



Australian Government  
Geoscience Australia



Digital Earth  
AUSTRALIA

# Digital Earth Australia: Tracking water in the landscape using satellite imagery

Dr Claire Krause



# What is Digital Earth Australia?



# Developing Digital Earth Australia

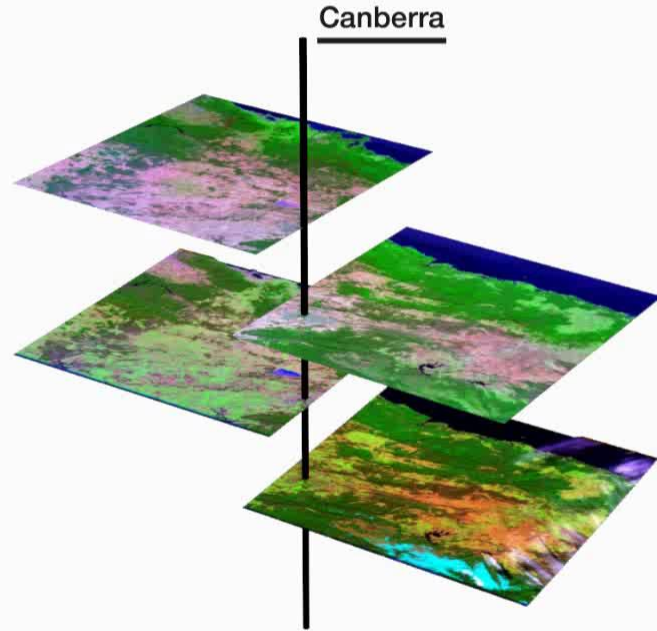
Orthorectification



Calibration



Time series



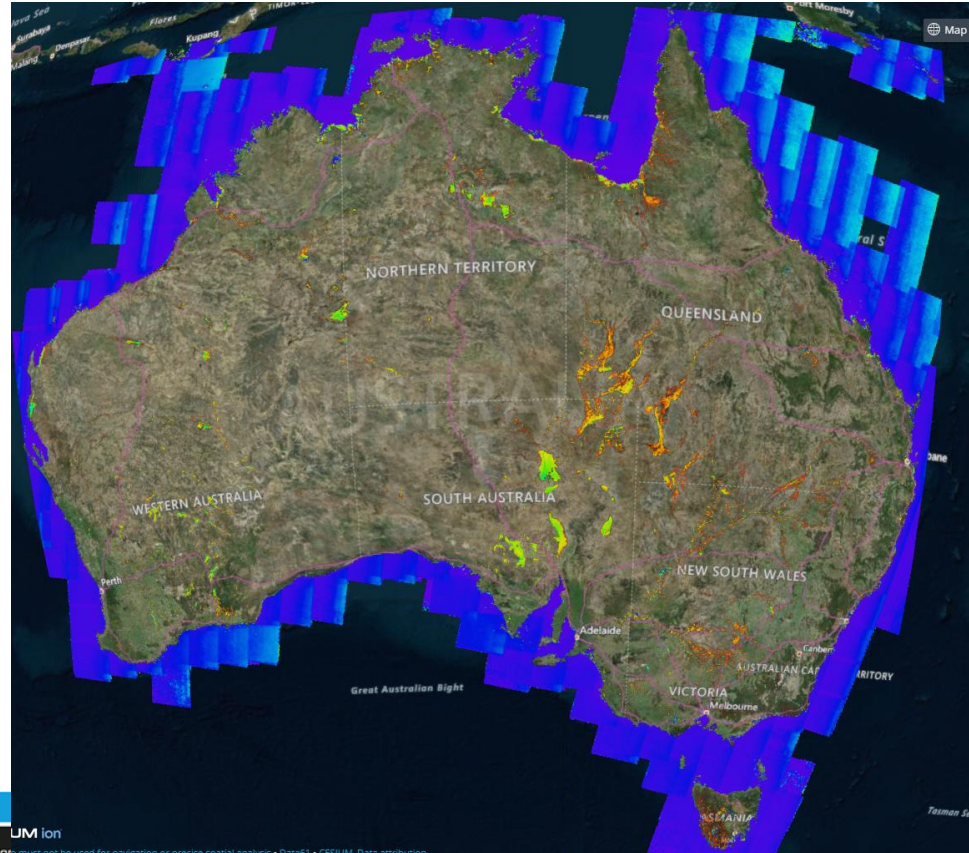
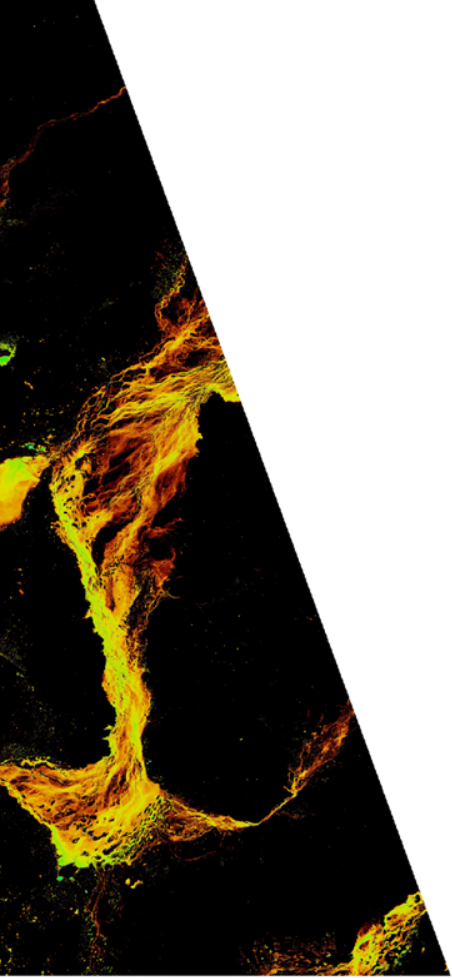


## Some case studies...

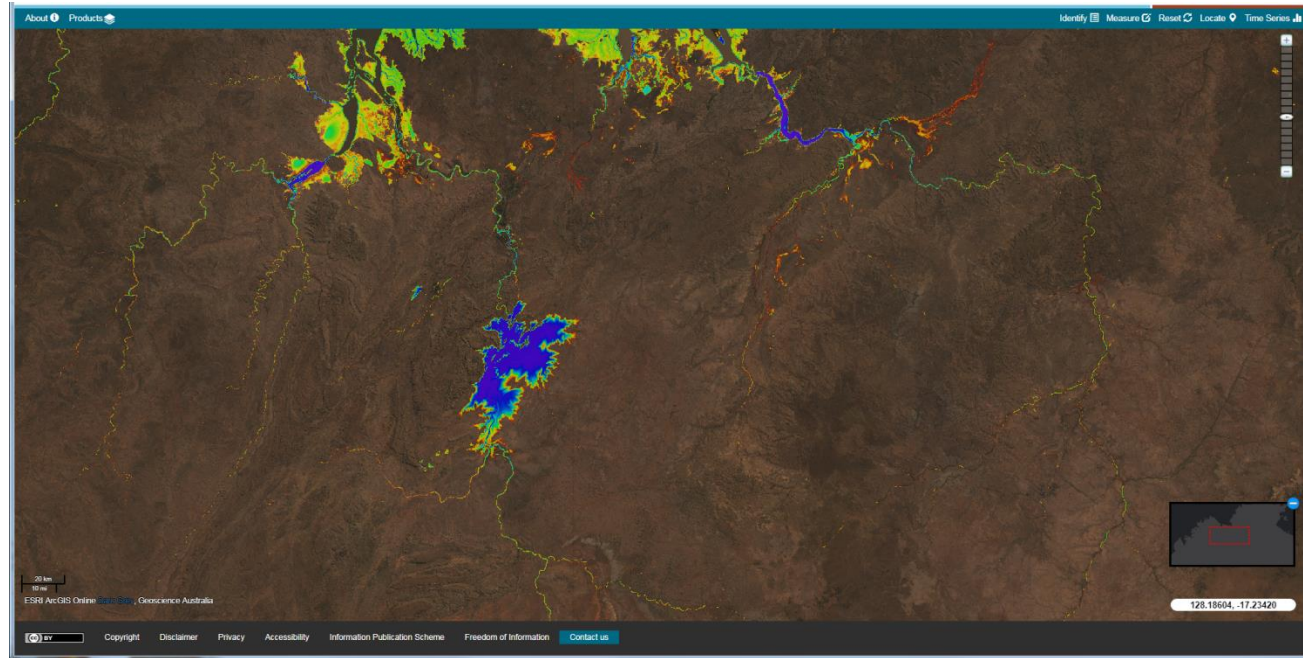
- Water Observations from Space
  - Application to Lake Argyle
- Examining the Ord River irrigation scheme
- Intertidal Extents Model
- National Intertidal DEM
- Mangroves
- Examining fire management practices
- Tracking water through the landscape
- Identifying groundwater dependent ecosystems
- Where are Australia's persistent water bodies?
- Characterising drought
- Tracking water into and out of water bodies



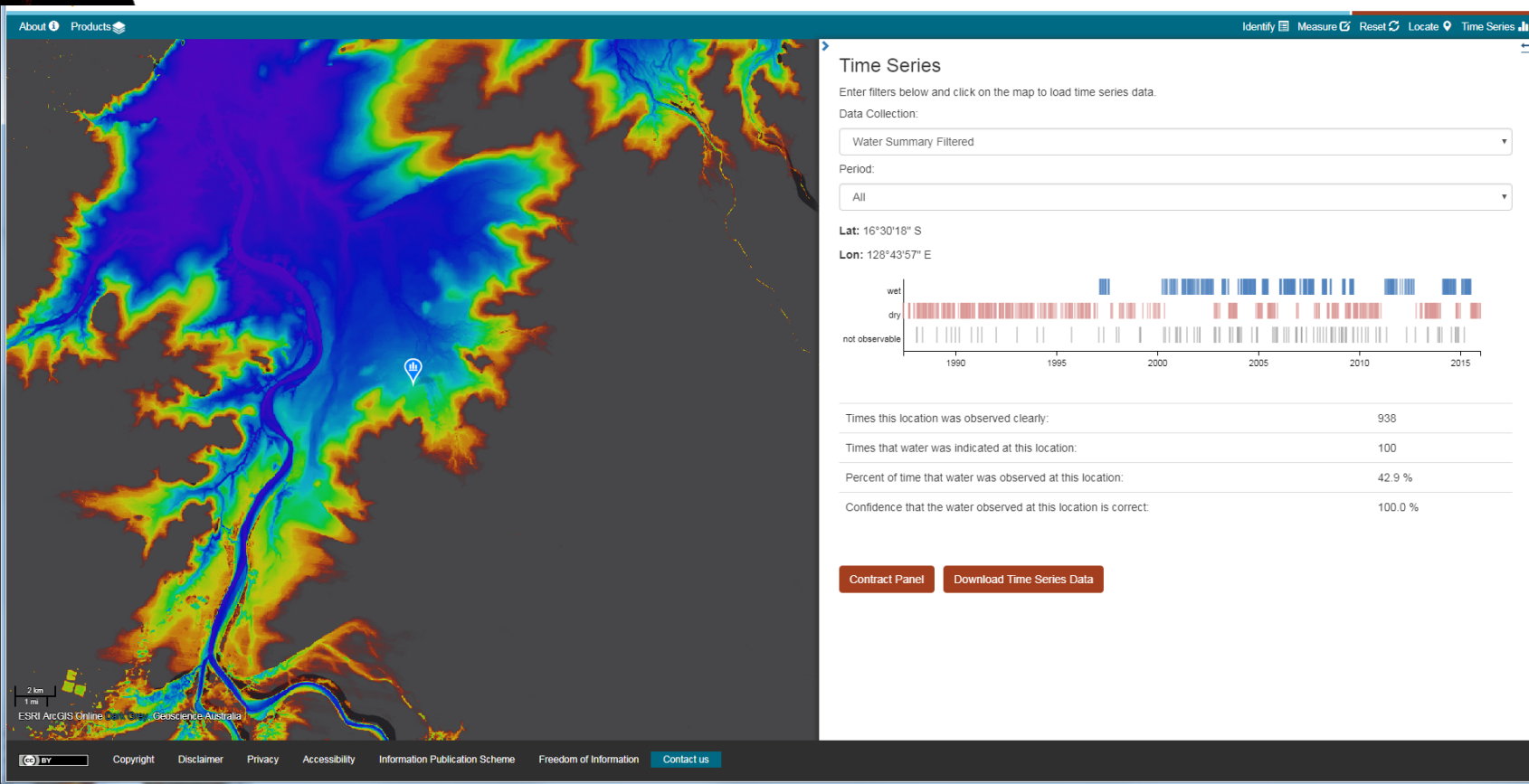
# Water Observations from Space (WOfS)



# Water observations from space for the Ord and surrounding region

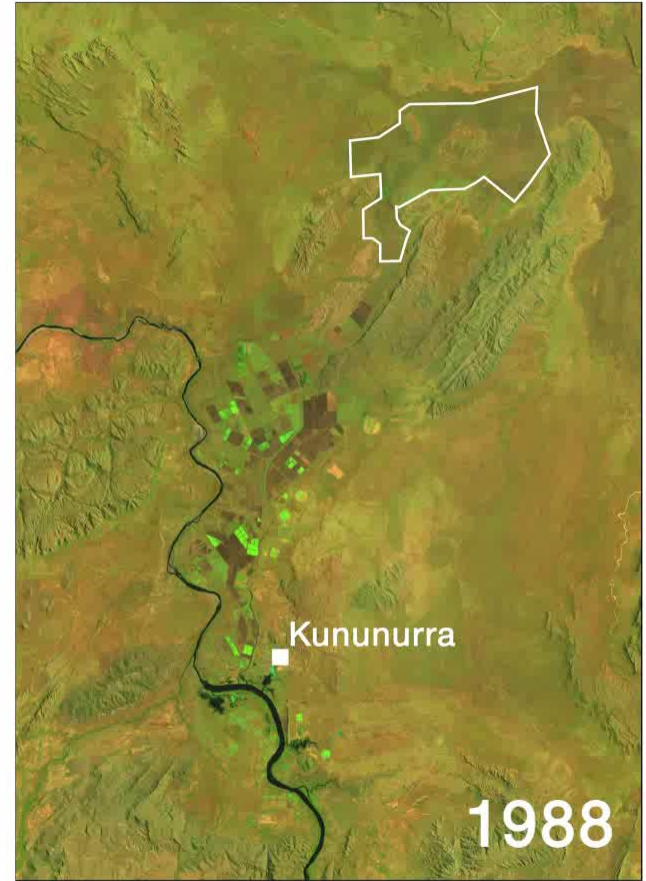
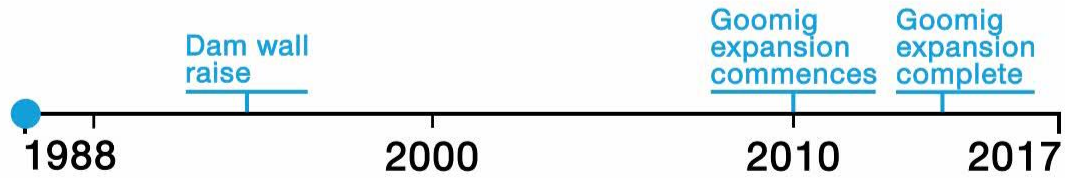


# Water observations from space for Lake Argyle





# Ord river irrigation scheme

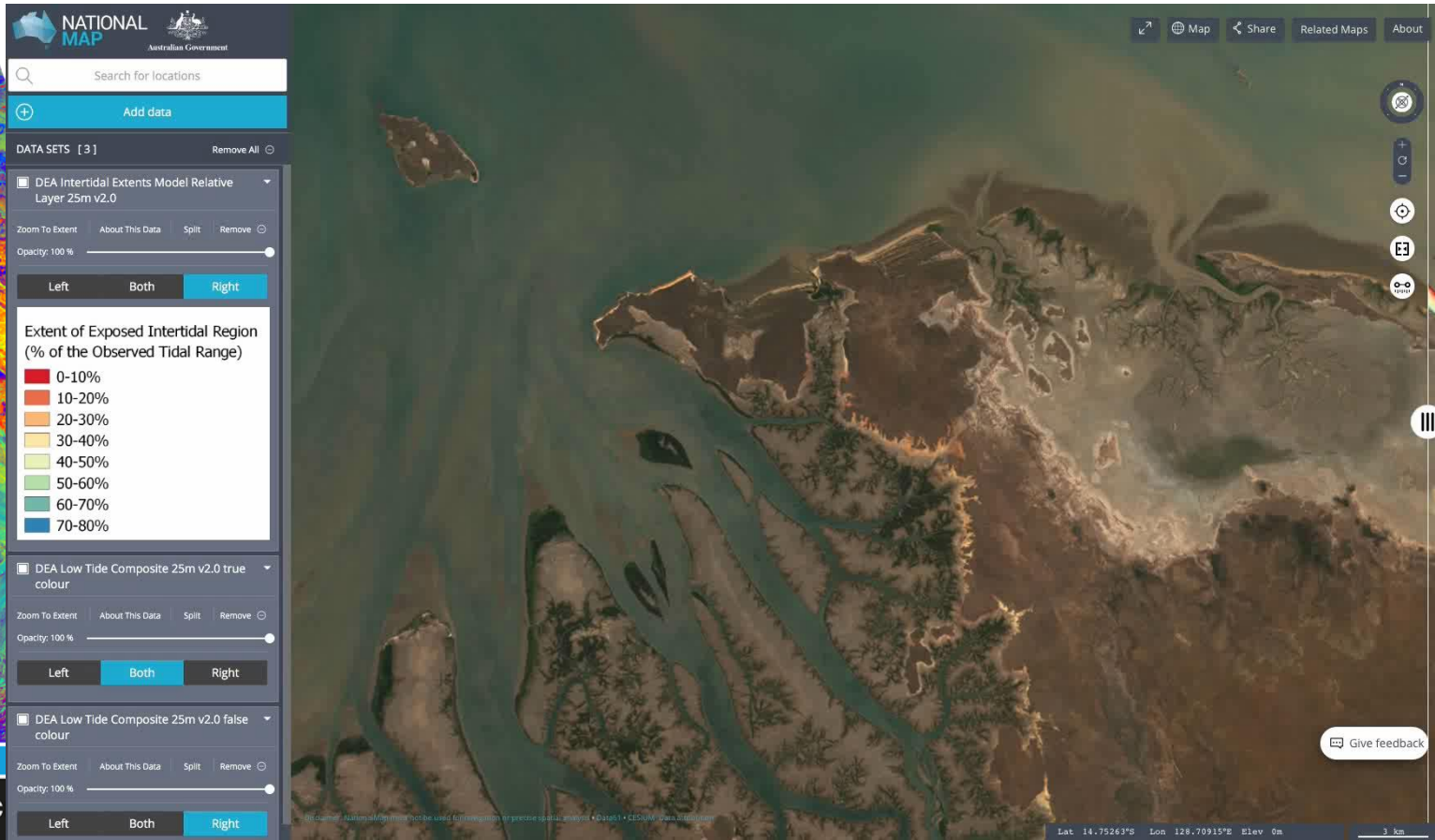
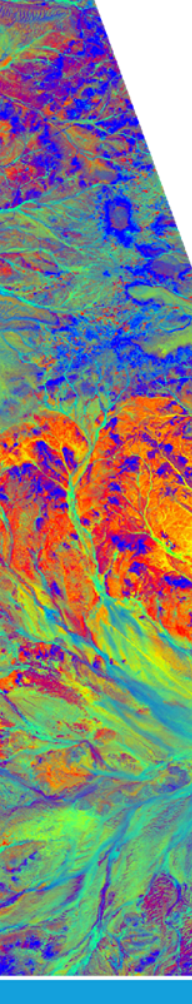




1988



# Intertidal Extents Model



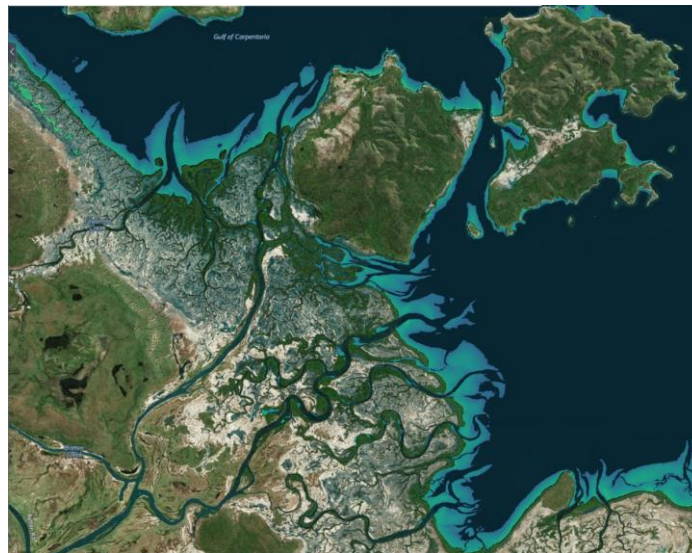
# High/Low Tide Composite





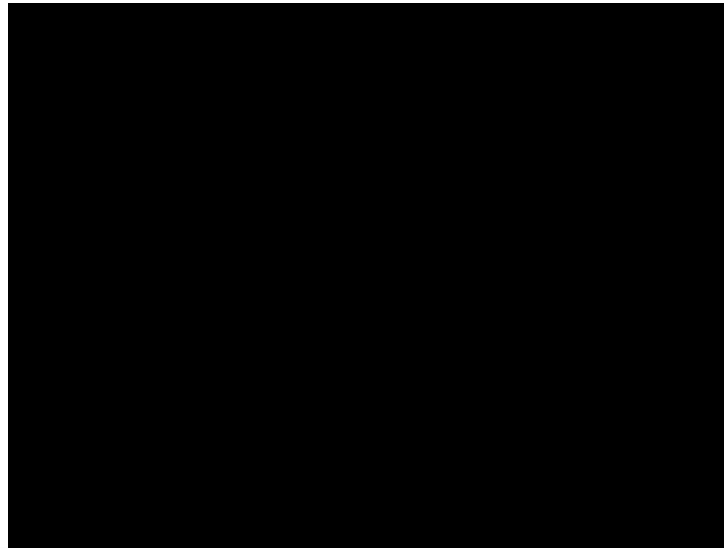
# National Intertidal DEM

The National Intertidal Digital Elevation Model (NIDEM) product is a continental-scale, 25 m spatial resolution gridded dataset providing continuous elevation data for Australia's exposed intertidal zone



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# Mangroves

Classification of mangrove location and canopy thickness for all of Australia each year



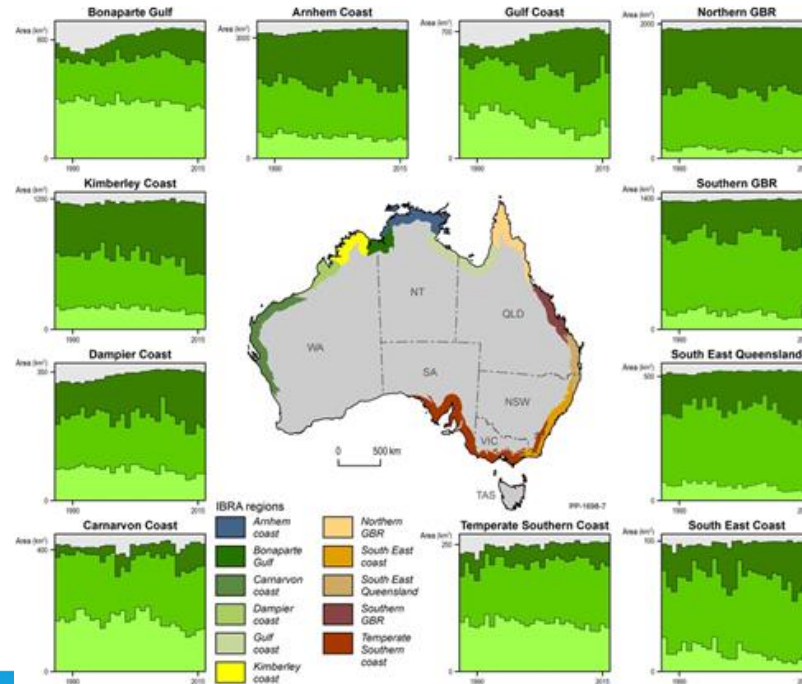


# High and Low tide view of Cambridge Gulf Mangroves



# Mangroves

Classification of mangrove location and canopy thickness for all of Australia each year



- Woodland - (20% - 50% cover)
- Open Forest - (50% - 80% cover)
- Closed Forest - (>80% cover)

# Fire management on Dampier Peninsula



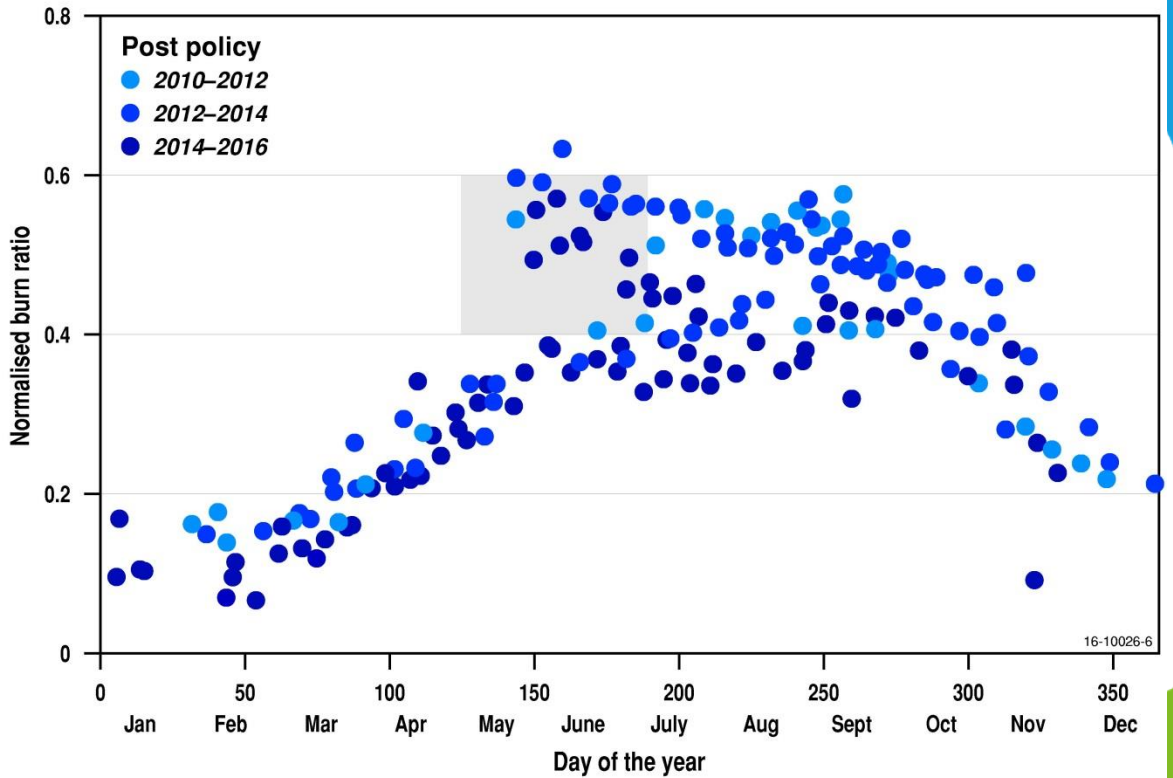
# Changes in fire management practices

20 Credits  
80 Emissions  
tCO<sub>2</sub>

**Early fire - cool**

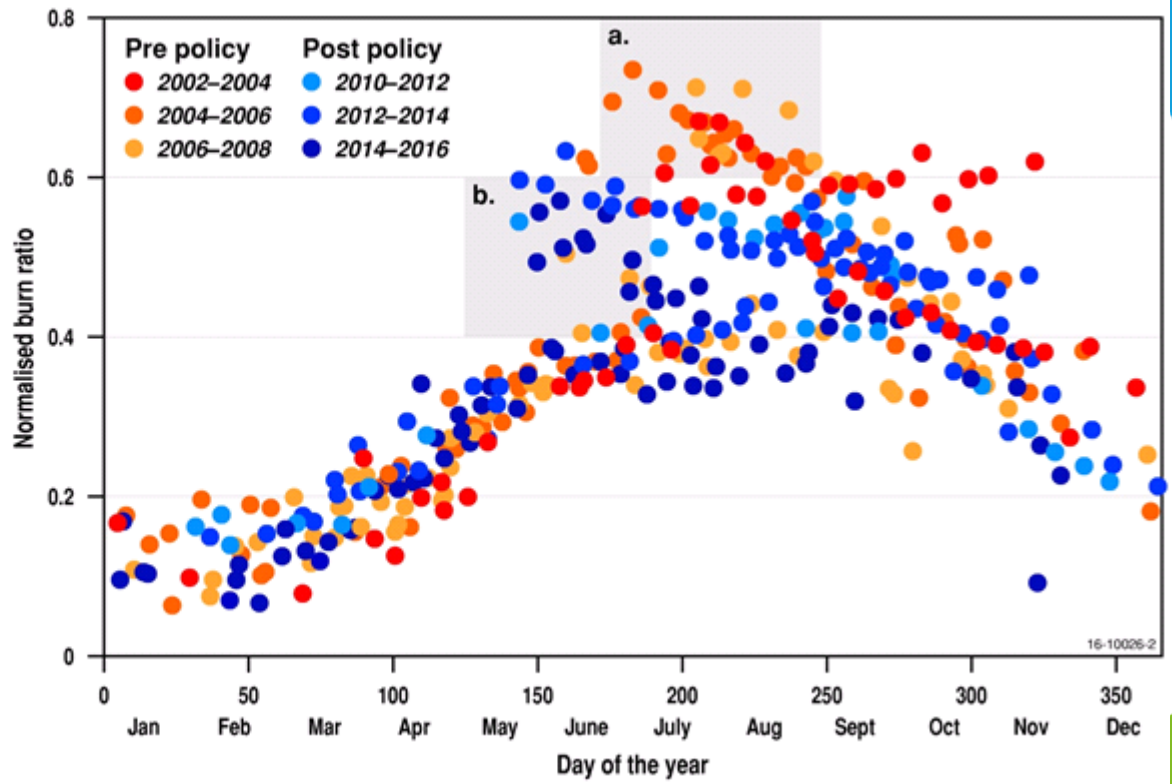
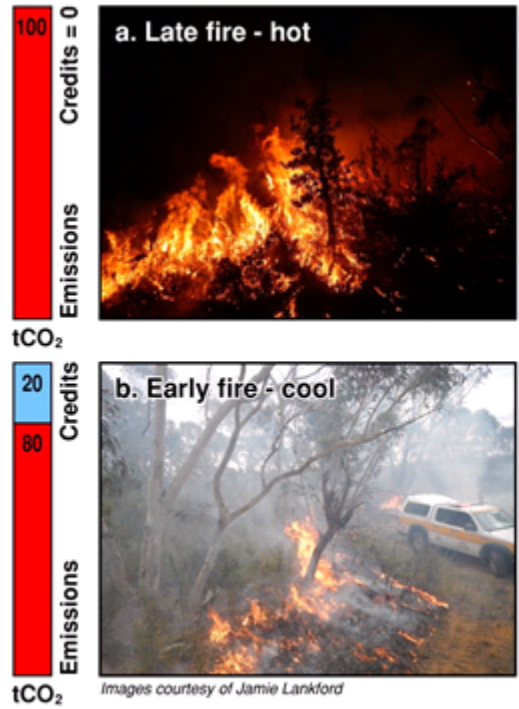


Image courtesy of Jamie Lankford



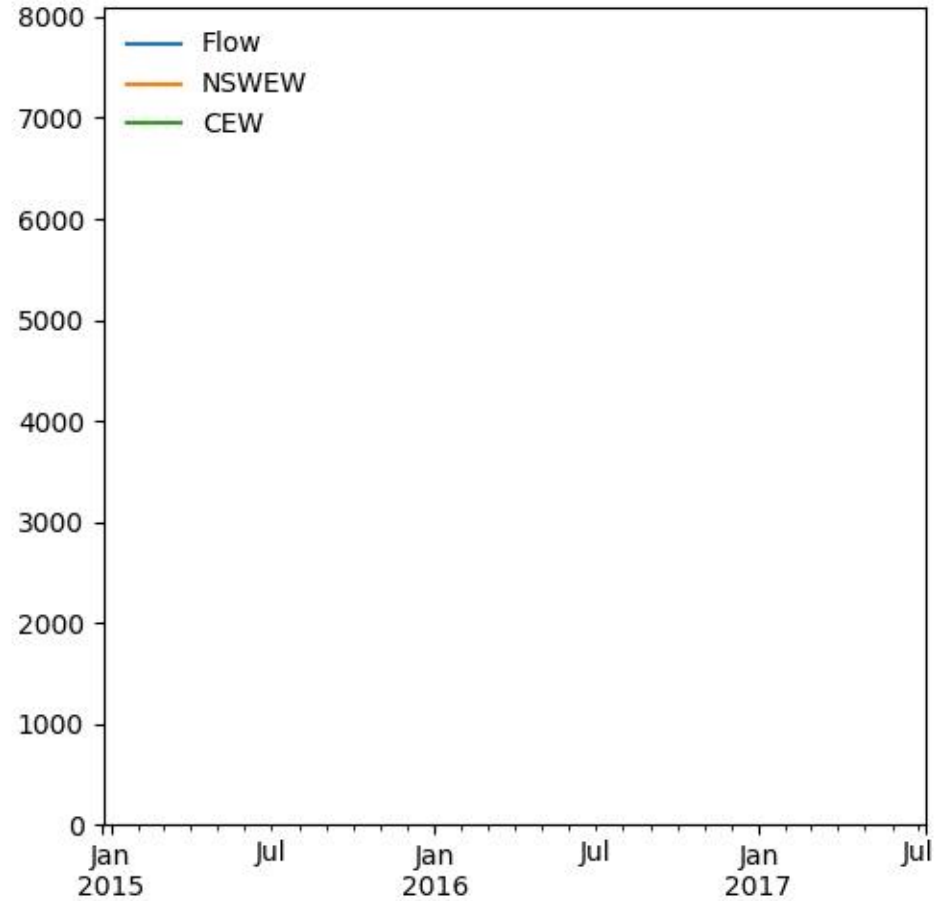
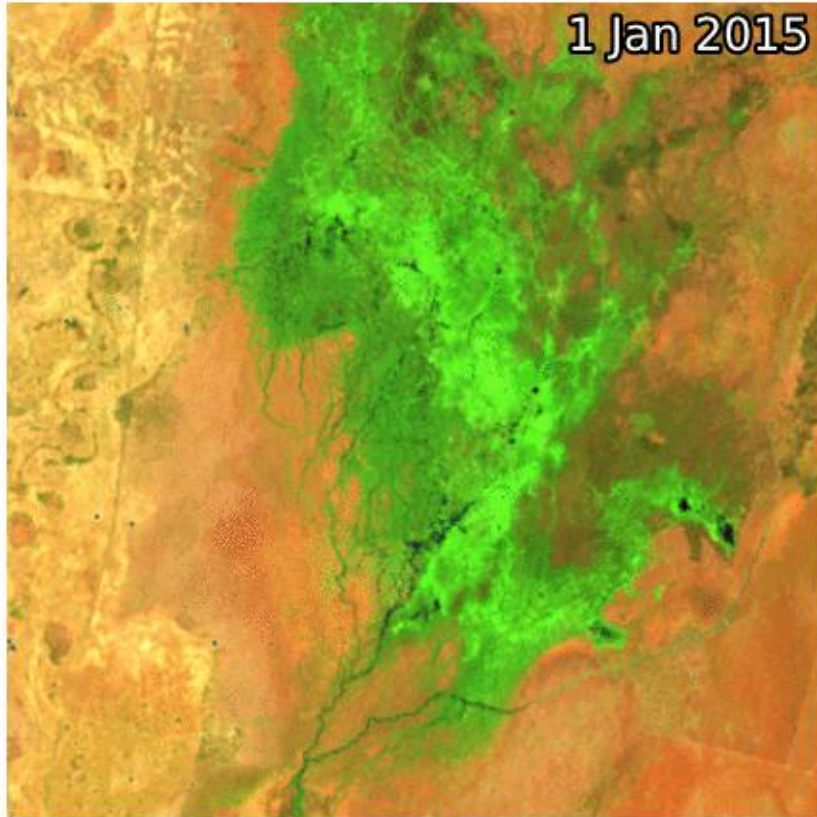


# Changes in fire management practices



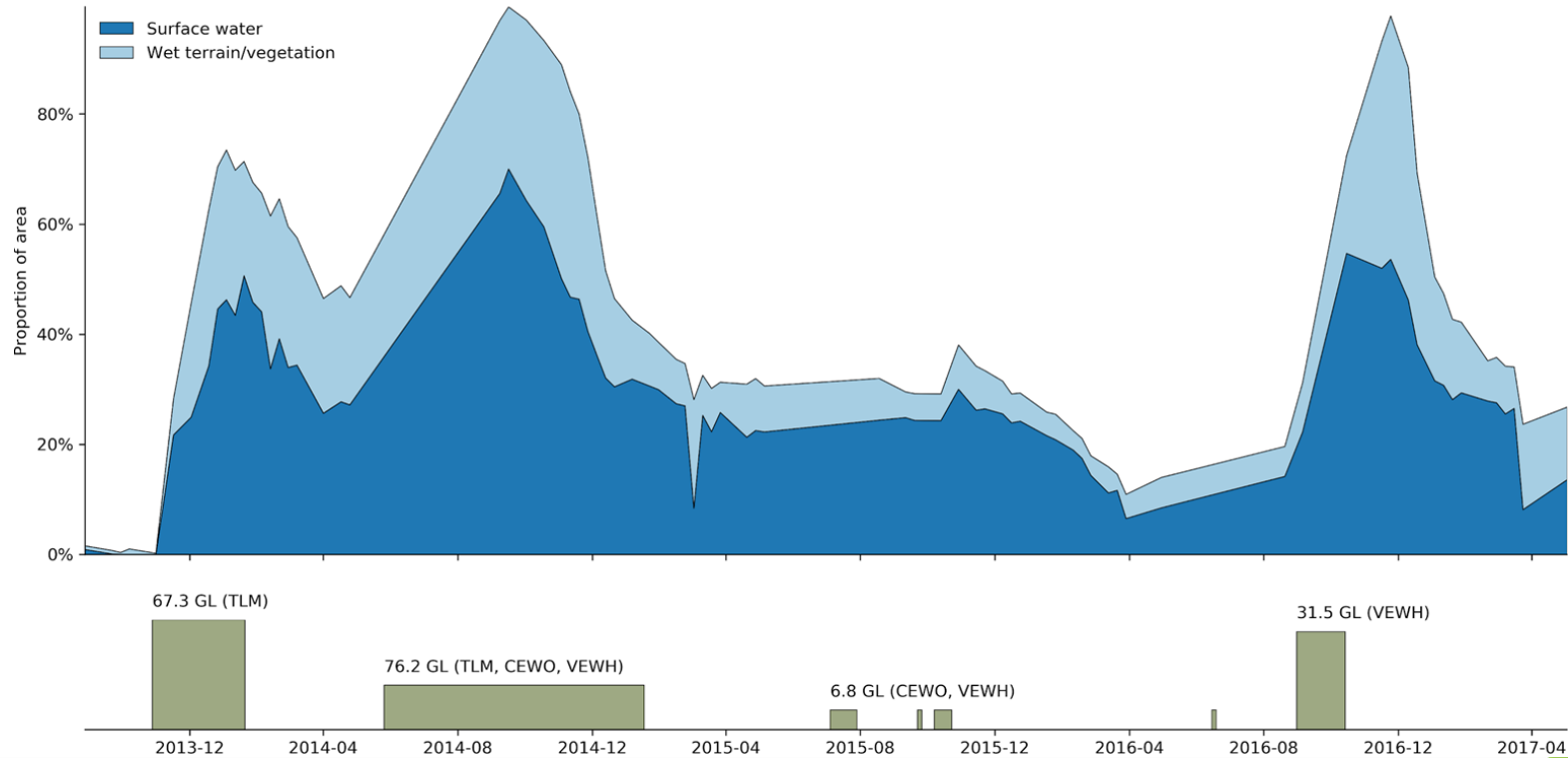


# Tracking water through the landscape

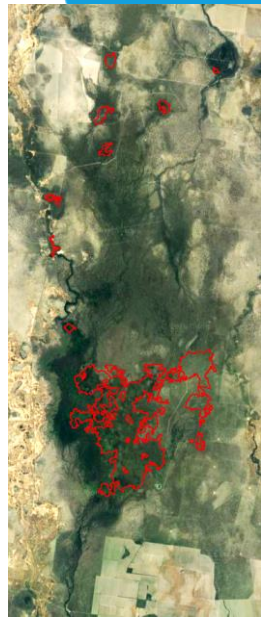
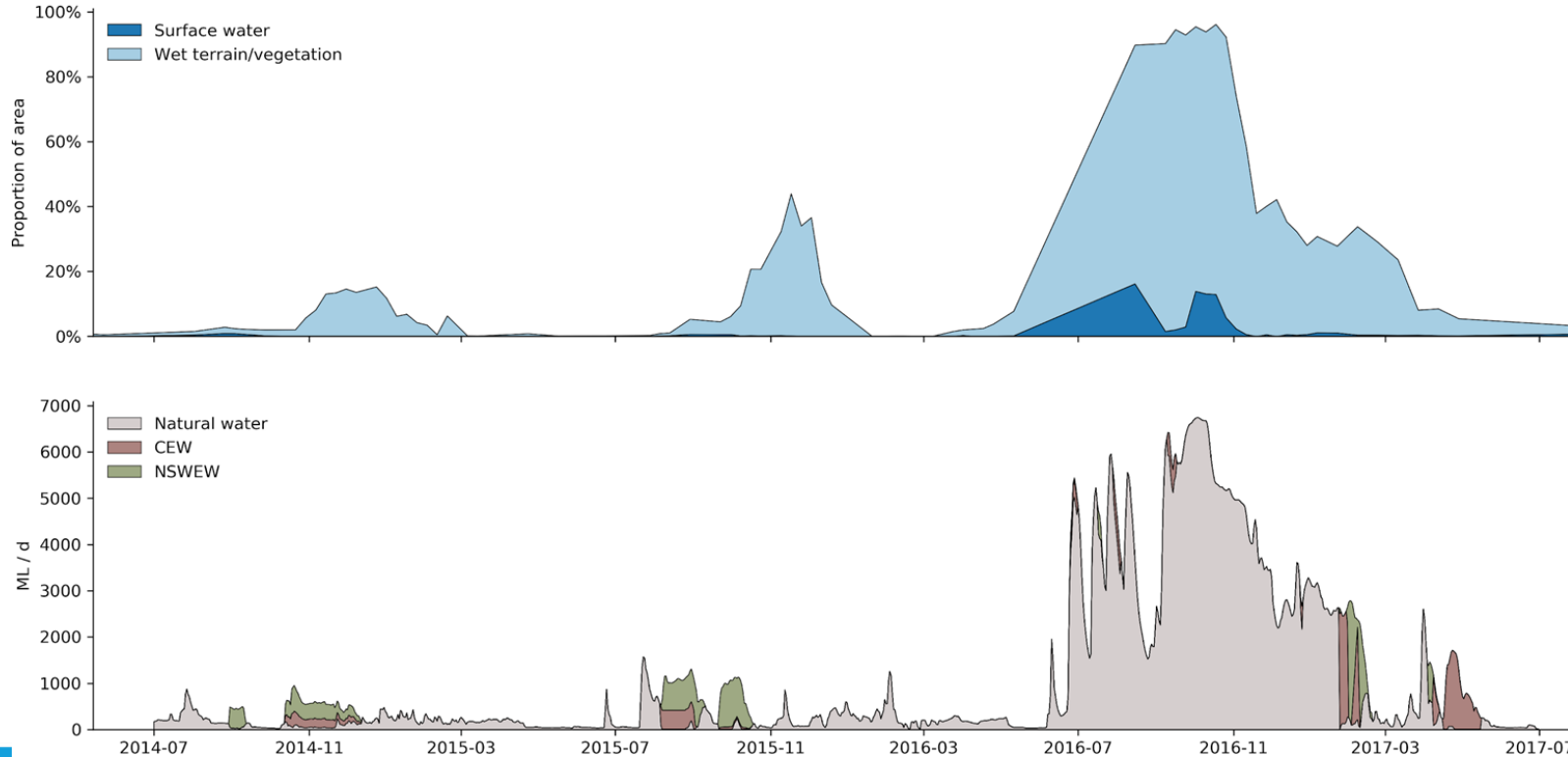


# Hattah Lakes, south complex

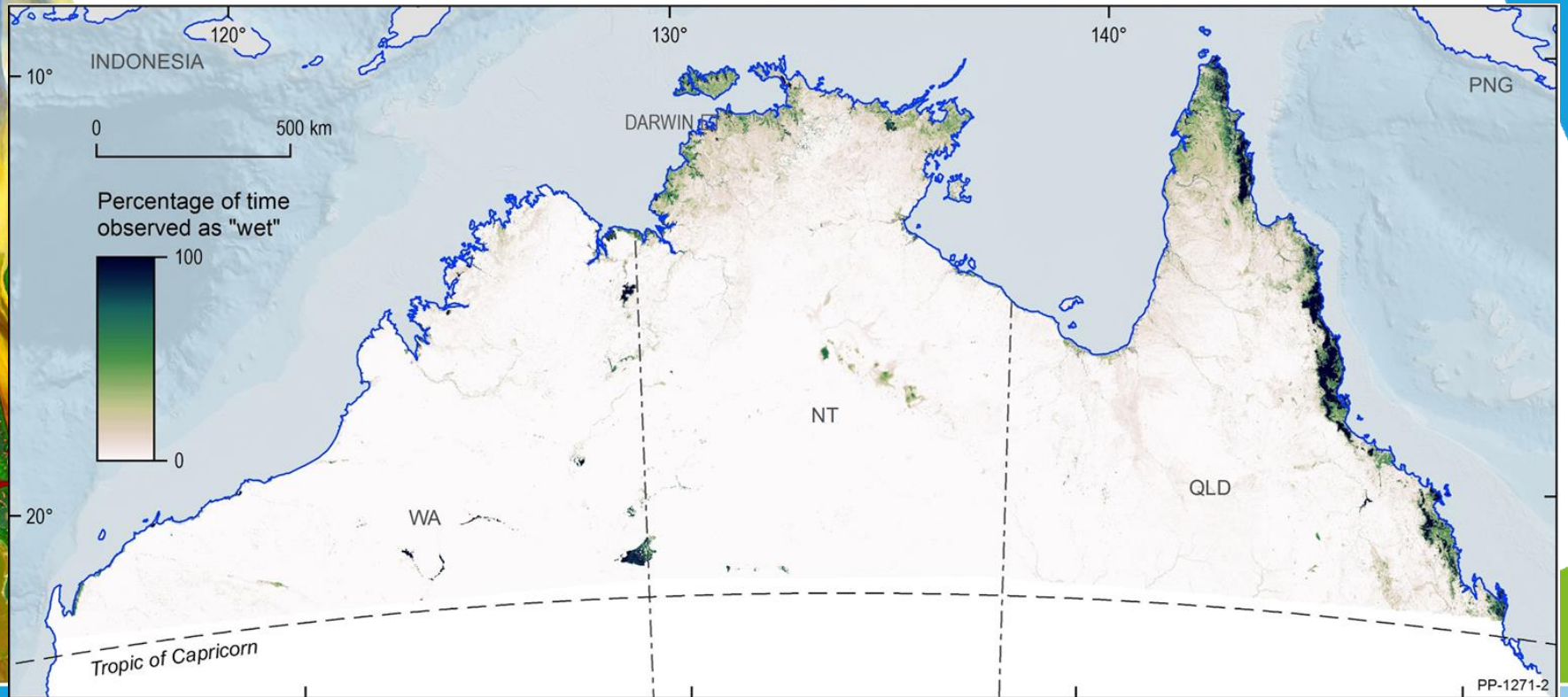
Hattah Lakes, south complex (2013-08-28 to 2017-07-30)



# Macquarie Marshes, common reeds community (OEH 1991)



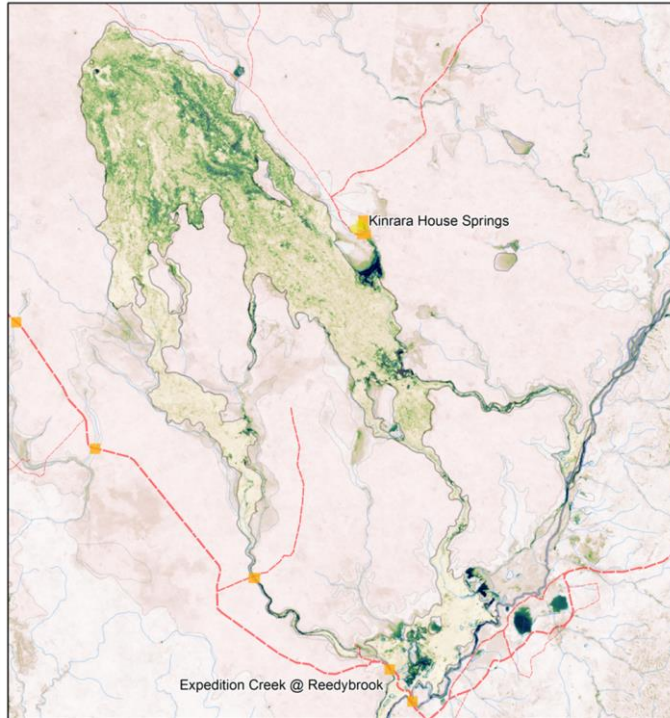
# Groundwater Dependent Ecosystems





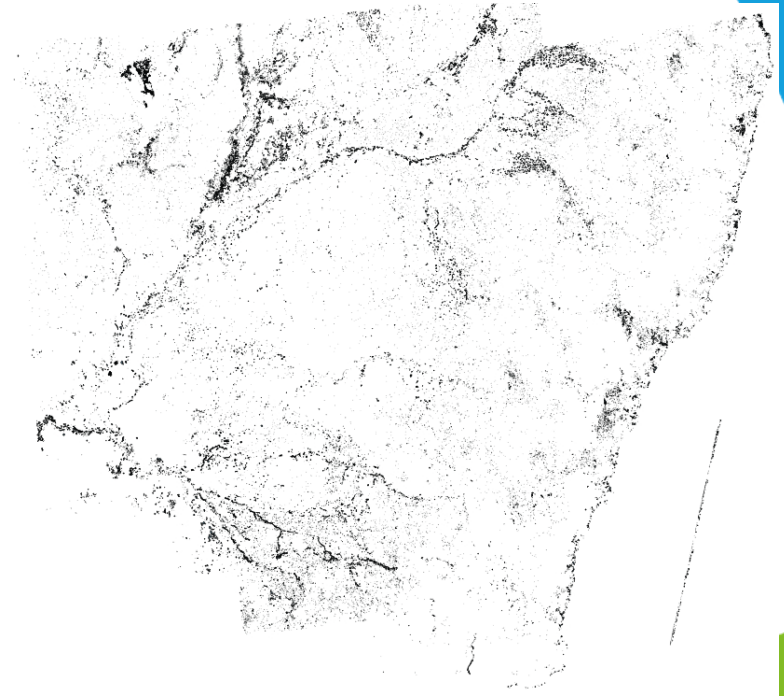
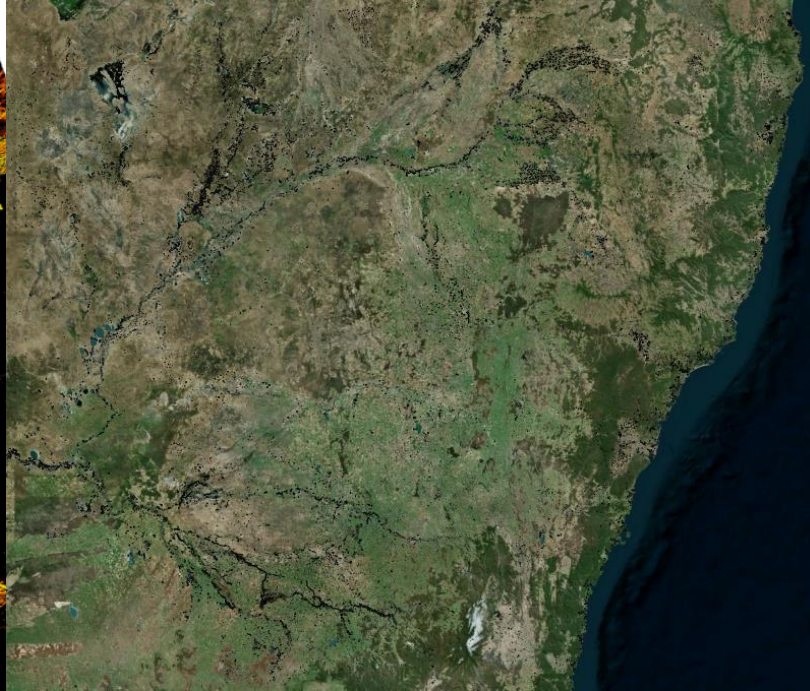
# Groundwater Dependent Ecosystems

Upper Burdekin: Kinrara Basalt Flow - DEA tasselled cap

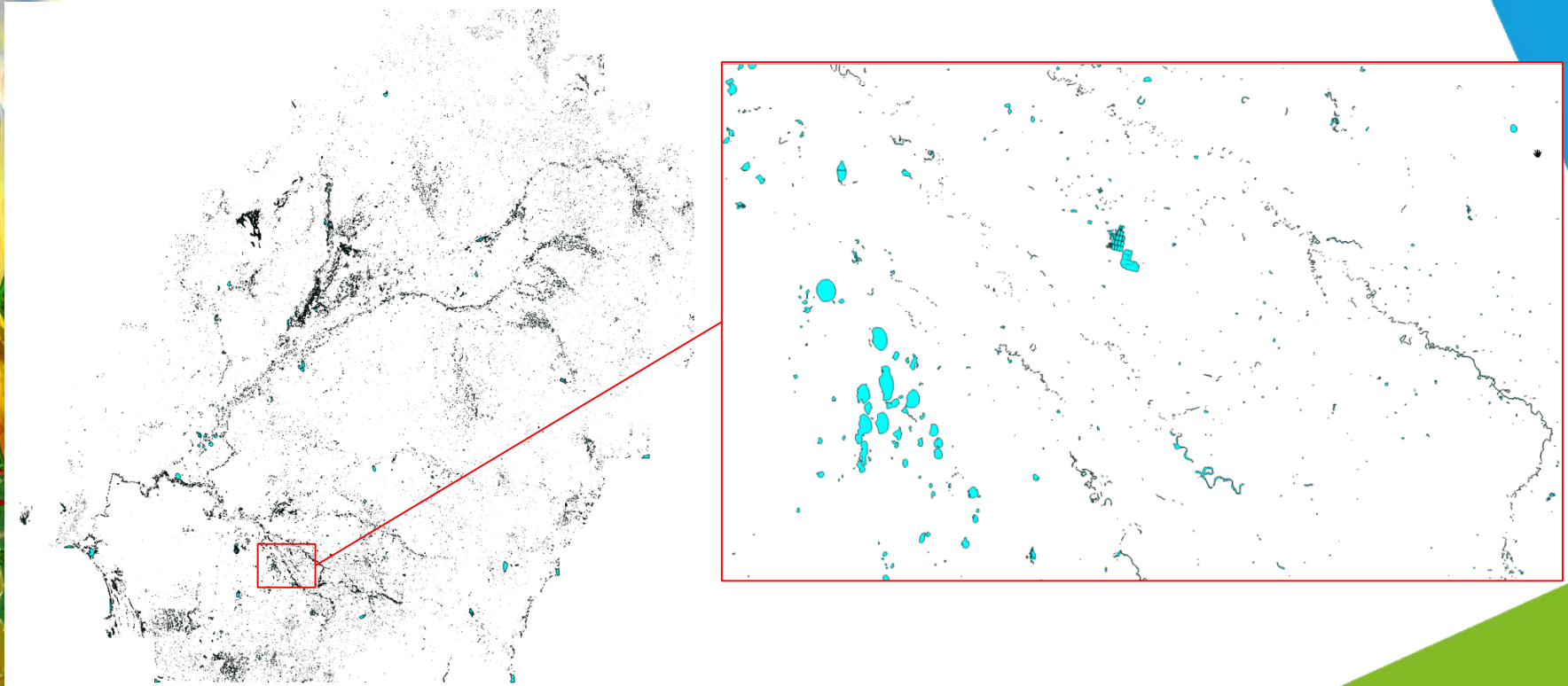




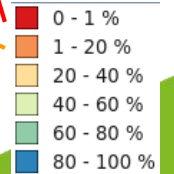
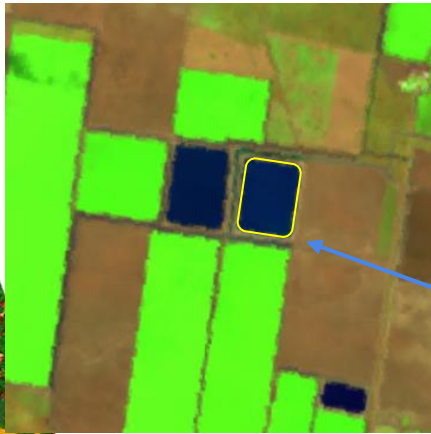
# Where is Australia's persistent water?



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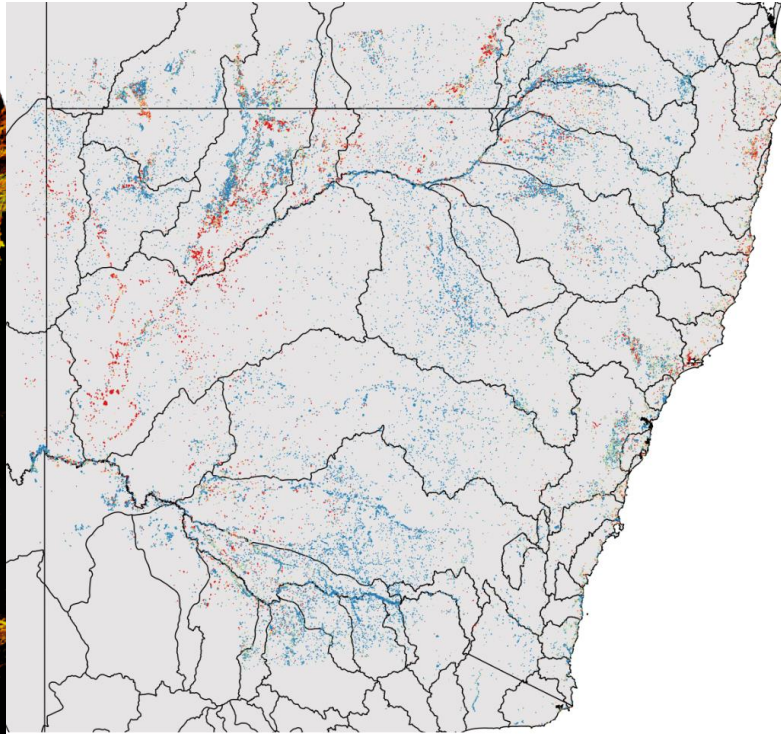


# How full is each water body?

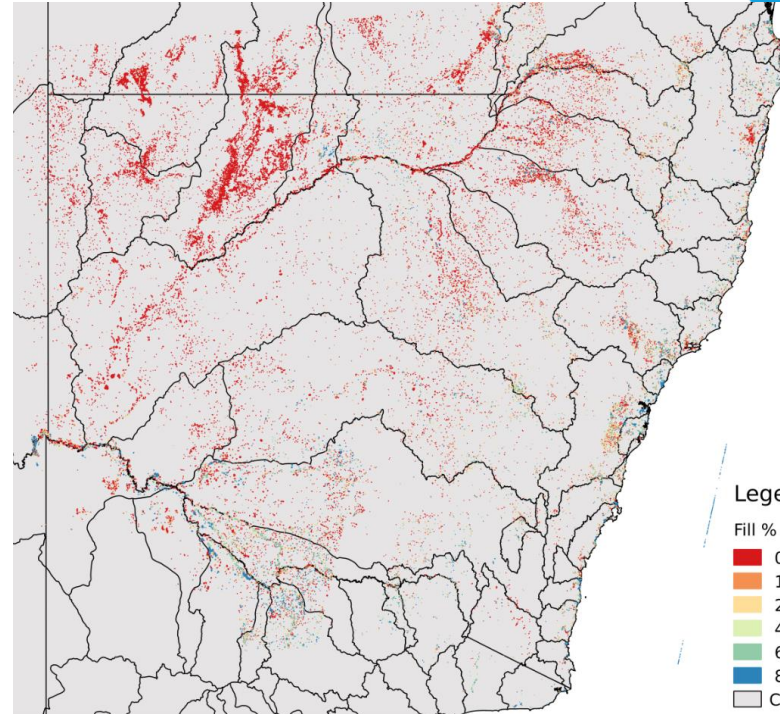




# A current drought snapshot of NSW



Oct 2016



Oct 2018

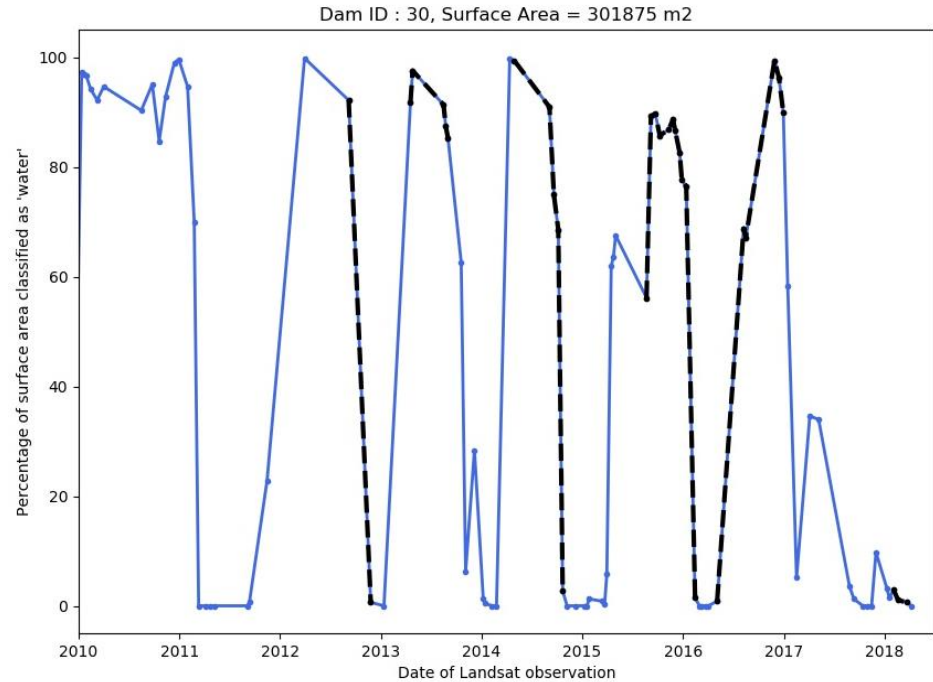
## Legend

Fill %

- 0 - 1
- 1 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100
- Catchments



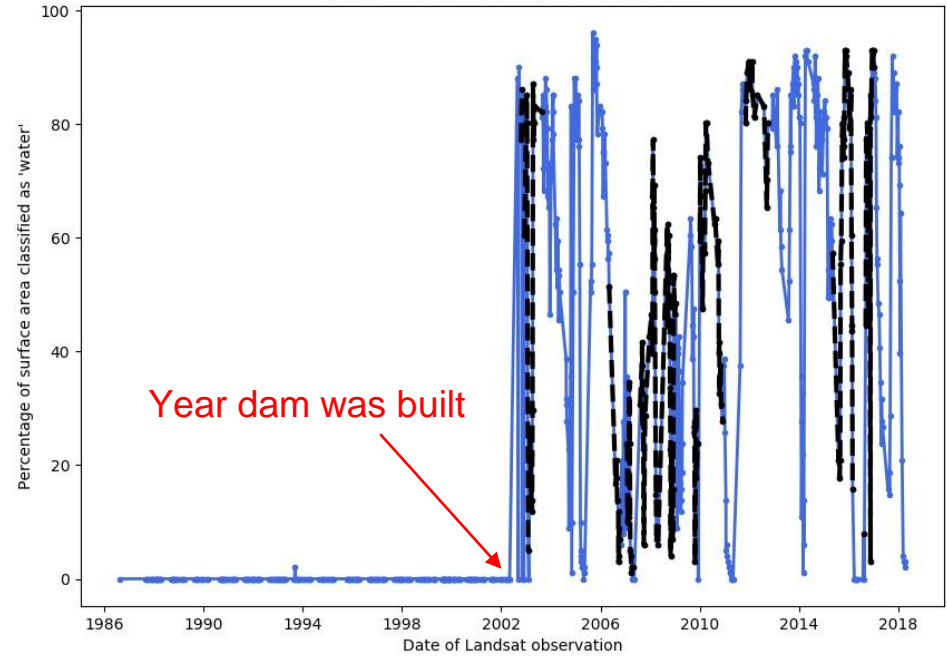
# Tracking water through time



# Tracking water through time



Dam ID : 69, Surface Area = 63125 m<sup>2</sup>



**For more info: [claire.krause@ga.gov.au](mailto:claire.krause@ga.gov.au)**

[Nationalmap.gov.au](http://Nationalmap.gov.au)

[github.com/GeoscienceAustralia](https://github.com/GeoscienceAustralia)

