



Baltic Sea Perspective on

- Building a Gas Pipeline and**
- Oil Spills**

Dr Juha-Markku Leppänen
Head of the Monitoring and Assessment
Unit, Marine Research Centre,
Finnish Environment Institute (SYKE)

Content

1. Process concerning the Nord Stream Pipeline

- Environmental concerns
- Legal framework
- Permitting process

2. Intentional oil spills and accidents

- Illegal oil spills and their monitoring
- Impacts on the marine environment
- Response activities
- Response organization in Finland



1. Nord Stream Gas Pipeline



- The biggest construction work in the Baltic Sea
- Two parallel pipes
- Length 1.220 km
- Connects Russian gas to the Central Europe

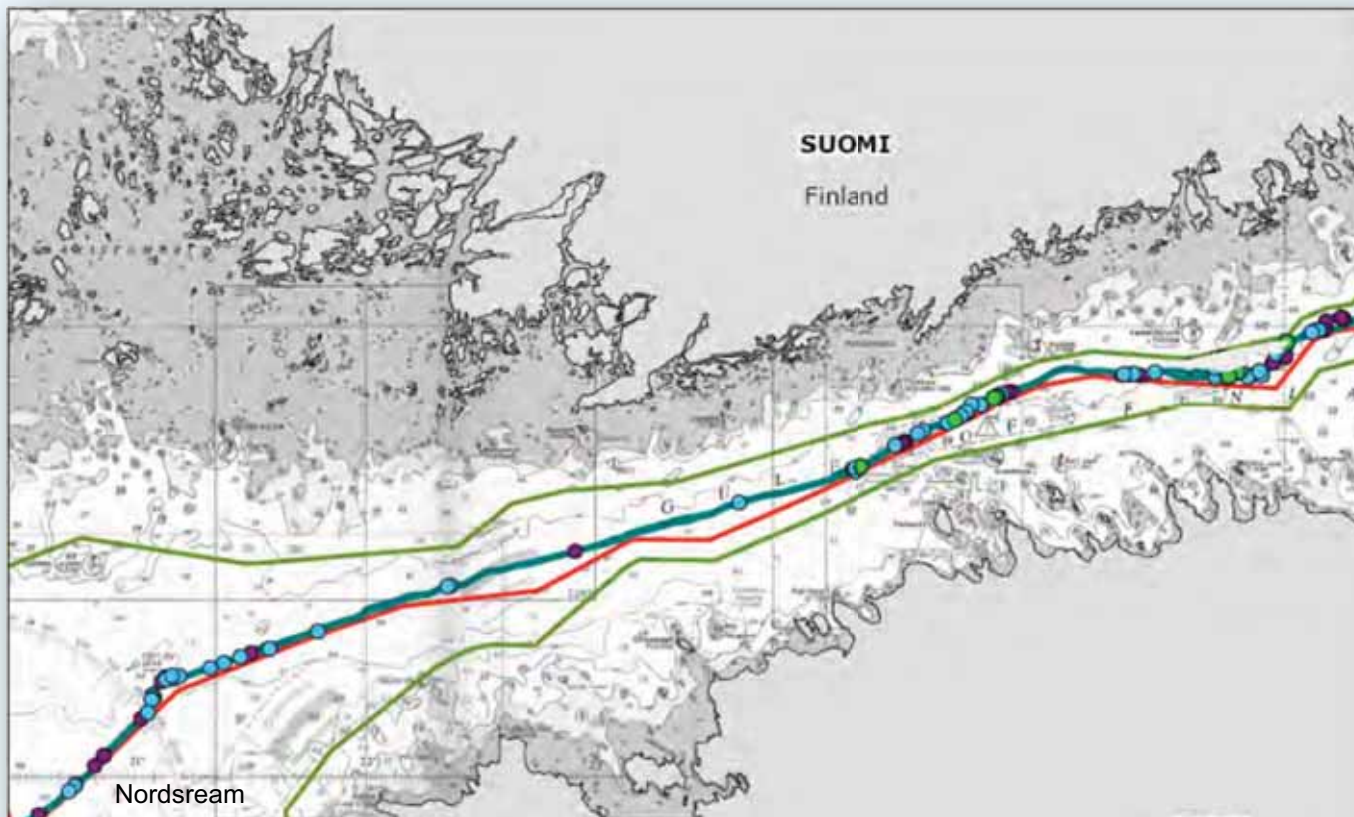


Environmental concerns are mainly related to the construction phase

- **Route goes through nature reserves (Natura 2000 sites) and areas with dumped munitions, natural heritage and fishing as well as maritime activities**
- **Sea bed interventions during constructions**
 - Munition clearance
 - Trenching, dredging and backfilling
 - Placement of fill material, rock (gravel) placement
 - Placement of (prefabricated) support structures

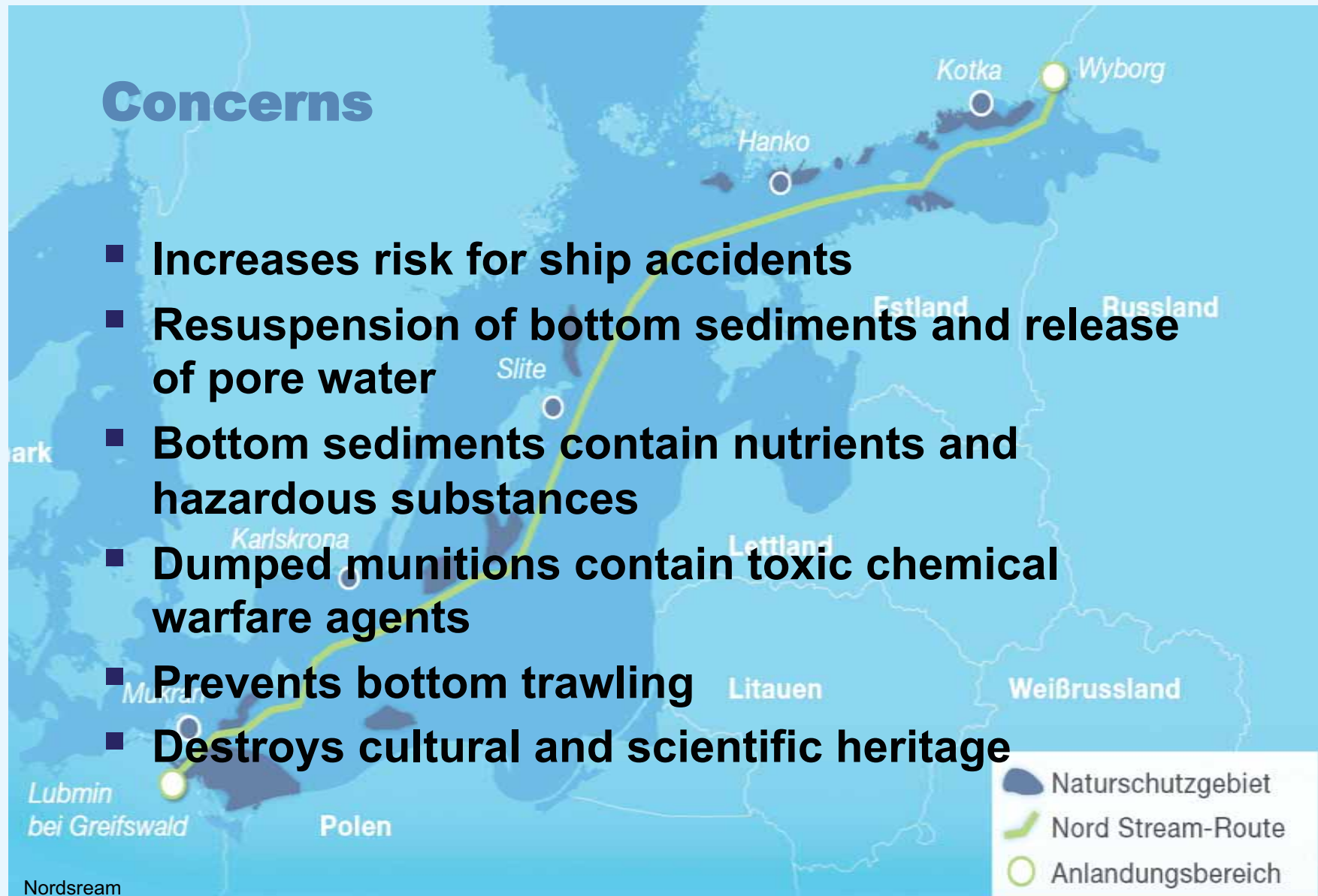


Seabed intervention works in Finnish waters



Concerns

- Increases risk for ship accidents
- Resuspension of bottom sediments and release of pore water
- Bottom sediments contain nutrients and hazardous substances
- Dumped munitions contain toxic chemical warfare agents
- Prevents bottom trawling
- Destroys cultural and scientific heritage



Legal Framework

- **An Environment Impact Assessment (EIA) must be completed in order to obtain a national construction and operation permit**
 - An EIA is a national procedure for evaluating the potential impact of a proposed activity on the environment
- **The Espoo Convention on the Environmental Impact Assessment in a Transboundary Context requires signatory countries to inform one another if a proposed activity might have an impact across national boundaries**
 - “Parties of Origin” (Russia, Finland, Sweden, Denmark, Germany)
 - “Affected Parties” (Estonia, Latvia, Lithuania, Poland)
 - First large-scale test in the Baltic Sea

The objectives of the Environmental Impact Assessment (EIA) documentation

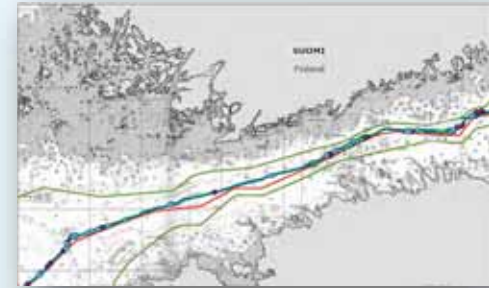
- **Meet requirements of legislation and environmental standards**
- **Identify, mitigate and avoid possible negative effects on the environment, human health and welfare**
- **Ensure environmental factors are considered in the decision-making process**
- **Develop the best plans for environment management and monitoring**
- **Inform competent authorities and the public**

Nord Stream's EIA documentation

- **Description of the Project and the route**
- **Physical environment and processes**
 - Water column, seabed and atmosphere
- **Biological environment**
 - Plankton, benthos, fish, sea birds, marine mammals, and nature conservation areas
- **Social and socioeconomic environment**
 - Fisheries, shipping and navigation, tourism and recreation, cultural heritage, offshore industry, and military operations
- **Revisions during the project**



EIA Process



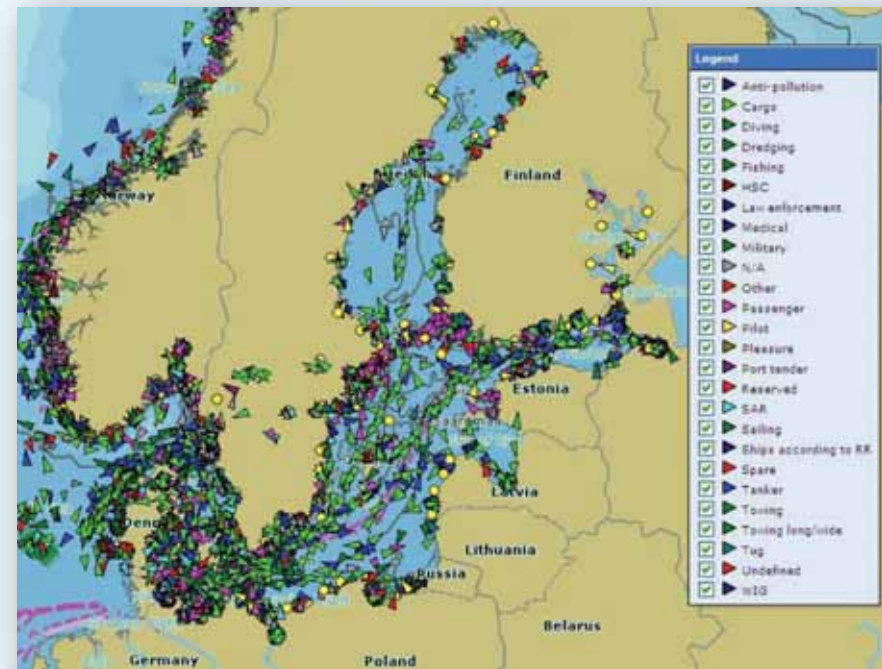
- **Interactive process**
- **National and international consultations**
 - Considerable improvements during the process
 - No route alternatives on land
- **In Finland**
 - EIA according to the Finnish EIA Act
 1. **Government's approval for the activity and to the delineation of the course for the pipe lay (the exploitation right) according to the Finnish Act on the EEZ**
 - Ministry of Employment and the Economy
 2. **Permit for construction according to the Water Act**
 3. **Permit for munitions clearance according to the Water Act**
 - Western Finland Environment Permit Authority

Regional State Administrative Agency for Southern Finland granted the permit on 12.2.2010 with conditions

- **Harm to marine environment small-moderate**
- **Main harm to fisheries**
- **Preconditions**
 - **Harm to the marine environment and its use to be avoided**
 - **Dynamic pipelay vessel to be used**
 - **Supporting bottom fillings to be made according to the application avoiding resuspension as much as possible**
 - **Specific requirements for maritime safety**
 - **Compensation for fisheries**
 - **Detailed monitoring programme**

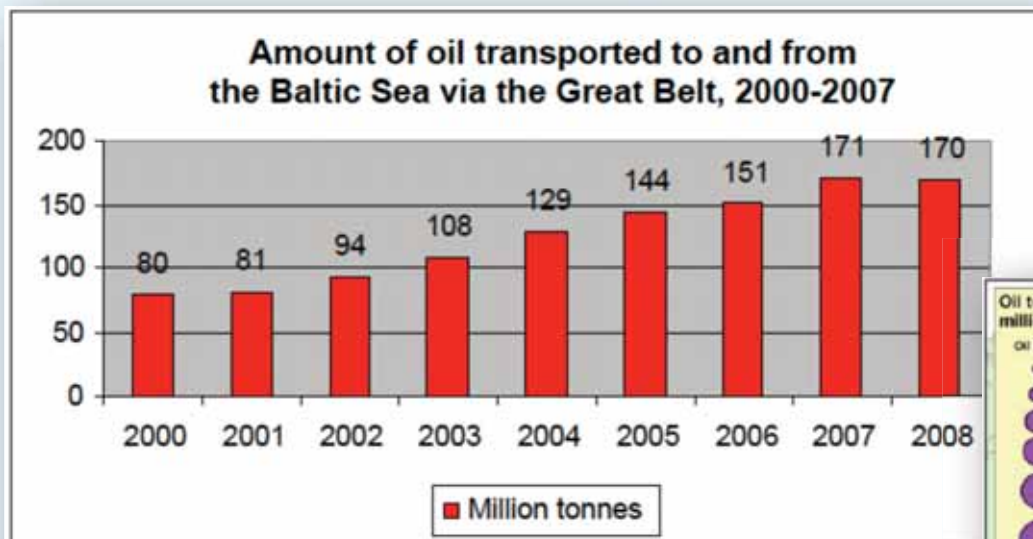
2. Oil spills and accidents

- **Baltic Sea heavily trafficked**
- **15% of the world's cargo transportation**
- **2000 ships at any moment**
- **Main Russian oil export route through the Gulf of Finland**

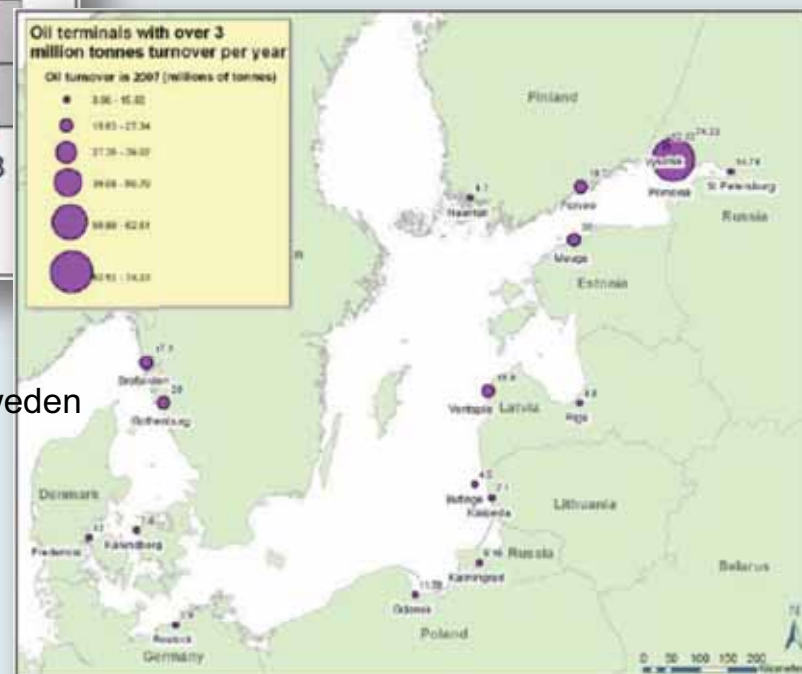


HELCOM Automatic Identification System (AIS)

Boosting traffic is increasing possibilities to major accidents



Year	Name of ship	Tons of oil spilled (t)	Location
2003	Fu Shan Hai	1,200	Denmark/Sweden
2001	Baltic Carrier	2,700	Denmark
1998	Nunki	100 m ³	Denmark
1995	Hual Trooper	180	Sweden
1990	Volgoneft	1,000	Sweden



Illegal oil discharges in 2008

- Any discharge of oil or oily mixtures into the Baltic Sea area is prohibited (IMO/MARPOL)
- Most parts of the Baltic with regular traffic zones are covered by national aerial surveillance
 - 4603 flight hours in 2008
- CleanSeaNet satellite surveillance service by EMSA
 - 608 satellite scenes 2008
- 210 oil spills were observed
 - Mainly $< 1 \text{ m}^3$
 - No spills $> 10 \text{ m}^3$
 - Total amount 63 m^3
- 5 m^3 of accidental spills
- 21 cases (10%) the polluters were identified
- Finland and Sweden can pose administrative fee
- All waters covered by territorial waters or EEZ



The impacts of oil on the marine environment

- **Wide-ranging impacts on the marine environment and human activities**
 - serious impacts on ecosystems
 - harming fish farms and sea fisheries, recreation and tourism
 - limiting the use of sea water in industrial processes
- **The effects varies based on**
 - type of the oil
 - season of the spill – ice cover in winter!
 - geographic area



Response activities



- **HELCOM coordinates at the Baltic Sea level to**
 - **ensure swift national and international response to maritime pollution incidents**
 - **Combating Manual defines the operational principles**
 - **ensure that in case of an accident the right equipment is available and routines are in place to respond immediately in co-operation with neighboring states**
 - **coordinate the aerial surveillance of maritime shipping routes to provide a complete picture of sea-based pollution around the Baltic, and to help identify suspected polluters**

Operational response

HELCOM AIS data

- Information on the oil

Aerial surveillance

- Distribution and amount

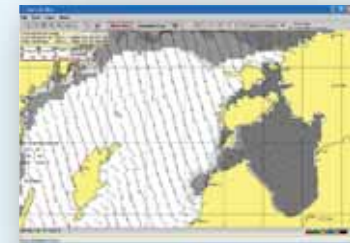
HELCOM SeaTracWeb

- Information on oil drift

HELCOM MARIS

- Information on sensitive areas

Response operations



AIS AS A TOOL AGAINST MARINE POLLUTION

HELCOM AIS data combined with the oil drifting model Seatrack Web

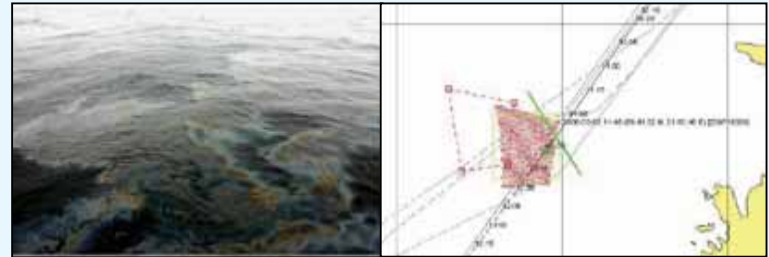
- increases the possibility to identify the vessels in charge of illegal oil spills
- gives evidence to court

AIS on-line information is used in oil and chemical response operations

- for coordinating the operations
- for warning other traffic about the operations

For guaranteeing most effective response measures AIS information should also include

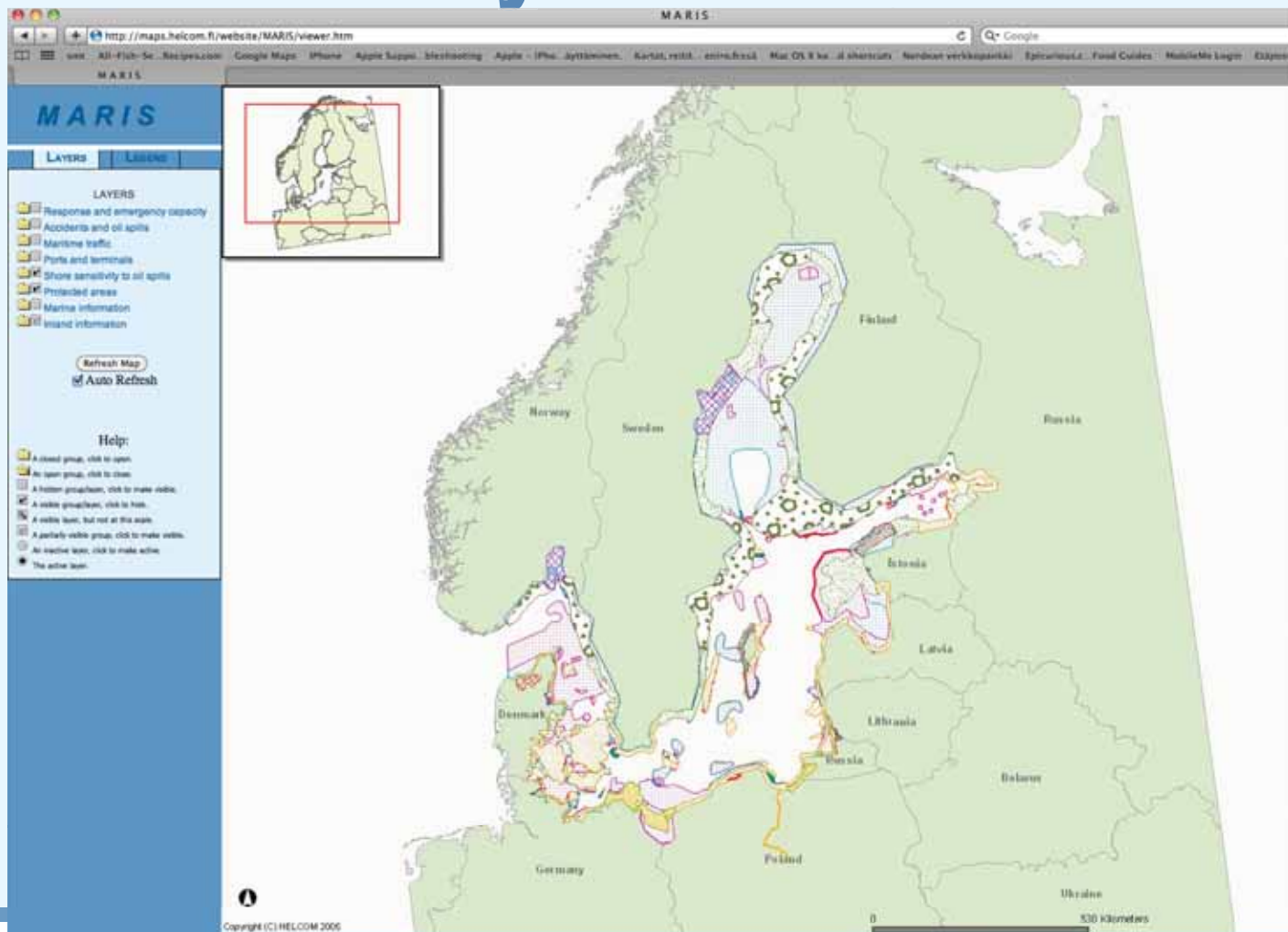
- the type, amount and location of cargo



Finnish Navy oil response vessels Halli and Hylje

Aerial surveillance photos taken by Finnish Border Guard

MARIS - Maritime Accident Response Information System

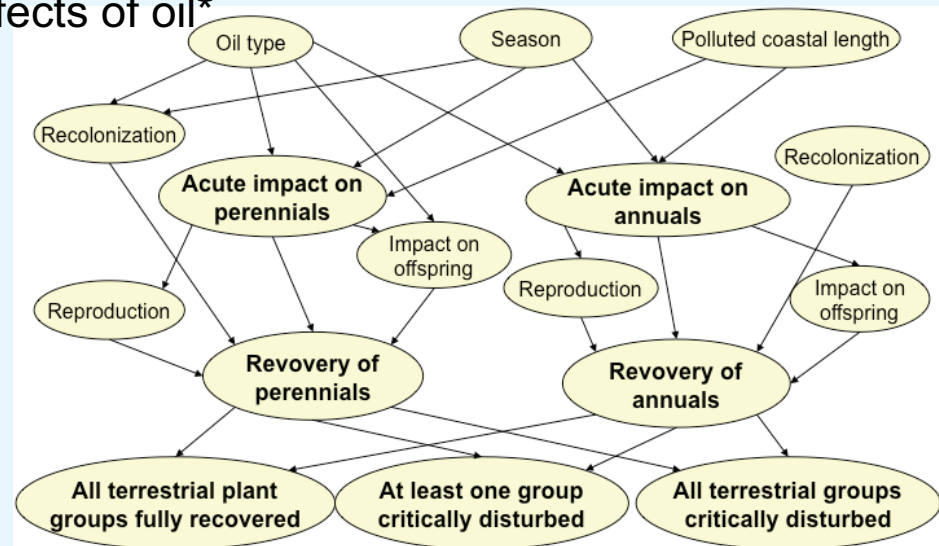


Environment sensitivity

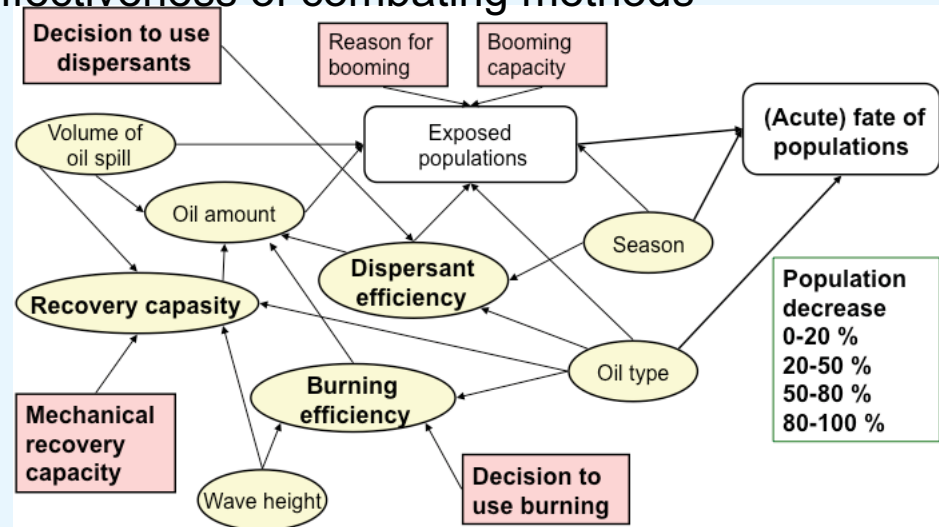
- Assess the effects of oil spill on different populations
- Assess the effectiveness of different oil combating methods to safeguard different populations

*(OILECO Project
<http://hykotka.helsinki.fi/oileco/>)

Effects of oil*



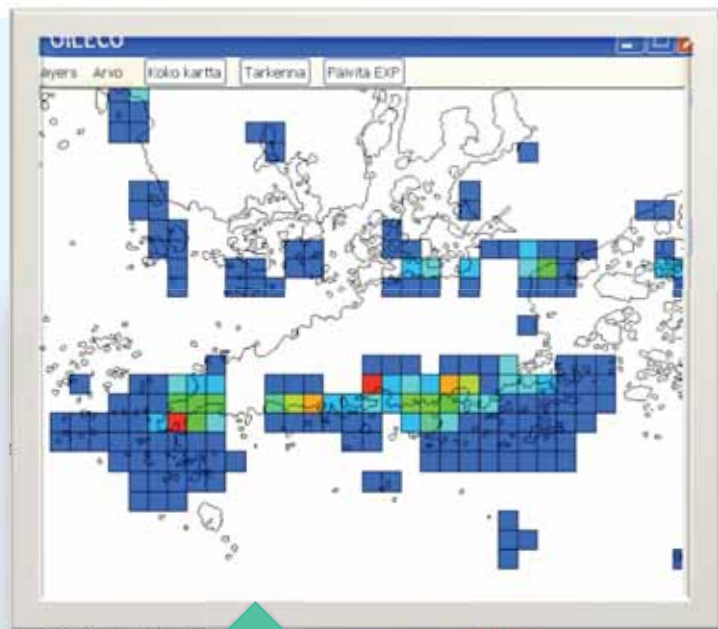
Effectiveness of combating methods*



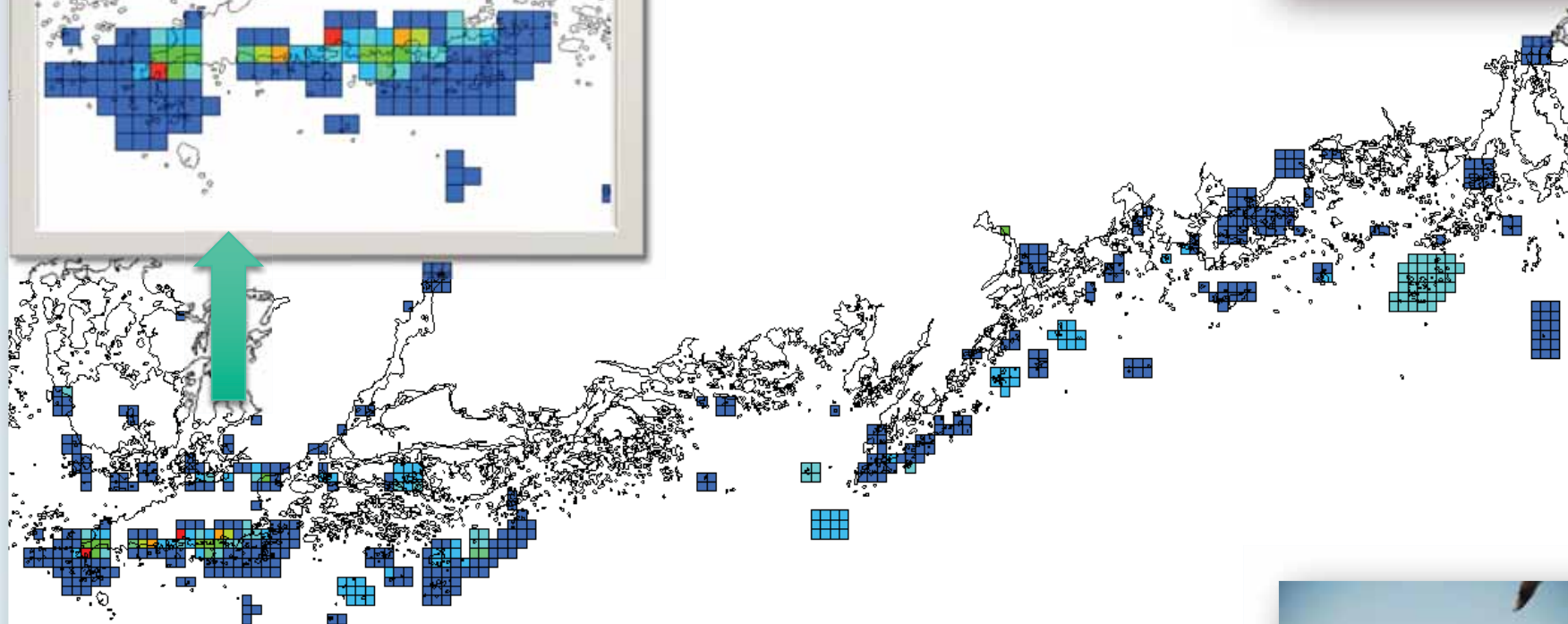
Prioritization of oil combating (OILECO Project)

- **Vulnerable species**
- **Protected areas**
- **Occurrences of keystone species**
- **Based on occurrences of 100 species (e.g. insects, plants, algae and birds) evaluated as vulnerable to oil spills**
 - **Nationally threatened or near threatened and dependant on coastal habitat types**
 - **Species that have predictable occurrence pattern and can be safeguarded with current methods**





And & Ilkka Lastumäki



OILECO Project <http://hykotka.helsinki.fi/oileco/>)

Sensitivity



- All taxa can suffer from the effects of oil, but there are significant differences in the recoverability of populations after the accident
- There are differences in the effectiveness of oil combating equipment to safeguard different species
 - e. g. birds are extremely difficult to safeguard with oil booms
- Specific areas with high number of vulnerable species can be identified in the Gulf of Finland



Contingency planning

- Detailed and objective analysis of vulnerable species and their occurrences is needed for oil spill contingency planning
- Oil combating should be prioritized according to conservation value, recovery potential and effectiveness of oil combating methods to safeguard vulnerable species



Response organisation

- Finnish Environment Institute (SYKE) is the competent governmental pollution response authority in Finland
 - give an order to undertake salvage activities which are intended to avoid or limit the pollution risk
- Finland implements the "Polluter-Pays Principle". In cases when the polluter cannot be identified, the national Oil Pollution Fund can cover the costs for oil pollution response.

