

Ecosystem-based oceans management: Norway's management plans

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Photo: T. de Lange Wenneck

Context & drivers
The plans
The scientific basis
Implementation
Relevance to tipping points



Integrated oceans management

Response to climate change, pollution,
increasing economic activity

*The **cumulative** impacts of various uses of
and pressures on the marine environment
necessitate integrated approaches*

Addressed through a number of **concepts**:
Marine Spatial Planning, Ocean Zoning,
Ecosystem-based ocean management etc.



An ocean state

- Area
 - **Sea:** 2,3 million km² under Norwegian jurisdiction
 - **Land:** 385 000 km²
- Value creation
 - Petroleum, aquaculture and fisheries are the main exports and foundation our welfare

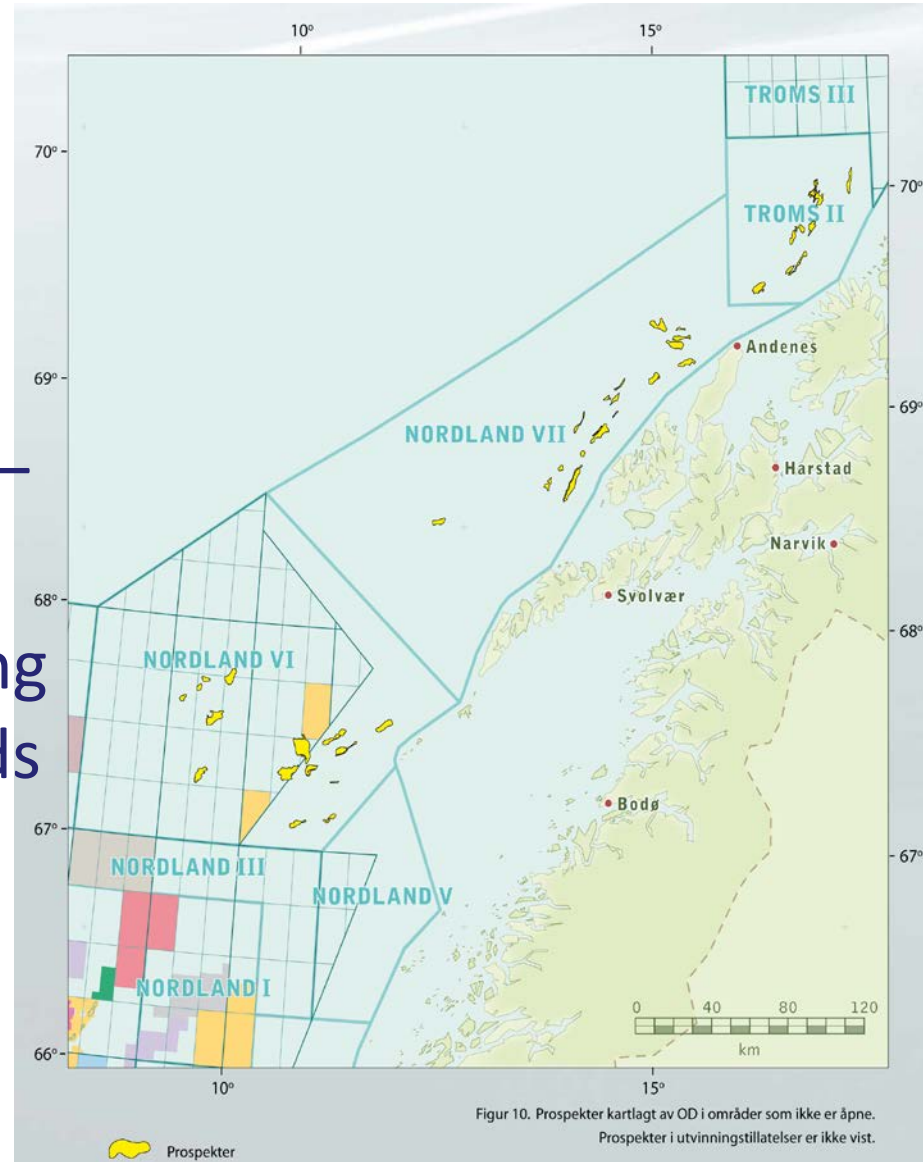


Decline in oil/gas production: need for new fields to fill the gap

New areas off Northern Norway

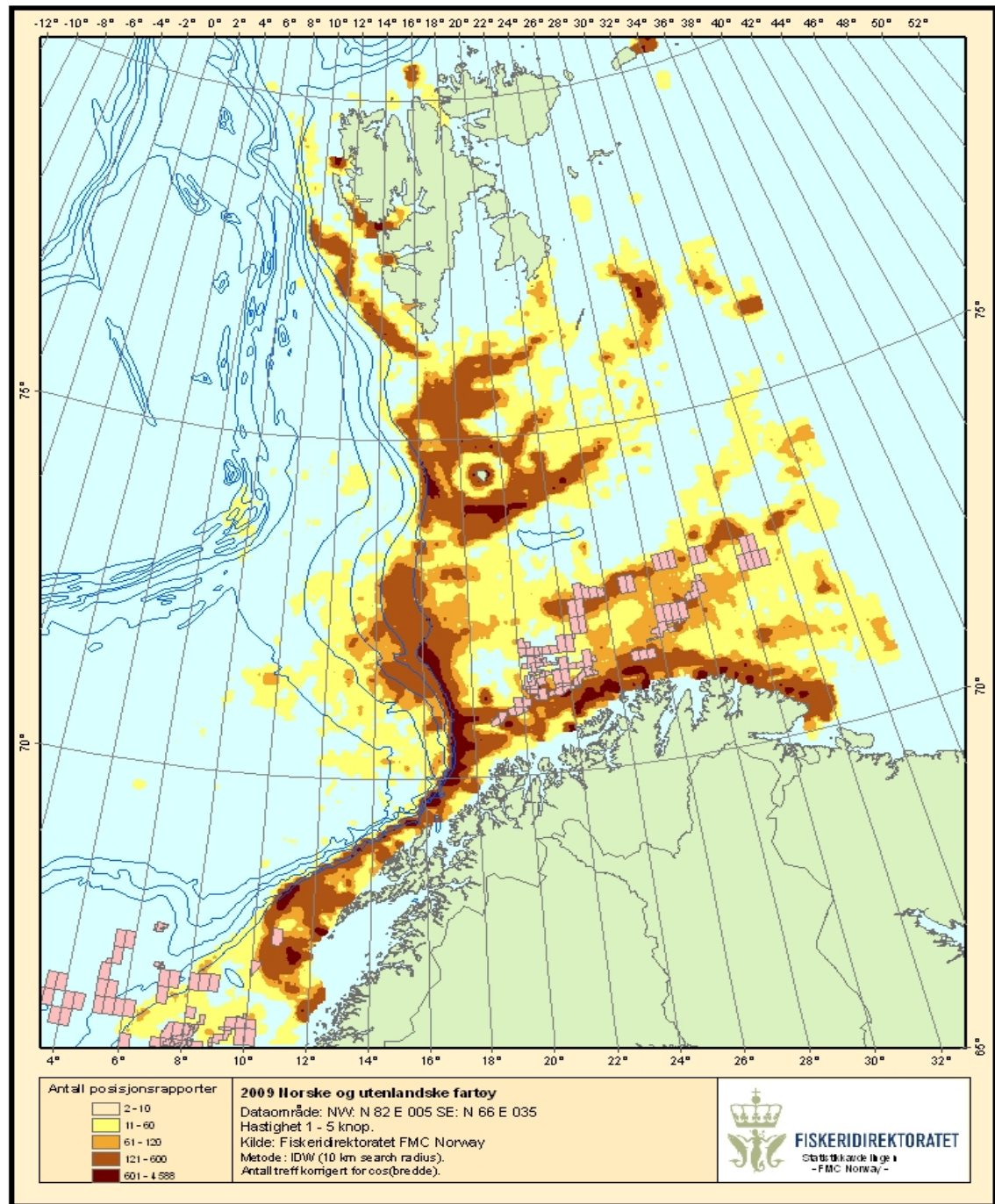
Most promising: Lofoten – Vesterålen

Need **infrastructure** moving north to access arctic fields

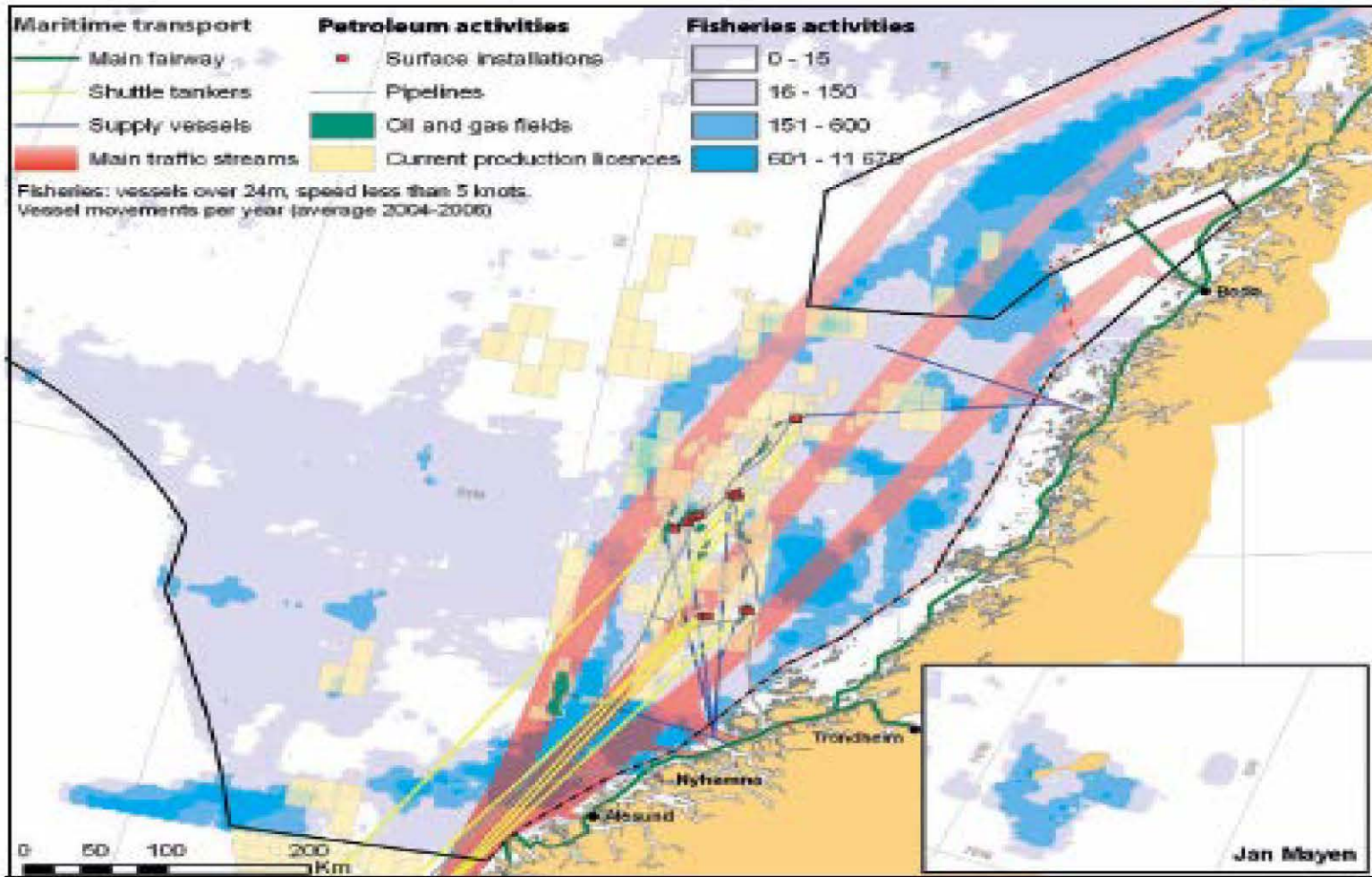


Fishing is the main impact, but with area-conflicts with oil/gas

- VMS data for 2009 for vessels >21m
- Pink blocks are areas opened for petroleum activities



Human use of the areas



Anon 2009

Pollution issues



The Plan

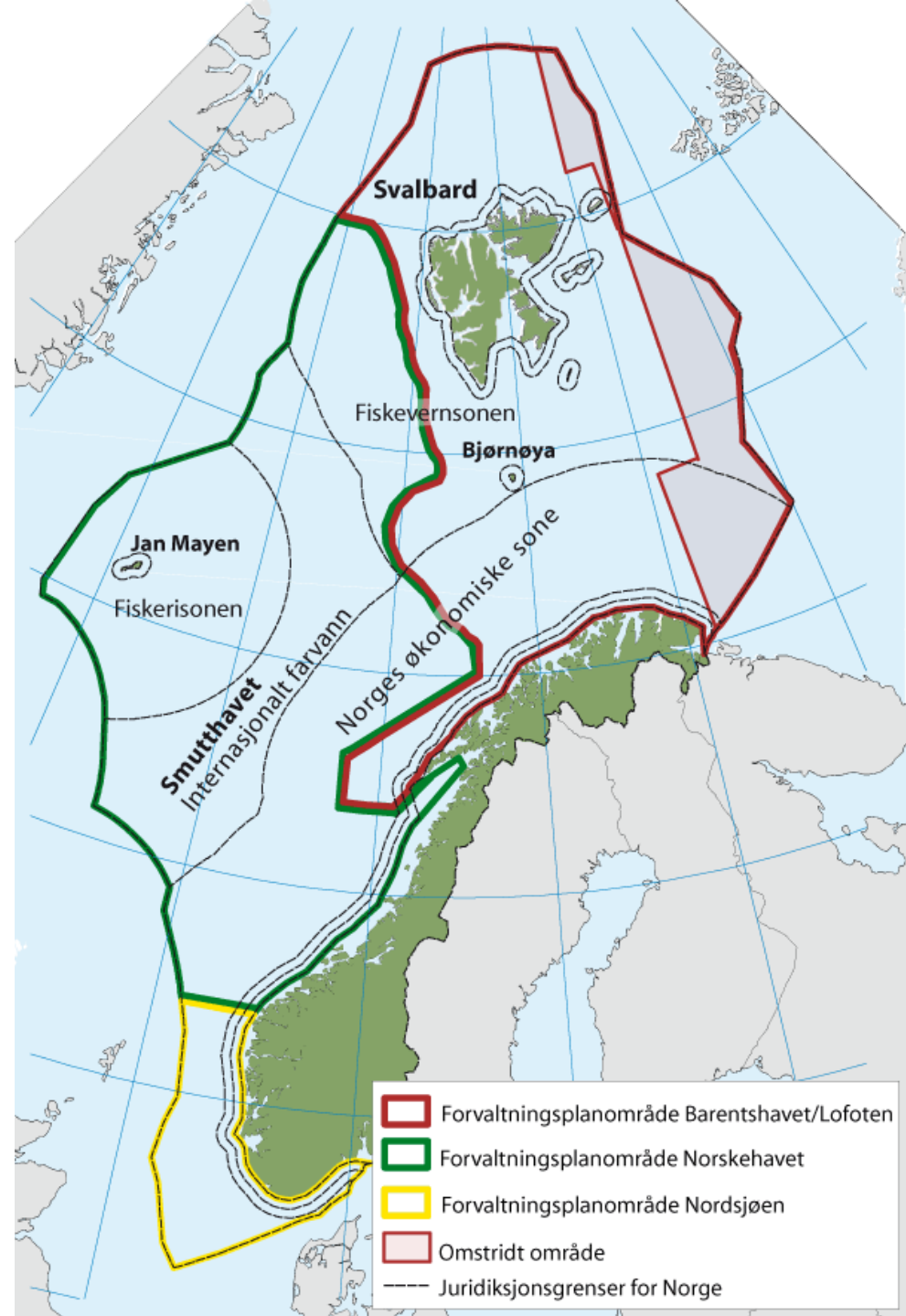


Start: 2001

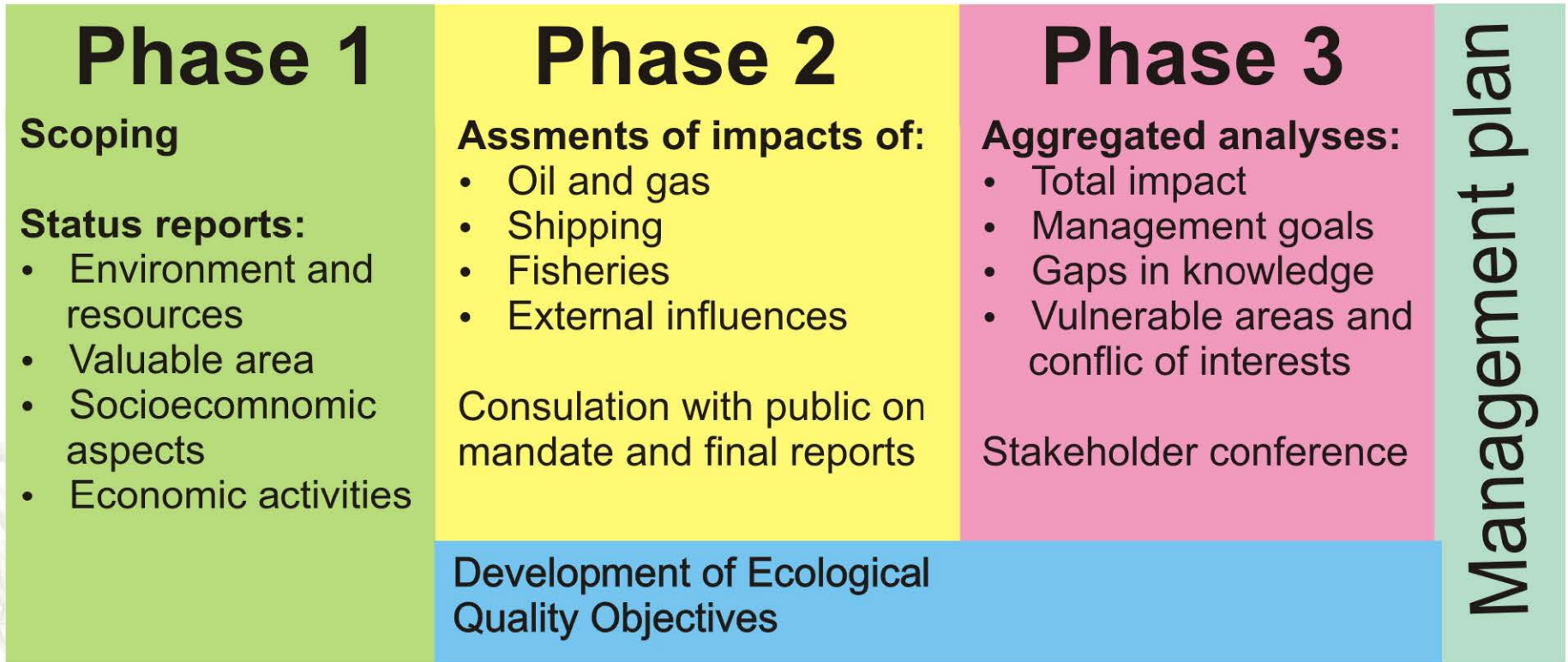
Barents Sea: 2006,
revision in 2010/2011

Norwegian Sea: 2009

North Sea: planned
2013



The planning process

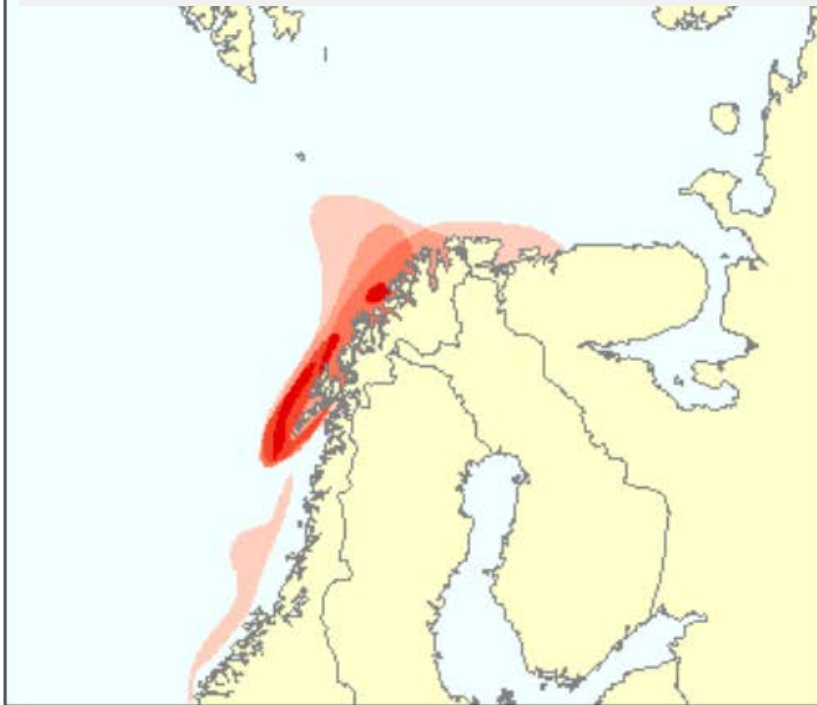


The science behind the plan

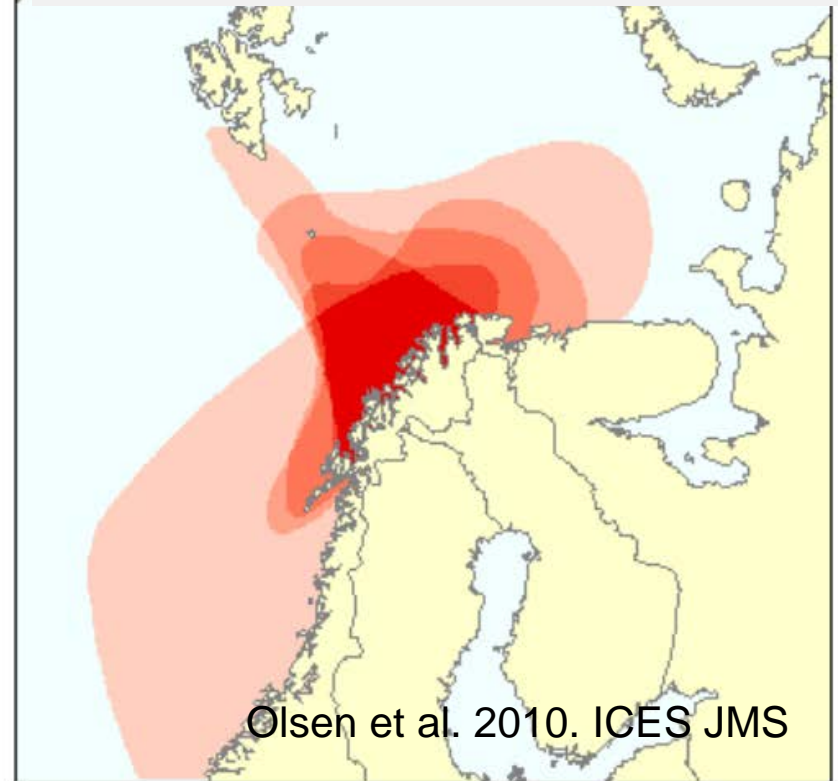


Some areas are more valuable than others

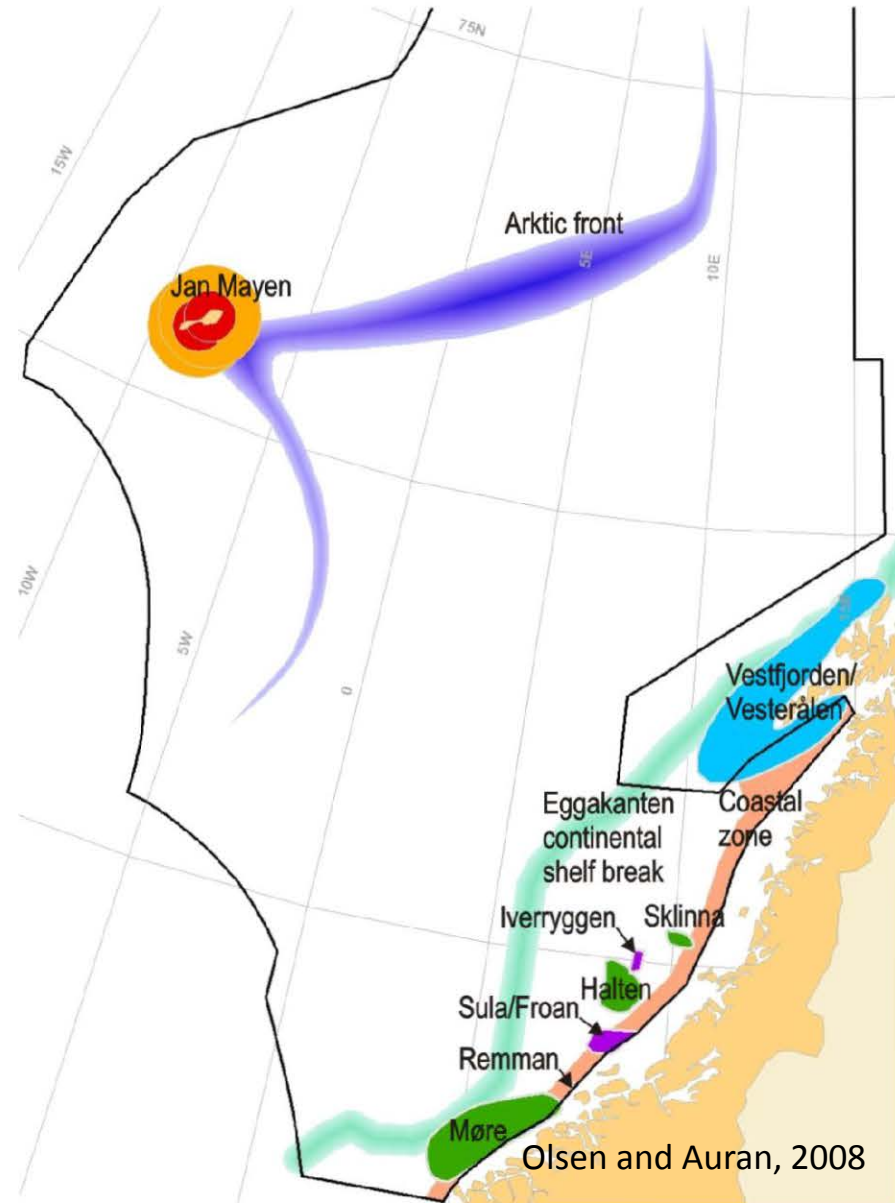
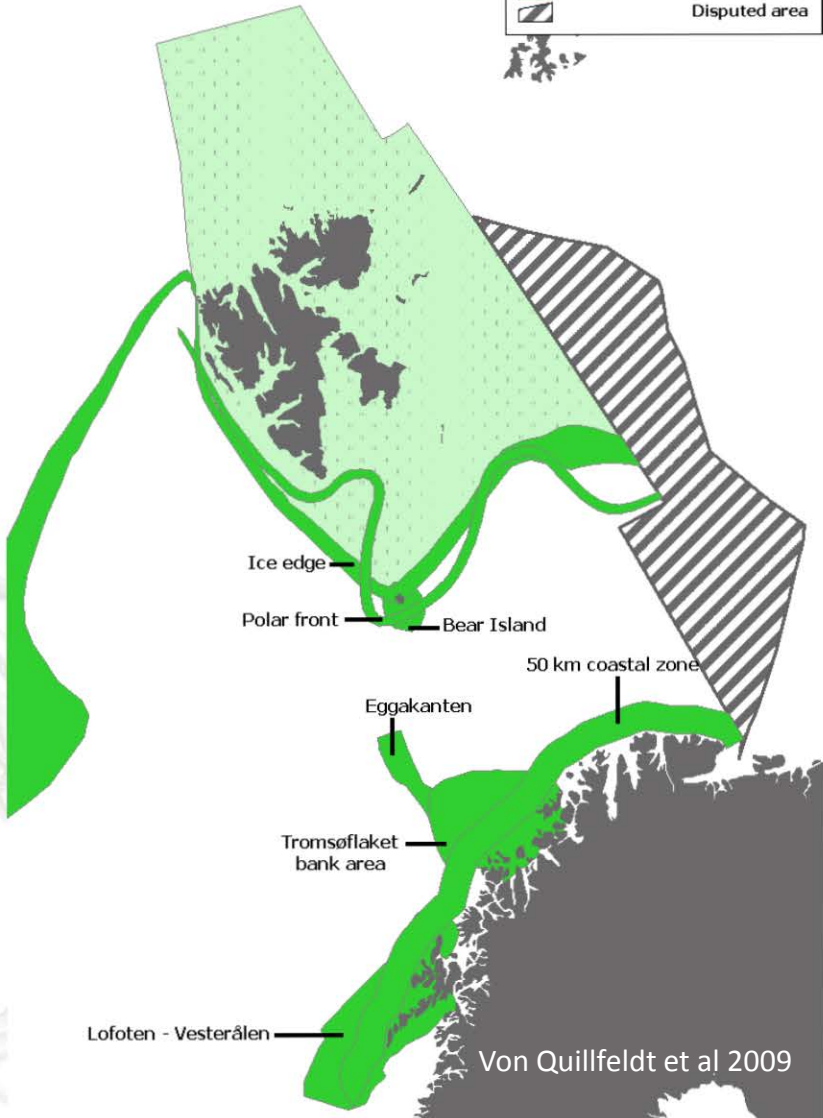
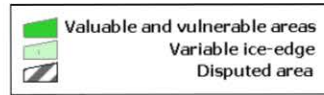
Spawning areas for cod, herring, capelin, haddock and saithe



Larvae areas for cod, herring, capelin, haddock and saithe

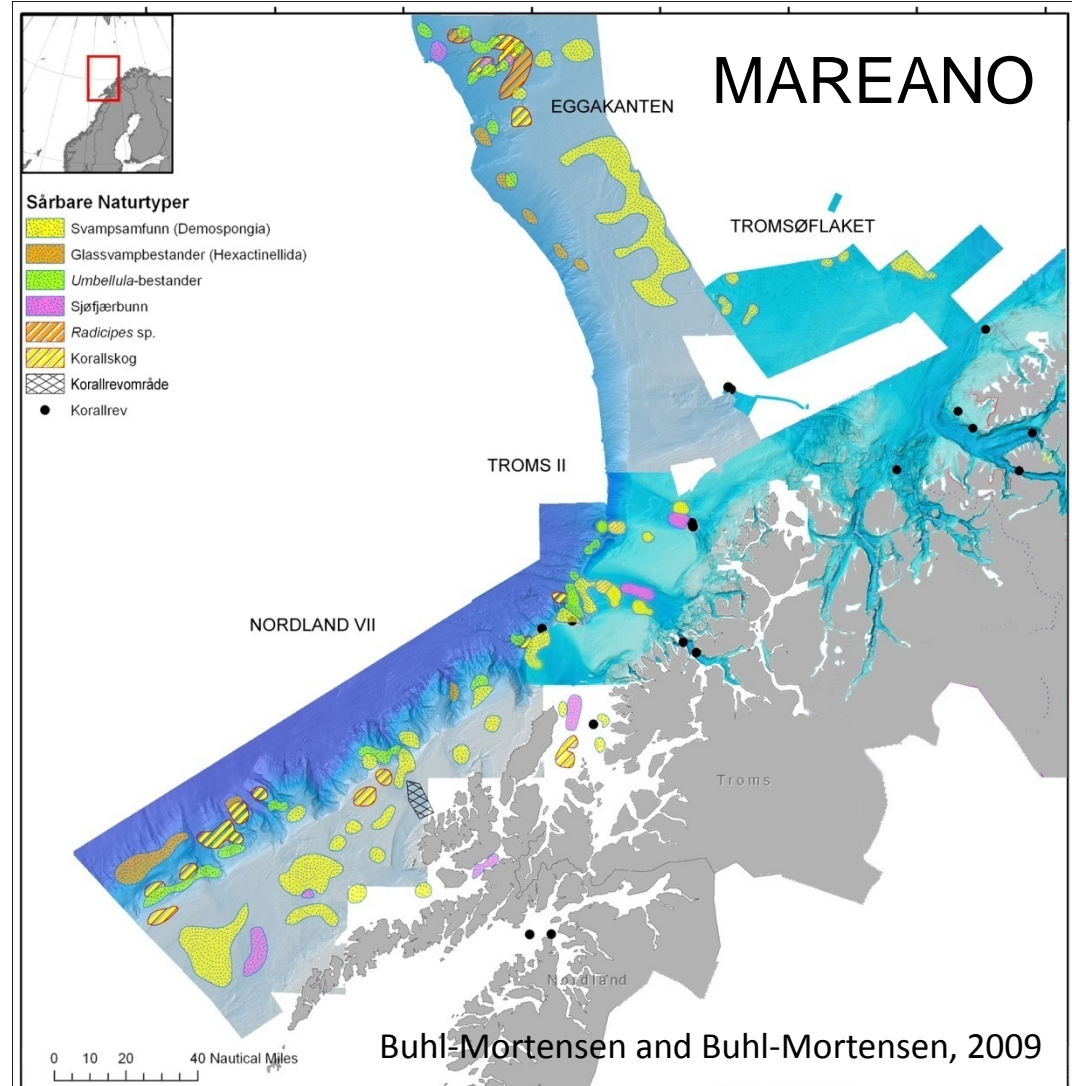


Particularly valuable and vulnerable areas



Revision of the Barents Sea plan (2010/2011) – new knowledge

- MAREANO seabed mapping project
- Identification of vulnerable nature types (OSPAR)
- + many other projects



Key Scientific challenges

Effects of climate change and ocean acidification

Environmental **risks** and consequences of human activities

Effect of **fisheries** on benthic habitats

Better understanding of **trophic interactions** in the system

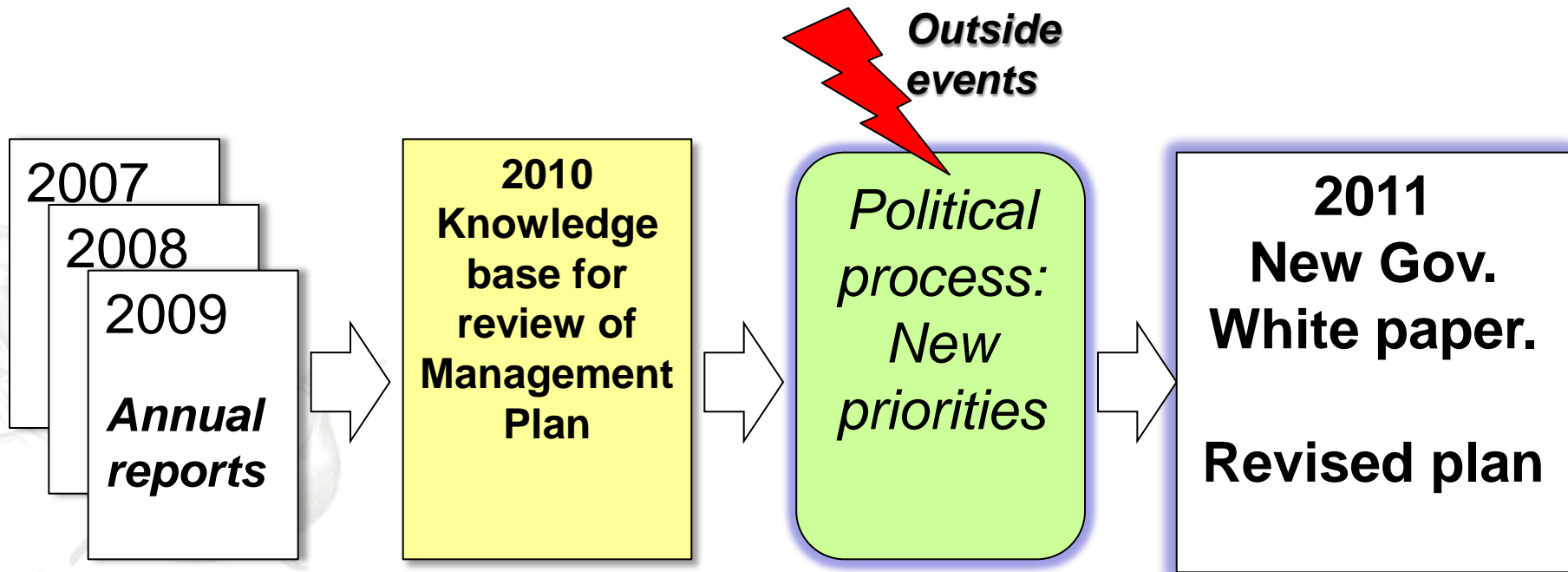
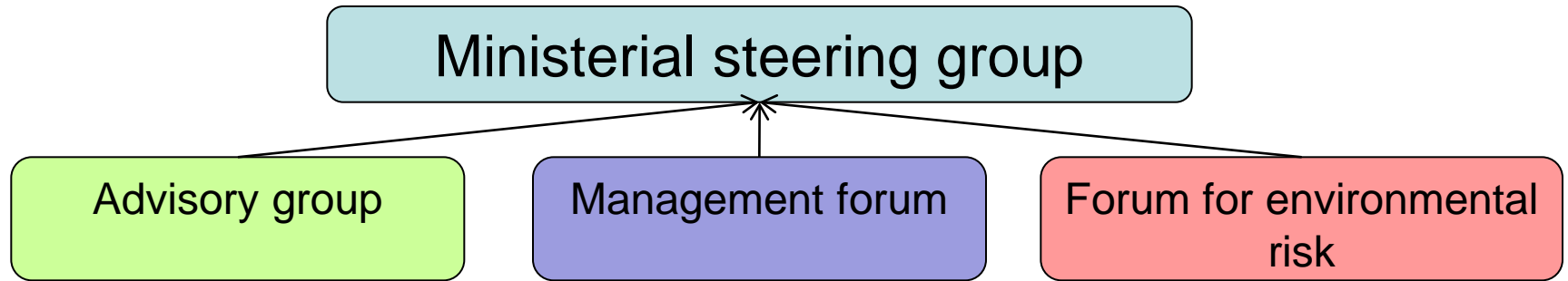
Defining and setting **value** to ecosystem components and habitats

Assessing vulnerability, **cumulative impacts** and cumulative vulnerability

Implementation



Implementation and review



**No specific legislation - implemented through
existing legislation**

New Oceans Resources Act

Annual reporting of status and state of knowledge

**Development of an indicator-based reporting
system (ecosystem state)**

Assessment of environmental risk

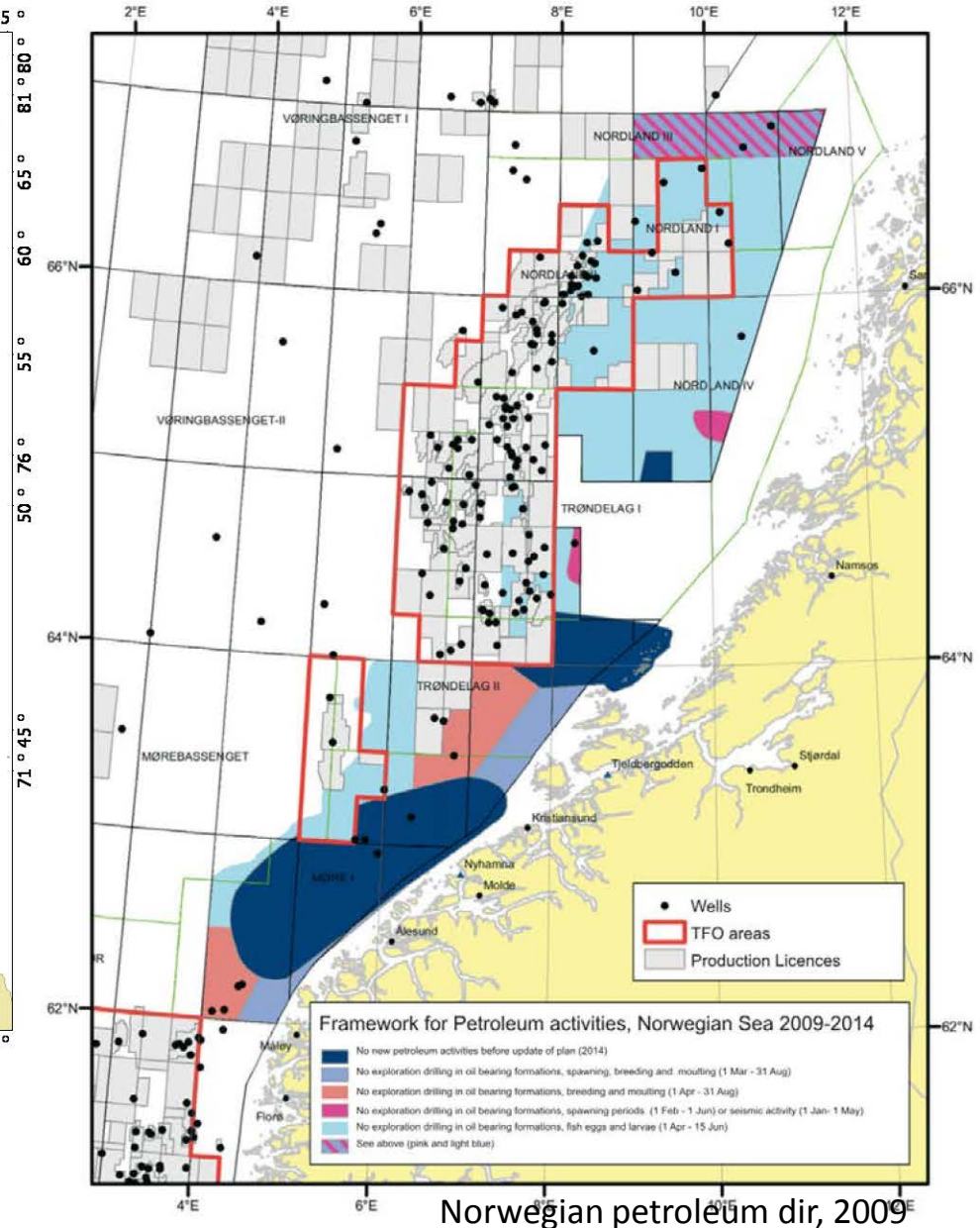
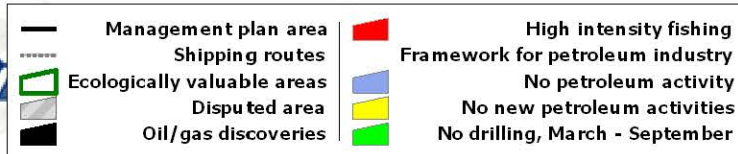
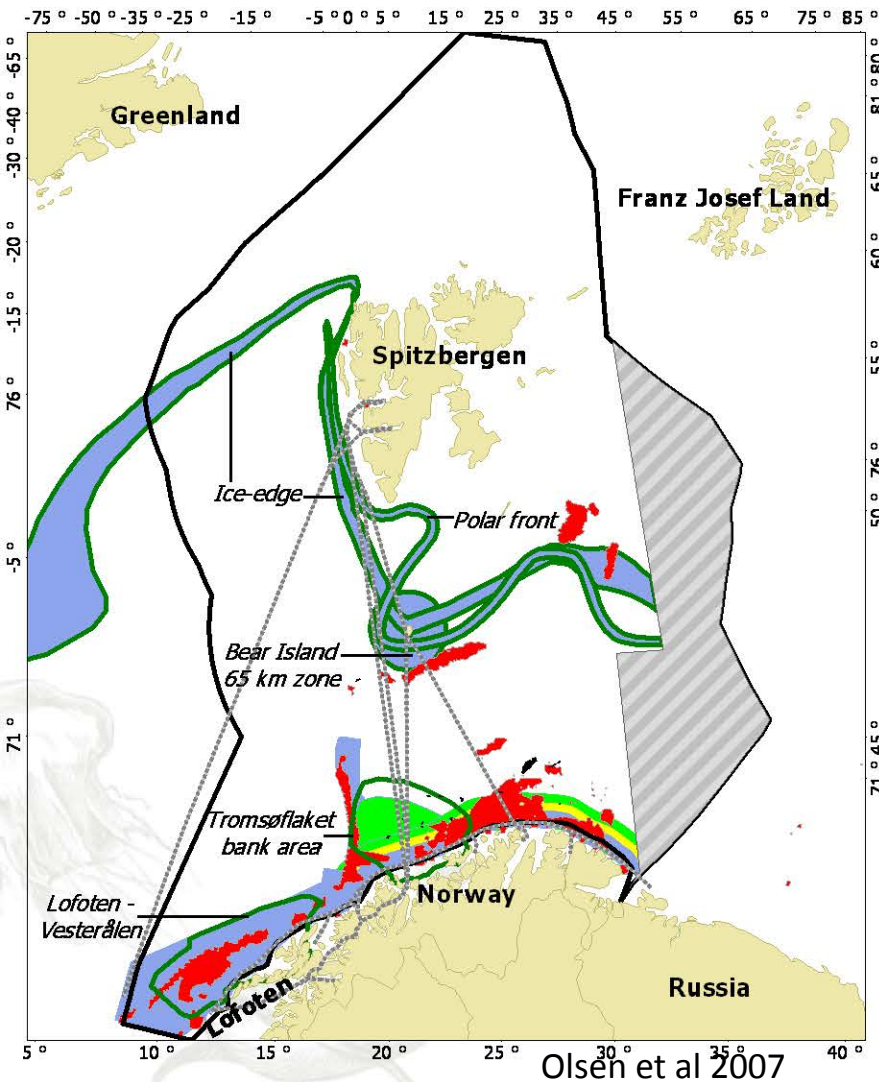
Routing system for shipping

Fisheries regulations

**Area-based management framework for
petroleum**

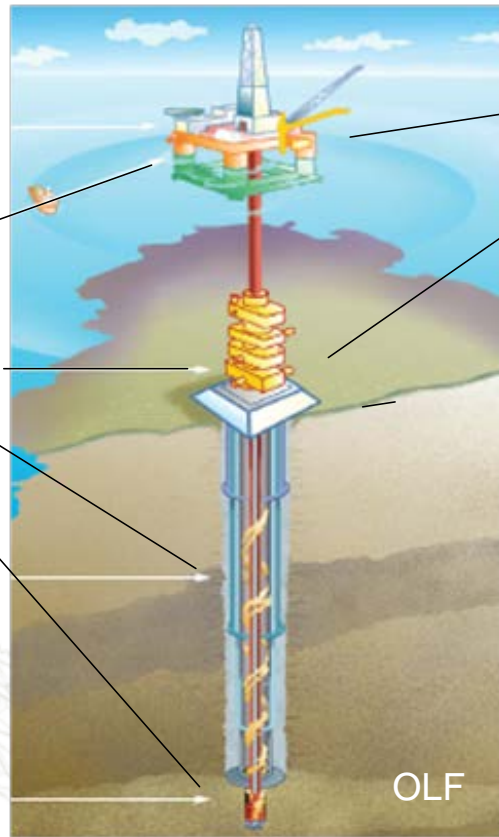


Area-based management frameworks

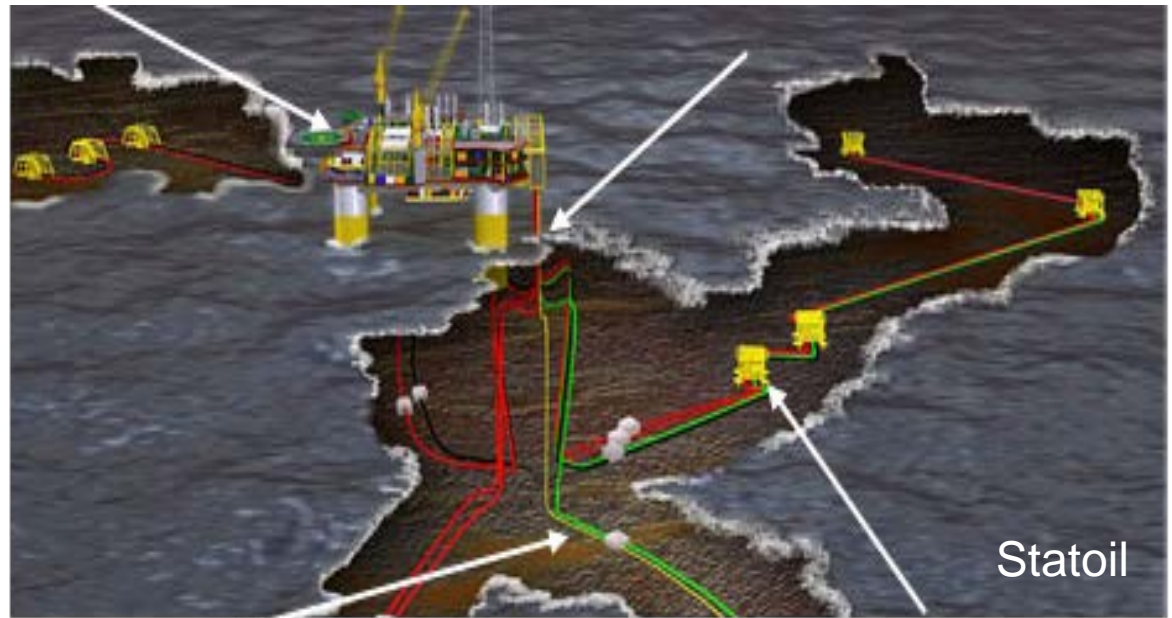


Norwegian petroleum dir, 2009

Risks associated with oil/gas production



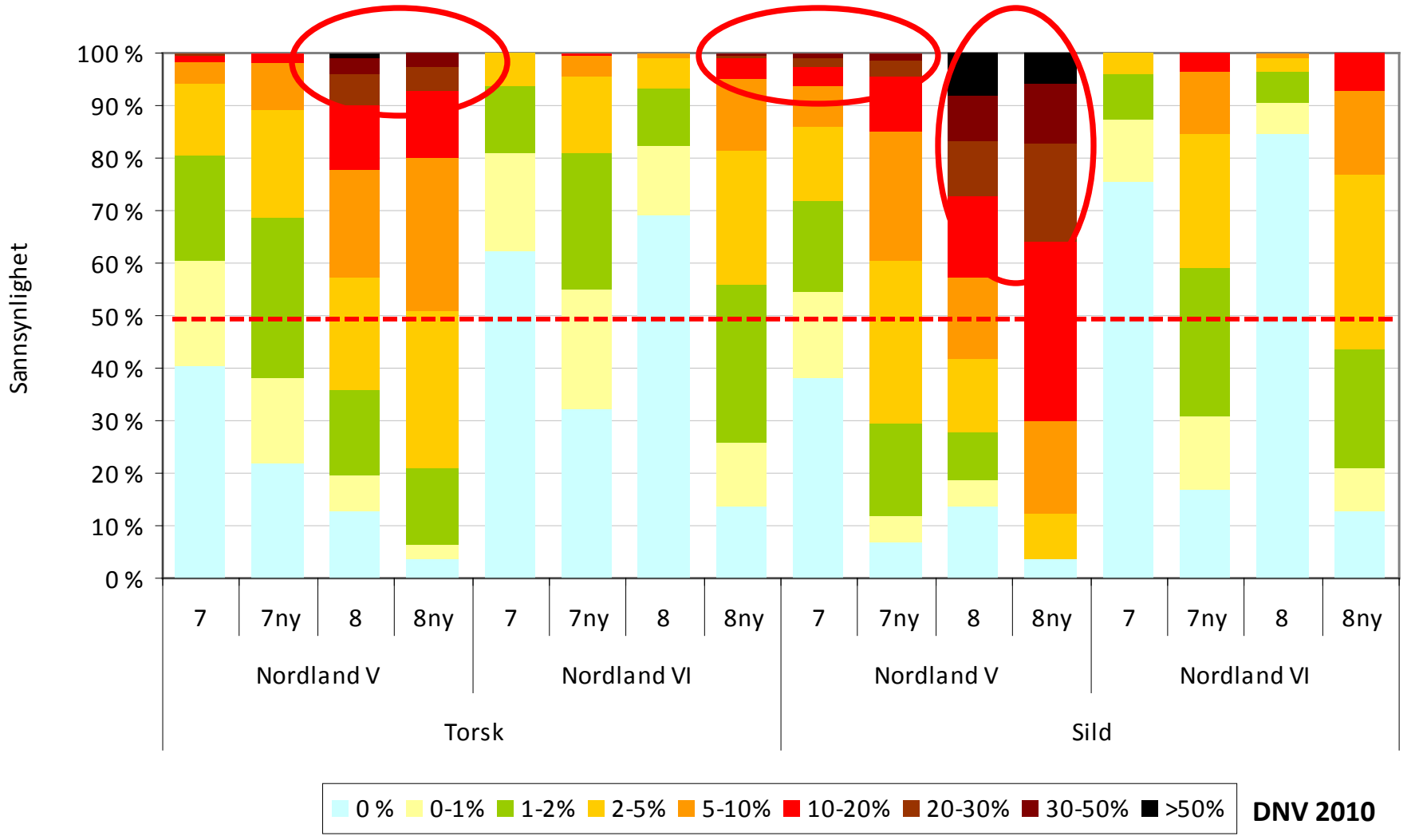
Exploration
drilling



Production

New Knowledge: Assessing environmental risk of oil spills

Tapsandel årsklasserekruttering - Data fra 1980-2004 vs. 2008/09





New Events: Deepwater horizon blowout

- **Duration: 87 d**
- **Total spill: 779 036 m³**
- **Spill rate: 8426–9857 m³d⁻¹**

Potential for improvements

ORGANIZATIONAL:

Based on science, but need transparency and peer review
Improve cooperation between sectors
Identifying disagreements, enhancing the scientific ethos

SCIENTIFIC

Socioeconomic effects are not assessed
Ecosystem services are not assessed

Communication of uncertainties

Integrated oceans management and tipping points

Consider cumulative impacts

Assess risks

Reconcile concerns

Enhance resilience



Can the Norwegian experience be copied?

Small, homogenous and rich
Efficient, centralized administration
Effective science



Thank you for your attention!



Photo: T. de Lange Wenneck