

**THE USE OF CIRCULATION PATTERNS TO ESTIMATE LOCAL
PRECIPITATION UNDER CLIMATE CHANGE**

D. PANAGOULIA¹ and G. DIMOU²

*¹National Technical University of Athens, Department of Civil Engineering, Division
of Water Resources – Hydraulic and Maritime Engineering, 5 Iroon Polytechniou,
15780 Zografou, Athens, Greece*

²Dr civil engineer, 7 Voutyra, 16673 Voula, Athens, Greece

ABSTRACT

A stochastic approach is developed to estimate at three locations (catchment elevation zones) the effect of climate change on daily precipitation. The approach is based on the use of daily atmospheric circulation patterns (CP_s) and the linkage between types of CP_s and daily precipitation. Historical data and 10-year outputs of the Max Planck Institute general circulation model for the 1xCO₂ and 2xCO₂ cases are used. Nine CP types for the winter and summer half years are obtained to characterize large-scale climatic forcing in Mesochora catchment in Central Greece. Under the continental climate of Mesochora catchment the effect of the 2xCO₂ case on elevation zone precipitation is variable and significant: the probability of daily precipitation slightly increases, whereas the mean and variance decrease considerably during the summer season.