

The ocean's loudest invertebrates may be silenced by acidification

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The snapping shrimp is the noisiest marine animal in coastal ecosystems facing silence. Credit: Tullio Rossi

Snapping shrimps, the loudest invertebrate in the ocean, may be silenced under increasing ocean acidification, a University of Adelaide study has found.

Published today in the journal *Proceedings of the Royal Society B*, the researchers report that under forecast levels of CO₂ predicted to be found in oceans by the end of the century, the [sound](#) of snapping shrimps would be reduced substantially.

This is expected to have profound consequences for many species that rely on sound cues for information about the location and quality of resources (food, shelter, partners and potential predators).

"Coastal reefs are far from being quiet environments — they are filled with loud crackling sounds," says Mr Tullio Rossi, PhD candidate in the University's School of Biological Sciences.

"Shrimp "choruses" can be heard kilometres offshore and are important because they can aid the navigation of baby fish to their homes. But [ocean acidification](#) is jeopardising this process."

The snapping shrimp is the most common and noisiest of the sound-producing marine animals in coastal ecosystems. They can produce sounds of up to 210dB through the formation of bubbles by the rapid closing action of their snapping claw, used as a warning sign to scare off predators and in their own hunting.

Mr Rossi, working with supervisor Associate Professor Ivan Nagelkerken and co-supervisor Professor Sean Connell in the University's Southern Seas Ecology Laboratories, measured the sound produced by shrimp in field recordings at natural CO₂ volcanic vents at three different ocean locations and under laboratory conditions. They found substantial reductions in both the levels of sound produced and in

the frequency of snaps.

"Our results suggest that this is caused by a change of behaviour rather than any physical impairment of the claw," says Associate Professor Nagelkerken.

"This outcome is quite disturbing. Sound is one of the most reliable directional cues in the ocean because it can carry up to thousands of kilometres with little change, whereas visual cues and scents are affected by light, water clarity and turbulence.

"If human carbon emissions continue unabated, the resulting ocean acidification will turn our currently lively, noisy reefs into relatively silent habitats. And given the important role of natural sounds for animals in marine ecosystems, that's not good news for the health of our oceans."

The sounds of snapping shrimps can be heard [here](#).

More information: Silent oceans: ocean acidification impoverishes natural soundscapes, *Proceedings of the Royal Society B: Biological Sciences*, [rspb.royalsocietypublishing.org1098/rspb.2015.3046](https://royalsocietypublishing.org/doi/10.1098/rspb.2015.3046)

Provided by University of Adelaide

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