[Test] January KC News

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Karst Commission

In this issue

January 2024 NEWS

Chairs: Peter Malik (Europe/Africa, 9/21 - 12/22); Avi Burg (Asia/Oceania, 1/23 - 4/24); Benjamin Tobin (Americas), 5/24 - 8/25)

Note from the chairs

The New Year holiday is behind us and we are ready for a new promising and fruitful year full of activities.
This News includes references to the usual topics – upcoming events and recommended publications, but also to unusual and even exciting topics, such as the TV interview of one of the oldest members of our group - Prof. Rafael Fernández Rubio.
We remind you of the events where we want to see many of you – the Eurokarst in Rome where we will hold the group's annual meeting, the IAH meeting in Davos where there will be three sessions on karst hydrology, and the "Man and Karst" conference in Sicily organized by our friend - Rosario Ruggieri.

Interview of Prof. Rafael Fernández Rubio

One of our oldest friends - Prof. Rafael Fernández Rubio from Spain recently gave an interview to the regional television of Andalusia, where he reviewed some moments of his long life, responding to current issues in the water universe, mining, and the environment. We are excited to share the interview with you. Here is the link to the interview: https://youtu.be/BTnMeAJu7Ms?si=08CVm44INzgwa
You can watch the video with English subtitles (or other languages). Below is the procedure for choosing a subtitle language:
1. Click on the icon with the gear shape; Select the "subtitles" icon option (and the

subtitles will automatically appear on the screen).
2. Select the “settings or configuration” icon, inside it, display the “language (automatically generated)” option, and here display “automatically translate” to select the desired language from the list of options. The subtitles should now appear in the selected language.

We asked Rafael to describe himself and his activities to those who don't know him, and here is what he wrote about himself:

Rafael Fernández Rubio started caving in 1946 (at the age of 14), which led him to study Mining Engineering, where he obtained his Ph.D. from the Polytechnic University of Madrid. He joined the IAH in 1959, first attending the Madrid Congress, and the following year the Belgrade Congress. That year, he spent a long time in the Dinaric Alps, with renowned hydrogeologists from the former Yugoslavia. He is the oldest Spanish member of the IAH, from which he has received the Millenium Hydrogeolofit. He was also been the first professor of hydrogeology at a Spanish University, focusing mainly on karst, mining, and thermalism, and worked in 59 countries, in more than 800 international missions as an academic and consultant. He is currently a Professor Emeritus at the Polytechnic University of Madrid (School of Mining Engineering).
He holds Honorary Doctorates from the University of Lisbon and the National Engineering University of Lima (Peru). He has received many awards, including the King Jaime I Award for Environmental Protection, with a Jury that included 21 Nobel Prize winners.
In the interview, conducted by 7TV (Andalusian television, Spain), with more than 1,100 downloads, he reviews his long career as a teacher and consultant in 59 countries, in a very pleasant conversation.

A message from Zoran Stevanović regarding Mikas (Most Important Karst Aquifer’s Springs) International project

MIKAS, the international project of the Karst Commission, aims to establish the first complete list of the most important karst springs at a global level (based on historical, aesthetic, and scientific values), promote them, and create a Code of Practice for them. The project is led by our very active friend - Zoran Stevanović and was first described in the April 2023 KC News and then in the October 2023 KC News where an update was given on the progress of the project.
Recently, Zoran has been working hard to adjust the database in order to create an available website framework. The link to the web page is https://mikasproject.org/. You are invited to take a look, to get an impression of the scope of the project and the progress over the last year.

UPCOMING KC EVENTS

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The IAH World Groundwater Congress 2024

The IAH World Groundwater Congress 2024 will take place from 8 to 13 September 2024 at the renowned Davos Congress Centre, Switzerland. The conference is organized around four main themes: (1) Hydrogeological systems and processes, (2) Groundwater as a resource, (3) Groundwater and society in a changing world, and

(4) Emerging field and computational approaches.
The call for abstract submission is now open. Submission will end on February 29. All sessions are arranged according to five overarching themes (see details at https://www.iah2024davos.org/parallel/). Three sessions focusing on different aspects of karst studies organized by KC members and chairmen are planned:
- Karst hydrogeology I: Flow systems and modeling approaches
  (led by P.-Y. Jeannin, H. Jourde, L. Gill)
- Karst Hydrogeology II: Water supply and engineering solutions
  (led by Z. Stevanovic, P. Malik)
- Karst Hydrogeology III: Water quality, sustainability and ecosystems
  (led by A. Burg, N. Goldscheider)

Karst Hydrogeology I is listed under the topic “Hydrogeological Systems and Processes” while the other two sessions are listed under the topic “Sustainable Groundwater Resources Management”.
We invite you to submit an abstract to one of these three sessions and encourage your students and friends to do so as well.
The submission platform can be accessed directly via www.iah2024davos.org/submit. The abstract should contain a maximum of 2,000 characters (including spaces); special characters, images or graphics cannot be included.

Key dates:
- 15 Dec 2023 – 29 Feb 20.24 – Abstract submission,
- 31 May 2054 – Early bird registration closes,

For more details about the conference see: www.iah2024davos.org

"Man and Karst" - 24 to 29 June 2024

This is a message from our friend - Rosario Ruggieri regarding the “Man and Karst” meeting in Sicily in June 2024:
Encouraged by the appreciated events, organized in 2019 in Ragusa and in Custonaci in 2022, which were attended by numerous participants, including university professors and researchers from prestigious universities, speleologists, hikers, and nature enthusiasts, in the context of the celebrations for the 50th anniversary of the foundation of the CIRS - Hyblean Center of Speleo-

Hydrogeological Research, the third edition of "Man and Karst" in Sicily is organized and will take place in Ragusa (Sicily) from June 24 to 29, 2024.
The event will take place in Ragusa Ibla (Sicily), a magical and fascinating baroque historic town, a UNESCO World Heritage Site.
For more details see https://cirs-ragusa.org/blog/man-and-karst-2024/ where you find the first circular with all the required details and the registration form.
Abstract submission and pre-registration close on April 30, 2024.

Eurokarst 2024

The EUROKARST 2024 will be held at the main campus of Sapienza University, central Rome, between June 10 and 14, 2024. The abstract submission is already closed. Registration for the conference will open soon.
You can find out more details at: http://www.eurokarst.org

eurokarst

Rome, June 10th-14th 2024

Water In Sensitive and Protected Areas (WSPA2024) - Pula, Croatia, April 10 - 13, 2024

The 4th International Conference WATER IN SENSITIVE AND PROTECTED AREAS (WSPA2024 Conference) will be held in Pula, Croatia on April 10-13, 2024.
On the conference website www.wspa2024.org, a SECOND NOTICE about the conference has been published, which provides potential authors and conference participants with relevant information about the conference, including information about: the conference program; thematic areas and conference topics; invited speakers by topic; preparation and submission of abstracts and full papers; opportunities for publication of full papers in international IWA journals (in English) as

well as in the journal Hrvatske vode (in Croatian); workshop and round tables that will take place during the conference and post conference tours (excursions).
Submission of Abstracts has already ended!
For more details see: www.wspa2024.org.

Characterization and Engineering of Karst Aquifers – CEKA

The international course "Characterization and Engineering of Karst Aquifers – CEKA" will be held in Trebinje, Bosnia and Herzegovina from May 26 to June 1, 2024.

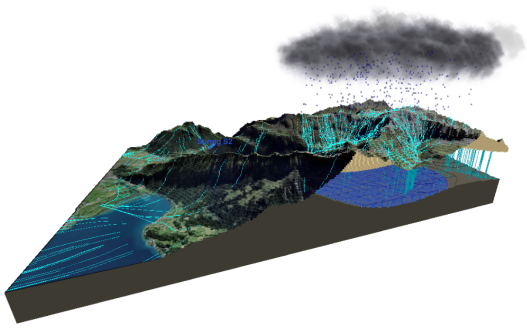
This international course includes theoretical lectures on the basic concepts of karst hydrogeology and a few practical demonstrations and field trips within the territories of the Dinaric karst. The course will be organized by The Centre for Karst Hydrogeology of the University of Belgrade, supported by UNESCO-IHP and several other institutions. The course is open to all but is especially devoted to younger and talented karst researchers. Attendance is free of charge.

Preliminary application form for CEKA 2024 can be found at the links below.
https://www.karst.edu.rs/en/ index.html

On line Visual KARSYS GeoModelling N18: 24-25 January 2024

The next Visual KARSYS online course will be organized in 2 sessions of 3 hours each.
- Wednesday, January 24th, 2024 - from 1 PM to 4 PM*
- Thursday, January 25th, 2024 - from 1 PM to 4 PM*
*(GMT+00:00 Time zone)

This workshop is dedicated to learning the KARSYS approach through an application on a pilot site by using the Visual KARSYS web tool. It is dedicated to geologists and hydrogeologists working in complex environments. Attendees will be introduced to the theoretical aspects of the approach and the practical process of its application: project dimensioning, data introduction, 3D geological modeling, groundwater modeling, end-user functionalities, etc.
Course fee: employees CHF 180 / students CHF 130
Contact for registration/questions: info@visualkarsys.com
For the program of the course go to: https://www.visualkarsys.com/courses



Recommended publications

We recently received a request from the Slovenian Karst team from the Karst Research Institute in Postojna led by our friend Natasa Ravbar to expose the KC members to a series of articles recently published by the team. The research presented in the articles focuses on the Unica Springs area that was visited during the 2023 geotrip. It includes research of Cerkniško and Planinsko poljes as well as the entire recharge area of the Unica springs.

Below is an introduction to the entire study written for us by one team member – Dr. Cyril Mayaud, and the list of publications:

With the first scientific studies started about 130 years ago, Slovenia can be considered the cradle of modern karstology. Today karst is still a very important topic in the country, especially because more than 50% of the Slovenian population depend on karst aquifers for its drinking water supply.
The Karst Research Institute ZRC SAZU is one of the rare institutions worldwide that focuses only on all possible aspects of karstology. The institute's hydrologists are devoted researchers who try to push karst science forward by improving current knowledge and developing new, transferable methods. Since late 2022, they have published four peer-reviewed publications focusing on the hydrology of the recharge area of the Unica Springs. This area is located in the southwestern part of Slovenia and is considered a locus-typicus due to its large variety of geological, geomorphological, and hydrogeological processes.
The western part of the Unica Springs recharge area is characterized by a set of large poljes that are regularly flooded. Because it is practically impossible to measure all inflows and outflows separately, Mayaud et al. (2022) developed a method to calculate the polje water balance by combining water level measurements with a Lidar of the polje surface. The method successfully reconstructed the water balance of Planinsko Polje and was validated with a numerical model reproducing the flood dynamics in the Polje and its surrounding aquifer. As poljes host highly sensitive water ecosystems, Blatnik et al. (2024) studied the effect of climate change and anthropogenic impact on the floods of Cerkniško Polje during the last 70 years. In this publication, the authors found that the general decrease in the water level is linked to the decrease in the average amount of precipitation in combination with human activities, notably constructions aiming to regulate flooding. These changing patterns further affect biodiversity, which is one of the most remarkable elements of the polje.
Since 21,000 people rely on the Unica springs for their drinking water, it is important to maintain good water quality over time, as well as to assess properly potential contamination risks in the recharge area. For this purpose, Ravbar et al. (2023) developed and tested an early warning system in the Unica Springs catchment area, providing in the meantime an accurate spatial hazard and risk assessment. They also proposed operational monitoring guidelines, including locations, indicator parameters, temporal resolution, and monitoring duration.
The recharge of the Unica springs is very complex due to the mixing of water from various recharge sources, and the reversal of the flow direction in the conduit network that depends on the hydrological situation. Therefore, Kogovšek et al. (2023) proposed a combination of time series analyses to identify the different recharge and storage components in the system. They were able to study the variation in the ratio between allogenic and autogenic recharge over time.

Impact on climate change and human influence on the hydrological behavior of Cerkniško polje:
Blatnik, M., Gabrovšek, F., Ravbar, N., Frantar, P., Gill, L.W., 2024. Assessment of climatic and anthropogenic effects on flood dynamics in the Cerkniško Polje (SW Slovenia) based on a 70-year observation dataset. Journal of Hydrology: Regional Studies V. 51, 101609. doi: 10.1016/j.ejrh.2023.101609.
https://www.sciencedirect.com/science/article/pii/S2214581823002963

Time series analyses in the karst aquifer recharging the Unica springs:
Kogovšek, B., Jemcov, I., Petrič, M., 2023. Advanced application of time series analysis in complex karst aquifers: A case study of the Unica springs (SW Slovenia). Journal of Hydrology V. 626, 130147. doi: 10.1016/j.jhydrol.2023.130147.
https://www.sciencedirect.com/science/article/pii/S0022169423010892

Investigating the water balance of poljes, with a focus on Planinsko Polje:
Mayaud, C., Kogovšek, B., Gabrovšek, F., Blatnik, M., Petrič, M., Ravbar, N., 2022. Deciphering the water balance of poljes: example of Planinsko Polje (Slovenia). Acta Carsologica V. 51/2, 43-65. doi: 10.3986/ac.v51i2.11029.
https://ojs.zrc-sazu.si/carsologica/article/view/11029

An early warning system for the water quality of the Unica springs:
Ravbar, N., Mulec, J., Mayaud, C., Blatnik, M., Kogovšek. B., Petrič, M., 2023. A comprehensive early warning system for karst water sources contamination risk, case study of the Unica springs, SW Slovenia. Science of The Total Environment V. 885, 163958. doi: 10.1016/j.scitotenv.2023.163958.
https://www.sciencedirect.com/science/article/pii/S0048969723025792

We also want to draw your attention to the article sent to us by our friend Nico Goldscheider:

Ohmer, M., Liesch, T. and Goldscheider, N., 2023. Influence of sediments burying the discharge area of a karst aquifer on the groundwater flow field - Numerical testing of conceptual models. Hydrological Processes, V. 37(12), e15048.
https://doi.org/10.1002/hyp.15048
The paper presents a numerical modeling study analyzing the hydraulic effects of sediments burying the discharge area of a karst spring. The study used six different model configurations incorporating sediment covers of varying thickness and permeability. The results indicate that even with a fully plugged outlet, the conduit network remains a significant contributor to the drainage system, collecting water from the matrix in the recharge zone.

Finally some articles on karst issues around the world:

Chen, J., Luo, M., Wan, L., Wang, J., Gan, Y. and Zhou, H., 2023. Accumulation, conversion and storage of solute from sinkholes to karst spring under concentrated recharge conditions. Journal of Hydrology, V. 620, 129396.
This paper studied the relationship between water quantity and quality in a karst aquifer system as well as the intense recharge processes with a focus on contaminants.

Martín-Rodríguez, J.F., Mudarra, M., De la Torre, B. and Andreo, B., 2023. Towards a better understanding of time-lags in karst aquifers by combining hydrological analysis tools and dye tracer tests. Application to a binary karst aquifer in southern

Spain. Journal of Hydrology, V. 621, 129643.
This work attempted to evaluate the applicability of the joint use of statistical time-lag evaluation and dye tracer testing techniques for the purpose of: developing conceptual models on the hydrogeological functioning that include the duality in the aquifer recharge processes and creating a reference framework for predicting potential effects derived from the concentrated recharge to the springs, which is required in the creation of water quality monitoring networks and early warning systems against water pollution.

Schmalfuss, C., Plan, L. and Pavuza, R., 2023. Statistical analysis of karst springs in Lower Austria. Austrian Journal of Earth Sciences, V. 116(1), 135-145.
This paper aims to provide an overview of the karst springs of Lower Austria, analyzing statistical correlations of spatial distribution, discharge, electrical conductivity (EC), and temperature. It was found that the spring water temperatures show an altitude gradient, which corresponds well to the regional air temperature gradient. Moreover, the springs show a negative correlation of the EC with the mean catchment elevation, which can be explained by a decrease in soil cover and thus reduced CO_2 uptake of the water, as well as dilution by rainwater.

Al Khoury, I., Boithias, L. and Labat, D., 2023. A Review of the Application of the Soil and Water Assessment Tool (SWAT) in Karst Watersheds. Water, V. 15(5), 954.
This article summarizes and discusses the findings of 75 SWAT-based studies in watersheds characterized at least in part by karst geology. The Soil and Water Assessment Tool (SWAT) is a semi-distributed hydrological model that has been used to simulate the flow and transport of pollutants in water, among other applications, in basins including karst watersheds.

De Filippi, F. M. and Sappa, G., 2023. Magnesium and groundwater flow relationship in karst aquifers: a tool for exploitation management of springs. Acque Sotterranee-Italian Journal of Groundwater, V. 12(4), 49-57.
This study shows the results obtained for two springs located in central Italy, confirming that monitoring groundwater quality in karst environments is often the key to the successful characterization of springs and the assessment of the total yield when direct measurements are not available. Specifically, Mg^{2+} content was found to be inversely related to the total baseflow discharge, and in other words, presented a reliable application for separation spring baseflow in karst settings, without additional discharge measurements.

Members who are interested in recommending a new relevant publication (their own or of their friends) are welcomed to send a link to one of the co-chairs.

IAH Karst Commission
Newsletter sent to members and friends of the IAH Karst Commission