
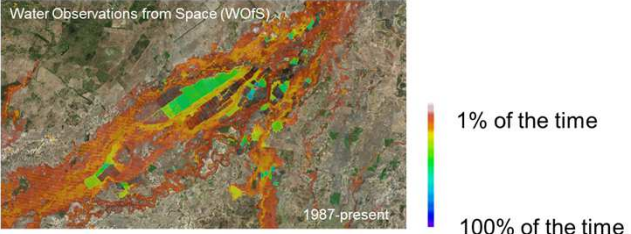


Australian Government
Geoscience Australia



Geospatial information and Natural resource Management in Australia

Andy Barnicoat
Geoscience Australia



Water Observations from Space (WORS)

1987-present

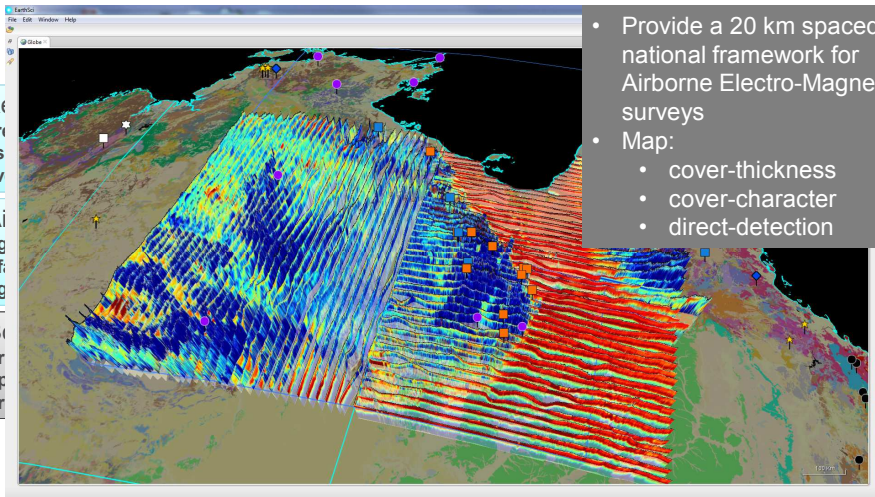
1% of the time

100% of the time

APPLYING GEOSCIENCE TO AUSTRALIA'S MOST IMPORTANT CHALLENGES

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Not just Earth Observation from Satellites....



- Provide a 20 km spaced national framework for Airborne Electro-Magnetic surveys
- Map:
 - cover-thickness
 - cover-character
 - direct-detection

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Geospatial information and Natural Resources in Australia

Digital Earth Australia – Why?



DEA improves the efficiency and effectiveness of the Australian Government’s investments and improves how we manage our natural resources



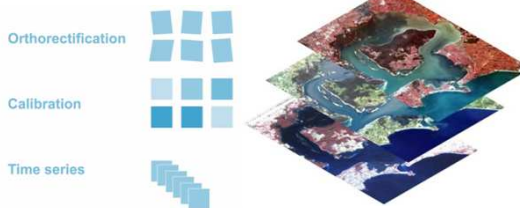
DEA supports innovation and growth in the digital economy and will drive increased productivity across a the Australian economy

What is Digital Earth Australia (DEA)?

A continental archive of 30 years of analysis-ready Earth Observation data

Processed to top-down (nadir) view angle, atmospherically and terrain-corrected surface reflectance (NBAR-T)

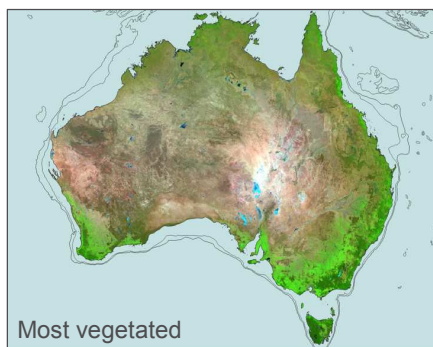
Pixel Quality flags for cloud, cloud shadow, saturation



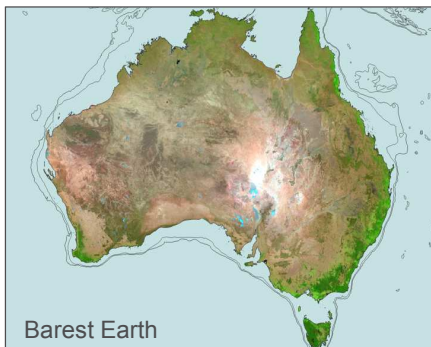
Vegetation Change Detection

- Applied to both natural and farm vegetation
- Examples of coastal mangroves and changing farm crops

Continental-scale vegetation state



Changing the sign of the weights to derive the most vegetated state of Australia, shown in False Colour (SWIR1, NIR, GREEN as RGB). Vegetation in green.



Landsat-8 Barest Earth mosaic, shown in False Colour (SWIR1, NIR, GREEN as RGB). Vegetation in green.

Annual Mangrove Extents – Roper River

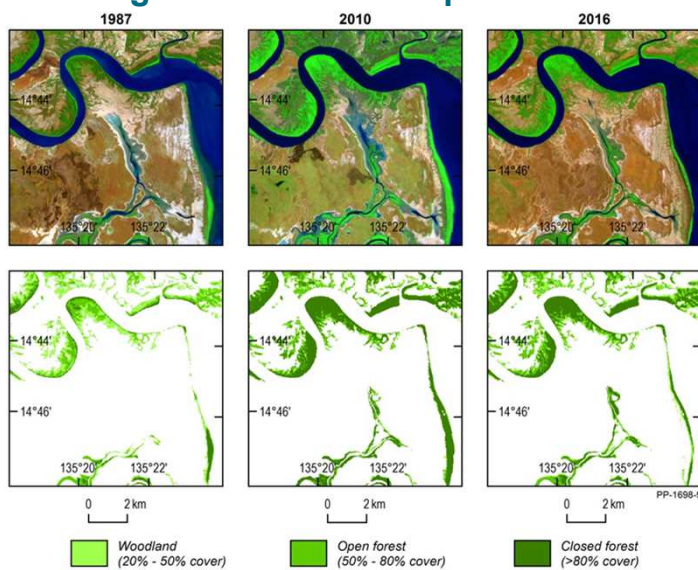


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Annual Mangrove Extents – Roper River



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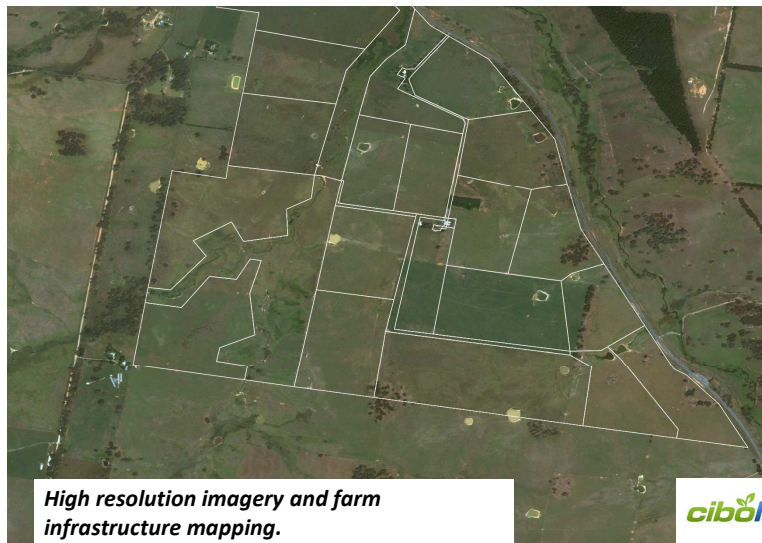
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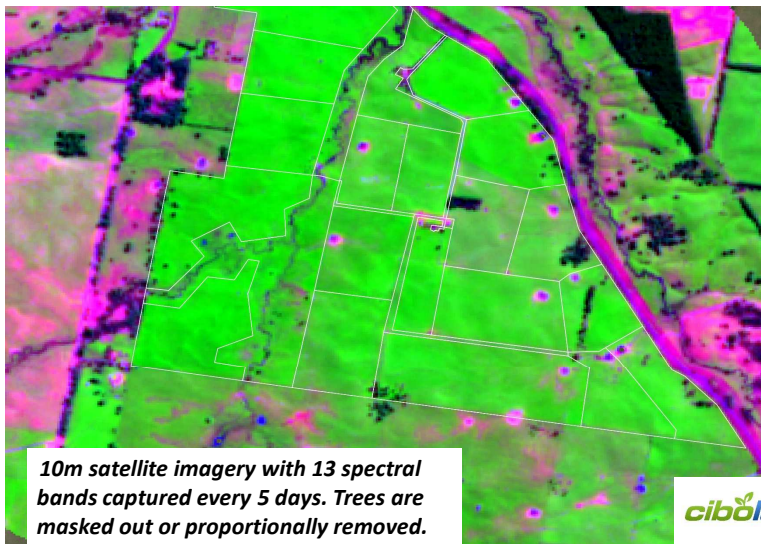
Cropping Patterns



Farm Yield Mapping



Farm Yield Mapping

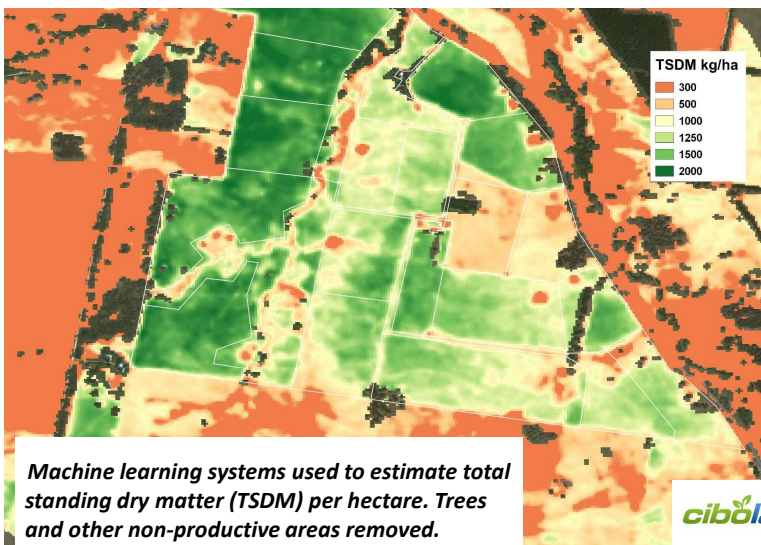


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Farm Yield Mapping

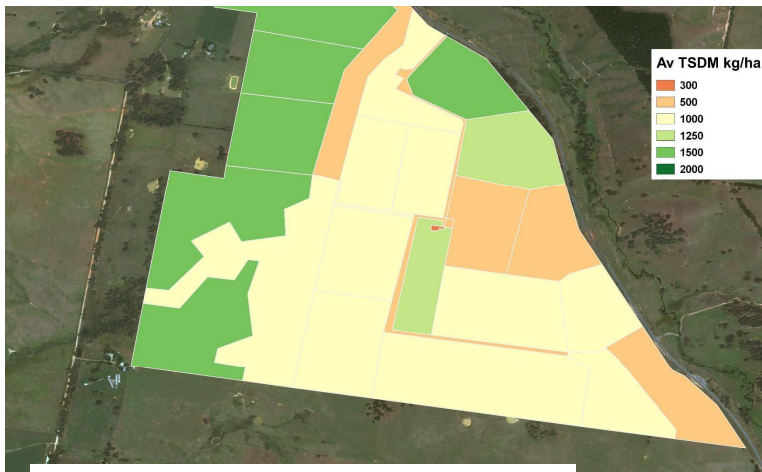


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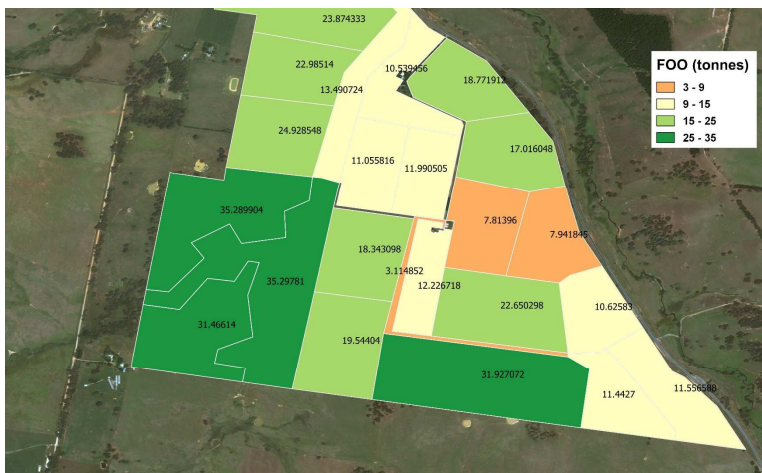
Farm Yield Mapping



Average Total Standing dry Matter (TSDM) per field provided as a simple "traffic light" map .



Farm Yield Mapping

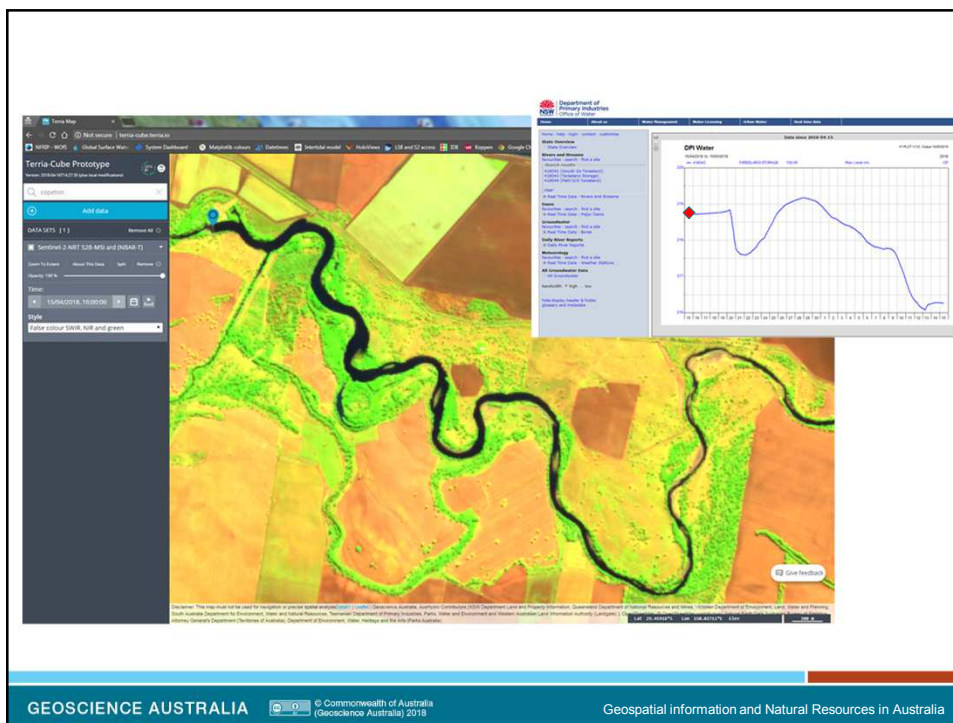


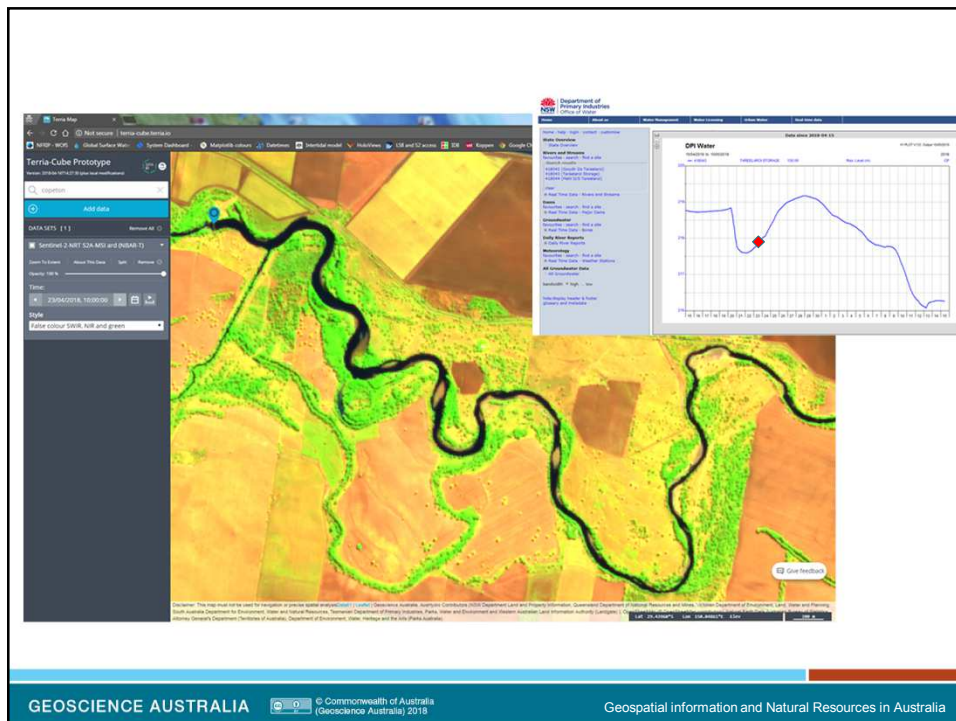
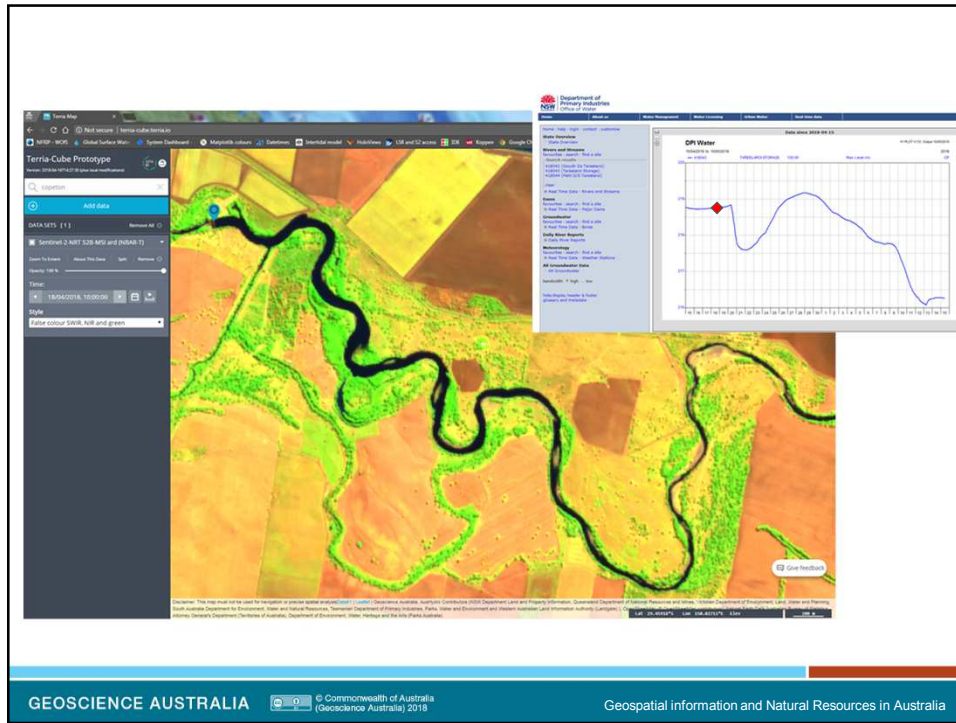
Total Feed on Offer (FOO) in tonnes per field provided as a simple "traffic light" map .

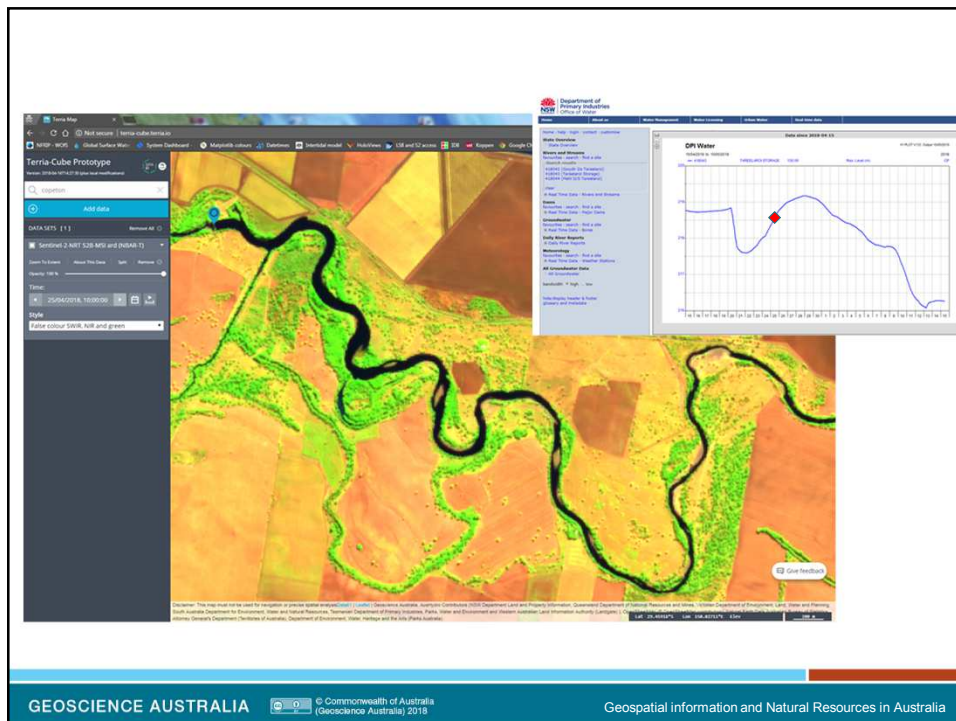
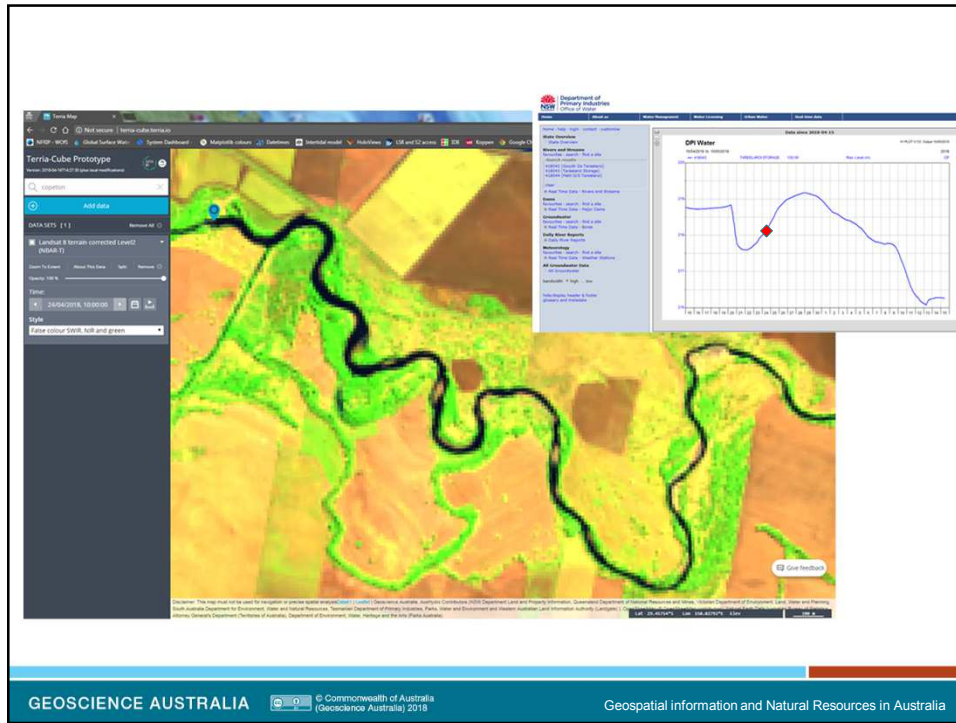


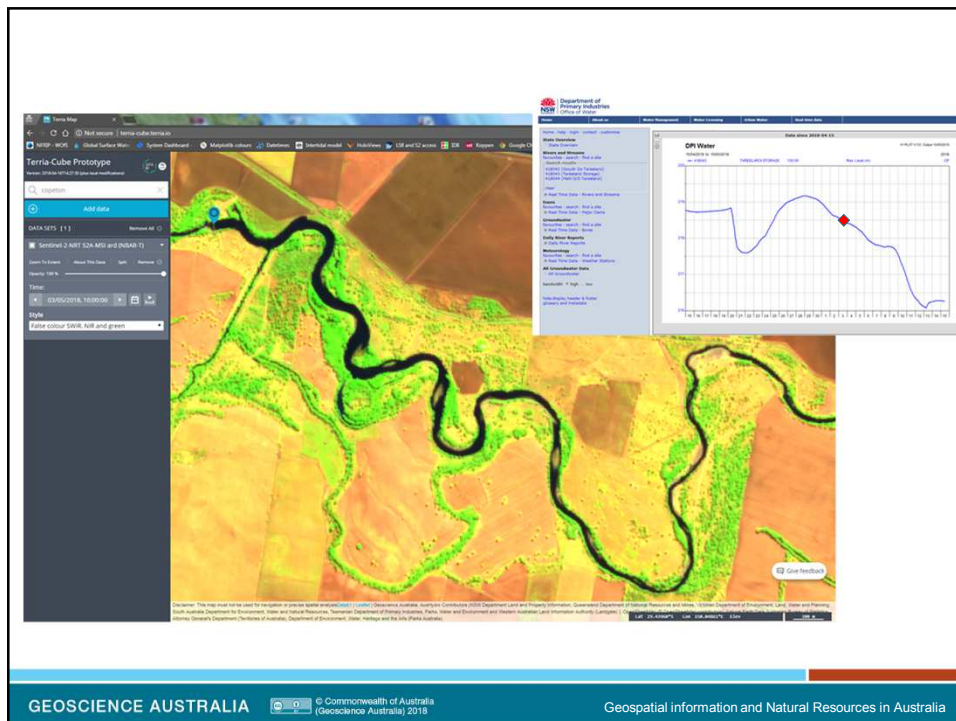
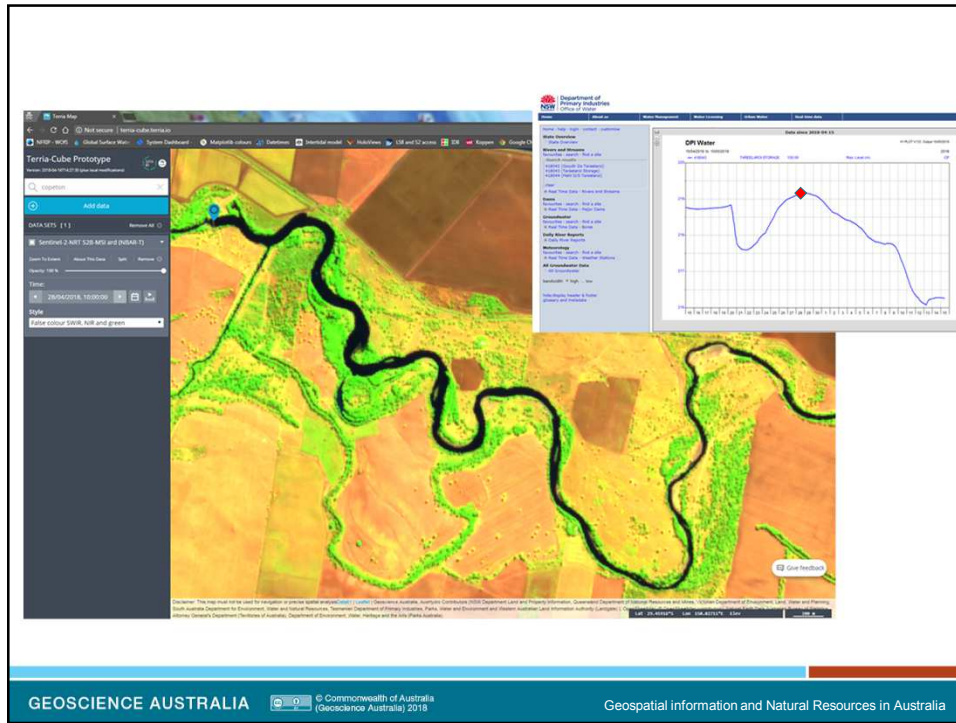
Water Release Monitoring

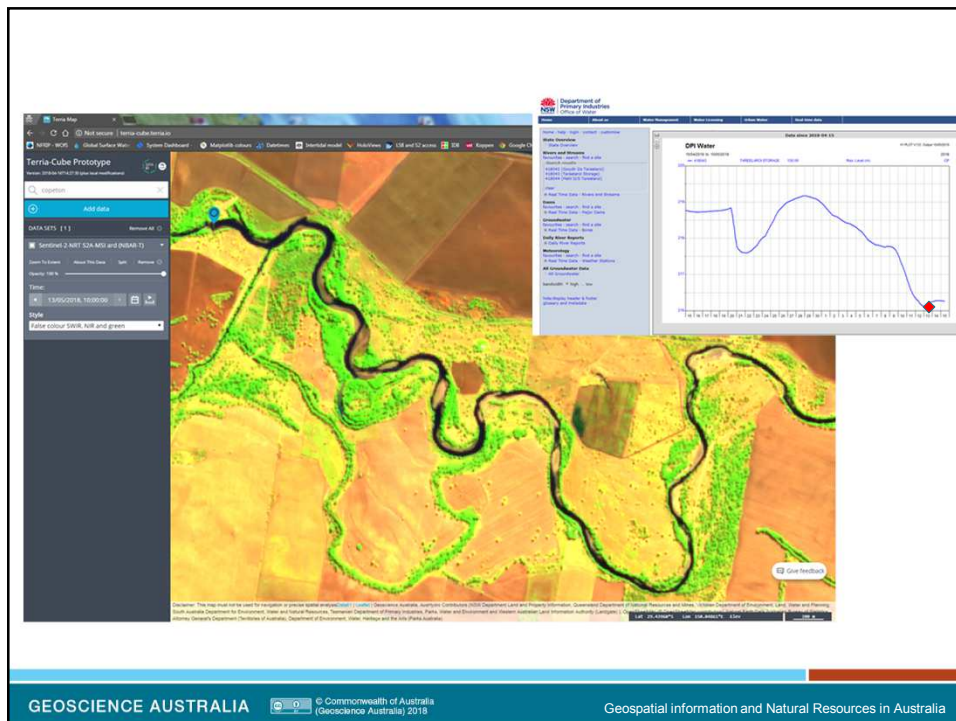
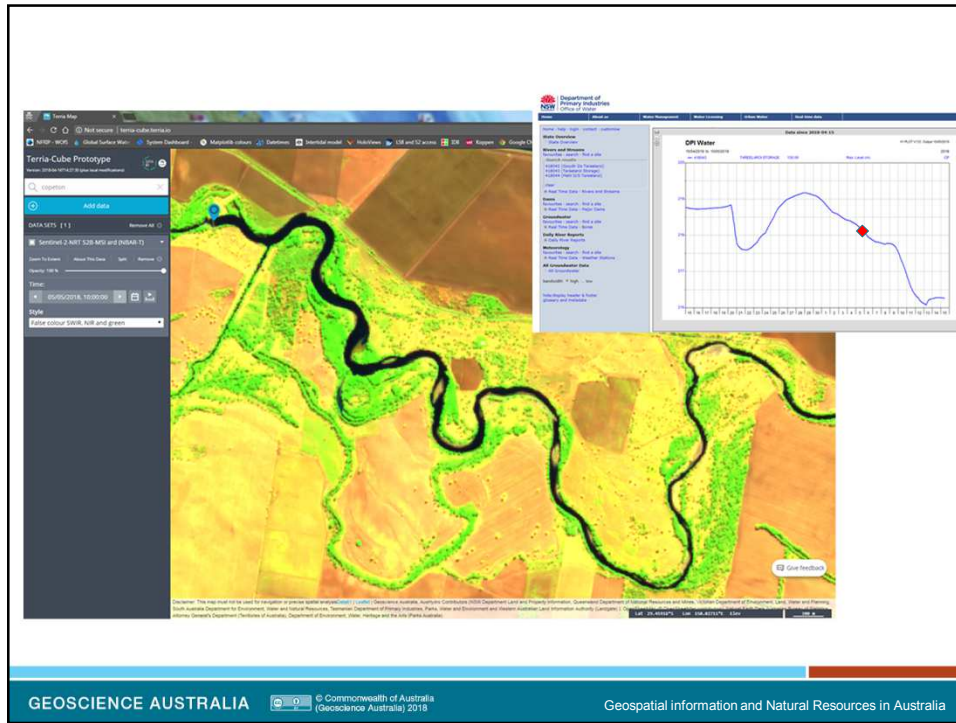
- Water released into Murray-Darling River Basin in mid-April 2018
- Murray-Darling Basin Authority and Commonwealth Environmental Water Office engaged DEA to provide Near Real-time Satellite Imagery












National Intertidal Digital Elevation Model

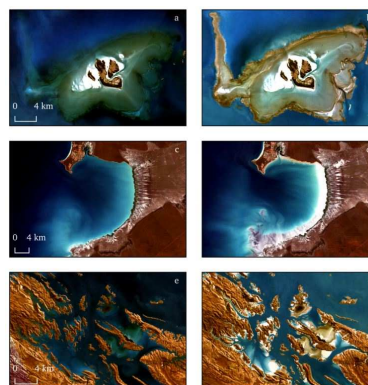
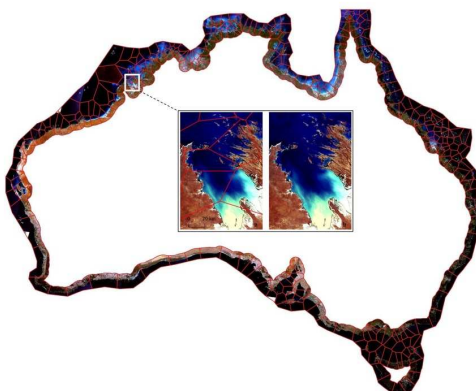
- Extract tide heights from tidal model and link to imagery
- Extract elevation data
- Continental scale product

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High and Low Tide Composites (HLTC) product – a continental scale mosaic



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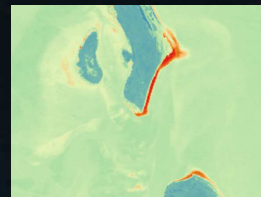
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Using Tidal Extents Confidence Data

Entrance to Moreton Bay,
Queensland

1987



Inter-tidal elevation model confidence layer (red indicates low consistency)

Note sand mining and vegetation rehabilitation

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Tweed River Bypass Project



Detection of change based on remedial actions, mostly in early 2000s



1988-93

1993-98

1998-03

2003-08

2008-13

2013-18



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Coming in 2018/19: National Intertidal Digital Elevation Model

Elevation data for the exposed intertidal zone along Australia's entire coastline
Mapped entirely from Landsat data and modelled tidal heights: RMSE < 50cm vs LiDAR



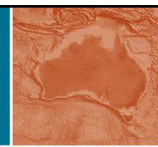
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Australian Government
Geoscience Australia



Phone: +61 2 6249 9111

Web: www.ga.gov.au

Email: clientservices@ga.gov.au

Address: Cnr Jerrabomberra Avenue and Hindmarsh Drive, Symonston ACT 2609

Postal Address: GPO Box 378, Canberra ACT 2601