

Classifying river landscapes

Biophysical classification: Classifying Riverscapes across Northern Australia

A vast continent, many land forms

River landscapes (or riverscapes) are all of the features of the land formed by rivers and connected to the river by floods, for example river channels, waterfalls, billabongs and floodplains.

Rivers are complex systems containing many landforms but to undertake useful scientific analysis, make valid modelling predictions or make robust planning decisions, it is often necessary to simplify, sort through and arrange rivers into a classification. However, a universal scheme for classifying rivers based on land forms, does not exist for the tropical north of Australia. This project will develop such a classification and so provide an understanding of the diversity of riverscapes in northern Australia.

Sorting through the complexity

Experts agree that the fundamental attributes of a robust river classification based on landform are:

- a. it needs to be scientifically valid; and
- b. it needs to be understandable and usable by natural resource managers.

Unfortunately scientifically valid schemes can require a lot of field work and so are often too expensive, while less resource intensive approaches relying on



“expert knowledge” are hard to repeat and therefore perceived to be less rigorous. To deal with these issues a practical, repeatable approach is being developed based on desktop Geographic Information Systems (GIS) modelling. This new approach will use existing sets of information including those from the Tropical Rivers Inventory and Assessment Project (TRIAP).

The river classification scheme will be constructed at three levels:

- a. regional scale (geo-landscape provinces);
- b. drainage basin scale; and
- c. sub-catchment scale.

The classification will use variables that describe hydrology (river flow), geomorphology (landforms), geology (rock type) and climate. Variables selected will be those that best explain how riverscapes have formed, their current physical features and habitats, as well as patterns of biodiversity.

Technology overcomes distance

Various types of remotely sensed data, such as satellite imagery, are increasingly being used to characterise riverscapes instead of data collected from extensive and



expensive field work. The vast distances and many remote and inaccessible locations of tropical northern Australia make these techniques the only feasible approach for riverscape classification in the region.

New technologies mean that the quality of the data is improving and can be used in new applications. In this project, higher resolution Digital Elevation Model (DEM) data will be used to describe and classify riverscape features while ultra-high resolution airborne remote sensing data will be used to perform much of the validation. While there is still a need for “on the ground” validation with such an approach, airborne data is often better for this purpose because researchers can see “the bigger picture” over a wide area.

Who is on the team?

This project is conducted by scientists at the Australian Rivers Institute (ARI) at Griffith University in Brisbane and the Australian National University in Canberra. The team is led by Dr Andrew Brooks (ARI).



Where is the research happening?

The riverscape classification will apply to the entire catchment area of tropical northern Australia (1.2 million km²), at varying resolutions. Field survey data and ground photos will be incorporated for specific sites in the Nicholson, Leichhardt, Mitchell, and Gilbert catchments. The project started in September 2007 and will finish in 2009.



Photo: Julien Olden



Photo: Michael Douglas

How will this research help?

This research will help enable the important findings of other TRaCK research projects in catchments such as the Daly, Fitzroy and Mitchell Rivers to be transferred and applied with confidence, to other catchments in northern Australia

For government and regional natural resource management agencies, this research will provide a web-based GIS tool that describes the similarities and differences in riverscapes across northern Australia, at three spatial scales. By better understanding the similarities between river systems, land management activity and policy can be better planned and more appropriately targeted.

Team Contacts

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