

Spatial grouping of annual streamflow patterns in Turkey

Ercan Kahya¹

Istanbul Technical University, Civil Engineering Department, Hydraulic Division, 34469 Maslak Istanbul, Turkey

M. Cüneyd Demirel

Istanbul Technical University, Institute of Science and Technology, 34469 Maslak Istanbul, Turkey

Thomas C. Piechota

University of Nevada, Las Vegas, Department of Civil and Environmental Engineering, 4505 Maryland Parkway, Box 454015, Las Vegas, NV 89054-4105, USA

Abstract. This paper describes a procedure grouping streamflow patterns across Turkey that exhibit similar annual flow behaviors. Streamflow information is the integrated response of the river basin, such as topography, soil and vegetation to external impacts such as climate. A regionalization of annual data is carried out using k-means analysis. Streamflow series from 80 gauging stations were chosen to characterize geographic differences in year to year streamflow variability. The eight-cluster solutions of k-means analysis are stable and interpretable with reference to spatial and temporal variations. It was shown that western Turkey is dominated by a relatively large cluster, indicating strong influences of the Mediterranean dynamics. The resultant map was given at the 8-cluster level, showing the spatial variability of homogeneous streamflow regions.

¹ Hydraulic Division
Civil Engineering Department
Istanbul Technical University
34469 Maslak Istanbul, Turkey
Tel: (212) 285-3002
e-mail: kahyae@itu.edu.tr