



Ecosystem approach - marine integrated management plans

Geir Klaveness, Specialist Director

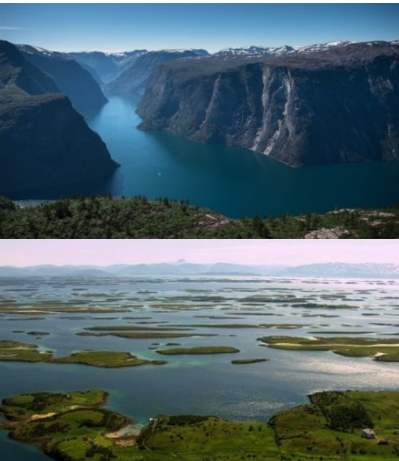
Significance of marine ecosystems

Marine Ecosystems of Norway

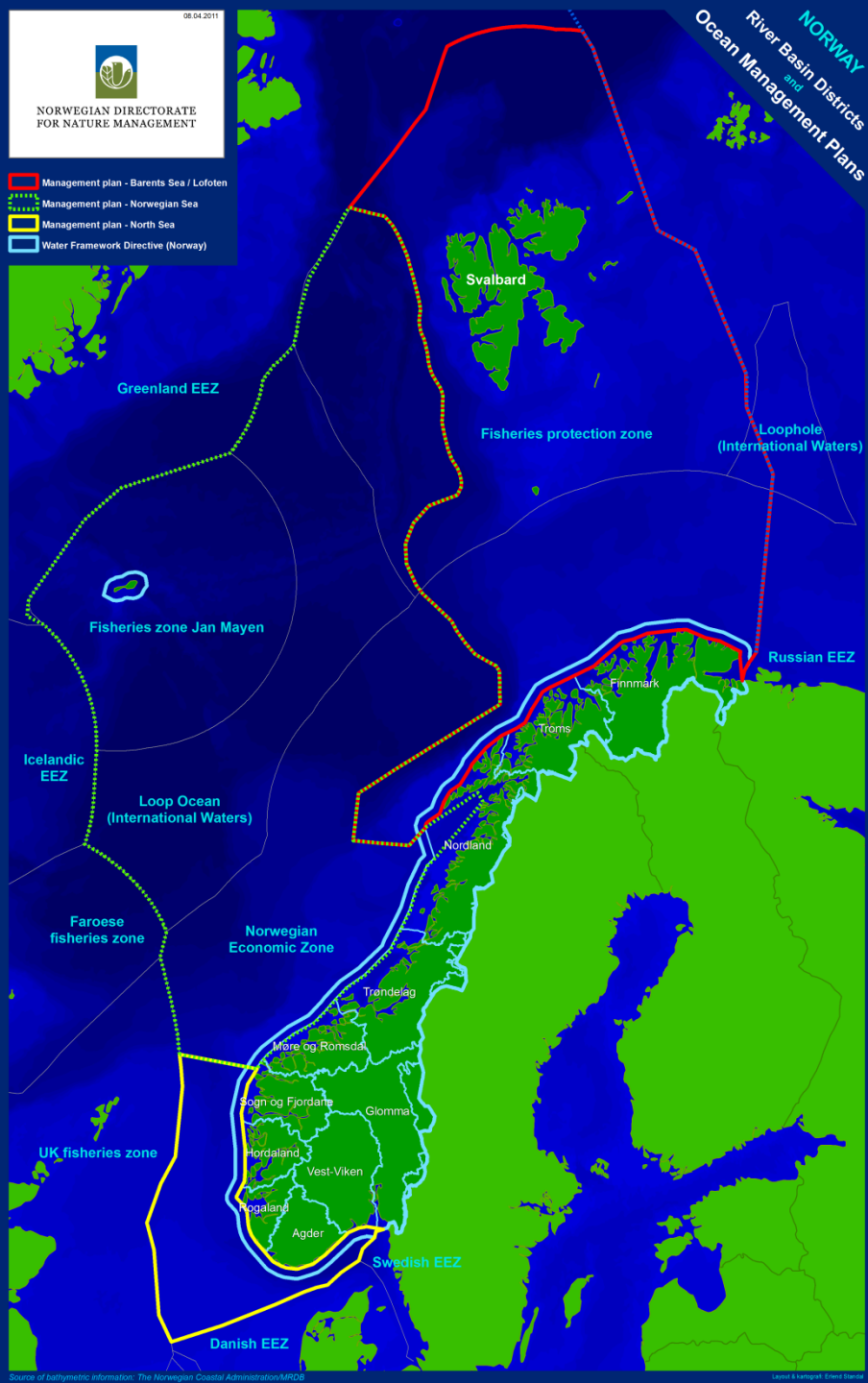
- Norwegian Seas: Jurisdiction over approx. 6 times the land area.
- Baseline: 2 500 km
- Coastline (mainland): 25 000 km
- Norwegian shoreline (mainland including islands): 83 000 km

Management plans:

- ❖ Barents Sea: 961 000 km², average depth 230 m
- ❖ Norwegian Sea: 1,17 million km², average depth 1800 m and maximum 4000 m
- ❖ North Sea: about 142 000 km², average depth 90 m



Source: Directorate for Nature Management/
Norwegian Mapping Authority



Source of bathymetric information: The Norwegian Coastal Administration/MRDB
Lands & Søknings, Erlend Strand

Economic significance of marine ecosystems and resources

- About 30 percent of national value creation (GDP)
- More than 10 percent of employment
- Well above 50 percent of the total Norwegian export



Photo: Øyvind Hagen – Statoil ASA



Photo: Frontline



Photo: Aker Seafoods



Photo : Hvalsafari

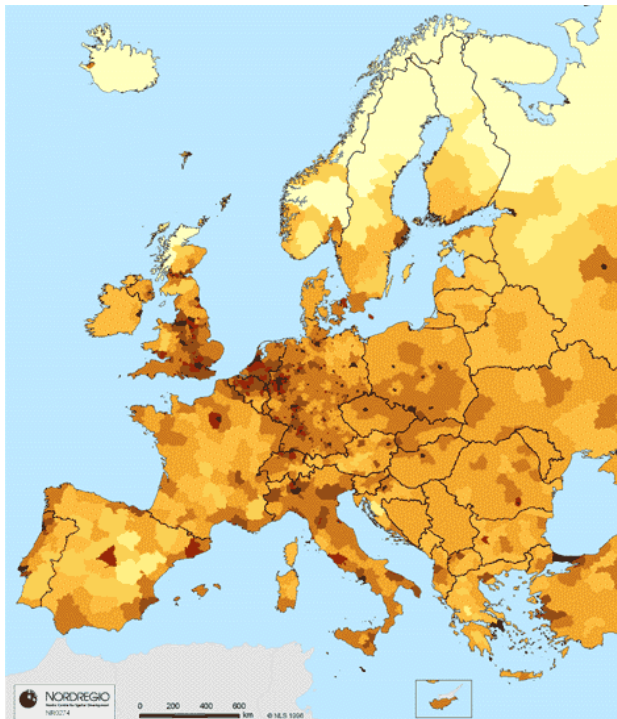


Photo : Vattenfall

Socio-economic aspects

- Value creation related to marine environment
- Employment (regional level)
- Social economics (national level)

Population density in Europe



Barents Sea – environment

Barents Sea - Fish stocks

- Almost all Norwegian catch of cod (93%) and haddock (85%) in Barents Sea – Lofoten
- Significant part even for herring (64%), prawns (57%) and saithe (50%)



Foto: Erling Svensen



Foto: Havforskningsinstituttet



Foto: Kystbloggen



Foto: MAREANO

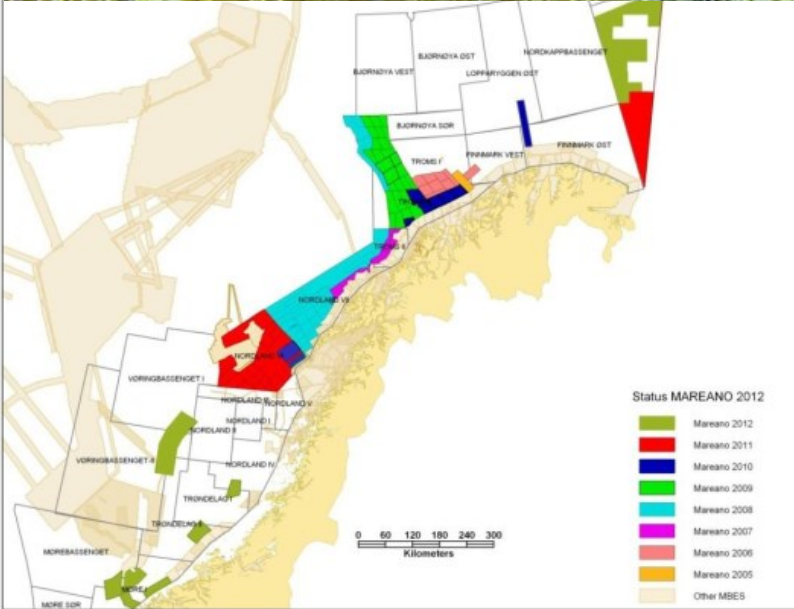
Barents Sea - Seabirds

- Barents Sea – Lofoten: 80% of seabirds on Norwegian mainland
- Røst and Gjesvær among biggest seabird colonies in Europe
- Population decline for several seabird species



Barents Sea - Seabed

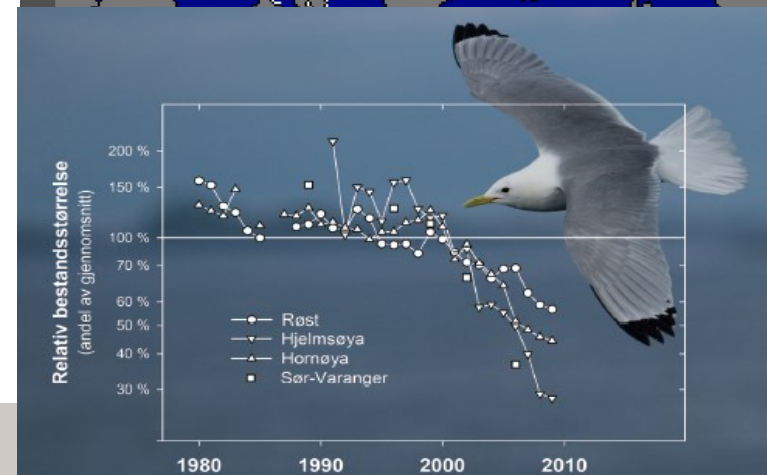
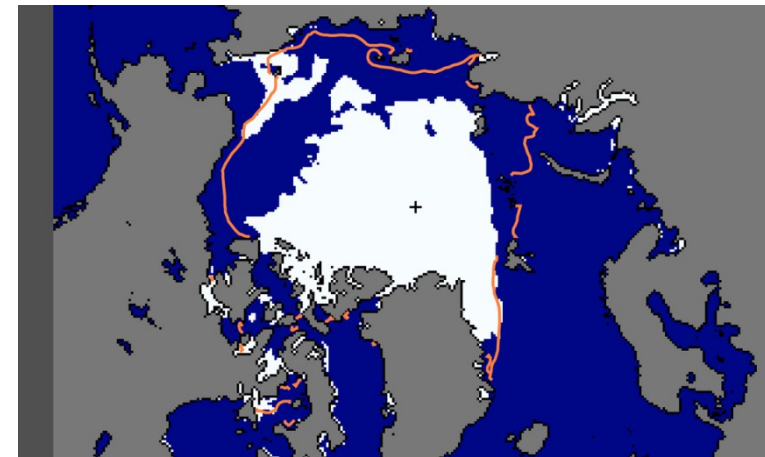
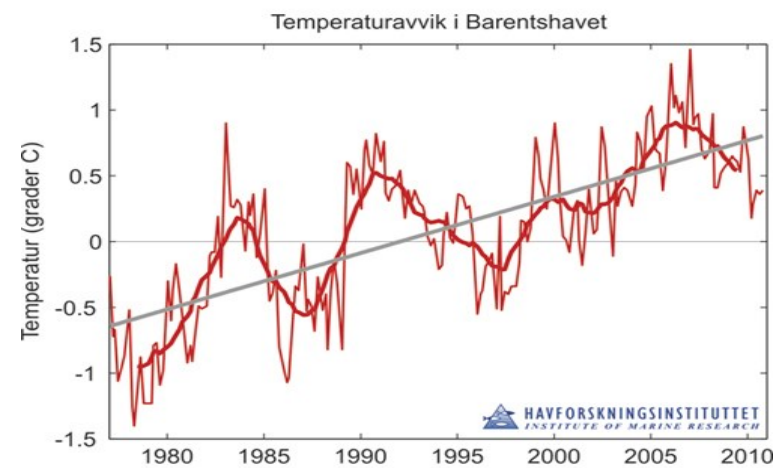
- Røst coral reef, greatest known deepwater reef
- Coral reefs may have important function for fish and the ecosystem
- New species and habitats discovered



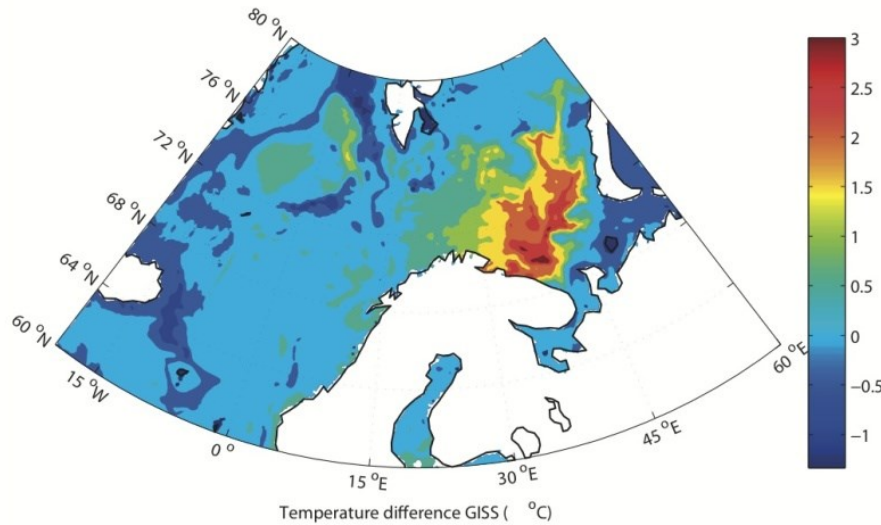
Environmental status – Barents Sea

Overall environmental condition is good, and major commercial fish stocks are in good condition. But:

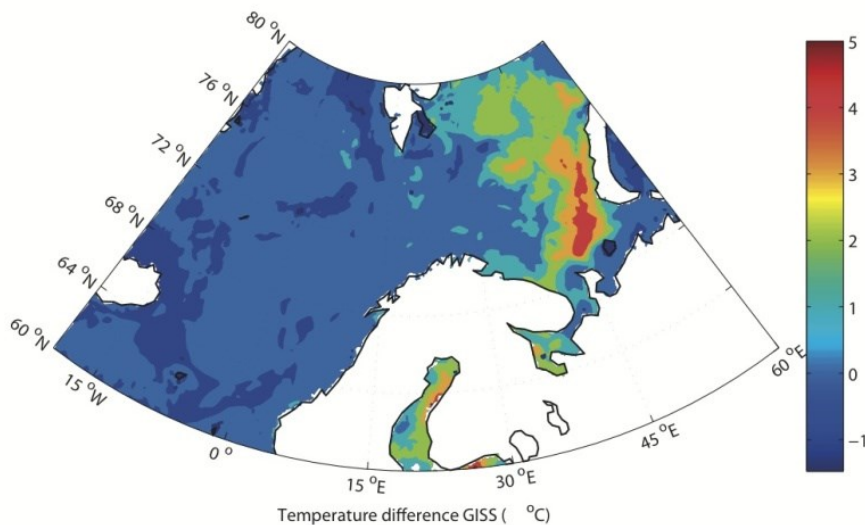
- Increasing water temperatures and acidity
- Sea ice in sharp decline
- Low pollution levels in general, but high in some top predators (polar bears, gulls)
- Negative trends for ice-dependent seals and some fish-stocks
- Most seabird populations in decline, some dramatically reduced



Climate change and ocean acidification



Damage to marine ecosystems expected in the following decades



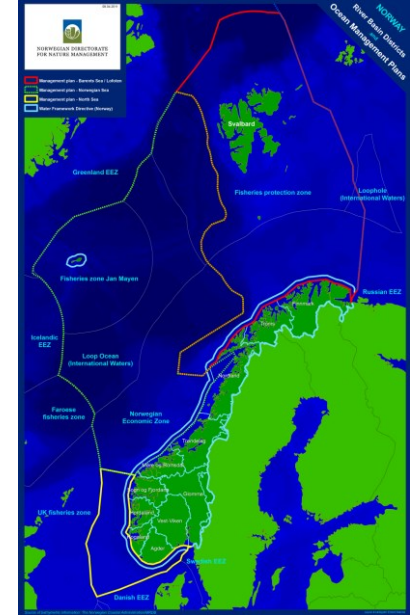
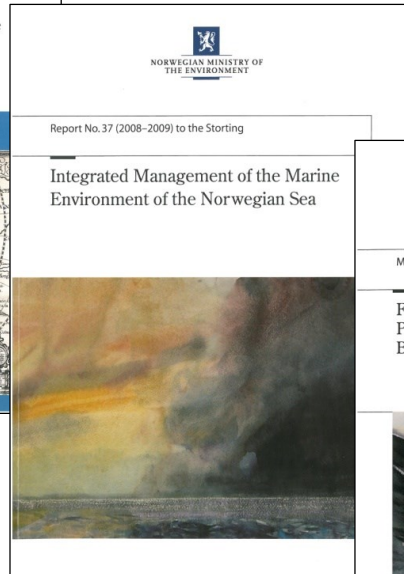
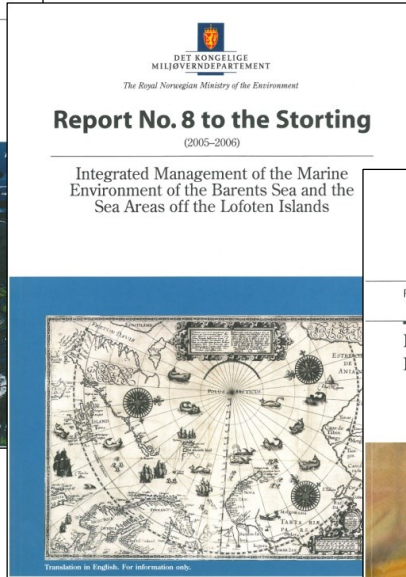
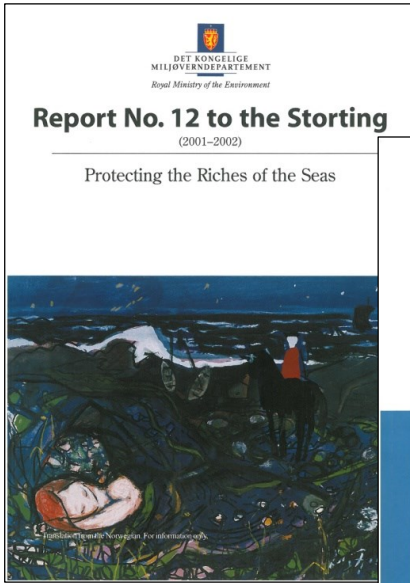
Biological diversity and production

Especially valuable and vulnerable areas in Norwegian waters



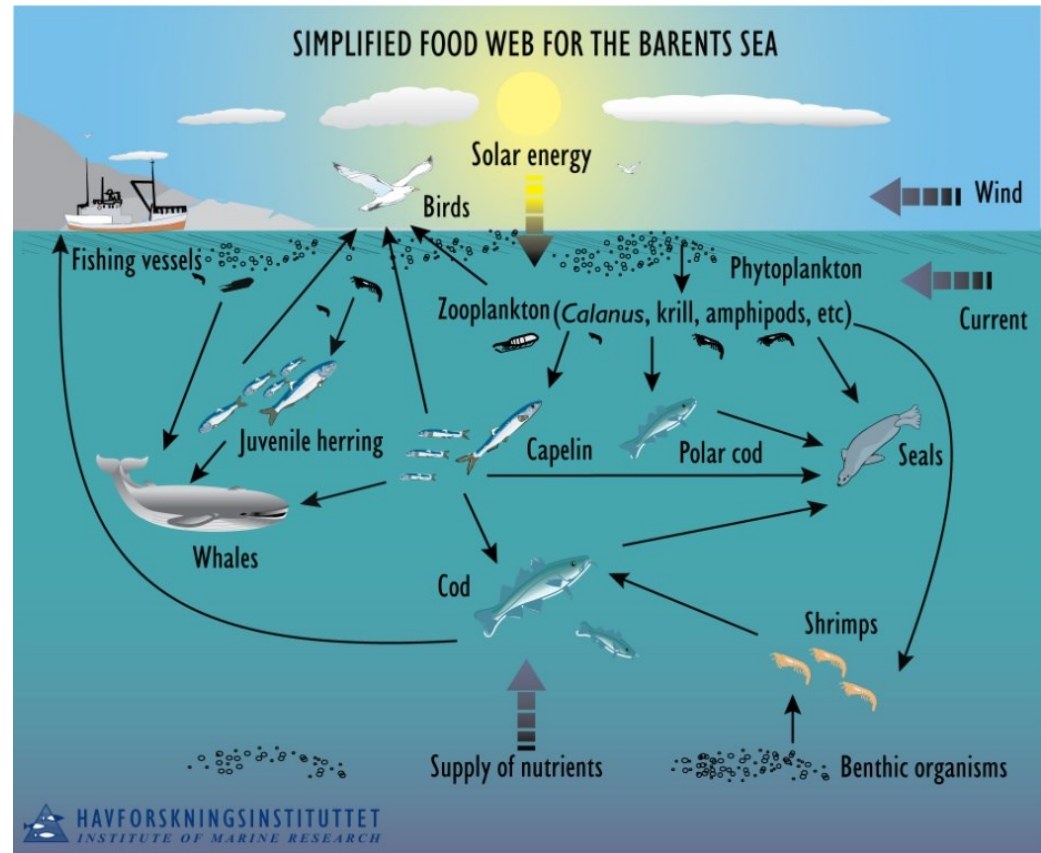
Management plan – organisation & process

White Papers 2002 - 2013

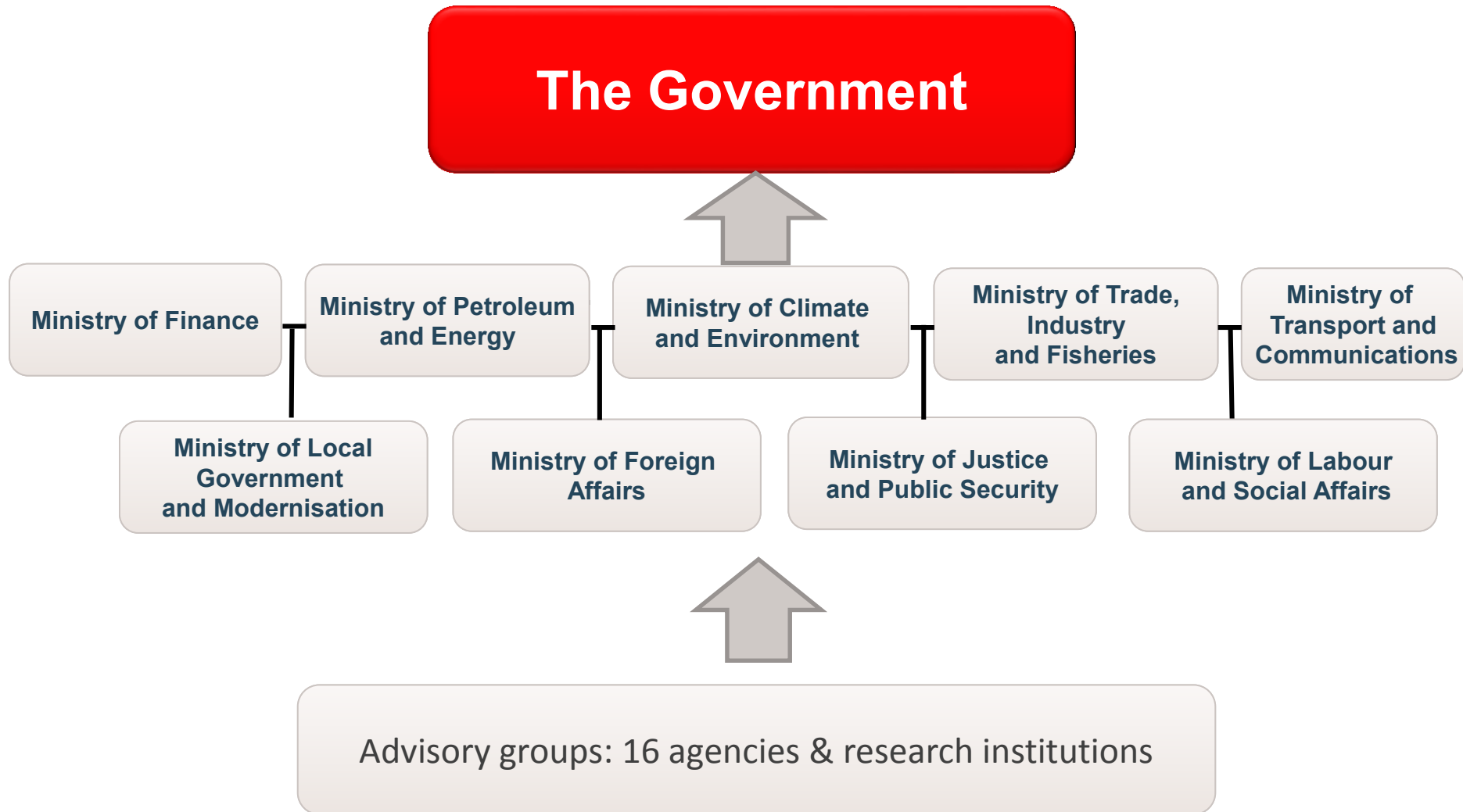


Integrated Management Plans – Ecosystem Approach

The purpose of the management plans is to provide a framework for value creation through the sustainable use of natural resources and ecosystem services in the sea areas and at the same time maintain the structure, functioning, productivity and diversity of the ecosystems of the areas.

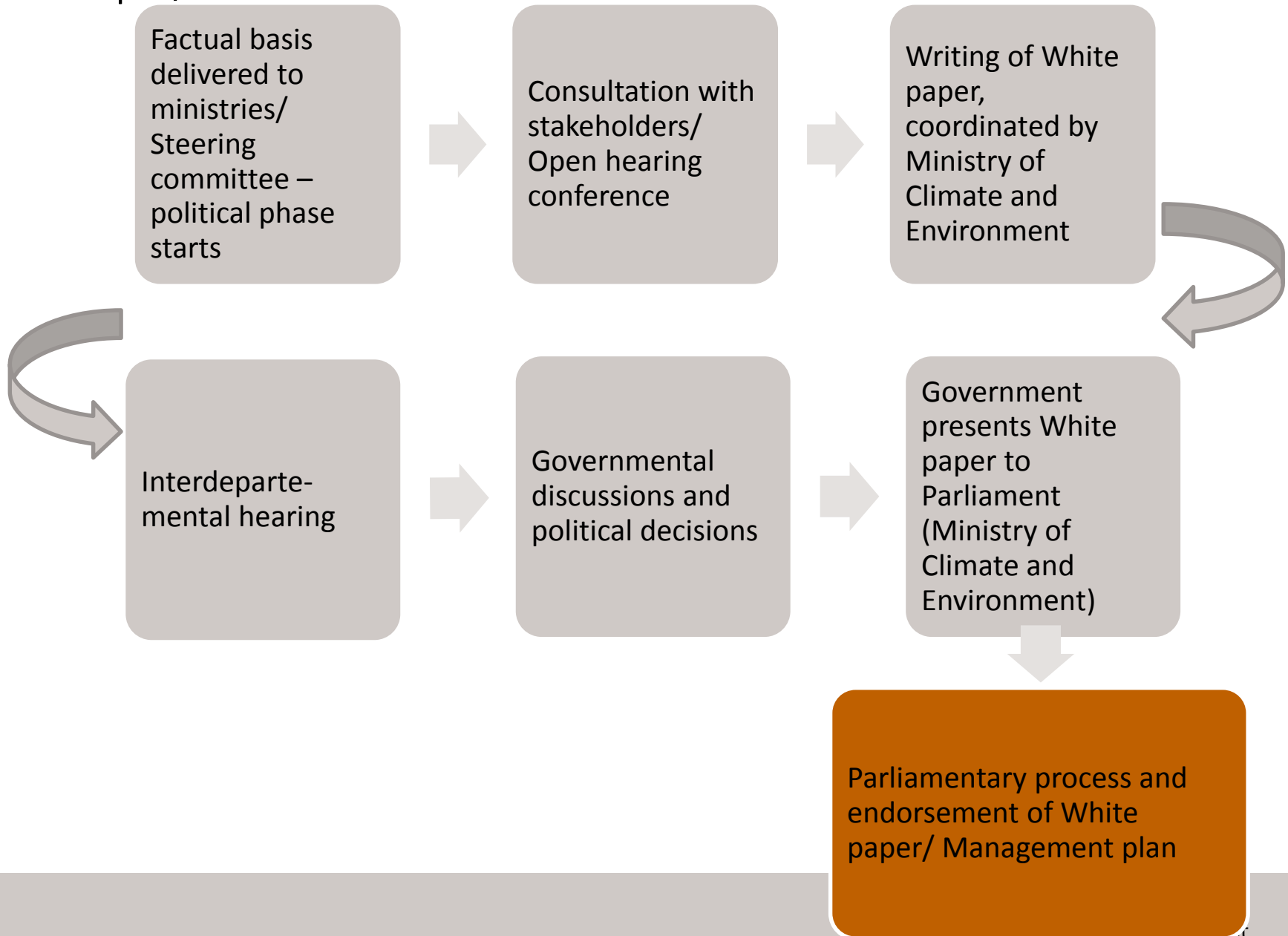


Norwegian marine management plans - Organization



Political phase – process for management plans

(White Paper)



Follow-up

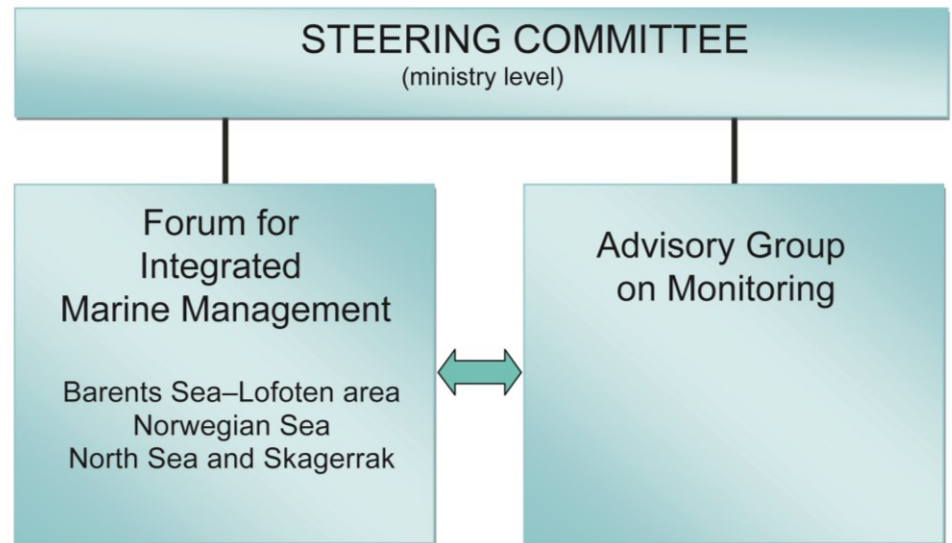
Sectoral

Existing sectoral legislation

Management plan: Framework for authorities' work with licencing, permits for activities etc.

- *Ocean Resource Act* (Ecosystem Approach to Fisheries)
- *Pollution Control Act*
- *Nature Diversity Act*
- *Petroleum Act*
- *Harbour and Fairway Act*

Cross-sectoral



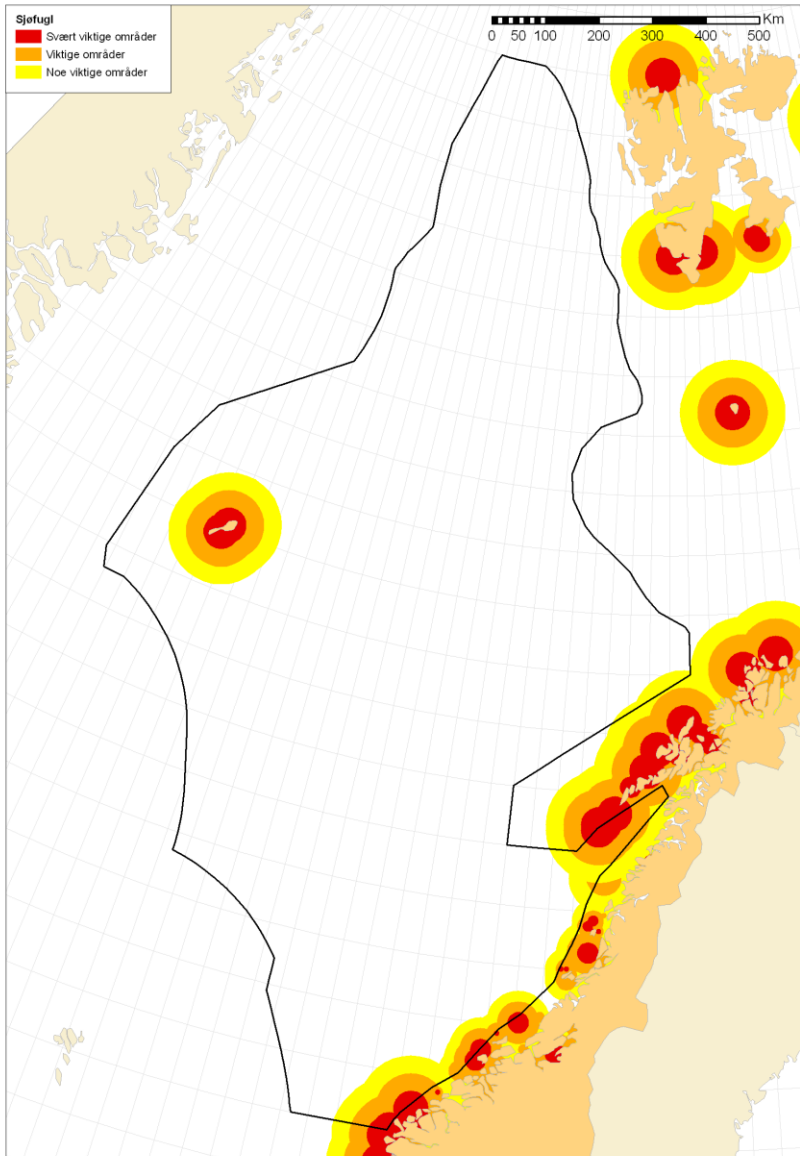
Shared knowledge

Particularly valuable and vulnerable areas (green)

- important for productivity & biodiversity of entire ecosystem
- require special attention

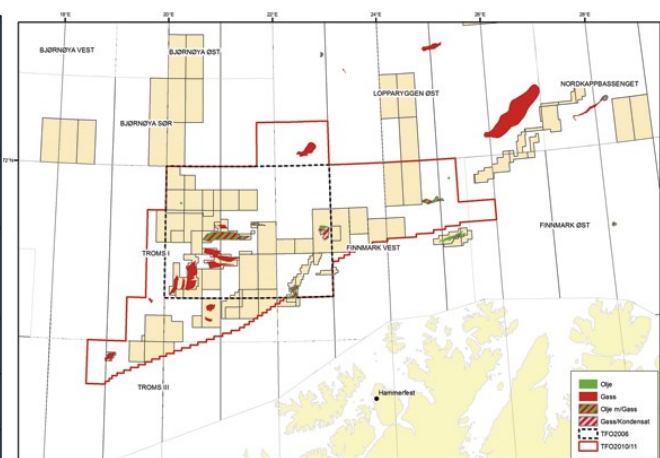
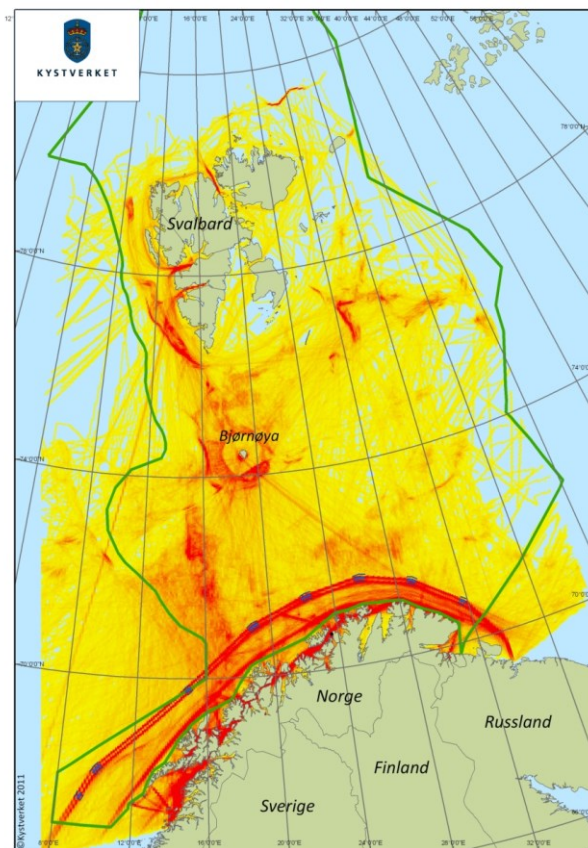
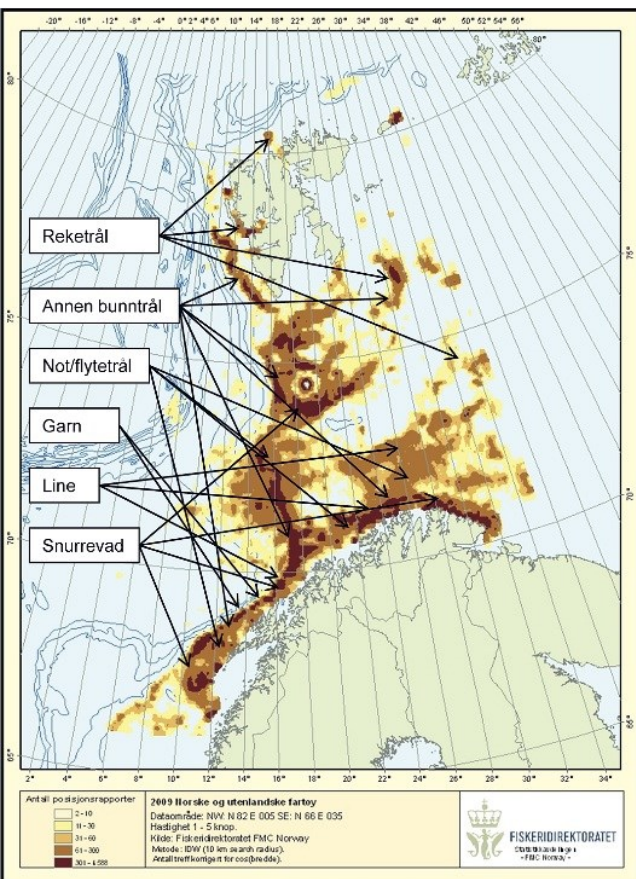


Seabird colonies

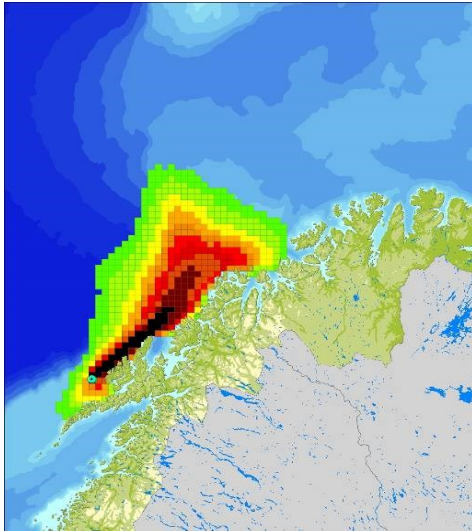


Economic activity

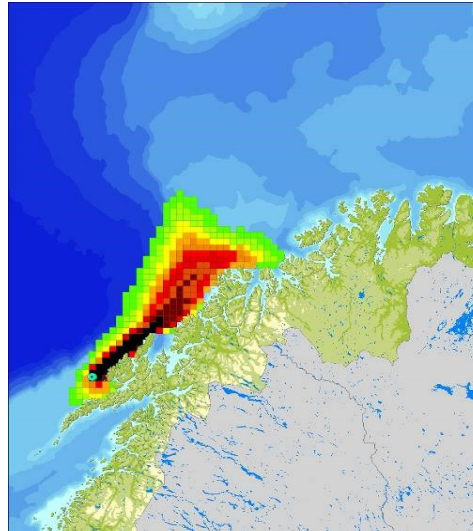
Fisheries – Sea transport - Petroleum



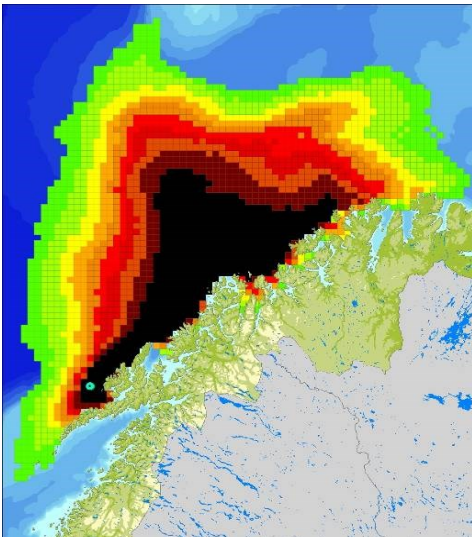
Risk of acute oil pollution – scenarios



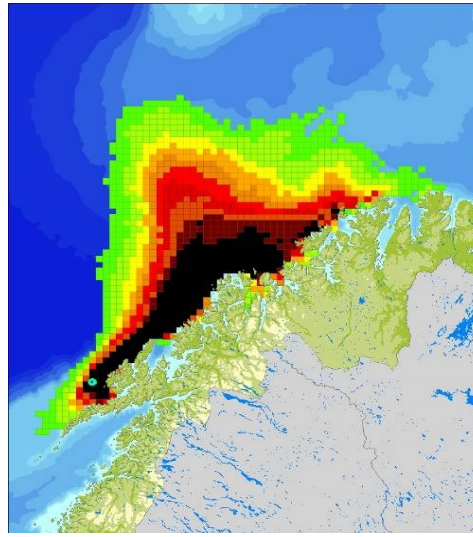
Surface discharge, 2 days



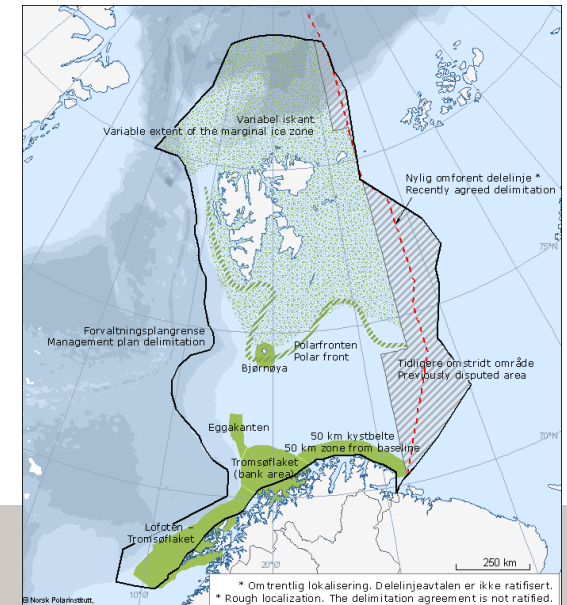
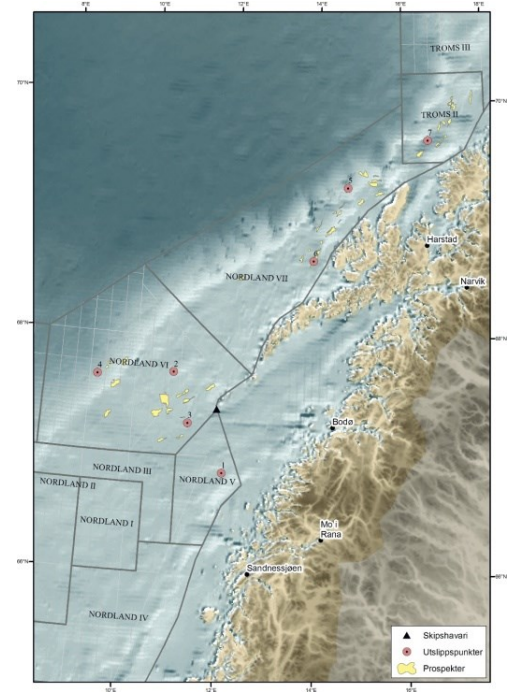
Sea bottom discharge, 2 days



Surface discharge, 50 days



Sea bottom discharge, 50 days



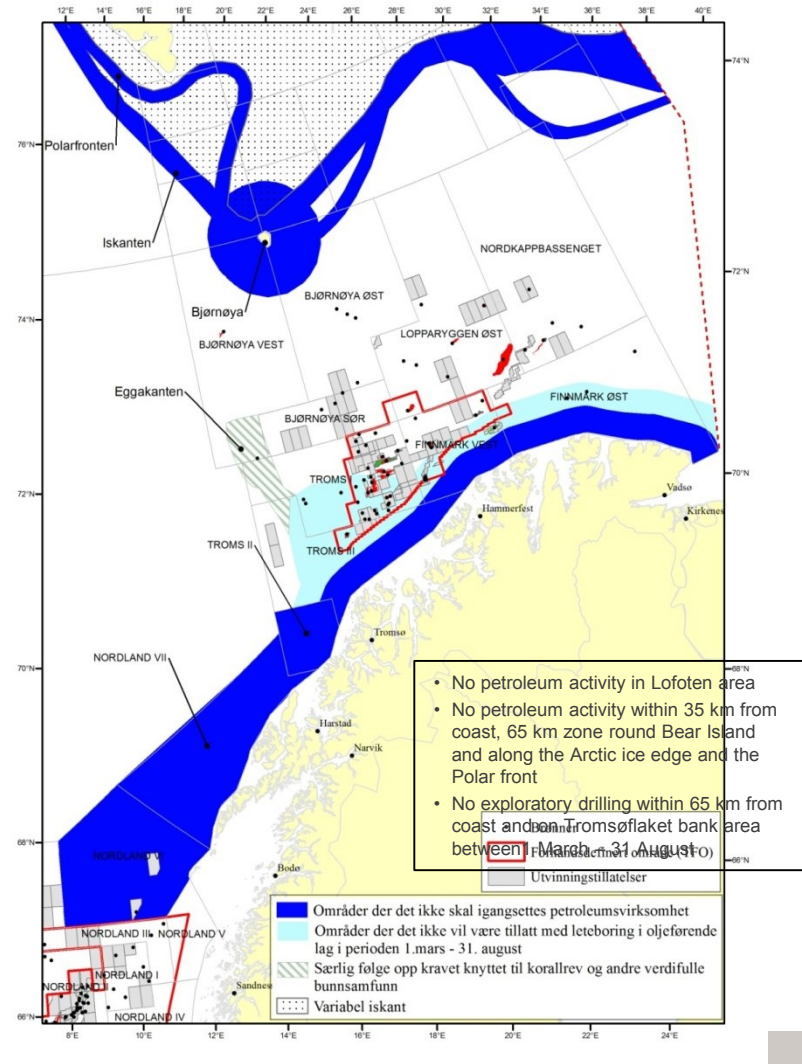
Relevant measures

Barents Sea – Lofoten:

Particularly valuable and vulnerable areas

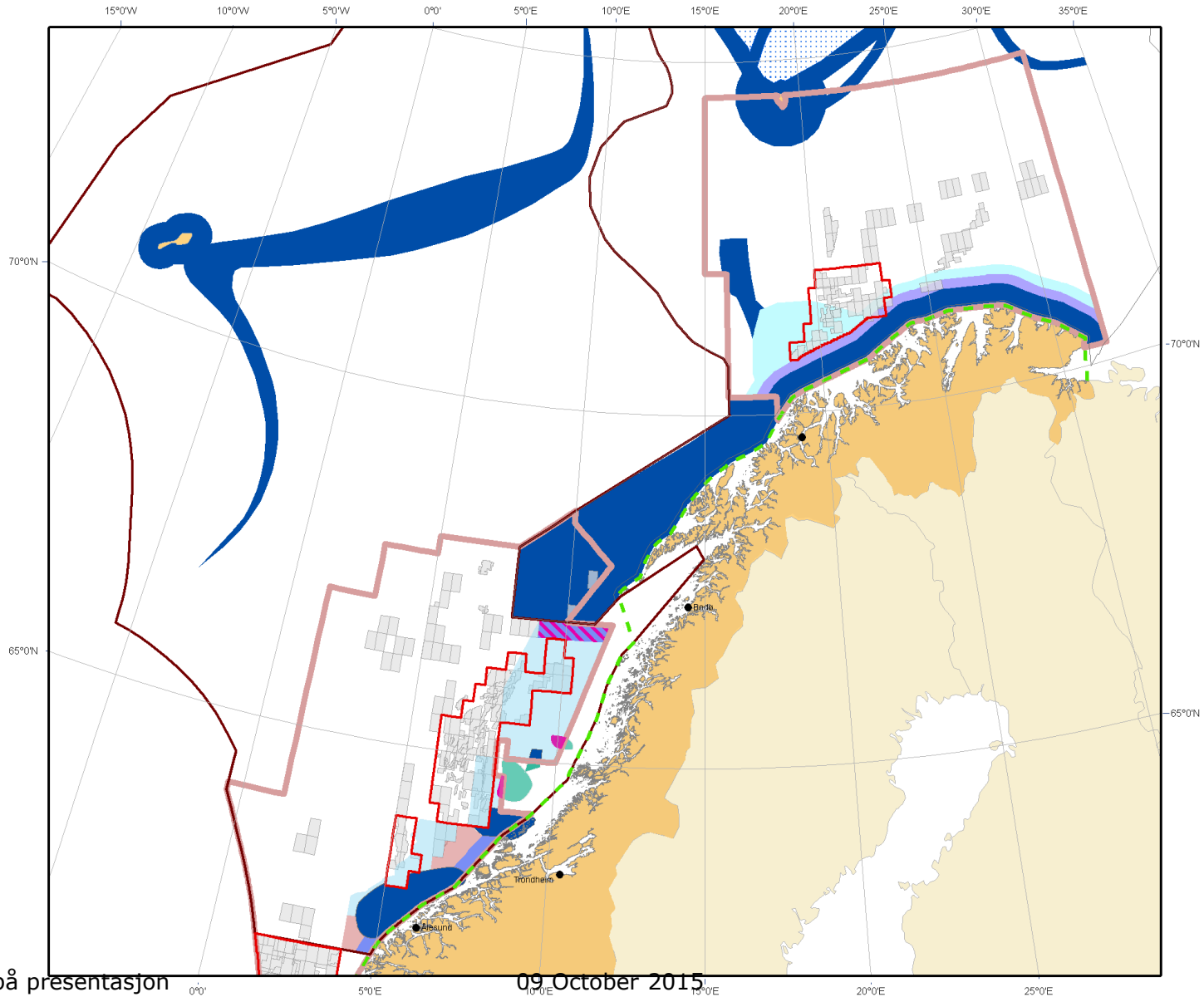


Framework for petroleum activities

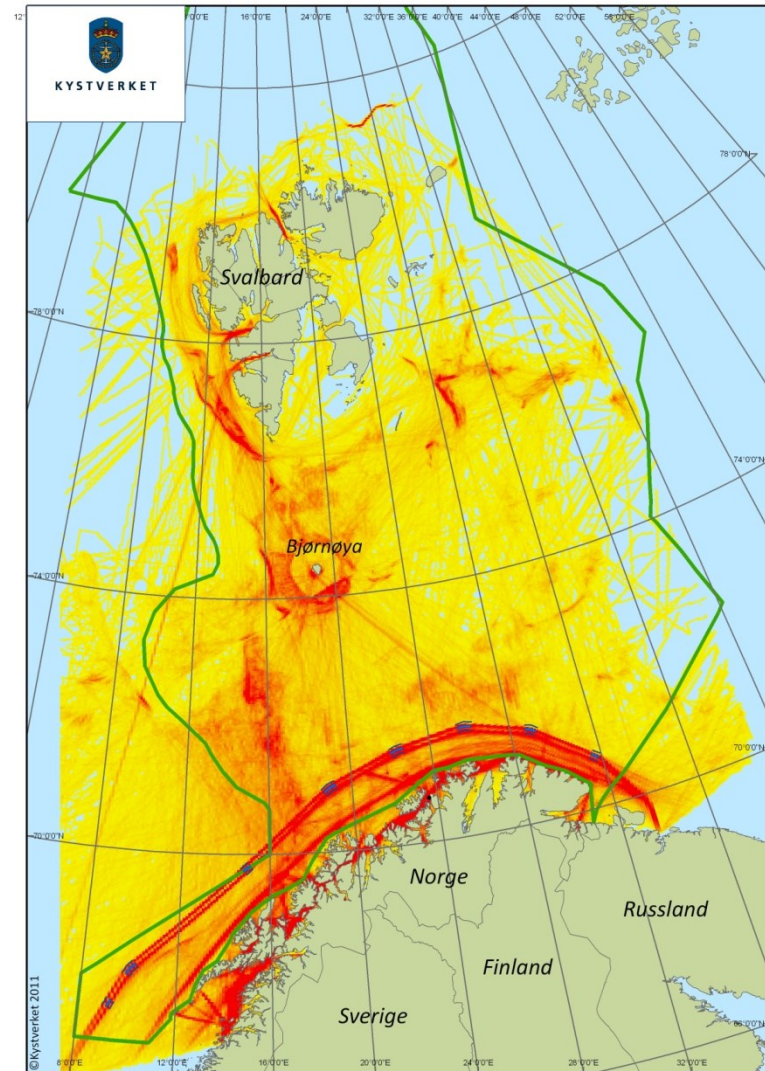
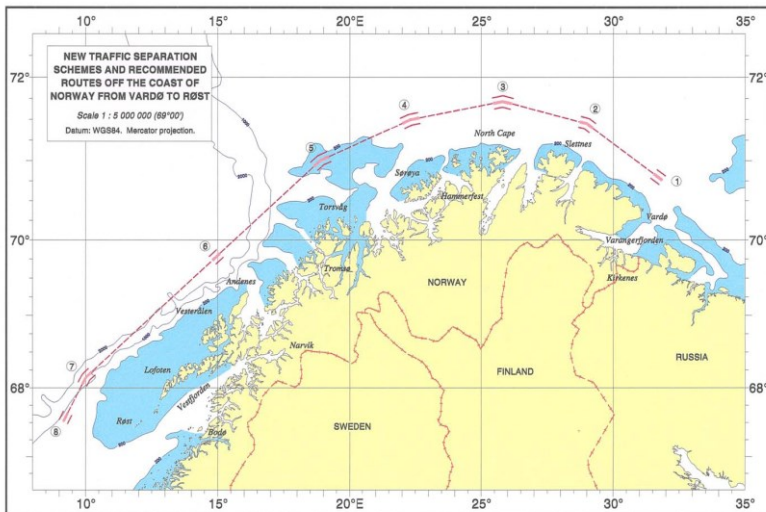


Framework for petroleum activities

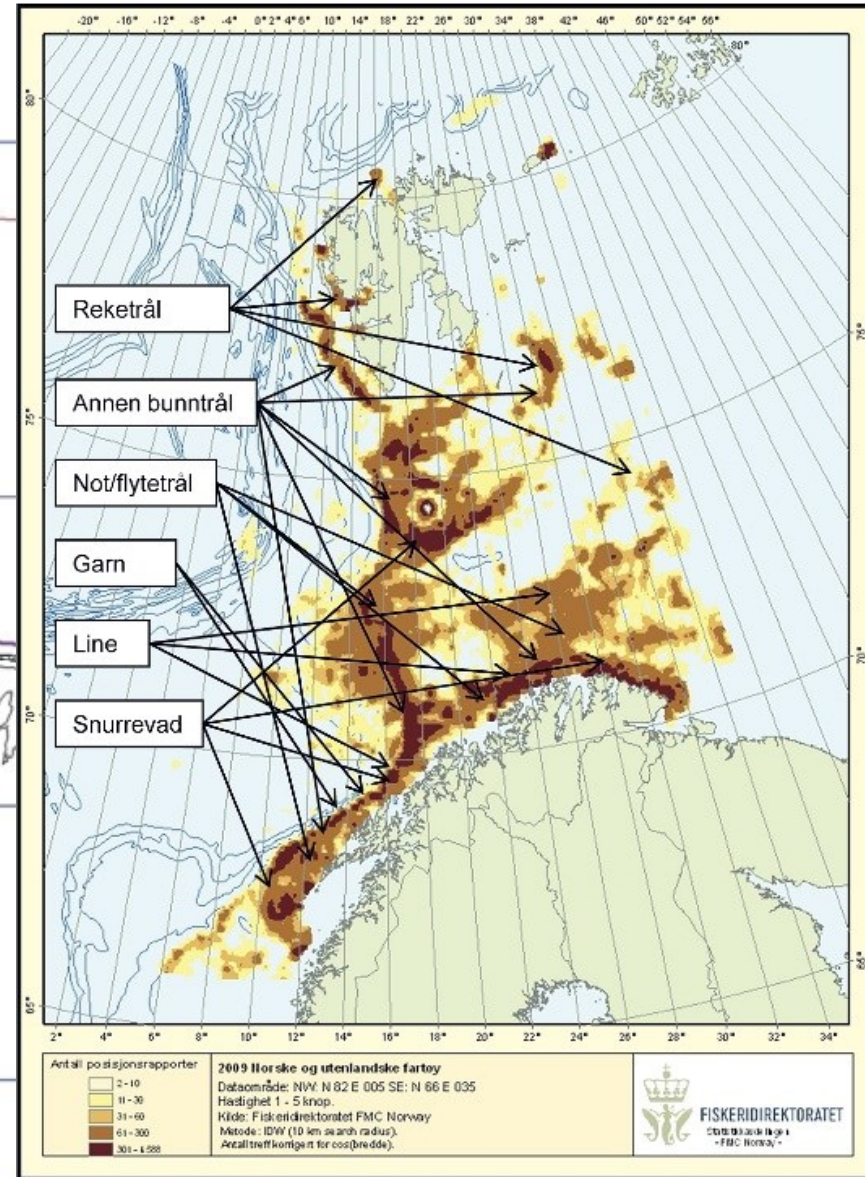
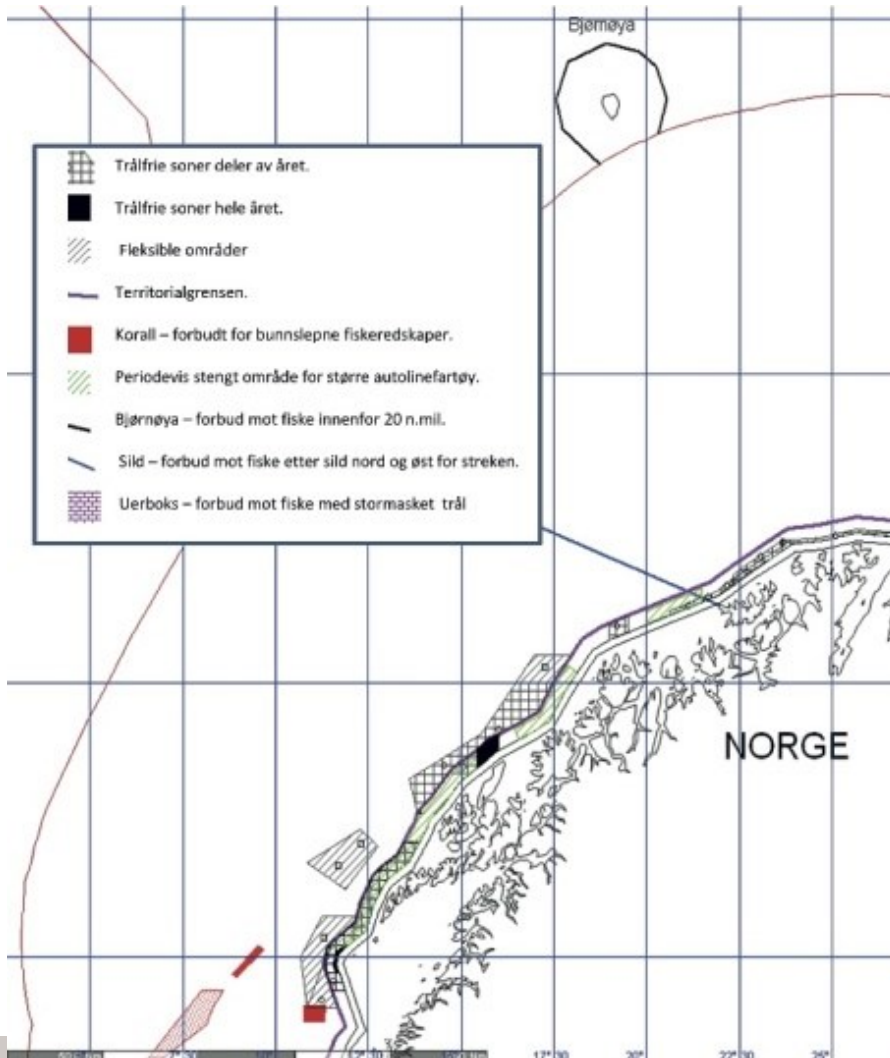
Barents Sea + Norwegian Sea



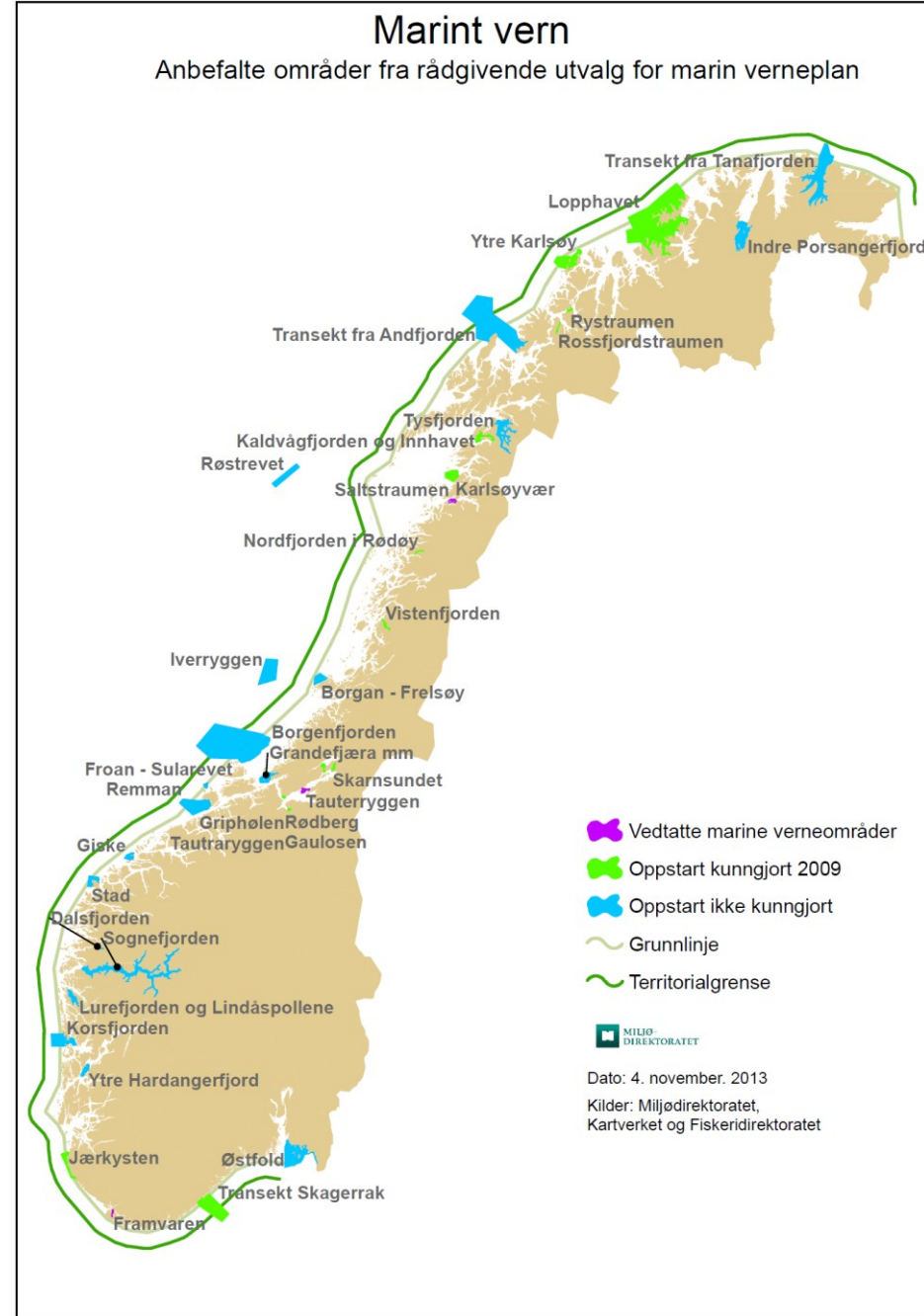
Managing risk of acute oil pollution from sea transport – routing system (IMO)



Sustainable Fishery Management



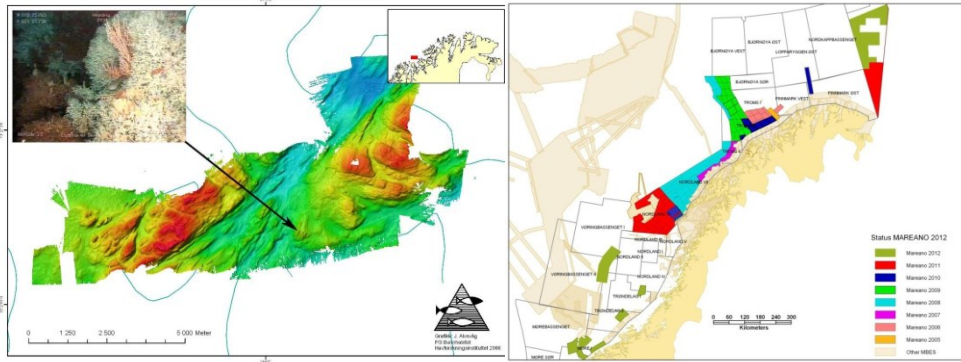
Marine Protected Areas



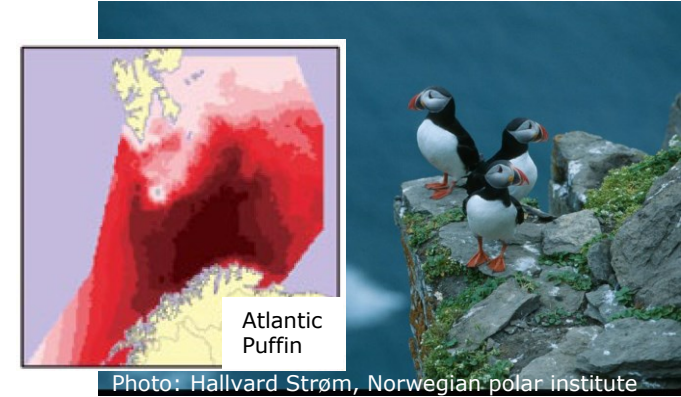
Knowledge build-up

Improving knowledge

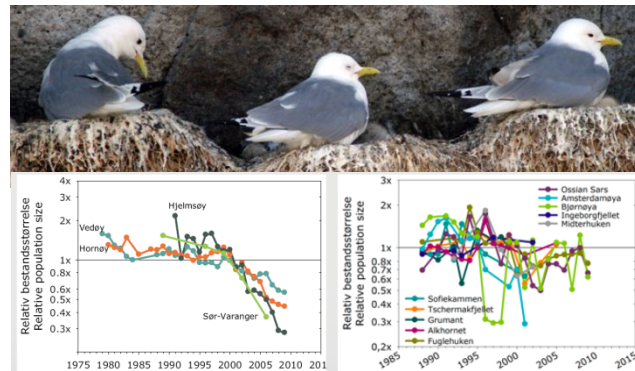
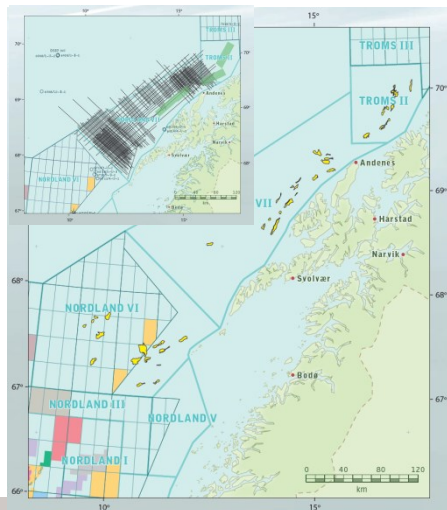
Seabed mapping – MAREANO programme



Seabird distribution – SEAPOP programme



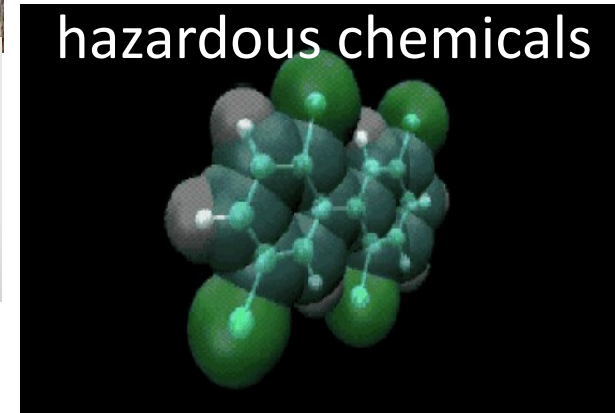
Geological mapping



Figur 4.8.2.5
Utviklingen i hekkebestanden av krykkje (tilsynelatende okkuperte reir) på Røst (Vedøy), Hjelmsøy, Hornøy og Sor-Varanger (til venstre) og i noen kolonier på Svalbard (til høyre), vist som bestand i prosent av gjennomsnitt for alle år den er overvåket. For en mer detaljert kartforklaring, se figur 4.8.2.1. For forklaring av y-aksebenevninger, se figur 4.8.2.2.

Environmental monitoring & research

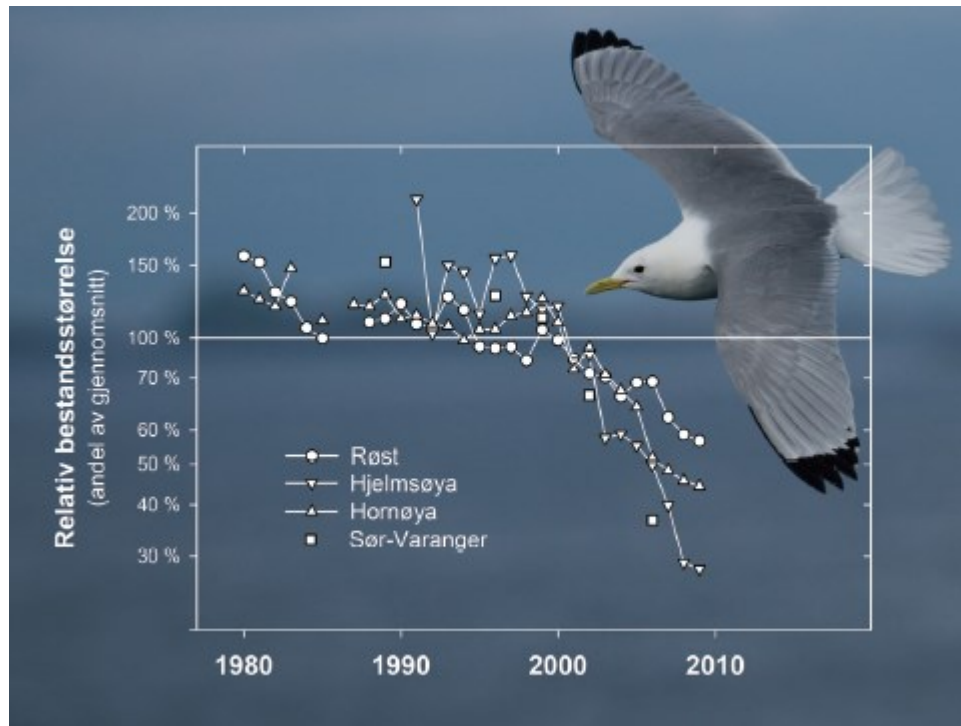
Screening of hazardous chemicals



Monitoring system for environmental quality

Indicator (34 different indicators)	Reference value	Action threshold
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Example Seabirds		
Population trend for kittiwake (<i>Rissa tridactyla</i>)	Average for last 10 years + historical data	Population decrease of 20 % or more in 5 years, or deviation of more than 10 % from expected adult survival rate, or failed breeding 5 years in a row



Conclusion

Summary: Integrated Marine Management Plans provides:

- A tool to cope with change and limit cumulative impacts through adaptive management of local activities
- A tool to resolve conflict of interests between activities in a way that safeguards the environment
- A system for early detection of negative impacts and implementation of mitigation measures
- A system to consider and implement conservation measures before new areas are opened up for activity
- A predictable framework for economic activities.



A large colony of seabirds, likely gannets, is gathered on a rocky cliffside overlooking the ocean. The birds are densely packed, covering the entire visible surface of the cliff. The ocean is a deep blue, and the sky is a pale, hazy blue. The cliff face is rugged and grey. The overall scene is a vast, natural habitat for these birds.

Thank you for
your attention!

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