Interreg Baltic Sea Region

Co-funded by the European Union

SUSTAINABLE WATERS OpenRisk II

TOETAB

UNIVERSITY OF HELSINKI

Chairman's summary

Sakari Kuikka, University of Helsinki

OpenRisk II Mid-Term Conference on Maritime Risk Management and Piloting in the Baltic Sea Region - 26-27.3.2025 Tallinn, Estonia

Sakari

- Professor in fisheries biology
- Fisheries management -> oil spill risk analysis
- Work: papers focus mainly on biological aspects, some papers on economics
- Content here: comments on four first papers and some environmental aspects

Photos by Sakari

Omar Frits Eriksson

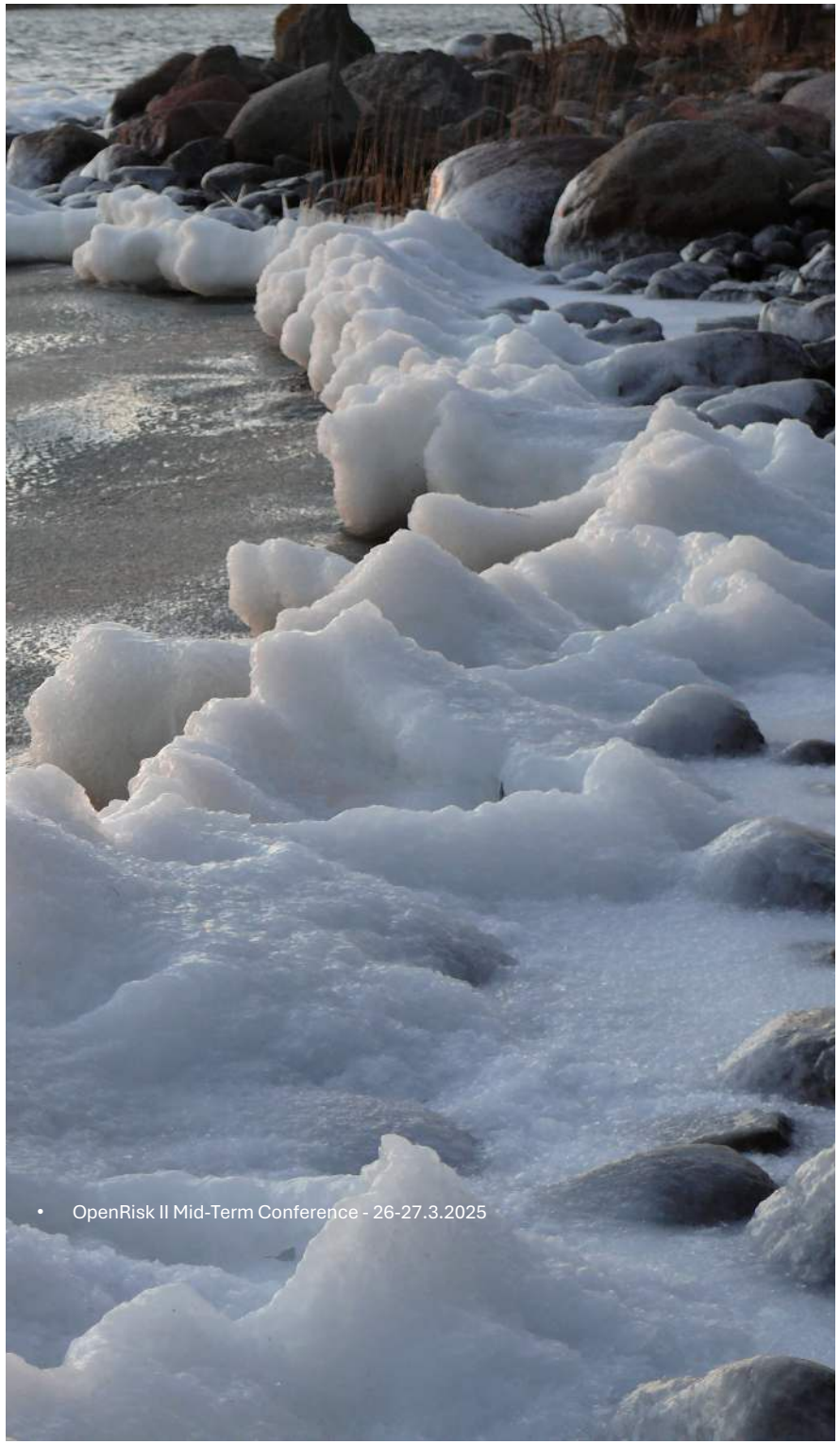
Non-binding standards

Management toolbox

ISO 31 000 standard

Simulation tools: BN

Navigation skills matter ☺



Víctor Díaz Seco

Use of dispersants?

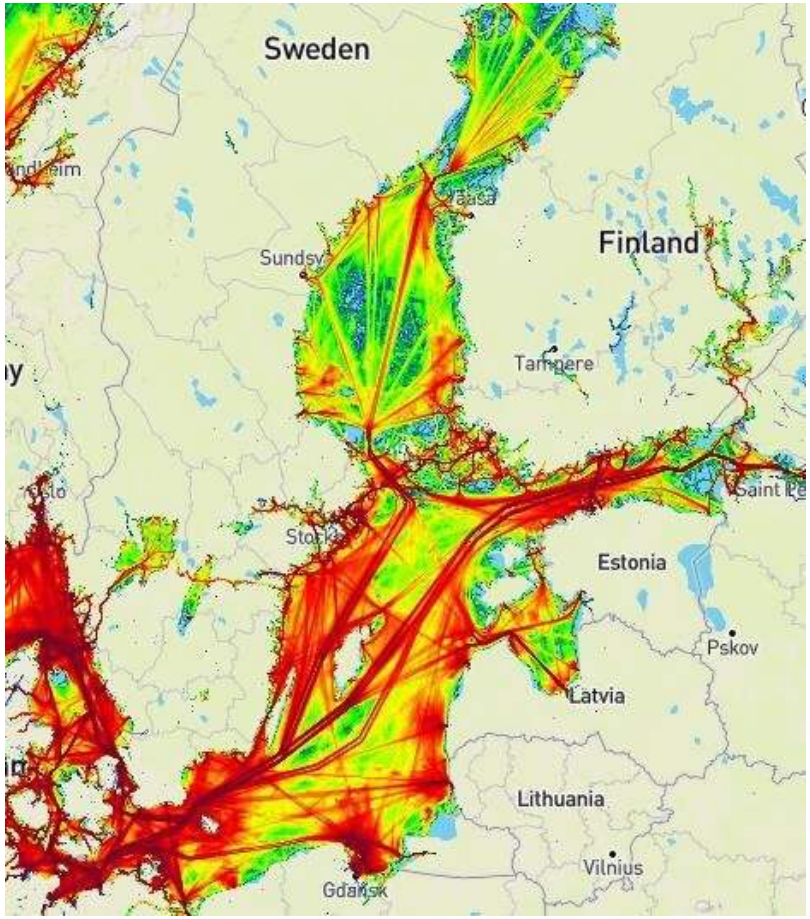
- In Baltic Sea, it depends, to my mind, on area, especially where bird islands are
- Common criteria for succes is, whether people see the oil in surface?
- A really poorly studied topic!

Víctor Díaz Seco

- How clean is clean?
- => potential total cost becomes known
- => Interest to avoid
- Openrisk supports the development of EU wide RA tools

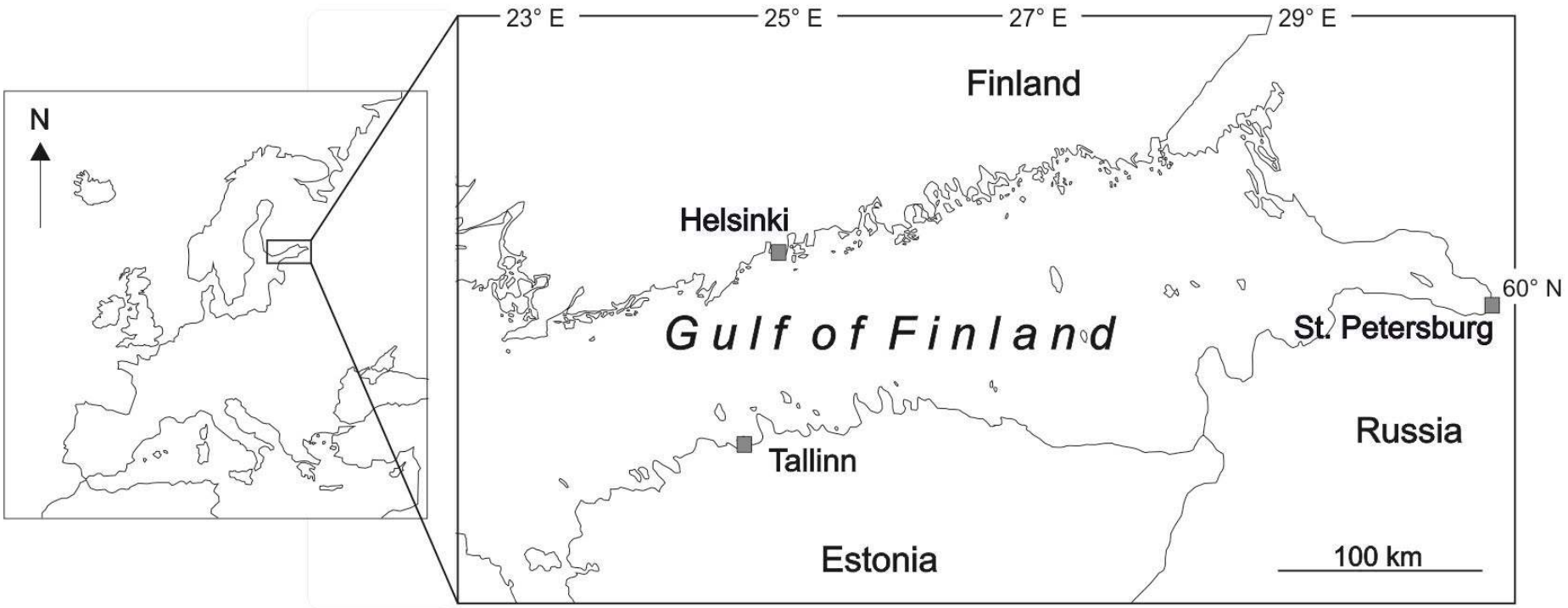
Jaak Viilipus

- amount of traffic is huge

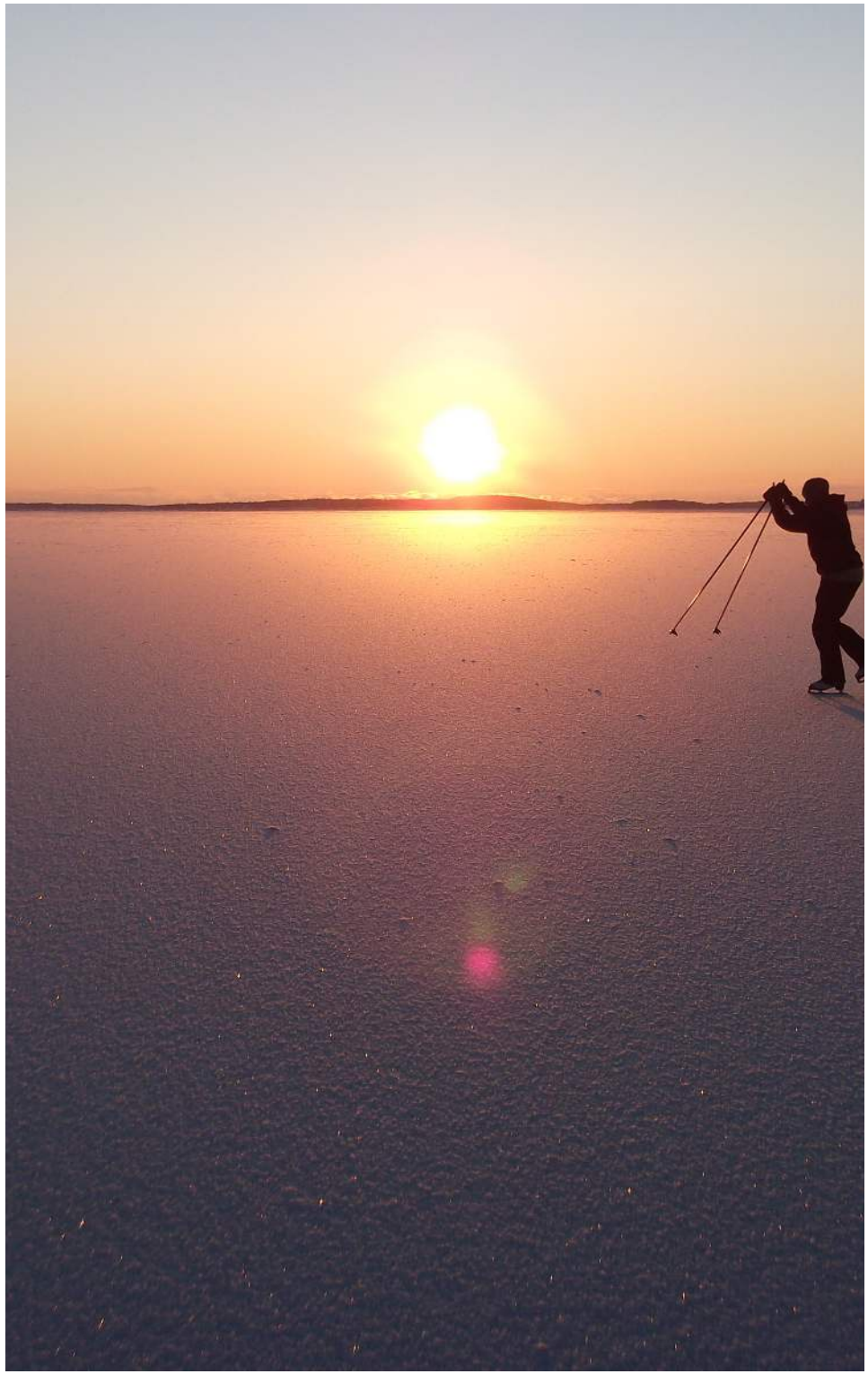


Jaak Viilipus

Two different coasts: Ice-age and biodiversity



Geospatial features increase the risks in two ways



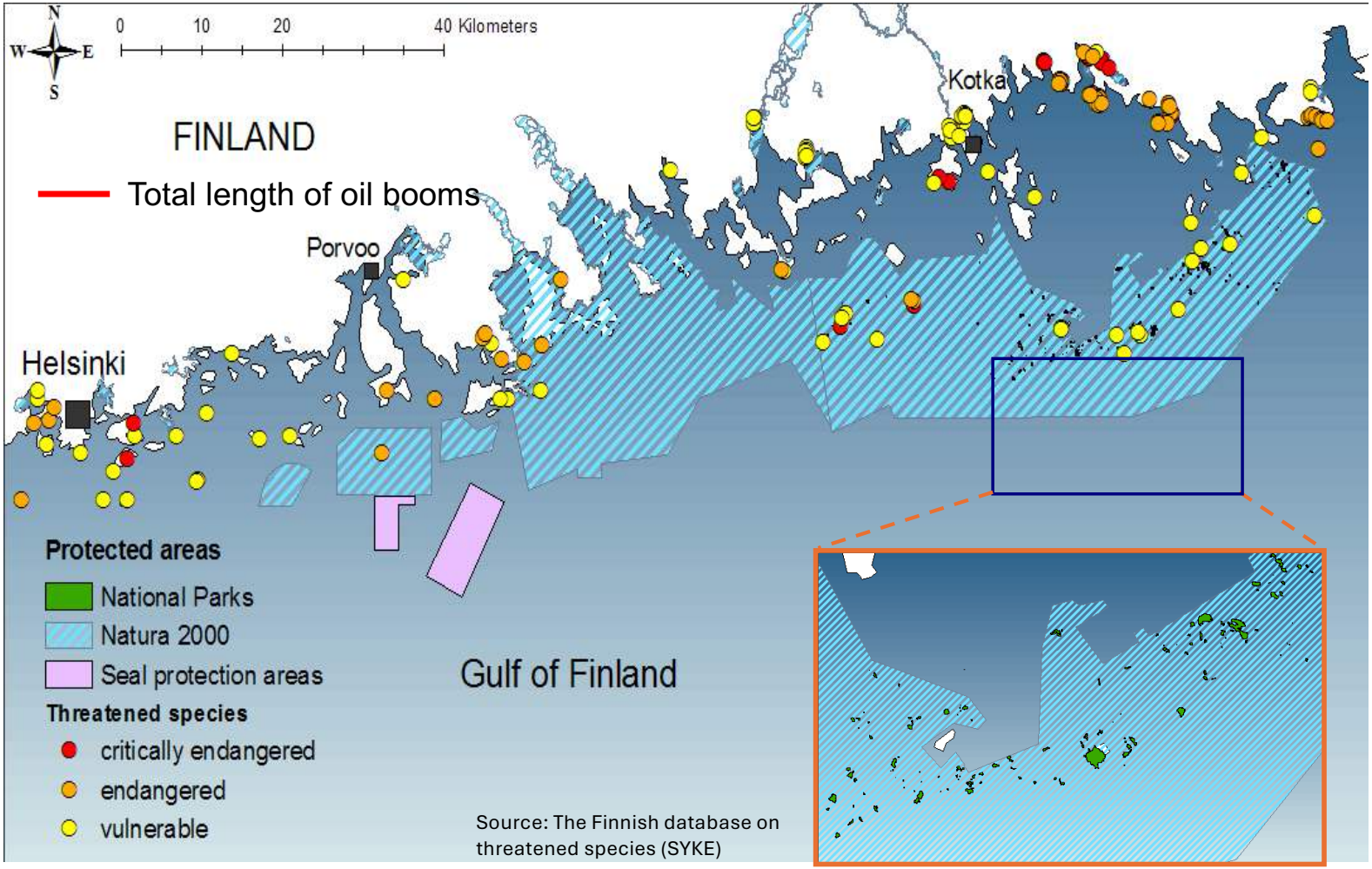
Risk : probability * loss

Degree of loss is value laden

1) Shipping: **impact on probability**
2) Research: **decreasing the risk?**
3) Mining: **impact on loss**
4) Tourism: **impact on loss**
5) Fisheries: **mainly loss**
6) Offshore oil industry: **both probability and impact**

Experiences in spatial risk analysis of the Finnish coast of Gulf of Finland

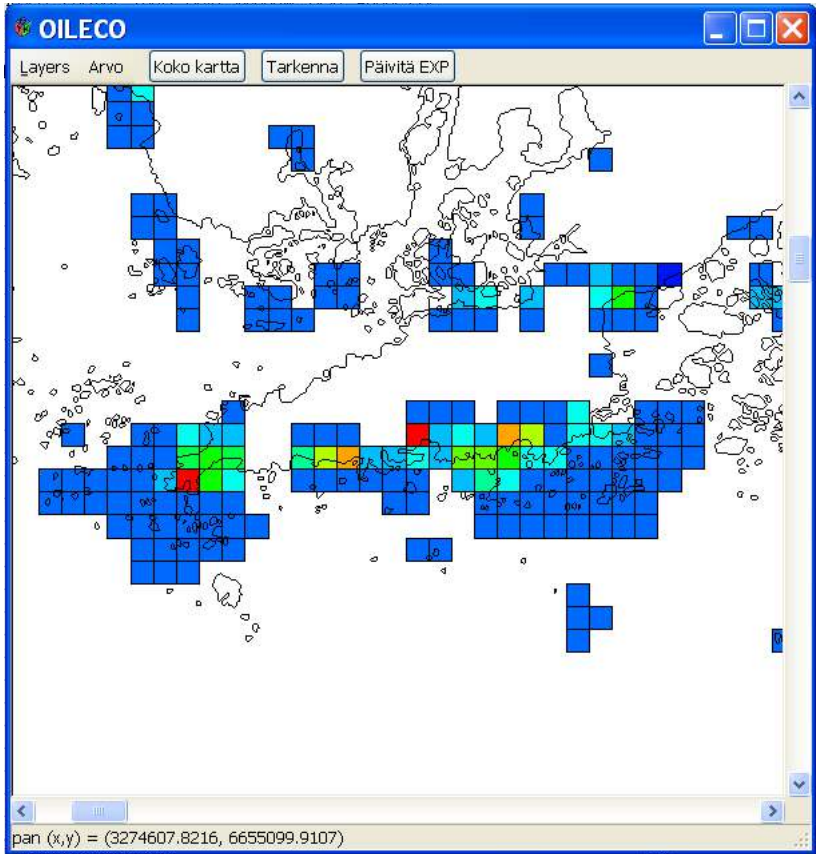
- By Fisheries and Environmental Management Group, University of Helsinki


N
W
E
S
0
10
20
40 Kilometers
FINLAND
Total length of oil booms
Porvoo
Kotka
Helsinki
Protected areas
National Parks
Natura 2000
Seal protection areas
Threatened species
critically endangered
endangered
vulnerable
Gulf of Finland
Source: The Finnish database on threatened species (SYKE)

Map interface

Menu:

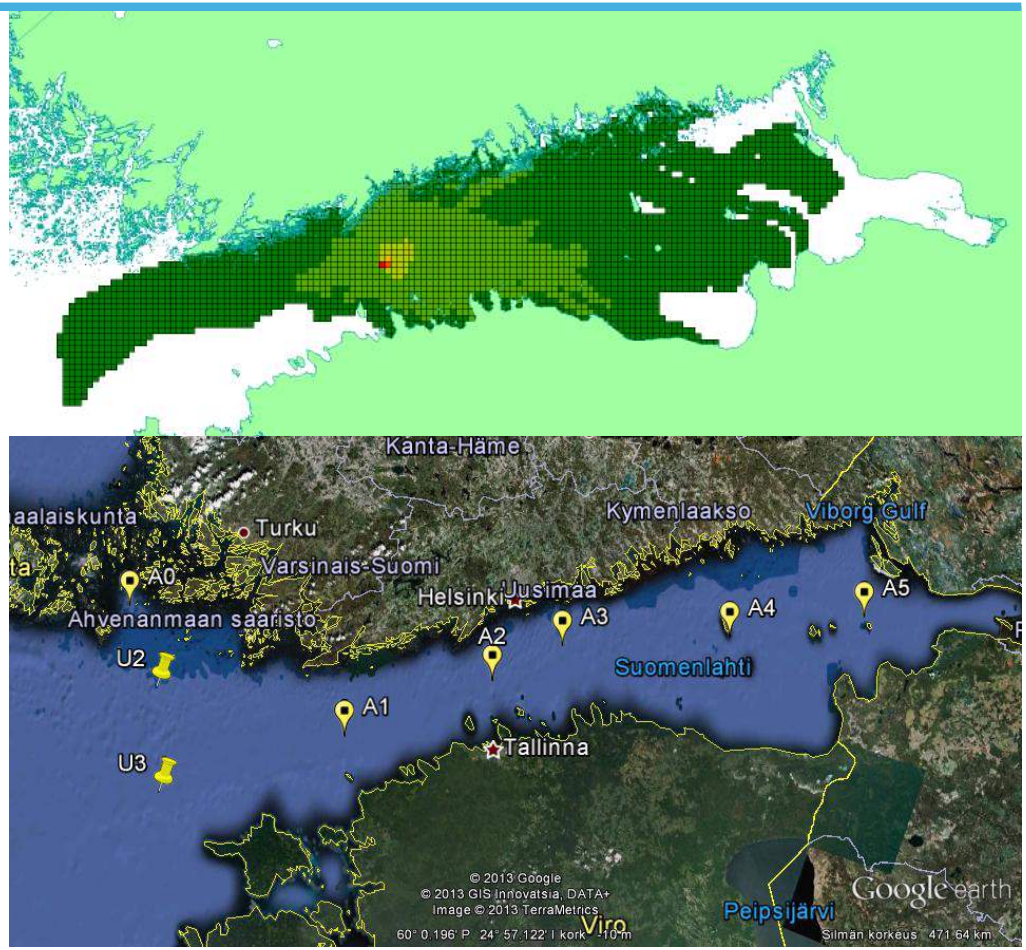
- Resolution (200/1000m)
- Month
- Oil type (light/medium)
- Wind speed and direction (inserted)
- Criteria for the valuation
  1. Conservation value
  2. Recovery potential
  3. Booming efficiency
  4. OILECO index (1-3)
  5. Number of vulnerable species



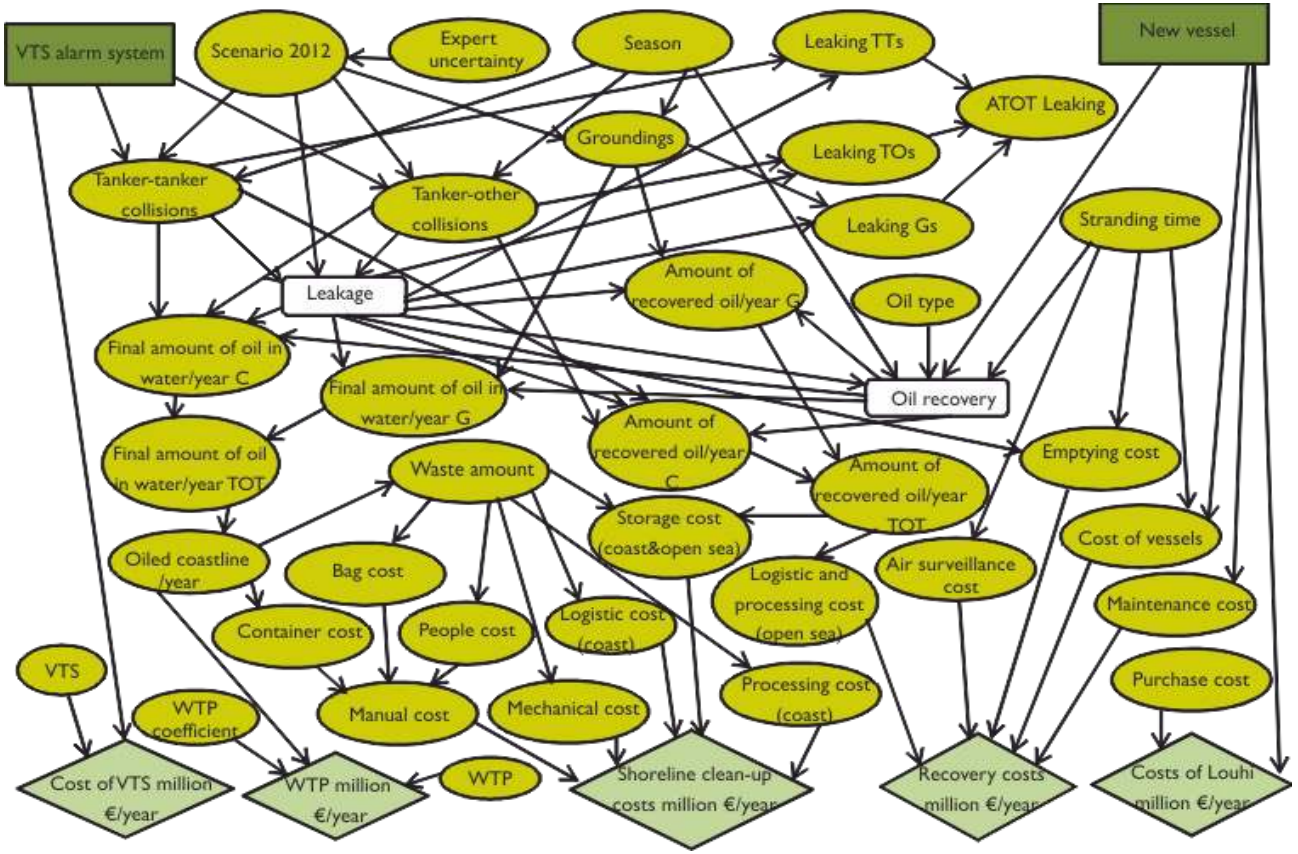
SpillMod oil maps

- 9 locations
- 3 oil types
- 6 spill sizes
- 3 seasons
- 6 years

2916 separate maps



Economic efficiency of risk management



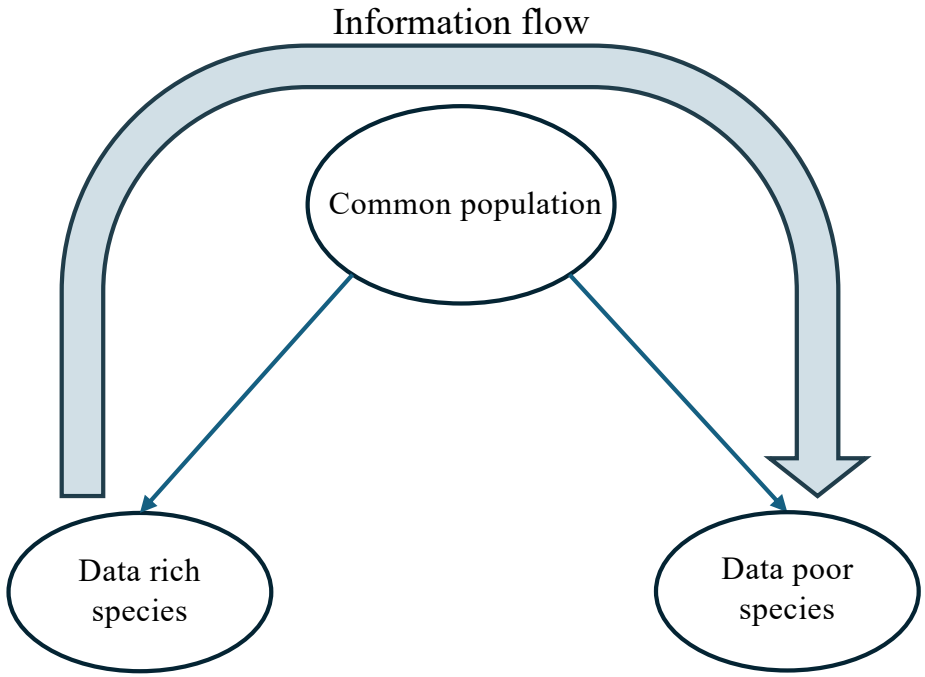
Helle et al 2016.

Decision	**Autom. Alarm syst.**		**New combatting vessel**	
State of the other option	**No**		**No**	
Costs/Benefit	***C (€)***	***B (€)***	***C (€)***	***B (€)***
Developing alarm system	-33 234			
Investment cost of vessel			-2 720 000	
Running costs of vessel			-264 226	
Open sea combatting		1 471	-28 837	
Waste treatment (open sea)		389	-1 507	
Shore line clean up		5306		11575
Waste treatment (avomeri)		6 750		35 706
Environmental damage		230 000		1 250 000
Sum	-33 234	243 916	-3 014 571	1 297 280
NBV (net benefit)	**210 682**		**-1 717 290**	

Helle et al 2016.

Meta-analysis of oil spill impacts on fish early life stages by Vikkula et al. (manuscript being prepared):

- Hierarchical model in which species are assumed to be random samples from a common population
- Common population distribution is an estimate of an average species in the dataset
- Any individual species' effect is a weighted average of the information on that particular species and on all species in the dataset, i.e. the common distribution
- This results in information being borrowed from data-rich species to data-poor ones
- Takes time, but less than with new laboratory work and data-analysis



Summarising conclusions

Technical, economic and biological knowledge must be integrated in decision analysis

Try to support and create interests to avoid accidents, by all economically reasonable means

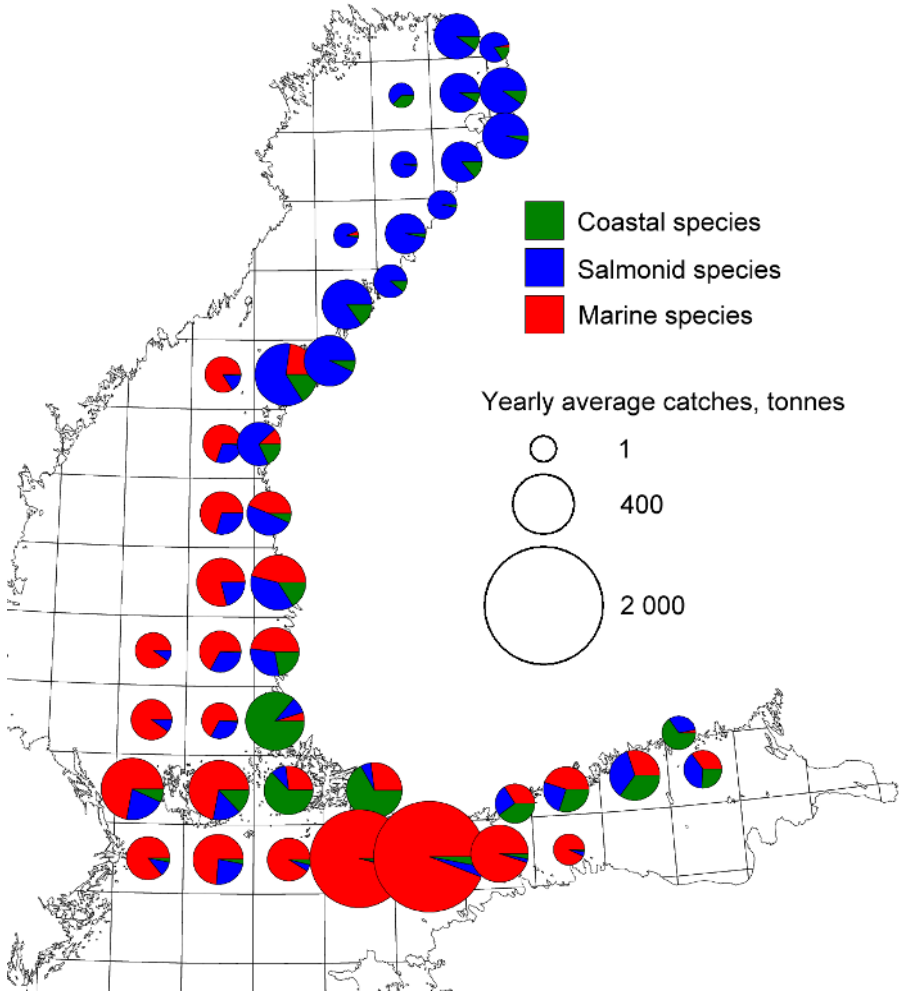
Learn from history as effectively as possible

The Beautiful White Sea

Thank you !

Thank thank you !

Coastal fish stock catches without herring



=> Migrations and location of reproduction areas have an impact on risk