

Migration to the north: climate change puts plankton on the move

May 22 2019, by Sara Hussein



Comparison between modern plankton communities and ocean floor sediment suggest plankton species have migrated north as the water temperature there became more like their original habitats

Climate change that has warmed the world's oceans has prompted a "worrying" northward migration among some communities of the

smallest organisms in the sea: plankton.

That is the conclusion of new research published Thursday in the journal *Nature* examining the make-up of [plankton](#) communities across the northern hemisphere.

The unassuming creatures are sometimes referred to as the "[building blocks](#)" of the ocean because of their importance in the [food chain](#), and their apparent migration is another indicator of the profound effect of [climate change](#) on the planet.

"This isn't good news for [marine ecosystems](#)," said Lukas Jonkers, the study's lead author and a post-doctoral researcher at the University of Bremen's Center for Marine Environmental Sciences.

"We see that we have pushed marine ecosystems, or at least this group of zooplankton, away from their natural state. I think that's very worrying," he told AFP.

"It means that even if we manage to keep the global temperature rise below 1.5 degrees, which is doubtful, ecosystems around the globe are likely to be profoundly affected."

The subject of the research is the organism known as planktonic foraminifera, a kind of plankton with a distinctive hard shell.

When these ubiquitous creatures die, they fall to the [ocean floor](#) like snow, and their hardy shells are able to resist the ravages of time.

That means they create an indispensable and unparalleled record of what plankton communities in different parts of the world have looked like going back centuries.

And that record solves a long-standing problem for researchers trying to examine how [marine life](#) has been affected by climate change—a clear baseline.

Jonkers decided to harness the record and compare samples collected in the modern era, between 1978 and 2013, with ocean floor sediment going back centuries.

What he found was that modern communities of plankton often bore little resemblance to the communities recorded in the sediment below.



A team studying whales and seals in the Arctic found the animals were being forced to shift their feeding habits as the ocean warms

Instead, the modern communities looked like the sediment record in waters further south, suggesting plankton species have migrated north as the water temperature there became more like their original habitats.

Clear pattern of change

"Everything moved towards the north," said Jonkers.

"At one location you always find many different species, but we now see that this species community is composed of different species that like warmer water better."

For example, the modern species that were seen near Greenland are the same as those in the pre-industrial sediment found further south.

The study looked at nearly 4,000 samples from a range of zones across the [northern hemisphere](#), so it is not yet clear how modern plankton communities in southern waters compare to their predecessors in those tropical locations.

But Jonkers said the pattern of change in the locations studied was clear.

"Where the temperature has changed more, the species has changed more."

It was not possible to pinpoint a precise timeline for the change, but Jonkers said it appeared to be gradual.

And so far, he said, there was not evidence of [species](#) extinction, just movement of communities from one location to another.

But the migration could pose a problem for plankton and the animals that rely on them for food if the new arrivals don't adapt quickly enough

to survive among the other residents of their warmer environments.

The research joins a growing body of evidence about the way climate change affects the ocean.

In March, a team studying seals and whales in the Arctic found the animals were being forced to shift their feeding habits as the [ocean](#) warms, melting ice and prompting fish stocks to move.

More information: Lukas Jonkers et al. Global change drives modern plankton communities away from the pre-industrial state, *Nature* (2019). [DOI: 10.1038/s41586-019-1230-3](https://doi.org/10.1038/s41586-019-1230-3)

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