Wave energy device would steer whales away

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When Ocean Power Technologies floats its first 200-ton wave energy-generating buoy off the Oregon Coast this year, it wants to be sure the device doesn’t disturb the coast’s most frequent multi-ton visitors: gray whales.

If a whale were to collide with one of the buoy’s massive floating cables and suffer an injury, the future of wave energy projects in Oregon also could take a hit. That’s why researchers from Oregon State University’s Marine Mammal Institute have developed a prototype device designed to deter marine animals from approaching the floating power plants.

“The largest concern with wave energy is blunt trauma to gray whales,” said Dr. Bruce Mate, director of the Marine Mammal Institute. “The underwater cables from these buoys are four to six inches in diameter. They don’t give. When an animal is traveling in the water at three or four miles per hour, there’s the potential to cause serious damage.”

According to George Wolf, a principal with Ocean Power Technologies, his company expects to have the first of 10 wave energy-generating buoys in the water by the end of this year. The project, once completed, will generate 1.5 megawatts of electricity for Douglas County.

If one of the buoys were to injure a gray whale, however, the company would need a stopgap measure until a permanent fix were identified. That’s where the acoustic device comes in.

Gray whales tend to stick close to shore to avoid predation by killer whales, which travel in deeper waters. So, gray whales will be traveling through prime real estate for the wave energy-generating buoys.

“The studies we’re doing address the concerns of our stakeholders at the coast,” Wolf said. “We’re in the process of signing an agreement that identifies specific studies to address those concerns.”

Mate in December will place an acoustic device on a mooring near Newport. The device emits a low, one-second “whoop” sound three times a minute during a six-hour stretch each day. The hope is that the sound, which is about as noisy as a fisherman’s fish radar device, would act as a whale deterrent.

A $600,000 grant from the U.S. Department of Energy is funding the study.

“At the present time, we’re not proposing this device be a routine part of wave energy devices,” Mate said. “The goal is to develop a device so if problems do arise, we can keep the animals safe until a solution is found.”

A device developed by Oregon State University researchers could help deter migrating gray whales from approaching future wave energy-generating buoys along the Oregon Coast. (Photo courtesy Dr. Bruce Mate)
Researchers aren't keen on putting an acoustic device on every wave buoy right now because the ocean is already a noisy place, according to Robin Hartman, ocean program director for the Oregon Shores Conservation Coalition. Many marine animals, such as whales and porpoises, have an extremely sensitive sense of hearing that they use for finding food, mating and other activities. Adding more noise underwater could harm certain marine animals, she said.

“These acoustic devices are going to be a big policy discussion,” Hartman said. “The ocean is a hard place to monitor effects. What would their cumulative effect be if they are installed on all of the projects? Do we hang it out there as a preventative measure or wait until a whale is injured? These are questions we’ll have to consider.”

While researchers are preparing for the worst possible effects of putting wave energy-generating devices in the water, Dr. George Boehlert, director of OSU’s Hatfield Marine Science Center, said there’s a chance the buoys could actually create new habitats for smaller ocean dwellers. He said that at wave energy facilities in Europe, crab populations have increased and are actually using the buoys as habitats.

“On a flat, sandy bottom, you’ll only see a few fish,” Boehlert said. “But put some big anchors out there and you’ll see other species in greater abundance. It may well be the effect won’t be damaging in any way, but these are things that need to be evaluated.”

There are few tools available today to control how whales travel, Mate said. He hopes that if the acoustic device is successful, it could be used to deter animals from approaching oil spills. As for how the device will influence the 18,000 whales that traverse Oregon’s coast between Alaska and Mexico, only time will tell.

“There’s no way to study the impact of a new device in the ocean until it’s there,” Mate said.

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