EXPEDITION PROGRAM ANTARCTICA

(ANT – Land 2008/2009)

STATIONS AND FLIGHT MISSIONS

Neumayer Station

Kohnen Station

Flight Missions

Dallmann Laboratory

Other Activities

Coordination

Hartwig Gernandt

ALFRED WEGENER INSTITUTE
FOR POLAR AND MARINE RESEARCH
HELMHOLTZ ASSOCIATION

October 2008

Address;
Alfred Wegener Institute
For Polar and Marine Research
Am Handelshafen 12
D-27570 Bremerhaven

Phone: +49 471 4831 – 1161
Fax: +49 471 4831 – 1355

Email of coordinators:
hartwig.gernandt@awi.de
thomas.matz@awi.de
dirk.mengedoht@awi.de
heinrich.miller@awi.de
christian.wiencke@awi.de

Email of secretariat: sanne.bochert@awi.de

EXPEDITION PROGRAM ANTARCTICA

(ANT – Land 2008/2009)

STATIONS AND FLIGHT MISSIONS

Neumayer Station

November 1, 2008 – March 5, 2009

Kohnen Station

No Scientific Activities

Flight Missions

November 18, 2008 – February 23, 2009

Dallmann Laboratory

October 25, 2008 –April 5, 2009

Other Activities

Coordination

Hartwig Gernandt

Thomas Matz

Dirk Mengedoht

Heinz Miller

Christian Wiencke

ALFRED WEGENER INSTITUTE

FOR POLAR AND MARINE RESEARCH

HELMHOLTZ ASSOCIATION

October 2008

EXPEDITION PROGRAM ANTARCTICA

(ANT – Land 2008/2009)

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1. NEUMAYER STATION III

1.1 Summary

The season ANT-Land 2008/2009 is scheduled for the period from 31 October 2008 until 05 March 2009.
Almost all personnel and approximately 14 tons of cargo will be flown into the Antarctic and back via the air link from Cape Town within the frame of Dronning Maud Land Air Network (DROMLAN). One ship call is scheduled for RV POLARSTERN (ANT XXV/2) mid December 2008 to supply the majority of freight and fuel for NEUMAYER STATION II and aircraft operations. Furthermore, two groups of scientists travel on this leg to and from NEUMAYER STATION. Additionally, MV IVAN PAPANIN will carry more cargo and fuel for NEUMAYER STATION III and will carry back all facilities and equipment used for the construction works. Her first call is scheduled for the beginning of January 2009, and the second one will be performed in the middle of February 2009. The voyage of MV IVAN PAPANIN has been coordinated in the frame of Dronning Maud Land Shipment (DROMSHIP) together with the national Antarctic programs of Norway and Belgium.

The main objective of the season 2008/2009 on the Ekström Ice Shelf will be the completion of the construction works and initiation of the pilot operation of NEUMAYER STATION III. The commissioning of the new station is one of the major German contributions in infrastructure to the International Polar Year (IPY).

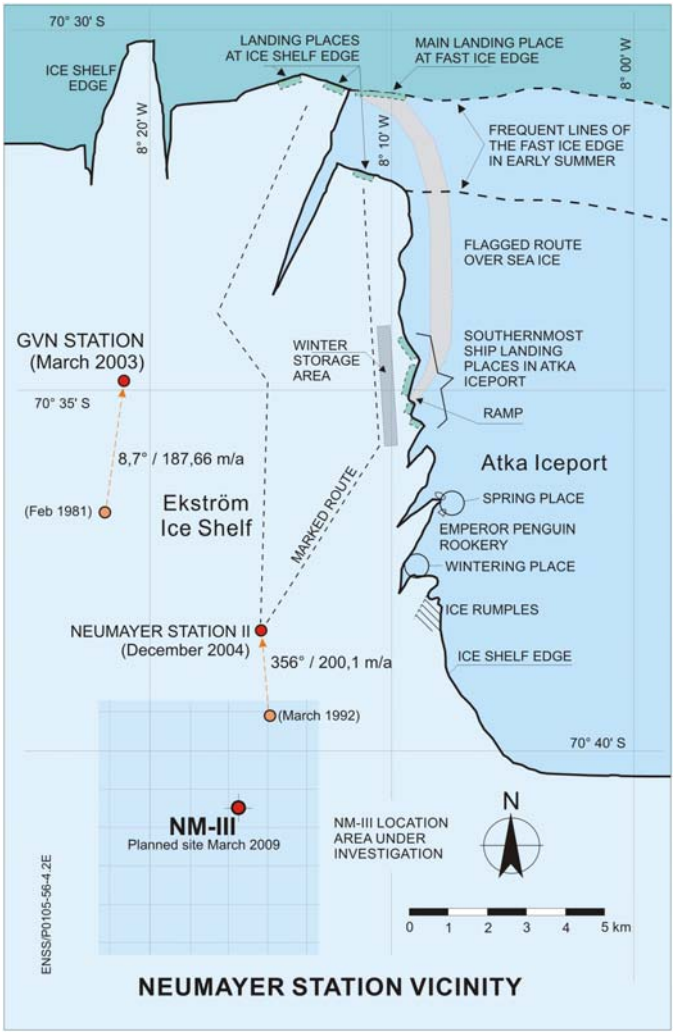

Figure 1.1: Vicinity of NEUMAYER STATIONs on Ekström Ice Shelf, position of the construction site of NEUMAYER STATION III (70°40.8' S, 008°16.2' W in January 2006, foundation stone).

The construction works and pilot operation of the new station will already start in the beginning of November 2008 to catch up with the delay of four weeks which occurred in the season 2007/2008 due to heavy sea ice conditions. Construction material will be uncovered from the snow mass accumulated during the winter. Subsequently, the assembling of the steel framework will be continued and the mounting of modules and technical service systems will be performed.

In parallel scientific inside installations, test runs and initiation of the pilot operation will start according to the construction progress and are scheduled to be completed by the end of February 2009. An international scientific and technical inspection and certification of the newly established station building and observatories will be performed by AWI scientists and their international partners.

It is planned that NEUMAYER STATION III will start its official operation in the beginning of March 2009. The first wintering in the new station will start at this time.

A television team (realnature.tv) will report on the ongoing construction and commissioning activities.

NEUMAYER STATION II will be occupied for the last time during this season. Starting in March 1992, the station will have run successfully for 17 years. Both the 28th and the 29th wintering staff will work together in transferring laboratories and outside facilities of the scientific observatories for air chemistry, meteorology, and geophysics from NEUMAYER STATION II to NEUMAYER STATION III.
In parallel station facilities will be used to operate the Basler BT-67 aircraft POLAR 5. The regular weather forecast service (AWI/DWD) will be provided to all aircraft operations within the Dronning Maud Land region, in particular as a contribution to Dronning Maud Land Air Network (DROMLAN).
A parallel operation of both NEUMAYER STATION II and NEUMAYER STATION III is necessary to serve all obligations, flight operations and data check and to minimise data gaps.

One scientific mission with AWI research aircraft POLAR 5 is scheduled south of NEUMAYER STATION for the season 2008/2009. PRE-IPICS GPS is short program of four survey days, in the beginning of February 2009 revisiting deformation figures established in 2006/07.
One field party (6 scientists) performing three projects on the ecology of Weddell seals is planned in the region of Atka Bay and NEUMAYER STATION during the season 2008/2009.
Medical studies of the Berlin Centre for Space Medicine (ZWMB) will be continued by the station staff during the winter period.

At KOHNEN STATION no scientific activities are planned in the oncoming season. The station will shortly be visited for maintenance work on the seismometer and the air sampling system. Personnel will be transported to the base by aircraft in the frame of DROMLAN.

In total 145 scientists, engineers, technicians, journalists and visitors are working or temporarily staying at NEUMAYER STATION II and at the construction site of NEUMAYER STATION III.

- Construction works and documentation (58 – ARGE, realnature.tv)
- Installation and pilot-operation of scientific observatories (28 - AWI, BGR, external companies)
- AWI scientific projects – aircraft missions and field parties (13)
- AWI wintering staff (18)
- DWD weather forecast service (3)
- International scientific and technical inspection and certification (number of participants not confirmed, preliminary reservation 25)

1.2 Setup and pilot operation of observatories

1.2.1 Meteorological observatory

Gert König-Langlo (AWI)

In the coming summer season 2008/2009 the meteorological observatory will be rebuilt at NEUMAYER STATION III. Within the new observatory all meteorological programs from NEUMAYER STATION II will be continued without interruption. This means that the full program from NEUMAYER STATION II – including the summer forecast service – has to go on until the new observatory at NEUMAYER STATION III is fully operational. Following work has to be done:

- Arrival of the weather forecaster from the German Weather Service (NN) and start of the DROMLAN-Service with the first aircraft arriving at NEUMAYER STATION.
- Arrival of Mathias Zöllner (leader of the meteorological observatory 2009) via POLARSTERN (about 15 December 2008).
- Installation of the new meteorological measuring site including a 15 m high tower 300 m south-east of NEUMAYER STATION III (Mathias Zöllner, Julia Wittig) till about 10 January 2009).
- Arrival of Jürgen Gräser, Bernd Loose, Gert König-Langlo (about 10 January 2009)
- Installation of the meteorological sensors on the roof of NEUMAYER STATION III.
- Installation of the new satellite picture receivers (Jörg Hofmann, Fielax).
- Cabling the measuring site and roof sensors with the meteorological observatory.
- Equipping the meteorological observatory and forecaster room.
- Test of the new balloon launching hall.
- Installation of the new data acquisition (about 2009-2-1).
- The new observatory should be fully operational (about 2009-2-15).
- Phase down the meteorological observatory at NEUMAYER STATION II (about 2009-2-15).
- Removal of meteorological sensors from NEUMAYER STATION II as spares for NEUMAYER STATION III or for return freight.
- Departure of the weather forecaster, Julia Wittig, Jürgen Gräser, Bernd Loose, Gert König-Langlo in the beginning of March 2009.

1.2.2 Operational weather forecast service for DROMLAN

Ralf Brauner (DWD), Christian Kreutzmann (DWD), Hans-Arnold Pols (DWD)

For the seventh summer season the meteorological observatory of NEUMAYER STATION offers a detailed and individual weather forecast service for all activities in Dronning Maud Land. This service is performed in close cooperation between the Alfred-Wegener-Institute for Polar and Marine Research (AWI) and the German Weather Service (DWD). The increasing flight activities within the

Dronning Maud Land and especially the intercontinental air link between Cape Town and Novolazarevskaya has made this service mandatory.

NEUMAYER STATION has a central position within the Dronning Maud Land due to its good communication facilities including a permanent satellite data link (Intelsat), and the modern infrastructure of the meteorological observatory.

The forecasts based on special model outputs from the European Centre for Medium-Range Weather Forecasts (ECMWF), the Antarctic Mesoscale Prediction System (AMPS) and the Global-Model (GME). New outputs are available twice daily. They are used to cover a forecast period of up to 10 days.

For short-term forecasts and flight activities the satellite image receiving station of NEUMAYER STATION (HRPT, SeaSpace) is of great importance. Up to 20 satellite passes can be obtained daily (NOAA). Visual as well as infrared images are geocoded automatically on a variety of masters covering the synoptic scale (2500 x 5000 km) down to local scale with a spatial resolution up 500 x 500 m at any place in the Dronning Maud Land.

Additionally, all information from the Global Telecommunication System (GTS) – including the 3-hourly synoptic observations and daily upper air soundings – are available via the permanent data link at any time. Also measurements from surrounding automatic weather stations transponding via ARGOS but not included into the GTS are extracted automatically from the NOAA-satellite information.

The forecaster at NEUMAYER STATION can be reached at any time from all DROMLAN members by email, fax, telex, phone, and short-wave communication. While the forecaster is not at NEUMAYER STATION his service can be obtained via Iridium.

During the summer season 2007/08 more than 3500 forecasts were performed for field parties, ships, stations and especially aircrafts. It is obvious that this service increased the safeness of the ambiguous projects in the Dronning Maud Land. Furthermore, it helps to reduce weather induced idle times of expensive flight operations to a minimum.

1.2.3 Geophysical observatory

Alfons Eckstaller (AWI), Christian Müller (Fielax), Heidi Anneli Turpeinen (AWI wintering team 2009), Ulrich Männl (AWI wintering team 2009), Daniel Zitterbart (AWI wintering team 2008), Seweryn Langer (AWI wintering team 2008)

Seismology

The main task of seismographic observations at NEUMAYER STATION is the monitoring of the local, regional and global seismicity. As the global seismographic monitoring network in the southern hemisphere is rather wide-meshed, especially in Antarctica, seismographic recordings at NEUMAYER STATION's local seismographic network (also including the broad band station SNAA at SANAE IV) contribute substantially to seismological research in Antarctica. Onset times of first arrivals and other seismic phases of detected earthquakes are determined and reported to the National Earthquake Information Center (NEIC), USA, on a daily schedule. One of the main topics in seismological research at NEUMAYER STATION is the investigation of local and regional seismicity. Antarctica is not as aseismic as it was generally believed. Monitoring this seismicity now for several years revealed the existence of distinct seismic active areas in Dronning Maud Land. These new results will substantially contribute to a better understanding of recent tectonic activities in Dronning Maud Land. The planned installation of new broad band seismographs at the stations VNA2 and VNA3, both located on top of ice rises, during the summer campaign 2008/2009 will enable to retrieve new seismographic recordings which will cover a much wider frequency and period range. This will give us the opportunity to conduct more detailed seismological research, e.g. the analysis of receiver functions or surface wave dispersion.

In late December 2006 a new seismographic station had been deployed at the Swedish summer base SVEA in cooperation with the Swedish Polar Secretariat. This station is designed to operate autonomously for almost a whole year, if power supply will not fail during winter. First data sets were already retrieved and look promising. Now it is intended also to change the seismograph at SVEA and to turn it into a modern broad band station.

A further seismographic station has been installed at KOHNEN STATION some years earlier. Currently, for technical reasons the seismograph is installed inside the container housing the clean air observatory. This reduces data quality substantially. Therefore, during the summer campaign efforts will be made to install another broad band seismograph again outside this container.

For technical reasons it is probably not possible in 2008/2009 to change the data acquisition and to bring it to the currently most modern standard. This will be done in the following year. Therefore, the old system, which has now been in operation for more than 20 years, must be used again for another year.

However, a new container, which should be moved to the array station VNA2 in 2009/2010, should be tested all the year. This container is equipped with 1200 W solar panels, two wind turbines with 300 W

each and a total battery capacity of 1000 Ah. It should hopefully be sufficient to guarantee a continous operation of the short period array.

Geomagnetism

The long term recordings of the geomagnetic field and its time dependent variations are further continued. Absolute hourly means of the three field components and the total field intensity are reported on a monthly schedule to the World Data Center (WDC) in Copenhagen, Denmark. The results of these measurements are included into the development of the International Geomagnetic Reference Field (IGRF) which is performed by WDC. The new three-component fluxgate system, which had been installed during summer season 2005/06 and which offers superior performance, is now in a very stable operation mode. It is intended to transfer preliminary, pseudo-calibrated high-resolution 1-Hz data from this new system on a daily schedule to one of the INTERMAGNET data centres.

As the location of NEUMAYER STATION III is approx. 8 km south of NEUMAYER STATION II a new geomagnetic observatory must be established. The basic construction principle is the same as in 1992 when NEUMAYER STATION II was built. A suitable non-magnetic building is installed inside an approx. 7-8 m deep snow trench which is covered by wooden girders with plywood as roofing. The non-magnetic hut has container dimensions and is made of light weighted aluminum coated PUR panels which are fastened together with special non-magnetic rivets. Thus, the hut can be dismantled and recovered again in future if necessary. The front and rear end sides of the trench are closed with snow bricks or blown snow from a snow mill. Entrance inside the cavern is possible through a vertical shaft with a ladder. The new geomagnetic observatory is in a distance of approx. 1.5 km South of NEUMAYER STATION III. This distance is wide enough to suppress the influence of the large steel masses of the new base significantly below 1 nT. A new Overhauser-proton-magnetometer with a sample rate of 1 HZ will replace the old PPM magneters. All sensors are connected via optical cables to the station's computer network. Electrical power comes from the new clean air observatory nearby (230 V and UPS).

1.2.4 Infrasound station I27DE

Gernot Hartmann (BGR)

According to the Comprehensive Nuclear Test Ban Treaty (CTBT), the I27DE infrasound station is to be operated continuously with at least 98 % data availability over a year's time. Routine maintenance of the array has to be carried out every year. In 2008/2009 the nine array elements have to be recovered from the snow and re-installed at the new location 2.6 km SW of NEUMAYER STATION III. The equipment of the central array control system has to be moved to the computer room at NEUMAYER

STATION III. The communication between the central array control system and the array elements has to be upgraded to WLAN.

1.2.5 Air chemistry observatory

R. Weller (AWI) and D. Wagenbach (IUPH)
Participants: Franziska Nehring (wintering team 2008), Jessica Hellmschmidt. (wintering team 2009)

During the forthcoming summer campaign, our activities will focus on assembling of the new Air Chemistry Observatory at NEUMAYER STATION III and the move of all experiments from the former observatory and laboratories to the new observatory and laboratories in NEUMAYER STATION III. The set-up of the new Air Chemistry Observatory will start in early January 2009. The progress in assembling the new observatory will heavily depend on the availability of the crane to set the containers onto the platform and supply of electric power from NEUMAYER STATION III. Although it will not be possible to run both observatories simultaneously, it is planned to minimize the down time of the measurements to around 2-3 weeks.
At KOHNEN STATION (EPICA-DML) maintenance of the automated aerosol sampler designed for year-round measurements is necessary. The equipment was set up during the summer campaign 2002/2003 in a purpose-built container located in the clean-air sector about 300 m north-easterly of the drilling trench. Electric power supply is realised by a combination of a wind turbine and solar panels, buffered by Ni/Cd batteries. The aerosol sampler consists of 22 filter holders, each one equipped with a teflon/nylon filter combination. Hence in total 22 aerosol samples per year are achievable with an individual sampling period of 15 days. Due to the fact that KOHNEN STATION will not be opened during this season (2008/2009), only the aerosol samples from 2008 will be retrieved. The samples are intended for analysis of the ionic composition by ion chromatography. More extensive general maintenance activities and installation of new filter holders are scheduled for the summer season 2009/2010. This project and also the air chemistry investigations at NEUMAYER STATION are cooperation with the Institut für Umweltphysik, University of Heidelberg (IUPH).

1.2.6 PALAOA hydroacoustic observatory

Lars Kindermann (AWI), Ilse Van Opzeeland (AWI)

Objectives: Since December 2005 the hydro acoustic observatory monitors the underwater soundscape at the ice shelf edge, 15 km north of NEUMAYER STATION. More than 10.000 hours of audio have been recorded so far, revealing the presence and behaviour of all the local marine mammal species, measuring the ocean noise budget which is mainly free of anthropogenic noise here and dominated by ice dynamics. The rare visits of ships, however give the opportunity to study the reaction of animals, not habituated to man made sounds yet. In addition to the acoustic

measurements, a CTD records oceanographic data from the water body below the ice shelf, a GPS constantly monitors the movement of the glacier and a camera documents the ice coverage of Atka Bay The first three years of operation provided many unforeseen results, e.g. the unexpected presence of a Ross Seal population at Atka Bay, the extreme intensity of the sound caused by iceberg collisions and a sound of yet unknown origin which turned out to be the dominant acoustic signal in the ocean during the Antarctic winter month.

Work at NEUMAYER STATION:

In addition to the regularly scheduled maintenance work at the field site like levelling the sastrugis around the container and increasing the cable poles, some repairs and improvements of the autonomous energy supply system and the reinstallation of an IRIDIUM link are necessary. Finally, the transition of the NEUMAYER STATION relay towards NEUMAYER STATION III has to be prepared. The NEUMAYER STATION based relay server receives the data via a dedicated WLAN link from PALAOA, saves it locally to disk and performs scheduled backups. It also remotely controls the energy system of the observatory and acts as a relay for the online connection to the lab in Bremerhaven. The antennas for the WLAN link have to be readjusted and the new server, to be located in the NEUMAYER STATION III computer centre, needs to be integrated into the local network of the new station to receive precise timing and weather information and to provide the satellite link to the AWI in Bremerhaven. In a field project, we will deploy three portable hydrophone recorders (PALAOA-Satellites) at the sea ice of Atka Bay through ice cracks in November and December 2008. Together with the main PALAOA observatory this setup forms a GPS synchronised long baseline acoustic array which allows for precise localisation of sound sources. This work will be coordinated with the POLARSTERN ANT XXV/2 expedition. During the ship's track through the Weddell Sea towards Atka Bay some identical recorders will be deployed by helicopter on drifting ice floes. Together all these recordings will yield information about the broader spatio-temporal distribution of many marine mammal species and aid in interpreting the long term but single spot data provided by the PALAOA observatory.

Expected Results:

About 83% of the calendar year is covered by the PALAOA data so far. However, some weeks during the midwinter are still missing due to energy shortage in extended calm periods of the polar night. The improvements in the energy system shall help to close this gap and provide year round presence data. The calibration of the acoustic system by incorporating the PALAOA-Satellites will allow to better infer the total number of individuals of each marine mammal species present at Atka Bay at a given time. Long term time series will provide information about possible changes in their abundance and distribution in response to external factors, both natural and anthropogenic. The calibration of the CTD data with synchronised measurements from POLARSTERN at the ice edge will allow quantitative descriptions of the long term water body dynamics below the ice shelf.

1.3 Scientific projects

1.3.1 PRE-IPICS GPS

D. Steinhage (AWI), C. Petersen (AWI)

The project PRE-IPICS GPS 2008/09 (IPICS – International Partnerships in Ice Core Sciences) focuses on GPS measurements on four strain nets established in 2006/07 Halvfarryggen and Søråsen. The GPS measurements shall reveal the ice dynamics on the two ice ridges and can be used for satellite validation as well. The knowledge of the ice dynamics is important for the proper interpretation of ice cores. It is currently under discussion if it is possible to drill an ice core within the framework of the IPICS 40k project on one of the four locations listed in table below.

Table 3.1: Names, locations and coordinates of drill sites on Halvfarryggen and Søråsen.

Location	Name	Lon.	Lat.
DML94	Halvfar North	W 006° 42,0’	S 71° 10,1’
DML95	Halvfar South	W 006° 40,2’	S 71° 34,0’
DML96	Søråsen North	W 009° 55,1’	S 71° 24,4’
DML97	Søråsen South	W 009° 33,6’	S 72° 03,8’

Each strain net consists of 6 aluminium poles arranged as a pentagon around the centre listed in table 3.1. The diameter of the strain nets varies between 1.5 and 3 km. It is planned to survey all six locations simultaneously for 4 h and to extend the poles for future measurements, because low deformation rates are expected. In case some poles are already covered with snow a high frequency ground penetrating radar system will be carried along.

In conjunction with the work at DML94 the close-by located AWS 11 of the Institute for Marine and Atmospheric Research (IMAU), of the University of Utrecht, The Netherlands, will be maintained, too.

The positions of the PRE-IPICS sites, NEUMAYER STATION and the seismological observatories are given in figure 1.3.

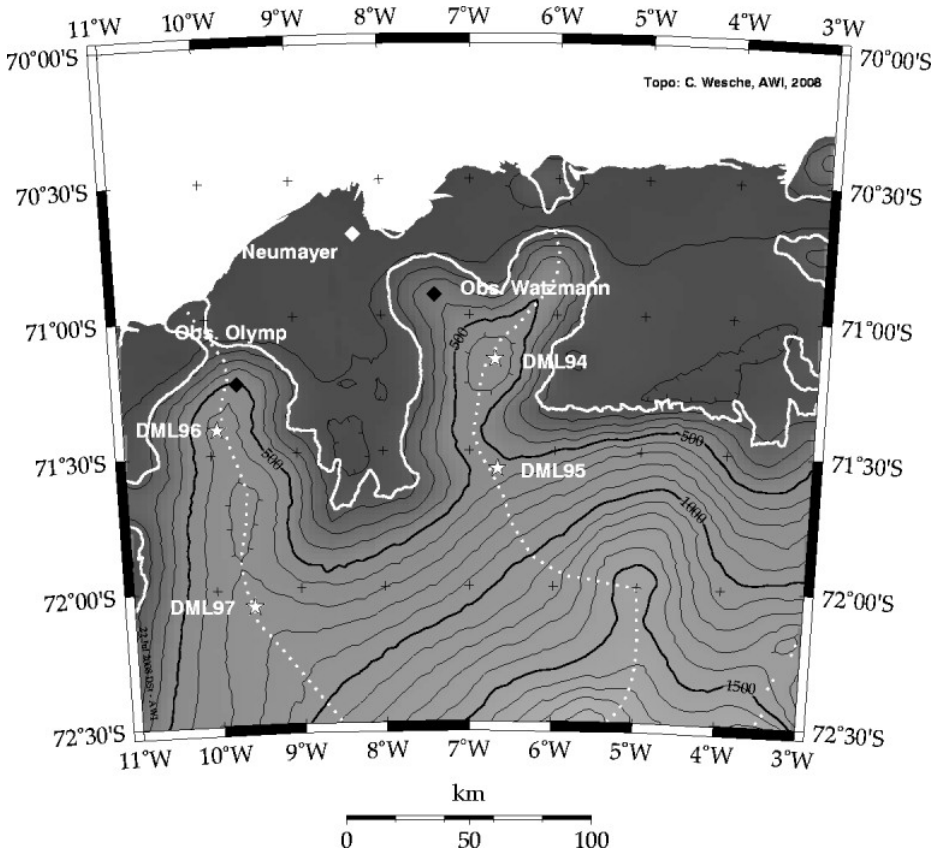

Figure 1.3: Map of PRE-IPICS survey locations DML94 – DML97.

1.3.2 Foraging ecology of Weddell seals and oceanography

J. Plötz (AWI), Y. Naito (NIPR), L. Kindermann (AWI), T. McIntyre (MRI) & H. Bornemann (AWI)

Scientific background: Our previous field studies using Weddell seals as autonomous samplers provided novel insights into marine life underneath the floating Riiser-Larsen Ice Shelf that is more than a hundred metres thick. Images taken by seal-mounted cameras at a water depth of about 150 m showed unexpected aggregations of isopods and other invertebrates attached to the underside of the ice shelf above the 500 m deep Drescher Inlet. These “inverse” cryo-benthic communities may represent an attractive food horizon where seals may benefit from the availability of fish and other prey. About half of the Antarctic coastline has floating extensions of ice shelves attached. Are our findings from the Riiser Larsen Ice Shelf representative for Antarctic ice shelves in general? What is the species composition of the under ice shelf fauna, to what horizontal extent do invertebrates inhabit this icy substrate, and what is the ecological significance of this unusual ecosystem? These questions are challenging a joint seal-shelf ice study using seals as data collectors to further understanding of the coastal shelf ecosystems of the high Antarctic sea ice zone.

Objectives: Bio-acoustic data registered by PALAOA indicate that Weddell seals explore the under ice shelf vicinity along the Atka Bay analogue to seals observed at Drescher Inlet. A miniaturized underwater still picture camera logger (DSL) with pressure sensor designed at the National Institute of Polar Research (NIPR), Japan, provides snapshots of the prey-field ahead of diving seals. By *post hoc* conversion of the images into grey-scale objects, the prey-field can be identified and analysed according to a brightness ratio. Based on this, a "prey index" can be calculated for each image and the prey distribution along the seal's dive path can be quantified. In addition, seal-mounted ARGOS-tags designed to record high-quality data of the animals' at-sea locations, their diving activity, and the concurrent water temperature and salinity features allow interpretation of the animals' fine-scaled movements and foraging locations along the Ekström Ice Shelf region in terms of the seals' immediate ocean environment. Our aim of relating behavioural data of top predators to physical and biological features of their marine environment requires a multi-disciplinary and technologically highly sophisticated approach which is based on long-term collaborations with scientists of the NIPR, and the Mammal Research Institute (MRI) at the University of Pretoria, SA.

Work at NEUMAYER STATION: Our field studies are part of the international MEOP project (Marine Mammals Exploring the Oceans Pole to Pole) and will be conducted on the sea ice at Atka Bay from mid November to mid December 2008. Satellite-relayed dive loggers combined with CTD's (called CTD-SRDL) will be deployed on Weddell seals in order to use these top predators also as oceanographic data samplers. The CTD-SRDLs measure temperature, pressure and salinity and transmit data along with seal positions to satellites when the seals surface. Some of the instrumented seals will also obtain a Digital Still Picture Logger which has to be retrieved about four to eight days after deployment in order to download the images. From each of the CTD-SRDL tagged seals we expect per day about 15 - 20 temperature, salinity and depth profiles almost in real time allowing us to study how changes in the underwater environment alter prey distribution beneath the ice as being indicated by the seals' individual diving and foraging behaviour. We further expect that these key physical oceanographic variables collected from hitherto inaccessible and thus undersampled coastal shelf regions may help scientists to refine their computer models of the Southern Ocean circulation.

1.3.3 Audiometric measurements of Weddell seals

L. Kindermann (AWI), J. Plötz (AWI), T. McIntyre (MRI) & H. Bornemann (AWI)

Scientific background: The audible frequency ranges and corresponding hearing thresholds are the most characteristic properties of the auditory system of any endotherm species. They are typically displayed in the form of an audiogram as the function of minimal audible sound level with respect to frequency. For about 90% of marine mammal species including all Antarctic seals, audiograms have not been measured yet, and knowledge about their basic hearing abilities is limited to the species specific vocalisation frequency spectra, with the underlying assumption that vocalisation frequencies correspond with hearing abilities. However, it is well known that hearing is generally possible in excess

of up to several octaves beyond the tonal vocalisation frequencies since hearing has not only evolved as a function of communication. Marine mammals in particular have evolved to use sound and hearing as their primary means of perceiving their surroundings. Recordings of vocalisations related to reproductive or feeding behaviour as well as measurements of hearing abilities are therefore very relevant to interpret population ecology as well as several other aspects of seal biology.

Objectives: We intend to register audiograms of Weddell seals. Audiograms can either be obtained by training subjects to react in a deterministic manner to any sound stimulus within their hearing range, or by using neurophysiologic techniques to measure the brain's bioelectric response to a given acoustic input. Behavioural audiograms, which are the common method to test human hearing abilities, are impossible to obtain from wild animals. Hence we measure auditory evoked potentials (AEP), especially the auditory brainstem responses (ABR) of immobilised seals by electro-encephalogram (EEG) electrodes. This non invasive method is frequently used in neonatology to test for hearing disabilities of newborn humans. It is also common for the investigation of hearing in dolphins and whales but has only recently been adapted to seals, where amplitudes of the evoked responses are much smaller and thus harder to detect.

Work at NEUMAYER STATION: The experiments will be conducted on the sea ice at Atka Bay during November/December 2008. The bio-acoustic studies are designed to provide results by in-air hearing tests. We intend to measure (1) pure tone sensitivity from 1 kHz to 120 kHz to obtain the basic audiograms, (2) sensitivity changes in respect to variations in signal duration from 500 msec down to 1 msec to determine the detection threshold in view of sound emissions of scientific sonars, (3) masking effects of broadband white noise across the main frequencies.

1.3.4 Acoustic behaviour of Weddell seal mother-pup pairs

I.C. Van Opzeeland (AWI), C.Kreiss (AWI)

Scientific background: Female Weddell seals attend their pup continuously on the ice during the first two weeks of the approximately 6-week long lactation period. After this initial period, female and pup movements become less coordinated as they both start to forage under the ice and the pair spends less time on the ice together. Weddell seals breed in colonies in which clear and consistent communication of individual identity is likely to be important to prevent allo-suckling. Vocal communication between mother and pup has been suggested to play an important role in the recognition process. Weddell seal mothers and pups are known to vocalize to each other while on the ice. It has, however, to date never been experimentally investigated if Weddell seal mother-pup pairs recognize each other vocally.

Objectives: Playback experiments will be conducted on Weddell seal mother-pup pairs, to investigate whether there is vocal recognition of pup vocalizations by Weddell seal females.

Work at NEUMAYER STATION: Experiments will take place in on the sea ice in Atka Bay Nov-Dec 2008. Sequences of calls of the female's own pup and alien pup vocalizations will be played back to Weddell seal females through loud speakers and their reactions monitored. In addition, we will experiment with using photo-ID to distinguish between adult Weddell seal females.

1.4 Scientific projects during wintering

1.4.1 Change of body weight, body composition and adaptation of the cardiovascular system during wintering in Antarctica

H.-C. Gunga (ZWMB, Berlin) and E. Kohlberg (AWI), Participants: wintering personnel 2009

During summer season 2004/2005 a medical study started at NEUMAYER STATION in cooperation with the Berlin Centre for Space Medicine (ZWMB) and the Alfred Wegener Institute. Data collection has been continued the complete wintering periods from 2005 to 2008. The 28th wintering team should resume the project in 2008. Measurements will be made during the whole wintering period focussed on the nine months lasting phase of isolation. All members of the wintering team will be involved.
The project derives from space medicine which made it possible to study the impacts of extreme environments referring to the human organism. In the same way Antarctica presents the opportunity to do research on change of body weight, body composition and adaptation of the cardiovascular system under isolated conditions. It is intended to record the body composition of the wintering personnel with the non-invasive body impedance analysis. Conditional on dehydration of the organism in Antarctic climate there is an increased loss of water through respiratory tract and skin. This potential dehydration can be recorded by the measurement of the impedance. Additional monthly taken blood samples should give information about possible correlation between changes of the autonomous nervous system and some metabolic parameters.
The autonomous nervous system is always involved in adaptation to extreme environments. That may become apparent in sleeplessness, loss of appetite, nausea and heart trouble. Early symptoms can be found in changes of the variability of heartbeat. This variability should produce knowledge about influence on the autonomous nervous system during isolation. There is a direct correlation between variability of heart frequency and actual state of reaction of the autonomous nervous system. All members of the wintering team will be introduced to the method and record an electrocardiogram weekly before getting up in the morning. The data are saved on a datalogger; the medical officer of NEUMAYER STATION will transmit the data via computer and internet to the Berlin Centre for Space Medicine (ZWMB). Due to these periodical checkups the state of health of the personnel can be followed. The dataloggers are developed by the Berlin Centre for Space Medicine. They record the beat-to-beat intervals of the heart to find out the variability.

2. AWI FLIGHT MISSIONS AND DROMLAN

2.1 Summary

POLAR 5 (C-GAWI), a Basler BT-67 on skis, will perform scientific and logistic flight missions within the ANT – Land 08/09 program. The ferry of POLAR 5 runs from Oshawa, Canada, straight down to Punta Arenas, Chile, and further on either via the Chilean wintering base Frei and its airfield Teniente Marsh, King George Island, or the British wintering base Rothera, Antarctic Peninsula, and Halley to Novo Airfield. POLAR 5 will be operated from Novo Airbase for flight missions. The preliminary schedule is given in table 2.1.
For the first time the southbound ferry flight will be used for scientific project. The Geoforschungszentrum Potsdam will perform methane measurements above selected areas covered by rainforest.

Table 2.1: Aircraft missions POLAR 5: 06 Nov 08 – 04 Mar 09 - preliminary schedule

06 Nov – 17 Nov 2008	Positioning, ferry flight from Oshawa to Novo Airfield
19 Nov 2008 – 21 Feb 2009	Logistic operations
20 Dec 2008 – 22 Jan 2009	Scientific operations for *CryoVEx ANT, **Reconnaissance Berkner Island, ***WEGAS*
22 Feb 2009 – 04 Mar 2009	Repositioning from Novo Airfield to Oshawa

*) CryoVEx-ANT – Validation measurements with ASIRAS – scheduled in January from Novo Airbase (AWI, ESA, and TU Dresden)

**) Reconnaissance Berkner Island – one survey flight from Halley in December (AWI, U Heidelberg, BAS)

***) WEGAS – scheduled in December/January from Novo Airbase (AWI)

AWI has coordinated the air transport of personnel and freight to NEUMAYER STATION within the frame of the Dronning Maud Land Air Network (DROMLAN), which is organized by 11 national operators. Altogether 13 intercontinental flights are planned. DROMLAN performs 13 flights from Cape Town to Novo Airbase (Russia) / Troll (Norway) and back with aircraft Iljushin IL-76TD. 4 flights are scheduled for November 2008, one flight for December 2008, 2 flights for January 2009, 4 flights for February 2009, and a final flight for the beginning of March 2009. Feeder flights to the NEUMAYER STATION will be performed with Basler (BT-67) aircraft.

Feeder flights activities in the frame of the DROMLAN cooperation will be supported by POLAR 5. Furthermore logistic flights are scheduled supporting the AWI field program and NEUMAYER STATION

observatories, British Antarctic Survey (BAS) participation in the AGAP project, Belgian Antarctic Research Expedition (BELARE), and Chinese Antarctic Research Expedition (CHINARE).

In 2008/09 the research aircraft POLAR 5 will perform three scientific missions with varying geophysical instrumentation. For logistic reasons POLAR 5 will be based at Novo Airfield for the forthcoming season, but the integration and de-integration of scientific equipment will be done at NEUMAYER STATION. The scientific equipment for the three intended geophysical surveys CryoVEx Ant, Reconnaissance Berkner Island, and WEGAS will be shipped in from Bremerhaven, Germany, on board of RV POLARSTERN.

2.2 Dronning Maud Land Air Network (DROMLAN)

The aim of the Dronning Maud Land Air Network (DROMLAN) is to provide an intercontinental air-link from Cape Town to destinations within Dronning Maud Land (DML) to any member country of COMNAP and SCAR in science related activities, including logistics. This regularly operated air-link improves the accessibility and extends the time period for summer season activities. DROMLAN has been established as an international project by Belgium, Finland, Germany, India, Japan, Norway, Russia, South Africa, Sweden, The Netherlands, and UK.

Each summer season runways are prepared at Novo Airbase close to the Russian station Novolazarevskaya and at the Norwegian station Troll for landing of heavy aircraft. The runway at Novo Airbase consists of compacted snow and is elevated about 500 m a.s.l. Because of surface melting this runway cannot be used for intercontinental flights from mid December until mid January. The runway at Troll station consists of blue ice at an elevation of about 1300 m a.s.l. Because of higher altitude this runway is operational for greater aircraft during the whole summer period. Novo Airbase is operated by Antarctic Logistics Centre International (ALCI, Cape Town) in charge of the Russian Antarctic expedition (RAE).

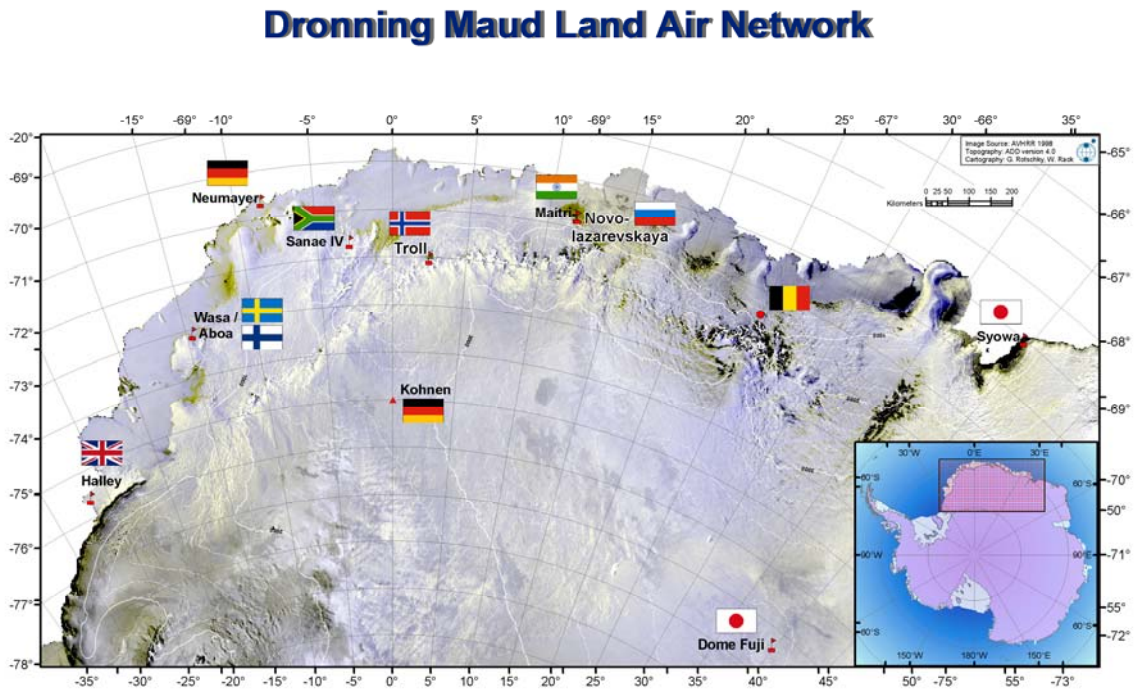

Figure 2.2: Overview map of Dronning Maud Land Air Network.

The Norwegian Antarctic Research Expedition (NARE) maintains the runway at Troll. The weather forecast for intercontinental and internal flight operations is organized at NEUMAYER STATION (AWI, DWD). This service covers the region between Halley and Syowa for all intercontinental and internal flights in the scope of DROMLAN.

Since the establishment of DROMLAN the Antarctic Logistics Centre International (ALCI) as the logistic operator of the Russian Antarctic Expedition (RAE) organises and performs intercontinental flights with cargo aircraft Iljushin (IL-76TD) between Cape Town and Novo Airbase every summer season. Internal feeder flights are performed with ski-equipped aircraft Basler (BT-67). The map shows destinations within Dronning Maud Land. DROMLAN members coordinate the feeder flights with ALCI and provide necessary services, fuel and facilities at their stations.

The number of flight missions depends on logistic and scientific requirements of the national programs. Every season DROMLAN generally aims to perform 10 - 14 intercontinental flights with connecting flights to various destinations.

For season 2008/2009 altogether 13 intercontinental flights are scheduled in order to carry personnel and cargo for AWI (Germany), BAS (UK), BELARE (Belgium), FIMR (Finland), NCAOR (India), NARE (Norway), NIPR (Japan), and RAE (Russia).

For DROMLAN 12 flights are planned with IL-76TD from Cape Town to Novo Airbase and 1 flight to Troll Station: 4 flights in November, 2 in December 2008, 2 in January 2009, 4 flights in February 2009 and the last flight beginning of March 2009. The IL-76TD flights running via Novo Airbase and Troll are arranged by ALCI.
At Troll runway flight management is arranged by NARE. Pre-flight assistance in Cape Town will be provided by ALCI for all DROMLAN intercontinental flights.
This season scientists, technicians and other personnel from 8 DROMLAN members are going to join the intercontinental flights. In total - including support personnel, pilots and others for Novo Airbase - 398 persons will fly into Antarctica and 391 persons back. About 65 tons of airfreight have to be carried in and about 18.5 tons out.

Table 2.2: DROMLAN intercontinental flight activities and AWI share.

DROMLAN intercontinental transport			**AWI share**	
Aircraft - number of flights	Persons in / out	Cargo (ton) in / out	Persons in / out	Cargo (ton) in / out
IL-76TD – 13 flights	398 / 391	65 / 18.5	130 / 132	9.3 / 5.4

The three BT-67 POLAR 5 (cs C-GAWI), LIDIA (cs C-GEAI), and MIA (cs C-GEAJ) will carry out the feeder flights to various stations and summer camps in Dronning Maud Land. ALCI coordinates and performs feeder flights according to the requirements for DROMLAN as well as for RAE activities at the Russian stations PROGRESS and VOSTOK.

2.3 DROMLAN for AWI activities

Altogether 125 scientists and technicians with about 14 tons of cargo will be carried from Cape Town to NEUMAYER STATION, and 126 persons with about 14 tons of cargo back to Cape Town.

The following aircraft will perform logistic tasks of AWI personnel and cargo:
Iljushin (IL-76-TD) operated by ALCI for DROMLAN
Basler (BT-67) 2 operated by ALCI (LIDIA and MIA) for feeder flights in the scope of DROMLAN and 1 (POLAR 5, AWI) for scientific and logistic tasks

The detailed flight schedules are shown in chapter 5.

2.4 Logistic flight missions of POLAR 5

In the forthcoming season POLAR 5 will be used for the logistic support of various projects in East Antarctica. Flights are scheduled for AWI's own activities as well as for international partners. The

map in figure 2.3 gives an overview on the stations and field camps. The main projects are briefly listed below. Several periods have been blocked for these flights. An overview is given in table 2.2.

Table 2.2: Schedule of logistic flight activities without DROMLAN flights.

Begin	End	Flight hours	Task
19/11/2008	26/11/2008	70	Support of AGAP North
25/01/2009	30/01/2009	25	Support of CHINARE
06/02/2009	12/02/2009	15	AWI field program
13/02/2008	17/02/2009	10	Support of BELARE
18/02/2009	21/02/2009	10	AWI field program – NEUMAYER STATION III commissioning

Because KOHNEN STATION and the Swedish base SWEA are not manned this season, flights to this station have to be carried out in order to enable maintenance and data collection of the outposts of the NEUMAYER STATION observatories. At KOHNEN STATION filter of the automatic air sampling system ROBERTA and at SWEA data from a seismometer will be collected.

The project PRE-IPICS GPS will be supported by flying personnel and equipment to four spots and Halvfarryggen and Søråsen. For more details on PRE-IPICS GPS see chapter 3.2.1 Flights for this project and the maintenance of the outposts of the NEUMAYER STATION observatories will need 6 days.

The final task for the season 2008/09 for POLAR 5 is to fly personnel for the opening of NEUMAYER STATION III from Novo Airfield and back via KOHNEN STATION.

POLAR 5 will participate in the flight activities of the installation of the field camp AGAP-N (S 77.309° / E 076.936°) in late November. 7.2 t of equipment have to be flown in from the Australian station Davis to AGAP-N. AGAP (Antarctica's GAmburtsev Province) is a joint BAS-BGR-NSF aero-geophysical IPY project in the Dome A region.

Mid February POLAR 5 will perform flights for the Belgian Research Antarctic Expedition (BELARE). These flights are in conjunction with the opening of the new established Princess Elisabeth station (71.95°S / 023.35°E) on Utsteinen Ridge, Sør Rondane Mountains.

On request of Chinese Antarctic Research Expedition (CHINARE) POLAR 5 will fly several Chinese scientists from the airstrip near Zhongshan to Dome A and back. The flight will be carried out end of January 2009. Included in this activity is the transport of several passengers to Novo Airfield.

2.5 Scientific surveys with POLAR 5

In 2008/09 POLAR 5 will be used for three different surveys. The scientific equipment will be shipped from Bremerhaven onboard of RV POLARSTERN directly to NEUMAYER STATION. The integration of the instrumentation will be carried out at NEUMAYER STATION, while the surveys are flown from the British base Halley and the DROMLAN base Novo Airfield. The map in figure 2.5 shows the areas of investigation for all three surveys, CryoVEx ANT, Reconnaissance Berkner Island, and WEGAS.

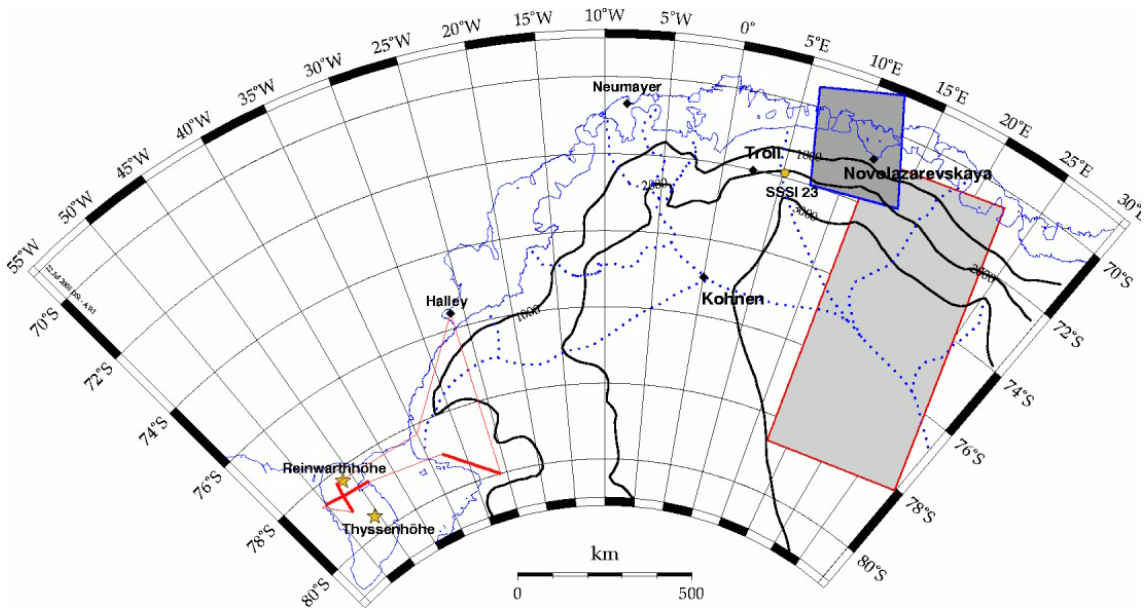

Fig. 2.5: The map shows the 2 areas of investigation for the CryoVEx ANT and WEGAS survey. The bold lines on Berkner Island and south of Halley show point out the main section for the reconnaissance flight of the Berkner Island project.

2.5.1 CryoVEx ANT

CryoVEx (CryoSat Validation Experiment) – Antarctica – 2008/09 continues and extends the preparatory activities related to the CryoSat-2 validation objectives with a program of airborne laser/radar altimeter acquisitions in conjunction with ground measurements on selected blue ice sites in Antarctica. Aim is to sample blue ice surfaces and those in the transition from firn to blue ice near Novo Airfield. The instrumentation of POLAR 5 will consist of the ASIRAS instrument of ESA, a laser scanner, a laser altimeter, nadir video camera, and several geodetic GPS receivers. On ground reference GPS stations will be established in the Schirmacher Oasis and corner reflectors will be brought out as reference markers in some selected areas. The survey area is shown in figure 2.5 as grey shaded area around Novolazarevskaya.

2.5.2 Reconnaissance Berkner Island

An improved understanding of ice mechanics and interpretation of radio-echo sounding data resulted in a new interpretation of RES data of the Institute of Geophysics of the Westfälische Wilhelms University Münster on Berkner Island. Indications of a so-called Raymond Bump have been detected underneath the saddle along the ice divide between the two summits Thyssenhöhe and Reinwarthöhe. The reconnaissance survey shall reveal if the Raymond Bump really exists and if so what the dimensions of the bump are. POLAR 5 will be equipped for this survey with AWI's RES system, laser scanner and altimeter, nadir looking video, various GPS receivers, and the data acquisition system MEDUSA-P. POLAR 5 will be operated from the British wintering station Halley. The proposed flight track is shown in the map in figure 2.3. This is a joint project of AWI and BAS.

2.5.3 WEGAS

WEGAS (West-East Gondwana amalgamation and its separation) is the continuation of the earlier projects EMAGE (Eastern Margin Antarctic Geophysical Experiment) and VISA (Verdichtung und Interpretation von Satellitendaten zur Bestimmung von Magnetfeld, Schwerefeld, Eismassenhaushalt und Krustenstruktur in der Antarktis unter Nutzung flugzeuggestützter und bodengebundener Messungen). The focus of WEGAS is the tectonic structure underneath the ice sheet of Dronning Maud Land and of the adjacent sea. The instrumentation of POLAR 5 consists of AWI's RES system, gravity meter, magnetometer, laser scanner and altimeter, nadir video, various GPS receiver, and the data acquisition system MEDUSA-P. The data collected will be used to study the tectonics of the region, but also to validate satellite measurements of CHAMP and GRACE as well as to contribute to local ice thickness data, surface and sub-glacial topography data sets.

The survey area is marked as light grey area in figure 2.3. The line spacing of the profiles is 10 km and the flight level approximately 13000 ft due to surface elevation of the operation of the gravity meter onboard.

Beside the scientific equipment onboard of the POLAR 5 magnetic base and GPS reference stations will be set up near Novo Airfield and in the Schirmacher Oasis. These stations are necessary for the evaluation of the magnetic and gravity field data.

3. KING GEORGE ISLAND

3.1 Summary

The transport of personnel and cargo to King Georg Island (KGI) needs close coordination and assistance by various national programs and commercial operators. That includes aircraft and ship transportation. Transport is organised by DNA and performed by Argentinean aircraft and vessels.
14 German staff members and 1175 kg cargo will be transported by the Uruguayan Air Force (FAU) between Punta Arenas and Teniente Marsh on King George Island.
7 scientists will return from Jubany by MS Marco Polo to Ushuaia in December 2008. The schedule for the second half of the season is not fixed yet.

3.2 DALLMANN Laboratory

The DALLMANN Laboratory at Base JUBANY (Argentina) will be opened at the end of October 2008. It is operated in cooperation with the Instituto Antártico Argentino (IAA) and placed at the Argentinean station Jubany. During the season 2008/09 up to 18 German scientists (7 scientific groups will work at the Potter Cove and the station area). The planned scientific activities of AWI focus on shallow water biological and molecular biological projects.
A German diving group will support the scientific work in cooperation with the Argentine divers.
In order to perform all planned scientific works up to 4.5 ton of cargo have to be shipped by sea and up to 760 kg by air.
On 05 April 2009 RV POLARSTERN will call for King George Island to pick up cargo. After this operation the station will be closed till the beginning of November 2009.

3.2.1 Planned scientific projects

3.2.1.1 Impact of climate change on Antarctic ecosystems – focusing on benthic algae

Katharina Zacher (AWI) and AWI diving group

The following experiments are planned during the first field season:
1. Field experiments on the succession of macro- and microalgal communities in the Antarctic during summer and winter will take place. First pilot-experiments were already performed in the years 2003 to 2005 together with Gabriela Campana and Dr. Maria Liliana Quartino. Artificial substrata will be installed at three different locations (Peñón Uno , Peñón de Pesca, new ice-free zone close to the glacier) in the lower intertidal and the upper subtidal to determine the settlement of macro- and microalgae in regular intervals throughout the year. Biomass, percent cover, species richness and

diversity will be determined on a monthly base if possible (during Antarctic winter the interval between two samplings might be longer). This experiment is part of cooperation between the Instituto Antarctico Argentino (Dr. ML Quartino) and AWI.

2. Field-experiments regarding the UV-susceptibility of different brown algal spores will take place. After collection of fertile specimen and spore release in the laboratory the spore solution will be exposed to different radiation regimes in the field ((i) ambient light, (ii) ambient minus UV-A, (iii) ambient minus UV) in different waters depth (0 to 8 m) for approx. 2 days. After that spore solutions will be post-cultured in the laboratory under low light for 9 days and survival and germination succession of the different species will be controlled every third day.

3. Sampling of microalgal communities will take place every third week or at least twice. At three different sites, five stations along transect from 0 to 15 m water depth (3m resolution) will be selected for sampling. Diving PAM will be used to give an approximation of the microalgal physiological status. Three sediment cores will be sampled at each station (depth) by SCUBA divers. To give an impression of areal cover of benthic microalgae, a digital video camera and a digital camera will be used to obtain a series of images of the sediment surface at randomly chosen sites. Subsamples of the upper 5 mm will be taken from each sediment core for species analyses and biomass estimation. In each core, cut-off syringes will be used for subsampling. Sediment subsamples will then be divided into a) samples for chl a measurements, b) samples for species composition and c) samples for grain size. If a) is impossible on site the samples will be freeze-dried and transported (-20°C) to Sweden for later analyses of photosynthetic pigments.

PAR and UV radiation will be measured continuously in air using a spectroradiometer. Underwater PAR and UVR will be monitored by underwater broad-band sensors and the water temperature and salinity checked weekly at different depth. Extinction coefficients will be calculated. Additional abiotic parameters include salinity, depth and temperature.

This experiment is part of cooperation between the Göteborg University, Sweden (Dr. A Wulff) and the AWI.

3.2.1.2 The response of Antarctic *Laternula elliptica* to climate change

Gunnar Husmann (AWI), Doris Abele (AWI), Eva Philipp (Kiel University)

The bivalve *Laternula elliptica* is a common benthic key species of the Antarctic coastal areas. Due to increasing temperatures and glacier melting on the Western Antarctic Peninsula, *L. elliptica* populations living at shallow areas are one of the first animals experiencing the impact of climate change related changes in environmental conditions including enhanced scouring of icebergs and increased inflow of melt water with reduced salinity as well as high sediment loads. Increased physical disturbance due to icebergs as well as changing food quality and quantity due to increased sedimentation may influence *L. elliptica* physiology and affect population dynamics in Antarctic coastal areas.

In the present project we will investigate the effect of environmental stress on the immune system of *L. elliptica*. The immune system of *L. elliptica* or other Antarctic invertebrates has not been investigated to date and a general characterization of immune parameters as well as the immune response towards stressors will be investigated. Under stressful conditions, the maintenance of physiological homeostasis may divert resources away from important processes like immune functions, thus bivalves from stressful environments may be more susceptible to additional environmental stressors, like potential pathogenic bacteria, which are accumulated during filter-feeding and from sediments in large amounts. Starvation and injury experiments will be undertaken under field and laboratory conditions and the immune response of *L. elliptica* will be recorded by hemocyte response, tissue apoptosis, proliferation rates and expression of selected genes of young and old *Laternula elliptica* individuals.

3.2.1.3 Adaptive competence and ecology of cold-stenothermal fish (AWI)

Magnus Lucassen (AWI), Heidrun Windisch (AWI), Chiara Papetti (AWI), Nils Koschnick (AWI)

Temperature largely affects poikilothermal marine animals and thus determines their biogeography. Latitudinal distribution of fish populations is thus mainly defined by their tolerance towards temperature, i.e. eurythermal fish inhabit wider latitudinal ranges than stenothermal species. Temperature tolerance and adaptability differ between polar animals. Recent insights demonstrated the close relationship of oxygen availability and transport within higher ectotherms for species fitness and abundance (Pörtner and Knust, 2007). Members of the family Zoarcidae (eelpouts) inhabit temperate, subpolar and polar waters, and thus represent a model system for the study of temperature adaptation versus acclimatisation. Our recent studies suggest that Antarctic Zoarcidae avoid the extreme cold high-Antarctic waters, thereby possessing higher tolerance against warmer temperatures. On the other hand Notothenioidei represent the most important and most specialized fish group in the Southern ocean, occupying all available habitats, but seem to be more sensitive to climate change. Furthermore, the currently rising CO_2 levels in the atmosphere with a concomitant increase of PCO_2 and a drop in pH in marine surface waters need to be considered. It is reasonable to assume that simultaneous shifts in temperature and CO_2 will enhance the sensitivity to environmental extremes especially in stenothermal animals.

The campaign at DALLMANN laboratory is divided into two subprojects. Within the first part the combined effect of temperature and CO_2 will be investigated mainly in Notothenioids. Here we focus on the energetic budget in gills on the one hand and mitochondrial functioning and energy metabolism on the other. Within a DFG-funded project we will focus on the Antarctic eelpout *Pachycara brachycephalum*. By use of genomic techniques we aim to identify differentially expressed genes and new candidate genes, which are important for adaptability. Functional studies will identify the physiological processes involved in the adaptations. The project will be supplemented by studies on the distribution and abundance of the Antarctic eelpout *Pachycara brachycephalum* in relation to

abiotic factors (temperature, salinity, depth) and food availability within the Admiralty Bay over the season.

Work at the DALLMANN laboratory:

- Catching of live Notothenioidei (mainly *Notothenia coriiceps*) and Antarctic eelpout (P. brachycephalum) with baited traps
- Time-course of acclimation (mainly *N. coriiceps*) to different temperatures (up to four weeks). Sampling of different tissues (liver, muscle, gills, brain, intestine) for further molecular studies at AWI
- Perfused gill model under increased CO_2 partial pressure with gills from thermally acclimated animals (*N. coriiceps* and other Notothenioidei). Characterisation of membrane transporters in the gills with the same techniques.
- Characterisation off mitochondrial functioning by measuring oxygen consumption, membrane potential and proton leakage rates
- Characterisation of aerobic versus anaerobic capacities through determination of maximum activities, mRNA expression and protein quantities (Immunoblotting) from mitochondrial and glycolytic key enzymes in different tissues
- Collection of DNA samples from all specimens for population genetic studies

3.2.1.4 Evolution of haemocyanin and its influence on thermal sensitivity in cold adapted cephalopods

Felix Mark (AWI), Anneli Strobel (AWI), Bernhard Lieb (AWI)

Cephalopods are found in high abundance throughout all world oceans on a wide latitudinal cline from tropical into polar waters and are of considerable commercial importance. When the Southern Ocean formed 35 million years ago with the opening of the Drake Passage, endemic and newly invading species had to adapt to increasingly cold Antarctic waters in this altered habitat. Many octopod species are found among the successful groups in the Antarctic. After its formation process, the Southern Ocean has remained a stable habitat over evolutionary timescales, however, recent changes in atmospheric optical properties and ocean chemistry may prove challenging to these species. This project sets out to investigate the evolution of this Antarctic group in the light of changing climatic conditions and the radiation of cephalopods into the Southern Ocean.

Temperature, pH and oxygen concentration are the three most important parameters that influence oxygen-binding capacities of cephalopod blood, and for survival at nearly -2°C, a cephalopod requires a highly specialised blood-gas exchange. By using extracellular haemocyanin, cephalopods possess a

less effective respiratory protein than fish (which have intracellular haemoglobin). In order to successfully compete with fish, cephalopods have developed a high level of haemocyanin adaptability. Despite their prominent position in Antarctic food webs and being highly abundant, very little is known about Antarctic octopod physiology in general and specifically of the role of haemocyanin as a mediator between the organism and an extreme environment.

In an integrative manner, this proposal aims to bridge the gap between classical physiological analysis of haemocyanin functions based on the physical properties of the respiratory pigment on the one hand and modern molecular biological and phylogenetical approaches that characterise haemocyanin isoforms on the other hand. A particular emphasis will be put on analysis of the physiological consequences of haemocyanin function that derive from the changes of amino acid composition of the specific isoforms.

During our stay at Jubany, we will physiologically characterise the ability of haemocyanin to adapt to varying environmental temperatures. Experiments will be conducted on fresh blood samples in vitro and will provide information on adaptive and/or different physiological properties with respect to the extreme habitat temperature. The methods applied will include pH and temperature dependent in vitro oxygen binding curves and biochemical characterisation of isoforms by native PAGE and immunoelectrophoretic investigations.

Further experiments will be carried out at home in Bremerhaven to investigate differential expression of haemocyanin isoforms throughout a latitudinal gradient by use of real-time PCR. RNA from animals acclimated to specific temperatures at Jubany will be screened for thermally induced shifts in isoform expression.

4. OTHER ACTIVITIES

4.1 AWI activities at other stations and locations

4.1.1 Glaciological and radar studies in the surrounding of the Chilean base BERNARDO O'HIGGINS (Plateau Laclavere) API 2009

Hanno Meyer (AWI)

The Antarctic Peninsula is one of the key regions to study climate change. Glaciological fieldwork and radar studies are planned in the frame of the Chilean-German expedition to Antarctic Peninsula 2009 (API 2009; 15 January " 25 February 2009) involving with Dr. Carlos Cardenas a scientist from Universidad de Magallanes (UMAG) in Punta Arenas and two people (Hanno Meyer, Francisco Fernandoy) from Alfred Wegener Institute in Potsdam. In order to gain information about the climate history of the last 15 to 20 years, firn cores will be retrieved in the surroundings of Chilean Base BERNARDO O'HIGGINS (63°19'S, 57°54'W) reaching a maximum depth of 15.0 m. The focus this year is on Plateau Laclavere (63.46° S / 57.75° W), which could not be reached in the frame of API 2008 pre-campaign. Generally, it is expected to reach locations at different altitudes from 400 m a.s.l to 1000 m. a.s.l. Two lower points may be reached by skidoos or using a helicopter. For the work on Plateau Laclavere (located at 1000 m a.s.l), which is the most interesting point for glaciological research, a helicopter is needed for transport and safety reasons. Additional personal support from the station will be required. Firn core studies will be mainly based on stable isotopes (AWI) and compared to the meteorological record and recent precipitation collection started at the base in 2008. Airborne and ground penetrating radar profiles (UMAG) will give information about the contact to bedrock and the glacier's internal structures that will complement the glaciological work. Logistics and transport are organised by the Chilean army (DAE).

4.1.2 Star photometer measurements at CONCORDIA STATION as part of the international project TAVERN (AWI, IPEV, PNRA, ISAC-CNR)

Andreas Herber (AWI)

Aerosol information during polar night only exists based on some LIDAR (Light Detection and Ranging) measurements, like at DUMONT D'URVILLE and at SYOWA. Using a star photometer to measure the Aerosol Optical Depth (AOD) will give information during the polar night. The star photometer is successfully tested in Germany and is successfully running at the Arctic research base AWIPEV in Ny-Ålesund, Spitsbergen (Norway) since 1996. The planned star photometer measurements at CONCORDIA STATION are part of the international project TAVERN (quantification of

tropospheric aerosol and thin clouds variability including the radiation budget over the east Antarctic plateau) under leadership of CNR-ISAC Bologna. In January 2009, the specially designed 4m Radom will be assembled at Concordia Station. Two engineers from Baader Planetarium Mammendorf in cooperation with one engineer of AWI will perform the construction works. It is planned to start the aerosol measurements then one year later during the polar night 2010.

Table 4.1.2: Preliminary schedule for the CONCORDIA STATION project

Beginning of January 2009	Arrival of the construction team (3 persons)
January 2009 (3 weeks)	Built up and installation of the Radome
February 2009	Departure of the construction team (3 persons)

4.2 Activities supported by AWI

4.2.1 DATIC - Dynamics of an Antarctic temperate ice cap

Norbert Blindow (Münster University), Martin Rückamp (Münster University), Sonja Suckro (Münster University), Jennifer Sobiech (Münster University)

The main objectivities of this field campaign is to measure a dataset of ice topography and bedrock topography with GPR and DGPS. These measurements will mainly be done by helicopter. To calibrate the airborne measurements, ground based GPR and DGPS measurements will be carried out. These data are also useful as re-measurements of ice thickness, ice velocities, accumulation/-ablation rates and inner structure of the ice body from former expeditions to get a long time dataset.
The dataset will be used for prognostic studies of the evolution of the ice thickness and dynamics under possible climatic forcings (IPCC-scenarios) with a 3D-Full-Stokes flowmodel.

4.2.2 Foraging ecology and migration of Antarctic skuas

Hans-Ulrich Peter (Jena University), Matthias Kopp (Jena University), Anja Nordt (Jena University), Simeon Lisovski (Jena University)

From October 2008 to March 2009 there are two main research fields on Fildes Peninsula (King George Island, South Shetland Islands):

The studies will use a combined approach of tracking migrating and foraging birds by different data loggers, non-invasive methods for determination of past and present diets by stable isotope analysis and direct food samples, and standardised methods for measuring reproduction performance.

The development of miniaturized GPS-systems allowed in recent years to track animals at a very fine temporal and spatial scale. We will employ GPS-logger at two predatory seabird species during the breeding period. Our work will take place at Fildes Peninsula/King-George Island, the biggest island of the South Shetland Islands in the maritime Antarctic in the austral summer season 2008/2009. In this area two skua species with an overlapping food spectrum sympatrically occur. The Brown Skua *Catharacta antarctica lonnbergi* mainly feeds on penguins while the South Polar Skua *C. maccormicki* mainly feeds offshore on several fish species and crustaceans. These are two of the key species within the Antarctic food web. We want to elucidate how often and how far South Polar Skuas fly out in the open ocean and whether they have preferred feeding areas.

The analysis of stage dependent regional and local resource use and its influence on reproduction performance will allow in the future predictions how changes in environmental conditions will affect skua populations.

A second project will use another logger system (GLS) which will be combined with stable isotope analysis to locate the migration route of these two skua species during the non-breeding season.

These projects are part of the international IPY-activities ClicOPEN, will be continued in the following summer season.

Figure 4.2.1: South polar skua with a GPS-logger attached on the back

4.2.3 CryoSat-2 Cal/Val with kinematic GPS

Axel Rülke (TU Dresden), Franziska Kube (TU Dresden)

One main objective of the European ice radar altimeter mission CryoSat-2, which is planned to be launched in 2009, is the determination of the surface geometry of the continental ice sheets with a resolution of a few centimeters which is an important input for studies of ice mass balances (Drinkwater et al. 2004). In this context detailed information on the error budget of the mission are essential for the interpretation of ice mass changes obtained from CryoSat-2 observations. Therefore, investigations of the error budget are an essential part for a successful mission.

The activities of the season 2008/2009 are located in a blue ice area south of the Schirmacher Oasis, Dronning Maud Land (Figure 4.2). The Institute for Planetary Geodesy of TU Dresden has been working in this area for a long time. From earlier observations a negative mass balance of the area with up to -20 cm/year is known (Korth et al. 2000). In the upcoming season the observations in the blue ice area have to be continued and extended with the following main purposes:

- Determination of an independent ice mass balance of the area over a time span of 18 years.
- Determination of spatial and temporal covariances of the ice mass balance caused by natural fluctuations.

Later, the determined observations shall be used for comparisons with the results based on CryoSat-2 observations. These comparisons yield to reliable resolution estimates for the long-term elevation changes determined with CryoSat-2.

The ice elevations are determined by kinematic differential GPS. A geodetic GPS antenna is mounted on a Nansen-sledge and the observed data are processed with respect to data obtained from a static reference antenna. On the one hand repeated observations of an already existing track has to be performed, on the other hand dense grids have to be observed. All together it is planned to survey 1000 km of kinematic profiles with 2 skidoos. The spatial dimension of the grids is planned to be 2 km by 10 km. The main activities will be based on a field camp in the blue ice area about 50 km south of the Novolazarevskaya air base. The expected resolution of the determined kinematic GPS heights is on a level of a few centimeters. Additionally, reference stations on existing markers on bedrock shall be established. With respect to earlier epochs these observations can be also used to determine long-term horizontal and vertical crustal movements with a resolution of a few millimeters, which may be caused by present tectonics or glacial isostasy.

The ground-based measurements are closely linked to the AWI Cal/Val activities based on the POLAR 5 aircraft. This aircraft is equipped with the ASIRAS radar altimeter as well as with a laser scanner and will be used for airborne surveys of the area. Later, those results can also be compared to the GPS heights.

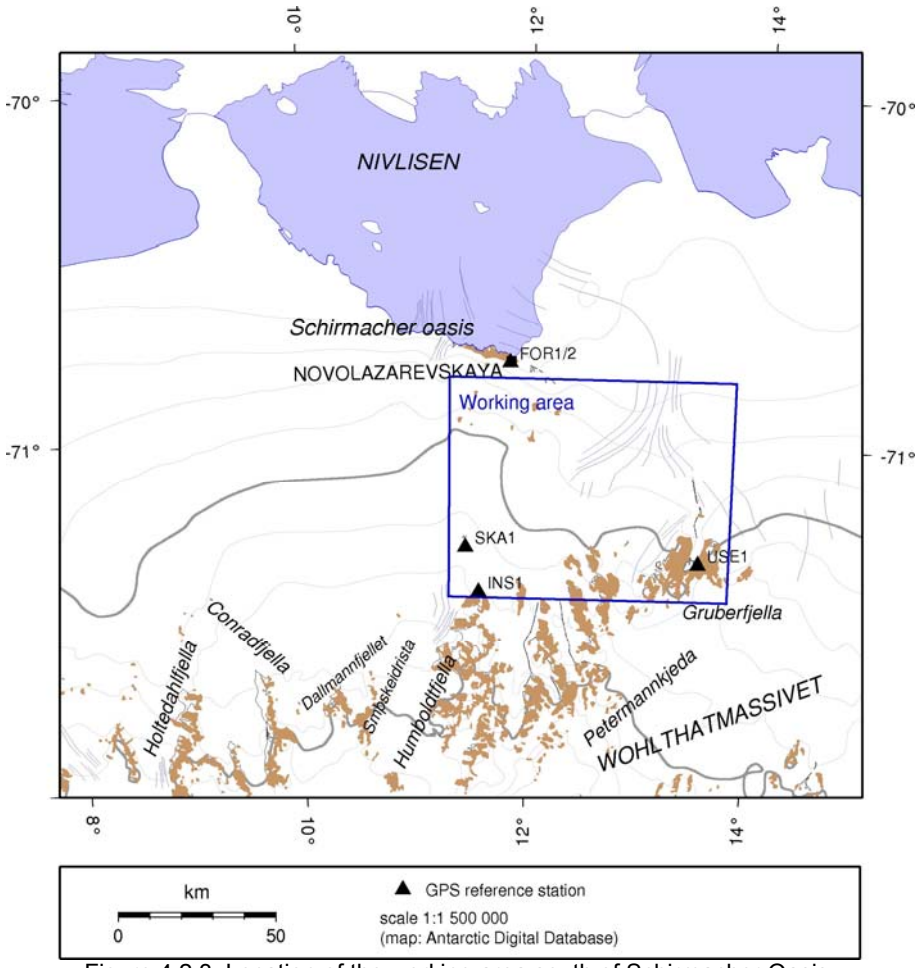

Figure 4.2.3: Location of the working area south of Schirmacher Oasis.

5. LOGISTICS, SCHEDULES, PARTICIPANTS

5.1 DROMLAN flight schedules and ship calls

5.1.1 Feeder flights and ship calls (planning stage: 09 October 2008)

in / out by	date	ID	route	pax in	pax out
DROMLAN flight - Iljushin 76TD	31 Oct-02 Nov 2008	D1	Cape Town - Novo - Cape Town	26	0
DROMLAN flight - Iljushin 76TD	05-07 Nov 2008	D2	Cape Town - Novo - Cape Town	0	0
DROMLAN flight - Iljushin 76TD	10-15 Nov 2008	D3	Cape Town - Novo - Cape Town	28	0
DROMLAN flight - Iljushin 76TD	21-25 Nov 2008	D4	Cape Town - Novo - Cape Town	13	0
DROMLAN flight - Iljushin 76TD	01-03 Dec 2008	TAC-1	Cape Town - Novo - Cape Town	7	0
DROMLAN flight - Iljushin 76TD	18-22 Dec 2008	TAC-2	Cape Town - Novo - Cape Town	2	1
DROMLAN flight - Iljushin 76TD	08-11 Jan 2009	D5	Cape Town - Troll - Cape Town	15	6
DROMLAN flight - Iljushin 76TD	26-30 Jan 2009	TAC-3	Cape Town - Novo - Cape Town	8	1
DROMLAN flight - Iljushin 76TD	02-06 Feb 2009	TAC-4	Cape Town - Novo - Cape Town	0	0
DROMLAN flight - Iljushin 76TD	09-11 Feb 2009	D6	Cape Town - Novo - Cape Town	2	40
DROMLAN flight - Iljushin 76TD	19-22 Feb 2009	D7	Cape Town - Novo - Cape Town	24	39
DROMLAN flight - Iljushin 76TD	03-05 Mar 2009	D8	Cape Town - Novo - Cape Town	0	39
POLAR 5 (BT-67)	06 Nov 08 (17 Nov-22 Feb) 04 Mar 09	P5	Oshawa - Novo - Oshawa	3	3
MIA (BT-67)	19 Oct 2008 - 06 March 2009	Mia	Oshawa - Novo - Oshawa	1	1
LIDIA (BT-67)	19 Oct 2008 - 06 March 2009	Lidia	Oshawa - Novo - Oshawa	0	0
RV POLARSTERN ANTXXV/2	05 Dec 08 (16-17 Dec) 05 Jan 09	Polarstern	Cape Town - Atka Bay - Cape Town	9	8
SA AGULHAS	30 Dec 08 (15 Jan-07 Mar) 18 Mar 09	Agulhas	Cape Town - Base - Atka Bay - Cape Town	0	0
IVAN PAPANIN - DROMSHIP - first call	06 Dec 2008 - (31 Dec-02 Jan)	Papanin-1	Cape Town - Breid Bay - 5East - Atka Bay - Cape Town	0	0
IVAN PAPANIN - DROMSHIP - second call	(05-12 Feb) - 21 Feb 2009	Papanin-2	Cape Town - Atka Bay - 5East - Cape Town	0	0
			DROMLAN Pax in / out:	**125**	**126**
Total number of participants:	**147**		**Total Pax in / out:**	**138**	**138**

5.1.2 Internal flight schedule of BT-67 aircraft for AWI activities (planning stage: 05 September 2008)

The aircraft fleet of Basler BT-67 will be in charge from November 2008 to March 2009.

In total **101** flight hours are scheduled for AWI activities, by **MIA: 35,90 h**, by **LIDIA: 45,25 h**, and by **POLAR 5: 19,75 h**.

Altogether POLAR 5 will be in operation for 375 hours in this season:

For positioning and repositioning:	100,20 h
For scientific flights:	226,00 h
For DROMLAN flights for AWI:	19,75 h
For DROMLAN flights for other parties:	28,80 h

BASLER (**up to 18 seats**) **L – "LIDIA", M – "MIA", P – "POLAR 5"**

N	Flight Code	Flight route Description of cargo and pax	Fuel JET A1 drums	ETD (GMT)	ETA (GMT	Flight time
1	***P-pos. 1***	Approx. 06-14.11.08 *Oshawa – Punta Arenas (incl. M-Program)*				approx. **40,00 h**
	P-pos. 2	Approx. 15-17.11.08 *P A – Rothera – Halley – Novo*	t.b.c.	t.b.c.	t.b.c.	**15,20 h**
	L1-DE	01.11.08 D1 (IL76) ETA at Novo **Novo (16 G + 200 kg) – Neumayer**	10 – Novo	06-30	**03-30** 09-00	**2,50 h**
		Neumayer (20 kg) – Novo	**6 – Neum.**	10-00	12-30	**2,50 h**
	M1-DE	**Novo (8 G + 3 AAE + 600 kg) – Neumayer**	10 – Novo	06-00	08-30	**2,50 h**
		Neumayer (20 kg) – Novo	**6 – Neum.**	09-30	12-00	**2,50 h**
	M2a-DE	***Novo (2 G + 1680 kg) – Neumayer*** *D1 (IL76) ETD from Novo*	10 – Novo	14-30 **22-30**	17-00	**2,50 h**

N	Flight Code	Flight route Description of cargo and pax	Fuel JET A1 drums	ETD (GMT)	ETA (GMT	Flight time
	M2b-DE	02.11.08 **Neumayer (1 AAE) – Novo**	**6 – Neum.**	t.b.c.	t.b.c.	**2,50 h**
	L2-DE	11.11.08 D3 (IL76) ETA at Novo ***Novo (16 G + 150 kg) – Neumayer***	10– Novo	06-00	**03-30** 08-30	**2,50 h**
		Neumayer - Novo	**6 – Neum.**	09-30	12-00	**2,50 h**
	M3-DE	***Novo (10 G + 400kg +1 NO + 50kg) – Troll***	10 – Novo	06-30	07-45	**1,20 h**
		Troll (- 1 NO – 50 kg) – Neumayer		08-00	09-25	**1,40 h**
		Neumayer – Novo	**6 – Neum.**	10-30	13-00	**2,50 h**
	M4a-DE	***Novo (1510 kg) – Neumayer***	10 – Novo	14-30	17-00	**2,50 h**
	M4b-DE	12.11.08 ***Neumayer (1 G) – Novo*** 14.11.08 D3 (IL76) ETD from Novo	**6 – Neum.**	08-00 **22-30**	10-30	**2,50 h**
	Ps1-DE	19-20.11.08 *Novo – S 17 – Davis*	18 – Novo **8 – S 17**	t.b.c.	t.b.c.	**8,50 h**
	L3-DE	22.11.08 D4 (IL76) ETA at Novo ***Novo (13 G + 470 kg) – Neumayer***	10 – Novo	06-00	**03-30** 08-30	**2,50 h**
		Neumayer – Novo	**6 – Neum.**	09-30	12-00	**2,50 h**
		24.11.08 D4 (IL76) ETD from Novo		**22-30**		

N	Flight Code	Flight route Description of cargo and pax	Fuel JET A1 drums	ETD (GMT)	ETA (GMT	Flight time
		22.11.08 - 03.12.08	**approx.**			**approx.**
	Ps2N-DE	*AGAP-N mission*	**158–Davis**	t.b.c.	t.b.c	**52,00 h**
		02.12.08 TAC-1 (IL76) ETA at Novo			**03-30**	
	M5-DE	***Novo (7 G+1 G +720 kg) – Neumayer***	10 – Novo	06-00	08-30	**2,50 h**
		Neumayer – Novo	**6 – Neum.**	09-30	12-00	**2,50 h**
		TAC1 (IL76) ETD from Novo		**22-30**		
		04.12.08				
	Ps3-DE	*Davis – S 17 – Novo*	**18 – Davis** **8 – S 17**	t.b.c.	t.b.c.	**8,50 h**
		19.12.08 TAC-2 (IL76) ETA at Novo			**03-30**	
	Ps4-DE	***Novo (2 G + 200 kg) – Neumayer***	9 – Novo	t.b.d.	t.b.d.	**2,50 h**
		21.12.08 (with CryoVEX)				
	Ps5-DE	***Neumayer (1G)– Troll (+1NO+35kg)– Novo***	**7 – Neum.**	t.b.d.	t.b.d.	**5,00 h**
		TAC-2 (IL76) ETD from Novo		**22-30**		
		22.12.08				
	Ps6-DE	*Novo – CryoVEX – Novo*	16 – Novo	t.b.c.	t.b.c.	**5,00 h**
		23.12.08				
	Ps7-DE	Novo – CryoVEX – Novo	22 – Novo	t.b.c.	t.b.c.	**7,00 h**
		24.12.08				

	Ps8-DE	*Novo – CryoVEX – Neumayer*		t.b.c.	t.b.c.	**5,00 h**
N	**Flight Code**	**Flight route Description of cargo and pax**	**Fuel JET A1 drums**	**ETD (GMT)**	**ETA (GMT**	**Flight time**
	Ps9N-DE	25.12.08 – 22.01.09 *WEGAS ex Novo*	**approx. 370 - Novo**	t.b.c.	t.b.c.	**approx. 120,0 h**
	L4-DE	09.01.08 D5 (IL76) ETA at Troll *Novo – Troll* ***Troll (15 G + 710 kg) – Neumayer*** ***Neumayer (6 G + 256 kg) – Troll*** 10.01.09 D7 (IL76) ETD from Troll	9 – Novo **7 – Neum.**	t.b.c. t.b.c. **22-30**	**03-30** t.b.c. t.b.c.	**1,20 h** **1,40 h** **1,40 h**
	Pd10-DE	25.01.09 *Novo – S 17 – Zhongshan*	18 – Novo **8 – S 17**	t.b.c.	t.b.c.	**8,50 h**
	Pd11-DE ***L5a-DE***	27.01.09 TAC-3 (IL76) ETA at Novo *Zhongshan (10 CH) – Dome A - Zhongshan* ***Novo (8 G + 460 kg) – Neumayer***	**t.b.d.** 9 – Novo	t.b.c. t.b.c.	**03-30** t.b.c. t.b.c.	**8,00 h** **2,50 h**
	Pd12-DE ***L5b-DE***	28.01.09 *Zhongshan (8 CH) – S 17 – Novo* ***Neumayer (1 G) – Novo*** 29.01.09 TAC-3 (IL76) ETD from Novo	**18 – Zhong** **8 – S 17** **7 – Neum.**	t.b.c. t.b.c. **22-30**	t.b.c. t.b.c.	**8,50 h** **2,50 h**
	Ps13-DE	01-04.02.09 **Novo – AWI field support – Novo**	t.b.c. –Novo	t.b.c.	t.b.c.	**7,00 h**

N	Flight Code	Flight route Description of cargo and pax	Fuel JET A1 drums	ETD (GMT)	ETA (GMT	Flight time
		03.02.09 TAC-4 (IL76) ETA at Novo			**03-30**	
		05.02.09				
	Pd14-BE	*Novo (4 BEL + 528 kg) – Utstainen*	11 – Novo	t.b.c.	t.b.c.	**3,30 h**
		Utstainen (5 BEL + 1644 kg) – Novo				
		TAC-4 (IL76) ETD from Novo		**23-30**		
		06-09.02.09				
	Ps15-DE	***Novo – AWI field support – Novo***	t.b.d – Novo	t.b.c.	t.b.c.	**8,00 h**
		10.02.08 D6 (IL76) ETA at Novo			**03-30**	
	Pd16-DE	**Novo (2 G + 420 kg) – Neumayer**	9 – Novo	t.b.c.	t.b.c.	**2,50 h**
		Neumayer (14 G +50 kg) – Novo	**7 - Neum.**	t.b.c.	t.b.c.	**2,50 h**
	Pd17-DE	**Novo – Neumayer**	9 – Novo	t.b.c.	t.b.c.	**2,50 h**
	M6-DE	**Novo – Neumayer**	9 – Novo	t.b.c.	t.b.c.	**2,50 h**
		11.02.09			**03-30**	
	M7a-DE	***Neumayer (8 G) – Troll***	**7 – Neum.**	09-00	10-25	**1,40 h**
	M7b-NO	***Troll (+6 NO + 150kg) – Novo***		11-00	12-15	**1,20 h**
	Pd17-DE	***Neumayer (16 G) – Novo***	**7 – Neum.**	09-30	12-00	**2,50 h**
		D6 (IL76) ETD from Novo		**13-30**		
		19.02.09 D7 (IL76) ETA at Novo			**14-00**	
	Pd18-DE	**Novo (16 VIP) – Neumayer**	9 – Novo	15-00	17-30	**2,50 h**
	L6-DE	**Novo (13 VIP + 200 kg) – Neumayer**	9 – Novo	15-00	17-30	**2,50 h**

		Neumayer (14 G + 160 kg) – Novo	7 – Neum.	18-30	21-00	**2,50 h**
N	**Flight Code**	**Flight route Description of cargo and pax**	**Fuel JET A1 drums**	**ETD (GMT)**	**ETA (GMT**	**Flight time**
		20.02.09				
	L7-DE	*Novo – SANAE IV*	6 – Novo	t.b.c.	t.b.c.	**1,75 h**
	Pd18-DE	***Neumayer (16 VIP + 1 UK) – SANAE IV***	**max- Neum.**	16-00	16-45	**0,75 h**
		21.02.09				
	Pd19-DE	***SANAE IV (16 VIP + 1 UK) – Kohnen***	2 – SANAE	09-00	11-30	**2,50 h**
		Kohnen – Novo		12-30	14-30	**2,00 h**
	L8-DE	***SANAE IV (13 VIP) – Kohnen***	max–SANAE	09-00	11-30	**2,50 h**
		Kohnen – Novo		12-30	14-30	**2,00 h**
		D7 (IL76) ETD from Novo		**15-30**		
		22.02.09 – 03.03.09				
	P-repos.	*Novo – Halley*	16 – Novo	t.b.c.	t.b.c.	
		Halley – Rothera				
		Rothera – Punta Arenas		t.b.c.	t.b.c.	
		Punta Arenas – Oshawa				
						45,00 h
		02.02.09				
	L9a-DE	***Novo – Neumayer***	9 – Novo	t.b.c.	t.b.c.	**2,50 h**
	M8a-DE	***Novo – Neumayer***	9 – Novo	t.b.c.	t.b.c.	**2,50 h**

N	Flight Code	Flight route Description of cargo and pax	Fuel JET A1 drums	ETD (GMT)	ETA (GMT	Flight time
		03.03.09 D8 (IL76) ETA at Novo			**14-00**	
	M8b-DE	***Neumayer (2000 kg) – Novo***	**7 – Neum.**	09-00	11-30	**2,50 h**
	M9a-DE	***Novo – Neumayer***	9 – Novo	t.b.c.	t.b.c.	**2,50 h**
	L9b-DE	***Neumayer (6 G + 480 kg) – Novo***	**7 – Neum.**	t.b.c.	t.b.c.	**2,50 h**
	L10a-DE	***Novo (400 kg) – Neumayer***	9 – Novo	14-30	17-00	**2,50 h**
		04.03.09				
	M9b-DE	***Neumayer (17 G) – Novo***	**7 – Neum.**	11-00	13-30	**2,50 h**
	L10b-DE	***Neumayer (17 G) – Novo***	**7 – Neum.**	07-00	09-30	**2,50 h**
		D8 (IL76) ETD from Novo		**14-30**		
		05.03.09				
	M-repos.	***Novo – Neumayer (1 G) – Halley***	9 - Novo	t.b.c.	t.b.c.	
	L-repos.	***Novo – Neumayer – Halley***	9 - Novo			
		15.03.09				
		C-GEAI and C-GEAJ ETA Oshawa				

5.2 Travel schedule for participants, DML (planning stage: 09 October 2008)

surname	given name	institute/company	profession	nation	activity	in	out
Neumayer-Station							
Logistics preparation for pilot operation							
Kohlberg	Eberhard	AWI-logistics	physician	Germany	coordinator logistics	TAC-1	D8
Matz	Thomas	AWI-logistics	engineer	Germany	coordinator logistics	D5	D8
El Naggar	Saad	AWI-logistics	scientist	Germany	coordinator scientific pilot operation	D5	D8
Janneck	Jürgen	AWI-logistics	engineer	Germany	coordinator construction Neumayer Station III	D1	D8
Witt	Ralf	AWI-logistics	technician	Germany	logistics	TAC-1	D6
Schlüter	Jens-Michael	AWI-computing center	technician	Germany	logistics IT	D6	D8
Blattner	Marc	Fa. Kässbohrer	technician	Germany	vehicle mainten. (sharing with Maitri/NCAOR)	D1	D8
Schubert	Holger	Reederei F. Laeisz	technician	Germany	logistics	D3	D8
Sulzbach	Frank	external company	technician	Germany	logistics /maintenance team	D3	D8
Falkenberg	Falk	external company	technician	Germany	logistics /maintenance team	D3	D8
Nittka	Dirk	external company	technician	Germany	logistics /maintenance team	D3	D8
Krump	Steffen	external company	technician	Germany	logistics /maintenance team	D3	D8
Pyrskalla	Boleslav	external company	technician	Germany	logistics /maintenance team, I27DE	TAC-1	D8
Eron	Andreas	external company	technician	Germany	logistics /maintenance team, I27DE	TAC-1	D8
Hilbrands	Holger	external company	technician	Germany	logistics /maintenance team	TAC-1	D8
Holz	NN	GL	engineer	Germany	superintendent for construction NM III	D5	D7
Korff	Michael	Enercon	engineer	Germany	wind power station, power plant NM III	D5	D8
							17

Observatories Neumayer Station III preparation for pilot operation							
König-Langlo	Gert	AWI	scientist	Germany	meteorological observatory	D5	D8
Loose	Bernd	AWI	scientist	Germany	meteorological observatory	D5	D8
Gräser	Jürgen	AWI	scientist	Germany	meteorological observatory	D5	D8
Eckstaller	Alfons	AWI	scientist	Germany	geophysical observatory	D5	D8
Müller	Christian	FIELAX	scientist	Germany	geophysical observatory	D5	D8
Weller	Rolf	AWI	scientist	Germany	airchemistry observatory	D5	D8
Kässbohrer	Johannes	FIELAX	scientist	Germany	airchemistry observatory	D5	D8
Dunker	Erich	AWI	technician	Germany	airchemistry observatory	D5	D8
Hofmann	Joerg	FIELAX	scientist	Germany	IT installations	D5	D8
Hartmann	Gernot	BGR Hannover	engineer	Germany	I27DE - infrasound array	D5	D8
Grasse	Torsten	BGR Hannover	engineer	Germany	I27DE - infrasound array	D5	D8
							11
Construction Team Neumayer-Station III							
Behrends	Detlev	ARGE (J.H.K. / KAEFER)	project leader	Germany	project management	D1	D8
Germerott	André	ARGE (J.H.K. / KAEFER)	engineer	Germany	operations scheduling	D3	D7
Trimborn	Klaus	ARGE (J.H.K. / KAEFER)	technician	Germany	storing /transport	D1	D7
Ellinger	Andreas	ARGE (J.H.K. / KAEFER)	technician	Germany	storing /transport	D1	D6
Schröder	Steffen	ARGE (J.H.K. / KAEFER)	technician	Germany	storing /transport	D1	D6
van Eijk	Joost	ARGE (J.H.K. / KAEFER)	technician	Germany	crane works	D1	D6
Kers	Raymond	ARGE (J.H.K. / KAEFER)	technician	Germany	crane works	D1	D6
Klostermann	Jörg	ARGE (J.H.K. / KAEFER)	technician	Germany	crane works	D3	D5
Krüger	Oliver	ARGE (J.H.K. / KAEFER)	technician	Germany	crane works	D3	D5
Lawrenz	Peter	ARGE (J.H.K. / KAEFER)	technician	Germany	const.camp	D1	D6
Hartling	Thomas	ARGE (J.H.K. / KAEFER)	cook	Germany	const.camp	D1	D6
Schreuder	Manfred	ARGE (J.H.K. / KAEFER)	kitchen assistant	Germany	const.camp	D3	D6
Eckhardt	Georg	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D5

Gröger	Herbert	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D5
Karpawitz	Jörg	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D6
Kröger	Thomas	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D6
Neuber	Jürgen	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D6
Pelludat	Ingo	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D6
Schmidt	Roland	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D6
Wartmann	Maik	ARGE (J.H.K. / KAEFER)	technician	Germany	steel const.	D1	D6
Lietmann	Heinrich	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Lindner	Detlef	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Koepp	Holger	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Staggat	Dieter	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Rhode	Martin	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Köniser	Markus	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Stanienda	Peter	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	D4	D6
Schröder	Rainer	ARGE (J.H.K. / KAEFER)	technician	Germany	elevator	D4	D6
Ahrens	Siegmar	ARGE (J.H.K. / KAEFER)	technician	Germany	hydraulic system	D3	D5
Hacker	Richard	ARGE (J.H.K. / KAEFER)	engineer	Germany	hydraulic system	D3	D6
Schmidt	Arne	ARGE (J.H.K. / KAEFER)	electrician	Germany	electro-technics	D3	D7
Lenuck	Michael	ARGE (J.H.K. / KAEFER)	electrician	Germany	electro-technics	D4	D6
Gerstmann	Michael	ARGE (J.H.K. / KAEFER)	electrician	Germany	electro-technics	D4	D6
Schwegmann	Kai	ARGE (J.H.K. / KAEFER)	electrician	Germany	electro-technics	D4	D6
Veen	Christian	ARGE (J.H.K. / KAEFER)	electrician	Germany	electro-technics	D4	D6
v. Borstel	Jörg	ARGE (J.H.K. / KAEFER)	electrician	Germany	electro-technics	D1	D8
Laukner	Markus	ARGE (J.H.K. / KAEFER)	technician	Germany	electro-technics	TAC-3	D7
Berger	Rolf	ARGE (J.H.K. / KAEFER)	technician	Germany	sanitary inst.	D3	D6
Irmler	Stephan	ARGE (J.H.K. / KAEFER)	technician	Germany	sanitary inst.	D3	D6
Marx	Oliver	ARGE (J.H.K. / KAEFER)	technician	Germany	sanitary inst.	D3	D7
v. Hassel	Ralf	ARGE (J.H.K. / KAEFER)	technician	Germany	sanitary inst.	D3	D7

Thöns	Dietrich	ARGE (J.H.K. / KAEFER)	technician	Germany	face const.	TAC-3	D6
Eder	Pitt	ARGE (J.H.K. / KAEFER)	technician	Germany	ventilation system	D3	D6
Stenger	Jan	ARGE (J.H.K. / KAEFER)	technician	Germany	ventilation system	D3	D6
Münch	Lothar	ARGE (J.H.K. / KAEFER)	technician	Germany	ventilation system	D1	D7
Krauß	Thomas	ARGE (J.H.K. / KAEFER)	technician	Germany	storing /transport	D3	D6
Minning	Bernd	ARGE (J.H.K. / KAEFER)	technician	Germany	ventilation system	TAC-3	D6
Wegener	Bernd	ARGE (J.H.K. / KAEFER)	technician	Germany	ventilation system	TAC-3	D6
Lux	Reinhard	ARGE (J.H.K. / KAEFER)	technician	Germany	face const./ finishings	D1	D7
Suhr	Axel	ARGE (J.H.K. / KAEFER)	technician	Germany	finishings	D1	D8
Fietzek	Dieter	ARGE (J.H.K. / KAEFER)	technician	Germany	paintworks	D4	D7
Köstner	Norbert	ARGE (J.H.K. / KAEFER)	technician	Germany	power plant	TAC-3	D6
Schleusener	Arno	ARGE (J.H.K. / KAEFER)	technician	Germany	electro-technics	TAC-3	D6
Langbein	Michael	ARGE (J.H.K. / KAEFER)	technician	Germany	clarification plant	TAC-3	D7
							54
Reporting and documentation of construction works Neumayer Station III							
Klimmeck	Jens	realnature.tv	journalist	Germany	TV team NM-III	D1	Polarstern
Brüggemann	Jörg	realnature.tv	journalist	Germany	TV team NM-III	D1	Polarstern
Trapp	Michael	realnature.tv	journalist	Germany	TV team NM-III	Polarstern	D8
Varga	Martin	realnature.tv	journalist	Germany	TV team NM-III	Polarstern	D8
							4
International scientific and technical inspection and certification							
Gernandt	Hartwig	AWI-logistics	head of logistics	Germany	general inspection	D7	D7
Nixdorf	Uwe	AWI-logistics	deputy head of logistics	Germany	general inspection	D7	D7
Lochte	Karin	AWI	director	Germany	scientific inspection	D7	D7
Miller	Heinz	AWI	deputy director	Austria	scientific inspection	TAC-3	D7
NN	NN	AWI - reservation still pending	AWI reservation still pending	Germany	scientific inspection	D7	D7

NN	NN	AWI - reservation still pending	AWI reservation still pending	Germany	scientific inspection	D7	D7
Valentine	Henry	SANAP	director	South Africa	scientific inspection	D7	D7
NN	NN	AARI - reservation still pending	director	Russia	scientific inspection	D7	D7
Stel	Jan	NWO	director	Netherlands	scientific inspection	D7	D7
Winther	Jan Gunnar	NPI - reservation still pending	director	Norway	scientific inspection	D7	D7
Culshaw	Robert	BAS	deputy director	UK	scientific inspection	(extern)	(D7)
Participation BMBF, HGF, DFG, BGR, UBA, journalists, companies (F. Laeisz, J.H.K. Engineering, KAEFER Isoliertechnik) still pending, preliminary reservation 15 Pax						D7	D7
							25
DROMLAN flight weather service							
Brauner	Ralf	DWD	meteorologist	Germany	DROMLAN weather forecast	Mia	TAC-2
Kreutzmann	Christian	DWD	meteorologist	Germany	DROMLAN weather forecast	TAC-1	D6
Pols	Hans-Arnold	DWD	meteorologist	Germany	DROMLAN weather forecast	D6	Mia
							3
Scientific projects							
Bornemann	Horst	AWI	scientist	Germany	Seals and PALAOA Observatory	D3	Polarstern
Plötz	Joachim	AWI	scientist	Germany	Seals and PALAOA Observatory	D3	Polarstern
Kindermann	Lars	AWI	scientist	Germany	Seals and PALAOA Observatory	D3	Polarstern
van Opzeeland	Ilse Catharina	AWI	scientist	Germany	Seals and PALAOA Observatory	D3	Polarstern
Kreiss	Cornelia	AWI	scientist	Germany	Seals and PALAOA Observatory	D3	Polarstern
Mc Intyre	Trevor	University Pretoria	scientist	South Africa	Seals and PALAOA Observatory	D3	Polarstern
							6

Wintering Team 2008							
Nantke	Jürgen	AWI	physician	Germany	station leader, physician	2007	D7
Heinzius	Benjamin	AWI / Reederei F. Laeisz	engineer	Germany	station engineer	2007	D8
Weise	Jörg	AWI / Reederei F. Laeisz	engineer	Germany	electrician	2007	D8
Görler	Max	AWI / Reederei F. Laeisz	engineer	Germany	electronic engineer, IT, radiooperator	2007	D8
Brandel	Stefan	AWI / Reederei F. Laeisz	cook	Germany	cook	2007	D8
Langer	Seweryn	AWI	scientist	Germany	geophysics	2007	D8
Zitterbart	Daniel	AWI	scientist	Germany	geophysics	2007	D8
Nehring	Franziska	AWI	scientist	Germany	air chemistry	2007	D8
Wittig	Julia	AWI	scientist	Germany	meteorology	2007	D8
							9
Wintering Team 2009							
Weigand	Gerhard	AWI	physician	Germany	station leader, physician	D3	2010
Brehme	Andreas	AWI / Reederei F. Laeisz	engineer	Germany	station engineer	D1	2010
Hüttebräuker	Olaf	AWI / Reederei F. Laeisz	engineer	Germany	electrician	D1	2010
Riess	Felix	AWI / Reederei F. Laeisz	engineer	Germany	electronic engineer, IT, radiooperator	TAC-1	2010
Kazanc	Tamer	AWI / Reederei F. Laeisz	cook	Germany	cook	Polarstern	2010
Turpeinen	Heidi	AWI	scientist	Finland	geophysics	Polarstern	2010
Männl	Ulrich	AWI	scientist	Germany	geophysics	Polarstern	2010
Hellmschmidt	Jessica	AWI	scientist	Germany	air chemistry	Polarstern	2010
Zöllner	Mathias	AWI	scientist	Germany	meteorology	Polarstern	2010
							9
						total:	**138**
Kohnen-Station							
					not operational		
							0

Aircraft Polar 5 scientific missions							
Steinhage	Daniel	AWI	scientist	Germany	science	Polarstern	D7
Petersen	Christoph	AWI	scientist	Germany	science	Polarstern	D7
Graser	Nora	FIELAX	scientist	Germany	science	TAC-2	TAC-3
Helm	Veit	AWI	scientist	Germany	science	TAC-2	D5
Burchartz	Brian	ALCI/Enterprise Airline Inc.	chief pilot	Canada	crew	P5	P5
Aylward	Jim	ALCI/Enterprise Airline Inc.	pilot	Canada	crew	P5	P5
Woudsma	David	ALCI/Enterprise Airline Inc.	engineer	Canada	crew	P5	P5
							7
None AWI projects/field parties							
Ruelke	Axel	Technical University Dresden	scientist	Germany	geodesy, Cryosat-Cal/Val	D3	D6
Kube	Franziska	Technical University Dresden	scientist	Germany	geodesy, Cryosat-Cal/Val	D3	D6
							2
					Total number of participants:		**147**

5.3 Travel schedule for participants, KGI
(planning stage: 09 October 2008)

Names, Institute	profession	Travel arrangements
Katharina Zacher, AWI	Scientific leader 2008	FAU 18.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Doris Abele, AWI	Scientific leader 2009	January – March 2009
Max Schwanitz AWI	Head of German diving group	FAU 18.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Claudia Daniel AWI	Scientific diver	FAU 18.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Hannah Schmidt, AWI	Scientific diver	FAU 18.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Gunnar Husmann, AWI	scientist	FAU 25.10. 08 Punta Arenas-Frei – January 2009
Francisco Javier López Gordillo, Universidad de Málaga	scientist	FAU 25.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Benjamín Viñegla, Universidad de Málaga	scientist	FAU 25.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Elena Moreira Neira Universidad de Málaga	scientist	FAU 25.10. 08 Punta Arenas-Frei – Marco Polo 11.12.08 to Ushuaia 17.12.08
Cornelius Lütz, University of Innsbruck	scientist	January-February 2009
Daniel Remias, University of Innsbruck	scientist	January-Februrary 2009
Felix Mark, AWI	scientist	February-March 2009
Anneli Strobel, AWI	scientist	February-March 2009
Magnus Lucassen, AWI	scientist	February-March 2009
Heidrun Windisch, AWI	scientist	February-March 2009
Nils Koschnick, AWI	technician	February-March 2009

5.4 Participants

5.4.1 DML

Name	First Name	Institute	Profession	Nation
Ahrens	Siegmar	ARGE	technician	Germany
Aylward	Jim	ALCI/Enterprise Airline Inc.	pilot	Canada
Behrends	Detlev	ARGE	project leader	Germany
Berger	Rolf	ARGE	technician	Germany
Blattner	Marc	Fa. Kässbohrer	technician	Germany
Bornemann	Horst	AWI	scientist	Germany
Brandel	Stefan	AWI / Reederei F. Laeisz	cook	Germany
Brauner	Ralf	DWD	meteorologist	Germany
Brehme	Andreas	AWI / Reederei F. Laeisz	engineer	Germany
Brüggemann	Jörg	realnature.tv	journalist	Germany
Burchartz	Brian	ALCI/Enterprise Airline Inc.	chief pilot	Canada
Culshaw	Robert	BAS	deputy director	UK
Dunker	Erich	AWI	technician	Germany
Eckhardt	Georg	ARGE	technician	Germany
Eckstaller	Alfons	AWI	scientist	Germany
Eder	Pitt	ARGE	technician	Germany
El Naggar	Saad	AWI-logistics	scientist	Germany
Ellinger	Andreas	ARGE	technician	Germany
Eron	Andreas	external company	technician	Germany
Falkenberg	Falk	external company	technician	Germany
Fietzek	Dieter	ARGE	technician	Germany
Germerott	André	ARGE	engineer	Germany
Gernandt	Hartwig	AWI-logistics	head of logistics	Germany
Gerstmann	Michael	ARGE	electrician	Germany
Görler	Max	AWI / Reederei F. Laeisz	engineer	Germany
Graser	Nora	FIELAX	scientist	Germany
Gräser	Jürgen	AWI	scientist	Germany
Grasse	Torsten	BGR	engineer	Germany
Gröger	Herbert	ARGE	technician	Germany
Hacker	Richard	ARGE	engineer	Germany
Hartling	Thomas	ARGE	cook	Germany
Hartmann	Gernot	BGR	engineer	Germany

Name	First Name	Institute	Profession	Nation
Heinzius	Benjamin	AWI / Reederei F. Laeisz	engineer	Germany
Hellmschmidt	Jessica	AWI	scientist	Germany
Helm	Veit	AWI	scientist	Germany
Hilbrands	Holger	external company	technician	Germany
Hofmann	Joerg	FIELAX	scientist	Germany
Holz	NN	GL	engineer	Germany
Hussel	Christian	Baader-Planetarium	engineer	Germany
Hüttebräuker	Olaf	AWI / Reederei F. Laeisz	engineer	Germany
Irmler	Stephan	ARGE	technician	Germany
Janneck	Jürgen	AWI-logistics	engineer	Germany
Karpawitz	Jörg	ARGE	technician	Germany
Kässbohrer	Johannes	FIELAX	scientist	Germany
Kazanc	Tamer	AWI / Reederei F. Laeisz	cook	Germany
Kers	Raymond	ARGE	technician	Germany
Kindermann	Lars	AWI	scientist	Germany
Klimmeck	Jens	realnature.tv	journalist	Germany
Klostermann	Jörg	ARGE	technician	Germany
Koepp	Holger	ARGE	technician	Germany
Kohlberg	Eberhard	AWI-logistics	physician	Germany
König-Langlo	Gert	AWI	scientist	Germany
Köniser	Markus	ARGE	technician	Germany
Korff	Michael	Enercon	engineer	Germany
Köstner	Norbert	ARGE	technician	Germany
Krauß	Thomas	ARGE	technician	Germany
Kreiss	Cornelia	AWI	scientist	Germany
Kreutzmann	Christian	DWD	meteorologist	Germany
Kröger	Thomas	ARGE	technician	Germany
Krüger	Oliver	ARGE	technician	Germany
Krump	Steffen	external company	technician	Germany
Kube	Franziska	Technical University Dresden	scientist	Germany
Langbein	Michael	ARGE	technician	Germany
Langer	Seweryn	AWI	scientist	Germany
Laukner	Markus	ARGE	technician	Germany
Lawrenz	Peter	ARGE	technician	Germany
Lenuck	Michael	ARGE	electrician	Germany
Lietmann	Heinrich	ARGE	technician	Germany

Name	First Name	Institute	Profession	Nation
Lindner	Detlef	ARGE	technician	Germany
Lochte	Karin	AWI	director	Germany
Loose	Bernd	AWI	scientist	Germany
Lux	Reinhard	ARGE	technician	Germany
Männl	Ulrich	AWI	scientist	Germany
Marx	Oliver	ARGE	technician	Germany
Matz	Thomas	AWI-logistics	engineer	Germany
Mc Intyre	Trevor	University Pretoria	scientist	South Africa
Miller	Heinz	AWI	deputy director	Austria
Minning	Bernd	ARGE	technician	Germany
Müller	Christian	FIELAX	scientist	Germany
Münch	Lothar	ARGE	technician	Germany
Nantke	Jürgen	AWI	physician	Germany
Nehring	Franziska	AWI	scientist	Germany
Neuber	Jürgen	ARGE	technician	Germany
Nittka	Dirk	external company	technician	Germany
Nixdorf	Uwe	AWI-logistics	deputy head of logistics	Germany
NN	NN	AWI - reservation still pending	AWI reservation still pending	Germany
NN	NN	AWI - reservation still pending	AWI reservation still pending	Germany
NN	NN	AARI - reservation still pending	director	Russia
Pelludat	Ingo	ARGE	technician	Germany
Petersen	Christoph	AWI	scientist	Germany
Plötz	Joachim	AWI	scientist	Germany
Pols	Hans-Arnold	DWD	meteorologist	Germany
Pyrskalla	Boleslav	external company	technician	Germany
Rhode	Martin	ARGE	technician	Germany
Riess	Felix	AWI / Reederei F. Laeisz	engineer	Germany
Rietze	Martin	Baader-Planetarium	engineer	Germany
Ruelke	Axel	Technical University Dresden	scientist	Germany
Schleusener	Arno	ARGE	technician	Germany
Schlüter	Jens-Michael	AWI-computing center	technician	Germany
Schmidt	Roland	ARGE	technician	Germany
Schmidt	Arne	ARGE	electrician	Germany
Schreuder	Manfred	ARGE	kitchen assistant	Germany

Name	First Name	Institute	Profession	Nation
Schröder	Steffen	ARGE	technician	Germany
Schröder	Rainer	ARGE	technician	Germany
Schubert	Holger	Reederei F. Laeisz	technician	Germany
Schwegmann	Kai	ARGE	electrician	Germany
Sellmann	Manuel	AWI	engineer	Germany
Staggat	Dieter	ARGE	technician	Germany
Stanienda	Peter	ARGE	technician	Germany
Steinhage	Daniel	AWI	scientist	Germany
Stel	Jan	NWO	director	The Netherlands
Stenger	Jan	ARGE	technician	Germany
Suhr	Axel	ARGE	technician	Germany
Sulzbach	Frank	external company	technician	Germany
Thöns	Dietrich	ARGE	technician	Germany
Trapp	Michael	realnature.tv	journalist	Germany
Trimborn	Klaus	ARGE	technician	Germany
Turpeinen	Heidi	AWI	scientist	Finland
v. Borstel	Jörg	ARGE	electrician	Germany
v. Hassel	Ralf	ARGE	technician	Germany
Valentine	Henry	SANAP	director	South Africa
van Eijk	Joost	ARGE	technician	Germany
van Opzeeland	Ilse Catharina	AWI	scientist	Germany
Varga	Martin	realnature.tv	journalist	Germany
Veen	Christian	ARGE	electrician	Germany
Wartmann	Maik	ARGE	technician	Germany
Wegener	Bernd	ARGE	technician	Germany
Weigand	Gerhard	AWI	physician	Germany
Weise	Jörg	AWI / Reederei F. Laeisz	engineer	Germany
Weller	Rolf	AWI	scientist	Germany
Winther	Jan Gunnar	NPI - reservation still pending	director	Norway
Witt	Ralf	AWI-logistics	technician	Germany
Wittig	Julia	AWI	scientist	Germany
Woudsma	David	ALCI/Enterprise Airline Inc.	engineer	Canada
Zitterbart	Daniel	AWI	scientist	Germany
Zöllner	Mathias	AWI	scientist	Germany

5.4.2 KGI and O'Higgins

Name	First Name	Institute	Profession	Nation
Abele	Doris	AWI	scientist	Germany
Braun	Matthias	Uni Bonn	scientist	Germany
Daniel	Claudia	AWI	diver	Germany
Fernandoy	Francisco	AWI	scientist	Chile
Gordillo	Francisco	Uni Málaga	scientist	Spain
Husmann	Gunnar	AWI	scientist	Germany
Kopp	Matthias	FSU Jena	scientist	Germany
Koschnick	Nils	AWI	technician	Germany
Lisovski	Simeon	Uni Jena	scientist	Germany
Lucassen	Magnus	AWI	scientist	Germany
Lütz	Cornelius	Uni Innsbruck	scientist	Austria
Mark	Felix	AWI	scientist	Germany
Moreira Neira	Elena	Uni Málaga	scientist	Spain
Meyer	Hanno	AWI	scientist	Germany
Nordt	Anja	Uni Jena	scientist	Germany
Peter	Hans-Ulrich	Uni Jena	scientist	Germany
Remias	Daniel	Uni Innsbruck	scientist	Austria
Rückamp	Martin	Uni Münster	scientist	Germany
Schmidt	Hanna	AWI	diver	Germany
Schwanitz	Max	AWI	scientist	Germany
Sobiech	Jennifer	Uni Münster	scientist	Germany
Strobel	Anneli	AWI	scientist	Germany
Viñegla	Benjamín	Uni Málaga	scientist	Spain
Windisch	Heidrun	AWI	scientist	Germany
Zacher	Katharina	AWI	scientist	Germany

6. PARTICIPATING INSTITUTIONS

6.1 Institute/Company Address

ALCI	Antarctic Logistics Centre Intl. (Pty.) Ltd. 97, Keerom Street Cape Town 8001 Republic of South Africa
ARGE	J.H.K. Engineering GmbH & Co. KG Labradorstr. 5 27572 Bremerhaven Germany KAEFER Isoliertechnik GmbH & Co. KG Riodemannstr. 3 27572 Bremerhaven Germany
AWI	Alfred Wegener Institute for Polar and Marine Research Postfach 12 01 61 27515 Bremerhaven Germany
Baader-Planetarium	Baader-Planetarium Zur Sternwarte 4 82291 Mammendorf Germany
BGR	Federal Institute for Geosciences and Natural Resources Stilleweg 2 30655 Hannover Germany
CHINARE	Chinese Arctic and Antarctic Administration No.1, Fuxingmenwai Ave Beijing, 100860 China
DEAT	Department of Environmental Affairs and Tourism Directorate: Antarctica and Islands P.O. Box 8172, Roggebaai 8012 Cape Town 9012 Republic of South Africa
DNA	Dirección National del Antártico Cerrito 1248 1010 Buenos Aires Argentina
DWD	Deutscher Wetterdienst Bernhard-Nocht Str. 76 20359 Hamburg Germany

EAI	Enterprise Air Inc. 1190 Keith Ross Court L1H 7K4 Oshawa Ontario Canada
FACH	Fuerza Aero de Chile, División Antártica Tarpaca No. 1129, 2°Piso Santiago de Chile Chile
FAU	Fuerza Aero de Uruguay Av. 8 de Octubre 2958 Montevideo 11600 Uruguay
Fielax	Fielax Gesellschaft für wissenschaftliche Datenverarbeitung mbH Schifferstraße 10 – 14 27568 Bremerhaven Germany
FIMR	Finnish Institute of Marine Research Erik Palmenin aukio 1 PL 2 00561 Helsinki Finland
Heli Service	Heli Service International Im Geisbaum 2 63329 Egelsbach Germany
IAA	Instituto Antártico Argentino Cerrito 1248 1010 Buenos Aires Argentina
IAU	Instituto Antártico Uruguayo Av. 8 de Octubre 2958 Montevideo 11600 Uruguay
INACH	Instituto Antarctico Chileno Plaza Munoz Gamero 1055 Punta Arenas, Chile
Kässbohrer	Kässbohrer Geländefahrzeug AG Kässbohrerstr. 11 88471 Laupheim Germany
Laeisz	Reederei F. Laeisz GmbH Brückenstr. 25 27568 Bremerhaven Germany

ManPower	MANPOWER GmbH Personaldienstleistungen Bürgermeister-Smidt-Str.16-18 27568 Bremerhaven Germany
NPIR	National Institute of Polar Research 9-10, Kaga Chome, Itabashi-ku Tokyo 173-8515 Japan
RAE	Russian Antarctic Expedition 38, Bering St. 199397 St. Petersburg Russia
University of Bonn	Zentrum für Fernerkundung der Landoberfläche (ZFL) Walter-Flex-Str. 3 53113 Bonn Germany
University of Jena	AG Polar- und Ornithoökologie Institut für Ökologie Dornburger Str. 159 07743 Jena Germany
ZWMB	Zentrum für Weltraummedizin Berlin Arnimallee 22 14195 Berlin Germany

6.2 DROMLAN – Partners

AWI	Alfred Wegener Institute for Polar and Marine Research, Germany
AARI	Arctic and Antarctic Research Institute, Russian Antarctic Expedition, Russia
BAS	British Antarctic Survey, UK
BELARE	Belgian Antarctic Research Expedition, Belgium
FIMR	Finnish Institute of Marine Research, Finland
NCAOR	National Centre for Antarctic and Ocean Research, India

NIPR	National Institute of Polar Research, Japan
NPI	Norwegian Polar Institute, Norway
NWO	Netherlands Organisation for Scientific Research, The Netherlands
AARI	Russian Antarctic Expedition, Russia
DEAT	Department of Environmental Affairs and Tourism, Directorate: Antarctica and Islands, South Africa
SPRS	Swedish Polar Research Secretariat, Sweden

6.3 DROMSHIP – Partners

AWI	Alfred Wegener Institute for Polar and Marine Research, Germany
BELARE	Belgian Antarctic Research Expedition, Belgium
FIMR	Finnish Institute of Marine Research, Finland
NPI	Norwegian Polar Institute, Norway
SPRS	Swedish Polar Research Secretariat, Sweden