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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 Web site (<http://www.iugg.org/publications/ejournals/>). Please forward this message to those who will benefit from the information. Your comments are welcome.

Contents

1. *Feature Article*: IAHS is ninety
2. Scientific meetings selected for IUGG support in 2013
3. Report on the Workshop “Measurement and Uncertainty Assessment of Glacier Mass Balance”
4. Report on the 16th International Conference on Clouds and Precipitation
5. Report on the 33rd General Assembly of the European Seismological Commission
6. Report on the 2012 EMSEV Meeting on Electromagnetic Studies of Earthquakes and Volcanoes
7. News from the Consultative Committee for Time and Frequency
8. Awards and honors
9. IUGG-related meetings occurring during December 2012 – February 2013

1. *Feature Article*: IAHS is ninety

Landmarks in the world of water – memorable attributes and events that are noted and quoted – often tend to focus on large physical features like the River Amazon and the Niagara Falls. Alternatively they consist of extremes such as the Pakistan floods of 2010 and the successive droughts in the Horn of Africa. But there are others that are less immediately recognizable which don't often hit the headlines, such as the start of international initiatives, for example the International Hydrological Programme (IHP) in 1975 and the Millennium Development Goals in 2000. Predating these happenings was the launch of the International Branch (or Section) of Scientific Hydrology at the Rome General Assembly of the International Union of Geodesy and Geophysics (IUGG) in 1922, later to become the International Association of Scientific Hydrology (IASH). This note commemorates the 90 years since that event. It highlights some of the main achievements of what is now the International Association of Hydrological Sciences (IAHS) – the foremost international learned society dealing with the pressing problems of water resources: floods, droughts, water pollution, erosion and so on, together with the science and technology to address them.

Today, the Association is a lively non-profit making international non-governmental scientific organization. However it started life very simply in 1922 in a small gathering of scientists and engineers from about half a dozen European countries – probably none of those present would have called themselves a hydrologist. What was in the minds of these delegates when they established the Branch and in the thoughts of those who made it into the Association in 1930 is not recorded in the

proceedings. However there is little doubt that they would be amazed at the extent and depth of the Association's activities as the 21st Century unfolds. Then the Association's assemblies attracted less than 100 participants with little activity in the years intervening. Now, with 10 Commissions and 3 working groups, one being on PUB (Prediction in Ungauged Basins), nearly 100 affiliated national bodies and some 5500 individual members, IAHS is a vibrant international community of hydrologists. Furthermore the Association shares activities in a number of fields: with several IUGG Commissions, with some of the other 7 Associations in the IUGG family, and also with a number of associations outside IUGG. These include the International Association of Hydrogeologists (IAH) and the International Association of Hydro-Environment Engineering and Research (IAHR). These linkages demonstrate that IAHS has a broad base for its science activities. And, of course, there is also the intergovernmental world where IAHS has interests in common with several UN bodies; particularly with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Meteorological Organization (WMO) and the International Atomic Energy Agency (IAEA) and also with UN Water. Indeed IAHS, through the efforts of Prof. L. J. Tison (Secretary General, 1948-1971), helped launch the UNESCO and also the WMO programmes in hydrology. Prof. Tison is recognised as one of the three "fathers" of the International Hydrological Decade (IHD), which preceded the IHP, and he was very influential in establishing the WMO Commission on Hydrological Meteorology, the forerunner of today's Commission on Hydrology. These and other facts and figures are captured on the Association's website <http://www.iahs.info>, together with a wealth of information about its current activities.

That there have been so many changes over the 90 years of the Association's existence, which facilitate its business, we tend to forget them. The ease of travel nowadays allows meetings to take place virtually anywhere on the planet, whereas they were all in Europe during the early years of the Association. Over the last decade IAHS and its Commissions have convened 6 to 8 conferences a year on particular subjects, in addition to the Scientific Assemblies and General Assemblies within IUGG Assemblies. The tradition of publishing "Red Books", which commenced in 1924 at the Madrid General Assembly, has continued to the present with Pub No. 356 (Erosion and sediment yields in the changing environment) being the most recent. Sediment dynamics, land subsidence, forest hydrology, isotopes, groundwater management – these are amongst the themes of recent proceedings. In addition there is the "Special Publications" Series (Blue Books), the Benchmark Series and the Hydrological Sciences Journal. Originally published 3 times a year as the Bulletin of IASH, commencing in 1953, it became the Journal in 1982 and now appears every 8 times a year with more than 1000 pages per volume. These publications can be ordered at the Association's on-line bookshop while members have free on-line access to the Journal and the whole archive 1924-2004 is free on-line. Key to the success of the Association's publication programme is the IAHS Press. The Press was established at Wallingford (UK) in 1972, and it probably produces now more scientific publications dealing with hydrology and water resources than any other publisher.

The different forums offer means for discussion, review, publication and dissemination of the results of research, and they help to direct efforts to areas where problems are proving more intractable. They stimulate educational outreach and the transfer of knowledge, which can be applied in planning, development and management of water resources, particularly through the IAHS Task Force for Developing Countries (TFDC). TFDC manages the programme for the free distribution of the Journal, Red Books and other publications to more than 70 libraries in some 50 developing countries, which has been underway since 1991. It has also been very successful in obtaining funds from a considerable number of donors to support the attendance of members from these countries at IAHS gatherings. To recognise outstanding contributions to the science and to international hydrology, along with UNESCO and WMO, IAHS awards the International Hydrology Prize annually and the Tison Award to young scientists for recording their innovative research in one of the Association's publications.

Peering into the past through the prism of the science to predict and forecast future events has a well established methodology in hydrology, whereas the means for predicting the path of the science itself remain rudimentary. Nevertheless the Association has, on several occasions, taken a glimpse at what the coming years may hold. For example, at Rome in 1987 the “Water for the Future Symposium” looked at the Thrust of Thought in Contemporary Hydrology and New Techniques in Data Capture. Twice since 1982 the minds of a selection of the younger members of IAHS have been exercised to probe the future. Most recently, the Hydrology 2020 Working Group reported its findings (Hydrology 2020. An integrating science to meet world water challenges, Edited by T. Oki, C. Valeo and K. Heal IAHS Pub. No 300, 2006). In a similar way the PUB initiative, which kicked off in 2002, was aimed at a future where the *ultimate goal* in hydrology would be achieved – the hydrological prediction of ungauged basins and reduction of the associated uncertainty. The results of the PUB Decade were examined and evaluated at the Symposium held recently in Delft from 23 to 25 October 2012, which also celebrated the 90th anniversary of the founding of IAHS. In addition there was discussion and debate on the call announced earlier in the year for an innovative science initiative to take the Association forward from 2013 into the decade leading to its 100th anniversary. This “Visionary Session” on the next hydrological decade sparked a number of ideas and possible themes which will be refined into a plan to be put to the Association at the Gothenburg Scientific Assembly next year.

John C. Rodda



John C. Rodda received his PhD and DSc degrees from the University of Wales, United Kingdom. From 1960 to 1969 John did research work at the Institute of Hydrology in Wallingford and later in the 1980s he was Assistant Director of the Institute. During the 1970s and early 1980s, he spent two years with the Department of Environment in London and eight years with the Water Data Unit in Reading. From 1969 to 1970, John worked in the WMO Secretariat in Geneva, Switzerland, to where he returned taking up the position of Director of the Department of Hydrology and Water Resources (1988-1995). He was a visiting professor at universities in the U.K. and the Netherlands and is an Honorary Professor at the University of Wales. Over the years, Dr. Rodda has held a multitude of IAHS positions: Chair of its Precipitation Committee (1967-1971), Editor (1971-1979), Secretary General (1979-1987), and President (1995-2001). Dr. Rodda was awarded the 2004 International Hydrology Prize.

2. Scientific meetings selected for IUGG support in 2013

IUGG co-sponsors symposia and workshops appropriate to our disciplines of study. IUGG allocated US\$30,000 to assist meetings in 2013 and especially to support the participation of young scientists and scientists from developing countries who intend to attend Association Scientific assemblies. Officers of the Associations proposed meetings to receive these awards. In 2013, IUGG will support the following meetings (the IUGG Associations endorsing the meetings are indicated in brackets):

- School “Impact of solar variability on climate”, Thessaloniki, Greece, 11-15 March (IAMAS)
- 4th International Workshop on Hydro-Ecology (HydroEco 2013), Rennes, France, 13-16 May (IAHS)
- Reconciling observations and models of elastic and viscoelastic deformation due to ice mass change, Ilulissat, Greenland, 30 May – 2 June (IAG)
- 19th CNAAC Conference, Fort Collins, USA, 24-28 June (IAMAS)
- Workshop “Measurement Problems in Ice Clouds”, Zurich, Switzerland, 5-6 July (IAMAS)
- International Tsunami Symposium, Fethiye-Gocek, Turkey, and Rhode Island, Greece, 22-26 July (IASPEI-IAPSO)

- Facets of Uncertainty: 5th EGU Leonard Conference; Hydrofractals '13; Statistical Hydrology - STAHY '13, Kos, Greece, 17-19 October (IAHS)

In addition to the awards, the IUGG Bureau agreed to allocate travel grant awards to all Association Scientific Assemblies.

3. Report on the Workshop “Measurement and Uncertainty Assessment of Glacier Mass Balance”

The World Glacier Monitoring Service (WGMS) in collaboration with Stockholm University organized a workshop on measurement and uncertainty assessment of glacier mass balance from 9 to 11 July 2012 in Tarfala, Sweden. The workshop built on the results and experience of earlier workshops in Tarfala in 1998 (Fountain et al., *Geografiska Annaler* 81A(4), 461–465, 1999) and Skeikampen in 2008 (*Annals of Glaciology* 50(50), 2009), with a focus on the re-analysis of glacier mass balances including a (standardized) uncertainty assessment. The meeting was held at the Stockholm University, Tarfala Research Station, in northern Sweden, and brought together 17 representatives of the leading research groups currently working on these issues. The major aims of the workshop were to discuss methods and to identify and quantify related uncertainties of mass balance measurements from the ground, air and space, as well as to provide best practices for the homogenization, validation and re-calibration of (long-term) observational series (re-analysis of glaciological and geodetic mass balance series). These goals are based on the following research questions:

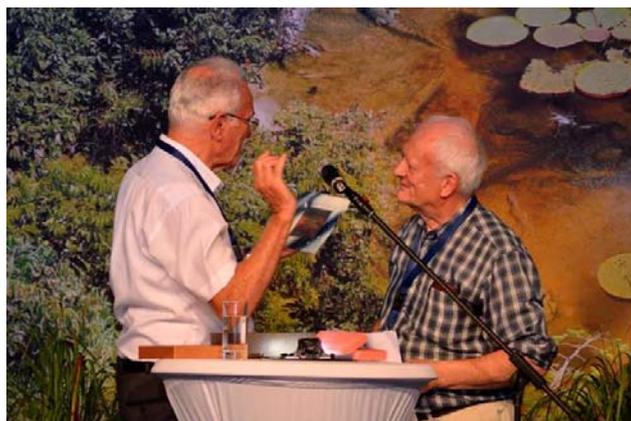
- What are sources of potential errors of glacier mass balance measurements, and how are these potential errors considered by glaciological and geodetic methods?
- How can the related uncertainties be quantified?
- What are typical values (ranges) for the systematic and stochastic uncertainties?
- What are the consequences for the comparison of glaciological and geodetic mass balances?
- What are related consequences for the interpretation of glacier mass balance results as indicators of climate change, fresh water resources, and contributors to sea level change?

The workshop included keynote presentations as input for the subsequent discussions on how to tackle the issues mentioned above. These covered uncertainties and problems related to the direct glaciological method, re-analysis of long-term mass balance series and homogenization methods, and co-registration and bias correction of elevation data. Newly available techniques such as airborne laser-scanning as well as statistical tools to assess the quality of mass balance series were discussed, too. As a final outcome of the workshop, a joint publication in a peer-reviewed journal (“*The Cryosphere*”) will be made available as soon as ready. It includes a review based on the expertise of the workshop participants working with long-term monitoring mass balance programmes, supplemented with recommendations. The setting of the venue greatly supported the spirit of intensive and constructive discussions during the two workshop days and the excursion day to the renowned and best-investigated Storglaciären, with its long-term monitoring mass balance series. The workshop was “A Marcus Wallenberg Symposium” sponsored by the Marcus Wallenberg Foundation for International Cooperation in Science and co-sponsored by IUGG through IACS as well as by the International Glaciological Society (IGS).

Received from Michael Zemp, Director of the World Glacier Monitoring Service

4. Report on the 16th International Conference on Clouds and Precipitation

The International Commission on Clouds and Precipitation (ICCP), which is one of the commissions of IAMAS, held its 16th International Conference on Clouds and Precipitation in Leipzig, Germany, from July 29 to August 4, 2012 (see <http://iccp2012.tropos.de/> or the ICCP webpage: <http://iccp-iamas.org>). Over 670 abstracts were submitted and over 500 people from 34 countries attended the conference. This large number of participants reflects the importance of cloud research in dealing with some of the pressing issues of climate change, weather forecasting and water availability. The importance of this research topic was highlighted recently by the IPCC (International Panel on Climate Change) by identifying clouds as the largest uncertainty in climate prediction. Changing cloud characteristics due to interactions with aerosols have played an important role in the discussions. In addition, many other topics such as the effects of clouds on climate, ice nucleation in clouds, bio-aerosols and their role in cloud processes were among the topics discussed. The program consisted of 13 sessions with oral and poster presentations in each. The sessions included: 1) Basic cloud and precipitation physics; 2) Warm boundary layer clouds; 3) Convective clouds (including cloud electrification); 4) Mixed phase clouds (including Arctic stratus, mid-level clouds); 5) Cirrus clouds; 6) Orographic clouds; 7) Mesoscale cloud systems (including severe storms); 8) Aerosol-cloud-precipitation-interactions; 9) Clouds and climate (including radiative properties of clouds); 10) Ice nuclei and cloud condensation nuclei; 11) Cloud and precipitation chemistry; 12) Measurement techniques of cloud and precipitation properties; 13) Applications of cloud and precipitation physics. In addition, a special panel discussion was conducted dealing with geoengineering, its scientific and ethical issues. As part of this discussion, a survey was conducted to learn about the participants' attitude regarding operational versus geoengineering practices. Preliminary analysis indicates that most people favor the continued research efforts but oppose starting operational geoengineering practices before the risks of such operations are clearly understood. During the conference a special award was given to Robert Knollenberg in recognition of his pioneering work in developing the electro-optical spectrometers that revolutionized the measurements of cloud microphysical properties. Knollenberg gave an acceptance speech discussing his personal history as a scientist and encouraging young scientists to take risks when they are young and to consider the possibility of private industry as an effective path to accomplish innovation.



Left: Robert Knollenberg during his acceptance speech. Above: John Latham (right) receiving his award from Zev Levin, President of ICCP.

John Latham was awarded the ICCP Honorary Member in recognition of many years of outstanding scientific contributions to cloud physics and cloud electrification. As part of the acceptance ceremony, Latham gave an after dinner speech with an interesting and humorous look at the way scientists often forget to mention similar works that took place many years prior.

Five awards were given to the best posters by students and postdocs.



Three of the five students receiving the best poster award with Robert Shaw (left), the Chairman of the Award Committee

The ICCP elected new officers and eleven new members replacing those that completed two terms. The new officers are: Andrea Flossmann (France), President; Robert Rauber (USA), Vice President; and Darrel Baumgardner (Mexico), Secretary. Manchester (UK) was chosen as the site for the next International Conference on Clouds and Precipitation that will be held in summer 2016.

Received from Zev Levin, Chair, Scientific Program Committee of the Conference

5. Report on the 33rd General Assembly of the European Seismological Commission



EUROPEAN SEISMOLOGICAL COMMISSION
33-rd GENERAL ASSEMBLY
August 19-24, Moscow, Russia
Seismology without boundaries



<http://www.esc2012-moscow.org>

The unique geographical position of Russia gave an opportunity for scientists from Europe and Asia to participate in the 33rd General Assembly of the European Seismological Commission (ESC), an IASPEI commission. 548 people from 51 countries (including 28 European states) representing five continents participated in the Assembly, among them 66 students. This manifests that the Assembly motto “*Seismology without Boundaries*” proved its value to the full. The scientific program of the Assembly was built according to these major topics of seismology. 845 scientific presentations were given (490 oral and 355 poster presentations) at 39 symposia. Some symposia were organized in cooperation with the Seismological Society of America (SSA) and the Asian Seismological Commission (ASC), another IASPEI commission. Four eminent seismologists gave plenary lectures: Koshun Yamaoka (Japan) on the impacts of the 2011 Tohoku earthquake on seismology and hazard assessments; Ezio Faccioli (Italy) on the recent evolution and challenges in the seismic hazards assessment of the Po Plain region, Northern Italy; Tatiyana Yanovskaya (Russia) on the surface wave tomography for upper mantle studies; and Rajender Chadha (India) on triggered earthquakes.

The year 2012 is the 60th anniversary of ESC. It is also the 150th anniversary of the birth of academician Boris Galitzin, one of the founders of Russian and world seismology, theoretician and inventor of the electrodynamic seismograph. On this occasion, the Assembly’s Organizing

Committee published a booklet presenting the scientific life of Boris Galitzin. Also the 2012-2014 seismological calendar (from the 33rd ESC GA to the 34th) was published to present the history of Russian seismology. It contains unique maps and documents, brief biographies of Imperial Russian, Soviet, and modern Russian seismologists.

A press conference dedicated to the ESC General Assembly was held on 21 August at RIA Novosti, one of the main Russian news agencies. The participants of the conference were Alexey Zavyalov (Russia), Chairman of the Local Organizing Committee of the Assembly and ESC Vice-President; Mariano Garcia Fernandez (Spain), ESC Secretary General; Peter Suhadolc (Italy), IASPEI Secretary General; Alik Ismail-Zadeh (Russia/Germany), IUGG Secretary General; Rajender K. Chadha (India), ASC Secretary General; and Alexey Malovichko (Russia), Director of the Geophysical Survey of the Russian Academy of Sciences (GSRAS).

As an accompanying event, the 9th International Young Seismologists Training Course “Modern Methods of Seismological Data Processing and Interpretation” was held from 25 to 30 August in GSRAS in Obninsk. 36 people representing 15 countries participated in the Training Courses.



At the Training Course in Obninsk, Russia

The organization of the 33rd General Assembly received financial support from IUGG, IASPEI, the Russian Academy of Sciences, the Ministry of Education and Science of the Russian Federation, the Russian Foundation for Basic Research, and several commercial organizations and cultural centers. The 34th General Assembly of the European Seismological Commission will be held in Istanbul (Turkey), 24-29 August 2014. This Assembly will be the second to be held jointly with the General Assembly of the European Association of Earthquake Engineering.

Alexey Zavyalov, ESC President

6. Report on the 2012 EMSEV meeting on Electromagnetic Studies of Earthquakes and Volcanoes

The scientific meeting of the Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes, EMSEV took place from 30 September to 3 October 2012. It was organized and hosted by the Tokai University at Gotemba, Japan, in front of the 3776 m high and

active Mount Fuji-yama volcano. This meeting was supported by three IUGG Associations (IAGA, IASPEI and IAVCEI). For three days more than 75 participants from 13 countries, including 10 young scientists, presented their latest results at plenary oral and poster sessions. Papers were organized within five different sessions: (i) electric, magnetic, and electromagnetic phenomena associated with active processes: earthquakes, tsunamis, volcanoes, active fault movements, landslides, and geothermal activities, (ii) electromagnetic imaging based on land and space monitoring techniques, (iii) pre-seismic, co-seismic and post-seismic phenomena related to the lithosphere-atmosphere-ionosphere coupling using multi-parametric observations to ensure reliable interpretation, (iv) generation mechanisms of electromagnetic signals related to active processes: theoretical and laboratory studies, and (v) seismic, geodetic and electromagnetic studies related to the off Tohoku M9 earthquake and tsunami on 11 March 2011.

The discussions showed that reliable observations of abnormal electromagnetic variations may be recorded before earthquakes and volcanic eruptions. They may be observed with the magnetic or electric field in ground-based stations, with regional disturbances of broadcast radio emissions in the atmosphere, and with electromagnetic, electronic and plasma changes in the ionosphere, and by infra-red anomalies detected by satellites as well. Different mechanisms at the origin of these signals were formulated (e.g., heat or/and gas release, ionization of the air, transfer of electric charges, etc.). And for the first time, several laboratory measurements were discussed in depth to provide a basis for physical mechanisms.

The meeting was followed by a general discussion concerning EMSEV activities in developing countries. In volcanology, EMSEV formed in 2004 a co-operative program on Taal volcano with the Philippines Institute of Volcanology and Seismology (PHIVOLCS). At present, this international cooperation involves teams from Japan, France, USA, Greece, Italy, and Belgium. A report on the state of the cooperation, discussions of problems encountered and the latest results were presented during the EMSEV meeting. It was pointed out that EMSEV has a primary responsibility to help PHILVOLCS to monitor the volcano. On active faulting, the EMSEV working group started a new cooperative research effort with Kyrgyzstan (Bishkek Research Station) in 2011. At this site an active electrical resistivity experiment using an extremely high power magnetohydrodynamic (MHD) generator is being used to induce earthquakes, and some outstanding research on the relation between EM phenomena and electrical resistivity changes with earthquakes has been accomplished during the last past 30 years. A formal cooperation agreement between EMSEV and the Bishkek Research Station was signed in 2011. The purpose of this agreement is to provide scientific and technical interaction between the two partners during a four-year collaborative research on active faults and physical processes generating earthquakes in Central Asia, to promote new investigations with electromagnetic and other geophysical methods, and to enhance data processing and analyses. The agreement will promote the development of scientific relations between the participants for solving fundamental problems on the generation of earthquakes and the ways to monitor and mitigate them along different active faults of the Central Asian continental lithosphere.

The minutes of the XVth EMSEV Business Meeting can be found on the EMSEV Web site (<http://www.emsev-iugg.org/emsev/>). The next EMSEV meeting will be held in Poland in 2014.

Jacques Zlotnicki, EMSEV Chair

7. News from the Consultative Committee for Time and Frequency

The Consultative Committee for Time and Frequency (CCTF) is one of the consultative committees of the International Committee for Weights and Measurements (CIPM). Its domain includes all aspects related to time and frequency. In addition to national delegates, CCTF members include representatives of some international organizations. This is the case for IUGG, as well as the International Astronomical Union (IAU) and the International Union for Radio-Sciences (URSI).

The 19th meeting of CCTF was held at the Bureau International des Poids et Mesures (BIPM), Sèvres (France) on 13-14 September 2012. Among the numerous activities discussed during this meeting, some are of more direct connection to IUGG and are briefly reported here. A strong and fruitful cooperation has been established between CCTF and the International GNSS Service (IGS) through the *IGS Working group on clock products* presently chaired by Ken Senior. Several connections also exist with the International Earth Rotation and reference systems Service (IERS). The first is about the *IERS Conventions*, the BIPM Time section being part of the IERS Convention product center, together with the US Naval Observatory (USNO).

The second is about the *International Terrestrial Reference System (ITRS)* which is the terrestrial reference system recommended by IUGG for all its activities (IUGG Resolution 2 adopted in Perugia in 2007). Following a resolution of CCTF, the CIPM recommended in 2011 to use ITRS for all metrological activities (Resolution 9 of the 24th meeting of the CGPM). As ITRS is adopted as the recommended system by various communities beyond geosciences, the issue of its governance is now raised with some urgency, with the objective to ensure quality and access for ITRS and its realizations.

The third topic is related to the *redefinition of UTC and the determination of UT1*. As conclusion of lengthy discussions held during the meeting, CCTF adopted a specific recommendation which summarized the overall opinion of the committee. In particular, it is proposed to establish a joint CIPM-IUT-R working group on UTC. Also the availability of UT1 estimations by IERS was recognized. The International Telecommunication Union (ITU) has recently sent a letter to IUGG (as well as several other international organizations) related to UTC. The recommendation adopted by the CCTF will help IUGG to define the content of the answer.

Received from Claude Boucher, IUGG Liaison Officer to CCTF

8. Awards and honors

Kathy Whaler, IAGA President, was selected to deliver the 2012 Bullard Lecture of the American Geophysical Union.

Tom Beer, IUGG Immediate Past President, was selected to deliver an Axford Distinguished Lecture at the AOGS Assembly in Brisbane, Australia in 2013.

9. IUGG-related meetings occurring during December 2012 – February 2013

A calendar of meetings of interest to IUGG disciplines (especially those organized by IUGG Associations) is posted on the IUGG web site (<http://www.IUGG.org/calendar>). Specific

information about these meetings can be found there. Individual Associations also list more meetings on their web sites according to their disciplines.

December

- 2-14, IAG, IUGG, PAIGH, Bogota, Colombia, Workshop on Vertical Datum Unification
- 3-7, AGU, San Francisco, USA, Fall Meeting
- 8-12, GRC/IUGG, AGU, IRDR, Orange, California, USA, First IUGG GRC Conference “Extreme Natural Hazards and Their Impacts”
- 13-15, ISPRS, IUGG, Enschede, The Netherlands, 8th International Conference on Geo-information for Disaster Management

February

- 24-25, IAHS, Algiers, Algeria, 5th International Conference on Water Resources and Sustainable Development (CIRED 2013)

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Editor: A.T. Ismail-Zadeh, Secretary General (<http://www.IUGG.org>).

E-mail: Alik.Ismail-Zadeh@kit.edu

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 by the Editor.