# Total vegetation cover soil protection
# Region:NRM Murray NSW Date: June 2013

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 cover class that 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.

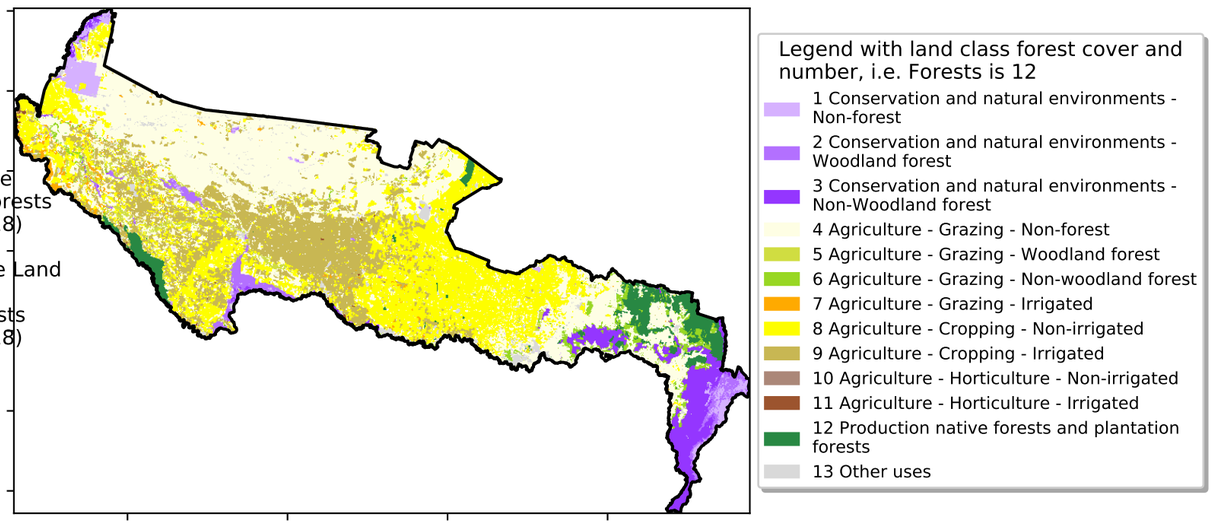
**Acknowledgment of data:**


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

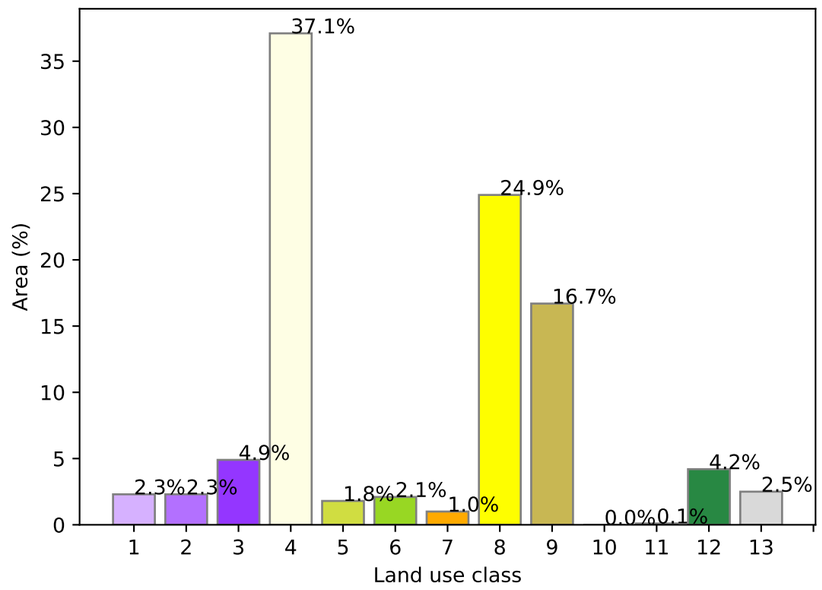
# Vegetation Cover Jun 2013

### Land use and forest cover

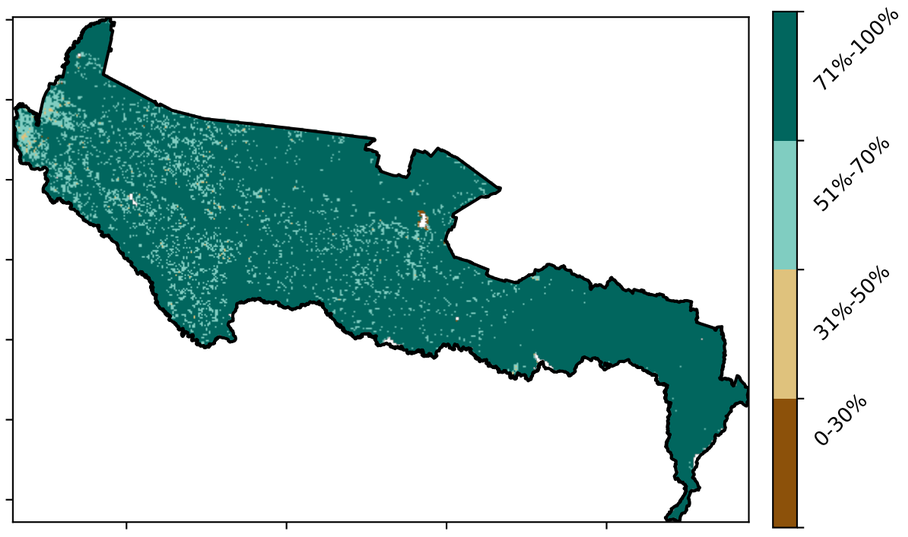



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

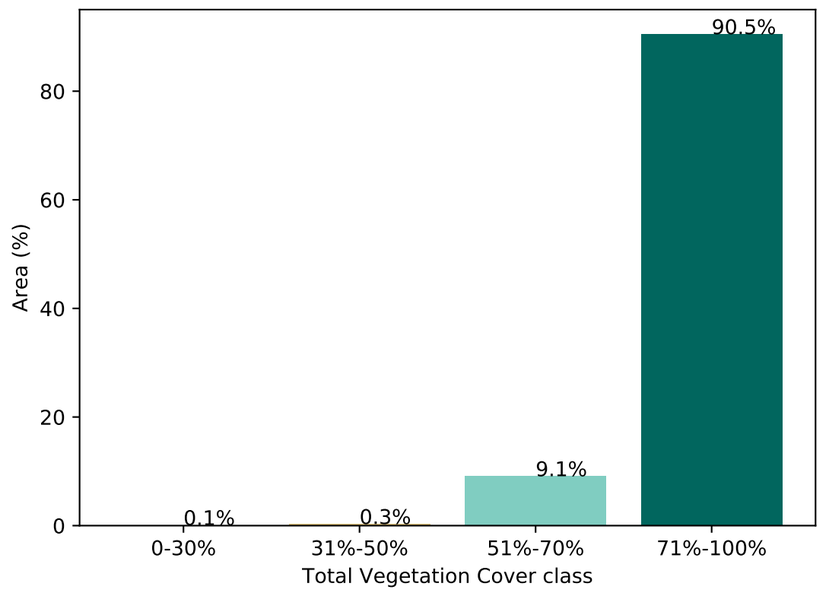
### Proportion of each land class in area



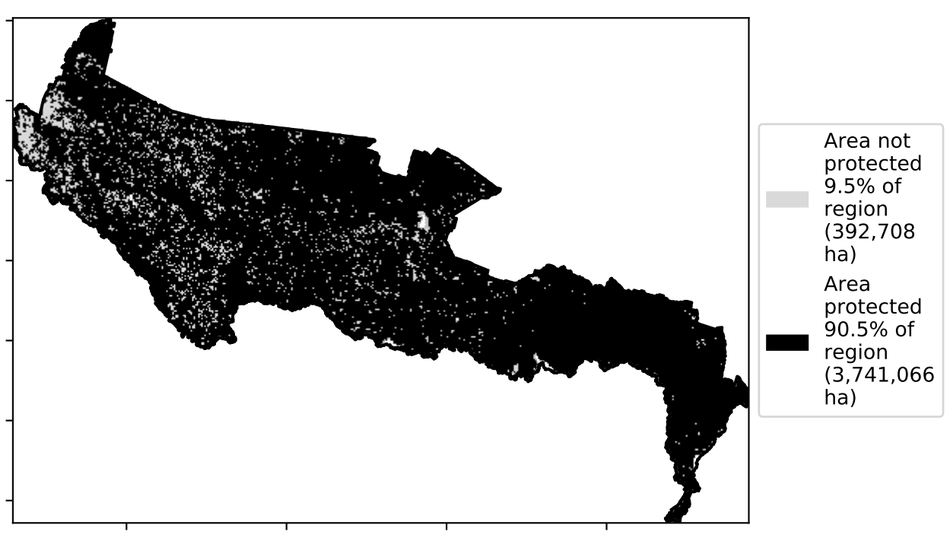

### Total Vegetation Cover [%]




### Proportion of vegetation cover class in area




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

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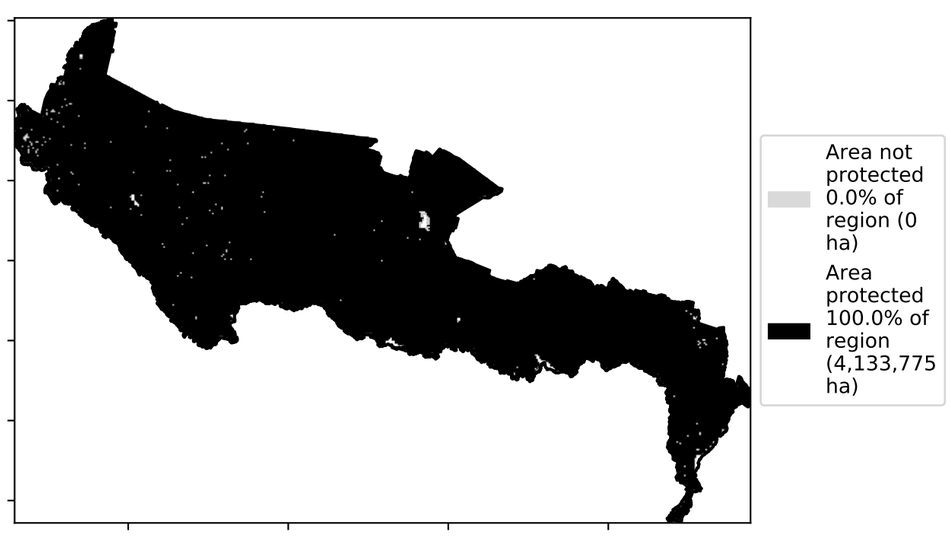


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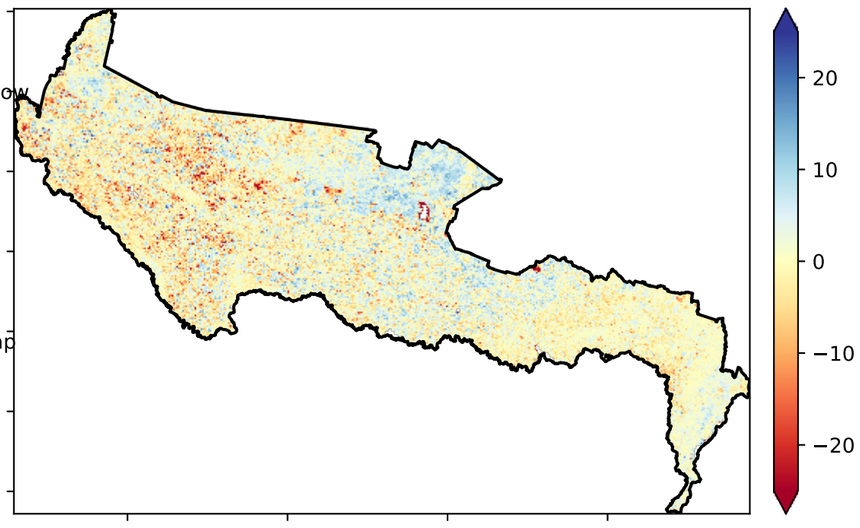


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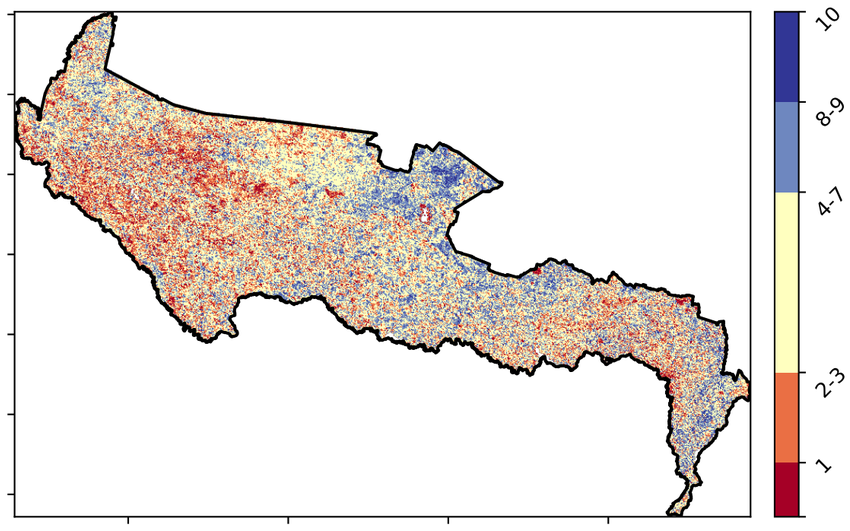
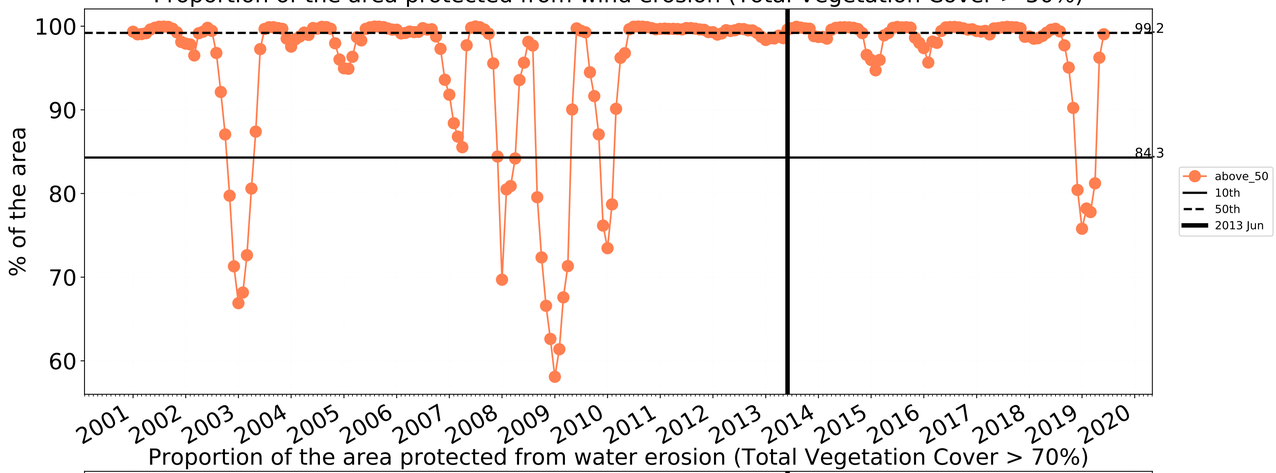
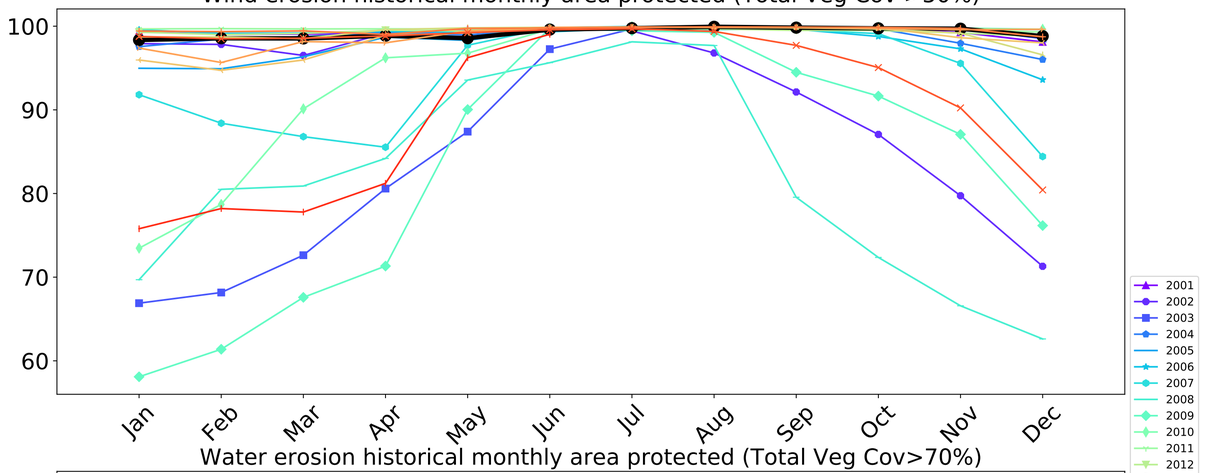
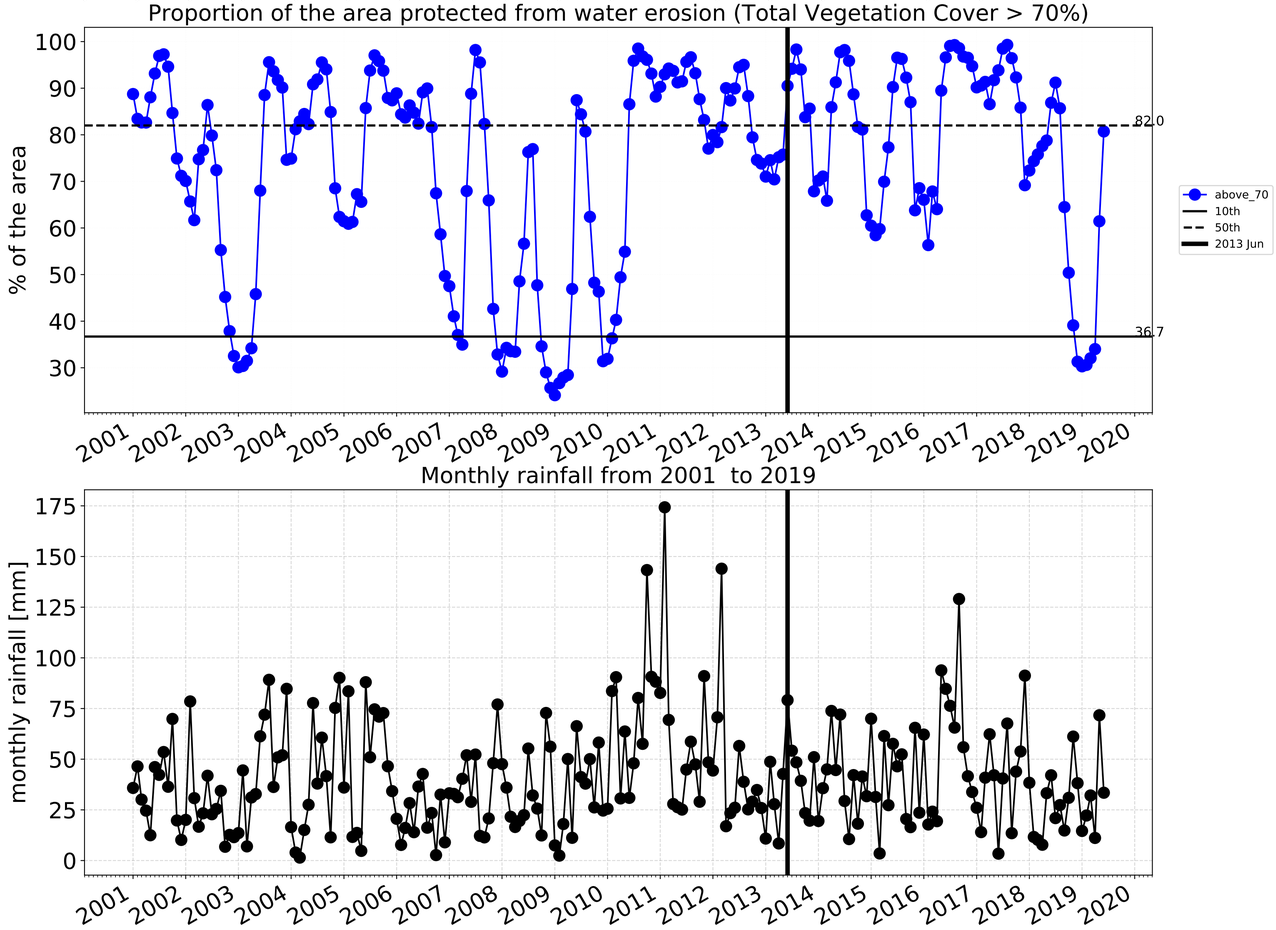
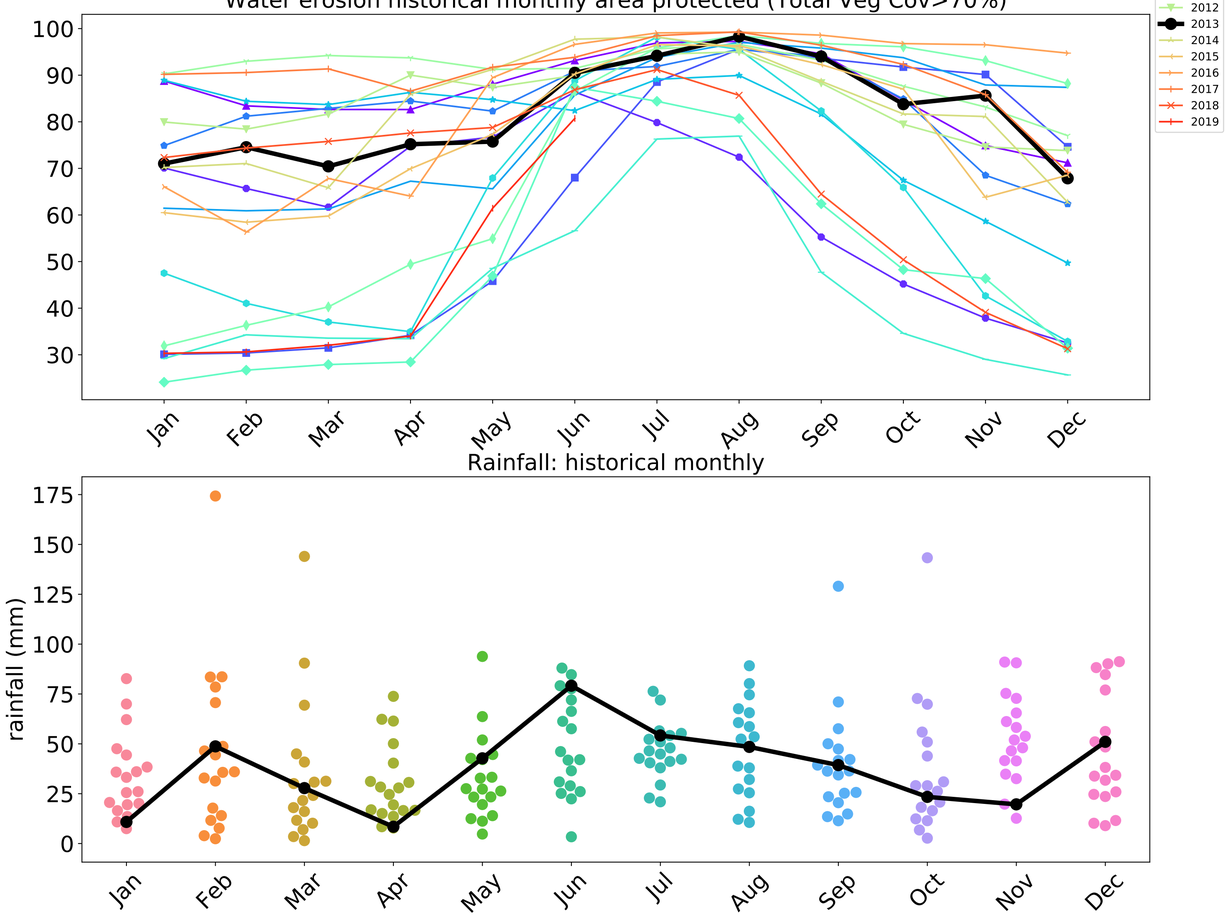



Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)
% of the area
99.2
84.3
above_50
10th
50th
2013 Jun

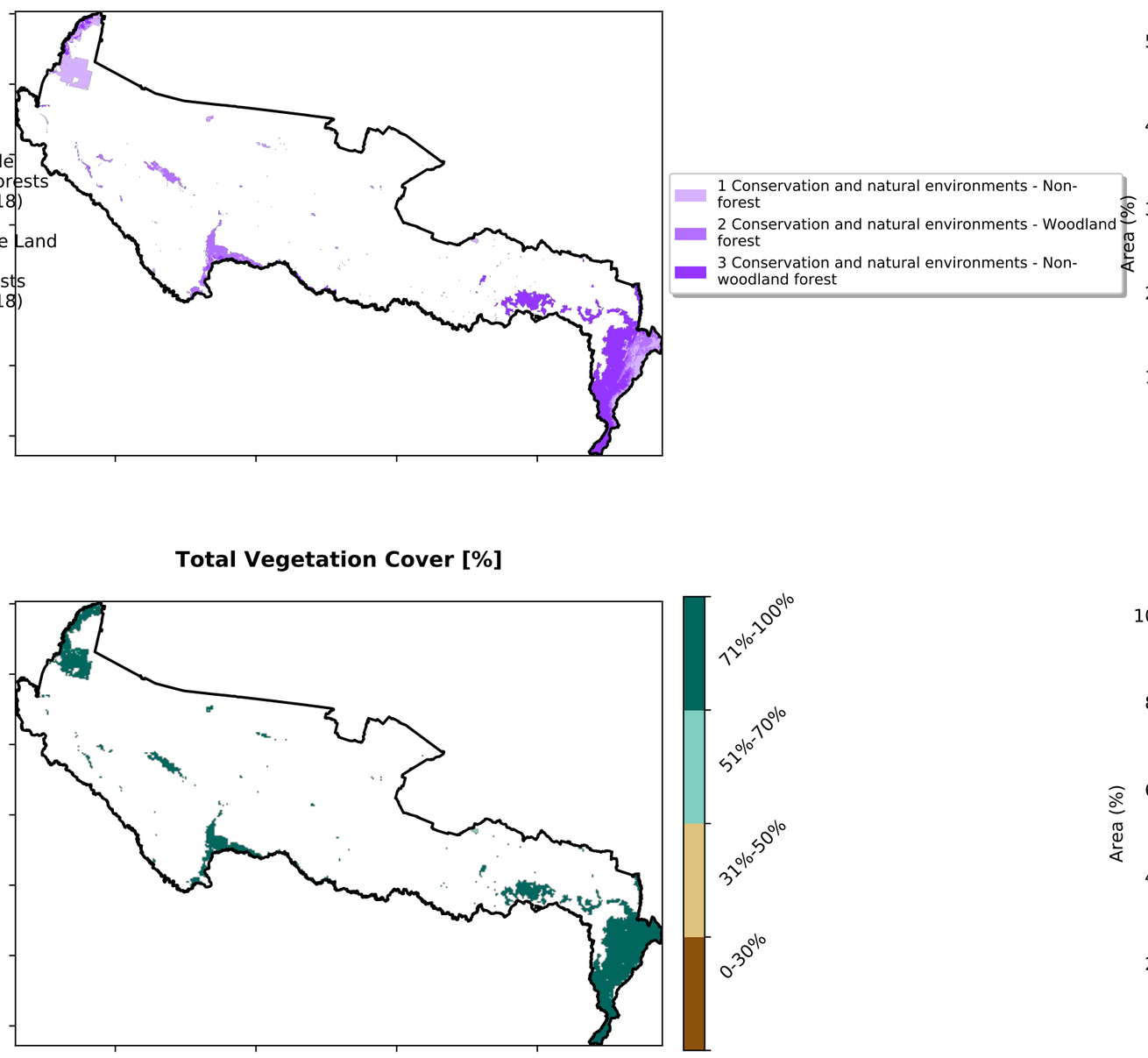

Wind erosion historical monthly area protected (Total Veg Cov >50%)
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)
% of the area
82.0
36.7
above_70
10th
50th
2013 Jun
Monthly rainfall from 2001 to 2019
monthly rainfall [mm]


Water erosion historical monthly area protected (Total Veg Cov>70%)
Rainfall: historical monthly
rainfall (mm)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

# Conservation and natural environments

## Land use and forest cover

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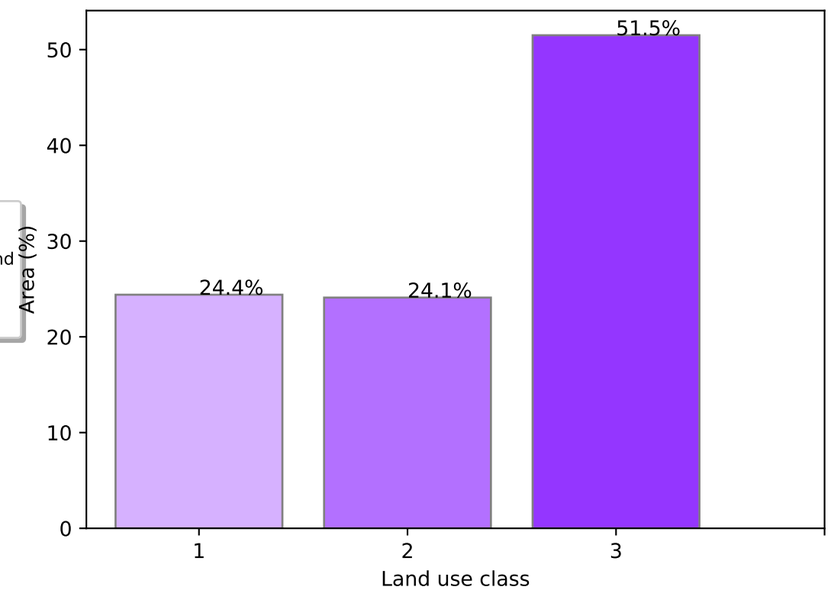
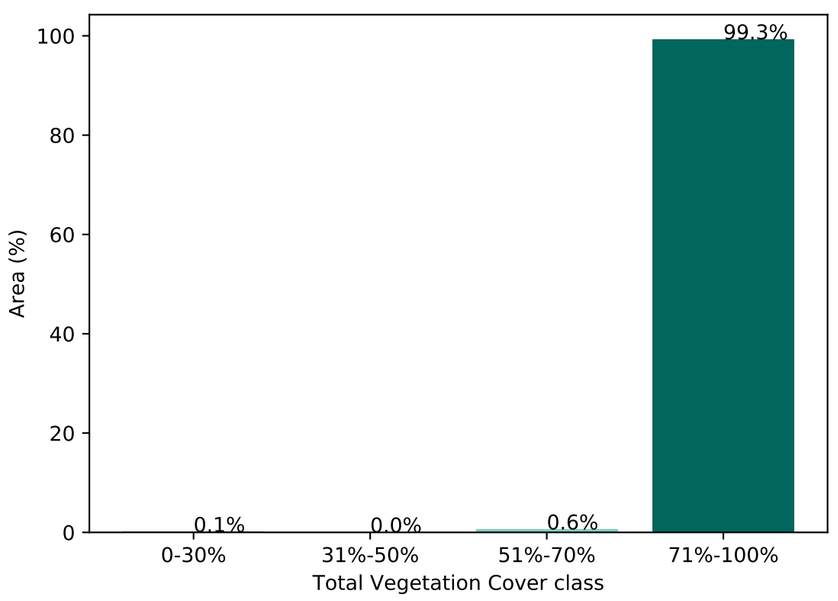


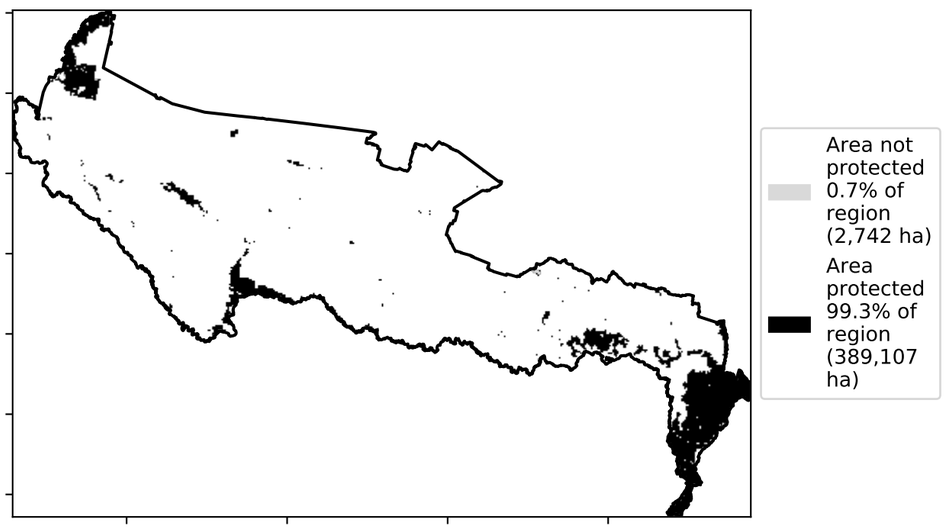

## Total Vegetation Cover [%]



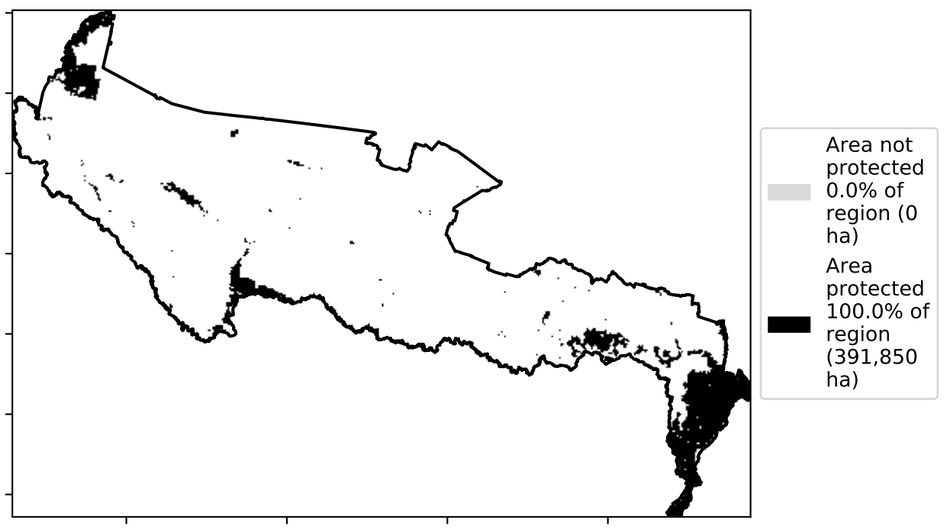

## Proportion of vegetation cover class in area




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




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

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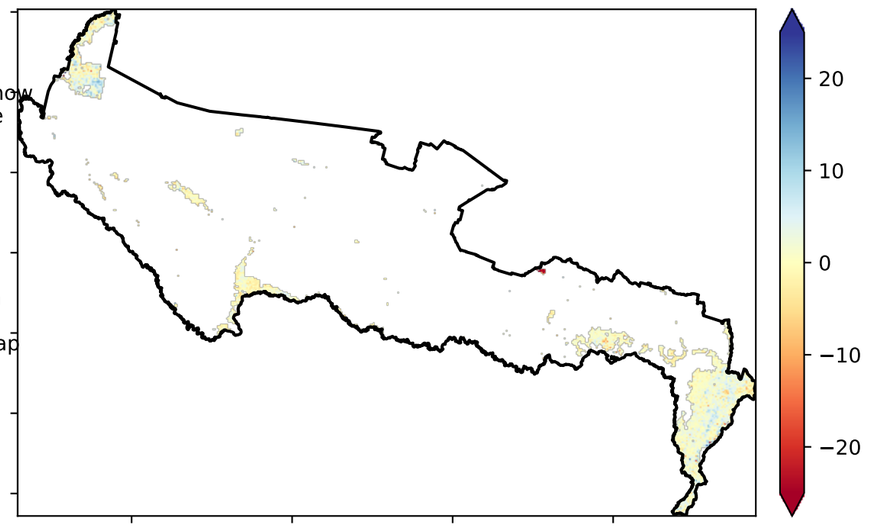


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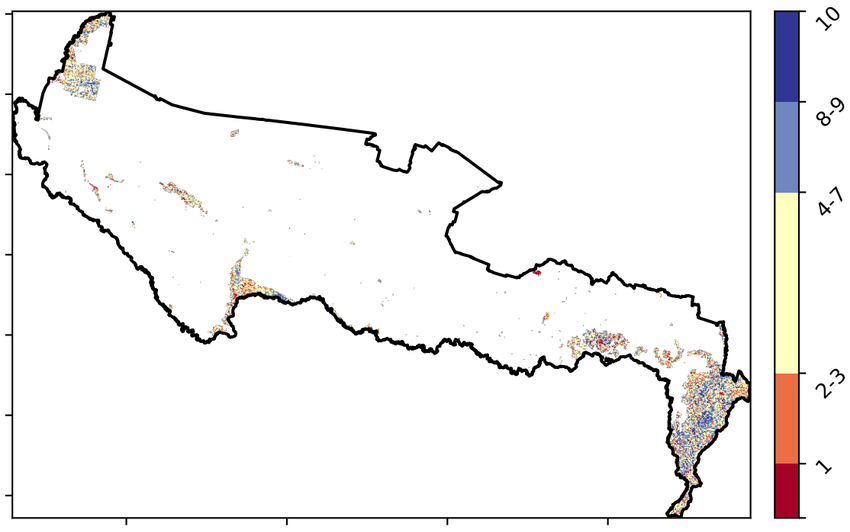
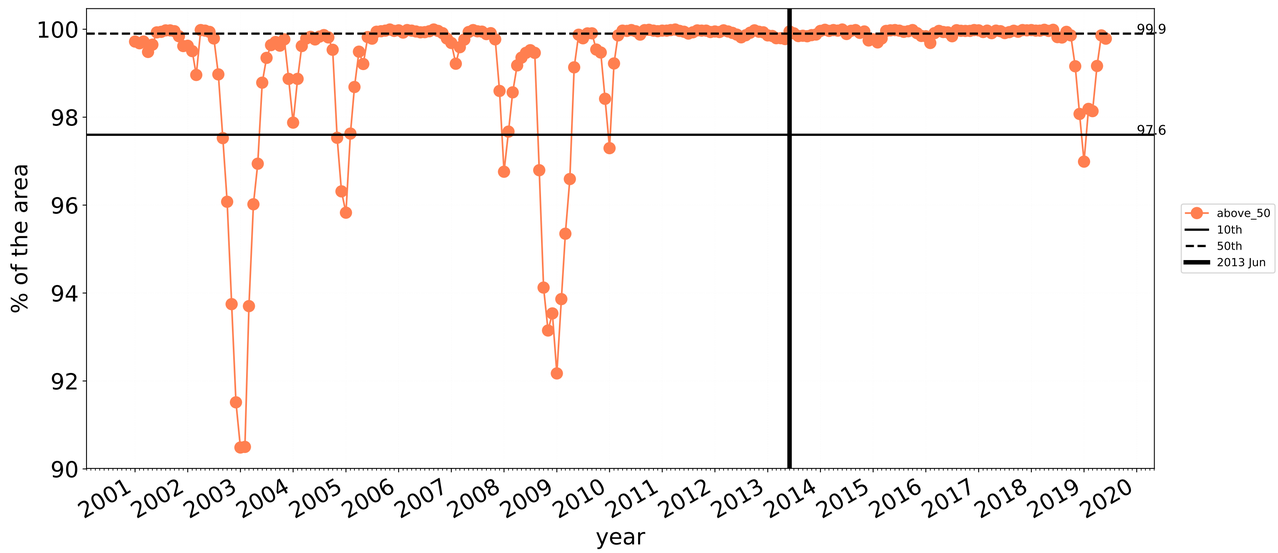
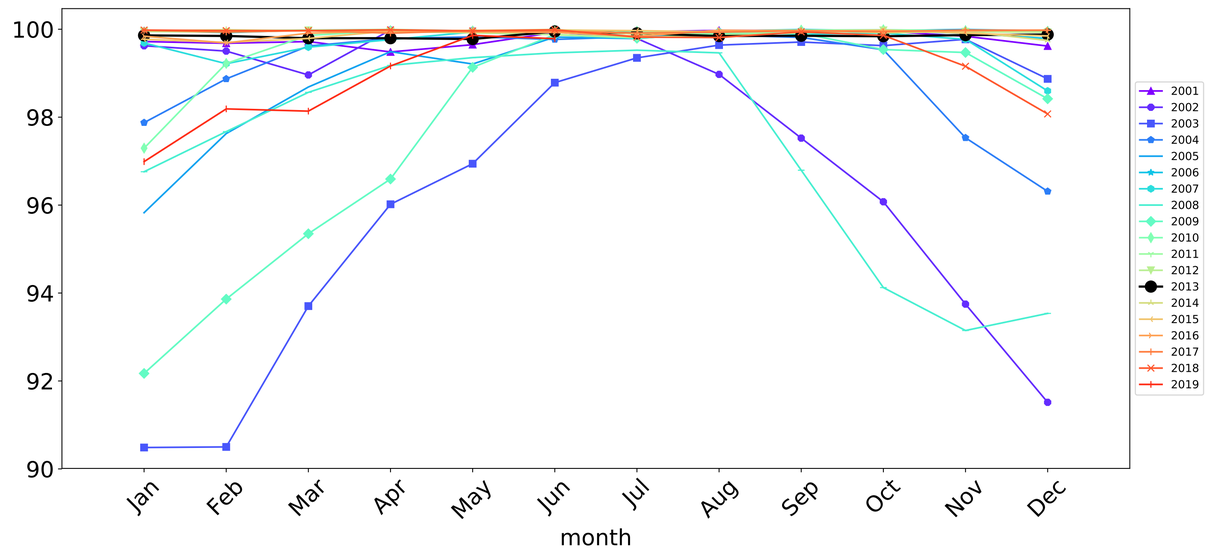


**Conservation and natural environments timeseries**

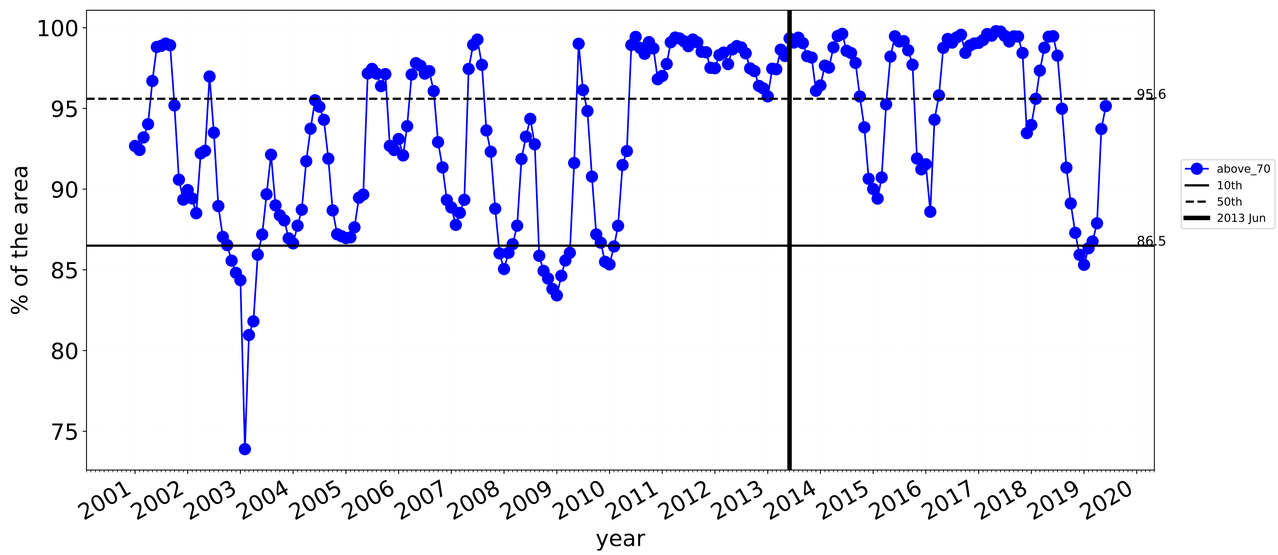
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



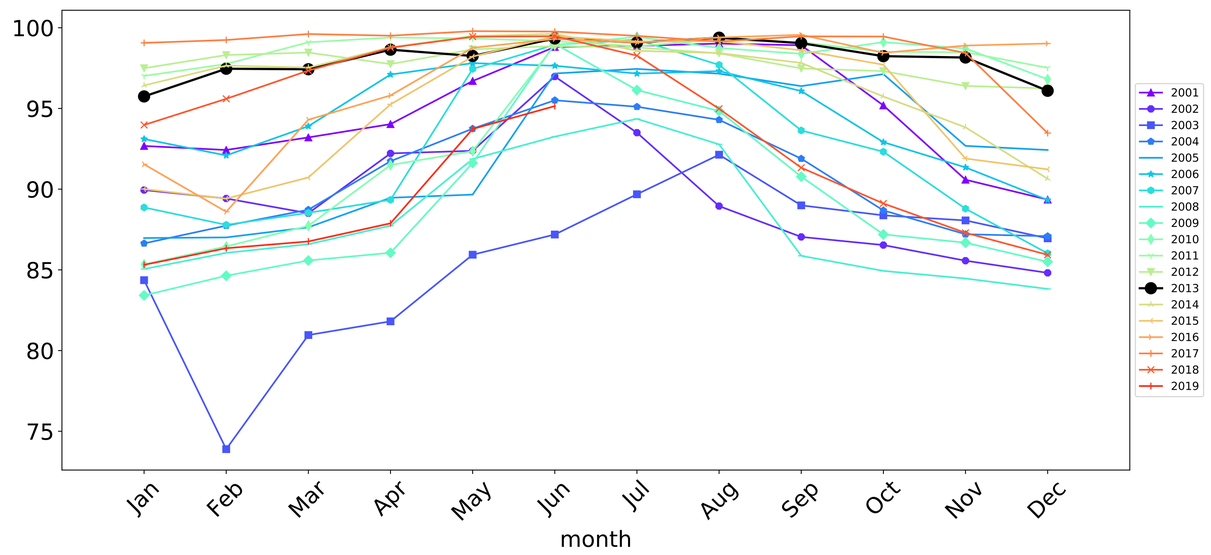

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

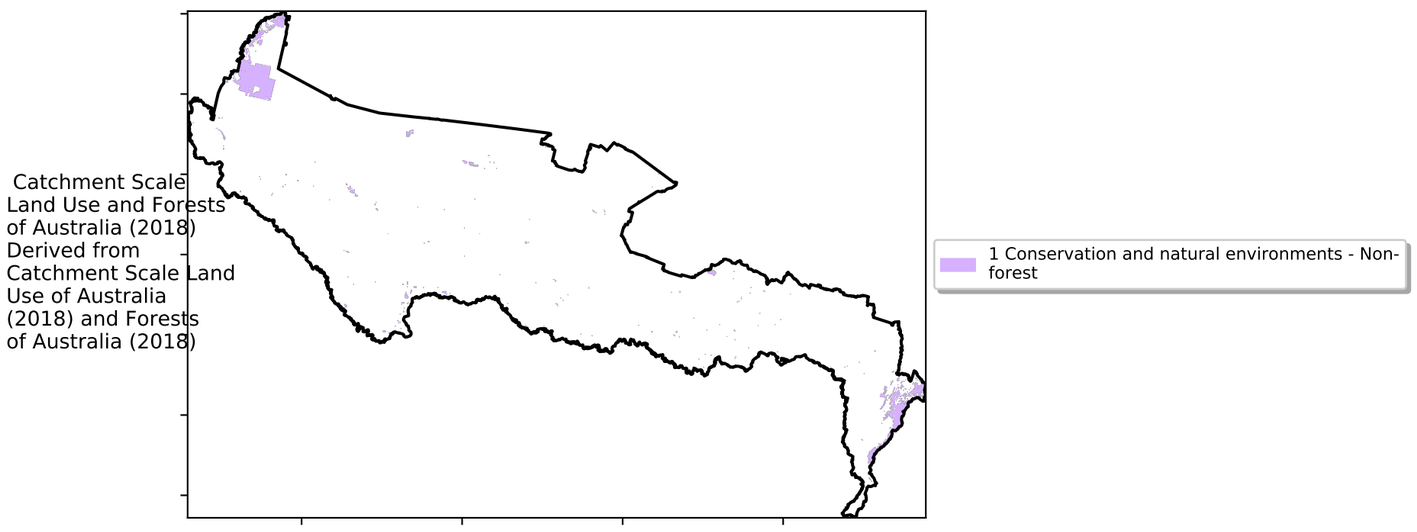



Water erosion historical monthly area protected (Total Veg Cov>70%)

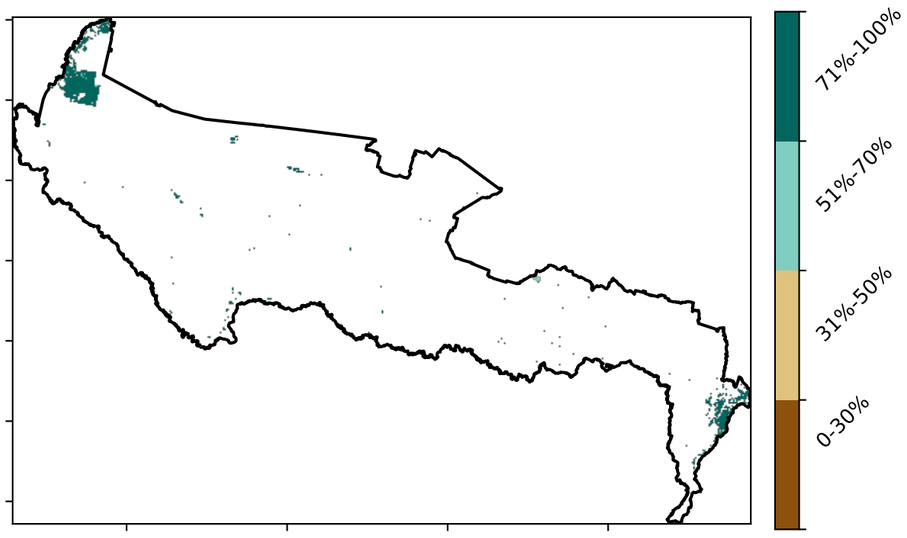


# Conservation and natural environments non forest

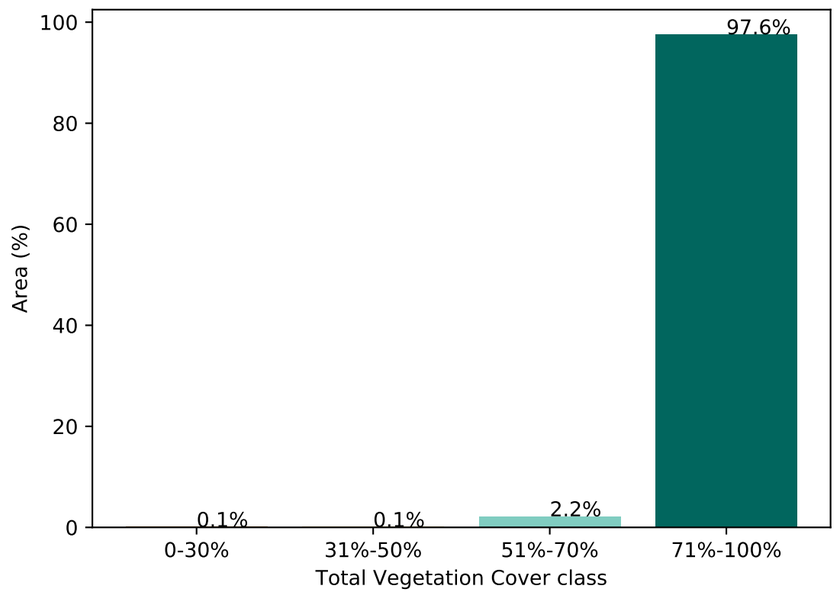
## Land use and forest cover



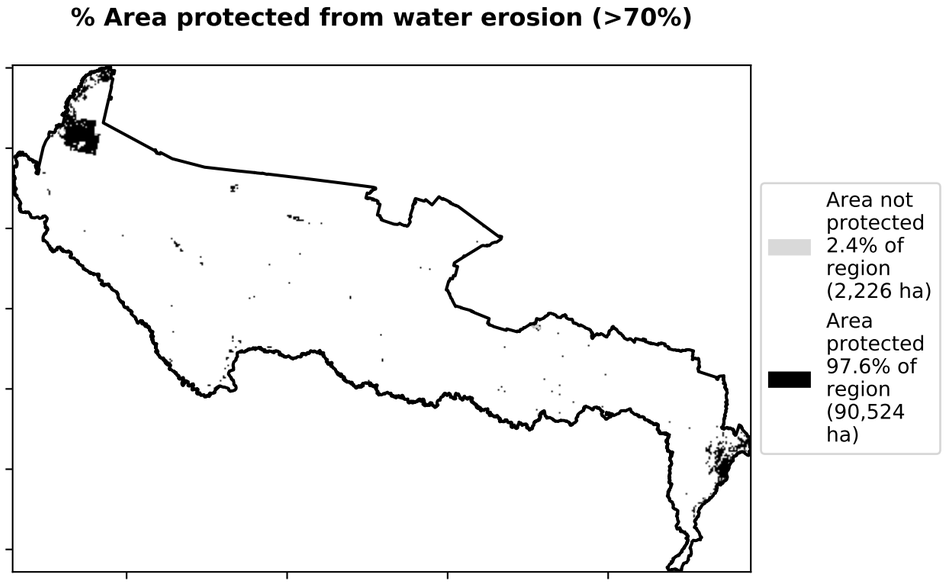

## Total Vegetation Cover [%]



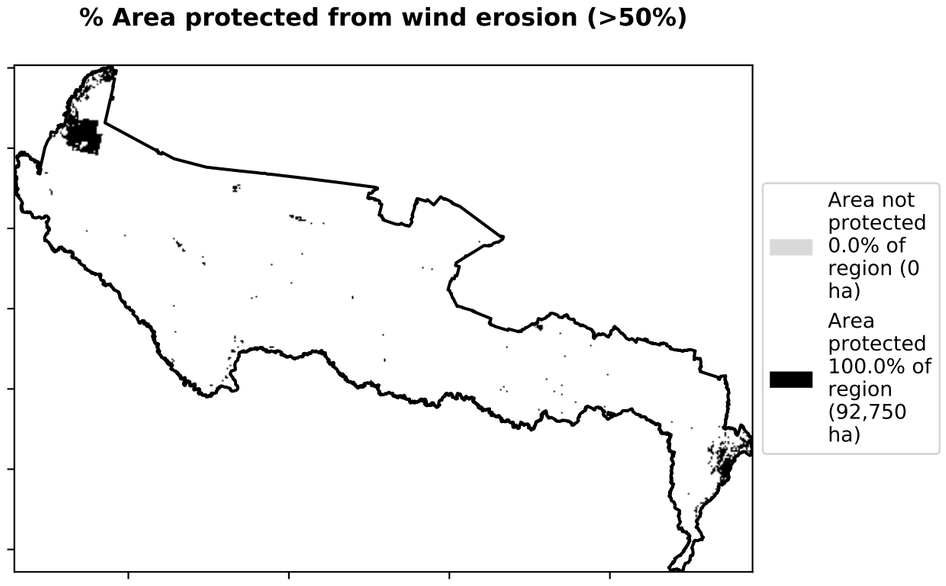

## Proportion of vegetation cover class in area




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




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

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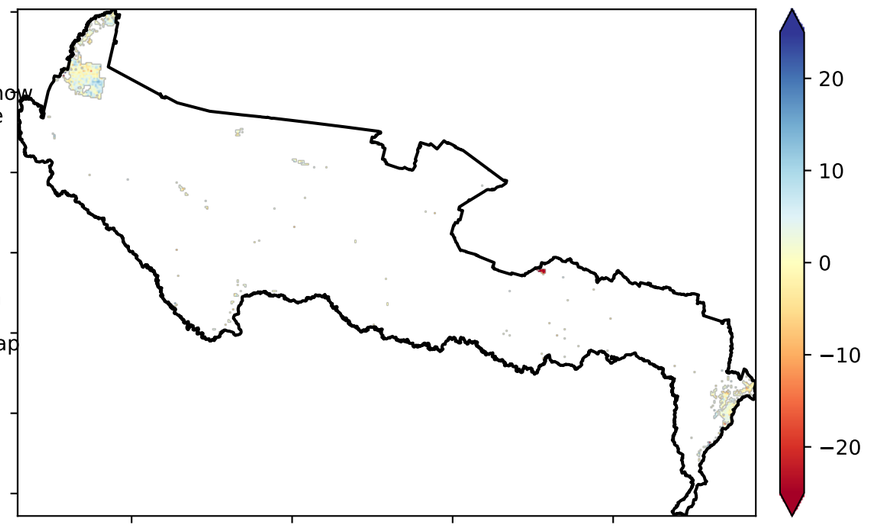


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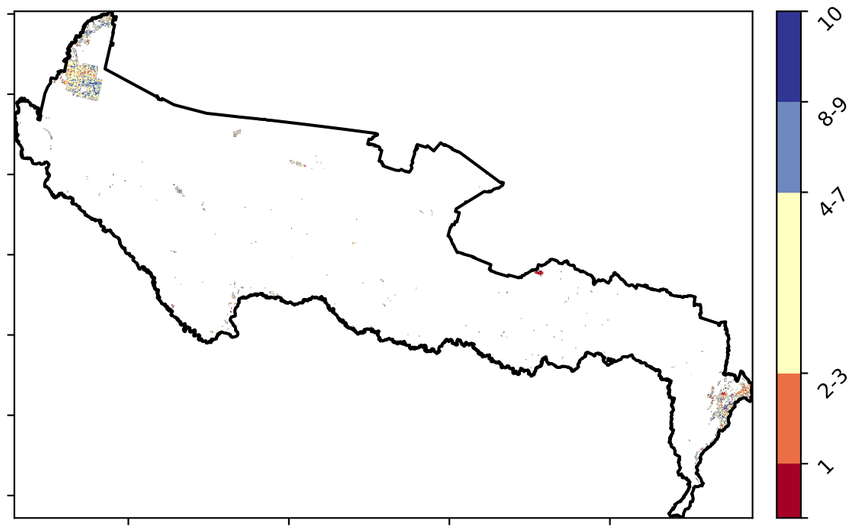
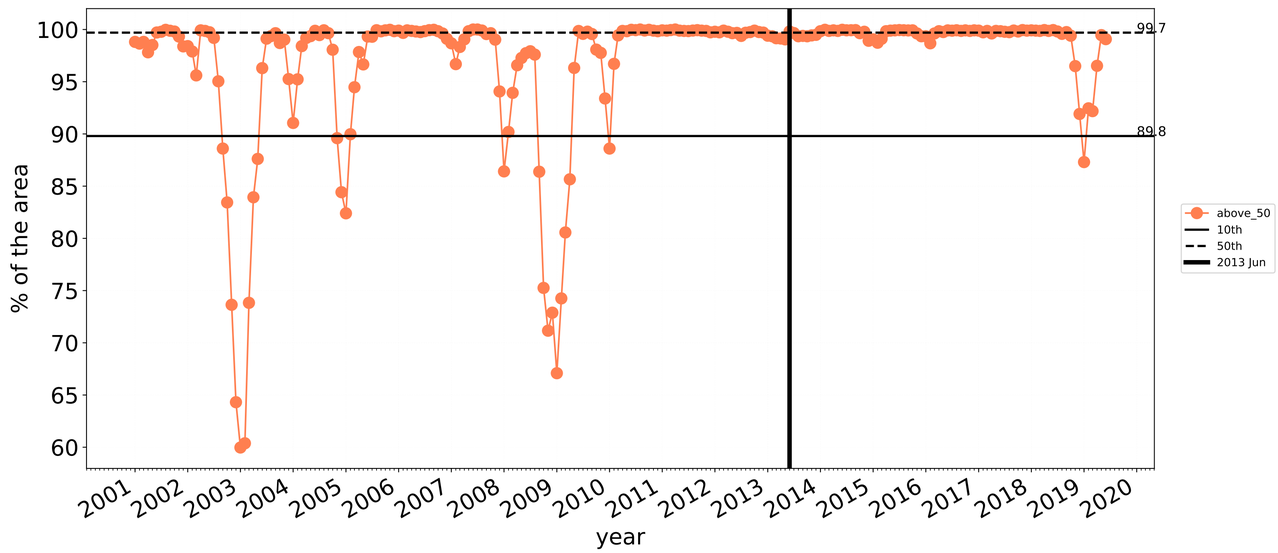
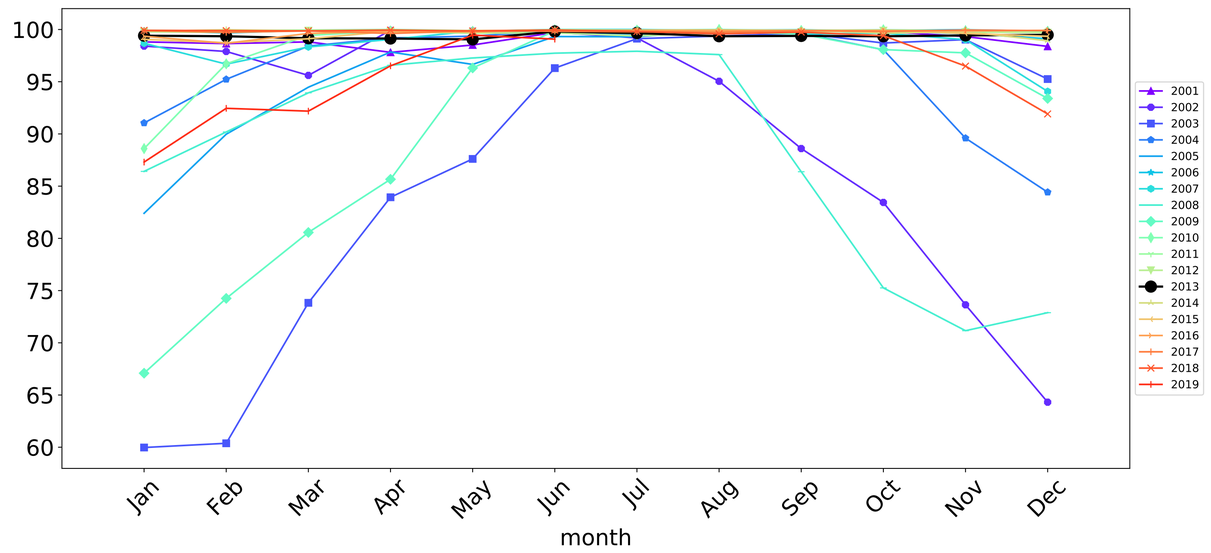


**Conservation and natural environments non forest timeseries**

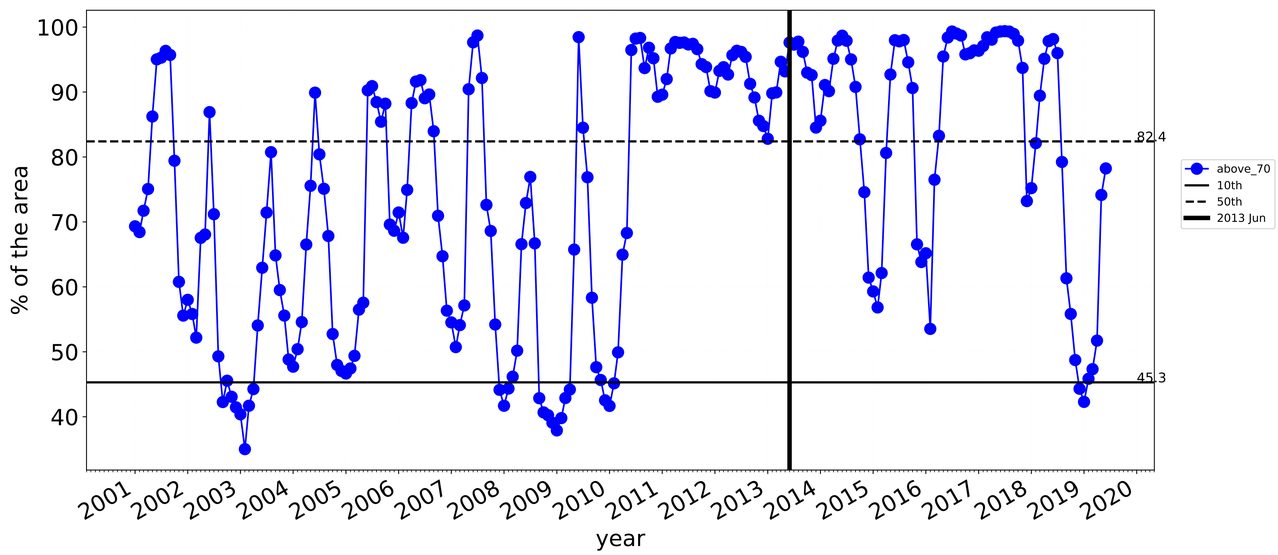
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



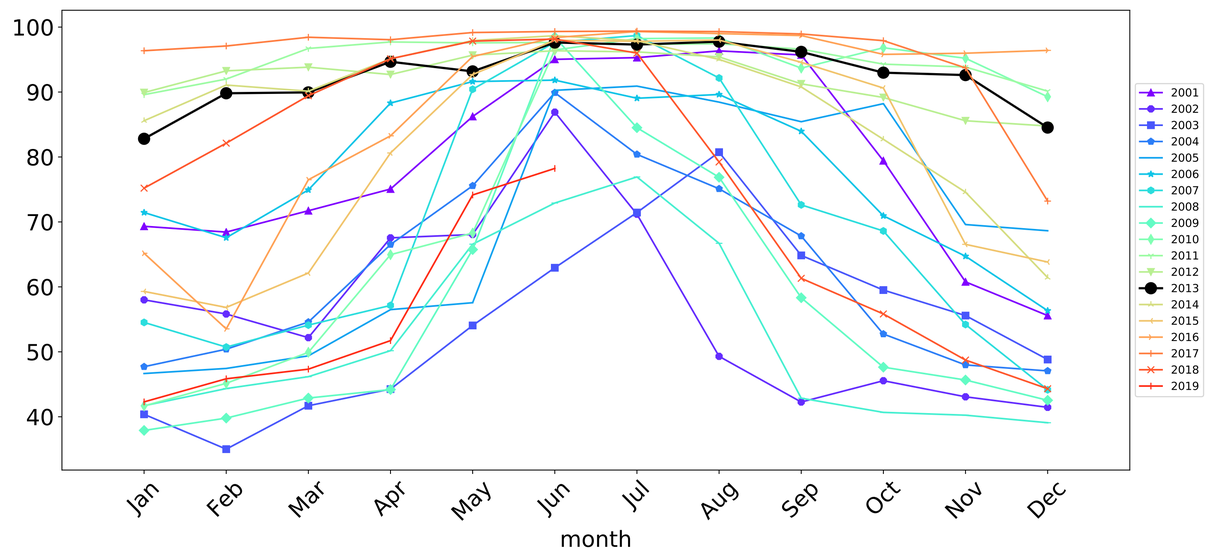

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

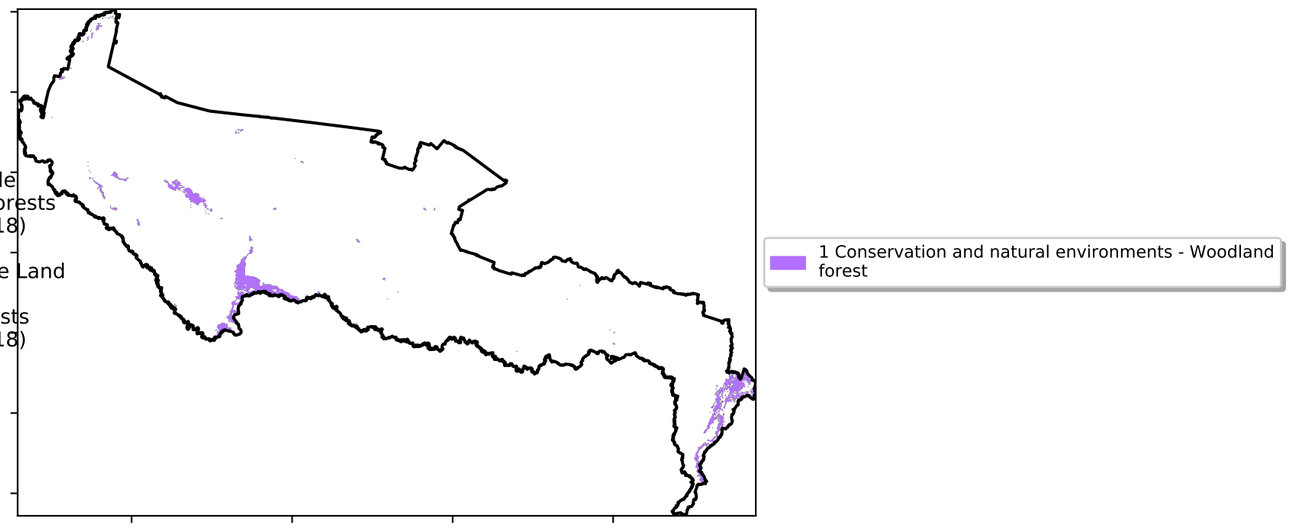



Water erosion historical monthly area protected (Total Veg Cov>70%)



# Conservation and natural environments Woodland forest

## Land use and forest cover

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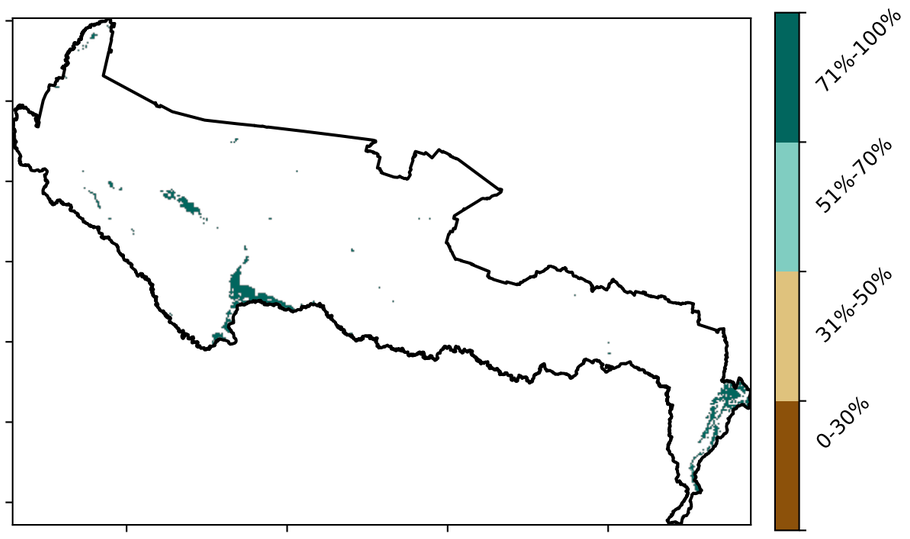


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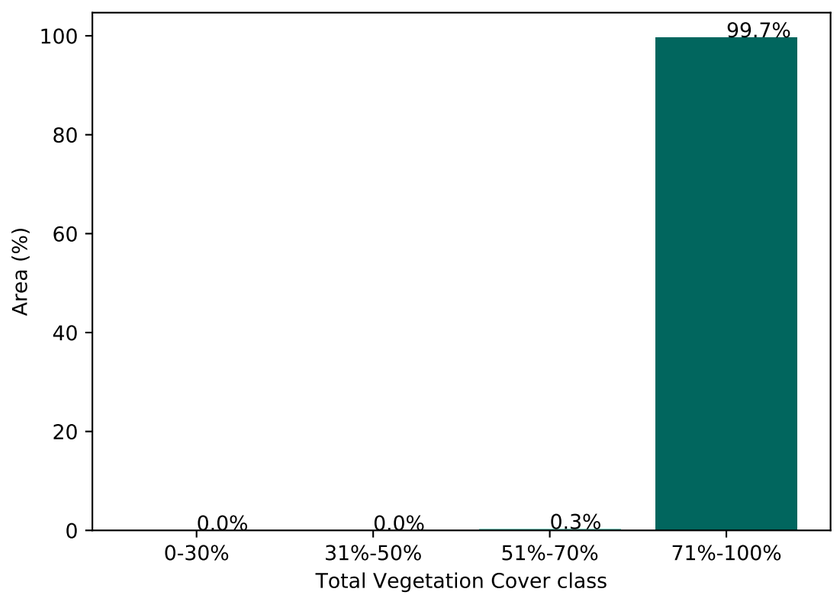
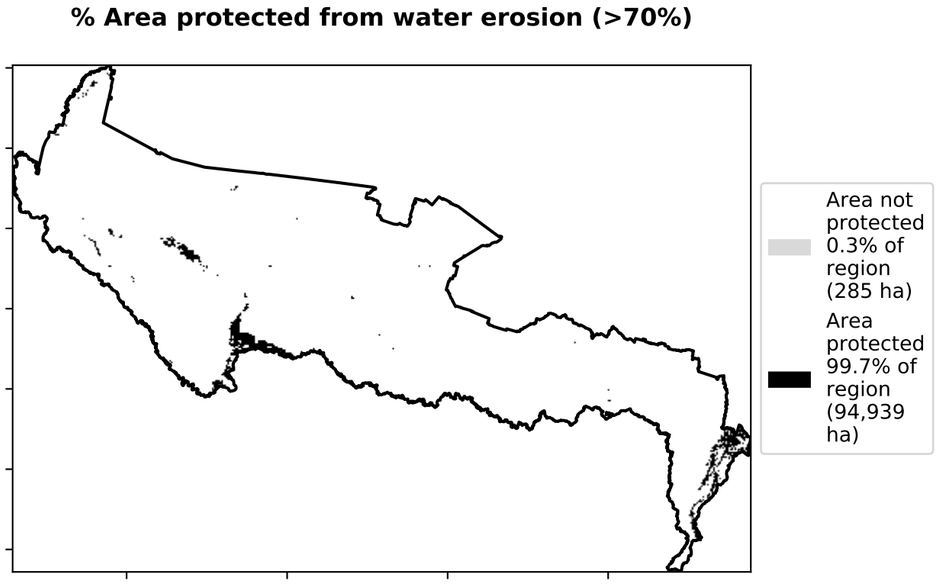
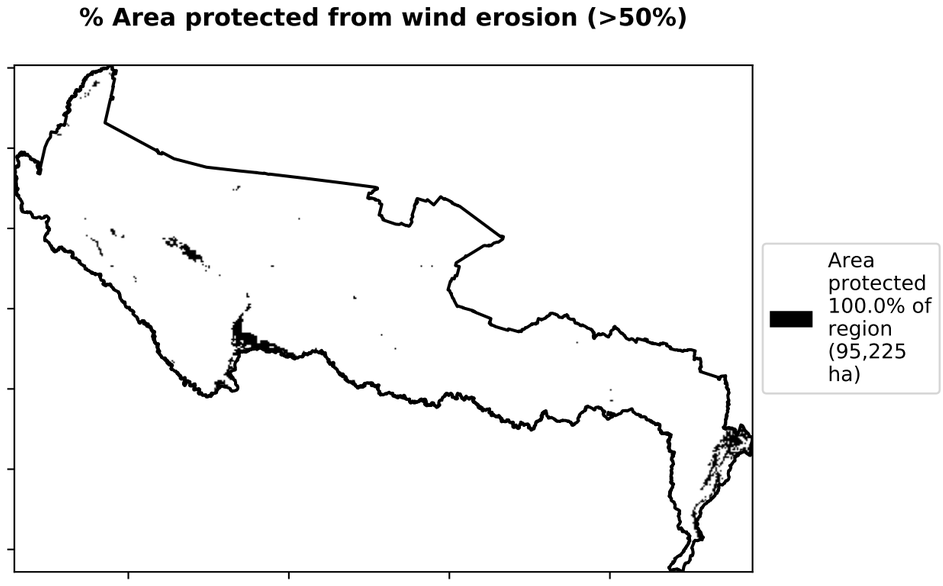



## % Area protected from water erosion (>70%)




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

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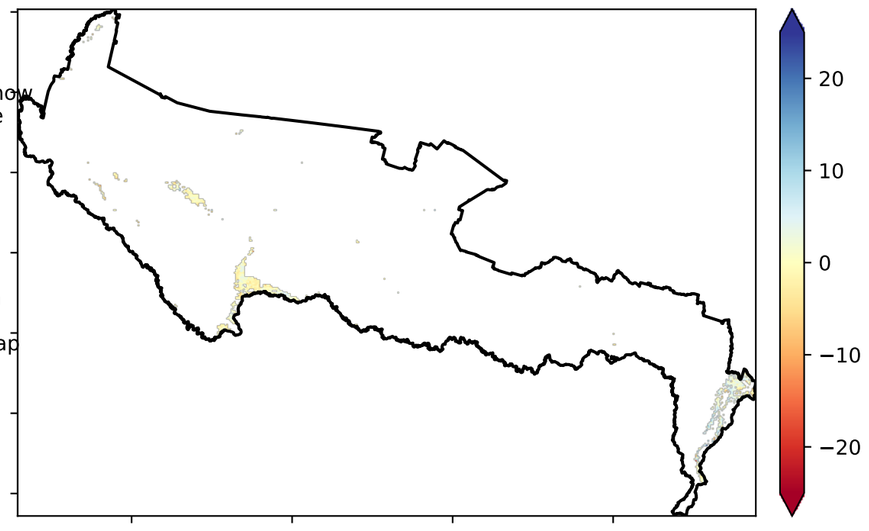


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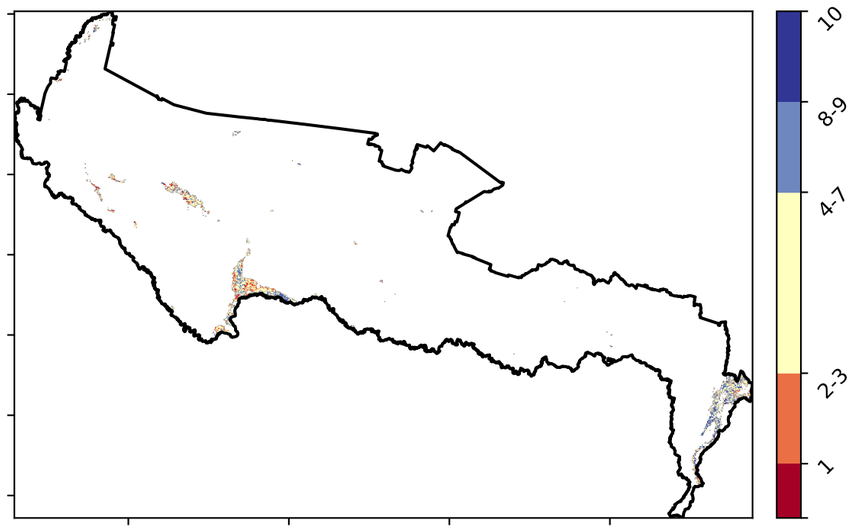
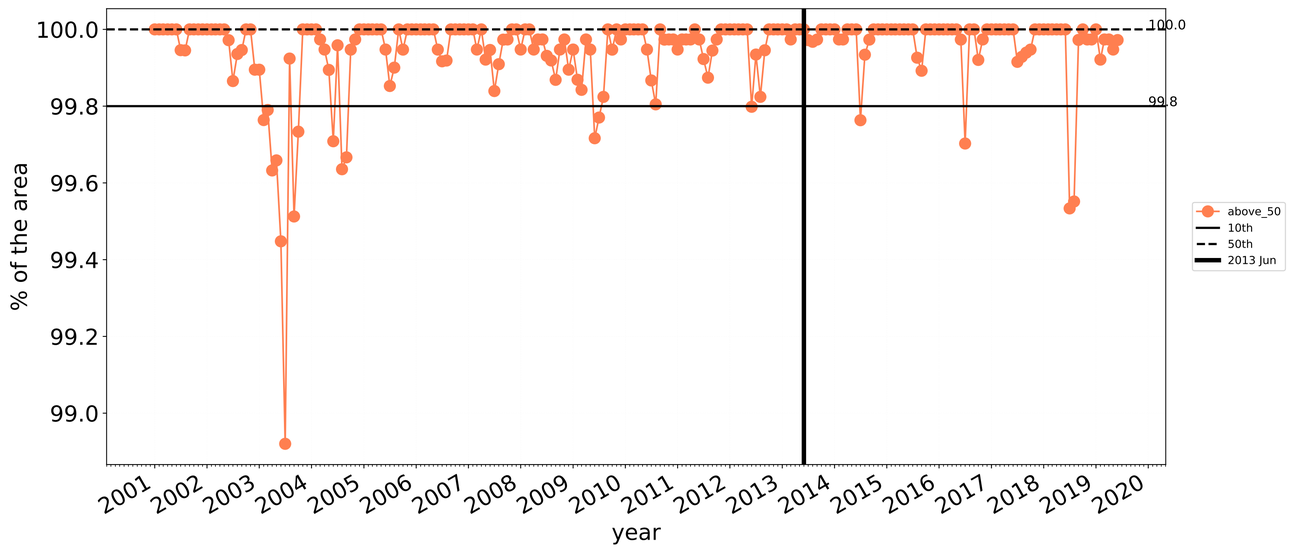
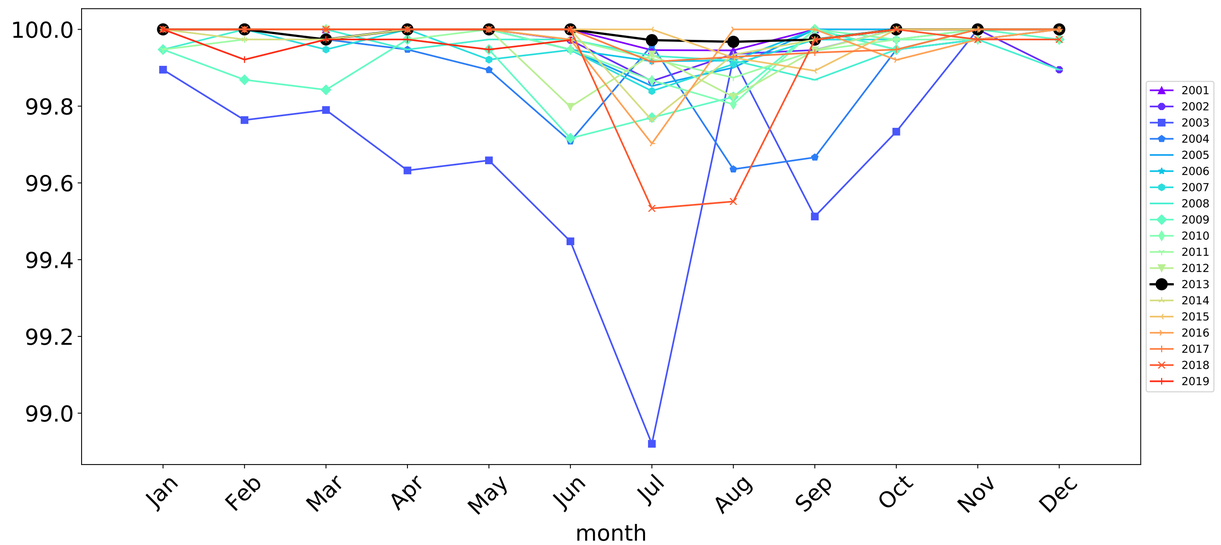


**Conservation and natural environments Woodland forest timeseries**

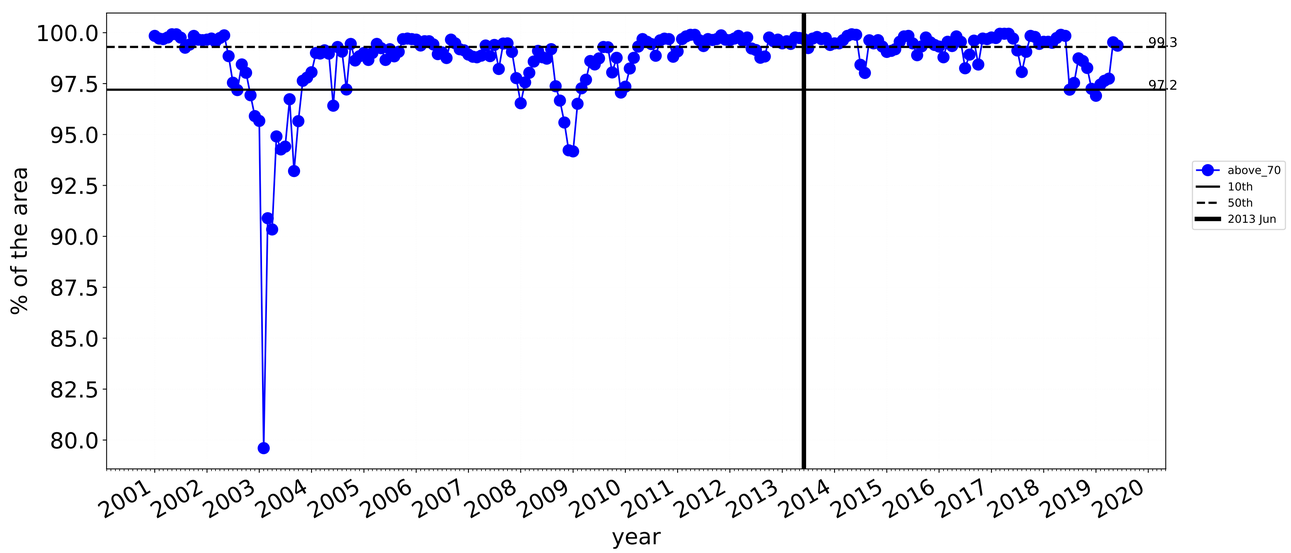
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



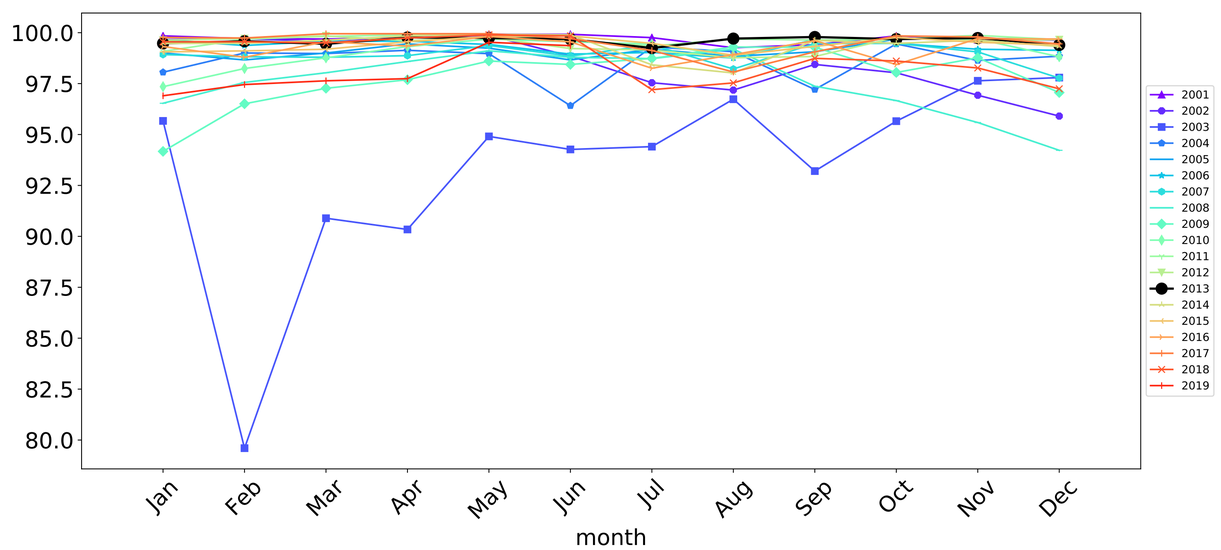

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

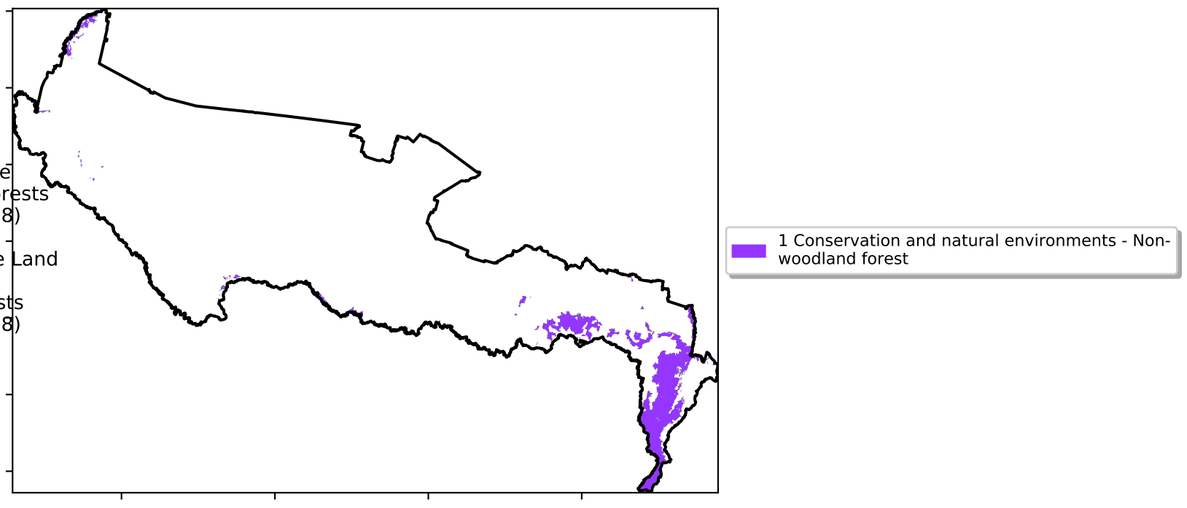



Water erosion historical monthly area protected (Total Veg Cov>70%)



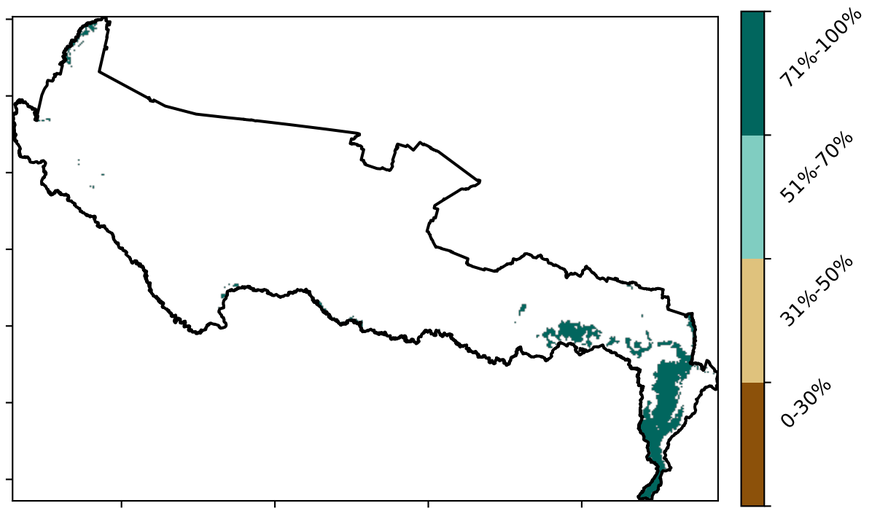
# Conservation and natural environments Forest (non woodland)

### Land use and forest cover

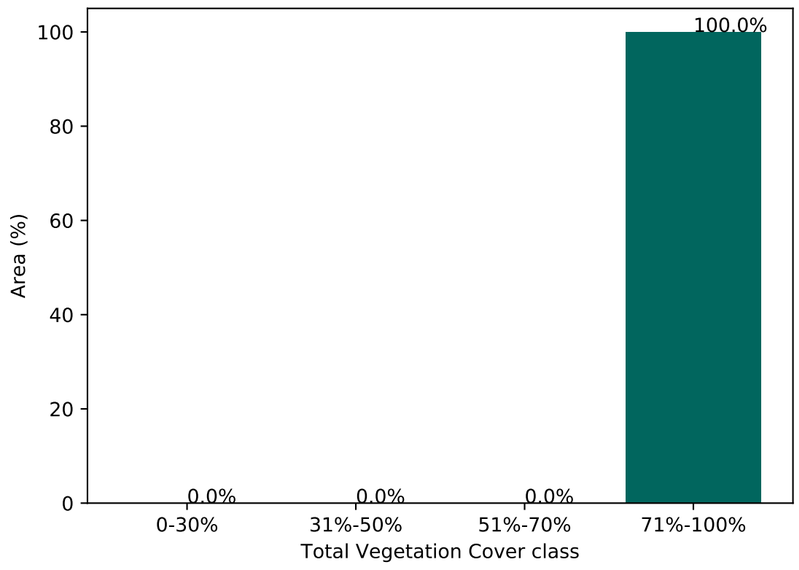



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

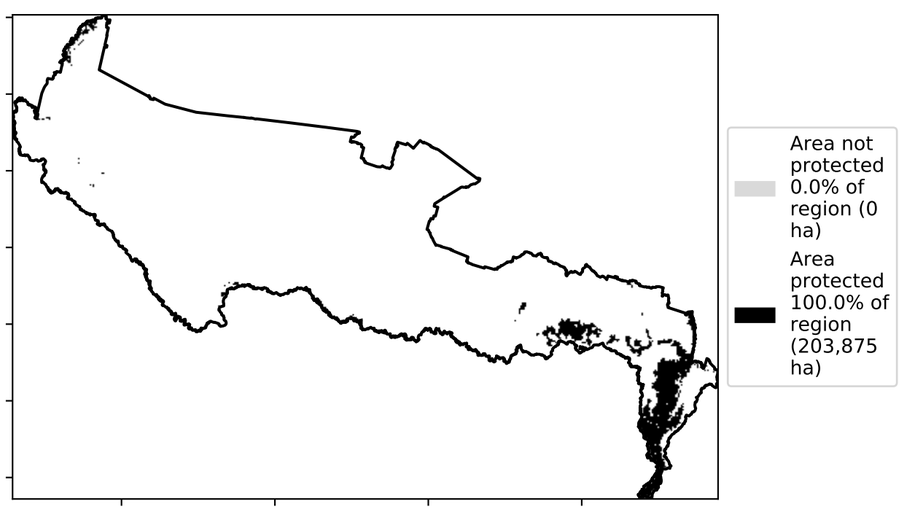
### Total Vegetation Cover [%]



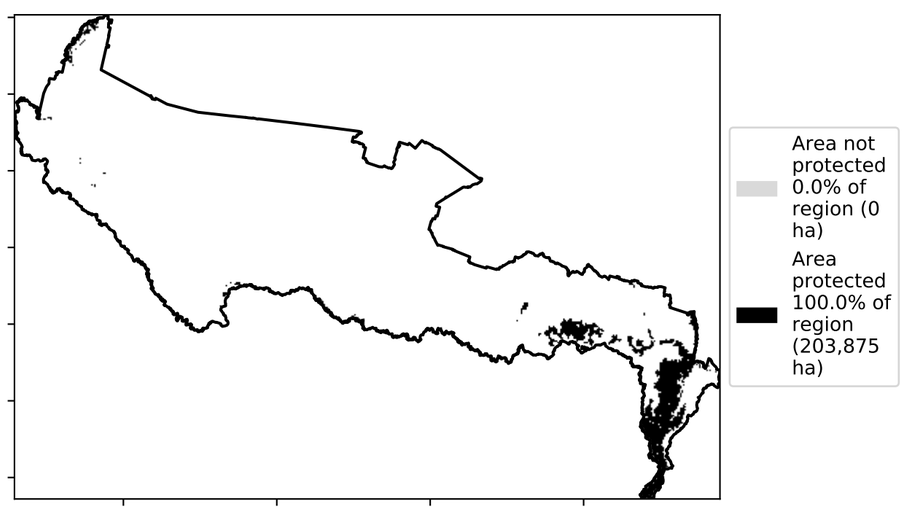

### Proportion of vegetation cover class in area




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

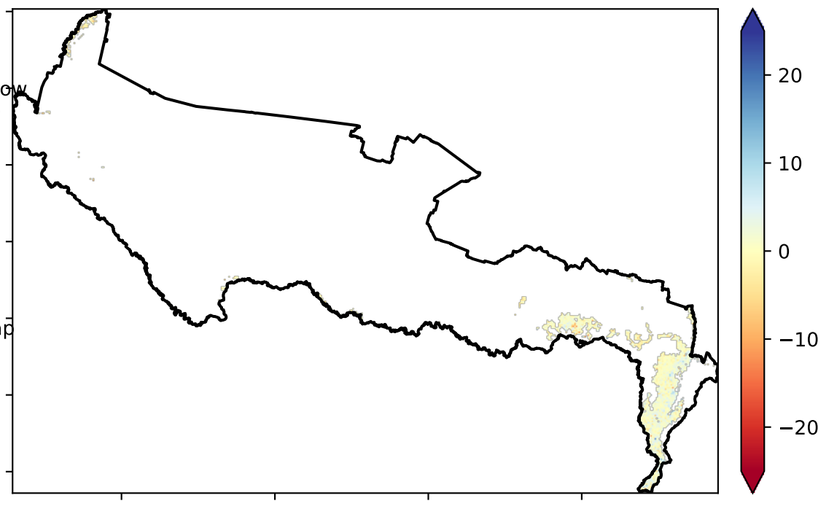



### % Area protected from wind erosion (>50%)



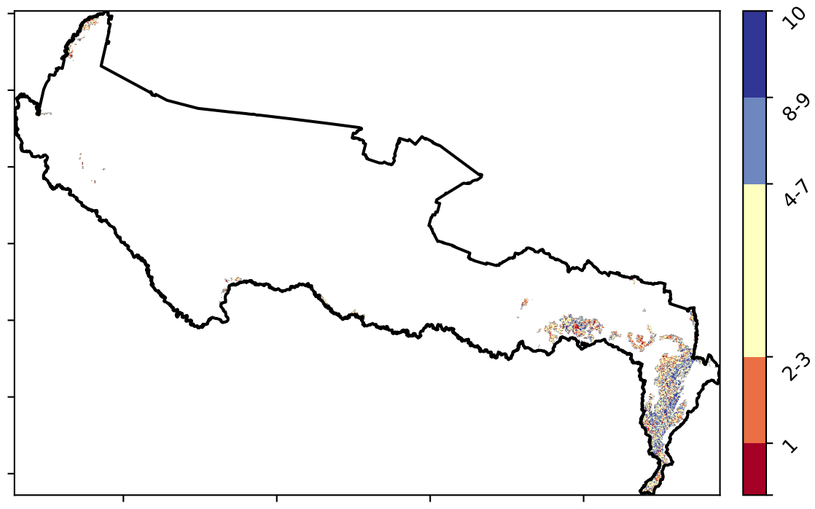

### Total Vegetation Cover Anomaly [%]

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.



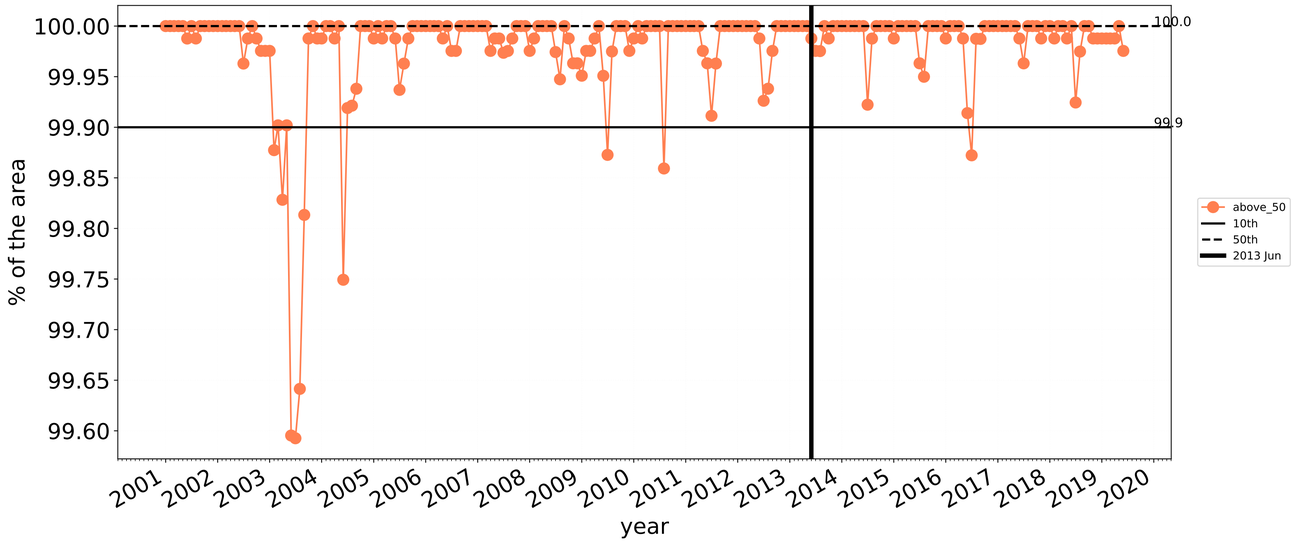

### Total Vegetation Cover Decile [%]

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.

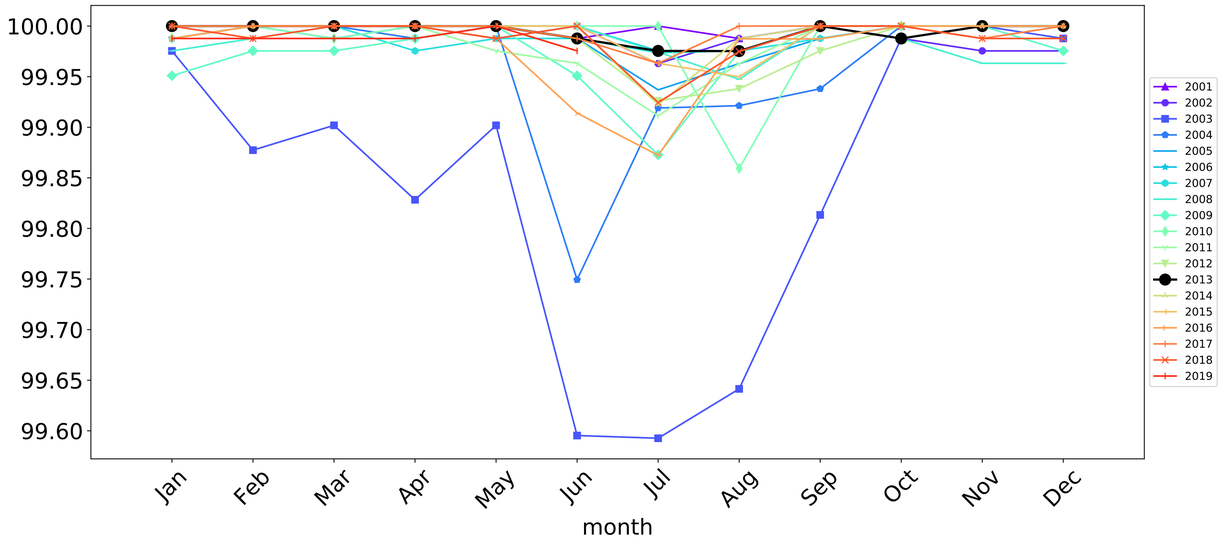


**Conservation and natural environments Forest (non woodland) timeseries**

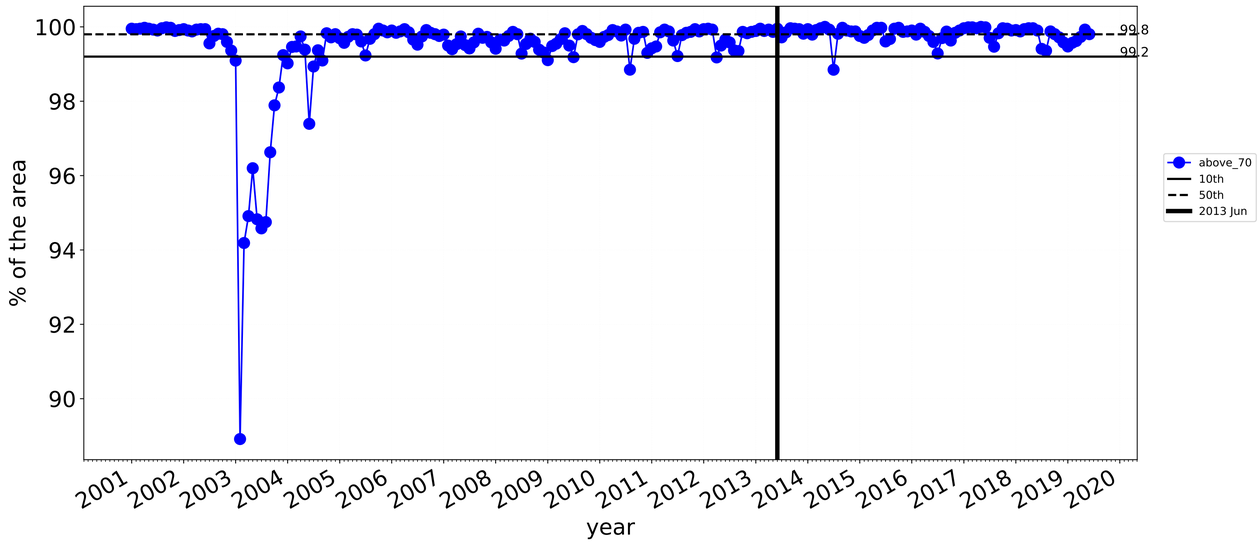
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



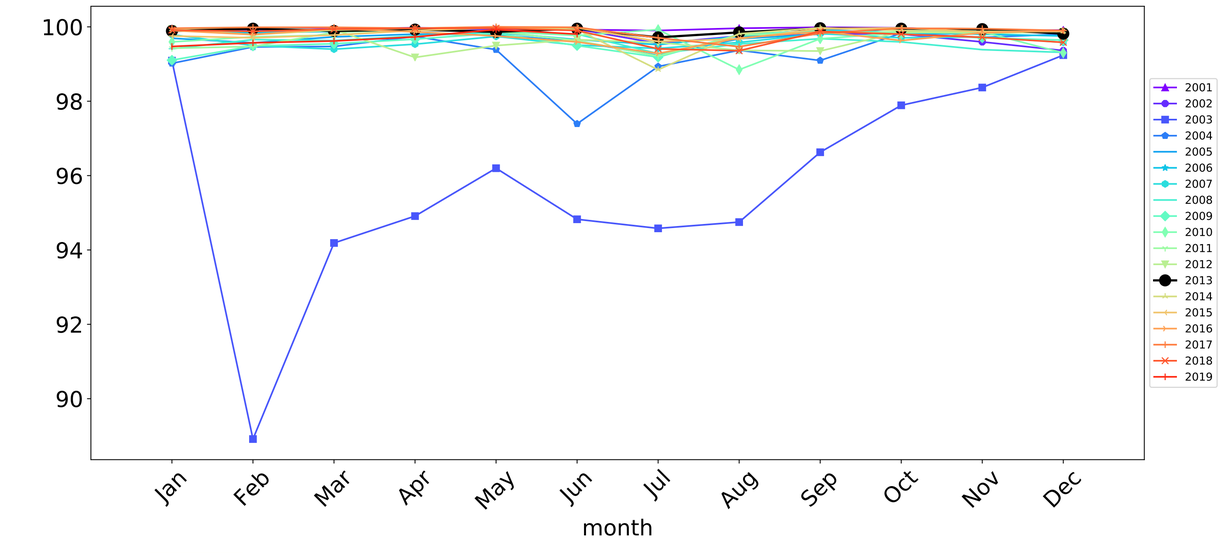

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

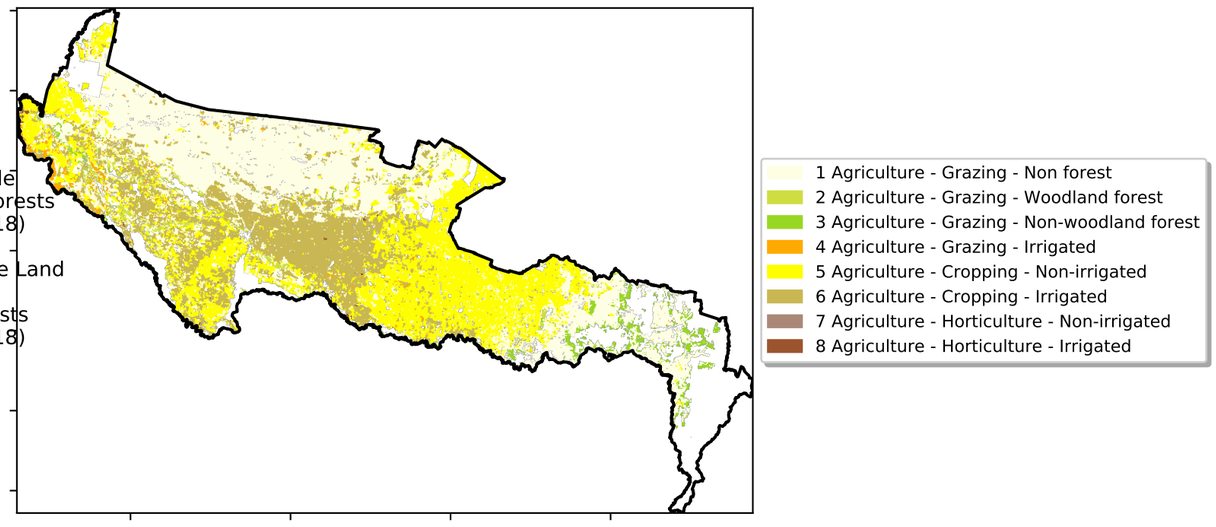



Water erosion historical monthly area protected (Total Veg Cov>70%)



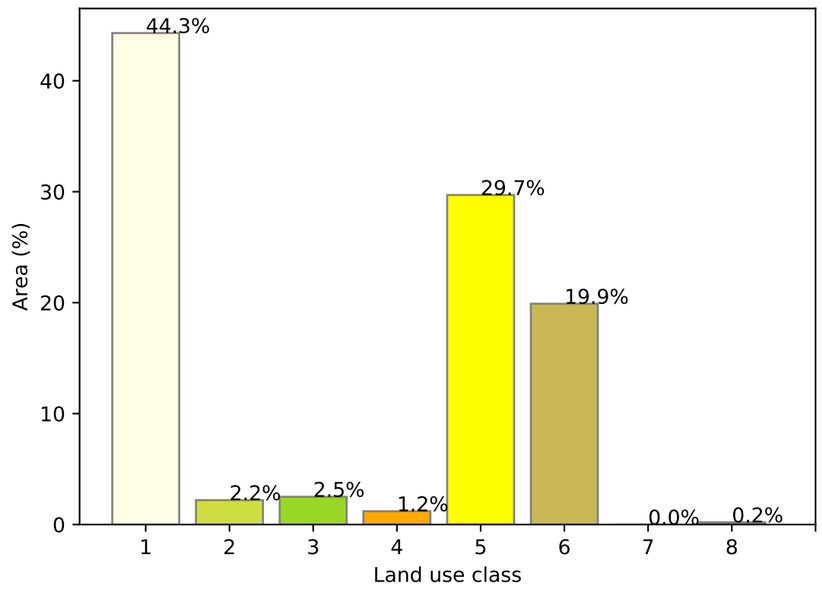
# Agriculture

### Land use and forest cover

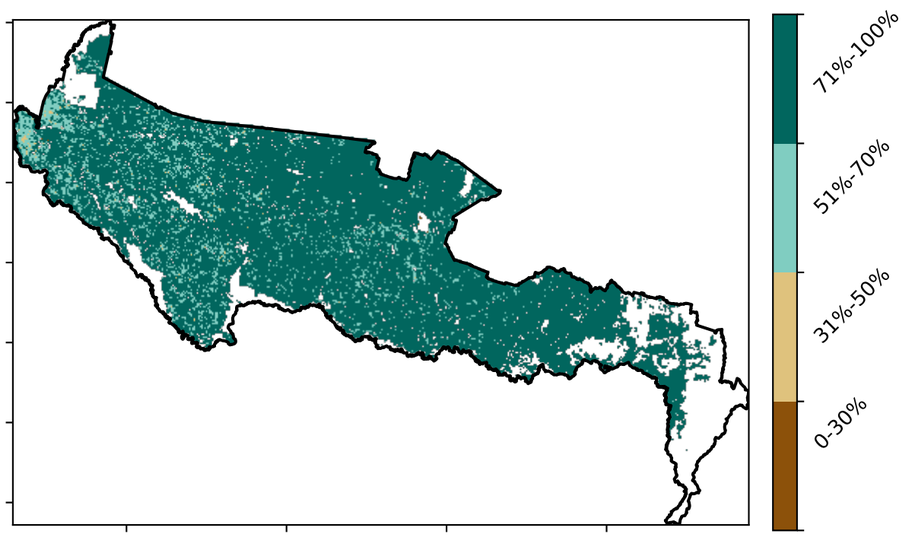



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

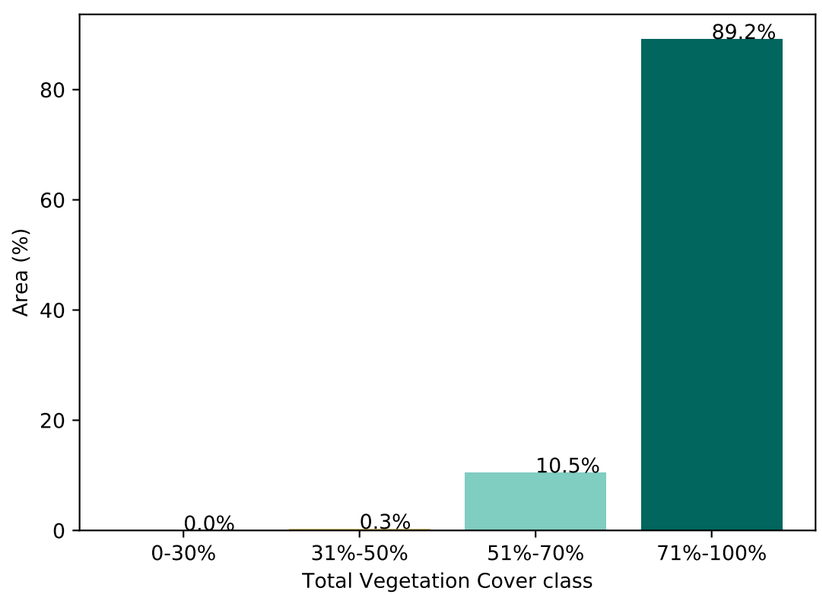
### Proportion of each land class in area



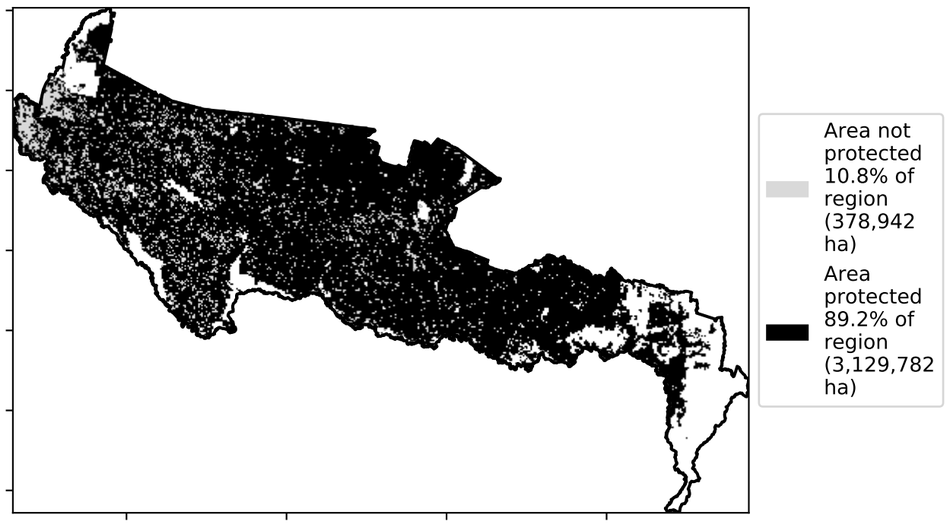

### Total Vegetation Cover [%]



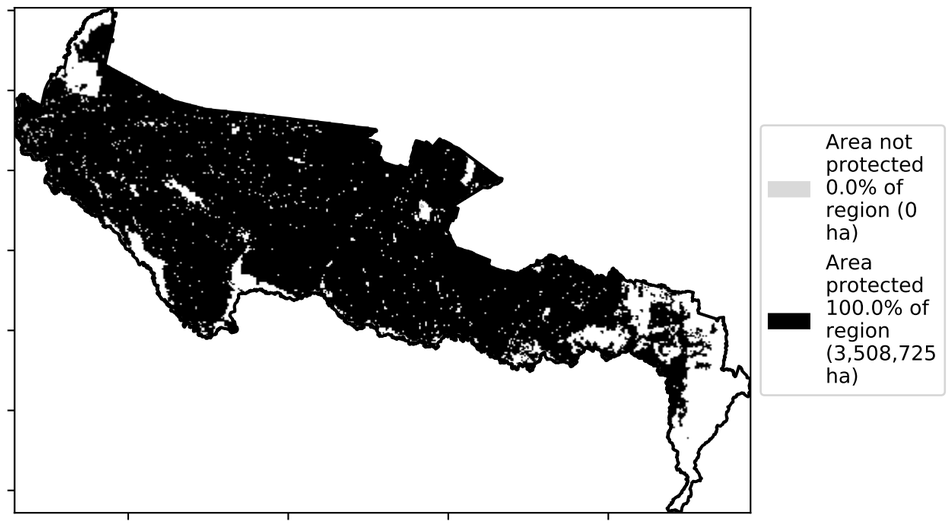

### Proportion of vegetation cover class in area




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

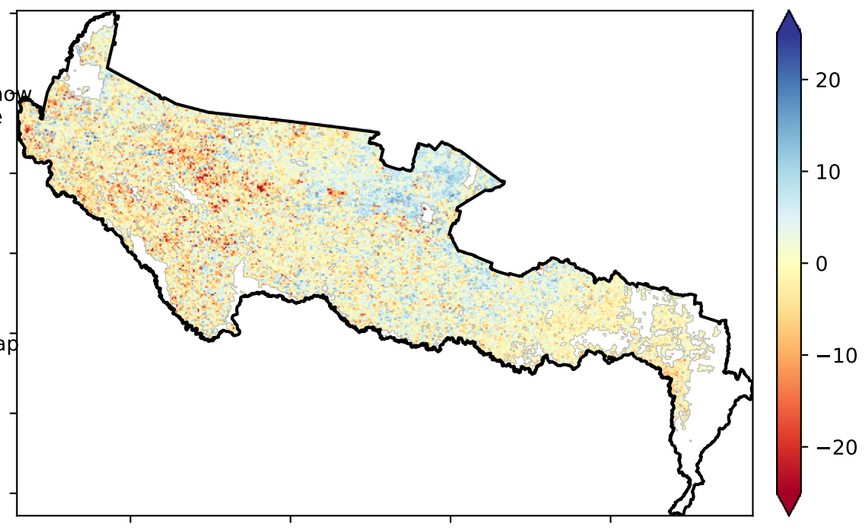



### % Area protected from wind erosion (>50%)



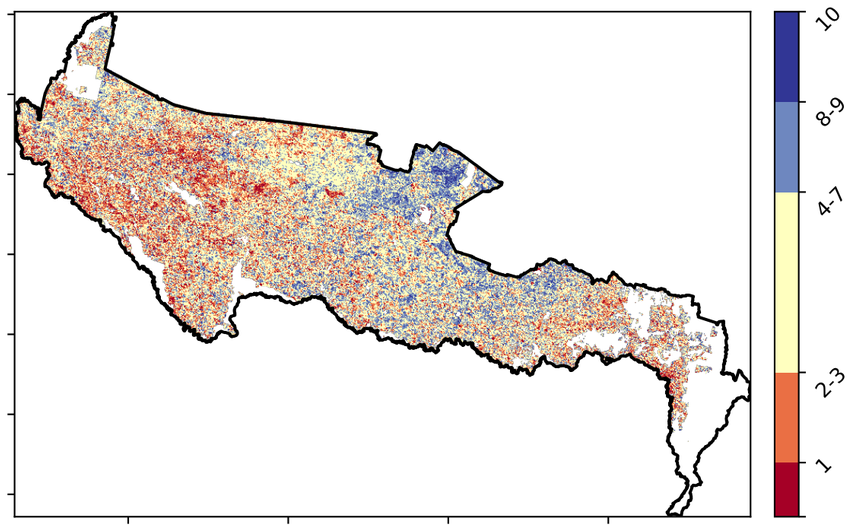

### Total Vegetation Cover Anomaly [%]

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.



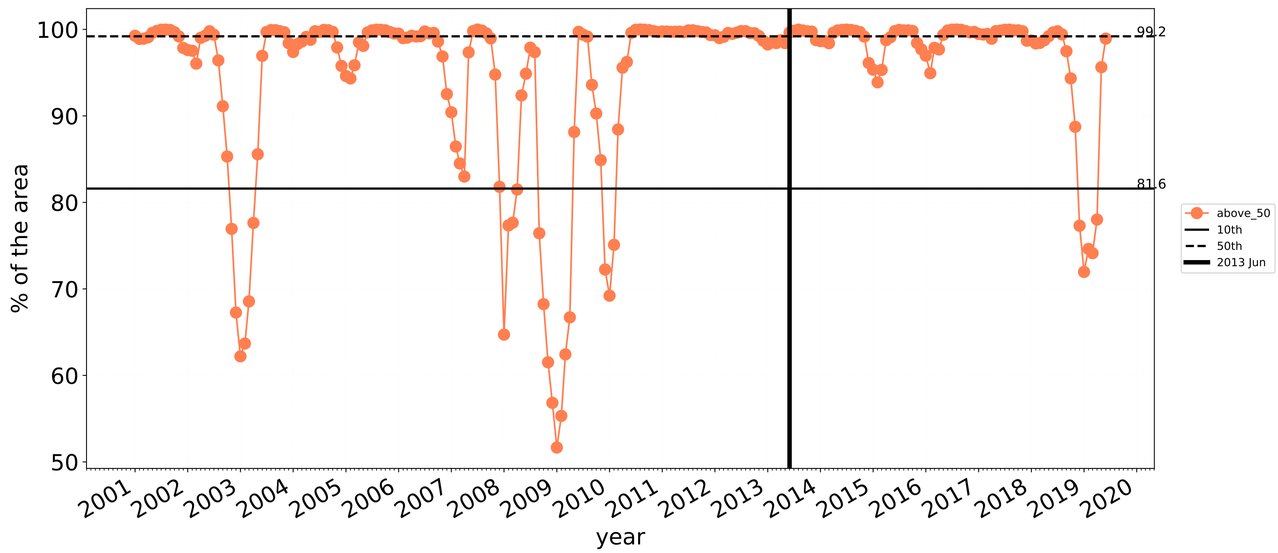

### Total Vegetation Cover Decile [%]

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.

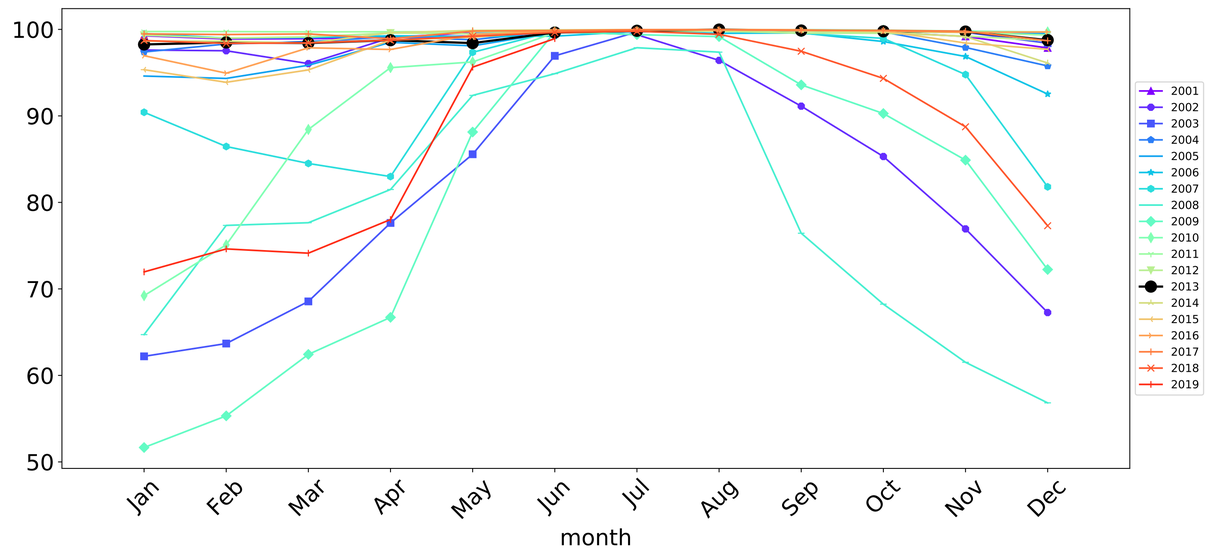


# Agriculture timeseries

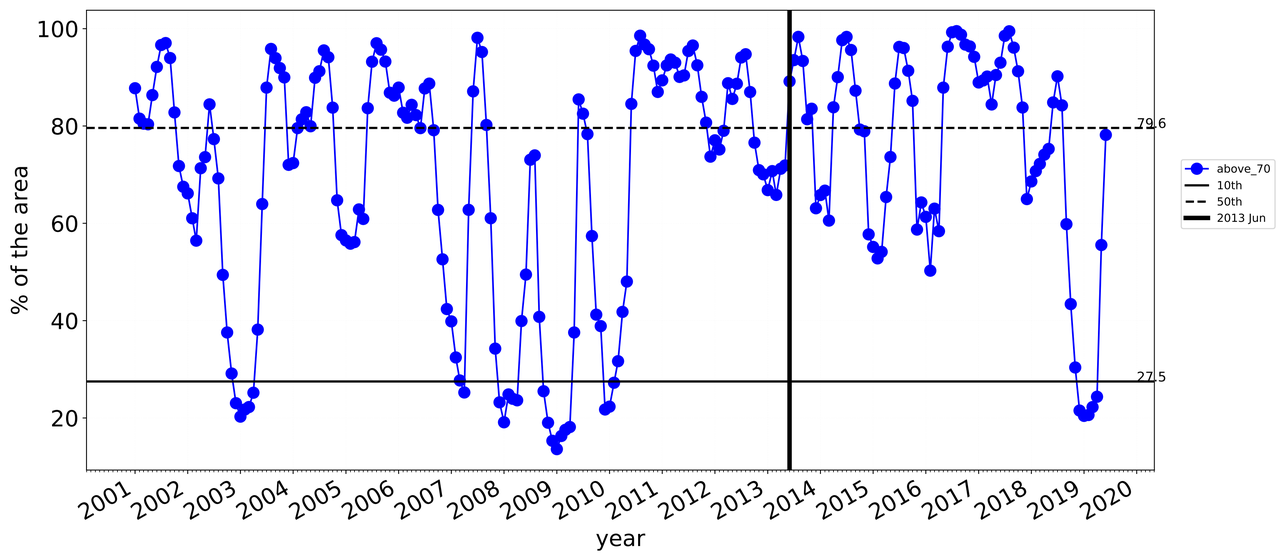
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



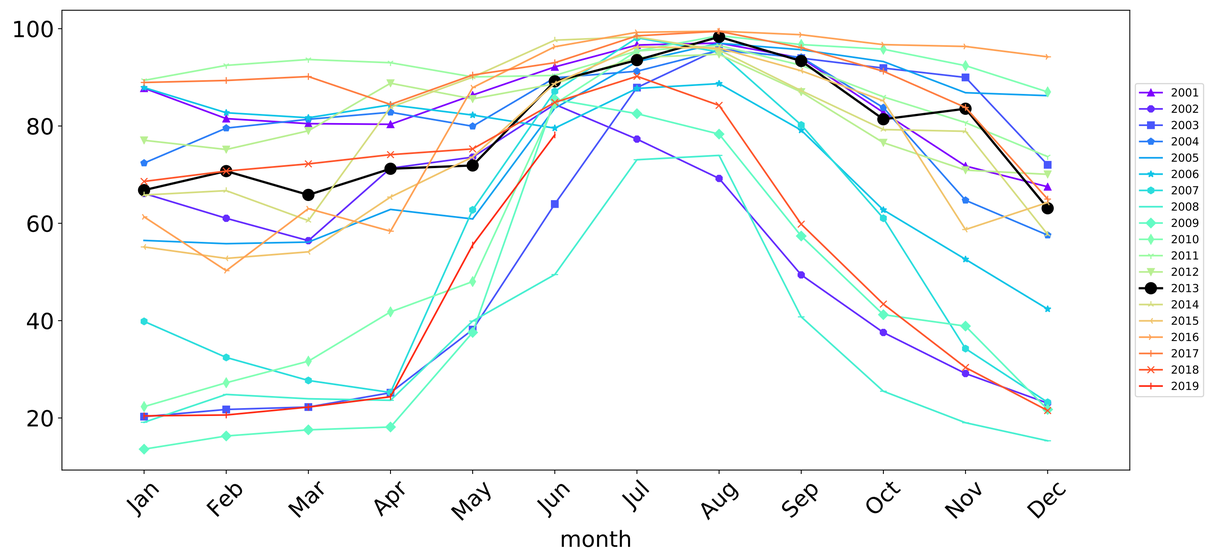

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

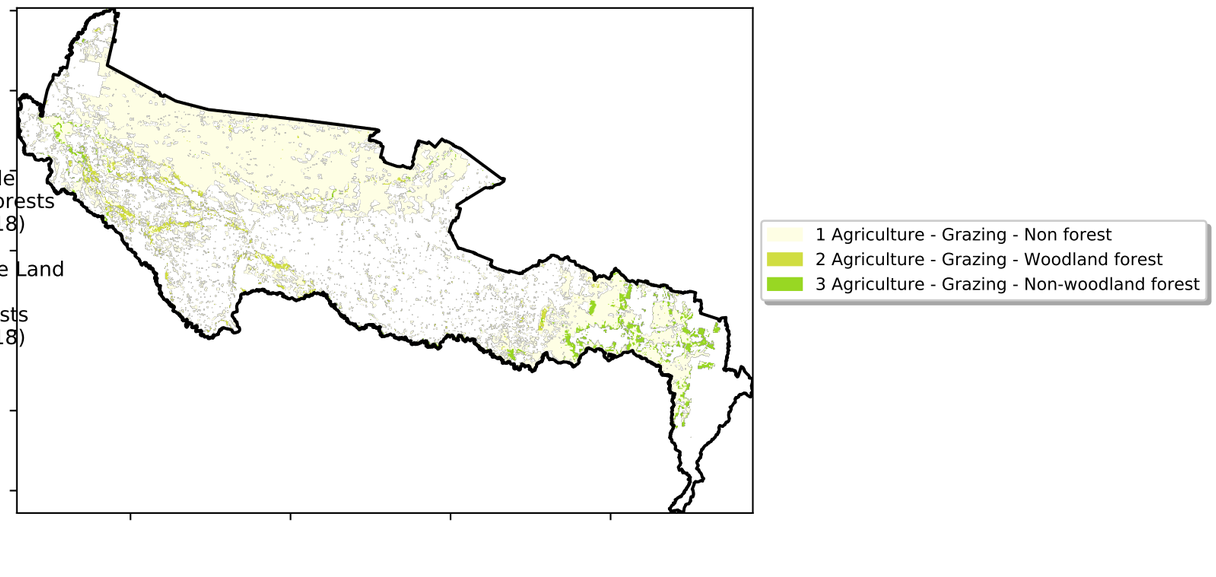



Water erosion historical monthly area protected (Total Veg Cov>70%)



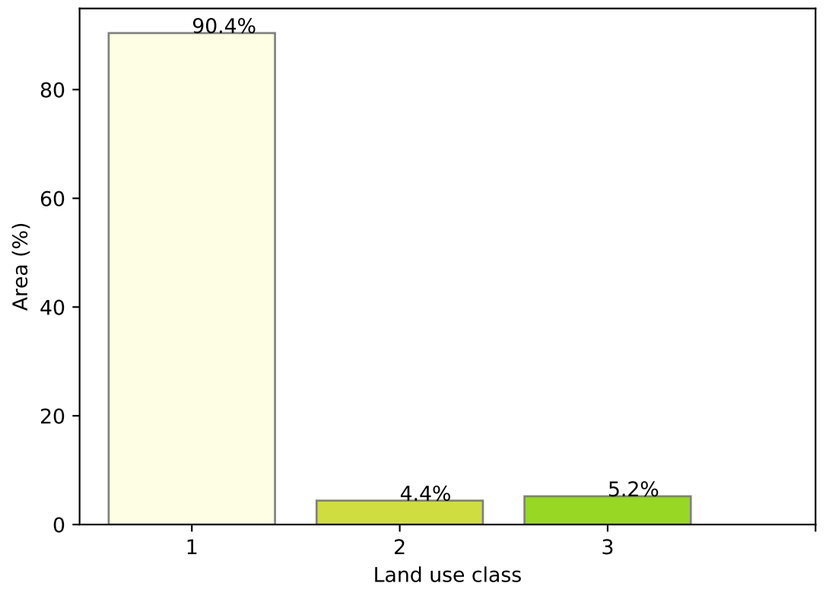
# Grazing

### Land use and forest cover

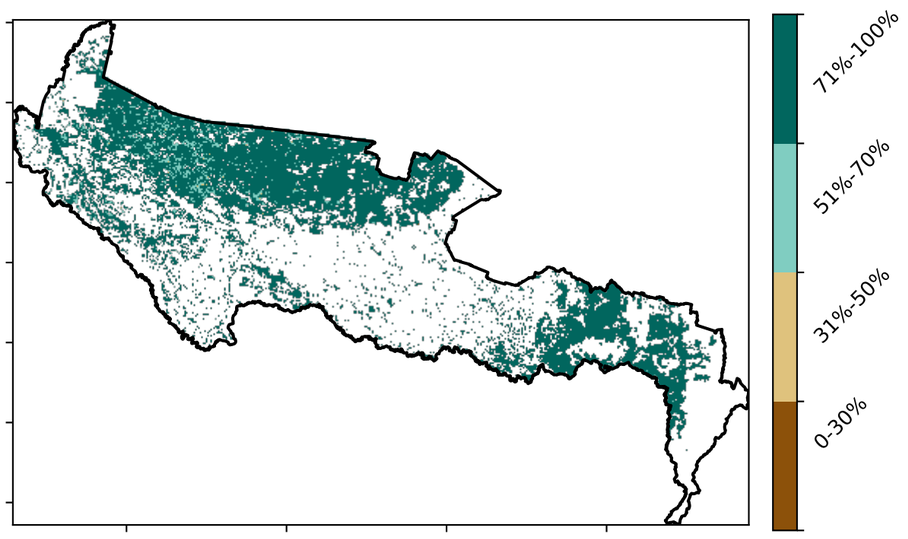



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

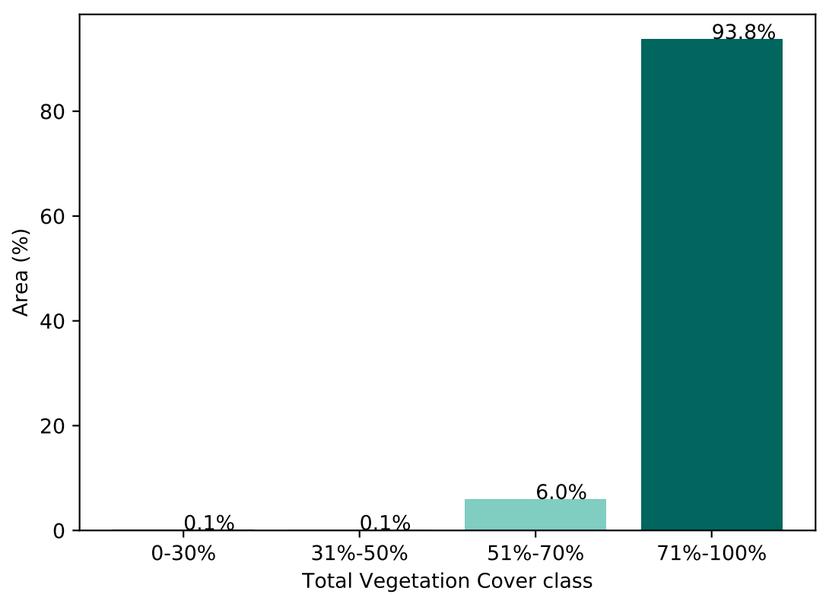
### Proportion of each land class in area



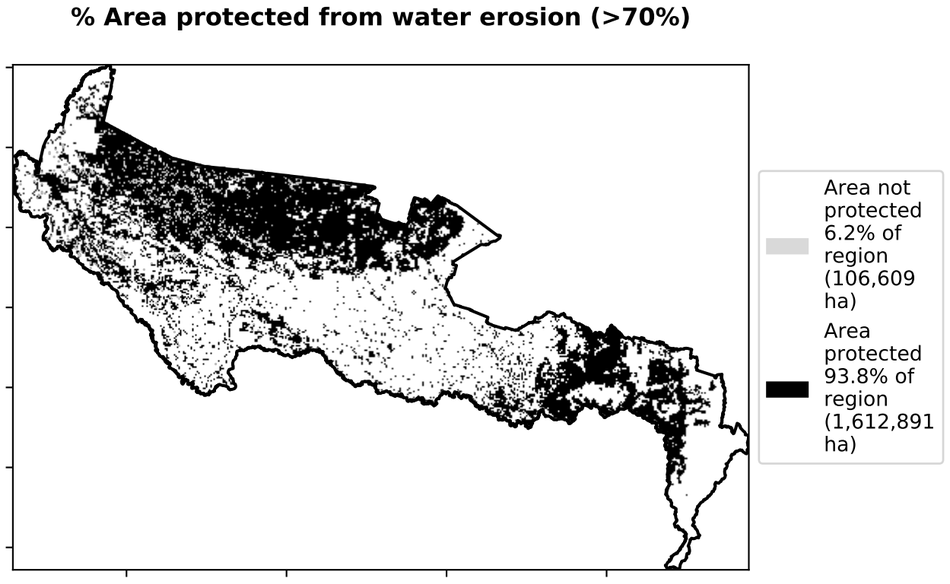

### Total Vegetation Cover [%]



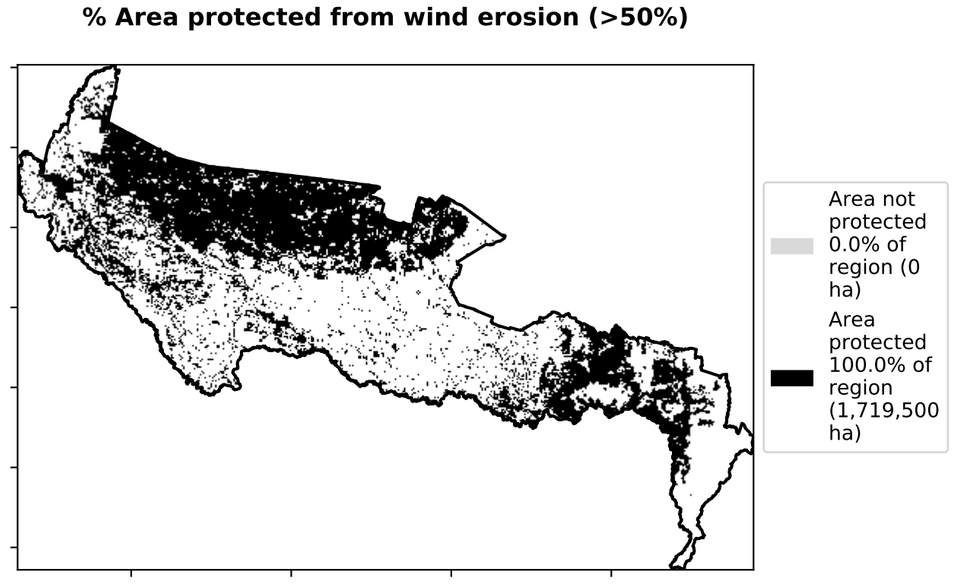

### Proportion of vegetation cover class in area




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

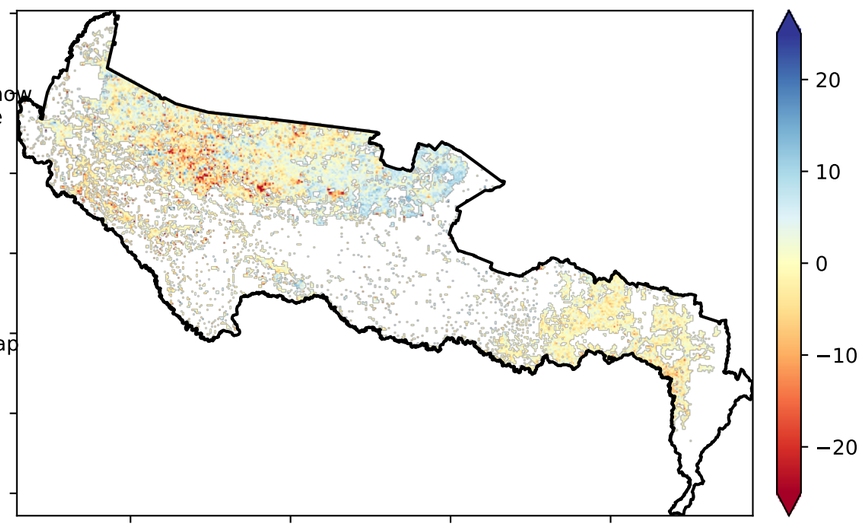



### % Area protected from wind erosion (>50%)



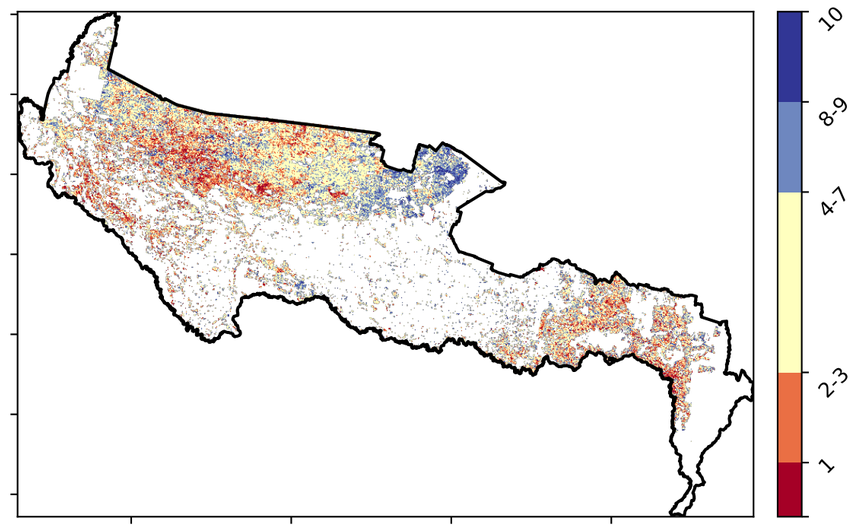

### Total Vegetation Cover Anomaly [%]

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.



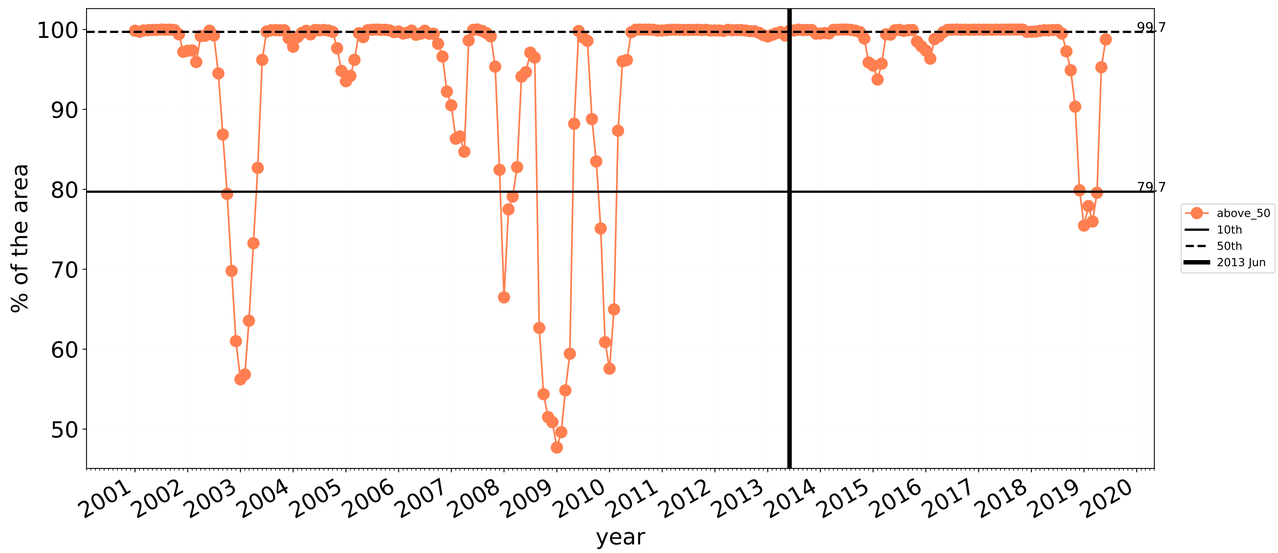

### Total Vegetation Cover Decile [%]

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.

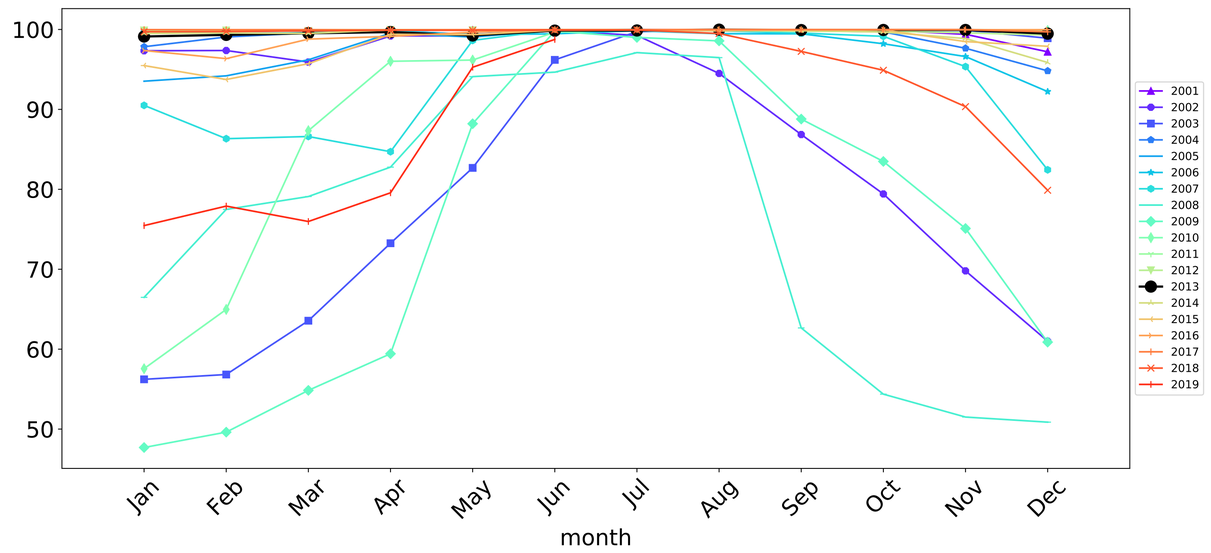


**Grazing timeseries**

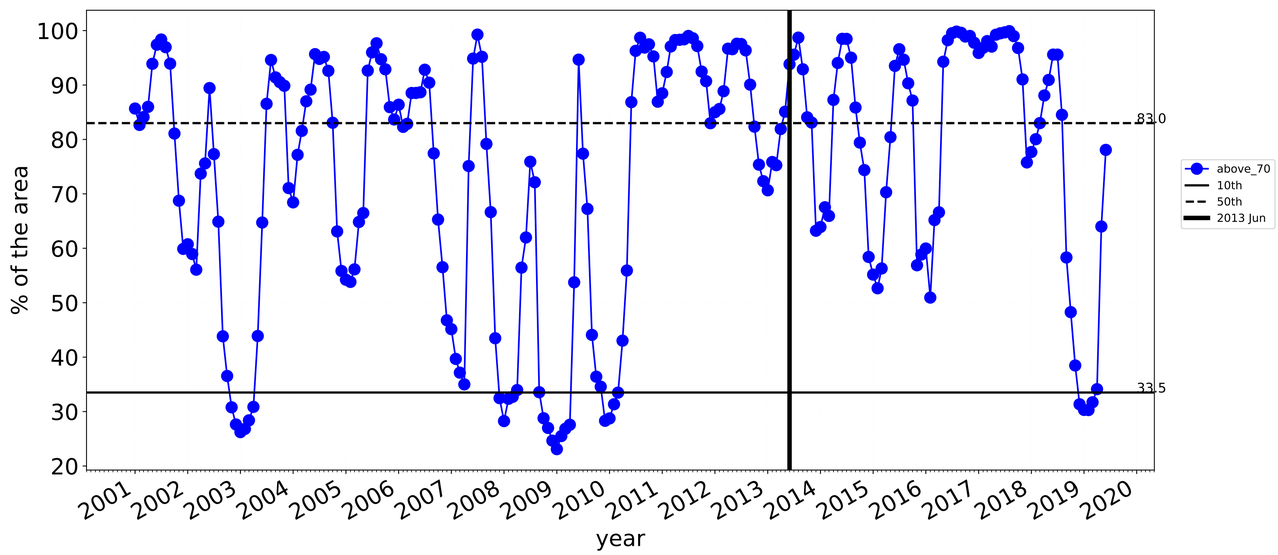
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



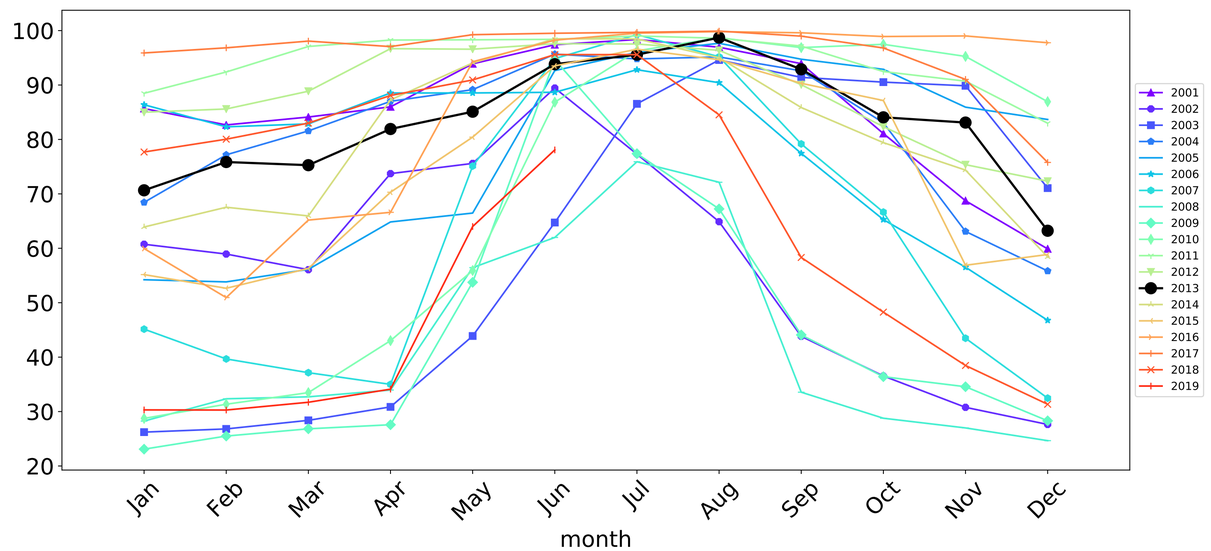

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

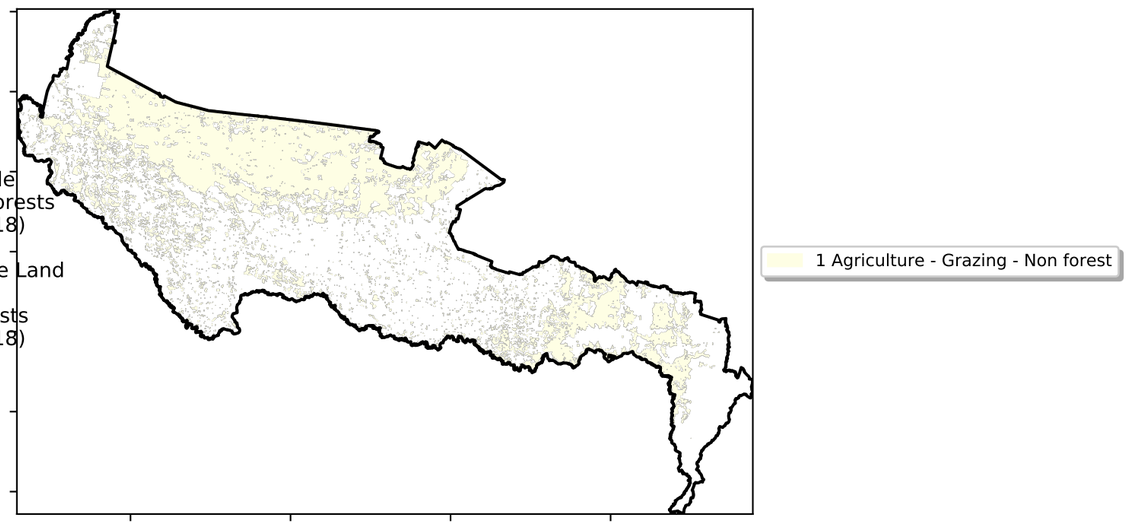



Water erosion historical monthly area protected (Total Veg Cov>70%)



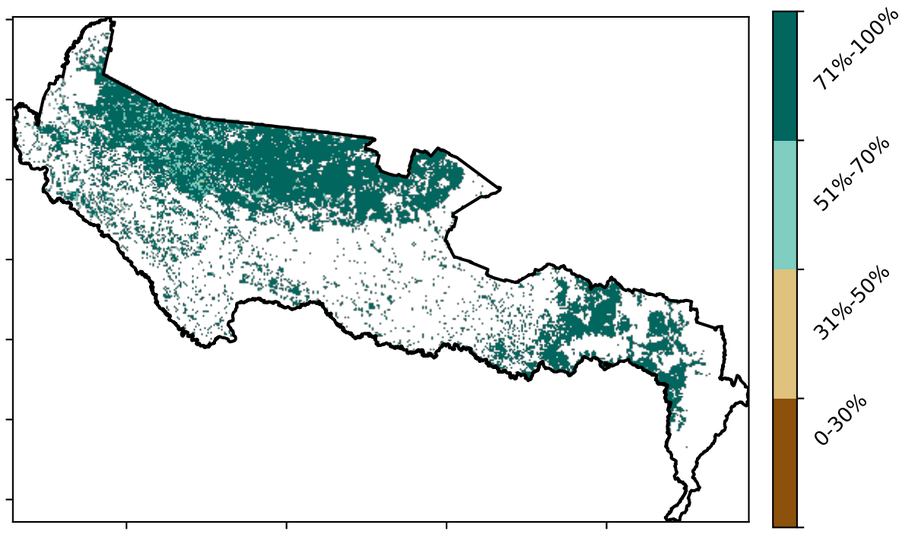
# Grazing non forest

## Land use and forest cover

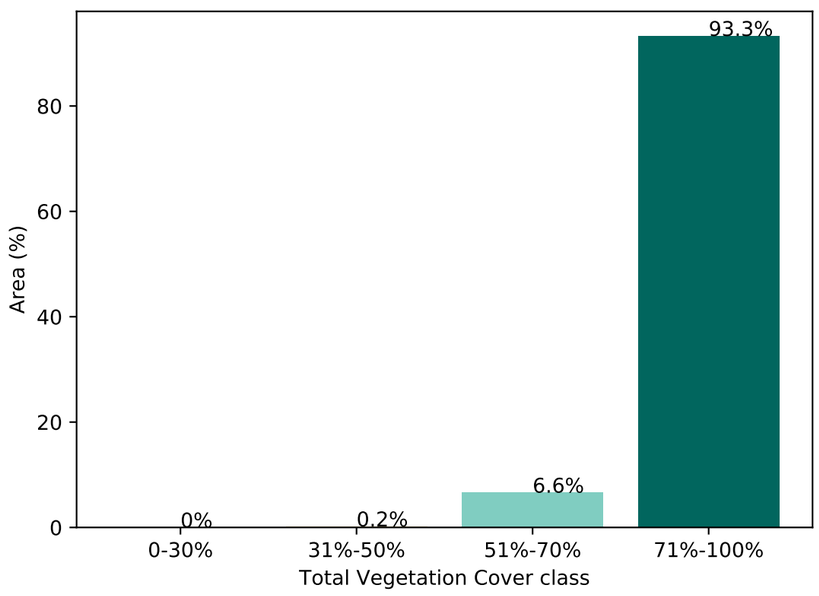



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

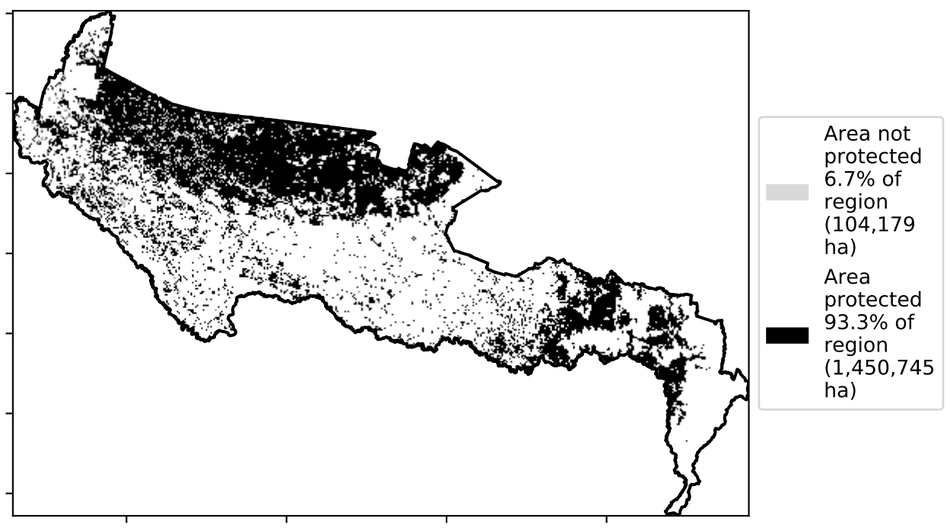
## Total Vegetation Cover [%]



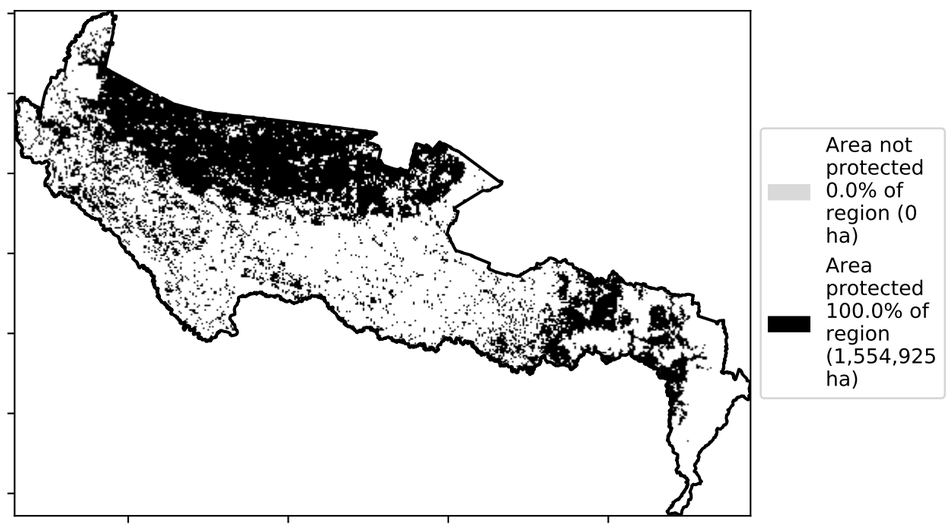

## Proportion of vegetation cover class in area




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

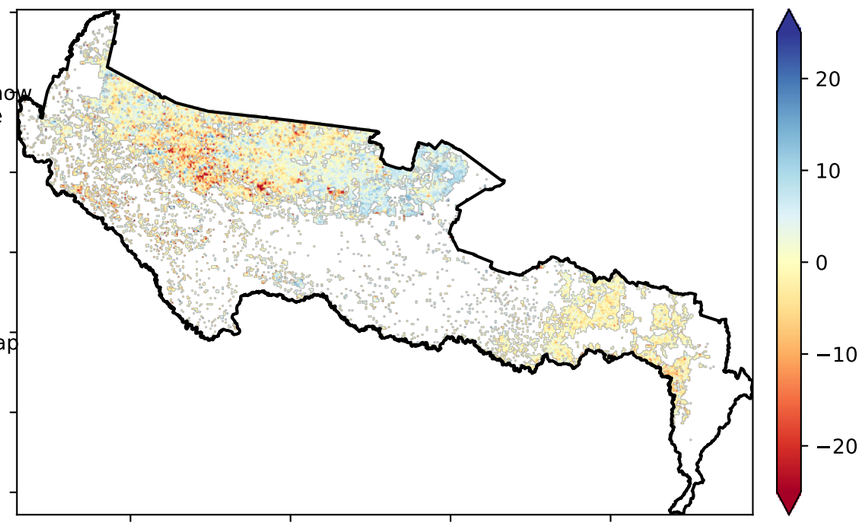



## % Area protected from wind erosion (>50%)



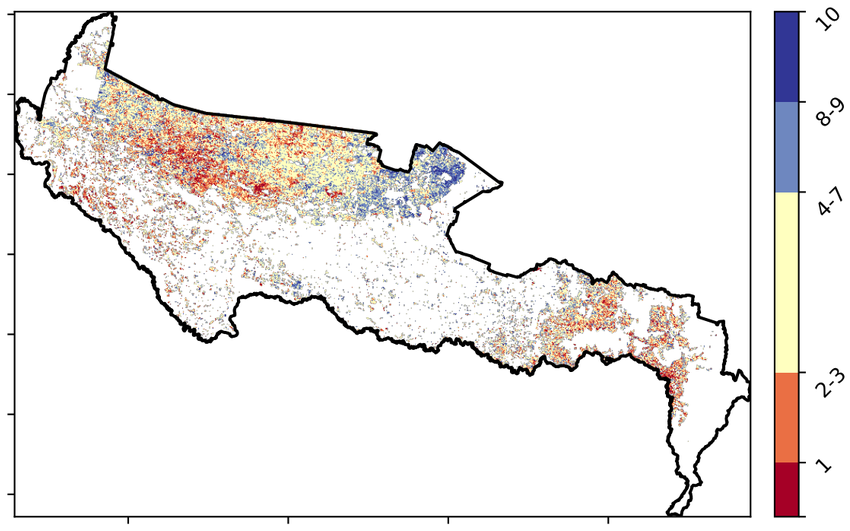

## Total Vegetation Cover Anomaly [%]

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.



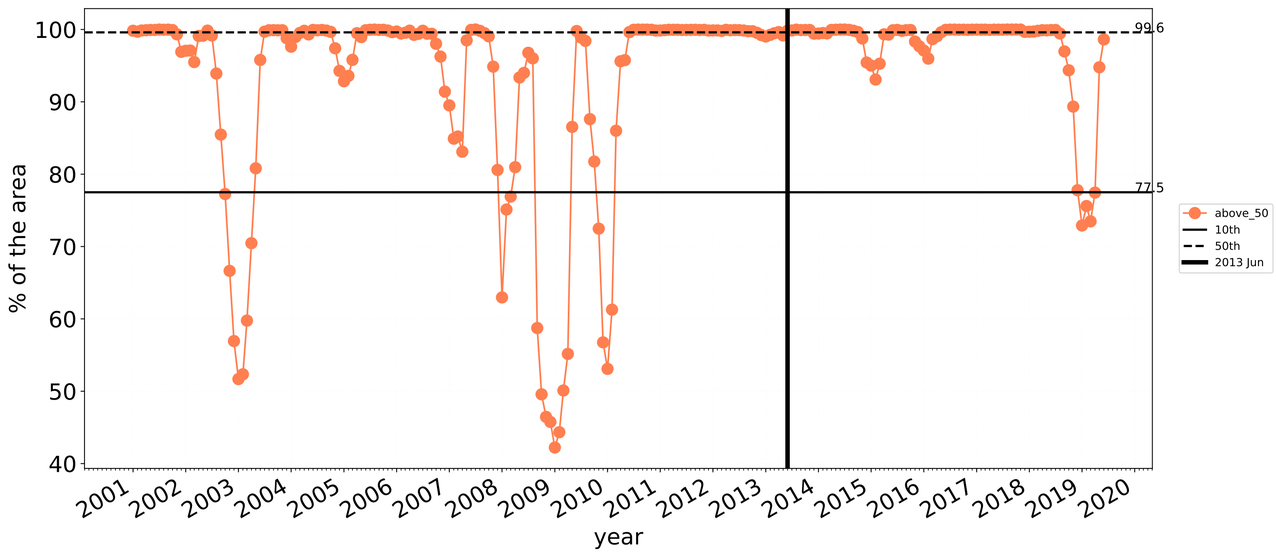

## Total Vegetation Cover Decile [%]

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.

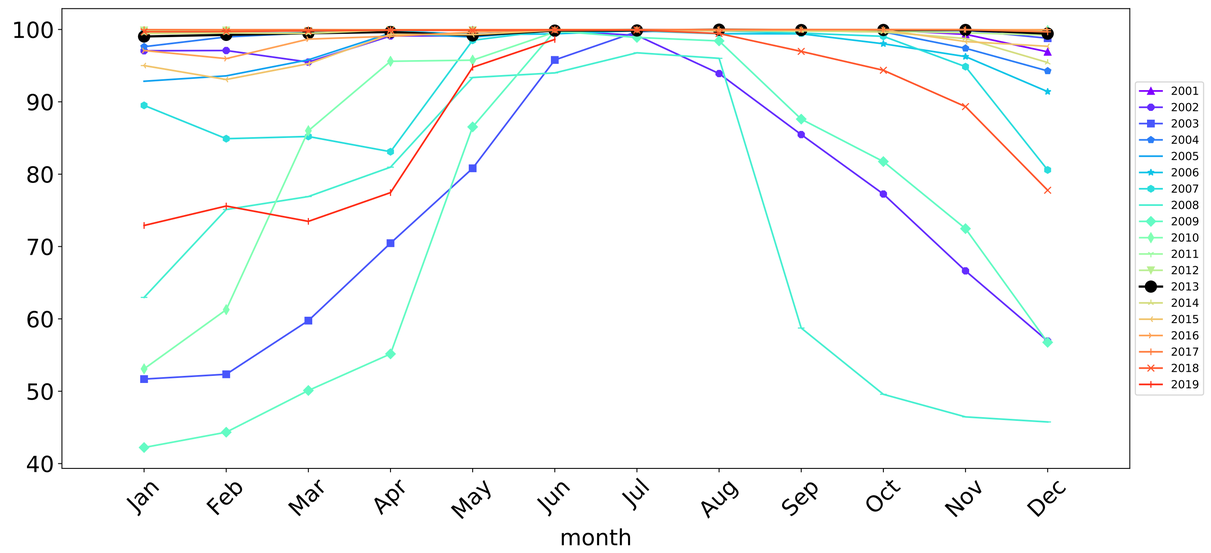


**Grazing non forest timeseries**

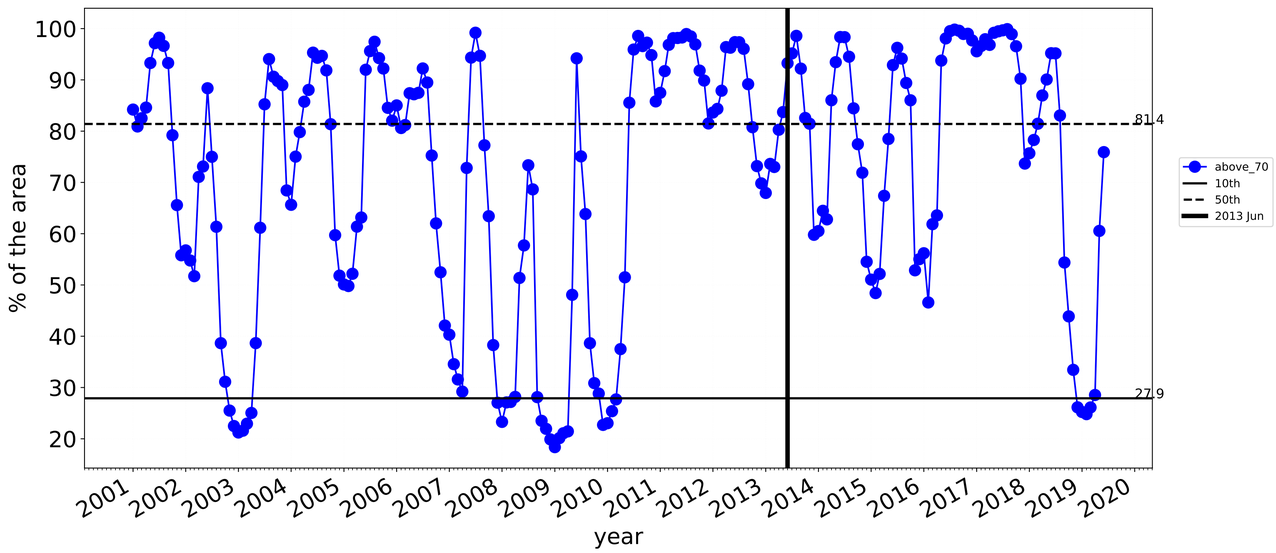
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



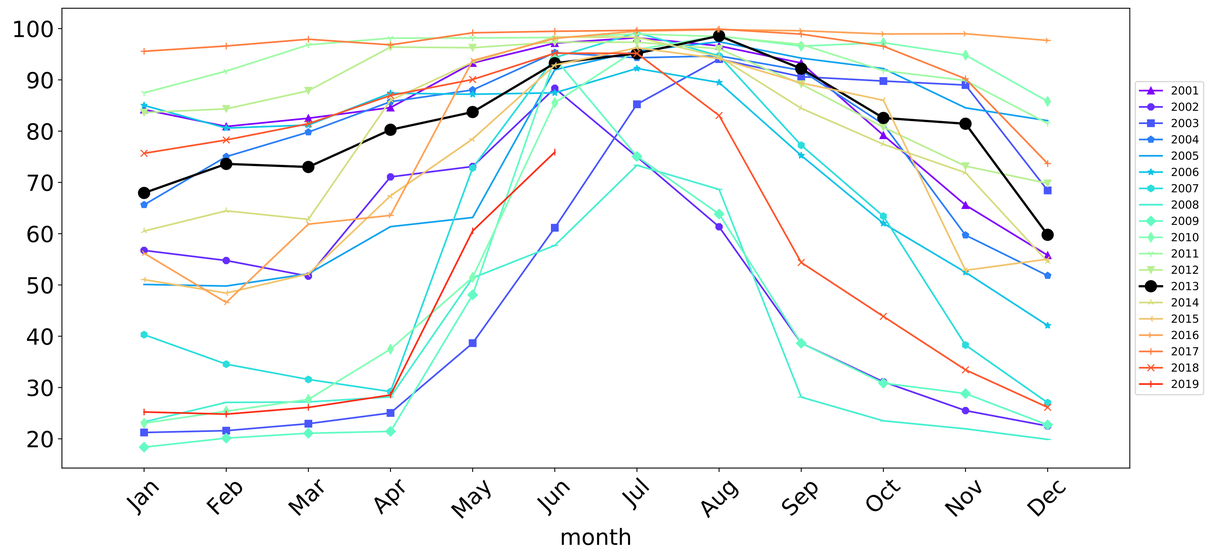

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

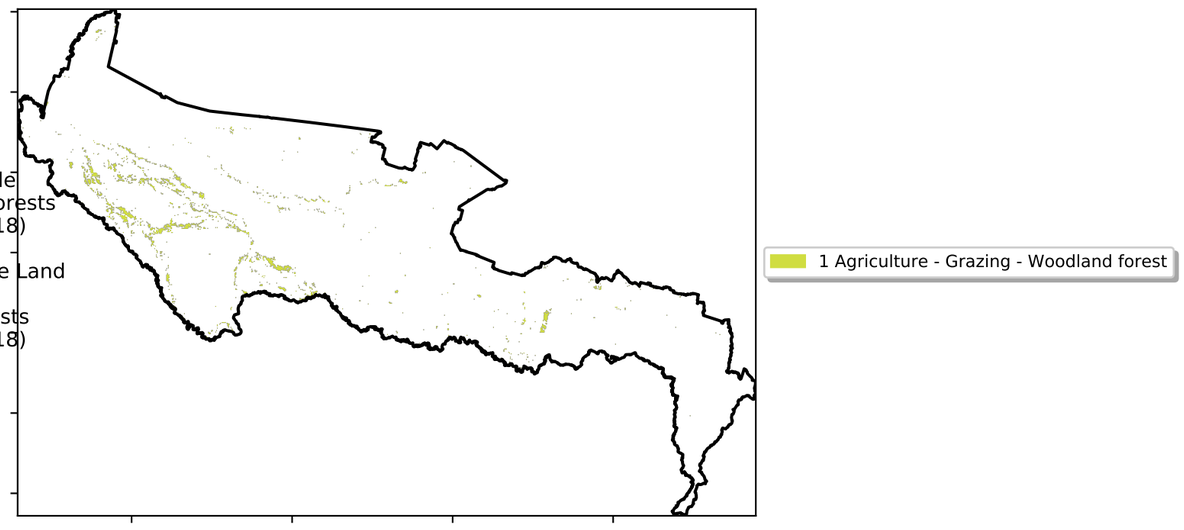



Water erosion historical monthly area protected (Total Veg Cov>70%)



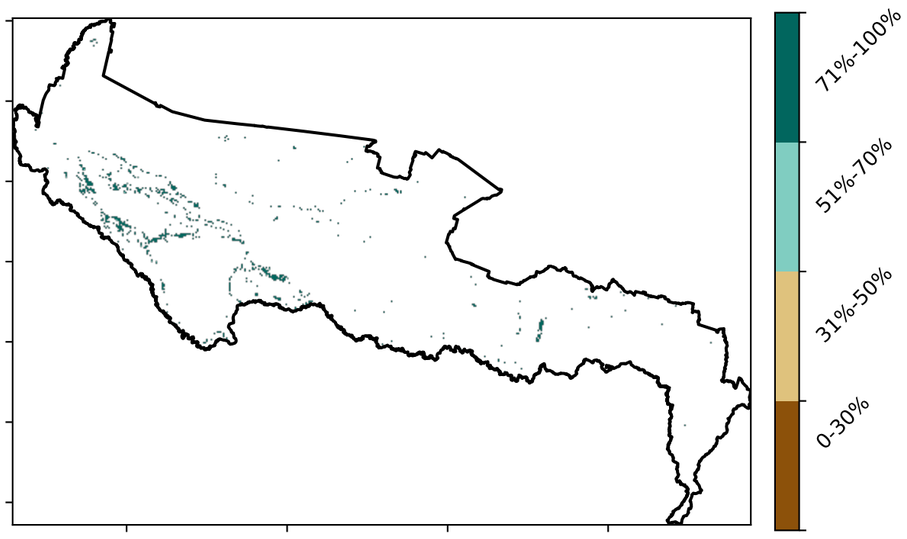
# Grazing Woodland forest

## Land use and forest cover

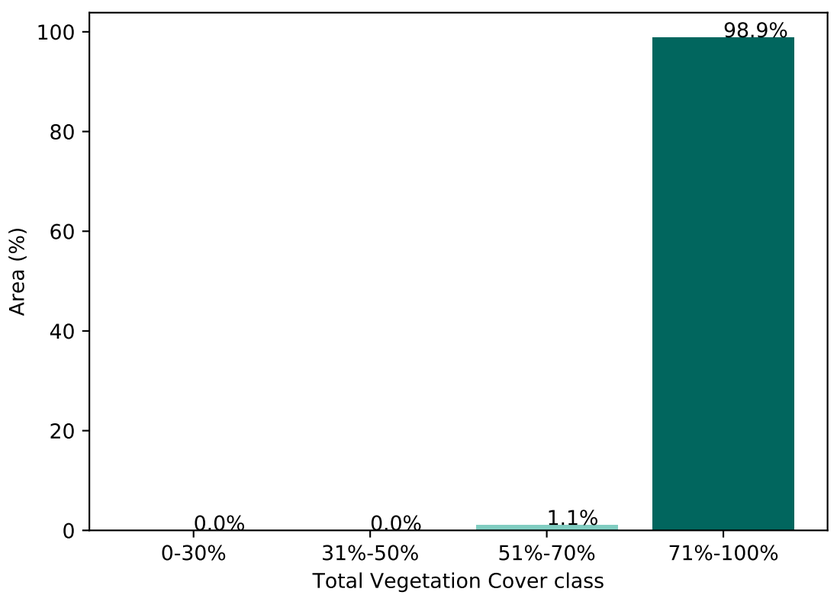



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

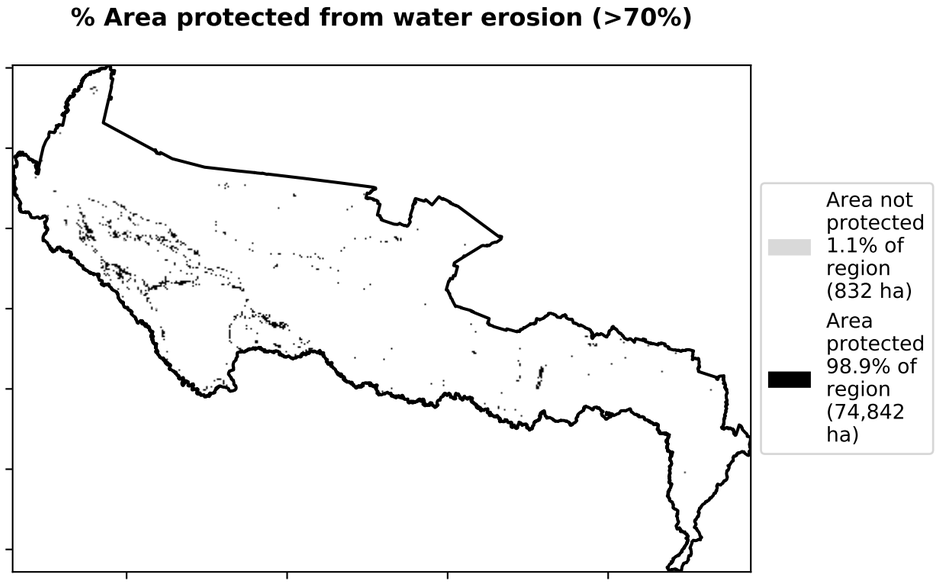
## Total Vegetation Cover [%]



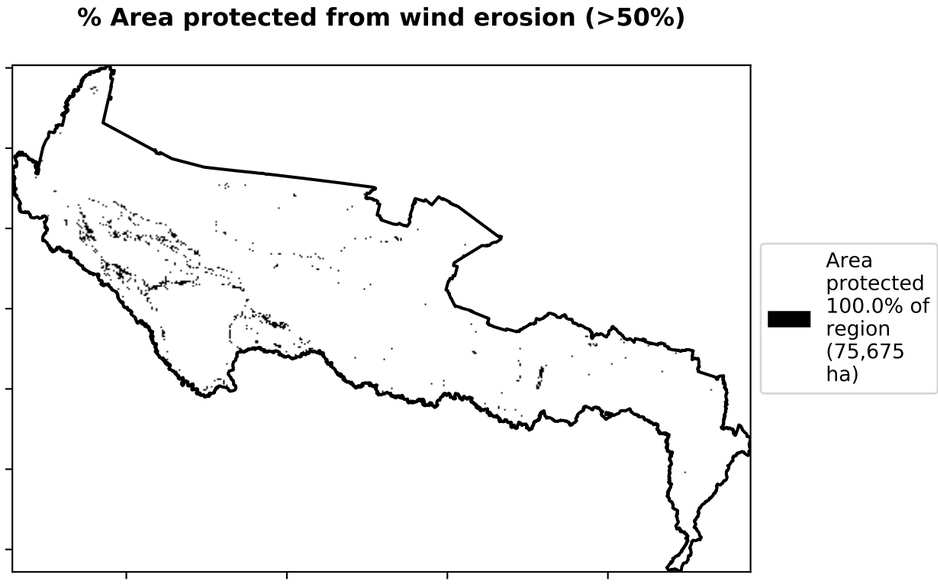

## Proportion of vegetation cover class in area




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

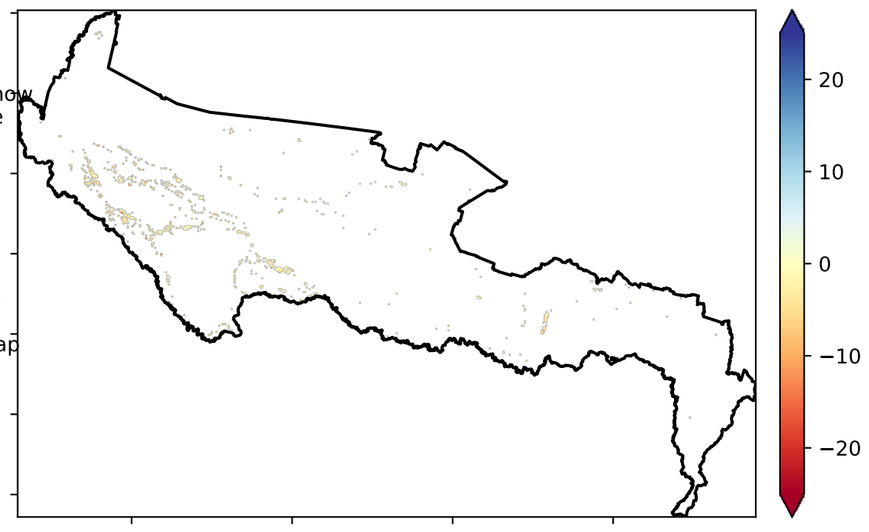



## % Area protected from wind erosion (>50%)



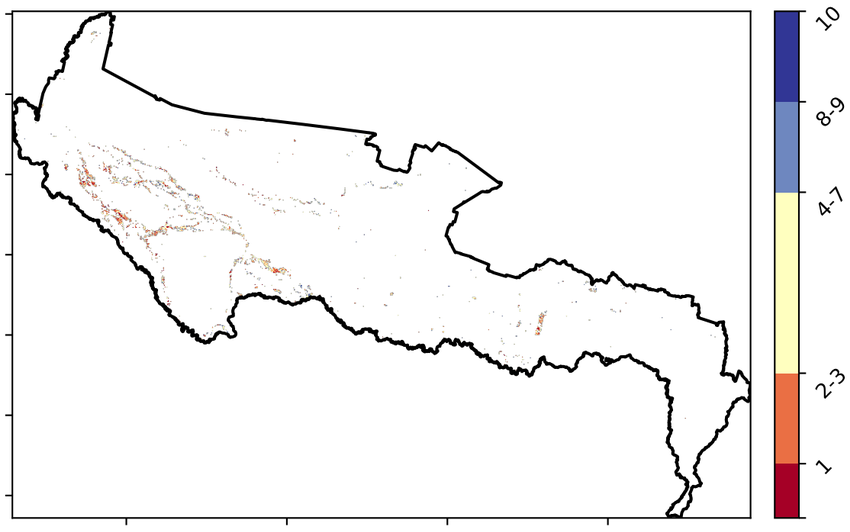

## Total Vegetation Cover Anomaly [%]

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.



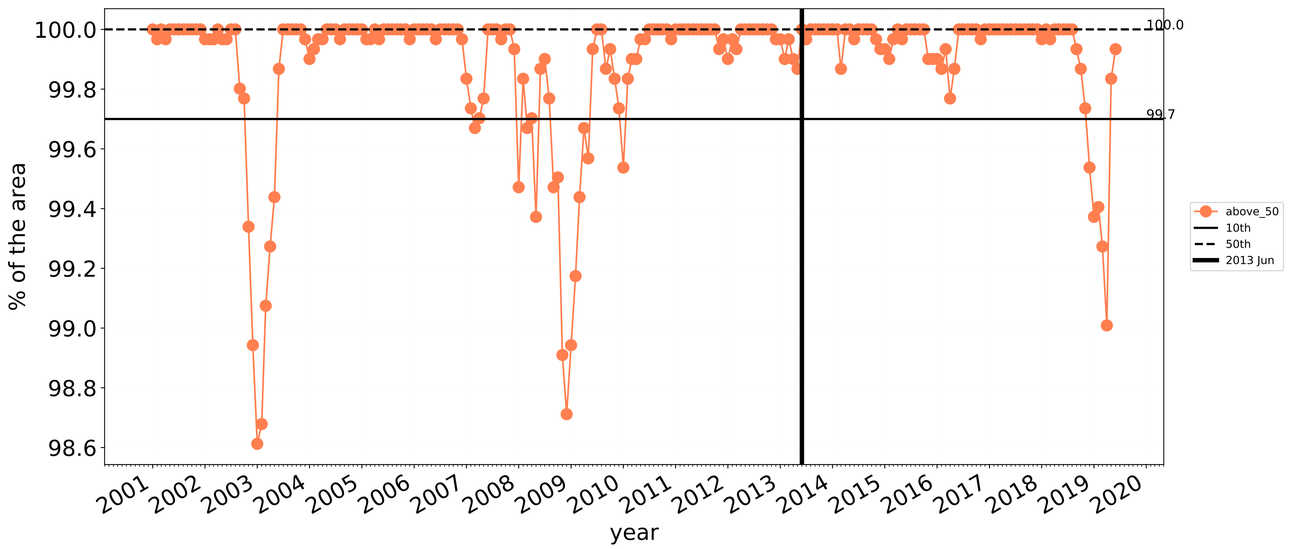

## Total Vegetation Cover Decile [%]

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.

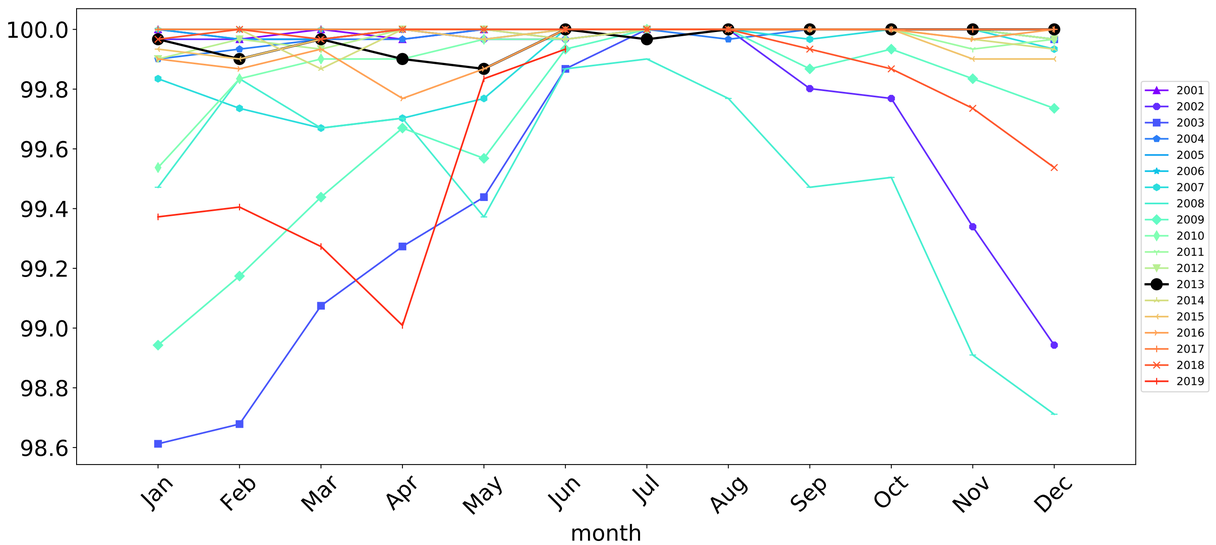


# Grazing Woodland forest timeseries

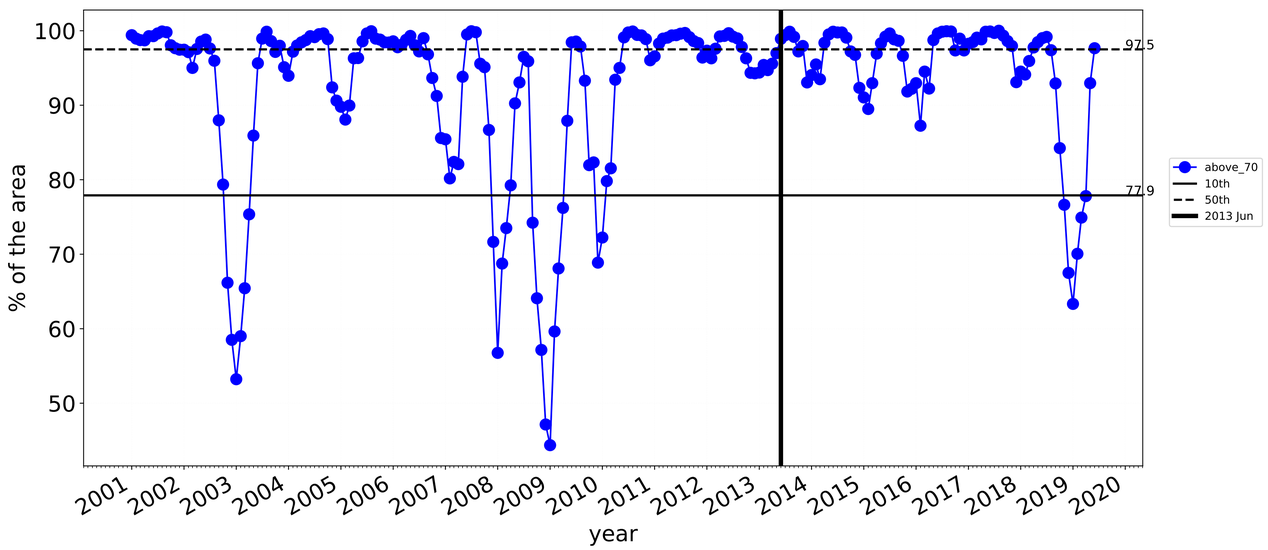
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



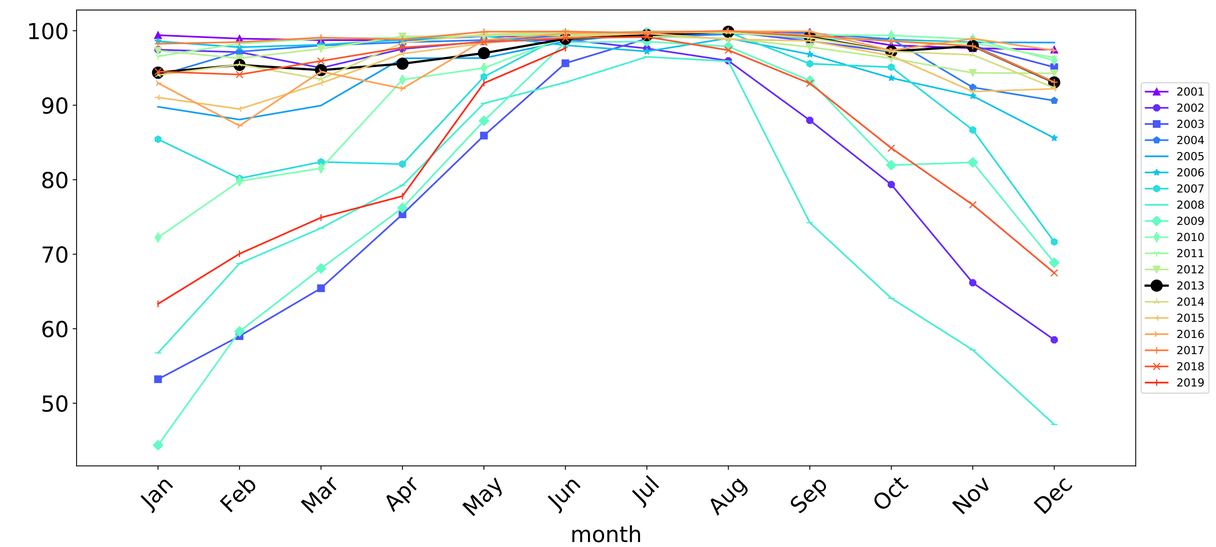

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

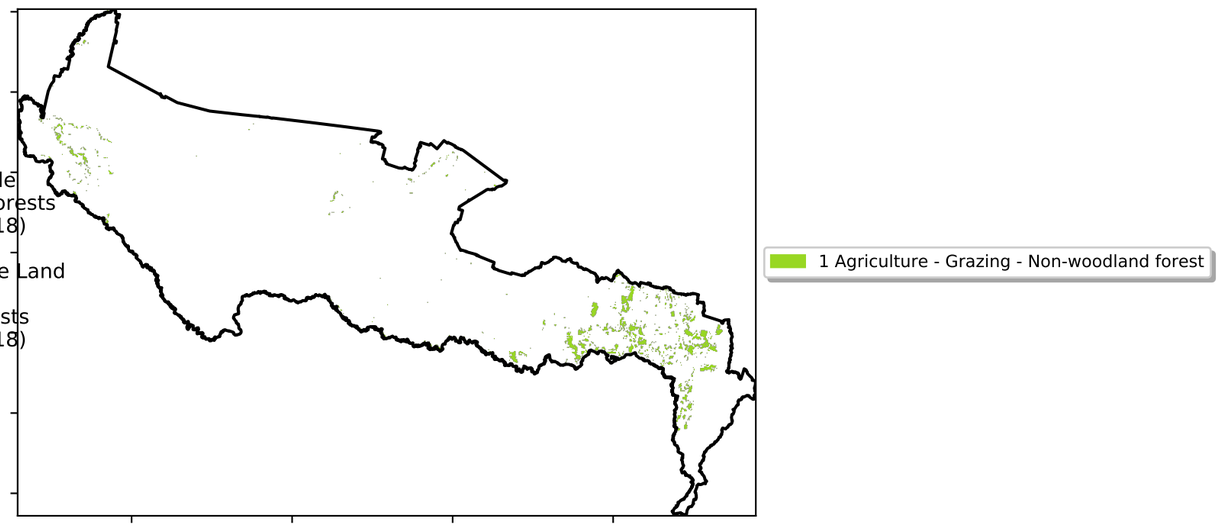



Water erosion historical monthly area protected (Total Veg Cov>70%)



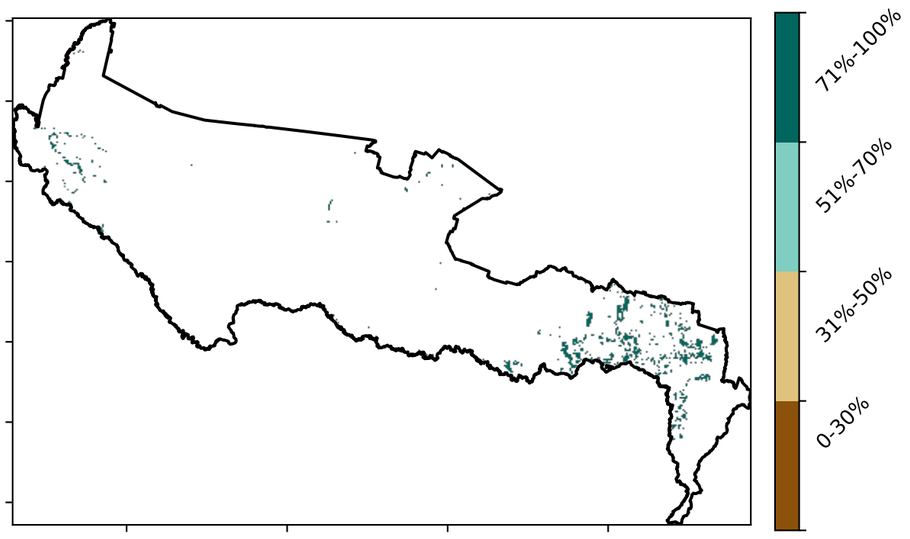
# Grazing - Forest (non woodland)

## Land use and forest cover

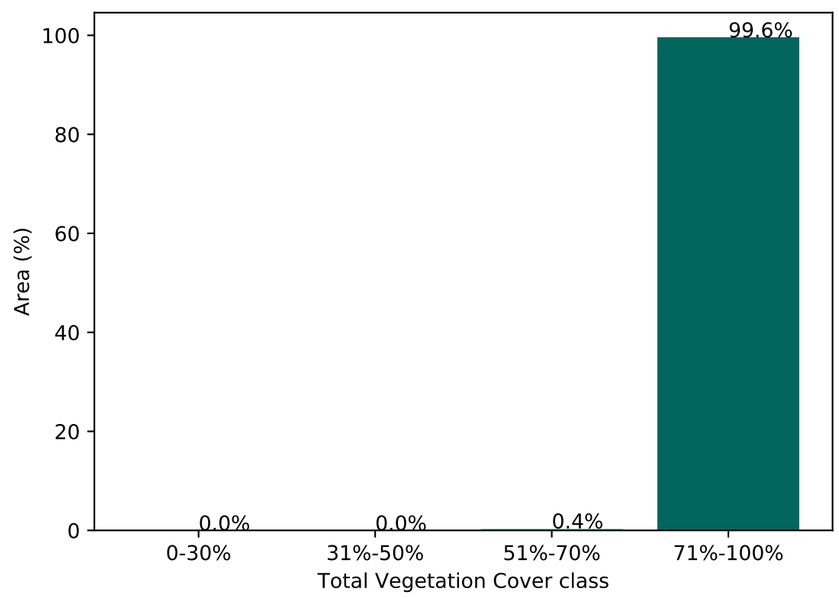



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

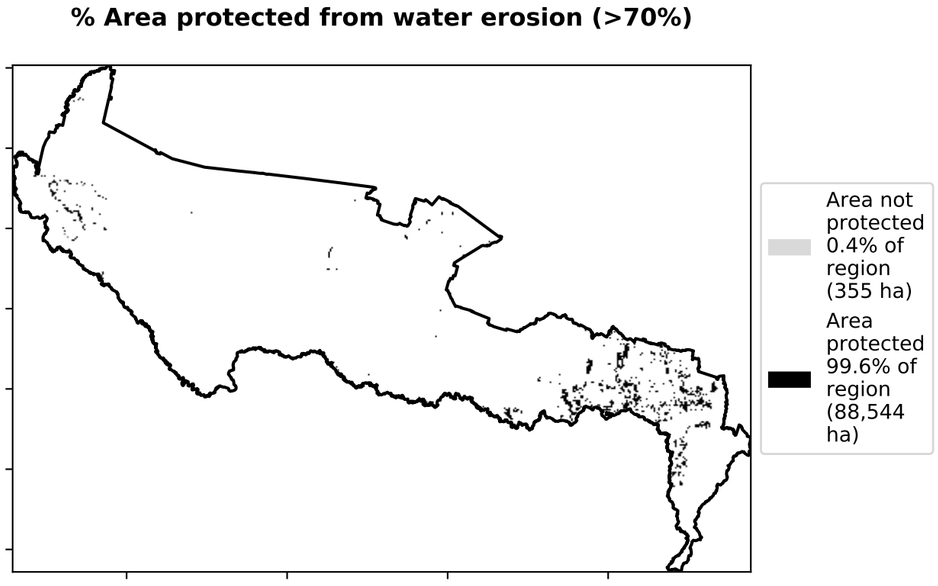
## Total Vegetation Cover [%]



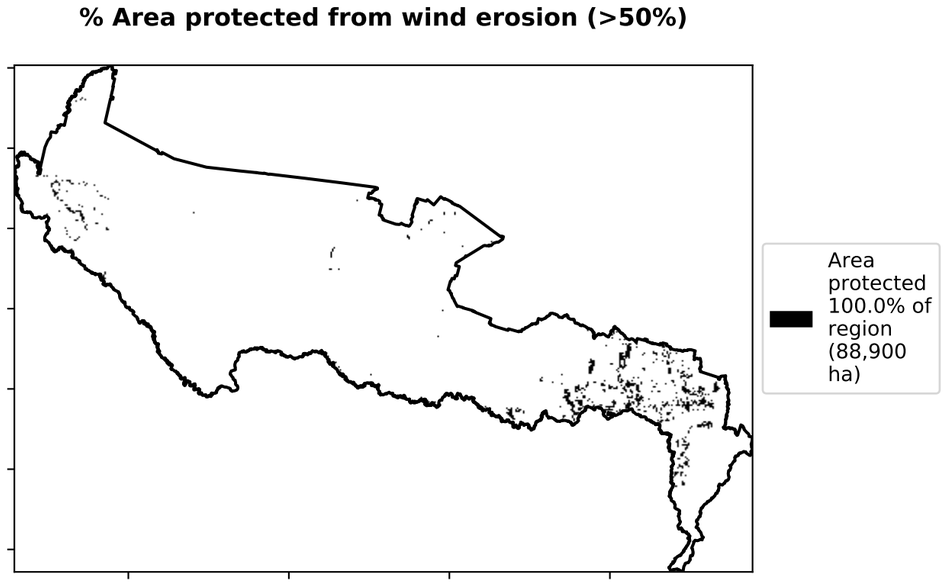

## Proportion of vegetation cover class in area




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

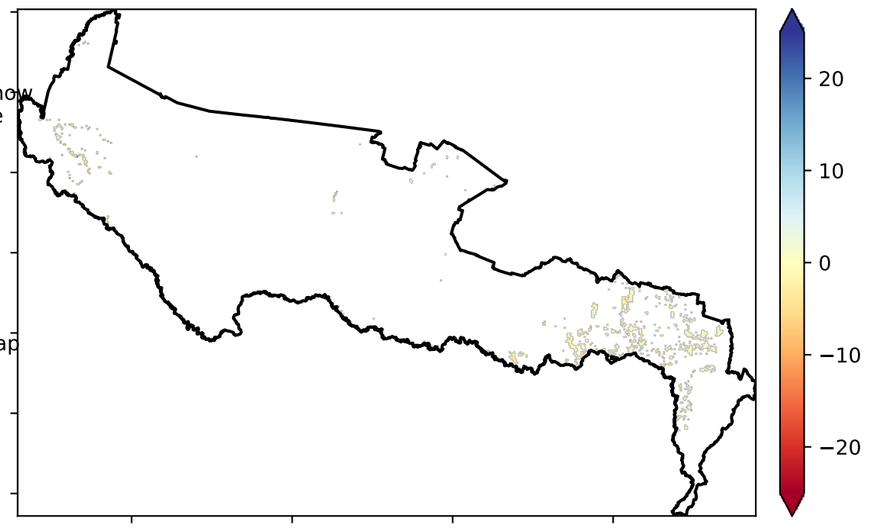



## % Area protected from wind erosion (>50%)



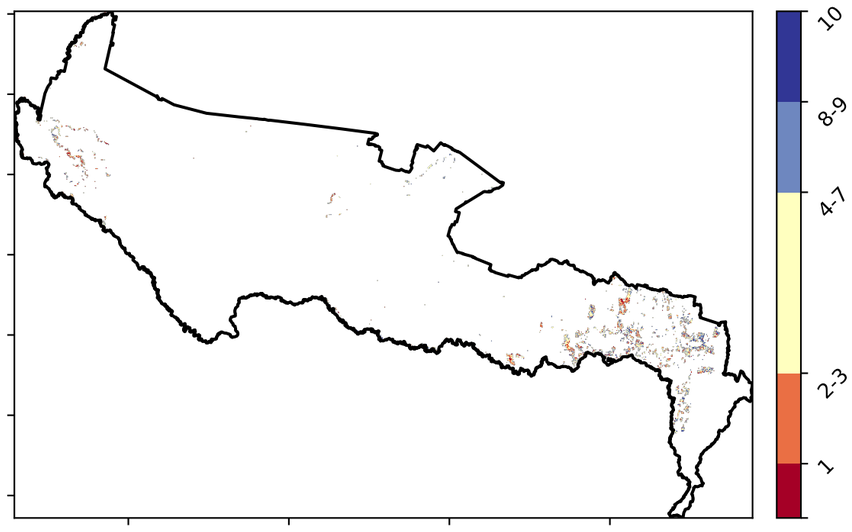

## Total Vegetation Cover Anomaly [%]

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.



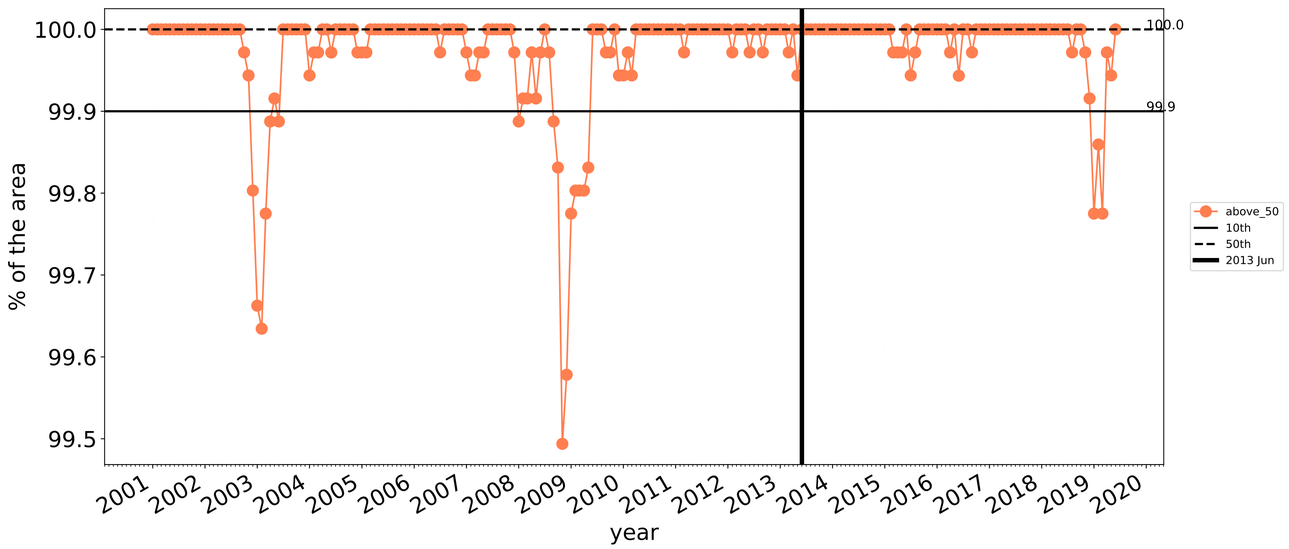

## Total Vegetation Cover Decile [%]

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.

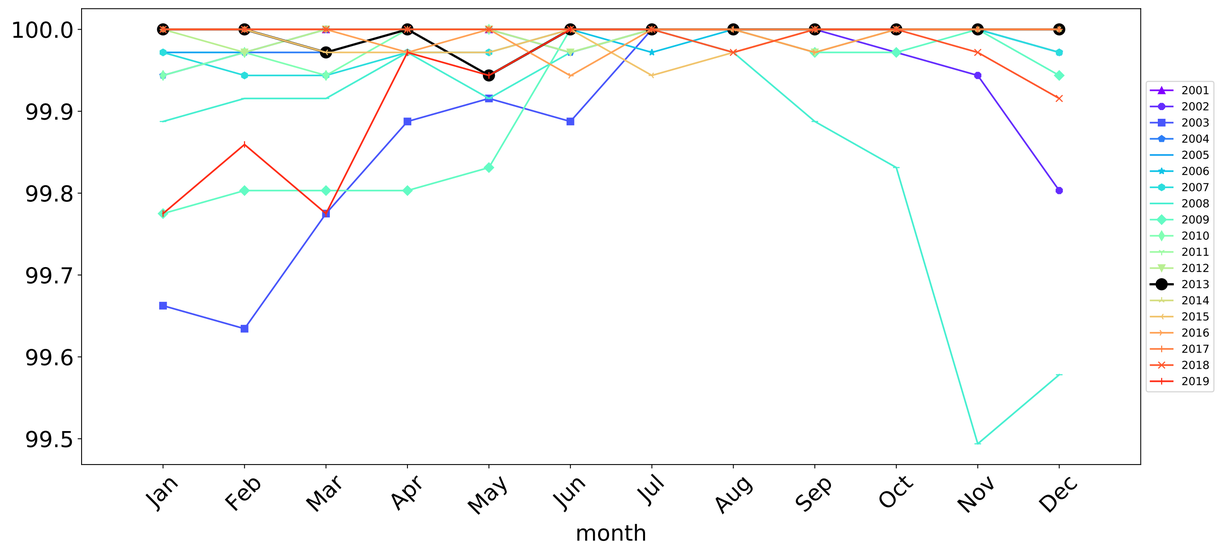


# Grazing - Forest (non woodland) timeseries

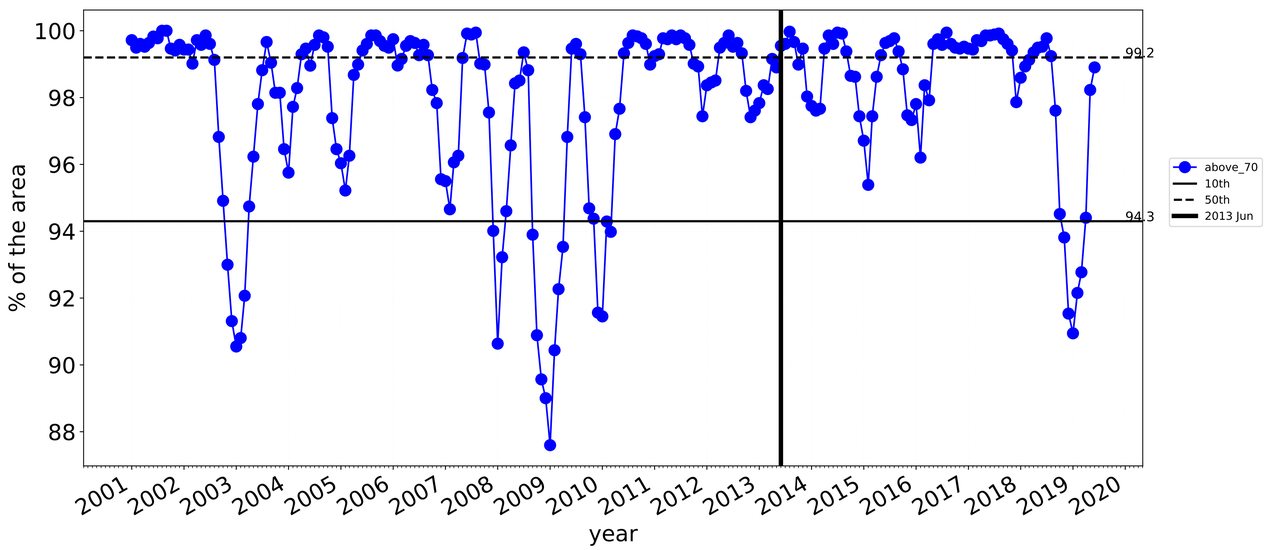
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



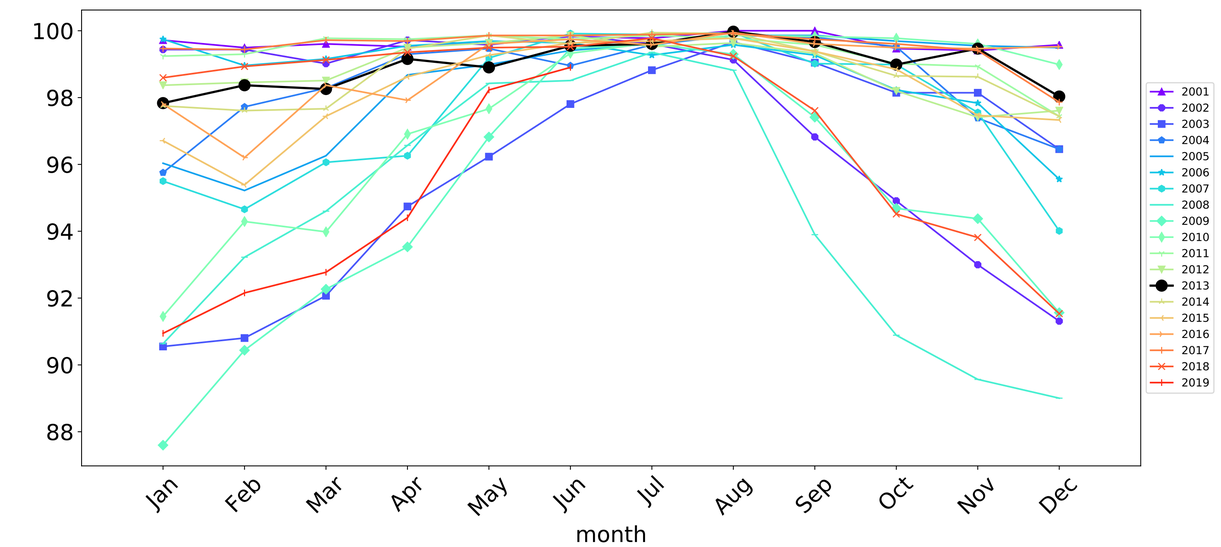

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

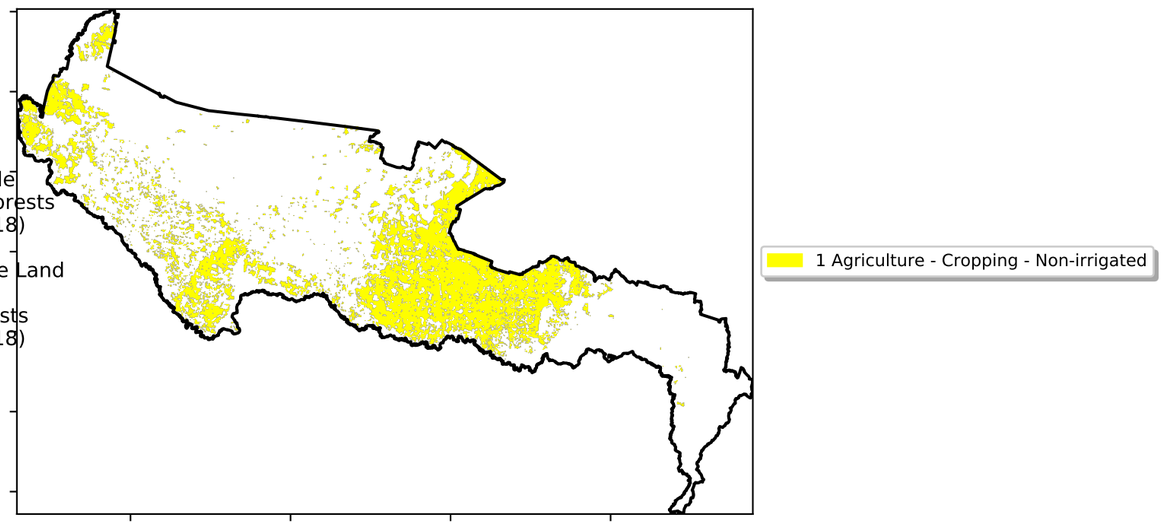



Water erosion historical monthly area protected (Total Veg Cov>70%)



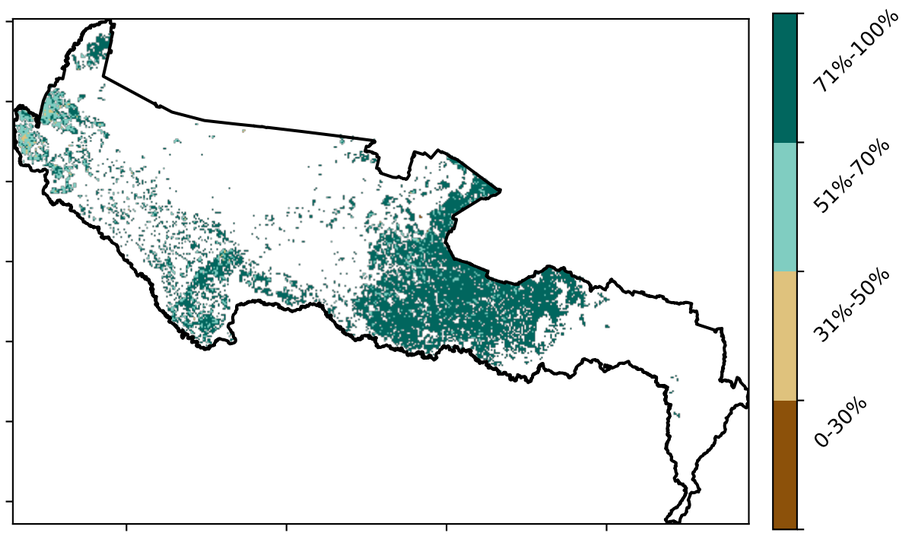
# Cropping

**Land use and forest cover**

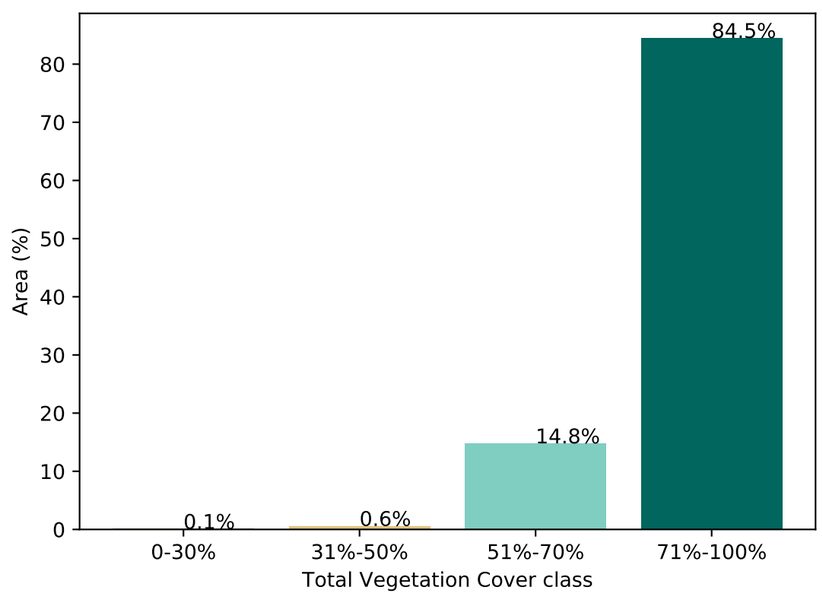



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

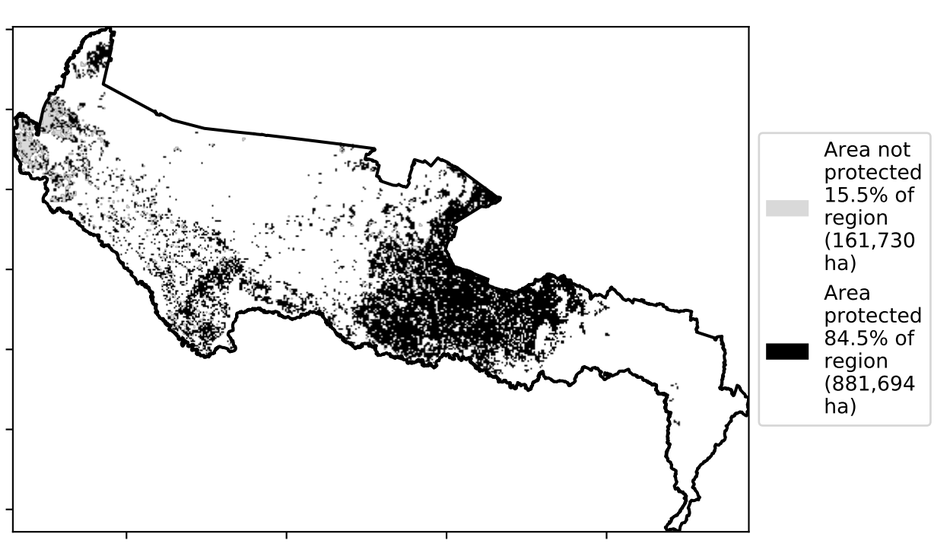
**Total Vegetation Cover [%]**



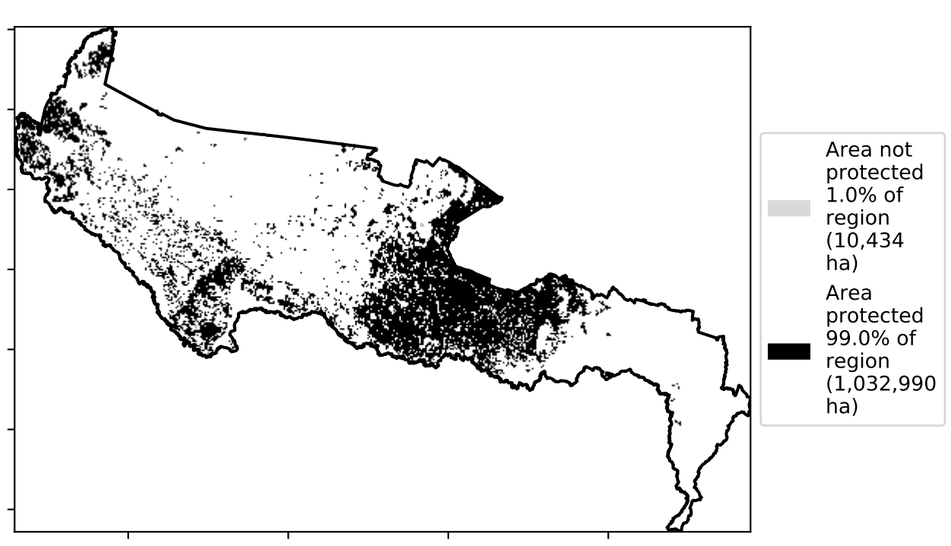

**Proportion of vegetation cover class in area**




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

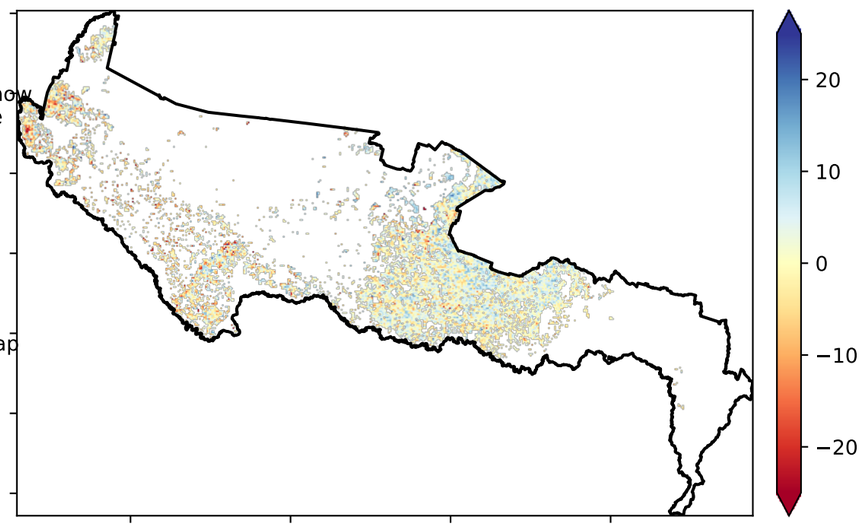



**% Area protected from wind erosion (>50%)**



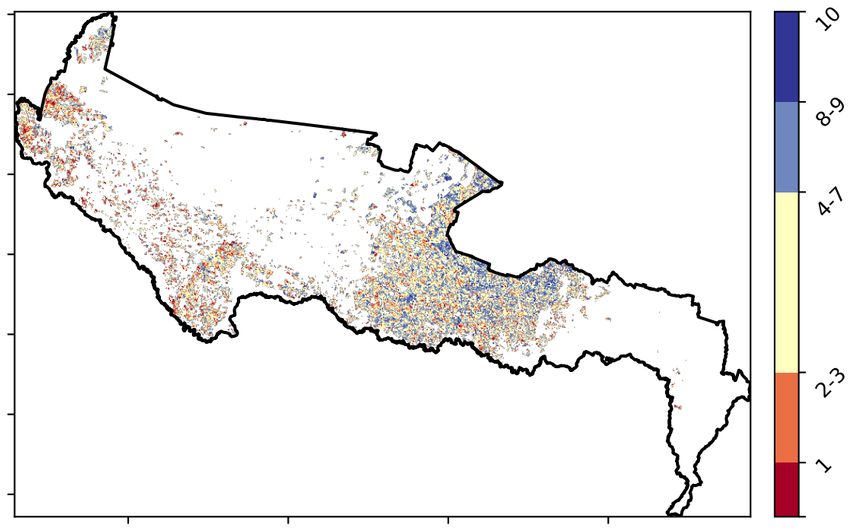

**Total Vegetation Cover Anomaly [%]**

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.



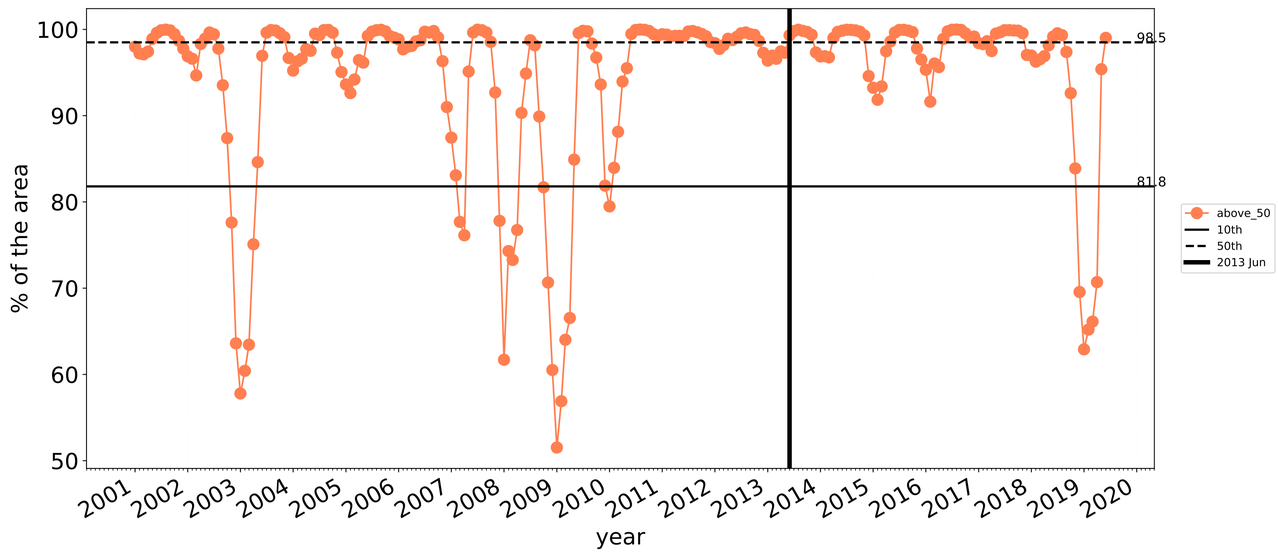

**Total Vegetation Cover Decile [%]**

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.

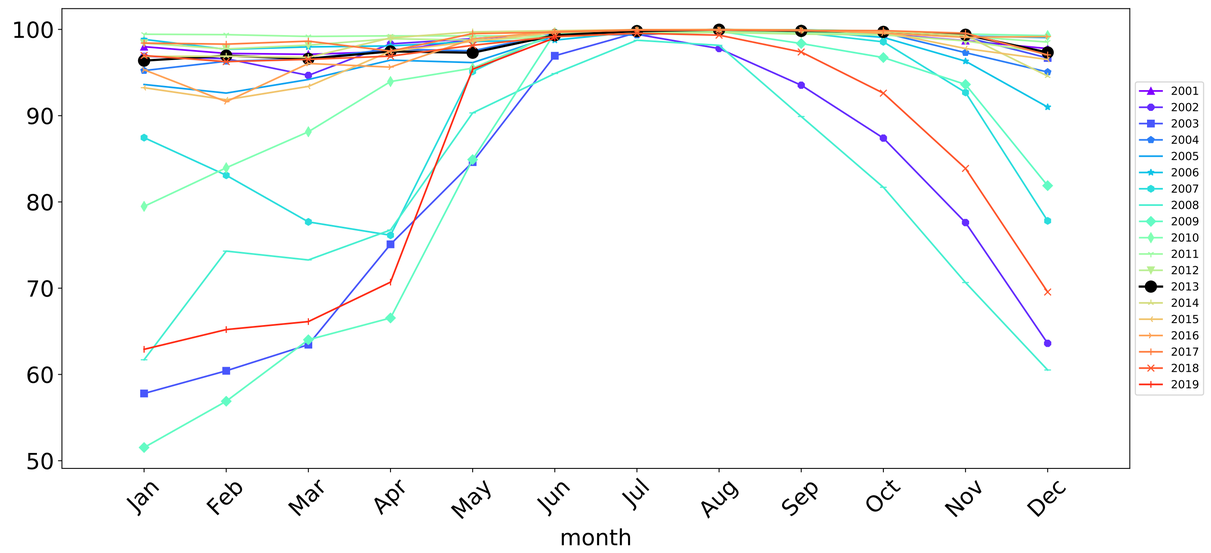


**Cropping timeseries**

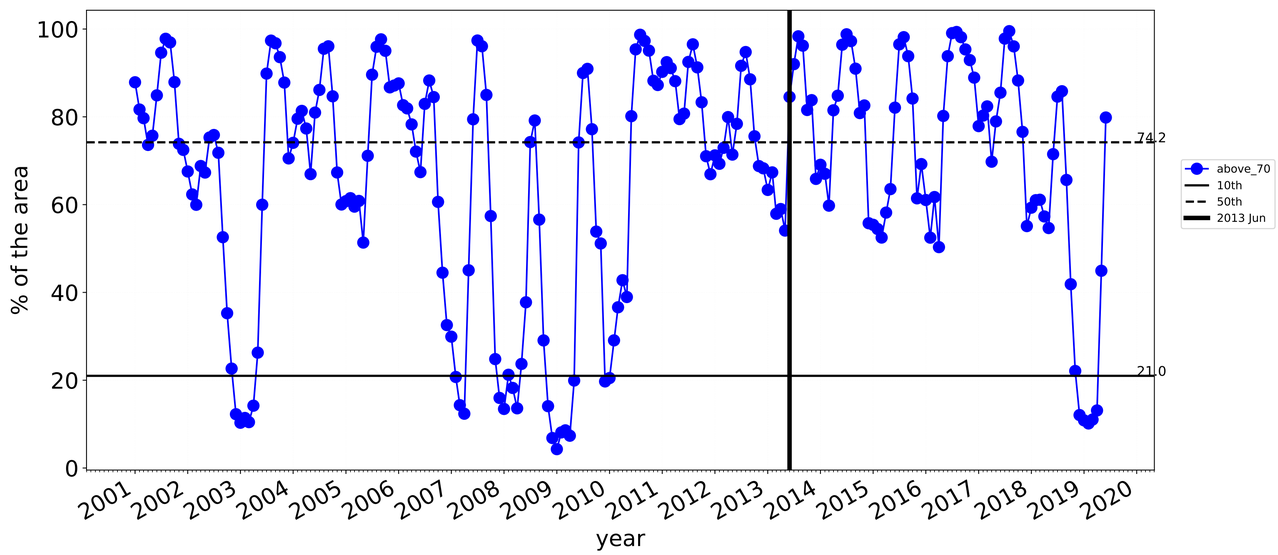
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



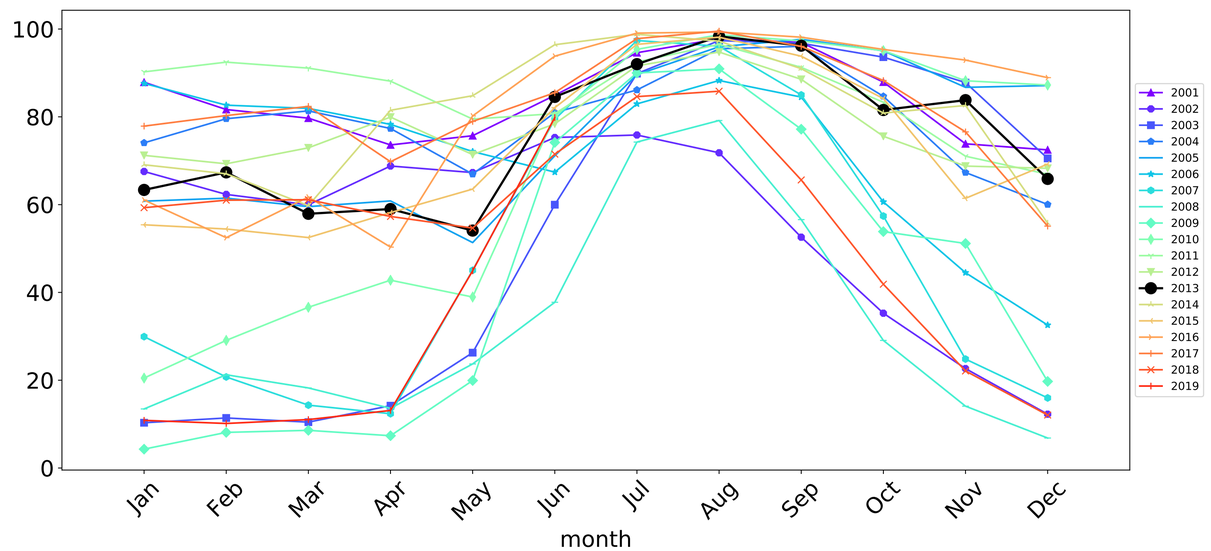

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

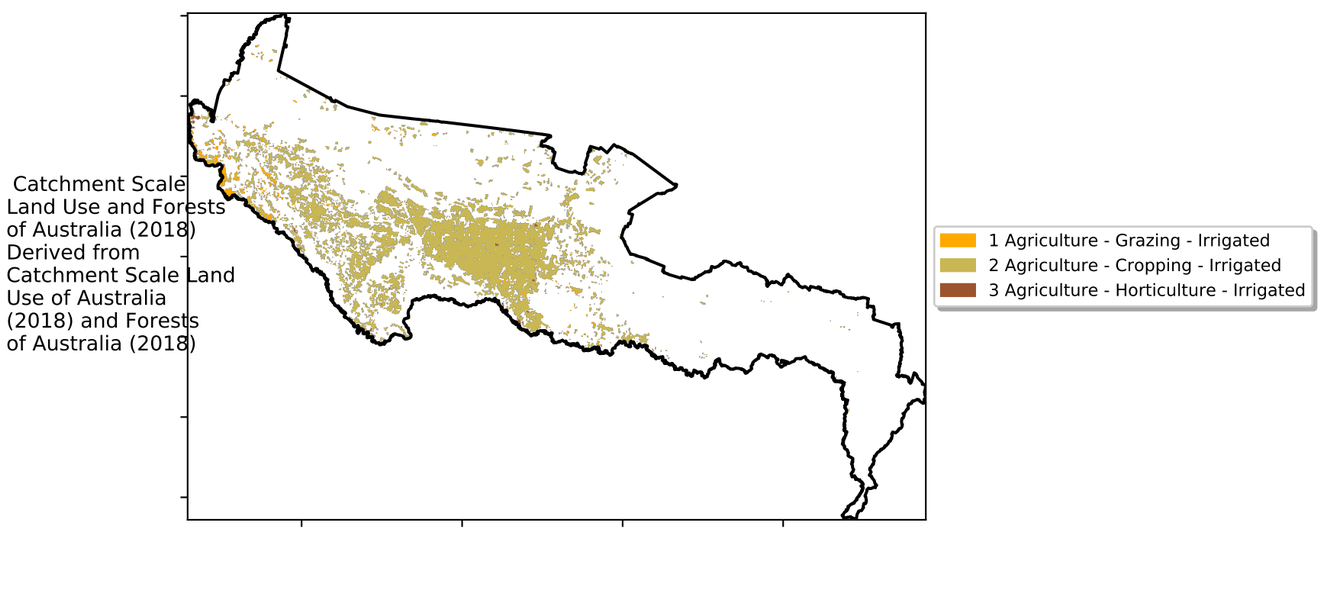



Water erosion historical monthly area protected (Total Veg Cov>70%)

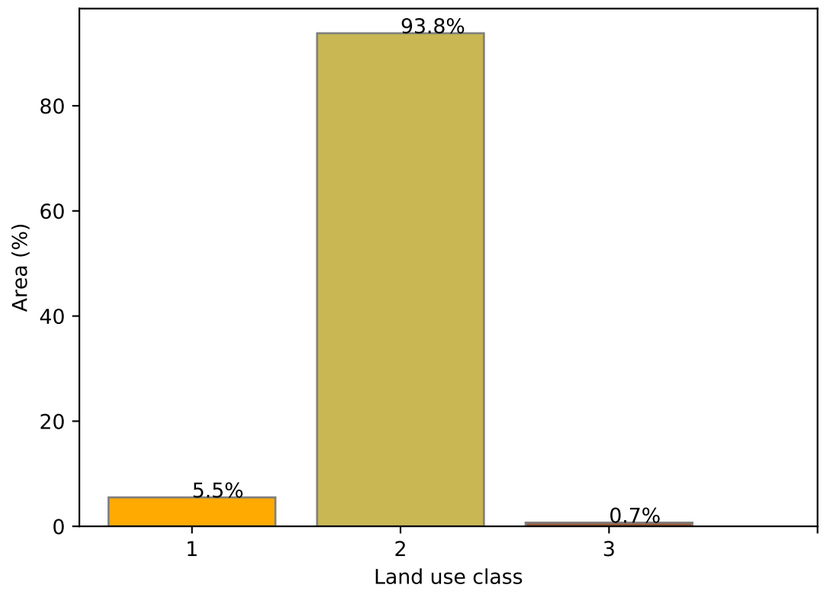


# Irrigation

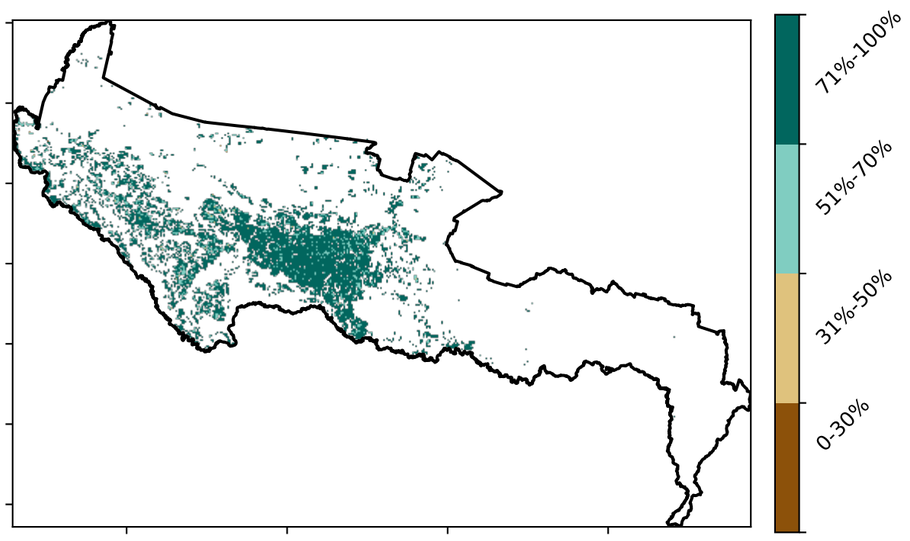
## Land use and forest cover



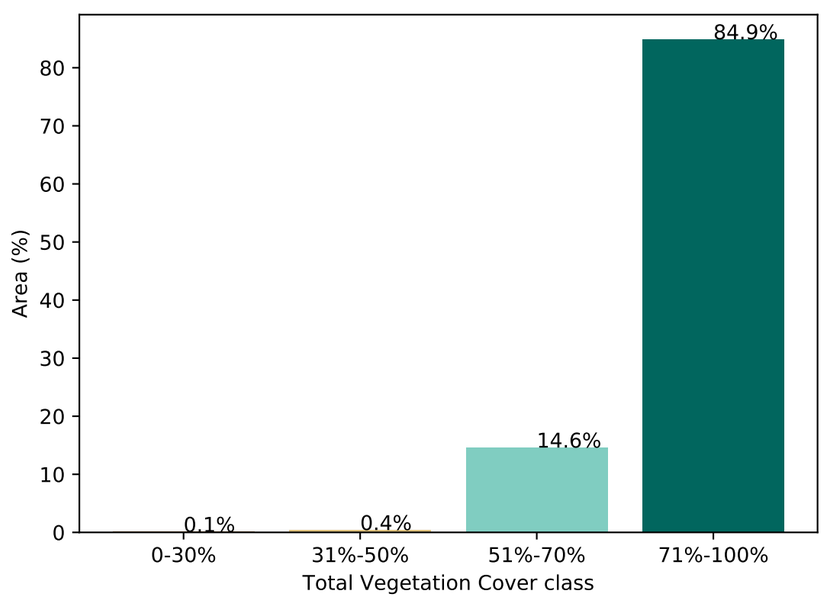

## Proportion of each land class in area



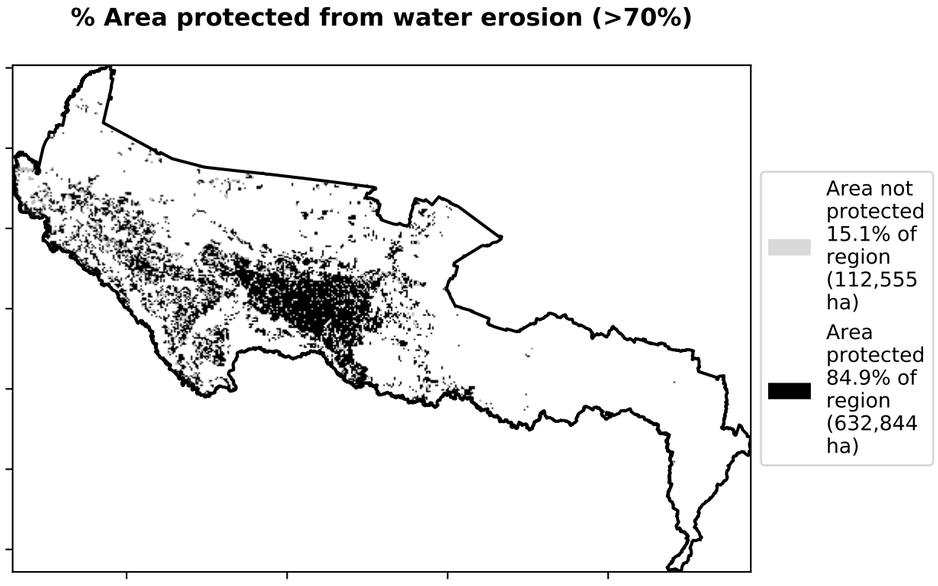

## Total Vegetation Cover [%]



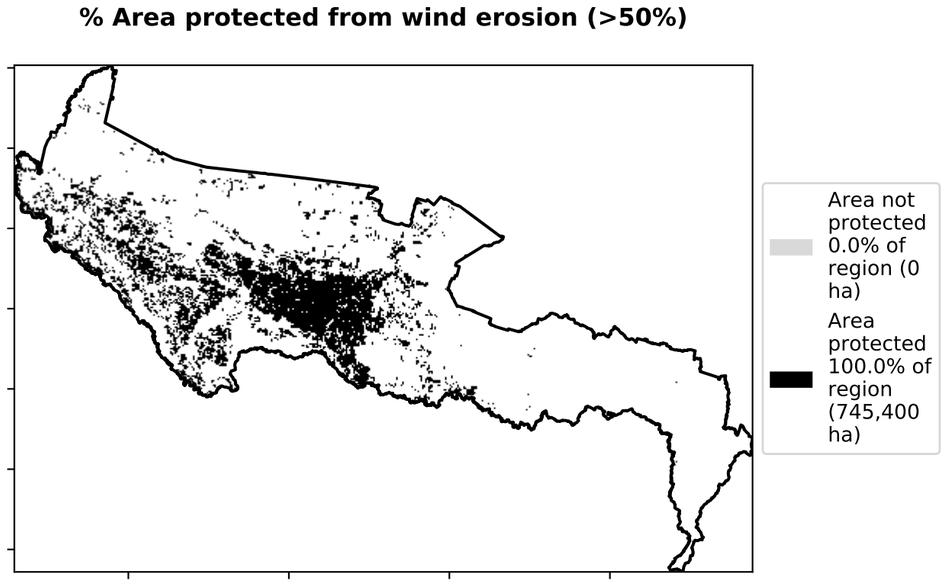

## Proportion of vegetation cover class in area




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

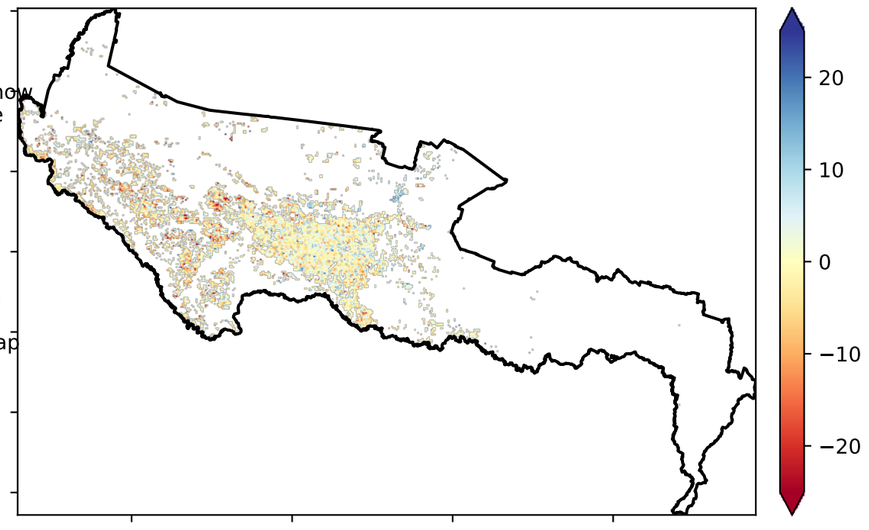



## % Area protected from wind erosion (>50%)



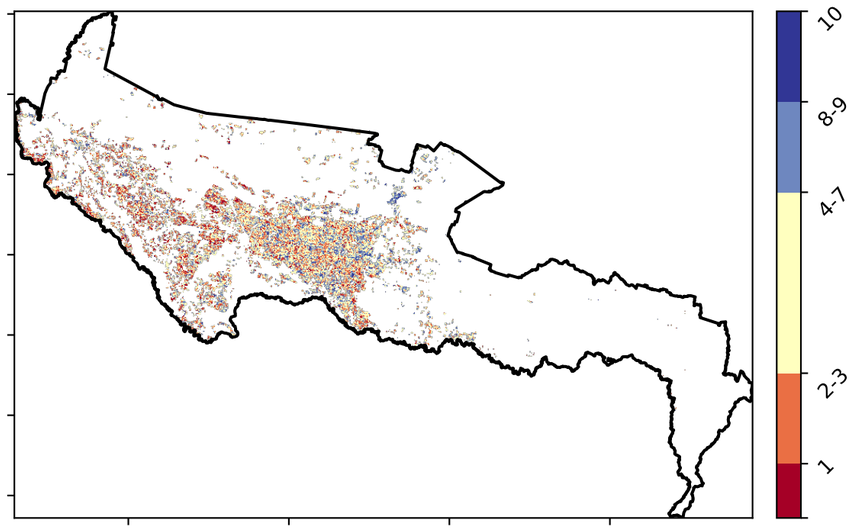

## Total Vegetation Cover Anomaly [%]

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.



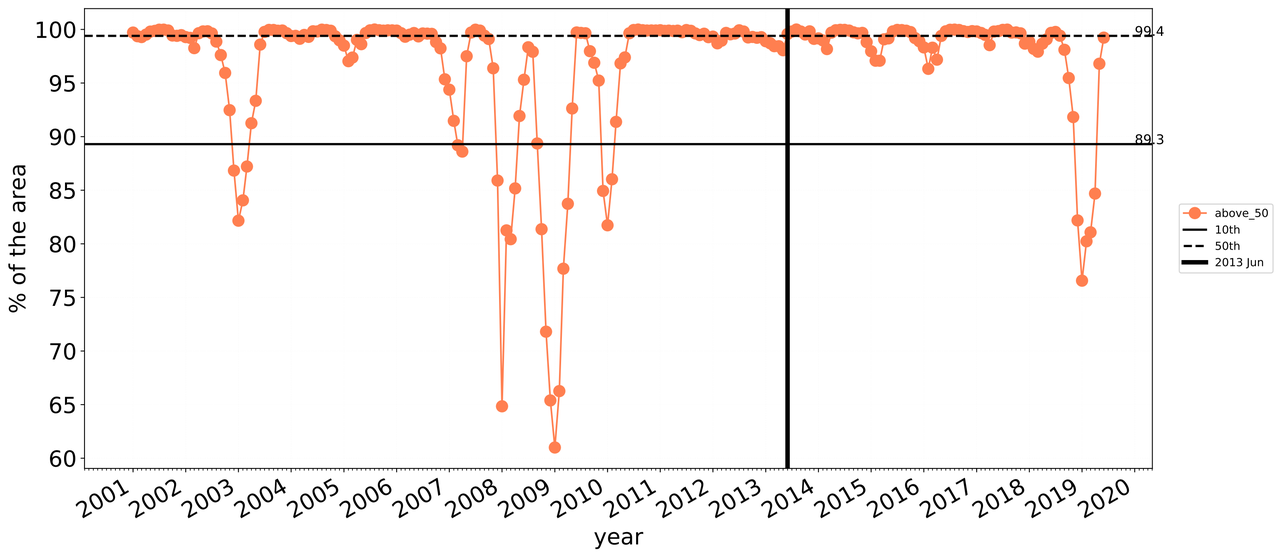

## Total Vegetation Cover Decile [%]

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.

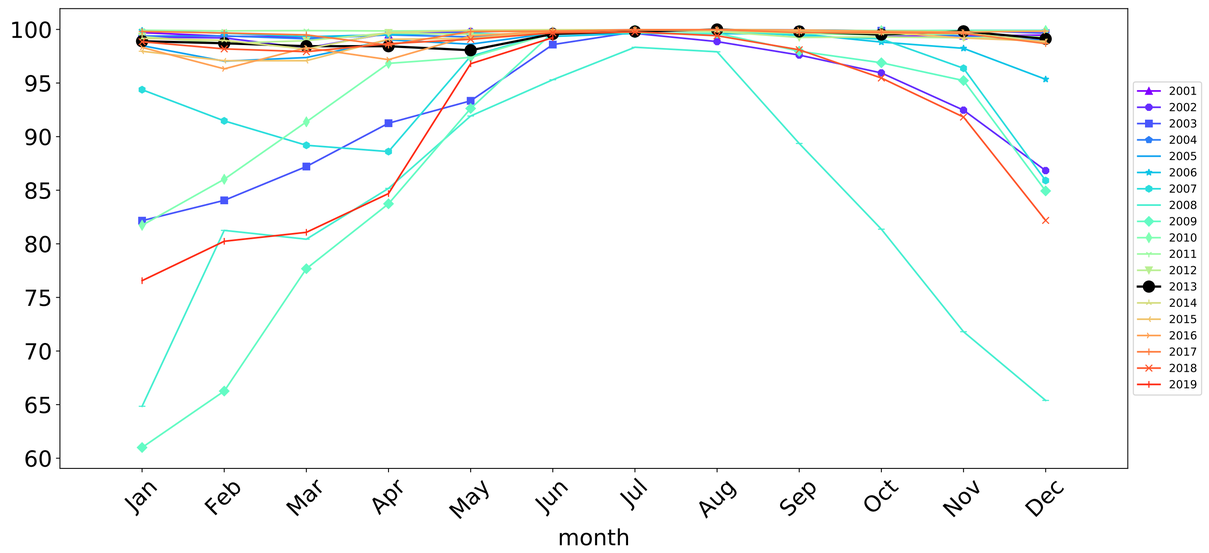


**Irrigation timeseries**

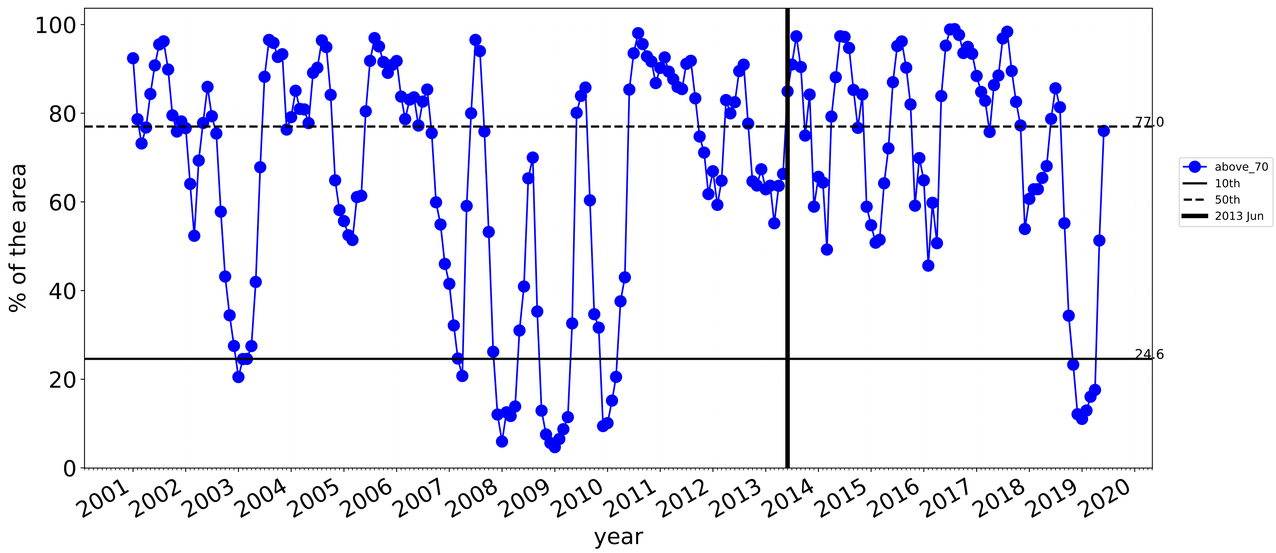
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



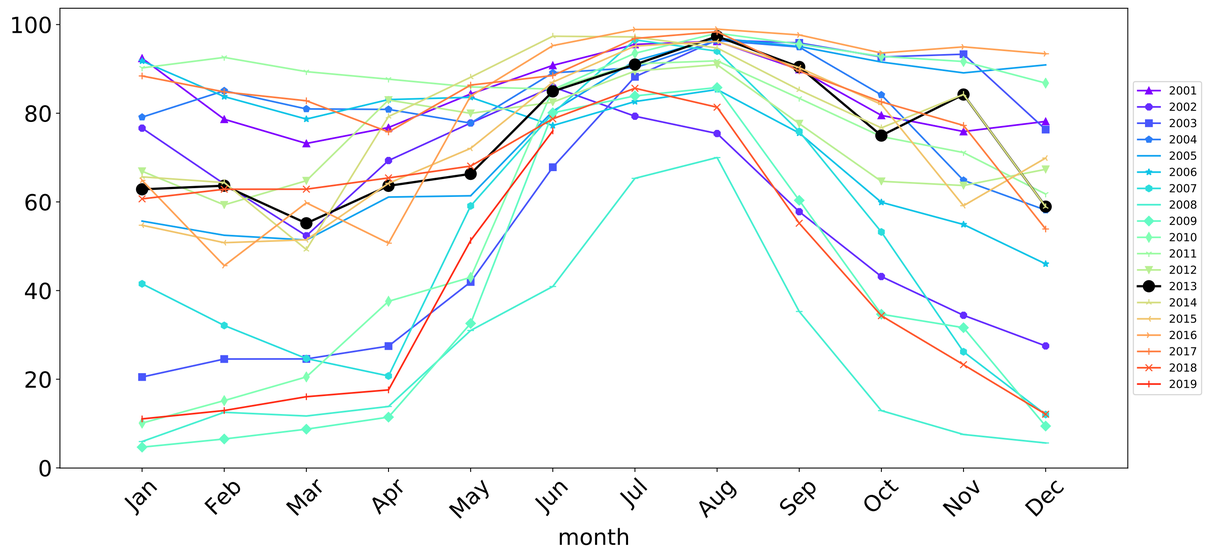

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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

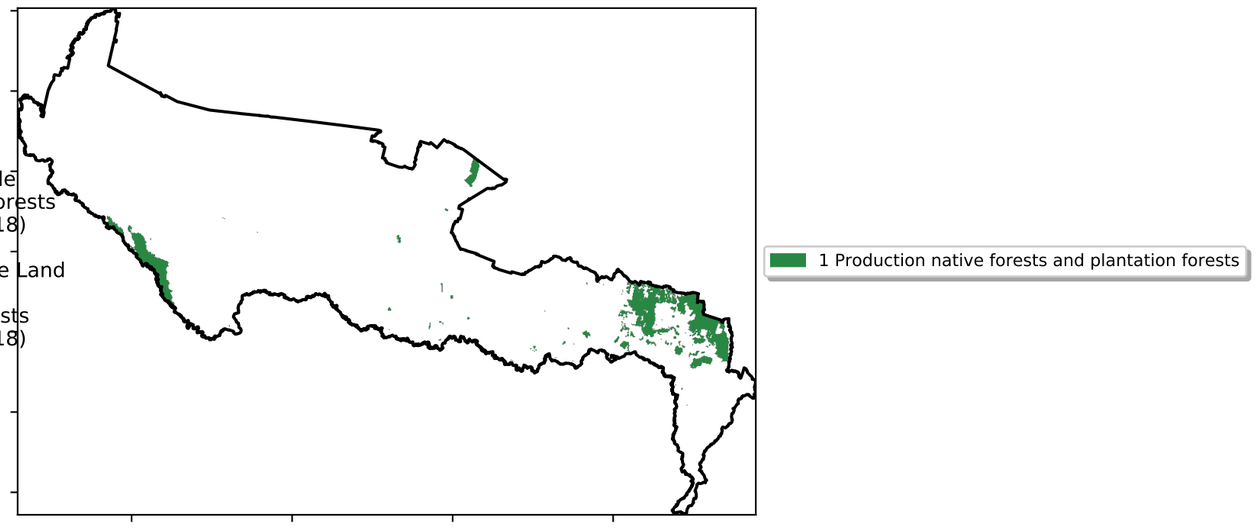



Water erosion historical monthly area protected (Total Veg Cov>70%)



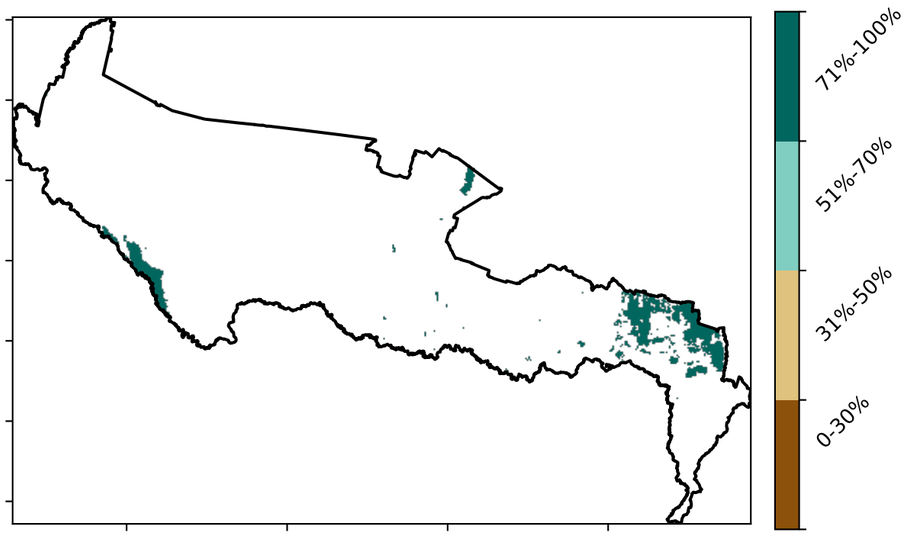
# Production native forests and plantation forests

## Land use and forest cover

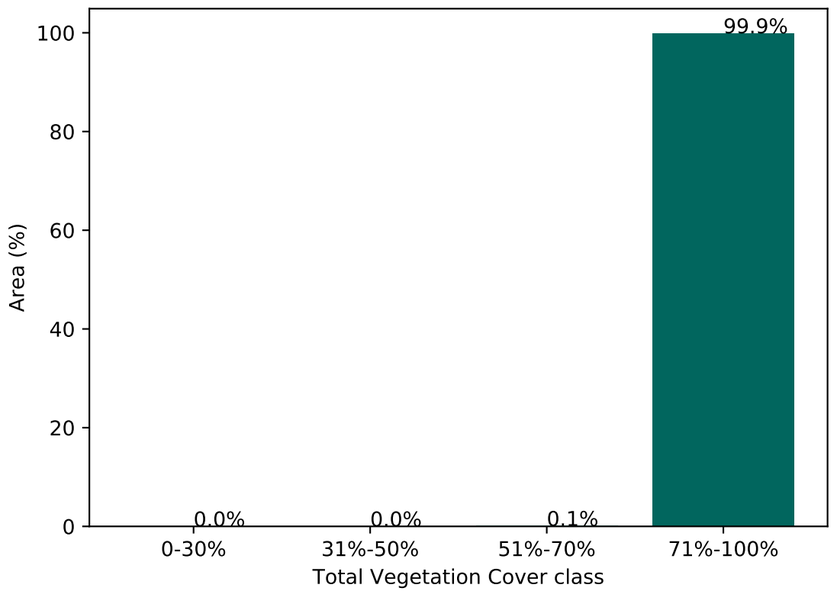



Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

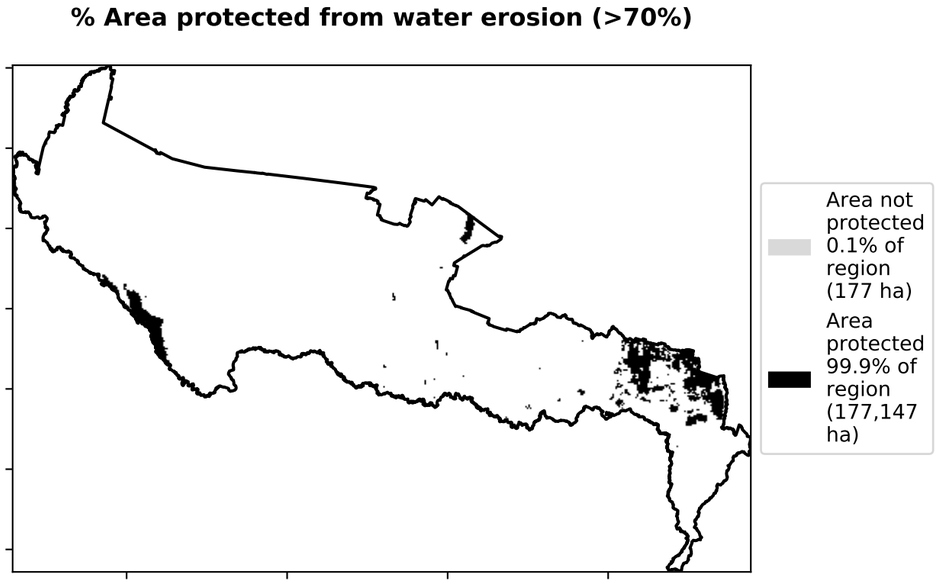
## Total Vegetation Cover [%]



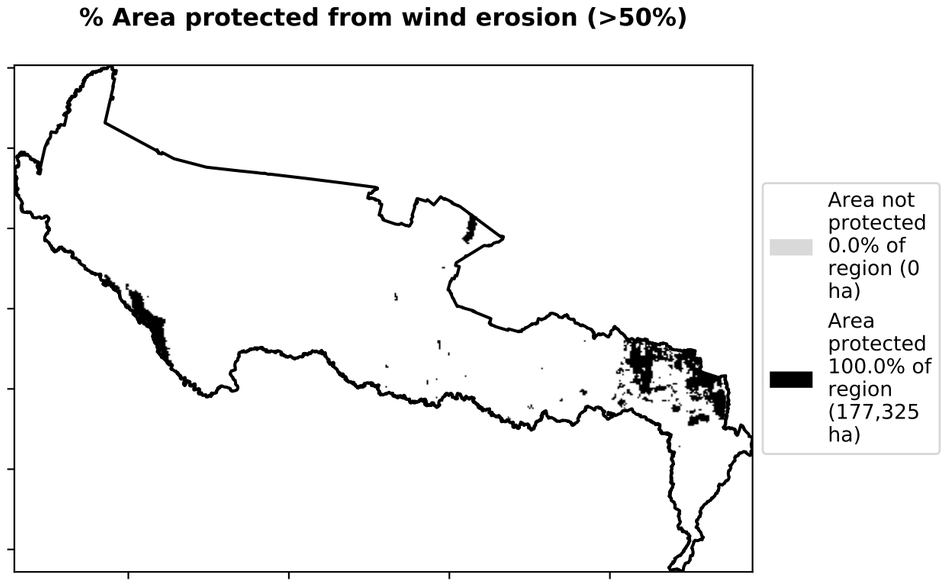

## Proportion of vegetation cover class in area




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

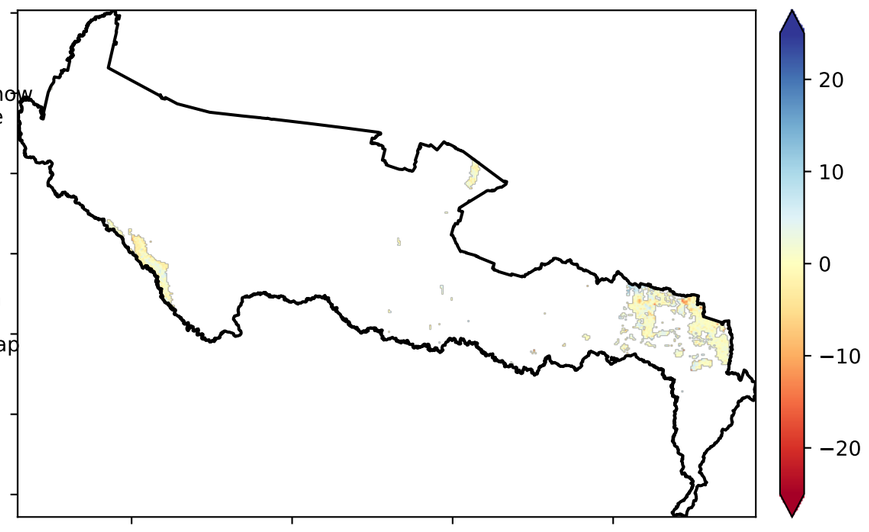



## % Area protected from wind erosion (>50%)



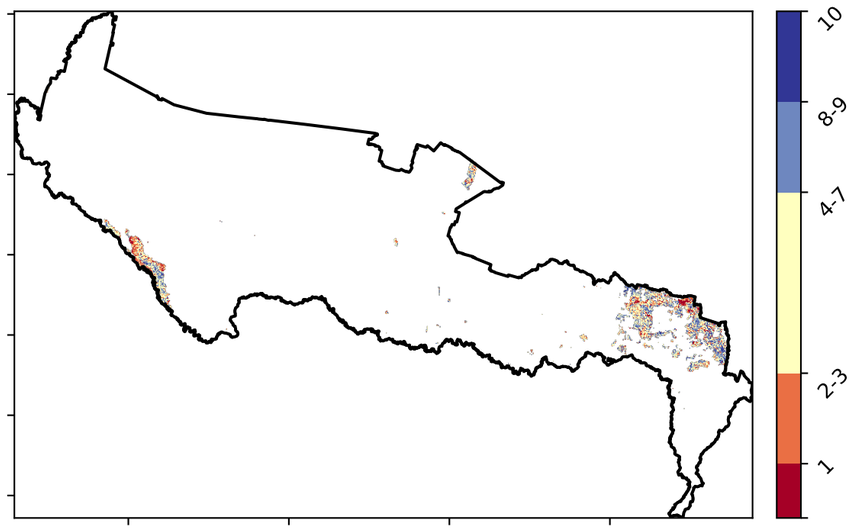

## Total Vegetation Cover Anomaly [%]

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.



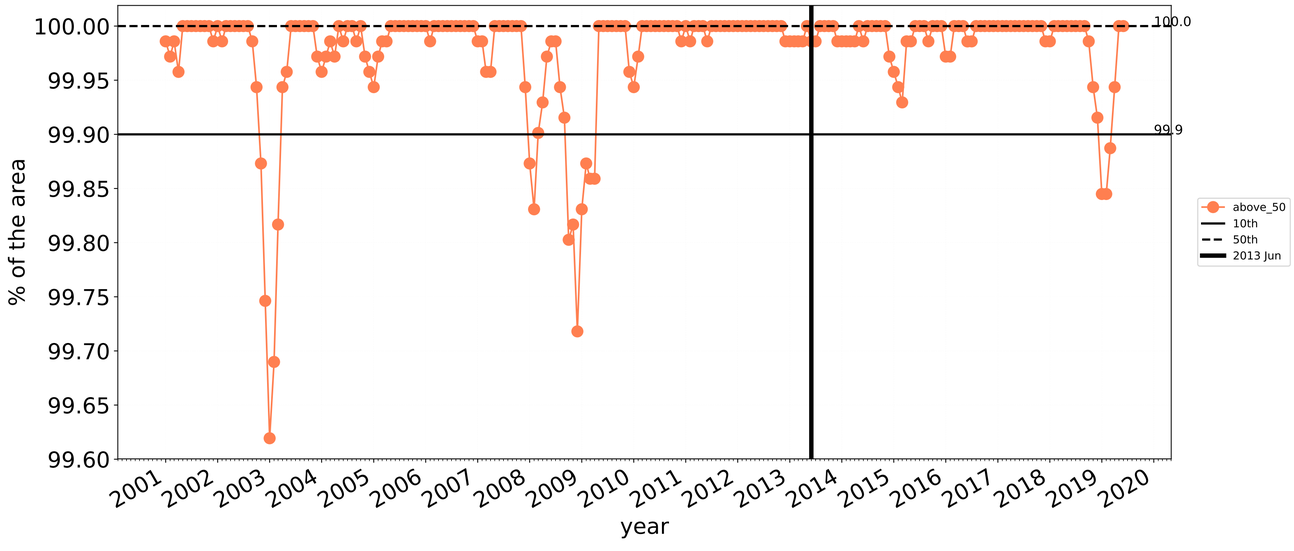

## Total Vegetation Cover Decile [%]

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.

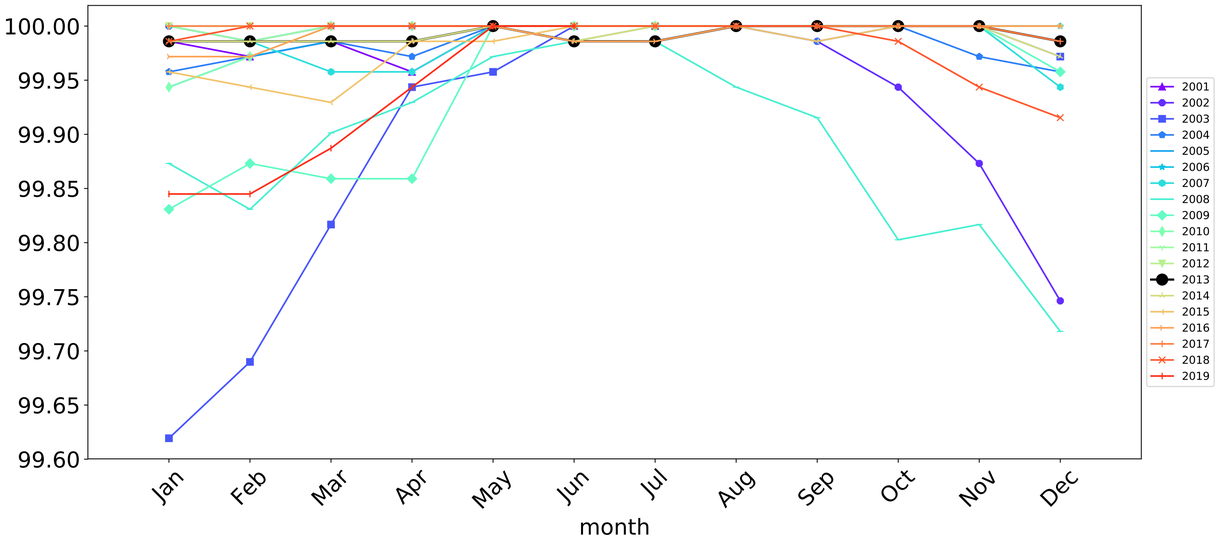


**Production native forests and plantation forests timeseries**

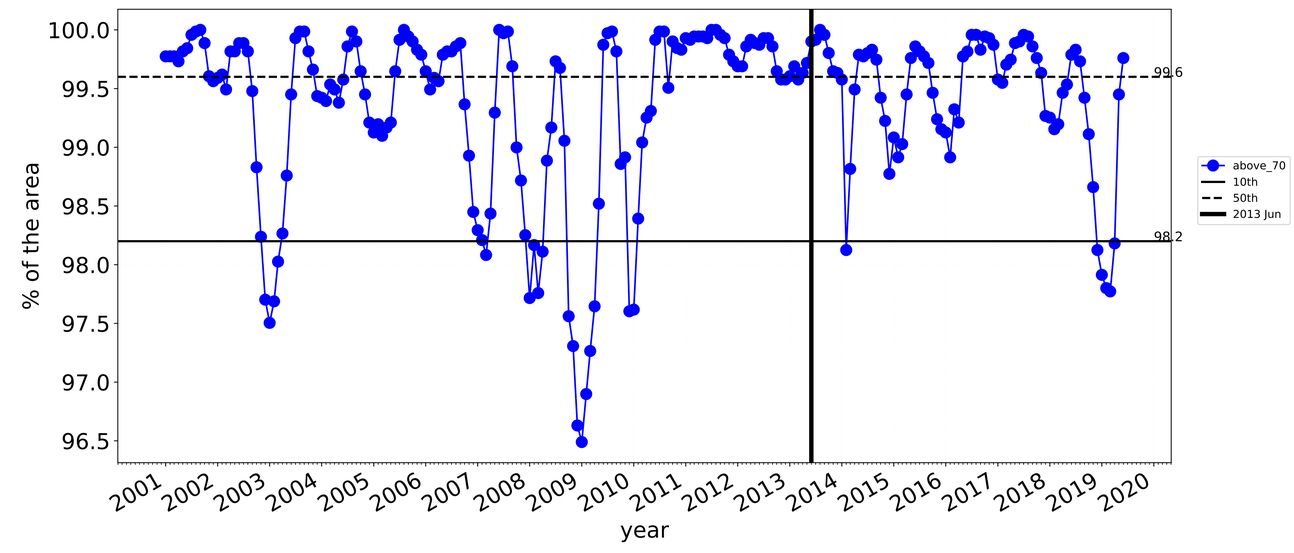
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



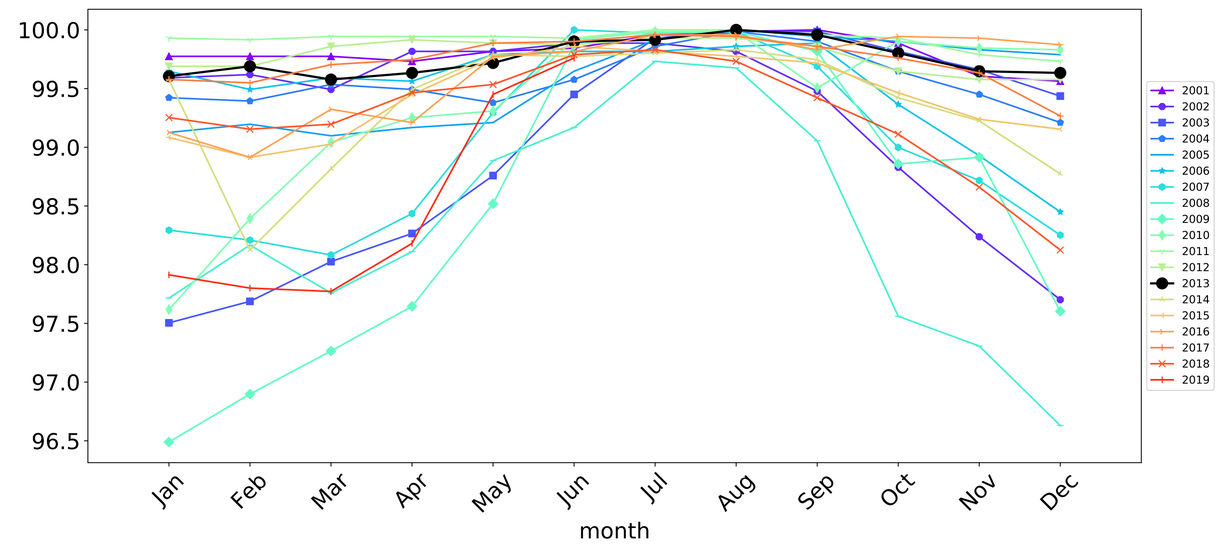

Wind erosion historical monthly area protected (Total Veg Cov >50%)




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




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



# Murray (4,133,775 ha and no data 55,908 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** | 4,133,775 | 99.9%<br>4,130,481 | 99.6%<br>4,117,107 | 90.5%<br>3,741,228 | 60.0%<br>2,481,414 | 21.1%<br>870,834 | 8.2%<br>339,918 |
| **Conservation and natural environments** | 391,850 | 100.0%<br>391,800 | 99.9%<br>391,650 | 99.3%<br>389,250 | 94.5%<br>370,200 | 69.4%<br>271,850 | 39.2%<br>153,525 |
| **Conservation and natural environments non forest** | 92,750 | 99.9%<br>92,700 | 99.8%<br>92,575 | 97.6%<br>90,550 | 80.4%<br>74,550 | 31.6%<br>29,350 | 14.3%<br>13,225 |
| **Conservation and natural environments Woodland forest** | 95,225 | 100.0%<br>95,225 | 100.0%<br>95,225 | 99.7%<br>94,925 | 98.0%<br>93,275 | 69.0%<br>65,750 | 31.0%<br>29,500 |
| **Conservation and natural environments Forest (non woodland)** | 203,875 | 100.0%<br>203,875 | 100.0%<br>203,850 | 100.0%<br>203,775 | 99.3%<br>202,375 | 86.7%<br>176,750 | 54.3%<br>110,800 |
| **Agriculture** | 3,508,725 | 100.0%<br>3,508,050 | 99.6%<br>3,496,000 | 89.2%<br>3,128,925 | 54.3%<br>1,905,150 | 12.9%<br>452,050 | 2.7%<br>96,025 |
| **Grazing** | 1,719,500 | 100.0%<br>1,719,375 | 99.9%<br>1,717,025 | 93.8%<br>1,613,325 | 68.9%<br>1,184,525 | 21.7%<br>372,650 | 5.0%<br>85,375 |
| **Grazing non forest** | 1,554,925 | 100.0%<br>1,554,800 | 99.8%<br>1,552,450 | 93.3%<br>1,449,975 | 66.7%<br>1,036,975 | 19.4%<br>300,950 | 3.5%<br>54,075 |
| **Grazing Woodland forest** | 75,675 | 100.0%<br>75,675 | 100.0%<br>75,675 | 98.9%<br>74,850 | 84.0%<br>63,600 | 15.1%<br>11,450 | 1.8%<br>1,350 |
| **Grazing - Forest (non woodland)** | 88,900 | 100.0%<br>88,900 | 100.0%<br>88,900 | 99.6%<br>88,500 | 94.4%<br>83,950 | 67.8%<br>60,250 | 33.7%<br>29,950 |
| **Cropping** | 1,043,425 | 100.0%<br>1,042,975 | 99.3%<br>1,036,325 | 84.5%<br>882,125 | 42.9%<br>447,700 | 5.5%<br>57,150 | 0.6%<br>6,625 |
| **Irrigation** | 745,400 | 100.0%<br>745,300 | 99.6%<br>742,250 | 84.9%<br>633,075 | 36.6%<br>272,675 | 3.0%<br>22,225 | 0.5%<br>4,000 |
| **Production native forests and plantation forests** | 177,325 | 100.0%<br>177,300 | 100.0%<br>177,300 | 99.9%<br>177,150 | 98.9%<br>175,400 | 80.6%<br>142,850 | 51.5%<br>91,350 |