

Salmon make clicking sounds when stressed—but no one knows how

May 12 2026, by Georg Mathisen



One of the sea cages at Tristein Atlantic salmon farm in Ørland municipality where acoustic monitoring was conducted. Credit: SINTEF

It's noisy underwater, especially just below the surface. "A lot of the ambient noise is from the wind and waves," says Kristbjörg Edda Jónsdóttir, who is a research scientist at SINTEF, where she found out how much noise the salmon make during normal net cleaning operations as well as how the same salmon produce strange sounds when they feel

crowded. The work is [published](#) in the journal *Aquaculture International*.

Stressful when space is cramped

"We had small sea cages with around 40 fish in each. We raised the bottom of the cages bit by bit, so that they had less water volume to move around in," she says.

Less space is stressful for the salmon. They are fast swimmers with extreme endurance, and they can swim long distances. They do not thrive when their environment becomes cramped.

A quiet species

"We detected a strange clicking sound when the salmon became stressed," says Jónsdóttir. This was particularly surprising because salmon are not actually a talkative—or vocalizing—species. Cod, for example, use sound to communicate. But salmon do not talk to each other that way.

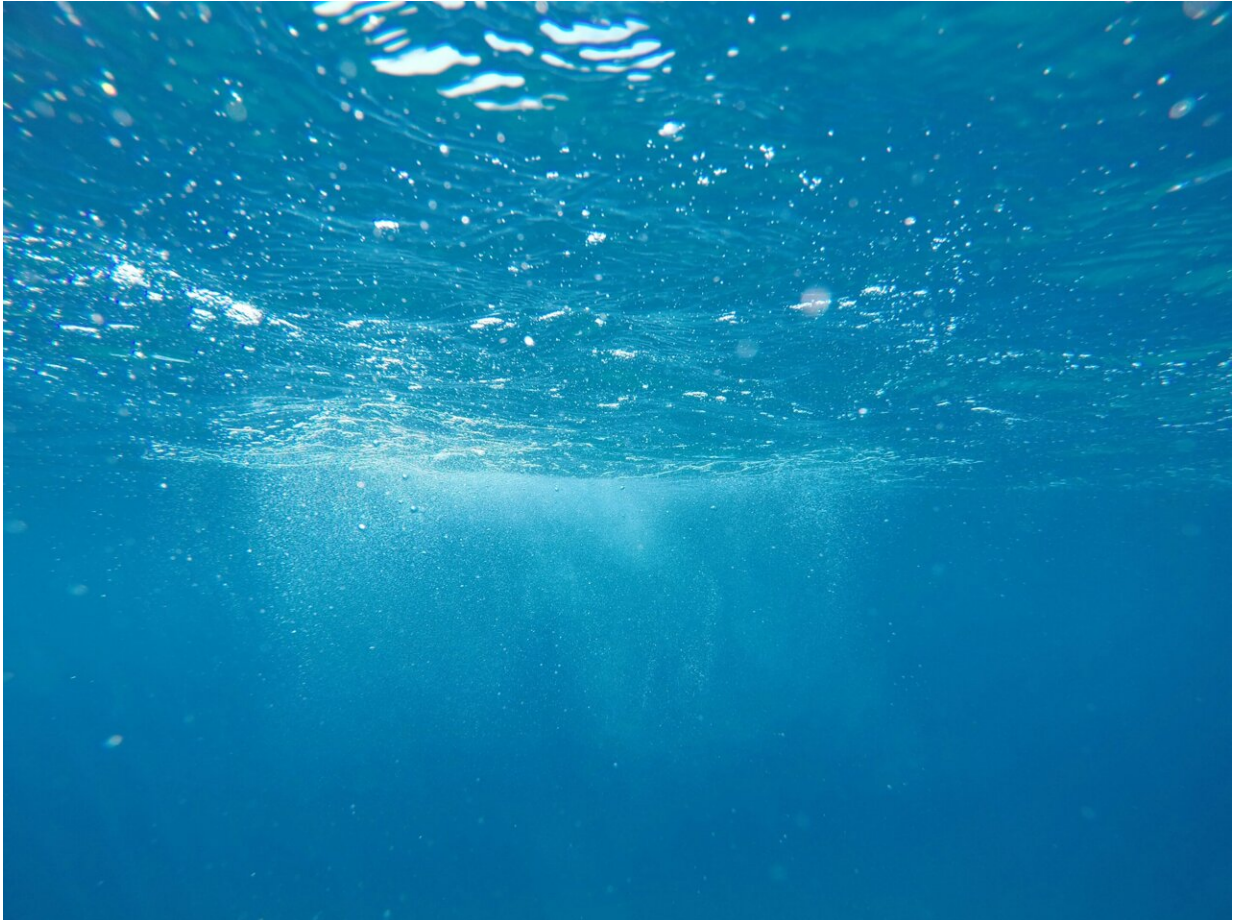
The salmon clicking is so unique that the researchers do not even know whether they make the clicks from their head or—yes, the other end.

Burping or passing gas?

"We aren't sure what produces the sound. One theory is that the salmon opens its jaw to release air and makes a mechanical sound. Or it could be that it is trying to empty air from its intestinal system. But the more cramped things became for them, the more cases of this sound we were able to identify," says the SINTEF researcher.

Jónsdóttir is not the only researcher that the salmon have produced a

clicking sound for. Gaute Alexander Nedberg Helberg, who recently earned his doctorate at the University of Tromsø, has detected a similar acoustic event. It came from salmon in a RAS facility, a land-based farm where the water is cleaned and reused. The clicking arose when the salmon were being fed, which can also be a stressful activity for them.



Credit: Unsplash/CC0 Public Domain

Noisy housecleaning

House cleaning can be stressful, too, whether you are a human or a fish. Jónsdóttir and her colleagues have now measured how much noise is produced in the net cleaning process—that is, the washing of the sea cages where the salmon live.

"There's so much noise. It's incredibly loud. We were aware that it was noisy, but just how noisy hadn't been documented," she says.

"There's been some research done that recorded the underwater acoustic soundscape for a couple of days, but this is the first time we set up long-term monitoring that lasted many months. This allowed us to look at the periods with and without net washing, and then we compared them."

Using hydrophones to measure sound underwater

The researchers used a method called [passive acoustic monitoring](#), which means they placed several hydrophones around the chosen area to listen to and measure the soundscape. A hydrophone is a microphone that is designed to record sound underwater.

The soundscape in a marine environment usually consists of three main categories:

- Human-made sounds (anthropophony)—for example, ship traffic, industry and other human activity.
- Natural sounds (geophony)—for example, waves, rain and wind.
- Biological sounds (biophony)—for example, sounds from living organisms such as fish, whales and other marine mammals.

Fish movement during cage cleaning

At its loudest, the sound level reached 139 dB. On land, this level would

be well above the pain threshold for humans, but sounds above and below water are not really comparable. The researchers cannot say for sure how loud the salmon perceive this level to be. Wild salmon swim upstream in rivers where the noise level can be even louder in many places.

"One theory holds that farmed salmon have poorer hearing than wild salmon," says Jónsdóttir.

Other experiments she has done show that the fish move around while the cages are being washed. The researchers lack enough data to determine whether this actually indicates that the cleaning noise causes them to move away.

Limited research available

"Research on sound in aquaculture is still in its early stages. Treatment of salmon is perhaps the most invasive activity that they are exposed to. The research has focused much more on making these activities gentle to avoid exposing the fish to things we know can cause direct damage to them. Sound has not had the highest priority," she says.

Underwater acoustic monitoring has been more about the impact of ambient noise from ships on mammals, not farmed fish.

"We may find that noise is no problem at all. But I think there will be more focus on this in the future," says Jónsdóttir.

More information: Kristbjörg Edda Jónsdóttir et al, Long-term underwater passive acoustic monitoring of the soundscape in an Atlantic salmon sea cage, *Aquaculture International* (2026). [DOI: 10.1007/s10499-026-02522-1](https://doi.org/10.1007/s10499-026-02522-1)

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Gaute Alexander Nedberg Helberg, Acoustic characteristics of Atlantic salmon feeding behaviour in RAS: Possibilities and pitfalls of using passive acoustics for monitoring in tanks. Doctoral thesis, UiT Arctic University of Norway, March 2026, ISBN: 978-82-8266-302-1

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