Total vegetation cover soil protection Region:LGA Mackay_(R) QLD

Date: December 2019

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 Dec 2019

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%)











12010-20091

· 52°10'10°10

320050010

0.30%



Total Vegetation Cover Decile [%]



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Conservation and natural environments

forest

woodland forest

Catchment Scale Land

Catchment Scale

of Australia (2018)

(2018) and Forests

of Australia (2018)

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

from 2001 to 2019.

is only for the month of the map

Derived from

Use of Australia

Land Use and Forests

Land use and forest cover

Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





1 Conservation and natural environments - Nonforest

3 Conservation and natural environments - Non-

2 Conservation and natural environments - Woodland





Proportion of each land class in area

Proportion of vegetation cover class in area









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



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

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







Conservation and natural environments non forest

ቅዸ Land Use and Forests 1 Conservation and natural environments - Non-Catchment Scale Land forest

12%200%

52°10-70°10

1 32°10'50010

0.30%

Land use and forest cover

Catchment Scale

of Australia (2018) Derived from

Anomaly show how many percetage points each pixel is from the mean That

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is only for the month of the map

Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]



% Area protected from water erosion (>70%)







% Area protected from wind erosion (>50%)







100-98-96 94 92 90 88-86 84 lar feb way In Mai (J) 26, month TERN CSIRO Australian Government

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







Conservation and natural environments 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)

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1 Conservation and natural environments - Woodland forest

Total Vegetation Cover [%]

Land use and forest cover



% Area protected from water erosion (>70%)

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National Landcare

Programme

Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

Planning, Industry & Environment

NSW GOVERNMENT



12

Australian Government

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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%)

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





Conservation and natural environments Forest (non woodland)



Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





- 20

- 10

0

-10

-20



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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

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Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

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.



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 baseling the map using baseline from 2001 to 2019.





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

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





99.8-99.6 --- above_70 **—** 10th 99.4 **——** 50th **——** 2019 Dec 99.2 99.0 98.8 98.6 lar feb In May PQ Mai month ΓERN CSIRO Australian Government

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

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



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





Agriculture

10

5

0

Land use and forest cover



Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





Area not protected 0.9% of

Area

ha)

region (3,856 ha)

protected . 99.1% of

region (424,593

- 20

- 10

0

-10

-20

1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest

4 Agriculture - Grazing - Irrigated

8 Agriculture - Horticulture - Irrigated

3 Agriculture - Grazing - Non-woodland forest

5 Agriculture - Cropping - Non-irrigated 6 Agriculture - Cropping - Irrigated

7 Agriculture - Horticulture - Non-irrigated



Proportion of each land class in area

<u>11.</u>0% 0.0% 0.1% 0.0% 0.0% 1 2 3 4 5 6 7 8 Land use class Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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Total Vegetation Cover Decile [%]





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Derived from

(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.

12



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%)

99 98 97 96



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





Grazing

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

Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



30 -1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest

12%2000

52% TON

320050010

0.30%

- 20

- 10

0

-10

-20





Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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Total Vegetation Cover Decile [%]







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.

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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%)

100 98 ---- above_70 **—** 10th **——** 50th **—** 2019 Dec 96 94 92 Jan 4eb In way PQ 1st Mai month FERN CSIRO Australian Government

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







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Grazing non forest

12%200%

· 520/070012

320050010

0.30%

- 20

- 10

0

-10

-20

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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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 Decile [%]



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.



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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%)

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



Australian Government

Programn

Grazing 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)

Total Vegetation Cover [%]

Land use and forest cover



% Area protected from water erosion (>70%)







99.7%

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% Area protected from wind erosion (>50%)



Proportion of vegetation cover class in area

100

80

60

40

20

0

0.0%

0-30%

Area (%)

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.

- 20

- 10

0

-10

-20

Total Vegetation Cover Decile [%]





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Grazing Woodland forest 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%)



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

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







Grazing - Forest (non woodland)

12%200%

· 52°10010

· 32°10'50°10

0.30%



Total Vegetation Cover [%]

Land use and forest cover



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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Total Vegetation Cover Decile [%]





Total Vegetation Cover Anomaly [%]

26





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22

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

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



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



Irrigation

Land use and forest cover





Total Vegetation Cover [%]



% Area protected from water erosion (>70%)









Proportion of each land class in area

Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





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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%)







Production native forests and plantation forests

Catchment Scale Land Use and Forests of Australia (2018) 1 Production native forests and plantation forests Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

12%200%

· 520/07/00/0

· 320050010

0.30%

Land use and forest cover

Derived from

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Total Vegetation Cover [%]



% Area protected from water erosion (>70%)







% Area protected from wind erosion (>50%)



Production native forests and plantation forests timeseries



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



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



Mackay_(R) (749,700 ha and no data 11,611 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	749,700	99.9% 749,300	99.8% 748,350	98.3% 736,750	89.2% 668,375	57.3% 429,850	27.9% 209,250
Conservation and natural environments	192,675	99.9% 192,575	99.9% 192,400	99.1% 190,900	97.1% 187,000	82.6% 159,200	46.7% 89,900
Conservation and natural environments non forest	5,125	99.5% 5,100	98.0% 5,025	89.8% 4,600	77.6% 3,975	39.5% 2,025	13.7% 700
Conservation and natural environments Woodland forest	37,100	100.0% 37,100	99.9% 37,075	98.9% 36,675	96.1% 35,650	71.0% 26,325	41.2% 15,300
Conservation and natural environments Forest (non woodland)	150,450	100.0% 150,375	99.9% 150,300	99.5% 149,625	98.0% 147,375	87.0% 130,850	49.1% 73,900
Agriculture	428,450	100.0% 428,450	100.0% 428,450	99.1% 424,700	87.7% 375,575	45.8% 196,175	18.0% 77,275
Grazing	295,825	100.0% 295,825	100.0% 295,825	99.7% 294,800	95.3% 281,825	60.9% 180,125	25.0% 74,000
Grazing non forest	140,050	100.0% 140,050	100.0% 140,050	99.5% 139,300	94.1% 131,800	56.8% 79,600	20.4% 28,600
Grazing Woodland forest	108,725	100.0% 108,725	100.0% 108,725	99.7% 108,450	94.9% 103,225	55.0% 59,850	20.9% 22,775
Grazing - Forest (non woodland)	47,050	100.0% 47,050	100.0% 47,050	100.0% 47,050	99.5% 46,800	86.5% 40,675	48.1% 22,625
Irrigation	132,025	100.0% 132,025	100.0% 132,025	97.9% 129,300	70.6% 93,150	11.8% 15,550	2.4% 3,200
Production native forests and plantation forests	62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	94.4% 59,400	58.6% 36,850

