HAVFORSKNINGSINSTITUTTET

Sensitive (vulnerable) natural resources in deep waters

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I’ll talk about

Examples of sensitive or vulnerable habitats/species

Examples on distribution

Sponges as test organisms

Fish in the deep

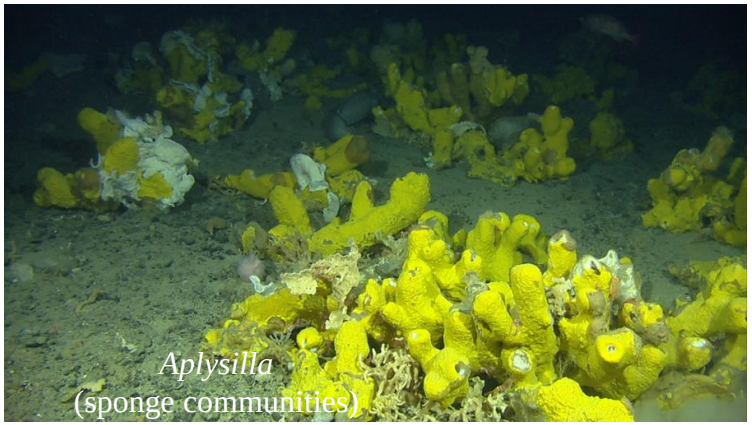
LoVe – a cabled seabed observatory

OSPAR List of Threatened and/or Declining Habitats

HABITATS	OSPAR Regions where the habitat occurs	OSPAR Regions where such habitats are under threat and/or in decline
Carbonate mounds	I, V	V
Coral gardens	I, II, III, IV, V	All where they occur
Cymodocea meadows	IV	All where they occur
Deep-sea sponge aggregations	I, III, IV, V	All where they occur
Intertidal Mytilus edulis beds on mixed and sandy sediments	II, III	All where they occur
Intertidal mudflats	I, II, III, IV	All where they occur
Littoral chalk communities	II	All where they occur
Lophelia pertusa reefs	All	All where they occur
Maerl beds	All	III
Modiolus modiolus beds	All	All where they occur
Oceanic ridges with hydrothermal vents/fields	I, V	V
Ostrea edulis beds	II, III, IV	All where they occur
Sabellaria spinulosa reefs	All	II, III
Seamounts	I, IV, V	All where they occur
Sea-pen and burrowing megafauna communities	I, II, III, IV	II, III
Zostera beds	I, II, III, IV	All where they occur

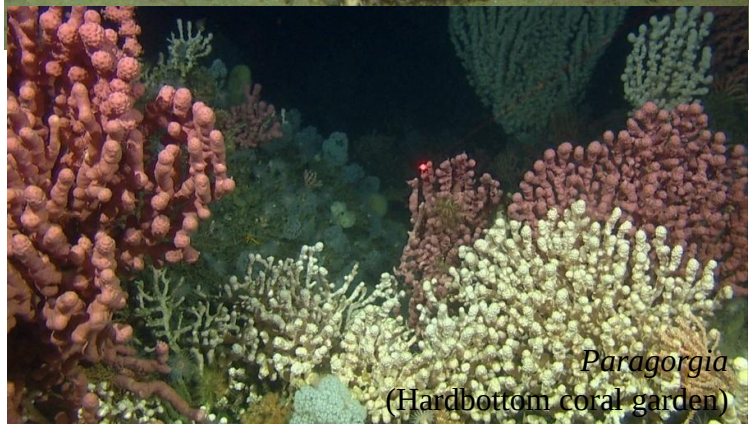
Sensitive or threatened habitats in deep water


Umbellula

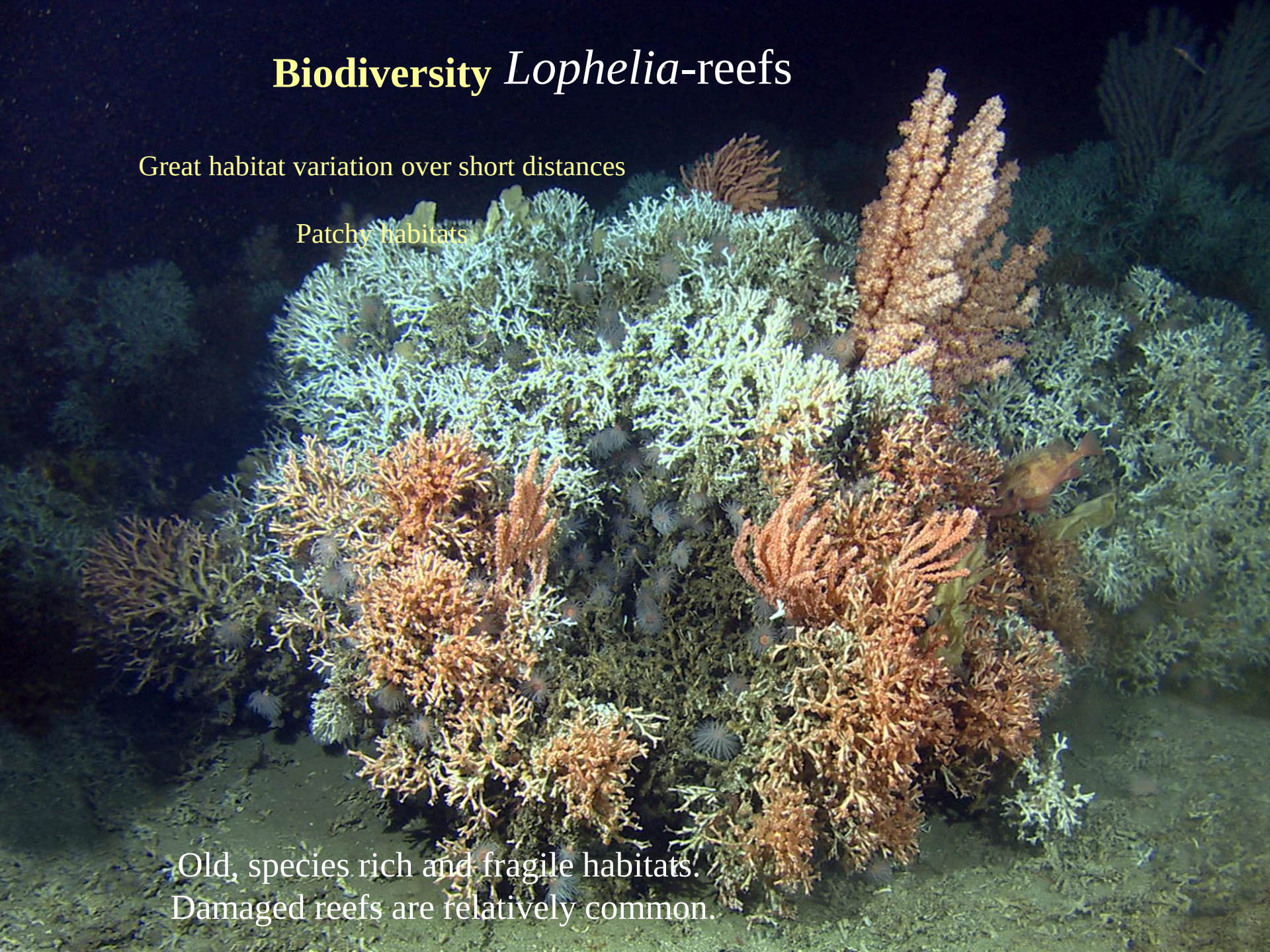

Aplysilla
(sponge communities)


Isidella
(Softbottom coral garden)


Paramuricea
(Hardbottom coral garden)


Paragorgia
(Hardbottom coral garden)

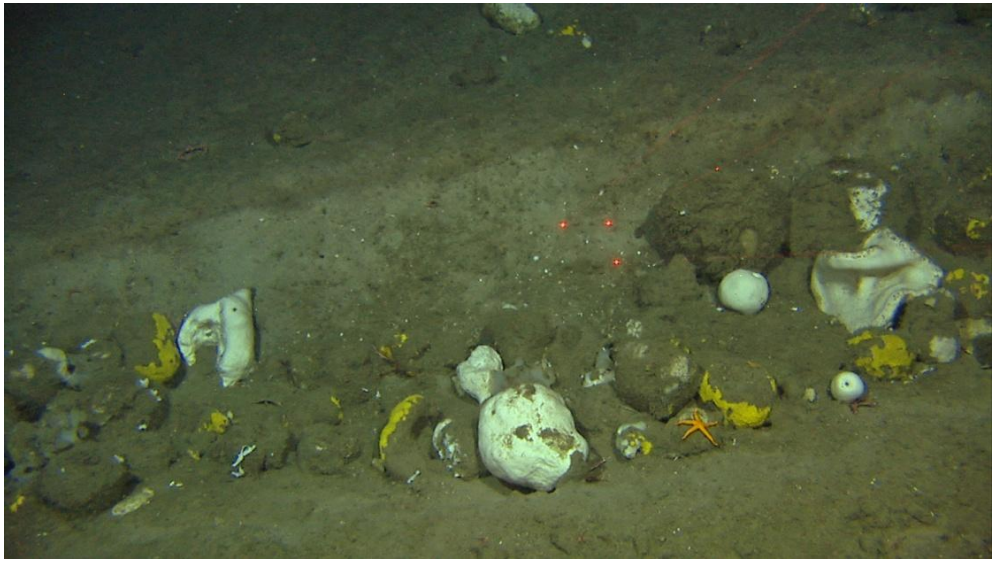

Kophobelemnon
(seapen and burrowing megafauna communities)

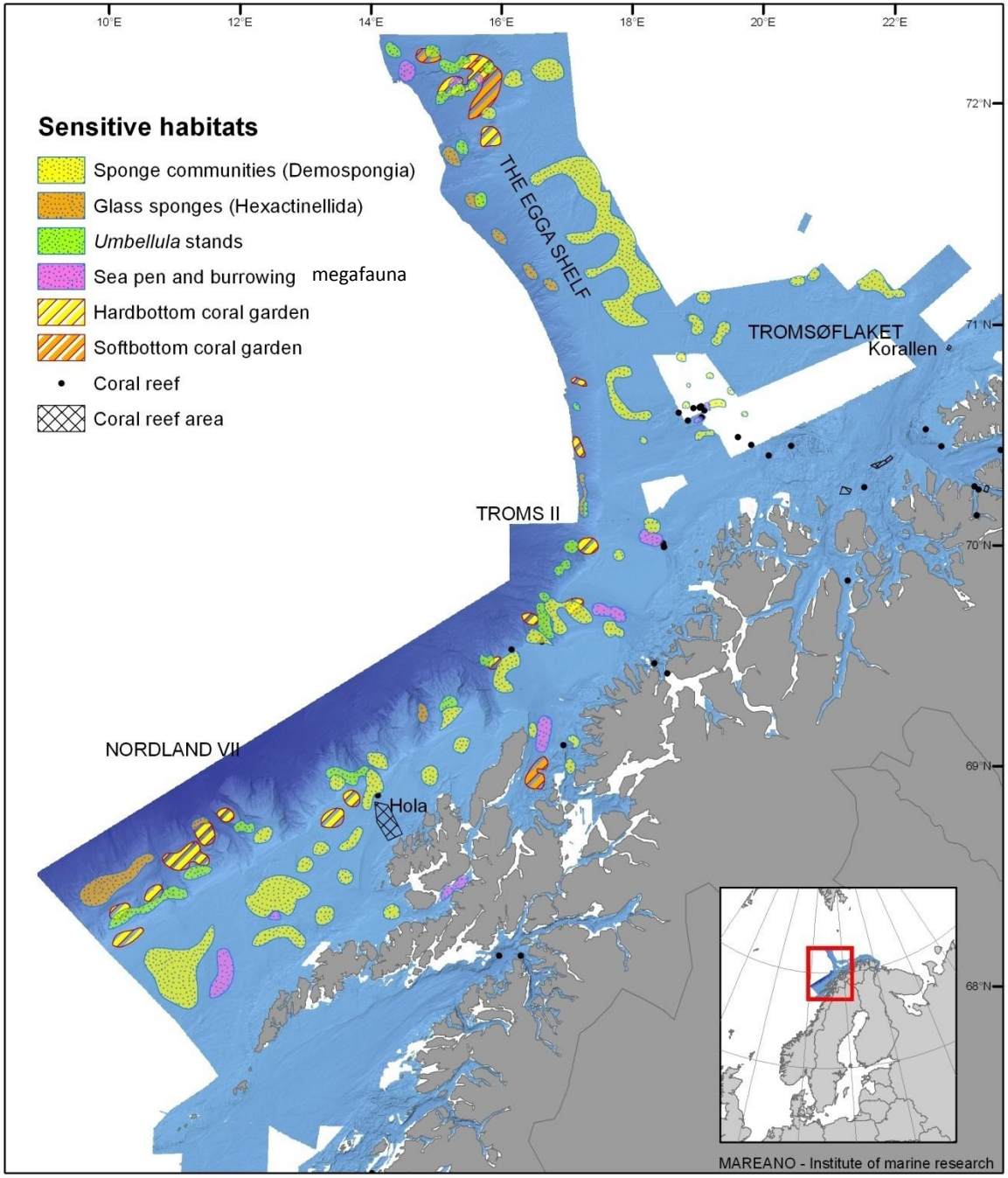

Biodiversity *Lophelia*-reefs
Great habitat variation over short distances
Patchy habitats
Old, species rich and fragile habitats.
Damaged reefs are relatively common.

Sponge communities (Demospongia)

Develop ”sponge spicule bottom”

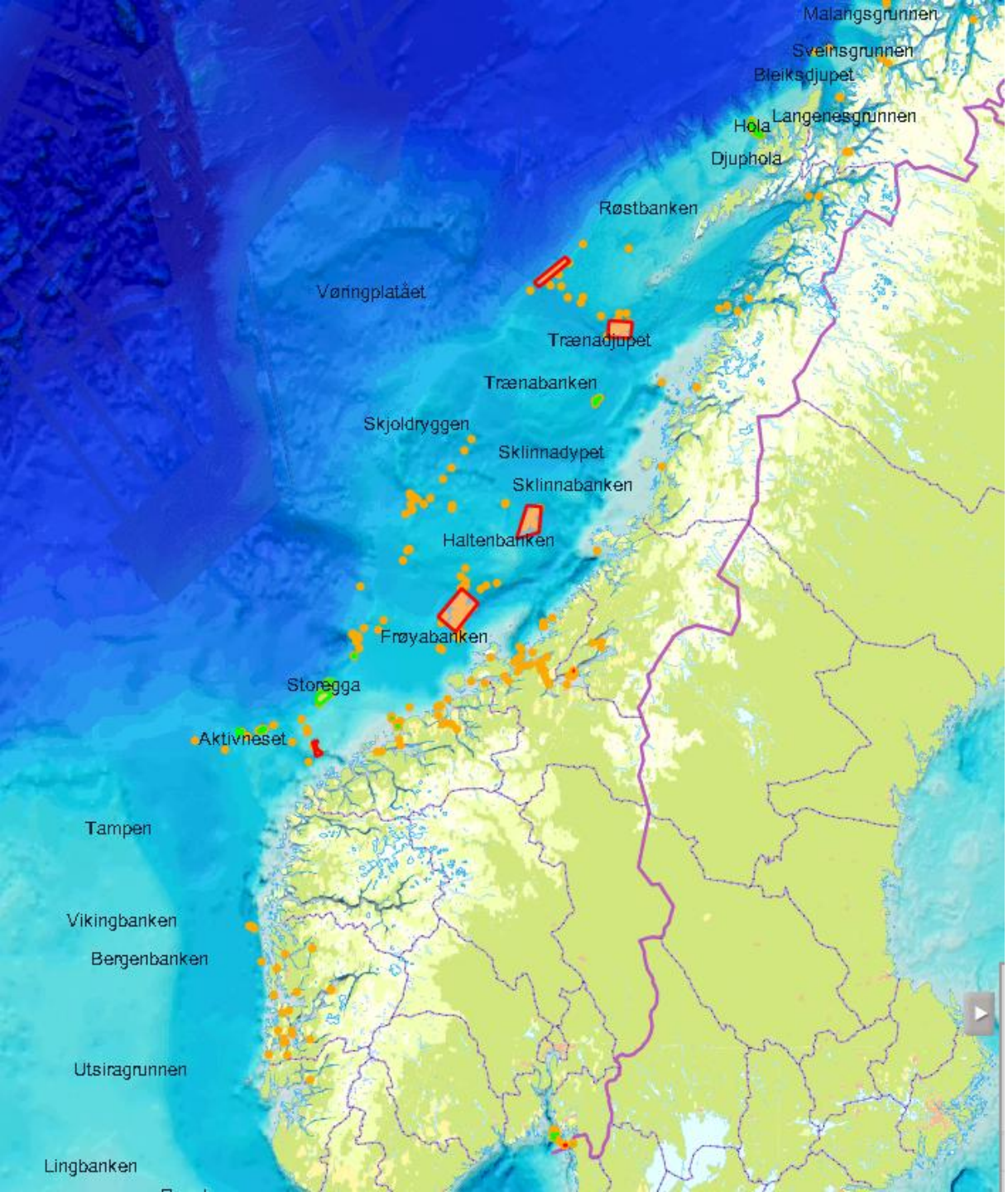
Trawl damage documented





Sensitive habitats in the MAREANO mapping area

(based on 700 stations kms apart = course gridding 5x5 km)



Lophelia coral reefs

Deep-water sponges vulnerable organisms

- OSPAR classified sponge as vulnerable organisms
- Sensitive to anthropogenic stressors
  - Trawling & oil drilling
  - Aquaculture
  - Dumping
  - Coastal runoff

} Particulate loading (organic / inorganic)

- Exposure to excessive sediments (suspended and settled)
  - Clogging of filtration system
  - Reduction in pumping
  - Increased metabolic costs
  - Decreased survival

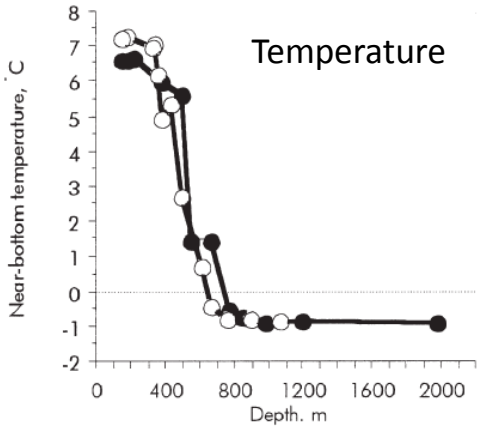
RESPONSE

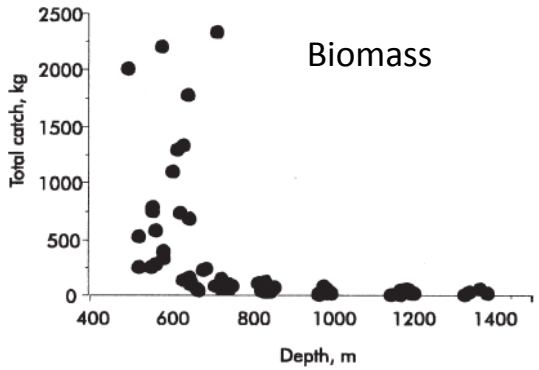
project – funded by NFR

Partners IMR, SINTEF, Univ. of Alberta, Zool. Mus. Copenhagen

The **main objective** is to evaluate the response of deep-water sponges exposed to particulate oil drilling discharges, and develop new tools (biomarkers) for exposure based studies to link molecular and biological stress responses.

FISH





From Bergstad et al. 1999

AW

Continental shelf

300 m depth

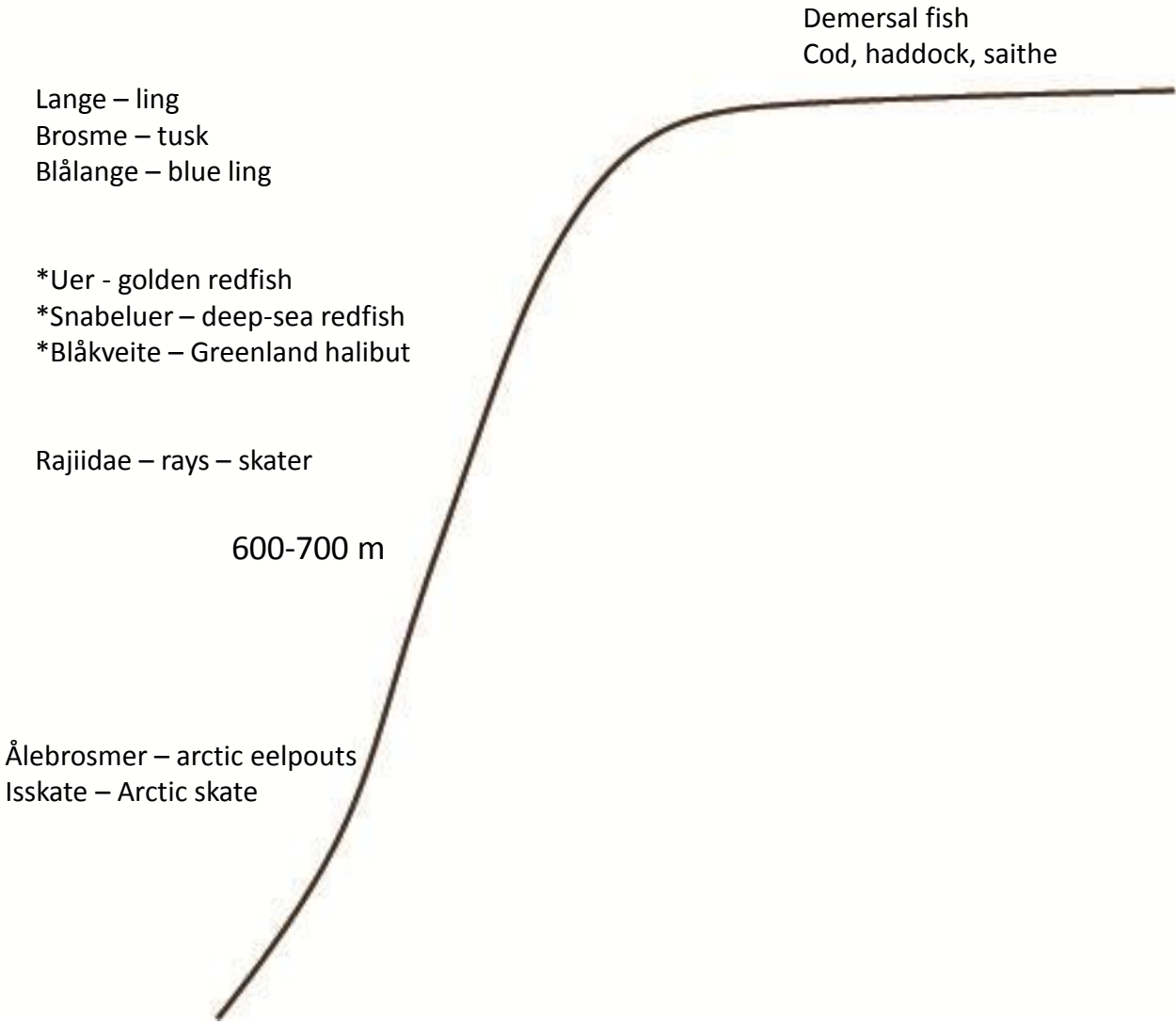
600-700 m depth

NSDW

FISH

Life history traits
Deep-Sea Fish

Long lived
Low growt rate
Low fecundity

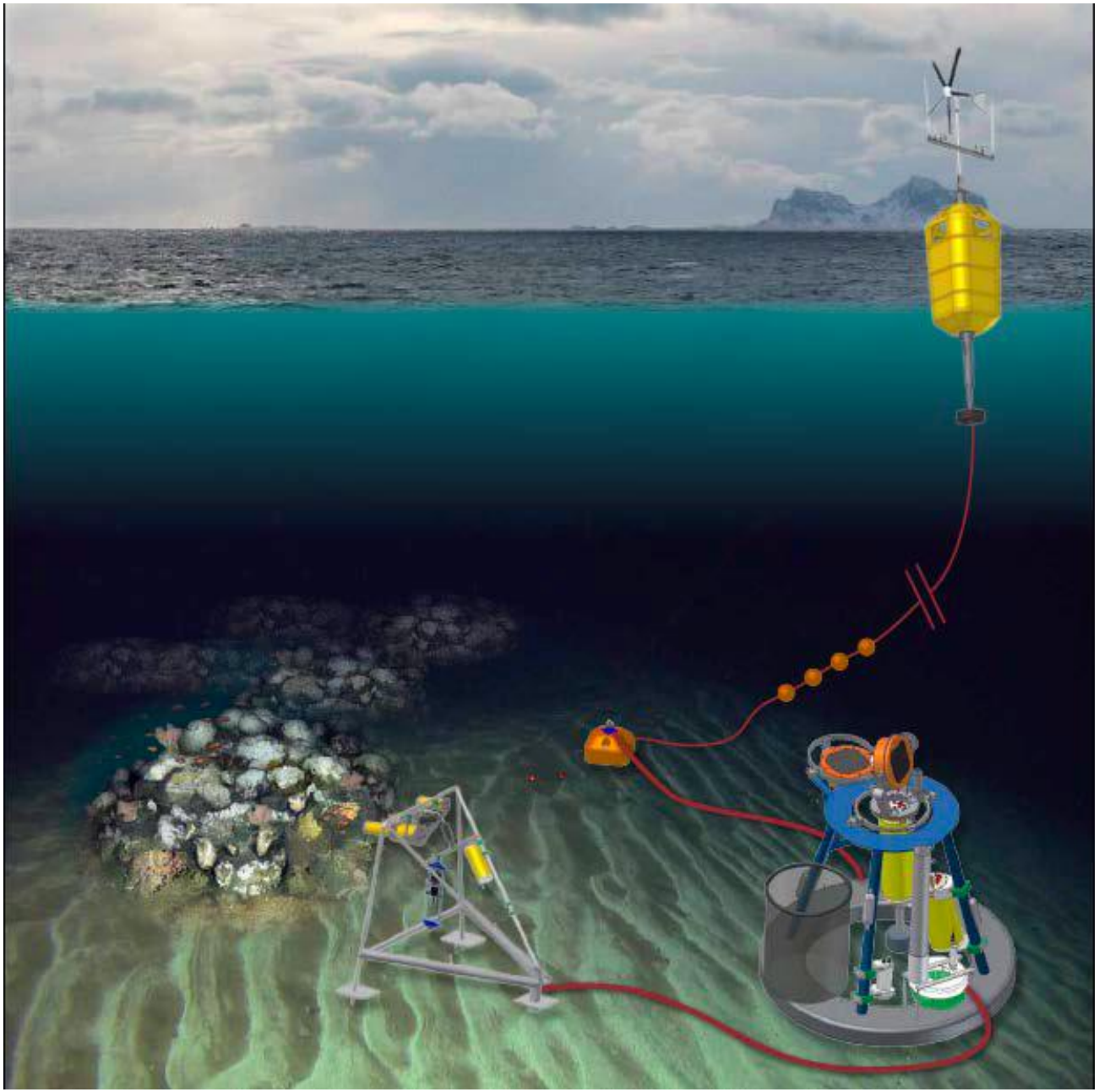


LoVe observatory project

Lofoten Vesterålen cabled observatory on the seabed

Statoil

IMR
other partners



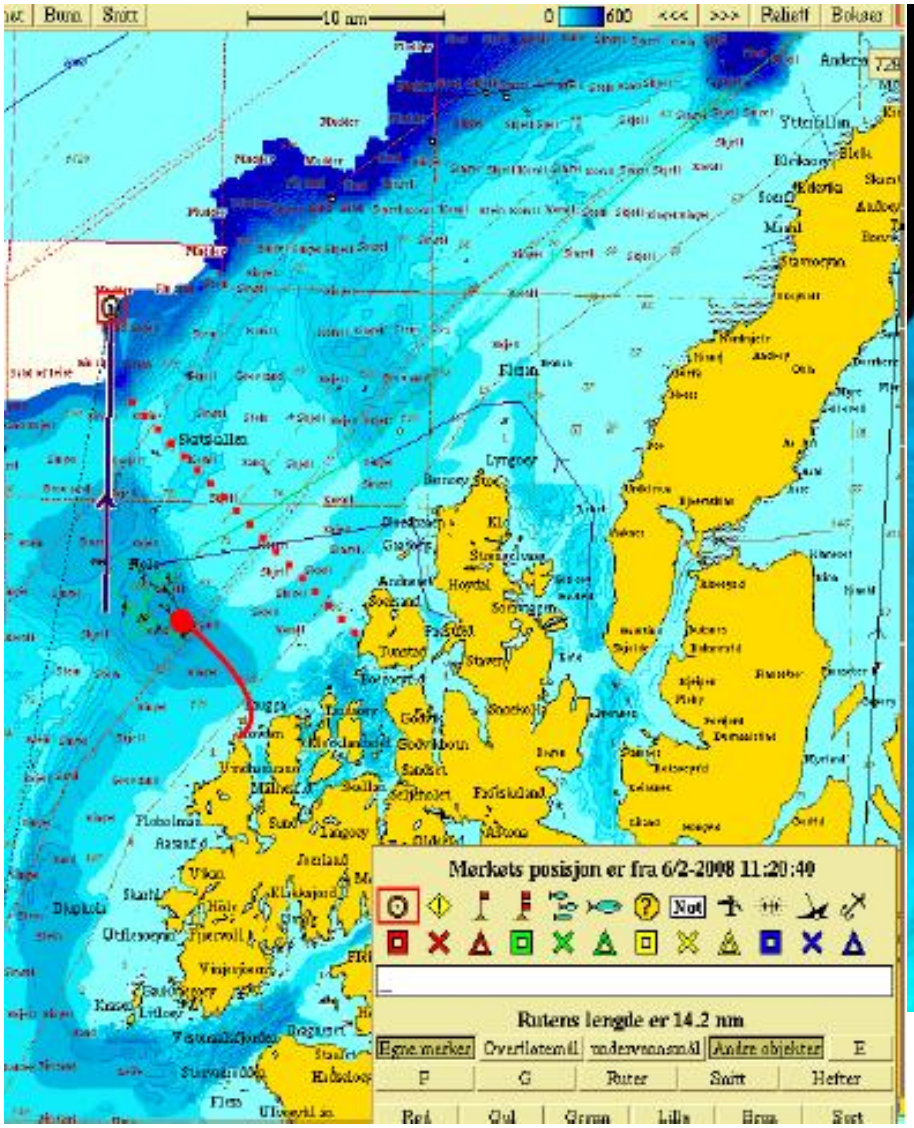
Hermes lander

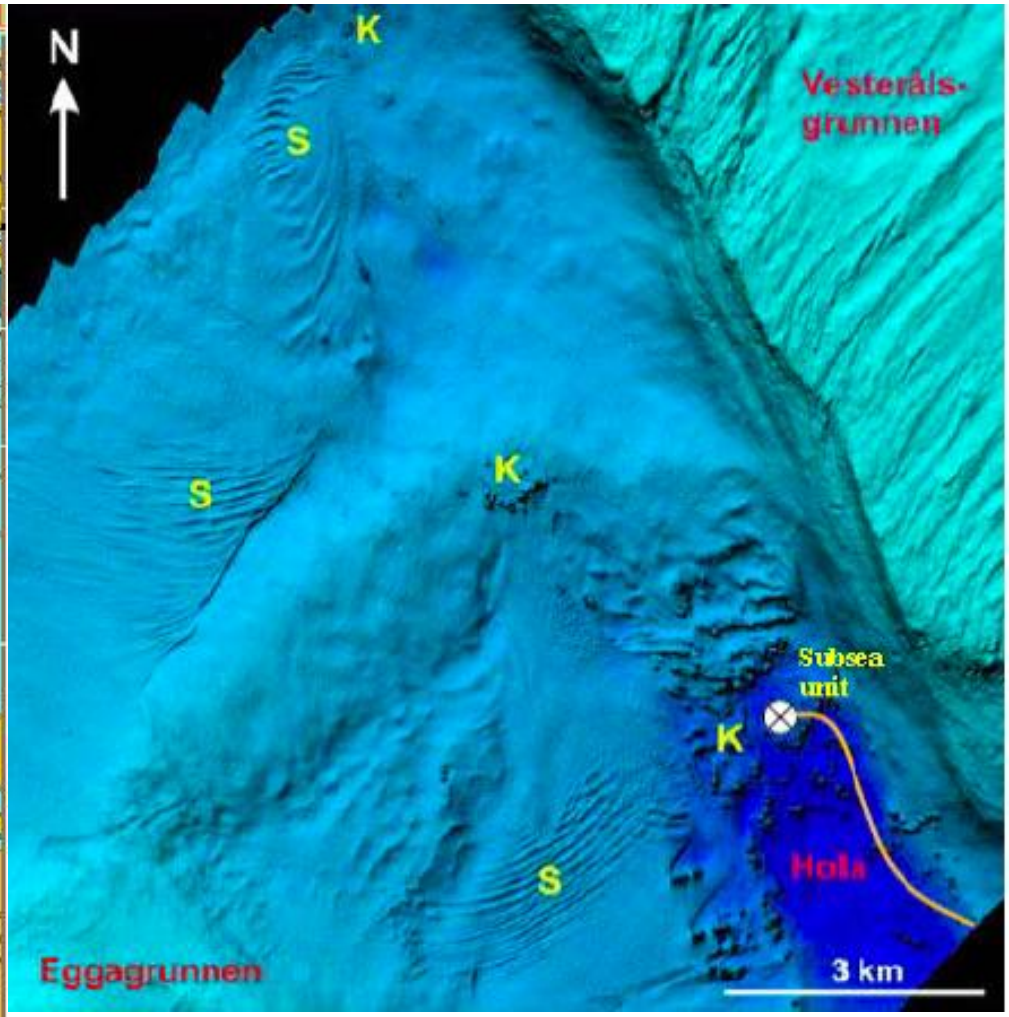
Fish dynamics
Fish migration
Fish larvae
Plankton
Coral behaviour
Coral growth
Marine chemistry
pH
Paticles

and more

Continental shelf off Vesterålen

Hola coral reef field





Thank you