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### Modelling the Swan River on small temporal and spatial scales

Michael Herzfeld, Ben R. Hodges and David Hamilton  
Centre for Water Research, University of Western Australia, Nedlands, Australia

In order for a numerical model to supply prognostic solutions of water quality variables to support the development of management strategies for the Swan River, the model must first undergo a comprehensive calibration procedure. The calibrated parameters use by the model should then be applicable to the system as a whole, irrespective of the spatial and temporal scale employed by the model. A successful calibration relies on intensive field data, both temporally and spatially.

The destratification experiment that took place in the upper reaches of the Swan River in October and November of 1997 has yielded high spatial and temporal resolution data suited to such a calibration exercise. The model used for this exercise consists of a three-dimensional hydrodynamic model, ELCOM, coupled with a water quality model, CAEDYM. A 20m x 20m horizontal resolution is used to resolve the effect of the destratifier, but also yields some insights into lateral changes in water quality and the increased relative influence of production in shallow waters compared with deep waters. The importance of lateral variations points to the need for a three-dimensional modelling approach capable of capturing these variations as well as the marked changes along the river and with depth. The implications of a three-dimensional modelling approach are discussed in relation to the requirements of management to have a modelling tool that will resolve seasonal or inter-annual variations.

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