bushfire&natural HAZARDSCRC

RISKS AND OPPORTUNITIES FOR SUSTAINABLE SAVANNA FIRE MANAGEMENT

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Australian Government
Department of Industry and Science
Business Cooperative Research Centres Programme

CDU 'NORTHERN HUB' PROJECTS

1) Savanna fire management

- Savanna burning tools
- Management of flammable high biomass grassy weeds
- Gulf (NT) community fire management

2) Scoping community resilience in remote communities

- Assessing community resilience
- Assessing effective community governance
- Payments for environmental services (PES) opportunities

3) Appropriate fire management training for remote communities

CDU 'NORTHERN HUB' PROJECTS: OVERARCHING OBJECTIVES

1) Improved understanding of issues affecting resilience in remote north Australian communities

1) Assessment and development of PES enterprise opportunities for remote communities (e.g. savanna burning markets; contract services)

1) Better understanding of natural hazard risks, especially in context of impacts on community resilience

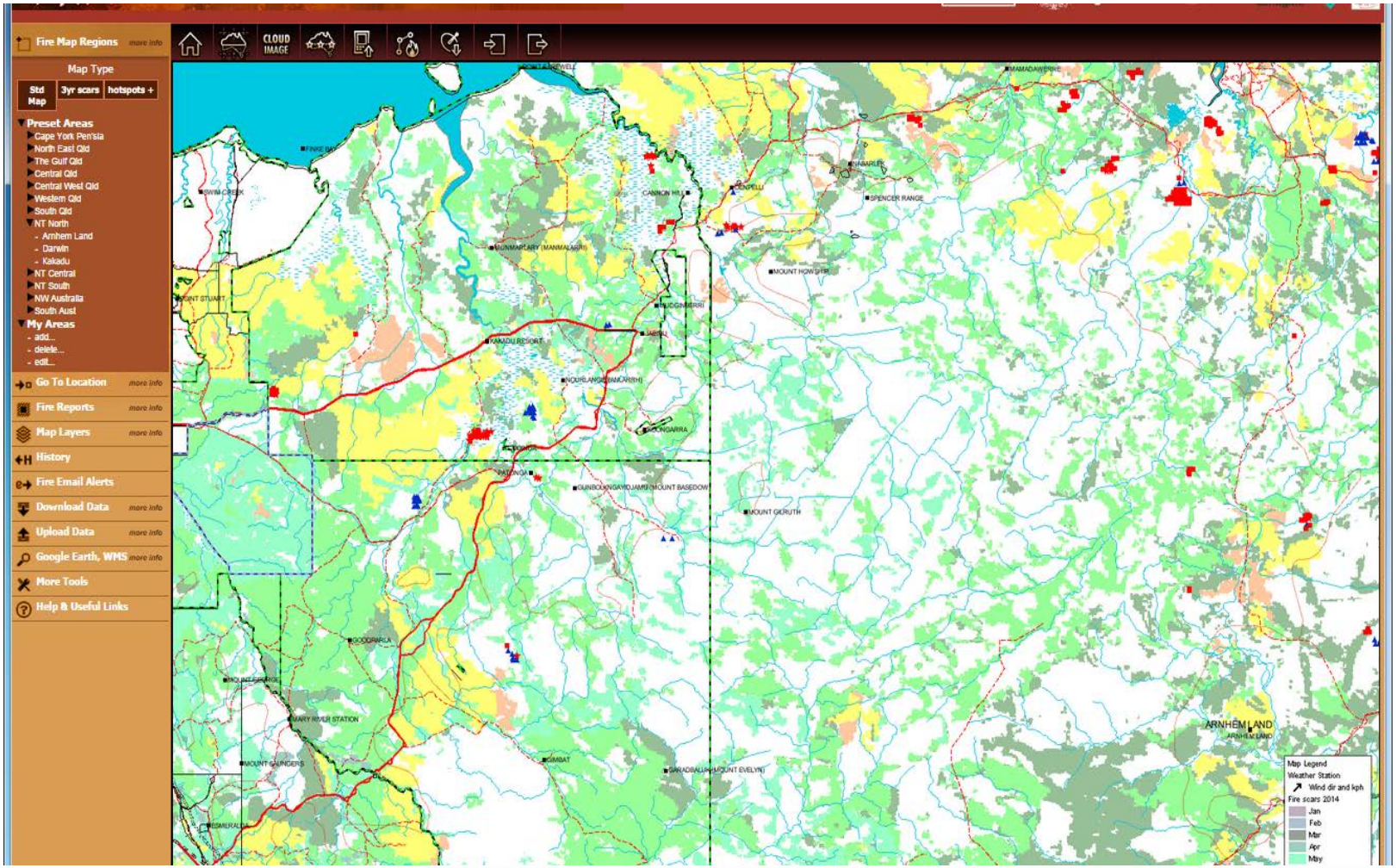
2) Development of information tools and training to assist development of enterprise opportunities and community resilience

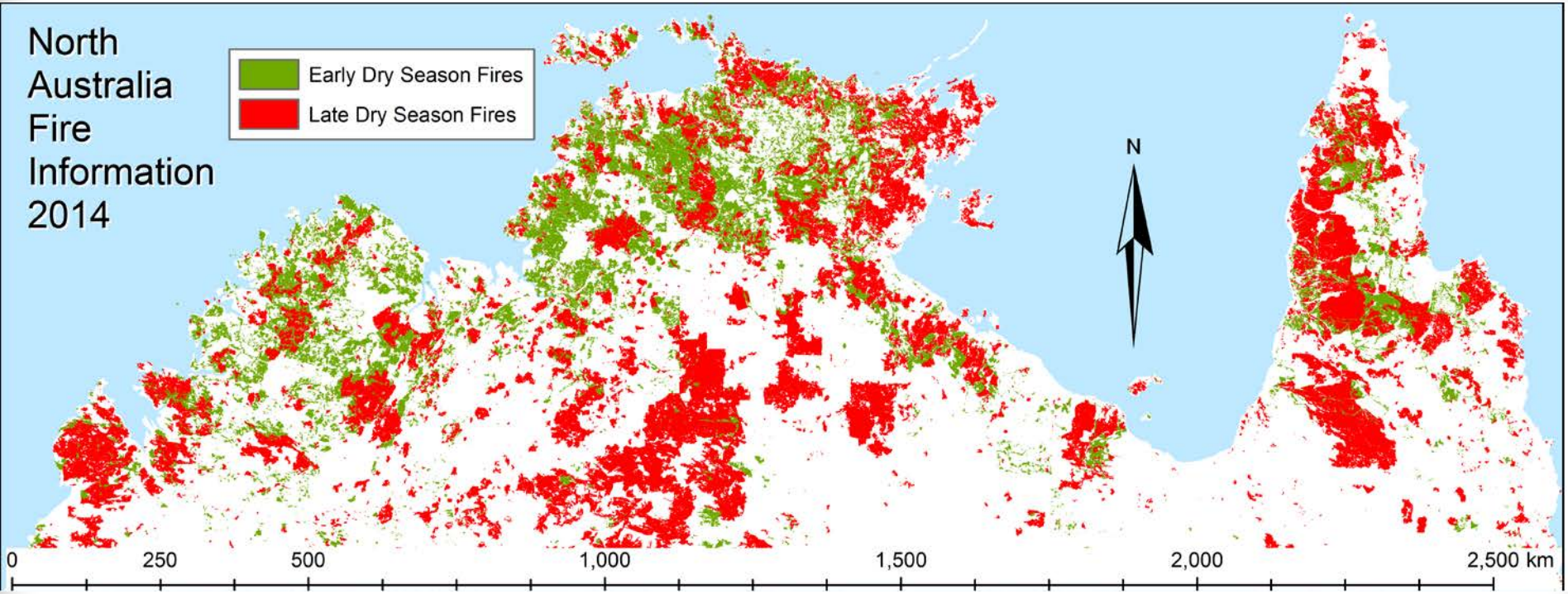
SAVANNA FIRE MANAGEMENT PROJECT: CURRENT PROJECT TEAM

Naomi Stephens	Lead End-User	OE&H NSW
Steve Rothwell	North Australia Lead End-User	NT F&ES
Mark Ashley	North Australia End-User	Bushfires NT
Bruno Greimel	North Australia End-User	QLD F&ES
Prof Jeremy Russell-Smith	Project Leader	DCBR, CDU
Dr Andrew Edwards	Researcher	DCBR, CDU
Cameron Yates	Researcher	DCBR, CDU
Assoc Prof Samantha Setterfield	Researcher	RIEL, CDU
Dr Natalie Rossiter-Rachor	Researcher	RIEL, CDU
Grigorijs Goldberg	PhD student	RIEL, CDU
Kate van Wezel	PhD student	DCBR, CDU

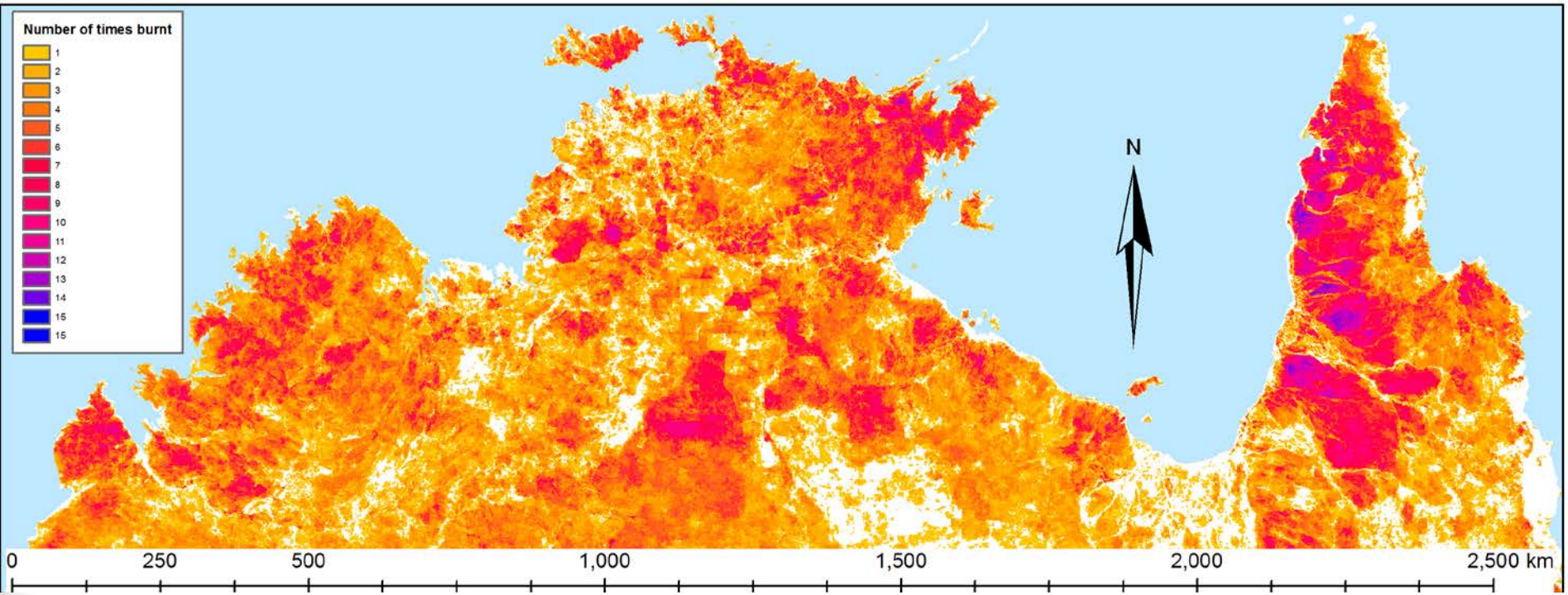
A) SAVANNA FIRE MANAGEMENT TOOLS

ANDREW EDWARDS

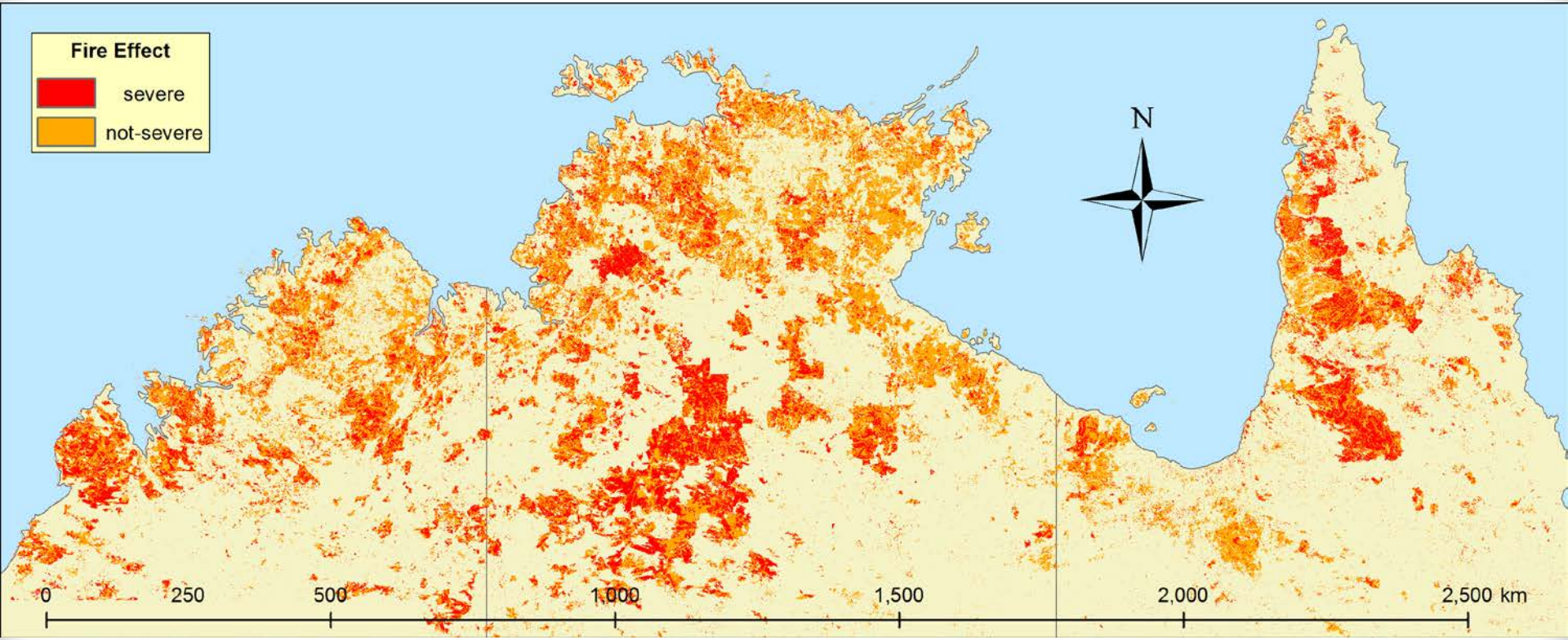



North Australia Fire Information 2014
Early Dry Season Fires
Late Dry Season Fires
N
0
250
500
1,000
1,500
2,000
2,500 km

North Australia Late Dry Season Fire Frequency 2000-14

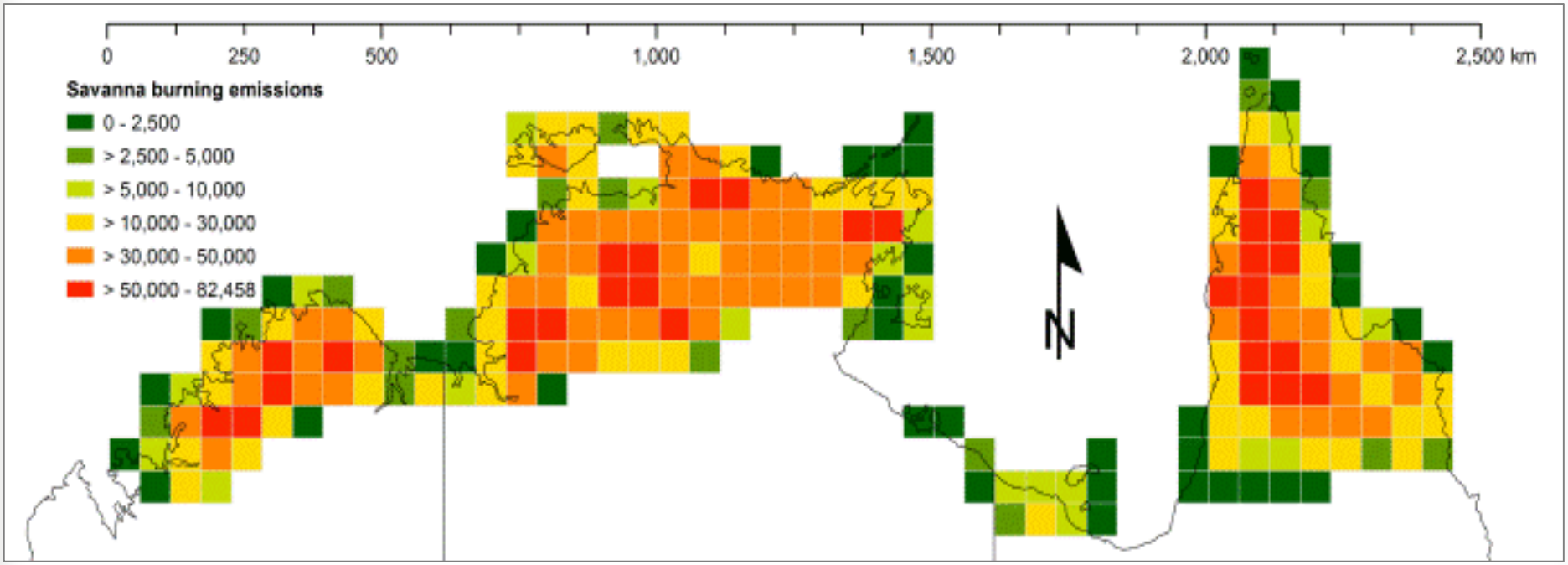


Fire Severity 2014



SAVANNA FIRE MANAGEMENT: MODEL

Greenhouse Gas Emissions ($t.CO_2\text{-}e.yr^{-1}$)

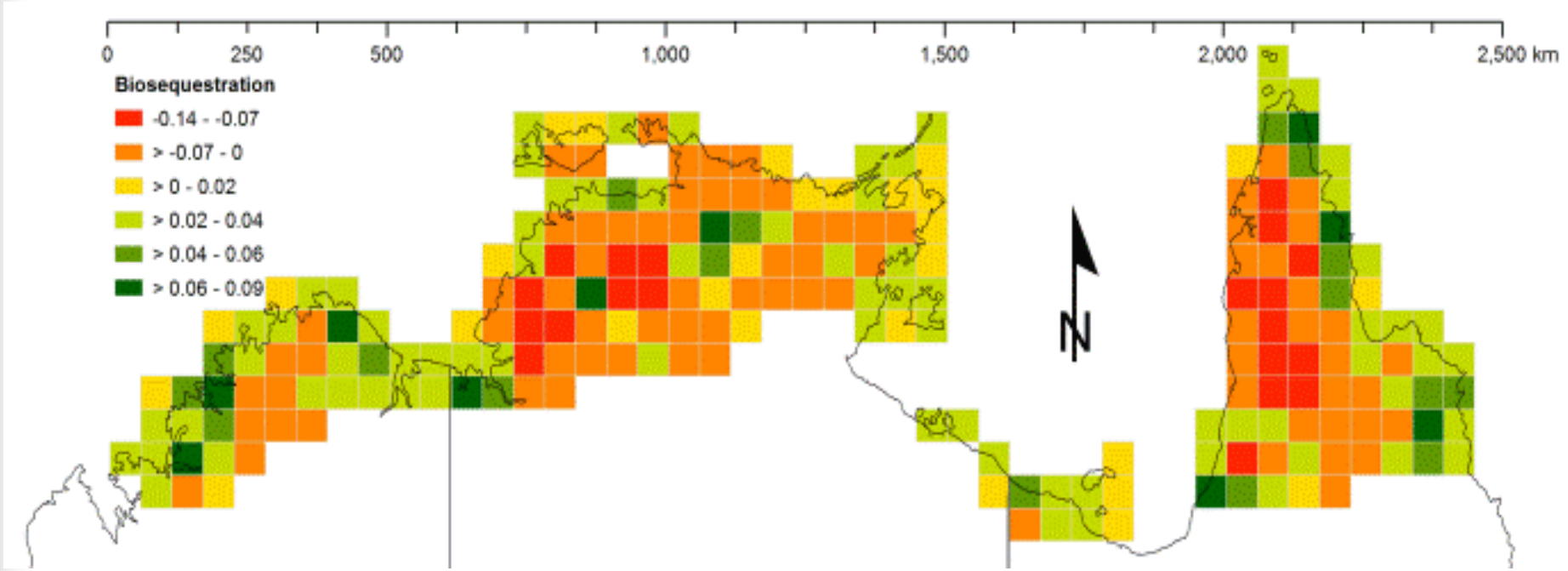


DCCEE (2013) Carbon Credits (Carbon Farming Initiative) (Reduction of Greenhouse Gas Emissions through Early Dry Season Savanna Burning—1.1) Methodology Determination 2013. Carbon Credits (Carbon Farming Initiative) Act 2011. Parliamentary Secretary for Climate Change Industry and Innovation. Australian 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

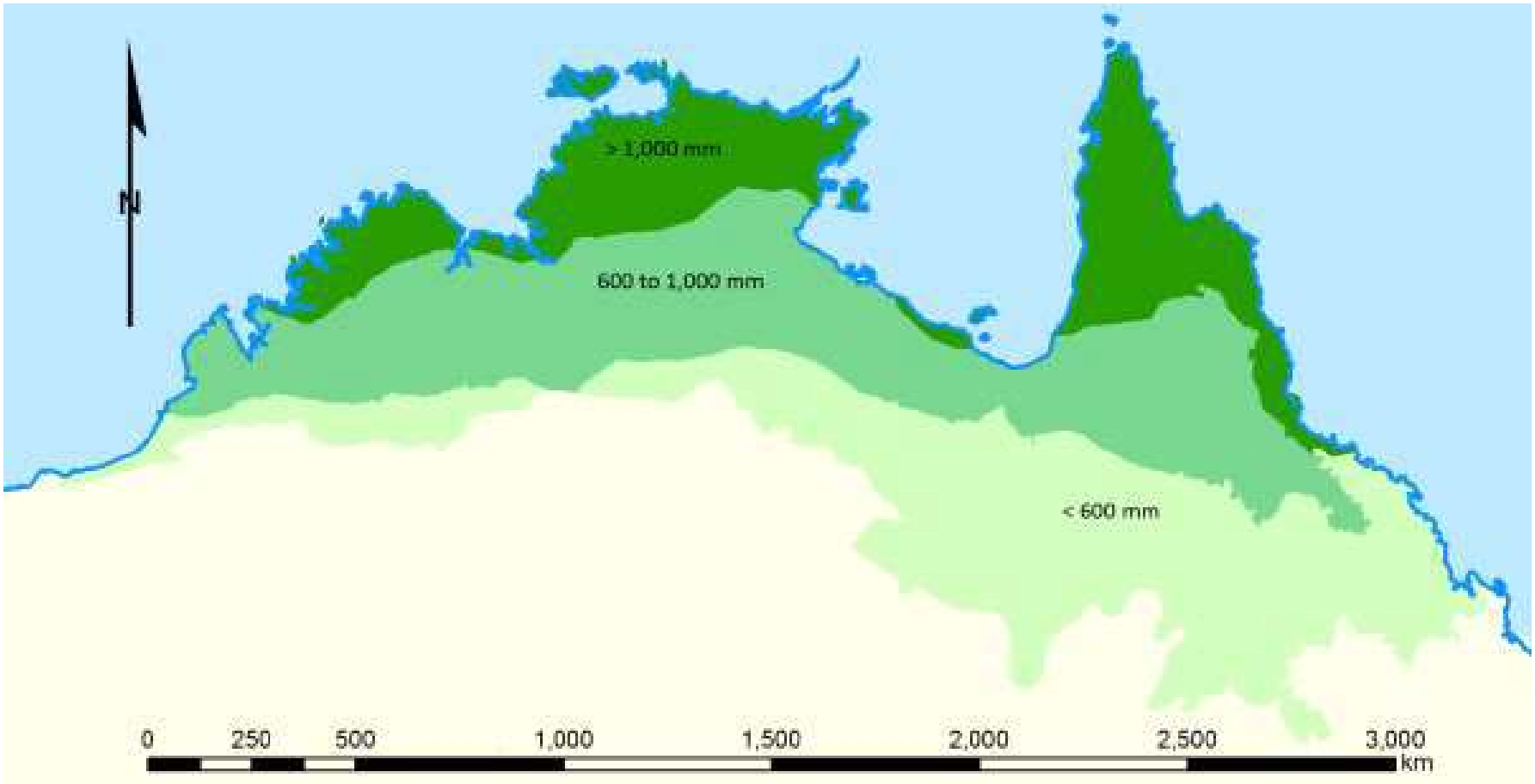
Tree Carbon Sequestration (Mt.C.yr^{-1})



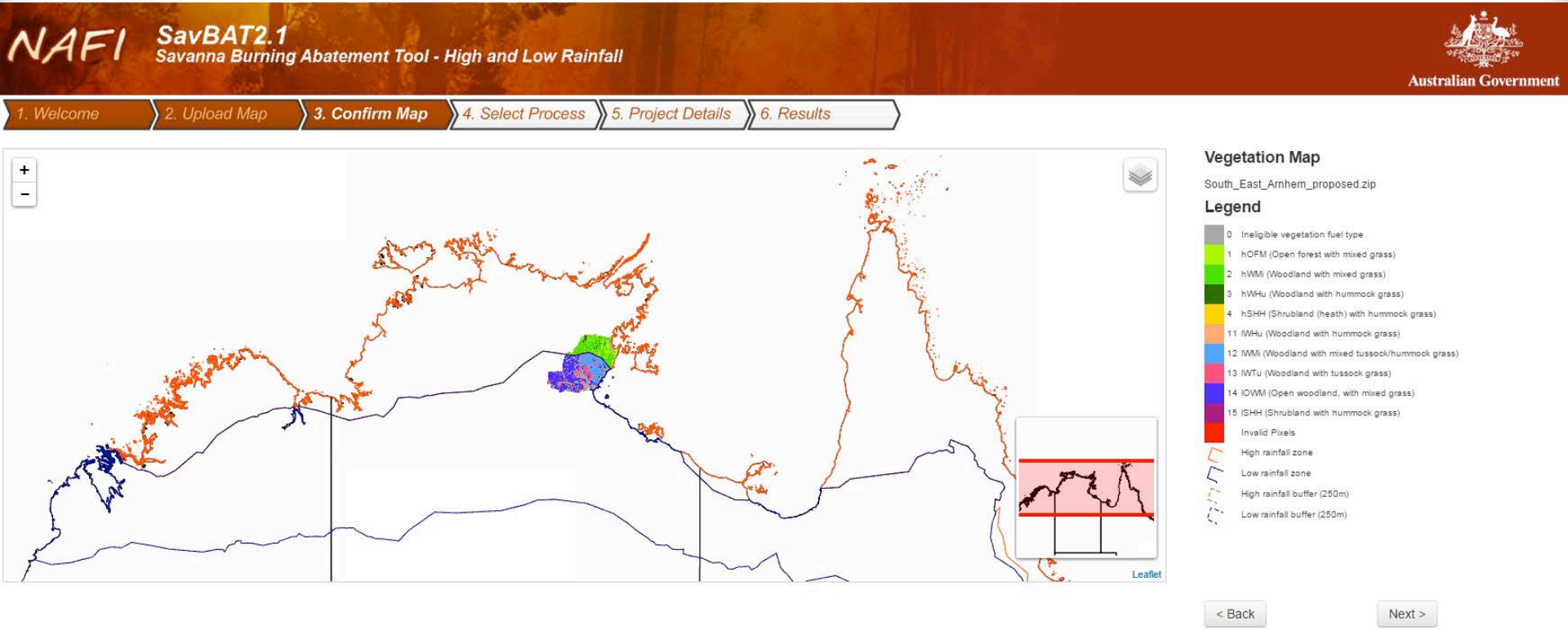
Murphy, B. P., Russell-Smith, J., Watt, F. A. and Cook, G. D. (2009) Fire Management and Woody Biomass Carbon Stocks in Mesic Savannas - In: Managing Fire Regimes in North Australian Savannas – Ecology, Culture, Economy. Russell-Smith, J. and Whitehead, P. (eds), CSIRO Publishing, Canberra, Australia.

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.

Savanna burning climatic envelope



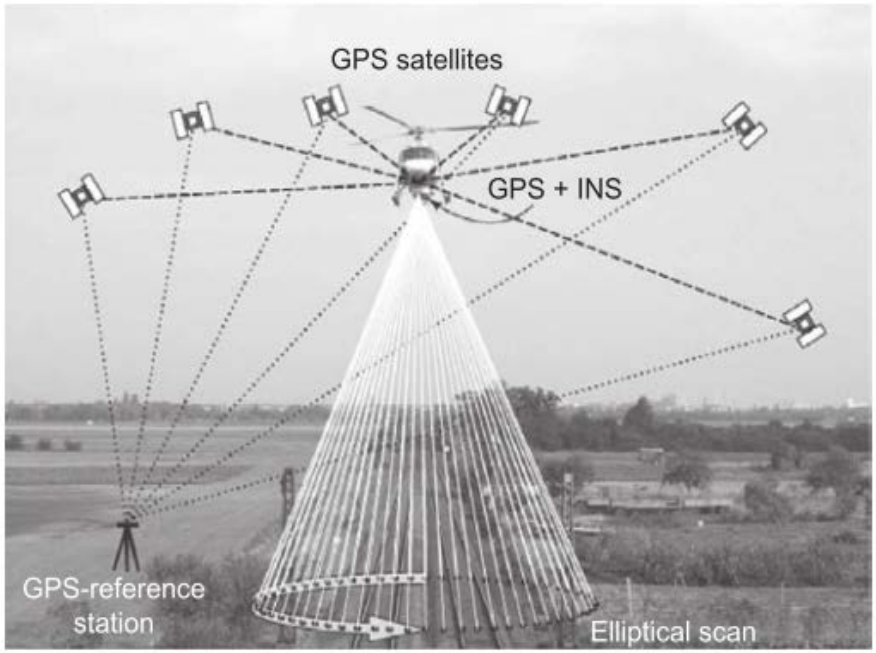
NAFI SavBAT tool for calculating GHG emissions



REMOTE SENSING OF TREE STRUCTURE AND BIOMASS IN NORTH AUSTRALIAN MESIC SAVANNA

GRIGORIJS GOLDBERG—PHD STUDY

LiDAR measures the distance from the sensor to a target, determined by timing the round-trip travel time of a pulse of laser using the speed of light



B) HIGH BIOMASS GRASSY WEEDS

SAMANTHA SETTERFIELD & NATALIE ROSSITER-RACHOR

1) Grassy weeds spreading rapidly

2) Invading range of ecosystems
   - Savanna, riparian, wetlands

3) Driving large changes in fire regimes (esp frequency & intensity)

4) Significant consequences
   - Ecological, economic, social

Grassy weeds increase fire risk

1) Major risk to:
   - Human Life,
   - Infrastructure
   - Tourism
   - Environmental assets
   - Cultural assets

2) Risk will vary with grassy weed species (fuel load, fuel continuity, distribution)

3) Currently not being managed strategically

4) Lack of decision support tools/models to inform management

Aims of project

1. **Assess the risk**
   - Likelihood, magnitude & distribution of risk of grassy weeds to fire regimes in tropical savannas
2. **Provide information for policy/planning**
   - Prioritisation of weed risk for fire management planning

Outputs

1) **Maps of altered fire risk**
   - Current/potential distribution of grassy weeds
   - Current areas of altered fire severity risk
   - Predicted areas of greatest risk

2) **Case studies of spatially-explicit risk assessment** to inform strategic management
   - Assessment of fire risk to community, pastoral & environmental assets
   - Costs & types of management actions to reduce risk
   - Decision support tools (Benefit/costs of risk reduction)

3) **Prioritisation framework for risk management**

C) NT GULF FIRE MANAGEMENT PROJECT
INCLUDING KATE VAN WEZEL'S PHD PROJECT

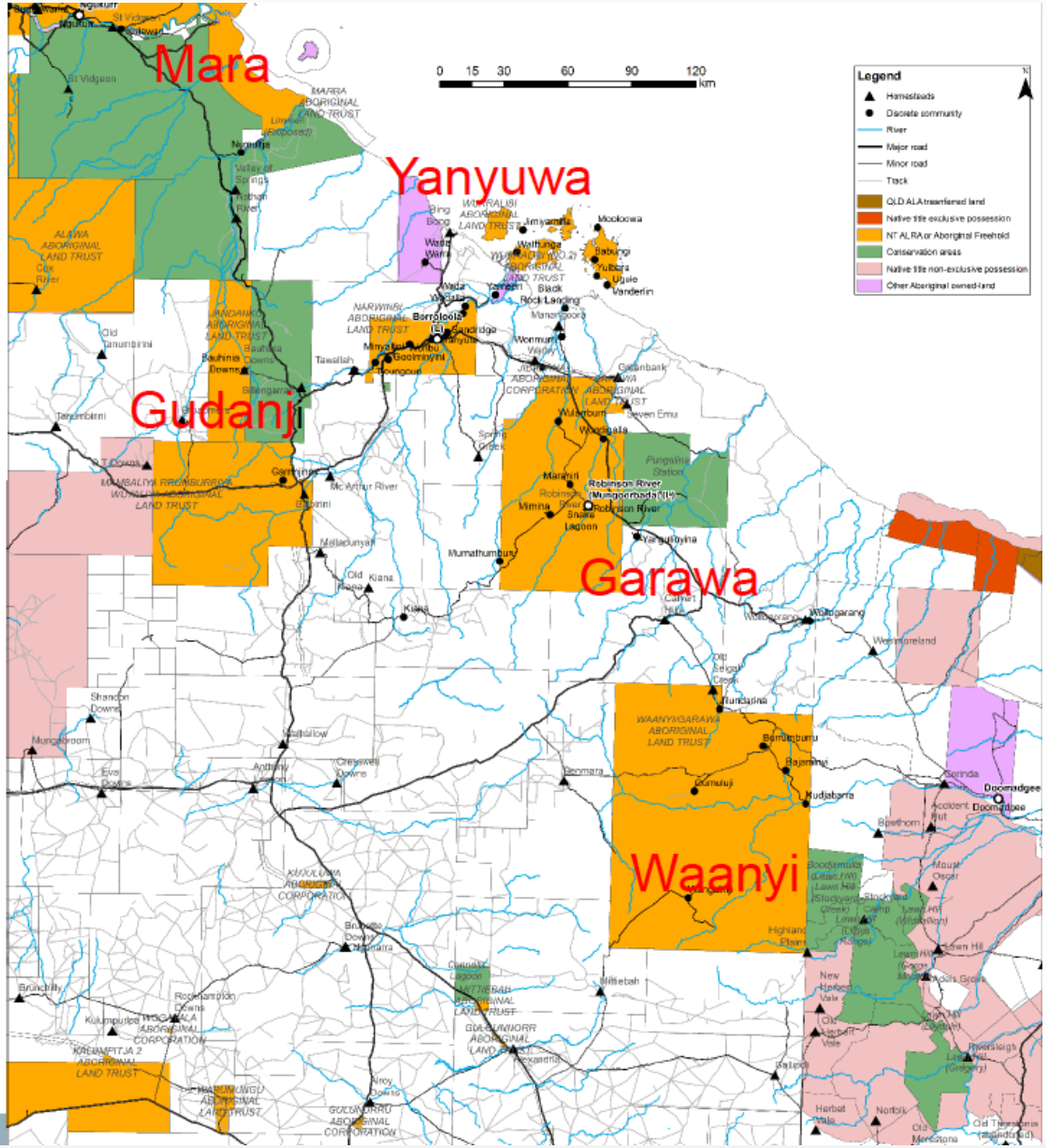
Working with Indigenous community ranger program and regional stakeholders to build:

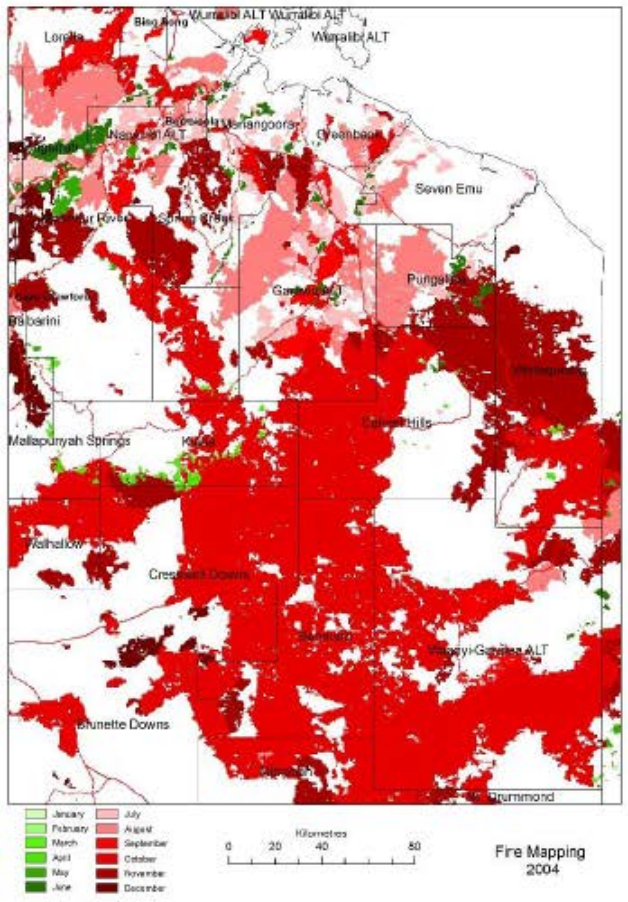
- operational fire management capacity
- appropriate formal governance arrangements (i.e. combining traditional and enterprise / regulatory requirements)
- PES opportunities, starting with C market

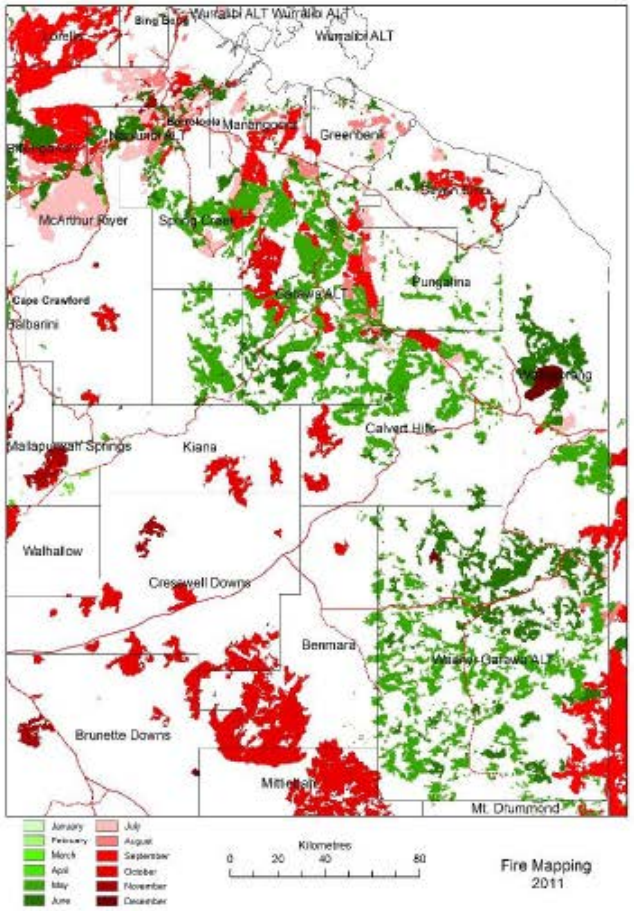
5 Indigenous peoples involved in the action research project

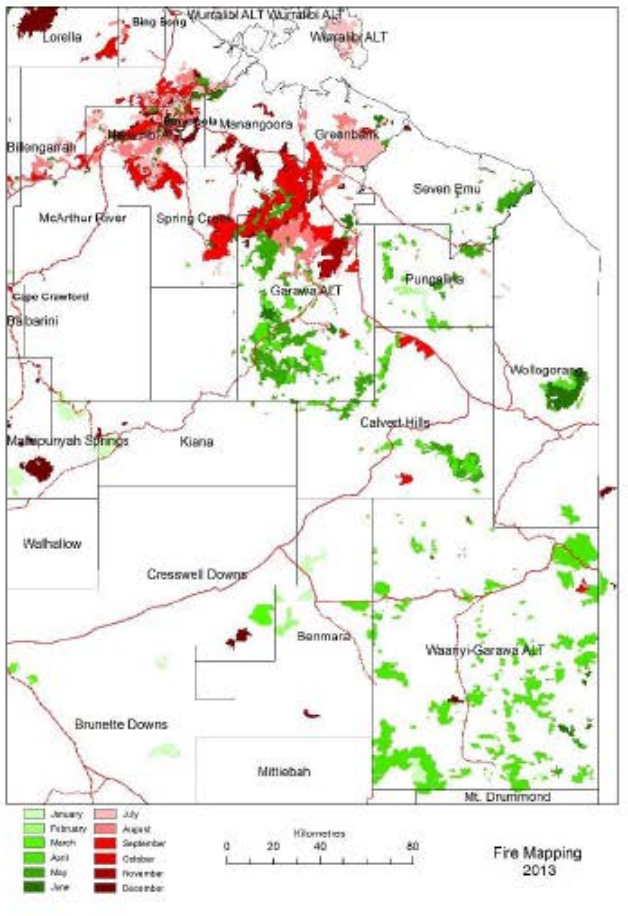
7 Aboriginal Land Trusts

Land area: 30,000 square kilometres









2004 2011 2013

CDU 'NORTHERN HUB' PROJECTS: CURRENT CHALLENGES

1) Developing a better understanding of governance needs across north Australian remote communities

1) Building better linkages with the Emergency Management community & agencies—especially QLD

1) Exploring emerging opportunities and synergies with the 'northern Australia development' agenda (e.g. the "Northern Development CRC")

2) Consolidating project activities with the publication of a book, *A sustainable future for northern Australia*, due 2017

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