NANOK

- Nautical Navigations Operational Knowledge

ICE-PPR presentation, April 2021

Invitation to interaction

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DHI GRAS**

We have worked with satellite imagery for 20 years..

- Part of the DHI group (1100 employees, +30 offices). Originally a spin-off from University of Copenhagen, founded in year 2000

- Specialized in EO imagery analysis, often coastal and marine environments. Use machine learning, AI, software development to automate data processing

- We work within industrial R&D and consultancy in close collaboration with public and private partners and draw upon a diverse international project portfolio

- Official reseller of satellite imagery and provider of satellite image analysis

- Leading remote sensing company in Denmark

Global experience: A selection of our partners and clients since the start of our company in 2000

esa · AIRBUS DEFENCE & SPACE · Vestas · Microsoft · MÆRSK · NASA

RAMBØLL · THE WORLD BANK · DigitalGlobe · THE VELUX FOUNDATIONS · Femern Sund&Bælt · VERDENS SKOVE

ADB · UNEP · IFAD · Ramsar · GLOBAL PARTNERSHIP

European Environment Agency · Innovation Fund Denmark · Danish Ministry of Energy, Utilities and Climate · DTU Danmarks Tekniske Universitet · Ministry of Environment and Food of Denmark

DHI GRAS – main Arctic activities

Marine applications

- Submerged Navigational hazards
- Object detection
- Bathymetry of shallow water
- Ice and iceberg mapping
- Sea surface temperature
- Met-ocean modelling and forecasting
- EIA and habitat modelling

Base mapping

- Digital Elevation Models
- Topographic mapping – coastlines, lakes, streams dynamics, vegetation,
- Glaciers, snow cover
- Natural resources (mineral exploration, hydro power)

Data supplier

- Data broker and imagery sourcing advisory service
- Reseller of optical/ SAR data from all major satellite image providers

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NANOK Background

"*A major difficulty with the paper charts available for **Greenland waters is the incorrect positioning of the coastline** in the geographic net in the charts. In general, charts of the **northern and eastern Greenland coastlines are misplaced by 0-5,000 meters**, and in some areas of the extreme northeast Greenland even more. Charts of the **West Greenland coastlines are misplaced by 0-1,000 metres**.*"
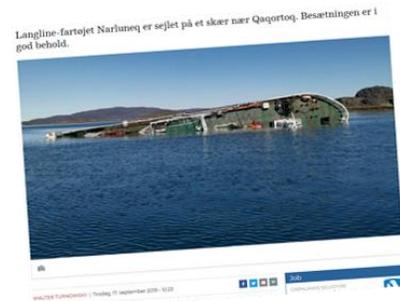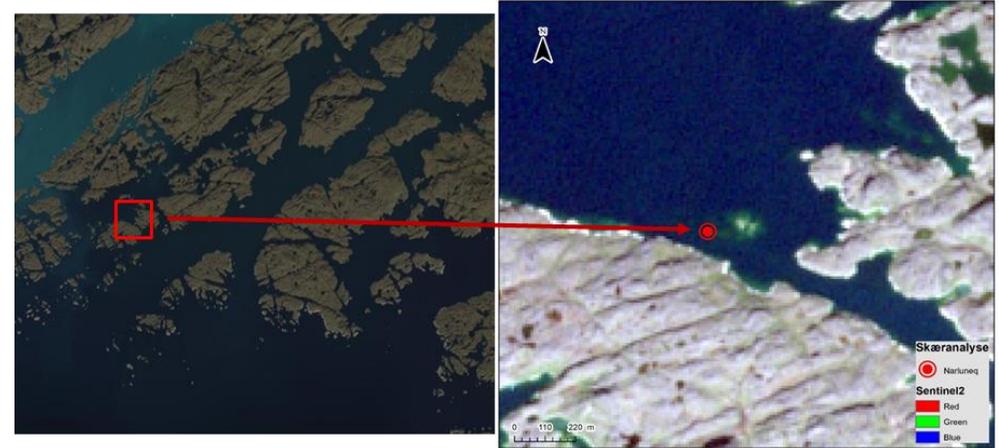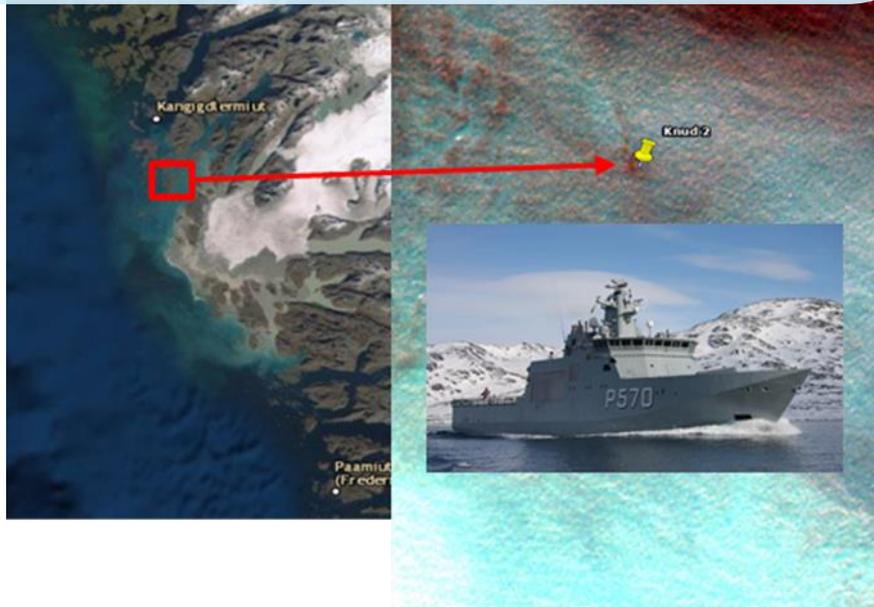
NANOK in a nutshell

Jointly with DALO, Joint GeoMETOC Support Center and Naval Warfare Centre, NANOK develops *an automation and upscaling* feasibility study of navigational hazards:

- Coast lines
- Intertidal zones
- Reefs

Workflows are based on DHI GRAS proprietary bathymetric retrieval model, machine learning and satellite data – all tailored Naval user requirements.

Project co-financed by DALO under their industrial R&D grant, works up until TRL 6 (a bit like the US API - Allied Prototype Initiative)

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DHI GRAS

Nuuk

Example of navigation into uncharted waters
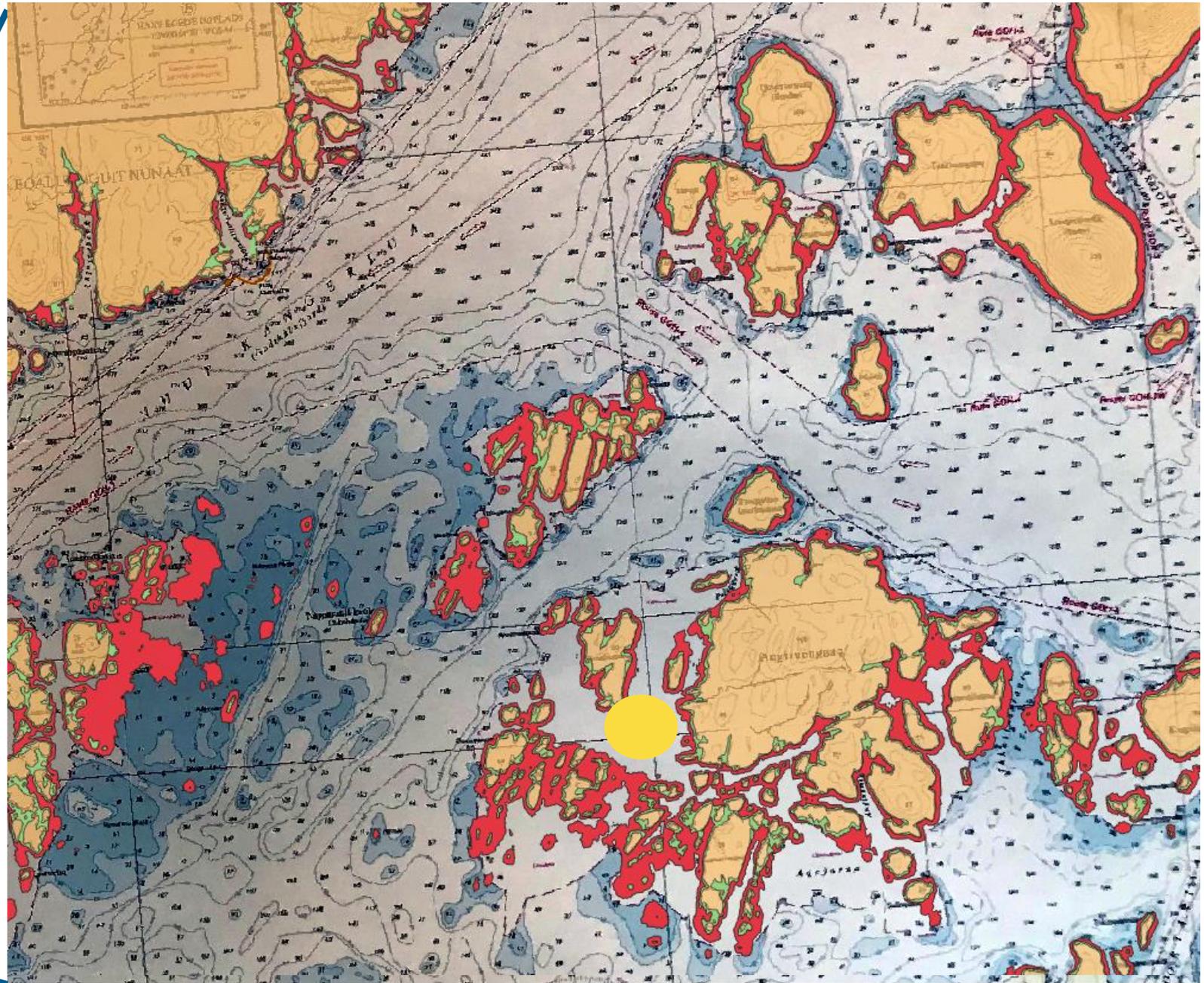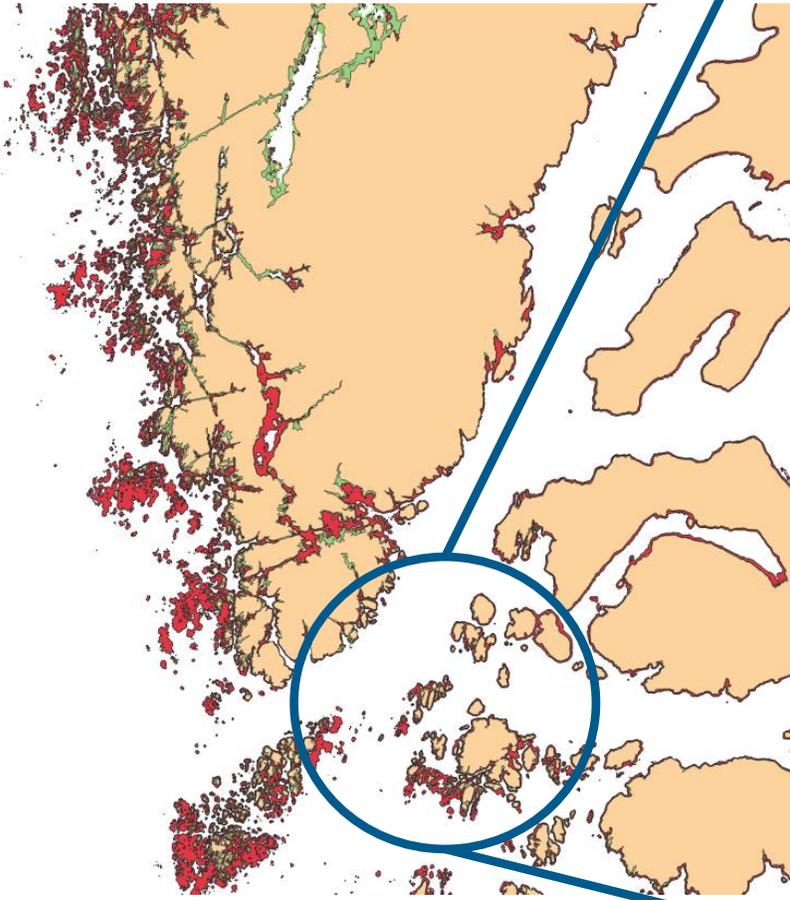
Nuuk – validation of coast line against high resolution data
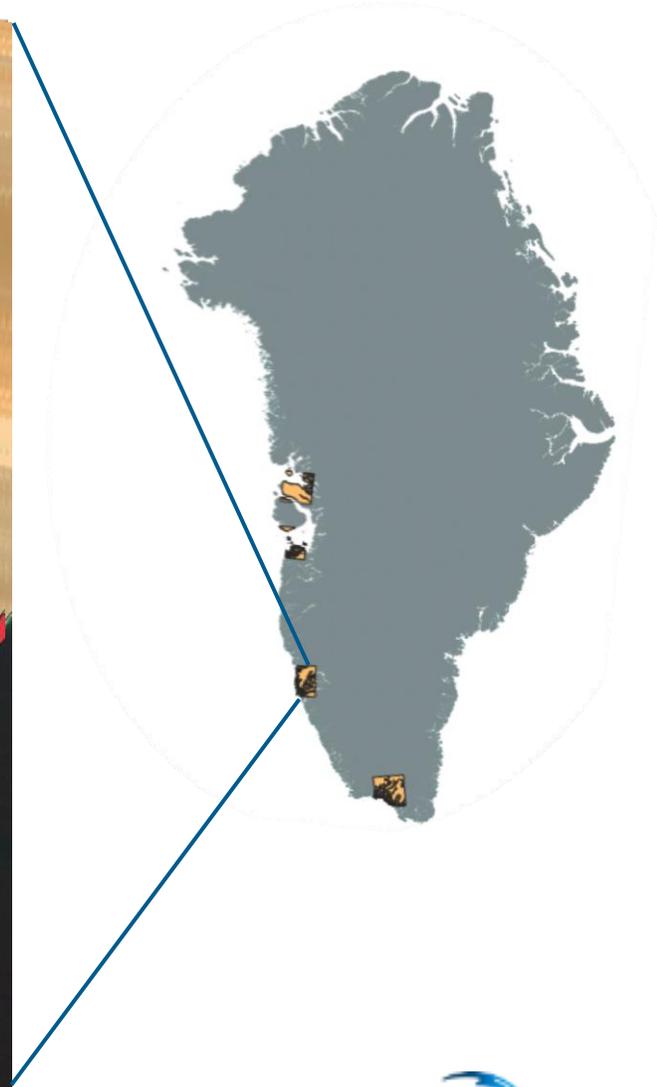
Aasiaat – example of multi temporal advantages

Multi-temporal approach
- to remove artefacts, tidal zone and tidal range
ADEM – to handle cast shadow effects

© DHI
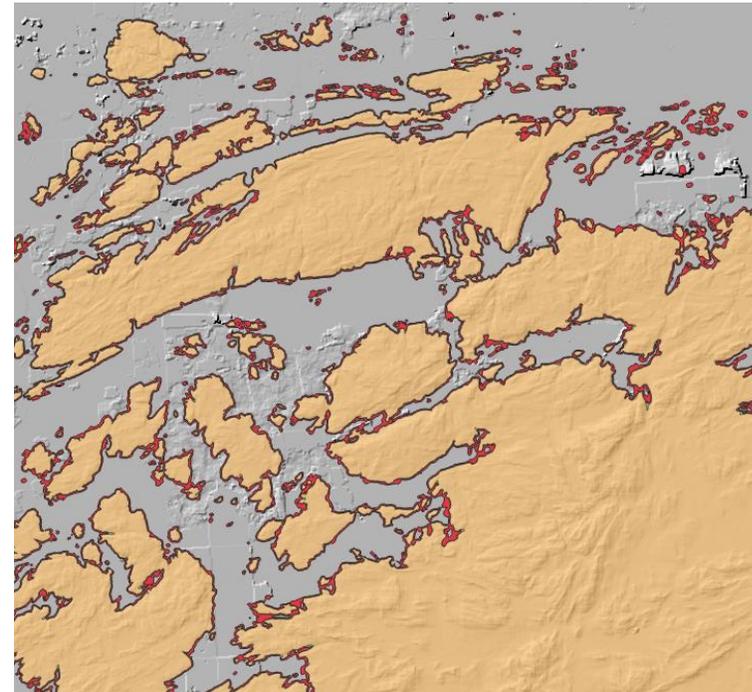
Testing your area – welcome aboard

Advantages with NANOK

- Multi temporal approach – possible to capture entire tidal range and remove artefacts

- Independant of calibration data

- Possible to validate agains any point data source (e.g. IceSAT2)

- Cloud based computing – i.e. fast delivery, updating and reiteration (inclution of in-situ data)

- Automated and scalable - pan arctic

- ECPINS integration – no additional screens to look at while navigating

NANOK

- Nautical Navigations Operational Knowledge

Reach out to get your early bird offering allowing you to test the navigational derisking of your area

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#EOatDHI

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