

Supporting effective management of water-dependent ecosystems: the IBIS DSS for NSW inland wetlands.

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In 2008, the NSW Department of Environment, Climate Change and Water (DECCW) commissioned the development of Decision Support Systems (DSS) for the Gwydir Wetlands and the Narran Lakes in inland NSW. The key purpose of these DSS is to compare scenarios relating water delivery (volume and timing) to ecological outcomes in order to support a transparent and scientifically rigorous decision-making process. Once developed it is intended that the DSS will help to define the annual watering priorities for the target wetlands (short-term planning), and will also be the principal mechanism whereby the ecological outcomes of proposed water sharing plans can be modelled (long-term planning).

The key driver of the DSS is climate and hydrology. Observed flow data, a hypothetical flow sequence or modelled data can be used to drive the ecological response models (ERM) in the DSS (Figure 1). The overlying interface enables rapid data input and scenario testing and provides users access to supporting information and model documentation as well as reporting and data export functionalities.

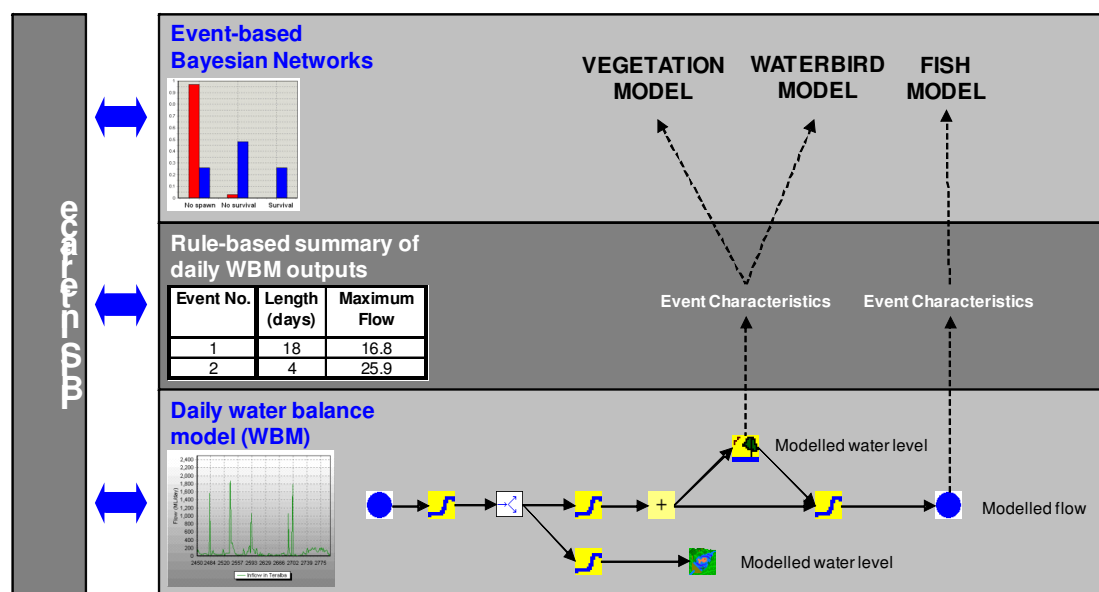


Figure 1. Model components of the IBIS DSS

There are multiple sources of local and regional information to support the development of the ERM in the IBIS DSS. These data sets vary in their form, spatial and temporal scale, comprehensiveness and reliability. A flexible approach that can encompass these different types of data and appropriately represent uncertainties is required to model ecological response in the DSS. Bayesian Networks (BNs) are well suited to integrating information from different disciplines and they can utilise a wide range of qualitative and quantitative data. Thus they are being used to model ecological response in the IBIS DSS. The BN is run for each event defined from a hydrological sequence.

This presentation will outline the way in which BNs are being integrated into the IBIS DSS. With a focus on the vegetation and waterbird BNs currently being developed as well as of the IBIS DSS that

allow users to systematically specify rules that define event characteristics and aid development of the probabilistic data in the Bayesian Network ecological response models.