INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE

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This informal newsletter is intended to keep IUGG Member National Committees informed about the activities of the IUGG Associations, and actions of the IUGG Secretariat. Past issues are posted on the IUGG website (http://www.iugg.org/publications/ejournals/). Please forward this message to those who will benefit from the information. Your comments are welcome.

Contents

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1. Global Geodetic Observing System (Feature Article)

One of the scientific goals of the Global Geodetic Observing System (GGOS) of the International Association of Geodesy (IAG) is the integration of geometric and gravimetric aspects of geodesy. It provides a framework for IAG services and other IAG components to integrate outputs and to generate higher-level products in order to address critical requirements for geoscientific research. Unlike other IAG components, GGOS is not a service, but rather an observing system that cannot function without the facilities and products of the IAG services.

The vision of GGOS – "*Advancing our understanding of the dynamic Earth system by quantifying our planet's changes in space and time*" – addresses the substantial task of quantifying Earth's changes in space and time due to Earth system dynamics. A successful implementation of this vision is only possible if the international scientific community and governmental agencies are strongly committed to the mission of GGOS. As a complement to these technical efforts, GGOS serves as a vehicle of engagement with international governmental and non-governmental organizations, space agencies, and national mapping/geodetic institutions. Developing and maintaining these relations ensures an optimal use of resources for the greatest good – to the benefit of science, and society in general. As the observing system of the IAG, GGOS serves a unique and critically important combination of roles related to advocacy, integration, and international relations. GGOS also promotes high-level outcomes, such as the realization of the International Terrestrial Reference Frame through a variety of internal and external channels. It is envisaged that

new reference frames or products for global height systems, absolute gravity values, and instantaneous precision positioning will, in time, also be established.

The IAG relies upon GGOS to advocate for improvements in the ground-based geodetic infrastructure of GNSS and DORIS reference stations, VLBI and SLR space geodetic stations, and gravity observatories; it also supports the development of new satellite missions for altimetry, gravity mapping and earth observation; and promotes the importance of modern geodesy for addressing the needs of science and society for stable spatial, time, and gravimetric reference frames. GGOS focuses attention on how international geodesy needs to evolve in order to deliver an order of magnitude improvement in the quality of its fundamental products – this includes identifying the critical elements of global physical infrastructure, efficient data management, and combined measurement analysis. The systematic implementation, operation, maintenance, and further development of GGOS must account for the technological challenges of modern geodesy as well as its societal importance. GGOS advocates for the establishment of Earth observing systems, analysis capabilities and stable reference frames, to enable social and economic benefits from the accurate monitoring and prediction of sea level change, rapid measurement of ground displacement following earthquakes, interpretation of mass transport signatures from temporally varying gravity field models, and others. Scientific and organizational skills are required at the highest level in order to ensure that the IAG Services will continue to provide current and new geodetic data products for science and society.

GGOS leadership is headed by a chair and vice-chair, who liaise with the GGOS Consortium, which serves as the steering and election committee. These are supported by the GGOS Coordinating Board (which acts as the decision-making body of the organization) and the GGOS Executive Committee (which serves as the management board of GGOS). In turn, all of the aforementioned leadership elements work in concert with the IAG Scientific Services. All GGOS elements are promoted by the GGOS Coordinating Office, which supports outreach, internal and external coordination, and the daily management of GGOS. At the heart of GGOS are its Bureaus, each containing working groups and other IAG support services. The Bureau of Networks and Observations (BNO) contains working groups on satellite missions, simulations, and data and information systems. BNO also serves as the link with, and the coordinating body for, the IAG observing services. As a complement the Bureau of Products and Standards (BSC) oversees working groups on Earth system modelling and standards, as well as promoting the development of new geodetic products associated with the three GGOS Themes: Unified Height System, Geohazards Monitoring, and Sea Level Change. BSC works closely with the various IAG processing and analysis services. Only when geodetic product needs cannot be met by any of the existing IAG components will GGOS propose new products or new IAG entities. More information can be found at the GGOS website: http://www.ggos.org

Hansjoerg Kutterer (Chair GGOS), President of German Federal Agency for Cartography and Geodesy

Ruth Neilan (Vice Chair GGOS), Director of the Central Bureau of the International GNSS Service (IGS)

(Photo: R. Neilan)

2. IUGG Visioning Committee renewed

The IUGG Bureau decided, during its Annual Meeting 2014, to renew the membership of the IUGG Visioning Committee. With the approval of the IUGG Bureau, President Harsh Gupta appointed the following members of the committee: Chris Rizos (IAG), Australia, Chair of the Committee; Domenico Giardini (IASPEI), Switzerland; Andrew Mackintosh (IACS), New Zealand; Mioara Mandea (IAGA), France; and Franz Kuglitsch (as ex-officio), Germany.

The Committee is charged

- To develop IUGG strategic plans based on inputs from Union Associations and National Members.
- To manage a visioning process and to prepare periodic reports on the vision plan with a particular emphasis on grand challenges in geophysics and geodesy, involvement of young scientists and women in Union activities, and relationships with external organizations, media and industry.
- To prepare and revise 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).
- To study the ways in which IUGG operates and formulate ideas on improvement of IUGG activities and structures and on new ways of operation.
- To 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 a decision-making process without losing its scientific rigor.

3. Report on the First Meeting of the Preparatory Committee for the Third World Conference on Disaster Risk Reduction

The United Nations (UN) General Assembly Resolution (A/RES/67/209) decided to hold the Third World Conference on Disaster Risk Reduction (WCDRR) in Sendai, Japan, 14-18 March 2015 (http://www.wcdrr.org/). A delegation led by the International Council for Science (ICSU), as the organizing partner of the UN Science and Technology (S&T) Major Group, took part in the First Meeting of the Preparatory Committee (PrepCom1) for WCDRR. The PrepCom1 was held in the UN Office in Geneva, Switzerland, 14-15 July, in order to prepare for the conference in Sendai, where governments are due to approve a new global framework for reduction of disaster risks to replace the current Hyogo Framework for Action (2005-2015), which was designed to build the resilience of nations and communities to disasters.

The S&T Major Group delegation brought together representatives of several organizations including IUGG, the Inter Academy Partnership, the Global Young Academy, the UKCDS, Public Health England, and the Science and Technical Advisory Group of the United Nations Office for Disaster Risk Reduction (UNISDR) as well as experts from Latin America, Africa and the Asia-Pacific region.

The S&T Major Group Delegation at the PrepCom1 meeting (Photo: Jauad El-Kharraz)

The S&T Major Group focused its interventions on the recommendation to establish an international science advisory mechanism for disaster risk reduction. Rüdiger Klein, Executive Director of the Integrated Research on Disaster Risk programme (IRDR), delivered the first statement to the Plenary on behalf of the Major Group (see the statement at the UNISDR website: http://www.preventionweb.net/files/globalplatform/statementscienceandtechnology.pdf). The statement mentions the importance of mutual reinforcement of strategies for disaster risk reduction and sustainable development. Irasema Alcántara Ayala, a representative of the ICSU Regional Office for Latin America and the Caribbean (ROLAC), delivered the second statement at the meeting highlighting the role of science in promoting a holistic and integrated approach by identifying critical inter-linkages, synergies and trade-offs. The final statement at the meeting was delivered by Alik Ismail-Zadeh, IUGG General Secretary. The statement emphasizes three important scientific contributions to disaster risk reduction: (i) integrated research on disaster risks, (ii) periodic scientific assessment of disaster risks, and (iii) the international science advisory mechanism to assist in research, monitoring and assessment of disaster risks. The full statement can be found in the Appendix below.

Many of the country statements emphasized the need for science and technology at the local and national levels. They requested more capacity building, better knowledge transfer and accessibility to data, more comprehensive multi-hazard risk assessment and monitoring that would contribute more strongly to deliver innovative solutions for disaster risk reduction, a government and civil society requirement. A Joint UN Statement conveys the view that "the future framework should recognize that the management of disaster risk requires prevention, mitigation, preparedness, response, recovery, rehabilitation and reconstruction measures, all of which should be informed by risk assessments ... Risk assessment, including analyses of hazards, exposures, vulnerabilities and capacities, and effective risk communication are fundamental for risk-informed development planning across all sectors". Among other commitments, the UN Statement supports "assessing and communicating risk that informs national and local development policies, programming and actions across sectors, and that maximize information available from the development, climate change and disaster risk management communities" as well as "the proposed creation of an international

science advisory mechanism to strengthen the evidence base for the implementation and monitoring of the new framework".

A first draft of the Second Hyogo Framework is expected to be available later this summer for comment, and will be taken forward to the 2nd preparatory committee meeting, 17-18 November this year in the UN Office in Geneva, Switzerland.

Appendix. **SCIENCE-DRIVEN DISASTER RISK REDUCTION: A MECHANISM FOR IMPLEMENTATION**

Statement delivered by Mr Alik Ismail-Zadeh, IUGG Secretary-General, on 15 July 2014, PrepCom1, Geneva, Switzerland, on behalf of the Science and Technology Major Group, coordinated by ICSU.

Disaster risk reduction - including prevention, mitigation, preparedness, warning systems and recovery - requires long-term planning. For this, a science-driven approach is needed to monitor, understand, and assess disaster risks at all levels. Recognizing this, the Science and Technology major group is *calling for the establishment of an international science advisory mechanism for disaster risk reduction* to strengthen the evidence base for effective reduction of disaster risk and for enhancement of resilience. The mechanism will provide scientific information to support countries and other stakeholders, to implement and to monitor progress on disaster risk reduction in the context of the post 2015 sustainable development agenda and the successor to the Hyogo Framework for Action.

In support of this mechanism, the group proposes to *strengthen integrated research on disaster risk* (i) emphasizing the importance of co-design of research with public, private and civil society stakeholders, (ii) ensuring that all the necessary natural and social sciences, engineering, health and humanity disciplines are deployed to conduct research, and (iii) connecting research, policy and practice on disaster risk reduction and resilience across sectors and scales.

The Science and Technology major group recognizes also the importance of *establishing and promoting authoritative international disaster risk assessments* on a regular basis. Such assessments should provide governments and society with scientific assessments and syntheses of the policy-relevant results of the best available research. Periodic assessments would significantly enhance our knowledge of disaster risk at local, regional, national and global levels and the awareness of those living with risk.

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4. The WMO Sand and Dust Storm Warning Advisory and Assessment System

The WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) was established in 2007 with the aim of improving the capacity of countries to produce and distribute forecasts of mineral dust content in the atmosphere. At present two regional centers exist, the Northern Africa-Middle East-Europe Node (NAMEE; http://sds-was.aemet.es) hosted by Spain, and the Asian Node (ASIA; www.sds.cma.gov.cn) hosted by China. The NAMEE center gathers daily outputs from eight different global and regional modeling systems to produce a multi-model ensemble interpolated at 0.5 degree resolution. A systematic forecast evaluation is performed for Aerosol Optical Depth (AOD) retrieved from the AERONET sun photometer network and the MODIS aerosol product. Forecasts and archived products are available at the NAMEE website.

In May 2013, the 65th WMO Executive Council (EC) designated the consortium formed by the Spanish State Meteorological Agency (AEMET) and the Barcelona Supercomputing Center (BSC-CNS) to create the Barcelona Dust Forecast Center (BDFC; http://dust.aemet.es/). This first

regional specialized meteorological center on atmospheric sand and dust forecast was launched in June 2014 to distribute operational predictions for Northern Africa, Middle East and Europe at 0.1 degree model resolution.

Received from Arnau Folch, IUGG liaison Officer to WMO

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5. Evolving Water Resources Systems Understanding, Predicting and Managing Water - Society Interactions

The International Symposium on Integrated Water Resources Management (IWRM) is a regular symposium organized by the International Commission on Water Resources Systems (ICWRS) of IAHS. The 6th Edition was co-organized with IUGG and EGU and focused on the topic Evolving Water Resources Systems - Understanding, Predicting and Managing Water-Society Interactions. The 6th edition, which was framed within the Panta Rhei research initiative of the International Association of Hydrological Sciences (http://www.iahs.info/pantarhei), brought together more than 200 experts from more than 30 countries from all continents. Participants delivered exciting presentations (90 orals and 134 posters) and stimulated vibrant discussions, showing their research ideas and results to bring hydrology into the future by reaching an improved connection with society.

The scientific contributions focused on a broad variety of topics associated with water resources assessment and management in a changing environment, and concentrated in particular on the two-way interaction between water and society. Main themes of the conference were: (1) Hydrological processes in a changing environment: Coping with uncertainties; (2) Floods, droughts and water risks in a changing socio-hydrological context: Feedbacks between water resources and social systems; (3) Water resources: Monitoring, integrated assessment and management; (4) Optimization of water resources systems: changing boundary conditions, targets and criteria of water management. The Conference Proceedings volume is published as "*Evolving Water Resources Systems Understanding, Predicting and Managing Water - Society Interactions*" (ed. by A. Castellarin, S. Ceola, E. Toth, A. Montanari; IAHS Pub. no. 364, ISSN 0144-7815, IAH Press, pp. 548).

The following experts delivered invited talks at the symposium: Peter Loucks (Cornell University, USA), Berit Arheimer (Swedish Meteorological and Hydrological Institute, Sweden), Tom Evans (Indiana University, USA), Quentin Grafton (Australian National University, Australia), Andreas Schumann (Ruhr-University Bochum, Germany), Ezio Todini (University of Bologna, Italy) and Pieter van der Zaag (UNESCO-IHE, The Netherlands).

The conference was financially supported by International Union of Geodesy and Geophysics (IUGG), European Geosciences Union (EGU), and Department of Civil, Chemical Environmental and Materials Engineering (DICAM) of the University of Bologna.

Received from Alberto Montanari, Conference Chair

6. News from the International Council for Science (ICSU)

ICSU organizes side event at UN High Level Political Forum

The International Council for Science (ICSU) organized, together with UN-DESA and UNEP, a side event this week at the meeting of the High-Level Political Forum in New York City, USA, focusing on the importance of science in the Sustainable Development Goals for monitoring progress and achieving the goals. The event, chaired by Gordon McBean, ICSU President-elect, was entitled "*Strengthening science-policy links for reviewing progress on sustainable development*". The main theme of discussion was how policymakers can collaborate with science to support the effective implementation and monitoring of sustainable development. More information about this event can be found at the ICSU website: http://www.icsu.org/news-centre/news/top-news/icsu-organizes-side-event-at-un-high-level-political-forum

Future Earth to get globally distributed secretariat

Future Earth, the new international programme for global sustainability, which brings together thousands of the world's leading researchers on global environmental change, will have a new secretariat with a unique and innovative structure that spans three continents. ICSU announced it on 2 July, on behalf of the members of the Science and Technology Alliance for Global Sustainability. The preferred bidder comprises five global hubs which will function as a single entity, and are located in Canada (Montreal), France (Paris), Japan (Tokyo), Sweden (Stockholm), and the United States (Colorado). The preferred bid includes a series of regional hubs, from which it is expected new regional networks will develop. These cover Latin America, the Middle East and North Africa, Europe and Asia. Discussions to develop an African hub are underway, with plans in other regions also under consideration. To assist researchers internationally, the Secretariat will support five core functions: coordination, communication and outreach, research enabling, capacity building, synthesis and foresight.

Yuan-Tseh Lee, President of the International Council for Science (ICSU) said: "*Solutions to the major sustainability challenges facing humanity require integrated science and a closer relationship with policy makers and stakeholders than we have seen to date. Future Earth has been designed to respond to these urgent needs, and I am impressed by the innovative consortium that has come together to drive the programme forward. The consortium will work with tens of thousands of scientists already engaged in excellent global environmental change research, attract new communities, and build new partnerships to achieve the goals of global sustainability*".

Source: ICSU webpage

7. Awards and Honors

Jaime Urrutia Fucugauchi (IUGG Liaison Officer to the ICSU Regional Office for Latin America and the Caribbean) was elected the President of the Academia Mexicana de Ciencias (Mexican National Academy of Sciences) for the term of 2014-2017. Congratulations to Jaime!

8. IUGG-related meetings occurring during August – October

A calendar of meetings of interest to IUGG disciplines (especially those organized by IUGG Associations) is posted on the IUGG website (http://www.IUGG.org/calendar). Specific information about these meetings can be found there. Individual Associations also list more meetings on their websites according to their disciplines.

August

- 2-10, COSPAR, Moscow, Russia, 40th Scientific Assembly.
  Web: https://www.cospar-assembly.org
- 3-8, IUGG-SEDI, Kanagawa, Japan, 14th Symposium of SEDI.
  Web: http://www.sedigroup.org/
- 3-7, IAVCEI, Portland, Oregon, USA, Tephra 2014 – Maximizing the potential of tephra for multidisciplinary science.
  Web: http://www.geohazards.buffalo.edu/documents/Tephra2014.shtml
- 5-12, IUCr, Montreal, Canada, 23rd International Congress and General Assembly of the International Union of Crystallography. Web: http://www.iucr2014.org/
- 6-8, ESA, IACS, Reading, UK, Microstructure in Snow Microwave Radiative Transfer (MICROSNOW) Workshop. Web: http://www.esa-da.org/content/microstructure-snow-microwave-radiative-transfer-microsnow-workshop
- 6-16, IACS, McCarthy, Alaska, USA, International Summer School in Glaciology.
  Web: http://glaciers.gi.alaska.edu/courses/summer-school/2014
- 11-14, the YES Network, Dar es Salaam, Tanzania, 3rd Young Earth Scientists (YES) Congress. Web: http://www.yescongress.org/2014
- 11-15, SCAR, Singapore, 22nd IAHR International Symposium on Ice.
  Web: http://www.iahr-ice2014.org/
- 14-16, GSAf, Date s Salaam, Tanzania, 25th Colloquium of African Geology (CAG25).
  Web: http://www.cag25.or.tz/
- 16-21, ICSU, WMO, Montreal, Canada, The World Weather Open Science Conference.
  Web: http://www.wwosc2014.org/
- 16-23, URSI, Beijing, China, URSI General Assembly and Scientific Symposium GASS 2014. Web: http://www.chinaursigass.com/
- 24-28, SCAR, Auckland and Christchurch, New Zealand, COMNAP Annual General Meeting, the COMNAP Syposium and the Waste Water Management Workshop.
  Web: https://www.comnap.aq/SitePages/AGM2014.aspx
- 24-29, IASPEI, Istanbul, Turkey, General Assembly of the European Seismological Commission, ESC2014. Web: http://www.2eceesistanbul.org/
- 24-30, IUGG, IAGA, Weimar, Germany, 22nd International Workshop on Electromagnetic Induction in the Earth.Web: http://www.emiw2014.de/index.php?id=58
- 25 - 28, SCAR, Auckland, New Zealand, Open Science Conference. Web: http://www.scar2014.com/
- August 30 - September 3, ICSU, Auckland, New Zealand, 31st ICSU General Assembly.
  Web: http://www.icsu.org/general-assembly

September

- 1-4, IAG, Leeds, UK, 18th WEGENER General Assembly “Measuring and Modelling our Dynamic Planet”. Web: http://see.leeds.ac.uk/wegener/
- 9-13, IAVCEI, Yogyakarta, Indonesia, Cities on Volcanoes 8.
  Web: http://citiesonvolcanoes8.com

- 15-20, IUGG, IAGA, ESA, EGU, Rhodes, Greece, Geospace revisited: a Cluster/MAARBLE/Van Allen Probes Conference. Web: http://geospacerev.space.noa.gr/
- 22-24, IAG, IAU, St. Petersburg, Russia, Journées 2014 "Systèmes de Référence Spatio-Temporels". Web: http://journees2014.gao.su/
- 22-26, IUGG, IAMAS, WCRP, WMO, Natal, Brazil, 13th Quadrennial iCACGP Symposium and 13th IGAC Science Conference on Atmospheric Chemistry. Web: http://igac-icacgp2014.org/
- 22-26, EMSEV, Warsaw, Poland, International Workshop on Electromagnetic Studies of Earthquakes and Volcanoes. Web: http://emsev2014.cbk.waw.pl/

October

- 6-8, IUGG, IASPEI, EGU, Rhodes, Greece, Mega earthquakes and tsunamis in subduction-zones: forecasting approaches and implications for hazard assessment. Web: http://www.gein.noa.gr/metsz/.
- 7-16, IAGA, Hyderabad, India, XVI IAGA Workshop on Geomagnetic Observatory Instruments, Data Acquisition and Processing. Web: http://www.ngri.org.in/iaga2013_14
- 12-18, SCOSTEP, Xian, China, SCOSTEP's 13th Quadrennial Symposium on Solar-Terrestrial Physics. Web: http://stp13.csp.escience.cn/dct/page/1
- 13-26, IAVCEI, Olot, Spain, 3rd International Course on Volcanology (in Spanish). Web: http://www.gvb-csic.es/CURSO/CURSO_OLOT/Home.html
- 13-17, ICTP, IUGG, Trieste, Italy, 2nd TOSCA training school on solar variability and climate response. Web: http://tosca.sciencesconf.org/
- 13-17, IAG, Luxembourg, Symposium 2014 on Reference Frames for Applications in Geosciences (REFAG2014). Web: http://iag.uni.lu/?id=189#355
- 13-17, WCRP, Darmstadt, Germany, The Climate Symposium 2014. Web: http://www.theclimatesymposium2014.com/
- 13-25, ICTP, IUGG, Trieste, Italy, Advanced Workshop and School on Megathrust Earthquakes and Tsunamis. Web: http://cdsagenda5.ictp.trieste.it/full_display.php?smr=0&ida=a13230
- 24-26, CNC-IUGG, Beijing, China, 1st Congress of China Geodesy and Geophysics .
- 27-28, IAG, Konstanz, Germany, IDS Workshop 2014. Web: http://ids-doris.org/report/meeting-presentations/ids-workshop-2014.html
- 27-31, IAG, Annapolis, MD, USA, 19th International Workshop on Laser Ranging. Web: http://ilrs.gsfc.nasa.gov/ilrw19/index.html

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End of IUGG Electronic Journal Volume 14 Number 8 (1 August 2014)

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Note: Contributions to IUGG E-Journal are welcome from members of the IUGG family. Please send your contributions to Alik Ismail-Zadeh by e-mail (insert in Subject line: *contribution to E-Journal*). The contributions will be reviewed and may be shortened.