

PLANT BIOGEOCHEMISTRY OF URANIUM MINERALISATION



Michael Neimanis, Dr. Steven Hill,
Steve Hore

CRC LEME – University of Adelaide
5TH Sprigg Symposium, 2007 CRCLEME

ACKNOWLEDGEMENTS

- CRC LEME
- PIRSA Minerals Division/PACE
- Dr Steven Hill (University of Adelaide),
Steven Hore (PIRSA)
- Heathgate Resources
- D & M Sprigg, Arkaroola

INTRODUCTION



Image: Steve Hill

- Plant chemistry as expression of substrate chemistry;
- Penetrative & accumulative capacity;
- Track record;
- Negligible uptake of method in Australia.

METHODS



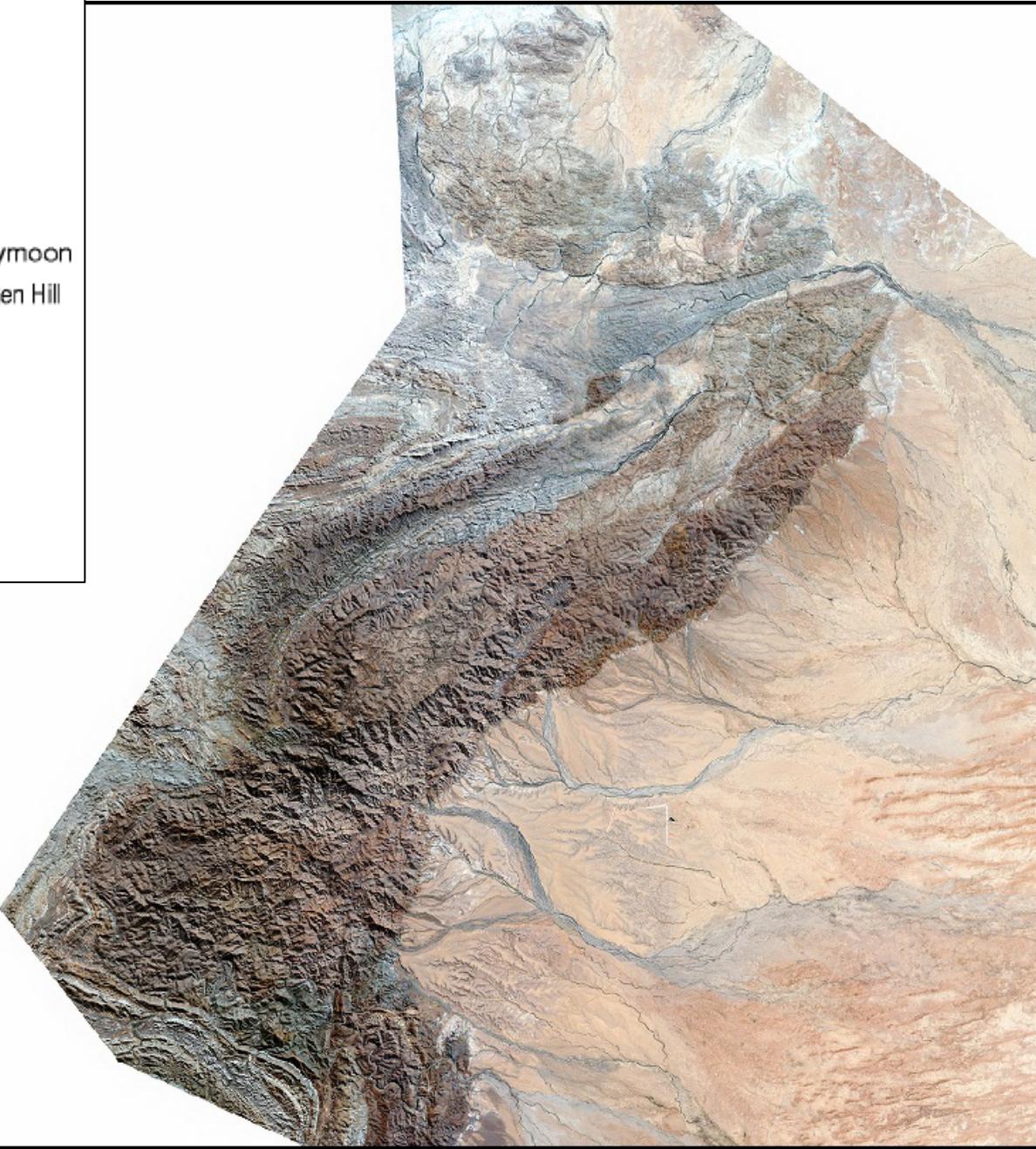
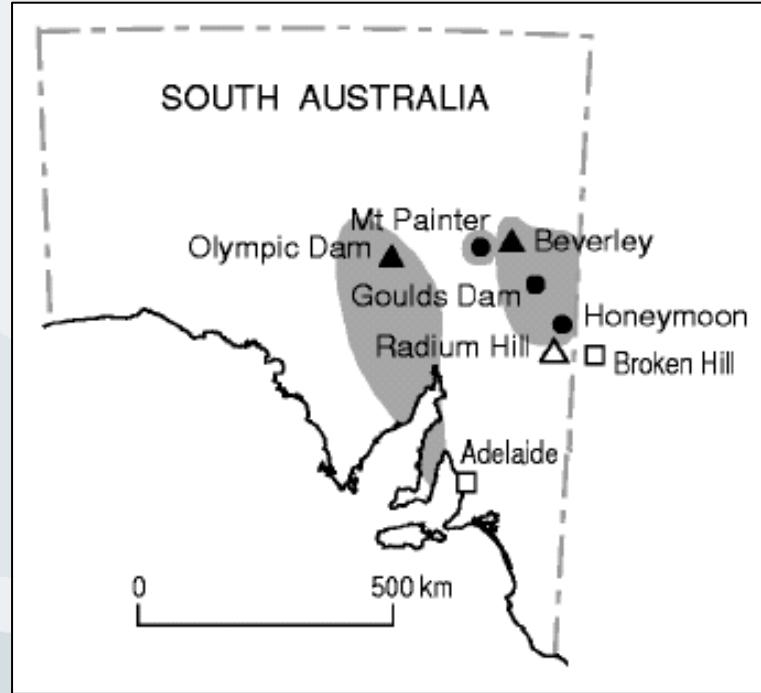
- ‘Clean’ sample collection
- Low-heat oven drying
- Milling
- Assay: 53 element ICP-MS 1VE-MS through ACME Labs, Canada

Image: Steve Hill

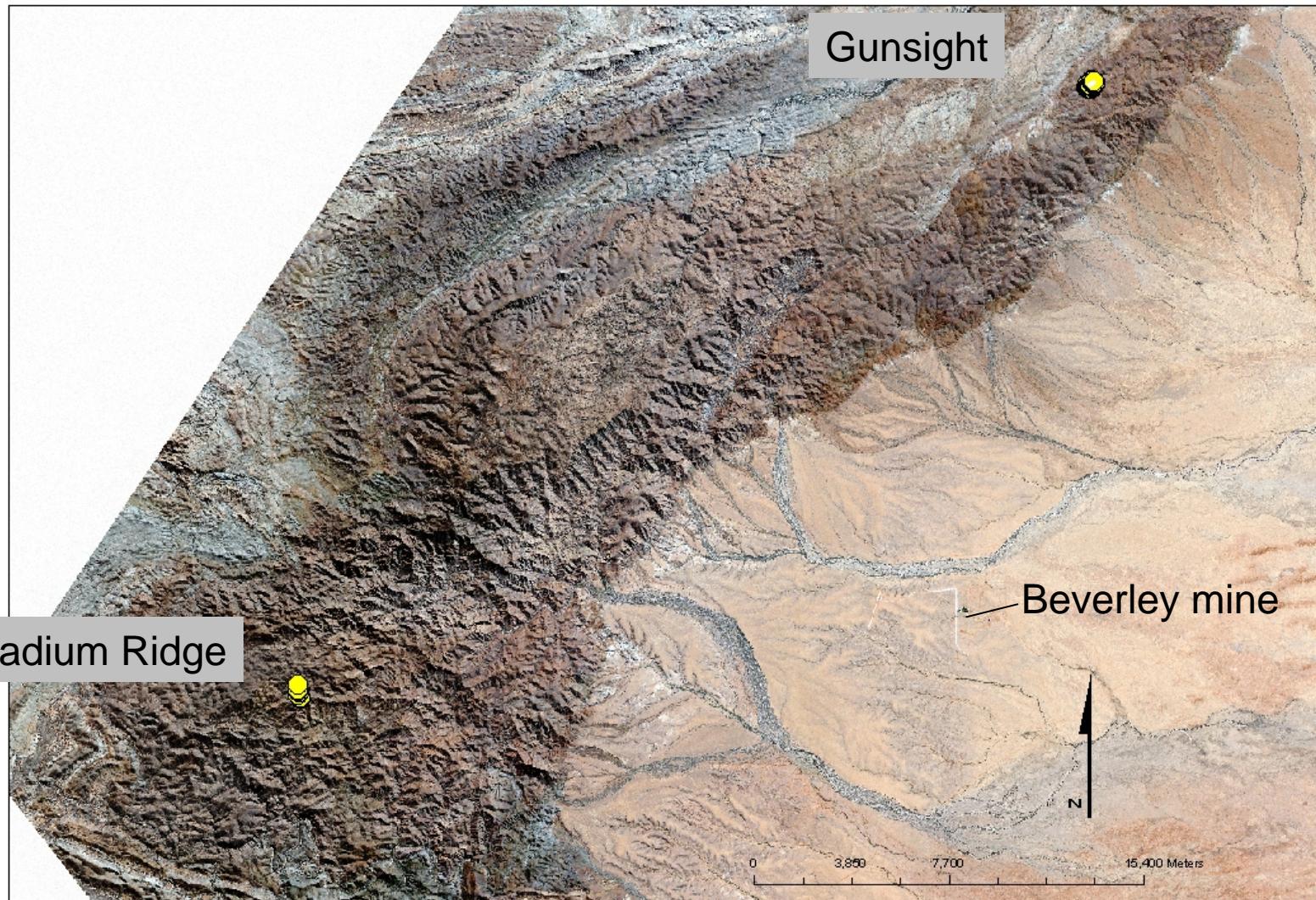
FIELD METHODS



Image: Jess Davey



NORTHERN FLINDERS RANGES SAMPLING



Radium Ridge

Eucalyptus gillii

0.12 – 6.59 ppm U

4.79 – 33.42 ppm Cu

0.01 – 0.02 ppm Th

Eucalyptus intertexta

0.06 – 6.49 ppm U

2.74 – 12.21 ppm Cu

0.01 – 0.04 ppm Th

GUNSIGHT PROSPECT



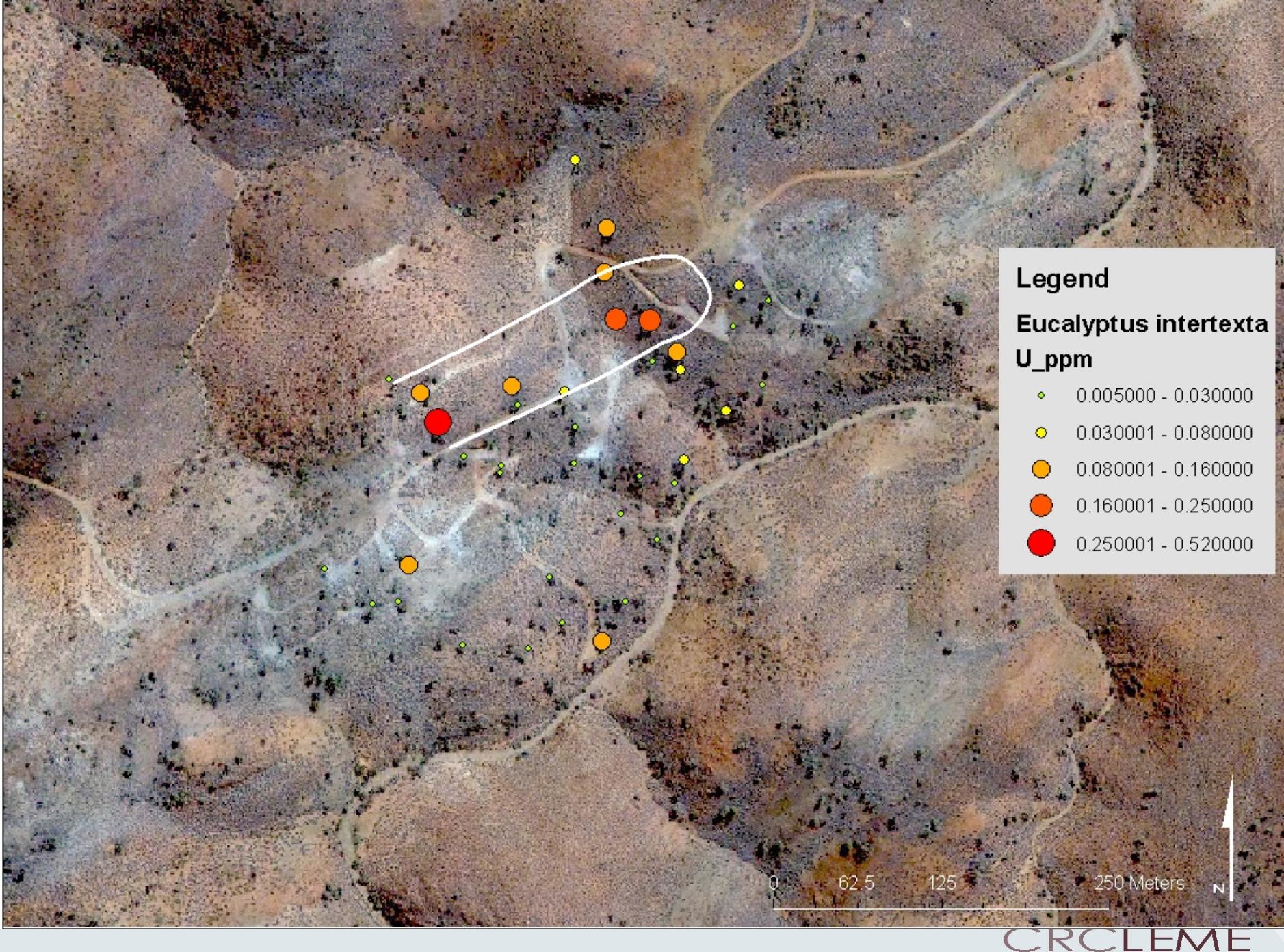
Image: Steve Hill

GUNSIGHT MINERALISATION

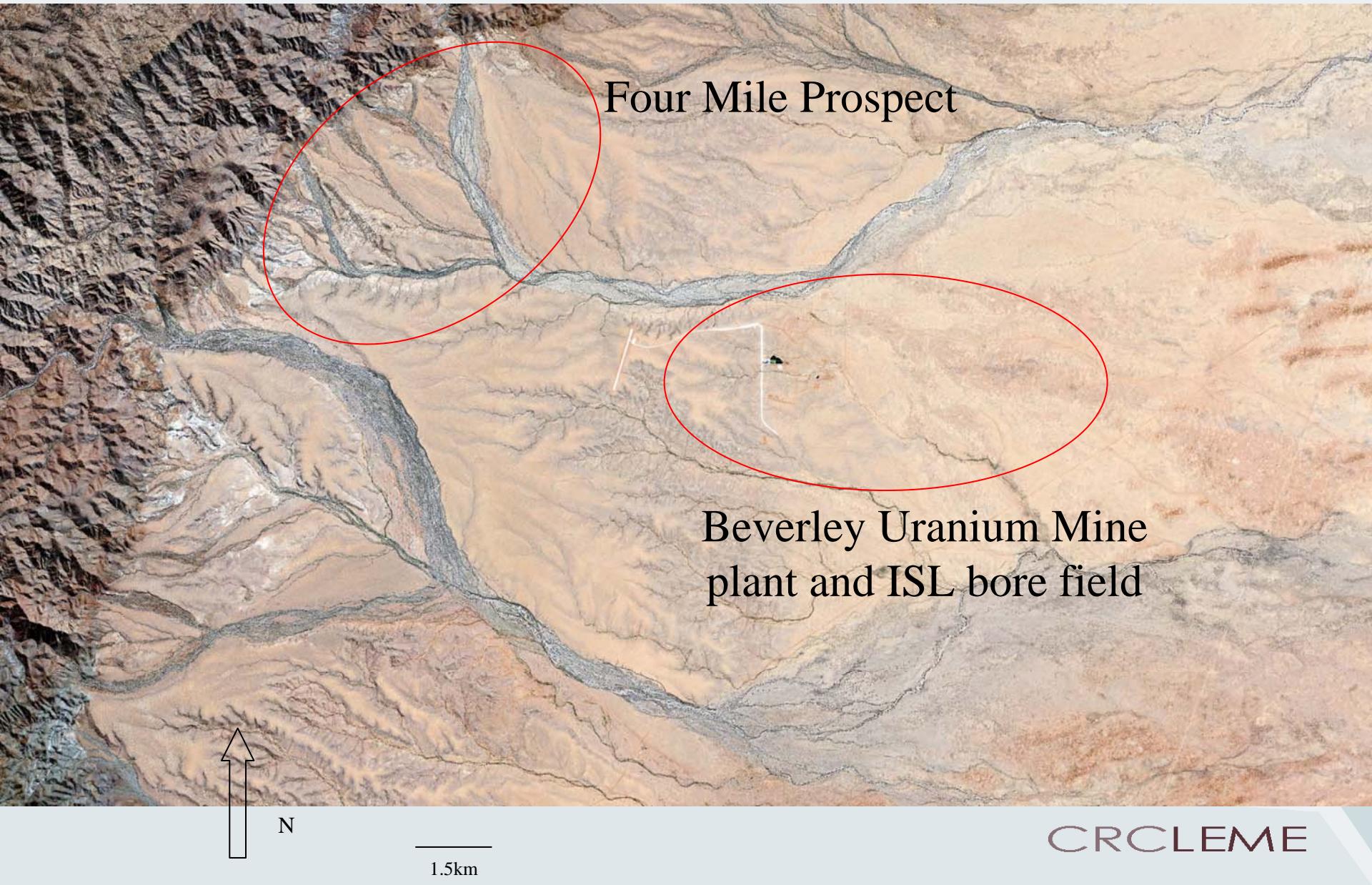


Image: Steve Hill

CRCLEME



BEVERLEY – FOUR MILE



FOUR MILE PLANT SAMPLING SURVEY

- BACKGROUND
 - Location
 - Access
 - Limitations
 - Concurrent research

FOUR MILE SAMPLING PROGRAM

- Vegetation sampling program January 2007
- >300 samples taken from 8 species
- Heathgate soil sampling March 2007

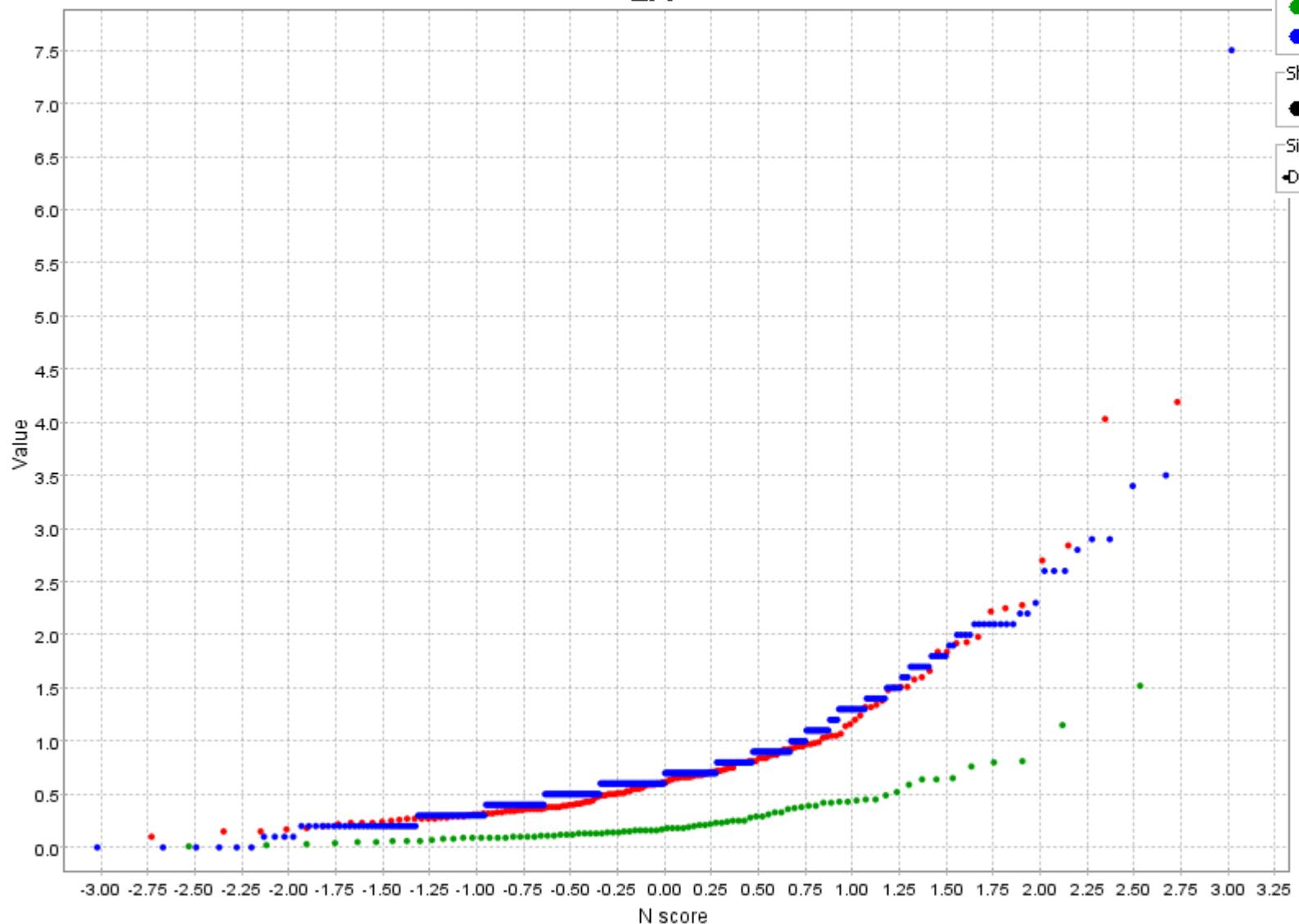


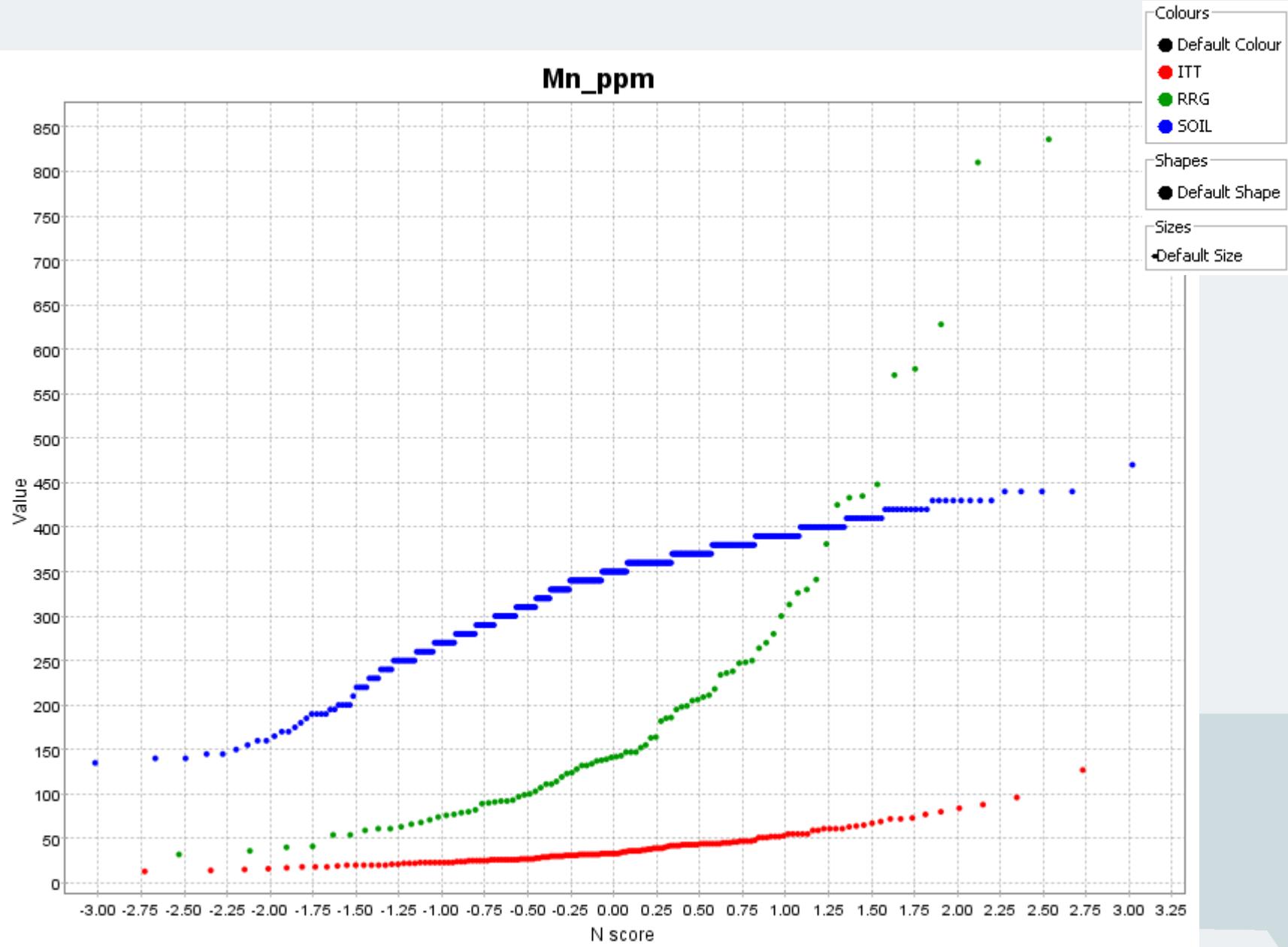
FOUR MILE SAMPLING: TARGET SPECIES



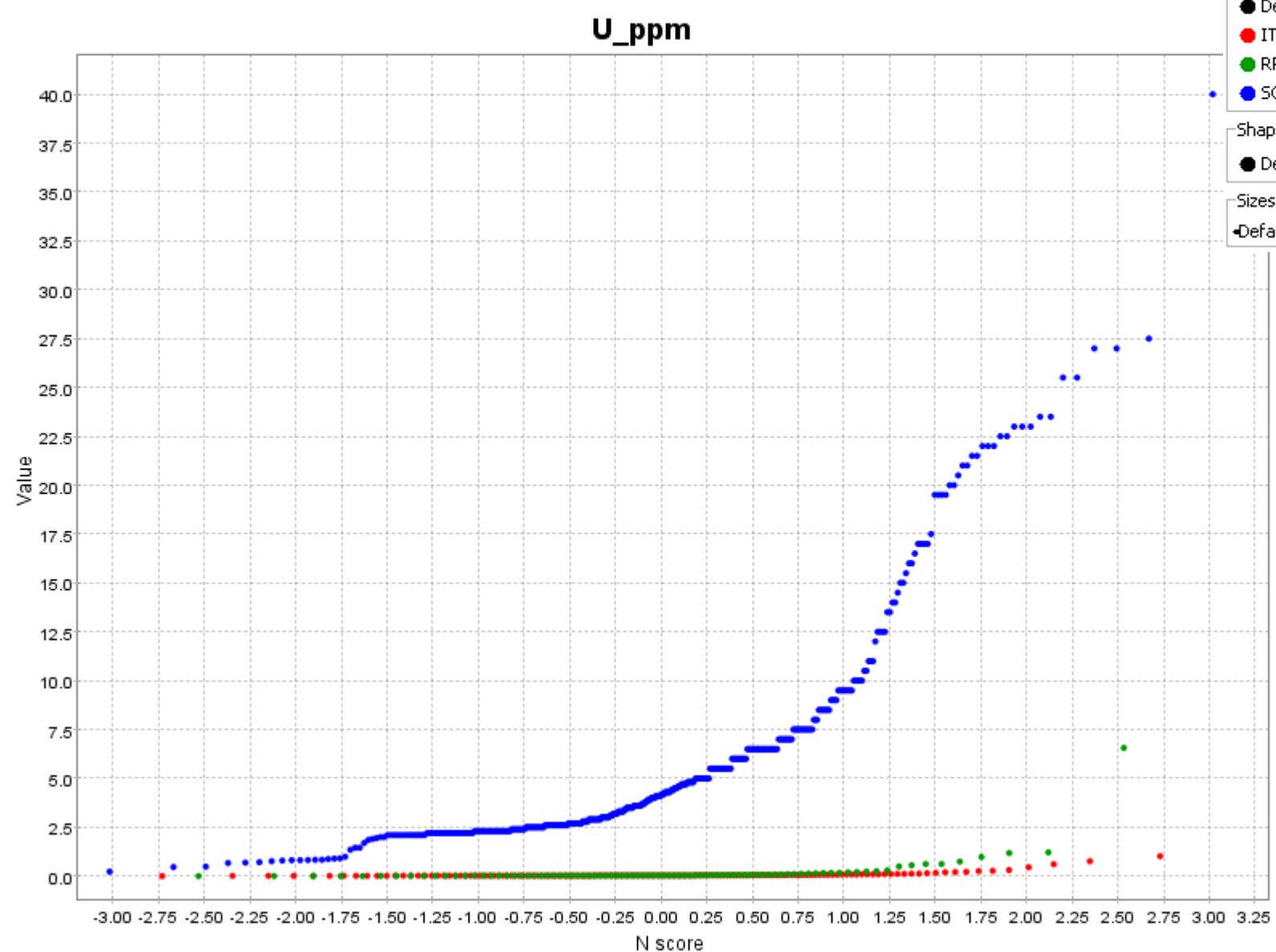
- Colours
- Default Colour
 - ITT
 - RRG
 - SOIL
- Shapes
- Default Shape
- Sizes
- Default Size

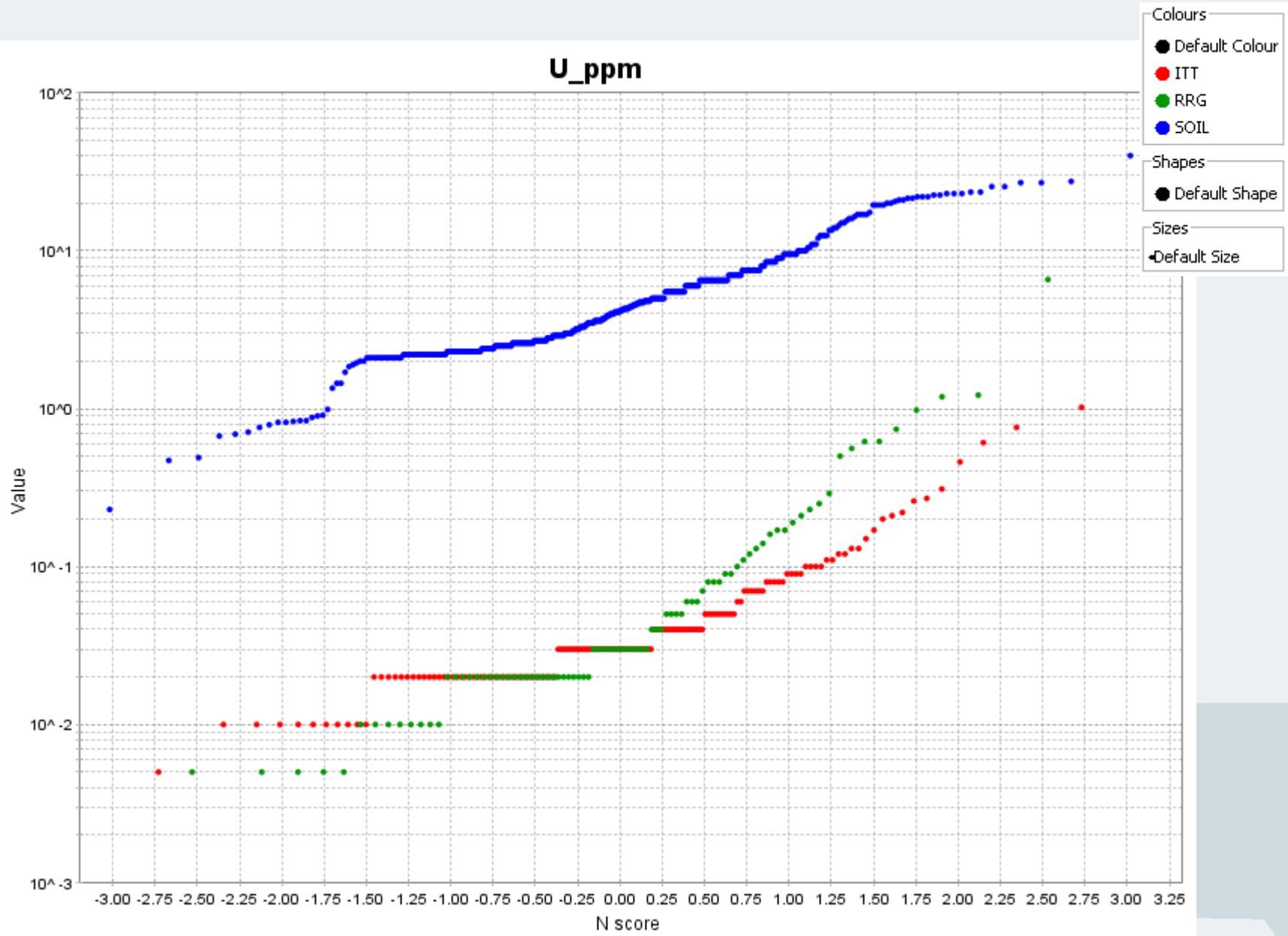
Mo_ppm

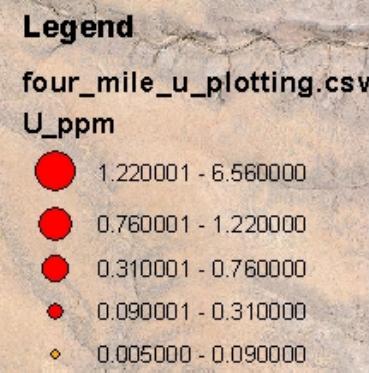




- Colours
- Default Colour
 - ITT
 - RRG
 - SOIL
- Shapes
- Default Shape
- Sizes
- Default Size







0 375 750 1,500 Meters

CRCLEME

Legend

Eucalyptus camaldulensis

U_ppm

- 0.005000 - 0.100000
- 0.100001 - 0.290000
- 0.290001 - 0.740000
- 0.740001 - 1.220000
- 1.220001 - 6.560000



0 500 1,000 2,000 Meters

Legend

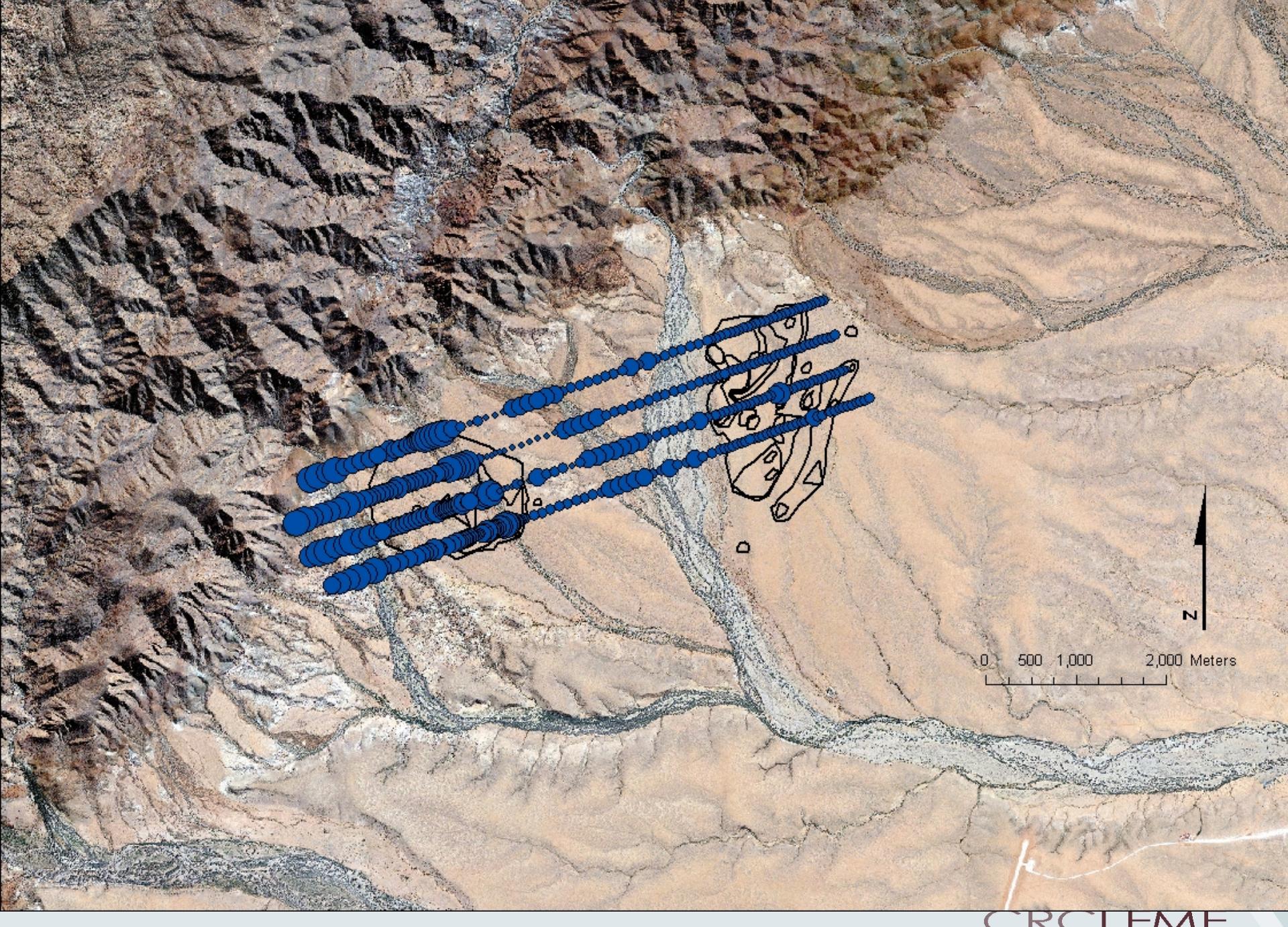
Melaleuca glomerata

U_ppm

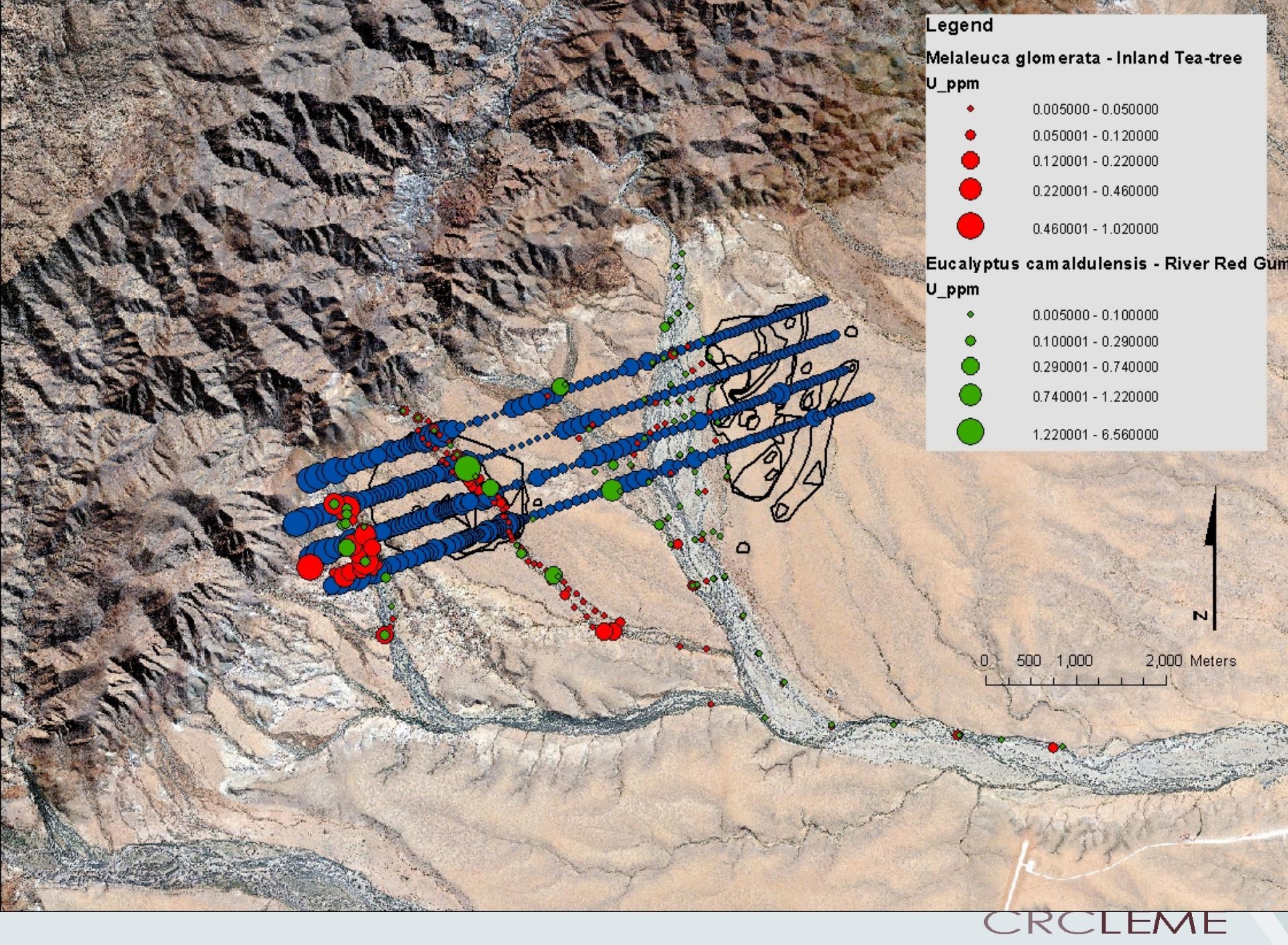
- 0.005000 - 0.050000
- 0.050001 - 0.120000
- 0.120001 - 0.220000
- 0.220001 - 0.460000
- 0.460001 - 1.020000

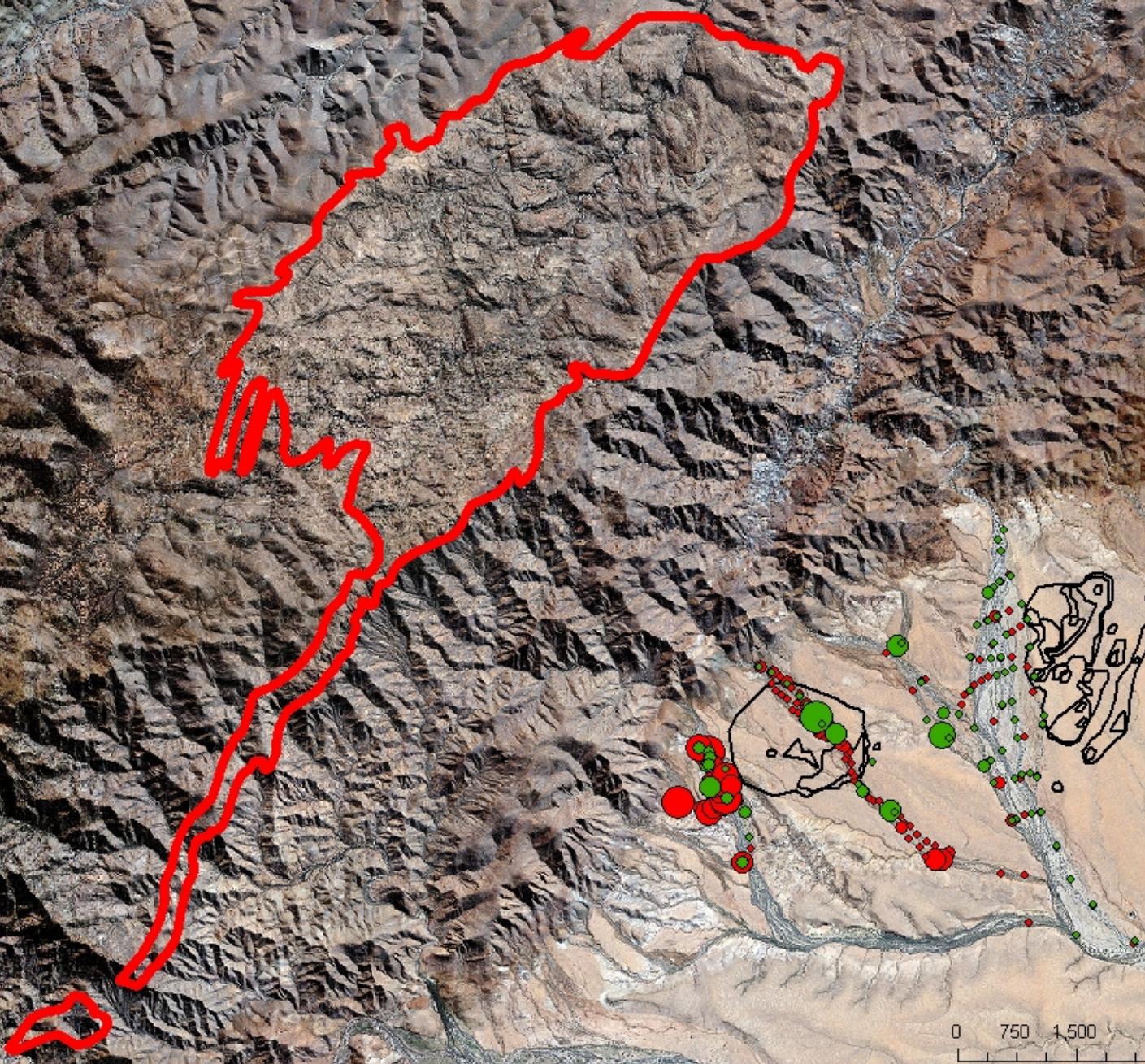


0 500 1,000 2,000 Meters



CRCLEME





0 750 1,500 3,000 Meters

CRCLEME

Legend

Eucalyptus camaldulensis

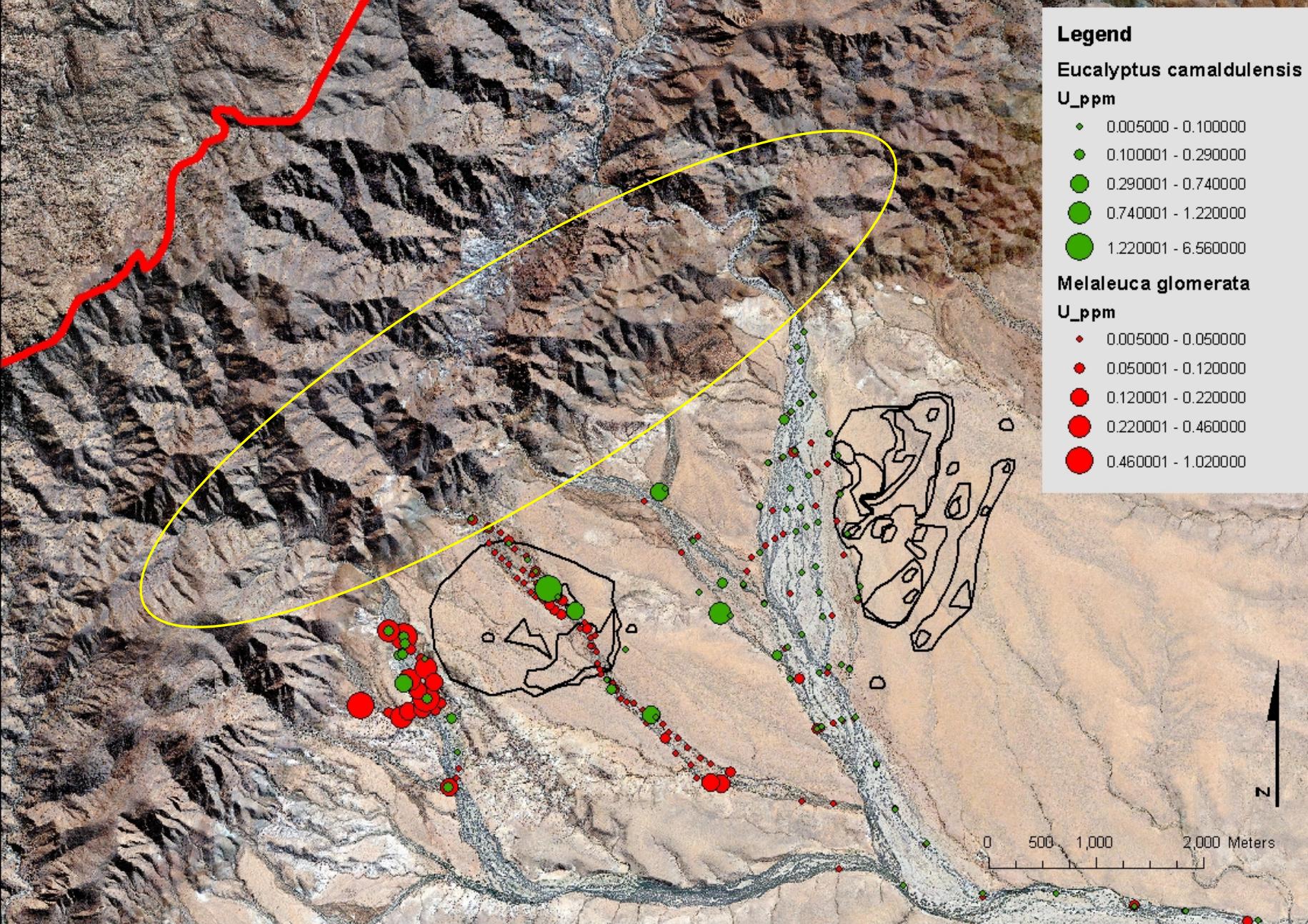
U_ppm

- 0.005000 - 0.100000
- 0.100001 - 0.290000
- 0.290001 - 0.740000
- 0.740001 - 1.220000
- 1.220001 - 6.560000

Melaleuca glomerata

U_ppm

- 0.005000 - 0.050000
- 0.050001 - 0.120000
- 0.120001 - 0.220000
- 0.220001 - 0.460000
- 0.460001 - 1.020000



CONCLUSIONS

- Plant biogeochemistry successfully expresses uranium mineralisation, dependent on:
 - species;
 - depth to and type of mineralisation;
 - regolith-landform setting.



ANY QUESTIONS?

CRCLEME