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 5

Hydrol. Earth Syst. Sci., 8, 891-902, 2004
www.hydrol-earth-syst-sci.net/8/891/2004/

Recession-based hydrological models for estimating low flows in ungauged catchments in the Himalayas

H. G. Rees[1], M. G. R. Holmes[1], A. R. Young[1], and S. R. Kansakar[2]
[1]Centre for Ecology and Hydrology,Wallingford, Oxfordshire, OX10 8BB, UK
[2]Department of Hydrology and Meteorology, PO Box 406, Babar Mahal, Kathmandu, Neapel
Email for corresponding author: hgrees@ceh.ac.uk

Abstract. The Himalayan region of Nepal and northern India experiences hydrological extremes from monsoonal floods during July to September, when most of the annual precipitation falls, to periods of very low flows during the dry season (December to February). While the monsoon floods cause acute disasters such as loss of human life and property, mudslides and infrastructure damage, the lack of water during the dry season has a chronic impact on the lives of local people. The management of water resources in the region is hampered by relatively sparse hydrometerological networks and consequently, many resource assessments are required in catchments where no measurements exist. A hydrological model for estimating dry season flows in ungauged catchments, based on recession curve behaviour, has been developed to address this problem. Observed flows were fitted to a second order storage model to enable average annual recession behaviour to be examined. Regionalised models were developed, using a calibration set of 26 catchments, to predict three recession curve parameters: the storage constant; the initial recession flow and the start date of the recession. Relationships were identified between: the storage constant and catchment area; the initial recession flow and elevation (acting as a surrogate for rainfall); and the start date of the recession and geographic location. An independent set of 13 catchments was used to evaluate the robustness of the models. The regional models predicted the average volume of water in an annual recession period (1st of October to the 1st of February) with an average error of 8%, while mid-January flows were predicted to within ±50% for 79% of the catchments in the data set.

Keywords: Himalaya, recession curve, water resources, ungauged catchment, regionalisation, low flows

Final Revised Paper (PDF, 707 KB)

Citation: Rees, H. G., Holmes, M. G. R., Young, A. R., and Kansakar, S. R.: Recession-based hydrological models for estimating low flows in ungauged catchments in the Himalayas, Hydrol. Earth Syst. Sci., 8, 891-902, 2004. Bibtex EndNote Reference Manager

Copernicus Publications
The Innovative Open Access Publisher

Search HESS
Library Search
Author Search

News
- New Service Charges
- Financial Support for Authors
- ISI Impact Factor: 2.270

Recent Papers
01 | HESS, 06 Mar 2009: Uncertainty analysis of hydrological ensemble forecasts in a distributed model utilising short-range rainfall prediction

02 | HESSD, 06 Mar 2009: EAGLE 2006 – multi-purpose, multi-angle and multi-sensor in-situ, airborne and space borne campaigns over grassland and forest

03 | HESSD, 06 Mar 2009: Evaluation of a probabilistic hydrometeorological forecast system