

The links between the categorized Southern Oscillation indicators and precipitation patterns over Turkey

M. Çağatay Karabörk

Civil Engineering Department, Dumlupınar University, Kütahya, Turkey

Ercan Kahya¹

Hydraulics Division, Civil Engineering Department, Istanbul Technical University, Istanbul, Turkey

Abstract. Previous global and regional studies have indicated teleconnections between the extreme phases of the Southern Oscillation (SO) and Turkey's hydrometeorological variables; however, they failed to suggest a strong correlation structure. In this study, the categorized Southern Oscillation Index (SOI) and Multivariate ENSO Index (MEI) series were used to examine the far reaching effects of the SO on Turkey's precipitation patterns. To represent neutral, moderate and extreme phases, SO indicators were subjectively categorized into five subgroups according to their empirical distributions. The correlation between the categorized SO indicators and Turkish precipitation series was computed from lag-0 to lag-4 using Spearman's *rho*. Significance of the calculated correlations was tested at the 0.01 level for the station based analysis and at the 0.05 level for the regional analysis. For some categories, precipitation was found to be correlated with the SO indicators at some stations mainly located in western Turkey. Regional analyses of precipitation revealed a clear and strong correlation structure with the categorized SO indicators over large portions of Turkey. This is an important fact that has not been emphasized by the previous studies. Moreover it was shown that significant correlations were obtained not only for the extreme phases (namely, El Nino and La Nina), but also for the neutral and moderate phases of the SO.

¹Assoc. Prof., Hydraulic Division
Civil Engineering Department
Istanbul Technical University
34469 Maslak Istanbul, Turkey
Tel: + 90 (212) 285-3002
e-mail: kahyae@itu.edu.tr