

KAMON

Kara-Arctic Monitoring and Operation Planning Platform



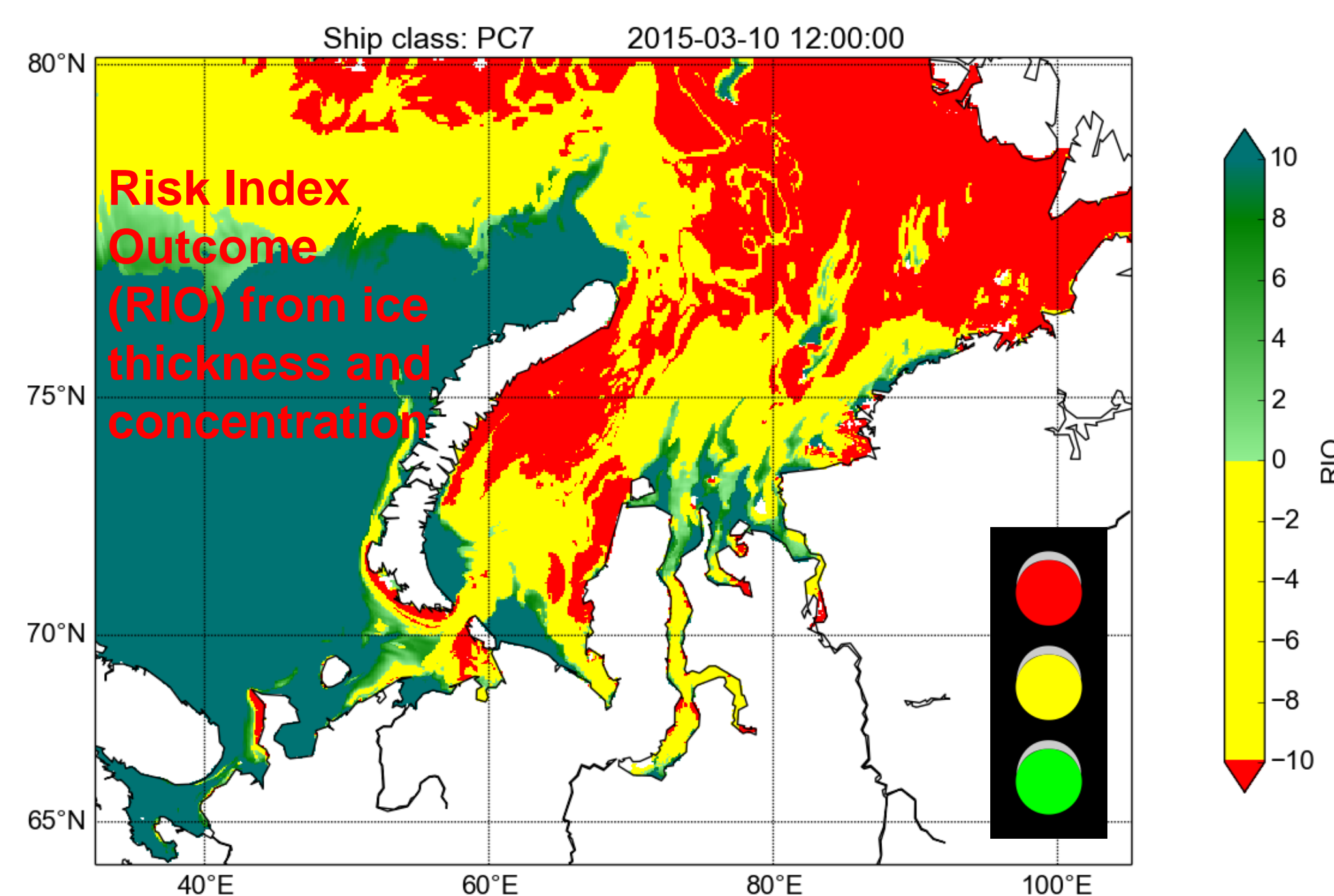
Mikko Lensu, Andrea Gierisch, Petteri Uotila, Markku Similä, Jukka-Pekka Jalkanen
Jukka Tuhkuri, Pentti Kujala, Arttu Polojärvi, Li Fang, Lauri Kuuliala, Hanyang Gong

ARCTIC
KARA
MONITORING
OPERATION
PLANNING
PLATFORM

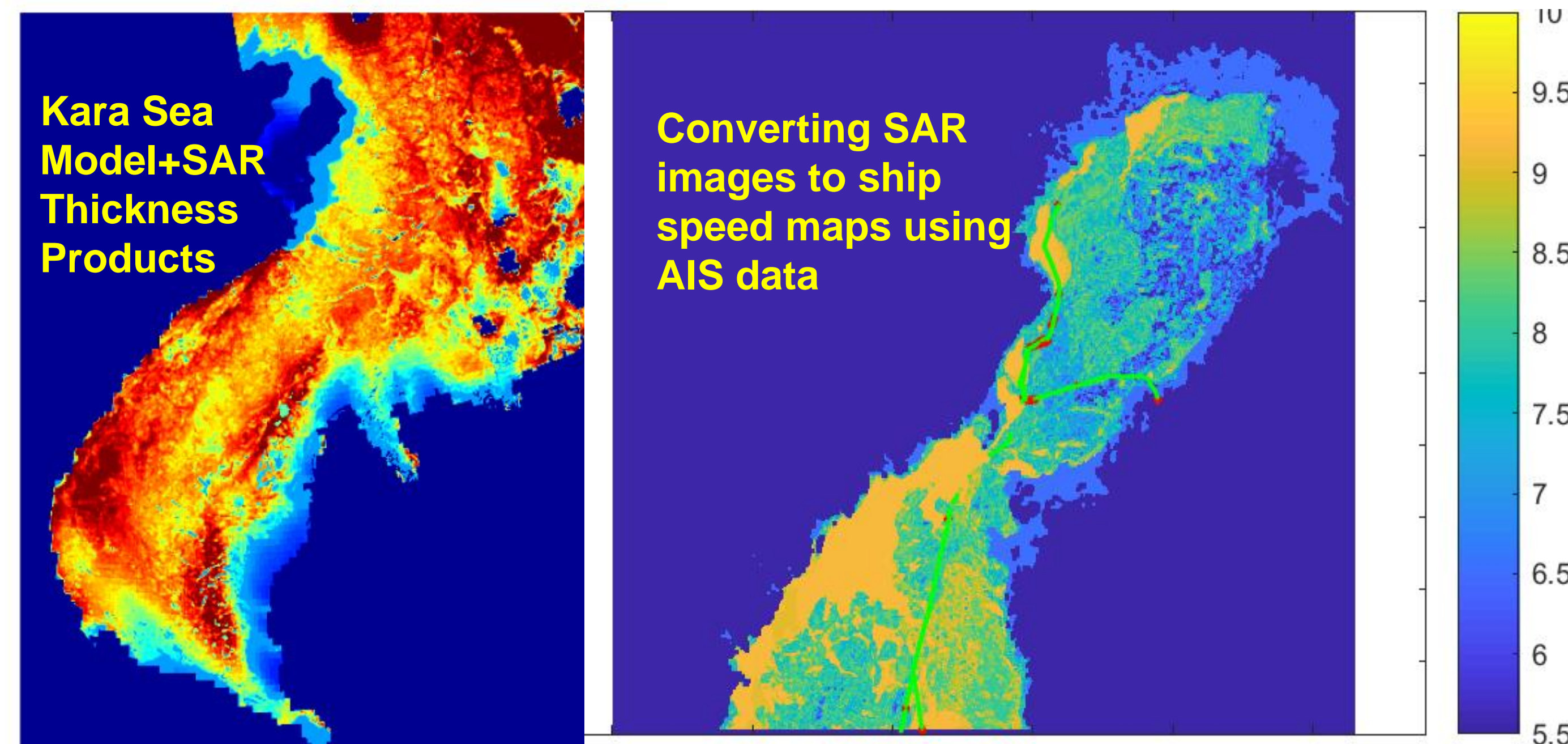
New services for ice covered Arctic seas
Special focus on Kara Sea
Monitoring of ship emissions and environment
Real time information for ships and offshore
Short and long range tools for all Arctic actors
Ice information + ship traffic + application tools

Finnish Meteorological Institute
Aalto University, Department of Applied Mechanics

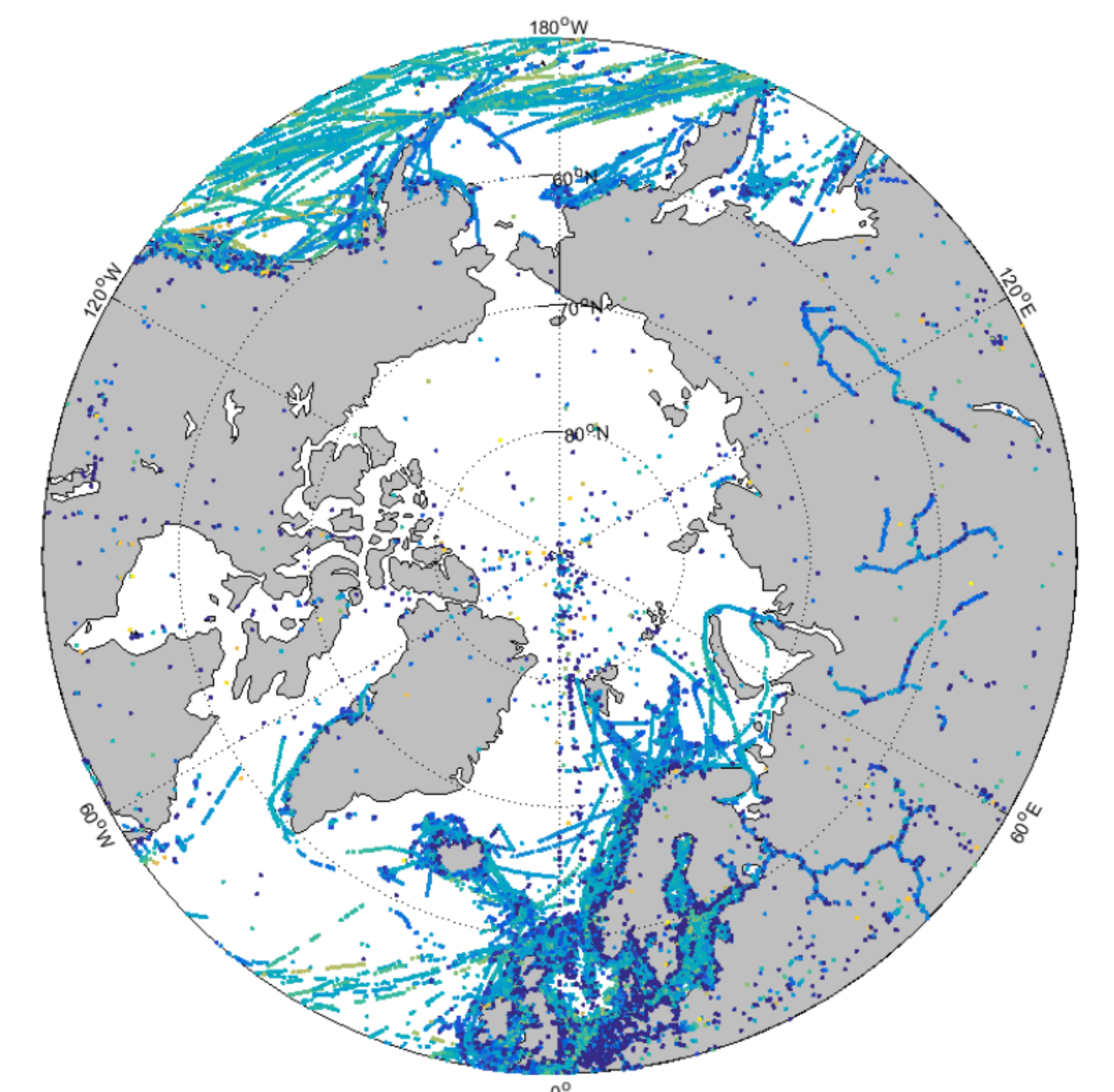
KAMON platform serves the Arctic community by integrating ice conditions from ice models and satellites with ship response to the ice conditions



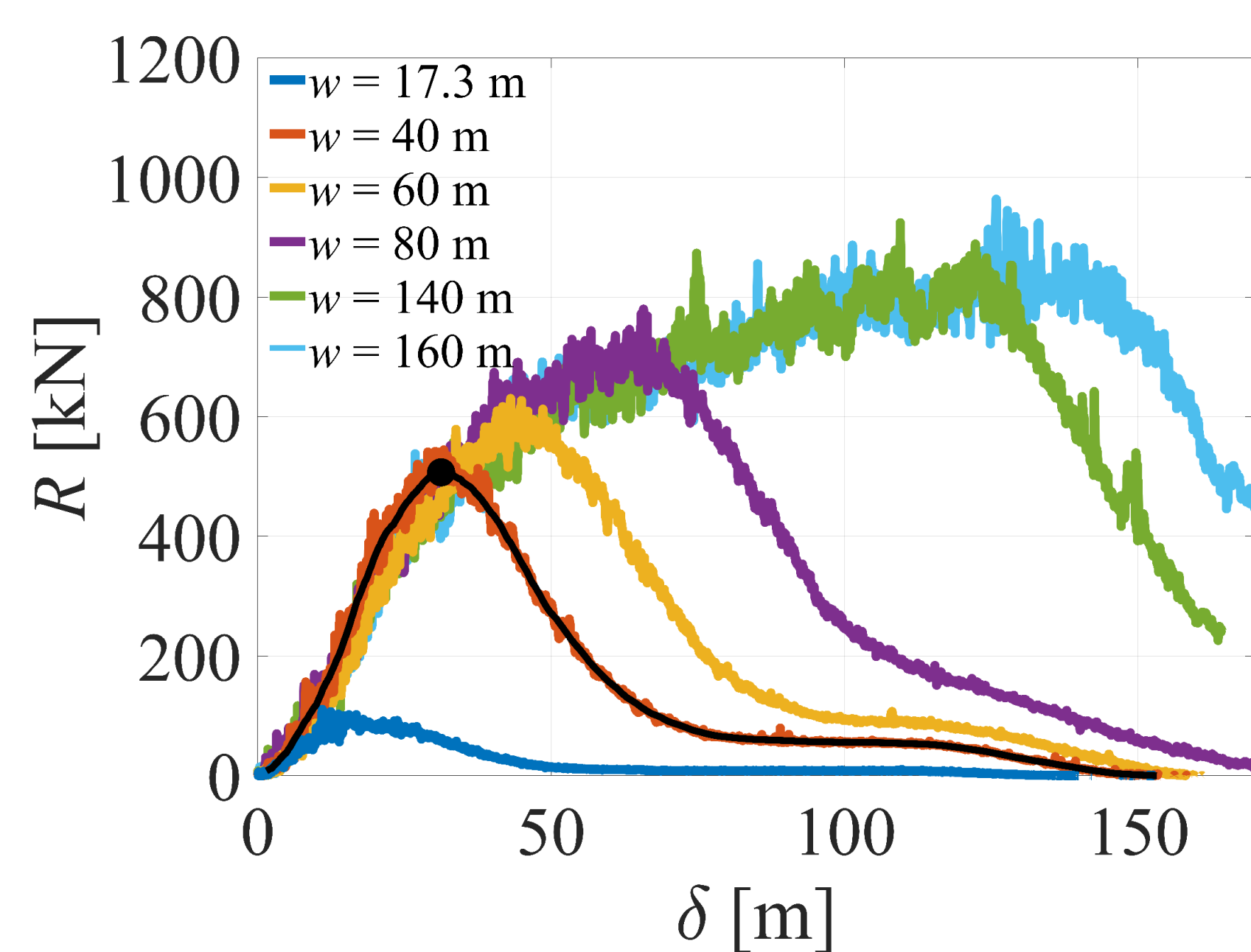
Fine resolution ice-ocean modelling of Kara-Barents sea and converting the results to forecast of ship specific navigability.



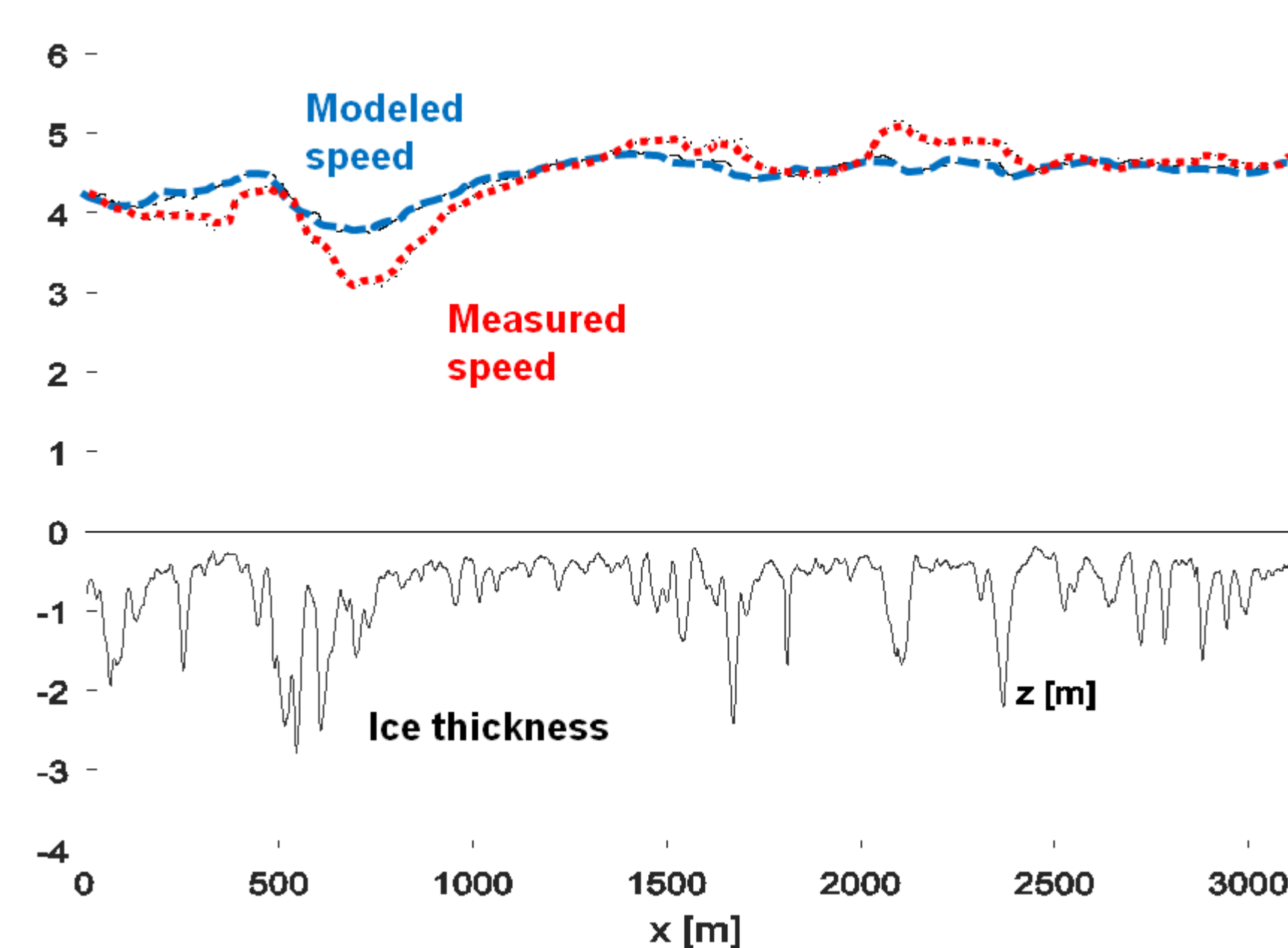
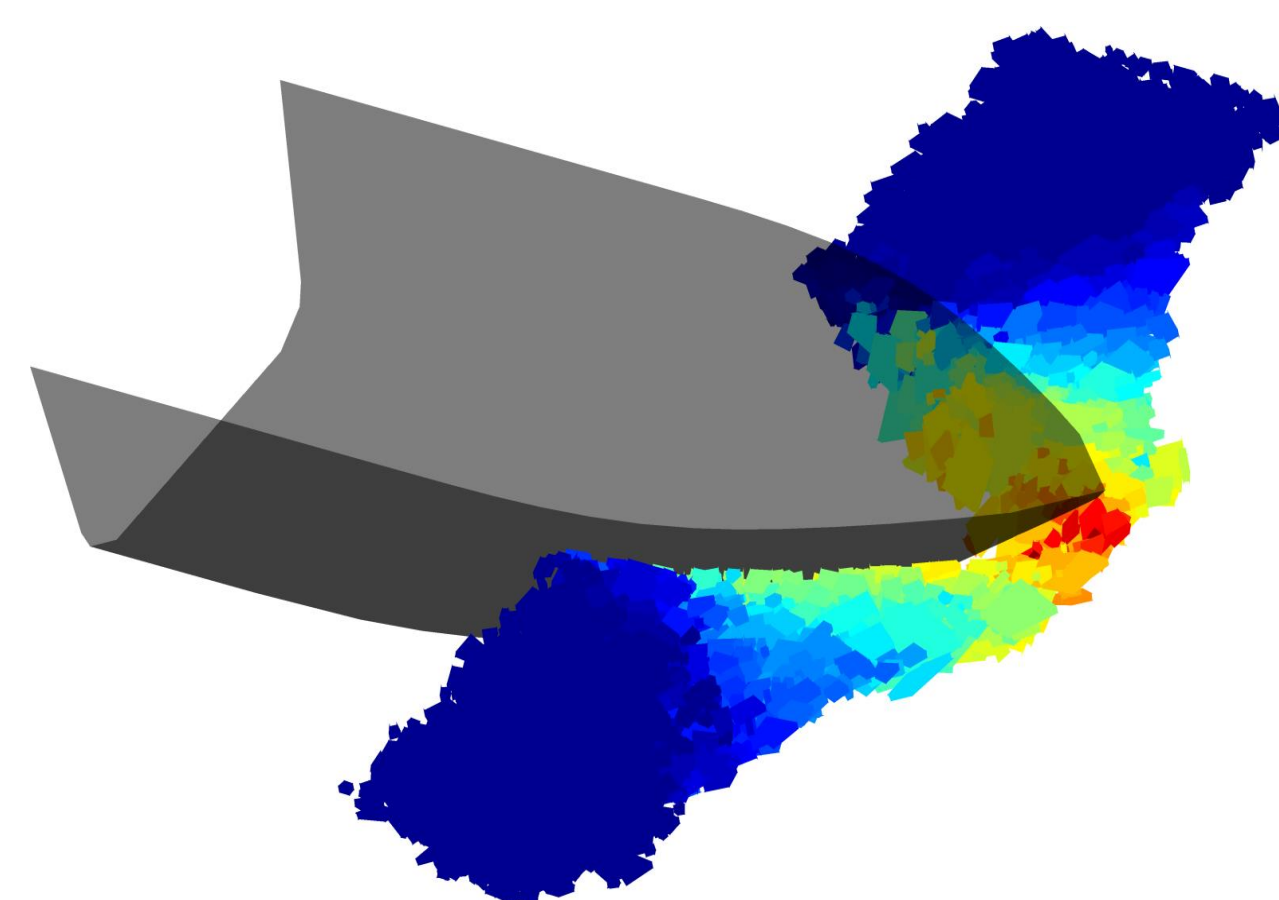
Combining thickness data from the ice model and satellite thickness data. Converting of SAR images to speed maps using observed ship response. Transfer of Baltic knowhow to the Arctic.



Global AIS data: speeds and locations of all navigating vessels intergrated with the ice information



Modelling of ship interaction with ice ridges with FEM/DEM numerical simulations and ice tank experiments



Modelling of ice resistance and ship ice transit speed in ridged ice types

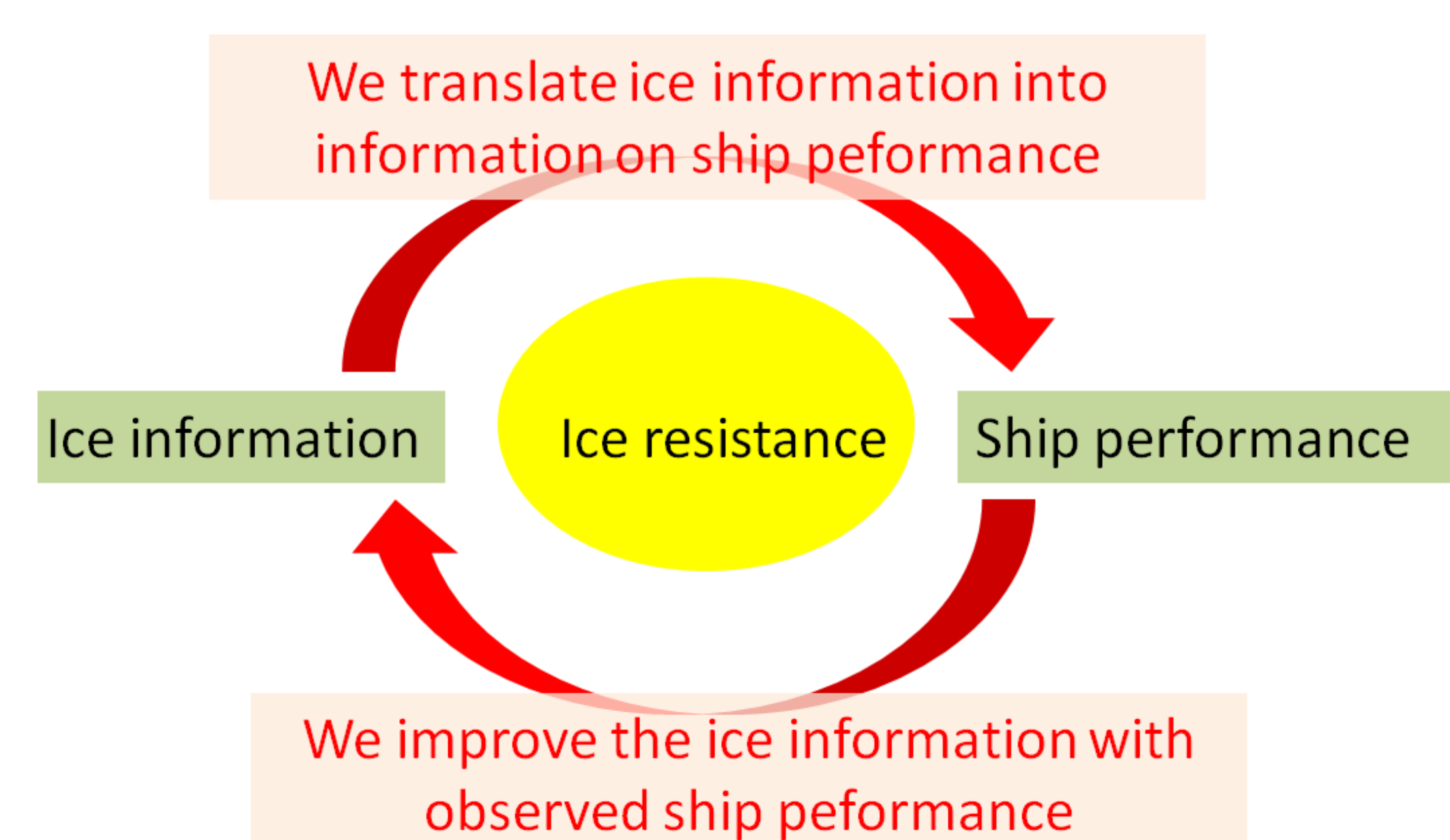


Modelling the increase of ship emissions with the increasing ice resistance

Feedback loop:

Ship speed forecasts are generated from ice information using ice resistance modelling.

Observed speed response of ships validates and improves the ice information and the ship ice resistance models.



The Platform concept:

1) We provide the ice information also as application oriented products like ship type specific performance, ice resistance and emission maps

2) We demonstrate application tools for route optimisation, operation planning, oil spill combatting, and environmental monitoring

Economic and societal impact:

1. New services benefit all Arctic actors and provide new possibilities for Finnish enterprises
2. Increased safety and predictability of Arctic shipping and offshore operations
3. Provides foundation for Arctic environmental monitoring and international Arctic policy making