Total vegetation cover soil protection
Region:LGA Toodyay_(S) WA Date: May 2025

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:

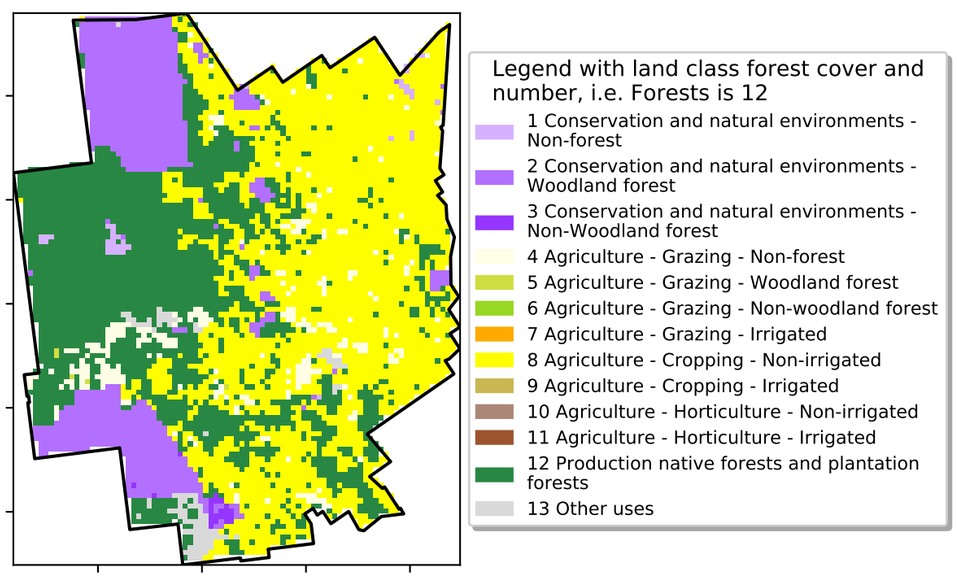
1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
4. MODIS Fractional cover algorithm:

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

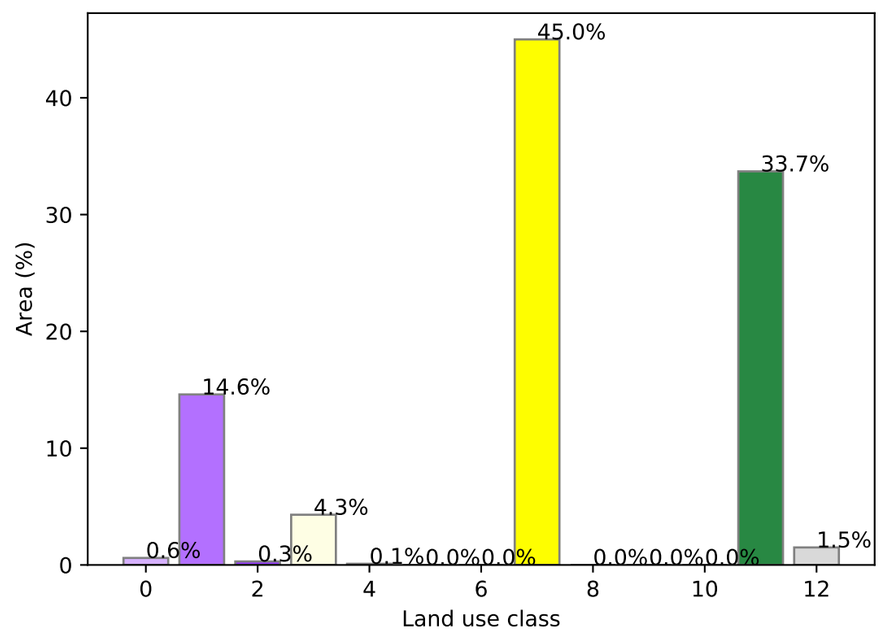
Vegetation Cover May 2025

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

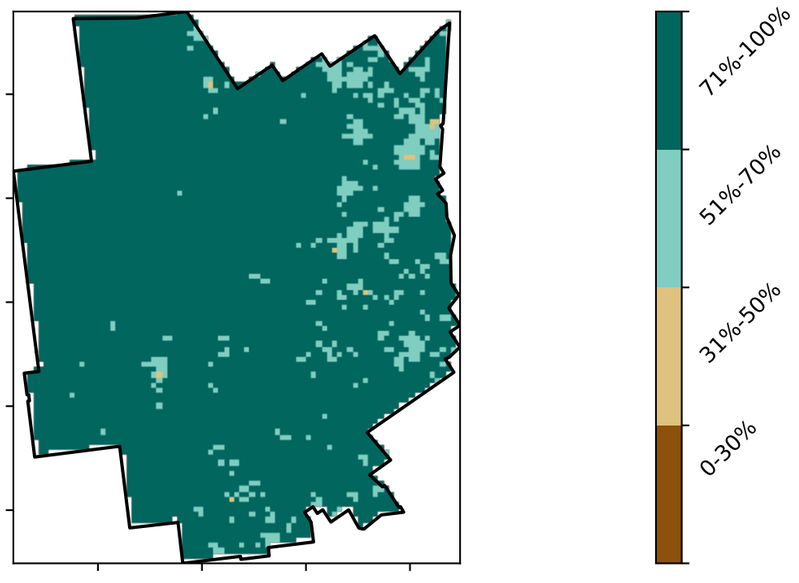
Land use and forest cover



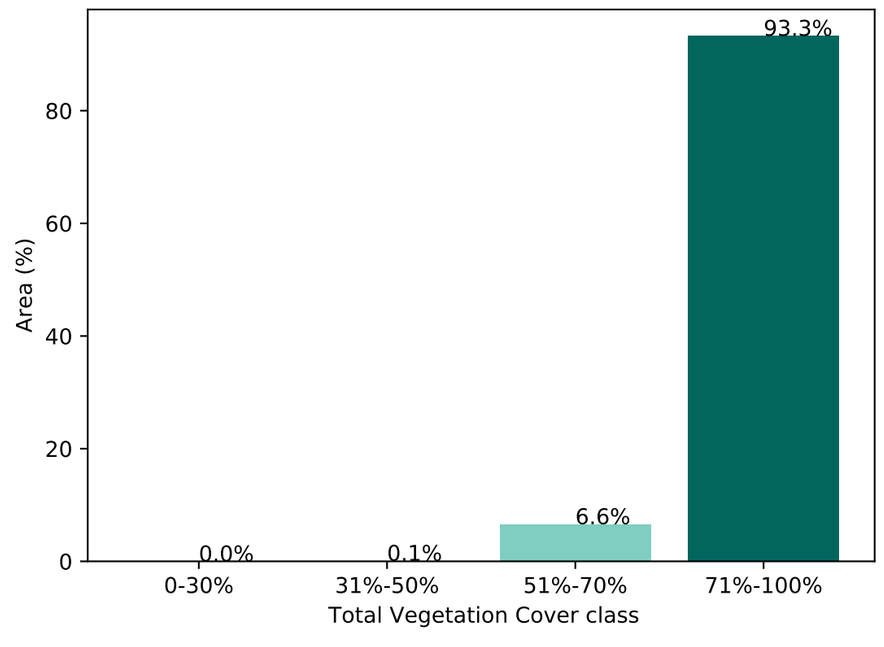
Proportion of each land class in area



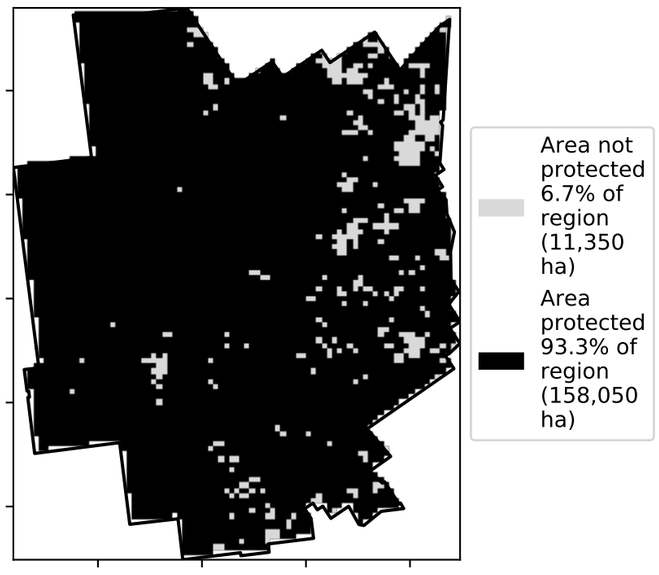
Total Vegetation Cover [%]



Proportion of vegetation cover class in area



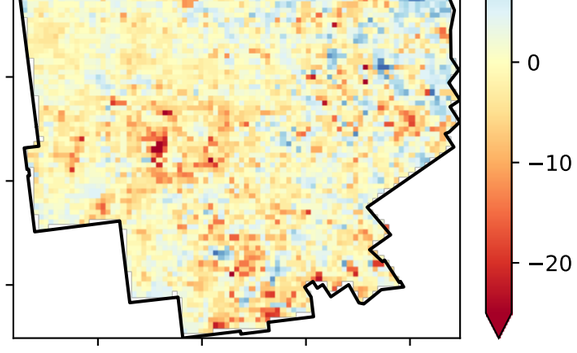
% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

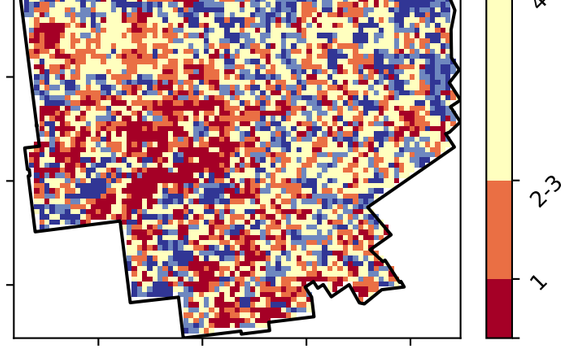
Total Vegetation Cover Anomaly [%]

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.

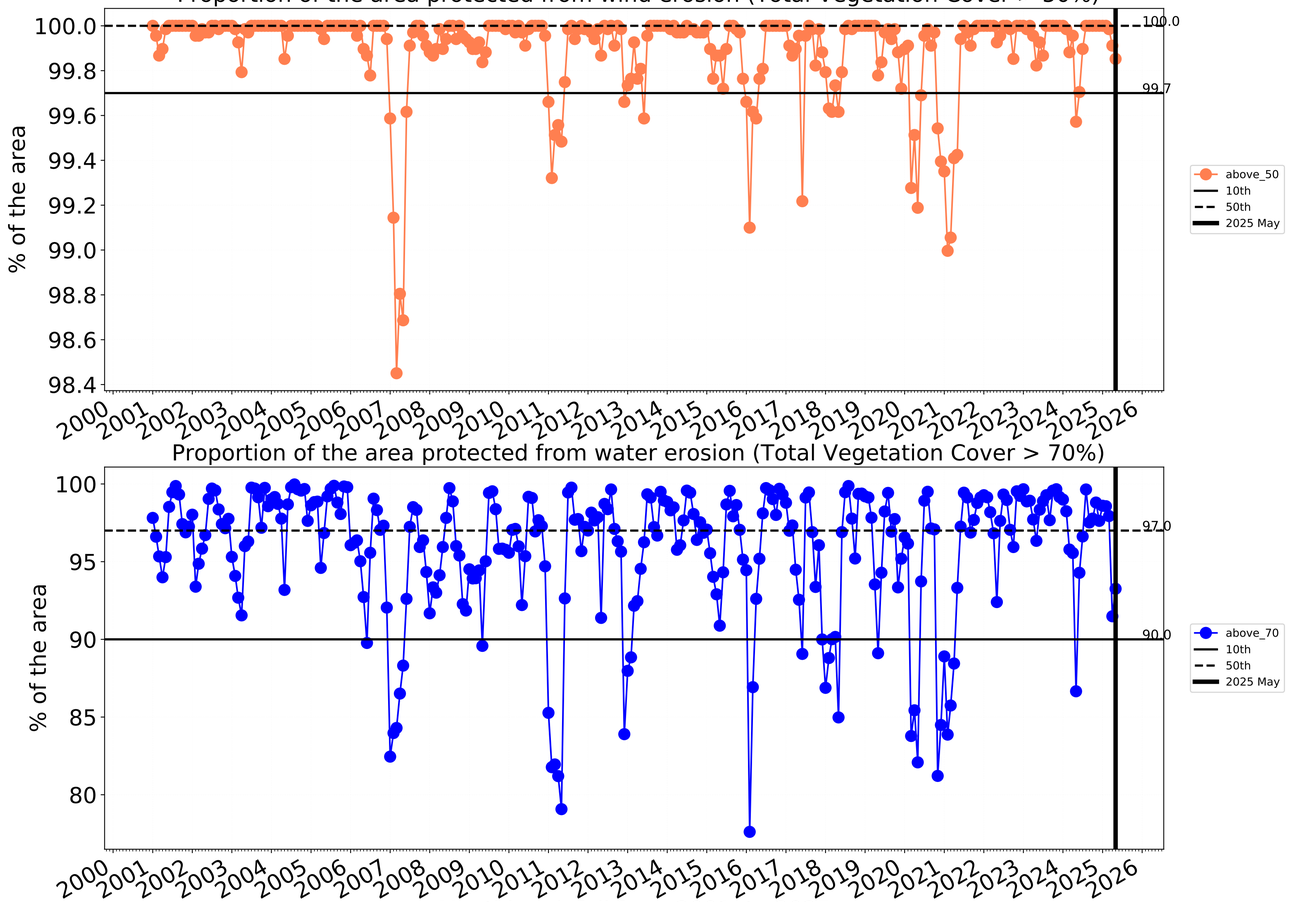


Total Vegetation Cover Decile [%]

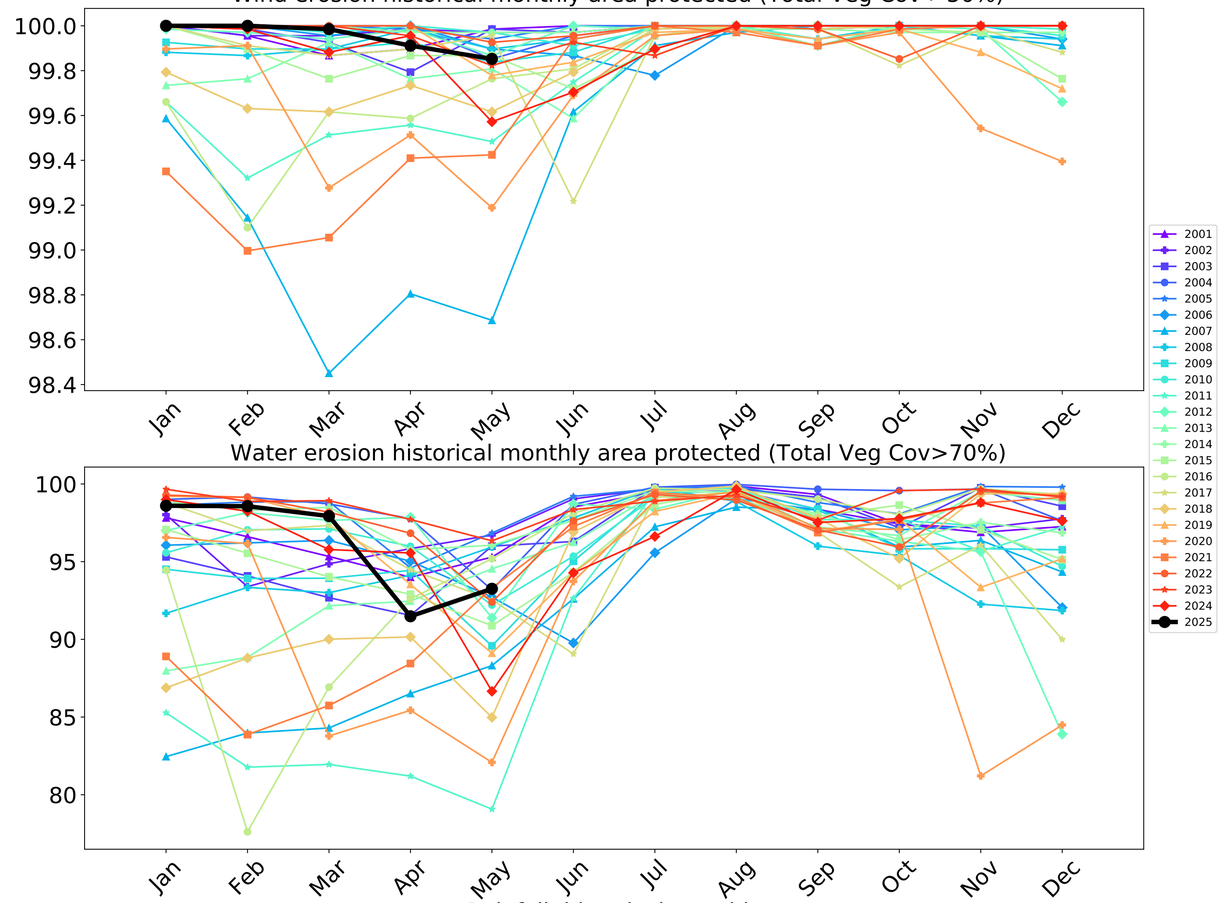
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



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

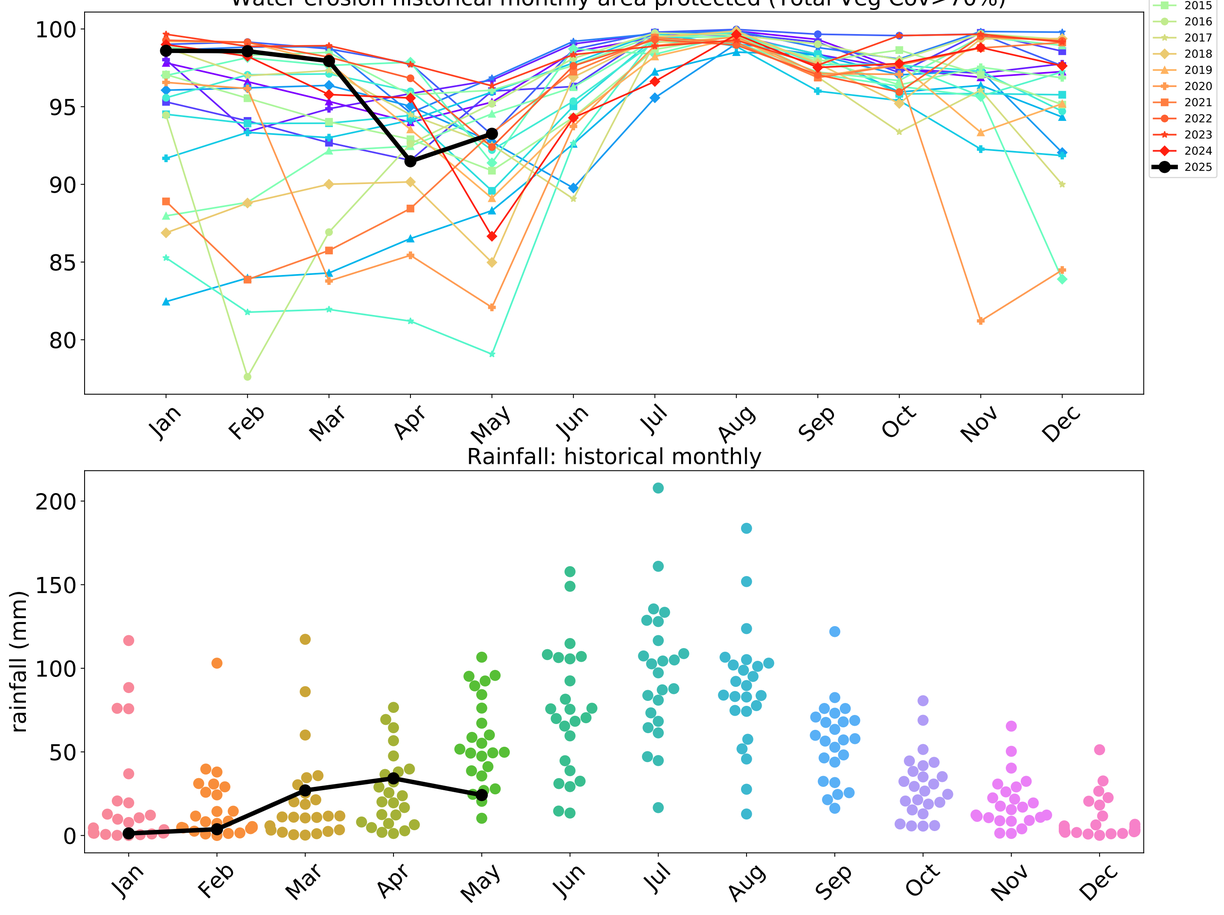


Wind erosion historical monthly area protected (Total Veg Cov >50%)



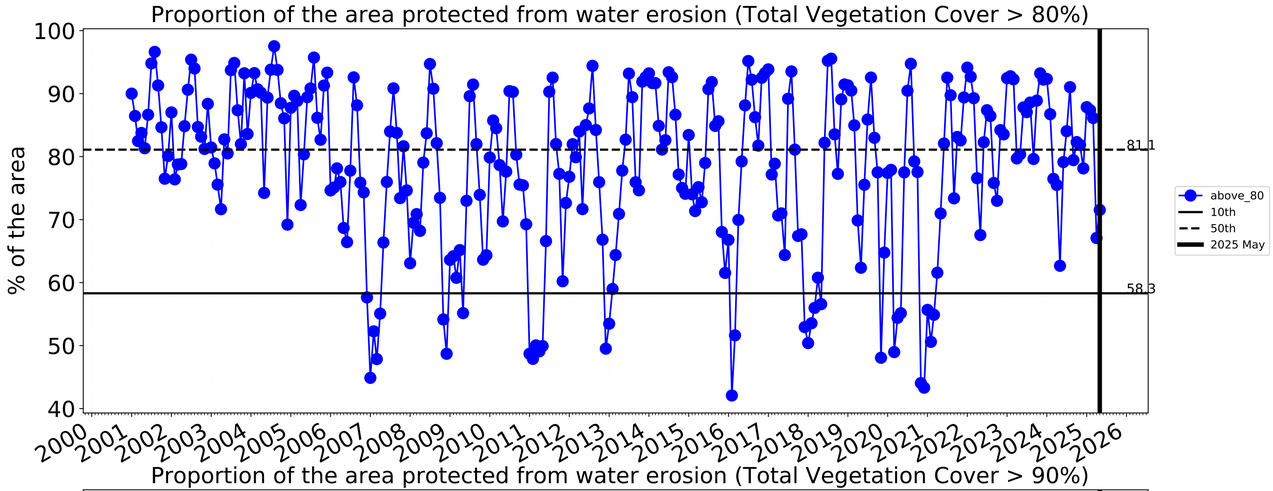
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

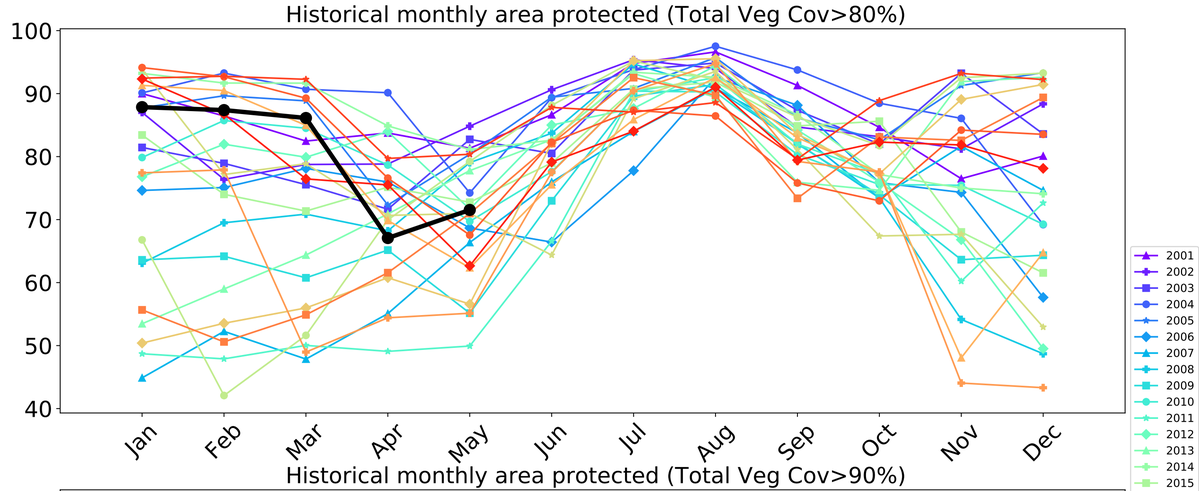
Water erosion historical monthly area protected (Total Veg Cov>70%)



Monthly rainfall from 2001 to 2025

Rainfall: historical monthly


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
81.1
58.3
above_80
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
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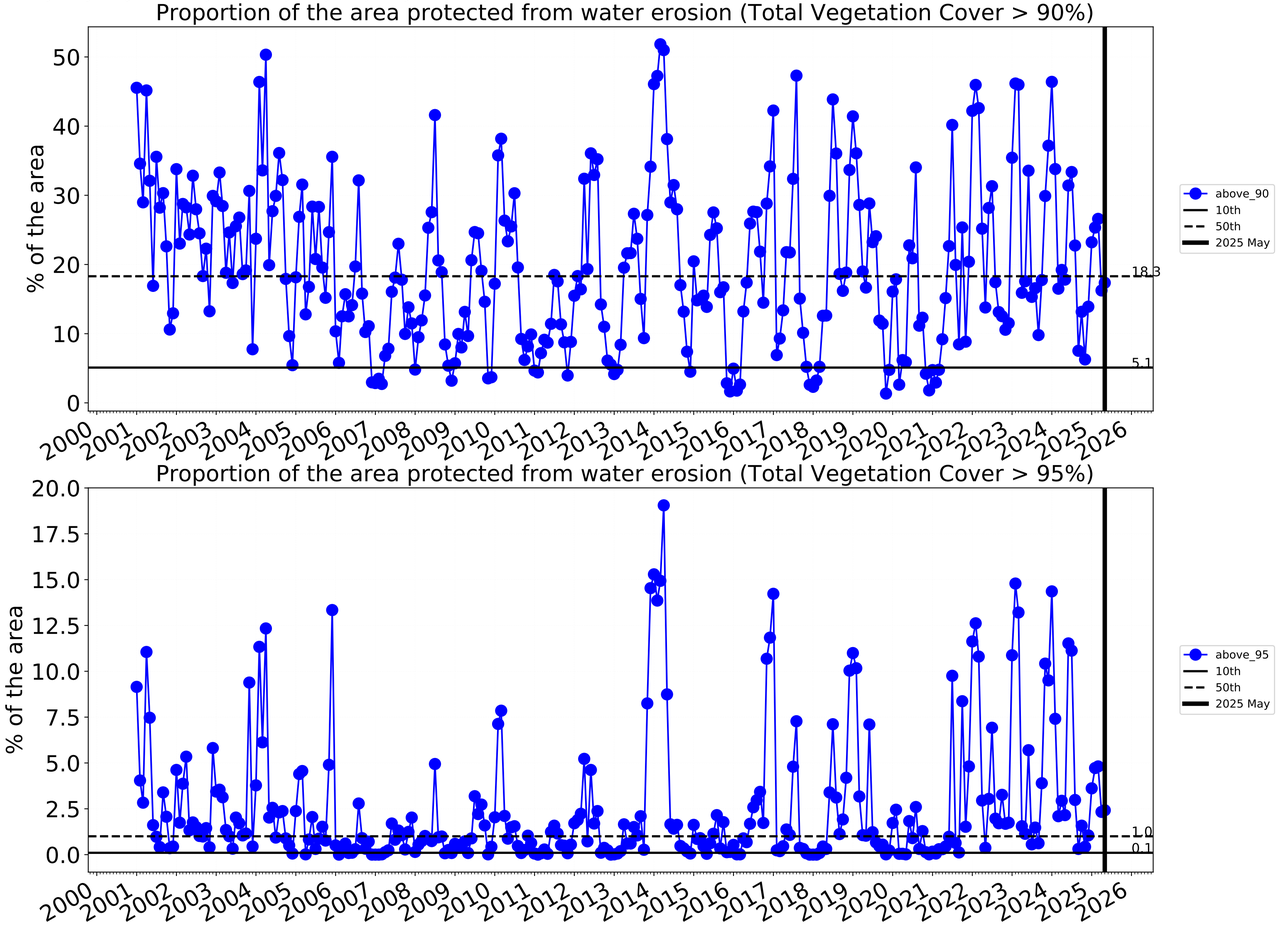
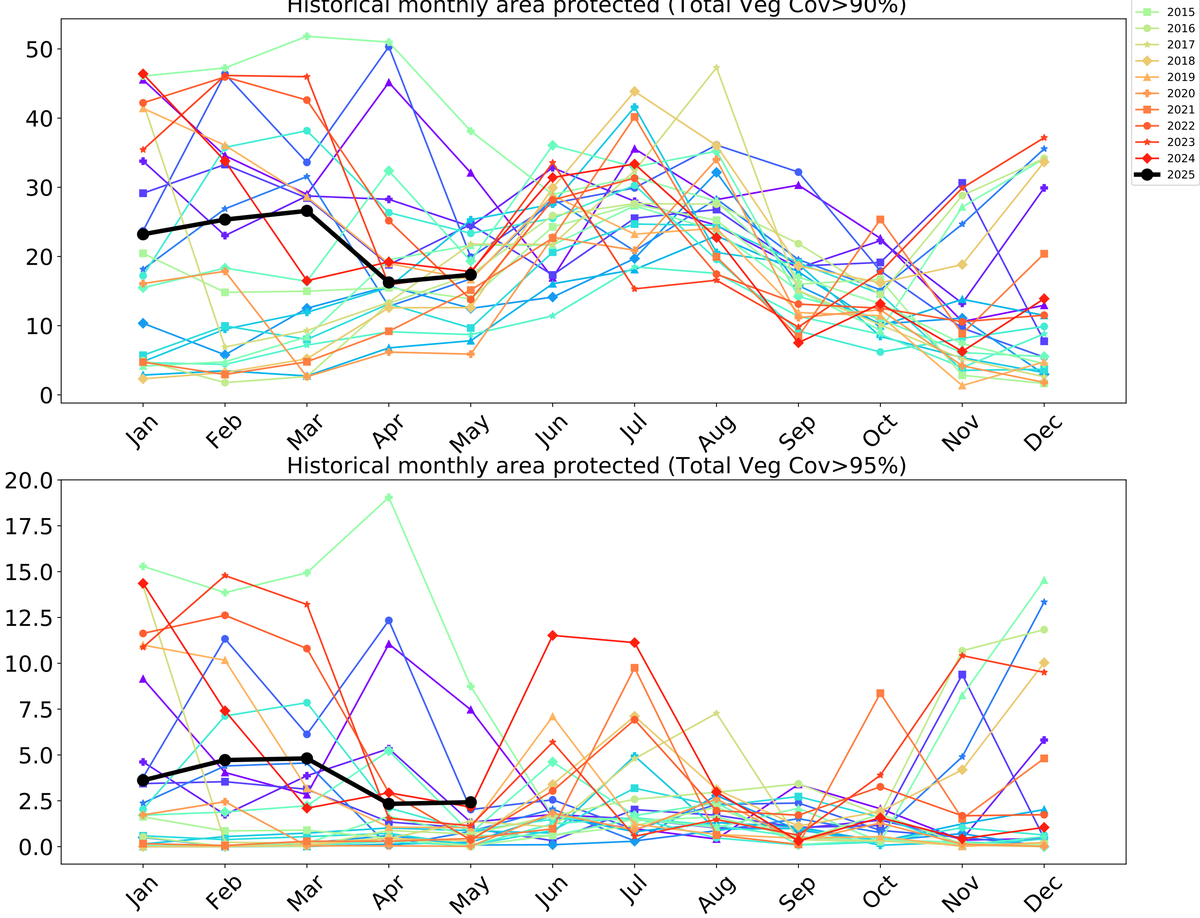

Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
18.3
5.1
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
1.0
0.1
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
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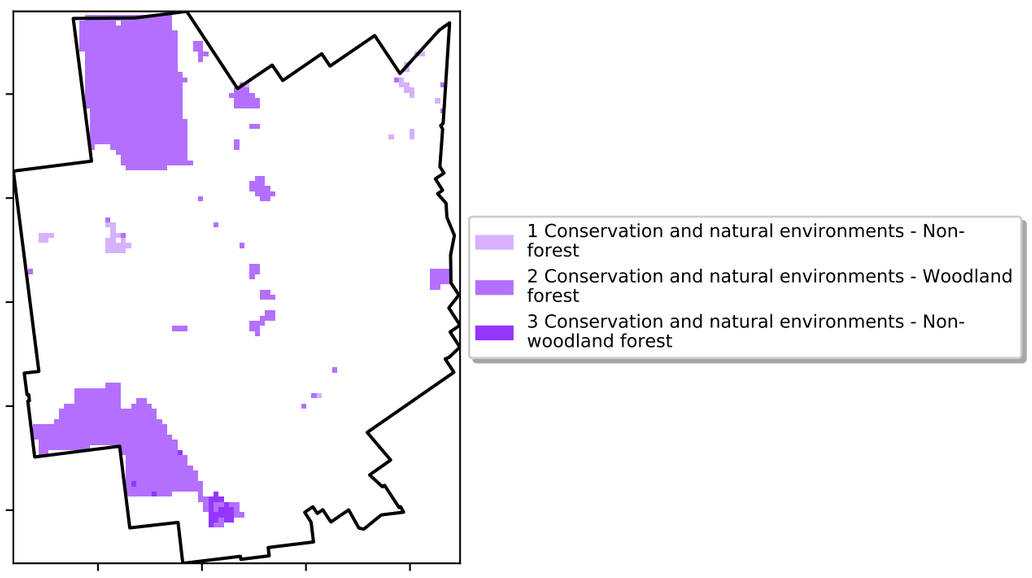
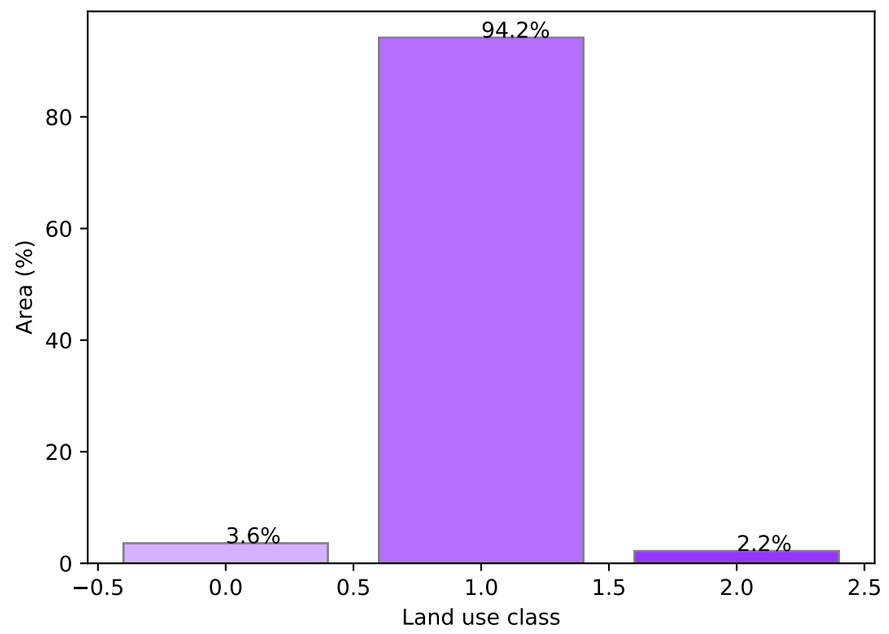
Conservation and natural environments

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

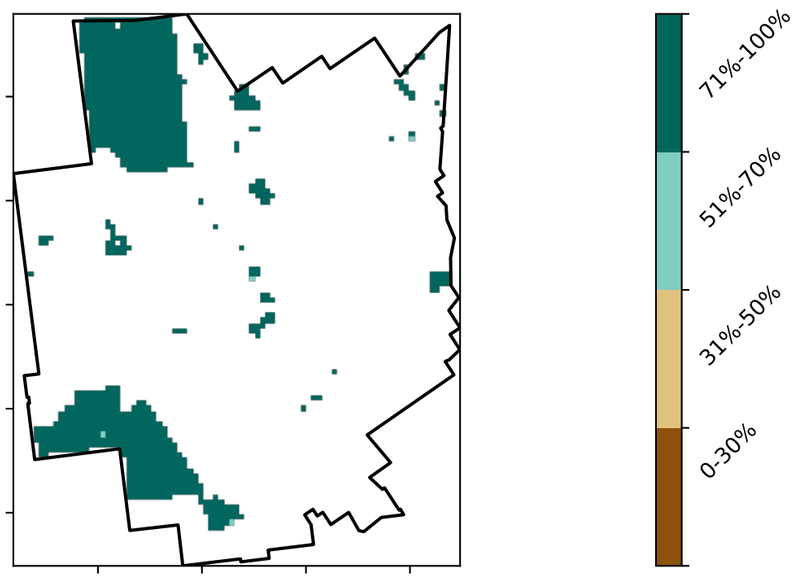
Land use and forest cover



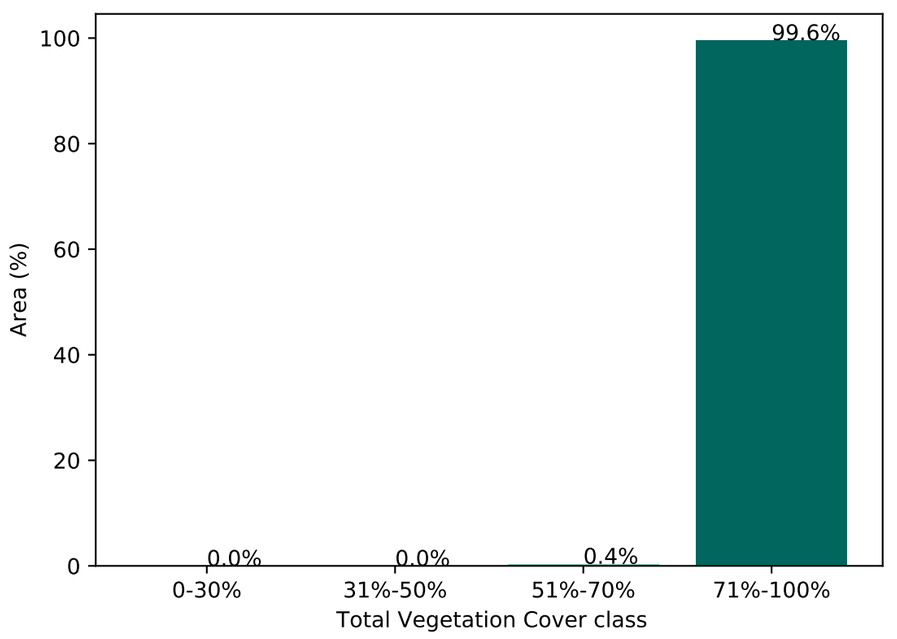
Proportion of each land class in area



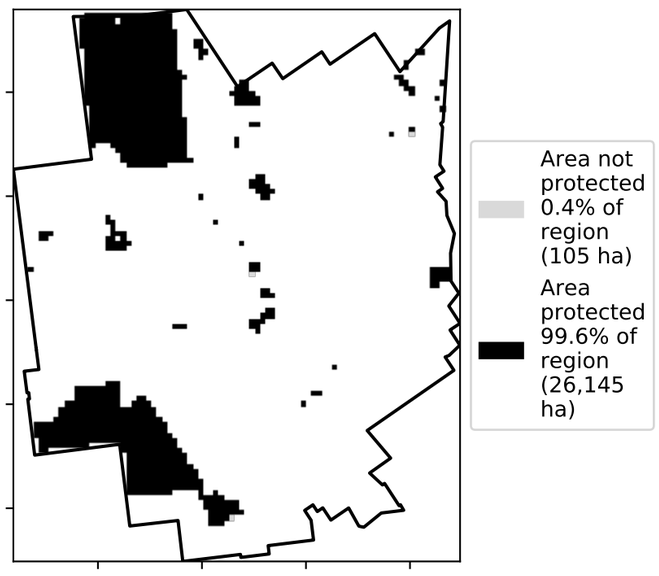
Total Vegetation Cover [%]



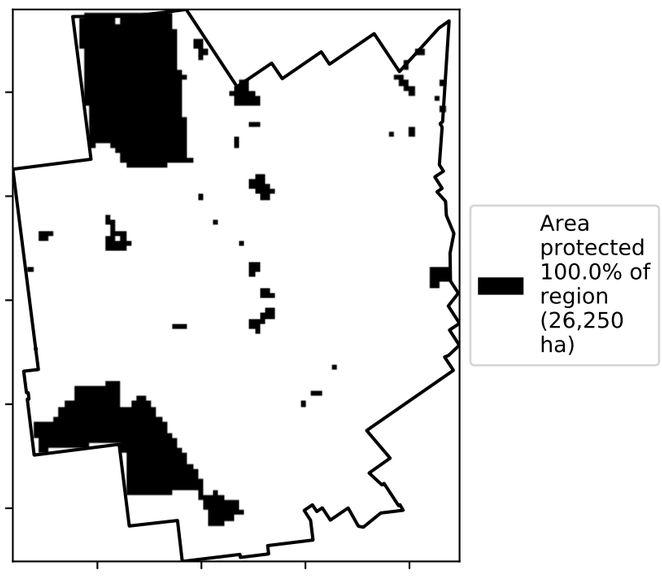
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



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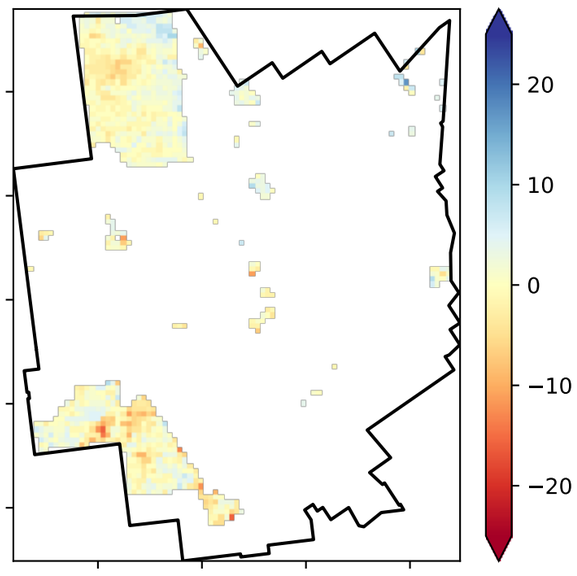

Total Vegetation Cover Decile [%]

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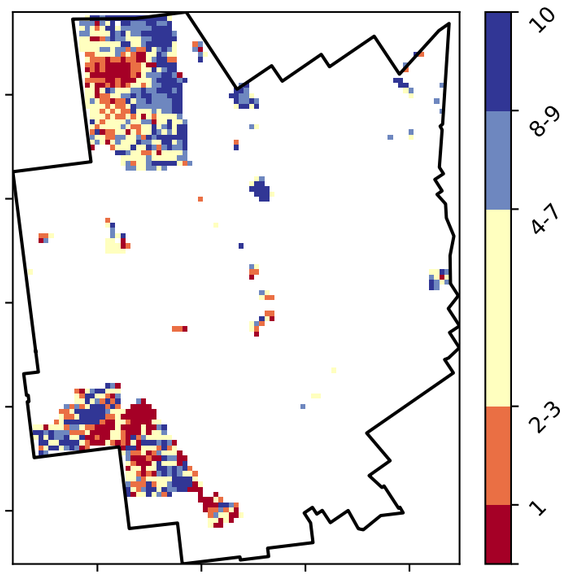
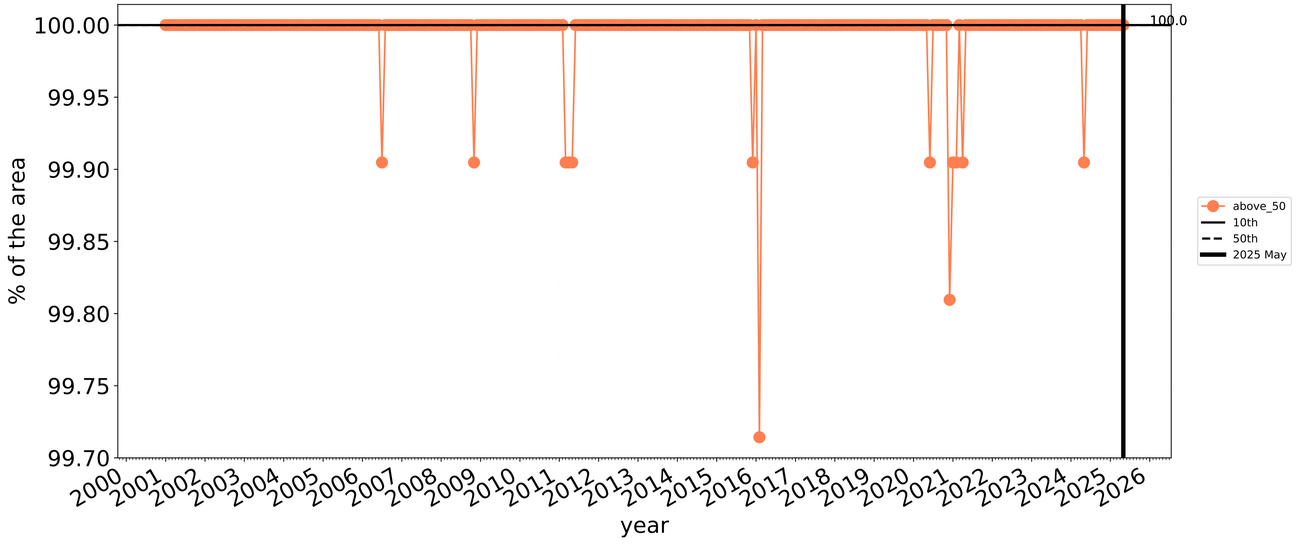
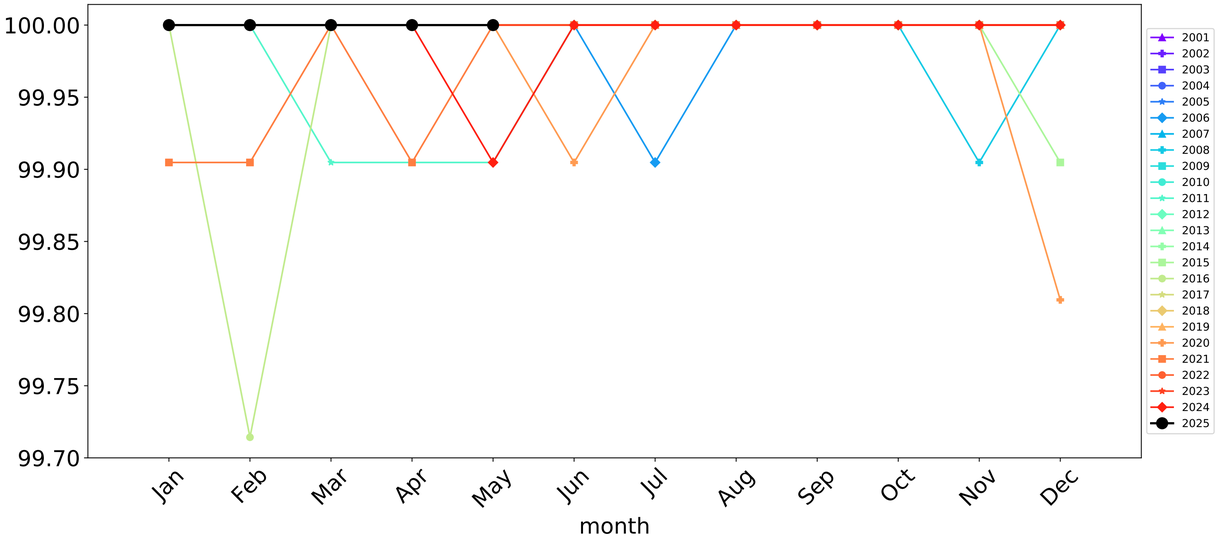


Conservation and natural environments timeseries

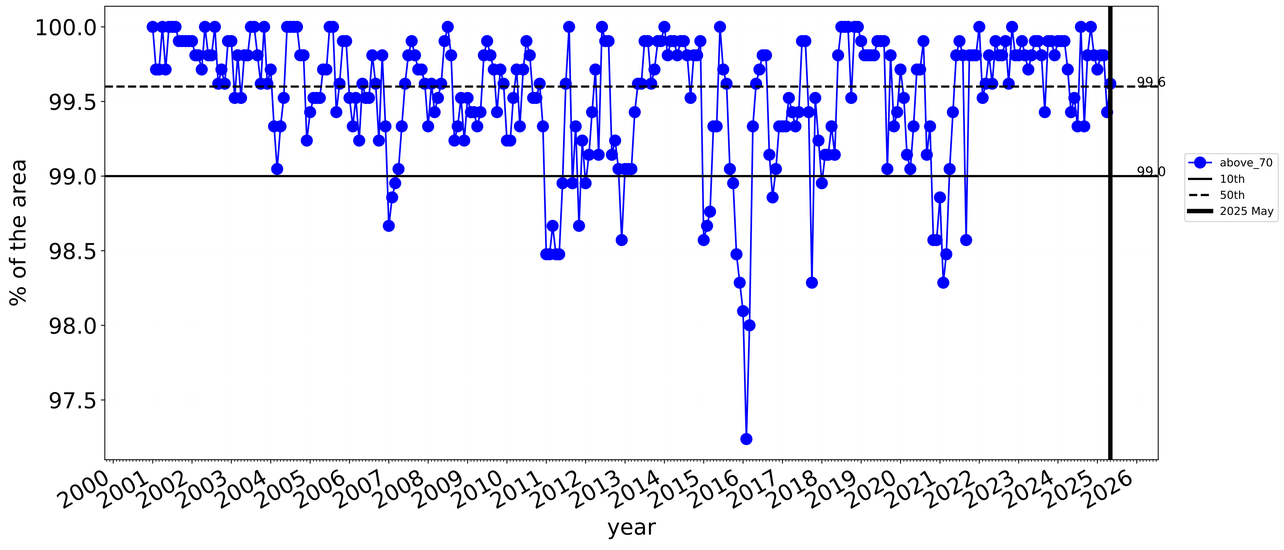
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



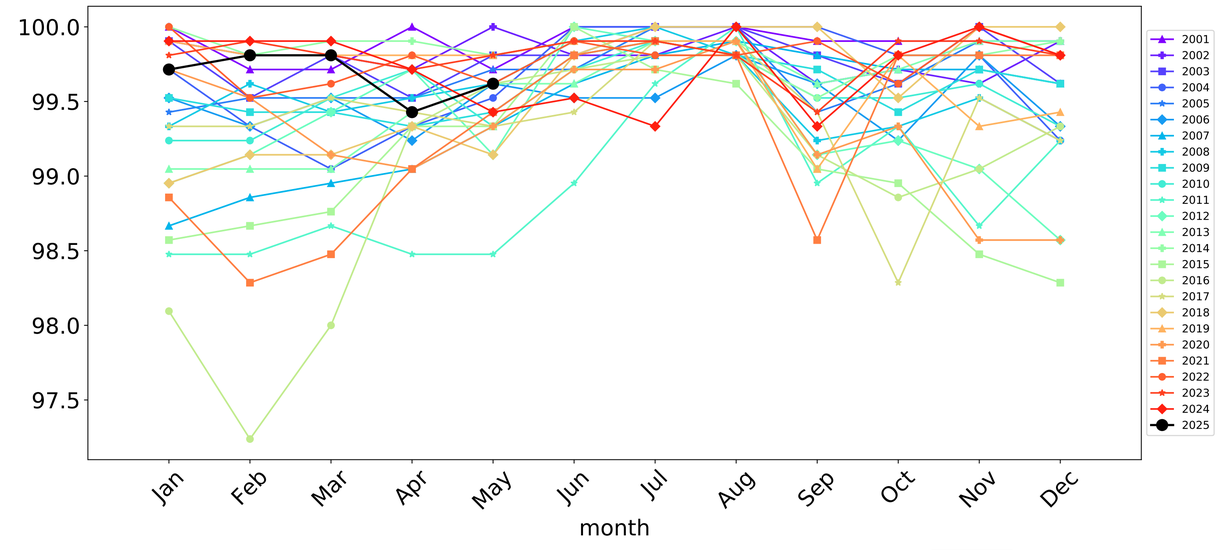
Wind erosion historical monthly area protected (Total Veg Cov >50%)

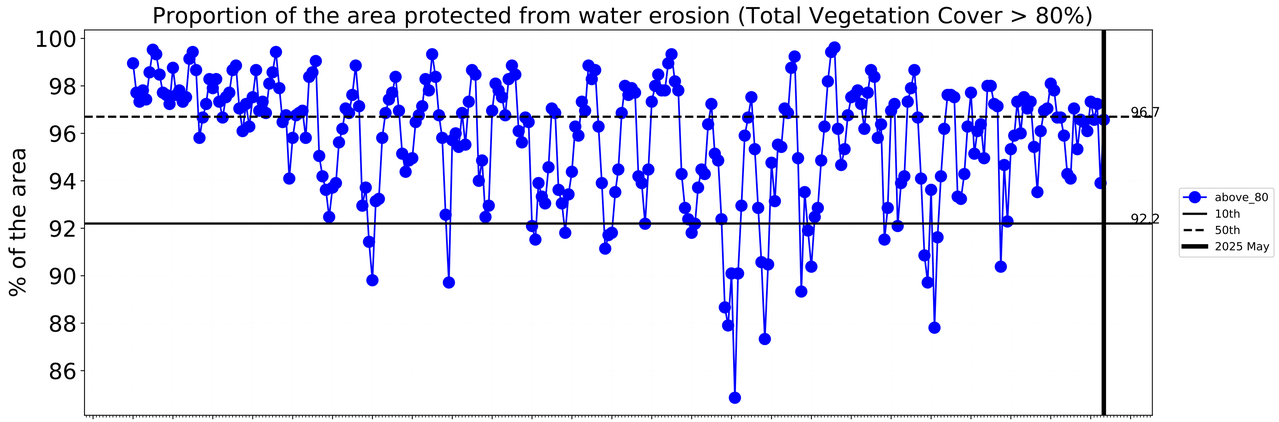


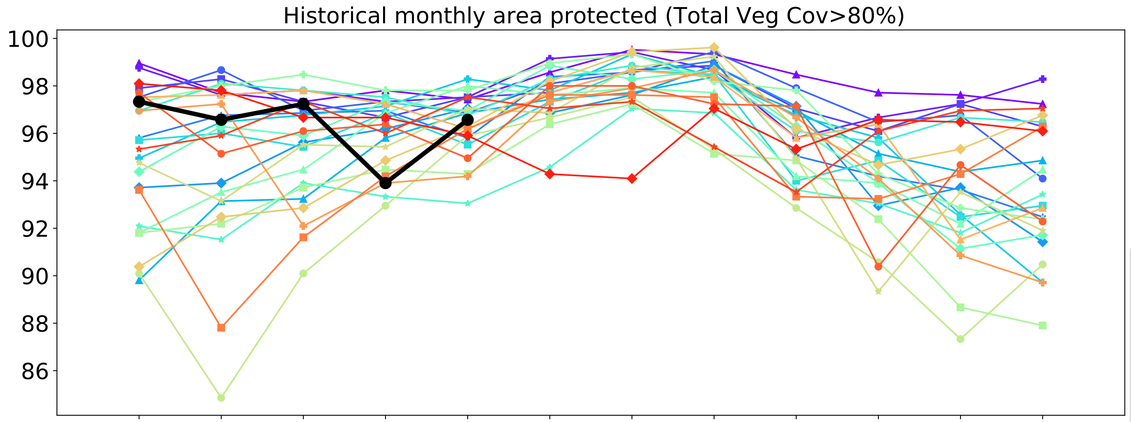
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
96.7
92.2
above_80
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
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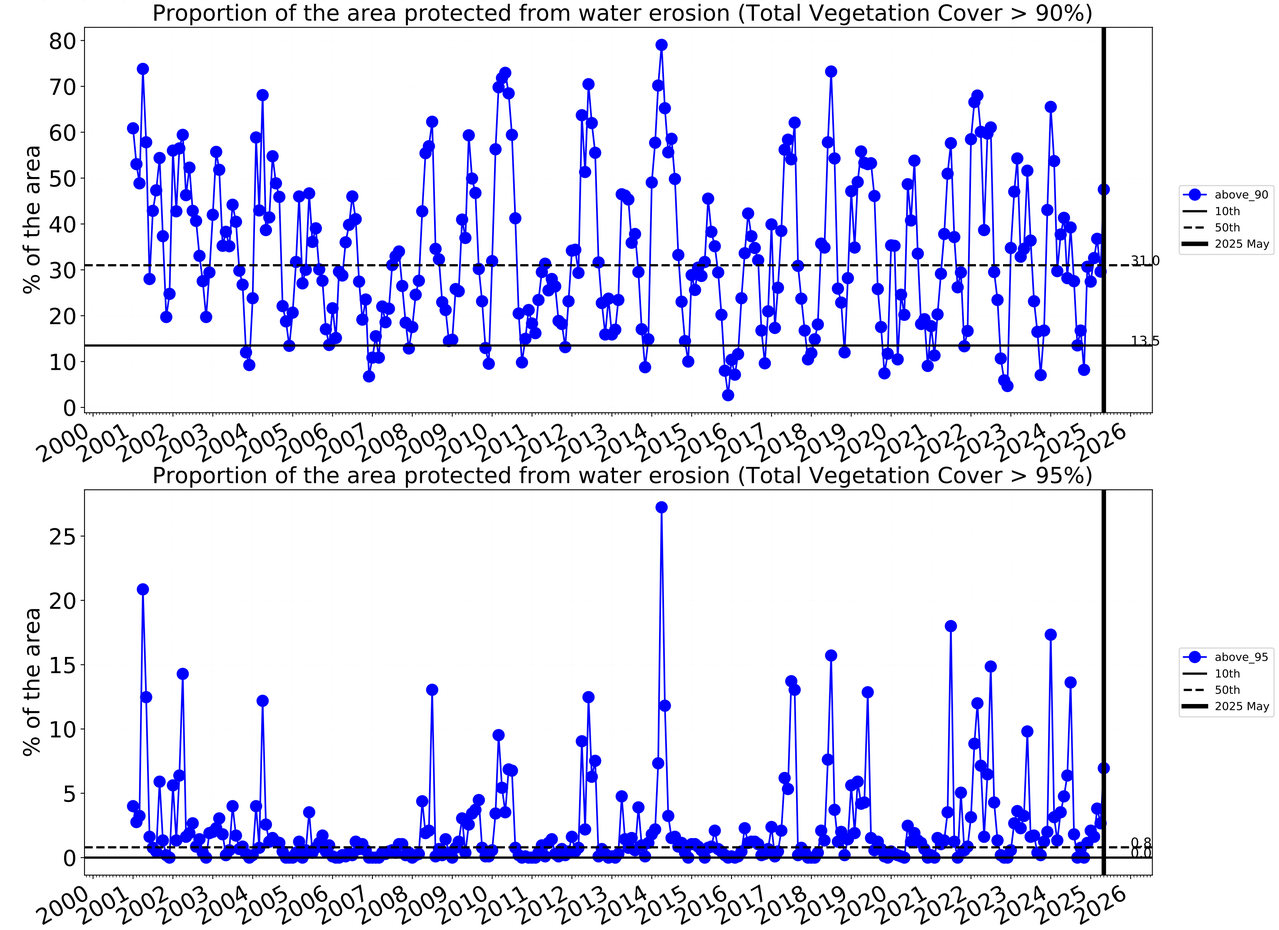
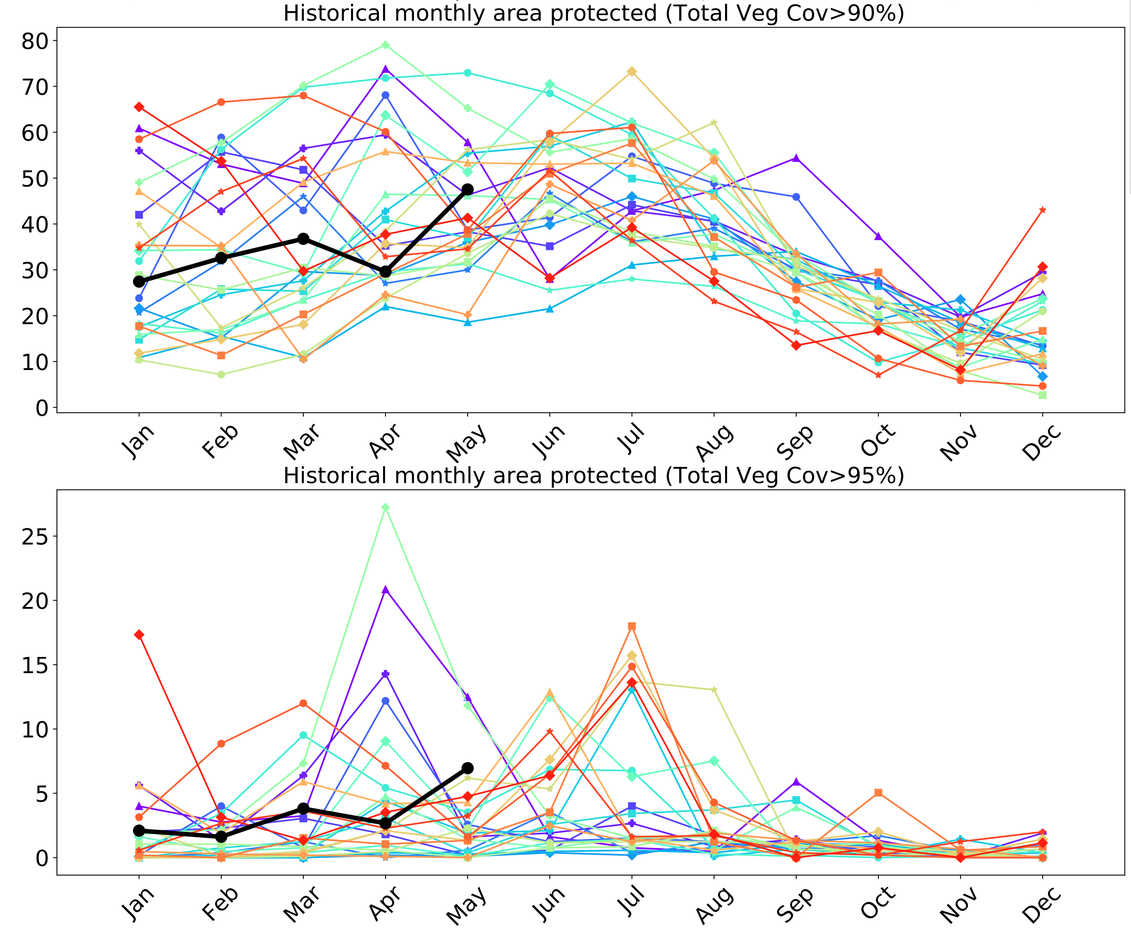

Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
31.0
13.5
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
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Conservation and natural environments Woodland forest

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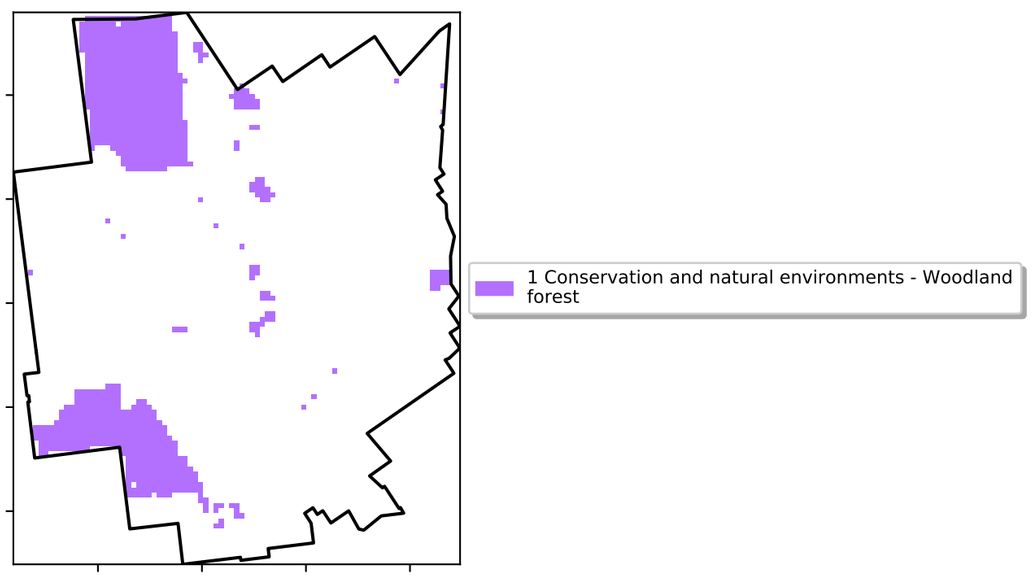
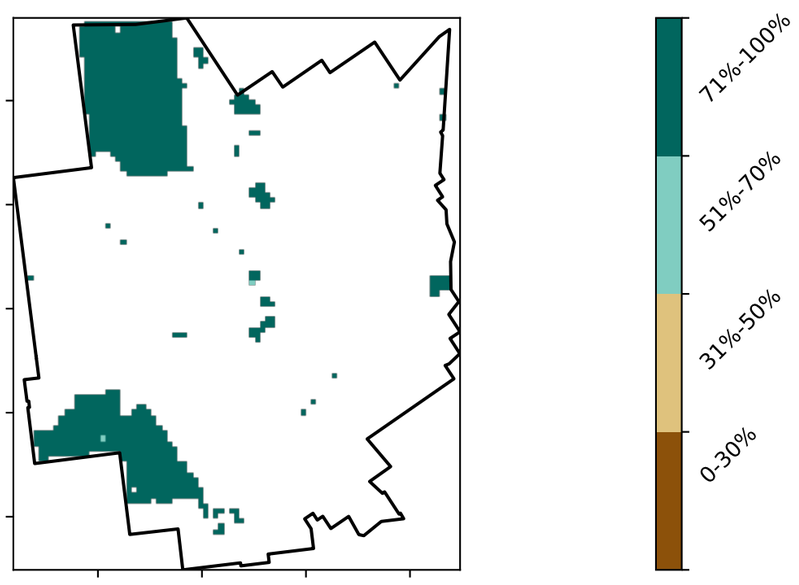
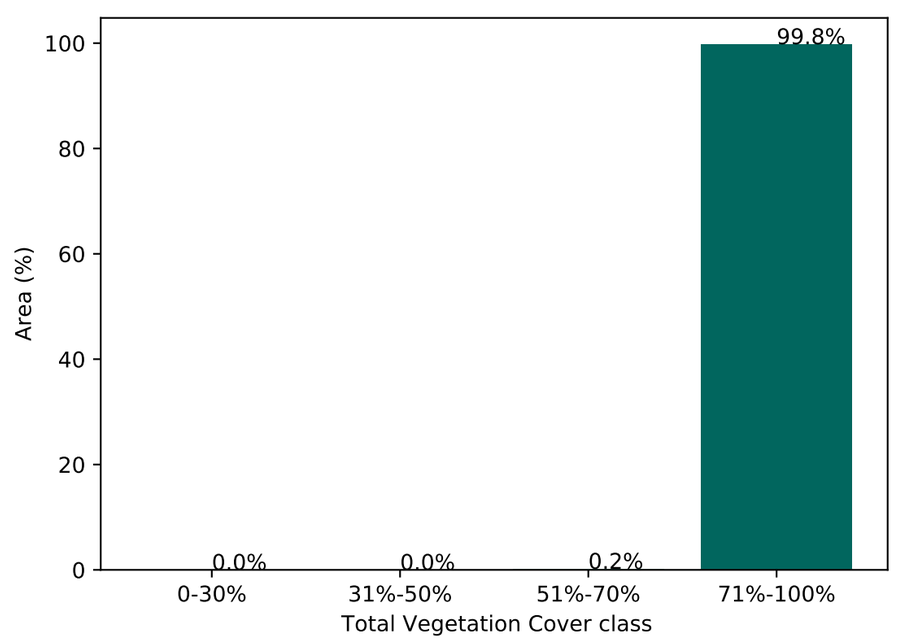
Land use and forest cover



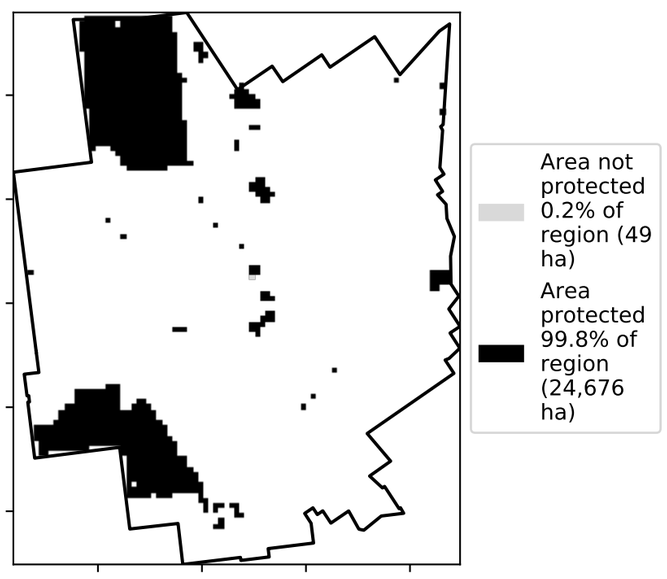
Total Vegetation Cover [%]



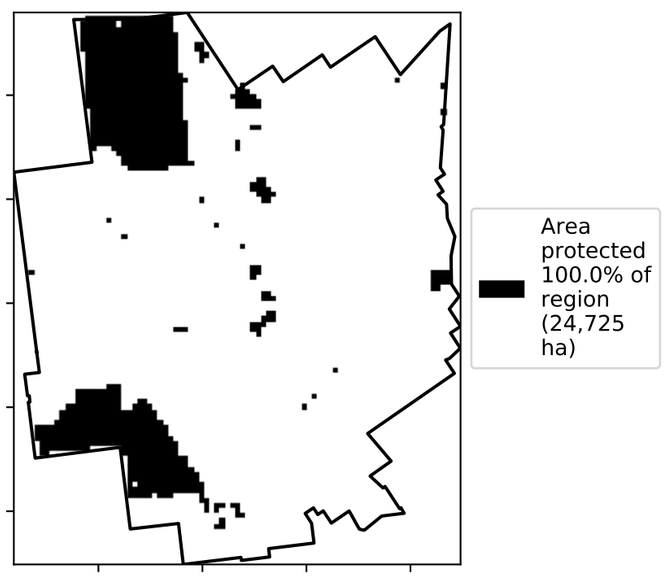
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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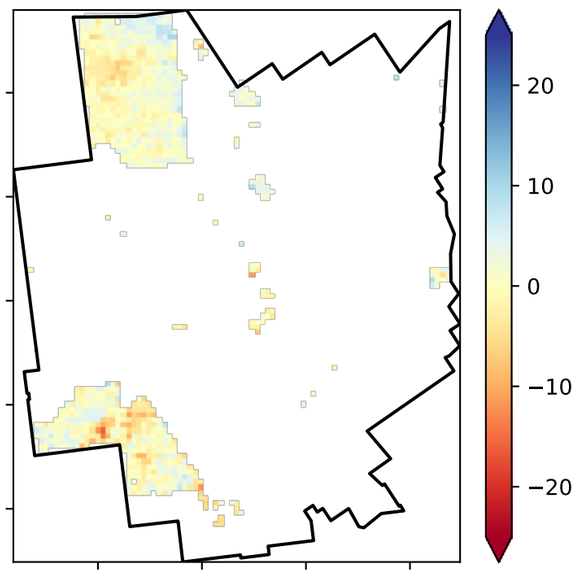
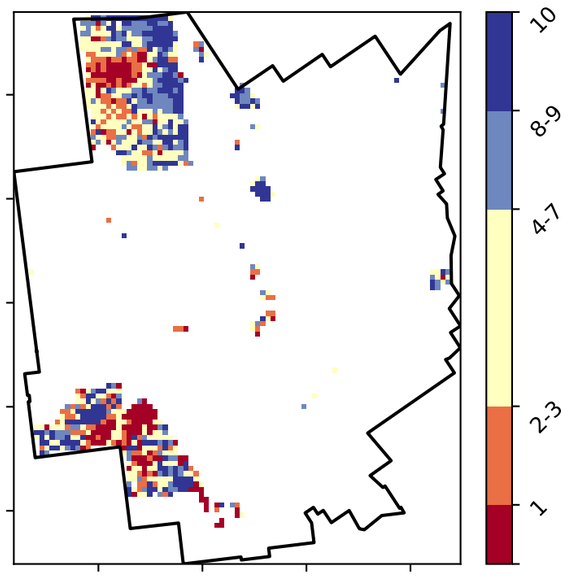


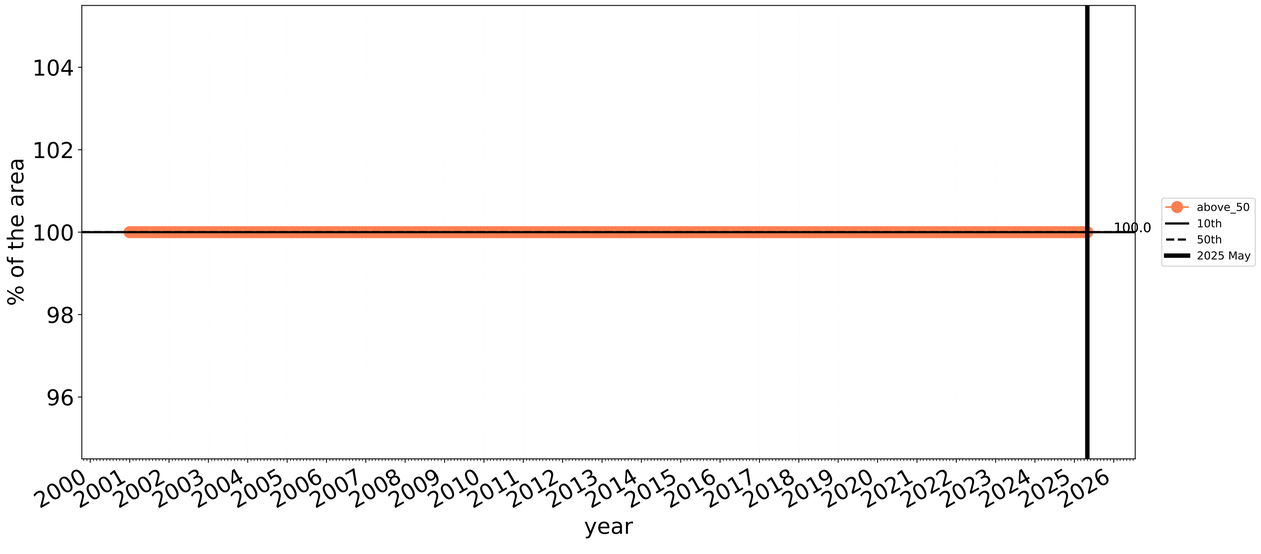
Total Vegetation Cover Decile [%]

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.

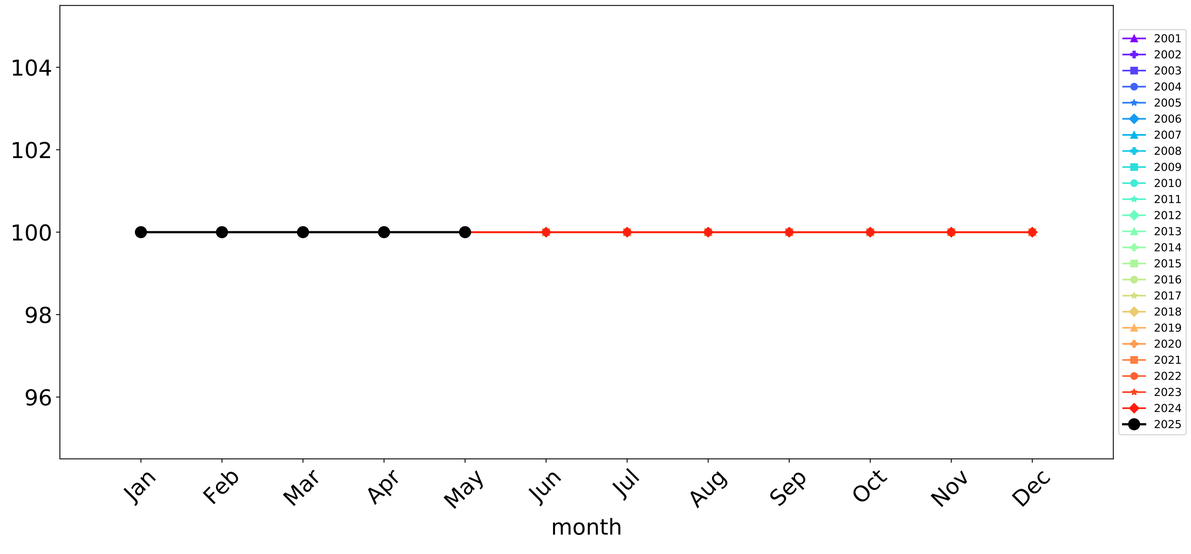


Conservation and natural environments Woodland forest timeseries

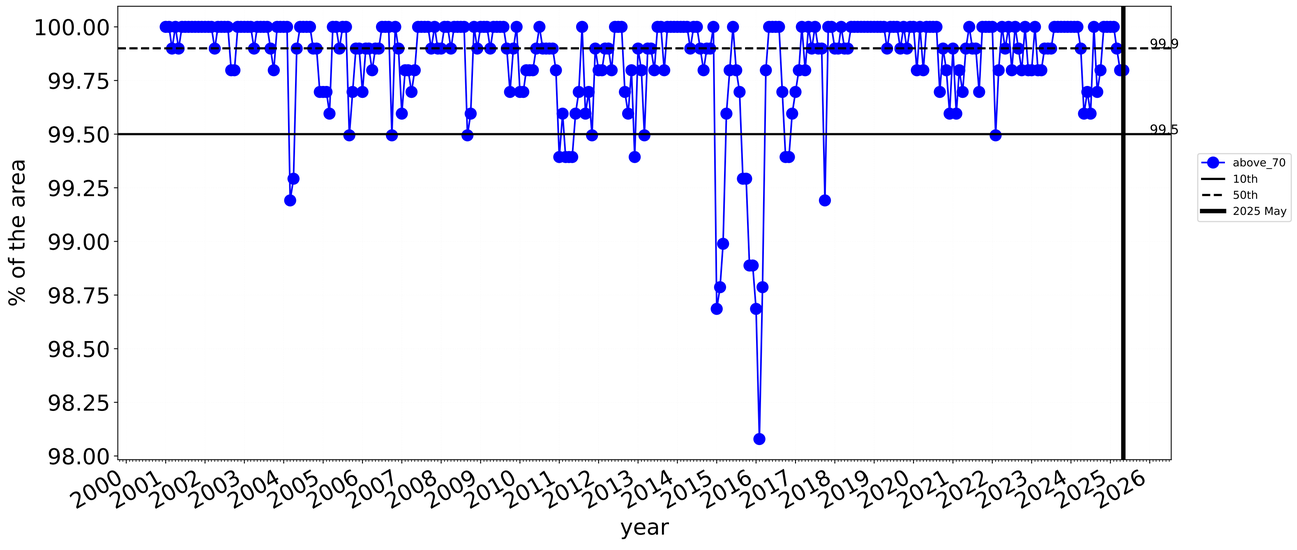
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



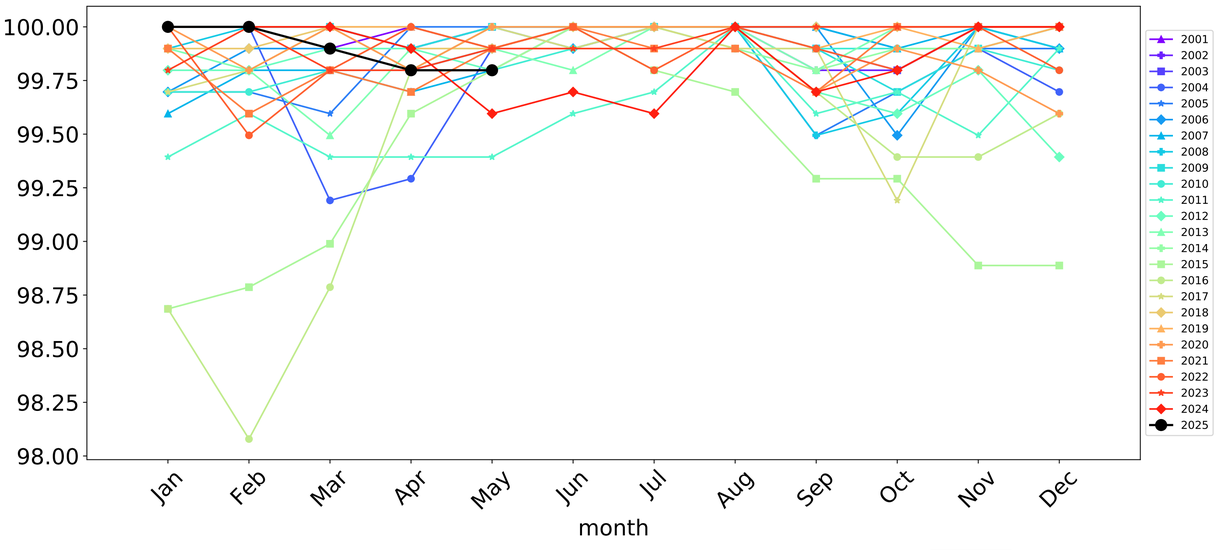
Wind erosion historical monthly area protected (Total Veg Cov >50%)

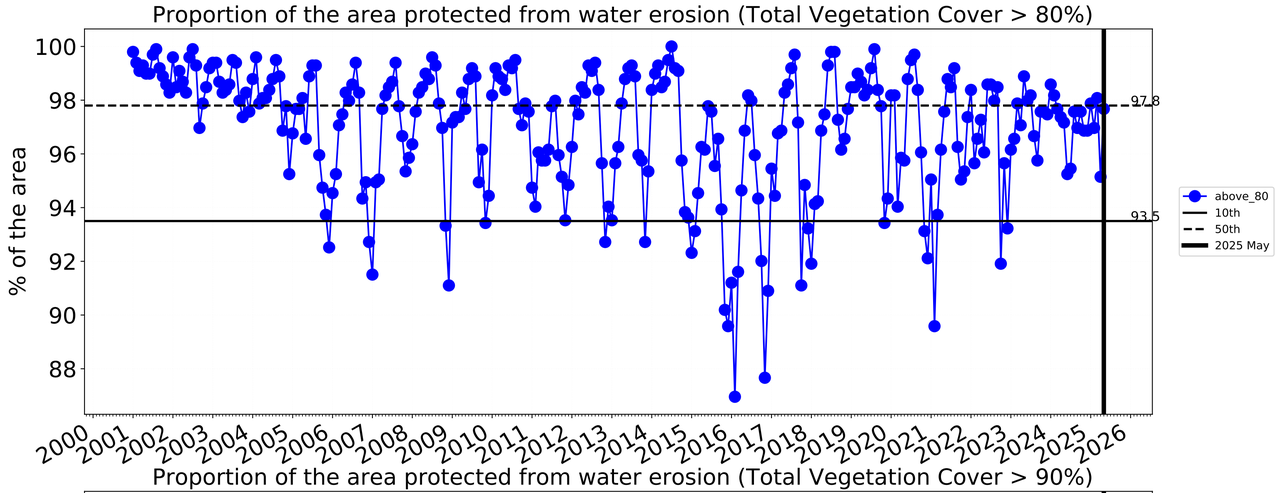


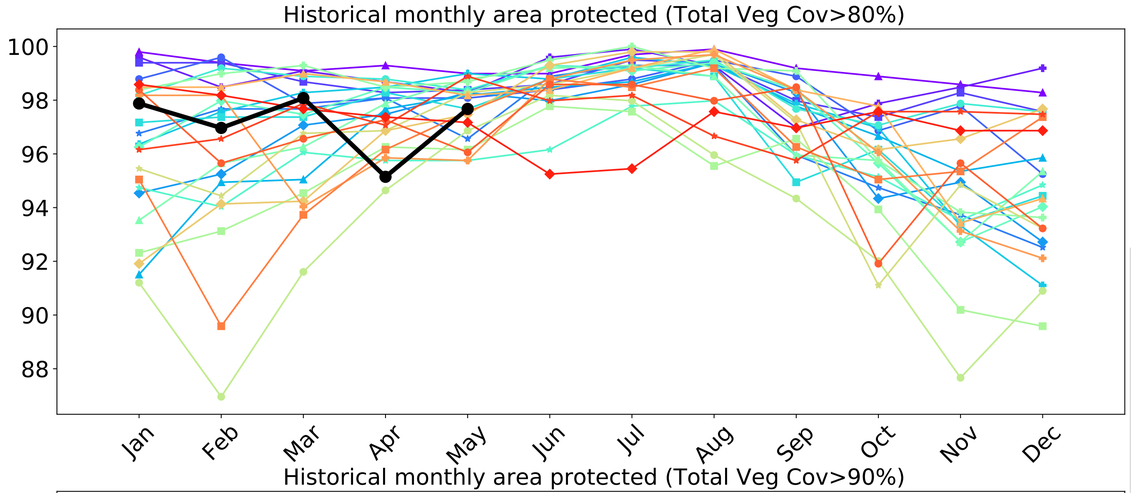
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
97.8
93.5
above_80
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
Jan
Feb
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2001
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2003
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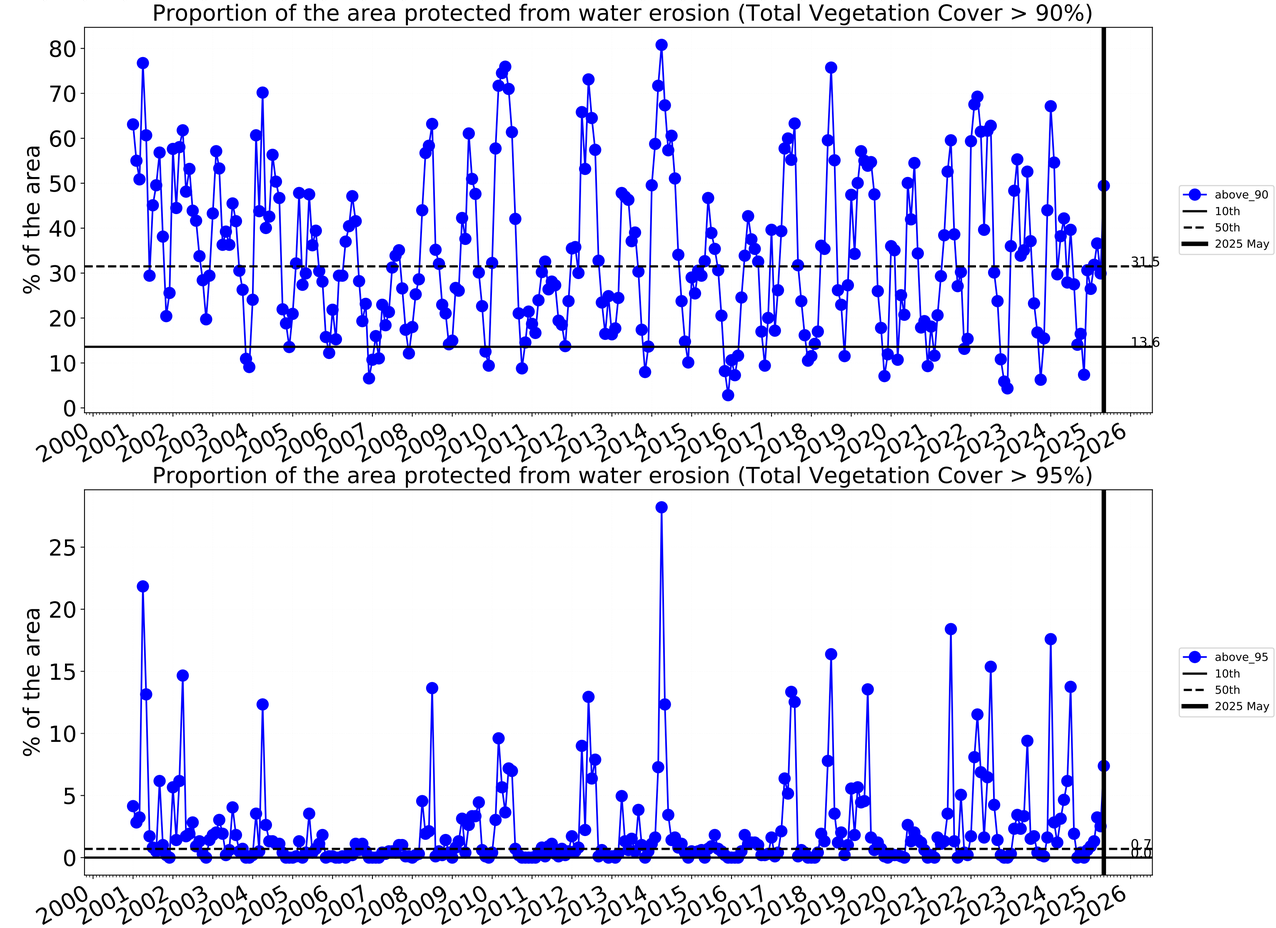
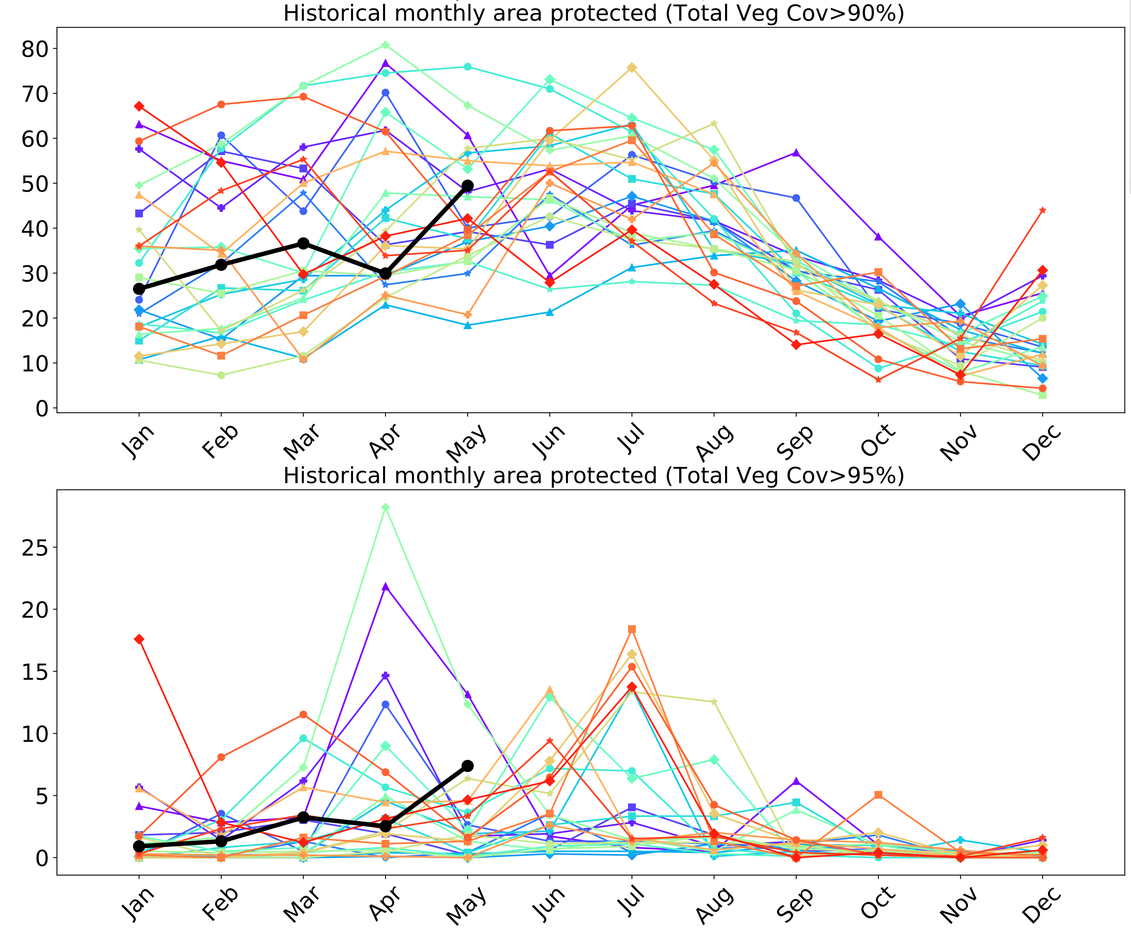
2024
2025


Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
31.5
13.6
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
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May
Jun
Jul
Aug
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Oct
Nov
Dec
2001
2002
2003
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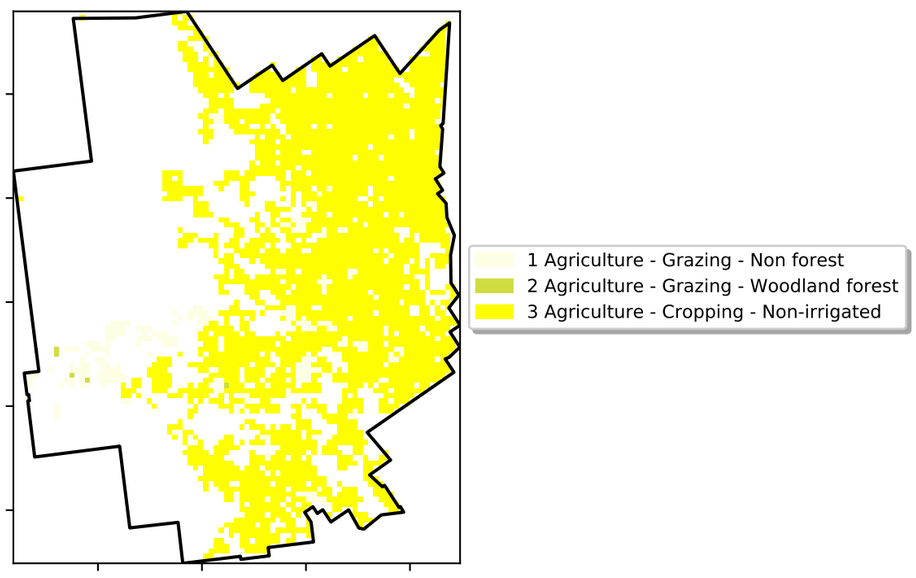
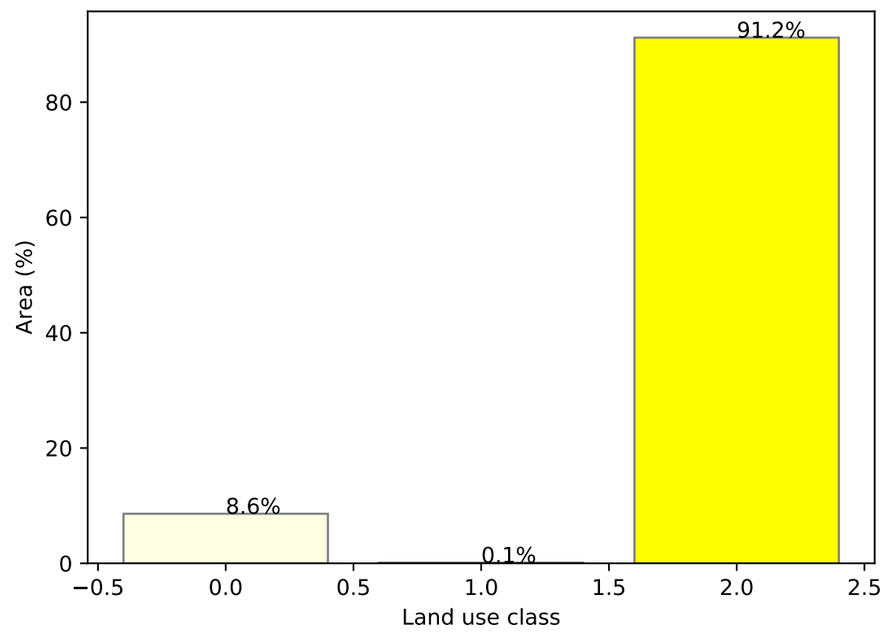
Agriculture

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

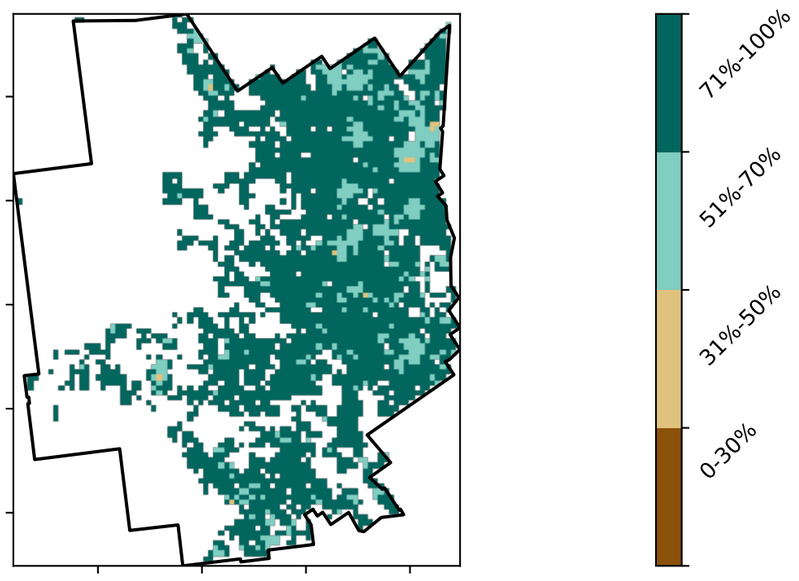
Land use and forest cover



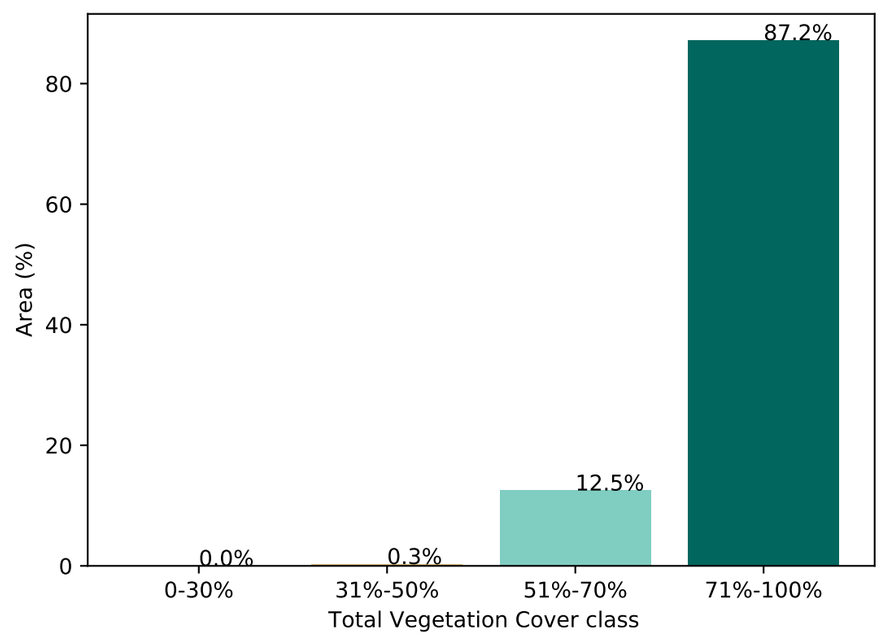
Proportion of each land class in area



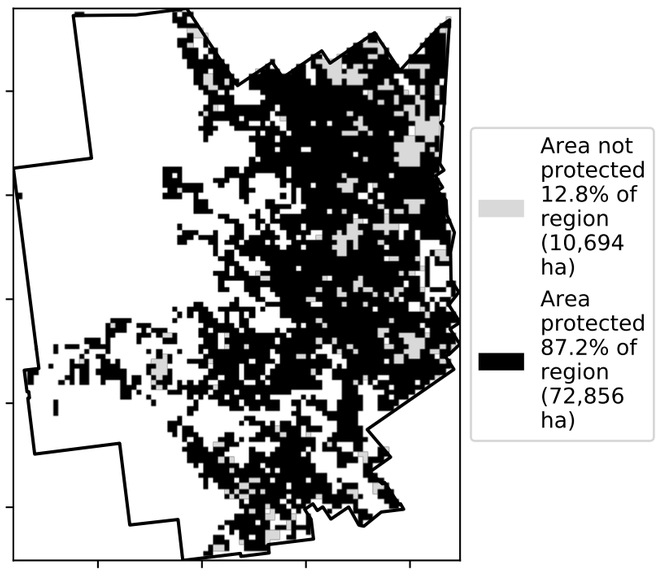
Total Vegetation Cover [%]



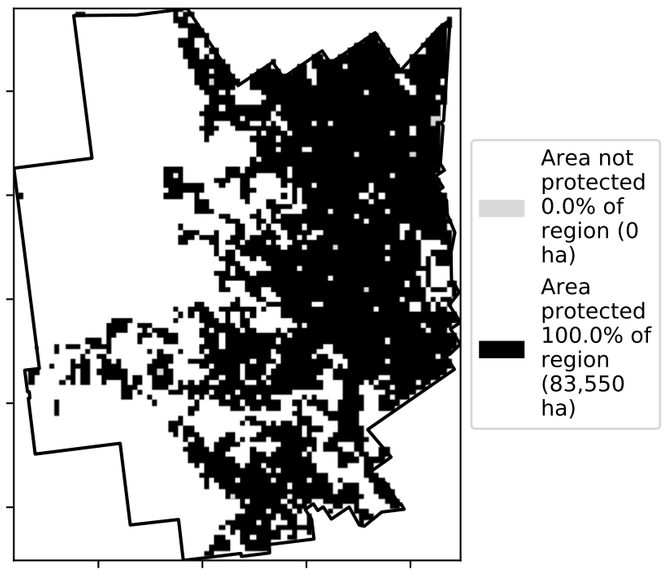
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

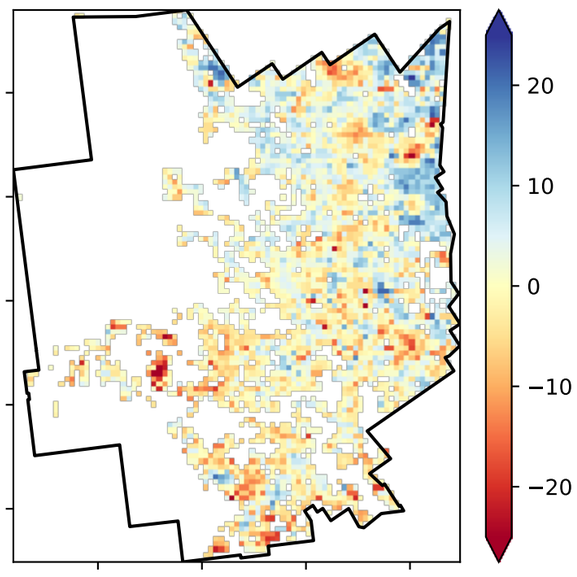


% Area protected from wind erosion (>50%)



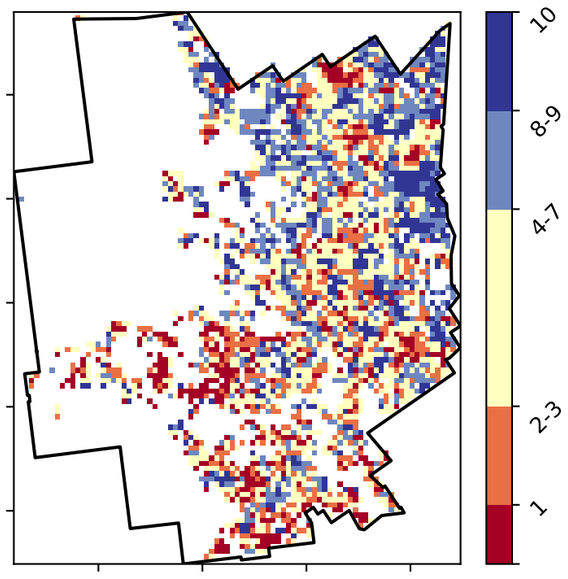
Total Vegetation Cover Anomaly [%]

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.



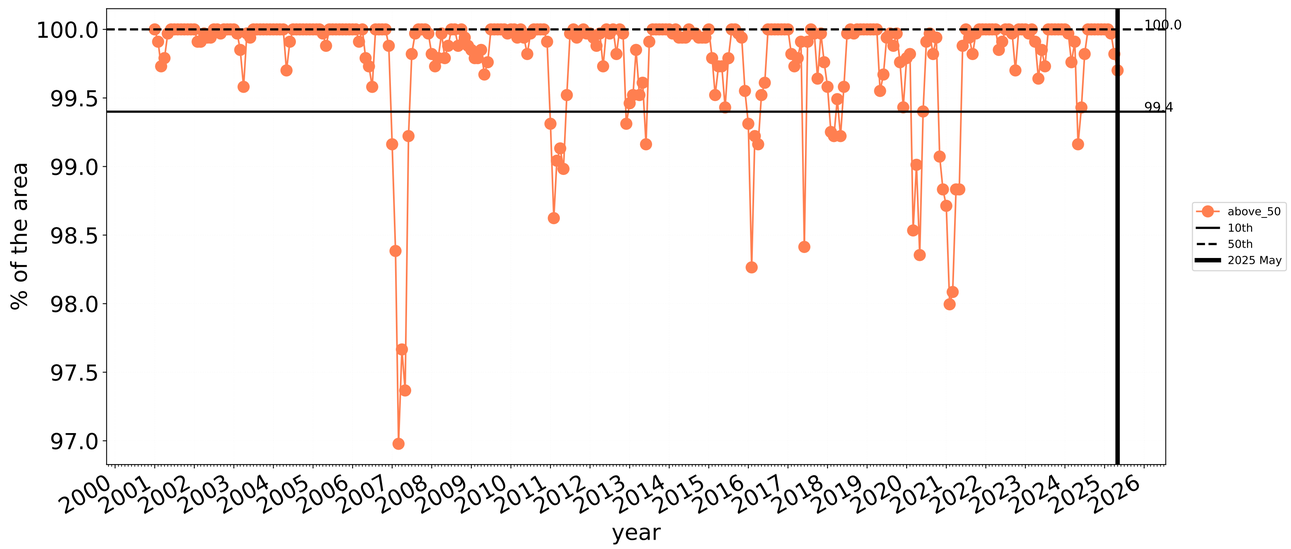
Total Vegetation Cover Decile [%]

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.

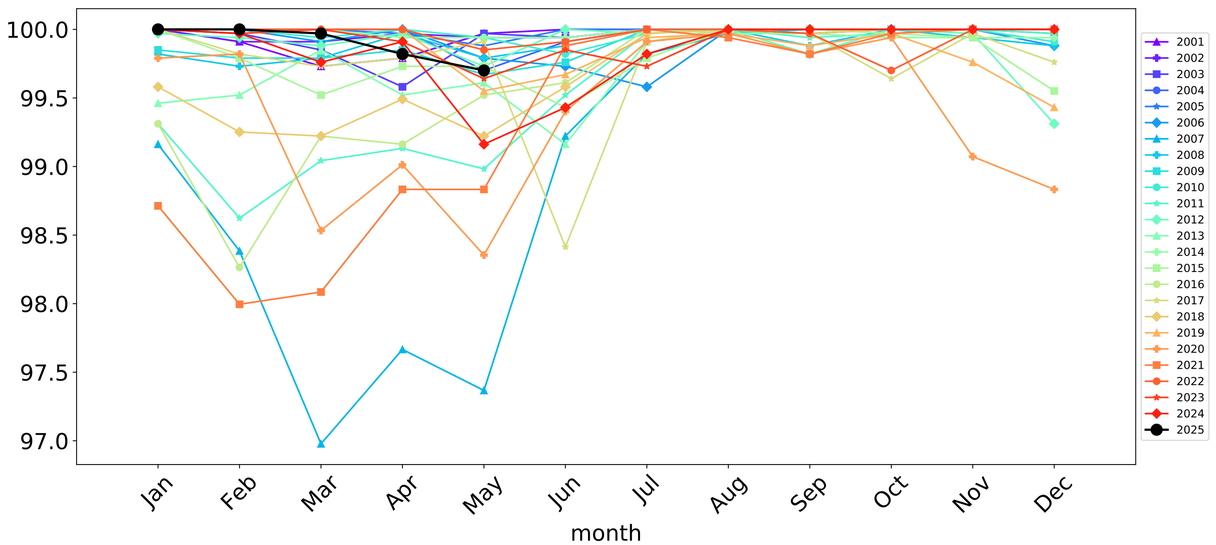


Agriculture timeseries

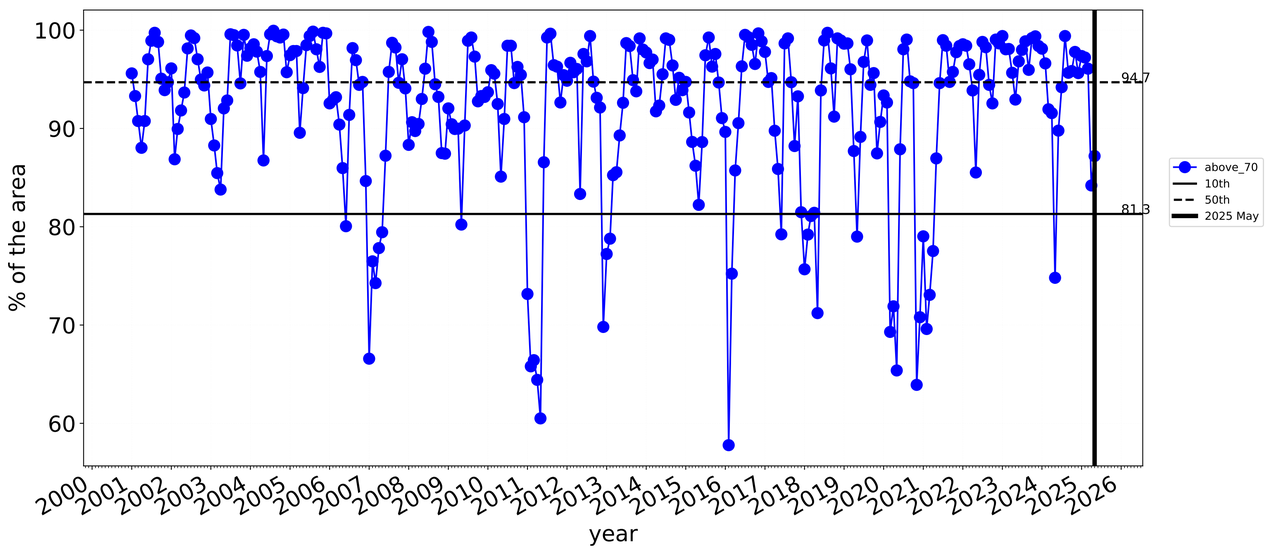
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



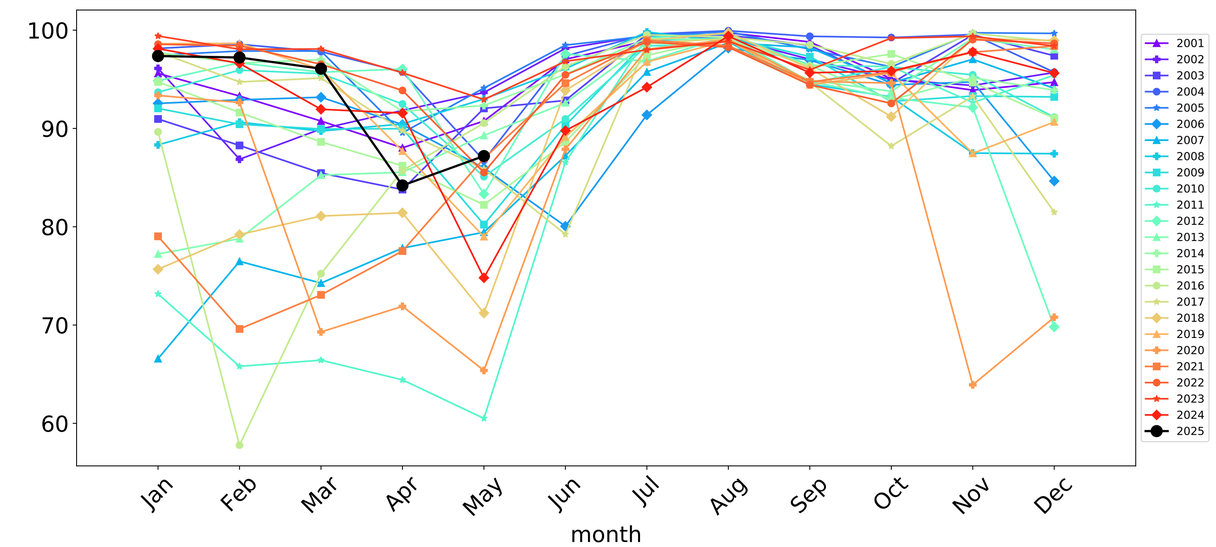
Wind erosion historical monthly area protected (Total Veg Cov >50%)

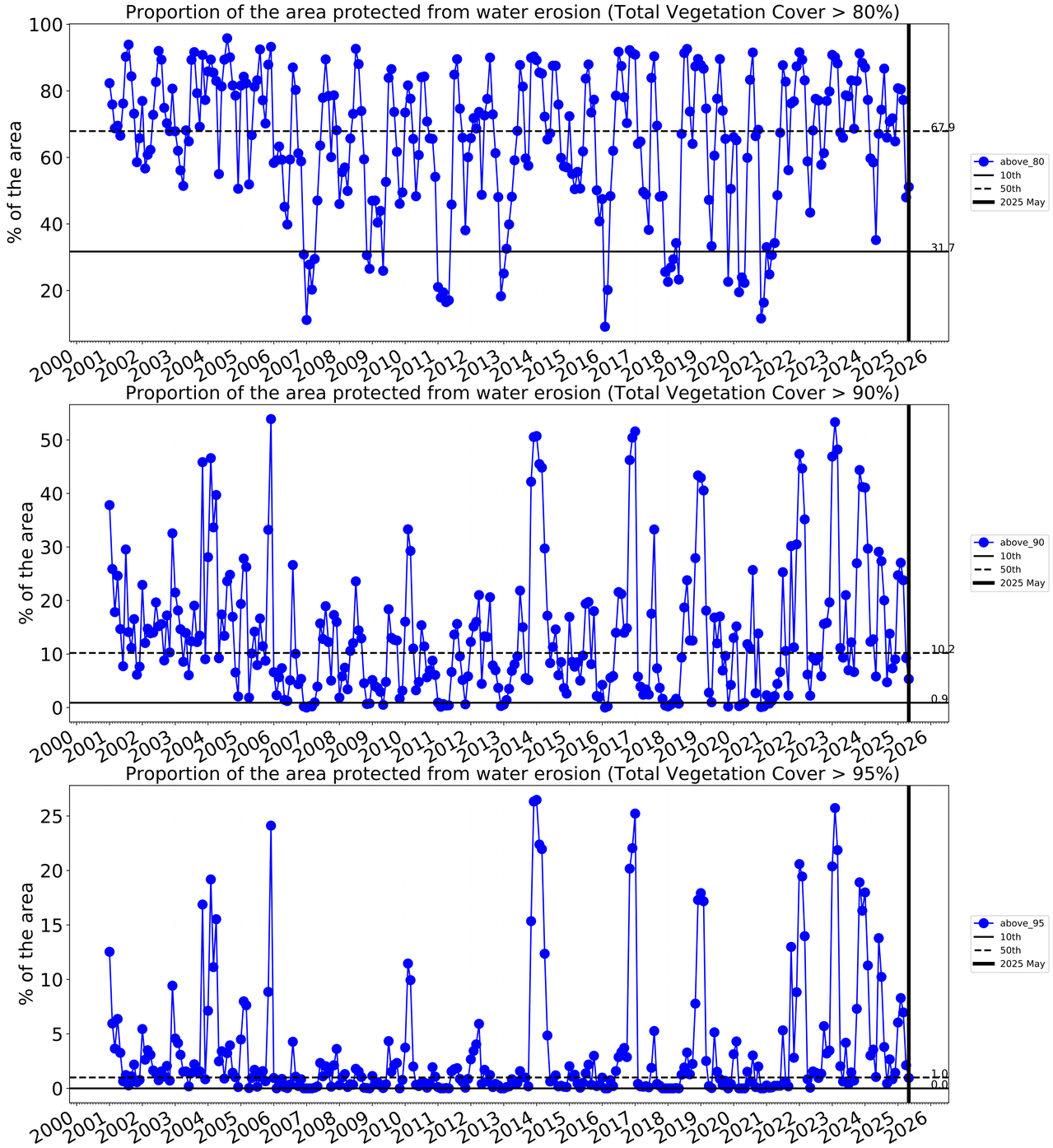


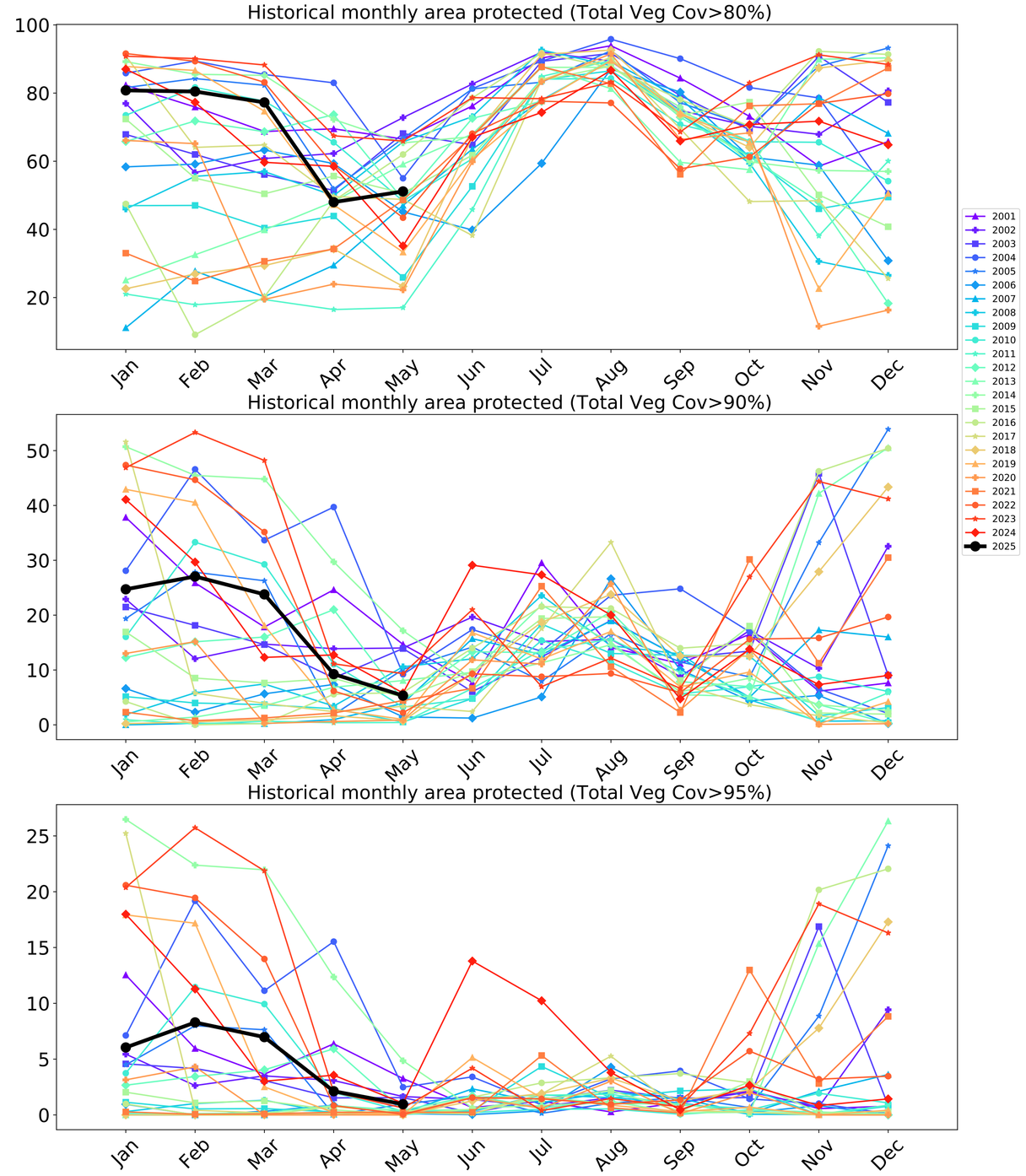
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
67.9
31.7
above_80
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
10.2
0.9
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
1.0
0.0
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
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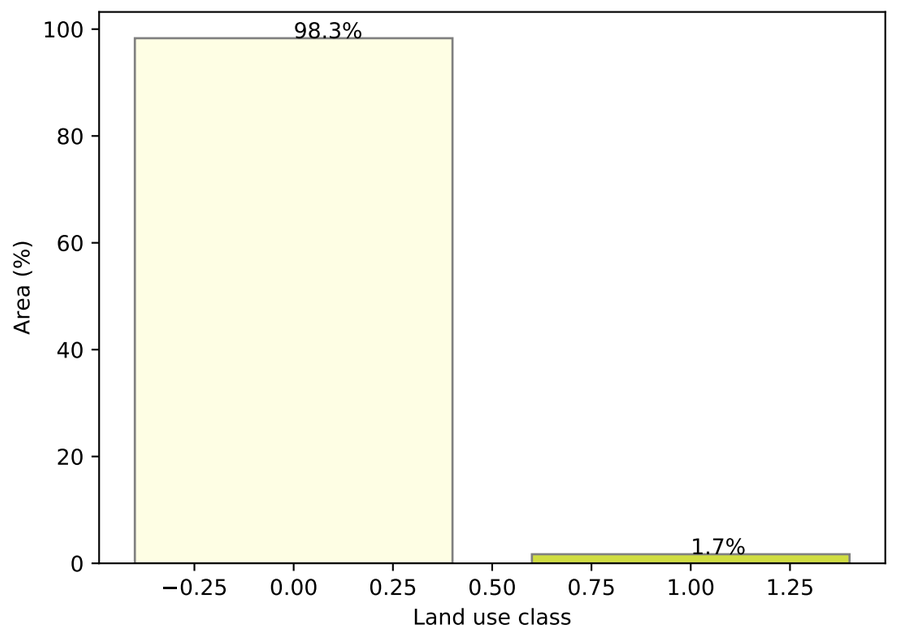
Grazing

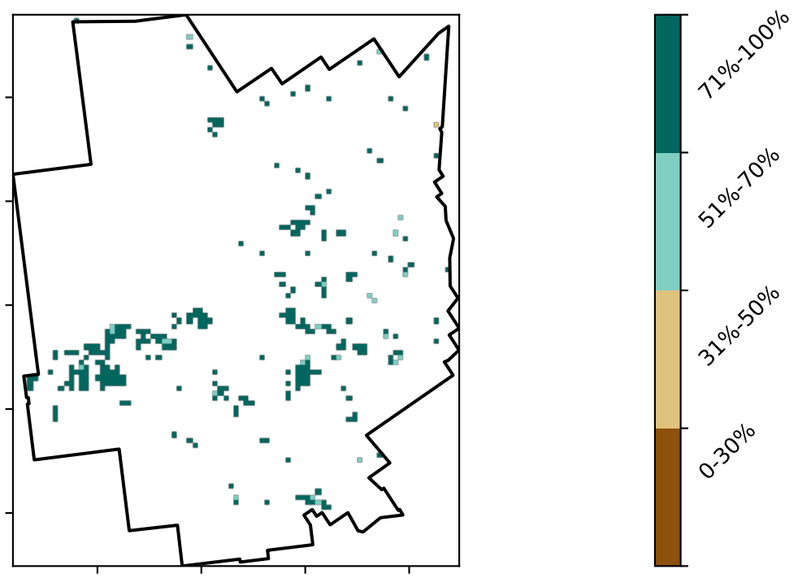
Land use and forest cover

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

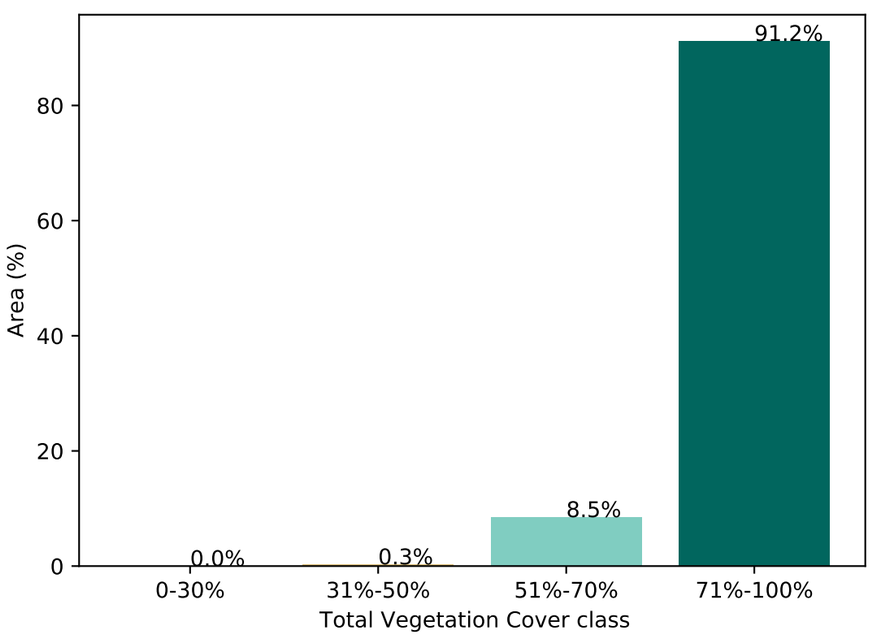
Proportion of each land class in area



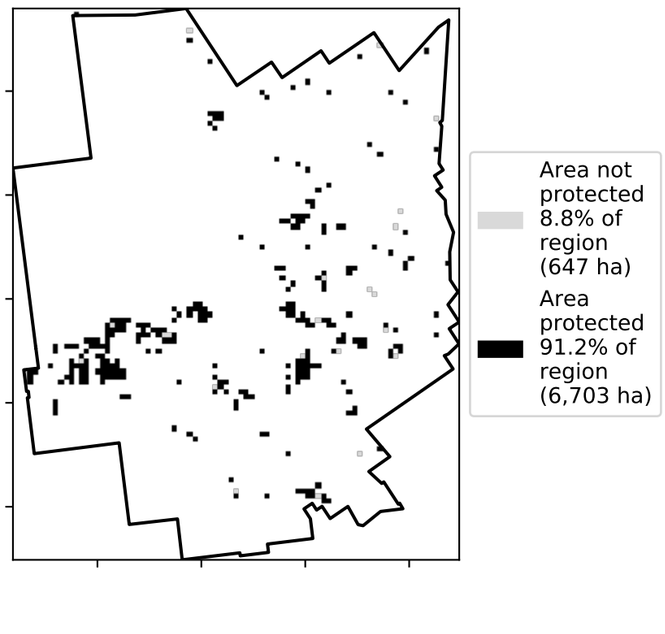
Total Vegetation Cover [%]



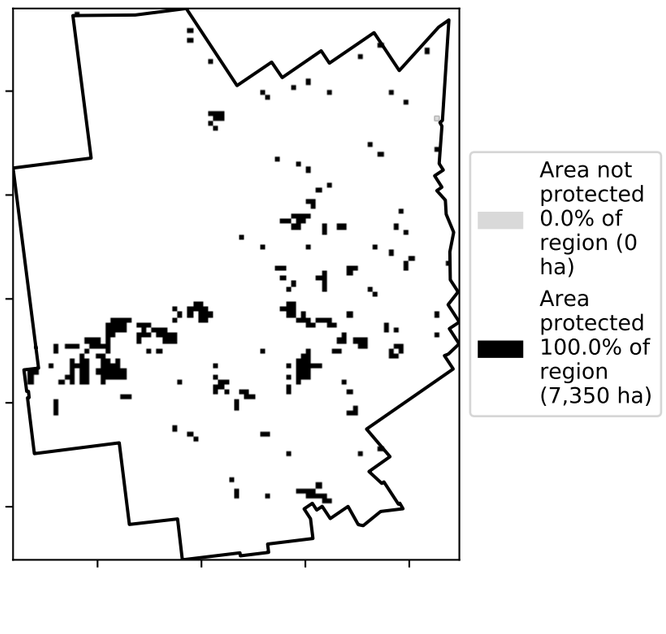
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

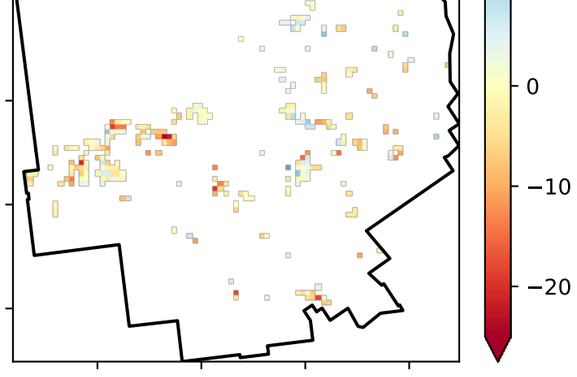


% Area protected from wind erosion (>50%)



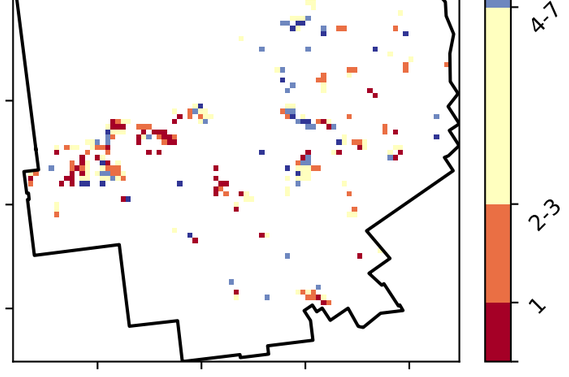
Total Vegetation Cover Anomaly [%]

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.



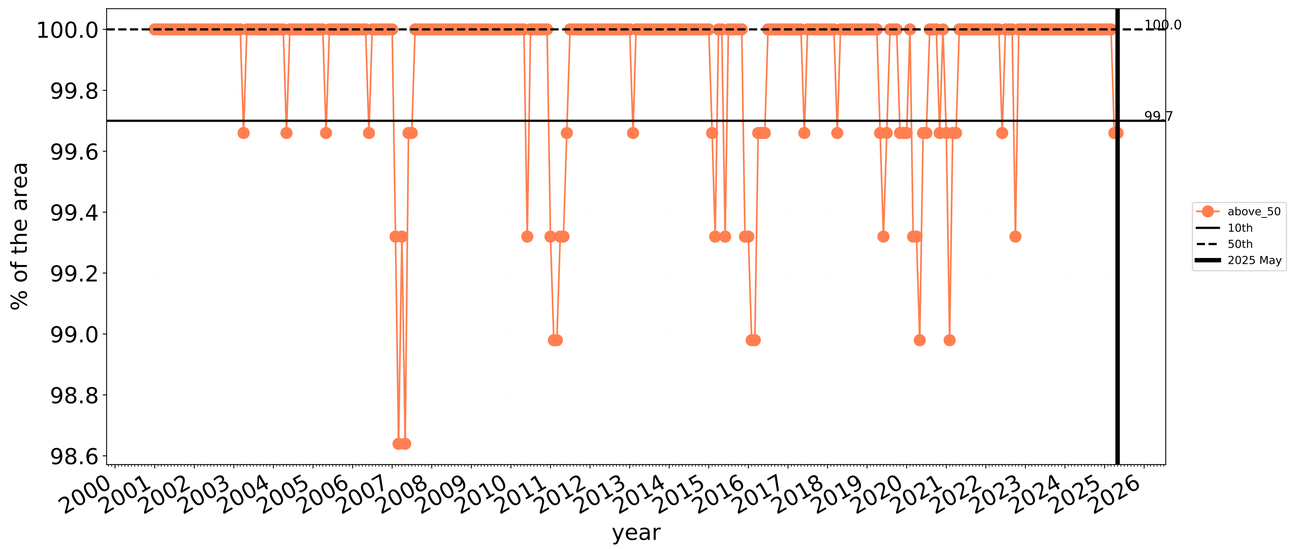
Total Vegetation Cover Decile [%]

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.

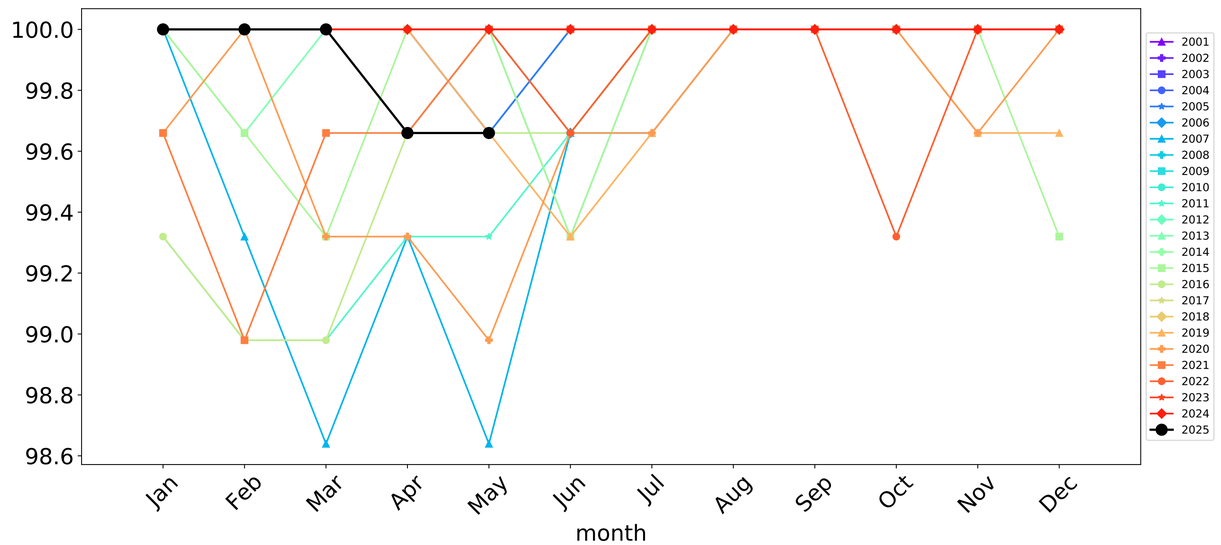


Grazing timeseries

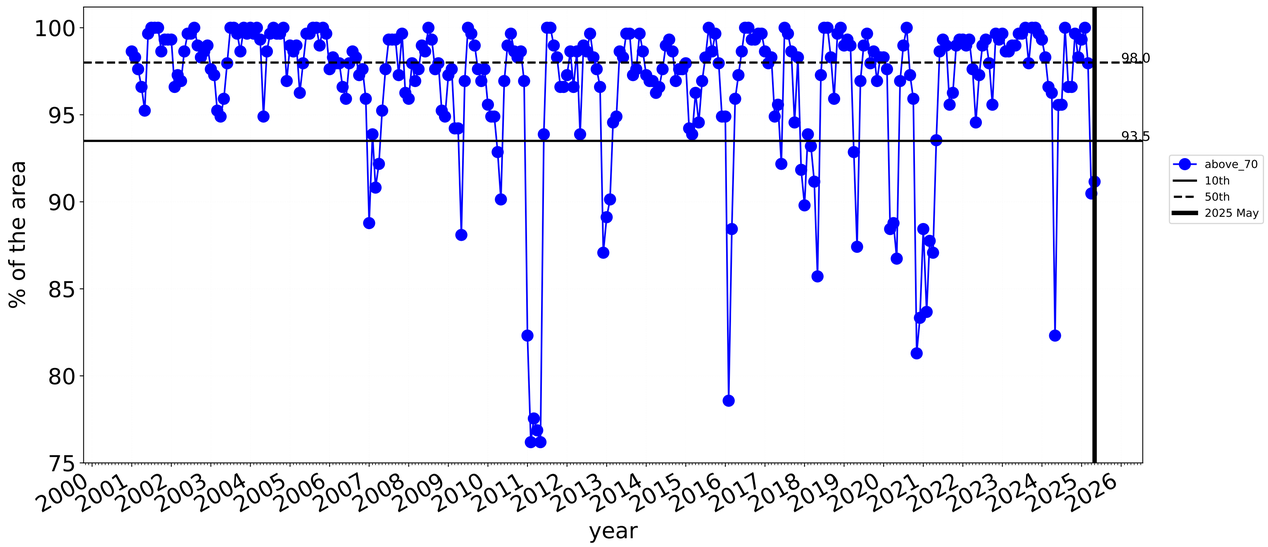
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



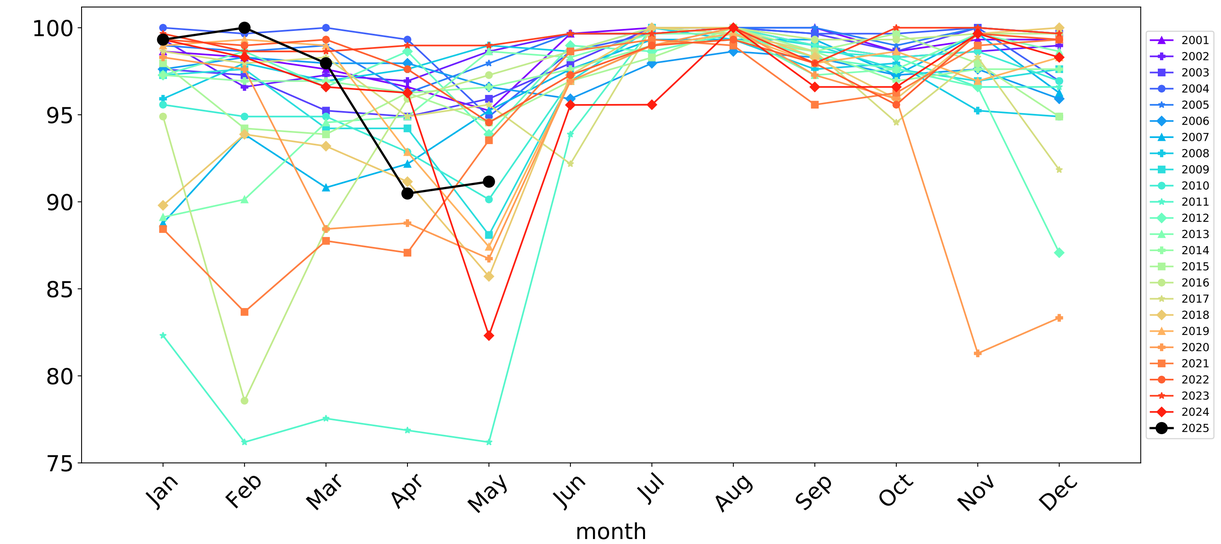
Wind erosion historical monthly area protected (Total Veg Cov >50%)

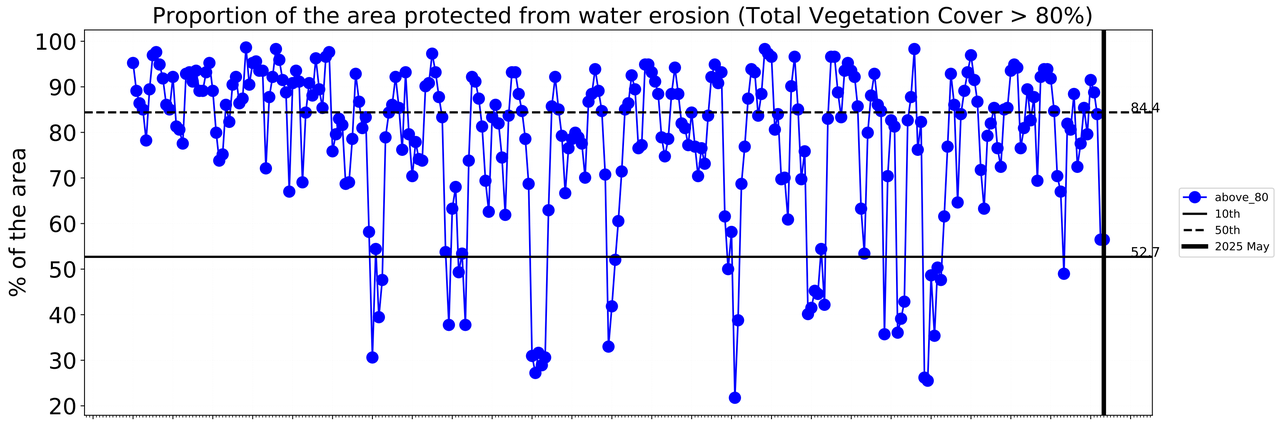


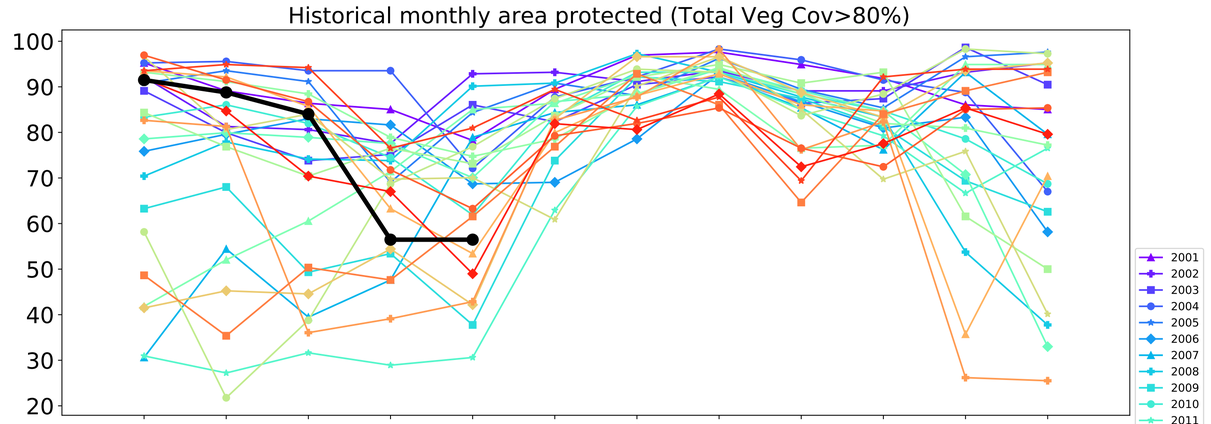
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
84.4
52.7
above_80
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
Jan
Feb
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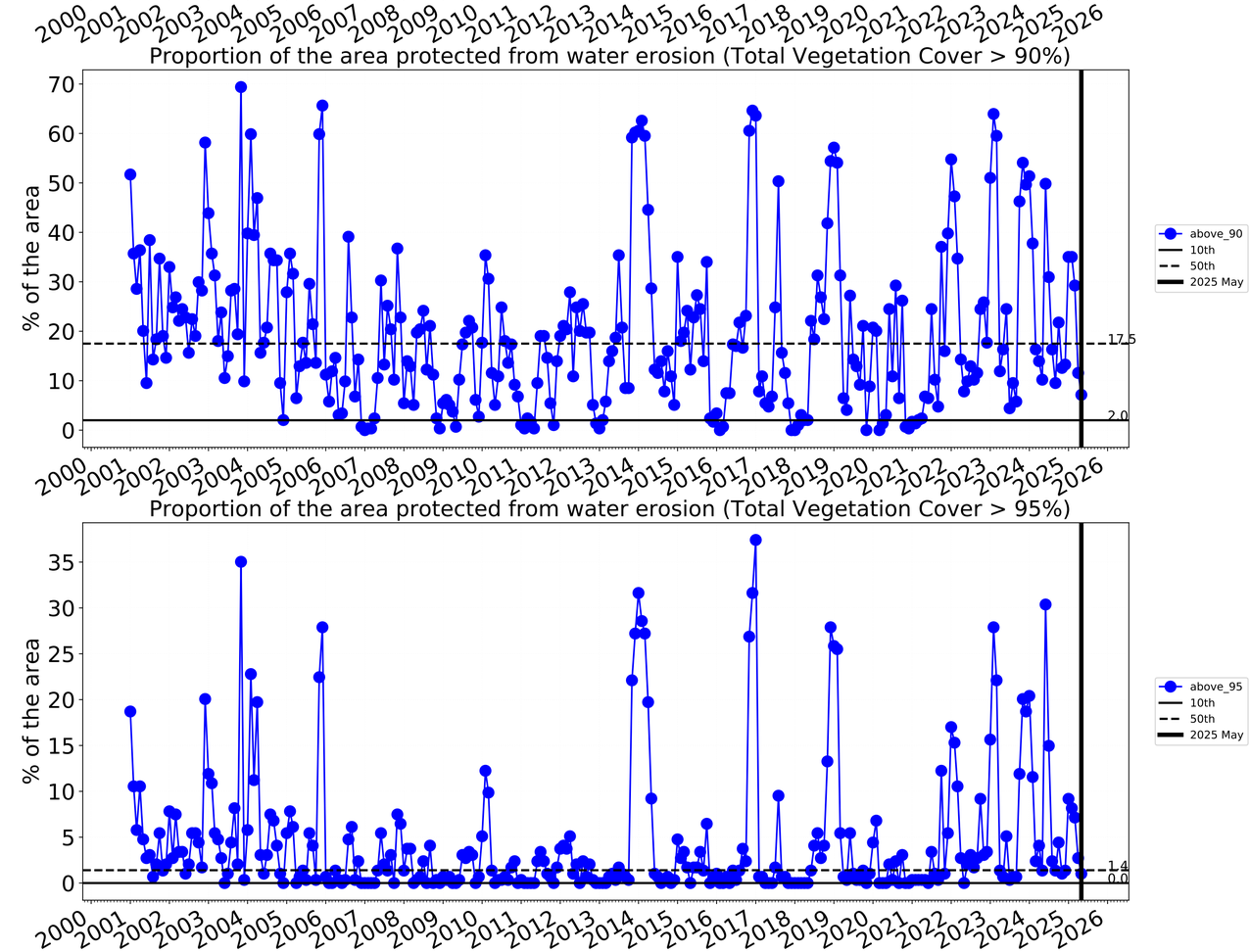
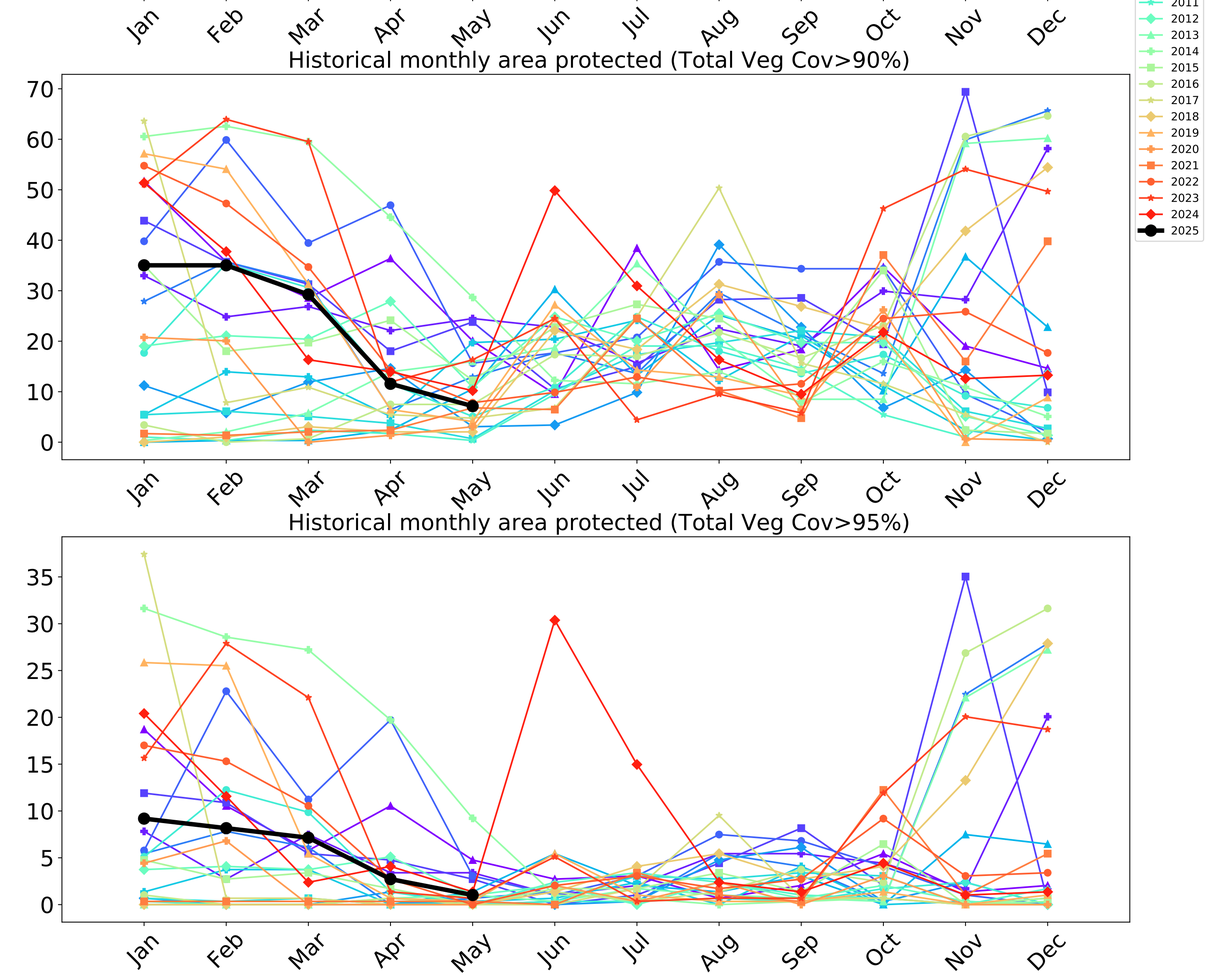

Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
17.5
2.0
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
1.4
0.0
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
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Nov
Dec
2001
2002
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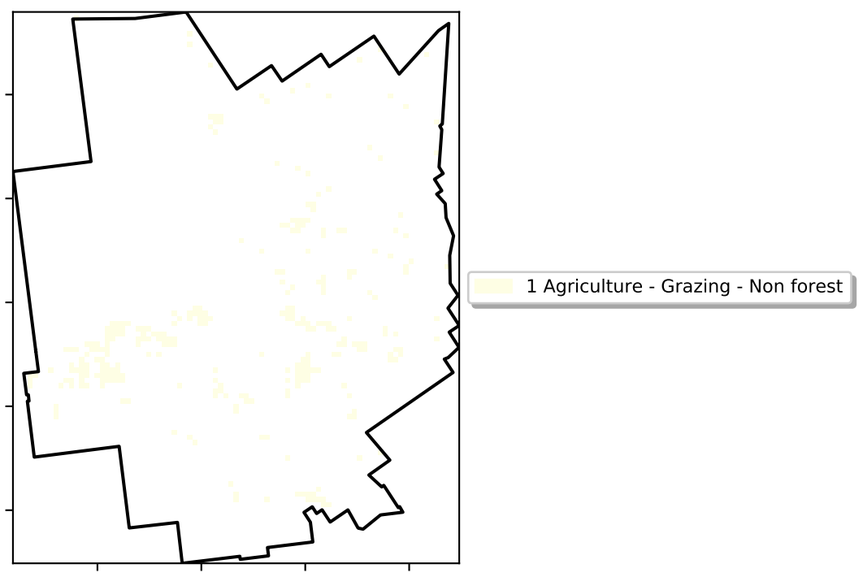
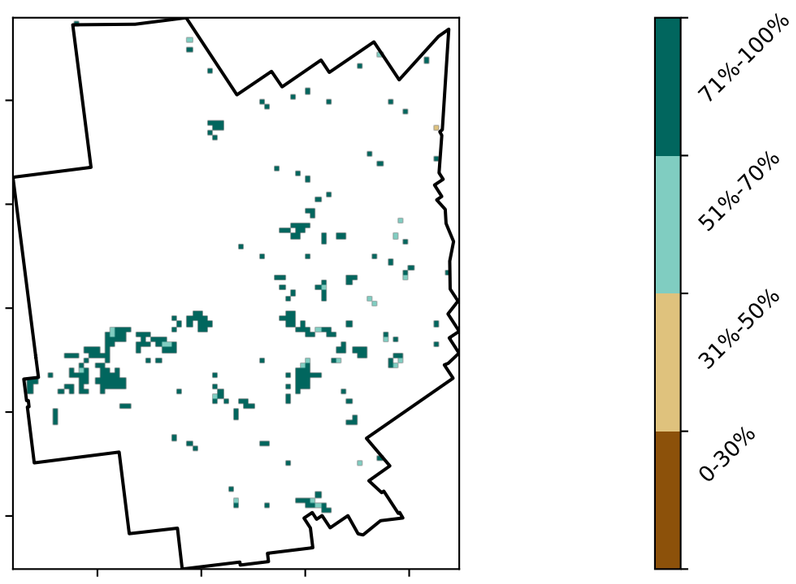
Grazing non forest

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

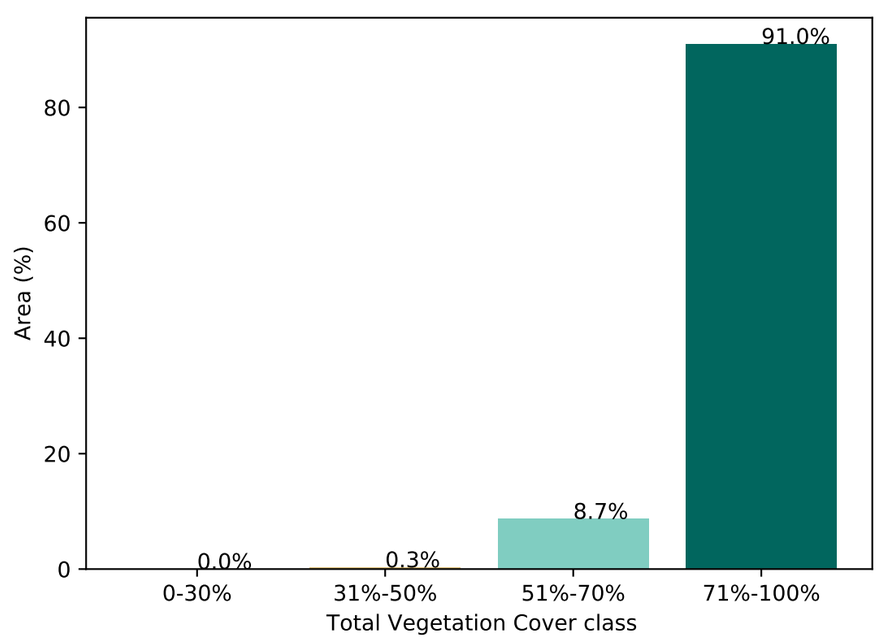
Land use and forest cover



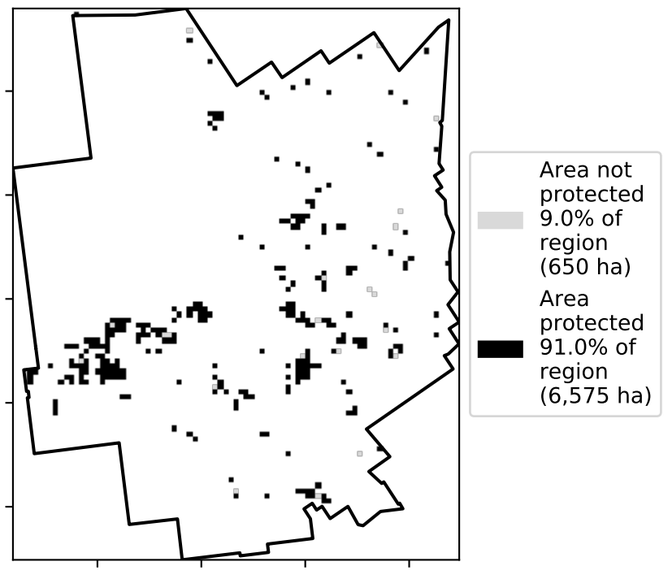
Total Vegetation Cover [%]



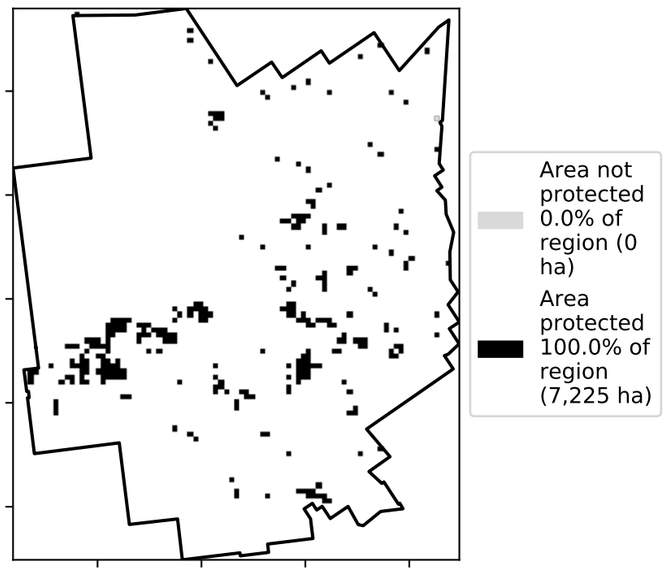
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

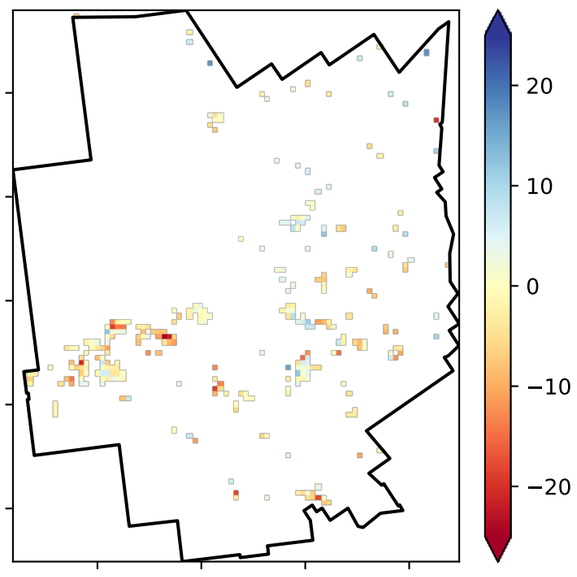


% Area protected from wind erosion (>50%)



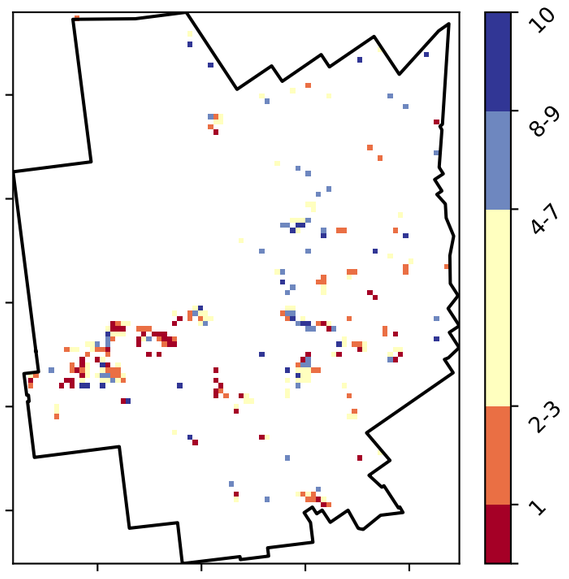
Total Vegetation Cover Anomaly [%]

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.



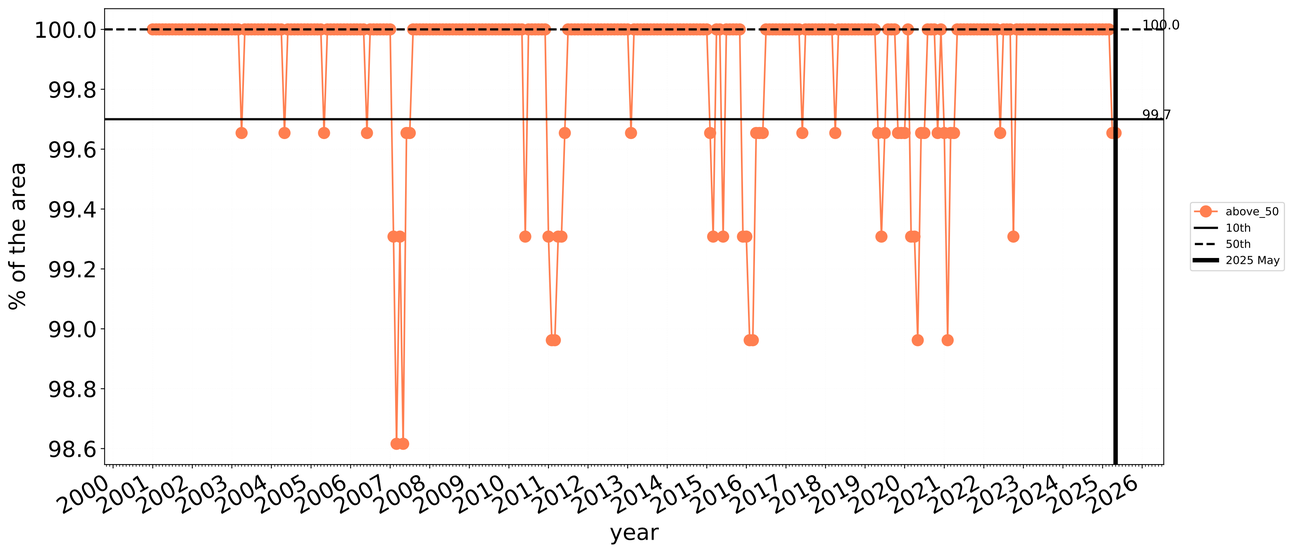
Total Vegetation Cover Decile [%]

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.

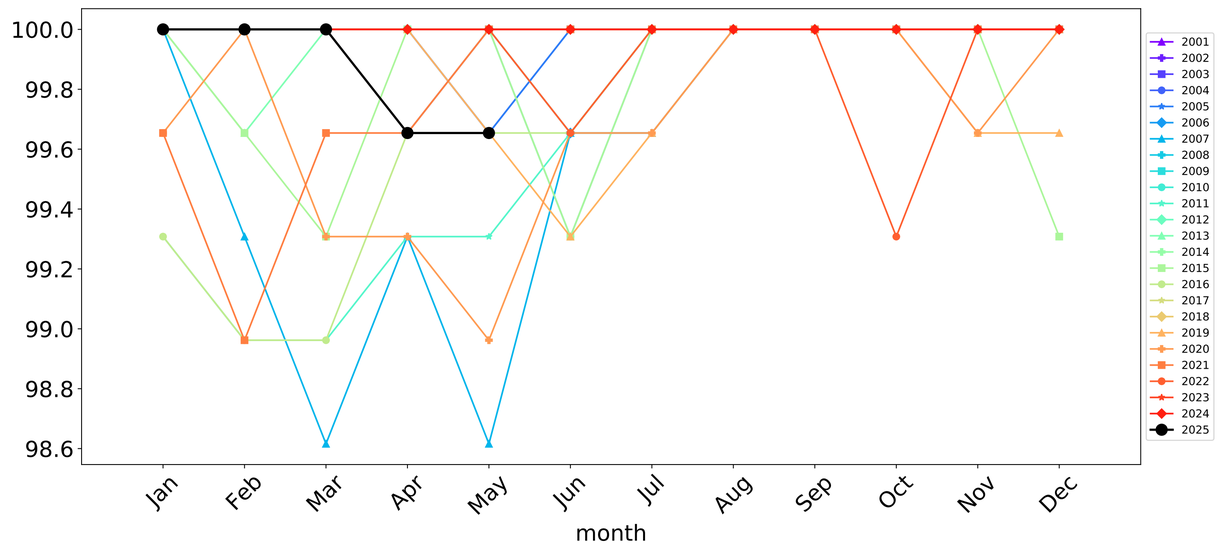


Grazing non forest timeseries

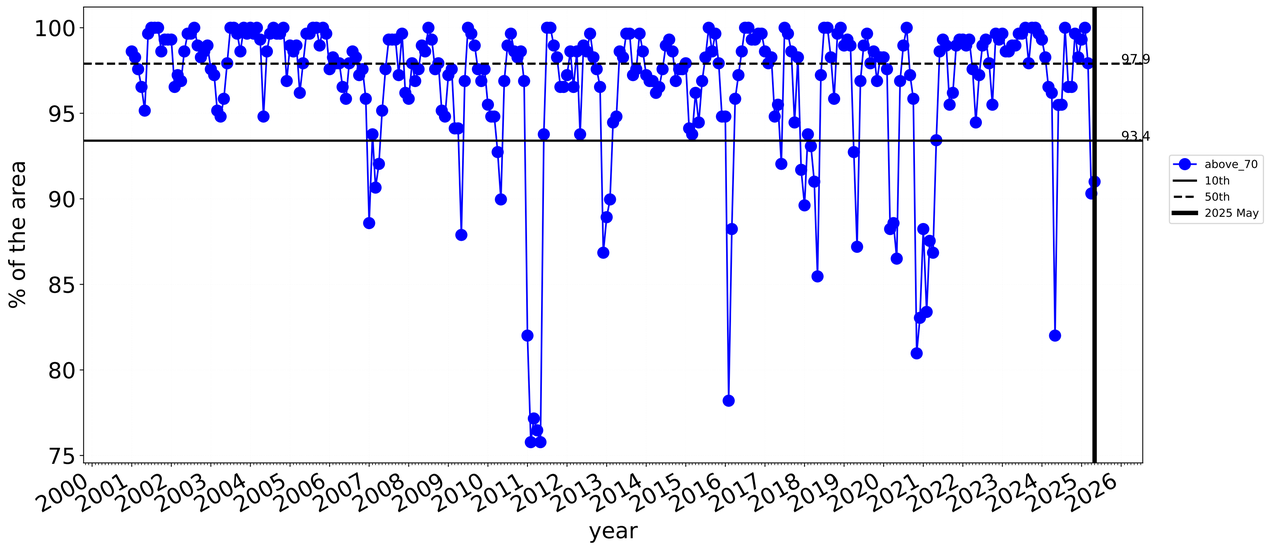
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



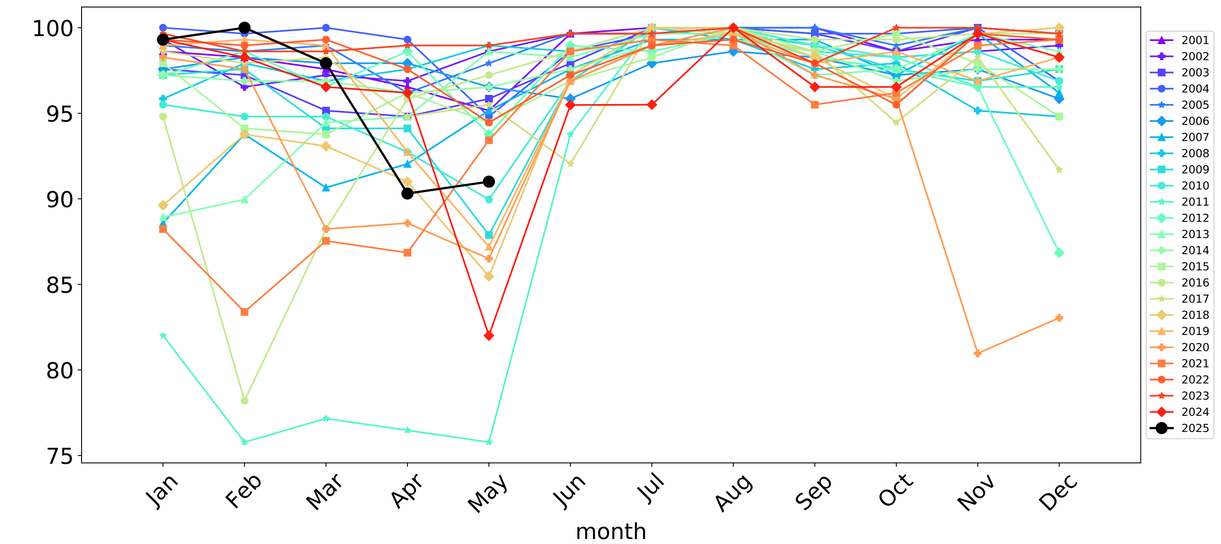
Wind erosion historical monthly area protected (Total Veg Cov >50%)

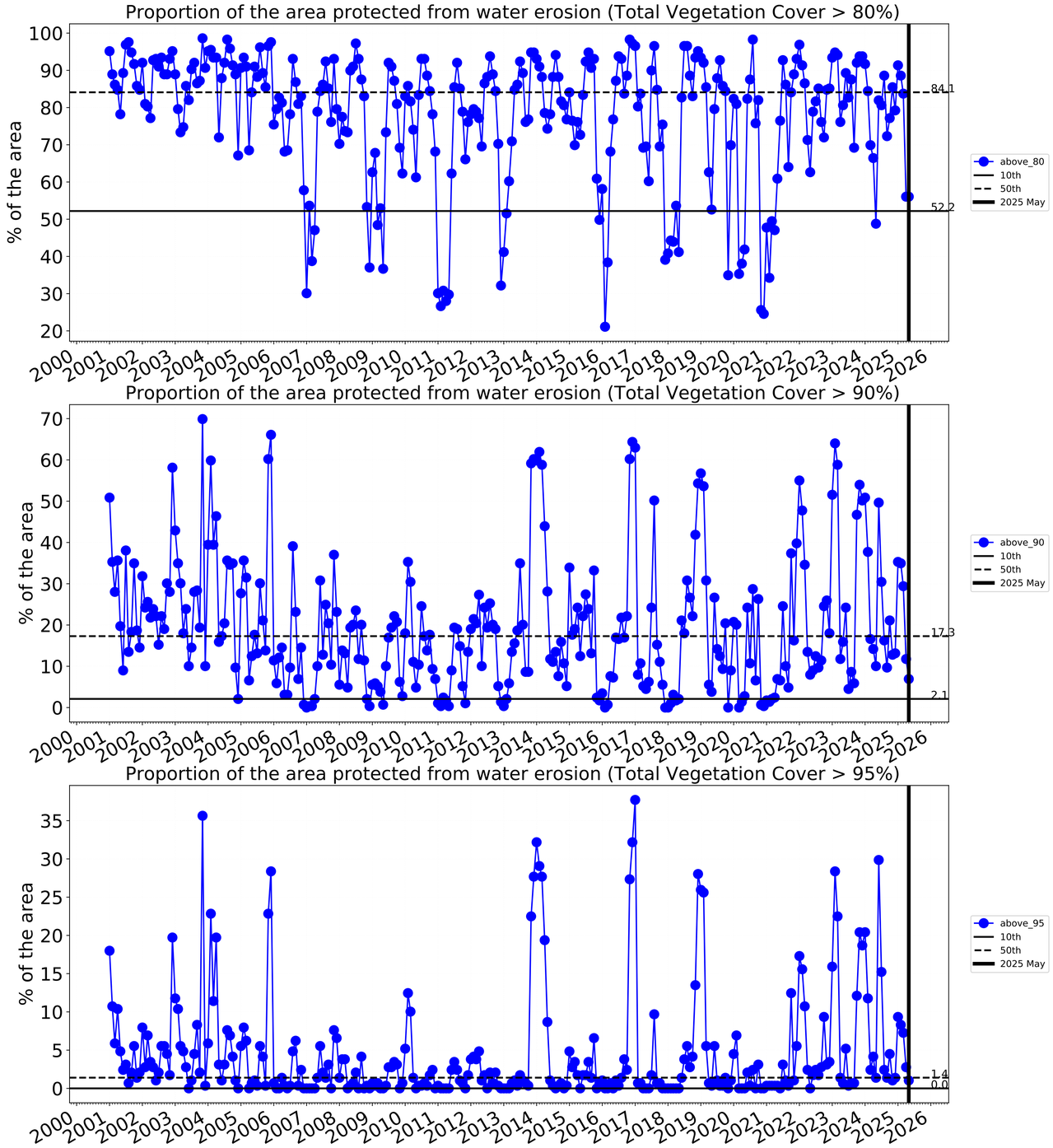


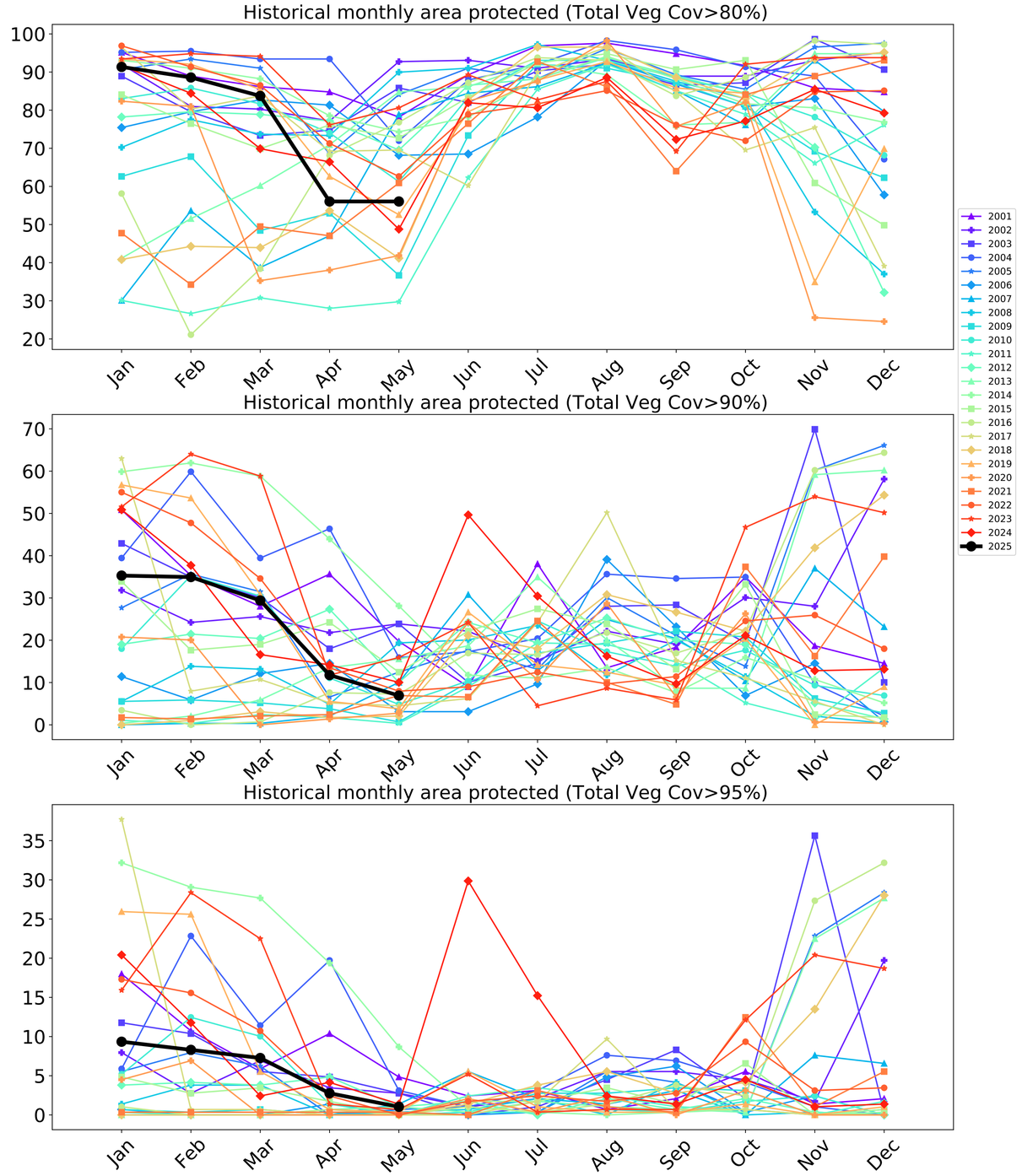
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
84.1
52.2
above_80
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
17.3
2.1
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
1.4
0.0
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2001
2002
2003
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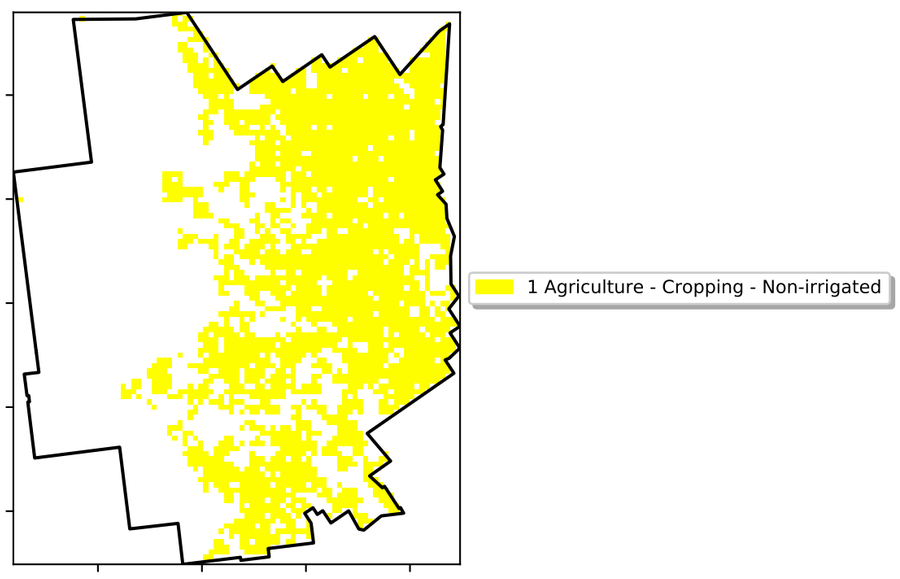
2024
2025

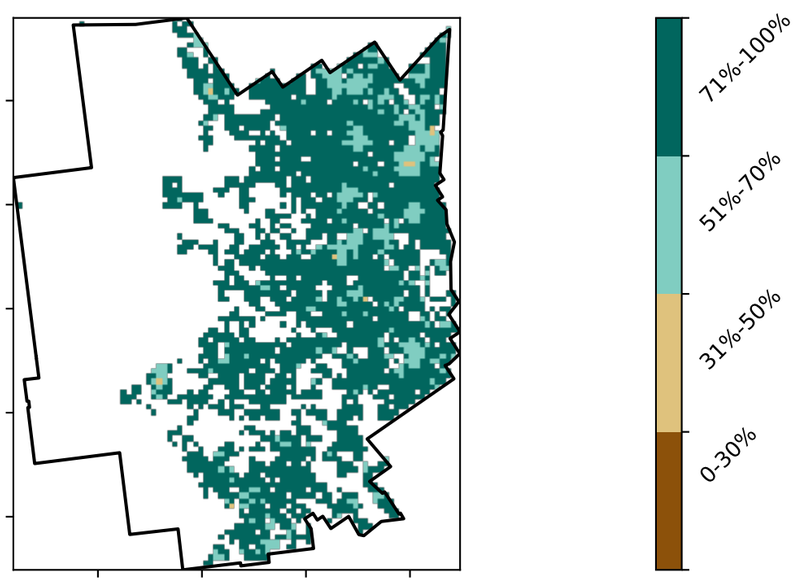
Cropping

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

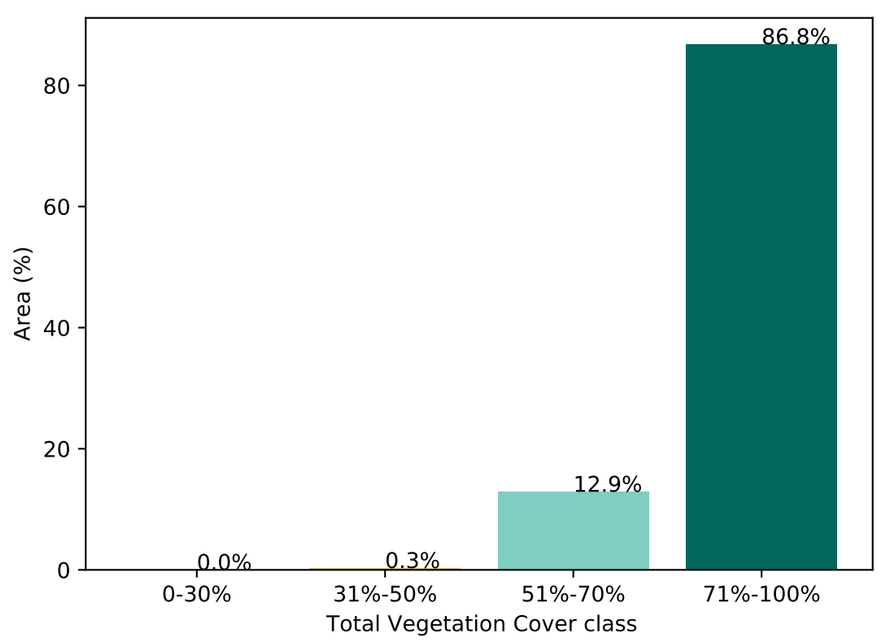
Land use and forest cover



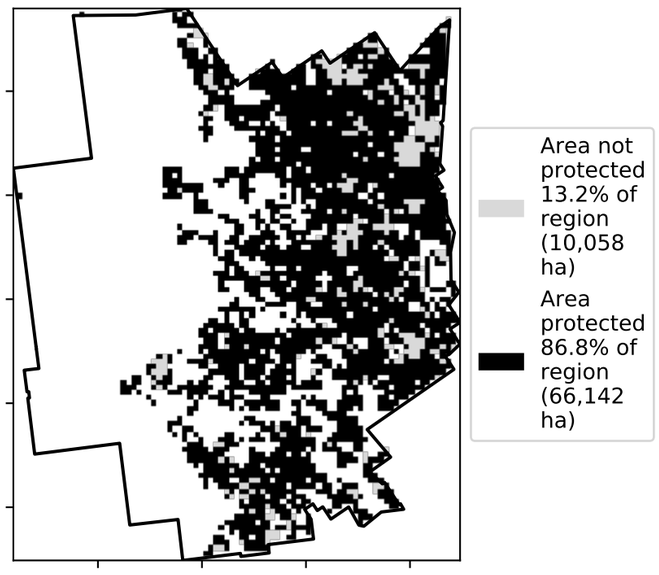
Total Vegetation Cover [%]



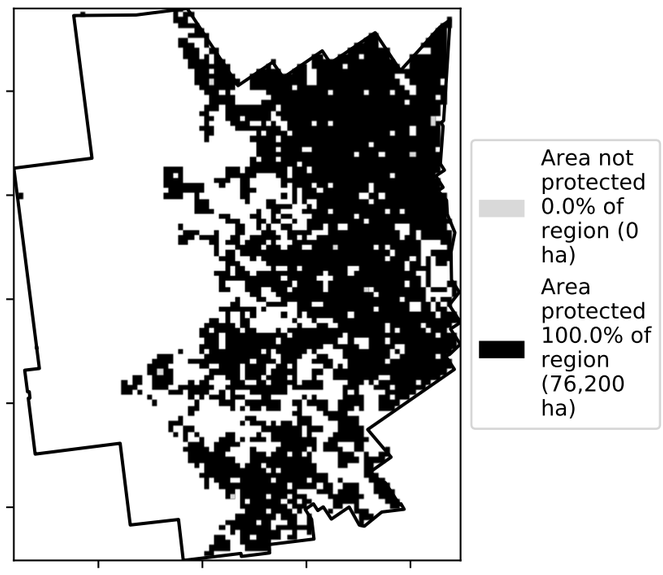
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

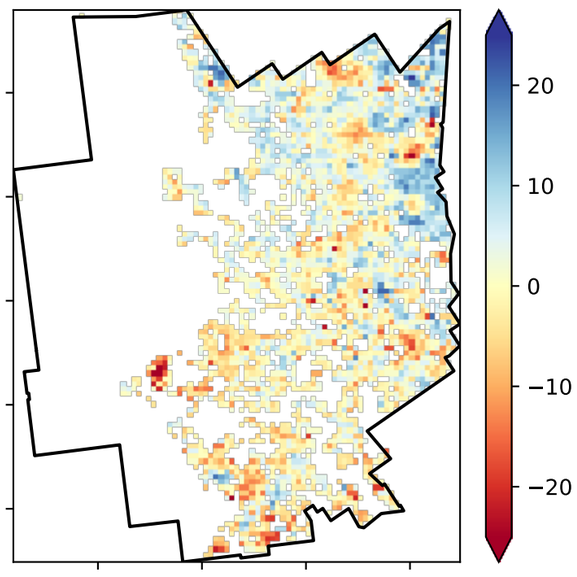


% Area protected from wind erosion (>50%)



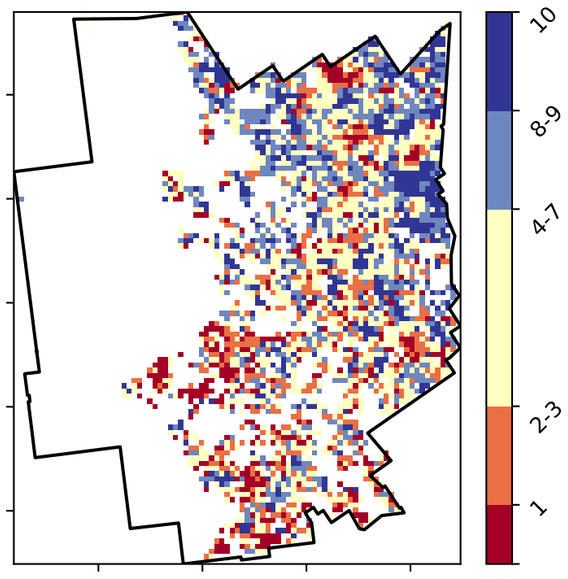
Total Vegetation Cover Anomaly [%]

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.



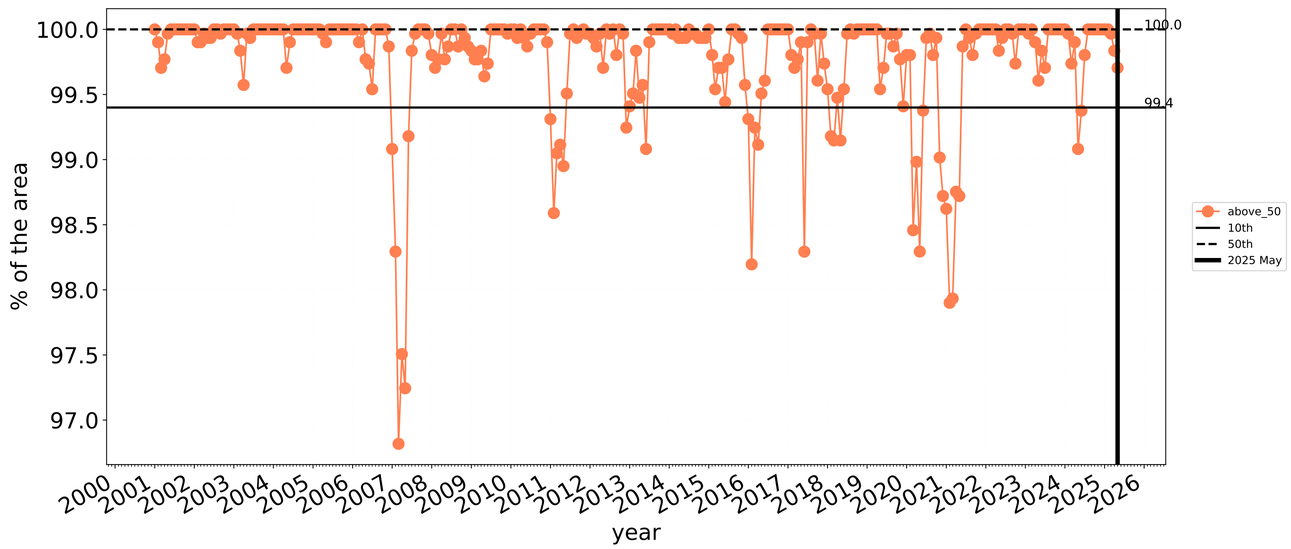
Total Vegetation Cover Decile [%]

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.

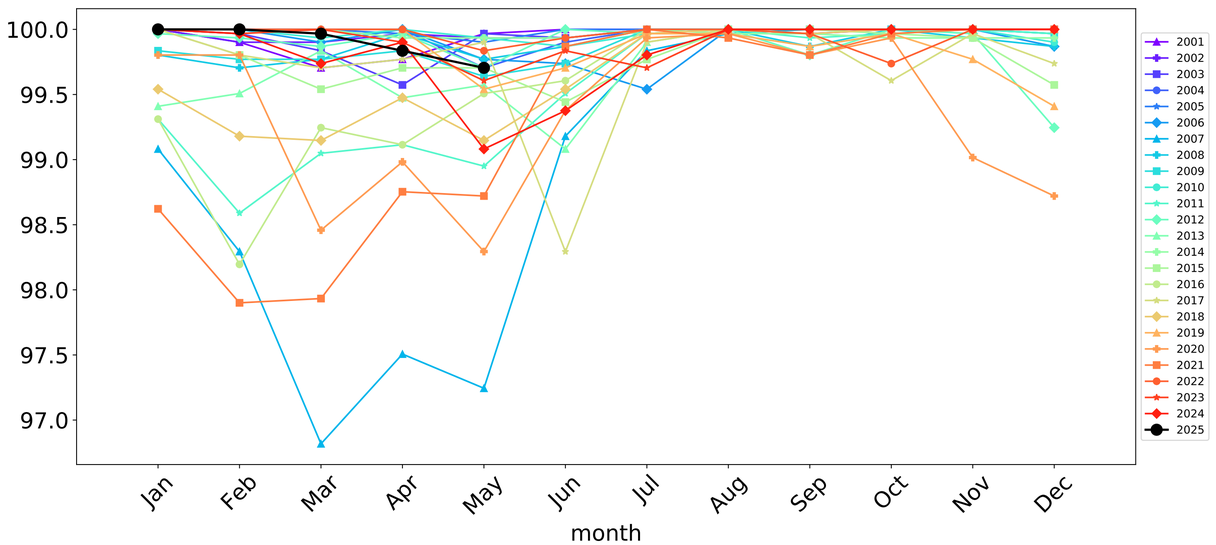


Cropping timeseries

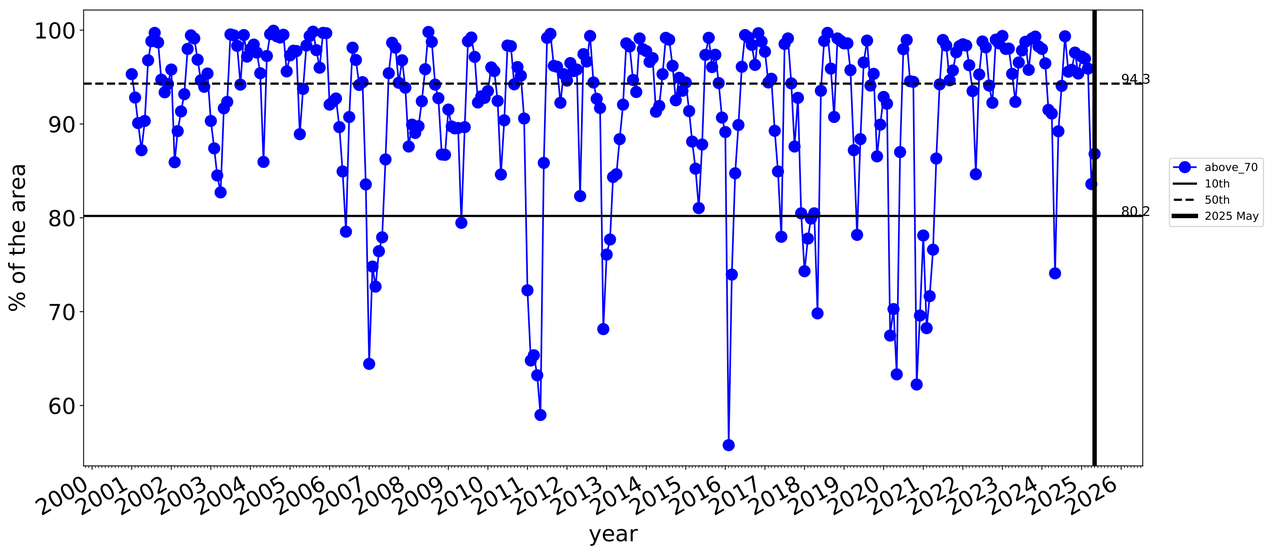
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



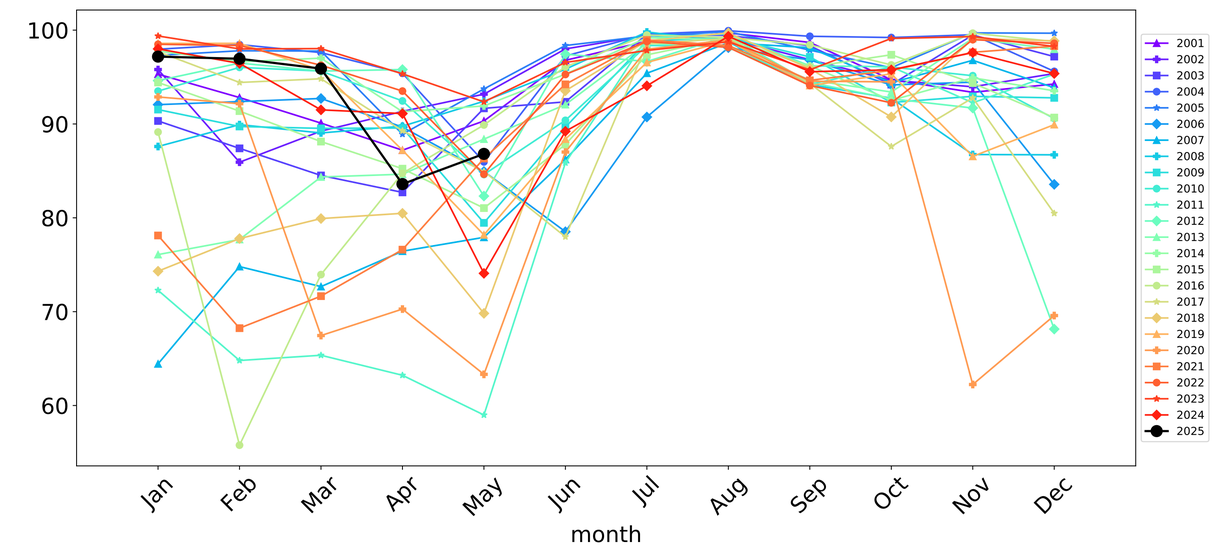
Wind erosion historical monthly area protected (Total Veg Cov >50%)

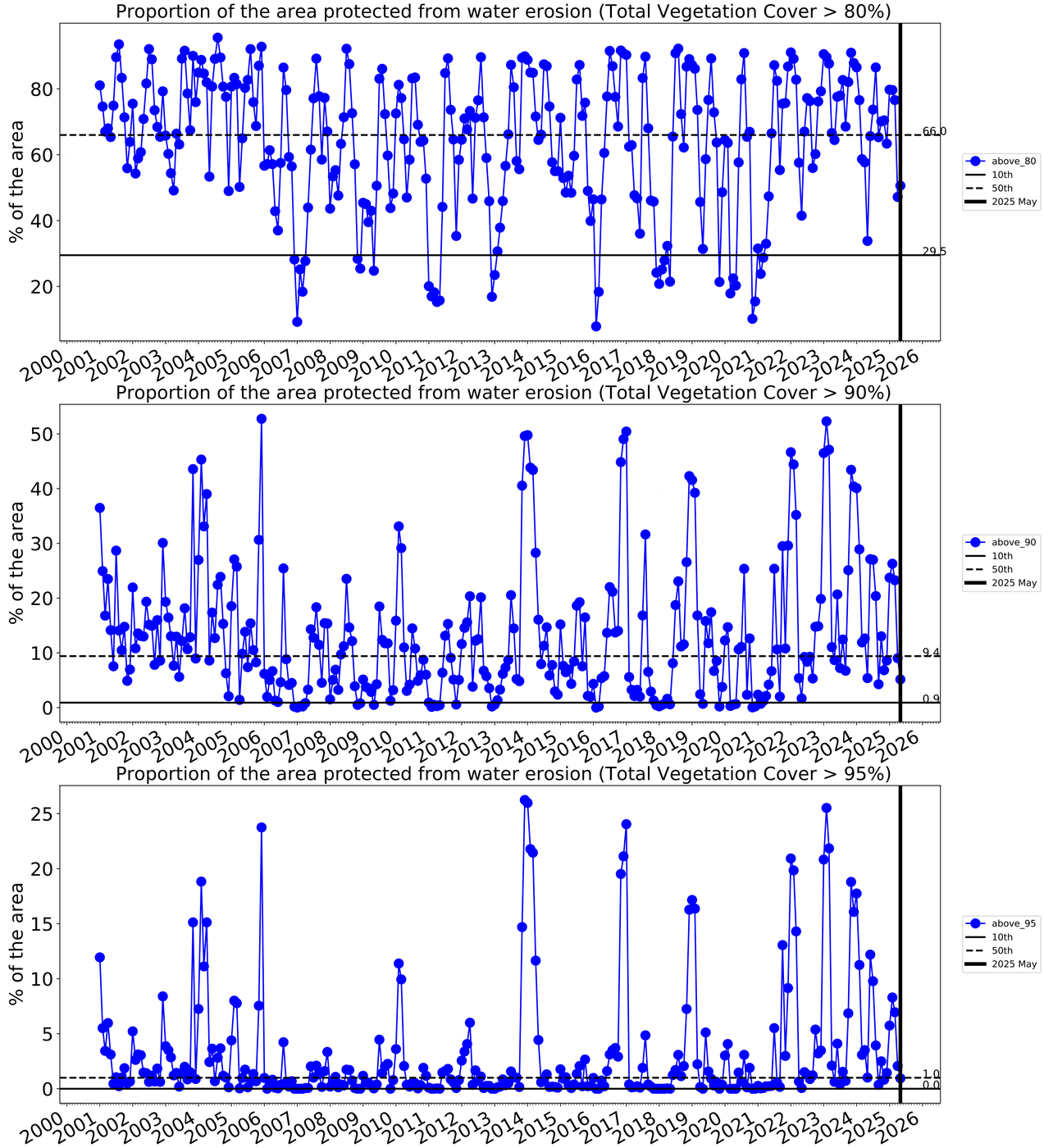


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
66.0
29.5
above_80
10th
50th
2025 May
Historical monthly area protected (Total Veg Cov>80%)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2001
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2003
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2007
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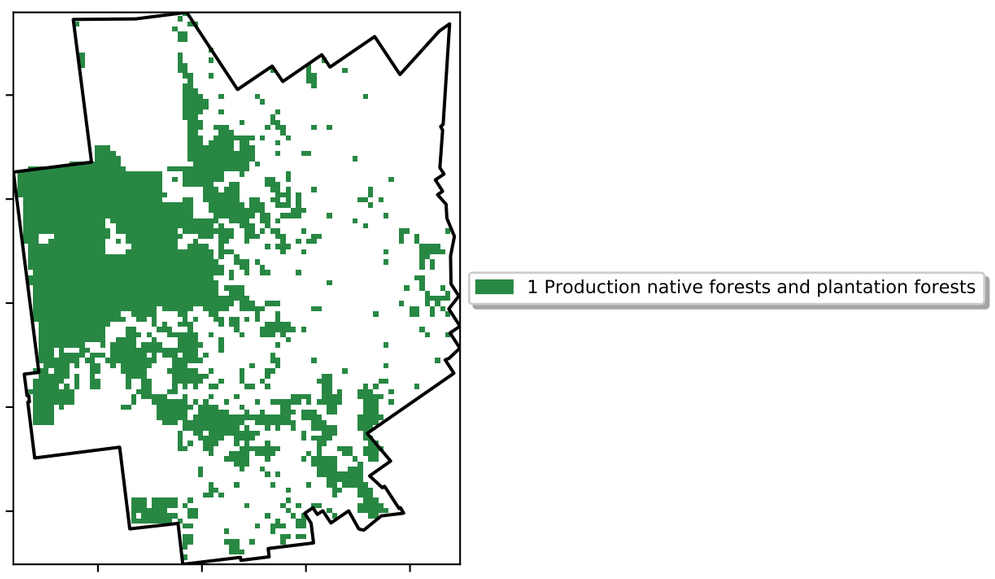
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
9.4
0.9
above_90
10th
50th
2025 May
Historical monthly area protected (Total Veg Cov>90%)
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
1.0
0.0
above_95
10th
50th
2025 May
Historical monthly area protected (Total Veg Cov>95%)
CSIRO
tern
Ecosystem Research Infrastructure
Australian Government
National Landcare Programme
NSW GOVERNMENT

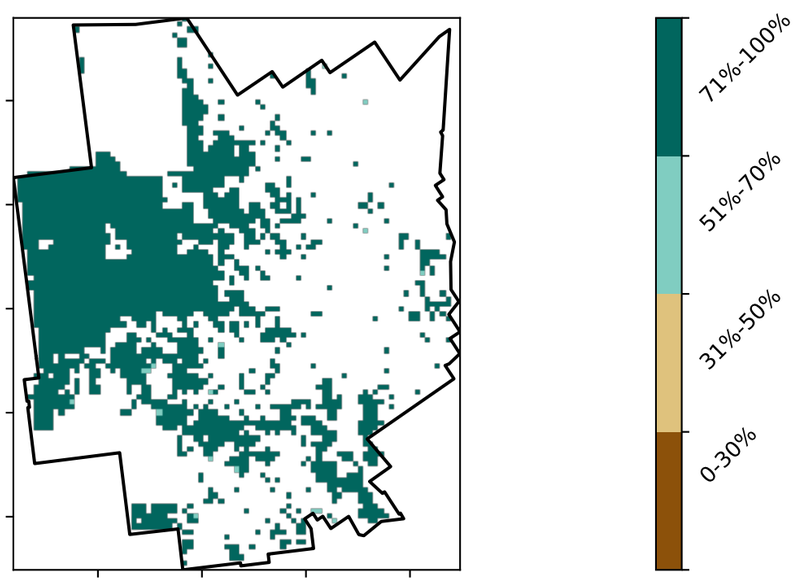
Production native forests and plantation forests

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

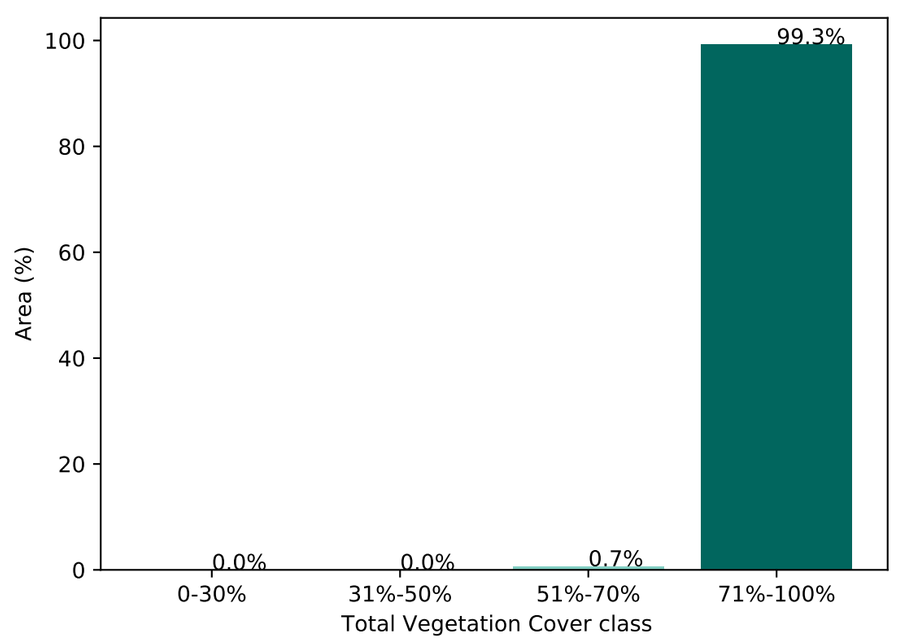
Land use and forest cover



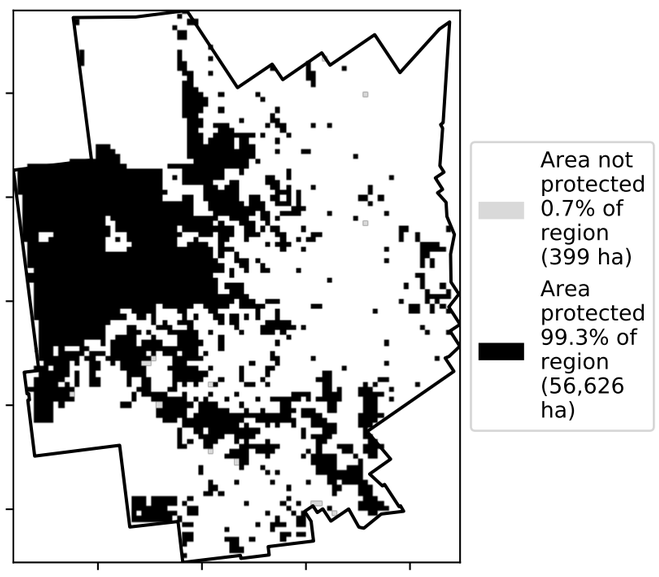
Total Vegetation Cover [%]



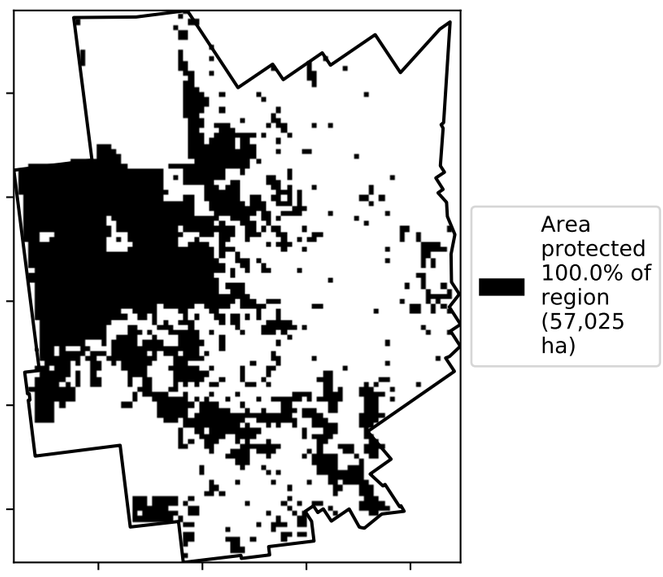
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

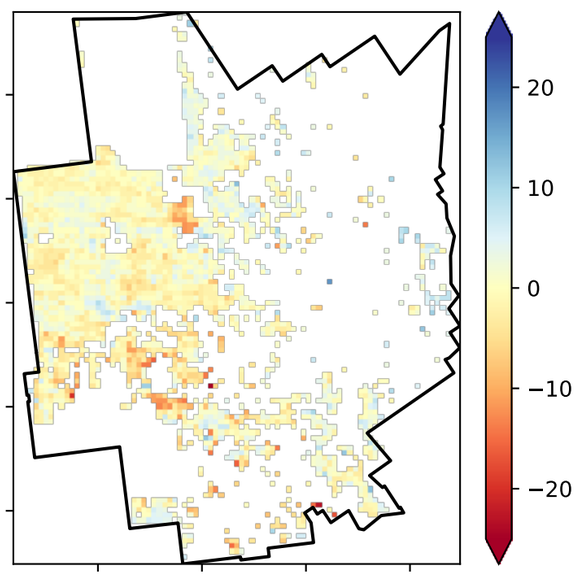


% Area protected from wind erosion (>50%)



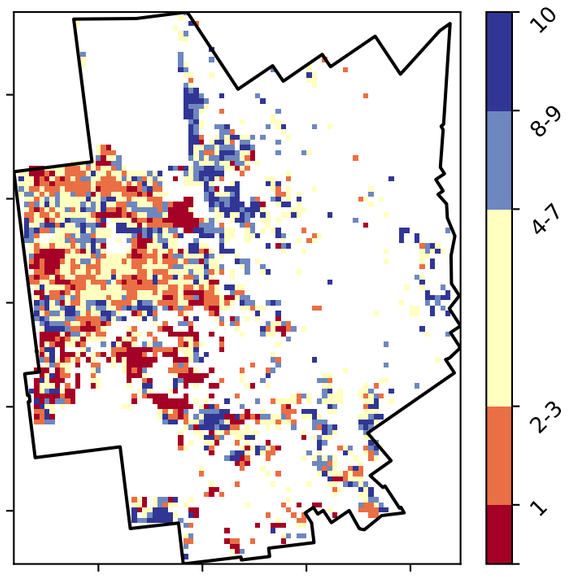
Total Vegetation Cover Anomaly [%]

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.



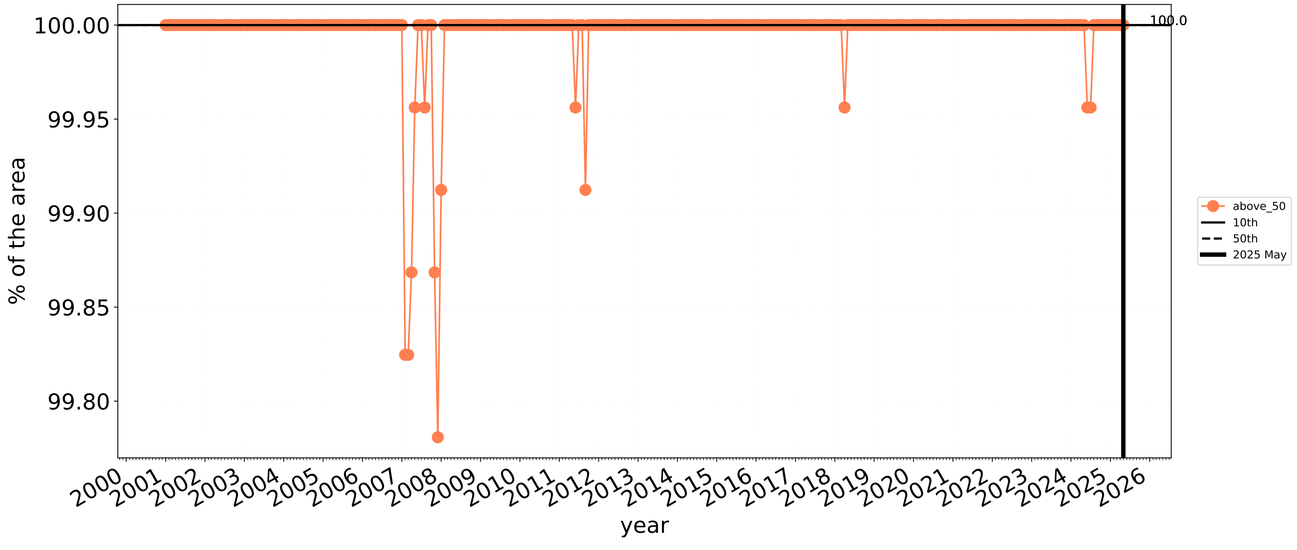
Total Vegetation Cover Decile [%]

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.

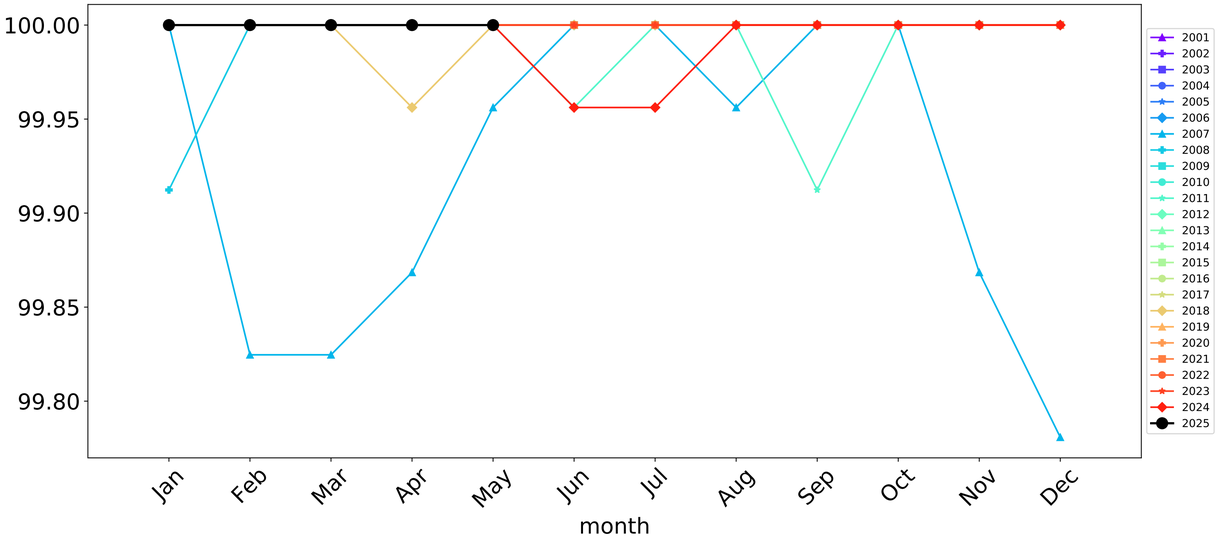


Production native forests and plantation forests timeseries

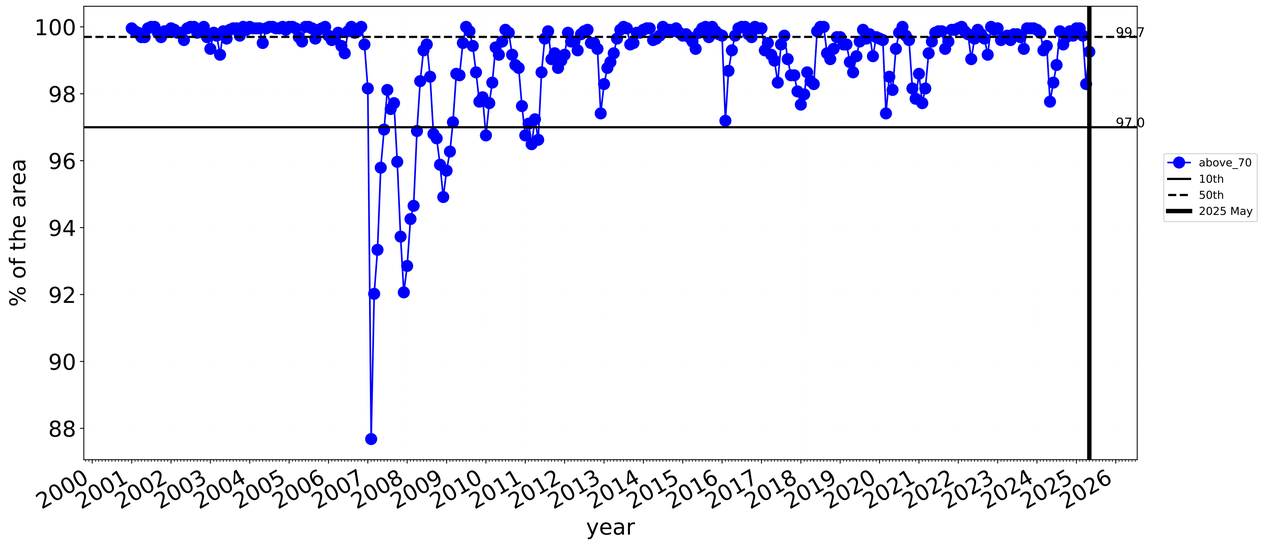
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



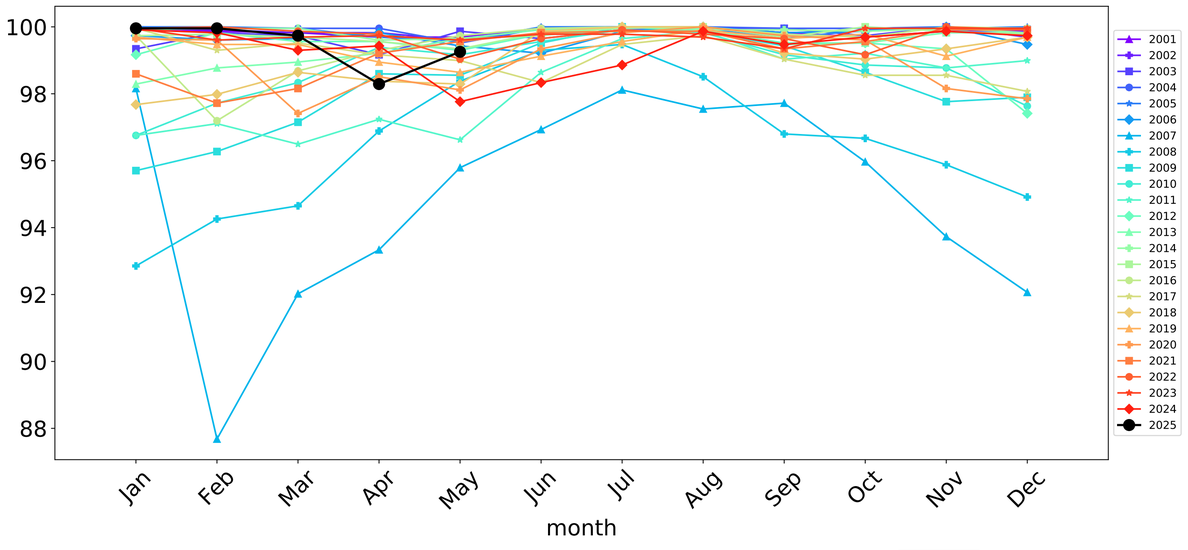
Wind erosion historical monthly area protected (Total Veg Cov >50%)

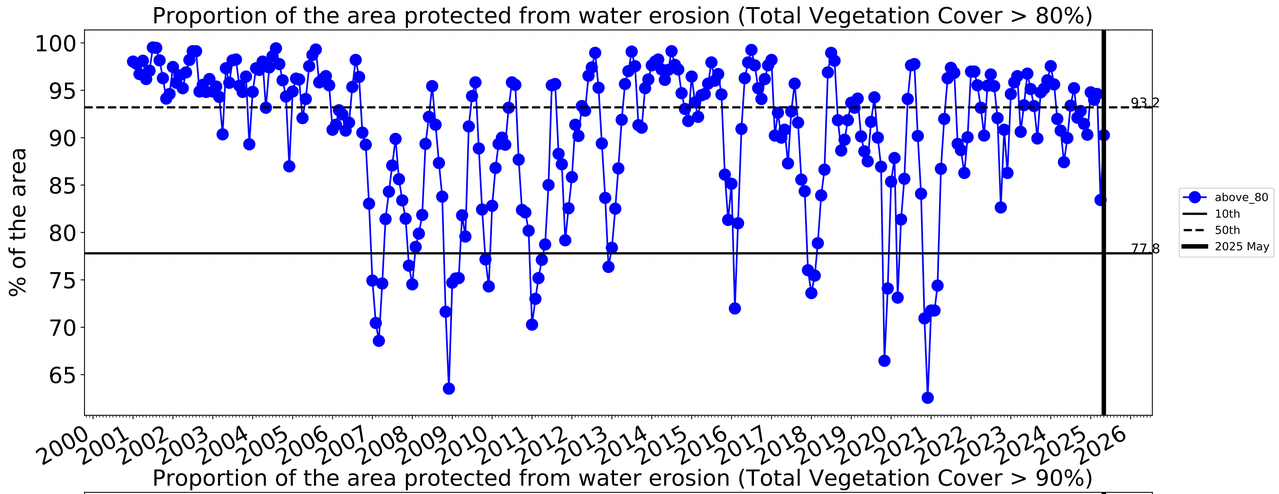


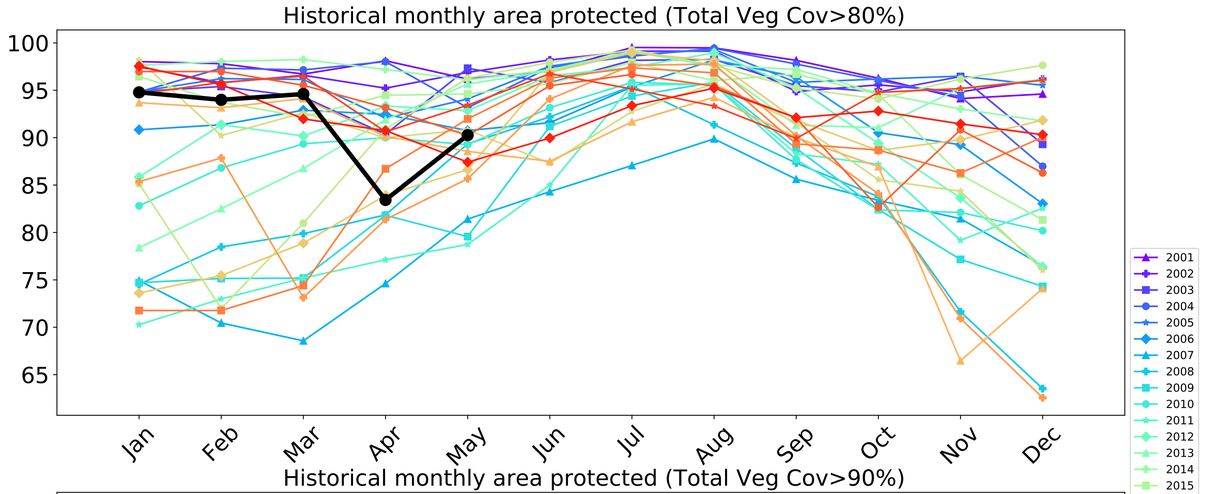
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
93.2
77.8
above_80
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>80%)
Jan
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2003
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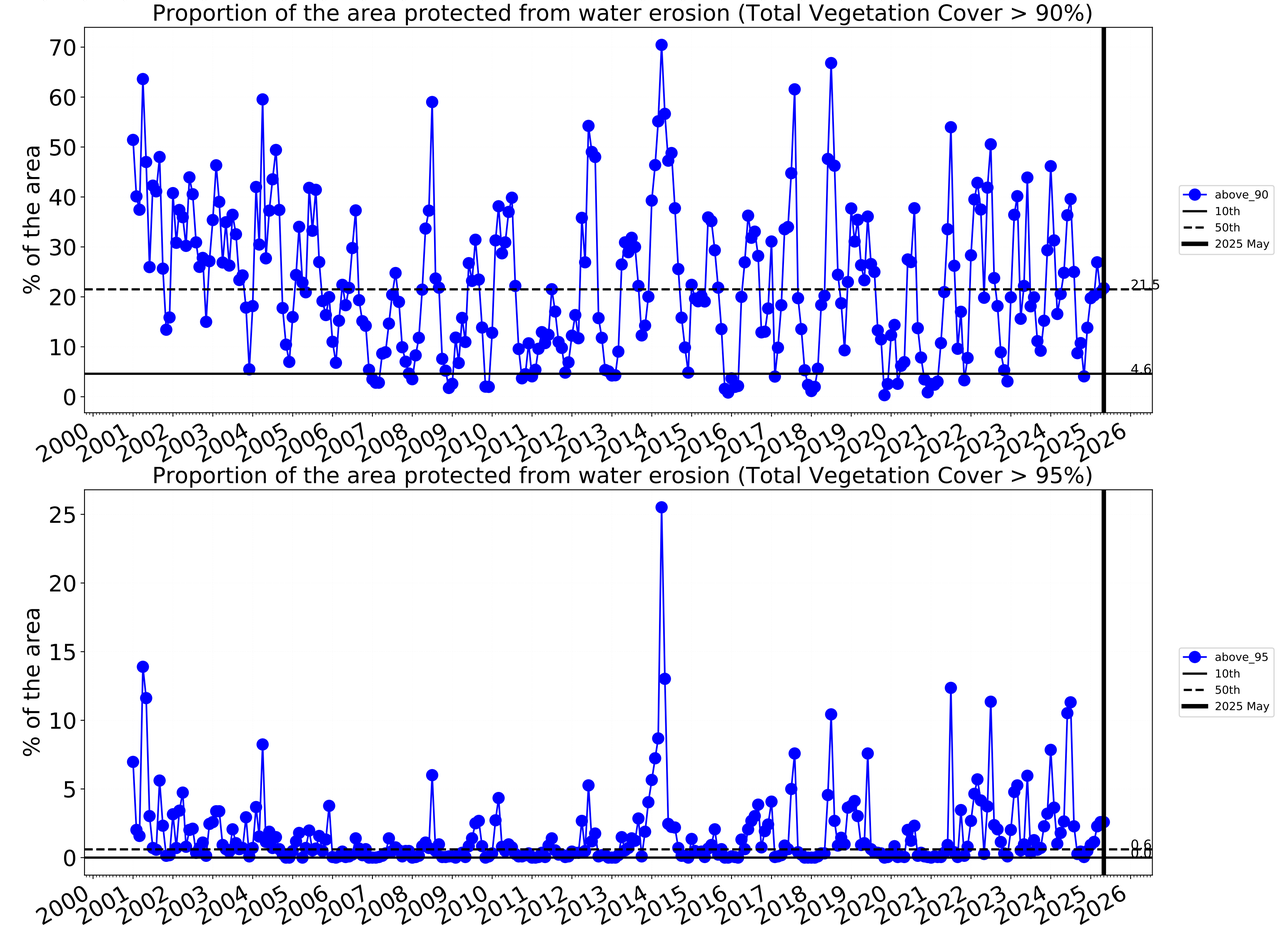
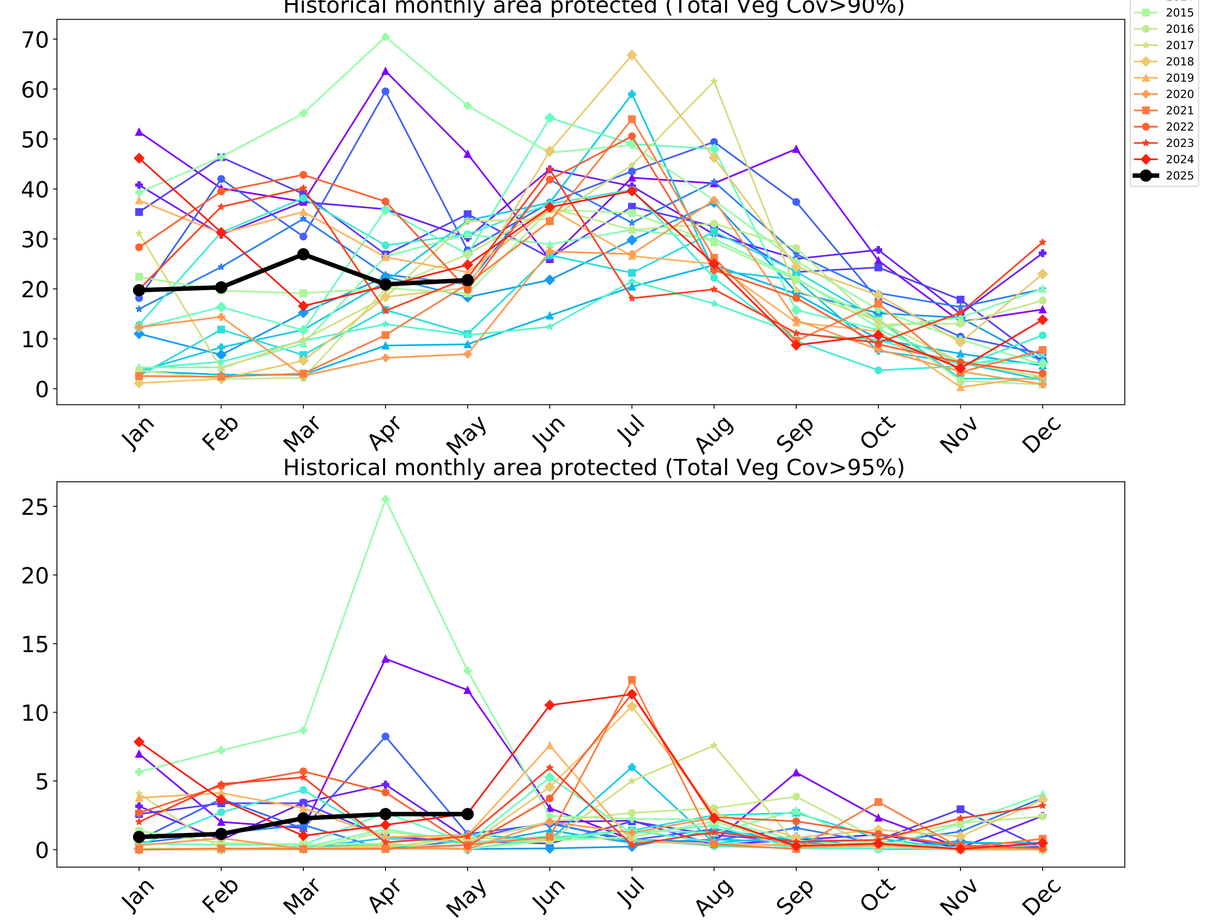
2025


Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
21.5
4.6
above_90
10th
50th
2025 May
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
above_95
10th
50th
2025 May


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
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Nov
Dec
2001
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2021
2022
2023
2024
2025

Toodyay_(S) (total 169,400 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	169,400	100.0% 169,400	99.9% 169,150	93.3% 157,975	71.5% 121,175	17.4% 29,400	2.4% 4,100
Conservation and natural environments	26,250	100.0% 26,250	100.0% 26,250	99.6% 26,150	96.6% 25,350	47.5% 12,475	7.0% 1,825
Conservation and natural environments Woodland forest	24,725	100.0% 24,725	100.0% 24,725	99.8% 24,675	97.7% 24,150	49.4% 12,225	7.4% 1,825
Agriculture	83,550	100.0% 83,550	99.7% 83,300	87.2% 72,850	51.1% 42,725	5.3% 4,450	1.0% 800
Grazing	7,350	100.0% 7,350	99.7% 7,325	91.2% 6,700	56.5% 4,150	7.1% 525	1.0% 75
Grazing non forest	7,225	100.0% 7,225	99.7% 7,200	91.0% 6,575	56.1% 4,050	6.9% 500	1.0% 75
Cropping	76,200	100.0% 76,200	99.7% 75,975	86.8% 66,150	50.6% 38,575	5.2% 3,925	1.0% 725
Production native forests and plantation forests	57,025	100.0% 57,025	100.0% 57,025	99.3% 56,600	90.3% 51,475	21.7% 12,400	2.6% 1,475