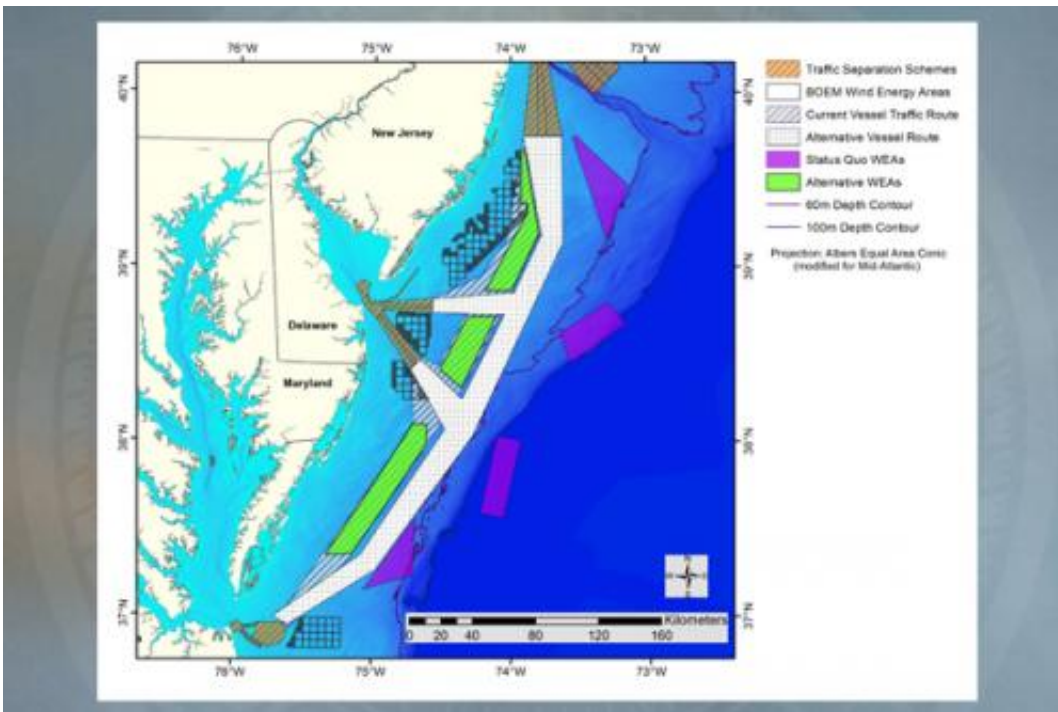


Altering shipping routes for offshore wind development could save billions

May 20 2014, by Teresa Messmore



Current and alternate vessel routes can be seen in this graphic, with two options for wind energy areas shown.

(Phys.org) —Rerouting ships to open up areas for offshore wind development could save billions of dollars in construction and operating costs for the renewable energy source, according to new findings by the University of Delaware's College of Earth, Ocean, and Environment (CEOE).

The savings come at a relatively small expense for sending commercial ships slightly farther out to sea when traveling between Mid-Atlantic ports, the research shows. The analysis was part of an economic study on societal [costs](#) and benefits of allocating ocean space off the coast for [wind energy development](#).

Offshore wind projects are being considered in the United States with aims of improving air quality, increasing energy security and supporting domestic manufacturing. Numerous factors play into decisions on where to place wind turbines, from wildlife migrations and fishing hotspots to boat traffic, ocean depth and seafloor geology.

"It's a big ocean, but there are a lot of users that need to work with each other to maximize benefits to society," said study co-author Jeremy Firestone, CEOE professor of marine policy and director of the Center for Carbon-free Power Integration.

Coastal and marine spatial planning is one common method used for mapping out and weighing the various options. Economic factors are typically left out of the mix, however, so UD researchers decided to examine the question of which would cost more to place farther off the coast: commercial shipping traffic or wind farms.

The team considered several hypothetical, large-scale offshore wind projects that could be built in the Mid-Atlantic region. Based on current shipping data, researchers considered deep-draft vessels—like tankers and container ships—that make approximately 1,500 trips between New Jersey, New York, Delaware Bay and Chesapeake Bay ports each year.

In one scenario, ships traveled at their present distance of about 33 miles from shore and wind projects were built beyond that. In a second scenario, ships traveled 46 miles from shore and wind projects were built where the ships used to go.

Researchers calculated the added cost of having ships travel farther by considering capital, fuel and operating costs and cost to society of emissions of CO₂, NO_x, SO_x, and particulate matter emitted during ships' voyages. The cost of offshore wind projects included capital costs of foundations, transmission cables and installation, as well as the cost of maintaining the turbines.

Directing ships farther out from shore added \$0.2 billion to the cost of their voyages over the course of three decades. This would increase the direct cost of transporting a metric ton of goods by 25 cents. Building [wind turbines](#) farther out beyond the shipping routes added a cost of \$13.4 billion to the cost of projects.

Overall, the savings from changing the routes would add up to \$13.2 billion.

"If the U.S. is to advance toward meeting its goal to build 54 GW (gigawatts) of offshore wind capacity by 2030, finding cost-effective locations for these wind projects is critical," the researchers wrote in the study. "By modifying vessel routes, shallow, nearshore sites in the U.S. Mid-Atlantic could be opened for wind development, allowing consumers to have the benefit of clean, domestic, carbon-free wind energy at a cheaper price."

The study focused on the economic costs and benefits, but other factors—such as safety measures to avoid ship collisions—would still need to be considered.

It is also important to note that because the study analyzed a hypothetical scenario, any actual changes to vessel routes would be done after an extensive consultation with stakeholders.

"We expect that if safety aspects to such a rerouting can be addressed,

the shipping industry will come to support this accommodation as it has with, for example, North Atlantic right whales," the authors said.

The study, titled "Changing vessel routes could significantly reduce the cost of future offshore [wind projects](#)," appears in the Aug. 1 issue of the *Journal of Environmental Management* and is available [online](#).

More information: Kateryna Samoteskul, Jeremy Firestone, James Corbett, John Callahan, "Changing vessel routes could significantly reduce the cost of future offshore wind projects," *Journal of Environmental Management*, Volume 141, 1 August 2014, Pages 146-154, ISSN 0301-4797, [dx.doi.org/10.1016/j.jenvman.2014.03.026](https://doi.org/10.1016/j.jenvman.2014.03.026).

Provided by University of Delaware

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