

# Wayne Meyer

Professor, Natural Resource Science

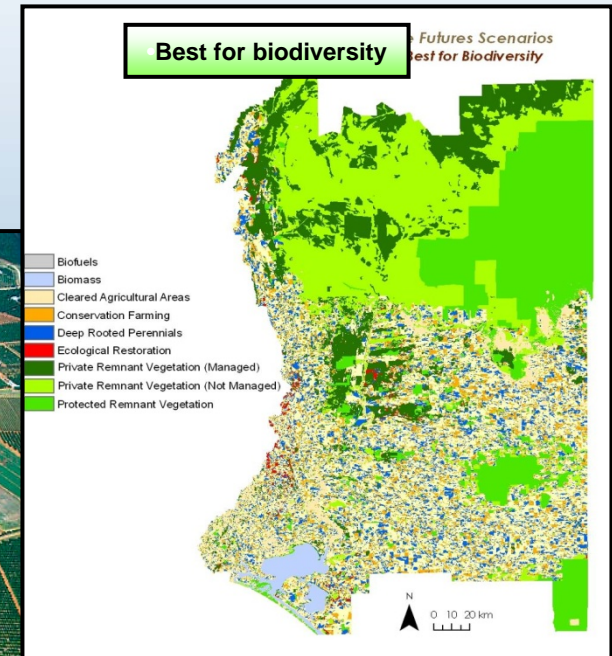
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## Landscape Futures Program

Climate, soil, water, biota, economics and people – researching complexity

<http://www.adelaide.edu.au/environment/>

<http://www.landscapefutures.com.au/>



## Tern – Ozflux Mallee site



# TERN Investment Plan

- A TERN Office and the Australian Centre for Ecological Analysis and Synthesis (operated by consortium, UQ, QUT, Griffith Uni, QDNRW, CSIRO).
  - *Total NCRIS funds - \$4.0 million*
- The TERN Office will manage the TERN program under the terms of a funding agreement with the Department of Innovation, Industry, Science and Research (DIISR). The ACEAS will be a virtual and physical environment for interdisciplinary integration, synthesis planning and modelling.

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# TERN Investment Plan

- An Eco-Informatics capability (operated by U Adelaide, SA DEH).
  - *Total NCRIS funds - \$4.5 million*
- This activity will build upon a range of investments made by governments at all levels and aims to provide, through a distributed model, a single framework for data and information management and discovery for Australian ecosystems data.

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# TERN Investment Plan

- A Distributed Archive and Access Capability (multiple operators, coordinated by CSIRO).
  - *Total NCRIS funds - \$6 million*
- This investment will provide a nationally consistent approach to delivery and calibration of key past, current and future satellite datasets, and the production of ecosystem science data products designed for Australian conditions.

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# TERN Investment Plan

- A National Scientific Reference Site Network – Australian Rangeland Ecosystems (coordinated by U Adelaide and SADEH).
  - *Total NCRIS funds - \$3 million*
- This investment, which builds upon a pre-existing inter-jurisdictional collaborative structure, will establish reference sites across the Australian interior for assessment of rangeland ecosystem changes. The focus of this investment is to trial coordinated, systematic and nationally consistent data collection methodologies for subsequent establishment and operation of reference sites for all Australian ecosystems

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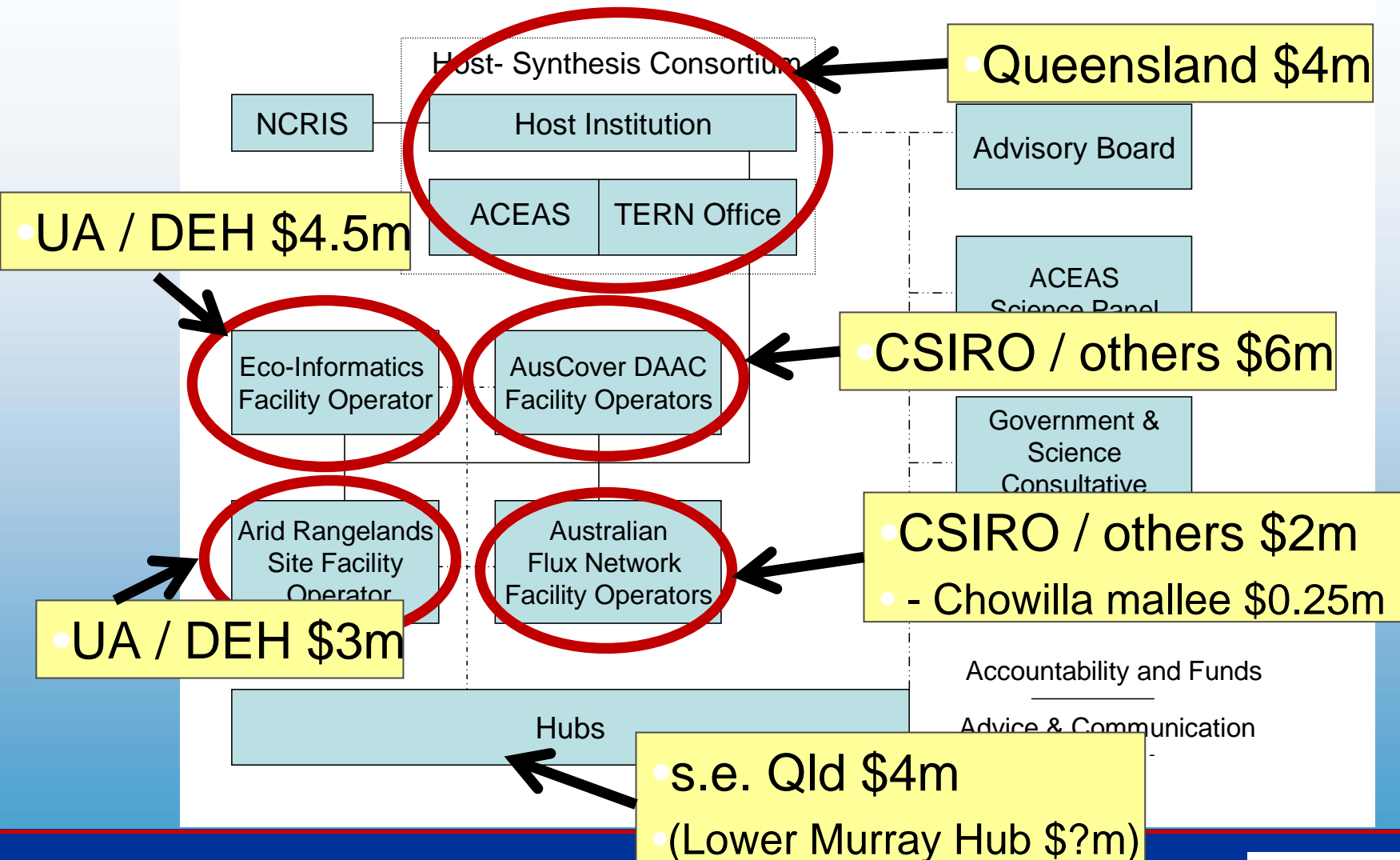
# TERN Investment Plan

- An Australian Flux Network (multiple operators, coordinated by CSIRO).
  - *Total NCRIS funds - \$2.5 million*
- This proposal builds upon the current Ozflux network and aims to commence the establishment of a national network of flux sites that can provide nationally consistent observations.

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# TERN structure and operational relationships

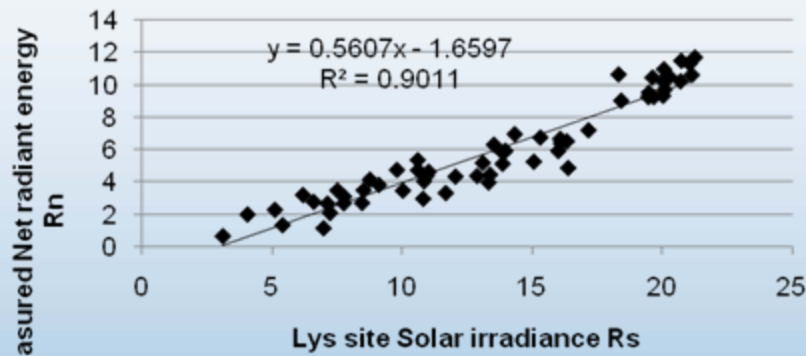


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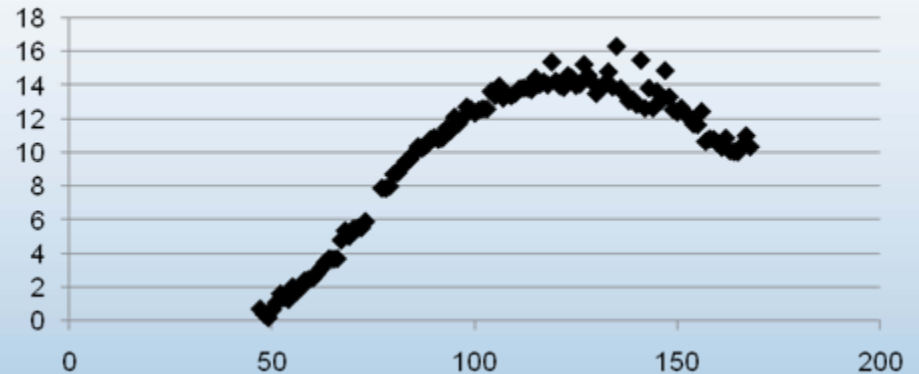


# Data from lysimeter site - 1987

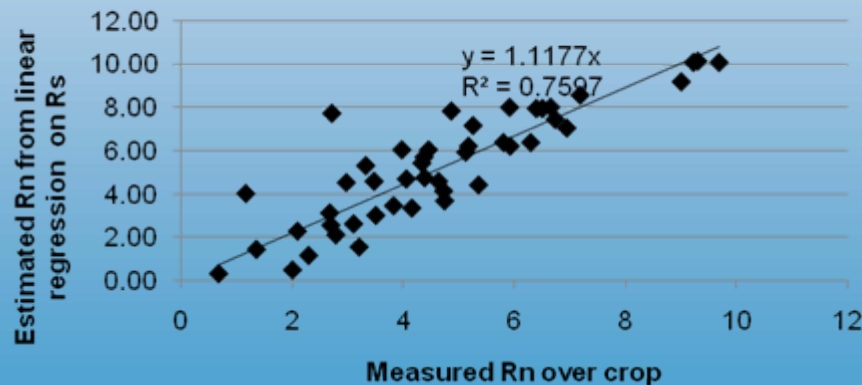
## Net radiant energy v's solar irradiance



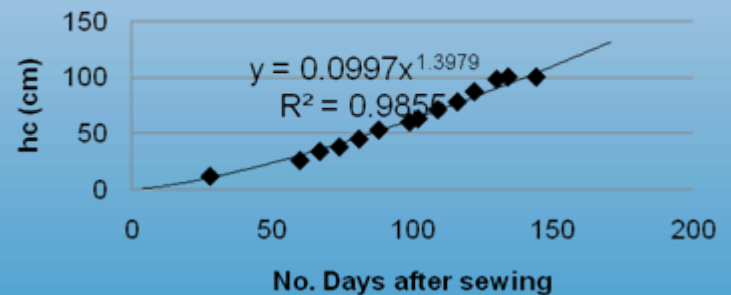
## L1 LAI



## Net radiant energy comparison



## L1 Crop height (10cm) vs. DAS



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# TERN Hub – Chowilla and connected ecosystems

## Scientific rationale

- “We need to improve our understanding of how species, communities and ecosystems will respond to a rapidly changing climate at a time when they are also subject to stresses from invasive species, fire, salinity, disease, habitat degradation and loss, water extraction, altered flow regimes and decreased water quality.” (Guidelines For Proposals For The Climate Change Adaptation Research Facility, Australian Greenhouse Office 2007).

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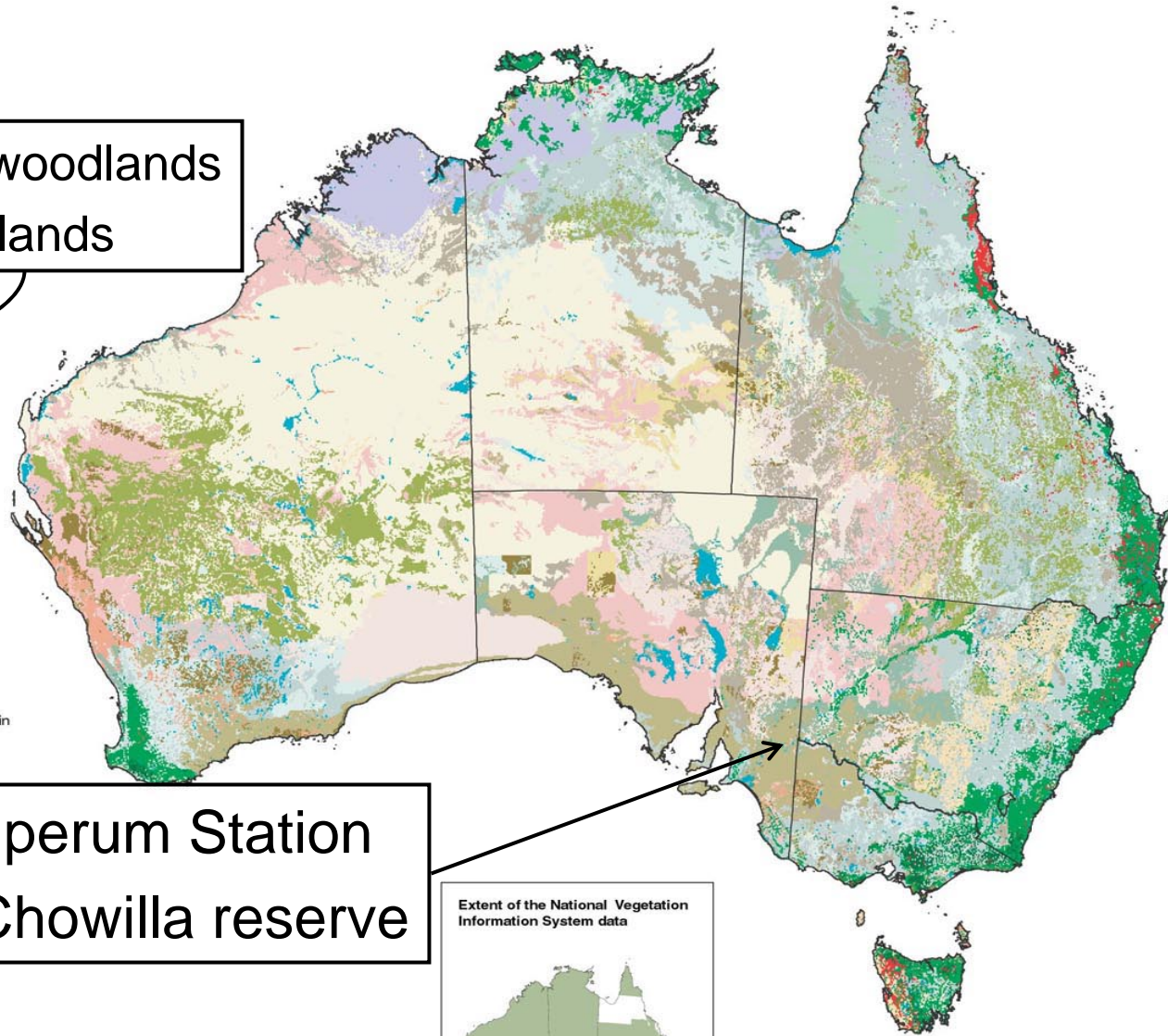


# Vegetation at continental scale

- Rainforest and vine thickets
- Eucalypt tall open forests
- Eucalypt open forests and low open forests
- Acacia forests and woodlands
- Callitris, casuarina and other forests and woodlands
- Melaleuca forests and woodlands
- Eucalypt woodlands
- Eucalypt open woodlands
- Tropical eucalypt woodlands/grasslands
- Low closed forests, closed shrublands and other shrublands
- Mallee woodlands and shrublands
- Acacia open woodlands
- Acacia shrublands
- Chenopod shrubs, samphire shrubs and forblands
- Heath
- Tussock grasslands
- Other grasslands, herblands, sedgelands and rushlands
- Hummock grasslands
- Mangroves, samphires, sand, rock, salt lakes, freshwater lakes

Mallee woodlands  
& shrublands

Calperum Station  
& Chowilla reserve



## Source:

National Land and Water Resources Audit 2001.

Data used are assumed to be correct as received from the data suppliers.

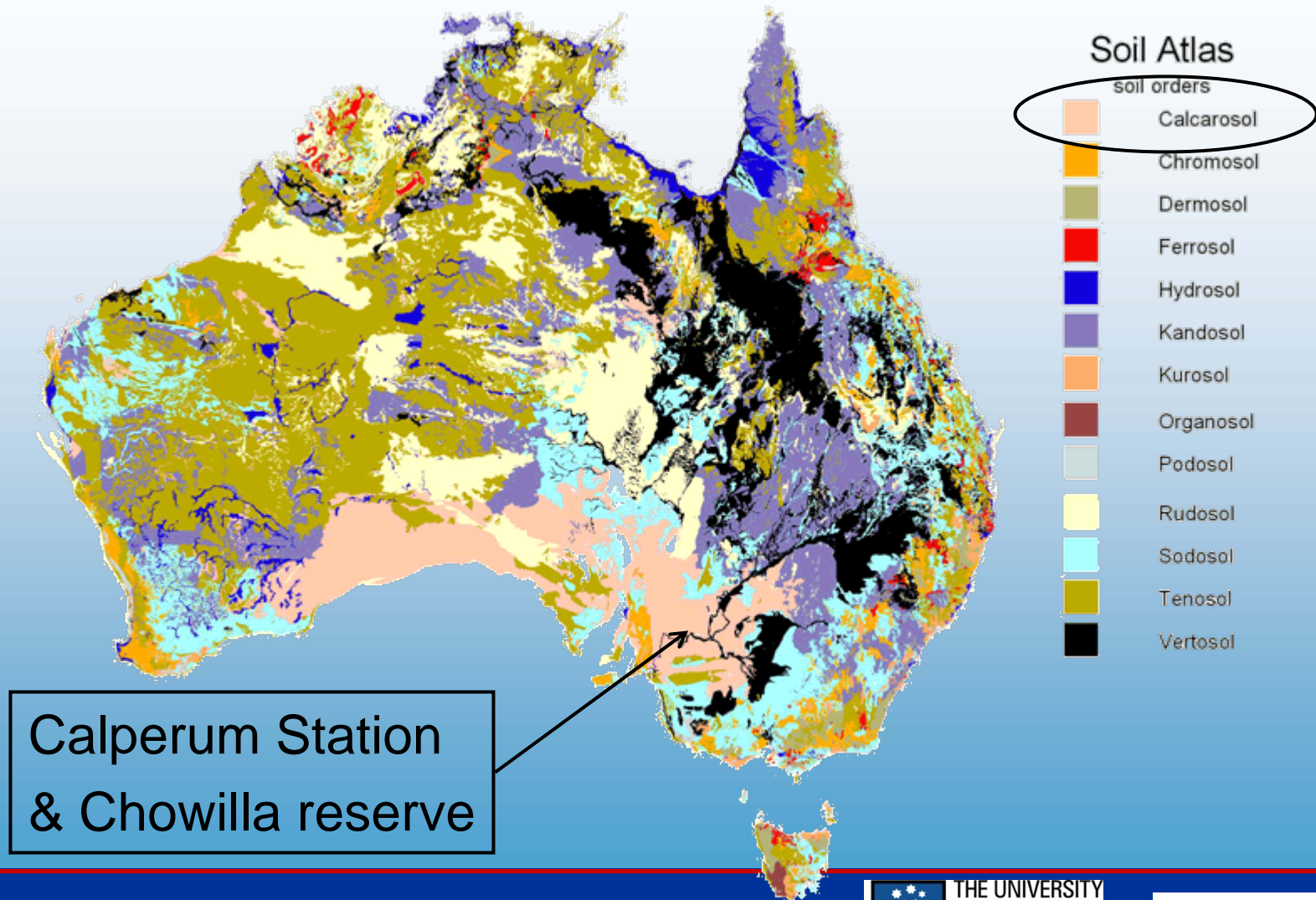
© Commonwealth of Australia 2001

These summary maps and tables provide information on Australia's native vegetation collated within the National Vegetation Information System at July 2001 and with additional mapped information where not available from the NVIS. The National Vegetation Information System will be updated continuously as vegetation mapping data becomes available from States and Territories.

Extent of the National Vegetation  
Information System data



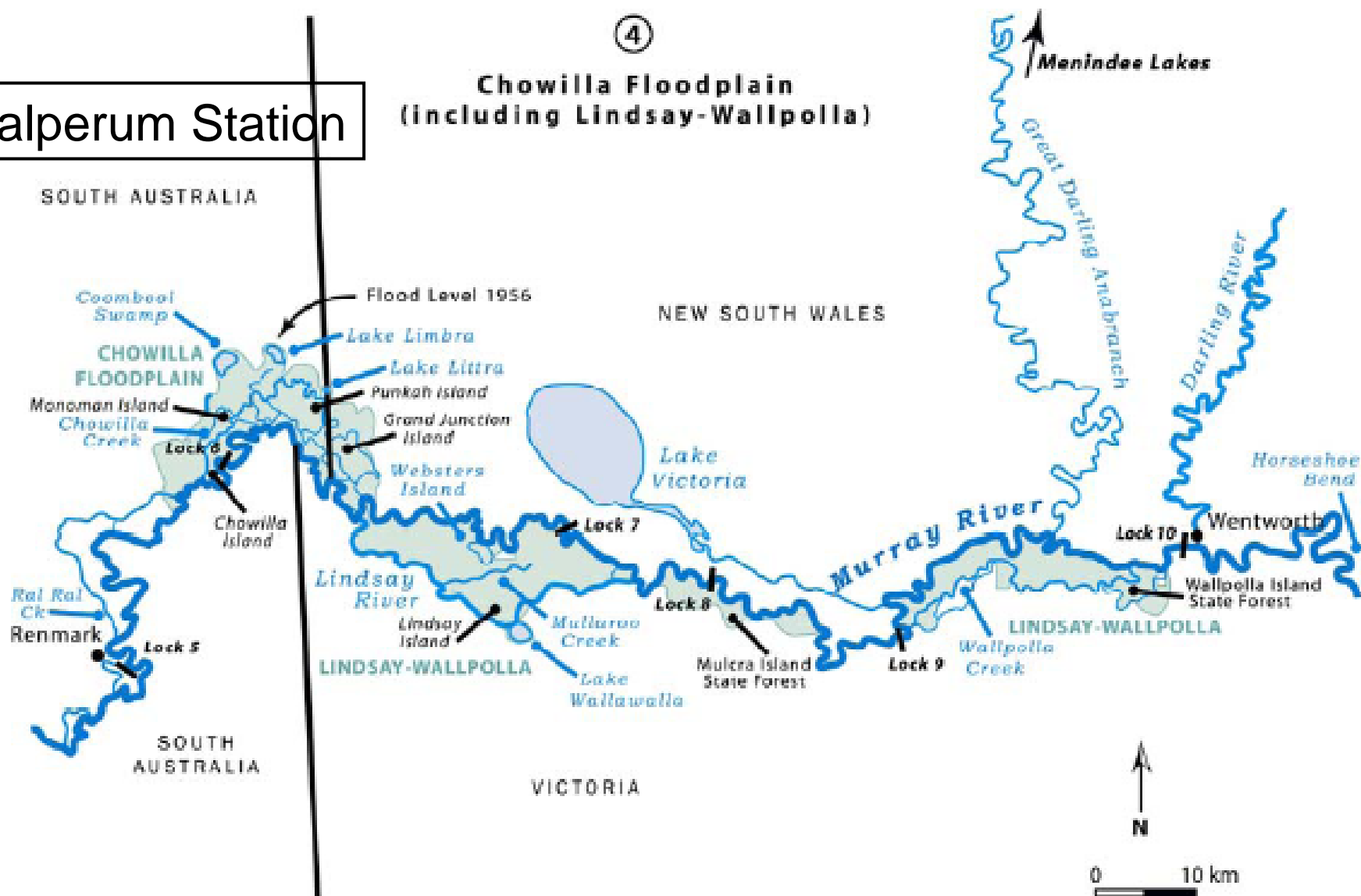
# Soils at continental scale



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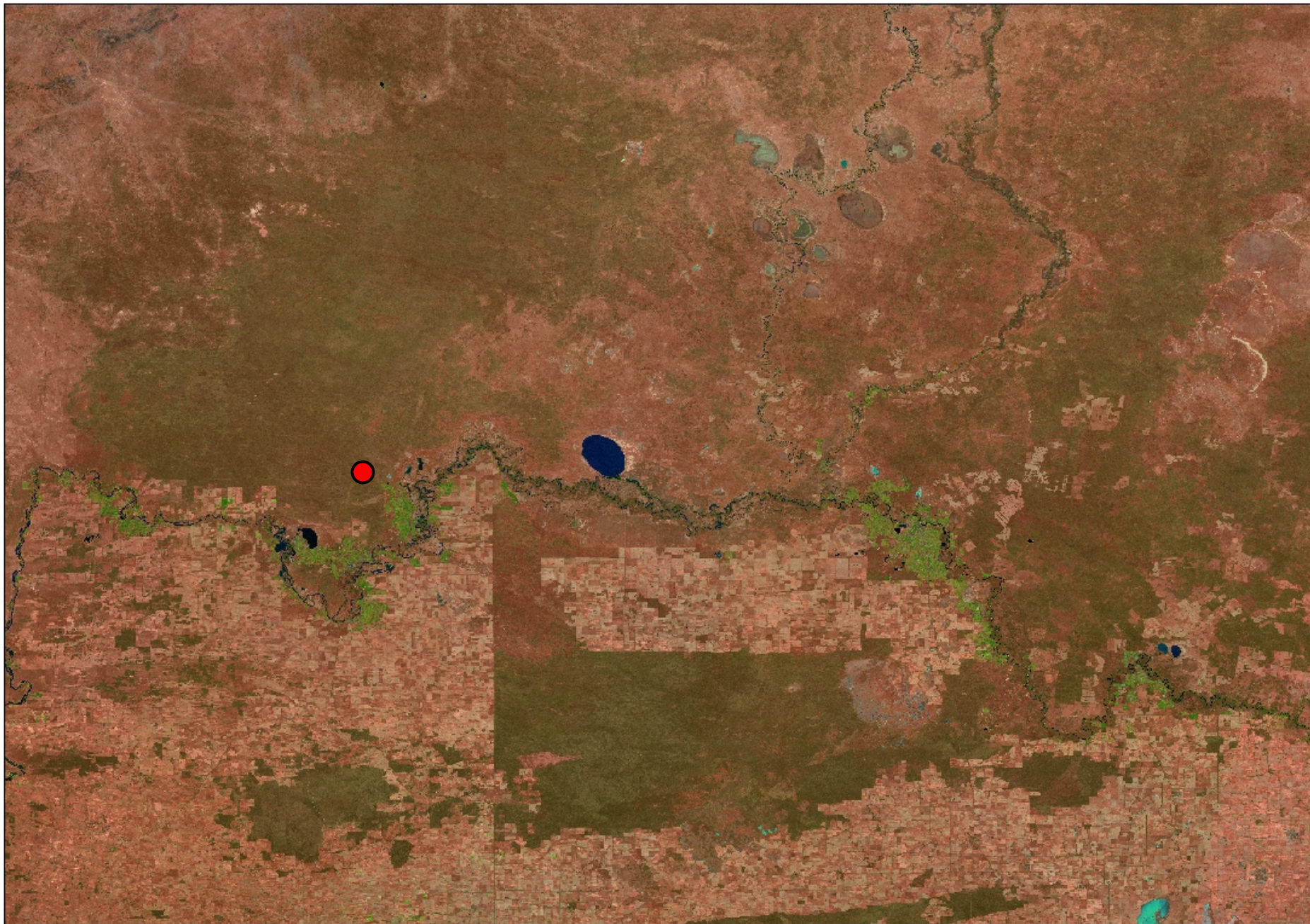
# Calperum Station

## Chowilla Floodplain (including Lindsay-Wallpolla)



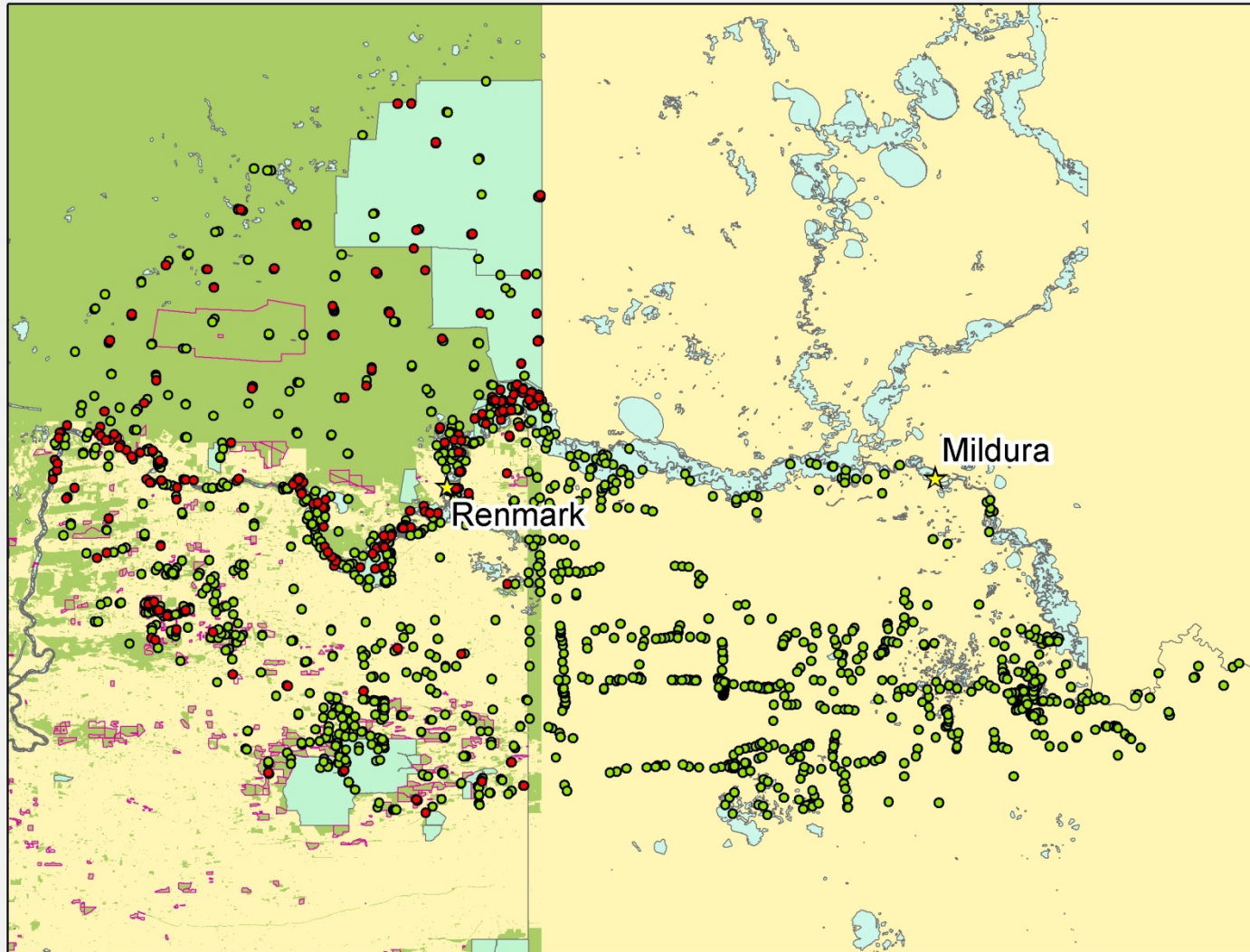
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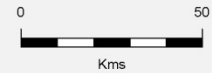


# Biological Survey Sites within 100km of River Murray between Renmark and Mildura



## Legend

- Bio-Survey Fauna Sites
- Bio\_Survey Flora Sites
- Heritage Agreements
- NPWSA Reserves
- SA Native Vegetation



Produced by Biological Survey and Monitoring -  
Science and Conservation  
Department for Environment and Heritage  
Hackney Rd, Hackney SA  
Data Source All Data sourced from DEH SDE and DBBSA

Projection GCS GDA84  
Compiled 29 May 2007  
Datum Geocentric Datum of Australia, 1984

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# TERN Hub – Chowilla and connected ecosystems

- **Why Chowilla?**
- Nationally significant ecosystems
  - representative of the significant and vulnerable ecosystems of the inland rivers in the Murray Darling system
  - icon site within the Living Murray initiative; restoration and conservation deemed by COAG to be nationally important.
- Nationally representative
  - The floodplain ecosystem is iconic of the Murray Darling river system
  - representative of Australia's calcareous pedologic terrain.
  - The mallee vegetation is representative of one of Australia's major vegetation types.

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# TERN Hub – Chowilla and connected ecosystems

- **Priority questions for research include:-**
- What is the vulnerability of terrestrial species and communities from cumulative impacts of climate change and other stressors?
- How will such changes affect inland aquatic and semi-aquatic ecosystems?
- What management responses are most effective in building the resilience of natural ecosystems to climate change impacts? For example, how can we identify and protect key refugia? Can we restore degraded habitats and ecosystems to recover and maintain ecosystem services?

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# TERN Hub – Chowilla and connected ecosystems

## Progress so far:-

- UA has assigned cost code with annual assigned cash
- Technical Officer position advertised – closes Friday
- Regional and state agency staff informed
- Calperum Station keen to assist site selection and installation
- Let's get going!

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# NCRIS TERN

- Terrestrial Ecosystem Research Network
- Southern Australian Landscape Science Cluster
  - Inclusive and nationally oriented
  - Has coherent and structured governance and management
  - Directed at adding value and building on
  - Linked with existing NCRIS and national programs
  - Has a credible team who have a record of successful national collaborative behaviour
  - We know what quality research is and we like to work with others with a similar passion



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