MERI KOTKA

ANNUAL REPORT 2019

PHOTOS:

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A new professorship at the University of Helsinki was established in 2019. Professor **Päivi Haapasaari** and her research team cover social scientific and interdisciplinary approaches to marine environmental problems and resource use. Her methodological expertise includes stakeholder engagement and participatory modelling. Professor Haapasaari's research topics align perfectly with KMRC aims, bring a more human perspective to the overall research, and strengthen collaboration with the industry and decision-makers.

KMRC has extensive experience in Russian cooperation. During the last ENPI CBC programme period, we conducted several research projects with Russian research organisations. However, due to the global political situation, the start of a new ENI CBC programme was delayed. For us, this caused a break in the joint research projects with our Russian colleagues.

Now the situation is better, as a new EU funding programme between Finland and Russia was launched. Due to our strong competence in project application processes, we have had success in project funding. This is also a result of hard and persistent work and numerous contacts and meetings with the stakeholders and partners. At the moment, we have three ongoing projects which enable close cooperation with six Russian organisations. These new projects give us a possibility to reactivate cooperation with Russian experts.

What is new is that in the GETREADY project, KMRA experts have an opportunity to learn what it is to be a partner, as the project is led from Russia. This a good opportunity for us to view project operation from a new perspective.

Anna Kiiski

Executive Director Kotka Maritime Research Association (KMRA)



2. KOTKA MARITIME NARTIME RESEARCH CENTRE IN BRIEF

Merikotka is an international research centre. We do multi- and interdisciplinary applied research in order to improve maritime safety, prevent accidents, and protect the marine environment.

Merikotka has an extensive global partner network. In addition to universities and research centres, we also work with other types of organisations.

Merikotka was founded in 2005 at the initiative of the City of Kotka. Because seafaring is important to the city, there was an urge to know more about the risks related to maritime transport and how to control them. For this purpose, a research centre was created to make use of the knowledge held by various universities and to produce high-quality research on maritime transportation, maritime safety, and the marine environment.

CUTTING-EDGE RESEARCH BY FOUR UNIVERSITIES

Good societal decision-making needs to be based on scientifically verified information. Merikotka's expertise is built on research carried out by the University of Helsinki, Aalto University, the University of Turku, and the South-Eastern Finland University of Applied Sciences. Kotka Maritime Research Association acts as an umbrella organisation that coordinates, manages, and supports the universities' joint research projects. At the moment, our multidisciplinary researcher network consists of over 30 experts.

Beyond academia, the research centre works closely with a great number of experts in related fields. Our partners include organisations such as

> the Finnish Environmental Institute, Natural Resources Institute, Finnish Transport and Communications Agency, Finnish Transport Infrastructure Agency, and Metsähallitus, as well as development company Cursor Ltd, Etelä-Kymenlaakso Vocational College, and Kotka Maretarium.



RESEARCH



MULTI- AND INTERDISCIPLINARY RESEARCH FOR SUSTAINABLE MARITIME TRANSPORT

Merikotka conducts multi- and interdisciplinary research to

 understand and develop the functioning and dynamics of ship operations and technology, maritime traffic, logistics, and maritime policy making;
assess environmental and safety risks related to maritime traffic, acknowledging the joint effects of other cumulative stress factors;

3) estimate the positive and negative impacts of maritime traffic on regional wellbeing, safety, and environment;

4) develop new intelligent tools for navigation, maritime spatial planning, and management purposes; and

5) produce information for education and decision-making to support the sustainable development of maritime traffic.

Each Merikotka research group has its own focus area and scientific field, which are then combined in joint research activities in order to address these topics. Based on the results, Merikotka aims to support shipping companies, port organisations, maritime/regional planners, and other stakeholders in developing their activities in a sustainable way, where the sustainability is achieved by considering the economic, safety-related, and environmental aspects combined.

MARITIME RISKS AND SAFETY Aalto University

Aalto University, as a part of Merikotka, offers a diverse research agenda which focuses on analysing the safety of maritime traffic, ships, and structures. In particular, Aalto University investigates the responses and strengths of ships in complex physical



HÄNNINEN

environments where ice and wave-induced loads are present. The research is done by conducting extensive full-scale trials onboard ice-going ships, by utilising the Aalto Ice Tank, and by developing theoretical models and analysing the ultimate strength of structures.

Furthermore, Aalto also investigates system-level issues at the scale of shipping systems/fleets, individual ships, and ship sub-systems. The focus is on passenger ships and ice-going vessels and, as a new opening, on autonomous ships. The core value of research is to guarantee safety, to enable sustainability by way of advanced solutions, and to focus on the first principles of applied mechanics, statistical methods, and systems engineering. The research on safety focuses on developing concepts, methods,





tests, and frameworks for creating safe technological and socio-technological systems and for managing the associated risks. These advances in risk analysis and safety science are applied to specific problems in maritime engineering. This serves the society by increasing our understanding of how maritime safety is created and maintained and how safety risks can be managed effectively.

In all the previously mentioned topic areas, Aalto focuses on conducting high-quality research and educating the future leaders responsible for ensuring the safety of maritime traffic operations. Our projects are funded both nationally and internationally. They are focused on ensuring the safety of maritime traffic, ships, people on board, and the entire maritime ecosystem, with the help of analyses developed by a multidisciplinary research group and with the support of national and international key partners in maritime safety.

Our research has three main spearheads:

1) Ship Technical Safety, focusing on safety in ship design.

2) Ship Operational Safety, focusing on safety in ship operations (e.g. ship safety performance).3) The safety of maritime traffic, focusing on the management of safety among all the maritime safety stakeholders.

The key personnel are Professors **Pentti Kujala** and **Spyridon Cheirdaris**, Post Docs **Osiris Valdez Banda**, **Ketki Kulkarni**, **Martin Bergström** and **Miguel Angel Calle Gonzales**, and doctoral students **Mikko Kotilainen**, **Roman Repin**, **Lu Liangliang**, and **Fi Lang**.

MARITIME INDUSTRIES AND LOGISTICS University of Turku

Research carried out by the Centre for Maritime Studies at the University of Turku offers a diverse research agenda in the field of maritime industries and logistics, combining business studies and economics with environmental and social sciences. The centre specialises in the field of traffic and ports in the Baltic Sea area, as well as logistics chains and infrastructure in the marine industry sector. It coordinates the interdisciplinary environmental research supporting marine spatial planning and integrated coastal zone management.

The research includes three main spearheads:

1) Shipping and maritime logistics, including: Maritime transport and infrastructure; port networks and port operations; maritime safety studies; pilotage operations; and national security of supply.

2) Maritime cluster, including: Development of marine industries; cluster dynamics and economic impacts; and corporate social responsibility in shipping operations together with studies focusing on Blue Growth.

3) Marine environment and spatial planning, including: Efficiency and impacts of environmental regulations in shipping; environmental status of ports; marine spatial planning; shipping and offshore activities in the Arctic; performance and impact of the European ports system; and integrated knowledge base and management system for ports.

The key personnel are Professor **Tommi Inkinen**, Senior Researchers **Reima Helminen** and **Tapio Karvonen**, Planning Officer **Talvikki Välimaa**, and Education Manager **Sari Nyroos**.





MARINE ENVIRONMENT

University of Helsinki

The Fisheries and Environmental Management Group (FEM) and Marine Risk Governance Group (MARISK) focus on the interaction between ecosystems and human society.

The research interests are:

 Decision and risk analysis in relation to renewable resources and biodiversity
Identification and quantification of risks in

the use of natural resources and in the various maritime activities

3) Integrating different sources of data and knowledge: Bayesian analysis

4) Inter/cross-disciplinary modelling of exploitation processes of natural resources in the face of risks and uncertainty of information5) Human, social, and cultural dimensions of managing the use and protection of sea areas

and their resources

6) Risk governance and communication

All previous applications focus either on fisheries science or oil spill risk analysis. The SmartSea and Wise projects focus on more generic risks.

People cause the main risks to the aquatic ecosystems. Therefore, we need human sciences to solve the problem. The research conducted in the University of Helsinki projects combines biology, limnology, fisheries management, geography, and sociology and anthropology. Moreover, mathematical sciences produce risk models that have a foundation in the other scientific fields.

Bayesian analysis forms the backbone of our environmental modelling approach. It provides an effective tool for learning from various information sources. These sources include data, models and their theoretical background, and expert knowledge. For example, the FEM Group has estimated the effectiveness of an oil combating fleet in collecting



SAKARI Kuikka



PÄIVI HAAPASAARI

oil from an oil spill. The Bayesian approach offers a good foundation for decision-making.

In oil spill impact analysis, it is important to develop a methodology that allows for maximum learning from previous accidents. It is important to understand that the level of uncertainties is high in impact predictions. By creating Bayesian models that can learn from previous accidents, it is possible to reduce the amount of uncertainties for future accidents.

The key personnel are Professors Sakari Kuikka and Päivi Haapasaari, Post Docs Annukka Lehikoinen and Inari Helle, and doctoral students Mirka Laurila-Pant, Lauri Ronkainen, Emilia Luoma and Tuuli Parviainen. PEOPLE CAUSE THE MAIN RISKS TO THE AQUATIC ECOSYSTEMS. THEREFORE, WE NEED HUMAN SCIENCES TO SOLVE THE PROBLEM.

MARITIME LOGISTICS AND SEAFARING South-Eastern Finland University of Applied Sciences (Xamk)

Xamk's applied research focuses on logistics and seafaring. In seafaring, the focus is on maritime safety and the management of environmental risks related to maritime operations. The main research topics include pollution prevention and spill response management, as well as maritime emergency response and distress operations.

In logistics, the focus is on green transportation, innovative business concepts, and ways to connect hubs and clusters.

Digitalisation and environmental issues are cross-cutting themes, both in logistics and seafaring.

The research projects are need-based and carried out in close cooperation with end-users, providing practical, ready-to-use research results. RDI activities in logistics and seafaring are conducted by working closely with authorities, companies, and public sector organisations.

The key personnel are Research Director Ville Henttu, Research Manager Justiina Halonen (maritime safety and oil spill response), Research Manager Olli-Pekka Brunila (logistics), Director of Research Unit Tomi Oravasaari, and RDI personnel Elias Altarriba, Emmi Rantavuo, Antti Lanki, Joel Kauppinen, Tommy Ulmanen, Riitta Kajatkari, Vesa Tuomala, Toomas Lybeck, Anna Kiviniitty and Vappu Kunnaala-Hyrkki.



JUSTIINA HALONEN



OLLI-PEKKA BRUNILA





IN LOGISTICS, THE FOCUS IS ON GREEN TRANSPORTATION, INNOVATIVE BUSINESS CONCEPTS, AND WAYS TO CONNECT HUBS AND CLUSTERS.

D O C T O R A L D I S S E R T A T I O N S

MSc **Maisa Nevalainen** from the University of Helsinki defended her thesis on 24 May 2019. The thesis applied a probabilistic framework for assessing the environmental risk oil spills pose for marine biota in the Arctic.

The work consists of the summary and four research papers. Paper I brings together the current understanding about Arctic oil spills and their environmental impacts and conceptualizes that knowledge as a probability-based framework that can guide further risk assessment. It further identifies the key Arctic marine functional groups that environmental risk assessment should focus on. Paper II carries out an expert elicitation to quantify the acute oil spill induced mortality of adult and offspring individuals belonging to each functional group. Paper III develops a vulnerability index describing the acute mortality and the longer-term recovery potential of the functional groups based on scientific and grey literature. Paper IV uses the information collected in papers I-III and combines it with estimates of oil spreading and species distributions to compare the spatiotemporally varying mortality risk for polar bears, ringed seals, and walrus in a case study area, the Kara Sea.

The results of the thesis suggest that, in general, polar bears and marine birds are most at risk from spilled oil in the Arctic, but there is great variation in the risk depending on the timing of the spill and the type of oil spilled. Moreover, the distribution of biota in relation to shipping routes can have a major impact on the risk the spilled oil poses to them. Furthermore, the amount of ice present at the spill site can alter the risk to biota, as ice cover affects both the spreading of oil and the abundance of species in the vicinity of the oil spill. On an acute scale, medium density oil spilled when ice concentration is relatively low seems to be the worst-case accident scenario when considering the joint impact on all biota. Determining the safest shipping route may however prove to be challenging. The thesis offers new insights into the risk that oil spills pose to Arctic biota and is a step on the way towards a comprehensive understanding of the impact of Arctic oil spills.

5. NEW Professor

Kotka Maritime Research Centre got a new professor in January 2019, when **Päivi Haapasaari** took up her post as professor in multidisciplinary risk analysis at the University of Helsinki (Ecosystems and Environment Research Programme, Faculty of Biological and Environmental Sciences). Päivi's academic background is in environmental social sciences. She completed her PhD at the University of Helsinki in 2012, and in 2016 the University of Helsinki awarded her the title of Adjunct Professor (Docent) in environmental policy. Päivi's research covers social scientific and inter/transdisciplinary approaches to marine environmental problems and resource use, and to maritime safety. She is also interested in the essence of interdisciplinarity as such.

Her methodological expertise includes, for example, risk and decision analysis using Bayesian networks, governance analysis, scenario building, stakeholder engagement, and participatory modelling. Päivi leads the Marine Risk Governance Research Group (MARISK) at the University of Helsinki. She has contributed to the work of ICES working groups (WG on Risks of Maritime Activities in the Baltic Sea (WGMABS), Integrated Assessment of the Baltic Sea (WGIAB), and Working Group on Fishery Systems (WGFS)). Päivi has worked as a researcher at the University of Helsinki since 2008; before that, she was a researcher at the Department of Sociology and Gender Studies at the University of Oulu. In 2017–2018, she held a post-doctoral position at the Centre for Blue Governance at Aalborg University, Denmark.



6. TOP PROJECT:

Future potential of inland waterways (INFUTURE)



The aim of the INFUTURE project is to open new business opportunities and prospects for inland waterways at the Lake Saimaa and Volgo-Balt areas by increasing possibilities for higher cargo volumes and a longer navigation season. Development of an online data based ICT system for inland waterway traffic monitoring, traffic control, and free cargo capacity management is one topic of the transshipment hub evaluation. Advanced navigation, hydrography services, and optimised ship concepts are needed for the inland waterways. One of the specific objectives of the INFUTURE is to build up strong stakeholder co-operation between Finland and Russia. This is seen important, as facilitation is needed to initiate discussions, cooperation, and partnerships between business stakeholders across the border.

WATERWAYS FORM AN ECOLOGICAL TRANSPORT ROUTE

The Baltic Sea Region, with its growing transport volumes between east and west, needs innovative and pragmatic solutions to cope with the future transport requirements. By 2050, the EU must cut transport emissions by 60 per cent compared to 1990 levels and continue to reduce vehicle pollution. Inland waterway transport is a great option, as it is sustainable and an environmentally friendly alternative for transporting goods, and there is still plenty of unused capacity.

SAIMAA CANAL IS A WATERWAY TO THE WORLD

The Saimaa Lake and Canal area forms the only inland waterway in Finland where cargo transportation takes place. This inland waterway connection to the sea is vital for the area. It runs from Lake Saimaa to the Gulf of Finland via the City of Vyborg, Russia. The Canal area



TARJA JAVANAINEN

has been rented from Russia until 2062. The total length of the Canal is 43 kilometres, including eight locks, three of which are on the Finnish side and five on the Russian side.

There are plans to make significant improvements in the Saimaa Lake and Canal area by prolonging the lock chambers by 10 meters in order to receive bigger vessels and larger shipments. Navigation in the northern waterways can be challenging, as the ice conditions cannot always be predicted. The commercial sustainability of inland waterways depends also on infrastructure. Technical solutions, digitalisation and the best practices focus on safe navigation. The sea freights on inland waterways can be

very competitive compared with other modes of transport.



LOGISTICS AND INLAND WATERWAY TRANSPORT BACKGROUND

Anatoly Burkov, Admiral Makarov State University of Maritime and Inland Shipping (AMSUMIS) Toomas Lybeck, South-Eastern Finland University of Applied Sciences (Xamk)

Commercial visibility and future cargo flows

During the first project period, Xamk and AMSUMIS have studied the domestic and international Inland Waterway Transportation (IWT) in two reviews, which included information about the current cargo flows, challenges and perspectives of IWT, and estimations of future development. These reviews provided an informative basis for launching the work in vessel design. The work will continue with a survey among businesses in order to collect vital information. The answers will be gathered in face-to-face interviews and through a questionnaire.



A N AT O LY B U R K O V



TOOMAS LYBECK

IWT Regulation

An important part of the work is information concerning the new IWT regulations in Russian territory. Updated Russian Federation legislation allows international vessels to sail in certain parts of the Russian Inland Waterway System, and the new situation will open up new possibilities for cargo traffic over the Finnish-Russian border. There are two thesis groups at Xamk studying these issues. Interim results will be available before the summer of 2020.

Study of Transshipment Hub

All the future actions, as well as the actions already carried out in the project, prepare us to make recommendations for the international Transshipment Hub development. The online service will make the Transshipment Hub business more competitive and cost-efficient. Several international IWT studies point out that the best way of developing an online data based ICT system is to cooperate with already functioning platforms. Educational organisations can support the Transshipment Hub in the form of trainings, IWT studies, and simulations.



ALL THE FUTURE ACTIONS, AS WELL AS THE ACTIONS ALREADY CARRIED OUT IN THE PROJECT, PREPARE US TO MAKE RECOMMENDATIONS FOR THE INTERNATIONAL TRANSSHIPMENT HUB DEVELOPMENT.

O T H E R R E S E A R C H P R O J E C T S

POLARCTIC

Joint Research Centre of Excellence for Arctic Shipping and Operations, funded by the Lloyd's Register Foundation *Pentti Kujala*, *Aalto University Sakari Kuikka*, *University of Helsinki*

This topic will be continued in a new project, funded by the LRF, concerning the recommended practice of scenario-based risk management for polar waters. The LRF awarded 800,000 euros in funding for the project for the term of 2019–2021. This project develops guidance notes on scenario-based risk management for polar shipping. It builds on previous LRF-funded research on arctic operations to significantly update the recommended practices. It enables the IMO, government agencies, class societies, and the industry to establish and maintain the highest standards of excellence for shipping operations in the polar areas.

COMPLETE

Completing management options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping *Miina Karjalainen*, *Kotka Maritime Research Centre*

Invasive species are identified as a major threat to the world's oceans and biodiversity. One important sector introducing harmful aquatic organisms and pathogens into the marine environment is shipping. There are two main ways ships spread alien species – through ballast water and hull fouling. COMPLETE addresses two of the major sources of harmful organism introduction caused by shipping and boating: ballast water and vessel hulls. The project tackles several gaps in current knowledge and management systems. COMPLETE works towards minimising the introduction of harmful aquatic organisms and pathogens by developing a consistent and adaptive management system for the Baltic Sea Region. The project has partners and collaborators in all Baltic Sea countries.

The COMPLETE project will provide a comprehensive approach on this complex issue. Through delivering required management tools and practical guidelines, it will propose a harmonised way to comply with the requirements set by the IMO's Ballast Water Management Convention in the Baltic Sea Region. Also, the IMO biofouling guidelines provide useful information on the practices applied to minimise the role of this pathway. The question is, to what extent are these guidelines followed by the shipping industry, how well the operators know the guidelines, and how applicable these guidelines are for the Baltic Sea Region.

The results of the project can be used to harmonise biofouling management and to plan a proposal for a biofouling strategy for the Baltic Sea Region. For three years, COMPLETE will develop management strategies and tools specifically for the Baltic Sea. By addressing one of the key challenges in the region, the goal of the project is to develop operational frameworks and provide user-oriented tools in close cooperation with relevant stakeholders to make shipping more environmentally friendly.

Funded by Interreg Baltic Sea Region (2017–2020) More information: www.balticcomplete.com

DIGIPORT

Port digitalisation and an open data model for ports Janne Saarikoski, Kotka Maritime Research Association

The DigiPort project aimed to generate new research data on port digitalisation and endow ports with an operational model based on open data. Using open data, ports can participate in the digitalisation trend in a concrete manner, without the need for massive investments. Digitalisation progresses in small steps by opening up data which, although already public, is not yet in the form of open data from a technical perspective.

DigiPort improved the preconditions for port development work through new knowledge. In the first half of the project, a report on the current state of digitalisation in Finnish ports was prepared. The report mapped out how data and digital technologies are utilised in Finnish ports and what possibilities digitalisation creates for port authorities. Future scenarios were developed in the second half of the project to outline how the digitalisation of transport, logistics, and society will affect ports over the next ten years.

The project increased awareness and knowledge of open data by organising two training workshops on open data and its opportunities for members of the port community. In addition, the project generated a public written guide, "ABC of Opening Data in Ports", in support of data opening and use of open data in ports, and a policy for port authorities to open and publish data on port infrastructure. Materials were stored in a data catalogue located on the database server created for the project, where they can be utilised. A domain name, www.datasatama.fi, was opened for the service. This created the world's first data catalogue focusing on port information. At the end of the project, the data catalogue contained infrastructure data opened by the ports of HaminaKotka and Turku, as well as links to the materials of the Finnish Transport and Communications Agency and the Finnish Meteorological Institute.

Funded by the European Regional Development Fund, the Port of HaminaKotka, and the Port of Turku. More information: www.merikotka.fi/digiport

LÄHTÖAIKA

Quality and availability of departure time data Janne Saarikoski, Kotka Maritime Research Association

Points of improvement have been identified in the quality and availability of the schedule data of ships departing from ports. Problems with the up-todateness or transmission of data may complicate the planning of towing, pilotage, and icebreaking activities, thus causing disturbances and extra expenses for the entire transport chain. The impact of such consequences may reach as far as to the port of destination of the ship in question.

The Lähtöaika project, which was concluded in April 2019, investigated the factors behind the generation and transmission of such schedule data, and assessed its quality and availability from the perspective of cooperation between the various actors involved in port traffic. Data was collected from interviews with port actors and other experts. The project also brought different parties together to reflect on the development of data transmission in the context of the new tools afforded to them by digitalisation.

Funded by the European Regional Development Fund and the Merenkulun säätiö foundation. More information: www.merikotka.fi/lahtoaika

BALTIMARI

Review and future of risk management in the Baltic Sea *Ketki Kulkarni*, *Aalto University*

The Baltic Sea is an area involving intense human activities in the fields of transportation, food, and offshore energy production. While these activities are important for the livelihood of the region, they also exert pressure on the sensitive sea. This causes a high risk to humans, wildlife, vessels, and the ecosystem as a whole. The environmental impacts of shipping are significant and include, for example, air pollution, sewage discharges from passenger ships, invasive species transported in ballast water or on hulls, and the risk of large-scale accidents, like oil spills. The shipping industry is also responsible for approximately two per cent of global greenhouse gas emissions.

The EU BONUS BALTIMARI project provides comprehensive reviews of the state-of-the-art risk management strategies and decision support systems available for maritime activities, including shipping, with maritime transportation systems (MTS) and offshore energy production systems (OEPS) as the target areas. The project also identifies several priorities for future research on risk management based on input from various stakeholders.

So far, the project has produced five journal and conference articles that are currently under review. Three policy briefs have also been generated to help communicate the findings to industry stakeholders. Furthermore, a panel discussion was organised to brainstorm ideas for bridging the gap between research and practice. This was followed up by a stakeholder workshop hosted by the World Maritime University, where several industry practitioners were invited.

Through a compilation and comparison of the available regional and global knowledge in risk management and offshore energy production systems from the past 50 years, it is hoped that scientific researchers may identify new future directions for research that are better aligned with the industry needs. At the same time, the industry stakeholders may benefit from the summarised insights of leading scientific work, as these findings guide the policies of the near future and encourage a more informed dialogue with scientists in order to make the models more useful in the real world.

Funded by BONUS, the Baltic Sea Research and Development Programme (2015–2017). More information: www.merikotka.fi/baltimari



C O M E T

Internationally competitive maritime education for modern seagoing and high-quality port services

Vesa Tuomala, South-Eastern Finland University of Applied Sciences Joonas Penttinen, South Kymenlaakso Vocational College

The primary aim of the project is to create a joint-simulator training framework for maritime education. The maritime simulators of maritime schools in Finland and Estonia are technologically connected, so that students can be trained in the same simulated world. Other maritime traffic in the simulated world has previously been mostly computer generated, but now other ships are controlled by students from other schools and from different countries. When students need to navigate their way among other human-controlled ships, the simulated environment will better represent the real environment. This also enables the training of human interaction in a simulated environment better than before: for example, students learn how to communicate in a multicultural environment.

To fully benefit from the possibilities of joint-simulation, new simulator exercises are created. Two studies are conducted to help with focusing on the training objectives and training methods. The study on labour market needs focuses on expert interviews and aims to answer the question of what skills should be trained. The study on best simulator practices aims to find out what the best ways to conduct simulator training are. Additional training on maritime safety management is also arranged for maritime teachers.

Joint-simulated exercises are especially useful for deck officer students, but the project also includes developing a training environment for engine room and cargo handling students. For cargo handling students, new training frameworks are created to better utilise the simulator training and on-the-job learning. Similarly, new courses are also created for engineering students. Cargo handling and engine room expertise are also included in the study of labour market needs.

Funded by the Central Baltic 2014–2020 Programme

"The maritime simulators of maritime schools in Finland and Estonia are technologically connected, so that students can be trained in the same simulated world."

SIMREC

Simulators for improving Cross-Border Oil Spill Response in Extreme Conditions Maria Hänninen and Tarja Javanainen, Kotka Maritime Research Association Justiina Halonen and Riitta Kajatkari, South-Eastern Finland University of Applied Sciences

The SIMREC project aims at mitigating the risks oil spills pose to the environment of the Gulf of Finland by fostering cooperation between Finland and Russia and jointly developing a new generation of training simulations. By combining the knowhow and expertise of authorities as well as research institutions of both countries, the project's objective is to develop tailored training programmes and optimise the preparedness of response teams.

The centrepiece of SIMREC is the development of an innovative and cost-efficient simulation environment that capacitates response teams to maximise the efficiency of their operations. These simulations will be elaborated based on a set of scenarios reflecting potential oil spills. The scenarios will consider data and predictions of maritime traffic as well as data on the impact of extreme weather and sea conditions on certain areas. Based on this data, hot spots for accidents can be located and all information converted into scenarios that are used for simulation training.

A fundamental pillar of a successful oil spill response operation is well-considered, responsible, and efficient decision-making. In order to optimise operations, SIMREC aims to elaborate protocols and tools that enable the persons responsible to enhance their decision-making and communication. Existing patterns of communication and decision-making will be analysed and converted into a roadmap providing recommendations for the best national and cross-border practices. A key factor in the process of fully understanding the nature of successful decision-making and information sharing during operations is to consider the different settings in Finland and Russia and the country-specific factors affecting operations.

Funded by the South-East Finland-Russia CBC 2014-2020 programme. More information: www.merikotka.fi/simrec

"By combining the know-how and expertise of authorities as well as research institutions of both countries, the project's objective is to develop tailored training programmes and optimise the preparedness of response teams."

GETREADY

Getting Ready for the Cross-Border Challenges: Capacity Building in Sustainable Shore Use Janne Saarikoski, Kotka Maritime Research Association Vesa Tuomala, South-Eastern Finland University of Applied Sciences

The objective of the project is to increase the readiness of the cross-border region to respond to the existing and expected challenges by introducing the best practices and applying innovative solutions in the field of sustainable shore use.

The main focus of GetReady is on maritime spatial planning. However, reports on the legislation and regulations related to sustainable coastal use will also be produced. Furthermore, one of the project targets is to carry out a study regarding the digitalisation of ports and the related benefits for sustainability.

"The main focus of GetReady is on maritime spatial planning. However, reports on the legislation and regulations related to sustainable coastal use will also be produced."



8. VISIBILITY

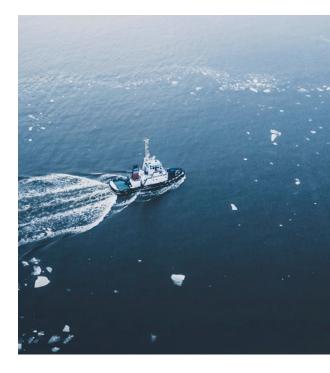
As we produce scientific evidence to improve maritime safety and sustainable maritime transport, we are committed to promoting evidence-based decision-making in the private and public sectors alike. In addition to our research projects, this is done through outreach and visibility.

It is important to us that as many people as possible benefit from our work. During the year 2019, we organised several discussion forums to deliver the project results. Firstly, the recent studies regarding alien species were presented in the COMPLETE project stakeholder conference in Jurmala, Latvia.

The INFUTURE project included a special roundtable discussion about the use of inland waterways during the TRANS NEVA Maritime and Shipping Industry Exhibition in St. Petersburg, Russia.

The Baltic Seas International Maritime Conference which was organised in collaboration with the University of Turku and the University of Le Havre, took place in Turku, Finland. The special session, led by KMRC, was targeted at experts on oil spill risks.

The Baltic Sea Village is one of our main outreach events aimed at all interested parties. The village provides practical advice on how to promote the wellbeing of the Baltic Sea. The family-friendly event takes place in July during the Kotkan Meripäivät festival. The event was organized with the slogan "Miä ja Itämeri", or "Me and the Baltic Sea", encouraging everyone to ask themselves: What can I do to take care of the Baltic Sea?



"It is important to us that as many people as possible benefit from our work. During the year 2019, we organised several discussion forums to deliver the project results."

FACTS AND FIGURES

MERIKOTKA

is a pioneer and a respected research centre in the field of multidisciplinary maritime research

RESEARCH THEMES



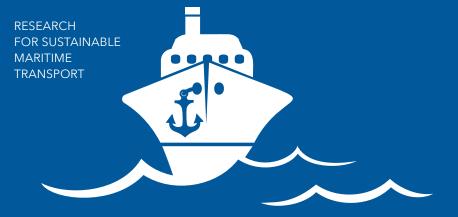
MARITIME INDUSTRIES & LOGISTICS







MISSION



DOCTORAL DISSERTATIONS



FUNDING **2,9 M€**

THE VALUES



1. WORKING TOGETHER Learning and solving through interdisciplinary collaboration



2. INNOVATIVENESS Creating novel and competitive solutionsthrough excellent science



3. HONESTY

Building trust by understanding and communicating the limitations of our research



4. RESPONSIBLY SERVING SOCIETY Supporting society by proactive value creation and preservation



TRAFICOM

