



## VISIT OF CENTRE FOR KARST HYDROGEOLOGY MEMBERS TO THE IRCK, GUILIN, CHINA, NOV. 2016

Members of the Centre for Karst Hydrogeology, **Dr. Saša Milanović**, Scientific Researcher and **Veljko Marinović**, MSc Hydrogeologist, Research Assistant, took part in **International Training course on Integrated Control on Rocky Desertification, Carbon Cycle and Sink in Karst System**, held in Guilin, China in the period from November 13 to 27 of 2016. The course was organized by the International Research Center on Karst (IRCK) under the auspices of UNESCO and supported by China Geological Survey (CGS), Institute of Karst Geology (IKG) of the Chinese Academy of Geological Sciences (CAGS) and UNESCO Beijing Office. CKH members, now traditionally, the third consecutive year are participating in the course organized by IRCK in China.

Dr. Saša Milanović participated in the course at the invitation of the IRCK as a lecturer and on that occasion gave two lectures: „**Research methods of karst systems from recharge to discharge zones (examples from Dinaric and Carpathian-Balkan karst); Physical modeling of karst aquifer**“ and „**Climate change and impact on groundwater in karst systems (SEE - Project CC-Waters)**“.



Beside Dr. Saša Milanović, 14 lecturers from 7 countries took part in the course and delivered 20 lectures to the participants.

Lecturer	Country	Title of lecture
<b>Eko HARYONO</b>	Indonesia	Carbon cycle and flux In karst
<b>Ralf BENISCHKE</b>	Austria	Austrian Karst Water Resources Aspects of their Management and Protection
<b>Saša MILANOVIĆ</b>	Serbia	Research methods of karst systems from recharge to discharge zones (examples from Dinaric and Carpathian-Balkan karst) - Physical modeling of karst aquifer
		Climate change and impact on groundwater in karst systems (SEE - Project CC-WaterS)
<b>Andrzej TYC</b>	Poland	Hypogene karst related to CO2 system
		Application of airborne (LiDAR) and terrestrial scanning to karst studies
<b>Yuan DAOXIAN</b>	China	Hydrogeology and Environmental Geology Issues in Karst of China
<b>Petar MILANOVIĆ</b>	Serbia	Aeration zone in karst; Properties and investigations
		Properties of complex karst system
<b>ZHANG Cheng</b>	China	Biogeochemical processes in karst stream and watershed input
<b>YONGGE Sun</b>	China	Sedimentary OC Delivery by Riverine System and Accumulation in Lakes and Marginal Seas - A Case Study of Yellow River
<b>James Judson WYNNE</b>	USA	Human-Induced Change and the Effects on Cave Ecosystems: A case study of China
<b>George VENI</b>	USA	The Impacts and Management of Climate Change on Karst Hydrology and Ecosystems
		Building Codes to Minimize Cover-Collapses in Sinkhole-Prone Areas
<b>WU Zhenbin</b>	China	Research and Engineering Application of Constructed Wetlands in China
<b>WEI LI</b>	China	Carbon Concentration Mechanisms in Aquatic Macrophytes
<b>JIANHUA CAO</b>	China	Karst Carbon Cycle and Monitoring Methods
<b>XIAOQUN Qin</b>	China	The Role of Sulfuric Acid in Rock Weathering and Carbon Cycle

**International Training course on Integrated Control on Rocky Desertification, Carbon Cycle and Sink in Karst System** was attended by 18 trainees from 12 countries (Brazil, Indonesia, Iran, Macedonia, Malawi, Mexico, Mongolia, Myanmar, Serbia, Slovenia, Thailand and Zimbabwe) and 17 students from Chinese universities as well. Veljko Marinović, MSc Hydrogeologist, a member of the Centre for Karst Hydrogeology and a PhD student of the Department of Hydrogeology of the Faculty of Mining and Geology was representative of Serbia among the participants.



The course was organized to have lectures, field trips to IRCK's experimental sites and trainees' assessment based on presentations about karst in their home countries and the topics of the course. The first day consisted of opening ceremony and presentation of **International Big Scientific Plan on "Resource and Environment Effects of Global Karst Dynamic Systems"** based on which new world project „**Resources and Environmental Effects of Global Karst Dynamic Systems**“ has been established. Countries that have cooperation with the IRCK (CKH signed an agreement with the IRCK in 2013) have signed this **International Big Scientific Plan** with representatives of the Chinese Ministry of Land and Resources, China Geological Survey, IRCK and other and in that way accepted the project idea. As a representative of Serbia, Professor Dr. Petar Milanović, who is also a member of the Governing Board of the IRCK, has signed the project.



After the opening ceremony, the course participants had an opportunity to visit the Karst museum, located inside the IRCK. The museum was reconstructed and reopened in 2016, so the trainees had a unique chance to take a tour. The tour in the museum started with presentation of the planet Earth, then continued with introduction to karst, its mineralogical and petrological characteristics and types, worldwide distribution,

implemented construction projects in world's and China karst, man and karst connection through evolution, while the final part of the museum was dedicated to the history of research in karst, where the name of Jovan Cvijić stands out as a founder of modern karstology.



On the second day of the course, trainees had lectures delivered by the members of the Governing Board of the IRCK, which has been formed by the Chinese Academy of Geological Science and UNESCO.



During the second week of the course, experts from the IRCK took participants to the experimental sites Yaji, Haiyang-Zhaidi and Maocun, where they observed the epikarst zones, mechanism on response of karst dynamics system to rainfall, the law of circulation and migration on carbon in the atmosphere, soil, vegetation and water of karst depression. On the other hand, geochemical characteristics and effects of natural and artificial factors, especial the impacts of agricultural activities on the groundwater quality<sup>1</sup>.

Modern equipment that are used in monitoring of groundwater and CO<sub>2</sub> cycle was showed to the participants during this field trips.

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<sup>1</sup> Source: Manual for Excursion 2016 IRCK International Training Course on Integrated Control on Rocky Desertification, Carbon Cycle and Sink in Karst System



During the rest days, CKH members went on the Li river cruising, visited the city of Yangshuo and Shangri-la Yangshuo in the vicinity of Guilin, and famous Reed Flute cave and Seven Stars park, located in the town.

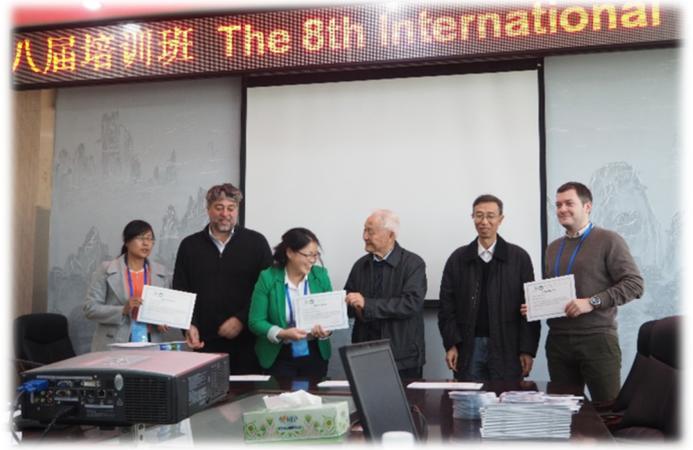




Last two days were reserved for trainees' assessment. Participants from abroad were obliged to prepare a 15 minutes presentation on karst geology, according to the training course (rocky desertification, CO<sub>2</sub> cycle and integrated control on it) and the karst development in their own country. Trainees' presentations were evaluated by the three-member committee assembled by the course lecturers: Jianhua Cao, Yuan Daoxian i Saša Milanović.



Afterwards, all participants received the Certification of Attendance from the organizers, while the several best presentations were awarded by the committee. Veljko Marinović, a CKH member was among them and in that occasion got award „excellent trainee“ based on his presentation. After closing ceremony, Jianhua Cao closed the course by expressing his gratitude to the course participants and willingness for continued cooperation between trainees' home institution and the IRCK.



Centre for Karst Hydrogeology members express big gratefulness to the International Research Center on Karst on invitation for attending the course, hospitality, acquired new knowledge and beautiful field trips.

We are looking forward to having such a successful cooperation in future period as well!