

# **Resolutions**

## **Adopted at the IUGG XXIIIrd General Assembly**

Sapporo, Japan, July, 2003

### **Resolution 1**

### **Resolution 2**

#### **Geophysical seafloor observations (IAG, IAPSO, IAGA, IASPEI)**

#### **Ocean Modelling:**

IUGG,

IUGG,

#### **Considering that:**

#### **Noting:**

1. Measurements of the Earth's time varying gravitational field will soon be available, in particular over the oceans, from the CHAMP and GRACE satellite missions; and
2. The gravitational field over the oceans and the pressure at the bottom of the oceans are both sensitive to changes in the distribution of mass within the oceans; and
3. The magnetic field over ocean areas, which is to-day monitored by several satellites, undergoes variations related to activity in the core, induction, and global ocean circulation; and
4. Significant improvement of seismological observations can be achieved by enhanced coverage in the ocean basins.

1. The value of ocean models for current, future and retrospective studies of the influence of the oceans on the Earth's rotation, deformation, gravitational field, and geocenter; and
2. The importance of having available models that conserve mass and are forced by atmosphere surface pressure.

#### **Recognizing:**

1. The major investment in resources required to develop, maintain, and operate the ocean models that are used in such studies; and
2. The value of assimilating data into ocean models.

#### **Recognizing that:**

#### **Recommends that:**

1. The value of assimilating data into ocean models; and
2. The importance of validating and calibrating satellite data and ocean models using *in situ* measurements; and
3. The benefits of enhanced global coverage of information on seismic sources and earth structure.

1. Support for such modelling activities be continued, including support for the development of forecast ocean models that conserve mass and are forced by surface pressure; and

#### **Encourages:**

#### **Recommends that:**

1. Regional and global networks of multidisciplinary geophysical seafloor observatories be deployed in all ocean areas; and
2. Efforts in this regard be coordinated through the International Ocean Network Committee.

1. The continued collaboration between geodetic and ocean modelling groups.

### **Resolution 3**

#### **Integrated Global Geodetic Observing System (IGGOS)**

IUGG,

#### **Recognizing:**

1. The great progress made in the use of space and terrestrial techniques for monitoring the phenomena and processes in the System Earth during the last decades; and
2. The efforts made towards the integration of space techniques in the management of observations, data processing, evaluation, and modelling of the observable parameters, in particular by the different international services; and
3. The urgent need to further develop and strengthen the scientific and organizational collaboration of geodesy within the geosciences; and
4. The necessity of generation and accessibility of consistent products for users in Earth sciences, neighbouring disciplines and society in general.

#### **Considering:**

1. That the International Association of Geodesy (IAG) has taken an initiative towards the realization of IUGG Resolution no.1 adopted at the 22<sup>nd</sup> General Assembly in Birmingham 1999 by installing the integrated Global Geodetic Observing System (IGGOS).

#### **Strongly supports:**

1. The establishment of the IGGOS Project within the new IAG structure as geodesy's contribution to the wider field of geosciences and as the metrological basis for the Earth observation programs within IUGG and the international organizations mentioned in the 1999 Resolution no.1.

#### **Urges That:**

1. Associations cooperate with the new project by providing data, models, products, and know-how useful for IGGOS and the benefit of geosciences; and
2. The participating in the IGGOS project by joining the relevant components in its structure and assisting its symposia and meetings.

### **Resolution 4**

#### **Adoption of the resolutions B1.1 through B1.9 of IAU**

#### **24th General Assembly, 2000**

IUGG,

#### **Noting that:**

1. The International Astronomical Union (IAU) adopted the resolutions appended below at its 24<sup>th</sup> General Assembly in Manchester, England, August 2000, concerning definition of the celestial reference system, time scales, and Earth's precession and nutation; and
2. The celestial reference system and the nutation-precession model have a practical influence on geodetic observational processing and their geodynamic interpretation.

#### **Recognising that:**

1. The International Earth Rotation Service (IERS), a service jointly affiliated with the IAU and IAG has adopted these IAU resolutions in its calculations and publications, but continues in parallel with the calculations in the previous system; and
2. Adoption of these IAU resolutions by the IERS has been undertaken in a way that makes a smooth transition in geodetic time series, almanac publications, and other services relevant to practical navigation, geodesy, and geodynamics; and
3. The full operational implementation of these IAU resolutions may require more time than originally proposed in the resolutions.

#### **Endorses:**

1. Resolutions B1.1, B1.2, B1.3, B1.4, B1.5, B1.6, B1.7, B1.8, B1.9 of the 24th General Assembly of the IAU; and

#### **Recommends that:**

1. The IERS continues to provide users with data and algorithms for the conventional transformations, as well as those recommended by the IAU 24th General Assembly, to ensure continuous operation of astronomical and geodetic systems.

## Resolution 5

### The impact of Biomass-burning aerosols on precipitation (IAMAS, IAHS, IAPSO)

IUGG,

#### Considering:

1. Biomass burning from agricultural practices, household consumption and wildfires produces substantial quantities of aerosol particles that can increase small cloud droplet number concentration.

#### Realizing that:

1. Higher concentrations of small cloud droplets affect their coalescence and the formation of precipitation and thus the water supply.

#### Welcoming:

1. The recognition of the potential effect of all aerosol sources on precipitation by Congress XIV of the World Meteorological Organization, WMO, in May 2003 and its projected actions focused on biomass burning plumes.

#### Urges:

1. The scientific community to undertake systematic studies of the impact of biomass burning aerosol on precipitation formation on all scales. Feedback effects on climate as well as the competing effects of industrial fine particle aerosols and natural coarse particle aerosols such as sea salt and soil dust should be included.

#### Recommends that:

1. A body be established to undertake an international program of study and assessment of the rain related effects of biomass burning in collaboration with WMO and other international organizations; and
2. This body creates a mechanism to assemble the scientific evidence needed to lay the groundwork for a UN sponsored conference on pollution effects on precipitation and hence water supply; and
3. This body reports in the IUGG Newsletters and the GA in 2007 on the steps taken and the progress made.

## Resolution 6

### Data access under the Comprehensive Nuclear Test Ban Treaty

IUGG,

#### Recognising that:

1. Free, open, international exchange of data has been the basis of advances in seismology and related sciences; and
2. The International Monitoring System for the Comprehensive Nuclear Test Ban Treaty (CTBT) provides a significant global network of seismic, infrasound and hydroacoustic sensors; and
3. Article IV Section A.10 of the Comprehensive Nuclear Test Ban Treaty states that "The provision of this Treaty shall not be interpreted as restricting the international exchange for scientific purposes"; and
4. The Federation of Digital Seismographic Networks (FDSN) is prepared to accept and disseminate waveform and parametric data to the scientific community.

#### Resolves that:

1. The Preparatory Commission for the CTBT organization be requested to set in place mechanisms for open scientific access to waveform and parametric data from the International Data Centre with minimal delay. In the case of recognized emergencies due to natural catastrophic events, data should be available in near real time.

## Resolution 7

### Monitoring the Earth with Synthetic Aperture Radar

IUGG,

#### Recognizing that:

1. We are approaching the 50<sup>th</sup> anniversary of the International Geophysical Year which was the dawn of international co-operation in exploration of the Earth from space; and
2. The new technology of Synthetic Aperture Radar Interferometry (InSAR) offers a unique view of surface displacements due to earthquakes, volcanoes, ground water withdrawal, ice streams and flood water levels that are indicators of natural and anthropogenic changes of interest to society and science; and
3. Our host country of Japan has shared its InSAR data with all scientists and thus is a role model for other countries.

#### Noting:

1. With concern that this technology has important military uses and commercial applications and is thus prone to restrictions.

#### Recommends:

1. The open access to all InSAR data; and
2. That space agencies allow unrestricted data sharing among scientists; and
3. The integration of InSAR observations with other geodetic systems; and
4. The co-ordination of InSAR space and ground systems of member countries for optimal scientific utilization of these assets for the benefit of society.

## Resolution 8

### MST/IS Radar in Antarctica

IUGG,

#### Considering that:

1. Planetary waves, atmospheric tides and gravity waves play a key role in the dynamics of the polar middle atmosphere, including the formation and termination of ozone holes and coupling between the lower and upper atmospheres; and
2. Our limited knowledge of the physics of clouds that occur only in the polar stratosphere and mesosphere and which are important for monitoring natural and anthropogenic effects on climate; and
3. Mesosphere-Stratosphere-Troposphere / Incoherent Scatter (MST/IS) radars are the only observational tools capable of quantitative studies of the dynamics of the atmosphere from the troposphere to the ionosphere; and
4. The orographic forcing of waves is different between the hemispheres and that the different separation between the geographic and geomagnetic poles means that the impact of the dynamics of the middle and upper atmospheres will be different between hemispheres; and
5. Substantial solar wind energy enters through the magnetosphere into the polar ionosphere and excites aurora, strong currents, winds and waves through plasma-neutral coupling; and
6. Combined incoherent scatter / MST radar observations at conjugate points in the polar regions provide an unparalleled tool to study these complex processes.

#### Noting that:

1. There are no MST/IS radar systems in the entire Antarctic region, which leaves a major gap in the global radar network.

#### Recommends that:

1. MST/IS radars be established at the earliest opportunity in the Antarctic region in order to fill this gap and provide invaluable information to the scientific community.

## **Resolution 9**

### **Release of Airborne & Marine Magnetic Data**

IUGG,

#### **Considering:**

1. The importance of magnetic anomaly mapping for global geological and tectonic interpretation.

#### **Noting:**

1. The existence of numerous sets of low-level airborne and marine magnetic anomaly data, and the rapid progress made in storing and compiling such data; and
2. That many data sets remain classified or confidential, even after most have outlived their original purpose; and
3. That the situation has not significantly improved following IAGA resolution 3 of 1997.

#### **Recommends that:**

1. The custodians of such data sets develop suitable mechanisms to release them into the public domain as soon as possible.

## **Resolution 10**

### **Inter-operability and Protection of Global Navigation Satellite System signals**

IUGG,

#### **Noting:**

1. The extensive use of the Global Positioning System (GPS) over the past decade and incredible potential of combining multiple Global Navigations Satellite Systems (GNSS), anticipated by the addition of European GNSS Galileo; and
2. The broad user base of the GPS/GNSS system within IUGG and sister organizations as a tool for science, multidisciplinary applications and societal benefits.

#### **Recognizes:**

1. The need to foster and protect GNSS system.

#### **Recommends that:**

1. GNSS providers are strongly encouraged to cooperate and coordinate closely to
  - Ensure inter-operability and compatibility in developing, deploying and operating the systems now and in the future.
  - Maximize common frequencies and signals.
2. Scientists in IUGG and sister organizations are encouraged to engage in continual activities to protect the signal and spectrum of collective GNSS, to secure long-term availability of these satellite signals.

## **Resolution 11**

### **Courtesy Resolution**

The International Union of Geodesy and Geophysics Gratefully records its appreciation for the organization, arrangements made, and generous financial support for the XXIII General Assembly. IUGG particularly acknowledges the gracious presence of their majesties the Emperor and the Empress of Japan for their warm welcome and message they extended to all participants and for their informal interaction with delegates from around the world. On behalf of all participants, the Council expresses its warm thanks to the Japanese National Committee for IUGG, to the Science Council of Japan and 16 Japanese geophysical societies, to the Japan Marine Science and Technology Center, to the Local Organizing Committee, to the Program Committee, and to all others involved in making the XXIII General Assembly a success and an enjoyable meeting in Sapporo.