

LEVERAGING DIGITAL TWIN OPPORTUNITIES FOR KEY SEA-ICE IMPACT SECTORS IN THE NORDIC AND BALTIC CONTEXT

NOrdic CryOSphere Digital Twin – NOCOS DT

Project duration: 2022–2024

Explore and pilot the digital twin technology opportunities and showcase how output from key initiatives such as the Destination Earth (DestinE) Climate Adaptation Digital Twin (Climate DT) could be leveraged for key sea ice impact sectors in the Nordic and Baltic context.

In the longer term, deliver a major Arctic and Baltic contribution to the climate change information system developed by Climate DT, with cryosphere-related use cases at the interface between science and policy, in line with the overarching Destination Earth approach.

Supporting a common vision in the Nordics

Part of a shared Vision 2030, the Nordic prime ministers declared that the Nordic Region will become the most sustainable and integrated region in the world. The action plan for 2021–2024 defines 12 key areas in achieving the objective, including:

- Research and development of solutions that support climate adaptation and carbon neutrality across various impact sectors
- International cooperation on climate and environmental challenges, promoting Nordic green solutions
- Fostering knowledge, innovation, digitalization and education in a cooperative manner in the Nordic countries

The NOCOS DT project, funded by the Nordic Council of Ministers, aims to contribute to these focus areas, and as such, also be part of the Nordic activities for the United Nations' Decade of Ocean Science for Sustainable Development (2021–2030).

Contribution to Destination Earth

Strengthening Nordic cooperation to ensure sustainability in the region is closely connected to bringing forward new opportunities supported by emerging European efforts such as Destination Earth. Focusing on different impact sectors for sea ice modelling, NOCOS DT addresses a series of application areas, building on previous modelling activities, products and data and optimising approaches for integration with Destination Earth and Climate DT.

Objectives

- Leverage the Climate Digital Twin outputs for piloting new climate information related products impacting sectors such as navigability, engineering and vessel design, fishing and shipping, renewable energy sectors
- Provide improved modelling and data quality for research of Arctic and Baltic climate change
- In alignment with the Green Deal objectives, support sea ice related data-driven research and support adaptation policies
- Engage stakeholders to ensure alignment, especially with the scientific and disciplinary community, standards and best practices

Impact

Broader societal and economic impact that spans from tools for more effective policy-making to improved innovation capabilities of various impact sectors and higher societal ability to adapt to the effects of climate change.

Key outputs

- Improved modelling of sea ice breakup into drift ice and its dynamics using exascale computing facilities
- Advanced code including novel ways to calculate navigation risk indicators, landfast ice, ridged ice and marginal ice zones, a toolkit for marine spatial planning by leveraging Climate DT developments
- Common framework gathering the specifications on input data and information, data management and modelling methodologies, key technical requirements across the applications, as well as an analysis of the output data and services developed and necessary interfaces
- Enhanced quality calculations, statistics and indexes, output data, maps and other visualisations building on new modelling approaches, novel calculation methods and the use of the Climate DT data

Funding



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Partners

