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**WORKING GROUP ON GEODESY AND GEOGRAPHIC INFORMATION**  
**REPORT TO XXVII SCAR DELEGATES MEETING, SHANGHAI, CHINA**  
**ON ACTIVITIES UNDERTAKEN IN 2000-2002**

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**PREAMBLE**

The need for a mapping and surveying component to Antarctic research was first recognised during the IGY in 1957/58, the crucible for the creation of SCAR. Initially the President of SCAR headed an interim committee, which included Geology, Glaciology and Cartography. This led to a Working Group on Cartography being separately established by SCAR in 1959. The main objectives of this WG were to provide mapping and positioning support to Antarctic scientists working in an uncharted continent.

From its formalisation as the Working Group on Geodesy and Cartography in 1961 until this SCAR XXVII meeting in Shanghai, forty one years later, it has operated as a continuous entity with one slight name change to Geodesy and Geographic Information. Australia has chaired the WG throughout the period with a focus on encouraging involvement amongst SCAR nations and coordination of activities. The WG has been productive in the support all Antarctic science groups and has produced many important products. These include the SCAR composite gazetteer of Antarctic place names, the SCAR Antarctic Digital Topographic data base, and the development of a uniform geodetic datum, being the basis for all spatial information in Antarctica.

The WG structure has evolved over the past ten years with umbrella groupings of related activities as below :

- GIANT for Geodesy related activities and
- Geographic Information group (GIP) for Geographic Information
- At the SCAR XXVI meeting in Tokyo a separate Outreach program was established as a communication strategy.

The WG-GGI has to date reported on its activities directly to the SCAR Executive, and to the SCAR delegates meetings.

In the SCAR Review, the Working Group on Geodesy and Geographic Information has been placed within the Geoscience Standing Scientific Group (GSSG). WG-GGI has been reformed within GSSG as the Geospatial Information Group of Experts to carry forward ongoing projects and incorporate Geophysical information in its scope. Future reporting will form part of the broader Geoscience SSG report to SCAR.

**1. SHANGHAI MEETING 14-17<sup>th</sup> July 2002**

Representatives and observers from 11 SCAR countries and observers from three non government organisations attended the Working Group on Geodesy and Geographic Information (WG-GGI) meeting at XXVII SCAR, 14-17 July 2002, in Shanghai, China:

- Members and observers (or their representatives): Australia, Canada, Chile, China, Germany, Italy, Japan, Poland, Russia, UK, and USA.
- Observers: International Association of Geodesy (IAG), International Steering Committee for Global Mapping (ISCGM), and International Federation of Surveyors (FIG).

Apologies were received from Argentina, Belgium, Brazil, Finland, France, New Zealand, Norway, Sweden and Uruguay. The current Working Group membership is listed at Attachment 1.

The agenda for the Shanghai meeting is at Attachment 2. Key activities were:

- reports by project leaders on outcomes from the seventeen WG-GGI projects defined at Tokyo in 2000;
- amalgamation with the former Geosciences Working Group to form the Geoscience Standing Scientific Group and creation of a Group of Experts on Geospatial Information (GIG); and
- definition of fifteen continuing and three new GIG projects for 2002-2004.

Through the period 2000-2002 the WG-GGI continued to focus on providing the fundamental geodetic and geographic information needed to support Antarctic science, environmental monitoring and logistics for field operations.

National reports were tabled from 11 countries, active in Antarctic geodesy, mapping and GIS. Presentations and briefings were given on the range of SCAR activities and other relevant projects and programs.

Recommendations were examined and revised. Two new recommendations were developed addressing geodetic observations at remote locations and King George Island scientific data.

Project reports on the seventeen projects developed at the SCAR XXVI Tokyo meeting were presented. All projects either fully or substantially met their goals, with the exception of the Bathymetric Database, which was withdrawn by the Project Leader in 2001 due to lack of resources. In summary:

### ***Geodetic Infrastructure for Antarctica (GIANT) Program***

1. Permanent Geodetic Observatories: the permanent network now comprises 13 GPS sites, 3 DORIS sites, 2 PRARE sites, 2 VLBI sites, 2 GLONASS sites, 12 tide gauges and 8 absolute gravity stations. Nine GPS sites are contributing data daily to the International GPS Service (IGS), an increase of 5 in the past four years.
2. GPS Epoch Campaigns for crustal motion: Continent wide field campaigns were not undertaken in the period as the technology now enables observations to be integrated on a daily basis rather than the need for simultaneous observations as continent wide campaigns. However specific regional high accuracy campaigns are being undertaken in the Trans Antarctic Mountains. Results from all past epoch campaigns were integrated and submitted to the International Earth Rotation Service (IERS) for inclusion in the International Terrestrial Reference Frame (ITRF) 2000.
3. Physical Geodesy: primary data sources have been identified and collaborative arrangements have been developed with the International Association of Geodesy (IAG) and the International Geoid Service (IGeS).
4. Geodetic Control data Base A considerable step forward was made on this activity with geodetic indexes from a number of countries being posted to the web as clickable locations for meta data
5. Tide gauges A report was presented on progress with the compilation of a history of tide gauges and the general need for a manual of coping with the difficulties of running tide gauges in Antarctica
6. Atmospheric impact on GPS Observations in an Antarctic environment The difficulties in obtaining correlated and reliable meteorological observations with GPS observation was providing some hindrance on the project but results were impressive in working with European colleagues on the issues.

7. Remote Observatory technology The progress made with TAMDEF equipment and on site data acquisition was discussed . It was noted that the new Javad receivers only needs 2.2 watts for operation whilst flash cards of 512mb allowed some 300 days to be captured.
8. Ground truthing for new satellite mission The requirements for calibration of neww satellite is being investigated for the Antarctic ice sheet particularly in the opportunity to improve the profiled data for Antarctica from ICeSAT

Detailed work plans for this 2000-2003 program can be found at Attachment 3.

### ***Geographic Information Program (GIP)***

1. Spatial Data Standards: in line with ISO TC211 standards a draft feature-type catalogue was produced as a requirement for the King George Island GIS project. This will form the basis for all on-going GIS activities to meet ISO standards. The feature-type catalogue will be circulated for comment by members.
2. Place Names: the SCAR Composite Gazetteer of Antarctica (CGA) Supplement 2002 was published and tabled. The CGA now contains in excess of 34 100 names for more than 17 000 features. The CGA web site <www.pnra.it/SCAR\_GAZE> continues to be updated quarterly. An ARC/INFO format file of the database is available from the web and has generated more than 50 requests within the first 6 months of being listed.
3. Topographic Database: SCAR Antarctic Digital Database (ADD) Version 4.0 contains a major revision of the east Antarctic coastline produced by Australia. It will be released online at [www.nerc-bas.ac.uk/public/magic/add\\_home.html](http://www.nerc-bas.ac.uk/public/magic/add_home.html), by the end of the year. Over 1000 users from 41 countries have downloaded ADD data, and derived data has been submitted to the Global Map project. Germany tabled a Digital Elevation Model (produced by Johannes Idhe of BKG) of the continent derived from ERS satellite radar altimetry.
4. King George Island GIS: Project nears completion and comprehensive documentation and website containing data will be available shortly This impressive activity highlighted positional inaccuracies in the place names on the island, which could be easily rectified by the integrated use of satellite imagery and GIS.
5. Bathymetric Database: New Zealand withdrew This project. Correspondence with IHO concerning a new project on the International Bathymetric Chart of the Southern Ocean is underway.
6. Maps and Charts Catalogue: a comprehensive web-based catalogue is available through the Australian Antarctic Division website. Countries are invited to validate their map catalogue collections with an online revision tool.
7. Imagery Catalogue: A selection of US flight line indexes are available online through the US Antarctic Research Centre at USGS – [usarc.usgs.gov](http://usarc.usgs.gov)
8. East Antarctic GIS: Russia reported on a major proposal, initially developing a GIS of the Larsemann Hills, before extending it across the East Antarctic. The full cost of the project was estimated to be in excess of US\$1 Million and would require a significant injection of funding from SCAR.
9. Cybercartographic Atlas: Prof. Fraser Taylor announced he has submitted a developmental proposal for significant funds to the Canadian government using the Antarctic region as part of a wider research project on cognitive cartography.
10. Online Atlases: A presentation was made on recent developments in the Atlas including the addition of a number of raster image datasets.

Detailed work plans for this program can be found at Attachment 4.

### ***Outreach Program***

1. Website Maintenance: The WG-GGI web site <[www.scar-ggi.org.au](http://www.scar-ggi.org.au)> now contains details of all GGI projects, reports of meetings, notices of future events, geodetic data, member contact details and links to related sites. Was maintained through the period with annual statistics on site usage being available on the site. More than 7 500 individual users accessing almost 100 000 pages each year were recorded.

2. Publications: Two e-mail list servers are used for circulation of information to members with approximately 2 messages per week being sent to the list. Four WG-GGI newsletters were sent out during the period reporting on the status of projects and activities being made by WG members.
3. Liaison: Liaison with WG observer members (such as FIG, IAG, Global Map, JCADM and IHO) has worked well during the last 2 years. It remains a very important aspect in the promotion of geodesy and geographic information activities. The Working Group's programs and products have significant global and interdisciplinary applications. Liaison with external bodies has been working well and it is essential it continue well in order to ensure that activities are appropriately integrated and focussed on scientific and operational needs.

A report from the Global Map project was presented to the Shanghai meeting. Prof D. R. Fraser Taylor (WG representative from Canada) has been recently appointed as the new Chairman of this important global mapping initiative.

Geodesists from WG-GGI are active in a number of IAG Commissions and Special Study Groups relating to Antarctic research, and three remain members of the ANTEC Group of Specialists. The WG-GGI also has a representative that is very involved with ISO TC211 and welcomed the fact that SCAR is now a Class A liaison member to TC211.

4. Meetings: The following WG-GGI meetings were held during the period:
  - Program Coordinators meeting, Italy, and July 2001. Thirteen members attended, enabling mid-term review of progress in all WG-GGI projects and the formal adoption of the Cybercartographic Atlas project into the work plan. There was also much discussion on the implications of the SCAR review on where GGI might end up in the new structure.
  - Geographic Information Workshop, Italy, July 2001. Ten members attended, with good progress being made on individual project activities. Demonstrations on on-line atlases and place names also occurred.
  - Antarctic Geodesy Symposium (AGS'01), St Petersburg, July 2001. Fourteen people from eight countries attended, with twenty four papers presented. The proceedings have been published by SCAR – SCAR Report Number 21, January 2002. Papers are available from both the SCAR and WG-GGI web sites.
  - Place Names Workshop, Rome, and November 2001. The project examined future strategies for maintaining the database and the project itself as well as making corrections to entries in the database.
  - Special Antarctic Session, European Geophysical Society Scientific Assembly, Nice, April 2001. Papers on the status of Antarctic geodesy were presented in a combined ANTEC and GIANT symposium.
  - Special Antarctic Session, European Geophysical Society Scientific Assembly, Nice, April 2002. A smaller group met to discuss the status of Antarctic geodesy projects.
  - Cybercartographic Atlas Workshop, Puerto Madryn, Argentina, November 2001. Thirteen people attended the workshop enabling further development of this WG-GGI project.
  - Cybercartographic Atlas Workshop, Ottawa, Canada, May 2002. Eight participants attended the workshop at which the structure and content of the Atlas was further developed. Preparation for a major funding application to the Canadian government occurred.

Detailed work plans for the program activities 200-2002 can be found at Attachment 5. Acronyms applicable to WG-GGI and used in this report are listed in Attachment 6.

## **2. PLANS FOR 2002-2004**

The future activities of the Working Group were discussed at the Shanghai meeting and it was recommended that the group should continue as a Geospatial Information Group of Experts, expanding its role from Geographic to include Geophysical and Geological elements. The

appropriate structure for future activities was to continue the umbrella approach linking program elements together, eg.

- GIANT for geodesy related activities and
- GIP for geographic information.

The ongoing GIANT program should consist of the following components

- Permanent geodetic observatories (to include geophysical observatories)
- Epoch crustal movement campaigns
- Tides Gauges
- Remote observatory technologies
- Physical Geodesy information data base (to include Geomagnetic information)
- Geodetic control data base
- Atmospheric Impact on GPS observations
- Ground truthing for new satellite missions
- East Antarctica GIS - the geodetic component
- Geodetic positioning advice on protected areas

The ongoing Geographic Information program should consist of the following components

- Names gazetteer
- Antarctic Digital topographic data base
- Digital map catalogue (to include Geological information)
- King George Island GIS
- Spatial data standards (including feature type catalogue for GIS)
- On line national atlas projects
- SCAR Cybercartographic Atlas (to include geological and Geophysical information)
- Larsemann Hills GIS
- GEBCO cooperative bathymetric database

Future work programs for the above will be developed as part of the Geosciences SSG activities at the meetings during the 18<sup>th</sup> and 19<sup>th</sup> of July.

John Manning  
Outgoing Chief Officer  
17<sup>th</sup> July 2002

*Attachments:*

- 1. Working Group membership and contact details*
- 2. Shanghai meeting agenda*
- 3. GIANT Program Work Plan 2000-2002*
- 4. GI Program Work Plan 2000-2002*
- 5. Outreach Program Work Plan 2000-2002*
- 6. Acronyms*
- 7. Screen dumps from WG-GGI web site*

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## WORKING GROUP ON GEODESY & GEOGRAPHIC INFORMATION

**Shanghai, China  
14-17 July 2002**

# AGENDA

### Venue

The meetings of the SCAR WG-GGI will be held in the Shanghai Exhibition Centre (SEC).

## Sunday 14 July 2002

### 1400 1. WG-GGI Administration

- confirmation of agenda
- circulation of Project Reports (hard copies)
- circulation of National Reports (hard copies)
- circulation of reports from International liaison bodies (hard copies)
- outcomes and actions arising from SCAR XXIV
- actions arising from Program Coordinators Meeting in Siena, Italy, July 2001

### Afternoon Tea

### 1600 1. WG-GGI Administration (continued)

- Future WG-GGI-type activities. Discussion on what sort of GGI projects might be carried forward as Action Groups into the new Geoscience Standing Scientific Group.
- Applications for SCAR funding will need be submitted for consideration at the SCAR Delegates Meeting. Funding from non-SCAR sources - such as ICSU - should also be considered. [Projects such as ADD, Place Names, Cyberatlas, Physical Geodesy and any other GIS / Geodesy related project, as well as an inter-period meeting could be considered]

## Monday 15 July 2002

### 0900 Official SCAR Opening Ceremony - Plenary

*To be held in the Shanghai Exhibition Centre*

### Morning Tea

### 1100 Address by the SCAR President - Plenary

*Address to all XXVII SCAR participants by President Bob Rutford*

### Lunch

### 1300 2. Project Reports 2000-2002

Project Coordinators to present reports, advising the Working Group of the status of projects.

Outreach Program Session (Chaired by Australia)

- |                |                 |
|----------------|-----------------|
| • Web site     | Glenn Johnstone |
| • Publications | Glenn Johnstone |
| • Liaison      | John Manning    |
| • Meetings     | Glenn Johnstone |

### 1330 2. Project Reports 2000-2002 (continued)

GIANT Program Session (Chaired by Australia)

- |                                    |                              |
|------------------------------------|------------------------------|
| • Permanent Geodetic Observatories | John Manning                 |
| • Crustal Deformation Network      | Reinhard Dietrich            |
| • Geodetic Control Database        | Tony Bevin / Glenn Johnstone |

### Afternoon Tea

### 1530 2. Project Reports 2000-2002 (continued)

GIANT Program Session (Chaired by Australia)

- |  |                   |
|--|-------------------|
| • Tide Gauge Data                        | Kazou Shibuya     |
| • Atmospheric Impact on GPS Observations | Jan Cisak         |
| • New Satellite Missions                 | Reinhard Dietrich |
| • Physical Geodesy                       | Alessandro Capra  |
| • Remote Geodetic Observatories          | Larry Hothem      |

### 1730 Reporting sessions finish

## Tuesday 16 July 2002

### 0830 2. Project Reports (continued)

Geographic Information Program Session (Chaired by UK)

- Topographic Database Janet Thomson
- Spatial Data Standards (inc. Feature Type Catalogue) Henk Broslma
- King George Island GIS Steffen Vogt / Jefferson Simones

### Morning Tea

### 1100 2. Project Reports (continued)

Geographic Information Program Session (Chaired by UK)

- Map Catalogue Henk Broslma
- Place Names Roberto Cervellati
- Imagery Catalogue Jerry Mullins

### Lunch

### 1300 2. Project Reports (continued)

Geographic Information Program Session (Chaired by UK)

- [Bathymetric Database \(Project withdrawn in 2001\)](#) Tony Bevin
- On-line Atlases Jerry Mullins
- Cybercartographic Atlas Fraser Taylor

### Afternoon Tea

### 1530 3. Final WG-GGI Report to SCAR

Members will assist the Chief Officer with the finalisation of budgets, funding applications, WG resolutions, identification of GGI projects that might be carried forward into the new Geoscience SSG, confirmation of actions arising from the meeting and the WG-GGI report to SCAR.

### 1700 Meeting Closed

### 1900 WG-GGI Dinner (to be arranged by Prof E Dongchen)

**Wednesday 17 July 2002**

**SCIENCE SYMPOSIUM - "The Antarctic sea ice zone:  
Physical and biological processes and interactions"**

John Turner from BAS is co-ordinating the symposium, and there will be a 30 minute session delivered by Prof Fraser Taylor on the WG-GGI project 'Cybercartographic Atlas of Antarctica'.

**WG-GGI activities during the Science Symposium**

**0930** Demonstration of Chinese 'GeoStar' GIS software

Dr Nengcheng Chen of the Chinese Antarctic Center for Surveying and Mapping

**1330** Technical Visits to either Shanghai VLBI Station OR Chinese Antarctic Database Centre at the Polar Research Institute of China

WG-GGI members can choose which technical visit they wish to participate in.

**Thursday 18 July 2002 and Friday 19 July 2002**

The old WG-GGI will be reformed as part of the new Geoscience Standing Scientific Group (GSSG) - a separate meeting will be held for these 2 days.

**Saturday 20 July 2002**

**Special Joint SCAR / COMNAP session**

It is intended to convene a joint session of COMNAP and SCAR members on the morning of Saturday 20th July 2002 to facilitate presentations and discussion on various topics including:

- \* Mapping and Geodesy;
- \* Subantarctic lakes exploration;
- \* Possible Southern Ocean initiative; and
- \* Science planning activities.

Presentations in the Mapping and Geodesy session are planned by:

- Prof Fraser Taylor: Cybercartographic Atlas
- John Manning: Other WG-GGI activities

# GIANT PROGRAM 2000-2002

There are eight projects in the GIANT Program, these are:

1. [Permanent Geodetic Observatories](#);
2. [Crustal Deformation Network](#);
3. [Physical Geodesy](#);
4. [Geodetic Control Database](#);
5. [Tide Gauge Data](#);
6. [Atmospheric Impact on GPS Observations in Antarctica](#);
7. [Remote Geodetic Observatories](#); and
8. [New Geodetic Satellite Missions](#)

**Program Coordinator:** [Mr John Manning](#)

**Program Objectives:**

1. Provide a common geographic reference system for all Antarctic scientists and operators.
2. Contribute to global geodesy for the study of the physical processes of the earth and the maintenance of the precise terrestrial reference frame
3. Provide information for monitoring the horizontal and vertical motion of the Antarctic.

A list of the activities within each project of the GIANT Program for the period 2000 to 2002 is given below, the Project Leader and Collaborators are also identified.

---

## [1. Permanent Geodetic Observatories](#)

**Project Leader:** Australia - [Mr John Manning](#)

**Collaborator:**

**Goal:** To develop an infrastructure of permanent geodetic stations to bring all individual geodetic networks to a common datum, and to provide geodetic information for the global monitoring and analysis of natural earth processes.

**Activities:**

1. Facilitate on-line satellite data retrieval from established ground stations
  2. Extend the network of permanent geodetic observatories which provide data for crustal deformation studies
  3. Post details of all permanent sites on web site
  4. Develop and publish GPS base station specifications, including [guidelines for monumentation](#)
  5. Facilitate survey of accurate local ties between collocated techniques and web access
  6. Collaborate with other SCAR scientists to identify requirements for space geodetic sites
    - for manned stations
    - for remote locations
- 

## [2. Crustal Deformation Network](#)

**Project Leader:** Germany - [Prof Reinhard Dietrich](#)

**Collaborators:** Italy, Chile, Japan, China, Australia, USA

**Goals:**

1. To densify the geodetic infrastructure established from the permanent observatories; and
2. To develop a deformation model for surface movement vectors within a common Antarctic reference frame.

**Activities:**

1. Co-ordinate annual epoch campaigns
  2. Maintain orderly data archive and data access from these campaigns
  3. Identify and coordinate integration of regional campaigns
  4. Facilitate GPS connections to tide gauge bench marks
  5. Deliver results to ITRF in conjunction with results from permanent observatories
  6. Collaboration with appropriate IAG Antarctic Crustal Deformation Sub-Commission
  7. Integration of solutions using ITRF guidelines
  8. Develop and place on the web guidelines for ground mark monuments
- 

## [3. Physical Geodesy](#)

**Project Leader:** Italy - [Prof Alessandro Capra](#)

**Collaborators:** Germany, Australia, Russia, USA, Japan, Canada



**Goal:** Compilation and analysis of physical geodesy data, for the development of a new high resolution Geoid for the Antarctic.

**Activities:**

1. Compilation of geodetic data and a gravimetric database
  2. Collaboration with IAG Antarctic Gravity project and SCAR Solid Earth Working Group
  3. Analysis and validation of observations and database specifically BEDMAP, RAMP (AMM1 & 2), airborne radar profiles
  4. Develop a simulation model & geoid model on a test area in North Victoria Land, in collaboration with IGES.
  5. Coordinate with Project 8 on new satellite gravity data mission
- 

#### 4. Geodetic Control Database

**Project Leader:** New Zealand - [Mr John Ritchie](#)

**Collaborator:** Australia, Russia

**Goal:** Establish a master index for Antarctic positional control, including all levels of accuracy

**Activities:**

1. Develop high level metadata index on location of all control (including significant tide gauges) and contact for each site on WG-GGI web site
  2. Develop a template for a distributed detailed data base including
    - Control identification information
    - Tide gauge connection information
- 

#### 5. Tide Gauge Data

**Project Leader:** Japan - [Dr Kazou Shibuya](#)

**Collaborators:** Australia, China, Germany, New Zealand, Italy, Russia, USA (Amos), UK (Woodworth), other specialists as required

**Goal:** To consolidate the collection of and access to Antarctic tide gauge information

**Activities**

1. Gather information on history of establishment and operation of Antarctic tide gauges
  2. [Research](#) and list all permanent and significant tide gauges established for hydrographic information and scientific studies. [Also available is [tide gauge instrumentation information](#) and [tide gauge reference information](#)]
  3. List all known sea level determinations, dates and accuracy estimates for all significant tide gauges
  4. Identify benchmark values and connections to GPS observations sites
  5. Facilitate index data into the Geodetic data base
  6. Facilitate the delivery of data to the Southern Ocean Sea Level Centre [SOSLC]
  7. Post meta data on web
  8. 2002 – 2004 (Facilitate guidelines on establishment and calibrating on bottom mounted and acoustic type gauges in Antarctic conditions)
- 

#### 6. Atmospheric Impact on GPS Observations in Antarctica

**Project Leader:** Poland - [Dr Jan Cisak](#)

**Collaborators:** Germany, Italy, USA, Australia (IPS), Norway, China

**Goal:** To understand the ionospheric and tropospheric impact of the atmosphere on the quality of GPS observations in Antarctica

**Activities:**

1. Facilitate access to GPS observations from permanent GPS sites and SCAR GPS epoch campaigns for computation of atmospheric delay to GPS signals
  2. Research impact of differing levels of solar and meteorological activity on Antarctic GPS observations
  3. Report on participation in international studies
  4. Report on project findings
  5. Develop recommendations for future GPS observations to minimise impact on GPS network surveys
- 

#### 7. Remote Geodetic Observatories

**Project Leader:** USA - [Mr Larry Hothem](#)

**Collaborators:** Japan (GSI), Australia, Italy, Netherlands (Swartz)

**Goal:** To identify technology for the deployment of GPS equipment at unattended remote Antarctic localities for regional densification of geodetic infrastructure, and for scientific studies of surface geodynamics.

**Activities:**

1. Monitor and report on use of solar, wind and other methods of power generation
  2. Monitor and report on developments for retrieval of data from remote sites by satellite communication techniques
  3. Prepare status report at the end of each austral summer summarising developments being undertaken by researcher in countries such as the USA, Australia, Japan, Netherlands.
- 

8. New Geodetic Satellite Missions

**Project Leader:** Germany - [Prof Reinhard Dietrich](#)

**Collaborators:** Italy, Australia, USA (U of Texas)

**Goal:** To ensure new satellite missions are integrated with the Antarctic geodetic system

**Activities:**

1. To identify and report on new satellite missions that will provide geodetic data or require geodetic support
  2. To provide calibration / validation data for these missions from ground truth observations, where appropriate
  3. Liaison with satellite mission principal investigators and GoS ANTEC
  4. Facilitate the transfer of satellite mission data to the Antarctic community
-

# GEOGRAPHIC INFORMATION PROGRAM 2000-2002

---

There are nine projects in the GI Program, these are:

1. [Topographic Database](#);
2. [Place Names](#);
3. [Spatial Data Standards](#);
4. [Map Catalogue](#);
5. [Imagery Catalogue](#)
6. [King George Island GIS Database](#);
7. [GIS Collaboration in East Antarctica](#)
8. [Bathymetric Database](#); and
9. [On-line Atlases](#)
10. [Cybercartographic Atlas](#)

Program Coordinator: [Mrs Janet Thomson](#), UK

## **Program Objectives:**

4. *To integrate and coordinate Antarctic mapping and GIS programs;*
  5. *To make fundamental reference data available to the Antarctic and global user communities.*
- 

## 1. Topographic Database

**Project Leader:** UK - [Mrs Janet Thomson](#)

**Collaborators:** USA, Japan

**Goal:** Provide a SCAR standard small scale topographic GIS database, for use by scientists and operators, and contribute topographic data to global mapping initiatives.

### **Activities:**

(if external funding is available)

1. Provide Antarctic data to the Global Mapping project
  2. Print Version 3.0 Antarctic Digital Database [ADD] manual - [Flyer is now available](#) [219 Kb]
  3. Develop and release Version 4.0 of the ADD
    - Incorporate new 1:250K and smaller scale data from members
    - Revise coastline and glaciers from radar data
    - Incorporate BEDMAP contours
    - Review extent to include sub-Antarctic islands
    - Review production CD-ROM
    - Review implications of new SCAR Spatial Data Model
- 

## 2. Place Names

**Project Leader:** Italy - [Prof Roberto Cervellati](#)

**Collaborators:** UK, Germany, Japan

**Goal:** Provide an authoritative database of all Antarctic place names approved by recognised bodies, for reference by national Antarctic naming authorities, scientists and operators.

### **Activities:**

1. Database development
    - incorporate new names as supplied by members
    - make revisions to the names database
    - collect descriptions and approval dates from members
    - incorporate descriptions and approval dates in the database
  2. Website Development
    - release updates each quarter
    - design a version control system
    - develop a data access and user registration facility
  3. Publish the updated letter "A" with descriptions, date and toponymic analysis
- 

## **3. Spatial Data Standards**

**Project Leader:** Australia - [Mr Henk Broisma](#)

**Collaborators:** UK, Germany, Chile

**Goal:** To provide a SCAR standard spatial data model for use in SCAR and national GIS databases.

**Activities:**

1. To determine the scope the model (content and application of the SDM)
    - incorporate map symbology into the data dictionary
  2. Review ISO TC211 and other relevant standards
  3. Produce and distribute a draft SDM for comment
  4. Publish as a SCAR standard
- 

**4. Map Catalogue****Project Leader:** Australia - [Mr Henk Broksma](#)**Collaborator:** USA**Goals:** To maintain a public-access catalogue of all Antarctic mapping products**Activities:**

1. Determine the scope of Edition 6 (map types and area of coverage)
  2. Collect revisions to draft version presented at XXVI SCAR
  3. Publish Edition 6 of the SCAR Map Catalogue [hardcopy (USA) and on-line (Australia)]
  4. Develop an [on-line catalogue revision tool](#) for use by members
- 

**5. Imagery Catalogue****Project Leader:** USA - [Mr Jerry Mullins](#)**Collaborators:** Australia, UK, NZ**Goals:** To maintain a public-access catalogue of all Antarctic satellite imagery and aerial photography**Activities:**

1. Identify existing satellite imagery, aerial photography and catalogues
  2. Describe functionality and content of each catalogue
  3. Develop a SCAR WG-GGI web site index to Antarctic imagery
  4. Proposed future developments for the Antarctic Imagery Catalogue
- 

**6. King George Island GIS Database****Project Leader:** Germany - [Mr Steffen Vogt](#)**Collaborators:** China, Chile, Argentina, Korea, Russia, Poland, Brazil, Uruguay**Goal:** To produce an integrated geographic database for use by all countries, for use in multi-disciplinary applications.**Activities:**

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.
- 

**7. GIS Collaboration in East Antarctica****Project Leader:** Russia - [Dr Alexander Yuskevitch](#)**Collaborators:** Australia (AAD), China**Goal:** To develop a proposal for GIS collaboration at a key site in East Antarctica.**Activities:**

1. Define user needs and select a site
  2. Develop a specification (incorporating the SCAR Spatial Data Model)
  3. Produce an index of existing data over the site
  4. Prepare a project plan and budget
- 

Notification received from NZ that they are unable to complete the project

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**8. Bathymetric Database****Project Leader:** New Zealand -- [Mr Tony Bevin](#)**Collaborators:** Australia, IHO, GEBCO, Germany**Goal:** To provide a SCAR Standard small scale bathymetric database to support research applications.**Activities:**

1. Identify sources and coverage of Antarctic bathymetric data
2. Produce and publish an index of sources and coverage
3. Develop a specification for a small scale database (incorporating the SCAR Spatial Data Model)

#### 4. Prepare a project plan and budget

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##### 9. On-line Atlases

**Project Leader:** USA - [Mr Jerry Mullins](#)

**Collaborators:** Canada, Argentina

**Goal:** To maintain and further develop the SCAR Science on-line atlas.

**Activities:**

1. Keep the US Antarctic Atlas up-to-date, as an element of the SCAR Science on-line atlas
  2. Add new scientific data, from SCAR member nations, where appropriate
  3. Develop an interface strategy with the Cybercartographic Atlas
  4. Produce a time frame on implementation of the above activities
- 

##### 10. Cybercartographic Atlas

**Project Leader:** Canada - [Prof Fraser Taylor](#)

**Collaborators:** Argentina

**Goal:** To define the user requirements of on-line atlas technology by SCAR and [develop implementation strategies](#) for an Antarctic Cybercartographic Atlas

**Activities:**

1. Identify potential user requirements and contributors including GOSEAC, GLOCHANT, COMNAP, ATCM, JCADM and other SCAR Working Groups
  2. Research capabilities of existing systems and data (both SCAR and non-SCAR) availability
  3. Develop an integration strategy with the SCAR Science on-line atlas
  4. Hold [workshop in Puerto Madryn](#), Argentina, late November 2001
  5. Subject to funding, hold [workshop in Ottawa](#), Canada, late May 2002
  6. Identify and pursue funding sources for implementation of the project
-

# OUTREACH PROGRAM 2000-2002

There are four projects in the Outreach Program, these are:

1. [Website Maintenance](#);
2. [Publications](#);
3. [Liaison](#); and
4. [Meetings](#)

Program Coordinator: Mr John Manning, Australia

**Program Objective:**

*To provide information on Antarctic geodesy and geographic information to the scientific and general community.*

---

## 1. Website Maintenance

**Project Leader:** Executive Officer

**Collaborators:** All members

**Goal:** To keep the web site up to date and contain relevant information to assist in achieving the Working Groups geodesy and geographic information program objectives.

**Activities:**

1. Maintain website  
[\[web statistics from 1 July 2000 to 30 June 2001 are available\]](#)  
[\[web statistics from 1 July 1999 to 30 June 2000 are available\]](#)
  2. Maintain [listservers](#)
  3. Maintain the [list of contacts for the exchange of map, chart and geographic publications](#)
  4. Maintain the [list of distributors of Antarctic maps](#)
  5. Maintain the [Antarctic Geographic Data Integration Data Library](#)
- 

## 2. Publications

**Project Leader:** Executive Officer

**Collaborators:** Chief Officer, Program Leaders and Project Coordinators

**Goal:** To publicise Working Group activities.

**Activities:**

1. Publications
    - [Develop a bibliography of Working Group papers \(both published and in preparation\)](#)
    - Encourage Project Leaders to publish their work
  2. Produce Antarctic Geodetic Datum support materials
  3. Produce Ice Site Survey Guidelines (based on Dome C survey)
  4. Maintain metadata for GGI products in the AMD
- 

## 3. Liaison

**Project Leader:** Chief Officer

**Collaborators:** Executive Officer, Program Leaders and Project Coordinators

**Goal:** To maintain communication between WG members, SCAR and related external bodies.

**Activities:**

1. Continued liaison with
    - [SCAR](#)
    - [COMNAP](#)
    - [International Association of Geodesy \(IAG\)](#)
    - [International Steering Committee for Global Mapping \(ISCGM\)](#)
    - [ISO TC211](#) - (New ISO TC211 directives for 2001 are available - [.ZIP file of 1.6Mb](#))
-

#### 4. Meetings

**Project Leader:** Executive Officer

**Collaborators:** Chief Officer, Program Leaders and Project Coordinators

**Goal:** To organise and coordinate Working Group meetings.

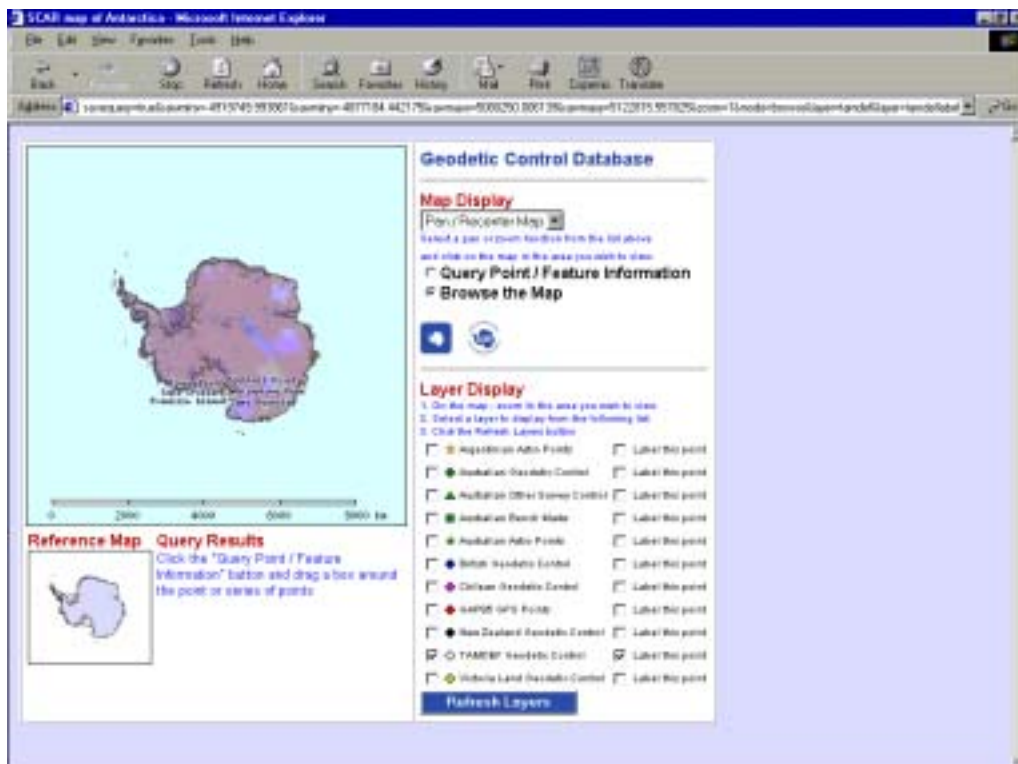
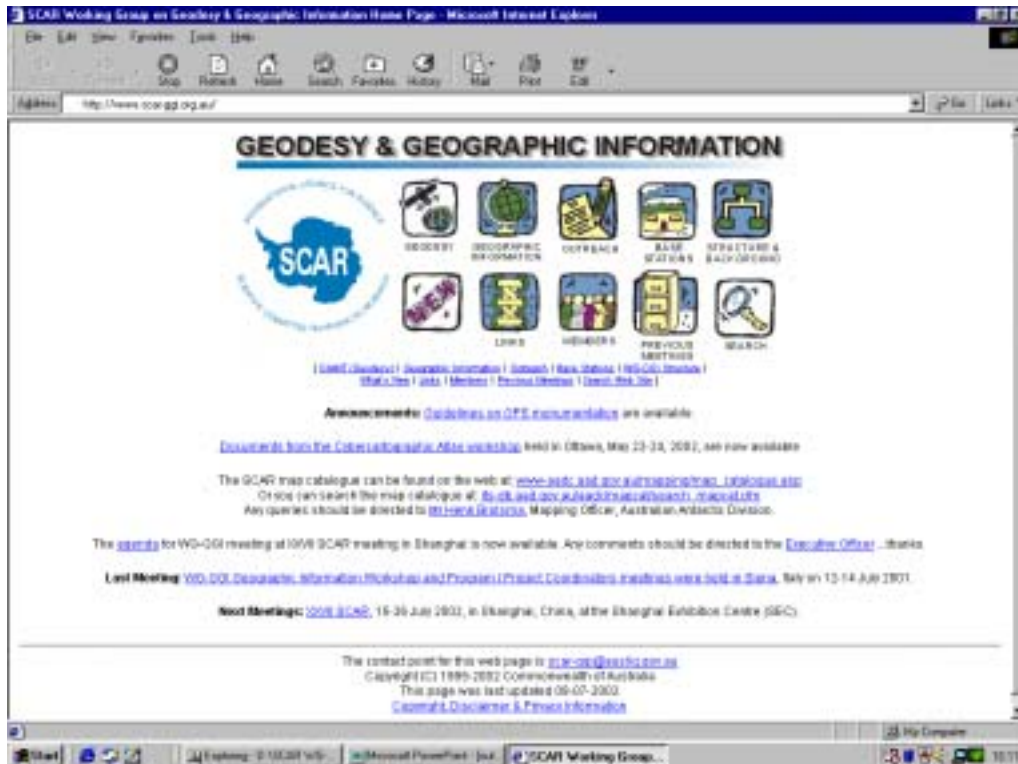
**Activities:**

1. Arrange inter-sessional meetings
    - [ANTEC meeting](#), Siena, Italy, 11-15 July 2001
    - [Coordinators meeting](#), Siena, Italy, 14 July 2001
    - [Geographic Information Workshop](#), Siena, Italy, 12-13, July 2001
    - [Antarctic Geodesy Symposium 2001 \(AGS'01\)](#), St. Petersburg, Russia, 17-21 July 2001
  2. Arrange WG-GGI meeting at XXVII SCAR, China, 15-19 July 2002
-

## ACRONYMS USED BY THE SCAR WORKING GROUP ON GEODESY AND GEOGRAPHIC INFORMATION

ADD	Antarctic Digital Database
ADGRAV	Antarctic Digital Gravity project
ADMAP	Antarctic Digital Magnetic Anomalies Project
AGDI	Antarctic Geographic Data Integration project
AGS	Antarctic Geodesy Symposium
ANTEC	SCAR Group of Specialists on Antarctic Neotectonics
ASMA	Antarctic Specially Managed Area
ATCM	Antarctic Treaty Consultative Meeting
BAS	British Antarctic Survey
BEDMAP	Ice Bed Elevation Mapping project – British Antarctic Survey
CEP	Committee for Environmental Protection
CGA	Composite Gazetteer of Antarctica
CHAMP	Challenging Mini-satellite Payload
COMNAP	Council of Managers of National Antarctic Program
DCDB	Data Center for Digital Bathymetry
DGPS	Differential Global Positioning System
DEM	Digital Elevation Model
DIF	Data Interchange Format
DORIS	Doppler Orbitography Information System
EGM96	Earth Geopotential Model 1996
FIG	International Federation of Surveyors
GEBCO	General Bathymetric Chart of the Ocean
GIANT	Geodetic Infrastructure in Antarctica
GIS	Geographic Information System
GLONASS	Global Navigation Satellite System
GPS	Global Positioning System
GRACE	Gravity Recovery And Climate Experiment mission
GRS	Geodetic Reference System
GSDI	Global Spatial Data Infrastructure
IAG	International Association of Geodesy
ICESat	Ice, Cloud and Land Elevation Satellite
IERS	International Earth Rotation Service
IGeS	International Geoid Service
IGEX	International GLONASS Experiment
IGS	International GPS Service
IHO	International Hydrographic Organisation
IOC	International Oceanographic Commission
ISCGM	International Steering Committee for Global Mapping
ISO TC211	International Standards Organisation - Technical Committee 211
ITRF	International Terrestrial Reference Frame
IUGG	International Union of Geodesy and Geophysics
JCADM	Joint Committee on Antarctic Data Management
KGIS	King George Island GIS
NADC	National Antarctic Data Centre
PRARE	Precise Range and Rate Experiment
RAMP	RADARSAT Antarctic Mapping Program
SPA	Specially Protected Area
SCAR	Scientific Committee on Antarctic Research
SSSI	Site of Special Scientific Interest
VLBI	Very Long Baseline Interferometry
WG-GGI	SCAR Working Group on Geodesy and Geographic Information







## Guidelines for Antarctic GPS Monumentation



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SCAR Working Group on Geodesy and Geographic Information

June 2002