



THE WAY FORWARD

The MAREANO Steering Board

Since its gentle start in 2005, MAREANO has carried out extensive mapping of Norwegian waters. New and basic knowledge has been produced about the seabed, geology, benthic organisms and the presence of harmful chemical substances in our valuable and varied sea areas.

The mapping off Lofoten–Vesterålen and the southern Barents Sea has revealed a seascape full of contrasts, with steep slopes, trenches and plains; and areas with a distinct and rich fauna. These areas are nursery grounds for the large stocks of Northeast Arctic cod, haddock and saithe in the Barents Sea. Large stocks of these species spawn along the shelf edge in the southern Barents Sea, on the plateau off Vesterålen and southwards along Lofoten, down to Møre. In the winter, there is a big fishery here – by a coastal fleet using traditional, fixed gears such as long-line and gill nets, but also by a seagoing fleet of trawlers.

Considerable deposits of petroleum have been documented on Tromsøflaket and its surrounding areas. Moreover, the oil and gas industry wants to enter the valuable fishing grounds further south. The shipping lanes for the harbours further north and east also pass through these areas. MAREANO has produced an essential knowledge base necessary for the integrated management of these important areas.

Since 2011, MAREANO has put considerable effort into mapping our new shelf areas in the Barents Sea and the areas off Finnmark,

Nordland, Trøndelag and Møre. The shelf edge and the fertile shelf plains just off the coast are essential to the marine ecosystems and the fish resources. But the areas are of equal interest to both the petroleum industry and the fisheries.

In 2009, two new laws were passed: the Marine Resources Act and the Nature Diversity Act. They introduced new premises for the management of marine life and resources and increased the need for basic knowledge. The information provided by MAREANO demonstrates how rich the marine ecosystems really are. This knowledge will be extremely useful to their management in the years to come.

The scientific method used by MAREANO provides detailed knowledge, including a three-dimensional survey of the seabed by multi-beam echo sounders which, depending on the depth, has an accuracy of a few centimetres vertically and a few metres horizontally. Based on seascape maps, the geology and biology is then surveyed by video and various sampling gear, such as corers, grabs, sledges and beam trawls (see chapter 3). The need for sampling and the density of the sampling depend upon local variations of depth and seabed conditions. In the varied areas close to the coast and the shelf edge, the sampling density is of about two stations and ten video transects per 1000 km², while it is about half this in the new shelf areas of the Barents Sea where the seabed is relatively homogenous.

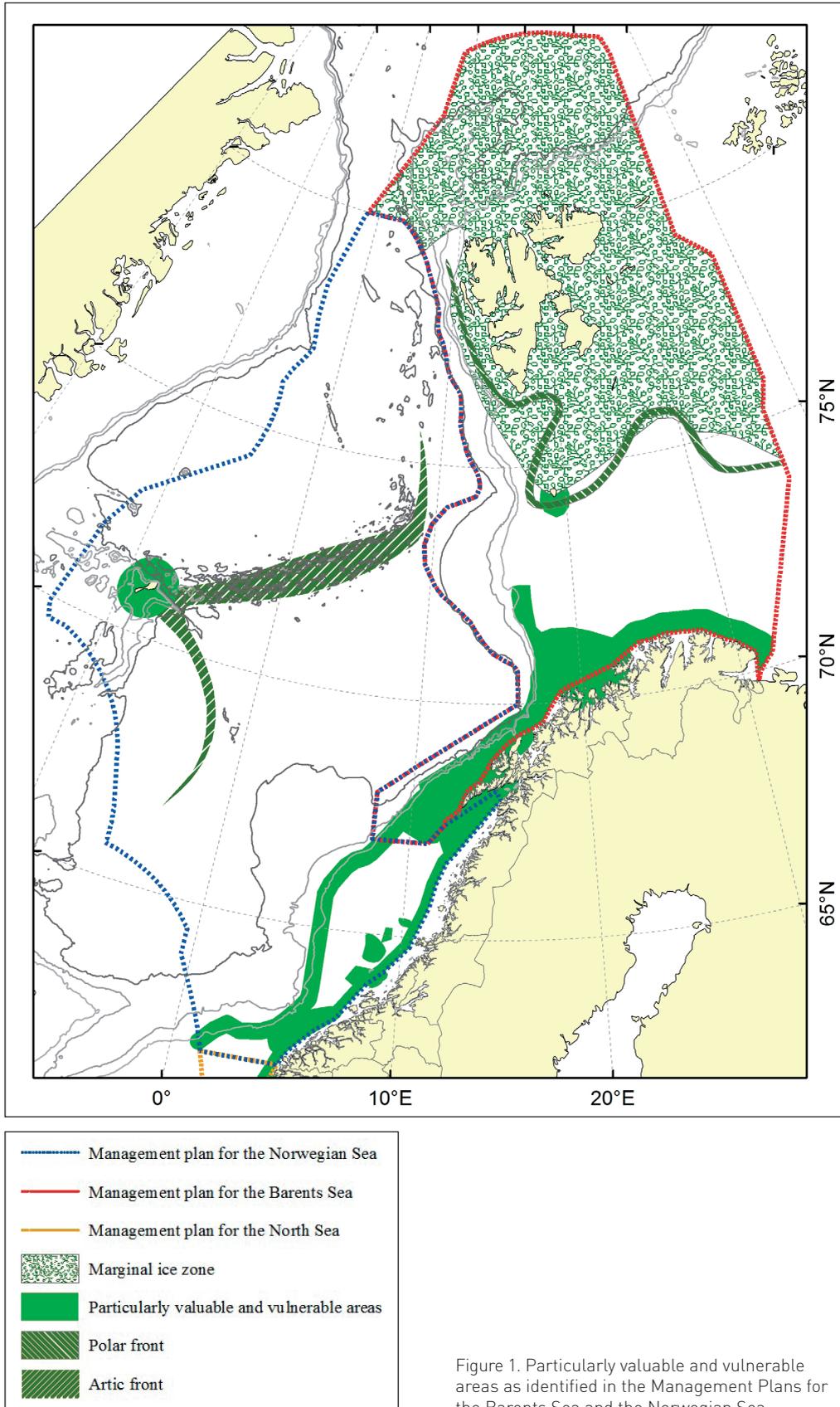


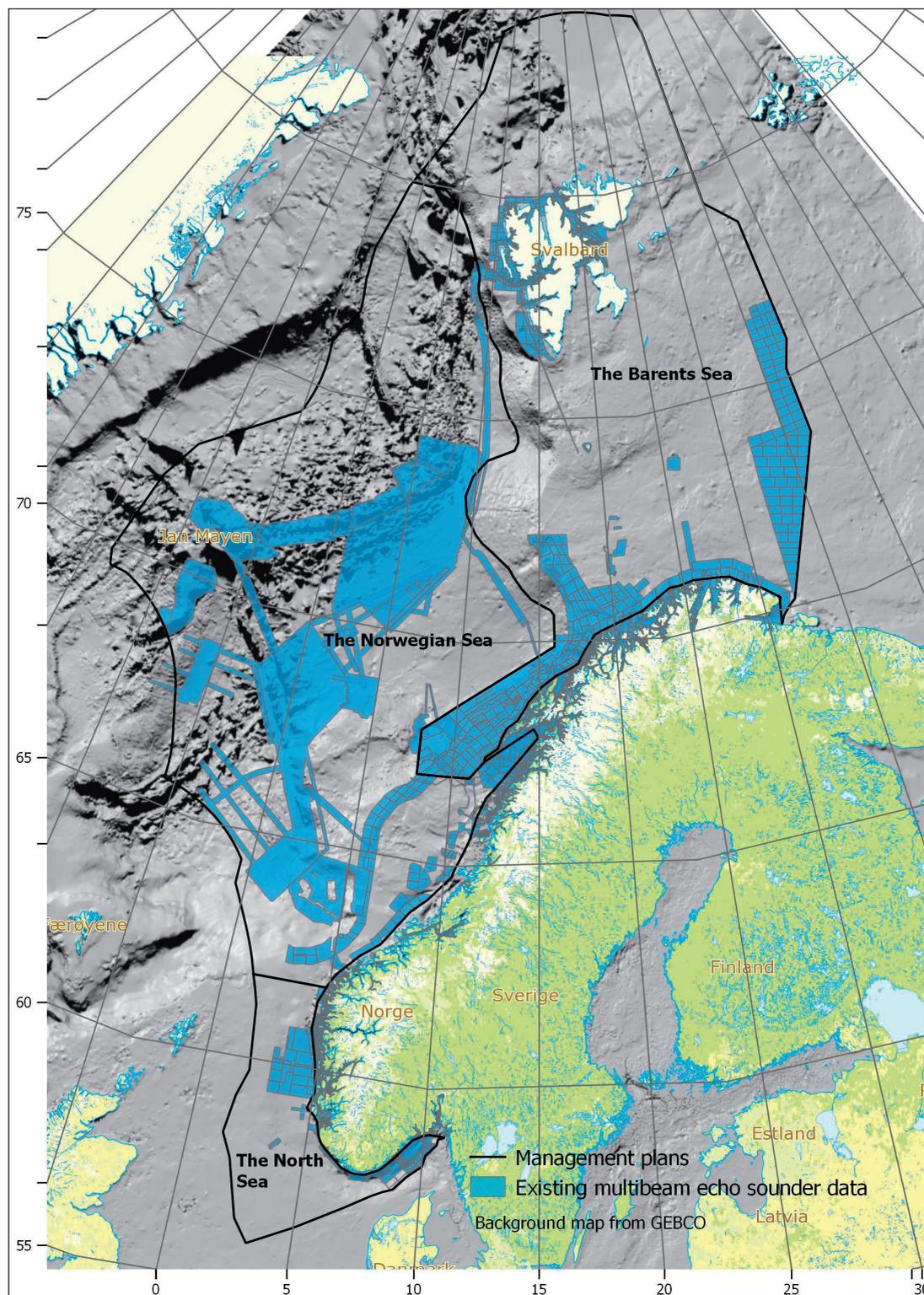
Figure 1. Particularly valuable and vulnerable areas as identified in the Management Plans for the Barents Sea and the Norwegian Sea.

Since it first started, MAREANO has mapped about 175,000 km², mainly in areas defined by the management plans as particularly valuable and vulnerable (figure 1). MAREANO has played an important part in filling the knowledge gaps identified in the Management Plan for the Barents Sea (Report to the Storting no. 8, 2005–2006). The input from MAREANO was considerable when the plan was updated in 2011. The Management Plan for the Norwegian Sea was presented in 2009 (Report to the Storting no. 37, 2008–2009), and MAREANO has contributed with new knowledge to the scientific basis for updating the management plan. According to the Management Plan for the North Sea – Skagerrak of 2013 (Report to the Storting no. 37, 2012–2013), the seabed of these areas will also be mapped by MAREANO. The programme contributes to supplementing and documenting the management’s interest and need for knowledge of the resources in all Norwegian sea areas (figure 2). Behind the management plans, there are years of scientific work instilling confidence in the content of the plans.

In the future, MAREANO will contribute with results from bottom mapping that are essential to a knowledge-based management of our large sea areas, where much is still to be discovered – as is demonstrated in this book. So far, the protocol followed by MAREANO indicates a mapping pace/efficiency of 15,000–25,000 km² per annum, based on the current allocations of about NOK 90 million per annum. It will take time to map our sea areas. Through the systematic mapping of MAREANO, we are building a knowledge base that will stand the test of time and remain important for many years to come. Our vision is that the seabed of Norwegian waters will be among the best mapped in the world.

MAREANO delivers detailed knowledge of bathymetry, geology, habitats and biotopes, with their biodiversity and occurrences of chemical substances. This provides the opportunity to produce accurate seabed maps including biodiversity and biomass of all main groups of benthic fauna. Data from MAREANO and data on benthic fauna from other projects using fish trawls, such as the ecosystem surveys undertaken by Institute for Marine Research (IMR), cannot be compared, as they cover different knowledge needs. Area-based management will normally require a good and integrated picture of the distribution of managed resources, including

Figure 2. The areas included in the management plans for the Barents Sea, the Norwegian Sea and the North Sea. Areas that have been surveyed with multi-beam echo sounder are shown in blue. In total, Norwegian waters on the northern hemisphere cover an area of about 2.28 million km².



vulnerable nature types and important areas for biodiversity.

In the continuation of MAREANO, the plan is to reduce the coverage of homogenous

basins compared to what is needed in more varied terrain. Experience from mapping in a large range of seascapes over a number of years, will allow for methods to be

discussed and continually developed by the experts responsible for MAREANO's deliverables, and by the agencies charged with leading and developing the MAREANO programme.