

Rising ocean temperatures impacting human health, new report finds

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Rising sea surface temperatures are causing marine-related tropical diseases and harmful algal blooms to spread towards the poles, a shift that is impacting human health, according to a chapter from a new report by the International Union for Conservation of Nature (IUCN) authored by professors from The University of Texas at Austin and Plymouth University.

The report, *Explaining Ocean Warming: causes, scale, effects and consequences*, was compiled for IUCN by 80 scientists in 12 countries and draws on several decades of scientific research from across the spectrum of marine science.

The chapter on "Impacts and effects of ocean warming on human health" highlights the spread of *Vibrio vulnificus*, an often lethal disease-causing bacteria.

The bacteria and disease it causes have historically been a problem in warm waters, such as the Gulf of Mexico, where 89 percent of human contraction has come from eating infected oysters. But the disease, which kills between one-third and one-half of those who end up in hospital, has been spreading. In recent years, outbreaks of related *Vibrio* bacteria have occurred in the Baltic Sea and in Alaska, 1,000 kilometers further north than previously recorded.

Harmful algal blooms, which can contaminate seafood with dangerous toxins that cause diseases such as ciguatera, are also spreading. Ciguatera

causes severe, sometimes lethal, gastric and neurological damage.

"In just a few years we have moved from a place where we knew this was hypothetically possible, to actual recorded cases of transmission to humans through interaction with a warming marine environment," said co-author Camille Parmesan, an adjunct professor and a senior research fellow at the UT Austin's Jackson School of Geosciences and a professor at Plymouth University.

Professor Martin Attrill, director of the Plymouth University Marine Institute, co-authored the chapter, which focuses on the correlation between ocean warming and human health. More study is needed to determine the specific pathways of these diseases, they said.

"What we don't yet know is whether these diseases were present already but not active or in sufficient number until the temperature rose, or whether they have spread to the area for the first time," Parmesan said. "What we do know is that we will need new healthcare strategies to treat these tropical pathogens where historically we have not needed to in the past."

Parmesan and Attrill also found that there is an emerging consensus in the scientific literature that climate change is likely driving tropical microbial diseases into cold temperate zones, which are historically free of them.

"This research is significant in showing the extent of current impacts of ocean warming on [human health](#), as well as the potential impacts. The most striking part of the study is that the science has moved from hypotheses and projections to the observed impacts of [ocean warming](#) in terms of the spread of disease," said Jay Banner, director of the Jackson School-affiliated Environmental Science Institute where Parmesan is a Senior Research Fellow. "This is similar to other recent observations that

are consistent with hypotheses and projections associated with [climate change](#) science, such as rising sea level now impacting coastal cities and the occurrence of record high temperatures and extreme weather events."

This report builds on the Intergovernmental Panel on Climate Change 2014 assessment.

"It's been just two years since the last major climate report, but already we have seen significant new impacts, with evidence and data gathered where previously we had models and hypotheses," Parmesan said. "This report is pitched at policy makers across the globe and sets out in stark terms the scale of the change and the challenge we are facing."

Provided by University of Texas at Austin

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