



"Gheorghe Asachi" Technical University of Iasi, Romania



Book Review

ENCYCLOPEDIA OF ENVIRONMETRICS

Edited by
Abdel H. El-Shaarawi¹, Walter W. Piegorsch²

¹National Water Research Institute, Burlington, Ontario, Canada and Department of Mathematics and Statistics McMaster University, Hamilton, Canada and The Department of Mathematics and Actual Science, The American University in Cairo, Egypt
²BIO5 Institute, University of Arizona, Tuscon, USA

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The second volume of *Encyclopedia of Environmetrics* provides 114 articles well structured. Each article cover adequate information on the subject treated: definitions, explanations of terms, calculation models, effects, description of evaluation methods, algorithms, examples etc.

The entries are from *C* to *F*:

Cooperative Programme for Monitoring and Evaluation of Long Range Air Pollution in Europe (EMEP): the article presents a network initially focused on collection of precipitation chemistry data.

Copula modeling for extremes: used in risk management and environmental science, the methodology of calculation is described in the article.

Copulas and copula models: the article deals with models, families, properties.

Correlated multinomial data: covers issues such as mixture distribution, covariance functions, inference, and illustration.

Counting process: presents the methodology for count the number of occurrences of some event of interest as time goes by.

Covariance matrix estimation - estimated parameters and high-dimensional are critical in performing relevant statistical inference, the methodology is described in detail.

Covariogram, examples of - the article provide some examples.

Creel surveys: deals with types of sampling surveys for recreational fisheries, sampling frames for creel surveys and estimations for catch and effort.

Critical loads: explains the concept, cumulative distribution functions and ecosystem protection isolines, gap closure and also presents the European Monitoring and Evaluation Program Project and the Regional Air Pollution Information and Simulation Model.

Criticality, self-organized: the article is based on the fundamental question of why nature is complex and not simple.

Cross scale morphology: discusses the discontinues body mass distribution and detection of body mass patterns.

Cross validation: presents the resembling method which can be used for assessment of statistical models.

Cylindrical data: presents a type of directional data comprised of a circular measure.

Data mining: the article deals with challenges of data mining, statistics, tools related to this new discipline.

Data monitoring: provides information on obtaining these data.

Databases, health assessment: presents the environmental data from national and international sources.

Decay rate: gives the algorithm for calculation of this rate.

Decision support systems, environmental: the article deals with description of the computer environmental decision support system (design, components and implementation).

Defoliation: the article describes the causes, significance, methods, predictions, artificial defoliation.

Delta method: presents the method of propagation of errors.

Demographic stochastic models: the article provides an example of the model.

Dendrochronology and dendroclimatology: presents a description of the science of tree-ring analysis.

Depth: deals with depth function and examples.

Desalination: describes two common desalination technologies (multistage flash and multiple effect distillation) and also the SWRO processes.

Detection limit: the article deals with limit of detection used in analytical chemistry basic theory, different types of detection limits, multivariate detection.

Developmental toxicity study: presents a typical Segment II developmental toxicity study (laboratory controlled studies on animals).

Diet, measurement of: explains the influence of the diet on human health, provides an example of a measurement.

Dirichelet distribution: the distribution can be applied to solve envirometric problems; the article provides the algorithm of calculation.

Discriminant analysis: presents a summary of software and algorithms for this method.

Disease clustering: the article if focused on investigation of disease clusters, disease maps.

Disease mapping: the mapping is important for medical, ecological and environmental investigations; the article provides types of data and of analysis.

Disease mapping, hierarchical models for: presents some hierarchical models as solutions to the problems associated with disease mapping.

Disease registry: deals with documents which contains information about individual person.

Dispersion parameter: explains the parameter which can be used to identify, study, test account for the excess variation.

Distance sampling: the article deals with survey design, line-transec and point-transec sampling, related methods.

Distribution function: explains the distribution function which can be used in environmetrics studies.

Diversity measures: is applied in ecology for characterization of relative abundances of species in a community, a presentation of these measures is provided.

Diversity profiles: provides an overview of measuring diversity.

DNA adducts: (bimarker of the biologically effective dose) presents specific pathways from smoking to adduct formation.

Dose calibration, Dose rate studies, Dose response model, Dose –response modeling for clustered data: the calculation algorithms are described for each of them, are used to describe in mathematical functions some biological aspects.

Drought: provide the concept of drought (normal feature of climate, complex natural hazard), definition, characteristics, impacts, drought policy and planning.

Dynamic model, Dynamic Modeling mathematical presents representation of time-dependent using differential equations; the model and the methodology.

Dynamic programming describes the technique applicable to various situations especially when the problem can be structured in stages, the dynamic programming problem.

Earth observation programes (EOP) includes three programs for observing the earth with satellite.

Echelon analysis – contains the method for objectively determination of spatial structure for direct mapping, spatial variation, characteristics, trees, profiles, supplemental scan statistics and environmental application of the analysis.

Ecological economics – presents a new field based on relationship between economic and environmental systems.

Ecological Society of America – presents a scientific society which promote ecological science, increase resources availability, enhancing communication between ecological community and policy-makers.

Ecological statistics – focuses on application of statistics for ecological problem solving; multispecies and multivariate analyses are described.

Ecological study design presents a brief description of these studies and the steps to conduct the studies.

Economics, environmental (management of environmental resources and assessment of environmental quality impact on human) includes optimal environmental quality, estimating costs and benefits, institutional mechanisms.

Ecosystem (conceptual foundation for ecology) describes evolution of the term ecosystems, ecosystem attributes, classification schemes and mapping and some applications.

Ecosystem element cycling – the article provides some basics biological and physical backgrounds on process responsible with ecosystem element cycling, describe carbon and nitrogen cycles in terrestrial ecosystems and discuss human modification on these cycles.

Ecosystem monitoring – describes design of ecosystem monitoring, presents the role of monitoring, of modeling.

Ecotoxicology – (science of contaminants in the biosphere and their effects) include statistical

methods, trophic transfer, organismal and community effects.

Edge effect – presents edge effect bias, methods for elimination of this effect.

Effect size – provides information about the degree of which one distribution differs to another.

Effluent – definitions of this term.

Electromagnetic fields discuss approach to data integration, strengths and limitations in the statistical integration of results.

Elicitation – presents the purpose, principles of this process.

Elliptical symmetry and *EM Algorithm* explains the methodologies.

Emission inventory deals with comprehensive listing of air pollutant emissions in a specific location and time interval; sources, type of emission inventories, uncertainties are discussed.

Emissions – includes presentation of pollutants, estimation of emissions.

Empirical Bayes methods: describes the methods.

Encounter sampling and *Encountered data* provides examples of encountered data in environmental studies.

Endocrine disruptors - describes exogenous substances that cause adverse health effect.

Energy efficiency includes information about measuring and tracking and implementation of energy efficiency.

Ensemble provides an example of ensemble

Ensemble models – the article presents the ensemble models.

Environmental and Ecological Statistics – provide presentation of a journal which acts as forum for multidisciplinary communication and discussion on statistics, ecology, environment and society.

Environmental forensics includes definitions and concepts, tools, methods.

Environmental indices: the article presents advantage and disadvantages and construction of an environmental index.

Environmental information systems: deals with management of data about water, soil, air and species.

Environmental justice involves legal social and scientific issues.

Environmental microbiology presents information about counting planktonic bacteria, laboratory tests of germicides and microbial ecology.

Environmental Protection Agency, US – gives information about mission, goals, activities, organizational structure of the Agency.

Environmental regulation in the European Union includes historical development, environmental legislation for improving air quality.

Environmental tobacco smoke (ETS) – presents health effects of exposure to ETS.

Environmetrics, overview – is a scientific discipline focused on development and use of quantitative methods in order to solve environmental problems; the article describe roots, domain of

environmetrics, measurement, graphics, mathematical models and planning for data.

Environmetrics, The Journal of the International Environmetrics Society – includes a presentation of the journal.

EnvStats, an R package for environmental statistics provides a set of powerful functions for performing graphical and statistical analysis of environmental data.

Epidemic models – presents simple, general, recurrent epidemics and natural extensions.

Epigenetics – the article describes the process by which genotypes give rise to phenotypes.

Equivariant estimation – provides algorithms and examples.

Escape trajectories: describes the trajectories.

Estimating functions – provides the applications of estimating functions.

European Environment Agency (EEA) – the article gives information about EEA.

Exact randomization technique – presents special application of data permutation for statistical analysis.

Exceedance over threshold and *Exceedance probability* are presented.

Excess risk – gives explanation of terms.

Exponential families – includes definitions, examples, properties, inference in exponential families.

Exposure assessment – describes the process of estimation or measurement of the frequency and duration of exposure to an agent.

Extinction rates, estimation of – provides methods for estimation of extinction rates.

Extra risk: discuss the extra risk.

Extrapolation – includes examples of processes where inferences about data-poor scenarios are developed from studies of data rich scenarios.

Extremal events can be expressed in terms of functional of observations, correspond to a single univariate or multivariate observation.

Extreme value analysis – describes the methodology.

Extremes for processes in random environments – discusses mathematical modeling of random processes.

Extremes: spatial models and prediction – presents the models and prediction of the models.

Extremes: spatial nonstationary statistical modeling – includes information about methodologies and challenges.

Extremes: spatial parametric modeling: discuss statistics of extremes, max-stable processes and latent variable models.

Factor analysis – presents the multivariate method for data reduction.

Factor analysis, dynamic: includes description of standard and dynamic factor analyses.

False discovery rate – describes the rate.

Familial aggregation – presents the family studies.

Farm odour – describes animal farms and odour, measuring odour, odour regulation and odour reduction.

Fate and transport modeling includes mass balance equations, analytical and numerical models.

Fertility studies: presents time of pregnancy, day specific conception probabilities.

Fiellers theorem: discuss the theorem.

Fish habitat - includes the importance, stressors, indicators and indices of fish habitat, mapping and models.

Fish population estimation – describes the methodology.

Fisheries – deals with statistical models.

Fisheries stock assessment – presents models for evaluation of fisheries.

Cristina Ghinea

Maria Gavrilescu

Department of Environmental Engineering,

Faculty of Chemical Engineering and

Environmental Protection

“Gheorghe Asachi” Technical University of

Iasi, Romania