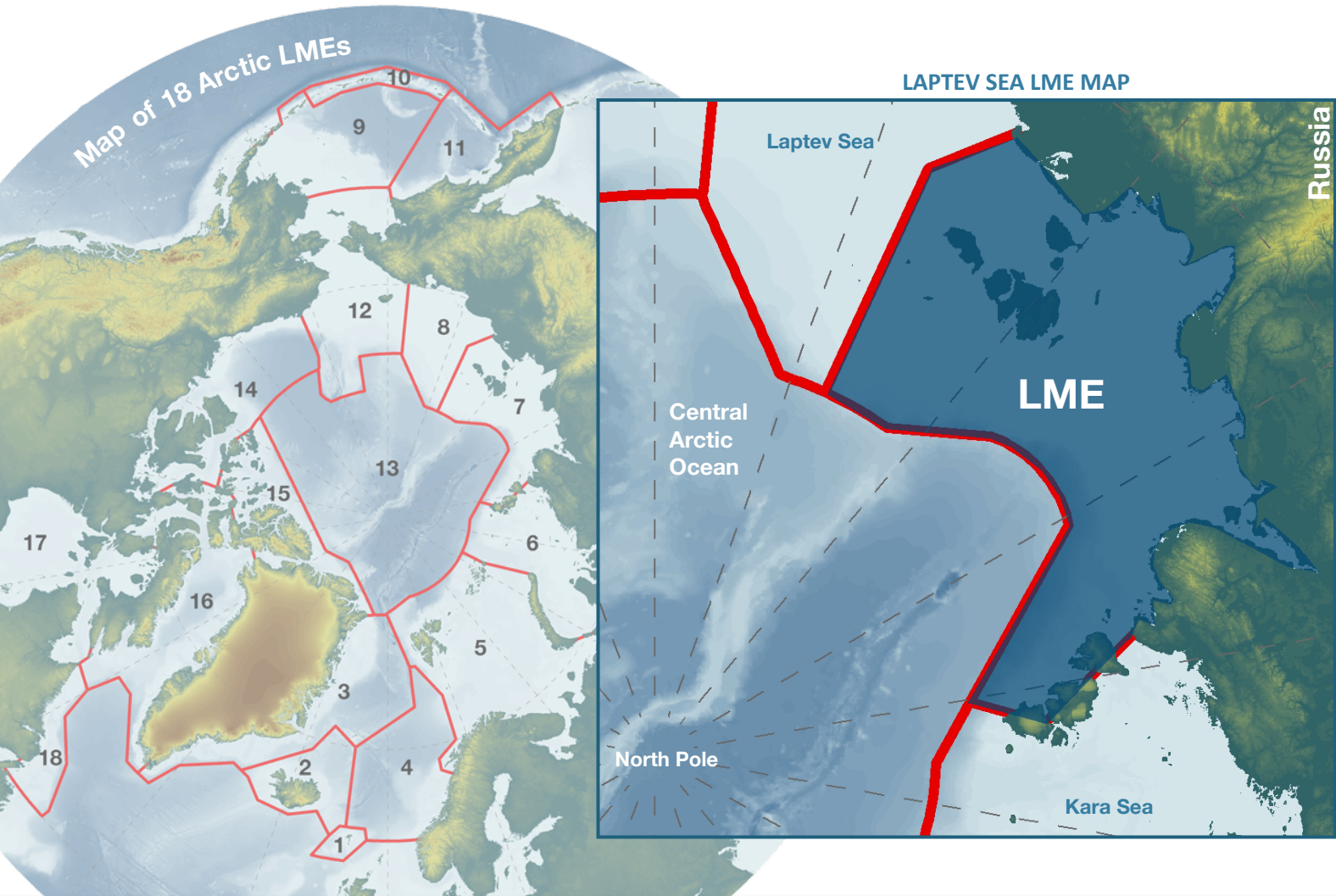


LAPTEV SEA LME



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 trophically 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.

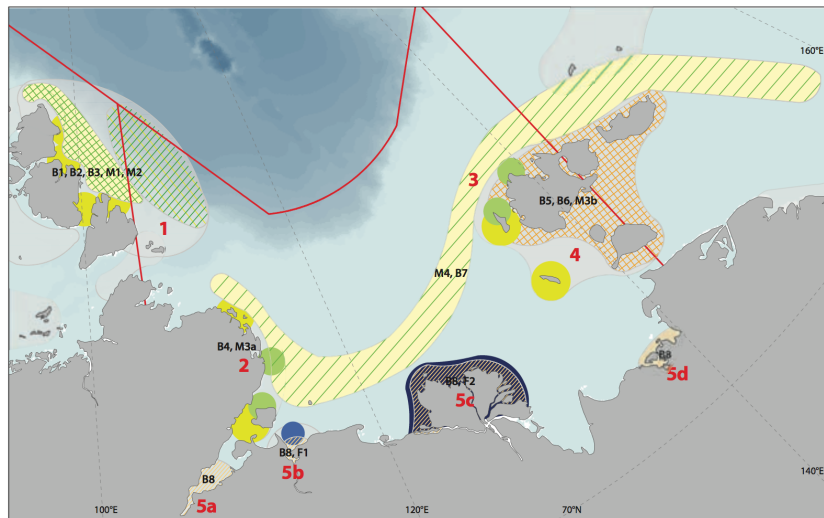
OVERVIEW: LAPTEV SEA LME

The Laptev Sea is located on the Siberian shelf between the Taimyr Peninsula and Severnaya Zemlya in the west and the New Siberian Islands in the east. It extends from about 7°N in the Buor-Kaya Inlet to 81°N and covers an area of about 0.8 million km². Large areas of the Laptev Sea shelf are shallower than 50 m and the mean depth of the southern part is only around 20 meters. The shelf is fairly narrow and moderately deep to the north and east of the Severnaya Zemlya island group. The shelf widens to the north of the East Siberian Islands where the slope connects to the Lomonosov Ridge that extends across the Arctic Ocean towards Greenland.

Severnaya Zemlya was the last archipelago in the world to be discovered (in 1913). It comprises four major islands (October Revolution, Bolshevik, Komsomolets, and Pioneer) and around 70 smaller islands, covering a total area of about 37,000 km². The larger islands are mountainous with extensive glaciers and have inlets and fjords and partly rocky shores facing the northwestern Laptev Sea.

The New Siberian Islands in the eastern Laptev Sea comprise two parts: the northern group of Anzhu Islands and the southern group of Lyakhovsky Islands, separated by the Sannikov Strait. The west Siberian shelf borders the deep Nansen Basin of the Arctic Ocean. This basin is elongated as is the Amundsen Basin that runs in parallel on the Eurasian side of the Lomonosov Ridge. The Nansen and Amundsen Basins are separated by the Gakkel Ridge that is a continuation of the mid-Atlantic Ridge. The steep shelf slope in the northern part of the Laptev Sea is the narrow end of these elongated basins.

Due to its open northern boundary, the circulation of the northern Laptev Sea is influenced by the large-scale circulation pattern of the Arctic Ocean. The main feature is a cyclonic (counter-clockwise) gyre in



Laptev Sea LME
Marine mammals
 Feeding (green hatched), Migration (blue hatched), Wintering-walrus (orange hatched), Haul-out-walrus (red hatched)
Seabirds
 Breeding colonies (yellow), Feeding (orange), Feeding and moulting (orange hatched)
Fish
 Feeding, moulting and staging (yellow), Staging and migration (orange), Nursery (dark blue), Spawning area (light blue), LME (AMSALIC) (red line)

Figure A.8. Areas of heightened ecological significance in the Laptev Sea LME.

Map: The Laptev Sea LME.

Source: AMSALIC Report

the central part of the Laptev Sea. This is also reflected in the ice-drift pattern where there is a southward transport of ice into the western area in summer and a northward transport from the eastern Laptev Sea into the Trans-Polar Drift. Freeze-up starts in late September and is completed within 2-3 weeks when the whole Laptev Sea is ice-covered.

The Great Siberian Polynya outside the fast-ice edge can stretch for more than 2000 km from north of the East Siberian islands to the western Laptev Sea. Polynyas also form on the eastern side of the Severnaya Zemlya islands and the Taimyr Peninsula. The polynya is a major area for ice formation, the ice being swept north into the Trans-Polar Drift, contributing to making the Laptev Sea the most important area for ice formation and export.



MARINE MAMMALS

Walrus occurs with a resident population in the Laptev Sea. Laptev walrus is depicted as distributed in the western Laptev Sea along the east coast of the Taimyr Peninsula and Severnaya Zemlya, and in the eastern Laptev Sea from the Lena Delta to the East Siberian Islands. There is limited information on the seasonal changes in the distribution of walrus in the Laptev Sea. The size of the Laptev Sea walrus population is suggested to be 4-5,000 individuals.

Ringed seal and bearded seal are widely distributed in the Laptev Sea and presumably use the polynyas during winter. The densities of ringed and bearded seals in the Laptev Sea are not known. While the size of their potential habitats may be large, including vast areas of fast ice, polynyas and shallow waters, their densities may in fact be on the low side. This is suggested by a relatively low abundance of polar bears that have ringed seals in particular as their main prey.

Beluga whale occurs regularly in fairly high abundance in the western Laptev Sea during summer. These animals belong to the Karskaya beluga population of the Barents, Kara and Laptev Seas that migrate into the northwestern Laptev Sea. The belugas migrate into the Laptev Sea mainly north of the Severnaya Zemlya and may leave in the autumn through the Vilkitskyi Strait between the mainland and this island group. Few belugas migrate into the eastern Laptev Sea. There is some uncertainty as to whether belugas winter in the Laptev Sea and what the stock structure of the Karskaya population is.

Narwhal occurs in the northern Barents and Kara seas with most observations made in the area of Franz Joseph Land. Their range extends into the northern Laptev Sea.

Polar bear occurs in the area with animals from the Laptev Sea subpopulation. The distribution area for this subpopulation includes the western half of the East Siberian Sea and most of the Laptev Sea, including the New Siberian Islands and probably the Severnaya Zemlya archipelago. Records and aerial surveys have found polar bears to be most frequent in the western Laptev Sea off Severnaya Zemlya and eastern Taimyr with fewer registrations in the central and eastern part of the sea.

Polar bears in the Russian Arctic have been found to be associated mainly with newly formed active ice with deformations and are seen less frequently on fast ice and rarely on heavy multiyear ice. In the Laptev Sea, the highest densities of polar bears have been found in the zone beyond shorefast ice near Severnaya Zemlya, along northern and northeastern Taimyr Peninsula, and north of the New Siberian Islands. When the ice retreats north in summer, often beyond the shelf edge, some polar bears come ashore to spend the ice-free period on the New Siberian Islands which play an important role as a seasonal terrestrial habitat for polar bears.

Maternity dens have been found on the New Siberian Islands and on Severnaya Zemlya as well as on the mainland coast. The density of polar bears in the Laptev Sea has been found to be lower than the density in the Barents and Kara seas. Based on the possible number of denning bears and the observed densities, the Laptev Sea polar bear subpopulation was suggested to be 800–1,200 polar bears. This estimate is uncertain and should be regarded as preliminary. Reported harvest activities in this subpopulation are limited to defence kills and current levels of harvest are not thought to be having a detrimental impact on the subpopulation.





FISH

The fish fauna in the Laptev Sea ecosystem includes a wide range of ecological types with occurrence of freshwater, brackish water, euryhaline and marine species. Anadromous coregonid whitefish constitute an important element in the coastal brackish waters of the southern and eastern areas during summer. Arctic cisco, least cisco, muksun and broad whitefish are common and often abundant species. The larger coregonid species is also common. The wide spread of brackish water allows these species to migrate far north in the eastern Laptev Sea during summer. Arctic char occur in the area and migrates between the sea and the rivers to reproduce. Chum salmon extends its distribution west to the Lena River.

Polar cod is the most important marine fish species in the Laptev Sea. They feed in the open parts of the sea and winter and spawn in the coastal zone. In addition to the local stock, polar cod from the Barents-Kara Seas stock may extend their feeding migration from the northern Kara Sea into the western Laptev Sea. Arctic cod is probably important in the northern Laptev Sea but little information about this species is available from this area.

Several small demersal species of the fish families typical of the high arctic shelf and slope environments, including eelpouts, sea snails, sculpins and others, occur on the Laptev shelf and slope. Arctic fourhorn sculpin is common, as is the arctic flounder. There are limited investigations on the fish fauna from the outer Laptev shelf and slope.



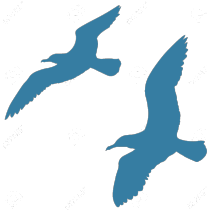
SHOREBIRDS

The lowlying coasts of the Laptev Sea with extensive estuaries and wetlands offer habitats for a large number of shorebirds. The extensive Laptev Delta is a major area for shorebirds as are the Yana Delta to the east and the deltas of Anabar and Olenjok rivers to the west.

Twenty-two species are regular inhabitants of the mainland coast of Yakutia. The species here are largely the same as those found in the Kara Sea region. A few of the species of the Kara Sea area have their eastern boundary in the Taimyr region (purple sandpiper, great snipe), or extend the breeding range into the western part of the Laptev region (Eurasian golden plover). Two eastern species appear in the area east of Yana where they are common: sharp-tailed sandpiper and long-billed dowitcher. For a number of species there is a shift in the occurrence of subspecies in the Laptev region (bar-tailed godwit, whimbrel, red knot, sanderling, and dunlin).

Most of the shorebirds breed on adjacent tundra and limited numbers breed in coastal habitats along shorelines. However, as is the common pattern in the Arctic, many wader species appear at lowland shores of the Laptev Sea as soon as the summer seaward migration commences in mid-June. The coastal zone is a main habitat for feeding in the post-breeding period and for staging for several species prior to the southward autumn migration. Many of the shorebird species of the Laptev region follow flyways south across the continent to wintering areas in southern Asia. The most numerous species on the mainland coast in the Laptev Sea are red phalarope, little stint, dunlin, and pectoral sandpiper. Fewer species are found on the New Siberian Islands and here the common species are ruddy turnstone, red knot, sanderling, red phalarope and little stint. Red knot and sanderling are the northernmost of the shorebird species in the Laptev region and do not occur on the mainland tundra.





SEABIRDS

Seabirds inhabiting the Laptev Sea are typical for the mid-Siberian Arctic, located away from the direct influence of both the Atlantic and the Pacific. The species composition is limited and the numbers of individuals are relatively low, though higher than in the Kara Sea LME. About 13 species of seabirds breed at the Laptev Sea coasts. These include 3 auks (thick-billed murre, dovekie, black guillemot), 6 species of gulls (black-legged kittiwake, Ross's, ivory, Sabine's, glaucous and Vega gulls), Arctic tern, and 3 species of skuas (Pomarine, Arctic and long-tailed).

Colonies of cliff-breeding seabirds (auks and kittiwakes) are found in the northwestern portion of the Laptev Sea LME on the high-Arctic Severnaya Zemlya archipelago and East Taimyr, and on the New Siberian Islands in the northeastern part. Three species form the core population of the seabird colonies: black-legged kittiwake, thick-billed murre, and dovekie. The largest colonies are associated with the Great Siberian Polynya, while abundant nesting colonies are also situated along the eastern coast of Severnaya Zemlya in proximity to the shelf break and East Severozemelskaya Polynya. The polynyas are used as spring staging areas prior to the birds occupying the breeding colonies and also for feeding in the early part of the breeding season.

Since Taimyr and, further to the north, the islands of Severnaya Zemlya, are considered a natural barrier of the so-called 'Enisey meridional zoogeographical Palaeoarctic border', the Laptev Sea appears to be a zone where Atlantic and Pacific subspecies or races and/or flyway populations meet. Several species bound to either the Atlantic or the Pacific have the limits of their ranges here. This is the case not only for seabirds but also for waterfowl (geese and ducks) and shorebirds.

Due to severe climatic conditions, the Laptev Sea does not support any significant wintering bird populations. Seabirds inhabiting the Siberian shelf seas are largely migratory birds.



WATERFOWL

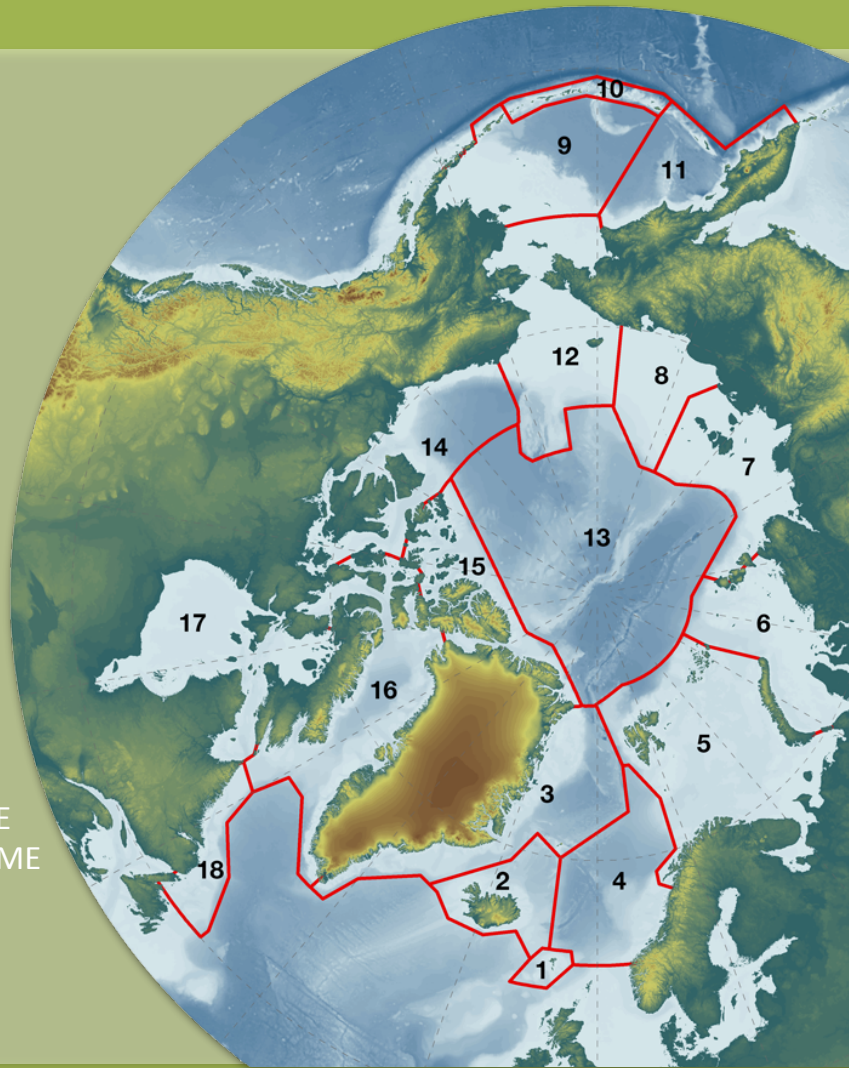
The low-lying southern coast of the Laptev Sea has large floodplains, estuaries, tundra and other wetlands that are important habitats for waterfowl. This is particularly the case for the very large Lena Delta, but the deltas and estuaries of the other main rivers (Khatanga, Anabar, Olejnek, and Yana) are also important. The New Siberian Islands (at the boundary to the East Siberian Sea LME) also contain substantial waterfowl habitats, while Severnaya Zemlya (at the boundary to the Kara Sea LME) and the eastern Taimyr have more rugged and ice-bound coasts with less favorable waterfowl habitats.

Three species of geese (brent, greater white-fronted, bean), around 12 species of ducks, and 3 species of divers (red-throated, black-throated, white-billed) occur commonly or regularly in this LME. The ducks include 7 sea duck species: all four eiders (common, king, spectacled, Steller's), long-tailed duck, and black and white-winged scoters. Northern pintail is the most common dabbling duck, and other species in this group are Eurasian wigeon, common teal, and Baikal teal. The diving duck greater scaup also occurs in this area.



ARCTIC LMEs

1. Faroe Plateau 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



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Acknowledgements

PAME gratefully acknowledges the financial support provided to this project by the Nordic Council of Ministers and the OAK Foundation.



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