



## **Integration for sustainable catchment management**

C.J.A. Macleod, D. Scholefield, and P. M. Haygarth

Institute of Grassland and Environmental Research, North Wyke Research Station,  
Okehampton, Devon, EX20 2SB, UK

(kit.macleod@bbsrc.ac.uk / Fax: +44(0)183782139 / Phone: +44 (0) 1837 883525)

There is growing recognition that to meet the goal of sustainable catchment management there is a need for improved 'integrated' catchment management (ICM). The need for further integration is illustrated by little or no reductions in nitrate and phosphate levels in surface and ground waters in England and Wales over the past 10 years. There is clearly a need for increased levels of integration across policies, the science base and their implementation if we are to reach our goal of sustainable catchment management. Multiple policy drivers covering urban and rural communities, their relationships with land and water use have resulted in the need for an integrated decision making framework that operates from the strategic national scale to the local catchment scale. In the past, risk assessment and risk management have been separate activities, with the former providing the scientific analysis and characterisation of adverse effects of environmental hazards. The analytical aspects of risk analysis need to be balanced by the appropriate involvement of interested and affected parties in all stages of the decision making process. The sustainable management of water resources must be based on a spatially explicit understanding of hydrological and biogeochemical processes together with the relevant socio-economic and environmental driving forces. We believe that, for truly integrated catchment management to occur requires:

- 1) the legislation and policies that aim to achieve ICM, must be combined with existing and future legislation and policies,
- 2) the science that is required to support ICM and provide the evidence base also needs to be integrated across natural and social science disciplines,
- 3) the management of catchments should be based on integrating land management

with a wide range of stakeholder requirements, policies and scientific evidence base.

The wider use of spatial technologies combined with scenarios, indicators and multicriteria analysis by policy makers, scientists and stakeholders with an interest in sustainable catchment management will assist in providing an analytical-deliberative approach to catchment management that is truly integrative.