Marine biodiversity in a changing climate

How do we best enable the Baltic Sea ecosystem to be part of the solution?
05.11.2020, 10.00-11.30 CET
Online Meeting

Welcome address

Nils TORVALDS MEP, Vice-Chair of the SEArica board responsible for the Baltic Sea, welcomed the participants and shared his personal experience of the Baltic Sea, highlighting its visible heritage of the last ice age and its specific biodiversity. Mr Torvalds showed how climate change's effect on the biodiversity is tangible in everyday life when one spends time in the Finnish archipelago. He illustrated this substantial change and the impact on biodiversity through the situation of iconic Baltic species such as sea eagles, eelgrass and blue mussels. The latter, a small variety of mussel, plays an important cultural role for the inhabitants of the Finnish coast. Blue mussels are at risk of disappearing from their traditional habitat, as they are immensely dependent on the salinity of the water. Finally, Mr Torvalds stressed the importance of finding a balance between human activities and marine protection as a means for climate action. Once the balance is restored, eelgrass could for instance act as an important blue carbon sink.

Panel discussion: How do we best enable the Baltic Sea ecosystem to be part of the solution?

The research approach:

Moderated by **Ms Hanna SJÖLUND,** Advocacy and Analysis Officer, Stockholm University Baltic Sea Centre. Ms Sjölund informed the audience that Dorina Seitaj was going to speak on behalf of IUCN instead of Ms Minna EPPS.

1. Biodiversity in a rapidly changing Baltic

Mr **Alf NORKKO,** Professor of Baltic Sea research at Helsinki University, started off by quoting the Global Assessment Report on Biodiversity and Ecosystem Services (IPBES) underlining that the two are quite interlinked. He explained that the climate crisis is worsening at the expense of biodiversity, compromising sustainability and our own future. Professor Norkko showed how the Baltic Sea is surrounded by a large catchment and consists of a very shallow sea with very limited water exchange, which is part of the reason why problems can be quite acute. Professor Norkko underlined how the Baltic biodiversity is very specific and valuable, but also very vulnerable. He compared marine biodiversity - and its strong sensitivity to pressure - to high risk patients. Mr Norkko stressed the role of coastal biodiversity as very efficient “carbon traps” and pointed out that for many species researchers are not even completely aware of the specific roles in carbon sequestration potential. Furthermore, he addressed the problem of eutrophication, which he described as the largest threat to the marine ecosystem while being strongly exacerbated by climate change. As there are too many nutrients in the sea, in calm days algae are emerging and suffocating the seafloor, clearly compromising biodiversity. Professor Norkko mentioned the success story of a recovery project proposed by the Helsinki Commission and later coordinated by the EU which led to Nitrogen and Phosphorus level to decrease. He also emphasised that while oceans have been buffering 90% of the heat produced, the Baltic is warming faster than the global average, with ever more frequent heatwaves. Since last Christmas, Professor Norkko observed 10 months of heatwaves and mass mortality in shallow areas. He also underlined the difficulty of quantifying the frequency of these events.

In addition, he underlined that increasing rainfall is causing the levels of salinity to lower dramatically, almost crossing the threshold that many species can tolerate. Professor Norkko also mentioned blue mussels and eelgrass as iconic species at risk of disappearing, thus creating large effects on the entire marine ecosystem. Mr Norkko concluded by emphasising that we need to protect biodiversity from multiple pressures through regional tailor-made measures, approaches and tailored measures, accompanying resilience-building of carbon-rich ecosystems.

2. Implication for carbon sequestration and greenhouse gas emissions

Mr **Christoph HUMBORG**, Professor in Coastal Biogeochemistry, focused on how marine ecosystems are not only victims of the climate crisis, but could contribute to our climate goals. He quoted Jane Lubchenco, who illustrated the impact of climate change on the oceans: they become higher, warmer, more acidic, struck by more frequent heatwaves, hold less oxygen and become less productive and less predictable.

Mr Humborg then presented simulation scenarios with climate models which show that the temperature in the Baltic Sea is expected to increase by 2 degrees in the next decades. He explained that the massive temperature change, combined with a drastic salinity decrease, will have dramatic implications for species already on the edge. He explained that actual water temperature measurements at a depth of 31m have shown that this dramatic temperature rise is not only speculation, but has really manifested itself. He further emphasised how heatwaves affect the carbon balance of ecosystems. During the 2018 heatwave, a study on gas emissions has led to measurements of massive methane and CO2 emission flaxes from the sea to the atmosphere. As the tropical conditions of 2018 heated the Baltic marine ecosystems up, organic matters were transformed and bubbled up as methane. He pointed out that this deadly cocktail risks to convert the Baltic Sea from carbon sink to carbon source.

Professor Humborg focused on five ocean-based mitigation options and showed how these could contribute to 21% of the annual GHG emissions reductions needed by 2050 to stay under a 1.5C change relative to pre-industrial levels. These five sea-based measures include ocean-based renewable energy, smarter shipping with batteries, the use of coastal and marine ecosystems as caron traps, implementation of sustainable fisheries, aquaculture and dietary shifts and carbon storage in seabed. Mr Humborg concluded by highlighting how degraded ecosystems will turn into carbon source, while a well-managed coast can be a very powerful carbon sink.

3. Marine biodiversity under climate change – A European overview of pressures, state and remaining challenges

Mr **Stéphane ISOARD**, Head of Group Water and Marine at the European Environmental Agency, explained how every 5 years, his organisation carries out an evaluation of the state of Europe's seas. Their most recent research shows an important implementation gap in terms of sustainable use of the seas, management of pressures and impacts on marine ecosystems as well as preservation of marine ecosystems and biodiversity. Mr Isoard pointed out that the prospects of meeting European commitments are positive only when it comes to marine protected areas. He further explained how the dramatic increase of sea surface temperatures will have chronic consequences on marine habitats, especially as species are moving northwards, permanently changing food webs. He then illustrated the acute effects of climate change through the example of mass mortality of corals and sponges in the Mediterranean area, caused by the 2003 massive summer heatwave.

Mr Isoard emphasised that marine ecosystems which are under stress because of climate change are also more sensitive to other pressures: non-indigenous species are in fact more likely to become invasive after heatwaves. He then explained how CO2 sequestration is causing ocean acidification, which threatens to dissolve shell builders like oysters and corals. Copernicus data clearly show that this affects food webs and ecosystem services provided by the oceans.

Mr Isoard then focused on the effects of these multiple pressures (especially nutrients and hazardous substances) on species living in the Baltic Sea. A lot of progress has been made over the last years on eutrophication, showing that there is hope and that the Baltic Sea Action Plan is having an impact, although this does not take into account climate change. Mr Isoard further stressed that while existing data showed that the state of biodiversity in Europe's seas in not good, there are numerous knowledge gaps due to a lack of monitoring, especially in the Baltic. Finally, Mr Isoard concluded that as climate change measures take a long time to make a visible difference, it is necessary in the meantime to reduce further pressure factors on European seas. This could be achieved through a combination of better fisheries management, expansion of protection regimes to common species to restore ecosystem resilience, better and consistent monitoring as well as an integrated approach to sectoral pressure management at European, national and regional level.

4. Restoring marine ecosystems to tackle ocean warming at global level

Ms **Dorina Seitaj**, Temporary Marine Officer at the International Union for Conservation of Nature (IUCN) drew attention to the necessity of protecting oceans from warming, acidification and deoxygenation. She emphasised the role of the IUCN as an intermediary between science and policy in multilateral negotiations and presented the numerous solutions explored by IUCN to protect coastal, marine and polar ecosystems. She outlined the contradiction between oceans' crucial role in addressing global warming, as they are able to absorb up to 90% of excess heat, and the numerous threats they are facing such as overfishing, pollution and habitat destruction. In the Baltic Sea, one of the major problems she touched upon is the loss of oxygen. She referred to a report published last year by the IUCN and presented at the COP 25. The study found that global ocean oxygen levels decreased by 2% between 1960 to 2010, mainly due to climate change and nutrient pollution. Furthermore, considering the impact of oceans' deoxygenation on the balance of marine life, the authors concluded that this will lead to a proliferation of certain species such as jellyfish at the expense of other species such as tuna, sharks and marlins. Ms Seitaj then detailed the multilevel strategy developed by the IUCN to tackle this problem. She explained that reducing greenhouse gas emissions and preserving habitats such as mangroves, tidal marshes and seagrass meadows would increase blue carbon storage capacities. She called for fostering nature-based solution in order to increase the resilience of the ecosystems. Finally, she presented a standard and toolkit recently developed by the IUCN in order for stakeholders to assess whether a project can be considered a nature-based solution.

The view of the regions:

Ms **Tiina Perho**, Member of SouthWest Finland's Managing Board and Chair of the CPMR Baltic Sea Commission's Maritime Working Group, first outlined the alarming state of the Baltic Sea environment and its main ecological threats, with a focus on the Archipelago Sea. She named the growing number of endangered species and the high pollution levels due to climate change, maritime transport and increasing nutrient loads as the main challenges facing the Baltic Sea environment. She endorsed Commissioner Virginijus Sinkevicius' call to EU, national and regional authorities to join forces in order to reverse this trend.

She then detailed some concrete examples of local action undertaken in Finland to safeguard the ecosystems. Ms Perho first took the example of fertilisers' use for agricultural purposes, which causes phosphorus runoffs to create nutrient pollution in the sea, thus leading to eutrophication. She showed how the reduction of fertiliser use in agriculture through several strategies, including the EU Farm-to-Fork strategy, can help to tackle this issue while increasing agricultural productivity. She presented an action undertaken in SouthWest Finland involving the spread of 42000 tonnes of gypsum to land in order to curb phosphorus runoff. This is expected to halve leaching of solids and phosphorus for five years. The second example she gave pertains to aquaculture related issues, such as phosphorus and nitrogen discharge into waterways. She explained that the main issue comes from fish feed and presented a local action engaged by Raisioaqua, which started producing Baltic Blend fish feed based on nutrient recycling from Baltic herring and Baltic sprat. She underlined that in 2017 this sustainable fish feed production led to removing 16,000 kilos more phosphorus from the Baltic Sea than what had been produced by the entire Finnish commercial fish farming over the year. She finally said that this experiment also caused a 75% reduction in nitrogen load. Finally, she described an example from the shipbuilding industry, one of the major factors of pollution in the Baltic Sea. While welcoming the positive effects brought by the EU Sulphur Directive on air quality as well as the significant reduction of cruise ship effluent discharges, she highlighted the risks caused by traditional marine fuels in the Baltic Sea. In this respect, she explained that LNG-powered ships help reducing the Nitrogen oxide emissions from 85% compared to heavy fuel oil vessels. While welcoming the efforts undertaken by SouthWest Finland as global leader in environmentally friendly shipbuilding, she underlined the importance of reaching the zero-emission target in maritime transport.

As a conclusion, she urged the EU to drop the traditional sectoral thinking and called for European guidelines to embrace a more global and holistic understanding of economic and environmental issues. She welcomed the Green Deal Agenda as a unique opportunity for protecting the Baltic Sea and outlined the social aspects of preserving a sound and healthful environment in this region for future generations.

Conclusions

Nils Torvalds MEP closed the webinar by calling for active dialogue between experts, citizens and politicians. He highlighted the lack of time and the urgent need to make decisions in the context of the intense negotiations ahead on the Climate Law, Farm2Fork, the new biodiversity strategy, LULUCF etc. He stressed that the Parliament needs the experts and the citizens' input, in order to act fast but also to make sure that the different acts mix well together and are fit to make a difference.