14 July 2014

Ms. Maureen Bornholdt
Program Manager
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
381 Elden Street, HM 1328
Herndon, Virginia 20170

Dear Ms. Bornholdt:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Bureau of Ocean Energy Management's (BOEM) 28 May 2014 notices calling for information and nominations (79 Fed. Reg. 30645) and indicating its intent to prepare an environmental assessment for commercial wind leasing and site assessment activities in offshore waters of New York (79 Fed. Reg. 30643). The latter notice solicits comments regarding environmental issues and the identification of reasonable alternatives related to the proposed action. The Commission offers the following recommendations and rationale.

BACKGROUND

BOEM is considering the issuance of one or more commercial leases to develop wind energy resources offshore of New York. The area identified by BOEM for potential leasing is located approximately 20 km south of Long Beach, New York, and extends approximately 48 km from west to east, to water depths of at least 50 m. The leasing area consists of five full Outer Continental Shelf (OCS) leasing blocks and 148 sub-blocks, comprising approximately 329 square kilometers (km^2).

The Commission supports BOEM's efforts to develop offshore renewable energy as part of the nation's long-term energy strategy. Nevertheless, there are considerable uncertainties regarding the potential effects of renewable energy development on marine mammals, their habitats, and prey species. Therefore, the development of renewable energy sources should proceed in a thoughtful and deliberate manner with regard to its potential effects on the marine ecosystem.

RATIONALE AND RECOMMENDATIONS

Marine mammals in the lease area

There are 37 species and 38 stocks of marine mammals documented to occur in waters off New York which could be found in or near the proposed lease area, six of which are listed as endangered or threatened under the Endangered Species Act (ESA) (Waring et al. 2013, 2012, 2010, 2009, 2008, 2000; Table 1). Some of the species identified in Table 1 were not identified in State of New York planning documents (Lageux et al. 2012, NYDOS 2013) as potentially within the lease area, or in comments received by the National Marine Fisheries Service (NMFS) on the BOEM request for interest (NOAA 2013). The size of the proposed leasing area and its extent beyond the

edge of the continental shelf warrants consideration of potential impacts to all offshore as well as coastal marine mammals.

Table 1. Marine mammal species/stocks found in U.S. Outer Continental Shelf (OCS) waters off New York, and their status under the ESA and Marine Mammal Protection Act (MMPA).

Common name	Stock	Species name	ESA Status
Pinnipeds			
Gray seal	Western North Atlantic	*Halichoerus grypus*	Not listed
Harbor seal	Western North Atlantic	*Phoca vitulina concolor*	Not listed
Harp seal	Western North Atlantic	*Pagophilus groenlandicus*	Not listed
Hooded seal	Western North Atlantic	*Cystophora cristata*	Not listed
Cetaceans			
Blainville's beaked whale	Western North Atlantic	*Mesoplodon densirostris*	Not listed
Blue whale	Western North Atlantic	*Balaenoptera musculus*	Endangered (ESA)
Bottlenose dolphin	Western North Atlantic offshore	*Tursiops truncatus*	Not listed
	Western North Atlantic coastal northern migratory		Depleted (MMPA)
Clymene dolphin	Western North Atlantic	*Stenella clymene*	Not listed
Common dolphin, short-beaked	Western North Atlantic	*Delphinus delphis*	Not listed
Cuvier's beaked whale	Western North Atlantic	*Ziphius cavirostris*	Not listed
Dwarf sperm whale	Western North Atlantic	*Kogia sima*	Not listed
Fin whale	Western North Atlantic	*Balaenoptera physalus*	Endangered (ESA)
Fraser's dolphin	Western North Atlantic	*Lagenodelphis hosei*	Not listed
Gervais beaked whale	Western North Atlantic	*Mesoplodon europaeus*	Not listed
Harbor porpoise	Gulf of Maine/Bay of Fundy	*Phocoena phocoena*	Not listed
Humpback whale	Gulf of Maine	*Megaptera novaeangliae*	Endangered (ESA)
Killer whale	Western North Atlantic	*Orcinus orca*	Not listed
Melon-headed whale	Western North Atlantic	*Peponocephala electra*	Not listed
Minke whale	Canadian east coast	*Balaenoptera acutorostrata*	Not listed
Northern bottlenose whale	Western North Atlantic	*Hyperoodon ampullatus*	Not listed
Pilot whale, long-finned	Western North Atlantic	*Globicephala melas*	Not listed
Pilot whale, short-finned	Western North Atlantic	*Globicephala macrorhynchus*	Not listed
Pygmy killer whale	Western North Atlantic	*Feresa attenuata*	Not listed
Pygmy sperm whale	Western North Atlantic	*Kogia breviceps*	Not listed
Right whale, North Atlantic	Western Atlantic	*Eubalaena glacialis*	Endangered (ESA)
Risso's dolphin	Western North Atlantic	*Grampus griseus*	Not listed
Rough-toothed dolphin	Western North Atlantic	*Steno brenadensis*	Not listed
Sei whale	Nova Scotia	*Balaenoptera borealis*	Endangered (ESA)
Sowerby's beaked whale	Western North Atlantic	*Mesoplodon bidens*	Not listed
Sperm whale	North Atlantic	*Physeter macrocephalus*	Endangered (ESA)
Spinner dolphin	Western North Atlantic	*Stenella longirostris*	Not listed
Spotted dolphin, Atlantic	Western North Atlantic	*Stenella frontalis*	Not listed
Spotted dolphin, Pantropical	Western North Atlantic	*Stenella attenuata*	Not listed
Striped dolphin	Western North Atlantic	*Stenella coeruleoalba*	Not listed
True's beaked whale	Western North Atlantic	*Mesoplodon mirus*	Not listed
White-beaked dolphin	Western North Atlantic	*Lagenorhynchus albirostris*	Not listed
White-sided dolphin, Atlantic	Western North Atlantic	*Lagenorhychus acutus*	Not listed

Risks to marine mammals from wind energy development

The assessment of wind energy sites and the construction and operation of offshore wind turbines pose several risks to marine mammals and the ecosystems of which they are a part. These activities can disturb marine mammals and may interfere with important activities, including foraging, resting, breeding and other social activities, communicating, and migrating.

Site assessment activities generally involve the use of sound-producing technologies to evaluate the sea floor and search for possible hazards. Although the effects of those technologies on marine mammals and other marine species are not well understood, there is a general recognition that use of certain technologies can disturb marine mammals. For example, sub-bottom profilers used for geophysical surveys and to guide sub-bottom sampling generate sound source levels (201–205 dB re 1µPa at 1 m) and frequencies (0.5–24 kHz) comparable to other sound sources that are considered to pose risks to marine mammal physiology (e.g., hearing) and behavior (e.g., habitat use) (Cox et al. 2006). Preliminary modeling exercises and studies with captive animals suggest that exposure to sub-bottom profilers could impair hearing (e.g., causing a temporary threshold shift) or elicit adverse behavioral responses if animals are below the ship (Wood et al. 2012). Other sound sources used in site characterization surveys, such as echosounders, are not expected to result in a loss of hearing or other physiological response in marine mammals (Lurton and DeRuiter 2011); however, their use may result in disturbance and ultimately stranding under certain conditions (Southall et al. 2013).

Pile driving associated with construction of meteorological towers (if needed for site assessment) and with fixed-platform type wind turbines represents the greatest known risk to marine mammals from wind energy development. Pile driving generates low-frequency sound impulses that are detectable up to 40 km from the source (McIwem 2006). Impact pile driving generates an intense, broadband sound that can impair hearing and has the potential to cause injury in marine mammals at close range (Madsen et al. 2006). Pile driving associated with wind farm construction has been well documented to cause short-term avoidance of the construction areas. For example, construction of a wind farm in Germany led to short-term avoidance by harbor porpoise of the construction area at distances of up to 20 km (Dahne et al. 2013). In a similar study, both impact and vibratory pile driving during wind farm construction in the Danish part of the western Baltic Sea resulted in reduced harbor porpoise acoustic detections, indicating avoidance of the construction area (Carstensen et al. 2006). Skeate et al. (2012) reported significant declines of harbor seals associated with construction of a wind farm in waters off the United Kingdom in close proximity to the seals' haul-out area, and a subsequent lack of recovery.

Long-term effects of wind farm operation on marine mammals are less well-known. Sound generated from wind turbine operations generally would be continuous, of low intensity, and dominated by a series of pure tones below 1 kHz (Madsen et al. 2006, Tougaard et al. 2008) transmitted directly to the water column from the turbine shaft. Playback experiments involving harbor porpoises and harbor seals prompted reactions by both species to wind-turbine sounds (Koschinski et al. 2003). Long-term monitoring of wind farm operations at the above-mentioned Danish wind farm studied by Carstensen et al. (2006) showed a slow increase in harbor porpoise call rates during wind farm operations; however, even after 10 years, call rates did not recover to baseline conditions (Teilmann and Carstensen 2012). At least one other study did not indicate any apparent adverse reaction to wind farm operations. Monitoring of harbor porpoise calls at a Dutch offshore wind farm showed an overall increase in call rates after five years of wind farm operations, coincident with an overall increase in harbor porpoise abundance in Dutch waters (Scheidat et al.

2011). The authors hypothesized that increased detections of harbor porpoise in the wind farm area were due to either an increase in food availability and/or decreased vessel activity.

In addition to effects of sound associated with site assessment, construction, and operation of wind farms, there may also be increased risk to marine mammals through collisions with survey and support vessels, and from marine debris, oil spills, and discharge of other materials associated with construction and maintenance activities.

Adequacy of existing information

A thorough evaluation of the potential impacts of wind energy development will depend on the availability of biological and environmental information collected prior to leasing activities (i.e., baseline information) and during those activities. The information should be sufficient to identify and avoid potentially harmful effects on protected populations and habitats (e.g., existing marine protected areas, national monuments, essential fish habitats, designated critical habitats, and biological hotspots or areas of particular biological richness). It also should be collected at temporal and spatial scales necessary to characterize the inherent variability in the potentially affected ecosystems and distinguish the effects of energy development from that variability.

With regard to marine mammals, the most important biological information for assessing status and vulnerability to short- and long-term effects includes stock structure, distribution and seasonal movements, abundance and trends, and vital rates (e.g., survival, recruitment, emigration, immigration). An ecosystem-based management approach requires additional information on habitat-use patterns and trophic relationships. The collection of broad-scale biological and environmental information requires both an immediate and long-term commitment of effort and resources to acquire the knowledge needed to detect adverse impacts associated with energy development and otherwise provide a strong foundation for responsible management of marine ecosystems.

Information on the majority of the species/stocks known to occur in the project area falls short of that required to assess their population status and vulnerability to various risk factors, and to assess and detect changes over time that may be caused by the proposed action. Many species/stocks have abundance estimates derived from infrequent or outdated surveys, and abundance estimates are not available for certain species (i.e., *Kogia* spp., beaked whales) (Waring et al. 2012). BOEM's Environmental Studies Program, in collaboration with the Navy, provided multi-year funding to the National Marine Fisheries Service for the Atlantic Marine Assessment Program for Protected Species (AMAPPS). That program involved a broad-scale, multi-year, seasonal collection of abundance and distribution data for marine mammals and other wildlife in the U.S. Atlantic, using visual aerial and shipboard surveys with towed passive acoustic arrays. The Commission commends BOEM for its recently-announced commitment to continue funding the program for an additional five years because this contributes significantly to improving the quality of baseline information needed for marine mammal stock assessments. The Commission recommends that BOEM continue to support broad-scale, multi-year, seasonal wildlife surveys in all areas of established or proposed energy development.

All survey methods have shortcomings, and using complementary survey methods is the best way to minimize those shortcomings. Aerial and ship surveys are limited by daylight, sea state, and

weather conditions, and depend on the availability of survey platforms (ships and planes) and trained personnel. To complement the surveys being conducted as part of AMAPPS, BOEM should also help support broad-scale, year-round acoustic monitoring of marine mammals and ambient sound levels in the proposed leasing area. Fixed acoustic recorders deployed year-round in the offshore waters of New York would fill data gaps resulting from infrequent, incomplete, or otherwise limited visual surveys. Fixed passive acoustic recorders can detect vocalizing marine mammals to the level of species regardless of season and sea state, 24 hours a day, over a longer time frame, and at a lower cost than visual surveys or towed arrays (Clark 1995, Mellinger et al. 2007). Acoustic recordings have been used to estimate the abundance and, in some cases, the density of certain marine mammals (Van Parijs et al. 2002, Marques et al. 2009, Marques et al. 2013). Fixed recorders also can be used to measure underwater ambient sound levels, which is critical for establishing baseline sound levels prior to the introduction of additional sound sources. Recent studies indicate that waters off New York have some of the highest ambient sound levels on the Atlantic OCS (Rice et al. 2014). Additional sound from wind energy-associated activities could result in even greater masking of whale vocalizations and other acoustic cues along this important migratory corridor.

For all these reasons, the Commission recommends that BOEM work with NMFS, marine mammal researchers, the New York Department of State, and other federal and state government agencies as appropriate, to continue and expand deployment of an array of fixed passive acoustic recorders across the proposed leasing area to measure the ambient sound field, the presence of various marine mammals, and the changes that may occur as a result of wind energy development in the area.

Evaluating the effects of wind energy development

As indicated above, studies conducted to date indicate possible disturbance from site assessment activities and short-term displacement of marine mammals during construction activities. However, additional studies are needed to assess the extent of long-term avoidance of wind farm areas and any resulting impacts on reproduction and survival of marine mammal populations in the lease area. Studies are also lacking regarding potential effects of wind farm construction and operation on large whales, especially baleen whales, which are sensitive to low frequency sounds produced during wind turbine construction and operation.

The National Environmental Policy Act (NEPA) requires the assessment of potential impacts for major federal actions. Either an environmental assessment or an environmental impact statement may satisfy the Act's requirements, but the latter is necessary when the federal action could possibly cause significant impacts. The Council on Environmental Quality's regulations implementing NEPA require that significance be determined on the basis of both context and intensity (40 C.F.R. § 1508.27). In determining the intensity of an action, the regulations direct agencies to consider, among other things—

- unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- the degree to which the effects on the quality of the human environment are likely to be highly controversial;

- the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;
- the degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;
- whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment; and
- the degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

As noted in previous comments to BOEM on proposed wind energy areas, most of the "significance" criteria under NEPA apply for wind energy areas identified by BOEM for commercial leasing off the east coast of the United States, and the proposed wind energy area off New York is no exception. The waters off New York are an important migratory corridor and feeding area for endangered marine mammals and sea turtles, as well as seabirds (NYDOS 2013). Offshore wind energy development involves relatively new technology; therefore considerable uncertainty exists regarding potential short-term and long-term impacts on marine species, marine habitats, and climate (Simmonds and Brown 2010, Mann and Teilman 2013). Furthermore, the proposed activities, and the manner in which they are managed, will set a precedent for expansion of this technology throughout the western North Atlantic region—an area identified as having high potential for offshore commercial wind leasing (Schwartz et al. 2010). Finally, the extensive areas and long lives of the proposed offshore wind energy operations have the potential to result in significant cumulative impacts on the environment.

The substantial uncertainties during this early stage of the leasing process argue for a controlled, deliberate approach to the development of wind energy in the Atlantic. Such an approach would ensure that decision-makers consider a broad suite of alternatives that clearly define the environmental issues. A controlled, deliberate approach also would ensure that the potential effects of each alternative are thoroughly evaluated before leasing decisions are made, and that public input and participation in the process is maximized (Portman 2009).

To date, BOEM's environmental analysis of commercial leasing of wind energy areas has been limited to an assessment of impacts associated with lease issuance and site assessment only, rather than the full life cycle of wind energy development from site assessment through construction, operation, and decommissioning. Limiting the environmental analysis to only the initial stages of the process may expedite the leasing process but does not allow for a comprehensive analysis of the potential impacts of renewable energy development. The Commission recognizes the need for expediency in wind energy development, but that need does not rule out the value of preparing an environmental impact statement. Indeed, section 1500.5 of the regulations implementing NEPA provides a number of guidelines for completing an environmental impact statement in an expeditious manner.

BOEM (at the time known as the Minerals Management Service) commissioned a synthesis of environmental effects of alternative energy development in 2007 (Michel et al. 2007), but that synthesis does not reflect new information regarding environmental effects, particularly new information on the environmental effects of construction and operation of numerous wind farms in

northern Europe and China[1] in the last decade. In light of recent commercial wind energy leases issued for state and federal waters off Massachusetts, Delaware, New Jersey, and Virginia, and proposed leasing off Rhode Island, New York, Maryland, North Carolina, Georgia, and Oregon[2], a programmatic environmental impact statement seems warranted to synthesize the current state of knowledge regarding impacts of wind energy development, outline alternatives to minimize short- and long-term environmental impacts, consider the cumulative impact of wind energy development as well as other human uses of the marine environment, and identify significant data gaps to guide future development, research, mitigation, and monitoring.

To ensure an informed and deliberate approach to wind energy development, the Marine Mammal Commission recommends that BOEM prepare a programmatic environmental impact statement on the full life cycle of commercial wind energy development (leasing, site assessment, construction, operation, and decommissioning) on the U.S. Outer Continental Shelf, incorporating new information on longer-term and cumulative effects of wind energy development on marine mammals, marine habitats, and prey species.

The inclusion of an alternative to protect North Atlantic right whales

The North Atlantic right whale may be one of the marine mammal species most at risk because of its small population size and high mortality rate from human activities (i.e., shipping and fishing). Analyses of sightings data indicate that right whales generally are coastal in distribution, but may occur 55 km or more offshore in the mid-Atlantic (Schick et al. 2009). The areas under consideration for wind energy development off New York appear to overlap with the right whale's migratory corridor between feeding areas in the Gulf of Maine and calving areas to the south.

Visual surveys and acoustic monitoring of waters off New York[3] and New Jersey (Whitt et al. 2013) indicate that right whales are present not only during the established migratory period (1 November through 30 April), but also in other parts of the year. NMFS currently is considering a petition to expand right whale critical habitat to incorporate areas in the mid-Atlantic, including waters off New York (75 Fed. Reg. 61690). Of particular concern are right whale mothers and calves due to their vulnerability to vessel strikes (Moore et al. 2004; Kraus et al. 2005, Hain 2013), and vessels will be required for site assessment, construction, and support operations. In addition, low-frequency sounds from vessels have been shown to result in habitat displacement, behavioral changes, and alterations in the intensity, frequency, and intervals of right whale calls (Rolland 2012).

The National Marine Fisheries Service has implemented regulatory measures to protect right whales in the western North Atlantic, including—

- the establishment of a seasonal management area within a 37-km radius of New York harbor and other major east coast ports; and
- the requirement that vessels greater than or equal to 19.8 m operating in the mid-Atlantic seasonal management area reduce speeds to 10 knots or less from 1 November to 30 April to reduce the risk of vessel strikes (73 Fed. Reg. 60173).

[1] http://www.gwec.net/global-offshore-current-status-future-prospects/
[2] http://www.boem.gov/Renewable-Energy-State-Activities/
[3] http://www.nefsc.noaa.gov/psb/surveys/

These measures have been effective at reducing right whale deaths (Laist et al. 2014), but are insufficient to protect right whales fully because they do not encompass all areas proposed for wind energy leasing off New York (and other states). They also do not address other activities involved in wind energy development, such as the introduction of noise during site assessment and construction activities.

In its programmatic environmental impact statement for geological and geophysical activities on the mid- and south Atlantic OCS, BOEM identified as part of its preferred alternative a measure that would restrict seismic surveys from occurring in right whale critical habitat and NMFS-designated seasonal management areas and active dynamic management areas. However, there are no similar time-area restrictions for high-resolution geophysical surveys operating at frequencies at or below 30 kHz conducted as part of wind energy site assessment plans. The preferred alternative would instead require evaluation by BOEM of high-resolution geophysical surveys on a "critical need basis" (BOEM 2014), and could allow high-resolution surveys to be conducted during times when right whales are present and have the potential to be disturbed.

A number of the potential impacts of wind energy development to right whales could be avoided if BOEM were to limit all site assessment and construction activities to the period of time when whales are least likely to be present (May through October). Such a limitation should not impose excessive costs because weather and sea conditions likely would already limit development activities during the November to April period. Therefore, the Commission recommends that BOEM include in any new environmental assessment or environmental impact statement for commercial wind energy site assessment and development off New York an alternative that would restrict all site assessment activities (including high-resolution geophysical surveys) and pile-driving throughout the leasing area to the period from 1 May to 31 October. This requirement would minimize the likelihood of noise-related injuries and vessel strikes to endangered right whales and other coastal marine mammals.

The Commission appreciates the opportunity to comment on BOEM's environmental assessment for renewable energy activities off New York. Please contact me if you have questions concerning the Commission's recommendations or rationale.

Sincerely,

Rebecca J. Lent, Ph.D.
Executive Director

cc: Ms. Donna Wieting, NMFS Office of Protected Resources
Mr. David Gouveia, NMFS Greater Atlantic Regional Fisheries Office

References

BOEM. 2014. Final programmatic environmental impact statement for Atlantic OCS proposed hgeological and geophysical activities in the mid- and south Atlantic planning areas. Prepared for BOEM Gulf of Mexico OCS Region by CSA Ocean Services Inc. BOEM 2014-001.

Carstensen, J., O.D. Henriksen, and J. Teilmann. 2006. Impacts of offshore wind farm construction on harbour porpoises: acoustic monitoring of echolocation activity using porpoise detectors (T-PODs). Marine Ecology Progress Series 321:295-308.

Clark, C.W. 1995. Application of U.S. Navy underwater hydrophone arrays for scientific research on whales. Scientific Report, International Whaling Commission 44:210–213.

Cox, T.M., T.J. Ragen, A.J. Read, E. Vos, R.W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernandez, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P.D. Jepson, D. Ketten, C.D. MacLeod, P. Miller, S. Moore, D.C. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, L. Benner. 2006. Understanding the impacts of anthropogenic sound on beaked whales. Journal of Cetacean Research and Management 7(3):177–187.

Dahne, M., A. Gilles, K. Lucke, V. Peschko, S. Adler, K. Krügel, J. Syndermeyer, and U. Siebert. 2013. Effects of pile-driving on harbour porpoises (*Phocoena phocoena*) at the first offshore wind farm in Germany. Environmental Research Letters 8:1-16 (025002).

Hain, J.H.W., J.D. Hampp, S.A. McKenney, J.A. Albert, and R.D. Kenney. 2013. Swim speed, behavior, and movement of North Atlantic right whales (*Eubalaena glacialis*) in coastal waters of northeastern Florida, USA. PLOS ONE 8(1):e54340.

Koschinski, S., B.M. Culik, O.D. Henriksen, N. Tregenza, G. Ellis, C. Jansen, and G. Kathe. 2003. Behavioural reactions of free-ranging porpoises and seals to the noise of a simulated 2 MW windpower generator. Marine Ecology Progress Series 265:263–273.

Kraus, S.D., M.K. Brown, H. Caswell, C.W. Clark, M. Fujiwara, P.K. Hamilton, R.D. Kenney, A.R. Knowlton, S. Landry, C.A. Mayo, W.A. McLellan, M.J. Moore, D.P. Nowacek, D.A. Pabst, A.J. Read, and R.M. Rolland. 2005. North Atlantic right whale in crisis. Science 309:561-562.

Lageux, K., B. Wikgren, and R. Kenney. 2012. Technical report for the spatial characterization of marine turtles, mammals, and large pelagic fish to support coastal and marine spatial planning in New York. Prepared for Stone Environmental Inc. and State of New York's Ocean Planning and Coastal Management Program, 194 pages. (Available at: http://docs.dos.ny.gov/communitieswaterfronts/ocean_docs/NEA_URI_Report_Marine_Mammals_and_Sea_Turtles.pdf)

Laist, D.W., A.R. Knowlton, D. Pendleton. 2014. Effectiveness of mandatory vessel speed limits for protecting North Atlantic right whales. Endangered Species Research 23:133-147.

Lurton, X., and S. DeRuiter. 2011. Sound radiation of seafloor-mapping echosounders in the water column, in relation to the risks posed to marine mammals. International Hydrographic Review, November 2011, 7-17.

Mann, J. and J. Teilmann. 2013. Environmental impact of wind energy: synthesis and review. Environmental Research Letters 8:1-3 (035001).

Madsen, P.T., M. Wahlberg, J. Tougaard, K. Lucke, and P. Tyack. 2006. Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs. Marine Ecology Progress Series 309:279–295.

Marques, T., L. Thomas, J. Ward, N. DiMarzio, and P.L. Tyack. 2009. Estimating cetacean population density using fixed passive acoustic sensors: An example with Blainville's beaked whales. Journal of the Acoustical Society of America 125(4):1982–1994.

Marques, T.A., L. Thomas, S.W. Martin, D.K. Mellinger, J.A. Ward, D.J. Moretti, D. Harris, and P.L. Tyack. 2013. Estimating animal population density using passive acoustics. Biological Reviews 88:287-309.

McIwem, J.A.D. 2006. Likely sensitivity of bottlenose dolphins to pile-driving noise. Water and Environment Journal 20:48–54.

Mellinger, D.K., K.M. Stafford, S.E. Moore, R.P. Dziak, and H. Matsumoto. 2007. An overview of fixed passive acoustic observation methods for cetaceans. Oceanography 20(4):36–45.

Michel, J., H. Dunagan, C. Boring, E. Healy, W. Evans, J.M. Dean, A. McGillis, and J. Hain. 2007. Worldwide synthesis and analysis of existing information regarding environmental effects of alternative energy uses on the Outer Continental Shelf. U.S. Department of the Interior, Minerals Management Service, Herndon, VA, MMS OCS Report 2007-038. 254 pages.

Moore, M.J., A.R. Knowlton, S.D. Kraus, W.A. McLellan, and R.K. Bonde. 2004. Morphometry, gross morphology and available histopathology in North Atlantic right whale (*Eubalaena glacialis*) mortalities (1970-2002). Journal of Cetacean Research and Management 6(3):199-214.

NOAA (National Oceanic and Atmospheric Administration). 2013. Letter from John Bullard, NMFS, Northeast Regional Office, to Dr. A. Krueger, BOEM, re: Comments on Commercial Leasing for Wind Power on the Outer Continental Shelf (OCS) Offshore New York, Request for Interest (RFI) and New York Power Authority (NYPA) Proposal, 13 pages. (Available at: http://www.regulations.gov/#!documentDetail;D=BOEM-2012-0083-0004)

NYDOS (New York Department of State). 2013. Offshore Atlantic Ocean Study. 144 pages.(Available at: http://docs.dos.ny.gov/communitieswaterfronts/ocean_docs/NYSDOS_Offshore_Atlantic_Ocean_Study.pdf)

Portman, M. 2009. Involving the public in the impact assessment of offshore renewable energy facilities. Marine Policy 33(2):332-338.

Rice, A.N., J.T. Tielens, B.J. Estabrook, C.A. Muirhead, A. Rahaman, M. Guerra, and C.W. Clark. 2014. Variation of ocean acoustic environments along the western North Atlantic coast: a case study in context of the right whale migration route. Ecological Informatics 21:89-99.

Rolland, R.M., S.E. Parks, K.E. Hunt, M. Castellote, P.J. Corkeron, D.P. Nowacek, S.K. Wasser, and S.D. Kraus. 2012. Evidence that ship noise increases stress in right whales. Proceedings of the Royal Society B (Published online doi:10.1098/rsp.b.2011.2429).

Scheidat, M., J. Tougaard, S. Brasseur, J. Carstensen, T. van Polanen Petel, J. Teilmann, and P. Reijnders. 2011. Harbour porpoises (*Phocoena phocoena*) and wind farms: a case study in the Dutch North Sea. Environmental Research Letters 6:1-10 (025102).

Schick, R.S., P.N. Halpin, A.J. Read, C.K. Slay, S.D. Kraus, B.R. Mate, M.F. Baumgartner, J.J. Roberts, B.D. Best, C.P. Good, S.R. Loarie, and J.S. Clark. 2009. Striking the right balance in right whale conservation. Canadian Journal of Fisheries and Aquatic Sciences 66:1399–1403.

Schwartz, M. D. Heimiller, S. Haymes, and W. Musial. 2010. Assessment of offshore wind resources for the United States. Technical Report, National Renewable Energy Laboratory NREL/TP-500-45889, 96 pages.

Simmonds, M.P. and V.C. Brown. 2010. Is there a conflict between cetacean conservation and marine renewable-energy developments? Wildlife Research 37:688-694.

Skeate, E.R., M.R. Perrow, and J.J. Gilroy. 2012. Likely effects of construction of Scroby Sands offshore wind farm on a mixed population of harbour *Phoca vitulina* and grey *Halichoerus grypus* seals. Marine Pollution Bulletin 64:872-881.

Southall, B.L., Rowles, T., Gulland, F., Baird, R.W., and Jepson, P.D. 2013. Final report of the Independent Scientific Review Panel investigating potential contributing factors to a 2008 mass stranding of melon-headed whales (*Peponocephala electra*) in Antsohihy, Madagascar, 75 pages. (Available at http://iwc.int/cache/downloads/4b0mkc030sg0gogkg8kog4o4w/Madagascar%20ISRP%20FINAL%20REPORT.pdf)

Teilmann, J., and J. Carstensen. 2012. Negative long term effects on harbour porpoises from a large scale offshore wind farm in the Baltic—evidence of slow recovery. Environmental Research Letters 7:1–10.

Tougaard, J., P.T. Madsen, and M. Wahlberg. 2008. Underwater noise from construction and operation of offshore wind farms. Bioacoustics 17:1–3.

Van Parijs, S.M., J. Smith, and P.J. Corkeron. 2002. Using calls to estimate the abundance of inshore dolphins: a case study with Pacific humpback dolphins *Sousa chinensis*. Journal of Applied Ecology 39:853–864.

Waring, G.T., J.M. Quintal, and S.L. Swartz (eds.). 2000. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2000. NOAA Technical Memorandum NMFS-NE-162, 301 pages.

Waring, G., E. Josephson, C.P. Fairfield, and K. Maze-Foley (eds.). 2008. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2007. NOAA Technical Memorandum NMFS-NE-205, 415 pages.

Waring, G., E. Josephson, C.P. Fairfield, and K. Maze-Foley (eds.). 2009. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2008. NOAA Technical Memorandum NMFS-NE-210, 429 pages.

Waring, G., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds.). 2010. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2010. NOAA Technical Memorandum NMFS-NE-219, 598 pages.

Waring, G., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds.). 2012. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2011. NOAA Technical Memorandum NMFS-NE-221, 319 pages.

Waring, G., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds.). 2013. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2012. 419 pages.

Whitt, A.D., K. Dudzinski, and J.R. Laliberté. 2013. North Atlantic right whale distribution and seasonal occurrence in nearshore waters off New Jersey, USA, and implications for management. Endangered Species Research 20:59-69.

Wood, J., B.L., Southall, and D.J. Tollit. 2012. PG&E offshore 3-D Seismic Survey Project Environmental Impact Report – Marine Mammal Technical Draft Report. SMRU Ltd, 121 pages.