

SCAR WG on GEODESY and GEOGRAPHIC INFORMATION (WG-GGI)

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REPORT OF CURRENT ACTIVITIES OF GERMANY FOR 1998-2000

Prepared by R. Dietrich, Dresden

The following German organisations/institutes have developed working programmes to conduct research or operational work in the Antarctic in the field of Geodesy, Photogrammetry, Remote Sensing, Bathymetry or Cartography:

AWI	Alfred Wegener Institute for Polar and Marine Research Bremerhaven
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover (Federal Institute for Geosciences and Mineral Resources)
BKG	Bundesamt für Kartographie und Geodäsie, Frankfurt am Main and Leipzig (Federal Institute for Cartography and Geodesy)
BSH	Bundesamt für Seeschifffahrt und Hydrologie, Hamburg (German Hydrographic Service)
DLR	Deutsche Forschungsanstalt für Luft- und Raumfahrt, Oberpfaffenhofen (German Aerospace Research Establishment)
GIK	Geodätisches Institute Universität Karlsruhe
IFE	Institut für Erdmessung, Universität Hannover
IPG	Institut für Physische Geographie, Universität Freiburg
TUBS	Institut für Geodäsie und Photogrammetrie, Technische Universität Braunschweig
TUDD	Institut für Planetare Geodäsie, Technische Universität Dresden

1 Field Activities

1.1 Geodetic Surveys

GPS Observations

GPS permanent stations (AWI, BKG) were running continuously at O'Higgins and Neumayer Station. Additional permanent GPS stations were operated at Jubany Station/Dallmann Lab., Rothera Station, Gough Island, Belgrano II Station in co-operation with the countries that are operating these stations. The GPS observations contribute to the network of globally distributed stations of the International GPS Service for Geodynamics (IGS).

The SCAR GPS campaign data analysis and archive center was established and operated at TUDD.

In 1998/99 SCAR GPS campaign's 1997/98 observations were analysed (AWI, IFE, GIK, TUBS, TUDD) to determine station coordinates and velocities in the ITRF96.

GPS measurements were made during the 1999/2000 GANOVEX VIII expedition in co-operation with Italy in order to determine crustal deformations in Northern Victoria Land (TUDD).

VLBI, PRARE

The permanent geodetic observatory at O'Higgins served as VLBI observing station as well as a PRARE ground station (BKG).

PRARE measurements were carried out at the Neumayer station, too (AWI).

1.2 Tide Gauge

Permanent tide gauges were operated at O'Higgins (BKG), Jubany Station/Dallmann Lab. and San Martin (AWI) in co-operation with the countries that are operating these stations. The sensors were connected to the local terrestrial height reference system by levelling and are surveyed and maintained regularly.

1.3 Remote Sensing / Satellite Altimetry

With the use of satellite altimetry, a DEM and changes of ice elevations were assessed by BKG in order to study ice mass balance.

Gravity anomalies from satellite altimetry were analysed by AWI for gravity field determination in the region of the Weddell Sea.

Calibration and validation of ERS radar altimeters over ice were carried out by AWI.

TUDD applied InSAR techniques for ice velocity determination and grounding line mapping in Dronning Maud Land and North Victoria Land.

1.4 ERS-1/2 Data Acquisition

The SAR data acquisition at O'Higgins was continued by DLR in the manner of campaigns.

2 Mapping Activities

2.1 Topographic and Thematic Mapping

The following maps have been prepared:

Satellite Image Map Dronning Maud Land 1:2000000, Draft Version 4.2,
BKG, Frankfurt am Main, Nov. 1998.

There are ongoing thematic & topographic mapping activities at Neuschwabenland, Filchner-Ronne-Iceshelf, Antarctic Peninsula (BKG).

AWI and BKG are working on a topographical and glaciological database of the Antarctic Peninsula.

The IPG carried out several measurements, including GPS, to draw up topographic maps at the Antarctic Peninsula, Primavera & Marguerite Bay.

For the purpose of ice cap and glacier studies, IPG worked on GIS and topographic maps, assessed glacier flow velocities and determined surface elevations by use of DGPS in the regions of King George Island, South Shetland Island, San Martin, Marguerite Bay and Antarctic Peninsula.

2.2 Hydrographic Charting

Activities are under way in the Weddell Sea to contribute to the INT Chart Series (AWI, BKG, BSH).

Bathymetric charting in Weddell Sea and Scotia Sea was done by AWI.

To study iceberg plough marks, AWI used bathymetry and side scan sonar in the Upper Shelf of the Eastern and Southern Weddell Sea.

German bathymetric charting activities in Antarctic waters are coordinated by AWI, hydrographic charting by BSH.

3 Geographic Information Activities

3.1 GIS established

With the support of the German Ministry for Research and Technology, BKG has established and does maintain the "Geo-scientific Information System Antarctica" (GIA).

BKG works on the 1st and 4th Antarctic quadrant.

4 Geographical Names

The co-operation with Gazetteer, Guidelines was continued.

BKG organised and hosted the WG-GGI Coordinators Meeting that was held in July 1999 in Heppenheim, Germany.