Coalition Clean Baltic
FOR PROTECTION OF THE BALTIC SEA ENVIRONMENT

Factsheet

Climate change in the Baltic Sea region:

Consequences of two scenarios, with a focus on biodiversity:

Policy recommendations

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Consequences for the Baltic Sea marine ecosystem of two scenarios of global temperature increases of 2 and 4 degrees centigrade, respectively

2-degree scenario

- Increased erosion of shore ecosystems, mainly in the south and east.
- Increased production of cyanobacteria (blue-green algae) will influence both biomass and composition of benthos, phytoplankton, zooplankton and fish communities negatively.
- Warmer and less saline water will benefit almost all freshwater species of fish, but species that are low-temperature dependent will become less abundant.
- Basically marine species at all trophic levels, including fish, will be negatively affected, first and foremost affecting the northernmost parts of the Bothnian Bay, in the Gulf of Finland and in shallow coastal areas of Estonia and Latvia.
- Few exotic species will benefit from this moderate temperature increase, with the exception of the comb jelly which is capable of changing the entire ecosystem.
- Stronger fishing quota restrictions must be applied, e.g. to cod, herring and sprat, and possibly include a ban on salmon and sea-trout caught off shore.
- Freshwater fish such as pike, pike-perch and perch may extend their ranges and increasingly support local coastal fisheries.
- Reduced availability of marine mussels and other benthic marine macro-invertebrates may limit access to food for birds relying on these resources.
- Wild salmon populations in rivers in the Baltic Proper will face severe survival problems.
- Decreased winter ice cover in the Baltic Sea will disfavour the reproduction of ringed seals.

4-degree scenario

- Coastal erosion and flooding of low-lying shore areas will impact human settlements (especially in the southern and south-western parts of the Baltic Proper), and coastal nature reserves will have to be extended further inland from the present shoreline.
- Cyanobacteria (blue-green algae) will out-compete phytoplankton, leading to ecosystem changes at all trophic levels, in addition to a reduction in total fish production.
- The effects of this level of temperature increase depend on e.g. future discharge of nutrients, salinity and oxygen conditions, but it is likely that the entire biomass of fish will diminish so much that open-sea fisheries will come to an end. Local coastal fisheries may still operate though.
- It is vital that ecosystem-based fisheries measures are based on conservation measures that are triggered as soon as stock levels fall below biomass levels capable of producing maximum sustainable yield.
- Most glacial relict species, especially the four-horn sculpin and the sea snail, are likely to become extinct, in addition to some exotic species, probably with the exception of e.g. the round goby, the zebra mussel and, above all, the comb jelly.
- Fish- and mussel-eating birds will diminish in abundance, and the much lower level of fish production will also affect seals and the harbour porpoise.

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Policy recommendations:

The predicted impact of a 2-degree temperature increase on Baltic Sea marine biodiversity is so serious that policy actions must safeguard that such a temperature rise is not reached. The impact of a 4-degree increase would be a catastrophic scenario, giving adverse ecosystem changes for the Baltic Sea. Thus, a precautionary maximum increase of no more than 1.5 degrees only should be set as acceptable.

HELCOM countries should take legally binding decisions so that the Baltic Sea region contributes to mitigation of the climate environmental impact, both regionally and globally.

Direct, immediate climate change mitigation

1) Baltic Sea region countries should align with proposals from Climate Action Network International (CAN) for long-term global goals as early as possible, but no later than by 2050,
   - to phase out all fossil fuel emissions, and
   - to phase in a 100% renewable energy future with sustainable energy access for all.
2) Recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius, HELCOM countries have to commence detailed scientific research into the impacts of a global temperature increase of 2 degrees and 4 degrees (worst case scenario) on the Baltic Sea environment.
3) The Baltic Sea and the climate are strongly interconnected systems, so a legally binding agreement within HELCOM that describes how to achieve and maintain an improved but natural Baltic Sea ecosystem must be reached and adhered to.
4) The United Nations must agree that the role of the World Ocean in the global climate system, including impacts of climate change and CO_2 emissions on biodiversity and human populations is taken into account in future climate agreements within the "climate regime" of adaptation, reduction, climatic finance, etc.
5) The international community should develop projects with climate funding (e.g. Green Climate Fund), green bonds etc., and ensure that these funds do not support projects that jeopardize the health of the Ocean, including the Baltic Sea ecosystem.
6) Decisions on projects regarding mitigation of climate change impact within the Baltic Sea Region must integrate and coordinate sectors, countries and regions, as well as social and ecological aspects from an interdisciplinary standpoint, and be based on precautionary principles and apply ecosystem-based management (EBM)

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Indirect climate change adaptation

7) As a result of climate change, without drastic nutrient load abatements, anoxic areas are predicted to increase in the Baltic Sea, despite efforts from EU countries and Russia to implement the HELCOM Baltic Sea Action Plan (BSAP). It is therefore vital that:

   – the effluents from agriculture, the dominant nutrient-polluting sector, as well as from municipalities and industry, are strongly reduced even below the agreed targets

   – new methods are widely applied to diminish nutrient discharges from livestock breeding, phasing out existing over-fertilization practices, and saving nutrient resources by utilizing manure in an environmentally sound way, applying nutrient-balanced practices, as well as addressing consumer behaviour to shift the demand for meat production.

8) Fisheries management in the 21st century will have to adapt to decreasing biomasses and appropriate precautions must be taken to diminish impact of future climate change, hence:

   – when stock levels fall below the biomass levels capable of producing maximum sustainable yield (MSY), fish populations, especially of benthic species such as cod, must be exposed to much lower fishing mortality than at present, also taking into account the fact that a maximum economic yield will normally be obtained by catching fewer fish than the number calculated as MSY.

   – it will be necessary to fully enforce the fisheries discard ban in the Baltic Sea, and phase out the discarding of fish that are too small or belong to non-commercial species, to achieve better fisheries management.

9) An ecologically coherent network of marine protected areas (MPAs), with management plans that also take into account climate change impact, should be established to protect biodiversity and ecosystem services. These MPAs must be planned for future potential impacts of climate change on shallow-water and coastal environments. Relevant changes in the HELCOM Guidelines for establishing and managing Marine Protected Areas should be implemented based on experiences from the IUCN World Commission on Protected Areas.

10) Improved stakeholder cooperation between research, industry and national and international authorities must be supported and encouraged. It is vital that this type of communication be continued and widened.

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