

IMPACT OF CLIMATE VARIABILITY ON WATER BALANCE IN SOUTHERN ITALY

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This work investigates the impact of climate variability on the water balance in the far East-South of the Italian "Boot" (Apulia and partially Basilicata region) in the period 1951-1990. The historical series of monthly precipitation and minimum and maximum air temperature, obtained at 162 meteorological stations, are used in analysis. Water balance is quantified as a difference between precipitation and potential evapotranspiration, and the latter is calculated from temperature data by using the Hargreaves formula. Data are analyzed by means of 10-year average values to find out the trend of the mean temporal variation of weather variables throughout four decades, from 1951-1960 to 1981-1990. The results have demonstrated a significant decrease of annual precipitation, in the range of 22.5%, which corresponds to an average yearly amount of about 167 mm. On monthly basis, the greatest reduction of precipitation was observed in January (50%) and May (39%), and then in November, October and April (about 29%). The analysis of temperature data indicated a slight decrease in maximum air temperature and a minor increase in minimum air temperature, both in the range of 0.5°C over four decades. Such a variation in air temperature provoked an average decrease of evapotranspiration on yearly basis of about 57 mm, which is equivalent to 5.4%. The overall results have shown that water deficit in the region has increased, on annual basis, on average by 110 mm, which could produce a serious impact on both water supply and demand in the major part of Southern Italy. Spatial analysis of data has indicated that the uplands of Gargano area and Appennine slopes, which in the past had favourable climatic conditions, were the most prone to weather changes and to extension of water deficit.