

▲ Map: D. Graffe, modified after Jacobsson et al., 2004, *The International Bathymetric Chart of the Arctic Ocean*

as the zooplankton key prey organisms. Population dynamics of polar bivalve communities, especially of the dominant Greenland cockles are also in the focus of the biological research.

Various bird species are investigated for their breeding performance and their physiology.

Geoscience

Geoscience work is done on topics like permanent frozen soil and hydrological systems, e.g. glacial meltwater runoff and sedimentological influence on the ecosystem Kongsfjorden.

The active layer, the annually freezing and thawing upper ground in permafrost areas, is of pivotal importance. The moisture and heat transfer characteristics of this layer also determine the boundary layer interactions of the underlying permafrost and the atmosphere and are therefore important parameters giving input for geothermal or climate modelling.

Liquid and solid fluxes from a typical polar glacier-system are investigated with a sensor web (both remote and in situ sensing) covering the glacier, its

forefront and the fjord. Its dynamics are monitored to improve the understanding of the system's reactivity to contemporary climatic fluctuations. This survey will help in apprehending processes differently and to display hydrologic and climatic data spatially in a context of accelerating glacial receding in Spitsbergen.

Further geosciences work is done on the dynamics of the glacio-marine sediments on the southern



▲ One of the boats of the AWIPEV Research Base at a glacier front (photo: F. Delbart)

Kongsfjorden shore. The aim of the programme is to understand and quantify terrestrial particle transfer to selected parts of the southern Kongsfjorden shore and to identify local and regional littoral sediment dynamics.

International Cooperation

The AWIPEV Research Base contributes to the global Network for the Detection of Atmospheric Composition Change (NDACC). The measurement of optical, UV, and infrared radiation levels in cooperation with the Norwegian scientists is a contribution to the worldwide Baseline Surface Radiation Network (BSRN). The meteorological and aerological data acquired are sent daily to the World Meteorological Organization (WMO).

Title photos: The Blue House (J. Kube, top) and the Rabot Station (F. Delbart, bottom)

 English



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**The French German
 Arctic Research Base
 AWIPEV**

Ny-Ålesund, Spitsbergen



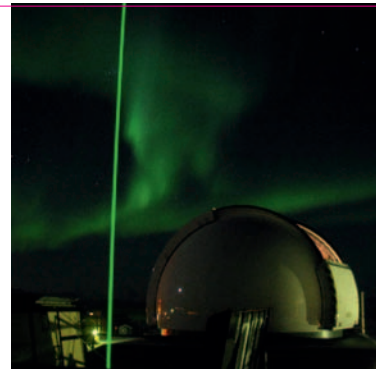
A joined research base

The French German Arctic Research Base AWIPEV was established in May 2003 by joining the research stations "Koldewey" and "Rabot", which had been operated since 1991 and 1998 by the German Alfred Wegener Institute for Polar and Marine Research (AWI) in the Helmholtz Association and the French Institut Polaire Français Paul Emile Victor (IPEV), respectively. AWIPEV provides research facilities and serves as expedition base for work in Ny-Ålesund and on West-Spitsbergen. Concerted French German scientific projects are involved into very diversified research themes (biology, geosciences, glaciology).

Location

**Spitsbergen, Kongsfjorden, Ny-Ålesund,
78.9°N, 11.9°E**

Spitsbergen belongs to the Arctic archipelago of Svalbard. The major part of Svalbard is declared as



◀ Aurora Borealis and the light of the LIDAR system for atmospheric measurements (photo: K. Piel)

national parks or national reserves, while the Kongsfjorden area has been designated a research area. Ny-Ålesund, at the Kongsfjorden, is a small settlement serving as an international centre for modern polar research with facilities from ten countries (Norway, Great Britain, Japan, Italy, China, The Netherlands, Korea, India, France and Germany). International cooperation is a daily experience here. Ny-Ålesund can be reached by plane all year round from Longyearbyen, the main town of Svalbard, and most of the time by ship. A local company, Kings Bay AS, provides infrastructure and logistical services, including harbour and airport, as well as a central mess for all inhabitants in the village.



Scientific and Logistic Installations

The AWIPEV Base comprises several buildings: The "Blue House", the Rabot station and the Corbel station (only during spring and summer time) offer laboratories, offices and accommodation for guest scientists. Other buildings at the base contain laboratories for physical, biological, and chemical analysis. In 1994, a large observatory building dedicated to atmospheric research was completed. Since 2005, researchers have access to the Marine Laboratory, which is operated by Kings Bay AS. The base provides a number of vehicles, snow scooter and motor boats as well as associated equipment for daily to weekly expeditions in the surrounding area.

Main Research Focus

Fundamental research in environmental sciences is the main focus at the AWIPEV Base. In the frame of global change, studies mainly aim to understand and to recognize changes in environmental conditions and related adaptation processes.

Atmosphere and Climate

A main topic of various continuous and campaign activities is research into climate and atmospheric composition changes in polar regions and their effects to mid latitudes.

Industrial countries produce a lot of pollutants which are transported to the Arctic in the atmosphere. The base is involved into pollution studies on monitoring aerosols, small particles in the troposphere, and mercury in snow. Meteorological data are collected by radio sondes sent upwards with balloons to measure wind, temperature, and the moisture content of air. These data are supplemented by the daily radiation balance of short and medium wavelength light. Of particular importance are the measurements taken during the winter months, when climatic conditions over the Arctic favour stratospheric ozone destruction processes.

◀ Ny-Ålesund with some of the buildings used by the AWIPEV Research Base (photo: J. Kube)



▲ Start of a balloon with an ozone radio sonde (photo: M. Herrmann)

Biology

One important research field of the biological working groups is the ecosystem of the Kongsfjorden. On the rocky substrate along the shores of the Kongsfjorden, macroalgae form forest-like canopies down to 30 metre depth. With respect to their ecological function these canopies resemble very much terrestrial forest ecosystems. The goal is to model the probable changes in the ecosystem of Kongsfjorden due to ongoing stratospheric ozone depletion.

The Kongsfjorden ecosystem is particularly suited for studies on the impact of water masses mixing associated to climate shift and related biological responses. Research programs are looking at the seasonal changes in the processes controlling life cycles and the rates of reproduction, nutrition and recruitment of the main pelagic predators as well