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Titolo	Predictability and Nonlinear Modelling in Natural Sciences and Economics // edited by J. Grasman, G. van Straten
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Altri autori (Persone)	GrasmanJohan StratenG. van <1946-> (Gerrit van)
Disciplina	003
Soggetti	Mathematical models Ecology Engineering mathematics Engineering - Data processing System theory Control theory Atmospheric science Botany Mathematical Modeling and Industrial Mathematics Environmental Sciences Mathematical and Computational Engineering Applications Systems Theory, Control Atmospheric Science Plant Science
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Livello bibliografico	Monografia
Note generali	"Papers presented at the International Conference on Predictability and Non-Linear Modelling in Natural Sciences and Economics, held at the occasion of the 75th anniversary of Wageningen Agricultural University ... 5-7 April 1993"--Pref.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Geophysics -- Karl Popper and the accountability of scientific models -- Evaluation of forecasts -- The Liouville equation and prediction of forecast skill -- An improved formula to describe error growth in meteorological models -- Searching for periodic motions in long-time series -- Comparison study of the response of the climate system to

major volcanic eruptions and el nino events -- Detection of a perturbed equator-pole temperature gradient in a spectral model of the atmospheric circulation -- A simple two-dimensional climate model with ocean and atmosphere coupling -- Climate modelling at different scales of space -- 2. Agriculture -- Simulation of effects of climatic change on cauliflower production -- Validation of large scale process-oriented models for managing natural resource populations: a case study -- Uncertainty of predictions in supervised pest control in winter wheat, its price and its causes -- The implications and importance of non-linear responses in modelling the growth and development of wheat -- Growth curve analysis of sedentary plant parasitic nematodes in relation to plant resistance and tolerance -- 3. Population Biology -- Using chaos to understand biological dynamics -- Qualitative analysis of unpredictability: a case study from childhood epidemics -- Control and prediction in seasonally driven population models -- Simple theoretical models and population predictions -- Individual based population modelling -- Ecological systems are not dynamical systems: some consequences of individual variability -- Spatio-temporal organization mediated by hierarchy in time scales in ensembles of predator-prey pairs -- Continental expansion of plant disease: a survey of some recent results -- Modelling of fish behavior -- 4. Systems sciences -- Understanding uncertain environmental systems -- System identification by approximate realization -- Sensitivity analysis versus uncertainty analysis: when to use what? -- Monte Carlo estimation of uncertainty contributions from several independent multivariate sources -- Assessing sensitivities and uncertainties in models: a critical evaluation -- UNCSAM: a software tool for sensitivity and uncertainty analysis of mathematical models -- Set-membership identification of nonlinear conceptual models -- Parameter sensitivity and the quality of model predictions -- Towards a metrics for simulation model validation -- Use of a Fourier decomposition technique in aquatic ecosystems modelling -- Multiobjective inverse problems with ecological and economical motivations -- An expert-opinion approach to the prediction problem in complex systems -- 5. Environmental Sciences -- Critical loads and a dynamic assessment of ecosystem recovery -- Uncertainty analysis on critical loads for forest soils in Finland -- Monte Carlo simulations in ecological risk assessment -- Sensitivity analysis of a model for pesticide leaching and accumulation -- Bayesian uncertainty analysis in water quality modelling -- Modelling dynamics of air pollution dispersion in mesoscale -- Uncertainty factors analysis in linear water quality models -- Uncertainty analysis and risk assessment combined: application to a bioaccumulation model -- Diagnosis of model applicability by identification of incompatible data sets illustrated on a pharmacokinetic model for dioxins in mammals -- Regional calibration of a steady state model to assess critical acid loads -- Uncertainty analysis for the computation of greenhouse gas concentrations in IMAGE -- 6. Economics -- Forecast uncertainty in economics -- Some aspects of nonlinear discrete-time descriptor systems in economics -- Quasi-periodic and strange, chaotic attractors in Hick's nonlinear trade cycle model -- Monte Carlo experimentation for large scale forward-looking economic models -- Erratic dynamics in a restricted tatonnement process with two and three goods -- Chaotic dynamics in a two-dimensional overlapping generation model: a numerical investigation -- Nonlinearity and forecasting aspects of periodically integrated autoregressions -- Classical and modified revealed range analysis: some evidence.

processes that are sensitive to environmental conditions. Nonlinearity of a system may significantly complicate the predictability of future states: a small variation of parameters can dramatically change the dynamics, while sensitive dependence of the initial state may severely limit the predictability horizon. Uncertainties also play a role. This volume addresses such problems by using tools from chaos theory and systems theory, adapted for the analysis of problems in the environmental sciences. Sensitive dependence on the initial state (chaos) and the parameters are analyzed using methods such as Lyapunov exponents and Monte Carlo simulation. Uncertainty in the structure and the values of parameters of a model is studied in relation to processes that depend on the environmental conditions. These methods also apply to biology and economics. For research workers at universities and (semi)governmental institutes for the environment, agriculture, ecology, meteorology and water management, and theoretical economists.
