

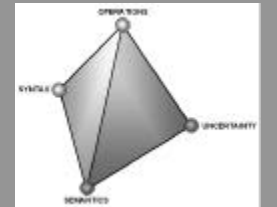
1. Introduction
  - Metaphors of nature
  - A solution space?
  - Scope and plan of this book

2. From GIS to geocomputation
  - In the beginning ...
  - Technological facilitation
  - Representing spatial phenomena in GIS
  - Putting the real world on a diskette
  - Data characteristics
  - Basic functionality of GIS
  - A systems definition of GIS
  - Limitations of GIS and the rise of geocomputation

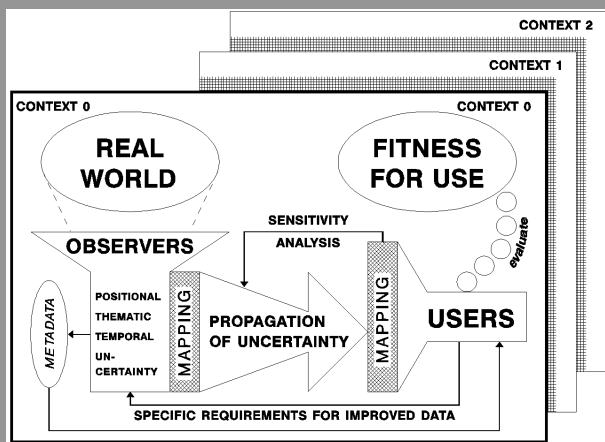
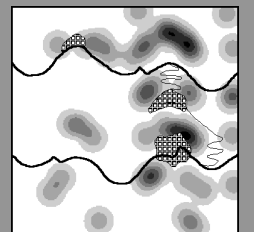
# GIS, Environmental Modelling and Engineering

Allan Brimicombe

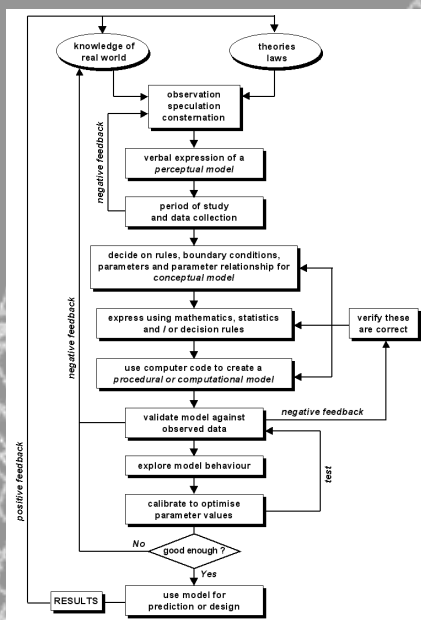
3. The rise of geo-information science and engineering
  - Technology first ...
  - Science to follow ...
  - And now ... Geo-information engineering



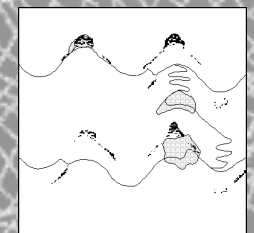
4. Approaches to modelling
  - A model of an  $x$
  - Typology of models
  - Building models
  - Evaluating models
  - Applying models
  - A summary of model development



5. The role and nature of environmental models
  - The context of environmental modelling
  - Environmental impact assessment
  - Sustainable development
  - Hazard, vulnerability and risk
  - The decision environment
  - Conceptual models
  - Empirical models
  - Models incorporating artificial intelligence
  - Process models

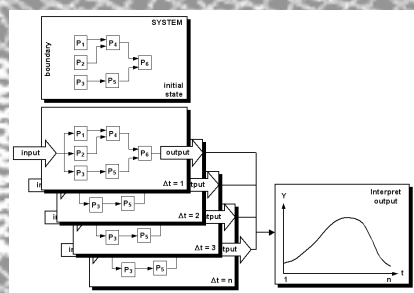


6. Case studies
  - Modelling approaches in GIS and environmental modelling
  - Spatial coexistence
  - Source-pathway characterisation
  - Cluster detection
  - Conclusion

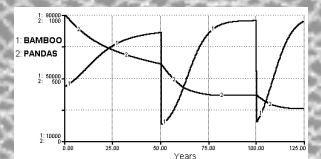


7. Issues of coupling the technologies
  - Some preconditions
  - Initial conceptualisations
  - An over-simplification of the issues
  - Maturing conceptualisations
  - de facto practices

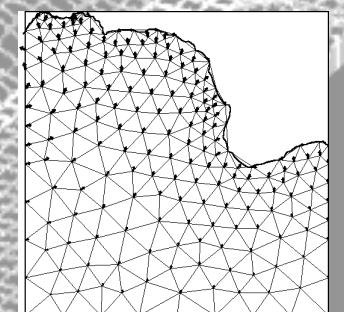
8. Data and information quality issues
  - The issue is ... Uncertainty
  - Early warnings
  - So, how come ...?
  - Measuring spatial data quality
  - Modelling error and uncertainty in GIS
  - Managing fitness-for-use



9. Modelling issues
  - Issues of scale
  - Issues of algorithm
  - Issues of model structure
  - Issues of calibration
  - Bring data issues and modelling issues together



10. Decision-making under uncertainty
  - Exploring the decision space: spatial decision support systems
  - Communication of spatial concepts
  - Participatory planning and Web-based GIS
  - All's well that ends well?



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