

World Conference on

Climate Change

October 24-26, 2016 Valencia, Spain

Impact of global warming on aquifer-river interactions under groundwater intensive use: Mancha Oriental Aquifer, Spain

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The Mancha Oriental System (MOS) is one of the largest aquifer within Spain (7,260 km²). MOS is located in the SE of Spain and belongs to the Jucar River Basin. Since the 80's, the exploitation of groundwater resources have become a key driver for the socioeconomic development of the Castilla-La Mancha Region. Irrigation agriculture area currently exceeds 1,000 km², and groundwater abstraction reached 314 Mm³/yr, from which 98% is used for irrigation. This figure contrasts with the available groundwater resources estimated (265 Mm³) in the Jucar Hydrological Plan. Global warming effects on groundwater resources have been masked by intensive use of groundwater. Coinciding with the launch expansion of the irrigated area, regional temperature increased 2°C, not being able to establish a definite trend in relation to precipitation. However, the temperature rise has caused a decline in aquifer recharge -18.9 Mm³/yr (compared to the full 1940-2010 period), which has generated a loss in the aquifer storage and a reduction in the Jucar river base flow of about 1.1 Mm³/yr. So far these data have not been taken into account in groundwater management measures tasks but should be crucial for a new hydrological planning policy taking into account that global warming continues its current trend.

Biography

Iordanka Dountcheva has completed her master degree studies in 1997 from Technical University – Sofia, Bulgaria in Industrial Automation Engineering and obtained the corresponding Spanish diploma from the Spanish Ministry of Education, Culture and Sports after complementary courses at the Politechnical University – Valencia, Spain in 2013. Before starting her PhD studies in Hydrological Modelling with joint supervision from Technical University Sofia and the University of Castilla-La Mancha, she has worked for the last 9 years in the private sector on Town Planning and Infrastructural Projects Consultancy. She is member of the College of Graduate and Industrial Technical Engineers of Albacete.

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