



North Carolina
Coastal Federation
Working Together for a Healthy Coast

August 15, 2017

Mr. Timothy Webster
217 West Jones St.
1601 Mail Service Center
Raleigh, N.C., 27699-1601

RE: Bureau of Ocean Energy Management's preparation of a new five-year national outer continental shelf program for 2019-24

Dear Mr. Webster:

Please accept these comments on the Bureau of Ocean Energy Management's preparation of a new five-year national outer continental shelf program for 2019-24 on behalf of the North Carolina Coastal Federation. The Coastal Federation is a state based non-profit organization dedicated to protecting and enhancing coastal water quality and habitat. It represents 16,000 supporters.

The Coastal Federation firmly opposes oil and gas exploration and drilling off the coast of our state, and thus any bottom floor leasing for such purposes. Federation is concerned with the effects of seismic surveying off our coast on marine species and about future oil spills should oil drilling be permitted in our waters. Past examples of oil drilling have shown that oil spills are not likely but imminent.

Bureau of Ocean and Mineral Management is proposing a new five-year oil and gas leasing program in the Atlantic Ocean. We urge the N.C. Division of Environmental Quality to oppose this program and the N.C. Division of Coastal Management (BOEM) to find the leasing program and activities associated with offshore oil and gas exploration inconsistent with its federally approved coastal program, like it did under Governor Martin's Administration.

Under 43 U.S.C.A. § 1344(a)(2)(F) the Secretary of BOEM is required to prepare and maintain an oil and gas leasing program consistent with "*laws, goals, and policies of affected States which have been specifically identified by the Governors of such States as relevant matters for the Secretary's consideration*". As such, it is imperative that Governor Cooper requests that North Carolina be excluded from the new leasing program.

The oil and gas leasing program is one of the preliminary steps to offshore oil and gas drilling close to our state waters. Oil and gas exploration off our coast can be detrimental to our natural environment and our economy for a variety of reasons stated below.

Ocean is Acoustic

Marine mammals and many other marine animals rely on low frequency sounds for their survival. Mammals in particular use sound for communication, breeding, foraging, and orientation among others.¹ The use of these sounds is already affected by the ambient noise in the ocean. Ambient noise can be natural – from other animals, surface winds and waves, or pressure changes. However, there is also anthropogenic noise from shipping vessels (90 percent of the world trade is seaborne.²) and transportation, commercial, sport and recreational fisheries, and naval sonar testing.

Seismic Surveys Harm Marine Life

Numerous studies have shown that seismic surveys, that rely on continuous blasting of compressed air from airguns towed behind the survey vessels can harm marine life including but not limited to marine mammals, fish, and zooplankton. Coupled with the existing ambient noise this added noise pollution exacerbates damage to marine life.

Noise generated by simultaneous firing of 20-30 airguns, which is a standard number used in seismic surveys, is equivalent to 180-230 dB. As a comparison, this level of noise is similar to standing 82ft away from the jet at takeoff, and is considered high enough to produce permanent hearing damage. It is the cumulative impact of these simultaneous firings in the same general testing area (i.e. Southeastern Atlantic) over a period of months at a time that raises concerns. While the air fired from the airguns is directed toward the ocean floor, energy escapes after the sound wave is reflected upwards. This horizontal propagation can travel thousands of miles away from testing sites. The guns produce the same low-frequency sounds used by some marine life, thus masking the animals' sounds and impeding their effective use of sounds.

Marine Mammals

Thirty five cetacean species inhabit the proposed seismic testing area in the Atlantic Ocean. Recent studies show that areas just north of Cape Hatteras are home to the highest cetacean species richness on the East Coast and Gulf of Mexico (Fig 1). However, multiple seismic survey permit application areas are located in the same geographic region thus posing potential direct harm to these mammal species (Fig 2).

1 Castellote, M., Clark, C.W., and Lammers, M.O. 2012. Acoustic and behavioural changes by fin whales (*Balaenoptera physalus*) in response to shipping and airgun noise, *Biological Conservation* 147: 115-122.

2 International Maritime Organization <https://business.un.org/en/entities/13>

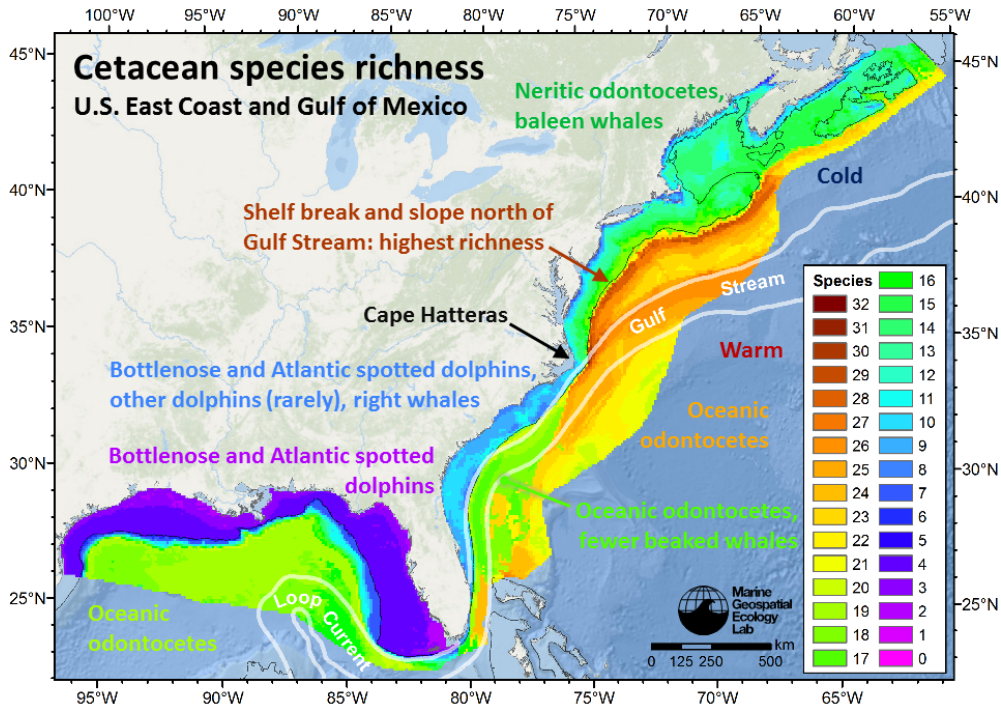


Fig 1: Cetacean species richness. Source: Duke Marine Geospatial Ecology Lab.

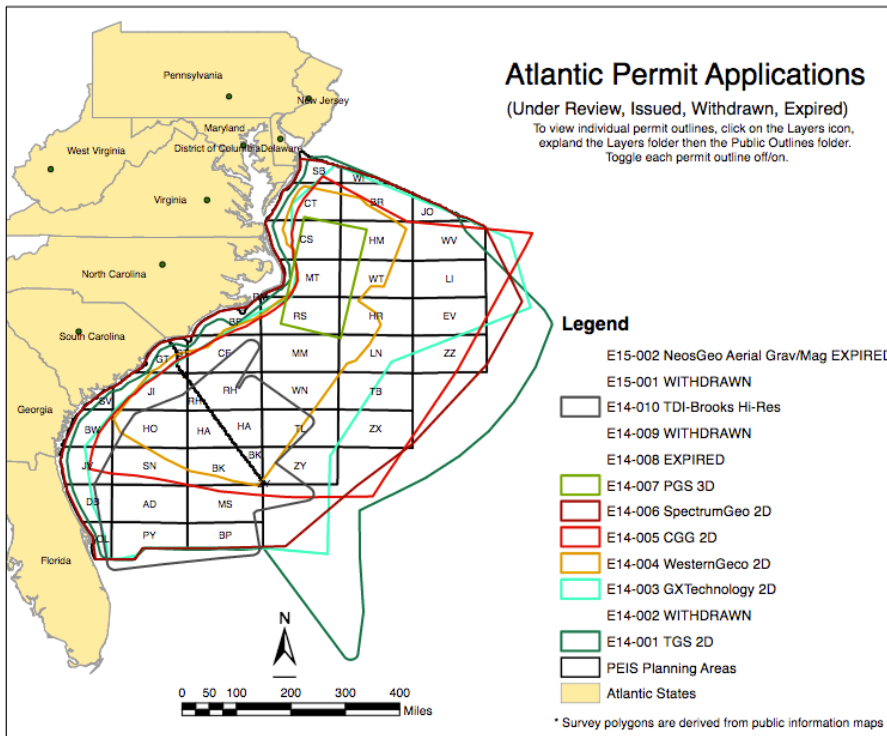


Figure 2: Atlantic Permit Applications for Seismic Surveys. Source: BOEM3

3 <https://www.boem.gov/Atlantic-G-and-G-Permitting/>

Fish

Numerous studies around the world have shown that seismic surveys cause disturbance to fish. For example, Wardle et al noted that while there was no long term effect, fish like cod and pollock were temporarily startled.⁴ Further, Slotte et al showed that herring fish were horizontally and vertically displaced due to exposure to seismic testing.⁵

More locally, a recent study done in the vicinity of Beaufort, N.C. has shown that reef fish (i.e. snapper, angel fish) can be negatively affected by seismic surveys as well. Scientists observed a 78 percent decline in reef fish abundance after seismic testing and concluded that hours after the testing fish from study area simply disappeared.⁶ Other studies from Northeastern Atlantic showed that commercial fish species catches, such as of cod and haddock, were reduced by 40-80% post seismic testing.⁷

While more studies are needed to show where the fish went and if and how many returned to the area, it stands that fish can also suffer from consequences of seismic testing.

Zooplankton

A recent study off the coast of Tasmania showed that seismic surveys can kill zooplankton, which serve a vital function as prey species in the ocean ecosystem.⁸ The study showed a 64 percent decreased abundance as a result of increased mortality rates of 200-300% of these animals.

More locally in North Carolina, scientists from Duke University replicated this study method and estimated that the same effect in North Carolina would kill approximately 280 trillion individual copepods (used as representative of zooplankton in the Mid-Atlantic Bight) in the proposed survey area at any time. These numbers of zooplankton can feed many individual snapper fish, a species popular among fishing enthusiasts.

4 Wardle, C. S., Carter, T. J., Urquhart, G. G., Johnstone, A. D. F., Ziolkowski, A. M., Hampson, G., & Mackie, D. (2001). Effects of seismic air guns on marine fish. *Continental Shelf Research*, 21(8), 1005-1027.

5 Slotte, A., Hansen, K., Dalen, J., & Ona, E. (2004). Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. *Fisheries Research*, 67(2), 143-150.

6 Study: Seismic Testing Disrupts Fish Behavior. <https://www.coastalreview.org/2017/02/19376/>

7 Engås, A., Løkkeborg, S., Ona, E., and Soldal, A.V. 1996. Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*). *Canadian Journal of Fisheries and Aquatic Sciences*. 53(10): 2238-2249

8 McCauley, R., Day, R. D., Swadling, K. M., Fitzgibbon, Q. P., Watson, R. A., & Semmens, J. M. (2017). Widely used marine seismic survey air gun operations negatively impact zooplankton. *Nature Ecology & Evolution*, 1, 1-8.

Offshore Oil and Gas Drilling will lead to imminent oil spills

Oil spill occurrence is not a question of probability but a question of time. Although the overall number of oil spills from tankers has been decreasing over time due to improved technology, oil spills still occur every year.⁹ This does not include oilrig spills. In fact, the second largest oil spill and the largest accidental oil spill in the history was the Deepwater Horizon that occurred only seven years ago.¹⁰

Effects on marine life

There is scientific evidence that oil spilled in the ocean persists in the ecosystem for decades. A study done 14 years after the Exxon Valdez oil spill showed that the petroleum contamination had a delayed, chronic and indirect effects on the marine environment. Almost a decade and a half after the spill oil persisted in significant amounts and in toxic forms that were available to and ingested by marine organisms.¹¹ These sublethal doses of oil compromised the health, growth and reproduction of many species in the ecosystem.¹² In addition, a new study showed that effects of oil spills in highly productive marine waters can have significant indirect effects on food webs in form of trophic cascades.¹³ Deepwater Horizon spill increased mortality rates of piscivorous seabirds, bottlenose dolphin, waders, and other fish-eating marsh birds, causing increased biomass of manhaden fish, which biomass more than doubled. This kind of increase in a major forage fish can lead to important food web disturbances.¹⁴ To conclude, oil spills can lead to changes in food web causing significant ecological damages.

It has also been shown that response of benthic fauna located near the oil drilling operations follows a pattern – both diversity and species richness in the vicinity of the oil installations are low.¹⁵

North Carolina's Ocean Economy is valuable

North Carolina's coast is a productive area and an important contributor to state's economy. At \$32 billion in 2013 twenty coastal counties contributed 6.8 percent to state's total gross

⁹ <http://www.itopf.com/knowledge-resources/data-statistics/statistics/>

¹⁰ NOAA. Office of response and restoration. Deepwater Horizon Spill.

<https://response.restoration.noaa.gov/oil-and-chemical-spills/significant-incidents/deepwater-horizon-oil-spill>

¹¹ Peterson, C. H., Rice, S. D., Short, J. W., Esler, D., Bodkin, J. L., Ballachey, B. E., & Irons, D. B. (2003). Long-term ecosystem response to the Exxon Valdez oil spill. *Science*, 302(5653), 2082-2086.

¹² Id.

¹³ Short, J. W., Geiger, H. J., Haney, J. C., Voss, C. M., Vozzo, M. L., Guillory, V., & Peterson, C. H. (2017). Anomalously high recruitment of the 2010 Gulf menhaden (*Brevoortia patronus*) year class: evidence of indirect effects from the Deepwater Horizon blowout in the Gulf of Mexico. *Archives of Environmental Contamination and Toxicology*, 1-17.

¹⁴ Id.

¹⁵ Kingston, P. F. (1992). Impact of offshore oil production installations on the benthos of the North Sea. *ICES Journal of Marine Science*, 49(1), 45-53.

GDP and 8.2 percent of total employment with 336,522 employees.¹⁶ Recent report defines North Carolina's ocean economy as a bundle of market and non-market services and goods – from measurable ones, such as commercial fishing and aquaculture opportunities, seafood, tourism and recreation, shipping and transportation, to those with intrinsic values such as the ecosystem services of regulating climate, aesthetic and spiritual benefits, or nutrient cycling.¹⁷ Tourism and recreation, in particular carry a heavy weight in our ocean economy. Tourism represents 54 percent of the total state ocean's economy GDP and contributes 88 percent to the overall coastal employment.

One common underpinning to a successful ocean economy are healthy ecosystems. As such, healthy natural environment and rich coastal biodiversity are the backbone of our communities. Keeping our coast healthy and free of oil spills is crucial for the survival and prosperity of our communities.

State Past Investments in Coastal Resources

In the recent decades North Carolina has invested large amounts of state funds to protecting clean water and enhancing water quality. For example, Clean Water Management Trust Fund that was established in 1996 has awarded through grants hundreds of millions of dollars to protect and enhance coastal water quality.¹⁸ North Carolina Ecosystem Enhancement Program also provides significant funds for coastal water quality restoration.

Similarly, many federal government agencies support coastal water quality and habitat restoration and enhancement in our state. For example, restoration of oyster sanctuaries is currently underway in Pamlico Sound, the nation's second largest estuary with funds from National Oceanic and Atmospheric Administration. Furthermore, Environmental Protection Agency funds a number of projects every year through the 319 program to improve coastal water quality; and U.S. Fish and Wildlife Service through the North American Wetlands Conservation Act funds protecting, restoring and enhancing wetland habitat for birds. Finally, the Farm Bill through the Wetlands Preserve Program offers funds to protect coastal wetlands.

It is obvious that the people and their government have been working for decades on improving their quality of life by improving coastal water quality and enhancing coastal habitats. Why would we want to waste these funds and improved ecosystem health they contributed to by opening our coast to oil drilling, knowing that oil spills are imminent?

¹⁶ North Carolina's Ocean Economy. 2017 Duke Nicholas Institute. N.C. Sea Grant.

¹⁷ Id.

¹⁸ According to 2007 CWMTF Annual Report two N.C. coastal regions (Northern and Southern Coastal Planes) received approximately \$368 millions from 1997-2007.

Conclusion

North Carolina's coast is an important state economic driver. The relationship between coastal communities and marine environment has deep social, cultural and spiritual roots. For the reasons stated above the state needs to let BOEM know that the people of North Carolina are not willing to risk our beautiful and productive coastline in favor of oil and gas businesses.

Thank you for taking our comments under consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ana Zivanovic-Nenadovic', written in a cursive style.

Ana Zivanovic-Nenadovic
Senior Policy Analyst