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Quiet Please, Across the Seas: Pause Ships to Hear the Fish

By MIKE SECCOMBE

To the human ear, the sea is a silent place. To float on your back in the ocean is to enjoy a blissful absence of sound.

But our senses deceive us. The ocean is actually a very noisy place. A blue whale can generate sounds of nearly 190 decibels. Its low frequency vocalizations can be heard for vast distances underwater.

By way of comparison, a jet engine or a loud rock concert is about 130 decibels.

But there are lots of other sound sources, too. Snapping shrimp, shellfish, fish, the rumble of other baleen whales, the echo-location of toothed whales, cracking ice, thunder, wave noise.

And since about 1870, human-generated noise. Lots of it. Ship engines — a big supertanker is louder even than a blue whale — sonar, seismic soundings, long-distance communication, bombs, mines, even sonic booms from aircraft can penetrate the ocean. Furthermore, sound, low-frequency sound in particular, travels fast and far in water.

Noisy as the oceans have always been, people have made them far, far noisier.

Yet when people think about the environmental damage human activity is causing in the ocean, they usually think of overfishing, pollution from oil, plastics and other sources, warming and acidification due to climate change.

But noise pollution?

Well, Jesse Ausubel has been thinking about it a lot. Now he is planning to do something about it, something really, really big. Silence the human cacophony in the oceans, in the cause of scientific endeavor.

That's right, stop all human activity for a period — maybe four, eight or 12 hours — to see what happens. To see if marine animals change their behavior.

Don't laugh. This scientist of big ideas, who lives on Martha's Vineyard and works out of Woods Hole for part of each year, has a track record of making ambitious ideas reality. He was the cofounder, for example, of the largest cooperative project in the history of marine biology, a 10-year, \$600 million census of all the world's marine life, which now is bearing fruit.

That project has seen more than 300 scientists from 34 countries undertake more than 200 journeys of discovery into the deep oceans, finding 17,000 new species. It has spawned an historical project tracing fish resources back over hundreds of years. Not to mention a movie, already completed, to go to general release in Europe in January, and here in April.

The idea for this latest project, Professor Ausubel said, "just came to me one afternoon while I was sitting in my office at the Oceanographic Institution in Woods Hole.

"A colleague in Florida had put together a history of human additions to sound in the ocean and he had showed me some data about the increase, which was particularly large in recent decades.

"But what struck me was that really before 1870, there were almost no human additions to noise in the ocean. That's really not so long ago.

"What a pity that Alexander Graham Bell or somebody wasn't there with hydrophones to measure sound in the oceans back before we started adding so much. And I thought maybe this is a wonderful challenge.

"Everyone is worrying about changes in climate, but a lot of other things have changed in the last 100 or 150 years, and it seems to me we ought to be thinking about all these major global changes."

Yet very little is known about the effects of human-created noise pollution on marine life.

What is known is that many marine species rely more on sound extent than light for communicating, navigating, sensing their environment and species interactions, because the ocean is more transparent to sound than to light.

Some species of whales, he said, have been observed to change their swimming patterns, sometimes to surface, in response to low frequency noise, and there is some evidence implicating intense sound in the stranding of some toothed whales.

As a result oil exploration companies and navies have been required in recent years to change their operations to minimize suspected noise impacts on marine mammals. Conservationists have concerns about the possible harmful effects of powerful military sonar.

“There is evidence that some marine mammals change the frequency they use to communicate if the channels they normally use are clogged up with other introduced noise,” he said.

“But I’m not starting off with a strong statement that we know terrible things are happening. What we know is we’ve added a huge amount of noise, but we don’t know the consequences,” he said.

“We’ve made this huge change, and that’s why we need to increase our effort to understand what the background noise of the oceans is . . . [and] how the noise we’re adding to the oceans may be affecting behavior.”

Marine mammals will be a major focus, of course.

“But it could be other life forms as well. Fish can hear, and there are fish like croakers, which make sound. Exactly what part this plays in communication is little known.”

He concedes the logistics will be hard. But the way sound travels in the ocean makes a grand-scale study necessary.

“High frequency noise doesn’t travel far [underwater]. Low frequency noise does. It can cross an ocean basin. Explosions for seismic testing or explosions in combat can be heard right across an ocean. When there was underwater testing of atomic bombs in the 1950s in the South Pacific, the noise was heard in Bermuda,” he said.

“We might want to take a semi-enclosed sea, like the sea of Okhotsk around Vladivostok, or the Bering Sea, first, where a lot of the noise would come from within the basin. Or the Mediterranean, although that would be hard, because there’s a lot of shipping.

“And then you would see if the whales change their behavior, whether the whiting, the shrimp, change their behavior.

“And if they do, then move on to a larger scale.”

Besides, he said, there is “an equality to everyone participating, whether it’s Malaysia or Denmark or Canada. If we do decide there should be a day when for four hours or eight hours or 12 hours we really try to reduce the noise, the ethics are better in some ways if everyone does it.”

The plan is some way from fruition just now.

He plans a workshop, probably to be held next May, in which maybe 20 or 30 world experts would gather to consider what might be gained.

As Professor Ausubel puts it, they will consider three basic questions: should it be done, could it be done, and would it be done.

“If we don’t think, from a scientific point of view, that we could learn an enormous amount, we don’t want to propose the disruption. But if there’s a lot to be learned then we should try to rally support for it,” he said.

And a world of increasingly global problems requires global science, not to mention global publicity about what is learned.

“There’s a lot of appeal to doing a global experiment. And from the point of view of environmental pollution — and we want to draw attention to the problem — there’s a kind of elegance to it,” he said.