EDITORIAL

Research on environmental topics is currently very popular and extremely challenging. There is a multiplicity of statistical methods that can be used for addressing environmental problems due in part to the enormous variability that exists in data availability and collection. For the reasons above, the invitation to organize a special issue on environmental statistics has been an honor and a pleasure, that also imposed a need to define a general theme for the issue. The restriction of applications to themes of European interest has been the crucial point: the identification of the common heading as "Environmental challenges for Europe: from data collection to models for general and specific topics" allows each contribution to be located in a well-structured framework.

In particular, the attention to the relationship between regional and global aspects are considered with respect to data collection, regional climate models and renewable energy consumption. Space-time modeling is of course common to the entire set of contributions. In this issue, it is extended to include zero-inflated distributions, and also by introducing geographical weights and space-time point processes. The methods addressed are at the frontiers of research, from generalized extreme value techniques, to hierarchical Bayesian models, to functional analysis. Also growth regression models for β-convergence that consider both spatial dependence and heterogeneity in data are proposed. Data collection by institutions charged with official duties has been explored, and the relationships between the national and European context deepened in the contribution of Cocchi and Alfò, while some of the evolution in environmental regulation, management and monitoring and the information needs are sketched in the work of Scott and Gemmell.

The application fields that are touched are varied. They include renewable energy consumption in Europe, in the contribution of Fontanella *et al.*, to extreme events such as wildfires in Portugal studied by Pereira *et al.*, and avalanche risk in an Alpine Italian region investigated by Nicolis. Emphasis on extreme events, i.e. mimimum temperatures, has been addressed also by Craigmile and Guttorp. Interdisciplinarity is very stimulating, especially in relation to biological problems and biodiversity profiles. Functional data analysis is proposed as a tool for interpreting, in modern way, the idea of the diversity profile curve when analyzing biodiversity in the work of Di Battista and Fortuna, which contains an application to Tuscany data, while the relationships between the spatio-temporal distribution of shrimp populations and environmental variables in the North-Western Ionian Sea are investigated by Arcuti *et al.*

Finally, I wish to thank the Editors of Statistica who stimulated the challenge of this special issue. Thanks also to the authors who wrote their contributions under a very strict time constraint and all the referees that acted very quickly in order to stimulate the due revisions and corrections to all papers.

Bologna, 30 March 2013

Daniela Cocchi
Guest Editor