

# The Norwegian Sea

## Innholdsfortegnelse

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The Norwegian Sea is the part of the North Atlantic between Norway, Svalbard and Iceland. Its environmental status is considered to be generally good, and much of the water column and deep seabed is relatively undisturbed. However, certain species and areas are clearly affected by human activity.



The spectacular clifftop view from the west side of Runde island, home to huge numbers of nesting seabirds. Photo: Kim Abel, Naturarkivet.no



Puffins, one carrying nesting material. The Atlantic puffin is the most numerous seabird in Norway, but a number of colonies have declined steeply. Photo: Kim Abel, Naturarkivet.no



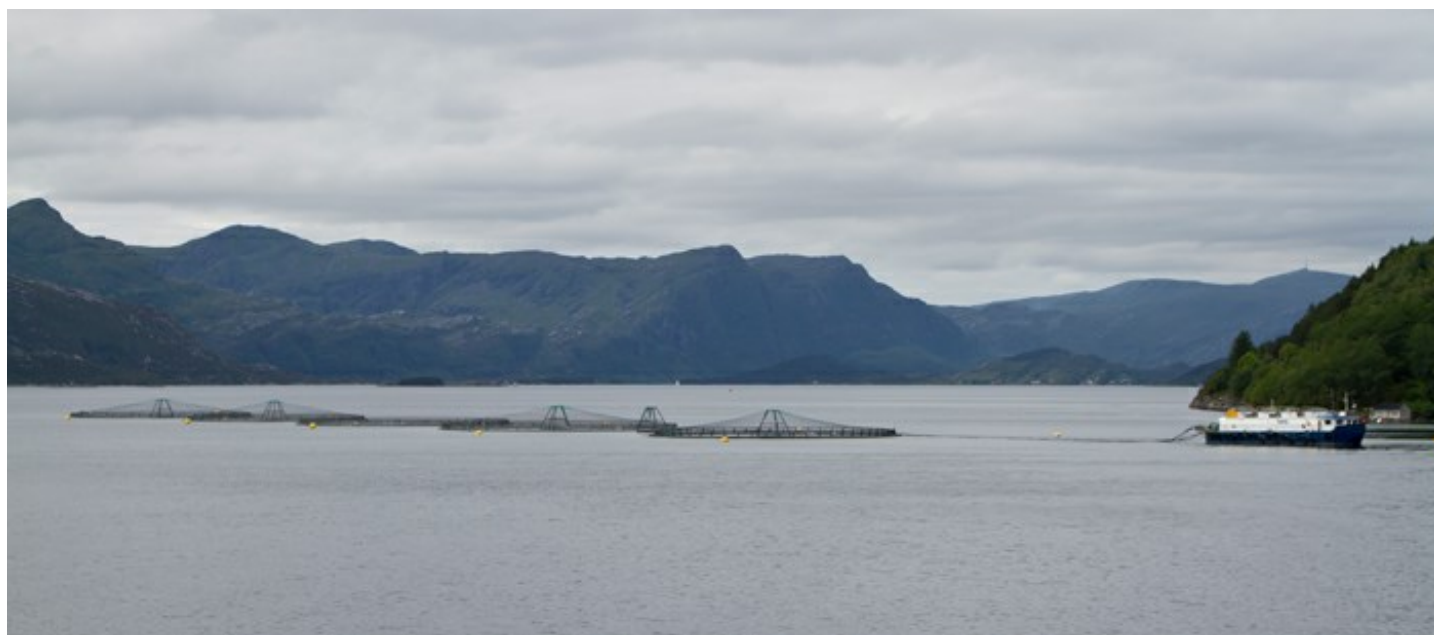
The cold-water corals *Lophelia pertusa* and *Paragorgia arborea* and a Gorgonian's head seastar on a moraine ridge in the Trondheimsfjord. The two coral species are classified as near threatened in the Norwegian Sea. Photo: ©UWPhoto/Erling Svensen



Herring from the Norwegian spring-spawning herring stock, the largest in the world. They spawn mainly off Møre og Romsdal county in February–March, but also further north off Nordland county and around the Vesterålen Islands. After spawning, the adult herring move into the Norwegian Sea. Photo: Institute of Marine Research



Fisheries are bound to have some impact on ecosystems, and it is essential to find a good balance between conservation and harvesting. Photo: iStockphoto



Salmon farming is an important industry in Norwegian coastal waters. To minimise its impact on ecosystems, it is essential to prevent escapes, avoid the spread of disease to wild salmon and control numbers of salmon lice. Photo: Kim Abel, Naturarkivet.no

## STATE

# Generally good environmental status

The Norwegian Sea is rich in species and supports large populations of fish, marine mammals and seabirds.

The dominant fish species in the ecosystem are mackerel, herring and blue whiting. The Norwegian spring-spawning herring stock is the world's largest herring stock, but has declined in recent years as a result of poor recruitment. The mackerel stock grew from 2012 to 2014, but declined slightly in 2015.

A wide variety of marine mammals can be found in the Norwegian Sea. Northern bottlenose whales, orcas, blue whales, fin whales, humpback whales and minke whales all pass through the Norwegian Sea as they migrate between the warmer waters where they spend the winter months and the northern feeding grounds where they find plankton and other prey in the summer months.

The Norwegian Sea is of vital importance to some of the largest seabird populations in the Northeast Atlantic, several of which are considered to be very valuable at both national and international level. Seabirds are wholly or partly dependent on the sea for food. For a number of seabirds, survival at the global level may depend on the breeding success of the colonies around the Norwegian Sea.

The most typical seabirds (fulmars, gannets, cormorants, auks and many gulls) forage entirely at sea. Most seabird populations have been declining in recent years. There has been a considerable drop in kittiwake and common guillemot numbers in Norway, and puffins have had poor breeding success or complete breeding failure for many years. Very few species other than the gannet have shown a positive trend in recent years.

There are large coral reef complexes all along the continental shelf. Scientists have made a number of new discoveries of coral reefs, gorgonian forests and sea pen and sponge communities in recent years. The density of *Lophelia coral* reefs is believed to be higher in the Norwegian Sea than anywhere else in the world. *Lophelia* is a stony coral, and the reefs it forms grown extremely slowly and may be very old. Coral reefs attract a wide variety of species and support species-rich communities, and are therefore important habitats.

## PRESSURE AND IMPACT

# Commercial fisheries put most pressure on the Norwegian Sea ecosystem

Commercial fisheries are the human activity that is putting most pressure on the Norwegian Sea ecosystem today. Pollution and climate change are also altering the environmental conditions for species that occur here.

## Fisheries

Commercial fisheries in the Norwegian Sea are concentrated in shallow bank areas (the Møre, Halten and Sklinna banks) and along the edge of the continental shelf. The most important commercial fish stocks are herring, blue whiting, mackerel, saithe, greater argentine and redfish. The authorities prohibit catches of fish below the minimum size set for each stock or species, and the total annual catches correspond to between 10 and 40 % of fish larger than the minimum size.

Fisheries, especially trawling, also have impacts on benthic communities, for example coral reefs and sponge communities. During the past 15 years, a great deal has been done to reduce pressure on benthic communities through regulatory measures and advances in fisheries technology.

The most important single factor affecting seabird populations is probably food shortages. It is uncertain how strongly commercial fisheries and climate change are implicated in the reduction in the food available to seabirds.

## Shipping and oil and gas activities

Shipping density in the Norwegian Sea is highest along the coast. Shipping can have adverse impacts on the environment through releases of greenhouse gases, oil and chemicals and through noise pollution. Ships may also introduce alien organisms to Norwegian waters when they discharge ballast water to the sea, and fouling organisms on ships' hulls can spread to Norwegian waters. In addition, there is a risk of acute pollution in the event of accidents such as groundings and shipwrecks.

There has been most oil and gas activity in the Norwegian Sea on the Halten and Dønn Terraces in the Norwegian Sea (off the counties of Sør- and Nord-Trøndelag and Nordland). Releases of greenhouse gases, oil and chemicals from the industry have negative environmental impacts. In addition, seismic surveys of the seabed can disturb fish and marine mammals. Production from the major oil and gas fields is declining.

## Acute pollution

Acute pollution in the Norwegian Sea could have major impacts on the particularly valuable and vulnerable areas that have been identified, such as the Møre, Halten and Sklinna banks, Vestfjorden, the Froan archipelago and Sula reef. In the event of an oil spill, it is expected that the consequences will be most serious for seabirds and the shoreline.

The map shows fairways and oil and gas activities in part of the Norwegian Sea. You can click on the oil platform symbols to obtain more information about the different fields (some of this is available in English). Clicking on "Explore maps" opens the full map with access to more topics.

## Environmentally hazardous and radioactive substances

At present, pollution levels in the Norwegian Sea are low and seafood from the area is generally considered to be safe. Environmentally hazardous substances are largely carried to the area by winds and ocean currents, but there are also local sources of pollution. Dilution of pollutants in seawater means that pollution levels measured in the water column and on the seabed are low. Levels of radioactive substances are also generally low.

However, scientists have measured levels of hazardous substances in several species of fish, seabirds and marine mammals that are high enough to have harmful effects on these species.

## Climate change and ocean acidification

The Norwegian Sea has become warmer and saltier since 1978. In recent years, measurements have also shown that it is becoming somewhat more acidic.

It is uncertain how climate change will affect the marine environment in the Norwegian Sea. Studies of benthic organisms have shown that many species previously found on the seabed of the North Sea have been moving northwards into the Norwegian Sea. This pattern has been found for almost 600 species, and on average their distribution has shifted by 750–1000 km during the past 13 years.

It is uncertain how ocean acidification is likely to affect the ecology of the Norwegian Sea.

## RESPONSE

## Ecosystem-based management

The authorities have given high priority to establishing an ecosystem-based management regime for the Norwegian Sea, and published an integrated management plan in 2009.

The management plan sets out a framework for human activity in the sea area, and includes a number of measures to minimise the impacts of different activities and maintain a clean marine environment with high species diversity.

### National marine protection plan

The authorities are working on a national marine protection plan to safeguard the diversity of species, habitats and ecosystems in Norway's coastal waters. Areas will be selected for protection because of their distinctive character or because they contain typical habitats. One example of a distinctive area is the Sognefjorden, the world's deepest fjord.

So far, two marine protected areas have been established in the coastal waters of the Norwegian Sea. These are Tauterryggen in Nord-Trøndelag, which includes the shallowest *Lophelia reef* ever discovered, and the strait Saltstraumen in Nordland, where the tidal current is the fastest in the world.

The Norwegian Environment Agency has the overall responsibility for the plan, which is being developed in cooperation with other directorates. The county governors and the regional offices of the Directorate of Fisheries are responsible for work at the local and regional level.

### The Norwegian Sea



- The Norwegian Sea covers an area of about one million square kilometres. Its average depth is 1600 metres, ranging from shallow bank areas to two deep-water basins where the depth reaches 3000–4000 metres.
- The wide variations in depth result in a varied benthic fauna, including large coral reef complexes. The inflow of warm, salty Atlantic water to the Norwegian is about eight million tonnes per second – eight times the discharge volume of all the world's rivers.
- A great deal of heat from the inflowing water is transferred to the atmosphere, and this plays a vital part in giving northwestern Europe its mild climate.