Applying research capabilities to natural resource management

GeoQuEST Research Centre

Key purpose: To develop and apply advanced geographical theories and technologies to both natural and anthropogenic phenomena, so as to develop detailed understanding of our environment and assess the impact of changes to this environment.
Key Competencies: GeoQuEST conducts leading edge research in the following areas:

Assessment and mitigation of climate change impacts

The vulnerability of coasts to extreme water levels has been tragically demonstrated by the Aceh tsunami and the New Orleans hurricane. Sea level rise and changed coastal processes associated with global climate change are predicted to increase coastal hazards risk to existing and proposed development in low lying coastal areas. Paleo-ecology research reconstructs the climate in the Australasian region over the past millennium in an effort to help predict climate change and what impact it may have on the modern world. GeoQuEST possesses expertise in determining sedimentation rates in riverine and coastal environments through stratigraphy and dating, identification of natural hazards, including mapping and management of landslides in the Illawarra region and the application of innovative new dating techniques to unravelling changing landscapes across Australia, including the history of floods and aridity.

Spatial Technologies

Spatial technologies are important tools, and provide a methodological foundation for much of GeoQuEST's research. Research includes, for example, remote sensing of coastal and forested environments, exploring the effectiveness of hyperspectral imagery for interpreting environmental disturbance, and modelling and visualisation of environmental impacts in the coastal zone such as the extent and spread of impacts of cyclones and oil spills on the Great Barrier Reef. Geographical Information Systems (GIS) are used in the analysis of many research projects, and advances spatial science, particularly focused on coastal processes and for assessment of environmental flow requirements in coastal river systems. GIS are increasingly being used to facilitate more effective communication between decision-making agencies and citizens who wish to contribute to environmental planning. Projects have included working with Kiama Municipal Council and a Community Panel as part of the Local Environment Plan review, and a community project funded by Southern Rivers Catchment Management Authority involving Landcare participants who designed their own GIS to assist their ongoing project planning.

Social issues in natural resource management

Social and integrative research within GeoQuEST encompasses work on natural resource management by new landowners in areas of population growth and farm subdivision. Pilot projects under way in the Windellama and Jamberoo areas incorporate demographic and land tenure change, land cover trends, weed management, and the values of new landowners. In 2007 we hope to expand this to include, for example, research into the implications that population and land ownership change have for bushfire management in native vegetation. This work builds on the experience of staff with research backgrounds in social and cultural aspects of rural natural resource management, biogeography and remote sensing, demography, and economic and social change in regional areas.

http://www.uow.edu.au/science/eesc/geoquest/

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