



# Statistics for Spatio-Temporal Data

*Noel Cressie, Christopher K. Wikle*

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**Statistics for Spatio-Temporal Data** Noel Cressie, Christopher K. Wikle  
**Winner of the 2013 DeGroot Prize.**

**A state-of-the-art presentation of spatio-temporal processes, bridging classic ideas with modern hierarchical statistical modeling concepts and the latest computational methods**

Noel Cressie and Christopher K. Wikle, are also **winners of the 2011 PROSE Award in the Mathematics category**, for the book “Statistics for Spatio-Temporal Data” (2011), published by John Wiley and Sons. (The PROSE awards, for Professional and Scholarly Excellence, are given by the Association of American Publishers, the national trade association of the US book publishing industry.)

*Statistics for Spatio-Temporal Data* has now been reprinted with small corrections to the text and the bibliography. The overall content and pagination of the new printing remains the same; the difference comes in the form of corrections to typographical errors, editing of incomplete and missing references, and some updated spatio-temporal interpretations.

From understanding environmental processes and climate trends to developing new technologies for mapping public-health data and the spread of invasive-species, there is a high demand for statistical analyses of data that take spatial, temporal, and spatio-temporal information into account. *Statistics for Spatio-Temporal Data* presents a systematic approach to key quantitative techniques that incorporate the latest advances in statistical computing as well as hierarchical, particularly Bayesian, statistical modeling, with an emphasis on dynamical spatio-temporal models.

Cressie and Wikle supply a unique presentation that incorporates ideas from the areas of time series and spatial statistics as well as stochastic processes. Beginning with separate treatments of temporal data and spatial data, the book combines these concepts to discuss spatio-temporal statistical methods for understanding complex processes.

Topics of coverage include:

- Exploratory methods for spatio-temporal data, including visualization, spectral analysis, empirical orthogonal function analysis, and LISAs
- Spatio-temporal covariance functions, spatio-temporal kriging, and time series of spatial processes
- Development of hierarchical dynamical spatio-temporal models (DSTMs), with discussion of linear and nonlinear DSTMs and computational algorithms for their implementation
- Quantifying and exploring spatio-temporal variability in scientific applications, including case studies based on real-world environmental data

Throughout the book, interesting applications demonstrate the relevance of the presented concepts. Vivid, full-color graphics emphasize the visual nature of the topic, and a related FTP site contains supplementary material. *Statistics for Spatio-Temporal Data* is an excellent book for a graduate-level course on spatio-temporal statistics. It is also a valuable reference for researchers and practitioners in the fields of applied mathematics, engineering, and the environmental and health sciences.

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