



Northern Australia
Environmental
Resources
Hub

National Environmental Science Programme

Overview 2016/17

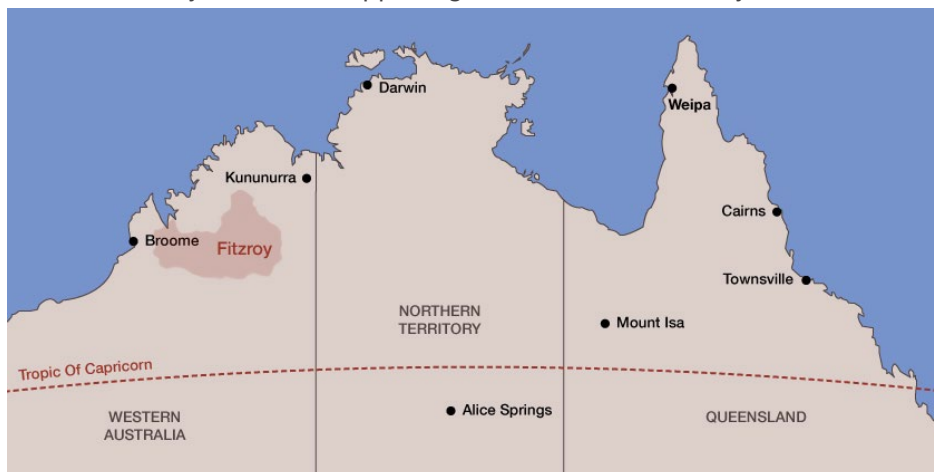
West Kimberley

Our regional focus

The West Kimberley's mighty Fitzroy River is of high environmental, economic and cultural significance. Areas within the catchment have been listed as National Heritage for a mix of geoheritage, biodiversity, Indigenous, historic and aesthetic values. There is increasing interest in the Fitzroy's significant land and water resources for development and the need for environmental research to inform land use and water allocation decisions is critical. Identifying Indigenous water needs for the Fitzroy River, and supporting

Traditional Owners in decision making through research, are key priorities in the area. We also need to better understand riparian or riverbank zones so that we can better support the health of these vulnerable areas.

Other Hub research across northern Australia on topics such as Indigenous land management, environmental monitoring techniques, fire and carbon, will also generate information to support development decisions in the West Kimberley.



What is the NAER Hub?

The Northern Australia Environmental Resources (NAER) Hub supports sustainable development in northern Australia and is assisting decision-makers to understand, use, manage and safeguard northern Australia's outstanding natural environment through world-class science. Current research focuses on:

- Landscape-scale studies covering savanna, rainforest and aquatic ecosystems and biodiversity;
- Land and water planning for urban, agricultural, and infrastructure development; and
- Indigenous land management including Indigenous Protected Areas.

The six year, \$24 million Hub collaborates with industry, Indigenous, environment and government bodies. Projects build on past work by the Tropical Rivers and Coastal Knowledge research hub and the National Environmental Research Program, and link with CSIRO research in the region.

West Kimberley projects running mid/late 2016 to 2019/20

Environmental water needs for the Fitzroy River

As the largest catchment in the Kimberley, there is increasing interest in the Fitzroy River's significant water resources for development. Working in collaboration with the Western Australian and Australian Governments, and CSIRO, the project team will improve the available information on the water requirements of key natural assets in the Fitzroy River. This knowledge will underpin water allocation and planning decisions to help protect environmental values.

Indigenous water needs in the Fitzroy catchment

This research aims to improve knowledge of Indigenous water requirements within the Fitzroy River catchment and to inform plans for future water use. It will identify customary uses of water and waterways, reveal links between Indigenous values, practices and water regimes, and elicit knowledge and objectives for the future management of land and water resources. Emphasis will also be placed on advancing Indigenous water planning by trialling social assessment methods and showing the value of community participation in environmental flow assessments. The information generated from this project will contribute to water planning and allocation, and enhance Indigenous capacity to influence regional water policy decisions and development solutions.

Multi-objective planning in northern Australia

This research will create a toolkit to assist planning and management decisions in northern Australia. The toolkit will allow users to assess the potential impacts of current and future development and management regimes on terrestrial, freshwater, and coastal and marine species and communities. It will also facilitate an assessment



Fitzroy River catchment. Photo: Michael Douglas

of the benefits and costs of implementing different management interventions to mitigate biodiversity threats associated with different land and water uses. The toolkit will be designed using the Fitzroy River catchment, but can also be used in other areas in northern Australia.

Knowledge brokering for Indigenous land management

Indigenous land management (ILM) occurs over significant proportions of northern Australia. Traditional Owners hold substantial bodies of knowledge about using, managing and safeguarding northern Australia's natural resources, and a significant body of scientific research is also available. However, these knowledge resources have not yet fully empowered Traditional Owners' land management and development capability. In this project researchers will partner with Indigenous people in the Fitzroy catchment (WA) and in the Northern Territory, to support improved ILM knowledge adoption and land-use decision-making. Together they will design and test culturally tailored knowledge brokering methods and tools, and share these through a pan-northern Indigenous knowledge network. The project will deliver tailored knowledge brokering tools, a knowledge network, and a diagnosis of the conditions under which knowledge brokering can improve Indigenous adaptive management of environmental assets.





Irrigated agriculture in the West Kimberley. Photo: Michael Douglas

Threats to savanna riparian zones

Riverbank (or riparian) zones are a vital part of the savanna landscape. In the north, riparian zones range from narrow strips of land alongside small creeks through to large floodplains. These areas are critical to the health of the surrounding environment and support significant economic and cultural values. However, savanna riparian zones are highly vulnerable to a number of threats such as invasive plants, feral animals, fire and overgrazing. In many places these threats are being compounded by intensified development such as irrigated agriculture. This research will deliver improved knowledge on the health of these key environmental areas and where resources should be directed to protect them. It will develop practical guidelines to support the sustainable use of riparian habitats. The project involves three complementary case studies in the Fitzroy River's Geikie Gorge National Park and in Kakadu National Park.

Other projects relevant to the West Kimberley

Savanna carbon sequestration method

This project aims to improve our ability to calculate the carbon benefit in dead organic matter from changed fire regimes in lower rainfall savannas across northern Australia. By accounting for carbon stored in dead grass, leaves, twigs and coarser woody debris, as well as the non-CO₂ greenhouse gases, we can better quantify the value to greenhouse gas abatement of improved fire management. This has the potential to increase the incentive for land managers to adopt improved fire practices, by allowing them to earn additional carbon credits.

Prioritising threatened species in northern Australia

This research will guide improved management and investment to reduce the impact of threats on threatened species and to bolster their recovery in high-priority areas of northern Australia. The project team is drawing on knowledge, data and expertise from a wide range of people to produce maps and information that will help prioritise investment, land assessments for future development and other stakeholder activities. The project team is working directly with research-users to ensure the research meets specific and broader needs.

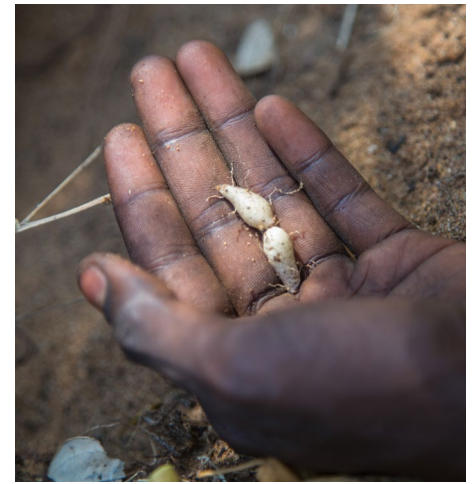
Multiple benefits & knowledge systems of Indigenous Land Management Programs

Indigenous people are integral to the conservation of Australia's biodiversity and maintenance of cultural resources. The importance of their ecological knowledge is globally recognised and is financially supported by investments in a variety of Indigenous land management programs (ILMPs). Aside from generating ecological benefits, these programs generate many social, cultural and economic co-benefits. While we have some understanding of the monetary value of some of these co-benefits, we lack information about other less tangible co-benefits or those relating to culture. Funding agencies such as governments, businesses and NGOs would like to know if their investments represent 'value for money'. This project will provide quantified, comparable data about the co-benefits of different types of ILMPs.

More Hub projects, or extensions of existing projects, may occur in the Kimberley depending on northern Australian priorities. For updates visit: www.nespnorthern.edu.au or E: nesp.northern@cdu.edu.au



Controlled burn. Photo: Glenn Campbell



Bush tucker. Photo: Michael Lawrence-Taylor

Lessons from Indigenous Fire Management (complete)

The research reviews existing Indigenous fire management partnerships and activities across northern Australia, focusing particularly on what is meant by Indigenous knowledge and practices, how that meaning is locally interpreted into fire management activities, and how it is likely to be shared with others. Perspectives are drawn from interviews and workshops held with key Indigenous fire managers and partners (Traditional Owners, NGOs, scientists and government agencies) across northern Australia who are actively participating in, or are interested in participating in, fire management projects.

Methods to measure temporal change in soil carbon (complete)

This research project reviews the current state of knowledge on measurement and modelling methods and techniques for estimation of soil carbon and soil carbon stock change in northern Australia. It provides an assessment of the applicability and cost of current and proposed methods and techniques in the context of soil carbon levels and the response of soil carbon to changes in management practices as they occur across the north.

Remote environmental monitoring techniques (complete)

Environmental monitoring in northern Australia is challenged by many resource and logistical constraints; including the large spatial scale, limited and variable site access (e.g. limited all weather road and infrastructure, wet season inaccessibility), environmental hazards to field-based studies (including crocodiles, cyclones and

harsh climate) and relatively small population base and limitations on technical capability. These constraints often lead to restricted sampling designs, with limited sample sizes, reduced spatial coverage, and poor power to track environmental change particularly in time frames suitable for managers. This project assesses the usefulness of new and emerging remote monitoring techniques for northern Australia, and prioritises future research needs.

Motion detection cameras are one of the techniques being explored in the 'remote environmental monitoring techniques project.' Photo: Michael Lawrence-Taylor



For further information, including our North Queensland and Top End fact sheets, see www.nespnorthern.edu.au or contact:

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