

# AIS analysis of current Short Sea Shipping - learning outcomes from the SloEuro project and current studies

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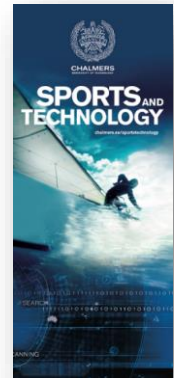
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# SSPA Research.

- Coordinates industry and society in development projects, applies for funding and participates and leads research projects
- Financed by public funding in Europe and Sweden
- More than 70 European projects since 1997
- SSPA develops new methods, tools, applications and commercial services and builds competence
- World-wide network
- World-class hydrodynamic facilities:



**SUMMETH**  
Sustainable Marine Methanol



TOWING  
TANK



MARITIME DYNAMICS  
LABORATORY



CAVITATION  
TUNNEL



SEAMAN  
SIMULATION

# ***Recent and ongoing studies using AIS data***

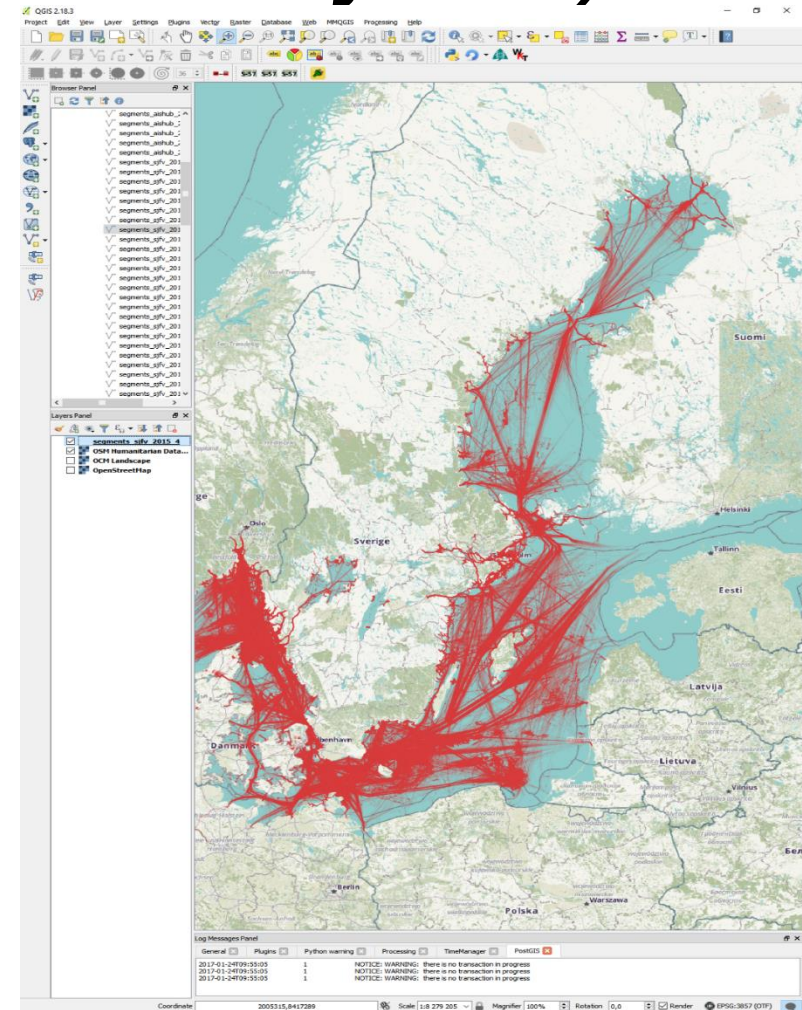
- Comparison of ship speed after SECA – SloEuRo
- Green steaming – Mona Lisa 2.0
- STM (Sea Traffic Management)
- Ship collision analysis
- Mapping Swedish short sea shipping using AIS data – NÖKS
- AIS in maritime research – Current status and future potential (a literature review study) – NÖKS

# AIS (Automatic identification system)

- Implemented: SOLAS 2002 – All ships over 300 gross tonnage must be equipped with AIS transponder

## Different types of data

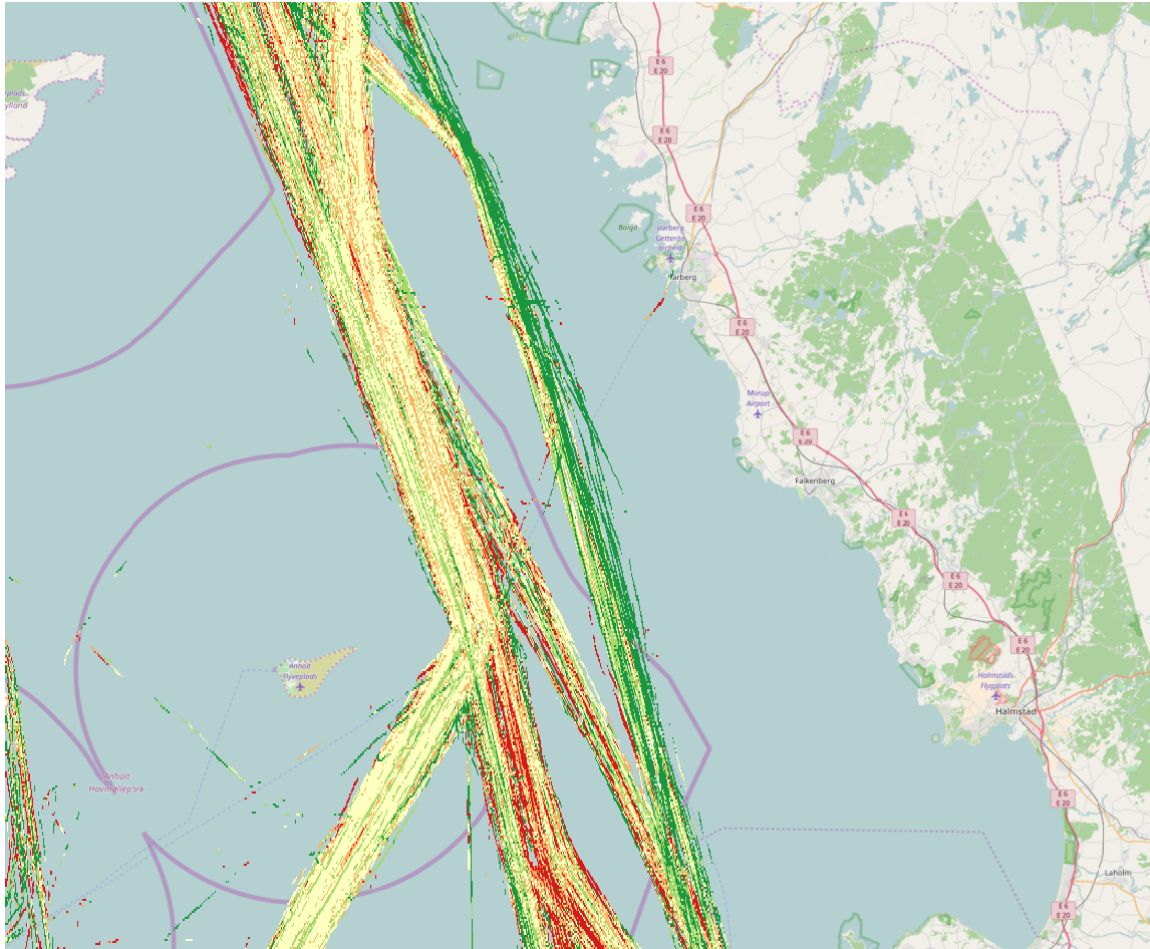
- Static data: ship name, destination, ship length and width, draft, tonnage, cargo type, ETA, origin, etc..
  - Dynamic data: position, course and speed etc..
- VHF – every 2-10 seconds
  - When collected and stored, AIS becomes BIG DATA
  - SSPA AIS: Collected, stored and processed since 2008



***SloEuRo – Cost effective short sea RoRo shipping to combine SECA compliance with slow steaming***



# Comparison of ship speed after SECA

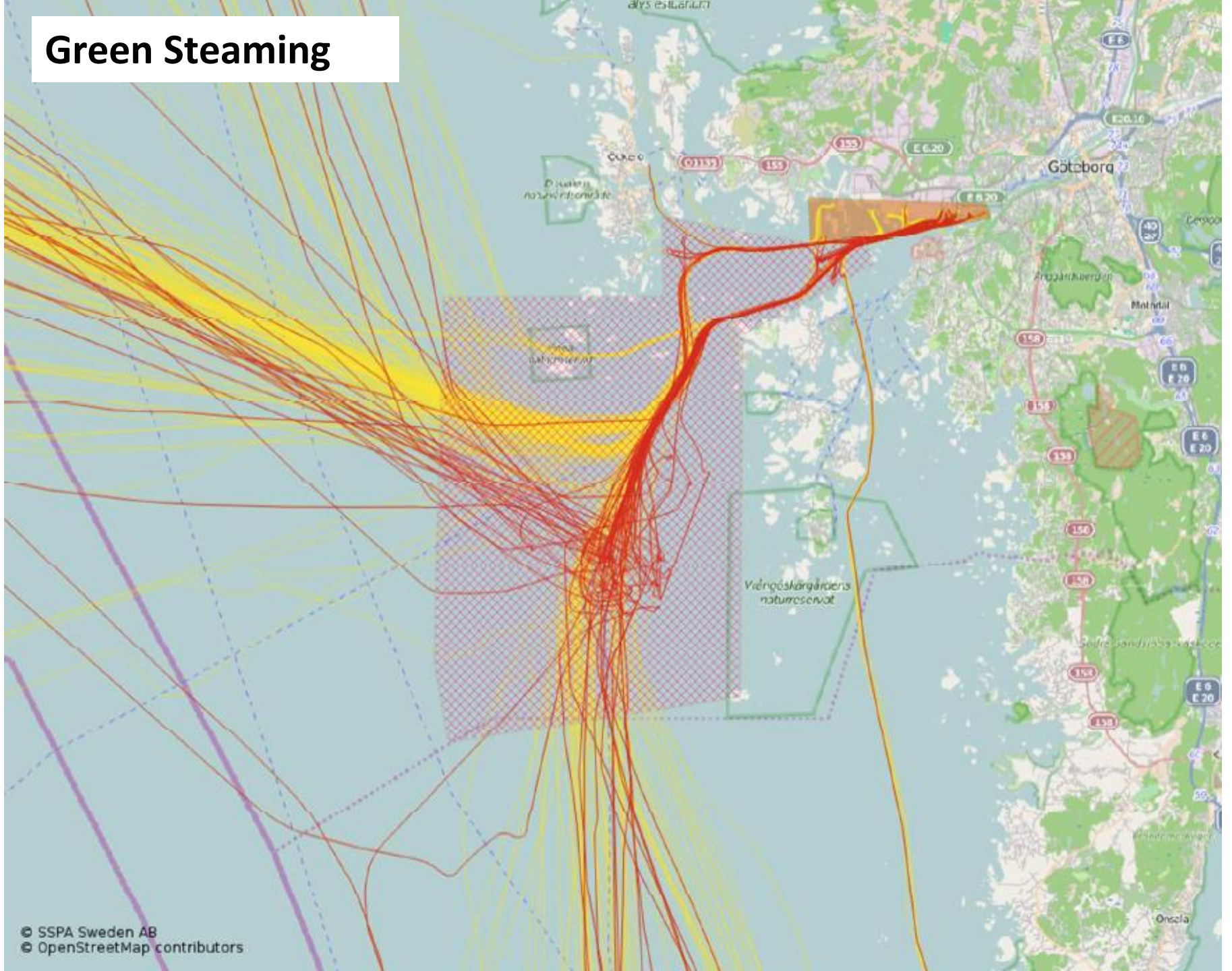


Red = 10-1.5 knots faster  
Orange = 0.5 - 1.5 knots faster  
Yellow = very little difference  
Light green = 0.5 - 1.5 knots slower  
Green = 1.5 – 10 knots slower

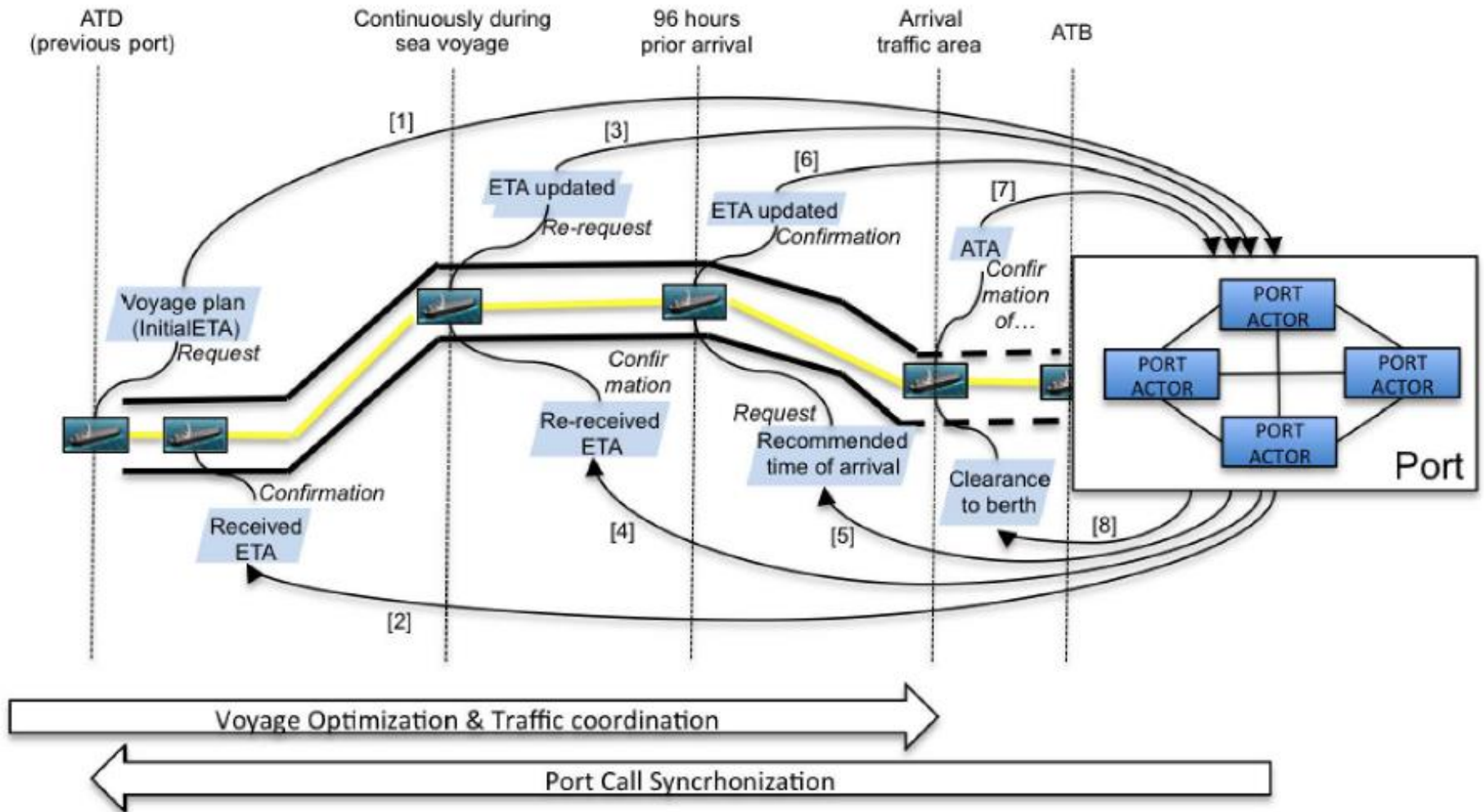




# Green Steaming



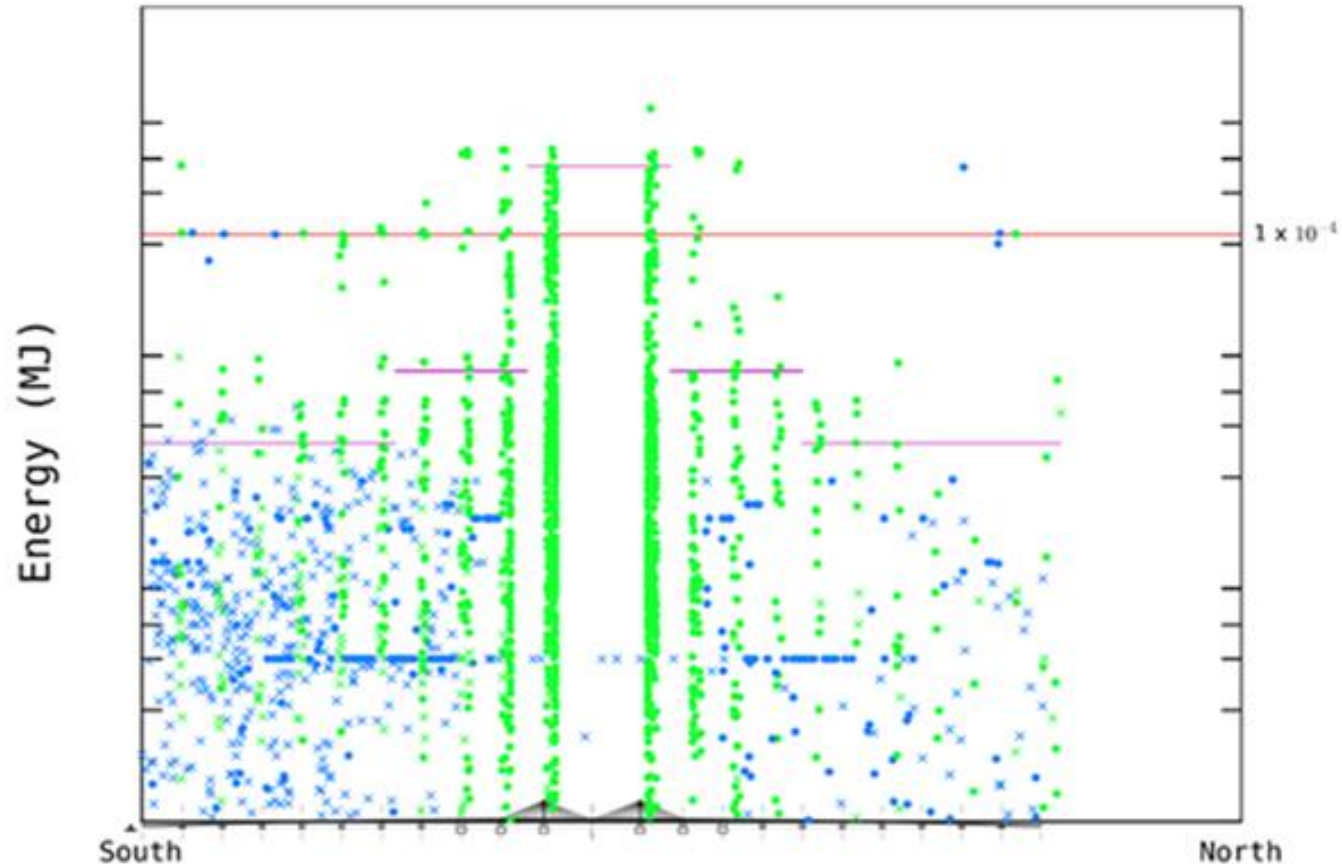
# STM-project





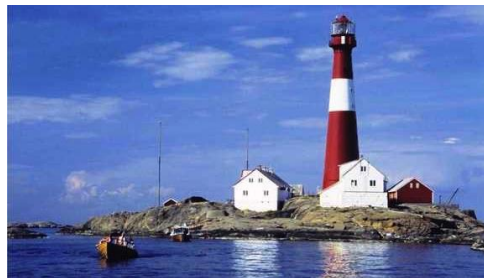
# Collision forces against bridges

- Dimensioning of bridges based on Monte-Carlo simulation
- Example from BjörnaFjorden – Axel Andersson, Ph.D. student. Axel.andersson@sspa.se





Närsjöfart i Öresund-Kattegat-Skagerrak



Intermodalitet och effektiv godshantering förenklar flöden i försörjningskedjor i regionen.

*Sjövägen skall utvecklas till att vara en attraktiv, grön, säker och bärkraftig länk för godsflöden i och mellan länderna Danmark, Sverige och Norge*



*Olika fartyg krävs för olika typer av godsflöden och tomflöden av till exempel containers. Marknad och behov skall styra fartygstyper – inte bara teknikutveckling.*



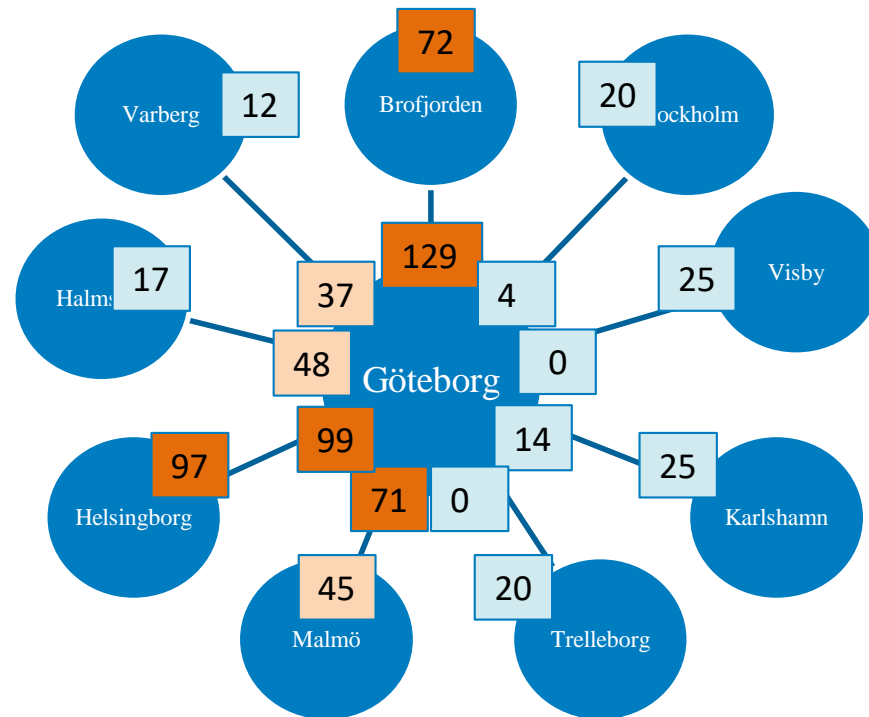
*Exempel på transportkorridorer i regionen. NÖKS projektet vill behandla hur närsjöfart kan avlasta befintliga godsflöden som i dag går på land*

# ***Mapping Swedish short sea shipping using AIS data (ongoing)***

- Purpose: To map national short sea shipping pattern
- Method
  - Identification of national port areas
  - AIS data analysis of traffic pattern between ports
  - Routing pattern, distances, frequency, type of ship and type of goods

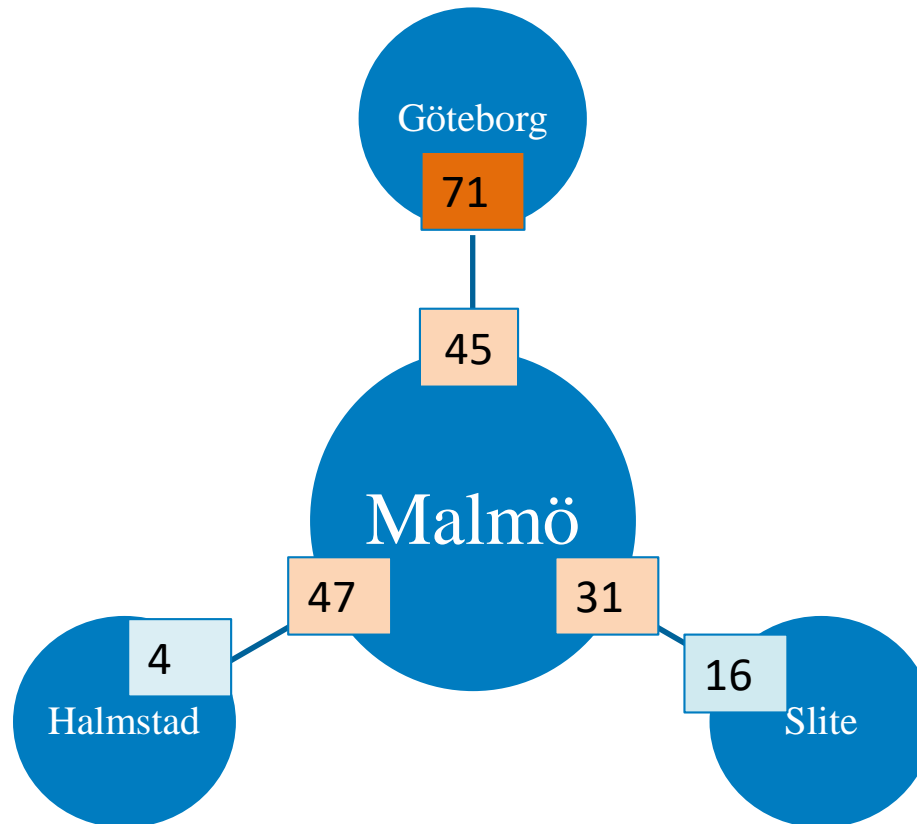


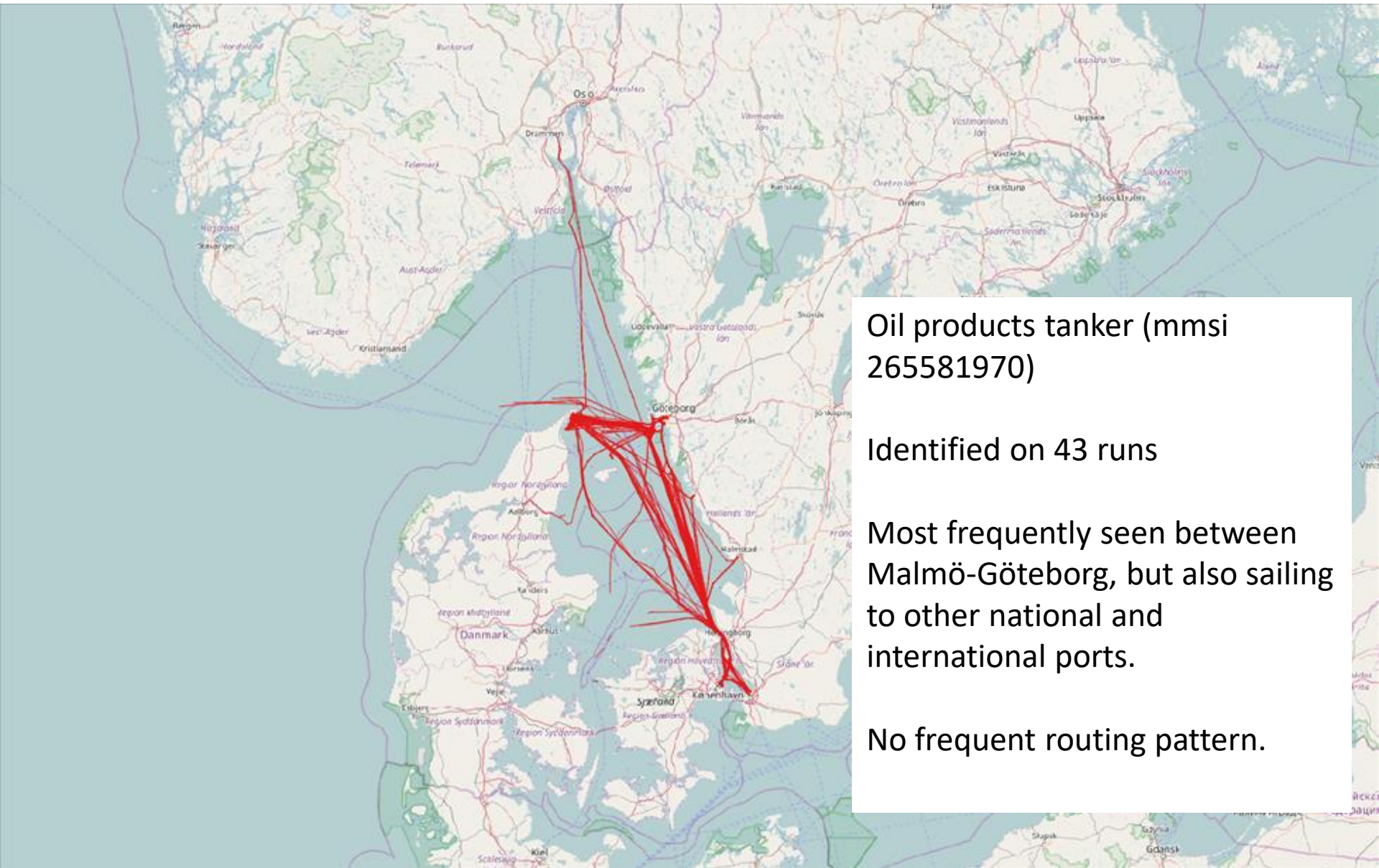
# Traffic to national ports to and from Port of Gothenburg (more than 20 runs/year)





# Traffic to national ports to and from Port of Malmö (more than 20 runs/year)





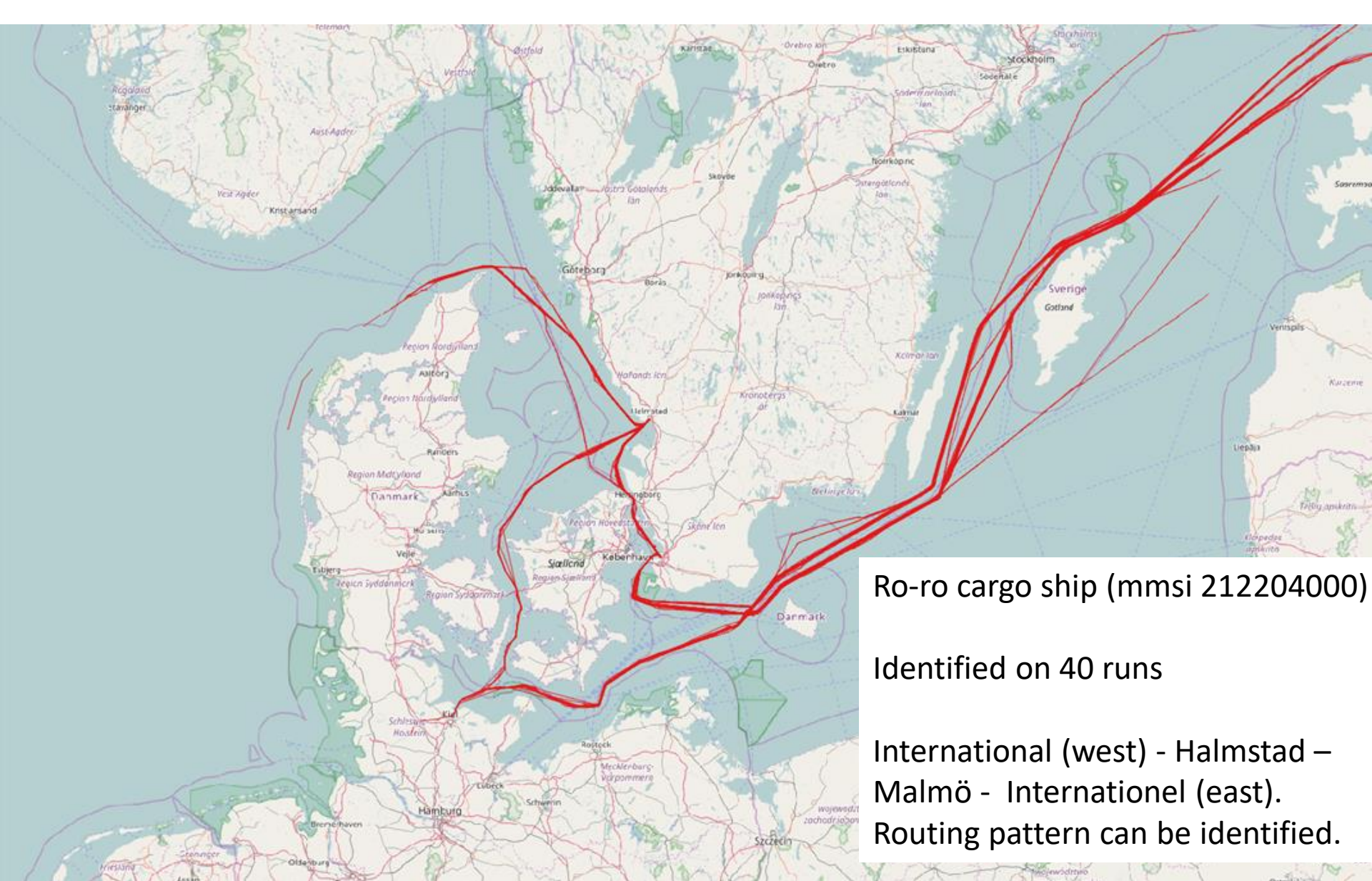
Oil products tanker (mmsi 265581970)

Identified on 43 runs

Most frequently seen between Malmö-Göteborg, but also sailing to other national and international ports.

No frequent routing pattern.





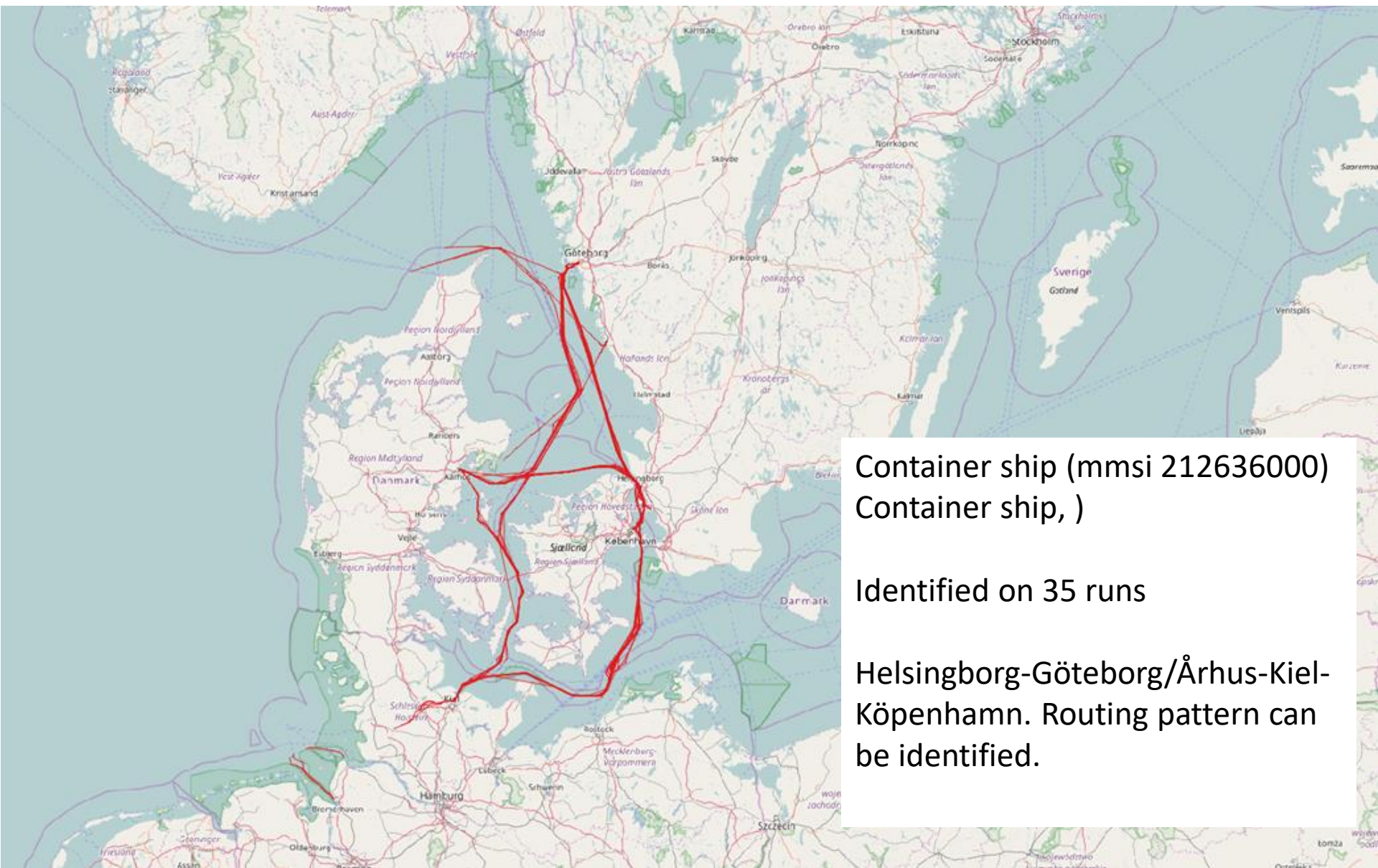
Ro-ro cargo ship (mmsi 212204000)

Identified on 40 runs

International (west) - Halmstad –  
Malmö - International (east).  
Routing pattern can be identified.







Container ship (mmsi 212636000)  
Container ship, )

Identified on 35 runs

Helsingborg-Göteborg/Århus-Kiel-  
Köpenhamn. Routing pattern can  
be identified.



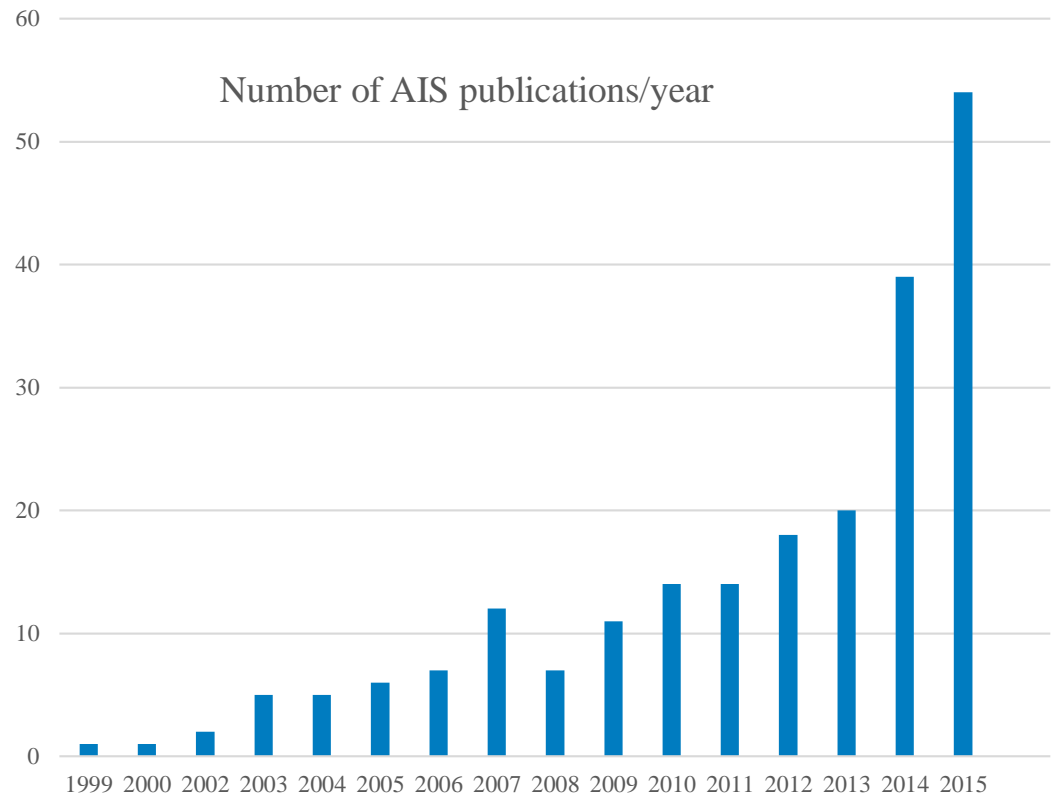
# ***AIS in maritime research – Current status and future potential (a literature review study)***

- Purpose:
  - To provide a structured overview and synthesis of how AIS is used in maritime research



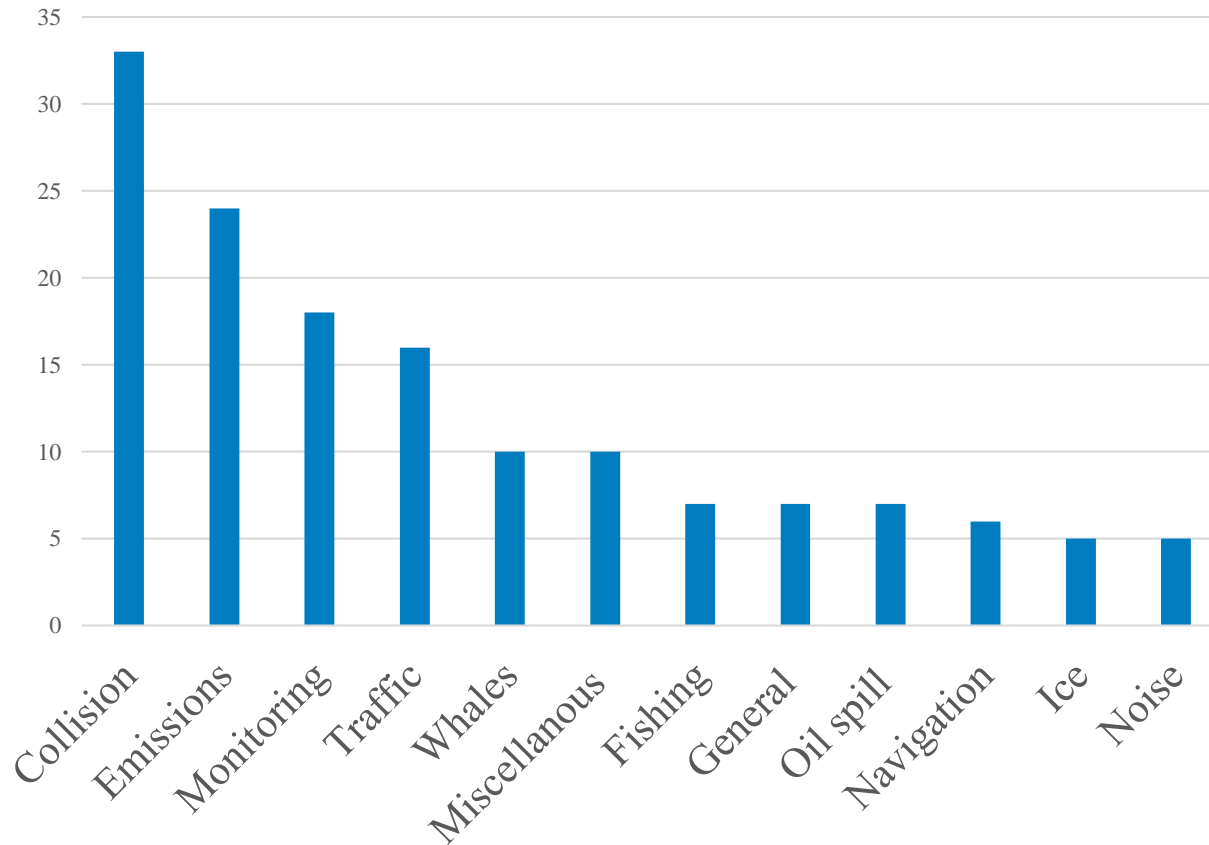
# Number of papers

- About 150 papers in roughly 90 scientific journals
  - Maritime journals (Ocean Engineering, Marine Policy, Marine Pollution Bulletin, Journal of navigation)
  - Non-Maritime Journals (Entropy, Wind Energy, Transportation Research Part A, Atmospheric Chemistry and Physics)



# Findings show the different Areas of application of AIS data

Classification of papers (preliminary)



# ***Conclusion and future research***

## **Conclusions:**

AIS can be used differently to solve various different research and industrial problems from which various problem owners can benefit





# ***Conclusion and future research***

## **Future Research**

- On small scale – further model development
- Implementations (from research papers to practice)

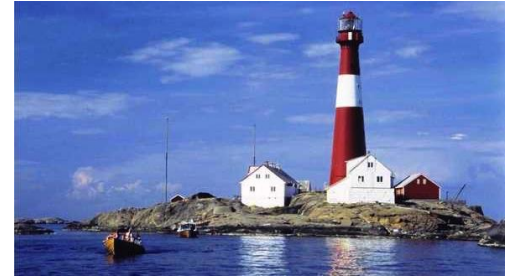


# ***Conclusion and future research***

(Our) suggestions on future research

- Trends in regional, national and worldwide shipping
- Economical analysis, e.g. analysis of how capacities of ships influence spot price
- Effects of policy implications
- AIS and hydrodynamics





Thank you for your attention!

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