

## Groundwater modeling: Methodological and conceptual choices

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### *Summary*

A complete methodology for groundwater flow and solute transport modelling is described step by step. Definitions, terminology and a general methodology are proposed. Emphasis is given to the conceptual model choices involving processes to be simulated, parsimony versus complexity, dimensionality. Model design and data input are addressed with a description of the different input data. Calibration, validation, sensitivity analysis, and inverse modelling are summarized.

The following long list of references is provided in order to allow the student/researcher to go into more detail on the subject. The references are used and accordingly cited in the associated slide-show.

### *Key words*

Deterministic model, stochastic model, probabilistic model, conceptual model, coupled processes, parsimony, complexity, dimensionality, boundary conditions, initial conditions, model design, stress factors, historical data, calibration, validation, objective function, performance criteria, sensitivity analysis, inverse modelling, uncertainty of predictions, geostatistics, probability density function, Bayesian approach, Monte Carlo simulations, variogram, kriging, multiple points statistics, prediction focused approach.

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