Newsletter #4

September 2020

ENeRAG in the shadow of the coronavirus

Coordinator:

ELTE

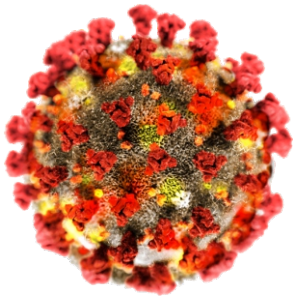
Partners:

GTK

UMIL

Dear Readers,

Welcome to the fourth issue of the ENeRAG newsletter with up-to-date news on project results and information as well as about the upcoming activities and events.
From some point of view, you can now read a special edition of the newsletter, as the situation of COVID-19 has/had a significant impact on the life of the project. The good thing about the bad, though, is that we will be with you for extra 6 months, as the project will only end in March 2022.



COVID-19 **VS** ENeRAG

It is because we had to postpone the planned actions (short courses, student and staff exchanges) with international travels. Moreover the conferences were cancelled, postponed or reorganized. Our Geofluids2020 conference had to be postponed as well.

However in the meantime, where we had the opportunity, we represented the project with full effort and enthusiasm. Such as conferences that were placed on online platforms. We also started a geofluids blog and were able to devote more time for publishing our studies. You will find out more details about these activities in the following pages.

The new schedule and the reorganization of project events are currently under discussion, therefore we can only inform you about future events with some uncertainty.

We'll be back with the 5th edition of the newsletter in March 2021!

Have a good read!

The ENeRAG project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 810980.

Events of the last 6 months

Periodic report - Review meeting

At the beginning of the year, after the first 15 months of the project, the time has come to submit the **periodic report** on the achieved results of the project to the European Commission. This milestone was followed by a personal **review meeting** on 30 March 2020, where we reported on our operation in the presence of EU representatives. The project was represented by all consortium partners (ELTE, UMIL, GTK) in the meeting, witch would have taken place in Brussels, but due to the evolving COVID-19 outbreak it was arranged online.

We experienced the meeting as a great **success**, as we received mostly positive feedback from the reviewers and our periodic report was approved by the EU.

The organization and implementation of international short courses, summer school, student exchanges, student competition and international conference sessions deserved praise. The project was also acknowledged in embracing young researchers in activities related to communication and dissemination. The submission of new international proposals and the establishment of new professional co-operations were also a good point. We received special recognition for the new practices introduced at ELTE, which will facilitate the administrative and management processes of similar international projects in the future. The judges acknowledged the progress made by ELTE in the field of geofluids and the consortium's enthusiasm for the project.

The EU has also made proposals for the second half of the project, in which we still need to develop and pay more attention in the future. Increasing the number of joint publications, emphasizing the development of partner institutions, maintaining gender balance, communicating the impacts and exploiting the implemented events remain areas of development.

With our experiences and in the knowledge of the suggestions made by the EU, we will continue our work in order to achieve the goals of the project.

Co-operation Agreement

Important step forward in exploiting the results of the ENeRAG project was the establishment of two co-operation agreements. The first one was with the József and Erzsébet Tóth Hydrogeology Chair Foundation where we can work together in dissemination and communication of the results. The second agreement was initiated by the Local Municipality of Kerekegyháza, Hungary. The objective of the cooperation is related to the MAR topic of the ENeRAG. The goal is the development and implementation of a research pilot project for the underground retention of ridge rainwater and for water replenishment, during which the Municipality and researchers of ELTE are collaborating. An MSc study in the topic of a pilot experiment has been successfully defended. In the project the experiences related to MAR systems from UMIL and GTK also are involved.

Events of the last 6 months

Conference attendances – Online!

Breaking with tradition the annual EGU General Assembly was held online between 4-8 May 2020. The event was named EGU2020: Sharing Geoscience Online, which brought part of the activities of the EGU General Assembly 2020 online, as a response to the COVID-19 pandemic situation.

On this online event, ENeRAG project co-organized a session, '*Groundwater flow and geofluids system understanding with regard to environmental problems and resource management* (HS8.2.9)' in cooperation with RGFC-IAH (Regional Groundwater Flow Commission of International Association of Hydrogeologists). Corrado Camera (UMIL) and Judit Mádl-Szőnyi (ELTE) served as co-chairs of the session.

The session was held in a form of a live text chat, where 25 presentations were discussed together with a fantastic number of about 100 individual users, who joined the chat. With this number of participants, this session was one of the most popular in the Groundwater session group.

We were happy to try this new platform, thereby also fostering the acquisition of new experiences in geofluid research and we could build new liaison with scientists from all over the world.

EGU 2020

In light of the COVID-19 pandemic Goldschmidt 2020 became the first virtual edition of the conference, that was held between 21-26 June 2020.

ENeRAG project was represented by Bianca Németh (PhD student at ELTE), who presented her study, '*Fluid-Rock Interaction in the Lower Crust based on Silicate Melt Inclusions in Garnet Granulite Xenoliths*' in the session 7e named '*Fluid and melt inclusions: the key to understanding links between fluid, melt, and mineral chemistry*'.

Goldschmidt 2020

Bianca was not just a presenter at the conference, but a delegate and student supporter as well, therefore she could have seen behind the curtains of this on-line event. She had many opportunities to discuss her results with others and could take part in the conference mentorship program.

Events of the last 6 months

Blog

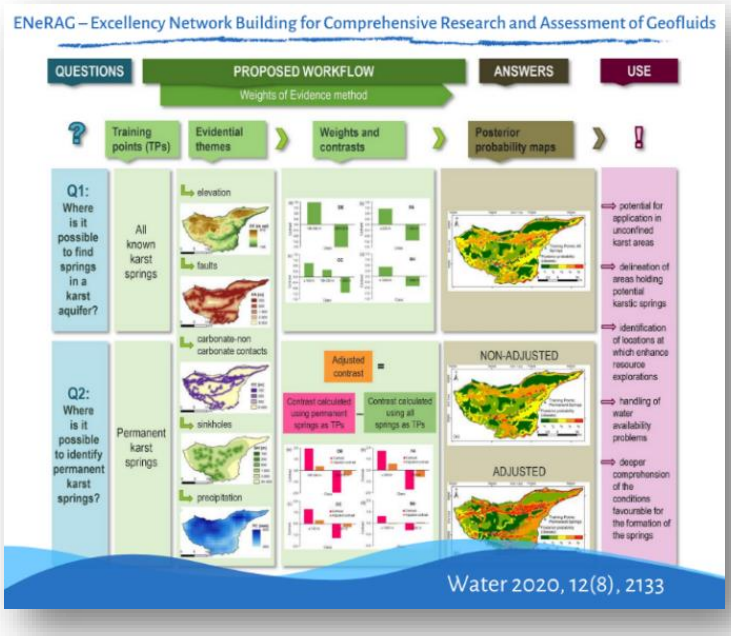
The ENeRAG H2020 project with the cooperation of the József and Erzsébet Tóth Endowed Hydrogeology Chair and the RGFC-IAH launched a geofluids blog named, *"Groundwater, Geoenergy, Hydrothermal minerals"*. This scientific blog intends to inform those who are interested in the underground fluids including groundwater, thermal water, hydrothermal mineral resources, geothermal energy, hydrocarbons and their interrelationships.

Our target audience are professionals from hydrogeology, geothermics and hydrothermal mineral resources. However, the blog also provides useful information for high school students and their teachers. University students as well as representatives of related disciplines, such as geography, meteorology, hydrology, water management, ecology, soil science, hydrocarbon geology and agriculture can also find their interests!

If we have piqued your interest, come and visit us and become a follower of our blog!

The József and Erzsébet Tóth Endowed Hydrogeology Chair with the cooperation of the ENeRAG H2020 project and the RGFC-IAH also launched a scientific blog in Hungarian language, named, "Vízkörforgalom a felszín alatt is...(Water circulation under the surface as well...)". This blog mainly focuses on hydrogeology. The blog provides a better understanding regarding the relationships between surface and groundwater. It conveys knowledge on issues related to groundwater and geothermal energy, mining and hydrocarbon exploration.

Joint paper



The first **joint** paper between ELTE and UMIL was published in the form of an Open Access publication in Water (MDPI) as a result of the student exchange period of Veronika Iván in 2019 (details on the exchange in the2nd newsletter). The study presents an enhanced approach for the distribution of springs in a transboundary karst aquifer. This paper well represents how the deterministic approach of ELTE researchers, and the stochastic methods developed by UMIL colleagues can combine to provide scientifically promising new results in geofluid research.

Events of the last 6 months

Workflow

One of the most important goals of the ENeRAG project is to work out a **workflow** for the **evaluation of geofluid systems**. We took a great step forward to achieve it till the end of April. The proposed preliminary workflow was compiled based on an intense communication amongst researchers. It summarizes the results of the three contribution institutes (ELTE, UMIL, GTK) in line with the goals of the ENeRAG. It is based on the complex application of isotopes, stochastic and numerical methods in the evaluation and sustainable exploration of geofluids as part of a dynamic system. This helps to synthesize, share and re-elaborate modern knowledge in the field of geofluid systems and related geological resources (water, geothermal energy, mineral resources). The final form of the workflow and the connecting guideline will be published at the end of the project.

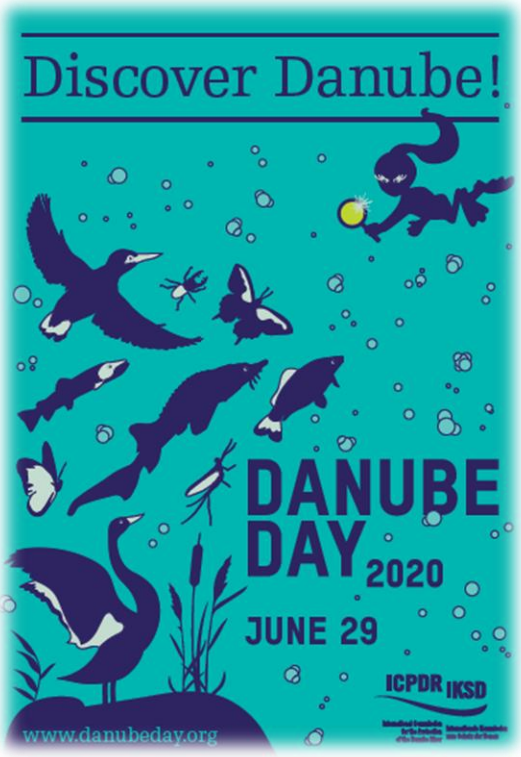
Danube day

On 29th of June each year, the 14 countries of the Danube River Basin jointly celebrate one of Europe's greatest river systems, along with its people and the wildlife that rely on it.

Due to the various restrictions on public gatherings throughout the Danube River Basin as a result of the global COVID-19 pandemic, this year's Danube Day celebration were shifted, and the public invited to #DiscoverDanube online!

In Hungary, the organizing partners made an online quiz contest. For this occasion, the hydrogeology group of ELTE has created a tale of groundwater droplets, in which children can learn the possible path of water droplets on land, water, air and below the surface, all in a playful way. And with that they can gain insight into the world of hydrogeology.

After completing all the quizzes, the families with the best results took part in a raffle. The most fortunate have benefited in tangible prizes. ELTE group donated the book of Judit Mádl-Szőnyi on geothermal energy. The awards were presented by state leaders at the Danube Museum in Esztergom.

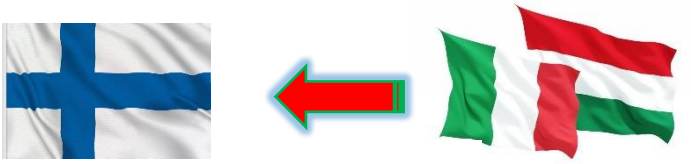


Planned events in the next 6 months*

Short courses

GTK will organize two short courses, namely 'Knowledge transfer in use of environmental tracers for hydrogeological applications' and 'Knowledge transfer for modelling shallow bedrock energy utilisation'.
In the framework of 'Modelling capacity improvement in groundwater energy utilisation' UMIL is going to organize a short course.

Student/staff exchanges



Exchange

In the framework of exchange programs, PhD students and staff members of ELTE and UMIL will start their work at GTK. The exchange is organised for application of cutting edge modern analytical techniques in research on crustal fluid systems and related geological resources.

Conference attendance

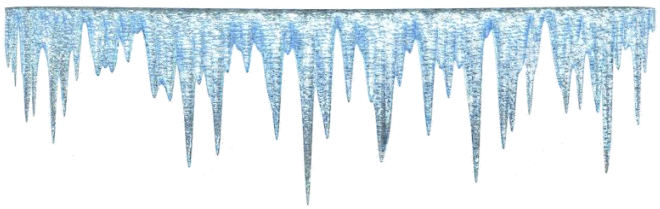
In the framework of augmenting scientific impact in geofluids' research, ENeRAG project participants will attend the following conference to gain knowledge and disseminate their own research results.

IWRA Online Conference on "Addressing Groundwater Resilience under Climate Change
29-30 October 2020
(3 ENeRAG related abstracts were submitted and approved)

Researchers' night

ELTE Team will join the European Researchers' night online event in November 2020 to popularize the science in the field of geofluids.

Winter school



GTK is going to organize a winter school on conservative and reactive transport modelling. The three main topics of the course: (1) Use of mathematical models for water budget and flow rates estimation in saturated porous and fractured media. (2) Contamination modelling and risk assessment. (3) Stochastic analysis in hydrogeological applications.

International Symposium on Geofluids

The International Symposium on Geofluids conference was also postponed due to the coronavirus situation. Our new plan is to hold the symposium between **7-9 July 2021 in Budapest, Hungary**.

SAVE THE NEW DATES!

We intend to keep all the previously planned topics, sessions and activities as well as we will invite the keynote speakers again. The re-organization of the conference is ongoing; therefore, we reserve the right to make changes. The finalized information will be posted on the conference website.

The declared objective of the Symposium is remained the same that is to bring together scientists, professionals, stakeholders to share and discuss all kinds of aspects of geofluids, i.e., groundwater, geothermal energy, hydrocarbon, geogenic contaminations and hydrothermal mineral resources, with special emphasis on harmonized exploration and utilization. During the symposium an ENeRAG session will be organized to display the results of the project. As a side event of the conference, ENeRAG Capitalisation Workshop will be held among project participants, in order to develop common research projects and research networks.

INTERNATIONAL SYMPOSIUM ON GEOFLUIDS

Publications in the framework of ENeRAG:

- ✓ Iván Veronika; Stevenazzi Stefania; Pollicino Licia C.; Masetti Marco; Mádl-Szőnyi Judit (2020): An Enhanced Approach to the Spatial and Statistical Analysis of Factors Influencing Spring Distribution on a Transboundary Karst Aquifer

- ✓ Katalin Csondor, Brigitta Czauner, Csobaji Lehel, Orsolya Győri, Anita Erőss (2020): Characterization of the regional groundwater flow systems in south Transdanubia (Hungary) to understand karst evolution and development of hydrocarbon and geothermal resources

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** Due to the coronavirus, the execution and/or timing of the planned events could change or will be cancelled.*