Geophysical Research Abstracts
Vol. 17, EGU2015-11368-1, 2015
EGU General Assembly 2015

Volumetric runoff coefficients for experimental rural catchments in the Iberian Peninsula

Encarnación V Taguas (1), Cecilio Molina (1), Estela Nadal-Romero (2), José L Ayuso (1), Javier Casalí (3), Patricio Cid (), Jorge Dafonte (4), Antonio C Duarte (5), Joaquim Farguell (6), Rafael Giménez (3), Juan V Giráldez (1), Helena Gómez (7), Jose A. Gómez (7), J Carlos González-Hidalgo (7), J Jacob Keizer (8), Ana Lucía (9), Luciano Mateos (7), M Luz Rodríguez-Blanco (10), Sussane Schnabel (11), M. Pilar Serrano-Muela (12), and the Noemí Lana-Renault (13), M. Mercedes Taboada-Castro (10), M.Teresa Taboada-Castro (10), Xabier Úbeda (6), Ane Zabaleta (14) Team

(1) University of Córdoba, Agronomist and Forest Engineering School, Cordoba, Spain (evtaguas@uco.es), (2) Departamento de Geografía, Instituto Universitario de Ciencias Ambientales (IUCA), Universidad de Zaragoza, Zaragoza, Spain (jcgh@unizar.es)-Institute for Biodiversity and Ecosystem Dynamics, IBED, University van Amsterdam, Amsterdam, The Netherlands (M.E, (3) Universidad Pública de Navarra, Departamento de Proyectos e Ingeniería Rural, Campus de Arrosadia s/n, 31006 Pamplona (jcs@unavarra.es, rafael.gimenez@unavarra.es), (4) Department of Agroforestry Engineering, University of Santiago de Compostela, Lugo, Spain.(jorge.dafonte@usc.es), (5) Escola Superior Agrária de Castelo Branco, Castelo Branco Portugal, (acduarte@ipcb.pt), (6) GRAM (Grup de Recerca Ambiental Mediterrània), Departamento de Geografia Física y Análisis Geográfico Regional, Universidad de Barcelona (Spain). Agència Catalana de l'Aigua (ACA). Departamento de Infraestructuras de Control y Regulación. (xubeda@gmail.co, (7) Instituto de Agricultura Sostenible—CSIC, Córdoba, Spain (joseagomez@ias.csic.es, ag1mainl@uco.es, ag1gomah@uco.es), (8) CESAM, Centre for Environmental and Marine Studies. University of Aveiro, Portuga. (jeejeeka@gmail.com), (9) Faculty of Science and Technology, Free University of Bolzano, Italy (a.lucia.vela@gmail.com), (10) Facultad de Ciencias and Centro de Investigaciones Científicas Avanzadas (CICA), University of A Coruña, Campus de A Coruña, 15071 A Coruña, Spain (teresat@udc.es), (11) GeoEnvironmental Research Group, Universidad de Extremadura, Spain (schnabel@unex.es), (12) Instituto Pirenaico de Ecología- CSIC, Zaragoza, Spain (piliserranomuela@gmail.com), (13) DCH, Physical Geography, University of La Rioja, 26004, Logroño, Spain (noemi-solange.lana-renault@unirioja.es)

Analysis of runoff and peaks therein is essential for designing hydraulic infrastructures and for assessing the hydrological implications of likely scenarios of climate and/or land-use change. Different methods are available to calculate runoff coefficients. For instance, the runoff coefficient of a catchment can be described either as the ratio of total depth of runoff to total depth of rainfall or as the ratio of peak flow to rainfall intensity for the time of concentration (Dhakal et al. 2012). If the first definition is considered, runoff coefficients represent the global effect of different features and states of catchments and its determination requires a suitable analysis according to the objectives pursued (Chow et al., 1988).

In this work, rainfall-runoff data and physical attributes from small rural catchments located in the Iberian Peninsula (Portugal and Spain) were examined in order to compare the representative values of runoff coefficients using three different approaches: i) statistical analysis of rainfall-runoff data and their quantiles (Dhakal et al., 2012); ii) probabilistic runoff coefficients from the rank-ordered pairs of observed rainfall-runoff data and their relationships with rainfall depths (Schaake et al., 1967); iii) finally, a multiple linear model based on geomorphological attributes. These catchments exhibit great variety with respect to their natural settings, such as climate, topography and lithology.

We present a preliminary analysis of the rainfall-runoff relationships as well as their variability in a complex context such as the Iberian Peninsula where contrasted environmental systems coexist. We also discuss reference parameters representing runoff coefficients commonly included into hydrological models. This study is conceived as the first step to explore further working protocols and modeling gaps in a very susceptible area to the climate change such as the Iberian Peninsula′s, where the analysis of runoff coefficients is crucial for designing appropriate decision making tools for water management.

REFERENCES

Chow V.T., Maidment D.R. and Mays, L.W. 1988. Applied Hydrology. MCGraw Hill, Nueva York.
Dhakal, N., Fang, X., Cleveland, T., Thompson, D., Asquith, W., and Marzen, L. (2012). "Estimation of Volumetric Runoff Coefficients for Texas Watersheds Using Land-Use and Rainfall-Runoff Data." Journal of Irrigation and Drainage Engineering, 1(2012):43-54.
Schaake JC, Geyer JC,Knapp JW. 1967. Experimental examination of the rational method. J. Hydr.Div. 93(6),353-70