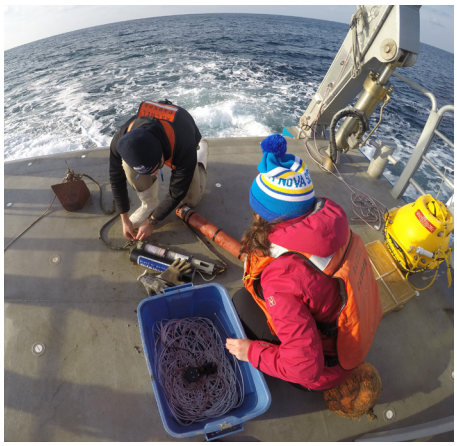
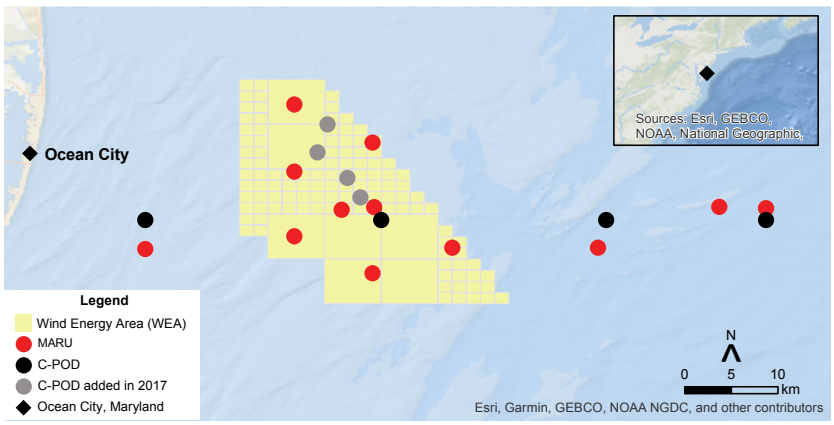
Listening for marine mammals in and around the Maryland Wind Energy Area

Photo courtesy of Helen Bailey

Offshore windfarms provide a clean, renewable source of energy, but activities during the construction phase can potentially affect marine mammals. To collect baseline data on when and where marine mammals occur within the proposed Maryland Wind Energy Area (WEA) off Ocean City, MD, scientists deployed underwater listening devices to record the ambient noise levels and marine mammal calls. The large whales (fin, humpback, minke, and North Atlantic right whale) and harbor porpoises were mainly detected from November to April. Dolphins were most common during April to October within and inshore of the WEA whereas they tended to occur more frequently offshore of the WEA from December to May. These results will help inform regulators so that appropriate protection and mitigation measures can be developed.

Marine mammals use sound for communication, hunting, and navigating. Information on the occurrence of marine mammals can therefore be obtained non-invasively by listening to their calls, an approach called passive acoustic monitoring. Dr. Helen Bailey's team, at the University of Maryland Center for Environmental Science, and Dr. Aaron Rice's team, at Cornell University, moored underwater microphones (called hydrophones) on the seabed to listen for the calls that whales, dolphins and porpoises produce. By recording and analyzing these calls, researchers are able to understand each species' distribution in space and time, seasonal patterns of their occurrence, and behavior. Data was collected from November 2014 to October 2017.

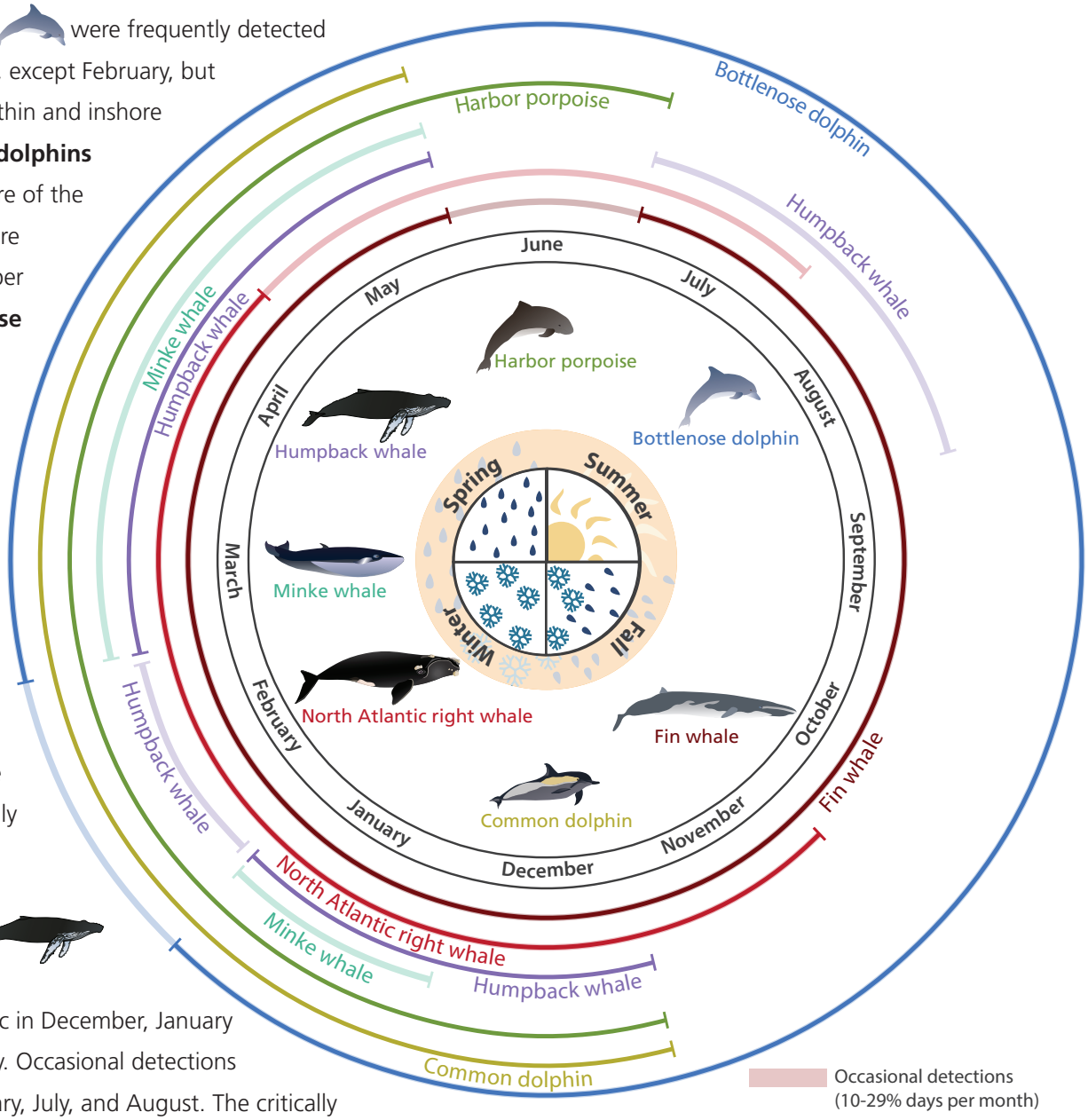




Underwater listening devices were deployed inside and outside the Maryland WEA. Twelve devices sensitive to the low-frequency calls of large whales (MARUs) were deployed throughout the WEA, inshore and offshore of the WEA (red circles). Four devices that can detect dolphin and porpoise clicks (C-PODs) were deployed in a transect line across the area studied (black circles) and a further four sites were added inside the WEA in 2017 (gray circles).

Marine mammal seasonal patterns

Bottlenose dolphins were frequently detected over all sites year-round, except February, but were more prevalent within and inshore of the WEA. **Common dolphins** occur offshore of the WEA and detections were consistent from December to May. **Harbor porpoise** were present consistently from December to June and detections revealed foraging mainly occured in the evening to early morning hours. **Minke whales**, the smallest of the large whales, were occasionally detected in January and from March to May. **Humpback whales** during their migration through the mid-Atlantic in December, January and March through May. Occasional detections were recorded in February, July, and August. The critically endangered **North Atlantic right whales** (NARW) were most prevalent from November to April, with occasional detections until July. NARW primarily moved within a nd offshore of the WEA, including through an area of high ship traffic on the offshore edge of the WEA approaching Delaware Bay. Endangered **fin whales** were the most frequently detected large whale species with the highest detections offshore of the WEA. Fin whales were detected year round, but less so in June.



This study describes the seasonal occurrence of whales, dolphins and porpoises within and around the Maryland Wind Energy Area. This information can be used to inform which species will be most at risk of disturbance by offshore wind energy construction and operation activities, as well as when and how those impacts can be most effectively mitigated.

This material is based upon work supported by the Maryland Department of Natural Resources, Maryland Energy Administration's Offshore Wind Development Fund and the U.S. Department of Interior's Bureau of Ocean Energy Management, Environmental Studies Program (Contract numbers 14-14-1916 BOEM & 14-17-2241BOEM). Symbols courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/).

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Maryland Energy Administration

BOEM Bureau of Ocean Energy Management

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