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Investigation of stochastic similarities among influent and treated effluent variables of spatially distributed wastewater treatment plants in Greece; II: Statistical analysis of treated effluent variables in terms of the marginal distribution

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The aim of this research is to identify any statistical similarities among treated effluent variables of spatially distributed wastewater treatment plants. The data is downloaded from the Greek national database of wastewater treatment plants (http://astikalimata.ypeka.gr) uniformly distributed over Greece. For each plant several treated effluent parameters (i.e. BOD5, COD, SS, T-N, NH4-N, NO_3-N, T-P) are analyzed in terms of their marginal distributions. Specifically, for each variable we estimate its marginal statistics for each season and overall, e.g. probability distribution function and first four classical and L-moments, and we perform statistical methods (e.g. square error and maximum-likelihood) to identify the most appropriate distribution that can adequately simulate the observed variability. We discuss over the spatial distribution of the marginal estimates of the selected variables and whether they exhibit any statistical similarities among them, and among the marginal estimates of the influent variables. Finally, we further discuss how the production of sludge can be used for energy production, based also on the available spatial information (type of treatment, location etc.) of each plant.