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UNH Media Relations

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Stimulus Funds Advance Offshore Wind Power Research At UNH

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DURHAM, N.H. –The University of New Hampshire’s Center for Ocean Renewable Energy (CORE), as part of a University of Maine-led consortium, will receive \$700,000 in federal stimulus funds from the U.S. Department of Energy. The consortium, DeepCwind, received a total of \$8 million to develop three deepwater wind energy test sites in the Gulf of Maine. CORE will deploy and test the first prototype floating structure with a wind turbine as its contribution to the project.

Unlike other offshore wind projects, which consist of wind turbines mounted on shafts sunk into the ocean floor in relatively shallow water, deepwater wind utilizes floating turbines moored to the ocean floor. The DeepCwind project will launch only the second deepwater wind energy facility in the world (the first is in Norway) and the first offshore, deepwater wind project in the U.S.

“This is a really exciting project, because we’re pushing the envelope,” says CORE director Ken Baldwin, professor of ocean and mechanical engineering.

Within the next year, CORE will install a wind turbine with a 25-foot diameter on a 60-foot tower floating in 170 feet of water just south of the Isles of Shoals, where a mooring grid is already in place – and permitted – from UNH’s Atlantic Marine Aquaculture Center. The site is six miles offshore and one mile south of White Island. CORE researchers will equip the 10-kilowatt turbine with extensive instrumentation to measure wind, wave, and temperature effects on the turbine itself, the platform on which it floats, and the mooring lines that anchor it to the ocean floor.

The University of Maine, which has been laying the groundwork for an offshore wind energy consortium for several years, selected UNH to join the DeepCwind consortium because of its expertise in ocean engineering as well as its existing mooring grid with a 10-year history of data collection. “We’re a small but important piece of the whole project, because we can deploy faster,” says CORE associate director Martin Wosnik, assistant professor of mechanical and ocean engineering. The data from the UNH wind turbine will help to prepare for deployments of 10- and 100-kilowatt wind turbines in Maine waters.

“We have a history of working in that environment,” adds Baldwin. “It’s our niche. We’re not afraid to put stuff in the water to test it.”

The U.S. Department of Energy, which granted American Recovery and Reinvestment Act funds to two additional wind energy research consortia, says that wind power, both land-based and offshore, has the potential to provide 20 percent of our electricity. Deepwater wind

projects are considered attractive because they overcome “viewshed” issues that have delayed other projects like Cape Wind on Nantucket Sound; they put energy generation closer to major population centers on the East or West coasts; and they harness the more powerful winds that blow farther offshore.

Energy Secretary Steven Chu called the Gulf of Maine “an ideal place to test this type of technology.”

Baldwin describes the project as a scaling-up process. Computer modeling of offshore wind turbines on floating platforms exist, but they’ve never been tested in a deepwater environment. The CORE team’s first step will be to test small models, developed by UNH seniors in an undergraduate ocean research projects course, in UNH’s indoor wave tank. The 10-kilowatt turbine deployed at the Isles of Shoals is still about one-tenth the size of fully operational energy-generating turbine, but “it’s the size that makes sense for this process,” says Baldwin.

This two-year grant is the first major research funding for CORE, which launched in January 2008. In addition to wind energy, CORE is exploring tidal, wave, and ocean current energy to help meet the challenges of energy sustainability and security. The physical infrastructure of CORE includes the Chase Ocean Engineering Laboratory with a wave/tow tank, engineering tank and water tunnel; the General Sullivan Bridge tidal energy site, where hydrokinetic turbines have been tested; and the offshore aquaculture, wave, and wind energy research site.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,200 graduate students.