GeoReach

Newsletter from the
SCAR Geoscience Standing Scientific Group

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From the CO's Desk

Having just returned from the International Symposium on Antarctic Earth Science (ISAES X) at the University of California-Santa Barbara, I would like to congratulate the organizers on a wonderful conference at a fantastic venue. The UC-Santa Barbara campus provided an ideal setting for the event with superb conference and accommodation facilities. The conference was noteworthy in that it attracted a more multi disciplinary attendance than usual with a marked increase in presentations on the cryosphere and climate change, and an influx of biological contributions. This is an exciting development creating a more interdisciplinary focus. Perhaps future conference organizers can consider reducing the number of parallel sessions to encourage more interdisciplinary debate and discussion.

Our next big conference will be the Open Science Conference in St Petersburg in July 2008. Plans are well advanced and there should be an announcement soon. We also need to start planning for ISAES XI and look forward to receiving proposals to host the symposium.

This issue of GeoReach contains interim reports from the GSSG Expert Groups. Many of you will be aware that there were group meetings during ISAES X. We hope to report on these meetings in the next issue of GeoReach and ask that the chair of the groups send their reports to me or Bryan Storey as soon as possible.

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19-Sep-2007
GSSG Chief Officer

GSSG Office Bearers 2006-2008

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SCAR News

The next SCAR meeting will be the Biennial SCAR Meeting as follows:

5-7 July 2008, St Petersburg, Russia:
- XXX SCAR Science Week with business meetings and workshops of SCAR's Standing Scientific Groups.

8-11 July 2008, St Petersburg, Russia:
- Joint SCAR-IASC Open Science Conference (4-days). The theme is Polar Research - Arctic and Antarctic Perspectives in the International Polar Year.

14-16 July 2008, Moscow, Russia:
- XXX SCAR Delegates' Meeting.

First circular is likely in October 2007 and further details will follow in due course.

See web link for full update on SCAR news
www.scar.org/news/

GSSG News

Since the XXIX SCAR meeting in Hobart the Geographic Information (GI) Expert Group became a SCAR Standing Committee (Standing Committee on Antarctic Geographic Information – SC-AGI). Furthermore, one of our Expert Groups ANTEC has ceased to exist in a formal sense but its activities have been absorbed within the IPY POLENET Programme, which can be accessed via the POLENET web site: http://www.polenet.org/

A 2nd SCAR cross linkages workshop was held in Rome, November 2006. The workshop proposed that we create a working group between ICESTAR (Interhemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research), the International Heliophysical Year (IHY) and POLENET through the Upper Atmosphere Monitoring for Polar Year (UAMPY). The Proposed title is *GPS for weather and space weather forecast.*

GSSG Structure

The Standing Scientific Group on Geosciences (SSG–G) comprises the following groups approved at XXIX SCAR in 2006:

***Action Groups (AGs)*:**
Marine Acoustics (the impacts of acoustic technology on the marine environment).
Sub-Ice Geological Exploration (SIGE)

Scientific Programme Groups (SPGs):
Antarctic Climate Evolution (ACE)
Sub glacial Antarctic Lake Environments (SALE, jointly sponsored with the Life Sciences Standing Scientific Group)

Expert Groups (EGs):
Geodetic Infrastructure of Antarctica (GIANT)
Antarctic Permafrost and Periglacial Environments (PPE).
Antarctic Digital Magnetic Anomaly Project (ADMAP)
International Bathymetric Chart of the Southern Ocean (IBCSO).
Antarctic Neotectonics (ANTEC) now amalgamated with IPY project POLENET.

Geodetic Infrastructure of Antarctica (GIANT) *(Chair: Reinhard Dietrich)*

Most of GIANT's activities have been incorporated within the POLENET IPY project.
An IPY-POLENET workshop was held in Dresden, October 2006.

Antarctic Permafrost and Periglacial Environments (PPE) *(Chair: Jim Boelhouwers)*

See related website:
www.erth.waikato.ac.nz/antpas/index.shtml .

PPE have completed a special issue of the journal GEODERMA entitled "Antarctic Soils and Soil-Forming Processes in a Changing Environment". The special issue contains 12 refereed papers and is intended for distribution at the SCAR OSC and the Ninth International Conference on Permafrost (NICOP) to be held in July 2008 in Fairbanks, Alaska. The group hosted a pre-conference workshop on the "Status of Antarctic Permafrost and Soils Database Compilation and Mapping" at the International Symposium on Antarctic Earth Sciences (ISAES) August 26, 2007 at the University of California-Santa Barbara (A full report will be included in next issue of GeoReach). The workshop featured 10 presentations representing 7 countries and a group discussion of PPE objectives, website, current projects, and publications.

Preliminary maps showing the distribution of permafrost by form and soil subgroups have been prepared for the Transantarctic Mountains, which comprise 24,200 km2 or 49% of the ice-free area of Antarctica (McLeod et al., 2007). In addition, permafrost and soil maps have been prepared for the McMurdo Dry Valleys (Bockheim et al., 2007; Bockheim and McLeod, in press). Detailed permafrost and soil maps are available for Taylor Valley (Bockheim et al., 2007) and are in preparation for Wright Valley (McLeod, in preparation). Megan Balks is coordinating soil and permafrost maps for the Antarctic Peninsula and its offshore islands.
The group is also preparaing sections for the SCAR publication "Antarctic Climate Change and the Environment (ACCE)" dealing with the current status, history, and predictions of climate change on Antarctic permafrost. Permafrost is a key "geo-indicator" for monitoring and assessing environmental change.

The group plans to host a workshop on Antarctic Permafrost and Soils at the SCAR Open Science Conference in July 2008, St. Petersburg, Russia. The workshop will be coordinated by Dr. Mauro Guglielmin (Italy).

***Representative Publications*:**

Bockheim, J.G., I.B. Campbell and M. McLeod. 2007. Permafrost Distribution and Active-Layer Depths in the McMurdo Dry Valleys, Antarctica. Permafrost & Periglacial Processes, in press.

Bockheim, J.G. and M. McLeod. 2008. Soil distribution in the McMurdo Dry Valleys, Antarctica. Geoderma, in press.

Bockheim, J.G., M.L. Prentice and M. McLeod. 2007. Distribution of glacial deposits, soils and permafrost in Taylor Valley, Antarctica. Arctic, Antarctic and Alpine Research, in press.

Campbell, I.B. and G.G.C. Claridge. 2006. Permafrost properties, patterns, and processes in the Transantarctic Mountains region of Antarctica. Permafrost & Periglacial Processes, 17:215-232.

Guglielmin, M. 2006. Ground surface temperature (GST), active layer, and permafrost monitoring in continental Antarctica. Permafrost & Periglacial Processes,17:133-143.

9th International Conference on Permafrost
29 June - 3 July 2008, Fairbanks, Alaska. The conference marks the 25th Anniversary of the formation of International Permafrost Association (IPA), 50th Anniversary of IGY and 125th Anniversary of the first IPY. The main Theme for this conference is: "Permafrost on a Warming Planet: Impacts on Ecosystems, Infrastructure and Climate".
For further information, please go to the conference website (http://www.nicop.org) or contact Elizabeth Lilly (email: elilly@nicop.org).

Antarctic Digital Magnetic Anomaly Project (ADMAP) (Chair: Marta E. Ghidella)

See http://earthsciences.osu.edu/admap/

The ADMAP multinational project was created in 1995 under the auspices of SCAR and IAGA (International Association of Geomagnetism and Aeronomy). The ADMAP group aims to produce a coordinated effort for:

- Compiling existing magnetic data acquired by various institutions
- Coordinating protocols for data distribution

- Serve as a reference for future survey planning
- Archiving and maintaining the magnetic anomaly data base of Antarctica

Its main achievements are as follows:

- Development of a DVD of the compilation of data up to year 1999 for release to the World Data Centers.
- Update of the near-surface anomaly predictions from Magsat in the ADMAP database with the significantly more accurate observations from the Ørsted and CHAMP satellite missions.
- Development of improved modeling of the Antarctic core field and its secular variations, and external fields for better definition of the crustal anomalies in magnetic survey data.
- Compilation of rock magnetic and other physical properties into a database to support geological applications of the ADMAP data.
- Development and promotion of regional and continental scale interpretation efforts of the ADMAP data. This provides new insight into global tectonic and geologic processes in the Antarctic context.
- Support to the World Magnetic Anomaly Map initiative of the International Association of Geomagnetism and Aeronomy (IAGA).

News

A new magnetic anomaly map of East Antarctica and surrounding regions (Golynsky et al., 2007) has been published. It is the result of the integration of significant new data to the entire Antarctic compilation. The complete reference is as follows:

Golynsky, A., D. Blankenship, M. Chiappini, D. Damaske, F. Ferraccioli, C. Finn, D. Golynsky, A. Goncharov, T. Ishihara, S. Ivanov, W. Jokat, H. R. Kim, M. König, V. Masolov, Y. Nogi, M. Sand, M. Studinger, R. von Frese and the ADMAP Working Group, New magnetic anomaly map of East Antarctica and surrounding regions, in Proceedings of the 10th ISAES, edited by A. K. Cooper and C. R. Raymond et al., USGS Open-File Report 2007.

von Frese, R.R.B., A.V. Golynsky, H.R. Kim, L. Gaya-Piqué, E. Thébault, M. Chiappini, M. Ghidella, A. Grunow, and the ADMAP Working Group, The next generation Antarctic Digital Magnetic Anomaly Map, in Proceedings of the 10th ISAES, edited by A. K. Cooper and C. R. Raymond et al., USGS Open-File Report 2007.

Future plans

Incorporate new magnetic surveys into the ADMAP digital database as the data become available according to the ADMAP protocols. By these protocols, working group members are prepared to contribute magnetic data to ADMAP's database within 6 years of the completion of the field survey. Numerous surveys have been completed by the international community since the production of the first map which was based on magnetic surveys through 1999.

Continue working to compile all available terrestrial, marine, and satellite magnetic survey data collected by the international community since the IGY 1957-58 for the region south of 60 degrees.

Continue the development and promotion of regional and continental scale interpretation efforts of the ADMAP data. New data and interpretations will also enhance studies addressing interplays between geological boundary conditions, Antarctic ice sheets and climate change. These efforts will also greatly assist in identifying high-priority areas for new collaborative magnetic surveys.

International Bathymetric Chart of the Southern Ocean (IBCSO)

(Chairs: Hans Werner Schenke & Norbert Ott)

The IBCSO project was restarted in 2006. A new scientific editor is now employed at Alfred Wegener Institute for Polar and Marine Research, Germany. The IBCSO group will combine existing bathymetric data from (i) the AWI Bathymetric Chart of the Weddell Sea with (ii) Indian Ocean Bathymetry from the GEBCO Digital Atlas Centenary Edition and (iii) new bathymetric charts from the Ross Sea produced by colleagues from New Zealand. Multibeam and narrow single beam data provided by a great number of data centers will be integrated in addition to ETOPO2v2 data, satellite altimetry, SAR imagery and other relevant data. Future work comprises (i) data compilation and evaluation of bathymetric data from various sources, (ii) data integration of heterogeneous data sets in a DBMS, (iii) data processing in a GIS environment for enhanced visualization, and (iv) publication of hard- and softcopy maps.
To achieve this, the new IBCSO website (www.ibcso.org) provides detailed information and news for expert group members and other interested parties. Communication and data transfer is now supported by an IBCSO mailing list which is hosted and maintained by the NGDC (ibcso@mailman.ngdc.noaa.gov). The restoration and animation of the communication network is a crucial factor for the success of IBCSO. Data provider and friends of IBCSO may subscribe to the mailing list and participate in this bathymetric network.

In 2007 international planning and organizing of IBCSO focused mainly on the establishment of an international network for data collection and data exchange. Up to now some important topics have been completed or updated:

- collection of new bathymetric data by various cruises with RV Polarstern (1)
- design and implementation of the IBCSO website for web presentation (www.ibcso.org)
- initiating the IBCSO mailing list hosted at the NGDC
- presentation of IBCSO reports to IOC, IHO, SCAR, and GEBCO
- submission of abstracts and extended abstracts to periodicals and journals
- organizing a first IBCSO business meeting during the 10th ISAES in Santa Barbara
- development and conceptual design of work plan and data flow
- development of GIS architecture with desktop GIS and server GIS capabilities
- A previously unknown seamount was discovered in the Southwest Indian Ridge by RV Polarstern. It is located in a water depth of about 2900 metres and is more than 1350 m high. This seamount has a spatial extend of 9400 m and the diameter of the crater is about 700 m. The caldera suggests a volcanic origin.The first large undersea feature

which RV Polarstern discovered at the beginning of the IPY was officially named 'IPY Seamount'.

Work Plan

Since the restart of the IBCSO at the end of 2006, the work plan has been modified due to changes in data infrastructure and GIS environment. In the course of the IBCSO project the emphasis shifted from 'digital ocean mapping' to 'GIS based data compilation for thematic mapping'. This implies integration of geophysical and geological data sets with topographic and bathymetric data of Antarctica and the Southern Ocean. Future tasks include:

- Data compilation and evaluation of bathymetric data
- Integration of heterogeneous data sets
- Organizing IBCSO meetings and work shops
- Request for funding to get additional support for IBCSO
- An IBCSO work shop is planned in July 2008 during the XXX SCAR Science Week in St. Petersburg, Russia. Work shop topics are (i) proceedings in echo sounding data acquisition (ii), problems and strategies in digital ocean mapping, (iii) progress in GIS based data modelling, and (iv) adjusting the implementation of SOGIS.
- The IBCSO Expert Group invites participants and official representatives who contribute to IBCSO by sharing data, information, and knowledge.

POLENET

ANTEC has recently merged with the International Polar Year approved POLENET programme. POLENET is the 'POLar Earth observing NETwork' and aims to co-ordinate the deployment of new seismic, GPS instrumentation, leaving a legacy of improved observing infrastructure and encouraging an integrated, interdisciplinary approach to interpreting the results (similar to ANTEC, but with Antarctic as well as Arctic science goals). See POLENET website: www.polenet.org

2008

9th International Conference on Permafrost

29 June - 3 July, 2008, Fairbanks, Alaska

The conference marks the 25th Anniversary of the formation of International Permafrost Association (IPA), 50th Anniversary of IGY and 25th Anniversary of the first IPY. The main Theme for this conference is: "Permafrost on a Warming Planet: Impacts on Ecosystems, Infrastructure and Climate".

Registration and further particulars are available on the conference website: http://www.nicop.org/

33rd International Geological Congress

5 - 14 August, 2008, Oslo, Norway

Several sessions on polar geosciences are being planned, especially those linked to IPY activities. For more information, go to: http://www.33igc.org/

ANTEC Planned Activity:

Workshop: *Integrated Analysis and Modelling of POLENET Data.*

Tentatively planned to be held in Modena, Italy; Convened by Dr. A. Capra (with POLENET Interpretation & Modeling Working Group); either before or following the EGU meeting in April, 2008.

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