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Book Review

ENCYCLOPEDIA OF ENVIRONMETRICS

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Second Edition, John Wiley & Sons, Chichester, UK, Volume 5, Rad-Spl,
ISBN 978-0-470-97388-2, lix+537 pages

In volume 5 of *Encyclopedia of Environmetrics* the authors provides 102 well structured articles. The entries are from *R* to *S*:

R and S – programming language are presented.

Radiation and radiative transfer – basic physics, transport theory, classical equation of transfer are presented, scattering, heating, cooling processes are discussed.

Radioactivity – the article is focused on measurement system and radioactive units, sampling, modeling, radiological protection and health effects.

Radon – a brief description of the gas and some issues are discussed.

Random effects – methodology of calculation is provided.

Random fields – is used for description of random process, a brief presentation is included in the article.

Random field, Gaussian – is focused on calculation method.

Random fields, nonparametric methods – some estimation problems and methods in random fields are discussed.

Random number generators – the algorithm of calculation is provided.

Random walk – the stochastic process is presented.

Randomization – principle of using randomization and some examples are provided.

Randomized branch sampling – terminology, path selection, and estimators are discussed.

Ranked set sampling – include multivariate ranked set sampling, variations of the basic protocol and other variations.

Ranks – basic definitions, elementary properties and calculation methods for different tests are included.

Reaction phenomena – is described.

Receptor and hybrid modeling tools – is focused on presentation of methodologies for different models.

Record linkage – mathematical model and estimation of matching parameters are described.

Regression diagnostics – linear model residuals, residual plots, leverage and influence, and also general models are discussed.

Regression trees – the construction of regression tree models are explained.

Regularization methods – Tikhonov and other regularization methods are presented.

Relative risk – the term of relative risk is discussed.

Remote sensing – definition, brief history and types of remote sensing are described, thematic mapping, quantitative estimation and accuracy considerations are presented.

Renewable energy technologies – the technologies are presented (solar heating, wind energy, biomass etc.).

Repeated measures – some models are discussed.

Reproductive epidemiology – the article is focused on general design of a reproductive epidemiological study, several major reproductive endpoints and methodological developments.

Reproductive toxicology – include discussion on reproductive toxicology studies.

Resampling methods – common resampling methods and computational issues are discussed.

Residuals – liniar and nonlinear regression and other models are presented.

Resource selection – include data types, study designs and statistical analysis.

Respiratory epidemiology – some studies are discussed.

Restoration, environmental – site characterization, risk assessment, remedial design are discussed and an example is provided.

Ripley's K function – describe this tool for analyzing spatial point process data, fousing on models and examples.

Risk assessment, ecological – the article outline the process for conducting ecological risk assessment.

Risk assessment and uncertainties – provide a critical approach for utilization of risk assessment methods and concepts in achieving the risk management objectives.

Risk assessment, probabilistic – include information about variability, uncertainty, utility of probabilistic risk assessment results and discuss future directions.

Risk assessment, quantitative – the structure of health risk assessments is discussed.

Risk assessment, seismological – strategy, sources, attenuation, local site, maps and other aspects are presented.

Risk governance – definition and content of risk governance, integrated risk governance, prospect and future are discussed.

Risk perception – presentation of risk perception is provided.

Robust estimation of location and scale – robustness properties, M-estimators are described.

Robust inference – include an overview of the inference that is sensitive to deviations from the assumptions under which it is derived.

Robust quantile regression – information about models, scores and test are provided.

Robust regression- robust statistics and estimation methods are discussed.

Royal Statistical Society, Environmental Statistics Section (formerly study group) – a brief presentation of the group is given.

Runs tests – include a famous teaching experiment, history of runs in a snapshot, domains of applications, extension to the multivariate setup.

S+Spatialstats – types of spatial data and tools available are described.

Sample support – a complete definition of sample support, description of some problems and a brief overview of the solution are provided.

Sampling agricultural resources – a brief description is given.

Sampling, environmental – the article is focused on utilization of the probability sampling as a scientifically defensible protocol.

SAS – the system of software for data management, analysis is presented.

Satellite data – the nature of satellite data, correction of geometric and radiometric distortion, feature estraction are discussed.

Screening effect – some applications and theory on the screening effect are described.

Sediment transport – the article focused on parameters governing sediment erosion, transport and deposition.

Seemingly unrelated regressions – an example of application is provided.

Seismological modeling – point processes models, parameter estimation are discussed.

Sensitivity analysis of computer models – the local and global sensitivity analysis are described.

Sensitivity analysis of statistical models – regression, state-space and space-time models are presented.

Sensitivity and specificity – include a brief presentation of these tehnical terms used in environmental and ecological applications.

Sensor network – the article include a brief history, examples of networks, information about design and data collection.

Sequential sampling – some examples are provided.

Shewhart method – different types of control charts, setting the alarm limits, evaluation, further developments are discussed.

Shrinkage – the problem of estimating is presented.

Shrinkage regression – methods of estimation or prediction in regression situation are discussed.

Sick building syndrome – a brief presentation is provided.

Sign tests – the ordinary sign test for median based on single sample and on paired samples is explained.

Similarity theory – the theory and some examples are provided.

Simulated annealing – a brief description of Monte Carlo method for combinatorial optimization is given.

Simulation and Monte Carlo methods – include information about Monte Carlo integration and variance reduction and Monte Carlo tests.

Simulation – optimization modeling – general formulation of simulation-optimization problem, embedded approaches to simulation-optimization modeling and decoupled approaches are discussed.

Singular value decomposition and high dimensional data – random matrix theory and sparse principal component analysis are presented.

Size biased sampling – a brief presentation is provided.

Skew distributions – different scale factors, skew symmetric distributions and some approaches are discussed.

Small area estimation – the area level and unit level models are described.

Smoothing – classes of smoothing, models, characteristics, parameters, examples, software are provided.

Smoothing in environmental apidemiology – an example of smoothing in environmental apidemiology is discussed.

Soil contamination and remediation – include information about contaminants and theirs sources, remediation of contaminated sites and some final remarks.

Soil erosion and conservation – water erosion, wind erosion, tillage erosion, total soil erosion, soli conservation are discussed.

Soil survey – some statistical aspects of approaches to soil survey are described.

Source apportionment – include information about general air quality model, chemical mass balance receptor model, chemical components, receptor locations, sampling periods, source profiles etc.

Space time covariance models – different models are presented.

Space time Kalman filter – some aspects related to the model are discussed.

Space time stochastic modeling in human exposure – is focused on some aspects regarding space time mapping, environmental fate, carcinogenics, genetics, population health indicators, exposure health effect associations and risk assessment.

Spacing trials – applications of spacing trials and statistical design for spacing trials are presented.

Spatial analysis in ecology – is focused on spatial analysis of ecological data.

Spatial and space time threshold exceedances – statistical approaches and structural analysis of threshold exceedances are explained.

Spatial covariance- methods and models are presented.

Spatial design optimal – contains information about prediction error variance criteria, other design criteria, expansion, contraction and designing from scratch and optimization algorithms.

Spatial distribution – a brief presentation of spatial distribution is provided.

Spatial optimization – adjacency constraints and direct approaches are discussed.

Spatial scan statistics – the algorithm of calculation is presented.

Spatial statistics in environmental epidemiology – spatial statistical models are explained.

Spatially constrained sampling – two examples are discussed.

Species competition – models of competition, designed experiments, indices for measuring competition, logistic regression are presented.

Species distribution, monitoring changes in – include a brief presentation of monitoring changes in species distributions.

Species diversity – assessment of species richness from sampling, compound diversity measures, patterns of diversity are described.

Species interaction networks – the quantitative practices in studying the network structure of species interactions are presented.

Species overlap – the concept is explained.

Species richness – brief presentation of species richness estimation.

Spectral methods – functions of calculation and the models are explained.

Spectrum analysis – spectral density of a stationary process, estimation of the spectrum, nonstationary time series are described.

Spherical statistics – theoretical aspects of this method of data analysis are provided.

Splines in nonparametric regression – univariate polynomial smoothing spline, cross validation, number of generalizations of univariate smoothing spline are described.

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