BALTIC ICEBREAKING MANAGEMENT

Baltic Sea Icebreaking Report 2018-2019

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1. Introduction

Baltic Icebreaking Management, BIM is an organization with members from all Baltic Sea states. BIM is a development of the annual meeting between Baltic Sea States icebreaking authorities which have assembled since 1982. The member countries of BIM are Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden.

After the difficult winter navigation season of 2002/2003 a project was started up within the framework of HELCOM, aiming at improving the safety of winter navigation in the Baltic Sea. The HELCOM recommendation 25/7 on the safety of Winter Navigation in the Baltic Sea Area was adopted in March 2004.

Within the EU concept Motorways of the Sea, which is one priority project in the trans-European network, the Baltic Sea countries established a working group with the aim of creating more efficient winter navigation by cooperation between the Baltic Sea countries. The icebreaking authorities around the Baltic Sea decided in Helsinki meeting 2004 that this work shall continue within the framework of BIM, where also non EU-member states are taking part. BIM should function all year round and its strategy should be to develop safe, reliable and efficient winter navigation between the Baltic Sea countries. The overall objective of BIM is to assure a well-functioning maritime transport system in the Baltic Sea all year round by enhancing the strategic and operational cooperation between the Baltic Sea countries within the area of assistance to winter navigation.

On 10 January 2007, the Joint Baltic web service on winter navigation www.baltice.org was launched. On 17 June 2015, a new version of the Joint Baltic web service on winter navigation was launched.

On 11 April 2007, the DVD of training in ice navigation for seafarers was launched.

On 15 November 2007, HELCOM adopted a new recommendation 28E/11 outlining further measures to improve the safety of navigation in ice conditions in the Baltic Sea; BIM was acting an “ice advisor” in this recommendation.

In 2008 the pamphlet “The World Icebreaker, Icebreaking Supply and Research Vessel Fleet” was presented and updated in 2011.

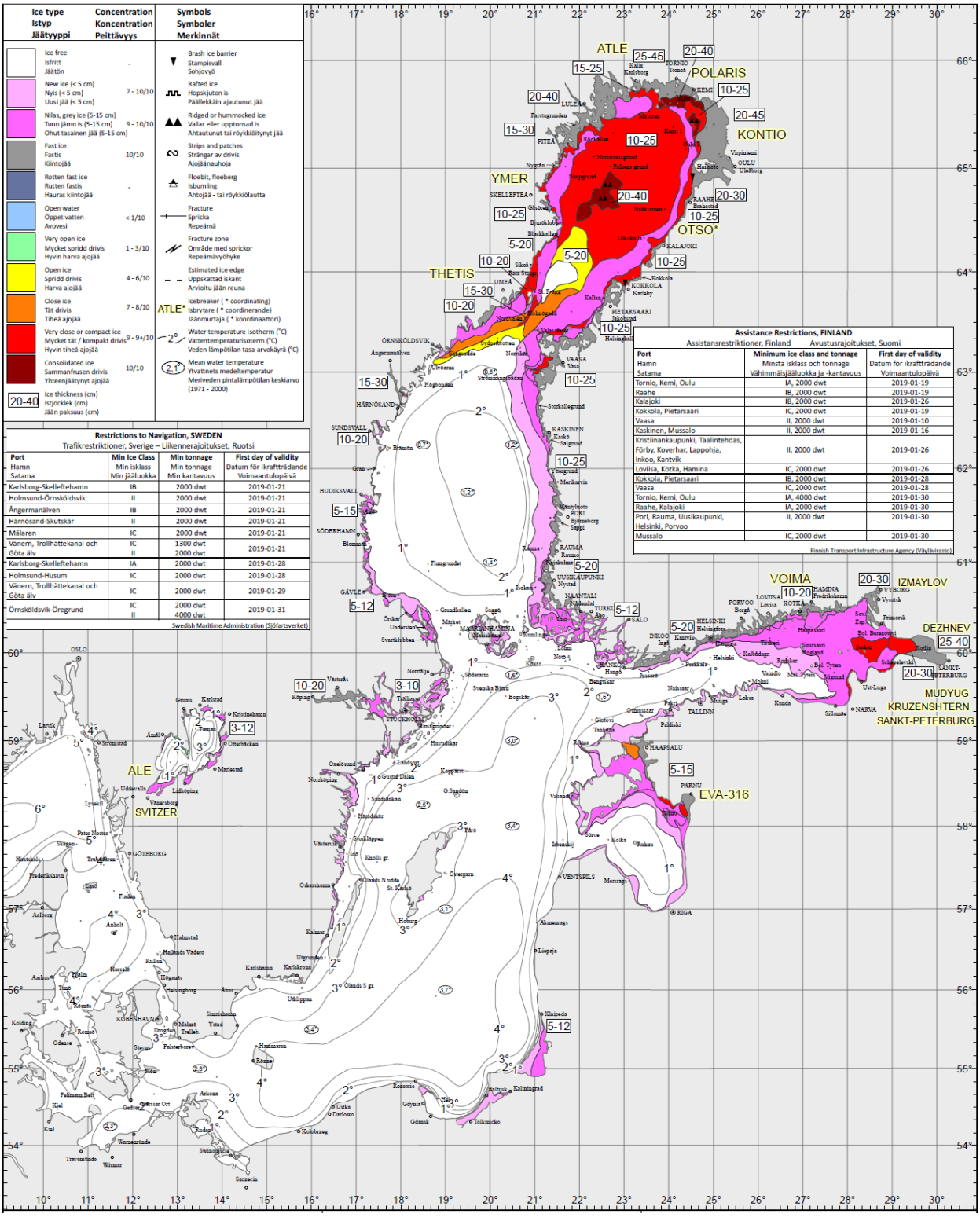
In April 2009, a computer based training program, based on the DVD, was introduced. After completing the course, the student gets a certificate over earned skills. One important task of BIM is to inform stakeholders in the maritime sector and policy makers about winter navigation and icebreaking. There is a need for information about winter navigation and icebreaking that covers the whole Baltic Sea region.

Several Baltic Sea countries prepare information about the winter navigation and icebreaking in their respective national waters. There has been a need to coordinate this country-specific information, improve the information and to distribute it to a wider target group by “Joint Annual Baltic Icebreaking Report”.

This report gives an overview of the winter navigation season 2018/2019 for the Baltic Sea area. National reports can be found on the site www.baltice.org . The report will also describe organizational changes in the icebreaking authorities or changes in icebreaking resources and provide a progress report of the Baltic Sea Icebreaking cooperation and the development of BIM.

2. Overview of the icebreaking season (2018-2019) and its effect on the maritime transport system in the Baltic Sea region

According to the Finnish Ice Service of the Finnish Meteorological Institute the Baltic Sea ice season 2018-2019 was mild. The maximum ice extent, 88 000 km², was reached on 27 January.



Restrictions to Navigation, SWEDEN
Trafikrestriktioner, Sverige – Liikennerajoitukset, Ruotsi

Port Hamn Satama	Min Ice Class Min isklass Min jääluokka	Min tonnage Min tonnage Min kantavuus	First day of validity Datum för ikraftträdande Voimaantulopäivä
Karlsborg-Skelleftehamn	IB	2000 dwt	2019-01-21
Holmsund-Örnsköldsvik	II	2000 dwt	2019-01-21
Ångermanälven	IB	2000 dwt	2019-01-21
Härnösand-Skutskär	II	2000 dwt	2019-01-21
Mälaren	IC	2000 dwt	2019-01-21
Vänern, Trollhättekanal och Göta älv	IC II	1300 dwt 2000 dwt	2019-01-21
Karlsborg-Skelleftehamn	IA	2000 dwt	2019-01-28
Holmsund-Husum	IC	2000 dwt	2019-01-28
Vänern, Trollhättekanal och Göta älv	IC	2000 dwt	2019-01-29
Örnsköldsvik-Öregrund	IC II	2000 dwt 4000 dwt	2019-01-31

Swedish Maritime Administration (Sjöfartsverket)

Assistance Restrictions, FINLAND
Assistansrestriktioner, Finland Avustusrajoitukset, Suomi

Port Hamn Satama	Minimum ice class and tonnage Minsta isklass och tonnage Vähimmäisjääluokka ja -kantavuus	First day of validity Datum för ikraftträdande Voimaantulopäivä
Tornio, Kemi, Oulu	IA, 2000 dwt	2019-01-19
Raahe	IB, 2000 dwt	2019-01-19
Kalajoki	IB, 2000 dwt	2019-01-26
Kokkola, Pietarsaari	IC, 2000 dwt	2019-01-19
Vaasa	II, 2000 dwt	2019-01-10
Kaskinen, Mussalo	II, 2000 dwt	2019-01-16
Kristiinankaupunki, Taalintehdas, Förby, Koverhar, Lappohja, Inkoo, Kantvik	II, 2000 dwt	2019-01-26
Loviisa, Kotka, Hamina	IC, 2000 dwt	2019-01-26
Kokkola, Pietarsaari	IB, 2000 dwt	2019-01-28
Vaasa	IC, 2000 dwt	2019-01-28
Tornio, Kemi, Oulu	IA, 4000 dwt	2019-01-30
Raahe, Kalajoki	IA, 2000 dwt	2019-01-30
Pori, Rauma, Uusikaupunki, Helsinki, Porvoo	II, 2000 dwt	2019-01-30
Mussalo	IC, 2000 dwt	2019-01-30

Finnish Transport Infrastructure Agency (Väylävirasto)

Figure 1. The maximum ice extent of the ice season 2018-2019 was reached on 27 January 2019.

The freezing started from inner bays of the northernmost Gulf of Bothnia already in the late October - early November. November and the first half of December were warm. In the middle of December temperatures dropped below zero and freezing continued.
The year 2019 started with storm and during that Finnish Meteorological Institute measured the new wave record, 8.1 meter significant wave height, in the Sea of Bothnia.
The beginning of January was mild, but in mid-January, cold air flowed from north to Fennoscandia. At the end of January the cold continued and the ice area grew rapidly. On January 27, the extent of the ice cover was 88,000 km², which was then the maximum of the winter. Winter is classified as mild according to the ice extent, but the moving ice field often hampered winter traffic and so winter was not easy.

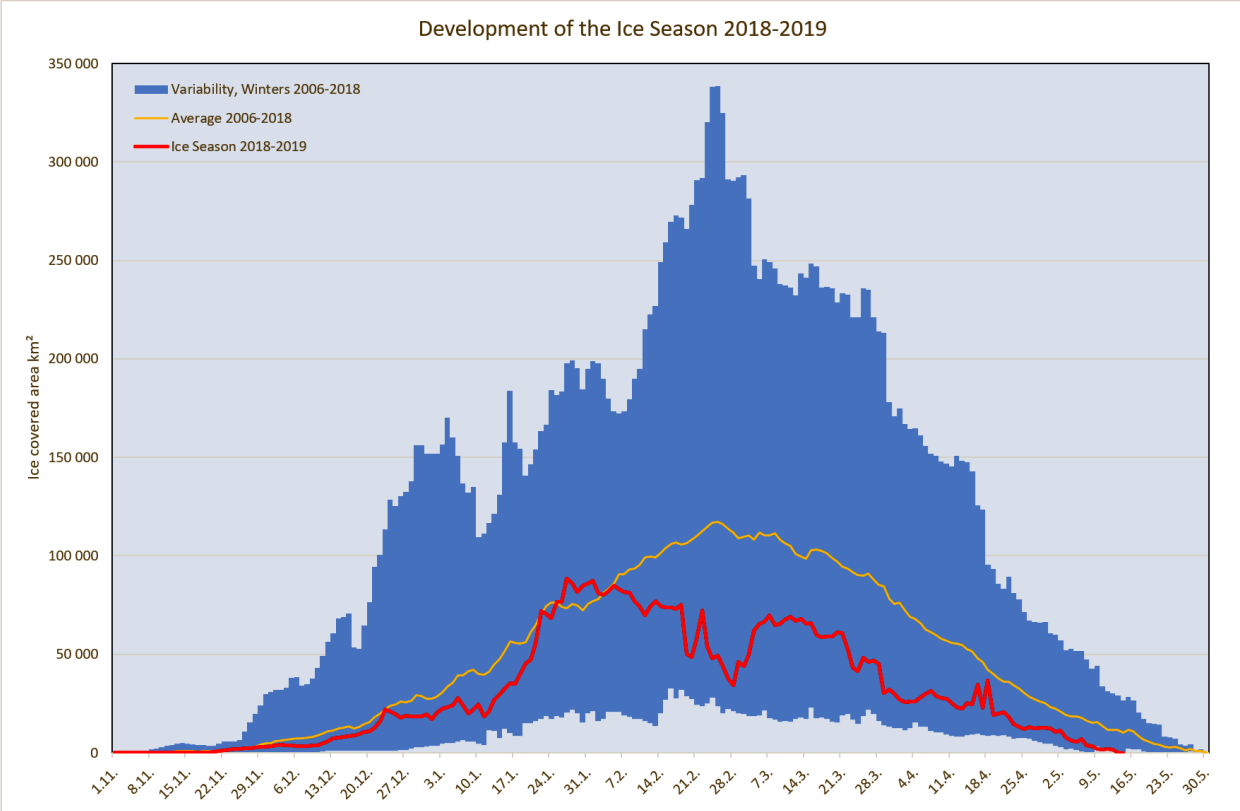


Figure 2. The development of ice season 2018-2019 compared to seasons 2006-2018.

February was just over two to five degrees warmer than our average in our seas and in the end of February the ice extent was only 34 000 km².
At the beginning of March, northern Europe was part of a cool polar air mass, and the ice area began to expand, reaching 70,000 km² on 7th. During the following week the ice area remained between 65,000 km² and 70,000 km². After that the low pressures and the spring began to reduce the area. At the end of March, the ice extent was 30,000 km².
April was warmer than usual and ice melting accelerated. At the end of April the extent of ice was 12 000 km². May was warmer than average and the Baltic Sea was ice free on 14 May.
The maximum thickness of fast ice was 35-80 cm in the Bay of Bothnia, 20-45 cm in the Sea of Bothnia and 15-45 cm in the Gulf of Finland. The thickness of pelagic ice was 10-50 cm in the Bay of Bothnia and 25-35 cm in the Gulf of Finland.

Ice conditions in the eastern part of the Gulf of Finland in 2018-2019

In general, the ice situation in the eastern part of the Gulf of Finland developed in the type of mild winter. Ice formation in the coastal shallow zone of the eastern part of the Gulf of Finland began in the first decade of December. At the same time, the appearance of nilas ice in the waters of the Neva Bay and in the northern part of the Vyborg Bay was noted.

In the first decade of January, moderately cold weather established in the waters of the Gulf of Finland. Night temperatures in some areas reached - 15 degrees, daytime temperatures were observed in the range from 5 to 10 degrees below zero. The temperature background contributed to the gradual increase of the ice cover. By mid-January, the areas of the Neva Bay and the Vyborg Bay was covered with very cohesive ice with thickness from 10 to 25 cm. A fast ice with thickness of 20-30 cm was formed in the coastal part of the Neva Bay and in the northern part of the Vyborg Bay. By the end of January, the ice situation became more complicated. Very cohesive ice thickness of 10-20 cm spread to the island Gogland. In the waters of the Neva Bay, Vyborg Bay and in the port of Primorsk, was fast ice with thick 30-40 cm.
February was the warmest winter month. The average temperatures of the month were - 2 - 4 degrees. There were frequent thaws. In the first and second decades, the southern wind prevailed, and therefore the most difficult ice conditions developed on the approaches to the Vyborg gulf, as well as to the seaports of Primorsk and the Big Port of St. Petersburg. The port of Ust-Luga and the approaches to it were free from the ice. At the end of the month, under the influence of the north-western winds, the ice situation on the approaches to the seaport Big Port of St. Petersburg became complicated. The edge of very cohesive ice was in the area of the buoy number 11 of the Great Ship Fairway. In the area of the receiving buoy with westerly winds, there was a strong compression and hummocking of the ice. The vessels proceeded under the icebreaker assistance. In the water area of the port of Ust-Luga, very cohesive ice was observed with a thickness of 20-35 cm. The southern part of the Vyborg Bay and the water area of the port of Primorsk was free of ice.
In March, the air temperatures were close to the average long-term values. Intensive ice formation was not observed. However, under the influence of winds of various directions, ice cover drifted, which greatly hampered navigation. In the second half of the month, the process of ice melting began. By the end of March, the water area of the port of Ust-Luga was cleared of ice. The ice situation in the port of Primorsk and on the approaches to the Vyborg Bay improved.
In April, the destruction of the ice cover began to occur more intensively. By April 10, the water area of the Neva Bay was cleared of ice. Vessels to the seaports Big Port of St. Petersburg, Primorsk and Ust-Luga began to go on their own without escorting by icebreakers. On April 19, the period of icebreaker assistance was completed in all Russian ports of the Baltic Sea.

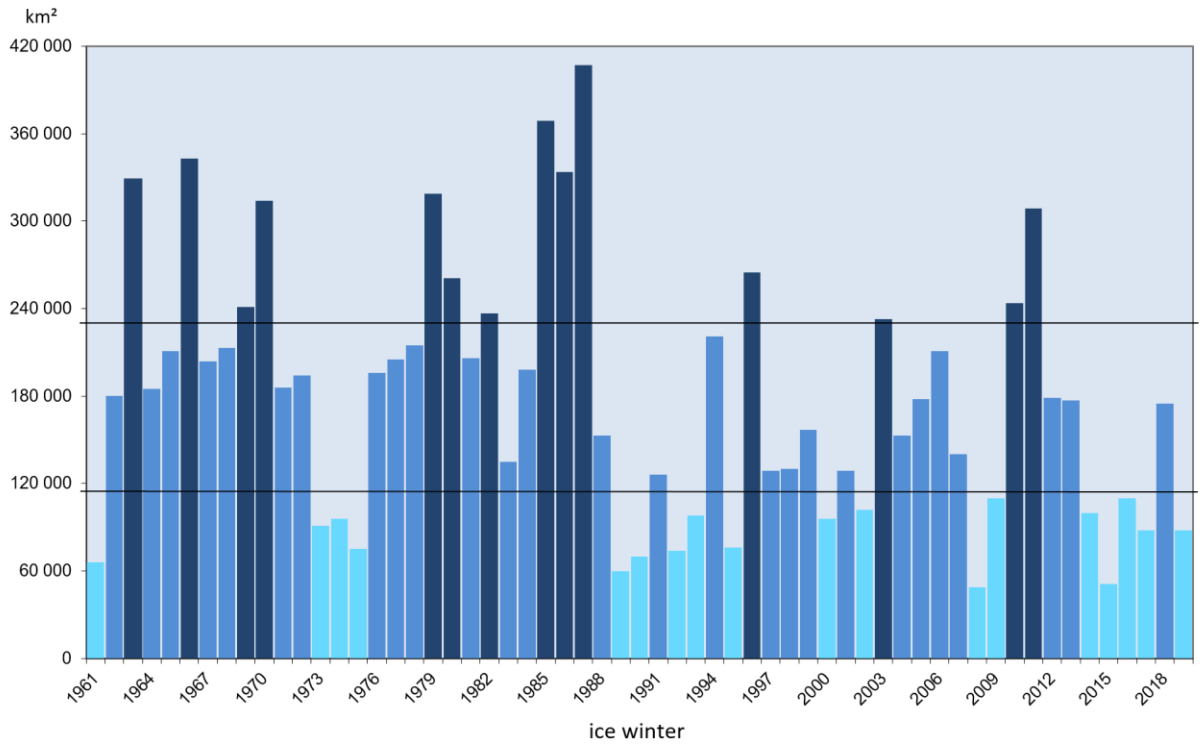


Figure 3. The maximum ice coverage in ice winters 1961-2019. The average of 1961-2011 (51 years) is 187 000 km². Severities of the season are indicated using colours from mild to severe (lightest blue to darkest blue respectively).

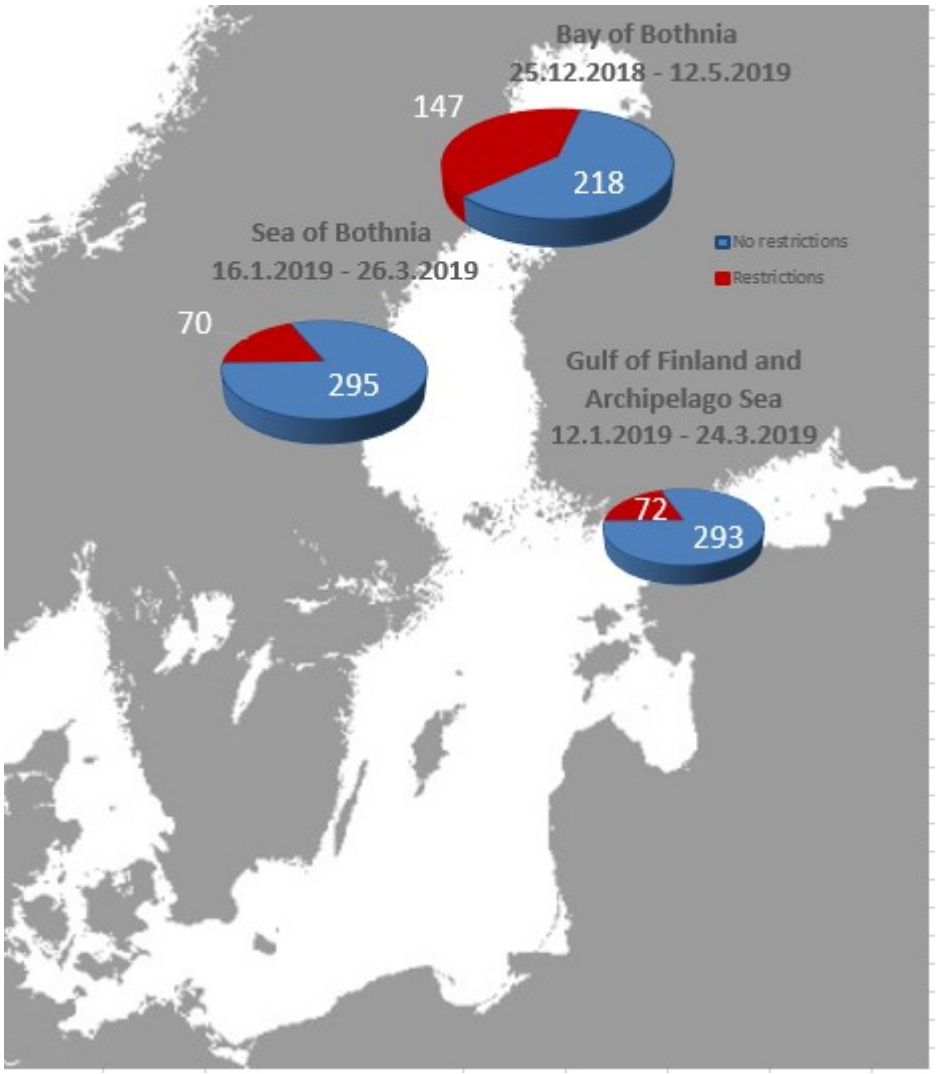


Figure 4. Number of days when traffic restrictions were in force in the different sea areas (Only Finland).

For safety reasons, the Baltic Sea countries have agreed within HELCOM on a joint policy when traffic restrictions are issued. For efficiency reasons, the icebreaking authorities can demand a lowest limit on vessels' engine power as well. Smaller vessels like buoy tenders and tugs with strong engines and hull are used as port icebreakers and for icebreaking mission in waters protected from drifting sea ice. In open sea areas that are affected by drifting sea ice with ridges and ice pressure, big sea icebreakers are required.

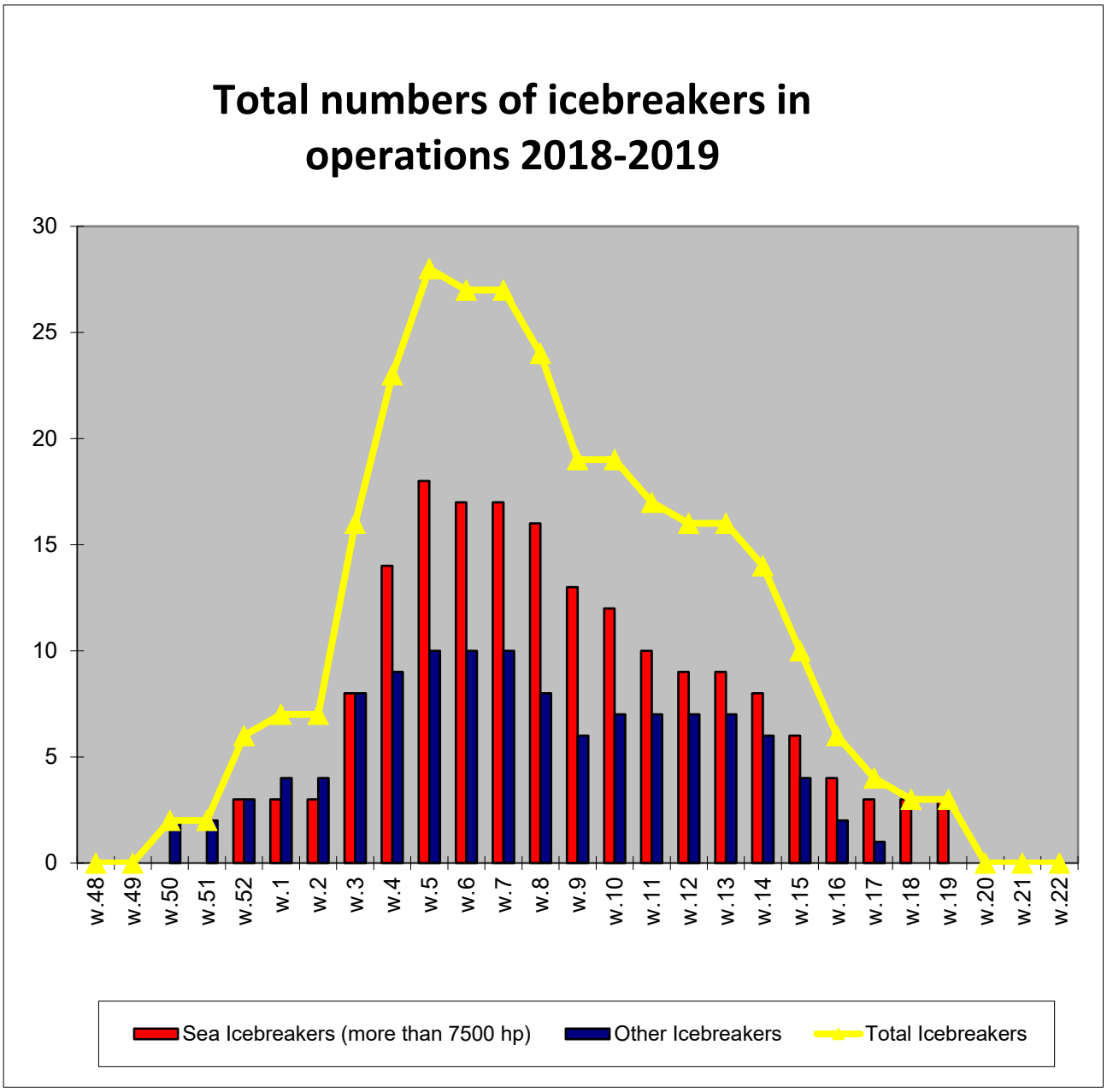


Figure 5. The total number of icebreakers in operation each week in the Baltic Sea during this season.

According to statistics from the Baltic Sea icebreaking authorities, 3539 vessels received assistance from icebreakers this season.

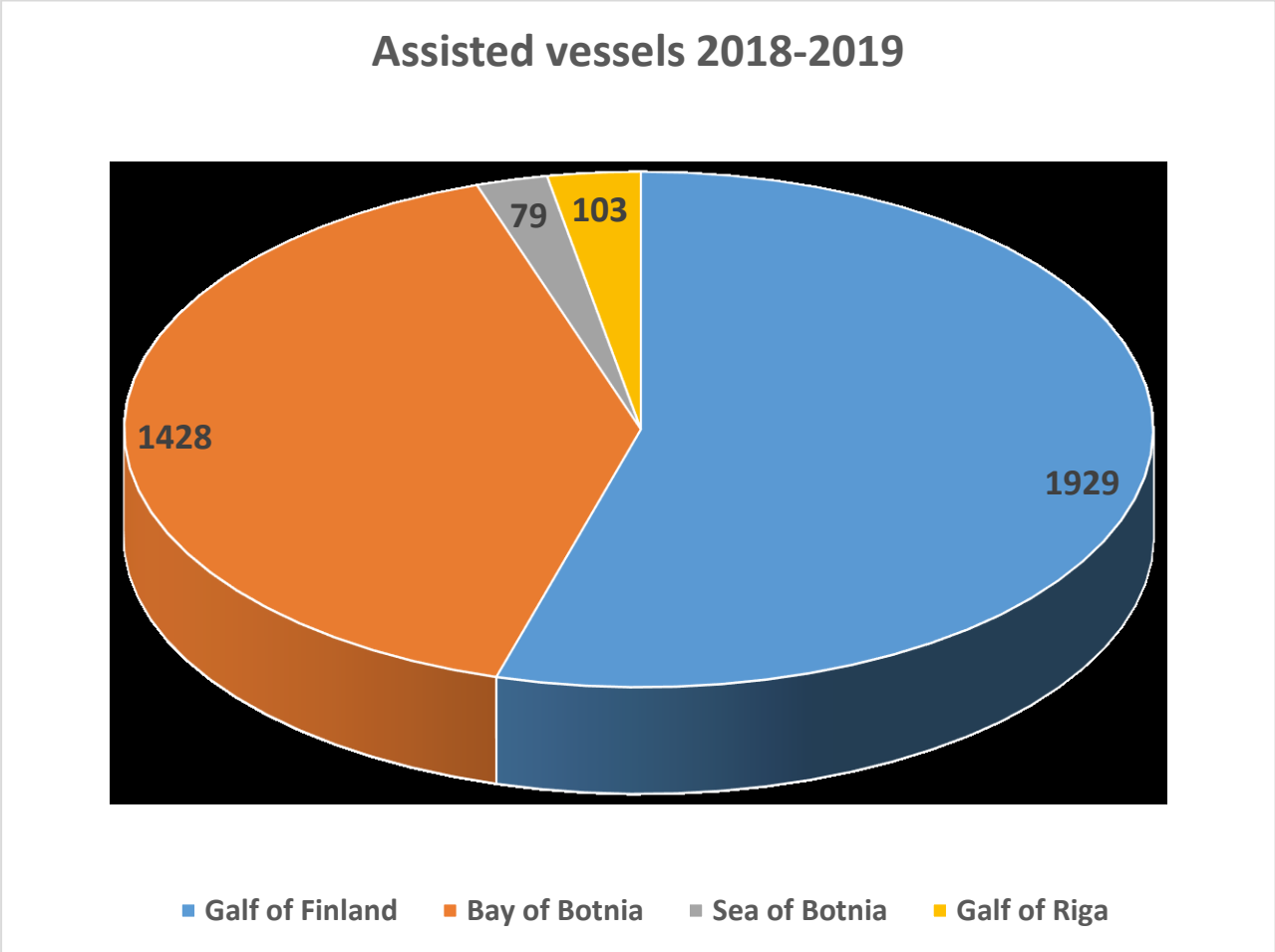


Figure 6. A total of 3539 vessels where assisted by icebreakers during the icebreaking season 2018-2019 in the Baltic Sea.

The longest sailing distance in sea ice is to the northernmost ports in the Bay of Bothnia. But due to the big number of vessels in the shorter fairway to the easternmost ports in the Gulf of Finland, the traffic is more affected by sea ice in this area, especially during periods with strong westerly winds when the icebreakers must tow many vessels one by one.

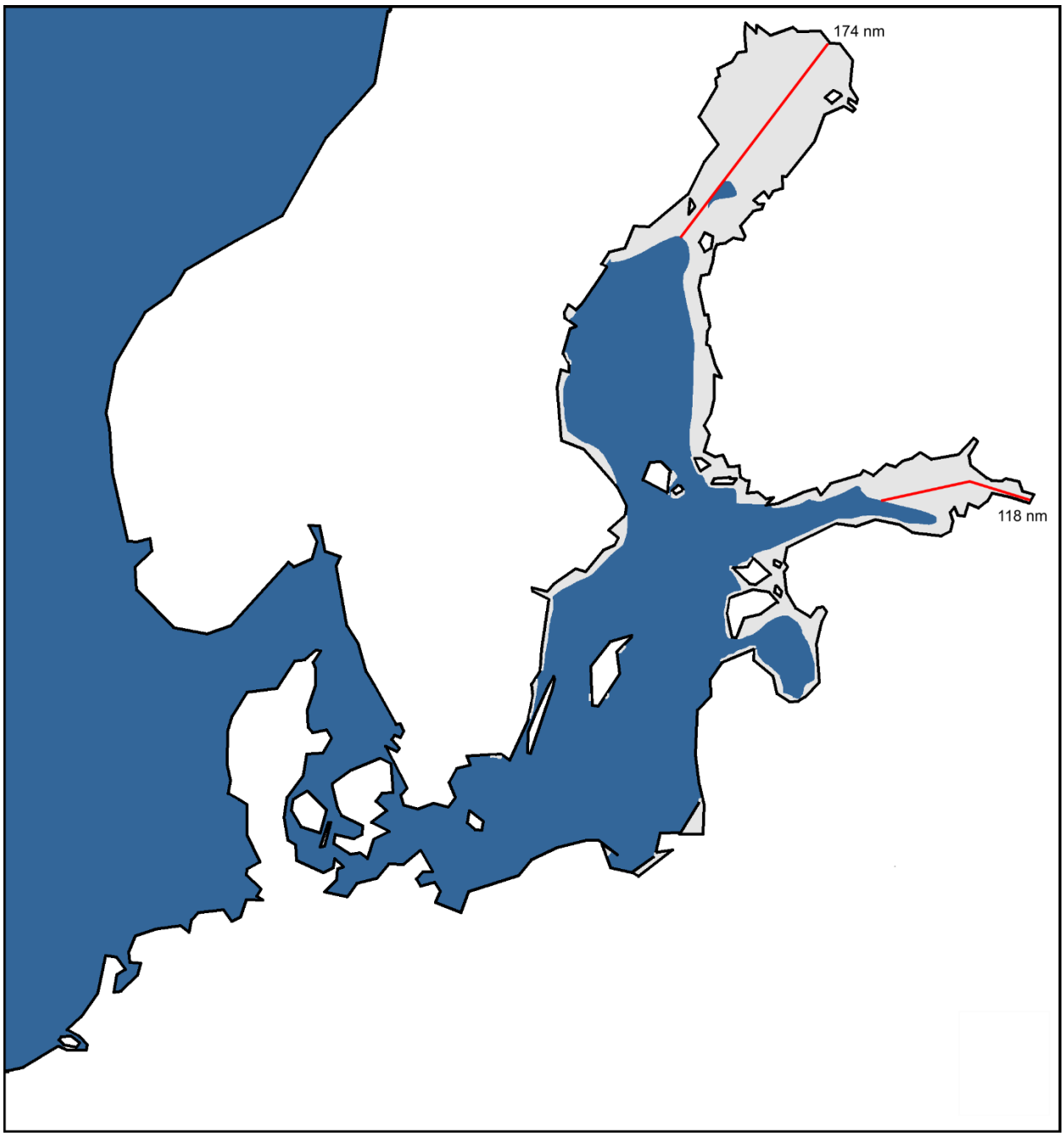


Figure 7. Sailing distance from ice edge during maximum ice extension on 27 January 2019: to Kemi 174 nautical miles and to St. Petersburg 118 nautical miles.

3. Accidents and incidents in sea ice

The Technical University of Helsinki collects information on accidents related to navigation in ice. Ship-owners and others within winter navigation are requested to report accidents, incidents and damages that are ice-related to icedamage@tkk.fi or to

Ice Damage Database
Helsinki University of Technology
Ship Laboratory

PL 5300
02151 TKK
FINLAND

4. Winter Navigation Research

Winter navigation research is carried out in co-operation between Finland and Sweden. Funds for research projects are allocated by the Winter Navigation Research Board, which consists of representatives of the Finnish Transport Infrastructure Agency, Finnish Transport Safety Agency, Swedish Transport Agency and Swedish Maritime Administration. Published research reports can be found on http://www.trafi.fi/tietopalvelut/julkaisut/talvimerenkulun_tutkimusraportit.

5. Costs of Icebreaking services in the Baltic Sea

5.1 Finland

In Finland the costs of icebreakers stand-by and operational costs were near 42,4 million EUR in period 2018-2019. Bunker costs were close to 5,0 million EUR. This season was rather hard in the Bay of Bothnia but quite mild in the Sea of Bothnia and Gulf of Finland. Total amount of operating days was 610. The Finnish Transport Infrastructure Agency (FTIA) has also contract with Alfons Håkans to charter Msv Zeus of Finland. Above mentioned costs includes all FTIA chartered ice breakers. The FTIA has also contracts with private tugboat companies for minor operations. The costs of the Finnish icebreaking services vary normally from 40 to 60 million EUR depending on winter.

5.2 Sweden

In Sweden the cost for the stand-by period for our own icebreakers is approximately 11,5 million euro, additional operational costs are 8,5 million euro, and fuel costs 5 million euro. The total cost for the Swedish icebreaking services including external recourses varies from 20 to 40 million euro, depending on the severity of the winters. The costs this winter are estimated to be 30,9 million euro. This is the government's costs; costs for the different ports and industries are not included.

5.3 Russia

In accordance with the orders of the FTS of Russia dated 20 December 2007 No. 522-t/1 and 18 November 2014 No. 262-t/5, and by order FAS of Russia of 06 June 2016 No. 711/16, new rates of icebreaking dues in the Russian ports of the Gulf of Finland are established as follows:

Icebreaking dues:

1. Icebreaking dues are applied for coming in, coming out or transiting the port area.
2. For the cargo ships engaged in liner services, which are officially declared, the factor of 0.8 is applied to the rates of the icebreaking dues.

From icebreaking dues are exempted:

- vessels of ice class ARC7 (according to classification of the Russian Maritime Register of Shipping or classes of other classification societies corresponding to it);
- passenger vessels.

Upon the announcement by the Harbour Master of winter (summer) navigation before the target date, and also after the prolongation of its duration, icebreaking dues are paid as per corresponding rates from the date of announcement to a date of completion (inclusive), corresponding to the period of winter navigation.

Rates for ships engaged in an international trade rub/1 GT (for Bolshoy port of Saint-Petersburg)

	All vessels except Ro-Ro, Ro-Flow, container ships and tankers	Container ships	Ro-Ro, Ro-Flow	Tankers
The summer rate from 01 May to 30 November	**6.65**	**4.64**	**2.67**	**7.28**
The winter rate from 01 December to 30 April	**16.55**	**11.58**	**6.36**	**18.14**

During the period from 01 May to 30 November, the following vessels are exempted from payment of icebreaking dues:

- arriving at the port from inland waterways of Russia or from the Saimaa canal and sailing back within the current year;
- arriving at the port from other Russian ports situated in the eastern part of the Gulf of Finland.

During the period from 01 December to 30 April, the vessels with ice class **ARC5** and **ARC6** (according to classification of the Russian Maritime Register of Shipping or classes of other classification societies corresponding to it) are subject to icebreaking dues multiplied by factor 0.75.

5.4. Estonia

In Estonia, the total cost of icebreaking in the 2018-2019 season amounted to approximately 5,8 million EUR, with about 600 000 EUR accounting for the costs in the Pärnu Bay and 5,2 million EUR for the Gulf of Finland. This is the Governmental costs.

5.5 Latvia, Lithuania, Poland and Germany

There was no cost information for icebreaking operations in the season 2018-2019 for Latvia, Lithuania, Poland and Germany.

5.6 **Denmark**

No icebreaking operations in the 2018-2019 season.

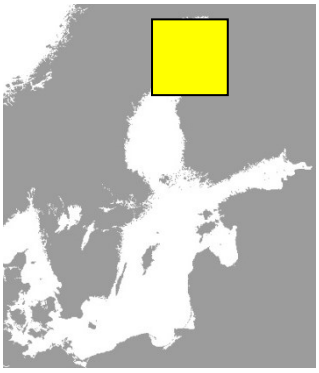
The operational costs of icebreaker services were around 408 000 euro for the 2018-2019 winter period.

5.7 Norway

During the winter 2018/19, the total costs of ice breaking service in Norwegian waters were approximately EUR 1.0 million.

6. Winter navigation in the different parts of the Baltic Sea

6.1 Bay of Bothnia



Traffic restrictions where initiated on 17nd of December on the Bay of Bothnia, the ice-breaking operations began on December 25th when icebreaker Otso was ordered to start this year's ice-breaking season.

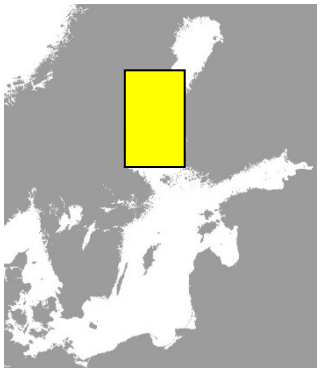
The first assistance of the merchant vessels was conducted on the 6th of January. At the end of December there were one liner icebreaker in operation in the Bay of Bothnia. When the ice extension was at its peak on week 10 there were 6 liner icebreakers in operation at the same time.

The highest level of assistance restrictions IA and 4000 dwt was reached on the 31st of January in the northern and IA and 2000 dwt on 2nd of February, in the southern parts. The icebreaking season ended in the Bay of Bothnia on 12th of May which was the last day, when the assistance restrictions were in force. Icebreaker Polaris was the last icebreaker to leave the Bay of Bothnia.
Assistance activity has been going on from December 27th until to May 5th. During this winter 1428 vessels were assisted in the Bay of Bothnia.

Assistance was conducted to following ports:

Karlsborg	Tornio
Luleå	Kemi
Haraholmen	Oulu
Skelleftehamn	Raahe
	Kalajoki
	Kokkola
	Pietarsaari

6.2 Sea of Bothnia and the Quark



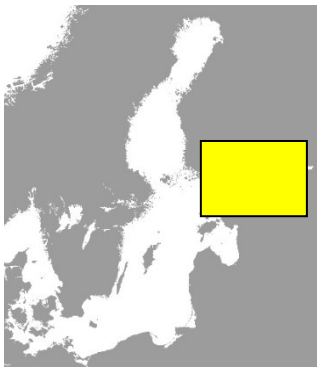
Traffic restrictions were introduced in the northern part on January 10th and in the southern part on the 25th of January.
Icebreaker Ale was stationed there and used jointly by the Swedish and Finnish icebreaking service.
This winter was a mild winter so in the southern part there was no need for any assistance activities.
Assistance activity has been going on from January 16th to 25th March. During this winter just 4 vessels were assisted in the Sea of Bothnia.

Assistance has been conducted to following ports:

Holmsund	Husum		
Vaasa	Kaskinen	Pori	Rauma

No restrictions were issued to Swedish ports.

6.3 Gulf of Finland



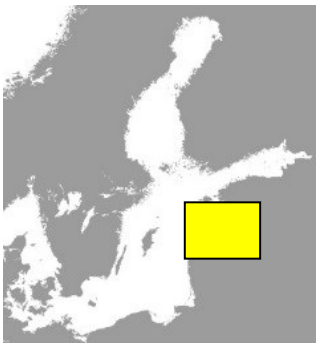
For the Finnish parts of Gulf of Finland, the first traffic restrictions I,II 2000 were initiated on 13th of January in Loviisa, Kotka and Hamina. The highest restrictions were raised to IA,IB 2000 / IC,II 3000 in the above mentioned ports on 18 th of January. On 20.1. rest of the ports in the Gulf of Finland got restrictions I,II 2000, which were the only restrictions for this season.
All restrictions were cancelled on 29th of March.
There was only one operating Finnish icebreaker, Voima in the Gulf of Finland.

The first traffic restrictions were imposed on 17 December 2018 in St. Petersburg. The restrictions were cancelled on 15 April 2019. All vessels which needed icebreaker assistance were bound for Russian ports. During the largest ice cover, the Russians had six sea (liner) icebreakers and **six** minor (port) icebreakers in use. The icebreaking season lasted from 10 December 2018 to 19 April 2019 in the Russian territorial water.
During the winter 1874 ships were assisted on their way to or from the Russian ports.
Assistance was conducted to the following ports:

Vyborg	Vysotsk
Primorsk	St. Petersburg
Ust-Luga	

For Estonian part of Gulf of Finland traffic restrictions were not initiated due to very mild winter. No assistance for Estonian ports in Gulf of Finland. IB TARMO and BOTNICA were stand-by in the port of Hundipea.

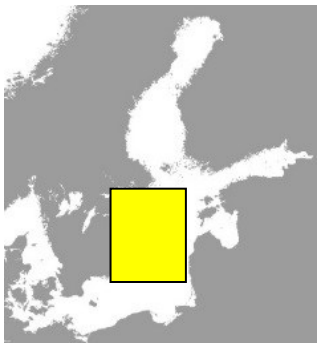
6.4. Gulf of Riga



The Estonian Meteorological and Hydrological Institute assessed the winter of 2018/2019 as mild. The traffic restrictions were initiated 19 th of January being IC-1600 kW in Pärnu. From 26th March traffic restrictions were cancelled. The icebreaking season lasted from 12 th of January to 26th of March and 103 ships were assisted by icebreaker multi-purpose-vessel EVA 316. Assistance has been conducted to following ports: Pärnu

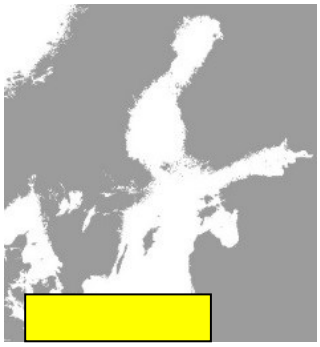
Winter 2018-2019 was mild in Gulf of Riga and Irbe strait so no winter navigation period was declared. No icebreakers were in operation during this winter season.

6.5 Central Baltic



No restrictions were issued to Swedish ports.

6.6 Southern Baltic

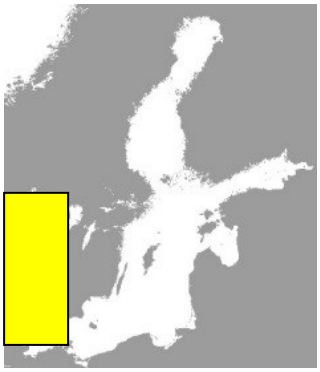


East Coast Area. Ports of Gdańsk and Gdynia
There were no significant difficulties for shipping caused by ice. The ice on inner waters of the ports was easy to break by berthing / unberthing vessels.
No icebreaking action has been announced.
There was no need to engage icebreaking tugs on the approaches to the ports.

West Coast Area. Ports of Szczecin and Świnoujście
Regarding to temperatures the winter months November and December 2018 were warm, on with mean temperature plus 8 and plus 5.
The first decade of January 2019 was warm as well, the next two was cold, the temperatures were even below zero.
February 2019 was definitely warm. And March the same.
Therefore no ice formation appeared.

Summary
In the thermal aspect - winter season 2018/2019 can be defined as warm without difficulties to navigation.

6.7 Danish waters, Swedish West coast, Germany and Norwegian waters



The 2018-2019 was a mild ice winter in Norwegian Waters. No traffic restrictions had to be imposed during the winter season. In January-February private companies conducting active ice breaking assistance for Halden 10 days, Drammensfjord 20 days, Oslo and Tønsberg 21 days, and Kragerø area 33 days.
Neither Norwegian Coast Guard, nor Norwegian Coastal Administration has conducted any additional ice breaking or assistance this winter.

No restriction was issued to Danish ports.

Germany
There was only sporadic icebreaking in the inshore waters.

7. Description of organizations and icebreakers engaged during the season 2018-2019

7.1 Finland

The Finnish Transport Infrastructure Agency (FTIA) is the national authority responsible for the assistance of winter navigation, its coordination, development and management nation-wide. The actual icebreaking services have been contracted out.

The FTIA develops Finland's icebreaking policy, taking into account the requirements of its clients (mainly the Finnish industry). Essential for the industry are as short waiting times as possible for traffic. The FTIA decides on the length of the assistance period, exemptions and traffic restrictions.

The traffic restrictions are normally made more stringent than the minimum HELCOM safety recommendations, as the objective is, besides safety, to assure an efficient and safe maritime traffic flow. Only vessels fulfilling the criteria of daily traffic restrictions are given assistance.

The icebreaking services are purchased from Arctia Icebreaking Ltd. and Alfons Håkans AS, and also from the private companies for minor operations (mainly tugboat services for ice breaking in light ice-conditions in harbour entrances and in Lake Saimaa).

FTIAs' Winter navigation is responsible of coordinating the icebreaking services in FInland. Coordination IB-masters are locally responsible for the management and daily operation of the icebreaking services together with close cooperation with VTS -Finland Ltd and Finnpilot Pilotage Ltd. to all winter ports.

The demands as to the standard of service are included in the contract.

The main requirement is that vessels should not have to wait for an icebreaker for more than 4 hours on an average. Another goal for the Finnish icebreaker service standard is that 90 % to 95 % of vessels navigating in the ice field could get through without waiting for icebreaker assistance.

The average icebreaker waiting time for all Finnish sea areas in this season was 2,5hrs. and 95% of all port calls did not have to wait for icebreaker assistance at all.

In Finland no special fee is collected for the icebreaker service. All ships pay fairway fees based on ship size and ice class. The fairway dues are used to cover the costs of fairway maintenance and icebreaking services.

New state agreement between Sweden and Finland further developed decade's long co-operation in winter navigation activities between these two countries. Optimal usage of "common" IB resources lower total costs and grants more reliable service to customers.

Icebreakers engaged by the Finnish Transport Infrastructure Agency 2018 - 2019:

Name	Type	Propulsion power
POLARIS	Icebreaker	21 000 kW
SISU	Icebreaker	16 200 kW
Urho	Icebreaker	16 200 kW
OTSO	Icebreaker	15 000 kW
KONTIO	Icebreaker	15 000 kW
VOIMA	Icebreaker	10 200 kW
ZEUS of FINLAND	Icebreaker	6 000 kW

On top of this FTIA used tugboats for assistance in different ports during this season.

7.2 Sweden

Icebreaking operations are managed by the Icebreaking Management of the Swedish Maritime Administration in Norrkцping and are based on the Swedish icebreaking regulation (2000:1149).
It allocates icebreakers to work areas, issues traffic restrictions, monitors the operational situation and informs the shipping stakeholders of ice conditions and the traffic situation. Sweden controls six icebreakers, of which the Swedish Maritime Administration owns five and has one on long-term charter from a private ship owner. All Swedish icebreakers are manned by a private shipping management company.
Sweden and Finland use a jointly developed IT based on-line system, IBNext (Icebreaker Net) for coordination of the joint icebreaking operations.
It contains information about the weather, ice conditions and traffic situation, and transmits the information between the different connected units (icebreakers, coordination centres, VTS etc.).
In addition to the icebreakers, ice strengthened buoy tenders of the Swedish Maritime Administration and private tugboats are also engaged in the icebreaking service.
Helicopters are chartered and used for ice reconnaissance and personnel transport in order to reduce time expenditure for icebreakers. Cooperation with the tugboats in ports is common around the coastline.
The governmental funding and fairway dues cover the costs for the icebreaking operations and no vessel that receives assistance from icebreaker is charged.
Icebreakers engaged by the Swedish icebreaking service in 2018/2019:

Name	Type	Engine power
ALE	Icebreaker	3500 kW
ATLE	Icebreaker	18400 kW
FREJ	Icebreaker	18400 kW
YMER	Icebreaker	18400 kW
ODEN	Icebreaker	18000 kW
THETIS	Icebreaking vessel	8004 kW

During the winter the Administration also engaged 1 tugboat for icebreaking operations in the Baltic Region.

7.3 Russia

The Harbour Master of the Port has the power to impose ice restrictions in the port and approach channels, based on actual ice conditions (according to articles Nos. 74 & 76, Russian Federal Law No. 81-FZ, Russian Merchant Marine Code, 30 April 1999).
The ice navigation assistance is conducted by the state-owned icebreakers and covers the seaports: Bolshoy port of St. Petersburg, Primorsk, Vyborg, Vysotsk and Ust-Luga. The state-owned icebreakers assist the inland transit navigation via the Saimaa Canal both ways.

The icebreaker fleet consists of the following icebreakers:

Name	Type	Engine power
ERMAK	Icebreaker	30 400 KW
CAPTAIN SOROKIN	Icebreaker	18 300 KW
CAPTAIN NIKOLAEV	Icebreaker	18 000 kW
MOSKVA	Icebreaker	21 000 KW
SAINT-PETERSBURG	Icebreaker	21 000 KW
VLADIVOSTOK	Icebreaker	17 400 KW
MURMANSK	Icebreaker	17 400 KW
NOVOROSSIYSK	**Icebreaker**	**17 400 KW**
MUDYUG	Icebreaker	7 000 KW
TOR	**Icebreaker**	**10 120 KW**
SEMION DEZHNEV	Icebreaker	4 500 KW

IVAN KRUZENSTERN	Icebreaker	4 500 KW
YURI LISYANSKY	Icebreaker	4 000 KW
CAPTAIN ZARUBIN	Icebreaker	3 300 KW
CAPITAN M. IZMAILOV	Icebreaker	4 000 KW
CAPITAN PLAKHIN	Icebreaker	3 240 KW

The icebreaker assistance, as a rule, is conducted as follows:

1. Independent ice navigation following icebreaker recommendations and strictly under him supervision.
2. Icebreaker assistance in a convoy.
3. Individual icebreaker assistance behind an icebreaker.

Icebreaker assistance is rendered to ships which do not fall under the acting restrictions in the ports of their destination. Icebreaker assistance for the traffic coming from the sea is conducted from the point where the convoy is formed to the inner road of the port, and the ships leaving the port are assisted from the inner road to the area next to the convoy forming point (CFP).
All ships coming from the sea are prohibited from entering the ice east of the convoy forming point (CFP) without permission of the icebreaker. The Masters of the ships sailing independently upon receiving the permission of the icebreaker are to report to the icebreaker while passing the established control points of the recommended route and inform of the ice situation in the area. If such a ship gets stuck, the icebreakers are to release them and correct their recommended route or get them in the convoy for further motion. The Masters of the ships are not recommended to rely on data regarding recommended routes received from other ships and not confirmed by the Master of the icebreaker.
When the ice thickness over the approach fairways leading to Russian ports in the eastern part of the Gulf of Finland becomes considerable, the Harbour Master of seaport imposes restrictions on ships the ice class of which are not sufficient for navigation under prevailing circumstances.

7.4 Estonia

The responsible organization for icebreaking in Estonia is the Estonian Maritime Administration. The Director-General of the Estonian Maritime Administration decides on traffic restrictions and directives on winter navigation.
Ports that are serviced by state ice-breakers are Muuga Harbour, harbours of Tallinn and Kopli Bay, Paldiski North Harbour, Paldiski South Harbour, Kunda Harbour, Sillamäe Harbour and Pärnu Harbour. Estonia has two icebreakers, TARMO and BOTNICA, to operate in the Gulf of Finland area, and the multi-purpose vessel EVA-316 to operate in the Pärnu Bay. Icebreaking to the port of Pärnu was carried out by multi-purpose vessel EVA 316.

Icebreakers engaged by the Estonian Maritime Administration 2018/2019:

Name	**Type**	**Engine power**
EVA-316	Multi-Purpose Vessel	5150 kW

7.5 Latvia

There is one icebreaker, the *Varma*, which is owned and operated by the Freeport of Riga Fleet, Ltd.
Icebreakers engaged by Latvia 2018-2019:

Name	**Type**	**Engine power**
Varma	icebreaker	10 000 kW

7.6. Lithuania

The port of Klaipeda is the northernmost ice free port in the eastern Baltic coast. Klaipeda State Seaport Authority is the responsible organisation for icebreaking in Klaipeda harbour areas. The Lithuanian fairways are open all year round.

7.7 Poland

Eastern & Western part:

The winter season 2018-2019 was very moderate and no ice formation appeared in the area. There was no need to engage icebreaking tugs on the approaches to the ports.

7.8 Germany

The Federal Waterways and Shipping Authority, Northern Region Office in Kiel coordinates according to an overall plan the icebreaking service for the harbour entrances, coastal and sea regions in German parts of the Baltic Sea.

The German ice service plan is set up annually by the responsible authority, listing all available vessels which are capable of icebreaking, giving information on the respective areas of icebreaking service, the expected ice situation etc.

Vessels available for icebreaking operations:

Name	Type	Engine power
NEUWERK	Multi-Purpose vessels	8400 kW
MELLUM	Multi-Purpose vessels	6620 kW
ARKONA	Multi-Purpose vessels	3700 kW

In addition to that, a number of smaller tugboats and river icebreakers are available for the inner coastal waters and harbours.

7.9 Denmark

Rules and regulations for icebreaking in Danish waters is described in “Act on the amendment of the National Ice Service Act”. Upon consultation with the Ice Service Council the minister of defence lays down the rules for the establishment of the icebreaking service in Danish waters for certain areas, named readiness areas.

The icebreaking service for readiness areas is financed by 25% from the requiring vessel and 75% by the Ice Service. The Ice Service will collect an annual fee from port administrations calculated on the basis of the volume of goods passing through the individual ports. In the new Act a state-controlled icebreaker shall be understood as icebreaking resources chartered by the state and other vessels used for icebreaking by the Ice Service.

When the ice situation so demands, assistance can be requested against payment. On Danish Defence homepage, ship owners with icebreaking capacity have the possibility to lay down information on these capacities and contact information to the company. If in any doubt or help needed, the Maritime Assistance Service can be contacted.

The Ice Service recommends that the necessary precautionary measures be taken in areas where experience shows that ice may make navigation very difficult.

No icebreakers available for icebreaking operations.

7.10 Norway

Norwegian waters, the Norwegian Coastal Administration is responsible of all ice breaking in the main fairways. Since 2014 this includes approaches to ports, which earlier has been conducted by the local port authority.

Governmental vessel with ice breaking capability:

Name	Type	Engine power
SVALBARD	Coast Guard vessel	13 500 kW
KRONPRINS HAAKON	Research vessel	10 000 kW
VILLA	Buoy tender	935 kW

Private vessel with ice braking capability:

Name	Type	Engine power
BAMSETUG	Tug	3564 kW
TOR III	Harbour Tug	1052 kW
TUG FRIER	Harbour Tug	883 kW
SKILSØE	Harbour Tug	932 KW

8. Progress report of BIM (Baltic Sea Icebreaking Management)

One important topic is to find solutions for how the existing Baltic Sea icebreakers can be utilized in other nations' icebreaking service and as previously mentioned, the long term vision of the BIM is a common icebreaker fleet in the Baltic Sea.

The Nordic countries have an agreement for cooperation that was signed in the early sixties.

Between the governments in Finland and Sweden an agreement was signed 2011.

In that agreement the states emphasizes the importance of well-functioning winter navigation for industry and trade.

In the Sea and Bay of Bothnia the two countries icebreaker fleets works as a common fleet, this cooperation can also be extended to other areas as the Gulf of Finland and the Baltic. This may serve as a model for other countries in terms of cooperation within icebreaking.

One other important project was the modernization of the joint website http://www.baltice.org which has been operational since 2007, the modernization was completed before winter season 2015-2016.

Within the Trans-European Transport Network (TEN-T) have a project started called "WINMOS II" Winter navigation Motorways of the Sea. The WINMOS II project is a continuity for WINMOS project, which was completed in spring 2016. WINMOS II aims to develop the maritime navigation system, improve environment performance and secure ice breaking resources in the Baltic.

www.baltice.org