



▲ The ‘Polarstern’ research ship (photo: Fahrbach)

Logistics

The most important instrument in German polar research is the ‘Polarstern’, an ice-breaking polar research and supply vessel. This ship is equipped for multidisciplinary use, enabling scientists from different fields to work at sea at the same time.

For research in the North Sea, the Atlantic, the Mediterranean and other sea areas in temperature latitudes, the institute uses its other research ships - ‘Heincke’, ‘Mya and ‘Uthoern’.

At the Helgoland marine station operated by BAH, a group of research divers is available for studies into the shallow waters around the rock. The BAH also operates an environment laboratory here, as well as a research and display aquarium. Another function of the BAH is to supply marine organisms to inland research establishments.

The ‘Polar 5’ research aircraft belonging to AWI is equipped for photogrammetric and geophysical, an acoustic surveys over shelf ices and rocky areas, as well as for meteorological and oceanographic observations.

The ‘Neumayer-Station III’ overwintering station in the Antarctic is occupied all year round and houses a meteorological, a geophysics, an acoustic and an air chemistry observatory. In the Antarctic, AWI also operates the Dallmann Laboratory, which is part of the Argentine research station ‘Jubany’ on King George Island and the ‘Kohnen’ Station inland of the Neumayer Station, which served as the base of the European ice drilling project EPICA.

The French German Arctic Research Base AWIPEV in Ny-Ålesund (Svalbard) carries out meteorological and air chemistry measurements and observations. Processing, analysis and visual presentation of research data is accomplished at AWI with the help of main-frame computers, workstations and PCs for a broad diversity of research posts. The Institute has permanent satellite contact with its various stations and ships. Broadband national and international communication networks provide links to external supercomputers and cooperation partners all over the world.



▲ Thin section of an ice sample

National coordination

The Alfred Wegener Institute is responsible for coordinating the German polar research effort. It works closely with the German National Committee for the Scientific Committee for Antarctic Research (SCAR) and Arctic research (IASC), and with the coordinated promotion of polar and marine research by the German Research Foundation (DFG). The deployment of the research ships and aircraft is jointly planned with user councils in the context of scientific cooperation and exchange of experience.

The Secretariat of the German Advisory Council on Global Change (WBGU) is located at AWI.

The BAH is represented on the German Scientific Commission for Marine Research (DWK), the German organisation within the International Council for the Exploration of the Sea (ICES). Each year, about 1,000 students complete courses carried out on Helgoland and Sylt by German universities.

International cooperation

The Alfred Wegener Institute maintains close contacts with numerous universities and institutions in Europe and overseas. It sends scientists to institutes throughout the world, to other research ships and stations, and invites scientists from other nations to work on joint research projects or to participate in further training. About a quarter of those participating in ‘Polarstern’ expeditions are foreign guests.

The Alfred Wegener Institute cooperates in many international research programs and is involved in projects for the European Science Foundation (ESF) in Strasbourg and for the European Union (EU).

Publications

The Alfred Wegener Institute publishes the ‘Reports on Polar and Marine Research’ containing the reports and results of the expeditions.

The ‘Biannual Report’ appears at regular intervals and reports on the ongoing and future research projects. In collaboration with Springer-Verlag, Berlin, Heidelberg, the Institute publishes ‘Helgoland Marine Research’, an international journal on all aspects of marine biology.

Title photo: Grobe ▶

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The Alfred Wegener Institute for Polar and Marine Research in the Helmholtz Association

Polar and marine research are central topics in environmental and earth system research. The Alfred Wegener Institute carries out research in the Arctic, Antarctic and the oceans of the middle and high latitudes. It coordinates polar research in Germany. The research programme encompasses four big topics: changes in the Arctic and Antarctic as well as in coastal ecosystems, lessons from the Earth's past and the optimisation of climate or Earth System models by incorporating current insights from polar research. Furthermore, major equipment like ships and polar stations crucial for polar and marine research is made available from the programme both nationally and internationally. The institute organises and nurtures international cooperation in polar and marine research.



▲ Main building of the Alfred Wegener Institute (photo: Grobe)

The Alfred Wegener Institute for Polar and Marine Research (AWI) was established in 1980 as a public-law foundation named after Alfred Wegener (1880 - 1930), the geophysicist and polar researcher who achieved worldwide renown with his 'continental drift' hypothesis.

Today, the Alfred Wegener Institute for Polar and Marine Research (AWI) comprises the following research establishments: the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven,

the AWI Research Unit in Potsdam, the Helgoland Biological Institute (BAH) and the Wadden Sea Station in List/Sylt. In 2009, the institute had about 800 employees and a total budget of about 100 million Euro. It is a member of the Hermann von Helmholtz Association of German Research Centres and is financed to 90% by the Federal Ministry for Education and Research (BMBF). The state of Bremen provides another 8% of total funds, the states of Brandenburg and Schleswig-Holstein a further 1% each.

The research mission of the Alfred Wegener Institute is to improve our understanding of the complex relations between the oceans, ice, atmosphere, the sea floor and the plant and animal kingdoms. Earth management based on scientific understanding can only be carried out effectively if the research community succeeds in improving our understanding of the global environmental changes induced by natural causes and human interference.

Research programme

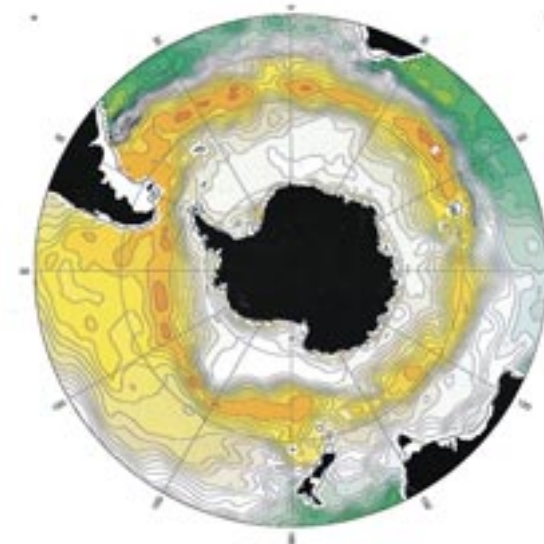
The physics research conducted at AWI is focused on the ocean-ice-atmosphere system and its importance for the world climate. The world's oceans, the atmosphere and the ice sheets are linked by manifold interactions operating over time scales of days to centuries.



▲ Working on the seaice (photo: Alfred Wegener Institute)

With the help of measurement campaigns and model simulations, research is conducted into the exchange processes in the polar seas, sea ice, the currents in the Arctic and Antarctic oceans, and into the structure, mass balance and dynamics of shelf and inland ice. Remote sensing methods are also employed.

Another general focus of research activities concerns the marine ecosystems of the polar regions and the temperate zones, a field in which marine biologists and chemists are studying the ecology and ecophysiology of individual species and genuses, the structure and development of marine communities under extreme conditions, ecological interrelations and processes, as well as the chemistry and biochemistry of marine and atmospheric trace substances.



▲ A section from the Hydrographic Atlas of the Southern Ocean



▲ Brown algae from the Helgoland mud flats (photo: Schilling)

The scientific focus of the Helgoland Marine Biological Station lies on life cycles, ecology and behaviour of marine organisms, foodweb interactions in shelf sea ecosystems, climate change research and long-term changes of the ecosystem as well as microbiological coastal research. The BAH conducts unique research in the Wadden Sea and on the rocky island of Helgoland. The scientists have been recording ecological change for several decades. By this means they established one of the most comprehensive data sets on ecological time series worldwide.

Earth scientists are investigating the history of the polar continents and seas, concentrating on the sedimentation history and deposition processes of marine sediments at high latitudes, the age classification of sediments, the conversion processes in sediment, the physical investigation of sediments near the ocean surface, the structure of the Antarctic continental shelf in the Weddell Sea and the South Atlantic, the identification of anomalies in the earth's gravity and magnetic fields, as well as the structure of Greenland's continental shelf and of the oceanic lithosphere in the Arctic basin. The Alfred Wegener Institute has strong links with Bremen University, for example with the DFG Research Centre 'Ocean Margins'.