

Mapping and Monitoring Persistent Pools Using Remote Sensing to Support River Resilience

Project information



Resilient
Landscapes

National Environmental Science Program



Martuwarra Fitzroy River. Photo by Thiago Tayer

This project is developing innovative tools using satellite imagery to support the sustainable management of Australia's rivers and floodplains. By identifying and monitoring persistent pools, which are a vital water source during dry periods, this research aims to improve our understanding of their stability and better manage their ecological and cultural values with climate change and growing water use.

Project details

Persistent pools (or waterholes) are critical ecological and cultural water features across Australia, especially in arid and semi-arid landscapes. These pools are particularly important in rivers like the Martuwarra Fitzroy, where they support biodiversity, cultural heritage, and ecosystem functions.

However, pressures from water extraction and climate change threaten the stability of these features. This project is harnessing satellite data to map and monitor persistent pools over time. It will deliver spatial datasets and practical tools for planners and managers in Western Australia, Queensland, and Victoria.

Using case studies from the Martuwarra Fitzroy River, the Gilbert River, and the Ovens River, the project will test methods in different environments and contribute to national efforts to develop sustainable water management strategies under predicted future environmental pressures.

Key research goals

- Develop and refine remote sensing methods for mapping and monitoring persistent pools
- Analyse pool stability, shape, and changes over time using historical and current satellite data
- Model future scenarios based on climate and water use projections
- Support planning and management decisions with science-based tools and visualisations
- Integrate findings with ongoing Indigenous partnerships and traditional knowledge, particularly in the Martuwarra Fitzroy catchment



Martuwarra Fitzroy River
Photo by Michael Douglas

What is the NESP Resilient Landscapes Hub?

The Australian Government's National Environmental Science Program (NESP) funds environment and climate research. NESP currently supports 4 multi-disciplinary research hubs, each hosted by an Australian research institution. The program:

- provides evidence for the design, delivery and on-ground outcomes for environmental programs
- helps decision-makers, including those from Indigenous communities, build resilience
- supports positive environmental, social and economic outcomes

This project is funded by the NESP Resilient Landscapes Hub, which is hosted by The University of Western Australia. The Resilient Landscapes Hub's research supports the management of Australia's terrestrial and freshwater ecosystems towards ensuring their resilience against extreme weather and other environmental pressures.



Researchers and Rangers prepare for a survey on Martuwarra Fitzroy River. Photo by Michael Douglas

Further information

The project is being co-led by Dr Thiago Tayer (University of Western Australia) and Dr Ben Stewart-Koster (Griffith University).

This document and further information are available from the project website at nesplandscapes.edu.au/

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