

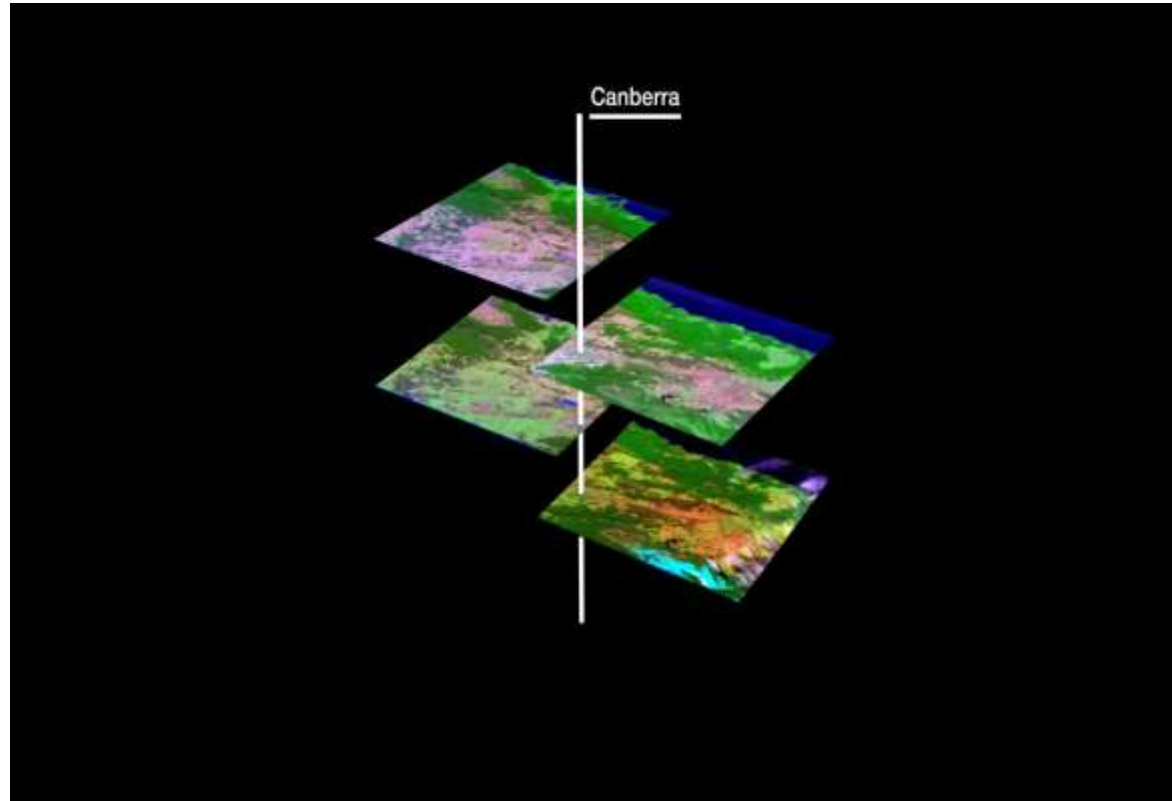
# Observing the Earth through Space and Time: The Australian Geoscience Data Cube

Dr. Stuart Minchin

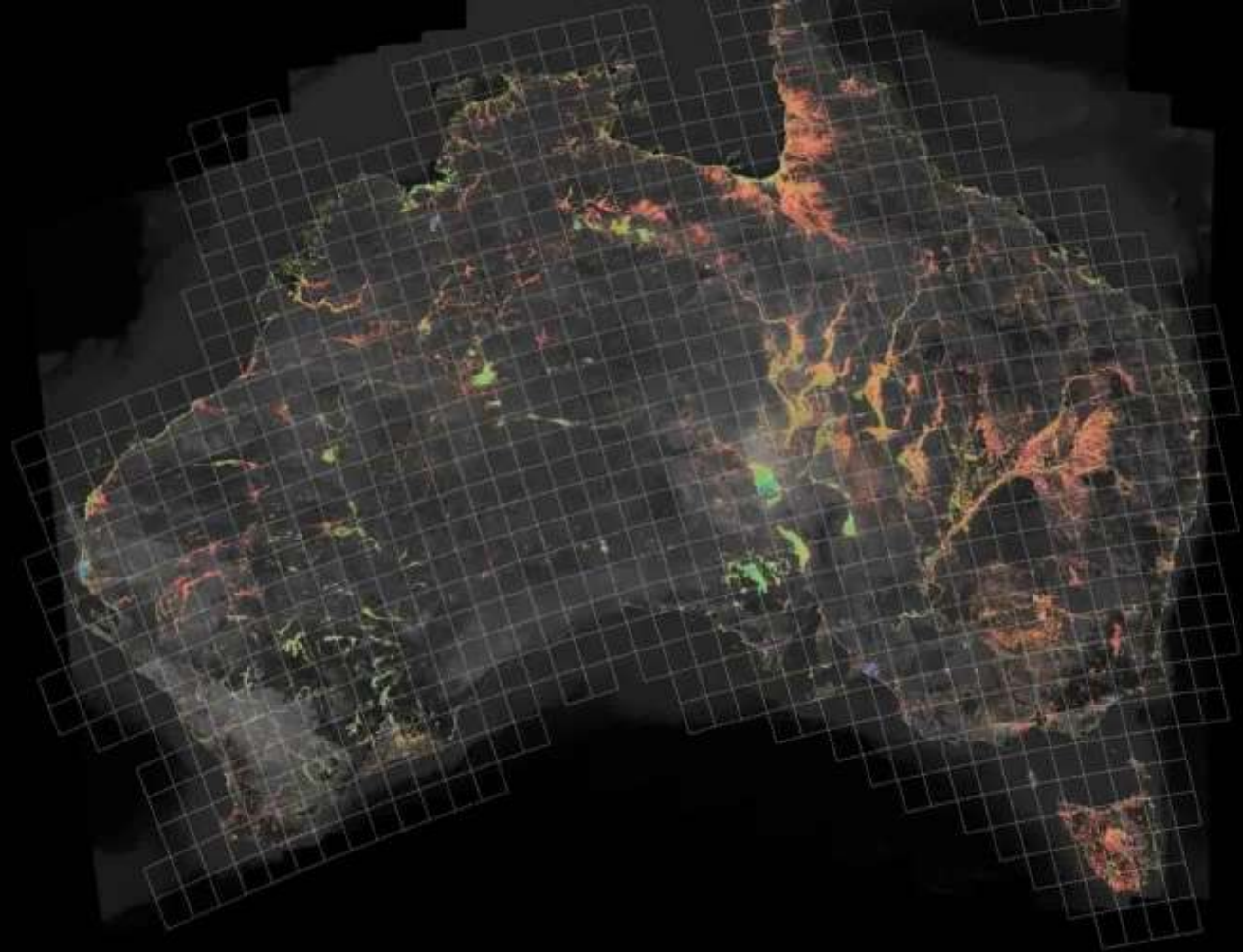
Geoscience Australia

# Developing the Australian Geoscience Data Cube

- Earth Observation data are calibrated to surface reflectance observations
- Calibration of data to a single uniform standard allows the comparison of data through time
- In the AGDC every unique observation is kept and included for analysis creating very dense time-series







# Surface water

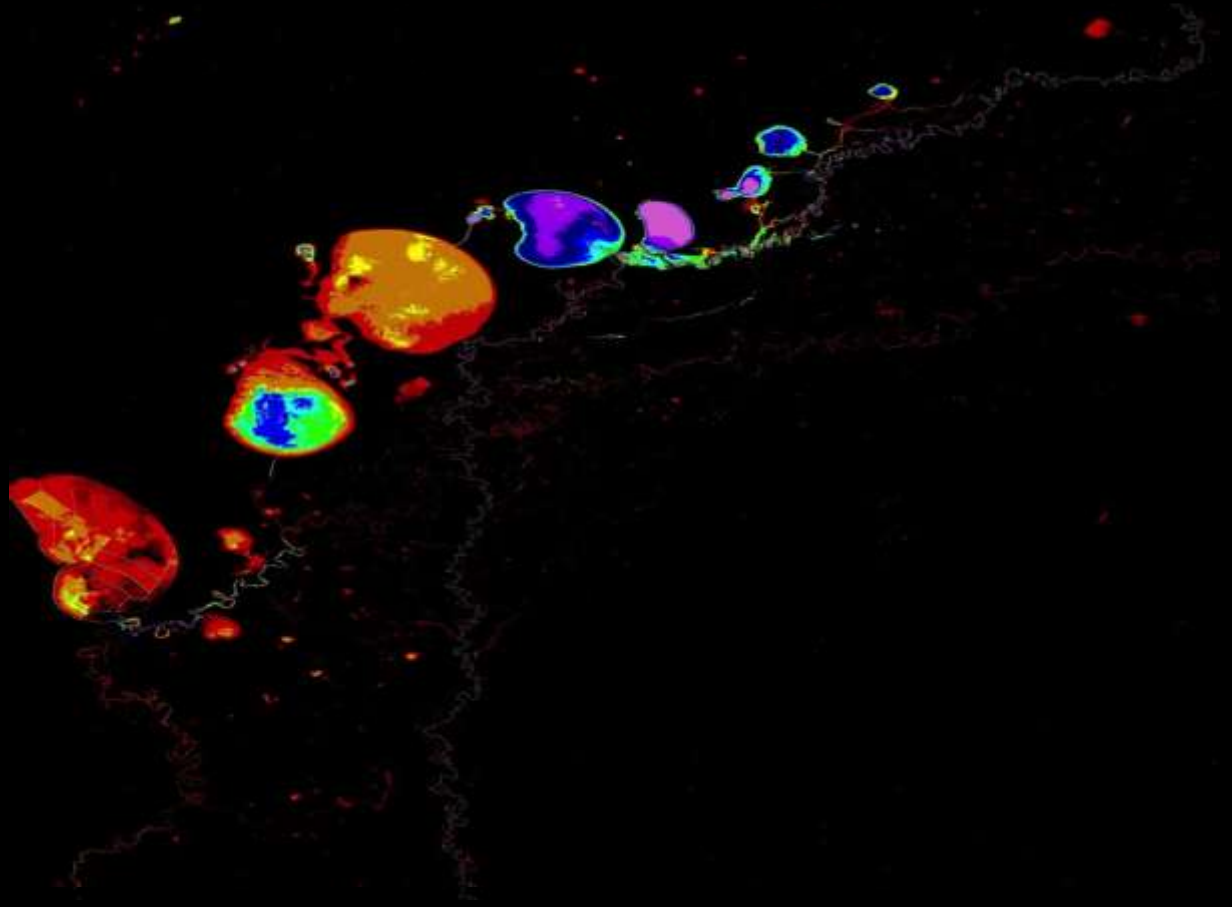
Menindee Lakes time  
series

1998-2012

Total observations per  
grid cell

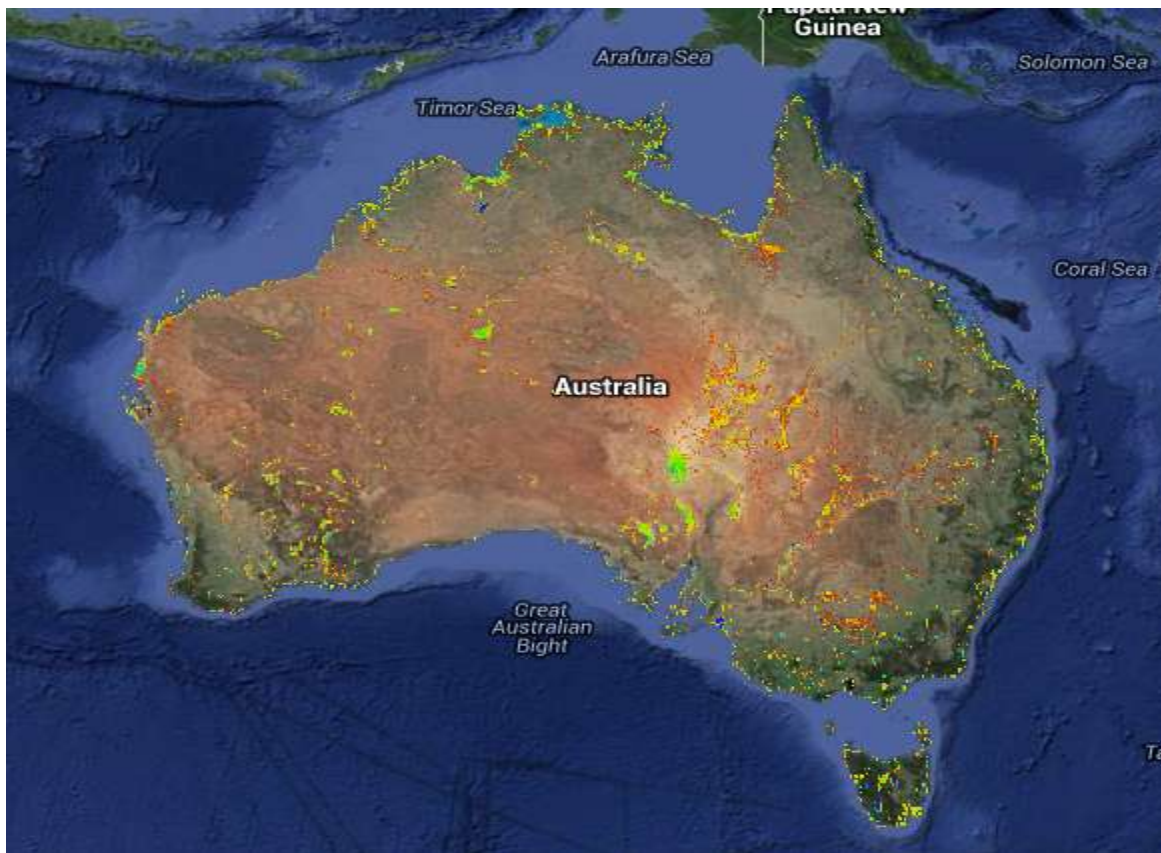
~600-1200

4000\*4000 grid cells



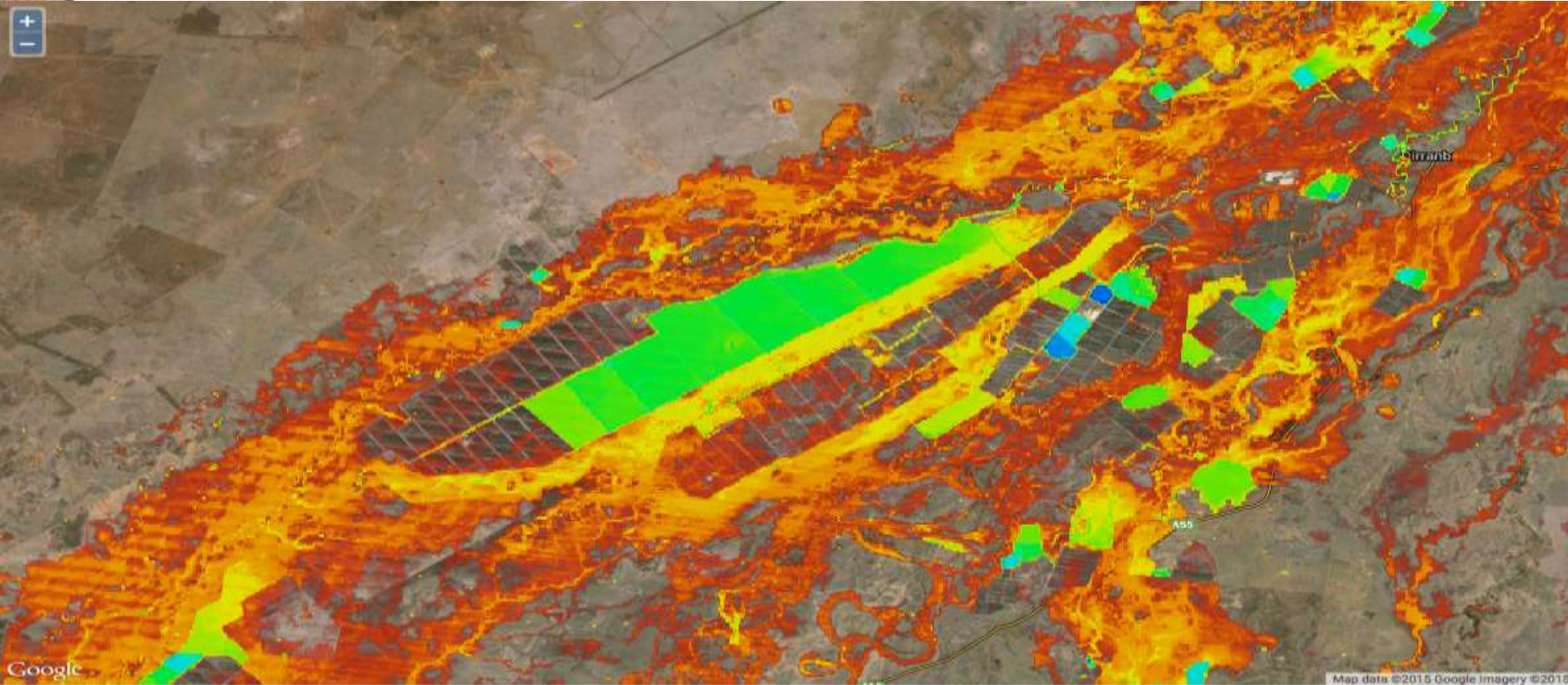


# Continental Scale Water Observations from Space



- **WOFS water detection**
- **27 Years** of data from LS5 & LS7(1987-2014)
- **25m** Nominal Pixel Resolution
- Approx. 300,000 individual source ARG-25 scenes in approx. 20,000 passes
- Entire 27 years of 1,312,087 ARG25 tiles =>  **$93 \times 10^{12}$  pixels** visited
- **0.75 PB** of data
- **3 hrs** at NCI (elapsed time) to compute.

# Cotton farm: floodplain water storages





# Cotton farm: floodplain water storages



At long: 147.76414, lat: -28.73998

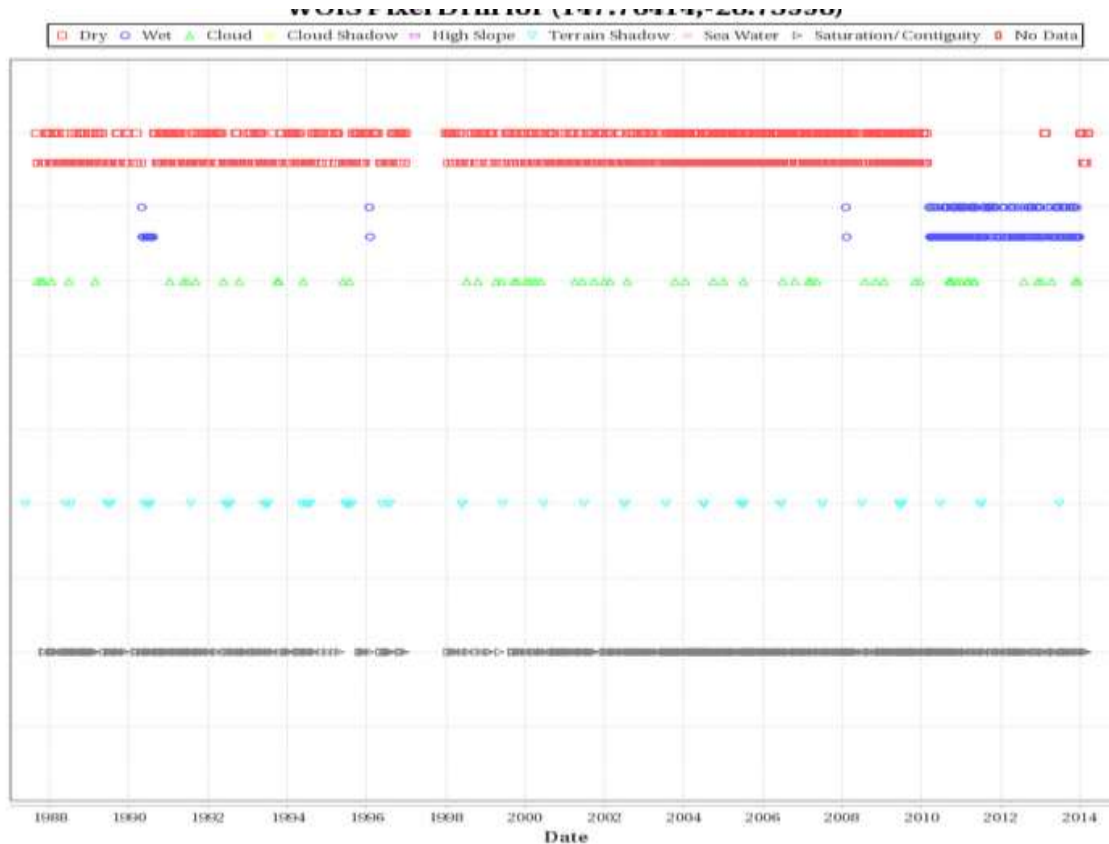
- Times this location was observed clearly: 475
- Times that water was indicated at this location: 80
- Percent of time that water was observed at this location: 16.8%
- Confidence that the water observation at this location is correct: 78%

The detailed water observation values can be seen:

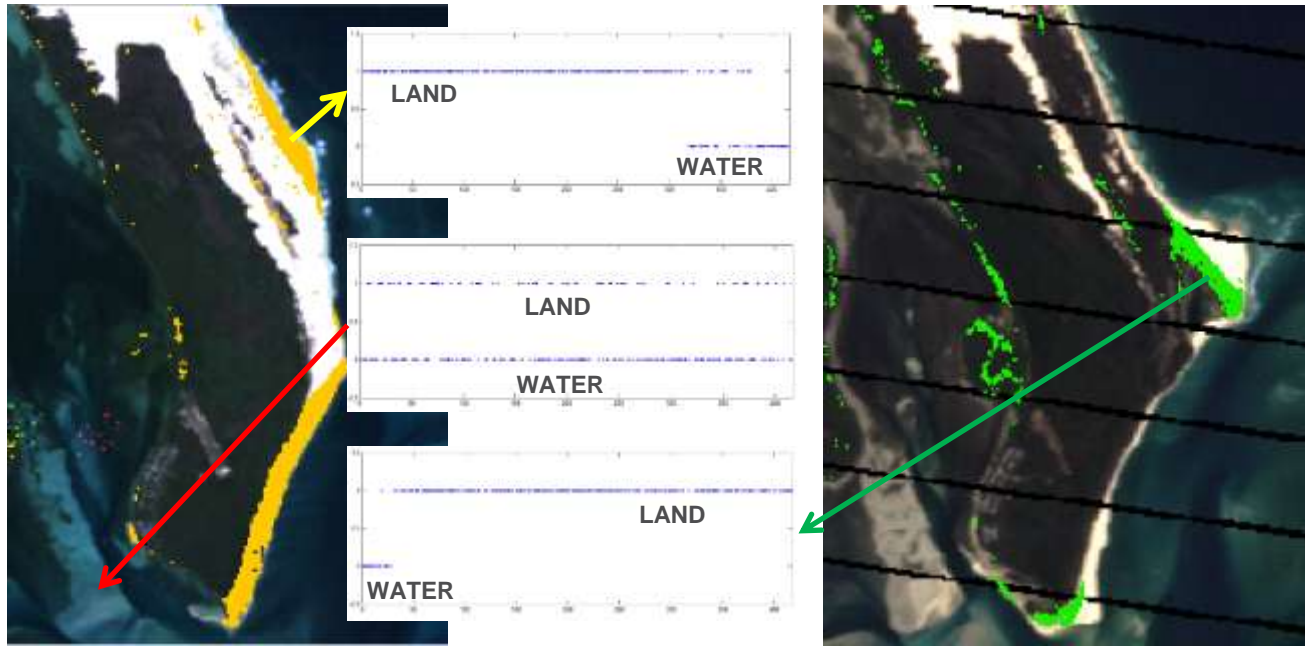
- [As CSV values](#)
- [As a graph](#)



# Frequency and timing of water inundation



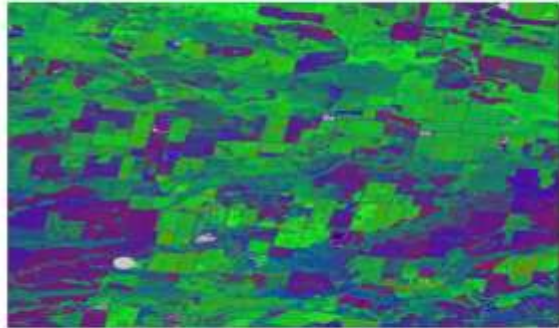
# Coastal Change Detection



1988 Landsat 5  
First Water Observation Anomaly

2013 Landsat 7  
Last Water Observation Anomaly

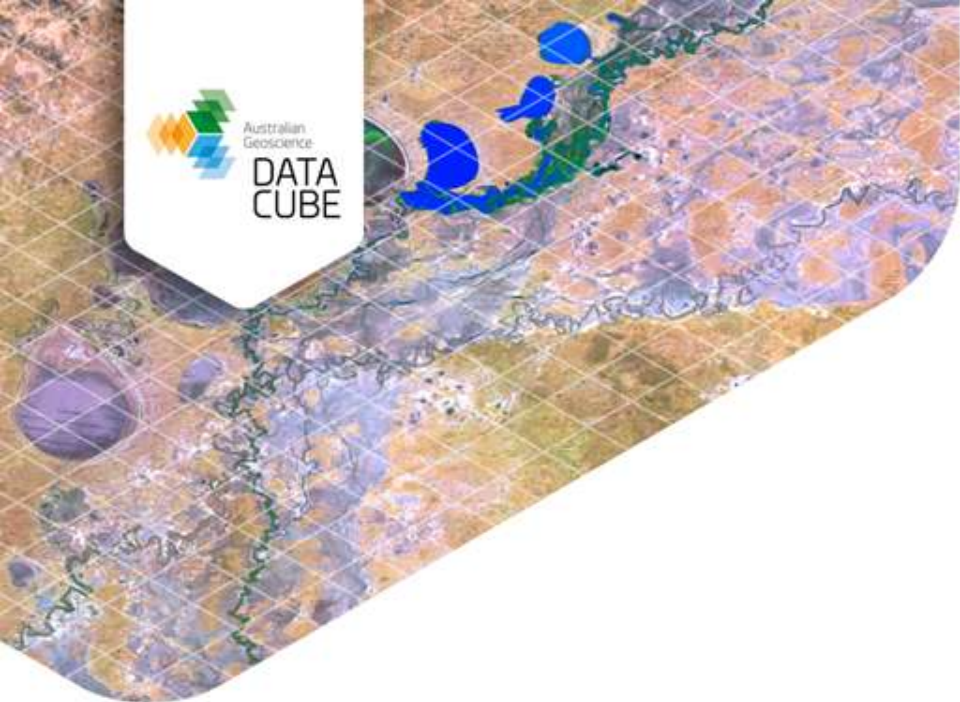
# Fractional Cover: vegetation time series



# Data Cube: National spatial information infrastructure







Thankyou