Spatiotemporal monthly precipitation mapping for Pinios river basin, Greece

L. Vasiliades (1) and A. Loukas (2)

(1) Department of Management of Environment and Natural Resources, (2) Department of Civil Engineering , University of Thessaly (lvassil@uth.gr /Fax: +302421093253)

This study evaluates the suitability of a novel interpolation technique for spatiotemporal monthly precipitation mapping in Pinios River Basin, Greece. Pinios River basin has an area of about 9500 km2, is located in Thessaly, an agricultural plain region surrounded by mountains. Sixty six (66) precipitation stations were used to construct a 1-km gridded precipitation dataset for the period October 1960 to September 2002, comprising more than 33000 cases. A novel interpolation method was employed that accounted for possible orographic effects at different spatial scales and allowed for regionally and seasonally varying relief-climate relationships. The methodology uses artificial neural networks with inputs spatial coordinates, elevation data, monthly weighting and areal or single site station precipitation. The spatial and temporal validity of the interpolation method was checked using supervised split sample test. Seventy percent (70%) of the precipitation cases were used in the development of the model and thirty percent (30%) of the remaining precipitation cases were used for the spatial and temporal validation of the methodology. The results showed that the proposed technique gave satisfactory spatiotemporal interpolation results in the study basin.