



Temporary evolution of ozone air quality in province of Burgos (Spain): regression and cluster techniques

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Air quality depends on the interaction between a series of natural factors, such as climatology or orography, and on a series of human factors such as population density, industrial development or modes of transport. It is as necessary as ever, for all these reasons, to identify and analyze this phenomenon, legislate and take action to counter the high levels of harmful substances or energies in the atmosphere.

From among the pollutants present in the air, we have selected ozone as an atmospheric pollutant that is representative of the state of the atmosphere; environmentally it awakens great interest, on the one hand, due to the formation of hydroxyl radicals, and on the other, because of its adverse effects on human health and the ecosystem.

Our general objective is the study of tropospheric ozone in a typical province of the Autonomous Community of Castile and Leon, such as Burgos. In order to study ozone concentrations in several areas, the records of eight stations in the Monitoring Network were used, with a data set that corresponds to 2001-2006.

In this work the specific studies are as follows: the monitoring of ozone values in the urban centre and the outskirts of Burgos and other cities, the analysis of geographical and temporal variations in ozone levels in the province, characterization of the time series of this pollutant, evaluation of air quality with respect to threshold exceedances as defined by current legislation, and the relation between ozone concentration levels and the meteorological parameters of temperature and global solar radiation.

The methodology applied in the experimental process is based on fifteen-minute data sets taken from the aforementioned stations; the study covers a time period over the last five years, which involves the following work: the statistical values of the pollutant concentrations and the most influential meteorological parameters in the latter have

been calculated on the basis of the experimental data available from the measuring stations.

The results were obtained by calculating the hourly and daily averages, the daily maximum and minimums over certain temporal periods, the monthly averages, and they demonstrate the influence of the meteorological parameters on the incidence of pollution. The results have also been compared with the target values which will give us an initial idea of air quality at a number of particular sites. Regression and cluster techniques were used as well as modelling of the experimental results. ACKNOWLEDGEMENTS: The partial financial support by the *Junta de Castilla y León* (project BU18/05)