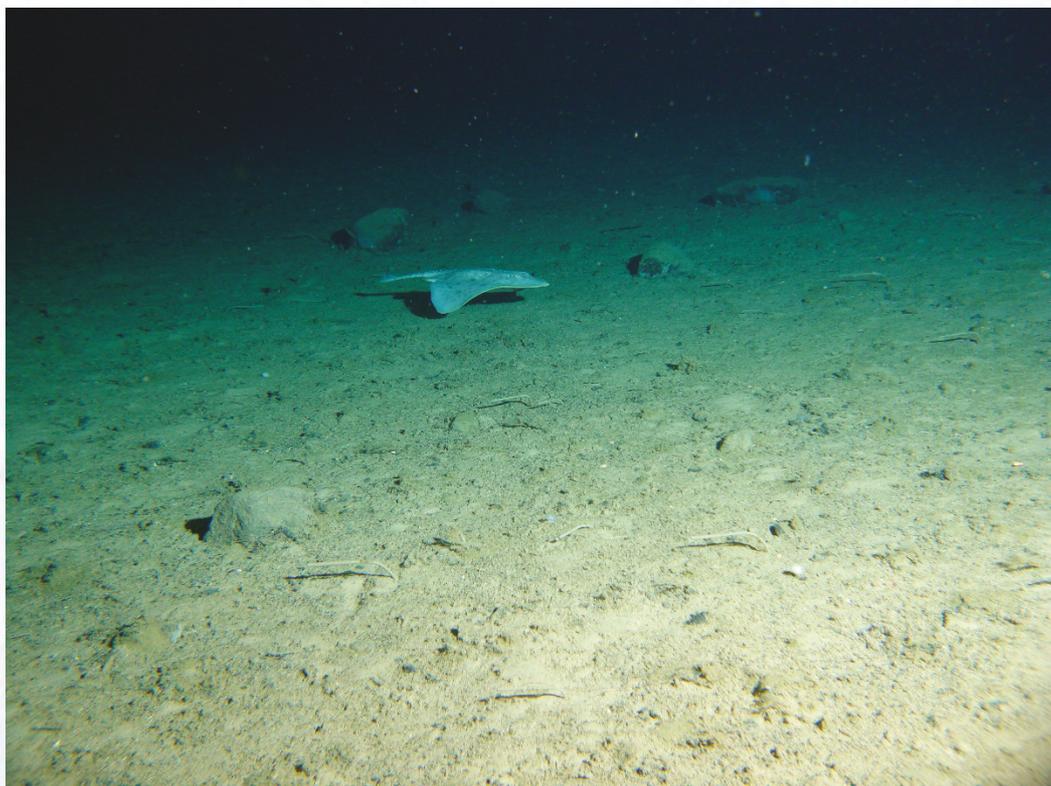


Benthic fauna in soft sediments from the Barents and Pechora Seas.

Akvaplan-niva AS research expeditions metadata and
database, 1992-2005



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**Rapporttittel / Report title**

Benthic fauna in soft sediments from the Barents and Pechora Seas.
Metadata and database from Akvaplan-niva AS research expeditions,
from 1992-2005

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Sammendrag / Summary

Benthic infaunal abundance data from 139 stations in the Barents Sea and surrounding waters are provided in a public database. All samples were collected with a 0.1 m² van Veen grab and identification was carried out by professional taxonomists.

Prosjektleder / Project manager

A handwritten signature in black ink, appearing to read "Paul Renaud", is placed over a light gray rectangular background.

Kvalitetskontroll / Quality control

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Forward

The research leading to these results has received funding from the Polish-Norwegian Research Programme operated by the National Centre for Research and Development under the Norwegian Financial Mechanism 2009-2014 in the frame of Project Contract No Pol-Nor/196260/81/2013. During this project, a data base of 139 benthic infaunal stations from the Barents Sea and surrounding coastal seas was compiled. These data are now made available publically.

Cover photo: Akvaplan-niva

1 Introduction

Benthic fauna data are collected worldwide for environmental monitoring and assessment purposes (Gray and Elliott 2009). As benthic species typically exhibit low motility and long life cycles, they are affected by local environmental conditions and reflect multiple time-integrated environmental factors (Andrade and Renaud 2011).

Since 1985, Akvaplan-niva AS (APN) has been collecting benthic data from across the North Atlantic, primarily in the North, Norwegian, Barents, Pechora and White Seas, as well as in fjords from mainland Norway and Svalbard. The information gathered has been employed primarily to monitor anthropogenic influences upon the marine environment derived from offshore oil and gas development, aquaculture production and coastal wastewater effluents. With the support of the Norwegian Research Council, the oil industry and other funding sources, APN has also carried out benthic research expeditions together with other national and international partners. The aim of such cruises has been among others, to assess patterns of benthic community variability across latitudinal gradients (temperate-polar front-arctic), and to examine the influence of environmental variables upon such communities, especially how climatic change might influence community structure.

In this report, we present an overview of the benthic fauna data collected in research cruises carried out from 1993-2005. The database includes species lists and abundances, location, depth, the gear employed for collection, numbers of stations sampled, number of replicates and samples as well as a reference list of scientific articles and reports where the data has been employed.

Additional information collected during these cruises includes several environmental variables and sediment parameters. This information is available from the list of publications or can be requested by contacting the authors of this metadata report.

Principal investigators of the original research project (Table 1) must be contacted before any of the data provided here are used, and the DOI number for the data itself should be cited.

2 Benthic faunal collection and data available

The methods employed to collect benthic samples has varied little between seven research expeditions undertaken from 1992-2003. Faunal samples were collected at each station with a 0.1 m² van Veen grab, with lead-weighted arms and hinged, lockable inspection ports. The number of replicates collected at each station varied between expeditions. Sediment in the grab from each cast was assessed through inspection ports and rejected if the jaws were not fully closed, if uneven penetration was detected, or if the grab contained little sediment. When needed, extra weights were added to the grab to improve penetration in the sediment. Approved grab samples were then washed and sieved through 0.5 - 1 mm mesh sizes, depending on the research cruise (see below). Samples were then preserved using formaldehyde (4-20%), usually buffered with borax and transported to the laboratory for identification to the lowest possible taxonomic level.

Additional sample collection information is presented for each research project in chronological order of sample collection. An overview is presented in Table 1.

2.1 Polar Front 1992

(From Cochrane et al. 2012).

Benthic fauna was collected between August 3rd and 16th, 1992 aboard RV Johan Ruud, of the University of Tromsø in stations located on both sides of the average location of the Polar Front in the Barents Sea. A total of 16 stations were sampled in stations located on the slope and in the depression around Kong Karls Land, a transect from the Storfjord Trough, across the Spitsbergen Bank and to the Hopen Trough, and in the depression south-east of Edgeøya. Samples were washed through a 1 mm sieve.

2.2 Pechora 1992

(From Dahle et al. 1998).

In July 1992, quantitative samples of benthic fauna as well as granulometry samples were collected in the Pechora Sea for analysis of species distribution and faunal composition. Sampling took place at 15 stations aboard the research vessel R/V *Dalnie Zelentsie*, MMBI. The samples were washed through a circular 1 mm diameter round-mesh screen.

2.3 Franz Josef Land

(From Dahle et al. 2009).

Benthic fauna of the deeper waters (50–320 m) of the Franz Josef Land archipelago were sampled in August 1992 aboard the research vessel "*Pomor*" belonging to Murmansk Marine Biological Institute, Russian Academy of Science. The sampling stations were placed along a depth gradient: one group at 300 m depth to the southwest of the archipelago, and two groups (150–200 m and less than 100 m depth) within the archipelago. Samples were washed on a 1-mm round mesh sieve.

2.4 Kara93

(From Jørgensen et al. 1999).

Macrobenthic faunal associations, hydrography and sediment structure were examined at 14 stations in the Kara Sea, in areas influenced by both the Ob and Yenisei Rivers and the Barents Sea. Samples were taken in August and September 1993 aboard the research vessel "*Dalnie Zelentsie*", MMBI. To sieve the macrobenthic samples, two techniques were used at different stations: the "Norwegian" technique utilising 1-mm round-hole metal screens (in database, stations sta617-620, or the "Russian" technique in which the samples were washed through a nylon-sieving sac with 0.75-mm quadratic holes (stations sta621-630). The main difference between the two techniques is probably the smaller minimum size of animals retained in the sieving sac. This was expected to increase the number of individuals taken, but the resultant biomass was thought to be relatively unchanged because the larger animals in the samples taken, particularly the large molluscs and echinoderms, contributed most to the biomass values. The main conclusions in this paper are based on biomass data, while the abundance data are supplementary, minimizing errors resulting from the different sieving methods.

2.5 KAREX

(From Fredriksen and Cochrane 1994, Evenset et al. 1999).

The scientific cruise KAREX 94 to the Kara Sea and the estuaries of Ob and Yenisey was carried between August 12th to September 19th, 1994, on the RV *Ivan Petrov* of the Archangels Hydromet Service. Samples for studies of distribution and diversity of benthic macrofauna were obtained from 15 stations. The samples were washed into a 1 mm round hole sieve.

2.6 On thin ice

(From Carroll and Ambrose 2012).

Benthic macroinfaunal communities and sediment pigments under Atlantic and Arctic water masses were examined on the northern shelf and fjords of Svalbard. Sampling expeditions were carried out on the R/V *Jan Mayen* (University of Tromsø): May 12–26, 2003, and on R/V *Lance* (Norwegian Polar Institute): August 10–September 6, 2003. Ten stations were

sampled for benthic fauna from northern and eastern Svalbard shelf. Samples were washed through a 0.5-mm sieve.

2.7 BASICC

From Cochrane et al. (2009)

Benthic faunal assemblages were analysed from 47 stations in the central and southern parts of the Barents Sea, together with sedimentary and water column parameters, daily ice records and modelled integrated primary productivity. Samples were collected from 03–28 August, 2003, from the R/V *Ivan Petrov* (VNIIOkeangeologia St. Petersburg). A sieve size of 0.75 mm square mesh bag was employed.