



BALTIC ICEBREAKING MANAGEMENT

Baltic Sea Icebreaking Report 2014-2015

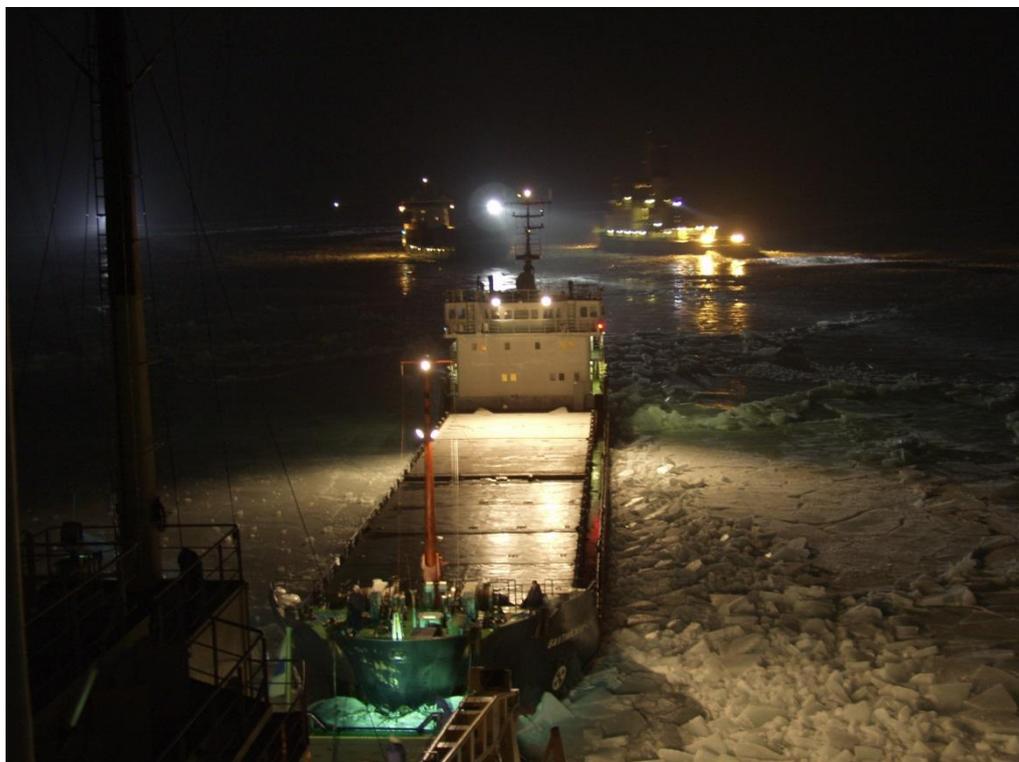


Table of contents

1. Foreword	3
2. Introduction	4
3. Overview of the icebreaking season (2014-2015) and its effect on the maritime transport system in the Baltic Sea region	5
4. Accidents and incidents in sea ice.....	12
5. Winter Navigation Research.....	12
6. Costs of Icebreaking services in the Baltic Sea	12
6.1 Finland	12
6.2 Sweden	12
6.3 Russia.....	13
6.4. Estonia	13
6.5 Latvia, Lithuania, Poland and Germany.....	14
6.6 Denmark	14
6.7 Norway	14
7. Winter navigation in the different parts of the Baltic Sea	15
7.1 Bay of Bothnia	15
7.2 Sea of Bothnia	15
7.3 Gulf of Finland.....	16
7.4. Gulf of Riga.....	16
7.5 Central Baltic.....	16
7.6 Southern Baltic.....	17
7.7 Danish waters, Swedish West coast and Norwegian waters.....	17
8. Description of organizations and icebreakers engaged during the season 2014-2015	18
8.1 Finland	18
8.2 Sweden	19
8.3 Russia.....	20
8.4 Estonia	21
8.5 Latvia	21
8.6. Lithuania	21
8.7 Poland.....	21
8.8 Germany	22
8.9 Denmark	22
8.10 Norway	22
9. Progress report of BIM (Baltic Sea Icebreaking Management)	23

1. Foreword

Efficient navigation in the Baltic Sea all year round, in spite the additional challenges caused by sea ice, is an important factor for the functioning of the North European transport system. This is the reason why Baltic Sea countries share a common interest to winter navigation. Icebreaking is an important and integrated part of the regions maritime infrastructure.

Efficient winter navigation requires cooperation between the icebreaking authorities in the Baltic Sea countries. The Baltic Sea countries are therefore working together for improved winter navigation through more efficient icebreaking services in the Baltic Sea. Cooperation with the industry is also of utmost importance.

In the beginning of the year 2007 the BIM released new service "the Baltic Sea Icebreaking Web site - www.baltice.org". Now it was time to update and at the same time modernize the site. New Baltice.org web site was published on 17.th of June 2015. The new site has the same information as the later, but displayed in chart format where possible.

You hold in your hand the tenth joint "Annual Baltic Sea Icebreaking Report". The report is an attempt from BIM's side to provide annual reporting on winter navigation and icebreaking beyond the national waters and to provide joint information about the progress and news within the area of winter navigation. This is a step towards the long-term vision of BIM to create a joint Baltic Icebreaking Service.

Helsinki 2015

Jarkko Toivola
Chairman of the BIM

2. 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.

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

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

15th November 2007, HELCOM adopted a new recommendation [28E/11](#). 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 Word Icebreaker, Icebreaking Supply and Research Vessel Fleet” were presented and updated 2011.

In April 2009 a computer based training program, based on the DVD, was introduced. After completing the course the student’s 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 2014/2015 for the Baltic Sea area. National reports can be found on 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.

3. Overview of the icebreaking season (2014-2015) 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 2014-2015 was mild. The peak of the ice winter was reached on 23rd of January, when ice covered an area of 51,000 km².

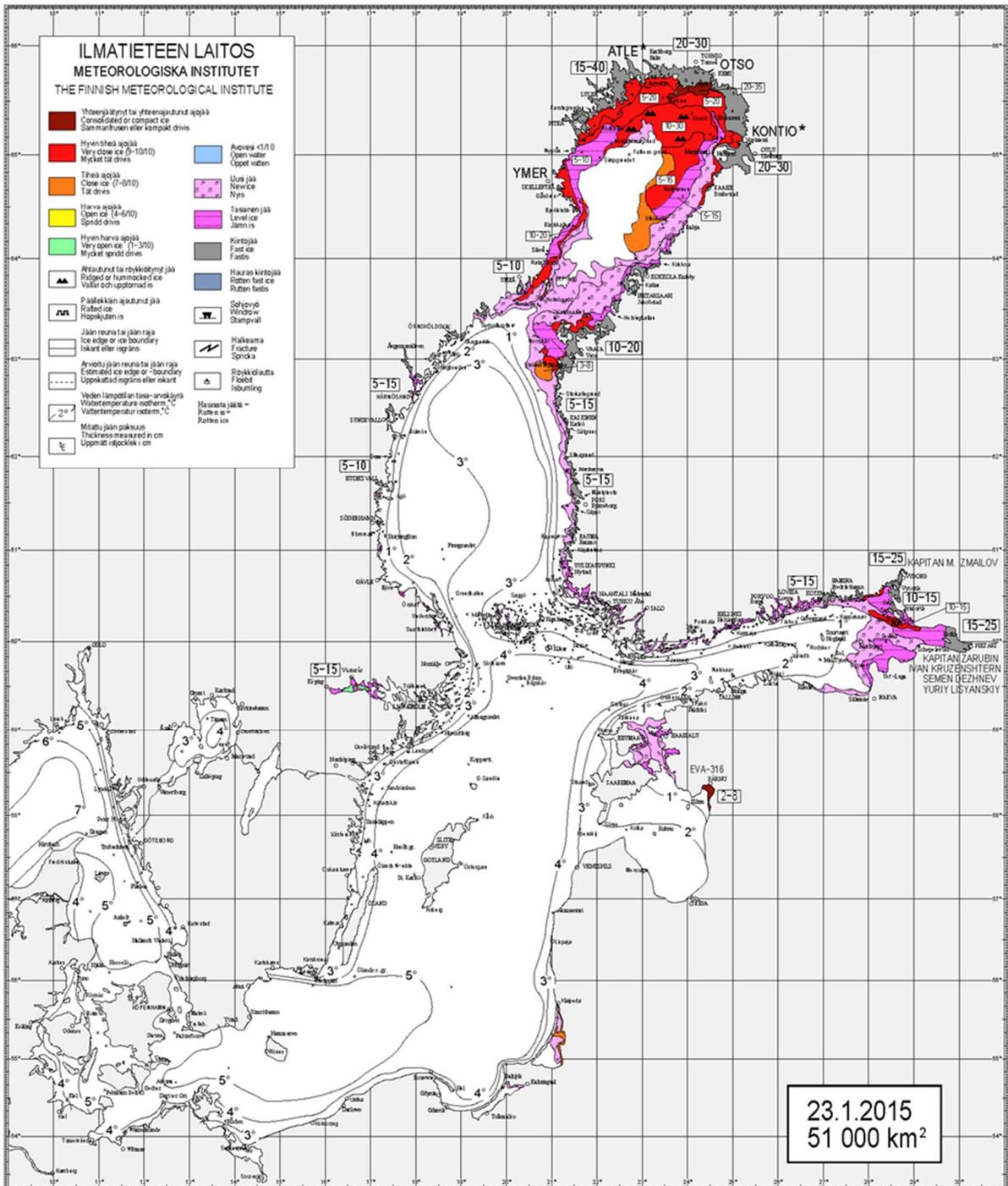


Figure 1. The maximum ice extent of the ice season 2014-2015 was reached on 23rd of January 2015.

The ice formation in the innermost bays of the northern part of the Bay of Bothnia began with the middle of November. At the beginning of December there was 1-10 cm thick level ice in the inner archipelago of the Bay of Bothnia and new ice off St. Petersburg. The beginning of December the weather was extraordinarily mild and no ice formation happened. During the Christmas weather was cold and the amount of ice increased. The first Finnish icebreaker began assistance on 25th of December. After this, the weather became milder. December and the first half of January were milder than normal.

Then weather became colder and the end of the cold period on the 23rd of January, reached the culmination of the ice winter - the extent of ice reached 51,000 km².

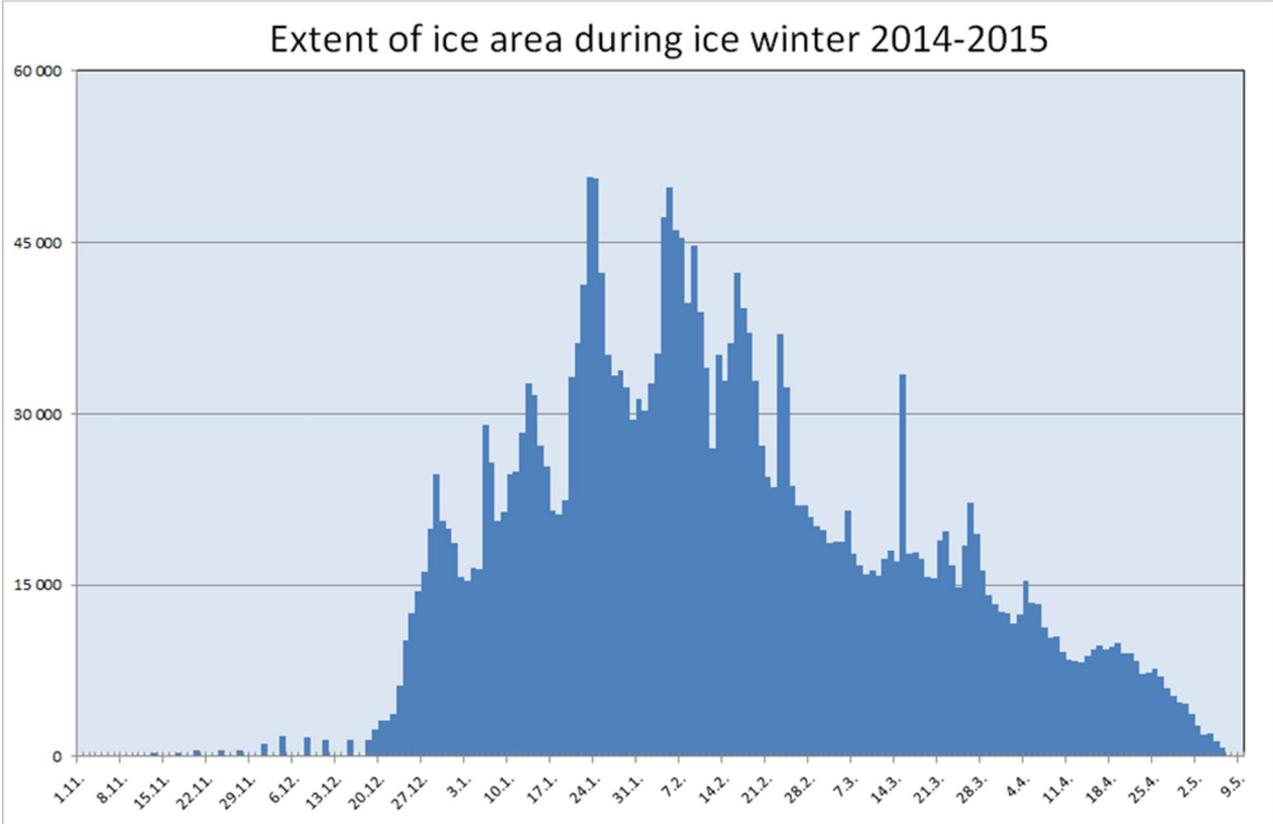


Figure 2. The area of the ice extent during the ice season 2014-2015.

After another cold period on the 5th of February the extent of ice reached 50,000 km². After this, the weather became milder, and the southern winds pushed the ice fields together. The rest of February was unusually mild. The beginning of March the ice extent was only 20,000 km².

Also in March was warmer than usual. In the end of March the ice covered area was unusually low, only about 15,000 km². April was also warmer than average and at the end of the month; ice appears only in the Bay of Bothnia. Finally, the last ice melted earlier than ever on 7th of May. The Baltic Sea was ice-free for two weeks earlier than usual.

Ice conditions in the eastern part of the Gulf of Finland in 2014-2015

The ice formation processes in the winter of 2014/2015 were those of a mild winter.

Ice formation in the coastal shallow zone of the eastern part of the Gulf of Finland begins in the second half of the December.

By the end of the December 2014, the fast ice 5 to 10 cm thick was in the Nevskaya Guba, 5 to 10 cm in the Gulf of Vyborg, 10 to 15 cm in the Bjorkesund passage. The edge of new ice reached the Moschny Island.

By the end of the January 2014, the fast ice 20 to 25 cm thick was in the Nevskaya Guba, the Gulf of Vyborg and in the Bjorkesund passage. The edge of drift ice 10–20 cm thick reached the longitude of the lighthouse Shepelevskiy.

In January, February due to high temperature condition and the prevailing winds, areas off the southern coast of the Gulf of Finland was observed weakening of ice conditions with the transition to clean water with separate drifting ice. In the port of Ust-Luga throughout the winter and has not been icebreaking assistance. On the approaches to Vyborg Bay periodically showed a strong compression of the ice fields, ice thickness reaches 40 cm. In late February, the spread to the West of a cohesive floating ice along the Great Ship channel reaches the longitude of the island of Seskar.

In March, the ice cover in the Eastern part of the Gulf of Finland due to variable temperatures and the winds started early destruction and by the end of March in the open part of the Bay was observed with clean water with separately floating ice floes. In the top of the Vyborg Bay landfast ice remained with the destruction of 6 points on the approaches discharged ice thickness of 10-15 cm In the Strait Berkesan – floating ice cohesion 4-7 points, thickness 10-15 cm.

Icebreaking activities were completed on April 9, 2015.

Ice conditions in the southern part of the Baltic Sea

The months of winter season in Poland usually are November, December, January and February. In that time temperatures were above freezing point. However, there were few days when temperatures slightly dropped below, even up to $-5,6^{\circ}\text{C}$, but ice formation did not appear, the highest temperature was $+11,5^{\circ}\text{C}$. The average temperature on November was $+4,2^{\circ}\text{C}$, on December $+6,4^{\circ}\text{C}$, on January $+5,6^{\circ}\text{C}$ and on February $+3,4^{\circ}\text{C}$.

On March there were no surprises and spring came as usual.

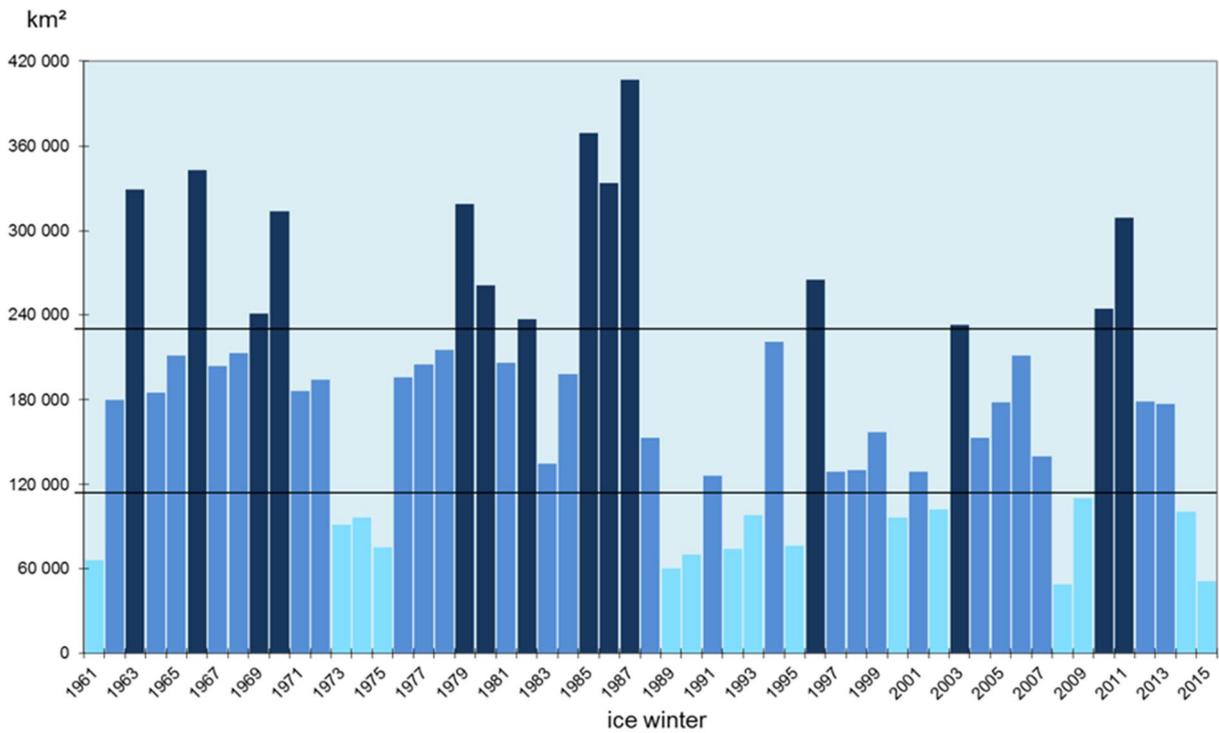


Figure 3. The maximum ice coverage in ice winters 1961-2015. The average of 1961-2011 (51 years) is 187 000 km². Severities of the season are indicated using colours from mild to severe (lightest blue to darkest blue respectively).

The maximum thickness of the fast ice was 35-55 cm in the Bay of Bothnia, 20-35 cm in the Sea of Bothnia and 30-40 cm in the Gulf of Finland. The thickness of the pelagic ice was 15-40 cm in the Bay of Bothnia and 5-20 cm in the Gulf of Finland.

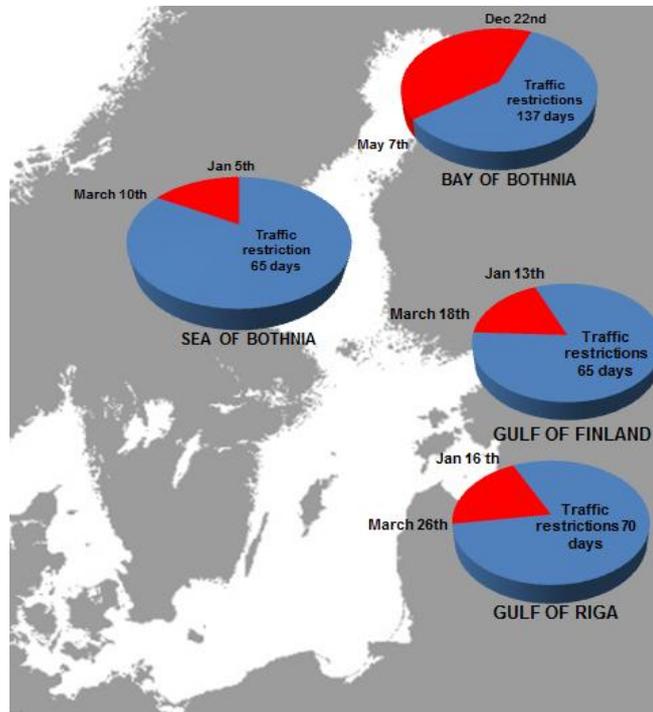


Figure 4. Number of days when traffic restrictions were in force in the different sea areas.

For safety reasons, the Baltic Sea countries have within HELCOM agreed on a joint policy when traffic restrictions shall be 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 icebreaker are required.

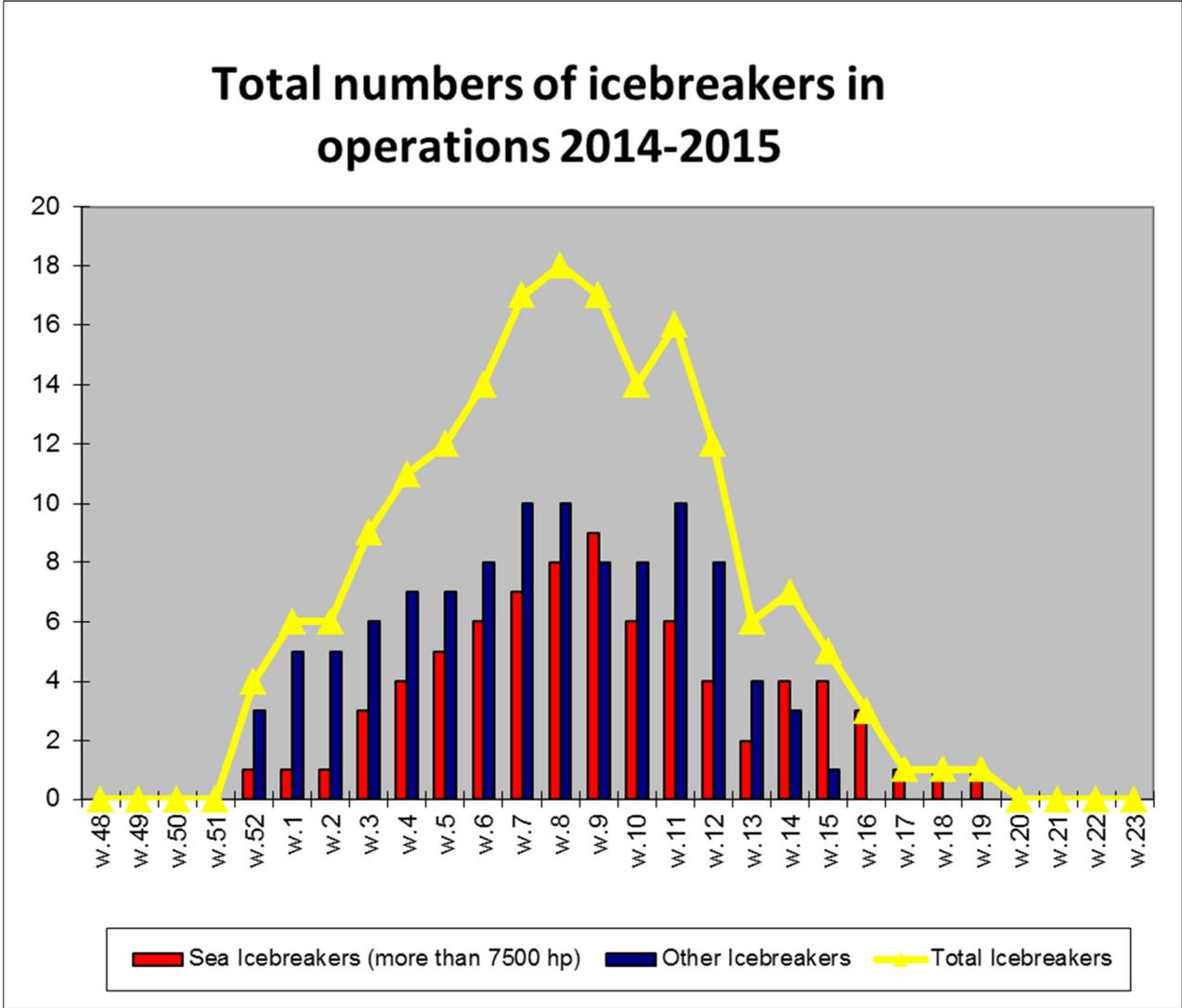


Figure 5. The total number of icebreakers in operation each week in the Baltic Sea during this season.

According to statistics from the Baltic Sea icebreaking authorities, 1919 vessels received assistance from icebreakers this season. These figures can be again compared with season 2012-2013, which was a normal winter, when 7.861 vessels were assisted.

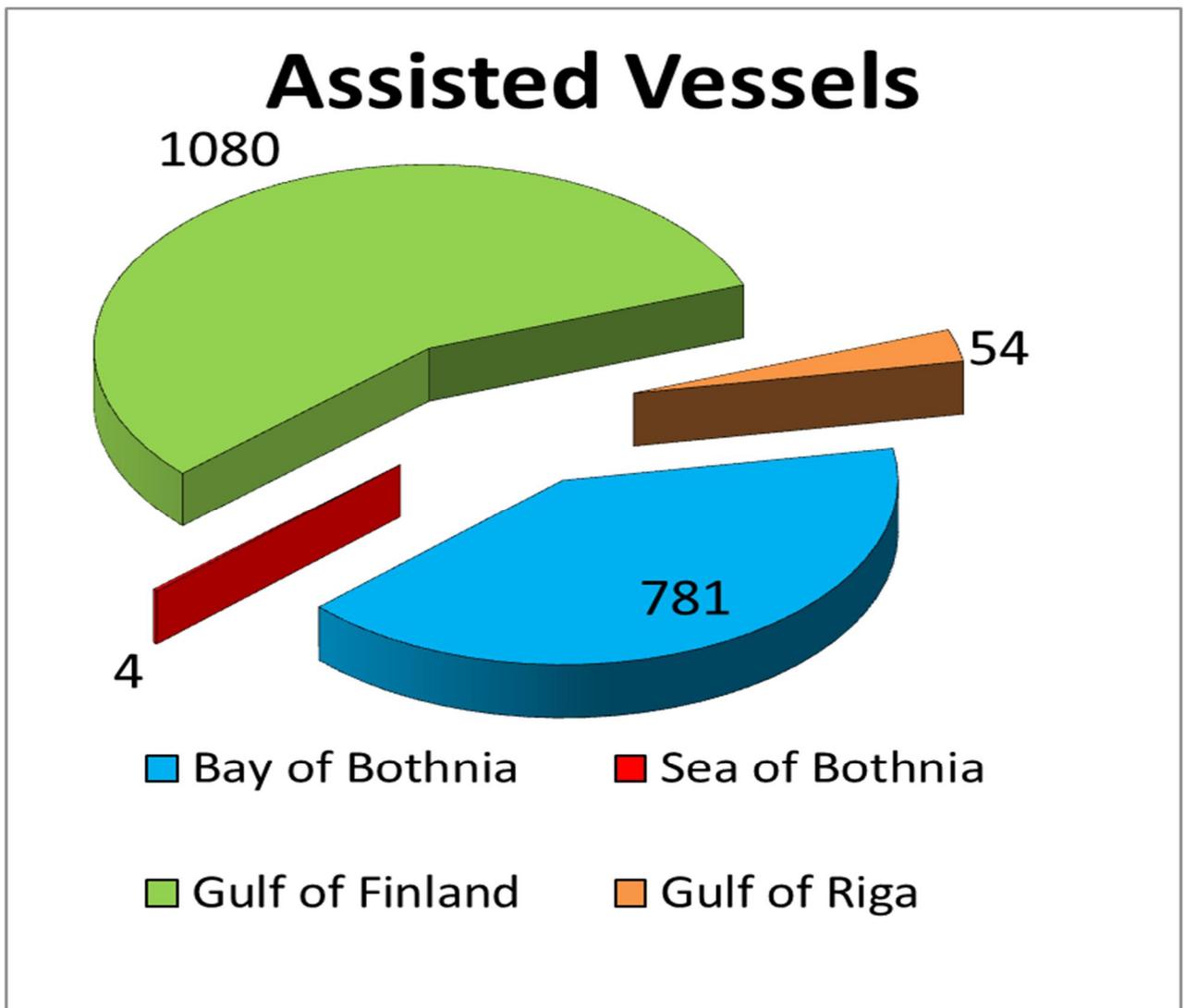


Figure 6. A total of 1919 vessels were assisted by icebreakers during the icebreaking season in the Baltic Sea.

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.

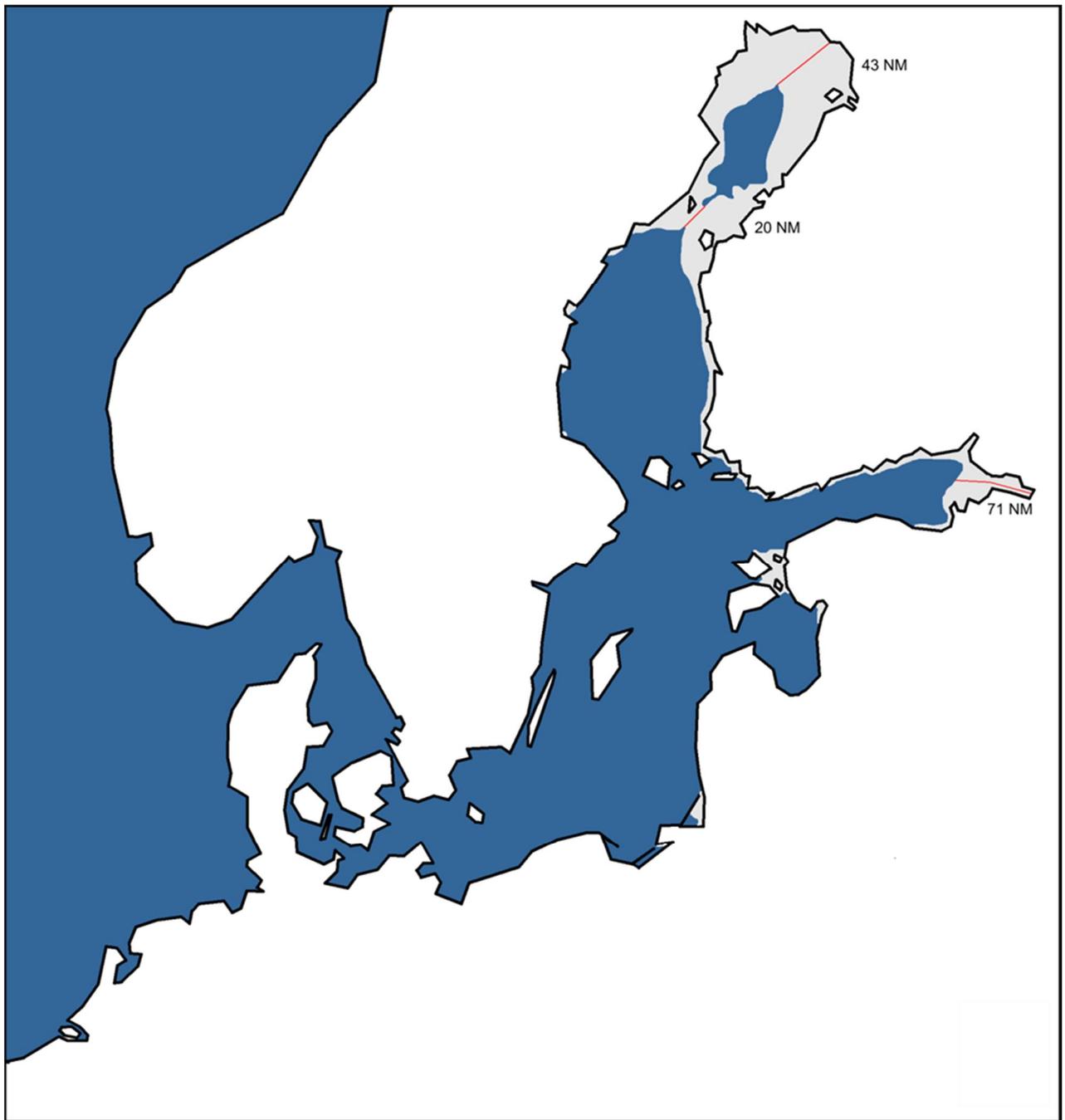


Figure 7. Sailing distance from ice edge during maximum ice extension, 23rd of January 2015: to Kemi 63 nautical miles in two parts and to St. Petersburg 71 nautical miles.

4. 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

Only two incidents were reported this season, one collisions and one damaged propeller. In comparison, about 100 vessels reported damages due to the severe ice conditions ten years ago in the year 2003.

5. 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 consist of representatives of the Finnish Transport Agency, Finnish Transport Safety Agency, Swedish Transport Agency and Swedish Maritime Administration. Published research reports can be found on www.trafi.fi.

6. Costs of Icebreaking services in the Baltic Sea

6.1 Finland

In Finland the costs of icebreakers stand-by and operational costs were near 29 million EUR in period 2014-2015. Bunker costs were 2,1 million EUR. This season was very easy and the total amount of operating days was 264. The Finnish Transport Agency (FTA) has also contracts with Swedish Maritime Administration to charter one Atle-class icebreaker and contract with Alfons Håkans to charter msv Zeus. Above mentioned costs includes all FTA chartered ice breakers. The FTA has also contracts with private tugboat companies for minor operations. The costs of the Finnish icebreaking services vary normally from 30 to 50 million EUR depending on winter

6.2 Sweden

In Sweden the costs for the stand-by period for our own icebreakers is approximately 12 million EUR, additional operational costs is 5 million EUR, and fuel costs to 2.5-9 million EUR. The total cost for the Swedish icebreaking services including external recourses varies from 20 to 40 million euros depending on the winters' severity. The costs this winter are estimated to be 21,5 million euros. This is the government's costs, costs for the different ports and industries are not included.

6.3 Russia

Since June, 12th, 2012 according to the act of Federal Service on Tariffs dd 04.05.2012 № 80-т/3 (corrections to the act of Federal Service on Tariffs dd 20.12.07 № 522-т/1) 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 incoming, out coming or transiting the port area.
2. For the cargo ships engaged in liner services, which are officially declared, to the rates of the icebreaking dues the factor of 0.8 is applied.

From icebreaking dues are released:

- vessels of ice class LU7 (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 May, 1st till November, 30th	6.30	4.40	2.53	6.90
The winter rate from December, 1st till April, 30th	15.69	10.98	6.03	17.19

During the period from May, 1st till November, 30th the following vessels are released from payment of icebreaking dues:

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

During the period from December, 1st till April, 30th the vessels with ice class LU5 and LU6 (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.

6.4. Estonia

In Estonia, the total cost of icebreaking in the 2014-2015 season amounted to approximately 6,8 million EUR, with about 300 000 EUR accounting for the costs in the Pärnu Bay and 6,5 million EUR for the Gulf of Finland. This is the Governmental costs.

6.5 Latvia, Lithuania, Poland and Germany

There was no cost information for icebreaking operations in this season 2014-2015.

6.6 Denmark

In 2014/2015 the cost of the Danish ice service was approximately € 0,3 mill. The reason for the low cost is the that, Denmark no longer operates state-owned icebreakers, but only operates chartered tugs with icebreaking capacity in four readiness areas, East and Western Limfjord, the waters south of Funen and Smålandsfarvandet south of Zealand.

6.7 Norway

During the winter 2014/15, the total costs of ice breaking service in Norwegian waters were approximately EUR 0.6 million.

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

7.1 Bay of Bothnia



Traffic restrictions were initiated on 22nd of December on the Bay of Bothnia, the ice-breaking operations began on December 25th when icebreaker Kontio was ordered to start this year's ice-breaking season.

Kontio had responsibility for both the Swedish and Finnish ports in the northern parts of Bay of Bothnia.

The first assistance of the merchant vessels was conducted on the 28th of December. At the end of December there were 1 liner icebreakers in operation in the Bay of Bothnia. When the ice extension was at its peak there were 4 liner icebreakers in operation at the same time.

During this winter the Coast Guard vessel Triton was on an ice trial in the Bay of Bothnia but due to the small ice extend the trial was ended in advance.

The highest level IA and 2000 dwt were reached on the 31st of January in the northern and IB and 2000 dwt in the southern parts. The icebreaking season ended in the Bay of Bothnia on the 6th of May when the last restrictions were cancelled. Icebreaker Kontio was the last icebreaker to leave the Bay of Bothnia.

Assistance activity has been going on from December 28th to April 27th. During this winter 781 vessels were assisted in the Bay of Bothnia.

Assistance has been conducted to following ports:

Karlsborg	Tornio
Luleå	Kemi
Haraholmen	Oulu
Skelleftehamn	Raahe
	Kalajoki
	Kokkola
	Pietarsaari

7.2 Sea of Bothnia



Traffic restrictions were introduced on January 5th and at the same time Ale was stationed there in the end of January and used jointly by the Swedish and Finnish icebreaking service.

This winter was a very mild winter and already in the beginning of March icebreaker Ale left the Sea of Bothnia

Assistance activity has been going on from February 8th to 17th the same month. During this winter just 4 vessels were assisted in the Sea of Bothnia.

Assistance has been conducted to following ports:

Vaasa

7.3 Gulf of Finland



For the Finnish parts of Gulf of Finland the first traffic restrictions I,II 2000 were initiated 14th of January in Loviisa, Kotka and Hamina. These restrictions were the only ones in the Gulf of Finland this year. The restrictions were cancelled on 18th of March.

There were no operating Finnish icebreakers in the Gulf of Finland.

The first traffic restrictions initiated 13 January 2015 in St. Petersburg. The restrictions cancelled 16 March 2015. All vessels, which needed icebreaker assistance, were bound for Russian ports. During the largest ice cover, the Russians had three sea (liner) icebreakers and seven minor (port) icebreakers in use. The icebreaking season lasted from 26 December 2014 to 9 April 2015 in the Russian territorial water.

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

During the winter there were 1080 ships assisted in the Gulf of Finland.

Assistance was conducted in following ports:

Vyborg	Vysotsk
Primorsk	St. Petersburg

7.4. Gulf of Riga



The Estonian Meteorological and Hydrological Institute assessed the winter of 2014/2015 as mild.

The traffic restrictions were initiated 16th of January being IC-1600 kW in Pärnu. From 26th March traffic restrictions were cancelled.

The icebreaking season lasted from 10th of January to 16th of March and 54 ships were assisted by icebreaker multi-purpose-vessel EVA 316. Due to the mild winter there were no need for assistance to the Port of Riga.

Assistance has been conducted to following ports:

Pärnu

7.5 Central Baltic



Traffic restrictions were not imposed on the Baltic Sea this winter. No assistance activities were carried out this winter.

7.6 Southern Baltic



West Coast of Poland. Port of Szczecin and Świnoujście Area

I. Preparatory action taken before winter season.

1. On September 2014 Harbour Master of the Port of Szczecin has begun the procedure for public procurement for Ice Breaking. The Ice Breaking Contract for winter season 2014/2015 was signed on 21 November 2014 by Director of Maritime Office in Szczecin and Director of Ice Breaking Company „WUŻ Port Service Company Gdynia”

2. The Rules of co-operation with The Institute of Meteorology and Water Administration were established.

3. The buoyage was partly removed and partly replaced by special winter buoys on the approach to Świnoujście and on the main fairway Świnoujście -Szczecin shortly before the winter season.

II. Winter season 2014/2015

The winter season 2014/2015 was very mild and there was no ice formation, no danger to navigation as well. Consequently there were no icebreakers activities and no need to put into force traffic restrictions.

East Coast of Poland. Ports of Gdansk and Gdynia Area.

The Ice Breaking Contracts for winter season 2014/2015, covering area of ports Gdansk, Gdynia, Hel and Wladyslawowo were signed in July and August 2014.

All necessary preparation were completed on beginning of November 2014.

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

Due to the very mild winter 2014/2015 there were no extraordinary disabilities for the vessel traffic in the western part of the Baltic Sea caused by sea ice.

Only the German governmental Multi-Purpose Vessel Arkona was needed for a small couple of days in icebreaking operations in coastal waters.

7.7 Danish waters, Swedish West coast and Norwegian waters



The Icebreaking Service was on readiness from December 15th. The temperature during the 2014/2015 season was higher than the average winter in Danish waters.

The water temperature dropped slowly and by the end of January, the water temperature were about 3°C. From the middle of February the water temperatures was between 2 and 3°C, and there were no ice development in Danish waters.

The readiness of icebreaking was subsequently ended as of February 28th.

In the season 2014/2015 there were no need for ships to be assisted.

Due to the mild winter the ice on the Swedish South and West Coast were not of the dignity that some traffic restrictions have to be imposed and there were no need for icebreaker assistance.

The 2014-2015 was a very mild ice winter in Norwegian Waters. No traffic restrictions had to be imposed during the winter season. Ice breaking service in Oslo Fjord, Drammen fjord, Halden, Moss, Kragerø and the South Coast of Norway has all been contracted to private companies now.

The mild winter made it necessary to run active ice braking service to only one port for 2 days, the port of Halden. No other active ice breaking had been conducted. Neither Norwegian Coast Guard, nor Norwegian Coastal Administration has conducted any ice breaking or assistance this winter.

8. Description of organizations and icebreakers engaged during the season 2014-2015

8.1 Finland

The Finnish Transport Agency (FTA) 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 FTA 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 FTA 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., Svenska Sjöfartsverket, 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).

FTAs' Winter navigation unit in general and VTS centres and area coordination responsible coordination IB-masters locally are responsible for the management and daily operation of the icebreaking services to all winter ports.

The demands as to the standard of service are included in the freight 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 4,97 hrs. and 97% of all port calls did not have to wait for icebreaker assistance at all. The reason for high average waiting time was industrial actions within Arctia Icebreaking Ltd, in the middle of March - early April. FTA used hired service from Svenska Sjöfartsverket and Alfons Håkans AS for covering the lack of Icebreakers during that time. Only couple freights needed to be cancelled or transferred to other port.

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 Agency 2014/2015:

Name	Type	Engine power
OTSO	Icebreaker	21 800 kW
KONTIO	Icebreaker	21 800 kW
FREJ/ATLE	Icebreaker	18 400 kW
ZEUS	Icebreaker	6 000 kW

The Swedish icebreaker Frej was chartered to FTA during the period 6.2.2015 - 4.4.2015 and icebreaker Zeus for period 13.3.2015 - 5.4.2015. FTA used two tugboats for assistance in two different ports during this season.

8.2 Sweden

Icebreaking operations are managed by the Icebreaking Management of the Swedish Maritime Administration in Norrköping 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 eight icebreakers, of which the Swedish Maritime Administration owns five and has three on long-term charter from a private ship owner. All icebreakers are manned by a private shipping management company.

Sweden, Finland and Estonia use a jointly developed IT based on-line system, IB-Net (IceBreaker Net) for coordination of the joint icebreaking operations. IBNet 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's 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 2014/2015:

Name	Type	Engine power
ALE	Icebreaker	3500 kW
ATLE	Icebreaker	18400 kW
FREJ	Icebreaker	18400 kW
YMER	Icebreaker	18400 kW
TRITON	Coast Guard Vessel	6600 kW

During the winter the Administration also has engaged 2 different tugboats for icebreaking operations.

8.3 Russia

The Harbour Master of the Port has the power to impose ice restrictions in the port and approaching, based on actual ice conditions (according to article Nos. 74 & 76, Russian Federal Law No. 81-FZ, Russian Merchant Marine Code, 30.04.1999).

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 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	16 000 KW
SAINT-PETERSBURG	Icebreaker	16 000 KW
TOR	Icebreaker	10 000 KW
MUDYUG	Icebreaker	9 100 KW
KARU	Icebreaker	6 450 KW
SEMION DEZHNEV	Icebreaker	4 000 KW
IVAN KRUZENSTERN	Icebreaker	4 000 KW
YURI LISYANSKY	Icebreaker	4 000 KW
CAPTAIN ZARUBIN	Icebreaker	3 300 KW
CAPITAN M. IZMAILOV	Icebreaker	3 240 KW
CAPITAN PLAKHIN	Icebreaker	3 240 KW

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

Independent ice navigation following icebreaker recommendations and strictly under her supervision.

Icebreaker assistance in a convoy.

Individual icebreaker assistance behind an icebreaker.

Icebreaker assistance render to the 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.

8.4 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. The icebreaking coordination centre consisted of 9 members in 2014, chaired by the Head of the Maritime Safety Division of the Maritime Administration, and acts as an advisory board for the Director-General in icebreaking issues.

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. Icebreaking for Gulf of Finland was carried out by IB TARMO and IB BOTNICA

Icebreakers engaged by the Estonian Maritime Administration 2014/2015:

Name	Type	Engine power
EVA 316	Multi-Purpose Vessel	3 x 1 717 kW

8.5 Latvia

There is one icebreaker, the VARMA, which is owned and operated by the Freeport of Riga Fleet, Ltd.

No icebreakers were engaged by the Latvia 2014/2015.

8.6. 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.

There are no demand and necessity for icebreaking service in the Lithuanian coastal waters. During severe winters private tugboats carry out needed icebreaking.

8.7 Poland

Eastern part:

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

Western part:

The winter season 2014/2015 was very mild and there was no ice formation, no danger to navigation as well. Consequently there were no icebreakers activities and no need to put into force traffic restrictions.

8.8 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 able for 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	8 400 kW
MELLUM	Multi-Purpose vessels	6 620 kW
ARKONA	Multi-Purpose vessels	3 700 kW

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

8.9 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 at the Joint Operation Center can be contacted.

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

8.10 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
VILLA	Buoy tender	935 kW
SVALBARD	Coast Guard vessel	13 500 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

9. 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 project was completed on 17th of June and model version was launched. Fully operational version of the pages are going to be released before the icebreaking season starts. .

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



www.baltice.org