

Theme Session Q

Advantages of Bayesian analysis for fisheries and ecological research

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Bayesian analyses are providing innovative new solutions to research and policy problems commonly faced by environmental scientists and decision-makers. Two distinct advantages of Bayesian analyses are that they allow the incorporation of expert knowledge and knowledge from other similar situations in the form of the prior, and they characterize total uncertainty in a compact and useful way via the posterior distribution. This allows the parameterization of processes that may be difficult to analyse by other means and permits sophisticated risk analyses that are requested by managers and policy-makers. Bayesian network analysis has become more common in community studies as a means of propagating information through a network of functional nodes (e.g. species, trophic groups) to reveal dependencies that may otherwise be ignored. Currently, the ecosystem approach to fisheries management needs to take into account these dependencies. There is increasing need to learn about these dependencies from all available information sources and Bayesian networks offer many advantages for this type of analysis.

Papers are sought which explore the use of Bayesian analyses in stock assessment, community ecology, and environmental science. Topics can include:

- uses of Bayesian hierarchical modelling to learn about fish population dynamics, fisheries ecology, fisheries dynamics, and environmental processes;
- uses of Bayesian approaches to account for conflicting stakeholder preferences, inform model choice, and account for model choice uncertainty in risk and policy evaluation;
- Bayesian analyses that have elicited expert knowledge and synthesized information contained in large data sets;
- Bayesian network analyses that integrate different types of knowledge (e.g., biological, sociological, and economic).