An Australian RADCALNET site?

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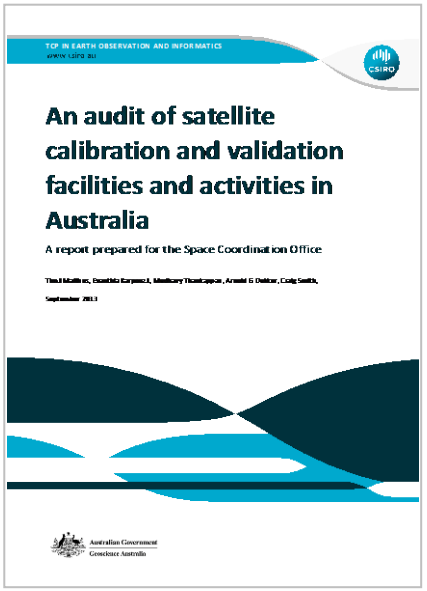
Australian experience

- Has a track record in vicarious calibration
- Further self-interest in investing in vicarious calibration
  - Internal needs
  - As a support to those nations upon whose EO data we rely
- Building the case with Government to invest via the NEOS-Infrastructure Plan
  - It helps if we can show foreign interest and investment

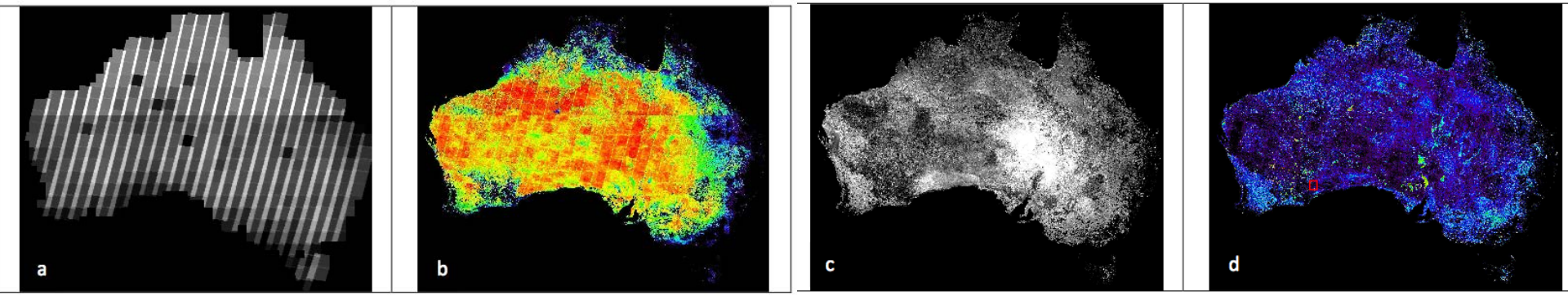
Australian advantages

- Low cloud coverage
- Low AOT
- Austral summer is northern winter
- Existing cal-val infrastructure (supported by TERN, IMOS, AuScope)
- Strong communities of practice
- Existing national and international collaborations



Australia-wide satellite-based survey of suitable vicarious calibration sites

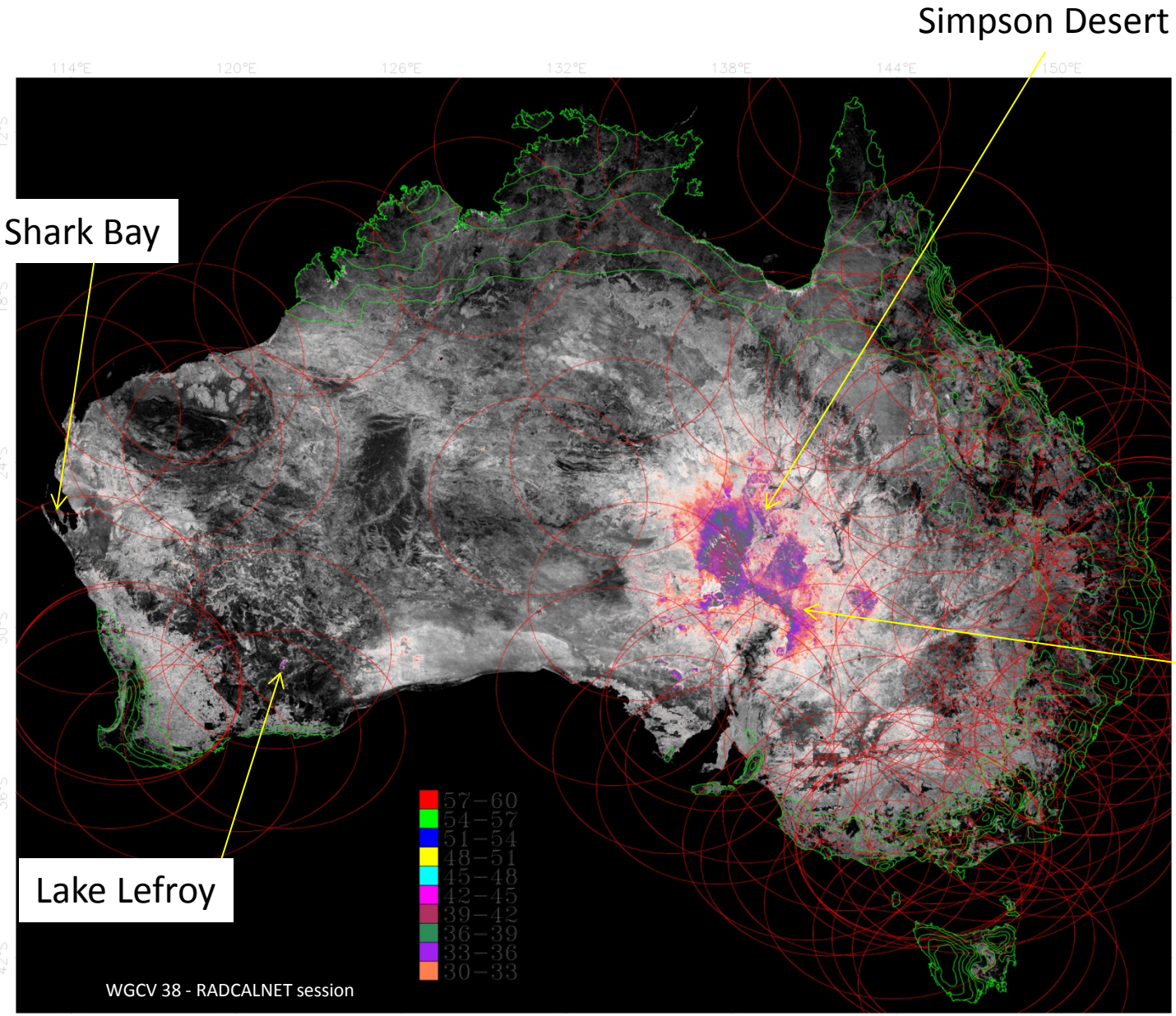
- Explored potential for an Australian Southern Hemisphere cal-val site
- Landsat 5 based analysis, 2003-2010, based on the Australian Geoscience Data Cube, total of 824 1 x 1 degree spatial tiles
- Physics-based surface reflectance correction (Nadir BRDF Adjusted Reflectance - NBAR)



Data analysis

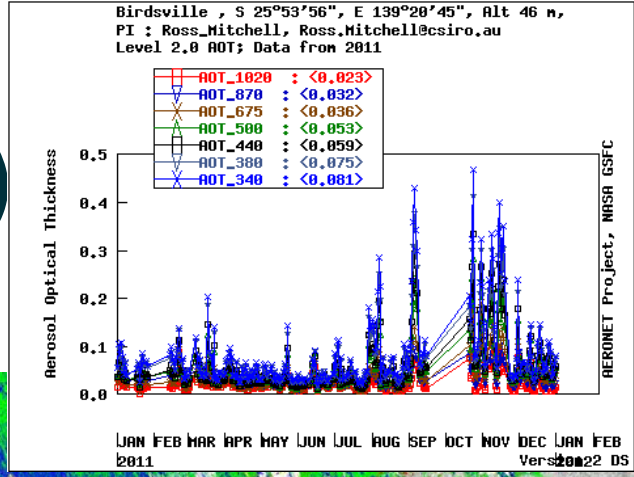
- Masked for bare areas using NDVI > 0.3, standing water (B4/B1), clouds
- Dry season (low rainfall data) only
- Partitioned into approximate two climatic zones (Tropic of Capricorn (-23.5S))
  - Sub tropical - dry season: May to October
  - Temperate - dry season: Nov to March
- Calculated temporal mean, standard deviation and coefficient of variation for average albedo across VNIR-SWIR, VNIR and SWIR separately
- Key criteria: high albedo, high frequency of observation, homogeneity in space and time, location, accessibility

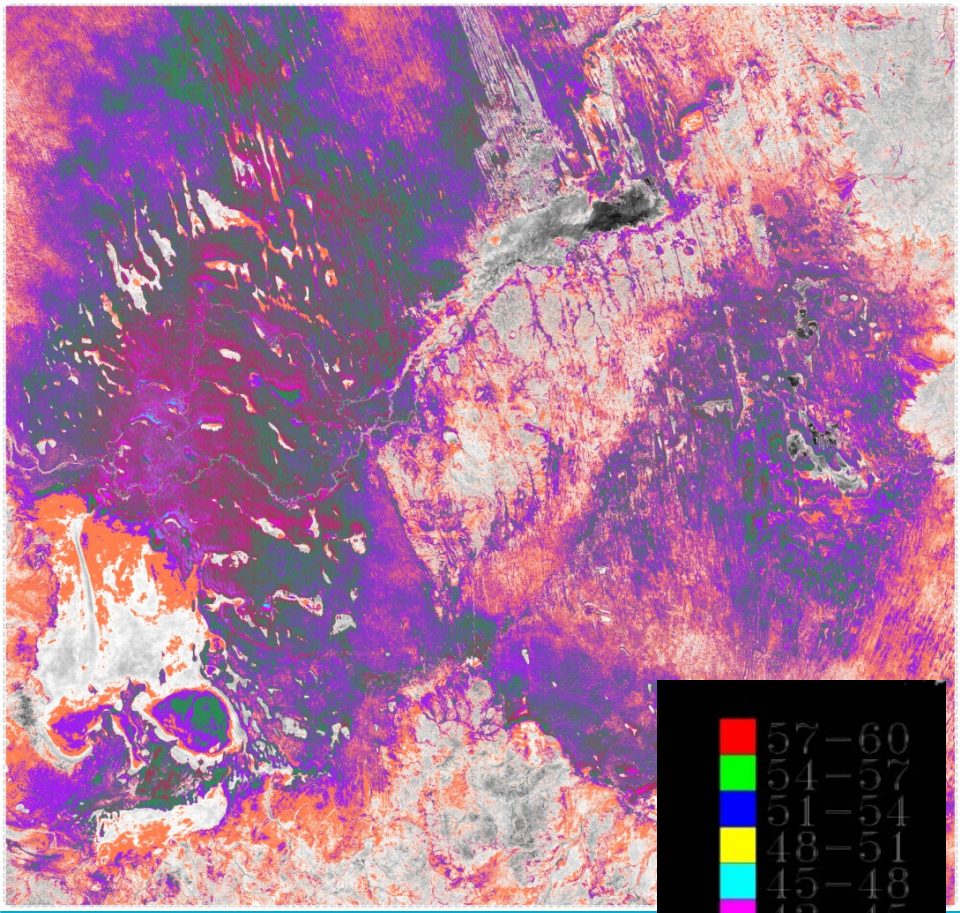
VNIR-SWIR temporal means



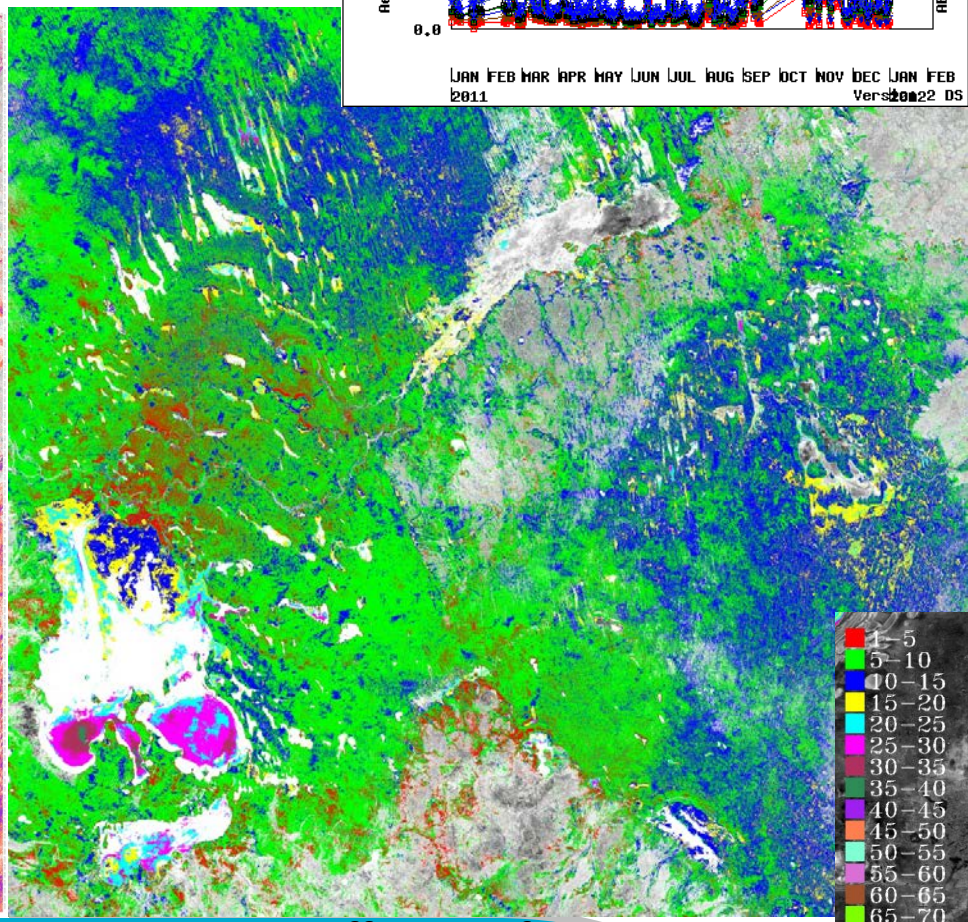
- Green vectors show high rainfall zone >600 mm pa
- Red circles show radius of 400 km (half day's drive) from major airport
- Image is VNIR-SWIR temporal means

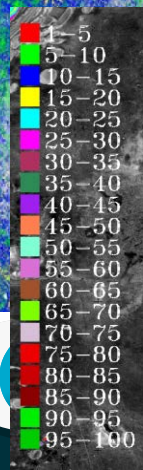
Desert temporal means and coefficient of variations (VNIR-SWIR)





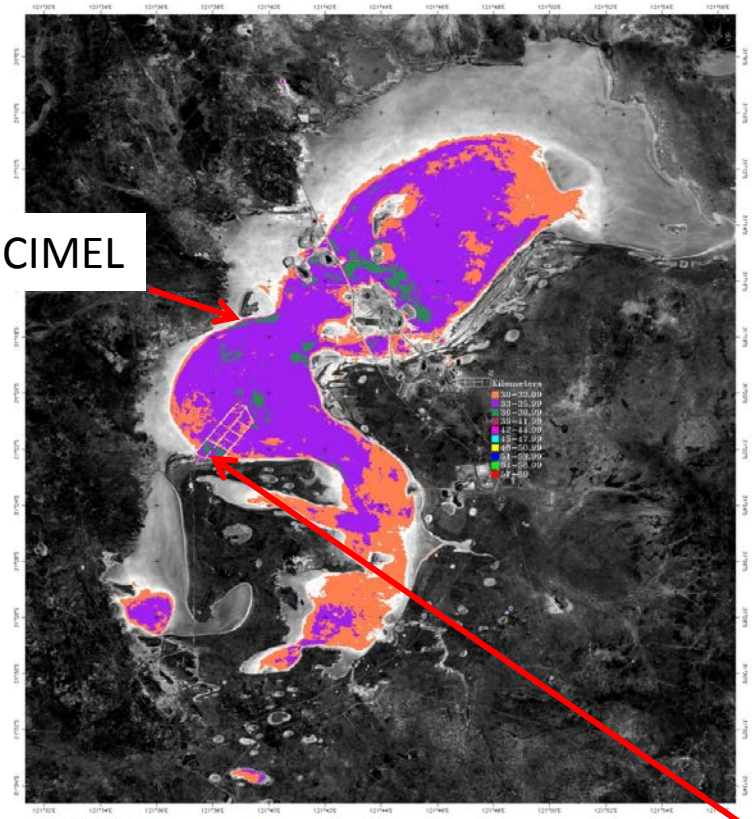
Means

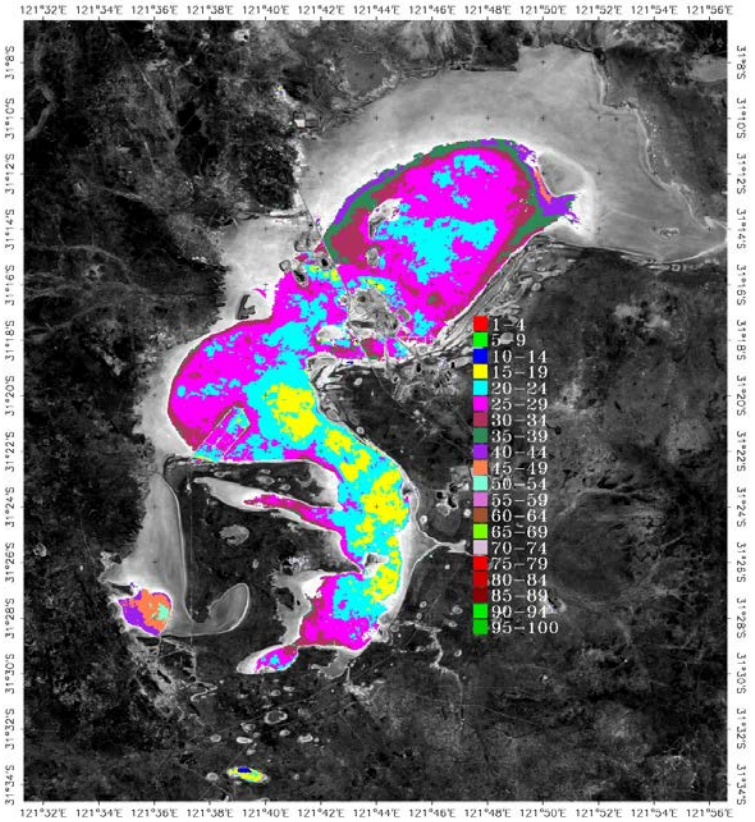


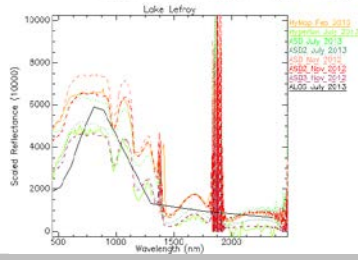


Coefficient of variation

Lake Lefroy temporal means (VNIR-SWIR)





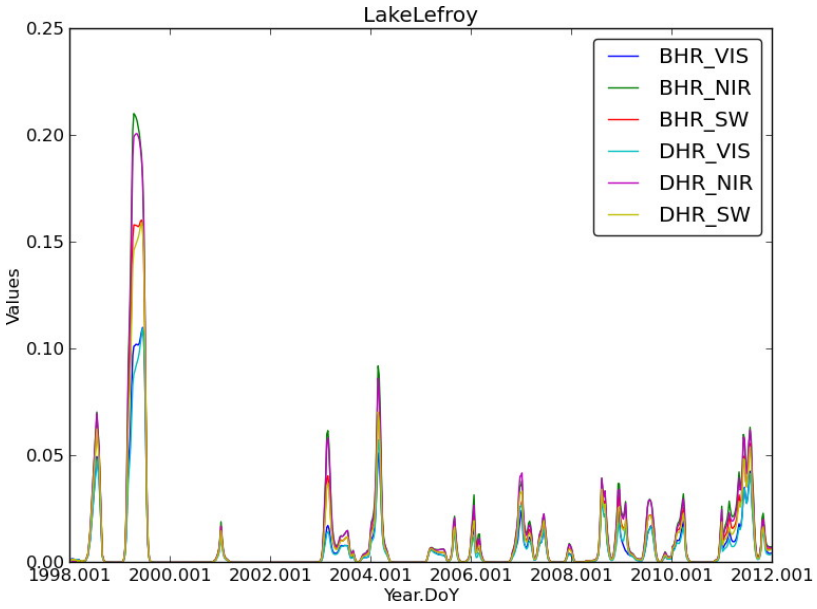


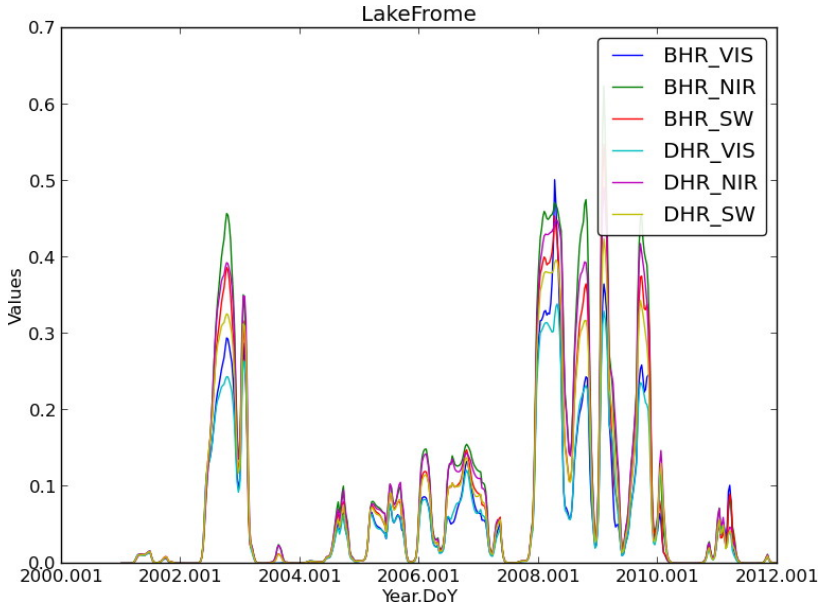
Mean

Current Field Site

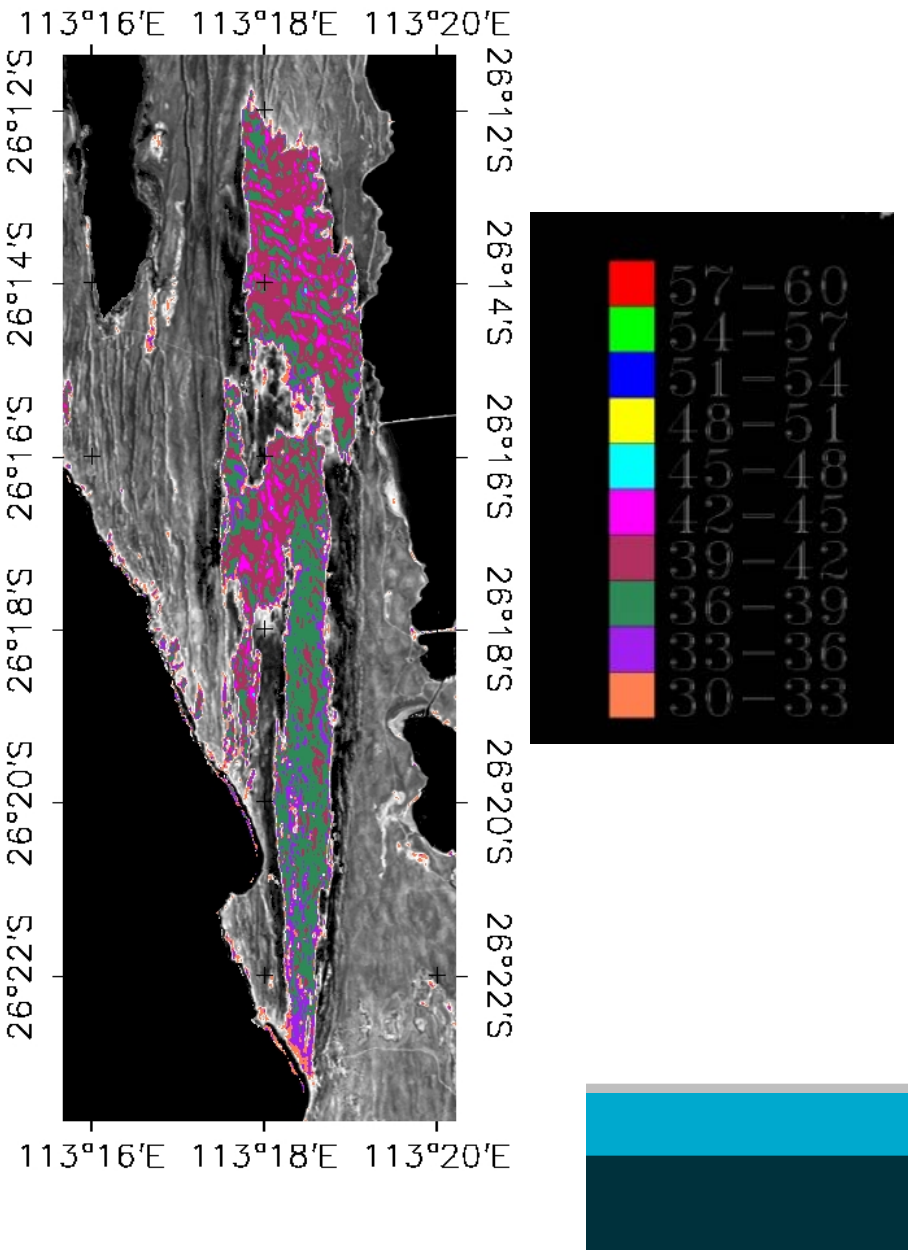
CoV

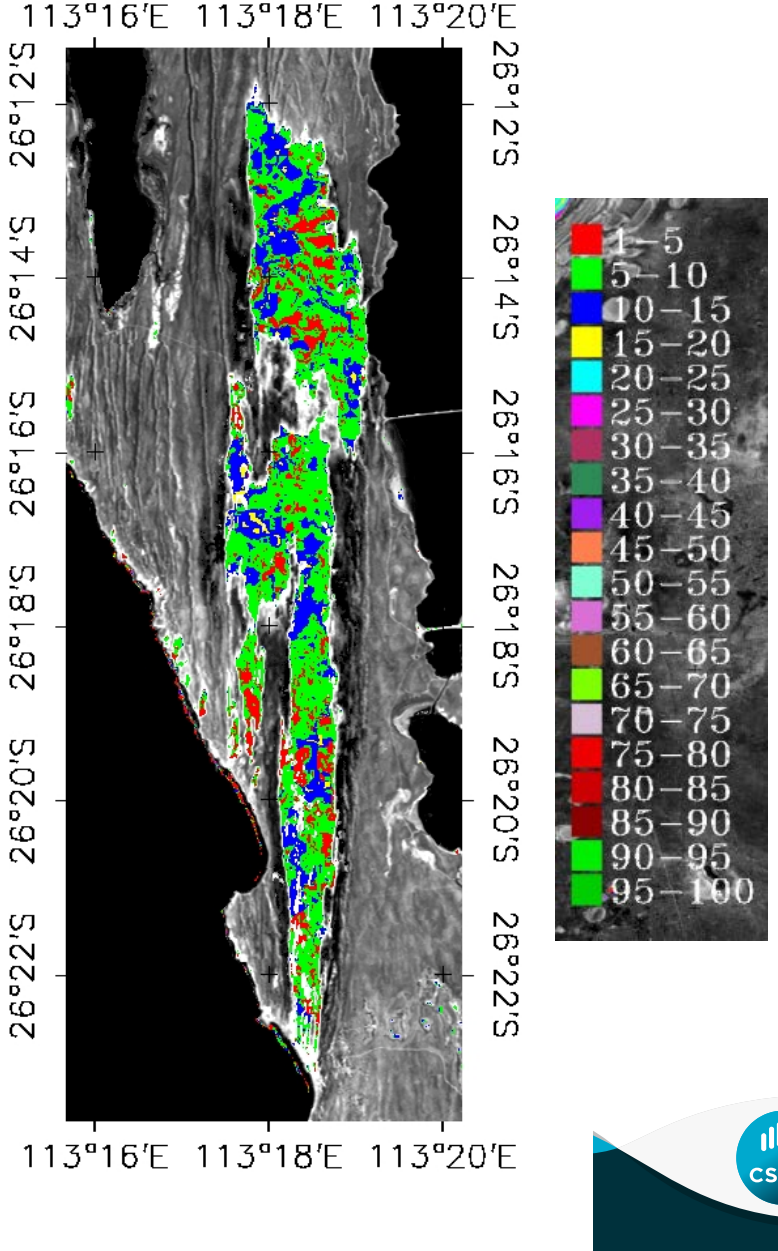
Salt pans (GlobAlbedo data)





Coastal sand

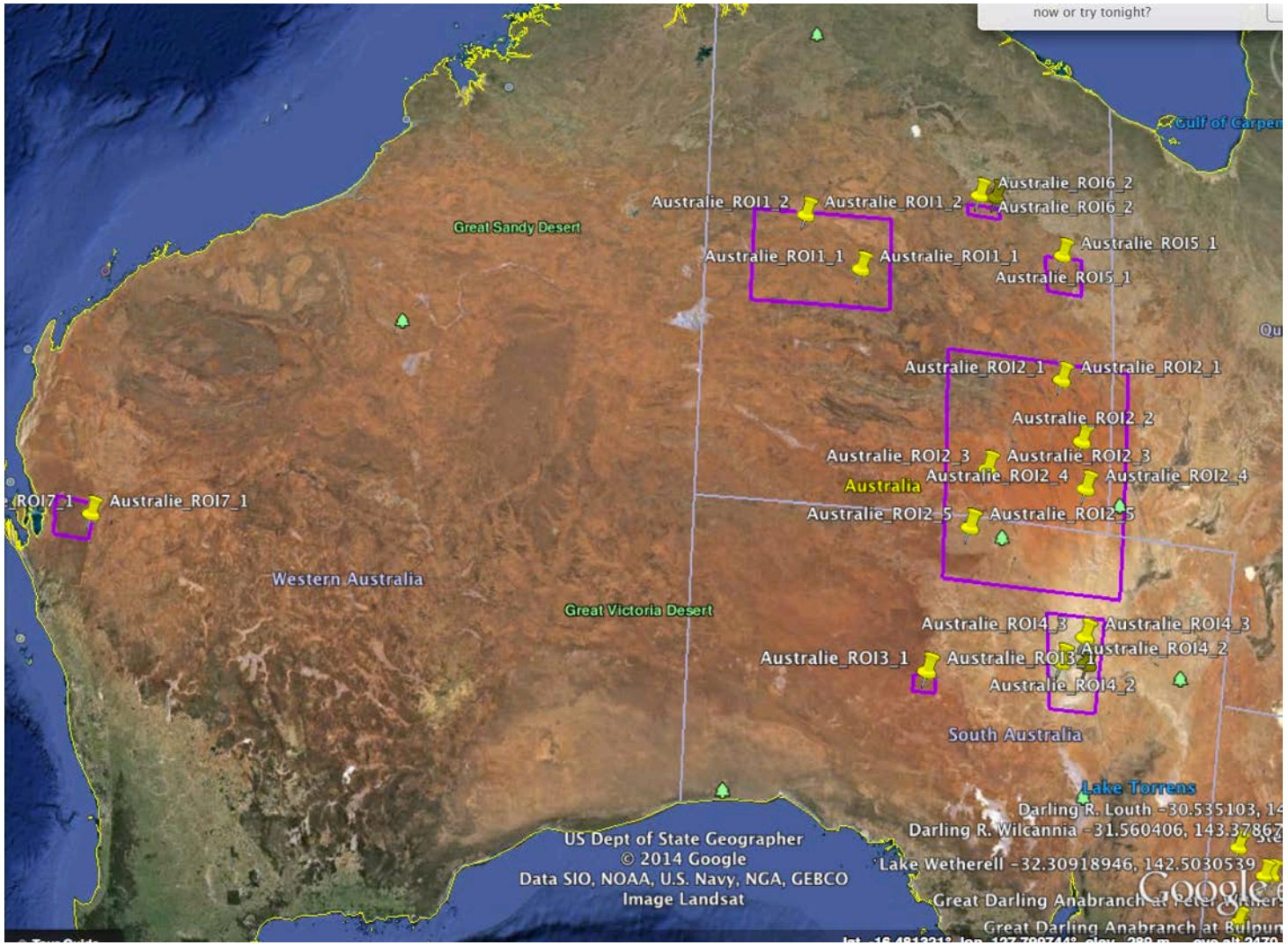




Insights

	Spatial homogeneity	Temporal homogeneity	Albedo	Issues
Salt lakes	6%	Up to 25%	High in VNIR Low in SWIR	Low SWIR albedo
Coastal sands	15%	< 10%	High	Aerosols, spatial extent
Dunes / deserts	12%	< 10%	High	Access Remoteness Topography

ESA analysis



Summary

- Desert sites seem the most suitable
- Vegetation cover potentially an issue that may require data re-analysis
- Issues with access, remoteness

- Australia is keen to contribute to RADCALNET, as a means of return to the international community
- Imaging spectroscopy site?

Thank you

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- **Research Group Leader**

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Lake Lefroy background

- **Climate**
  - rainfall @ Kambalda (on lake shore) mean 266.2 mm, lowest 13.7 mm (June), highest 69.5 mm (January);
  - Temperature @ Kalgoorlie (60 km away) mean 25.3°C, highest 33.6°C (January), lowest 16.7°C (July);
  - average number clear days is 151.1, annual average cloudy days 89.2.

Landscape/Landform

  - medium-sized playa lake within Lefroy Palaeodrainage on Yilgarn Craton of Western Australia;
  - bed of Lake Lefroy is extremely flat, mean elevation of the lake bed approximately less than 286 m, crust is halite up to 10 cm thick, but often no more than 1-2 cm in thickness. Halite covers approximately 64% of the lake bed, the crust becomes thinner towards the lake shore and lake islands.

- **Vegetation**
  - No vegetation on lake bed but surrounding vegetation consists of 50 vascular plant species with the predominant families of species being Chenopodiaceae, Asteraceae, Aizoaceae, Poaceae, Portulacaceace and Frankeniaceae.
- **Instrumentation**
  - CIMEL (on Aeronet);
  - Weather station (to be upgraded this year);
  - Cosmic Ray probe (moisture);