

Technologies exist to drastically reduce ship noise, but they're not seeing widespread adoption. Photo by Image Source Salsa/Alamy Stock Photo

## Commercial Ships Could Be Quieter, but They Aren't

Shipbuilding economics and lack of regulations are getting in the way of a quieter ocean.

by <u>Evan Lubofsky</u> November 10, 2016 | 750 words, about 3 minutes

When a ship's propeller blades rev up and begin slicing furiously through the ocean, a frothy storm erupts below. The churned seawater boils, forming millions of bubbles that snap, crackle, and pop like firecrackers. For animals in the sea below, this process—known as propeller cavitation—can be as loud as a rock concert.

As the ocean drowns in sound, the number of studies showing the harmful effects of noise on marine life has surged. And so, too, have the projections for how loud things might soon become. A new study from researchers at the Woods Hole Oceanographic Institution and the Massachusetts Institute of Technology estimates that over the next 15 years, the level of ocean noise being produced by commercial ships could rise by 87 to 102 percent.

"The combined effects of increased shipping, larger and noisier ships, and longer shipping distances create a perfect storm of amplifying factors," says <u>Max Kaplan</u>, lead author of the study. "Our findings highlight the acute challenge facing the world's oceans and the value of prompt mitigation."

Kaplan's projections assume that the way commercial ships are designed, built, and operated will remain relatively unchanged. He notes that noise levels could be curbed *if* commercial shipbuilders become more willing to incorporate ship-quieting technologies.

Ocean noise affects marine animals' ability to communicate. Video by Gord More, Steve De Neef, Judy Somers, and Jacob Levenson

Over the past decade, ship designers have begun incorporating noise control systems into select vessels.

Technologies such as low-noise propulsion systems—which use larger and slowerspinning propellers to minimize cavitation—and vibration-isolated mounting systems, which get ship engines off the engine room floor, have allowed the National Oceanic and Atmospheric Administration (NOAA) to tone down the growl of some of their vessels.

These tactics can notch things down by 30 decibels, give or take, which translates to a 400 to 600 percent difference in the amount of sound animals hear. For researchers conducting stock assessments of fish, these increasingly stealthy ships are valuable.

"From a fisheries perspective, it had long been known that fish could hear the sounds of vessels passing overhead, but it was also assumed the fish were reacting to the radiating noise in a way that biased survey results," says <u>Michael Jech</u>, a fisheries biologist with NOAA. "So our ships—like most involved in fisheries throughout the world—have been developed to be quieter."

The science community has embraced noise-reducing technologies with open arms, but the commercial shipping sector has largely ignored them, despite having a significantly larger acoustic footprint.

According to <u>Kathy Metcalf</u>, chief executive officer of the Chamber of Shipping of America, for shipbuilders, it all comes down to economics.

"The shipyard situation is pretty simple," Metcalf says. Shipbuilders "will design and build ships at the least cost to make the most profit, given the close competing margins across all shipyards offering the same type of ship."

For ship buyers, however, that cost is *not* a major roadblock, she says. Outfitting a new ship with noise control can cost an average of US \$300,000 to \$500,000, but based on ship prices of \$50-million and up, it's a mere one percent of the total cost. <u>Michael Bahtiarian</u>, an engineer and vice president of acoustic engineering firm Noise Control Engineering, LLC, agrees the relative costs can be small, but says buyers aren't lining up to purchase quieter ships.

"Ship owners and operators have heard the concerns regarding increases in underwater noise from shipping and other sources," he says. "I get the sense they want to do the right thing for the environment, but it's hard for them to justify the extra cost without understanding what the endgame is."

Compounding the situation is a lack of legislation limiting underwater ship noise. The International Maritime Organization (IMO), a branch of the United Nations that looks after shipping pollution, has established guidelines for marine noise—a checklist of best practices, more or less—but these guidelines are not mandatory.

Yet as growth in commercial shipping traffic drowns out the marine soundscape, will the IMO turn those guidelines into a mandate?

Bahtiarian feels they may at some point, but says it will be a long road ahead.

"To make things regulatory, the first thing we need to do is develop standards for how sound from ships is measured," he says. "We are just now developing these. Beyond that, there needs to be a stronger mandate from the people of the world, saying they've had enough of this and we need to fix it."

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