



INTERNATIONAL UNION OF
GEOLOGICAL SCIENCES

2018 REPORT

Fostering a global voice for the geosciences

In association with ISC and UNESCO

120+ Adhering Organizations

50+ Affiliated Organizations

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THE UNION'S AIMS

The International Union of Geological Sciences (IUGS) was founded in 1961 with the mission to unite the global geological community in promoting development of the earth sciences.

The Union is the largest member organizations (about 1 million earth scientists) of the International Science Council (ISC) and one of the world's largest scientific organizations.

Origins

2012 Strategic Plan

In 2012, IUGS redefined its missions according to a new Strategic Plan:

- Produce authoritative scientific standards
- Contribute to earth science education and public understanding of geosciences
- Represent the geological sciences in forums and decision-makers
- Encourage and support new original ideas in basic and applied geological research
- Foster collaboration between developed and developing countries in earth science research, capacity building, and applications
- Encourage more interdisciplinary involvement within the broad spectrum of the geosciences.

For the period 2017, the Union had the following aims:

- Encourage and substantiate the participation of the Adhering organizations and National Committees in promoting Geosciences
- Develop initiatives, (i.e. Resourcing Future Generations, Forensic Geology) of wide societal and applied interest
- Renew and establish closer links to UNESCO, ISC, and Geo-Unions, as well as develop new initiatives together with these organizations
- Improve visibility of IUGS through publications and presence at scientific forums.

Present Strategic Plan

GOVERNING THE UNION

The Council

Meets every four years at the International Geological Congress

Representatives appointed by the Adhering Organizations from the active IUGS member countries/regions

Inactive or non-member countries/regions may send observers (without voting rights) to Council meetings

Executive Committee (2016-2020)

Bureau

Day-to-day decisions and responsibilities

Secretary General



Prof. Dr. Stanley FINNEY

President



Prof. Dr. Qiuming CHENG

Treasurer



Prof. Hiroshi KITAZATO

Past President



Prof. Dr. Roland OBERHÄNSLI

Vice Presidents



Dr. Kristine ASCH



Prof. William CAVAZZA

Councilors (2014-2018)



Dr. Amel BARICH



Prof. Stephen JOHNSTON

Councilors (2016-2020)



Prof. Ben MAPANI



Mr. Edmund NICKLESS

Councilors (2018-2022)



Dr. Silvia PEPOLONI



Dr. Claudia Inés MORA

Prof. Dr. Qiuming CHENG



PRESIDENT (2016-2020)

The year of 2018 was an auspicious year! Scientists have made gratifying and congratulatory progress in many fields of earth sciences ranging from deep space, deep Earth, deep ocean, to deep time. I would like to congratulate these achievements and advancements in Earth sciences by pointing out a few examples. In the field of Earth deep time and evolution of Earth life, researchers in South Africa reported that a 26,000-Pound Dinosaur named “Ledumahadi mafube” was one of the largest animals on Earth during the early days of the planet’s existence. Australian scientists examined the fat molecules extracted from the fossil of a mysterious creature called Dickinsonia and have confirmed that it lived 558 million years ago, making it the earliest known member of the animal kingdom. British scientists reported that life, based on genetic and fossil evidence, may have begun on Earth nearly 4.5 billion years ago, much earlier than thought before. In space and planetary science, Italian scientists detected by radar measurements a 20-km-wide lake of liquid water underneath solid ice in the Planum Australe region on Mars. The presence of liquid water on Mars has long been debated and has implications for astrobiology and future human exploration. NASA has launched a new mission “InSight” which has landed on Mars to pursue three main goals: taking the planet’s temperature, measuring its size, and monitoring quakes. The new data about the thickness, size, and composition of Mars will help scientists better

understand why Mars is so different than Earth. Plate tectonics has only been found on the Earth but not on any other planets. In deep Earth, the ten-year Deep Carbon Observatory project (DCO) announced the discovery of considerable amounts of life forms living up to at least 4.8 km deep underground, including 2.5 km below the seabed. Ice seven (ice VII) was identified among inclusions found in natural diamonds. The ice VII was presumably formed when water trapped inside the diamonds retained the high pressure of the deep mantle. This discovery might provide new insight into the deep Earth water cycle, which is a key question of Earth dynamics and plate tectonics. In the field of critical minerals and resources, researchers in Japan reported finding centuries’ worth of rare-earth metals in the deep ocean mud in the northwest Pacific. Publications in Nature and Science indicated that one of the fastest-growing research fields in Earth system science is the automatic extraction and integration of information from big data in cloud environment. Deep learning approaches in integration with physical processes-based model show promising potential for revealing patterns assisting in an understanding of complex Earth system, and improving the ability and precision of prediction and modelling of complex extreme geo-events such as earthquakes, volcanos, and mineralization. The key factors for the success of data-driven Earth system science may include FAIR (Findable, Accessible, Interoperable, and

Re-usable) data, modern algorithms for computing and physical processes-based models for knowledge discovering. Facilitation of big science program and collaboration in data-driven Earth system science has been considered as challenges as well as strategic priorities of IUGS in order to reach its primary goals: enhancing its leading roles in geosciences, increasing the level of interaction with IUGS constituent groups and collaborating with other organizations, ultimately, improving the engagement of IUGS membership. This report provides a brief summary of the progress in these regards.


IUGS’ Leading New Science Program

In the new era of Earth system science, in conjunction with digital revolution such as big data, internet and cloud computing, new platforms and programs are required for facilitating efficiency for the utilization of geoscience data with a move from traditional approaches conducting research to a modern data-driven approach involving data mining, machine learning, knowledge discovery and artificial intelligence. Transitions towards this goal reflects the new ‘big data’ driven paradigm for supporting scientific research. Since different subject areas have various scientific focuses and needs, and because scientists in separate regions are affected differently by the finances of scientific infrastructures, IUGS is an ideal organization to bring together their expertise through big science program and member engagement. During the 72th IUGS EC meeting held in Potsdam Germany January 2018, President Qiuming Cheng had proposed to establish IUGS Big Science International Programs and Centers of Excellence, which were aimed to increase public awareness and education, international collaboration, open data sharing, and transdisciplinary research. Big science programs should

meet the following criteria:

- ◇Global and major issues
- ◇International collaboration
- ◇Transdisciplinary
- ◇Global – Free – Open – Sharing - Service
- ◇Collaboration with ISC, UNESCO etc.
- ◇Promotion in underrepresented nations

International collaborations are required and encouraged on establishing big science program especially among IUGS constituent groups including adhering national committees and affiliated international associations. The primary areas of consideration include, but not limited to, integration of data-driven sciences and Earth science focusing on major earth science questions such as converging plate boundary dynamics and their effects on natural resources, environment, hazards and human resilience, big data discovery for resources assessments in the African continent, and predictability of extreme geological events such as earthquakes, volcanos and landslides. Over past several years, President Cheng took all opportunities of attending numerous conferences and other occasions to promote IUGS new initiatives and to convince IUGS national committees, organizations and associations to develop proposals for establishing IUGS big science programs and setting up centers of excellence with the primary objectives for sharing new knowledge and developing cutting-edge technology to tackle global issues, as well as problems facing numerous countries. Great progress has been made in this initiative for IUGS’ facilitation of big science international programs. The Deep-time Digital Earth (DDE) program initialized by Chinese scientists, supported by several IUGS bodies including Commissions, Adhering Committees and Affiliated Organizations has been approved by IUGS EC as the first Big Science Program.



Since the approval of the DDE proposal, it has attracted a great deal of interest and support worldwide. DDE aims to establish a link between earth big-data hubs that are interoperable with other databases including published data in the public domain and unpublished data in institutions and centers of expertise. DDE will be an international consortium that aims to provide “Geological Google” with harmonized data convenient for science, industry, and the general public. However, unlike other existing databases, DDE will provide the geologies and geographies of Deep-time, as well as data on the properties of those geologies, and thus will provide insight into the distribution and value of Earth’s resources and materials, as well as hazards – while also providing a glimpse of the Earth’s geological future. DDE has been set as a 10-year international big science program (2019-2028) with milestones anticipated at the subsequent International Geological Congress (36th IGC in 2020, New Delhi, 37th IGC in 2024, Busan, and 38th IGC 2028, venue to be decided). DDE is going to serve as a new platform for facilitating efficient and additive international collaboration along with knowledge sharing. The program will run as an open program which encourages broad collaboration among geosciences as well as in transdisciplinary fields including engineering, social science and economics.

Interaction with International Communities

2018 started with a very successful 72nd EC meeting which was held in Potsdam, Germany. The IUGS EC produced fruitful interactions with approximately 50 participants from Europe and worldwide.

IUGS has maintained close and collaborative relationships with UNESCO, ISC, ISC-GeoUnions and other organizations. IUGS

has been actively participating in the processes of merging ICSU and ISSC into the new International Science Council (ISC), the election of new governing council of ISC and development of new ISC initiatives. Several members from GeoUnions were elected as officers of ISC. President Qiuming Cheng has communicated with ICS on various occasions including the development of the DDE initiative. Dr. Li Jinghai (vice president of ISC) and Dr. Alik Ismail-Zadeh (Secretary of ISC) have participated in the DDE forum and IUGS EC on behalf of ISC. The ISC GeoUnions have met twice last year (Paris and Istanbul). The main objectives of these meetings were to show support for the election of ISC officers and to suggest new project proposals to ISC. President Qiuming Cheng shared several suggestions including the DDE initiative at these meetings. He encouraged the collaboration of GeoUnions on further development of DDE. As follow up action, representatives from five GeoUnions members (IGU, ISPRS, ANQUA, IUGG and IUGS) also attended the DDE forum and exchanged constructive suggestions.

UNESCO and IUGS take efforts to promote and to enhance their joint program IGCP. In 2018, IGCP welcomed a new partner, the Jeju Province Development Corporation (JPDC) of the Republic of Korea. Through the new project partnership agreement entitled “Geoscience for Society: JPDC supporting the International Geoscience and Geoparks programme” the JPDC supports IGCP projects and UNESCO Global Geoparks. More than 20 IGCP projects including six new projects have been granted financial support. Three world top scientists were elected amongst a hundred nominations to join the IGCP council. At the past IGCP annual council meeting, President Qiuming Cheng made suggestions about the possibility to develop a super IGCP project with new funding to be

sought in addition to the current IGCP projects. President Cheng has invited UNESCO via Dr. Flavia Schlegel, the assistant DG of UNESCO, to participate in the IUGS EC meeting and the DDE Forum. UNESCO responded positively and sent Dr. Ozlem Adiyaman Lopes to represent the organization for this occasion.

At several international conferences and on other occasions, President Qiuming Cheng has had good opportunities to interact with large groups of adhering members, affiliated members as well as other organizations. For example, he attended the CGMW General Assembly (February in Paris), EGU2018 (April in Vienna), Big Data Workshop (May in Zhejiang, China), RFG 2018 (June in Vancouver), ISC GA (July in Paris), 15th IAGOD and 24th ASGMI (August in Argentina), IAMG 2018 and 50th Anniversary Celebration (September in Prague), China Mining 2018 (October in Beijing), GSA 2018 (November in Indianapolis), GeoUnions Meeting (November in Istanbul), Workshop on Risk Reduction (November in Sendai) etc. On these occasions, President Qiuming Cheng introduced IUGS, focusing on its recent development and progress. He has also interacted with leaders from many organizations, such as EGU, GSA, ASGMI, OAGS, EuroGeoSuveys, CFES, GAC, CIM, and adhering members from Canada, US, BGR, Japan, Finland, Norway, Australia, India, and Turkey, as well as various international programs such as USARRAY (US), LithoProbe (Canada), EON-ROSE (Canada), SinoProbe (China), International Lithosphere Program (ILP), International Ocean Drilling Program (IODP), International Continent Drilling Program (ICDP) and Deep Carbon Observatory Project (DCO).

Promoting IUGS for New Members

At the 24th Council of ASGMI in Argentina,

President Qiuming Cheng delivered a presentation in front of leaders from 22 Geological Surveys (Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, Cuba, de Catalunya, Ecuador, El Salvador, España, Guatemala, Honduras, México, Nicaragua, Panamá, Paraguay, Perú, Portugal, República Dominicana, Uruguay, Venezuela). Some of these countries are not yet IUGS members. Qiuming Cheng welcomed these Latin-American countries to join IUGS. Further interactions with leaders of the ASGMI regarding DDE initiative occurred during the Forum of Geological Survey Directors at the China Mining Forum. ASGMI responded positively to the proposal of DDE initiative and its representatives attended the IUGS EC meeting and DDE forum.

Organization of African Geological Survey (OAGS) is an organization comprising Geological Surveys of 54 nations in Africa among which, only 5 are active members of IUGS. As many as 25 African countries are not IUGS members. At a special Forum during the China Mining and Expo in October, Qiuming Cheng interacted with directors of several geological surveys and ministers of Ministry of Energy and Mines including the leaders of OAGS and the minister of the Ministry of Energy, Mines, Water and Environment of Morocco. Potential collaborations regarding membership and promotion of DDE initiative in Africa were discussed. Actions have been followed up and several members have reactivated their IUGS memberships.

To end this report, I would like to thank all those who have made generous contributions. Without their hard work and supports, participations and collaborations, would be impossible for any significant progress. As the President of IUGS, I appreciate the opportunity to work with everyone to take collective efforts to further advance geological sciences and to improve IUGS.

Prof. Dr. Stanley C. FINNEY



SECRETARY GENERAL (2016-2020)

2018 was a very busy year for me as Secretary General of the IUGS. In my second full year, I have come to know well the leaders of all IUGS constituent groups and to know the status of all internal matters in the functioning of the Union. Following the 2018 IUGS Executive Committee meeting in Potsdam, I wrote to leaders of all IUGS constituent groups, informing them of the funding decisions of the EC and of the expectations for annual reports and funding requests. The current EC requires budget requests to be itemized, prioritized, and justified and expenditures from the previous year to be specified. This is a departure from previous years when budget allocations tended to be unchanging and based on history. Accordingly, in preparation of 2018 annual reports and 2019 budget requests, I communicated regularly with leaders of IUGS constituent groups (committees, commissions, task groups, initiatives, and joint programs) to advise on how best to prepare budget requests for 2019.

Wonderful work is produced by the IUGS constituent groups, as you can learn from the contributions in this report. The Publications Committee is being transformed. Perhaps, its name ought to be changed to Publications and Media Committee because of extensive publicity of IUGS activities through the E-Bulletin and Social Media with support from the webpage. In 2018, the Facebook post on the new subdivisions of the Holocene approved by the Commis-

sion on Stratigraphy and ratified by IUGS received more than 120K views, 20K likes, and 10K shares in two weeks. Dolores Pereira succeeded Brian Marker as chair of the Publications Committee. Gurmeet Kaur now manages Social Media, and IUGS Councilor Silvia Peppoloni assumed the position of editor of the E-Bulletin following the IUGS Vice President Kristine Asch who served as editor for most of the year. Giuseppe Di Capua is now very experienced as IUGS webmaster and maintains currency of the website daily. In 2018, he discovered and resolved a long-standing problem with the server hosting the website and has planned a long-needed redesign. I sit on the Publications Committee as a representative of and provide a direct line of communication with IUGS Bureau. I take great satisfaction in participating in the improvements made in IUGS publications and media in 2018.

As Secretary General, I oversaw the production and recruited and edited all contributions to the 2017 IUGS Annual Report. I developed the agendas for the IUGS EC meeting in Potsdam and for IUGS Bureau meetings in Potsdam, Vancouver, and Sendai. I managed votes in the EC for approval of 1) new Holocene subdivisions, Cambrian and Permian GSSPs, and a revision to a statute for the Commission on Stratigraphy, 2) seven proposals for Global Heritage Stone Resources for the Heritage Stone Subcommittee of the Commission on

Geoheritage, 3) the new chair, members, and statute change for the Publications Committee, and 4) Kyrgyzstan, Myanmar, and Nepal as new adhering members. The statute revision approved for the term of the Publications Committee and the approval of new adhering members will be presented to the Council for ratification at the 36th IGC. I also managed the by-election in the Council for the vacated position of IUGS Councilor for 2018-2022. The Secretary General monitors much of the internal business of the IUGS, e.g., ensuring the reports of Ad-hoc reviews are sent to the Secretariat and then to the IUGS President, responding to

questions of membership from various affiliated organizations, advising constituent groups on difficult situations and on views of the EC. And, the Secretary General regularly requests contributions and photos from IUGS constituent groups for inclusion in the E-Bulletin, the IUGS Brochure, and the IUGS Annual Report.

The Director and Staff of the Permanent Secretariat provide valuable and exceptional support to the Secretary General. They are skilled in IUGS matters and respond immediately to requests.

Prof. Dr. Hiroshi KITAZATO



TREASURER (2016-2020)

General Financial Situation of IUGS

During the period from 01/01/2018 to 31/12/2018, IUGS was in a healthy financial position. The revenue and expenditure were USD 605,233.43 and USD 418,611.07 respectively, thus contributing a net income of USD 186,622.36. Therefore IUGS had revived and been stable financially after the negative net income in 2014. This was a consequence of the receipt of more dues combined with cuts in unnecessary expenditure.

The table below reflects more detailed information of the financial situation during the recent four years.

	(USD)		
	revenue	expenditure	net income
2018	605,233.43	418,611.07	186,622.36
2017	494,755.49	401,008.60	93,746.89
2016	597,039.88	499,247.90	97,791.98
2015	519,655.44	424,780.01	94,875.43

Description of income

In comparison with the previous year, total revenue increased by USD 110,477.94 mainly due to 35th IGC capitation fee and others. Membership receipts increased by USD 28,337.59. It is noteworthy that several countries, like Spain, Guyana, Morocco and Bangladesh changed their status from “Inactive” to “Active” IUGS members.

The table below reflects detailed information of the income situation in 2017 and 2018.

Income		(USD)	
		2018	2017
Membership Fees		428,978.28	400,640.69
	Previous years	18,775.49	29,601.78
	Current year	410,202.79	371,038.91
Contribution from UNESCO		61,364.36	46,868.16
	Final payment for last year		5,000.00
	1st payment for current year	39,931.90	33,930.75
	2nd payment for current year	21,432.46	7,937.41
35th IGC Capitation Fee		108,581.15	
	1st payment	80,138.20	
	balance payment	28,442.95	
RFG 2018 Capitation Fee		1,797.34	
Other Income		4,512.30	47,246.64
Total Income		605,233.43	494,755.49

Status of Countries by Fees Category - 2018

Category	Active	Inactive	Total	Number of Countries paid for			
				2018	2017	2016	2015
1	24	46	70	16	5	1	-
2	15	2	17	11	2	-	-
3	13	3	16	10	1	-	-
4	7	1	8	7	1	1	1
5	-	-	-	-	-	-	-
6	2	-	2	2	-	-	-
7	4	-	4	4	1	-	-
8	5	-	5	5	-	-	-
Total	70	52	122	55	10	2	1

Description of Expenditure

Almost all projects in the allocation table have been paid except IGCP 641.

The table below reflects more detailed information of expenditure situation in 2017 and 2018.

Expenditure	(USD)	
	2018	2017
IGCP	134,442.17	102,000.00
Joint Programmes	20,685.00	20,340.00
IUGS Commissions	66,500.00	77,000.00
IUGS Task Groups	9,500.00	13,500.00
Initiatives	38,000.00	33,000.00
Committees	12,213.15	5,768.42
Affiliated Organizations	31,300.00	34,000.00
Contributions	0.00	13,557.50
Episodes	28,346.00	28,314.00
Contingency	0.00	0.00
Secretariat expenses	15,000.00	15,000.00
Russian Reserve expense	6,724.37	6,885.13
IGC Special expense	0.00	0.00
Other expenses	55,900.38	51,643.55
Total Expenditure	418,611.07	401,008.60

Mr. MA Yongzheng



PERMANENT SECRETARIAT

The IUGS Secretariat is hosted within the premises of the Chinese Academy of Geological Sciences (CAGS) under the China Geological Survey, the Ministry of Natural Resources of China. Since the relocation of the Secretariat to Beijing in December 2012, the Chinese government has been providing tremendous and stable financial and logistical support for the smooth operation of the Secretariat.

Under the guidance of the IUGS Bureau and Executive Committee, the Secretariat has maintained professional and efficient operation in line with its duties, and played an active role of communication and coordination in the scientific activities and daily administration of IUGS.

In 2018, the Secretariat assisted in the organization of several regular administrative meetings, including the 72nd EC Meeting (Potsdam, Germany on January 23-26, 2018) and the 73rd EC Meeting (Beijing, China on February 27-March 2, 2019) and three Bureau Meetings (Potsdam, Germany on January 22, 2018; Vancouver, Canada on June 20-21, 2018; Sendai, Japan, November 12-13, 2018).

In order to increase the visibility and influence of IUGS in the international geoscience community, the Secretariat arranged and manned IUGS booth exhibitions at several major international events, including EGU 2018 Annual Meeting in Vienna, Austria (April 9-13, 2018), RFG 2018 Conference (June 17-21, 2018), China Mining 2018 in Tianjin, China (October 18-20, 2018),

GSA 2018 Annual Meeting in Indianapolis, United States (November 4-7, 2018) and AGU 2018 Fall Meeting in Washington D.C., United States (December 11-15, 2018). At the above events, the Secretariat staff displayed and distributed the IUGS brochure and other promotional items.

Major work of the Secretariat in 2018 also includes: arranging a series of IUGS activities during 2018 China Mining Conference; designing and printing the hardcopies of the 2017 IUGS Annual Report and mailing them to IUGS Constituent Groups; mailing the hardcopies of Episodes to IUGS Constituent Groups; updating IUGS Contact Database and strengthening links with IUGS bodies; assisting in membership maintenance; Reformatting E-Bulletins and distributing them monthly to over 14,000 recipients; assisting the IUGS Nominating Committee in the election of new IUGS Councillor (2018-2022); producing and distributing New Year's E-Cards for Bureau Members and the Secretariat; designing several IUGS promotional items, including T-shirts, Polo shirts, mouse pads, keychains, hats etc.

Under the leadership of the Secretariat Director Mr. Ma Yongzheng, all the Secretariat staff members will continue full devotion to the Secretariat duties with concerted efforts to actively support the work of the IUGS Bureau and Executive Committee and the broad-ranging scientific activities of IUGS.



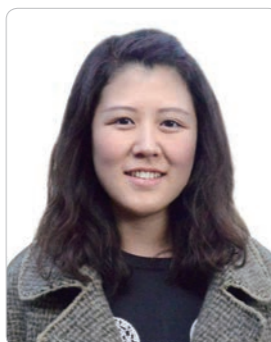
Ms. LI Wei
Secretary



Ms. SITU Yu
Secretary



Ms. GU Yanfei
Secretary



Ms. XU Yaqi
Secretary



Ms. MU Langfeng
Secretary



Mr. YANG Chen
IT Specialist



IUGS booth at the 2018 AGU Fall Meeting

2018 HIGHLIGHTS

JANUARY 2018

The IUGS Executive Committee (EC) held its 72nd Meeting on January 23-24, 2018 at Deutsches GeoForschungsZentrum (GFZ), Potsdam, Germany. Cheng Qiuming, IUGS President, warmly welcomed all the participants and expressed his gratitude to GFZ who hosted the Meeting with hospitality and to the German National Committee to IUGS who provided consistent support to IUGS. Alan Woodland, the President of German National Committee to

IUGS, introduced the active geoscience community and research work in Germany. Ralph Watzel, the President of BGR, reviewed BGR's collaboration with IUGS and significant international cooperative projects. Reinhard Hüttel, the Chair of the Board and Scientific Director of GFZ gave a detailed presentation on GFZ. In total 29 scientists participated in the meeting as observers. Other participants include the IUGS EC members and staff members from the IUGS Secretariat.



72nd IUGS Executive Meeting at GFZ, Potsdam, Germany.

FEBRUARY 2018


IUGS-IFG supported and endorsed the 3rd Ibero-American Seminar on Forensic Geoscience, in La Plata, Argentina. This event was the latest focusing on the development of forensic geology throughout Latin America.

IGCP Council meeting was organised with the participation of five Council members using UNESCO HQ Paris facilities between 19 and 21 February 2018. Following the completion of the closed IGCP council session, the Council presented their recommendations to the members of IGCP UNESCO National Commissions,

IGCP National Committees and UNESCO Permanent delegations on 21 February 2018. Seventy representatives participated in this meeting and were informed about IGCP 2017 activities and the decisions of the closed IGCP council session.

MARCH 2018

The first meeting of the recently established IUGS Finance Committee took place on March 12th, 2018 at the Royal Society in London. The committee is composed of William Cavazza (IUGS Vice-President), Edmund Nickless (IUGS Councilor, formerly Executive Secretary,



Geological Society of London), Jack Hess, (President, Geological Society of America Foundation, formerly GSA Executive Director); Andy Fleet (Chair and Trustee, Dorset County Museum, formerly Assistant Director of Science, Natural History Museum, London).

The IUGS Journal “Episodes” took a major step forward. The new online submission and review system for papers submitted to Episodes became available on the Episodes website www.episodes.org.

APRIL 2018

The IUGS Executive Committee voted to approve Myanmar as an Adhering Member with provisional status, once the annual subscription is paid, until a vote on active status at the meeting of the IUGS-IGC Council at the 36th IGC.

The IUGS Executive Committee voted to approve Dr. Dolores Pereira, University of Salamanca, Spain, as chair of the IUGS Publications Committee (2018-2022), membership of the Publications Committee, and changes to IUGS statutes to accommodate a Publications Committee for a four-year term that begins and ends in the mid-terms of two successive IUGS Executive Committees.

IUGS set up a booth at the EGU Meeting in Vienna, Austria.

With the support of the Bellona Foundation (Oslo), on April 13th members of the NASIC group gathered in Moscow to hold a symposium on “Mineral resources for low-carbon and sustainable future”. The symposium was hosted by the GORPROMEXPO, an event of the Russian mining industry and miners’ associations at Gostiny Dvor, Moscow, Russia. During this one-day symposium, there were 14 presentations comprising three discussion sessions

and a closing event.

The Global Stone Congress held its 6th session in Lihueus (Bahia), Brazil from 26 to 29, April 2018. The aim of this congress was to assemble international participants interested in natural stones, from geologists to architects, designers, engineers, representatives of research and teaching institutions and technological centers linked to the natural stone industry. More than 150 persons attended the congress.

MAY 2018

The IUGS International Commission on Stratigraphy (ICS), which is responsible for standardizing the Geologic Time Scale, approved the definition of three new stages that comprise the Holocene Series. The ICS Commission forwarded this proposal to its parent body, the IUGS, for consideration, and the Executive Committee of IUGS voted unanimously to ratify them. This is a key achievement for the International Union of Geological Sciences and particularly for its Commission on Stratigraphy. The Holocene is now composed of three stages: the Lower Holocene Greenlandian Stage, the Middle Holocene Northgrippian Stage, and the Late Holocene Meghalayan Stage. The lower boundary of each is placed at a carbon isotope excursion that defines the respective climatic event.

The continental Scientific Drilling Project of the Cretaceous Songliao Basin (SBDP) completed the drilling of its Songke II borehole at a depth of 7,018 meters in Heilongjiang Province of China on May 26, 2018. It is the first continental scientific drilling project to penetrate the whole of a Cretaceous terrestrial formation in the world. Prof. Cheng Qiuming and Prof. Roland Oberhänsli, IUGS President and Past President, were invited to attend the celebration ceremony held at the drilling site in northeastern China. In the remarks delivered at the celebration cere-

mony, Prof. Cheng Qiuming said that the successful drilling of the Songke II borehole developed key technologies and equipment for deep earth exploration and experimental research, opened a new space for clean energy prospecting in the Songliao Basin and contributed to the global efforts on Cretaceous terrestrial paleoclimate research. He said the IUGS would continue its attention to and support for the earth exploration and research.

Prof. Qiuming Cheng and Prof. Roland Oberhänsli attended a meeting on May 27 at China University Geosciences (Beijing) with Prof. Chengshan Wang, Academician of Chinese Academy of Science and Vice President of International Association of Sedimentology. The meeting concerned the potential collaboration on the project, “Deep-time Digital Earth” sponsored by several international associations: International Commission on Stratigraphy (ICS), International Association of Paleontology (IAP), International Association of Sedimentologists (IAS), International Association of Sedimentary Geology (IASG), International Association for Mathematical Geosciences (IAMG), and several geological surveys including CGS and BGS. Since most of these sponsoring associations are IUGS adhering or affiliated members, these organizations invite IUGS to become the main sponsor leading the development of this program as an international big science program.

Geolodía (‘Geology-Day’) is an initiative, organized in Spain, since 2005 trying to bring geology closer to the general public through the observation of landscapes and rocks in the field. This year with the focus “Look where you walk”, Geolodía showed how the materials that we have below our feet is critical for our lives and that Geology is a fascinating science. 9613 people participated on 12th and 13th May 2018

in 56 free field excursions in all Spanish provinces and Andorra guided by about 600 volunteers.

JUNE 2018

The Resources for Future Generations Conference (RFG 2018) was held in Vancouver Canada on June 16-21, 2018. Jointly sponsored by IUGS, the Canadian Federation of Earth Sciences (CFES), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), the Geological Association of Canada (GAC) and the Mineralogical Association of Canada (MAC), RFG 2018 aimed to bring industry, academia and governments and civil society together to develop and utilize earth resources in better and cleaner ways that minimize impacts so as to realize a sustainable supply of energy, minerals and water for human existence and progress.

The second Bureau meeting of 2018 was held on June 20-21 at Vancouver Convention Center, Vancouver, Canada during the RFG 2018 Conference.

On June 25, 2018, the IUGS Executive Committee ratified the GSSP proposal for the boundary stratotype section and point that defines the base of the third series of the Cambrian, the Miaolingian Series and the base of the lowest stage of that series, the Wuliuan Stage. The ratified GSSP largely completes the new classification for the upper part of the Cambrian System.

By June 13th, 2018, IUGS had 65 active members and 6 pending members. In the first half of 2018, Myanmar has become the new member of IUGS and Spain has been reactivated.

JULY 2018

Episodes, the flagship journal of the IUGS, increased its Impact Factor in the recently published review (Clarivate Analytics, 2017 IF).

The new IF is 1.614, derived from the increase in citations of published articles. The aim of the IUGS Publications Committee is to continue increasing the impact of the journal within the scientific community.

On July 21, 2018, the IUGS Executive Committee ratified the GSSP proposal for the boundary stratotype section and point that defines the base of the Sakmarian Stage of the Cisuralian Series of the Permian System.

The geounions cluster - a network of representatives of the international scientific unions dealing with the Earth Sciences at large - met on the occasion of the inauguration ceremony of the International Science Council in Paris on July 5th, 2018. IUGS President, Prof. Cheng Qiuming attended the inauguration ceremony and met with representatives of geounions cluster.

The IUGS Publications Committee met on 14th and 15th July in London, UK to review progress in 2017/2018 and discuss issues and improvements for 2018-2019. The new Chair, Professor Lola Pereira of the University of Salamanca, Spain, presided over the meeting during which 2 members of the Committee, the previous Chair Dr. Brian Marker and former Editor of Episodes Dr. Fareeduddin, stood down and expressed thanks to both. The meeting paid particular attention to: securing better design software for, and improvements to the IUGS website to be implemented during the coming months; seeking topics for thematic issues of Episodes; the structure and content of a new IUGS brochure; and the development of a statement of policy for content and co-ordination of all IUGS news outlets (website, E-Bulletin and social media) to be presented to future meetings of the IUGS Bureau and Executive.

IUGS President Prof. Cheng Qiuming congratulated Dr. Chang Meemann, a senior professor from the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) of the Chinese Academy of Sciences (CAS), for being honoured by UNESCO with the L'Oréal-UNESCO for Women in Science Awards as one of five outstanding female scientists from around the world for "her pioneering work on fossil records leading to insights on how aquatic vertebrates adapted to life on land."

AUGUST 2018

The 15th Quadrennial International Association on the Genesis of Ore Deposits (IAGOD) Symposium was held in the city of Salta, Argentina on August 28-31, 2018. IUGS President Prof. Cheng Qiuming attended the Symposium at the invitation of IAGOD President Prof. Eduardo Zappettini to further strengthen communication and cooperation with IAGOD, an affiliated organization of IUGS. During the symposium, Prof. Cheng attended the 24th Council Meeting of the Association of Geological and Mining Survey of Ibero-America and introduced scientific activities and programs of IUGS at the meeting. Prof. Cheng also welcomed more Latin-American countries to join the IUGS.

SEPTEMBER, 2018

President Cheng Qiuming attended the IAMG 2018 and its 50th Anniversary Celebration in Prague in September 2018.

Stephen Johnston and Amel Barich end their 4-year terms as Councillors on the IUGS Executive Committee. Silvia Peppoloni begins her term (2018-2022) as Councillor on the IUGS Executive Committee.

OCTOBER, 2018

In October 2018 the editing of the IUGS E-Bulletin changed hands from Dr. Kristine Asch, IUGS

Vice-President, to Dr. Silvia Peppoloni, IUGS Councillor.

President Cheng Qiuming participated in the GeoUnions meeting in Istanbul, 8-10 October 2018.

The First Workshop on Heritage Stones, organized by the IUGS Heritage Stones Subcommittee, within the frame of IGCP637, took place in Salamanca from 2 to 4 of October. 49 participants from 16 countries attended the different activities, from oral talks, round tables, poster session, fieldtrip and debates, as well as social activities.

The China Mining 2018 Conference and Exhibition was held in Tianjin, China on October 18th to 20th. Prof. Cheng Qiuming, President of the IUGS, addressed the opening ceremony of the Conference and attended a series of activities during the Conference. The IUGS Secretariat prepared and provided an IUGS booth at the Exhibition. Prof. Cheng Qiuming had a meeting with the delegation of Organization of African Geological Surveys (OAGS) and he encouraged the inactive members in Africa to reactive their membership and those non-member countries to become IUGS members.



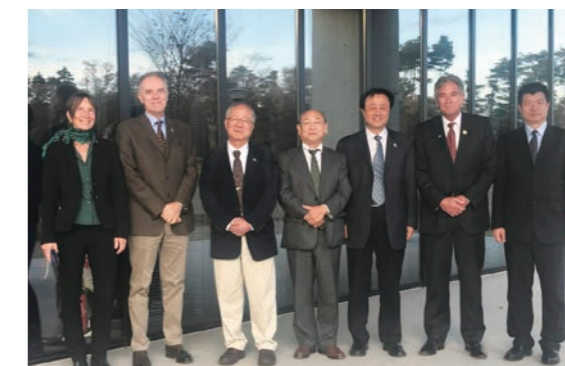
The CCOP and IUGS Task Group on Geohazards (TGG) organized a seminar on the 30th

October, 2018 in conjunction with the 54th CCOP Annual Session held in Busan, Korea. Seven papers from Finland, Japan, Korea, Myanmar, Thailand and Vietnam were presented.

The I Workshop on Heritage Stones was held from 2 to 4 October 2018 with 49 participants from 16 countries.

NOVEMBER, 2018

At the IUGS Bureau meeting (Sendai, Japan, 12-14 November 2018), the Bureau discussed important ongoing activities such as publications and news outlets; decided on significant changes to the IUGS awards to be presented at the 36th IGC; discussed activities at the 36th IGC and a call for bids for the 38th IGC; ratified several Heritage Stone Resource proposals; and received reports of the Finance Committee and the Resourcing Future Generations Initiative. Also discussed were plans for the 2019 IUGS EC Meeting to be held in Beijing and a forum for the Deep Time Digital Earth (IUGS-DDE) project, which IUGS will recognize as a Big Science Program.



The European Geosciences Union (EGU) has recently approved and fully funded, for 2019 at least, a strategy document for enhancing geoscience education in Europe and beyond. The IUGS Commission on Geoscience Education (IUGS-COGE) and the International Geoscience Education Organization (IGEO) are

devising a strategy to build on the EGU initiative in a global context.

The newly ratified Proposal for new Holocene Subdivisions has been published in Episodes and is freely available online. This article describes the GSSPs (Global Stratotype Section and Point) that define the boundaries of the three formalized subdivisions of the Holocene Series/Epoch: the Greenlandian, North-Grippian, and Megalayan Stages/Ages and the corresponding Lower Holocene, Middle Holocene, and Upper Holocene Subseries/Subepochs.

The Commission for the Management and Application of Geoscience Information (CGI) of IUGS attended the first United Nations World Geospatial Information Congress (UNWGIC) in Deqing, China on 19-21 Nov. 2018 with the support of the China Geological Survey with the purposes of improving understanding and promotion of geological science and its own data and information standards of itself and with the Open Geospatial Consortium.

The IUGS - Science Council of Japan (SCJ) - International Research Institute of Disaster Science (IRIDeS) geohazard symposium was held on 13 Nov., 2018 at Tohoku Univ. in Sendai, Japan. Approx. 30 people from IUGS, SCJ and IRIDeS attended the symposium and discussed geological investigation of tsunami, disaster mitigation research, activities of TGG and geohazards risk sciences.

IUGS set up a booth at the Geological Society of America Annual Meeting 2018 in Indianapolis, Indiana, 4-7 November 2018.

The 43rd Annual INHIGEO Conference took place at the Palace of Mining in Mexico City from 12 to 22 November 2018 with 46 contribu-

tions in seven sessions. This conference was organized by the Vice-President of the INHIGEO of Latin America L.F. Azuela in cooperation with the Institute of Geography, the Institute of Geology, the Institute of Geophysics of the Universidad Nacional Autónoma de México (UNAM) and has received financial support from UNAM.

DECEMBER, 2018

The TecTask commission on Tectonics and Structural Geology renewed the website of OUTCROPEDIA (<http://outcropedia.tectask.org/>) where you can upload your photos and use them for teaching or research.

IUGS set up a booth at the AGU Fall Meeting 2018 in Washington, D.C., 10-14 December 2018.

The main goal of the IUGS HSS is to recognize those stones that have been used for many years, preferable centuries, in the construction of the architectonic heritage and which meet the requirements of the IUGS geological standard of Global Heritage Stone Resource. Designations of seven stones have been approved by the IUGS Executive Committee this year: Lioz limestone from Portugal; Lede stone from Belgium; Lower Globigerina limestone from Malta; Jacobsville stone from the USA; Kolmarden serpentinite "marble" from Sweden; and Welsh slate from Wales; and Piedra Mar del Plata from Argentina.

The Deep-time Digital Earth program was approved by the IUGS EC as the IUGS Recognized Big Science Project on 22nd December 2018.

Voting underway, completed in January 2019, that elected Claudia Mora as Councillor 2018-2022 on the IUGS Executive Committee.

IUGS BODIES THE REAL LIFE OF THE UNION

The International Union of Geological Sciences promotes and encourages the study of geological problems, especially those of world-wide significance throughout the activities of IUGS Commissions, Task Groups and Initiatives.

At present IUGS gives special consideration to:

- International standards;
- Geoscience education;
- Geoscience information;
- Environmental management.

IUGS believes that it is of mutual benefit to establish close links with other organizations engaged in geosciences activities and especially those organizations whose work relates to some of the major activities of IUGS.

The list of currently active IUGS bodies testifies to these major aims of the Union. Links allowing description of the organization and activities of the IUGS bodies are provided on the IUGS website (www.iugs.org):

Scientific Commissions

Commission on Geoscience Education, Training & Technology Transfer (COGE)
International Commission on Stratigraphy (ICS)
International Commission on History of Geological Sciences (INHIGEO)
Commission for the Management and Application of Geoscience Information (CGI)
Commission on Tectonics and Structural Geology (TECTASK)
International Commission on GeoHeritage (ICG)
Commission on Global Geochemical Baselines (CGGB)

Joint Programs

International Geoscience Programme (IGCP)
International Geological Congress (IGC)
International Lithosphere Program (ILP)

Task Groups

Task Group on Global Geoscience Professionalism (TGGGP)
Task Group on Geohazards (TGG)
Task Group on Isotope Geology and Geochronology (TGIG)

Initiatives

Resourcing Future Generations (RFG)
Initiative on Forensic Geology (IFG)

Edmund NICKLESS Chair of NASIC



IUGS INITIATIVES - APPLYING GEOSCIENCE TO SOCIETAL NEEDS

The New Activities Strategic Implementation Committee (NASIC) was established in 2013 following the 66th IUGS Executive Committee to implement the Resourcing Future Generations (RFG) initiative.

Global economic and social development relies upon the discovery and extraction of mineral, energy and water resources and the rationale in establishing RFG is to consider and challenge how can demand for these resources be met with continued population growth and the right of all peoples to improved living standards? How do we secure resources for future generations in ways that are economically, environmentally and socially responsible?

The prime objective of RFG is to help ensure the multigenerational needs for raw materials, energy and water while ensuring social equity. To do that requires four fundamental actions by the global geoscience community:

- Comprehensive evaluation and quantification of 21st century supply and demand;
- Enhanced understanding of the subsurface as it relates to resource deposits;
- Assessment of where new resources are likely to be found;
- Building the needed and advanced skills capacity, particularly in lesser developed nations, to discover and responsibly develop mineral resources.

While seeking to:

- Secure supply of raw materials 20 years from now, beyond the span of present predictions;
- Develop a multidisciplinary approach across

the broad range of geoscience disciplines, bridging academia, industry and national geological surveys sector, and working with the social sciences;

- and including original research, drawing together available data and providing modern, innovative interpretations and including outreach and educational activities.

It has been estimated that to continue to improve the lot of the world's poorest by eradicating poverty and disease by 2030, as envisaged by the UN Sustainable Development Goals, while simultaneously reducing the level of atmospheric carbon dioxide, as envisaged by the Paris Agreement of December 2018, will double or triple the demand for metals and minerals by 2040. That increase in demand has to be seen in the context of the rising cost of exploring for and developing new deposits (Figure 1); that lower grade ores are being worked (Figure 2) and mines are going deeper (Figure 3) with the increased risk of environmental damage; and the rate of discovery of new deposits is failing to match with the exhaustion of those currently being worked. All of which illustrates the prescience of IUGS in establishing RFG as a contribution by the geoscience community to the resolution of this societal challenge.

Specific activities to advance the RFG initiative during 2018 included:

i.Resources for Future Generations 2018, an event organised by Canadian colleagues

as the first inter International Geological Conference, which was without a doubt, the highlight of the year. The meeting was held in the magnificently situated city of Vancouver, British Colum-

bia during June and brought together more than 2000 delegates to discuss three critical resources, energy, minerals, and water, in the context of the Earth, environment, education, society, and the needs and roles of future generations.

The conference took place under the auspices of IUGS and was delivered by Canadian partners: the Canadian Federation of Earth Sciences (CFES), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), the Geological Association of Canada (GAC), and the Mineralogical Association of Canada (MAC). Reflecting the multi-sector, multi-disciplinary nature of the conference, keynote, plenary and evening lectures addressed topics that present major opportunities and challenges related to the three key resource sectors. A feature of the conference was that more than half of the delegates were early career being within ten years of their first degree, a feature which lent a youthfulness and energy to the meeting.

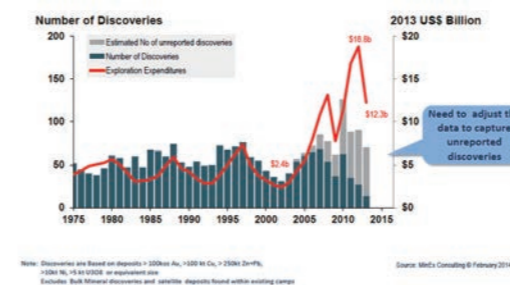


Figure 1: Western world exploration spend and discovery.
Schodde, 2014, Minex consulting

ii.With logistical and financial support from the Bellona Foundation (Oslo, Norway),

organising a workshop in Moscow on 13 April, entitled 'Mineral resources for low-carbon and sustainable future'. The symposium was hosted by the GORPROMEXPO, an event of the Russian mining industry and miners' associations at Gostiny Dvor, Moscow, Russia.

The purpose of this one-day symposium was to discuss and exchange views on:

- Supplying a two- to threefold increase in the demand of metals and minerals that will be needed to deliver the UN Sustainable Develop-

ment Goals and the new electricity generation and transmission technologies to decarbonise the global economy implied by the Paris Agreement;

- Social acceptance of mining and promotion of the least environmentally damaging technologies;
- International resource governance.

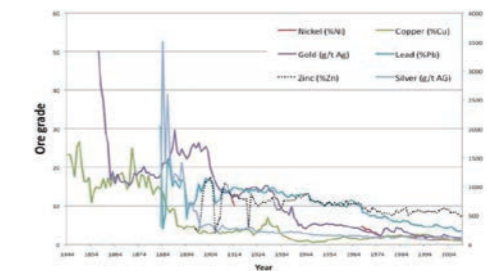


Figure 2: Ore grades are steadily declining for a variety of base and precious metals in 693 Australia (Prior T., Giurco, D., Mudd, G., Mason, L. & Behrisch, J. (2012). Resource depletion, peak minerals and the implications for sustainable resource management. Global Environmental Change, 22(3), 577-587, Fig3.)

iii.In August, RFG was invited by iCRAG (the Irish Centre for Applied Research in

Applied Geosciences) to work with them in organising a summer school for 50 post graduate research students to be held in Dublin, Ireland from 30 June to 6 July 2019. It has been a long-term ambition of the RFG initiative to reach out to younger geoscientists and social scientists. Many attending RFG2018 were keen to see a follow up event. With iCRAG IUGS, through RFG, is co-sponsoring and organising a Summer School.

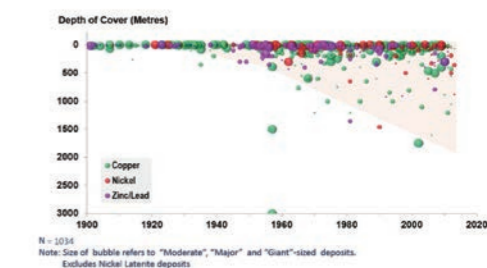


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Dolores PEREIRA



IUGS Publications and Social Media Committee

Membership of the Publications Committee during 2018:

At the start of the year the Committee consisted of:

- Chair – Dr Brian R Marker
- Prof Stanley J Finney – IUGS Secretary General
- Prof. Daekyo Cheong – Editor of Episodes
- Mr Giuseppe di Capua – Webmaster
- Dr Fareeduddin – former Editor of Episodes
- Prof Lola Pereira

From July 2018, the Committee was rejuvenated and now consists of:

- Chair – Prof Dolores Pereira
- Prof. Stanley J Finney – IUGS Secretary General
- *Prof. Daekyo Cheong – Editor of Episodes
- Mr Giuseppe di Capua – Webmaster
- Dr Gurmeet Kaur – member responsible for social media outreach issues

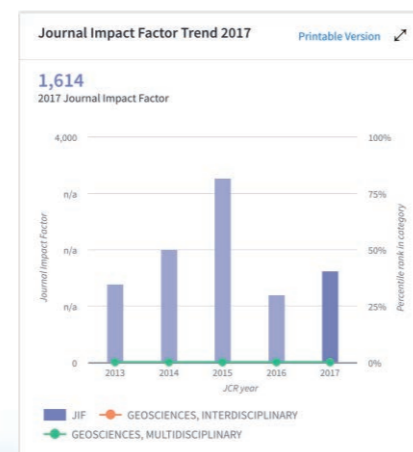
*From the 1st of January, 2019, Professor Jin-Yong Lee is the new Editor of Episodes. Bokyun Ko will be standing down as Managing editor of Episodes in January 2019. The replacement proposed by the GSK is Dr Heejung Kim.

A new PC member is taking care of the dissemination of news through Social Media: Facebook, Twitter, LinkedIn and Google (the latter will stop in the next months, as it is not popular)

- The chair of the PC procures news monthly from the IUGS bodies and IGCP leaders to include in both eBulletin and Social Media. Also, she reminds the IGCP leaders of the obligation of preparing a final report the last year of the IGCP to be published in Episodes. She has a continuous contact with them,

advising on how to promote their projects.

- The chair of the PC is in continuous contact with the Episodes editor and manager to secure complete, punctual and quality issues of the journal quarterly. She also deals with permits to publish Episodes contents (e.g. figures) in other publications, and also to store some articles in the archives of institutions of authors.
- In 2018, the Committee continued preparing and editing statements of policy and ethics for publications. These statements will be uploaded in Episodes web page as soon as the on-line system is conveniently updated.
- Two books from IUGS activities were published by the Geological Society of London. Two more books are almost ready and are available on line at the GSL web page (volumes 474 and 477), and eight more books are at different stages of preparation. Downloading data for the articles published in these books, available at the web page of GSL Special Publications, are very positive. The chair of the PC is in permanent contact with GSL editorial manager to keep updated and promote IUGS books.



- Episodes is already on line. Work on the update of the online editorial and review management system and to introduce online-first publication of papers continues. The journal attracted a good number of submitted papers, keeping a good record of manuscripts rejection, without affecting issue sizes, and maintaining quality. We managed to bring up the Impact Factor in 2018 and we continue to work on the maintenance of the impact for 2019.

- 36th International Geological Congress: Liaison with the Committee of the 36th IGC is continuing in respect of the planning of the IGC issue of Episodes, which will be one of increased size, of the 4 issues for that year. Discussions on a Memorandum of Understanding between IUGS EC, the IGC Publications Committee and the GSK are in progress.

- The work on the IUGS web page was based on updating the contents, 176 geoscience events were added in the “Calendar”; “Directory” and “Links” were better organized; a “History” section was added, with links to articles on past IGCs published in Episodes; “E-Bulletin” adds progressively the new issues of the E-Bulletin released during the year. More than 29,000 unique visitors accessed the website in more than 36,000 visits, with average values of 80 visitors/day and 2 pages/visit.

- The IUGS has dedicated social media pages where all the information and activities of the various IUGS commissions, Subcommissions, joint programs, task groups and initiatives are posted. The meticulous IUGS E-bulletin and IUGS website is also promoted through social media as brief and concise reporting is done on social media thus encouraging social media users to open the E-bulletin and website for detailed reports. The IUGS publication

Episodes is also promoted through social media which is easily accessible to all through the IUGS website. The reporting on social media is aided with appropriate photographs and web links for further probing. On an average 2-3 posts are done every week and the total facebook followers have crossed a 7k mark. The close coordination and cooperation amongst the PC members has been instrumental in the smooth operation of the various IUGS social media pages.

- Membership of the Editorial Board was expanded, but we are still working to cover some specialities and to reach a better diversity related to geography and gender. An orderly turnover of membership should be instituted soon.



EPISODES

The new Editor of EPISODES, Prof. Dr. Jin-Yong Lee and Managing Editor, Dr. Heejung Kim have been charged with editing EPISODES since January 1, 2019. The total number of published documents in the journal in 2018 was 29 (19 original articles, 7 reports, 1 book review, and 2 profiles). Since March 2018, we have been accepting all submissions only through the Editorial Manager system (<https://www.editorialmanager.com/episodes>) and all the review and publication are processed using it. Now we are dedicating to renew the EPISODES website (<http://www.episodes.org>) to increase the colleagues' access to the journal, which will be completed in the end of May and we have started to give DOIs to past articles with no DOIs. Reports from IGCP, ICS, and others are classified into one type, just Report from 2019 March issue.



Jin-Yong Lee



Heejung Kim

Giuseppe Di Capua



IUGS Webmaster

The work has been focused on updating pages of the website, in particular: the section "News and Information", in the homepage; "Calendar", to which were added 176 geoscience events; "Directory" and "Links", in order to keep information about IUGS bodies and officers neat; "History", to which links to articles on past IGCs published in Episodes were included; "E-Bulletin", in order to add progressively the new issues of the E-Bulletin released during the year. Severe technical problems in website access occurred during August were successfully solved and gave impulse to go ahead with the design of a new IUGS website by using a new online platform. Currently, the IUGS website is managed through the CMS Made Simple™ platform, an online and open-source tool. The new website should be published at the end of 2019. Regarding 2018 access statistics, more than 29,000 unique visitors accessed the website in more than 36,000 visits, with average values of 80 visitors/day and 2 pages/visit.

Silvia PEPPOLONI



E-Bulletin Editor

Since October 2018 the IUGS E-Bulletin has been edited by Silvia Peppoloni with the support of Brian Marker (English editing) and in close cooperation with Giuseppe Di Capua (IUGS webmaster) and Gurmeet Kaur (IUGS social media manager). In that time, the process of final production developed by Kristine Asch, Susanna Kösterke, and the IUGS Secretariat was continued and perfected. Production of the E-Bulletin runs smoothly, following the processes illustrated below. Issues appear regularly and on time and are distributed worldwide to more than 16,000 e-mail addresses. The E-Bulletin summarizes and highlights the accomplishments and activities of all IUGS constituent groups, which rarely received exposure in the past. The E-Bulletin has become the primary outlet for rapid dissemination to a global audience of those IUGS matters of immediate importance and attention.

Actions:

- the process of publication includes the mailing of the call for contribution to potential contributors, the collection of texts, pictures and captions and their layout in the draft, the optimization of images, the review of the English, a further final review and the delivery of the complete issue to the IUGS secretariat (as word and pdf files) for electronic distribution;
- correspondence with the contributors, webmaster, social media manager, English editor, and IUGS secretariat is carried out regularly;
- the E-Bulletin issues from October 2018 to March 2019 were compiled in time, according to the process below.

Process

End of the month

Call for contributions	Brian Marker
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16th day of the month

Submission of contributions	IUGS bodies
Content evaluation, format control	Silvia Peppoloni
Sending emails to the contributor to accept, request the modification or refuse the contribution	Silvia Peppoloni
Insertion in the standard layout and text formatting and figures	Silvia Peppoloni
Text control	Silvia Peppoloni
Sometimes requests for changes	Silvia Peppoloni / IUGS bodies
Sending to Brian Marker for editing in English	Silvia Peppoloni
Changes and new sending to Silvia Peppoloni	Brian Marker
Insertion of the modified text	Silvia Peppoloni
Request to the webmaster for links in case of an extended web version of the contribution	Silvia Peppoloni
Inserting links	Silvia Peppoloni
Last check of layout, text and format	Silvia Peppoloni
Creation of the pdf file	Silvia Peppoloni

25th day of the month

Sending by email to IUGS Secretariat, webmaster/social media manager as word and pdf files	Silvia Peppoloni
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Gurmeet KAUR



Management of IUGS Social Media

Gurmeet Kaur took over the responsibility of popularising the activities of IUGS and associated bodies from September 2018 onwards through the powerful Social media platforms such as facebook, twitter, linkedin and google plus. The IUGS has dedicated social media pages where all the information and activities of the various IUGS commissions, Subcommissions, joint programs, task groups and initiatives are posted. The meticulous IUGS E-bulletin and IUGS website is also promoted through social media as brief and concise reporting is done on social media thus encouraging social media users to open the E-bulletin and website for detailed reports. The IUGS publication Episodes is also promoted through social media which is easily accessible to all through the IUGS website. The reporting on social media is aided with appropriate photographs and web links for further probing. On an average 2-3 posts are done every week and the total facebook followers have crossed a 7k mark. The close coordination and cooperation amongst the PC members has been instrumental in the smooth operation of the various IUGS social media pages.

William CAVAZZA



FINANCE COMMITTEE

After a long time of quiescence, the IUGS Finance Committee (FC) was reestablished in 2018.

The FC is an independent body overseeing the financial aspects of the various IUGS activities. As such, the FC reports directly to the Executive Committee and -every four years on the occasion of the International Geological Congresses- to the Joint IUGS-IGC Council. According to the IUGS Statutes and Bylaws (2012) "The Finance Committee ... plan(s) for the finances of the Union, evaluate(s) proposals for the independent auditing of the Union for Council, and advise(s) the Executive Committee on the management of funds and improving the funding of the Union. ... Its primary roles are to identify external financial opportunities for the IUGS and to propose to the Executive Committee ways to improve IUGS financial operations, including (i) the allocation of funds in relation to the strategic priorities and missions adopted by the Executive Committee; and (ii) overseeing the conduct of an independent external audit of IUGS finances..."

Following its appointment in January 2018 at the IUGS Executive Committee meeting in Potsdam, the FC met on March 12th and November 30th. Both meetings took place in London and were graciously hosted by the Linnean Society and the Geological Society of London, respectively. The main goals of the FC activity during 2018 can be summarized as follows:

- quantitative analysis of the current financial situation of the Union;
- identification and analysis of present sources of income and expenses;
- definition of historical trends in the Union's finances;
- evaluation and improvement of financial investments;
- protection and marketing value of IUGS intellectual property;
- alignment of IUGS expenses with strategic priorities;
- increased level of auditing.



Estremoz Marble. Picture by Lola Pereira

The members of the Committee (pictured above, left to right) are: William Cavazza (Chair), Edmund Nickless (formerly Executive Secretary, Geological Society of London), Jack Hess, (President, Geological Society of America Foundation, formerly GSA Executive Director); Andy Fleet (Chair and Trustee, Dorset County Museum, formerly Assistant Director of Science, Natural History Museum, London).



INTERNATIONAL COMMISSION ON STRATIGRAPHY



David A.T. Harper
Chair



Brian T. Huber
Vice Chair



Philip L. Gibbard
Secretary General

The core activity of the International Commission on Stratigraphy, as the guardian of global chronostratigraphy, is the establishment of Global Boundary Stratotypes Sections and Points (GSSPs), their definition and correlation. It is a permanent commission of the IUGS and its oldest and largest incorporated body. This year (2018) has been one of phenomenal success, based on the detailed research by colleagues over a number of years matched by lively discussions within working groups and their subcommissions and a degree of consensus. Five stages, three subseries and one series, were defined at GSSPs ranging in age from the Cambrian to the Holocene; the older, Palaeozoic stratotypes were defined in rock successions whereas the youngest, Holocene horizons are preserved in an ice core and a speleothem. The GSSP for the base of the Cambrian Wuliuan Stage and the Miaolingian Series was ratified by the IUGS in June 2018; the Golden Spike for the base of the Wuliuan Stage is within the Kaili Formation in Wuliuan Quarry, exposing the Wuliu-Zengjiayan Section, at Balang, Guizhou Province, China (Fig. 1); it is coincident with the base of the Miaolingian Series. An article detailing the section will be published in Episodes later in 2019.

The GSSP for the base of the Permian Sakmarian Stage was ratified by the IUGS in July 2018

(Fig. 2); the base is defined within the carbonate mudstones of the Usolka Section in the southern Ural Mountains, Russia and is primarily correlated by the first appearance (FAD) of the conodont species *Mesogondolella monstra*. An article describing the GSSP in detail will be published in Episodes during 2019.

The GSSPs for the base of the Holocene coincident with the base of the Greenlandian Stage and the successive Northgrippian and Meghalayan stages and their respective subseries/subepochs were ratified by the IUGS in June 2018, attracting considerable media attention for both the ICS and IUGS. The first two are defined at levels within the 'Greenland Ice Core Project' or NorthGRIP ice core (Fig. 3); the last, coinciding with an abrupt near global aridification with implications for human civilization, is defined within a speleothem from Mawmluw Cave in northwest India (Fig. 4). The article was published in Episodes in late 2018 (see Head et al. 2018, vol. 41, 213-223).

This flurry of activity was matched by a series of eight revisions of the ICS Geological Timescale (see Cohen et al. 2018 in www.stratigraphy.org) incorporating the new GSSPs and some updates of the absolute ages for the bases of a number of stages. International interest has been intense with currently 16 translations of the

timescale available for download (www.stratigraphy.org).

At the time of writing, we are only a few months away from the third international stratigraphic conference, STRATI 2019 in Milano (www.strati2019.it). Already over 400 delegates have registered and some 350 abstracts have been submitted to over 20 separate sessions. This promises to be an outstanding meeting with the majority of subcommissions ready to present their plans for the coming years, not only to complete all the outstanding GSSPs but to continue to develop accurate dating and calibration of our stratigraphic record.

Finally, a rejuvenated International Subcommission on Precambrian Stratigraphy has been established and discussions are in progress to revisit the rank and status of the term Precambrian.

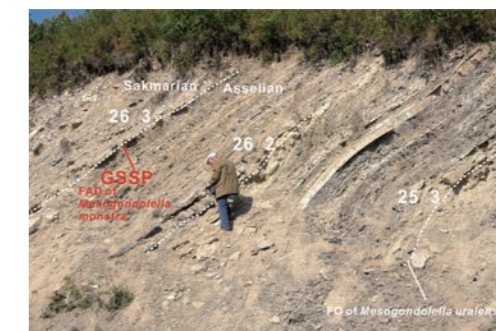
Figure captions

Figure 1. Global Stratotype Section and Point for the base of the Cambrian Wuliuan Stage and the Miaolingian Series in the Wuliu-Zengjiayan Section, at Balang, Guizhou Province, China. Nigel Hughes (left) and Loren Babcock (right), chair of the International Subcommission on Cambrian Stratigraphy, are in shot (photo courtesy of Per Ahlberg).



Wuliuan_Nigel Hughes and L. Babcock, Wuliu-Zengjiayan section near Balang, Jianhe County, Guizhou

Figure 2. Global Stratotype Section and point for the base of the Permian Sakmarian Stage in the Usolka Section in the southern Ural Mountains, Russia (photo courtesy of Shuzhong Shen).



Sakmaria

Figure 3. Global Stratotype Section and Point for the base of Northgrippian Stage (Middle Holocene Subseries) in the North GRIP core; Sune Rasmussen is holding the part of the core containing the boundary between the Greenlandian and Northgrippian (photo courtesy of Kurt Kjær).



Greenlandian_Northgrippian



Figure 4. Global Stratotype Section and Point for the base of the Meghalayan Stage (Upper Holocene Subseries) in the Mawmluw Cave speleothem (photo courtesy of Martin Head).

Mawmluw Cave speleothem



INTERNATIONAL COMMISSION ON GEOHERITAGE



Chairman
Bjorn Schouenborg



Secretary-General
Benjamin van Wyk de Vries

Introduction

The International Commission on Geoheritage was established in 2016, and is responsible for the IUGS's involvement in the development and coordination of geoheritage at a global scale.

Geoheritage is a rapidly expanding and evolving area of geological sciences, which deals with critical questions about the preservation, evaluation, and use of our natural heritage. This geoheritage spans from untouched nature to exploited natural resources, such as building stones. It includes protected natural areas, urban areas and areas at risk from natural disasters. UNESCO Geoparks and UNESCO World Heritage sites are particularly important for the commission as the IUGS has important responsibilities in the assessment of both, as it does for the designation of heritage stones.

The commission's objectives include the development and dissemination of guidelines for good geoheritage practice in the selection and management of sites, institutional collections and culturally significant geological resources such as Heritage Stones. Over the last two years the commission has begun to promote and co-ordinate these activities at international, national and regional levels through research, workshops, conferences and publications, as

well as through training and other educational activities.

One major aspect is the formation of working groups to tackle specific problems. A major result for 2018 is the Geological Assessment Working Group, which has produced Guidelines for the Assessment of Geoheritage in UNESCO Global Geoparks. This valuable document will be of direct use to IUGS evaluators and to those developing geoparks, and it is the first systematic set of guidelines to be created.

The Heritage Stone subcommission is communicating with stakeholders and decision-makers to communicate the need to use the proper (and original if possible) stone in the restoration of historic buildings, mainly in World Heritage Sites and Cities. It provides the information on the need for proper characterization of stones in order to promote their use in construction and restoration.

The commission actively collaborates with other organisations and networks at all scales, from local to regional to international, which are active within the field of geoheritage and related disciplines. For example, the commission works closely with the Geoheritage Specialist Group of the International Union for the Conservation of Nature (IUCN).

The commission formed from the re-constitution of two IUGS Task Groups: the Task Group on Geoheritage and the Heritage Stone Task Group. These became two subcommissions, respectively the Heritage Sites and Collections Subcommission (<http://geoheritage-iugs.mnhn.fr>) and the Heritage Stones Subcommission (<http://globalheritagestone.com/>).

International Geoscience Programme Projects

The Commission runs two UNESCO International Geosciences Programme projects:

IGCP 637: Heritage Stones

(Website address: www.globalheritage-stone.com). This project aims to firmly establish the first international standard for building and ornamental stones via extensive documentation of those stones that have been significant in human culture.

The project has enhanced the capacity of Heritage Stone subcommission, this group has become the largest international group representing natural stone geoscientists.

International heritage stone designation will benefit society by:

- promotion of increased awareness of natural stone and its positive attributes in terms of sustainability and regional economic development.
- facilitation of preservation/restoration of extant stone heritage using appropriate material.
- its encouragement to safeguard important heritage stone resources from subsequent sterilization where there is pressure for alternative development.
- promotion of precise specification of stone in

the same way that regional designation of food-stuffs has occurred in the European Union.

IGCP 692: Geoheritage for Geohazard Resilience

The term 'geoheritage' refers to the knowledge, communication and protection of the Earth's value to society. Geoheritage sites are areas with unique geological, scientific, aesthetic, cultural or educational value. This geoheritage project focuses on helping people understand their landscape and exposure to various natural hazards by identifying the geological elements, such as river courses, faults, volcanic rocks, and placing them in a wider societal context. This project aims to support a local community's ability to react to and absorb changes from one or multiple hazards and develop a grass roots type of resilience.

Heritage Stones Designated in 2018

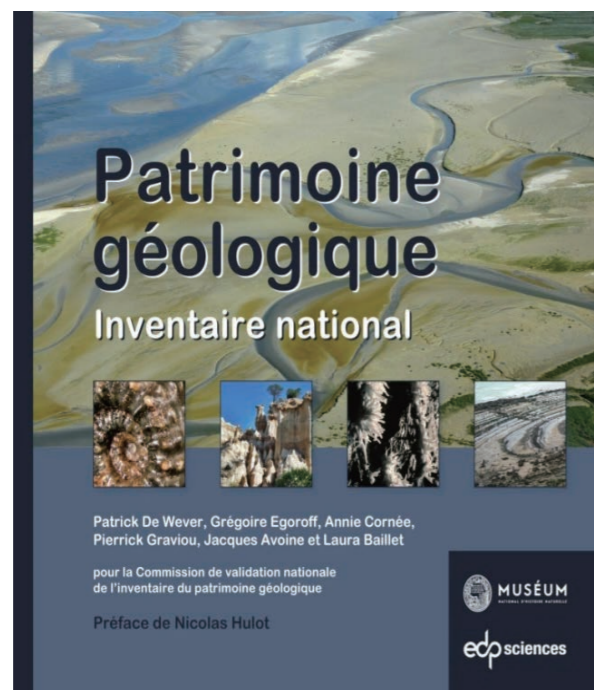
During 2018 we have been able to review and designate seven stones:

Maltese Globigerina Limestone,
Jacobsville Sandstone,
Lede stone Welsh Slate,
Piedra Mar del Plata,
Kolmården serpentine marble,
Lioz limestone

Meetings Organised

Global Stone Congress (24-April/2-May, 2018)-
170 participants from 12 countries

Workshop on Heritage Stones (2-4 of October,
2018)- 49 participants from 16 countries



Example of a publication: The Geological Heritage, a national inventory of France
With the help of the IUGS Commission for Geoheritage.



Stone Heritage and Geosites working together: Cagsawa church, and Mayon volcano in the Philippines. This church built of Mayon lava was destroyed by the volcano in 1814, with great loss of life. It remains as a geo-monument to the risk of the volcano and an example of the use of heritage stones.

COMMISSION ON GEOSCIENCE EDUCATION

The IUGS Commission on Geoscience Education (IUGS-COGE) has prepared a 'Strategy for Enhancing Global Geoscience Education' document in response to the global surveys of geoscience education. The latest of these surveys in 2017 and 2018 have shown great scope for improvement in many countries. In particular they show that around a third of countries do not have geoscience in their school curriculum; for those countries that do, many schools do not follow curriculum guidelines relating to geoscience, teachers of geoscience are not well supported, and the textbooks and teaching materials they rely on are of only moderate or poor quality.

Strategy Document

Since research has shown that the most effective way to improve geoscience education is to target teachers and other educators, the IUGS-COGE strategy document focusses attention on five different geoscience education groups, as shown below.

1. Teachers of geoscience in schools and colleges with strong geoscience backgrounds

These people are being supported by the continued financial support of IUGS for the International Geoscience Education Organisation (IGEO), its annual Earth Science Olympiads, and its four-yearly geoscience education conference chapters. They are also supported by the regular Geoscience Education for Teachers (GIFT) conferences run by the European Geosciences Union (EGU) and the American Geophysical Union (AGU) and publicised by IUGS.

2. Teachers of science or geography with some geoscience in their teaching, who have weak geoscience backgrounds

IUGS-COGE has supported and approved a new free-to-download textbook written for sixteen year olds, which will be adapted for different regions and languages. Its title is The 'Exploring geoscience across the globe'

IUGS continues to support the Earthlearningidea website, which has published more than 300 teaching ideas in English, with nearly 1000 translations into other languages, accessed 200 countries, with more than 4 million downloads so far.

IUGS-COGE has appointed Field Officers in India and Morocco who are being trained alongside four European Field Officers (in France, Italy, Portugal and Spain) to train school teachers in offering interactive teaching activities (such as Earthlearningidea activities) in their own countries.

3. Teachers of geoscience in Higher Education

Strategies are being developed by EGU, supported by IUGS-COGE, to support geoscientists teaching in Higher Education. More information on this initiative will be available in next year's report.

4.Providers of informal geoscience education

A training package for informal educators in geoparks has been developed and the new Field Officers, following their own training, will be able to offer this training package in their own countries.

5.Researchers into geoscience education

Mechanisms for developing a database of geoscience educational researchers are being explored as a means of facilitating networking between them.

These initiatives are based on educational research and have a track record of impacting on teachers and their teaching. As a result, they are likely to be effective in improving the poor state of global geoscience education reported by the international surveys.

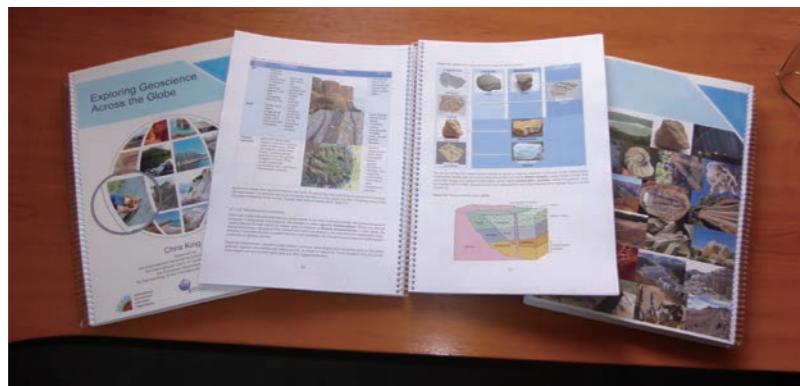
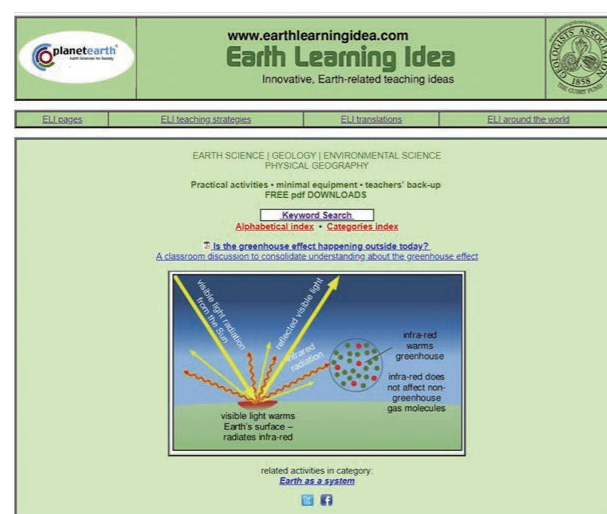


Photo of book



Earthlearningidea website

Commission on Tectonics and Structural Geology (TecTask)

Rodolfo Carosi and Hermann Lebit

The Commission on Tectonics and Structural Geology represents an initiative by Earth Scientists to stimulate communication and coordination within the international science community and to provide information to the public. The group encourages innovative research and continued education in Tectonics and Structural Geology, the growth of intellectual capital and hence the impact of our science on the wealth of the global society. TecTask reaches out to scientists and students, particularly those from developing countries, to share cutting-edge research and development, and state-of-the-art training. Among the initiatives of the Commission is the establishment of a homogeneous professional terminology. The Commission has developed a wikipedia-like internet platform (http://www.tectonique.net/ttt/index.php?title=Main_Page) populated with terms and their definition, which can be publically discussed by the enrolled

members before those are elevated into formal glossaries or a dictionary. With the gradual increase of entries it is anticipated that the Structural Geology & Tectonics community will recognize and share the forum and actively participate in the formulation of the terms and definitions.

In 2018, the Commission held its second Conference of Young Researchers in Structural Geology and Tectonics (Yorsget). The Conference is aimed primarily at MSc/PhD students, post-docs, and early career researchers, and Montgenevre, France, was selected as its location due to proximity to world-famous examples of structural geology and tectonics in the Alps, from outcrop to regional scale. Yorsget 2018 was attended by 57 delegates from many European countries, Argentina, USA, Australia, Japan, Canada, and India.



Yorsget2018: group photo

In June 2018, the Commission launched the TecTask You Tube channel (<https://www.youtube.com/channel/UCXFYiccBYX-w85bneuMm4Xgg>) where monthly invited seminars are uploaded. Topics of Structural Geology and Tectonics are covered, including regional studies of wide interest. The community has

found the seminars useful for both their teaching and their research.

Outcropedia, the long-term show piece of the Commission, was overhauled in 2018. The new website (<http://outcropedia.tectask.org/>) is now able to host bigger and higher quality photos and allows for quick navigation.

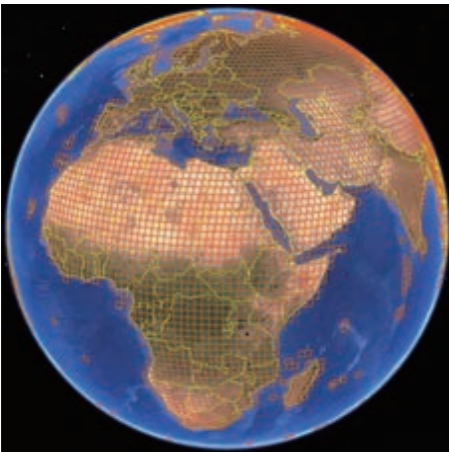
COMMISSION ON GLOBAL GEOCHEMICAL BASELINES

- The mission of the IUGS Commission on Global Geochemical Baselines (CGGB) is to:
- (i) Develop a Standard Methods Manual for the Global Geochemical Reference Network project;
 - (ii) Establish a global Geochemical Reference Network (GRN) similar to a geodetic network for levelling existing databases (prime objective);
 - (iii) Prepare a global geochemical database and its representation in map form, and
 - (iv) Document the concentration and distribution of chemical elements and species in the Earth's near-surface environment.

The database is urgently needed for environmental and natural resource management throughout the world. The CGGB also promotes and facilitates the implementation of harmonised sample collection, preparation, quality control, and analysis protocols for geochemical mapping programmes.

The CGGB, in early 2018, decided on the contents of a comprehensive 'International Union of Geological Sciences Manual of Standard Methods for Establishing the Global

Geochemical Reference Network'. Preparation of the first draft of this document was initiated, with completion planned for late 2019. Another important part for planning the sampling campaign in each country is the development of the Global Terrestrial Network (GTN) grid cells of 160x160 km, and the five random points in each grid cell for the selection of catchment basins. This part has been completed, and all files are available for downloading from the CGGB's website (<https://www.globalgeochemicalbaselines.eu/>).



160x160 km GTN grid cells for Europe, Africa and part of Asia

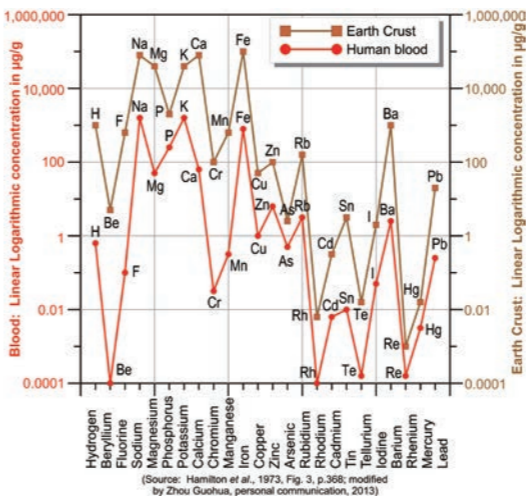


Five-random points in each GTN grid cell for part of South Africa for planning the sampling in catchment basins

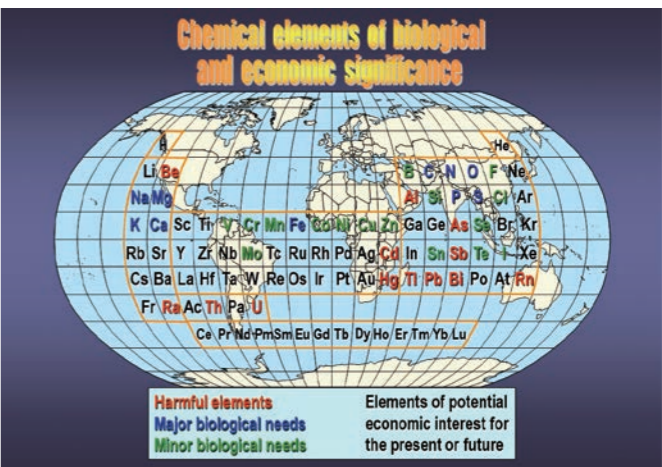
The CGGB is participating in the Global Black Soil Critical Zone Geo-Ecological Survey (BASGES) project, which is coordinated by the Shenyang Geological Survey of China. It is developing another standard methods manual for this project, which will also be completed in 2019.

In 2018, CGGB organised a session on 'Global-scale geochemical mapping: A critical component for resourcing future generations' on the occasion of RFG2018 in Vancouver, and a one-day field training workshop in collaboration

with the Association of Applied Geochemists. The joint annual business meeting of the IUGS CGGB and EuroGeoSurveys Geochemistry Expert Group was hosted by the Instituto Geológico y Minero de España (IGME) at its premises in Madrid from the 16th to the 19th May 2018. The CGGB published two papers in a special issue on 'Geochemical Mapping' of Geochemica Brasiliensis. For additional information about CGGB's activities, its annual report should be consulted (https://www.globalgeochemicalbaselines.eu/datafiles/file/IUGS-CGGB_2018_Annual_Report_final.pdf).



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COLLABORATIVE JOINT PROJECTS

INTERNATIONAL GEOSCIENCE PROGRAMME (IGCP)

UNESCO is the only United Nations organization with a mandate to support research and capacity in Earth Sciences and UNESCO's flagship programme, the International Geoscience and Geoparks Programme is delivered through two co-operative ventures with the International Union of Geological Sciences (IUGS) and with the Global Geoparks Network. The first pillar of the IGPP, International Geoscience Programme (IGCP), since 1972, has harnessed the intellectual capacity of a worldwide network of geoscientists to lay the foundation for our planet's future, focusing on responsible and environmental resource extraction, natural hazard resiliency and preparedness, and adaptability in the era of a changing climate. In 2018, the IGCP welcomed a new partner, the Jeju Province Development Corporation (JPDC) of the Republic of Korea. This new partnership enabled IGCP to provide higher seed funds to add to the substantial support from IUGS since the programme's inception.

In 2018, the IGCP Council meeting was organized with the participation of IGCP Council members and IUGS President Prof Qiuming Cheng and past-president Prof Roland Oberhänsli between 19 and 21 February 2018 at UNESCO HQ. IGCP Council approved seven new projects in February 2018 including IGCP 672: Himalayan Glaciers and Risks to Local Communities project for the duration of 5 years. IGCP project 672 focuses on developing meth-

ods for systematic monitoring of hazardous glacier lakes in the Himalaya using remote sensing, and disseminating methodologies developed via trainings and workshops to local institutions).

Three new IGCP Council members were successfully appointed in 2018 and they started their activities in October 2018. Mr Sobhi Nasir (Jordan/Canada): Earth Resources, Mrs Weijian Zhou (China): Global Change, Mr Carlos Vargas Jimenez (Colombia): Geohazards

UNESCO and IUGS thank Guy Narbonne (Chairperson, Canada), Maria Julia Orgeira (Global Change Theme Council Member, Argentina) and Alik Ismail-Zadeh (Geohazards Theme Council Member, Azerbaijan) for their efforts to promote and support IGCP as outgoing IGCP council members since their initial appointments in 2016.

The IGCP Secretariat actively presented the success of the programme during International conferences. These outreach activities increased the visibility of the IGCP and resulted in the submission of a high number of new IGCP project proposals in 2018 (as of October 2018, UNESCO Secretariat received 21 new IGCP project proposals).

In 2018, 160 project leaders collaborated with at least 4485 project participants to deliver the objectives of 27 active IGCP projects in 105 countries.

IGCP projects published over 300 scientific papers.

In 2018, 26 IGCP project meetings have been successful in building bridges between disciplines and between 105 member states, engaging young scientists from developing countries, with aims of stimulating cutting-edge research, and sharing scientific knowledge for the benefit of all.

The UNESCO Secretariat IGCP website is regularly updated. There you can view IGCP progress (www.unesco.org/igcp) including the outcomes and presentations of the IGCP 2018 Council meeting and UNESCO IGCP annual report.

Graphic Options:

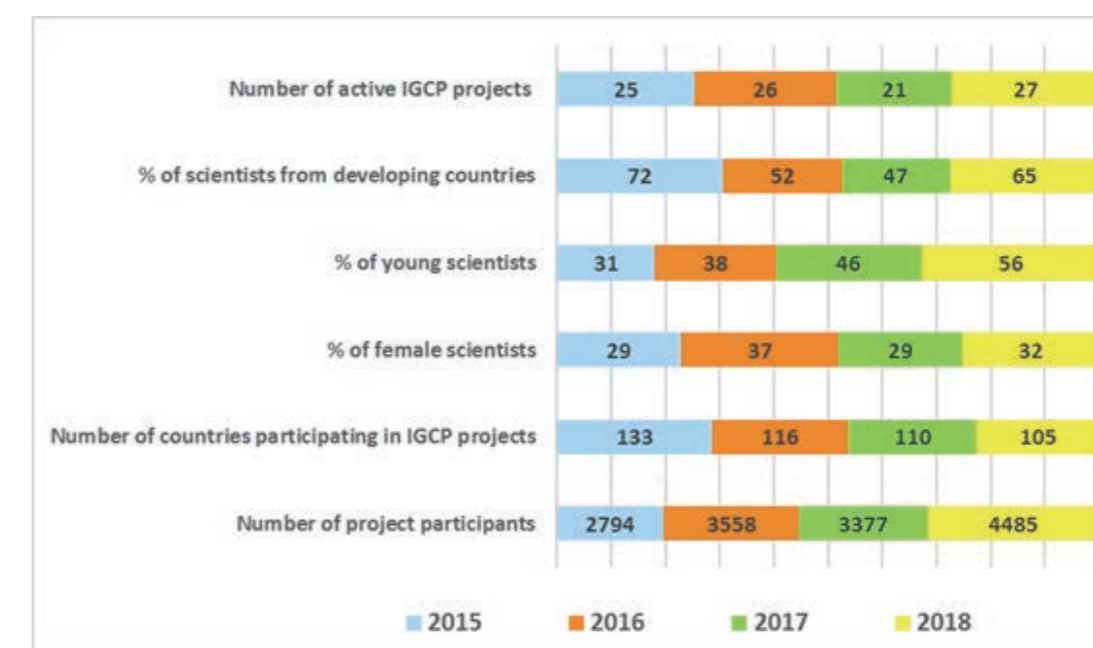


Figure 1: Comparison of IGCP projects participants between 2015 and 2018.

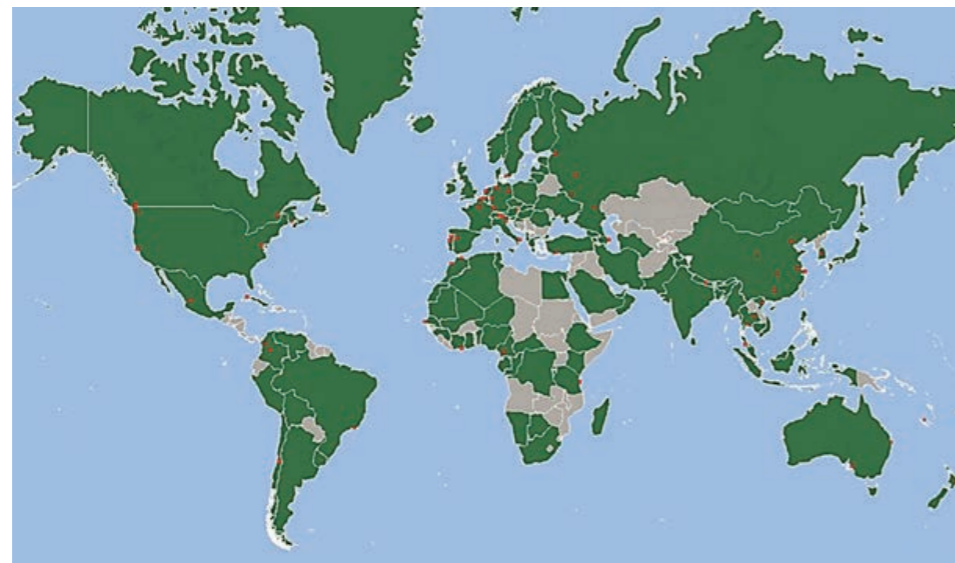


Figure 2: World map showing IGCP projects participating member states (in green) in 2018 and IGCP meetings sites (in red).



Figure 3: IGCP Council members and UNESCO Secretariat staff at UNESCO HQ during last IGCP Council meeting.

TASK GROUP ON GEOHAZARDS

Yasukuni Okubo

The Task Group on Geohazards (TGG) operates as an exchange group on a wide scale, primarily to facilitate a basic understanding of geohazards and natural disasters among the public. The activities of TGG in 2018 include:

1. Participation in the Workshop of Korean Active Faults R&D Project in Gyeongju, Korea, March 15th - 18th 2018

<http://iugs.org/uploads/E-Bulletin/IUGS-E-bulletin-April-141.docx.pdf>



Joint observation at the trench site at the workshop.

2. Visit to the Institute for Volcanology and Risk Assessment (IVAR), Azores, Portugal, July 11, 2018

<http://iugs.org/uploads/E-Bulletin/IUGS-E-bulletin-November-148.pdf>

3. Organization of the session entitled "Convergent Margin Geohazards and Geodisasters: on 20th June 2018 at RFG2018 in Vancouver.

4. Participation in the Taiwan-Korea-Japan Joint Symposium, Taichung City, Taiwan, 3-4 October 2018

<http://iugs.org/uploads/E-Bulletin/IUGS-E-bulletin-October-147.pdf>

5. Organization of the seminar on the 30th October 2018 in Busan, Korea, at the 54th CCOP Annual Session

<http://iugs.org/uploads/E-Bulletin/IUGS-E-bulletin-December-149.pdf>

<http://iugstgg.lab.irides.tohoku.ac.jp/archives/228>

6. Organization of the IUGS-SCJ-IRIDeS Geohazard Symposium in Sendai and field excursion around Sendai Plains 13-14 Nov., 2018

http://iugs.org/uploads/E-Bulletin/IUGS_E_bulletin_January_150.pdf

<http://iugstgg.lab.irides.tohoku.ac.jp/archives/257>



Dr. Goto points the evidence of pollen of the pine trees residing in the layer just above the tsunamis deposits of 1611.

A number of geohazards have occurred and will continue to occur in the future. In order to improve our understanding of geohazards and to develop tools to mitigate their effects, it is essential to publish the guideline of geohazards surveys. UNESCO has already published an English guideline on tsunami survey. The report is fundamentally composed of text with few photos and figures. TGG will revise it by adding photos and figures to assist not only scientists, authorities and community leaders but also leaders in emerging regions and the public. Publishing guidelines requires cooperation between scientists and engineers, which is easier said than done but worth doing.

Laurance DONNELLY Chair



INITIATIVE ON FORENSIC GEOLOGY

In 2018, IUGS-Initiative on Forensic Geology (IFG) held 47 registered events. These included outreach events, knowledge exchange and capacity building, and the provision of training for the police, law enforcement and geologists. Two new members were assigned to the IUGS-IFG Committee including an Officer for India and a Crime Scene Adviser.

Throughout 2018, IUGS-IFG attention focused on India and the surrounding countries Bangladesh, Bhutan, Nepal, Sri Lanka, Pakistan and Afghanistan. In India, IUGS-IFG initiated forensic geology and held meetings with; (a) Ministry of Home Affairs, Government of India, (b) Head and Director of the Central Forensic Laboratories in India, (c) Director, National Institute of Criminology and Forensic Science, (d) Director of the Geological Survey of India, (e) Amity University, (f) Aspire Forensics (g) the Secretary General and 36th IGC Organising Committee and (h) the police. IUGS-IFG will hold a session on Forensic Geology at the 36th IGC, in Delhi, March 2020.

The scope of IUGS-IFG expanded in 2018 to include the application of geology to help investigate, manage and mitigate crimes associated with minerals, mining and metals. IUGS-IFG now includes a focus on under-developed countries and harder to reach communities in South and Central America, Africa and Asia. These typically involve criminal mining, illegal mining,

conflict minerals, smuggling of minerals across borders, substitution, sample adulteration, theft, fakery and fraud. A particular project was the Colombian Gold Fingerprinting Project, with the University of Pretoria, Colombian Geological Survey (Ingeominas) and Colombian Ministry of Mines.

IUGS-IFG gave a presentation on Forensic Geology in the Italian House of Representatives, in Rome, Italy on search for missing persons. It submitted written evidence to the UK House of Lords, Science and Technology Committee, Forensic Science Enquiry.

IUGS-IFG committee members were contacted by a number of police forces around the world to assist with supporting operational cases. IUGS-IFG Chair was invited to the Federal Bureau of Investigation (FBI) laboratory in Washington DC, USA to discuss geological ground searches for burials.

IUGS-IFG organised, co-organised and supported many conferences workshops and seminars, including: (a) Resourcing Future Generations (RFG2019) in Vancouver, Canada; (b) the European Network of Forensic Science Institutes (ENFSI) in Scotland and France; (c) Forensic Detector Dog events in the UK and USA; (d) the 7th European Meeting on Forensic Archaeology (EMFA), in Belfast; (e) the Brazilian Federal Police, International Geoscience Education Organization (IGEO) and the Brazil-

ian Geological Congress; (f) Soil Science Australia, Australian Clay Society, National Soils Conference; (g) the American Geophysical Union (AGU) Congress in Washington DC on 'From Crime Scene to Court Room; (h) planning for the 4th IberoAmerican Congress on Forensic Geology, Universidad Autonoma de Mexico (UNAM) and the Annual Meeting of Mexican Geophysics, Mexico; (i) Amsterdam Medical School, Human Taphonomy Facility, (j) University of Central Lancashire, Taphonomy Faculty, (k) Forensic Geology in Japan and the Geological Society of Japan, (l) UK Defence College of Policing and Guarding (m) Archaeological Geophysics, Environmental & Criminal Forensics in the UK with the Near Surface Geophysics Group (NSGG) and Forensic Geoscience Group (FGG), Geological Society of London, UK.

Learning and development in forensic geology was provided by IUGS-IFG for BSc and MSc university courses, PhD research, schoolchildren and members of the public. In 2018, IUGS-IFG advanced the writing of 'A Guide to Forensic Geology' and 'Forensic Soil Science and Geology', both are scheduled to be published in 2019-2020.

Members of the IUGS-IFG were recognised for their work and some gained senior postings. Professor Lorna Dawson received a CBE in the Queen of England's birthday list honors for

services to Soil and Forensic Science. Prof Pier Matteo Barone, for the second consecutive year, was awarded the Italian National Awards for Investigators and Forensic Experts. Prof Shari Forbes accepted a position as Associate Professor of Forensic Science and Chemistry at University of Ontario Institute of Technology (UOIT). Commander Mark Harrison, MBE (formerly UK National Police Search Adviser), was promoted from Australian Federal Police to a position in the Australian Criminal Intelligence Commission. Dr Fábio Augusto da Silva Salvador was promoted to Perito Criminal Federal, Chefe do Setor Técnico-Científico, Superintendência da Polícia Federal no Paraná. He is now responsible for the Technical-Scientific Directorate of the Federal Police in Brasília. During 2018, IUGS-IFG brought positive, international exposure at the highest level in geology (education, academia and industry) police, law enforcement and Governments. The work conducted by IUGS-IFG has been multi-disciplinary, resulted in increased visibility across international borders. This has also been multi-reaching with broad interactions (from school children to police and secret service agents). Forensic geology is regarded as being new, innovative, interesting and it also appeals to public and media.



36th INTERNATIONAL GEOLOGICAL CONGRESS 2-8 MARCH, 2020, DELHI, INDIA

India, with the support of the Indian National Science Academy, and the Science Academies of Bangladesh, Nepal, Pakistan and Sri Lanka will be hosting the 36th session of the International Geological Congress in Delhi during 2-8 March 2020. The Congress is funded by the Ministry of Mines and Ministry of Earth Sciences, Government of India. The Geological Survey of India is the nodal agency for organizing the event.

During the year 2018, various preparatory activities were undertaken.

Science Program

The 36th IGC has developed a comprehensive Science Program comprising as many as 44 science themes covering all fields of geosciences. Activities pertaining to the themes are being steered by 137 Science Coordinators from 17 different countries. The themes comprise 264 Symposia managed by 576 Conveners from 44 countries, making the 36th IGC Science Program not only technically sumptuous and diverse but also truly global. The details of the Science Program are published in the Second Circular of 36th IGC. In addition, 12 Plenary Speakers have also been identified by the Science Program subcommittee after inviting nominations from the eminent Indian geoscientists of the Science Advisory Committee of 36th IGC. The list of Plenary Speakers includes 11 internationally-reputed geoscientists from the UK, USA, Germany, Australia, France and, Russia.

Field Trip Program

The Indian subcontinent has a unique geological heritage that spans in age from the Archaean to the Recent. The Field Trip committee has organized 61 pre- and post-Congress field trips in India. The field trips include the great Himalayan orogen, the granulite terrains in south India, the Proterozoic ultrahigh temperature granulite of Eastern Ghat Mobile Belt in India, the Central Indian Tectonic Zone, large Neoproterozoic felsic-volcanic dominated Malani Igneous Suite in western India, the Late Cretaceous Deccan Flood Basalts covering an expanse of over 0.5 million sq. km in western India, the great Bengal Delta fans (3000 km long and 1000 km wide), rare dinosaur nestling sites, the Proterozoic basins in NW India that host world-class base metal deposits (about 400 MT) and the great Indo-Gangetic Plain (2200 km long and 220 km wide). Ten more proposals i.e., three from Bangladesh, six from Nepal and one from Sri Lanka also are included in the Congress program to showcase the geological uniqueness of these countries. In total, a bouquet of 71 field trips is being offered for participation. They are described in the second Circular. Costs and other details for each field trip will be published in the third Circular and subsequently on the website.

Geohost Program

The Geohost program has been designed to help active geoscientists whose abstracts have been accepted for presentation. Financial

support will be provided based exclusively on scientific merit. The Geohost program will comprise 1000 registration fee waivers, 1000 travel and 1000 local hospitality supports, which may be awarded either as full or partial support. This will include the Youth Geohost program under which meritorious students from IUGS-adhering countries would be offered fully-funded Geohost grant (one per country) for participation in the 36th IGC.

Legacy Program

The Legacy Committee is working towards bringing out the following publications during the IGC: 1) The Geodynamic Evolution of the Indian Subcontinent-Hadean to Archean; 2) Geotourism Spots of India; 3) Bibliography of Geological Society of India Publications; 4) Mineral belt map of India; 5) Commemorative Postal Stamp.

Outreach Program

To popularize the 36th IGC among the geoscientists across the world, the 36th IGC Secretariat participated in several national and international geoscientific events during the year. These include: RFG Conference, June 2018, Vancouver, Canada; 15th Asia-Oceania Geoscience Society (AOGS) conference, June, 2018, Honolulu; International Conference on Geoscience Education, July, 2018, Campinas, Brazil; International Association of Engineering Geologists (IAEG), September, 2018, San Francisco; Australian Geoscience Council Convention, October, 2018, Adelaide, Australia; The Geological Society of America (GSA) Annual Meeting: November, 2018, Indianapolis, United States; the AGU Fall Meeting: December 2018, Washington, DC, United States



Members of the Secretariat at the 36th IGC Exhibit Booth at the RFG Meeting, Vancouver, Canada.

THE 37TH INTERNATIONAL GEOLOGICAL CONGRESS 25-31 AUGUST 2024, BUSAN, KOREA

The Geological Society of Korea (GSK) and the Korea Institute of Geoscience and Mineral Resources (KIGAM), together with the support of the Ministry of Science and ICT, the Ministry of Trade, Industry and Energy, Busan Metropolitan City, the Korea Tourism Organization, and the Busan Tourism Organization, are preparing for the 37th International Geological Congress (IGC 2024) to be held from 25 to 31 August, 2024 in Busan, Korea. The theme of the congress 'The Great Travelers: Voyages to the Unifying Earth' will identify currently debated issues and the future-oriented technologies in the geosciences. The IGC 2024 will offer a broad ranging program to serve the interests of all distinguished delegates, including a Young Geologists Program, a Geological Film Festival and exciting field excursion programs, to promote dialogue and exchange among the world's leading experts in the geosciences.

To ensure a successful congress, we have formed a Preparatory Committee and have held regular meeting since 2017. The committee has members from universities, academic societies, researchers, local governments, convention centers, and PCO. These experts quarterly gather to discuss and examine IGC preparation. The term of this committee will remain until the IGC 2020 officially launches the Organizing Committee from 2020.

Furthermore, we are in the process of forming an overseas advisory committee of former IUGS executives and IUGS members with IGC experience. We have now 11 committee members

from Canada, China, Finland, Germany, Japan, Norway, Slovenia, South Africa, Sweden, and UK. The overseas advisory committee will continue to serve until the year 2024. We will mainly consult with them via on-line and invite them as needed.

Geological science-related events are held in Korea to promote and publicize our prestigious congress and host city Busan over the world. This Pre-Publicity Program includes the Next Generation Geological Scientist Conference, which was held in conjunction with the 2018 Fall Joint Conference of the Geological Sciences in Gyeongju. This conference will be held every year until 2024, and it can make young geoscientists interested in IGC and encourage them to participant in IGC 2024. International events such as the 45th International Association of Hydrogeologists Congress in Daejeon, 54th CCOP Annual Session & 71st Steering Committee Meeting in Busan were held last year and Asia Oceania Geoscience Society Annual Meeting (AOGS2020) in Hongcheon will be held next year.

Since there are 5 years left before the IGC 2024, it would be necessary to gradually promote the IGC 2024 to the public and scientists. We are going to participate in EGU General Assembly and AGU Fall Meeting every year to operate the promotional booth. As the next host country many Korean delegates will take part in the IGC 2020 at Delhi, India, and open a big unique national pavilion and offer traditional performance at the closing ceremony. During the Geo

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