



# Concept Symposium 2018

## Governing Megaprojects – Why, What and How

### Lessons from Research and Management of Polar Bears in the Extreme North

An Agreement on the Conservation of Polar Bears was signed by the five Arctic range states in 1973. The rationale for the Agreement was concerns that polar bears were over-harvested in many areas. Local/ indigenous people's rights and roles as custodians of polar bears was, however, recognized and the Agreement allows for taking of polar bears by local people using traditional methods in the exercise of their traditional rights. However, much has changed over more than the forty years, which have passed since the agreement was signed. The consequences of climate change are particularly pronounced in the polar regions. Less sea ice around denning areas in autumn means that pregnant females are unable to get ashore at their denning areas, hence fewer dens and reduced cub production. Pregnant females stranded ashore in summer goes without food for months. They have poor body conditions and lack fat reserves needed for their newborn cubs to increase body weights from 0.5 kg to 10 kg. There are fewer ringed seals because of less ice, hence less prey/ food for polar bears, which also can affect cub/ yearling survival. Transboundary pollution may add to the problem. Adult bears will probably survive one way or another, but with reduced recruitment and increased cub/ yearling mortalities, the polar bear populations will probably decline in many areas in the foreseeable future. Added mortalities caused by hunting (Greenland, Canada and Alaska) will make things worse. Some researchers/ managers/ indigenous people groups are of the opinion that hunting of polar bears will not have detrimental consequences, even in times of negative impact from climate change/ reduction of sea ice. But others disagree and claim that many polar bear populations are declining. The precautionary principle should be recognized and applied to polar bear management.



**Thor S. Larsen**

Dr. Philos, researcher  
The Norwegian University of Life Sciences/  
Department of International Environment  
and Development Studies, Norway

#### ***The Concept Symposia on Project Governance***

*The Norwegian Ministry of Finance and the Concept Research Program hosts every second year a symposium on project Governance. Project governance, in brief, is concerned about investments and their outcome and long-term effects. In view of the problem at hand, the aim is to ensure that the best conceptual solution is chosen, that resources are used efficiently and anticipated effects realized. Resource persons from ministries, governmental agencies, academia, international organizations, and industry are invited. In order to facilitate professional exchange and direct communication between participants, the number of individuals is restricted. The aim is to initiate further international cooperation and research on important issues related to project governance.*

<https://www.ntnu.edu/concept/concept-symposium>



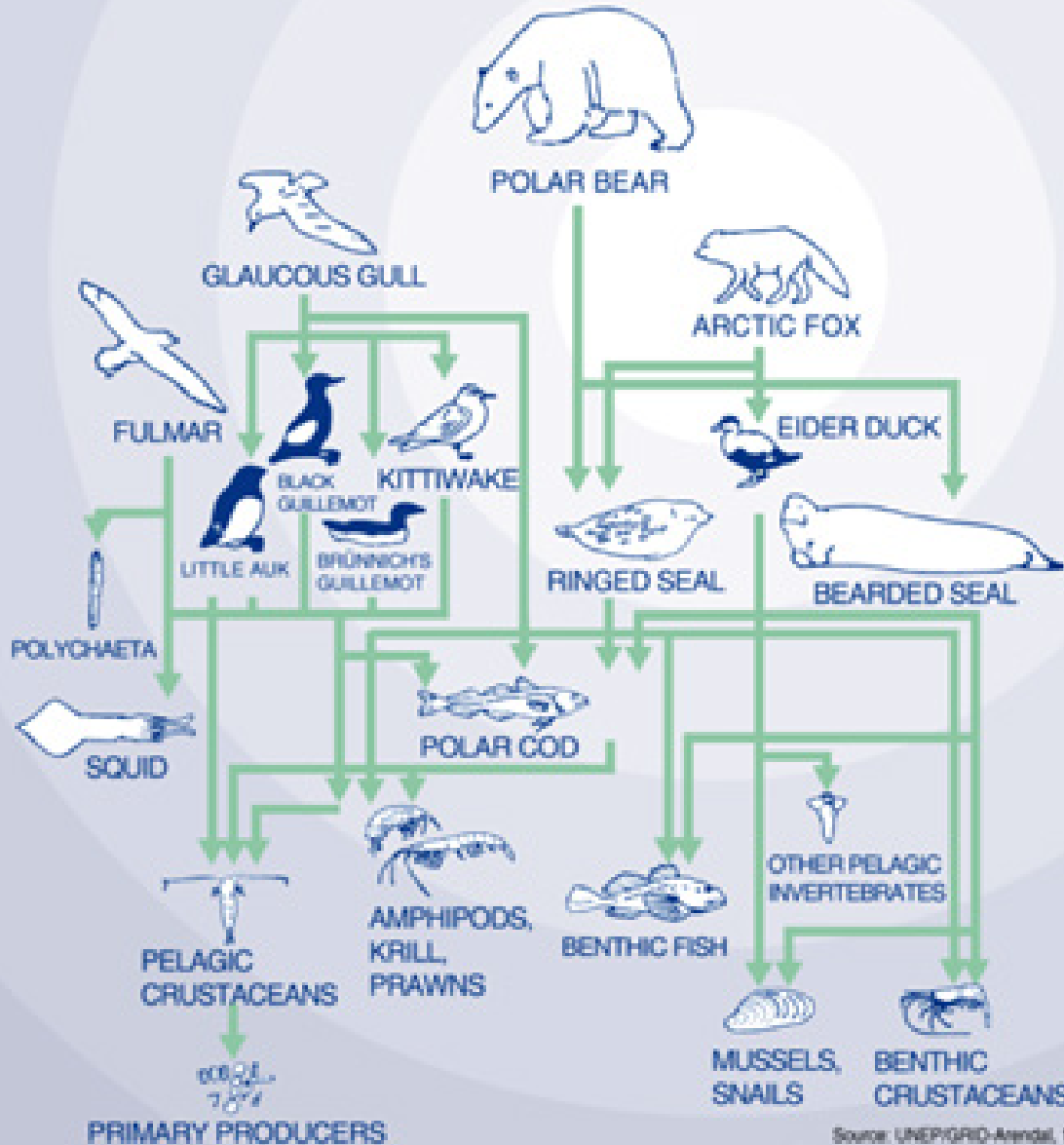
**Research and Management of Polar  
Bears in the Extreme North. Lessons  
Learned Over More than 50 Years.  
By Thor S. Larsen**

The polar bear is on the top of Arctic food web.

Changes in the ecosystem will have consequences for all levels in the food web and will ultimately affect polar bear population dynamics.

The polar bear is therefore an indicator species for changes in Arctic ecosystems, e.g. caused by climate change.

Illustration: UNEP/ GRID-Arendal



**“The First Scientific Meeting on the Polar Bear” in Fairbanks, Alaska, 1965 stated that “... *scientific knowledge of the polar bear is far from being sufficient as a foundation for sound management policies...*”**











**Systematic polar bear research in Svalbard started in 1967. Summer expeditions with icegoing vessels for capturing, marking and sampling.**

**The project was a joint cooperation between the Norwegian Polar Institute and the University of Oslo**

**Main questions were:**

- **One or several polar bear populations in the Arctic?**
- **Population distribution and migration?**
- **Population size?**
- **Recruitment, mortality and population trends?**



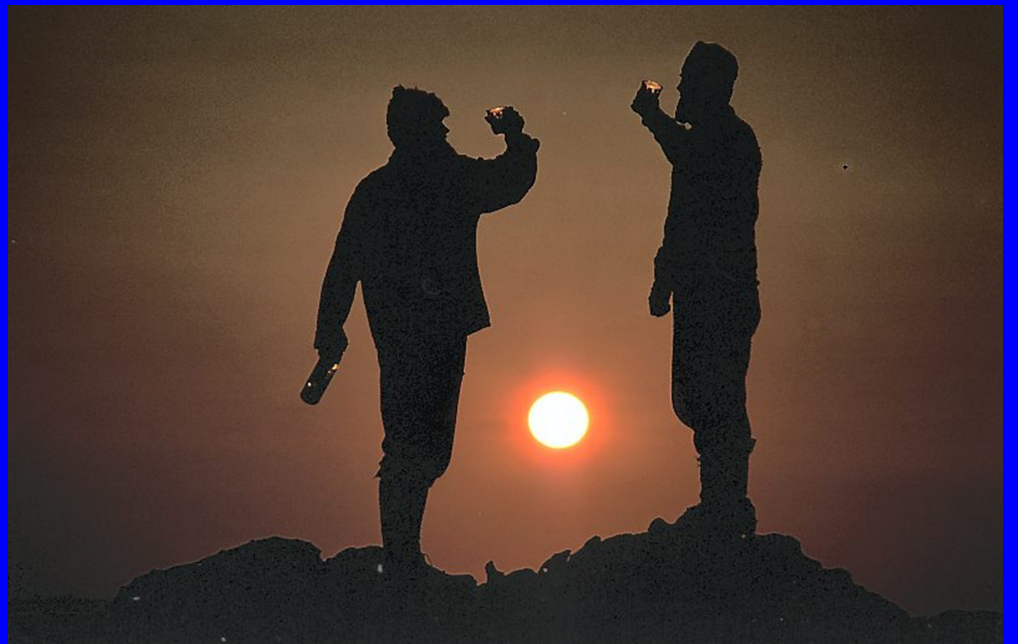






OLSTJERNA











## Results as of 1973:

- **Several discrete polar bear populations in the Arctic. Svalbard and Frans Josef land og and adjacent ice covered seas has one common population.**
- **Limited exchange of polar bears between Svalbard and Greenland.**
- **Population size estimated to be around 2.500 bears.**
- **Population growth rate estimated to be maximum 5% per year.**
- **An average annual hunt of 310 bears in Svalbard between 1945 and 1970 was three times more than what the population could sustain.**





**An international agreement for the protection of polar bears was negotiated, signed and ratified by the five Arctic range states in Oslo in 1973: Denmark/ Greenland, Canada, USA, the Soviet Union and Norway.**

- **The main objective of the “Agreement on the Conservation of Polar Bears”: Polar bears are protected in all Arctic areas.**
- **People who traditionally are dependent upon the resource, i.e. Inuits and other indigenous people can be permitted to hunt.**
- **Under this clause, legislation in Greenland, Canada and Alaska allows for polar bear hunting.**
- **Russia banned all polar bear hunting already in 1956. People in Svalbard are not indigenous and polar bear hunting is therefore prohibited in Svalbard.**

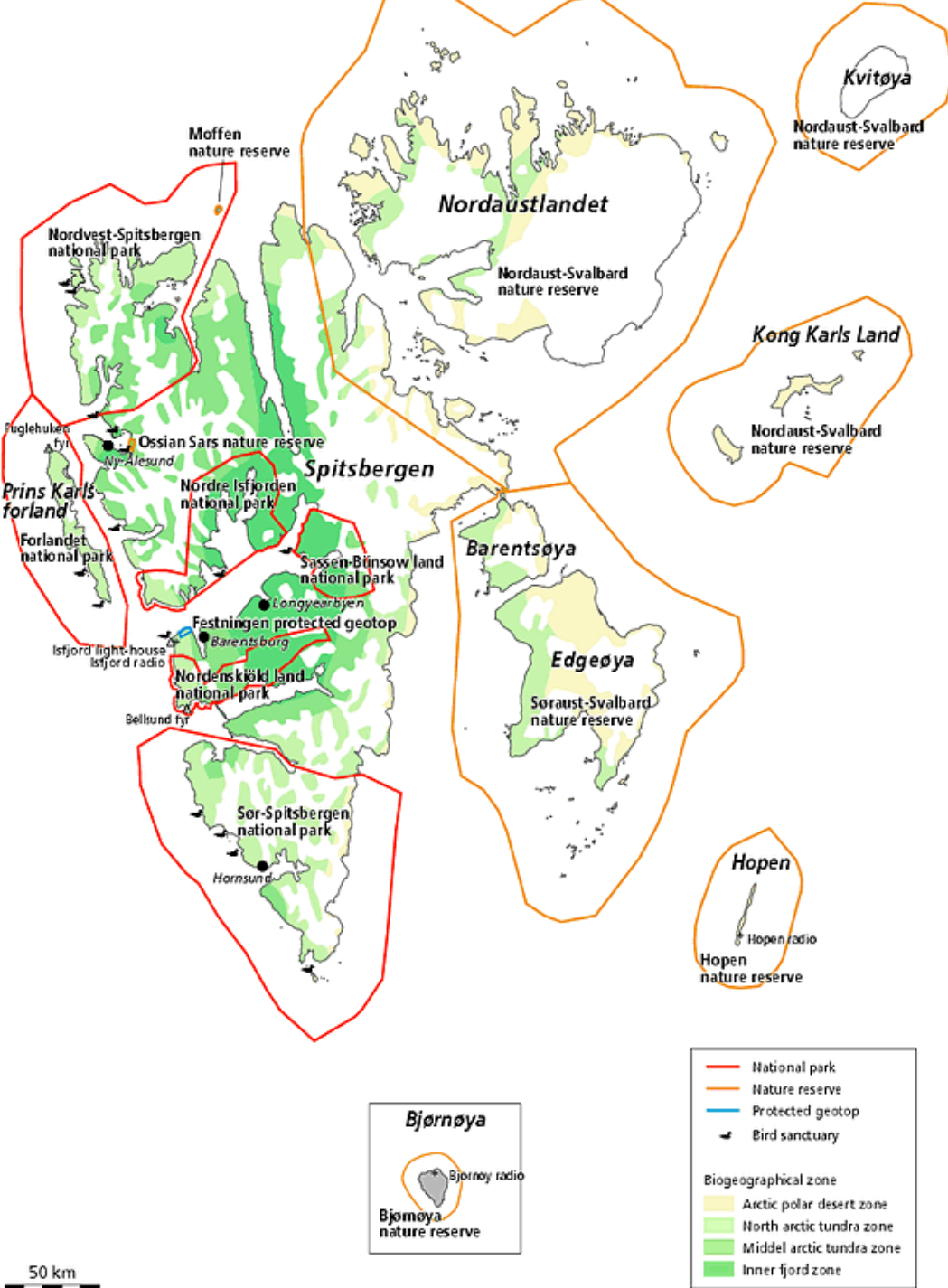




## Updated knowledge by 1985:

- Several polar bear populations in the Arctic. Limited migration between populations in most areas.
- Population growth rate estimated to be maximum 5% per year, but less in populations which are hunted.
- Heavy overhunting of the Svalbard/ western Russian Arctic population until the total protection in 1973.
- Good growth in this population after 1973. +/-2.500 bears in 1973, probably +/- 3-4.000 i 1985.

But what happens now..?







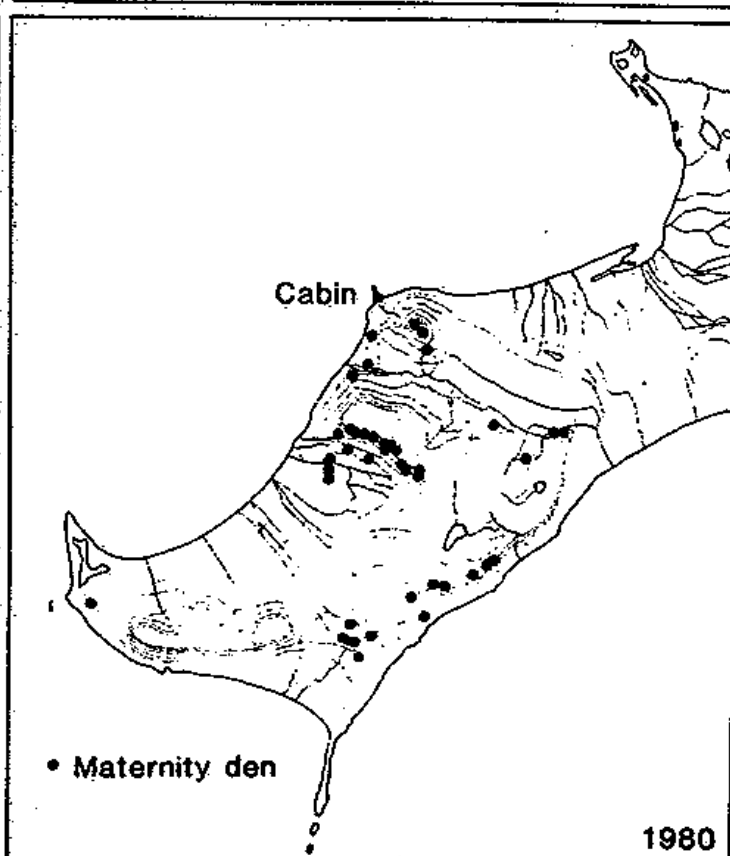
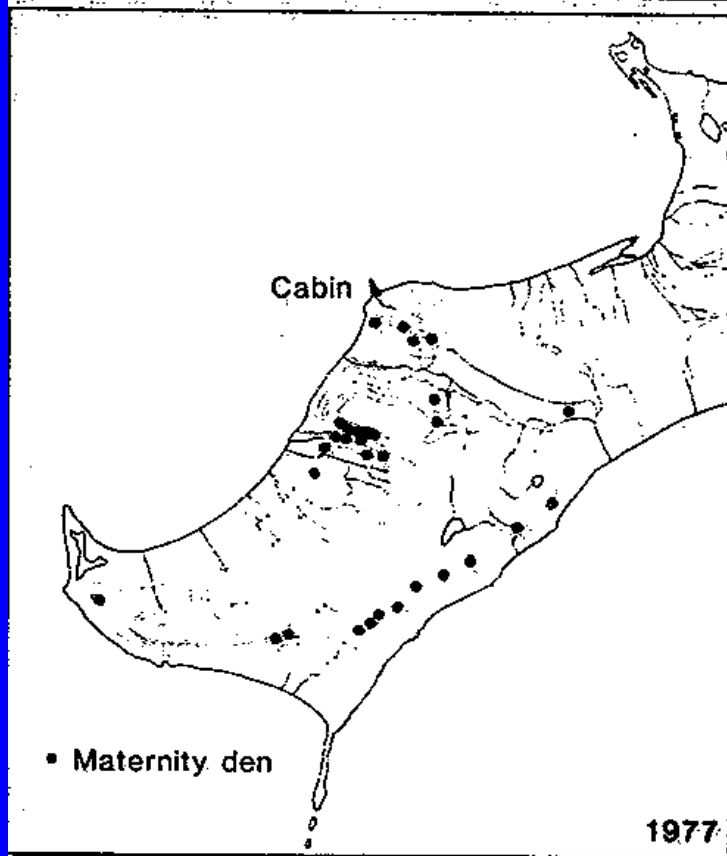
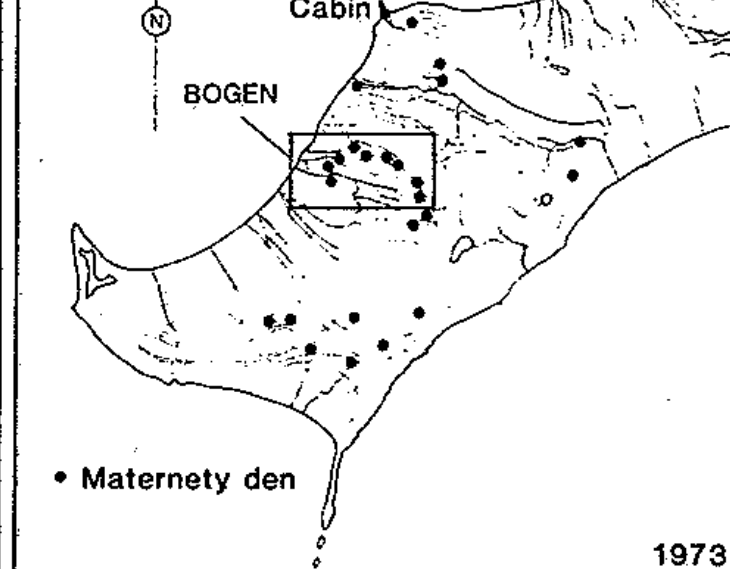
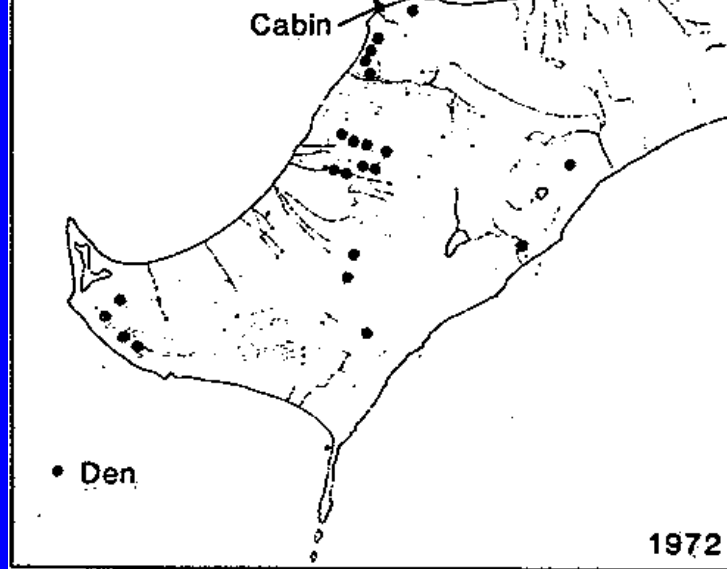












**Pregnant females will have difficulties in getting ashore in the autumn if sea ice around denning areas is lacking. Hence fewer dens and reduced cub production.**



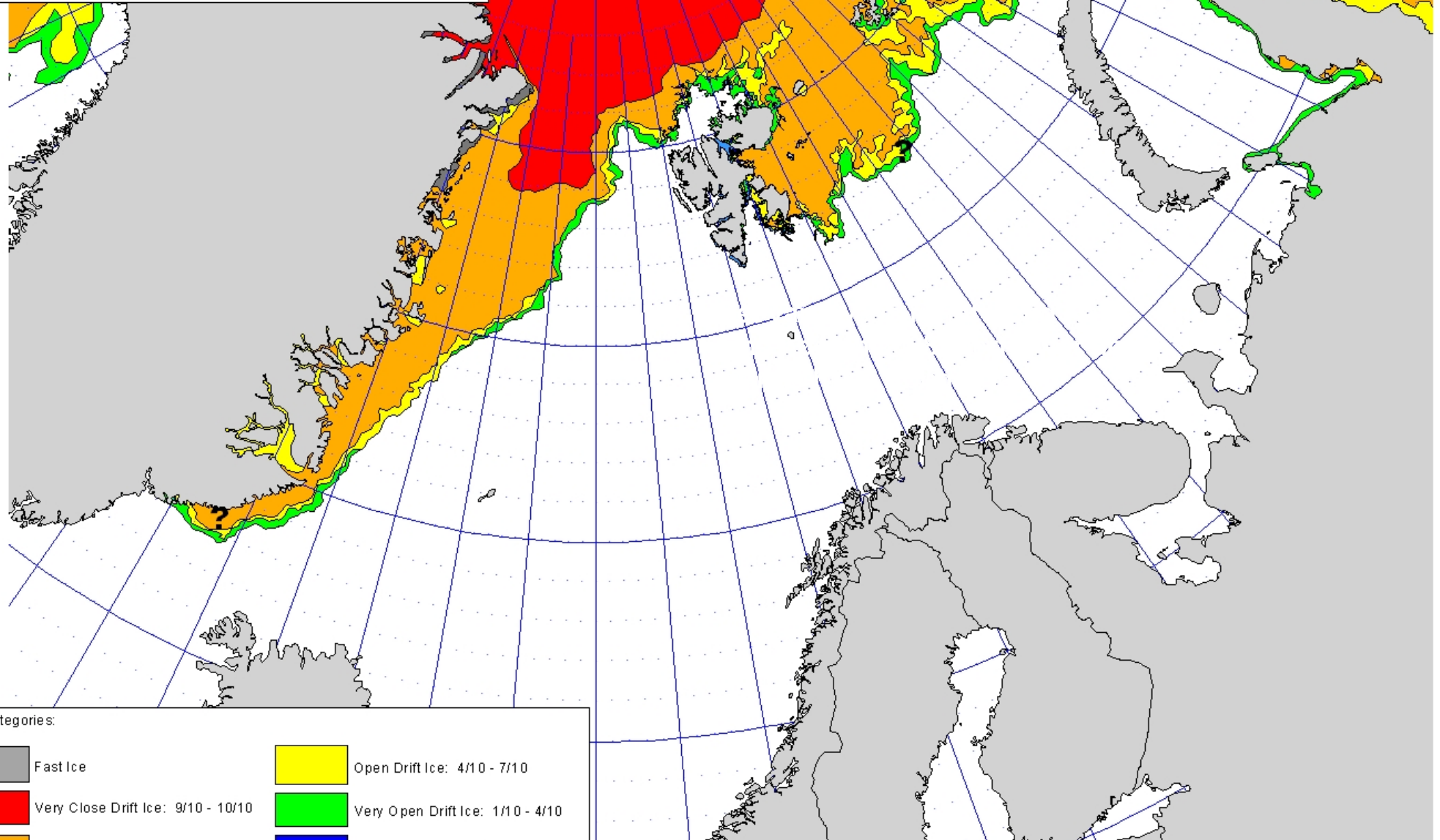


Meteorologisk  
institutt  
met.no







November 7th 2008

Sea Ice Service  
Forecasting Division for Northern Norway

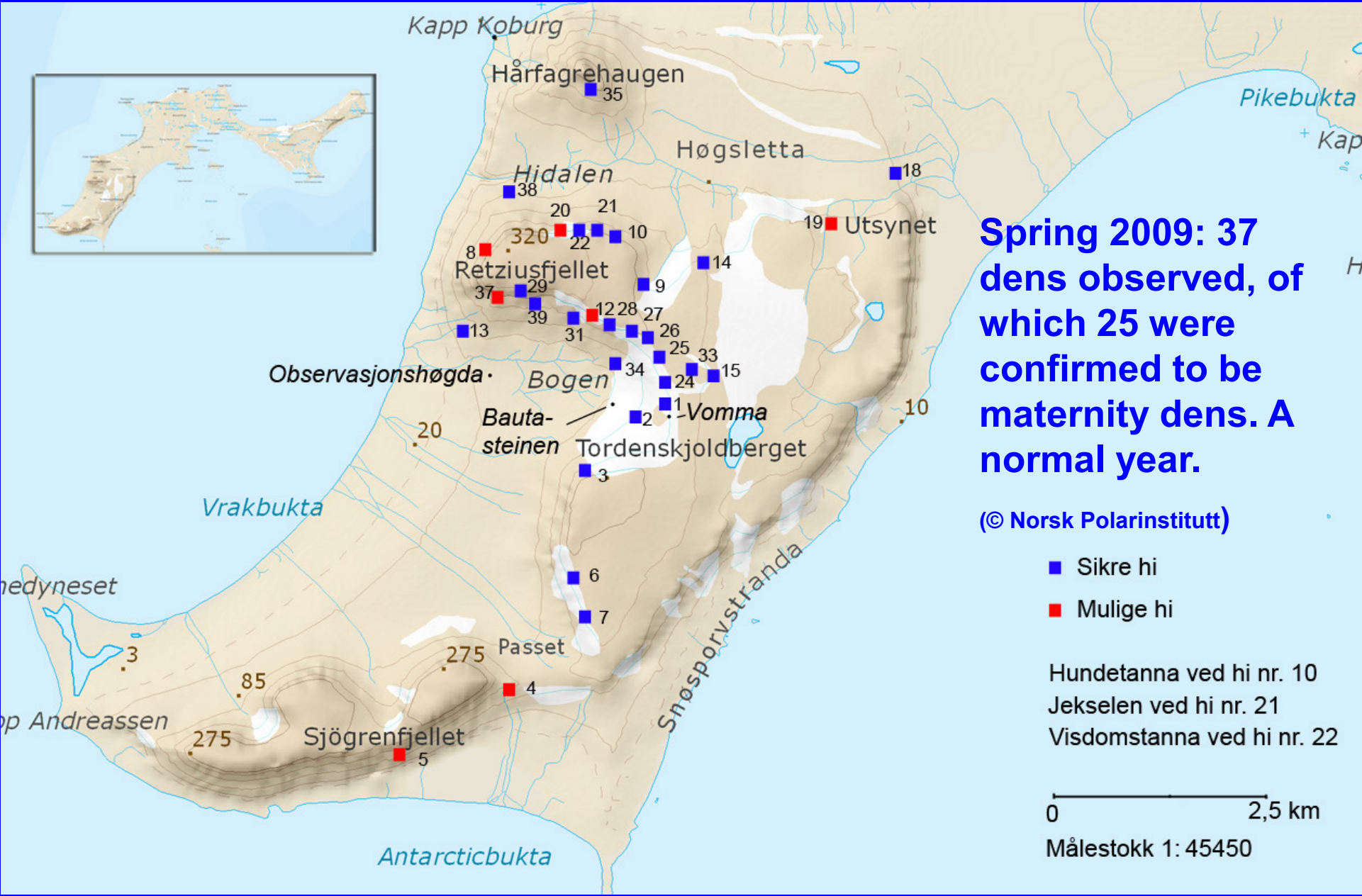
N-9293 Tromsø, Norway Tel: +47 77621462 Fax: +47 77621401 email: istjenesten@met.no



Ice Categories:

 Fast Ice	 Open Drift Ice: 4/10 - 7/10
 Very Close Drift Ice: 9/10 - 10/10	 Very Open Drift Ice: 1/10 - 4/10
 Close Drift Ice: 7/10 - 9/10	 Open Water: 0/10 - 1/10

! Sea surface temperatures will no longer be displayed on the icecharts. Take contact with the ice service for further info. !



**Spring 2009: 37 dens observed, of which 25 were confirmed to be maternity dens. A normal year.**

(© Norsk Polarinstitutt)

- Sikre hi
- Mulige hi

Hundetanna ved hi nr. 10  
 Jekselen ved hi nr. 21  
 Visdomstanna ved hi nr. 22

0 2,5 km  
 Målestokk 1: 45450

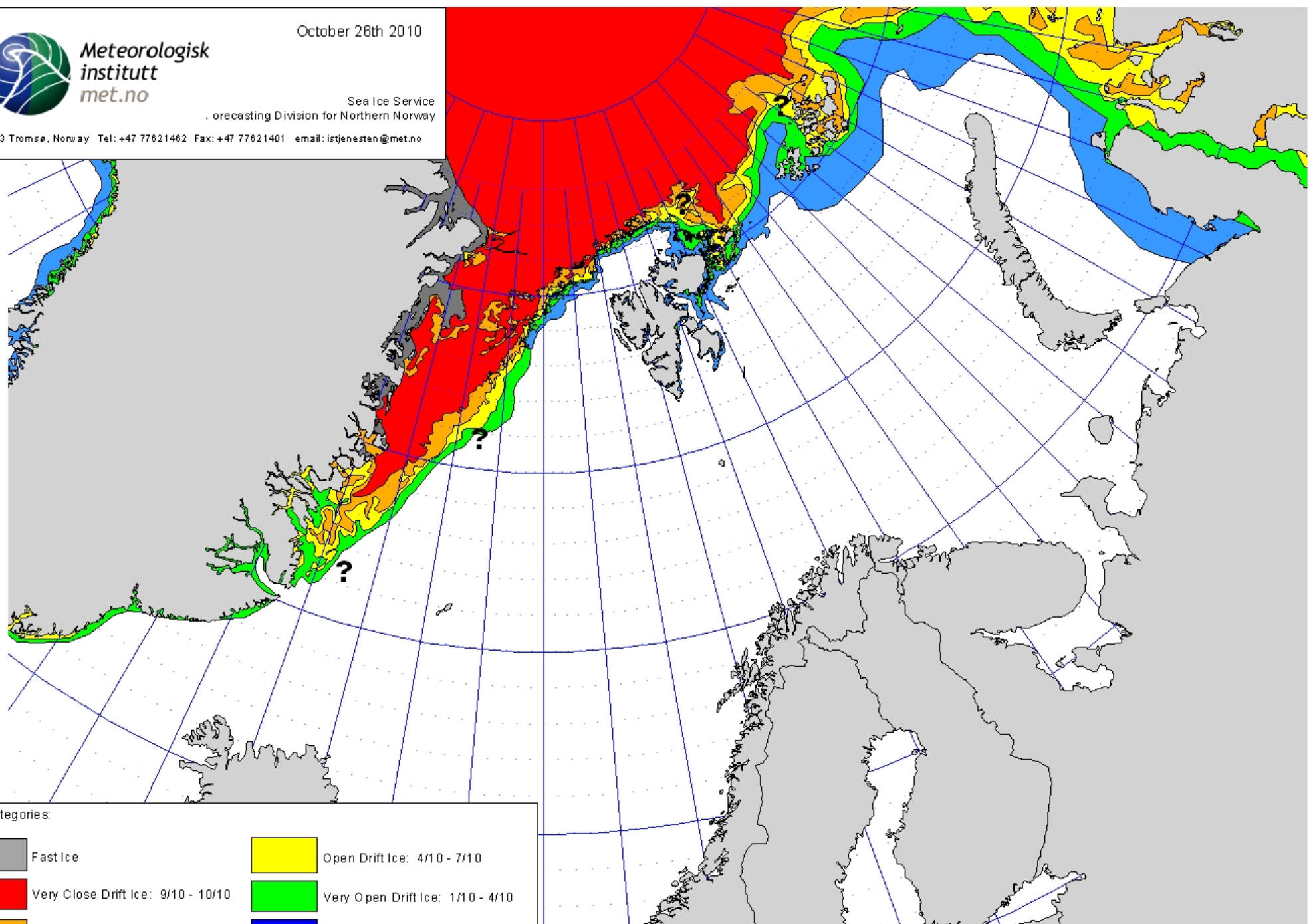


Meteorologisk  
institutt  
met.no






October 26th 2010

Sea Ice Service  
Forecasting Division for Northern Norway

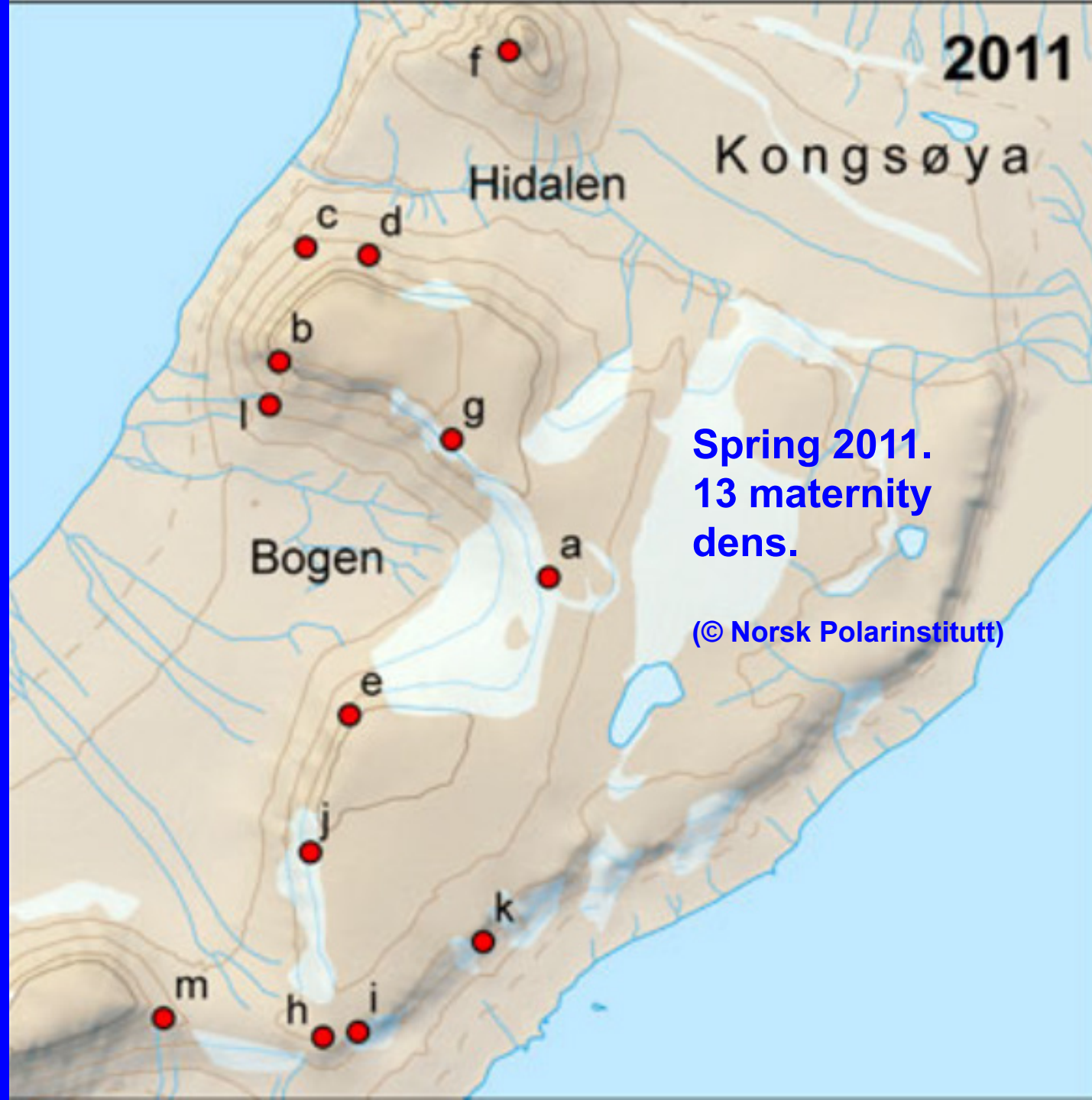
N-9293 Tromsø, Norway Tel: +47 77621462 Fax: +47 77621401 email: istjenesten@met.no



Ice Categories:

 Fast Ice	 Open Drift Ice: 4/10 - 7/10
 Very Close Drift Ice: 9/10 - 10/10	 Very Open Drift Ice: 1/10 - 4/10
 Close Drift Ice: 7/10 - 9/10	 Open Water: 0/10 - 1/10

! Sea surface temperatures will no longer be displayed on the icecharts. Take contact with the ice service for further info. !



Spring 2011.  
13 maternity  
dens.

(© Norsk Polarinstitut)



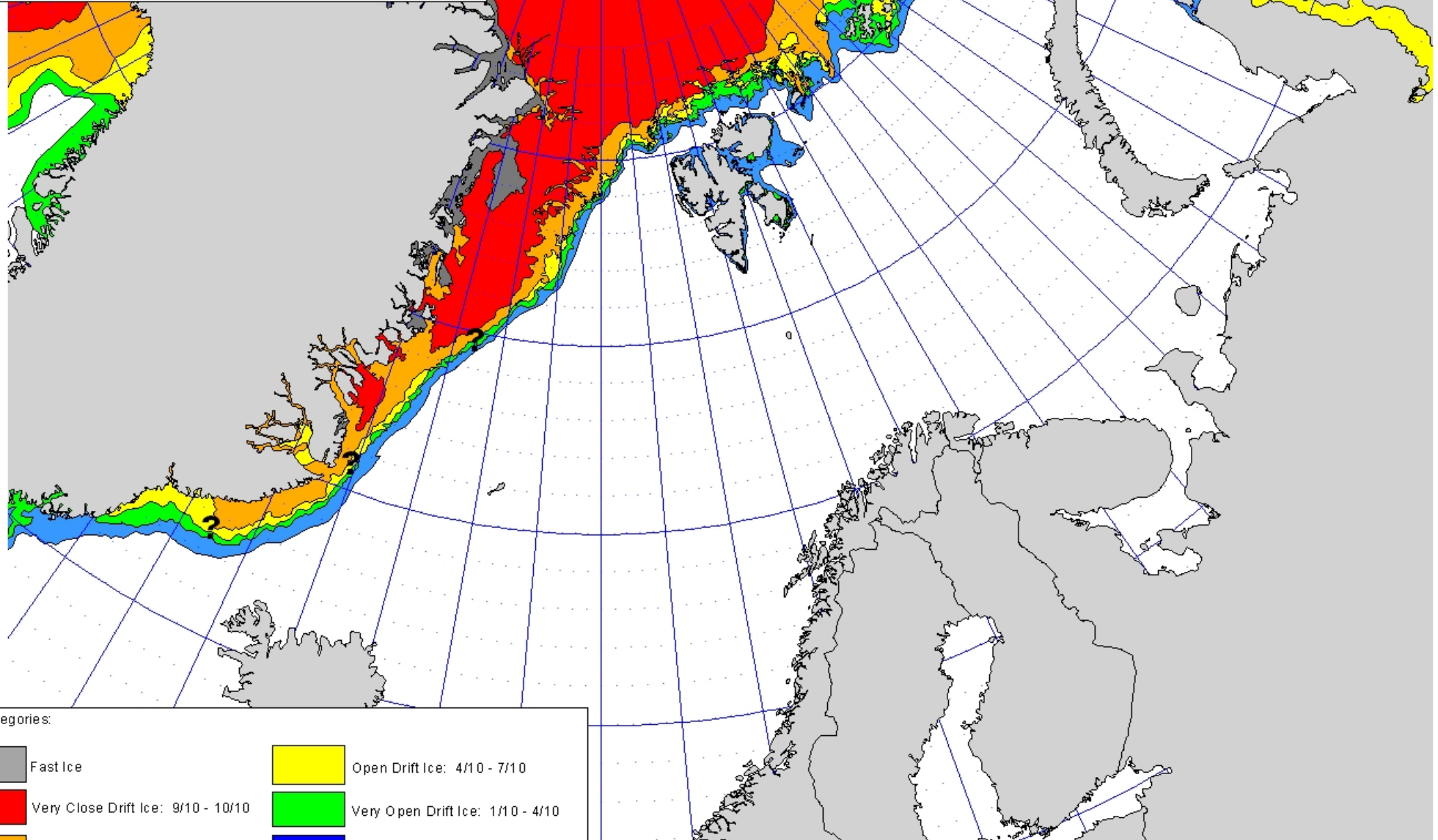


Meteorologisk  
institutt  
met.no







November 2nd 2011

Sea Ice Service  
Forecasting Division for Northern Norway

N-9293 Tromsø, Norway Tel: +47 77621462 Fax: +47 77621401 email: istjenesten@met.no



Ice Categories:

 Fast Ice	 Open Drift Ice: 4/10 - 7/10
 Very Close Drift Ice: 9/10 - 10/10	 Very Open Drift Ice: 1/10 - 4/10
 Close Drift Ice: 7/10 - 9/10	 Open Water: 0/10 - 1/10

! Sea surface temperatures will no longer be displayed on the icecharts. Take contact with the ice service for further info. !

2012



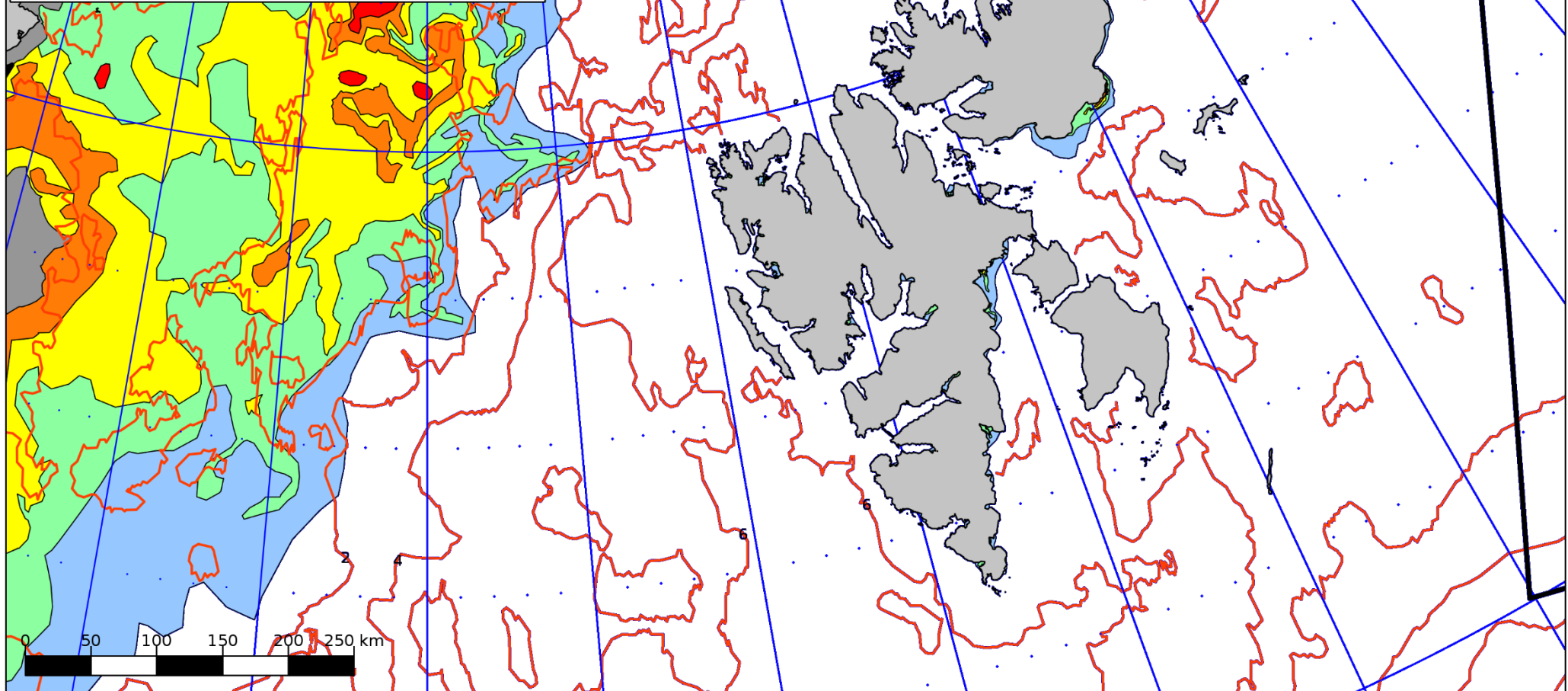
Spring 2012.  
Only 5 dens.

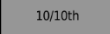
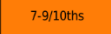
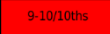
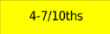
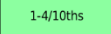
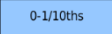
N

2 km

Contour interval: 50m

© Norwegian Polar Institute 2012



Ice Categories			
 10/10ths	Fast Ice	 7-9/10ths	Close Drift Ice
 9-10/10ths	Very Close Drift Ice	 4-7/10ths	Open Drift Ice
		 1-4/10ths	Very Open Drift Ice
		 0-1/10ths	Open Water

Projection: Polar Stereographic, True Scale at 90°N, WGS84 Scale: 4,361,969  
 Map Corners:  
 UL = 81°45'19.861"N, 20°19' 2.245"W UR = 79°5' 6.637"N, 44°58'14.787"E  
 LR = 73°16'49.115"N, 27°21'31.209"E LL = 74°51'39.956"N, 10°51'22.615"W  
 Coastline Data: GSHHS version 2.2.0 (<http://www.soest.hawaii.edu/wessel/gshhs/>)



 Sentinel-1  
 Radarsat-2  
 Sea Surface Temperature

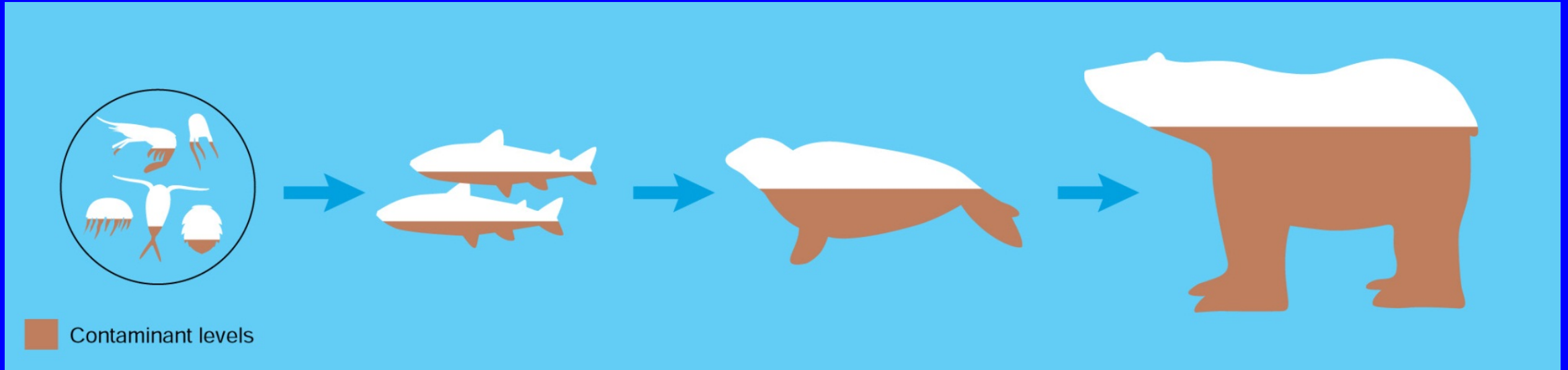
Climate change and pollution. Four factors which add up:

1: Less sea ice makes it difficult for polar bears to catch seals, which is their main prey. Research by the Norwegian Polar Institute indicates that there are fewer ringed seals in recent years.



**2: Transboundary air and ocean currents bring pollutants such as heavy metals and chlorinated hydrocarbons to Svalbard. Such pollutants may affect polar bear reproduction.**





**3: Pollutants are concentrated step by step in the food chains (bioaccumulation.)**

**4: Pregnant females stranded ashore in summer goes without food for months. They spend up to additional six months in the den without any eating. They are probably unable to raise their cubs (usually two) because of poor body condition and lack of fat reserves.**



# STATE OF THE POLAR BEAR

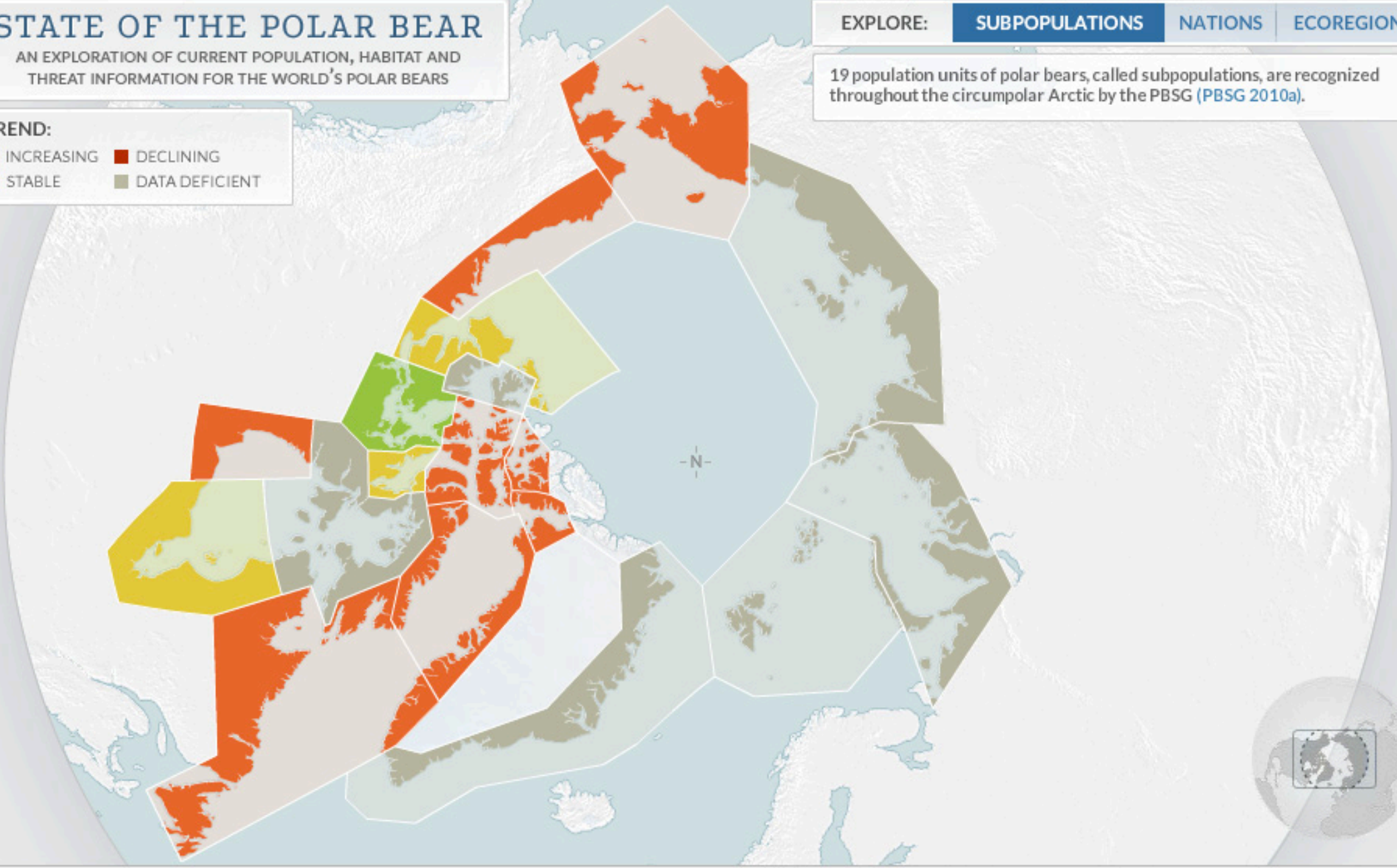
AN EXPLORATION OF CURRENT POPULATION, HABITAT AND THREAT INFORMATION FOR THE WORLD'S POLAR BEARS

EXPLORE: **SUBPOPULATIONS** NATIONS ECOREGIONS

19 population units of polar bears, called subpopulations, are recognized throughout the circumpolar Arctic by the PBSG (PBSG 2010a).

**TREND:**

<span style="color: green;">■</span> INCREASING	<span style="color: red;">■</span> DECLINING
<span style="color: yellow;">■</span> STABLE	<span style="color: grey;">■</span> DATA DEFICIENT







Skinnlager av  
skinnlager  
nr 298.

Skinnlager av  
skinnlager  
nr 298.

33



Nr 2  
Lengde 2,80m  
Breidde 2,80m  
Tas #  
14 202  
  
200.000?  
NOK





**Rasmus Hansson wrote in cabin journal on Kapp Koburg on Kongsøya during the Ymer-expedition in 1980:**

***"Ellers kan det slås fast at Jørn og Rasmus nå oppgir konkurransen med Thor om hegemoniet på Kongsøya. En tur øst på Hårfagrehaugen avslørte at Thor stiller i klasse med Fantomet og George Washington; en diger fjellhammer noen hundre meter fra hytta ligner ham til forveksling..."***

