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HAZARDSCRC

PROJECT: SAVANNA FIRE MANAGEMENT and B&NH scenario planning for northern Australia.

Savanna Burning sub-project

Dr Andrew Edwards, Professor Jeremy Russell-Smith, Dr Kamal Sangha, Mr Cameron Yates
Darwin Centre for Bushfire Research, Charles Darwin University, NT

Aboriginal Research Practitioners' Network (ARPNNet)
Research Institute of Environment and Livelihoods, Charles Darwin University, NT

North Australian Indigenous Land and Sea Management Alliance (NAILSMA) Ltd

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Australian Government
Department of Industry and Science

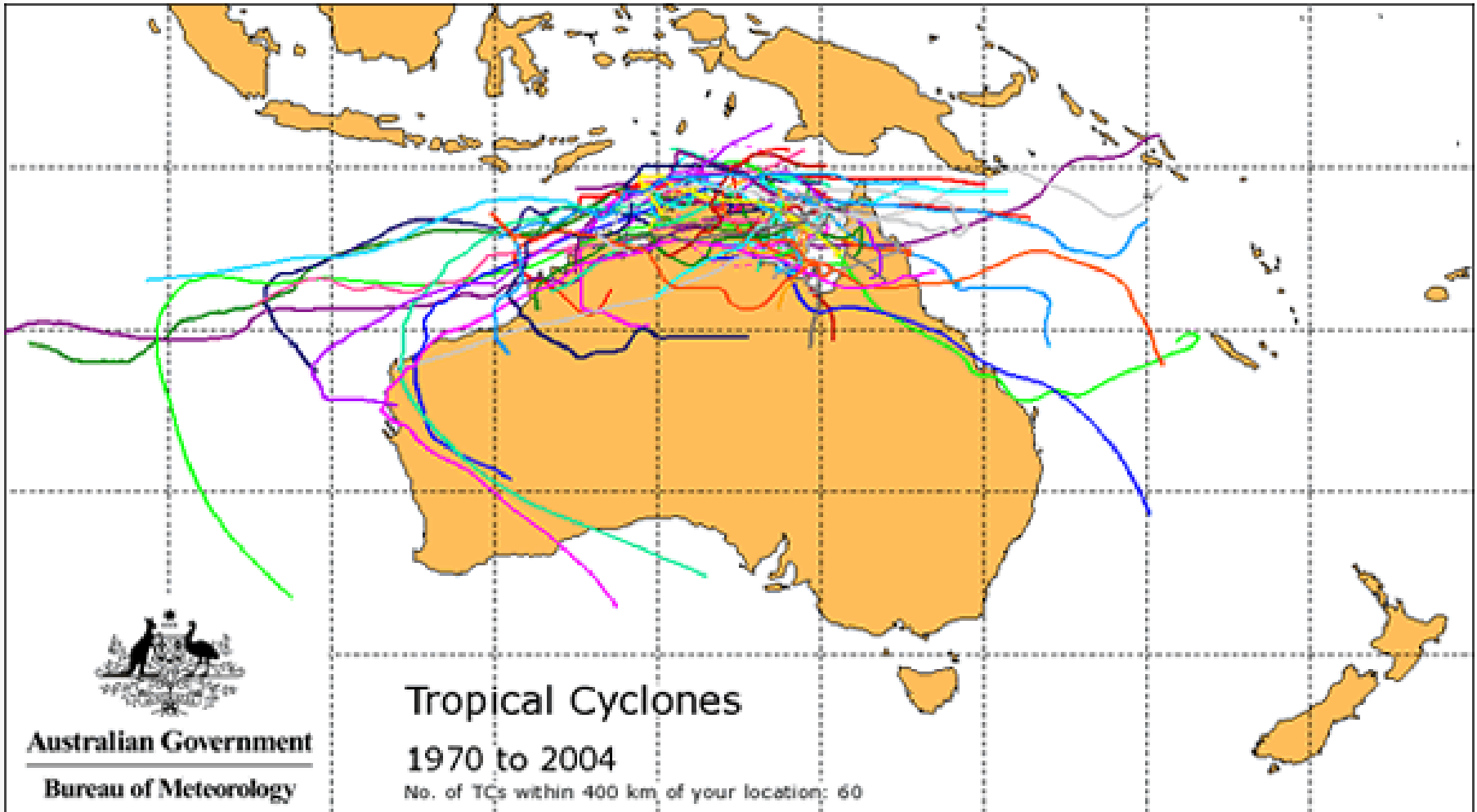
Business
Cooperative Research
Centres Programme

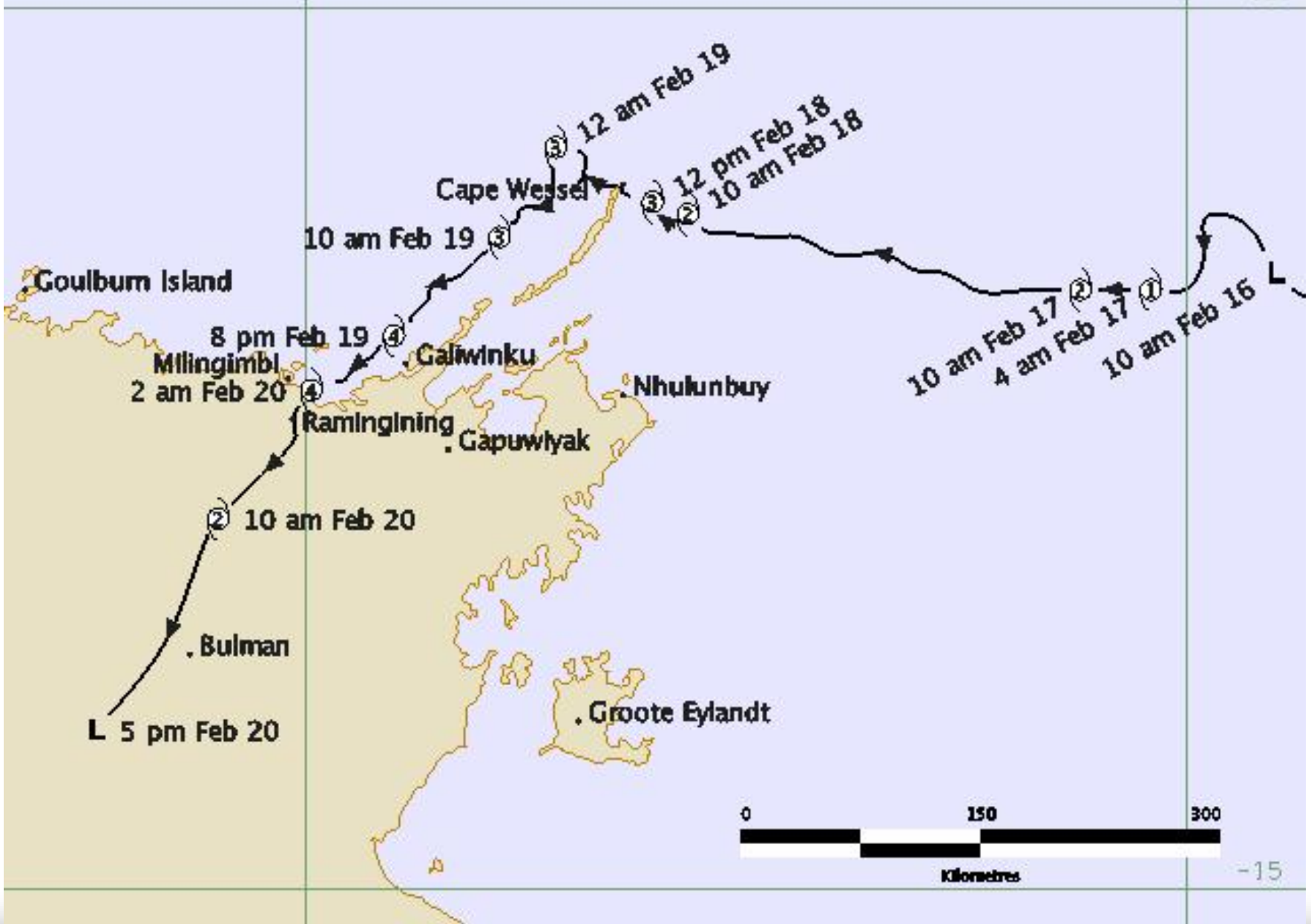


***Culturally appropriate mapping tools
for informing two-way fire management planning
in remote indigenous north Australian communities***

Outline

1. Context
2. Savannas
3. Remote Communities: Aboriginal Land tenure
4. Spatial data (Fire histories and ancillary data)
5. Model development and application
6. Benefits to Indigenous Communities
7. Study Areas
8. ARPNet : Aboriginal Research Practitioners' Network



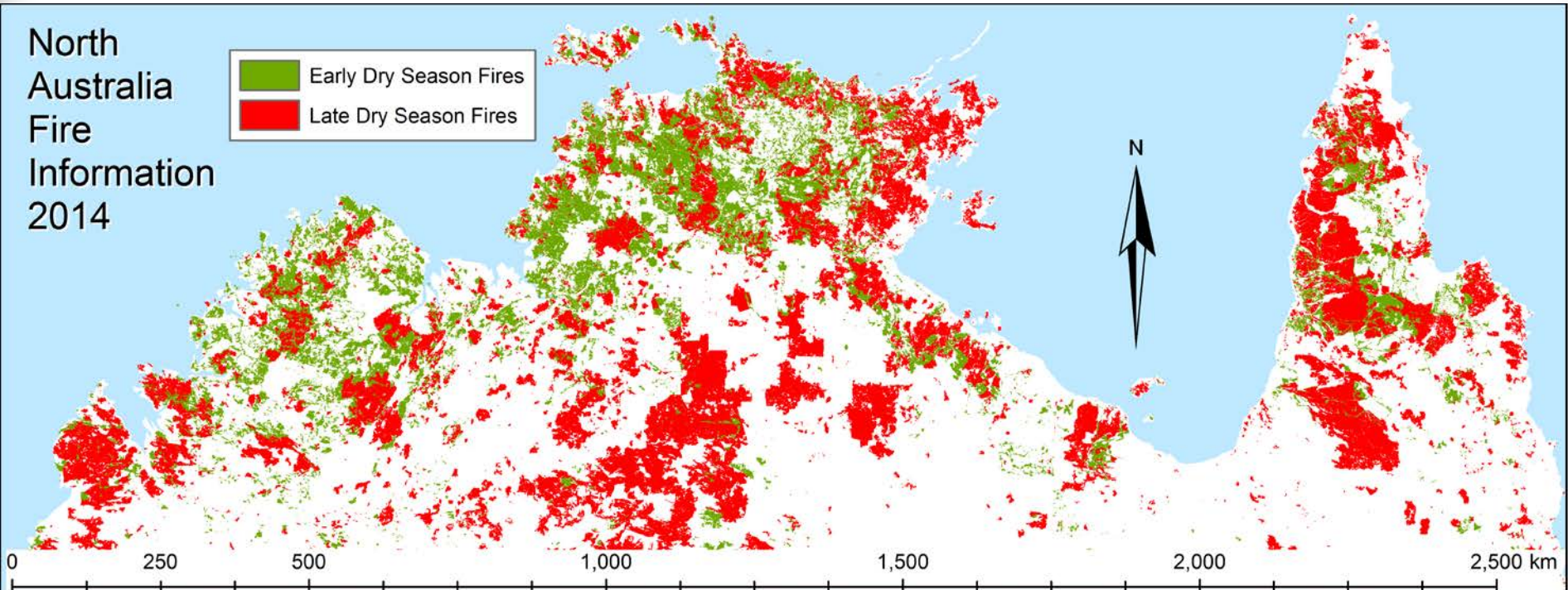






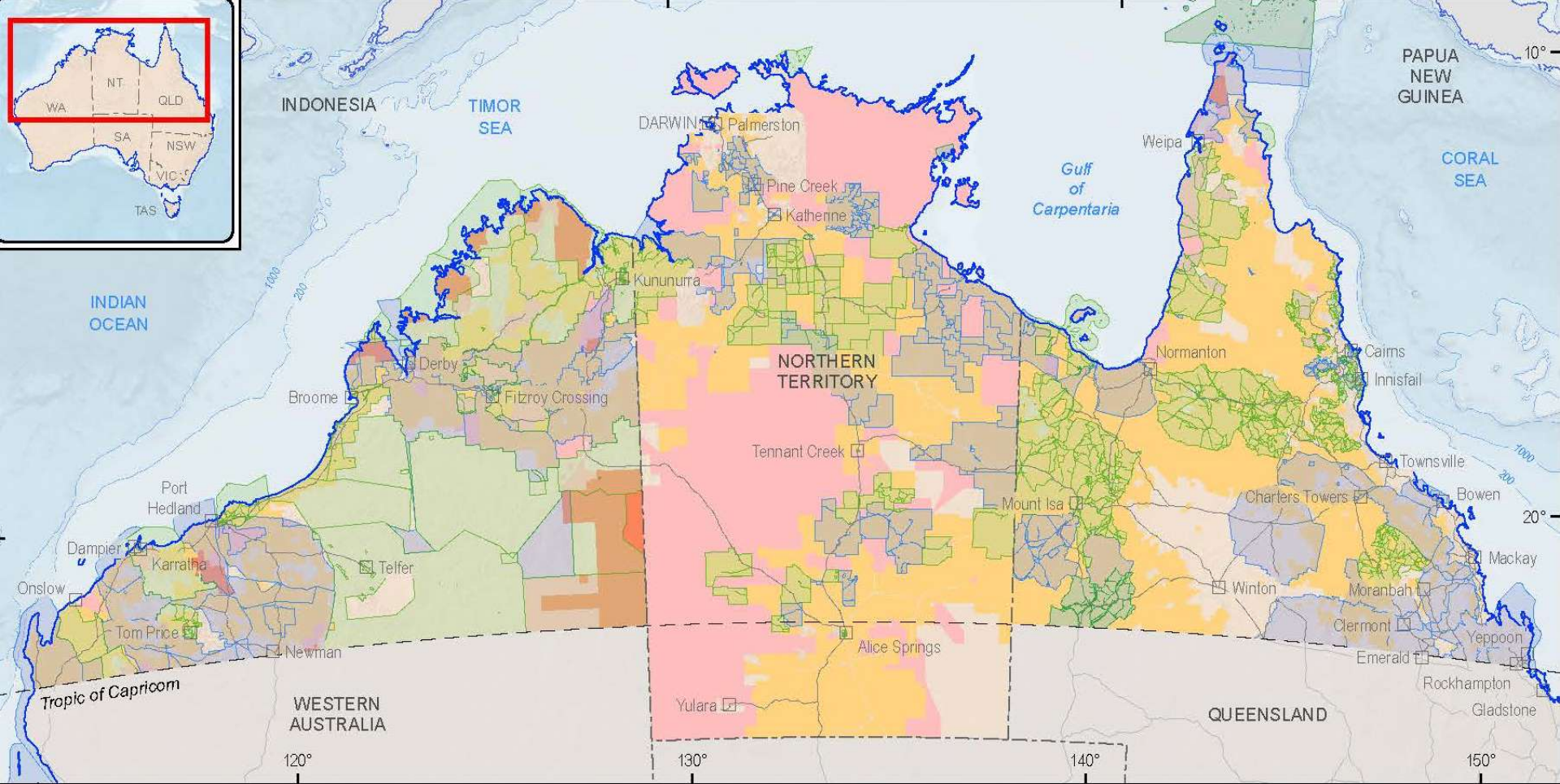
Katherine - 2006

North Australia Fire Information 2014



INDIGENOUS OWNED LAND IN THE NORTH

- Generally, Indigenous land is 'inalienable'. This means it cannot be sold and is held in perpetual trust for the communal benefit of Indigenous Australians.
- Approximately 50% the NT (635,000 km²), 5% north Qld (60,000 km²) and 12% of north WA (114,000 km²) is 'inalienable' Aboriginal freehold.



Australia Land Tenure 1993, Native Title 2014
 The Registrar, the National Native Title Tribunal and its staff, members and agents and the Commonwealth (collectively the Commonwealth), accept no liability and give no undertakings, guarantees or warranties concerning the accuracy, completeness or fitness for purpose of the information provided. In return for you receiving this information you agree to release and indemnify the Commonwealth and third party data suppliers in respect of all claims, expenses, losses, damages and costs arising directly or indirectly from your use of the information and the use of the information you obtained by any third party.

SCALE 1:17 000 000
 0 750 km
 LAMBERT CONFORMAL CONIC PROJECTION
 Central Meridian: 134°E Standard Parallels: 18°S, 36°S
 Geocentric Datum of Australia



- Indigenous freehold and leaseholds
- Indigenous reserves
- Pastoral leasehold
- Native title determined area
- Native title area subject to claim
- Tropic of Capricorn
- Major road
- 200- Bathymetry (depth in metres)

Figure 2: Land Tenure of Northern Australia. from *Our North, Our Future: White Paper on Developing Northern Australia*. Commonwealth of Australia, 2014

Figure 1: Population density of northern Australia (2011)



© Commonwealth of Australia (Geoscience Australia) 2014. Data sourced from ABS 2012, *Census of Population and Housing, 2011*, cat. no. 2003.0, Australian Bureau of Statistics, Canberra

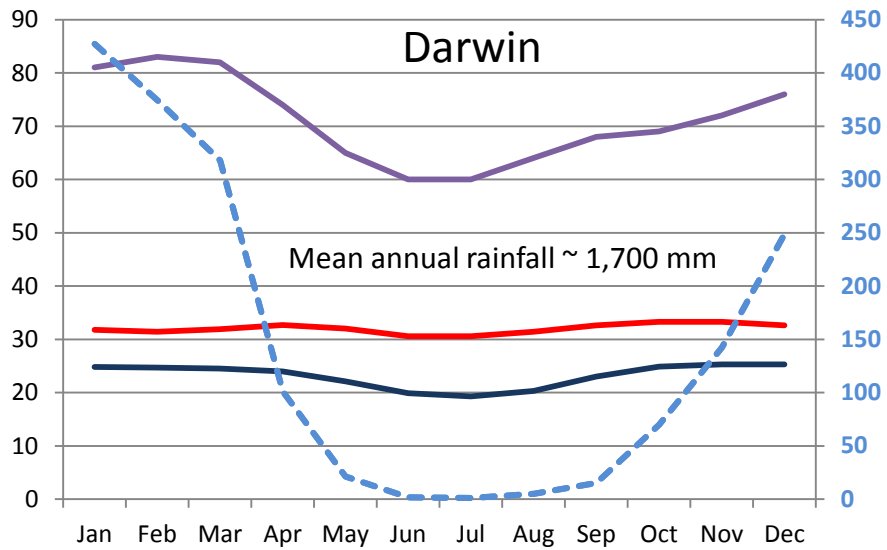
The Plateau, Escarpment & Lowlands



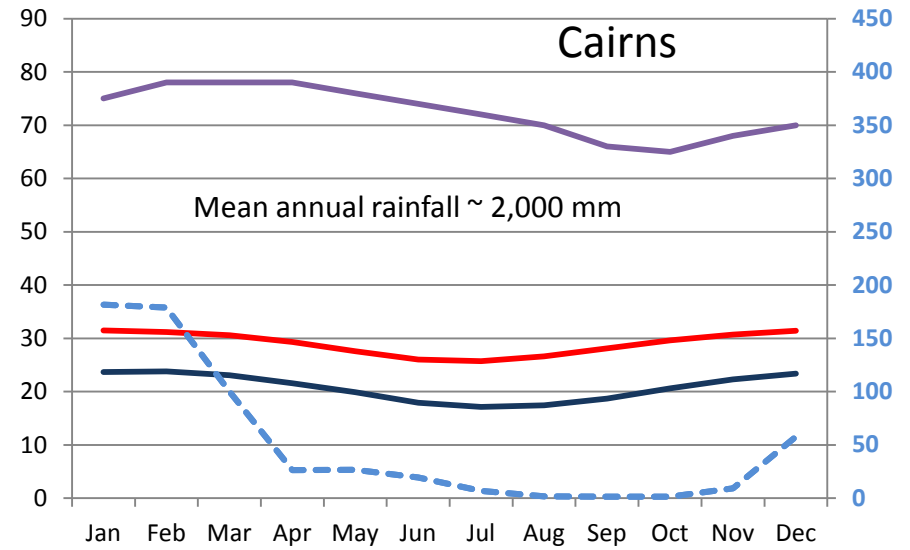
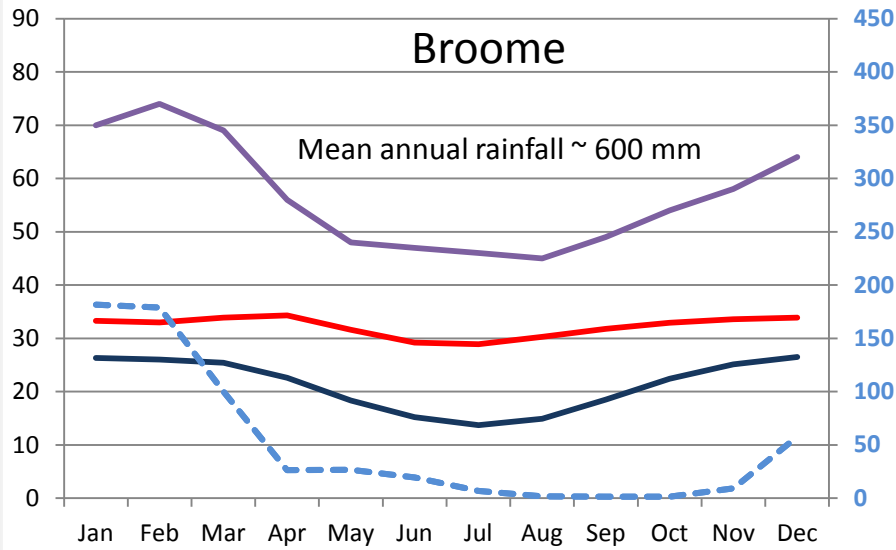




21 05 2003



- Mean maximum temperature (°C)
- Mean minimum temperature (°C)
- Mean 9am relative humidity
- - - Mean rainfall (mm)





26.04 15:15



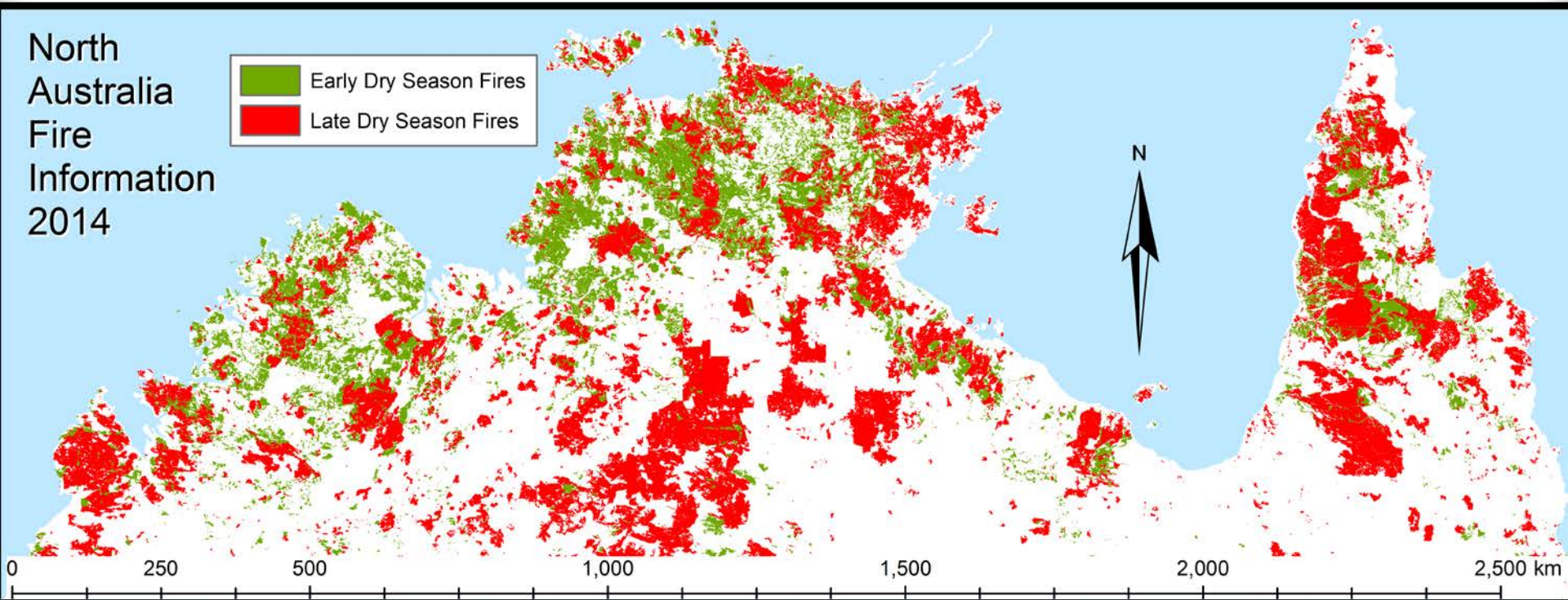






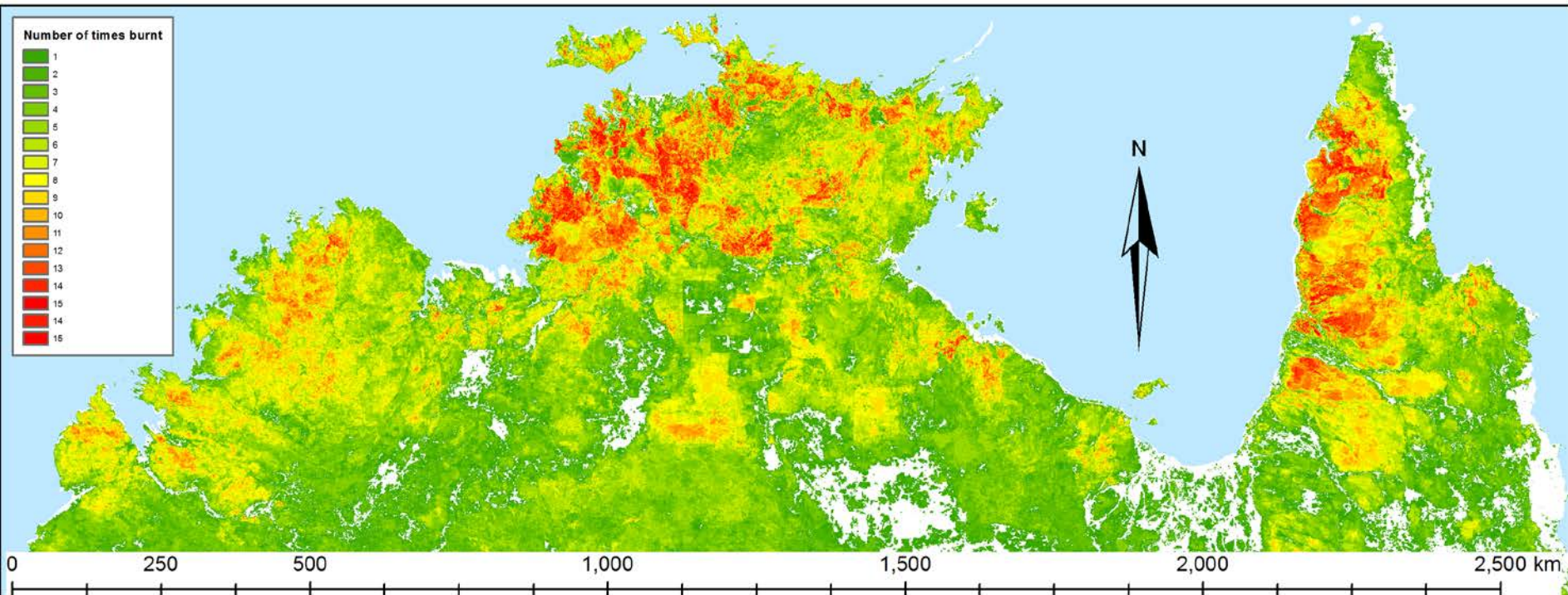
SAVANNA FIRE MANAGEMENT: METRICS

Uses the extensive history of fire mapping derived by NAFI (North Australia Fire Information).



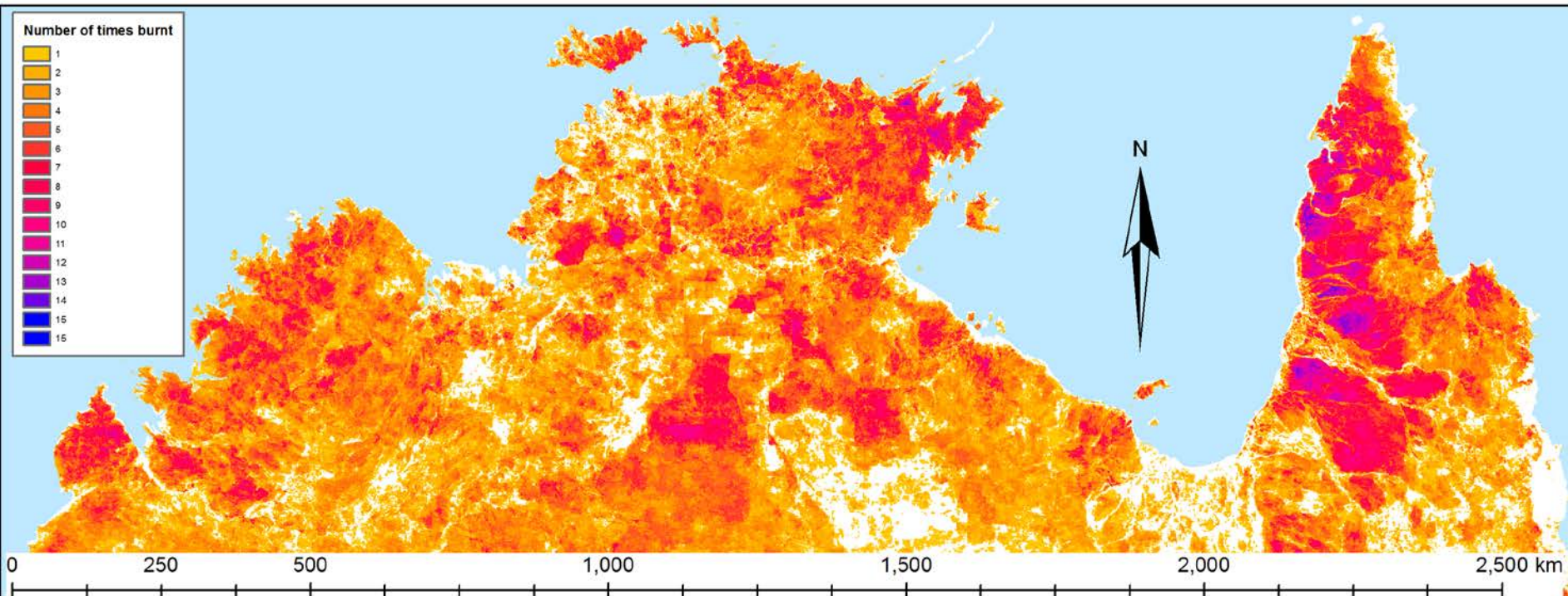
SAVANNA FIRE MANAGEMENT: METRICS

North Australia Fire Frequency 2000-14



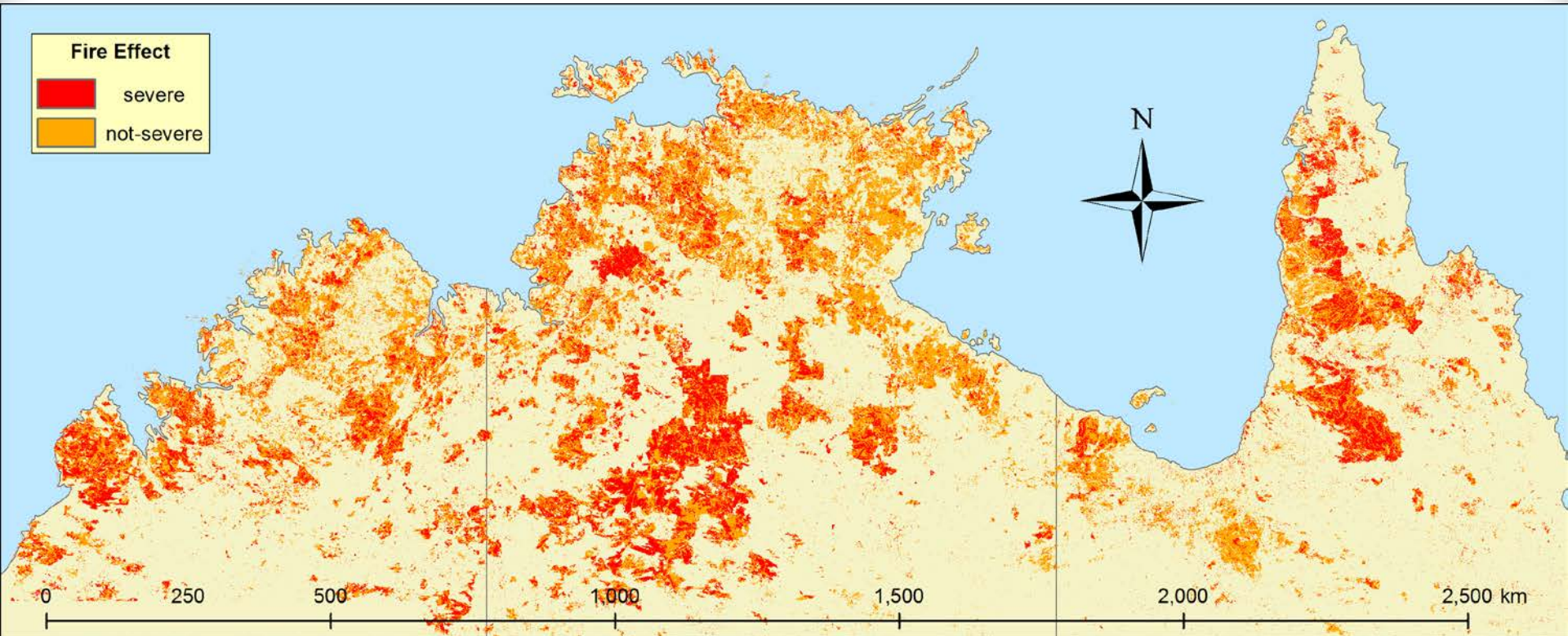
SAVANNA FIRE MANAGEMENT: METRICS

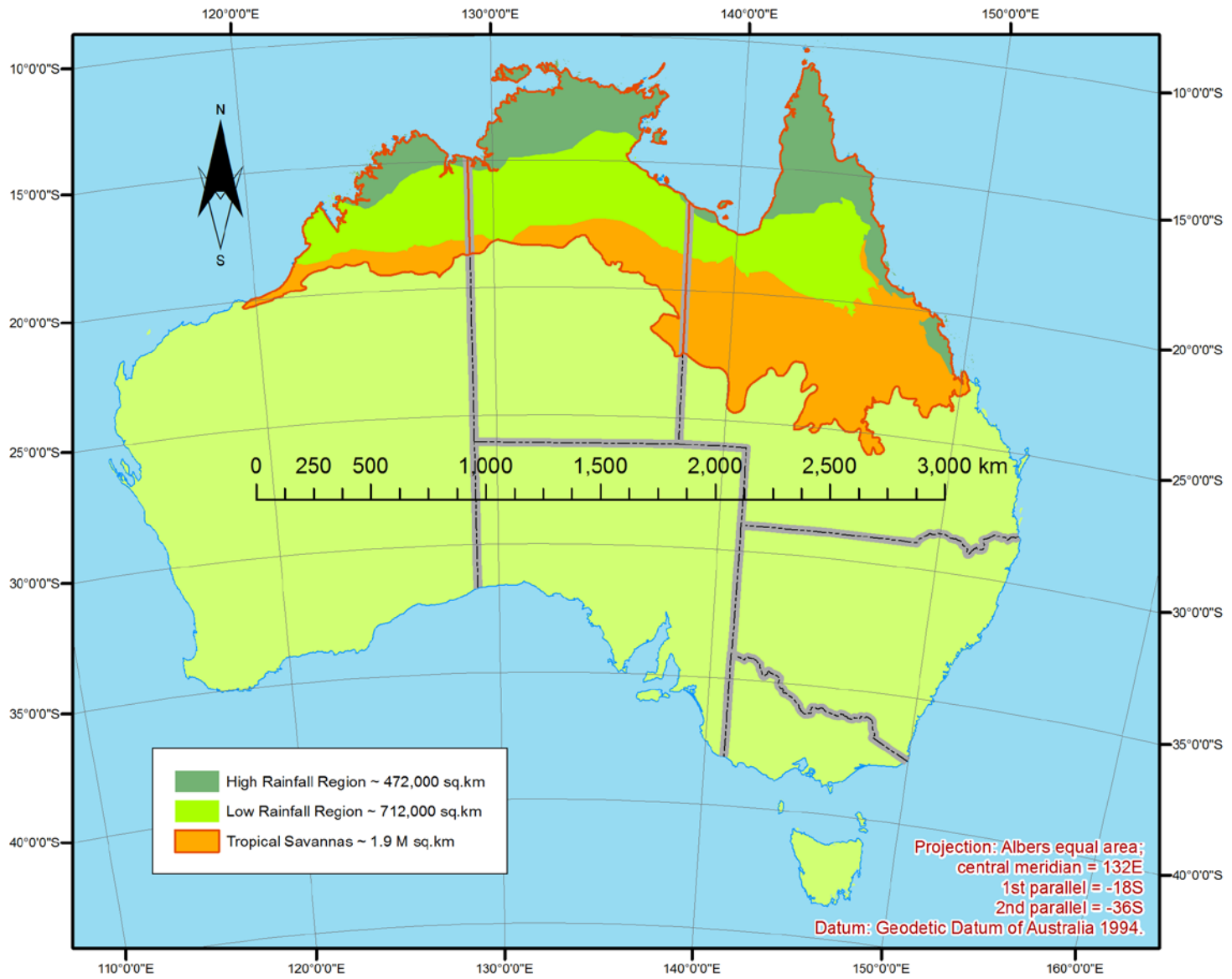
North Australia Late Dry Season Fire Frequency 2000-14



SAVANNA FIRE MANAGEMENT: METRICS

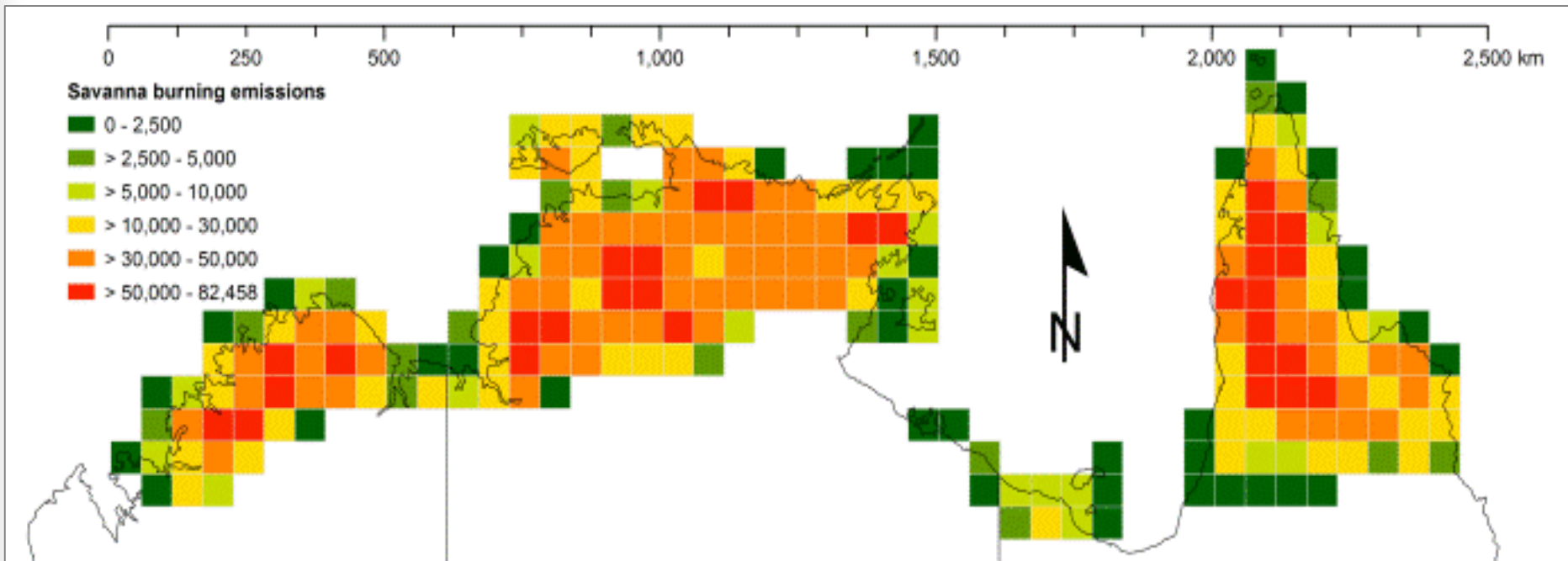
Fire Severity 2014





SAVANNA FIRE MANAGEMENT: MODEL

Greenhouse Gas Emissions (t.CO₂-e.yr⁻¹)

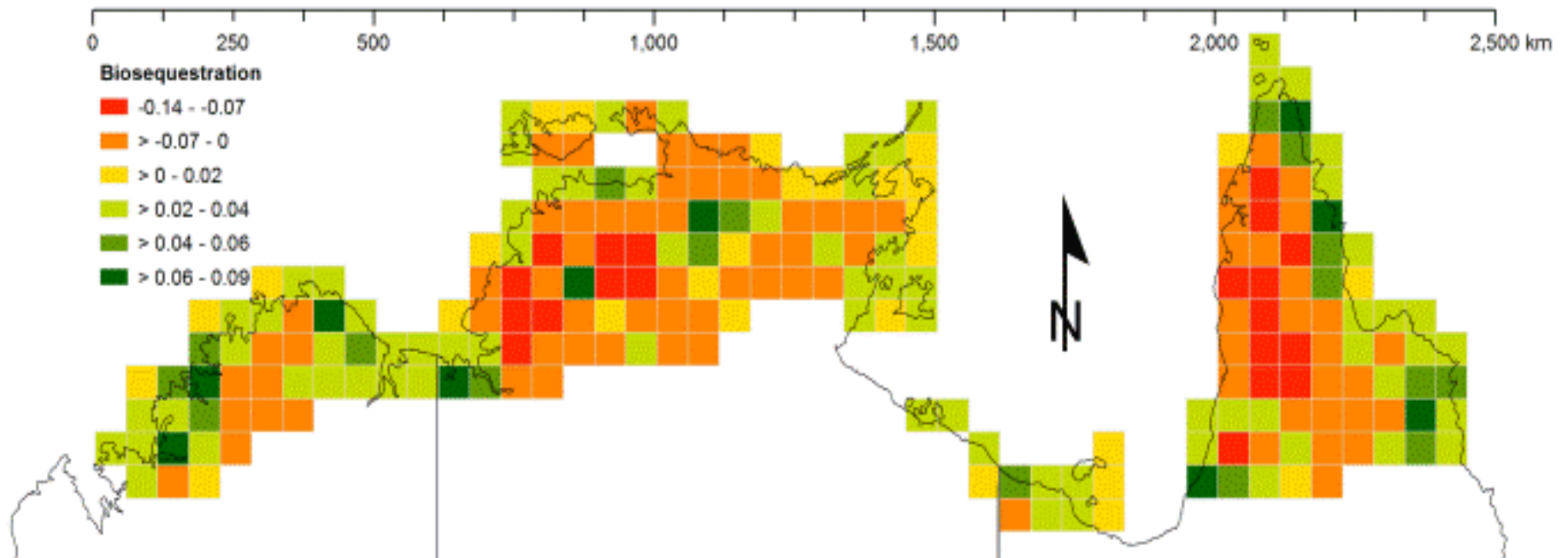


DCCEE (2013) Carbon Credits (Carbon Farming Initiative) (Reduction of Greenhouse Gas Emissions through Early Dry Season Savanna Burning—1.1) Methodology Determination 2013. Carbon Credits (Carbon Farming Initiative) Act 2011. Parliamentary Secretary for Climate Change Industry and Innovation. Australian Government, Canberra, Australia. **Federal Register of Legislative Instruments F2013L01165**: pp. 41.

Russell-Smith, J., Murphy, B. P., Meyer, C. P., Cook, G. D., Maier, S., Edwards, A. C., Schatz, J. and Brocklehurst, P. (2009) Improving Estimates of Savanna Burning Emissions for Greenhouse Accounting in Northern Australia: Limitations, Challenges, Applications. *International Journal of Wildland Fire* **18** (1), 1-18.

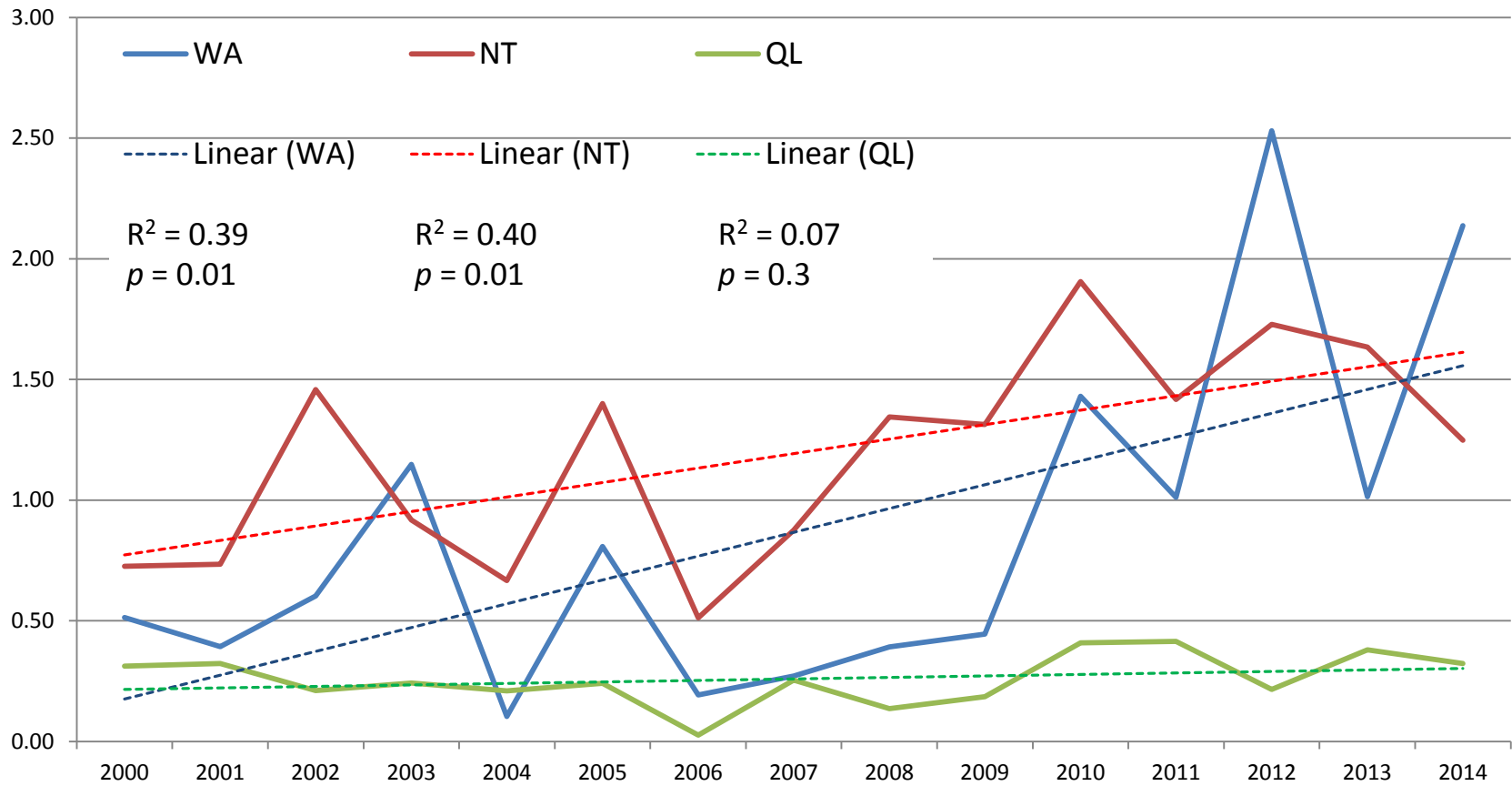
SAVANNA FIRE MANAGEMENT: MODEL

Tree Carbon Sequestration (Mt.C.yr^{-1})

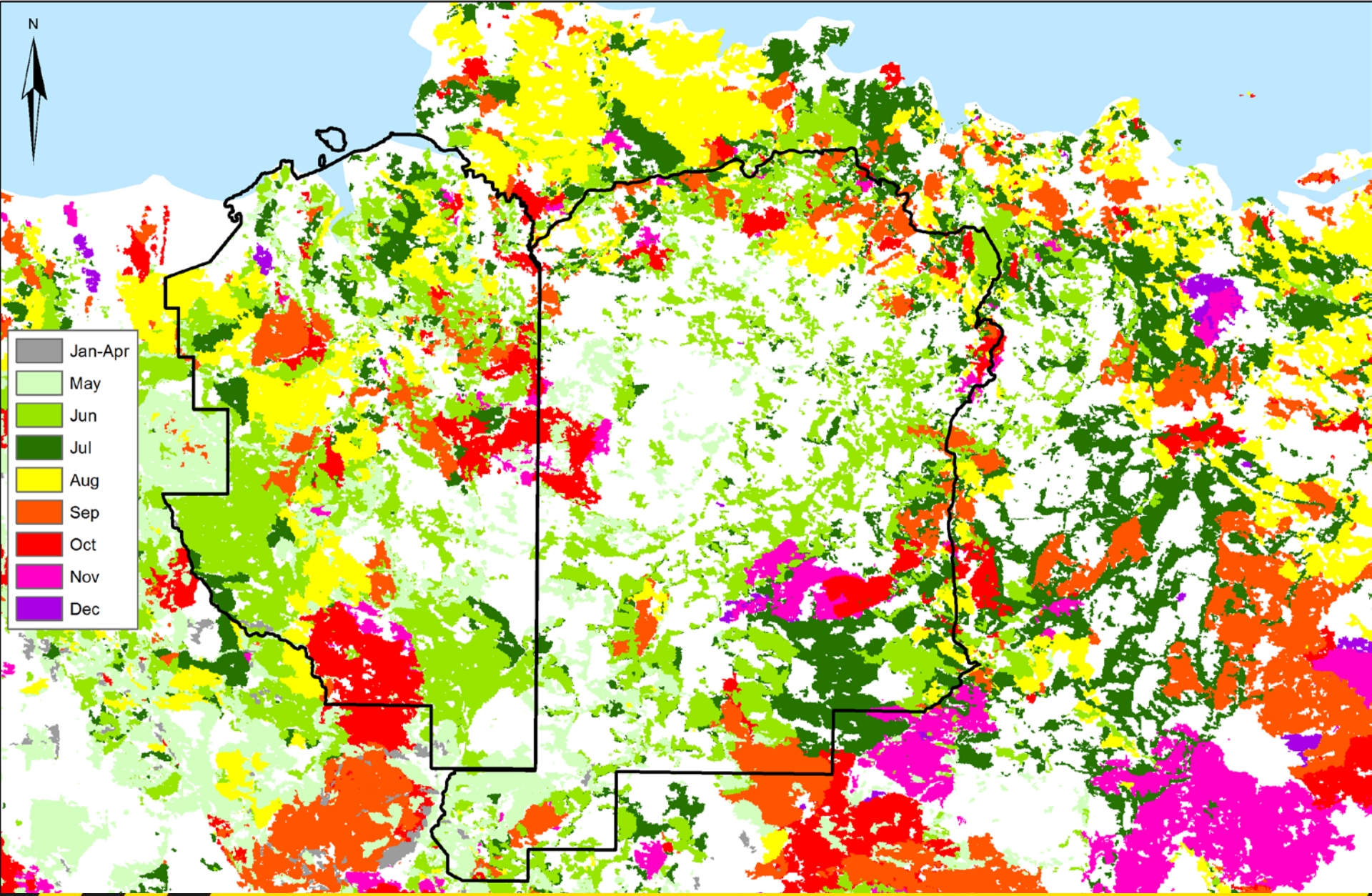


Murphy, B. P., Russell-Smith, J., Watt, F. A. and Cook, G. D. (2009) Fire Management and Woody Biomass Carbon Stocks in Mesic Savannas - In: *Managing Fire Regimes in North Australian Savannas – Ecology, Culture, Economy*. Russell-Smith, J. and Whitehead, P. (eds), CSIRO Publishing, Canberra, Australia.

Murphy, B. P., Russell-Smith, J. and Prior, L. D. (2010) Frequent Fires Reduce Tree Growth in Northern Australian Savannas: Implications for Tree Demography and Carbon Sequestration. *Global Change Biology* **16** (1), 331-343.

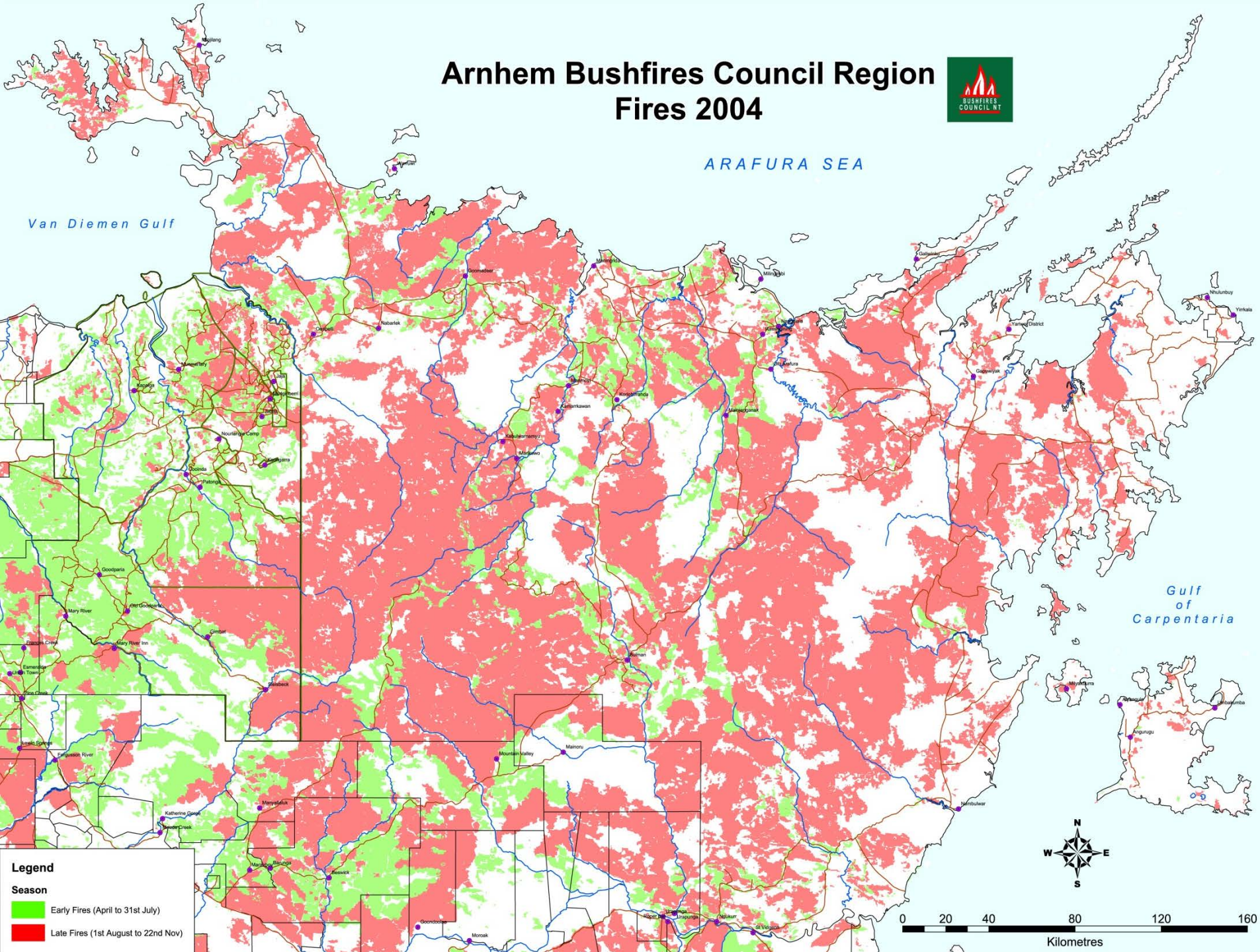


The change in the ratio of Early to Late dry season fires for the 3 High rainfall (> 1,000 mm mean seasonal rainfall) jurisdictions.



- Jan-Apr
- May
- Jun
- Jul
- Aug
- Sep
- Oct
- Nov
- Dec

Arnhem Bushfires Council Region Fires 2004









22.09 07:16



Fully trained and equipped, young Indigenous Rangers prepare for fire suppression



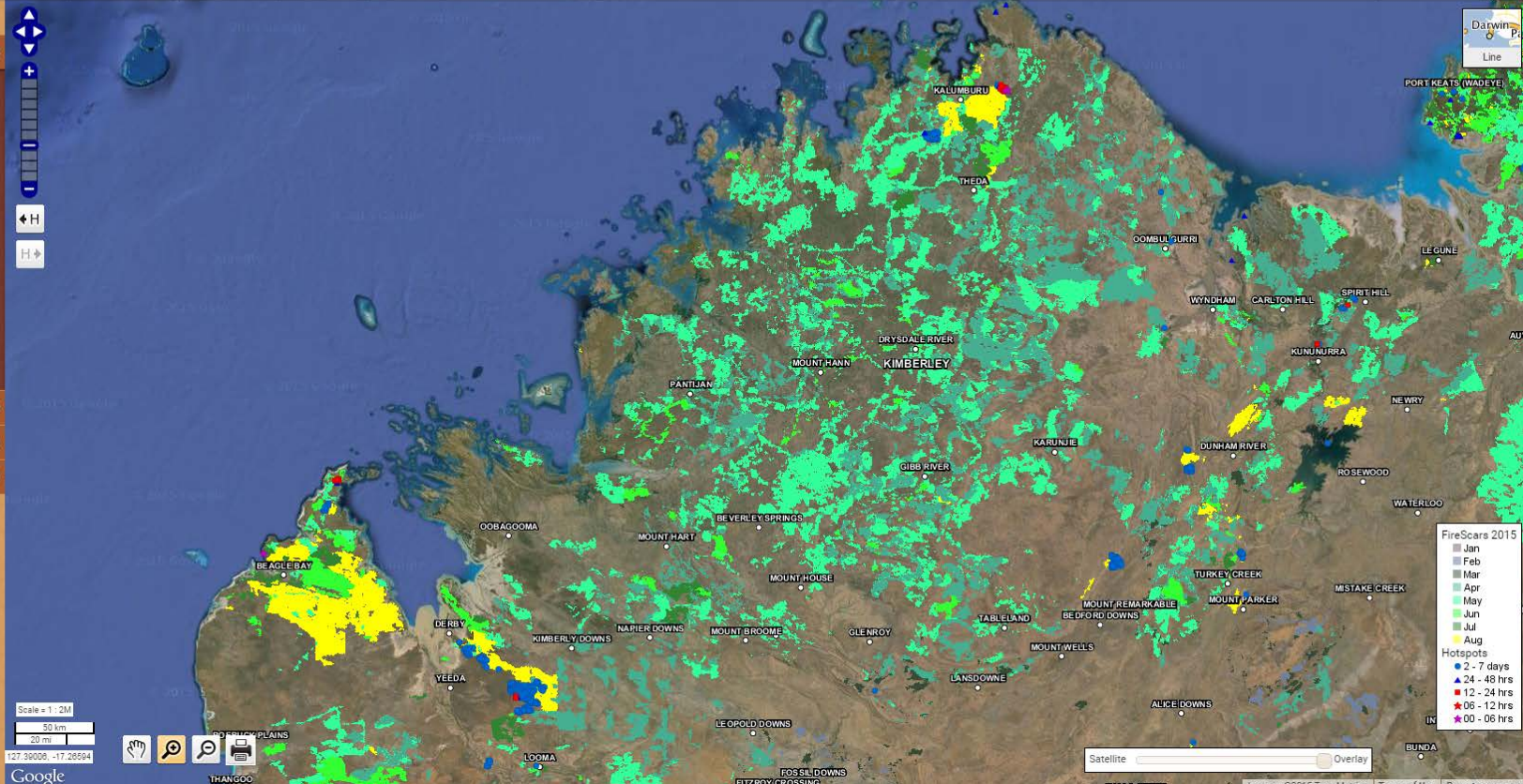
Indigenous Rangers creating a mineral earth fire break to halt an impending wildfire

- Hide Menu
- Areas ?
- Presets Areas
 - Cape York Pen'sla
 - North East Qld
 - The Gulf Qld
 - Central Qld
 - Central West Qld
 - West Qld
 - South Qld
 - NT North
 - Amhem Land
 - Darwin
 - Kakadu
 - NT Central
 - NT South
 - NW Australia
 - South Aust
 - My Areas +

Go to Location ?

View your own maps ?

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Hide Menu

Areas ?

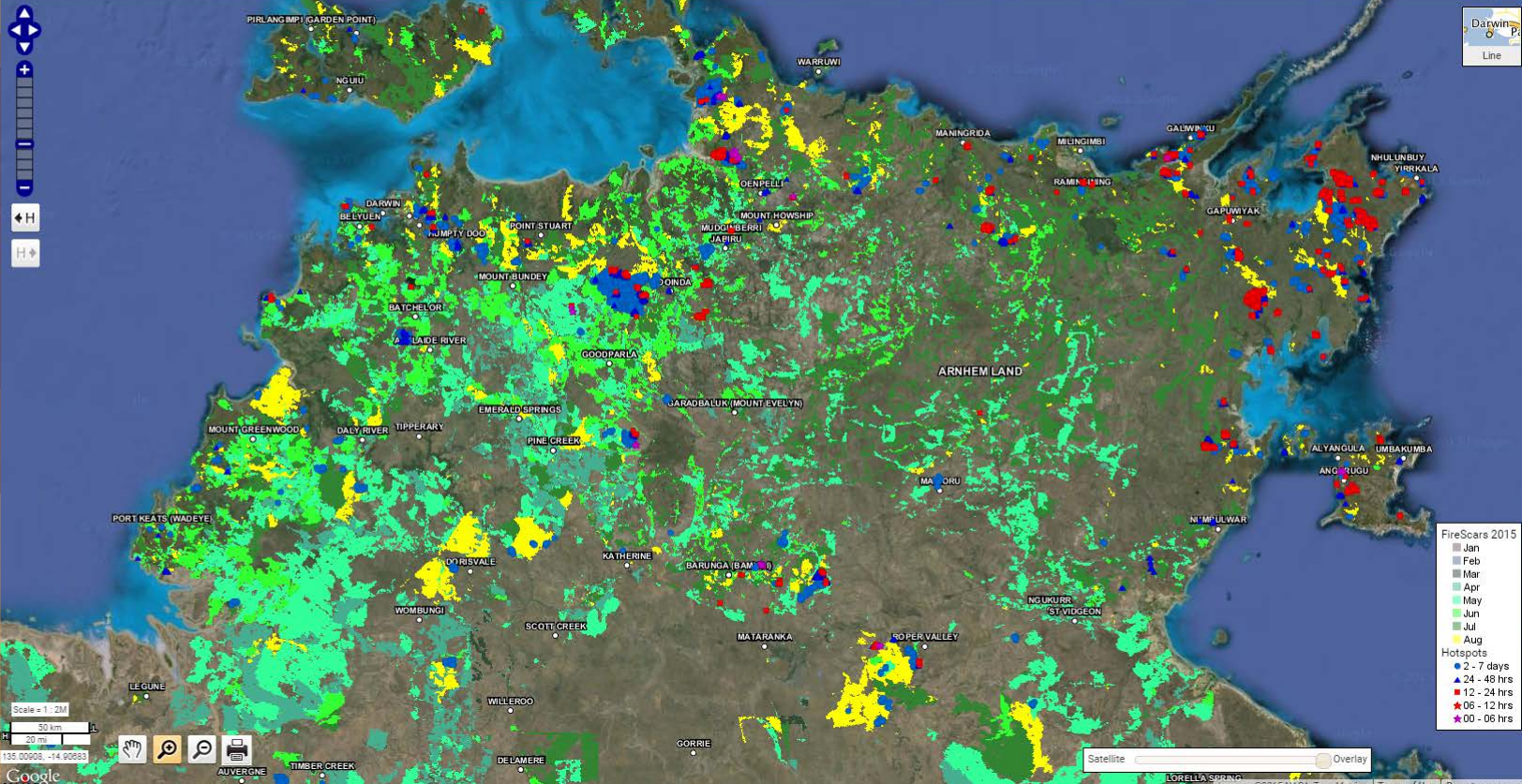
Presets Areas

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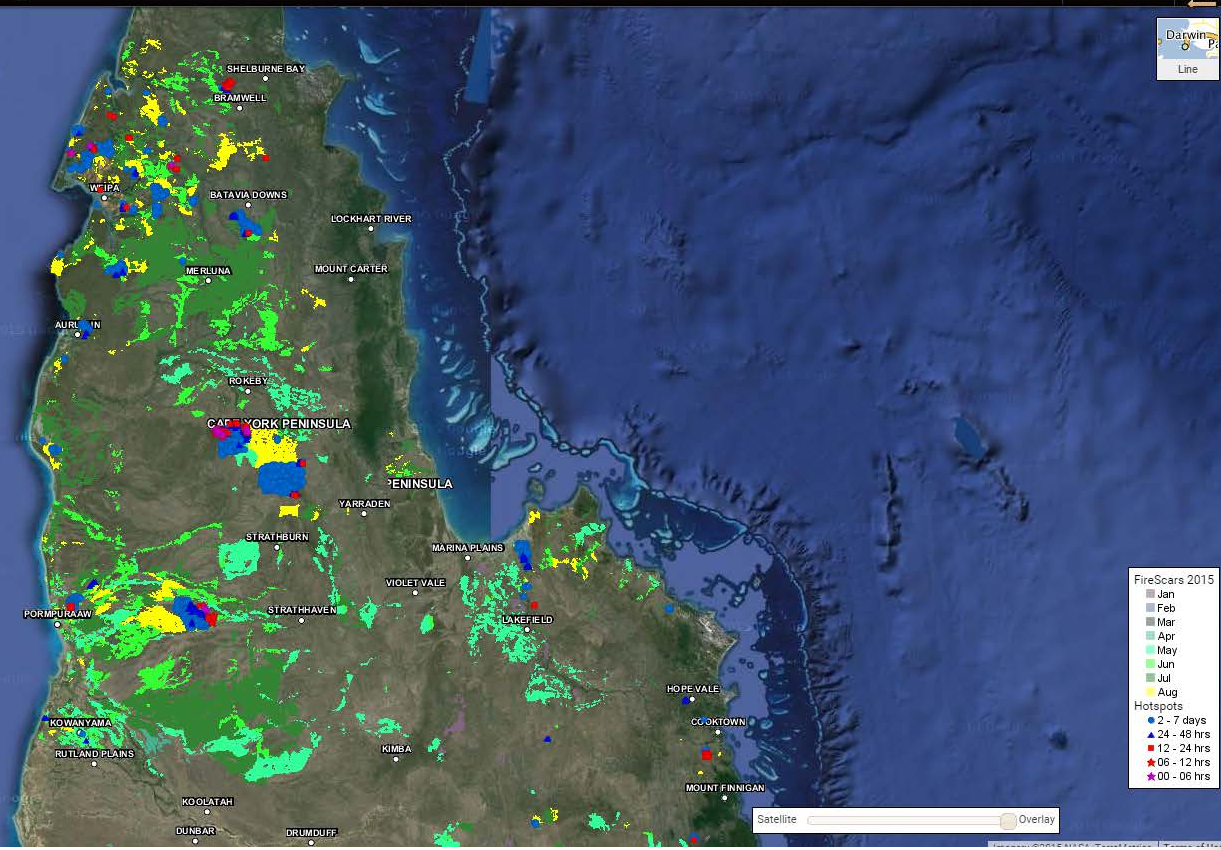
Log On / Email Alert ?

Scale = 1 : 2M

50 km

20 mi

142.84233, -14.15175



FINANCIAL BENEFITS OF LAND MANAGEMENT ENGAGEMENT

Payment for Ecosystem Services

- Land owners can improve fire management
- This reduces Greenhouse Gas Emissions
- Abatement = the unmanaged less the managed emissions
- A methodology to calculate emissions abatement:
<http://www.environment.gov.au/climate-change/emissions-reduction-fund/cfi/methodologies/determinations/savanna-burning>

“Carbon Farming (Reduction of Greenhouse Gas Emissions through Early Dry Season Savanna Burning 1.1) Methodology Determination 2013”

All of these benefits are financially empowering

→ Resilience

- prevent activities like the NTER (the Intervention)

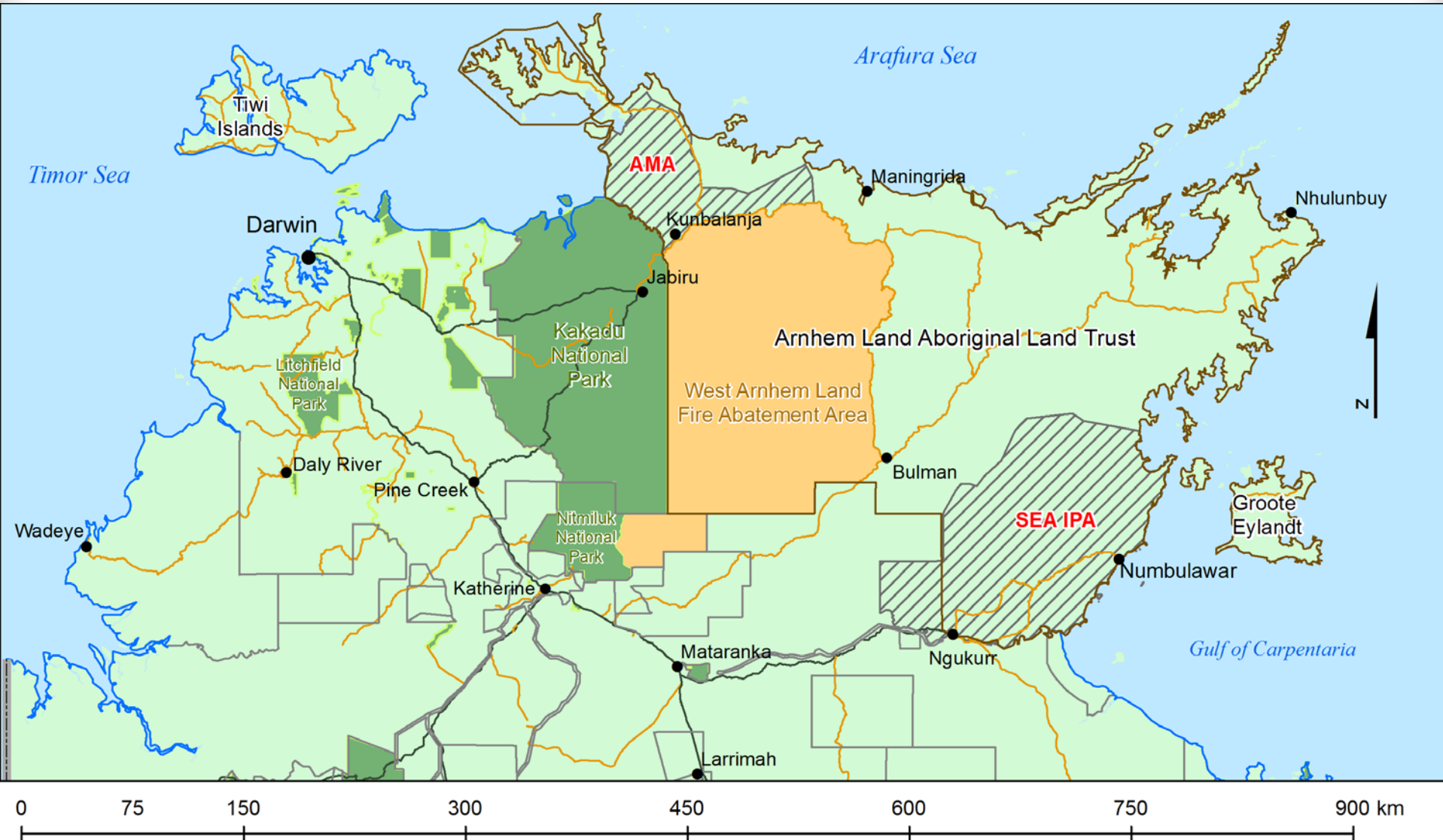
SOCIAL BENEFITS OF LAND MANAGEMENT ENGAGEMENT

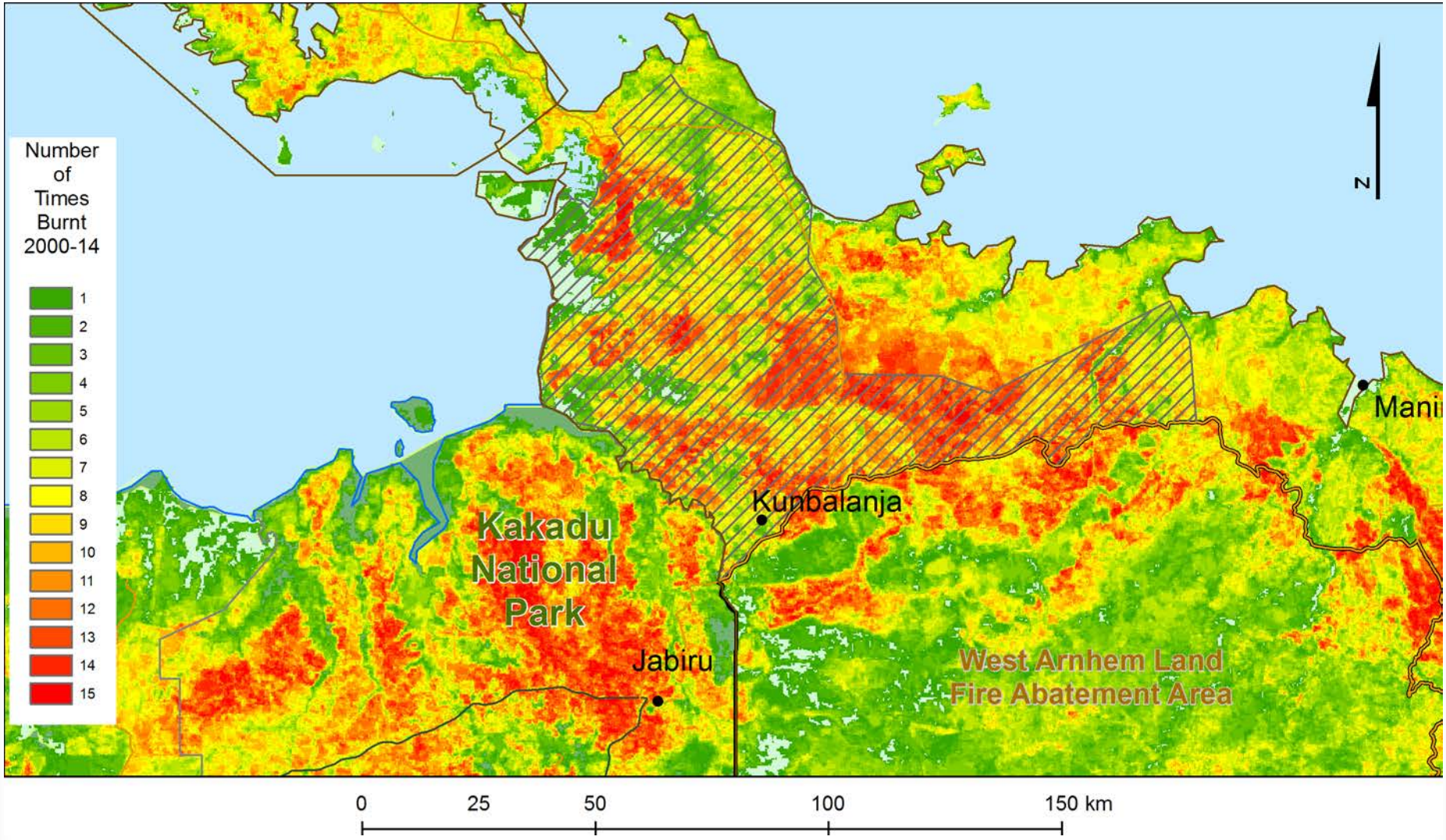
Health

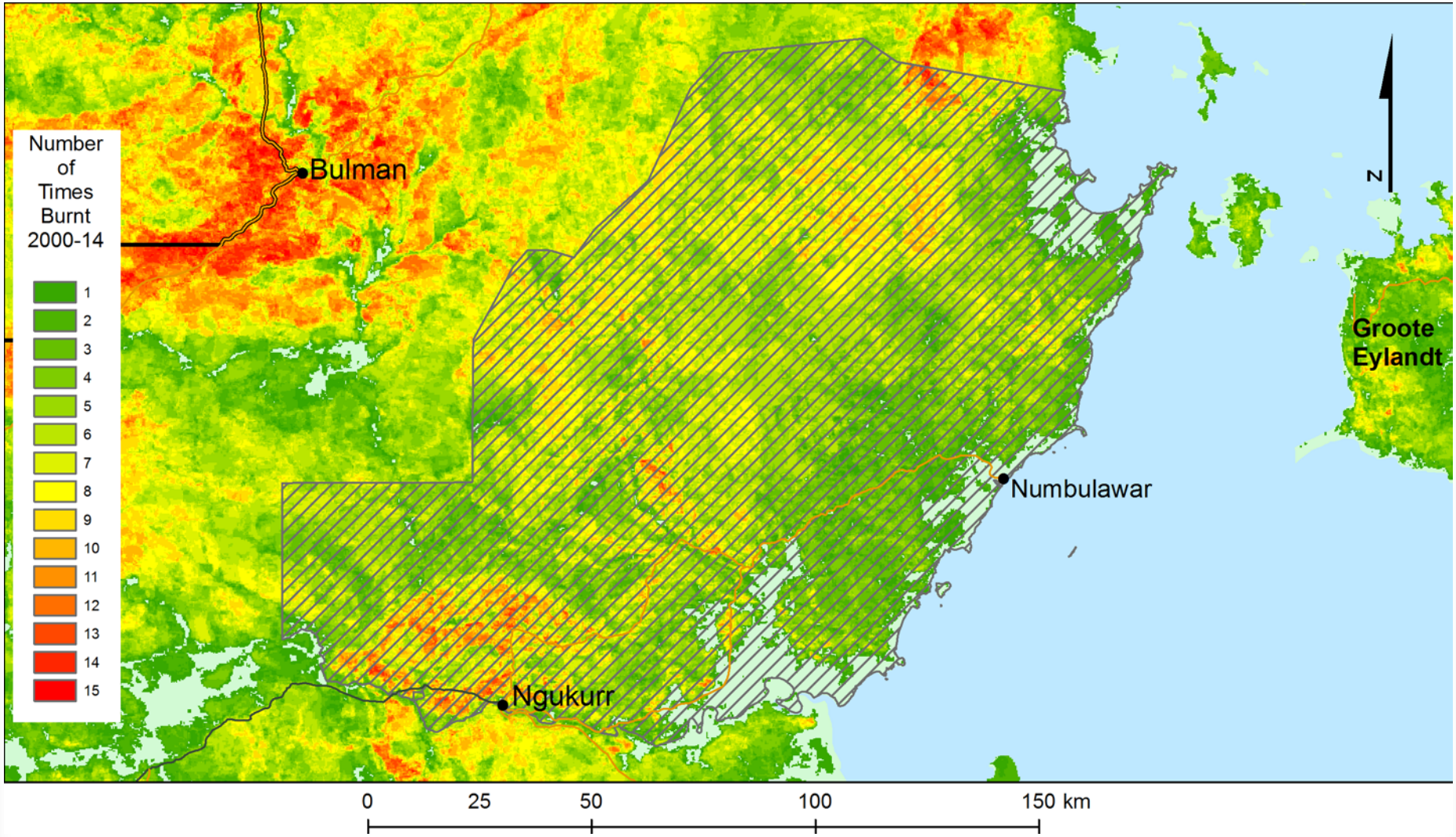
“Research reveals land management health benefits...
...those on the land had significantly lower rates of renal disease,
diabetes and hypertension. The estimated cost savings are
\$270,000 a year for a community of 1,200 residents”.

- Perpetuation of traditional knowledge
- Improved school engagement
- Improved physical fitness
- Improved diet

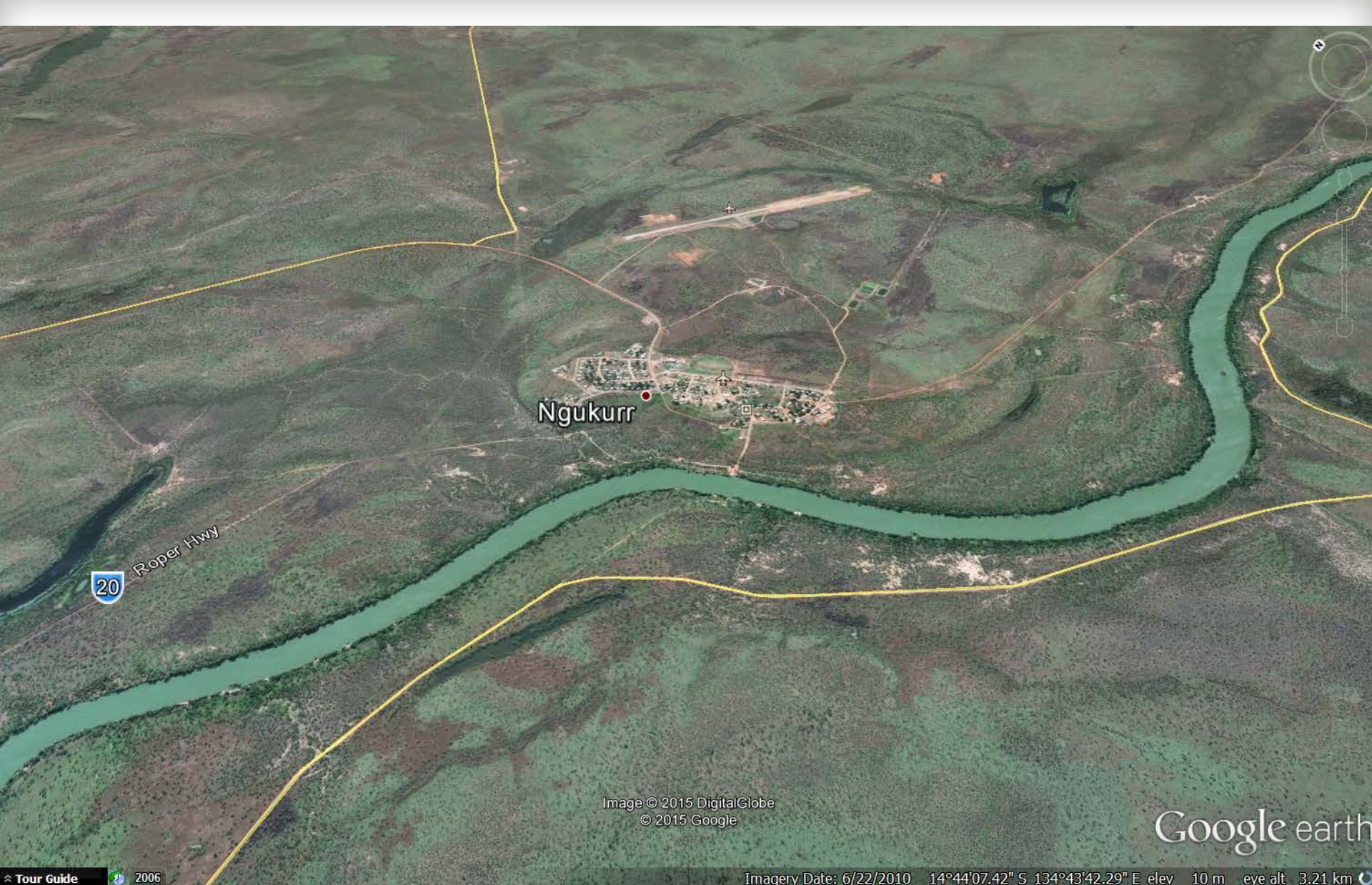
All of these benefits are empowering → Resilience











Ngukurr

20

Roper Hwy

Image © 2015 DigitalGlobe
© 2015 Google

Google earth

Tour Guide 2006

Imagery Date: 6/22/2010 14°44'07.42" S 134°43'42.29" E elev 10 m eye alt 3.21 km

bnhcrc.com.au

COMMUNITY BASED RESEARCH

Aboriginal Research Practitioner's Network (ARPNet)



“Our North, Our Future: White Paper on Developing Northern Australia”

A new \$75 million Cooperative Research Centre (CRC) for Developing Northern Australia located in the north will provide necessary research and development (R&D), utilising the expertise and experience of northern researchers and business...the focus is on agriculture, food and tropical medicine.

