EXPEDITION PROGRAM ANTARCTICA

(ANT – Land 2009/2010)

STATIONS AND FLIGHT MISSIONS

Neumayer Station III

Kohnen Station

Flight Missions

Dallmann Laboratory

Other Activities

Coordination

Uwe Nixdorf

Hartwig Gernandt

ALFRED WEGENER INSTITUTE

FOR POLAR AND MARINE RESEARCH

HELMHOLTZ ASSOCIATION

October 2009

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:
uwe.nixdorf@awi.de
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 2009/2010)

STATIONS AND FLIGHT MISSIONS

Neumayer Station III

Kohnen Station

Flight Missions

Dallmann Laboratory

Other Activities

Coordination

Uwe Nixdorf
Hartwig Gernandt
Thomas Matz
Dirk Mengedoht
Heinz Miller
Christian Wiencke

ALFRED WEGENER INSTITUTE
FOR POLAR AND MARINE RESEARCH
HELMHOLTZ ASSOCIATION

October 2009

EXPEDITION PROGRAM ANTARCTICA

(ANT – Land 2009/2010)

CONTENTS

1. NEUMAYER STATION III

1.1 Summary

The season ANT-Land 2009/2010 is scheduled for the period from 31 October 2009 until 02 March 2010.
Most of personnel and approximately 7.6 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). Ship calls are scheduled for MV Mary Arctica end of December 2009 and end of January 2010, furthermore for SA Agulhas end of December 2009 and beginning of February 2010 to supply the majority of freight and fuel for NEUMAYER STATION III and aircraft operations. RV Akademik Federov will overtake the transport of modules and machines out of Antarctica mid of March 2010.
The voyages of MV Mary Arctica have been coordinated in the frame of Dronning Maud Land Shipment (DROMSHIP).

NEUMAYER STATION III has successfully run its first wintering period.
The main objective of the season 2009/2010 on the Ekström Ice Shelf will be further optimised operation of NEUMAYER STATION III. Logistics will focus on the first lifting of the station under field conditions. Furthermore a construction team will be onsite to repair and modify on the modules of the station.

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).

One field party (10 scientists) performing reflection seismic measurements is planned in the region of Halfvarryggen and Neumayer Station during the season 2009/2010.
Medical studies of the Berlin Centre for Space Medicine (ZWMB) will be continued by the station staff during the winter period.

KOHNEN STATION will be visited for maintenance work such as lifting up the station. Personnel will be transported to the base by aircraft in the frame of DROMLAN.

In total 88 scientists, engineers, technicians and visitors are working or temporarily staying at NEUMAYER STATION III.

- Construction works and documentation (24)
- Logistic operations (16)
- Operation of scientific observatories (3)
- AWI scientific projects – aircraft missions and field parties (14)
- AWI wintering staff (18)
- DWD weather forecast service (2)
- Maintenance of KOHNEN STATION (6)
- International scientific and technical inspection and certification (number of participants not confirmed, preliminary reservation 5)

1.2 Operation of observatories

1.2.1 Meteorological observatory

Bernd Loose (AWI), Mathias Zöllner (AWI), Holger Schmithuesen (AWI)

The meteorological observatory program at Neumayer III is planned to be ongoing. It includes:

- 3-hourly routine synoptic observations,
- daily upper-air soundings,
- weekly ozone soundings,
- continuous surface radiation and mast measurements,
- satellite picture reception (HRPT)

The meteorological observatory provides the necessary support for the forecast service for DROMLAN, aircraft missions and field parties. The meteorological observatory acts as the DROMLAN weather forecast centre.

During the summer season 2009 / 2010 the following activities are planned:

- Exchange of some radiation sensors with new ones.
- Repair and maintenance of all other equipment of the meteorological observatory as necessary.
- Training of the winterers.
- Upgrade of the radiosounding system.
- Heightening of the meteorological field facilities.
- Support of the observatory with expendable goods, spare parts and new equipment.
- Disposal of the observatory of old or defective equipment.
- Installation of an improved ventilation system for air temperature measurements. Aim is the development of a system which ensures an optimal ventilation of the inserted Pt100 – thermometers at all wind directions and speeds.
- Installation of an automatic weather station in the near neighbourhood of the meteorological mast. Aim is to get information about accuracy and reliability of special sensors and to achieve experience in handling of AWS.

1.2.2 Operational weather forecast service for DROMLAN

Christian Kreutzmann (DWD), Hans-Joachim Möller (DWD)

Since 2002/03 the meteorological observatory of the German Antarctic station Neumayer offer 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).

During the summer season 2009/2010 several thousand forecasts will get performed for field parties, ships, stations and especially aircrafts. It is obvious, that this service will increase the safeness of the ambiguous projects in the Dronning Maud Land. Furthermore, it will help to reduce weather induced idle times of expensive flight operations to a minimum

1.2.3 Geophysical observatory

Alfons Eckstaller (AWI), Heidi Anneli Turpeinen (AWI wintering team 2009), Ulrich Männl (AWI wintering team 2009), Tanja Fromm (AWI wintering team 2010), Sarah Huber (AWI wintering team 2010)

The main task of the geophysics group at Neumayer-III during summer season 2009/2010 is the complete replace of the old data acquisition system of the local seismographic network around the base. The former PCM recording system, which dates back to late 1980, does not meet modern technical standards any more for years. It will be replaced by a modern Kinemetrics system. This new data acquisition system will enable us to get seismographic recordings with both high resolution and high dynamic range. Additionally, with the "Antelope" software package there will be a new comprehensive toolbox available for event detection and localisation. With "Antelope" the overwinteres have a wide range of possibilities to analyze their recordings under different seismological aspects. The search for local seismicity in Dronning Maud Land will become more efficient than it was in former years. At both remote stations VNA2 and VNA3 on top of the ice rises Halfvar Ryggen and Søråsen the 20-sec 3-component seismometers, which are currently installed there, will be replaced by new Guralp CMG-ESP broad band seismometers which record waves with periods up to 120 sec. By this a new modern standard in seismographic recording will be introduced at Neumayer-III.

At station VNA2 with its 15-channels detection array the old container for housing the recording equipment a new, specially designed recording container will be installed. The new container holds solar panels with a nominal power of 1200 Watt and 2 wind generators with 300 Watt power each. However, the wind generators which have been currently tested during the winter 2008 showed severe problems. They must be replaced by modified generators next austral summer. The 15 vertical seismometers of the array, in operation since 1997, must definitely recovered next saison and reinstalled near the snow surface. The seismometers are deployed in tubes and should be at depths of approximately 8 meters. Currently it could not be estimated if we might encounter sevre troubles by recovering these seismometers. However, we will try to bring all seismometers up to surface again. Because of a critical shortage of Pistenbullys during summer season 2009/2010 it must tried to free the seismometer tubes from overlaying snow already in December within a few days. For the same reason station VNA3 will be recovered by the wintering team already in late October 2009 and moved back to the base. Reinstallation of VNA3 has to be accomplished by using the aircraft Polar-5. Eventually VNA3 will be deployed at a new site with significantly less snow accumulation.

Data from the broad band station deployed at the Swedish summer base Svea will be retrieved first time by Finnish colleagues who intend to visit this base during next summer season. A separate visit by ourselves is not planned yet. At KOHNEN STATION annual service and data retrieval will be done by a member of the Kohnen traverse team.

At the new built geophysics observatory there are some remaining works to do and some necessary improvements have to be carried out. The installation of a new non-magnetic electrical heating system, made from natural rock, is very important to keep the temperature inside the insulated recording container better at an almost constant level of approximately +5° C. The entrance shaft into the observatory needs also some repairs.

From inside the old geophysics observatory at Neumayer-II all removable parts and materials should be recovered, as far as this will be possible without any risks and can be done with reasonable efforts. After this, the observatory can be completely abandoned. The science store at Neumayer-III needs some reorganization and all equipment which will be no longer needed has to be brought to the freight back home. And there is still some other remaining clearing work, for example at the winter depots, for which there was no time left last season.

1.2.4 Air chemistry observatory

Rolf Weller (AWI), Jessica Helmschmidt (wintering team 2009), Holger Tülp (wintering team 2010)

During the forthcoming summer campaign, our activities at Neumayer III station will focus on the installation of several aerosol measuring instruments from the Finnish Meteorological Institute (FMI, principal investigator: Risto Hillamo) in the new Air Chemistry Observatory. This extension of our instrumentation will aim at assessing aerosol scattering properties dependent on their chemical composition. To this end, an Optical Particle Counter (OPC) to measure aerosol size distribution, an impactor to determine size segregated chemical composition of the aerosol, and an additional nephelometer with an aerodynamic cut-off of 1 µm will be operated at least for the next over-wintering period. It is also planned to re-install a repaired condensation particle counter. Finally, the aerosol sampling apparatus has to be modified. This project and also the air chemistry investigations at NEUMAYER STATION are cooperation with the Institut für Umweltphysik, University of Heidelberg (IUPH).

1.3 Scientific projects

1.3.1 Reflection seismic measurements at Halfvarryggen (LIMPICS)

Olaf Eisen (AWI), Christoph Mayer (BAdW), Astrid Lambrecht (BAdW), Coen Hofstedt (AWI), Reinhard Drews (AWI), Ralf Witt (AWI), Daniela Jansen (Swansea Univ.), Yngve Kristoffersen (Univ. Bergen), Rick Blenker (Univ. Bergen)

The expedition aims at performing a seismic reflection survey from the surface at the Halfvarryggen ice dome, a candidate for the upcoming IPICS 2k/40k ice cores. At ice domes the internal structure imaged with radar data often indicates upwarping internal layers, so-called isochrone arches or Raymond bumps. Modelling studies indicate that the crystal orientation fabric (COF) at larger depths at ice domes should be highly anisotropic. As changes in COF also change the impedance contrast such changes should be detectable with seismic methods. Scientific goals therefore are to detect internal seismic reflection horizons, which will later be compared to radar reflection horizons, along two perpendicular profiles across the ice dome, detect the ice-bed interface and image the upper tens of meters of the underlying bedrock. In addition to these scientific goals the expedition will employ improved drilling devices and new techniques for seismic data acquisition, such a conventional vibroseis truck, in preparation for a similar study at KOHNEN STATION in 2010/11.

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 2010

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 2009. The 29th wintering team should resume the project in 2009. 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 09/10 program. The ferry of POLAR 5 runs from Calgary, 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. For logistic reasons POLAR 5 will be based for the forthcoming season at Novo airfield. The team will consist of 2 scientists, 2 engineers for the scientific system, and a complete flight crew of 2 pilots and a mechanic. The preliminary schedule is given in table 2.1.

Table 2.1: Aircraft missions POLAR 5: Nov 2009 –Feb 2010 - preliminary schedule, first part of the season only.

30/11/2009		ETA at Novo runway
06/12/2009		Support of DROMLAN
07/12/2009	- 15/01/2010	WEGAS off-shore ex Novo airfield
16/01/2010	- 20/01/2010	DoCo ex Novo airfield
20/01/2010	- 24/01/2010	De-integration and packing of scientific equipment
24/01/2010	- 03/02/2010	Support of Neumayer observatories and DROMLAN
04/02/2010		ETA at Rothera for AIRBASE

AWI has coordinated the air transport of personnel and freight to NEUMAYER STATION III within the frame of the Dronning Maud Land Air Network (DROMLAN), which is organized by 11 national operators. Altogether 11 intercontinental flights are planned. DROMLAN performs 11 flights from Cape Town to Novo Airbase (Russia) / Troll (Norway) and back with aircraft Iljushin IL-76TD. 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.

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).

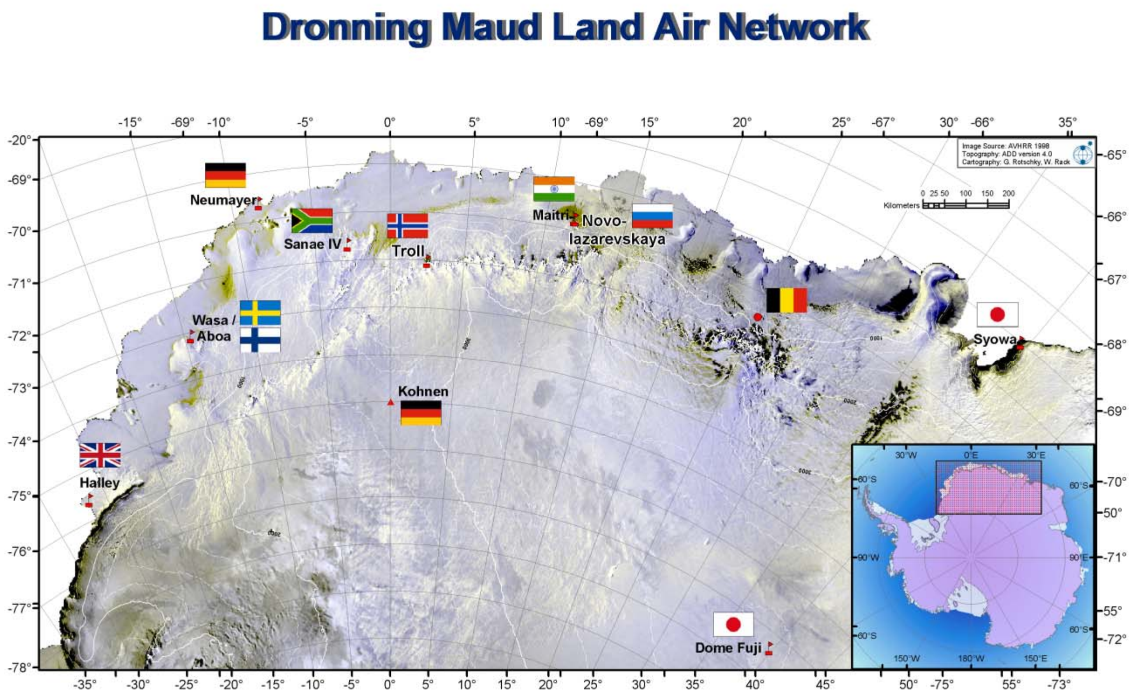

Figure 2.2: Overview map of Dronning Maud Land Air Network.

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.

In season 2009/2010, for DROMLAN altogether 11 intercontinental flights are scheduled with IL-76TD, between 3 Nov. 2009 and 25 Feb 2010.
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 9 DROMLAN members are going to join the intercontinental flights. In total - including support personnel, pilots and others for Novo Airbase - 375 persons will fly into Antarctica and 333 persons back. About 55 tons of airfreight have to be carried in and about 11 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 – 11 flights	375 / 333	55 / 11	88 / 88	7.6 / 1.1

The three BT-67 POLAR 5 (cs C-GAWI), LIDIA (cs C-GEAI), and MIA (cs C-GEAJ) will carry out the feeder flights 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 88 scientists and technicians with about 7.6 tons of cargo will be carried from Cape Town to NEUMAYER STATION III, and 81 persons with about 1.1 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. Logistic flights (approximately 35 flight hours) are planned only for the support of the maintenance of the external observatories of the Neumayer Station and within the DROMLAN project. The schedule for the feeder flights does not exist yet, as the planning for the flights between Cape Town and Novo airfield, respectively Troll Station has not been completed.

2.5 Scientific surveys with POLAR 5

In 2009/10 POLAR 5 will be used for two different geophysical and glaciological projects. The scientific equipment for DoCo and WEGAS off-shore will be flown in from Cape Town, South Africa, with the DROMLAN Iljushin flights.

2.5.1 DoCo East Antarctica

(approximately 30 flight hours)

The project Dome Connections in East Antarctica (DoCo) aims for radar sections connecting deep ice core drill sites in East Antarctica mainly following the ice divides between them (Dome Fuji, Dome A region, Vostok, Dome C, Talos Dome, see also figure aero.fig1) supporting interpretation of the deep ice cores. The ice divides between Kohnen and Dome Fuji with POLAR 2 as well as between Talos Dome – Dome – Vostok – Dome A with POLAR 5 have been mapped in the past. The larger endurance of POLAR 5 compared to POLAR 2 and the possibility to refuel at the former AGAP-N camp allows now to complete the survey and map the ice divide between Dome A and Dome F. The profiles will allow for the first time an independent correlation of the cores by tracing internal layers, isochrones, along the ice divides between the deep ice core drill sites. This survey will be conducted within 4-5 days in January 2010. The instrumentation will consist of the AWI ice thickness radar, geodetic GPS, laser altimeter, and nadir photo camera.

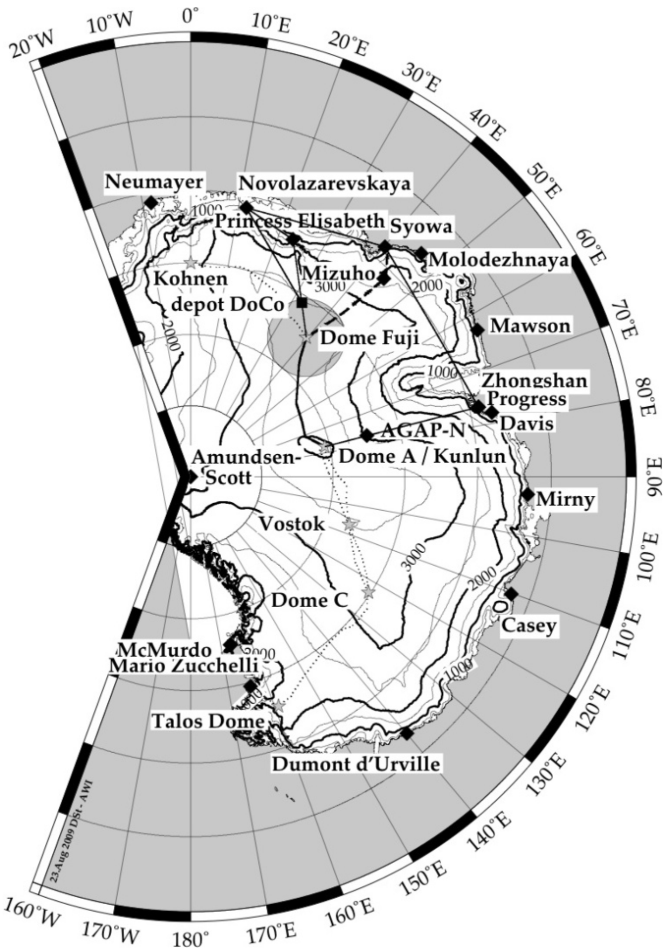

Fig. 2.5.1: Map of the Dome Connection East Antarctica project, bold line bewetenn Dome A and Dome F. The grey stars indicate the deep ice core drill sites (Dome Fuji, Dome A (in preparation), Vostok, Dome C, and Talos Dome) in East Antarctica. The straight grey lines indicate flight tracks towards, respectively from the dome line.

2.5.2 WEGAS off-shore

(up to 150 flight hours)

It is planned to carry out several flights for the WEGAS offshore project, filling gaps in the earlier EMAGE survey, in order to achieve a homogenous line spacing of 10 km for the whole area covered by magnetic and gravity survey flights, see figure aero.fig2. The WEGAS data set will serve as a reference for satellite based magnetic and gravity field measurements, e.g. GRACE. Furthermore will these flights be used to obtain aerial fotos from the sea for looking for seal on ice flows and whales in the upper meters of the sea. For WEGAS off-shore a GPS reference station will be established on a nunatak nearby Novo airfield and a magnetic base station will be set-up for the period of the survey at Novo runway.

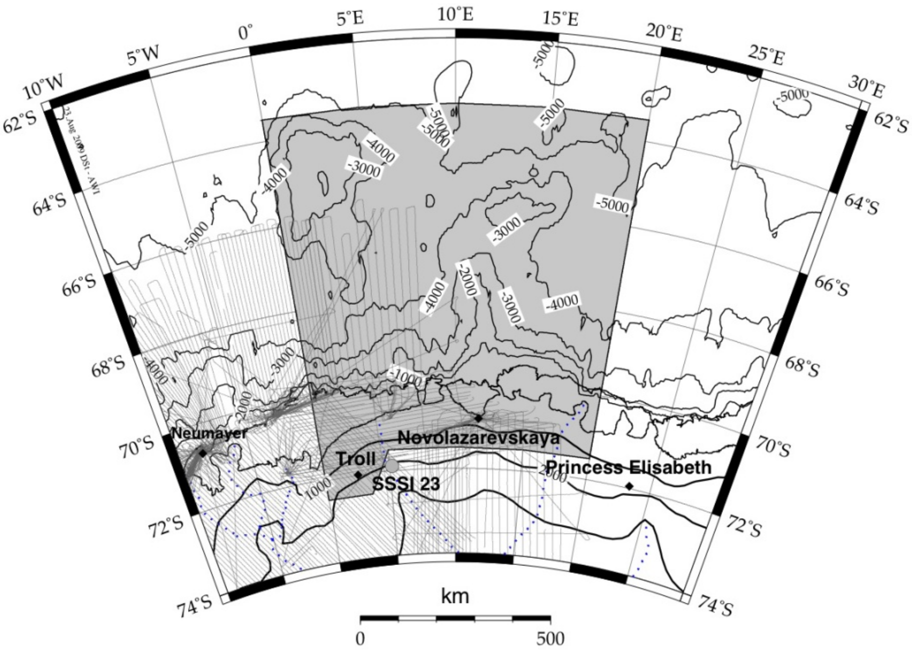

Fig. 2.5.2: Map of survey area of WEGAS off-shore. The tracks of the earlier surveys EMAGE, VISA, and WEGAS are shown as thin grey lines. In the western part of the survey area the planned profiles will have a line spacing of 20 km, and from about 8°E the line spacing will be reduced to 10 km.

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.
Due to delays caused by H1N1 pandemic influenza alarms in the winter period in Argentina and Chile, transport schedules are still pending.

3.2 DALLMANN Laboratory

The DALLMANN Laboratory at Base Jubany (Argentina) will be opened at the end of November 2009. It is operated in cooperation with the Instituto Antártico Argentino (IAA) and placed at the Argentinean station Jubany. During the season 2009/10 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 8.5 ton of cargo have to be shipped by sea.
On 30 March 2010 RV Ernest Shackleton will call for King George Island to pick up cargo. Station will be closed end of April 2010, after the sea elephant tagging period.

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 (Max Schwanitz, Claudia Daniel, Marco Brunotte)

“Climate change in polar regions is expected to be among the largest and most rapid of any region on the Earth, and will cause major physical, ecological, sociological, and economic impacts, especially in the Arctic, Antarctic Peninsula, and Southern Ocean” (IPCC 2001, Climate Change: Impacts, Adaptation and Vulnerability). On the Antarctic Peninsula a recent rapid regional warming with a temperature increase of more than 2.5K has been observed over the last 50 years.
Moreover, due to anthropogenic emission of ozone-depleting substances a decline in stratospheric ozone concentrations was detected in the early1980s. The ozone layer protects all living organisms from excessive ultraviolet-B radiation (UV-B, 280-320 nm). During Antarctic spring, the ozone concentration can decrease by >50%, increasing the UV-B radiation reaching the Earth’s surface. Little improvement is expected for total column ozone in that region for the next several decades and whether or not ozone levels will ever recover to pre-1980s values is still unknown.

How do these changes affect the benthic primary producers and consequently the Antarctic ecosystem? Benthic algae are of great importance for the diversity and stability of coastal ecosystems and are responsible for 10% of the global total carbon production. Marine benthic algae play an essential role for many marine animals, providing food and shelter. They are directly consumed by grazers, which can therefore alter the structure and species composition of algal communities.
Changes in pelagic and benthic PP will have subsequent cascading effects through the pelagic and benthic food webs and thus, community structures. Due to the extreme importance of the benthic primary producers within coastal ecosystems any change or decrease in their abundance, diversity and primary productivity due to environmental changes, can have dramatic consequences for all species associated.
Although proven to be of great importance to the shallow-water ecosystem, Antarctic benthic algae communities have rarely been studied. The results of the experiments planned will help to understand more about the trophic links and dynamics of the Antarctic ecosystem under a changing environment. The focus of the study lies on macro- and microalgal communities and young developmental stages (as they are shown to be most susceptible to anthropogenic stresses). The planned field-experiments with spores and germlings are the first attempts to detect differences in germination due to UV radiation in the Antarctic region and there is a general lack of information about the long-term succession of algal communities in Antarctica.

This will be the second field-season of this project from January to February 2010.
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 Lic Gabriela Campana and Dr. Maria Liliana Quartino. Artificial substrata has been 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 time between two samplings might be longer). This experiment is part of a cooperation between the Instituto Antarctico Argentino (Dr. ML Quartino) and the 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 and simultaneously in the laboratory to ((i) ambient light, (ii) ambient minus UV-A, (iii) ambient minus UV) in different waters depth (0 to 8 m) for approx. 2d. After that spore solutions will be post-cultured in the laboratory under low light for 9 d and survival and germination succession of the different species will be controlled every third day.
3. Two-factorial experiments will take place in the laboratory checking the interactive effects of macroalgal spores to e.g. different temperatures and light regimes.

PAR and UV radiation will be measured continuously in air. 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.

3.2.1.2 The impact of environmental change on the Antarctic fish *Pleuragramma antarcticum* – identifying physiological and ecological limits

Katja Mintenbeck (AWI)

This project aims at investigating the vulnerability of the Antarctic silverfish, *Pleuragramma antarcticum* (Notothenioidei, Perciformes), to environmental alterations due to climate change. The pelagic shoal fish *P. antarcticum* is a key species in the Antarctic marine food web and provides a major trophic link between zooplankton and the systems top predators, such as seals, seabirds and penguins. Climate change in the marine Antarctic is reflected in increasing temperature and reduced salinity, both entailing alterations in phytoplankton and zooplankton composition. Alterations in the zooplankton community include changes in species composition, size structure, and species' energy content. *P. antarcticum* might, thus, be affected by environmental change (i) directly at the physiological level and/or (ii) indirectly via alterations in zooplankton composition and prey availability. The work on King George Island will focus on the impact of the indirect effects and hence on the ability of *P. antarcticum* to cope with alterations in zooplankton community. Using simple feeding experiments, the impact of changes in prey availability, prey size, and prey quality on survival and condition of *P. antarcticum* will be analysed.

Work on King George Island:

All available developmental stages of *P. antarcticum* will be caught alive using different gears (e.g. purse seine/drag net, Bongo net, Agassiz trawl). Animals will be transferred to tanks and kept at natural temperature and salinity.

To test for the effects of food availability and prey quality, fish will be kept separated in three tanks for several weeks. One group of fish will starve, one group will be fed on energy rich prey, and one group will be fed on low quality food. After ending of the experiment, increases in length and weight of individuals will be measured. Tissue samples will be taken and stored deep frozen for analyses of lipid content, lipid composition and elemental composition in the home lab.

To investigate the capability of different developmental stages of *P. antarcticum* to cope with changes in prey size, individual fish (larvae, juveniles, adults) will be fed on prey of different size. For each individual encounter rate depending on prey size will be determined.

Depending on the available number of live fish, some preliminary experiments on temperature and salinity sensitivity of *P. antarcticum* might be carried out, as well.

3.2.1.3 Mitochondrial plasticity in response to changing abiotic factors in Antarctic fish and cephalopods

Anneli Strobel (AWI), Felix Mark (AWI)

Mitochondria are a key element in shaping whole organism energy turnover and functional capacity. Recent insight into the special molecular characters of Antarctic fish mitochondria provides a unique opportunity to develop and test hypotheses explaining the role of these characters in setting thermal tolerance.

In this project we focus on the responses of Antarctic fish and cephalopods to changing ambient temperature at the mitochondrial level. Fishes of the sub-order Notothenioidei inhabit polar, sub-polar and in part cold temperate waters and therefore are good comparative model organisms for studies of thermal plasticity among closely related Antarctic fish species. This holds also true for the octopods (order: Cephalopoda), which are found from tropical to polar latitudes. In Antarctic waters, these highly developed animals share the same spatial and ecological niche as benthic notothenioids and thus directly compete for the same resources in the ecosystem. Elaboration of the contribution of mitochondria to the special features of stenothermy and climate sensitivity in Antarctic fishes and cephalopods appears as a highly relevant and timely contribution to the field of climate sensitivity of Antarctic ecosystems.

We intend to investigate the effects of temperature on mitochondrial metabolism of cephalopods and fish, specifically addressing the effects of thermal acclimation and adaptation on mitochondrial capacities and proton leakage. Furthermore, we want to analyze how the standard metabolic rate is affected when the Antarctic animals are exposed to thermal challenges. We will investigate the effect of temperature change on the respiration rate of the animal and in this way analyse a potential oxygen limitation of thermal tolerance of notothenioids and octopods.

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

Felix Mark (AWI), Anneli Strobel (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 second season at Jubany, we will further 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.

3.2.1.5 Foraging ecology of southern elephant seal males and oceanography

J. Plötz (AWI), P.J.N. De Bruyn (MRI), R. Reisinger (MRI), H. Bornemann (AWI)

Southern elephant seals undertake long-distance migrations in search of food. Variations in their foraging ranges and feeding habitats are therefore an important source of information about environmental variability integrated over a wide range of spatial and temporal scales. The proposed study is a follow-up of an ARGOS satellite telemetry project on elephant seals tagged at King George Island in March and April 2000. We found that adult males moved as far as 75°S to the east of the Antarctic Peninsula with maximum distances of more than 1700 km from King George Island. The seals travelled deep into the winter pack ice of the Weddell Sea along the western continental shelf break until they reached the region of the sill of the Filchner Trough outflow where they remained in a localized 100 km wide shelf-slope area for several months. This area corresponds with one of the main source regions for deep and bottom water production, which are important for initiating the global ocean circulation as Antarctic Bottom Water. The area restricted movements of the seals in this region are indicative of active foraging in a locally attractive feeding spot. The factors contributing to these oceanic hotspots of enhanced food availability are largely unexplored. What makes certain areas in the Antarctic Ocean better for foraging than others, what is the spatial and temporal stability of these feeding spots, what are the dominant oceanographic features under the sea ice particularly in wintertime, and do seals continue to travel to these areas? These questions are challenging and call for re-instrumentation of adult males from this southernmost breeding population of elephant seals.

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 Mammal Research Institute (MRI) at the University of Pretoria, South Africa, the National Institute of Polar Research (NIPR), Tokyo, Japan, and the Instituto Antártico Argentino (IAA) within the Dirección Nacional del Antártico (DNA) in Buenos Aires, Argentina. A new type of seal-mounted ARGOS satellite-relayed dive loggers (SRDL) is designed to record high-quality data of the animals' at-sea locations, their diving activity, and the concurrent water temperature and salinity (CTD) profiles, allowing for interpretation of the animals' fine-scale movements and foraging locations in terms of their immediate ocean environment. From each of the satellite tagged seals we expect up to 20 CTD-profiles per day in almost real time, allowing us to study how changes in the underwater environment may alter prey distribution beneath the ice as being indicated by the seals' individual diving and foraging behaviour. We further expect that the 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. Some seals may be additionally instrumented with miniaturized jaw acceleration (JAM) and underwater camera loggers (DSL). These units are designed by the NIPR to provide proxy data for food ingestion and snapshot images of the prey-field ahead of the diving seals.

Work at King George Island - Isla 25 de Mayo:

Up to 20 post-moult southern elephant seal males will be equipped with ARGOS CTD-SRDLs at the haul out sites of the seals along ASPA 132 (Potter Peninsula). A maximum of six of the satellite tagged animals may be additionally equipped with JAM and DSL to directly measure feeding activity. It is envisaged that a number of devices can be retrieved when the seals will have returned to the beaches at ASPA 132 during their forthcoming breeding our moulting season in 2010/11. For the purpose of instrumentation, the field team will check the haul out sites of the seals from March to April on a daily schedule in order to register arrival or respectively presence of suited males, in particular of those that have previously been marked by A. Carlini (IAA) and co-workers. The moult period needs almost three weeks to be completed. Towards the end of the moult the devices will be glued to the new fur of anaesthetized seals using quick setting epoxy resin and nylon mesh. The proper instrumentation of the seals will be controlled until the seals are going to leave for their winter foraging migration.

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 2010

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 2010 (API 2010; 15 January " 25 February 2010) 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). 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. 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) and AWI.

4.2 Activities supported by AWI

4.2.1 The geochemical response of sedimentary archives to rapid recent glacier retreat at the Western Antarctic Peninsula (WAP): from source to sink

Patrick Monien, Sanja Asendorf (ICBM)

The Western Antarctic Peninsula (WAP) region is one of the most sensitive and dynamic areas of the earth, where ecological and cryospheric systems respond rapidly to climatic changes. During the past 60 years a rapid regional warming and a concomitant glacier retreat were observed, affecting the coastal ecosystem by turbid meltwaters and contributing to global sea level rise. Furthermore, the occurrence of new ice-free areas may promote chemical weathering and soil formation on previously ice-covered bedrocks.

The overarching goal of our study is to assess whether the documented temperature increase and associated glacier retreat at WAP is reflected in the sedimentary record and weather such episodes have occurred within the Holocene before. Therefore, we intend to characterize the particulate (SPM)

and dissolved load of glacial meltwaters draining into Potter Cove, King George Island, by inorganic geochemical methods (major and minor elements, nutrients). The extent of meltwater drainage and SPM input will be investigated by analyzing surface sediments from Potter Cove on a 500 m grid. Based on provenance analyses we will document whether the material introduced into this bay is evenly distributed and uniform in composition and if specific source areas can be distinguished by their chemical signature. Additionally, it will be studied whether the reported increase in SPM may be quantified by determining sediment accumulation rates with ^{210}Pb. Longer sediment cores from Potter Cove and Maxwell Bay may moreover serve as archives for the climatic and paleoenvironmental development of this area during the Late Holocene - the last century in particular - and will be analyzed at high temporal resolution. In cooperation with the British Antarctic Survey sediments from lakes located at the Fildes and Potter Peninsula will further be used as reference sites.
The results of this research may contribute to the better understanding of the impact of global climate change on regional terrestrial and marine ecosystems at the WAP in the past and future. This study forms part of the project *Rapid Climate Change at the Western Antarctic Peninsula: Chemical Flux Change and Environmental Consequences* and will be conducted in close cooperation with the project *Fe and Mn in Antarctic bivalves: Indicators of change in near-shore biogeochemistry?* by Dr. Doris Abele from the Alfred Wegener Institute, Bremerhaven.

4.2.2 Foraging ecology and migration of Antarctic skuas

Stephanie Domaschke (Senckenberg institute), Fernando Fernandez (Senckenberg institute)

Antarctic and arctic populations of lichens select genetically different strains of green algal photobionts than temperate ones. The goals of the project are to genotype mycobionts and photobionts from antarctic, arctic and temperate populations of *Cetraria aculeata*, to measure their photosynthetic parameters and to transplant arctic and antarctic individuals to temperate plots in a common garden design in order to find out whether this is indicates ecotypic differentiation. In addition, populations of six other bipolar lichens shall be collected for investigation of their dispersal capacities. The ultimate goal is to investigate whether differential association with ecotypically differentiated photobionts allows widely distributed lichen fungi to inhabit climatically hostile polar regions and whether there is ongoing gene-flow between arctic, antarctic and temperate lichen populations

4.2.3 Foraging ecology and migration of Antarctic skuas

Hans-Ulrich Peter (Jena University)

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. 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.

5. LOGISTICS, SCHEDULES, PARTICIPANTS

5.1 DROMLAN flight schedules

5.1.1 Feeder flights (planning stage: October 2009)

in / out by	date	ID	route	pax in	pax out
DROMLAN flight - Iljushin 76TD	03-05 Nov 2009	D1	Cape Town - Novo - Cape Town	4	0
DROMLAN flight - Iljushin 76TD	10-12 Nov 2009	D2	Cape Town - Novo - Cape Town	9	0
DROMLAN flight - Iljushin 76TD	13-17 Nov 2009	TAC-1	Cape Town - Novo - Cape Town	9	0
DROMLAN flight - Iljushin 76TD	19-24 Nov 2009	D3	Cape Town - Novo - Cape Town	0	0
DROMLAN flight - Iljushin 76TD	30 Nov-02 Dec 2009	D4	Cape Town - Novo - Cape Town	6	4
DROMLAN flight - Iljushin 76TD	16-20 Dec 2009	TAC-2	Cape Town - Novo - Cape Town	9	1
DROMLAN flight - Iljushin 76TD	06-08 Jan 2010	D5	Cape Town - Troll - Cape Town	30	2
DROMLAN flight - Iljushin 76TD	29 Jan-02 Feb 2010	TAC-3	Cape Town - Novo - Cape Town	13	10
DROMLAN flight - Iljushin 76TD	08-11 Feb 2010	D6	Cape Town - Novo - Cape Town	1	32
DROMLAN flight - Iljushin 76TD	20-22 Feb 2010	D7	Cape Town - Novo - Cape Town	0	28
DROMLAN flight - Iljushin 76TD	24-25 Feb 2010	D8	Cape Town - Novo - Cape Town	0	4
Basler (BT-67)	26 Oct 2009 – 02 March 2010	Basler	Calgary – Novo - Calgary	16	13
Polar 5, Mia, Lidia			**DROMLAN Pax in / out:**	**81**	**81**
Total number of participants:	**88**		**Total pax movements**	**97**	**94**

5.2 Travel schedule for participants, DML
(planning stage: October 2009)

surname	given name	institute/company	profession	nation	activity	in	out
Neumayer-Station							
Logistics							
Kohlberg	Eberhard	AWI-logistics	physician	Germany	coordinator logistics	D2	D8
Matz	Thomas	AWI-logistics	engineer	Germany	coordinator logistics	D1	D8
El Naggar	Saad	AWI-logistics	scientist	Germany	coordinator science/construction NM III	D5	D7
Janneck	Jürgen	AWI-logistics	engineer	Germany	coordinator construction NM III	D2	D8
Marold	Peter	AWI	engineer	Germany	occupational safety	TAC-3	D6
Stoeckert	Axel	AWI	physician	Germany	occupational health	TAC-3	D6
Enss	Dietrich	AWI	engineer	Germany	surveyor	D1	D7
Blattner	Marc	Fa. Kässbohrer	technician	Germany	vehicle maintenance	D2	D8
Hofmann	Joerg	FIELAX	engineer	Germany	IT maintenance	D1	D5
Hacker	Richard	IgH	hydraulics engineer	Germany	hydraulic system	D2	TAC-2
Laukner	Markus	ARGE (J.H.K. / KAEFER)	technician	Germany	electro-technics	TAC-3	D6
Korff	Michael	Enercon	technician WKA	Germany	wind power plant NM III	D5	D6
NN	NN	Enercon	software engineer	Indian	software development	TAC-3	D6
NN	NN	Enercon	software engineer	Germany	software development	TAC-3	D6
Walker	Ingrid	external company	service	Germany	service	TAC-1	D7
Quirandt	Katharina	external company	service	Germany	service	TAC-1	D7
							16

Observatories Neumayer Station III

Loose	Bernd	AWI	technician	Germany	meteorological observatory	D5	D7
Eckstaller	Alfons	AWI	scientist	Germany	geophysical observatory	TAC-2	D7
Weller	Rolf	AWI	scientist	Germany	air chemistry observatory	D5	D7
							3

Construction Team Neumayer-Station III

Behrends	Detlev	ARGE (J.H.K. / KAEFER)	project leader	Germany	project management	TAC-3	D7
Germerott	André	ARGE (J.H.K. / KAEFER)	engineer	Germany	construction leader	D5	D7
Hennsmanns	Hartmut	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	TAC3	D6
Hartwig	Hubert	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	TAC-3	TAC-3
Meyer	Hans-Jürgen	ARGE (J.H.K. / KAEFER)	engineer	Germany	surveyor	D1	D2
Tegge	Holger	ARGE (J.H.K. / KAEFER)	technician	Germany	construction leader	D1	D4
Sommer	Jörg	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Gieslak	Adam	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Al-Khaled	Khaled	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Schreuder	Manfred	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Karpawitz	Jörg	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
v. Borstel	Jörg	ARGE (J.H.K. / KAEFER)	electrician	Germany	electrical engineering	D5	D7
v. Hassel	Ralf	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Eder	Pit	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Schütz	Sven	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D5	D7
Minning	Bernd	IMTECH	technician	Germany	construction works	D5	D7
Lux	Reinhard	ARGE (J.H.K. / KAEFER)	technician	Germany	construction works	D1	D4

Falkenberg	Falk	external company	technician	Germany	logistics / maintenance team	D5	D7
Nittka	Dirk	external company	technician	Germany	logistics / maintenance team	D2	D7
Lemkau	Sascha	external company	technician	Germany	logistics / maintenance team	D2	D7
Rautenkranz	Mathias	external company	technician	Germany	logistics / maintenance team	D2	D7
Rogge	Bernhard	external company	technician	Germany	logistics / maintenance team	D2	D7
Scheffing	Egon	external company	technician	Germany	logistics / maintenance team	D2	D7
Schwennesen	Björn	external company	technician	Germany	logistics / maintenance team	TAC-1	D7
							24
KOHNEN STATION - maintenance							
Drücker	Cord	AWI	engineer	Germany	Kohnen maintenance	TAC-2	D6
Schubert	Holger	AWI, Reederei F. Laeisz	technician	Germany	Kohnen maintenance	TAC-2	D6
Köhler	Jens	AWI, Reederei F. Laeisz	technician	Germany	Kohnen maintenance	TAC-2	D6
Trimborn	Klaus	external company	technician	Germany	Kohnen maintenance	TAC-2	D6
Lochthofen	Norman	AWI	technician	Germany	Kohnen maintenance	TAC-2	D6
Fröhlich	Mike	AWI, Reederei F. Laeisz	cook	Germany	cook Kohnen station	TAC-2	D6
							6
DROMLAN flight weather service							
Kreutzmann	Christian	DWD	meteorologist	Germany	DROMLAN weather forecast	D5	Basler
Möller	Hans-Joachim	DWD	meteorologist	Germany	DROMLAN weather forecast	Basler	D5
							2
Scientific projects							
Eisen	Olaf	AWI	scientist	Germany	LIMPICS expedition	D5	D6
Drews	Reinhard	AWI	scientist	Germany	LIMPICS expedition	D5	D6
Hofstede	Coen	AWI	scientist	Netherlands	LIMPICS expedition	D5	D6

Jansen	Daniela	Swansea Univ. UK	scientist	Germany	LIMPICS expedition	D5	D6
Bohleber	Pascal	Univ. Heidelberg	scientist	Germany	LIMPICS expedition	D5	D6
Kristoffersen	Yngve	University Bergen	scientist	Norway	LIMPICS expedition	D5	D6
Blenkner	Rick	University Bergen	technician	Norway	LIMPICS expedition	D5	D6
Mayer	Christoph	BAdW	scientist	Germany	LIMPICS expedition	D5	D6
Lamprecht	Astrid	BAdW	scientist	Germany	LIMPICS expedition	D5	D6
Witt	Ralf	AWI	technician	Germany	LIMPICS expedition	D5	D6
							10
Wintering Team 2009							
Weigand	Gerhard	AWI	physician	Germany	station leader, physician	2009	D6
Brehme	Andreas	AWI / Reederei F. Laeisz	engineer	Germany	station engineer	2009	D6
Hüttebräuker	Olaf	AWI / Reederei F. Laeisz	engineer	Germany	electrician	2009	D6
Riess	Felix	AWI / Reederei F. Laeisz	engineer	Germany	electronic engineer, IT, radiooperator	2009	D6
Kazanc	Tamer	AWI / Reederei F. Laeisz	cook	Germany	cook	2009	D6
Turpeinen	Heidi	AWI	scientist	Finland	geophysics	2009	D6
Männl	Ulrich	AWI	scientist	Germany	geophysics	2009	D6
Hellmschmidt	Jessica	AWI	scientist	Germany	air chemistry	2009	D6
Zöllner	Mathias	AWI	scientist	Germany	meteorology	2009	D6
							9
Wintering Team 2010							
Wetegrove	Olaf	AWI	physician	Germany	station leader, physician	D4	2011
Heuck	Hinnerk	AWI / Reederei F. Laeisz	engineer	Germany	station engineer	TAC-1	2011
Ganter	Armin	AWI / Reederei F. Laeisz	engineer	Germany	station electrician	TAC-1	2011
Erdmann	Guido	AWI / Reederei F. Laeisz	engineer	Germany	IT engineer	TAC-1	2011
Schoon	Paul	AWI / Reederei F. Laeisz	cook	Germany	cook	D4	2011

Fromm	Tanja	AWI	scientist	Germany	geophysics	TAC-2	2011
Huber	Sarah	AWI	scientist	Germany	geophysics	TAC-2	2011
Tülp	Holger	AWI	scientist	Germany	air chemistry	D5	2011
Schmidthüsen	Holger	AWI	scientist	Germany	meteorology	D5	2011
							9
Aircraft POLAR 5 scientific missions							
Steinhage	Daniel	AWI	scientist	Germany	POLAR 5 campaign	D4	TAC-3
Leinweber	Volker	AWI	scientist	Germany	POLAR 5 campaign	D4	TAC-3
Müller	Christian	FIELAX	scientist	Germany	POLAR 5 campaign	D4	TAC-3
Gehrmann	Martin	AWI	engineer	Germany	POLAR 5 campaign	D4	TAC-3
							4
Visitors							
VIP				Germany	official visit	TAC-3	TAC-3
VIP				Germany	official visit	TAC-3	TAC-3
VIP				Germany	official visit	TAC-3	TAC-3
VIP				Germany	official visit	TAC-3	TAC-3
VIP				Germany	official visit	TAC-3	TAC-3
							5
					Total number of participants:		**88**

5.3 Travel schedule for participants, KGI

(planning stage: October 2009)

Names, Institute	profession	Travel arrangements
Elena Moreira Neira, Universidad de Málaga	scientist	November-December 2009
Francisco Jimenez, Universidad de Málaga	scientist	November-December 2009
Andrea de Souza, Universidad de Málaga	scientist	November-December 2009
Felix Mark, AWI	scientific manager	November 2009- January2010
Anneli Strobel, AWI	scientist	November 2009- January2010
Katja Mintenbeck, AWI	scientist	November 2009- January2010
Fernando Fernandez, Senckenberg institute	scientist	December 2009
Stephanie Domaschke, Senckenberg institute	scientist	December 2009
Harald Poigner, AWI	scientist	Januar- March 2010
Patrick Monien, ICBM	scientist	Januar- March 2010
Sanja Asendorf, ICBM	scientist	Januar- March 2010
Doris Abele, AWI	scientific manager	February-March 2010
Katharina Zacher, AWI	scientist	Februar- March 2010
Max Schwanitz, AWI	head of German diving group	Februar- March 2010
Claudia Daniel, AWI	scientific diver	Februar- March 2010
Marco Brunotte, AWI	scientific diver	Februar- March 2010
Francesca. Pasotti, Uni Gent	scientific diver	Februar- March 2010
Ann Vanreusel, Uni Gent	scientist	February 2010
Joachim Plötz, AWI	scientist, scientific manager	March- April 2010
P.J.N. De Bruyn, MRI	scientist	March- April 2010
R. Reisinger, MRI	scientist	March- April 2010
Horst Bornemann, AWI	scientist	March- April 2010

5.4 Participants

5.4.1 DML

Name	First Name	Institute	Profession	Nation
Al-Khaled	Khaled	ARGE (J.H.K. / KAEFER)	technician	Germany
Behrends	Detlev	ARGE (J.H.K. / KAEFER)	project leader	Germany
Blattner	Marc	Fa. Kässbohrer	technician	Germany
Blenkner	Rick	University Bergen	scientist	Norway
Bohleber	Pascal	Univ. Heidelberg	scientist	Germany
Brehme	Andreas	AWI / Reederei F. Laeisz	engineer	Germany
Drews	Reinhard	AWI	scientist	Germany
Drücker	Cord	AWI	engineer	Germany
Eckstaller	Alfons	AWI	scientist	Germany
Eder	Pit	ARGE (J.H.K. / KAEFER)	technician	Germany
Eisen	Olaf	AWI	scientist	Germany
El Naggar	Saad	AWI-logistics	scientist	Germany
Enss	Dietrich	AWI	engineer	Germany
Erdmann	Guido	AWI / Reederei F. Laeisz	engineer	Germany
Falkenberg	Falk	external company	technician	Germany
Fröhlich	Mike	AWI, Reederei F. Laeisz		
Fromm	Tanja	AWI	scientist	Germany
Ganter	Armin	AWI / Reederei F. Laeisz	engineer	Germany
Gehrmann	Martin	AWI	engineer	Germany
Germerott	André	ARGE (J.H.K. / KAEFER)	engineer	Germany
Gieslak	Adam	ARGE (J.H.K. / KAEFER)	technician	Germany
Hacker	Richard	IgH	hydraulics engineer	Germany
Hartwig	Hubert	ARGE (J.H.K. / KAEFER)	technician	Germany
Hellmschmidt	Jessica	AWI	scientist	Germany
Hennsmanns	Hartmut	ARGE (J.H.K. / KAEFER)	technician	Germany
Heuck	Hinnerk	AWI / Reederei F. Laeisz	engineer	Germany
Hofmann	Joerg	FIELAX	engineer	Germany
Hofstede	Coen	AWI	scientist	Netherlands
Huber	Sarah	AWI	scientist	Germany
Hüttebräuker	Olaf	AWI / Reederei F. Laeisz	engineer	Germany
Janneck	Jürgen	AWI-logistics	engineer	Germany
Jansen	Daniela	Swansea Univ. UK	scientist	Germany
Karpawitz	Jörg	ARGE (J.H.K. / KAEFER)	technician	Germany
Kazanc	Tamer	AWI / Reederei F. Laeisz	cook	Germany
Kohlberg	Eberhard	AWI-logistics	physician	Germany
Köhler	Jens	AWI, Reederei F. Laeisz	technician	Germany

Name	First Name	Institute	Profession	Nation
Korff	Michael	Enercon	technician WKA	Germany
Kreutzmann	Christian	DWD	meteorologist	Germany
Kristoffersen	Yngve	University Bergen	scientist	Norway
Lamprecht	Astrid	BAdW	scientist	Germany
Laukner	Markus	ARGE (J.H.K. / KAEFER)	technician	Germany
Leinweber	Volker	AWI	scientist	Germany
Lemkau	Sascha	external company	technician	Germany
Lochthofen	Norman	AWI	technician	Germany
Loose	Bernd	AWI	technician	Germany
Lux	Reinhard	ARGE (J.H.K. / KAEFER)	technician	Germany
Männl	Ulrich	AWI	scientist	Germany
Marold	Peter	AWI	engineer	Germany
Matz	Thomas	AWI-logistics	engineer	Germany
Mayer	Christoph	BAdW	scientist	Germany
Meier	Hans-Jürgen	ARGE (J.H.K. / KAEFER)	engineer	Germany
Minning	Bernd	IMTECH	technician	Germany
Möller	Hans-Joachim	DWD	meteorologist	Germany
Müller	Christian	FIELAX	scientist	Germany
Nittka	Dirk	external company	technician	Germany
NN	NN	Enercon	software engineer	Germany
NN	NN	Enercon	software engineer	Indian
Quirandt	Katharina	external company	service	Germany
Rautenkranz	Mathias	external company	technician	Germany
Riess	Felix	AWI / Reederei F. Laeisz	engineer	Germany
Rogge	Bernhard	external company	technician	Germany
Scheffing	Egon	external company	technician	Germany
Schmidthüsen	Holger	AWI	scientist	Germany
Schoon	Paul	AWI / Reederei F. Laeisz	cook	Germany
Schreuder	Manfred	ARGE (J.H.K. / KAEFER)	technician	Germany
Schubert	Holger	AWI, Reederei F. Laeisz	technician	Germany
Schütz	Sven	ARGE (J.H.K. / KAEFER)	technician	Germany
Schwennesen	Björn	external company	technician	Germany
Sommer	Jörg	ARGE (J.H.K. / KAEFER)	technician	Germany
Steinhage	Daniel	AWI	scientist	Germany
Stoeckert	Axel	AWI	physician	Germany
Tegge	Holger	ARGE (J.H.K. / KAEFER)	technician	Germany
Trimborn	Klaus	external company	technician	Germany
Tülp	Holger	AWI	scientist	Germany
Turpeinen	Heidi	AWI	scientist	Finland
v. Borstel	Jörg	ARGE (J.H.K. / KAEFER)	electrician	Germany

Name	First Name	Institute	Profession	Nation
v. Hassel	Ralf	ARGE (J.H.K. / KAEFER)	technician	Germany
VIP				Germany
VIP				Germany
VIP				Germany
VIP				Germany
VIP				Germany
Walker	Ingrid	external company	service	Germany
Weigand	Gerhard	AWI	physician	Germany
Weller	Rolf	AWI	scientist	Germany
Wetegrove	Olaf	AWI	physician	Germany
Witt	Ralf	AWI	technician	Germany
Zöllner	Mathias	AWI	scientist	Germany

5.4.2 KGI and O'Higgins

Name	First Name	Institute	Profession	Nation
Abele	Doris	AWI	scientific manager	Germany
Asendorf	Sanja	ICBM	scientist	Germany
Bornemann	Horst	AWI	scientist	Germany
Brunotte	Marco	AWI	scientific diver	Germany
Domaschke	Stephanie	Senckenberg	scientist	Germany
Daniel	Claudia	AWI	scientific diver	Germany
De Bryn	P.J.N.	MRI	scientist	South Africa
de Souza	Andrea	Universidad de Málaga	scientist	Spain
Fernandez	Fernando	Senckenberg	scientist	Spain
Jimenez	Francisco	Universidad de Málaga	scientist	Spain
Mark	Felix	AWI	scientific manager	Germany
Mintenbeck	Katja	AWI	scientist	Germany
Monien	Patrick	ICBM	scientist	Germany
Moreira Neira	Elena	Universidad de Málaga	scientist	Spain
Passotti	Francesca	Uni Gent	scientific diver	Italy
Plötz	Joachim	AWI	scientific manager	Germany
Poigner	Harald	AWI	scientist	Germany
Reisinger	R.	MRI	scientist	South Africa
Schwanitz	Max	AWI	head of diving group	Germany
Strobel	Anneli	AWI	scientist	Germany
Vanreusel	Ann	Uni Gent	scientist	Belgium
Zacher-Aued	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
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
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
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
RAE	Russian Antarctic Expedition 38, Bering St. 199397 St. Petersburg Russia
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
Enercon	ENERCON GmbH Dreekamp 5 D-26605 Aurich Germany
ICBM	Institut für Biologie und Chemie des Meeres (ICBM) AG Mikrobiogeochemie Carl-von-Ossietzky-Str. 9-11 Postfach 2503 26111 Oldenburg, Germany

MRI	Mammal Research Institute Room 2-33 Zoology & Entomology University of Pretoria Pretoria South Africa
Universidad de Malaga	Universidad de Málaga Avda. Cervantes,2 29071 MÁLAGA Spain
Swansea Univ. UK	Swansea University Geography/ Glaciology Singleton Park Swansea SA2 8PP Wales, UK

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