Evidence of Altered Fire Regimes in Spinifex Grasslands

N.D. Burrows, A.A. Burbidge & P. Fuller

Department of Conservation & Land Management,Western Australia

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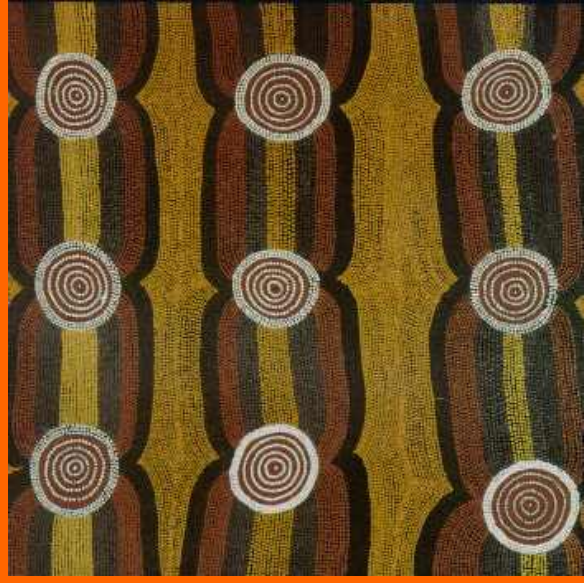
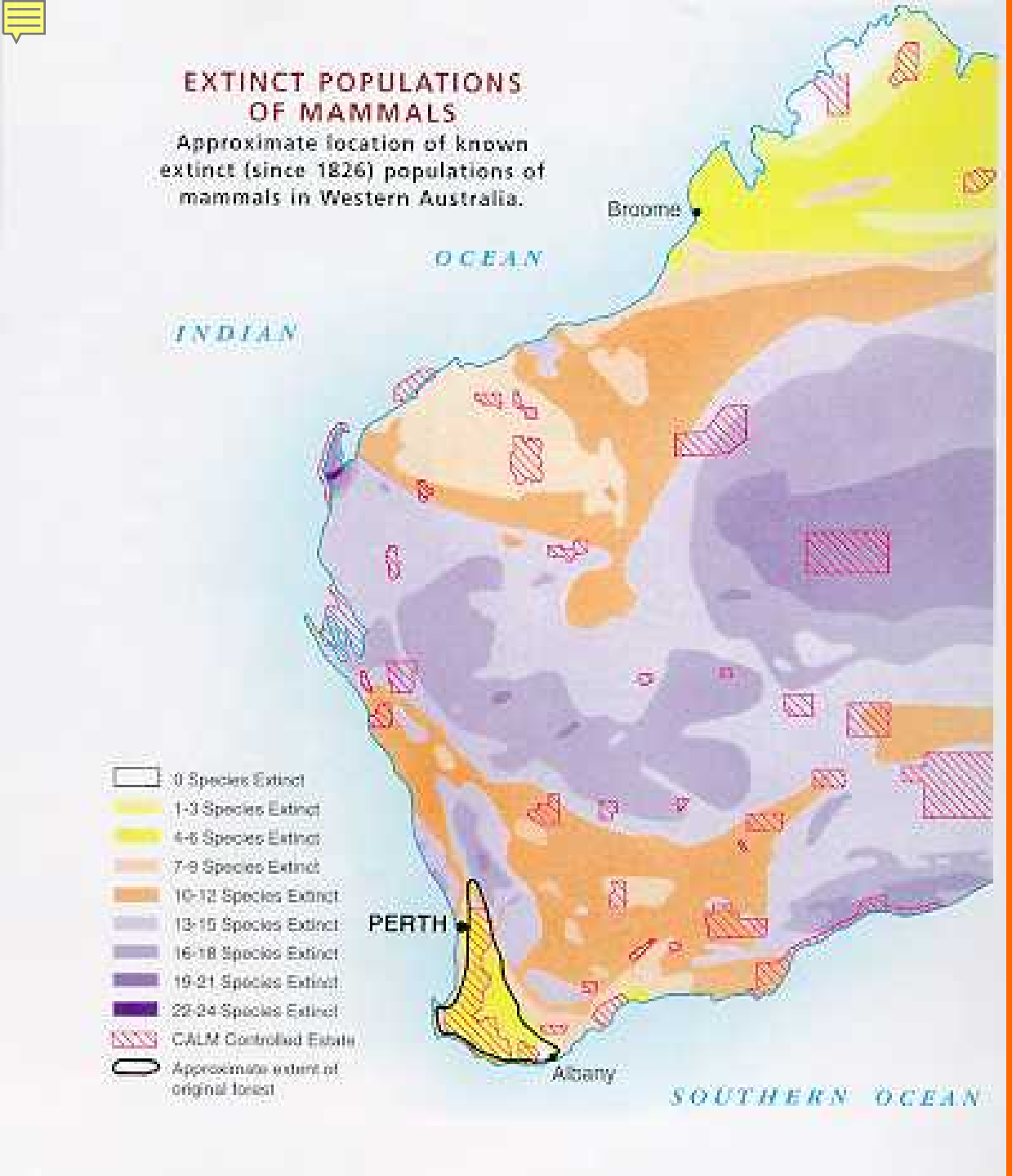




Native Mammals Desert Regions

- 9 species presumed extinct
- 15 species endangered, locally extinct

Possible causes of mammal decline

Caring for country (photo courtesy Ngaanyatjarra Council LMU)

People *inherit*, *exercise* and *bequeath* customary responsibilities to manage their traditional country

Using fire - the right way (photo courtesy Ngaanyatjarra Council LMU)

Study aims

- Document traditional use of fire
- Seek evidence of an altered fire regime

Outcomes

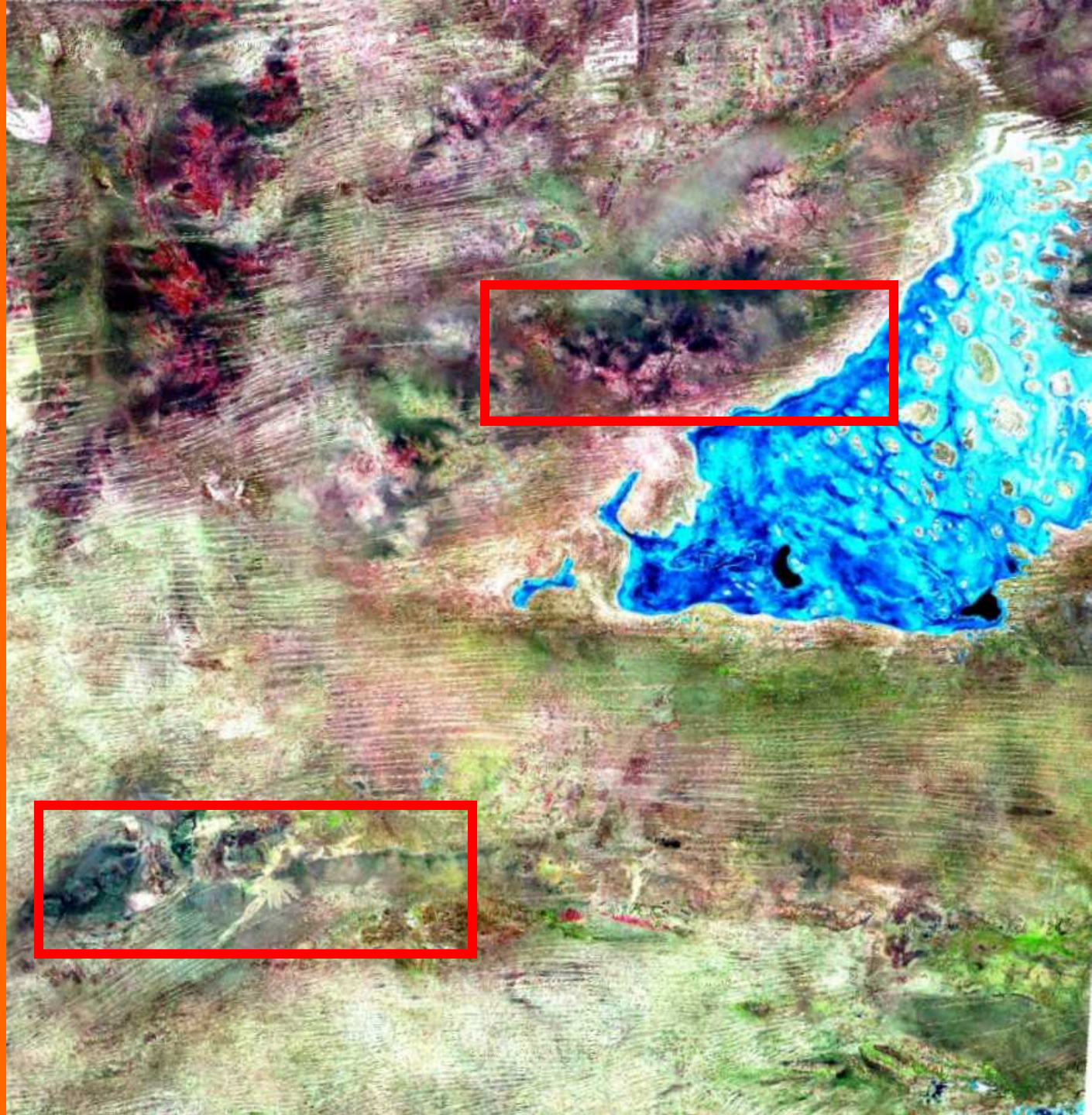
- Ecologically appropriate fire regimes
- Co-management opportunities?

Impacts

- Conservation of desert biodiversity
- Aboriginal communities participate in land management on their own terms
- Aboriginal communities maintain connections with country. Traditional knowledge and skills maintained.

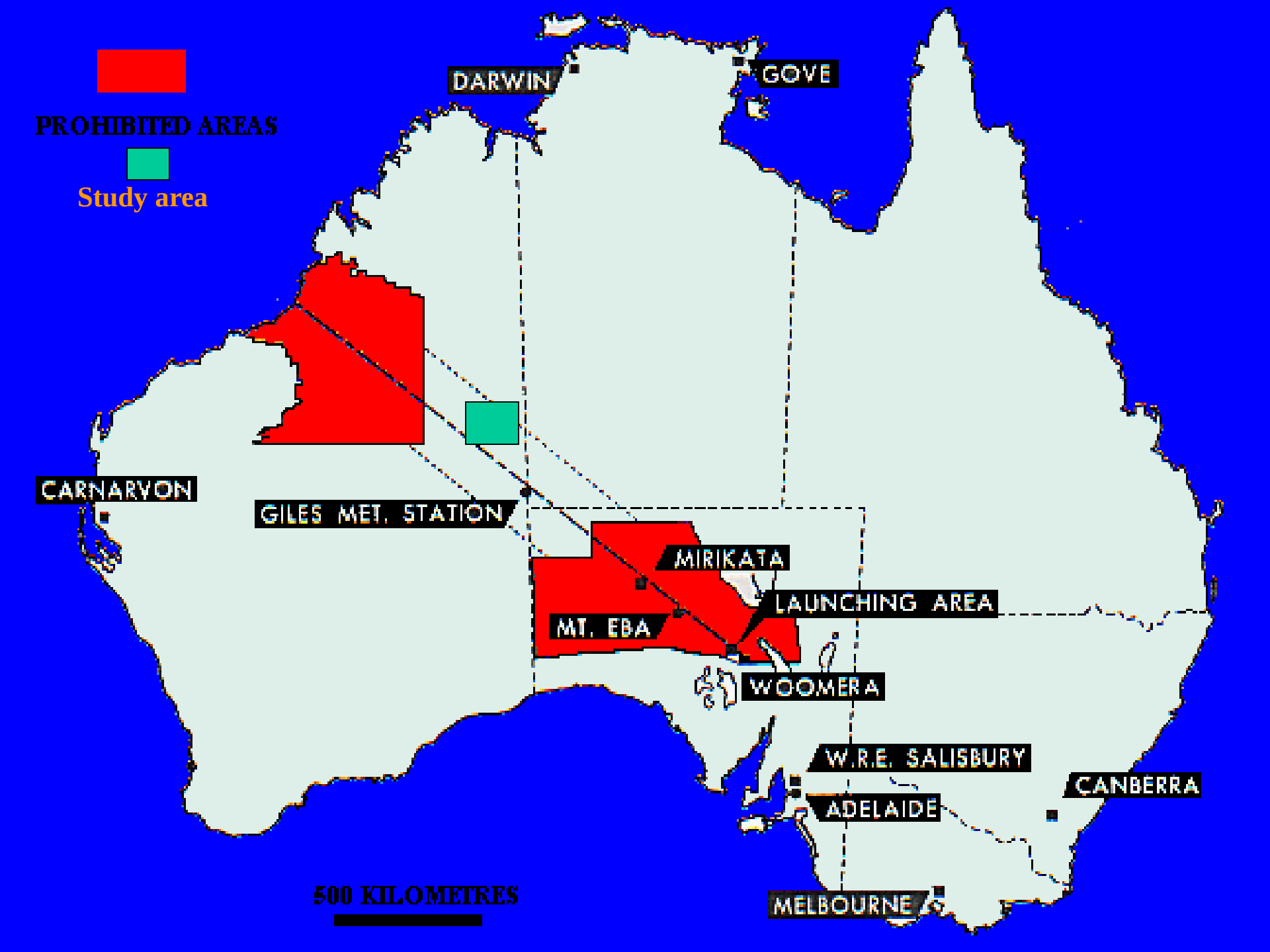
Study Sites

1. Last place known to be occupied by people living traditional lifestyle
2. Early B&W aerial photography



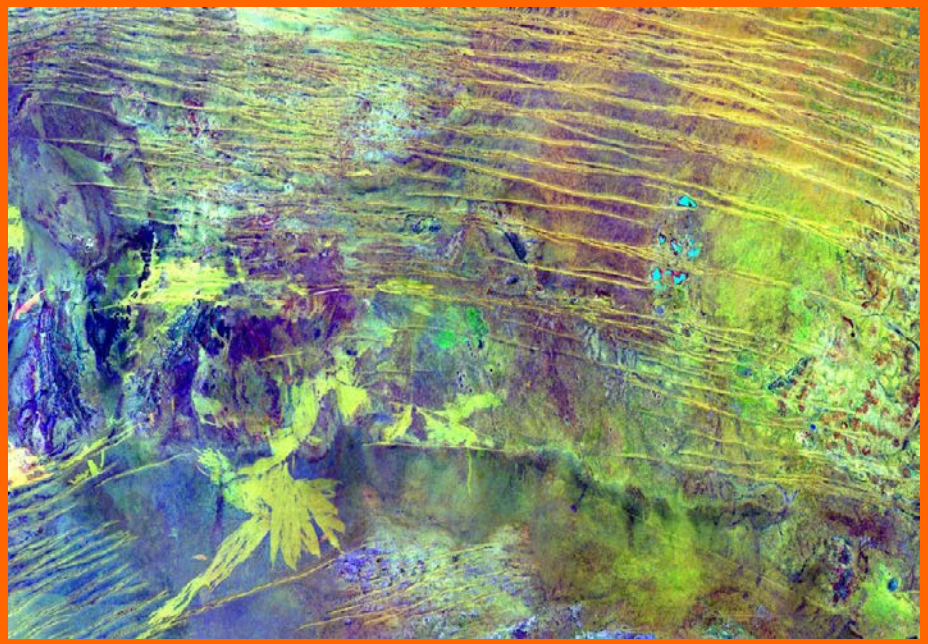
Blue Streak launch

Black Night rocket


PROHIBITED AREAS
Study area
DARWIN
GOVE
CARNARVON
GILES MET. STATION
MIRIKATA
LAUNCHING AREA
MT. EBA
WOOMERA
W.R.E. SALISBURY
CANBERRA
ADELAIDE
MELBOURNE
500 KILOMETRES

Study approach

- Interviews with Pintupi men
- Field trip
- Photographic and satellite evidence of historical fires.



Summary of interviews & field trip with Pintupi men

- Use fire for many purposes
  - procure food
  - access
  - clean-up country
  - signaling
  - spiritual
  - fun

Summary of interviews with Pintupi men

- Everyone lit fires
- Fires lit every day
- Most fires small but some large
- Burnt when spinifex was dense

Role of Women (Mardu)

(source: Douglas & Rebecca Bird – Anthropologists U Maine)

- **The role of women in both burning and in reaping the benefits of mosaic burning has generally remained unexplored.**

- **Women benefit in the short term through burning patches of old-growth spinifex as a result of increases in their own hunting returns, particularly hunting sand goanna and perenti.**

- **Women may actually experience greater relative gains in foraging returns over the short term as a result of mosaic burning than men.**

- **Strong positive effect of mosaic burning on the efficiency of hunting burrowed prey (mostly by women) but not large mobile prey**

- “Especially in fine-grained mosaics, Mardu often encounter and collect a wide array of fruits (especially Solanum spp.), roots and tubers (*Vigna lanceolata* and *Cyperus bulbosus*), larvae (Cossid spp.), nectar (primarily *Grevillea eriostachya*), and grass, shrub, and tree seeds (especially *Eragrostis eriopoda* and *Acacia* spp.) (Tonkinson 1991; Veth and Walsh 1988; Walsh 1990).”

- “Analyses of these other aspects of Mardu foraging are currently underway. So far our focus is on differences between the major Wandajarra "hunt types": wana hunting for burrowed game and gun hunting for large game.”

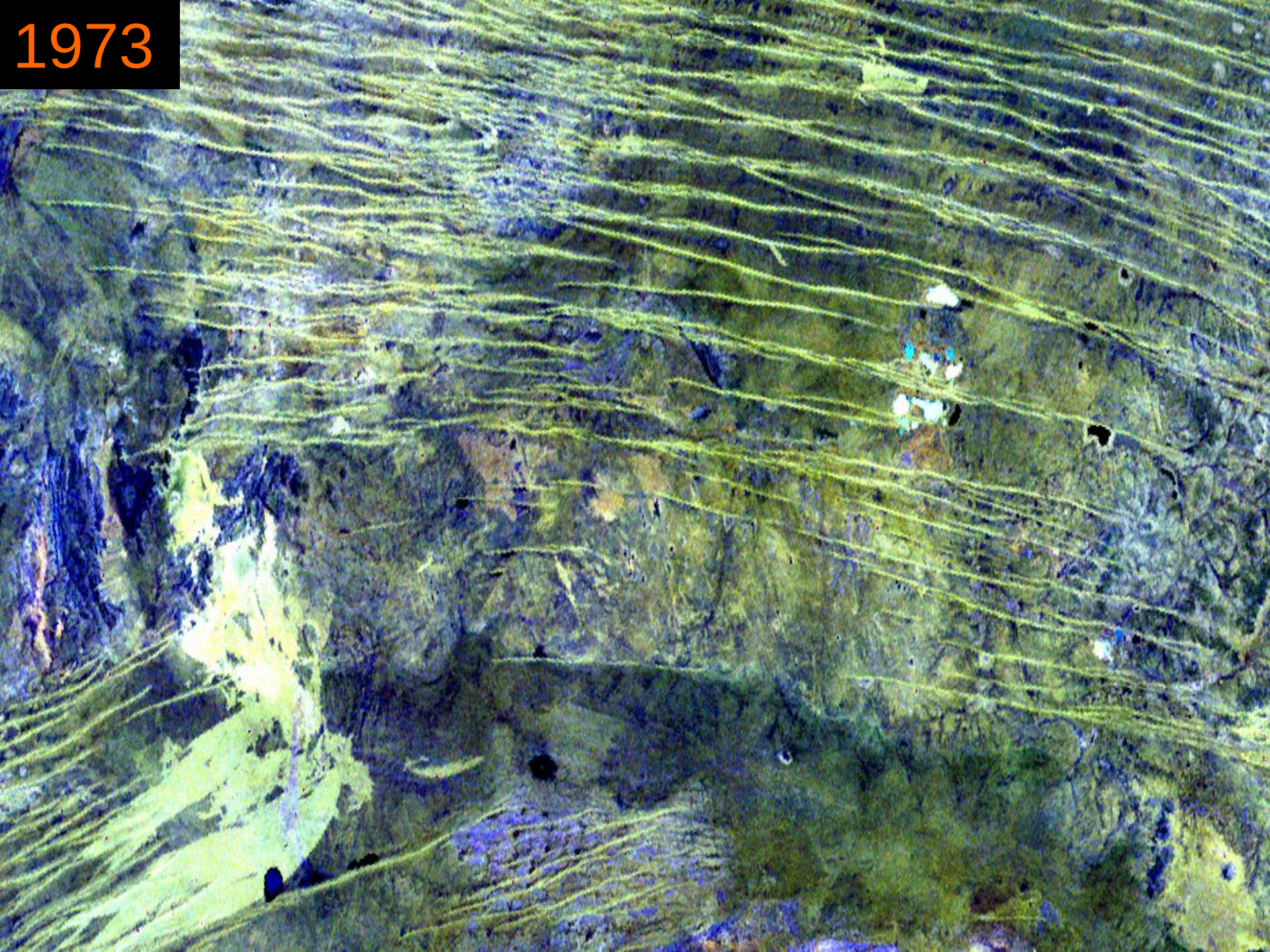
"You could burn up country, go away, visit family and relatives, come back again after rains when animals would be there. Kids would burn up country to catch lizards. Fires would make it easier to track animals. People would walk and keep up with the fire so they could hit kuka on the head as they came out".

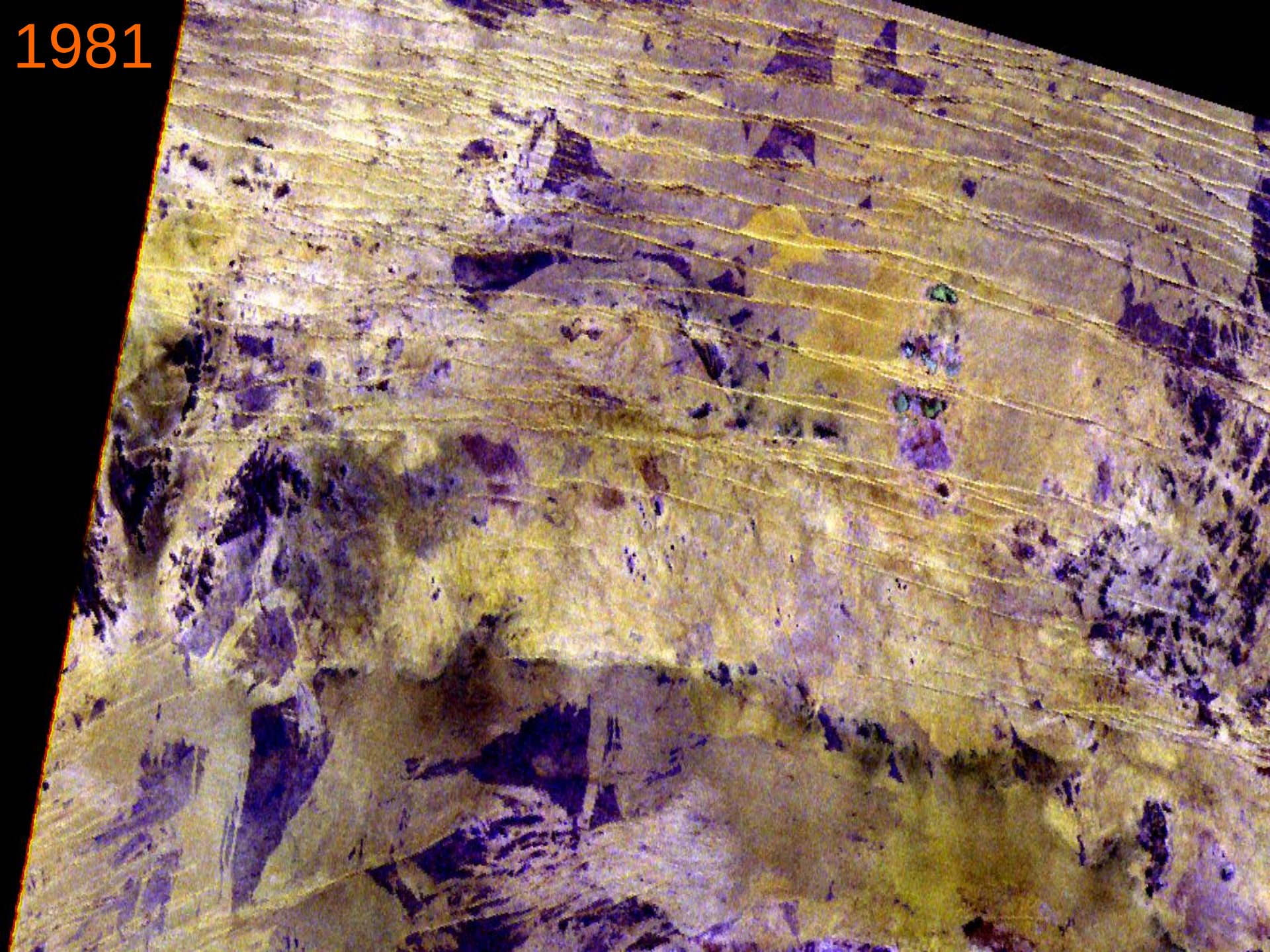
"No need to go hunting with fire anymore because there is no kuka there"

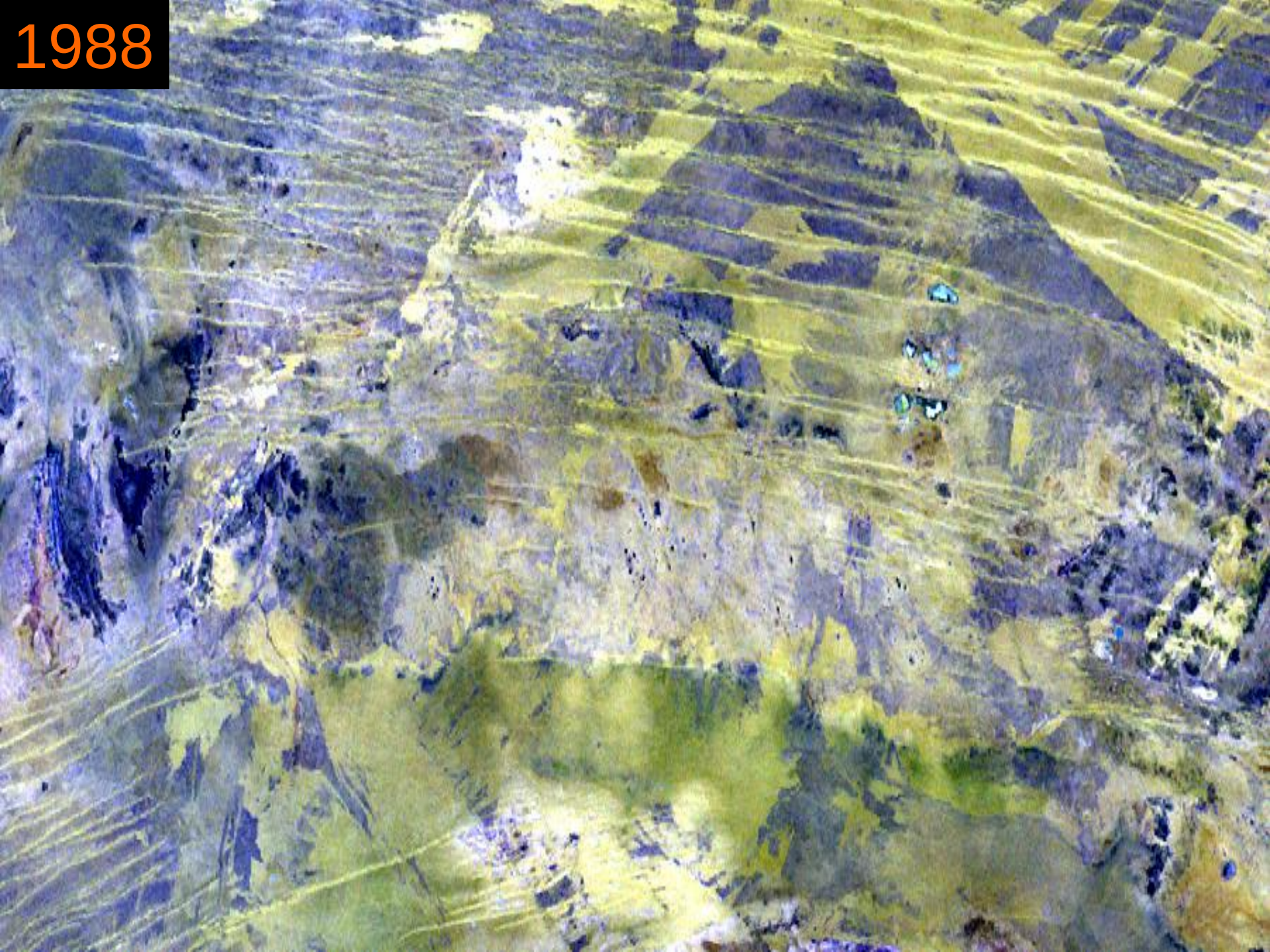
Billy Nolan Tjapinati

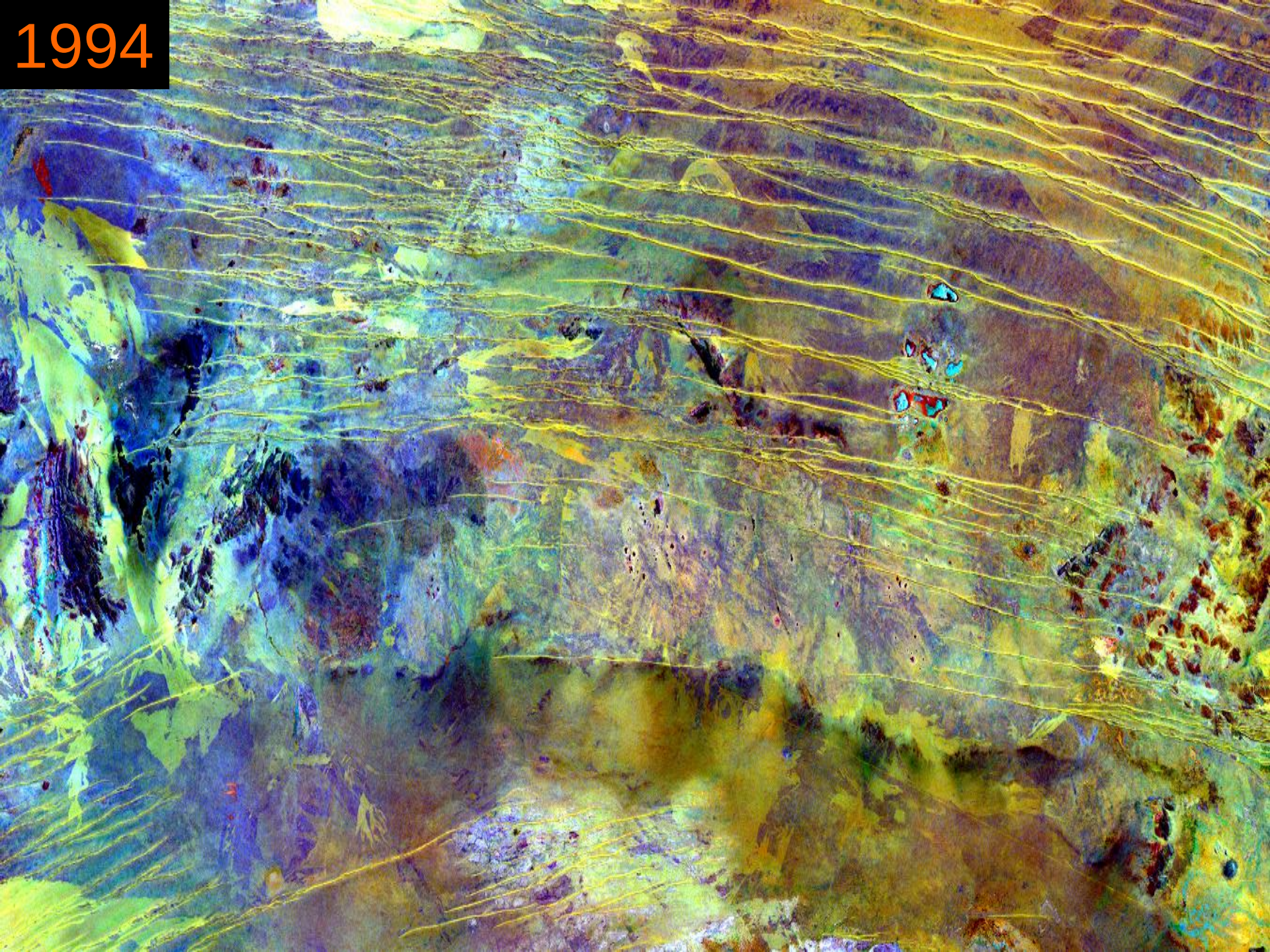
Photographic and satellite evidence

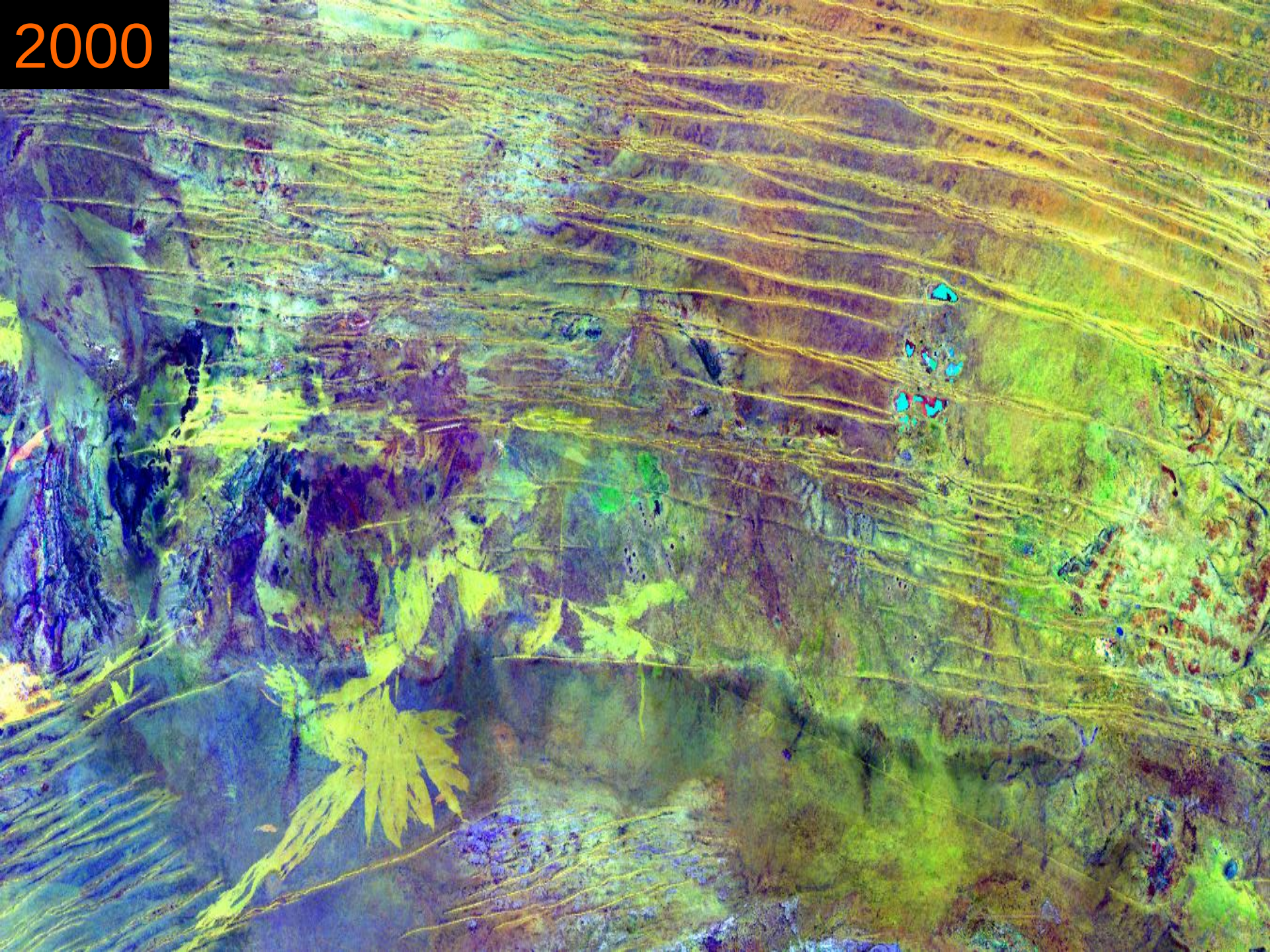
Pintupi patch-burning, Great Sandy Desert (RAAF 1953)


1973


1981


1988

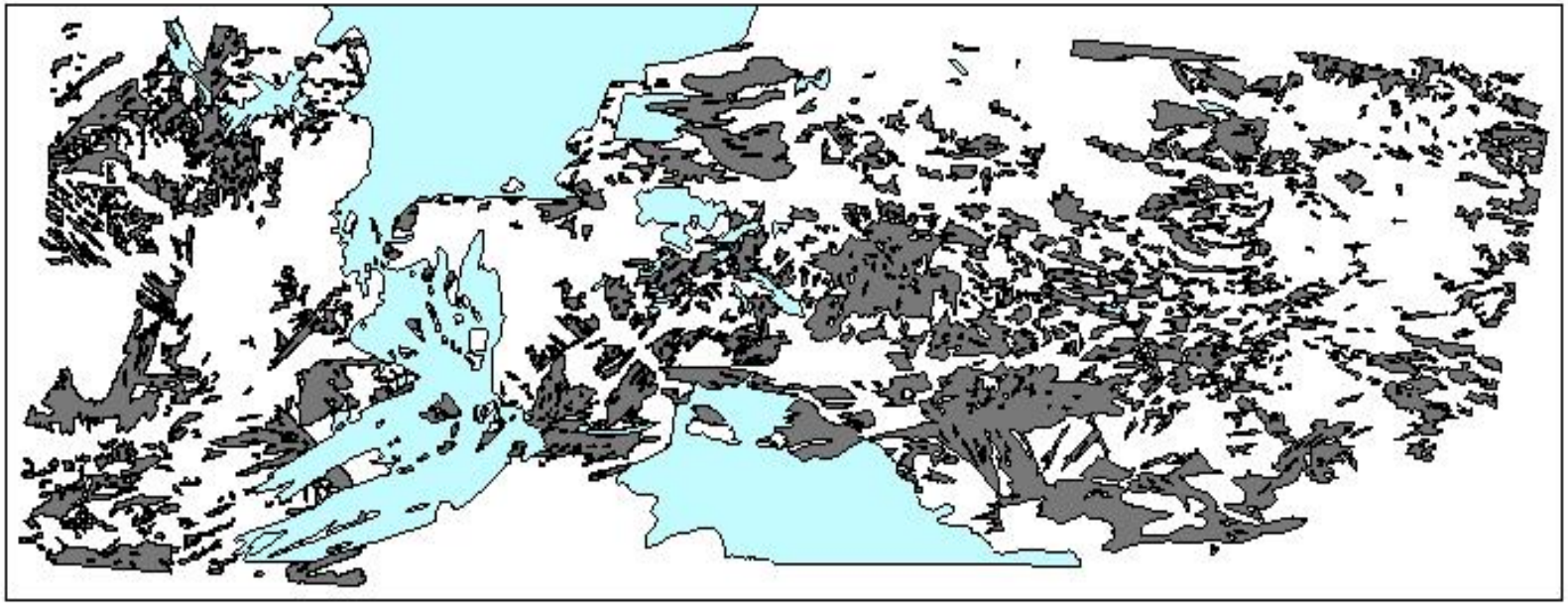

1994


2000

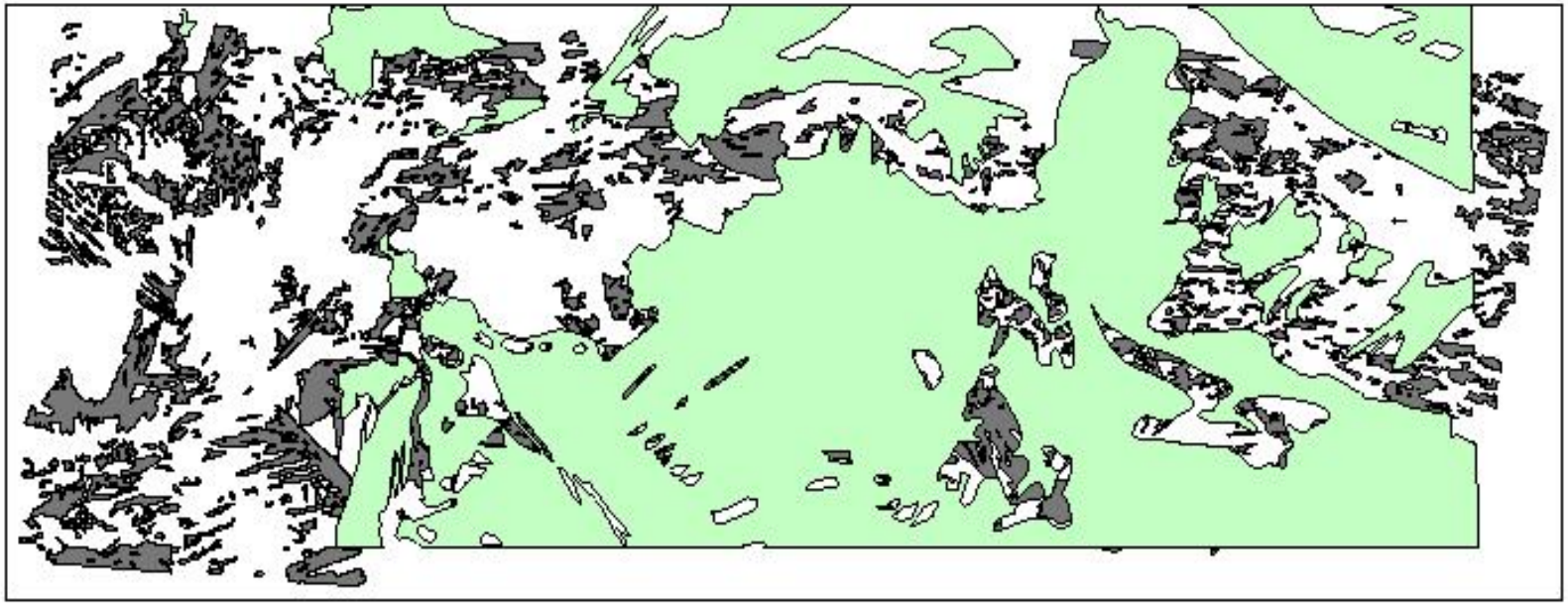
Recently burnt patches
1953 aerial photography (241,210 ha)

47% recently burnt (<5 years) 8% non-flammable

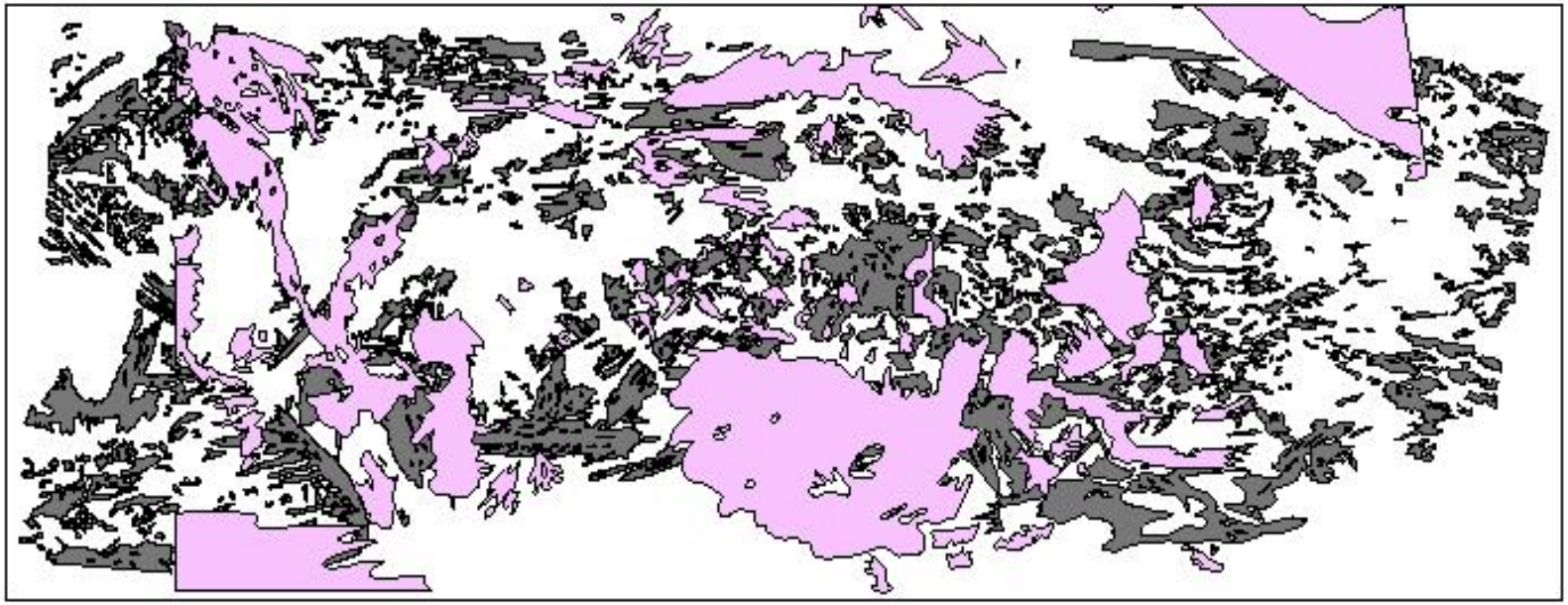
Recently burnt patches
1973 Landsat imagery



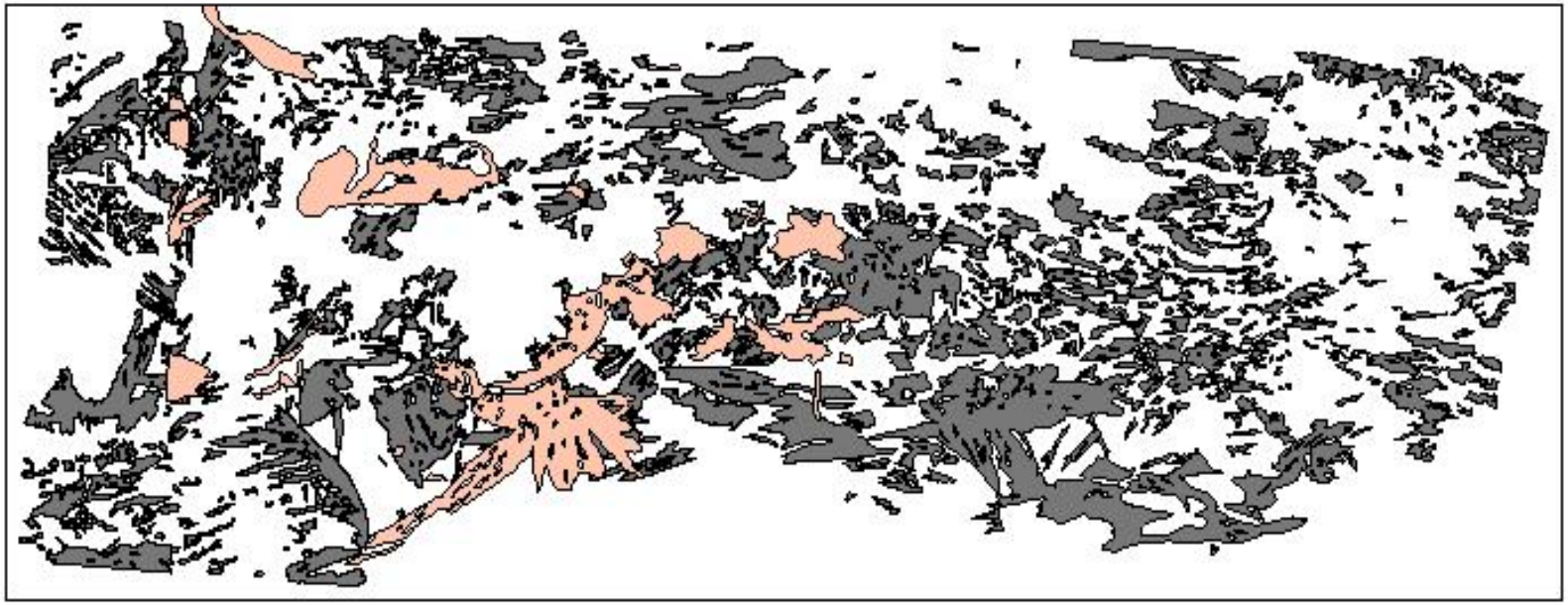
Recently burnt patches
1988 Landsat imagery



Recently burnt patches
1994 Landsat imagery



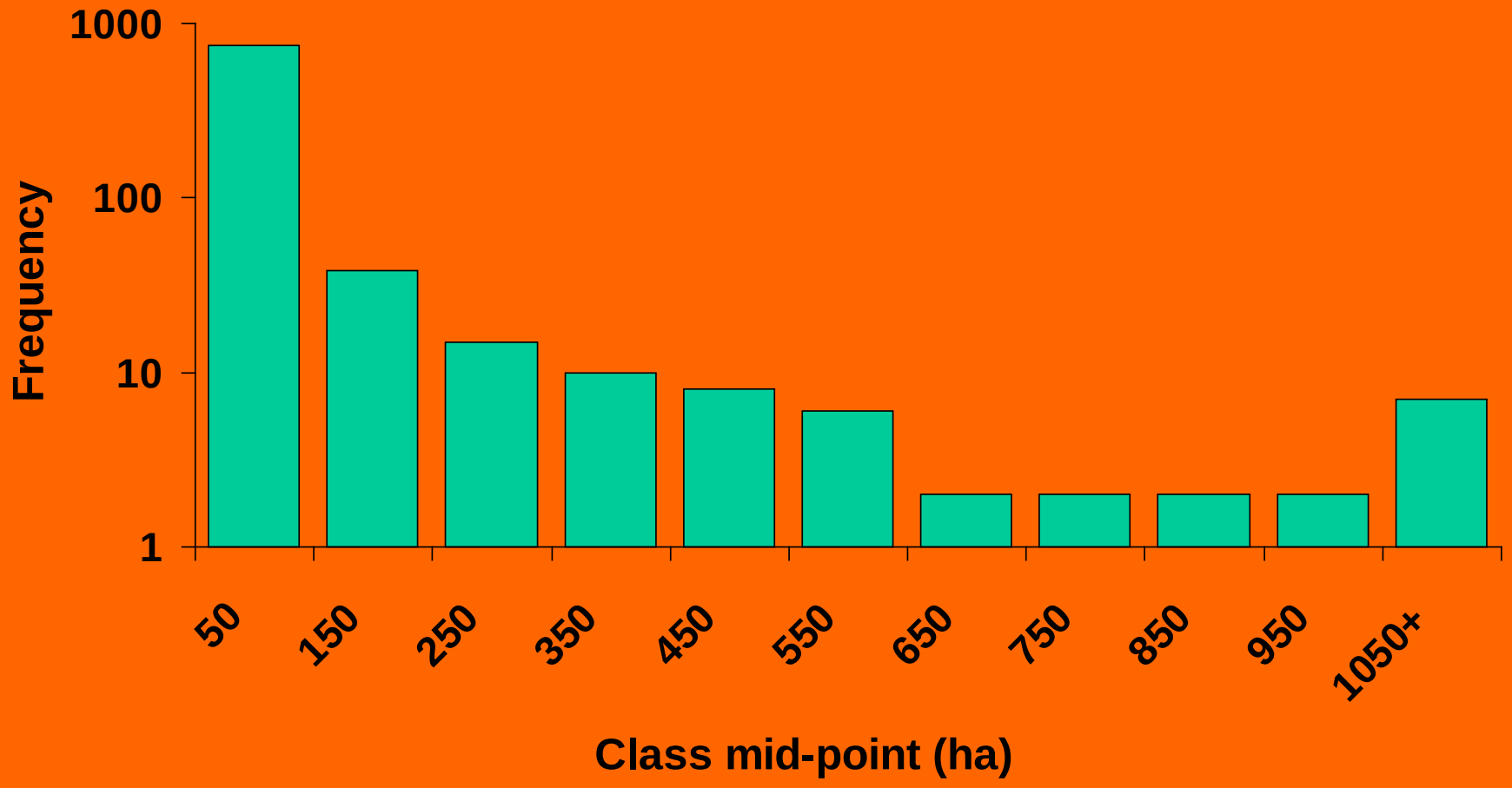
Recently burnt patches
2000 Landsat imagery



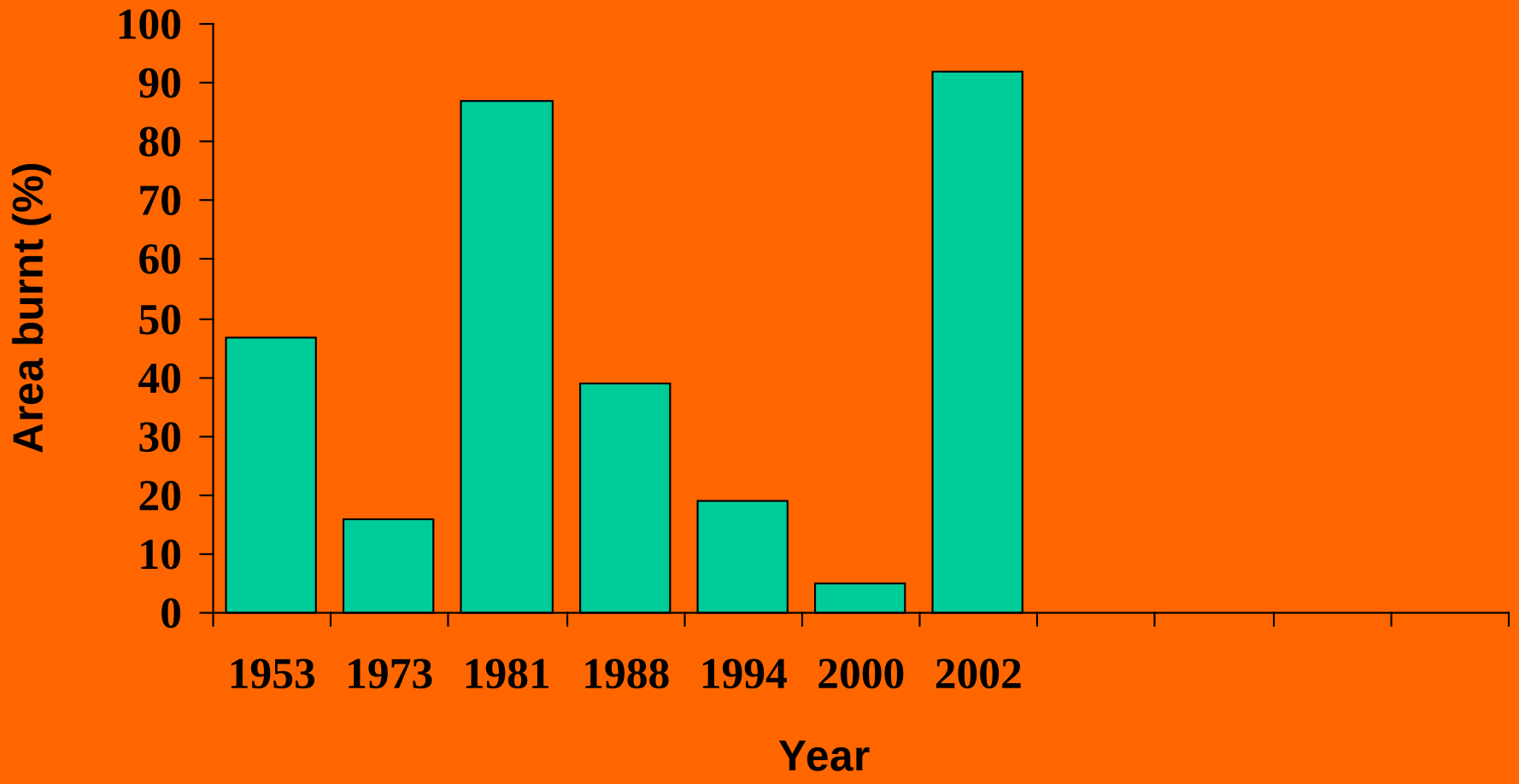
Study area (241,210 ha) recent (< 5years?) burnt patch statistics 1953 – 2002/03

Year	No. of recent burnt patches	Total area burnt (ha)	Total burnt perimeter (km)	Mean (ha)	Range (ha)	75th per/tile (ha)	50th per/tile (ha)
1953	846	54,234 (22%)	3,888	64	0.5 - 6,005	32	5
1973	24	38,014 (16%)	518	1,583	15 - 24,780	236	61
1981	4	210,576 (87%)	1,324	52,644	17,113 - 129,646	-	-
1988	19	94,447 (39%)	814	4,970	1 - 71,346	1,581	390
1994	83	46,589 (19%)	1,053	561	8 - 11,992	234	91
2000	25	11,121 (4.6%)	392	445	19 - 3,683	412	78
2002/03	4	221,913 (92%)					

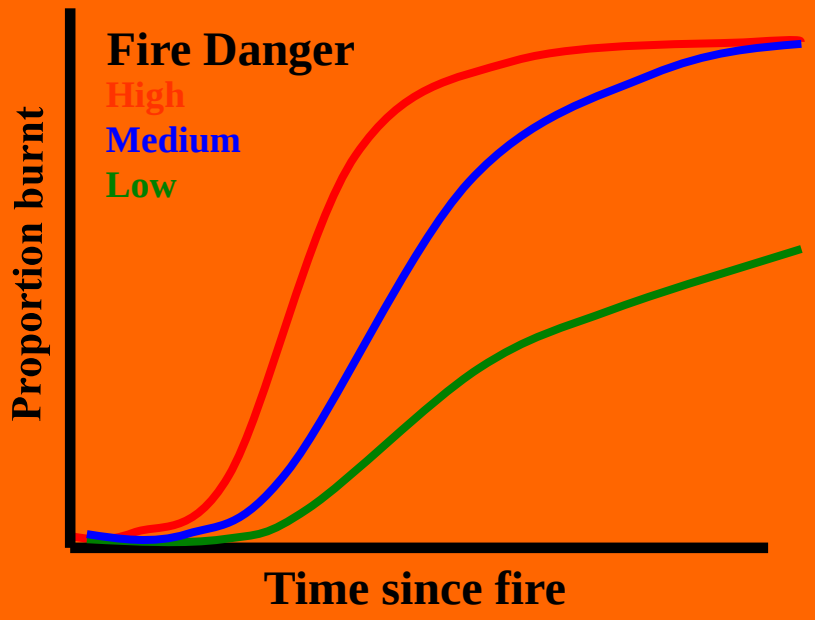
Size class frequency distribution of recently burnt patches (<5 yo)- 1953



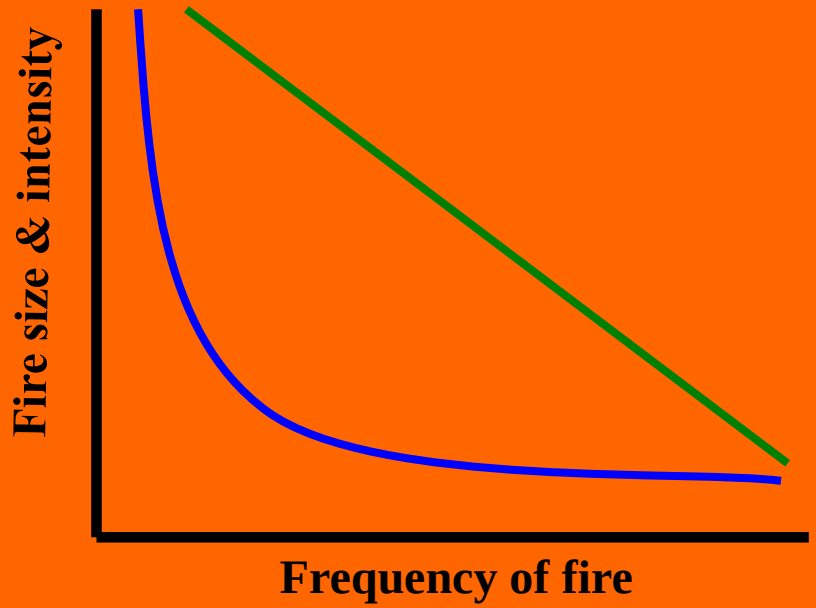
Proportion of study area recently burnt (<5 yrs)



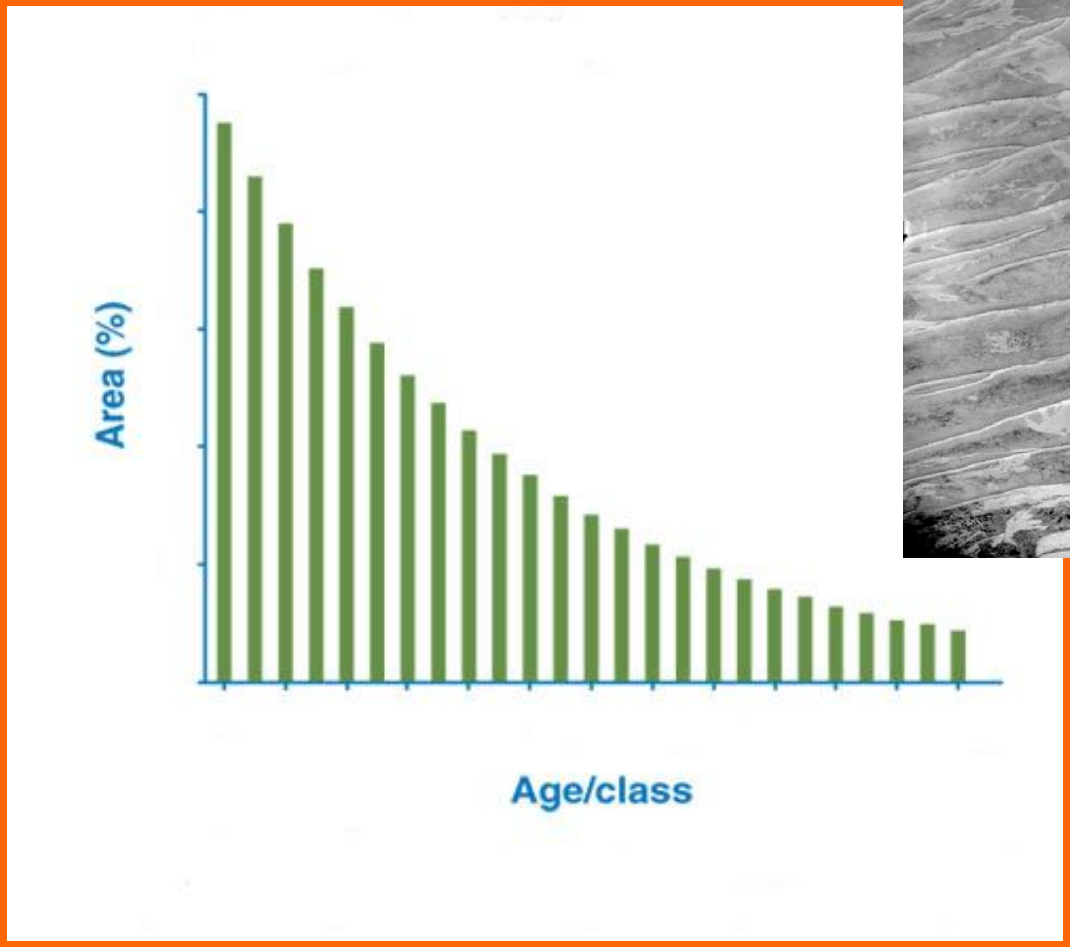
Proportion of landscape burn-out under various conditions of fire danger (weather & fuel dryness) with time since last fire



Potential size & intensity of fire with frequency of fire introduction into the landscape



Frequent introduction of fire into the landscape



Conclusions

- Pintupi knowledge of fire is profound.
- Pintupi use of fire was deliberate, skilful and frequent.
- Oral and photographic evidence of traditional use of fire is consistent.
- Dramatic change in fire regime on study area over the last 50 years.

Conclusions

Dramatic landscape changes on study area:

- During occupation by traditional owners: frequent patch-burning resulted in fine-grained complex mosaic (habitat heterogeneity)
- Today, cycle of infrequent, very large fires resulting in coarse-grained simple mosaic (habitat homogeneity)

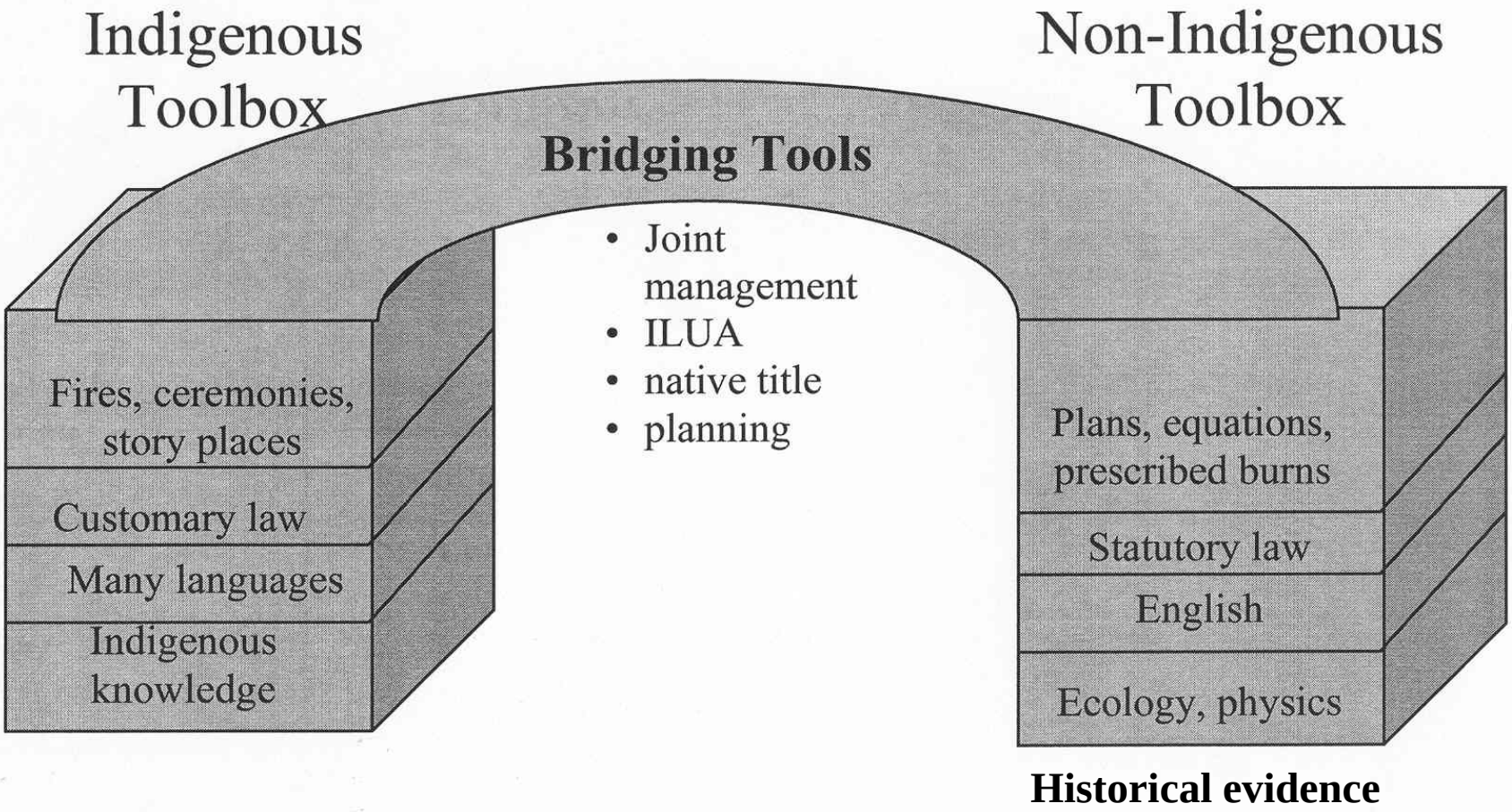


Figure 1
The emerging concept of dual toolboxes for land and fire management

Bridging Tools

- Enabling legislation
  - Native title rights
- Alternative Management Arrangements
  - Joint management, decision making role
- Employment, training & economic development opportunities
- Partnerships
  - Knowledge generation & exchange
  - Joint planning
- Communication
  - Language, culture

Co-management of country

An opportunity for Aboriginal people in remote communities to participate in an economic activity on their own terms while at the same time ensuring that important connections with country and traditional knowledge and skills are maintained.