

CAPACITY BUILDING ACTIVITIES

IUGG Report to ICSU, 16 May 2001

SCIENCE EDUCATION

K-12 LEVEL

IAPSO:

A page "Information for younger students" has been added to the IAPSO Web site providing links to K-12 programs, and to information resources from various agencies that would be useful for K-12 students and teachers. The Secretariat periodically responds to direct requests received from students and teachers.

IAVCEI:

In 1994 IAVCEI issued a poster "Safety at Volcanoes" intended for schools.

UNIVERSITY LEVEL

IAG:

IAG's Working Group on Education plans to centralize information regarding technical courses on topics of geodesy offered world-wide by universities and private organizations; collect information about educational material (texts, exercises, solutions to exercises, and software used for educational purposes) and have important material translated; propose/initiate courses where necessary, especially in developing countries, investigate the possibility of "distance-learning" internet courses, and foster cooperation between Universities that offer Ph.D. degrees or that would like to offer advanced degrees.

IAPSO:

IAPSO maintains links on its Web page to all identifiable university program web sites related to the physical sciences of the oceans, as well as various institutes and government laboratories. Links are also provided for ocean related models, data sources, and other information useful to university faculty, research staff, and students.

OTHER: Distributions of Publications

IAHS:

IAHS TFDC (Task Force for Developing Countries) continued its action in 2000 and distributed free

of charge all IAHS publications (Hydrological Science Journal and the Red Books) to more than 60 selected Universities and Research Institutions of Africa, Asia, South-America and Eastern Europe.

IAPSO:

Since 1997, IAPSO has electronically published abstract books of its Assemblies on the IAPSO Web page. These are, therefore, freely available to the global community. By July 2000, the Web page was receiving 5,000 hits per month, with over half of these accesses to abstracts. Occasional hard copies of older publications are provided on request.

IASPEI:

The Publications Transfer Program of the Committee for Developing Countries (CDC) makes available basic texts and publications on seismology and related earth sciences to institutions in need. In the year 2000 the project provided publications to the following institutions:

- Instituto Geofisico del Peru (Lima, Peru) - on May 22nd the library was totally destroyed. Hence, in addition to sending them the journals on their list, we also sent them 4 boxes of assorted texts.
- Centre for Earth Science Studies (Akkulam, India) - This is an institution with "poor library facilities" that does not have any of the publication transfer journals dated after 1987.
- Guru Jambheshwar University (Hisar, India) - This is a request from their applied mathematics department on behalf of 3 members of their staff conducting research in theoretical seismology. They apparently do not have access to geophysical journals.
- Gadjah Madah University (Yogyakarta, Indonesia) - Journals were requested on behalf of the departmental library of the Department of Geodetic Engineering. They will primarily be used by students.
- Univ. Nac La Plata (Argentina) - They are trying to fill gaps in their BSSA collection.

IAVCEI:

IAVCEI distributes 2 videotapes: "Understanding Volcanic Hazards," available in both PAL and NTSC (VHS) formats and in English, Spanish, French, and Italian, and "Reducing Volcanic Hazards," available in both PAL and NTSC (VHS) formats and in English and Spanish. They also produce and sell an attractive wall calendar featuring well-known and scenic volcanoes. The calendar not only informs the public but also raises money for their purposes. In 1994 IAVCEI issued a document "Safety Recommendations For Volcanologists And The Public" including a poster "Safety at Volcanoes" intended for schools.

FELLOWSHIPS and GRANTS

IAG:

IAG is investigating a strategy to support Ph.D. students in Geodesy.

TRAINING PROGRAMS

IAG:

The 4th Geoid School was intentionally placed in Malaysia in order to attract scientists from developing countries.

IAPSO:

IAPSO Commissions and Permanent Services (and Joint Commissions with other Associations) periodically provide training workshops.

IASPEI:

Two technical workshops, Educating the Public about Earthquake Hazard and Risk, and, Seismic Networks and Site Selection, were held at the Institute of Geophysics, University of Teheran on 13-14 October 2000.

CURRICULUM DEVELOPMENT

K-12 LEVEL:

None known.

UNIVERSITY LEVEL:

IAG:

IAG's Working Group on Education plans to centralize information regarding technical courses on topics of geodesy offered world-wide by universities and private organizations; collect information about educational material (texts, exercises, solutions to exercises, and software used for educational purposes) and have important material translated; propose/initiate courses where necessary, especially in developing countries, investigate the possibility of "distance-learning" internet courses, and foster cooperation between Universities that offer Ph.D. degrees or that would like to offer advanced degrees.

OTHER: Handbooks

IAG:

The Geodesist's Handbook 2000 (J. Geodesy, 74, 1, 2000). This publication, updated every 4 years, includes information about the IAG itself and scientific information related to geodesy. The Handbook is posted on the IAG internet site at <http://www.gfy.ku.dk/~iag>.

IAGA:

Guide for Magnetic Measurements and Observatory Practice (J. Jankowski and C. Sucksdorff, 1996). This Guide provides comprehensive information how to organize and run a magnetic observatory and make magnetic measurements. The main topics include a brief description of Earth's magnetic field, the selection of a site and layout of the observatory, magnetometer instruments (including testing and calibration), absolute magnetic measurements, recording of magnetic variations, and data processing. This handbook and the following one were distributed free of charge to the world's network of geomagnetic observatories that report data to World Data Centers.

Guide for Magnetic Repeat Station Surveys (L. R. Newitt, C.E. Barton, and J. Bitterly, 1996). This Guide presents specifications and procedures recommended to determine magnetic secular variation by carrying out magnetic repeat station measurements. These procedures are much more stringent than those for vector ground-surveys. Permanent magnetic observatories provide the most accurate source of secular variation information, but the present network of magnetic observatories does not give adequate spatial coverage of the globe. Repeat stations provide an important and cost-effective means of supplementing observatory data. Repeat data have long been used for producing regional field models and charts. Appendices to the Guide include an equipment checklist, reporting forms and record sheets, and computer programs.

IAPSO:

IAPSO has independently produced a variety of special publications including 3 volumes of Pelagic Tidal Constants (in 1979, 1985, and 1992). "The International System of Units (SI) in Oceanography," was published in cooperation with UNESCO/IOC, and "The Physics of Ice Covered Seas," was published in cooperation with Helsinki University Press.

IASPEI:

International Handbook of Earthquake and Seismology (in preparation). This Handbook will help to bridge the gap between seismologists and earthquake engineers and will be truly international in scope. The aims for the Handbook are: to summarize the well established facts; to review relevant theories; to survey useful methods and techniques; and to document and archive basic seismic data. It will consist of about 84 chapters grouped into 10 parts, with 4 CD-ROMs containing materials to augment the printed chapters, and including a compilation of seismic data from around the world and a global earthquake database with software for displaying seismicity maps. New Manual of Seismological Observatory Practice (in preparation). This is a job-related education, training and instruction material in the field of observational seismology, currently under development as a web site. The web-based NMSOP is maintained as continuously up-graded, up-dated and complemented reference source with integrated training modules. There will be an open interactive dialog between users and contributors. First contributions are already available via www.seism.com/msop/nmsop/nmsop.php. A hard copy version of the NMSOP is planned, complemented by an easy to update loose-leaf collection of job-related worksheets. Manual chapters and worksheets may be used as training modules for observatory practice. IASPEI Seismological Software Library (SSL) - Each software volume of the IASPEI Software Library includes the executable code, examples on floppy diskettes, and printed documentation. IASPEI PC Shareware Library - Under the auspices of the Working Group on Personal Computers, a PC shareware library is being published on diskette, including files with short-form manuals of the programs. The Library provides for fast and wide distribution of geophysical programs and utilities, reduced or demonstration versions of geophysical software, and beta-versions of new programs to be included in future volumes of the SSL.

Strengthening of Scientific Institutions

GRANTS & FUNDING FOR NEW OR ENHANCED SCIENCE FACILITIES, EQUIPMENT & PUBLICATIONS

IAGA:

An ICSU grant was received to support the INTERMAGNET programme, thus accelerating the modernisation of instrumentation, and practices for data collection and dissemination in the global magnetic observatory network. In 2000 participation in INTERMAGNET grew to 75 observatories from 32 countries.

STAFF SUPPORT: (e.g. recruitment of new staff and training) related to improved efficiency and effectiveness of scientific institutions

None known.

ENHANCED INSTITUTIONAL CAPACITY TO PROVIDE ADVICE TO GOVERNMENTS, INDUSTRY, & THE PUBLIC

IAG:

The possibilities for establishing a geodetic reference system for Africa is being investigated on the initiative of IAG Commission X.

IASPEI:

IASPEI was a major contributor to the Global Seismic Hazard Assessment Program (GSHAP) which was launched in 1992 by the International Lithosphere Program (ILP) with the support of the International Council of Scientific Unions (ICSU). GSHAP was a demonstration program within the framework of the United Nations International Decade for Natural Disaster Reduction (UN/IDNDR). All the results of the program, the regional reports and maps, and the global map can be found on the GSHAP site at <http://seismo.ethz.ch/GSHAP>

ENHANCED INSTITUTIONAL CAPACITY TO PREPARE & DISSEMINATE SCIENCE POLICY STATEMENTS

None known.

ENHANCED INSTITUTIONAL CAPACITY TO PROMOTE PUBLIC AWARENESS OF SCIENCE

None known.

Cooperation & Exchange

WORKSHOPS, SEMINARS & CONFERENCES

UNION:

- Awarded \$6000 to support the South America Geoid 2000 Workshop held at Escola Politacnica, Universidade de Sao Paulo, Brazil, in May, 2000. Countries that participated were Argentina, Brazil, Chile, Ecuador, Paraguay, and Uruguay.
- Awarded \$6000 to support a Workshop on Gravity, Geodesy, and the Ocean Circulation as inferred from Altimetry in Mar del Plata, Argentina (October 2001)
- Awarded \$3000 to explore a Joint IAHS/IAMAS/IAPSO Assembly in India in 2002

IAPSO:

- IAPSO's 2001 scientific assembly is joint with the International Association for Biological Oceanography (IABO) in Mar del Plata, Argentina, in October. Discussions are presently underway for a Joint Assembly (or specialized conference) with IAMAS and IAHS in 2005 in Asia.

IAVCEI:

- The General Assembly was held from July 18-22, 2000 in Bali, Indonesia. Approximately 500 volcanologists attended the five-day meeting organized by the Volcanological Society of Indonesia (VSI), assisted by the Directorate General Geology and Mineral Resources (DGGMR), the Indonesian Geologists's Association (IGA), the Institute of Technology of Bandung (ITB), and the Department of Mining and Energy (DME). Midway through the five-day meeting, the participants traveled to Batur caldera and one of VSI's volcano observatories. There were also two workshops and six field trips held in association with the meeting.
- The next General Assembly is scheduled for November-December 2004 in Chile. The IAVCEI 1902 Centennial Workshop (May 2002) is planned for Martinique.

PROMOTION & SUPPORT OF COLLABORATIVE PROGRAMS & INTERDISCIPLINARY PROJECTS

UNION:

- Awarded \$6000 to support initiation of a Joint Commission on Groundwater-Seawater Interactions, including planning a new project on submarine groundwater discharge in Lingayen Gulf, Luzon, The Philippines in cooperation with the University of the Philippines.
- Awarded \$4000 to support formation of a Joint Working Group on Subduction Zone Studies with special emphasis to involve scientists from developing countries in Southeast Asia, the Pacific, and South America.

IAPSO:

- IAPSO participates in ICSU's Scientific Committee on Oceanic Research (SCOR) and reviews various proposals for new SCOR Working Groups.

IASPEI :

- The International Commission for Earth Sciences in Africa (ICESA) was formed jointly with IASPEI as a Coordinating Committee of the International Lithosphere Program (ILP) with the overall objective of promoting and coordinating geo-scientific work in Africa by facilitating the exchange of scientific personnel, information and collaboration among African countries and similar organizations working in the field of earth sciences. ICESA is also devoted to the initiation of training programs for African scientists and technicians as well as to the organization of meetings/seminars for the exchange of ideas among earth scientists. Eight Special Issues of the Journal of African Earth Sciences (JAES) are being planned as a joint venture between ICESA and JAES. These issues will contain review papers to be used as background material for an ICESA's book on the geology of Africa.

*TRAVEL GRANTS***UNION:**

- Awarded \$4000 to support scientists from Russia, Greece, Papua New Guinea, and Turkey who are either members of a Tsunami Historical Database for the Pacific project, or engaged in a study of submarine slumping as a tsunami generation mechanism.
- Awarded \$15,000 in 2001 to support travel for young scientists or scientists from developing countries to 8 separate meetings held in Argentina, Colombia, Hungary, Czech Republic, The Netherlands, Italy, and New Zealand.

IAG:

- IAG has established an "IAG Fund" which is used to support the participation of scientists from developing countries to IAG sponsored meetings.

IAMAS:

- Travel grants totalling \$15,500 were given in 2000 to the IAMAS Commissions for use for scientists from needy countries attending conferences or symposia. In 2001, 57 scientists (including 13 young scientists) from 27 countries have been approved for travel assistance totaling \$ 43,878 to the IAMAS Scientific Assembly in Innsbruck, Austria.

IAPSO:

- IAPSO awarded over \$60,000 in travel grants to scientists from developing countries in 1999 for the purpose of attending the 1999 IUGG General Assembly. It is expected that over \$40,000 in grants will be made to scientists from developing countries in 2001.

Other Associations:

- Although details are not immediately available, all other IUGG Associations provide assistance for disadvantaged and underrepresented scientists to attend scientific meetings.

PROMOTION & SUPPORT OF NATIONAL SCIENCE NETWORKS

IASPEI:

- A Committee on Developing Countries (CDC) Newsletter is distributed twice a year. The Newsletter gives information about symposia, meetings, training courses, network development, reports of important geological events, software and instrumental development, etc. The Newsletter has provided a forum for various scientific activities of IASPEI and other scientific bodies. Every effort has been made in these Newsletters to increase participation from developing countries in international symposia/seminars by reproducing meeting announcements well in advance and also advising about the sources of financial support. Very often popular scientific articles on earth and natural sciences from various international journals are reproduced. The Newsletter is circulated globally, primarily to the scientists in developing countries, but also to some scientists in developed countries who are especially interested in the development of seismology in third world countries. The present circulation figure is more than 300.

PARTICIPATION IN INTERNATIONAL SCIENCE NETWORKS (including internet fora)

UNION:

- Awarded \$6000 to initiate a "Webcyclopedia of Urban Risk and Sustainability" project that will organize cities, hazards, and risks on an internet site to be maintained at the International Institute of Earthquake Prediction Theory and Mathematical Geophysics of the Russian Academy of Science.

IAMAS:

- An ICSU/UNESCO grant of 30,000 was awarded to the project "Alliance for Capacity Transfer" in 1999. This initiated an effort to provide on-line access to scientific expertise and meteorological data world-wide, that is still under development. Planned features include creating international "Help" bulletins and "Mentoring" boards and other means for discussion

and collaboration through the Internet. ACT will make use of already available Internet Web sites relating to meteorology, hydrology and a pool of dedicated scientists willing to volunteer as resource persons and advisors.

IAPSO:

- IAPSO maintains a wide range of links to oceanographic resources on its Web page. Other organizations link directly to IAPSO pages of particular interest.

Summary

IUGG and its Associations actively assist scientists in developing countries to improve conditions for observations and studies of Earth physics. This assistance is provided both as altruistic outreach, and because the data and expertise that is resident in these countries is vital for pursuit of our scientific objectives.

Strategies used to build capacity in science worldwide include:

- Supporting participation in educational opportunities, including internet sites, public outreach, short courses, summer schools, and research campaigns
- Convening meetings in developing countries
- Providing financial support to disadvantaged scientists for attendance at meetings
- Supporting scientific initiatives that include developing countries