Offshore oil and gas – vulnerability and potential effects/impacts

Hein Rune Skjoldal Institute of Marine Research, Norway AOR Workshop Washington DC, 13-14 September 2010

## Assessment of Oil and Gas Activities in the Arctic

- Chapter 1 Introduction
- Chapter 2 Oil and gas activities
- Chapter 3 Social and economic effects
- Chapter 4 Sources, inputs and concentrations
- Chapter 5 Effects on biota and human health
- Chapter 6 Status and vulnerability of ecosystems
- Chapter 7 Conclusions and recommendations
- www.amap.no

Three main messages ("Commandments")

- 1. Do not spill oil in ice
- 2. Use best practices
- 3. Do not pollute



### Feathers and fur

- Seabirds
  - Colonies

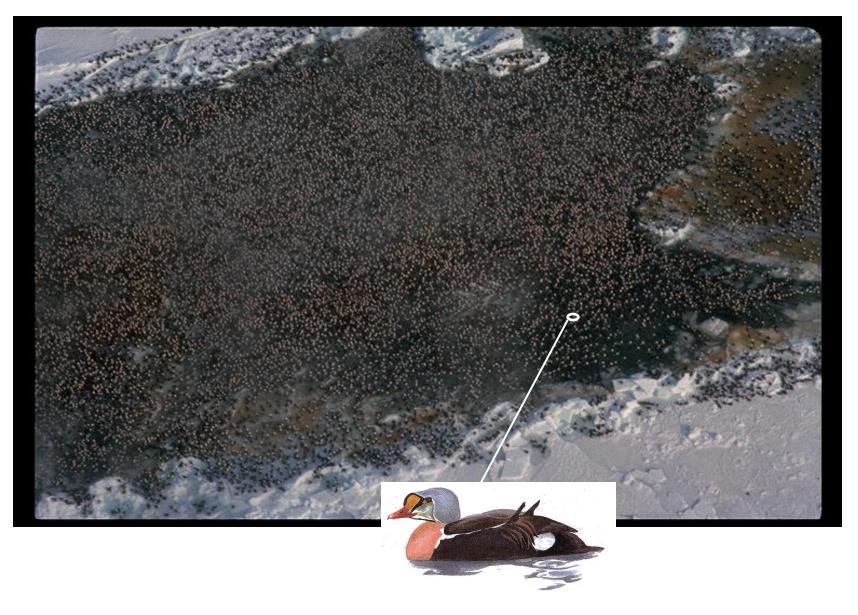


- Feeding in leads and polynyas
- Molting areas (auks and seaducks)
- Waders and waterfowl
- Polar bear, sea otter, northern fur seal
- Seal pups



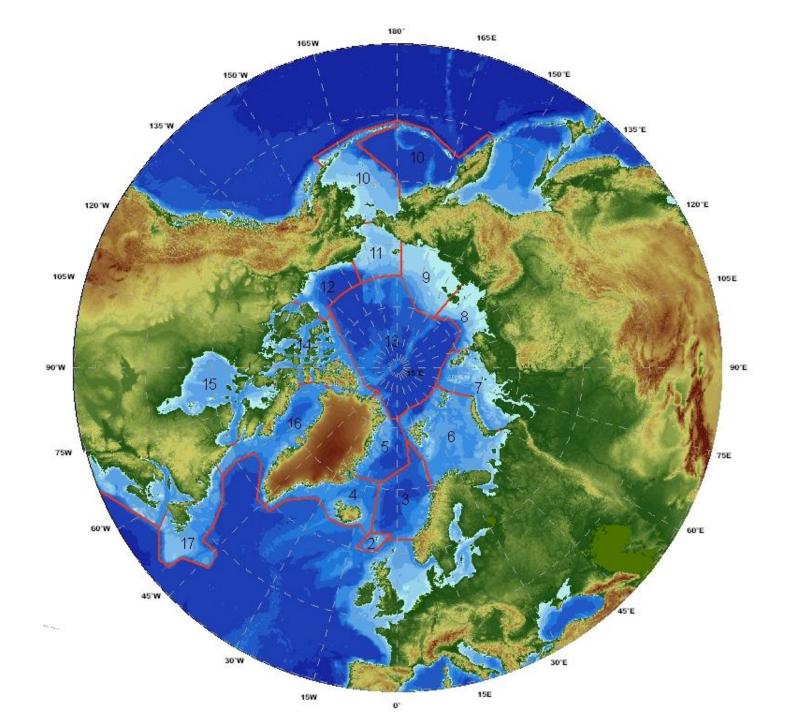
Northern Fur Seal Callorhinus ursinus 1.4-2.1 m

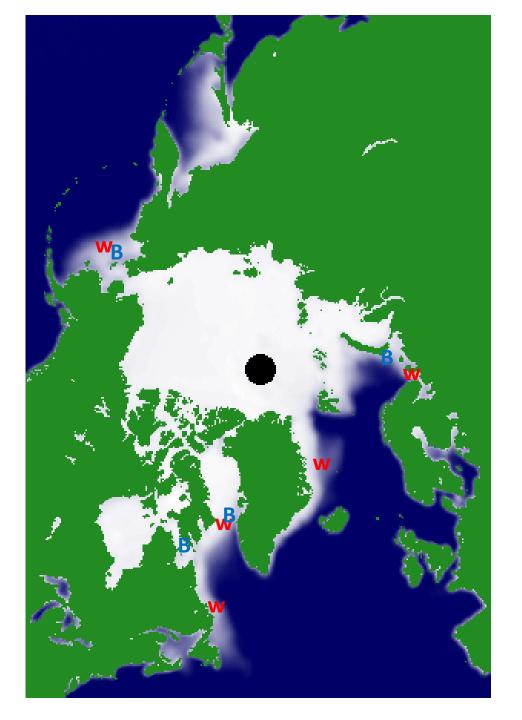
#### 25,000-30,000 kongeederfugle



### Oil spills in ice

- Animal aggregations
- Even a small spill could potentially affect many individuals
- Small cod-fishes sensitive components spawns under ice in winter
- Potentially large ecological impacts





## W - Whelping area seals

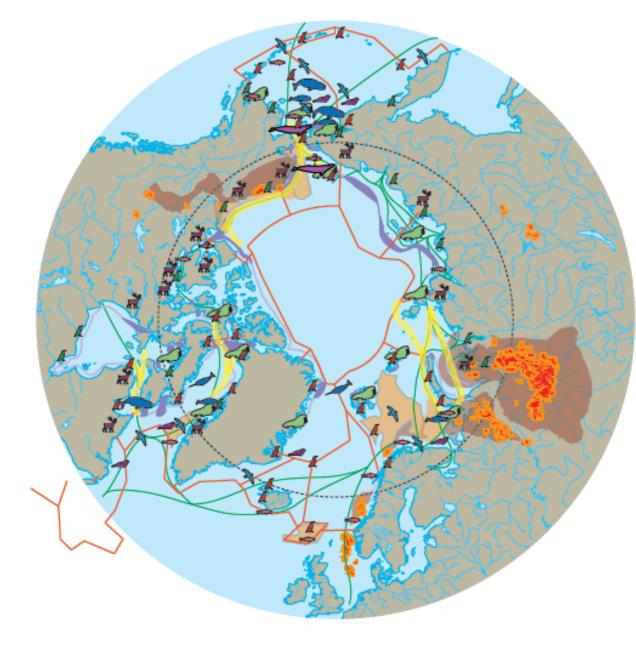


Harp Seal Phoca groenlandica 1.6-1.7 m

# B – Winteringarea Bowheadand/or beluga



#### Illustrative circumpolar vulnerability map



2	Caribou/reindeer calving grounds
Á	Seabird colonies
Á	Staging area - birds
24	Wintering area - birds
$\sim$	Feeding area - grey whale
	Wintering area - bowhead
	Wintering area - narwhal
$\sim$	Wintering area - beluga
0	Walrus aggregations
-	Whelping area - seals
*	Spawning area - fish
-	Marine mammal migration corridor
—	Shipping route
—	Large Marine Ecosystem boundary
	Major shore lead polynya
-	Concentrations of polynyas
	Producing fields
	Production areas
	Producing petroleum basin/province
	Major exploration basins

