Geophysical Research Abstracts, Vol. 8, 06577, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06577

Integrated land-water risk analysis for the protection of sensitive catchments from diffuse pollution

Reaney S M (1), Lane S N (1) and Heathwaite A L (2)

(1) Department of Geography, Durham University, Science Laboratories, South Road, Durham, DH1, UK, sim.reaney@durham.ac.uk, fax +44 (0) 191 3341801; (2) Centre for Sustainable Water Management, Lancaster Environment Centre, Lancaster, LA1 4YQ, UK, fax +44 (0) 1524 510217

Diffuse pollution is a major management challenge as it commonly involved processes that are small in magnitude, distributed over a large spatial area and associated with certain land use types when they are well connected to the drainage network. Whilst some of these processes have been addressed in terms of water quality forecasting models and field measurements, we lack effective tools to prioritise where within a catchment action should be taken to remediate the diffuse pollution problem. From a management perspective, the required information is on 'what to do where' rather than exactly how much fine sediment is moving and when. This change in focus opens up the problem to be considered in a probabilistic / relative framework rather than concentrating on absolute values.

The SCIMAP risk mapping framework has developed a distributed treatment of surface hydrological connectivity based on the analysis of the potential pattern of soil moisture and saturation within the landscape. For each point in the landscape, the probability of continuous flow to the river channel network is assessed. This is achieved through the prediction of the spatial pattern of soil moisture and hence the susceptibly of each point in the landscape to generate saturated overland flow. For a point in the landscape to exports risk in surface flow, every other point along the flow path to the channel must be capable of transporting the risk. If a down slope point is not also saturated, the upslope risk will be captured at this point and not reach the river channel, the cell is disconnected. The total risk that a point represents is a function of the point scale risk and the risk of connectivity to the river channel. These risks are accumulated through the river catchment to show the points in the landscape where

there is a greater or lower risk of diffuse pollution impacting on the aquatic ecosystem.

The SCIMAP risk mapping framework for fine sediments has been applied to the River Ure catchment, northern England, UK. The results from this application are presented.