Scientists track porpoises to assess impact of offshore wind farms

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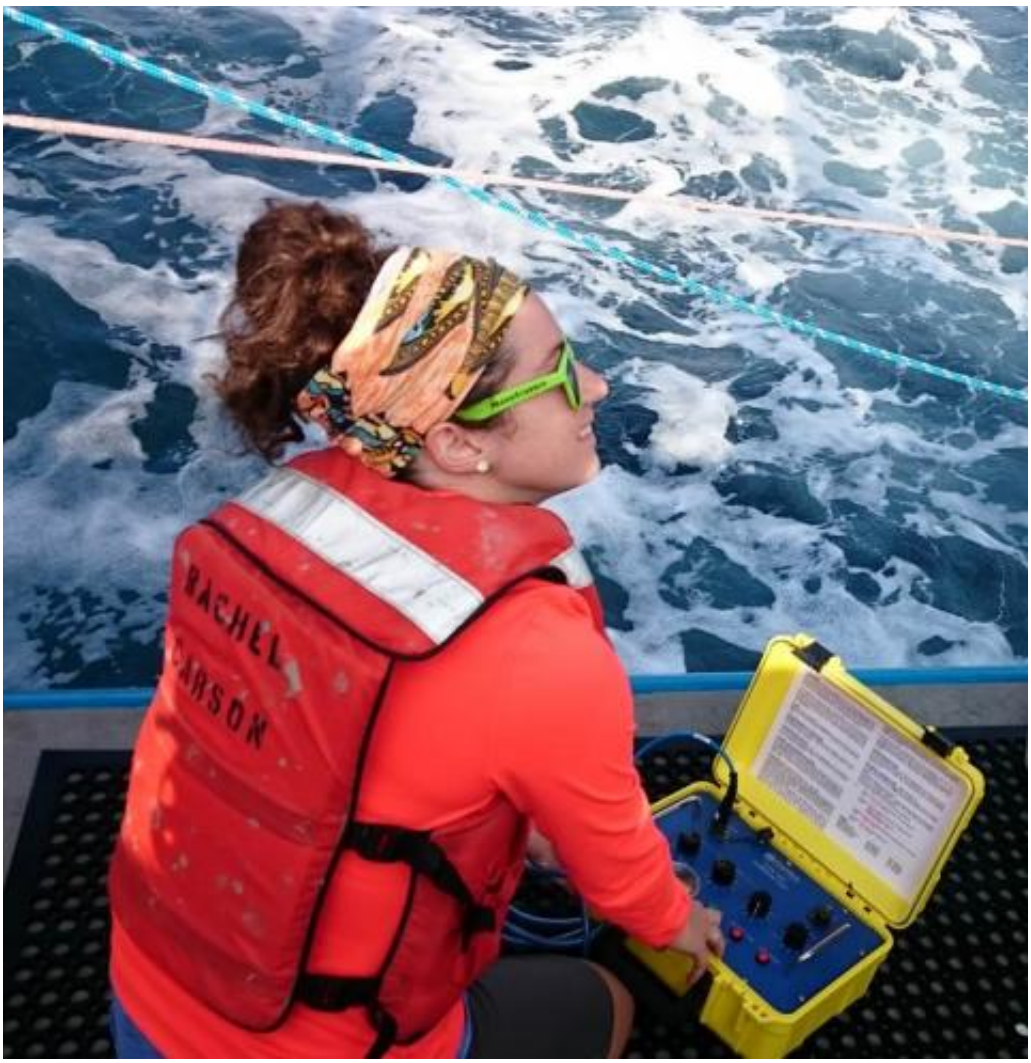

UMCES graduate student Jessica Wingfield is first author on the paper. Credit: University of Maryland Center for Environmental Science

A new study by scientists at the University of Maryland Center for Environmental Science's Chesapeake Biological Laboratory, Cornell University and Duke University is the first in a series to understand how marine mammals like porpoises, whales, and dolphins may be impacted by the construction of wind farms off the coast of Maryland. The new research offers insight into previously unknown habits of harbor porpoises in the Maryland Wind Energy Area, a 125-square-mile area off the coast of Ocean City that may be the nation's first commercial-scale offshore wind farm.

Offshore wind farms provide renewable energy, but activities during the construction can affect marine mammals that use sound for communication, finding food, and navigation.

"It is critical to understand where marine mammals spend their time in areas of planning developments, like offshore wind farms, in order to inform regulators and developers on how to most effectively avoid and minimize negative impacts during the construction phase when loud sounds may be emitted," said Helen Bailey, the project leader at the UMCES' Chesapeake Biological Laboratory.

Scientists from the University of Maryland Center for Environmental Science used underwater microphones called hydrophones to detect and map the habits of harbor porpoises, one of the smallest marine mammals. Bailey describes harbor porpoises as "very shy" ranging 4 to 5 feet long with a small triangular fin that can be hard to spot. They swim primarily in the ocean, spending summers north in the Bay of Fundy and migrating to the Mid-Atlantic, as far south as North Carolina, in the winter. There are about 80,000 of them in the northwestern Atlantic.

"There was so little known about them in this area," said Bailey. "It was suspected they used the waters off Maryland, but we had no idea how frequently they occurred here in the winter until we analyzed these data."

Porpoises produce echolocation clicks, a type of sonar that hits an object and reflects back to tell them its distance, size and shape. They use it to navigate and feed. The researchers used hydrophones anchored 65-145 feet deep, and about 10 feet off the bottom of the ocean, to pick up these clicks over the course of a year.

"We found that harbor porpoises occurred significantly more frequently during January to May, and foraged for food significantly more often in the evenings to early mornings," said study author Jessica Wingfield.

Scheduling wind farm construction activities in the Maryland WEA to take place during summer months (June to September) could reduce the likelihood of disturbance to harbor porpoises.

"We were certainly surprised by how frequently we detected harbor porpoises because there had not been a lot of reported sightings," said Wingfield.

Maryland Department of Natural Resources secured the funding for this study from the Maryland Energy Administration's Offshore Wind Development Fund and the Bureau of Ocean Energy Management.

"Year-round spatiotemporal distribution of harbour porpoises within and around the Maryland wind energy area" was recently published in *PLOS ONE*.

More information: Jessica E. Wingfield et al, Year-round spatiotemporal distribution of harbour porpoises within and around the Maryland wind energy area, *PLOS ONE* (2017). DOI: 10.1371/journal.pone.0176653