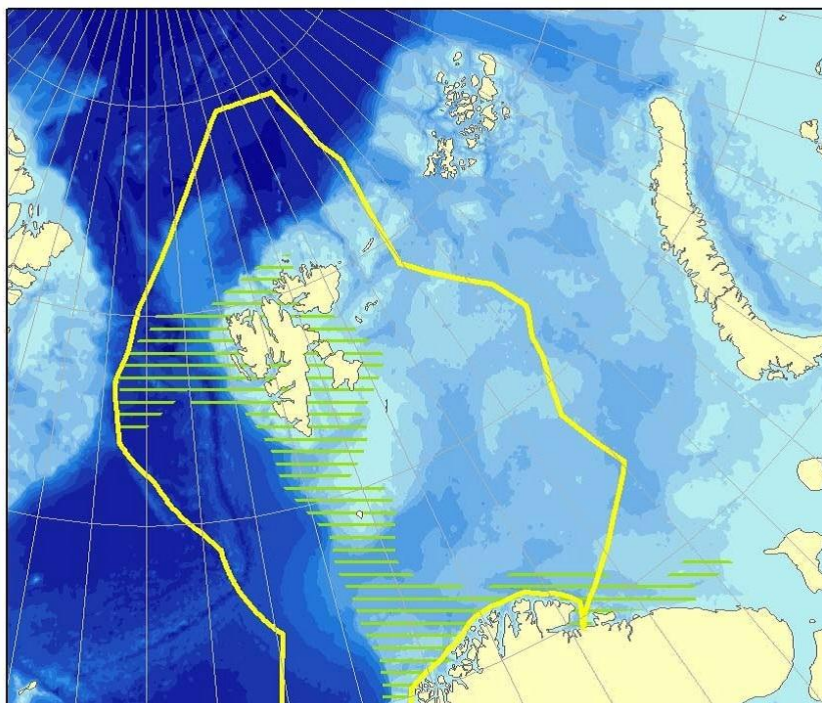


SENSITIVE SEA AREAS IN ARCTIC NORWAY

Tentative identification based on IMO cultural, social and economic criteria.

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<p>Sammendrag</p> <p>Abstract. The report contains an overview of coastal and sea areas in Arctic Norway that are of social and economic importance, as well as human dependency areas and cultural heritage sites. These areas are especially sensitive relative to impacts from increasing shipping activity in the Arctic, and are arrived at based on the three criteria for sensitive sea areas employed by the International Maritime Organisation (IMO). There is a lack of literature and research in this field, as well as few authoritative guidelines for what is to be regarded as a particularly sensitive sea area. Therefore, this report only contains existing knowledge on which to make further assessments of particularly sensitive sea areas in Norway, based on social, cultural and economic criteria. The report however provides a tentative overview, piloting a way to identify such areas in Arctic Norway. More research is needed in this field, in addition to national processes for deciding on criteria for identification of social, economic and human dependency areas.</p>
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<p>Emneord</p> <p>Sensitive sea areas, cultural and social importance, cultural heritage, marine environment</p>
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Avdelingsleder

Myrvoll, Marit

Preface

This report was commissioned by the Saami Council, one of the Permanent Participants in the Arctic Council. It is a contribution to the Arctic Marine Shipping Assessment's (AMSA 2009) follow-up work on mapping particularly sensitive sea areas in the Arctic (AMSA II C). The report contains an overview of coastal and sea areas in Arctic Norway that are of social and economic importance, as well as human dependency areas and cultural heritage sites. These areas are especially sensitive relative to impacts from increasing shipping activity in the Arctic, and are arrived at based on the three criteria for sensitive sea areas employed by the International Maritime Organisation (IMO). There is a lack of literature and research in this field, as well as few authoritative guidelines for what is to be regarded as a particularly sensitive sea area. Therefore, this report only contains existing knowledge on which to make further assessments of particularly sensitive sea areas in Norway. The report however provides a tentative overview, piloting a way to identify such areas in Arctic Norway. More research is needed in this field, in addition to national processes for the identification of social, economic and human dependency areas in the marine environment.

Camilla Brattland, Tromsø June 4th 2012.

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1 Sensitive sea areas in Arctic Norway

The impacts of marine shipping activities on Arctic communities in Norway are relevant following new oil and gas activities in the Barents Sea, as well as increasing industrial development initiatives in the interior of the country which makes marine transport routes increasingly used. Arctic Norway is here defined as the land mass and territorial waters north of the Arctic circle, including the areas encompassed by the management plan for the Barents Sea and Lofoten areas. The area is special in the sense that its coastal ports and infrastructure facilitate increasing industrial and shipping activity compared to other regions at the same latitude (see figure 1). Spatial planning of shipping activities is therefore of crucial importance in order to govern marine uses relative to one another and manage marine ecosystems sustainably. The Arctic Marine Shipping Assessment Report (2009) identified a need for surveying sea areas that are particularly sensitive to impacts from increased shipping activities such as cruise ships and oil tankers.

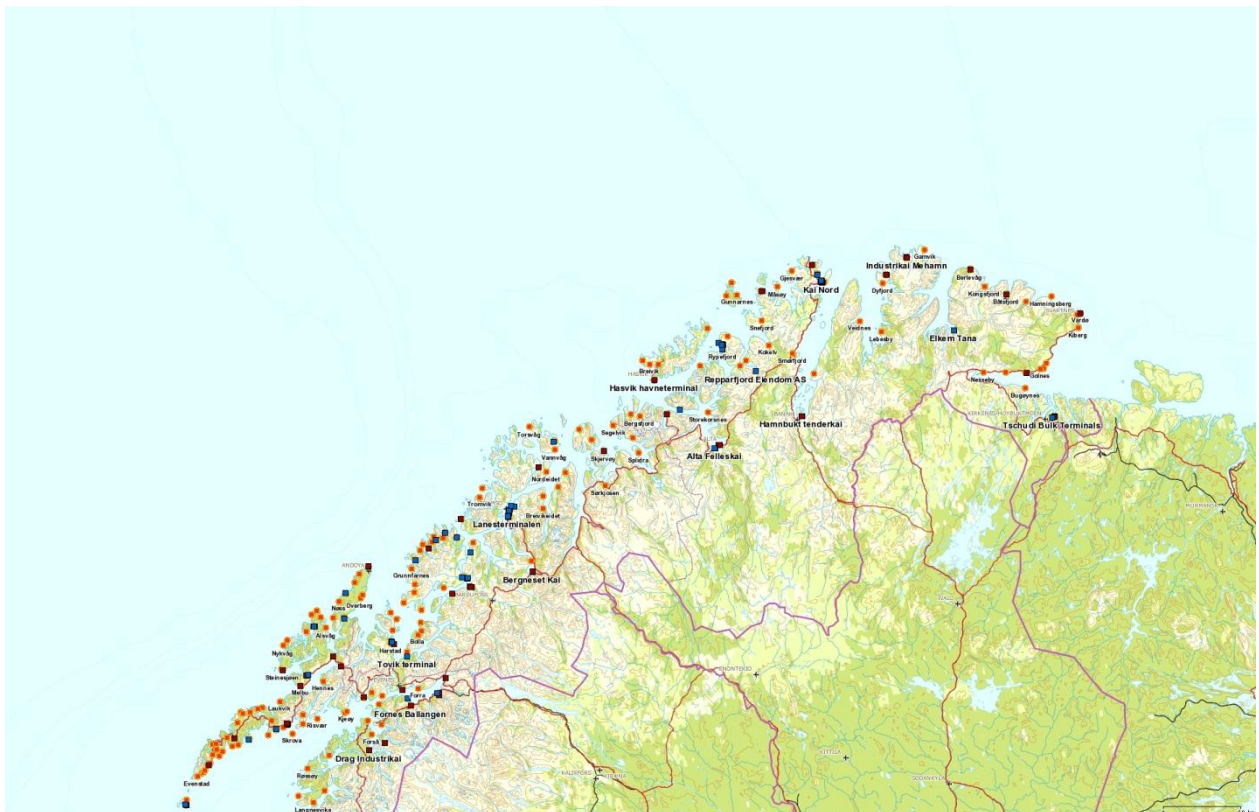


Figure 1 Shipping ports (blue) and fishery harbours (red) along the coast of northern Norway. Source: The Norwegian Coastal Administration.

The task for this report is to identify sensitive sea areas based on the International Maritime Organization's (IMO) social, cultural and economic criteria. The areas are categorized according to the International Maritime Organization's criteria for particularly sensitive sea areas (see table 1). The identification of particularly sensitive sea areas based on this primary knowledge base is however a task to be conducted through appropriate governance processes and is not carried through in this report.

IMO Particularly Sensitive Sea Areas <i>Social, cultural and economic criteria</i>			
4.4.12 Social or economic dependency – An area where the environmental quality and the use of living marine resources are of particular social or economic importance, including fishing, recreation, tourism, and the livelihoods of people who depend on access to the area.	4.4.13 Human dependency – An area that is of particular importance for the support of traditional subsistence or food production activities or for the protection of the cultural resources of the local human populations.	4.4.14 Cultural heritage – An area that is of particular importance because of the presence of significant historical and archaeological sites.	

Table 1 IMO criteria for sensitive sea areas

According to the IMO criteria, sensitive sea areas are defined as important on social and economic terms based on the environmental value of the area in which human activities are conducted (see table 1). The identification of sensitive sea areas based on the first two criteria is therefore necessarily dependent on knowledge of the quality of the marine environment. Analytical delimitations of socially and ecologically sensitive sea areas as separate from each other are difficult to make, as these are analytical exercises constructed for governance purposes. Norwegian environmental legislation emphasises the importance of biodiversity as a basis for human activities, thereby making the identification and protection of biodiversity areas a social as well as an ecological issue. This is especially pertinent for the role of biodiversity as basis for Saami culture. According to the Nature Diversity Act (2009), 'the environment provides a basis for human activity, culture, health and well-being, now and in the future, including a basis for Saami culture' (purpose of the Act). Any identification of human dependency, socially and economically sensitive sea areas must therefore be based on the value of the environment as basis for human activities. Cultural heritage areas are however important because of remnants of human presence in the area and not necessarily because of its present environmental qualities. This implies other approaches to the identification of such areas, although cultural heritage and protected areas can also be established because of their environmental qualities (f.i. the Vega islands, table 3). Given these limitations, a tentative description of sensitive sea areas according to the IMO social, cultural and economic criteria is given in the present report.

1.1 Method and data

A review of map databases and literature on protected areas, management zones and other spatially delimited sea areas in Arctic Norway was conducted for the report. Most of the data are available in government databases or reports, which were compiled and selected data aggregated in a GIS database. As part of the ecosystem-based approach to marine governance, marine data have been collected and aggregated particularly by the Ministry of the Environment, the Directorate for Nature Management, and the Directorate of Fisheries. These government bodies hold map databases

displaying protected areas in various categories as well as fisheries activities along the northern Norwegian coast. Environmental data and data on social parameters were also published in official reports prior to the implementation of the Integrated Management Plan for the Barents Sea and Lofoten Area (Report no 8 to the Storting). The map data as well as social and demographic data are available on the following webpages:

Directorate of Fisheries: <http://kart.fiskeridir.no/default.aspx?gui=1&lang=2>

Ministry of the Environment: <http://www.environment.no/Maps-and-data/Norway/>

Map Catalogue for the Directorate for Nature Management in Norway:

http://kartkatalog.dirnat.no/map_catalog_dataset.asp?datasetid=0&download=yes&language=EN

The Norwegian Coastal Administration: <http://www.kystverket.no/en/>

Statistics Norway: <http://www.ssb.no/samer>

The overview starts with the identification of valuable and vulnerable biodiversity areas and their social and economic importance in the Barents Sea, areas that are protected under national legislation and cultural heritage sites, and goes on to describe social, economic and human dependency areas in coastal Norway.

2 Sensitive sea areas in Arctic Norway

2.1 Social and economic areas in the Barents Sea

The offshore marine environment in the Barents Sea is managed according to the Integrated Management Plan for the Barents sea and Lofoten Area (Report no 8 to the Storting 2005 - 2006). The Management Plan sets up a framework for long-term management of spatial conflicts between marine use forms and sustainable management of marine ecosystems. Much knowledge has therefore already been produced in terms of governing shipping activities in Arctic Norway and assessing the potential impacts of oil spills and other risks on marine ecosystems.

The management plan is based on a thorough analysis and identification of valuable and vulnerable areas in terms of how important the areas are for biological production and biodiversity (Olsen and Quillfeldt 2003). A similar assessment of socially vulnerable and valuable areas has however not been conducted for the coastal communities and social-ecological systems in Arctic Norway, although recent government publications have reported on the socio-economic development patterns for the area (KRD 2010). The IMO criteria are 'sea areas where the use of living marine resources are of particular social or economic importance, including fishing, recreation, tourism, and the livelihoods of people who depend on access to the area' (table 1). In the Norwegian context, the social and economic importance of the valuable sea areas in the Barents Sea are mainly connected to their function as basis for commercial fisheries activities. Of a population of 460 000 in northern Norway, around 20 000 or 4,7 % are employed in or connected to marine industries (KRD 2010). In addition to the importance of these fishing fields to the fisheries industry in northern Norway, they are also important to foreign fishers from the south of Norway and from EU countries and Russia.

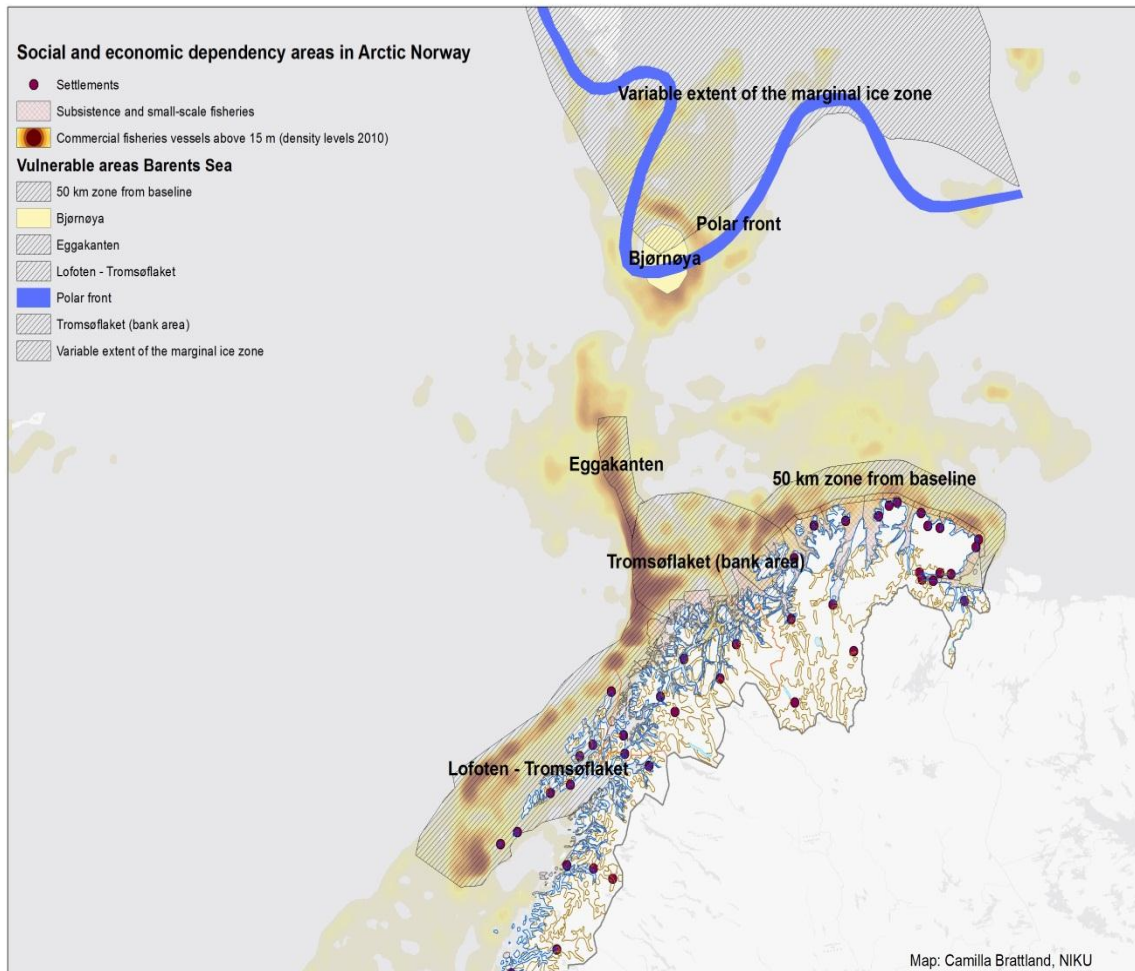


Figure 2 Valuable and vulnerable areas in the Barents Sea. Source: Ministry of the Environment, www.environment.no, Directorate of Fisheries, Norwegian Map Authority.

The valuable areas in the Barents Sea largely overlap with areas where a majority of the commercial fisheries activity is taking place. Coastal fisheries are mainly conducted by the local fishing fleet, whose activities are limited by the fishing vessels' range and fishers' settlement patterns. According to a recent agreement between the Saami Parliament and the Norwegian government, small-scale fishers in the Saami traditional industry priority area (see section 2.3) in northern Norway have the right to feed their households and earn their living from fishing in these areas. According to the Saami Parliament, this right is based on historical use rights of the coastal population in northern Norway (Ministry of Fisheries and Coastal Affairs 2012).

Figure 2 shows the whereabouts of the valuable areas in the Barents Sea relative to commercial fisheries activities (based on the Fisheries Directorate's density mapping for 2010) and subsistence and small-scale fisheries in the coastal zone (red hatched lines). The seascape made visible through the mapping of fishing activities can be compared to a social landscape in the marine environment. Especially the Tromsøflaket bank area towards Lofoten, Eggakanten as well as spots off the coast of Finnmark and Bjørnøya are identified as areas that fall under the criteria of importance for social and

economic dependency. Both in terms of their biological value and in terms of social values, they represent areas where the use of fish resources is of particular social and economic importance for commercial and small-scale fisheries. A closer analysis of these areas' importance is treated in section 2.2 and 2.3 where municipalities on shore are described according to their value as human dependency or social and economic dependency areas. The Svalbard Islands and other offshore areas are excluded from the further analysis, although these can also be included under the social and economic dependency criteria.

2.2 Social and economic dependency in coastal Norway

The coastal areas of social and economic importance are treated in this section. Fisheries and other marine industries are particularly important for settlement and employment opportunities in the fjords and coastal areas of Arctic Norway. In almost all of the coastal municipalities in northern Norway, more than 100 people are employed in marine industries, making marginalized areas particularly dependent on the fisheries industry. According to a report by the Ministry of Local Government and Regional Development, a polarization between growth zones and economically marginalized zones can be witnessed in Arctic Norway during the last ten years (KRD 2010). Growth zones are areas characterized by a growing population and industrial activity, where social and economic vitality is expected to be maintained within the next 30 years. These are the regions connected to the larger cities Bodø, Tromsø and the Alta-Hammerfest region. Marginalized zones are particularly coastal areas in the eastern part of Finnmark County that have experienced a negative development in terms of employment rates, outmigration and age distribution.

The communities in Finnmark that are particularly vulnerable areas in social and economic terms show a negative development in employment rates (see figure 3, dark blue municipalities). Together, this makes the social and economic dependency on the sea areas of the coastal communities that are in marginalized areas more significant. Protected areas with a social or economic component are also included here, such as protected nature reserves, marine protected areas and UNESCO World Heritage Sites. Protected areas and cultural heritage sites are areas that already have a spatial delimitation and are recognised as sensitive areas. For instance, marine protected areas are areas that have been selected for their environmental qualities and have national significance for research and monitoring of the marine environment. In addition, there are landscapes protected as cultural or natural landscapes under the Cultural Heritage Act (1978), the Nature Diversity Act (2009) or Marine Resource Act (2009) which are listed in table 2 and displayed on the map in figure 3. In terms of sensitive sea areas, marine protected areas and coral reefs are particularly vulnerable to destruction from fishing or other shipping activities.

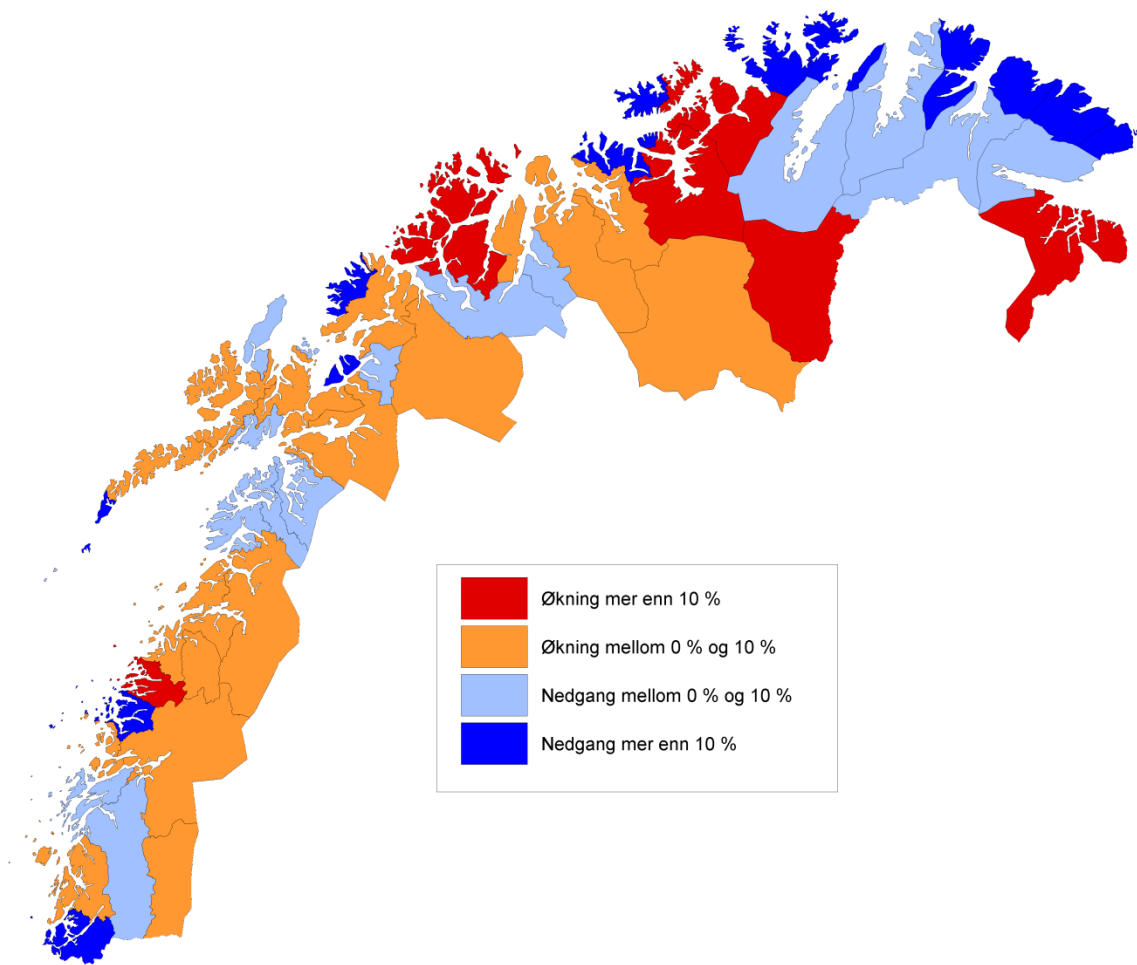


Figure 3 Growth and decrease in number of employees in northern Norway 1998 – 2008. Blue areas marginalized zones with decreasing number of employees, red areas growth zones with increasing number of employees in general. Source: KRD 2010 p. 16.

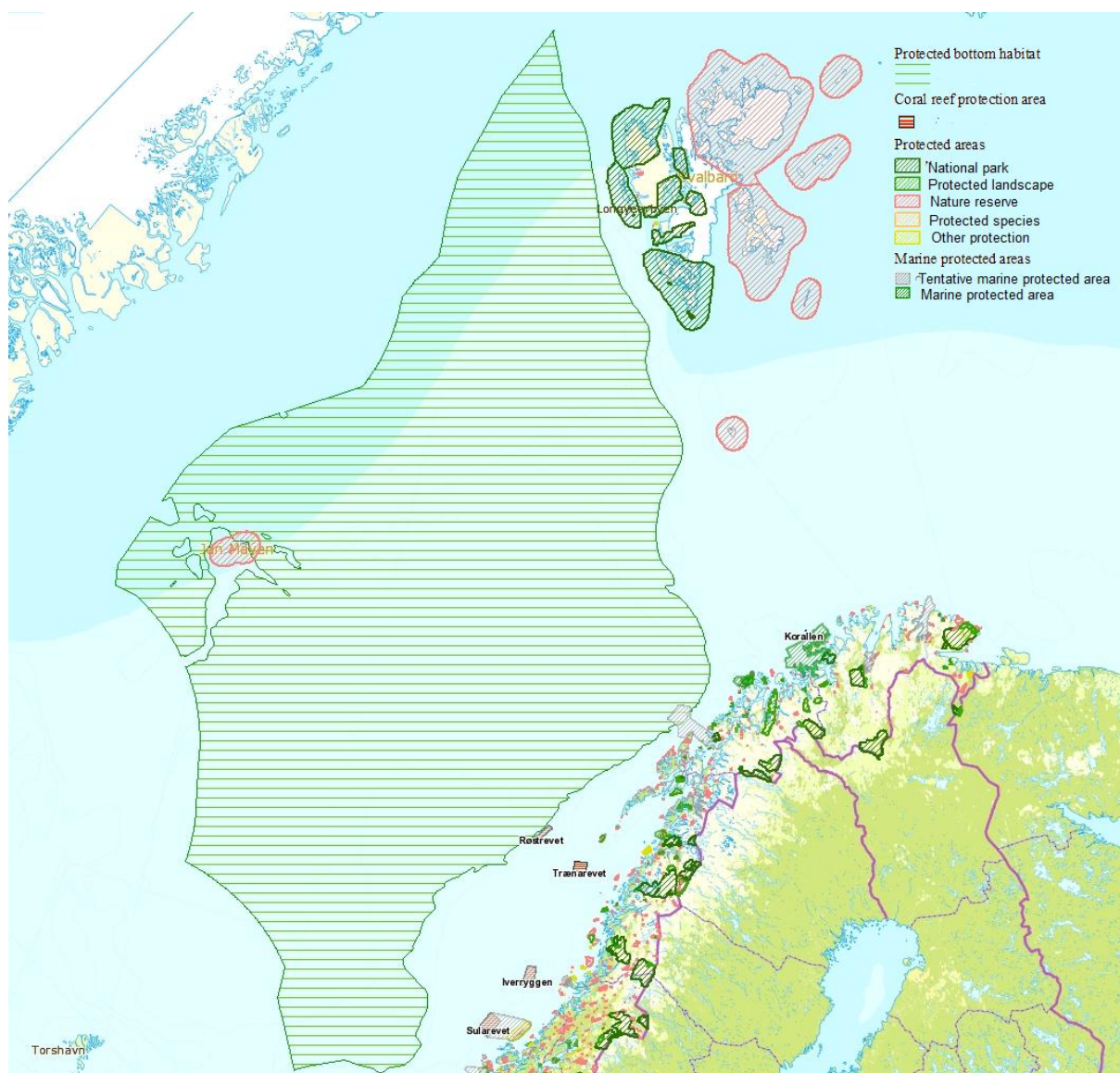


Figure 4 Protected areas in Norwegian territorial waters and coastal areas. Source: www.environment.no.

	IMO Particularly Sensitive Sea Areas <i>Social, cultural and economic criteria</i>				
Figure	Area	Cultural attributes	4.4.12 Social or economic dependen cy	4.4.13 Human dependen cy	4.4.14 Cultural heritage
Figure 3	Protected areas				

	Marine protected areas: LoppHAVet, Ytre Karlsøy, Rystraumen, Rossfjordstraumen, Kaldvåg fjorden and InnHAVet, Karlsøyvær, Salstraumen, Nordfjorden. Tentative list: Tanafjord, Indre Porsanger fjord, Andfjorden, Tysfjord.	National significance for research and monitoring of the marine environment.	X		
	Coral reefs	Protected coral reefs: closed for fishing and destruction prohibited	x		
	Protected natural areas	Protected natural areas: nature reserves of national importance	x		
	Protected bottom habitat (Norwegian Sea).	Protected vulnerable bottom habitat below 1000 meters: prohibited for fishing with bottom gear in Norwegian economic zone, the fishery zone around Jan Mayen and Svalbard	x		
	Svalbard islands, sea floor, coast and coastal waters; All marine areas and coastal segments around villages and coastal communities	A majority of the Svalbard islands are protected, as well as 84% of the territorial waters. The sea bed is protected, except for fisheries activities. Kongsfjord is closed for shrimp fisheries.	x		

Table 2 Protected areas with a social or economic component.

2.3 Human dependency

Human dependency areas are 'of particular importance for the support of traditional subsistence or food production activities or for the protection of the cultural resources of the local human populations' (table 1). The traditional northern Norwegian fisher-farmer adaptation thrives on a combination of small-scale fishing, farming and other occupations. The small-scale fishing fleet is considered the backbone of Norwegian and Saami culture, and the marine environment is as such the material basis for traditional fisheries and for Saami culture (Nature Diversity Act 2009). According to the Marine Resource Act and the Nature Diversity Act, Saami culture is to be regarded as especially vulnerable to new management measures. Sea areas in Saami areas are of importance for commercial and subsistence fisheries, aquaculture, local community subsistence uses, subsistence economy, cultural significance and transportation.

For the present purposes, human dependency areas are defined as areas where Saami traditional industries are prioritized by the Saami Parliament - the *Saami priority area for traditional industries* (see figure 5). This means that fishers and farmers who are settled in the priority area are eligible for support from Saami Parliament funds, as well as other targeted social and economic support measures (Statistics Norway). These areas form the basis for yearly statistical assessments of the state of Saami society. These areas are also the target areas for special measures and governance regulations issued by the Norwegian Government, thus making these areas subject to the criteria of human dependency under the IMO criteria 4.4.13.

According to Norwegian legislation, living marine resources are especially important as the natural basis for Saami culture (Nature Management Act 2008; Marine Resources Act 2009). Settlements in Saami municipalities are particularly vulnerable to social-ecological changes and impacts from marine industries. Small-scale fisheries in the Saami priority area are prioritized as a traditional occupation through special measures and quota allocations (Ministry of Fisheries 2011). In addition to important fishing areas, traditional fishing settlements would be affected by oil spills and any development of emergency harbors and facilities for off-loading fishing hauls.

According to the Saami Parliament, small-scale fisheries (vessels under 15 m length) and subsistence fisheries are considered more vulnerable than fisheries conducted with vessels above 15 m, although commercial fisheries are important for the development of the fisheries industry and maintaining community settlements and livelihoods in the whole Norwegian settlement area. The coastal fishing vessels operating in the Saami priority area range from between 5 to 21 meters of length, with the vessel group between 10 and 15 meters being the most economically important for coastal communities. In inshore areas, the Norwegian Directorate of Fisheries has conducted a survey of the most important fishing fields used by local fishers, in addition to a mapping of marine biodiversity areas in the Norwegian coastal zone. At the municipality level, spatially delimited fishing fields and cod spawning areas are recognized as important for local livelihoods, and they are to be protected from conflicting forms of marine use in most local government marine spatial plans.

This applies particularly to all coastal communities within the Saami priority area, as well as the settlements that are located in the economically marginal zones, especially east of the North Cape ¹.

¹ Kjøllefjord, Gamvik and Mehamn on the Nordkinn Peninsula, Kongsfjord, Berlevåg, and Båtsfjord, Vardø and Kiberg on the Varanger Peninsula as well as the settlements along the Varanger fjord (see figure 7, all settlements east of the North Cape (Nordkapp)).

A scoping paper following up the suggestion that an indigenous marine use survey should be erected under the Arctic Council describes indigenous use areas as the aggregate areas where all three IMO categories overlap, and not limited only to human dependency areas (Aleut International Association and Saami Council 2011). Recognising that human dependency areas and social and economic areas are difficult to separate from one another, all marine areas upon which small-scale fisheries are dependent, can be identified as sensitive sea areas both in terms of the human dependency criteria and the social and economic criteria.

Figure 5 shows the location of the settlements, the Saami priority area as well as the economically marginalized municipalities, and the location of the coastal fishing fields.

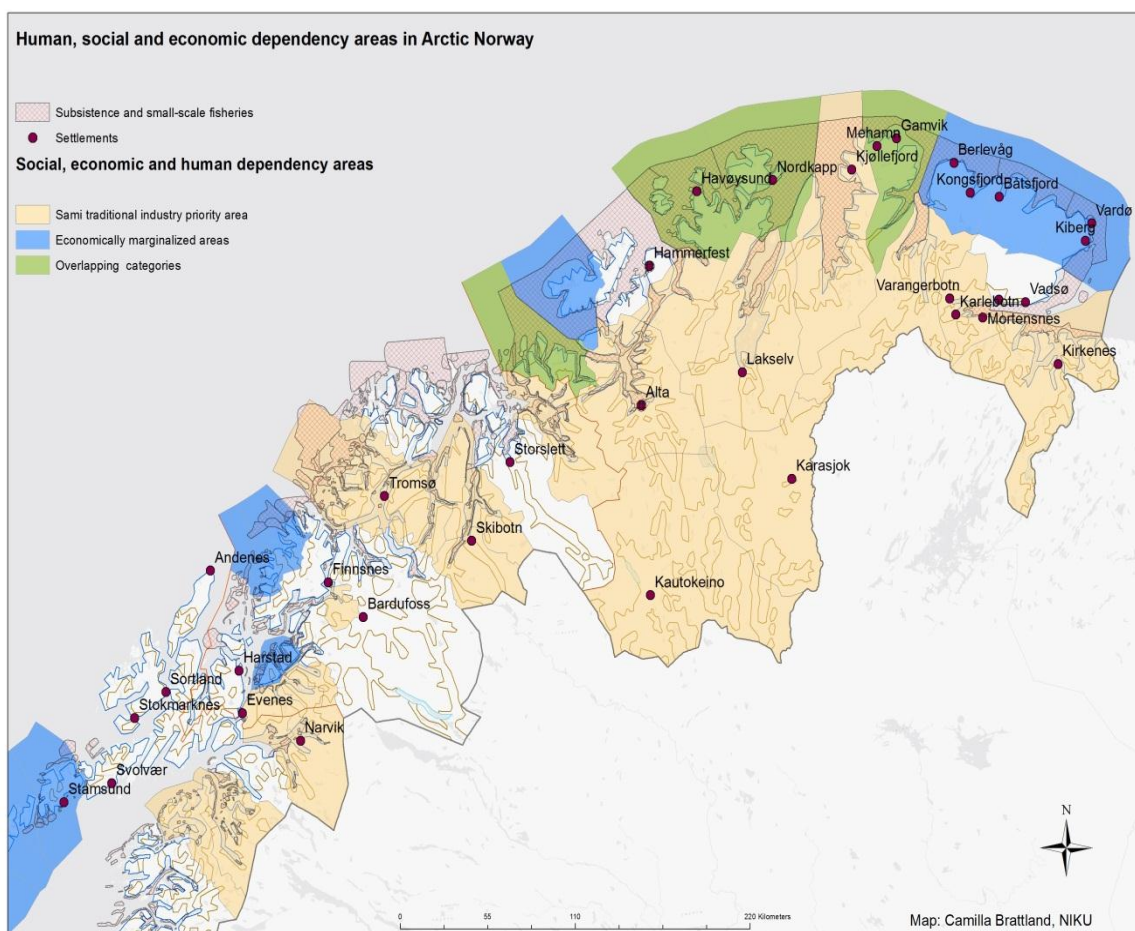


Figure 5 Overview of coastal sea areas that are important on social, economic and human dependency terms.

2.4 Cultural heritage areas

Cultural heritage areas are 'areas that is of particular importance because of the presence of significant historical and archaeological sites' (IMO criteria, table 1). The whole of Arctic Norway is important for the understanding of prehistoric human occupation and migration to Fennoscandia. Cultural heritage objects such as hunting grounds, turf huts, stone chambers and other objects are generally found close to existing communities and communication routes, a majority of which are close to the sea. See figure 6 for an excerpt of registered cultural heritage in the eastern part of Finnmark County. All Sami cultural heritage objects older than 100 years and all Norwegian cultural heritage older than the year 1537 are automatically protected by law (Cultural Heritage Act 1978). Since survey and registration of cultural heritage objects is not conducted systematically, these areas have the potential to contain further unknown but significant resources, implying that the entire coastal zone (strandsonen) contains cultural heritage sites. The exact locations of registered cultural heritage sites are managed by the Norwegian and Saami national Cultural Heritage Authorities (Riksantikvaren). On Svalbard all locations before 1946 are automatically protected by law (Svalbard Environment Act §39), and single locations such as the research station Kinnvika are protected by the cultural heritage authorities.



Figure 6 Excerpt over cultural heritage (black letters/locations) in the eastern part of Finnmark County to the Russian border. Source: NordAtlas.www.nordatlas.no

Underwater cultural heritage in Norway is poorly documented and the known positions of shipwrecks and other heritage objects are not revealed to the public. Ship wrecks older than 100 years of age are automatically protected (Cultural Heritage Act 1978). Ship wrecks from WWII Murmansk convoys are a particular feature of the Barents Sea. The locations of many shipwrecks are not known except last position and general area. Known shipwrecks as cultural heritage are managed by Norwegian maritime museums. In addition, there may be submerged Stone Age sites along the coast of northern Norway (especially Lofoten) and coastal heritage objects from earlier land-based activities in the coastal waters of Svalbard. See figure 6 for reference to potential underwater cultural heritage sites as identified through the process for the Barents Sea management plan. As the map shows, the potential cultural heritage sites largely overlap with the already identified valuable areas in the Barents Sea (see figure 2).

The cultural heritage areas and protected areas are listed along with UNESCO World Heritage sites and sites on the tentative list in table 3.

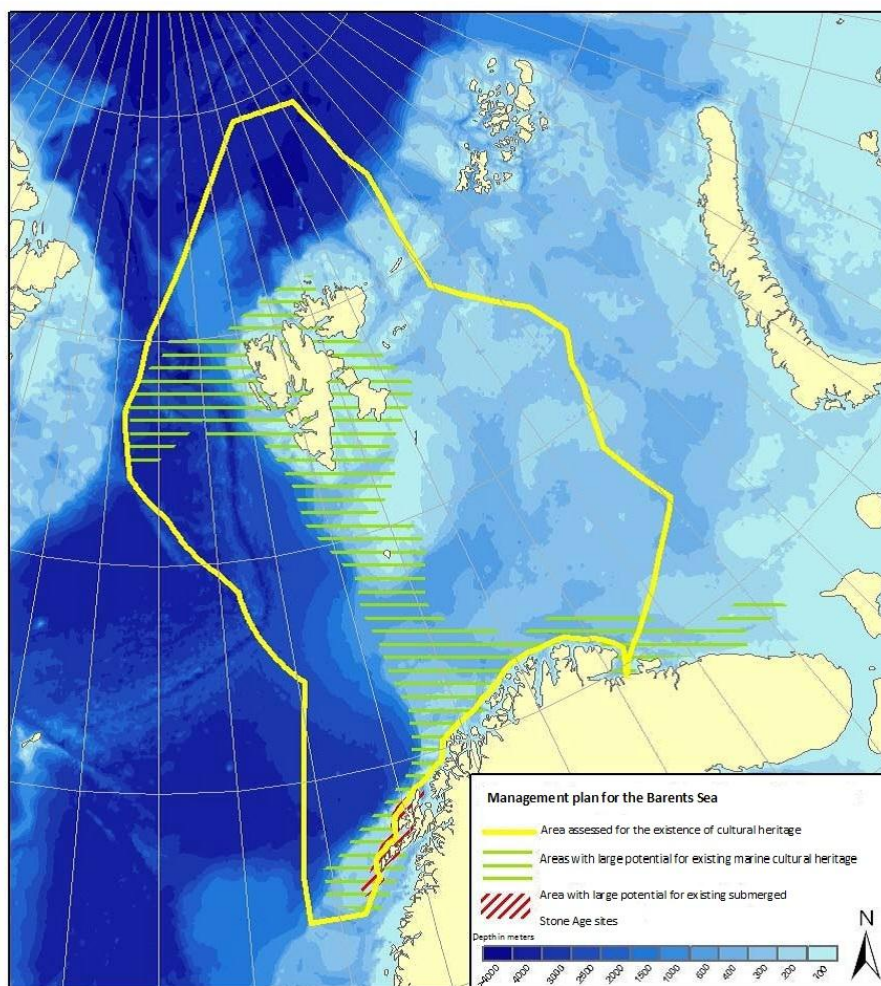


Figure 7 Areas with potential underwater cultural heritage sites. Source: Rapport fra arbeidsgruppe 2005. Management plan for the Barents Sea.

	IMO Particularly Sensitive Sea Areas <i>Social, cultural and economic criteria</i>				
Figure	Area	Cultural attributes	4.4.12 Social or economic dependen cy	4.4.13 Human dependen cy	4.4.14 Cultural heritage
	UNESCO World Heritage Sites				
Figure 7	Rock Art of Alta	A field of thousands of petroglyphs dating from c. 4200 to 500 B.C. close to the sea.			x
	Vega Archipelago (not on map, south of the Arctic circle).	Cultural landscape/seascape with human settlement from Stone Age, constituted by fisher-farmer practices and harvesting of down eider.	X	x	X
Figure 7	Hammerfest: Struve geodetic Arc	Cultural historical site for geodetic arc survey			x
Figure 6	Lofoten Islands (tentative list)	Historical significance as centre of Norwegian cod fisheries since before the Viking Age. Unique marine biodiversity, bird cliffs, cultural heritage sites and cultural life.	x	x	x

Figure 6	The Svalbard Archipelago (tentative list)	High-Arctic environment as natural archive for geology and natural history of great scientific value.	x		x
	Jan Mayen and Bouvet Island as part of the mid-Atlantic ridge system (tentative list, not on map)	Plant societies and bird colonies with unique value, breeding areas for Greenland seals and hooded seals, whaling stations and hunting and trapping cabins.	x		x
	The Laponian area (tentative list, not on map)	Lule Saami cultural landscape in unique branched system of fjords. Tysfjord, Hellemobotn and Rago.	x	x	x
	Cultural heritage areas				
Figure 7	The entire coastline of Arctic Norway. All marine areas and coastal segments around villages and coastal communities.	All coastal areas contain known sites such as rock carvings, stone labyrinths, and other Saami and other cultural heritage objects and landscapes.			x
Figure 6	Lofoten-Tromsøflaket, Eggakanten, Tromsøflaket, 50 km zone from baseline, Bjørnøya and Svalbard islands.	Potential underwater cultural heritage areas with ship wrecks and possible submerged Stone Age sites (Lofoten area).			x

Table 3 Overview of cultural heritage areas.

2.5 Arriving at particularly sensitive sea areas

Based on the overview presented in this report, a basis for the identification of particularly sensitive sea areas has been provided. Table 4 sums up the identified areas, as also shown in figure 10. As the figure shows, there is particularly overlap between categories all along the coast, as well as in the identified valuable areas in the Barents Sea. These are areas that are important for the livelihoods of people who depend on access to the area, and the wellbeing of marine ecosystems for human livelihoods, in addition to containing cultural heritage or environmental qualities.

The particularly sensitive sea areas in Norwegian territorial waters are detailed in the table below. Since almost all of the Norwegian coast, Barents Sea and Lofoten area are covered by one or all of the categories, a further identification of particularly sensitive sea areas must be left to other processes to decide.

<u>Sensitive Sea Areas in Norway</u>				
<u>Area</u>		<u>4.4.12 Social or economic dependency</u>	<u>4.4.13 Human dependency</u>	<u>4.4.14 Cultural heritage</u>
Norwegian coast, Barents Sea and Lofoten area, Svalbard Islands.		Valuable areas in the Barents Sea and commercial fisheries areas (figure 1). Protected areas (figure 3).	Settlements and subsistence fisheries areas in the Saami traditional industry priority area and marginalized areas (figure 4).	Underwater cultural heritage areas in the Lofoten-Tromsøflaket area, Eggakanten towards the Svalbard Islands, and 50 km zone from baseline off Finnmark (figure 6), coastal Arctic Norway and UNESCO World Heritage Sites (figure 7).

Table 4 Sensitive sea areas in Norway based on social, cultural and economic criteria.

Figure 8 gives an overview of the identified areas based on the IMO criteria. The municipalities in the human dependency and social and economic dependency areas which intersect with the sensitive sea areas that are important for subsistence and small-scale fisheries and commercial fisheries are shown in beige. Protected areas that intersect with the sensitive sea areas are shown in red, and the two UNESCO cultural heritage sites are indicated on the map. It must be noted that the valuable sea areas were previously in sections 2.1 and 2.4 shown to overlap with commercial fisheries activities and potential cultural heritage areas. See figure 6 for reference to protected areas regarding the Svalbard islands and other offshore areas in Arctic Norway. Because of the lack of data on these areas, they are not included to a greater extent here.

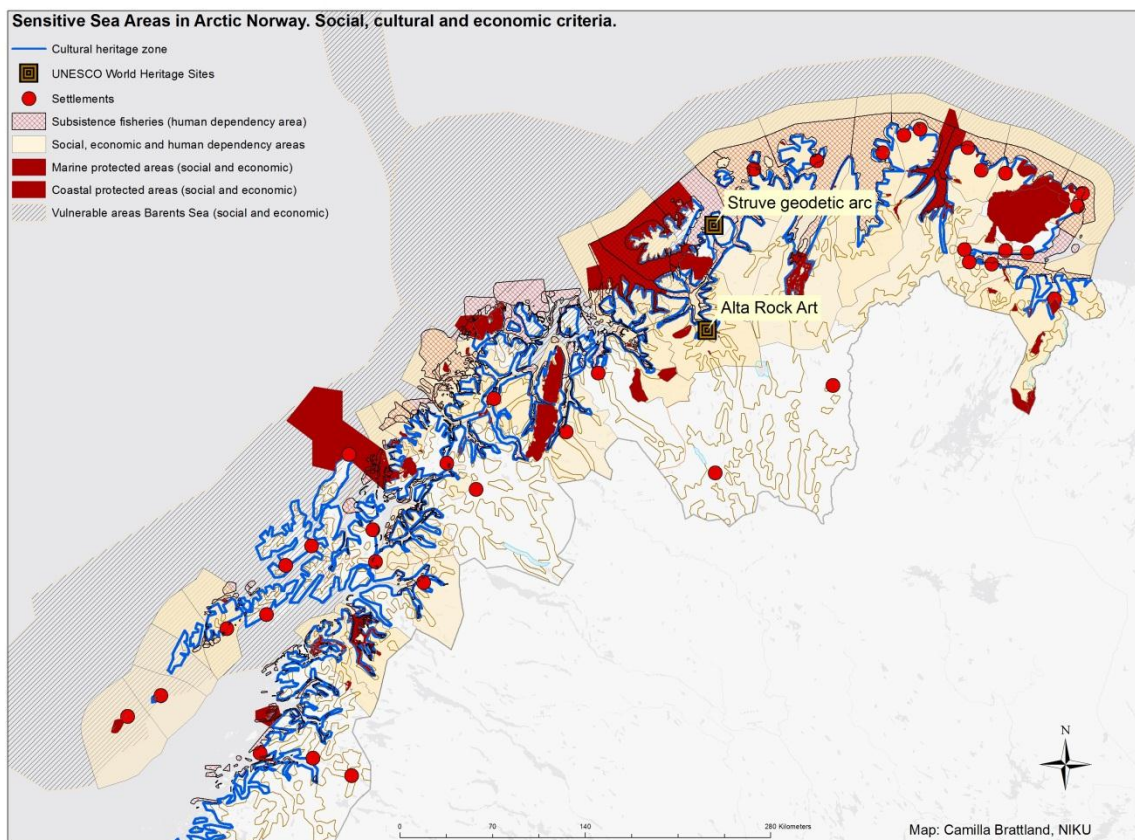


Figure 8 Sensitive sea areas in Arctic Norway.

3 Conclusion

This report has identified sensitive sea areas in Arctic Norway based on the IMO social, economic and cultural criteria in Norwegian territorial waters. The report must be read in the light of a lack of knowledge on cultural, social and economic relations with the marine environment in Arctic Norway. The report provides a knowledge basis for the further identification of particularly sensitive sea areas for future reference and for policy making. In general, there is significant overlap between the three IMO categories on the coast of Finnmark. This is a result of the inclusion of coastal municipalities in Finnmark in the Saami traditional industry priority area, the areas' economic dependency on marine industries, the importance of the Finnmark sea areas for subsistence, small-scale and commercial fisheries, and the whereabouts of cultural heritage sites. Since the abundance of cultural heritage sites is dense in the coastal zone, the entire coastal zone is here regarded as a cultural heritage zone. Until further knowledge on these topics are collected and digitized, it is however challenging to make a thorough description of sensitive sea areas in social and economic terms. The identification of particularly sensitive sea areas requires further research and the involvement of authoritative institutions with a mandate to commission such an assessment.

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