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3.2 SPATIAL CLASSIFICATION AND PREDICTING FROM SOIL MAPS 3.2.1 Theory; 3.2.2 Summary; 4 Characterizing Spatial Processes: The Covariance and Variogram; 4.1 INTRODUCTION; 4.2 A STOCHASTIC APPROACH TO SPATIAL VARIATION: THE THEORY OF REGIONALIZED VARIABLES; 4.2.1 Random variables; 4.2.2 Random functions; 4.3 SPATIAL COVARIANCE; 4.3.1 Stationarity; 4.3.2 Ergodicity; 4.4 THE COVARIANCE FUNCTION; 4.5 INTRINSIC VARIATION AND THE VARIOGRAM; 4.5.1 Equivalence with covariance; 4.5.2 Quasi-stationarity; 4.6 CHARACTERISTICS OF THE SPATIAL CORRELATION FUNCTIONS; 4.7 WHICH VARIOGRAM? 4.8 SUPPORT AND KRIGE'S RELATION 4.8.1 Regularization; 4.9 ESTIMATING SEMIVARIANCES AND COVARIANCES; 4.9.1 The variogram cloud; 4.9.2 h-Scattergrams; 4.9.3 Average semivariances; 4.9.4 The experimental covariance function; 5 Modelling the Variogram; 5.1 LIMITATIONS ON VARIOGRAM FUNCTIONS; 5.1.1 Mathematical constraints; 5.1.2 Behaviour near the origin; 5.1.3 Behaviour towards infinity; 5.2 AUTHORIZED MODELS; 5.2.1 Unbounded random variation; 5.2.2 Bounded models; 5.3 COMBINING MODELS; 5.4 PERIODICITY; 5.5 ANISOTROPY; 5.6 FITTING MODELS; 5.6.1 What weights?; 5.6.2 How complex? 6 Reliability of the Experimental Variogram and Nested Sampling 6.1 RELIABILITY OF THE EXPERIMENTAL VARIOGRAM; 6.1.1 Statistical distribution; 6.1.2 Sample size and design; 6.1.3 Sample spacing; 6.2 THEORY OF NESTED SAMPLING AND ANALYSIS; 6.2.1 Link with regionalized variable theory; 6.2.2 Case study: Youden and Mehlich's survey; 6.2.3 Unequal sampling; 6.2.4 Case study: Wyre Forest survey; 6.2.5 Summary; 7 Spectral Analysis; 7.1 LINEAR SEQUENCES; 7.2 GILGAI TRANSECT; 7.3 POWER SPECTRA; 7.3.1 Estimating the spectrum; 7.3.2 Smoothing characteristics of windows; 7.3.3 Confidence 7.4 SPECTRAL ANALYSIS OF THE CARAGABAL TRANSECT

Sommario/riassunto

Geostatistics is essential for environmental scientists. Weather and climate vary from place to place, soil varies at every scale at which it is examined, and even man-made attributes - such as the distribution of pollution - vary. The techniques used in geostatistics are ideally suited to the needs of environmental scientists, who use them to make the best of sparse data for prediction, and to plan future surveys when resources are limited. Geostatistical technology has advanced much in the last few years and many of these developments are being incorporated into the practitioner's repertoire
