



OPENRISK II PROJECT KICK-OFF CONFERENCE “NEW MARITIME RISK MANAGEMENT TOOLS & END USER NEEDS”

Held on 6-7 March 2024, in Helsinki, Finland

25 March 2024

Introduction

The project OpenRisk II "*Tools for shared & dynamic maritime traffic risk picture of the Baltic Sea region*", initiated in November 2023, is funded by EU's Interreg Baltic Sea Region Programme 2021-2027. The project develops risk assessment and risk management tools designed to assist competent maritime authorities in preventing maritime accidents, while also minimizing their impact on both humans and the environment. The focus lies in enhancing the quality of maritime risk management in overall. Specifically, the aim is to prioritize user needs by concentrating on practical solutions that directly tackle real-world challenges encountered by maritime authorities and other end-users of the tools. This approach ensures that the tools are not only user-friendly but also highly effective in elevating the standard of risk management across the board.

The project consortium consists of 7 partners including Finnish Transport and Communication Agency Traficom (Finland, Lead Partner), Aalto University (Finland), Norwegian Coastal Administration (Norway), Gdansk University of Technology (Poland), University of Tartu (Estonia), University of Helsinki (Finland) and Northern Dimension Partnership on Transport and Logistics (NDPTL) secretariat (Intergovernmental).

At the core of OpenRisk II lies the development of three innovative, user-centric risk management tools designed to empower authorities in preventing maritime accidents, minimizing their consequences, and enhancing risk management across transportation modes.

The three tools are:

- 1) A Baltic adaptation of the AISyRISK tool (<https://aisyrisk.no>) for shared and updated risk picture of maritime traffic in the region, and creation of a new risk assessment module on ice navigation, with potential use also beyond the Baltic, e.g. in the Arctic
- 2) A regional service on vulnerability of the Baltic marine ecosystem to maritime spills
- 3) A tool to evaluate risk management performance of the relevant administrations, and the quality of risk assessments, commissioned or produced.

Scope

The OpenRisk II Kick-off conference, took place on March 6th to 7th 2024 in Helsinki, Finland. The conference focused on collecting national, regional, EU and global end-user needs for new risk management tools under development by the project. These needs will shape the plans of the OpenRisk II project, to optimise the real-world utility of the output. See the conference agenda in Annex I.

The conference gathered 62 registered participants on both days representing authorities and policymakers, academic institutes, and industry sector from different countries across the Baltic Sea, Nordics and other parts of the Europe. See the list of participating organizations as Annex II.

The first day of the conference looked into the end-user needs on national, regional, EU and international levels as well as OpenRisk II plans to meet these needs. In the beginning of the conference, welcome words were provided by Sakari Kuikka from the University of Helsinki (Presentation 1) and Valtteri Laine from the Finnish Transport and Communications Agency Traficom (Presentation 2). To establish the context for collaboration across the Baltic Sea region and the involvement of various organizations as the European Union Strategy for the Baltic Sea Region (EUSBSR) and the Council of the Baltic Sea States (CBSS), introductory remarks and welcome speech was delivered by Helena Tuuri, the Ambassador for Baltic Sea Affairs from the Ministry for Foreign Affairs of Finland. See the list of presentations as Annex III.

The next session of the conference focused on the international and EU approaches and needs for new risk management tools. We had presentations by Filip Zarzycki from the Gdansk University of Technology (Presentation 3), Sarah Robinson from the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) World-Wide Academy (Presentation 4) and Víctor Díaz Seco from the European Maritime Safety Agency (EMSA) (Presentation 5).

To delve deeper into the national and regional efforts regarding risk assessment tools, presentations were delivered by Markus Helavuori from the HELCOM Secretariat (Presentation 6), Esa Kallio from the Fintraffic VTS (Presentation 7) and Jon-Arve Røyset from the Norwegian Coastal Administration (Presentation 8).

To explain how the challenges and needs will be addressed, project partners provided presentations outlining the key components of the OpenRisk II project. Mirka Laurila-Pant, representing the lead partner, the Finnish Transport and Communications Agency Traficom, offered an overview of the project (Presentation 9). This was followed by presentations detailing the AISyRISK Baltic & Ice module (Presentation 10) by Osiris Valdez Banda from the Aalto University, Jon-Arve Røyset from the Norwegian Coastal Administration and Jakub Montewka from the Gdansk University of Technology, and the Environmental Sensitivity Decision Support Tool by Anneliis Kõivupuu from the University of Tartu (Presentation 11) and Sakari Kuikka from the University of Helsinki (Presentation 12). Additionally, tools for organizational risk management maturity and evaluation of risk assessment quality were (Presentation 13) presented by Valtteri Laine from the Finnish Transport and Communications Agency Traficom.

The final session of the day one featured a panel discussion on International, EU and regional user needs, as well as planned outcomes of the OpenRisk II. The discussion was moderated by Hermanni Backer from the Northern Dimension Partnership on Transport and Logistics Secretariat and the valued panel of experts were Sarah Robinson from the IALA World-Wide Academy, Víctor Díaz Seco from the EMSA, Markus Helavuori from the HELCOM, Jon-Arve Røyset from the Norwegian Coastal Administration, Heli Koivu from the Finnish Transport and Communications Agency Traficom and Esa Kallio from the Fintraffic VTS.

Summary of the Day 1: End-user needs on national, regional, EU and international levels for new risk management tools as well as OpenRisk II plans to meet these needs.

On the day 1 in the Kickoff conference identified the following needs in relation to Maritime Risk Management in the International, EU, and regional scale – with focus on the Baltic Sea region:

A) Overall Needs

- More international & EU Cooperation on maritime risk management to develop organizational safety culture (no safety culture-> no RM data)
 - Revitalise & link EU and Regional networks –with also to support global work (e.g. IALA)
- Interoperable systems (from international tools to national systems and vice versa according to needs)
- Customizable (resources & needs are different) and data-driven tools, allowing for evaluation & adjustment of results based on practical knowledge.
- Common terminology and typology of RM products and tools
- Data needs:
 - More accident, incident & near miss data (convince industry to provide reports)
 - Navigational data (AIS with 20 sec. resolution)
 - More information on cargo carried & fuels used
 - Sensitivity of ecosystems (regional and national scales)
 - Metocean data (ice cover, weather, wave)
- Regional transboundary maritime risk assessments (& tools) for:
 - Frequently implemented assessments
 - Strategic/long term assessments

B) Needs on specific themes identified during conference

- Ice navigational risk and response in ice
- Scenarios for new fuels (Ultra-Low Sulphur Fuel Oil)/propulsion & new technologies (autonomous vessels)
- Causation factors -including studies on comparability across different geographic areas
- How to identify/ define socially acceptable risk? Methods and approaches for Facilitation in different types of communities, geographic scales.
- Tools for identifying optimal risk control options (e.g. new routing measures, AtoNs, more advanced VTS services)
- Machine learning studies -what is “normal” traffic?
- Development & use of joint & flexible transboundary spill simulator systems (e.g. EMSATOIL)
- Dynamic real time AIS based risk management tools
- Data & Risk Assessment Quality
- “How clean is clean” -defining what is a sufficient level of environmental cleaning.
- Updating risk picture related to offshore installations (wind power, aquaculture facilities)
- Risks related to unregulated black/shadow fleet operating currently in international waters in Europe in service of Russian exports.

Summary of the Day 2: Comprehensive End-User Feedback from Collaborative Group Work on OpenRisk II Approaches and Plans

To initiate the main activity of Day 2, the Group Work, Jaana Haavisto from the University of Helsinki delivered a presentation summarizing the key insights gleaned from the pre-conference questionnaire responses (presentation 14), setting the stage for the day's agenda. Thus, on Day 2, the emphasis shifted to collaborative Group Work aimed at translating the end-user needs articulated on Day 1 into detailed specifications for the output of OpenRisk II. All the participants of the conference were organized into groups corresponding to the project's three key components:

1. **AI SyRISK Baltic & Ice module**
2. **Environmental sensitivity decision support tool**
3. **Tools for organizational risk management maturity & Evaluation of quality of risk assessments**

Please find the summaries of each group's findings below.

Summary: Group Work on AISyRisk Baltic & ice module

Organizers:

Aalto University

Norwegian Coastal Administration

Gdansk University of Technology

General feedbacks on the current tool and proposed ideas:

- AIS data requires at least 20s resolution for calculating relevant collision risk, etc. in winter navigation operations. The current data from HELCOM has not in enough resolution.
- GPS signal maybe not accurate enough for ice navigation
- In ice, a lot happen in 20 sec intervals, this indicates that raw data may be needed
- Oil spill calculation method is discussed, a simple approach is adopted in the modelling, i.e. oil spills worst case scenario for average vessel. Moreover, effectiveness of the response to oil spills (oil recollection) in ice is unknown.
- The small vessel does not have AIS records, this is relevant for open water, maybe not for ice conditions
- Operations like convoy and cutting loose can easily bring overlaps of domain, this needs to be considered
- Drifting in ice a risk for ships as it may leads to groundings and it is also a problem for windmill park, this need to be considered
- Few oil spill cases in ice, there are limited accidents
- The calculations are expected outcomes based on historical data, the comparison with real accidents are suggested
- The current version is calculating historical accidents, prediction function can be also considered but it should be carefully considered when determining actions (issues behind the numbers need to be properly understood)
- It has to be easy for the users (the current functionality of the AISyRISK tool is a good reference)
- Different ice years have different operations, consider differ years for analysis and also maybe consider 2024 months
- Besetting consequence is raised and discussed
- Domain can be found suitable to some extent for independent navigation, but for other operations it needs to be carefully considered
- Ships are forced to travel along tracks in winter navigation, if no permission, not able to travel as they want
- The highest risk may be when vessels are not with icebreaker, just on their own
- Access IBNet may be helpful for understanding and analysis
- For ice breaker operations, they use satellite pictures on top of the map, skills for using ice map - satellite - wind is practically important for winter navigation
- Satellite images can be inputs
- In convoy: stronger vessels are further away from ice breaker and weak one are closer to icebreakers, icebreakers provide advices to the vessels that needs to be followed
- Deadweight/power can be in indicator to define ship capability



- VTS and icebreakers usually monitor ships and provide guide or help around
- Vessels in convoy also monitor the safe distance, they need to keep constant speed. In ice channels vessels sometimes proceed by their own
- Area will be smaller and smaller because of new windfarms, When the ice is going through the windfarm it gets "packed" and it makes no go area

Internal reflections on next steps:

- High resolution AIS data is critical, discussion on how to obtain the full data for the region need to be planned further.
- Access to IBNet and discussion of operation features of winter navigation with relevant experts can be planned so that a good foundation can be settled.
- Internal brainstorming can be further planned, organization and obtaining of different data can be further planned.
- Familiarization with some available short term -regional AIS and ice data have started to get insights and get ready for bigger data.

Summary: Group Work on Environmental sensitivity decision support tool

Organizers:

University of Tartu

University of Helsinki

See also the presentation on previous research on oil spill decision analysis (Presentation 15)

General feedback about the concepts of EcoSensitivity tool

- Good to integrate different tools together (interdisciplinary point of view, interoperability) so information comes from another application as input that directs to results. However, the opposite comment came also, indicating that those tools are not for amateurs and maybe such tools should be used only by experts and “right” persons. If there is really an accident, you need a person who is able to navigate with this tool.
- Countries have their own specific interest of certain places (sensitive areas that they want to prioritize) – try to connect the national priority areas maps. 2016 HELCOM Response sensitivity maps report.
- Scrubbers-related pollution: Number of ships using scrubbers has increased rapidly. If HELCOM has those records as a map we can include it. Our application and calculations relate to input layers. How bad is the pollution from scrubbers? There’s a method for doing it, but very few have done it.
Scrubbers come in three varieties: open-loop, closed-loop, and hybrid. Open-loop systems suck in seawater, spray it into the exhaust, and discharge it overboard, often without treatment. Instead of using seawater, closed-loop systems have a tank of alkaline-dosed freshwater onboard.
- Sensitivity, recovery, and mobility of species to take into account in calculation of the ecosystem sensitivity.
- Visual tools are helpful to set the scales.



- Wise to have some No-Go-Zones if very valuable spots like seagrass that we don't have good restoration practices yet and the cost to recover will be high or the restoration will be not even possible.
- What are the units for oil spill – Needs to develop threshold that oil has impact areas where it is so then it gets value 1. Usually, the unit is the area of habitat or biomass of species lost due to the impact/damage.

Uncertainty of decision making

- Huge time consuming and professional work about Bayesian networks and research about uncertainties has been already done (based on Jaana Haavisto's presentation; see Presentation 15) and this should be used and acknowledged.
- It was asked if one number or probability distribution would be better for communicating the uncertainty of the outcome/ decision. Probability distribution for sure but visualize it as a color (bad – red, green – good). Important to keep results visual, simpler for decision maker.
- Decision should not be based on one number but behind the data that is behind this value. This is the role of the tool, to generate probability. Based on the colors, you will see where you are standing – what is the level of the risk (high uncertainty – red, low uncertainty – green).
 - For this type of colorful signaling, thresholds need to be decided and shown as well.
- Estimates of uncertainty and the strength of knowledge were seen as useful information.

Challenges

- What's the borderline/threshold for losing some nature values. If you are not an expert of the environmental sector. You should have a value that you can base on making decisions. It's hard to tell what's the borderline for losing some nature values. Is 10% or 5% even too much loss already or still, ok? Easier with those nature values where you have EU directives connected with it.
- Environmental damage in the cost would be needed and interesting, however it is very hard to calculate.
- Pan-Baltic rare species maps
- Climate change makes the predicting harder, organisms act accordingly to the weather and if weather is unpredictable then hard to predict the behaving of the ecosystems and organisms also.
- The protectability of different species needs to be included but for many species there is a lack of this information.
- There should be common understanding about sensitivity and no sensitivity – that is politically quite difficult.
 - Emphasis (or prioritization) of sensitivity can be very different for each country/ valuer
 - Still, joint maps were seen as valuable for e.g., indicating hotspots

Next steps based on the stakeholder's feedback:

- Continue with the concept of the EcoSensitivity tool (concept 1) and develop the first version of the tool.
 - Try to connect/include the national priority areas maps (cf. 2016 HELCOM Response sensitivity maps report).
 - Sensitivity, recovery, and mobility of species to consider in calculation of the ecosystem sensitivity, also rare species.
 - Wise to include some No-Go-Zones.

- Keeping the tool visual – easier for stakeholders.
- Try to include the previously done uncertainty research knowledge into the EcoSensitivity tool.
- Look for the availability of scrubbers- related data/ map layers from HELCOM

Summary: Group Work on tools for organizational risk management maturity & Evaluation of quality of risk assessments

Organisers:

Finnish Transport and Communications Agency Traficom

Northern Dimension Partnership on Transportation and Logistics

The workshop aimed to gather insights and feedback on the R-Mare matrix model, focusing on selected risk assessment attributes. Additionally, it sought to identify end-user needs for the model interface and explore potential user-cases at national, regional, and global levels.

Discussion Highlights:

1. Feedback on the Model: Participants emphasized the importance of honesty and trust in the organizational environment when utilizing the R-Mare model. There was discussion on its operational applicability, particularly in scenarios such as assessing the adequacy of oil spill response performance. A guidance document has pivotal role when employing the model as a tool to assess organizational performance. Clear definition of scope and guidance documentation becomes indispensable for organizations utilizing the model to evaluate their performance effectively. For example, it was raised whether the assessment targets the risk maturity across the entire spectrum of maritime administrations within the organization or focuses specifically on individual departments or units. Clarifying this distinction is crucial to ensure a precise and tailored evaluation process.
2. End-User Needs for the Model Interface: Discussions revolved around visualizing causal links between attributes and the maturity levels within the model. Suggestions were made to color-code maturity levels for clarity, with green indicating acceptable levels (4 and 5), and red, orange, and yellow representing lower maturity levels (1, 2, and 3).

Testing of R-Mare Matrix Model:

1. Data and Information: Challenges were identified in data sharing, with maritime authorities possessing most maritime-related data, yet facing limitations in sharing due to privacy concerns. The need for open-source data to enhance risk assessment effectiveness was emphasized, along with the necessity of identifying new data requirements and optimizing data collection processes. There was also discussion about the scarcity of data concerning the "shadow tanker fleet", which could potentially elevate the risk level in the Baltic Sea region. Uncertainty surrounded the appropriate formal approach to addressing security issues related to these vessels.
2. Tools and Techniques: Discussions highlighted varying levels of transparency in tools and their outputs, particularly when external consultants conduct risk assessments. Authorities were urged to understand the

limitations of tools used by the external consultant and interpret results effectively. Continuous training on risk assessment tools and techniques was deemed essential, emphasizing the iterative nature of risk understanding and identification.

3. Hazard Identification: Participants noted the lack of a regularly updated hazard identification process in some maritime organizations and advocated for a systematic and regular approach to document, review, and update hazard lists. Additionally, there was discussion about the reporting of near-miss data in databases for hazard identification purposes.

Based on the collected feedback, the next phase involves further development of the tools while taking into account the feedback received.

Annex I: OpenRisk II Kick-Off Conference agenda

OpenRisk II Project Kick-Off Conference ***“New Maritime Risk Management Tools & End User Needs”*** ***Helsinki, 6. & 7. March 2024***

Venue: University of Helsinki, Siltavuorenpenger 3a (“Athena” building), room Athena 302.

Programme

Day 1 (Wednesday 6.3.2024, 12:00-17:45) on-site and online

Registrations 12:00-12:30

Introductions / Context 12:30 - 13:00

Moderator: Jaana Haavisto, University of Helsinki
Speakers: Sakari Kuikka, University of Helsinki
Valtteri Laine, Finnish Transport and Communications Agency Traficom
Helena Tuuri, Ministry for Foreign Affairs of Finland

International and EU approaches and needs for new risk management tools 13:00-13:50

Moderator: Jaana Haavisto, University of Helsinki
Speakers: Filip Zarzycki, Gdansk University of Technology
Sarah Robinson, IALA World-Wide Academy
Victor Diaz Seco, European Maritime Safety Agency

Discussion 10 minutes

Coffee Break 13:50-14:20

National and regional approaches and needs for new risk management tools 14:20-15:00

Moderator: Jaana Haavisto, University of Helsinki
Speakers: Markus Helavuori, HELCOM
Esa Kallio, VTS Finland
Jon-Arve Røyset, Norwegian Coastal Administration

Discussion 10 minutes

Overview of Planned OpenRisk II Output 15:00-16:00

Overview of the OpenRisk II project

Speaker: Mirka Laurila-Pant, Finnish Transport and Communications Agency Traficom

AI SyRISK Baltic & Ice module

Speakers: Jon-Arve Røyset, Norwegian Coastal Administration
Osiris Valdez Banda, Aalto University
Jakub Montewka, Gdansk University of Technology

Environmental sensitivity decision support tool

Speakers: Anneliis Kõivupuu, University of Tartu
Sakari Kuikka, University of Helsinki

Tools for organizational risk management maturity & Evaluation of quality of risk assessments

Speakers: Valtteri Laine, Finnish Transport and Communications Agency Traficom
Hermann Backer, Northern Dimension Partnership on Transport and Logistics Secretariat

Coffee Break 16:00-16:30

Panel discussion on International, EU and regional user needs & planned OpenRisk II Outcomes (with interactive elements) 16:30-17:30

Moderator: Hermanni Backer, Northern Dimension Partnership on Transport and Logistics Secretariat
Panelists: Sarah Robinson, IALA World-Wide Academy
Victor Díaz Seco, European Maritime Safety Agency
Markus Helavuori, HELCOM
Jon-Arve Røyset, Norwegian Coastal Administration
Heli Koivu, Finnish Transport and Communications Agency Traficom
Esa Kallio, VTS Finland

Wrap-up of the day 17:30-17:40 (free time 17:40-18:30)

Speaker: Valtteri Laine, Finnish Transport and Communications Agency Traficom

Dinner 18:30-ca. 20:30

Venue: The University of Helsinki banquet room at Unioninkatu 33, Helsinki

Day 2 (Thursday 7.3.2024, 09:00-15:30) on-site only

Registrations 08:30-09:00

Welcome, summary of the project and key points from Day 1 09:00 - 9:20

Speakers: Valtteri Laine, Finnish Transport and Communications Agency Traficom
Mirka Laurila-Pant, Finnish Transport and Communications Agency Traficom

Presentation of pre-conference questionnaire results 09:20-09:30

Speaker: Jaana Haavisto, University of Helsinki

Introduction to group work methods 09:30-10:00

Speaker: Hermanni Backer, Northern Dimension Partnership on Transport and Logistics Secretariat
**Division into 3 groups*

Group Work on User needs 10:00-12:10

Groups (three 60 min sessions each, possibility to change group between sessions):

1. AISyRISK Baltic & Ice module 3x60 min (+3 x 10 min breaks)
2. Environmental sensitivity decision support tool 3x60 min (+3 x 10 min breaks)
3. Tools for organizational risk management maturity & Evaluation of quality of risk assessments 3x60 min (+3 x 10 min breaks)

Lunch Break (lunch at own cost): 12:10-13:10

Group Work on User needs (continued) 13:10- 14:10

Presentation of group work results ca. 14:10-15:10

- One from each group presents the results
 - o Group 1 (AISyRISK Baltic & Ice module)
 - o Group 2 (Environmental sensitivity decision support tool)
 - o Group 3 (Tools for organizational risk management maturity & Evaluation of quality of risk assessments)

Final Discussion and closure 15:10 – 15:30

Speakers: Valtteri Laine, Finnish Transport and Communications Agency Traficom
Mirka Laurila-Pant, Finnish Transport and Communications Agency Traficom

ANNEX II: List of Participating Organizations in the Conference

Participating Organizations
Aalto University
Arctia Icebreaking Oy
Arctia Management Services
DNV AS
ESL Shipping Ltd
Estonian Transport Administration
European Maritime Safety Agency
Finnish Border Guard
Finnish Shipowners' Association
Finnish Transport and Communications Agency Traficom
Finnish Transport Infrastructure Agency
Finnpilot Pilotage Oy
Fintraffic VTS
Gdansk University of Technology
German Authority for Waterways and Shipping
HELCOM
IALA
Kotka Maritime Research Centre
MARIN
Maritime Search and Rescue Service Poland
Minister for Foreign Affairs (Finland)
MW Maritime
NDPTL Secretariat
Nord University Business School
Norwegian Coastal Administration
RISE Research Institutes of Sweden
SASEMAR
The Swedish Meteorological and Hydrological Institute
Sweco AB
Swedish civil contingencies agency, MSB
Swedish Coast Guard
Tallinn University of Technology, Estonia Maritime Academy



Transport Safety Board (Latvia)
University of Helsinki
University of Tartu

ANNEX III: List of presentations

Presentation 1_Welcome_Sakari Kuikka_University of Helsinki

Presentation 2_Traficom introduction_Valtteri Laine_Traficom

Presentation 3_ISO 31000 Standard and FSA_Filip Zarzycki_Gdansk University of Technology

Presentation 4_IALA Risk Management Toolbox_Sarah Robinson

Presentation 5_EMISA supporting Marine Pollution Risk Assessment_Victor Diaz Seco

Presentation 6_HELCOM_Response and Risks_Markus Helavuori

Presentation 7_Fintraffic_Esa Kallio

Presentation 8_Automated calculation of risk related to ship traffic_Jon-Arve Røyset

Presentation 9_overview of the OpenRiskII_Mirka Laurila-Pant

Presentation 10_AISyRISK Baltic & Ice module_Osiris Valdez Banda_Jon-Arve Røyset_Jakub Montewka

Presentation 11_Regional service on ecosystem sensitivity to spills_Anneliis Koivupuu

Presentation 12_Environmental sensitivity_Sakari Kuikka

Presentation 13_A Risk Maturity Model_Valtteri Laine

Presentation 14_Pre-Conference Questionnaire Results_Jaana Haavisto

Presentation 15_Previous research on oil spill decision analysis_University of Helsinki