

IAH Karst Commission – The Annual Report for 2018

In 2018, Zoran Stevanović (Serbia), Augusto Auler (Brazil) and Cheng Zhang (China) served as Chairs of the Karst Commission (KC). Zoran Stevanović served as the Principal Chair and, following the established rotation procedure, he will hand over this position to Augusto Auler on 1 January 2019.

In 2018, KC held its official annual meeting on 3 July 2019 in Besançon, France, during the conference EUROKARST 2018. It was attended by approximately 30 members and friends of the KC. The meeting was chaired by Zoran Stevanović and Augusto Auler. The minutes are available at: <https://karst.iah.org/>.

Events

Catherine Bertrand and her team have perfectly organised EUROKARST 2018, which was attended by more than 180 participants. Keynote lectures were presented by A. Hartmann, Z. Stevanović, H. Jourde, Y. Hao and M. Bakalowicz. Three parallel oral sessions, three post-excursions, as well as several social events and workshops presented great opportunities for learning, establishing new contacts and presenting the results of several ongoing or completed projects. The conference Proceedings with 141 abstracts are available at: http://www.eurokarst.org/wp-content/uploads/2016/07/Proceedings_Eurokarst2018.pdf.

Karst hydrogeology and the activities of our commission were represented in many ways at the 45th IAH Congress that took place on 9-14 September 2018 in Daejeon, South Korea. One of the plenary keynote lectures was given by N. Goldscheider, Past-Chair of the KC. A special session organised by the Institute of Karst Geology (CAGS) was dedicated to the IGCP project “The Critical Zone in Karst Systems”.

In honour of the 80th anniversary of the birth of our distinguished member Petar Milanović, the international conference “KARST 2018 – Expect the Unexpected” was organised in Trebinje, Bosnia and Herzegovina by the Centre for Karst Hydrogeology of the University of Belgrade, Serbia and the HE Power Plant Dabar. More than 100 participants from more than 20 countries presented their works in three thematic sessions. One field trip and a round table were organised as well. Proceedings with 56 articles are available at www.karst.edu.rs and www.karstportal.org.

Another event took place in Vancouver, Canada, during the conference “Resources for Future Generations – RFG 2018”. Our Chinese and other colleagues involved in IGCP 661 “The Critical Zone in Karst Systems” organised one of the sessions on the following topics: Education and Knowledge, Energy, Minerals, Resources and Society, the Earth, Water. The session focused on the resources and environmental effects of karst dynamics systems.

The AGU Fall Meeting in Washington D.C., which was convened by N. Massei, Y. Padilla and J. Lamoreaux, took place on 10-14 December 2018 and included a session titled

“Characterisation, Modelling and Remediation of Fissured, Carbonate, and Karst Groundwater Systems”.

Several other international events also had special sessions devoted to karst hydrogeology topics, including the XXI Congress of the Carpathian Balkan Geological Association which took place in Salzburg, Austria on 10-13 September 2018. On 7 November, Special Session and Conference were organised by the Serbian Academy of Science and Arts in Belgrade to commemorate 125 years from the publishing of what is one of the milestones in the development of karstology and karst hydrogeology – monograph “Das Karstphänomen” by Jovan Cvijić.

Courses and trainings

The 5th International UNESCO course and field seminar *Characterisation and Engineering of Karst Aquifers (CEKA)*, sponsored by UN-IGRAC and the Regional Waterworks for the Montenegro Coast and organised by the Centre for Karst Hydrogeology of the Department of Hydrogeology, University of Belgrade and the Geological Survey of the Republic of Srpska from Zvornik took place in two countries this year: Bosnia & Herzegovina and Montenegro, on 1-8 June 2018.

The 26th International Karst School ‘Classical Karst’, organised by the Karst Research Institute, Postojna, Slovenia, was also successfully completed in June 2018. This year, the topic was “Show Caves”.

The 10th International Karst Training Course, organised by the International Research Centre on Karst from Guilin, China under the auspices of UNESCO (IRCK), took place in Nanning, Jishou (Xiangxi) and Guilin on 13-26 November 2018. It involved 22 participants, students and practitioners from 17 countries and four continents. Along with the course, nine KC members attended perfectly organised events in the capacity of invited lecturers, such as the 9th ASEAN-China Mining Cooperation Forum & Exhibition (Nanning), the 2nd Workshop on Xiangxi Geopark (Jishou, Hunan), and the High-Level Forum for Sustainable Development in Guilin.

Several one- or two-day workshops and trainings were organised under the framework of thematic conferences. Two workshops were conducted during EUROKARST 2018:

-KARSYS, KarstALEA and KarstFlowSIM: applied and innovative methods for the management of karst environments; and

-PaPRIKa, a multi-criteria method for vulnerability mapping of karst aquifers / KarstMod, an adjustable platform for hydrodynamic modelling in karst aquifers.

The KC continued to contribute to several international lecture series dedicated to karst hydrogeology:

In 2018, under *Karlsruhe Karst Lectures*, the University of Karlsruhe (KIT) organised three lectures, two of which were presented by KC members (A. Kovacs and M. Petitta): <http://www.agw.kit.edu/english/karstlectures.php>

The *Edward Aquifer Distinguished Lecture Series* organised one lecture in 2018. Details: (<https://www.edwardsaquifer.org/science-and-maps/scientific-community>).

Initiatives and Projects

Following a recent initiative of the Chinese institutions IRCK and IKG, Guilin to set up a new Technical Committee on Karst under the umbrella of the International Standardisation Organization (ISO) "to carry out standardisation in the fields of karst terminology, sustainable development of karst resources, environmental protection and management, investigation...", members of KC have had extensive discussions and have exchanged much information on the topic. Doubts were expressed at the KC Annual meeting concerning the above idea, for several reasons and due to the absence of KC on the list of parties to be engaged as liaisons. However, under the authorisation of the KC, Z. Stevanović established a contact with the initiators in order to ensure regular communication during the creation of this Technical Committee and its sub-committees, which must include representatives of the KC. Full support to this communication was also provided by our member George Veni, current President of the International Union of Speleology (UIS).

At its Annual Meeting, KC decided to extend its full support to the proposal of the UIS to establish the International Year and Day of Caves and Karst, and to take an active role as partner in related activities. The proposal will be prepared and submitted to UNESCO for approval, and whatever year and date may be selected, KC will organise presentations, trainings or thematic conferences, and stimulate its members to organise similar events in their respective countries.

The KC also expressed full support for the idea to organise an IAH Congress at the China University of Geoscience (Wuhan, China) one of the following years.

The two important ongoing projects in karst under the leadership of KC members are:

-IGCP 661 - "The Critical Zone in Karst Systems" (2017-2021) (Zhang Cheng, Chris Groves *et al.*);

-Emmy-Noether Programme of the German Research Foundation (DFG): "Global Assessment of Water Stress in Karst Regions in a Changing World (GloW)" (Andreas Hartmann *et al.*).

The two approved, in-the-pipeline projects are:

-PRIMA (Partnership for Research and Innovation in the Mediterranean Area): "Karst Aquifer Resources Availability and Quality in the Mediterranean Area" (KARMA) (Nico Goldscheider, Nadine Göppert and Bartolomeo Andreo, Marco Petitta, Hervé Jourde, Joanna Doummar).

-UNESCO: DIKTAS Project (Dinaric Karst Transboundary Aquifer System) Phase 2: "Implementation of the Strategic Action Plan: Improving Groundwater Governance and Sustainability of Related Ecosystems" (Neno Kukurić, Zoran Stevanović, *et al.*)

Publications in 2018

Books by two of our eminent and long-standing KC members have been published recently:

-Petar Milanović: *Engineering Karstology of Dams and Reservoirs* (CRC Press, Taylor & Francis Group),

-David Drew: *Karst of Ireland - Landscape Hydrogeology Methods* (Geological Survey of Ireland).

The two publications that include active contribution of KC members are:

-*Advances in Karst Research: Theory, Field Work and Applications* (Geological Society of London),

-Karst Water Environment: Advances in Research, Management and Policy (Springer).

Communication and promotion

In the course of 2018, regular information mechanism has been established and KC members and friends are now receiving news regularly, on a monthly basis. The mailings refer to conferences, job announcements, scholarships, project ideas, innovations, candidates for membership, and are aimed at avoiding cross-information as much as possible. The agreement reached with KC member George Veni, current President of the International Union of Speleology, to include our list of members in his information channel additionally helped improve the circulation of news.

Our previous website was re-designed with the support of KC member Aidan Foley. It is now functioning as a sub-site of the IAH website (<https://karst.iah.org>), and A. Foley is regularly updating it. Mostly thanks to our member Andreas Hartmann, KC is present in the social media Facebook (<https://www.facebook.com/iahkarst/>) and Twitter (<https://twitter.com/iahkarst>), while KC member Catherine Coxon is handling our LinkedIn platform which now has more than 100 members (<https://www.linkedin.com/groups/4957376/profile>).

The World Karst Aquifer Map (WOKAM), a recent major achievement that resulted from the cooperation between IAH and UNESCO, was promoted on several occasions. During the IAH General Assembly in Daejeon, IAH Vice President for Science and Programme David Kreamer also mentioned WOKAM as an important accomplishment of our Commission.

Membership

During the past 16 months 11 new members joined the KC. Eight are from countries that were not previously represented in the KC including (for the first time) one representative from Africa (Albania, Belgium, Ethiopia, Greece, Israel, Lebanon, Montenegro, Turkey).

Awards

On the occasion of the 10th anniversary of its establishment and successful operation, the Centre for Karst Hydrogeology (CKH) of the University of Belgrade presented five awards to renowned experts who have “contributed to the development of the Centre and the science of karst hydrogeology”. They have actively cooperated in the implementation of CKH projects, programme activities and have helped with the organisation and lecturing in the international course “Characterisation and Engineering of Karst Aquifers”. The awardees are: Petar Milanović, Neven Krešić, Ognjen Bonacci, Derek Ford and Borivoje Mijatović (posthumously). The awards were presented on 6 June 2018 in Trebinje during the opening ceremony of the international conference “KARST2018 – Expect the Unexpected”.

The “*Young Karst Researcher Awards*” for 2018 were presented to Pierre Fischer, Alessandro López-Tamayo and Simone Carrière for their excellent and innovative presentations at the EUROKARST 2018. The Examination Panel comprised of A. Auler, P. Meus and Z. Stevanović had a very difficult task, as competition was fierce and all of 36 candidates had to be evaluated.

Events in 2019

The next annual meeting will take place in Malaga, Spain during the 46th IAH Congress, 22-27 September 2019.

Karst session titled “Field and Modelling Approaches to the Assessment of Hydrogeological and Engineering Problems in Complex Karst Environment” will be held at the next General Assembly of the European Geosciences Union (EGU), on 7–12 April 2019 in Vienna.

KC members will also attend several other events, e.g. the International Conference “Man & Karst” in Ragusa, Italy; the 23rd National Cave & Karst Management Symposium in Virginia, USA; the 4th Conference of the Central European Group (CEG) of IAH in Donji Milanovac, Serbia.

Same as this year, training courses are planned to take place in Trebinje, Postojna, Guilin, and during some of the conferences.

Between 14 and 18 June 2019, the KC is organising a geo trip to the Carpathian karst. The tour includes visits to attractive karst surface features, springs and caves along the southern margin of Carpathian Mountains in two countries - Romania and Serbia - between the Danube and Olt Rivers (Donji Milanovac – Baia de Arama – Trgu Jiu – Horezu).

And, last but not least, the Annual Meeting to mark the 50th anniversary of KC activities will be held during the conference “UNESCO and Karst 2020” in mid-May 2020 in Bowling Green, USA. This conference will include topics from three current UNESCO conservation programmes: the Man in the Biosphere Programme (MAB), the World Heritage Convention (WHC), and the Global Geoparks Network (GGN). The organisers are the George Wright Society (GWS), the Western Kentucky University (WKU), and the Mammoth Cave Area Biosphere Reserve (MACBR).

Most of the presented or planned activities of the IAH Karst Commission are described on the website: <https://karst.iah.org/>

Zoran Stevanović (Serbia)

Augusto Auler (Brazil) & Zhang Cheng (China)