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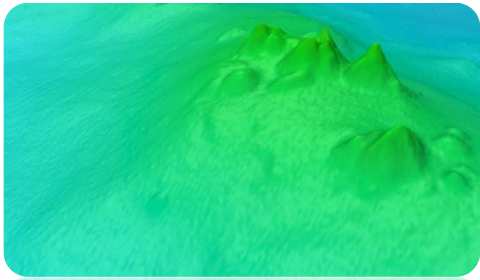
MAREANO

Marine **AREA** database for **NO**rwegian waters



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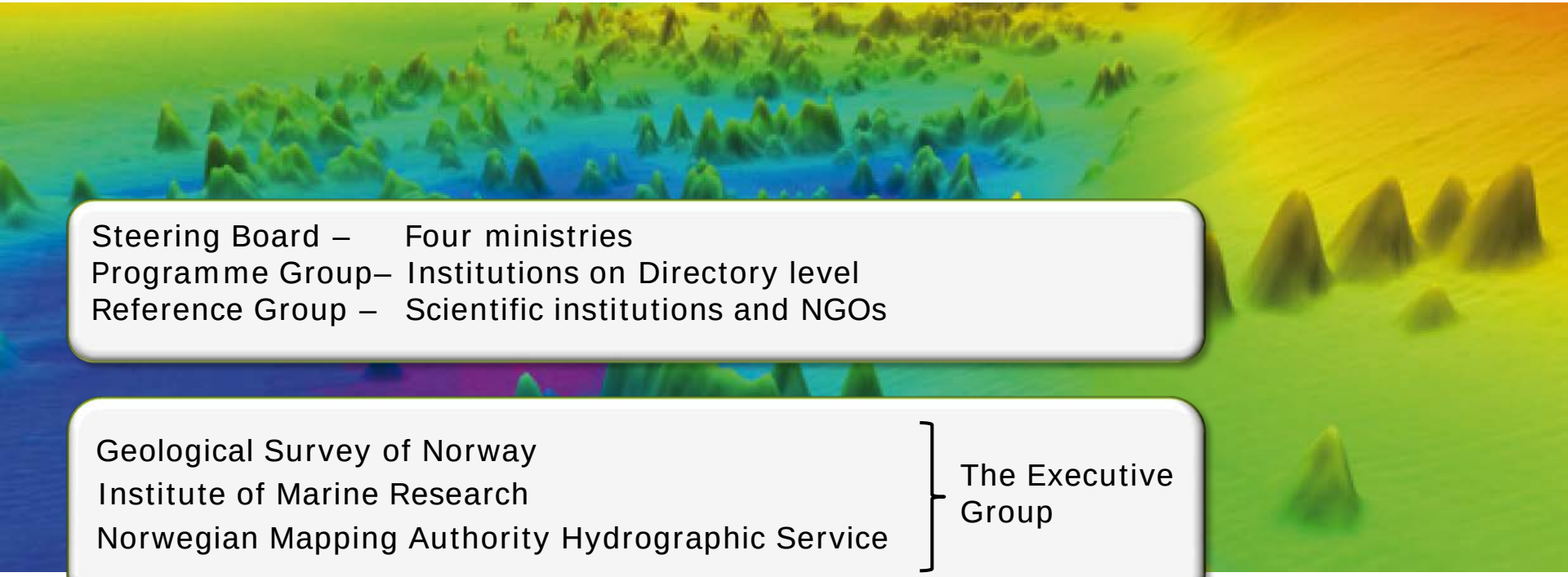
Collecting marine benthic knowledge

MAREANO maps the seabed off the Norwegian coastline, presenting knowledge on:

- Habitats – geological and biological composition
- Nature types – terrain variability and seascape
- Environmental status in bottom sediments
- Detailed depth data
- Database- and mapping services presenting systematic information about Norwegian seas

Co-operation and organisation

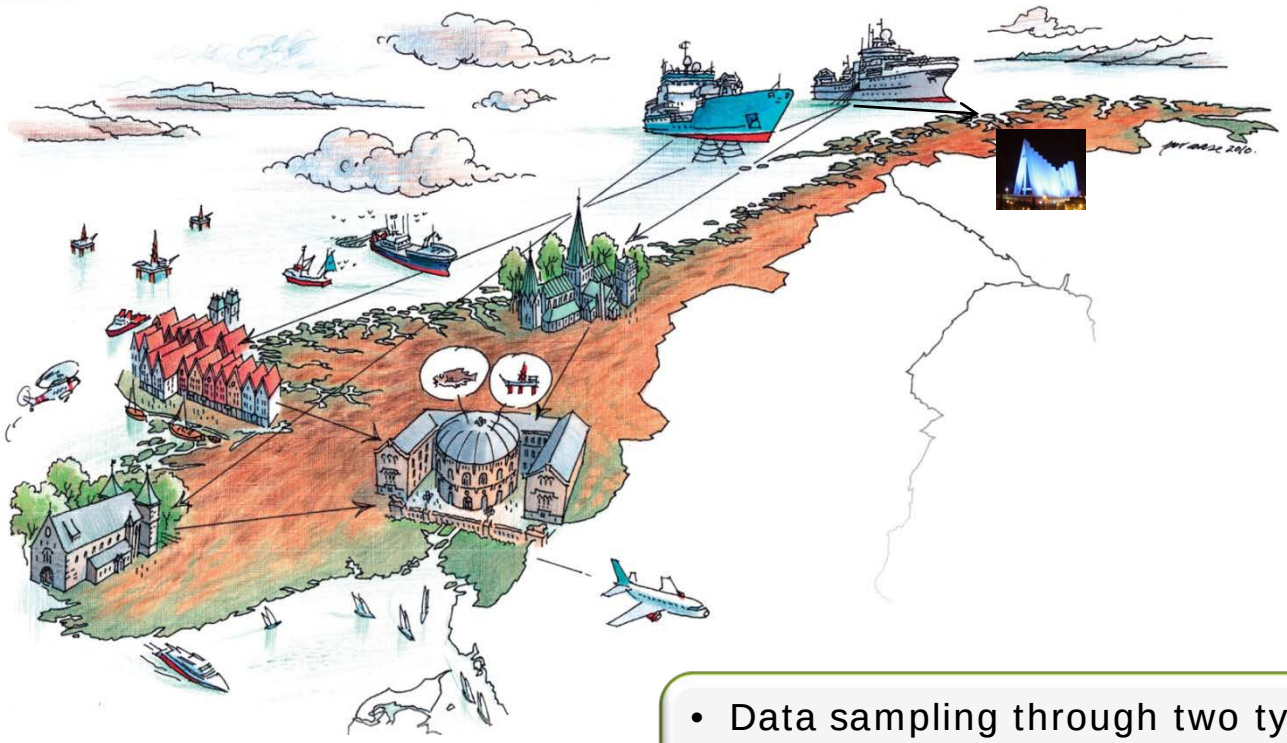


Steering Board – Four ministries
Programme Group– Institutions on Directory level
Reference Group – Scientific institutions and NGOs

Geological Survey of Norway
Institute of Marine Research
Norwegian Mapping Authority Hydrographic Service

} The Executive Group

Data collection, management and information



- Data sampling through two types of cruise activities
- Management within three State services
- Information of the combined results

Organising

The Programme Group (executive heading):

- the Climate and Pollution Agency
- the Coastal Administration
- the Directorate of Fisheries
- the Geological Survey of Norway
- the Institute of Marine Research
- the Norwegian Directorate of Nature Management
- The Norwegian Mapping Authority
- the Norwegian Petroleum Directorate
- the Norwegian Polar Institute

Financing

MAREANO is financially supported through the Norwegian State Budget

2005: 5,0 mill. Norw. kroner
2006: 23,6 mill. Norw. kroner
2007: 32,6 mill. Norw. kroner
2008: 32,6 mill. Norw. kroner
2009: 51,5 mill. Norw. kroner
2010: 51,5 mill. Norw. kroner
2011: 96,4 mill. Norw. kroner
2012: 88,4 mill. Norw. Kroner
2013: 90,5 mill. Norw. kroner

Field Methods

Depth mapping / Bathymetry

- Multibeam echo sounding from surface ship (depth data, backscatter signals and water column data)

Geological sampling

- Sediment samples by using corers or grab
- Visual observation of the seabed (real-time video)
- Sediment-penetrating echo sounder (e.g. TOPAS)

Biological sampling

- Fauna is sampled by using grab, sledge and beam trawl
- Video

Processing of sampled data

the Norwegian Mapping Authority:

- Noise reduction and quality assurance of depth data
- Terrain modelling and production of shadowed relief pictures

the Institute of Marine Research:

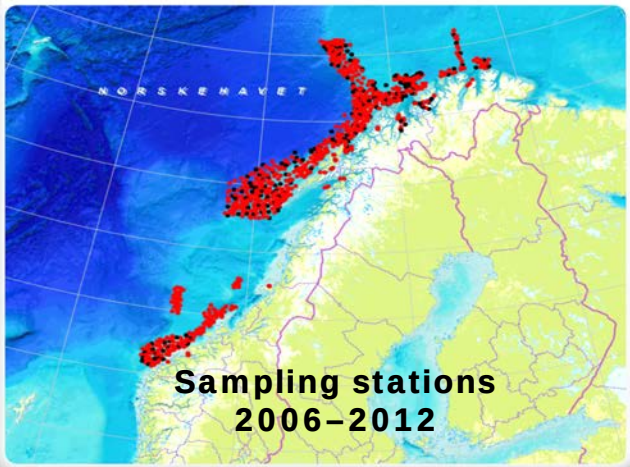
- Analysing video films
- Identification, counting of animals per species, and biomass measurements of collected fauna
- Production modelling of benthic fauna
- Modelling of different nature types/ biotopes in co-operation with the Geological Survey of Norway
- Chemical sampling and analyses in co-operation with the Geological Survey

the Geological Survey of Norway:

- Sediment grain size
- Chemical analyses using ICP-AES and AAS
- Dating of sediments through ^{210}Pb and ^{14}C
- Processing of backscatter- and water column data
- Terrain analyses
- Interpretation and digitalising of seabed maps
- Modelling of habitat maps (”natural system” level) in co-operation with the Institute of Marine Research

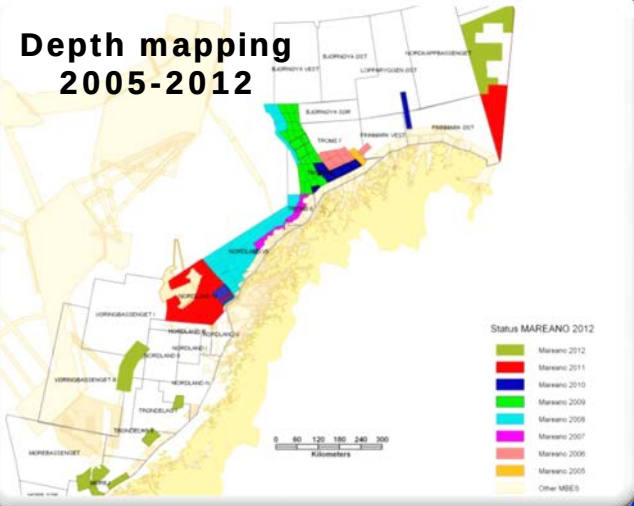
- Management-directed mapping
- Future climatic tool
- Pollution
- Geological sea floor maps
- Species richness
- Habitats / nature types / biotopes
- New species and habitats/biotopes

2005–2012	
Mapped area bio-geo-chemistry	95 950 km²
Video stations	964
Physical sampling	184
Cruise time (geo/bio)	15 md
Depth mapping	104 000 km²



Sampling stations 2006–2012

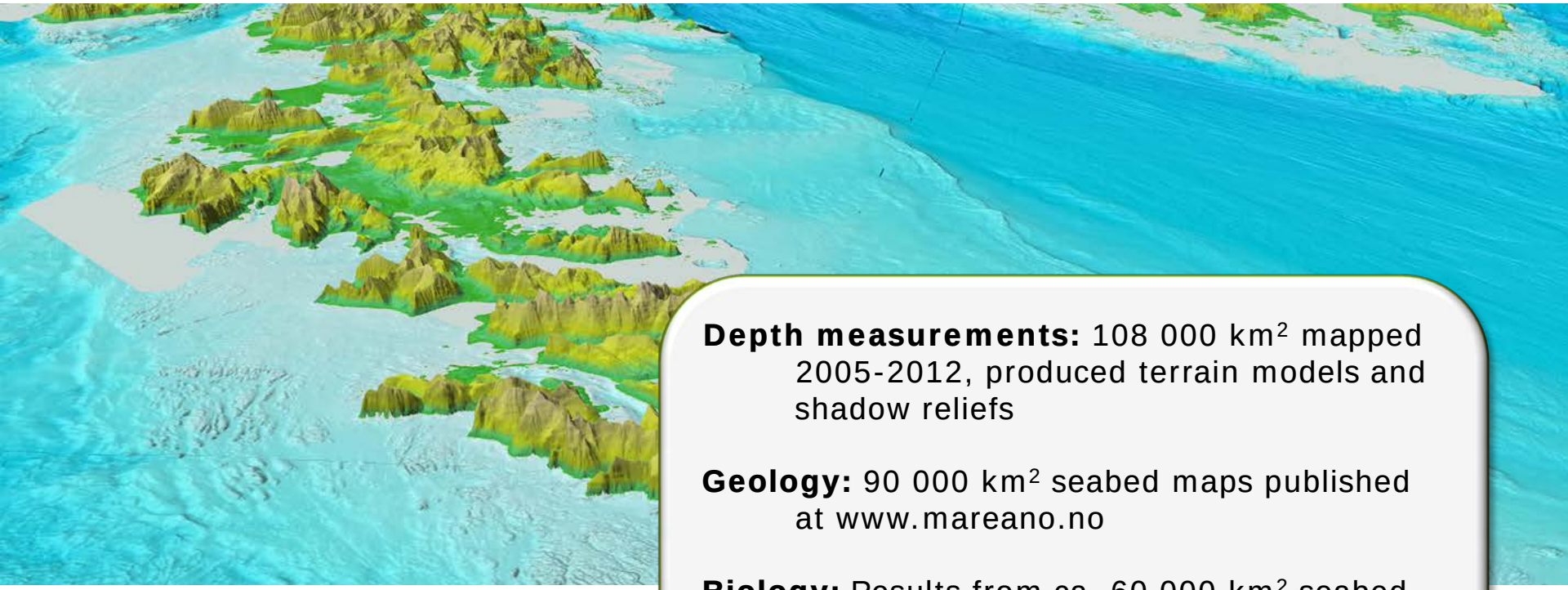
Depth mapping 2005-2012



BARENTSHAVET

NORSKEHAVET

Results



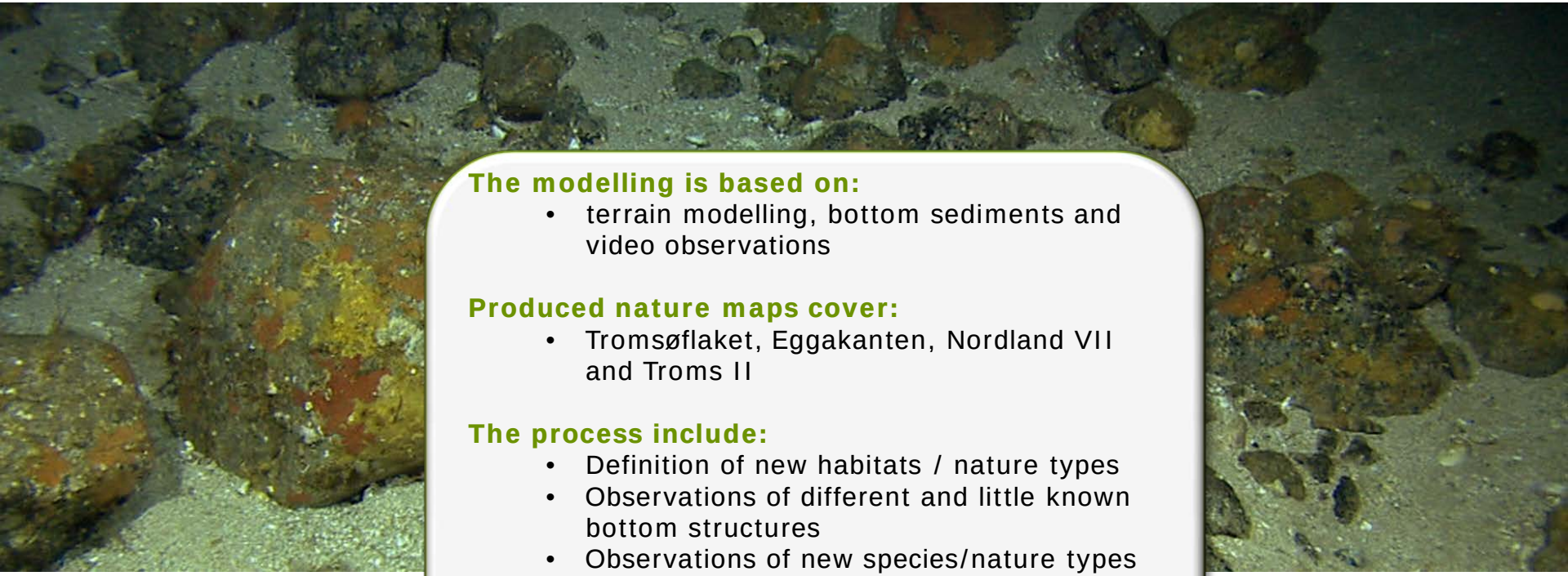
Depth measurements: 108 000 km^2 mapped 2005-2012, produced terrain models and shadow reliefs

Geology: 90 000 km^2 seabed maps published at www.mareano.no

Biology: Results from ca. 60 000 km^2 seabed, published at www.mareano.no.

Pollution: Results from ca. 90 000 km^2 seabed are published at www.mareano.no

Nature type maps – one of the main products



The modelling is based on:

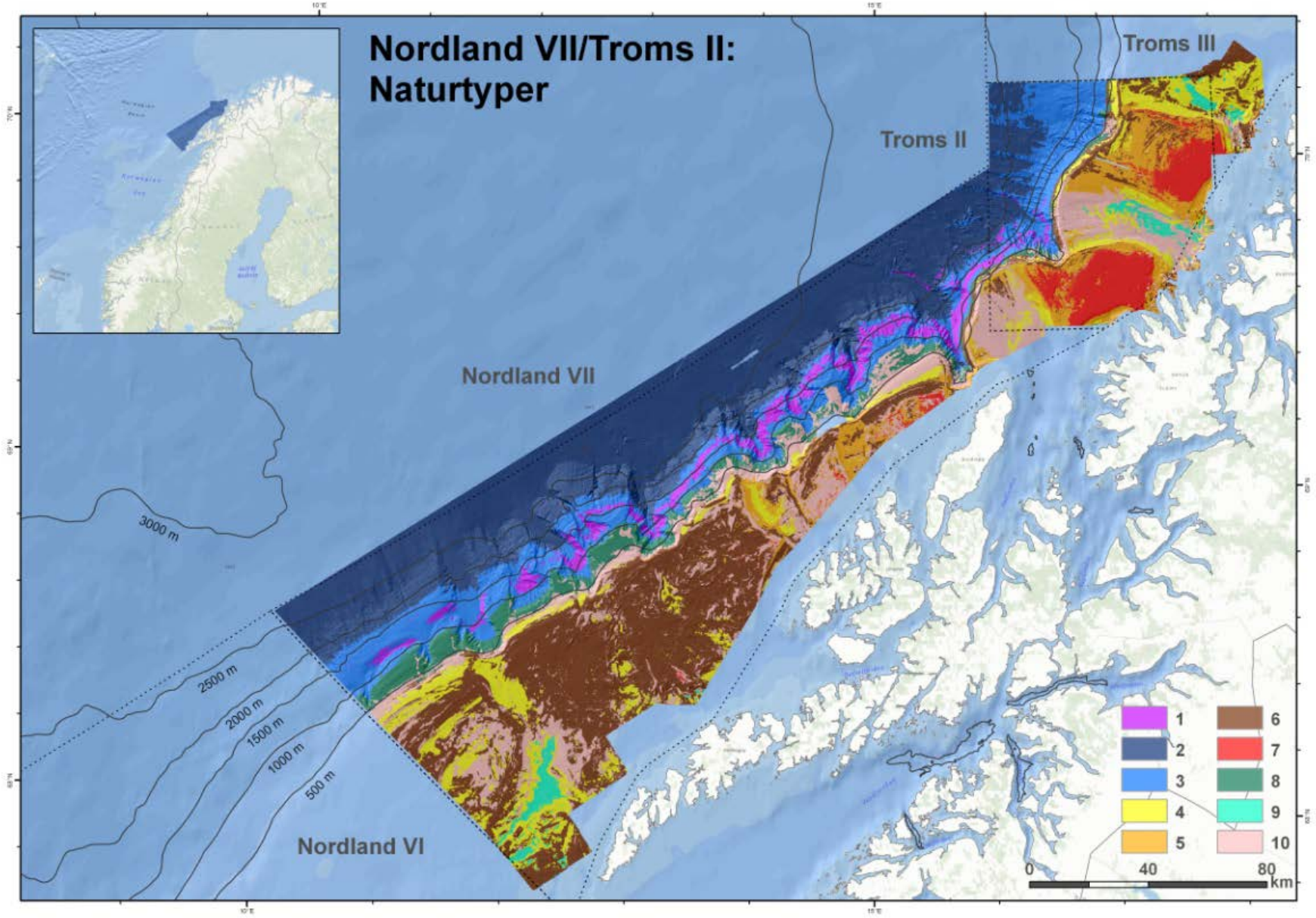
- terrain modelling, bottom sediments and video observations

Produced nature maps cover:

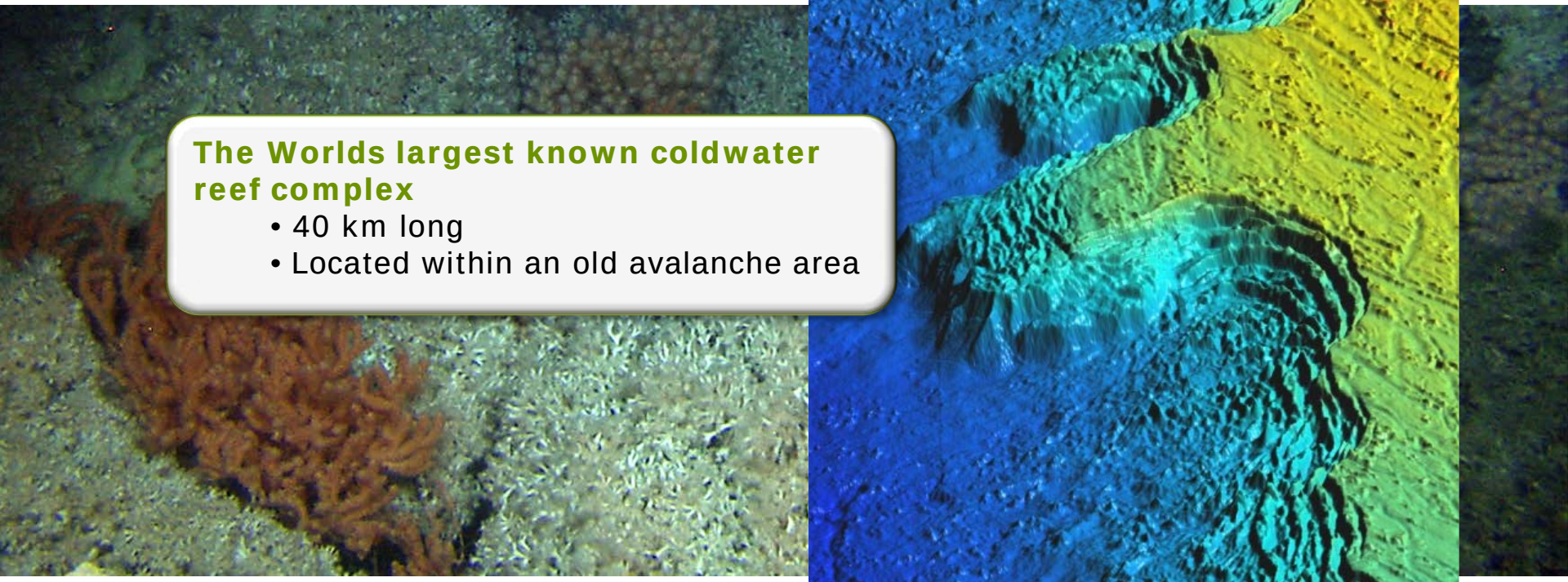
- Tromsøflaket, Eggakanten, Nordland VII and Troms II

The process include:

- Definition of new habitats / nature types
- Observations of different and little known bottom structures
- Observations of new species/nature types that according to international conventions are recognised as being vulnerable


Nordland VII/Troms II:
Naturtyper
Troms III
Troms II
Nordland VII
Nordland VI
3000 m
2500 m
2000 m
1500 m
1000 m
500 m
1
2
3
4
5
6
7
8
9
10
0
40
80
km

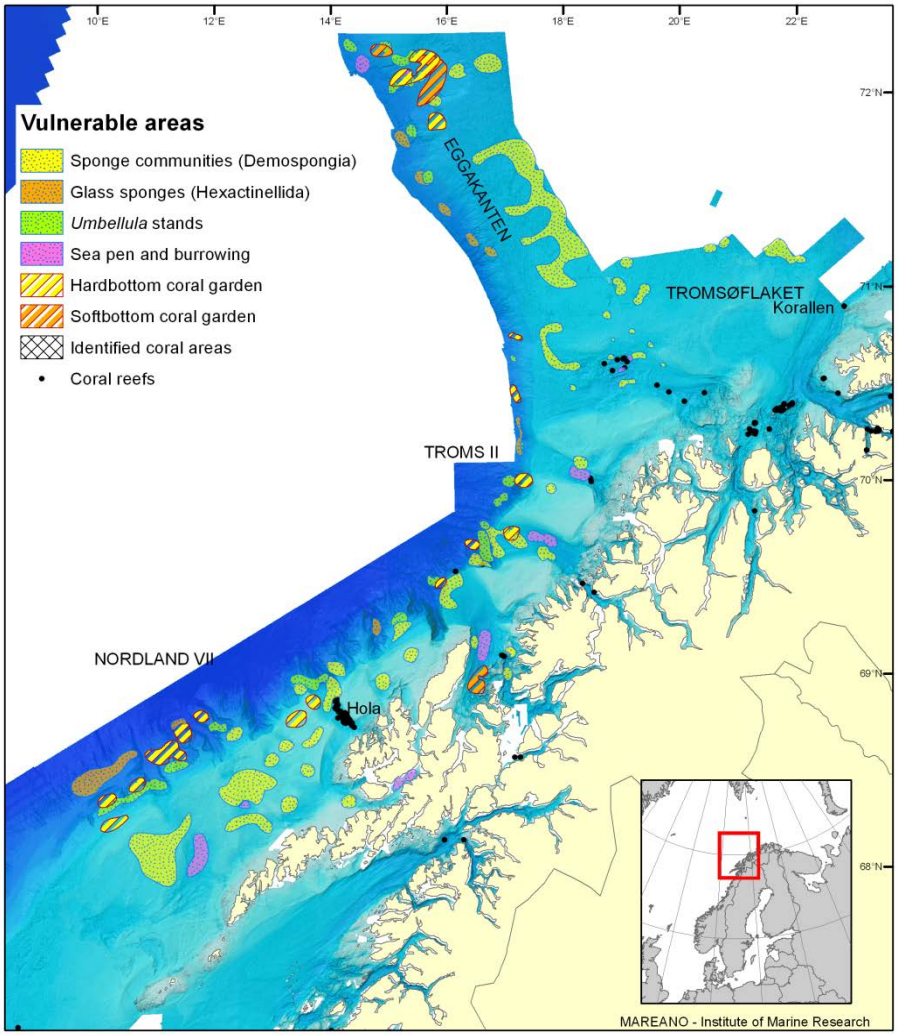
The Røst reef



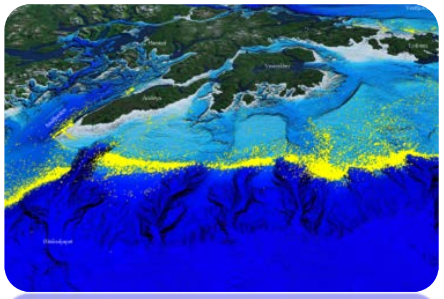
The Worlds largest known coldwater reef complex

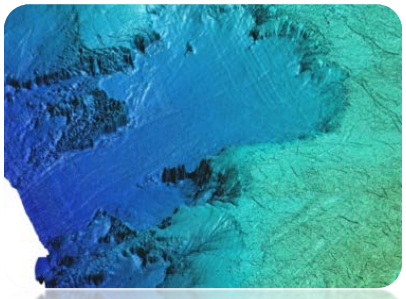
- 40 km long
- Located within an old avalanche area

Vulnerable nature types / habitats



Knowledge for whom and for what?





Characterising of nature types –
Basic knowledge for future ecosystem-based oceanic management

Pollution status for marine sediments –
Basic knowledge for future ecosystem - based oceanic management

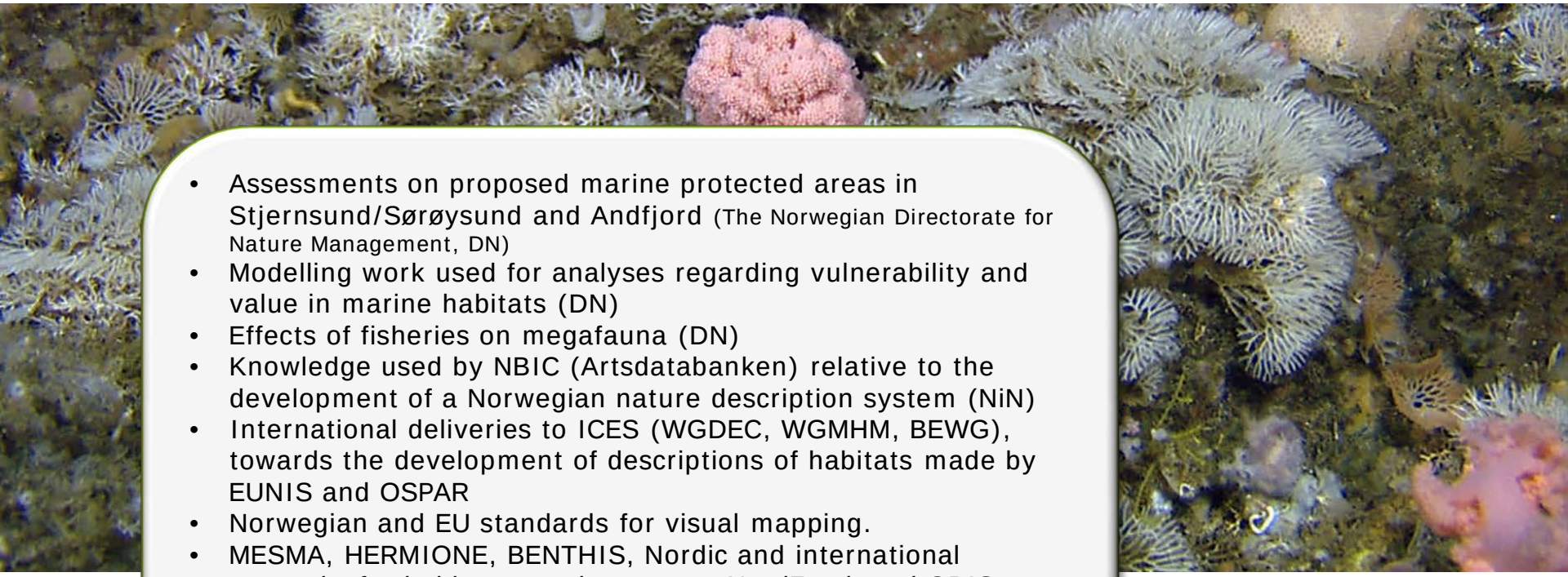
Fisheries –
Reduced fuel combustion, reduced negative effects on the seabed and fishing gears

- Stability judgement for subsea installations
- Location of wind-driven marine located electric power plants

MAREANO's knowledge is being used

- MAREANO delivers results to the revision of the Management Plan for the Barents Sea and the Norwegian Sea
- New habitat and species knowledge delivered to relevant national and international bio-agencies (e.g. the Norwegian Biodiversity Information Centre (NBIC = Artsdatabanken); OSPAR)
- Data on distribution of vulnerable and valuable habitats is available for e.g. official management services, industry and NGOs.

MAREANO's knowledge is being used



- Assessments on proposed marine protected areas in Stjernsund/Sørøysund and Andfjord (The Norwegian Directorate for Nature Management, DN)
- Modelling work used for analyses regarding vulnerability and value in marine habitats (DN)
- Effects of fisheries on megafauna (DN)
- Knowledge used by NBIC (Artsdatabanken) relative to the development of a Norwegian nature description system (NiN)
- International deliveries to ICES (WGDEC, WGMHM, BEWG), towards the development of descriptions of habitats made by EUNIS and OSPAR
- Norwegian and EU standards for visual mapping.
- MESMA, HERMIONE, BENTHIS, Nordic and international networks for habitat mapping as e.g. NordForsk and OBIS.
- Studies of trawling effects on the seabed – Biotrawl
- NMG2 – deliveries of new detailed marine bottom data to be used by the fishing fleet
- Terrain models are delivered to the production of bathymetric charts: IBCAO and GEBCO

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Information

www.mareano.no – mapping and description services

Downloadable datasets – terrain models, shape-files, WMS, produced standard maps, quality ensured data – *http://www.mareano.no/datanedlasting* and ”Norge digitalt:” *www.geonorge.no*

Books, brochures, conferences

Scientific and popular papers and articles

The future of MAREANO

MAREANO delivers basic knowledge for future use for management, science, industrial development, etc.

MAREANO is a long-term mapping project

- the Barents Sea
- the Norwegian Sea
- the North Sea?

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Thank you for your attention!