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Historical and RCM future trends in Northern Tuscany (Italy)

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The paper presents some results of a study conducted in northern Tuscany (Italy). The study area is the competence zone of the water company GAIA S P A. It has a surface of about 2900 km^2 with a great variety of landscapes with altitude ranging from 0 to 2000m A. S. L. For this study 18 rain and 14 temperature gauges, with the longest series of historical daily observations and excellent continuity (79-97anni for rainfall data and 62-89 years for medium temperatures) were selected for a detailed investigation. With rare exceptions, a downward trend of annual precipitation is noticed; the downward trend seems to be more evident in the first six months of the year and less clear in the remaining period. The tendency is rather opposite as regards the temperature where, with few singularities, an increase of the values can be noticed in recent years and for many stations the trend is significant. The historical trends were compared with the prediction produced by 13 RCM models, developed within the project EURO-Cordex project. For each pair available the simulation results, as daily rain and temperature data, for two future scenarios (RCP 4.5 and 8.5) of forcing agent's emissions were acquired. As a global result it can be assumed that for all the analyzed rain stations there is a more than acceptable agreement between the trends identified from historical data and predictions of climate models. About the temperature trends the historical outcomes frequently underestimate the RCM model predictions.

Biography

Maria Giovanna Tanda is a Full Professor of Hydraulic Structures in the Department of Civil Engineering (DICATeA), University of Parma (Italy) from 2004 to present. Previously she had teaching experience as Associate Professor of Hydraulics and Fluid Mechanics in the Politecnico di Milano from 1990 to 2001. Her main research topics are mathematical modeling of groundwater: flow and transport problems, forensic consulting about water and flooding problems, analysis of water distribution system, sewer systems, hydrologic models of rural and urban watersheds, impact of climate change on water resources, flood routing in rivers, mathematical modeling of flood routing in lakes and storage systems.

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