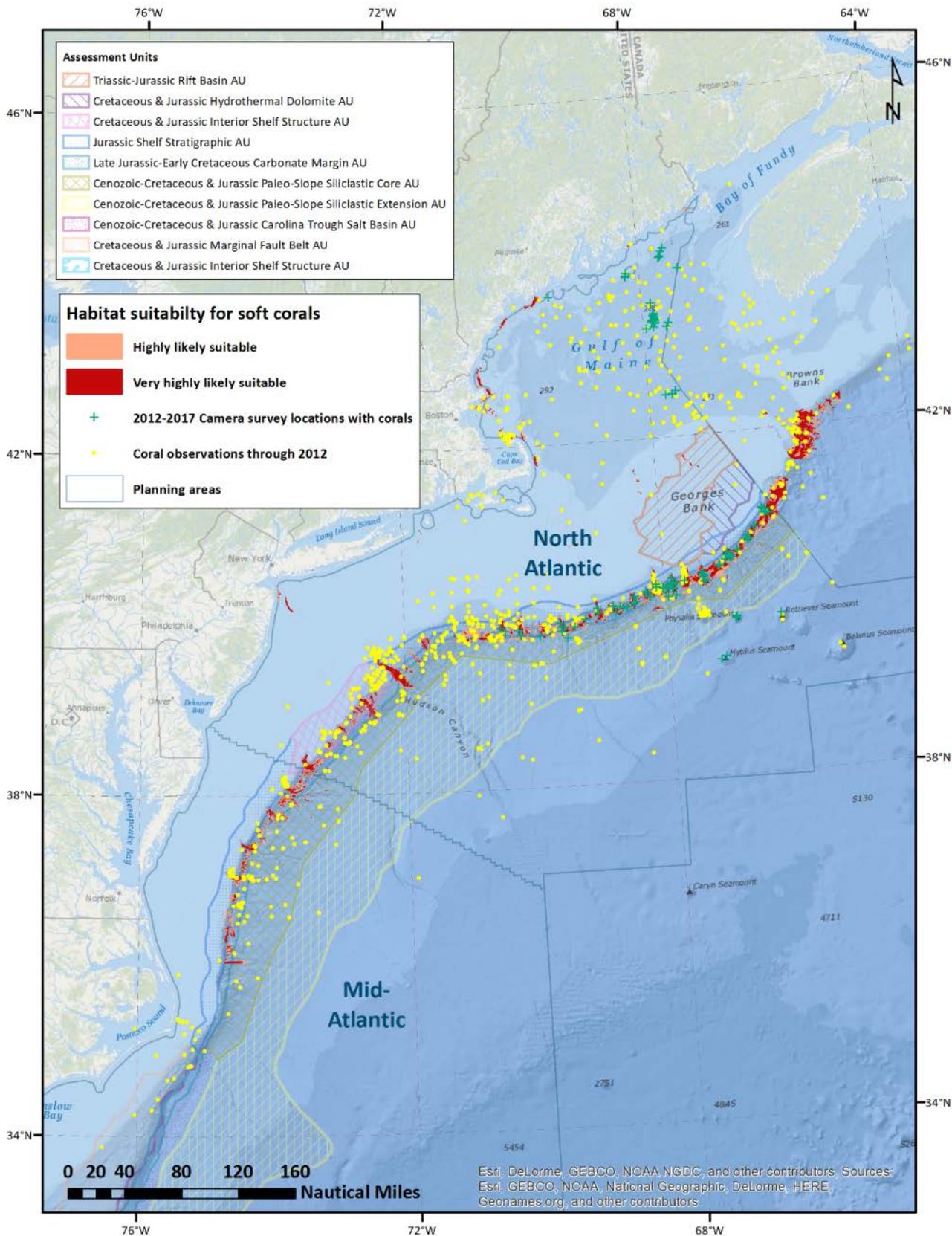
Map 1 – New England Fishery Management Council Habitat Areas of Particular Concern.



Map 2 – New England and Mid-Atlantic Fishery Management Council Coral Zones.



Map 3 – Evidence of deep-sea coral habitat from a habitat suitability model, recent remotely operated vehicle and towed camera surveys, and coral observations.





New England Fishery Management Council

50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

August 15, 2017

Ms. Kelly Hammerle
National Program Manager, BOEM
45600 Woodland Road, Mailstop VAM-LD
Sterling, VA 20166

Dear Ms. Hammerle:

Please accept these comments from the New England Fishery Management Council (Council) regarding the preparation of a new five-year National Outer Continental Shelf Oil and Gas Leasing Program for 2019-2024.

On June 29, in the context of the near-term potential for seismic exploration in the Mid- and South Atlantic regions, we sent a letter¹ to Secretary Zinke expressing our concerns regarding the potential ecological impacts of such surveys, and urging further study of potential impacts before such surveys are allowed. As we mentioned in our letter, commercial and recreational fisheries are important economic drivers in the North, Mid-, and South Atlantic, and the three Atlantic coast regions are highly interconnected in terms of commercial fisheries and fisheries management structures. The Council has management jurisdiction over 28 marine fishery species², and we are very concerned that oil and gas exploration and extraction activities may harm these resources and the communities that depend on them. Many of these species and their associated fisheries extend beyond New England, often into the Mid-Atlantic, and in some cases, into the South Atlantic. New England Council-managed fisheries overlap the North and Mid-Atlantic Planning Areas.

While we recognize the importance of domestic energy development and energy security to the U.S. economy, we urge caution as the agency considers whether to include planning areas in the Atlantic OCS in the 2019-2024 five-year plan. The commercial and recreational fishing industries provide significant benefits to the nation, including contributions to our nation's food security. As the world's population continues to increase, this will grow in importance. If we are to realize the benefits of these activities into the future, energy development must minimize risks to marine species and existing human uses.

Our concerns regarding oil and gas development fall into five categories. First, we are concerned about direct displacement of fishing activities due to survey or extraction activities occurring in offshore environments. Second, there are sensitive, deep-water benthic habitats in the Atlantic OCS that overlap strongly with hydrocarbon assessment units. These habitats, which are essential to many deep-sea species as well as some commercially-exploited stocks could be

¹ See attachment

² Atlantic cod, haddock, pollock, white hake, Acadian redfish, Atlantic wolffish, ocean pout, Atlantic halibut, winter flounder, American plaice, witch flounder, windowpane flounder, yellowtail flounder, monkfish, winter skate, little skate, smooth skate, thorny skate, barndoor skate, rosette skate, clearnose skate, silver hake, red hake, offshore hake, Atlantic herring, Atlantic sea scallop, Atlantic salmon, Atlantic deep-sea red crab

negatively impacted by extraction activities. Third, as mentioned in our prior letter, we are concerned that sounds produced by oil and gas surveys and drilling operations will have negative impacts on living marine resources, and that changes in distribution or abundance of these resources will in turn affect fishing operations. Fourth, infrastructure development to support an Atlantic oil and gas industry could have negative impacts on nearshore fish habitats which must be fully considered. Finally, there is a risk of leaks and spills associated with oil and gas extraction and transport. Such spills would have negative impacts on marine ecosystems, and cascading effects on human activities.

Survey and extraction activities could directly displace fishing vessels. We have reviewed the Inventory of Technically and Economically Recoverable Hydrocarbon Resources of the Atlantic Outer Continental Shelf as of January 1, 2014 (BOEM 2016). Some of the North and Mid-Atlantic Assessment Units (AU) have a strong spatial overlap with important fishing grounds, and others lie just offshore of these grounds (Figure 1). The Triassic-Jurassic Rift Basin AU and Cretaceous & Jurassic Hydrothermal Dolomite AU encompass much of the U.S. portion of Georges Bank. Georges Bank is a shallow submarine plateau that interacts with regional ocean currents to generate strong areas of upwelling, which leads to the high primary production that supports the food chain of the bank, and in turn, commercial fisheries. Eastern Georges Bank is an important fishing area for groundfish, scallops, and lobster. The Atlantic Sea Scallop fishery has revenues of nearly half a billion dollars per year, and eastern Georges Bank is a core fishing ground for this fleet. Some fishing operations might not be economically viable if forced to move to less productive or more distant fishing grounds.

Along the continental shelf break, the Jurassic Shelf Stratigraphic AU and Late Jurassic-Early Cretaceous Carbonate Margin AU overlap fishing grounds for whiting, squid, red crab, lobster, Jonah crab, monkfish, butterfish, and tilefish. We manage some of these fisheries, and others are managed by our partners, the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission. Highly migratory fishes and marine mammals are also abundant along the shelf break. Surveys or drilling activities in these AUs could directly displace fishing activities. If the five-year plan authorizes leasing in any portions of the Atlantic OCS, it is imperative that BOEM become familiar with the seasonal movements of marine resources and their target fisheries in our region, so that survey and construction activities can be conducted in ways that minimize interactions. We have found through our own work that it is critical to review fisheries data for multi-year periods, as management changes and natural inter-annual fluctuations in stock conditions lead to different levels of activity between years.

We are also concerned about the effects of extraction activities on fish habitats. The above-mentioned AUs along the shelf break, in addition to the Cretaceous and Jurassic Interior Shelf Structure AU and the Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Core AU, overlap deep-sea coral habitat that occur in both the canyons and on the open slope. Deep-sea corals are fragile and very slow growing, such that recovery from anthropogenic impacts, whether due to fishing, oil and gas exploration, or another activity, will likely be extremely slow. These corals, in combination with other benthic animals such as sponges, provide habitats for fishes and marine invertebrates, with some very specific interactions between species. In addition to these deep sea habitats, the shallower AUs on the bank overlap the northern edge, which is an area of concern for juvenile Atlantic cod (shaded blue in Figure 2).

While we still have much to learn about deep-sea coral ecology, recent (2013-present) NOAA studies have thoroughly documented coral occurrence within all surveyed canyons, many intercanyon slope areas, and at a range of depths, from the edge of the EEZ near Heezen Canyon south to Norfolk Canyon. Corals also occur on the New England seamounts, of which Bear and

Physalia Seamounts overlap the deepest hydrocarbon assessment units (Cenozoic-Cretaceous & Jurassic Paleo Slope Siliclastic AU and Cenozoic-Cretaceous & Jurassic Paleo Slope Siliclastic Extension AU).

All three Atlantic coast regional fishery management councils have designated areas to highlight important coral habitats and restrict fishing from these areas to protect them from damage. The Council is in the process of finalizing a plan to restrict certain types of bottom-contact fishing from the shelf break out to the EEZ boundary (NEFMC 2017, some of these areas are shown in red on Figure 2). In addition, through our Omnibus Essential Fish Habitat Amendment (NEFMC 2015, currently under NMFS review), we have designated Habitat Areas of Particular Concern in 11 canyons and canyon complexes from Heezen to Norfolk (blue shaded areas in Figure 2). Although there are no fishing restrictions associated with the Habitat Areas of Particular Concern, the designations highlight the ecological importance of these canyons, and serve as a starting point for further consideration of fishery management measures, and as a focus for the evaluation of non-fishing activities. In light of the sensitive habitat types present in the canyons along the Atlantic continental margin, we agree that the previous administration's withdrawal of the major canyons from oil and gas exploration and development was an appropriate, precautionary choice, and we would hope to see these withdrawals reinstated, if leasing is permitted in the North and Mid-Atlantic Planning Areas under the 2019-2024 plan.

We are concerned that sounds produced by oil and gas surveys and drilling operations will have negative impacts on living marine resources. Human-generated, low-frequency noise in the marine environment has doubled every decade for the period 1950 to 2000 (Hildebrand 2009), a substantial change has occurred within the lifetimes of some longer-lived species. Oil and gas extraction activities generate various types of sounds, including explosions, vessel noise, survey air gun blasts, and pile driving during construction of nearshore and offshore facilities (Hawkins et al. 2015). As BOEM is aware, the science on the effects of these sounds on living marine resources is not conclusive, and there are many gaps in our collective knowledge (Hawkins et al. 2015, which builds on a 2012 BOEM workshop summarized by Normandeau 2012). However, scientific uncertainty in the magnitude of and biological mechanisms behind these impacts should not be used as a rationale for downplaying this issue in either impacts assessment or decision making.

Impacts of sound on marine fishes are difficult to assess, in part due to the logistics of conducting such studies, but also because effects vary according to both the species and the characteristics of the sound, which may in turn vary according to environmental characteristics such as temperature (Popper and Hastings 2009). Further limiting our ability to generalize about effects across different fishes and types of noise, in some studies (e.g. Popper et al. 2007, Wysocki et al. 2007), different cohorts of the same species exhibit varying responses to sound exposure, perhaps due to developmental history or genetic differences (Popper and Hastings 2009). These challenges in assessment extend to marine mammals and invertebrates as well. Because it is difficult to extrapolate the results of existing studies to species and sound types not specifically examined (Popper and Hastings 2009, Hawkins et al. 2015), BOEM should be very precautionary when authorizing sound generating activities, and should encourage additional research that is regionally-specific.

It is easy to appreciate the logistical difficulties of tracking the long-term effects of sound exposure on specific populations of animals in the field, but such challenges should not preclude a rigorous attempt to estimate long-term and cumulative effects. The research we have reviewed has generally focused on assessing individuals or populations shortly before, during, and after exposure to sounds from air guns or pile driving, and we understand that these types of studies

are most typical. Ideally, it would be possible to expand upon the results of such studies to determine the population-level effects of exposure on fisheries stocks, protected and endangered species, and ecosystem component species. Although such assessments may not be possible in the short term, we encourage BOEM to consider the potential cumulative and long-term effects of sound exposure at population levels when drafting the five-year plan, even if such an assessment is largely qualitative.

Even if population-level effects of sound cannot be estimated, either for fishery resources or for other species they depend on for food, localized movement of fish within the water column or out of the immediate area may still affect commercial fleets targeting those resources. A variety of studies have documented localized movement of fisheries stocks following sound exposure (e.g. Fewtrell and McCauley 2012, Paxton et al. 2017). Localized declines in abundance or availability of fish could negatively affect fishing fleets in the absence of a population-level or long-term effect on the resource.

Our concerns about negative effects on fish habitats are not limited to offshore areas. While the harvest of federally-managed fishes and invertebrates generally occurs outside the coastal zone, many of the species we manage begin their lives in nearshore habitats. Although the hydrocarbon assessment units occur offshore, oil and gas resources extracted from the seabed will need to come onshore for refining and distribution. If new onshore or nearshore infrastructure is needed to support oil and gas development of the Atlantic OCS, construction activities could impact nearshore habitats. NMFS Office of Habitat Conservation has substantial expertise in mitigating these types of impacts. The new five-year plan should explore the extent to which infrastructure development might be necessary for Atlantic oil and gas development, and consider the cumulative effects of such construction on managed species and their habitats. We encourage BOEM to work closely with NMFS to evaluate and mitigate, when necessary, impacts of development on both nearshore and offshore marine habitats.

Finally, an attendant risk with hydrocarbon development, unlike with renewable energy development, is the possibility of a spill or blowout. The extensive body of scientific literature resulting from the work done after the 2010 Deepwater Horizon spill documents a broad range of impacts on the species and associated human communities of the Gulf of Mexico (see Murawski et al. 2016 for summary). While we acknowledge such events are rare, they are possible, and should be evaluated in the new five-year plan as a potential impact of oil and gas development. Weather conditions in the northwestern Atlantic can be extreme in terms of both wind speeds and waves. Such conditions would increase the risk of spills during oil transport and drilling as compared to some other regions of the United States.

Given the above concerns, we believe that hydrocarbon development in the Atlantic OCS inappropriately risks living marine resources and associated human communities, and we recommend that BOEM exclude the Atlantic planning areas from the 2019-2024 plan. We think that renewable energy development is a better focus area for the Atlantic coast at this time. While wind and other renewable projects may still have impacts on fisheries, the risks appear to be fewer. The Gulf of Maine is one of the fastest warming bodies of water on the planet, and we are already seeing evidence of changes in the Northeast Shelf Ecosystem³. Actions to prioritize renewable energy and decrease reliance on non-renewable resources will reduce the risk of negative ecological impacts on our ocean resources, and thereby support the human communities that depend on them.

³ See <https://www.nefsc.noaa.gov/ecosys/current-conditions/> for a detailed condition report for the Northeast Shelf Ecosystem.

We look forward to working with the Department of the Interior and its Bureau of Ocean Energy management to ensure responsible development of domestic energy resources on the Atlantic OCS.

Sincerely,

A handwritten signature in black ink, appearing to read "John F. Quinn". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Dr. John Quinn
Chairman

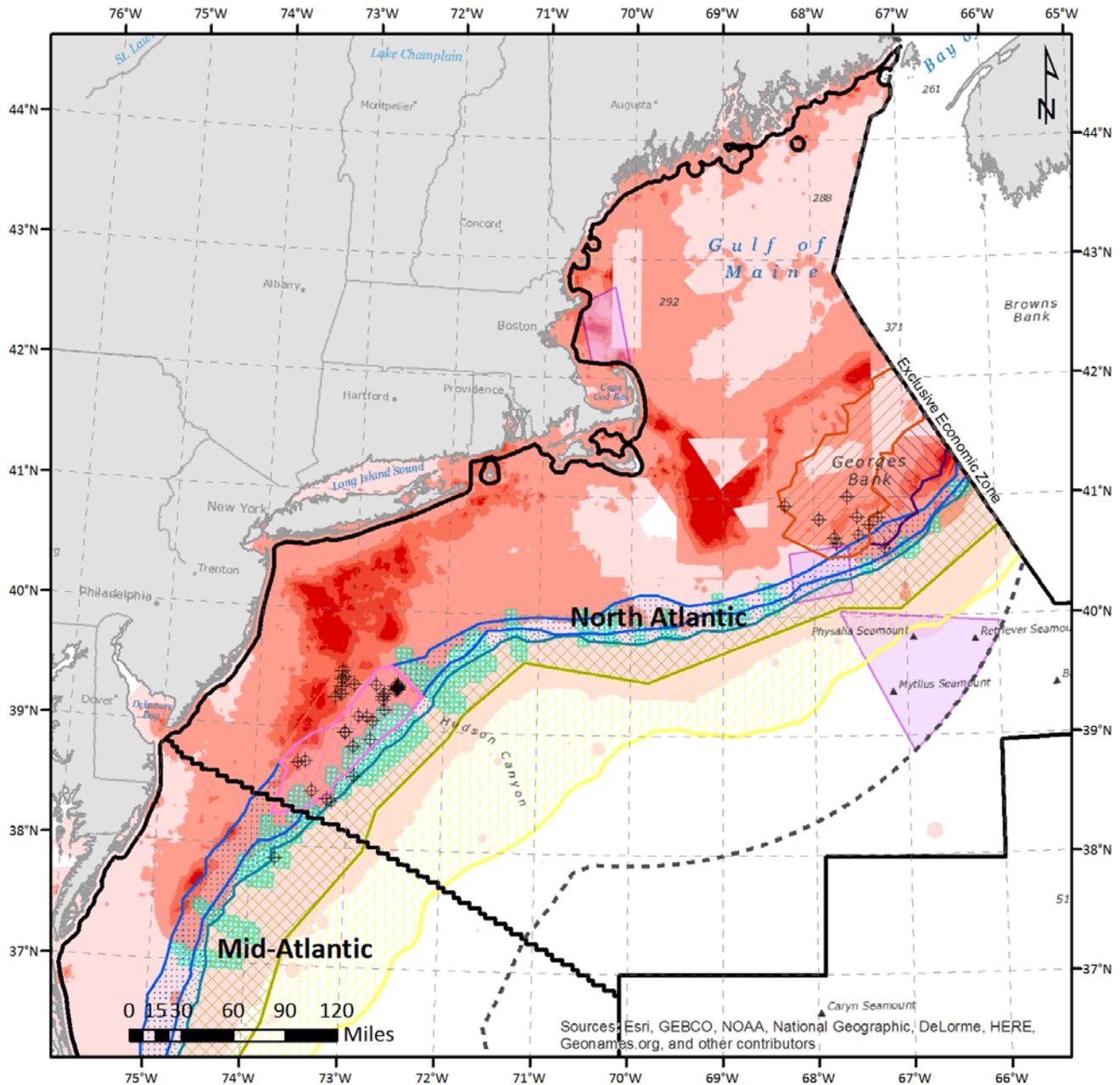
cc: Robert Beal, ASMFC
Dr. Chris Moore, MAFMC
Lou Chiarella, GARFO Habitat Conservation

Attachment – June 29, 2017 Letter from NEFMC to Ryan Zinke

References

- BOEM (2016). Inventory of Technically and Economically Recoverable Hydrocarbon Resources of the Atlantic Outer Continental Shelf as of January 1, 2014. OCS Report BOEM 2016-071. 58.
- Fewtrell, J. L. and R. D. McCauley (2012). "Impact of air gun noise on the behaviour of marine fish and squid." *Marine Pollution Bulletin* 64(5): 984-993.
- Hawkins, A. D., A. E. Pembroke and A. N. Popper (2015). "Information gaps in understanding the effects of noise on fishes and invertebrates." *Reviews in Fish Biology and Fisheries* 25(1): 39-64.
- Hildebrand, J. A. (2009). "Anthropogenic and natural sources of ambient noise in the ocean." *Marine Ecology Progress Series* 395: 5-20.
- Murawski, S. A., J. W. Fleeger, W. F. I. Patterson, C. Hu, K. Daly, I. Romero and G. A. Toro-Farmer (2016). "How Did the Deepwater Horizon Oil Spill Affect Coastal and Continental Shelf Ecosystems of the Gulf of Mexico?" *Oceanography* 29(3): 160-173.
- NEFMC (2015). Omnibus Essential Fish Habitat Amendment 2, Including Draft Final Environmental Impact Statement and Regulatory Impact Review. Volumes I-VI plus appendices. Available at <http://www.nefmc.org/library/omnibus-habitat-amendment-2>.
- NEFMC (2017). Draft Omnibus Deep-Sea Coral Amendment, Including a Draft Environmental Assessment. Available at <http://www.nefmc.org/library/omnibus-deep-sea-coral-amendment>
- Normandeau Associates, I. (2012). Effects of Noise on Fish, Fisheries, and Invertebrates in the U.S. Atlantic and Arctic from Energy Industry Sound-Generating Activities. A Workshop Report for the U.S. Dept. of the Interior, Bureau of Ocean Energy Management. Contract # M11PC00031: 72.
- Paxton, A. B., J. C. Taylor, D. P. Nowacek, J. Dale, E. Cole, C. M. Voss and C. H. Peterson (2017). "Seismic survey noise disrupted fish use of a temperate reef." *Marine Policy* 78: 68-73.
- Popper, A. N. and M. C. Hastings (2009). "The effects of human-generated sound on fish." *Integrative Zoology* 4(1): 43-52.
- Popper, A. N., Halvorsen, M. B., Kane, A., Miller, D. L., Smith, M. E., Song, J., Stein, P., Wysocki, L. E. (2007). The effects of high-intensity, low-frequency active sonar on rainbow trout. *J. Acoust. Soc. Amer.* 122: 623-635.
- Wysocki, L. E., Davidson, J. W. III, Smith, M. E., et al. (2007). Effects of aquaculture production noise on hearing, growth, and disease resistance of rainbow trout *Oncorhynchus mykiss*. *Aquaculture* 272: 687-97.

Figure 1 – Fishery revenues, Planning Areas and Assessment Units, and Past and Current Withdraw Areas



Assessment Units

-  Triassic-Jurassic Rift Basin AU
-  Cretaceous & Jurassic Hydrothermal Dolomite AU
-  Cretaceous & Jurassic Interior Shelf Structure AU
-  Jurassic Shelf Stratigraphic AU
-  Late Jurassic-Early Cretaceous Carbonate Margin AU
-  Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Core AU
-  Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Extension AU
-  Cenozoic-Cretaceous & Jurassic Carolina Trough Salt Basin AU
-  Cretaceous & Jurassic Marginal Fault Belt AU
-  Cretaceous & Jurassic Interior Shelf Structure AU

 Atlantic wells

 Planning areas

 Atlantic Region Withdraw Areas

 Canyon Withdrawal (rescinded by April 2017 EO)

Sum of commercial fishery revenue 2010-2014

\$ per 500x500 m grid

 590 - 1300

 1400 - 7800

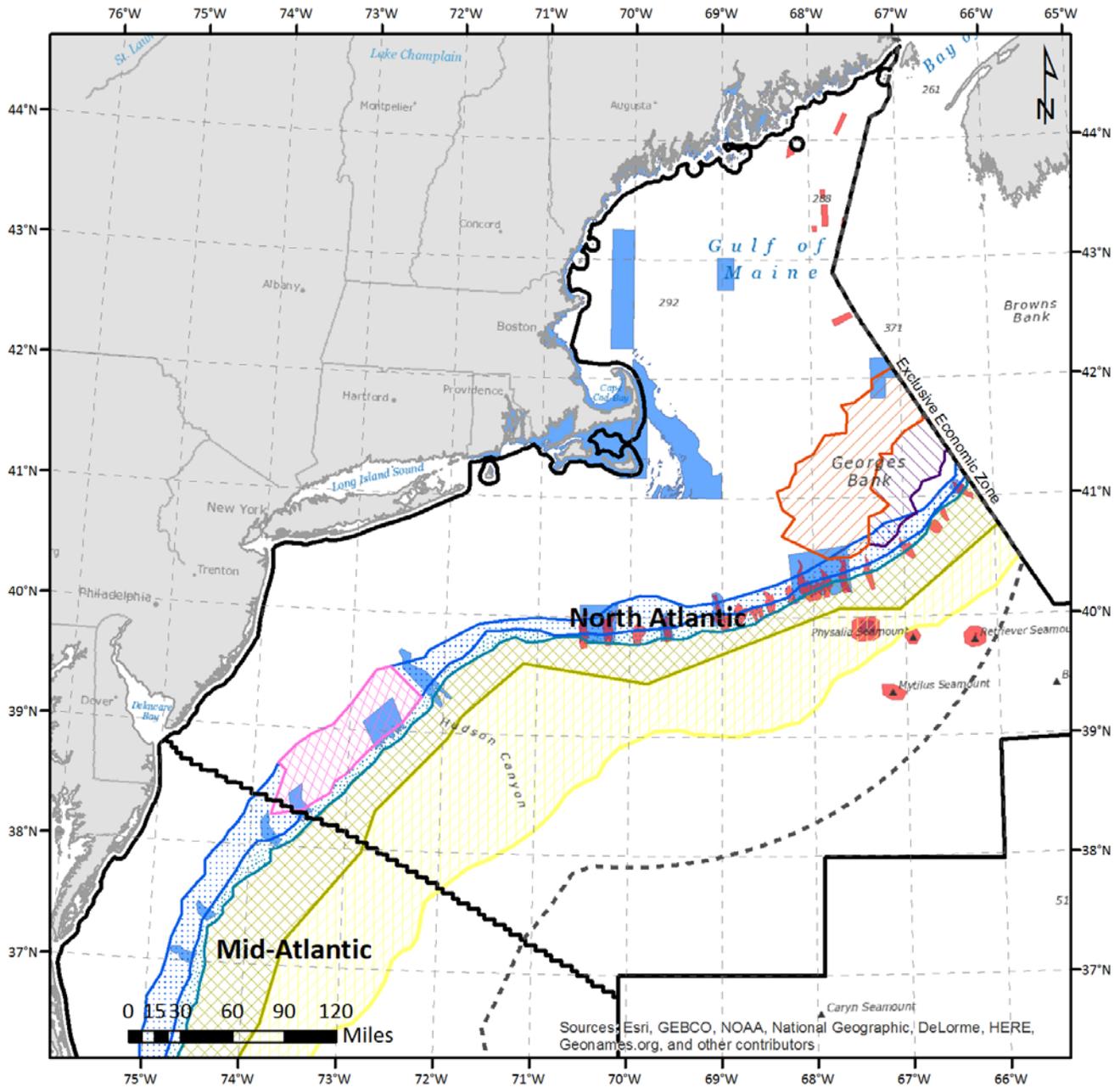
 7900 - 14000

 15000 - 21000

 22000 - 150000

Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

Figure 2 – Habitat Areas of Particular Concern, Discrete Deep-Sea Coral Zones, Assessment Units, and Planning Areas



Assessment Units

-  Triassic-Jurassic Rift Basin AU
-  Cretaceous & Jurassic Hydrothermal Dolomite AU
-  Cretaceous & Jurassic Interior Shelf Structure AU
-  Jurassic Shelf Stratigraphic AU
-  Late Jurassic-Early Cretaceous Carbonate Margin AU
-  Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Core AU
-  Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Extension AU
-  Cenozoic-Cretaceous & Jurassic Carolina Trough Salt Basin AU
-  Cretaceous & Jurassic Marginal Fault Belt AU
-  Cretaceous & Jurassic Interior Shelf Structure AU

-  Planning areas
-  Canyons, seamounts, and other areas identified as possible coral protection zones
-  Habitat Areas of Particular Concern, recommended 2015

Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors