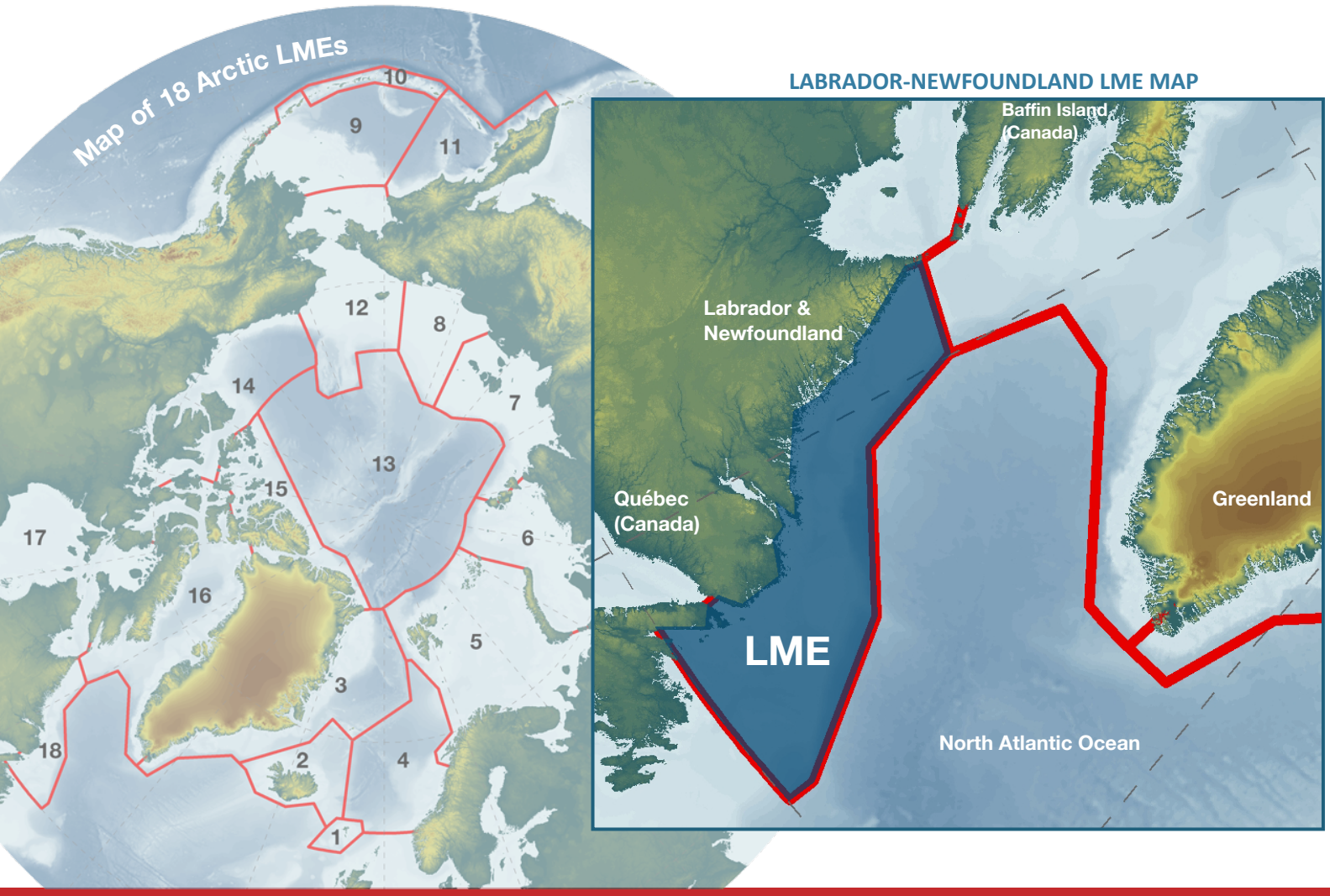
LABRADOR-NEWFOUNDLAND SEA LME



18

PAME

Protection of the Arctic Marine Environment

ARCTIC LMEs

Large Marine Ecosystems (LMEs) are defined as regions of ocean space of 200,000 km² or greater, that encompass coastal areas from river basins and estuaries to the outer margins of a continental shelf or the seaward extent of a predominant coastal current. LMEs are defined by ecological criteria, including bathymetry, hydrography, productivity, and tropically linked populations. PAME developed a map delineating 17 Arctic Large Marine Ecosystems (Arctic LME's) in the marine waters of the Arctic and adjacent seas in 2006. In a consultative process including agencies of Arctic Council member states and other Arctic Council working groups, the Arctic LME map was revised in 2012 to include 18 Arctic LMEs. This is the current map of Arctic LMEs used in the work of the Arctic Council in developing and promoting the Ecosystem Approach to management of the Arctic marine environment.

Joint EA Expert group

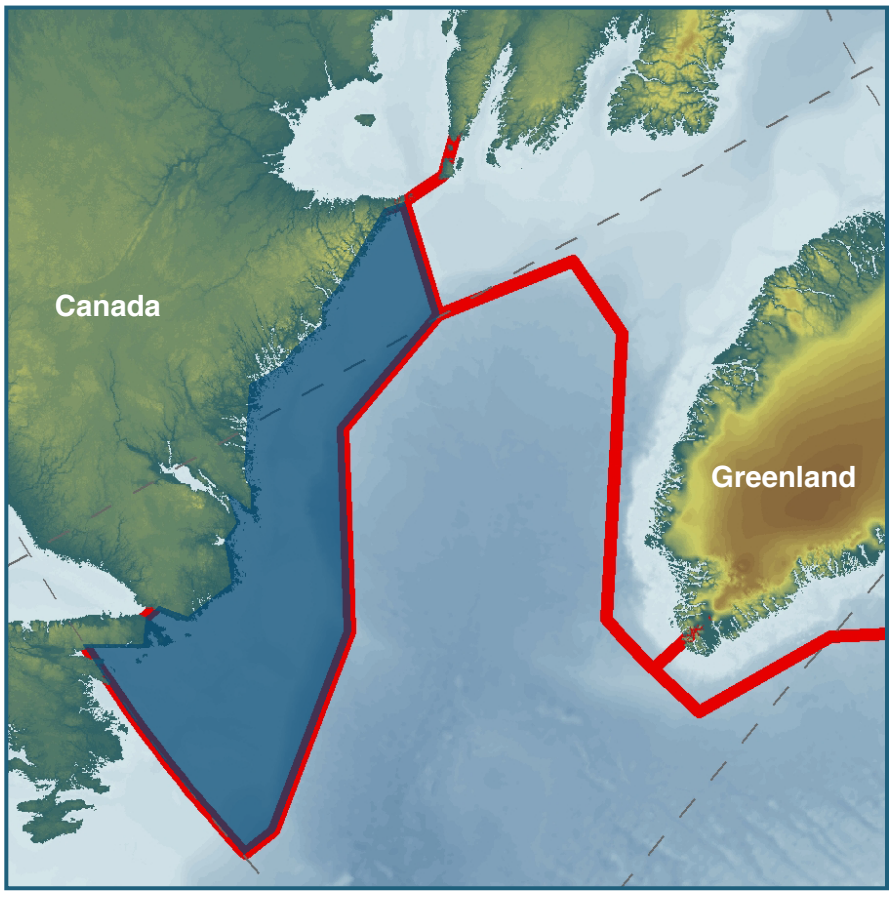
PAME established an Ecosystem Approach to Management expert group in 2011 with the participation of other Arctic Council working groups (AMAP, CAFF and SDWG). This joint Ecosystem Approach Expert Group (EA-EG) has developed a framework for EA implementation where the first step is identification of the ecosystem to be managed. Identifying the Arctic LMEs represents this first step.

This factsheet is one of 18 in a series of the Arctic LMEs.

OVERVIEW: LABRADOR-NEWFOUNDLAND SEA LME

The Labrador Shelf Large Marine Ecosystem (LME) is a large shelf area extending from about 52.5ºN to 57ºN off Labrador, the mainland portion of the province of Newfoundland and Labrador, Canada. In general, the coast of Labrador is very irregular with numerous inlets (including deep fjords, shallow bays, and tickles), shoals, and small islands. The outer coast is generally barren and rocky while the shores of sheltered bays are well vegetated.

The water circulation of the area is dominated by the southward flow of the Labrador Current Originating from Davis Strait, the cold (<0ºC), fresh (<34‰) boreal water of the Labrador Current is the southernmost penetration of polar waters in the northern hemisphere. Offshore banks split the current into two main branches. The inshore branch carries much of the outflow of arctic water from Hudson Strait and follows the trough of the inner shelf. The remainder flows south around eastern Newfoundland and continues westward over the western Grand Bank towards the Gulf of St. Lawrence. The offshore branch is more voluminous, carrying about 80% of the water flow of the Labrador Current.



Map: Labrador-Newfoundland Sea LME area.

In typical years, ice formation commences in northern Labrador between mid-November and mid-December when landfast ice forms in bays and inlets. The Labrador pack ice is very dynamic; it moves southward with the Labrador Current and is under the direct influence of severe North Atlantic winter storms. The retreat of the ice pack commences in April-May, and by the end of June, the ice has retreated to the middle of the Labrador coast. Shorefast and pack ice disappear from northern Labrador in July and the LME is normally ice-free, with the exception of icebergs, from August through October. The icebergs that appear off Labrador originate primarily in West Greenland (approximately 95%), although a few originate in the Canadian eastern Arctic (5%). During an average year more than two thousand icebergs are observed in waters off northern Labrador with approximately one in eight reaching the Grand Banks.

MARINE MAMMALS

There are 12 species of cetaceans in the waters of the Labrador region. Most species are migratory, occurring along the Labrador coast and offshore on their way to and from summer ranges in the Arctic Ocean.

The northern bottlenose whale occurs in waters off Labrador year round. During winter, it occurs along the pack ice edge. Breeding and calving occurs in April off Labrador and during summer, bottlenose whales may be observed along the coast. The pilot whale is believed to winter in offshore areas of the Labrador Sea and the southeast Grand Banks. They are located along the ice edge off the coast of Labrador as early as mid-May and continue to move inshore in search of squid.

Sperm whale, the largest toothed whale inhabiting the Labrador marine environment, is common as far north as Cape Chidley from June until late October. They remain offshore along the continental shelf, often over bottom channels. **Fin whales** are present from mid-June to mid-October along the southern half of the Labrador coast. **The sei whale** is a summer migrant to the waters off southern Labrador. This species is generally not observed until August and it remains in the region until October. **Minke whales** occupy summer feeding grounds within the Labrador Shelf LME. This species move north along the east coast of Labrador as the ice recedes in June and July. They remain in Labrador waters until forced south in November-December by the ice. Labrador is the northern extreme of the summer feeding grounds of the northwestern Atlantic population of **humpback whale.**

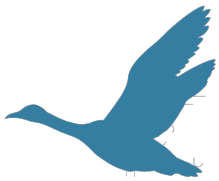
The circumpolar ringed seal is widely distributed throughout the Canadian Arctic and occurs in eastern Canada from Newfoundland and Labrador northward to the North Pole. The most common resident seal along the Labrador coast, it is only seal found along the coast year round. Closely associated with the distribution of landfast ice, ringed seal densities are generally higher on the northern coast of Labrador. **The bearded seal** is a very large, solitary seal that occurs in Canadian Arctic waters which are shallow and free of landfast ice in winter. In Labrador, bearded seals are found along the entire coast, but are more common in more northerly areas. **Harbour seals** are widely distributed along the Labrador coastline. The densities of these seals increase southward; however, the population in Labrador has not been well defined.

The harp seal is highly migratory and undergoes annual migrations between arctic and sub-arctic regions in the North Atlantic. After summering in the eastern Canadian Arctic and Greenland, most move southward along the Labrador coast to whelp on pack ice off southern Labrador-northern Newfoundland or in the Gulf of St. Lawrence during late February or March. The northwestern Atlantic population of hooded seals undertakes annual migrations between whelping grounds, located along the coast of Canada (southern Labrador-northeastern Newfoundland, Gulf of St. Lawrence) or in Davis Strait, and moulting/summering areas, located off southeastern and western Greenland.

The polar bear was fairly common in southern Labrador a few hundred years ago. Human habitation and associated hunting forced a retreat northward although small numbers are observed on the Labrador coast south of Saglek Fjord. These are believed to be bears drifting with pack ice while hunting seals.

FISH

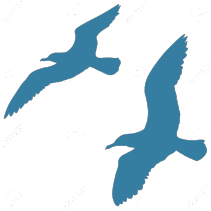
Most of the fishes of the Labrador Shelf area are forage species that play important roles in arctic and sub-arctic food webs or the commercially important species. Capelin, arctic cod, and herring are important food items for many animals, including seabirds, marine mammals, and other fish species. The groundfish or demersal fish are the most important commercial fishes in the northwest Atlantic. Historically, Atlantic cod was the most important groundfish in Labrador waters; however, over-exploitation in the 1960s and 1970s severely diminished the stock.



WATERFOWL

The Labrador coast is an important area for sea ducks. The largest colonies of Common Eiders in Newfoundland and Labrador occur in the area of Table Bay to Groswater Bay with a secondary concentration in Nain Bight reflecting a productivity also noted for breeding seabirds. Published estimates of numbers are rare and conservative because aerial surveys generally underestimate true population size. Nevertheless probably more than 10,000 pairs of Common Eiders nest in the Hamilton Inlet area.

Surf, Black, and White-winged Scoters breed in interior Labrador and by mid summer relatively large aggregations have been identified moulting in Hamilton Inlet and Nain Bight. Sites, such as The Backway off Lake Melville and Nain Bight, typify traditional sites where large groupings of males and non-breeders aggregate annually to complete the feather moult. Common Goldeneye, Barrow's Goldeneye, and Red-breasted Mergansers moult in coastal areas of Labrador in smaller aggregations (generally hundreds). Especially from Nain Bight and northwards many coastal aggregations of goldeneye include the Barrow's Goldeneye.

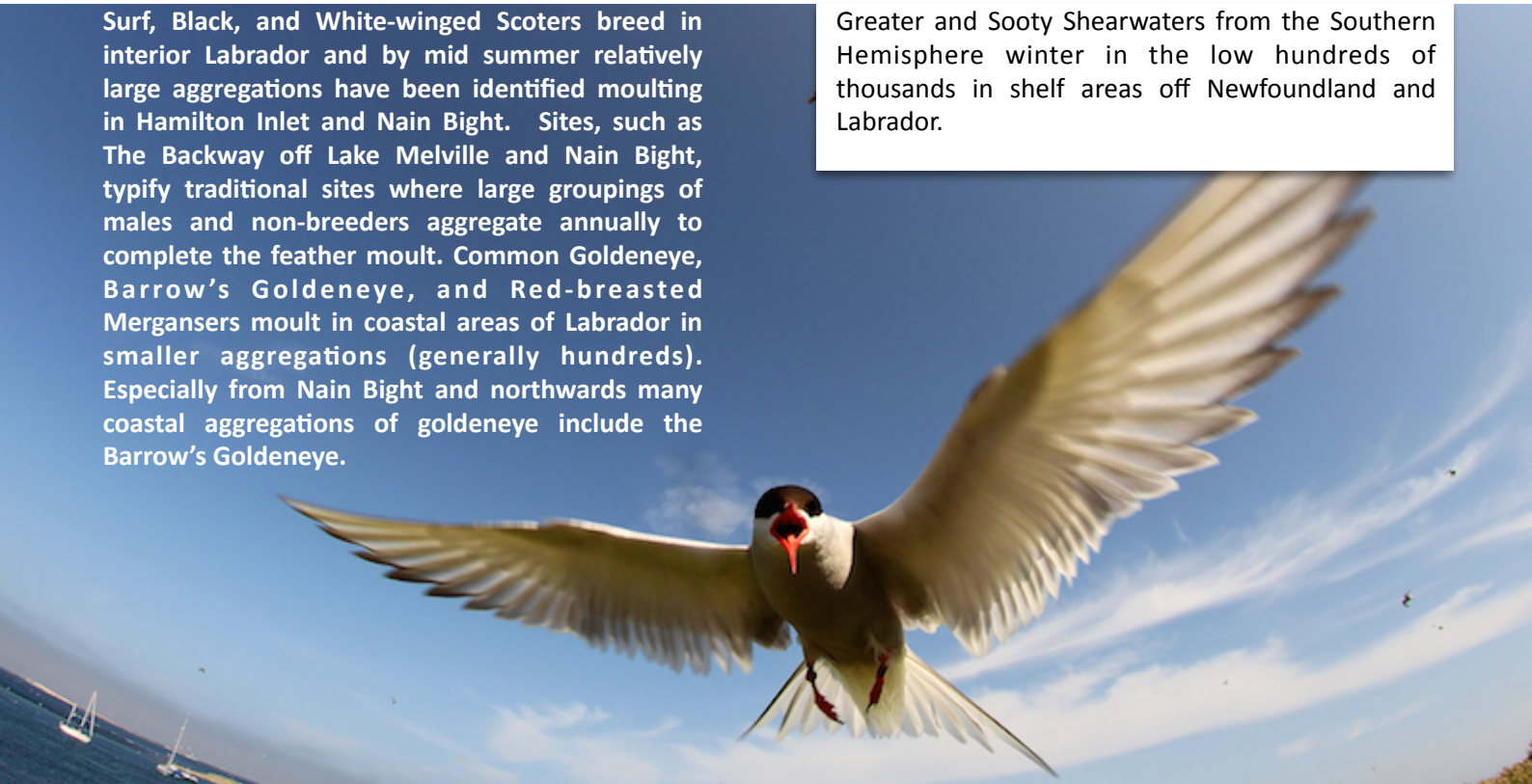


SEABIRDS

The Labrador Shelf LME is rich in breeding and migratory marine birds. There are 32 species of marine birds occurring regularly on the mid Labrador coast. There are countless islands along this section of Labrador coast providing suitable nesting habitat for numerous colonies of alcids, such as Razorbills, Thick-billed Murres, Common Murres, Atlantic Puffin, Black Guillemots, gulls and terns.

Colonies of murres, Razorbill and Atlantic Puffin are concentrated in two groups of islands off Nain and off Hamilton Inlet. About 38% of the North American breeding population of Razorbill nests on this section of Labrador coast. The Gannet Islands (including the Gannet Cluster) off Hamilton Inlet supports the largest breeding numbers of seabirds on the coast of Labrador. This group of islands harbours more than 124,000 pairs of nesting seabirds, mainly Razorbills, Common Murres, and Atlantic Puffins.

Colonies of terns (Arctic and Common) and gulls (Herring, Great Black-backed, Ring-billed, and Glaucous) are scattered along the coast. Ivory Gull, listed as a species at risk, winters on the pack ice off the coast of Labrador. The Labrador Shelf and continental slope are thought to support more migrant seabirds than breed in Labrador. Large numbers of Arctic-breeding Thick-billed Murres, Dovekies, Northern Fulmars, and Black-legged Kittiwakes migrate through the Labrador Sea to winter there or in Newfoundland shelf areas. Greater and Sooty Shearwaters from the Southern Hemisphere winter in the low hundreds of thousands in shelf areas off Newfoundland and Labrador.



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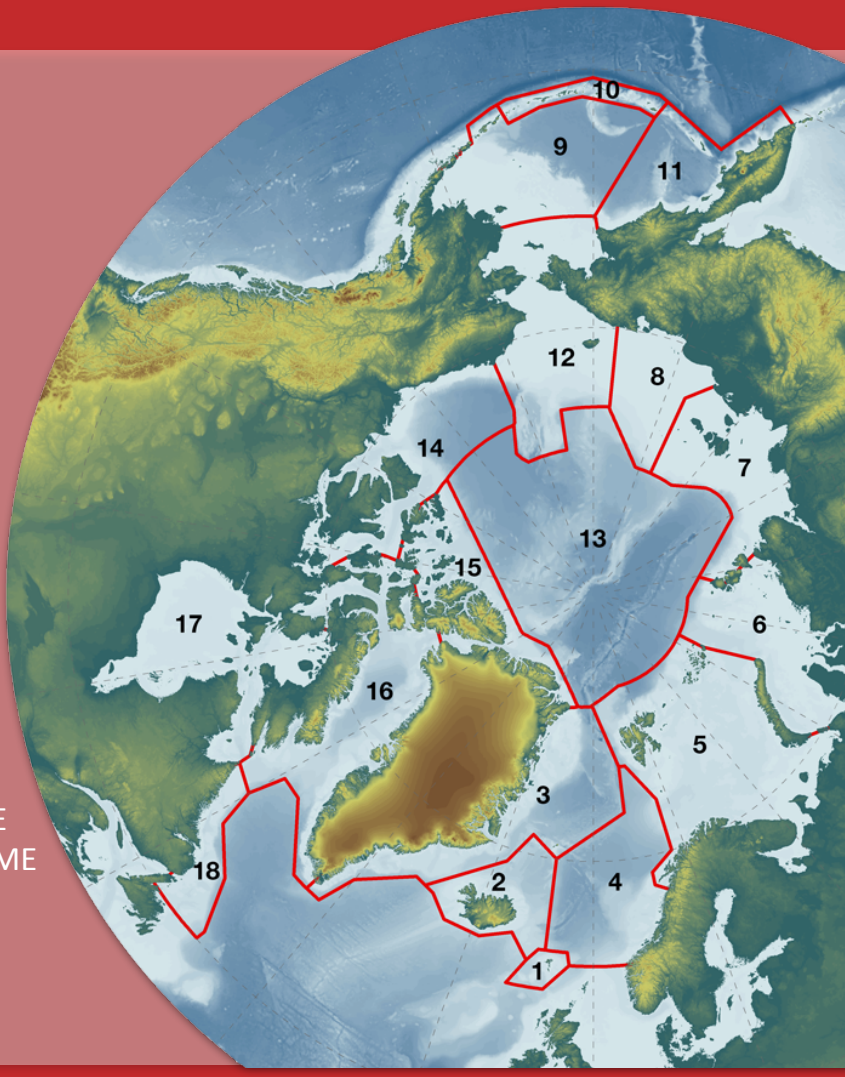
Protection of the Arctic Marine Environment

ARCTIC LMEs

1. Faroe Plateu LME
2. Iceland Shelf and Sea LME
3. Greenland Sea-East Greenland LME
4. Norwegian Sea LME
5. Barents Sea LME
6. Kara Sea LME
7. Laptev Sea LME
8. East Siberian Sea LME
9. East Bering Sea LME
10. Aleutian Islands LME
11. West Bering Sea LME
12. Northern Bering-Chukchi Sea LME
13. Central Arctic Ocean LME
14. Beaufort Sea LME
15. Canadian High Arctic - North Greenland LME
16. Canadian Eastern Arctic - West Greenland LME
17. Hudson Bay Complex LME
18. **Labrador-Newfoundland LME**



LITERATURE REFERENCES

- *The 2007 assessment of Oil and Gas in the Arctic (OGA) - AMAP (2007)*
- *AMAP OGA 2007 - Updated description of the Barents Sea LME. Lead author: Hein Rune Skjoldal.*
- *Arctic Marine Areas of Heightened Ecological and Cultural Significance: Arctic Marine Shipping Assessment (AMSA) IIC - AMAP/CAFF/SDWG (2013)*
- *Large Marine Ecosystems (LMEs) of the Arctic area Revision of the Arctic LME map - PAME (2013)*

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