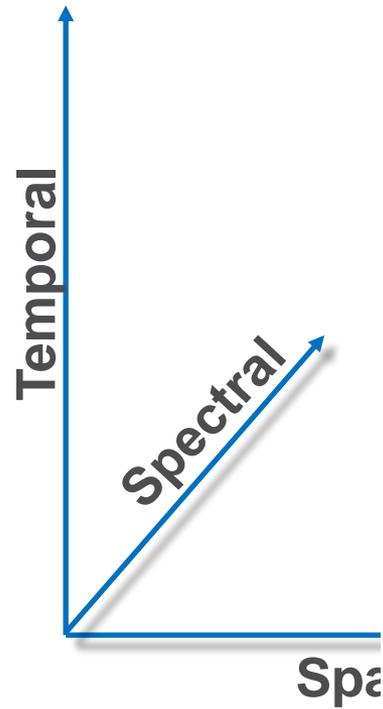




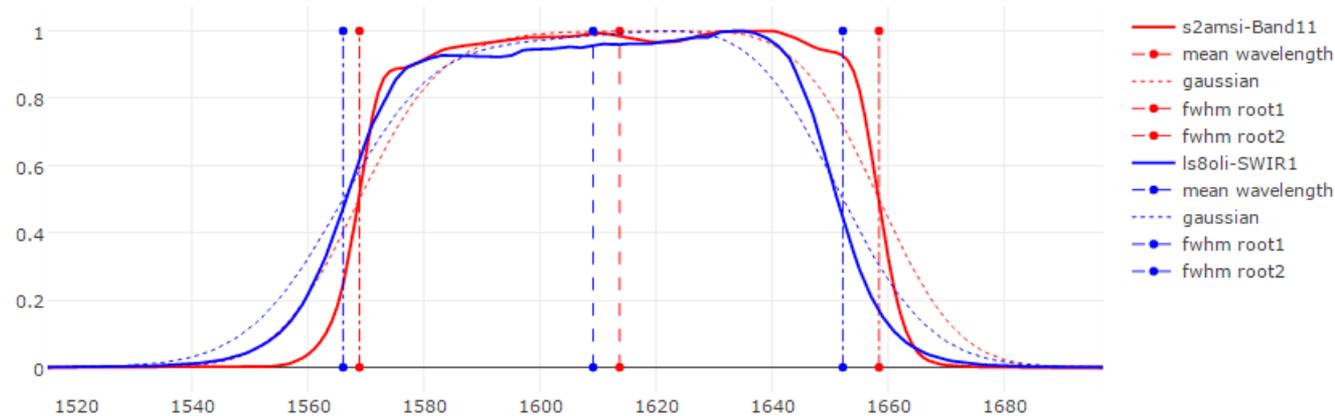
Observing the Earth through Space and Time: The Australian Geoscience Data Cube

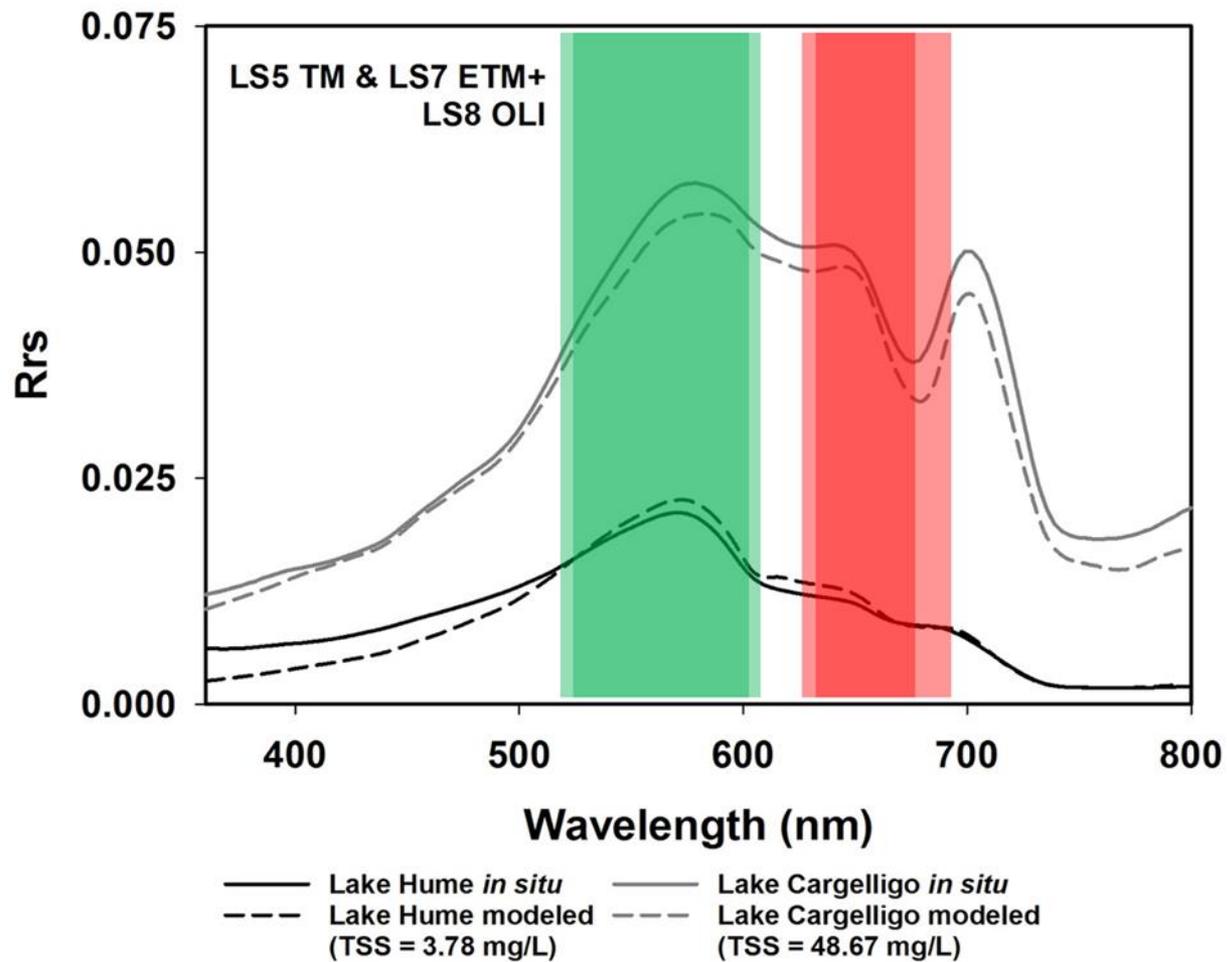
Leo Lymburner, Steve Sagar, Hannelie Botha, Erin Hestir, Adam Lewis, Simon Oliver and the AGDC development team

Information domains in multi temporal multi spectral data



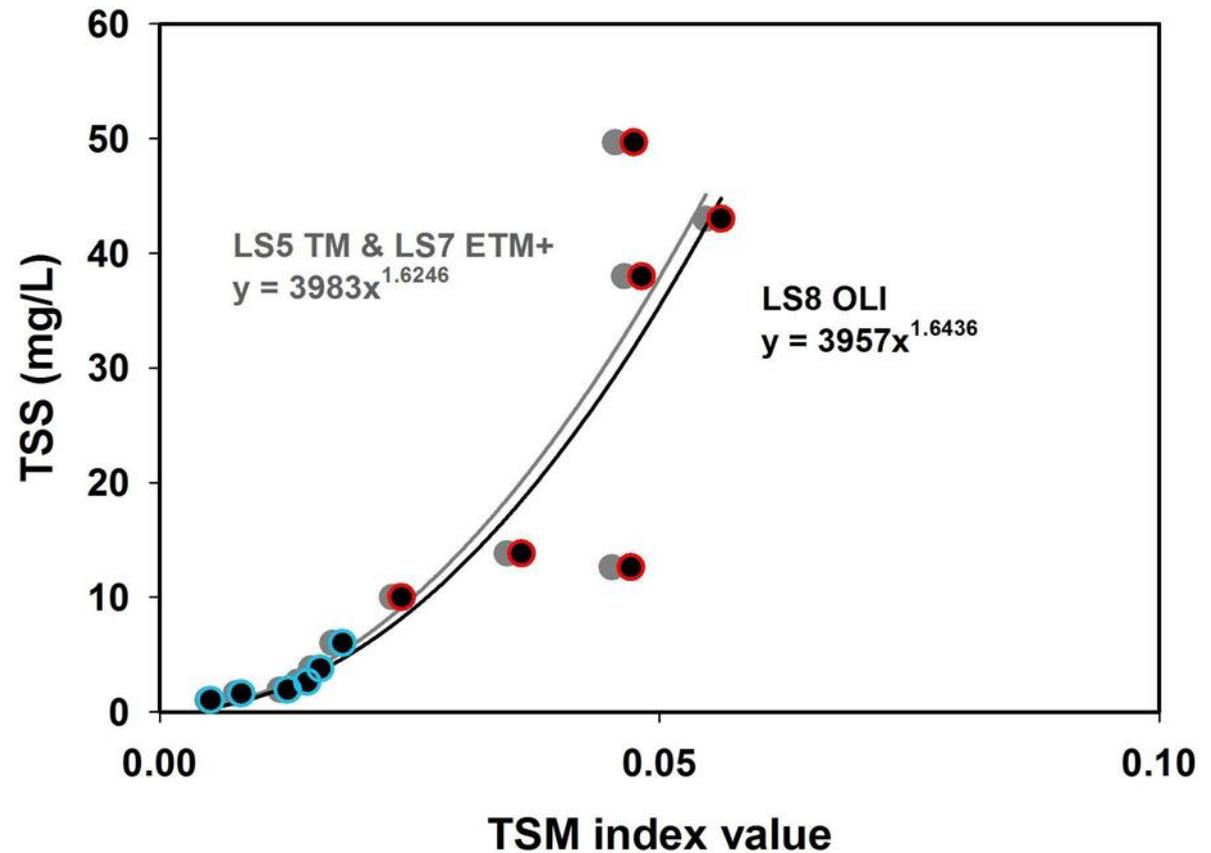
- Geometric alignment
- Radiometric correction
- Per pixel metadata
- Characterization of differences between sensors





Conversion from TSS index to TSS concentration

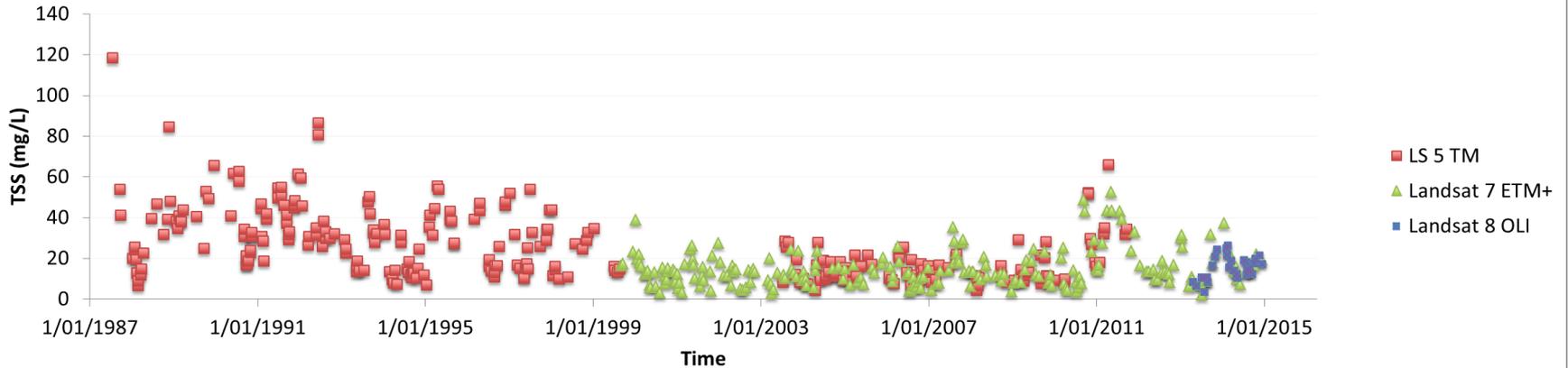
- Using Ecolight 5 forward modelling of water bodies with known TSS concentrations



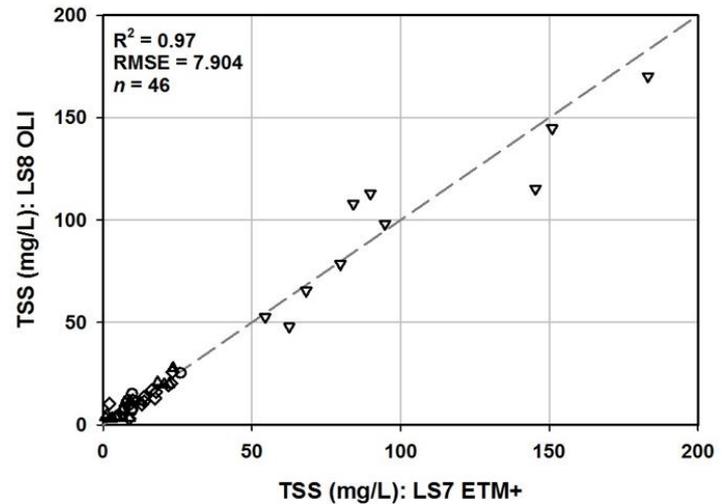
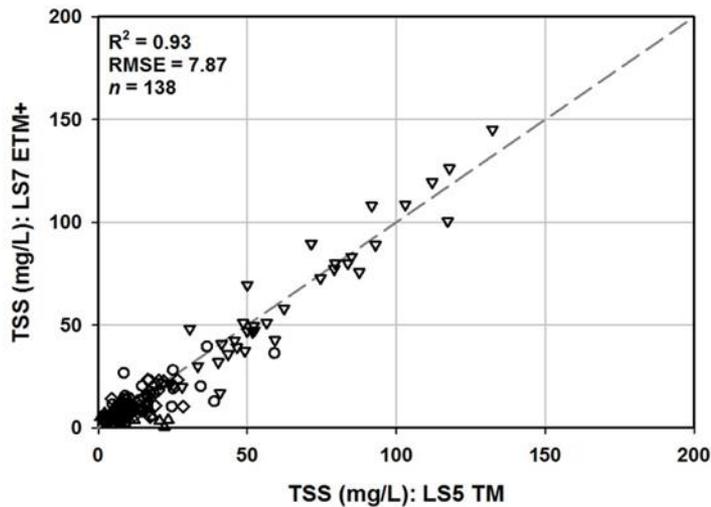
- LS5 TM & LS7 ETM+
- LS8 OLI
- deep, clear waterbodies
- turbid waterbodies

Temporal domain information about optical water quality

Lake Burley Griffin



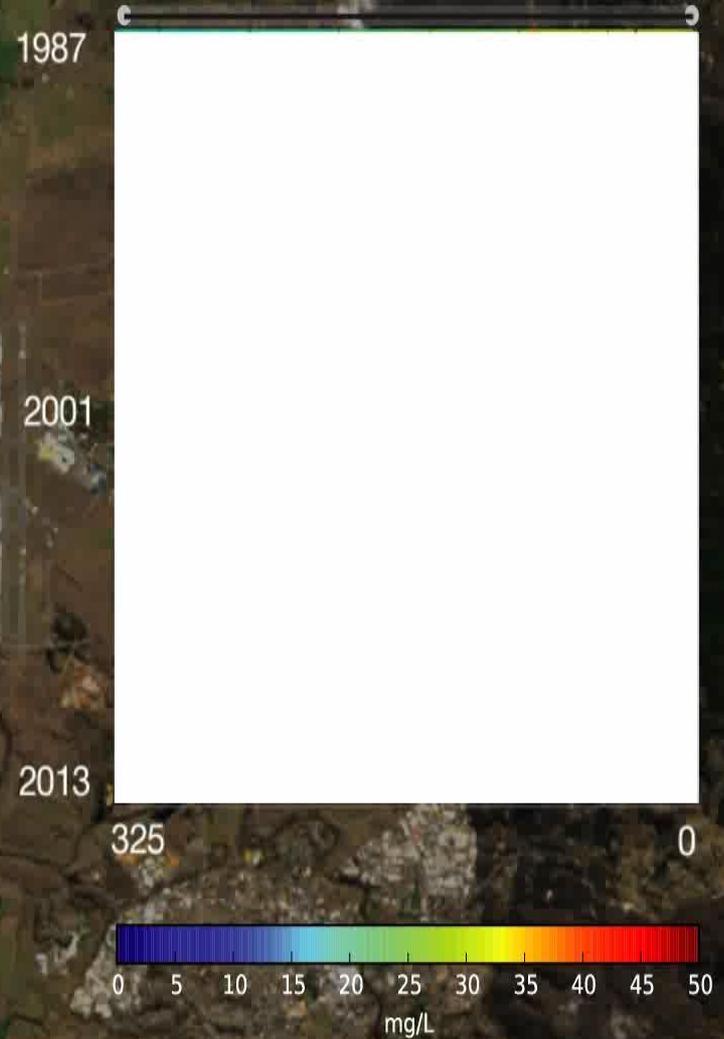
Lake Burley Griffin sits in the side lap between two passes – observations within 24 hours



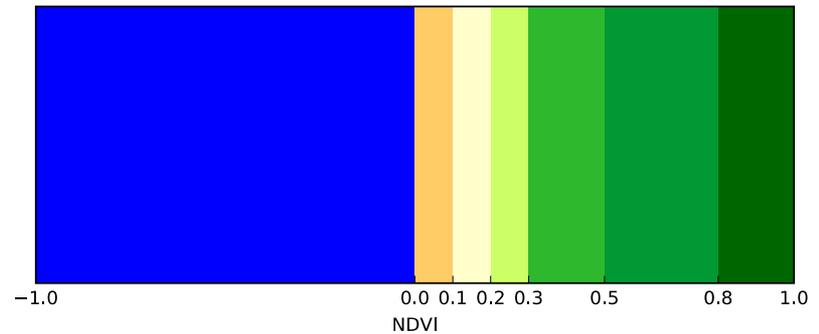
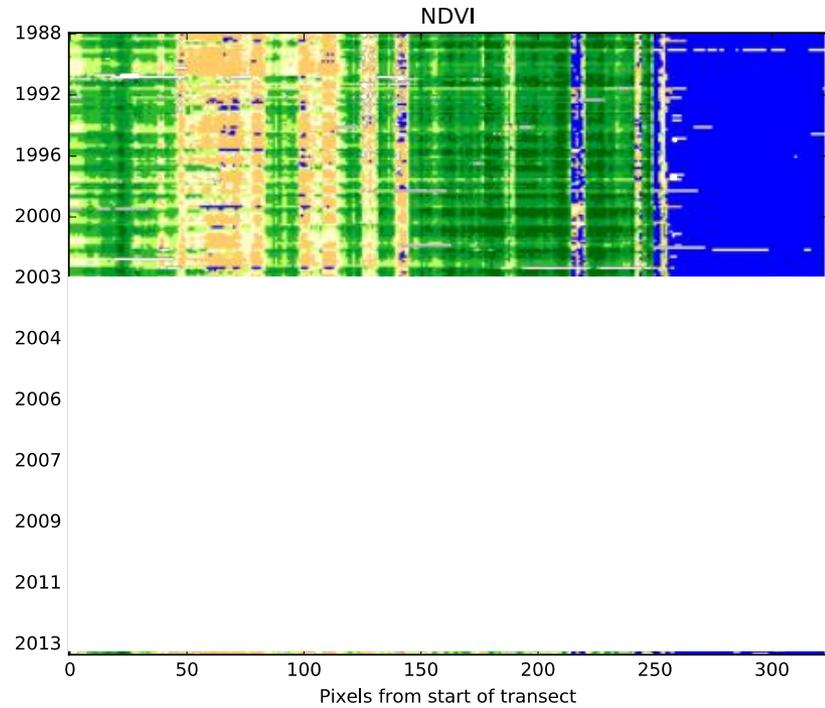
○ LI △ MA ▽ CA ◇ BG

Characterizing spatial and temporal domain information

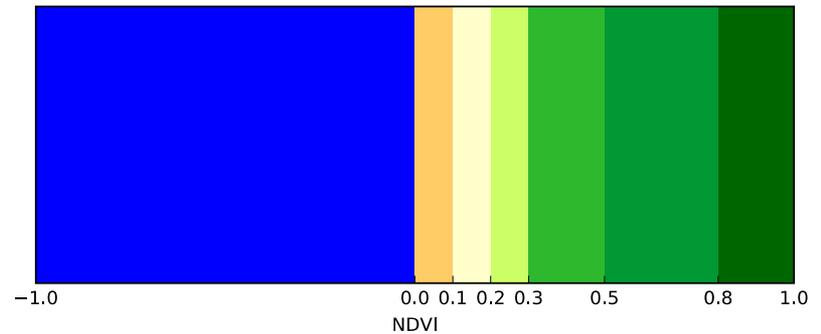
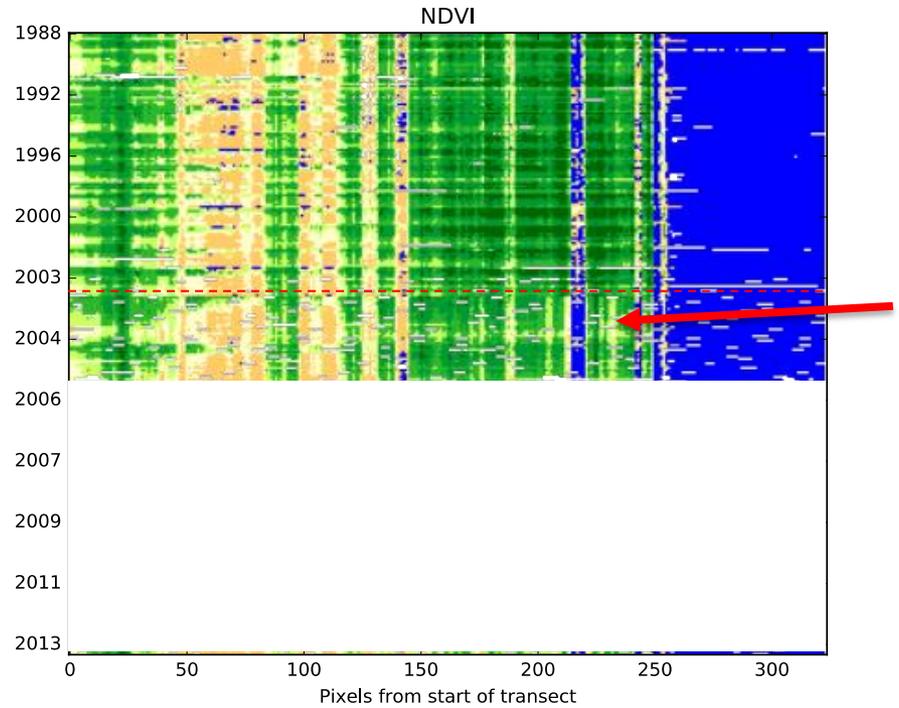
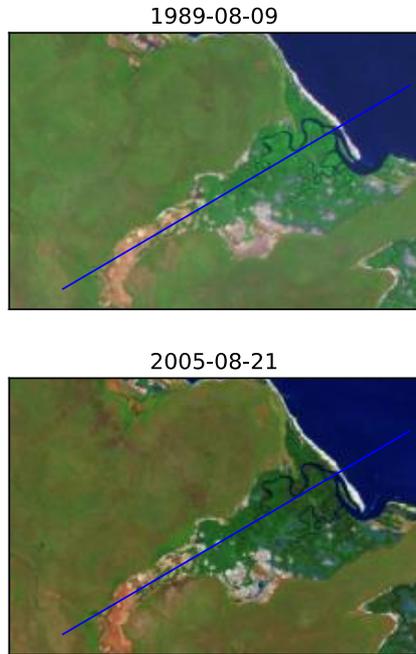
Lake Burley Griffin



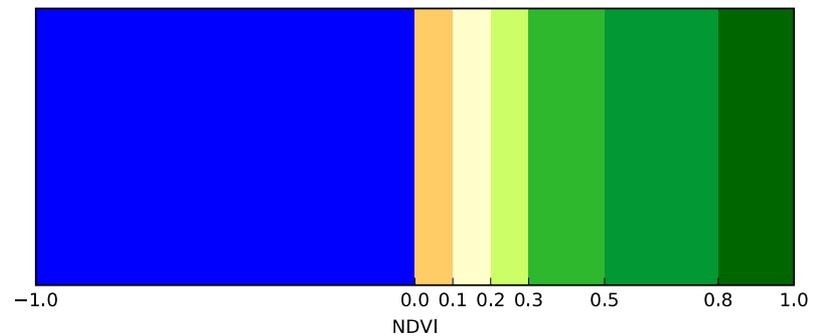
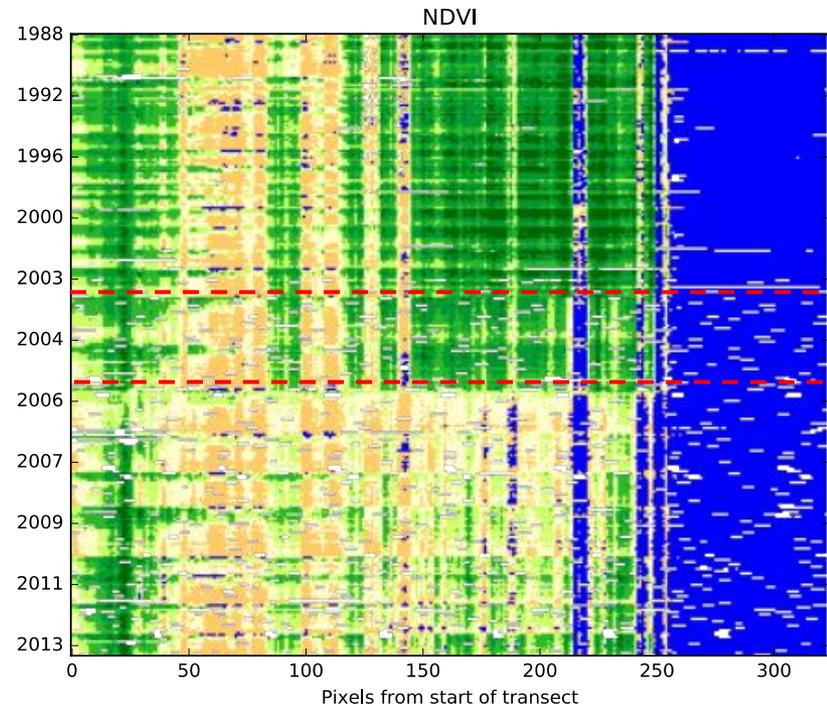
Using spatial and temporal information to characterize Junction Bay mangroves – pre disturbance



Junction Bay mangroves – impact by Cat 3 cyclone



Junction Bay mangroves – impact by Cat 5 cyclone



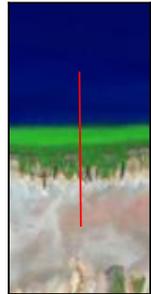
Massive mangrove die-off on Gulf of Carpentaria worst in the world, says expert

Climate change and El Niño the culprits, says Norm Duke, an expert in mangrove ecology, after seeing 7,000ha of dead mangroves over 700km

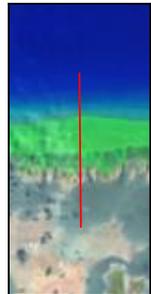


Long term patterns of change

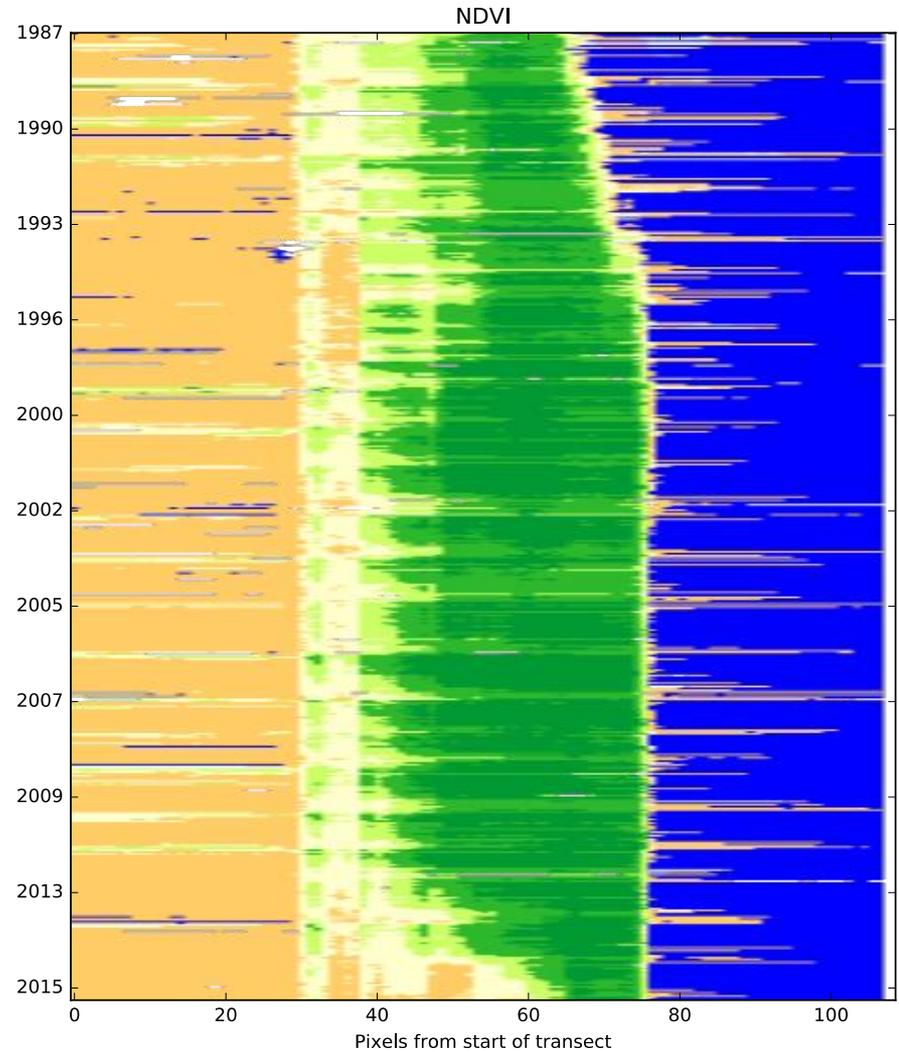
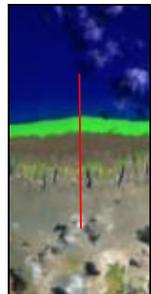
1988-07-09



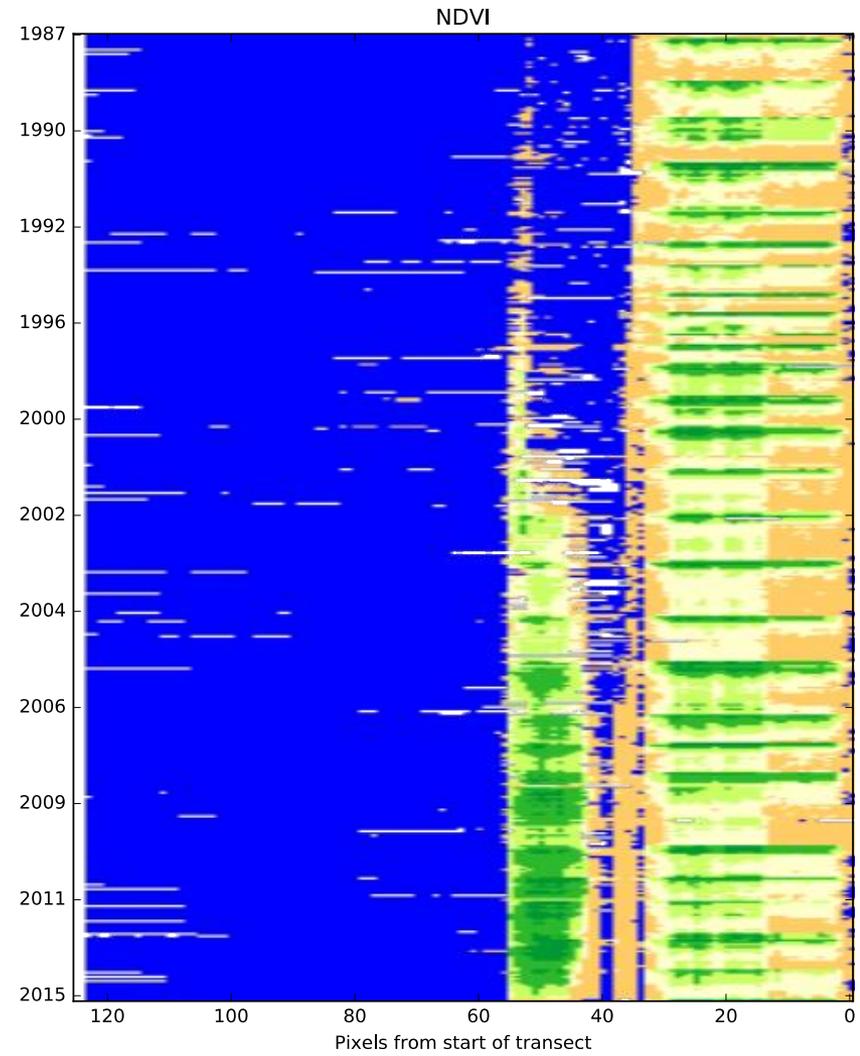
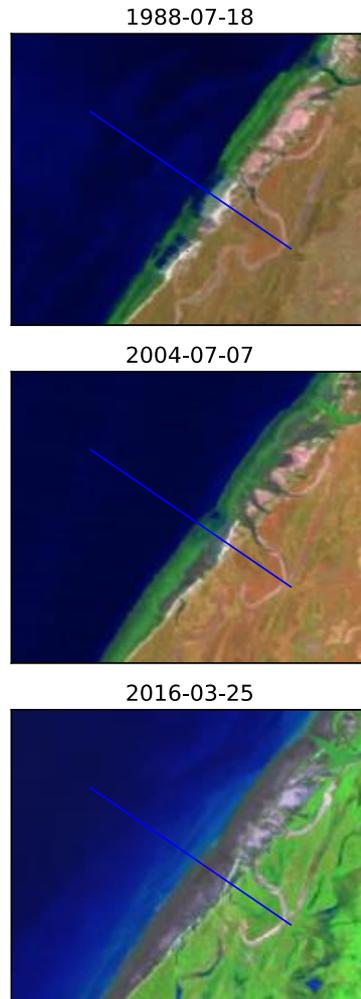
2004-09-07



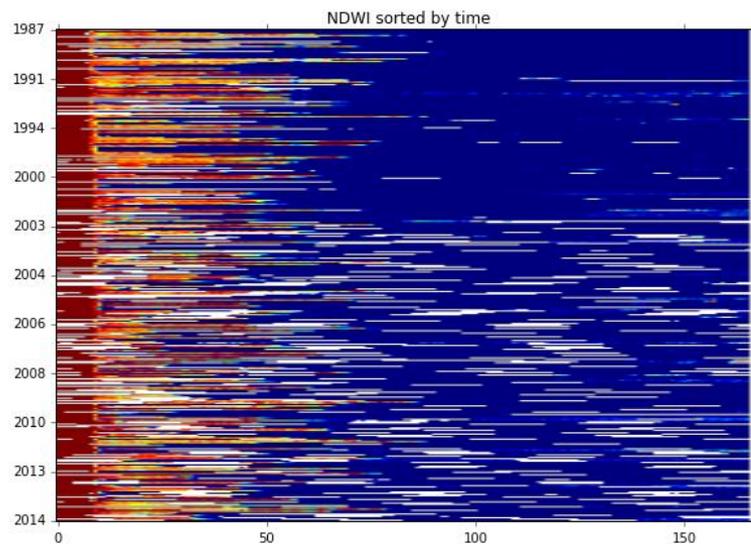
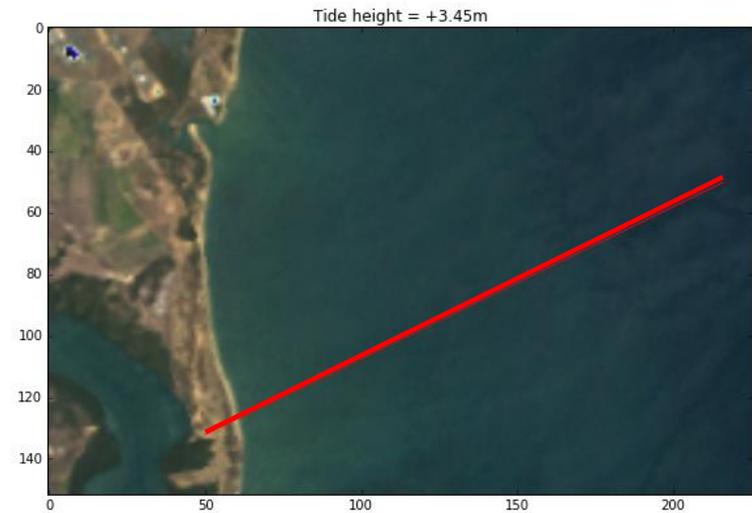
2016-03-25



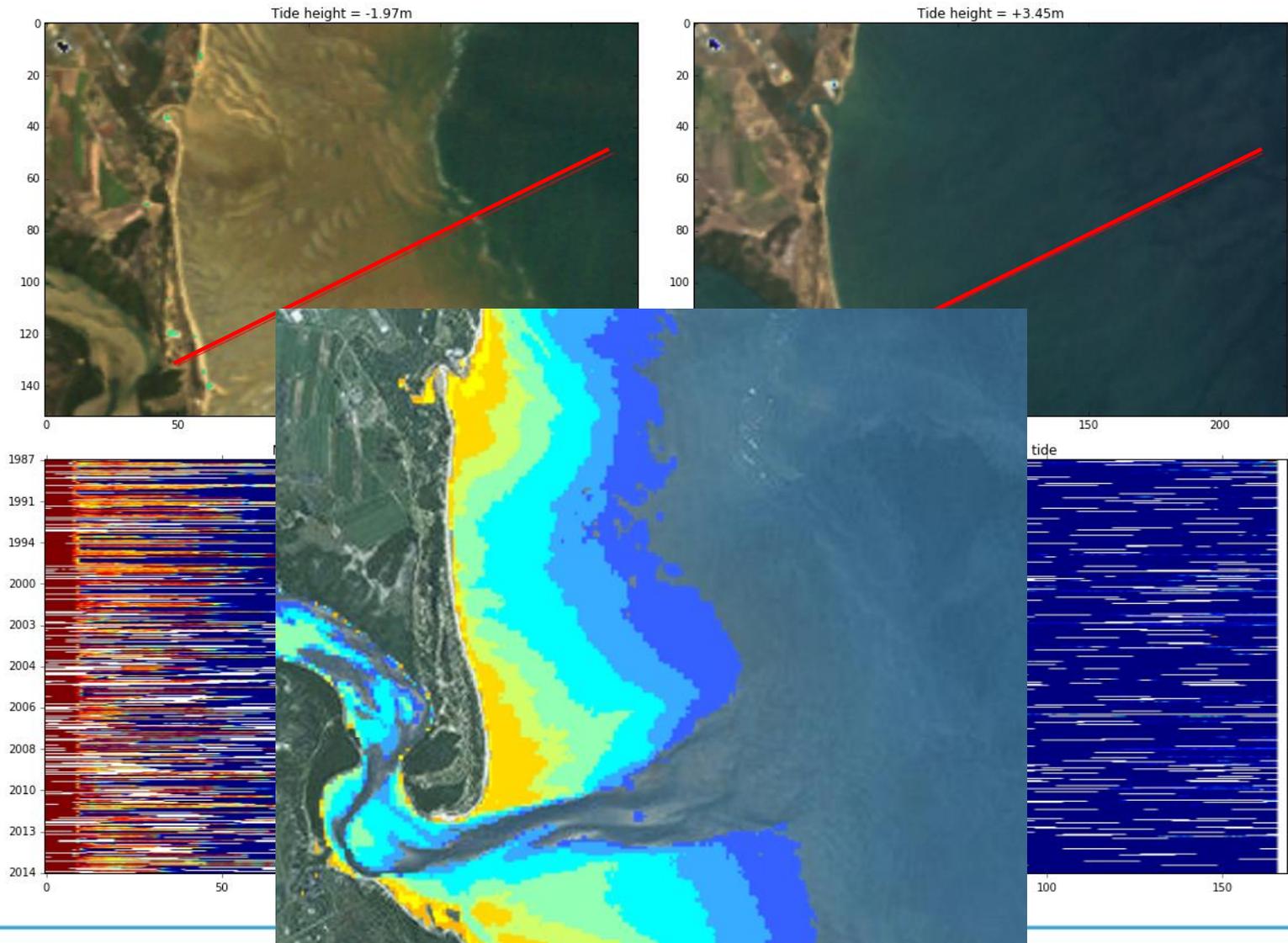
Long term patterns of change and sudden loss



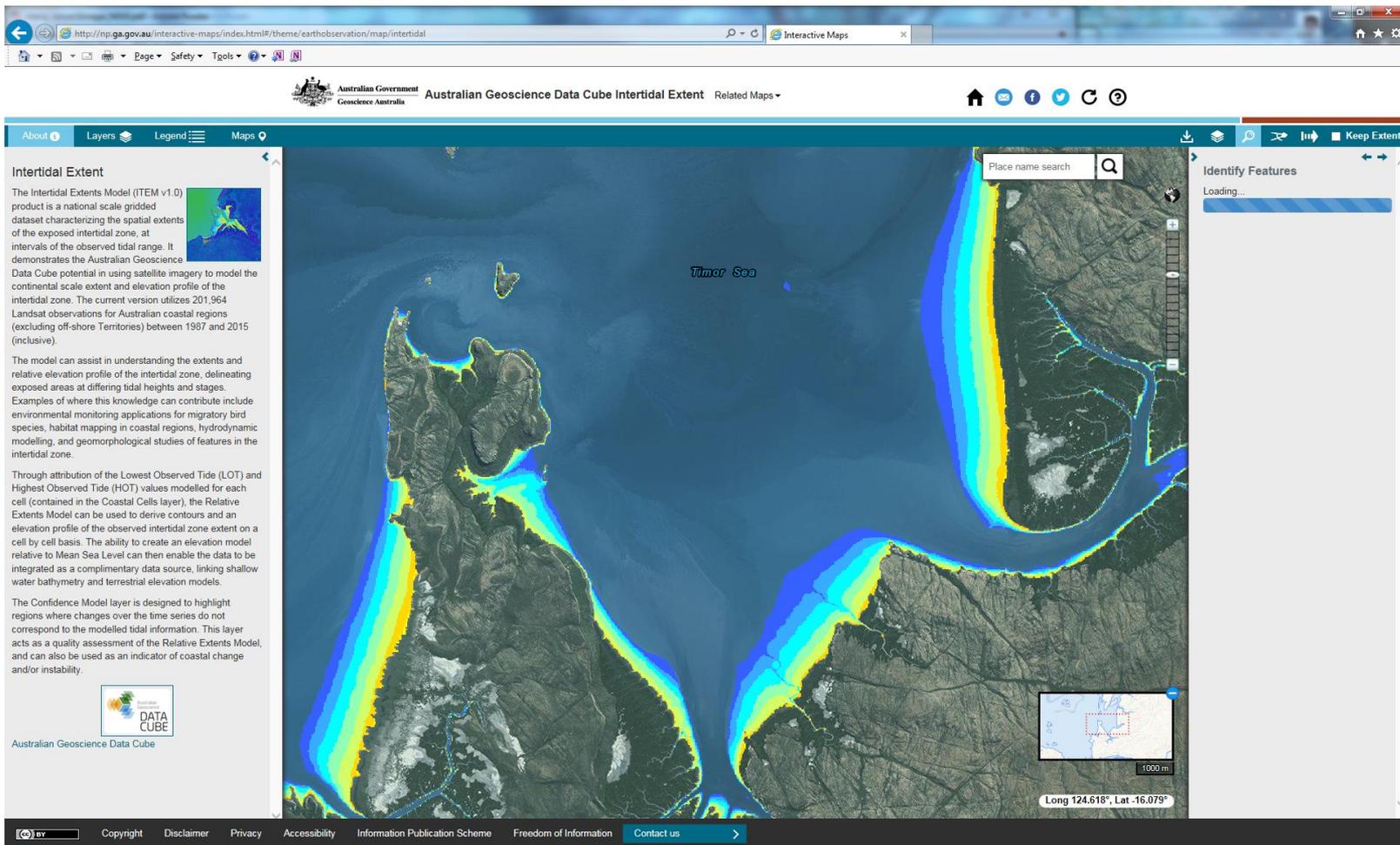
Harnessing spatial, temporal and wavelength domains to create an intertidal elevation model



Intertidal elevation model generation



Intertidal elevation model



Intertidal Extent

The Intertidal Extents Model (ITEM v1.0) product is a national scale gridded dataset characterizing the spatial extents of the exposed intertidal zone, at intervals of the observed tidal range. It demonstrates the Australian Geoscience Data Cube potential in using satellite imagery to model the continental scale extent and elevation profile of the intertidal zone. The current version utilizes 201,964 Landsat observations for Australian coastal regions (excluding off-shore Territories) between 1987 and 2015 (inclusive).

The model can assist in understanding the extents and relative elevation profile of the intertidal zone, delineating exposed areas at differing tidal heights and stages. Examples of where this knowledge can contribute include environmental monitoring applications for migratory bird species, habitat mapping in coastal regions, hydrodynamic modelling, and geomorphological studies of features in the intertidal zone.

Through attribution of the Lowest Observed Tide (LOT) and Highest Observed Tide (HOT) values modelled for each cell (contained in the Coastal Cells layer), the Relative Extents Model can be used to derive contours and an elevation profile of the observed intertidal zone extent on a cell by cell basis. The ability to create an elevation model relative to Mean Sea Level can then enable the data to be integrated as a complimentary data source, linking shallow water bathymetry and terrestrial elevation models.

The Confidence Model layer is designed to highlight regions where changes over the time series do not correspond to the modelled tidal information. This layer acts as a quality assessment of the Relative Extents Model, and can also be used as an indicator of coastal change and/or instability.

Australian Geoscience Data Cube

Place name search

Identify Features

Loading...

Timor Sea

Long 124.618°, Lat -16.079°

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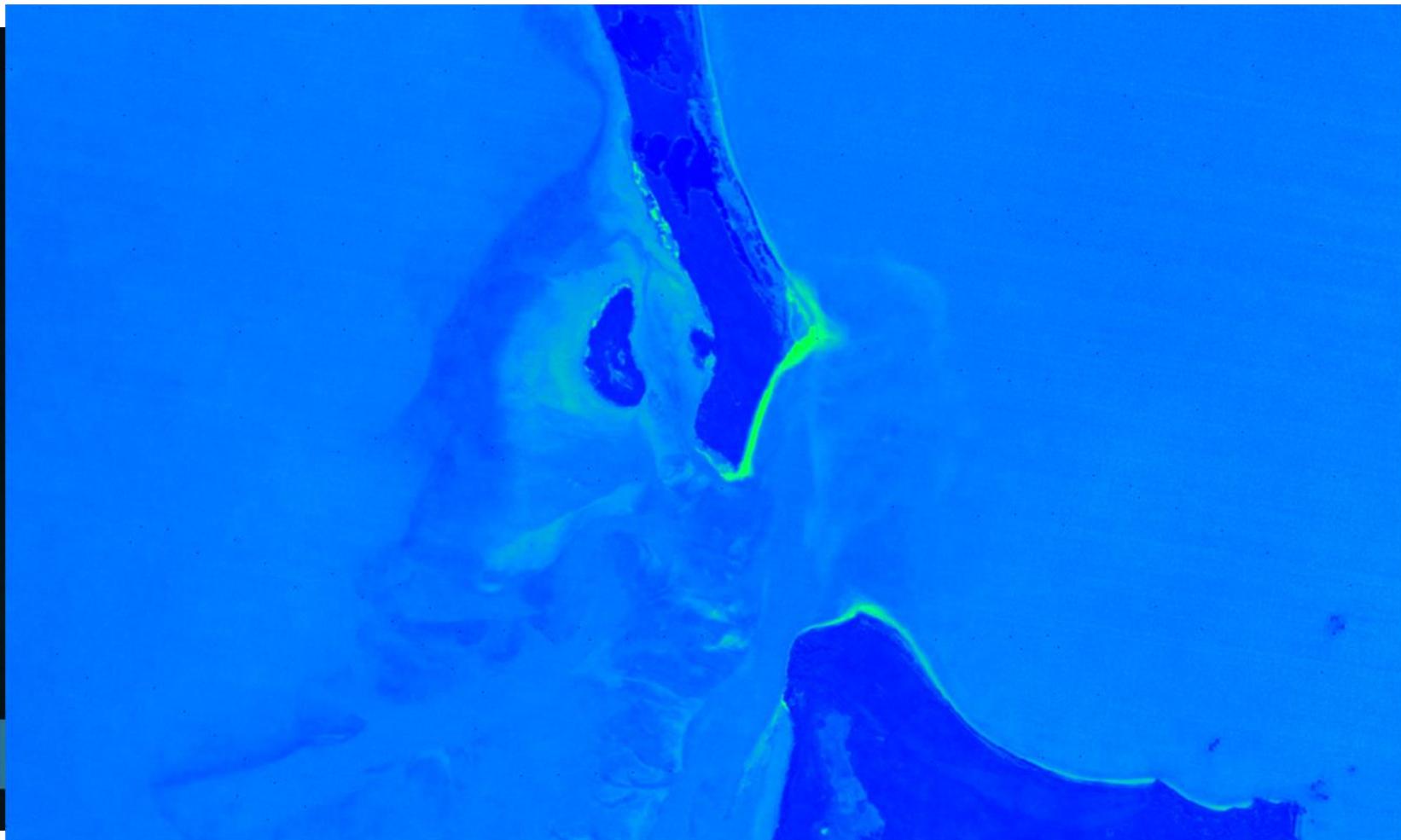
Intertidal elevation model

- <http://np.ga.gov.au/interactive-maps/#/theme/earthobservation/map/intertidal>



1987

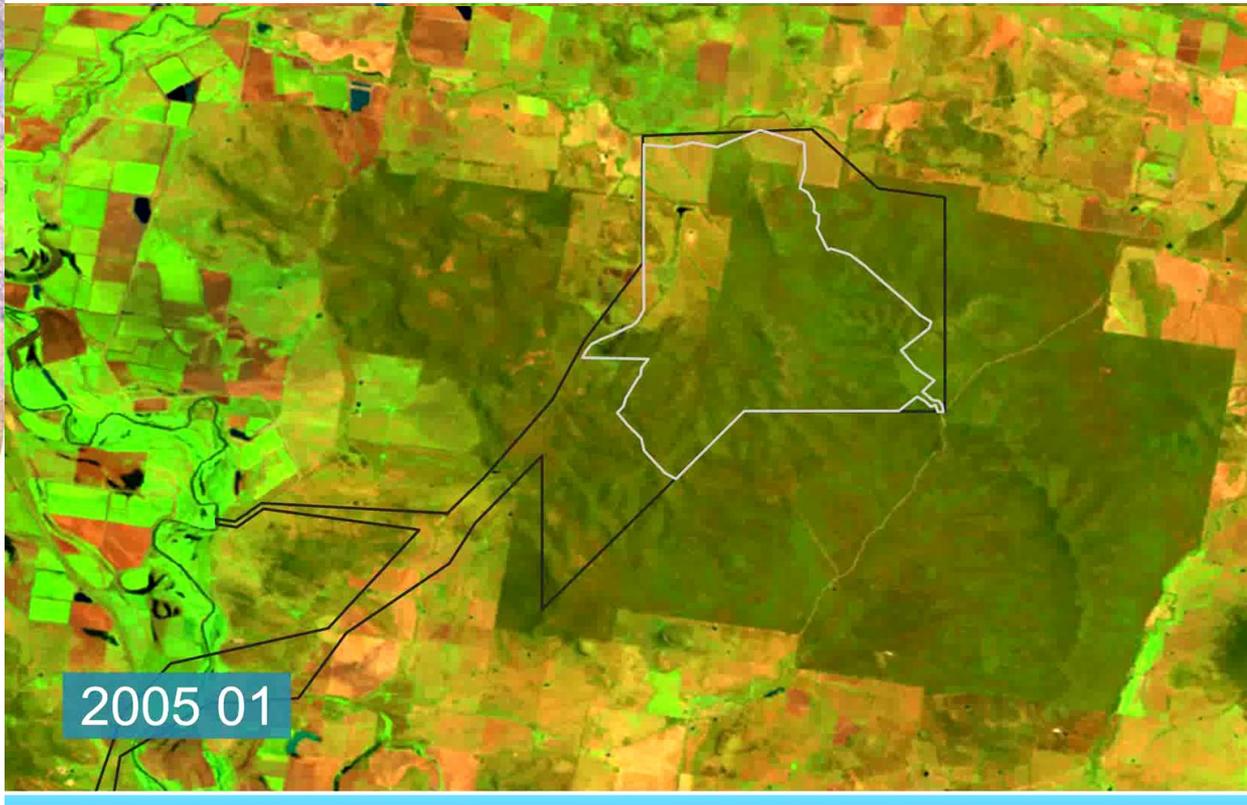




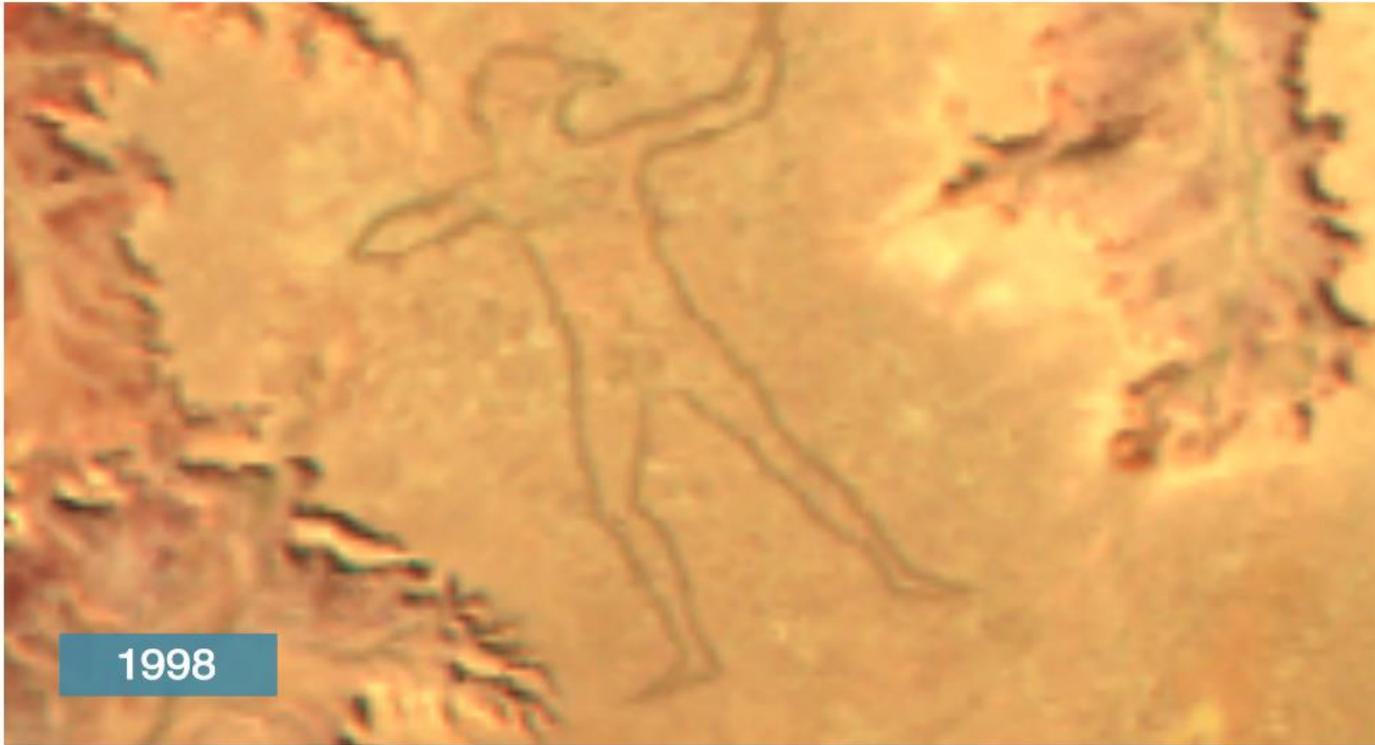
Questions?



A knowledge base to inform decisions



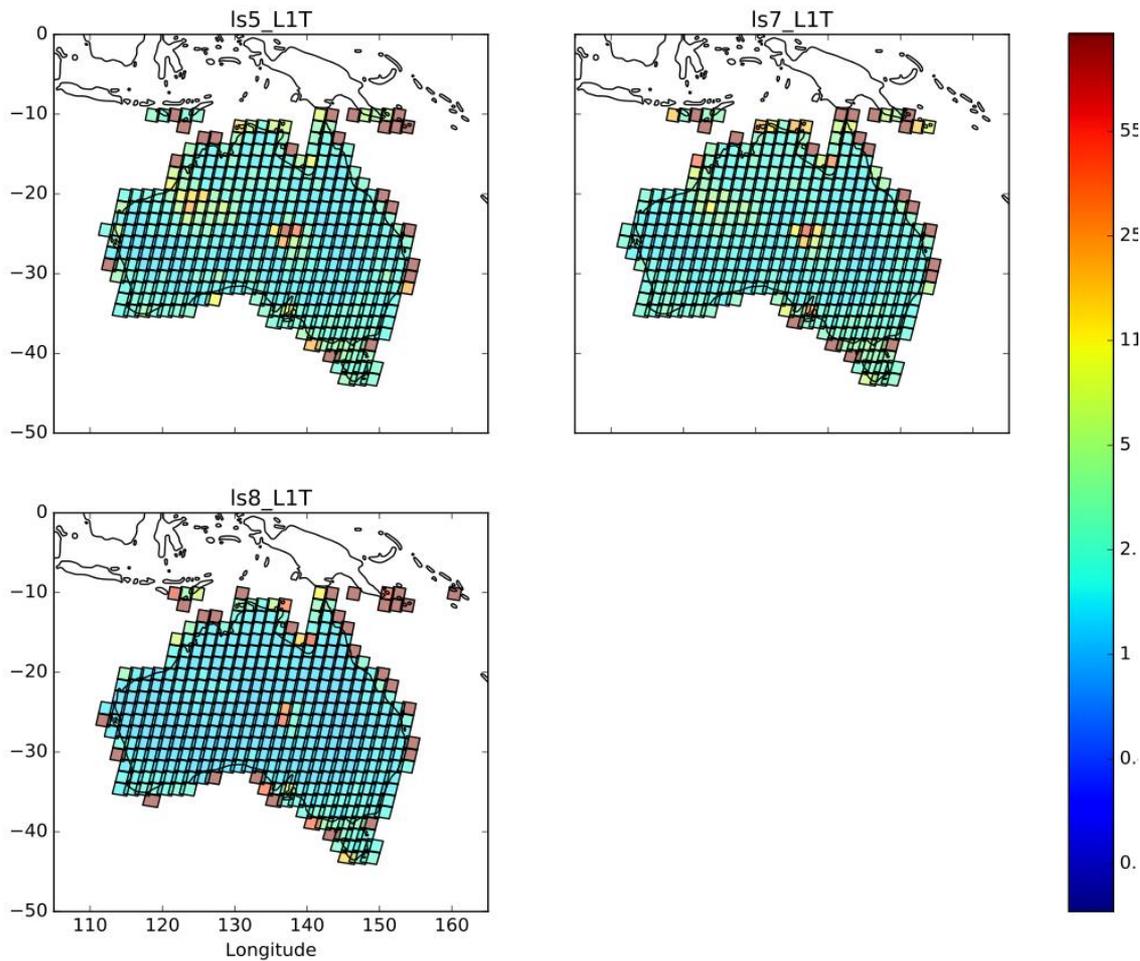
Calibration (Marri Man)

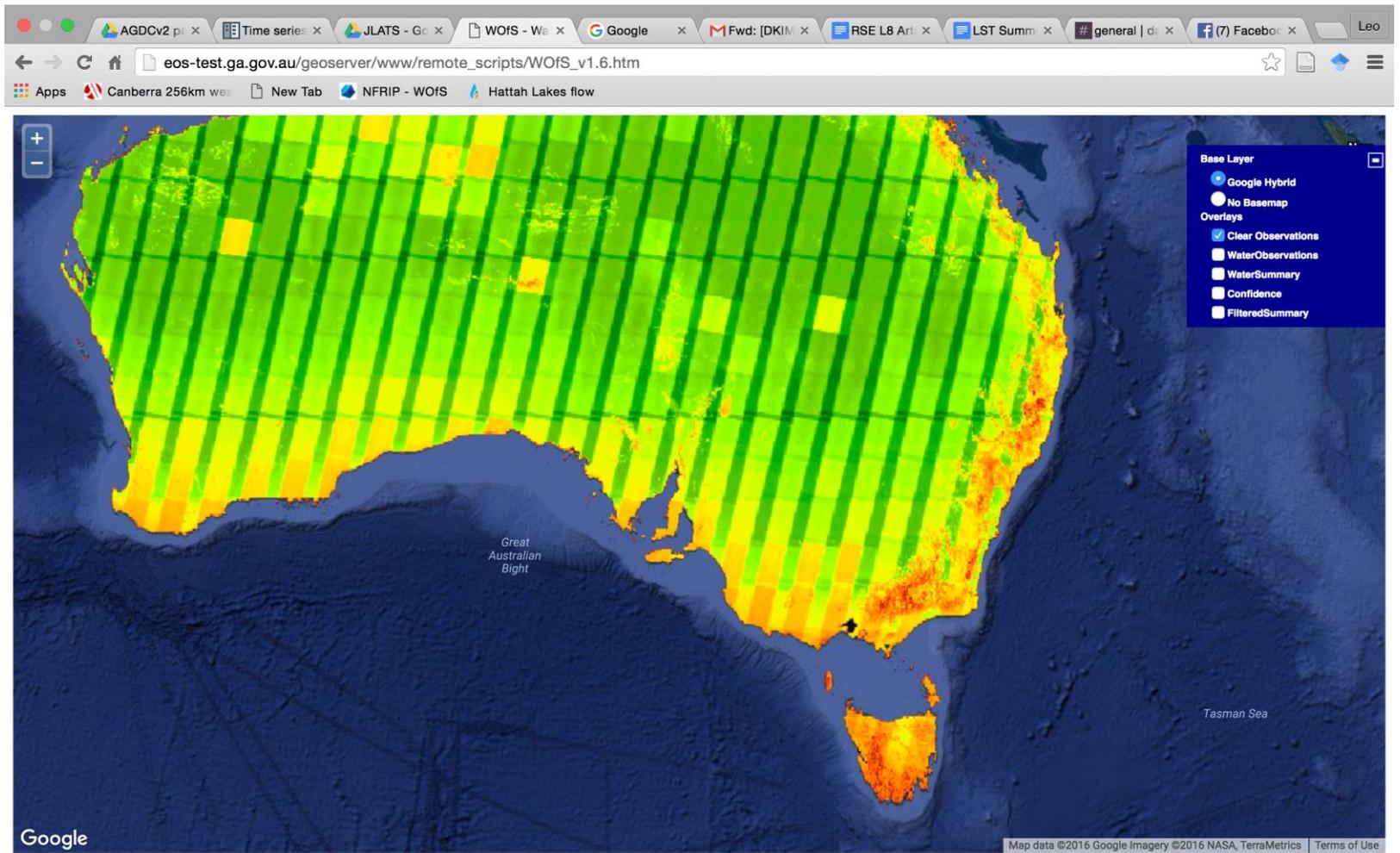


Adam.lewis@ga.gov.au

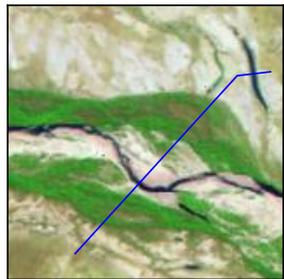
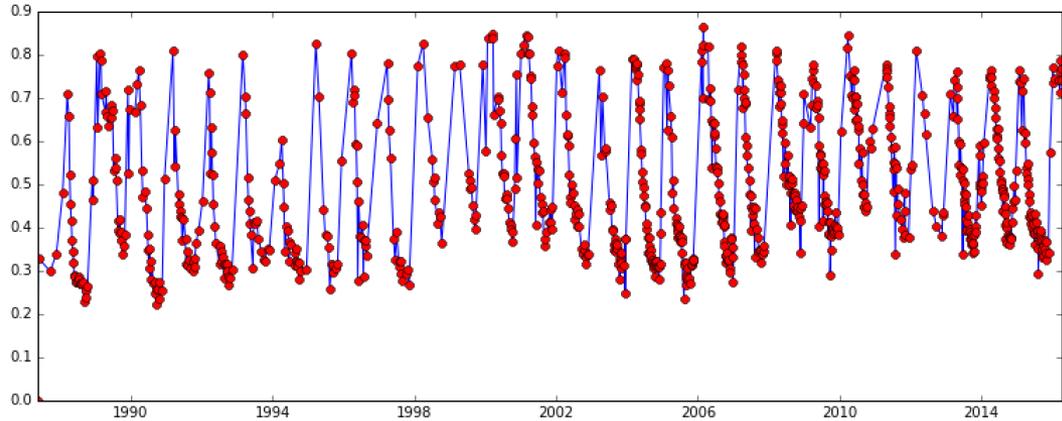
Median CEP90 for 29 years of data

GQA residual estimate

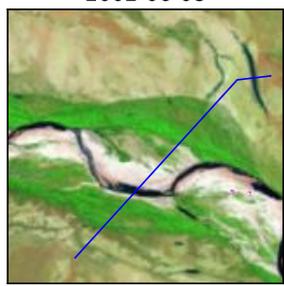




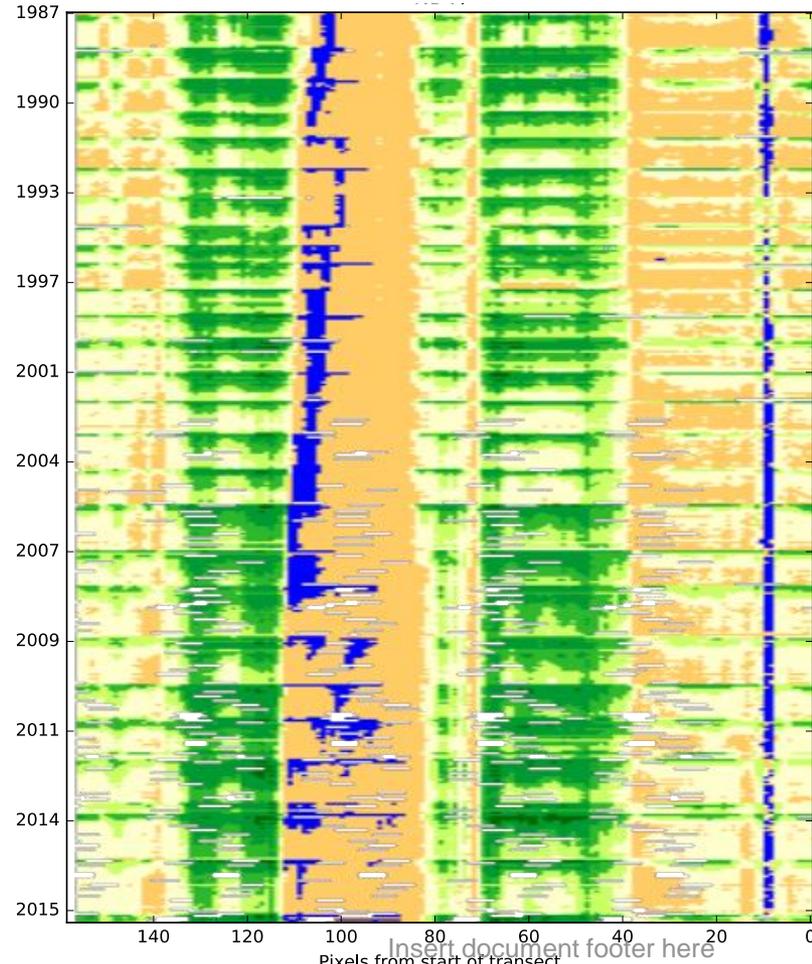




2002-06-08

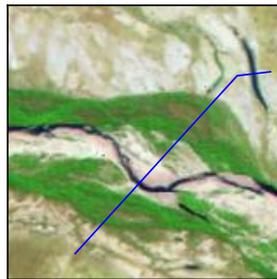


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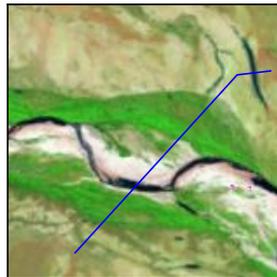




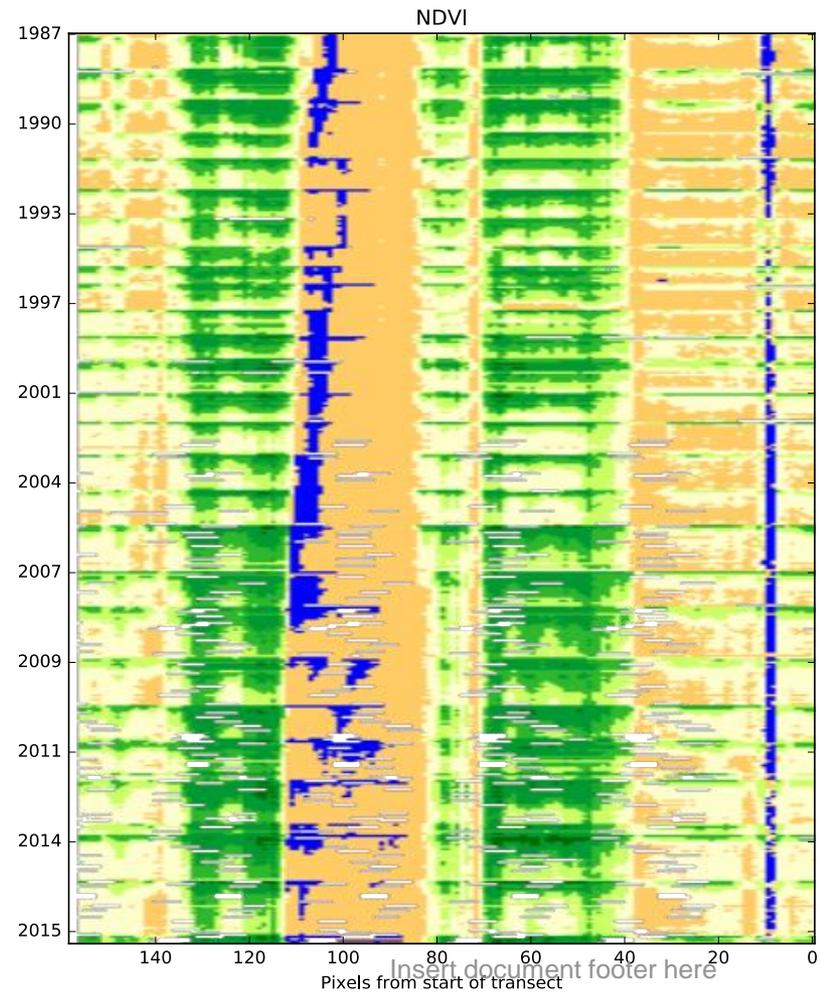
1988-06-09



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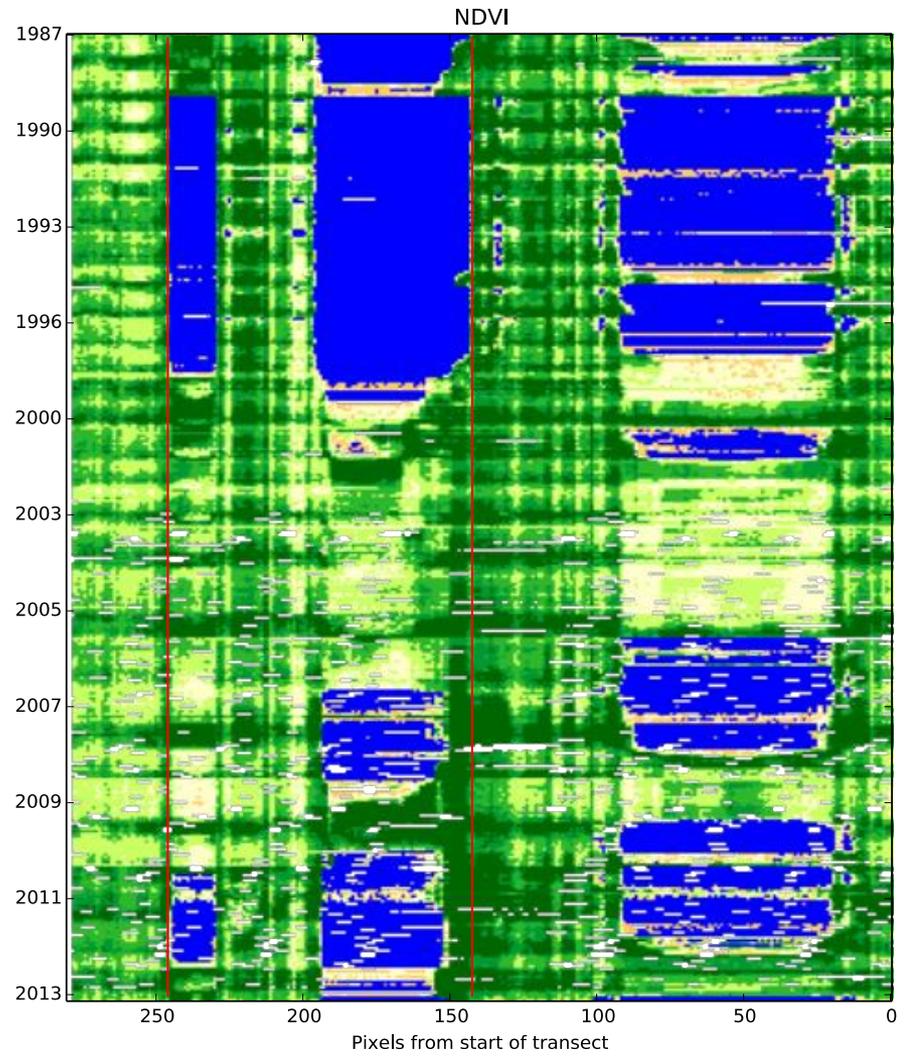
1990-03-05



2006-06-06



2008-03-07



The case for target specific spectral band adjustment factors

