



River flow variability in southern part of Romania and its connection to large scale atmospheric circulation

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We investigate the dominant modes of flow variability of ten rivers from southern part of Romania, for 69 years of monthly data (1931-1999). The dominant mode of streamflow variability has a monopolar structure. A composite analysis based on the time coefficients of this mode reveals that low (high) values of the streamflow in this region are related to a large-scale atmospheric circulation pattern similar to the negative (positive) phase of the Arctic Oscillation (AO). The time coefficients of the dominant mode of streamflow variability correlates with the AO index at -0.80 , also demonstrates a strong connection between Romanian hydrologic variability and the AO. A similar analysis of precipitation (PP) variability recorded at six meteorological stations for the same period reveals that positive (negative) phase of AO is related to negative (positive) PP in southern part of Romania, consistent with the results of streamflow variability. Therefore, a persistent positive phase of AO, due to natural or anthropogenic forcing is related to a persistent hydrological and meteorological drought in this region with important consequences on the agriculture and electric power production in this region.