CLIMATE DEBATE OVERLOOKS OUR OCEAN

The oceans moderate global warming, which in turn has major effects on their ecosystems. Within the framework of the Oceans 2015 Initiative, some 20 researchers from across the world have analysed the risks of impact on marine and coastal ecosystems. They warn that safeguarding our oceans must be a priority of the United Nations Climate Change Conference (COP 21) in Paris.

Global warming, actors and victims

BY JEAN-PIERRE GATTUSO AND ALEXANDRE MAGNAN

BY FERDINAND MOECK

Five thousand protected areas

The ocean covering more than two-thirds of our planet functions as a “climate integrator”, moderating climate change in two ways. It absorbs 93% of the excess heat from the increased greenhouse effect (1), at the cost of rises in ocean temperature and sea level, largely due to thermal expansion and the melting of the Greenland ice cap. It also captures much of the carbon emissions generated by human activity (28% since 1750), at the cost of acidification (see graphic, page IV).

This climate regulating function therefore comes at a cost, since the ocean deteriorates as it mitigates climate change. The changes in the ocean’s fundamental physics and chemistry, though less spectacular than the rise in sea level, have a considerable impact on marine ecosystems, and consequently on humanity. Ocean warming and acidification impede the calcification process vital to some marine organisms (corals, shellfish); many coral reefs are being bleached by the destruction of their symbiosis with zooxanthellae (algae); phytoplankton is declining in warmer waters; the fish food chain is being disturbed; some species can migrate to cooler waters, but not all.

Despite the ocean’s critical role in providing food security for hundreds of millions of people around the world, international climate negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) have given it minimal attention. To fill this gap, a number of researchers (2) taking part in the Oceans 2015 Initiative (3) decided to provide the negotiators at the Paris climate conference (COP 21) with a synthesis of past changes and changes projected to occur by the end of the century, and of the consequences for marine ecosystems and the services they provide. Two contrasting greenhouse gas emissions scenarios were considered: a continuation of the present rising trend (business-as-usual) and, more optimistically, a fall that would keep the global temperature increase to less than 2°C in the 21st century.

Apart from strict limitation of carbon emissions, the international community needs to protect marine and coastal ecosystems, restore those that have already been damaged, and enable societies that depend on marine resources to adapt to change. A number of approaches are being tested at local level, but the further we move away from the 2°C target, and the warmer and more acidified the ocean becomes, the less room there is for manoeuvre. For the further coral reefs deteriorate, the more vulnerable they will become and the harder it will be to save them. Some approaches are antagonistic: solar radiation management aims to limit global warming by increasing the amount of heat reflected back into space. This could undermine efforts to reduce carbon emissions and would do nothing to remedy ocean acidification.

Four key messages emerge from the Oceans 2015 Initiative’s analysis. First, the ocean strongly influences the climate system and provides important services to humans. Second, the deterioration of marine and coastal ecosystems is already detectable and is certain to worsen, even under the optimistic scenario where global carbon emissions fall – especially as, no matter what happens, the damage to the ocean will occur across all latitudes, making this a global concern. Third, an immediate and substantial reduction of emissions of greenhouse gases, especially carbon dioxide (CO2), is vital to prevent irreversible impacts on ocean ecosystems; any treaty that did not make it possible to limit global warming to 2°C would have disastrous consequences. Finally, the higher atmospheric CO2 rises, the fewer the options for protecting the ocean and restoring its ecosystems.

The Oceans 2015 Initiative, noting that the ocean has received minimal attention at previous climate conferences, pleads for a radical change of perspective: COP 21 must take the necessary action and propose a new, less destructive plan for civilisation. The future condition of the ocean depends on the amount of carbon emitted in the coming decades. The more stringent, optimistic scenario allows less than one-sixth of the emissions expected by the end of the 21st century under the pessimistic scenario, without regulation. In fact, carbon emissions will need to be even lower since the ocean’s capacity to absorb will decline over time. The choices made at COP 21 will therefore have serious consequences for the ocean.

According to the Oceans 2015 Initiative scenarios, ocean acidity may have risen by 38-150% between the industrial revolution and the end of the 21st century, while average sea level may have risen by 60-86 centimetres between 1901 and 2100. The ocean’s oxygen inventory is projected to decrease, slower or faster depending on the scenario, affecting all forms of marine life.

Ocean warming and acidification is already seriously affecting warm-water corals, mid-latitude seagrass, high-latitude pteropods and krill (planktonic crustaceans), mid-latitude bivalves and finfish. Even under the optimistic scenario, projections of the impact on warm-water corals and mid-latitude bivalves are cause for serious concern. But

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Organisations

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Supplement: Oceans 2015 Initiative

http://www.fondation-bertarelli.org


(7) IUCN, “Globally Significant Coastal Ecosystems,” www.iucn.org

(8) The Convention on Biological Diversity (CBD) adopted at the Earth Summit in Rio de Janeiro in 1992 and signed by 168 states, is “any area defined within or adjacent to the marine environment, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than its surroundings” (1). In response to extreme weather events and the consequences of the exploitation of natural resources, the creation of MCPAs seeks to limit exploitation of fish stocks, oil and gas. MCPAs protect “the sustainable use of [the] components of biodiversity, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources.” Recognised by international organisations such as the United Nations, the International Union of Conservation and the CBD, they established rules that are largely non-binding on states; most of them continue to define MCPAs according to their own legislation. This explains the difficulty of protecting international waters, in terms of establishing the legal authority and implementing the necessary international regulation. The CBD does, however, respond to the need for shared norms that will make it possible to standardise the concept of MCPAs at global level for the first time. If national governments legislate on the basis of the CBD, transnational norms could emerge and help define effective action for protecting all oceans.

The latest report of the UN Environment Programme (UNEP) in partnership with the IUCN estimates that MCPAs cover 3.4% of the global ocean area, and only 0.25% of the ocean area outside national jurisdiction (3). This means just 2% of the world’s oceans are effectively protected. The CBD’s strategic plan for 2011-20 calls for “at least 10% of marine and coastal areas” to be covered by MCPAs by 2020 (4).

Translated by Charles Goulden.
Towards a ‘blue economy’

By protecting our marine resources we can help local economies, especially through ecotourism.

BY DAN LAFOLLEY

The Mediterranean has now been added to the list of ocean regions needing urgent attention. Since the last World Parks Congress in Sydney, Australia, in 2013, we have grown to understand that MPAs are key to managing and conserving marine biodiversity. Across the globe, marine protected areas are becoming more common, and their number has increased from 1,800 in 1999 to over 20,000 today. However, it is now clear that more must be done to ensure these areas are adequately protected.

When considering the importance of marine protected areas, it is essential to understand their role in supporting local economies. MPAs can provide benefits to local communities through ecotourism and other economic activities, such as fishing and aquaculture. These benefits can be significant, especially in areas where the ocean is a central part of the local culture.

However, the benefits of marine protected areas are not always realized. In many cases, MPAs are established without sufficient input from local communities, leading to a lack of awareness and support. This can result in a failure to realize the potential economic benefits of the protected areas.

To address this issue, it is crucial to involve local communities in the planning and management of marine protected areas. This can be achieved through community-based management, where local people are actively involved in the decision-making process. This approach not only ensures that the benefits of the protected areas are realized, but it also enhances the long-term sustainability of the marine environment.

In conclusion, marine protected areas are crucial for the conservation of marine biodiversity and the support of local economies. However, their success depends on effective planning, management, and involvement of local communities. By ensuring that MPAs are designed and managed in a way that benefits local people, we can ensure the long-term sustainability of our oceans.

References

3. World Fish Migration Day: http://www.worldfmsday.com
5. World Oceans Day: http://www.worldoceansday.org

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if carbon emissions continue at their present rate, ocean warming will have a disastrous impact on all these organisms, leading to mass displacement and a decline in marine biodiversity in the tropics. These results – derived from experiments, field observations and modelling – are consistent with evidence from other periods in the geological record when atmospheric CO2 was high, owing in particular to volcanic activity. The impact of these changes on marine ecosystems also varies according to the scenario. If greenhouse gas emissions continue at their present rate, fishing will be severely affected, especially in tropical waters where it is a key source of protein and income for millions of people. There will also be a very high impact on services provided by coastal ecosystems – coastal protection (coral reefs, mangroves, seagrass beds), aquaculture or tourism. The damage caused by ocean acidification and rising sea levels to marine organisms and ecosystems, and the resulting loss of biodiversity, is already detectable and could become severe, even under the optimistic scenario. It comes on top of other human impacts such as overexploitation of living resources, habitat destruction and pollution. Given the scale of the expected changes, we can expect that no country is safe: this is a worldwide problem and we cannot afford to let the North/South divide prevent us from taking action.

JEAN-PIERRE GATTUSO
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OCEAN SOLUTIONS

June 2015 the UN General Assembly

proved a resolution to negotiate a new legal instrument to implement the UN Convention on the Law of the Sea. We may hope this will pave the way for the creation of areas where marine biodiversity is rigorously protected by law, as well as more equitable access to the high seas and fairer sharing of their benefits, within a framework of shared governance.

It’s clear we need to think differently. The ecological, scientific and legal arguments for ocean conservation are numerous and irresistible, but they are not enough. To be effective, they must be combined with new ideas, technologies and sources of finance suited to the task.

The creation of an “ocean bank” for sustainability and development,” funded through a one-time equity investment by governments and private partners, could offer viable financing options for initiatives to promote the survival and regeneration of the oceans. We also need to broaden our partnerships. The Paris climate conference (COP 21) this month offers an opportunity to form alliances between organizations from different sectors united by their awareness of the importance of protecting marine biodiversity. This is why we recognize that the oceans are not just a source of food and minerals for exploitation, but also vital for the future of our planet and the survival of humanity.

Torstén Thiele

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Globe diplomatique

SUPPLEMENT: OCEANS 2015 INITIATIVE

Time for international rules

Climate talks too often neglect the world’s oceans. One of the key aims of the Paris conference (COP 21) is to define precise rules to protect oceans and manage them sustainably

BY TERESA RIBERA, JULIEN ROCHETTE AND ALEXANDRE MAGNAN

RÈNE DUVILLIER – “Returns from sea” (1977)

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