



Rain intensity forecast using Artificial Neural Networks in Athens, Greece

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The frequency of heavy precipitation events has increased over most areas and it is very likely future increased trends based on projections for 21st century using SRES scenarios, according to the Summary for Policymakers of the IPCC 2007. The forecast of extreme weather events become imperative due to the emerging climate change and possible adverse effects in humans.

The objective of this study is to construct predictive models in order to forecast rain intensity (mm/day) in Athens, Greece, using Artificial Neural Networks (ANNs) models. The ANNs outcomes concern the projected mean, maximum and minimum monthly rain intensity for the next four consecutive months in Athens. The meteorological data used to compute the rain intensity, were the monthly rain totals (mm) and the respective rain days, which were taken from the National Observatory of Athens, for a 111-year period (1899-2009).

The results of the developed and applied ANN models showed a fairly reliable forecast of the rain intensity for the next four months. For the evaluation of the results and the ability of the developed prognostic models, appropriate statistical indices were used. In general, the predicted results compared with the corresponding observed rain intensity seemed to be in a very good agreement at a statistical significance level of $p < 0.01$.