DestinE Use Case - DESIDE

Provider name: Polar View

Use Case topic: Decision Support for Polar Voyage Planning and Policy Development

Scale of the Use Case *(Global/Regional/Nationa*l*)*: Polar oceans with a focus on the European Arctic.

Policy addressed:

* Regulatory Compliance: Deliver short and medium-term forecasts of ice, meteorological, and ocean conditions, meeting the requirements of the IMO Polar Code.
* Climate Change Effects: Provide long-term forecasts on changing ice and other conditions, enabling planning and policy development for the fishing, tourism, research, and oil and gas industries.

Data Sources used:

Historical, current, and forecast data will be obtained through the DestinE core Service Platform (DESP) from:

* Copernicus services,
* Copernicus Data Space Ecosystem,
* Climate Adaptation Digital Twin, and
* Weather-Induced Extremes Digital Twin.

# Challenge

*Please describe the context and challenge addressed by the Use Case in 2 – 3 paragraphs*

The Use Case will demonstrate the added value of the DestinE system in supporting policy and decision making at three levels within the context of polar operations:

* Execution support: supporting ships needing to avoid or navigate through sea ice.
* Planning support: supporting ship operators in planning for polar voyages, guided by the information requirements of the IMO Polar Code.
* Strategy and policy support: supporting organizations and policy analysts wanting to assess the impact of climate change on future decisions regarding polar operations.

A person sitting on a boat with a computer

Description automatically generated

# Solution

*Please describe the solution and challenge addressed by the Use Case in 2 – 3 paragraphs. If possible, add pictures of graphics.*

Information to support different types of decisions will be generated through the following workflow:

1. Data Ingestion: Collect past, current, and forecasted information on sea ice, snow thickness, icebergs, ocean currents and waves, wind, temperature, visibility, and Sentinel 1 imagery from DESP/DestinE.
2. Data Processing, Modeling, and Analysis: Use models, machine learning, and algorithms to process data for different user communities.
3. Information Product Generation: Create short, medium, and long-term sea ice charts, risk profiles, and route optimization suggestions for better decision-making.

Decision support will be provided in three ways to meet different needs and levels of sophistication of user groups:

* IcySea: Tactical decision support for ships operating in polar regions.
* Polar Dashboard: Strategic decision support for policy analysts and residents.
* Polar TEP: Research collaboration platform for private, academic, and public sectors.

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Description automatically generated with medium confidence

A screenshot of a computer

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# Impact

*What is the expected impact for users? What is the expected impact in the long-term? How will it help to address the challenge you described? Please describe in 2-3 paragraphs.*

Benefits to Polar Operations and Society:

* Increased Safety: Accurate information supports strategic and tactical decision-making, enhancing safety of life and property.
* Pollution Reduction: Efficient route optimization minimizes fuel consumption and emissions.
* Protection of Sensitive Environmental Areas: Better forecasts can help policymakers protect environmentally sensitive areas affected by changing polar conditions.