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IPCC report on the ocean: what are the main climate change-related threats?

Auteur

Jean-Pierre Gattuso

Ocean Scientist, Associate Researcher at IDDRI

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On 25 September, the IPCC presented a new special report (after the one on the difference in impacts between 1.5 and 2°C of warming and the one on land use) on the ocean and cryosphere in the face of climate change.^{[1](#)} These reports (all commissioned by the United Nations Framework Convention on Climate Change) are intended to synthesise all available scientific knowledge in order to inform decision-makers, as well as civil societies and populations.

Jean-Pierre Gattuso, oceanographer, is CNRS research director at the Laboratoire d'océanographie de Villefranche and Sorbonne University and an associate researcher at IDDRI. He is one of the co-authors of this report, with Alexandre Magnan, senior research fellow at IDDRI. In this interview, he lists the dangers

facing the ocean and warns of the urgency of taking decisive action.

The IPCC report on the ocean, of which you are one of the co-authors, has already had a considerable global impact. He makes a striking observation of the impact of climate change on the ocean.

Indeed, it appears that the impacts of climate change on the ocean and cryosphere as well as future risks are unprecedented. What strikes me most among all its conclusions is the upward revision of sea level rise. By the end of this century, and if we do not embark on an ambitious adaptation approach, we must expect high levels of risk on low coastlines (below 10 metres in altitude) such as the atoll islands and some Arctic communities, even if the decarbonisation efforts of our economies put us on a path of warming limited to 1.5 or 2°C compatible with the objectives of the Paris Climate Agreement. And in a higher-emission scenario, even developed country megacities and large agricultural deltas will face high to very high risks. Without climate action, sea level could rise by 1.1 m and, with the increase in the frequency and intensity of storms, could cause annual flooding events where their frequency is only 100 years today.

In addition, deoxygenation and acidification of seawater have impacts on the survival of species and the maintenance of ecosystems, but the most immediate issue, in my opinion, is the rise in temperature. Moreover, man has a three-dimensional impact, since the effects of climate change on the ocean are not only seen on the surface: they also affect the depths, and therefore the entire water column. This report shows that past and future changes caused by climate change extend from the top of mountains to the coasts and deep into the oceans, from the tropics to the poles.

Will the ocean, as we have read, become our worst enemy?

I am very surprised by this statement and consider that in reality the ocean is actually our best friend! It provides us with immense services such as climate regulation through heat and CO₂ storage, the supply of protein for food, the maintenance of biodiversity, etc. The ocean is also a victim of climate change (global warming, acidification, sea level rise, oxygen depletion), which jeopardises the services it provides to us.

Yet, while the ocean is a powerful vehicle for the risks associated with climate change (loss of biodiversity, migration of marine species, depletion of fisheries resources, coral bleaching and mortality, marine submersion, salinisation of groundwater and soil lenses, etc.), it is also our best ally in climate change efforts, due to the wide range of options it offers to reduce both greenhouse gas emissions and impacts on biodiversity and human activities.

What are these options?

Some are based on nature, others are technological.² Nature-based solutions, such as mangrove or coral reef restoration, can be implemented as "no regrets" solutions. On the other hand, caution must be exercised with solutions that are solely technological and could have harmful side effects, in particular disrupting the major balances of the ocean. Each territory must take up the issue and weigh its decision-making in the light of the opportunities that science, particularly through this report, offers, and its local specificities, because the pressures on the ocean are multiple, both climatic and non-climatic (overfishing, pollution, maritime transport, etc.): these impacts are cumulative. Warming adds one more problem to an already fragile ocean. Threats are up to the challenge, and the more threats increase, the less open the range of options will remain.

The mobilisation for climate has increased in recent months. Can it be the same for the ocean?

The effort to protect the oceans is not new. Tools exist and civil society awareness is also increasing. Civil society must hold states to account. This report, which summarises all the scientific knowledge in the world on the ocean, cryosphere and global warming, is part of a political moment that seems appropriate, with the recent climate summit of the United Nations Secretary-General in New York, and before the next climate COP, which the host country,

Chile, wants to make a *Blue COP*. This report basically provides a positive message. Because it shows that drastic reductions in greenhouse gas emissions make it possible to stabilise or moderate the impacts, which, if we do not act, would be very worrying. It also provides guidance on adaptation measures to limit unavoidable risks. There is an urgent need to take measures that will put human societies on a path compatible with the Paris Agreement, and the future of the ocean and cryosphere is therefore in our hands.

1 <https://www.ipcc.ch/srocc/home/>

2 Read IDDRI's Issue brief published in October 2018 :

https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Propositions/201810-PB0618-oceans%20solutions_0.pdf

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