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

Phase 1
Scoping
Status reports:
- Environment and resources
- Valuable area
- Socioeconomic aspects
- Economic activities

Phase 2
Assessments of impacts of:
- Oil and gas
- Shipping
- Fisheries
- External influences
Consulation with public on mandate and final reports

Phase 3
Aggregated analyses:
- Total impact
- Management goals
- Gaps in knowledge
- Vulnerable areas and conflict of interests
Stakeholder conference

From: von Quillfeldt et al 2009
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

Olsen et al. 2010. ICES JMS
Particularly valuable and vulnerable areas

Von Quillfeldt et al, 2009
Olsen and Auran, 2008
Revision of the Barents Sea plan (2010/2011) – new knowledge

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

Buhl-Mortensen and Buhl-Mortensen, 2009
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

Photo: T. de Lange Wenneck
Implementation
Implementation and review

Ministerial steering group

Advisory group
Management forum
Forum for environmental risk

2007
2008
2009
Annual reports

2010 Knowledge base for review of Management Plan

Political process: New priorities

Outside events

2011
New Gov. White paper.
Revised plan
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

Management plan area
Shipping routes
Ecologically valuable areas
Disputed area
Oil/gas discoveries

High intensity fishing
Framework for petroleum industry
No petroleum activity
No new petroleum activities
No drilling, March - September

No new petroleum activities before update of plan (2014)
No exploration drilling in oil bearing formations, spawning, breeding and moulding (1 Mar - 31 Aug)
No exploration drilling in oil bearing formations, breeding and moulding (1 Apr - 31 Aug)
No exploration drilling in oil bearing formations, spawning periods (1 Feb - 31 Jan) or seismic activity (1 Jan - 1 May)
No exploration drilling in oil bearing formations, fish eggs and larvae (1 Apr - 15 Jan)
See above (pink and light blue)
Risks associated with oil/gas production
New Knowledge: Assessing environmental risk of oil spills

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

Sannsynlighet

DNV 2010
New Events: Deepwater horizon blowout

- Duration: 87 d
- Total spill: 779,036 m$^3$
- Spill rate: 8426–9857 m$^3$d$^{-1}$
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!