

**Eleventh Session of the UN Committee of Experts on  
Global Geospatial Information Management  
23, 24 and 27 August 2021**

**Report: UN-GGIM Geospatial Societies (formerly the Joint Board of Geospatial Information Societies). <http://www.fig.net/jbgis/>**

### **Summary**

This document provides a report from the UN-GGIM Geospatial Societies Thematic Group (formerly the Joint Board of Geospatial Information Societies - JBGIS) to the Eleventh Session of the UN Committee of Experts on Global Geospatial Information Management, 23, 24 and 27 August 2021, (virtual format).

### **UN-GGIM Geospatial Societies (UN-GGIM GS)**

The UN GGIM Geospatial Societies Thematic Group is a coalition of the Presidents, General Secretaries or equivalent office bearers or their nominees that lead recognized international organisations involved in the coordination, development, management, standardisation or regulation of geospatial information and related matters. These organisations are:

- IEEE Geoscience and Remote Sensing Society (GRSS)
- International Association of Geodesy (IAG)
- International Cartographic Association (ICA)
- International Federation of Surveyors (FIG)
- International Geographical Union (IGU)
- International Map Industry Association (IMIA)
- International Society for Digital Earth (ISDE)
- International Society of Photogrammetry and Remote Sensing (ISPRS)
- International Union of Geodesy and Geophysics (IUGG)

UN GGIM GS meets formally once each year, typically when the UN-GGIM Committee of Experts meet, and informally when schedules permit. This report provides an update on the activities of the organisations listed above where they have been provided.

### **IEEE Geoscience and Remote Sensing Society (GRSS)**

No report received

### **International Association of Geodesy (IAG)**

#### **Activities and Areas of Work**

The main activities in the period was greatly affected by the COVID-19 pandemic. Almost all planned meetings, symposia and workshops were either cancelled, postponed or arranged virtual. The most notable outcome was the quadrennial publication, Geodesist's Handbook, published as the November issue of the Journal of Geodesy. This open access publication summarizes the structure, governing and plans of the IAG, including all its commissions, committees, services and other sub-entities.

The IAG General Assembly, the Council of national delegates, the Executive Committee (EC), and the Office carry out the administration of IAG. The IAG Council consists of the delegates appointed by the Adhering Bodies of the IUGG member countries and is responsible for governance, strategic policy and direction of the IAG. The Council meeting is organized at the General Assembly every four years, last

time 2019 in Montreal with the election of IAG Officers for the period 2019-2023 and a Review of the Statutes and Bylaws. The IAG Executive Committee (EC) had a virtual meetings in 10/2020, 04/2021 and 06/2021. The IAG Bureau consists of the IAG President, the Vice President and the Secretary General. It meets monthly by teleconferences to administer the day-to-day affairs.

The scientific structure of IAG comprises four Commissions (Reference Frames, Gravity Field, Earth Rotation and Geodynamics, Positioning and Applications), three Inter-Commission Committees, one project, 12 International Scientific Services, the Global Geodetic Observing System (GGOS), and the Communication and Outreach Branch (COB). The Services generate scientific products by means of Operation, Data and Analysis Centers. The GGOS is IAG's observing system to monitor the geodetic and the global geodynamic properties of the Earth as a system. GGOS works with the IAG Services to facilitate the production of geodetic products and to promote its use to the scientific community, policy makers and the public. The COB provides communication, public information and outreach links, in particular via the IAG Website (<http://www.iag-aig.org>) and the monthly Newsletters.

The Scientific Assembly 28.6-2.7, 2021 was organized as a virtual meeting. The organizational responsibility was with the Chinese Society for Geodesy, Photogrammetry and Cartography at Beijing. A total of 1269 participants and 613 presentations made this event the biggest IAG meeting ever.

The contribution of IAG to the Global Geodetic Reference Frame (GGRF) within the United Nations' Global Geospatial Information Management (UN-GGIM) has been an essential activity, in particular in view of IAG's involvement in the UN-GGIM Subcommittee on Geodesy and planning for the Global Geodetic Center of Excellence.

### **Partnerships and Regional and International Collaboration**

Besides the close cooperation with the other IUGG Association and the UN-GGIM relation, the official liaisons of IAG include

- Advisory Board on the Law of the Sea (ABLOS)
- Group on Earth Observation (GEO)
- International Science Council (ISC) Commission on Space Research (COSPAR)
- International Astronomic Union (IAU) Commission A2 "Rotation of the Earth"
- International Standards Organization (ISO) TC 211
- United Nations Initiative on Global Geospatial Information Management (UN-GGIM)
- UN-GGIM: Geospatial Societies (previously Joint Board of GIS, JBGIS)
- United Nations Office for Outer Space Affairs (UNOOSA)
- UNOOSA Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)
- UNOOSA International Committee on Global Navigation Satellite Systems (ICG)

Representatives of IAG will participate in the meetings of these bodies and will report to the IAG EC. The reports of all IAG components (Commissions, Inter-commission Committees, Global Geodetic Observing System (GGOS), IAG Office and Communication and Outreach Branch will be published in the IAG reports.

### **Priority Issues, Challenges and future plans**

A continuing priority is the IAG involvement in the Global Geodetic Reference Frame (GGRF) Subcommittee on Geodesy (SCoG) of the United Nations' Global Geospatial Information Management (UN-GGIM). IAG contribution to the SCoG and the Global Geodetic Center of Excellence (GGCE) will be one of the central targets in the coming years. Priority issues in this respect are the improvement and sustainability of the geodetic infrastructure that underpins all geodetic reference products provided by IAG Services.

The common research with other IUGG Associations is another priority issue, e.g. in joint (sub-) commissions. Research in marine geodesy, climate change, and a Project on New sensors and technologies (e.g. optical and atomic clocks, quantum sensors) shall be intensified, e.g. in the new inter-commission committee adopted in the General Assembly. IAG Study and Working Groups are dedicated to address clearly defined well-focused scientific topics of limited scope within the field of the IAG's Commissions, Services and the Global Geodetic Observing System (GGOS).

The technical and scientific development of geodesy is continuing in the next decade. Space techniques are improving in quantity and quality. New sensors (e.g. optical and atomic clocks, quantum sensors) allow measurements of new parameters, and powerful computers extend the horizon of processing huge amounts of data. The objective of geodesy expanded to the observation and quantification of global change (climate and dynamics of the solid, fluid and gaseous Earth). Increased demands of accuracy and real-time applications will cast new challenges in the future.

One of the challenge in coming year is to recover and re-establishment of several lost opportunities due to the COVID-19 pandemic. On organizational level effects are perhaps smaller, but to improve the situation of young scientists and especially the position of less developed countries will be a challenge.

## International Cartographic Association (ICA)

### Activities, Areas of Work

The International Cartographic Association (ICA), founded in 1959, has as its aim to promote the discipline of cartography internationally. It offers its expertise and knowledge of technological developments to other organizations via events, meetings, workshops, and publications. Its activities happen through the work of its Commissions and Working Groups. These deal with a wide range of topics that cover much of the discipline.

During this period from September 2020 to July 2021, the ICA Executive Committee (EC) met virtually in October, February, and June due to the COVID-19 pandemic. In October, the ICA EC also met with the Commission and Working Group Chairs virtually to advance the programs of the ICA. With travel restrictions, events have increasingly moved to virtual environments which poses different challenges with global time zones.

The five new Working Groups for this term are focused on specific priority areas of interest not currently covered by the 28 Commissions. They include: Cartographic Body of Knowledge; Cartography and Sustainable Development; Digital Transformation of National Mapping Agencies; History of the ICA and; New Research Agenda in Cartography. The ICA is focusing initial attention on these topics to assure a healthy and successful start during challenging times.

The work program of the UN-GGIM serves as an influence to applicable activities within the ICA. High priority topics include the Integrated Geospatial Information Framework and the Sustainable Development Goals. Examples are offered below.

Continued recent publications of the *International Journal of Cartography*, the *ICA News*, eCarto News on the ICA website, and articles in GIM and ArcNews.

### Partnerships and Regional and International Collaboration

The ICA works together with the other geospatial societies with the UN-GGIM. In the ISC (International Science Council), we work together with the Geo-unions. Recently, the ICA participated in the ISC virtual Extraordinary General Assembly as well as an information session on the officer nomination process. Via our Commissions and Working Groups we are active in ISO/TC 211 and OSGeo. The ICA recently joined the OGC as an Associate Member.

Several keynote addresses were made virtually in cartography and GIScience so that professional societies indicate that their “lights are on” and that the work continues. During this period, keynotes were made at EuroCarto 2020, European Forum on Geography and Statistics, Argentina’s Tenth Congress on Cartographic Science, AutoCarto 2020 and the Saudi Geographical Society.

Participated in the Eight Plenary Meeting of UN-GGIM Arab States, Online Meeting and prepared two presentations that emphasized the value of the ICA-UN book *Mapping for a Sustainable World* and on the importance of integrating geospatial and non-geospatial data.

The ICA accepted an invitation by the UN to serve as a member of the newly formed International Advisory Committee for the recently formed UN-Global Geospatial Knowledge Information Center (UN-GGKIC) hosted by the government of China in Deqing and attended the first introductory meeting.

At the request of the UN-GGIM Secretariat, the ICA assisted in forming a High-Level Group (HLG) comprised of executives from Member States for governing the Integrated Geospatial Information Framework and prepared a draft strategic plan for the HLG’s consideration.

### **Priority Issues and Challenges**

The ICA is planning its 30<sup>th</sup> International Cartographic Conference (ICC). Originally scheduled for July 19-23, 2021, the dates were extended to December 14-18, 2021 in Florence Italy. The ICC is now a hybrid conference to accommodate both in-person and virtual participation. Details about the conference themes, registration, scholarships and other conference specifics are regularly updated on the conference website at <https://www.icc2021.net/>. The Local Organizing Committee received the largest number of full paper submissions for an ICC and are currently reviewing abstract submissions for the December conference.

With COVID-19, the ICA website serves as the principal communication channel for timely updates. Periodic blogs, news updates, and future activities are made available on the website in addition to all of the various programs, activities, and work by cartographers and GIScientists.

The ICA is very proud to announce the completion of a book project in association with the United Nations that addresses the Sustainable Development Goals called ‘Mapping for a Sustainable World’, which is a follow-on to the former SDG poster project. This publication project has been a close collaboration between the ICA and the United Nations Geospatial Information Section. It is currently available as an epub at <https://unite.un.org/news/mapping-sustainable-world>. Limited printed copies will be made available for distribution in the foreseeable future, including registrants of the ICC in Florence and attendees at next year’s GGIM-12 meeting. This project is viewed by the ICA as an anchor for future ICA activities including webinars, training, and new connections for ICA Commissions and Working Groups as they advance their programs. The ICA and UN convened the first highly successful webinar on the book in July 2021.

A second ICA publication was completed during this period called “The world drawn by children” published by the National Geographic Institute of Spain. The book is a collection of children’s maps from the Barbara Petchenik international competition from the 2017 and 2019 ICCs. This is a wonderful collection of the creative views of children from around the world.

### **Perspectives and Future Plans**

Looking toward the immediate future, the ICA is focused on a successful International Cartographic Conference in Florence in December. We see this as a renaissance opportunity to push through the

challenges of the pandemic while offering opportunities and new directions for our discipline, our people, the organization and even the businesses that will benefit from such an event.

The ICA is also looking toward innovative ways to advance the work of the Commissions and Working Groups. As evidenced by the recent publication and first webinar on “Mapping for a Sustainable World”, cartography offers important opportunities to support social, economic, and environmental needs, plans, and future developments.

## International Federation of Surveyors (FIG)

### **Activities, Areas of Work – Achievements**

Like for all others the years 2020 and 2021 were very different. With the postponed General Assembly 2020 and cancelled Working Week it was clear to FIG that there should be some kind of event in 2021 and also a General Assembly. The election of two new vice presidents were postponed to 2021 and FIG council decided that the current Vice President would continue until the new were elected.

The first FIG e-Working Week took place 20-25 June 2021 and was organised together with the local organising committee from the Netherlands, who were originally going to organise the Working Week in 2020. They had agreed to continue the preparations also despite the fact that in October it became clear that the event in 2021 had to be entirely virtual. 1300 online participants met at an event that focused not only on technical sessions but also on elements that are normally seen at face-to-face events such as networking, connecting attendees and giving a community feeling. Around 80 sessions were held in an online environment under the overall theme “Smart Surveyors for Land and Water Management – challenges in a new reality”. Institutional partners were UN-GGIM, UN-Habitat/GLTN and FAO.

Only online meetings were possible during this past year, however, FIG President Rudolf Staiger managed to participate in the 11th Training Summer School in Naples Italy.

The fact that it is not possible to meet in person did not prevent work to be done and it became clear that online meetings are useful as a supplement to meeting in reality.

FIG Commission 7 on cadastre and land management held its yearly meeting online and 11 sessions were organised over 4 days of which one session was in cooperation with FIG Commission 2 and another session was held in Chinese/Mandarin. The overall theme of the conference was Building community resilience: Urban-rural land linkages and strategies to deal with COVID-19

FIG Commission 1 – Professional Standards and Practice held a workshop on Professional Standards and Practice of Surveying and Mapping in the countries along the Belt and Road Routes which was held in Deqing, China also with online participation.

Commissions 3 (Spatial Information Management and 8 (Spatial Planning and Development) are preparing a workshop on “Spatial information management to optimize Spatial planning and Sustainable development” held as part of the yearly Summer School in Italy (Prato).

Internally a work on the governance of FIG has been carried through by a task force led by FIG Vice President Diane Dumashie. The Task Force presented their final report to the General Assembly 2021.

*There are two new FIG publications:*

No 76 – [International Boundaries on Unstable Ground](#)” – which is a follow up publication from publication 59: [International Boundary Making](#), a FIG report edited by Haim Srebro.

No 77 - [Good Practice for Resilience Planning to Address Water Governance Challenges in Africa](#)  
Which is the work of FIG Commission 8 - Spatial Planning and Development, Working Group 8.5 on African Water Governance.

Finally in the printer is currently 7 volumes on Three Millenniums of Measurement of Earth written and compiled by Jan De Graeve and Jim Smith, on Notes on the History of Determining the Size and Shape of the Earth Using Meridian Arcs (volumes 1-5) and Meridian Arcs in East & Southern Africa with Emphasis on the Arc of the 30th Meridian (volume 6) and Connection Between the Struve Geodetic Arc and the Arc of the 30th Meridian (volume 7).

100 special edition copies are being prepared and will be sold. All income will go in full to FIG Foundation, and a generous contribution from Trimble has secured the printing costs. The authors have hereby also given this amazing work covering 35 years of research, 3,000 pages and over 350 illustrations free of charge to FIG.

### **Partnerships and Regional and International Collaboration**

Through our international collaboration with FIG members, the sister professional associations, regional professional bodies as well as UN bodies and the World Bank, FIG aims to transform all surveyors into global surveyors. Surveyors who will have a global education for the progress of surveying in all its fields and applications everywhere; but also surveyors who will have an understanding of global challenges and will be able to develop the profession for the betterment of all parts of our world.

FIG works closely together with several UN organizations. We have diverse relationships with our partner and stakeholders. This allows us to offer our professional expertise in all kind of projects. At the same time, it gives us the opportunity to amplify not only the voice of our federation but also our entire profession.

Together with FAO a webinar was held on the FAO Legal Guide and its Application at the Country Level with more than 550 online participants.

GLTN held its partners meeting in December, and at this meeting FIG was elected to continue in the position of co-chair of the GLTN International Professional Bodies Cluster together with Arab Union of Surveyors. The co-chairs also attend the steering committee meetings. At the GLTN partners meeting FIG organised a well attended and successful side event on Fit-for-Purpose Land Administration Implementation. The International Professional Bodies Cluster concentrated on two activities:

1. Urban Rural Land Linkages – URLL – that has resulted in a report that was launched at the FIG e-Working Week 2021
2. Valuation of Unregistered Land – a manual was published and launched at the FIG e-Working Week 2021 where also the next steps on how to implement this at a national level was discussed.

### **Priority Issues and Challenges**

“Surveying is a modern profession acting globally for a good and better infrastructure of our society and our planet earth. FIG wants to keep and even improve its role as the premier non-governmental organisation that is representing the interests of all surveyors worldwide.” This is the vision described in the work plan.

In a direct relationship to our vision is the motto: “Volunteering for the future”. It sounds simple and trivial, but it is touching a very crucial point: Although we have an Office (in Denmark), FIG is primarily an organisation of volunteers.

### **Perspectives and Future Plans**



The motto for this term is “Volunteering for the Future” aiming both internally to be certain that there are representatives working on the FIG agenda around the world, and externally that the volunteers work for the future of FIG. Another aim is to develop a long-term-strategy for FIG, called FIG 2028.

Over the last 30 years, FIG became a globally acting organisation representing the full range of a modern surveying profession. To keep the position as the premier international representation of surveyors, FIG cannot ignore the dramatic changes in technology and society that have occurred in the last decades in order to stay relevant for our profession and society.

FIG will continue to work in the commissions, with sister organizations and with FIG members on the UN Sustainable Development Goals. Surveyors and their products play an essential role in the majority of the 17 SDGs. To respond to this, FIG Council has established a Task Force to work on SDG's, hereunder to identify the professional fields in which surveyors can contribute the most to fulfilling the SDG's, to propose ways in which the surveying community can contribute, and to coordinate the SDG activities. All commission chairs published together with the task force and article in GIM magazine on FIG and the SDGs.

Maintaining the significance of the surveying profession remains an important target for FIG. Council will continue to keep and strengthen our partnership with UN agencies, the World Bank, other international agencies, and sister organizations.

The Volunteer Community Surveyor Program (VCSP) is an innovative volunteer programme that intends to be a powerful driver for both social impact and professional development. The VCSP leverages on the skills, experience, talents and education of young surveyors and matches these competences with the needs of GLTN, particularly in GLTN's county-level implementation plans and programmes. The VCSP is run by the FIG Young Surveyors Network, in partnership with the Global Land Tool Network (GLTN) which is facilitated by UN-Habitat. VCSP is a global initiative that started in late 2017 when the FIG Young Surveyors Network worked with the GLTN and FIG to deploy 13 Volunteer Community Surveyors (VCS). The focus of that Pilot was to work with GLTN's NGO partners to implement the Social Tenure Domain Model, which is a pro-poor land information tool. It bridges the gap between formally registered land and customary/informal land rights. A strategy has been made, and during the coming years, VCSP will scale up, however somewhat delayed by the fact that currently travelling is restricted.

### **Matters/Issues for Consideration**

Some years ago FIG proposed that an issue for further consideration might be “How to increase fruitful cooperation and how to join efforts within the UNGGIM Geospatial Societies to further improve the cooperation among the Geospatial Societies and to support UN-GGIM”. With the development of IGIF and the implementation at a national level there is a strong urge to get all members on UN-GGIM-GS more involved in making these future trends come alive.

## **International Geographical Union (IGU)**

### **Activities and Areas of Work**

The IGU was formally established in Brussels in 1922. However, the history of international meetings of geographers is much longer. The first of a series of congresses (IGC) met in 1871 in Antwerp. Several IGU Commissions have been focusing on GGIM tasks and activities. **IGU Commission on Modeling Geographical Systems** organised 2nd Water Information Modeling and Comprehensive Simulation Forum at School of Geography, Nanjing Normal University, China on 26<sup>th</sup> December 2020. This forum discusses the cutting-edge progress and scientific breakthroughs related to water information modeling and comprehensive simulation, and provides researchers in this field with a platform to display scientific research results, exchanges academic ideas, inspires research thinking, enhances academic friendship, and strengthens inter-university cooperation. This forum enhanced the

communication of scholars in the field of water information modeling and promoted the sharing of hydrological models.

**IGU Commission on Hazards and Risks** supported the three-day online seminar: Machine Learning Driven Use of Satellite Imagery for Landslide Detection, on October 7–9, 2000. This thematic online seminar organized by Gorgan University of Agricultural Sciences and Natural Resources, Iran. He gave a series of talks on quantitative remote sensing applied to optical and SAR amplitude imagery. Our commission became an official supporter of the seminar.

**IGU Commission on Modeling Geographical Systems** organised Second National Forum on Geographic Modeling and Simulation-Training Course on Domestic Geographical Analysis Model, Nanjing Normal University, January 16-17, 2021. Apart from IGU Secretary General R.B.Singh, Several Chinese and Australian scientists addressed the Forum. Based on the current situation of the field of geographical modeling and simulation, this forum is committed to providing a platform for geographical modelers to exchange academic ideas, inspire research thinking and enhance academic cooperation. It also takes this opportunity to launch the training course of geographical analysis model, in order to break the barrier of popularization and cooperation of geographical analysis model, and promote the development of geographical analysis model and the establishment of independent geographical model system ecosystem

### **Partnerships and Regional and International Collaboration**

Multi-commissions collaborative Conference is organized in cooperation with several IGU Commissions such as Commission on Future Earth, Commission on Geo-Heritage, Commission on Tourism, Commission on Local and Regional Development, Commission on Bio Geography and Biodiversity, Commission on Mountain Studies, Commission on Karst.

The IGU-India International Conference 2020 on “Global to Local Sustainability & Future Earth” being organized by the Department of Geography, Mohanlal Sukhadia University, Udaipur, Rajasthan, INDIA on 18-20 December, 2020. The conference was joined by more than 800 of participants from about 40 countries including Afghanistan, Kazakhstan, Algeria, Kenya, Argentina, Kyrgyzstan, Australia, Libya, Bangladesh, Lithuania, Benin, Macedonia, Canada, Mongolia, Myanmar, Nigeria, China, Philippines, Egypt, Poland, Ethiopia, Qatar, Haiti, Romania, Hungary, Russia, India, South Africa, Indonesia, Thailand, Iran, United States, Italy, Vietnam, Japan, Zambia, Zimbabwe, etc. Three days’ conference is held in Mohanlal Sukhadia University. More than 800 attendees, paper presenters, keynote and numerous panel discussion, academic and social community have benefited in many ways from this conference. More than 200 scientific papers were presented by authors from all participated countries.

**Collaboration with ISC GeoUnions:** IGU got invitation from Prof. Orhan Altan, Honorary Member of ISPRS, to nominate two people from IGU to the ISC GeoUnions Committee on Disaster Risk Reduction. After discussion and exchange of ideas, it was agreed to nominate Dr. Peijun Shi, President, Qinghai Normal University, China, and Prof. R.B. Singh, Secretary-General and Treasurer of IGU (IGU EC representative). Singh informed that the GeoUnions Committee on DRR has prepared a policy brief initiated by Singh which is being circulated at the meeting. A second, ocean-related, policy brief is being prepared in line with the United Nations Decade of Ocean Science for Sustainable Development.

### **Priority Issues and Challenges**

IGU Springer Series on Advances in Geographical and Environmental Sciences is bringing out two volumes on contemporary challenges:



**COVID-19 Pandemic Trajectory in the Developing World**, Editors: Mishra, Mukunda, Singh, R. B. (Eds.). This volume discusses the multidimensional impacts of COVID-19. We are witnessing an unprecedented global outbreak of COVID-19, which has been devastating in its consequences. Beyond the acute health hazard, the pandemic has carried with it other threats for mankind associated with the human economy, society, culture, psychology and politics. Amidst these multifarious dimensions of the pandemic, it is high time for global solidarity to save humankind. Human society, its ambient environment, the process of socio-economic development, and politics and power – all are drivers to establish the world order. All these parameters are intimately and integrally related. The interconnections of these three driving forces have a significant bearing on life, space and time. In parallel, the interrelationship between all these drivers is dynamic, and they are changed drastically with time and space. This book provides multidisciplinary contributions for expressing the solidarity of academic knowledge to fight against this global challenge. It is crucial that there should be an on-going discussion and exchange of ideas, not only from the perspective of the current times but keeping in view the preparedness for unforeseen post-COVID crises as well.

**Sustainable Climate Action and Water Management**, Editors: Mishra, R K, Singh, R. B., Dubey, Anupama. The volume discusses various issues and approaches relating to water resources, climate change and sustainability. This book discusses various issues relating to water resources, climate change and sustainable development. Water is the main driving force behind three major pillars of sustainable development: environmental, social and economic. As stated in the United Nations Sustainable Development Goals, development of these pillars rests on the availability and management of resources to fulfil the demand for water. By identifying the various challenges in the context of water resources and climate change, the book offers insights into achieving a better and more sustainable future. It provides a unique forum for practitioners and academics to exchange ideas on emerging issues, approaches, and practices in the area of water resources, climate change, and sustainability, while also presenting valuable information for policymakers on the changing contours of water management and climate change mitigation. As such it is a useful resource for decision-makers at the local as well as the global level.

### **Perspectives and Future Plans**

Globally, the concerns for the environment and the human well beings have increased due to the threats imposed from the climate change & disasters, environmental degradation, pollution of natural resources, water scarcity and proliferation of slums. Finding appropriate solutions to these threats/challenges are not simple as these are generally complex and require state-of-the-art technology for the collection, measurement, handling, analyzing large volumes of different data sets. However, the recent advances in sensor technology, coupled with the rapid development of computational power, have greatly enhanced our abilities to capture, store and analyze the surrounding physical environment. *Geo-intelligence for Sustainable Development* explores different dimensions of GI technology in developing a computing framework for location-based, data integrating earth observation and predictive modelling to address these issues at all levels and scales. This book provides an insight into the applications of GI technology in different fields of spatial and social sciences and attempts to bridge the gap between them. IGU planning to bring Innovations in geospatial technology such as miniature sensors, Cloud and Artificial Intelligence, duly augmented by delivery platforms like small satellites and drones. Today, the most location offers the much needed fourth pillar (along with AI, IoT and Big Data) to the Fourth Industrial Revolution, enabling disruptive innovations and driving smart solutions for the future generations who are facing challenges of growing consumerism and depleting resources.

**Case Study of Geospatial Policy in India** : The Government of India has announced liberalised policy for geo-spatial data. By revising the geo-spatial guidelines, the government has taken a historic decision that will lead to a One Lakh Crore Rupees Geo-Spatial economy. This will enable science to become a public movement and also to deliver a New India. The next generation of technologies will

use hyper-resolution maps. Availability of comprehensive, highly accurate, granular and constantly updated representation of Geospatial Data will significantly benefit diverse sectors of the economy and will significantly boost innovation in the country and greatly enhance the preparedness of the country for emergency response. With the advent of publicly available geospatial services, a lot of Geospatial Data that used to be in restricted zone are freely and commonly available now and some of the policies/guidelines that used to regulate such information have been rendered obsolete and redundant. Minister of Science and Technology said “All geospatial data produced using public funds, except classified geospatial data collected by security/law enforcement agencies, will be made accessible for scientific, economic and developmental purposes to all Indian Entities and without any restrictions on their use. Government agencies and others need to collaborate and work towards open linked geospatial data”.

## International Map Industry Association (IMIA)

Education and capacity building, and networking and collaboration continue to be important components of the International Map Industry Association (IMIA) since our last report.

- The new International Map Industry Association organizational restructuring is now completed and is described in the first article in the [January Newsletter](#) and the [new path forward details are in last November’s Annual meeting](#) where the decision was formally approved by membership. The highlight of this is the move to a representative board of the organization’s now unified international membership.
- Networking and collaboration - The new Affiliations Committee announced IMIA has entered into a new affiliate partnership with the British Cartographic Society (BCS), in the [second article in the newsletter](#) with additional affiliate relationships expected later in 2021.
- Education and capacity building - The 2020 Mapping Leaders Virtual Forum Series last Sept, [Government Session link is here](#) and [video of the session](#) is at the bottom (Networking hour afterwards is not included, as it was a member benefit and not publicly available). This was one of five successful Virtual Events put on by the IMIA in 2020 and are expected to be a core value offering for IMIA membership and the international community at large going forward.
- IMIA has hosted 4 virtual events during the first half of 2021:
  - [Visualizing the Uncertain Future with GIS](#) (February 2021)
  - [Where Cartography Meets Industry](#) (March 2021)
  - [State of the Map Industry](#) (May 2021)
  - Outdoor Mapping – A Digital Transformation (June 2021)
- Education and capacity building - Upcoming events include:
  - Let’s Talk About Maps with BCS and IMIA (July 20 – joint event with the British Cartographic Society)
  - Mapping Leaders Forum (3-part series in November)
  - In-person events are scheduled for Washington, DC and Denver, Colorado in 2022
  - Participation in Frankfurt Bookfair 2021 and Annual London Networking event coinciding with the London Bookfair
  - More information will be available in our [Events Section of our website](#) soon.
- Networking – Our virtual events have included an hour of networking within small groups giving attendees a chance to meet each other, continue the conversation about the event’s topic and build relationships.
- Content – IMIA produces a newsletter every other month that includes industry news, member milestones and highlights sponsors and members.
  - [May 2021](#)
  - [March 2021](#)
  - [January 2021](#)

## International Society for Digital Earth (ISDE)

### **Activities and Areas of Work**

The International Society for Digital Earth (ISDE) was founded in Beijing China in 2006. ISDE is an international organization principally promoting academic exchange, science and technology innovation, education, and international collaboration towards Digital Earth. The ISDE Secretariat is hosted by Aerospace Information Research Institute, Chinese Academy of Sciences.

### **ISDE Working Groups**

At the council meeting of January 13, 2021, ISDE working group chairs reported the progress of working group preparation and follow up work. For selected thematic, the relevant scientific and technical work of ISDE is to be strengthened through the ISDE Working Groups (WG). Each ISDE WG will define its own internal organization and is co-chaired by leading scientists joined with expert members who are interested in further advancing the relevant work. Each of the ISDE WG has its own working scope and objectives with methodologies to achieve them. These groups also design WG long-term or short-term plans in order to implement the aims of the associated working group. It is desired that from time to time the ISDE WG organizes a dedicated workshop and/or has a dedicated Session at an ISDE event.

At present, 6 working groups are established:

- 1) WG1 - Science and Technology for Digital Earth
- 2) WG2 - Industry Engagement for Digital Earth
- 3) WG3 - Digital Earth Governance and Ethics
- 4) WG4 - Citizen Engagement and Empowerment in Digital Earth
- 5) WG5 - Education and Capability Building for Digital Earth
- 6) WG6 - Contribution of Digital Earth to Sustainable Development Goals

For more information about the chairs, scope, objectives and methodology, ongoing and planned activities of these working groups, please visit website at: <http://www.digitalearth-isde.org/list-92-1.html>

### **Presentations from the 8th Digital Earth Summit shared in YouTube Channel**

The ISDE Digital Earth Summit 2020 YouTube Channel shares videos of the presentations from 8th Digital Earth Summit, held from November 30 to December 2, 2020 under the slogan "Digital Earth in a Changed World: Challenges and Opportunities." For user convenience, the speeches of individual participants, roundtables, opening and closing ceremonies of the Summit, and full recordings of all three days are presented separately.

Also, the summit has been reported on:

<http://desummit2020.org/digital-earth-in-a-changed-world-challenges-and-opportunities/>

### **Preparation of the 12<sup>th</sup> International Symposium on Digital Earth**

#### **1) ISDE Video Competition**

On January 15, 2021, ISDE secretariat launched the Call for Participation to the Video Competition, with the focus on the followings:

- a. Digital Earth technologies supporting global problems and >SDGs
- b. Location based technologies facilitating public participation in Digital Earth contexts
- c. Geospatial Citizen Science enabling understanding of Earth and current problems
- d. The value of Cloud technologies for public engagement in Digital Earth
- e. Geomedia for communication and education in regional and global issues
- f. Earth Observation monitoring state and dynamics of geospatial phenomena

The video competition is a part of ISDE Youth Forum of the 12<sup>th</sup> International Symposium on Digital Earth. The winner of the video competition will be awarded to Ms. Perizat Imanalieva from Kyrgyzstan.

#### **2) Bureau Meetings with ISDE12 Host Organizers**

In order to have the 12<sup>th</sup> International Symposium on Digital Earth well organized, ISDE Bureau organized several meetings with ISDE12 local organizers, Prof. Josef Strobl and Prof. Thomas Blaschke. On the 5<sup>th</sup> July, 6 sessions of workshop will be organized. On 6<sup>th</sup> to 8<sup>th</sup> July, the 12<sup>th</sup> ISDE will be held. Due to the influence of COVID-19, a hybrid workshop and symposium will be organized. More detailed results of this symposium will be provided in next report.

### **ISDE Publication Report**

ISDE publishes two international peer-reviewed academic journals – the *International Journal of Digital Earth* (IJDE) and the *Big Earth Data* (BEDJ). IJDE is a monthly issue. On June 30, it received Journal Citation Report for 2020 with an increased Factor from 3.097 (2019) to 3.538. For IJDE's

2020 CiteScore, that is 6.6, with ranking: 17 / 186 Earth and Planetary Sciences (Q1), 85 / 389 Software (Q1), 116 / 693 Computer Science Applications (Q1).

BEDJ has made considerable progress in 2020. It has been accepted by EI Compendex and GeoBase in March, and ESCI in April. It received 2020 CiteScore: 6.5, and ranking: 9 / 52 (Q1) Computers in Earth Sciences, 121 / 693 (Q1) Computer Science Applications.

## International Society of Photogrammetry and Remote Sensing (ISPRS)

### Activities, Areas of Work – Achievements

ISPRS has been continuing to run its existing Initiatives funded by ISPRS. The year of 2020 has brought results of the Education and Capacity Building Initiatives (2020 ECBI 2020). The reports from this Initiative can be found at <https://www.isprs.org/society/ecbi/default.aspx>.

The year of 2021 call is dedicated to ISPRS Scientific Initiatives (SI) 2021 program. A brief summary of these projects will be available in January 2022 since most of the projects are one-year projects. The period from August 2020 drastically changed by decisions of the world politicians was divided into two parts – autumn with many workshops, scientific meetings and summer schools. Since March 2020 many events were cancelled at the beginning and later many of them held virtually. The complete list of proceedings can be found at <https://www.isprs.org/publications/archives.aspx> and <https://www.isprs.org/publications/annals.aspx>,

ISPRS organises its Congresses including the General Assembly in the quadrennial period. Their original date – June 2020 was postponed to July 2021. However, all accepted papers in 2020 were virtually presented during the XXIV ISPRS Congress the virtual 2020 edition (31 August – 2 September 2020). The [XXIV ISPRS Congress, the digital 2021 edition](#) is again held virtually without the General Assembly (July 5-9, 2021). A hybrid version of the [XXIV ISPRS Congress the 2022 edition](#) will take place in Nice in June 6 – 11 in 2022.

ISPRS has started a new activity called [Keynote Speaker Webinar Series](#) – open virtual presentations of top ISPRS Scientists which is free of charge. All webinars are announced at the ISPRS [web site](#).

### ISPRS Journals

ISPRS publishes three scientific journals: a hybrid one - the [ISPRS Journal of Photogrammetry and Remote Sensing](#) (IF=8,979), open access one - the [ISPRS International Journal of Geo-Information](#) (IF = 2,971), and the [ISPRS Open Journal of Photogrammetry and Remote Sensing](#) which was established in January 2021.

### Partnerships

The cooperation has been far less intensive due to the covid situation. It is possible to mention a cooperation of ISPRS and other members of ISC (International Science Council) GeoUnions. Gi4DM (Geoinformation for Disaster Management) conference coordinated by the ISPRS working group ICWG III/IVa Disaster Assessment, Monitoring and Management of the ISPRS Technical Commission IV was virtually organised as another conference within the GI4DM series in cooperation with ISC GeoUnions under the name: Gi4DM 2020 – 13th GeoInformation for Disaster Management. Members of GeoUnions participated to this conference. It was held from November 30 to December 4, 2020.

## **Perspectives and Future Plans**

A hybrid version of the XXIV ISPRS Congress the 2022 edition including the General Assembly, summer school and other activities will take place in Nice in June 6 – 11, 2022.

Further information can be found at <http://www.isprs2020-nice.com/>.

## **Matters/Issues for Consideration**

UN-GGIM Geospatial Societies needs to develop its strategies and implementation plans for further promotion of geospatial information to address key global challenges, especially the challenges facing the 2030 Agenda. The “Covid-19” situation can be regarded as one of very important topics of the last 19 months. The GGIM experts should use their knowledge and tools and create a global co-operation in evaluation of this period. The evaluation should cover not only the data presented by individual countries, WHO, etc., concerning the numbers of people with covid and victims, but it should go far deeper to analyse the data quality, uncertainty, to homogenise the values and their attributes. The other part of the analysis should take into account various restrictions in various countries, in various periods and their impact in the scale of countries, continents and the entire world to their population – generation of children, teenagers, people in the active period of their life, and of retired people. As an example, these can be impact to the health state in a complex scale – significantly increased children depressions, deaths due to other diseases like cancer, domestic violence, significant economic decrease in many areas, lowered quality of education and many others.

## **International Union of Geodesy and Geophysics (IUGG)**

### **Activities and Areas of Work**

The International Union of Geodesy and Geophysics (IUGG), established in 1919, such as the International Research Council (IRC), is the international 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. IUGG is committed to the principle of free exchange of data and knowledge among nations, and encourages unreserved scientific participation by all people.

IUGG is comprised of eight semi-autonomous International Associations, each responsible for a specific range of topics or themes within the overall scope of Union activities. Owing to the interactive nature of the subject fields managed by the Associations, six Union Commissions and the Working Group on History have been established which serve the Union and the international geophysical community by promoting the study of particular interdisciplinary problems. The Union Commissions are reviewed and renewed at each IUGG General Assembly. In addition, IUGG establishes inter-Association Commissions, and relationships with other scientific bodies with similar interests.

Due to the COVID-19 pandemic, the year 2020 was a remarkable one in the IUGG’s history.

### ***Slovenian IUGG National Committee celebrates 25th Anniversary***

The [Slovenian Association of Geodesy and Geophysics](#) (SZGG) was founded in 1993 and was formally accepted by the IUGG in 1995 at the General Assembly in Boulder CO, USA. The SZGG organizes regular annual meetings which are held at the Faculty of Civil and Geodetic Engineering of the University of Ljubljana. In addition to the regular annual meeting of the SZGG on 30 January 2020 the Slovenian National Committee of IUGG organized a 25<sup>th</sup> Anniversary celebration of their membership in IUGG. We are pleased that the event was attended also by the directors of the Slovenian Environment Agency, Lilijana Kozlovič and the Geodetic Institute of Slovenia, Milan Brajnik, representatives from



institutions where SZGG members work and promote IUGG activities as well as by the special guest, the Secretary General of the IUGG, Alexander Rudloff. During the anniversary meeting IUGG activities were presented by Alexander Rudloff, followed by an overview of more than 25 years of history of the SZGG (Jože Rakovec), and concluded with short presentations of the IACS, IAG, IAGA, IAHS, IAMAS, IAPSO, and IASPEI activities in Slovenia. On this occasion, the [25<sup>th</sup> issue of the SZGG proceedings](http://fgg-web.fgg.uni-lj.si/SUGG/referati.htm) (<http://fgg-web.fgg.uni-lj.si/SUGG/referati.htm>, in Slovene) was published, including contributions on the research performed in 2019 in the field of geodesy and geophysics, and the history of SZGG activities.

### ***Reports by IUGG National Committees***

Several IUGG National Committees have published Quadrennial Reports on their activities from 2015 to 2019. The reports from Argentina, Canada, China, Croatia, Greece, India, Russia, Serbia, and the Slovak Republic are now available [here](#).

### ***IUGG Grants Program 2020-2021 – Awardees***

The [IUGG Grants Program](#) aims to support projects, of importance to the international geophysical and geodetic community, which explore new scientific ideas, develop future international initiatives, and promote geoscience education. For 2020-2021, IUGG awarded grants to the following projects:

- Data Assimilation and Inverse Problems in Geophysical Sciences (a joint project between CMG, IAGA, IASPEI, and IAVCEI);
- Implementing IUGG 2015 Resolution #4: Organization of the GNSS Tsunami Early Warning (GTEWS) Consortium (a joint project between GRC and IAG);
- A Unified Height Reference System for Africa (AFRUHRS) (a joint project between IAG and IASPEI);
- Paper volcanoes Lab: a way to engage early childhood and primary school children on Earth Science (a joint project between IAVCEI and IASPEI).

The total amount of funds allocated to the projects is USD 50,000.

The deadline for project proposal submission for the funding period 2022-2023 is on **1 April 2022**. More information can be found here: [http://www.iugg.org/programs/grants\\_program\\_2020-2023.php](http://www.iugg.org/programs/grants_program_2020-2023.php)

### **Partnerships and Regional and International Collaboration**

The work of IUGG is related to that of many other scientific organizations. Some of these are inter-governmental such as those affiliated with the United Nations; some are Interdisciplinary Bodies of ISC, and others are organizations of particular interest to specific Associations. From time to time, it has been deemed beneficial for IUGG to name liaisons to specific organizations in order to promote communication and co-operation.

In 2020, IUGG was involved in various activities and showed its strength in international cooperation and science promotion.

### ***IUGG's endorsement of the Declaration of the Significance of Geoscience Expertise to Meet Global Societal Challenges***

In solidarity with the European Geosciences Union (EGU), the American Geophysical Union (AGU), the Asia Oceania Geosciences Society (AOGS), and other partners, IUGG is pleased to sign the following “Declaration of the Significance of Geoscience Expertise to Meet Global Societal Challenges” <https://www.egu.eu/news/654/declaration-of-the-significance-of-geoscience-expertise-to-meet-global-societal-challenges/>.

### ***IUGG signs Kyoto Landslide Commitment 2020***

On 18 August 2020, the IUGG President, Prof. Kathy Whaler, signed the Kyoto 2020 Landslide Commitment 2020 (KLC2020) - a framework aimed at providing key actors and stakeholders concerned with landslide risk at all levels and sectors with the tools, information, platforms, technical expertise and incentives to promote landslide risk reduction on a global scale. It supports the implementation, follow-up and review of the Sendai Framework, the 2030 Agenda for Sustainable Development, the New Urban Agenda and the Paris Climate Agreement as it addresses the adverse effects of climate change. Kathy Whaler and John LaBreque (Chair, Union Commission on Geophysical Risk and Sustainability - GRC) will attend an online signatory and launching session for KLC2020 on 5 November 2020.

The signed commitment can be found [here](#).

### **IUGG Supports African Light Source Project**

On 10 November 2020, the IUGG President signed a letter of support for the “African Light Source (AfLS) Project” <https://www.africanlightsource.org/>.

AfLS is engaged in developing the case for an advanced light source to be designed, constructed and operated on the African continent, driven by science and technologies of interest to Africa.

Central to the science case for an African advanced light source is concomitant investment in all the sciences that present users to advanced light sources, prominent amongst them being the geosciences. The AfLS has consistently called for governments and universities to invest in local infrastructure for teaching and research in geochemistry, geophysics, soil science, petrology, etc., including major equipment for spectroscopy, light scattering, imaging, crystallography and microscopy.

AfLS is supported by The Abdus Salam International Centre for Theoretical Physics (ICTP), the International Union of Pure and Applied Physics (IUPAP), the International Atomic Energy Agency (IAEA), and other partners.

More information about the history of AfLS can be found here <http://aphysrev.ictp.it/index.php/aphysrev/article/view/1610/586>.

### ***IUGG co-organizes the International Year of Basic Sciences for Sustainable Development***

On 15 December 2020, the IUGG signed a Memorandum of Understanding with the International Union of Pure and Applied Physics (IUPAP) to co-organize the International Year of Basic Sciences for Sustainable Development (IYBSSD) as a Founding Union.

It is intended that IYBSSD will be organized in 2022, under the aegis of UNESCO and with the collaboration of UNESCO International Basic Sciences Program (IBSP). Multiple scientific organizations support this initiative as Founding Unions or Partners.

During IYBSSD, there will be several international events organized by Founding Unions and Founding Partners, with the aim to promote the role of basic sciences in the achievement of the United Nations ‘Sustainable Development Goals’. We encourage anyone with an idea (or already ongoing project) that could fit within the scope of IYBSSD to apply for a grant. There will also be communication actions at various scales, and incentives for local, regional and national organizations to set up their own events with the same aim.

More information about IYBSSD can be found here <https://www.iybssd2022.org/en/home/> .