

# Model-based Geostatistics with Environmental and Epidemiological Applications

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This two-day course covers the core theory and methods of model-based geostatistics, as introduced by Diggle, Moyeed and Tawn (1998) and described in more detail in Diggle and Ribeiro (2007). The course also covers the implementation of these methods in the open-source R computing environment, using the `geoR` and `geoRglm` packages. Theoretical ideas will be motivated by, and applied to, case-studies in environmental science and epidemiology.

The course assumes a working knowledge of statistical methods to the level of linear and logistic regression modelling. Familiarity with the R computing environment is desirable, but not essential. Course delivery will use a combination of lectures, software demonstrations and open-ended lab sessions where participants can gain experience of the `geoR` and `geoRglm` packages with tutorial assistance on hand.

## Course outline

1. Introduction - motivating examples
2. Linear models
3. Bayesian inference
4. Generalised linear models
5. Geostatistical design
6. Geostatistics and marked point processes

## Software and data

The R software, and the required contributed packages `fields`, `geoR`, `geoRglm`, `sp` and `splancs`, can be downloaded from the R project web-site, <http://www.r-project.org/>

Data-sets used in the course can be downloaded from the author's web-site, <http://www.lancs.ac.uk/staff/diggle/>

## References

Diggle, P.J., Moyeed, R.A. and Tawn, J.A. (1998). Model-based geostatistics (with Discussion). *Applied Statistics*, **47**, 299-350.

Diggle, P.J. and Ribeiro, P.J. (2007). *Model-based Geostatistics*. New York: Springer.