



Kartverket

National report Norway

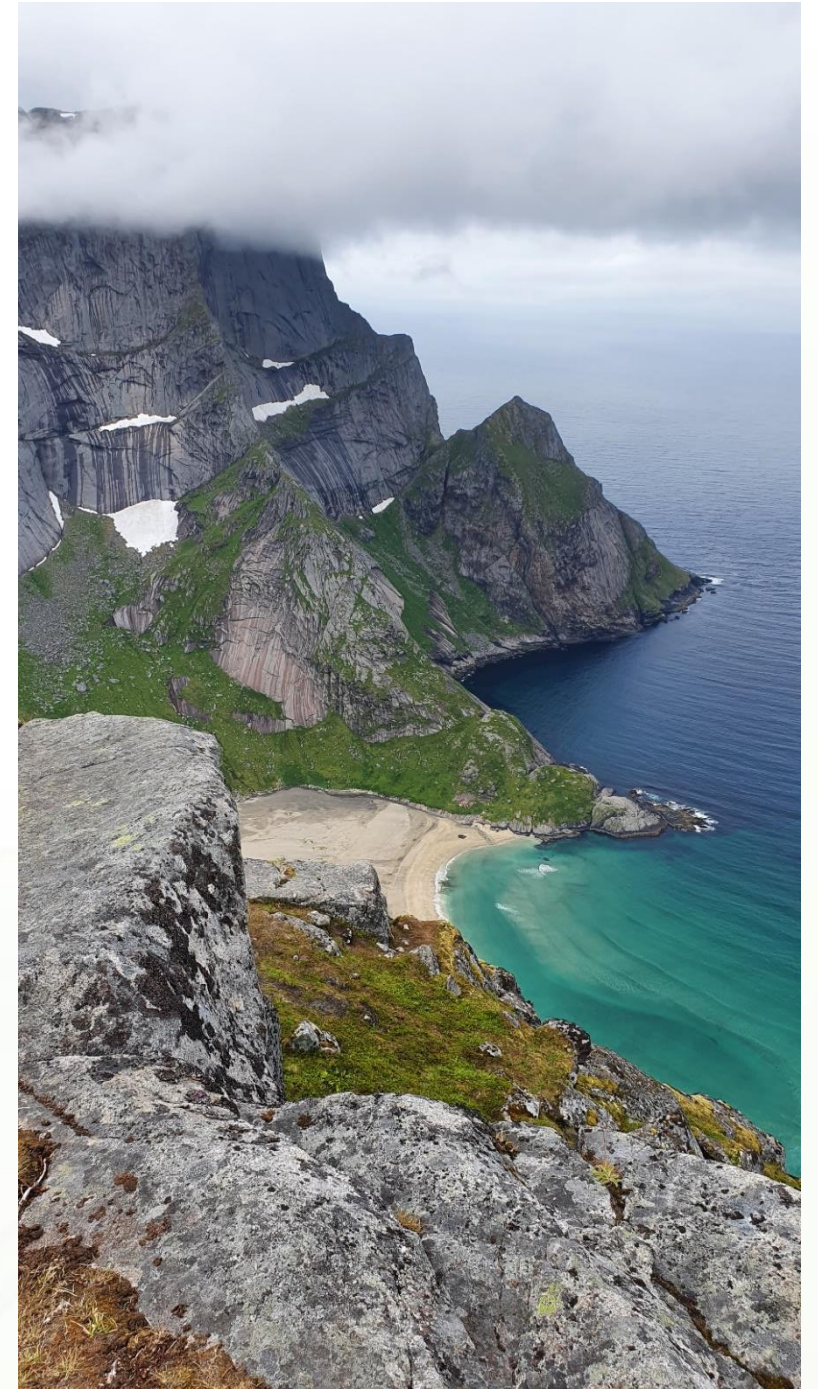
SAIHC18

9-12 May 2022, Maputo, Mozambique



Highlights

- Marine base maps in Norway (MAGIN)
- New survey technologies
- Digital Port Data
- HD ENC



Marine Base Maps for the Coastal Zone, Norway

No: Marine grunnkart i kystsonen

- The *Marine Base Maps for the Coastal Zone, Norway* project was officially announced October 2019.
- 3 years duration as a pilot project, focusing on three locations along the coast.
- .. then hopefully established as a program in 2023.
- The Norwegian Hydrographic Service (NHS) leads the pilot.
- Partners:
 - Geological Survey of Norway (NGU)
 - Institute of Marine Research (HI)

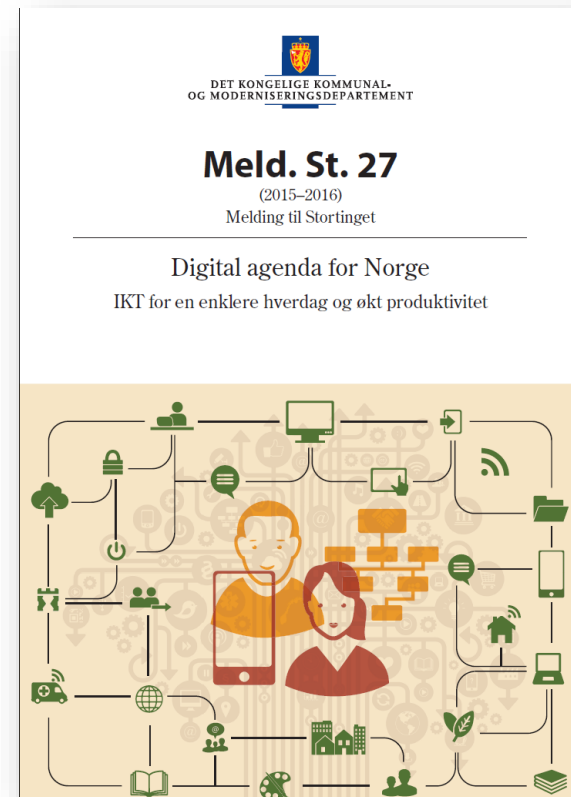
<https://www.kartverket.no/en/Prosjekter/marine-grunnkart-i-kystsonen/>



National Geodata coordinator

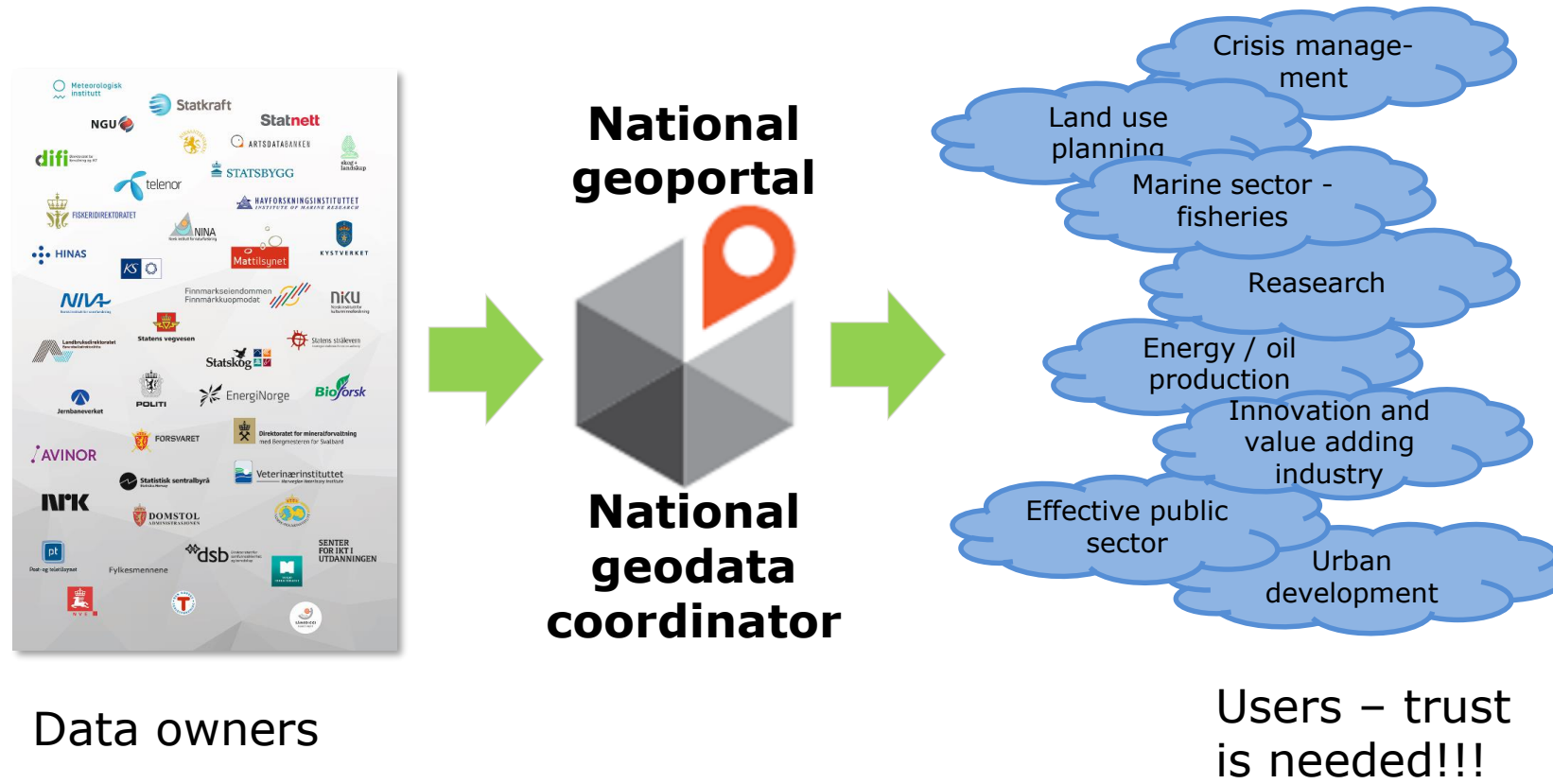
- Geodata act
- Geodata strategy
- Digital agenda

- Key to digitisation and value adding in public and private sector



Authoritative

Unless we provide stable, trustworthy data for free with easy access; users, public or private, will not use the NSDI products. As a result their investments may fail.

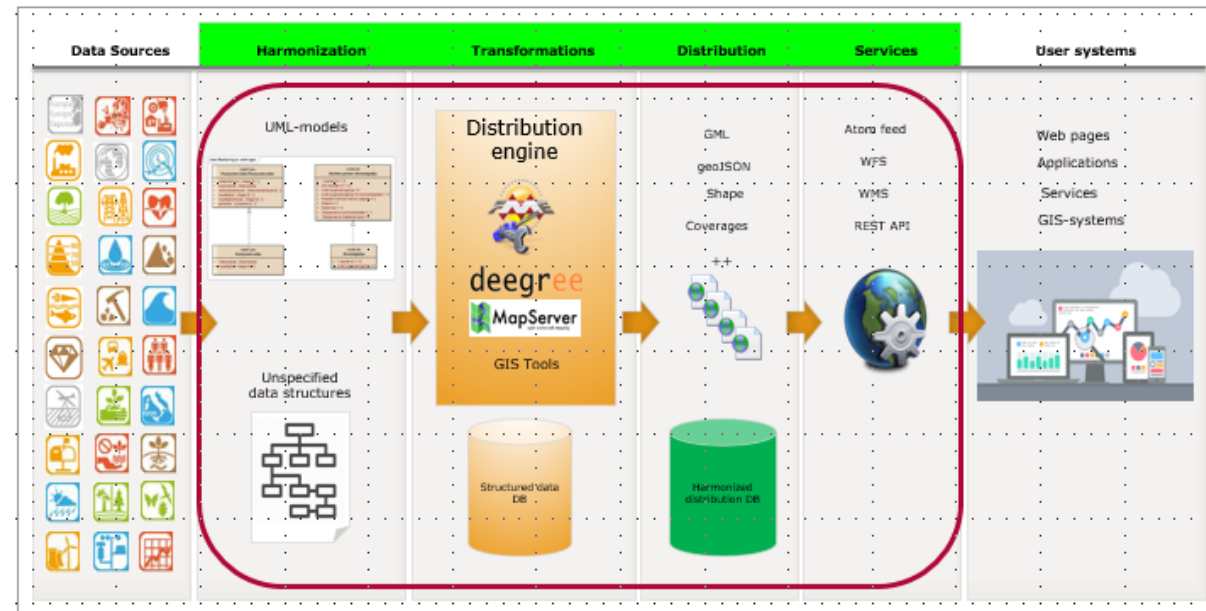


Marine base maps

The data foundation

Key elements:

- Thematic datasets provided by the corresponding sectoral authority (data owners)
- Data available through standardized geospatial services by the individual data owner. (Mainly OGCs WMS, WMS-T, and WFS at the moment).
- Datasets and services documented by the data owner through metadata registrations in the national SDI (official announcement / productification of a dataset / service)
- Terminology and cartography harmonized and adjusted to the user needs

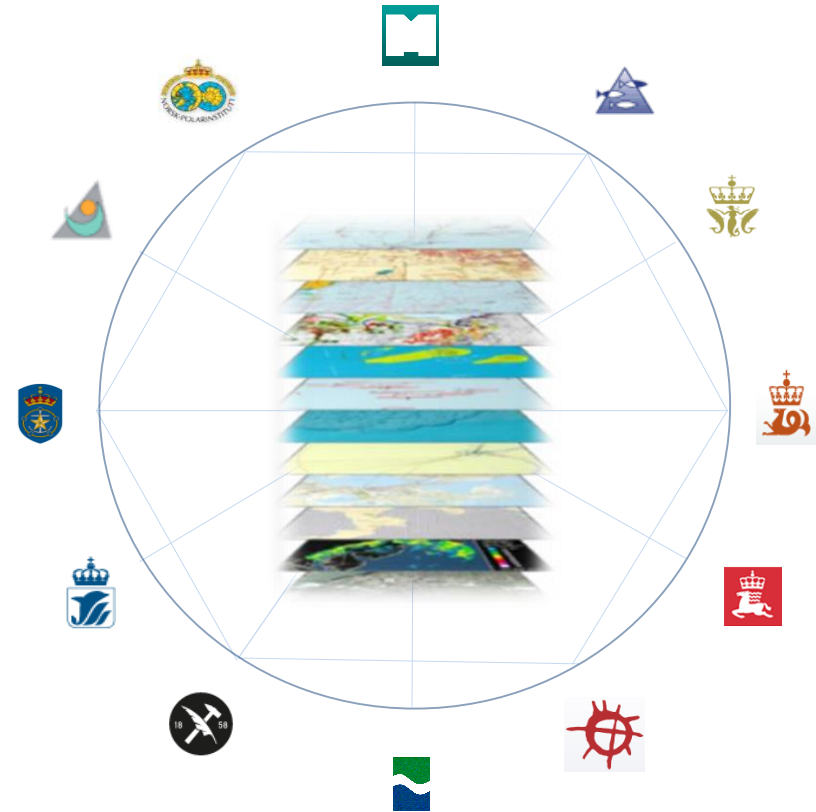


Marine base maps

Support the marine spatial planning process in Norway with authoritative data

Main stakeholders

- Norwegian Environment Agency
- Norwegian Mapping Authority
- BarentsWatch
- Directorate of Fisheries
- Institute of Marine Research
- Norwegian Coastal Administration
- Norwegian Maritime Authority
- Norwegian Petroleum Directorate
- Petroleum Safety Authority
- Norwegian Radiation Protection Authority
- National Institute of Nutrition and Seafood Research
- Norwegian Polar Institute
- Norwegian Mapping Authority



FAIR principles

Mareano Status Register

The register provides an overview of data collected through the projects; Mareano and "Marine base map". The overview shows the status of various datasets' fulfillment of the FAIR principles as well as other requirements from the national geographical infrastructure

Updated: 23/06/2021

Dataset Reports

Showing 1 - 50 of 54 hits

1 » »»

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Akkumulasjonsrater for organisk karbon i havbunnsedimenter i Nordsjøen og Skagerrak	Geological Survey of Norway	😊	😞	😞	😊	😊	😞	😊	😊	👤	👤	😊	😞	😞	😞	👤			
Artsmangfold – Svampobservasjoner per video-transekt	Institute of Marine Research	😊	😊	😊	😊	😊	😞	😞	😊	😊	😊	😞	😊	😞	😊	👤			
Artsmangfold – Videoobservasjoner	Institute of Marine Research	😊	😊	😊	😊	😊	😞	😞	😊	😊	😊	😞	😊	😊	😊	👤			



Survey technology developments in Norway

*SAIHC18
Evert Flier*



Marine Base Maps for the Coastal Zone, Norway

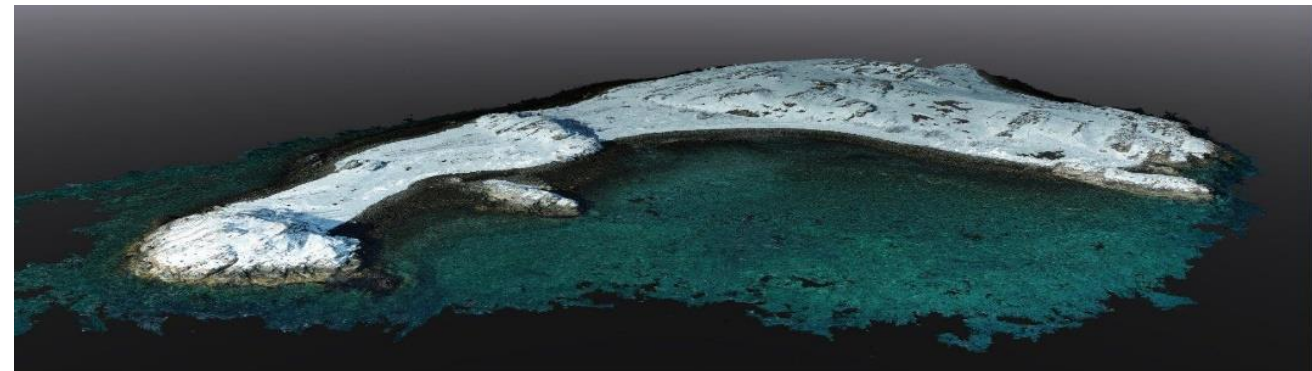
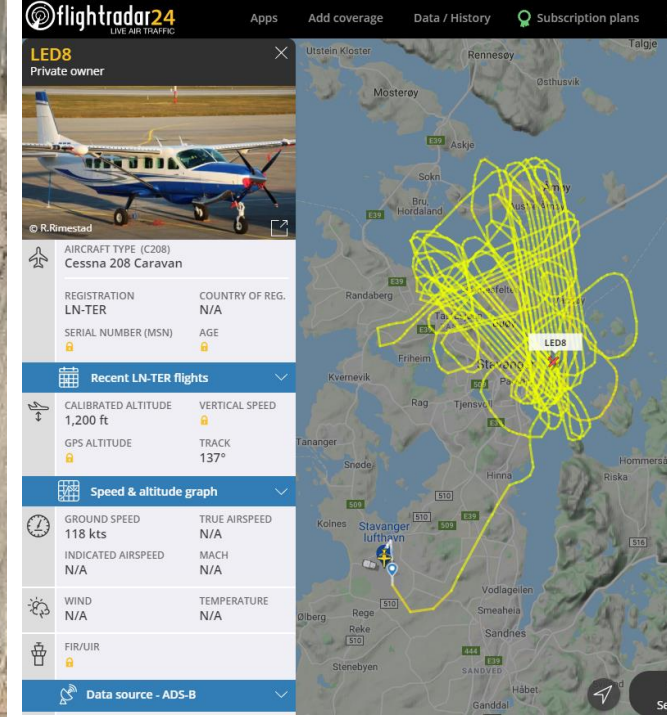
No: Marine grunnkart i kystsonen

A Marine Basemaps program will depend on new sensors and platforms. As well as software that allows us to process and distribute data more efficient.

- Data will be acquired with several areas of use in mind. Historically the NHS collect data *primarily* to serve as a basis for nautical charts.
- Surveying shallow areas and the shoreline will have a much higher priority.
- Shorter duration from data collection to distribution.

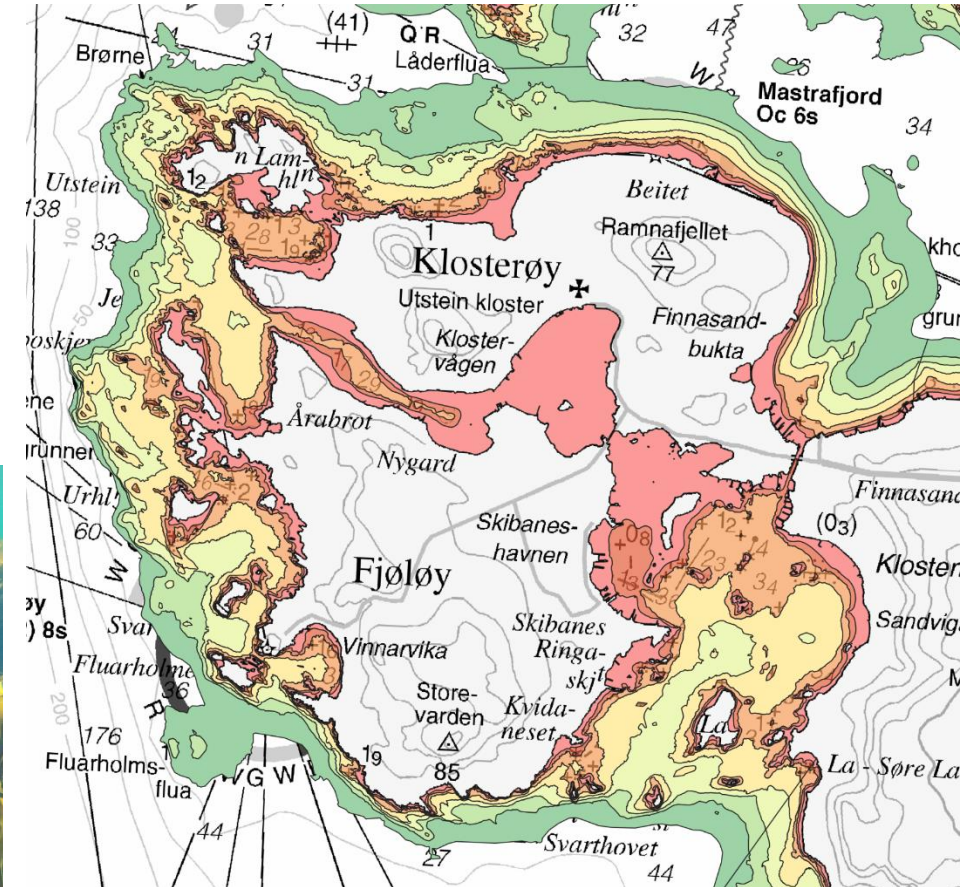


Shallow water activities in 2020-21

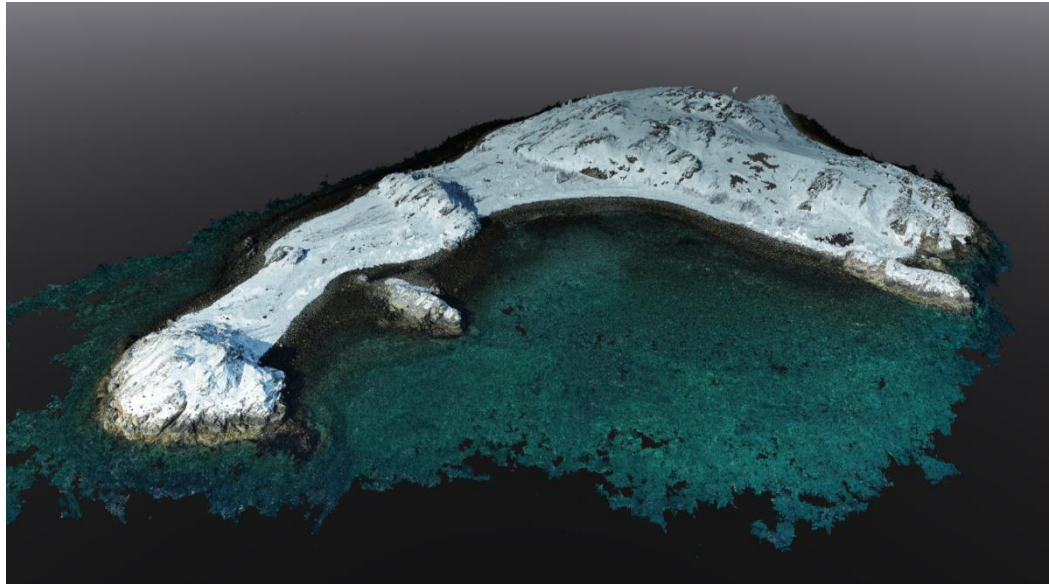


The Fjøløy test site

- Developed for testing sensors and platforms suitable for shallow water surveying.
- Declassified 0-30 meters (until 2022).
- Both sheltered and exposed areas.
- Big variation in types of seabed and marine vegetation, representative for conditions along the Norwegian coast. These conditions can be tricky for all kinds of sensors and platforms.
- Examples from ROV footage from the site:



Mapping smaller areas with drones



Left:
Digital Terrain Model of *Lille Haukøya* in *Troms og Finnmark*, northern Norway.

The model is based on images taken with a smaller (DJI) drone on **low tide**.

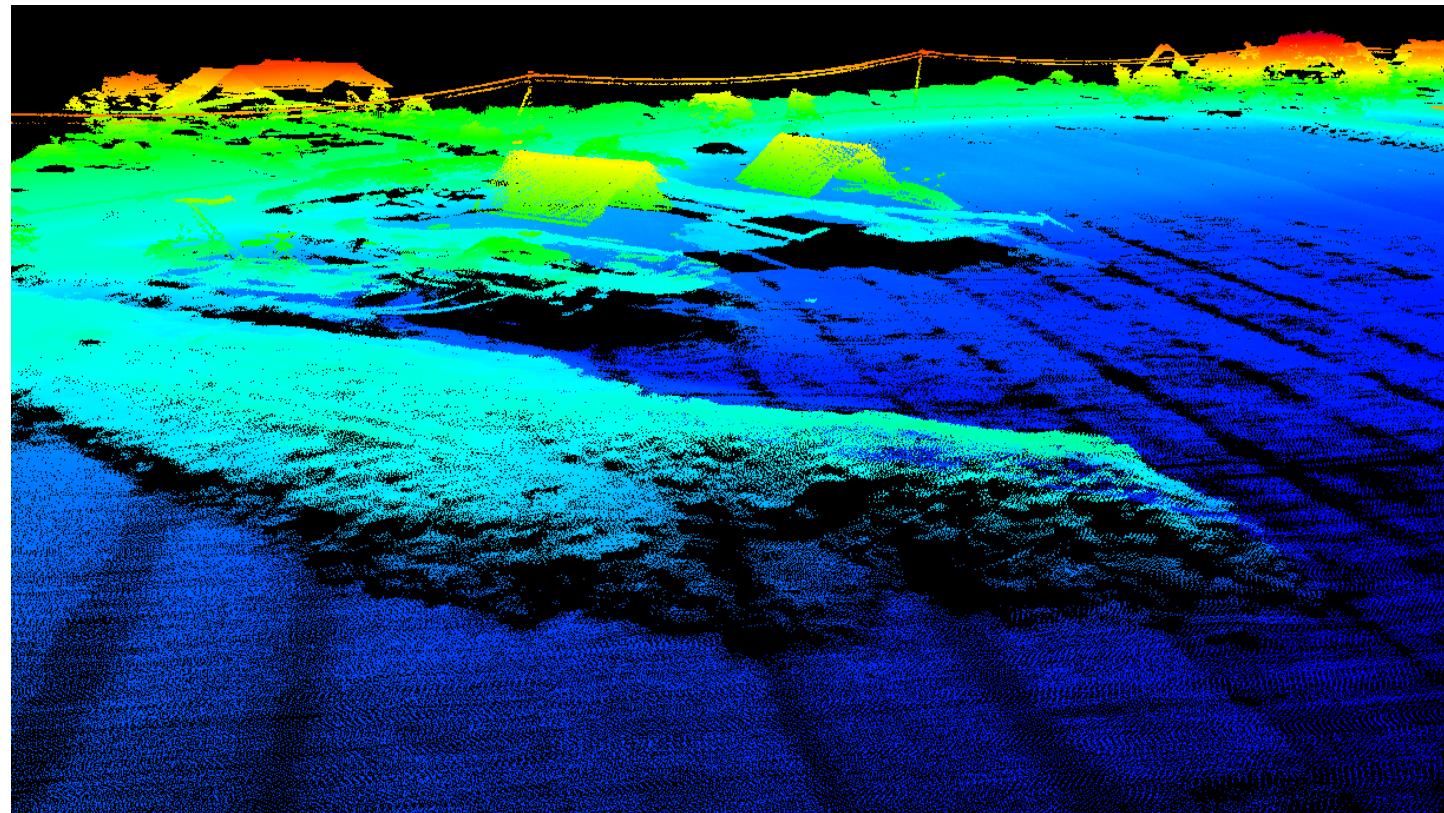
The images have been post-processed using a photogrammetric technique called *Structure from Motion (SFM)* in Pix4D.



Right:
Digital Terrain Model from *Fjøløy* test site.

Data was collected using a bathymetric (green) LIDAR on a Nordic Unmanned drone.

In the foreground of the model you can see the seabed and shore. On land you can see power lines, houses, boats and boathouses.



Drone-borne bathymetric LIDAR



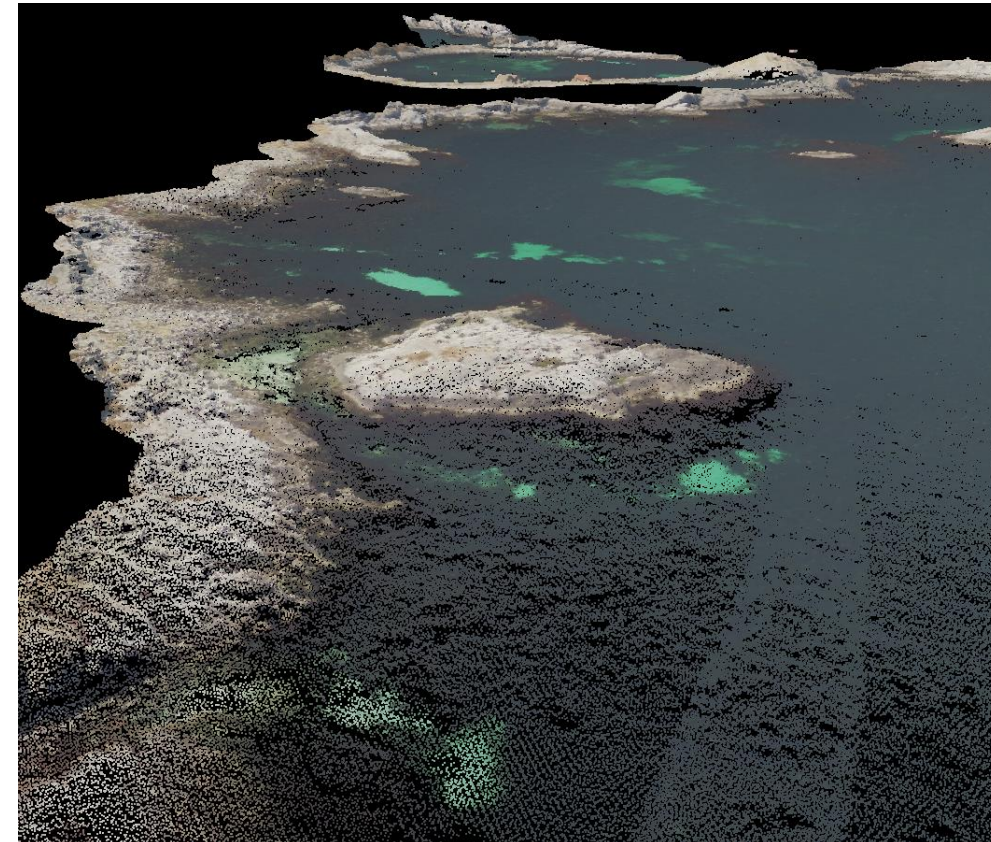
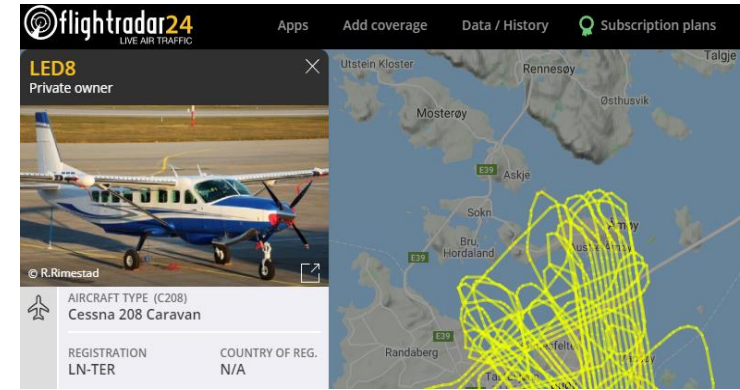


Airborne LIDAR

These 3D models are based on data collected by Terratec using airborne bathymetric LIDAR plus existing data from topographic LIDAR on land.

Almost the entire municipality of Stavanger is now fully covered with LIDAR along the shoreline. Very good result: Full coverage down to 10 meters depth, 10 points/m² (5 points seabed + 5 points marine vegetation).

Terratec also collected hyperspectral images in July 2021. Hyperspectral images can potentially be used to map marine vegetation.

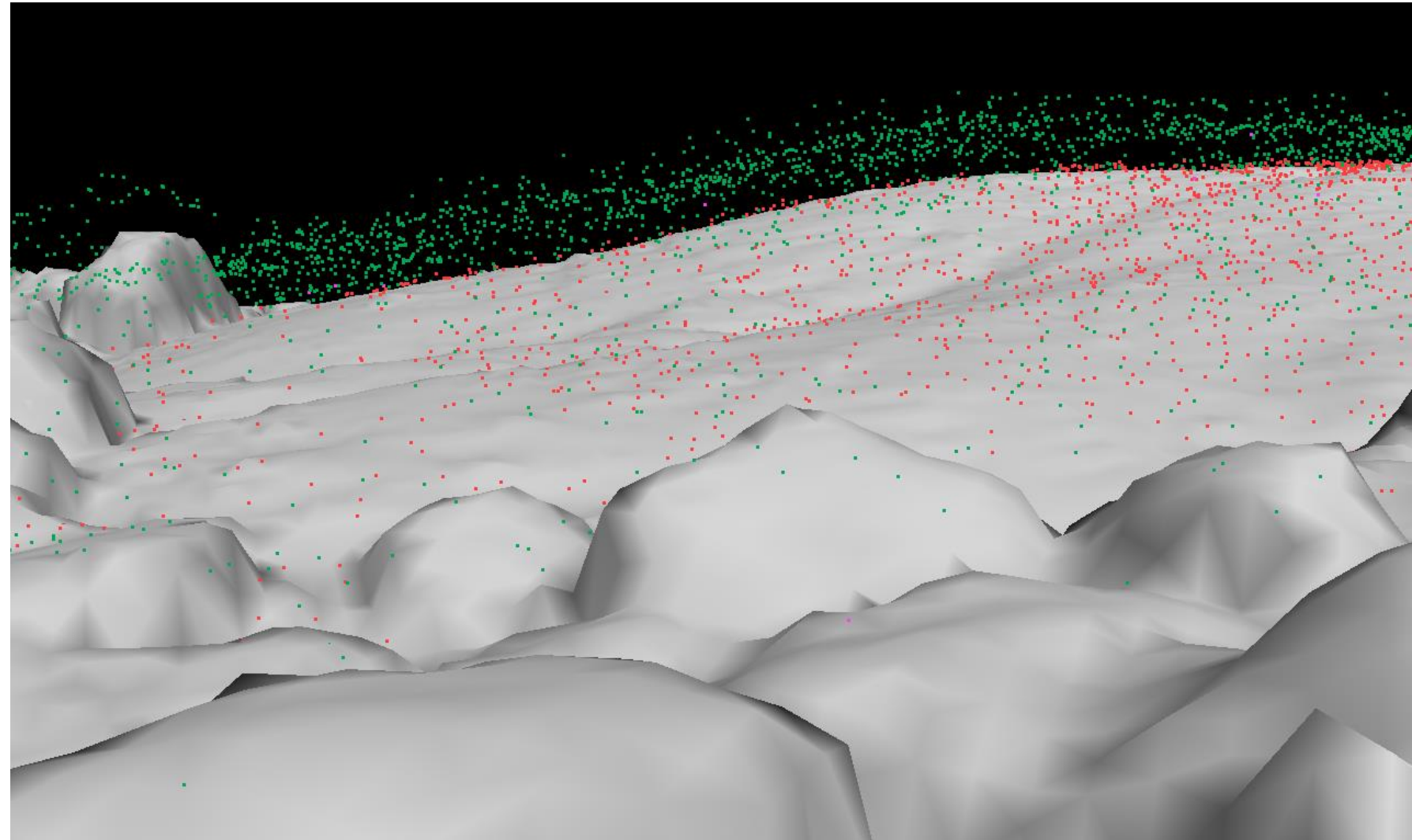


Airborne LIDAR

Uses of bathymetric LIDAR data :

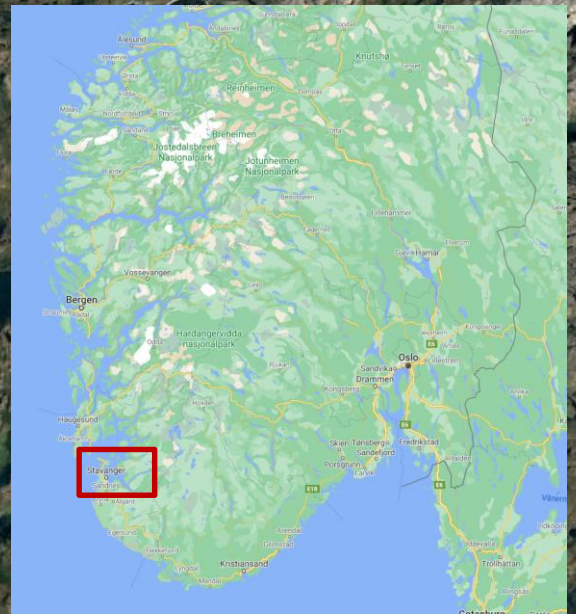
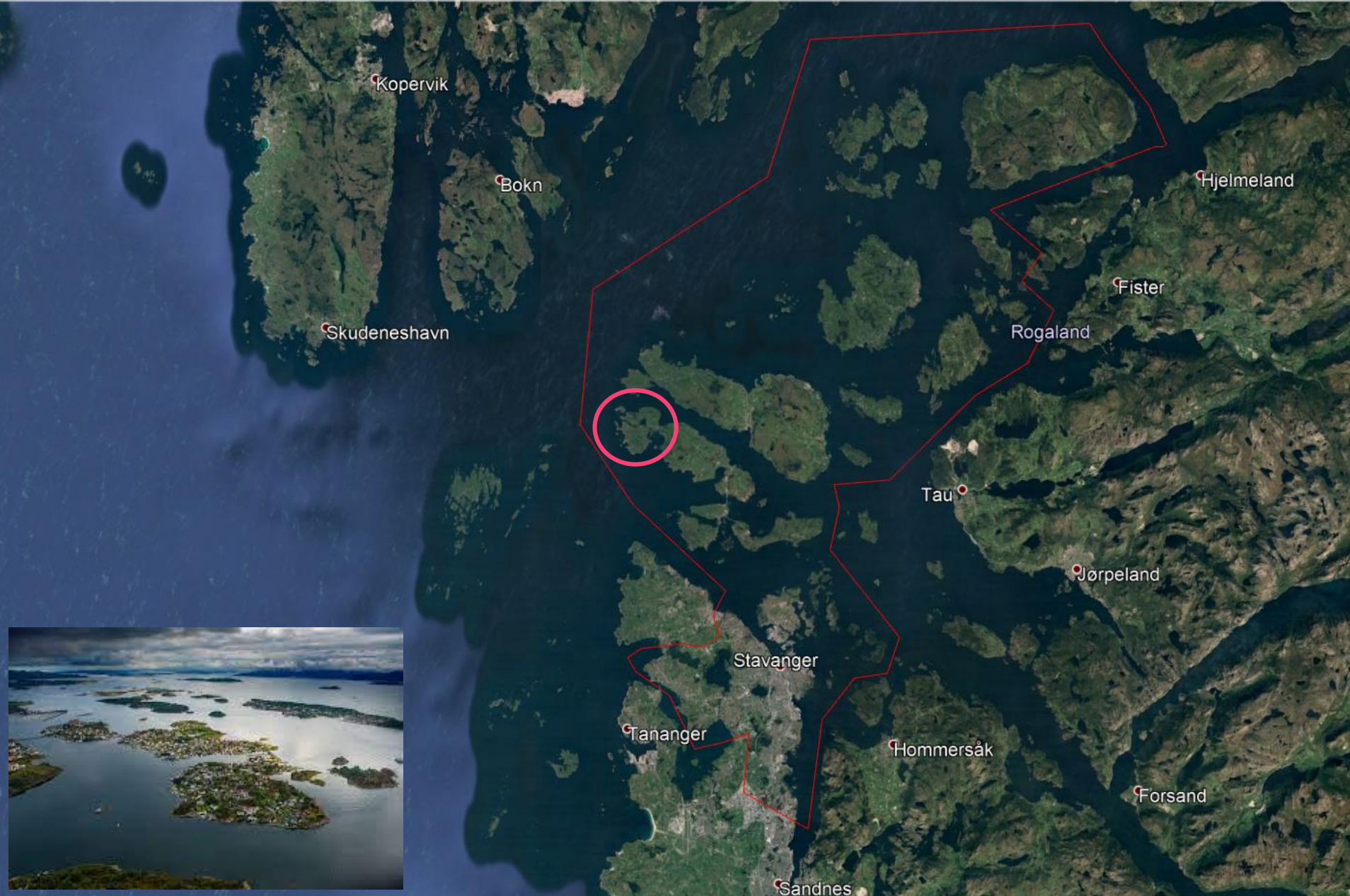
- .. to make DTMs of the seabed by using only the **red** LIDAR points in the illustration to the right.
- .. and to model the distribution and height of marine vegetation. The **green** laser points that "float" approx. 1 meter above the bottom, we believe is the top of a kelp forest.

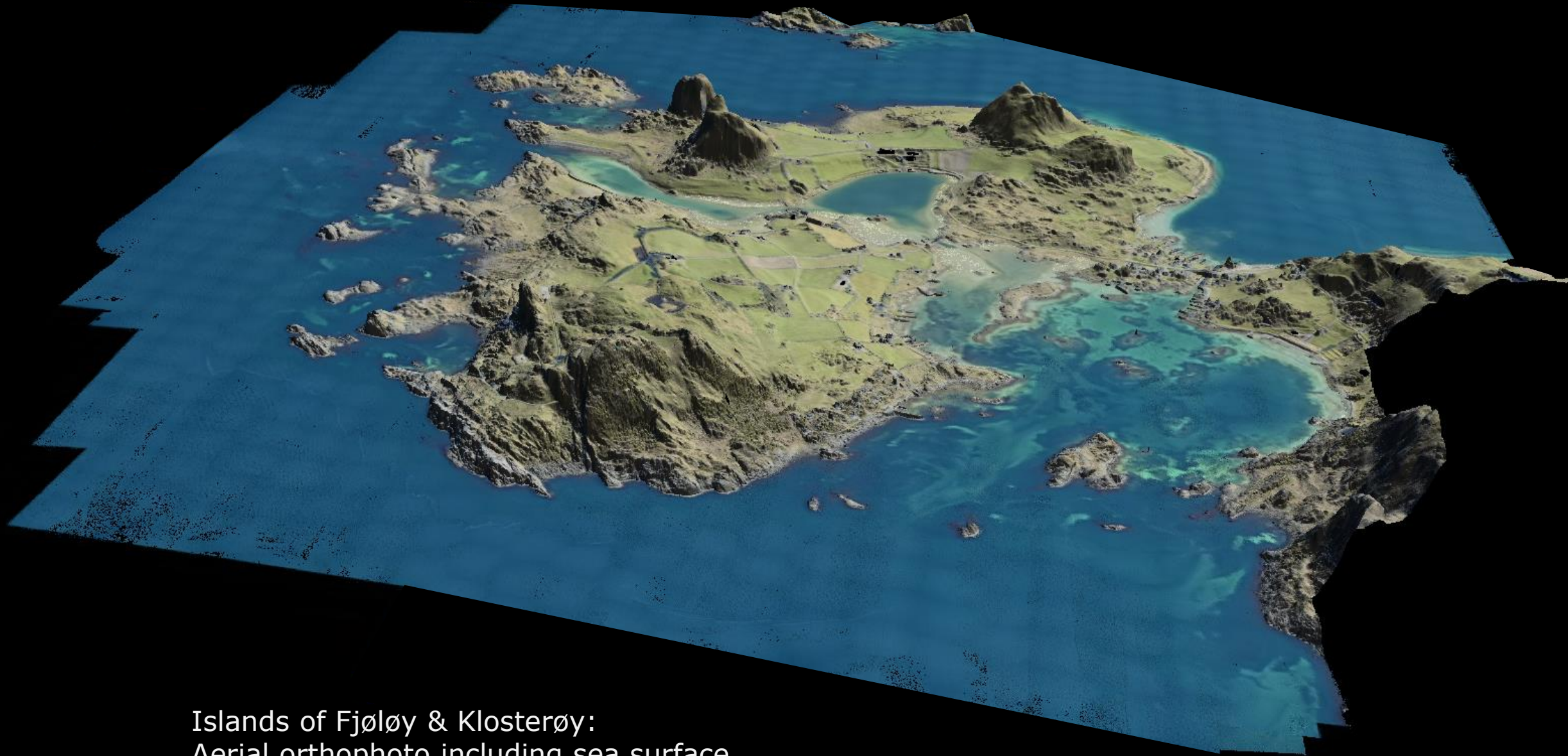
The illustration also includes echosounder data in **gray**, which gives a slightly more detailed picture of the seabed than LIDAR data.



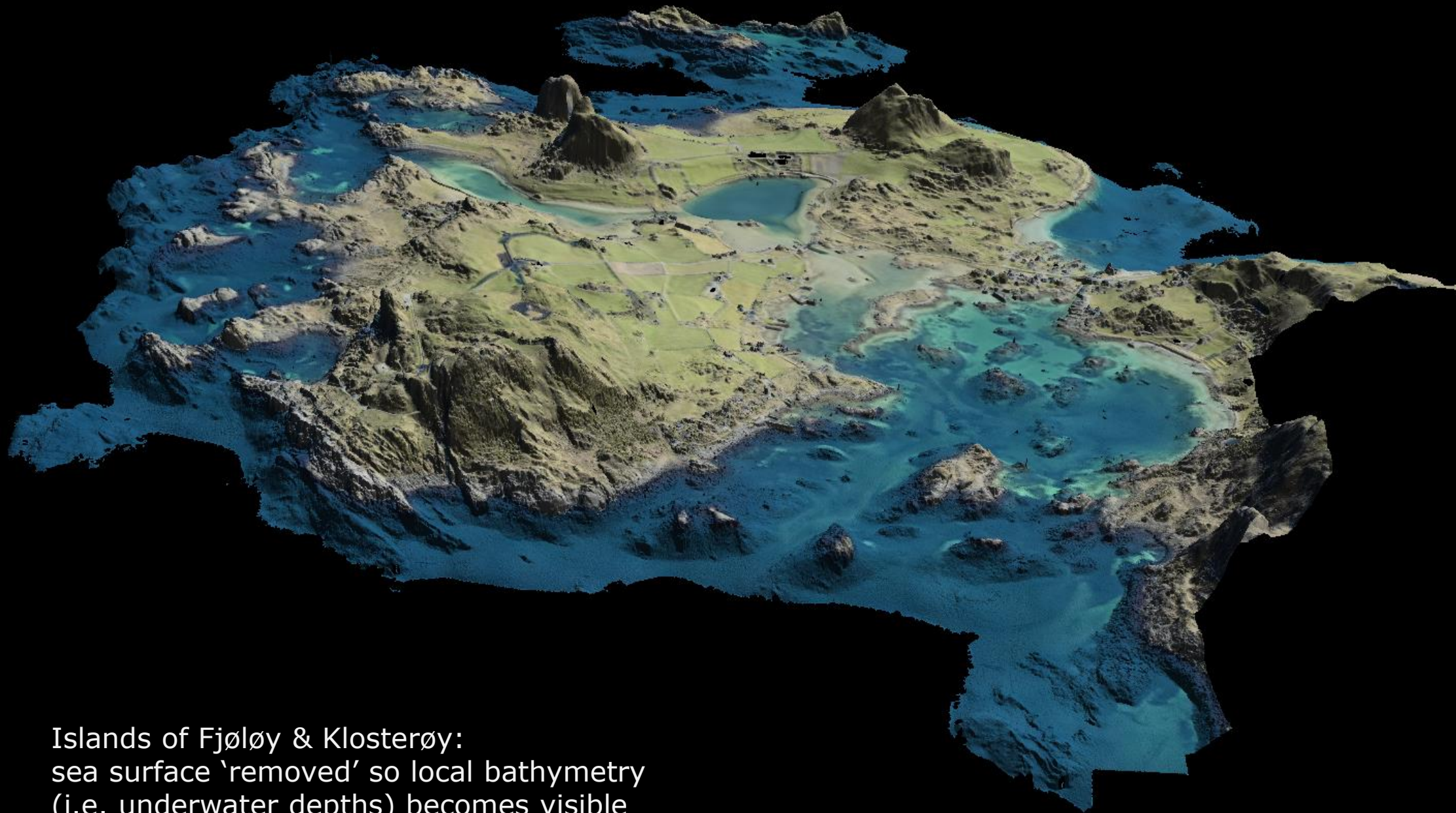
Terratec Use Case: Survey around Stavanger

Project: Marine Base Maps for the Coastal Zone (Marine Grunnkart)

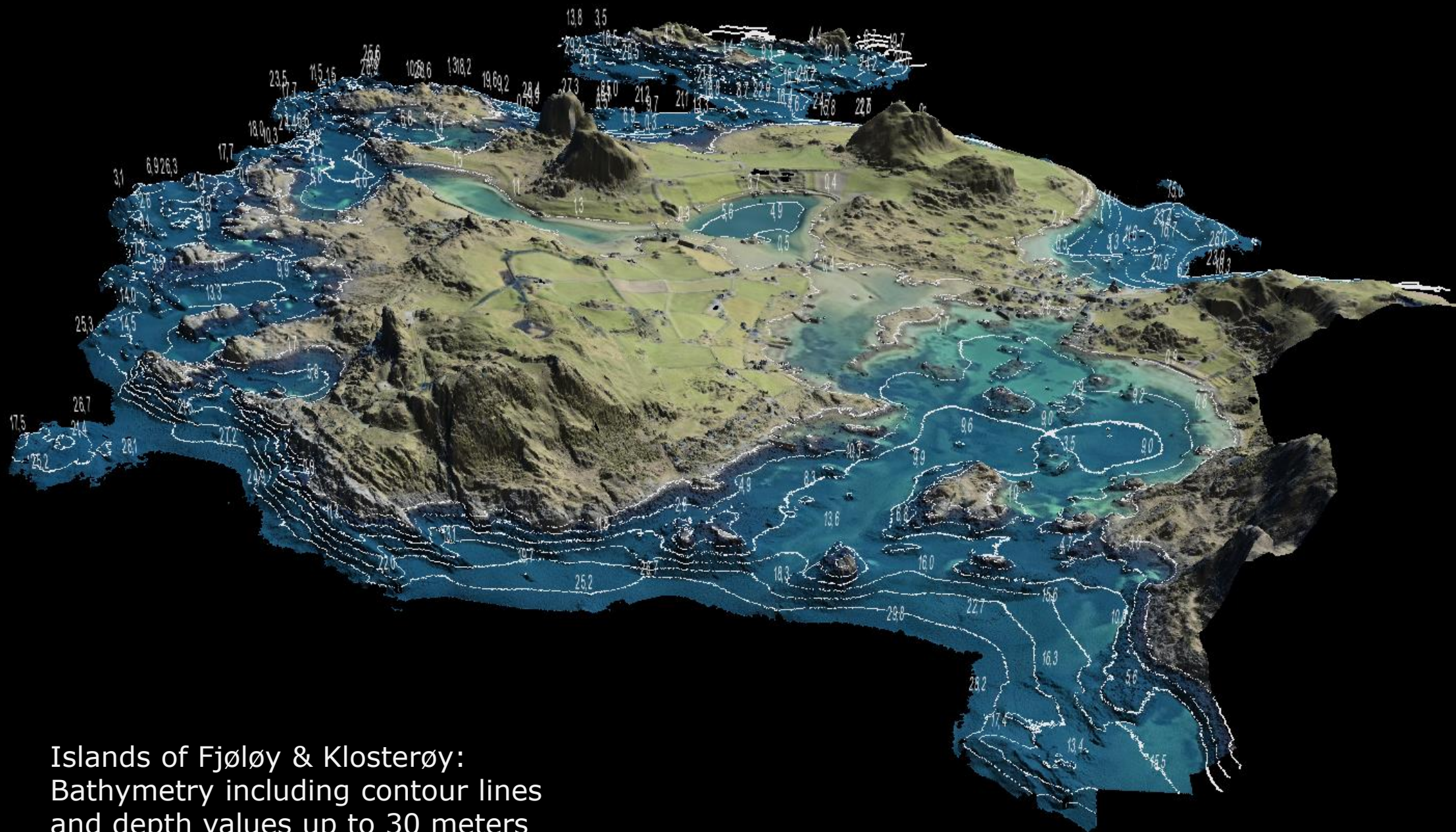




Islands of Fjøløy & Klosterøy:
Aerial orthophoto including sea surface



Islands of Fjøløy & Klosterøy:
sea surface 'removed' so local bathymetry
(i.e. underwater depths) becomes visible



Islands of Fjøløy & Klosterøy:
Bathymetry including contour lines
and depth values up to 30 meters

High quality RGB: an added bonus from flying LIDAR

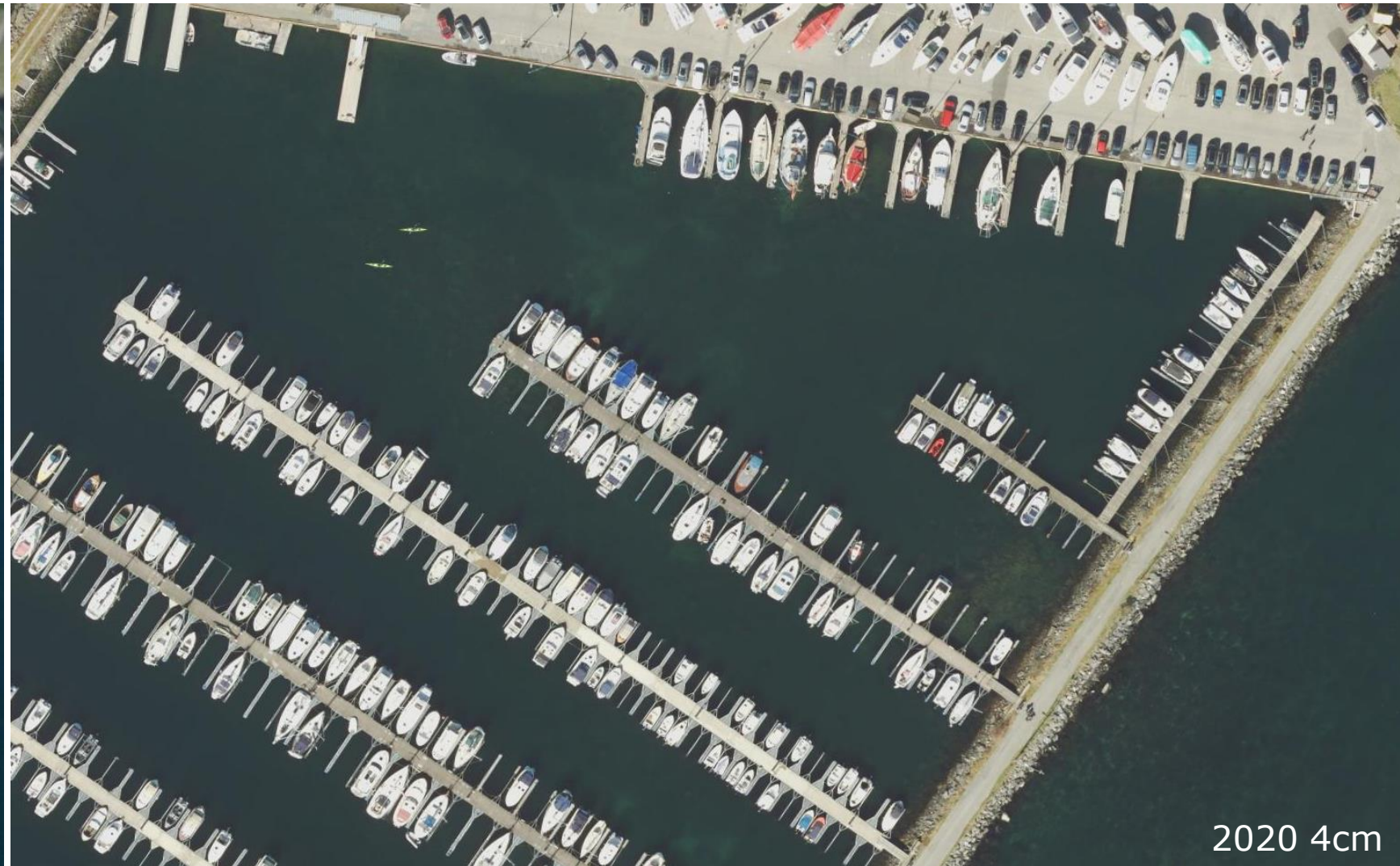




2021 2.5cm

- Lower flight altitude (400m vs. approx. 6000m in 2019)
- Optimal turbidity (water clarity) in April
- Post-Processed for optimal visibility in the water

High quality RGB: an added bonus from flying LIDAR

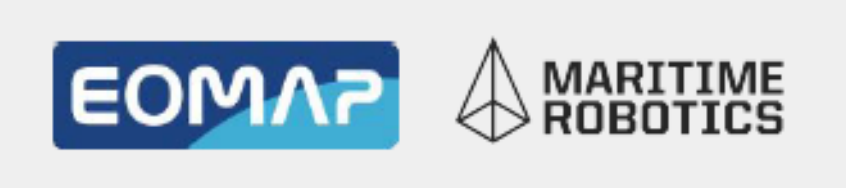




The SyriUS project



The SyriUS project, concept



EOMAP
 processes data from satellite
 uses USV data to calibrate
 & validate
 delivers data product to customer



Customer
 requests data
 for a certain region



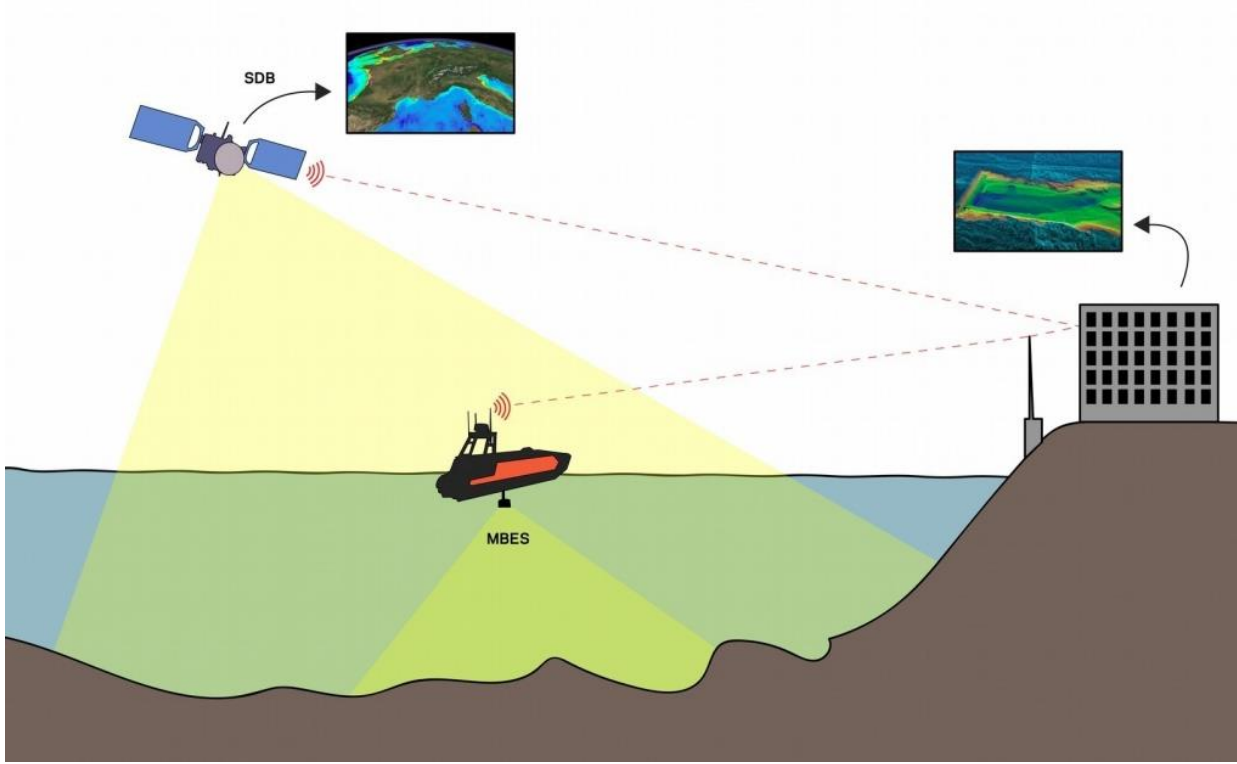
Satellite
 collects data



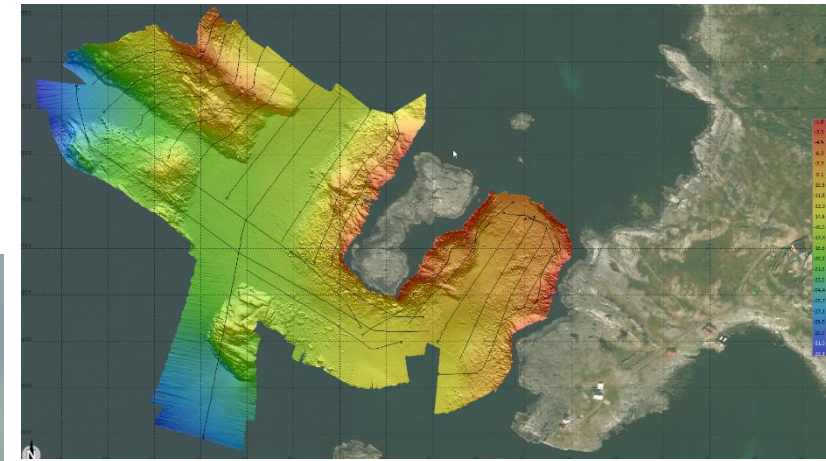
USV Operator / Surveyor
 oversees USV survey
 off-loads & post-processes data



Maritime Robotics' USV
 runs mission to collect
 in-situ data



XOCEAN demo





Kartverket

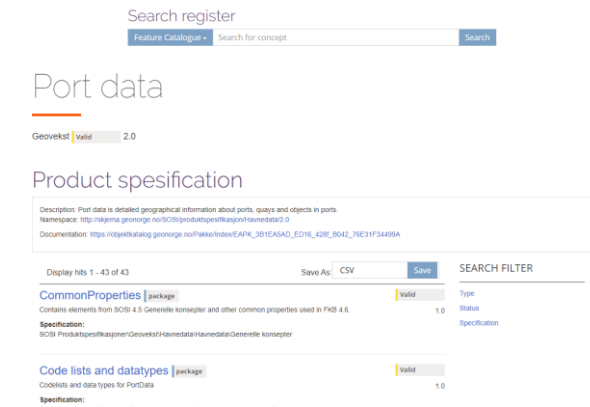
Standardization and digitalization of Port data



Photo: Port of Kristiansand

Port Data 2020

Project goal for Havnedata 2020:
Make it easy to share and update port data through common national infrastructure for spatial information.



Kartverket • Geodataarbeid • Havnedata

Havnedata

Infrastruktur og standard for havnedata er utviklet. Et nytt system muliggjør forvaltning og ajourføring av havnedata direkte fra de enkelte havnene etter samme prinsipp som øvrige basis kartdata (FKB).

Artikler og video



Sikre og effektive havner

– Det er utvilsomt god samfunnsnytte i å bygge infrastruktur for havnedata, sier kartverksjef Johnny Welle. Prosjektet som har jobbet med digitalisering av havner er fullført og sjøsatt – og infrastruktur og standard for havnedata er nå på plass.



Digitaliserer havnene

Gjennom offentlig-privat samarbeid og med ny teknologi samles detaljerte data om bunnforhold og anlegg i en rekke havner.



Tema havner på Sjøkartkonferansen 2020

Arbeid og tiltak for å standardisere og fremskaffe bedre data som skal bidra til å skape sikrere og mer effektive havner ble presentert på Sjøkartkonferansen 2020. Se foredragene fra konferansen i opptak.

Data på Geonorge

Havnedata WMS

Registreringsinstruks for havnedata

Datamodel for havnedata

Havnensymboler

Nyttig

Sentral felles kartdatabase

Standardisering

Nasjonal geodatastrategi

KONTAKT

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Laserskanning av Oslo havn







Kartverket

VEILEDER

Registreringsinstruks for havnedata
Versjon 1.4



Bilde: Trygve Emil Tønnesen



www.kartverket.no

Guidance document

Practical guide that ensures quality and uniform registration.



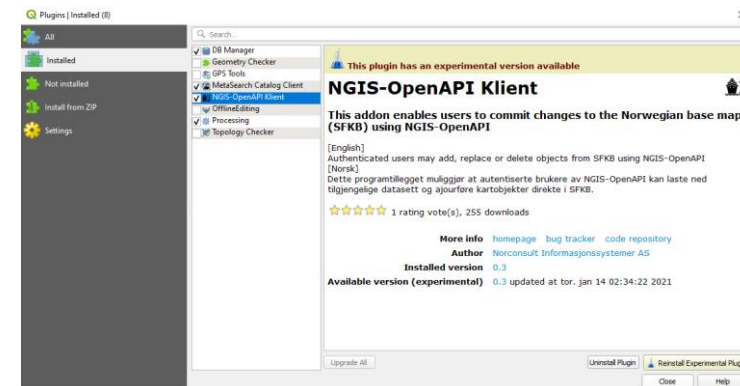
Mapping

Digitization in 17 ports
Bathymetry in 10 ports



Standardized drawing rules

WMS-services



Database management
Common database for Port data, with access via Plugin i QGIS/NGIS Open API



Norwegian Mapping Authority

Port Data 2021

A continuation from «Port data 2020»

Project goal:

Make it easy to share and update port data through a common national infrastructure.

Joint project with:



Coastal
Administration



Maritime
Authority



Environment
Agency



Mapping
Authority

Port Data version 2.0



- Port data version 2.0 was published 15.oct -21:
 - Updated version of the Port Data standard
 - Updated Guidance document
 - UML-model available in norwegian and english
- Next version (3.0):
- Summer 2022
- Product specification and guidance document (no/en)
- Approved as official product specification

Latest project : «Norwegian digital port infrastructure»

- Financial support from the Norwegian Coastal Administration
- Budget 32 million NOK
- Ends in december 2022
- Port of Oslo is project owner
- Norwegian Mapping Authority is project leader
- 9 major Norwegian ports



KYSTVERKET



 BÅTSFJORD HAVN K/F



Arendal Havn



KRISTIANSAND
HAVN



Bergen
Havn



KARMSUND
HAVN



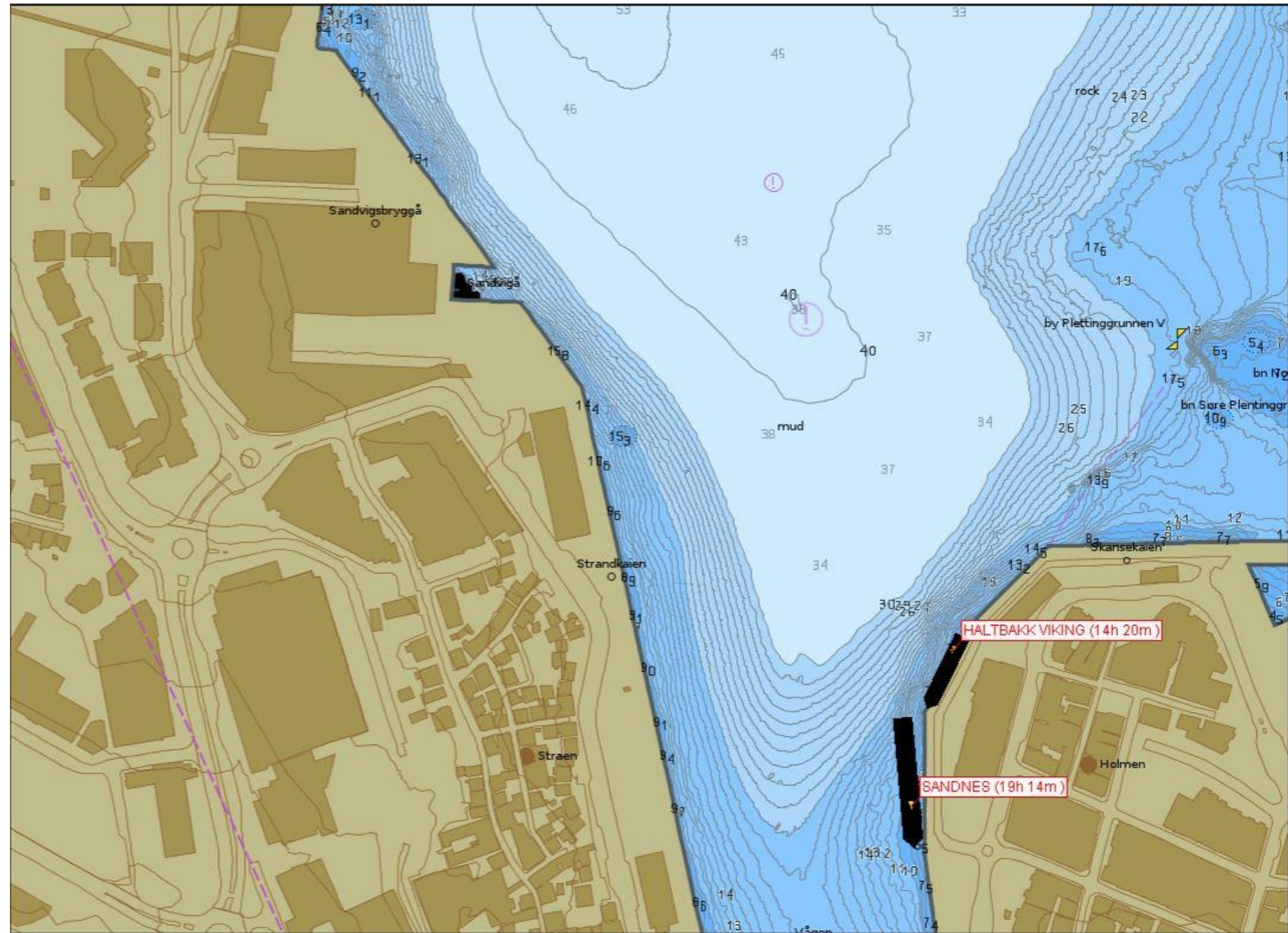
Trondheim Havn



BODØ
HAVN

KRISTIANSUND
& NORDMØRE | HAVN

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Questions?

