MarSat

Satellitengestützte Dienste für die maritime Wirtschaft

MARSAT
Satellite services and geospatial infrastructures for maritime industry

Knut Hartmann, MARSAT coordinator

2018-06-06

Gefördert durch:

Bundesministerium für Wirtschaft und Energie

EOMAP 7Cs SevenCs Drift & Noise Polar Services ISL TRENZAG

Maritime Industry

Relevance in Germany:

70 Mrd € turnover

400,000 jobs

Topics:

Safe Navigation

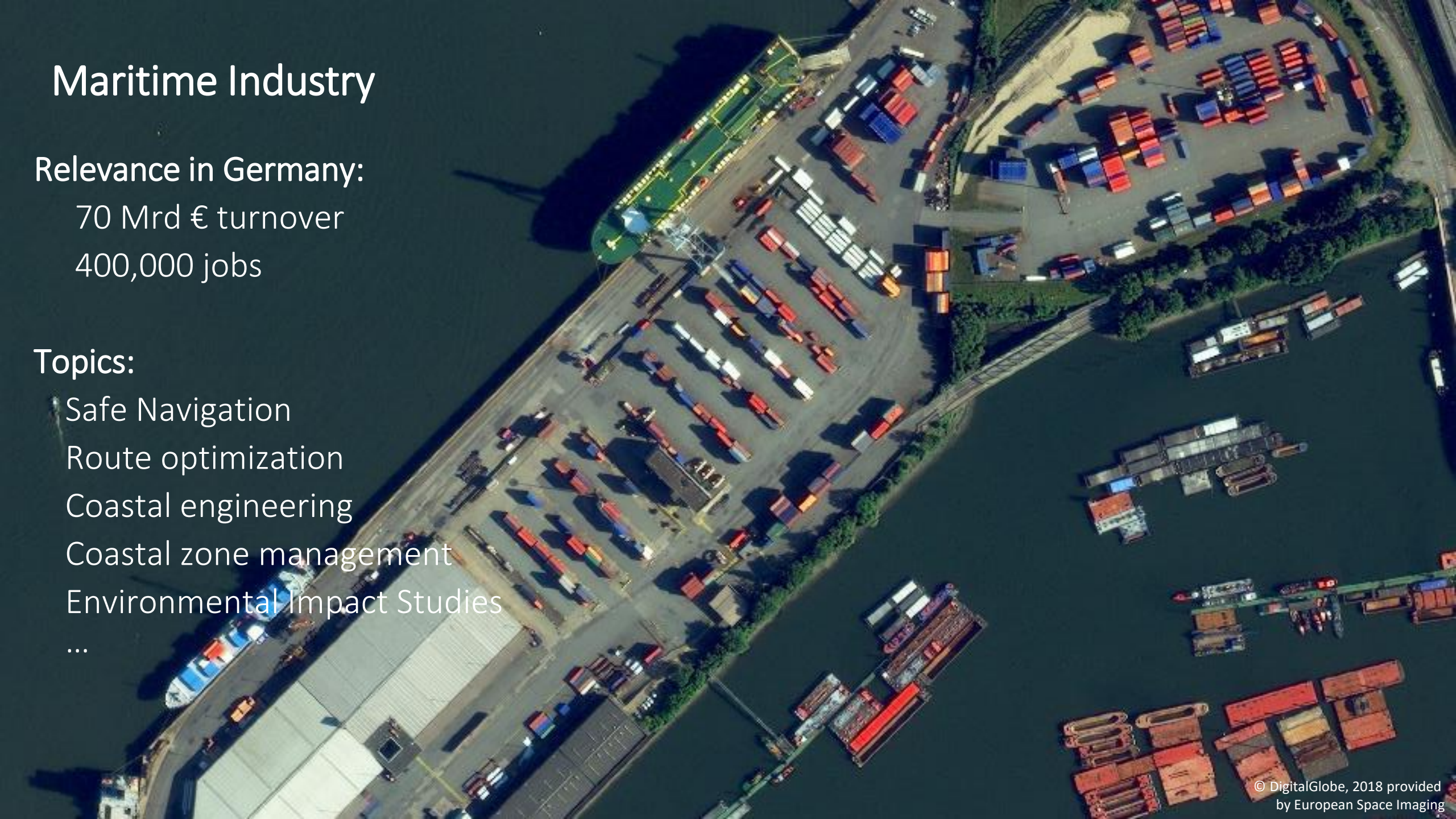
Route optimization

Coastal engineering

Coastal zone management

Environmental Impact Studies

…



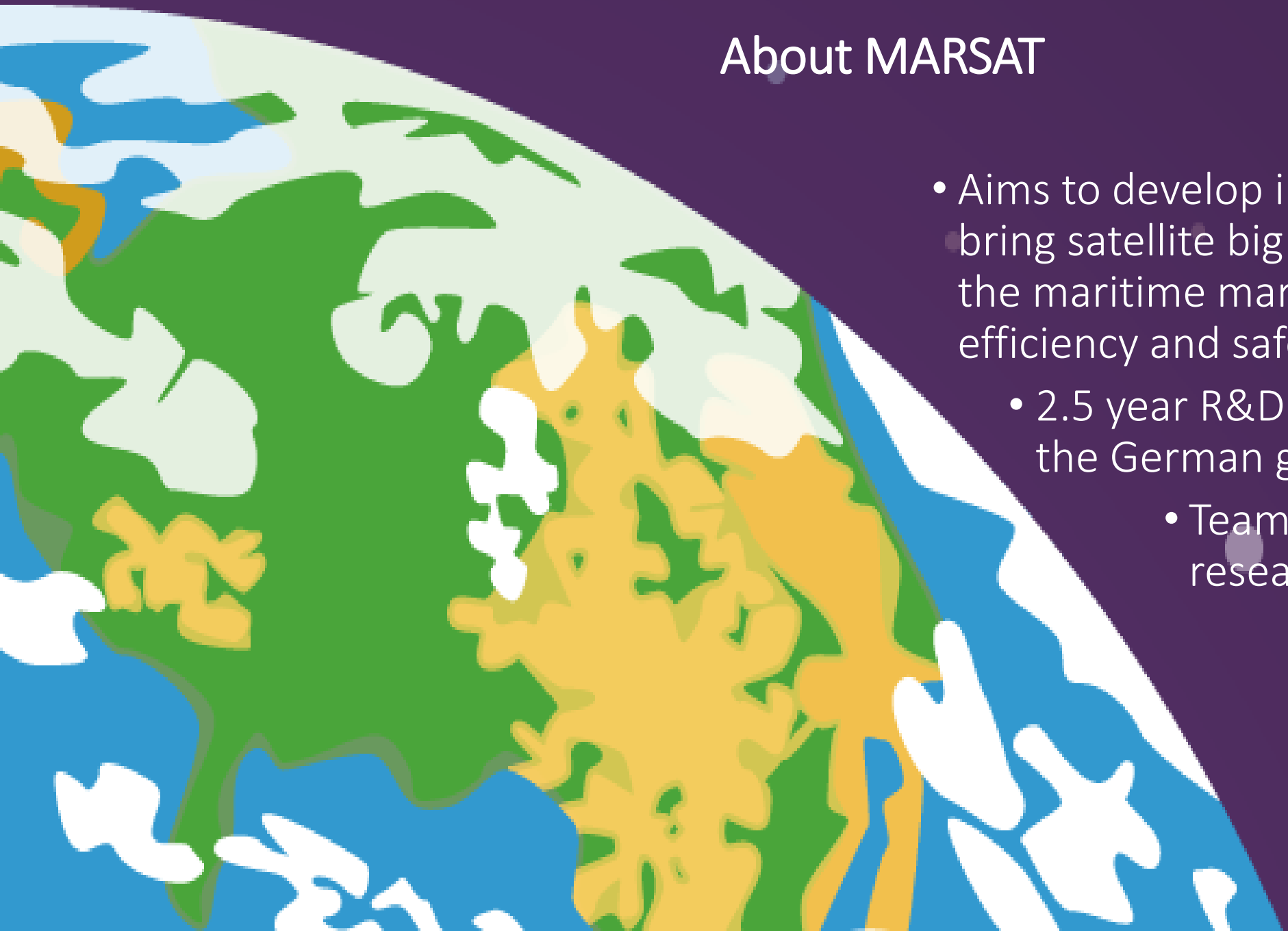
© DigitalGlobe, 2018 provided by European Space Imaging

Challenge

- Maritime industry aims to get more effective (costs, time and risks)
- Industry 4.0 concepts are becoming more and more relevant

→ Access digital data and operational information flows for decision making and management

- Satellite sensors, data and derived information are significantly increasing over the last years and in future – Era of Earth Observation –
- Value added information are relevant to the maritime industry bur require integration into user's workflows.

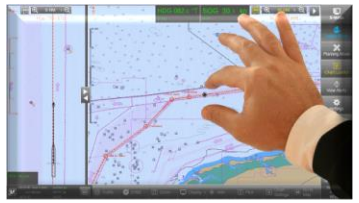


About MARSAT

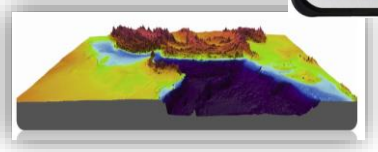
- Aims to develop innovative solutions to bring satellite big data and value adds to the maritime market to increase efficiency and safety of navigation
  - 2.5 year R&D project co-funded by the German government
    - Teaming of 4 SME’s and 1 research organisation

MARSAT‘s partner & network

- Maritime solution providers & integrators



- EO satellite data & service providers



Gefördert durch:
Bundesministerium für Wirtschaft und Energie

About MARSAT

- **Applications & Economical suitability**
  - **Integration** into user environments
    - Information access, harmonization
      - Distributed IT and data platforms

- Range of relevant space **EO products and services**
  - EO data and product access
    - Value adding processes: Automation and cost reductions

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

MARSAT approach

EO-Ressourcen

Supplementary data
e.g. AIS, models,
3rd party services

Application
Integration

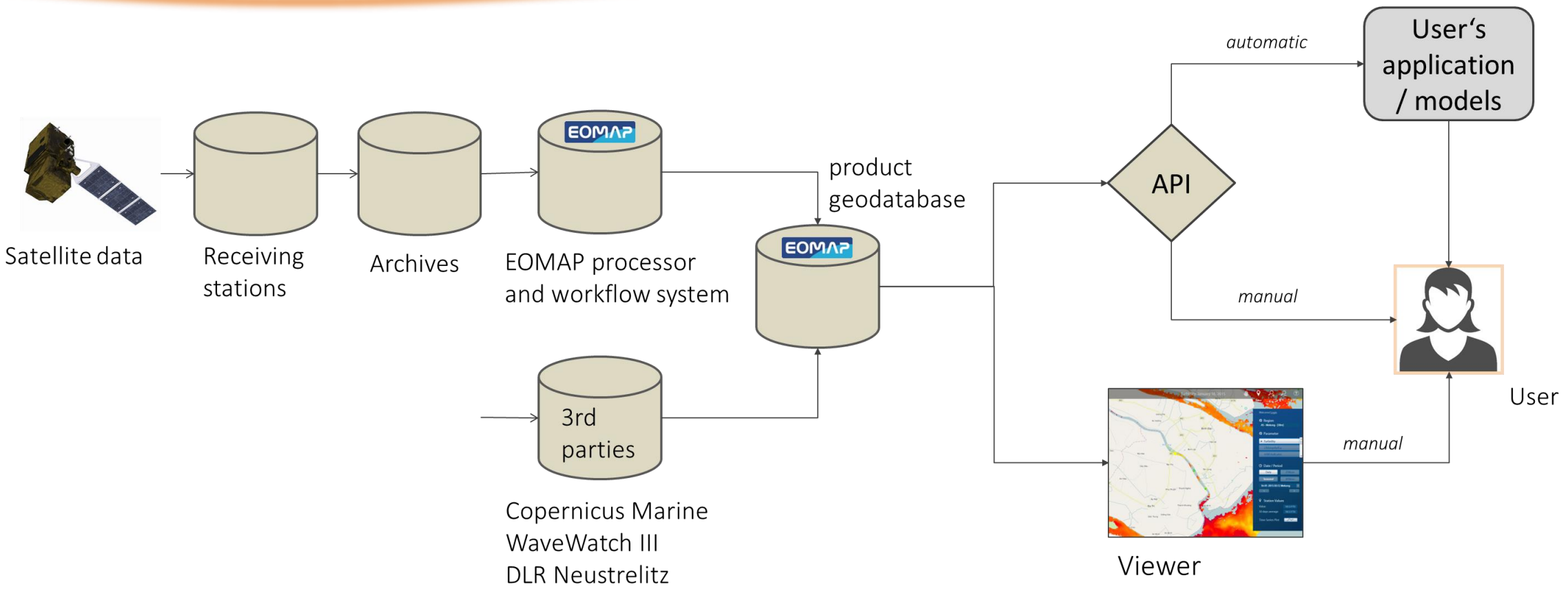
Interfaces
Distributed IT infrastructures & data

Value adding processes

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Use Case
Identification of floating objects

Data and information flow



Recording | Value Adding | Storage | Access | Application

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Identification of floating objects

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Identification of floating objects

Simulation of potential drift
based on wind and current data…

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Identification of floating objects

… about 10,000 iterations…

Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

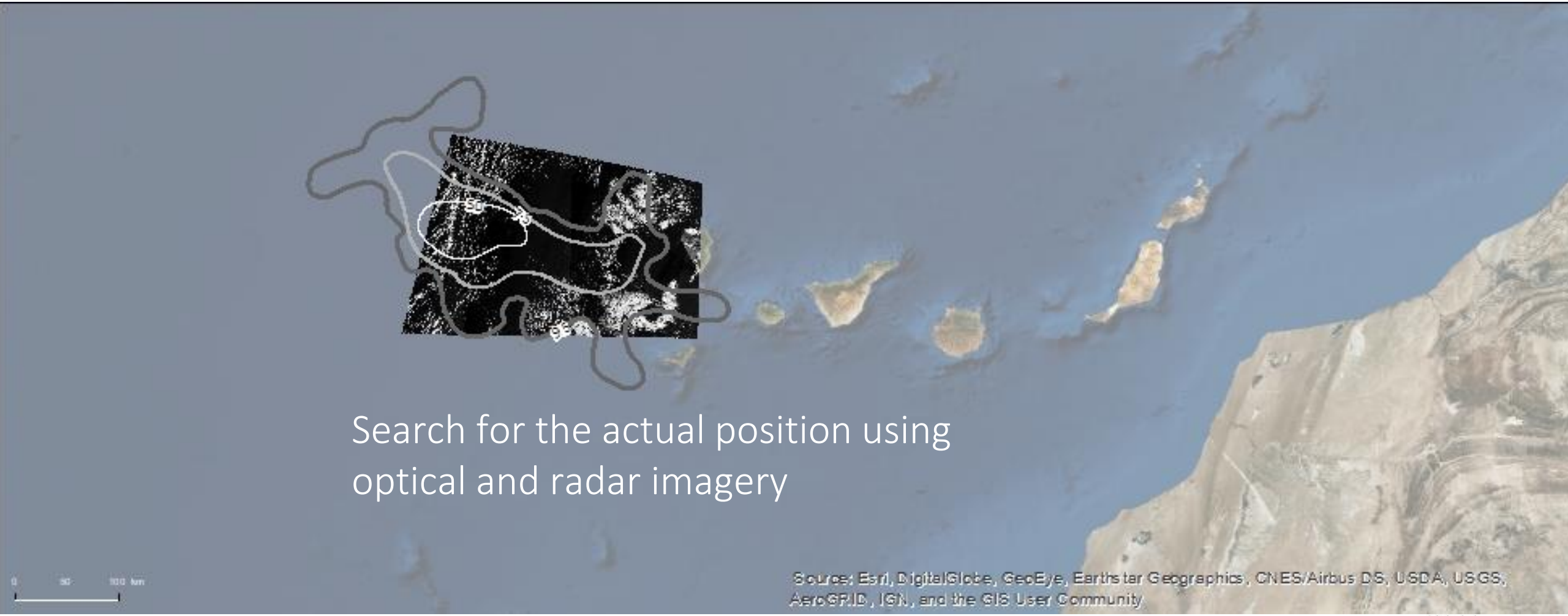
Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Identification of floating objects

Identification of the likelihood of
the occurance 3 weeks after the recording

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

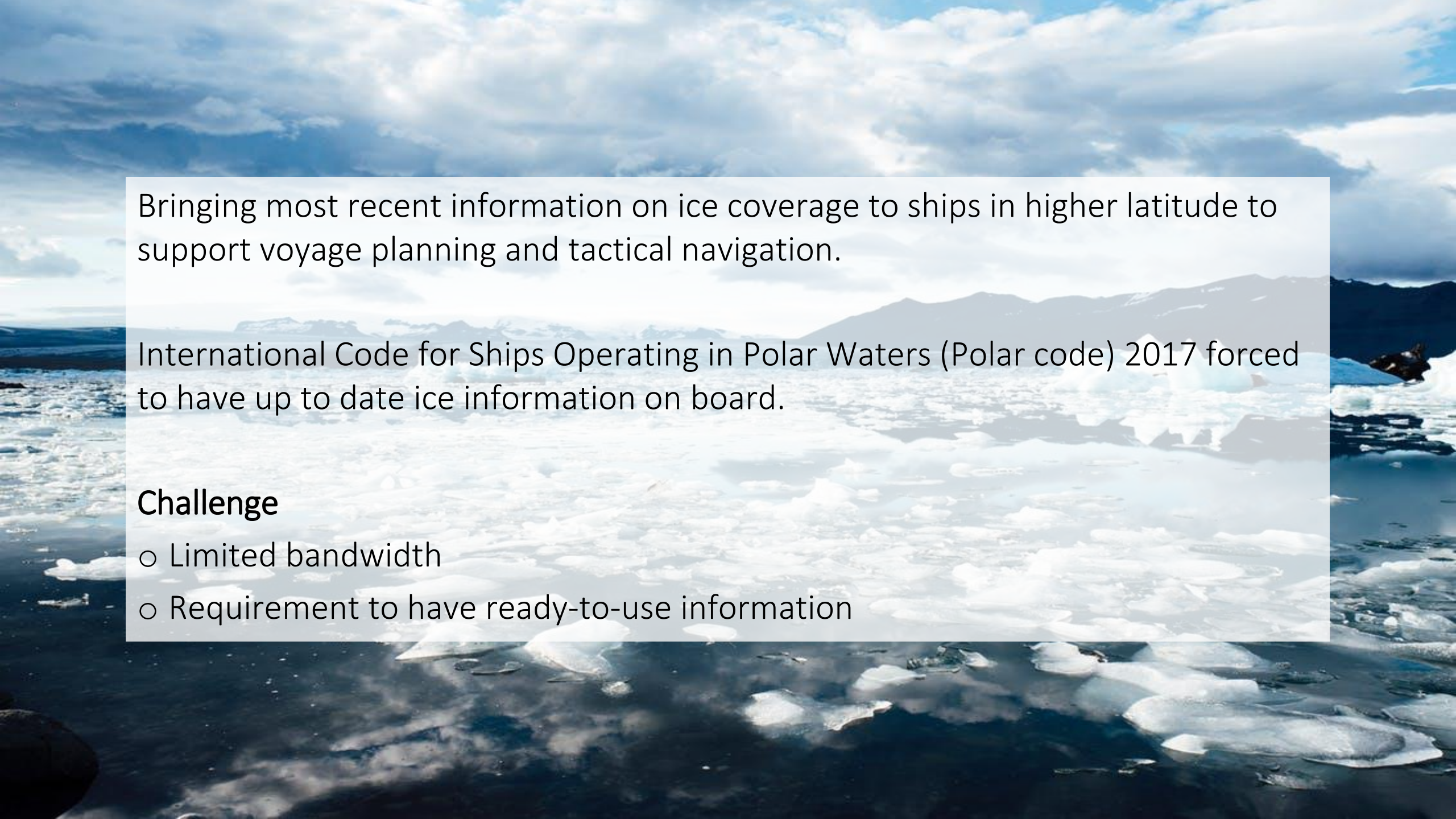
Identification of floating objects



Search for the actual position using optical and radar imagery

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Use Case
Navigation in higher latitudes



Bringing most recent information on ice coverage to ships in higher latitude to support voyage planning and tactical navigation.

International Code for Ships Operating in Polar Waters (Polar code) 2017 forced to have up to date ice information on board.

Challenge

- Limited bandwidth
- Requirement to have ready-to-use information

Navigation in higher latitudes: Ice

AIS
signal

Luxspace

request position

DNPS
EOMAP

request **satellite data**

ESA, NASA

Commercial
providers

request **models**

Models

Download of selected data

Operational request of metadata

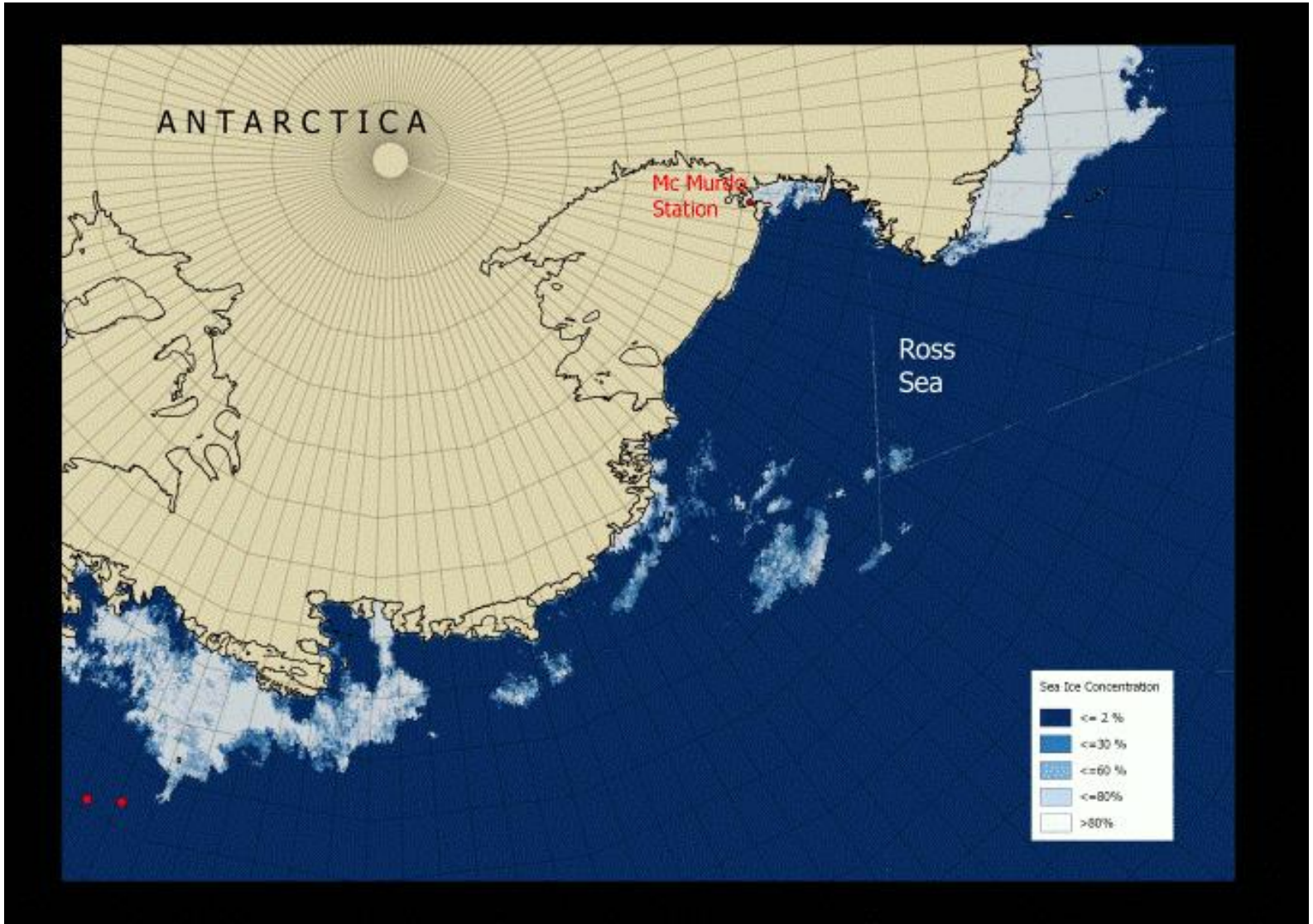
ICE
PAD

TRENZ

Icon by freepic

Gefördert durch:
Bundesministerium für Wirtschaft und Energie

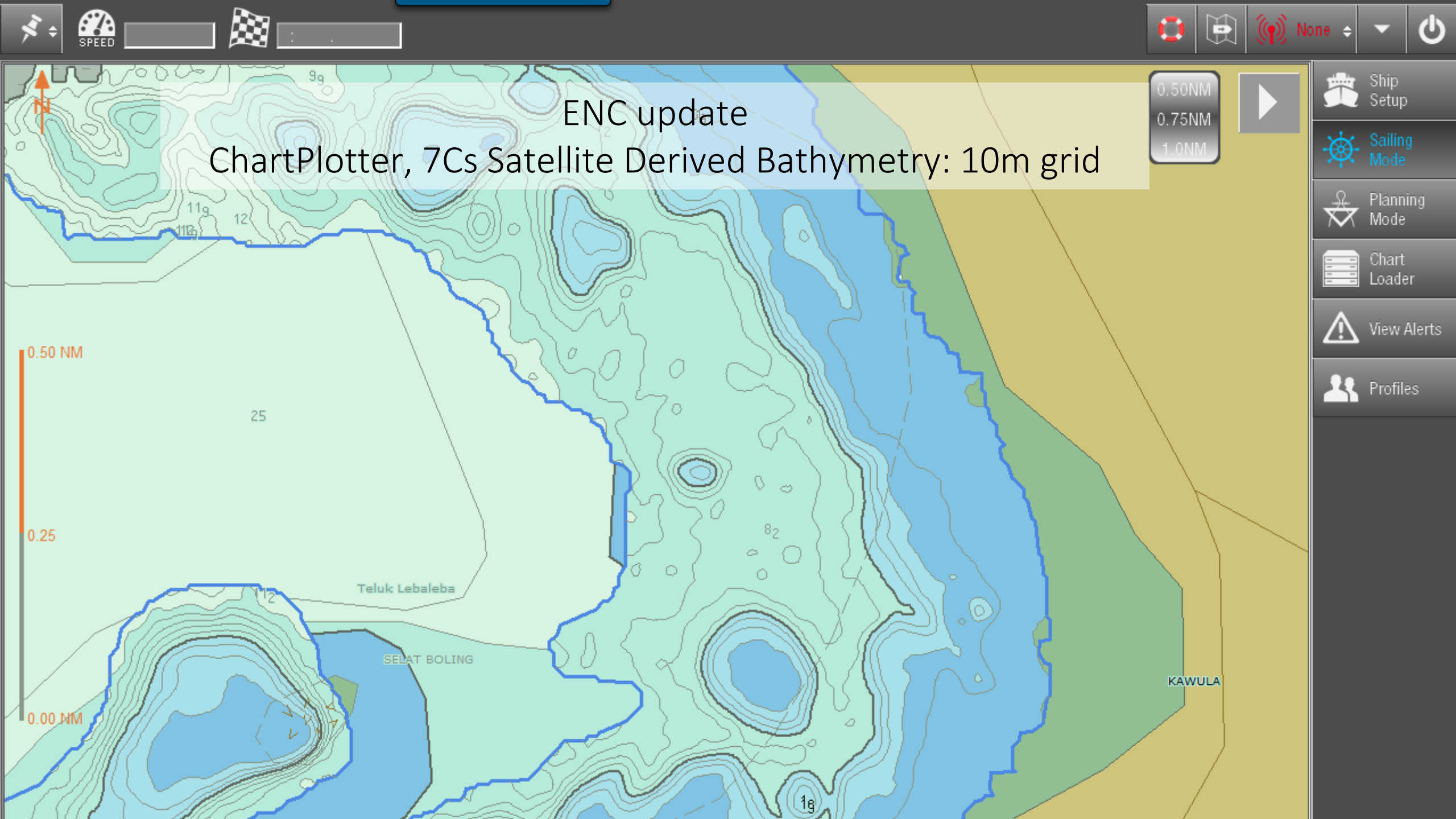
Navigation in higher latitudes: Ice



© Drift&Noise

Use Case
Satellite Derived Bathymetry for bENCs

SPEED
None
0.50NM
0.75NM
1.0NM
Ship Setup
Sailing Mode
Planning Mode
Chart Loader
View Alerts
Profiles
Edition 5, Update 2, Issues Date 20160310 ENC, Indonesia, Pulau L.
Improving bathymetric data for poorly surveyed areas
0.50 NM
0.25
0.00 NM
Teluk Lebaleba
SELAT BOLING
KAWULA


SPEED
None
ENC update
ChartPlotter, 7Cs Satellite Derived Bathymetry: 10m grid
0.50NM
0.75NM
1.0NM
Ship Setup
Sailing Mode
Planning Mode
Chart Loader
View Alerts
Profiles
0.50 NM
0.25
0.00 NM
Teluk Lebaleba
SELAT BOLING
KAWULA

Satellite Derived Bathymetry for bENCs

9	Bathymetry 5069331938	freshENC: Ready to use Electronical Nautical Charts (ENCs) based on Satellite Derived Bathymetry	Shipping Companies and Hydrographic Offices	EOMAP GmbH & Co. KG, ChartWorld, SevenCs	Germany

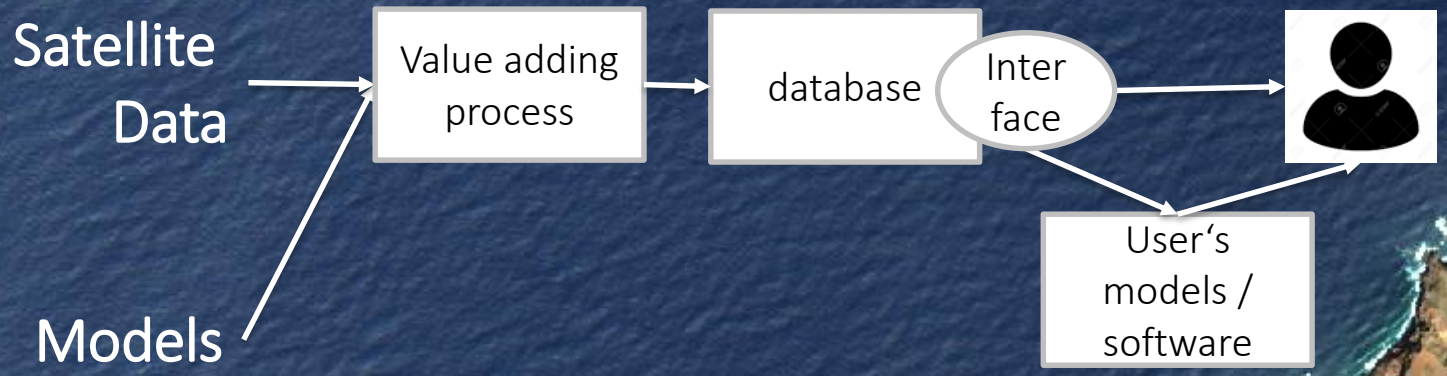
Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Use Case
Innovative seastate data

Innovative seastate data

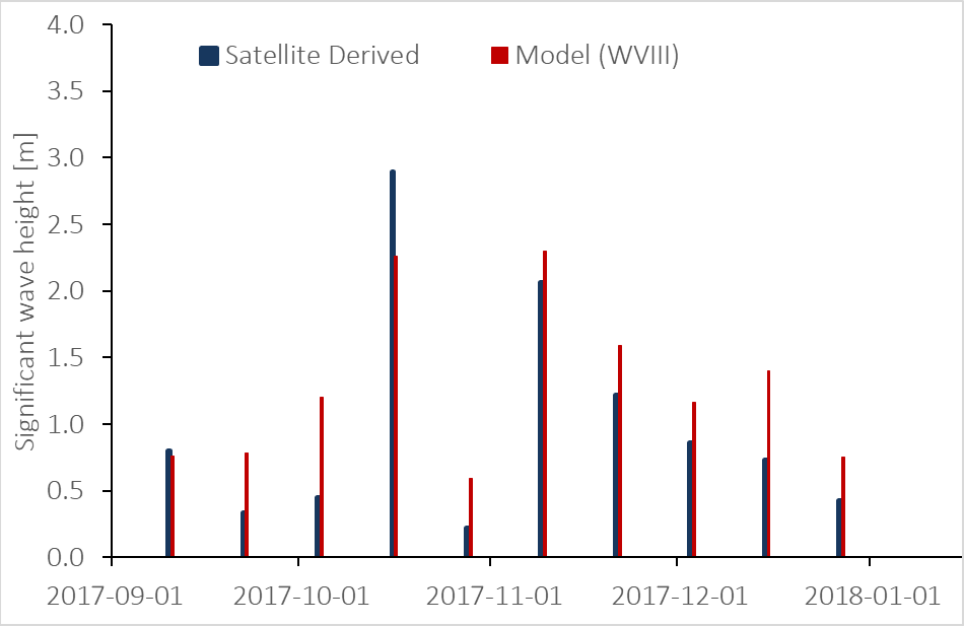
- High resolution nearshore hindcast information on wave and wind using satellite data (optical and radar) in combination with seastate models

→'Measured' information on wave (and wind) statistics for coastal areas worldwide → Rapid site characterization and data source to improve local hydrodynamic models



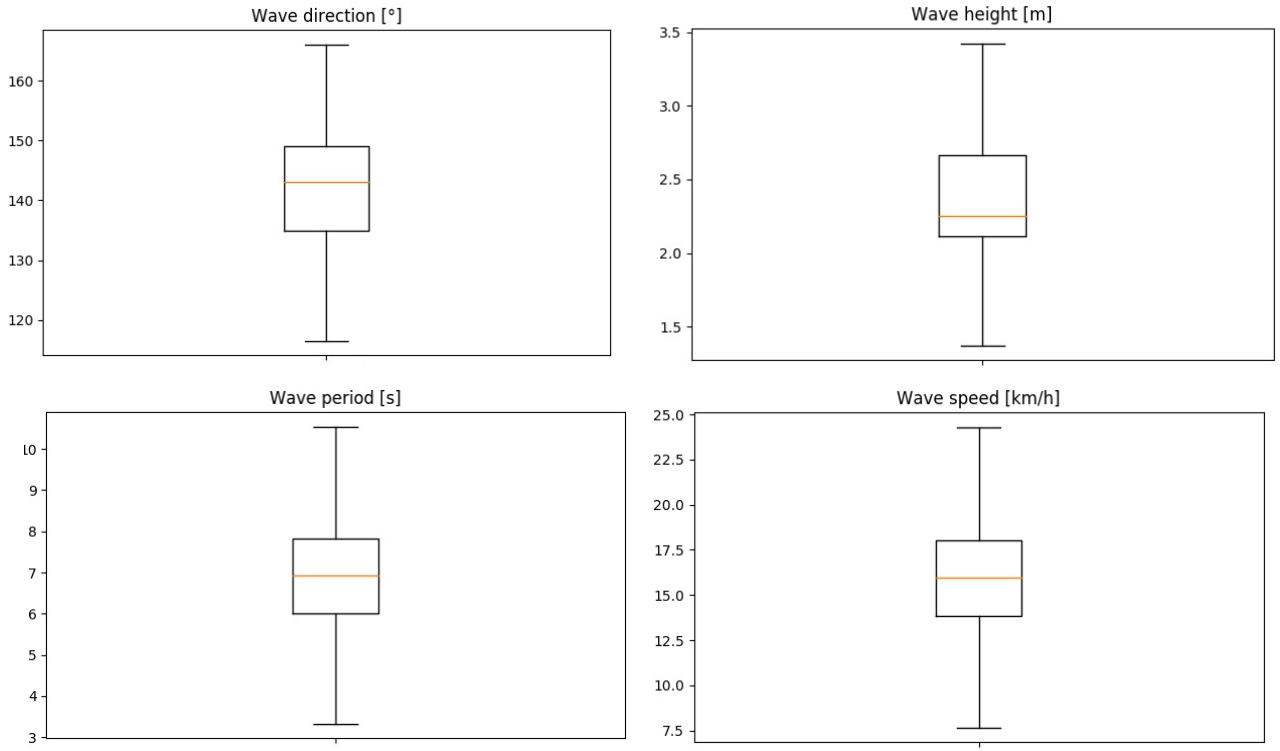
Innovative seastate data

Time Series



© DLR, 2018

Coastal seastate statistics



Gefördert durch:
Bundesministerium für Wirtschaft und Energie

Summary

MARSAT

- developed new ways to make use of modern satellite capabilities in the maritime industry
- created new information to support maritime industry
- Integrated information and data flows in user‘s workflows/applications

Get engaged and be part of it, visit
https://marsat-project.org

Next MARSAT user workshop
6th Sept. 2018 2pm, SMM show, Hamburg, DE