

Report on Activities 2000-2002

Program: Geographic Information
Project: KGIS (King George Island GIS)
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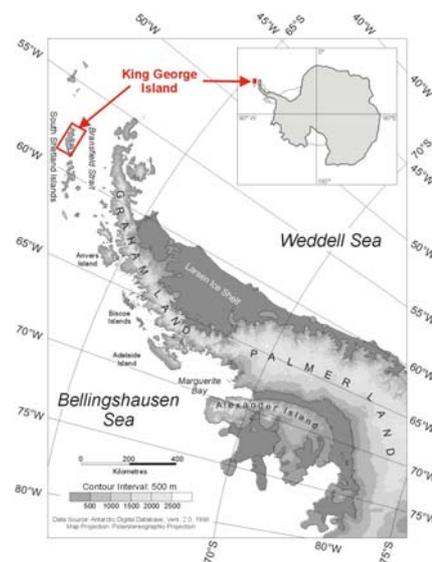
A. Project Summary

King George Island, part of the South Shetland Islands, is located at the northern tip of the Antarctic Peninsula. The ice-free areas and coastal zones of the island carry a diverse plant and animal life. Several protected areas have been established on the island under the Antarctic Treaty. Penguins, seals, petrels and the rich vegetation make the island's natural environment a favourite for ship borne and airborne tourism. King George Island features also the probably greatest concentration of multinational research activities in Antarctica. Human activities on the island are based on several permanent and summer stations of a variety of nations and on an airstrip on ice-free ground maintained by the Chilean air force. The manifold human activities lead to severe impacts on the vulnerable ecosystems of the island.

Probably nowhere else in Antarctica the need for co-ordinated approaches in research activities and environmental management is more evident than on King George Island. This is reflected by Scientific Committee on Antarctic Research's (SCAR) recommendation SCAR XXVI-6 adopted at the XXVI SCAR in Tokyo, July 2000, that calls for efforts to integrate scientific objectives and for collaboration among the nations working on the island.

The King George Island GIS (KGIS) project of the Working Group on Geodesy and Geographic Information (WG GGI) provides a fundamental contribution to these endeavours. The aim of the project is to produce an integrated geographic database for use by all countries and in multi-disciplinary applications. It is co-ordinated under the Geographic Information Program of the SCAR Working Group on Geodesy and Geographic Information by Institut f. Physische Geographie, University of Freiburg, Germany (IPG Freiburg). Contributing nations include Argentina, Brazil, Chile, China, Germany, Korea, Poland, Russia and Uruguay. The KGIS project provides a database for research and management that can be accessed on the www.

The KGIS project was formally adopted by the WG GGI in 1998 at SCAR XXV under the co-ordination of Poland. A scoping study was performed on existing spatial data and on the geodetic infrastructure of the nations active on the island. The International Antarctic GIS Workshop hosted by the Wuhan Technical University of Surveying and Mapping in July 2000 was a major push to the GIS work on King George Island. At XXVI SCAR, Tokyo, July 2000, the project coordination was transferred to IPG Freiburg.



B. Report on Activities 2000-2002

Goal: To produce an integrated geographic database for use by all countries, for use in multi-disciplinary applications.

Activities according to the 2000-2002 GI program:

1. Develop a specification (including the SCAR Spatial Data Model)
2. Obtain geographic data from members
3. Integrate the geographic data and standard products
4. Produce a user manual for the database including all metadata
5. Provide on-line access and user registration facility.

Source: GGI website <http://www.scar-ggi.org.au/>

1. Develop a specification (including the SCAR Spatial Data Model)

The KGIS datasets comprise a wide range of data produced by different nations and institutions, by a variety of surveying methods, and come in a multitude of data types ranging from paper maps and CAD drawings to GIS data. To integrate these datasets requires specifications, and these are being developed by the GI project SCAR Spatial Data Model. The KGIS is adopting these standards and assisting in the development of the Model.

2. Obtain geographic data from members

A large scale topographic database for major parts of the island was compiled based on the substantial contributions of most of the collaborative partners of the project. Data contributors include FH Karlsruhe (Germany), IAA Buenos Aires (Argentina), IAAG Muenchen (Germany), IGIK Warszawa (Poland), INACH/IGM Santiago de Chile (Chile), IPG Freiburg (Germany), KORDI Seoul (Korea), LaPAG/UFRGS Porto Alegre (Brazil), RAE St. Petersburg (Russia) and SGM/IAU Montevideo (Uruguay). Thematic data for e.g. hydrography, glaciology, and infrastructure forms also part of the database.

3. Integrate the geographic data and standard products

Integration activities ranged from digitising of paper maps, to converting CAD and other digital datasets to GIS format. All data were transformed to a common geodetic datum, projected to UTM Zone 21S, and integrated to seamless datasets. If data adjustment was necessary less accurate data was adjusted to more accurate data.

The KGIS datasets offer a suitable testbed for the feature type catalogue, an important part of the SCAR Spatial Data Model. A four week stay in June/July 2002 at Australian Antarctic Division proved to be very helpful in the integration of the data and to the further development of the Feature Type Catalogue. The close link between the KGIS project and the SCAR Spatial Data Model project should be maintained and the KGIS data used as an example in further development of the model.

4. Produce a user manual for the database including all metadata

An informative User Manual was written to assist scientists, managers and logistic personnel with details on how the data was compiled and how it can be used.

Information on data quality is crucial when exchanging, integrating and re-using data. Care was taken to collect and document metadata including data quality. These were regarded as an integral part of the datasets. Metadata on the source datasets (as provided by the data producers) as well as metadata on the integrated datasets will be published in the Antarctic Master Directory, the internationally accessible, web-based, searchable record of Antarctic data set descriptions (<http://gcmd.gsfc.nasa.gov/Data/portals/amd/>). It will also be distributed with the shapefiles in FGDC (Federal Geographic Data Committee) Content Standard for Digital Geospatial Metadata format using XML. The User Manual includes details about finding and reading the respective metadata.

5. Provide on-line access and user registration facility

The KGIS website is hosted by IPG Uni Freiburg and can be access at:

<http://www.ipg.uni-freiburg.de/forschung/ap3/kgis/>

The website provides information on the project, a list of maps on King George Island, disclaimer and terms of use as well as user registration and data download facilities. Access statistics are recorded. Users can download the data in ESRI shapefile format. These should be readily included into any common GIS package. The user registration mechanism enables users to be informed of updates of the datasets. The website is based on an Apache Web server using php4 and MySQL.

Once the data is completely remapped to the SCAR feature type catalogue the download facilities will be online (expected in September 2002).

Additional Activities

Close links to related GIS projects on King George Island by INACH and Laboratório de Pesquisas Antárticas e Glaciológicas, Universidade Federal do Rio Grande do Sul (LaPAG/UFRGS), Porto Alegre/Brazil, have been established. On invitation by Instituto Antártico Chileno (INACH), Santiago de Chile, the project was introduced on the island itself at a scientific meeting at Bellingshausen Station in February, 2001. At CoMNAP/SCALOP XIII (Council of Managers of National Antarctic Programs / Standing Committee on Antarctic Logistics and Operations) in August 2001 the project was introduced to CoMNAP/SCALOP representatives.

Introducing the project to scientists and station commanders on the island proved to be very successful and resulted in substantial data input and feedback to the project. Unfortunately it was not possible to attend the 2nd Scientific Coordinators Meeting of King George Island Stations. A key component of the success and further advancement of the project is to participate in the next Scientific Coordinators Meeting on King George Island.