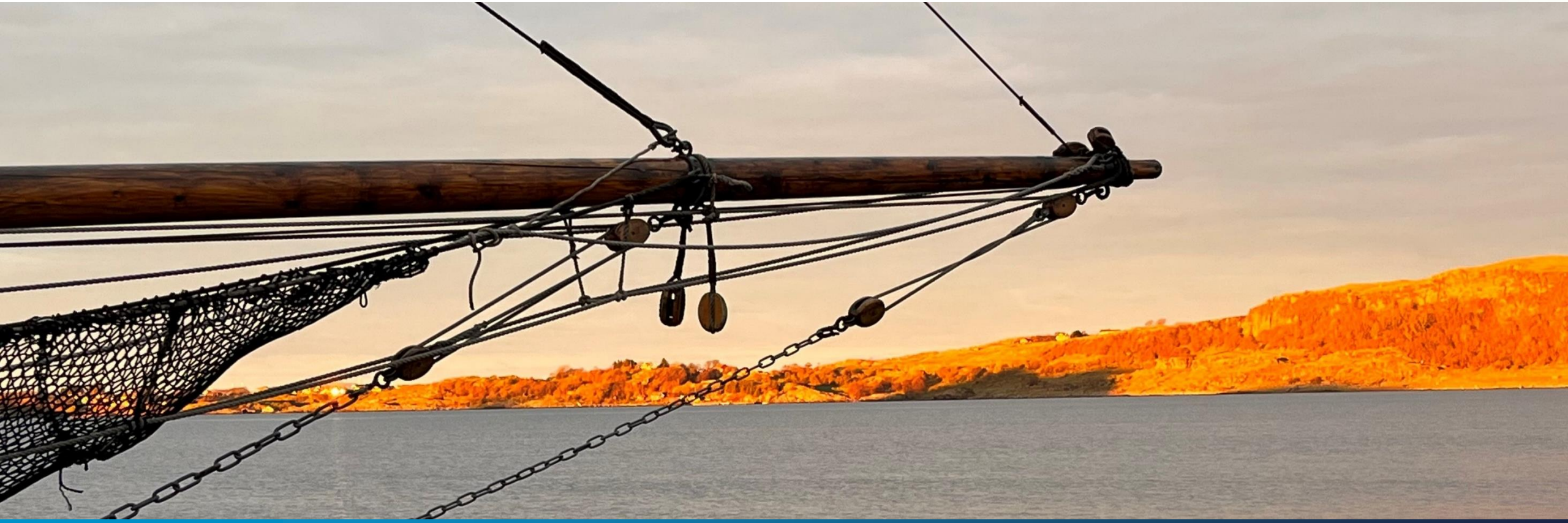
National report Norway

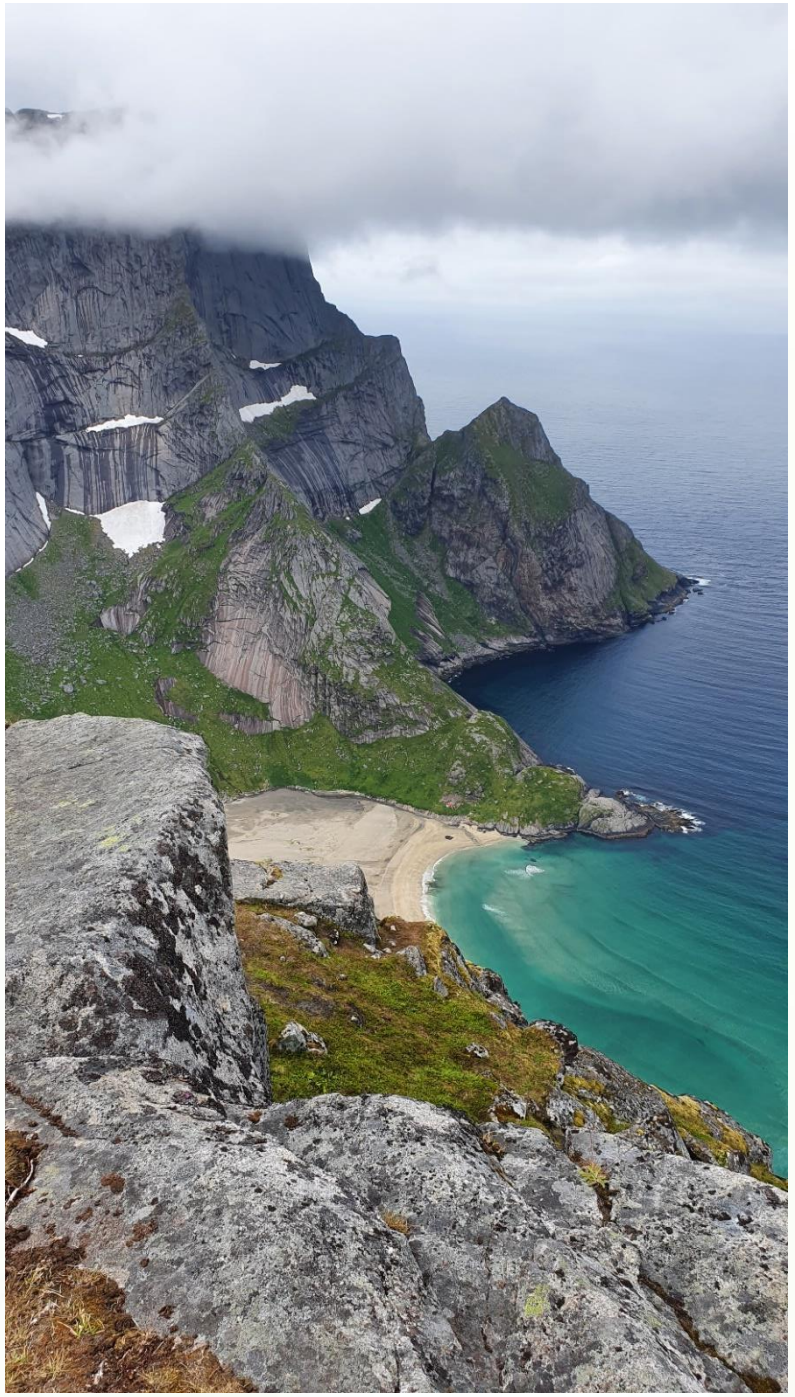
ARHC13

5-7 September 2023, Nuuk, Greenland



Highlights

- Norwegian Mapping Authority celebrates 250 years
- Marine Base Maps pilot project succesfully completed
- Status S-100 implementation
- HYDRIS, our new production line in development
- Data sharing agreement with Oil & Gas industry
- Office location / constellation



Kartverket

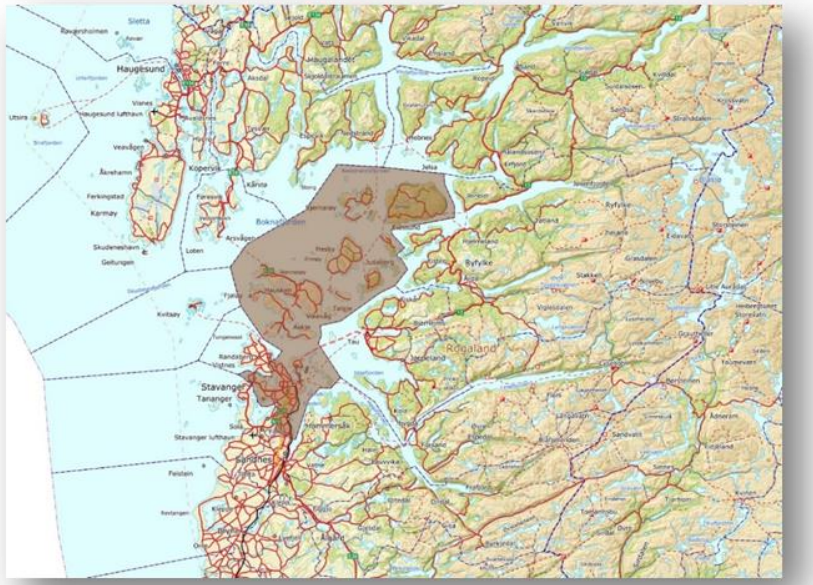
Marine Base Maps for the Coastal Zone Norway

Is all about gathering detailed information and boosting the knowledge of the sea bed and marine coastal systems along Norway's coast - for a sustainable ocean economy.

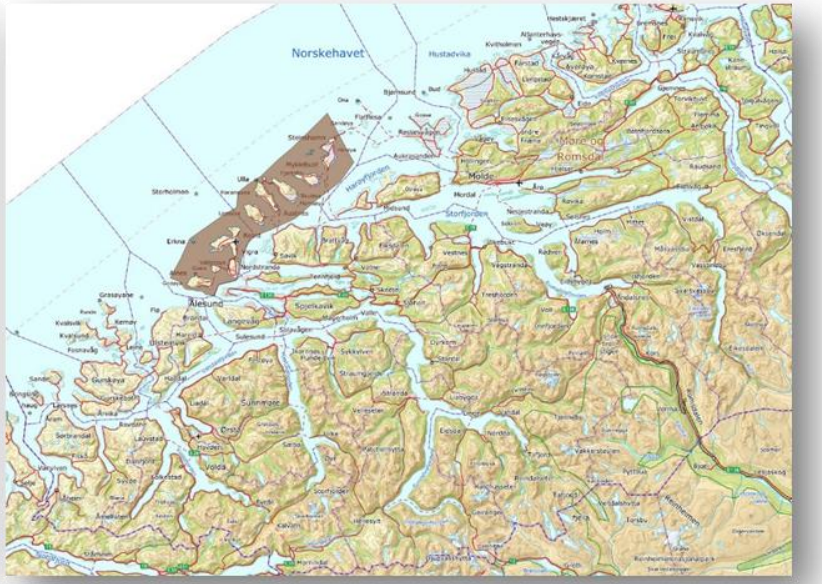
FOTO: EILIV LEREN. TERRENGMODELL: KARTVERKET

Marine Grunnkart pilotprosjekt 2020-2022

Stavanger

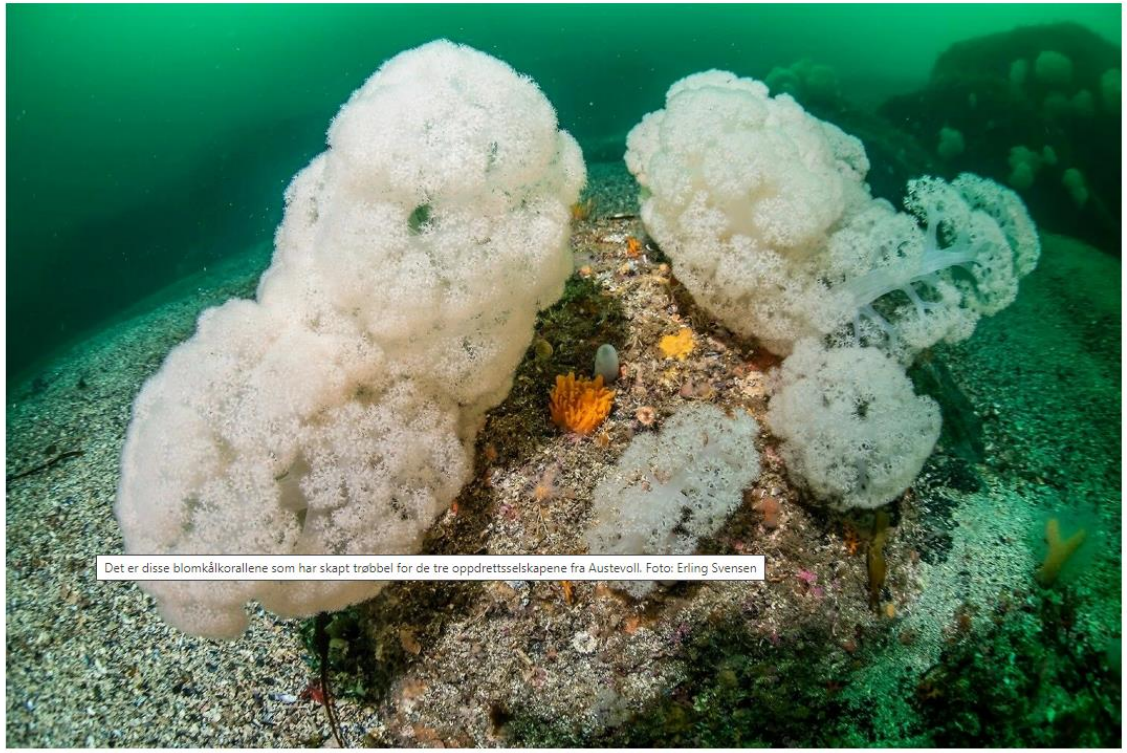


Ålesund og Giske



Skjervøy og Kvænangen

Consequences of lack of baseline knowledge



Det er disse blomkålkorallene som har skapt trøbbel for de tre oppdrettsselskapene fra Austevoll. Foto: Erling Svensen

Tapte rettssak om blomkålkoraller

De tre oppdrettsselskapene Troland Lakseoppdrett, Austevoll Melaks og Langøylaks har tapt rettssaken der de ble nektet å drive oppdrett grunnet funn av blomkålkoraller.

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From the Norwegian Environmental Department:

This lawsuit shows that had adequate baseline knowledge (bathymetry, geology, biology) been accessible before auqaculture industry applied for new locations, permission would not have been given and costs would have been saved

Coastal Zone Management in Stavanger

Acces to marine basemaps has greatly improved the knowledge base for decision making.

Fisheries Directorate

FISKERIDIREKTORATET

Adm.enhet: Forvaltningsseksjonen i region Sør
Saksbehandler: Knut Kristian Skjolden
Telefon: 97672957
Vår referanse: 22/9738
Deres referanse: 20/1909-283
Dato: 30.09.2022

Stavanger kommune
Postboks 8001
4068 STAVANGER

Innspill til høring og offentlig ettersyn av forslag til Kommuneplanens arealdel 2023-2040 – Stavanger kommune Rogaland

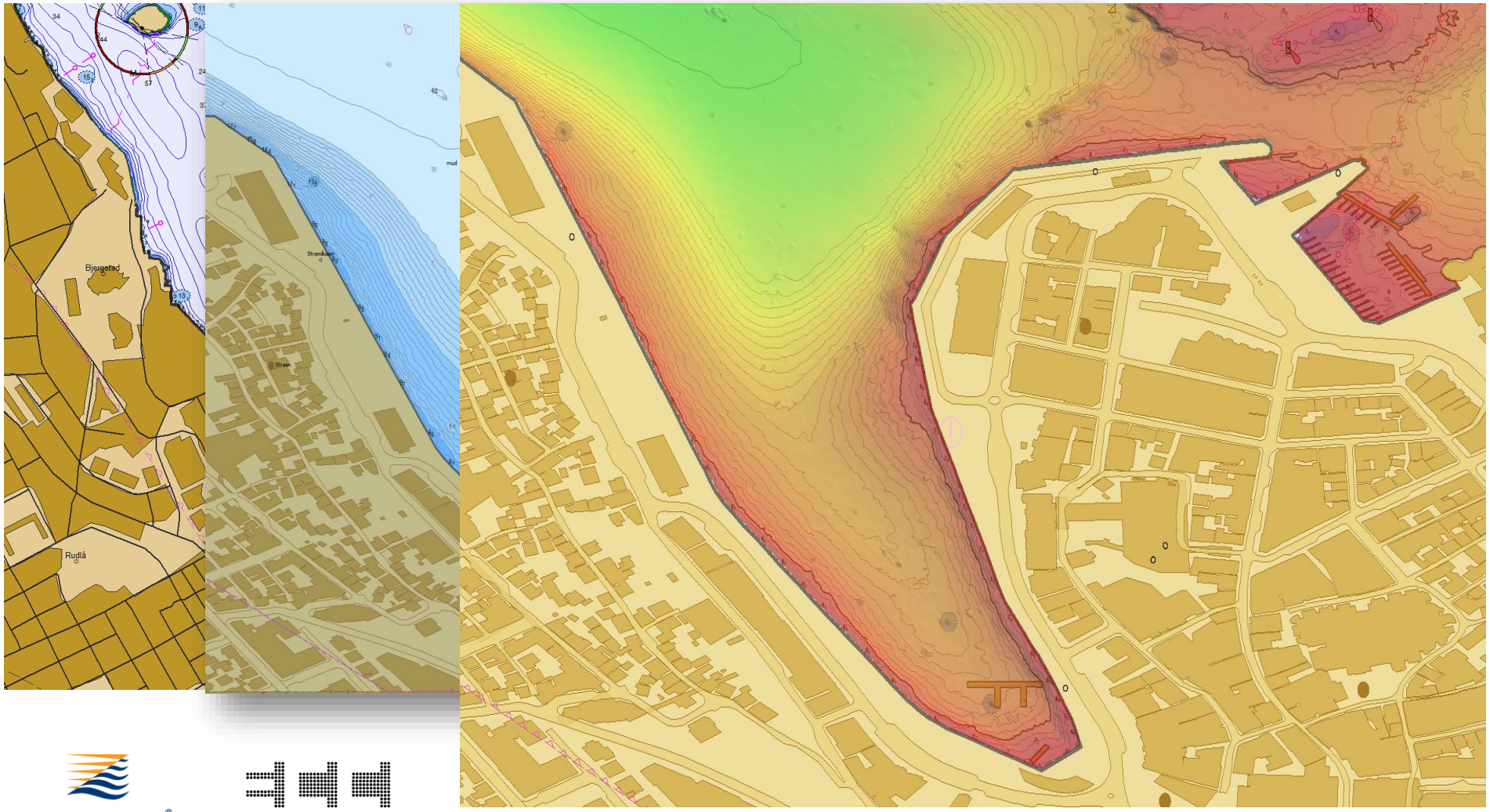
Vi viser til brev 1.7.2022, hvor Stavanger kommune ber om innspill til den nye, og første, arealdelen for Stavanger kommune etter kommunesammenslåingen 1.1.2020. Planen skal erstatte kommuneplanens arealdel for de tre kommunene som ble sammenslått, og kommuneplanens arealdel i Hjelmeland kommune for østre deler av Ombo. Fiskeridirektoratet region Sør har fått utsatt frist til å gi tilbakemelding.

Fiskeridirektoratet
Fiskeridirektoratet er myndighetenes rådgivende og utøvende organ innen fiskeri- og havbruksforvaltning i Norge. Vår oppgave når det gjelder arealforvaltning er å sikre eksistens og utviklingsmuligheter for marine næringer - fiskeri og akvakultur - herunder å ta vare på marint biologisk mangfold. Dette oppnås best ved å tilstrebe en balansert og bærekraftig utnyttelse av kystsonen.

Fiskeridirektoratet sin visjon er: *"Livet i havet – vårt felles ansvar"*.

Vurdering og merknader
Generelt om kyst- og sjøområder i kommuneplanen
Det er viktig å inkludere kystnære sjøarealer og marin sektor i planarbeidet - for å sikre de marine næringene samt gi kommende generasjoner mulighet til å dra nytte av de fordeler som ressursene, beliggenheten og miljøet i en kystkommune gir. Det er også viktig for den videre utviklingen av marine næringer at de sikres gjennom kommunens planer. Stavanger kommunes forslag til ny arealdel framstår for Fiskeridirektoratet region Sør som over snittet solid og gjennomarbeidet mtp. sjøarealene.

New digital nautical charts



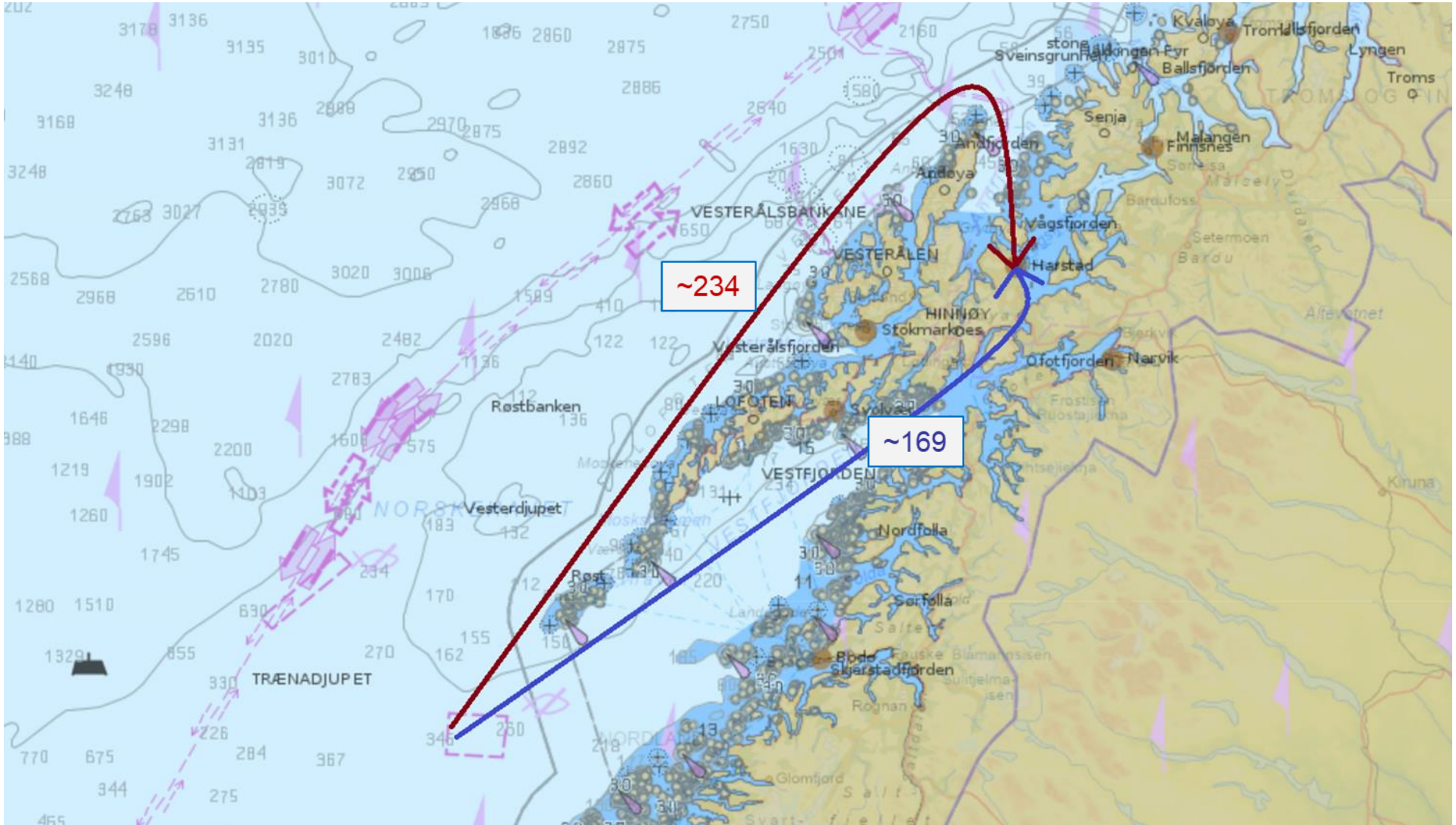
S-102

PRIMAR®

ELECTRONIC CHART CENTRE


Elevation model
Water level
Cadastre
Point cloud of port
Standarized port data
Vegetation
Detailed bathymetry
Data from the Norwegian Mapping Authority / the Norwegian Hydrograhic Office

Combination of S-102, S-104 and S-111, resulted in 65Nm shorter route, saving 2 tonns of LNG AND 5.5 TONNS OF co2



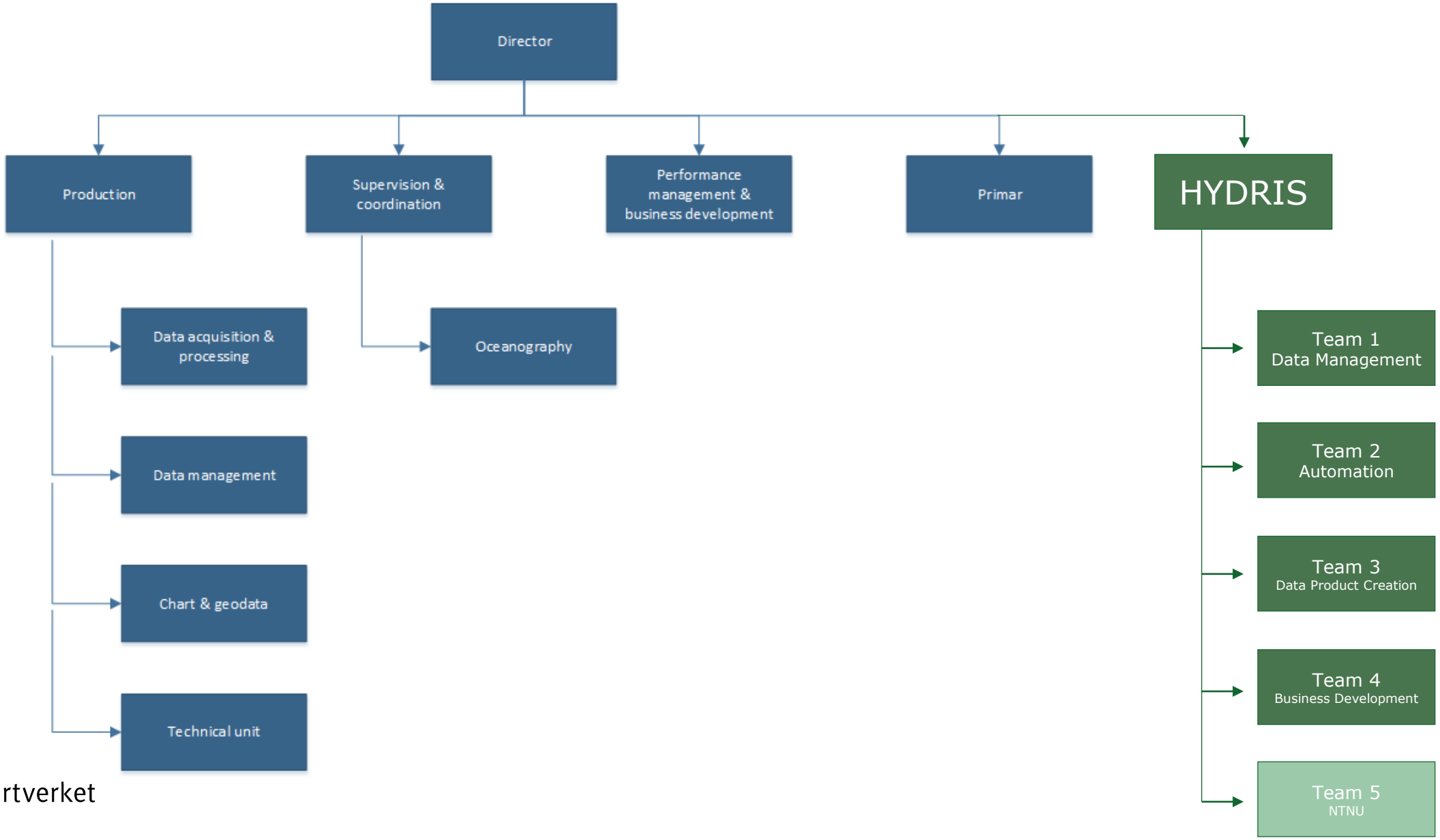
Kartverket

Product Organisation HYDRIS
(Hydrographic Information System)

ARHC13 – National Report of Norway

September 2023

HYDRIS Product Organization in Norwegian Hydrographic Service



Kartverket

HYDRIS Product Organization – part of digital transformation strategy

HYDRIS - working with technology

Renewing the existing hydrographic data management solution, automating parts of the product production pipeline and building the technical architecture combining commercial off the shelf technology and custom development based on open-source technology.

HYDRIS - implemented agile methodology

The teams work as multi-disciplinary, autonomous teams in an agile fashion towards agreed upon OKRs. We have found this a remarkably effective way of organizing such highly technical work. Improving the digital competency throughout the organization.

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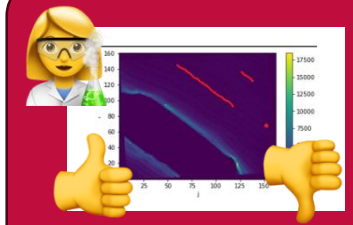
HYDRIS will give the Sea Division a technological boost and provide reliable marine geodata, easily accessible in a user-friendly and efficient way.

The new solution will be based on a modern technological platform that supports:

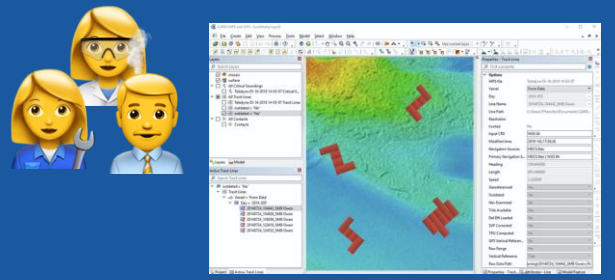
- FAIR principles emphasizing machine-actionability
- support a more efficient nautical production
- multiple/various digitization and data sharing solutions
- fast data access and effective bathymetric production (short processing time / increased automation)
- layered services and functional structure (allowing algorithmic, AI/ML, production etc. processes to run on top off the data)
- an integrated metadata management
- management of complete and original data (no or minimum generalization required)
- integrated product and data sharing solutions (machine-to-machine, APIs, etc.).

HYDRIS Architecture

Data Reception



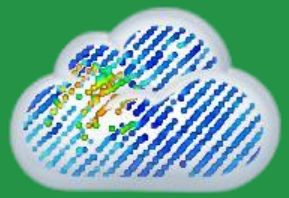
Dashboards and Notebooks



Caris Applications

Product Creation

Automation / Orchestration



Sensor Data Archive

Catalog

Automated Processes

Caris Bathy Database

Product Databases

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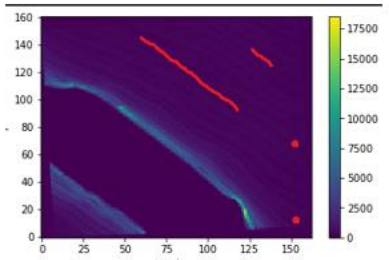
Example: Automated validation of the MAREANO specification

Survey

Point Clouds

Validation

Deviation map



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Digital specification

Kartverket

Achievements – where are we?

New Data Management System - COTS

- Implementation of Caris BDB server 6 has been ongoing for almost 1.5 years now
- Started migrating our legacy data and receiving new data into the system before summer
- Gained increased competence in:
  - the new data management system
  - automaton of processes

Automation open-source

- Built a software stack based on open-source components.
- Stack is used for automatic validation of survey datasets according to the survey spec (coverage, noise, levels, etc.)
- Read and write data in common formats
- Accumulating building blocks for processing and analysis

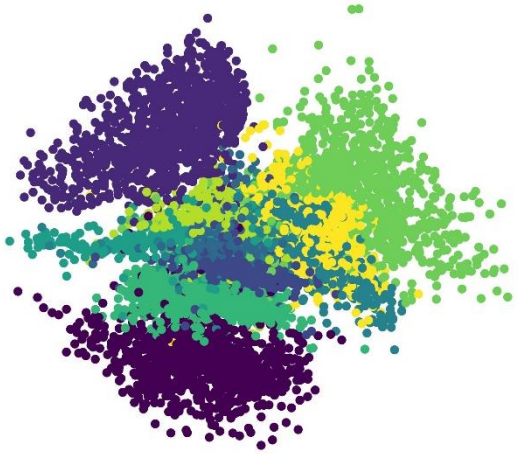
Data Product Creation

- Recently adapted activity where we facilitate for creation of the products
- Outlined new processes that are currently under testing and includes:
  - New master DB
  - Several product DB’s
- Development is based on COTS

AI-project with Norwegian University of Science and Technology (NTNU): Anomaly screening for MAREANO Bathymetric Surveys

Start-up August 2023

6 master's students in computer technology



Project description:

Utilize **latent space classification** techniques to perform quality screening of multibeam echo sounder data. By mapping the raw data to a latent space, the project aims to identify and classify anomalies, **survey issues**, and areas with **notable seabed topography**, providing valuable insights for the **quality assessment** and planning of further data processing.

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NTNU

Collaboration

Before summer, NHS, HYDRIS and Danish Geodata Agency (Geodatastyrelsen) held a meeting in Aalborg. The meeting was particularly promising as both entities have acquired, are using, developing and maintaining very similar management systems for the administration of hydrographic data. The system is delivered by the same vendor, which identified numerous of opportunities for collaborations.

NHS is planning to broaden the collaboration and welcome participation from all the other Nordic countries too.

Collaboration structure, organization, goals and results yet to be formalized and defined.

...and, HYDRIS will take an active role here, both of structural and technical character.

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Oil and gas data sharing

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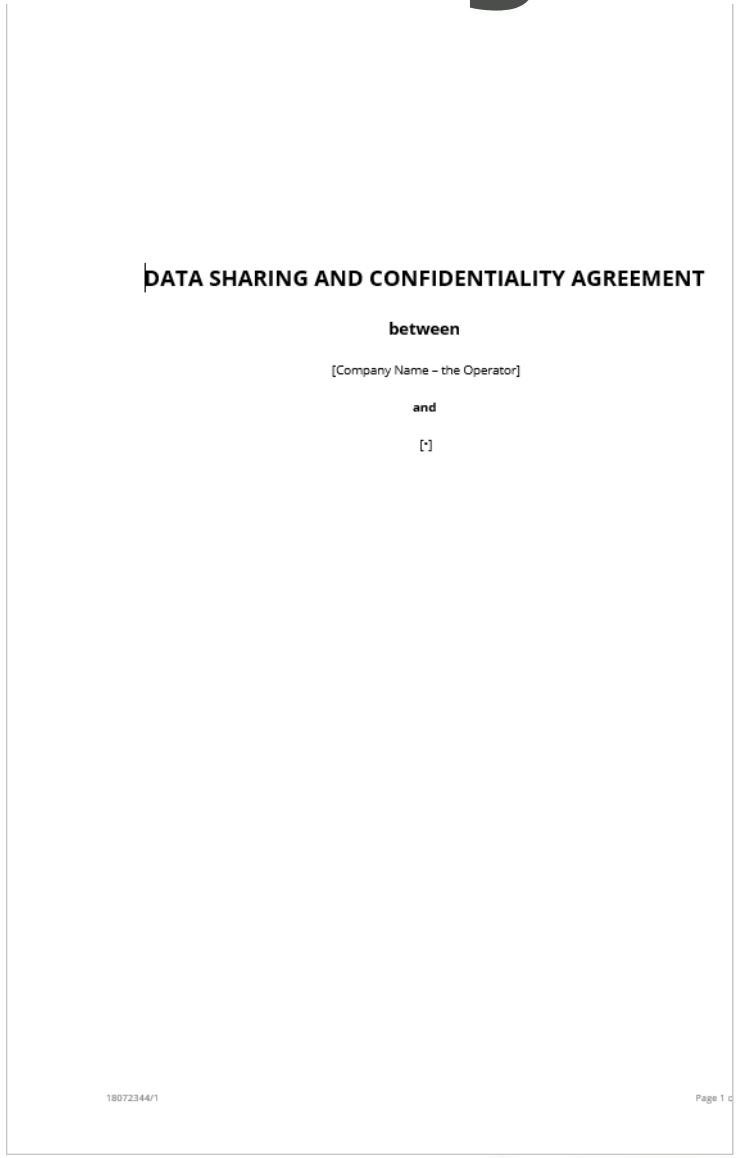

DATA SHARING AND CONFIDENTIALITY AGREEMENT

between

[Company Name – the Operator]

and

[•]

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Page 1 c

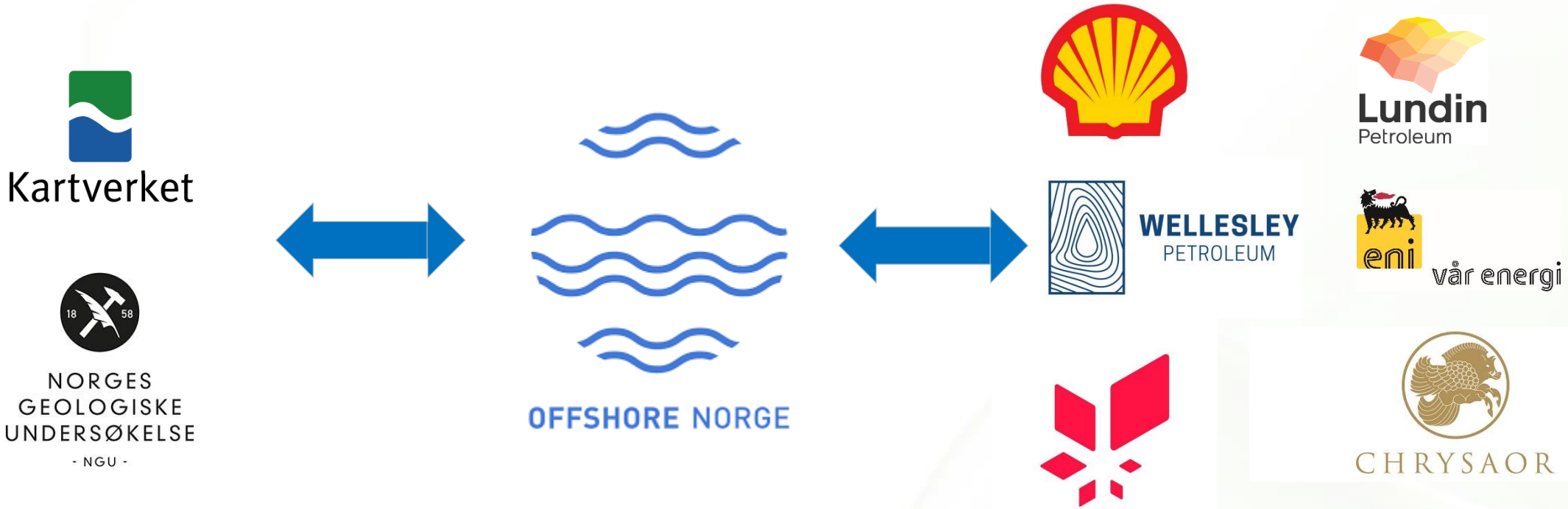
OFFSHORE NORGE

REPORT

Guidelines for data sharing with Mareano:
Recommendations from EMF work group

Postboks 8065, 4068 Stavanger | offshorenorge.no

Participants:



Oil and Gas data sharing

- At the turn of the year 2022/2023, there were a total of 39 exploration and production companies on the shelf; 18 companies as operators and 21 as licensees in extraction permits.

- Making the oil industry’s data available in Geonorge (within certain limitations)
- Quality-assured data on a common data model
- Easier data access, updated data

To the benefit of:

- Emergency services
- Armed forces
- Mareano
- Marine spatial plans
- Oil and gas industry
- Offshore wind industry
- Fisheries

Oil and Gas data sharing

- Chemical analyses
- Biological analyses
- Geo-referenced photos
- Geo-referenced videos
- Habitat and biotope observations
- Seismic from site surveys
- Proprietary seismic from licenses
- Bathymetry data
- Watercolumn data
- Side-scan sonar data

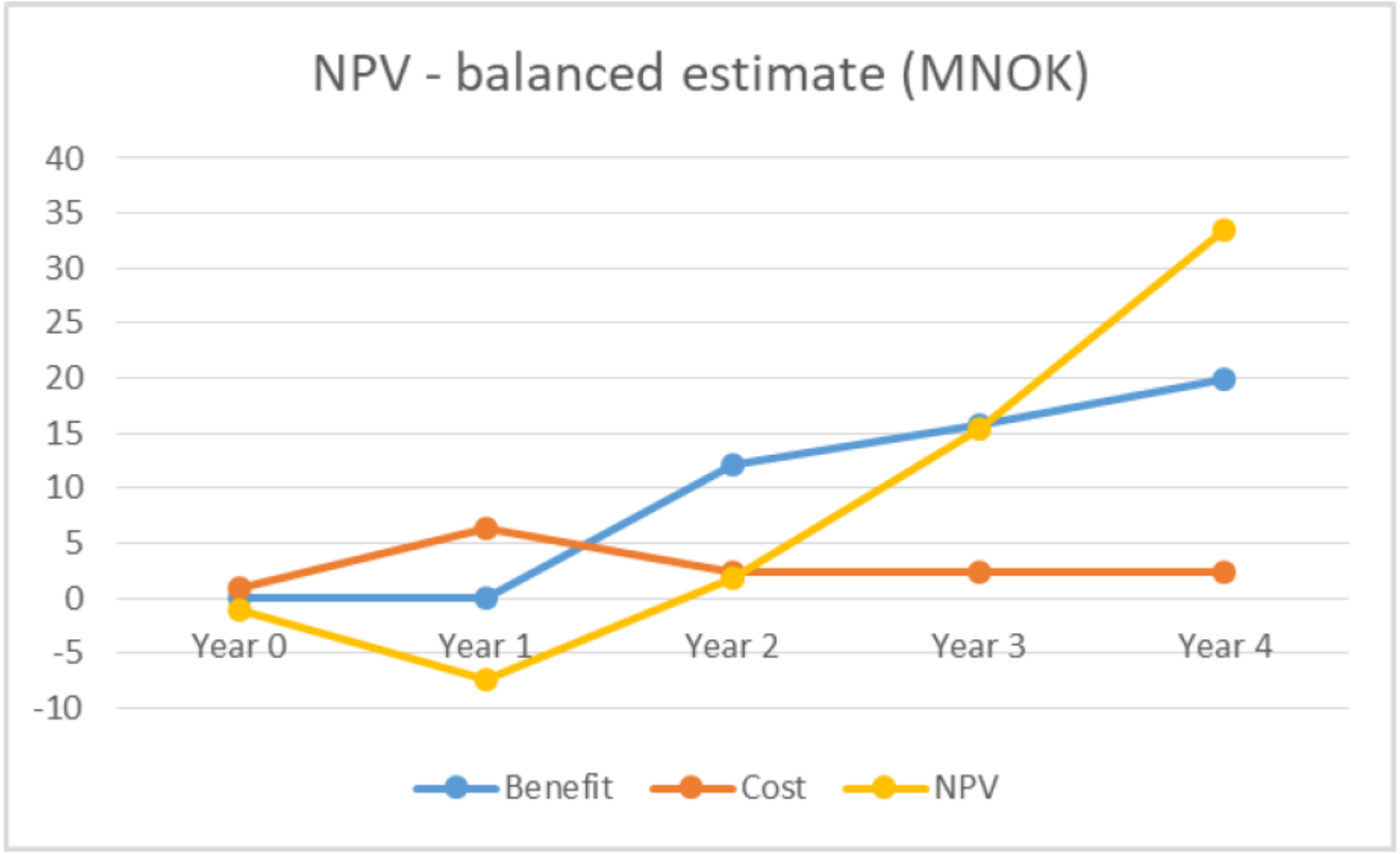
Oil and Gas data sharing – next step

- Cables
- Facilities (platform, plant, windpark etc.)
- Land Installations
- Pipelines
- Safetyzones and Restricted Areas
- Subsea/Seabed installations (template, riserbase etc..)
- Surface installations (Loading buoy, anchorbuoy, metocean, Rigs etc.)

Benefits for the industry

Shared Geographic Information: Benefit Assumptions						
Benefit specific assumptions	**Unit**	**Low**	**Most likely**	**High**	**High ****	**Balanced**
Operational						
Marine Operations Incidents with Non Productive Operational Time / Geographic Information related	No/year	3	5	5	0.1	4.6
Hours Per Incident	Hrs/Incident	12	24	48	84	26.4
Cost per Hour Marine Operation	NOK/hr	31,250	41,667	62,500	100,000	43,750
Equipment Damage (infrastructure)		500,000	1,000,000	2,000,000	50,000,000	11,100,000
Share of time per incident that can be reduced	%	50%	70%	90%	90%	70%
					** High cost, low incidence	
Planning & Reporting	**Unit**	**Low**	**Most likely**	**High**	**Balanced**	
Number NCS Marine Operations	No/year	200	250	300	250	
Planning & Reporting GI - Hours per Job	No/Hours	25	30	35	30	
Cost Per Man Hour	NOK/hr	2,000	2,250	2,500	2,250	
% Time Planning and Reporting GI which can be reduced	%	40%	50%	60%	50%	

Benefits for the industry



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Questions?

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