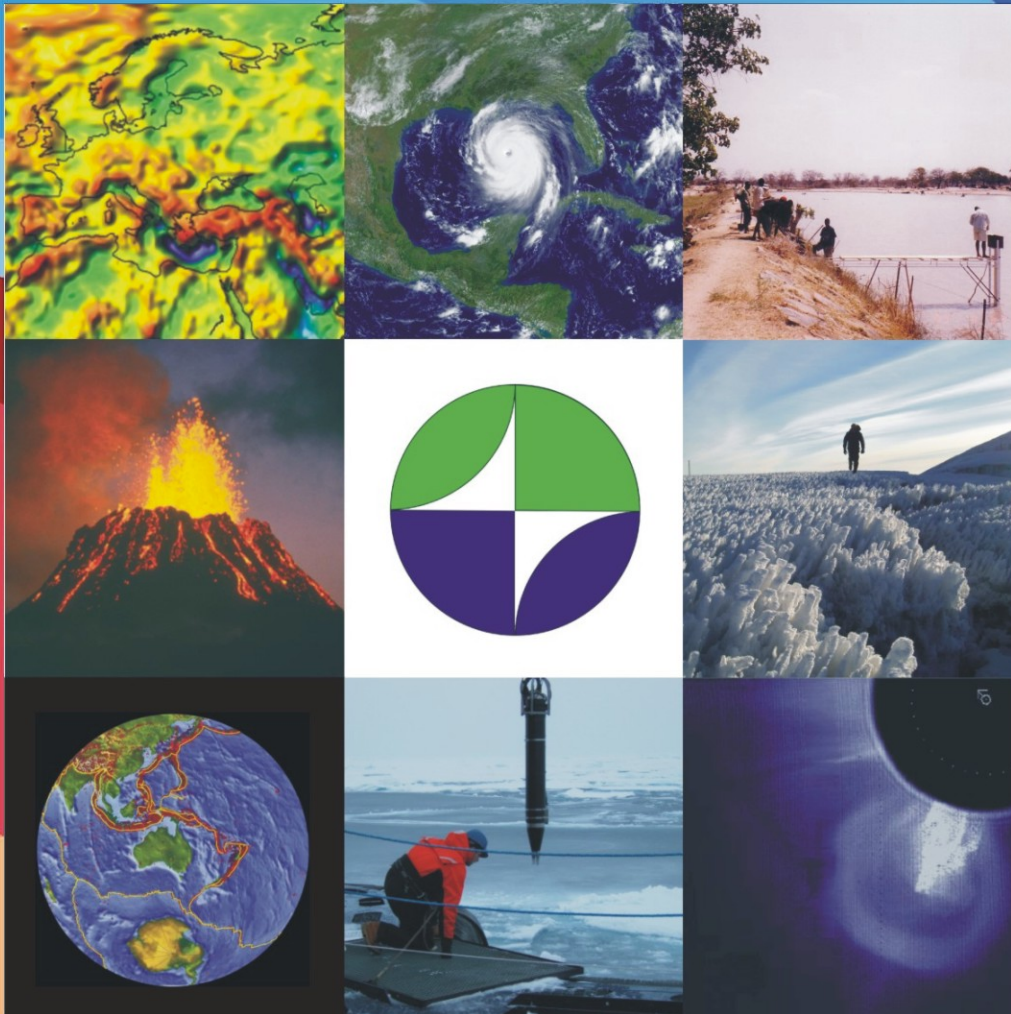




International Union of Geodesy and Geophysics (IUGG)
Union Géodésique et Géophysique Internationale (UGGI)

ANNUAL REPORT 2010





**INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE**

**IUGG Annual Report
2010**

**Published by Secretary General
Alik Ismail-Zadeh**

No ISSN: 1038-3846

IUGG Annual Report 2010

TABLE OF CONTENTS

INTRODUCTION	3
GENERAL INFORMATION	4
MESSAGE FROM THE PRESIDENT	8
MESSAGE FROM THE SECRETARY GENERAL	10
IUGG ACTIVITIES	11
ACTIVITIES OF THE UNION ASSOCIATIONS	38
International Association of Cryospheric Sciences (IACS)	39
International Association of Geodesy (IAG).....	42
International Association of Geomagnetism and Aeronomy (IAGA).....	46
International Association of Hydrological Sciences (IAHS).....	48
International Association of Meteorology & Atmospheric Sciences (IAMAS)	51
International Association for the Physical Sciences of the Oceans (IAPSO).....	55
International Association of Seismology and Physics of the Earth's Interior (IASPEI).....	57
International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).....	60
ACTIVITIES OF THE UNION COMMISSIONS AND INTER-ASSOCIATIONS WORKING GROUPS	62
Commission for Data and Information (UCDI).....	62
Commission on Geophysical Risk and Sustainability (GRC)	66
Commission on Mathematical Geophysics (CMG)	68
Commission on the Study of the Earth's Deep Interior (SEDI)	70
Inter-Associations (IAGA/IASPEI/IAVCEI) Working Group on Electromagnetic Studies on Earthquakes and Volcanoes (EMSEV)	72
THE INTER-UNIONS COMMISSION: International Lithosphere Program (ILP)	75
IUGG FINANCIAL REPORT 2009	78
ADDITIONAL UNION MATTERS	85
Awards and Honors.....	85
Appointments	86
Obituaries	87

INTRODUCTION

Established in 1919, the International Union of Geodesy and Geophysics (IUGG) is the international, non-governmental, non-profit organization dedicated to advancing, promoting, and communicating knowledge of the Earth system, its space environment, and the dynamical processes causing change. Through its constituent associations, commissions, and services, IUGG convenes international assemblies and workshops, undertakes research, assembles observations, gains insights, coordinates activities, liaises with other scientific bodies, plays an advocacy role, contributes to education, and works to expand capabilities and participation worldwide. Data, information, and knowledge gained are made openly available for the benefit of society – to provide the information necessary for the discovery and responsible use of natural resources, sustainable management of the environment, reducing the impact of natural hazards, and to satisfy our need to understand the Earth's natural environment and the consequences of human activities. IUGG Associations and Union Commissions encourage scientific investigation of Earth science and especially interdisciplinary aspects. Each Association establishes working groups and commissions that can be accessed by using the links on our website.

IUGG is one of thirty scientific unions adhering to the International Council for Science (ICSU). ICSU provides a global forum for scientists to exchange ideas and information and to develop standard methods and procedures for all fields of research. IUGG brings expertise on Earth studies from researchers in its International and Inter-Association Commissions. As a member of ICSU, IUGG strongly supports its policy of non-discrimination by affirming the rights and freedom of scientists throughout the world to engage in international scientific activity without limitation by such factors as citizenship, religion, creed, political stance, ethnic origin, race, color, language, age or gender.

IUGG has initiated and/or vigorously supported collaborative efforts that have led to highly productive world-wide interdisciplinary research programs, such as the International Geophysical Year (1957-58), the Upper Mantle Project (1964-70), the International Hydrological Decade (1965-74), the Geodynamics Project (1972-79), the Global Atmospheric Research Programme (1967-80), the International Lithosphere Programme, the World Climate Research Programme, the International Decade for Natural Disaster Reduction, Integrated Research on Risk Disasters, the International Heliophysical Year (2007-2009), the Electronic Geophysical Year (2007-2008), the International Year of Planet Earth (2007-2009), and the International Polar Year (2007-2008). These programs have set a model for international, interdisciplinary cooperation. Representing all geophysical disciplines, IUGG is involved in the projects and programs related to climate change, global warming, and related environmental impacts.

IUGG supported and supports initiatives by ICSU, especially those in which Earth sciences have a role to play. One major contribution has been the creation, some 50 years ago, through ICSU, of the World Data Centers (WDC) and the Federation of Astronomical and Geophysical Data Analysis Services (FAGS). These organizations are being transformed to the ICSU World Data System, from which the data gathered during the major programs and data products will be available to researchers everywhere. IUGG cooperates with UNESCO in the study of natural catastrophes, hydrological and oceanographic research. IUGG also places particular emphasis on the scientific problems of economically less-developed countries by sponsoring activities relevant to their scientific needs (e.g. Geosciences in Africa, Water Resources, Health and Well-Being etc.)

The web site, available in English and French, can be found at <http://www.IUGG.org>.

GENERAL INFORMATION

MEMBERSHIP

By their very nature, geodetic and geophysical studies require a high degree of international co-operation. IUGG is critically dependent on the scientific and financial support of its member Adhering Bodies. The list of present and past IUGG Adhering Bodies is published in the IUGG Yearbook and posted on the web site. Each Adhering Body establishes a National Committee for IUGG, and names Correspondents to each Association (as appropriate). During 2010, the Union had 69 Member Adhering Bodies. Several members were in observer status because they were in arrears of dues payment. Five Adhering Bodies were in Associate Member status. New member country applications are being actively encouraged.

STRUCTURE

Responsibility for directing the Union's affairs is vested in the IUGG Council by the Statutes and Bylaws. The IUGG Council consists of the Council Delegates, who are designated by the Adhering Body of their respective countries as their representatives for each Council meeting. The Council is convened at each quadrennial General Assembly. A Bureau, an Executive Committee and a Finance Committee administer IUGG affairs between Council meetings. The Executive Committee has the particular responsibility of overseeing the scientific programs of the Union. There is no permanent Secretariat; the National Committee of the country where the IUGG Secretariat is located is expected to provide administrative support for Union affairs.

Associations

The Union brings together eight semi-autonomous Associations, each responsible for a specific range of topics or themes within the overall scope of the Union's activities and each with a sub-structure. The Associations convene their own assemblies and sponsor scientific symposia, often in partnership with one another. Within its own discipline each Association is responsible for determining its own program of investigations and for supporting the activities of its own component parts. All Earth scientists, worldwide, are eligible to participate in IUGG and Association assemblies, workshops, and symposia, although only scientists from member countries with dues paid may serve as officers.

The eight International Associations are listed below, and short reports on their 2010 activities are included here. Additional information about each Association is given on their web sites, which can be accessed from the IUGG web site.

- International Association of Cryospheric Sciences (IACS)
- International Association of Geodesy (IAG)
- International Association of Geomagnetism and Aeronomy (IAGA)
- International Association of Hydrological Sciences (IAHS)
- International Association of Meteorology and Atmospheric Sciences (IAMAS)
- International Association for the Physical Sciences of the Oceans (IAPSO)
- International Association of Seismology and Physics of the Earth's Interior (IASPEI)
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

Union Commissions

Owing to the interactive nature of the subject fields addressed by the Union's Associations, a number of Union Commissions have been established that promote the study of particular interdisciplinary problems. In 2010, the following bodies were active:

- Commission for Data and Information (UCDI)
- Commission on Geophysical Risk and Sustainability (GRC)
- Commission on Mathematical Geophysics (CMG)
- Commission on the Study of the Earth's Deep Interior (SEDI)

Inter-Unions Commission

The International Lithosphere Program, guided by the Scientific Committee on the Lithosphere (SCL), was established in 1980 as the Inter-Unions Commission on the Lithosphere (ICL) by the International Council for Science (ICSU), at the request of IUGG and the International Union of Geological Sciences (IUGS). The name was formally changed to the Scientific Committee on the Lithosphere in 1999. According to Decision 8.4 from the 2005 ICSU General Assembly, ICSU decided "to withdraw ICSU sponsorship from SCL/ILP and to recommend that responsibility would then shift to IUGG and IUGS." Since that time, IUGG and IUGS have reaffirmed the ILP mission and have collaborated to re-define ILP as an Inter-Unions body.

GENERAL ASSEMBLIES OF THE UNION

General Assemblies have been held since 1922 and, since 1963, at 4-year intervals. These assemblies provide an extraordinary opportunity for Earth scientists from around the world to gather and share expertise, research data, and results. Past IUGG General Assemblies are listed in the IUGG Yearbook and on the web site. The most recent General Assembly was held in Perugia, Italy, 2-13 July 2007. The next General Assembly will be held in Melbourne, Australia, 27 June – 8 July 2011.

OTHER SCIENTIFIC MEETINGS

Each Association organizes its own scientific assembly in the 4-year interval between Union General Assemblies in order to report scientific progress and conduct Association business. Associations sometimes meet jointly with the purpose of promoting interdisciplinary science. Topical and regional symposia and workshops are organized on other occasions by the Associations to provide opportunity for geodesists and geophysicists worldwide to discuss their respective methodologies, results and hypotheses and to plan collaborative research projects. The symposia, often held in less-visited, geophysically interesting locales, are intended to be attractive to the younger scientists from the developing countries of the world.

PUBLICATIONS

The IUGG publishes an annual Yearbook that lists the organizational structure and officers of each body within the Union. The Yearbook is posted on the IUGG web site: <http://www.iugg.org/publications/yearbooks/yearbook2011.pdf>. The Union also distributes an electronic newsletter (the IUGG E-Journal) monthly to Adhering Bodies and National Committees. Each Association manages its own publications.

IUGG OFFICERS FOR 2007-2011

IUGG Bureau

President: Tom Beer (Australia)
Secretary General: Alik Ismail-Zadeh (Germany/Russia)
Vice President: Harsh Gupta (India)
Treasurer: Aksel Hansen (Denmark)
Members: Yun-Tai Chen (China)
David Jackson (USA)
Ali Tealeb (Egypt)

IUGG Executive Committee

IUGG Bureau members

Immediate Past President: Uri Shamir (Israel)
IACS President: Ian Allison (Australia)
IAG President: Michael Sideris (Canada)
IAGA President: Eigil Friis-Christensen (Denmark)
IAHS President: Gordon Young (Canada)
IAMAS President: Guoxiong Wu (China)
IAPSO President: Lawrence Mysak (Canada)
IASPEI President: Zhongliang Wu (China)
IAVCEI President: Setsuya Nakada (Japan)

IUGG Finance Committee

Chair: Juan Vilas (Argentina)
Members: David Collins (UK)
Jan Krynski (Poland)
Kiyoshi Suyehiro (Japan)

Association Presidents and Secretaries General

International Association of Cryospheric Sciences

President: Ian Allison (Australia)
Secretary General: Manfred Lange (Germany/Cyprus)

International Association of Geodesy

President: Michael Sideris (Canada)
Secretary General: Hermann Drewes (Germany)

International Association of Geomagnetism and Aeronomy

President: Eigil Friis-Christensen (Denmark)
Secretary General: Mioara Mandea (France)

International Association of Hydrological Sciences

President: Gordon Young (Canada)
Secretary General: Pierre Hubert (France)

International Association of Meteorology and Atmospheric Sciences

President: Guoxiong Wu (China)
Secretary General: Hans Volkert (Germany)

International Association for the Physical Sciences of the Oceans

President: Lawrence Mysak (Canada)
Secretary General: Johan Rodhe (Sweden)

International Association of Seismology and Physics of the Earth's Interior

President: Zhongliang Wu (China)
Secretary General: Peter Suhadolc (Italy)

International Association of Volcanology and Chemistry of the Earth's Interior

President: Setsuya Nakada (Japan)
Secretary General: Joan Martí (Spain)

Union Commission Officers

Union Commission for Data and Information (UCDI)

President: Peter Fox (USA)
Secretary: Adelina Geyer Traver (Spain)

Union Commission on Geophysical Risk and Sustainability (GRC)

President: Kuniyoshi Takeuchi (Japan)
Secretary: Gerd Tetzlaff (Germany)

Union Commission on Mathematical Geophysics (CMG)

President: Dan Rothman (USA)
Secretary General: Claudia Pasquero (USA)

Union Commission on Studies of Earth's Deep Interior (SEDI)

President: Gauthier Hulot (France)
Secretary General: Michael Bergman (USA)

Inter-Unions Commission: International Lithosphere Program (ILP)

President: Sierd Cloetingh (The Netherlands)
Secretary: Roland Oberhänsli (Germany)

IUGG BUREAU AND EXECUTIVE COMMITTEE MEETINGS

The IUGG Bureau meeting was held from 30 October to 2 November 2010 in Cairo, Egypt. The next Bureau and Executive Committee meetings will take place in Melbourne, Australia, at the occasion of the XXVth IUGG General Assembly.

MESSAGE FROM THE PRESIDENT



Because the Year 2010 is one year out from the IUGG General Assembly, to be held in Melbourne 27 June – 8 July 2011 many of the Union activities revolved around preparations for this important event. Held every four years the General Assembly is an opportunity for the countries that comprise the membership to congregate and assure themselves that the Union has progressed, and will continue to progress, in a desirable and relevant manner. IUGG and Union Association have been involved in preparation of the comprehensive scientific program. The assembly's program includes nine keynote Union Lecturers:

Dr. Greg Ayers, the Director of the Australian Bureau of Meteorology in Melbourne.

Dr. Dan Baker, Director of the Laboratory and Space Physics at the University of Colorado.

Dr. Anny Cazenave from the 'Centre National d'Etudes Spatiales' in Toulouse.

Prof. Tom Jordan, Director of the Southern California Earthquake Center, Los Angeles.

Prof. Brian Kennett of the Australian National University in Canberra.

Dr. Demetris Koutsoyiannis of the National Technical University of Athens.

Prof. Markus Rothacher of the Institute of Geodesy and Photogrammetry, Zurich.

Prof. Steve Self of the US-Nuclear Regulatory commission, Alameda.

Dr. David Vaughan of the British Antarctic Survey, Cambridge.

The Year 2010 certainly confirmed the relevance of geodesy and geophysics. The journal *Nature*¹ in its round-up of top science news stories of 2010 led with "Natural disasters pummelled the Earth".

The magnitude 7.0 earthquake that struck Haiti on 12 January 2010 killed an estimated 230,000 people. Almost eight months later, on 3 September Christchurch, New Zealand was struck by an earthquake of identical magnitude that caused considerable damage but no loss of life. An even stronger earthquake in Chile, of magnitude 8.8 on 27 February, also caused widespread damage with an estimated death toll of 521 victims.

On 29 January 2010 IUGG revised and updated the IUGG Resolution concerning "Science on Natural Hazards and Environmental Disasters"² again resolving:

1. To promote the development and application of scientific expertise and experience in modeling and visualization of physical, technological, biological and social processes and their implications to the mitigation of natural disasters; and
2. To share this critical information to the greatest extent possible with government officials, emergency planners, the insurance industry, policy makers, and the public.

This statement was highlighted by ICSU (The International Council of Science) as an important scientific issue related to societal needs and is reproduced on their web site³. ICSU organises a meeting of scientific union members half-way between the three-yearly ICSU General Assemblies. Both the Secretary-General and I attended this scientific union meeting (6-9 April) to represent IUGG and its interests. Eight of the ICSU union members⁴ have self-organised themselves into a cluster called the GeoUnions Consortium that met the day before the official ICSU meeting. IUGG is the

¹ Nature 468, 1014-1016, 2010 – doi:10.1038/4681014a

² <http://www.iugg.org/about/special.php>

³ http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/3014_DD_FILE_IUGG_NatHazResolution.pdf

⁴ IAU (astronomy), IGU (geographers), INQUA (quaternary science), ISPRS (remote sensing), IUGG (geophysics), IUGS (geology), IUSS (soil science), URSI (radio science)

lead in the ICSU sponsored project on Extreme Natural Hazards and Societal Implications (ENHANS)⁵.

IUGG also released two statements related to the eruptions of Eyjafjallajökull volcano in Iceland: the first statement on Volcanic Ash Clouds (20 April) was distributed at the Congressional Briefings on Reducing Volcano Risks in the U.S. Senate and the House of Representatives, and the second statement on Volcanological and Meteorological Support for Volcanic Ash Monitoring (28 May) was welcomed by the Executive Board of the World Meteorological Organization (WMO) and the International Civil Aviation Organization (ICAO). Both statements can be found in the “About IUGG” section of the web site⁶.

During the year an Italian prosecutor indicted the members of the Abruzzi High Risk Committee for their failure to warn the population before the strong earthquake of 6 April 2009. IUGG believes that no scientist should be prosecuted for having expressed a scientific opinion based on the available knowledge – which is often necessarily limited – and therefore issued a statement on Freedom to Conduct Science and Responsibilities of Scientists (28 June) highlighting the Principle of the Universality of Science of the International Council for Science (ICSU). This principle encompasses freedom in relation to expressions of scientific ideas, hypotheses and forecasts, to conduct of research using data, information, experiments and theories, and to communicate scientific results to the public through open publications and scientific conferences.

The IUGG Bureau met from 30 October – 2 November in Cairo, Egypt and prepared background materials for the forthcoming Council meeting of the Union. During my travel to the Bureau Meeting I took the opportunity to visit representatives of the IUGG National Committees of Austria, Hungary and Egypt.

I would like to express my appreciation to the IUGG Secretariat, and to the members of the IUGG Bureau for their hard work, and for the assistance they have provided during the year.

Tom Beer

⁵ <http://www.enhans.org/>

⁶ <http://www.iugg.org/about/special.php>

MESSAGE FROM THE SECRETARY GENERAL



In 2010 the Union was involved in various activities and showed its strength in international cooperation and science promotion. A few major activities and events in the life of the Union for this year are highlighted below (they will be presented in the Annual Report in some detail):

- As a response to the Haiti earthquake disaster, IUGG adopted the special resolution on “Science on Natural Hazards and Environmental Disasters” (29 January).
- Two statements related to the eruptions of Eyjafjallajökull volcano in Iceland were issued by IUGG: the first statement on Volcanic Ash Clouds (20 April), and the second statement on Volcanological and Meteorological Support for Volcanic Ash Monitoring (28 May).
- IUGG issued a statement on Freedom to Conduct Science and Responsibilities of Scientists (28 June) highlighting the Principle of the Universality of Science of the International Council for Science (ICSU).
- IUGG and Union Association have been involved in the preparation of the comprehensive scientific program for the XXV General Assembly of IUGG to be held from 27 June to 8 July 2011 in Melbourne, Australia.
- IUGG co-sponsored 16 international scientific meetings worldwide in 2010 and awarded grants to four international research projects.
- IUGG strengthened further its relationship with the ICSU GeoUnions, UNESCO and the American Geophysical Union through a cooperation in the ICSU project “Extreme Natural Hazards and Societal Implications – ENHANS”
- Azerbaijan and F.Y.R. Macedonia joined IUGG as Regular Members and Costa Rica as an Associate Member.
- The IUGG Bureau met on 30 October – 2 November in Cairo, Egypt and prepared background materials for the forthcoming Council meeting of the Union.

The IUGG Bureau and Secretariat thank the Union Associations and Commissions as well as individuals who helped making the year 2010 exciting and productive in strengthening international Earth and space sciences to benefit society.

The IUGG Secretariat is located on the campus of the Karlsruhe Institute of Technology, Germany. As a response to the request of the German National Committee for Geodesy and Geophysics (NKGG), the German Research Foundation (DFG) awarded the IUGG Secretariat a grant to hire an Assistant Secretary General and to assist with business travels of the Secretary General for the years 2010-2011. The IUGG is very grateful to the NKGG for the support and to the DFG for the sponsorship of the IUGG Secretariat.

The report below highlights the activities of the Union, the Union Associations and Commissions, and the Inter-Union Commission for 2010.

Alik Ismail-Zadeh

IUGG ACTIVITIES

IUGG SECRETARIAT

IUGG Yearbook for 2010 and Annual Report for 2009

The 2010 Yearbook was available at the IUGG web site electronically in PDF format in January 2010 (<http://www.iugg.org/publications/yearbooks/yearbook2010.pdf>). The IUGG web site maintains the directory of Union and Association officials and the archive of IUGG memberships and General Assemblies. The IUGG Annual Report summarises the activities of the Union, IUGG Associations and Union and Inter-Unions Commissions for 2009. The 2009 IUGG Annual Report is posted on the web page: <http://www.iugg.org/publications/reports/report2009.pdf>. The report was printed together with the 2010 IUGG Yearbook and was mailed to the Adhering Organizations, National Committees, International partners, and major libraries in May 2010.

IUGG web-page

The IUGG web site, in English and French, was updated by introducing the Membership Zone and restructuring the site. The IUGG web-master, Dr. D. Krupsky, carried out a statistical analysis of the IUGG website performance for 2009-2010. An average number of the visits of the IUGG website is determined to be about 60,000 per year.

IUGG Electronic Journal

The E-Journal, an informal newsletter, was published monthly and distributed on the first day of each month keeping IUGG Member National Committees informed about the activities of IUGG, its Associations and Commissions, and actions of the IUGG Secretariat. Also the journal publishes news from ICSU, GeoUnions, IUGG scientific programs and co-sponsored scientific meetings, about awards and honours bestowed on IUGG scientists as well as obituaries, and meeting calendar (<http://www.iugg.org/publications/ejournals/>).

German Research Foundation sponsorship of the IUGG Secretariat

As a response to the second request of the German National Committee for Geodesy and Geophysics (NKG), the German Research Foundation (DFG) awarded the IUGG Secretariat a grant to support the position of the Assistant Secretary General and to assist with business travels of the Secretary General for the years 2010-2011. A letter of appreciation was sent to the DFG International Department by IUGG President Tom Beer.

Call for Reports of the National Committees for IUGG

It is the custom of the National Committees for IUGG to prepare a Quadrennial Report for the General Assemblies. Many of these have been comprehensive summaries of national activities in geodesy and geophysics that showcase the accomplishments of the past four years (<http://www.iugg.org/members/nationalreports/index.php>). IUGG called for the reports of the National Committee for IUGG to be submitted prior the XXV IUGG General Assembly, 27 June- 8 July 2011, Melbourne, Australia.

Call for Delegates to the XXV IUGG General Assembly

In a formal letter posted on 15 July 2010 to all IUGG Adhering Bodies, a request was made for the name of the official delegate to the IUGG Council meetings in Melbourne, Australia, 27 June – 8 July 2011. This person must be accredited by means of a signed letter from the IUGG Adhering Body. This person will be admitted to the Council meeting and may participate in Council business. Delegates from Adhering Bodies in Observer status (i.e., dues not paid through 2010), may participate in Council Business but may not vote on issues requiring a ballot, including elections of officers and approval of the budget. IUGG Members in Associate status may send one representative to the Council meetings as a Listener; Listeners are not permitted to engage in discussions or vote on IUGG business. The

Adhering Bodies are asked to send these letters so that they arrive at the IUGG Office by 1 February 2011. In order to expedite the Council meetings, documents regarding items of business will be sent directly to the delegates for consideration in advance of the General Assembly.

Call for Invitations to Host the 2015 IUGG General Assembly

By the deadline of 27 December 2010, six invitations were received to hold the XXVI General Assembly of IUGG in 2015 in:

- *Athens, Greece*, from the Hellenic National Committee of Geodesy and Geophysics and the Research Center for Atmospheric Physics and Climatology of the Academy of Athens;
- *Buenos Aires, Argentina*, from the Instituto Geografico Nacional and the Argentinean National Committee for Geodesy and Geophysics;
- *Copenhagen, Denmark*, from the Danish National Committee for IUGG;
- *Honolulu, Hawaii, USA*, from the National Academy of Sciences and the American Geophysical Union;
- *Hyderabad, India*, from the Indian National Academy of Sciences; and
- *Prague, Czech Republic*, from the Institute of Geophysics of the Academy of Sciences of the Czech Republic and the Czech National Committee for Geodesy and Geophysics.

MEMBERSHIP APPLICATIONS

Former Yugoslav Republic of Macedonia a Regular member of IUGG

On 25 March 2010 an application for admission of the F.Y.R. of Macedonia to IUGG as a regular member (Category 1) was received from the Ss Cyril and Methodius University in Skopje. The IUGG Executive Committee welcomed this application, and it was placed before the IUGG Adhering Bodies in regular status (dues paid) for a vote by correspondence. The vote is now complete, and the application was accepted (32 affirmative). According to the IUGG Statutes and By-Laws, the membership of F.Y.R. of Macedonia is provisional until the next meeting of the IUGG Council in Melbourne, Australia, 2011, when a final vote will be taken.

The new officers of the National Committee: M. Jovanovski (President) and Z. Srbinoski (Secretary). Correspondents to the Associations are Z. Srbinoski (IAG), C. Popovska (IAHS), V. Pavlovska (IAMAS), and M. Garevski (IASPEI).

Azerbaijan a Regular member of IUGG

On 21 April 2010 an application for admission of Azerbaijan to IUGG as a regular member (Category 1) was received from the Azerbaijan National Academy of Sciences. The IUGG Executive Committee welcomed this application, and it was placed before the IUGG Adhering Bodies in regular status (dues paid) for a vote by correspondence. The vote is now complete, and the application was accepted (31 affirmative and 1 abstaining). According to the IUGG Statutes and By-Laws, the membership of Azerbaijan is provisional until the next meeting of the IUGG Council in Melbourne, Australia, 2011, when a final vote will be taken.

The new officers of the National Committee for Azerbaijan: I. Guliev (President) and G. Babayev (Secretary). Correspondents to the Associations are F. Kadirov (IAG), E. Guliyev (IAGA), Y. Israfilov (IAHS), R. Mammedov (IAPSO), G. Yetirmishli (IASPEI), and Arif Ismail-Zadeh (IAVCEI).

Costa Rica an Associate member of IUGG

By vote by correspondence of the Regular Members of IUGG, Costa Rica has been accepted as a new member of IUGG in Associate status. The Adhering Body is the Costa Rican National Academy of Sciences. The Academy appointed Dr. Marino Protti, Secretary of the Academy, who together with Dr. Walter Fernández, President of the Costa Rican National Council of Science and Technology, will form the National Committee for IUGG.

IUGG BUREAU MEETING

The IUGG Bureau met from 30 October – 2 November in Cairo (Egypt) upon the invitation of the Egyptian Academy of Scientific Research and Technology. Items of discussion included reports from the President, the Vice-President, and the Secretary General; the current state of arrangements for the XXV IUGG General Assembly in Melbourne; the modus operandi of IUGG; a review of the Union Associate Membership; reviews of the Union Commissions; reports from Union Committees; the future of Scientific Assemblies of the Union; reports from IUGG liaisons and representatives to international and intergovernmental organizations; the International Lithosphere Programme; ICSU matters including the Regional Offices, the new research programme on Integrated Research on Disaster Risk, and the ICSU initiative on data and information; IUGG Membership; reports of the IUGG Treasurer and the Chair of the IUGG Finance Committee; the 2012-2015 draft budget of the Union; the visibility of the Union; and reaching out to young scientists and developing countries. On 1 November a Round-table Discussion on Natural Hazards was held in the Academy where IUGG scientists discussed state-of-the-art research on natural hazards, extreme events and disaster risks. The IUGG Bureau very much appreciates the hospitality of the Academy and our Cairo Ambassador Ali Tealeb.



The IUGG Bureau members with the representatives of the Egyptian National Committee for IUGG

IUGG RESOLUTIONS AND STATEMENTS

IUGG Resolution “Science on Natural Hazards and Environmental Disasters” (Adopted by the IUGG Bureau, 10 January 2005; *Revised and adopted by the IUGG Bureau, 29 January 2010*).

Whereas, The first decade of the XXIst century has been marked by a significant number of environmental disasters due to natural extreme events, such as earthquakes (e.g. 2004 Sumatra-Andaman in the Indian Ocean, 2005 Kashmir in Pakistan, 2008 Sichuan in China, and 2010 Haiti), which triggered landslides and/or tsunamis; floods (e.g. in western and central Europe in 2002, China in 2007; Taiwan and Philippines in 2009); cyclones and hurricanes (e.g. Katrina in 2005; Nargis in 2008); and some others, resulting in tragic loss of life and property;

The International Union of Geodesy and Geophysics (IUGG)

Considering, Global, regional, and local increases of vulnerability and all changes of environmental conditions including climate; and

2. The continuous increase of fatalities, the number of people affected, and property damage caused by natural events;

Realizing, That disaster reduction, management, and preparedness as well as warning systems need long term planning; and

2. That reducing the impact of disasters should be carried out mainly at the local level;

Noting, That existing technology observations for topography, real-time monitoring of land, ocean and atmosphere activity, satellite observations from space, and natural hazard prediction models could prevent loss of life if predictions were timely and warnings were heeded; and

2. That the economic impact of natural disasters exceeds the cost of mitigation; and
3. That in the aftermath of a natural disaster, existing scientific knowledge and technology could provide rescue agencies and civil defense managers immediate quantitative estimates of the extent and severity of the disaster; and
4. That the reduction of predictive uncertainty is the most important scientific agenda in natural hazards reduction;

Recommends, That multidisciplinary and multinational research programs and research networks on geophysical hazards and risks be developed to integrate diverse data streams, to improve understanding of the natural phenomena associated with the disasters, and to develop predictive modeling capability; and

2. That systems and procedures be prescribed for early warning, public awareness, regional evacuation routes and shelters based on charts of natural hazards, vulnerability, and risk assessments; and
3. That regional disaster management centers be established where they do not now exist to catalog information on the population and infrastructure at risk, and to monitor land, ocean and atmosphere in relation to all kinds of natural hazards; and
4. That regional natural hazard warning systems be set up in order to generate and disseminate timely and accurate information needed by decision makers and the public, and

Urges, The international science community to quantify natural hazards and extreme events at all scales;

2. To adopt integrative and comprehensive interdisciplinary approaches towards developing adaptation in order to decrease vulnerability; and
3. To produce planning tools for disaster risk reduction at all scales.

Resolves, To promote the development and application of scientific expertise and experience in modeling and visualization of physical, technological, biological and social processes and their implications to the mitigation of natural disasters; and

2. To share this critical information to the greatest extent possible with government officials, emergency planners, the insurance industry, policy makers, and the public.

IUGG Statement on Volcanic Ash Clouds (*Adopted by the IUGG Bureau on 20 April 2010*)

Explosive eruptions form broken hot magma and volcanic gas, which heats the air and rises like a thunderstorm. This brings volcanic ash and gases high into the atmosphere, up to the levels where jet aircraft fly and even beyond. This ash and gas are blown by the wind, which blows in different directions at various heights. The ash and gas lead to volcanic clouds, which incorporate water and ice particles. If these clouds reach the surface of the Earth then they may cause adverse respiratory effects in susceptible individuals. They are also a threat to the safety of jet aircraft because the ash melts inside the engines and may cause engine failure and other damage. These clouds may last for days or even weeks and can travel all the way around the world.

Ground based radar systems and satellite sensors can map the volcanic clouds. The satellite sensors can detect, measure and map ash, ice and sulfur dioxide gas. Radar and satellite data provide information about cloud altitude in near real time. There are accurate trajectory models, which can forecast the winds at all levels and predict the position of volcanic ash in advance. Volcanic ash aviation centres worldwide relay this information to aircraft dispatchers and pilots.

To summarise:

1. Volcanic clouds, which may be invisible, especially in the dark, are a hazard to jet aircraft because they contain volcanic ash, which melts inside jet engines and can cause engine failure.
2. There have been cases in the past where jet aircraft flew into invisible volcanic ash clouds and all engines stopped.
3. The volcanic clouds may exist at a variety of altitudes and can affect the health of people on the ground, and also may be dangerous to aircraft.

4. The extent of the volcanic clouds can be mapped by satellites, which sense silicate ash, ice and sulfur dioxide.
5. The existence of the volcanic cloud is sustained by continuing volcanic activity, but volcanic clouds may drift long distances and be detectable for a week or more after eruption.
6. The altitude of the volcanic cloud generally increases as the eruption intensity increases.
7. The volcanic cloud position is dynamic and is governed by wind directions, which are typically different at different altitudes. Once an eruption begins, the volcanic cloud position can be forecast by trajectory models.

The International Union of Geodesy and Geophysics (IUGG) through its constituent scientific association, the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), works with the U.N. International Civil Aviation Organization (ICAO) to better understand physics and chemistry of volcanic clouds and to find ways for pilots to distinguish volcanic ash clouds from normal clouds.

IUGG Statement “Volcanological and Meteorological Support for Volcanic Ash Monitoring”

(The Statement was adopted by the IUGG Bureau on 28 May 2010 and follows the IUGG Statement of 20 April 2010 on Volcanic Ash Clouds.)

The eruptions of Eyjafjallajökull, Iceland, during early 2010, have highlighted the importance of a close understanding of the eruptive state of each of the world's active volcanoes, for the safety and health of local residents as well as for air traffic and other purposes. It has become increasingly evident during the eruption that accurate specification of the ash column height and the ash characteristics from the eruption are necessary for safe and efficient routing of air traffic. To be able to forecast ash clouds for the aviation hazards, the clouds' concentration, particle size and total mass is required in real time. The work of the volcanologists and meteorologists of Iceland, bringing together earth and atmospheric sciences, in support of the operations of the London Volcanic Ash Advisory Centre, has been critically important in this regard.

In improving the global response to volcanic clouds as aviation hazards, it must be understood that the great majority of the Earth's active volcanoes are located in less industrialized countries or in remote locations, and are not monitored to the standards of Iceland. Only about 50% of the World's volcanoes that currently threaten air operations have any sort of ground based monitoring. Also, less than 50 of the 1300 volcanoes with Holocene age eruptions (approximately the last 12000 years) worldwide are considered to be *well* monitored.

In this regard, the IUGG emphasises:

- The capability to understand, forecast and promptly report eruptions, based on thorough study and instrumentation of active volcanoes, remains vital for aviation safety, for residents exposed to local volcanic hazards, and also for assessing the magnitude and effects of volcanic emissions on our atmosphere and climate;
- An improvement in support for local volcano observatories would improve the timing, scope, and accuracy of information on volcanic activity;
- In meeting requirements from the International Civil Aviation Organization (ICAO) for States to provide volcanological information to aviation, the long term sustainability of such support for volcano observatories is an important consideration. ICAO, advised by the International Union of Geodesy and Geophysics and other organisations including the World Meteorological Organization (WMO), has prepared arrangements where a State may choose to recover reasonable costs for the provision of information to aviation from the aviation industry. A State could, alternatively, choose to support observatories directly without such arrangements. Guidelines on these issues are now available as referenced below;
- Any volcanic crisis places high pressure on the responsible agency: support for aviation functions is typically only one of many aspects of a volcanic crisis that volcanologists must consider. International science protocols, prepared by IUGG constituent association, the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), already exist to assist in scientific cooperation during a crisis, and may be useful in the context of an aviation-focused volcanic crisis;

- Where observations exist (such as satellite data, pilot reports and meteorological radar coverage over a volcanic area), arrangements for multi-disciplinary observation sharing between all those concerned with the hazard assessment from the volcanic activity should be specified and followed to ensure the best possible use of observations.

In summary, increased support for the volcano observatories of the world, as part of the international science effort to improve volcanic cloud monitoring, is a necessary measure for improving volcanic impact management and aviation safety as well as for aiding natural hazard mitigation on the ground.

IUGG Statement on Freedom to Conduct Science and Responsibilities of Scientists

(The IUGG Bureau adopted the Statement on 28 June 2010.)

The International Union of Geodesy and Geophysics (IUGG) and all of its component bodies adhere to the Principle of the Universality of Science of the International Council for Science (ICSU), which is fundamental to scientific progress. This principle encompasses freedom in relation to (i) expressions of scientific ideas, hypotheses and forecasts, (ii) conduct of research using data, information, experiments and theories, and (iii) communicating scientific results to the public through open publications and scientific conferences. These freedoms are highly valued by the scientific community and generally accepted by governments and policy makers. However, this is not always the case.

For example, recently the L'Aquila (Italy) Prosecutor's office indicted the members of the Abruzzi region's High Risk Committee for unintended murder in L'Aquila⁷. The indictment is based on the failure of the Committee to warn the population before the strong earthquake of 6 April 2009 that killed about 300 people. It is shocking and unacceptable to accuse and legally indict scientists and members of a governmental panel because they failed to make a prediction of an extreme natural event in a particular place. No scientist (or official person giving statements based on scientific opinions) should be prosecuted for having expressed a scientific opinion based on the available knowledge, which is always limited. Meanwhile societal stakeholders can use even limited scientific knowledge to benefit society. IUGG condemns unacceptable political and judicial interference into scientific issues.

This case shows how society can misuse science for political or other purposes and reflects the urgent necessity of the Earth science community to improve communication with policy makers and the public to explain the limitations of the present scientific knowledge of the Earth and its environment and the limitations on the predictability of extreme natural hazards.

The ICSU Principle of the Universality of Science focuses on scientific rights and freedoms but also emphasizes a number of responsibilities. Scientists have an individual responsibility to conduct their work with honesty, integrity, openness and respect, and a collective responsibility to maximize the benefit and minimize the misuse of science for society as a whole. The primary obligation of scientists is to conduct research, to discover new phenomena, to develop new knowledge, and based on the new knowledge to improve their forecasting capability so as to benefit society. A secondary, but important, obligation is to inform public and societal stakeholders on scientific findings within a reasonable time.

IUGG COMMITTEES

Several IUGG Committees have been established in 2010. Among them the Committee to serve for the IUGG General Assembly:

Nominating Committee

Chair:	Masaru Kono (Japan)
Members:	Gerhard Beutler (Switzerland)
	Marta Calvache (Colombia)
	Vladimir Cermak (Czech Republic)
Alternate Member	Corina Risso (Argentina)

⁷ Caporale, G., Sottovalutarono il pericolo-terremoto. La Repubblica, 4 June 2010.

DeWind, A., Italian seismologists on shaky ground. Geoscientist online, 15 June 2010.

Nosengo, N., Italy puts seismology in the dock. Nature, 465, p. 992, 24 June 2010.

Statutes and By-Laws Committee

Chair: David J. Kerridge (UK)
Members: Jean-Pierre Barriot (France)
Priscilla Grew (USA)
Ronald Stewart (Canada)
Bob Engdahl (USA)

Resolution Committee

Chair: Uri Shamir (Israel)
Members: Georg Kaser (Austria)
József Adam (Hungary)
Pierre Hubert (France)

Site Evaluation Committee

Chair: Michel Béland (Canada)
Members: Peter Suhadolc (Italy)
Kiyoshi Suyehiro (Japan)

Based on the decision of the IUGG Executive Committee, four new IUGG Committees have been set up.

Honours and Recognition Committee

Chair: Victor P. Savinykh (Russia)
Members: Harry Bryden (UK)
Jianping Li (China)
Crisan Demetrescu (Romania)

The Committee was formed by the decision of the IUGG Executive Committee meeting held on 9-11 October 2009 in Melbourne (Australia) to consider the topic of honours and recognition and if considered appropriate to recommend ways to:

1. develop IUGG Fellows, Medals and Awards programs and maintain oversight of the programs;
2. recommend changes to the policies and statutes and by-laws (if needed) in order to enhance the effectiveness of the IUGG honours and recognition programs;
3. ensure that protocols and nominating procedures for the medals and awards are well defined and properly publicised;
4. recommend procedures for the nomination and selection of Fellows, medallists and awardees;
5. make recommendations to ensure that sufficient and appropriate nominations for the Fellows, Medals and Awards are received; ensure that the Union medals and awards are appropriate and current;
6. ensure that IUGG scientists are nominated for appropriate external awards;
7. search for fund-raising opportunities for the Union's honours and recognition programs.

To ensure sufficient time for any recommendations to be considered by the Statutes and By-Laws Committee, the IUGG Honours And Recognition Committee must report nine months before the General Assembly.

Membership Committee

Chair: Aksel Hansen (Denmark)
Members: Silvia Blanc (Argentina)
Tirumalachetty Harinarayana (India)
Jiaqi Liu (China)
Fred Spilhaus (USA)
Ali Tealeb (Egypt)

The Committee was formed by the decision of the IUGG Executive Committee meeting held on 9-11 October 2009 in Melbourne (Australia) to consider the topic of membership and if considered appropriate to recommend ways to:

1. develop an IUGG Fellows Program;
2. develop IUGG Individual and Honorary Membership programs;
3. develop an IUGG Adjunct Members program (e.g., to provide a tight link between IUGG and national and regional geophysical and geoscience unions and societies);
4. develop an IUGG Inactive Members program (to deal with the countries whose “observer” status is expired);
5. liaise with the IUGG Finance Committee, Statutes and By-Laws Committee, and Honours and Recognition Committee on the issues related to membership.

To ensure sufficient time for any recommendations to be considered by the Statutes and By-Laws Committee, the IUGG Committee on Membership Issues must report nine months before the General Assembly.

Capacity and Education Committee

Chair: Laszlo Szarka (Hungary)
Members: Nasser Abou-Ashour (Egypt)
Tomas Halenka (Czech Republic)
Jadwiga Anna Jarzyna (Poland)
Shichang Kang (China)
José Sellés Martínez (Argentina)
Gerhard Navratil (Austria)
Kathy Whaler (UK)

The Committee was formed by the decision of the IUGG Executive Committee meeting held on 9-11 October 2009 in Melbourne (Australia) to

1. examine current issues in science education and research on learning and disseminate knowledge about it;
2. be in charge of the science education policy of the Union (e.g. K-12 level, university level, other);
3. assist the Union officers in defining new fellowships and grants programs;
4. identify funding sources for fellowships and grants;
5. advocate, in partnership with other ICSU Unions and geophysical societies, for increased teaching of the geosciences in classrooms worldwide;
6. be responsible for cooperation and exchange (via workshops, seminars, symposia, conferences) and collaborative programs and interdisciplinary projects (especially in the developing world) and for technology transfer issues.

Visioning Committee

Chair: Eigil Friis-Christensen (Denmark)
Members: Alexei Gvishiani (Russia)
Zhengfu Guo (China)
ex-officio Tom Beer (Australia)

The Committee was formed by the decision of the IUGG Executive Committee meeting held on 9-11 October 2009 in Melbourne (Australia) to

1. manage a visioning process and prepare a vision plan placing particular emphasis on (i) grand challenges in geophysics and geodesy, (ii) involvements of young scientists and women in the Union activity, and (iii) relationships with external organizations, media and industry;
2. study the ways in which IUGG operates and formulate ideas on improvement of IUGG activities and structures and on new ways of operations;

3. examine (i) how IUGG science interacts with other geoscience disciplines, (ii) how IUGG science is relevant to societal needs, (iii) how to present IUGG to the rest of the world; and (iv) how IUGG can be involved in international and national decision-making processes without losing its scientific rigour;
4. develop an IUGG strategic plan based on inputs from the Union Associations and National Members;
5. examine the content of existing IUGG policy statements and revise if necessary;
6. determine the need for new IUGG policy statements;
7. prepare IUGG major statements (e.g. vision, mission, goals, objectives, values etc.) and IUGG special statements on scientific topics related to society (e.g. natural hazards, climate change, geoscience & geotechnology , etc).

XXV IUGG GENERAL ASSEMBLY



With the XXV IUGG General Assembly in Melbourne less than half a year away, preparations are now moving quickly. Registration is open at <http://www.iugg2011.com>.

The Scientific Program will run from **Tuesday 28 June until Thursday 7 July**. Each day will consist of four 90-minute sessions and one poster session (excluding the first Tuesday and the second Thursday). The Tuesday afternoon session of the first week will be the opening ceremony, the Thursday afternoon session of the second week is the closing ceremony, and three morning sessions will have plenary presentations. The GA's Scientific Program includes three categories of symposia and a number of workshops on a wide range of geophysical themes.

- *Union Symposia* cover a wide range of themes of concern to the eight Associations. Invited speakers feature in these Symposia, supported by poster presentations submitted. Several of the Union Symposia are expanded or followed in greater depth in Joint Symposia or in Association Symposia;
- *Lead (Inter-Associations) Symposia* with keynote speakers and scientists whose oral and poster presentations are accepted by the session convenors. The themes have been devised by at least two Associations, one of which is the lead Association. Some Joint Symposia are further developed separately in Association Symposia and Workshops.
- *Association Symposia* with keynote speakers and scientists whose oral and poster presentations are accepted by the session convenors.

The Scientific Program (<http://www.iugg2011.com/program.asp>) and other important information are available on the GA's web site <http://www.iugg2011.com/>.

Several administrative meetings related to the IUGG business will be held during the General assembly. The Schedule of IUGG administrative meetings was set as follows:

IUGG Bureau Meeting

- Session 1: Sunday, 26 June, 9:00-12:00
- Session 2: Friday, 1 July, 12:00-14:00
- Session 3: Tuesday, 5 July, 12:00-14:00

IUGG Executive Committee Meeting

Session 1: Sunday, 26 June, 14:00-18:00

Session 2: Friday, 1 July, 15:00-18:00

Session 3: Tuesday, 5 July, 15:00-18:00

IUGG Council Meeting

Session 1: Monday, 27 June, 14:00-18:00

Session 2: Saturday 2 July, 10:00-13:00

Session 3: Wednesday, 6 July, 15:00-18:00

IUGG new Bureau & Executive Committee meetings

Friday, 8 July, 10:00-11:30 – meeting of the new Bureau

Friday, 8 July, 13:00-15:00 – meeting of the new EC

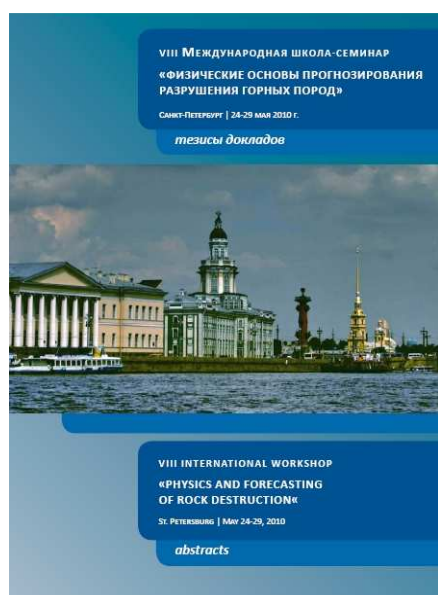
IUGG SUPPORT FOR SCIENTIFIC MEETINGS IN 2011

IUGG co-sponsors symposia and workshops appropriate to our disciplines of study and supports the participation of young scientists and scientists from developing countries. The IUGG budget for research meeting supports during the year of an IUGG General Assembly is very limited, and therefore, only a few meetings can be supported. For 2011, IUGG will support the following meetings (the names of the IUGG Associations that endorsed the meetings are indicated in brackets):

- Colloquium of African Geology, Johannesburg, South Africa, 8-14 January;
- Symposium “The 2001 Bhuj Earthquake and Advances in Earthquake Science”, Gandhinagar, Gujarat, India, 22-27 January;
- Vertical Coupling in the Atmosphere-Ionosphere System, Prague, Czech Republic, 14-18 February;
- 3rd IAGA Symposium “Heliospheric physics during and after a deep solar minimum”, Luxor, Egypt, 19-23 March; and
- Towards an Observing System for the Greater Agulhas System: Building links and capacity for East African participation, Port Louis, Mauritius, 21-25 March.

REPORTS FROM IUGG – CO-SPONSORED SCIENTIFIC EVENTS

VIII International Workshop “Physics and Forecasting of Rock Destruction”



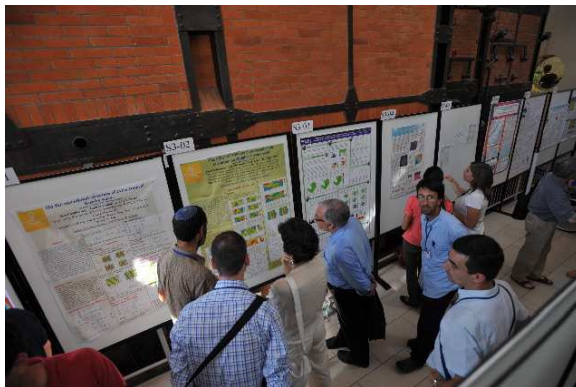
The Eighth International Workshop “Physics and Forecasting of Rock Destruction” (<http://www.ioffe.ru/kuksenko2010/>) was held in Saint Petersburg, Russia, from 24 to 29 May 2010. The workshop was organized by the Schmitt Institute of Physics of the Earth and the Ioffe Physical Technical Institute, both Institutes of the Russian Academy of Sciences (RAS) and co-sponsored by IUGG, the IASPEI Commission on Earthquake Sources: Modeling and Monitoring for Prediction, the Departments of Earth Sciences and Physics of RAS, the Russian Foundation for Basic Research, and Pradicom Ltd. More than 100 scientists representing eight countries (Belarus, Germany, Greece, India, Kazakhstan, Kyrgyzstan, Russia, and Tadjikistan) participated in the workshop.

Three scientific sessions presented the latest development in the field. Session 1 discussed problems related to the theory of destruction of rocks, mathematical and physical modeling of processes in the sources, spatial-temporal regularities, fractal and multi-fractal structure of seismicity, and triggering and synchronization of processes of rock instability. Problems of catastrophe theory, phase transitions and self-organized criticality in complex systems were considered in session 2, whereas session 3 was

dedicated to earthquake precursors, regularities of seismic noise, and new approaches to the earthquake forecast. The Workshop participants adopted a resolution noting (i) the progress in the understanding of complexity of the physical nature of fracture sources of different scale levels (seismicity, rock bursts, etc.); (ii) the progress in the interpretation of observations of various geophysical fields; (iii) the recent achievements in studies of trigger effects and effects of synchronization of geophysical fields; and (iv) the recent development of research methods in the field of seismology and mining.

Conference on Mathematical Geophysics

The 28th International Conference on Mathematical Geophysics was held in Pisa in June 2010. The conference was organized by the IUGG Union Commission on Mathematical Geophysics (CMG), the Istituto Nazionale di Geofisica e Vulcanologia, and the University of Pisa and was co-sponsored by the U.S. National Science Foundation. The theme of the conference was “*Modelling Earth Dynamics: Complexity, Uncertainty and Validation*”. More information about the conference can be found on the website (<http://cmg2010.pi.ingv.it>). Many talks at the conference illustrated the complexities affecting geophysical processes. Novel applications of geophysical fluid dynamics were presented with specific reference to volcanological and subsurface/surface flow processes. Fluid-dynamic models of atmospheric, oceanic, environmental and climatic systems also illustrated the fundamental role of non-linear couplings between the different sub-systems as well as of Earth’s topography to explain the complex stratifications and circulations affecting the domains. Similarly, advances in solid-Earth mathematical geophysics have allowed researchers to obtain the first planet-wide tomographies based on the complete solution of the elasto-dynamic equations in 3D, to formulate non-local and dynamic damage models of rocks, to investigate statistically the triggering, clustering, and synchronization of faults, as well as to develop realistic simulations of the planetary dynamo, plate tectonics, and gravity and magnetic fields.



Uncertainty identification and quantification was the second key theme of the conference. The contributions presented clearly highlighted how an important part of the geophysical community has addressed this issue over some years. Applications of the Bayesian paradigm, development of logic event trees, production of ensemble forecasting of expected processes, reconciliation techniques of sparse geological evidence, as well as expert elicitation techniques have all been developed for several geophysical systems including applications to hazard and risk assessment. The model validation issue was widely discussed during the conference. This theme was also revised in the light of the most

recent outcomes of philosophical research. The well-known concepts of model verification and validation were complemented with the terms “confirmation” and “testing”. Direct comparisons between observational data and deterministic and probabilistic modelling forecasts were presented for seismic, volcanological, geodynamical, atmospheric and climatic systems well illustrating the challenging aspects of model evaluation. The conference also hosted a special session “*Can our models only predict the irrelevant?*” in memory of Prof. Albert Tarantola (see the obituary in the IUGG E-Journal, Vol. 10, No. 2, 1 February 2010), an outstanding mathematical geophysicist and former CMG President, which was dedicated to the relevance of mathematical models in terms of predictability in real applications.

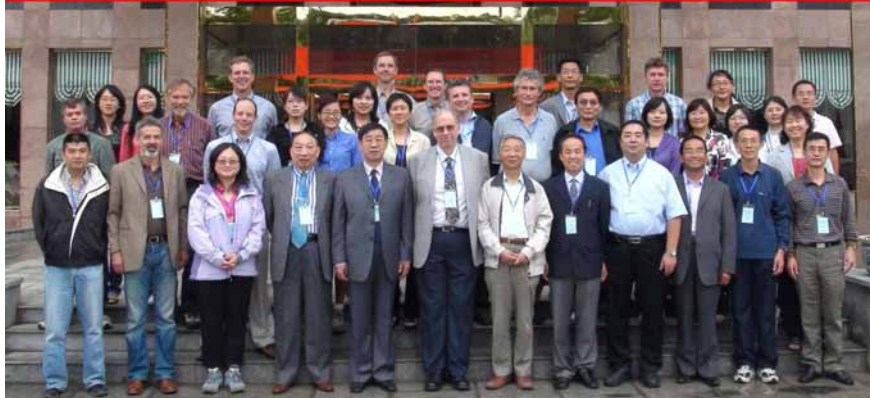
Symposium “Disaster Prediction and Management”

The Symposium “Disaster Prediction and Management”, co-sponsored by IUGG and EUROSCIENCE and organized by the IUGG GeoRisk Commission and the Euroscience Working Group “Science and Urgent Problems of Society”, was held on 6 July 2010 in Turin, Italy. The symposium attracted attention of mass media and representatives various fields of knowledge. Contemporary science is responsible for coping with the challenging changes of exposures and vulnerability inflicted by growing population, its concentration, etc., which result in the observed steady increase of social losses due to natural disasters. Scientists owe to the society for lack of knowledge, education, and communication. The symposium demonstrated that contemporary science can do a better job in disclosing natural hazards, assessing risks, and delivering such info in advance catastrophic events. Geoscientists initiate shifting the minds of community from pessimistic disbelieve to optimistic challenging issues of hazard predictability (based on the recent, enormous progress in real-time data retrieval and monitoring of distributed multiple geophysical characteristics world-wide). Giuliano Panza (Italy) spoke on new approaches in seismic hazard and risk assessment. Jacques Zlotnicki (France) spoke on volcano hazards analysis and mitigation using various geophysical techniques. Vladimir Kossobokov (Russia) spoke about statistical approach to analysis of extreme natural events and about their predictability. Alik Ismail-Zadeh (Germany) emphasized the importance of research on extreme natural hazards and discussion societal impact of natural disasters. The German Radio SWR2 broadcast the interview with the participants of the symposium on 11 July.

International Monsoon Workshop

The China National Committee (CNC) for IAMAS/IUGG sponsored and organized an international workshop on “Asian Summer Monsoon and its Role on Global Stratosphere-Troposphere Exchange” in Lhasa, China, on 21-23 July 2010. Daren Lu, President of CNC-IAMAS, chaired the workshop’s scientific advisory committee. The IAMAS President Guoxiong Wu, CNC-IUGG Secretary General Jianping Li and CNC-IAMAS Co-Secretaries General Hongbin Chen and Jianchun Bian have been the organizing committee members. Yingnan Liang, Deputy Director General of Department of International Affairs, China Association for Science and Technology (CAST), in his opening speech acknowledged the efforts of CNC-IAMAS/IUGG in promoting atmospheric sciences in China and the international cooperation. He reiterated the continuous support for CNC-IUGG activities from CAST, the superior and sponsor of CNC-IUGG.

**International Workshop on Asian Summer Monsoon and Its Role in
Global Stratosphere-Troposphere Exchange (ASM-STE)
Lhasa China, July 21-23 2010**



The workshop focused on detailed understanding of Asian monsoon-convection- aerosol-cloud-radiation interactions, stratosphere-troposphere exchange in the Asian monsoon, and the role of Asian monsoon in the global climate and environment. About 40 scientists from China, USA, UK, Germany, France, and Italy gave talks at the workshop. In particular, Georg Kaser, the immediate past President of IACS, was invited by CNC-IUGG to attend the workshop, and he delivered a talk on the potential of glacier research for detecting decadal and decennial monsoon variability. The cooperation between IAMAS and other IUGG associations has always been active and will be continued in the forthcoming XXV IUGG General Assembly (IUGG2011) in Melbourne, Australia, in particular, on the related themes of monsoon studies. IAMAS, IAPSO, IAHS, IACS and other organizations will co-sponsor an IUGG2011 joint symposium JM10 “Monsoons, Tropical Cyclones and Tropical Dynamics”.

More information on the workshop can be found at
<http://lageo.iap.ac.cn/index.php/article/197/289> (circular)
<http://lageo.iap.ac.cn/index.php/article/197/299> (program)

Workshop “Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)”

The workshop was held at the Chapman University (Orange, California, USA) on 3-6 October 2010. About 55 participants from 12 countries (Japan, France, Italy, Romania, Poland, India, Russia, Ukraine, New Zealand, China, Mexico and US) attended the Workshop. At the opening ceremony Ramesh Singh, Vice Chair of the IUGG GeoRisk Commission and local organizer of the workshop, welcomed the participants and presented the background of the EMSEV Workshop organized at the Chapman University. Jacques Zlotnicki, Chair of the EMSEV Inter-Association Working Group of IUGG, presented the historical perspective of EMSEV. Catherine Clark, Associate Dean of the Schmid College of Science, and Daniele Struppa, Chancellor of the Chapman University, welcomed the participants and wished them a fruitful meeting.



Three keynote presentations were delivered at the workshop. Thomas Rockwell (University of California, San Diego) spoke about the Southern California Active Fault (Targetting Faults that are

Near Failure for Precursor EM Studies). John Eichelberger (USGS) gave a talk entitled “Will Electromagnetic Techniques be the Key to Understanding Magmatic-Hydrothermal Systems”. Karl Kappler (Lawrence Livermore Laboratory, Berkley, USA) presented an overview of the long-term monitoring of ultra-low frequency electromagnetic fields at Parkfield, California.

Two Panel Discussions were held at the workshop: “EM Precursors, Do they Really Exist?” and “What Next Related to Seismo-Electromagnetic Activities?” The discussion was focused on the future of seismo-electromagnetic studies, particularly on coordinated efforts in seismo-electromagnetic studies and on the free use of data collected by individual groups.

A business meeting of the EMSEV Working Group was held during the workshop. A proposal to carry out integrated EM studies in Kyrgyzstan was discussed, and the members of EMSEV supported this idea. Also two proposals were discussed to host the next EMSEV Workshop in Poland and Japan. The members endorsed that the EMSEV Bureau may take a decision about the next workshop.

The workshop was supported by USGS, EMSEV, IASPEI, IAGA, the Chancellor of the Chapman University, and the Schmid College of Science, Chapman University.

The Sixth World FRIEND Conference focused on the Mediterranean Basin

Jointly organized by the Faculty of Science and Techniques of the University Sidi Mohamed Ben Abdellah of Fez (Morocco) and the Laboratory “HydroSciences Montpellier” (France), the 6th World FRIEND Conference took place in the Palais des Congrès of Fez, 25 - 29 October 2010. Since 1984, FRIEND (Flow Regimes from International Experimental and Network Data) has been aiming at developing and strengthening the exchanges between researchers in the field of hydrology. More than 150 participants coming from 36 countries put together their knowledge about “Global Change: Facing Risks and Threats to Water Resources”. Dr. Gordon Young, the President of the International Association of Hydrological Sciences, attended the Conference. IUGG co-sponsored the Conference.

In order to reach a better assessment of the risks linked to global change, five topics have been considered during the Conference: (i) Hydro-hazards, (ii) Adaptation strategies, (iii) Anthropogenic pressure on limited water resources, (iv) Environmental information and monitoring systems, (v) Large scale hydroclimatic variability and impact. Steering Committee meetings of various FRIEND groups as well as the FRIEND Inter-Group Coordination Committee (FIGCC) meeting were held. Dr. Henny Van Lanen (Netherlands) took over from Dr. Trevor Daniell (Australia) as new FIGCC Chairman for the next four years. It was also decided that the next World FRIEND Conference will take place in Asia in 2014. The Red Book corresponding to that FRIEND Conference (IAHS Pub n°340) shows 87 papers.

The Mediterranean Basin region faces strong population increase and deals with poor, unequal and overexploited water resources. Climatic scenarios are not fair when considering the next decades: an expected decline of the precipitations and an increase of the temperatures are supposed to worsen the hydrological situation. This very specific context had been taken into account when deciding to organize this FRIEND Conference in a Mediterranean country. The goal was reached as the conference was a perfect occasion to underline the extreme fragility of water resources in the arid and semi-arid Mediterranean areas in connection with both the climate worsening and the overexploitation of the resources. In order to mitigate such consequences, several major issues were underlined during the Conference: increasing the study of underground waters (particularly karstic aquifers, very common all around the Mediterranean), improving the analysis of anthropogenic activities impacts both on quality and on quantity of water resources or, more, coupling climatic scenarios with models taking into account water uses, etc. These issues are considered as priority fields of research primarily, but not only, for Mediterranean hydrologists, but not only. The conference also emphasized interface areas such as coastal environments. Indeed, they are places of many and heavy socio-economic stakes, and they have to face an increasing touristic exploitation.

General Meeting of SIRGAS and on the Second IAG-PAIGH-SIRGAS School on Reference Systems

SIRGAS (Sistema de Referencia Geocéntrico para las Américas) is the geocentric reference system for Latin America and the Caribbean, including a gravity field-related vertical reference system. It is the

Sub-commission 1.3b (Regional Reference Frame for South and Central America) of the International Association of Geodesy (IAG) and a Working Group of the Cartographic Commission of the Pan American Institute for Geography and History (PAIGH). The Second IAG-PAIGH-SIRGAS School on Reference Systems took place on 8-10 November 2010, and the SIRGAS 2010 General Meeting and the 42th Meeting of the PAIGH Directing Council on 11-12 November. The events were held in Lima, Peru and hosted by the Instituto Geográfico Nacional of Peru. IUGG co-sponsored the events.

The School was attended by 112 participants from 13 countries. It comprised the themes: Types of coordinates, their definitions, relations and transformations; geodetic reference systems and frames (ICRS/ICRF, ITRS/ITRF, regional and national densifications of ITRF); determination of precise coordinates (station positions and velocities) using GNSS techniques, including network adjustment and alignment to ITRF; vertical reference systems (geometrical and physical heights, reference surfaces, unification of heights systems); and definition, realization, and use of SIRGAS in practice and science.

The SIRGAS General Meeting was attended by 89 participants. In 37 oral presentations and 13 posters, the following SIRGAS issues were presented: Enlargement/densification and analysis of the continuously operating network SIRGAS-CON; the SIRGAS reference frame and the impacts caused by the recently occurred earthquakes in Latin America and the Caribbean; studies of the atmosphere (ionosphere and troposphere) based on the SIRGAS infrastructure; achievements related to the use of GNSS data in real time in the SIRGAS area; national reports about the SIRGAS activities in the Latin American and Caribbean countries; SIRGAS vertical reference system; and contribution of SIRGAS to GGOS (Global Geodetic Observing System). Presentations and extended abstracts of the contributions are available at the SIRGAS web site: <http://www.sirgas.org>.

EGY-Africa Workshop

EGY-Africa is a bottom-up initiative by African geoscientists and others to secure better Internet connectivity in their institutions. IUGG and IAGA are currently the main sponsors. The Association of African Universities (<http://www.aau.org>) and ICSU Regional Office for Africa are expanding their commitment to eGYAfrica. This planning workshop was held in Accra (Ghana) on 24-25 November 2010. The workshop was attended by a core of 12 persons from 7 countries with the twin objectives of reviewing National Research and Education Network (NREN) developments in Africa and planning the next steps for eGYAfrica: (1) raise awareness about the digital divide issue and the cost-benefits of investing in Internet connectivity in higher education and research institutions, (2) develop national groups of concerned scientists and others who will engage with decision makers, (3) collaborate with other bodies and programs who share the objective of reducing the digital divide, and (4) collect information and measurements of Internet performance via the Pinger Project to be used as the basis for making the case for better interconnectivity.

IUGG SUPPORT FOR MULTI-DISCIPLINARY SCIENTIFIC PROJECTS

IUGG established a Grants Programme for 2008-2011 to complement its existing programme of funding symposia and workshops organised or co-sponsored by Union Associations and Union Commissions (<http://www.iugg.org/grants/>). For 2010-2011, IUGG awarded the following projects:

- Improving Geophysical Science Link to the Society during Natural Extreme Events, especially in Developing Countries (“Networking of World Seismologists”). Lead Applicant: IASPEI. Supporting Applicants: IAPSO and the IUGG Union Commission on Geophysical Risk and Sustainability.
- Extension of INTERMAGNET Russian Segment: Prospects and Challenges. Lead Applicant: IAGA. Supporting Applicants: IAG and the IUGG Union Commission on Data and Information.
- Predicting Volcanic Ash Dispersal Combining Field, Experimental and Meteorological Data into Super-computational Numerical Simulations. Lead Applicant: IAVCEI. Supporting Applicant: IAMAS.

Report on the IUGG Project “Monitoring Taal volcano unrest in the Philippines”

The Philippines archipelago suffers frequent and large catastrophic natural hazards (volcanic eruptions, earthquakes, cyclones, and tsunamis). These events induce great loss of human life, economic hardship and destruction of social tissue. The Philippines Institute of Volcanology and Seismology (PHIVOLCS, <http://www.phivolcs.dost.gov.ph/>) is in charge of monitoring most of these hazards and provides direct response to Civil Authorities on the likely consequences and risks. In 2003, during an international workshop held in Manila for ‘Initiating seismic and volcanic electromagnetic (EM) monitoring in Asian countries’ PHIVOLCS and the IUGG Inter-Association on ‘Electromagnetic Studies of Earthquakes and Volcanoes’ (EMSEV, <http://www.emsev-iugg.org/emsev/>) proposed a tight cooperation on Taal volcano. Taal volcano is responsible for serious hazards in the region such as pyroclastic flows, base surges, and violent phreatic explosions, as experienced during the previous 33 historical eruptions. Since the last long eruptive episode in 1965-1977, Taal volcano continuously exhibited sporadic and intense seismic activity, ground deformation, and surface activity. In 2004, PHIVOLCS and EMSEV signed a Memorandum of Agreement with the objectives to: (1) understand the interactions between the magma feeding system and the hydrothermal system buffered by both the hot acidic inner Crater Lake and the cold outer Taal Lake, the geological discontinuities along which heat and soil degassing prevail, (2) evaluate scenarios of activities, (3) monitor the volcanic activity, and (4) build an electromagnetic scientific community at PHIVOLCS.

Late in 2004, a newly formed PHIVOLCS EM team and a Japanese-French EMSEV team started to image the hydrothermal system, the geological and tectonic discontinuities with combined magnetic, electric, ground temperature and soil degassing surveys. Progressively, the international EMSEV community enlarged with researchers from Greece, Italy, USA, and Belgium. New research methods, also applicable by the PHIVOLCS EM team, were carried out, such as audiomagnetotellurics and resistivity soundings, magnetic and bathymetric mappings of the inner acidic lake, and bottom lake temperature. From these bi-annual field campaigns, new important results were obtained. These are now used in information planning by both the local inhabitants and the Civil Authorities. One outcome is that the northern part of the volcano is apparently undergoing strong thermal transfers, degassing, and mineralization. The activity takes place along active E-W fissures possibly linked to the root of the northern border of the Crater at a depth of some hundreds of metres, and connected to the hydrothermal/volcanic source of the volcano. This thermal source could be the primary focus of the next eruptive activity. In such a case, strong activity could induce a collapse of a part of the northern crater rim into the Crater Lake, due to mechanical weakening by the active 1992-1994 fissures.

Simultaneously with repeated surveys, EMSEV and PHIVOLCS have built a real-time monitoring network based on electromagnetic and other geophysical parameters as magnetic and electric fields, ground temperature and gradients, seismicity, and tilt. Data are automatically transferred to Taal volcano observatory, PHIVOLCS headquarter and EMSEV servers. Thanks to the real-time multi-parametric network, EMSEV was able to regularly process data and to inform PHIVOLCS about anomalous signals observed before and during the April to June 2010 strong seismic crisis. During this crisis, PHIVOLCS raised the alert level from 1 to 2 requiring a partial evacuation of the volcanic Island. Two new real time EM stations will be added to the 2 existing multi-parametric stations in 2011. In addition to these land observations, satellite Aster thermal imagery, MOPITT observations, and Robust Satellite Techniques will now be jointly performed.

PHIVOLCS is now a major contributor to the development of EM studies on Taal volcano and to the analysis of its ongoing activity as it was stated during the February 2010 EMSEV-PHIVOLCS international workshop on ‘Monitoring active volcanoes by electromagnetic and other geophysical methods; Application to Asian volcanoes’. The new Memorandum of Agreement for the coming 5-years is the confirmation of long term and successful cooperation between PHIVOLCS and the Inter-Association working group EMSEV. Further information can be found on EMSEV and PHIVOLCS web-sites (<http://www.emsev-iugg.org/emsev/> and <http://www.phivolcs.dost.gov.ph/>). This cooperation was supported by an IUGG grant.

ENHANS Symposium “Natural Hazards and Disaster Risks in Latin America and the Caribbean”

The first ENHANS Project events took place at the Meeting of the Americas in Iguassu, Brazil on 9–

10 August 2010. The project “Extreme Natural Hazards and Societal Implications – ENHANS” is sponsored by ICSU and co-sponsored by several international and intergovernmental organizations (<http://www.enhans.org>). The symposium on Natural Hazards and Disaster Risks in Latin America and the Caribbean was convened by O. Cordona (Colombia), A. Ismail-Zadeh (Germany), and V. Kossobokov (Russia). A. Lavell (Costa Rica) spoke on new multidisciplinary research programme of ICSU “Integrated Research on Disaster Risk” and discuss the content and significance of the programme when looking at concrete examples of the social construction of risk in the Latin American and Caribbean region. T. Gibbs (Barbados) presented his view on meteorological hazards and associated risks in the Caribbean. The talk was followed by the presentation “A scaling criterion to estimate and compare the volcanic hazard among different volcanoes” S. De La Cruz-Reyna (Mexico). O. Perez (Venezuela) spoke on earthquake activity and associated hazards in South America and the Caribbean and on socio-economic impact of severe earthquakes in these regions. I. Alcantara-Ayala (Mexico) discussed the anatomy of landslides disasters and presented case studies from Mexico and other South American countries. A. Soloviev (Russia) discussed problems in seismic hazard assessment and earthquake predictability, and V. Kossobokov continued the discussion on predictability of extreme events presenting a paper “Natural Hazards At Extreme: Predictive Understanding Versus Complex Reality”. O. Cardona (Colombia) spoke on indicators of disaster risk and risk management in the Americas. F. Romanelli (Italy) presented scenarios- based seismic hazard assessment methodology and its implication to hazard evaluation in Valparaiso. H. Salmun (USA) discussed statistical prediction of storm surge in the New York Metropolitan area, and A. Rice (USA) spoke on multiple meteoroid impacts in Antarctica and implications for humanity. Two oral sessions of the symposium was continued as a poster session of 25 papers.

Another exciting ENHANS event was a town hall meeting on “Natural Hazards in Latin America and Caribbean (LAC): From Risk to Opportunity by Partnership of Science and Society”. The meeting focused on the following aspects: How science (both natural and social) and society can form partnership for disaster reduction? How science and society partnership can convert natural disaster risk to opportunity? What are the urgent issues of disaster risk in LAC cities and regions under intensifying natural and social pressure? A. Lavell (Latin American Social Sciences Faculty – FLACSO and LA RED, Costa Rica; member of the ICSU Scientific Committee “Integrated Research on Disaster Risk” and ICSU Regional Office for LAC) spoke on increasing importance of disaster risk management on the political agenda. Disaster Risk Management is still not of sufficient social and political relevance given current and future predicted disaster trends and costs, and which climate change will probably add to. The talk highlighted why this may be so and what are the principle ways to place the theme more firmly on the political and social agenda. K. Alverson (Director, Global Ocean Observing System, Intergovernmental Oceanographic Commission of UNESCO) spoke on the Global Ocean Observing System (GOOS) in Latin America and the Caribbean. The talk focused on the importance of sustained ocean observing systems that need to be in place both to prevent and mitigate disasters, where possible, but also in order to rapidly bring observing assets to bear in post disaster relief efforts. Both natural coastal inundation hazards, such as storm surge and tsunamis, as well as anthropogenic hazards, such as oil spills, was discussed, focusing where possible on Latin America and the Caribbean, including the Gulf of Mexico. P. Boccardo (Director, ITHACA, and Professor of Politecnico di Torino, Italy) presented at first the ITHACA - Information Technology for Humanitarian Assistance, Cooperation and Action. Through its partnership with the U.N. World Food Programme (WFP) - the world's largest operational humanitarian agency - ITHACA is envisioned as a centre of applied research developing IT products and services in support of humanitarian activities especially during natural disasters. Also he discussed geomatics and disaster management in the case of the recent Haiti earthquake disaster. Presentation highlighted issues and challenges associated with emergencies related to natural disasters. Taking into account the last earthquake occurred in Haiti, data acquisition, processing and information extraction were presented when humanitarian response is involved. Milestones gained and issues to be approached have been also discussed, with the aim to set up effective procedures suitable for technologic assistance to early impact and reconstruction phases.

Jaime Urrutia Fucugauchi (AGU International Secretary) and Alik Ismail-Zadeh (IUGG Secretary General) moderated the town hall meeting's discussion. Two panellists I. Alcantara-Ayala (Vice-President of the International Geographical Union) and M. McPhaden (President of the American

Geophysical Union) mentioned how professional societies can assist in mitigation of natural hazards and disasters. The speakers and panellists answered questions of the attendees.

ENHANS Symposium “Natural Extreme Events: Modeling, Prediction and Mitigation”

The Symposium was held on 13 December 2010 at the Fall Meeting of the American Geophysical Union (AGU) and was a part of the activity in the framework of the ICSU project “Extreme Natural Hazards and Societal Implications – ENHANS” (<http://www.enhans.org>) led by IUGG and supported by several ICSU Scientific Unions (namely, IGU, ISPRS, IUGS, IUTAM), AGU, International Program Office of the Integrated Research on Disaster Risk (IRDR), and the UNESCO-IOC Global Oceanic Observing System (GOOS). The symposium consisted of three scientific sessions and was attended by more than 300 experts in various fields of extreme natural hazards. The session was chaired by Ilya Zaliapin (University of Nevada, Reno, USA) and Alik Ismail-Zadeh (Karlsruhe Institute of Technology, Germany; Institut de Physique du Globe de Paris, France; and Russian Academy of Sciences, Moscow, Russia).

Daniel Baker (Colorado University, Boulder, USA) spoke on the predictability and mitigating impacts of extreme space weather events. Storm surge, as a globally distributed risk, was the topic of the talk by Hans von Storch (University of Hamburg, Germany). Upmanu Lall (Columbia University, New York, USA) explained why flooding was severe in 2010. He considered several case studies and discussed whether this is a coincidence or a predictable climate phenomenon and how to respond on these extremes. Thomas Jordan (University of Southern California, Los Angeles, USA) spoke about new large-scale numerical simulations to forecast extreme earthquake ground motions, whereas Steven Sparks (University of Bristol, UK) gave a talk on extreme volcanic eruptions and discussed their return period, impact and implications. Rowan Douglas (Willis Research Network, London, UK) spoke about how re/insurance and public science interact to manage risk of extreme events for societal benefit. The 2010 AGU Natural Hazards Focus Group Graduate Research Awardee Ning Lin (Massachusetts Institute of Technology, Cambridge, USA) spoke on a hurricane risk assessment related to wind damage and storm surge. Kelly Klima (Graduate Student, Carnegie Mellon University, Pittsburgh) talked about tropical cyclones and presented her approach to a decision-analytic assessment of cyclone hazards. Extreme precipitation in the European Alpine region was the topic of the talk by Nauman Awan (University of Graz, Austria). John Rundle (University of California, Davis, USA) spoke about precursory activation and quiescence prior to major earthquakes. Fausto Guzzetti (University of Perugia, Italy) discussed landslide hazard, vulnerability and risk assessment and emphasized importance of methodology for risk assessment, its limits and challenges. Kenji Satake (University of Tokyo, Japan) spoke about tsunami modeling, forecast and warning. Adam Smith (National Oceanographic Atmospheric Administration, Asheville, USA) examined insurance loss return periods with extreme event intensity thresholds across the United States. The poster session (20 papers) presented a variety of topics related to natural hazards, extreme events, theory, modeling, prediction and mitigation. The culminating event of the symposium was a keynote lecture on “Society’s Growing Vulnerability to Natural Hazards and Implications for Geophysics Research” by Julia Slings (Met Office, U.K.)

IUGG OFFICERS ATTENDED BUSINESS MEETINGS OF THE NATIONAL COMMITTEES

Business Meeting of the Austrian National Committee for IUGG

The business meeting of the Austrian National Committee for IUGG (ANC-IUGG) was held on 20 April 2010 at the Vienna University of Technology (Vienna, Austria). Prof. Harald Schuh, President of the Austrian Geodetic Commission, the adhering organisation of the ANC-IUGG, has been leading the ANC-IUGG since 2008. Austrian representatives of six IUGG Associations reported about their work and presented their recent and planned activities. The cooperation between scientists representing IUGG Associations in Austria was discussed, particularly in the field of public relations and mass media. Topics such as the Austrian contribution to the European Plate Observing System (EPOS) and its relation to GEO were also discussed. It was agreed to allow two days for the next meeting of the National Committee because there are many open questions and common tasks to be discussed.

IUGG President visits the Austrian Adhering Body

On Friday 22 October, the IUGG President Tom Beer paid a courtesy visit to the headquarters of the BEV, the Federal Office of Metrology and Surveying, which is the Austrian Adhering Body to IUGG. The forthcoming XXV IUGG General Assembly in Melbourne 27 June – 8 July 2011 was a major topic of conversation. Because Vienna was the location of the XX IUGG General Assembly in 1991, President Beer was most appreciative of the conference insights that his hosts proffered.



Left to right: Norbert Höggerl, Secretary-General of the Austrian National Committee for IUGG, Tom Beer, IUGG President, and Gert Steinkellner, Head of the BEV International Affairs Department

IUGG President met with the Hungarian National Committee

IUGG President Tom Beer attended the business meeting of the Hungarian National Committee for IUGG at the Secretariat of the Hungarian Academy of Sciences on 27 October 2010. The forthcoming IUGG General Assembly was the major agenda item. Tom Beer gave a summary of the preparations to date – pointing out that abstract submission and registration are now open. The Hungarian National Committee discussed the preparation of a special issue of *Acta Geodetica et Geophysica Hungarica* to incorporate the quadrennial national communication to the General Assembly.



The lunchtime meeting of the Hungarian National Committee for IUGG chaired by Jozsef Adam, the President of the National Committee. IUGG President Tom Beer is on Dr. Adam's right side. Dr. Laszlo Bozo, Secretary-General of the National Committee, is seated on Dr. Adam's left side.

Business Meeting of the German National Committee for IUGG

The business meeting of the German National Committee for Geodesy and Geophysics (NKGG) was held on 12 November 2010 at the Alfred Wegener Institute for Polar and Marine Research (AWI) in Bremerhaven. The meeting was chaired by the NKGG President Rainer Kind. Heinrich Miller, head of

the Glaciology Department of the Alfred Wegener Institute and host of the meeting, presented the Institute and spoke about the AWI history, the structure, and the scientific activities. Members of the Committee reported on their activities in the IUGG Associations, commissions, and working groups. IUGG Secretary General Alik Ismail-Zadeh attended the business meeting and informed the NKGG members about the current and planned IUGG activities, particularly about the preparations for the XXV IUGG General Assembly in Melbourne. The Committee discussed closer cooperation with the German National Committee for IUGS. A special lecture on the tsunami warning system in the Mediterranean was delivered by Peter Koltermann, former head of Section, UNESCO Tsunami unit. More information on the Committee can be found on the web page www.bgr.de/nkgg/ (in German).

IUGG LIAISONS

CODATA

The Chair of the IUGG Union Commission on Data and Information (UCDI), Peter Fox, attended the 2010 CODATA Biennial Conference (<http://www.codata2010.com/>) and General Assembly as an IUGG representative in place of Charles Barton, the IUGG Liaison Officer to CODATA, who was unable to attend. These were held in Stellenbosch, South Africa, 24-27 October and 28-29 October 2010, respectively. Attendance was lower (260 registrants) than the 2008 CODATA Conference in Kiev (Ukraine). A substantial part of the program (<http://www.codata2010.com/scientific-program.php>) was of relevance to IUGG and many IUGG scientists were strong contributors. Peter Fox presented a paper at Union Session F about IUGG's Union Commission for Data and Information.

The new CODATA Officers elected at the General Assembly comprises: *President*: Huadong Guo (China), *Past-President*: Krishan Lal (India), *Vice-Presidents*: Takashi Gojobori (Japan) and Fedor Kuznetsov (Russia), *Secretary General*: Robert Chen (USA), and *Treasurer*: Michel Sabourin (Canada). Outgoing President Lal has been elected President of the Indian National Science Academy. Eleven Task Groups and two Working Groups were approved. *Electronic Geophysica Year: Earth and Space Science Interoperability* is continuing. New Task Groups of particular interest to IUGG are established: (i) *Polar Year Data Policy and Management* and (ii) *Data at Risk*: <http://www.nature.com/news/2010/101102/full/468017a.html>. South Africa is spearheading activities to collect and curate research data about the African continent in an effort to shrug off its data-poor image. The 2012 CODATA Conference (23rd) and General Assembly (28th) will be hosted by Academia Sinica in Taipei (China). The date will be announced later.

Peter Fox, on behalf of Charles Barton, IUGG Liaison to CODATA

ICAO

The International Civil Aviation Organization (ICAO), a UN Specialized Agency, is the global forum for civil aviation. ICAO works to achieve its vision of safe, secure and sustainable development of civil aviation through cooperation amongst its member States. IUGG via its constituent association, the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) works with ICAO on (i) developing a formal volcanic-activity warning message template for aviation; (ii) improving volcanological input to ash-dispersion models that are used by weather services globally in warning forecasts; (iii) providing guidance to meteorologists about ash deposition at airports; and (iv) improving the reporting of aircraft encounters with volcanic ash and gas. Recent joint IUGG-ICAO working papers are listed below. The papers can be downloaded from the ICAO web-site (under "Meetings"): <http://www2.icao.int/en/anb/met-aim/met/iavwopsg/Lists/Meetings/AllItems.aspx>

- IUGG and ICAO, 2007, Development of a template for the provision of information from observatories to ACC, MWO and VAAC: For presentation at the third meeting of ICAO's International Airways Volcano Watch Operations Group in Bangkok, Thailand, 19-23 March 2007 (IAVWOPSG/3, WP10).
- United States, Canada, and IUGG, 2007, Status of research on eruption source parameters and dataset of well-documented eruptions: For presentation at the third meeting of ICAO's International Airways Volcano Watch Operations Group in Bangkok, Thailand, 19-23 March 2007 (IAVWOPSG/3, WP10).

- United States, Canada, and IUGG, 2007, Status of research on eruption source parameters and dataset of well-documented eruptions: For presentation at the third meeting of ICAO's International Airways Volcano Watch Operations Group in Bangkok, Thailand, 19-23 March 2007 (IAVWOPSG/3, WP10).
- Australia, IUGG, and ICAO, 2008, Fostering implementation of the volcano-observatory reporting template: For presentation at the fourth meeting of ICAO's International Airways Volcano Watch Operations Group in Paris, France, 15-19 September 2008 (IAVWOPSG/4, WP12).
- IUGG and Canada, 2008, Status of research on eruption source parameters and dataset of well documented eruptions: For presentation at the fourth meeting of ICAO's International Airways 4 Volcano Watch Operations Group in Paris, France, 15-19 September 2008 (IAVWOPSG/4, WP21).
- Australia, United States, IATA, IFALPA, and IUGG, 2008, Proposal to modify the Volcanic Activity Report to include SO₂ and to improve the distribution of the VAR: For presentation at the fourth meeting of ICAO's International Airways Volcano Watch Operations Group in Paris, France, 15-19 September 2008 (IAVWOPSG/4, WP24).
- United States and IUGG, 2008, Guidance on reporting of volcanic ash deposition at aerodromes, 2008: For presentation at the fourth meeting of ICAO's International Airways Volcano Watch Operations Group in Paris, France, 15-19 September 2008 (IAVWOPSG/4, WP27).

William Rose and Marianne Guffanti, IUGG Liaisons to ICAO

SCOPE

The Scientific Committee on Problems of the Environment (SCOPE) is working with the United Nations Environment Programme (UNEP) to produce the next UNEP Year Book that will be launched at UNEP's Governing Council meeting in February 2011. The 2011 Year Book will be the eighth edition in this acclaimed UNEP series that reports on new environmental science and emerging issues and communicates directly to policy-makers. The Year Book provides scientists and experts with an opportunity to reach out to primary target audiences that include delegates of the UNEP Governing Council, policy advisors and ministers of the environment around the world. Other audiences include UN agencies, academia, the private sector and the general public.

Norman E. Peters, IUGG Liaison to SCOPE

WMO

The World Meteorological Organization (WMO) is governed by the World Meteorological Congress, which meets every four years. The Congress elects an Executive Council (EC) composed of 37 individuals who meet on an annual basis to oversee the work of the Organization. The sixty-second session of the Council was held in Geneva from 8 to 18 June 2010 and, following long established practice, IUGG was invited to send a representative to the meeting.

As this was the last session of the Council before the Sixteenth Congress meets in May-June 2011, considerable attention focussed on the structure and funding of WMO's activities in the years 2012-2015. In recent years WMO has increasingly presented and discussed its programme and budget on the basis of a series of strategic themes and expected results, which cut across traditional disciplinary boundaries. It is interesting to note that next Congress will revert to the traditional subdivision of the Organization's fields of interest, which will facilitate IUGG's contacts with WMO.

Various items on the agenda were of interest to IAHS and IAMAS, but they did not call for any new actions on the part of IUGG. On the other hand, this session of the EC saw volcanology on the agenda for the first time in relation to the ash cloud that resulted from the eruption of the Eyjafjallajökull volcano in Iceland in April-May 2010. The London Volcanic Ash Advisory Centre made a very interesting presentation on the action it took in response to the eruption. This emphasised the importance of data on the source of the ash and the extent to which a lack of such data limited the ability of the Centre to forecast the future development of the ash cloud. Arthur Askew, an IUGG

representative to WMO, presented members of the Council with copies of the statement on “Volcanological and Meteorological Support for Volcanic Ash Monitoring” that was adopted by the IUGG Executive Committee in May 2010.

The WMO Executive Council “noted with appreciation” the IUGG statement and “welcomed the kind offer of the Union to work closely with WMO in the context of the Scientific Advisory Group” that is being set up, comprising experts in volcanology, transport and dispersion modelling and aerosol observations. As a result, close personal contact is being established between officers of IUGG and senior staff of the WMO Secretariat to agree on how best to encourage collaboration at local level between meteorologists and volcanologists so as to ensure that both scientific communities can react rapidly and together in the event of future eruptions and thus minimize the impact on the economic and social lives of the effected communities.

Arthur Askew, IUGG Liaison to WMO

INTERNATIONAL COUNCIL FOR SCIENCE (ICSU)

Meeting of the International Scientific Unions of ICSU

The meeting was held on 7-8 April 2010 at the Jacques Monod amphitheatre, Institut Pasteur in Paris. The theme of the meeting was “Strengthening the Involvement of Unions in ICSU Activities”. IUGG President Tom Beer, Past President Uri Shamir (as an ICSU Executive Board Member), and Secretary-General Alik Ismail-Zadeh attended the meeting. Prof. Alice Dautry, President of the Institut Pasteur, and Prof. Catherine Bréchnignac, ICSU President, welcomed the participants of the meeting. Prof. Deliang Chen, Executive Director, then presented the ICSU view on the role of the Scientific Unions in ICSU.



Participants of the ICSU Meeting with officers of the French Academy of Science. Catherine Bréchnignac, ICSU President, is front centre with Jean Dercourt, Secrétaire Perpetuel of the Academie des Sciences, on her right.

The following topics were discussed: (i) the implementation of the ICSU Strategic Plan 2006-2011 and the development of the ICSU Strategic Plan 2012-2017; (ii) International Years and trans-Union activities (IUGG reported on the IUGG programmes: International Heliophysical Year and Electronic Geophysical Year); (iii) Visioning Process in ICSU; (iv) ICSU Foresight Analysis (Officers of the ICSU GeoUnions together with Prof. D. Chen and Prof. Y.T. Lee, ICSU President-elect, discussed our vision of the major changes in the conduction of science and of the evolvement of the science-society interface over the next 20 years); (v) Health and Well Being in the Changing Urban Environment; (vi) World Data System and the Union role in responding to GA29 Resolution 2 on data; (vii) Unions’ role in ICSU Programmes; (viii) ICSU finances and weighted voting; (ix) ICSU Grants Programme; (x) ICSU communications; ICSU Regional Offices; (xi) ICSU’s role in Sustainable Development; (xii) freedom and responsibility, and some others. On 7 April the French Academy of Sciences invited the

participants of the meeting to the lecture “Population and Sustainable Development” by Prof. Henri Leridon at the French Academy of Sciences, which was followed by a reception.

ICSU Grant Awards

ICSU announced the 2010 awardees to be funded from the ICSU Grants Programme. The project proposal “*Extreme Natural Hazards and Societal Implications (ENHANS)*”, submitted by IUGG, has been awarded EUR 30,000. The project is supported by the ICSU GeoUnions (International Geographical Union, International Society for Photogrammetry and Remote Sensing, International Union of Geological Sciences, International Union of Theoretical and Applied Mechanics), the ICSU Scientific Committee “Integrated Research on Disaster Risk”, the ICSU-UNESCO Interdisciplinary Body “Global Ocean Observing System”, the ICSU Regional Offices for Asia and the Pacific and for Latin America and the Caribbean, and the American Geophysical Union. The principal goals of the project ENHANS (<http://www.enhans.org>) are (i) to improve the understanding of critical phenomena associated with extreme natural events and to analyse impacts of natural hazards on the sustainable development of society; (ii) to promote studies on the prediction of extreme events reducing predictive uncertainty and on natural hazards mitigation; to bring the issues into the political and economical policies; (iii) to disseminate knowledge and data on natural hazards for the advancement of research and education in general and especially in developing countries; and (iv) to establish links and networks with the international organizations involved in research on extreme natural hazards and their societal implications. Three major events are planned within the project framework: (1) scientific symposium and town hall meeting on natural hazards and disaster risks in Latin American and the Caribbean (Brazil, 9-11 August 2010), (2) scientific symposium on “Extreme natural events: modelling, prediction and mitigation” to be held at the 2010 AGU Fall Meeting (14 December 2010); (3) workshop on natural hazards and disaster risks in Africa (Pretoria, 17-20 January 2011), and (4) symposium on grand challenges in natural hazards research and risk analysis and Open Forum “Natural Hazards: From Risk to Opportunity by Partnership of Science and Society” (Melbourne, July 2011).

The project “*MicroPerm - An international workshop to initiate the circumpolar integration of permafrost microbiological studies*” submitted by the International Union of Geological Sciences and supported by IUGG, the International Arctic Science Committee (IASC), and the ICSU Scientific Committee on Antarctic Research (SCAR), was awarded EUR 20,000. MicroPerm main objectives are to (1) organize a process leading to the establishment of a panarctic study programme on permafrost microbiology under the auspices of the International Permafrost Association; (2) convene a kick-off workshop to gather the leaders in the field of permafrost microbiology and qualify the framework of the programme; and (3) to seek additional endorsement and sponsorship through the supporting applicants to firmly embed the future program in global scientific and observing efforts. IUGG via the International Association of Cryospheric Sciences (IACS) will contribute to this project through the joint IACS-IPA scientific working group “Glacier and Permafrost Hazards in Mountains”. IUGG/IACS will provide scientific expertise in all aspects of cryospheric sciences related to the project and providing assistance in search of relevant experts to be invited to attend the proposed kick-off workshop.

Polar Information Commons (PIC)

The data generated during the International Polar Year – IPY (2007-2008) may be one of the most important long-term outcomes of this exciting international initiative. Where will these data be in 50 years? Will they be available and accessible for future scientists and other users? The Polar Information Commons (PIC), was officially launched at the IPY Oslo Science Conference on 8 June. PIC aims to ensure that the IPY data legacy and polar science data more generally are openly accessible and safely preserved for future generations for the benefit of science and society as a whole. Building on the precedent set by the Antarctic Treaty, the PIC is an open access information resource about the Earth’s polar regions managed by the polar science and data community and accessible to all.

Members of the PIC Committee and relevant stakeholders to date: ICSU Committee on Data for Science and Technology (CODATA); International Union of Geodesy and Geophysics (IUGG);

World Meteorological Organization (WMO); International Arctic Science Council (IASC); Scientific Committee on Antarctic Research (SCAR); IPY International Program Office (IPY IPO); ICSU World Data System Scientific Committee (WDS-SC), Science Commons, the Association of Polar Early Career Scientists (APECS) and the Royal Netherlands Academy of Sciences (KNAW).

Two IUGG representatives, Ian Allison (IACS President) and Mark Parsons (Member of the IUGG Union Commission on Data and Information), attended the PIC launch. For general information on PIC: <http://www.polarcommons.org>.



Mark Parsons (left) welcomes HRH Crown Prince Haakon of Norway / PIC birthday cake / HSH Prince Albert II of Monaco with David Carlson (left) and Mark Parsons (right)

Regional Office for Africa

Dr. Rocky Skeef has been appointed as the Acting Director of the Regional Office for Africa (ROA) to maintain continuity in the operation of the office while the search for the new Director is ongoing. Dr. Skeef is currently an executive at South Africa's National Research Foundation (NRF), and has been a key figure driving the establishment of and providing support for the Regional Office. Dr. Skeef took up his appointment on 1 March 2010, following the departure of the previous Director Dr. Sospeter Muhongo, who vacated the post on 28 February. In 2010–11 the office will focus on implementing the projects of the four science plans—sustainable energy, natural and human-induced hazards and disasters, health and human well-being, and global environmental change (including climate change and adaptation). ROA will begin implementing the second phase of the African Diaspora Project in collaboration with South Africa's NRF. IUGG cooperated with ROA in preparation to the ENHANS International Workshop in Pretoria, South Africa.

Regional Office for Asia and the Pacific

The Terms of Reference for the mid-term review of the Regional Office for Asia and the Pacific (ROAP) were approved by the ICSU Committee on Scientific Planning and Review in February. The Review Panel will meet for the first time in May, followed by a site visit in July. The review will be high on the agenda at the 9th meeting of the Regional Committee for Asia and the Pacific when they meet in Kuala Lumpur, 29-30 April. The Regional Office is establishing a Science Planning Group on Human Health and Wellbeing in the Urban Environment. The group will develop the final science plan for ROAP, which is scheduled for publication in January 2011. ROAP assists IUGG to prepare a Union symposium on natural hazards and disaster risks to be held in Melbourne (Australia) during the IUGG General Assembly (29 June 2011).

Regional Office for Latin America and the Caribbean

The mid-term review of the Regional Office for Latin America and the Caribbean (ROLAC) is underway, with an online consultation of ICSU Members receiving more than 60 responses. The responses will be discussed at the first meeting of the Review Panel, 19-20 March. The 8th meeting of the Regional Committee for Latin America and the Caribbean will take place in Rio de Janeiro, 14-15 May. The Regional Committee will engage with the Review Panel who will be making a site visit 17-18 May. IUGG cooperated with ROLAC in preparation to the ENHANS symposium in Iguassu, Brazil.

Integrated Research on Disaster Risk (IRDR)

The programme “Integrated Research on Disaster Risk (IRDR)” is a major new 10-year international research programme that aims to provide answers to the growing global problem of disasters and how countries can reduce the root causes of disaster risk. In a break from past approaches, it will combine diverse expertise and perspectives into one coordinated effort, drawing on the natural, socio-economic, health and engineering sciences. Kuni Takeuchi, Chair of the IUGG GeoRisk Commission, was elected Vice-Chair of the IRDR Scientific Committee.

Dr. Jane Rovins (USA) has been appointed as Executive Director of the new Integrated Research on Disaster Risk (IRDR) programme. The programme's co-sponsors—ICSU, the International Social Science Council (ISSC) and the United Nations International Strategy for Disaster Reduction (UN-ISDR) – made the appointment following an extensive international search. One of her first tasks will be to establish the International Programme Office for IRDR, which will be located in Beijing at the Center for Earth Observation and Digital Earth (CEODE) of the Chinese Academy of Sciences.

ICSU World Data System

ICSU is now inviting tenders to host the ICSU World Data System (WDS) International Programme Office (IPO). The office will manage and coordinate the establishment and operations of the WDS, and take responsibility for outreach and promotional activities. The IPO will act under the guidance of the ICSU World Data System Scientific Committee (WDS-SC). More information can be found on the ICSU web-page: http://www.icsu.org/1_icsuinscience/DATA_WDS_1.html. Seismologist Jean-Bernard Minster, Chair of the WDS Scientific Committee, and geodesist Ruth Neilan, IUGG Liaison to the former FAGS, are members of the Committee.

GEOUNIONS

Report on the IUGS Executive Committee Meeting

The Executive Committee (EC) of the International Union of Geological Sciences (IUGS) met in Paris, France, on 22-25 February. In the tradition of collaboration among the ICSU GeoUnions, IUGG was invited to the meeting. IUGG Secretary General Alik Ismail-Zadeh attended the EC meeting on behalf of Union President Tom Beer. Matters of common interest to the two Unions were discussed. Among them were the discussion on the International Lithosphere Program (IUGG-IUGS Commission on Lithosphere), the ICSU GeoUnions Consortium, the relationship with UNESCO, and the 2012 International Geological Congress to be held in Brisbane. Particularly, it was mentioned that IUGS and IUGG should work together on the planning of big geoscientific events (like international geological congresses and IUGG general assemblies) and discuss possibilities for holding joint world geosciences congresses biennially.

GeoUnions Business meeting

IUGG President Tom Beer, Past President Uri Shamir, and Secretary-General Alik Ismail-Zadeh attended the GeoUnions Caucus at Salle Louis Martin Chauffier, Academie des Sciences, Institut de France at Paris on 6 April 2010 prior to the ICSU Unions meeting described in the next item. GeoUnions is a consortium of the Scientific Unions of the International Council for Science (ICSU) comprising eight International Unions: International Astronomical Union (IAU), International Geographical Union (IGU), International Union for Quaternary Research (INQUA), International Society for Photogrammetry and Remote Sensing (ISPRS), International Union of Geodesy and Geophysics (IUGG), International Union of Geological Sciences (IUGS), International Union of Soil Sciences (IUSS), and International Union of Radio Science (URSI). Professor Deliang Chen, ICSU Executive Director, participated in the meeting. Professor Jean Dercourt, Secrétaire Perpétuel of the Academie des Sciences, welcomed the Officers of the GeoUnions.

Each Union reported on the progress since the last business meeting in Maputo, October 2008. The major topics for discussion were (i) the role of GeoUnions in ICSU activities; the relationship with the ICSU Secretariat and with the ICSU Regional Offices; (ii) major research topics and programmes of GeoUnions (Health Program, Natural Hazards Program, new initiative on Global Understanding); (iii)

GeoUnion Joint Resolution “Natural Hazards, Risks and Disasters”; (iv) new initiatives of the International Year of Planet Earth: Planet Earth Institute and Global Geoscience Initiative; (iv) Participation of the GeoUnions at GEOITALIA 2011 in Turin prior to the ICSU General Assembly, Rome, September 2011; (v) the role of GeoUnions in the activities of UNESCO.

GeoUnions Meeting at UNESCO

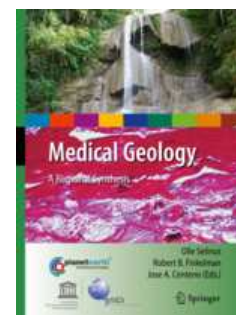
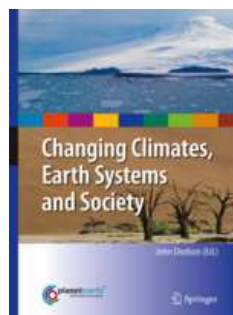
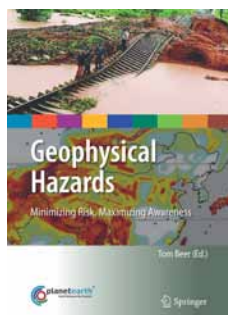
The GeoUnions Officers met Dr. Robert Missotten, Chief of the UNESCO Global Earth Observation Section, at UNESCO on 9 April to discuss possible ways to strengthen cooperation between the ICSU GeoUnions and UNESCO. IUGG President Tom Beer, Past President Uri Shamir, and Secretary-General Alik Ismail-Zadeh attended the meeting. Several topics of common interest were discussed, particularly programs on Solid Earth, Natural Hazards, and Water. UNESCO would like to develop closer interaction with the GeoUnions. Several joint programmes of UNESCO and ICSU GeoUnions are already well developed, namely the International Geoscience Programme (IGCP) with IUGS involvement, International Hydrological Programme and several programs of the Intergovernmental Oceanographic Commission (e.g. GOOS) with IUGG involvement, and some others. UNESCO seeks support of GeoUnions in the programs related to geo-engineering, natural hazards, and climate, and also GeoUnions support for the UNESCO program on education and science in Africa.

Centenary Anniversary of ISPRS

The Centenary Celebrations of the International Society for Photogrammetry and Remote Sensing (ISPRS) took place at its birthplace in Vienna (Austria) from 2 to 7 July 2010. On 2 July the booklet “Best Practices Booklet on Geo-Information for Risk and Disaster Management” produced by the Joint Board of Geospatial Societies (including the International Association of Geodesy – IAG – among others) was launched at the U.N. Office of Outer Space Affairs (UN-OOSA) followed by the press conference on the booklet. On 3 July ISPRS held its Open Business Meeting, where several guests were invited including Harald Schuh (President of the Austrian National Committee for IUGG) and Chris Rizos (IAG). The central event of the celebrations was the extraordinary Centenary General Assembly of ISPRS held on 4 July. IUGG Secretary-General Alik Ismail-Zadeh addressed the General Assembly on behalf of the ICSU Scientific GeoUnions. The Assembly was followed by the unveiling of a plaque of Eduard Dolezal (Professor of the Vienna University of Technology), the founder of ISPRS, and by a lecture series on the history of ISPRS, GeoImagery, and future developments in ISPRS’s areas of interest. The evening lecture by Franz Radermacher (University of Ulm, Germany) on globalization, innovation and global sustainability was followed by a gala dinner at the Vienna Rathaus (Town Hall). The symposium “Advancing Remote Sensing Science” on 5-7 July concluded the centenary celebrations.

International Year of Planet Earth (IYPE)

The second issue in the IYPE-Springer Legacy Series, *Geophysical Hazards* by Tom Beer (Ed) is available now. *Changing Climates, Earth Systems and Society* by John Dodson (Ed) is in production and *Medical Geology* by Selinus, Finkelman & Centeno (Eds) is in the proofing stage.



Young Earth Scientists

The Young Earth Scientists (Y.E.S.) held elections for their Network in which IYPE's Executive Director and IYPE Board member Edmund Nickless assisted as scrutinizers. The new Y.E.S. President is Joanne Venus (UK). Also Support Teams were elected for Communications, Financial Planning, Outreach activities, Professional Development, Visioning and Advisory. Moreover national representative were elected from 30 countries. More information on: http://www.networkyes.org/index.php/leadership_team/

ACTIVITIES OF THE UNION ASSOCIATIONS

The following reports, prepared by the Secretaries General of the eight Associations of IUGG:

International Association of Cryospheric Sciences (IACS)

International Association of Geodesy (IAG)

International Association of Geomagnetism & Agronomy (IAGA)

International Association of Hydrological Sciences (IAHS)

International Association of Meteorology & Atmospheric Sciences (IAMAS)

International Association of the Physical Sciences of the Oceans (IAPSO)

International Association of Seismology & Physics of the Earth's Interior (IASPEI)

International Association of Volcanology & Chemistry of the Earth's Interior (IAVCEI)

The reports illustrate the impressive range of activities within each Association as well as their dedication to supporting science within developing countries.



International Association of Cryospheric Sciences (IACS)

www.cryosphericosciences.org

This report covers the period from January 2010 to February 2011.

INTRODUCTION

The International Association for Cryospheric Sciences is the Association (IACS) of the International Union of Geodesy and Geophysics (IUGG) that is concerned with snow and ice science and which provides expert advice on cryospheric issues to governmental and non-governmental organisations. The objectives of IACS are to:

- promote studies of cryospheric subsystems of the Earth solar systems,
- encourage research in the above subjects by members of the cryospheric community, national and international institutions and programmes, and individual countries through collaboration and international co-ordination,
- provide an opportunity on an international basis for discussion and publication of the results of the above research,
- promote education and public awareness on the cryosphere, and
- facilitate the standardisation of measurement or collection of data on cryospheric systems and of the analysis, archiving and publication of such data.

ADMINISTRATION

The business of IACS is managed by a Bureau of elected officers. The Bureau consists of President (Ian Allison - Australia), immediate Past-President (Georg Kaser -Austria), Secretary General (Manfred Lange - Cyprus) three Vice-Presidents (Kumiko Goto-Azuma – Japan; Gino Casassa – Chile; Peter Jansson – Sweden) and the heads of five disciplinary Divisions (Glaciers and Ice Sheets, Julian Dowdeswell – UK; Snow and Avalanches, Charles Fierz – Switzerland; Marine and Freshwater Ice, Claude Duguay – Canada; Planetary and Other Ices of the Solar System, Ralf Greve – Japan; and Cryosphere, Atmosphere and Climate, Valérie Masson-Delmotte – France). Most routine business of the Association is conducted by email, although during the last 12 months a sub-set of the Bureau met at the Department of Physical Geography and Quaternary Geology, Stockholm University, Sweden on 22-23 November 2010. The main purpose of this meeting was to prepare information on issues related to the funding and profile of the Association that were then decided on at a formal Bureau meeting held by tele-conference on 21 December 2010.

The current four-year term of most Bureau members finishes in July 2011, and a “nominating panel” of members independent of the Bureau (Jon-Ove Hagen – Norway; Konrad Steffen – USA; Qin Dahe – China) was established in June 2010 to identify suitable candidates for election to the Bureau. The nominating panel’s role is to ensure that candidates for the IACS Bureau provide a good coverage of world regions and cryospheric disciplines.

IACS facilitates the transfer of research methods and explores new avenues in cryospheric science through Standing Groups and Working Groups devoted to a theme or subject and composed of experts in the particular field of study. The currently active Working Groups (WG) of IACS are the WG on Glacier Mass Balance Terminology and Methods and the WG on Glacier and Permafrost Hazards in

Mountains (GAPHAZ, a joint WG with the International Permafrost Association). The current Standing Groups (SG) are the Joint commission on Volcano-Ice Interactions (with the International Association of Volcanology and Chemistry of the Earth's Interior - IAVCEI) and a newly formed Standing Group (December 2010) that is the Steering Committee of the Global Terrestrial Network for Glaciers (see below).

ACTIVITIES

Working Groups of IACS completed two significant reference publications during the year. *The International Classification for Seasonal Snow on the Ground*, edited by Charles Fierz and members of a now disbanded WG, was published as Technical Documents in Hydrology 83 (IACS Contribution No. 1) by the International Hydrological Programme of UNESCO. The *Glossary of Glacier and Mass Balance Terms*, edited by Graham Cogley and members of the WG on Glacier Mass Balance Terminology and Methods, was completed and will also be published by IHP/UNESCO as IACS Contribution No. 2.

The role of IACS in providing scientific advice and oversight to the World Glacier Monitoring Service (WGMS) has been further formalised. The WGMS, based in Zurich, collects and publishes standardized information about ongoing glacier changes under the auspices of IACS, the Federation of Astronomical and Geophysical Data Analysis Services (FAGS/ICSU), UNEP, UNESCO and WMO. The Global Terrestrial Network – Glaciers (GTN-G), a component of the Terrestrial Observation Panel for Climate of GCOS/GTOS, links WGMS with other bodies involved with observations of glacier systems and their fluctuations: the US National Snow and Ice Data Center (NSIDC) in Boulder, and the Global Land Ice Measurements from Space (GLIMS) initiative. A GTN-G Steering Group has been recently formed and established as a Standing Group of IACS, with the IACS Division Head for Glaciers and Ice Sheets as the chair of its Advisory Board. The WGMS has succeeded in securing long-term funding from the Swiss government, and the IACS Past-President served as a member of the selection committee for a new director of WGMS.

During 2010 IACS cosponsored, with funding support from IUGG Small Grants, meetings on *Southern Hemisphere Cryospheric Change*, in Valdivia, Chile and on *Cryospheric Change and its Influences in Regional Sustainable Development* in Lijiang, China and an international summer school/workshop in glaciology at the Wrangell Mountain Center, McCarthy, Alaska. IACS officers also played lead roles in the organization of the *International Polar Year Conference* in Oslo, and are strongly involved in the IPCC Fifth Assessment Report. All officers, and particularly the Secretary-General and President, have been involved in planning scientific sessions for the IUGG General Assembly in Melbourne in June/July 2011.

The historical records of the International Commission on Snow and Ice have been catalogued and will be transferred to NSIDC, Boulder for permanent archiving. A new process has been established to formalize requests for financial support from IACS for conferences and other activities.

PLANNED FUTURE ACTIVITIES

A new WG on *Flow law for polycrystalline ice* has been approved and will be established in 2011. An improved constitutive relationship for ice is particularly important in developing better models of the response of ice sheet systems to anthropogenic climate change. New WGs on *Quantitative Snow Stratigraphy* and on *Polar Surface Features* are also under consideration. The GAPHAZ WG is to be reconstituted as a Standing Group which will provide liaison to the IUGG Commission on Geophysical Risk and Sustainability (GeoRisk).

IACS, with its partners the Scientific Committee on Antarctic Research and the International Arctic Science Committee, is planning a two day symposium prior to the ICSU General Assembly in Rome in September 2011. This will address all aspects of polar science, with a focus on the functioning of the Earth System in the Arctic and Antarctic, the major drivers of pervasive change and the as yet unaddressed research issues in these regions. These global issues will be considered in the polar regions within the context of the ICSU Grand Challenges and as a legacy of the International Polar Year 2007-2008.

Planning has also commenced for a Joint IAMAS/IACS Assembly in Davos, Switzerland in 2013 (DACA-13, the Davos Atmosphere and Cryosphere Assembly 2013). The theme of the conference will be *Ice and Air: Process Interactions*. A Swiss National Organizing Committee has been established and a logo and web-site are in preparation and should be ready for release at IUGG 2011 in Melbourne.

Ian Allison, IACS President



International Association of Geodesy (IAG)

Home: <http://www.iag-aig.org>

Office: <http://iag.dgfi.badw.de>

INTRODUCTION

IAG is structured into four Commissions, fifteen scientific Services, the Global Geodetic Observing System (GGOS), the Inter-Commission Committee on Theory (ICCT), and the Communication and Outreach Branch (COB). The Commissions are divided in Sub-commissions, Projects, Study and Working Groups. The Services have their Operation, Data and Analysis Centres and may install Working Groups for specific tasks. The administration is supervised by the Council and operated by the Bureau, the Executive Committee and the Office. All these entities are in steady contact and inform each other about their activities at the Executive Committee meetings, and through the IAG Newsletter and the bi-annual IAG Reports (Travaux de l'AIG).

ADMINISTRATION

IAG Council

The list of national representatives forming the IAG Council was regularly updated in contact with the IUGG Secretary General. Doubtful nominations (double, questionable) were cleared up. The Council was regularly informed about activities of the Bureau and the Executive Committee. The Council was invited to nominate candidates for the upcoming elections of the IAG Executive Committee and the IAG Awards to be granted at the General Assembly 2011.

IAG Executive Committee (EC)

The IAG EC met twice in 2010, namely in Vienna, Austria, 2 May 2010, and in San Francisco, California/USA, 12 December 2010. The meeting summaries are published in the IAG Newsletter in the IAG Journal of Geodesy (Springer Verlag), and online in the IAG Homepage (<http://www.iag-aig.org>) and the IAG Office Homepage (<http://iag.dgfi.badw.de>). Important topics were the revised structures of GGOS and some of the Services, the sponsoring of symposia, the preparation of the IUGG General Assembly 2011, and the links to other organizations (e.g. FIG, GEO, JBGIS, IHO, ISO, and UN-OOSA).

IAG Bureau

The IAG Bureau, consisting of the President, the Vice-President and the Secretary General, made the day-to-day decisions via Internet and held regular teleconferences. Formal meetings were held in Vienna, 3 May 2010, and San Francisco, 11 December 2010. The IAG President was particularly active in the supervision of GGOS and some of the Services. The Vice-President represented IAG at the 16th Annual Meeting of the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP), Singapore, 18-22 October 2010, and at the Centenary Celebration of the International Society of Photogrammetry and Remote Sensing (ISPRS), Vienna/Austria, 4 July 2010. The IAG

Secretary General represented IAG at the Nordisk Geodetic Commission Meeting, Hoenefoss/Norway, 27-29 September 2010.

ACTIVITIES

IAG Office

A main activity of the IAG Office was the preparation of the IAG participation in the IUGG General Assembly 2011. Publications of the Journal of Geodesy and the Proceedings in the IAG Symposia series, both in Springer-Verlag, were supervised. Travel grants were assigned to young scientists for several symposia. The personal IAG memberships were regularly updated, the membership fee was collected. IAG EC meetings were prepared including detailed minutes for the participants and meeting summaries for publication in the Internet and the IAG Newsletter.

Communication and Outreach Branch (COB)

The COB maintained the IAG Homepage and published the monthly Newsletter online and in the Journal of Geodesy. Since July 2010 the IAG newsletter is also sent to the Presidents and Secretaries General of the IUGG Associations and JBGIS members. A main outreach activity is the distribution of the IAG leaflet and IAG brochure among institutions and at meetings.

Commissions and Inter-Commission Committee

The four IAG Commissions and the Inter-Commission Committee on Theory (ICCT) are maintaining their individual Homepages. Some of the Commissions held symposia and meetings (see below). They organized some IAG symposia at the IUGG General Assembly 2011 and participated in preparing joint symposia.

Services

The fifteen IAG Services are maintaining their own Homepages (all easily accessible via <http://iag.dgfi.badw.de>) and data servers, and they hold their administrative meetings (Directing Board or Governing Board, respectively). Several Services held international meetings (see below) and participated in the preparation of symposia at the IUGG General Assembly 2011.

Global Geodetic Observing System (GGOS)

GGOS held a planning meeting (retreat) in Miami, Florida/USA) in February 2010. A new structure of GGOS was established including a Coordinating Office, two Bureaus, and several Working Groups. Steering Committee meetings were held on this occasion on February 4, in Vienna, Austria, on May 5, and in San Francisco, California/USA on December 11. A GGOS Inter-Agency Committee is being established to support the sustainability of GGOS. Officers of GGOS participated in the GEO Plenary VII and Ministerial Summit 2010 in representation of IAG as a participating organization in GEO.



IAG-GGOS Delegation at the GEO Plenary VII and Ministerial Summit, Beijing, November 2010

Cooperation with other Organisations

IAG maintains close cooperation with several organizations outside IUGG. In 2010 there were meetings with the Advisory Board on the Law of the Sea (ABLOS, together with IHO), Group on Earth Observation (GEO, with IAG as a participating organization), International Standards Organization (ISO, with IAG represented in TC211 Geographic Information / Geomatics), Joint Board of Geospatial Information Societies (JBGIS), United Nations Offices for Outer Space Affairs (UN-OOSA, with participation in Space-based Information for Disaster Management and Emergency Response, UN-SPIDER, and International Committee on Global Navigation Satellite Systems, ICG).

Meetings

Important meetings of IAG components and IAG sponsored bodies in 2010 were:

- International VLBI Service for Geodesy and Astrometry (IVS) 2010 General Meeting, Hobart, Australia, February 07-14, 2010;
- V Congreso Internacional de Agrimensura, Havana, Cuba, March 02-05, 2010;
- Geophysics, Geodesy and Tectonics of the North Africa Plate Boundary for Better Earthquake and Tsunami Hazard Assessment, Algiers, Algeria, May 15-21, 2010;
- European Reference Frame (EUREF) 2010 Symposium, Gävle, Sweden, June 02-06, 2010;
- Second Workshop on Application of Artificial Intelligence and Innovations in Engineering Geodesy, Braunschweig, Germany, June 16, 2010;
- Beacon Satellite Symposium, Barcelona, Spain, June 07-11, 2010;
- IAG School on Reference Frames, Aegean University, Mytilene, Lesbos, Greece, June 07-12, 2010;
- IAG Symposium on Terrestrial Gravimetry: Static and Mobile Measurements, St. Petersburg, Russia, June 22-25, 2010;
- 10th International Geoid School, St. Petersburg, Russia, June 28 – July 02, 2010.
- IGS Workshop and Special Workshop on Vertical Rates from GPS, Newcastle, UK, June 28 – July 2, 2010;
- 15th General Assembly of WEGENER, Bogazici University, Istanbul, Turkey, September 14-17, 2010;
- 2nd General Assembly of the IGFS - International Gravity Field Service Fairbanks, Alaska, USA, September 20-22, 2010;
- IAG Commission 1 Symposium 2010. Reference Frames for Applications in Geosciences (REFAG2010), Marne-La-Vallée, France, October 04-08, 2010;
- 9th International e-VLBI Workshop, Perth, Australia, October 10-20, 2010;
- IGCP 565 Workshop 3: Separating Hydrological and Tectonic Signals in Geodetic Observations, Reno, Nevada, USA, October 11-13, 2010;
- International DORIS Service (IDS) Workshop, Lisbon, Portugal, October 21-22, 2010;
- Observing and Understanding Earth Rotation, Shanghai, China, October 25-28, 2010;
- Sixth ABLOS Conference, Monaco, Monaco, October 25-27, 2010;
- Second SIRGAS School on Reference Systems, Lima, Peru, November 08-10, 2010;
- SIRGAS 2010 General Assembly, Lima, Peru, November 11-12, 2010.

Publications

The monthly issues of the Journal of Geodesy were continuously published in Springer-Verlag. The proceedings of the IAG Symposium on Gravity, Geoid and Earth Observation were published in the series of IAG Symposia at Springer-Verlag. The proceedings of the IAG Scientific Assembly in Buenos Aires 2009 were compiled and are in press.

Awards, anniversaries, obituaries

Several travel awards were granted to young scientists (not older than 35 years). An obituary was written for Leif Svensson, Sweden, an outstanding geodesist who passed away in 2010.

PLANNED AND FUTURE ACTIVITIES

The most important activities are related to the IUGG General Assembly in Melbourne. They will concentrate preparation and execution of the symposia and on the installation of the new structures of the IAG Commissions after the elections becoming effective during the IUGG General Assembly. A focus will be laid on GGOS, whose new structure with three principal themes has to be consolidated. IAG Components will actively participate in meetings during interdisciplinary assemblies (e.g., American Geophysical Union, European Geosciences Union, Fédération Internationale des Géomètres, International Astronomical Union).

Hermann Drewes, IAG Secretary General



International Association of Geomagnetism and Aeronomy (IAGA)

www.iugg.org/IAGA/

INTRODUCTION

IAGA, the **International Association of Geomagnetism and Aeronomy**, is the premier international scientific association promoting the study of terrestrial and planetary magnetism, and space physics.

ADMINISTRATION

Among the matters dealt with by the EC the following should be mentioned: preparation and implementation of the selection of the venue for the next scientific assembly through voting by the National Bodies of the Member Countries in 2013, endorsement for indices of magnetic activity, adoption of the new geomagnetic constant, a design of a new IAGA logo.

ACTIVITIES

Preparation of the XXV IUGG General Assembly:

The year 2010 has been marked by preparations for the XXV IUGG General Assembly in Melbourne 2011, Earth on the Edge: Science for a Sustainable Planet. IAGA's General Assembly in 2011 will be part of the IUGG Assembly but will take place in the second part of the IUGG Assembly, i.e. from 2 July to 7 July rather than occupying the full ten days of 28 June - 7 July.

Sponsored Topical Meetings

IAGA sponsored the following seven topical meetings during 2010:

15 - 18 June	Long-Term Changes and Trends in the Atmosphere
12 - 16 July	Representation of the Auroral and Polar Ionosphere in the International Reference Ionosphere (IRI)
29 Aug - 4 Sept	12th "Castle Meeting" on Paleo, Rock and Environmental Magnetism
13 - 17 Sept	4th VLF/ELF Remote Sensing of the Ionosphere and Magnetosphere (VERSIM)
18 - 24 Sept	20th Electromagnetic Induction Workshop
13 - 23 Sept	XIVth IAGA Workshop on Geomagnetic Observatory Instruments, Data Acquisition and Processing
3 - 6 Oct	XIIIth EMSEV workshop on Electromagnetic studies of Earthquakes and Volcanoes

IAGA Young Scientist Award 2009-2010

Analysing the proposals received from different co-sponsored meetings and conferences by the IAGA, the following young scientists received the 2009- 2010 IAGA Young Scientist Award: Annika Seppälä - High Energy Particle Precipitation in the Atmosphere (HEPPA) Workshop; Klaus Reuter –

Conference on Natural Dynamos; Joanna Roszkowska-Remin - 12th meeting on New Trends in Geomagnetism - Paleo, Rock and Environmental Magnetism; Gilda Currenti – International EMSEV-2010 Workshop on Electromagnetic Studies of Earthquakes and Volcanoes.



IAGA News

IAGA News 47 was distributed in January 2010. It can be found at the IAGA web site www.iugg.org/IAGA. Among other things, reports from topical meetings co-sponsored by IAGA can be found there.

FUTURE ACTIVITIES

IAGA is the proper international organization for handling the subject Sun-climate relationships, as agreed by the EC. A programme has been started in this field.

Mioara Manda, IAGA Secretary General



International Association of Hydrological Sciences (IAHS)

<http://iahs.info>

INTRODUCTION

The International Association of Hydrological Sciences (IAHS) promotes the study of all aspects of hydrology through discussion, comparison, and publication of research results and through the initiation of research that requires international cooperation. IAHS Press publishes the bi-monthly Hydrological Sciences Journal, the Red Book Series that includes proceedings of between eight and 12 symposia per year, and other more specialised publications. IAHS maintains strong connections with the International Hydrological Programme of UNESCO and with the Hydrology and Water Resources Programme of the World Meteorological Organisation (WMO).

ADMINISTRATION

Even though situated between the Hyderabad Joint International Convention (2009) and the Melbourne General Assembly (2011), the last year has been very active for IAHS with many Meetings and Publications. The IAHS Bureau met in Paris on July 4.

ACTIVITIES

IAHS meetings

Many scientific events have been organized, sponsored or supported by IAHS and its Commissions and Working Groups in 2010. Among them we would like to quote the following:

- Integrated Water Resources Management and challenges of the Sustainable Development (GIRE3D), Agadir, Maroc, 24-26 March 2010
- 1er Séminaire international euro-méditerranéen sur l'aménagement du territoire, la gestion des risques et la sécurité civile, Batna, Algérie, 27-29 April 2010
- Advances in statistical hydrology, Taormina, Italy, 23-25 May 2010
- BALWOIS 2010, Ohrid, Macedonia, 25-29 May 2010
- GQ10 Groundwater Quality 2010 Conference, Zurich, Switzerland, 13-18 June 2010
- International Symposium on Sediment dynamics for a changing future, Warsaw, Poland, 14-18 June 2010
- Water 2010, Constantza, Romania, 16-19 June 2010
- Tenth International Conference on Precipitation (IPC10) "Space time precipitation from urban scale to global change", Coimbra, Portugal, 23-25 June 2010
- Workshop Flowpath Characterisation, Neuherberg, Germany, 29-30 June 2010
- Xth Kovacs Colloquium Hydrocomplexity: New Tools for Solving Wicked Water Problems, Paris, France, 2-3 July 2010
- 13th ERB Conference. Hydrological Responses of Small Basins to a changing environment, Vienna, Austria, 5-8 September 2010

- 11th International Symposium on River Sedimentation (ISRS), Stellenbosch, South Africa, 6-9 September 2010
- 9th International Conference on Hydroinformatics HIC2010, Tianjin, China, 7-11 September 2010
- XXXVIIIth IAH Congress, Krakow, Poland, 12-16 September 2010
- HydroPredict'2010 : 2nd International Interdisciplinary Conference on Predictions for Hydrology, Ecology, and Water Resources Management: Changes and Hazards caused by Direct Human Interventions and Climate Change, Prague, Czech Republic, 20-23 September 2010
- Remote Sensing and Hydrology 2010, Jackson Hole, Wyoming, USA, 27-30 September 2010
- 6th World FRIEND Conference. Global Change : Facing Risks and Threats to Water Resources, Fez, Morocco, 25-29 October 2010
- Groundwater as a key for adaptation to changing climate and society, Kyoto, Japan, 14-16 November 2010
- International Graduate Conference on "Climate Change and People», Kathmandu, Nepal, 15-19 November 2010
- Irish National Hydrology Conference 2010, Athlone, Ireland, 16 November 2010
- IWRM 2010, 5th International Symposium on Integrated Water Resources Management : Water Resources Sustainability in a Changing Environment, Nanjing, China, 19-21 November 2010
- 4th International Seminar on Small Catchments Dynamics: Connectivity in Time and Space, Israel, 22-25 November 2010
- ARGeo-C3, African Rift GEOthermal resources, Djibouti, Republic of Djibouti, 22-25 November 2010
- International Conference on Challenges and New Directions in Transboundary Aquifers Management, Paris, France, 6-8 December 2010

IAHS Publications

In 2010 *IAHS Press* published eight issues of the *Hydrological Sciences Journal*. Three issues of the *IAHS Newsletter* have also been published and widely disseminated free of charge, both as hard copies and on the Web. A lot of thought is being given to what amendments should be introduced into IAHS' publications and the workings of IAHS Press in order to meet the new challenges facing scientific publishing. This is sure to lead to some important changes in the organization of our press office in Wallingford.

During the year, IAHS Press published 5 *Red Books*:

- Status and Perspectives of Hydrology in Small Basins, Edited by Andreas Herrmann & Sybille Schumann, Co-edited by Ladislav Holko, Ian Littlewood, Laurent Pfister, Piet Warmerdam & Ulrich Schröder, IAHS Publication 336.
- Sediment Dynamics for a Changing Future, Edited by Kazimierz Banasik, Arthur J. Horowitz, Philip N. Owens, Mike Stone & Des E. Walling, IAHS Publication 337.
- Hydrocomplexity: New Tools for Solving Wicked Water Problems, Proceedings of the Xth Kovacs Colloquium, Edited by Shahbaz Khan, Hubert Savenije, Siegfried Demuth and Pierre Hubert, IAHS Publication 338.
- Land Subsidence, Associated Hazards and the Role of Natural Resources Development, Edited by Dora Carreón-Freyre, Mariano Cerca & Devin I. Galloway, Technical editor: J. Jesús Silva-Corona, IAHS Publication 339.
- Global Change : Facing Risks and Threats to Water Resources, Proceedings of the 6th World FRIEND Conference, Edited by Eric Servat, Siegfried Demuth, Alain Dezetter & Trevor Daniell, Co-edited by: Ennio Ferrari, Mustapha Ijjaali, Raouf Jabrane, Henny Van Lanen & Yan Huang, IAHS Publication 340.

Two volumes have also been published in the "Benchmark Papers in Hydrology" Series:

- Rainfall-Runoff Modelling, Selection, Introduction and Commentary by Keith Loague.
- Riparian zone hydrology and biogeochemistry, Selection, Introduction and Commentary by T. P. Burt, G. Pinay & S. Sabater.

IAHS Task Force for Developing Countries (TFDC)

The TFDC continued its work and distributed free of charge all IAHS publications (Hydrological Science Journal and the Red Books) to more than 60 selected universities and research institutions in Africa, Asia, South-America and Eastern Europe.

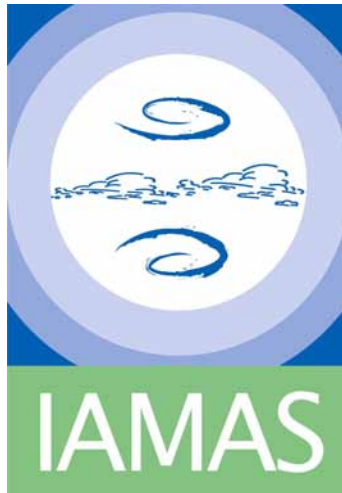
Awards

Muguresu Sivapalan (Australia) has been awarded the International Hydrology Prize, which is administrated together with UNESCO and WMO, for his long career devoted to hydrology. Audrey Valéry, Vazken Andréassian and Charles Perrin (France) received the 2010 Tison Award for their paper “Inverting the hydrological cycle: when streamflow measurements help assess altitudinal precipitation gradients in mountain areas” published in the IAHS Publication No. 333 in 2009.

Cooperation with UNESCO, WMO and UN-Water

The close cooperation of IAHS with UNESCO, WMO and UN-Water has been continued. We have attended the IHP Council meeting held at Paris in June 2010. Much effort during the year has been put into preparations for the next IUGG and IAHS Assembly which will be held in Melbourne.

Pierre Hubert, IAHS Secretary General



International Association of Meteorology & Atmospheric Sciences (IAMAS)

<http://www.IAMAS.org>

INTRODUCTION

IAMAS is the specialized association of the International Union of Geodesy and Geophysics (IUGG) which deals with all aspects of the gaseous envelope around the Earth and other planets. The main research work is carried out, coordinated and communicated in IAMAS's ten International Commissions (IC), which are in alphabetical order the ICs on *Atmospheric Chemistry and Global Pollution* (ICACGP), on *Atmospheric Electricity* (ICAE), on *Climate* (ICCL), on *Clouds and Precipitation* (ICCP), on *Dynamical Meteorology* (ICDM), on the *Middle Atmosphere* (ICMA), the *International Ozone Commission* (IOC), the ICs on *Planetary Atmospheres and their Evolution* (ICPAE), on *Polar Meteorology* (ICPM), and the *International Radiation Commission* (IRC). All ICs, and IAMAS as a whole, take a leading part within the global communication and discussion of latest research results in a wide range of scientific meetings that are open to all scientists.

ADMINISTRATION

IAMAS did not hold business meetings in 2010; no changes of IAMAS bureau occurred in 2010. The IAMAS bureau cooperated closely by email and by telephone conferences on a monthly basis, mainly concerning preparations for IAMAS/IUGG2011. The Sec.-Gen. kept personal contact with a number of commissions officers at the COSPAR assembly in Bremen (July) and met several of his colleagues from IUGG and its associations at EGU in Vienna (May). Issue 10 of the IAMAS newsletter appeared. The website got transferred from UK to Germany where it is being refurbished.

ACTIVITIES

Here a brief selection of activities is reported; the full compilation of IAMAS commission reports will be posted on www.IAMAS.org/Reports.html.

International Commission on Atmospheric Chemistry and Global Pollution (ICACGP)

ICACGP elected new officers for the period 2010-2014:

President: Prof. Dr. John. P. BURROWS (Germany)
Vice President: Prof. Laura GALLARDO KLENNER (Chile)
Secretary: Dr. Frank DENTENER (Italy)

ICACGP organized the 12th Symposium of CACGP jointly with the 11th Science Conference of the International Global Atmosphere Chemistry (IGAC) Project in Halifax Canada 11 to 16 July 2010. Information about the symposium can be found at www.icacgp-igac-2010.ca. ICACGP has continued to strengthen the links and common activities with the international research projects IGAC and SOLAS, which the Commission co-sponsors together with IGBP as well as SCORE and WCRP, respectively.

International Commission on Atmospheric Electricity (ICAE)

ICAE released two detailed newsletters, which are available from <http://icae.jp/>. ICAE held one committee meeting in 2010 and is preparing for IUGG2011 and its 14th International Conference on Atmospheric Electricity to be held in Brazil from 8 to 12 August 2011.

International Commission on Climate (ICCL)

The ICCL president Keith Alverson has continued to participate in the IAMAS statutes revision committee chaired by past president Mike MacCracken. Keith has been active in the development of a Global Framework for Climate Services being led by WMO. The ICCL Executive Secretary, Neil Holbrook, has been actively working with the IAMAS Secretary General, Hans Volkert, on preparing for the IUGG Conference in Melbourne in 2011, also as National (Australian) Co-Convenor of IUGG 2011 – reporting within the SPC meetings for IUGG. Neil is currently leading the redesign and development of the ICCL website. Both Keith and Neil participated in the Global Oceans Conference 2010 (GOC2010) held at UNESCO in Paris from 3-7 May 2010 – this being the Fifth Global Conference on Oceans, Coasts, and Islands, cf. www.globaloceans.org.

International Commission on Clouds and Precipitation (ICCP)

The ICCP activities in 2010 were mostly related to IUGG2011 and the next conference, the ICCP international conference to be held in Leipzig in July 2012 with the expectation of 450 people.

International Commission on Dynamical Meteorology (ICDM)

The ICDM main activity has been preparation for Melbourne 2011. ICDM is also looking to organising a dynamical meteorology workshop in 2012 – the first such activity for many years.

International Commission on the Middle Atmosphere (ICMA)

ICMA co-sponsored following activities in 2010:

- 6th IAGA/ICMA/CAWSES-II workshop “Long Term Changes and Trends in the Atmosphere”, June 15-18, 2010 in Boulder, Colorado, USA, cf. www.hao.ucar.edu/TREND2010
- SCOSTEP's Symposium STP12, July 12-16, 2010 in Berlin, Germany, cf. www.iap-kborn.de/SCOSTEP2010/

and will co-sponsor

- AGU Chapman conference “Atmospheric Gravity Waves and Their Effects on General Circulation and Climate”, 28 Feb. – 4 March, 2011 in Honolulu, Hawaii, USA, cf. www.agu.org/meetings/chapman/2011/ccall/.

International Ozone Commission (IO3C)

An IO3C meeting was held at the EGU2010 organized in May 2010. The main topics of the meeting were (1) the geographical representation of IO3C and (2) the organization of the 2012 Quadrennial Ozone Symposium which will be held in Toronto in 2012. Other activities in 2010 included:

- IO3C Members were strongly involved in the 2010 WMO Ozone Assessment, which was published on January 2011. The Ozone Assessment is available at http://www.unep.ch/ozone/Assessment_Panels/SAP/index.shtml. A summary of the

Assessment was written by the IO3C office for the latest 10th issue of the IAMAS newsletter (Dec 2010);

- the IO3C annual press statement on the state of the ozone layer was released on the “Ozone Day” on September 16th 2010,
ioc.atmos.illinois.edu/press/IO3C_OzonePressRelease2010_Final.pdf .

International Commission on Planetary Atmospheres and their Evolution (ICPAE)

The ICPAE Commission activities have benefited from important breakthroughs from space missions and ground-based data, in particular, CASSINI-HUYGENS, MARS EXPRESS, VENUS EXPRESS, and MARS RECONNAISSANCE ORBITER. Many of the ICPAE members are involved in these space missions and have been extremely active in working on the data obtained from these missions. These missions will be highly represented at IUGG2011.

The ICPAE, through its President and other members, have sponsored other meetings in 2010 to promote Planetary Atmospheres and their Environments, namely:

EGU 2010 (Vienna, Austria, 2-7 May), AOGS 2010 (Hyderabad, India, 5-9 July), COSPAR 2010 (Bremen, 18-25, July), EPSC 2010 (Rome, Italy, 20-25 Sept), DPS (3-8 October, Pasadena), AGU (13-17 Dec 2010)

ICPAE sponsored the publication of two special issues in Planetary and Space Sciences (volumes 57, Issue 13 and volume 58, issue 13). ICPAE members played a leading role in putting together and editing of the special issue of Journal Geophysical Research “Venus Express: results of the nominal mission” that included more than 40 original papers and was published in 2010 as a book. More than 20 papers are submitted to the special issue of Icarus “Advances in Venus Science” to appear in 2011. In 2010 ICPAE members significantly contributed to the Planetary Science Decadal Survey in the US. As of October 15, the draft report had entered the peer review process with an anticipated delivery date in early Spring 2011. Also, ICPAE members are participating in proposals and studies for future space missions to planetary objects from the space agencies (NASA, ESA), such as EJSM-Laplace, TSSM, TAE, Saturn Probes, EVE, etc.

International Commission on Polar Meteorology (ICPM)

The primary activity of ICPM in 2010, in conjunction with other organizations, was to sponsor and organize the International Workshop on Antarctic Clouds (cf. <http://polarmet.osu.edu/workshops/iwac/>), that was held at the Byrd Polar Research Center of the Ohio State University, July 15-16, 2010. The goal was to evaluate what (little) is known about Antarctic clouds and suggest what future efforts are needed to dramatically improve their understanding. A report that will outline the next steps recommended by workshop participants is being prepared and should be ready for distribution to the community by March 2011. The workshop presentations (online at the above website under Program) are being turned in a review manuscript for the Reviews of Geophysics with a submission date of April 1, 2011.

International Radiation Commission (IRC)

At present the IRC is composed of 42 members from 18 countries. The Commission has eight active working groups and three associated groups. As of January 2011, the IRC account balance is approximately US\$25K.

At the 2010 Annual Business Meeting held on 22 July 2010 in Bremen, Germany during COSPAR, IRC members voted to hold the 2012 International Radiation Symposium in Berlin, Germany, 5-12 Aug 2012. The IRC submitted five reviewer/author nominations for IPCC AR5.

Other Meetings and Activities IRC members co-organized or participated in 2010 include:

- ITSC-17 (International TOVS Study Conference), 14-20 April 2010, Monterey, CA.
- 11th BSRN Scientific Review and Workshop, 13-16 April 2010, Queenstown, New Zealand
- The Eleventh Biennial HITRAN Conference (united with the 10th ASA Conference), 16-18 June 2010, Cambridge, Massachusetts.

- AMS Joint 13th Conference on Cloud Physics and 13th Conference on Atmospheric Radiation, 28 June-2 July 2010, Portland, Oregon.
- 3rd Asia Pacific Radiation Symposium, Seoul, 25-28 August 2010.

Reports of IAMAS liaisons to other organizations

SCOR: Michael MacCRACKEN, the liaison to the Executive Committee of the Scientific Committee on Oceanic Research (SCOR), attended the annual SCOR meeting in Toulouse, France (13-16 September). The meeting reviewed the status of SCOR Working Groups and the many international ocean research programmes that SCOR oversees, and evaluated proposals for new working groups, moving forward on only one of them due to funding limitations.

WCRP-JSC: Guoxiong WU, the liaison to the World Climate Research Program (WCRP), attended the WCRP Joint Science Committee's (JSC) 31st Session in Antalya, Turkey (15-19 February). In addition to the traditional agenda, the JSC reviewed the overall WCRP function and structure, discussed how to hold the WCRP Open Science Conference (OSC) and strengthen climate service, and had a joint Session with WMO Commission for Climate (CCI) on the subject "Working together towards strengthened research and operations linkages for enhancing the use of climate information".

SCAR: John Turner, the liaison to the Scientific Committee on Antarctic Research (SCAR), attended SCAR XXXI and the SCAR Open Science Conference in Buenos Aires, Argentina in July-August 2010. At this meeting he was awarded the 2010 SCAR Medal for Excellence in Antarctic Research. IAMAS sponsored several symposia at the Open Science Conference. John Turner is on the organising committee for the next major SCAR meeting in July 2012 in Portland, Oregon. It is anticipated that IAMAS will co-sponsor several sessions at this meeting.

FUTURE ACTIVITIES

IAMAS set up a statutes revision committee and a nomination committee in 2009. Both committees will lead important discussions at the IAMAS EC meetings during IUGG2011. With a complete revision of the statutes and a newly elected bureau, IAMAS will embrace a new era of opportunities and challenges. IAMAS is also intending to set up an award to recognize the achievement of young scientists. The first award would be given at IAMAS-IACS 2013 joint assembly in Davos, Switzerland, termed DACA-13 for short. The Swiss National Organisation Committee (SNOC) has started a series of planning meeting towards DACA-13; the Secretary General joined one of them in August 2010.

Guoxiong Wu, IAMAS President
Hans Volkert, IAMAS Secretary General



International Association for the Physical Sciences of the Oceans (IAPSO)

iaps0.iugg.org

INTRODUCTION

IAPSO has the prime goal of "promoting the study of scientific problems relating to the oceans and the interactions taking place at the sea floor, coastal, and atmospheric boundaries insofar as such research is conducted by the use of mathematics, physics, and chemistry."

IAPSO maintains formal liaison with other scientific commissions and committees. These include the ICSU's Scientific Committee on Oceanic Research (SCOR), and UNESCO's Intergovernmental Oceanographic Commission (IOC).

For more information see <http://iaps0.sweweb.net/db/>

ADMINISTRATION

2010 was a year-in-between assemblies. In such years most of the Secretary General's time is spent with the planning of the scientific symposia for the next assembly (IUGG2011 in Melbourne).

In September, the IAPSO President AND Secretary General attended the annual SCOR meeting in Toulouse, France, where we reported on IAPSO activities, reviewed the accomplishments of current SCOR and SCOR/IAPSO Working Groups (WGs) and evaluated the proposals for six new SCOR WGs. While several of the proposed WGs were rated quite highly, there were only sufficient funds in the SCOR budget to support one new WG, namely, Modern Planktic Foraminifera and Ocean Changes. IAPSO does not co-fund the WG.

In December the LOC for the Joint (IAPSO, IAHS and IASPEI) Assembly in Gothenburg, Sweden, 22-26 July 2013 was formed. The three Secretaries General visited the venue and had a first meeting with representatives for LOC.

ACTIVITIES

The IAPSO activities during 2010 were within the working groups. The SCOR/IAPSO WG 127 (The Thermodynamics and Equation of State of Seawater) completed their extensive work, which involved the introduction of the Gibbs potential function for seawater and a new salinity formulation called Reference Salinity (SR), expressed in g/kg. The Gibbs function makes it possible to obtain accurate representations of many thermodynamic properties of seawater (e.g., density, enthalpy, entropy, heat capacity, and sound speed). The Reference Salinity more accurately represents the chemical composition of seawater over a wide range on concentrations, and it replaces the familiar Practical Salinity (SP), which has been used by the oceanographic community for the past 30 years. However, we note that Practical Salinity will continue to be recorded in national and international data bases to maintain continuity with past practice. The new formulation for the thermodynamics of sea water is now published as: IOC, SCOR and IAPSO, 2010: *The International Thermodynamic Equation of Seawater – 2010: Calculation and use of Thermodynamic Properties*. Intergovernmental Oceanographic Commission, Manuals and Guides No. 56, UNESCO (English), 196 pp. It is also available electronically from <http://www.TEOS-10.org>. This WG was chaired by Trevor McDougall (Australia).

SCOR/IAPSO WG 133 (Ocean Scope) held its second meeting in London 12-14 April 2010. The WG is chaired by Tom Rossby (USA) and Kuh Kim (Korea).

SCOR/WCRP/IAPSO WG: The Climatic Implications of the Greater Agulhas System held its first meeting 20 – 21 February 2010 in Portland, Oregon, USA. This WG is chaired by Lisa Beal (USA) and Arne Biastoch (Germany).

A IAPSO co-sponsored publication: *Sea-Level Rise and Variability*. Edited by John A. Church, Philip L. Woodworth, Thorkild Aarup & W. Stanley Wilson. 2010. Blackwell Publishing Ltd.

Four prominent scientists were nominated for the Prince Albert Medal for 2011. Trevor McDougall (CSIRO Marine and Atmospheric Research, Hobart, Australia) was selected for “his outstanding work on (1) important and fundamental problems of ocean fluid dynamics over the full range of ocean scales, and (2) the thermodynamic properties of seawater”. The award ceremony will take place at the IUGG2011 General Assembly in Melbourne, 1 July, at 10:30.

PLANNED FUTURE ACTIVITIES

The main activity in 2011 will be the IUGG General Assembly in Melbourne.

The SCOR/WCRP/IAPSO WG Climatic importance of the Greater Agulhas System will meet 21-25 March in Mauritius. The theme is “Towards an Observing System for the Greater Agulhas System: Building links and capacity for East African participation” IUGG sponsors student participation in this workshop.

Johan Rodhe, IAPSO Secretary General



International Association of Seismology and Physics of the Earth's Interior (IASPEI)

www.iaspei.org

INTRODUCTION

The International Association of Seismology and Physics of the Earth's Interior is the leading international association promoting the studies of the structure and of the geodynamical processes ongoing in our Earth's interior. IASPEI achieves its goals through scientific conferences, primarily those organized by IASPEI and its Commissions, but sponsoring also other international initiatives, fosters international cooperation, both in the monitoring seismic activity, research and education activities, especially in countries that are in the process of working towards full scientific development.

Most of the IASPEI efforts during 2010 were directed towards the forthcoming IUGG2011 General Assembly, in particular the scientific programme. However, several important scientific meetings have been also sponsored by IASPEI. The two IASPEI Regional Commissions have held their General Assemblies and associated Training schools.

ADMINISTRATION

EC & Bureau meetings

The IASPEI Bureau has met in Shanghai in March, invited by the Chinese Earthquake Administration.

Website

The IASPEI website has been updated continuously, mainly with the help of the IASPEI webmaster Alice Walker.

Newsletters

Also the IASPEI Newsletter in its new vest has been regularly sent as pdf file attachment to e-mails. The Newsletters are also available for downloading from the website. Four issues were distributed in 2010.

ACTIVITIES

AGU Meeting of the Americas, August 8-13, 2010, Iguazu Falls, Brazil

IASPEI has actively participated, with the organization of the seismological sessions at the conference, the attendance of one of its Vice-Presidents the active involvement of its Executive Committee member Marcelo Asumpção, with sponsoring and some financial support Latin American graduate students, to the AGU Joint Assembly (or "Meeting of the Americas") that had a total of 2012 participants. The IASPEI logo was shown in both the AGU and the local webpage. It was also printed in the AGU program book and in the folder distributed to all participants.

Global Earthquake Model

The IAEE-IASPEI Joint Working Group on the International Alliance of Seismology and Earthquake Engineering Professional Associations activities were related to one of its missions: the GEM project, a global risk assessment initiative. Peter Suhadolc, GEM Foundation Governing Board member on behalf of IASPEI has attended two meetings in 2010, in June in Washington and in December in Singapore. The GEM initiative is progressing extremely well and a number of Projects have been assigned to groups of the seismological worldwide community to study basic seismological input data for seismic hazard assessment.

Asian Seismological Commission (ASC) meeting in Hanoi, Vietnam

The 8th General Assembly of the Asian Seismological Commission was held during November 8-10, 2010 in Hanoi, Vietnam. 287 from 32 countries participated to the well-organized conference that had its venue at the Vietnam Academy of Science and Technology. 70 Participants received full or partial grants from LOC. 208 abstracts were printed in the *ASC2010 Programme and Abstracts*, 150 posters and 117 reports were scheduled. The gala dinner on the boat cruising the big Hanoi lake was unforgettable.

The conference was preceded by a Pre-Assembly Training Course on Seismic Hazards and Disasters in Asia, attended by 20 participants. Eleven participants took part to the Post-Assembly Field Trip to the Red River Fault Zone.

No changes in the ASC Bureau. The venue of the next 2012 ASC conference will be: Ulaan Bataar, Mongolia.

European Seismological Commission (ESC) meeting, Montpellier, France

The 32nd General Assembly of the European Seismological Commission was held during September 6-10, 2010 in Montpellier, France.

A record attendance of 739 from 63 countries is a clear evidence of a successful event. The total attendance includes 701 registered participants, 8 master students from Montpellier University who followed keynotes and 29 high-school students and their teachers who presented their experiments in seismology on Friday morning. The gala dinner was attended by 350 people.

From a questionnaire distributed to participants the major highlight of the conference was the scientific program, perceived as attractive. Also the many keynotes given have been appreciated and as well as the extension of the topics beyond core seismological fields. The videos of the keynotes are available online at: <http://www.emsc-csem.org/News/esc2010/>

The Young Seismologist Training Course 2010 followed the conference and took place in the period 13 – 17 September 2010. The venue of the Course was the University Montpellier 2, and the title of the course was **Urban Seismology**. There were 19 participants from 17 countries. IASPEI provided as usual some financial support.

A new ESC Executive has been elected (details on www.iaspei.org). The venue of the next 2012 ESC conference will be: Moscow, Russia.

The Teamwork For Hazard Estimation For Triggered And Induced Seismicity

The Triggered and Induced Seismicity Working Group (TAIS WG) of IASPEI announced *The Teamwork For Hazard Estimation For Triggered And Induced Seismicity* (THE TAIS) Initiative. The overall intention of this Initiative is to integrate research groups and improve the efficiency of knowledge transfer by creating the international platform of cooperation between scientists and industry representatives in the field of human induced seismicity, with facilitating instantaneous access to data, results, methodologies and interpretations. The platform will be composed of Virtual Research Centres (VRC) that will work on specific problems and cooperate with the whole TAIS Team by modern IT. The first open meeting of THE TAIS was held during the ESC General Assembly in Montpellier.

Sponsored meetings

IASPEI has sponsored (on its own or via an IUGG grant) the following workshops/symposiums in 2010:

- The VIII International Workshop “Physics and Forecasting of Rock Destruction”, Saint Petersburg, Russia, from 24 to 29 May 2010.
- The IRIS Workshop on “Managing Waveform Data & Related Metadata for Seismic Networks”, Foz do Iguaçu, Brazil, 13-19 August 2010.
- 13th Business Meeting of IASPEI/IAGA/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV), October 6, 2010, Chapman University, California, USA. The deployment of equipment for joint studies of electromagnetic, seismic and deformation of Taal volcano near Manila in the Philippines has been partly supported by IASPEI.

Scientific Programs and Projects

The IDEA (International Digital Earthquake Archives) project of the Committee for Preservation of WWSSN and Historical Seismograms (also called simply *Seismoarchives: Seismogram Archives of Significant Earthquakes of the World*), is continuing under the guidance of Willie Lee. IRIS is archiving the scanned seismograms.

Recently, an IUGG-funded IASPEI-ISC Project *Networking of world seismologists (Improving Geophysical Science Link to the Society during Natural Extreme Events, Especially in Developing Countries)* has started. IASPEI and ISC will develop and maintain a worldwide registry of seismologists & geophysicists willing to serve as a point of contact in countries with and without affiliation to IUGG.

IASPEI has set up a Scientific Advisory Board (SAB) for the GEM hazard global component project *Global Instrumental Earthquake Catalogue* under the leadership of ISC. IASPEI has received financial support from this grant for this activity. The money is intended mainly for reimbursing the SAB members and for related IASPEI administration.

Publications

Several publications are available from the IASPEI Secretariat. IASPEI on approval distributes free copies of its publications to institutional libraries in less developed countries.

- IASPEI: Cooperation for Better Understanding of the Earth.
- International Handbook of Earthquake and Engineering Seismology (Part A and B)
- New Manual of Seismological Observatory Practice.

PLANNED FUTURE ACTIVITIES

- IUGG2011 General Assembly, Melbourne, Australia. June 28 – July 7, 2011.
- The Fourth International Symposium on the effects of Surface Geology on Seismic Motion, will be held in Santa Barbara, California, USA in August 2011.
- Seismotectonics and Seismic Hazards in Africa, a session at the CAG23, 7 - 14 January, 2011, Johannesburg, South Africa.
- Short course on Waveform Inversion for local earthquakes. OVSICORI Institute, Universidad Nacional de Costa Rica, Heredia, Costa Rica. Fall 2011.
- International Symposium on Geophysical Imaging with Localized Waves, Sanya, Hainan Island, China. July –August 2011.
- 12th International Workshop on Modeling of Mantle Convection and Lithospheric Dynamics. Groß Dölln, Germany. August 20 to 25, 2011.

Peter Suhadolc, IASPEI Secretary General & Treasurer



International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

<http://www.IAVCEI.org>

INTRODUCTION

The International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) represents the primary international focus for: (1) research in volcanology, (2) efforts to mitigate volcanic disasters, and (3) research into closely related disciplines, such as igneous geochemistry and petrology, geochronology, volcanogenic mineral deposits, and the physics of the generation and ascent of magmas in the upper mantle and crust.

Volcanology over the last 25 years has increased greatly its status as a fundamental discipline in the earth sciences. Its concerns reach from the deep roots of volcanic systems where magma is generated in the Earth's mantle, to the upper atmosphere which was formed originally- and is still being modified - by volcanic eruptions. Furthermore, only part of the scientific interests of IAVCEI centres on active volcanism. Much of the work undertaken to understand volcanic processes is carried out on dormant or extinct volcanoes and in ancient volcanic areas. The earliest crust-forming processes on Earth were volcanic, and large portions of Archaean terrains- the greenstone belts-are entirely volcanic. A small, but dedicated part of the scientific community also studies volcanic processes on the Earth's Moon and on planets such as Mars and Venus.

IAVCEI is run by the Executive Committee, whose membership changes every four years. The Executive Committee determines policies for the Association, enacting them through a series of Commissions and Task Groups. IAVCEI aims to be outward-looking, seeks relationships with other international scientific organisations, and participates in international scientific projects. It aims also to maintain a robust publishing policy, encouraging the presentation of high calibre, volcanological research results, mainly through its premier international journal the *Bulletin of Volcanology*.

ADMINISTRATION

IAVCEI Executive Committee activities

IAVCEI Executive Committee activities during 2010 have all been carried out through email exchange among the EC members. These include:

- Revision of IAVCEI Finances, funding support, and potential funding sources and strategies.
- The revision of the existing commissions, past activities and future plans is still ongoing and we expect to make a decision on which Commissions will continue and which ones will be cancelled during the first half of 2011, in order to present a final report during the IUGG GA in Melbourne.
- The website has been revised and updated.
- The IAVCEI scientific program for IUGG GA 2011 has been updated in collaboration with Prof. Ray Cas, Local Chairman and member of IAVCEI.
- The former editor of *Bulletin of Volcanology*, Dr. John Stix, decided to leave his position for personal reasons and has been replaced by Dr. James White, who is currently working on the reorganisation of the Editorial Board of *Bulletin of Volcanology*.

Members

In 2010 the number of IAVCEI paid individual members was 701, 72 of them being Life Members.

ACTIVITIES

Webpage

The IAVCEI web page has been updated again and includes new sections.

Newsletters

Two issues of the newsletter "IAVCEI News" have been published through the website, one in January 2010 and a second one in June 2010.

2010 Meetings, workshops and courses

The following meetings, workshops, and courses have been organised by one (or more) of the IAVCEI commissions in 2010:

- Cities on Volcanoes 6 (Tenerife, Spain, June 2010) (Commission on Cities on Volcanoes)
- State of the Arc (SOTA) 2010 (Santorini, Greece, 19-25 September 2010) (Commission on Arc Magmatism)
- III International workshop on Caldera Volcanism (La Reunión, France, October 2010) (Commission on Caldera Volcanism)
- 18th International Field Course of Central Andes (Argentina, November 2010) (Commission on Caldera Volcanism)
- Ash Dispersal Forecast and Civil Aviation (Switzerland, October 2010) (Commission on Tephra studies)

PLANNED FUTURE ACTIVITIES

Executive Committee activities for 2011

Foreseen activities for 2011 are:

- Full revision of the IAVCEI Statutes and By Laws and approval in the General Assembly to be held in Melbourne during the IUGG GA.
- Completion of the reorganisation of IAVCEI Commissions.
- Election of the new Executive Committee for the period 2011-2015. The new members will be officially presented during the General Assembly to be held in Melbourne during the IUGG GA.

Meetings, workshops and courses in 2011

Forthcoming meetings, workshops and courses in 2011 are:

- 11th Field Workshop on Volcanic Gases (Kamchatka, Russia, 5-9 April) (Commission on Volcanic Gases)
- Sufriere Hill Volcano 15+ years on (Montserrat) (Commission on Explosive Volcanism)
- Analysis of Probabilistic Volcanic Hazards (Buffalo, USA, 16-19 May, Commission on Explosive Volcanism)
- IAVCEI General Assembly (Melbourne, Australia, 27 June-7 July) (IAVCEI)

Joan Martí, IAVCEI Secretary General

ACTIVITIES OF THE UNION COMMISSIONS AND INTER-ASSOCIATIONS WORKING GROUPS

The following reports illustrate the impressive range of activities within each Union Commission as well as their dedication to supporting science within developing countries. Each Union Commission has a web site where much more information can be found.

Commission for Data and Information (UCDI)

INTRODUCTION

The International Union of Geodesy and Geophysics (IUGG) through its Union Commission for Data and Information (UCDI) strongly supports the use and development of standards for data, metadata and vocabulary exchange in advancement of IUGG science, education and outreach.

IUGG's eight scientific Association currently have standards activities ranging from digital cartographic data, spatial hydrological data sets, geochemical data, wave data, polar metadata profiles, geomagnetic data exchange, geodetic data, formats for seismic data, and community convention adoption of climate data and metadata formats.

UCDI was formed to allow IUGG to become more cohesive on the topic of data standards, as well as to retain current activities in its Associations, noting that in some cases metadata and vocabulary activities are sub-critical. UCDI activities and outcomes are directed to support and advance data and metadata standards across the Union.

The IUGG UCDI is coordinating IUGG's contribution to this initiative especially during the 2011 IUGG General Assembly in Melbourne, Australia and the 2011 ICSU General Assembly in Rome Italy. IUGG is strongly supporting participation of IUGG experts in this project. IUGG UCDI works closely with CODATA, other International Scientific Unions, and the International Council on Scientific and Technical Information (ICSTI).

ADMINISTRATION

Membership - UCDI executive

IACS	Mark Parsons, NSIDC, IPYDIS (USA)	parsonsm@nsidc.org
IAG	Bernd Richter (Germany)	richter@iers.org
ICSU-FAGS	Ruth Neilan JPL (USA)	Ruth.Neilan@jpl.nasa.gov
IAGA	Peter Fox, RPI (USA) - CHAIR	pfox@cs.rpi.edu
IAHS	Pierrick Givone (France)	pierrick.givone@cemagref.fr
IAMAS	Maria Assunção F. Silva Dias, CPTEC/INPE (Brazil) (IAMAS Vice-Pres.)	assuncao@cptec.inpe.br
IAPSO	W John Gould, Southampton, UK	wjg@noc.soton.ac.uk
IASPEI	Tim Ahern, IRIS, (USA)	tim@iris.washington.edu
IAVCEI	Adelina Geyer Traver, Barcelona (SPAIN)	ageyer@ija.csic.es
eGY & CODATA	Charles Barton, Australian National University, (Australia) – VICE CHAIR	cebarton@gmail.com

Business meetings

- Active email exchange
- Chair and IAGA President met at EGU to discuss terms of reference
- In-person meeting at CODATA2010 in South Africa (Oct.)
- Planned meeting at IUGG 2011 in Melbourne

ACTIVITIES

The commission via its executive continued and expanded participation at meetings including Fall AGU (Fox, Ahern, Neilan), eGYoutcomes (Barton, Parsons), EGU (Fox, Geyer Traver).

Letters of support

- Prepared, in consultation with the UCDI executive, a letter of support entitled “The necessity for community-based e-Science infrastructure and sustained support: the example of the Grid in Europe“, to the IUGG secretary general, for an EU proposal

UCDI’s near-term plans and progress were

- Collect, compare, adapt and recommend policies and procedures for collaboration on data collection, and use and sharing across IUGG Association activities – ongoing in PIC (Parsons).

Representation

- Peter Fox and Bernd Richter represent UCDI and IUGG on the ICSU Strategic Coordinating Committee on Information and Data (SCCID), which met in Paris, in March and September 2010. SCCID’s first public and preliminary report will be released in early April 2011.
- Ruth Neilan represents UCDI and IUGG on the World Data System Science Committee, which met twice in 2010.
- Mark Parsons represents UCDI and IUGG on the Polar Information Commons effort funded by ICSU and CODATA
- Liaisons for scientific societies: Liaise with related data and information bodies and forums to advance the shared responsibilities for modern data and information practices – identify commission representatives to those bodies’ and forums.
 - AGU (Peter Fox – chair and program committee)
 - EGU (Peter Fox – program committee, Adelina Geyer Traver)
 - GSA - pending
 - JGPS – pending

IUGG General Assembly

UCDI is convening a Union session 05 at the IUGG 2011 General Assembly in Melbourne, Australia, entitled: Data science/informatics and data assimilation in geophysical models (climate, oceanography, hydrology, solid Earth).

- The goal of this session is to assess the current state of data science and informatics effort in support of IUGG science and inform IUGG scientists, as well as indicate successful progress made to date and the challenges that presently exist.
- Conveners: Peter Fox (RPI), Charles Barton (ANU), Mark Parsons (NSIDC), Adelina Geyer Traver (CIMNE), Roger Proctor (UTas), Richard Swinbank (UK MetOffice). Co-Conveners: Ruth Neilan (JPL/NASA), Alik Ismail-Zadeh (KIT). While planning for the meeting is still underway, 8 oral talks and 13 posters are under consideration for the programme.

CODATA participation, cooperation

Close collaborative ties to CODATA continue. These occur at the Assembly level, at CODATA meetings, in proposal preparation as well as with the CODATA Task and Working Groups. Refer to the CODATA 2010 report by Fox for complete details.

Collaboration with IUGS/CGI

- UCDI via its chair (Fox) has continued to develop collaborative relations with the International Union for Geological Science’s Commission on Geoscience Information (CGI) via their chair (Kristine Asch (BGR)). Fox was invited and attended a CGI workshop in Berlin to represent IUGG/UCDI.

ICSU proposal preparation

- IUGG together with four other scientific unions (IUGS, IAU, IUCr, IUPAC) and the International Council for Scientific and Technical Information (ICSTI) collaboratively prepared a proposal with CODATA entitled: “Making Sense of the ICSU Role in Scientific Data Standards”.
- The proposal for Eu 30,000 was submitted to the ICSU Grants Programme on Dec. 1, 2010.
- The project supports the overall ICSU goal related to data and information, i.e., to facilitate a coordinated global approach to scientific data and information that ensures equitable access to quality data and information for research, education and informed decision-making.
- It also responds to the Strategic Plan's call for the development of new inter-union initiatives and for facilitating interactions between scientists from different disciplines and between developing and developed countries.

Polar Information Commons (PIC)

UCDI is very active in the ICSU funded and CODATA-led Polar Information Commons (PIC) – see the PIC website at <http://polarcommons.org/> for all details on this activity. Mark Parsons (UCDI) attended the PIC workshop entitled: “The Polar Information Commons, Life after Oslo” in Oslo in June 2010. PIC has been active in promoting best practices in data sharing, citation and attribution for geoscience data. Mark Parsons will also present PIC progress at the Union session in Melbourne. PIC's impact is beginning to be noticed, as Nature has just published a Special on Data Sharing: <http://www.nature.com/news/specials/datasharing/index.html>

eGYAfrica

eGYAfrica is a bottom-up initiative by African geoscientists and others to secure better Internet connectivity in their institutions. IUGG and IAGA are currently the main sponsors. The Association of African Universities and ICSU's Regional Office for Africa are expanding their commitment to eGYAfrica.

Meetings attended by eGYAfrica members - IST-Africa, Durban which was attended by Barton and Chukwuma. They presented a paper about eGYAfrica presented. Discussions with Muhongo about establishing an Africa Geophysical Union as a counterpart to AGU, EGU, AOGS, and JpGU.

A planning workshop was held in Accra, Ghana 24-25 November 2010. It was attended by a core of 12 persons from 7 countries with the twin objectives of reviewing National Research and Education Network (NREN) developments in Africa and planning the next steps for eGYAfrica: (1) raise awareness about the digital divide issue and the cost-benefits of investing in Internet connectivity in higher education and research institutions, (2) develop national groups of concerned scientists and others who will engage with decision makers, (3) collaborate with other bodies and programs who share the objective of reducing the digital divide, and (4) collect information and measurements of Internet performance via the PingER Project to be used as the basis for making the case for better interconnectivity.

World Data System (WDS) involvement

The ICSU World Data System Scientific Committee (WDS-SC) held its administrative meetings around the 22nd International CODATA Conference in South Africa in 2010. In addition, the WDS-SC organized three scientific sessions within the framework of the scientific conference on Data Publishing in the context of the World Data System; ICSU World Data System: International Building Blocks; and The ICSU World Data System: a Disciplined or Un-disciplined Initiative? A special keynote session on Strategic Planning on Data and Information issues took place within the conference preceded by key note presentations from Bernard Minster, Chair of the WDS-SC and Kari Raivio, Vice-President, ICSU. For information on this and much more see <http://www.codata2010.com/scientific-program.php>. UCDI members, particularly Ruth Neilan, are very active in the WDS-SC representing IUGG Association interests.

New relations with ICSTI

New collaborative relations are forming with the International Council for Scientific and Technical Information (ICSTI, www.icsti.org), an organization that “offers a unique forum for interaction between organizations that create, disseminate and use scientific and technical information. ICSTI’s mission cuts across scientific and technical disciplines, as well as international borders, to give member organizations the benefit of a truly global community.” ICSTI has approached IUGG with an invitation to become a member of ICSTI.

Selected Publications linked to UCDI activities

- Barton, C.E., R. Smith, and R. Weaver (2010). Data practices, policy, and rewards in the information era demand a new paradigm. *Data Science Journal*, 9, pages IGY 95 – 99.
- Boubakar, B., C. Barton, V. Chukwuma, L. Cottrell, U. Kalim, M. Petitdidier, and B. Rabiou (in press). eGY-Africa: better Internet connectivity to reduce the digital divide. *Proceedings of the IST-Africa Conference*, Durban, May 2010.
- Peterson W.K., D.N. Baker, C.E. Barton, P. Fox, M. Parsons, and E. CoBabe-Ammann (in press). The Electronic Geophysical Year (eGY). *Encyclopedia of Solid Earth Geophysics*, 2nd Edition, Van Nostrand.

PLANNED FUTURE ACTIVITIES

- Continue membership outreach, especially for participants in activities
- Liaise with related data and information bodies and forums to advance the shared responsibilities for modern data and information practices – identify commission representatives to those bodies’ and forums.
- Arrange informatics and collaborative sessions at Assemblies and major conferences of IUGG and at other Geo-union activities.
- Arrange workshops and training in support of IUGG’s mission related to data and information.
- Outreach to increase awareness – encourage Commission members to include discussions on the Commissions activities in talks, lectures at any suitable venue.
- Ensure the themes of the Commission are publicized in publications – via articles in journals and newsletters, and potentially the development of promotional literature.
- Maintain website presence.

Peter Fox, UCDI Chair

Commission on Geophysical Risk and Sustainability (GRC)

<http://www.iugg-georisk.org/>

INTRODUCTION

The IUGG Commission on Geophysical Risk and Sustainability (IUGG GeoRisk Commission) established by the IUGG Bureau in August 2000 is dedicated (i) to promoting scientific studies applied to the reduction of risk from natural hazards in an increasingly urbanized world and sustainability and (ii) to reducing death and destruction from natural and technological hazards by providing hazards data and information to emergency managers, policy-makers, scientists and the general public in the most timely and effective manner as possible. This includes the integration of knowledge concerning environmental, social and economic processes. The fundamental scope of this Commission is to facilitate communications – between scientists via meetings, workshops and publications, as well as between scientists and decision makers, between scientists and the public, and between scientists and schools.

ADMINISTRATION

Memberships

Kuniyoshi Takeuchi has been serving as a vice chair of the Science Committee of Integrated Research for Disaster Risk (IRDR) participating in the according activities. Yevgeni A. Kontar is member of the Executive Committee of the International Natural Hazards Society. There are several further memberships by GRC members.

Business meetings

There were no business meetings in 2010. The year was however used to prepare for the 25th IUGG General Assembly (see also below). GRC started the process of reorganizing the commission under the new terms of reference adopted by the IUGG Bureau in 2009.

ACTIVITIES

The deadliest disaster hit Haiti on the 12th of January 2010. It cost more than 230 000 lives, devastated large parts of the country's infrastructure and living conditions. Recovery is still ongoing and will be so for a considerable time in the future. The activities of the Georisk commission comprised a noteworthy resolution, triggered by the earthquake event, based on earlier resolutions emphasizing the important role of science in reducing adverse effects of natural hazards, thus reducing disasters.

Scientific meetings

- The outstanding activities were within the ENHANS Project started in 2010 (project leader Alik Ismail-Zadeh) comprising the symposia “Natural Hazards and Disasters in Latin America and the Caribbean” in Brazil (09-11 August), and “Extreme Natural Events: Modeling, Prediction and Mitigation” in the USA (12-17 December).
- Vladimir Kossobokov organized the symposium “Disaster Prediction and Management” at the ESOF2010 in Turin, Italy (6 July 2010).
- Yevgeni A. Kontar prepared and chaired the session on “Implication to Natural Hazards and the Global Carbon Cycle” within the American Geophysical Union Fall Meeting December 2010, contributing to several further conferences.
- Harsh Gupta and Kuniyoshi Takeuchi were invited to a Science Council of Asia (SCA) Joint Project 2 session “Natural Disasters” at the 10th Science Council of Asia Conference “Meeting the Health Challenges in the Asia Pacific Region” held in Manila 14-16 May. Both members contributed to several further conferences.

- Paula Dunbar presented an invited talk “National Geophysical Data Center Historical Natural Hazard Event Databases” on the AGU Meeting of the Americas in August.
- Gerd Tetzlaff prepared and chaired a session on “Coastal Disasters” in the International Conference of the Coastal Protection in Germany in September.

Projects

The outstanding project for GRC was ENHANS (Extreme Natural Hazards and Social Implications). This is an ICSU project led by IUGG (see www.enhans.org).

Publications

- Tom Beer (ed.), 2010, Geophysical Hazards: Minimising Risk, Maximising Awareness; Springer as part of the IYPE Legacy Series.
- Dölemeyer, J. Zimmer, G. Tetzlaff (eds.), Risk and Planet Earth, 110 p., Schweizerbarth, 2010.

There are several scientific articles in journals e.g.:

- Gupta H.K.: “Cooperation plan on Hazards and disasters risk reduction in Asia and the Pacific” and Kontar Y.A. et al., Hazards in the coastal zones related to groundwater-seawater interaction processes, both in T. Beer (ed.), Geophysical Hazards, Minimizing Risk, Maximising Awareness; International Year of Planet Earth, Springer Science and Business Media, 2010;
- Dunbar P. et al., Do the 2010 Haiti and Chile earthquakes and tsunamis indicate increasing trends?, Geomatics, Natural Hazards and Risk 1.

Participations and representations

GRC-members contributed to a broad spectrum of workshops, conferences and expert meetings.

PLANNED FUTURE ACTIVITIES

Main activities are centered around the ENHANS-project. These plans comprise co-organizing a workshop “Extreme Natural Hazards and Disaster Risk in Africa” in South African in January 2011, a session “Natural Hazards and Disaster Risks in the Middle East Region” at the Conference on “GeoInformation for Disaster Management” in Turkey on 03-08 May 2011, a Union Symposium “Grand challenges in Natural hazards research and risk analysis” and an open forum “Natural hazards : from risk to opportunity by partnership of science and society” at the 25th IUGG General Assembly Melbourne. GRC-members plan to contribute to the 3rd ISDR Global Platform Meeting in Geneva to be held from 08 to 13 May 2010.

Kuniyoshi Takeuchi, GRC Chair
Gerd Tetzlaff, GRC Secretary General

Commission on Mathematical Geophysics (CMG)

<http://www.fys.uio.no/cm2008/>

INTRODUCTION

The Committee on Mathematical Geophysics is a Union Commission. Its aims to encourage exchange of ideas and information in all areas of geophysics, with emphasis on the application of mathematics, statistics and computer science to geophysical problems, and to promote the development and application of mathematical methods and appropriate theoretical techniques for the solution of problems across the complete spectrum of geophysical disciplines. The Committee is sponsored by all IUGG Associations.

The earliest incarnation of the present CMG Committee was as the Working Group on Geophysical Theory and Computers (WGGTC), which was founded by Vladimir Keilis-Borok. The first meeting of the WGGTC was held in Moscow and Leningrad in 1964 and the last in Moscow in 1971 with intervening meetings held once yearly. Subsequent to 1971 the group was re-structured as the present Committee on Mathematical Geophysics, which has met on a semi-annual basis since that time, beginning with a meeting in Banff (Canada) in 1972.

The schedule since 1986 has included the following sequence of major CMG sponsored conferences:

Oosterbeek (The Netherlands, 1986), Blanes (Spain, 1988), Jerusalem (Israel, 1990), Taxco (Mexico, 1992), Villefranche (France, 1994), Santa Fe (USA, 1996), Cambridge (UK, 1998), Villefranche sur Mer, (France, 2000), Torino (Italy, 2002), New York (USA, 2004), Sea of Galilee (Israel, 2006), Longyearbyen (Norway, 2008), Pisa (Italy, 2010).

ADMINISTRATION

The following are current officers of the Union Commission on Mathematical Geophysics:

Chair: Daniel Rothman (USA)
Secretary General: Claudia Pasquero (USA)
Vice-Chair: Einat Aharonov (ISRAEL)

A business meeting was held on June 8th, 2010 in Pisa, Italy, during the semi-annual Conference on Mathematical Geophysics. Among the participants, CMG officers (Dan Rothman, MIT, Cambridge, USA; Einat Aharonov, Weizmann Institute, Israel; Claudia Pasquero, UCI, Irvine, USA), representatives from the Associations (Yehuda Ben Zion, IASPEI; Mathias Holschneider, IAGA; Augusto Neri, IAVCEI), the IAGA Secretary-General (Mioara Manda), and the IUGG Secretary General, Alik Ismail-Zadeh, (University of Karlsruhe, Germany). Possible locations and chair of local organizing committee for the next meeting, to be held in 2012, were discussed. It was decided to give preference to people who had previously participated to the CMG Conference, to allow continuity, to contact them and take a final decision before Fall 2010. The possibility of having the next Conference outside Europe and North America was discussed, and Alik Ismail-Zadeh informed about the possibility of receiving extra funding for organizing a conference in Africa.

The possibility of having a partial overlap with a SETI (Solid Earth Deep Interior) Conference was discussed. The issue will be further investigated, considering the positive reaction from CMG.

The Terms of Reference were briefly discussed, with particular emphasis on the fact that Representatives of the Associations should be elected for a total of no more than 8 years, and that each Association can nominate two Representatives.

Finally, it was decided to constitute a mailing list for people interested in Mathematical Geophysics. The most updated version of the list will be kept by the CMG Secretary.

Later during the year, the Committee decided to accept the proposal of Mark Naylor to hold the 2012 meeting in Edinburgh, Scotland, UK. The organization of the meeting has now started.

ACTIVITIES

The principal activity of the CMG is to sponsor a biennial conference on theoretical geophysics. The 28th International Conference on Mathematical Geophysics was held in June 7-11, 2010 in Pisa, Italy. The conference theme was “Modeling Earth Dynamics: Complexity, Uncertainty, and Validation”. The local organizing committee was chaired by Augusto Neri, Italian Institute for Geology and Vulcanology (INGV). Detailed information can be found on the conference website <http://cmg2010.pi.ingv.it>.

The attendance was particularly large: there were 165 participants, including senior scientists, students and young scientists. A special session dedicated to the memory of prof. Alberto Tarantola was able to put together scientists and philosophers to discuss how science in general, and climate change in particular, is communicated to the public.

The program of the conference included the following sessions:

0. Can our models only predict the irrelevant? (Special Session in honor of Prof. Tarantola)
 1. Geophysical fluid dynamics I - Volcanoes
 2. Geophysical fluid dynamics II - Sub-surface and surface flows
 3. Geophysical fluid dynamics III - Atmosphere and ocean
 4. Brittle deformation and computational seismology
 5. Geodynamics and geomagnetism
 6. Environmental systems and climate
 7. Quantifying the uncertainty in Earth Systems

Keynote lectures included:

- Modeling coupled fluid-grain deformation, with implications for landslides, fault-zones, and liquefaction by David Sparks
- Multi-scale approach to seismic inverse scattering and applications in Earth's upper mantle transition zone by Marteen V. de Hoop
- Settling plankton settling by Claudia Pasquero
- The maintenance of stratification in the ocean and atmosphere: from conveyor belts to geostrophic turbulence by Geoffrey Vallis
- Confirmation and Testing of Scientific Models, Revisited by Wendy Parker
- Predictive Modeling of Processes on the Surface of the Earth Doesn't Work by Orrin Pilkey
- Forecasting large earthquakes and eruptions: is it a scientific issue? By Warner Marzocchi
- Limitations of global terrestrial biosphere models used for future climate projections by Victor Brovkin
- The Risk Management Perspective in Climate Change by Roger Cooke
- Extracting Insight from Predictions of the Irrelevant: Can the Diversity in Our Models Inform Our Uncertainty of the Future? By Leonard Smith

PLANNED FUTURE ACTIVITIES.

The committee is now organizing the next biennial conference on theoretical geophysics. The 29th International Conference on Mathematical Geophysics will be held in Edinburgh, Scotland, UK, in June 2012. Local organizing committee is chaired by Mark Naylor, who is setting up the logistics and the scientific program of the conference in collaboration with IUGG Union Commissioners and CMG Officers.

Claudia Pasquero, CMG Secretary General

Commission on the Study of the Earth's Deep Interior (SEDI)

<http://www.sedigroup.org>

INTRODUCTION

SEDI is an international scientific organization dedicated to the **Study of the Earth's Deep Interior**. The scope of SEDI includes the core and lower mantle, but interest may extend to the surface, for example, in the study of mantle plumes or dynamics of descending lithospheric slabs. The scientific questions and problems of interest to SEDI include: 1) the investigation of the origin, evolution, structure, geochemical and mineralogical composition of the inner core, outer core, mantle and crust (on a planetary scale), 2) the investigation of core magnetohydrodynamics at all time scales, both from a theoretical point of view (dynamo theory, magnetohydrodynamic waves) and from an observational point of view (as provided by modern, historical, archeomagnetic and paleomagnetic data), and of more general fluid rotational dynamics that can affect the core (such as precessional effects and short time scale instabilities), 3) the investigation of mantle dynamics, both from a theoretical point of view (solid state convection in the presence of complex rheology and phase transitions, role of plumes and descending slabs) and observational point of view (global 3D reconstruction of mantle convection from surface, seismological, geochemical and geodetic observations), 4) the investigation of mechanical, electromagnetic, thermal and chemical interactions between the inner-core, core, mantle, crust and possibly outer layers on a planetary scale, particularly in view of a global understanding of the Earth as a globally interacting system, with special emphasis on investigation of interfaces (nature, shape, role), 5) The thermodynamics of the Earth and the investigation of its long-term thermal evolution.

Since 1987, SEDI has been a Union Committee of the International Union of Geodesy and Geophysics (IUGG). As such, it cuts across the traditional discipline-oriented bounds of the Associations of the IUGG [such as the International Association of Geodesy (IAG), the International Association of Geomagnetism and Aeronomy (IAGA), the International Association of Seismology and Physics of the Earth's Interior (IASPEI), and the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)] which normally study the Earth from a particular point of view. The intent of SEDI is to amalgamate all sources of data and all points of view to generate the most coherent and consistent picture of the workings of the Earth's deep interior.

ADMINISTRATION

SEDI is currently chaired by Gauthier Hulot (IPGP, France), vice-chaired by Satoru Tanaka (JAMSTEC, Japan), with Michael Bergman (Simon's Rock College, USA) acting as Secretary-General. It has a membership of about 605, as recorded on the email list used to broadcast information related to SEDI activities, upcoming meetings, funding opportunities, and academic openings.

ACTIVITIES

SEDI's main activity is the organization of a dedicated workshop every even year, and 2010 was no exception. This 12th SEDI workshop was held in UCSB, California, USA, July 18-23 2010, overlapping with a 7-week CIDER (Cooperative Institute of Deep Earth Research, <http://www.deep-earth.org/workshop09.html>) program sponsored by NSF/CSEDI. It was very successfully organized by a Local Organizing Committee led by Barbara Romanowicz (UC Berkeley, Chair) and involving Ralph Archuleta (UCSB), Jonathon Aurnou (UCLA), Bruce Buffett (UC Berkeley), Louise Kellogg (UC Davis), Guy Masters (UCSD) and Toshiro Tanimoto (UCSB). A website was set up and is still accessible at <http://www.deep-earth.org/2010/sedi2010.html>.

About 135 participants attended, coming from twelve different countries (Bulgaria, Canada, Czech Republic, France, Germany, India, Ireland, Japan, Switzerland, Turkey, UK and USA). As is usually the case with SEDI meetings, the meeting was organized around eight sessions led by discussion

leaders. This time each session had one lead review talk and two shorter more focused talks, followed by ample time for discussion of posters and key scientific issues. These eight sessions were: Structure and Chemistry of the Core and Lower Mantle, Seismic Observation of the Earth's Deep Interior, Mantle Convection and Dynamics, Cycling of Volatiles through the Deep Earth, Physical and Chemical Interaction Between the Core and the Mantle, Core Dynamics: short-period waves to long-term evolution, Geodynamo Theory and Observations, and Deep Interiors of Other Planets and Small Bodies.

Highlights of the meeting included the Zatman Lecture on "Effects of giant impacts on the mantles and cores of Mars and Mercury" by James Roberts (Johns Hopkins University) and the awarding of the Doornbos Prizes for outstanding work by a beginning scientist to:

- Michael Le Bars (IRPHE, France), for pioneering laboratory models of planetary mantle and core fluid dynamics;
- Sang-Heon Dan Shim (MIT, USA), for systematic studies of mineral phase transformations and thermoelastic properties at high temperatures and pressures, with an emphasis on elucidating the role of the post-perovskite transformation in the deep mantle;
- James Wookey (University of Bristol), for innovative analysis of seismic data to reveal seismic anisotropic structure, with a view to constraining physical mechanisms of deformation and fabric formation in the Earth's deep interior.

The proceedings of the 2010 SEDI meeting are now under review, and will be published in a special issue of *Physics of the Earth and Planetary Interiors*, guest edited by Michael Bergman (Simon's Rock College, USA), Jon Aurnou (UCLA, USA), Gauthier Hulot (IPGP, France), and Satoru Tanaka (JAMSTEC, Japan).

A business meeting was also held and attended by most of the participants. After some presentations, discussions and votes, it was agreed that the next (13th) SEDI workshop would be held in Leeds, UK, July 1-6 2012.

In 2010, SEDI also co-sponsored various scientific sessions at American Geophysical Union and other major meetings, such as the Meeting of the Americas (Foz de Iguassu, Brazil, August 8-13 2010). A Union Session to be held at the forthcoming 2011 IUGG General Assembly has also been organized, entitled "Recent Progress in the Studies of the Earth's Deep Interior" and co-convened by Gauthier Hulot (IPGP, France), Michael Bergman (Simon's Rock College, USA), Greg Houseman (University of Leeds, UK) and Satoru Tanaka (JAMSTEC, Japan).

PLANNED FUTURE ACTIVITIES

As the 2011 IUGG General Assembly also marks the end of the term of the current SEDI officers, a business meeting will be held to renew this board. We warmly encourage participants to take part to this important event.

Gauthier Hulot, SEDI Chair
Satoru Tanaka, SEDI Vice-Chair
Michael Bergman, SEDI Secretary-General

Inter-Associations (IAGA/IASPEI/IAVCEI) Working Group on Electromagnetic Studies on Earthquakes and Volcanoes (EMSEV)

<http://www.emsev-iugg.org/emsev/>

INTRODUCTION

The Inter-Association Working Group of Electromagnetic Studies on Earthquakes and Volcanoes (EMSEV) is supported by IAGA, IAVCEI and IASPEI Associations under IUGG. EMSEV focuses on the physics, monitoring and interpretation of electromagnetic (EM) phenomena of earthquakes and volcanic eruptions (<http://www.emsev-iugg.org/emsev/>).

The main objectives of EMSEV are (i) to promote international co-operation and develop collaboration between individuals and research groups focused on observations and research into electric and magnetic effects associated with earthquakes and volcanoes, (ii) to develop EM methods in developing countries based on joint field campaigns, workshops and educational plans and (iii) to support the dissemination and discussion of relevant data and research results.

EMSEV is very active in the organization of international and regional meetings, specialized sessions workshops and assemblies as well. During these conferences and the business meetings, EMSEV promote new directions of research and encourage international projects with developing countries.

ADMINISTRATION

EMSEV is composed of an elected executive bureau, a nominated assembly of members, and the community interested in electromagnetic phenomena, called corresponding members.

The bureau consists of a Chairperson (J. Zlotnicki), a Vice-Chairperson (M.J.S. Johnston), the past Chairperson (S. Uyeda), a Secretary (T. Nagao), liaison members from IAGA (T. Liu), IAVCEI (Y. Sasai) and IASPEI (M.J.S. Johnston), and a corresponding liaison member from IAGA WG1-2 (T. Harinarayana).

The WG members are nominated for their expertise in the EM field, and their scientific activity. They are nominated during EMSEV business meetings. Now, they are 44 working group members from 16 countries (China, France, Greece, India, Indonesia, Italy, Japan, Kyrgyz, Philippines, Poland, Romania, Russia, Taiwan, Turkey, Ukraine, and USA).

The number of corresponding members has crossed 264.

In 2010, EMSEV hold the XIIIth business meeting during EMSEV International workshop at Santa-Ana, USA during Oct. 3-6. In this meeting, new directions of research in EM field were discussed. There was discussion on initiation of new projects. It is proposed and accepted to start a new project by EMSEV on the physics of EM signals generated by large earthquakes. Annual reports, minutes of the business meetings and activities on the Working Group can be found on EMSEV web site (<http://www.emsev-iugg.org/emsev/>).

ACTIVITIES

EMSEV is very productive during the year 2010. For example,

- EMSEV and the Philippines Institute of Volcanology and Seismology (PHIVOLCS, <http://www.phivolcs.dost.gov.ph>) hold an International Workshop entitled 'Monitoring active volcanoes by electromagnetic and other geophysical methods – Application to Asian volcanoes' in Quezon City (Feb. 24-27, Quezon City). About 60 participants were present. The workshop was followed by 2 weeks of joint field work on Taal volcano.
- 2008 EMSEV workshop and meeting held at Sinaia (Romania). The 2010 International EMSEV workshop was organized at Chapman University (USA, October 3-6; <http://sites.google.com/site/emsev2010/>) by Professor R.P. Singh. About 55 participants from

12 countries (Japan, France, Italy, Romania, Poland, India, Russia, Ukraine, New Zealand, China, Mexico and US) have participated in the meeting. A total of 67 abstracts were presented in oral or poster sessions, devoted to the following six sessions: 'Seismicity, Geophysical and Seismo-electromagnetic studies', '2009 L'Aquila Earthquake and San-Andreas Fault', 'Electric, magnetic, and electromagnetic methods related to earthquakes, tsunamis, volcanic, landslides and geothermal activities', 'Techniques for Correction of EM data and Identification of EM Signals Associated with Earthquakes and Volcanoes', 'Generation and Propagation Mechanisms of EM signals and Laboratory Studies', and 'Ionospheric and GPS studies associated with Seismo-electromagnetic Processes'.

- EMSEV is also active in organizing specific sessions in international meetings like:
 - EGU, Vienna, May 2-7, 2010
 - COV6 (Cities on Volcanoes 6), Tenerife Island, Spain, May 31-June 4, 2010
 - AOGS, Hyderabad, India, 5-9 July 2010
 - AP-RASC (Asia-Pacific Radio Science Conf.), Toyama, Japan September 22-24, 2010
 - AGU, San Francisco, USA, December 13-17, 2010

EMSEV sincerely makes efforts for promotion of scientific projects at international scale with well-recognized Institutes in developing countries. One such project was initiated in 2004 on Taal volcano in the Philippines with PHIVOLCS, and one is now on the way to be launched with Bishkek Institute in Kyrgistan.

In Volcanology sector, EMSEV has started a cooperation with PHIVOLCS (<http://www.phivolcs.dost.gov.ph/>) on Taal volcano in November 2004. The objectives are a) to get a better knowledge of the volcano structure and tectonic setting, b) to develop a strong EM community in the Philippines, and c) to monitor the activity of the volcano. About twice a year, joint EMSEV-PHIVOLCS field works are organized. IUGG has granted EMSEV in 2008 for a two years project. During these two years, bathymetry, magnetic, electric, resistivity, and temperatures mappings of the Crater Lake and also on land are achieved. Considerable effort was made for developing a multi-parametric real time monitoring network including electric, magnetic, ground temperature and gradient, seismic noise, deformation and Rn emission. As of now, the international cooperation involves scientific teams from Japan, France, USA, Greece, Italy, and Belgium. A new Memorandum of Agreement was signed for the next 5-years between PHIVOLCS and EMSEV. It is a standing example of long term and successful cooperation.

In the study of active faulting, we plan for better understanding of the interrelation between the changes in the electrical conductivity structure associated with seismic activity with the Bishkek experimental high power current ejection system.

The following target experiments are discussed:

- 3D modeling of the source region(s) where electrical conductivity changes are occurring,
- Detailed investigation of correlation between electrical conductivity changes and seismicity,
- Electromagnetic triggering processes and their implications,
- Distortion of electrical signals by regional tectonics and faults systems,
- Independent checking of VAN'S SES observations outside Greece,
- Physical mechanisms of EM signals generated by the MHD-generator.

Realizing the importance of the experiment, we propose to organize an international cooperation agreement between the Bishkek Institute and the EMSEV working group. Within the framework of this agreement, EMSEV members will visit and conduct joint experiments with the Bishkek Institute.

PLANNED FUTURE ACTIVITIES/ ANNOUNCEMENTS

In 2011, EMSEV will be involved in all important international meetings. For example in:

- EGU meeting, Vienna, Austria, 3-8 April 2011
- IUGG GA, 27 June – 8 July 2011, Melbourne, Australia.

Four sessions are being organized under EMSEV responsibility in association with other organizations and one session by one EMSEV member. Following are the details:

- J-S09: Electromagnetic Studies of Earthquakes, Active Faulting and Tsunamis [Convenors: M. Johnston, T. Harinarayana];
- J-S10: Electromagnetic studies of active processes using space technology [Convenors: M. Parrot, Y. Hobara]; J-S11: Imaging and monitoring active volcanoes and geothermal fields by ElectroMagnetic (EM) and other geophysical techniques [Convenors: J. Zlotnicki, Y. Sasai, V. Spichak];
- J-S12: Towards short-term earthquake prediction - Electromagnetic and other possible precursors and their generation mechanisms [Convenors: T. Nagao, K. Eftaxia, F. Freund];
- J-A04: Electromagnetic oscillations from space to Earth: Celebrating 150 years and recent developments in ultra-low frequency wave research [Convenors: B.J. Fraser, M.J.S. Johnston].

EMSEV is also planning to organize sessions in:

- AOGS, 8 - 12 August 2011, Taipei, Taiwan
- URSI GA, 13-20 August 2011, Istanbul
- DEMETER meeting (October, CNES-Paris, France)
- AGU Fall Meeting, San Francisco, December 2010

Jacques Zlotnicki, EMSEV President



THE INTER-UNIONS COMMISSION: International Lithosphere Program (ILP)

<http://scliip.gfz-potsdam.de>

INTRODUCTION

The International Lithosphere Program (ILP) seeks to elucidate the nature, dynamics, origin and evolution of the lithosphere through international, multidisciplinary geoscience research projects and coordinating committees.

The ILP is charged with promoting multidisciplinary research projects of interest to both the geological (IUGS) and geophysical (IUGG) communities.

The ILP seeks to achieve a fine balance between: “*addressing societal needs*”, e.g. understanding natural catastrophes and other solid earth processes that affect the biosphere, providing information for improved resource exploration and environmental protection; and “*satisfying scientific curiosity*”.

According to the Terms of Reference published in 2008, ILP is a body of IUGG and IUGS.

ADMINISTRATION

ILP is basically financed by IUGS and IUGG (each 15,000 US \$ up to 2008). In 2009 IUGS lowered its support while IUGG continued regularly. The Bureau has raised and is still raising funds via the national committees and other bodies from the participating countries (e.g. National Science Foundations, Academies; see list of contributing countries 2008 and 2009). It was possible to convince France to become a supporting member of ILP. During 2010 several efforts in raising national support and acquainting new member countries were undertaken. The Arab Emirates, Jordan and Saudi Arabia were approached: up to now no success can be signalized. The new head of the national committees undertook major efforts that might succeed in 2011. For the 2010 Potsdam meeting our bureau hosting organization the Deutsches GeoForschungsZentrum Potsdam and the University of Potsdam supported ILP with logistics and financially. ILP is greatly indebted to the GFZ.

Joint IUGS-IUGG meeting in Paris, France, 20 February 2010

Both President and Secretary General went to the IUGS - IUGG meeting held at the UNESCO in Paris to report on ILP matters. S. Cloetingh gave a brief report on the scientific achievements of ILP stating amongst other things that:

- Tectonophysics became the ILP journal
- ILP as founding partner of the IYPE will supports the Planet Earth Institute
- Several Task Force meetings shall be organised during 2010
- An ILP general meeting will be held in Potsdam where after decisions on the Task Forces for the next 5 years shall be taken.

ILP officials pointed out that a successful program absolutely needs support from the mother organisations IUGG as well as IUGS. As a result of these efforts IUGS raised its funding, however unfortunately not to its original level.

ILP thanks IUGS for the rise in funding.

Bureau meeting of ILP, Vienna, Austria, 3 May 2010

Minutes of the SCL/ILP Bureau Meeting at the EGU 2010 meeting are given in the full report. The aim of this meeting was to encourage and prepare the Task forces for the forthcoming 5 Year period. In 2009 a call for new Task Force ideas was launched. Ideas were gathered and discussed along this meeting as a result the most promising short proposals were encouraged to give a full proposal and presentation during the second ILP Potsdam conference.

Informal Bureau meeting Potsdam, 8 October 2010

This informal meeting was held with Task Force and Coordination Committee leaders.

The bureau informed about the IUGG/IUGS review in Paris and the fact that ILP is about to be evaluated by the two organisms. This leads to the request for early reports in order to supply a full Report to the evaluation committee. It was decided to publish the abstracts submitted for the second Potsdam conference electronically. This process is about to be completed by the end of 2010 by registering the abstract volume with a DOI number.

A discussion on new Task Forces and Coordination Committees reached the conclusion that despite reduced funding a larger number of Task Forces should be accepted and financed with a reduced sum.

Dr. D. Spengler was nominated as next candidate for the Penbrock Hart ILP Prize.

ACTIVITIES

New Task Forces & Coordinating Committees in the realm of the major ILP themes as decided upon during the ILP conference "Solid Earth - Basic Science for the Human Habitat" in Potsdam

I. Geoscience of global change

- TF 3: Bridging the gap from microseismicity to large earthquakes
- TF 10: The Unconventionals

II. Contemporary dynamics and deep processes

- TF 4: Continental Collisional Orogens: from Atomic Scales to Mountain Building
- TF 8: Tracking supercells through Earth history
- TF 9: DISC - Deep Into the Subduction Channel

III. Continental lithosphere

- TF 1: CALE - Circum Arctic Lithosphere Evolution
- TF 2: Volcanoes and society: environment, health and public outreach
- TF 3: Bridging the gap from microseismicity to large earthquakes
- TF 4: Continental Collisional Orogens: from Atomic Scales to Mountain Buildings
- TF 5: LAPBOX - The lithosphere-asthenosphere boundary depth paradox
- TF 6: Sedimentary Basins
- TF 7: 3D Geomechanical modelling of geodynamic processes in the lithosphere

IV. Oceanic lithosphere

- TF 1: CALE - Circum Arctic Lithosphere Evolution

Coordinating Committees:

- TOPO-Europe
- TOPO-Asia
- DynaClim
- MEDYNA - Mantle Dynamics and Plate Architecture Beneath North Africa

The activities of the past projects are documented in the bibliography (see <http://sclilp.gfzpotsdam.de>).

PLANNED FUTURE ACTIVITIES

It is the intention of the President to stimulate further projects relating to the TOPO-EUROPE philosophy on all other continents.

Since 2009 the running Task Forces ended their 5 years period, new Task Forces were installed in 2010 and their scientific goals were presented during the Potsdam meeting 2010. Their effective work and outreach will be visible by 2011

The ILP meeting in October 2010 in Potsdam envisaged as a comprehensive international meeting aimed reporting the results of the activities of the last 5 years period. In addition to this the basic focus and science plans for the Task Forces running for the next 5 year period were presented. The outcome of the Potsdam meeting is an electronic publication. The meeting was thought as an expression of excellence to the reviewing committee of IUGS and IUGG. The Secretary General and his office members will continuously try to enhance fund raising by acquainting new National members. It is also aimed to convince industrial partners as sponsors of this highly visible program.

Sierd Cloetingh, ILP President
Roland Oberhänsli, ILP Secretary General
Alexander Rudloff, ILP Executive Secretary

IUGG FINANCIAL REPORT 2009

General introduction

This report describes the status of the IUGG finances for the year 2009, the second year of the quadrennium 2008-11. The report is sent to the Finance Committee and the Bureau and will be discussed at the meeting in Cairo, October 30-November 2, 2010.

The 2009 budget was approved at the Council meeting in Perugia, July 24, 2007. A few changes have been added since (ICSU is paid in EUR, ILP gets 15K and GeoRisk 8K).

The price of 1 unit has gone up again from \$1,675 in 2008 to \$1,750 in 2009. The price in a given year is determined according to an inflator index in September in the year before according to the decision of the GA, Boulder 1995.

By the end of 2009 IUGG had 65 members representing 278 units. 4 members were associate members. On January 1, 2009, 1 member is supposed to have withdrawn: Philippines (again paying member in 2010). Bulgaria returned to paying status and India moved to cat. 6. Georgia is admitted as a new cat. A member.

On January 1st, 2009, 12 members were in arrears with their dues. By the end of the year the number was down to 5. In 2010 the number of observers went up to 9. At the time of writing the number of members in arrears with dues is now down to 5 again, including Morocco that has a special status.

The downward trend in membership in the period 2004-2008 has now stopped. IUGG seems to be in a more stable period, and there are signs that new recruiting initiatives in fact will increase the number of members.

The membership dues are the economical basis for the activities of IUGG. However sound this situation is right now, it leaves only limited resources for new initiatives. And in several countries a value for money debate is taking place. Therefore, IUGG must keep focus on the membership issue in the foreseen future.

Realizing that several members have EUR currencies and several associations are located in the EUR zone it is now made possible to do transactions in EUR as well as in USD and DKK.

The accounts of the treasurer's office are audited by a chartered auditor.

A student assists me with the keeping order in my files, writing letters etc. Since 2007 I have not had an Assistant Treasurer.

Content:

1. A review of "The summary of the IUGG accounts in US dollars for 2009" page 79-81
2. An overview of administrative and travel expenses in 2009 page 81
3. An overview of IUGG grants, allocations and inter-association activities in 2009 page 82
4. Some Membership information and statistics (July 25) page 83

1) Comments to The summary of the IUGG accounts in US dollars for 2009

IUGG has now accumulated more cash than 1 years turn over. It is noticed that IUGG always has at least \$100.000 as reserve for the next GA.



SUMMARY OF IUGG ACCOUNTS 2009

US dollars	Accounts	Budget
RECEIPTS		
1. Membership Subscription	536.479,42	440.600,00
2. ICSU Grants	0,00	
3. Assembly Surcharge	0,00	
4. Contrants with ICSU	0 00	

The summary of the IUGG accounts is in USD. It is based on three USD, EUR and DKK accounts with Danske Bank. In addition IUGG also has a Mastercard account which is used mostly in connection with traveling. Occasionally, one more account is involved: whenever the level of interest makes it relevant a certain amount is set aside for a specified period of say 3 - 6 months. I keep track of such agreements in the US2 og KR2 accounts.

Since 2008 a EUR account allow European members to pay dues directly in EUR and IUGG to do relevant transfers in EUR (several Associations have accounts in EUR).

The accounting:

My accounting is based on a cash flow model. This means that the balances not necessarily reflect the real financial status of the union.

The numbers quoted here can deviate from the actual values in the accounting due to fluctuations in the exchange rates from day to day.

Notes:

Receipts

1

The income from members is substantially higher than the budget. Right now (July 25, 2010) we have received payments equivalent to a total 276 units for 2009 compared to 263 for 2008 exactly one year ago. In comparison the total number of units is 278 for the year 2009. Included in the 276 units are 3 from the Philippines paid in 2010. The Philippines were considered to have withdrawn in 2009. This means that only 5 units are not paid for in 2009.

2, 3, 4

No activities

5

The royalties from AGU are slowly fading out.

6.b

This line (gain of exchange or loss in line 19.4) is used to balance the accounts. In 2009 there is a significant gain on exchange. This is explained by large fluctuations in the US\$/€ ratio during the year.

Expenditures

11.1

Compared to 2008 there is less spending on personnel in 2009 and also less than in the budget. From 2009 and onward the assistant secretary is paid by German funds. Right now IUGG is paying a web master and a student assistant.

11.2 through 11.7

Line 11.6 covers representative expenses and expenses in connection with the Bureau and Executive meeting in Melbourne, October 2009.

The sum of 11.7 includes liaison officers travel expenses only.

12

This line was intended to account for new initiatives offered to the associations as 2 year grants, including Geophysics in Africa project. The only payment in 2009 covers the second installment of a grant to IAGA.

13

No activities

14

See page 6 for details. One grant was not paid because no contact could be established.

15.1a

All 8 associations have received their allocations for 2009. The total allocated amount includes the 20 K added by the union to the normal 50% share of the net income during the previous year.

The new distribution percentages for 2008 – 2011 are

IACS	9,340
IAG	12,140
IAGA	17,415
IAHS	11,030
IAMAS	15,765
IAPSO	10,765
IASPEI	14,205
IAVCEI	9,340

15.1b, 16.1

As of 2007 IUGG is paying its ICSU contribution in EUR as requested by ICSU (approved at EC meeting in Karlsruhe, August 2008). Also the contribution to WCRP is now paid in EUR.

17.1

Liaison officers's travel expenses are moved to line 11.7

Substantially lower than in the budget: travel expenses of liaison officers are moved to line 11.7 and only GeoRisk Committee received money in 2009.

22

The balance by the end of 2009 is 100K higher than one year earlier and substantially higher than the budget value, the reason being a combination of higher income from members and less pay out than assumed in the budget, one example is 2 unsuccessful Africa initiatives.

2) An overview of administrative expenses and travel expenses in 2009

The major 2009 event was the Bureau/EC meeting in Melbourne, October 2009.

The Bureau + EC meeting, Melbourne October 2009		\$ 71.443
Travel expenses	\$ 50.299	
Other meeting expenses, dinner etc	\$ 21.144	
Bureau related travelling expenses		\$ 10.966
Liaison Officers		\$ 4.449
Jake Peters, SCOPE, London	\$ 2.153	
Guoxiong Wu, Maryland, USA	\$ 1.465	
Luiz Fortes, UN Regional Cartographic Conf, US	\$ 831	
Total		\$ 86.858

3) An overview of IUGG grants, allocations, inter-association activities and union activities in 2009

i) Line 12 (New initiatives grants, including “Geophysics in Africa”)

EMSEV, TAAL volcano	\$ 5.000	
Total		\$ 5.000

ii) Line 14 (IUGG 2009 Symposia grants)

IAMAS	Clouds and Turbulence	\$ 2.000	
IASPEI	Int. Sym. on Earthquake Seismology and Earthquake Predictability	\$ 2.000	
SEDI	Int. Workshop "Geodynamical Phenomena from Field, Observational, Computational, Seismological and Rheological Perspectives"	\$ 2.000	
GeoRisk	Spring School "Fluid Mechanics and Geophysics of Environmental Hazards"	\$ 2.000	
IAPSO	MOCA2009 - Scientific Assembly of IAMAS-IAPSO-IACS	\$ 2.000	
IAG	Symposium "Geodesy in Latin America"	\$ 2.000	
IAGA	Symposium "Geodesy in Latin America"	\$ 2.000	
IAGA	IAGA Symp. 2: solar wind - space env. Interaction	\$ 2.000	
Tsunami Com	24th Int. Tsunami Symposium	\$ 2.000	
IASPEI	2nd Int. seminar on prediction of earthquakes	\$ 2.000	
Total			\$21.000

iii) Line 15.1b (Inter-Association Activities)

WCRP	\$ 4.196	
EMSEV	\$ 2.000	
Total		\$ 6.196

iv) Lines 17.1, 17.2 (Union Activities)

GeoRisk	\$10.000	
SEDI	\$ 0	
CMG	\$ 0	
FAGS	\$12.000	
ILP	\$15.000	
Total		\$37,000

v) Lines 13.2, 18.1 (traveling support for General Assemblies)

No support paid in 2009		
Total		\$ 0

4) Some Membership information and statistics

At the time of writing (August 24, 2010) IUGG has 68 members (compared to 65 on January 1st) representing 283 units. The Philippines have returned as a paying member and Azerbaijan and FYR Macedonia are new cat. 1 members. 4 members are in associate status and 5 members are in observer status.

The 5 members in observer status are

In category 1

Albania (1. year as observer)

Armenia (2. year as observer)

Croatia (4. year as observer)

Vietnam (2. year as observer)

Morocco (1. year as observer)

In addition another 4 members started 2010 as observers, but all of them have paid their dues for 2009 and earlier as of this date (August 24).

The 5 observer countries together represent 5 units (and a debt of US\$ 17,005 in total).

The Philippines were assumed to have withdrawn on January 1st, 2009, but they returned as paying member in 2010.

Morocco is treated as an observer, because they didn't pay dues in 2009. The 2008 dues were paid by Royal Society, UK. The future of Morocco's membership is however uncertain.

Members of IUGG, 2009 (December 31)

Members by category

4 adhering bodies in	A	
Bolivia		
Georgia	new member in 2009	
Peru		
Mauritius		
1 adhering body in	11	35 units
USA		
3 adhering bodies in	8	60 units
Germany		
Great Britain		
Japan		
1 adhering body in	7	15 units
France		
5 adhering bodies in	6	50 units
Canada		
China		
India	cat 6 in 2009	
Italy		
Russia		
3 adhering bodies in	5	21 units
Australia		
Spain		
Switzerland		
6 adhering bodies in	4	30 units
Academy Sinica, Taipei		
Belgium		
Denmark		
Netherlands		
Norway		
Sweden		
6 adhering bodies in	3	18 units
<i>Argentina</i>	<i>observer 2009</i>	
Austria		
Brazil		
Finland		
<i>Greece</i>	<i>observer 2009</i>	
South Africa		
New members in 2009		
Georgia		

Members by category

13 adhering bodies in	2	26 units
Chile		
Czech Republic		
Egypt		
Hungary		
Ireland		
Korea, South		
Mexico		
Nigeria		
<i>Pakistan</i>	<i>observer 2009</i>	
Poland		
Portugal		
Thailand		
Turkey		
23 adhering bodies in	1	23 units
Albania	<i>observer in 2010</i>	
Armenia	<i>observer</i>	
Bosnia-Herzegovina	<i>observer</i>	
Bulgaria		
Colombia		
Croatia		
D.R. Congo		
Estonia		
Ghana		
Iceland		
Indonesia		
Iran		
Israel		
Jordan		
Luxembourg		
Monaco		
Morocco	<i>observer in 2010</i>	
Mozambique		
New Zealand		
Romania		
<i>Slovak Republic</i>	<i>observer 2009</i>	
Slovenia		
Vietnam	<i>observer</i>	

Members that have paid dues in arrears between January 1st to December 31st, 2009 are shown in *italics*

Countries withdrawn in 2009 **category**
 Philippines 3
 (resuming paying membership status again in 2010)

New members in 2009
 Georgia A

Aksel Walløe Hansen, IUGG Treasurer
 August 24, 2010

ADDITIONAL UNION MATTERS

Awards and Honors

The General Assembly of the Hungarian Academy of Sciences (HAS) elected IUGG President **Tom Beer**, (CSIRO in Aspendale, Australia), as an Honorary Member of the Hungarian Academy of Sciences.

The President of Egypt awarded **Ali Abd-El-Azim Tealeb**, IUGG Bureau Member, the most prestigious national scientific award “State Appreciation Prize in Basic Sciences” for his outstanding contribution to Earth sciences.

The McGill University (Montreal, Quebec, Canada) awarded IAPSO President **Lawrence Mysak**, Canada Steamship Lines Emeritus Professor of Meteorology at the Department of Atmospheric and Oceanic Sciences of the McGill University, a *McGill Medal for Exceptional Academic Achievement*. The McGill Medal was created to recognize retired members of the academic staff who have made extraordinary contributions to their discipline, to McGill or to scholarship, over the course of their academic careers.

The Royal Swedish Academy of Sciences has decided to award the Crafoord Prize in Geosciences 2010 to **Walter Munk**, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, USA “for his pioneering and fundamental contributions to our understanding of ocean circulation, tides and waves, and their role in the Earth’s dynamics”. Professor Munk was the keynote speaker at the 1997 IAMAS/IAPSO Scientific Assembly in Melbourne (Australia).

Gary Glatzmaier (University of California, Santa Cruz, USA) and **Ignacio Rodriguez-Iturbe** (Princeton University, Princeton, USA) were elected to the U.S. National Academy of Sciences. Glatzmaier is a Member of the Advisory Committee, IUGG Commission on the Study of the Deep Interior of the Earth (SEDI). Rodriguez-Iturbe has served IUGG in several capacities: First Vice-President of IAHS, Vice-President of the IAHS International Commission on Water Resources Systems, Chairman of the IAHS Working Group on Scale Problems in Hydrology, and Associate Editor of the IAHS Hydrological Sciences Journal.

Daniel Baker (University of Colorado at Boulder, USA) was elected to the U.S. National Academy of Engineering. The American Institute of Aeronautics and Astronautics bestowed the James A. Van Allen Space Environments Award for excellence and leadership in space research on **Daniel Baker**. Baker is a Member of the IAGA Executive Committee.

Sierd Cloetingh (President of the International Lithosphere Program) has been awarded the 2010 Alexander von Humboldt Prize. Every year, the Alexander von Humboldt Foundation presents this prize to two non-German scientists whom they expect to make an important scientific contribution in the years to come. Recently, Sierd Cloetingh has also been named as the only Earth scientist to be a member of the European Research Council, which is the European funding organization recently set up to support investigator driven frontier research.

In 2010, the American Geophysical Union (AGU) elected new Union’s Fellows. Among this year’s elected Fellows are the following IUGG experts: **Harry Bryden** (University of Southampton, UK), IAPSO Correspondent of the UK National Committee for IUGG; **Ed Garnero** (Arizona State University, USA) and **Louise Kellogg** (University of California, USA), Members of the Advisory Committee of the IUGG Union Commission on the Study of the Earth’s Deep Interior (SEDI); **Kenji Satake** (University of Tokyo, Japan), Member of the IASPEI Executive Committee and Chair of the IUGG Inter-Association Tsunami Commission; **James Syvitski** (University of Colorado, USA), Chair of the SCOR/IAPSO Working Group on Mechanisms of Sediment Retention in Estuaries.

The 2010 Vening Meinesz Medal of the European Geosciences Union is awarded to **Philip Woodworth** (Proudman Oceanographic Laboratory, Liverpool, UK) in recognition of his outstanding contributions to sea level research. Woodworth is the President IAPSO Commission on Mean Sea

Level and Tides and the past Secretary of the ICSU Federation of Astronomical and Geophysical Data Analysis Services (FAGS).

Michael J. McPhaden (NOAA/Pacific Marine Environmental Laboratory, Seattle, Washington) is awarded the Fridtjof Nansen Medal for his leadership in developing ocean observing systems for climate research and forecasting and for fundamental contributions to our understanding of the ocean's role in climate. McPhaden is President of the American Geophysical Union and was a lead convener of the IUGG Symposium on Inter-annual to Inter-decadal Climate Variability (Perugia, 2007).

The Beno Gutenberg Medal is awarded to **Jean-Paul Montagner** (Institut de Physique du Globe de Paris) for his influential contributions to the study of seismic anisotropy in the earth's mantle and for services to global seismology. Montagner was an organiser of several IUGG and IASPEI symposia.

Eliecer Duarte (Costa Rica) and **Cristian Farías** (Chile) have been selected recipients of the American Geophysical Union's (AGU) Bruno Martinelli Travel Fellowship to support their attendance at the 2010 Workshop "Earthquakes and Volcanoes" of the European Seismological Commission (an IASPEI Commission) (http://earth.leeds.ac.uk/esc_wg/Wshop/work2010.htm) in Clermont-Ferrand, France, 18–25 September 2010. The Martinelli Fellowship provides funding for young Latin American scientists to attend an international meeting or workshop, and present a paper on volcanic processes. A fund supporting this fellowship was established in 2001 by colleagues of Dr. Bruno Martinelli, a Swiss volcanologist who worked in South America and personally provided travel assistance to young scientists.

Appointments

Several scientists with IUGG responsibilities began a two-year term in July 2010 as officers or members of the AGU Council, Sections and Focus groups, and Committees. **Francis Albarede**, Member of the Advisory Committee of SEDI, was elected the International Secretary of the American Geophysical Union. **Stephen Sparks** (Past IAVCEI President) is elected to the AGU Board of Directors. **Alik Ismail-Zadeh** (IUGG Secretary-General), **David Sandwell** (IAG Commission on InSAR for Tectonophysics), **Anne Thompson** (IAMAS Vice-President), and **Donald Wuebbles** (IAMAS Commission on Ozone) are elected or appointed Members of the AGU Council. **Harsh Gupta** (IUGG Vice-President) and **Laszlo Szarka** (Chair, IUGG Capacity Building and Education Committee) are appointed Members of the AGU Committee on International Participation. **David Chapman** (Vice-Chair, International Heat Flow Commission) and **Veronique Dehant** (IAG National Correspondent and 2007 IUGG Council Delegate) were appointed Chair and Member of the AGU Bowie Medal Committee, respectively. **Masaru Kono** (Past IUGG President) was appointed Member of the AGU Smith Medal Committee. **Guenter Blöschl** (President, IAHS International Commission on Water Resources Systems) is appointed Chair of the AGU Horton Medal Committee. **Mioara Manda** (IAGA Secretary General) was appointed Chair of the AGU Excellence in Geophysical Education Award Committee.

Obituaries

Alfred Becker (1934-2010), who passed away on 18 August, was a staff member of PIK nearly from the beginning of the Institute, and the present international position of PIK in water sciences owes much to Alfred's long-term efforts. Dr. Becker was actively involved in the International Association of Hydrological Sciences since the early 1970s, attending symposia and workshops, collaborating with Journal editors, and holding offices, such as Vice-President of IAHS International Commission on Atmosphere-Soil-Vegetation Relations (ICASVAR) in 1995-1999. Dr. Becker was also active in other streams of international hydrology, under the aegis of UNESCO, the IGBP's Biospheric Aspects of the Hydrological Cycle, and IPCC.

Keith Cole (1929-2010), a distinguished expert in geomagnetism and aeronomy, passed away on 13 December 2010. He was a leading theorist in solar-terrestrial physics having shown that red arcs and the pre-dawn enhancement are produced by thermal conduction from above, and having made significant advances in our understanding of geomagnetic storms and particularly the ring current. In 1962 he proposed that the ionosphere is heated via Joule heating, a phenomena now known to be a major energy source for the ionosphere and thermosphere at high latitudes. Keith Cole served IAGA as Vice-President [1976-79] and President [1980-83] and was President of SCOSTEP [1977-86].

James C. I. (Jim) Dooge (1922-2010), an outstanding hydrologist, engineer and Irish politician, passed away on 20 August 2010 in Dublin, Ireland, at the age of 88. Professor Jim Dooge, friend and colleague of so many scientists, was a giant of a man. His truly outstanding scientific achievements were accomplished with a sense of the highest integrity and yet with compassion and sensitivity for the feelings of those with whom he worked. Jim served as President of the International Association of Hydrological Sciences (IAHS) from 1975 to 1979. He was the elected Secretary-General of the International Council for Science (ICSU) (1980-82), an IUGG Bureau member (1983-87), and ICSU President (1993-96).

Irene Kaminka Fischer (1907-2009), a prominent geodesist whose career spanned the years 1952–1977, died on 22 October 2009 at the age of 102. She was born in Vienna, Austria, in 1907 and grew up there; graduating with a degree in mathematics from the Vienna Institute of Technology. In 1939, the Fischers fled Nazi Austria, first to Palestine, and by 1941 had relocated to the United States. Her entire career (1952-1977) in geodesy was spent with U.S. Army Map Service and its successors (currently the National Geospatial-Intelligence Agency). Irene's first notable achievement was her participation in the revision of the 1924 International Ellipsoid, the reference model for the figure of the Earth officially sanctioned by the International Association of Geodesy (IAG). Irene participated fully in the global geodetic community. She became familiar figures on the international scene, starting with the 1957 IUGG General Assembly in Toronto. She soon joined and eventually led several IAG Commissions.

Igor Shiklomanov (1938-2010), a prominent hydrologist and a recognized authority in water resources, human impact on river runoff and the dynamics of water use and availability on regional and global scales, passed away in St. Petersburg (Russia) on 22 August 2010 at the age of 72. Since 1981 Professor Shiklomanov had been the leader and director of the Russian State Hydrological Institute (RSHI) at St. Petersburg, one of the oldest scientific hydrological institutions in Russia and in the world. For more than 30 years, Igor Shiklomanov significantly contributed to international cooperation in the field of hydrology and water resources within the International Association of Hydrological Sciences - IAHS of IUGG, UNESCO, WMO, and UNEP. In the middle of the 1990s, he was elected Chairman of the Intergovernmental Council for the International Hydrological Program of UNESCO, and during eight years he was a member of the United Scientific Committee for the Global Energy and Water Cycle Experiment. For many years Professor Shiklomanov was a member of the WMO Commission for Hydrology. Shiklomanov's scientific activity was highly recognized by the international scientific community.

Valery Troitskaya (1917–2010), an eminent Russian geoscientist, passed away in Melbourne, Victoria, Australia, on 22 January 2010, age 92. She was known internationally for her pioneering work in characterizing the natural oscillations of the Earth's magnetic field and their origin in the

magnetospheric plasma surrounding the Earth. She accepted major roles in international science as a member of the IUGG Bureau from 1963 to 1967 and as the first woman president of IAGA from 1971 to 1975. In 1985 she was elected an Honorary Member of IAGA. She also made significant contributions to COSPAR and SCOSTEP. Within the International Council for Science (ICSU), she served as a member of the first Steering Committee of the International Geosphere-Biosphere Program (1986-1990).

Gilbert Brian Tucker (1930-2010), who played a major role in forging the current landscape of atmospheric and environmental research in Australia and who also contributed seminal to a range of IUGG-related activities, died on 25 November 2010 in Mornington, Victoria. Tucker's research extended from observational studies of local Alpine cloud formations, to modeling considerations of regional air dispersion and pollution, and the diagnostic elucidation of global transport processes and chemistry research. Tucker was an IAMAS President (1987-1991) and also served as a member for the ten key formative years of the Scientific Committee of the World Climate Research Programme (WCRP).