

DEA Wetlands Insight Tool (QLD)

Wetlands Insight Tool Queensland Wetlands Polygons

Version

1.0.0

Program

Digital Earth Australia

Collection

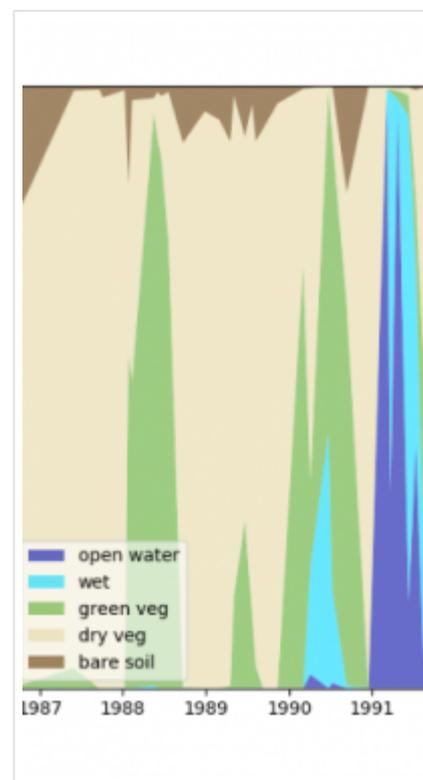
Geoscience Australia Landsat Collection 2
(DEPRECATED)

Resource type

Data service

Published Date

04/12/2020



View the [original metadata page](#) for the most up-to-date information on this product.

Basics

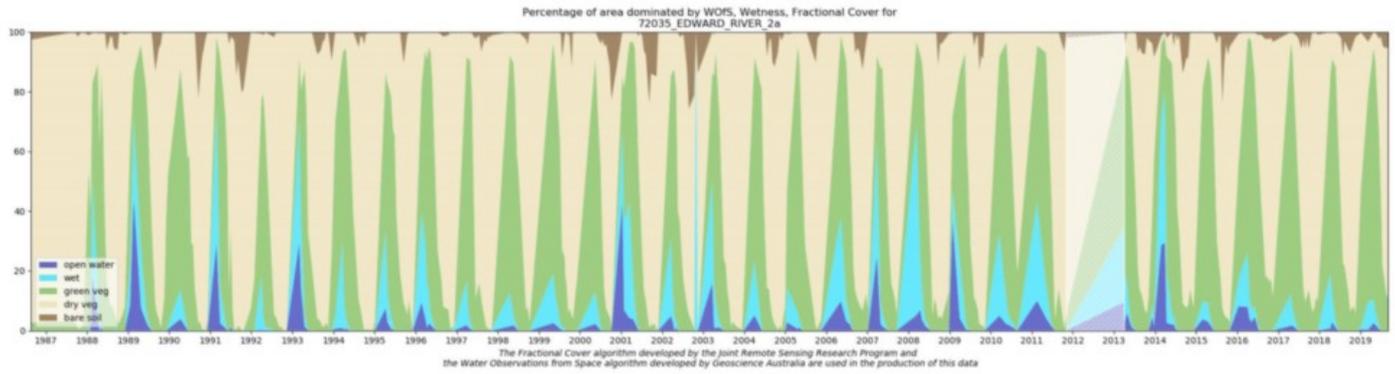
Background

Wetlands provide a wide range of ecosystem services including improving water quality, carbon sequestration, as well as providing habitat for fish, amphibians, reptiles and birds. Managing wetlands in Australia is challenging due to competing pressures for water availability and highly variable climatic settings. The Wetlands Insight Tool (QLD) has been developed to provide catchment managers, environmental water holders, and wetlands scientists a consistent historical baseline of wetlands dynamics from 1987 onwards. The Wetlands Insight Tool (QLD) is available online through the Queensland Government *WetlandInfo* website.

What this product offers

The Wetlands Insight Tool (QLD) summarises how the amount of water, green vegetation, dry vegetation and bare soil varies over time within each wetland. It provides the user with the ability to compare how the wetland is behaving now with how it has behaved in the past. This allows users to identify how changes in water availability have affected the wetland. It achieves this by presenting a combined view of Water Observations from Space, Tasseled Cap Wetness and Fractional Cover measurements from the Landsat series of satellites, summarised as a stacked line plot to show how that

wetland has changed over time.



Wetlands Insight Tool stacked line plot for a seasonally inundated wetland

Applications

The product is designed to support QLD wetland managers, catchment managers and environmental waterholders in understanding whether or not wetlands are changing over time. In instances where the wetlands are changing, the tool allows users to identify whether the changes are gradual, rapid, once-off or cyclical in nature. For example the response of wetlands to the following drivers can be assessed:

- Changes in river flow volumes
- Changes in flood frequency
- Long term shifts in rainfall
- Wet-season/Dry-season shifts in water availability
- Invasive weeds
- Environmental watering events

Care should be used when interpreting Wetlands Insight Tool (QLD) results as increases/decreases in particular cover types can be associated with different processes. For example an increase in green cover could indicate canopy recovery of desirable wetland species or an increase in the amount of invasive weeds.

Related products

- [DEA Fractional Cover \(Landsat, DEPRECATED\)](#)
- [DEA Wetness Percentiles \(Landsat\)](#)
- [DEA Water Observations \(Landsat, DEPRECATED\)](#)

Access

Data access

Link to data	DEA Data
Link to maps	https://wetlandinfo.des.qld.gov.au/wetlands/
eCat record	144795
CMI RESTful node ID	608
Access constraints	Creative Commons CCBY 4.0
Security classification	Unclassified
Update frequency	asNeeded
Product life span	04/12/2020 - 31/12/2022

Access notes

Information on how to access the Wetlands Insight Tool using the QLD Wetland*Maps* service can be found on this page:

<https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wetland-background/insight.html>

Wetland*Maps* interactive online maps and data can be accessed via this link:

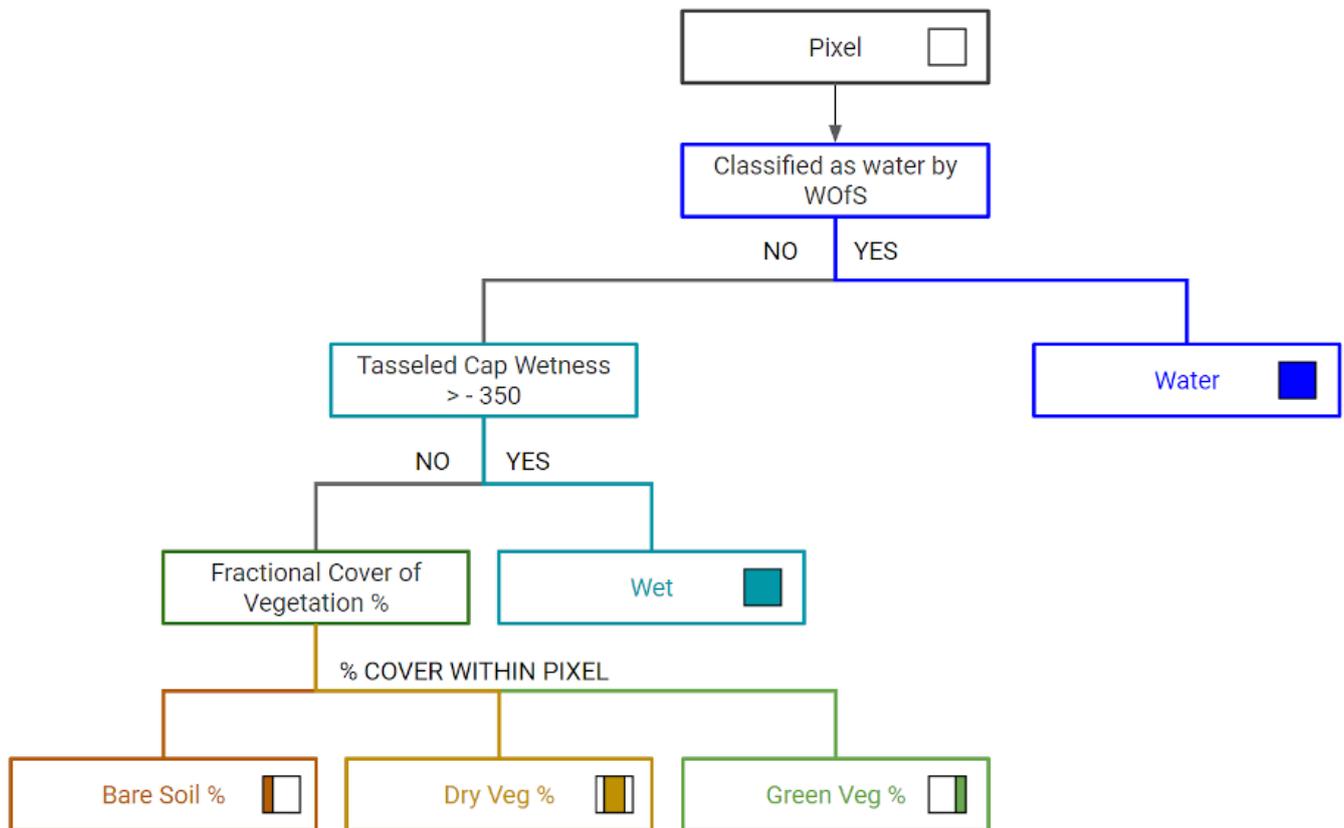
<https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/get-mapping-help/wetland-maps/>

The QLD Wetland management resource portal Wetland*Info* can be found here:

<https://wetlandinfo.des.qld.gov.au/wetlands/>

Details

Technical information



Every pixel within a wetland polygon is evaluated using this decision tree at every time step, and the results are tabulated to create the input data to the stacked line plot for that wetland.

Accuracy and limitations

The accuracy of the stacked line plots is dependent on the accuracy of the underlying algorithms: Water Observations from Space (Mueller et al. 2016) and the Joint Remote Sensing Research Program's Fractional Cover algorithm (Scarth et al. 2010).

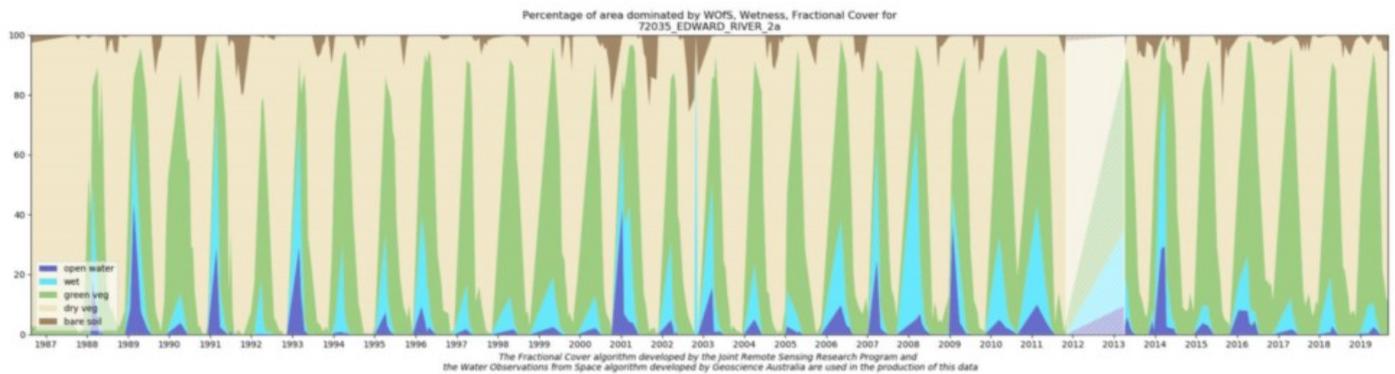
The Tasseled Cap Wetness threshold used in the Wetlands Insight Tool has been compared with independent inundation data for one major wetland complex, however the Tasseled Cap Wetness index may under or overestimate the actual extent of inundation for individual wetlands. The use of a consistent threshold means that the 'precision' is high, insofar as you're measuring the same aspect of the wetland at each point in time, however the accuracy with which Tasseled Cap Wetness measures free water underneath/within wetland vegetation is not quantified.

The interpretability of the results for each polygon is dependent on the accuracy of the linework that has been used to

create that polygon.

The 30 metre resolution of Landsat imposes an intrinsic limitation on the Wetlands Insight Tool. Wetland areas that are small, or long and narrow in nature are likely to be inaccurate (due to inclusion of neighbouring non-wetland pixels) or difficult to interpret (stack line plots for areas with a small number of pixels have sharp steps in them).

The period of time between when Landsat 5 ceased operations (November 2011) and Landsat 8 data became routinely available (May 2013) is likely to be inaccurate. There will be some wetlands, close the centre of Landsat paths where Landsat 7 continued to capture suitable (gap free) data, however it is safer, as a general rule, to consider this period as 'low data quality'.



Wetlands Insight Tool stacked line plot for a seasonally inundated wetland

Quality assurance

Quality assurance was undertaken to ensure that a Wetlands Insight Tool stacked line plot was generated for every polygon in the QLD WetlandInfo polygon set.

Software

The Fractional cover (v2) algorithm is provided courtesy of the Joint Remote Sensing Research Program. The development of the algorithm was supported by field data collection by Australian State and Territory agencies, TERN and the National Ground Cover Monitoring Program, coordinated by ABARES. The code base used to generate the QLD Wetlands Insight Tool results is available at https://github.com/GeoscienceAustralia/wit_tooling

Relevant websites

- <https://wetlandinfo.des.qld.gov.au/wetlands/>

References

- Scarth, P., Röder, A., Schmidt, M., 2010. Tracking grazing pressure and climate interaction - the role of Landsat fractional cover in time series analysis. In: Proceedings of the 15th Australasian Remote Sensing and

Photogrammetry Conference (ARSPC), 13-17 September, Alice Springs, Australia. Alice Springs, NT.

- Guerschman, J.P., **Scarth**, P.F., McVicar, T.R., Renzullo, L.J., Malthus, T.J., Stewart, J.B., Rickards, J.E., & **Trevithick**, R. (2015). Assessing the effects of site heterogeneity and soil properties when unmixing photosynthetic vegetation, non-photosynthetic vegetation and bare soil fractions from Landsat and MODIS data. *Remote Sensing of Environment*, 161, 12-26, <https://doi.org/10.1016/j.rse.2015.01.021>
- Muir, J., Schmidt, M., Tindall, D., Trevithick, R., Scarth, P., Stewart, J., 2011. Guidelines for Field measurement of fractional ground cover: a technical handbook supporting the Australian collaborative land use and management program. Tech. rep., Queensland Department of Environment and Resource Management for the Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
- Mueller, N., Lewis, A. Roberts, D., Ring, S., Melrose, R., Sixsmith, J., Lymburner, L., McIntyre, A., Tan, P., Curnow, S. and Ip, A.(2016) 'Water observations from space: Mapping surface water from 25 years of Landsat imagery across Australia', *Remote Sensing of Environment*, 174, 341-352, <https://doi.org/10.1016/j.rse.2015.11.003>
- Crist, E.P. (1985) 'A TM Tasseled Cap equivalent transformation for reflectance factor data', *Remote Sensing of Environment*, 17(3), 301-306, [https://doi.org/10.1016/0034-4257\(85\)90102-6](https://doi.org/10.1016/0034-4257(85)90102-6)

Processing

Lineage

The code base used to generate the QLD Wetlands Insight Tool results is available at https://github.com/GeoscienceAustralia/wit_tooling

- The polygon set defined in <https://wetlandinfo.des.qld.gov.au/wetlands/>
- [DEA Water Observations \(Landsat\)](#)
- [DEA Fractional Cover \(Landsat\)](#)
- [DEA Surface Reflectance NBART \(Landsat\)](#)

Data sources

- [DEA Fractional Cover \(Landsat, DEPRECATED\)](#)
- [DEA Water Observations \(Landsat, DEPRECATED\)](#)
- [DEA Surface Reflectance NBART \(Landsat, DEPRECATED\)](#)

Schema / spatial extent

WIT_QLD

Update frequency	asNeeded
Temporal extent	1987-01-01 11:44:40 – 2019-12-31 11:44:40
Coordinate reference system	WGS 84 (EPSG: 4326)
Cell size X	25.00
Cell size Y	25.00

Media

Credits

Owner

Commonwealth of Australia (Geoscience Australia)

Principal contributors

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Subject matter experts

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Acknowledgments

The Queensland Government Department of Environment and Science wetlands team promotes and delivers wetlands tools and information, enabling the delivery of Geoscience Australia DEA Wetlands Tool (QLD) capabilities.

The Joint Remote Sensing Research Program (JRSRP) developed the Fractional Cover algorithm that is used as one of the inputs into the Wetlands Insight Tool.