

# OUR RURAL LANDSCAPE

Sustainable development through innovation

## FACT SHEET 11: What are the hazards and where are the risks?

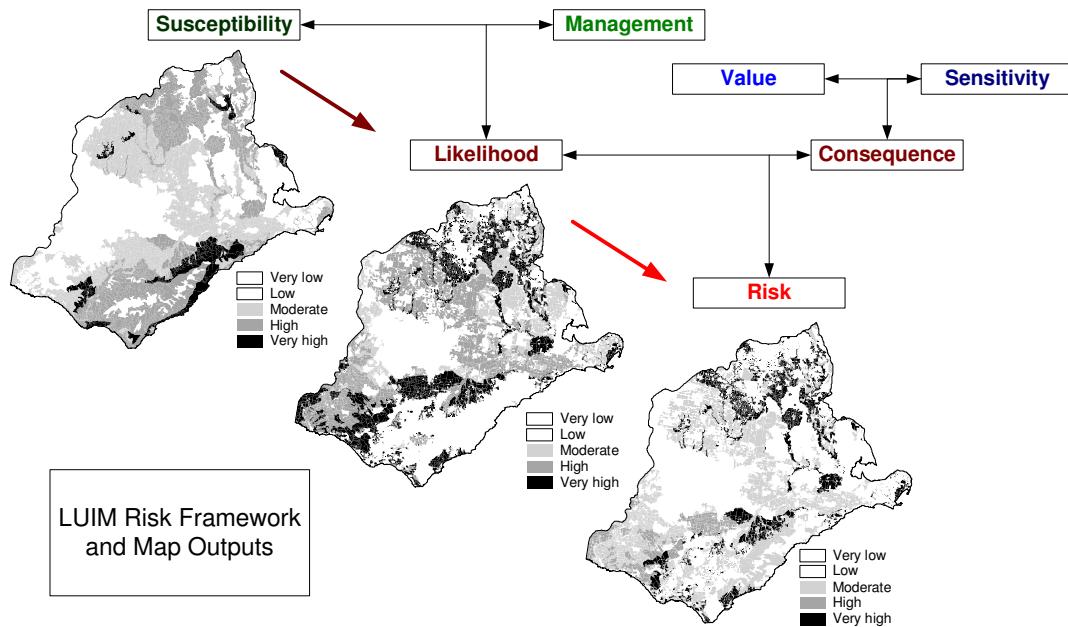
*An output of the ORL 1.1 project 'Our Landscape'*

### What is the project?

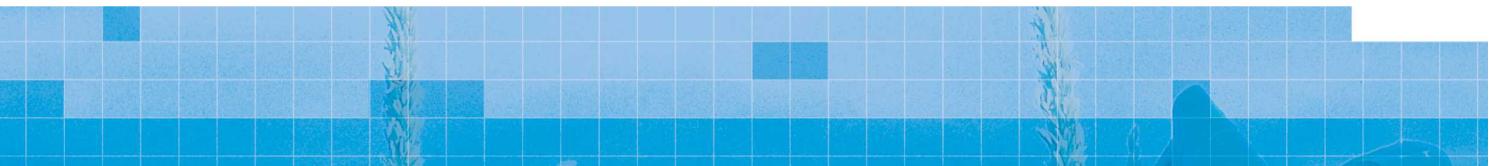
We need to understand the potential impacts of land use practices on natural resources – our soil, waterways and biodiversity, and we need tools to help managers make the best decision when planning for natural resource protection or improvement. The Land Use Impact Model or 'LUIM' is one such tool. It has been pioneered through earlier projects, but now, through the ORL investment, the LUIM is more readily available to use in many different applications.

### What is the purpose?

The LUIM is a tool that uses 'hard' and 'soft' data about land attributes and land use practices in a risk framework to map the degree and extent of risks to natural resources.



The likelihood and risk maps can be used in a simple way to identify the priority areas for action in the landscape. Some relationships between land use, land use practices and potential impact are uncertain because we do not have perfect knowledge of what is happening and where. However, the LUIM is able to incorporate probabilistic data in a (Bayesian) network that can take account of these uncertainties. This allows the likelihood and risk maps to be used in a more complex way to identify areas where better data or knowledge should be acquired in a region.



## What have we achieved?

- We have worked with Drs Carl Smith and David Pullar at the University of Queensland to develop software for the tool. We have integrated the three components of the LUIM, the database, the Bayesian software, and the GIS, into a functional tool that uses ARCGIS to display susceptibility, likelihood and risk maps.
- We have a partner project with the Land Technologies Alliance in the 'Lower Murray Landscape Futures' project which will use the LUIM in two applications – a biodiversity risk assessment and a groundwater risk assessment.
- We have another partner project through the Agriculture Division's 'Soil Health for Victorian Agriculture', in which the Gippsland CMA will use the LUIM to assist the development of a Soil Erosion Management Plan.
- The LUIM is being used to apply a farm nutrient loss risk assessment index (see FACT SHEET 5) to broader landscape scales.
- The LUIM has been demonstrated to a number of stakeholders including the National Land and Water Resources Audit, The Bureau of Rural Sciences, CMAs, DPI and University researchers, DPI and DSE policy staff. Papers have been presented at conferences in Australia, Portugal and the USA as well as to more informal audiences at institutes in England, Scotland and the USA.

## What is the next step?

1. The LUIM is a tool with huge potential. Understanding risks in their spatial context is fundamental to natural resource management. We would like to see the LUIM applied in new situations, different environments and different threats. Ultimately we would like to see a library of rule sets developed for a range of land uses and environments in Australia.
2. Currently the LUIM runs only within ARCGIS, an expensive and powerful GIS. If the functions of the LUIM could be preserved in a more affordable GIS then this spatial risk assessment approach could be more widely adopted.

## Want to know more?

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