

Safe winter traffic on the Baltic Sea

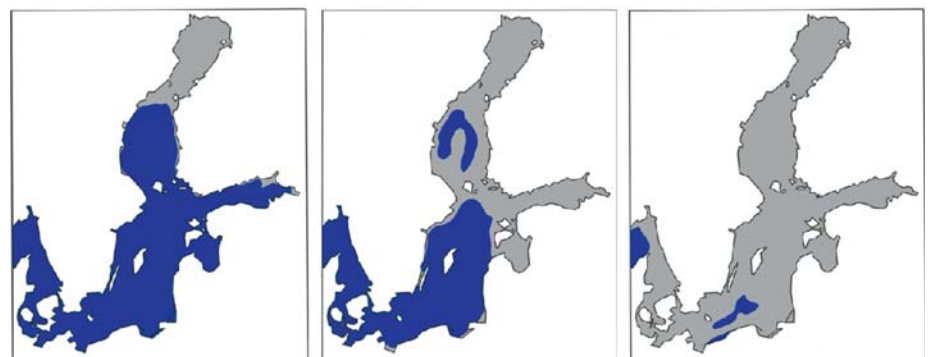
The European Union's northernmost waters are covered by sea ice every winter, affecting smooth maritime transport in the region. During normal and cold winters a high number of vessels are frequently delayed due to ice conditions. The Winter Navigation Motorways of the Sea II (WINMOS II) project aims to ensure safe and reliable winter traffic in a cost-efficient way by further developing the winter navigation system and ensuring sufficient icebreaking capacity.

WINMOS II is a continuation of the previous WINMOS (I) project. The main objectives of WINMOS II are to further develop and enhance the maritime winter navigation system and its safety and to safeguard the required icebreaking resources by developing new options as well as by upgrading the old capacity to meet modern day environmental standards.

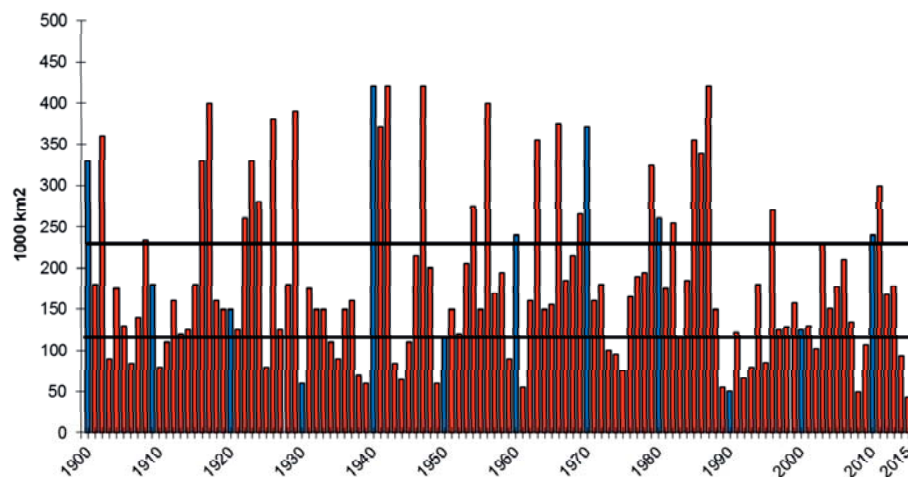
Ice extent varies

The debate on global warming is continuously ongoing and some people think that there will be no ice in the Baltic Sea in the future. It is therefore important to underline the fact that sea ice is expected to occur during the foreseeable future and will not disappear for many generations. Long periods with mild winters have happened before, e.g. between 1930 and 1940.

merchant vessels to pass through without icebreaker assistance, hence making icebreaking a necessity in the region even during mild winters. Ice coverage in the Baltic Sea varies between winters. During severe winters, even the Danish straights freeze over.



Different ice extents between mild, average and severe winters.



Ice extent 1900-2015

It is impossible to forecast the extent of ice coverage for the next coming years and therefore there must always be preparedness for severe winters. It is also very important to bear in mind that winters with lesser ice coverage are not easy from a merchant vessel's perspective. During these winters the winds are typically stronger, causing heavy ridging, and pressurised and drifting ice-fields in the fairway entrances. Most often these are either impossible or at least not safe for

Costs of icebreaking services

The annual cost of icebreaking services depends on how severe the winter is, but during an average winter the cost of icebreaking in the Baltic Sea for Sweden, Finland and Estonia is about 86M€. The cost of the whole winter navigation is much greater. The operational season for icebreakers is usually between December and May but in a severe winter it can start as early as October.

Modern logistic standards require predictability in the transport system the whole year round, which is why the winter

navigation system must continuously be developed and meet the requirements of trading countries. More efficient, economical and environmentally friendly transportation is needed due to increasing traffic volumes, increased demands for sustainable development and more demanding environmental laws. This equally applies during the winter, and it is further important to remember that education and training is required to work and operate in cold icy conditions.

Implementation

The implementation period of the project is from 11 February 2016 till 31 October 2019. The budget of the whole project is

18.97 million euro and the amount of granted CEF funding is 6.64 million euro.

Nine focus areas

1. Implementation and further development of IBNext

The objective of this activity is to further modernise and deploy the IBNext platform. The existing 20-year-old icebreaking network, IBNet is a system where satellite images, AIS-targets, port list, ships register, weather forecast, information on other icebreakers' intentions etc. are integrated in one system aboard the icebreakers and ashore in control centres.

2. Study on battery hybrid for safer and more environmentally friendly operation

The objective is to investigate the needs and potential savings for the large *Atle/Urho*-class icebreakers, which have a diesel-electric propulsion system. The outcome of this study can be used for a number of applications in the maritime field when additional power is required for a short time.

3. Further development of the common rail system

The objective for this activity is to complete the installation of the common

rail system for the five engines aboard the Swedish icebreaker *Ymer* and to develop software for regulation of the interaction between all five engines; finally, a full-scale test trail will be performed.

4. Life extension of Finnish icebreakers

The aim of this activity is to execute a life extension and upgrading programme for two Finnish icebreakers, the 1954-built *Voima* and the 1976-built *Sisu*.

5. Pilot study on removable icebreaking bow

The objective of this activity is to pilot the transformation of ice strengthened vessels and larger tugboats into icebreakers during wintertime by installing a removable icebreaking bow equipped with engines and propellers. With reduced investment costs, this concept would provide more flexibility for the use of the fleet and will be of great assistance in terms of extra resources during extremely hard winters when more icebreaking services are needed.

6. Development of icebreaker training

The aim of this development activity is to develop a programme and tools for training icebreaker officers. In the previous WINMOS (I) project, a training programme for ship officers was developed. The focus of the project was mainly on merchant vessels and the required skills of the ship officers navigating in ice covered waters. The training of icebreaker officers also needs further development.

7. Study on life extension works for Estonian icebreakers

The objective of this activity is to prepare a detailed study of the current technical situation of Estonian ships. A detailed technical study will be focused on the icebreaker *Tarmo* and the multipurpose vessel *EVA-316*.

8. Study on the adequacy of icebreaking capacity in the Baltic Sea for severe winters

Statistically, severe winters occur once or twice in a decade. The last winter classified as a severe winter was in 2010-2011 with a maximum ice extent of 309,000 km². Since then the winters

have been classified as normal or mild. The simulation model for winter navigation traffic from the WINMOS (I) project will now be utilized in the analysis and will be further developed and a scenario for very severe winters will be studied.

Based on these findings, a contingency plan will be drawn up to ensure icebreaker capacity and other operational means to safeguard maritime transport in the whole Baltic Sea during a very severe winter when most of the Baltic Sea freezes.

9. Project management and dissemination

This activity covers the technical and financial coordination of the action by the project coordinator – the Finnish Transport Agency, with the support of the activity leaders.

<http://www.winmos.eu/about/>

News in brief



Photograph: Vyborg Shipyard

Novy Port icebreakers close to delivery

The two icebreakers designed to support loading operations at the Arctic Gates oil loading terminal off Novy Port are currently in the final stages of construction at Vyborg Shipyard. The first vessel, *Alexandr Sannikov*, will be delivered to Gazprom Neft this spring and the second icebreaker, *Andrey Vilkitsky*, will follow later this year. The oblique icebreaker *Baltika*

is currently performing ice management and standby duties at the offshore oil terminal, while waiting for the two more powerful vessels based on the Aker ARC 130 A design to start service in the Gulf of Ob next winter. Full-scale ice trials will be performed after delivery of the vessels.

Port icebreaker for Sabetta to be launched

The port icebreaker for Sabetta LNG-terminal, *Ob*, will soon be launched at Vyborg Shipyard. The Icebreaker7 ice class vessel is expected to be ready for delivery before the end of this year. Based on the Aker ARC 124 concept and basic design by Aker Arctic, *Ob* will become part of Atomflot's

Portoflot project, tasked with keeping the harbour in Sabetta open and assisting LNG-tankers in berthing and loading at the terminal. Additionally, three tugboats have been delivered for the harbour: two Arc4 ice class tugs and one Arc6 icebreaking tug.