

**Energy Transportation in the Baltic Sea  
and the Black Sea Regions seminar**

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**Emissions and discharges  
from shipping**

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# Content

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1. Finnish Transport Safety Agency Trafi
2. Similarities and differences:
  - \* The Baltic Sea
  - \* The Black Sea
3. Impacts of increasing shipping on marine environment
4. Eutrophication
5. Alien species
6. Baltic and Black Seas connected?

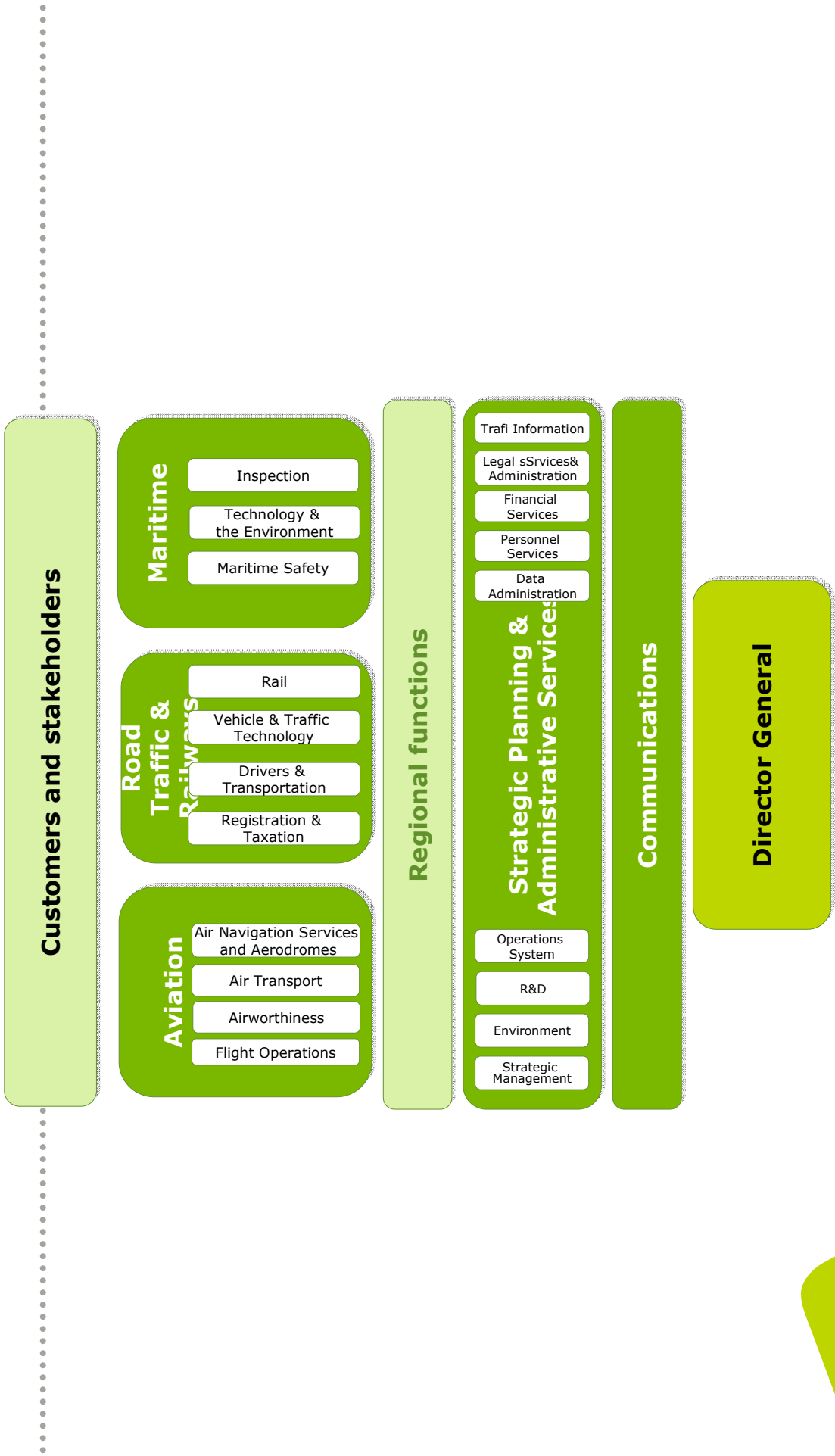


# Finnish Transport Safety Agency



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- The agency is an administrative and safety authority responsible for transport regulatory and supervisory functions, whose remit covers all modes of transport.
  - The agency's remit also includes the promotion of sustainable development throughout the transport system and the provision of administrative services for the transport sector.
  - The agency is also responsible for communications and information campaigns targeting the general public as well as for research and development in the sector.
  - The agency employs about 530 people.
  - The annual budget is €114.1 million.
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- A decorative graphic at the bottom of the slide consisting of a solid green horizontal bar with a curved, wave-like shape on the left side.

# Organisation



# The Baltic Sea and the Black Sea

## - Similarities and differences





# The Baltic Sea

## Young Sea

**Area:** 373 000 km<sup>2</sup>

**Depth:** average 55 m; max 459 m

**Volume:** 20 900 km<sup>3</sup>

**Catchment area:** 1.6 million km<sup>2</sup>

**Water residence time:** 25-35 years

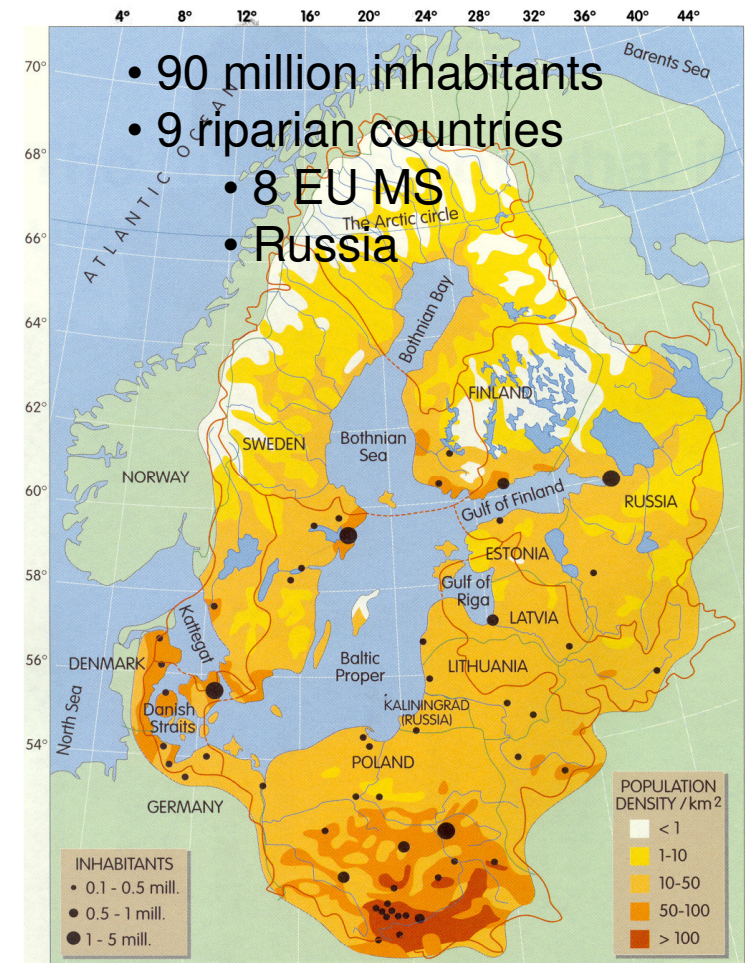
**Salinity range:** from 23 ‰

in the Danish Straits to approx. 2-3 ‰  
in the easternmost GOF and  
northernmost GOB.

There is **no tide** in the Baltic.

Due to exceptional salinity conditions,  
the Baltic Sea is characterised by **low species  
diversity of freshwater and marine origin,  
and a simplified food web.**

## THE BALTIC REGION



The Baltic Sea, its seven basins and the drainage area. Furman et al. 1998b

**For geographical reasons:**

**Seasonal variation is characteristic for the Baltic Sea,  
especially in the Northern parts.**

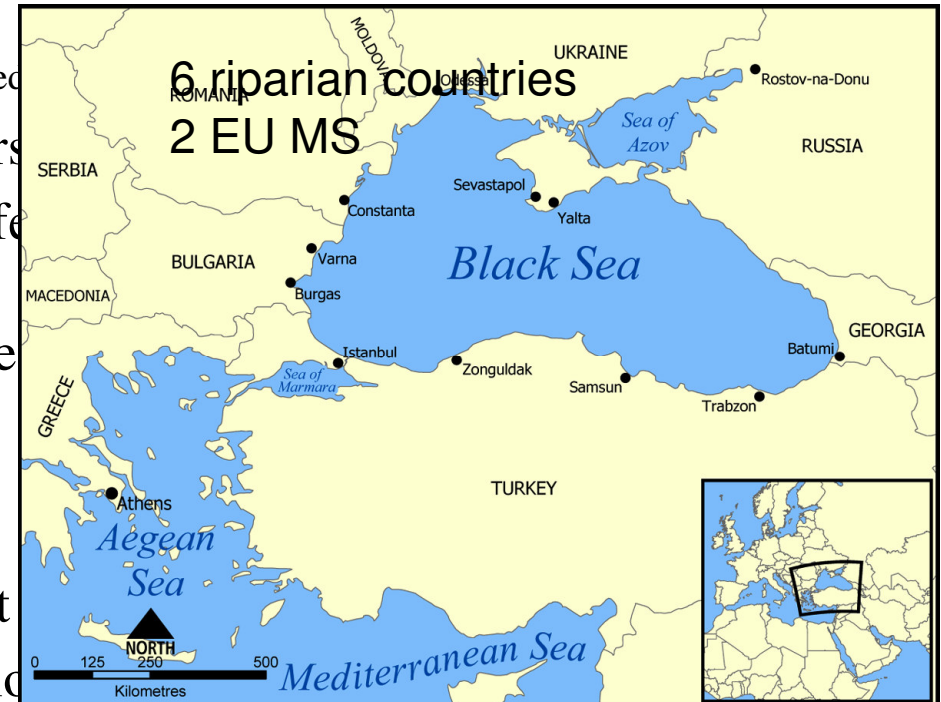


**Photo by WWF/ Seppo Keränen**



# The Black Sea

- **Young Sea**
- **Area:** 436,400 km<sup>2</sup> (The Sea of Azov excluded)
- **Depth:** maximum depth of 2200 meters
- Below 200 meters anoxic -> marine life is very limited below this depth
- **Volume:** 547 000km<sup>3</sup> (26 x Baltic; the largest brackish water ecosystem)
- **Salinity range:** 17 to 21 ‰; brackish water
- **Ice cover:** 40-130 days in the NW part
- **Biota:** threatened by aliens and pollution





# Similarities



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- **1. Semiclosed sea areas with narrow straits:**
    - **The Black Sea:** The Bosphorus Strait, through the Sea of Marmara and the Dardanelles Strait
    - **The Baltic Sea:** The Danish Straits.
  - **2. Important routes for commercial shipping (oil)**
  - **3. Nutrient loading and pollution** have serious impacts in both Seas
    - and alien species through **ballast water** are threatening biota.
  - **4. Both Sea Areas are protected by Regional Sea Conventions:**
    - Helsinki Convention (1974/92) for the Baltic and
    - Bucharest Convention (1994) for the Black Sea
  - **5. Protected under MARPOL73/78 Annexes as follows:**
    - **The Baltic Sea** has a Special area status under **I, V and VI**
    - **The Black Sea** has a Special area status under **I and V**

# Increasing international shipping in the Baltic Sea

At every moment > 2000 vessels trafficking in the Baltic Sea



## Oil harbours in the Gulf of Finland

..... New: Lomonosov, Batareinaya, Vistino (+Gorki), Ust-Luga, Sillamäe, Aseri, Kunda .....



# Oil transportation in the Gulf of Finland

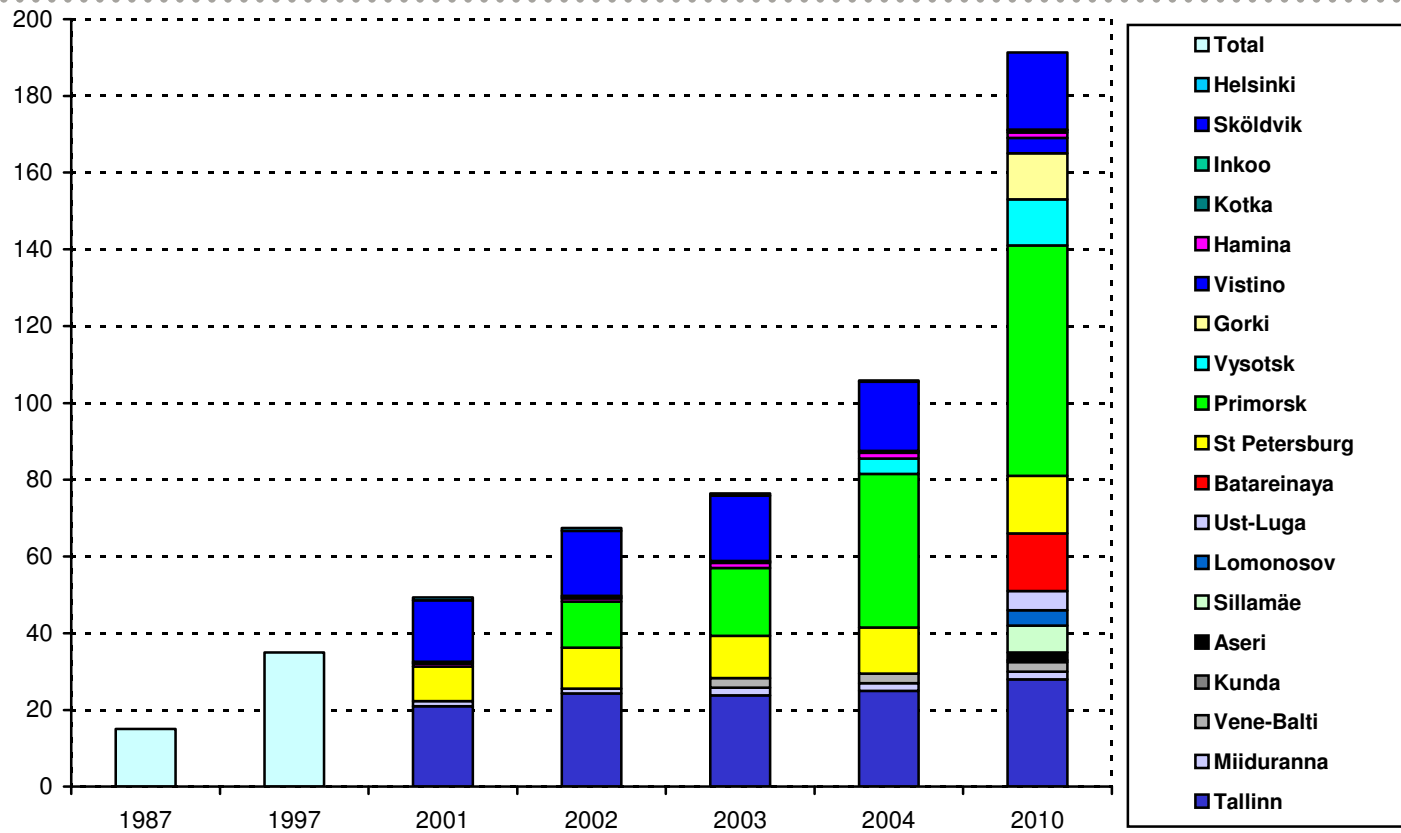




Photo by WWF-Canon

Oil shipping in the Gulf of Finland > 170 million tonnes /year



# HARMFUL DISCHARGES AND EMISSIONS FROM SHIPS

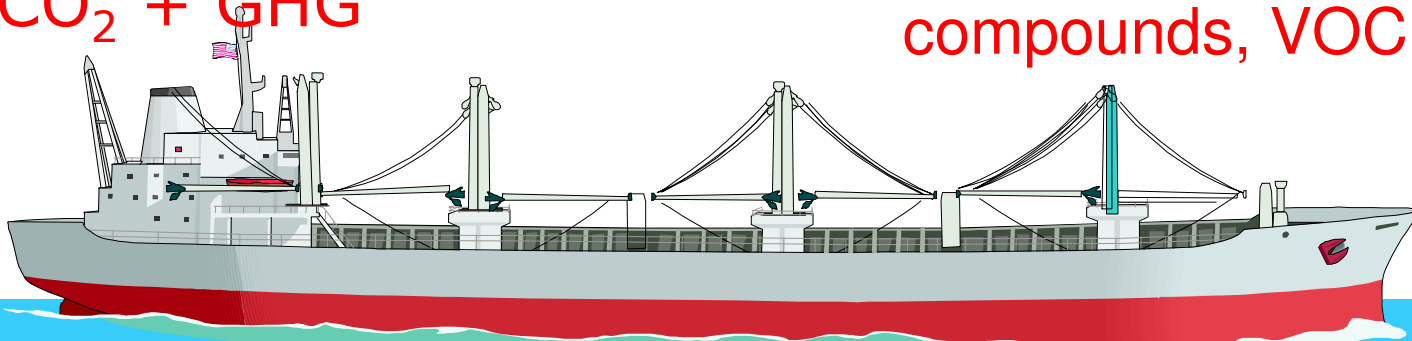


## Exhaust gases:

SO<sub>x</sub> and NO<sub>x</sub> emissions  
CO<sub>2</sub> + GHG

CFC, halon

Volatile organic  
compounds, VOC



Oil

Ballast water

Hazardous  
substances

Sewage

Garbage

Antifouling paints

An aerial photograph of a research vessel in the Baltic Sea. The vessel is white with a red hull and is surrounded by a large, dense, greenish-brown algal bloom. The water is a deep blue-green color, and the vessel is moving through the bloom, leaving a white wake.

**Eutrophication is a serious problem for The Baltci Sea!**

**Algal blooms...**

**Photo by FIMR**

# Findings from ShipNOdex project (focus on NO<sub>x</sub> emissions)



- 1) Shipborne nitrogen loading can be up to 30 % of atmospheric nitrogen (NO<sub>x</sub> + NH<sub>4</sub>) deposition in the Baltic area during summer months!
- 2) In the Finnish EEZ the total amount of shipborne nitrogen is
  - 56 000 t/a ( > 53 000 t/a from landbased traffic).
- 3) As a source of nutrient loading there are differences between different kinds of ships!
- 4) Agreement among HELCOM contracting parties to reduce NO<sub>x</sub> emissions from ships!
  - Joint submission into IMO on MARPOL 73/78 Annex VI to get the Baltic Sea as a Control area for NO<sub>x</sub> emissions (NECA)?
  - Cost effectiveness reports under preparation.



## Additional means to cut nutrient loading



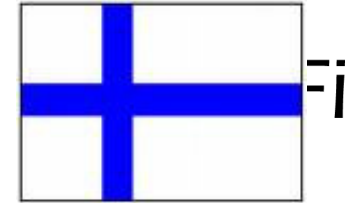
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- Joint submission to MEPC60 (March 2010) by all Baltic countries to get the Baltic Sea as a Special area under MARPOL Annex IV, i.e. ban for waste water discharges for passenger vessels.
  - To be further discussed at MEPC61 in October 2010.

# Oil transportation increases risk of alien species



- Alien species considered by IMO to be one of the biggest threats to marine biodiversity
- 170 million tonnes of oil transportation/year in the Gulf of Finland
- ->means 85 million tonnes of ballast water discharge annually
- \* >120 alien species in the Baltic Sea
- 25 of them are found in the Finnish coastal sea area
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**THE TWINNING LIGHT PROJECT  
BG2006/IB/TR/02/UE/TWL  
OF THE REPUBLIC OF BULGARIA**

**CAPACITY BUILDING FOR ENHANCED CONTROL AND  
PREVENTION OF MARINE POLLUTION GENERATED BY SHIPS IN  
THE BLACK SEA**

**Reducing risks inside (Ballast water)  
and outside (Antifouling) ship hulls**

**Seminar in Sofia June 29<sup>th</sup>, 2009**

***Erkki Leppäkoski, Abo Akademi University, and  
Markus Helavuori, Finnish Maritime Administration***



**Finnish Maritime  
Administration**



**Bulgarian Maritime  
Administration**

# Alien species in the Black Sea



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- **Ships are known to**
  - - carry some 320 million tons of ballast water through the Bosphorus every year
  - - carry some 4000 to 7000 species of animals and algae at any given moment
  
  - **Ships are**
  - - getting bigger (= more ballast) and faster (= shorter voyage time = better survival of animals)
  
  - **Alien species are here to stay**
  - - 165 alien species recorded in the Black Sea,
    - >40 developed mass occurrences;
    - have caused serious ecological and economic problems



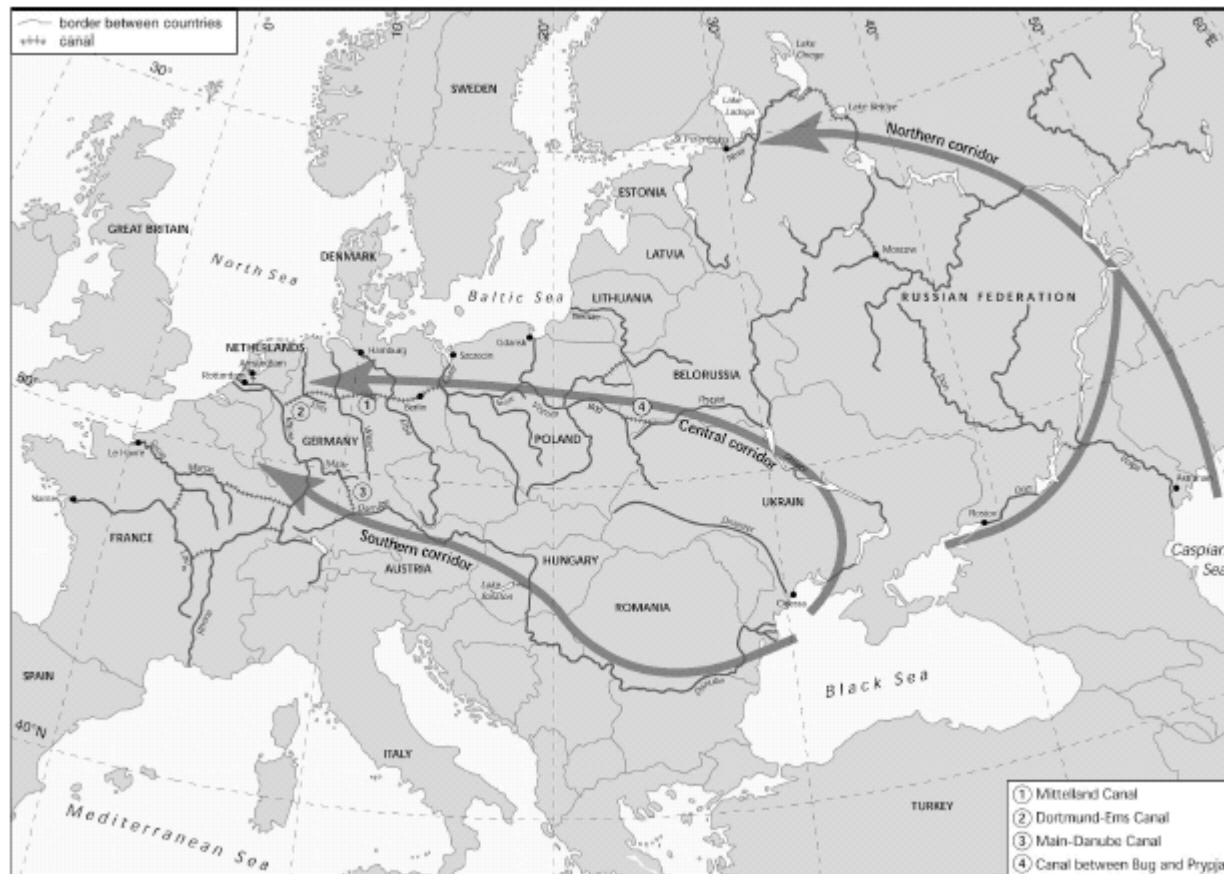
# Aliens are here!

BWMC (2004) to be ratified by Baltic countries; roadmap agreed, all Baltic countries should ratify the convention by 2010 or latest by 2013 .



American comb jelly

# The main migration corridors of Ponto-Caspian species in Europe



(Bij de Vaate *et al.* 2002).

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- **Thank you for your attention!**
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