



Annual Report for 2024

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INTRODUCTION

The main activities of the Commission on Karst Hydrogeology (KC) of the International Association of Hydrogeologists – IAH, during the year 2024 are presented in this report.

The IAH Karst Commission has a collective chairmanship, represented by Peter Malík (Slovakia), Avihu (Avi) Burg (Israel) and Benjamin (Ben) Tobin (USA), who were elected in the summer period of 2021 for their four-year term. The ongoing mandate began on September 1, 2021, and will continue until August 31, 2025. Having a regional background of chairmanship – Avi Burg for Asia and Oceania, Ben Tobin for the Americas, and Peter Malik for Europe and Africa, there is a rotation of the three responsible appointees for an equal period of 16 months each. Peter Malík who served

as the principal chairman of the Karst Commission until December 31, 2022, has been replaced by Avi Burg on January 1, 2023. Avi Burg was in charge throughout 2023 and the first four months of 2024 and has been replaced by Ben Tobin at the beginning of May 2024.

This summary report was written by the two chairmen on duty during 2024 – Avi Burg, (January-April 2024) and Ben Tobin (May-December 2024) with the great assistance of Peter Malik.

MEMBERSHIP

The KC started the year 2024 with 87 full regular members from 40 countries, including 3 new members this year: Abe Springer (USA), Vincent Bailly-Comte (France) and Marlon Ccopa Alegre (Peru). According to the long-standing tradition of the Karst Commission membership rules, the newcomers are kept as “associate members” for the next two years before gaining full regular membership.

Besides this, the Karst Commission also counts a few tens of “friends” – people interested in karst hydrogeology, including young karst researchers, professionals, and students who want to receive information and be updated on the IAH Karst Commission activities through the monthly issued newsletter. The list of “friends of the Karst Commission” is informal and open to anyone interested.

MEETINGS IN 2024

The annual meeting 2024 of the IAH Commission on Karst Hydrogeology was held on 11 June 2024, during the EUROKARST meeting in Rome. Two of the current chairs who were present at the Conference - Peter Malik and Avi Burg welcomed the participants and led the meeting. 33 KC members attended the meeting while 4 others joined remotely via Zoom. The meeting was opened with sincere greetings and thanks by co-chair Avi Burg and one of the EUROKARST organizers – Marco Petitta.

The agenda of the meeting included a presentation of the group’s activities, a description of the ongoing MIKAS project, the KC involvement in special events (Geotrip to Croatia and Slovenia in 2023, and the “Geological Heritage Sites program”), and the intentions of the KC for the coming year.

In addition, John Gunn and MaryLynn Musgrove spoke respectively in memory of Alexander Klimchouk and Barabara Mahler, two KC members who passed away recently; with the support and consent of all participants, the KC granted a certificate of honor to Jim LaMoreaux for his distinguished prolonged and useful activity in the KC. Gheorghe Ponta respectfully described Jim's long-term activity and contribution; the KC congratulated Nico Goldscheider for being awarded an “Honorary Fellow” of the Geological Society of America; Philippe Meus provided some information on the activities carried out by the water tracing initiative/working group on dye tracing; Zoran

Stevanović spoke about the progress of the Most Important Karst Springs (MIKAS) project in which many KC members are involved; Zoran Stevanović, on behalf of all authors (John Gunn, Nico Goldscheider, Zoran Stevanović, and Nataša Ravbar), briefly described the content of the new book - "Karst: Environment and Management of Aquifers", in which several KC members are involved and which is now available for free download.

The IAH Karst Commission annual meeting also serves as a platform for awarding young researchers and students (the Young Karst Researcher Prize –YKRP). With the assistance of members of the Karst committee, the three best were announced and awarded:

- Juan José Durán Valsero from Spain –“A karstic cave with an exceptional geological value: Cueva de las Estegamitas (Malaga, Southern Spain)”.
- Nane Weber from Germany – “Global estimation of drainage characteristics in karst landscapes”.
- Augustin Gouy from France – “Simulation of the polyphasic karst system of the Barrois limestones with a discrete karst network simulation method”.

The annual meeting of the IAH was held in Davos, Switzerland, between 8-13.9.2024. Many members of the IAH KC actively participated in the conference. Three sessions on karst hydrogeology were organized and chaired by KC members (Pierre-Yves Jeannin, Hervé Jourde, Laurence Gill, Peter Malik, Zoran Stevanović, Nico Goldscheider and Avi Burg). Moreover, two of the KC members - Nico Goldscheider and Pierre-Yves Jeannin, were the organizers and leaders of two field trips that took place on Wednesday, September 11.

COURSES IN 2024

The Visual KARSYS online courses are routinely organized by the Swiss team of ISSKA/SISKA, the Swiss Institute for Speleology and Karst Studies. Visual KARSYS is a software platform dedicated to karst groundwater management, offering a series of tools for assessing aquifer geometries and groundwater flow systems. Two 3-hour sessions of Visual KARSYS course for geologists and hydrogeologists (engineers, academics, students), working in karst environments, were organized several times during 2024.

MEMBER AWARDS

In the KC annual meeting in Rome, Co-chair Avi Burg described the activities and achievements of the previous KC chairmen - Zoran Stevanović, Augusto Auler, and Zhang Cheng who served as the KC chairs from 9/2017 to 8/2021. Gifts from the KC and the EUROKARST organizers were given to two of the trio who were present at the meeting - Zoran and Augusto.

Zoran Stevanovic received the IAH Applied Hydrogeology Award during the IAH conference in Davos. Zoran received this award due to his continual activity in hydrogeology. He has conducted work in two parallel directions: (1) scientific activity mainly on the topic of karst hydrogeology, brought about by hundreds of published articles, monographs, and books, and (2) practical projects aimed at bringing quality water to populations in many countries.

His activity in the IAH KC is prolonged, active, and influential; he has been a member since 1988; elected Chairman of the Commission in 2017-2019, and Co-Chair for Europe and Africa between 2019-2021.

NEW RELEVANT PUBLICATIONS

KC member Neven Kresic has released a new book, "Notable Springs of the United States" which can be downloaded completely free from either the Karst Waters Institute: <https://karstwaters.org/>

COLLABORATIVE PROJECTS AND ARTICLES

Most Important Karst Aquifer's Springs (MIKAS) International Project

MIKAS, the international project of the Karst Commission, and the newest among the KC projects, intends to establish the first complete list of the most important karst springs on a global level (based on historical, aesthetic, economic, ecological, and scientific values), to promote them and create a Code of Practice for them. The way of progress is by bringing together both KC members and many national experts to: (a) develop criteria for selecting the most important karst springs, which inter alia should include historical, aesthetic, economic, ecological, and scientific values; (b) establish the list of the most important springs at the global level; (c) create the Code of Practice for the utilization and protection of these springs; and (d) promote these springs by labeling them "on-site" and publishing them in the internet. This project was initiated and coordinated by the very active KC member - Zoran Stevanović and is supposed to operate entirely voluntarily for a duration of three years. Alongside Zoran, an Advisory Board (AB) was appointed to assist in: (1) completing the guidelines that include criteria for selecting suitable springs for both established groups - MIKAS (list of globally important springs) and NIKAS (Nationally important springs), and the spring's survey

form; (2) review the springs submitted, and to whom they are suitable - MIKAS or NIKAS.

The project's achievements were reported at the KC Annual Meeting in Tampa, Florida in March 2023, , at the KC Annual Meeting in Rome, Italy in June 2024 and on the KC website (<https://karst.iah.org/projects>). The project is currently run by almost 100 national experts who have agreed to work voluntarily on the project. The final MIKAS/NIKAS list will be proclaimed at the end of the project when data from all “karst countries“ will be submitted and cross-checked.

A website framework for the project was recently established (<https://mikasproject.org/>).

RObust Conceptualisation of KARst Transport – ROCKAT

This project aims to develop a conceptualized bucket model of discharge and transport in karst systems by separating hydrologic processes based on different storage compartments (i.e. epikarst, matrix, and conduit systems). Conceptual bucket models are widely used to predict spring discharge in karstic watersheds, while solute transport modeling remains challenging due to the underlying karst complexity. The main scientific objectives of this project are: (a) to develop lumped bucket models with different levels of complexity to reproduce the dominant solute transport processes in the different compartments of the karst systems – the solute transport routines will be combined with existing discharge models, i.e. LuKARS and KarstMode, and validate for multiple karst systems; (b) to perform calibration and validation of the hydrological karst models based on the discrete wavelet decomposition (multi-temporal scale calibration), of both discharge and hydrogeochemical signals (multi-objective calibration); (c) to use the experimental results of tailored event-based sampling campaigns to decompose time series of electrical conductivity with a high temporal resolution into the major ion concentrations to determine relevant factors affecting transport processes in the different parts of the karstic systems; (d) to create an applicable modelling toolbox as a graphical user interface (GUI) for all the developed tools. The project is managed by Gabriele Chiogna and Andreas Hartmann at the School of Engineering and Design, Technical University of Munich, and is scheduled to be completed in 2024. Details are described in:

<https://www.cee.ed.tum.de/en/hydrologie/research/current-projects/rockat>

Water Tracing Initiative

At the initiative of KC member - Philippe Meus from Belgium, a group of participants interested in water tracing issues met for a discussion during the EUROKARST 2022 conference in Málaga, Spain. Several issues were discussed, including legal environment and tracing methodology, but the two main issues seem to be: a)

presenting clear standards for international regulations; and b) organizing an international ring test on fluorescence tracers for laboratories involved in the detection/quantification of fluorescent tracers/dyes using conventional fluorometric techniques, with laboratory and/or field instruments. Participation in the test is voluntary and is carried out with an implicit agreement between the participants and the organizers. Each participating laboratory receives an anonymous code for reporting its final results in an online web form.

The project progress is slower than expected due to technical problems.

Inventory of Geological Heritage Sites

The KC was invited to be involved in an ongoing project managed by the International Union of Geological Sciences (IUGS) – the “Geological Heritage Sites program”, in collaboration with UNESCO. The project aims to develop a worldwide inventory of geological heritage sites of international relevance (<https://www.unesco.org/en/igpp/igcp-projects/731>). The first report - “First 100 IUGS Geological Heritage Sites” was published in 2022 (<https://iugs-geoheritage.org/>, and: https://en.wikipedia.org/wiki/Category:First_100_IUGS_Geological_Heritage_Sites).

The second report (“Second 100 Heritage Sites”) was published in 2024. The KC was asked by the IAH to propose some outstanding karst springs to be included in the list of the Geological Heritage Sites. KC member - Zoran Stevanović, having extensive knowledge of karst springs all over the world, proposed 4 springs, of which three were selected to be on the list. In addition, the KC chairmen, as well as the past chairmen of the KC, served voluntarily as evaluators of the 174 geological candidate sites, part of a group of 88 international experts.

PROGRAMS

The KC currently has two programs, the well-established Young Karst Researcher Prize and the new Funding for Young Scientists to Attend Karst Commission Conferences.

Young Karst Researcher Prize

The Young Karst Researcher Prize (YKRP) was first awarded in 2009 by Nico Goldscheider to encourage and promote young scientists in the field of karst hydrogeology. The prize is intended to be given once a year at the conference where the Karst Commission organizes its annual meeting, to three winners with equal prize value. During the EUROKARST meeting held in Rome on June 2024, the KC chairs, with the help of several karst committee members, decided to award presentations by Juan José Durán Valsero, Nane Weber, and Augustin Gouy (see details above). The

awardees received certificates of appreciation, souvenirs, and books issued by Springer.

Funding for Young Scientists to Attend Karst Commission Conferences

Eligibility criteria and rules for providing financial support for young karst scientists to attend the official annual IAH Karst Commission conferences are published at: <https://karst.iah.org/funding-for-young-scientists-to-attend-conferences>. In 2024, the KC didn't receive any request for support.

SOCIAL MEDIA

The Karst Commission has been well-represented on social media.

Our website <https://karst.iah.org> is regularly updated by KC co-chairman Ben Tobin.

KC's Facebook page is active and updated by KC member Andreas Hartmann.

KC's Twitter page is also active and updated by KC member Andreas Hartmann.

KC's LinkedIn page is administrated by KC member Daniel Bittner.

KC NEWS

Pages of the KC News, our monthly newsletter, are published monthly and sent electronically to the Karst Commission members and friends. Throughout 2024, the responsibility for KC News compilation, editing, and distribution rested with Avi Burg (January-April, 2024) and Ben Tobin (May-December, 2024) as the acting chairmen of the KC.

Following Ian Davey's request, the Executive Manager of the IAH, all KC News are displayed on the KC website and available not only to the "members" and "friends" but to all interested curious people (<https://karst.iah.org/kc-news>).

The KC News also serves as a platform for special requests from the KC members and the IAH. During 2024, this platform was indeed used for publishing several requests.

FUTURE KC ACTIVITIES AND MEETINGS

The next annual meeting of the IAH Commission on Karst Hydrogeology has been agreed to be at the 32nd INTERNATIONAL KARSTOLOGICAL SCHOOL, to be held at the Karst Research Institute, Postojna, Slovenia, between 16 – 20 June 2025.

The next geotrip will take place in the spring of 2025 in the Ozarks region (Missouri, USA). KC member Neven Kresić volunteered to organize this event together with the KC chairmen. This plan corresponds to the decision of the KC board to organize a

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geotrip once every two years and each time to a different region around the world (the last two geotrips enjoyed the karst landscapes in southeast Europe).

At the end of the Geotrip, some participants will continue to Florida to visit more impressive karst springs. This additional trip will be guided by Todd Kincaid.