



# **Introducing Australia's Terrestrial Ecosystem Research Network: linking disciplines for better environmental outcomes.**

**Nikki Thurgate**

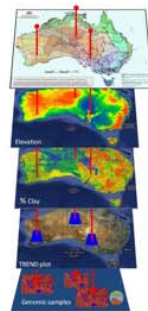
*TERN is supported by the Australian Government through the National Collaborative Research Infrastructure Strategy and the Super Science Initiative.*



# TERN: *Transforming Australian ecosystem science*

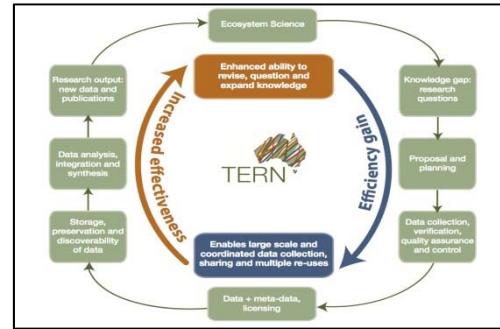
## TERN:

- **Infrastructure and networks** to support a coordinated and collaborative ecosystem science community
- Enabling sustained, long-term **collection, storage, synthesis and sharing** of ecosystem data
- Connecting science with **policy and management**



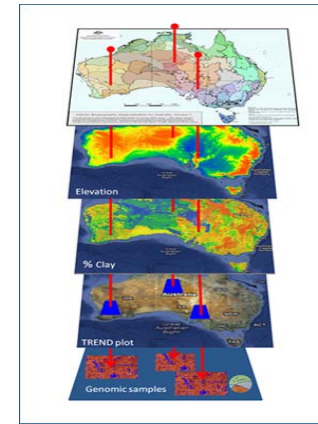


### Collection Methods

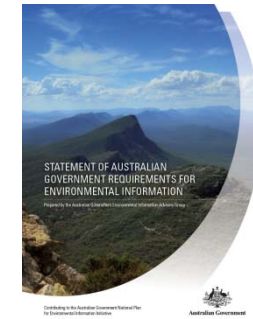


### Data Storage

### Data Sharing



### Modelling



### Policy + Management



### Instruments + Sensors

### Processing + Analysis

### Data Curation + Publishing

### Data Searching

### Analysis + Synthesis



**Vast lands and variable data: systematic analyses to understand the patterns and processes of mammal decline**  
 Principal Investigator: Alice Kuhl  
 Group Members: Alice Fisher, Andy Shepherson, Andre Paiva, Brett Albert, Chris N. Johnson, Corinne Thomas, Chris O. Fisher, Hansen McCullum, Iain Gordon, Jeremy VanDerWal, Mike Lesica, Nicole Theriault, Peter Leadley, Sarah Legge, Suzanne Frank

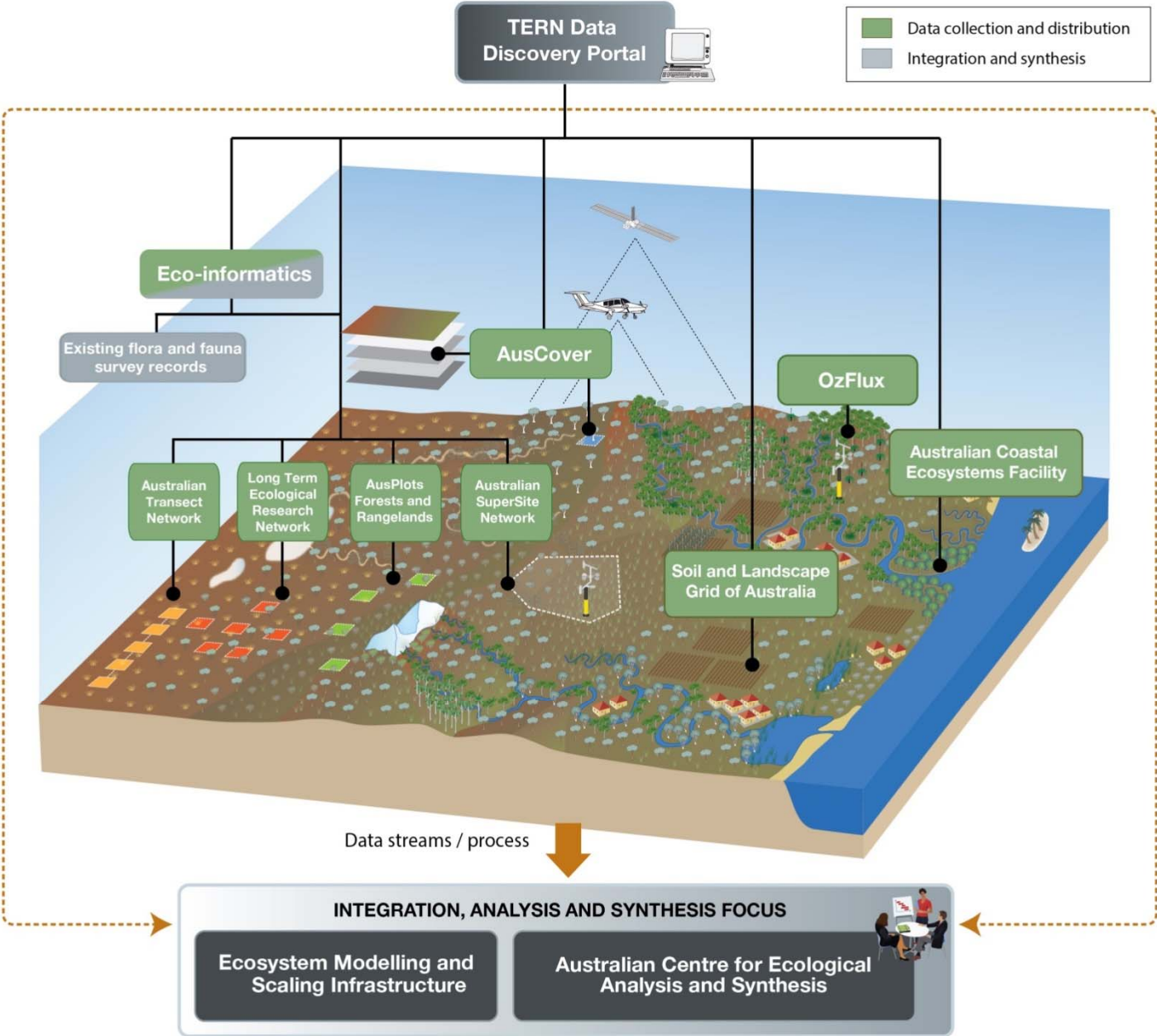
**Project Objectives**  
 Australia has the remarkable record of the highest rate of mammal extinctions in the world (Bridgman et al. 2005). There is mounting concern that this is a true signal of extinction pressure in Australia, with evidence that land-use and associated impacts are driving extinctions. However, the remote nature of Australia and the vastness of its land area make it difficult to monitor the status of its mammal species. The challenge is to understand the patterns and processes of mammal decline and to identify the factors that are driving extinctions. This paper reports on the results of a systematic analysis of mammal extinctions in Australia, using a combination of data from museum collections and field surveys. The analysis shows that the majority of mammal extinctions in Australia are the result of land-use change, with the majority of extinctions occurring in the eastern and southern regions of the country. The analysis also shows that the majority of extinctions are the result of land-use change, with the majority of extinctions occurring in the eastern and southern regions of the country.

**Methods**  
 Data: We used a large number of existing survey and museum collection databases that have provided mammal presence and absence data for over 100 years. We used the Australian Mammal Database (AMDB) and the Australian Mammal Survey (AMS) to obtain data on mammal presence and absence. We used the Australian Mammal Survey (AMS) to obtain data on mammal presence and absence. We used the Australian Mammal Survey (AMS) to obtain data on mammal presence and absence.

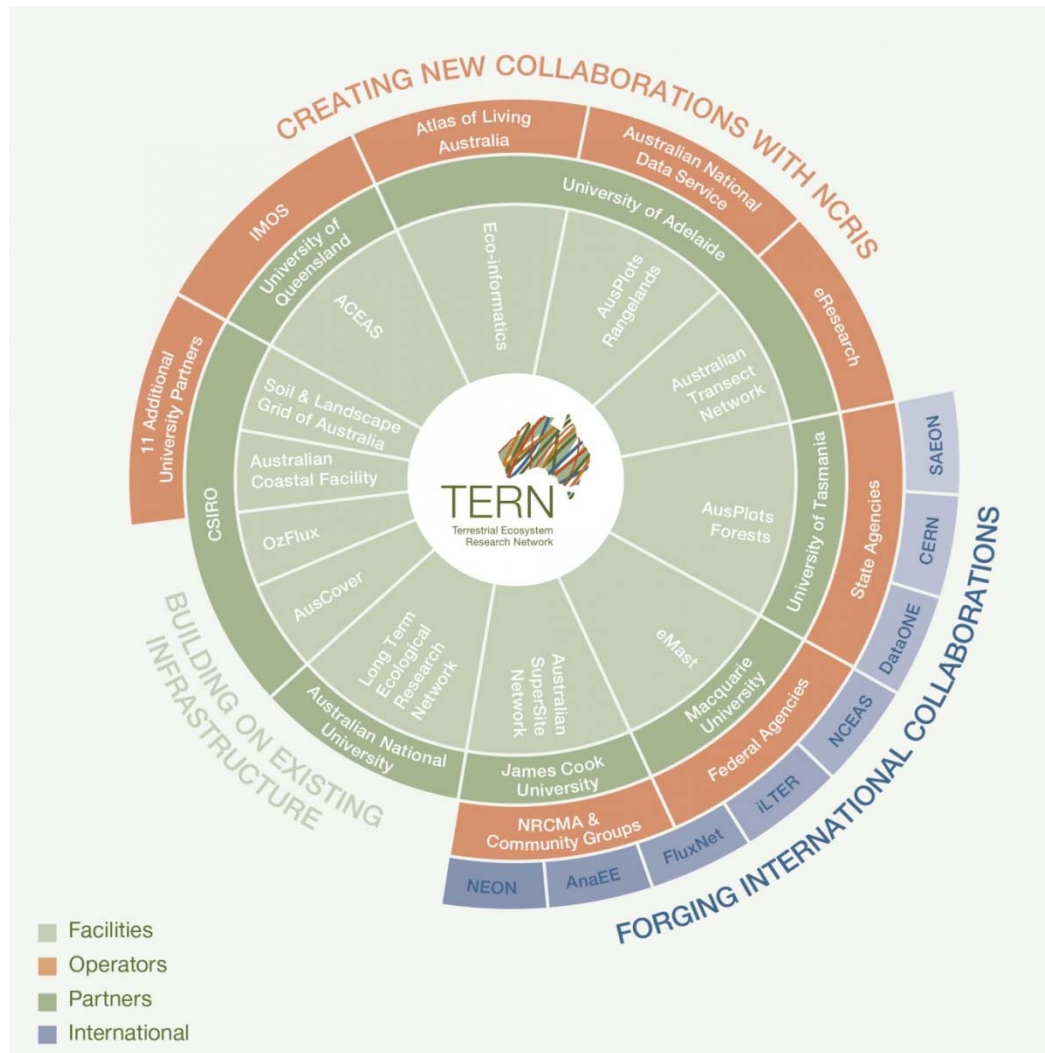




# How TERN fits together



# TERN Collaborative Network



CERN:	Chinese Ecological Research Network
SAEON:	South African Ecological Observation Network
NEON:	National Ecological Observation Network
ILTER:	International Long Term Ecological Research
NCEAS:	National Centre Ecological Analysis and Synthesis
NRCMA:	Natural Resource & Catchment Management Authorities
AnaEE:	Analysis and Experimentation on Ecosystems
IMOS:	Integrated Marine Observing System





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## NEON and TERN Sign Interoperability and Collaboration Agreement



TERN Director Tim Clancy (left) and NEON Project Scientist David Tazik (right) announce the formal agreement between TERN and NEON at the 2013 TERN Symposium. Photo by Claire Heath

NEON and the [Terrestrial Ecosystem Research Network \(TERN\)](#) signed a memorandum of understanding in mid-May 2013. The MOU is a written agreement to foster collaboration and interoperability between TERN and NEON on core network elements such as delineation of science requirements, measurements and sampling protocols; data products; informatics; science and education programs and project management.

Collaboration objectives include establishing an action plan using this strategic framework, continuing program-level discussions to enhance opportunities for collaboration, exploring opportunities for personnel exchange and continuing joint participation in a variety of workshops and symposia.

The MOU formalizes announced a working agreement announced at the [2013 TERN symposium](#) held February 18-20 in Canberra, Australia. Attendees included ecosystem scientists, managers, and policymakers from across Australia and New Zealand. The symposium brought together a diverse group of people who are intent on building a national, networked program of collaborative research.

NEON meetings with TERN and its [Australian Supersite](#)

[Network began last fall](#). Interoperability and data comparability were discussed, among other topics that the MOU now addresses.

# Bottom Up Approach

- Existing infrastructure harnessed
- New infrastructure to fill gaps
- Proof of concept studies

## BENEFITS

- Flexible and adaptive
- Avoids duplication
- Allows for open networks





# Bottom Up Approach

## BENEFITS

- Responsive to change

## CHALLENGES

- Governance
- Integration
- Cultural change
- The wrong reasons
- Competition
- Interoperability



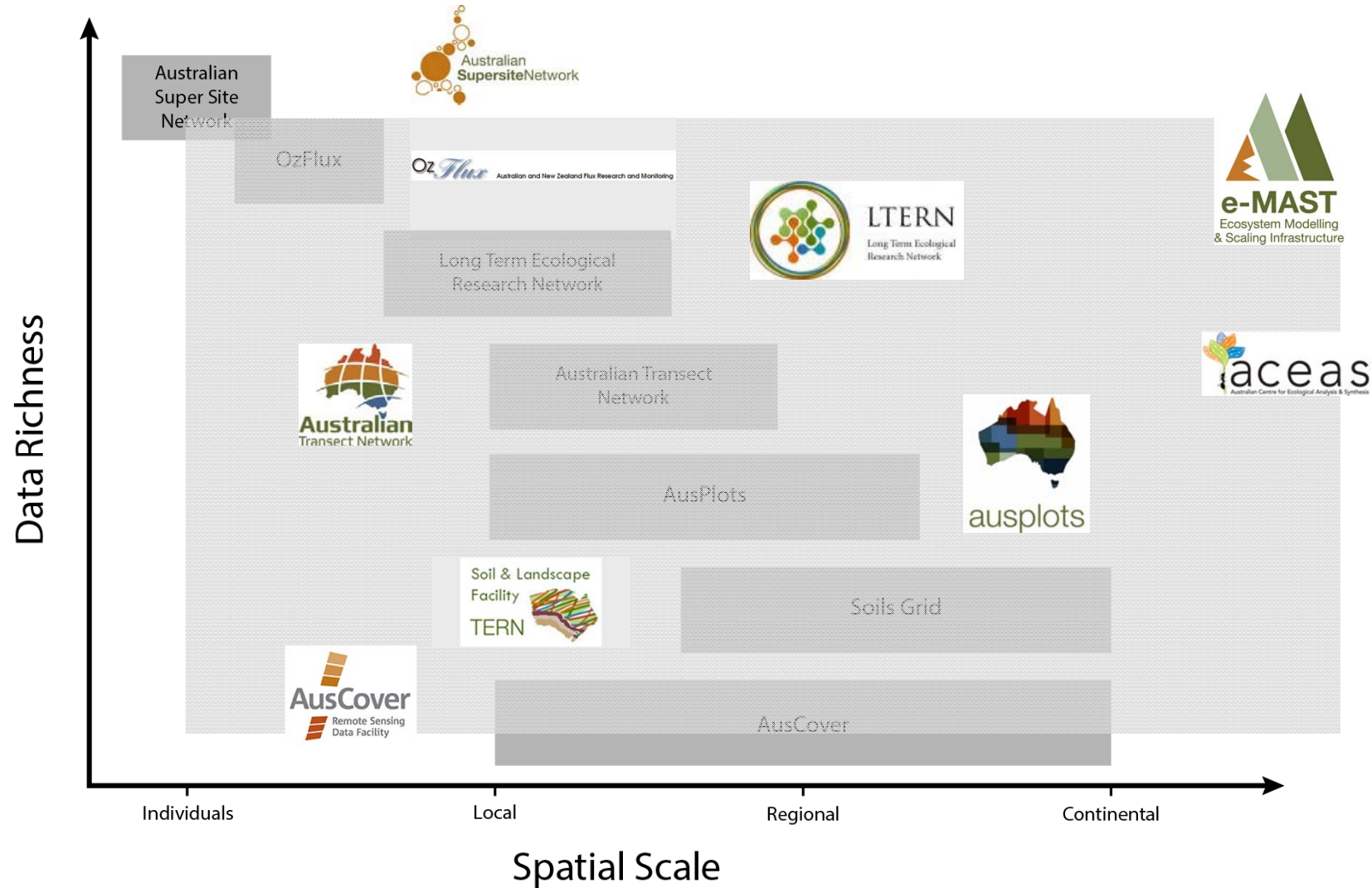


# Building a true network

- Coalition of the willing
- Stakeholders are part of the process
- Build relationships
- Build trust
- Common goals and questions
- Flexibility



# TERN Monitoring Frameworks



# Environmental Outcomes

- Resource characterisation and status
- Condition/Quantity Trend
- Outlook
- Option evaluation
- Bespoke solutions

# Better Environmental Outcomes

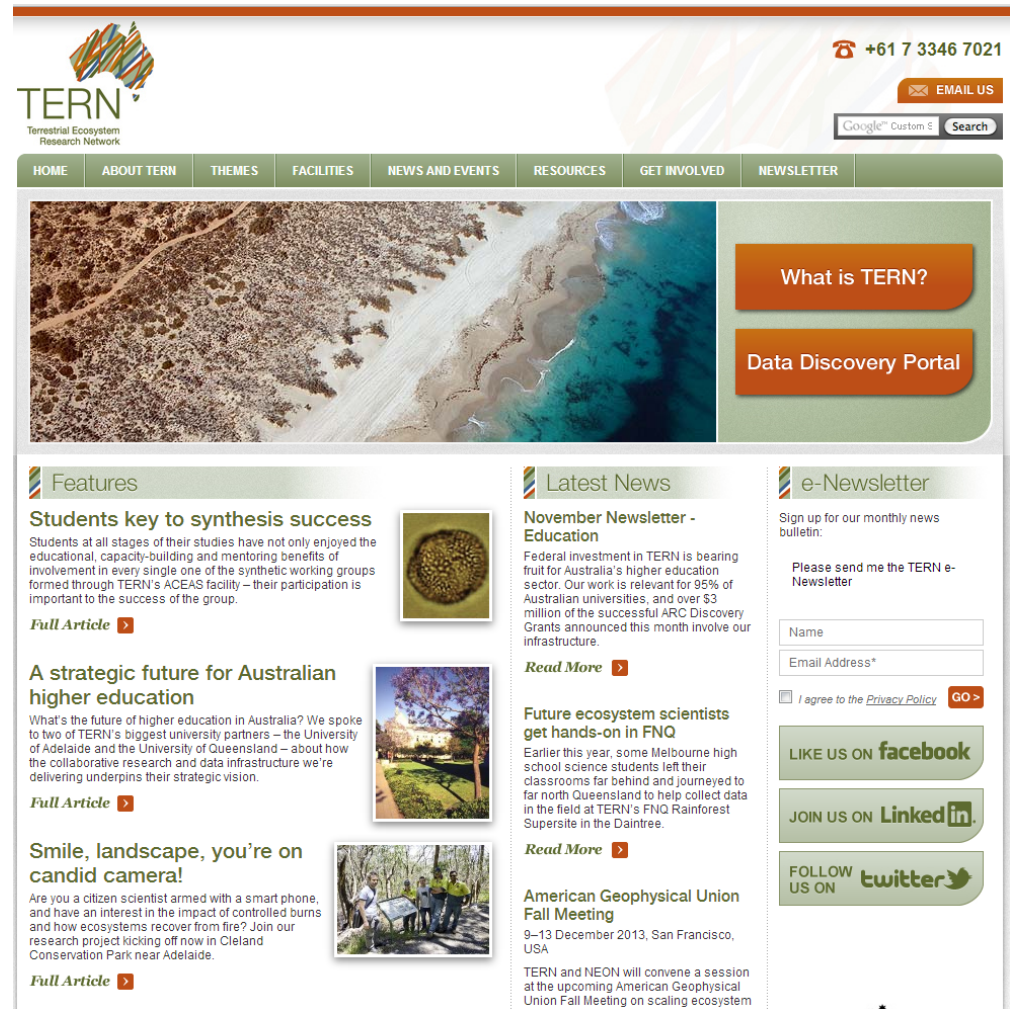
- Multi-disciplinary approach allows for novel outcomes
- Includes expertise that ecosystems scientists don't have
- Includes policy and decision makers so that outcomes are meaningful NOW!
- Some part of the network can help
- The whole is greater than the sum of its parts



# Connecting with TERN

[www.tern.org.au](http://www.tern.org.au)

[Nikki.Thurgate@adelaide.edu.au](mailto:Nikki.Thurgate@adelaide.edu.au)



The screenshot shows the TERN website homepage. At the top left is the TERN logo (Terrestrial Ecosystem Research Network) with a stylized map of Australia. To the right is a phone number (+61 7 3346 7021) and an 'EMAIL US' button. Below the logo is a navigation menu with links: HOME, ABOUT TERN, THEMES, FACILITIES, NEWS AND EVENTS, RESOURCES, GET INVOLVED, NEWSLETTER. A search bar is also present. The main content area features a large image of a coastal landscape. Below this are two buttons: 'What is TERN?' and 'Data Discovery Portal'. The page is divided into three columns: 'Features', 'Latest News', and 'e-Newsletter'. The 'Features' column includes three articles: 'Students key to synthesis success', 'A strategic future for Australian higher education', and 'Smile, landscape, you're on candid camera!'. The 'Latest News' column includes 'November Newsletter - Education', 'Future ecosystem scientists get hands-on in FNQ', and 'American Geophysical Union Fall Meeting'. The 'e-Newsletter' column has a sign-up form with fields for Name and Email Address, a 'GO' button, and social media links for Facebook, LinkedIn, and Twitter.

**TERN**  
Terrestrial Ecosystem  
Research Network

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What is TERN?

Data Discovery Portal

**Features**

**Students key to synthesis success**  
Students at all stages of their studies have not only enjoyed the educational, capacity-building and mentoring benefits of involvement in every single one of the synthetic working groups formed through TERN's ACEAS facility – their participation is important to the success of the group.  
[Full Article](#)

**A strategic future for Australian higher education**  
What's the future of higher education in Australia? We spoke to two of TERN's biggest university partners – the University of Adelaide and the University of Queensland – about how the collaborative research and data infrastructure we're delivering underpins their strategic vision.  
[Full Article](#)

**Smile, landscape, you're on candid camera!**  
Are you a citizen scientist armed with a smart phone, and have an interest in the impact of controlled burns and how ecosystems recover from fire? Join our research project kicking off now in Cleland Conservation Park near Adelaide.  
[Full Article](#)

**Latest News**

**November Newsletter - Education**  
Federal investment in TERN is bearing fruit for Australia's higher education sector. Our work is relevant for 95% of Australian universities, and over \$3 million of the successful ARC Discovery Grants announced this month involve our infrastructure.  
[Read More](#)

**Future ecosystem scientists get hands-on in FNQ**  
Earlier this year, some Melbourne high school science students left their classrooms far behind and journeyed to far north Queensland to help collect data in the field at TERN's FNQ Rainforest Supersite in the Daintree.  
[Read More](#)

**American Geophysical Union Fall Meeting**  
9–13 December 2013, San Francisco, USA  
TERN and NEON will convene a session at the upcoming American Geophysical Union Fall Meeting on scaling ecosystem

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