

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](#)

Hydrol. Earth Syst. Sci., 13, 1019-1029, 2009
www.hydrol-earth-syst-sci.net/13/1019/2009/

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

A look at the links between drainage density and flood statistics

B. Pallard¹, A. Castellarin², and A. Montanari²

¹International Center for Agricultural Science and Natural resource Management Studies, Montpellier Supagro, Montpellier, France

²Faculty of Engineering, University of Bologna, Bologna, Italy

Abstract. We investigate the links between the drainage density of a river basin and selected flood statistics, namely, mean, standard deviation, coefficient of variation and coefficient of skewness of annual maximum series of peak flows. The investigation is carried out through a three-stage analysis. First, a numerical simulation is performed by using a spatially distributed hydrological model in order to highlight how flood statistics change with varying drainage density. Second, a conceptual hydrological model is used in order to analytically derive the dependence of flood statistics on drainage density. Third, real world data from 44 watersheds located in northern Italy were analysed. The three-level analysis seems to suggest that a critical value of the drainage density exists for which a minimum is attained in both the coefficient of variation and the absolute value of the skewness coefficient. Such minima in the flood statistics correspond to a minimum of the flood quantile for a given exceedance probability (i.e., recurrence interval). Therefore, the results of this study may provide useful indications for flood risk assessment in ungauged basins.

[Final Revised Paper](#) (PDF, 970 KB) [Discussion Paper](#) (HESSD)

Citation: Pallard, B., Castellarin, A., and Montanari, A.: A look at the links between drainage density and flood statistics, Hydrol. Earth Syst. Sci., 13, 1019-1029, 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