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David A. Rivas  
*IMDEA Water Institute*, david.rivas@imdea.org

Angel de Miguel  
*Alterra*, angel.demiguelgarcia@wur.nl

Bárbara Willarts  
*CEIGRAM Centro de Estudios e Investigaciones de Riesgos Agrarios y Medioambientales, Universidad Politécnica de Madrid*, barbara.willaarts@upm.es

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# Hydrological Water Resources Assessment of CEGA-ERESMA-ADAJA Watershed System using SWAT model

**David A. Rivas**<sup>1</sup>, **Angel de Miguel**<sup>2</sup>, **Bárbara Willarts**<sup>3</sup>

<sup>1</sup>IMDEA Water Institute, Avda/Punto Com, n°2, 28805, Alcalá de Henares, Madrid, Spain,  
[david.rivas@imdea.org](mailto:david.rivas@imdea.org)

<sup>2</sup>Alterra, PO Box 47, 6700 AA Wageningen, The Netherlands.  
[angel.demiguelgarcia@wur.nl](mailto:angel.demiguelgarcia@wur.nl)

<sup>3</sup>CEIGRAM Centro de Estudios e Investigaciones de Riesgos Agrarios y Medioambientales,  
Universidad Politécnica de Madrid, UPM, Edificación Fitotecnia, 28040, Madrid, Spain  
[barbara.willaarts@upm.es](mailto:barbara.willaarts@upm.es)

**Abstract:** In the hydrological assessment of water bodies, modeling is a key fact in water management strategies of watersheds and serves as a tool for decision making considering environmental issues as the core of sustainable development in the region. In this direction, SWAT model (Soil and Water Assessment Tool) was used to assess the water availability related with agricultural management in the watersheds of the tributary rivers Cega, Eresma and Adaja of Duero's River in Spain both in the current and future climate change scenarios. To define the HRUs, land use maps from remote-sensing processes were used, extracting the agricultural uses of soil by crops and classified into 33 LU codes for SWAT; the soil map used was the result of data combination between a 1:500.000 resolution edaphological map and data from field soil samples; also terrain slope was reclassified in 4 slope groups from a 20m x 20m DEM. Since groundwater use by agriculture is an important issue in the watershed, comprising more than 50% of the total water demand, groundwater balance was also assessed and compared with actual information of DRBA (Duero River Basin Authority)

The result shows a good correlation between the observed and simulated flows in different parts of the watershed. All the scenarios developed translate into an important reduction of the stream flow in the watershed, as well as an increment in the water demands by agriculture. This trend, coupled with the anticipated expansion of irrigation in the coming years, threatens the sustainability of water resources management within the basin in the mid-term as well the future of irrigated agriculture.

**Keywords:** SWAT, Climate change, Hydrological modelling, Sustainability.