Collaboration and modelling – Tools for integration in the Motueka catchment, New Zealand#

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Abstract

A conceptual model of integrated catchment management (ICM) is presented in which ICM is defined as a process to achieve both ecosystem resilience and community resilience. It requires not only biophysical knowledge developed by hydrologists and other environmental scientists, but an active partnership with catchment communities and stakeholders to break the 'paradigm lock' described by the UNESCO-HELP programme.

This paper reports observations from ICM research in the Motueka HELP demonstration basin in the upper South Island of New Zealand. The Motueka occupies 2 170 km^2 of land yet the river effects are felt on the seabed more than 50 km^2 offshore, so the true 'catchment' is larger. A hydrologically temperate mountainous catchment with horticultural, agricultural, plantation forestry and conservation land uses, the Motueka also hosts an internationally recognised brown trout fishery. Land and water management issues driving ICM research include water allocation conflicts between instream and irrigation water uses, impacts on water quality of runoff from intensifying land uses, catchment impacts on coastal productivity and aquaculture, and how to manage catchment processes in an integrated way that addresses cumulative effects of development.

Collaboration with catchment stakeholders can be viewed as having two primary purposes:

- Building knowledge and commitment of resource users towards sustainable resource management (collaborative learning)
- Stakeholder involvement in resource management itself (governance).

Examples are presented of a Collaborative Learning Group on Sediment learning of their differing perspectives on fine sediment impacts, and a Catchment Landcare Group working with scientists to improve water quality in their river. Success factors for water user committees making decisions about water resource management include creating opportunities to communicate and build trust, share scientific knowledge on the issue, and willingness to compromise. Functioning catchment groups have potential to take on delegated governance responsibility for meeting agreed water quality and other community goals.

Finally a scenario modelling framework IDEAS (Integrated Dynamic Environmental Assessment System) is presented, in which environmental indicators such as nutrient fluxes are simulated alongside socio-economic indicators such as job numbers and catchment GDP for a range of land and marine use options.

Keywords: integrated catchment management (ICM), resilience, HELP, UNESCO, water governance, Landcare, scenario modelling, collaborative learning, water allocation, water user committees, catchment groups, watershed management