Climate change and ocean acidification are drivers of major change

OSPAR's Quality Status Report (QSR) 2023 Key Findings: OSPAR's QSR 2023, comprising assessments of over 120 different components, is the most authoritative assessment of the North-East Atlantic. The QSR reflects the collective work of the 16 Contracting Parties to the OSPAR Convention, scientists, experts and their institutions. This fact sheet focuses on our key findings on climate change and ocean acidification.

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The effects of climate change are clearly measurable

Climate change is causing ocean warming, decreased oxygen concentrations, marine heatwaves and sea-level rise, with many further related impacts across marine ecosystems and the services they provide. Climate change also triggers widespread change in the water cycle and is altering ocean stratification and ocean circulation. These changes in the physical and chemical conditions of the marine environment are affecting marine species across the OSPAR Maritime Area, with regional and local variations in these pressures. The root cause is global, but the effects, such as storm intensification, increased risks of flooding and changes in rainfall, are felt at more local scale. There are regional variations in the rate of change, such as the higher rates of ocean temperature increase found in the Arctic region. These localised effects can trigger changes in other regions, as for example when losses of Arctic sea ice affect the position and strength of strong winds such as the polar vortex and the jet stream, which may then cause extreme weather at mid-latitudes. Changes in sea-level rise and in the frequency and intensity of the strongest storms are expected to impact lower-lying regions in OSPAR countries more significantly. The eventual climate risk, a combination of vulnerability and exposure, emerges on a much more local scale, requiring a national response. While OSPAR does not yet have agreed indicators that would allow regional assessment of climate change effects, there is a broad body of knowledge about climate change in the North Atlantic that provides evidence of effects including warming-related species distribution shifts, altered trophic interactions, changes to productivity, and sea level rise

Links to OSPAR's QSR 2023

Climate change thematic assessment https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/thematic-assessments/climate-change/

Ocean acification assessment https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/ocean-acidification/

Key findings interactive report https://indd.adobe.com/view/5c0a433c-0b2a-4c3b-9b7d-64e1e49f8db4

Synthesis Report https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/synthesis-report/

Ocean acidification puts marine ecosystems at further risk

Ocean acidification is occurring throughout the OSPAR Maritime Area, though the rate of change varies regionally. This acidification occurs because at least a quarter of the CO_2 released into the atmosphere by human activities is being absorbed by the oceans, changing their carbon chemistry through an increase in acidity and reduced availability of carbonate ions. This change in the prevailing chemical environment affects marine organisms, with direct effects especially for calcareous habitats and calcifying organisms, and indirect consequences for entire marine ecosystems. Policy responses to combat ocean acidification will need to be considered with care, especially where potential measures to address climate change could exacerbate ocean acidification. For example, the potential leakage from carbon dioxide storage sites or approaches that aim to increase ocean uptake of atmospheric CO2, such as iron fertilisation, could increase ocean acidification. Responses will also need to consider the cumulative impacts of climate change and ocean acidification and the knock-on effects for biodiversity, so as to avoid any unintended consequences of climate change mitigation.

Cold Water Coral reefs are biodiversity hotspots that occur along the shelf slopes throughout the OSPAR region and are vulnerable to Ocean Acidification and Climate Change. Insert: Details of Lophelia pertusa and one of its many inhabitatants, the squat lobster Munidopsis serricornis.

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What is OSPAR doing?

OSPAR's North-East Atlantic Environment Strategy 2030 includes 3 Strategic Objectives to tackle climate change and ocean acidification.
Strategic objective 10. Raise awareness of climate change and ocean acidification by monitoring, analysing and communicating their effects;
Strategic objective 11. Facilitate adaptation to the impacts of climate change and ocean acidification by considering additional pressures when developing programmes, actions and measures; and
Strategic objective 12. Mitigate climate change and ocean acidification by contributing to global efforts, including by safeguarding the marine environment's role as a natural carbon store. For more information www.ospar.org/convention/strategy.

To acknowledge the urgency of this issue, in 2023 OSPAR established a Working Group on Changing Ocean Climate and Ocean Acidification (WG COCOA). The WG works with the remit to facilitate the implementation of Strategic Objectives in the NEAES 2030 concerning ocean acidification and climate change, and to ensure the integration of climate change and ocean acidification throughout the OSPAR structure. For more information www.ospar.org/work-areas/cross-cutting-issues/cocoa.

In 2022 OSPAR became an affiliate member of the Ocean Acidification Alliance www.oaalliance.org.