



Newsletter #2

September 2019

Dear Readers,

Coordinator:



ELTE

Partners:



GTK



UMIL



Welcome to the second issue of the ENeRAG newsletter, which aims to provide you up-to-date news on project results and information about the upcoming activities and events.



EXPERT VISITS



ATTENDANCE
ON INTERNATIONAL
CONFERENCES



ORGANISATION
OF SESSIONS



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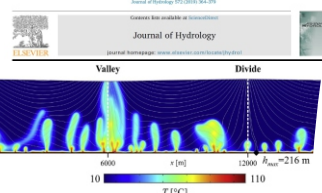
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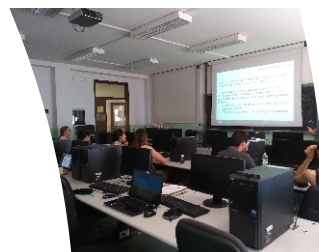
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OPEN ACCESS PUBLICATIONS



SUMMER AND WINTER SCHOOLS



TRAINING WORKSHOPS



LABORATORY AND FIELD TRAININGS



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

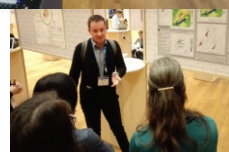
Conference attendances



March was the month of the success of young researchers. Two young researchers from ELTE group represented the ENeRAG project on the [26th Groundwater Conference](#) (26-27 March, Siófok, Hungary). This conference is one of the most prominent national events of hydrogeologists professionals, where several representatives of industrial partners (OVF, Waterworks, MBFSZ) were attended as well. Zsóka Szabó (PhD student) presented the aims of ENeRAG project related to Managed Aquifer Recharge, introduced the Hungarian MAR booklet and MAR database were made in the project, as well as the recent application and future prospects of MAR in Hungary. Petra Baják (MSc student) presented a study based on the dynamic system approach about natural radioactivity of groundwater. Three young researchers, Zsóka Szabó, Márk Szijártó and Petra Baják from ELTE kept awarded presentations on the [50th Meeting of Young Geoscientists](#) (29-30 March 2019, Ráckeve, Hungary).

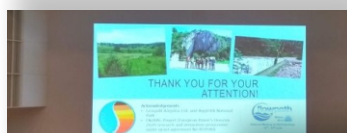


ENeRAG was present by its own session in the largest and most prominent [European Geosciences Union General Assembly](#) event (7-12 April Vienna, Austria). The project co-supported a session, 'Geofluids as natural resources or sources of contamination: Research and Innovation' with RGFC-IAH (Regional Groundwater Flow Commission of International Association of Hydrogeologists). Among the session's convenors were Daniele Pedretti (UMIL) and Ádám Tóth (ELTE), ENeRAG project participants. The session aimed to foster scientific discussion between those with interest in a range of geofluid systems to better understand the role which these fluids have, as socio-environmental and economic resources. The session was successful with 7 oral and 22 poster presentations in front of a wide audience.



Conference sessions

Flowpath 2019



The [Flowpath](#) conference, which is a key biennial event for Italian and international hydrogeologists to exchange ideas and knowledge on different groundwater topics, was held in Milan from 12 to 14 June 2019. On this important event, the ENeRAG project co-supported a session titled 'Groundwater Resource Management'. The session aimed to foster scientific discussion about balancing the increasing demand of water with groundwater resources availability in terms of quantity and quality. In the successful session, 10 oral and 13 poster presentations were held.



Events of the last 6 months

Field Course

Field course on Fluid-rock Interaction in Shallow Hydrothermal Systems was held at ELTE (27-31 May, 2019), which was organized by the ENeRAG and co-organized by the József and Erzsébet Tóth Hydrogeology Chair Foundation. The 39 participants were BSc, MSc, PhD students and early career scientists from 8 institutions (ELTE, GTK, UMIL, ELTE-MTA /ELTE-Hungarian Science of Academy/, Mawson, University of Oulu, LEM Resources, Eldorado Gold) and from 4 countries (Hungary, Finland, Italy, Romania). The 5-day long course started in Budapest at ELTE, with 8 introductory lectures held by instructors from GTK and ELTE, where participants could get the basic knowledge for the following field days. The next 4 days continued outside of the university walls, the participants visited the outcrops of hydrothermal systems in Tertiary volcanic and Mesozoic-Tertiary volcanic and sedimentary units in the volcanic belts of Hungary (Velence, Mátra and Tokaj Mountains) as well as thermal karst and warm spring areas of the Buda Hills.



In the framework of the ENeRAG project and with the support of József and Erzsébet Tóth Hydrogeology Chair Foundation Judit Mádl-Szőnyi, the scientific coordinator of ENeRAG, and Zsóka Szabó (PhD student) participated in the [10th International Symposium on Managed Aquifer Recharge](#) (20-24 May, Madrid, Spain). Judit Mádl-Szőnyi had a poster presentation about the recent applications and future prospects for MAR techniques in Hungary and Zsóka Szabó had an oral presentation about the 150 years old Induced Bank Filtration system of Budapest. During their stay they participated in short courses and workshops related to MAR suitability mapping, web-based numerical modeling and groundwater recharge and recovery through wells (ASR technique). They could also visit Spanish MAR sites, the Los Arenales Aquifer Facilities in Segovia Province and ASR/ASTR/Depth Injection Boreholes in Madrid.

Conference attendances

ISMAR10



ECROFI 2019



Anikó Lovász (PhD student, ELTE) participated in the [-ECROFI - European Current Research on Fluid and Melt Inclusions conference](#) (23-27 June, Budapest, Hungary). The conference ended with a field trip to the Buda Thermal Karst, lead among others also by Anita Erőss (Wp4 leader of the ENeRAG project).



Events of the last 6 months

Two colleagues of ENeRAG's ELTE team attended the [27th International Karstological School](#) in Postojna (Slovenia, 17-21 June 2019). This year it was devoted to karst hydrogeology, which is distinctive for carbonate aquifers. The event aimed to develop the exchange of knowledge and experience of karst characterisation, utilisation and protection based on dynamic system approach. Katalin Csondor (PhD student) and Ádám Tóth (junior assistant professor) presented their basin-scale approach and recent findings in karst hydrogeology. The lectures had high interest since new ideas, methods, as well as investigation scale were outlined to the classical karst hydro(geo)logy society. The attendees could visit the famous Kras/Carso Plateau, the archetype of karst, huge naturally discharging springs, however, the massive karst caves of the region were the most impressive ones, indeed.



The UMIL Team organized, hosted and led the summer school on sustainable approaches in vadose zone hydrology and groundwater vulnerability in Milan (17 to 28 of June 2019) within the framework of the ENeRAG H2020 project. The 17 participants were MSc students, PhD Students and Post-docs, coming from 8 different countries: Hungary (ELTE), Finland (GTK), Italy (UMIL), Tunisia, Germany, Colombia, and South Africa. The first week of the summer school dealt with vadose zone hydrology, and the second week with the assessment of aquifer vulnerability through statistical techniques. The summer school included theoretical presentations, practical exercises and field trips.



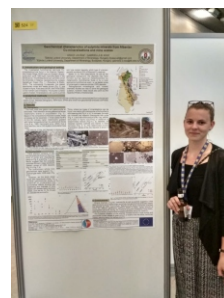
A post-doc student from ELTE, Veronika Iván, was the first trainee of the project at UMIL. The aim of the exchange was to train the young researcher in learning and applying spatial statistical techniques to evaluate groundwater vulnerability in karst aquifers. The program was based on data coming from the selected area of Gömör-Torna Karst that extends between Hungary and Slovakia. During the exchange Veronika has gained an excellent insight on spatial statistical methods, which allows her to use it for independently testing new variables and scenarios on groundwater vulnerability assessment. Moreover, this long-term researcher exchange has developed strong connections between ELTE and UMIL on a topic of interest for both the Institutes.



Events of the last 6 months

Conference session

ENeRAG project was appeared at the [Goldschmidt Conference](#) (18-23 August Barcelona, Spain), which is the foremost annual, international conference on geochemistry and related subjects. On the conference ENeRAG project organized a session, named Environmental Impacts of Mine Wastes. Among the session's convenors was Daniele Pedretti (UMIL), ENeRAG project participant. The session aims to identify and address current knowledge-gaps related to the environmental management of mine wastes by bridging across scientific fields and international engineering experience. From ELTE team Anikó Lovász (PhD student) represented the project with a poster presentation. The session was outstanding with 30 oral and 33 poster presentations before a vast audience.



The [15th Biennial Meeting of the Society for Geology Applied to Mineral Deposits](#) was held in Glasgow between 27 - 30 August, 2019. The conference was organized in the name of "Life with Ore Deposits on Earth". Besides presentations, participants were able to participate in short courses and field trips. The 4 main topics of the meeting: Advances in understanding hydrothermal processes, Magmatic sulfide and oxide systems, Magmatic-hydrothermal systems, Co-evolution of Life and Ore Deposits. The project was represented by prof. Ferenc Molnár from GTK.

Biannual Meeting

Travelling Assembly

Two young PhD students (Anikó Lovász and Máté Biró) from ELTE represented the ENeRAG project on the [10th Petrological and Geochemical Travelling Assembly](#) (5-7 September, Mátraháza, Hungary). Oral and poster presentations were kept on the first two days of the conference, whereas on the last day field excursions were organized, one of those led by Anikó Lovász, who was also awarded first prize in the poster section with her research.



UMIL and ELTE joined the national program series, called the Researcher's night event to involve the wider audience itself into our work, where we could provide understanding on dynamic geosystems. ELTE team prepared playful tasks and simple experiments, that the guests could perform by themselves. UMIL set up a stand addressing the issue of water sustainability.

Researchers' night

Through games and experiments the visitors could learn about the strict connection between surface water and groundwater, and how these resources can be protected.

ENeRAG was present in the largest and most popular hydrogeology related worldwide event, in the [46th IAH Congress](#) (22-27 September 2019, Malaga, Spain). The ENeRAG project sponsored a session, named 'Advanced modelling tools for subsurface hydrology: from the vadose zone to deep environments', and co-supported one, 'Innovative approaches for understanding groundwater flow systems' with RGFC-IAH. Among the session's convenors were Daniele Pedretti (UMIL), Stefania Stevenazzi (UMIL), Marco Masetti (UMIL), Ádám Tóth (ELTE) and Judit Mádl-Szőnyi (ELTE), ENeRAG project participants. The topics of the sessions deal on the broad spectrum of methodologies and models conventionally applied in Hydrogeology (hydrogeological mapping, hydrodynamic, hydrochemistry, isotopes, tracers, etc.), but particularly to the most innovative ones and to new trends in modelling.



Conference session



Upcoming events

Conference session

Course on environmental tracers

ENeRAG project will support a session on the [Nordic Geological Winter Meeting 2020](#), held in 8-10 January 2020 in Oslo, Norway. The aim of this session is the innovative approach of geothermal systems by the geofluids' concept. At the meeting Ferenc Molnár (GTK) will give a keynote presentation in the "Nordic mineral resources" session, that will be focussed on epigenetic hydrothermal systems with gold deposits.

GTK will host and organize a five-day-long course named 'Knowledge transfer in use of environmental tracers for hydrogeological applications'. There will be three main topics of this event: (1) use of environmental isotopes, (2) use of natural isotopes, halogen anion isotopes and natural and artificial tracers, (3) use of radioactive tracers.

In the framework of capacity development, a candidate from ELTE will start her 4-months-long work at GTK, then at UMIL. UMIL will also host a PhD student from ELTE for a training on vadose zone modelling (including MAR). New knowledge and skills on groundwater energy utilisation will be acquired and exported to ELTE.

In February 2020 GTK will organize a course at ELTE to enhance capacity in isotope geochemistry of fluid-rock interaction. The one-week-long event will focus on the application of conventional and unconventional isotopes to understanding processes in hydrothermal and geothermal systems.

Student exchanges

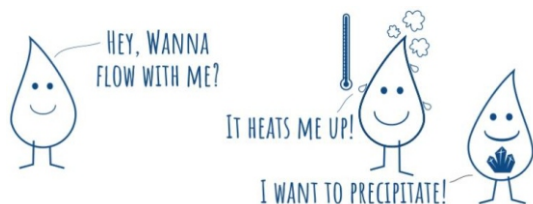
Isotope geochemistry course

Satellite Conference on 'Geofluids'

[International Symposium on Geofluids](#) will be held in Budapest, Hungary, between 8-10 July, 2020.

The declared objective of the Symposium 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. An ENeRAG session will be organized to display the results of the project.

The symposium is organized by the József and Erzsébet Tóth Endowed Hydrogeology Chair and Foundation and by the Regional Groundwater Flow Commission of the International Association of Hydrogeologists, in scientific collaboration with the ENeRAG H2020 project.






Publication(s) in the frame of ENeRAG:

Márk Szijártó, Attila Galsa, Ádám Tóth, Judit Mádl-Szőnyi: [Numerical investigation of the combined effect of forced and free thermal convection in synthetic groundwater basins](#)

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