# Total vegetation cover soil protection Region:LGA Livingstone\_(S) QLD

# Date: July 2021

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 Jul 2021**

#### 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%)



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**Total Vegetation Cover Anomaly [%]** 







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52°10°10°10

3201050010

0.30%

**Total Vegetation Cover Decile [%]** 







2

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

Derived from

Use of Australia

(2018) and Forests

of Australia (2018)

Land Use and Forests of Australia (2018)

Catchment Scale Land







## **Conservation and natural environments**

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%)







Proportion of vegetation cover class in area

Land use class



#### % 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

records for that month of

the map using baseline from 2001 to 2019.

in the lowest 10% of

**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.







---- above\_70

**——** 10th

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

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



## **Conservation and natural environments timeseries**



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

100-98 96 94 92 90 88 86 84 Jan feb In Mai way Þb, month tern Ecosystem Research Infrastructure Australian Government

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









## **Conservation and natural environments 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%)



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



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 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.





12/02/001

· 52% 70%

3201050010

0.30%





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



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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)



**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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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 man using baseline

the map using baseline from 2001 to 2019.

**Total Vegetation Cover Anomaly [%]** 

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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%)



--- above\_70 **—** 10th **——** 50th 



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)**

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%)





Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**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.







**Total Vegetation Cover Decile [%]** 







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



**—** 10th

**——** 50th

**——** 2021 Jul

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



year



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







## Agriculture

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%)





#### Proportion of each land class in area

Proportion of vegetation cover class in area



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



Total Vegetation Cover Decile [%]





**Total Vegetation Cover Anomaly [%]** 







· 12%-200%

· 52% 70%

3201050010

0.30%







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





# Agriculture timeseries



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

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









## Grazing

1 Agriculture - Grazing - Non forest

· 12%-200%

· 52% 70%

3201050010

0.30%

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 [%]** 









#### Proportion of each land class in area

Proportion of vegetation cover class in area



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



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2?

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 man using baseline 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%)



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







## **Grazing non forest**

Land use and forest cover



**Total Vegetation Cover [%]** 





12%2000

% Area protected from water erosion (>70%)





0.1%

0-30%

100

40

20

0



97.9%

71%-100%

2

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Total Vegetation Cover class

% Area protected from wind erosion (>50%)

0.0%

31%-50%



2.0%

51%-70%

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 man using baseline

the map using baseline from 2001 to 2019.

**Total Vegetation Cover Anomaly [%]** 

Anomaly show how many percetage points each 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 Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)









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

# Grazing non forest timeseries





Australian Government

## **Grazing Woodland forest**

Land use and forest cover

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 [%]** 











Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

Total Vegetation Cover Decile [%]

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**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.



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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 man using baseline 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%)



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

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







## Grazing - Forest (non woodland)

12%200%

52% TO%

3201050010

0.30%



**Total Vegetation Cover [%]** 











#### % 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 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 man using baseline the map using baseline from 2001 to 2019.



# Grazing - 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%)



100 98 ---- above\_70 **—** 10th **——** 50th 96 **——** 2021 Jul 94 92 Jan 4eb In way PQ 1st War month tern Ecosystem Research Infrastructure Australian Government

30

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



**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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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.





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







# Livingstone\_(S) (1,154,650 ha and no data 20,810 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	1,154,650	100.0% 1,154,300	99.9% 1,153,325	98.6% 1,138,050	94.8% 1,094,425	75.6% 872,850	24.8% 285,875
Conservation and natural environments	334,650	100.0% 334,500	99.8% 334,050	98.8% 330,600	96.5% 322,825	85.9% 287,575	37.7% 126,075
Conservation and natural environments non forest	11,425	99.6% 11,375	98.0% 11,200	91.7% 10,475	82.9% 9,475	59.1% 6,750	22.8% 2,600
Conservation and natural environments Woodland forest	212,400	100.0% 212,325	99.9% 212,225	99.5% 211,375	98.8% 209,850	89.9% 190,875	39.9% 84,800
Conservation and natural environments Forest (non woodland)	110,825	100.0% 110,800	99.8% 110,625	98.1% 108,750	93.4% 103,500	81.2% 89,950	34.9% 38,675
Agriculture	679,025	100.0% 678,900	100.0% 678,750	98.7% 669,950	95.2% 646,100	72.8% 494,000	20.0% 135,950
Grazing	673,650	100.0% 673,525	100.0% 673,375	98.7% 664,775	95.3% 641,825	73.1% 492,350	20.2% 135,825
Grazing non forest	412,175	100.0% 412,075	99.9% 411,950	97.9% 403,575	92.7% 382,275	68.0% 280,475	18.9% 77,825
Grazing Woodland forest	219,375	100.0% 219,375	100.0% 219,350	99.9% 219,150	99.3% 217,800	79.9% 175,200	21.8% 47,800
Grazing - Forest (non woodland)	42,100	99.9% 42,075	99.9% 42,075	99.9% 42,050	99.2% 41,750	87.1% 36,675	24.2% 10,200
Production native forests and plantation forests	53,200	100.0% 53,200	100.0% 53,200	100.0% 53,200	100.0% 53,175	94.0% 50,000	22.9% 12,175

