Geophysical Research Abstracts
Vol. 16, EGU2014-16875, 2014
EGU General Assembly 2014

Soil moisture under contrasted atmospheric conditions in Eastern Spain

César Azorin-Molina (1), Artemi Cerdà (2), and Sergio M. Vicente-Serrano ()

(1) Instituto Pirenaico de Ecología, Consejo Superior de Investigaciones Científicas, Departamento de Procesos Geoambientales y Cambio Global, Avda. Montañana 1005, 50059-Zaragoza, Spain, cazorin@ipe.csic.es ; svicen@ipe.csic.es ; http://www.ipe.csic.es/ , (2) SEDER Soild Erosion and Degradation Research Group, Departament de Geografia, Universitat de València, Blasco Ibañez 28, 46010, Valencia, Spain, artemio.cerda@uv.es ; http://www.soilerosion.eu/

Soil moisture plays a key role on the recently abandoned agriculture land where determine the recovery and the erosion rates (Cerdà, 1995), on the soil water repellency degree (Bodí et al., 2011) and on the hydrological cycle (Cerdà, 1999), the plant development (García Fayos et al., 2000) and the seasonality of the geomorphological processes (Cerdà, 2002). Moreover, Soil moisture is a key factor on the semiarid land (Ziadat and Taimeh, 2013), on the productivity of the land (Qadir et al., 2013) and soils treated with amendments (Johnston et al., 2013) and on soil reclamation on drained saline-sodic soils (Ghafoor et al., 2012). In previous study (Azorin-Molina et al., 2013) we investigated the intraannual evolution of soil moisture in soils under different land managements in the Valencia region, Eastern Spain, and concluded that soil moisture recharges are much controlled by few heavy precipitation events; 23 recharge episodes during 2012. Most of the soil moisture recharge events occurred during the autumn season under Back-Door cold front situations. Additionally, sea breeze front episodes brought isolated precipitation and moisture to mountainous areas within summer (Azorin-Molina et al., 2009). We also evidenced that the intraanual evolution of soil moisture changes are positively and significatively correlated (at $p<0.01$) with the amount of measured precipitation. In this study we analyze the role of other crucial atmospheric parameters (i.e. temperature, relative humidity, global solar radiation, and wind speed and wind direction) in the intraanual evolution of soil moisture; focussing our analyses on the soil moisture discharge episodes. Here we present 1-year of soil moisture measurements at two experimental sites in the Valencia region, one representing rainfed orchard typical from the Mediterranean mountains (El Teularet-Sierra de Enguera), and a second site corresponding to an irrigated orange crop (Alcoleja).

Key Words: Soil Moisture Discharges, Intraannual changes, Atmospheric parameters, Eastern Spain

Acknowledgements
The research projects GL2008-02879/BTE, LEDDRA 243857 and RECARE FP7 project 603498 supported this research.

References:
Azorin-Molina, C., Connell, B.H., Baena-Calatrava, R. 2009. Sea-breeze convergence zones from AVHRR over the Iberian Mediterranean Area and the Isle of Mallorca, Spain. Journal of Applied Meteorology and Climatology 48 (10), 2069-2085.
Azorin-Molina, C., Vicente-Serrano, S. M., Cerdà, A. 2013. Soil moisture changes in two experimental sites in Eastern Spain. Irrigation versus rainfed orchards under organic farming. EGU, Geophysical Research Abstracts, EGU2013-13286.
Bodí, M.B., Mataix-Solera, J., Doerr, S.H. & Cerdà, A. 2011. The wettability of ash from burned vegetation and its relationship to Mediterranean plant species type, burn severity and total organic carbon content. Geoderma, 160, 599-607. 10.1016/j.geoderma.2010.11.009
Cerdà, A. 1995. Soil moisture regime under simulated rainfall in a three years abandoned field in Southeast Spain. Physics and Chemistry of The Earth, 20 (3-4), 271-279.
Cerdà, A. 1999. Seasonal and spatial variations in infiltration rates in badland surfaces under Mediterranean climatic conditions. Water Resources Research, 35 (1) 319-328.
Cerdà, A. 2002. The effect of season and parent material on water erosion on highly eroded soils in eastern Spain. Journal of Arid Environments, 52, 319-337.
García-Fayos, P. García-Ventoso, B. Cerdà, A. 2000. Limitations to Plant establishment on eroded slopes in Southeastern Spain. Journal of Vegetation Science, 11- 77- 86.
Ghafoor, A., Murtaza, G., Rehman, M. Z., Saifullah Sabir, M. 2012. Reclamation and salt leaching efficiency for

tile drained saline-sodic soil using marginal quality water for irrigating rice and wheat crops. Land Degradation & Development, 23: 1 -9. DOI 10.1002/ldr.1033
Johnston, C. R., Vance, G. F., Ganjegunte, G. K. 2013. Soil properties changes following irrigation with coalbed natural gas water: role of water treatments, soil amendments and land suitability. Land Degradation & Development, 24: 350- 362. DOI 10.1002/ldr.1132
Qadir, M., Noble, A. D., Chartres, C. 2013. Adapting to climate change by improving water productivity of soil in dry areas. Land Degradation & Development, 24: 12- 21. DOI 10.1002/ldr.1091
Ziadat, F. M., and Taimeh, A. Y. 2013. Effect of rainfall intensity, slope and land use and antecedent soil moisture on soil erosion in an arid environment. Land Degradation & Development, 24: 582- 590. DOI 10.1002/ldr.2239