

FOREWORD

A special section of *Acta Carsologica* is dedicated to the successfully concluded 5-year-long global UNESCO IGCP Project No. 598.

IGCP/SIDA 598 “Environmental Change and Sustainability in Karst Systems (2011–2015)” is the 5th karst-related IGCP project sponsored by UNESCO/IUGS and the Swedish International Development Cooperation Agency (SIDA). It is a successor to IGCP 299, IGCP 379, IGCP 448, and IGCP 513 projects. The project was proposed and co-led by Zhang Cheng (China), Chris Groves (USA), Martin Knez (Slovenia), Jiang Yongjun (China), Augusto Auler (Brazil), Bartolome Andreo-Navarro (Spain), and Yuan Daoxian (China). The main objectives of the project are to better estimate the carbon sink potential from carbonate rock dissolution on continents by improving the approaches; to reveal the responses of the hydrogeological behavior of karst aquifers and water resource processes under the influence of different weather and climate events; to improve assessments methods for groundwater vulnerability to contamination; to quantify the records of environmental change within karst water, sediments, and speleothems that provide information over various timescales.

During the implementation of the project, more than 200 scientists from 40 countries were involved in the project’s annual meetings, symposia, and field excursions. In line with the four objectives of the project, the new developments of IGCP/SIDA 598 were published in the journal *Episodes* in 2015 as the project’s final report.

For this occasion, seven papers have been prepared.

The diel variations of the dissolved inorganic carbon, the isotopic composition, and partial CO₂ pressure from a karst spring (southwest China) to the 1,350 m downstream profile of the stream were investigated. The carbon loss and CO₂ exchange flux at the water-gas interface were estimated. It was established that the pH value and DO in the stream varied regularly on a daily basis with the temperature of the stream water, suggesting that the photosynthesis of aquatic plants and algae is the controlling factor for the diel variations of the pH and DO.

A contribution to Speleobiology Appearing in *Acta Carsologica* was made. Although primarily known as a journal of karst geosciences and hydrology, *Acta Carsologica* has played a vital role in the development of speleobiology. A total of 65 biological papers on speleobiology were published in the journal from 1955 to 2014.

The next paper deals with karst areas in densely populated and industrialized areas in Brazil, which are

under severe environmental pressure due to urbanization, quarrying, groundwater pollution, groundwater overpumping, and cave vandalism. Although karst terrains receive no special protection under Brazilian environmental law, caves, regardless of rock type, are classified as belonging to the society, and must be studied in detail to have their significance determined. Most caves are of either maximum or high significance, which results not only in the protection of the cave but of the associated buffer zone as well.

From Spain comes a paper which discusses the hydrogeological characterization of the Salinas-Los Hoyos evaporitic karst (south Spain) using geomorphometric, hydrodynamic, hydrochemical and isotopic methods. To assess the wetland-spring relation and the general functioning of the system, the geomorphologic framework has been analyzed and hydrogeological controls have been performed, consisting of limnometric and discharge logging and in situ measurements of physicochemical parameters; in addition, wetland and rain samples have been taken for subsequent chemical and isotopic analysis.

The effects of the use of N-fertilizers and acid deposition on carbonate weathering have been quantified by hydrochemistry and $\delta^{13}\text{C}_{\text{DIC}}$ of groundwater in Qingmuguan underground river system (QURS) – a small karstic agricultural catchment of Southwest China.

An article from Java, Indonesia, about the nature of carbon flux in Gunung Sewu karst, is presented. It devotes special attention to the estimation of carbon flux by considering the conical karst as a system. It includes carbon input into the karst area, soil respiration, SOC, soil CO₂, particulate-dissolved and organic carbon, as well as dissolved organic carbon. Two study sites were selected to represent different morphological and hydrogeological settings. The carbon input included in this research was litter fall, plant residue, and organic fertilizer. Incorporated into field measurement, soil samples were collected for SOC estimation.

Lastly, laboratory modeling of karst phenomena and their rock relief, subsoil karren, rain flutes karren and caves in plaster is presented. The study of the formation and development of karst phenomena and their rock relief using laboratory plaster modeling has again proven useful and informative. Authors continued the study of subsoil karren that forms under tight, poorly-permeable contact with soil, and the study of rain flutes formed by water at various temperatures, and an experiment was carried out in phreatic conditions where water in a flume was forced to flow between layers of different composition.

The research of one of the papers was included in the framework of the UNESCO Chair on Karst Education, while another was included in the framework of the International Research Center on Karst under the auspices of UNESCO.

We would like to thank the Editor-in-Chief of *Acta Carsologica*, Associate member of Slovene Academy of Sciences and Arts, Prof. Dr. Franci Gabrovšek for invit-

ing us, and Assistant Editor Ass. Prof. Dr. Nataša Ravbar and Ass. Blaž Kogovšek for editing, proof-reading and helping make the articles suitable for the journal. We would like to thank all reviewers for writing reviews which helped us improve the quality of the papers.

Section editors

Martin Knez, Cheng Zhang, Chris Groves