

Home

Online Library HESS

- Recent Final Revised Papers
- Volumes and Issues**
- Special Issues
- Library Search
- Title and Author Search

Online Library HESSD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper



- Volumes and Issues
- Contents of Issue 7
- Special Issue

Hydrol. Earth Syst. Sci., 13, 1261-1271, 2009
www.hydrol-earth-syst-sci.net/13/1261/2009/

© Author(s) 2009. This work is distributed under the Creative Commons Attribution 3.0 License.

The hydrological response of baseflow in fractured mountain areas

A. Millares¹, M. J. Polo², and M. A. Losada¹

¹Environmental Fluid Dynamic Group, Andalusian Centre for Environmental Studies (CEAMA), Avda. del Mediterráneo s/n. 18006, Granada, Spain

²Hydrology and Hydraulics in Agriculture Research Group, University of Córdoba. Campus de Rabanales, Edif. Leonardo da Vinci, 14071-Cordoba, Spain

Abstract. The study of baseflow in mountainous areas of basin headwaters, where the characteristics of the often fractured materials are very different to the standard issues concerning porous material applied in conventional hydrogeology, is an essential element in the characterization and quantification of water system resources. Their analysis through recession fragments provides information on the type of response of the sub-surface and subterranean systems and on the average relation between the storage and discharge of aquifers, starting from the joining of these fragments into a single curve, the Master Recession Curve (MRC). This paper presents the generation of the downward MRC over fragments selected after a preliminary analysis of the recession curves, using a hydrological model as the methodology for the identification and the characterization of quick sub-surface flows flowing through fractured materials. The hydrological calculation has identified recession fragments through surface runoff or snowmelt and those periods of intense evapotranspiration. The proposed methodology has been applied to three sub-basins belonging to a high altitude mountain basin in the Mediterranean area, with snow present every year, and their results were compared with those for the upward concatenation of the recession fragments. The results show the existence of two different responses, one quick (at the sub-surface, through the fractured material) and the other slow, with linear behaviour which takes place in periods of 10 and 17 days respectively and which is linked to the dimensions of the sub-basin. In addition, recesses belonging to the dry season have been selected in order to compare and validate the results corresponding to the study of recession fragments. The comparison, using these two methodologies, which differ in the time period selected, has allowed us to validate the results obtained for the slow flow.

- Final Revised Paper (PDF, 19437 KB)
- Discussion Paper (HESSD)

Citation: Millares, A., Polo, M. J., and Losada, M. A.: The hydrological response of baseflow in fractured mountain areas, *Hydrol. Earth Syst. Sci.*, 13, 1261-1271, 2009. [Bibtex](#) [EndNote](#) [Reference Manager](#)



Search HESS

Library Search

Author Search

News

- New Alert Service available
- New Service Charges
- Financial Support for Authors

Recent Papers

01 | HESS, 21 Jul 2009:
The hydrological response of baseflow in fractured mountain areas

02 | HESSD, 21 Jul 2009:
Less rain, more water in ponds: a remote sensing study of the dynamics of surface waters from 1950 to present in pastoral Sahel (Gourma region, Mali)

03 | HESSD, 21 Jul 2009:
Deriving a global river network map at flexible resolutions from a fine-resolution flow direction map with explicit representation of