

# Mapping marine life in Porsangerfjorden

*In Porsangerfjorden, the local cod population has declined sharply, sea urchins have degraded the kelp forest and the fjord is being invaded by king crab. As the diet of the king crab includes sea urchins, it may help to restore the kelp forest. The fjord is also home to harbour seals and grey seals, whilst periodic visits by harp seals are common. The fjord is relatively untouched by human activity.*

BY BEATE HODDEVIK SUNNSET

Earlier this year, Porsangerfjorden became part of the EPIGRAPH research programme on coastal and fjord ecosystems, which is a collaborative project between the Institute of Marine Research, the universities of Bergen, Tromsø, Ås and St. Andrews in Scotland, NIVA and Finnmark University College. The programme aims to increase our knowledge of the workings of the ecosystems in Porsangerfjorden and Hardangerfjorden, thereby improving our understanding of the underlying causes of changes in various marine populations.

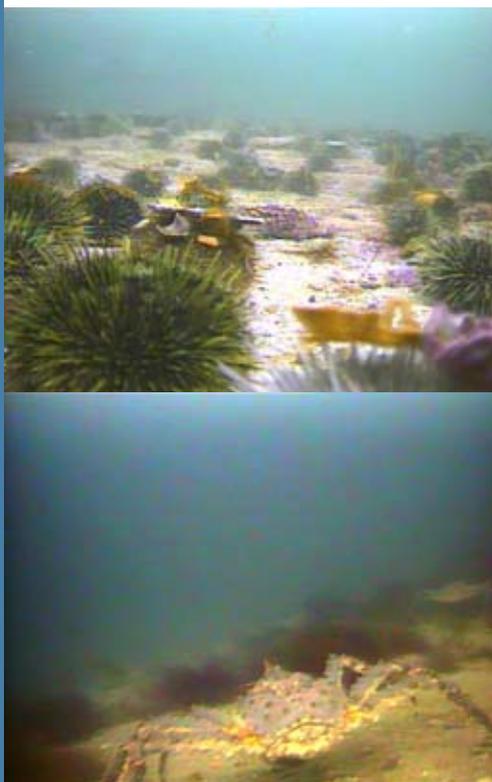
## FIVE SUB-PROJECTS

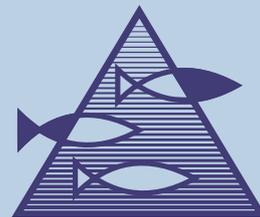
To help uncover the reasons for the changes in

Porsangerfjorden, researchers will use a modelling tool that has previously produced good results. There will be a strong focus on fish, seals, king crab, sea urchins, other bottom feeders and macroalgae (kelp). The necessary data will be obtained and evaluated through five sub-projects:

### 1. Transport of king crab larvae and cod eggs and larvae

Porsangerfjorden is a spawning ground for both local coastal cod and cod from the Barents sea. The spawning products of the two cod populations have slightly different physical characteristics, and the scientists want to find out how this affects the drift of the populations. For the king crab, the scientists are trying to establish when and where the larvae settle on the fjord bed.





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### 2. Fish population dynamics and pelagic crustacean density

Scientists will study cod migration patterns, calculate the biomass of important species of fish and pelagic crustaceans and investigate the diet of important fish populations. For the cod, they will also study recruitment, mortality, growth, age distribution and age of reaching sexual maturity.

### 3. Harbour seals, grey seals and other marine mammals

The ecological role of the marine mammals that live in Porsangerfjorden will be investigated. The main focus will be on the harbour seal, but the grey seal will also be studied, and if possible we will collect data on porpoises. In the event of an invasion of harp seals, their ecological role will be assessed.

### 4. Kelp forest, sea urchins and king crab

The aims of this sub-project are to establish the extent of the kelp forests, the size of the king crab population and the distribution and production of sea urchins. The impact of the king crab on the sea urchin population will also be investigated.

### 5. Benthic habitats

Species that live in and on the sediment at the bottom of Porsangerfjorden will also be studied. The number of individuals and the biomass of the various groups of animals, combined with our knowledge about growth rates and temperature measurements, will be used to calculate the productivity of these groups of animals. The quantity, distribution and size of the of the king crab's potential prey will also be mapped. In the longer term it will be interesting to study the level at which the balance between the king crab and the benthic organisms stabilises.

#### ABOUT PORSANGERFJORDEN

Porsangerfjorden in the county of Finnmark stretches 120 km in a north-south direction, and is 13-19 km wide (approx. 1800 km<sup>2</sup>). The outer part of the fjord is mainly 50-180



metres deep, but it reaches a maximum depth of approx. 310 metres. The island of Store Tamsøy lies roughly in the middle of the outer fjord, and is home to a small number of grey seals. In the inner part of Porsangerfjorden there are more than fifty skerries and islands, and these have a population of just over 200 harbour seals. There are several different habitats in the inner part of the fjord. The south-western section is shallow (3-27 m) with a sand and mud bottom, whilst Austerbotn in the south-east reaches depths of down to 115 metres. The bottom water in that part of the fjord is extremely cold (around 0° C), and there is a local Arctic cod population there. In the shallower areas between Austerbotn and the inner western section, the fjord bed consists of sand, gravel and rock. There are several Iceland scallop grounds in that section. Large parts of the inner fjord normally freeze over during winter.

#### ABOUT EPIGRAPH

EPIGRAPH is a research programme on coastal and fjord ecosystems, which is looking in detail at Porsangerfjorden and Hardangerfjorden. The aim of the programme is to discover more about the nature of the fjord ecosystems, how they work, and not least how human activities affect ecological interactions. The programme will play an important role in obtaining the necessary background information for the implementation of management plans for our coastal waters.



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