

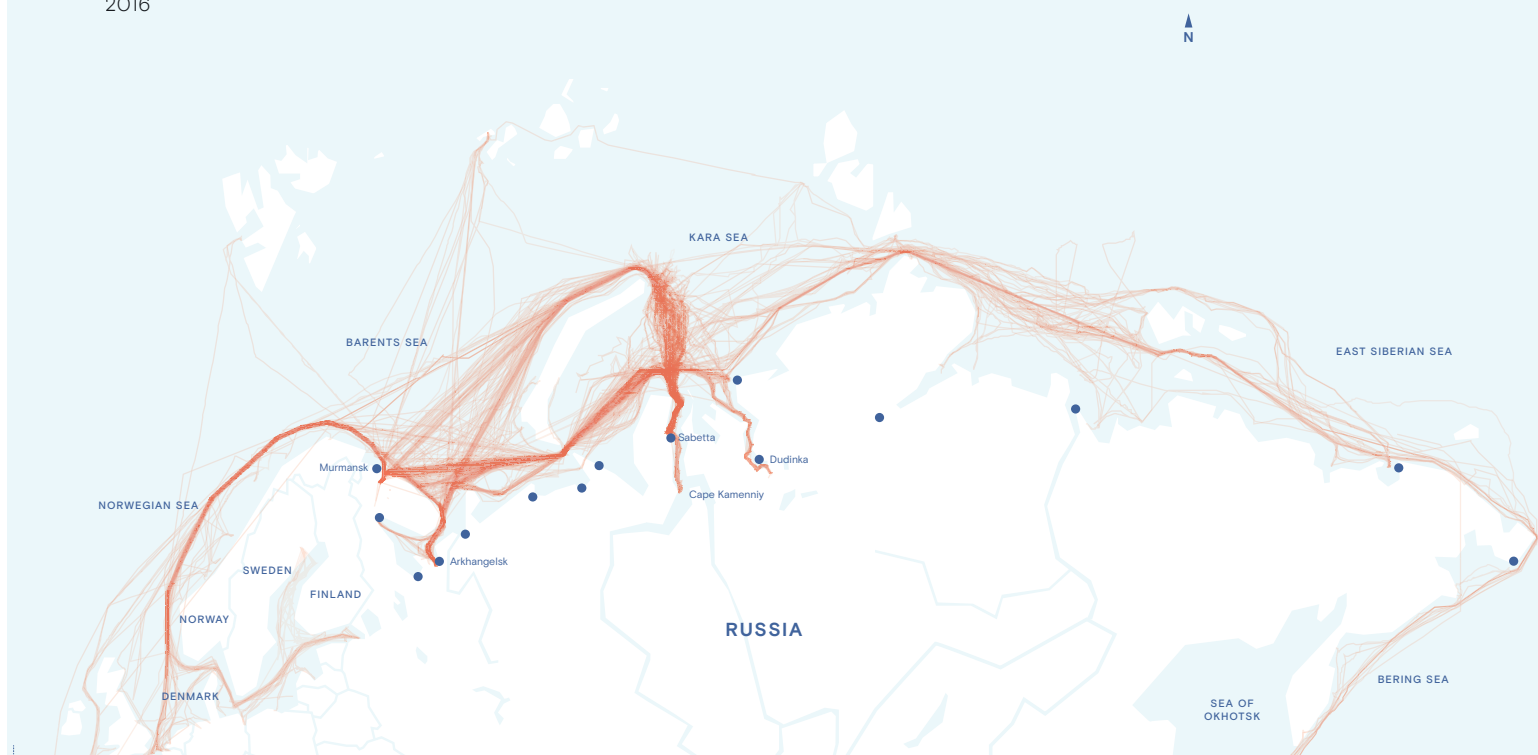
Maritime activity on the Northern Sea Route.

(06) —————

*Maritime Transportation
in the North*

Shipping lanes of vessels on the Northern Sea Route in 2016 mapped from satellite AIS data

2016



Source: Center For High North Logistics

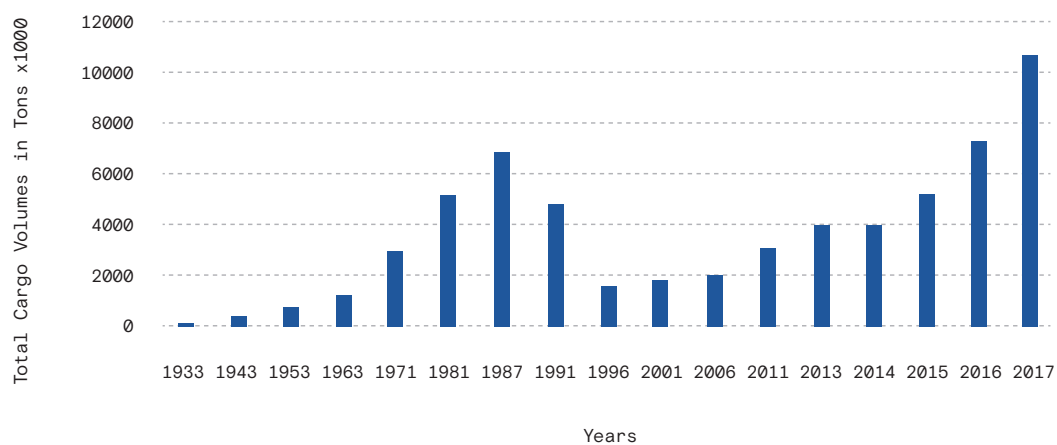
297 vessels
1705 separate voyages
7 479 000 tons total cargo
214 000 tons cargo in transit sailings

The most active area:

Traffic between ports of Murmansk and Arkhangelsk to Sabetta Port and the Arctic Gate Terminal at Cape Kamenny and the port of Dudinka.

Total cargo volumes on the Northern Sea Route

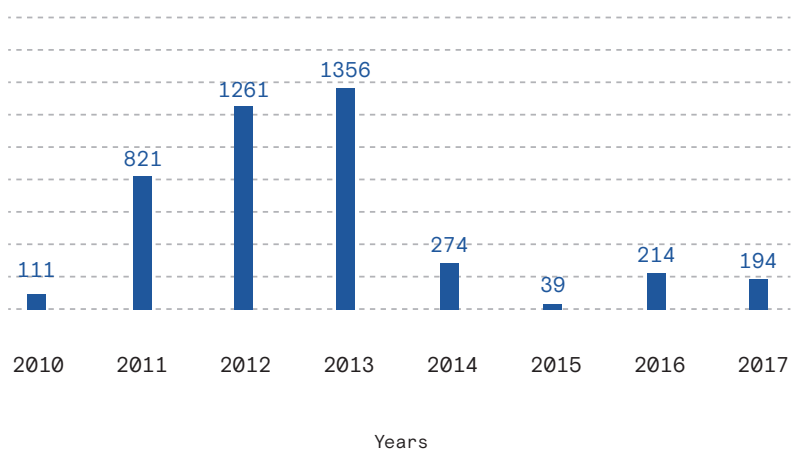
1933-2017



Source: Northern Sea Route Administration

Transit cargo via the Northern Sea Route ×1000 tons

2010-2017



Source: Northern Sea Route Administration and Rosatomflot

Section (06)

Maritime Transportation in the North

In this chapter, the focus is on maritime activity on the Northern Sea Route (NSR) the water area off the north coast of Russia – an area extending from Novaya Zemlya in the west to the Bering Strait in the east and outwards to the limits of Russia's Exclusive Economic Zone (EEZ).



Murmansk, base of Rosatomflot;
photo: Valery Vasilevsky

Russia regulates all traffic on the NSR, which is an integral part of the Northeast Passage, a shortcut between NW Europe and NE Asia through the Arctic Ocean. This chapter only addresses shipping traffic to and from the NSR, and within the NSR Water Area. We provide statistical data on current traffic development on the NSR relevant for the BIN area – for businesses, policy-makers and other stakeholders.

Major findings:

- The numbers of vessels working within the borders of the NSR in 2016 and 2017 were 297 and 283, making a total of 1,705 voyages in 2016 and 1,908 in 2017.
- The south-western part of the Kara Sea had the highest traffic density on the NSR in the period 2016-2017.
- Altogether 129 shipping companies were operating on the NSR in 2016; 75 were Russian companies and 54 non-Russian. The largest number of non-Russian shipping companies operating on the NSR in 2017 were Norwegian, with 11 vessels making 92 separate voyages.
- In 2017, 83 vessels belonged to the general cargo category, followed by 51 tankers, 28 tugboats, 20 research vessels, and 19 heavy load carriers.
- Internal Russian traffic (cabotage) and destination traffic between Russian ports and non-Russian ports are the most common means of transport on the NSR. The total volume of cargo transported along the NSR in 2016 was 7.5 million tons and 10.5 million tons in 2017.
- The main driver of increased shipping on the NSR will continue to be exploitation and transport of natural resources out of the Arctic to markets in Europe and NE Asia.

Background information on the Northern Sea Route

Future Arctic development will be dependent on efficient and innovative Arctic logistics – largely based on maritime transportation. This implies that Arctic development in general is heavily dependent on the development of the NSR as a reliable transport and trade route. In this capacity the NSR could act as a catalyst for value-creation and innovative industrial development throughout the Eurasian Arctic area.

Maritime transport via the NSR is also the only delivery route for natural resources originating in the remote Arctic regions with no pipelines, roadways or railway infrastructure. Cargoes for export from the Arctic will remain the driving force for the development of shipping on the NSR. In the future, oil, gas (LNG), coal, various ores and minerals, fish and timber products will continue to be the main cargoes to be transported from the Russian Arctic. The transport of cargo and construction materials for large-scale Arctic port and energy projects (e.g. the Port of Sabetta and the Yamal LNG in the Ob Bay) is also significant, as is transport of goods and supplies between Arctic ports. Additionally, cruise tourism is likely to increase in the coming years in the Barents Sea, White Sea and Pechora Sea.

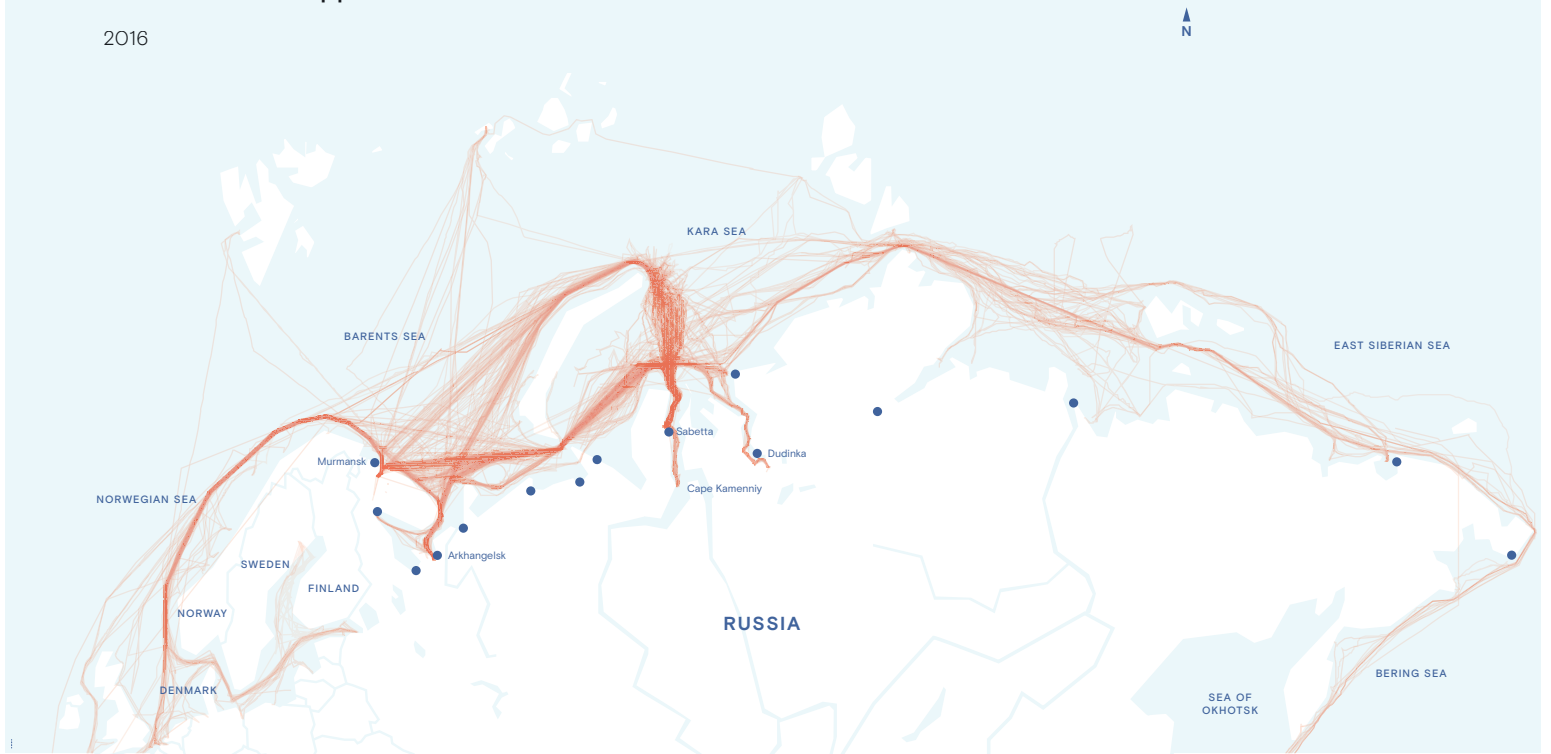
Due to the opening of the NSR, the Eurasian Arctic has changed from having a distance disadvantage to having a transport advantage to the fast growing markets in NE Asia. This development is now more realistic than before due to the reduction in sea-ice (in both areal extent and thickness), particularly during the 5 months of the summer-to-autumn navigating season (July–November), technological developments (high ice-class vessels and innovative icebreaking technologies) and interest from Russia and other Arctic States as well as from countries in NE Asia. However, several challenges still exist, not the least the presence of sea-ice cover along the entire route during the remaining months of the year and commonly difficult ice conditions in the eastern part of the NSR. Other factors include the need for ice-strengthened vessels, winterization of vessels during the winter months and the need for special crew training to operate vessels under harsh Arctic conditions, and the remoteness from developed areas.

In the past the development of the NSR as a transport route was linked to the industrialization of Siberia in the Soviet era. The NSR was an important part of the transport system that included inland waterways and the Trans-Siberian railway. Shipping volumes on the NSR increased and peaked in 1987 (6.6 million tons) but declined sharply with the dissolution of the Soviet Union (about 1.7 million in 1996). The route was opened to non-Russian flagged ships in 1991. Transport volumes on the NSR started to increase again in 2010 and reached a record high in 2016 with 7.5 million tons and 10.5 million tons in 2017. Russian officials predict cargo volumes on the NSR as high as 80 million tons per year by 2030 due to transport of natural resources, or an eight-fold increase over 2017.

Figure 1

Shipping lanes of vessels on the Northern Sea Route in 2016 mapped from satellite AIS data

2016



Source: Centre for High North Logistics (CHNL)

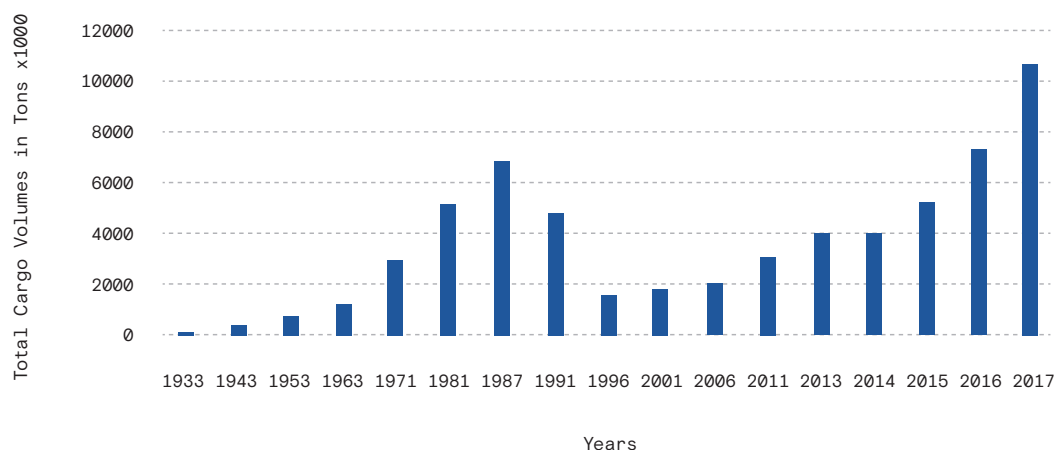
Transit sailings (sailing through both the western and eastern borders of the NSR) on the NSR during the summer-autumn season increased between 2010 and 2013 from 0.1 million tons in 2010 to 1.35 million tons in 2013 but fell sharply in 2014 to 0.24 million tons. Subsequent transit cargo figures for 2015 were 0.04 million tons, 0.21 million tons in 2016 and 0.19 million tons in 2017. This decline in transits coincided with a sharp drop in the price of bunker fuel on the world market in 2014; a general economic downturn and unfavourable freight rates; geopolitical tensions and EU-USA sanctions against Russia (during the Ukrainian crisis and the situation with Crimea); and limited icebreaker assistance to escort transiting vessels. The last point was due to Russia's increased focus on the development of new port infrastructure at Sabetta Port on the Ob Bay and new energy projects at Yamal LNG and Arctic Gate Oil Terminal, requiring year-round assistance from Russia's own Arctic icebreakers. These events made transit shipping between NE Asia and NW Europe via the NSR less attractive as savings in the fuel costs compared to the Suez Route became insignificant due the large drop in the price of bunker fuel, exacerbated by reduced price differences for commodities between Asian and Western markets.

The main advantage of using the NSR as a transit route is the reduction in the transport distance (30–50%) and sailing time (14–20 days) between ports in Northern Scandinavia/NW Europe and NE Asia compared to the traditional southern route through the Suez Canal. This can lead to substantial cost savings during the summer-autumn season (July–November) when sea-ice conditions are most favourable on the NSR. This advantage depends on the location of the departure and receiving ports. The more ports are located to the north the greater the distance advantage of the NSR. Besides the reduction in sailing distance, the existence of an additional transport route is also important.

Figure 2

Total Cargo Volumes on the Northern Sea Route

1933-2017



Source: Northern Sea Route Administration

However, the NSR is no alternative to the Suez Route and will not significantly affect the existing schemes of general cargo delivery via traditional routes, with 16,833 vessels passing through the Suez Canal in 2016 transporting 974 million tons of cargo. Rather, the NSR's future significance lies in its role as a transport corridor along the Eurasian Arctic Coast and between the Eurasian Arctic and port destinations and markets in the Atlantic and Pacific.

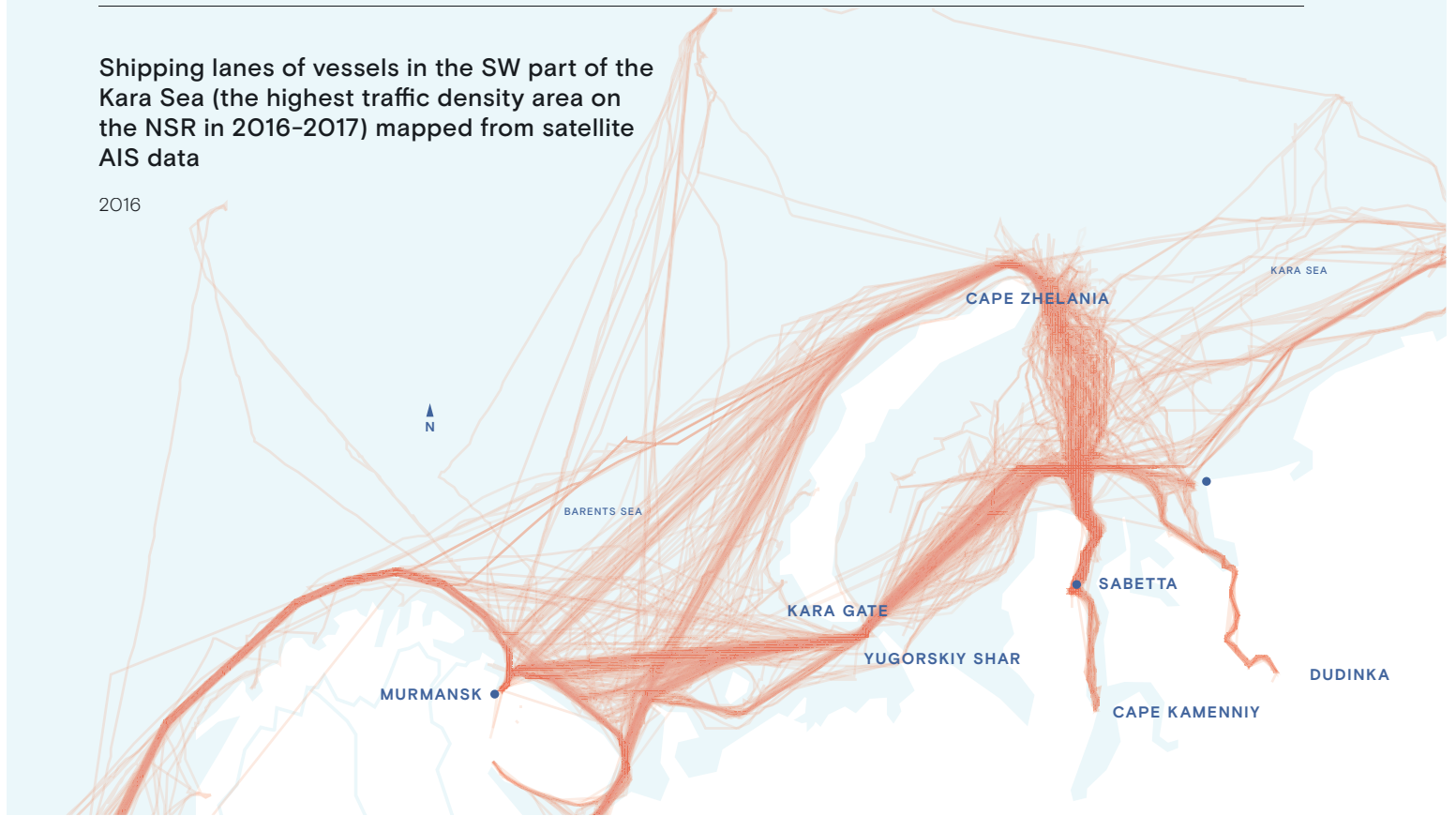
For the NSR to achieve its full potential, also as a transit route, a number of changes need to take place in the coming years and decades to improve the route's overall safety, reliability, services and attractiveness for ship owners and cargo owners. Further development of essential transportation and logistics infrastructure is needed, including more icebreakers for escorting vessels; a fleet of specialized high ice-class Arctic shuttles; improved search and rescue capacity; oil spill preparedness and response; environmental protection measures; communication systems, hydrographic surveying and navigational aids; and better forecasting of sea ice conditions. These measures together with modernization of Russian Arctic ports will take time and require large investments.

Continued development of Arctic resources through new Arctic energy and mining projects is seen as a prerequisite for future investments in the maritime transport and logistics infrastructure needed along the NSR, at least in the short to medium-term. Also important and requiring still further investments is the intermodal connectivity between the NSR and other modes of transport, namely river transport, railways, roadways and aviation facilities. China wants to secure its interests in future Eurasian Arctic economic development and diversify its transportation options to Europe by taking an active role in infrastructure development on the NSR through its Belt & Road Initiative. The same applies to South-Korea and Japan.

Figure 3

Shipping lanes of vessels in the SW part of the Kara Sea (the highest traffic density area on the NSR in 2016–2017) mapped from satellite AIS data

2016



Source: Centre for High North Logistics (CHNL)

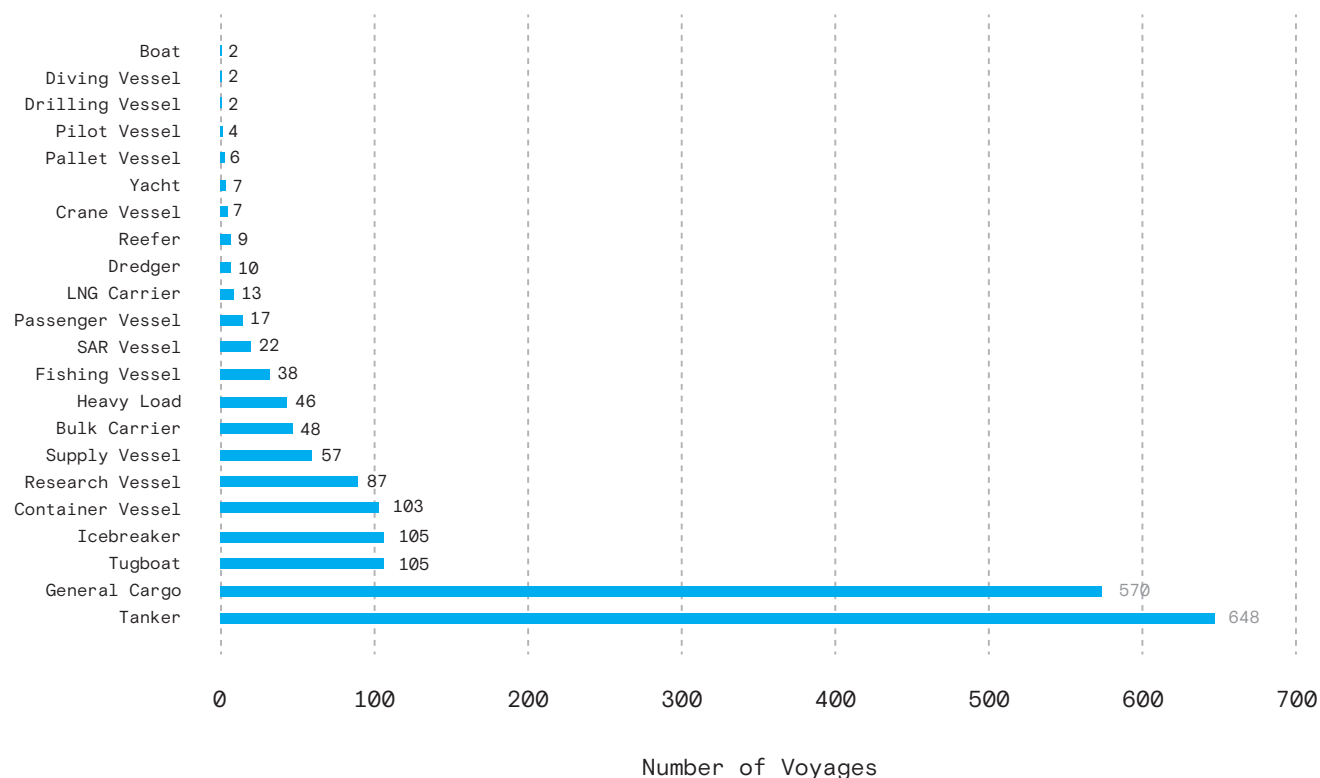
All together 1,705 separate voyages took place on the NSR in 2016 by 297 vessels. This number increased to 1,908 voyages in 2017 by 283 vessels. The SW part of the Kara Sea had the highest traffic density on the NSR in 2016–2017.

The three most active areas of navigation within the NSR in 2016 were Sabetta Port (33% of all voyages) and the Arctic Gate Terminal at Cape Kamenniy on the Ob Bay (16%), and the Port of Dudinka on the Yenisey River (11%). Shipping between these three locations and the ports of Murmansk and Archangelsk stood out as the main traffic routes. Altogether 596 separate voyages took place into the Kara Sea during 2016, compared to 89 into the Laptev Sea, 73 into the East Siberian Sea, and 22 into the Chukchi Sea.

Figure 4

Types of vessels operating on the Northern Sea Route in 2017 and number of voyages for each

2017



Source: Centre for High North Logistics (CHNL)

Of the 283 vessels operating on the NSR in 2017, 83 belonged to the general cargo category, followed by 51 tankers, 28 tugboats, 20 research vessels, and 19 heavy load carriers. Figure 4 shows the number of voyages for each vessel type. Of these vessels 49% were less than 5,000 gross tonnage (GRT). Most of the vessels under the Russian flag were under 10,000 GRT. The NSR is currently mainly used for the transportation of relatively small cargo volumes by small capacity vessels. Only four vessels were over 50,000 GRT in 2017 but this number will increase in the next few years with the arrival of additional LNG carriers (128,800 GRT) transporting LNG from the Yamal LNG plant in the Ob Bay.

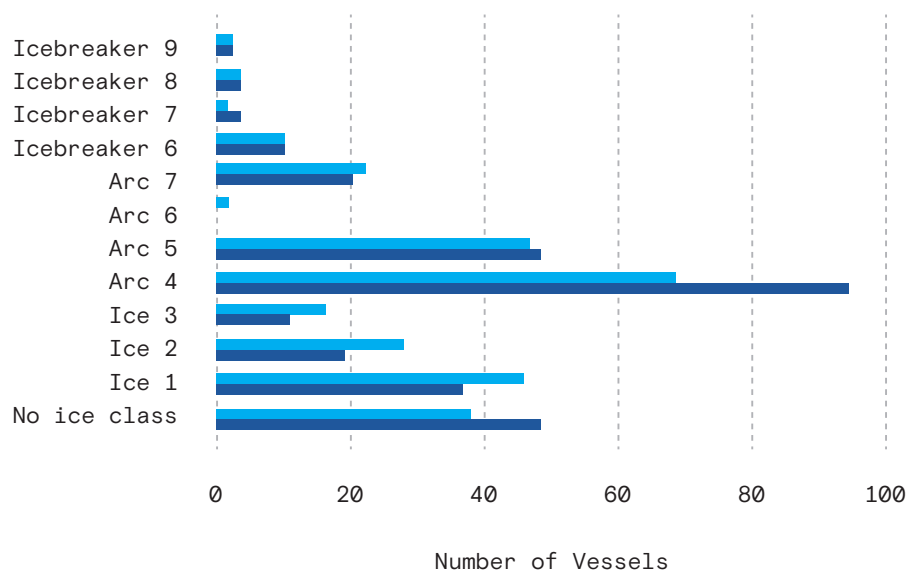
¹ The following definition of a voyage is used in this chapter: If a ship leaves a port and arrives at another port (or in another water area, e.g. for a research vessel that does not call at any port) then this is considered one voyage. When the same vessel departs from the first port or water area and returns to another port or destination then this becomes a second voyage.

Figure 5

2016 2017

The ice class of vessels on the Northern Sea Route

2016-2017



Source: Centre for High North Logistics (CHNL)

The most common ice-class displayed by vessels on the NSR in 2016-2017 was Arc4 (Russian Maritime Register of Shipping) with 95 vessels having this level of ice reinforcement in 2016 and 70 vessels in 2017. In the second place were vessels with ice-class Arc5, or 50 vessels in 2016 and 48 in 2017. Vessels with very weak ice-reinforcement, or ICE1-3, numbered 66 in 2016 and increased to 89 in 2017. A total of 49 vessels had no ice-class in 2016 and 38 in 2017.

Table 1

Number of shipping companies, vessels and voyages on the Northern Sea Route

2016-2017

2016

Country	Companies	Vessels	Voyages
Russia	75	188	1188
Netherlands	11	35	112
Germany	7	17	40
Cyprus	6	7	70
Norway	5	7	40
Luxembourg	4	12	25
Belgium	4	6	20
Greece	3	5	158
UK	3	3	10
China	2	7	13
Hong Kong*	2	2	9
South Korea	2	2	4
Japan	1	2	6
Singapore	1	1	2
Malta	1	1	2
Denmark	1	1	2
Finland	1	1	4
Total	129	297	1705

2017

Country	Companies	Vessels	Voyages
Russia	74	203	1538
Norway	8	11	92
Netherlands	7	14	52
Germany	6	15	31
China	5	12	20
UK	4	4	35
Greece	3	5	54
Denmark	3	4	18
Luxembourg	3	4	8
Cyprus	2	3	29
Hong Kong*	1	2	4
South Korea	1	1	8
Japan	1	2	6
Panama	1	1	6
Poland	1	1	2
no info	1	1	5
Total	121	283	1908

*Although Hong Kong now belongs to China it is listed separately due to its flag status.

Source: Centre for High North Logistics (CHNL)

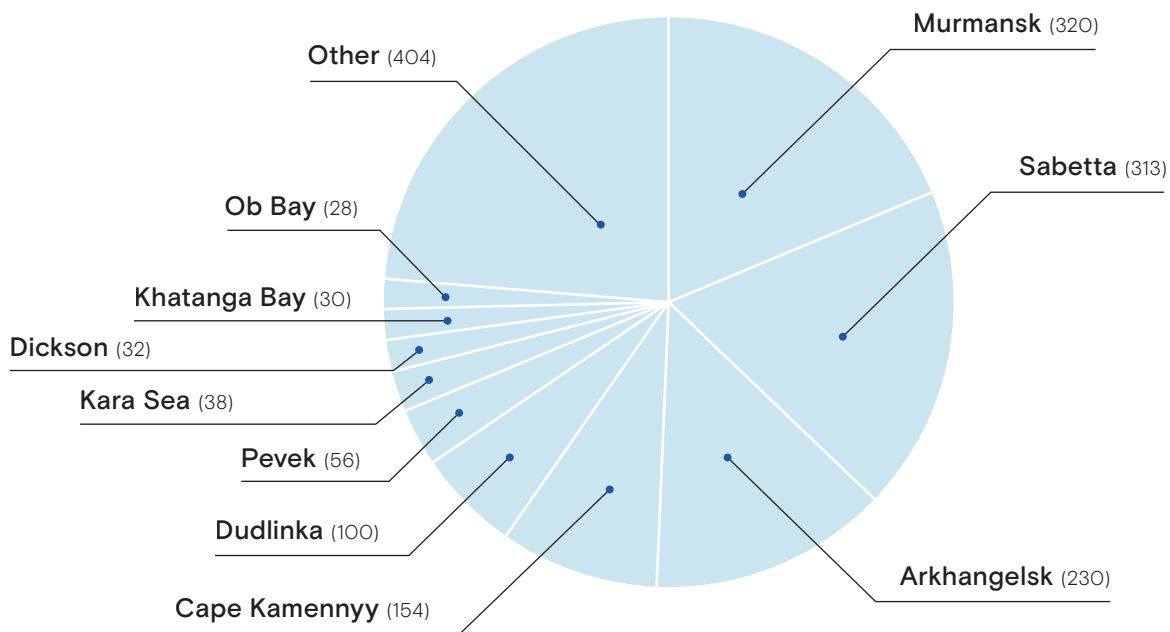
A total of 129 shipping companies were operating their vessels on the NSR in 2016; 75 were Russian companies and 54 non-Russian. In 2017 Norway had the largest number of non-Russian companies operating on the NSR with 11 vessels making 92 separate voyages.

In 2016 the largest number of voyages was made by the Murmansk Shipping Company (MSCO; 190 voyages), followed by Norilsk Nickel (175 voyages). In 2017, Sovcomflot (SCF; 175 voyages), Lena River Shipping (165 voyages) and Norilsk Nickel (162 voyages) were the most active shippers.

Figure 6

Most frequent departure ports and numbers of voyages from each port

2016



Source: Centre for High North Logistics (CHNL)

Of the 1705 voyages on the NSR in 2016, 697 originated from NSR ports to ports located outside the borders of the NSR. A total of 576 voyages originated from western Russian ports to NSR ports. The largest number of these voyages was from Murmansk (320) and Arkhangelsk (230). A total of 46 voyages were from eastern Russian ports, including Vladivostok, Provideniya, Anadyr, Petropavlovsk-Kamchatsky, and Nakhodka. A total of 251 voyages were internal transport between NSR ports.

Voyages from European ports to NSR were 59 in 2016. The countries and number of voyages included Belgium (29), Spain (9), Netherlands (3), Estonia (1), France (1), Germany (1), Finland (1), and Great Britain (1). All these voyages delivered cargo to the Sabetta Port. From Norway the main location was the Kara Sea (13 voyages); these were mainly research vessels and tugboats working during the summer- autumn period.

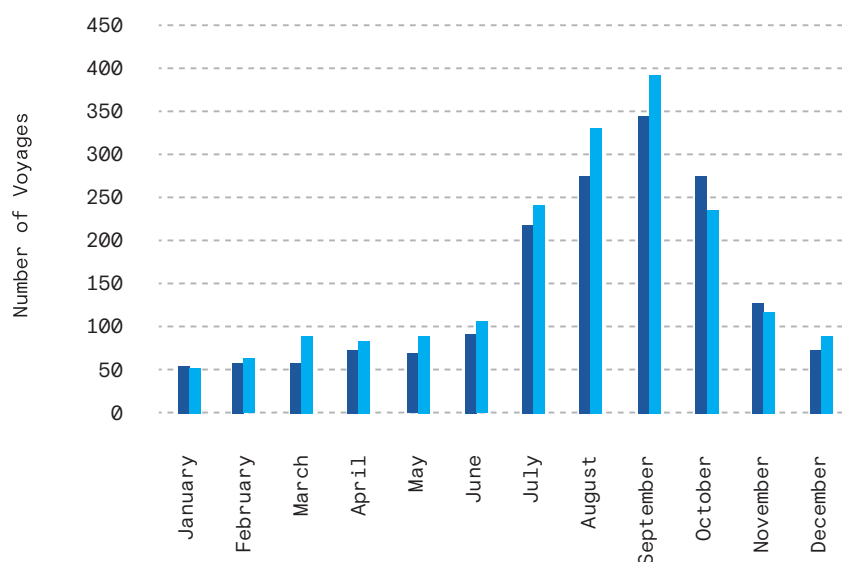
Voyages from NE Asian ports to NSR were 36 in 2016. These voyages were from China (20), South-Korea (14), and Japan (2) with NSR destination in all cases the Sabetta Port. Finally, in 2016 there were a total of 19 transit voyages and 21 voyages were between NSR and other countries or locations.

Figure 7

2016 2017

Number of voyages per month on the Northern Sea Route

2016-2017



Source: Centre for High North Logistics (CHNL)

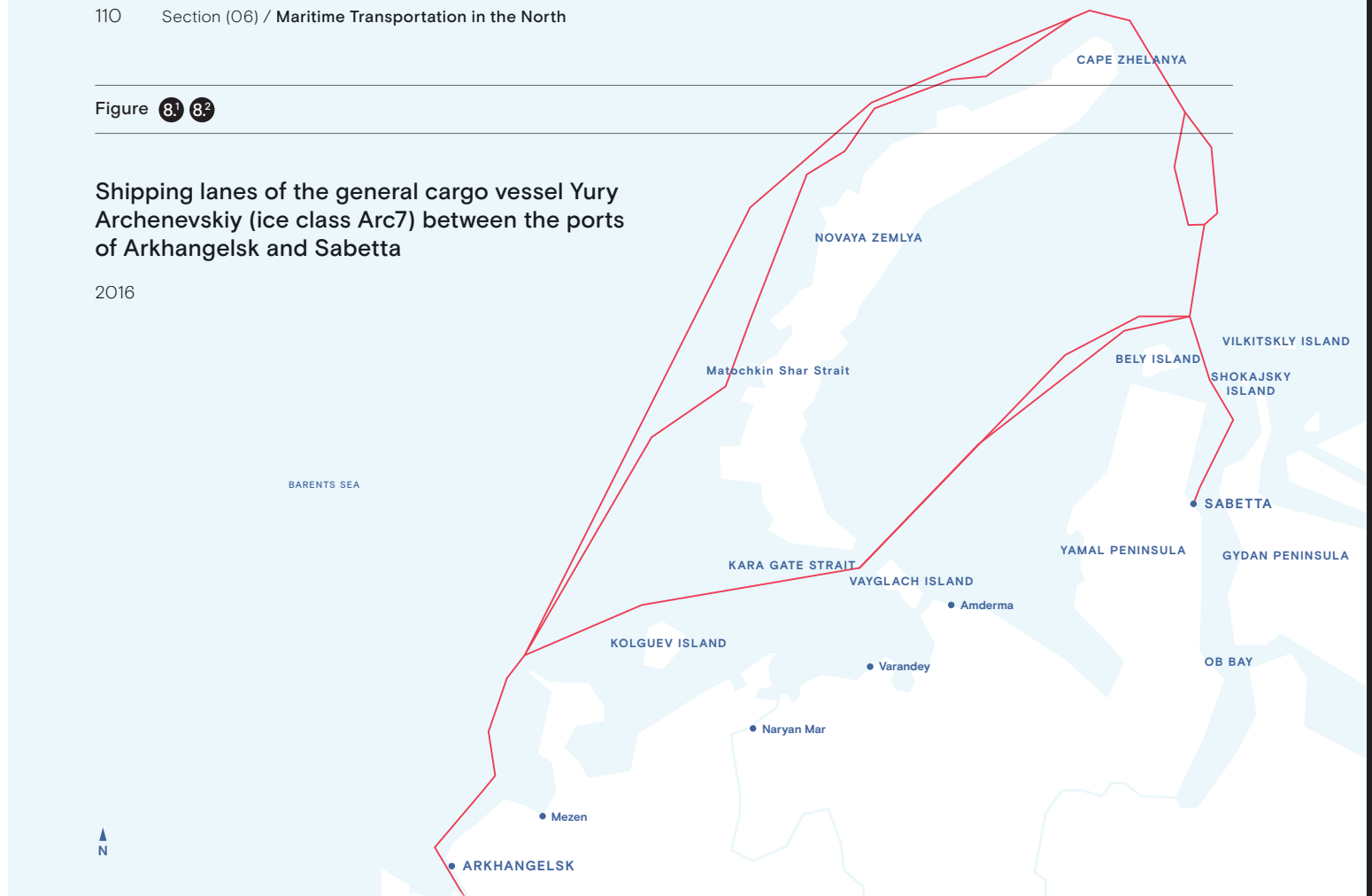
The figure shows the number of voyages on the NSR per month during 2016-2017. A total of 1,211 voyages took place during the summer-autumn season (July-November) in 2016 and 494 voyages in the winter-spring season (January-June + December). Corresponding figure for 2017 were 1,312 during the summer-autumn and 596 during the winter-spring season.

Due to yearly fluctuations in sea ice the start of the summer-autumn navigational season may vary, but in general begins in early July and extends to the end of November. During the month of September, which usually has the most favourable ice conditions, the number of voyages reached a total of 345 in 2016 and 393 in 2017. Although the figures indicate that navigation on the NSR has a pronounced seasonal character, cargo flow is increasing in the winter period in the Kara Sea as a result of year-round operations.

Figure 8.1 8.2

Shipping lanes of the general cargo vessel Yury Archenevskiy (ice class Arc7) between the ports of Arkhangelsk and Sabetta

2016



Source: Centre for High North Logistics (CHNL)

The average speed of 21 voyages in 2016 of the general cargo vessel Yuri Arshenevskiy (ice-class Arc7; 18,580 GRT) between Arkhangelsk and Sebetta was 9 knots. The vessel sailed independently during the summer-autumn season but required icebreaker assistance for parts of the route during the winter-spring season.

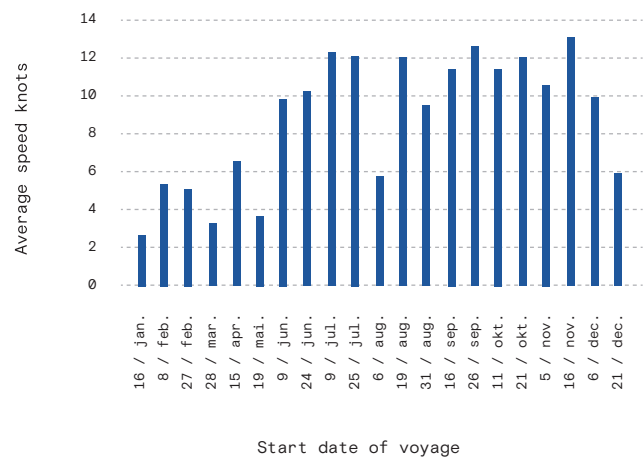
The duration of voyages between the two ports in the summer-autumn season was 4-5 days, but 10-18 days during the winter-spring season. Thus the average year-round voyage time was 7 days between Arkhangelsk and Sabetta.

In sailing between the two ports the approximate difference in travel distance passing through the Kara Gate versus Cape Zhelania is 250 nautical miles. With an average speed of 12 knots this is equal to one day saved by going through the Kara Gate rather than rounding Cape Zhelania.

The duration of the voyage and a vessel's average speed through the NSR depends on a number of different variables including sea ice conditions, the actual sailing distances, the vessel's engine power, ice class, visibility, wind strength and wind direction, and possible waiting time for icebreaker assistance.

Average voyage speed of the general cargo vessel Yury Archenevskiy between the ports of Arkhangelsk and Sabetta

2016



Source: Centre for High North Logistics (CHNL)

Challenges and findings

Implications for the BIN area

Increased commercial traffic on the NSR eastward and westward could boost regional socio-economic development in the BIN area (Northern Scandinavia and NW Russia):

- A** The NSR offers shipping companies and cargo owners the shortest trade route for imports/exports between the BIN area and the North Pacific market (USA, China, Japan, and South Korea). The proposed new railway connection between Rovaniemi in Finnish Lapland and the port of Kirkenes in northern Norway would further strengthen those trade routes. The same applies to a proposed railway connection between Arkhangelsk and the southern Urals.
- B** The NSR offers natural resource industries in the BIN area (oil, LNG, minerals, forestry products, and fisheries) the shortest route to transport raw materials or processed natural products to the rapidly growing Asian market. Arctic cruise tourism has also future growth potential.
- C** The ice-free deep-water ports in northern Norway (e.g. Kirkenes) and Murmansk on the Kola Peninsula are in a strategic location to serve as storage and transshipment hubs for various cargoes being transported along the NSR and as a location of logistics support industries. These ports lie at the western gateway of the NSR, midway between the Bering Strait in the North Pacific Ocean and Gibraltar at the entrance to the Mediterranean Sea.
- D** The shipbuilding and offshore resource extraction industries in the BIN area could further benefit from specializing in the design and construction of innovative and energy efficient ice class vessels, icebreaking technologies, mining and offshore equipment and platforms for Arctic operations, including vessel repairs and logistics services.
- E** Actors in the BIN area are in an ideal position to shape the future development of the NSR. This includes private and public investments in new transportation and logistics infrastructure with a focus on innovative, environmentally-friendly and cost-effective logistics solutions.