

LOCAR - Inter-disciplinary science for integrated catchment management

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LOCAR objectives

- The EU Water Framework Directive focus on integrated river basin management and ecological quality raises major scientific and technical questions.
- Particular problems arise for permeable lowland catchments; the scientific understanding of the major UK aquifers is poor, and tools for integrated modelling of surface water-groundwater interactions are limited.
- The NERC Lowland Catchment Research programme (LOCAR) was conceived to develop new interdisciplinary science and improved modelling tools to meet the challenges of integrated catchment management.



Experimental borehole array on the Lambourn at Boxford

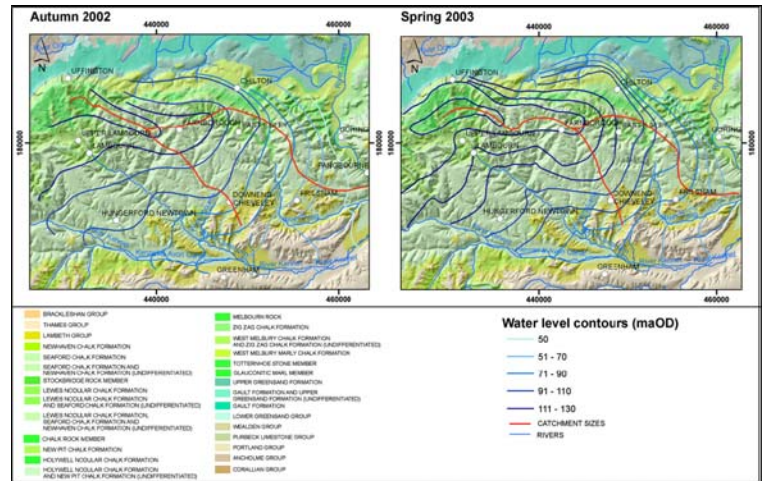
The programme

LOCAR instrumented 3 river catchments:

- the Pang/Lambourn (Chalk),
- the Dorset Frome (Chalk), and
- the Shropshire Tern (Triassic Sandstone).

Routine monitoring included rainfall, evaporation, soil water, groundwater, river flow and quality and aquatic ecology.

Research projects focused on specific aspects of the science, ranged from satellite-based evaporation estimation to fish habitat utilisation and included additional specialist facilities and instrumentation.



The outcomes

Major research achievements include the development of:

- New remote sensing methods for evaporation studies
- Improved understanding of recharge and nutrient transport in the unsaturated zone
- New insights into groundwater behaviour, the role of fractures and karst, and pumping tests
- Improved understanding of wetland functioning and stream-aquifer interactions
- Definition of sediment budgets and sediment sources
- Improved understanding of phosphorus in river sediments and the effects of improved sewage treatment
- The first studies demonstrating denitrification and methanogenesis in the hyporheic zone
- A new model of nitrate transport in Chalk catchments, linking the groundwater, hyporheic and surface water systems at catchment scale

Interdisciplinary science at work

The LOCAR programme brought together a community of research scientists, policy makers and scientists from the full range of hydrosciences research disciplines.

The combined skills of the LOCAR team brought new insights into the hydrogeochemical functioning and ecology of lowland permeable catchments which are now feeding into the development of policy and management strategies for these systems

The multidisciplinary community built under LOCAR is one of the cornerstones of the HYDRA consortium.

Find out more...

Hydro-ecological functioning of the Pang and Lambourn catchments, UK Journal of Hydrology Special Issue, Vol 33, 1-2, Oct 2006
Wheater, Peach, Neal, Johnes, Whitehead (2006) *Hydrogeochemical functioning of lowland permeable catchments*. Final Report. NERC LOCAR Programme NER/T/S/2001/00942

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