Regional analysis of low flow in Tuscany (Italy)

GIUSEPPE ROSSI & ENRICA CAPORALI

Dipartimento di Ingegneria Civile e Ambientale, Università degli Studi di Firenze Via S. Marta 3, 50139 Firenze, Italy
giuseppe.rossi@dieca.unifi.it

Abstract In environment protection, estimates of low flows in rivers are needed for many purposes. Generally estimation is based on observed streamflow data. For sites where data are not available, alternative techniques are necessary to infer this information. A regional approach is often used for ungauged basins and is the one adopted for this study. The analysis is carried out on the discharge data of 65 consistent hydrometric stations located in the Tuscany region, central Italy, with recorded data from 1949 to 2008. The area is subdivided into different regions using the L-moments method applied to the 7-day annual minimum flows and to the $Q_{70}$ annual series. The division into sub-regions was tested using discordancy and heterogeneity statistics. A unique region and a subdivision into three different sub-regions, following previous studies on rainfall extremes were considered. The subdivision into five homogeneous sub-regions was undertaken by accounting for hydrological features.

Key words drought; low-flow; ungauged rivers; regional analysis; L-moments; homogeneity measure