

Accepted Manuscript

Research papers

Hydraulics of epiphreatic flow of a karst aquifer

Franci Gabrovšek, Borut Peric, Georg Kaufmann

PII: S0022-1694(18)30185-9

DOI: <https://doi.org/10.1016/j.jhydrol.2018.03.019>

Reference: HYDROL 22652

To appear in: *Journal of Hydrology*

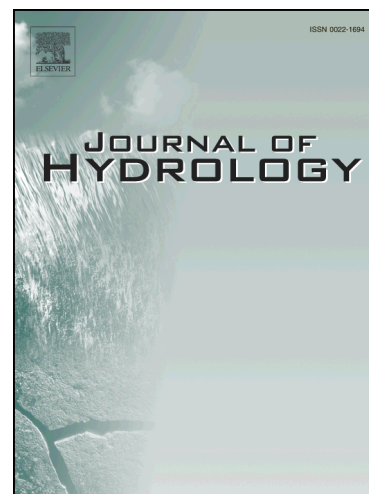
Received Date: 18 October 2017

Revised Date: 6 March 2018

Accepted Date: 7 March 2018

Please cite this article as: Gabrovšek, F., Peric, B., Kaufmann, G., Hydraulics of epiphreatic flow of a karst aquifer, *Journal of Hydrology* (2018), doi: <https://doi.org/10.1016/j.jhydrol.2018.03.019>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



HYDRAULICS OF EPIPHREATIC FLOW OF A KARST AQUIFER

Franci Gabrovšek¹, Borut Peric², Georg Kaufmann³

¹Karst Research Institute ZRC SAZU, Titov trg 2, 6230 Postojna Slovenia, e-mail: gabrovsek@zrc-sazu.si

²Škocjan Caves Regional Park, Škocjan 2, 6215 Divača, Slovenia, e-mail: borut.peric@psj.gov.si

³Freie Universität Berlin, Fachbereich Geowissenschaften, Fachrichtung Geophysik, Malteserstr. 74, 12249 Berlin, Germany, e-mail: georg.kaufmann@fu-berlin.de

ABSTRACT

The nature of epiphreatic flow remains an important research challenge in karst hydrology. This study focuses on the flood propagation along the epiphreatic system of Reka–Timavo system (Kras/Carso Plateau, Slovenia/Italy). It is based on long-term monitoring of basic physical parameters (pressure/level, temperature, specific electric conductivity) of ground water in six active caves belonging to the flow system. The system vigorously responds to flood events, with stage rising more than 100 m in some of the caves. Besides presenting the response of the system to flood events of different scales, the work focuses on the interpretation of recorded hydrographs in view of the known distribution and size of conduits and basic hydraulic relations. Furthermore, the hydrographs were used to infer the unknown geometry between the observation points. This way, the main flow restrictors, overflow passages and large epiphreatic storages were identified. The assumptions were tested with a hydraulic model, where the inversion procedure was used for an additional parameter optimisation. Time series of temperature and specific electric conductivity were used to assess the apparent velocities of flow between consecutive points.

Key words: karst, groundwater dynamics, epiphreatic flow, observation network, modelling, Kras/Carso.

Download English Version:

<https://daneshyari.com/en/article/8894730>

Download Persian Version:

<https://daneshyari.com/article/8894730>

[Daneshyari.com](https://daneshyari.com)