AWI Research Base
Ny-Ålesund 79°N IPEV

The French German Arctic Research Base

Ny-Ålesund, Spitsbergen

Photo: Franck Delbart

Table of contents

The French German Arctic Research Base

The global questions of polar research can only be addressed by science that is internationally oriented. Climate change, to name just one prominent example, does not recognize national borders. Our understanding of global climate change requires insights in processes and composition of the Arctic atmosphere. Throughout earth's history, there have been repeated drastic temperature changes at the poles. Therefore, high geographic latitudes are particularly suitable for the study of natural and anthropogenic climate change. The data collected will allow predictions of future climate evolution, hopefully enabling the timely intervention in man-made climate problems.

Photo: Jens Kube

Foreword

Photo: Konstanze Piel

During the last decade of the twentieth century, a number of national Arctic research stations were established in Ny-Ålesund on Spitsbergen. The tiny village in the very north of Europe quickly became a well known international research location. Only one thousand kilometres from the North Pole, but many thousands of kilometres away from the home institutes, close collaboration between the individual stations happened rapidly and naturally. The superb hospitality of the Norwegian institutions 'Norsk Polarinstitutt' and 'Kings Bay' have contributed significantly to this development. Following the spirit of tackling small and large problems jointly, the Alfred Wegener Institute and the Institute Polaire Française – Paul Emile Victor also decided to seal their close collaboration also formally: Marking the fortieth anniversary of the Franco-German Elysee ('Friendship') Treaty, Koldewey and Rabot Station on Spitsbergen were merged into a united research base. Complementing equipment and resources of both stations facilitated this process. Hence, the new research base represents more than simply the sum of two single stations and has enabled new research projects. In this context, the new Franco-German research centre represents an additional step towards advancement of Ny Ålesund as a research location and promotes coalescence of European polar research.

With this small brochure, we would like to briefly introduce the kaleidoscope of research topics being addressed at the joint research base. Most projects use an interdisciplinary approach, making the French German Arctic Research Base a highly state-of-the-art institution, far beyond its modern facilities.

The French 'Rabot Station' (Photo: Anne Hormes)

The Blue House, oldest building of the French German research base, represents the heart of Koldewey Station. In the past, the Blue House accommodated the administration of Kings Bay – the former strong-room where the miner's salaries were kept is now the laundry area. (Photo: Jens Kube)

As in the past, polar research still depends on the tireless personal commitment of the people involved. As well as Norwegian hospitality and the general openness of the people in Ny-Ålesund, the over-wintering crew deserves special thanks for the successes of the research base. Their continuing dedication has provided the foundation for the research work.

Jörn Thiede, Director of the Alfred Wegener Institute for Polar and Marine Research
and Gerard Jugie, Director of the Institute Polaire Française – Paul Emile Victor

Spitsbergen (Pictures: ESRI, Redlands Calif., USA 2004)

The Arctic

The Arctic, the most northerly region on earth, extends from the Arctic Circle to the North Pole. It includes parts of Russia, Alaska, Canada, Greenland, Norway, Sweden and Finland as well as the Arctic Ocean surrounding the North Pole. This ocean, up to 5000 metres deep in places, is permanently ice-covered.

During ancient times, the Arctic was portrayed as 'the land where the sun is shining at midnight, surrounded by seas frozen solid during winter'. Since north of the Arctic circle the sun does not set during at least one night on June 21st (Midsummer), the Arctic also has been called 'land of the midnight sun'.

Mankind has always been fascinated by the Arctic. This is despite extremely forbidding living conditions in the region. Icy storms, bitter cold, little accessible drinking water and the dangers associated with a drifting layer of ice have prevented long-term survival of most humans in the Arctic. Only the highly specialised native peoples of the Inuit, Sami and Siberians were able to overcome this adversity.

'The Three Crowns' – scenic landmark of the Kongsfjord (Photos: Jens Kube)

Spitsbergen

The Vikings' spirit of discovery has provided us with early testimonies about the Arctic. In approximately 1000 AD, Eric the Red came across the native inhabitants of Greenland during a voyage towards the North Pole. Roughly two hundred years later, the Norsemen made another significant geographical discovery: "Svalbardi discovered" was recorded in the Icelandic annals of 1194. "The land of the cold coasts", nowadays known as the "Svalbard-Archipelago", had been found. Spitsbergen is the largest island within this archipelago.

During subsequent centuries, countless explorers, adventurers and polar researchers from across the world risked their lives in an attempt to conquer the most northerly regions on earth. Throughout the 16th and 17th century, expeditions were motivated primarily economically. In order to break the trade monopoly held by Spain and Portugal, English and Dutch merchants in particular tried to find a short route to the rich markets of Asia. On his third expedition searching for a Northern passage along the Siberian coast, the Dutch seafarer and discoverer Willem Barents discovered Spitsbergen in 1596. He named it after the pointed mountains, visible in large numbers especially along the West coast. In the name of Holland, Spitsbergen was taken possession of. In addition, Barents told of thousands of whales in the polar waters of the region. Soon afterwards, the tremendous abundance of animals attracted Dutch, English, French, Danish and Norwegian whalers, who entered into – at times bloody – disputes about the ownership rights towards the islands. In the 17th century, whalers established whaling stations on Spitsbergen where whale oil boiling facilities were only utilised during the summer season. The whales' blubber was used as lighting fuel, the clear oil (also termed 'spermaceti') for soap production and medicinal purposes and the rare intestinal 'Ambergris' as a fragrance base in the production of perfume. Of particular importance were also the baleen plates from the whale's mouth. They were highly elastic and hence could be used to make corsets. During the 18th century, as processing of whale products was increasingly carried out at sea, the whale processing stations gradually disappeared again from Spitsbergen.

Towards the end of the 18th century, the exploration of the North Pole progressively became the centre of interest. A 'race to reach the pole' was ignited, and eventually Germany was one of the many nations participating in it.

Atmospheric research

The atmosphere and its composition control climate on our planet. For humans, atmosphere and climate have great significance as they allow life on earth as we know it. The layers of the atmosphere most important for climate are the troposphere and stratosphere. In the Arctic, the troposphere (lowest level) extends from the earth's surface up to approximately 8 to 12 kilometres altitude. All weather events, i.e. rain, wind, cloud formation, storms etc. take place in this layer. Researchers of the French German research base track weather patterns by means of meteorological weather stations continually recording air temperature and humidity, wind speed and radiation. Meteorological data collected on-site complement computer model calculations, and represent an important component of global weather forecasting. The second atmospheric layer is the stratosphere. It reaches to an altitude of approximately 50 kilometres. Part of the stratosphere is the vital ozone layer which protects us from ultraviolet (UV) radiation. Degradation of the ozone layer over the past 20 years, particularly in polar regions, has been a major cause of concern. Since plants and animals also have to adapt to an increase in UV radiation, there is a direct relationship between atmospheric and biosphere research and the two disciplines complement one another at the French German research base. German and French polar researchers collaborate in interdisciplinary teams to make systemic predictions for the bio-, geo- and atmosphere. Extensive monitoring programmes, field experiments and laboratory analyses provide results which are of great importance to all of us and which, eventually, are applied in the context of international agreements about climate protection, such as the Kyoto protocol.

Rising balloons equipped with data loggers record vertical stratification in the atmosphere, up to three kilometres altitude. They are released from the balloon house of the Atmospheric Observatory and provide weather data such as air pressure, temperature, humidity and wind speed. (Photo: Anne Hormes)

„The French German research base has developed into an important experimental forum which will facilitate the definition of atmospheric process parameters. Furthermore, it will contribute to making climate models more realistic by detecting polar changes.“

Klaus Dethloff, Alfred Wegener Institute, Potsdam

Mercury in the high Arctic – a man-made phenomenon

The earth's polar regions are considered the last extensive pristine environments on our planet. Nevertheless, toxic and persistent substances, the evidence of human activities, can be measured in air and snow samples from the Arctic. Such pollutants from the industrial centres of Europe are transported predominantly by air until, eventually, they accumulate in the cold regions on earth. Although Ny-Ålesund is far from any urban centres, industrial as well as household emissions are detectable here. Researchers of the University of Grenoble, in cooperation with the GKSS research centre, were able to identify so-called atmospheric mercury incursions. These incursions probably lead to an increased input of mercury from the atmosphere into polar ecosystems. According to measurements, the mercury concentration in the air declines significantly shortly after the onset of the Arctic spring. Scientists assume that gaseous mercury is removed from the air by a series of chemical reactions and finds its way into the layers of snow and ice below. As this process is related to the intensity of solar radiation, mercury input is enhanced during the particularly sensitive period of arctic spring, when the ecosystem is rejuvenated after the long polar night.

„Because of the extreme conditions in the Arctic, the environment is highly sensitive to climate changes and pollution. Therefore, it provides a finely tuned early-warning-system that we should make use of."

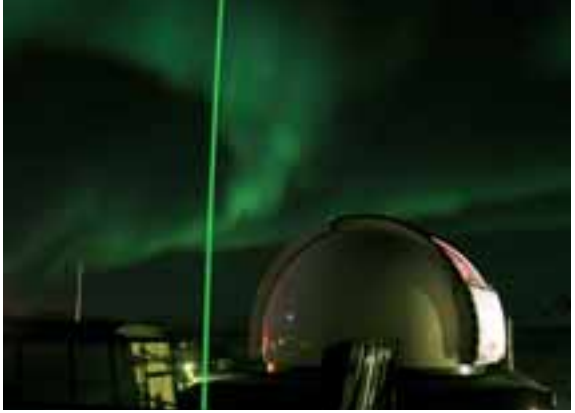
Roland Neuber, Alfred Wegener Institute, Potsdam

Five kilometres away from Ny-Ålesund, the Corbel Field Station, named after the French polar researcher Jean Corbel, houses scientific instruments for local weather observations. Solar panels provide part of the energy required. (Photo: Franck Delbart)

Measuring devices from the University of Grenoble document mercury pollution of snow and atmosphere during the Arctic spring. (Photo: Christophe Ferrari)

On the track of climate change

Research of natural and man-made trace elements in the atmosphere plays an important role in the context of both climate research and environmental problems. Therefore, one main research focus of the German French research base is the development and utilization of precise methods for the detection of minute airborne particles of dust and liquid (aerosols) in the polar air, as well as their interaction with solar radiation and cloud formation. Aerosols are measured as well as trace gases (e.g. ozone, carbon monoxide, hydrogen cyanide, methane, nitrogen dioxide and fluoro-hydrocarbons). Atmospheric researchers from the Potsdam research unit of the Alfred Wegener Institute were able to use ground-based remote sensing equipment to gather insights in the vertical distribution of aerosols in the polar atmosphere. This optical method is based on the attribute of trace elements to reduce solar and lunar radiation in the atmosphere. High resolution infrared spectrometers or photometers are used for this purpose. The 'Lidar' method works by sending a short laser impulse into the atmosphere. Analysis of the light back-scattered by atmospheric molecules or particles generates concentration profiles of the substances to be investigated. For these measurements, highly sensitive instruments are housed in the atmospheric observatory of the research base. Climate researchers involved in the project investigate how substances are transported and transformed in the atmosphere and where the source regions and source types for global aerosol pollution are located. This will be accomplished through a series of monitoring stations distributed across Arctic, temperate latitudes, the Tropics and the Antarctic on the one hand and computer model calculations on the other. Simultaneously, aerosol concentrations are also measured directly from the air using both, airplanes or high resolution sensors carried aloft on a captive balloon.



During the polar night, emphasis is placed on optical measurements of the atmosphere using lasers. During this dark season, the colour displays of the Northern Lights are particularly impressive. (Photo: Konstanze Piel)

By means of an aerosol collector, minute airborne dust and liquid particles are detected in the atmosphere. Across national borders, these kinds of data are used in air-monitoring. (Photo: Heiko Reinhardt)

„One of the exciting things about working in Ny-Ålesund is the opportunity to collaborate with other groups that use various methodologies, thus complementing the interpretation of one's own results."

Michael Kriews, Alfred Wegener Institute, Bremerhaven

Water vapour in the atmosphere

In the monitoring series of the French German research base, particular emphasis is placed on measuring variability of water vapour content, as this represents the most important natural greenhouse gas in the atmosphere. In the polar stratosphere, water vapour plays a significant role in the formation of so-called 'stratospheric clouds'. These clouds develop at very low temperatures of less than –78°C and represent key contributors to severe ozone depletion in the stratosphere. Water vapour sensors deployed by balloons enable the long-term observation and assessment of stratospheric water vapour. Major activities, using satellite operated remote sensing systems, are carried out by the National Research Centre for Geosciences Potsdam (GFZ). The signals of the GPS navigation system are used to obtain highly accurate information about the distribution of temperature and humidity in order to improve global weather forecasting. Ny-Ålesund maintains a significant ground station for the CHAMP and Grace 1 and 2 research satellites. Linking satellite measurements of gravitational fields on the one hand, and marine currents and air pressure on the other, will provide an additional future contribution to climate research which is carried out in close cooperation with colleagues of the Alfred Wegener Institute. Global warming and the resulting sea level rise are further aspects investigated at the French German research base by means of satellite recordings.

„Climate research is a global problem. Measurements in regions far from the sources are essential for the investigation of global changes."

Justus Notholt, University of Bremen

The station engineer looks after technical maintenance of the microwave radiometer used in the identification of atmospheric gases such as water vapour and ozone. (Photo: Bettina Saier)

The satellite ground station at Ny-Ålesund airport. Data from CHAMP and GRACE 1 and 2 are recorded here. (Photo: Carsten Falck)

„Through the good cooperation with colleagues from the French-German Research Base, problems arising in the short term can be resolved quickly. The annual visits by co-workers of the GFZ Potsdam represent an exciting highlight – not only because of the very careful preparation, but also because of the gathering with colleagues from the Alfred Wegener Institute."

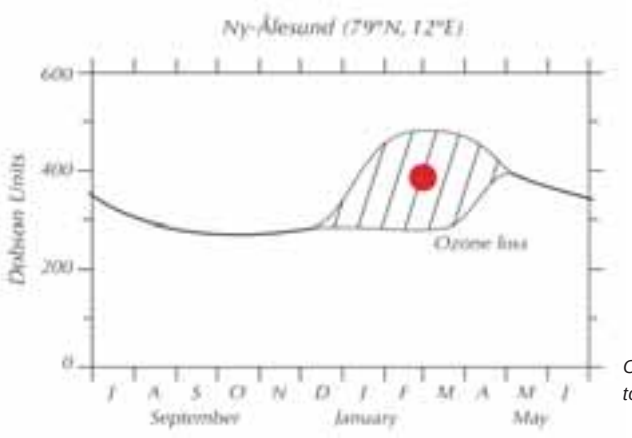
Carsten Falck, National Research Centre for Geosciences (GFZ), Potsdam

Ozone hole above the Arctic – alarming measurements

Launch of a balloon-borne ozone sensor. The routinely performed launch of both weather and ozone balloons is one of the daily recording tasks of the station personnel. (Photo: Marko Herrmann)

Ozone, an atmospheric trace gas, represents another focus of investigation at the French German research base. Ozone plays a key role for the atmosphere because it acts as a filter and eliminates the dangerous, high energy ultraviolet (UV) component of solar radiation, protecting living beings like a gigantic parasol. Extensive ozone measurements have confirmed a rapid depletion of the ozone layer over the Arctic during spring. Ozone profiles are generated with microwave radiometers, lasers and special sensors carried by balloons. Fundamentally, ozone depletion is caused by high atmospheric pollution with chlorine and bromine from halogenated hydrocarbons. However, in addition, large temperature variations cause the high variability in ozone depletion from year to year. This was discovered by researchers of the Alfred Wegener Institute during the comparison of data from balloon-borne ozone sensors with satellite data. Ozone measurements from across the Arctic are coordinated and analysed using a method developed specifically for this purpose. The following observation represents an equally exciting and alarming research result: Cold winters in the stratosphere, major contributors to ozone depletion, have become even colder over past decades. Should this trend continue, the future will see stronger ozone depletion during individual winters, than in the past. This effect would even outweigh a zero emission scenario of chlorine and bromine containing chemicals responsible for destroying atmospheric ozone.

In order to answer questions about the effects of increased UV radiation on flora and fauna, biological studies carried out at the French German research base include investigations of algae, plants, insects and bacteria.



Ozone loss in some recent Arctic winters. About half of the loss is due to anthropogenic effects. (Picture: AWI)

„Arctic monitoring series provide an essential basis for the prediction of further changes to the ozone layer.“

Peter von der Gathen,
Alfred Wegener Institute, Potsdam

Sunburn in seaweeds?

When seaweeds are exposed to increased UV radiation, important biological molecules, such as the hereditary DNA or proteins, can be seriously damaged. Photosynthesis may be inhibited or enzymes with a key metabolic role may lose their function. Central to the investigations of the researchers working on algae are so-called transplant- and UV-exclusion experiments. In transplant experiments, seaweeds from greater depth are moved into shallow areas with higher UV radiation. UV-exclusion experiments work on the basis of removing the dangerous UV component of solar radiation using transparencies with specific filter properties. A large team of researchers from the Alfred Wegener Institute and from the universities of Kiel and Hamburg records responses of the seaweeds to these types of treatment. One result of the investigation, for instance, is that the sensitivity towards UV damage varies throughout a seaweed's life time. In addition, many seaweeds are able to protect themselves against elevated UV radiation by producing special pigments. Since such UV protective pigments from algae may also be used to shield the human skin, this research field is of great potential interest for the pharmaceutical industry.

„Within a day one can get to the Arctic – a completely different environment. The underwater world is fascinating.“

Christian Wiencke, Alfred Wegener Institute, Bremerhaven

A higher quantity of UV radiation in sunlight, the result of reduced ozone concentration in the stratosphere, could lead to diminished growth of marine algae. (Photo: Christian Wiencke)

During an under-water experiment in Kongsfjord on Spitsbergen, algae are exposed to different levels of UV radiation. (Photo: Heike Lippert)

The scientific diving team of the French German research base takes advantage of the onset of summer to collect seaweeds from Kongsfjord waters. They investigate the impact of increased ultraviolet radiation on the marine ecosystem. (Photo: Max Schwanitz)

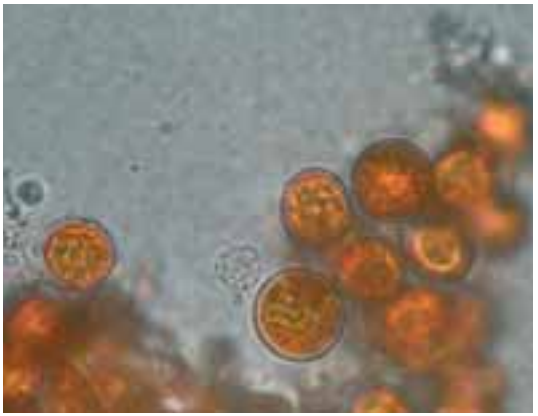
„One of the nicest aspects of the work is sampling in Arctic nature. The research expeditions provide a unique opportunity to experience the Arctic first hand, especially from our small 'MS FARM' research vessel. The quick changes of natural events, e.g. snow, storm, fog with a flat-calm sea and sunshine, continue to be fascinating."

Niko Finke, Max Planck Institute, Bremen

Red snow

The balance between damaging effects of UV radiation on the one hand, and protective and repair mechanisms on the other is one main research focus of biologists from the University of Innsbruck in close collaboration with the algal researchers from Bremerhaven. Biochemical laboratory procedures have revealed that snow algae from polar as well as alpine regions use the same mechanism for protection against UV: red pigments (carotinoids) act as sun screen for snow algae. Also, flowering plants from polar regions are similar to those living in high alpine areas with regard to their UV-adaptation. Many biological and biochemical processes are comparable and there do not seem to be different responses in metabolism or cell structure for plants from either polar or high mountain regions.

During the summer months, snow with a red tinge is a clear indication of the presence of snow algae (Chlamydomonas nivalis). (Photo: Cornelius Lütz)



Unicellular green algae produce many red pigments which optically shield the green chloroplast. Researchers from the University of Innsbruck are investigating whether these red pigments may act as protection against ultraviolet radiation. (Photo: Cornelius Lütz)

Heat shock at the North Pole

Aside from the effects of UV radiation caused by stratospheric ozone depletion, other biological projects study interactive effects of UV radiation with elevated temperatures. Guest researchers from the Max Planck Institute in Bremen, for instance, are investigating the activities of marine sediment bacteria. They want to find out what, exactly, bacteria are doing when temperatures are permanently low (1.8 degrees), and what impact they have on the global carbon cycle and the world climate.

Visiting scientists from the Max Planck Institute in Bremen investigate the decomposition of organic material in sediments of the seafloor. (Photo: Bo Barker Jørgensen)

Sampling with the so-called HAPS corer is a method to retrieve sediment cores from the seafloor. (Photo: Bo Barker Jørgensen)

A species of plant louse (aphid) native to Spitsbergen (Photo: Maurice Hullé)

Lousy times

How global climate change affects the evolution of terrestrial ecosystems is investigated by insect biologists from Rennes. The entomologists study the example of plant lice (aphids) native to Spitsbergen. During the short Arctic summer, plant lice are collected directly from plants or in specifically deployed traps, and the researchers examine the animals' molecular genetics. The genetic data are analysed mathematically, allowing predictions about the future development of the population. These types of results could also become relevant for pest control in our latitudes.

Plant lice (aphids) are collected in specifically designed tents in order to investigate their distribution and genetics in relation to climate change. (Photo: Maurice Hullé)

„We can observe here such living organisms, as insects or plants, living at their extreme location. This is a fascinating work. How can those species be so well adapted to these extreme climates? During the evolution, they became very specialized in cold resistance. But will they be able to resist to a global warming and to fight against new species invasions? Spitsbergen is a typical country where to find answers!“

Maurice Hullé, INRA, Rennes

Stress test for Kittiwakes

Kittiwakes serve as an example of how a climate-related rise in temperature may affect the diet of birds. Changes in sea temperature and sea ice distribution influence the abundance of Arctic cod, one of the most important food items of kittiwakes. The phenomenon is investigated by French researchers in collaboration with members of the Norwegian Polar Institute and the University of Trondheim. Ecophysiological studies have shown that the birds release stress hormones whenever fish supply is low. Initially, this leads to more intensive foraging efforts by the kittiwakes; however, beyond a certain point, the birds cease any parental care of their chicks, which means that breeding success in the population is low. In order to come to these conclusions, the researchers have been climbing into the gull colonies year after year to determine clutch sizes and to take blood samples of individuals for further analysis.

Kittiwakes rearing their chicks in the cliffs around Ny-Ålesund show annual population fluctuations which are associated with water temperatures, ice cover and food availability. (Photos: Olivier Chastel)

„It is always amazing when arriving in this cold, completely white and quiet landscape, to find such a colored village with so diversified and friendly people.“

Franck Delbart, Institute Polaire Française – Paul Emile Victor, Brest

Thawing permafrost

The Bayelva permafrost monitoring station is operated by geoscientists from the Potsdam research unit of the Alfred Wegener Institute. (Photo: Konstanze Piel)

Alternating freezing and thawing in permafrost soils leads to shifting and sorting of soil material within the thawing layer. As a result of this process, ('hummocks' or 'mud boils') are formed. Geoscientists from the French German research base are investigating to what extent climate change has an effect on soil profiles in Spitsbergen. (Photo: Brigitte Van Vliet-Lanoë)

An additional effect of global climate change is the alteration of Arctic permafrost (continually frozen soils). Through the thawing process, the soil layer above the permafrost which thaws every year, increases in thickness. Geoscientists from the research unit Potsdam of the Alfred Wegener Institute and the University of Lille want to find out how the states of water (snow, ice, liquid, vapour) and its quantity change throughout the year at different depths inside the ground. They are also interested in how water may alter the characteristics of the thawing layer which acts as a buffer between atmosphere and permafrost soil. Profiles are dug from both, frozen and unfrozen soils. Further measurements might include sub-sampling of the cores for laboratory analysis or the insertion of various sensors, e.g. thermistors. By combining mathematical model simulations with field data, the geoscientists have revealed an interesting relationship: rain falling onto warm snow soaks through the snow to the ground where it re-freezes, leading to the formation of ice lenses below the snow. This may be fatal for reindeer because the layer of ice can prevent the animals from access to their vital food source on the ground.

„Society and the environment profit from our research in two ways – firstly, we are able to record and assess potential climate changes through long-term studies and understanding of underlying processes. Secondly, our research facilitates access to the beauty and complexity of our investigation objects.“

Julia Boike, Alfred Wegener Institute, Potsdam

The formation of ice lenses on the ground may interfere with the feeding of Svalbard reindeer. (Photo: Jens Kube)

Fauna of the Arctic Ocean

Diet and feeding are also the focus of attention in various marine biological projects studying comb jellies, sea butterflies and Greenland cockles. Researchers are interested in what the animals eat, and who eats them. The seasonal development of cockles is investigated in the field: Cages containing cockles buried within the sediment are deployed under water just off the coast. They are recovered at monthly intervals. Histological sections in the laboratory reveal the maturity of the animals. Feeding trials with Greenland cockles are performed in plexi-glass chambers in which the concentration change of feeding particles of different sizes can be monitored.

Apart from Greenland cockles which live buried in soft sediment sea beds and which are dug up and eaten by walruses, the waters around Spitsbergen are also home to a rich underwater flora and fauna on rocky sea floor. In order to test how fast the sea floor is colonised, synthetic plates (to simulate hard substratum) and sediment filled terra cotta pots (to simulate soft sediment) have been deployed at 20 metre depth. Their colonisation with plants and animals over time is documented by underwater photography. In addition, the scientific diving team of the French German research base, excellently equipped for a multitude of tasks in the icy waters surrounding Spitsbergen, takes care of sampling the settlement structures on site.

„Kongsfjord: The feeling to live in two different but finally very close worlds. The world of humans on the station which contrasts with the world of animals in the islands; and one passes from one to the other in a few minutes.“

Thierry Raclot, Institut Pluridisciplinaire Hubert Curien, Strasbourg

Life cycle and feeding biology of Greenland cockles are one focus of marine research investigations. (Photo: Thorsten Wilhelm)

Walruses use their tusks to dig through the sandy seafloor for nutritious Greenland cockles. (Photo: Max Schwanitz)

Eider ducks (Somateria molissima) are large marine ducks with a breeding range extending from the Arctic to temperate climate zones. Soon after egg-laying, the hen (below) is left by the drake (above). Throughout the whole breeding period, the female Eider does not feed. (Photos: Thierry Raclot)

Gigantic icebergs break loose from the glaciers and freeze to the sea ice in winter. (Photo: Bettina Hoffmann)

Global solutions through international cooperation

The Ny-Ålesund research location provides excellent conditions for international cooperation with the objective to integrate research results into a global context. Scientists from all over the world are always exchanging ideas and data. The 'Arctic Marine Laboratory', for instance, established in 2005, is open for research by all nations. The facility provides opportunities for international cooperation as well as new challenges for polar marine research in Ny-Ålesund. Mutual stimulation and inspiration in the research village are facilitated as much by the spectacular landscape with glaciers and fjords as by the diversity of social activities and excellent accommodation and catering services of the Norwegian host Kings Bay AS.

Kings Bay AS

The government owned company Kings Bay AS holds property rights to the international research village of Ny-Ålesund, including all land and buildings. Among the main tasks of Kings Bay, ensuring the smooth operation of research activities for up to 20 nations is on top of the list. With a personnel team of 35 maximum, Kings Bay also looks after the maintenance of roads and buildings, organises waste disposal and manages air transport and shipping. Ny-Ålesund operates its own diesel power station and receives drinking water from a nearby lake.

Research life in Ny-Ålesund

February twilight over Ny-Ålesund (Photos: Jens Kube)

Carrying a gun for protection against polar bears is an absolute requirement during field work as well as on other excursions.

The maximum number of 150 inhabitants during summer is reduced to approximately 30 in winter. Throughout the polar night from the end of October to the end of February, a station manager, an engineer and a technician maintain operations at the German French research base. At this dark time of year, optical measurements of the atmosphere, making use of lasers and the astrophotometer, are the central activities at the station. The personal life of people staying over winter is focused on social contacts and on a multitude of leisure time activities, e.g. indoor sports, solarium, sauna, billiards or film presentations. Other than during the coal mining era when whole families lived in Ny-Ålesund, schools, churches and medical support are no longer part of the village infrastructure.

Nowadays, daily life centres around the mess hall where, up to four times per day, the inhabitants gather for plentiful buffet meals. On special occasions, the dining hall is also used for banquets and festive receptions. Weekly bar evenings provide an opportunity for researchers and staff to gather in a relaxed atmosphere.

The former research cabin of the Institute for Geophysics and Geodesy of the German Democratic Republic (GDR), used during the 1950s, is now a weekend cottage for the inhabitants of Ny-Ålesund.

Every year, the village is visited by polar bears during winter and spring. Because the animals are strictly protected, they are chased off by guards shooting noise makers or blanks. Anyone conducting research outside the village must undergo training on the correct response in case of a polar bear encounter. Firing at a polar bear is only sanctioned as a very last resort in self defence.

As soon as the sunlight returns to Ny-Ålesund at the beginning of March, the research village is revived. Test sites and cabins in the area are visited by snowmobile. If the fjord is ice-free, boats working on marine biological projects or accessing the wider area by water, can enter the harbour. After the end of March, with 24 hours of daylight, outdoor research activities are no longer limited by light.

The French German research base consists of several buildings (‘Blue House’, ‘Atmospheric Observatory’, ‘Rabot Station’) with a total of 17 beds, modern computer work stations, five guest offices and two workshops. In addition, state-of-the-art laboratory work space for both, biological and chemical research can be rented in the marine research laboratory. A special roof construction on the Atmospheric Observatory allows installation of measuring equipment. During field work, the clean air observatory ‘Corbel’, located ap-proximately five kilometres east of Ny-Ålesund, offers working space and accommodation. In addition, nu-merous boats and snowmobiles are further components of the outstanding infrastructure of the French German research base.

In February, the return of the sunlight to the horizon marks the beginning of a busy field season. (Photo: Jens Kube)

Arctic tern
(Photo: Jens Kube)

A family of Polar Foxes has settled in Ny-Ålesund. Every year, the young foxes are a delight for Ny-Ålesund researchers and visitors.
(Photo: Max Schwanitz)

Barnacle geese
(Photo: Tor Marschhäuser)

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View of 'Engelsbukta' (English Bay) south of Ny-Ålesund (Photo: Jens Kube)

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Photo: Jens Kube

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