How search teams could use sound to find the Titan sub—and why it's a challenge

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The U.S. Coast Guard Cutter Warren Deyampert is docked as a member of the Coast Guard walks past, Tuesday, June 20, 2023, at Coast Guard Base Boston, in Boston. Rescuers are racing against time to find the missing submersible carrying five people, who were reported overdue Sunday night, June 18, 2023. Credit: AP Photo/Steven Senne, File

Search teams racing to find the missing Titanic submersible have detected underwater noises in the area. But it won't be easy to find the source of that sound in the ocean.

"It's not a simple problem," said Matt Dzieciuch, an ocean acoustics expert at the Scripps Institution of Oceanography.

The ocean is a "noisy place," Dzieciuch said. There are many other potential sources of sound under water, including from fish, other animals and of course human-made instruments, he explained.

The Coast Guard said search teams heard banging noises at 30-minute intervals.

But it's still "speculative" whether the banging noises were a true signal of life, said Art Trembanis, a marine scientist at the University of Delaware. Even this kind of pattern could come from an underwater instrument making repeated noise.

Usually, an underwater vehicle will have a device called a pinger that can correspond with the surface and make it easier to locate, Dzieciuch said. But it's unclear whether the Titan submersible was using one.

A big challenge is that the search team doesn't know exactly what kind of signal they're looking for, said Lora Van Uffelen, an ocean engineering researcher at the University of Rhode Island.

"They're just kind of listening for anything," she said.

Another challenge for the search team: Sound gets bent as it travels underwater, because of how pressure and temperature change at different depths, Dzieciuch said. This can create echo-like effects and make it hard to locate the source of a particular sound.

"Someone tapping, say, an S.O.S. at the bottom of the ocean might sound like just some random banging at the surface of the ocean," he said. "It's like shouting in a canyon. You can't really understand what the person at the other end of the canyon is saying."

The sounds in the Titan search were picked up using devices called sonobuoys, which can be tossed out of airplanes to detect noises to avoid interference with ship sounds, Dzieciuch said. These devices could help triangulate the location of the sub, but searchers would need to deploy many buoys to make it work, experts said.

But Van Uffelen said that despite the challenges, "sound is one of the best hopes they have of finding it." Sound waves move farther underwater compared to on land, she said.

And in the underwater environment, sound also travels farther than light, she pointed out—so "it's going to be easier to find it by listening than it would be by looking."

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