Working Group on Glaciology

Representatives from 13 SCAR countries attended the Working Group on Glaciology (WG-Glaciol.) meeting at XXVI SCAR, 10-14 July, 2000, in Tokyo, Japan:

Members from: Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Italy, Japan, Korea, UK, USA

The WG-Glaciol. continues to focus on fundamental scientific activities related to the discipline of Glaciology.

The key activities during the meeting were:

- reports on activities for the preceding two years from National representatives;
- reports on International Programmes and projects;
- discussions on the document "Preparing SCAR for 21st century science in Antarctica" written by the Ad Hoc group on SCAR Organisation and Strategy
- a one day scientific symposium on "Antarctic Precipitation and Mass Balance" jointly hosted by the SCAR Working Groups on Glaciology, and Physics and Chemistry of the Atmosphere.
- a joint meeting with SCAR Working Group on Geodesy and Geographical Information to hear reports on SCAR Coordination and International Liaison, and to hear reports from related SCAR organisations;
- a joint meeting with SCAR Working Groups on Glaciology, Geology, SEG, ANTEC, JCADM and CGI to exchange information on each others programmes.

The Agenda of the Working Group meeting is attached in an Appendix to this report.

A report was heard of a successful SCAR sponsored scientific meeting, The International Symposium on Antarctic Glaciology, held in Lanzhou, China from 5-7 September 1998. 105 papers were received and 78 were presented by 84 international and 30 local scientists. SCAR provided funding for the meeting , with some additional support from the International Glaciological Society and several Chinese communities. The scientific proceedings were published in a single issue of peer-reviewed Journal, Annals of Glaciology, Vol.29, published in 1999. The WG-Glaciol. met in committee during the symposium.

National reports were tabled by each of the countries present, with both verbal reports, and written documents presented. Additional written reports were received from Chile, Finland and Russia. The WG noted the wide range of scientific activity represented by the discipline of glaciology.

In addition to projects detailed in the National Reports, reports were heard from a number of international programmes and initiatives:

- Sub-glacial lakes in Antarctica &endash; a report was given on the Cambridge Workshop, held in September 1999. The WG-Glaciol. welcomes the SCAR initiative to create a Group of Specialists with an interest in sub-glacial lakes, and notes the continuing interest of the

glaciological community in this subject. The WG-Glaciol. will table a Recommendation to SCAR relating to this.

- ISMASS (SCAR-GLOCHANT initiated) &endash; the WG-Glaciol. believes this programme is an important forum for promoting studies on the mass balance of the Antarctic ice sheet, but progress has been slow, and recommends the SCAR-GLOCHANT sponsor a meeting to re-invigorate the programme. The WG-Glaciol. will table a Recommendation to SCAR relating to this.
- PICE &endash; originally set up to coordinate all deep ice core drilling activity in Antarctica, but now embraces the Greenland ice cores, recognising the importance of the bi-polar approach to understanding the global climate system. Several strong linkages to related WCRP and IGBP programmes were noted. The WG-Glaciol. will table a Recommendation to SCAR relating to this.
- ITASE &endash; held a successful meeting, sponsored by SCAR, in Durham, New Hampshire, USA, in April 1999. The meeting noted the completion of a number of the initially proposed traverse routes, and proposed new traverse routes to focus activity for the next 10 years. This wide-ranging programme for ice core palaeoclimate research spanning the last 200 years provides a focus for a large number of SCAR Nations.
- ASPeCt &endash; the sea-ice programme within SCAR-GLOCHANT has released a CD-ROM defining a standard for observing sea-ice. ASPeCt has compiled a database on Antarctic sea ice and snow thickness distribution and will add to this with planned cruises.
- BEDMAP &endash; this SCAR/WG-Glaciol. supported project collates all existing measurements of Antarctic ice sheet thickness. Data describing the thickness of the Antarctic ice sheet collected by national surveys undertaken over the past 50 years have been brought together into a single database. These data have allowed the compilation of a suite of digital topographic models for the Antarctic continent and surrounding ocean south of 60 degrees. The models represent: the ice sheet thickness over the ice sheet and ice shelves; water-column thickness beneath the floating ice shelves; bed elevation beneath the grounded ice sheet; bathymetry including areas beneath ice shelves. A map product based on the data has been published, while the data models have been made available on a website.

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The WG-Glaciol. note the completion of this project, and congratulate the BEDMAP consortium on their achievement.

- VELMAP &endash; an analogue project to BEDMAP plans to collate all existing ice sheet velocity measurements to produce a map of ice flow. The WG-Glaciol. welcome this new initiative and encourage National representatives to ensure all relevant data are made available. The WG-Glaciol. will table a Recommendation to SCAR relating to this.
- Radarsat Antarctic mapping programme is generating considerable new data on the ice sheet.
- GLASS &endash; the WG-Glaciol. supported project on the glaciology of the South Shetland Islands is nearing completion, with surveys of the ice caps, ice core records and mass balance studies described in more than 50 papers now published. A Final Report on the project is expected soon. The GLASS project forged an effective cooperation between seven national members, the majority of whom were newer SCAR nations.
- WAIS &endash; West Antarctic Ice Sheet programme is the largest US-NSF supported Antarctic project.
- EPICA &endash; European Project for Ice Coring in Antarctica &endash; this 10-nation European project is continuing its drilling campaigns in East Antarctica and Dronning Maud Land.
- FRISP &endash; The Filchner-Ronne Ice Shelf Programme has widened its scope and has been renamed as Fundamental Research in Ice Shelf Processes. The WG-Glaciol. will table a

Recommendation to SCAR relating to this.

Future science: the WG-Glaciol. notes that many of the fore-mentioned projects will continue, but notes the following items that have been formulated as Recommendations to SCAR.

- The development of the VELMAP programme to collate all existing ice sheet velocity measurements;
- The development of an implementation plan for the ISMASS programme;

The WG-Glaciol. proposed the following meetings:

- The Seventh International Symposium on Antarctic Glaciology &endash; Italy proposes to host this meeting in 2003;
- A meeting on the topic of Sea Ice;
- A PICE programme workshop on the comparison of Antarctic ice core records for the last deglaciation, to be held in Denver, Colorado, in 2001. An application for SCAR funding support will be submitted.

The SCAR Working Groups on Glaciology, and Physics and Chemistry of the Atmosphere jointly hosted a one day scientific workshop on "Antarctic Precipitation and Mass Balance" during the SCAR meeting. The WG-Glaciol. welcomes the inclusion of scientific symposium in the SCAR meetings as a focus for participation of a wider audience of scientists. A summary of the Workshop is attached.

The WG-Glaciol. reviewed the proposals contained in the document "Preparing SCAR for 21st century science in Antarctica" written by the Ad Hoc group on SCAR Organisation and Strategy. The WG formulated a Recommendation welcoming the review of SCAR structures, with amendments noted.

Elections were held for the post of Vice Chairman of the Working Group for Glaciology. Heinz Miller (Germany) proposed T. H (Jo) Jacka of Australia, seconded by Guiseppe Orombelli (Italy), and a vote was unanimous in support of this nomination. Jo Jacka was therefore duly elected Vice Chairman of the WG-Glaciol.

A proposal to hold the next meeting of the WG-Glaciol. in Shanghai in 2002 was accepted, subject on the outcome of discussions on the reorganisation of SCAR.

The meeting of the WG-Glaciol. concluded at 1500 on 14th July.

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Acronyms

ASPeCt Antarctic Sea Ice Processes and Climate
BEDMAP Bedrock Mapping project for Antarctica
EPICA European Project for Ice Coring in Antarctica
FRISP Fundamental Research in Ice Shelf Processes
(Formerly: Filchner-Ronne Ice Shelf Programme)
GLOCHANT Global Change and the Antarctic
GLASS Glaciology of the South Shetland Islands
IGBP International Geosphere Biosphere Programme
ISMASS Ice Sheet Mass balance programme
ITASE International Trans-Antarctic Science Expedition

PICE Polar Ice Cores
Radarsat Radar Satellite
SCAR Scientific Committee on Antarctic Research
SCOR Scientific Committee on Oceanographic Research
US-NSF United States of America &endash; National Science Foundation
VELMAP Ice sheet Velocity Mapping project for Antarctica
WAIS West Antarctic Ice Sheet programme
WCRP World Climate Research Programme
WG-Glaciol. SCAR Working Group on Glaciology

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RECOMMENDATIONS

ON SCAR/GLOCHANT ICE SHEET MASS BALANCE (ISMASS) PROJECT

The SCAR Working Group on Glaciology:

Recognizing the recommendations of the WCRP Climate and Cryosphere (CLIC) Project Science and Coordination Plan,

o expresses support for a new Antarctic Ice Sheet Mass Balance (ISMASS) initiative as a component of SCAR/GLOCHANT

Noting the Plan states that "a priority for the immediate future is a forum to assess the certainties and uncertainties in determining mass balance by field, remote sensing, and modelling techniques and to evaluate methods of combining the three approaches."

Recommends that SCAR/GLOCHANT host and sponsor an international forum during 2001 with the above aim.

ON VELMAP

Recognising the considerable effort by many national programs over many years to make both in situ and space based measurements of surface ice velocity, and

Noting the critical importance of such measurement to Antarctic Ice Sheet mass balance studies,

The SCAR Glaciology Working Group

Welcomes the VELMAP initiative to compile, and make available to the glaciological community, all available surface velocity measurements, and

Recommends that SCAR encourages National Committees to insure that all relevant data are made available to the VELMAP Project.

ON SUB-GLACIAL LAKE EXPLORATION

The SCAR Working Group on Glaciology

o strongly supports the SCAR recommendations concerning sublglacial lake exploration, and
o highlights the wide interest within the field of glaciology in this project, both in terms of paleoenvironmental records and ice dynamics, and

Recommends
o the Lake Vostok Special Program Group takes into account its important glaciological context

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ON CLIMATE AND PALEOENVIRONMENTAL PAST RECORDS

Recognizing that the role of Antarctica and the Southern Ocean is a very important part of the climate system, and

Noting that the Working Group on Glaciology and GLOCHANT have highlighted the importance of Antarctic ice cores for understanding global change, and that SCAR, together with PAGES/IGPB, plays a major role in this area,

The Committee on Glaciology

Recommends that:

SCAR encourage National Antarctic programs to

o support ice coring field activities, and

o ensure the archiving and sharing of ice core data and

o promote their syntheses as well as their comparison with oceanic records.

ON THE SCAR REVIEW

ROLE OF SCAR

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Welcoming the Report Preparing SCAR for 21st Century Science in Antarctica by the Ad Hoc Group on SCAR Organization and Strategy;

Mindful there is a need for SCAR to be flexible, make changes to accommodate its own growth in national membership, adapt to the increasing pace and scale of demands on it, and to ensure the quality of its scientific advice;

Noting that while there is a requirement to consider 'the global picture' there are also important regional projects, and noting that these are often carried out by countries unable to provide the resources required for global programs;

The SCAR Glaciology Working Group recommends the report be endorsed, with the following amendments:

o The structure consist of not more than two Delegate Committees.

o The Operating Groups recommended by the report should include discipline-based groups, with representation from each interested nation. A major role of the Operating Groups should be to recommend, when scientifically necessary, Special Program Groups whose objective is specific and time constrained.

o The newly structured SCAR Executive Secretariat should be funded to enable it to respond more actively to the evolving needs of Operating Groups, and to improve communications within the SCAR community, and particularly inter- and intra- Discipline Based Operating Groups.

The SCAR Glaciology Working Group further recommends

o The SCAR Executive consider establishing a new Discipline Based Operating Group responsible, in co-operation with SCOR, for the coordination of studies in the Physical and Chemical Oceanography of the Southern Ocean.

o Noting Recommendation19, that "National Antarctic committees and other bodies adhering to SCAR should continue to give more attention to participation of younger scientists both in research in Antarctica and in SCAR's scientific operating groups", the Glaciology Working Group calls upon SCAR to set an example by providing funds so that this recommendation may be brought to fruition.

o The SCAR Executive should consider holding an open cross-discipline scientific symposium each 2 years, aimed at defining major problems to be resolved.

ON FRISP

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The SCAR Working Group on Glaciology:

Recognising the importance of understanding the mass outflux of the Antarctic ice sheet through the ice shelves, the interaction between ice-shelves and the oceans, and their role in climate change and sea-levels;

o highlights the research carried out under the coordination of the Filchner-Ronne Ice Shelf Programme (FRISP), and particularly the progress made in understanding ice-shelf/ocean interactions; and

Noting the value of the FRISP-report series in rapidly disseminating the early results of the FRISP research;

Welcomes the widening of the FRISP programme to include all research fundamental to understanding ice-shelves, ocean and climate interactions, under the new name Fundamental Research in Ice Shelf Processes (FRISP); and

Recommends:

o the continuation of the FRISP-Report Series.