ICEBREAKING MANAGEMENT

ON FINNISH COAST

Helsinki/PIANC

27.05.2009

Director Ilmari Aro

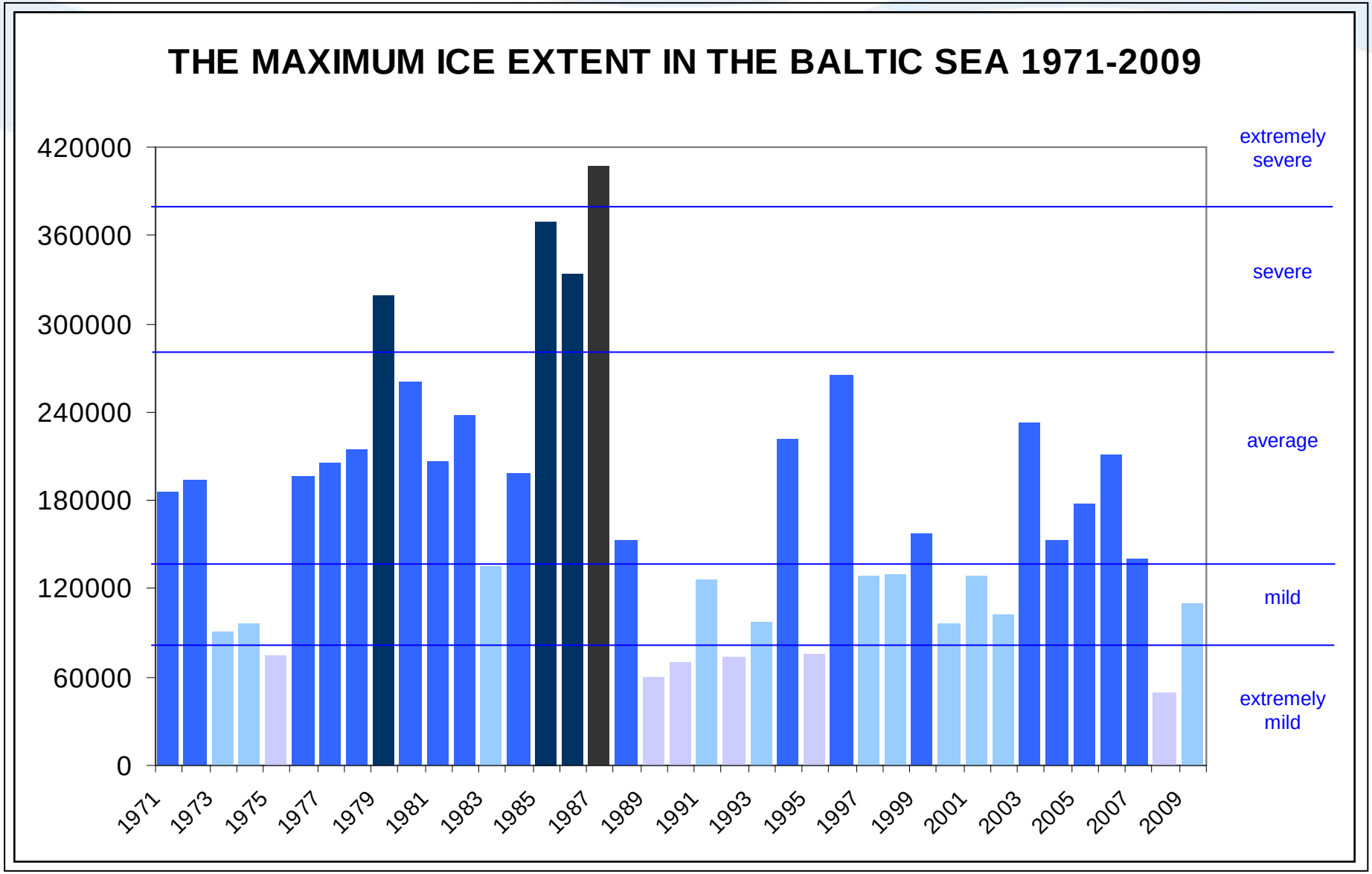
Finnish Maritime Administration

Icebreaking management means:

- to know ice-circumstances at open sea, in fairways and harbours
- to be responsible for safe and fluent traffic
- to have icebreakers available
- to know the traffic density and the ice performance of visiting ships and possibilities to cooperation
- to have a good information system
- to have a good weather/ice forecast service

Finnish Maritime Administration

- Responsible authority of the winter navigation
- Orderer of icebreaking services
  - 8 icebreakers time-chartered annually
  - Decision maker in traffic restrictions
  - Customer satisfaction
  - Quality control


THE MAXIMUM ICE EXTENT IN THE BALTIC SEA 1971-2009
420000
360000
300000
240000
180000
120000
60000
0
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
extremely severe
severe
average
mild
extremely mild

Main Traffic Restriction Ports: avg. 11

Tornio

Kemi

Oulu

Raahe

Kokkola

Pietarsaari

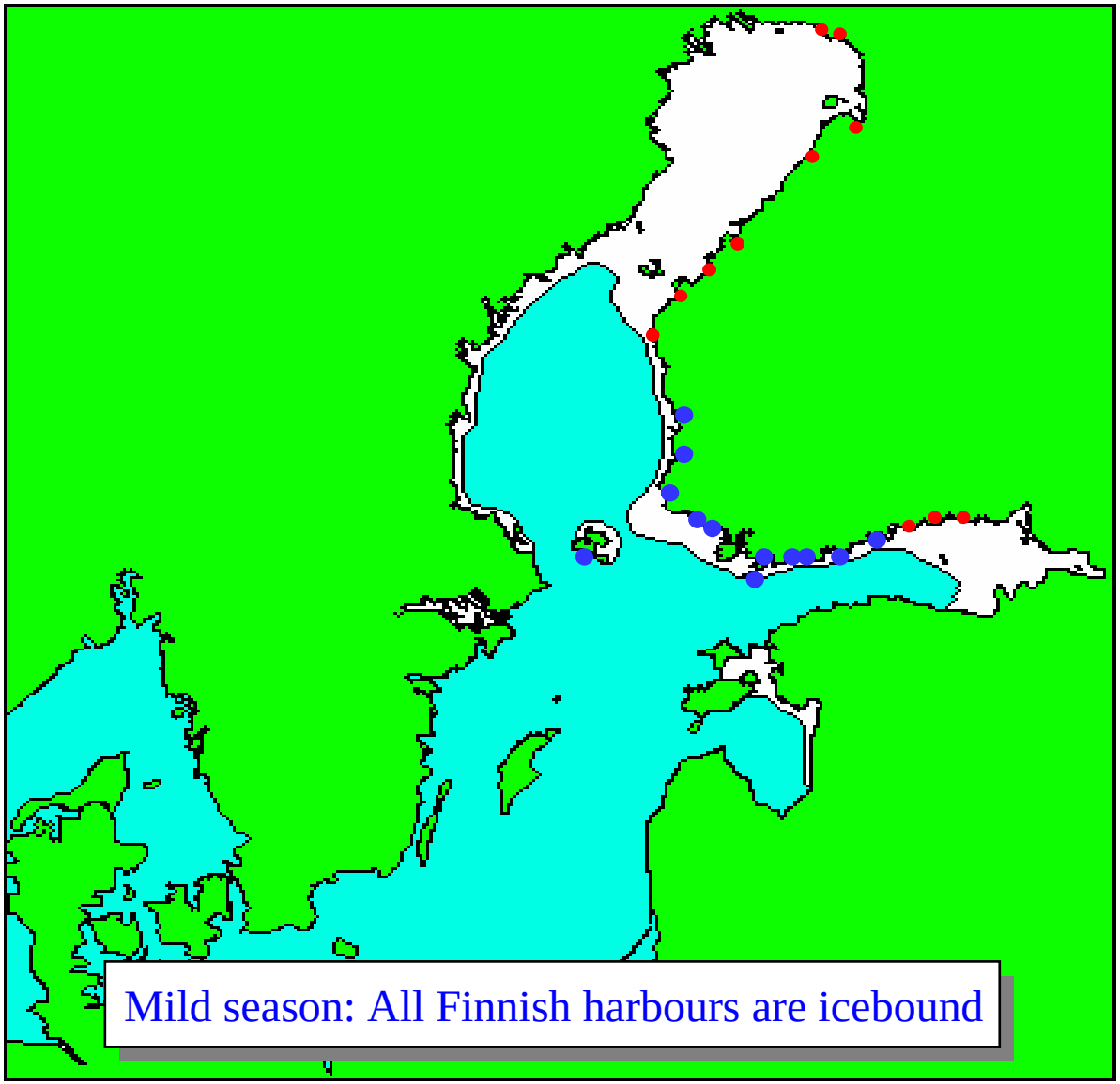
Vaasa

Kaskinen

Loviisa

Kotka

Hamina



- Port with Traffic Restriction
- Port without Traffic Restriction

Main Traffic Restriction Ports: avg. 19

Tornio

Kemi

Oulu

Raahe

Kokkola

Pietarsaari

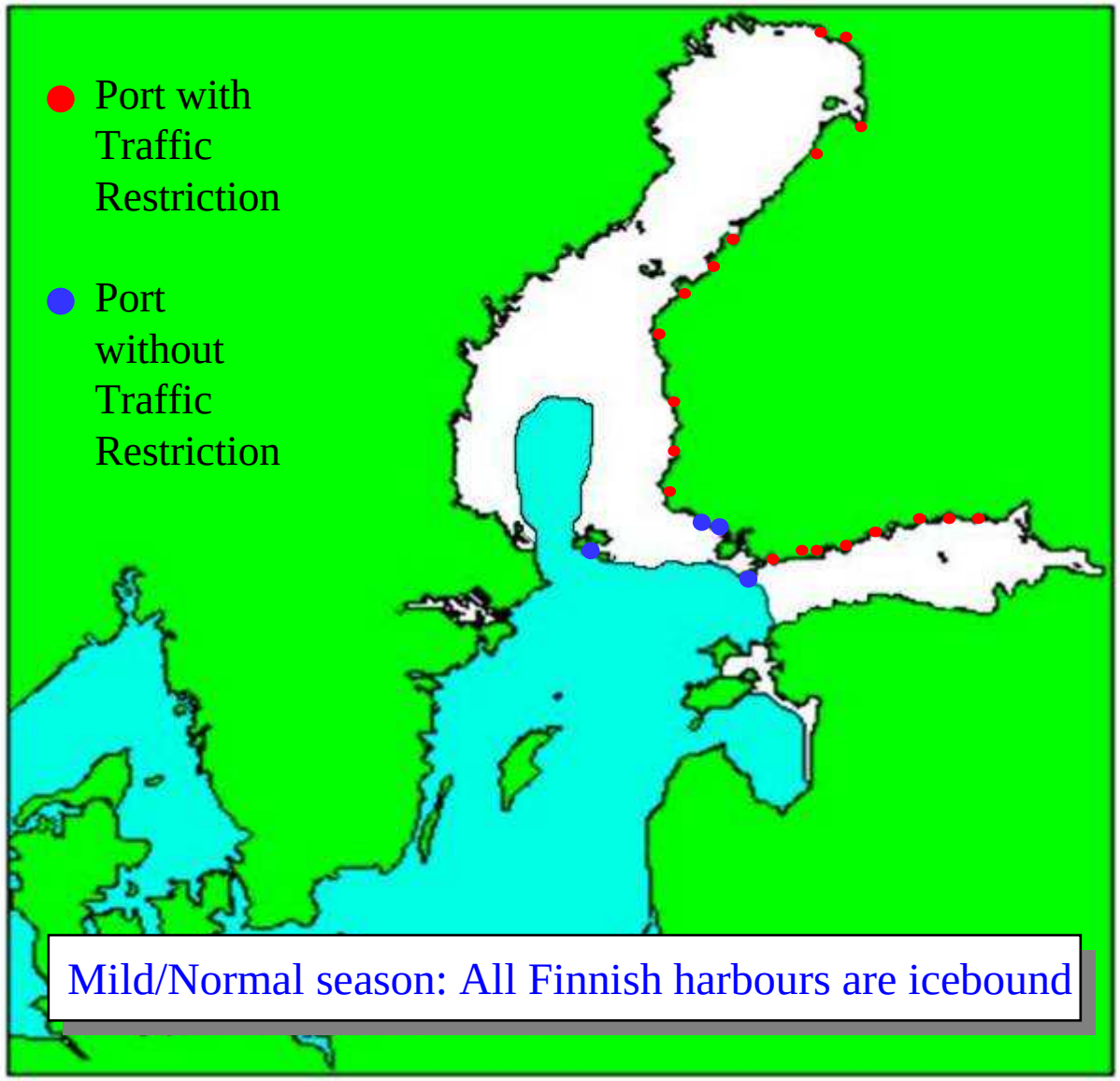
Vaasa

Kaskinen

Pori

Rauma

Uusikaupunki



Koverhar

Inkoo

Kantvik

Helsinki

Porvoo

Loviisa

Kotka

Hamina

Main Traffic Restriction Ports: 23

Tornio

Kemi

Oulu

Raahe

Kokkola

Pietarsaari

Vaasa

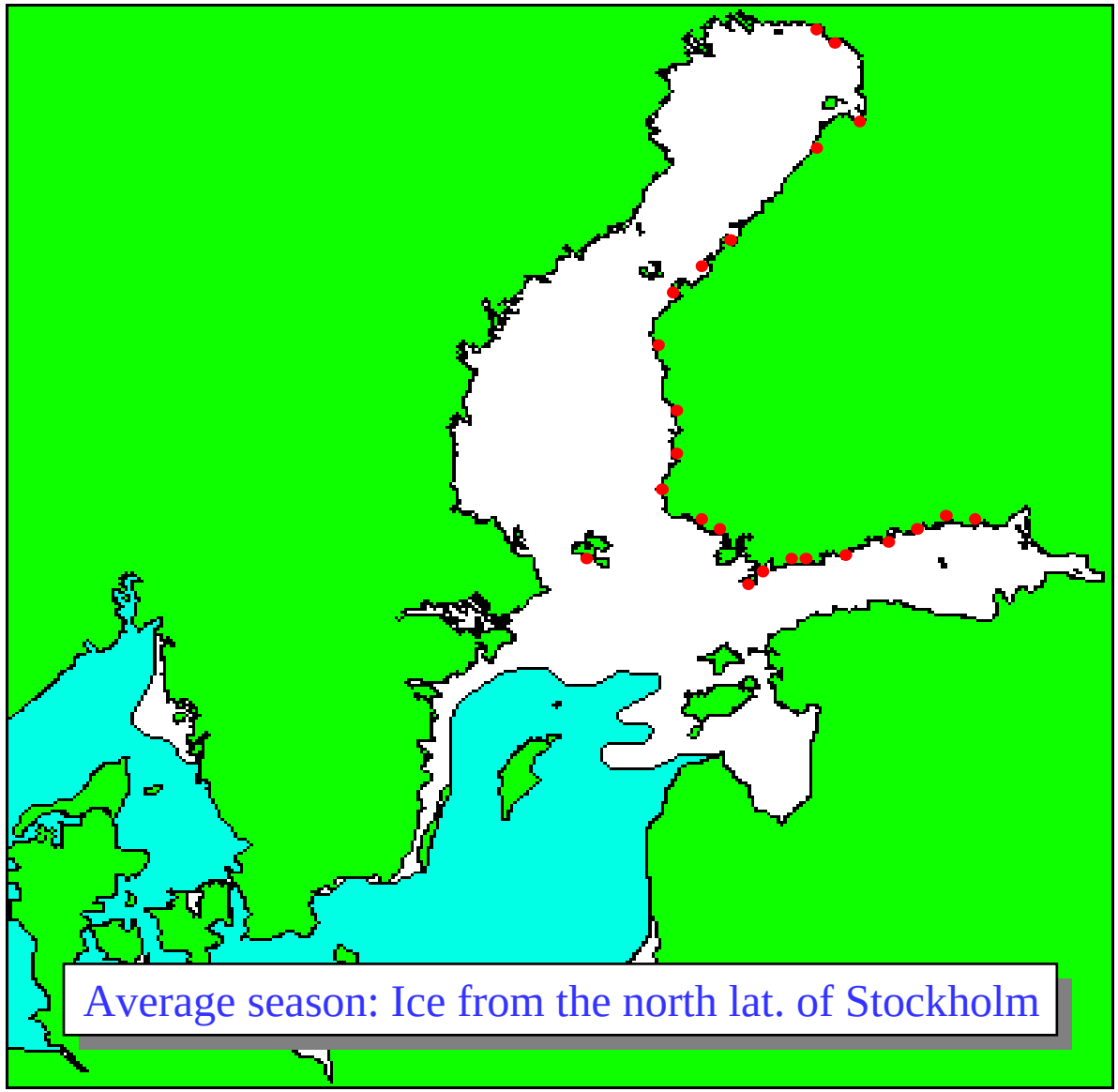
Kaskinen

Pori

Rauma

Uusikaupunki

Maarianhamina



Naantali

Turku

Hanko

Koverhar

Inkoo

Kantvik

Helsinki

Porvoo

Loviisa

Kotka

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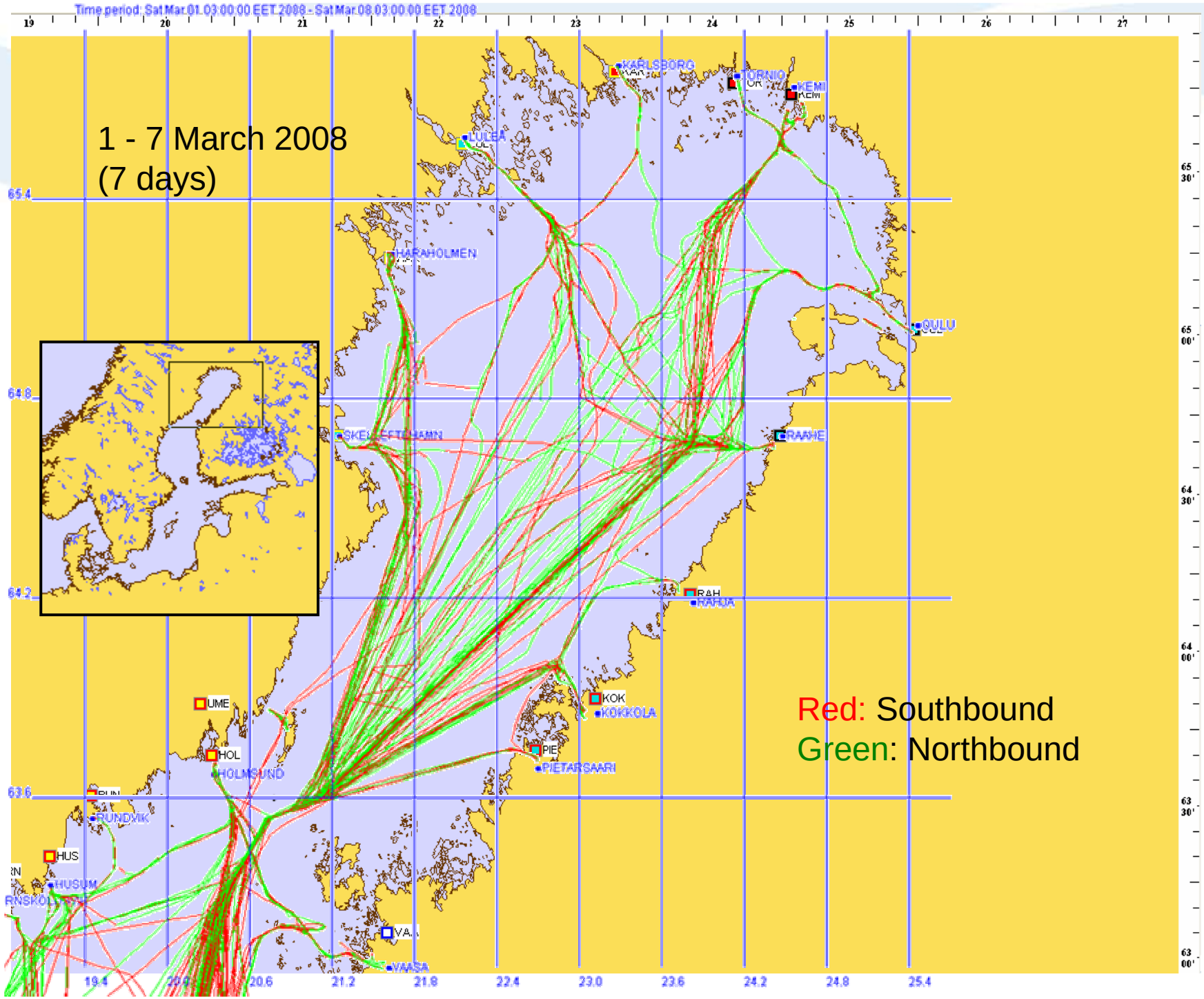
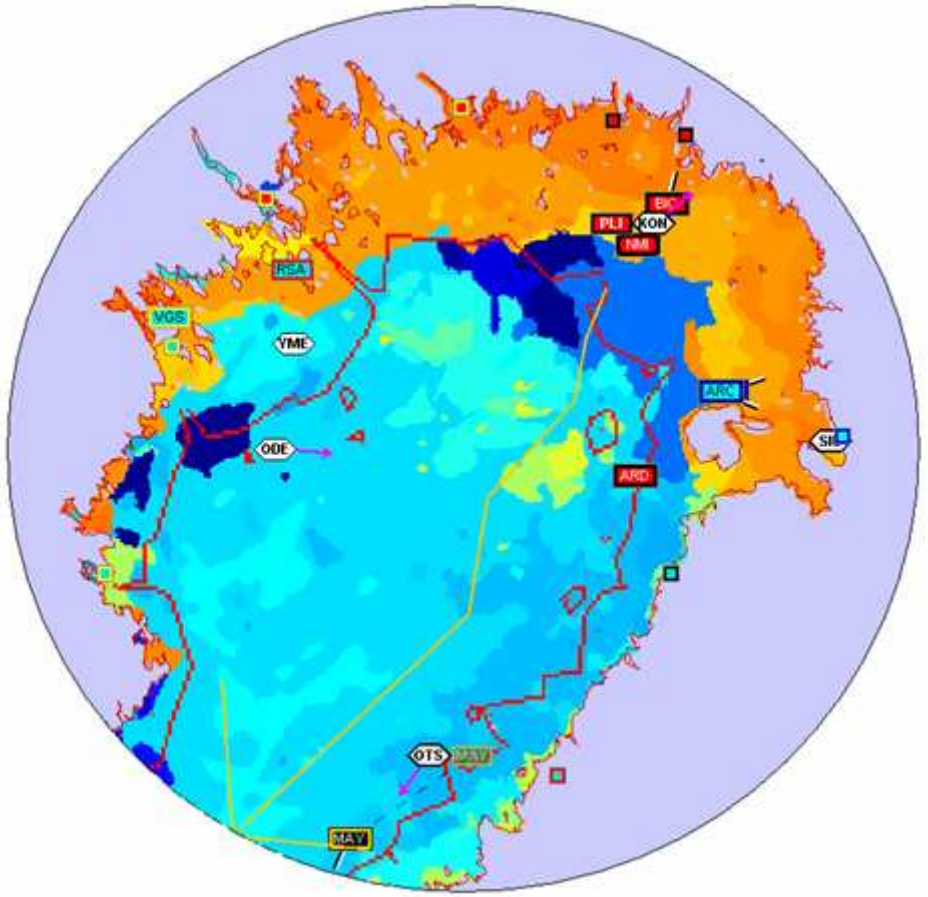
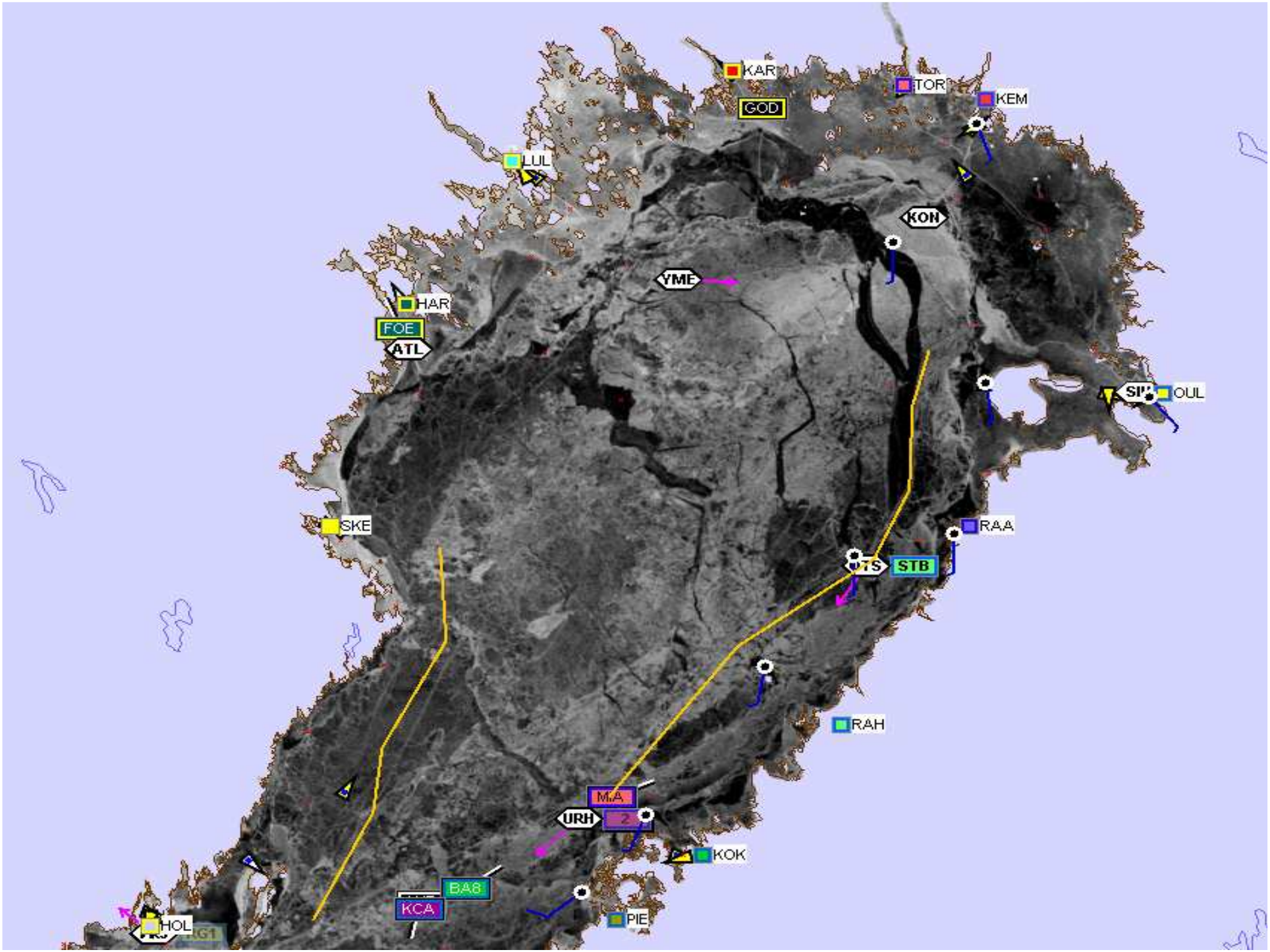

Time period: Sat Mar 01 03:00:00 EET 2008 - Sat Mar 08 03:00:00 EET 2008
1 - 7 March 2008
(7 days)
Red: Southbound
Green: Northbound
KARLSBORG
TORNIO
KEMI
LULEA
HARAHOLMEN
OULU
RAAHE
RAH
RAHJA
KOK
KOKKOLA
PIE
PIETARSAARI
UME
HOL
HOLMSUND
RUNDVIK
HUS
HUSUM
VAASA

IBNet

Good monitoring and coordination system in real time for icebreakers, ships, ice, weather, waypoints and cooperation



Finnish Maritime Administration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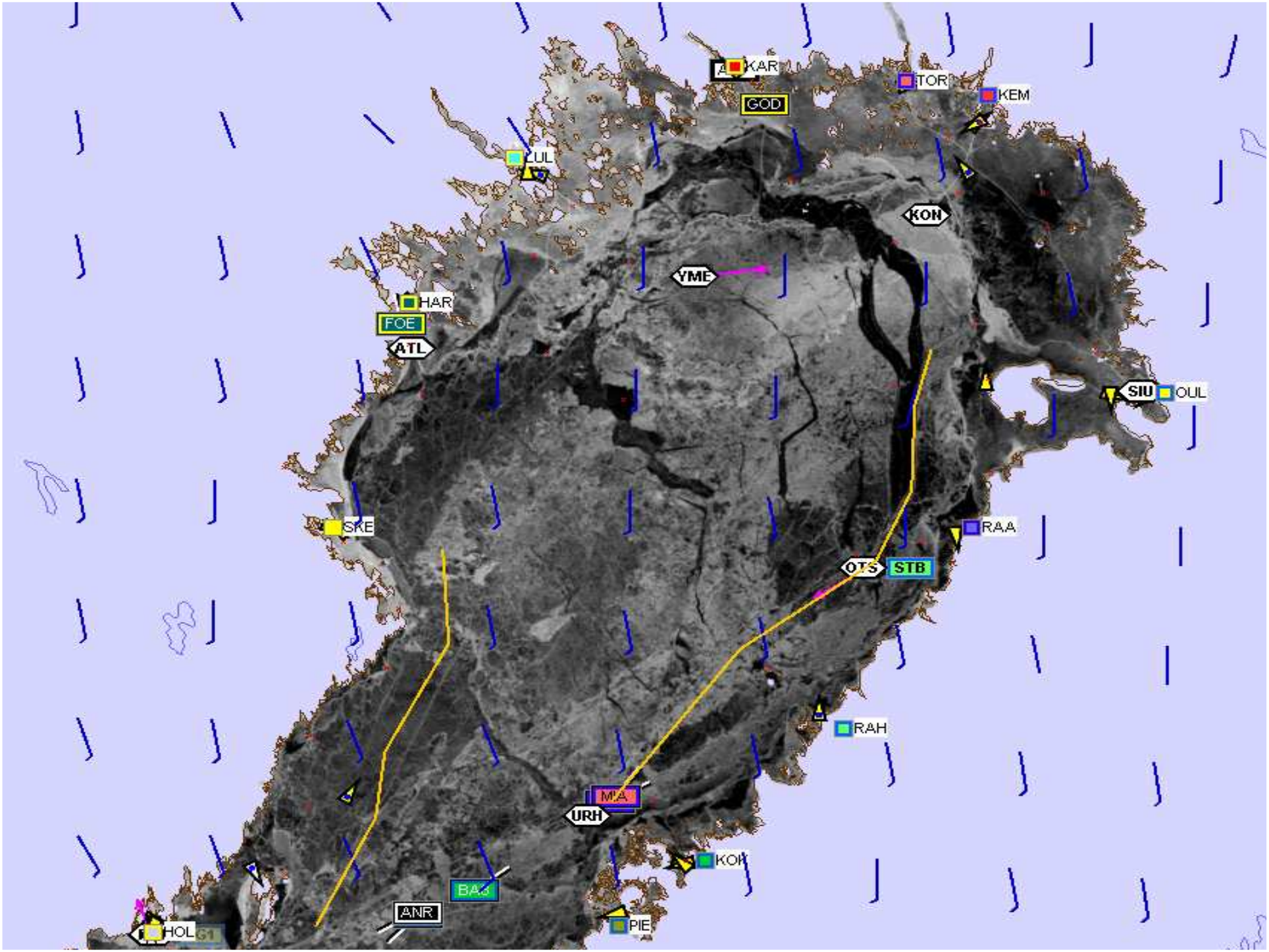
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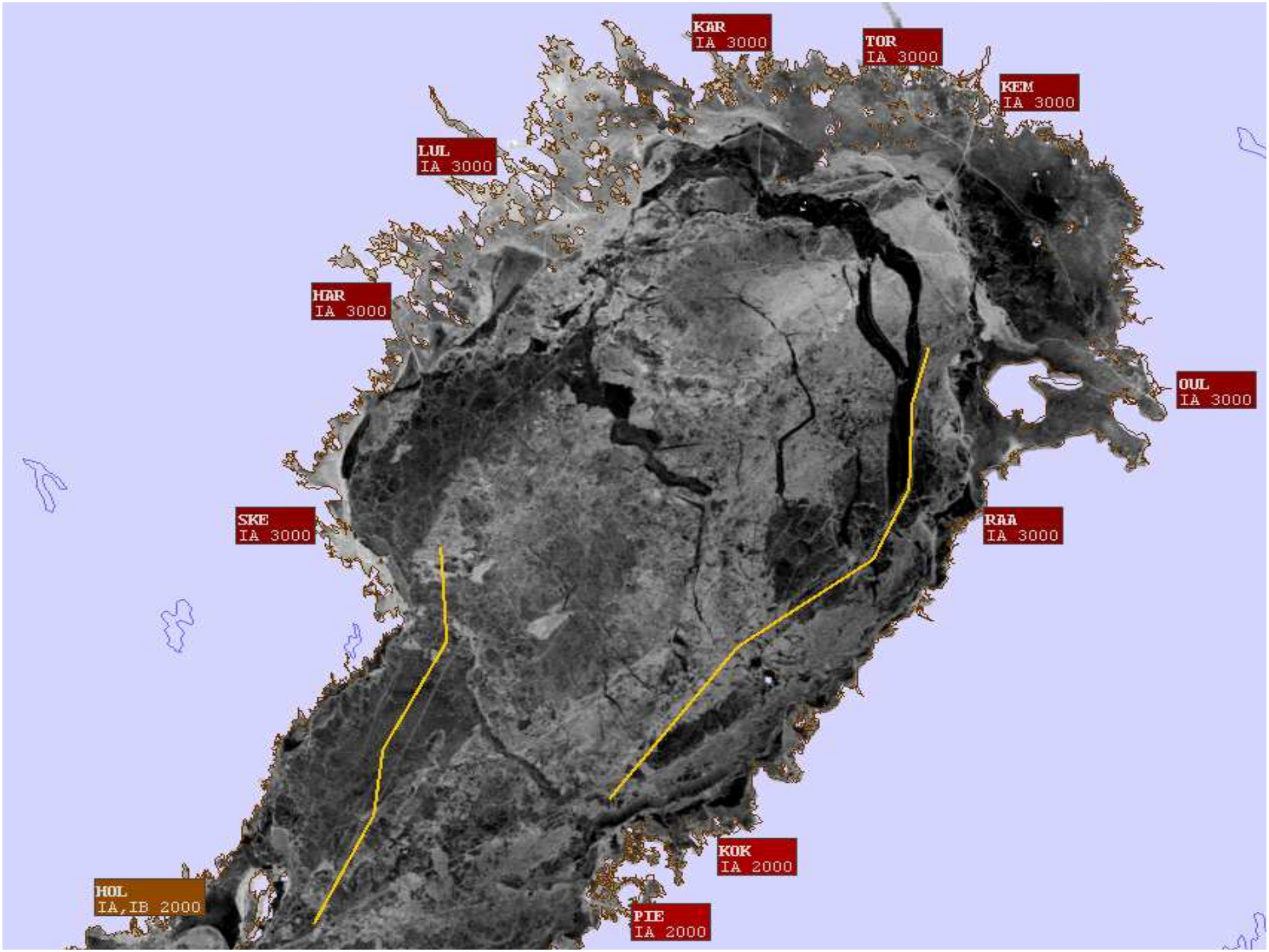
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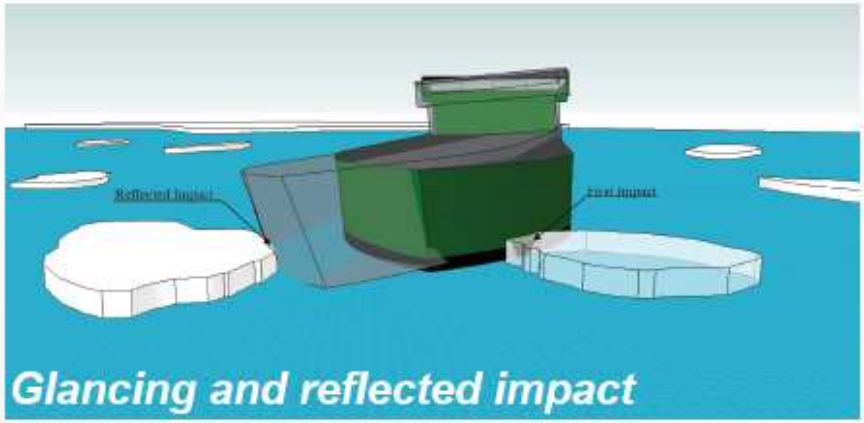
KOK
IA 2000
HOL
IA,IB 2000
PIE
IA 2000

The icebreaking management has three tools:

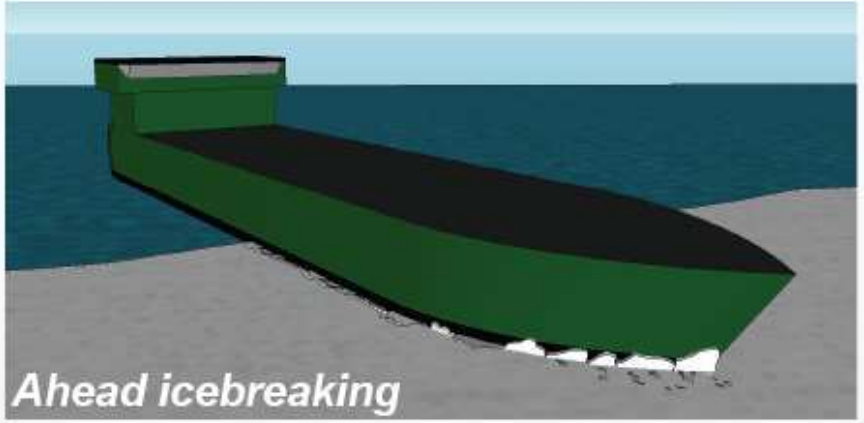
1. Icebreakers
2. Traffic restrictions
3. Good ice-going vessels information and cooperation

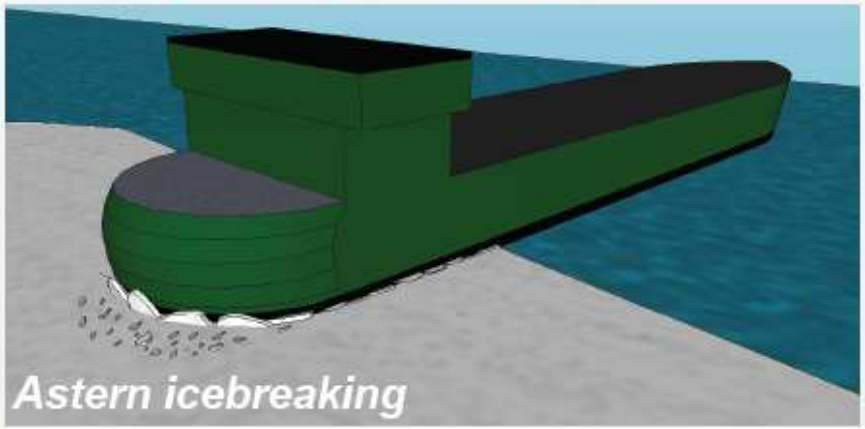
ICE LOAD SCENARIOS – SHIP STRUCTURE

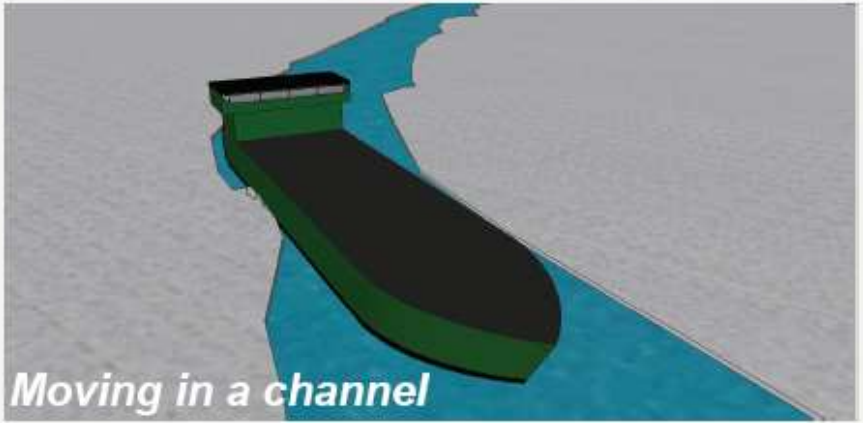
Scenario	Contact region	Description
Glancing impact	Bow, shoulder	Moving in broken ice
Glancing impact	Midbody	Moving in channel, manoeuvring
Reflected impact	Bow, shoulder	Moving in broken ice
Icebreaking	Stem, bow, stern	Moving in ice field



Glancing and reflected impact


Ahead icebreaking


Astern icebreaking


Moving in a channel

ICEBREKER ASSISTANCE

- Icebreaker assistance is granted only for ships with an ice class fullfilling daily criteria.
- The fairway dues depend on the ice class of the vessel. A vessel with a high ice class pays less than a vessel with a low ice class.
- Typical traffic restrictions for ships bound to Finnish ports are:
  - Eastern Gulf of Finland: Ice Class IA and minimum deadweight 2000 tdw
  - Northern Bothnian Bay: Ice Class IA and minimum deadweight 4000 tdw
  - South-western coast of Finland: Ice Class IC and minimum deadweight 3000 tdw

Basis in traffic restrictions

HELCOM recommendation 25/7

<u>Developing of ice on fairways and setting restrictions:</u>

- **Thickness of ice 10-15 cm -> restriction II**
  Forecast predicts continuing low temperature ->
- **Thickness of ice 15-30 cm -> restriction IC**
  Forecast predicts continuing low temperature ->
- **Thickness of ice 30-50 cm -> restriction IB**
  Forecast predicts continuing low temperature ->
- **Thickness of ice >50 cm -> restriction IA**

Fairway Due Variations

M/S Linda
Deadweight: 11300 t
Machine Power: 8385 kW
Ice Class: IAS
Type: General Cargo
Fairway due: 4 903,0 € (Nrt: 4205)

M/S Formosa Container No. 6
Deadweight: 11200 t
Machine Power: 6480 kW
Ice Class: IB
Type: Container
Fairway due: 21 794,85 € (Nrt: 4950)

M/S Ara Atlantis
Deadweight: 11435 t
Machine Power: 8400 kW
Ice Class: II
Type: Container
Fairway due: 37 945,9 € (Nrt: 6006)

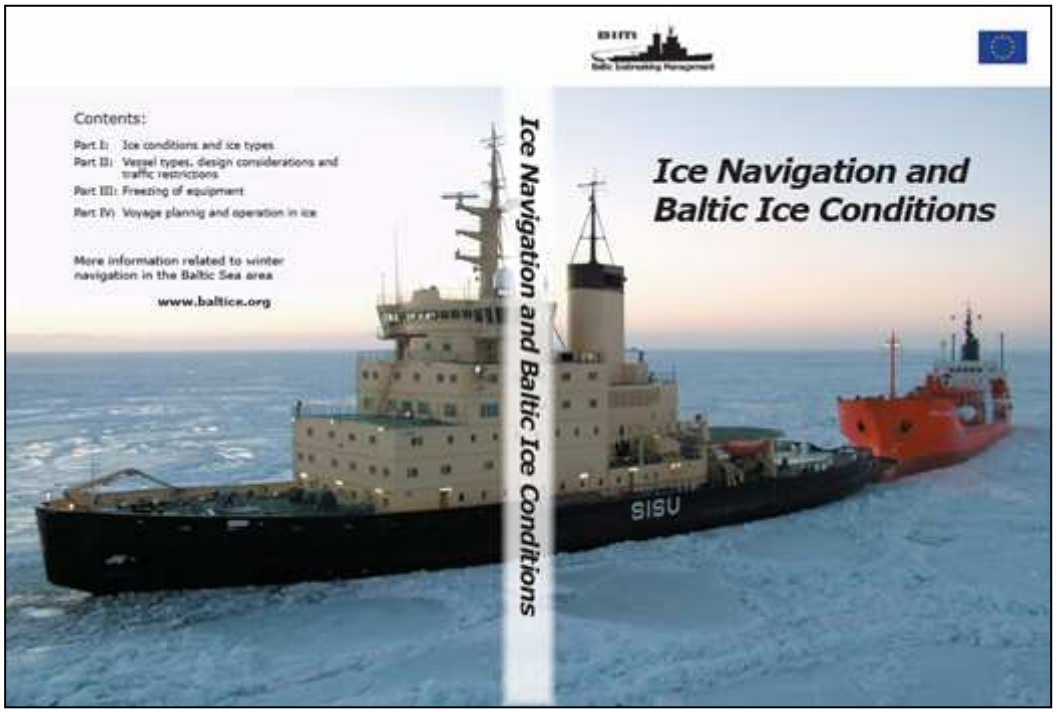
M/S Aurora
Deadweight: 11386 t
Machine Power: 8400 kW
Ice Class: IA
Type: Container
Fairway due: 13 105,1 € (Nrt:6006)

M/S Furth
Deadweight: 12500 t
Machine Power: 8508 kW
Ice Class: IC
Type: Container
Fairway due: 22 323,21 € (Nrt: 5070)

Why we need ice experience?

- Internal safety onboard
- The owner will keep his vessel undamaged
- The charterer will get the ship on schedule
- The industry is aiming 0 -storages and short delivering time is competitive advantage
- Lack of long term forecast
- Lack of Search and Rescue (SAR)
- Environmental impact of shipping
- Lack of icebreakers in stringent winters

Information available in the Baltic Sea



Freezing sea water sprays

Icing has an effect on stability


Improper ballasting
Cooling water problems
Screw and rudder breakdowns

www.baltice.org

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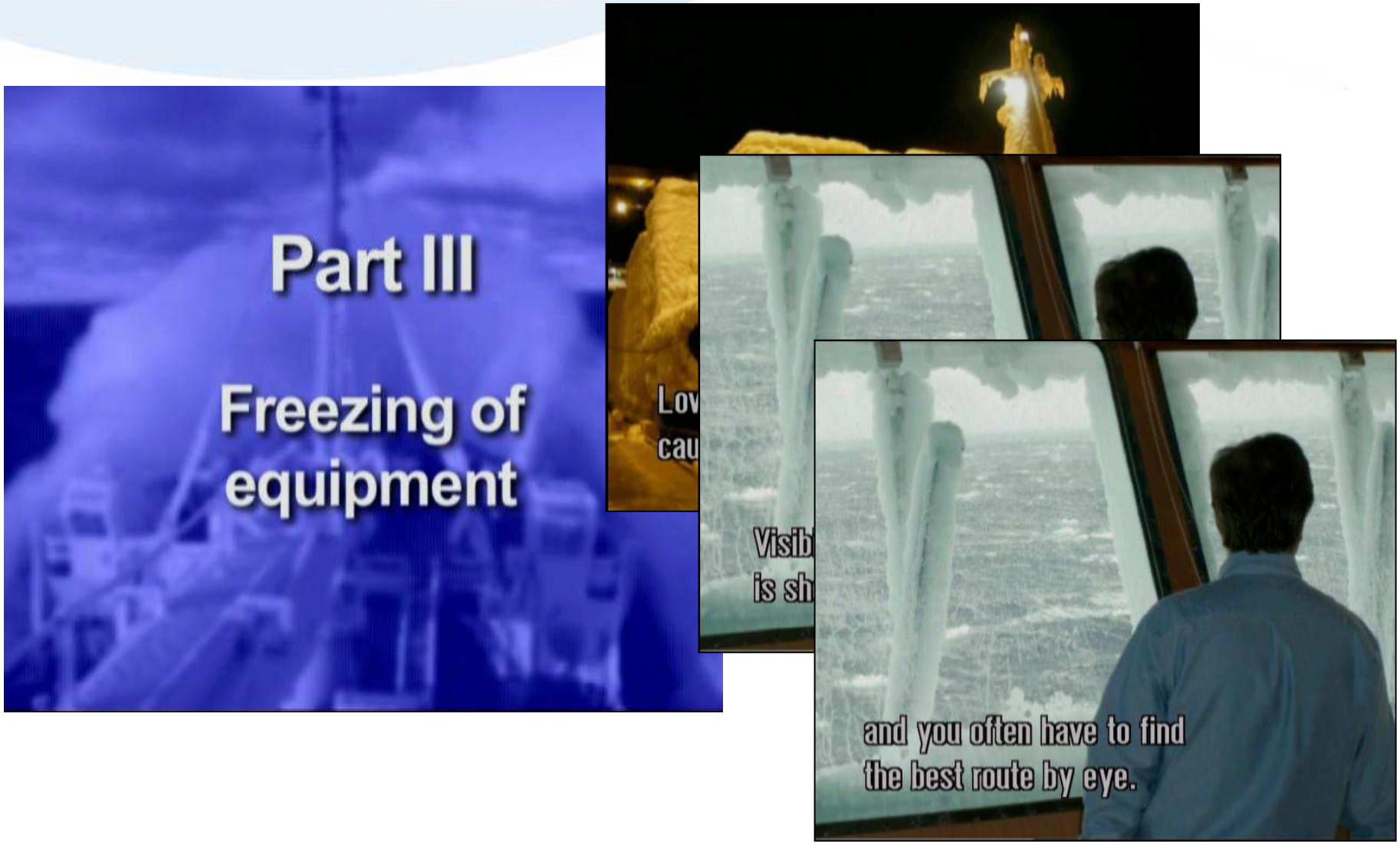

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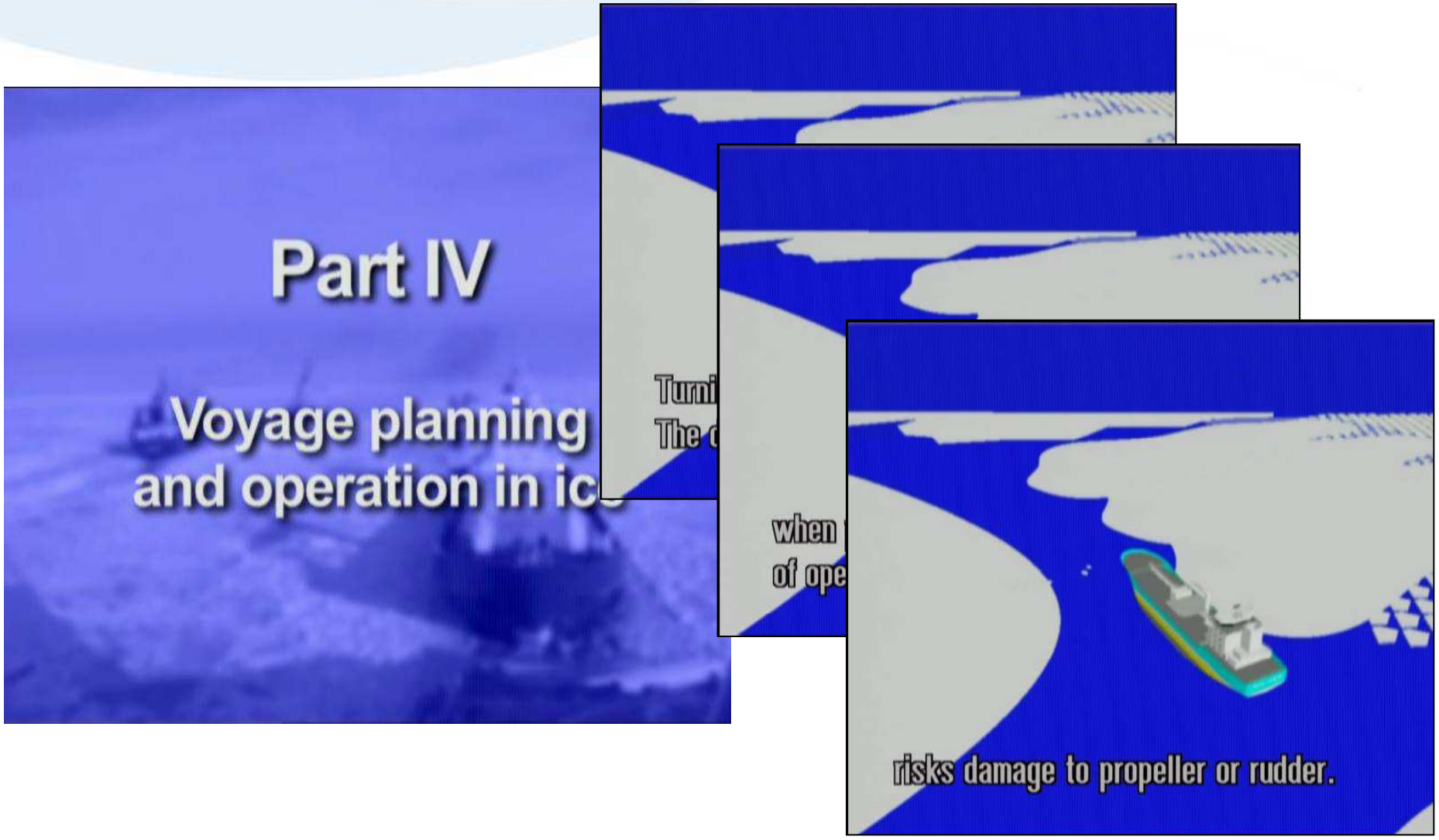

Customers satisfaction

- The price of the icebreaking services is low
- Normal waiting hours in average (4 hours)
- The average speed in assisting (10-12 knots)

Finnish Maritime Administration

Icebreaking costs €€€

Estimation

Readiness for 8 JM	~19 700 000 €
Operation	~ 7 600 000 €
Fuel	~5 400 000 €
Totally	**32 700 000 €**

Calculation is made after 650 operating days

Finnish Maritime Administration


Kiitos!
Finnish Maritime
Administration


Thank you!