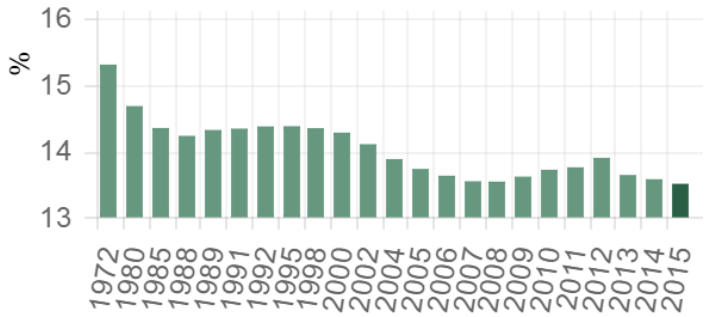
Australia's Environment in 2015

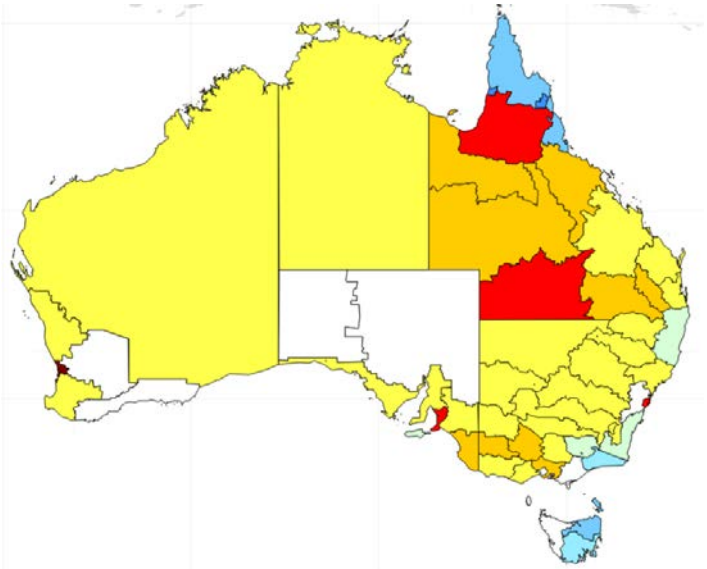
After three years with average national rainfall, many environmental indicators once again reached values last seen during the Millennium Drought. This fact sheet summarises indicators of Australia's environment in 2015. Much more detail is available at www.wenfo.org/aus-env

Tree cover change

- Tree cover fell by 530,000 ha in 2015, with reductions in all states except Tasmania. This continues a decline that started in 2012, reaching its lowest level since at least 1972.
- Key drivers of tree cover change are changes in water availability, bush fire, and direct human activities such as planting and clearing.



Tree cover as percentage of Australia's total area



Tree cover change by Natural Resource Management region, varying from declines (red) to increases (dark blue) greater than 0.3 percent of region surface area

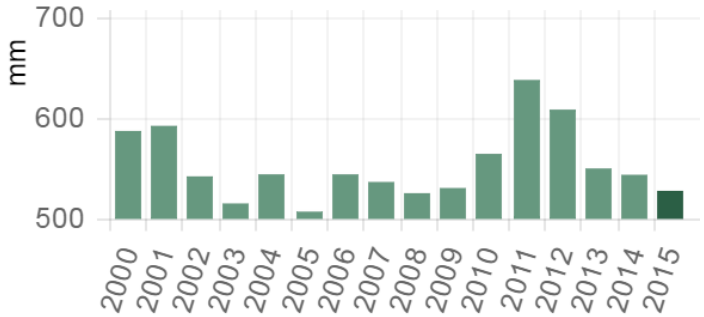
- Largest tree cover losses occurred in interior Queensland and most metropolitan regions.
- Total tree cover across all National Parks combined remained stable.

Bushfire

- Bushfire activity remained at average levels after increased fire activity in 2011 and 2012.
- Slightly more than half of all fire events occurred in woody vegetation types. 86% of all fires occurred in northern Australia.
- Large fire events occurred in southwest Western Australia in January (>65,000 ha) and South Australia in January and November (>98,000 ha).
- Other notable fires occurred north of Rockhampton (Qld) in March and Otway (Vic) in December.

Water availability

- National average precipitation of 422 mm was slightly below the long-term mean of ca. 465 mm.
- At national scale, rainfall 2015 was around average the fourth year in a row and the lowest since 2005.
- Precipitation and soil moisture availability are both measures of water availability, and generally show very similar regional and annual patterns.



National average soil moisture availability

- Water availability declined across most of Australia, but increased along the central and southern East Coast.

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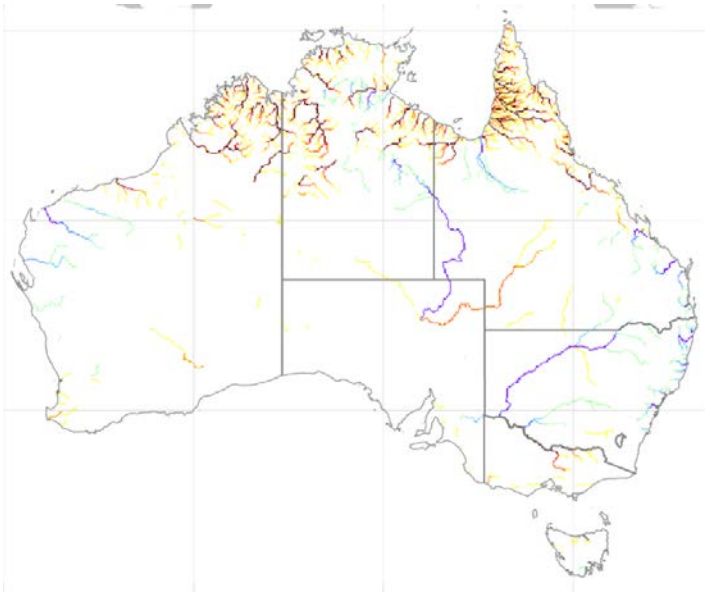
- Well below average rainfall and soil moisture conditions continued in interior Queensland.
- Water availability was lowest since at least 2000 in western Tasmania.

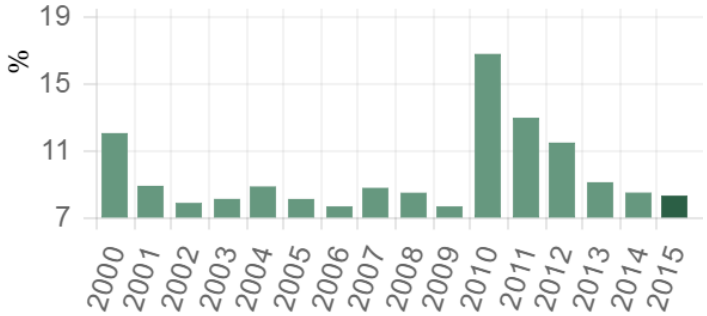
Rivers and Wetlands

- Large river flow declines occurred along the northern coast, in some cases to the lowest levels since at least 2000.
- Flows increased in the Darling River and decreased in the Murray River.



Change in annual river flows by river region, varying from >1000 GL reductions (dark red) and increases (purple)

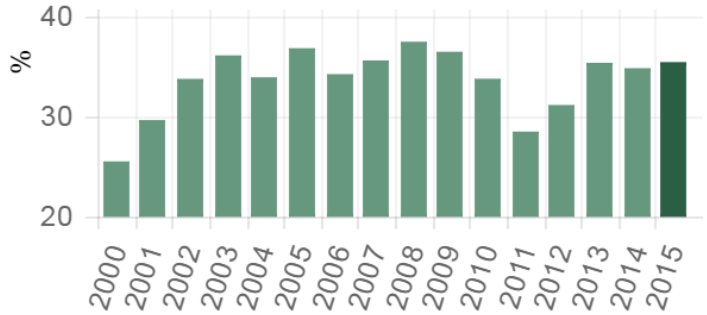
- The total area inundated at least once in 2015 increased by 11,000 km^2 – lower than the wet years 2009-2012 but higher than during the 2002-2008 drought.
- The largest increases occurred in the Lake Eyre Basin, with new inflows from the Georgina River.
- Total inundated area in the Murray River Basin was lower than during 2009-2014 and similar to 2006 area.
- Inundation in all Ramsar-listed wetlands combined declined slightly, reaching the lowest level since 2009.



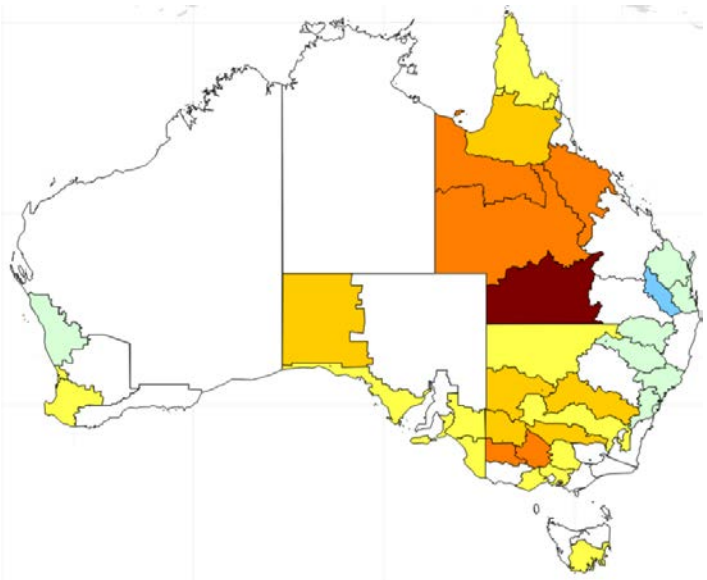
Percentage of the combined area of Ramsar-listed wetlands that was inundated at least once during 2015

Landscape condition

- The area of exposed soil increased by 4.7 million ha in 2015, approaching levels last seen in 2009.
- The largest increases occurred in interior regions of the Eastern States.



Percentage of national area with exposed soil



Change in soil exposure by NRM region, showing declines (brown) and increases (blue) of more than 2 percent

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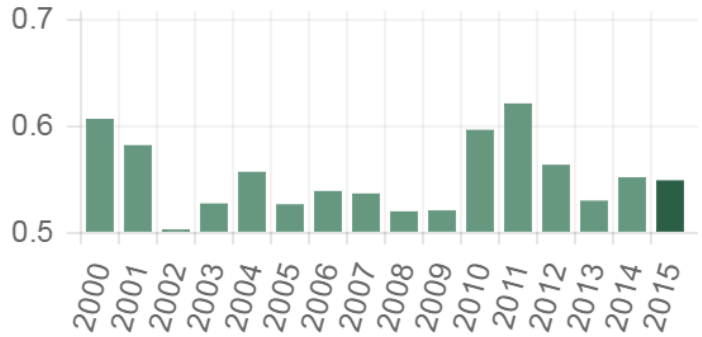
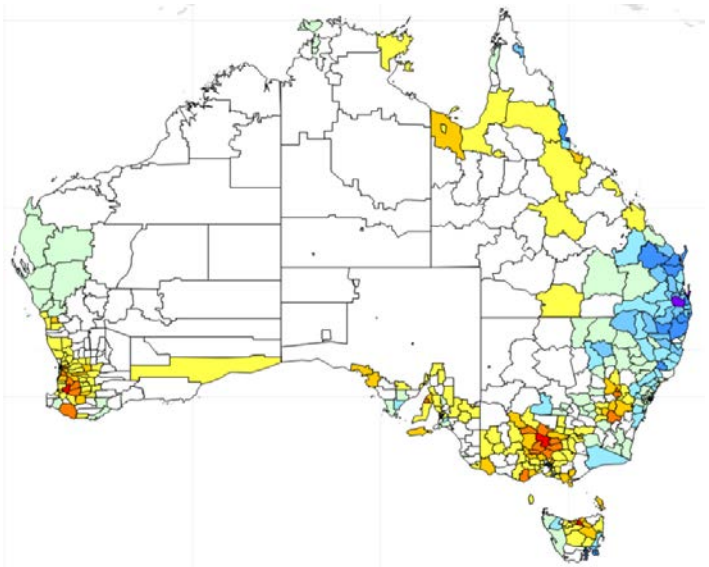
- Total vegetation leaf area remained relatively stable after record highs in 2011.



National average leaf area index

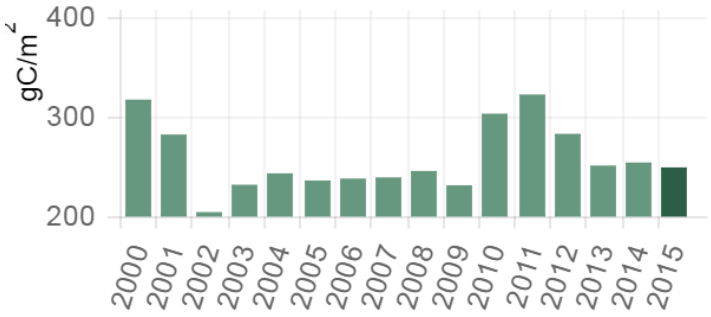
- Leaf area generally declined in both regional and metropolitan areas, reaching the lowest values since 2000 in interior Queensland. Leaf area increased along the central East and West Coasts.
- Total leaf area across all National Parks combined remained stable.



Leaf area index changes by Local Government Area, with declines (red) and increases (blue) greater than 0.3

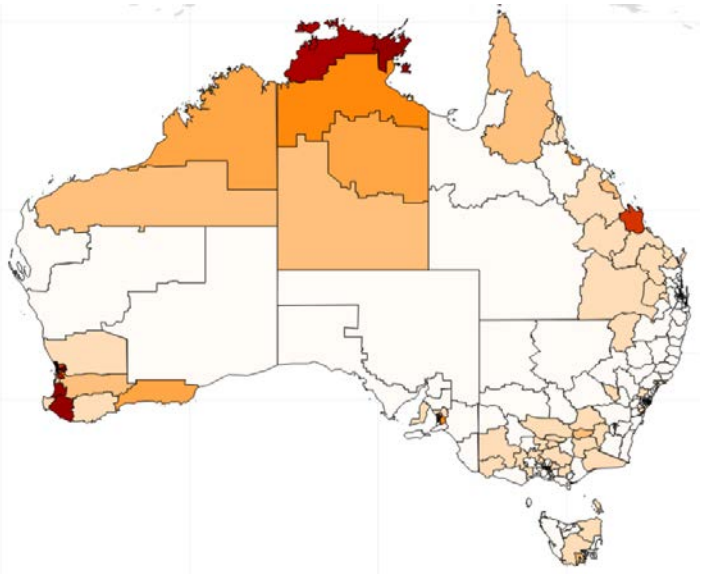
Carbon storage

- Total national vegetation carbon uptake was estimated at 2.0 billion tonnes of carbon in 2015, 2% lower than 2014, and well below high values during the wet years 2010-2012.



National average annual vegetation carbon uptake

- Carbon uptake declined more strongly in interior Queensland and western Victoria, in some regions reaching the lowest vales since 2000. Increases occurred along the central and southern East Coast.
- 132 million tonnes of carbon were emitted from bushfires in 2015, 9% less than in 2014 and well below emissions during 2011-2012.
- Just over half of fire emissions were from woody vegetation. 83% of fire emissions occurred in Northern Australia.



Bushfire carbon emission rates for 2015 by statistical region, showing values in excess of 1000 tonnes per ha (dark brown)

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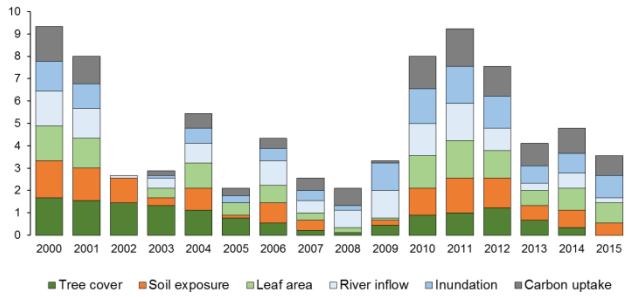
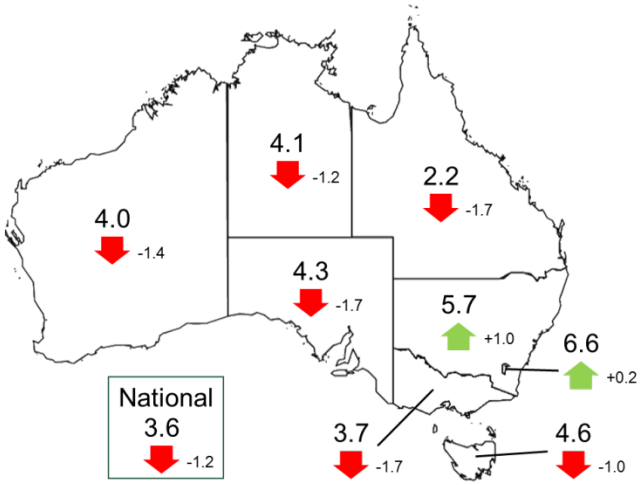
Headline indicators

- An experimental Environmental Condition (EC) score was calculated by ranking indicator values for 2015 among those for the years 2000-2015. EC score was calculated as the average of six indicators: tree cover, soil exposure, leaf area, river inflow, inundation, and carbon uptake.
- While subjective and incomplete, patterns in the different indicators over time are often similar, which makes the end result less sensitive to the method of calculation.
- National-level ECS declined from around average (4.8) in 2014 to well below average (3.6) in 2015.



Time series of national Environmental Condition (EC) score, showing the contribution from the six input indicators

- ECS increased in New South Wales and the ACT, but declined in other regions. Queensland showed the lowest ECS, declining further as a result of continuing drought conditions.



Environmental Condition Score by State and Territory, showing the actual score and change from 2014

How were the data derived?

- Mapping of tree cover, land cover, inundation, bushfire intensity and occurrence, exposed soil and vegetation leaf area were derived through automated interpretation of satellite imagery.
- The other indicators were estimated by integrating ground- and satellite data with spatial environmental models.

About this report

- This report provides a brief summary of a large amount of environmental information made available through our interactive web site.
- Our objective is to make spatial information on environmental conditions easier and faster to access for interested users.
- On the web site, data on 13 indicators in 6 themes can be viewed as maps, accounts and graphs. Data can be examined by region and land cover type, compared to preceding years, or downloaded for further analysis.
- Lack of national-scale observations means that information is not available on some important aspects, such as biodiversity and soil health.
- Data and summary reports for 2016 are planned for release in January 2017.

Acknowledgements

This report was possible thanks to the efforts of many individuals at the ANU, the National Computational Infrastructure, CSIRO, Geoscience Australia, Bureau of Meteorology, Australian Bureau of Statistics, and NASA. Seed funding was provided by the Australian Research Council and Bureau of Meteorology.

More information

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