



Marine and Coastal Management Sharing Norway's Experience from Coexistence Between Fisheries and Other Users of the Sea

By
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Namibia Phosphate Mining
June 2014

Norwegian Sea Areas



Source:
Directorate for Nature Management

► The research vessels

Our most important tools for collecting data on the ecosystem



G.O. SARS
BUILT: 2003
4067 GRT.
L.o.a: 77,5 M



ROSA
BUILT: 1990
1828 GRT.
L.o.a: 64,4 M



G.M. DANNEVIG
BUILT: 1979
171 BGRT.
L.o.a: 27,9 M



HÅKON MOSBY
BUILT: 1980
701 GRT., L.o.a: 47,2 M
OWNER: UNIVERSITY OF BERGEN



DR. FRIDTJOF NANSEN
BUILT: 1993
1444 GRT.
L.o.a: 56,8 M
OWNER: NORAD

Oil industry and fisheries, Norwegian experience.

Fisheries was the most important industry in Norway when oil exploration started 45 years ago

A few years later the fast growing offshore petroleum industry took the lead as Norway's economically most important industry.

The situation is similar in many other countries



Petroleum is an unrenewable resource that will be important for a limited period of time, while fisheries represent a renewable resource with a potential of development and increased production.

Petroleum provinces on the Norwegian Continental Shelf



Integrated Management Planning

Ecosystem-based



Assessment of cumulative environmental effects

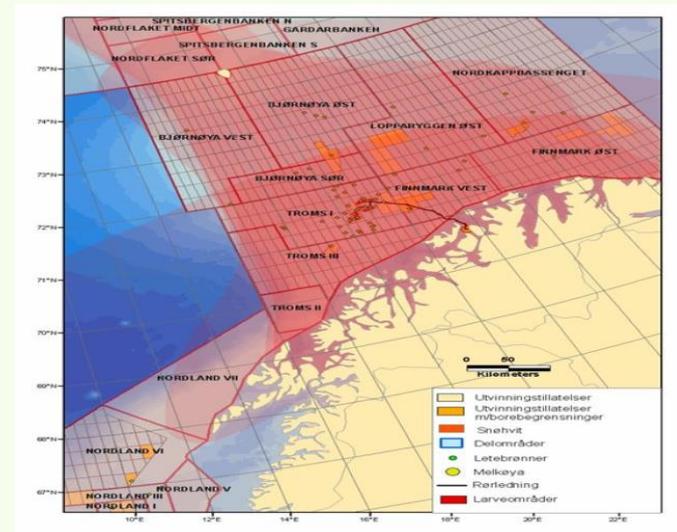
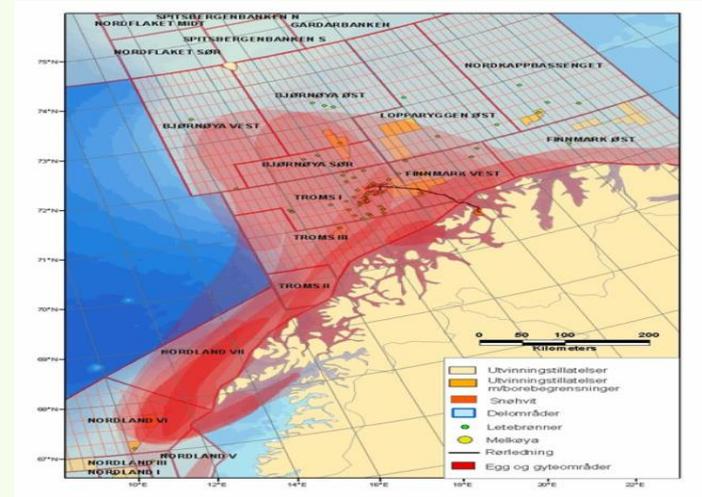


Purpose:

Sustainable use of fish and other natural resources

Safeguarding of the environment

Particularly
valuable areas
for fish:
Cod,
Haddock,
Herring,
Capelin



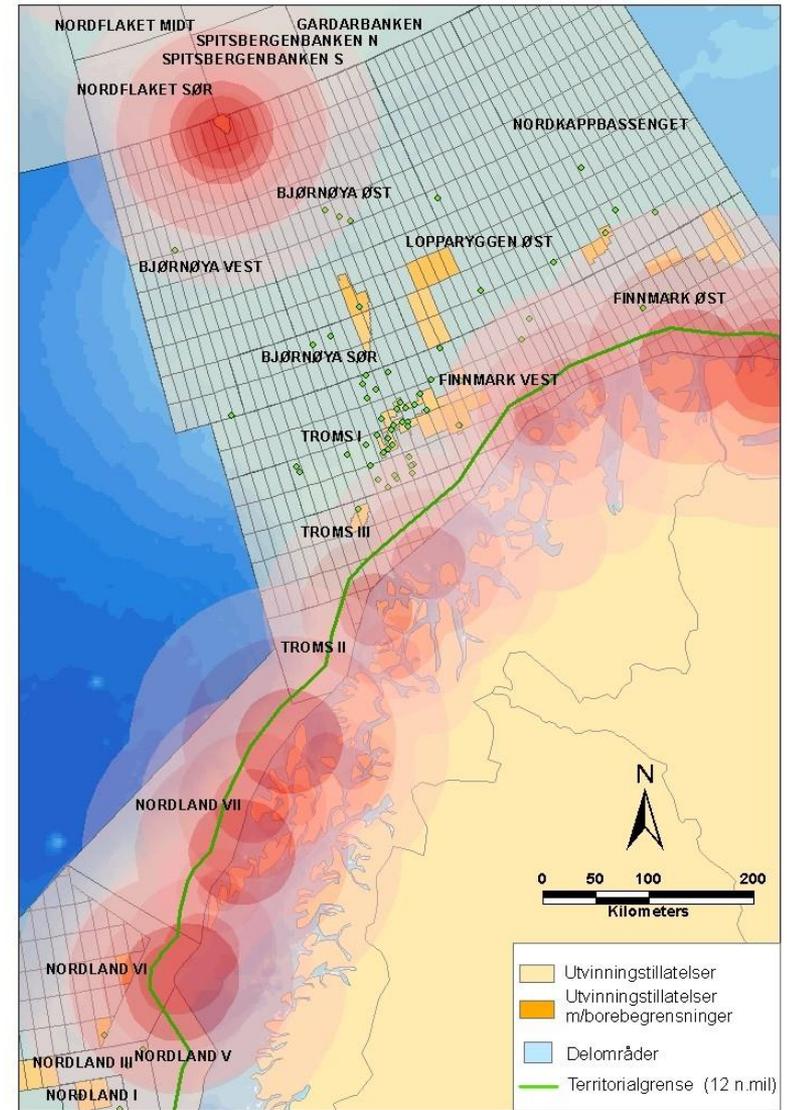
Development stages of marine fish larvae

The different stages has
different sensitivity to
pollution and
environmental factors

(Atlantic Halibut)



Particularly valuable areas for seabirds

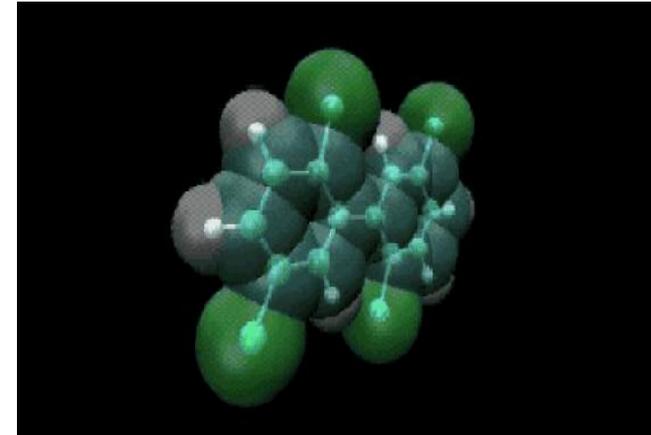


Need for knowledge improvement

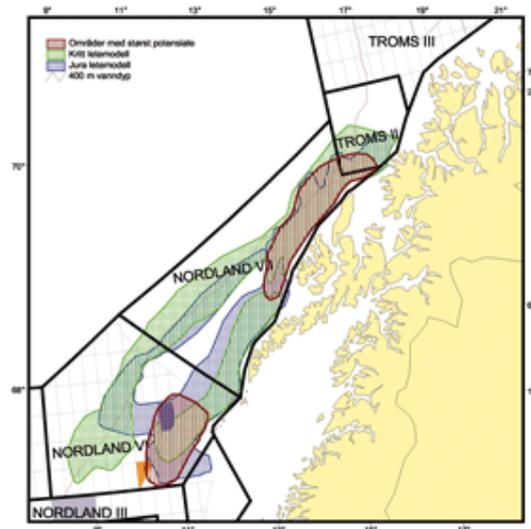
Fish stocks and fishery



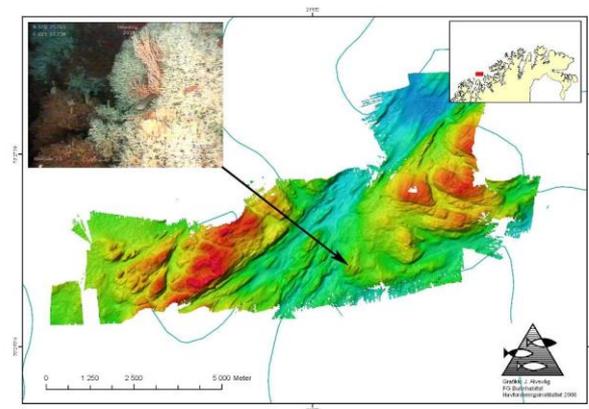
Screening of hazardous chemicals in sediments, water column and living marine organisms (according to standard procedures)



Seabed, coral reefs etc.



Geological mapping



Seabird distribution



MAREANO

(Marine Area Database for Norwegian sea areas)

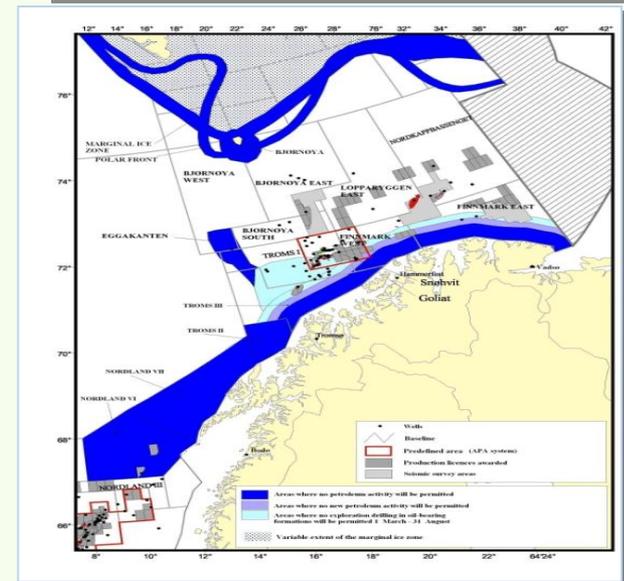
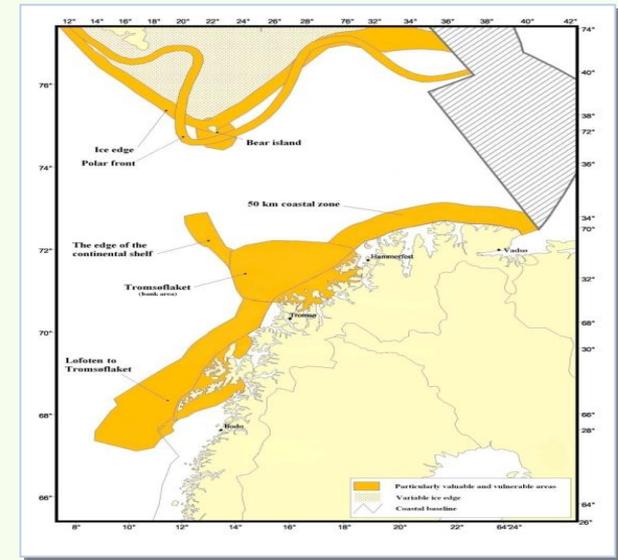
Started due to the need for decisional background data in Norwegian management

main products:

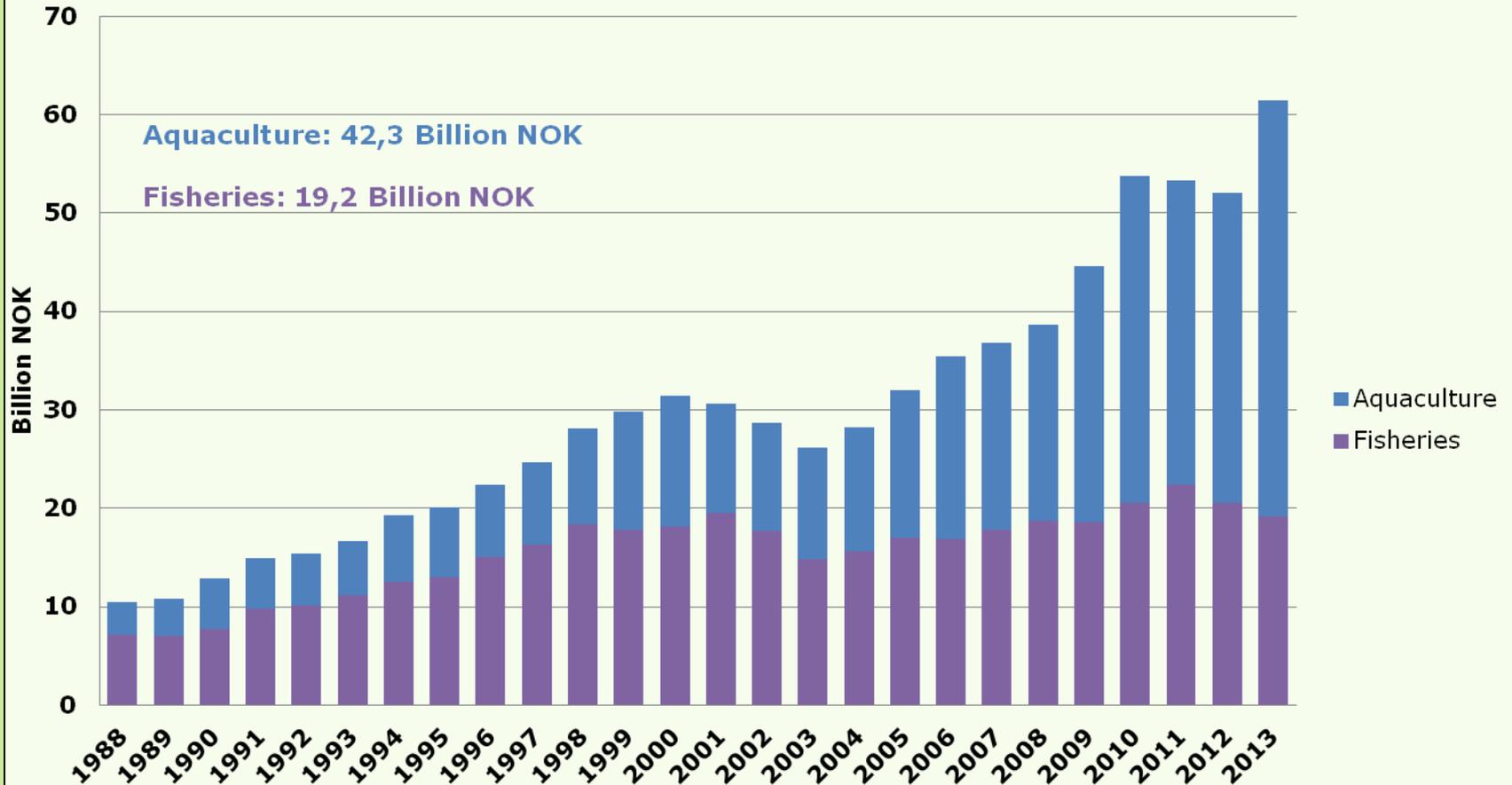
- Detailed bathymetric maps
- Fine-scaled information about sediment types, habitats, and geological features
- Distribution of benthic fauna, biodiversity, communities, and production
- Environmental status for sediments
- Area database for Norwegian coastal- and offshore areas – available for all

Summary:

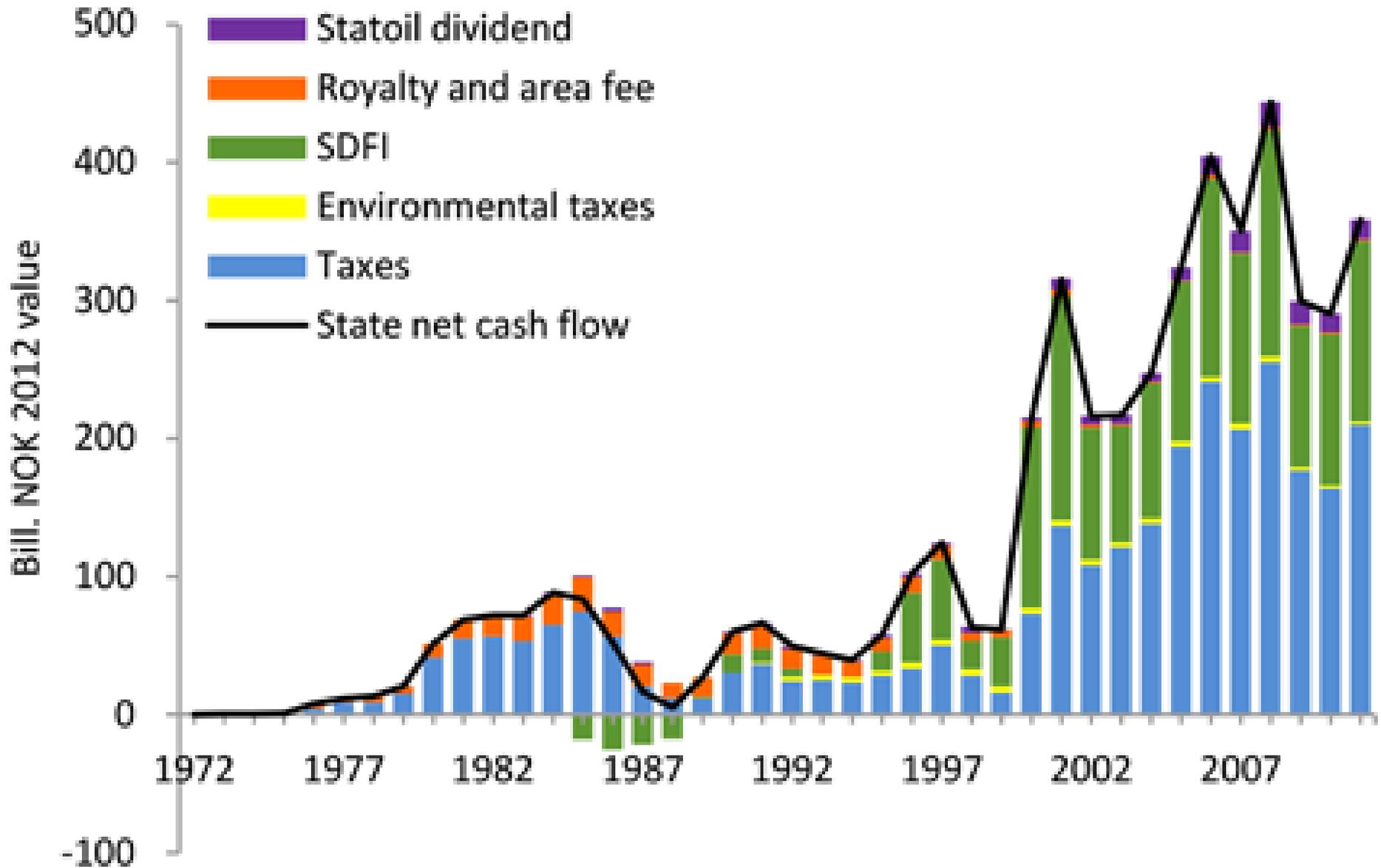
- The integrated management planning approach considers both environment and economic activity through an ecosystem approach
- Provides a predictable framework for economic activities.
- Safeguards the especially valuable and vulnerable areas against pollution
- Introduces more coordinated and systematic environmental monitoring and mapping, strengthening the basis for future decisions and measures.



Norwegian seafood exports 1988-2013



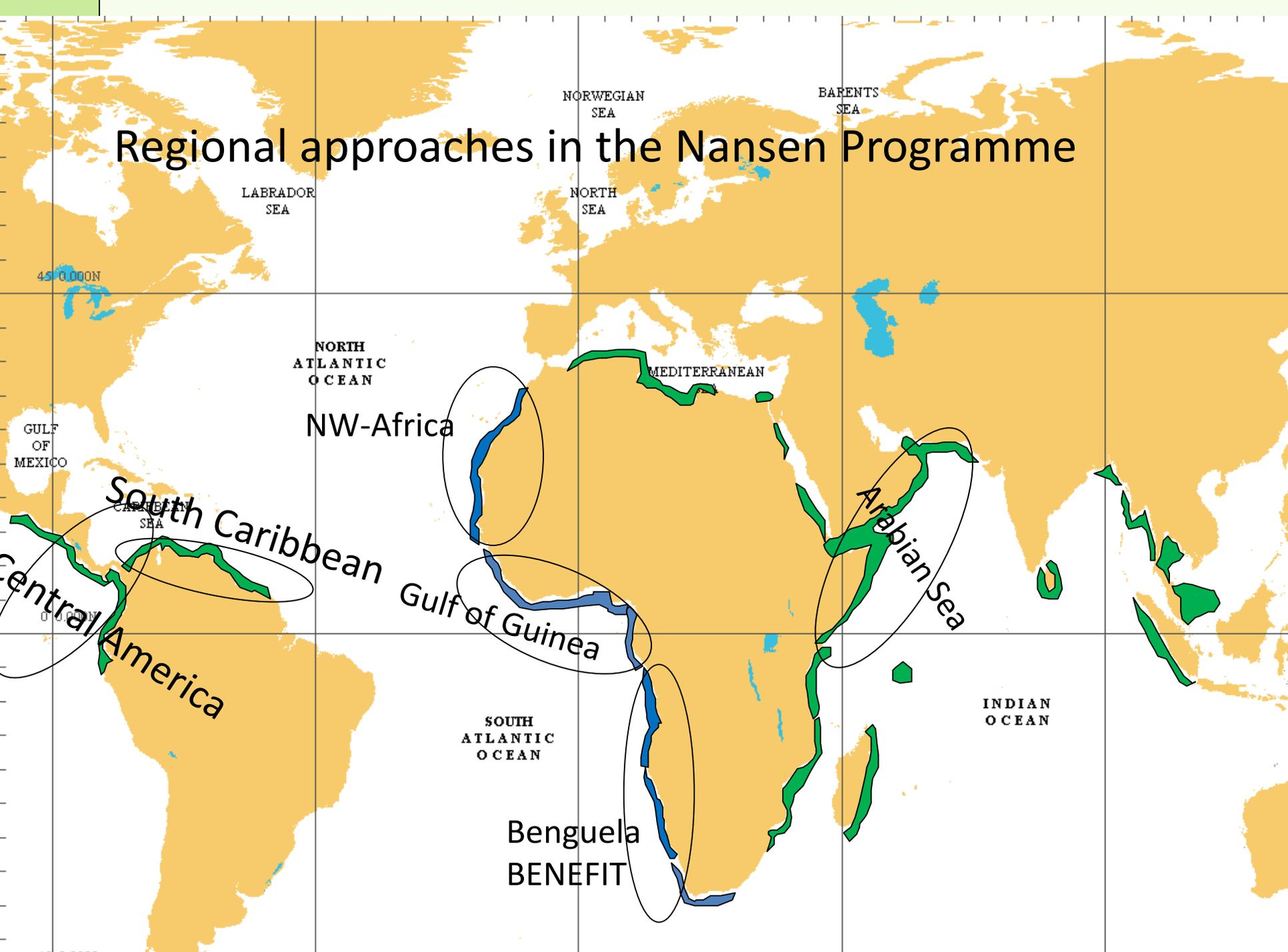
Net cash flow to the State from the petroleum activities



How can we share the Norwegian experience?



Regional approaches in the Nansen Programme

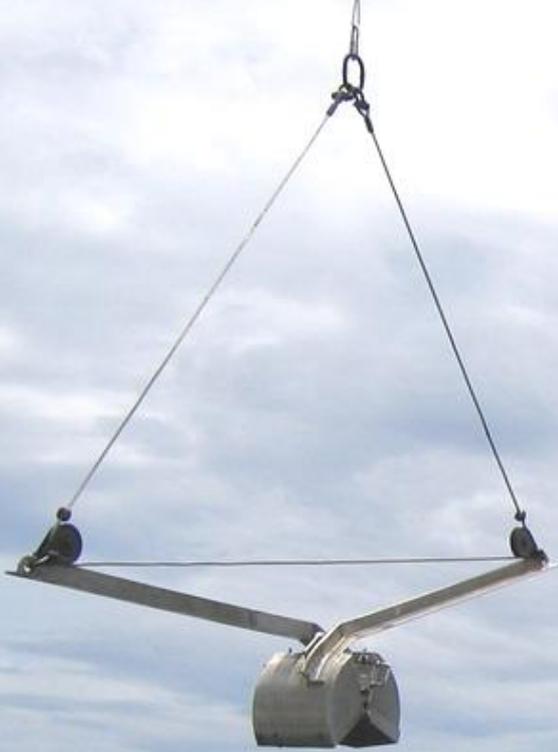




Political ambition for co-existence between the fisheries and other users of the sea both in Norway and other countries

Knowledge about environmental conditions is an important factor

Legislation and regulations are often in place but the systems for auditing, control and enforcement are not fully implemented.



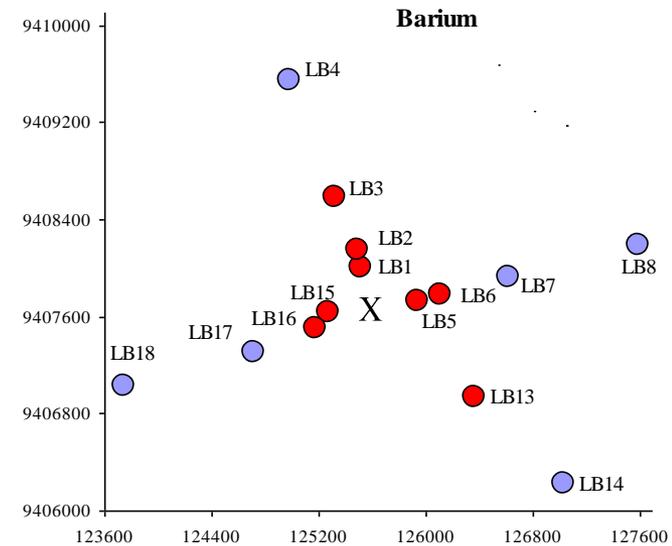
Training and education of local people



Angolan scientists working
Onboard the research vessel
Dr. Fridtjof Nansen



The Cabinda study:
Significant contamination by Petroleum related
chemicals out to 1 km from the drilling site
(red dots, barium a tracer for drilling fluid)
Levels of contamination is comparable to
the North Sea levels in the 1980's







Crustacea
GE-1



*Pythonichtys
microphthalmus*
GE-1



Mollusca
GE-1



Echinoidea
GW-2



Crustacea
GW-3



Ophiuroidea
GW-2



Mollusca
GW-1



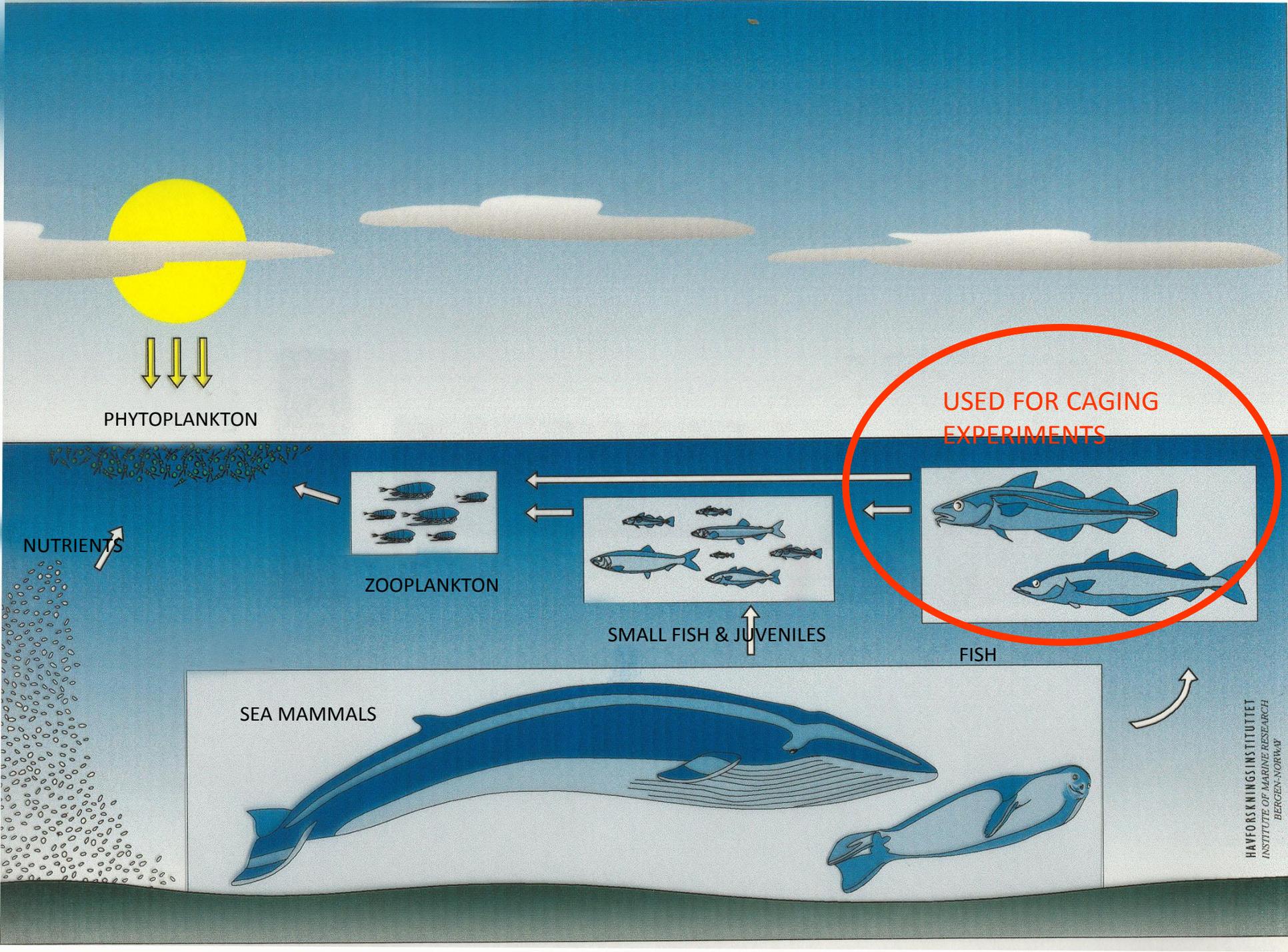
Polychaeta
GE-3

Fish and Invertebrates

Heading: 340



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11:43:41



Water column Monitoring

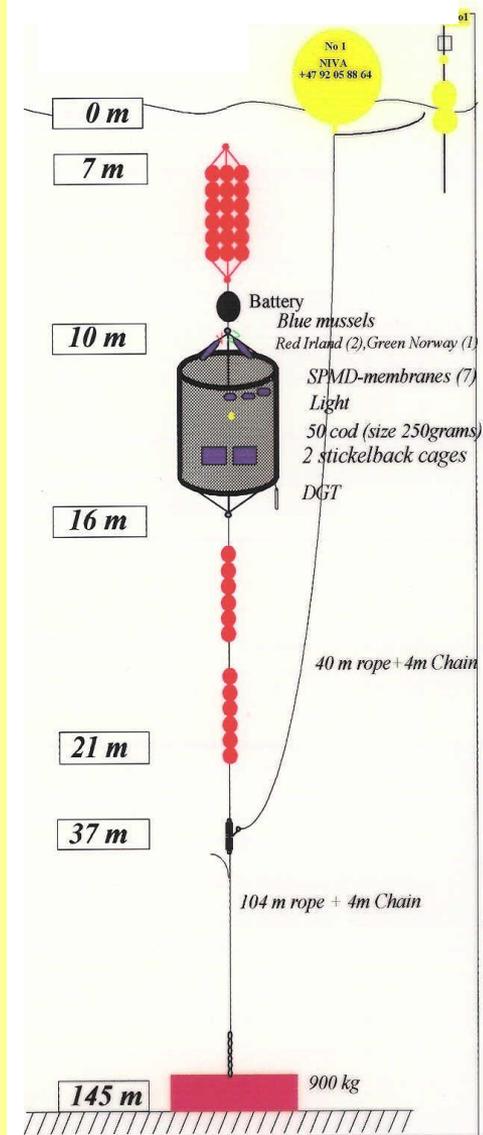
In situ deployment of fish, mussels and passive samplers to monitor accumulation and effects of contaminants.



Ocean Climate A/S

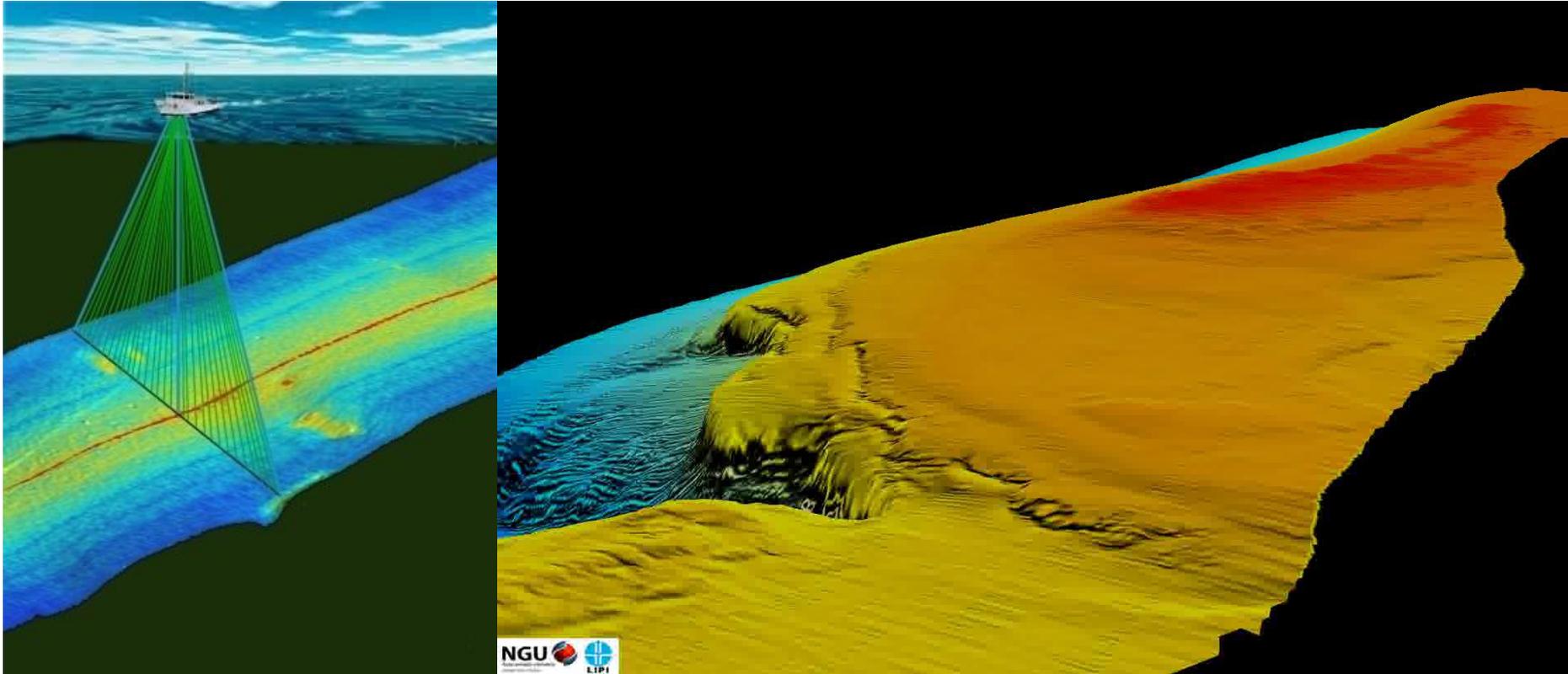
Experience from Caging Experiments

- Fish cages using light to attract food organisms has successfully been used in environmental monitoring both offshore and in coastal waters.
- Fish has been kept in cages up to 1 year without additional feeding.
- Growth rates up to 0,7% per day has been recorded
- 3 different species - Cod, Saithe and Haddock have successfully been tested in caging experiments.
- Can use fish from a group with "known history".
- Blue mussels and passive samplers can be attached to the cages.
- Multiple sampling is easy, in some experiments cages have been sampled every 6 week over a 6 months period.

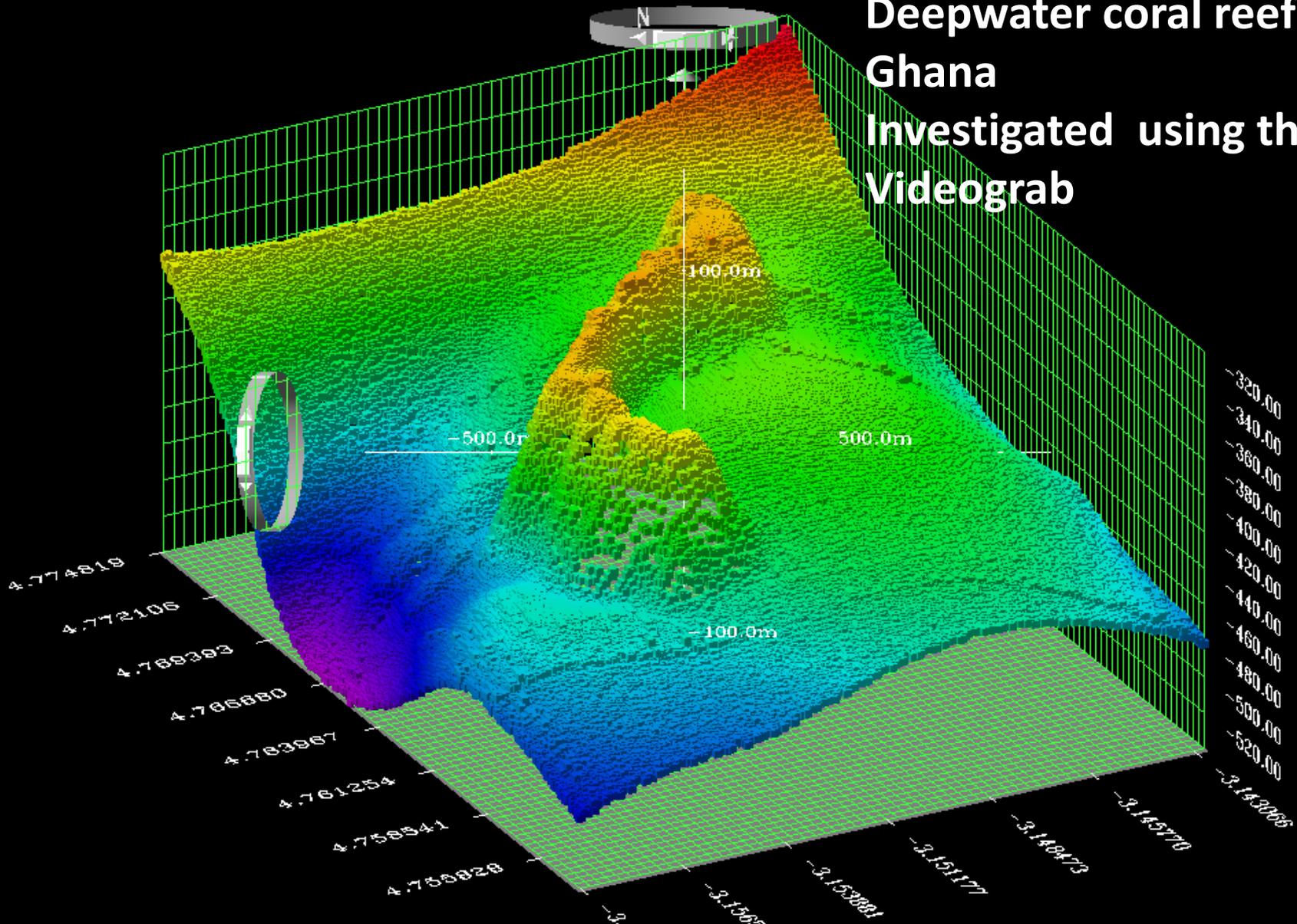


Remote sensing of the ocean using acoustics

1) Using multi-beam echosounders to obtain detailed maps of sea b

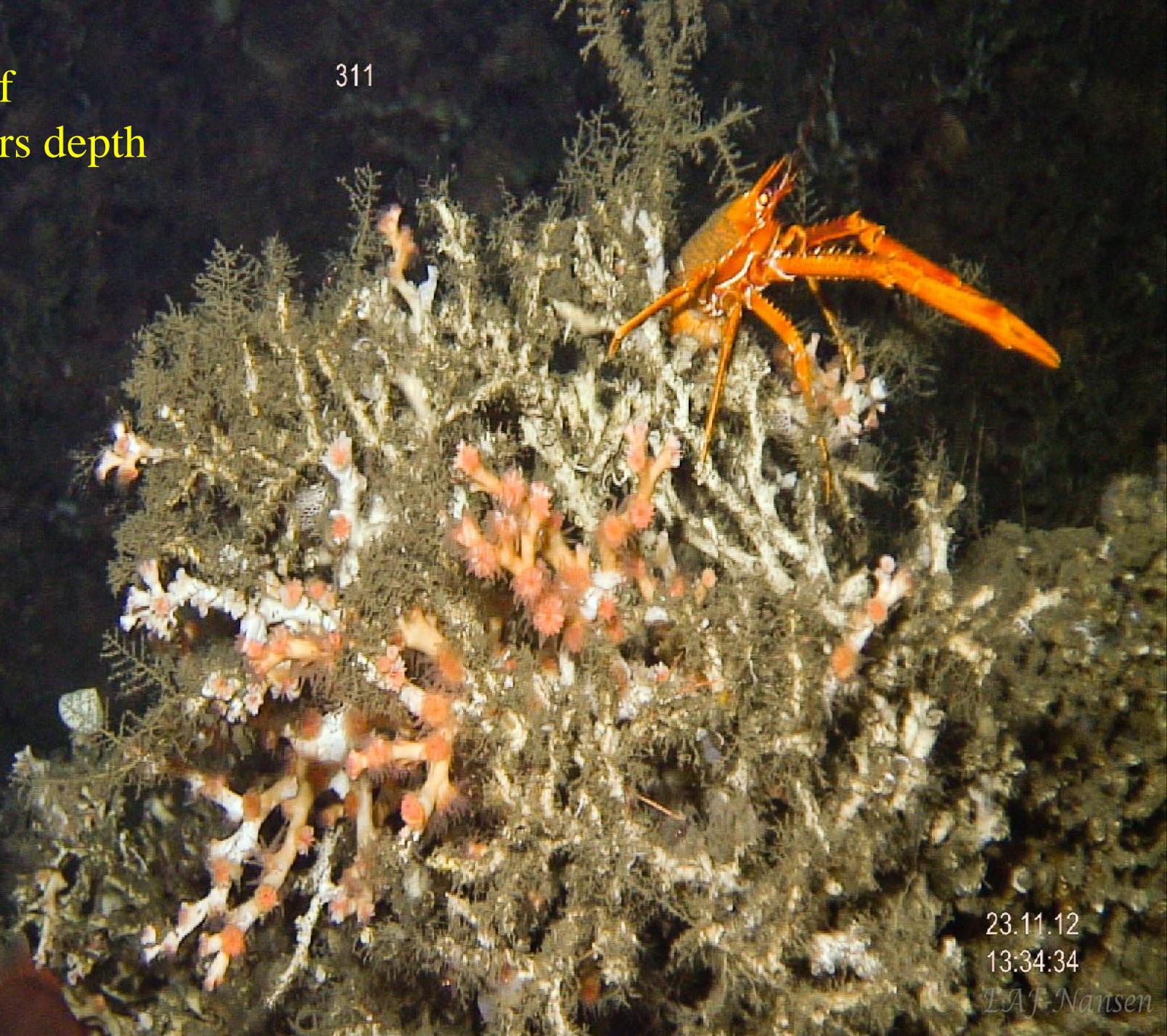


Deepwater coral reef in Ghana Investigated using the Videograb



Coral reef
450 meters depth

311



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LAF-Nansen

What's in the barrel?

Clean water

