



*Our policy briefs are summaries of scientific knowledge produced in BONUS BALTIMARI, connected to current management and policy actions concerning the Baltic Sea. The briefs engage in and respond to important issues that support long-term sustainability of ecosystem goods and services of the Baltic Sea.*

## Marine risk: how technology-ready is the science?

The Baltic Sea is a highly active region for transportation, food and offshore energy production of the neighbouring countries. The activities in this zone have high impact on socio-economic well-being and livelihood and future of many people. While these activities are important for the livelihood of the region, they also exert pressure on the sensitive sea.



Transport companies, trading corporates, marine industries and government agencies are all eager to work on faster, efficient and safer operations at the Baltic Sea, as per a report by Policy Area on Maritime Safety and Security PA Safe. A series of stakeholder workshops involving industry and academia under the BONUS BALTIMARI project revealed **that the industry is keenly interested in gaining deeper understanding of marine risks through scientific research. However, several barriers limit knowledge transfer such as differing goals and priorities, lack of common language and institutional settings.** An assessment by Aalto University’s Maritime Risk and Safety group under the project BONUS BALTIMARI shows that **the Baltic Sea Region leads the world in developing scientific solutions for reducing and responding to maritime risk.** However, researchers frequently carry out their projects and only consider the needs of the potential end-users at the very end, which one of the participants referred to as the “we hope they will use it” – attitude. Clearly, this is an ineffective strategy for improving risk management. Extensive reviews under BONUS BALTIMARI reveal that scientific results are rarely developed keeping in mind an end-product. This



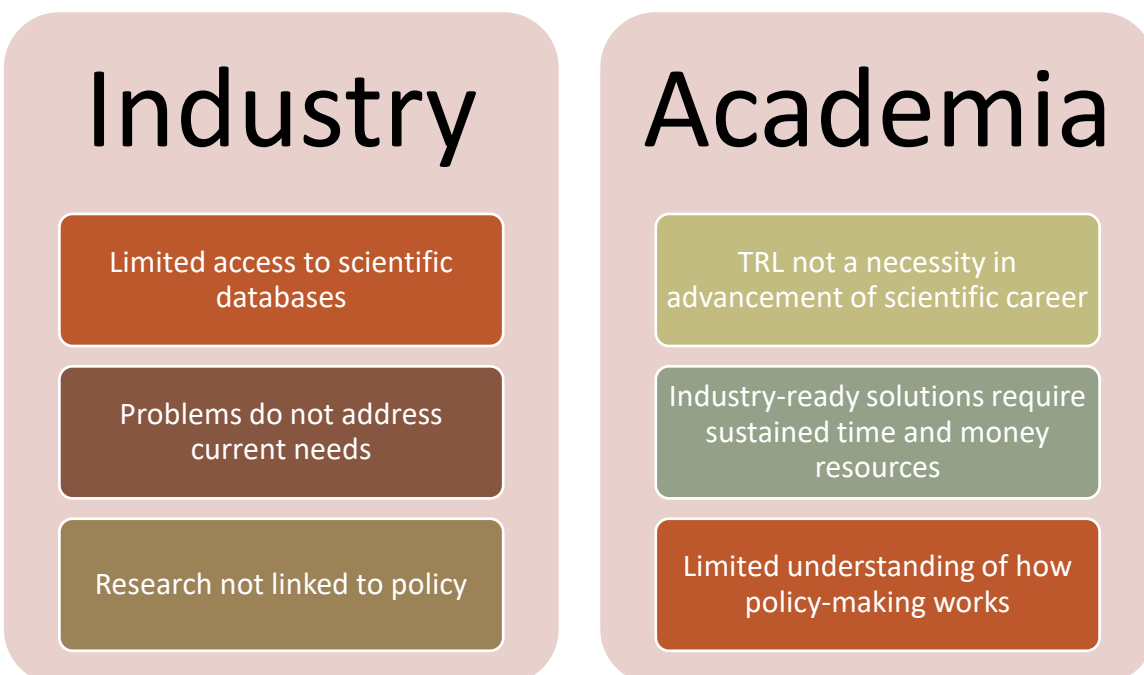
article and the work done under BONUS BALTIMARI aims to bridge this gap between researchers and practitioners by offering a wider perspective on technology readiness to both groups.

### Where do we stand today?

According to a Horizon 2020 guideline, a Technology Readiness Level (TRL) of 1-3 suggests basic principles being involved, formulation of concepts and experimental proof. TRL 6-9 requires testing in industry relevant environment. BONUS BALTIMARI summarizes the TRL of the scientific output over the last 50 years:



Interactive workshops with industry and researchers under BONUS BALTIMARI identified some challenges for both these stakeholders

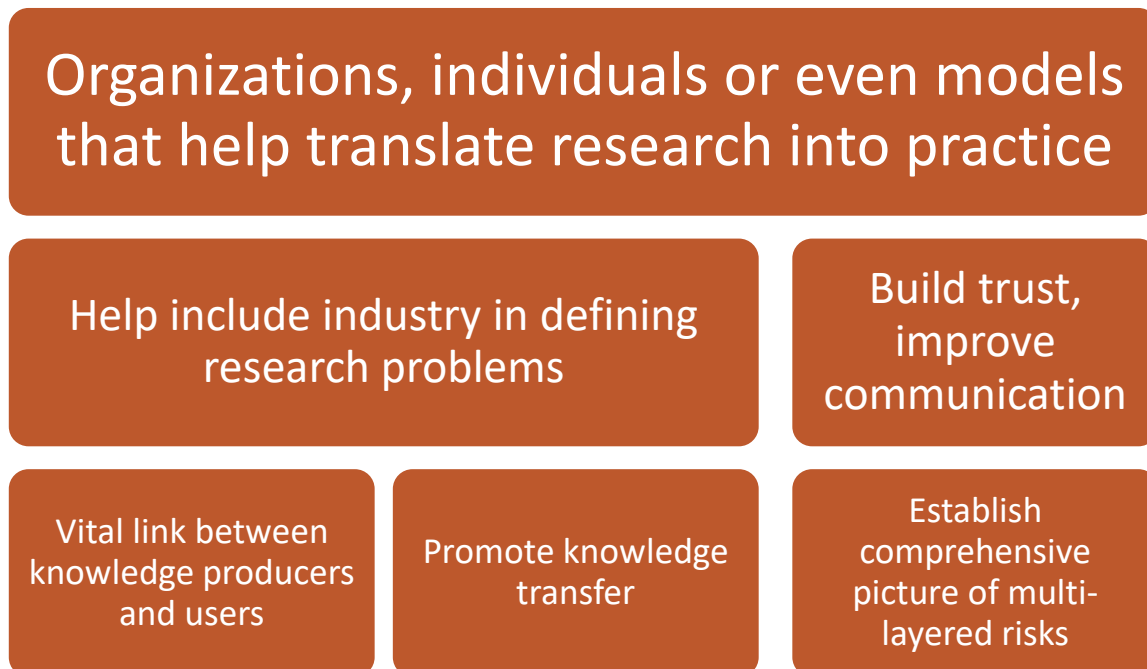




## What are the next steps?

Findings from the reviews and workshops in BONUS BALTIMARI emphasize that the future of marine risk solutions is in multi-disciplinary research and collaborative risk management. This is especially because risks are complex, with different interpretations and perceptions.

Given the situation, **knowledge brokers are important players in helping make scientific output more industry ready**. The workshops discussed who knowledge brokers are and what they bring to the table:



The challenge of making science technology-ready can be tackled by identifying and training teams of knowledge brokers, who can act as a bridge between research and practice. Stakeholders from both industry and academia are encouraged to form meaningful collaborations, involving each other in discussion from the very inception of projects. Industry persons can also help scientists gain a working knowledge of how policy-making works, so they may incorporate those perspectives in their work. Ideas like exchanging citation index for uptake index as an alternate measure of achievement in scientific field need to be discussed further and their feasibility evaluated. This move may encourage future researchers to take up real-world problems whose outcomes are tools and industry-ready technology.



**BALTIMARI**



**BONUS**

SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION

BONUS BALTIMARI policy brief no. 2

*THROUGH A COMPILATION AND COMPARISON OF AVAILABLE REGIONAL AND GLOBAL KNOWLEDGE OVER THE LAST 50 YEARS IN PREVENTION-ORIENTED RISK MANAGEMENT, IT IS HOPED THAT SCIENTIFIC RESEARCHERS MAY IDENTIFY NEW FUTURE DIRECTIONS FOR RESEARCH WHICH ARE BETTER ALIGNED WITH INDUSTRY NEEDS. AT THE SAME TIME, THE INDUSTRY STAKEHOLDERS MAY BENEFIT FROM SUMMARIZED INSIGHTS OF LEADING SCIENTIFIC WORK GUIDING THE POLICIES OF NEAR FUTURE AND ENCOURAGING A MORE INFORMED DIALOGUE WITH SCIENTISTS IN ORDER TO MAKE MODELS MORE USEFUL IN THE REAL WORLD.*

This policy brief summarizes the key highlights from the journal article: “Preventing shipping accidents: Past, present, and future of waterway risk management with Baltic Sea focus” by Ketki Kulkarni, Floris Goerlandt, Jie Li, Osiris Valdez Banda, and Pentti Kujala and from the BONUS BALTIMARI workshop: “From Research to Practice”, described here by Tuuli Parviainen: <https://blogs.helsinki.fi/fem-feature/2020/01/13/insights-from-the-bonus-baltimari-from-research-to-practice-workshop/>. For sources, citations and more detailed analysis, please visit: <https://www.aalto.fi/en/departement-of-mechanical-engineering/bonus-baltimari> or email us at [Ketki.kulkarni@aalto.fi](mailto:Ketki.kulkarni@aalto.fi). This work was supported by the BONUS BALTIMARI project. The project has received funding from BONUS (Art. 185), funded jointly by the EU and the Swedish Research Council Formas, the Polish National Center for Research and Development, and the Estonian Research Council.