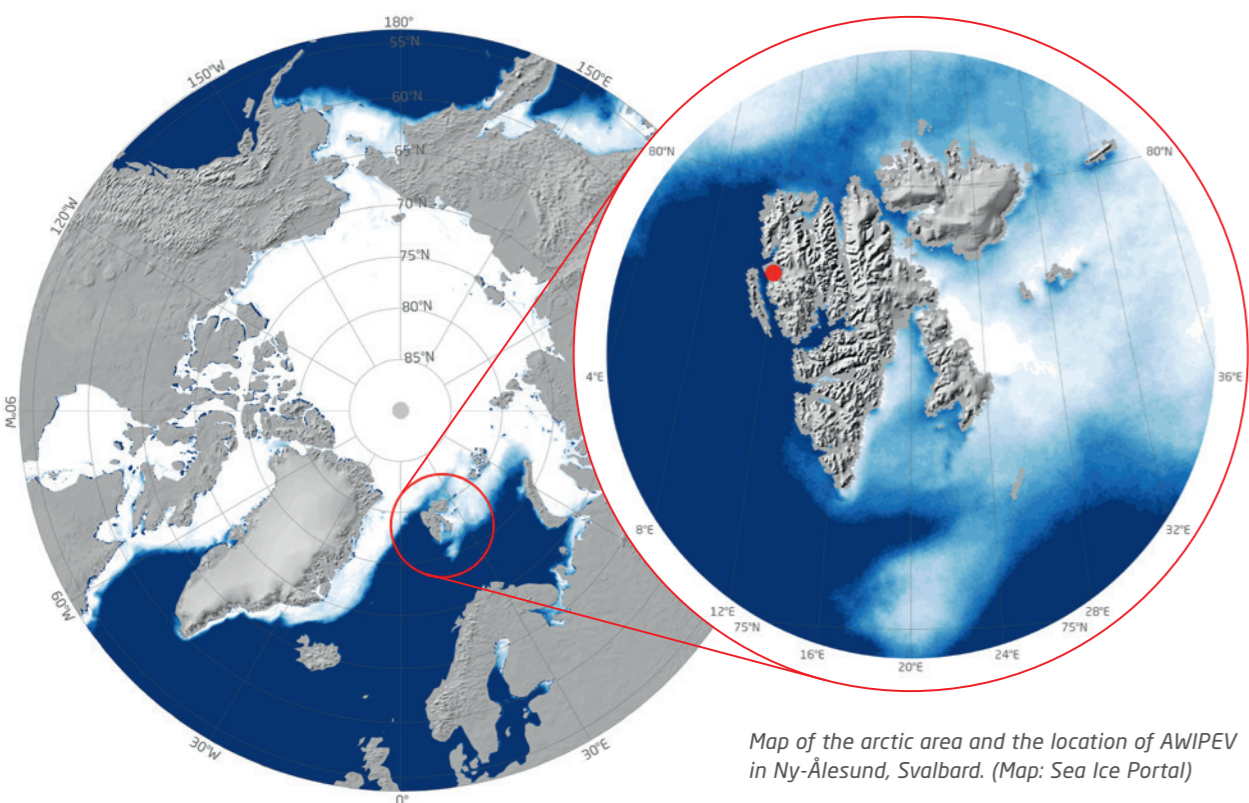


The Arctic is impacted by climate change more than other parts of the globe. A particular hot spot of climate warming is the Svalbard region along oceanic and atmospheric heat transport routes to the Arctic. At the west coast of Svalbard, Ny-Ålesund has developed into a forefront of international research. Here, the Alfred Wegener Institute (AWI) and the French Polar Institute Paul-Émile Victor (IPEV) jointly operate the Arctic research base AWIPEV since 2003. With the help of an overwintering team on site all year round, AWIPEV serves German, French, and Dutch research projects as a platform for investigations in the fields of biology, glaciology, geophysics and atmospheric research. The AWIPEV staff supports scientific activities in the field and takes care of the technical operation of the station as well as continuous long-term measurements.



LOCATION AND COOPERATION

- Ny-Ålesund, Svalbard, 78.92°N, 11.92°E

The Svalbard Treaty of 1920 regulates the Norwegian sovereignty and the protection and use rights over the archipelago. The major part of Svalbard is declared as national parks or national reserves, while the Kongsfjord area has been designated a research area. Ny-Ålesund, at the Kongsfjord coast, is a small settlement that has grown into an international center for modern polar research with facilities from eleven different countries (Norway,

Sweden, United Kingdom, Japan, Italy, China, India, Korea, The Netherlands, France and Germany). Norwegian authorities and institutions, by virtue of their sovereignty, regulate international research activities. The Norwegian Research Council has published a research strategy for Ny-Ålesund in 2019, giving the host role in Ny-Ålesund to the Norwegian Polar Institute. The Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) and the French Polar Institute Paul-Émile Victor (IPEV) with their joint AWIPEV research base are an integral part of this international research landscape.



View of Ny-Ålesund. (Photo: AWIPEV / M. Schwanitz)



Corbel station offers accommodation and laboratories. (Photo: AWIPEV / M. Maturilli)

FACT SHEET



AWIPEV

The French-German Arctic Research Base

Ny-Ålesund, Svalbard

AWIPEV^{79°N}
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More information?

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On board the French research boat Jean Flo'h deploying scientific measuring equipment. (Photo: AWIPEV / G. Tran)

OBSERVATORIES AND LONG-TERM MEASUREMENTS

In order to make climate change visible, continuous long-term observations of the atmosphere, land, sea and glaciers are of particular importance. At AWIPEV, several observatories are operated for the long-term recording of essential climate variables, which contribute to international networks of the Global Climate Observing System (GCOS). The atmospheric observatory is specially designed for



Launch of a radiosonde for atmospheric measurements. (Photo: AWIPEV / E. Horvath)

In the Air

Clouds and humidity are among the atmospheric key factors for the Arctic Amplification of climate warming. Together with related variables as aerosol particles and radiation, they are the subject of investigations using mobile platforms such as balloons and drones, in addition to the long-term operation of remote sensing instruments like radar or lidar. Further research is about trace gases and their various effects from the upper atmosphere to the ground, e.g. from stratospheric

In the Water

As the glaciers melt, sediments and nutrients are washed into the fjord, where they affect water turbidity and thus light availability needed for photosynthesis. At the same time, the higher nutrient richness can increase biological growth. Phytoplankton is the basis of the marine ecosystem and plays an important role in the carbon dioxide absorption capacity of the ocean. Researchers at AWIPEV have been investigating the so-called spring bloom, i.e. the mass

On the Glacier

Biodiversity of the microbial communities inhabiting the snowpack are studied on the glaciers surrounding the Kongsfjord. The glaciers themselves are shrinking due to the warming climate, as the glacier mass balance is controlled by accumulation of snow during winter and ablation due to melting in summer. Researchers at AWIPEV study the processes in the fast deglaciating basin regarding snow and water budgets, geomorphological evolutions, plant colonisation and sediment transfer.

FACILITIES AND INFRASTRUCTURE

Ny-Ålesund can be reached by plane from Longyearbyen, the main town on Svalbard, and most of the time by ship. The local company Kings Bay AS provides infrastructure and logistic services, including harbor and airport, as well as a central mess for all inhabitants. In this village-like setting, AWIPEV research base consists of several buildings: the 'Blue House' of the former German 'Koldewey Station', and the former French 'Rabot Station' and 'Corbel station' buildings, which offer accommodation, offices and laboratories for guest scientists. The AWIPEV atmosphere observatory building is dedicated to atmospheric research with remote sensing instruments. Other buildings at the base contain laboratories for physical, biological and chemical analysis. Researchers also have access to shared research infrastructure and laboratory services by Kings Bay AS. AWIPEV provides a number of vehicles, snow scooters and motor boats, as well as associated equipment for daily to weekly expeditions to the surrounding area.

The atmospheric observatory with the green laser beam of the lidar system, which measures the aerosol distribution in the atmosphere. (Photo: AWIPEV / R. Bürgi)



remote sensing instrumentation. In addition, long-term data series of meteorology and radiation are collected on a dedicated measuring field and balloon soundings are carried out regularly. Since 1998, the permafrost observatory outside of Ny-Ålesund records soil temperature and hydrological parameters at different soil depths, as well as parameters related to the exchange between atmosphere and ground. An underwater observatory is operated at AWIPEV since 2012, which records oceanographic parameters of the Kongsfjord over the long term. Beginning with first studies of the Austre-Lovén glacier in the 1960s, a regular monitoring project of glacier dynamics and mass balance aims to establish the glacier basin as a long-term observatory using classical and innovative instruments.

MAIN RESEARCH TOPICS

In addition to long-term monitoring activities, shorter term projects target a broad variety of processes in the context of climate change and its impacts.



A melting glacier on Svalbard. (Photo: AWIPEV / G. Tran)

ozone depletion to effects on snow chemistry. In a regular snow sampling program, AWIPEV staff takes snow probes for physical, chemical and biological analysis.

reproduction of phytoplankton, almost every year. Studies in winter conditions and the characteristics of the spring bloom help to better predict future changes in the marine ecosystem.



Instruments at the Bayelva permafrost observatory. (Photo: AWIPEV / M. Maturilli)

On the Ground

The terrestrial ecosystem is affected by changes in permafrost conditions. While permafrost is the ground that remains frozen over several years, the soil layer that is subject to seasonal freezing and thawing is called 'active layer'. At the AWIPEV permafrost observatory, the thickness of this thaw layer has approximately doubled over the last two decades. AWIPEV projects are studying the related release of greenhouse gases from the active layer, the microbial activity and erosion processes.