## Total vegetation cover soil protection Region:LGA Byron\_(A) NSW

## **Date: February 2022**

This report describes vegetation protecting the soil surface from erosion during a chosen month compared to previous years. This report has been generated using MODIS fractional vegetation cover information available in Rangelands and Pasture Productivity (RAPP) map tool https://map.geo-rapp.org/#australia. The report is based on 500 metre pixel data on monthly time steps. Land use forest cover:

Results can be shown for the whole region (polygon), and separated by land use and forest cover classes which are likely to show different cover patterns and targets. Land use is divided into four broad classes: Conservation and natural environments, Agriculture, production native forests and plantation forests (no report), and other (no report). Agriculture is divided into grazing, crops and horticulture which are sub-divided into non-irrigated and irrigated. If forest is present land use is further divided into: non-forest, woodland forest and non-woodland forest. The area of each land use and forest class are shown as a map and chart. The report content is repeated for each land use and forest covers at least 1% of the area of the chosen region. Total vegetation Cover:

The total vegetation cover indicates where soil is likely to be protected from wind and or water hillslope erosion. Total vegetation cover for this month is shown on a map and chart classified into 4 classes.

• 71-100% High cover – protected from wind and usually water erosion (high rainfall, steep slopes, and erodible soils may need greater than 80, 90, 95 and up to 100% cover)

- 51-70% Moderate cover protected from wind erosion
- 31-50% Low cover not protected
- 0-30% Very Low cover not protected

Erosion protection: Wind erosion 50% total vegetation cover

The vegetation cover threshold required to prevent soil erosion is usually 50% to reduce wind erosion, 70% or 80% to reduce water (hillslope) erosion depending on the steepness and rainfall. Areas protected from erosion for the month:

- Map: water erosion protection (>70% cover) percentage area and hectares.
- Map: wind erosion protection (>50% cover) percentage area and hectares. Comparison with previous years:
  - Map: anomaly comparing this month to the average cover from the same month in previous years.
  - Map: deciles rank of month against the same month in previous years.

Anomalies and deciles until September 2019 are calculated comparing to the same months 2001 to 2019. Extra monthly data will be used to calculate anomalies and deciles post September 2019 as they become available. Time series monthly from January 2001 to current:

#### **Erosion protection**

- Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for each month (orange lines). Horizontal lines are 10th (cover target) and 50th percentiles.
- Water erosion protection time series: percentage of the area of the region with greater than 70% cover for each month (blue line). Horizontal lines are 10th (cover target) and 50th percentiles.

#### Rainfall

• Millimetres rainfall each month (black line).

Each time series is also stacked by year. The black line shows the current year of data. Water erosion protection for higher rainfall and steeper slopes:

Water erosion protection on higher slopes. As slope increases, more cover is required to control water erosion. The thresholds reported are:

- the percentage area with pixels greater than 80% total cover.
- the percentage area with pixels greater than 90% total cover.
- the percentage area with pixels greater than 95% total cover.

### Acknowledgment of data:

- 1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
- 2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
- 3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
- 4. MODIS Fractional cover algorithm:

https://doi.org/10.4225/08/5848a3f19a7b3



## **Vegetation Cover Feb 2022**

#### Land use and forest cover

#### Proportion of each land class in area



#### **Total Vegetation Cover [%]**



#### % Area protected from water erosion (>70%)







#### Proportion of vegetation cover class in area



#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

**Total Vegetation Cover Decile [%]** 











Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Catchment Scale

of Australia (2018)

(2018) and Forests

of Australia (2018)

Derived from

Use of Australia

Land Use and Forests

Catchment Scale Land



Deciles show where the

pixel value lies in the

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in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



99-98 area 9. 96 the of <sup>≫</sup> 95+ 94 90 80 area 20 the Ⴆ 60 % 50 40-Proportion of the area protected from water erosion (Total Vegetation Cover > 95%) 50of the area 8 20 10 

Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)









#### **Conservation and natural environments**

forest

woodland forest

Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

#### Land use and forest cover

Proportion of each land class in area



Proportion of vegetation cover class in area



#### % Area protected from wind erosion (>50%)





% Area protected from water erosion (>70%)



120010000 52%70% 320050010 0.30%

1 Conservation and natural environments - Non-forest

3 Conservation and natural environments - Non-

2 Conservation and natural environments - Woodland

**Total Vegetation Cover Anomaly [%]** 



Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 99 98 97 96 95<sup>-</sup> 94 Jan 4e0 In Mai May 1<sup>1</sup>1 PQ1 month tern Ecosystem Research Infrastructure Australian Government

Water erosion historical monthly area protected (Total Veg Cov>70%)







### **Conservation and natural environments non forest**

Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)







% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

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Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





Wind erosion historical monthly area protected (Total Veg Cov >50%)

Water erosion historical monthly area protected (Total Veg Cov>70%)









#### **Conservation and natural environments Woodland forest**

Land use and forest cover



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





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is only for the month of the map

mean of that



**Total Vegetation Cover Anomaly [%]** 



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Water erosion historical monthly area protected (Total Veg Cov>70%)







### **Conservation and natural environments Forest (non woodland)**

Land use and forest cover



1200-2001

52% 70%

32%50%

0.30%

**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)







% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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## **Conservation and natural environments Forest (non woodland) timeseries**



Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





Wind erosion historical monthly area protected (Total Veg Cov >50%)









### Agriculture

Land use and forest cover

Proportion of each land class in area



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)







**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





**Total Vegetation Cover Anomaly [%]** 



Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



**Total Vegetation Cover Decile [%]** 





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Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





## Agriculture timeseries

Water erosion historical monthly area protected (Total Veg Cov>70%)

Wind erosion historical monthly area protected (Total Veg Cov >50%)



#### Grazing

Land use and forest cover



**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





1 Agriculture - Grazing - Non forest



Proportion of each land class in area



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



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**Total Vegetation Cover Decile [%]** 





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### Grazing timeseries



Water erosion historical monthly area protected (Total Veg Cov>70%)



### **Grazing non forest**

Land use and forest cover



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





**Total Vegetation Cover Anomaly [%]** 



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**Total Vegetation Cover Decile [%]** 





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Water erosion historical monthly area protected (Total Veg Cov>70%)



### **Grazing Woodland forest**

Land use and forest cover



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover Anomaly [%]** 



Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



**Total Vegetation Cover Decile [%]** 





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## Grazing Woodland forest timeseries







Water erosion historical monthly area protected (Total Veg Cov>70%)



#### Grazing - Forest (non woodland)

Land use and forest cover



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





**Total Vegetation Cover Anomaly [%]** 



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**Total Vegetation Cover Decile [%]** 





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## Grazing - Forest (non woodland) timeseries

3**0** 

Water erosion historical monthly area protected (Total Veg Cov>70%)





### Cropping

#### Land use and forest cover



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)







**Total Vegetation Cover Anomaly [%]** 

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## **Cropping timeseries**



33

Water erosion historical monthly area protected (Total Veg Cov>70%)



### Horticulture

120/01/1000/0

· 52% 70%

32%50%

0.30%

Land use and forest cover



**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



**Total Vegetation Cover Anomaly [%]** 

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## Horticulture timeseries

Water erosion historical monthly area protected (Total Veg Cov>70%)



### **Production native forests and plantation forests**

Land use and forest cover



**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)







**Total Vegetation Cover Anomaly [%]** 

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Water erosion historical monthly area protected (Total Veg Cov>70%)



# Byron\_(A) (55,100 ha and no data 1,595 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

Land use and forest cover Class	area(ha)	above_30	above_50	above_70	above_80	above_90	above_95
Entire region	55,100	99.8% 54,975	99.2% 54,650	98.3% 54,150	95.5% 52,625	57.5% 31,675	17.0% 9,375
Conservation and natural environments	10,450	99.5% 10,400	97.6% 10,200	95.7% 10,000	92.8% 9,700	73.9% 7,725	38.3% 4,000
Conservation and natural environments non forest	1,275	98.0% 1,250	90.2% 1,150	82.4% 1,050	70.6% 900	45.1% 575	7.8% 100
Conservation and natural environments Woodland forest	625	100.0% 625	100.0% 625	100.0% 625	96.0% 600	60.0% 375	24.0% 150
Conservation and natural environments Forest (non woodland)	8,550	99.7% 8,525	98.5% 8,425	97.4% 8,325	95.9% 8,200	79.2% 6,775	43.9% 3,750
Agriculture	33,425	100.0% 33,425	100.0% 33,425	99.9% 33,375	99.1% 33,125	57.7% 19,300	12.1% 4,050
Grazing	30,050	100.0% 30,050	100.0% 30,050	99.8% 30,000	99.1% 29,775	58.2% 17,500	12.6% 3,775
Grazing non forest	24,600	100.0% 24,600	100.0% 24,600	99.8% 24,550	99.0% 24,350	51.6% 12,700	7.2% 1,775
Grazing Woodland forest	2,600	100.0% 2,600	100.0% 2,600	100.0% 2,600	100.0% 2,600	84.6% 2,200	14.4% 375
Grazing - Forest (non woodland)	2,850	100.0% 2,850	100.0% 2,850	100.0% 2,850	99.1% 2,825	91.2% 2,600	57.0% 1,625
Cropping	1,175	100.0% 1,175	100.0% 1,175	100.0% 1,175	97.9% 1,150	34.0% 400	12.8% 150
Horticulture	2,175	100.0% 2,175	100.0% 2,175	100.0% 2,175	100.0% 2,175	63.2% 1,375	4.6% 100
Production native forests and plantation forests	600	100.0% 600	100.0% 600	100.0% 600	100.0% 600	66.7% 400	4.2% 25

