

New River Research

At a time of increasing awareness of the value of water across Australia, it is vital that public debate, policy and management decisions about our tropical rivers and estuaries are informed by sound science.

There are however, significant gaps in our current knowledge.

Tropical Rivers and Coastal Knowledge (TRaCK) is a consortium of 18 organisations including universities, CSIRO, state and federal agencies, working together to provide the science and knowledge that governments, communities and industry need for the sustainable use and management of Australia's tropical rivers and estuaries.

TRaCK is a substantial new research investment of more than \$30 million from the Australian Government, leading research institutions and the Queensland, Western Australian and Northern Territory Governments.



Photo courtesy of Ian Dixon

TRaCK is providing new insights into:

- Values and assets;
- Classifying tropical rivers;
- Water, carbon, sediment and nutrients;
- Food webs and biodiversity;
- Sustainable enterprises;
- Evaluating scenarios; and
- Communicating and integrating.

More than 20 projects will be undertaken over the next four years - combining science, economic and social research to uniquely look at the “whole river picture”.

TRaCK's research is targeted to the critical natural resource issues facing tropical rivers and estuaries. It will be undertaken in a way that involves communities and with deliberate effort to connect with the needs of end-users.

Working in catchments

Australia's tropical north is large and many parts are difficult to access, so research efforts will focus on four catchments including the Mitchell. The others are the Flinders in the southern gulf, the Daly in the Northern Territory and the Fitzroy in Western Australia. Specific research efforts will ensure that relevant findings in these catchments can be transferred across northern Australia.

During 2008, TRaCK is planning to undertake field work and associated community workshops for six research projects. Other projects will start their work in the Mitchell in following years.

This information sheet has been produced to provide a brief description of projects likely to be on the ground, collecting data in the Mitchell during 2008.



Theme: Assets and Values

Valuing ecosystem services – Anna Straton & team

The Mitchell River is of economic, social, cultural and environmental importance. It is used for activities such as fishing, farming and recreation, and its water flows and habitat support these values by maintaining a healthy, productive environment. The Mitchell River is also important for the identity of the region and its people and for customary use. All of these uses, values and benefits need to be taken into account when decisions are made about the future of the River and its surrounds.

This project will work with communities, businesses and the government to identify the uses, values and benefits provided by the Mitchell River and to quantify some of them in dollar terms so that their extent and importance can be taken into account when decisions are made. The project will also examine how these have changed through time so that we can learn how some potential development actions may impact on future uses, values and benefits.

In the first half of 2007, Anna Straton from CSIRO in Darwin met with a range of people in the Mitchell to help tailor the case study to the specific river management issues of community interest. In 2008, Anna will return to undertake a survey to ascertain people's preferences and opinions about river uses, values and benefits, and to talk further with people about the history of the region.

Contact Anna Straton: anna.straton@csiro.au



Photo courtesy of Jeff Shelberg



Theme: Material Budgets

Regional scale sediment and nutrients budgets – Gary Caitcheon & team

Researchers from CSIRO Land and Water in Canberra and Charles Darwin University will be working closely with the other TRaCK projects to investigate the generation, movement and storage of sediments and nutrients through the Mitchell river system.

To build a “budget” for the Mitchell, the team will be out measuring sediments at major river junctions. They will be able to analyse this material to determine not only which tributaries are the major contributors but what type of erosion produces the sediment (e.g. erosion from overland flow versus erosion of river banks). They will also measure how much sediment is being stored, for example, on floodplains.

Ultimately the team will be able to assess the impact of current land uses on sediment and nutrient generation (erosion) and the potential impacts of changing land-use on these materials.

Contact Gary Caitcheon: gary.caitcheon@csiro.au

Bedload transport and its effect on dry-season pools – Andrew Brooks & team

Andrew Brooks and his team from Griffith University (Brisbane) have been working in the Gulf for the last few years looking at a range of erosion and gullying issues. For their TRaCK project, they will be out on the Mitchell in the dry season, measuring the sediments accumulating in pools. In the wet season they will be measuring sediment movement down the river. Ultimately, they aim to determine whether pools are increasingly being filled by sediment over time and if so, what this is in response to.

It is important to understand the dynamics of bedload transport if we are to appreciate the specific flow regimes required to maintain the balance of sediment movement and deposition. One of the potential consequences of pools filling with sediment is reduction in the amount of habitat available for fish and other aquatic species.

Contact Andrew Brooks: andrew.brooks@griffith.edu.au



Theme: Foodwebs and Biodiversity

Waterholes in tropical rivers – Stuart Bunn & team

In the 2008 dry season, Stuart Bunn's team based out of Griffith University (Brisbane) will be selecting river waterholes to study in the Mitchell catchment. River waterholes are a critical refuge for aquatic plants and animals when rivers stop flowing. They can also be highly valued by local communities.

Stuart's team will firstly be looking at where and when waterholes are present in the landscape and their sources of water. Information will be collected through a combination of remote sensing, on-the-ground observations, water chemistry analyses and discussions with local people.

The food webs of waterholes will also be investigated, including how nutrients and energy move through them and what effect local pressures (such as feral animals, domestic stock and fishing) might have on ecosystem processes. This work will help us understand the types of river flows required to maintain the waterholes and the consequences of local pressures on their healthy functioning.

Contact Stuart Bunn: s.bunn@griffith.edu.au

Flow impacts on estuarine finfish of the Gulf of Carpentaria – Ian Halliday & team

Ian Halliday and his team from the QLD Department of Primary Industries and Fisheries will be investigating how flows of freshwater into estuaries affect the productivity of estuarine fisheries. They will be approaching commercial, recreational and community fishers from the Mitchell estuary to take specimens from their catch so they can age the fish and look at how numbers vary from year to year in relation to the size of river flows into the estuary.

This work will enable researchers to predict how changes in rivers flows might affect the productivity of fish that live in the estuaries at the end of tropical river systems.

Contact Ian Halliday: ian.halliday@dpi.qld.gov.au



Theme: Scenario Evaluation

Scenario evaluation and modelling – Kostas Alexandridis & team

Researchers from CSIRO in Townsville have been busy arranging meetings for early 2008 with a diverse range of people with different perspectives of the Mitchell. Their project is looking at the big picture for the future of the northern rivers and the Mitchell in particular. They will bring together data collected by other TRaCK projects and invite community and government interests to develop realistic stories (or scenarios) for the future of the Mitchell. Using models, these visions for the future will allow participants to explore the social, cultural, economic and environmental consequences of different policy approaches.

This project is where the new knowledge generated by TRaCK research mixes with the real world concerns of communities along the Mitchell and the practical needs of decision-makers.

The project team are keen to meet people and hear their different perspectives on how resource use and management in the Mitchell might look in coming years.

Contact Kostas Alexandridis: kostas.alexandridis@csiro.au



Photo courtesy of Mitchell River Watershed Management Group Inc



Photo courtesy of Jeff Shelberg

What will TRaCK give back?

Many TRaCK projects will provide opportunities for face-to-face discussions with researchers about their results and input of community knowledge and values. Some projects will also provide opportunities for direct community participation in the research activity, helping to develop skills, training and employment.

TRaCK's research findings will be publicly available and presented in ways that enable them to be easily used.

Contacts

For further information on individual projects, including updates to field plans, contact the researchers identified above or the:

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Australian Government

**Department of the Environment,
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Land & Water Australia

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Raising National Water Standards**



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Coastal Knowledge