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

Date: December 2023

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

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

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

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

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

Erosion protection: Wind erosion 50% total vegetation cover

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

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

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

Erosion protection

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

Rainfall

• Millimetres rainfall each month (black line).

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

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

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

Acknowledgment of data:

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

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

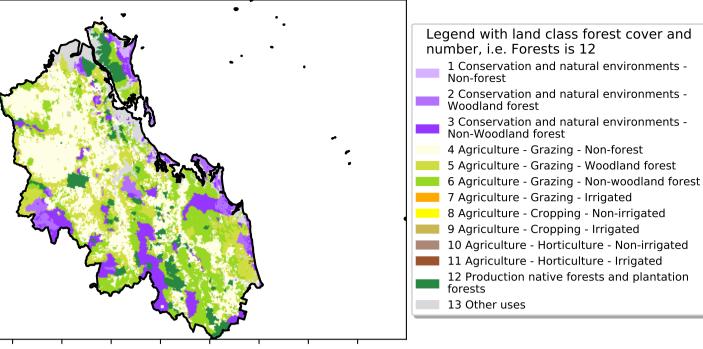


Vegetation Cover Dec 2023

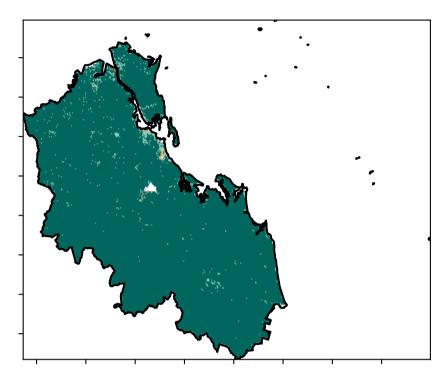
Land use and forest cover

Proportion of each land class in area

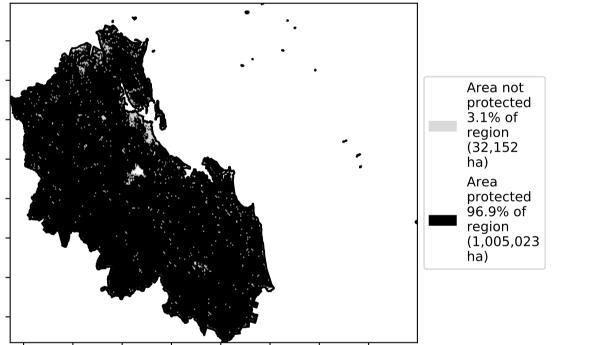


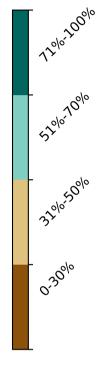


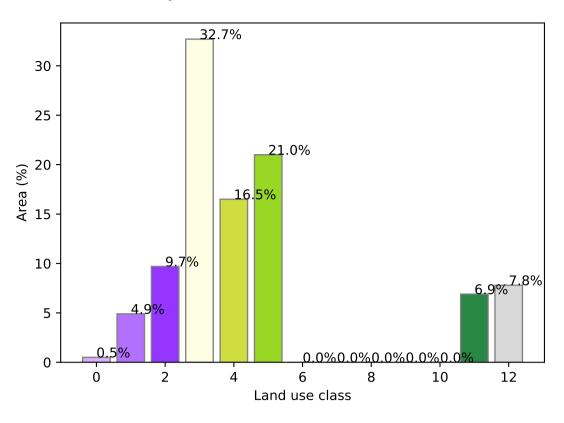
Total Vegetation Cover [%]



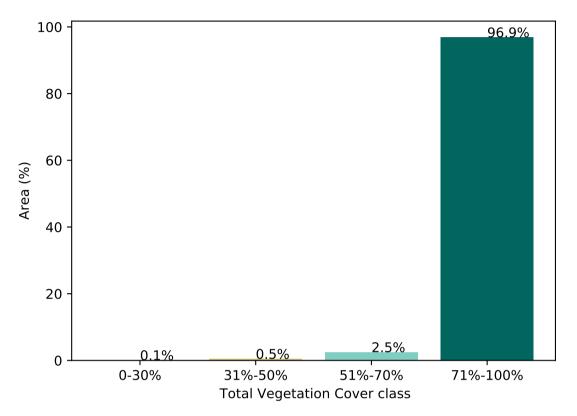
% Area protected from water erosion (>70%)



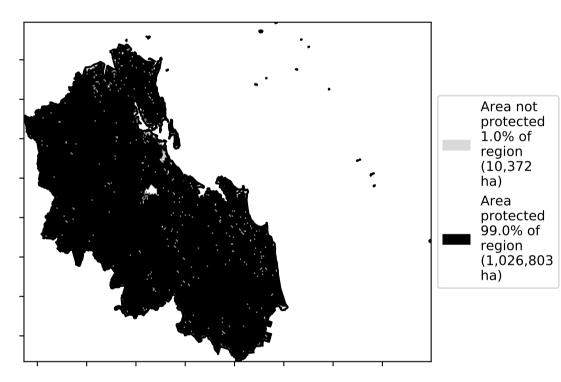




Proportion of vegetation cover class in area

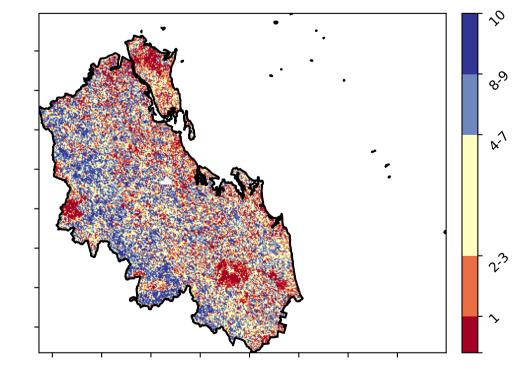


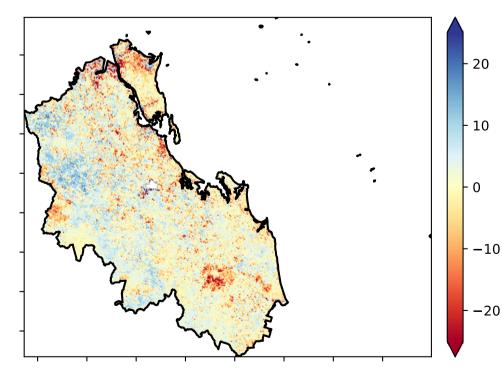
% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

Total Vegetation Cover Decile [%]





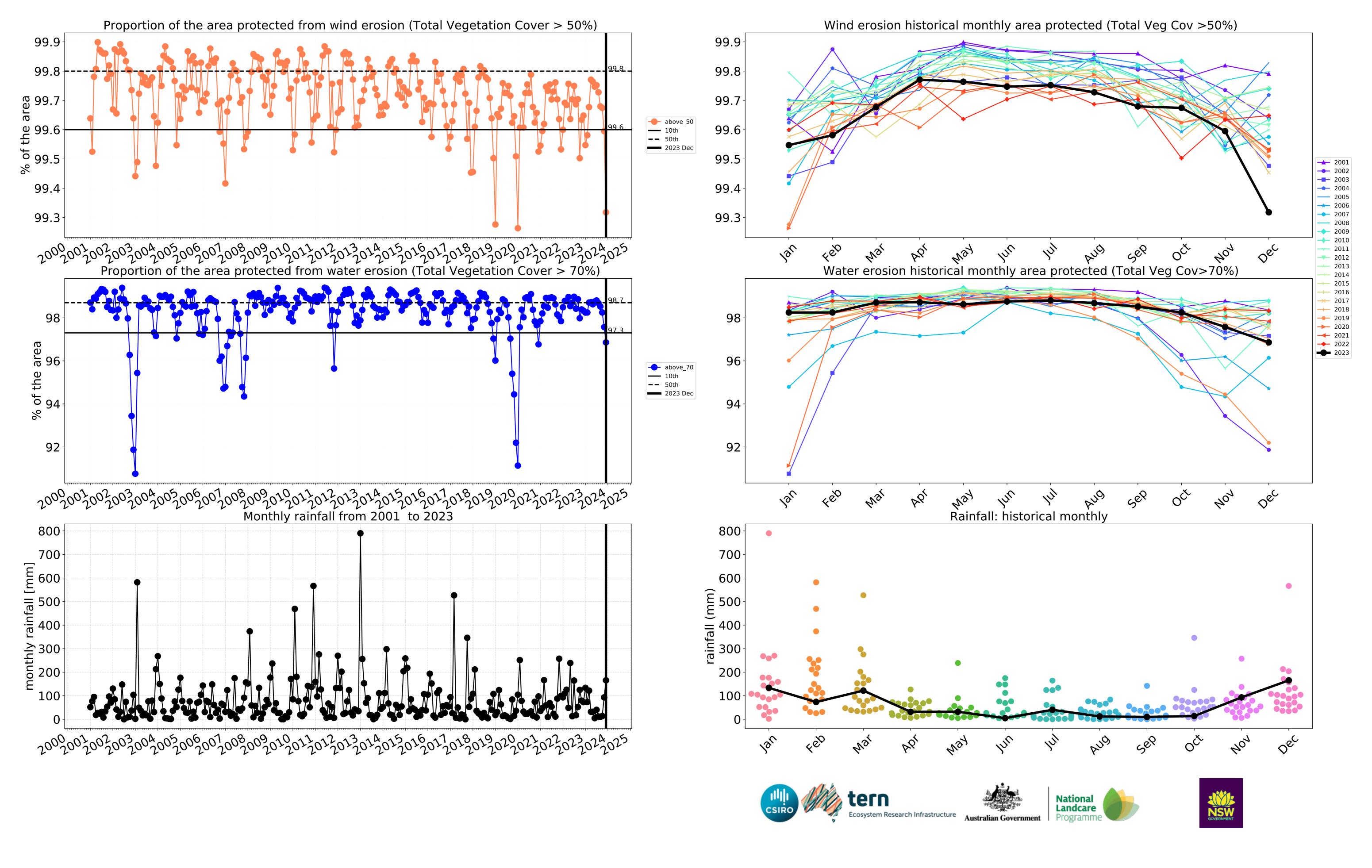
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

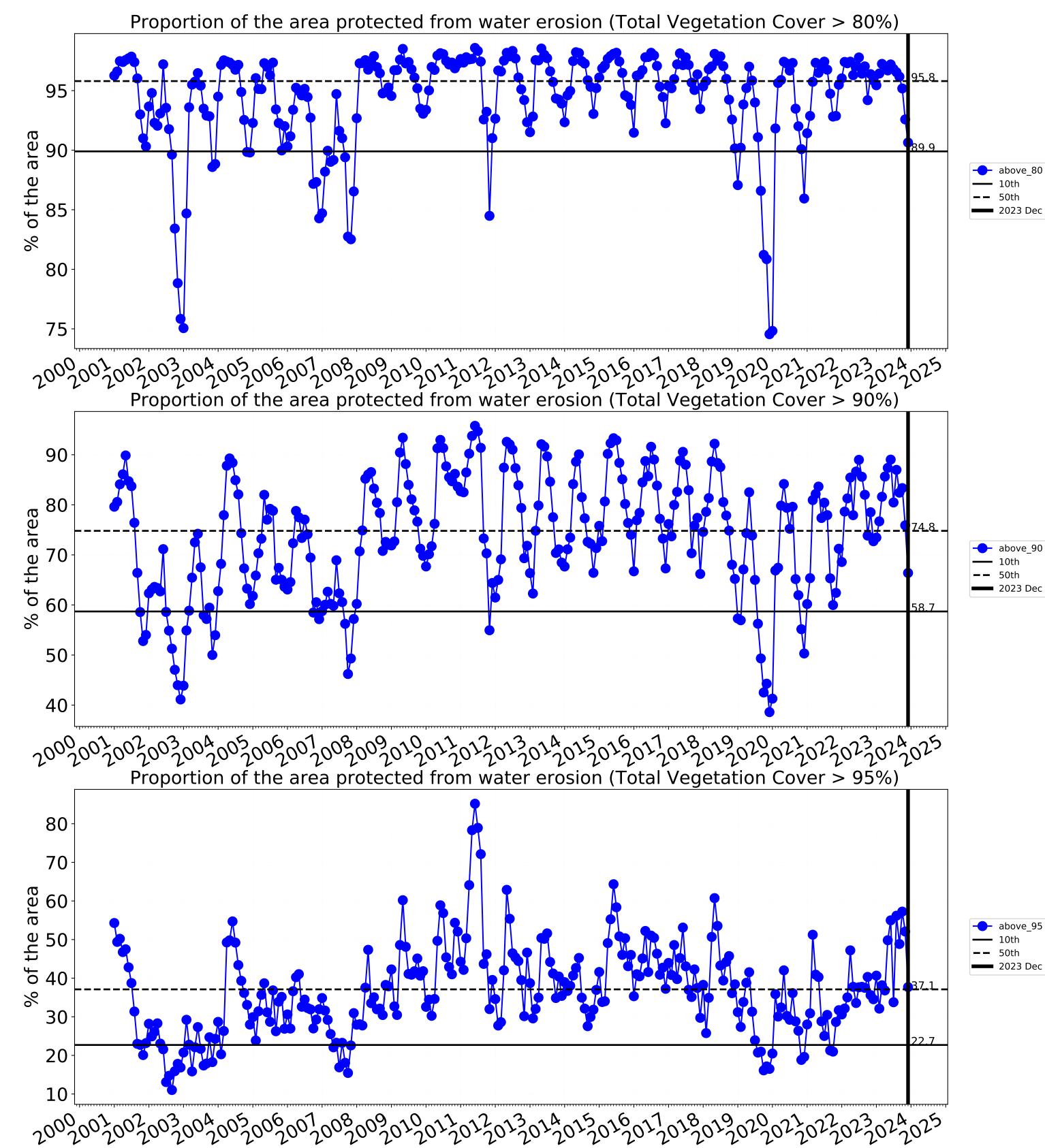


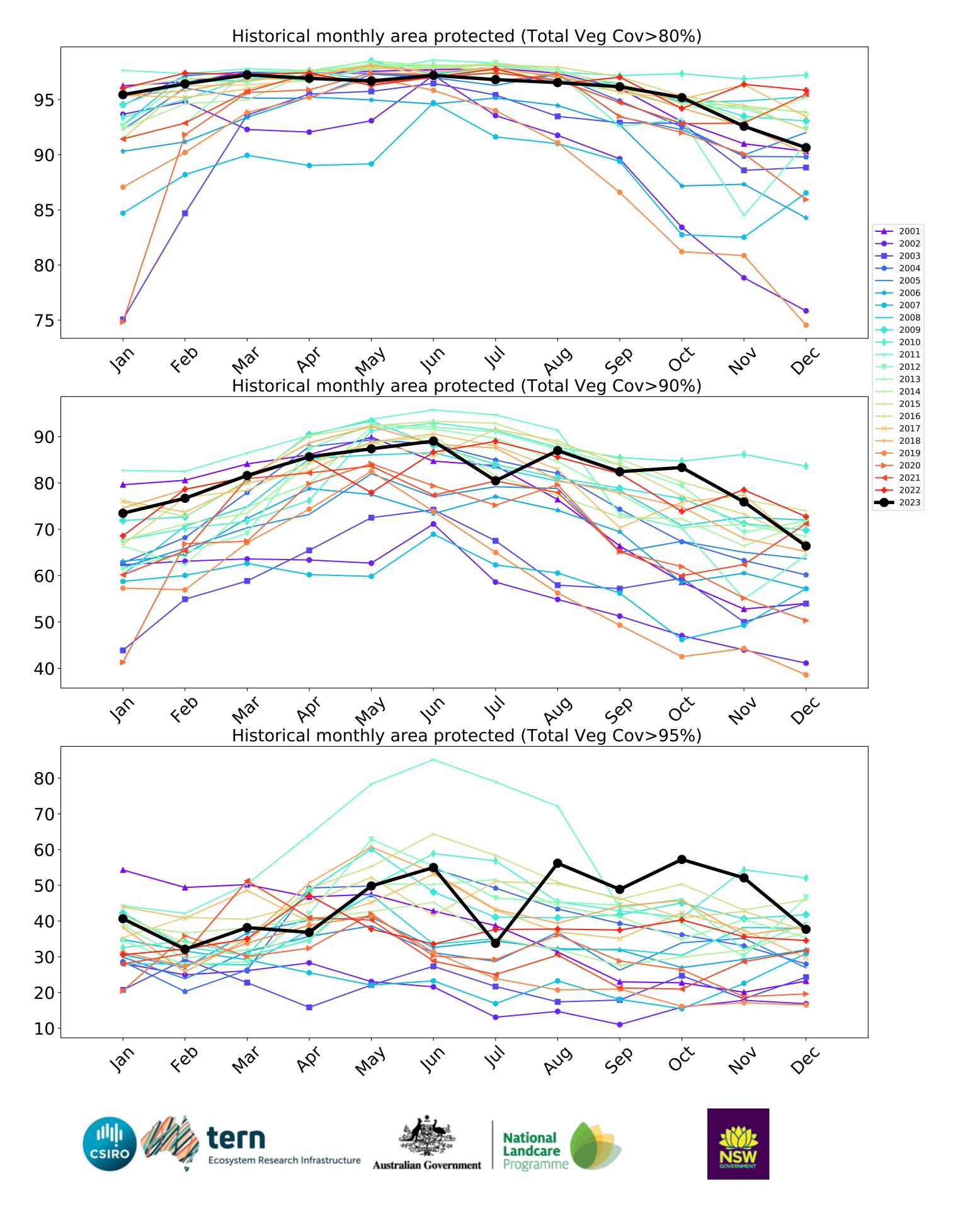
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



2







Conservation and natural environments

forest

forest

Land use and forest cover

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

Derived from

is, red pixels are about 20% lower than the

mean of that

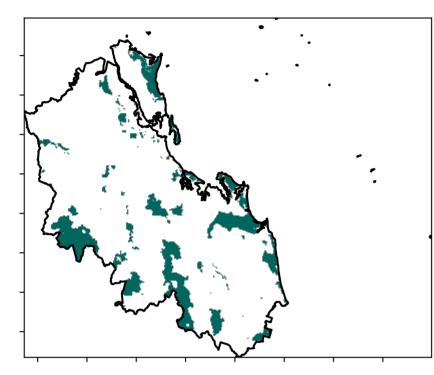
pixel. The mean

using baseline from 2001 to 2019.

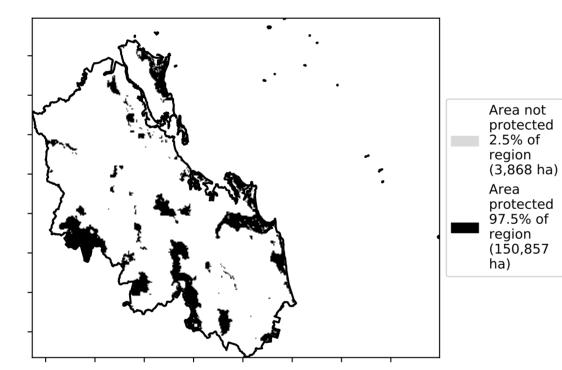
Use of Australia

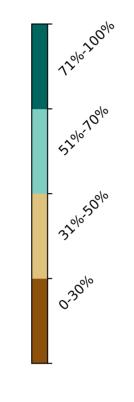
(2018) and Forests of Australia (2018)

Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





1 Conservation and natural environments - Non-

3 Conservation and natural environments - Non-woodland forest

2 Conservation and natural environments - Woodland

10

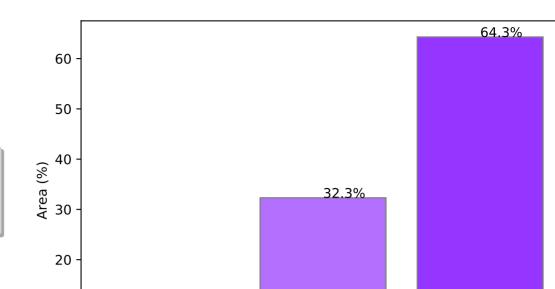
0

-0.5

3.3%

0.0

0.5



Proportion of each land class in area

Proportion of vegetation cover class in area

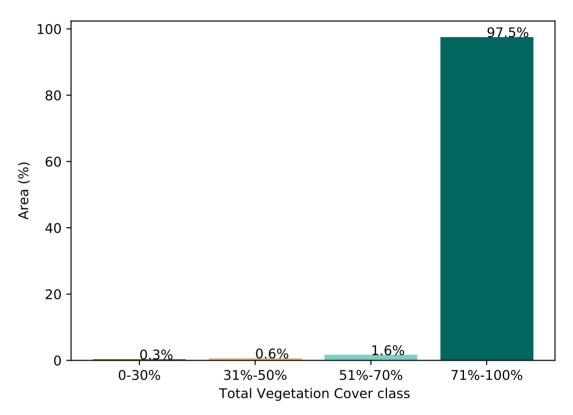
1.0

Land use class

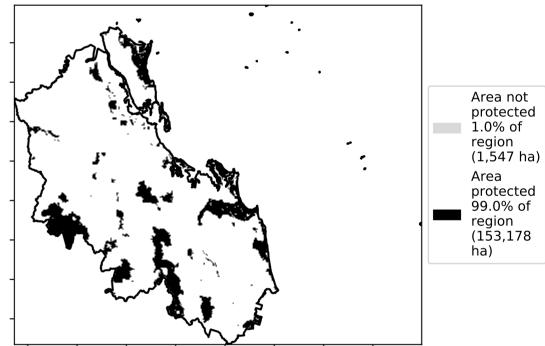
1.5

2.0

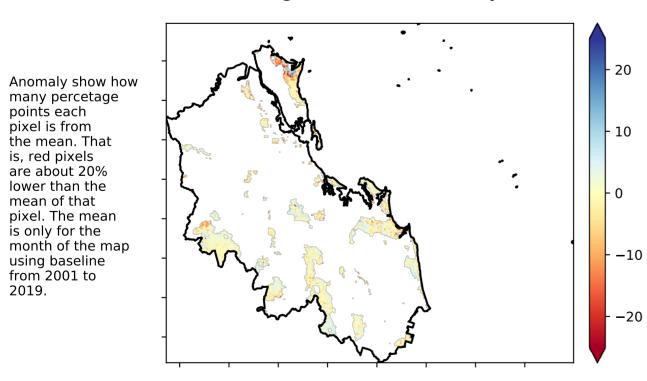
2.5



% Area protected from wind erosion (>50%)

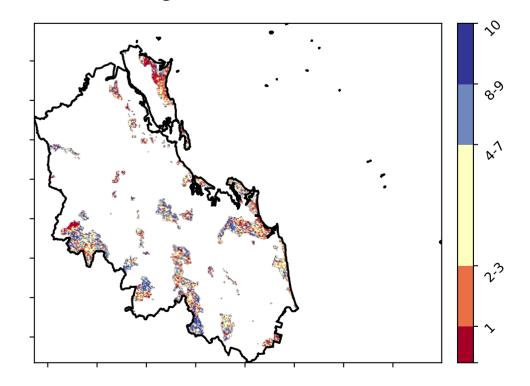


Total Vegetation Cover Anomaly [%]



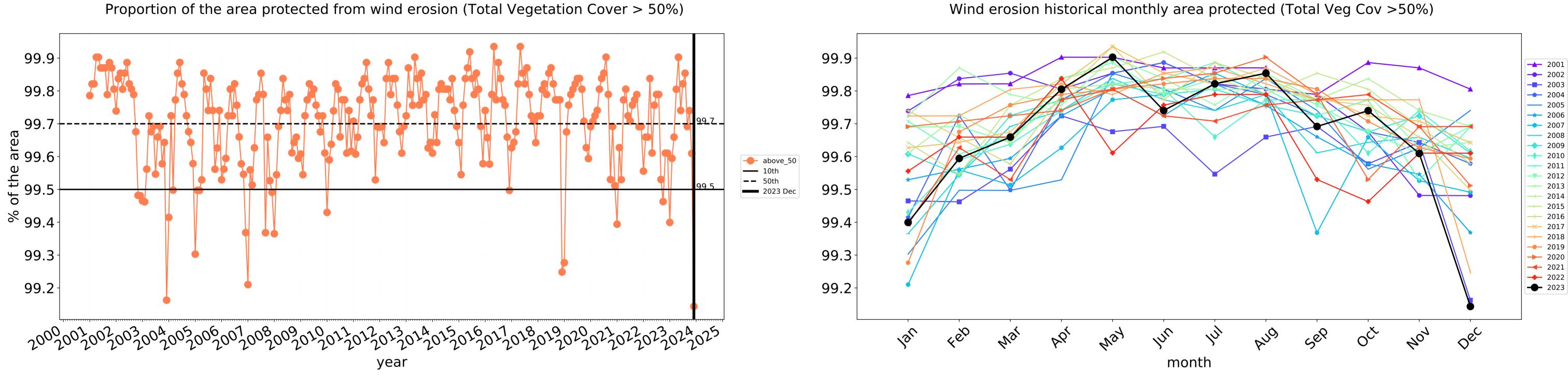
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



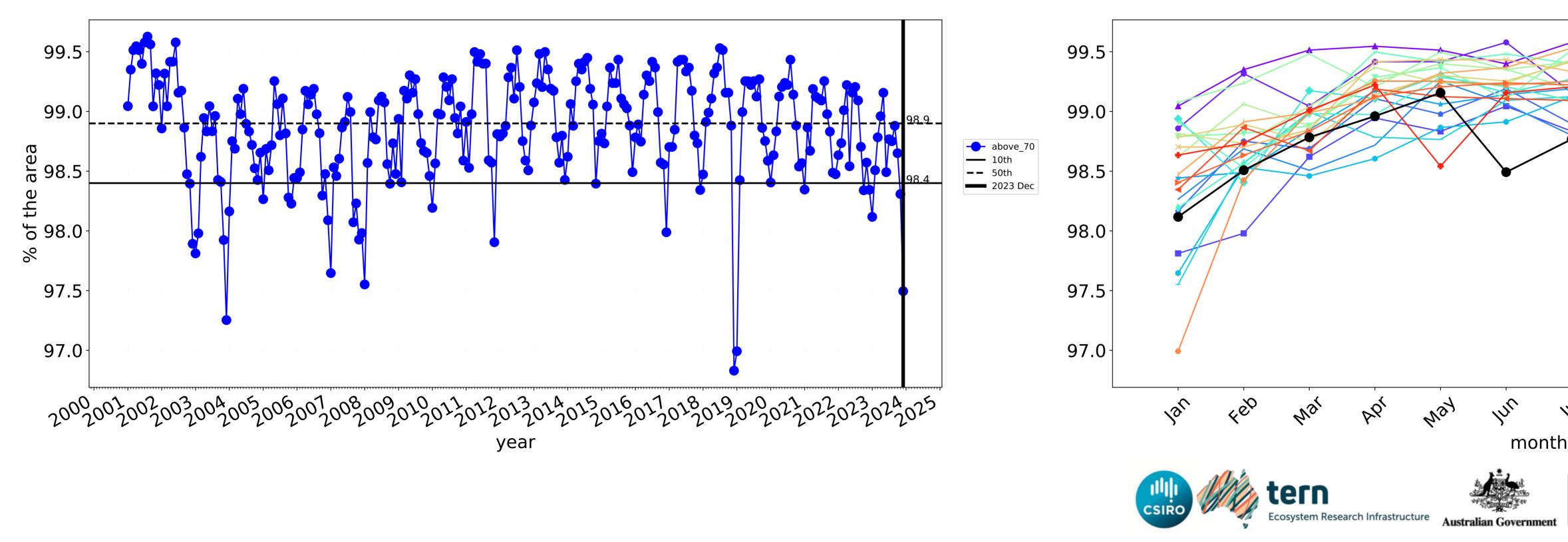


3



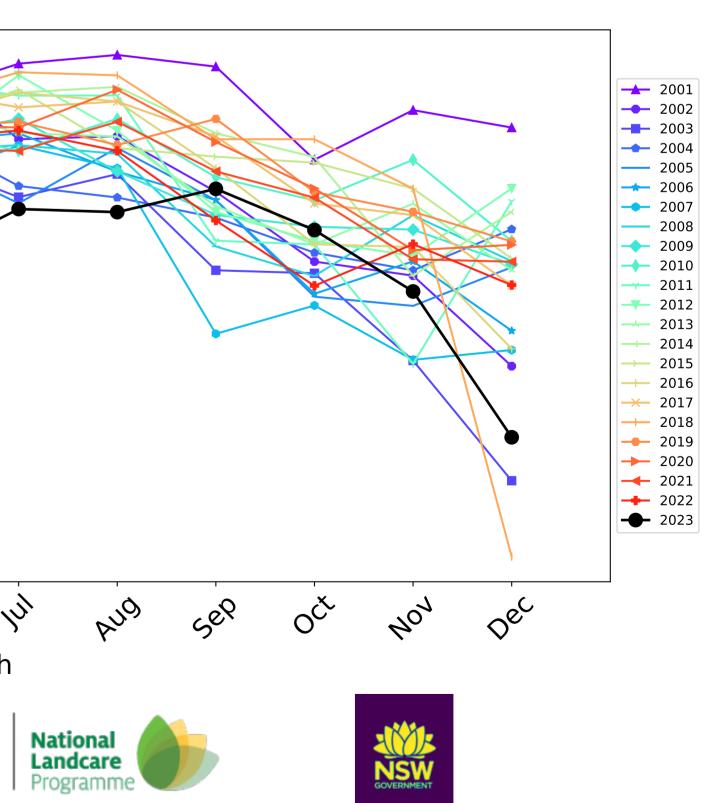
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

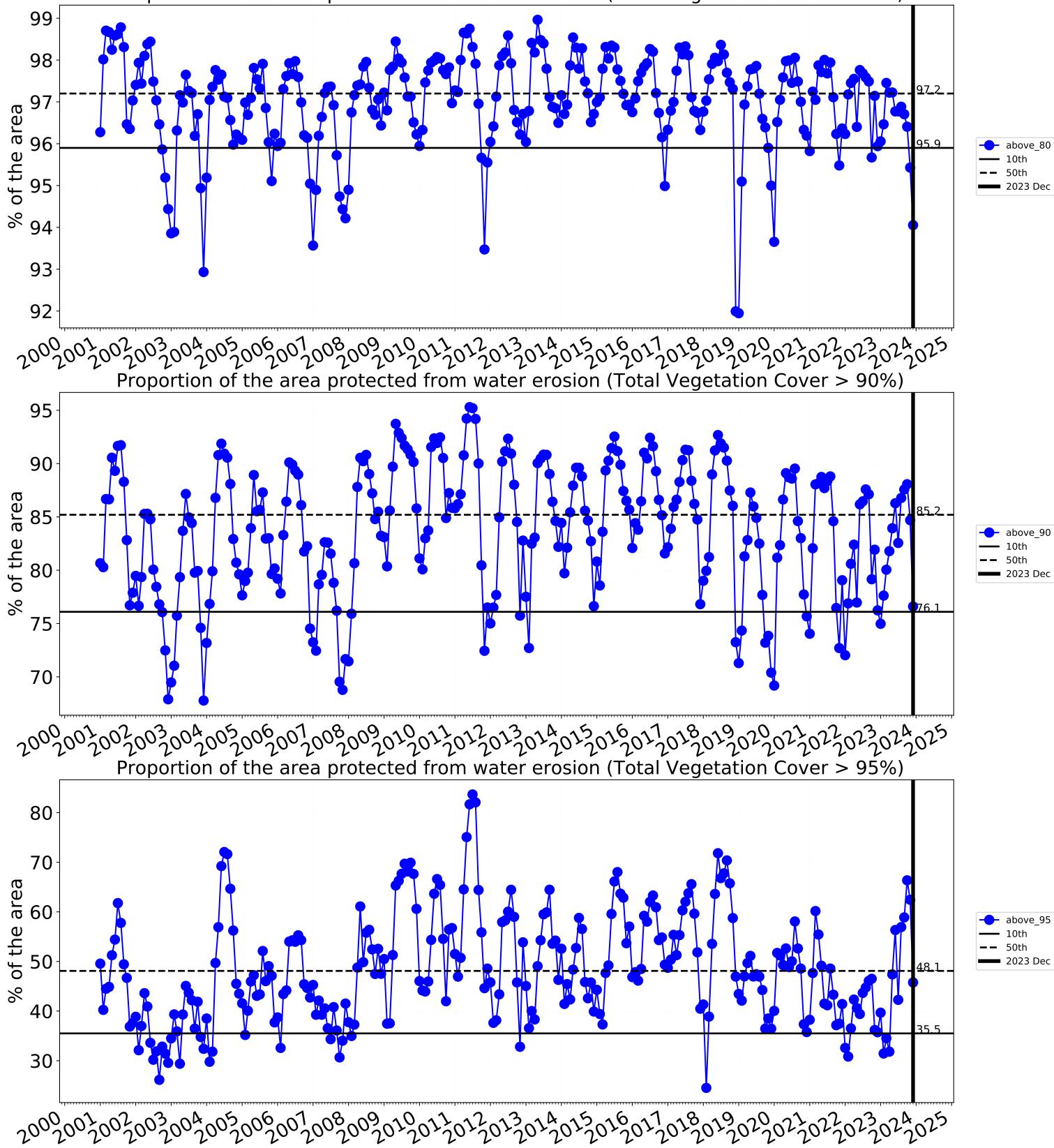


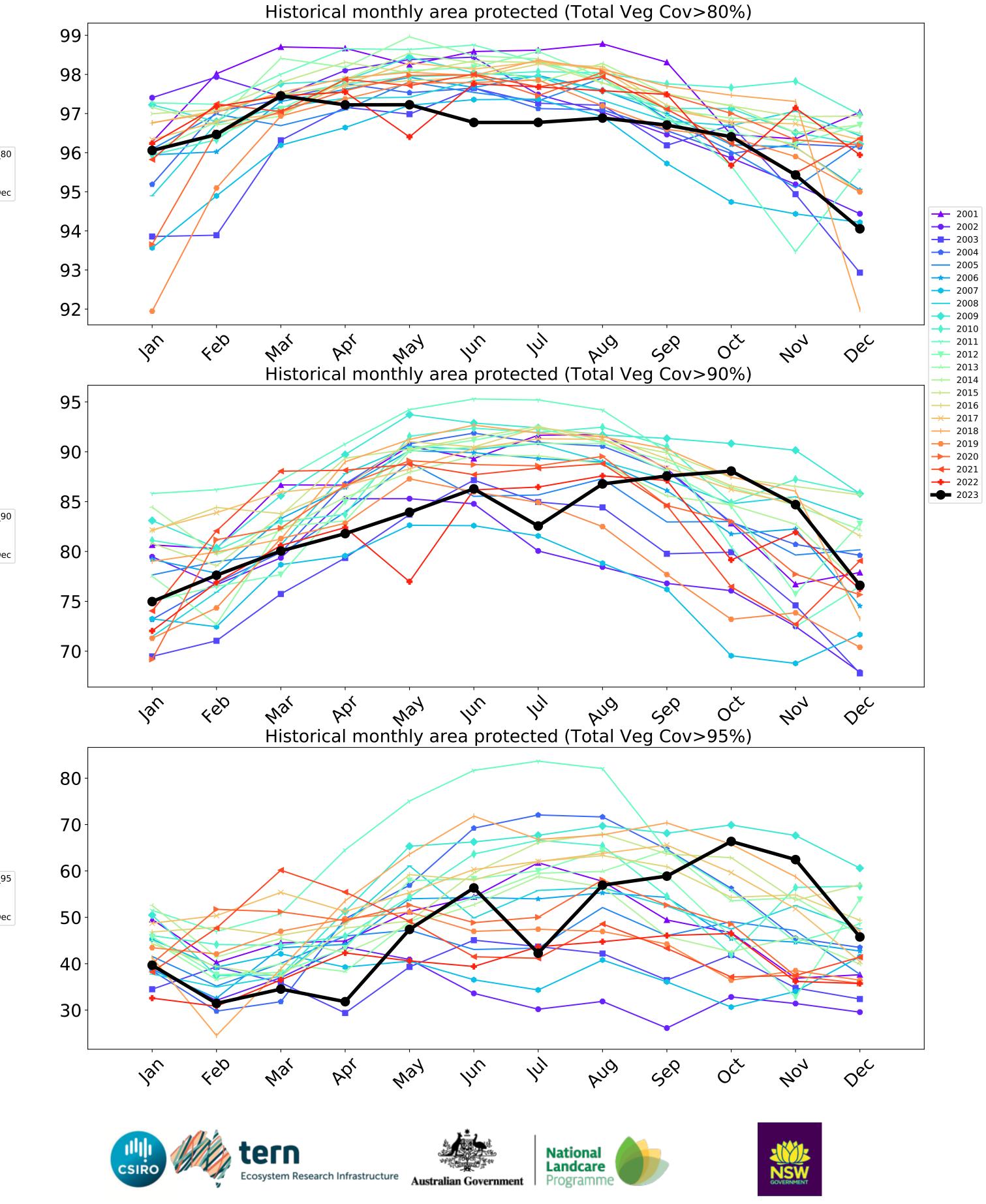
6

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



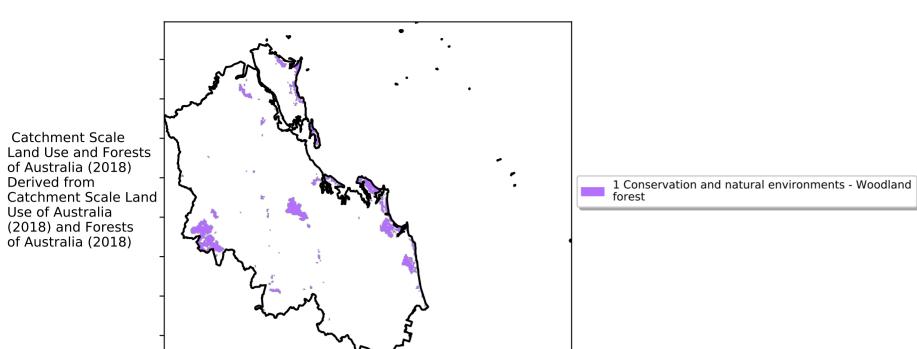
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



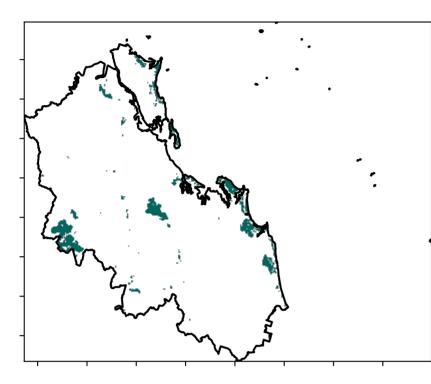


Conservation and natural environments Woodland forest

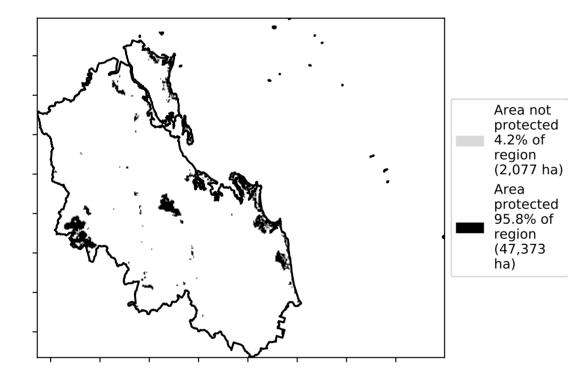
Land use and forest cover

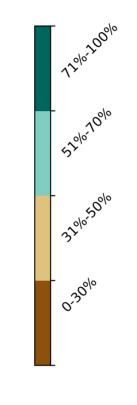


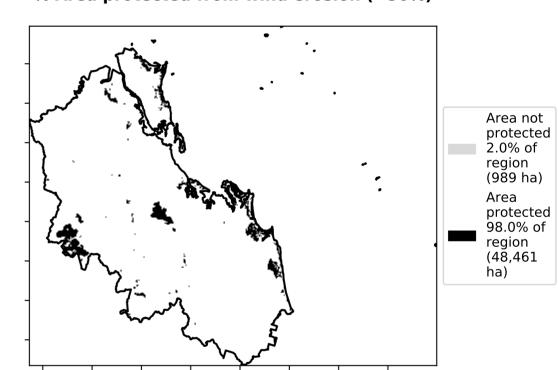
Total Vegetation Cover [%]



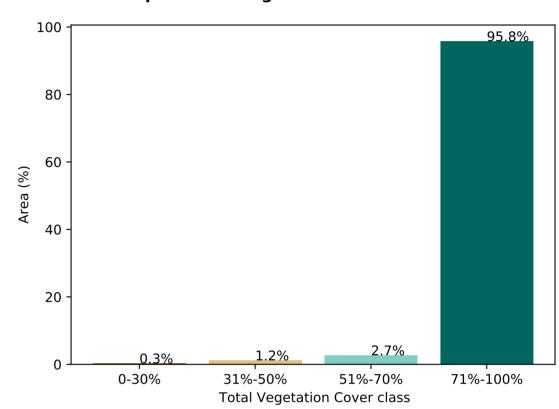
% Area protected from water erosion (>70%)







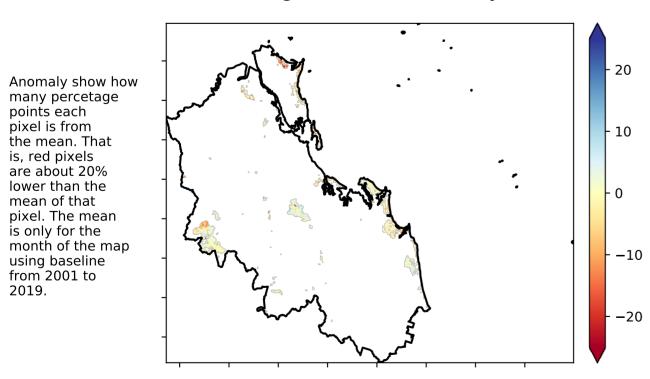
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



is, red pixels are about 20% lower than the

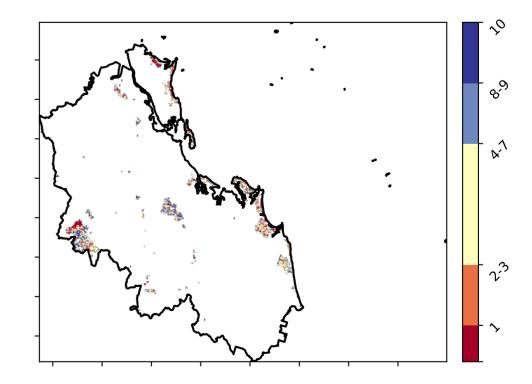
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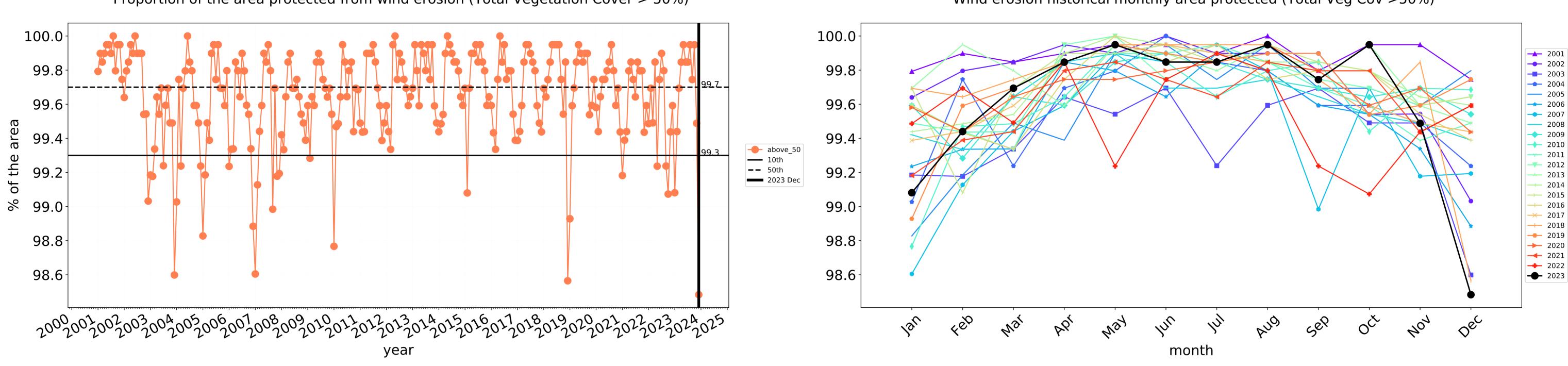
using baseline from 2001 to 2019.

is only for the month of the map

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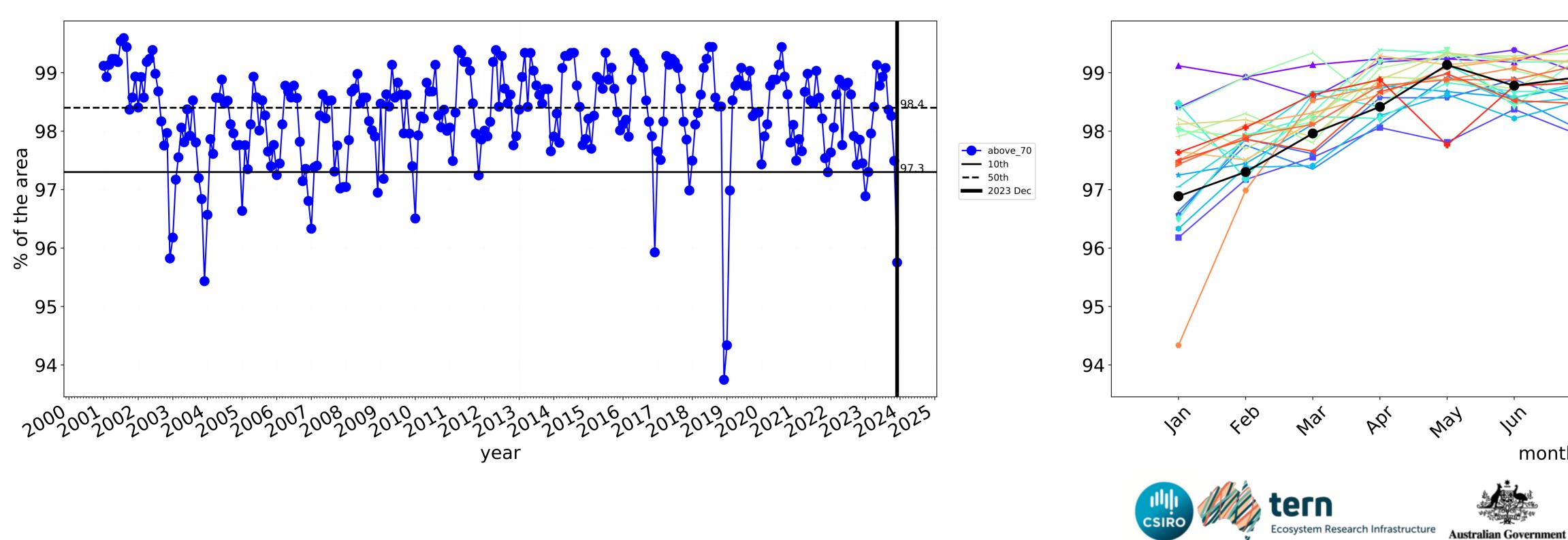






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

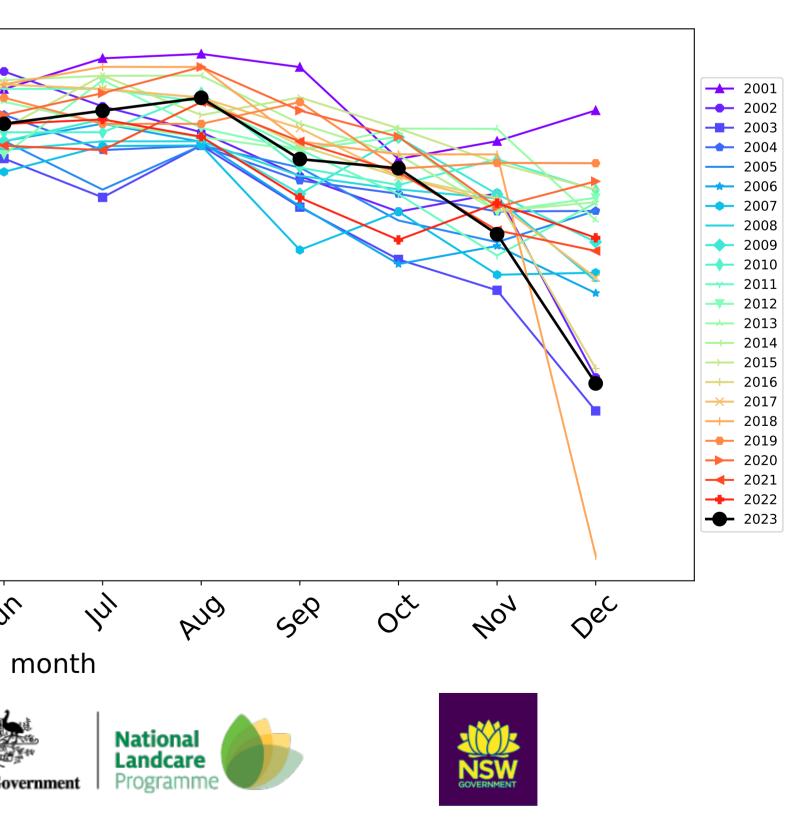


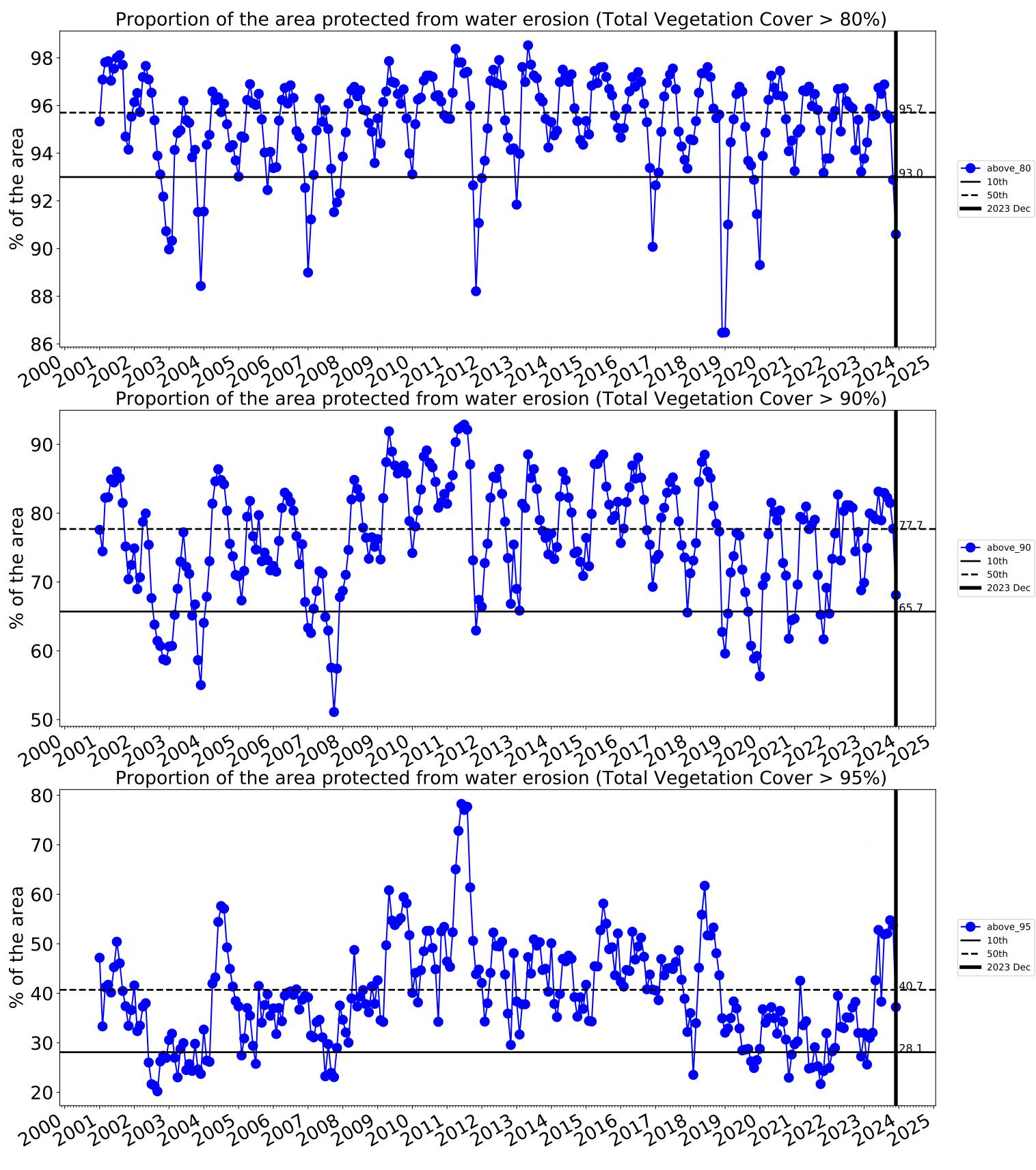
Wind erosion historical monthly area protected (Total Veg Cov >50%)

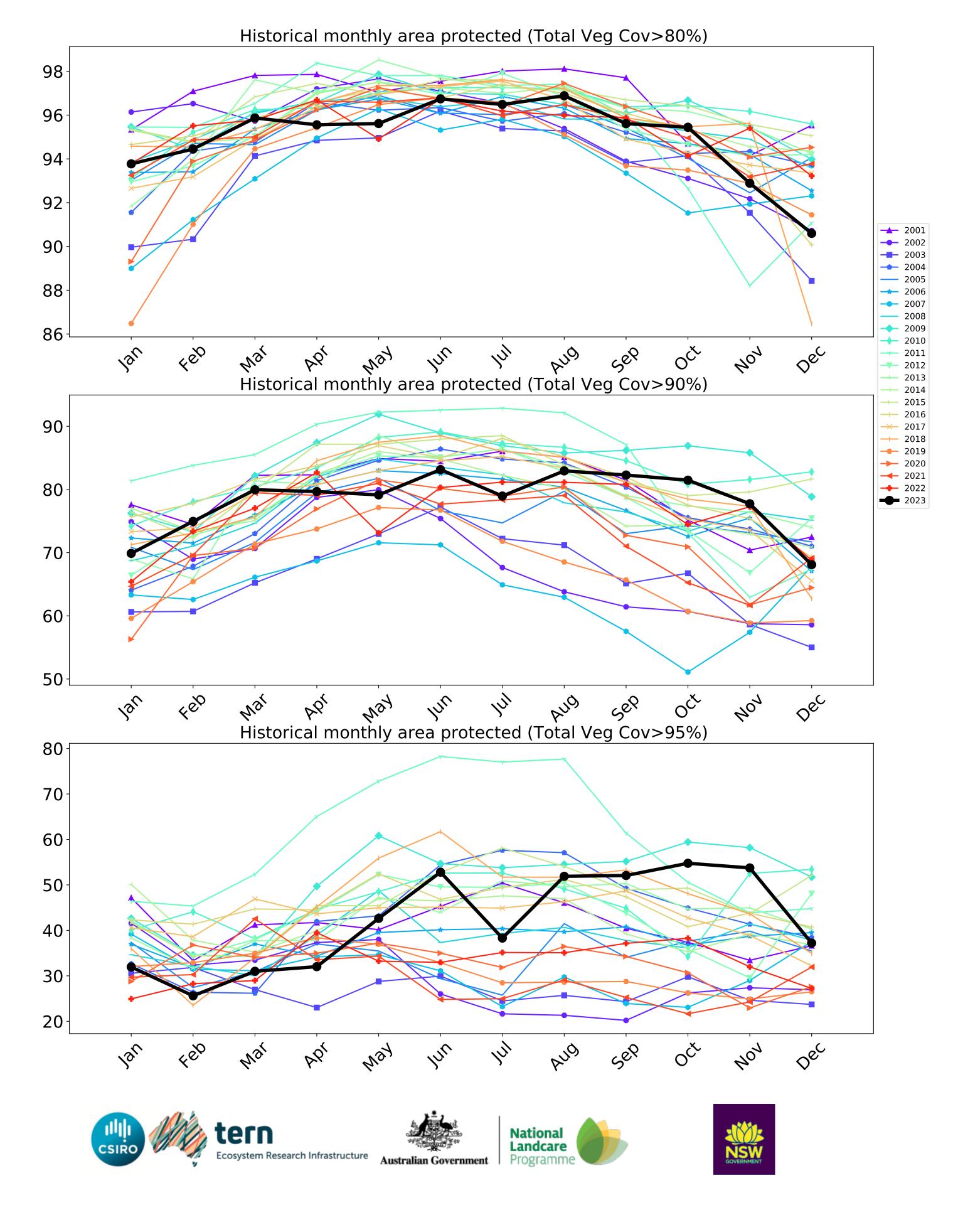
9

In

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

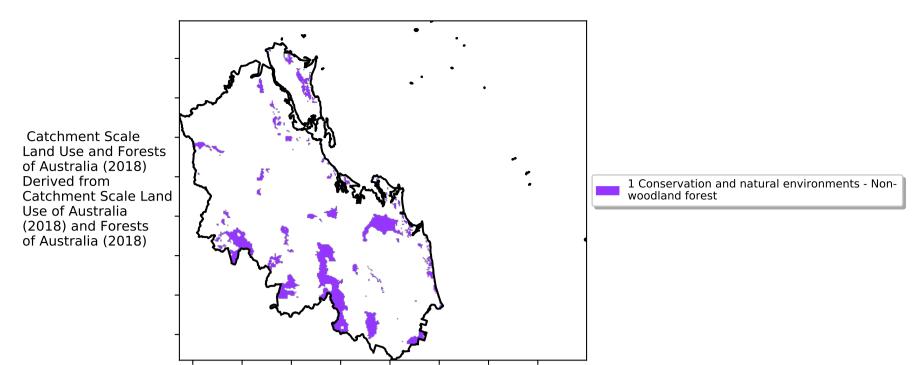




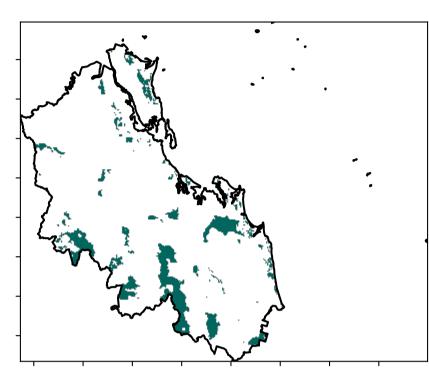


Conservation and natural environments Forest (non woodland)

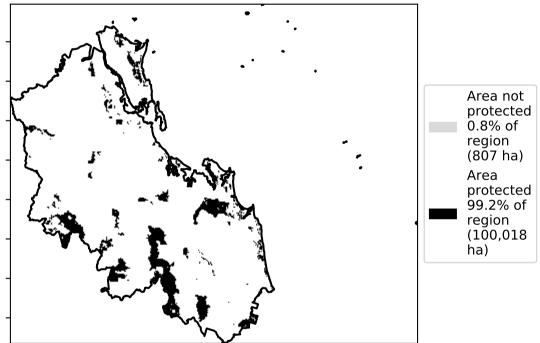
Land use and forest cover

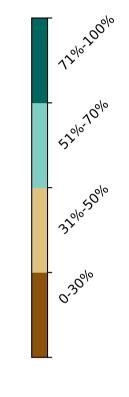


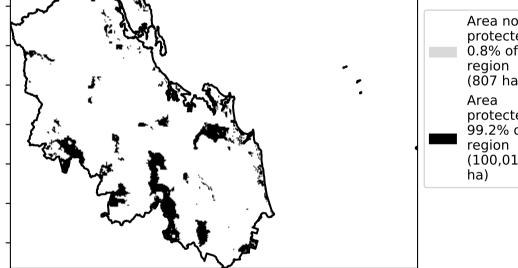
Total Vegetation Cover [%]



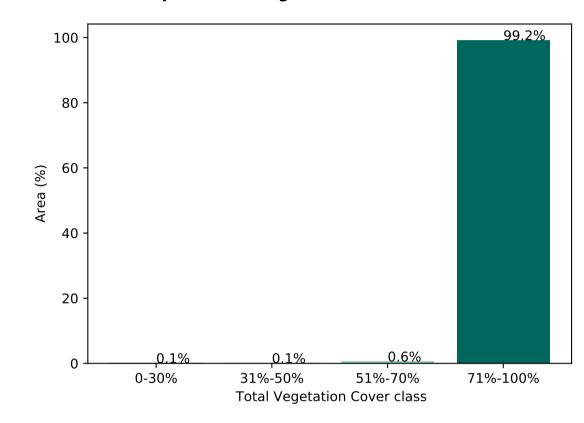
% Area protected from water erosion (>70%)



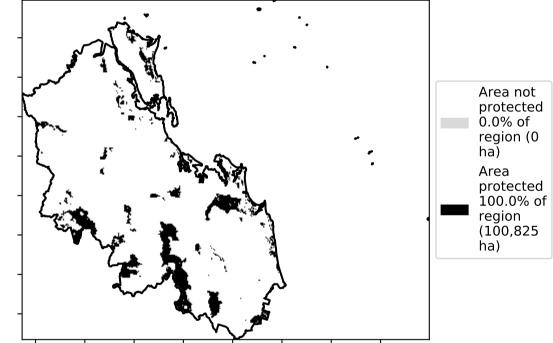




Proportion of vegetation cover class in area

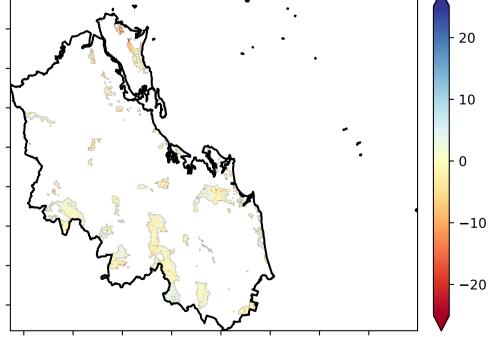


% Area protected from wind erosion (>50%)

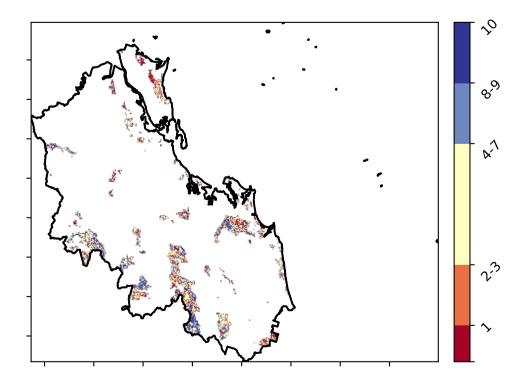


Total Vegetation Cover Anomaly [%]

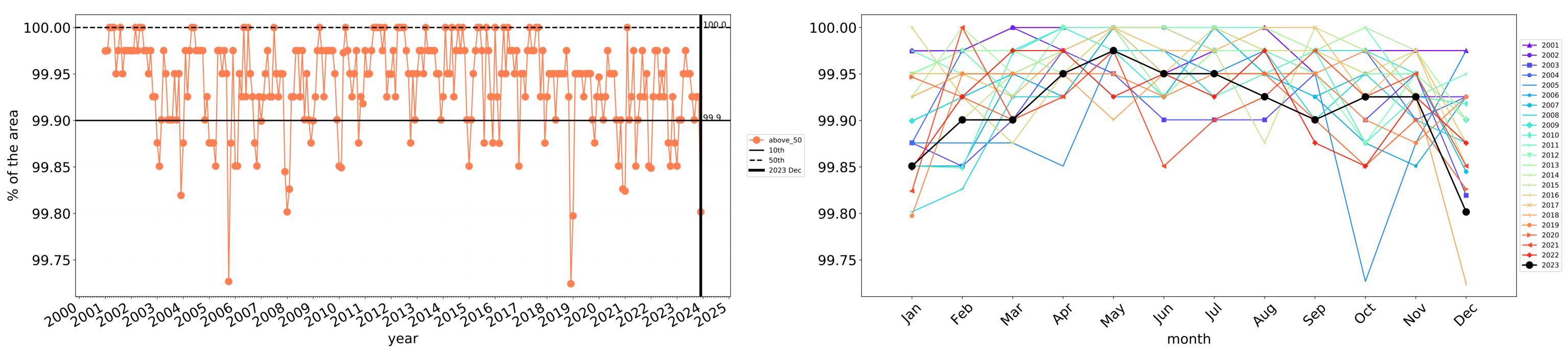
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



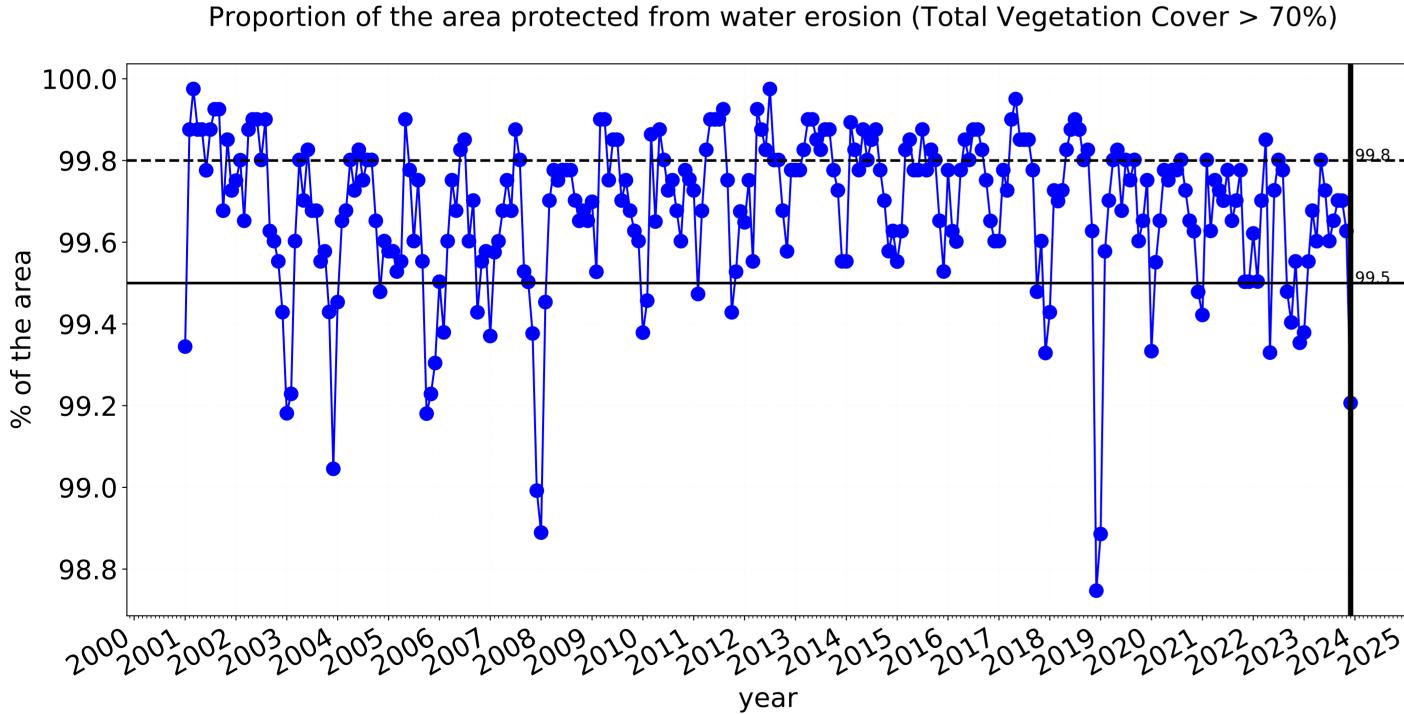
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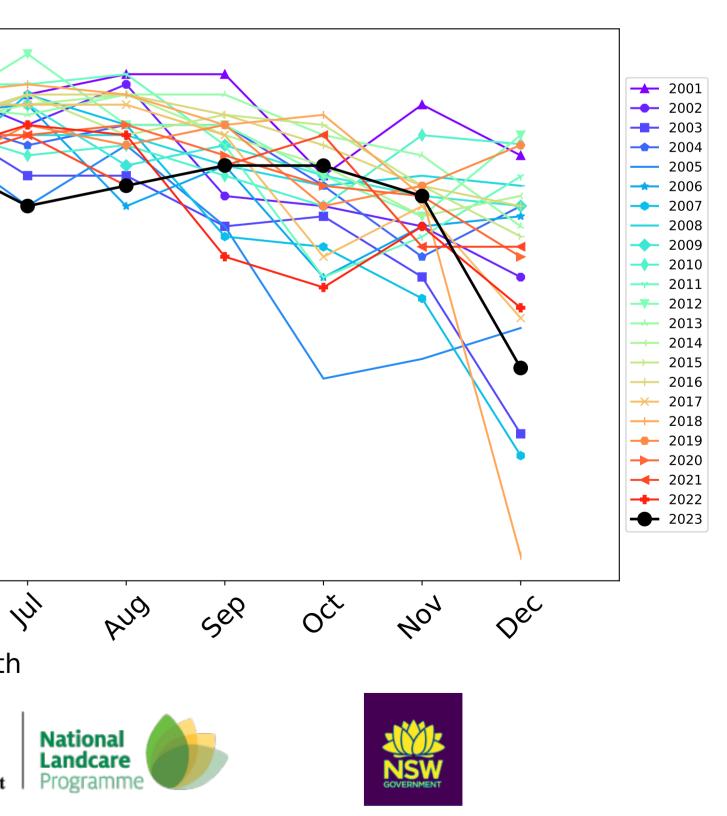
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

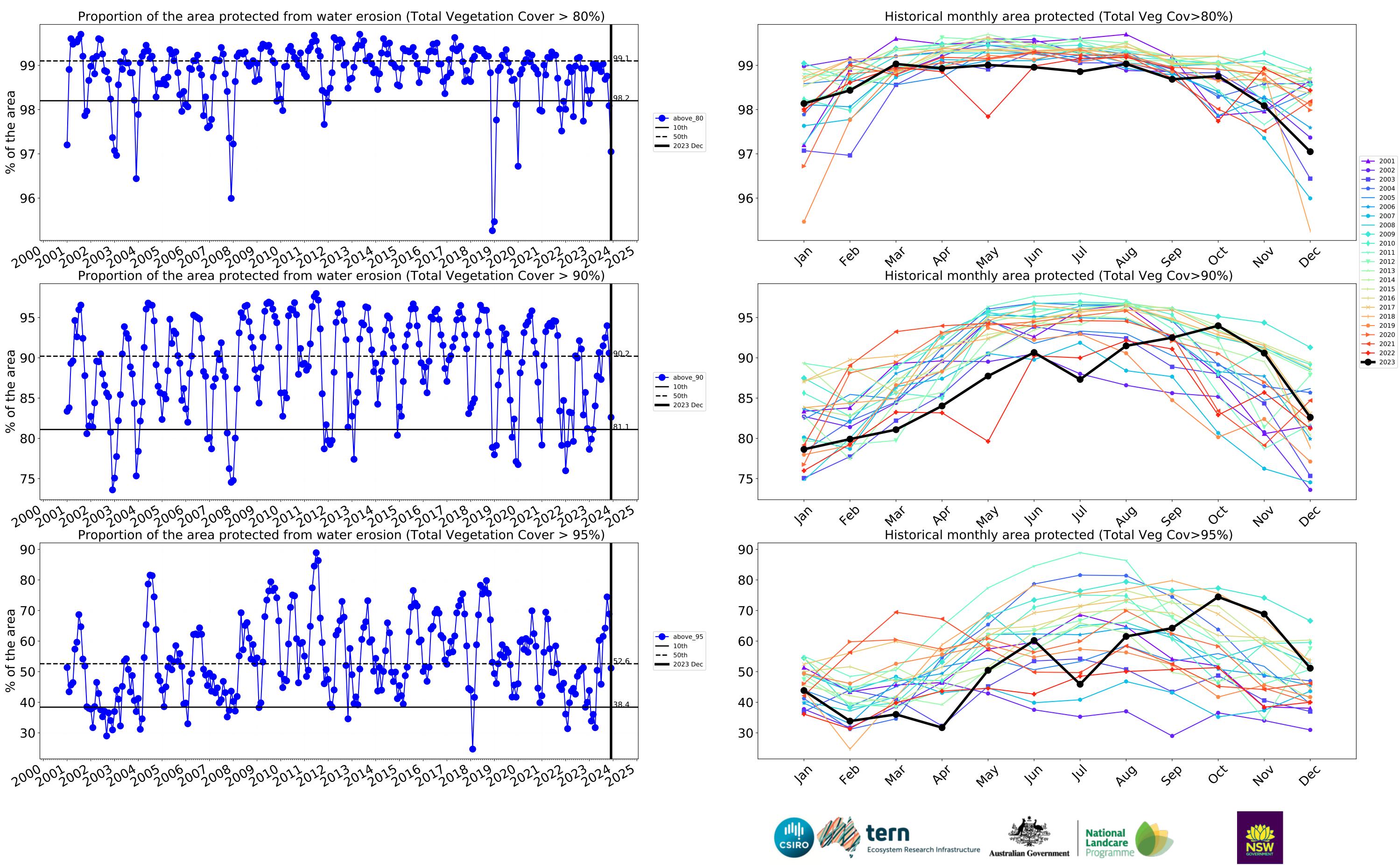


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0 99.8 99.6 ---- above_70 **—** 10th **--** 50th ------ 2023 Dec 99.4 99.2 99.0 98.8 4eb 1ar May In PQ' Way month mli tern Ecosystem Research Infrastructure Australian Government

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





Agriculture

1 Agriculture - Grazing - Non forest

5 Agriculture - Cropping - Non-irrigated

7 Agriculture - Horticulture - Non-irrigated 8 Agriculture - Horticulture - Irrigated

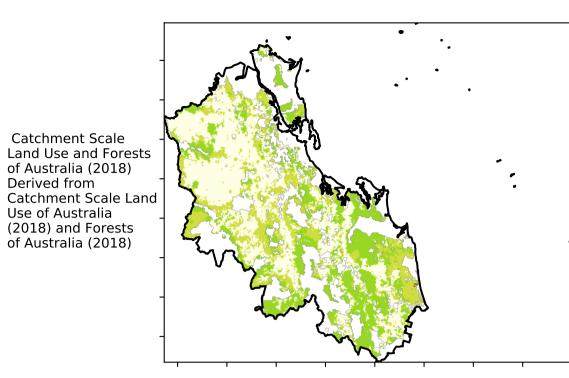
4 Agriculture - Grazing - Irrigated

6 Agriculture - Cropping - Irrigated

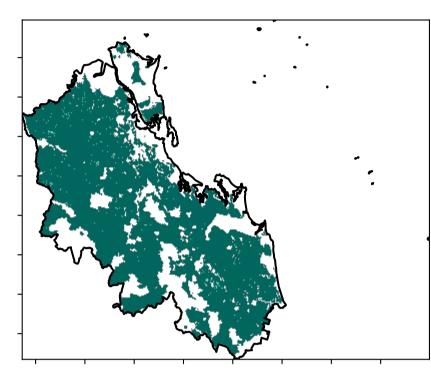
2 Agriculture - Grazing - Woodland forest

3 Agriculture - Grazing - Non-woodland forest

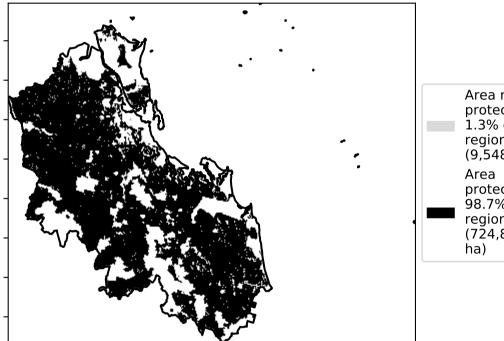
Land use and forest cover

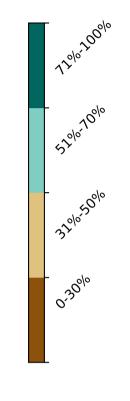


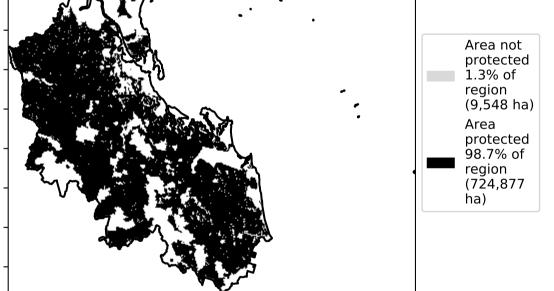
Total Vegetation Cover [%]

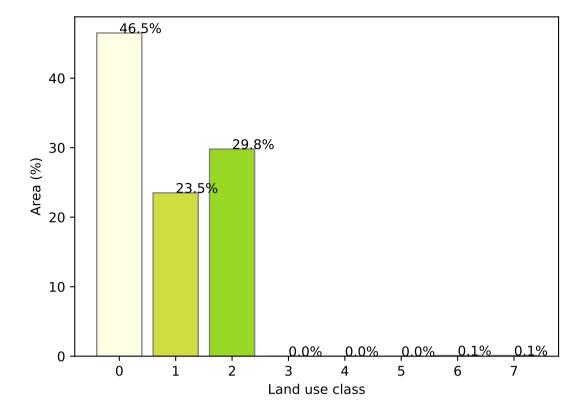


% Area protected from water erosion (>70%)



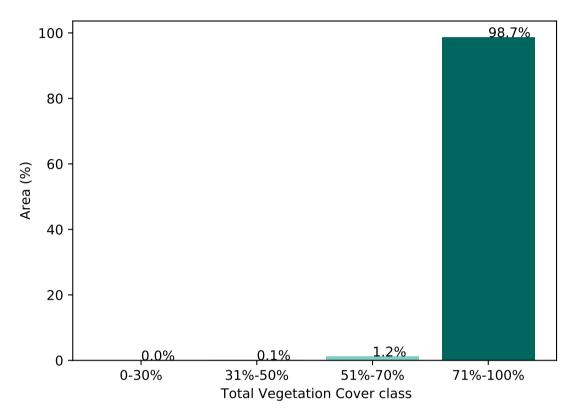




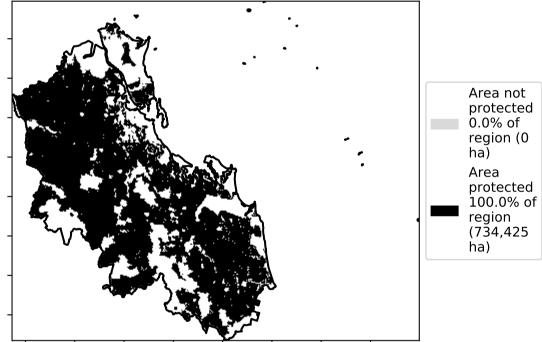


Proportion of each land class in area

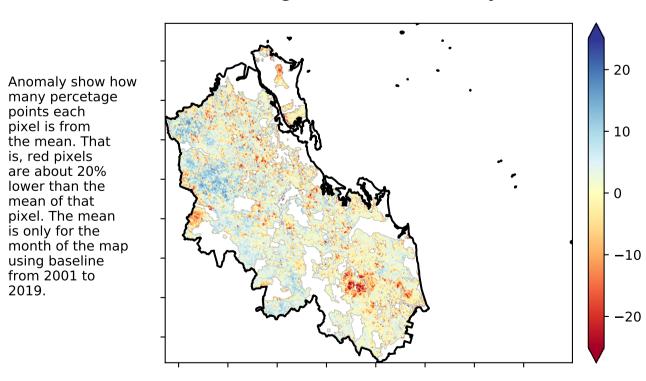
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



the mean. That

is, red pixels are about 20% lower than the

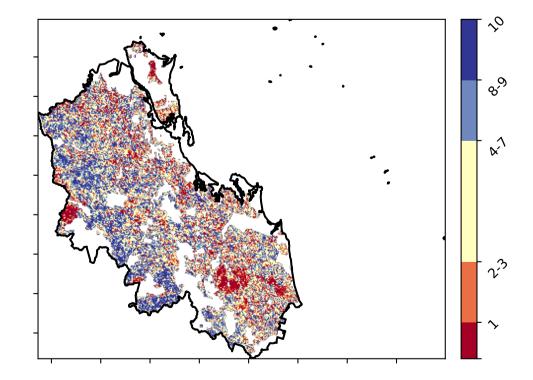
mean of that

pixel. The mean

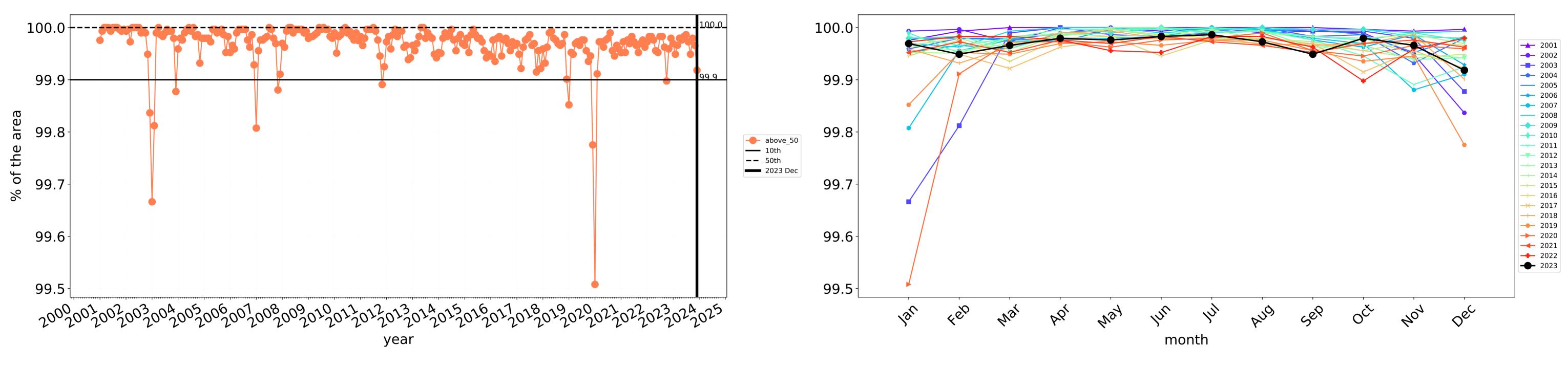
using baseline from 2001 to 2019.

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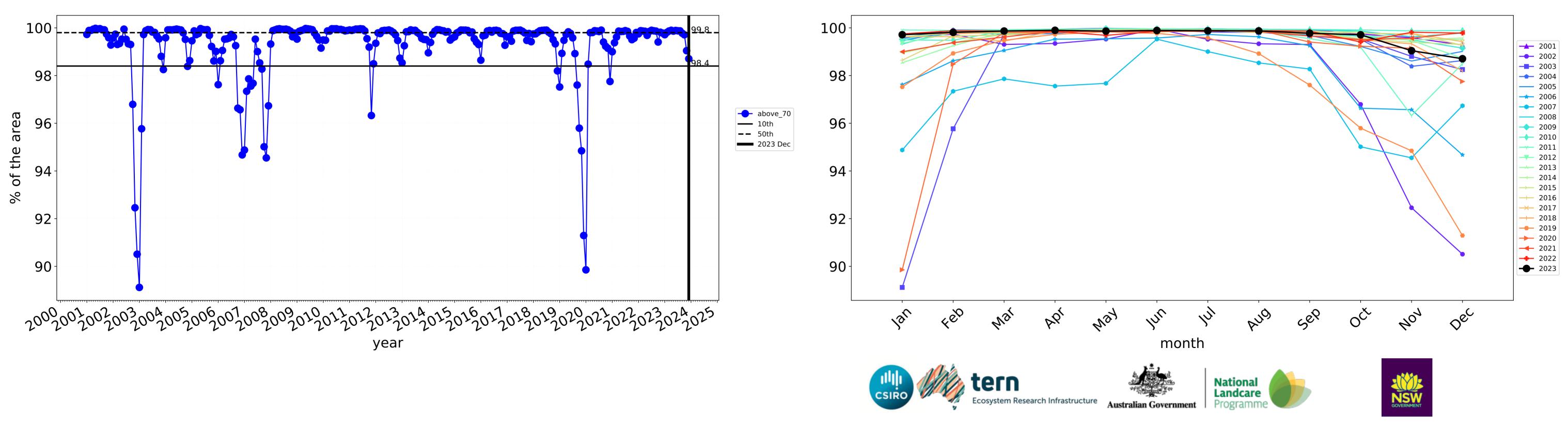




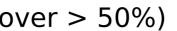


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

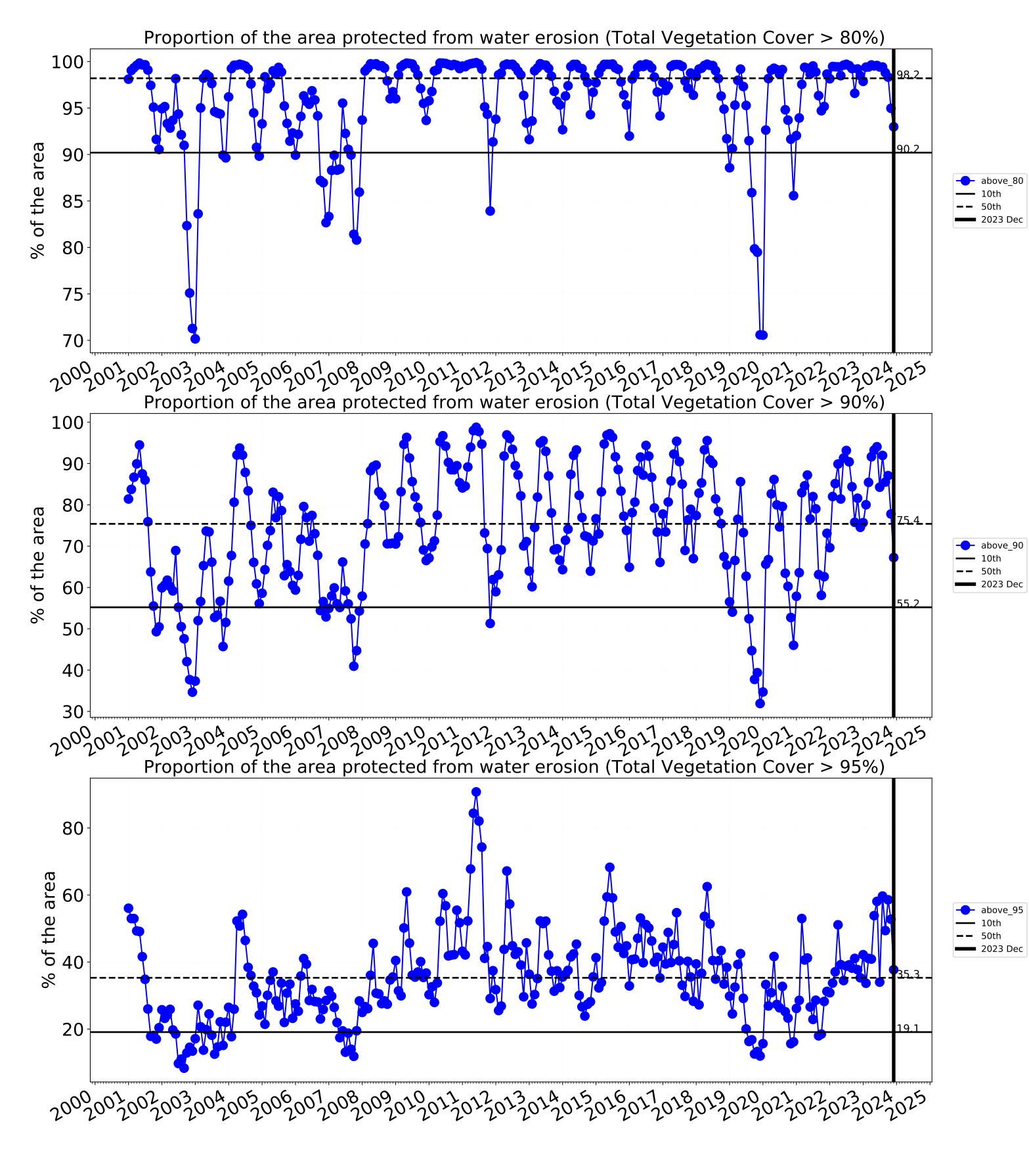


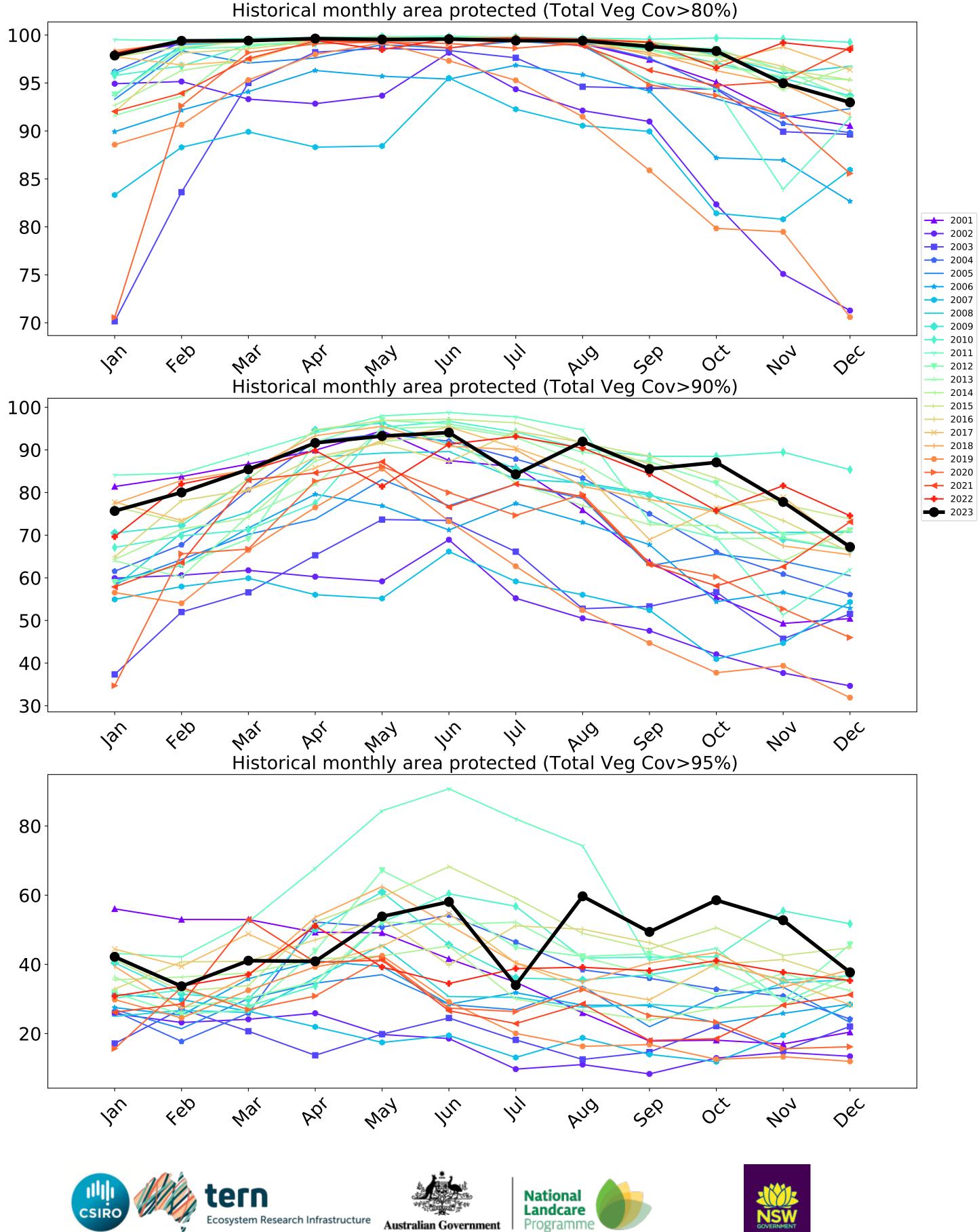
Agriculture timeseries



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

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

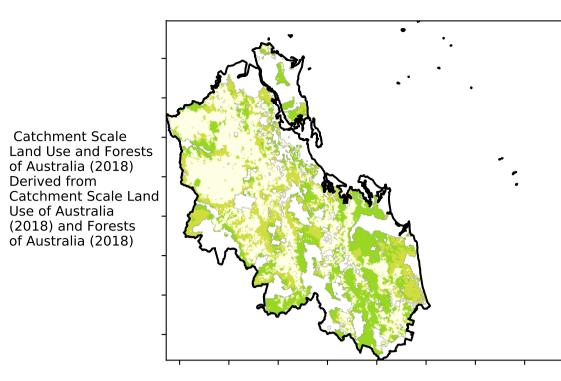




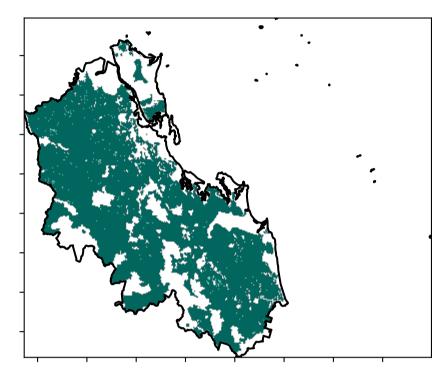


Grazing

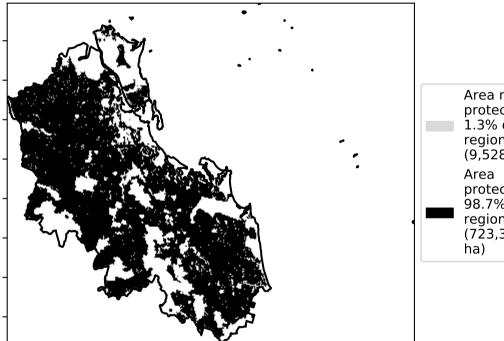
Land use and forest cover

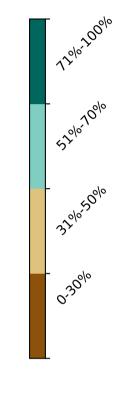


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



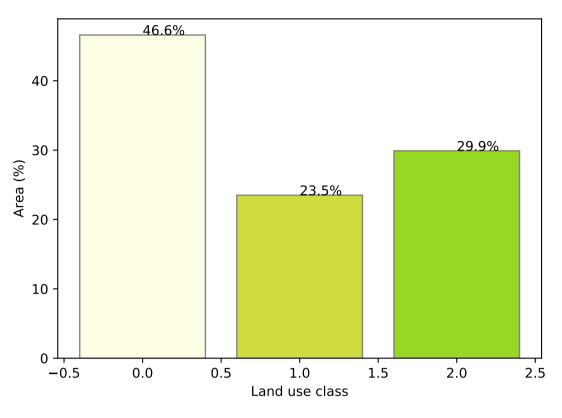


1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest

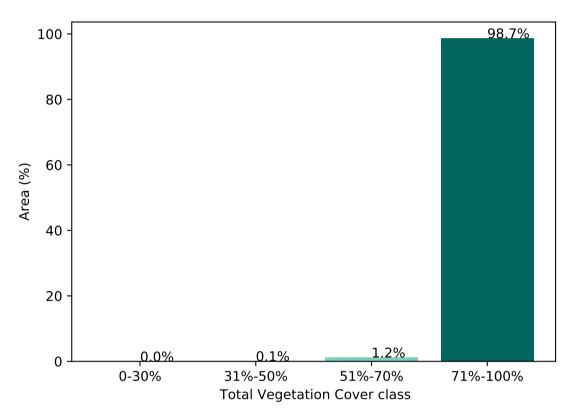
3 Agriculture - Grazing - Non-woodland forest



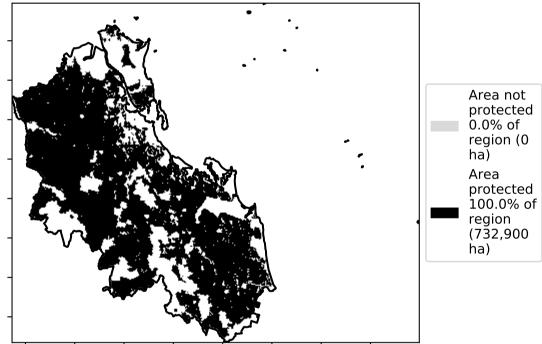
Proportion of each land class in area



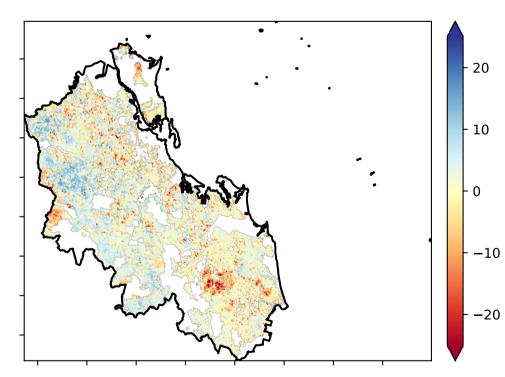
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

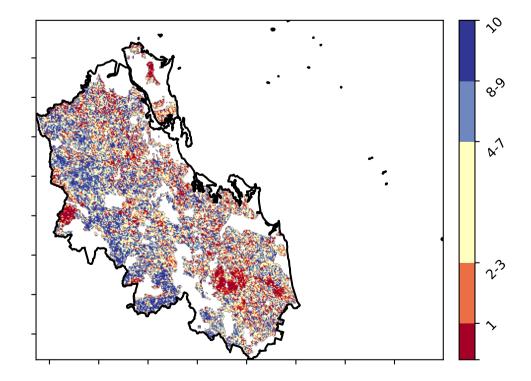


Total Vegetation Cover Anomaly [%]



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

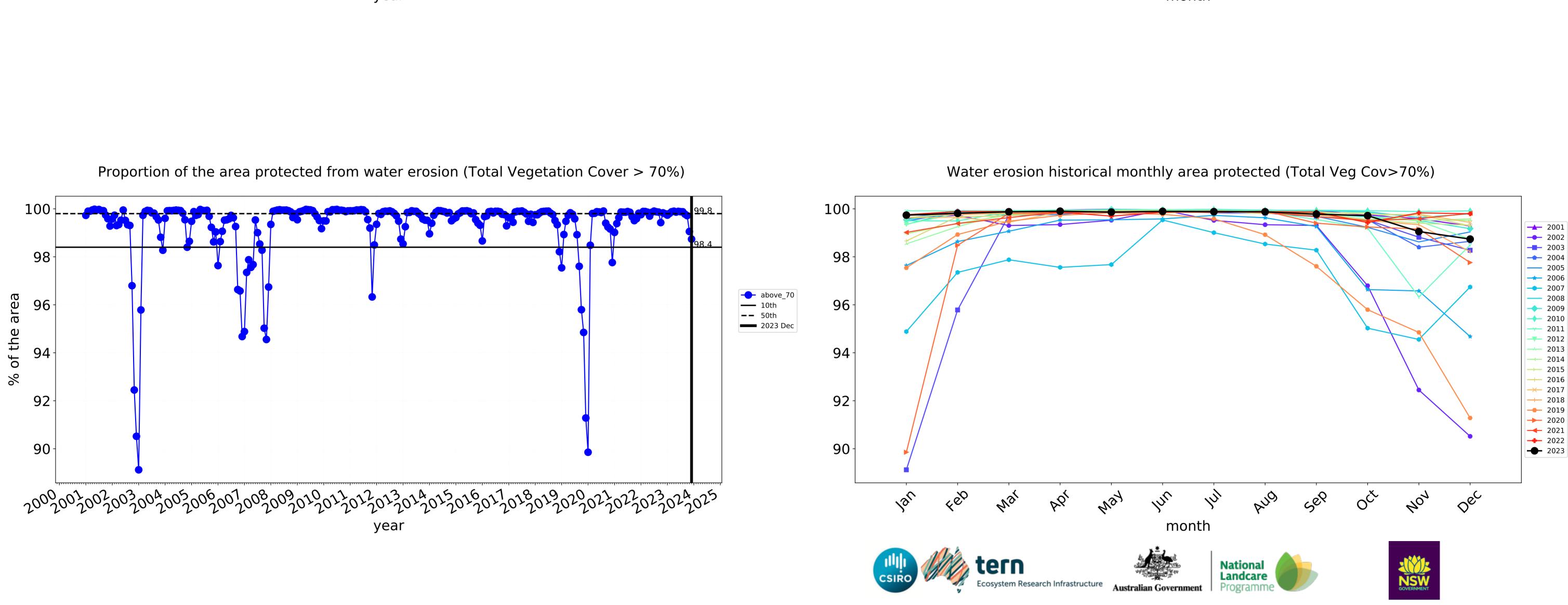
Total Vegetation Cover Decile [%]



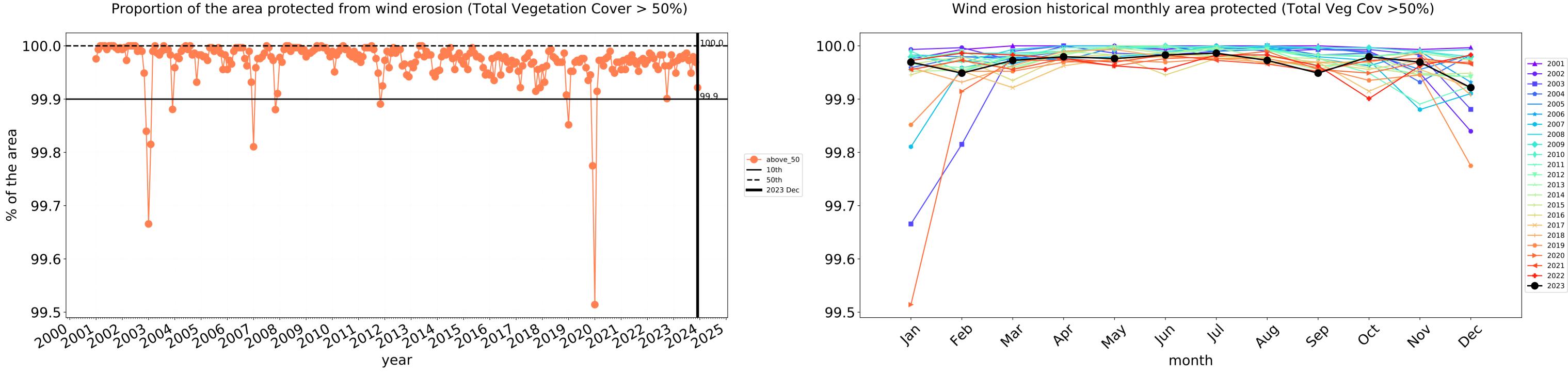


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

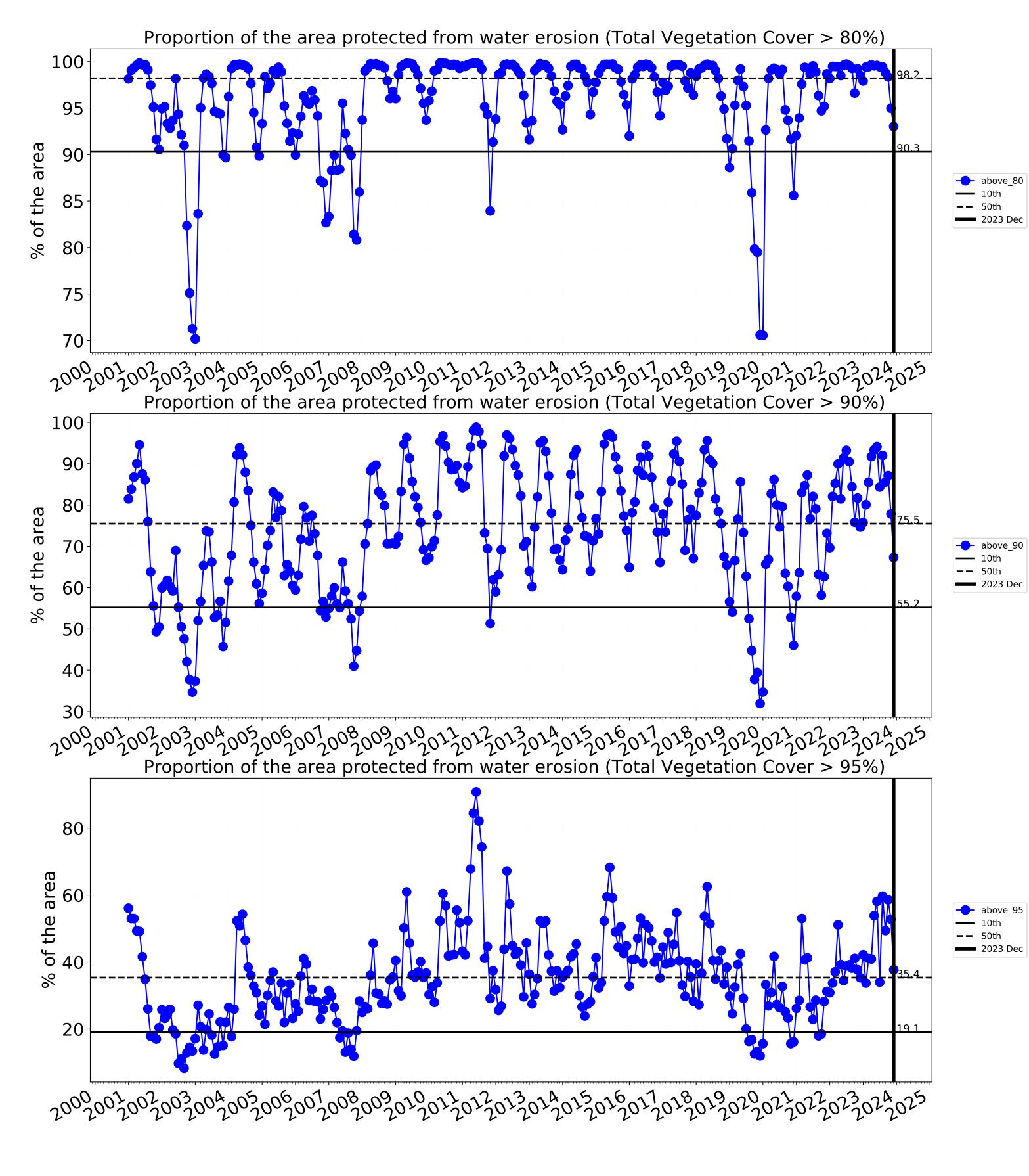


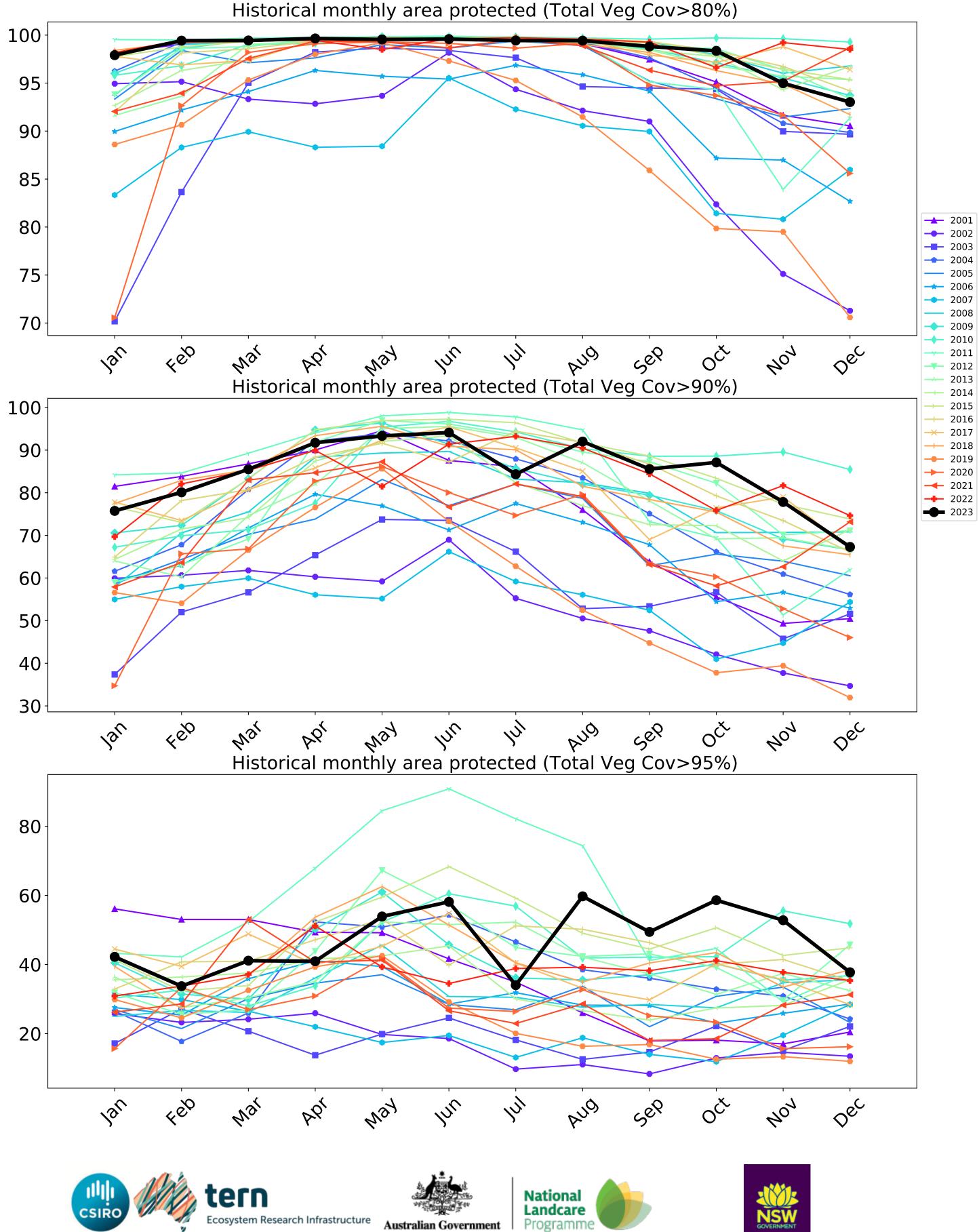






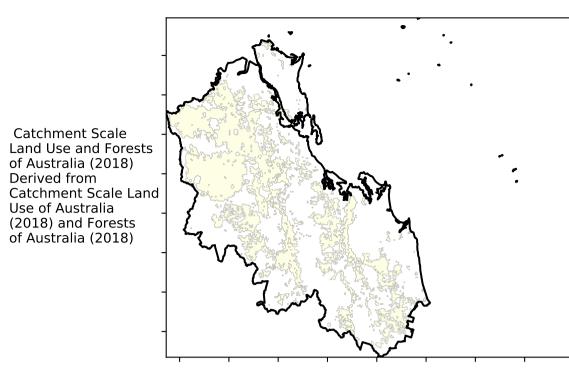
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





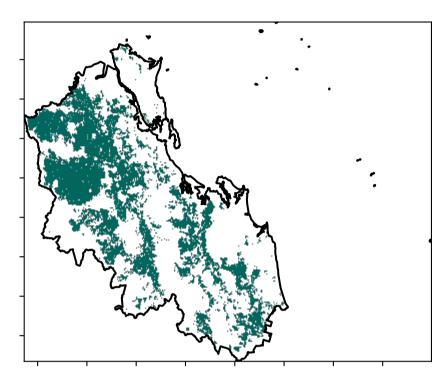
Grazing non forest

Land use and forest cover

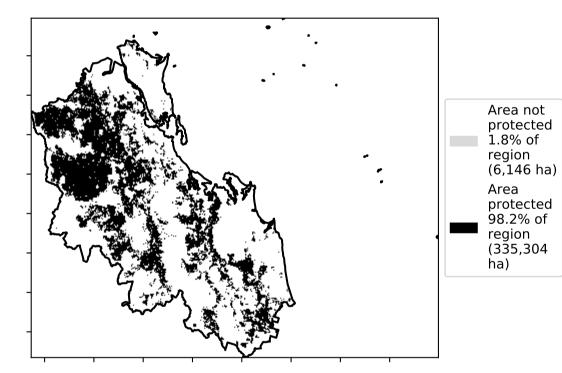


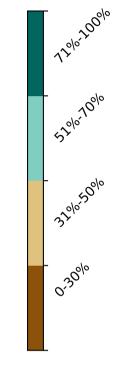
1 Agriculture - Grazing - Non forest

Total Vegetation Cover [%]

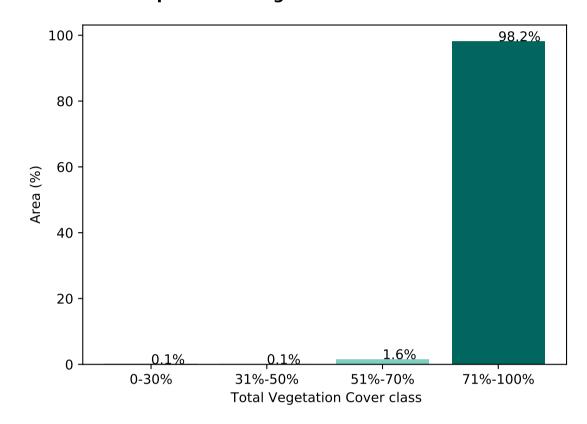


% Area protected from water erosion (>70%)

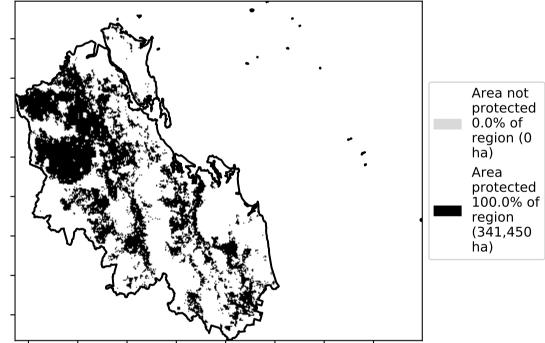




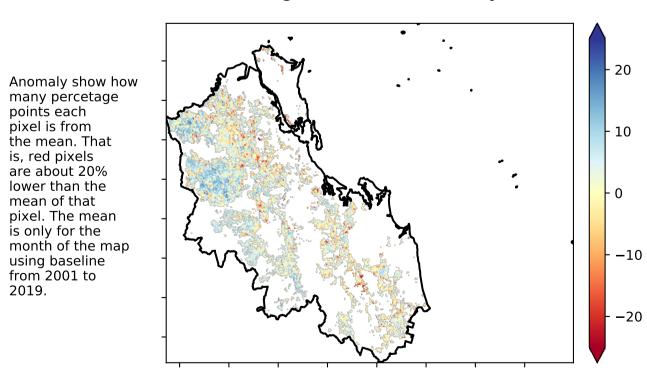
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

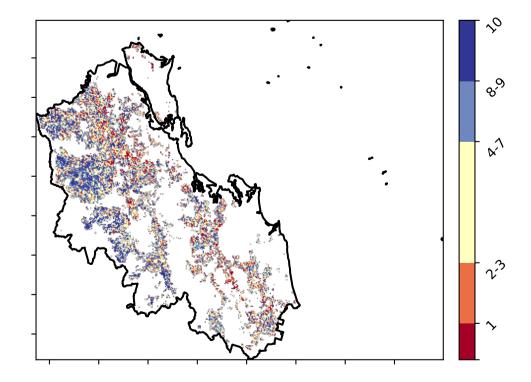


Total Vegetation Cover Anomaly [%]

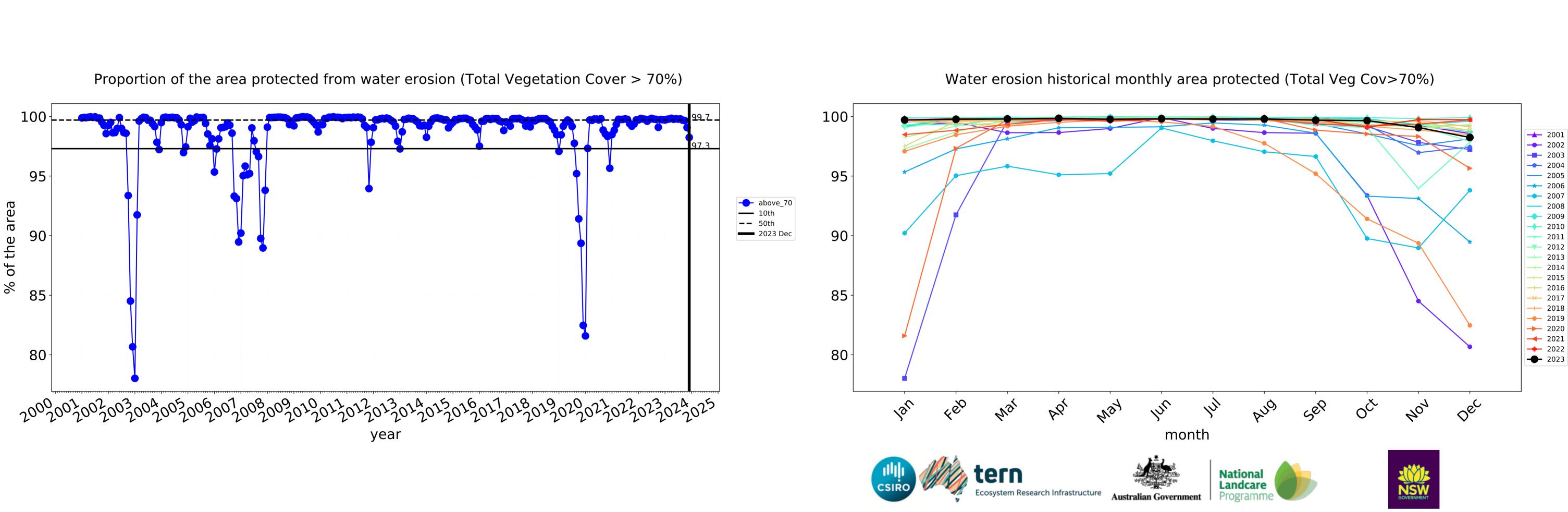


lower than the

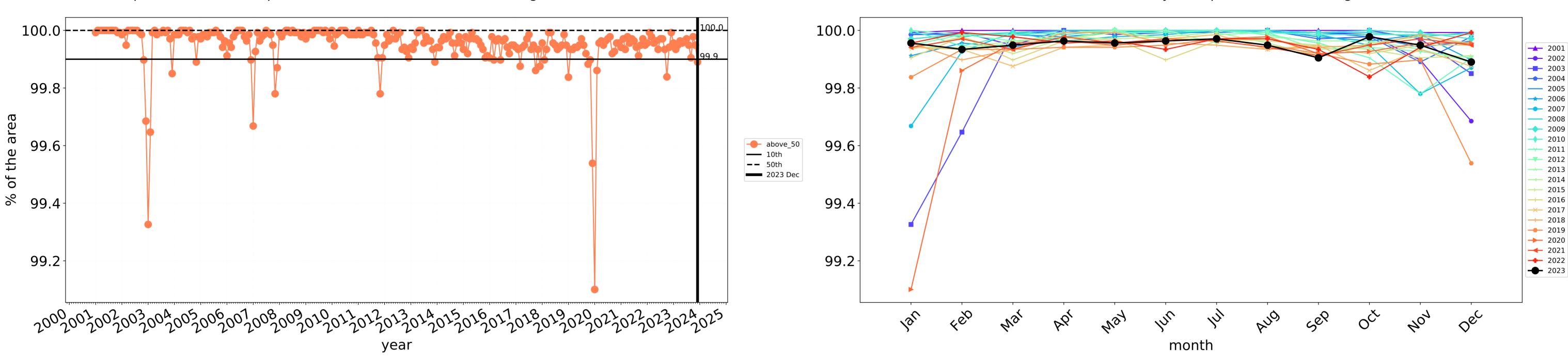
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





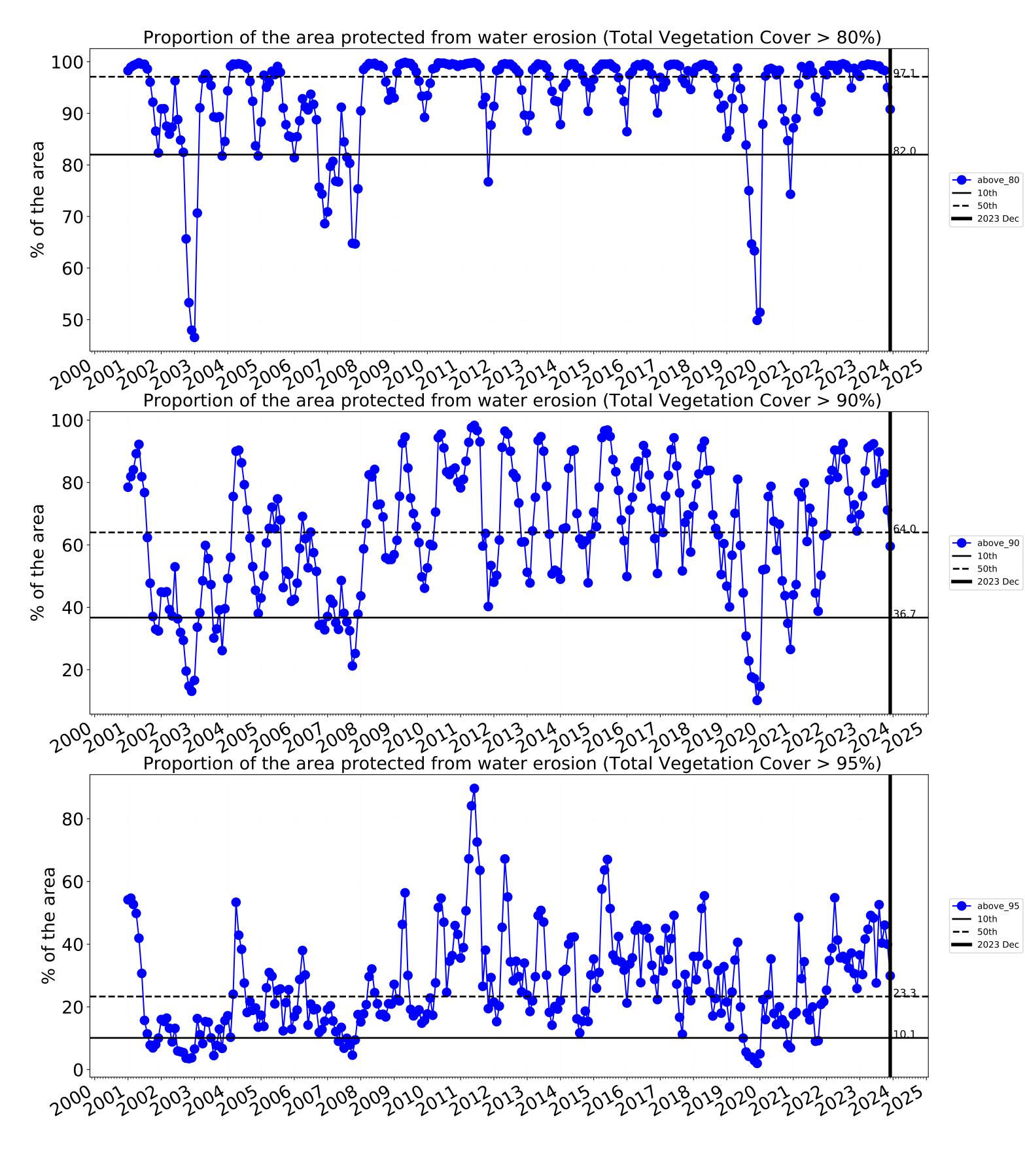


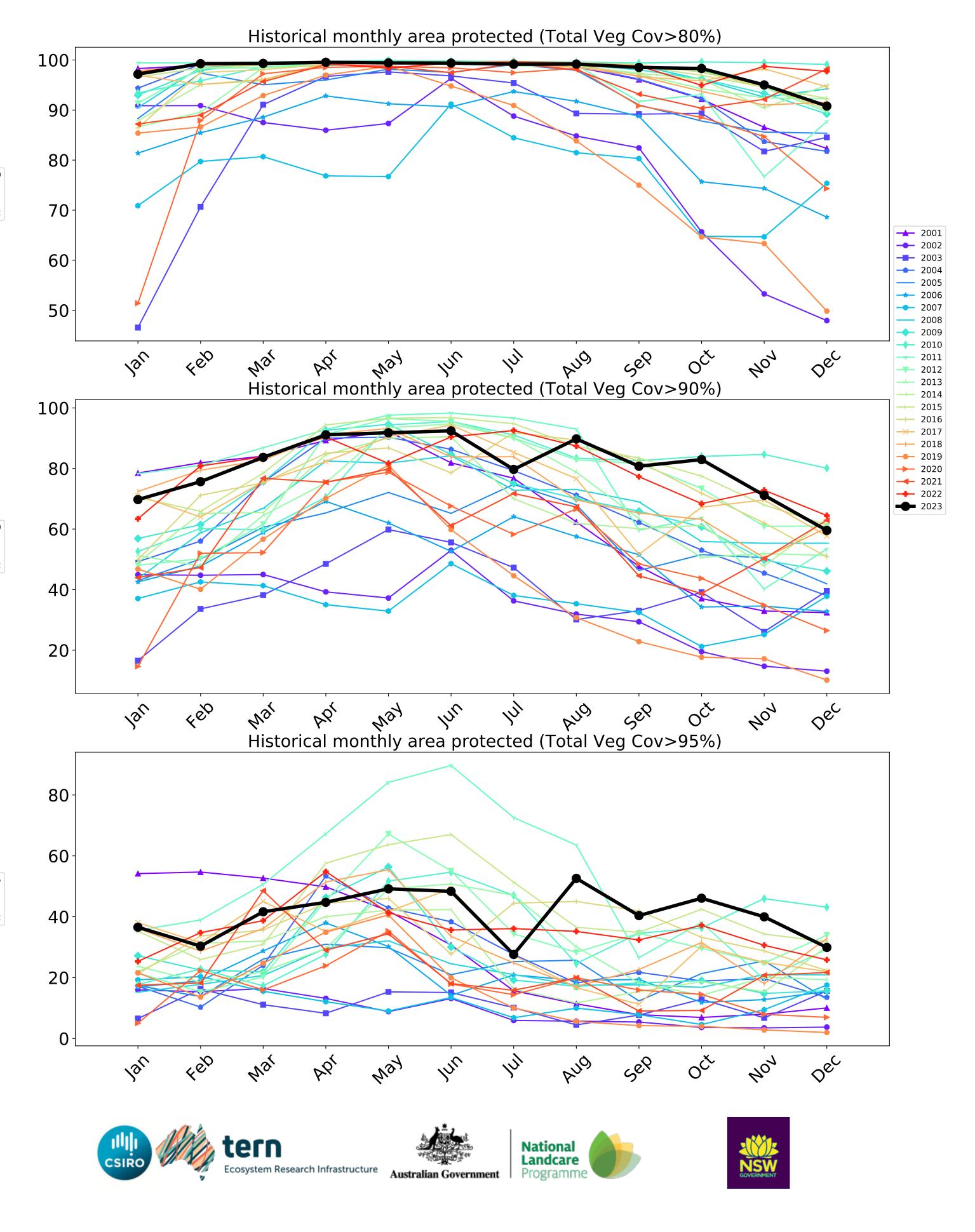




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

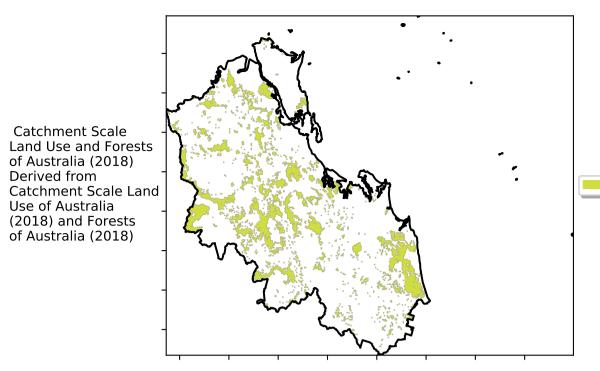
Wind erosion historical monthly area protected (Total Veg Cov >50%)





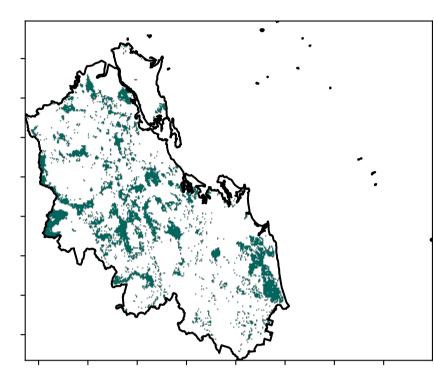
Grazing Woodland forest

Land use and forest cover

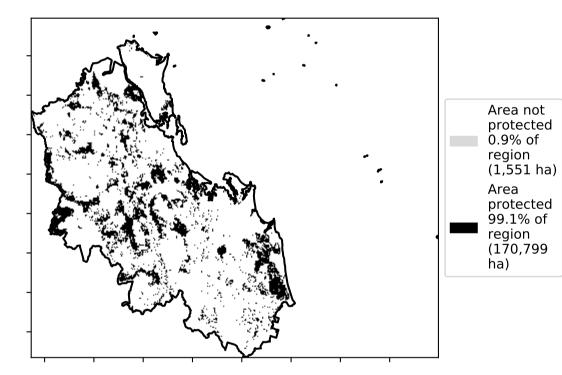


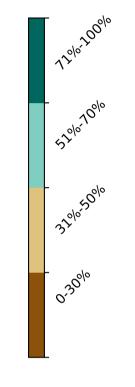
1 Agriculture - Grazing - Woodland forest

Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





% Area protected from wind erosion (>50%)

100

80

60

40

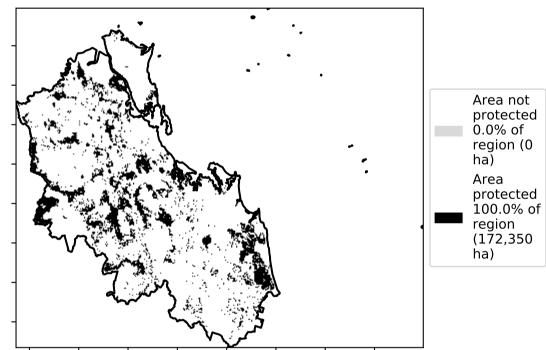
20

0

0.0%

0-30%

Area (%)



0.8%

51%-70%

Proportion of vegetation cover class in area

0.1%

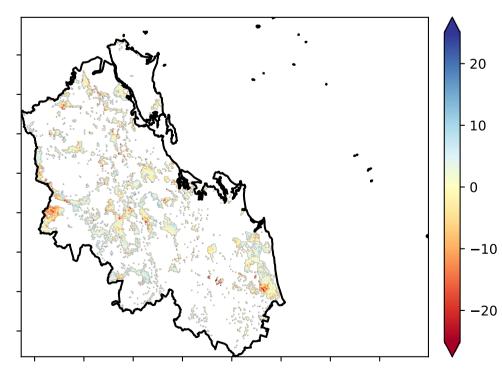
Total Vegetation Cover class

31%-50%

99.1%

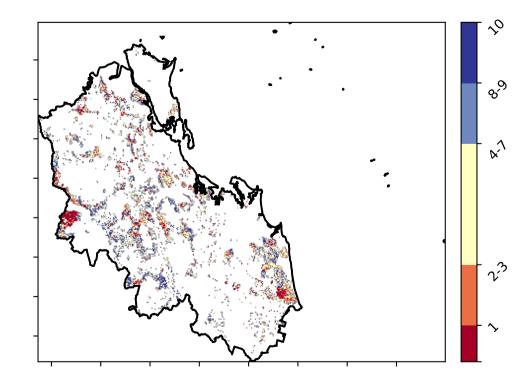
71%-100%

Total Vegetation Cover Anomaly [%]



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

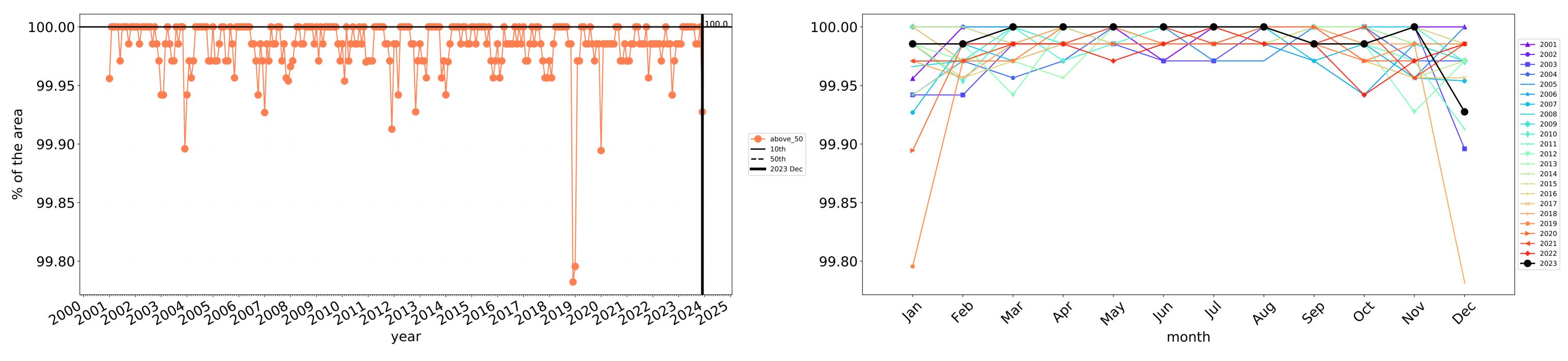
Total Vegetation Cover Decile [%]





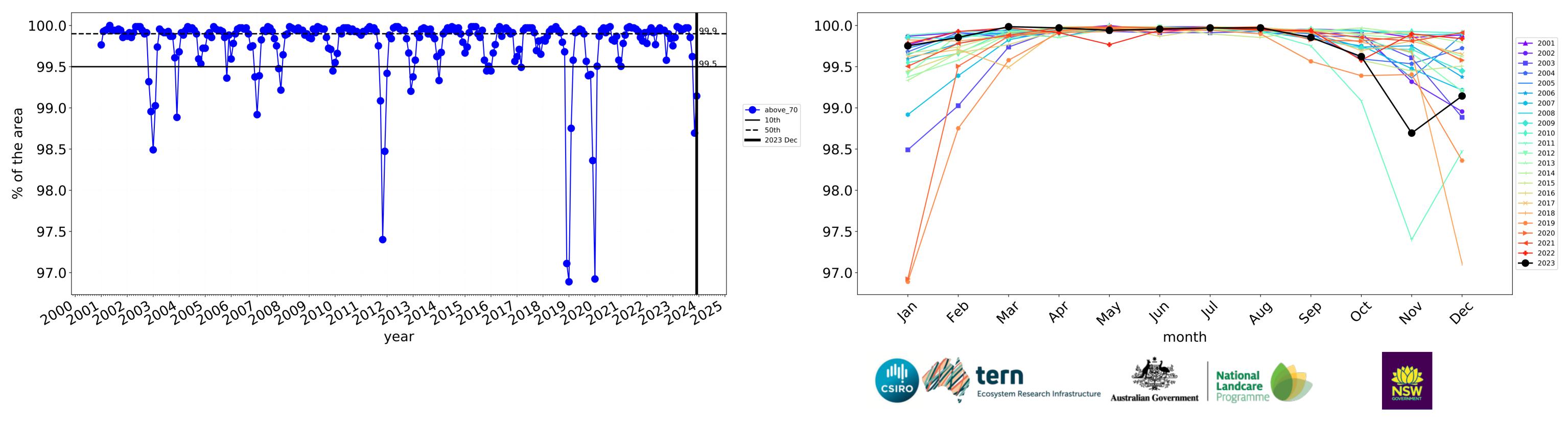
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





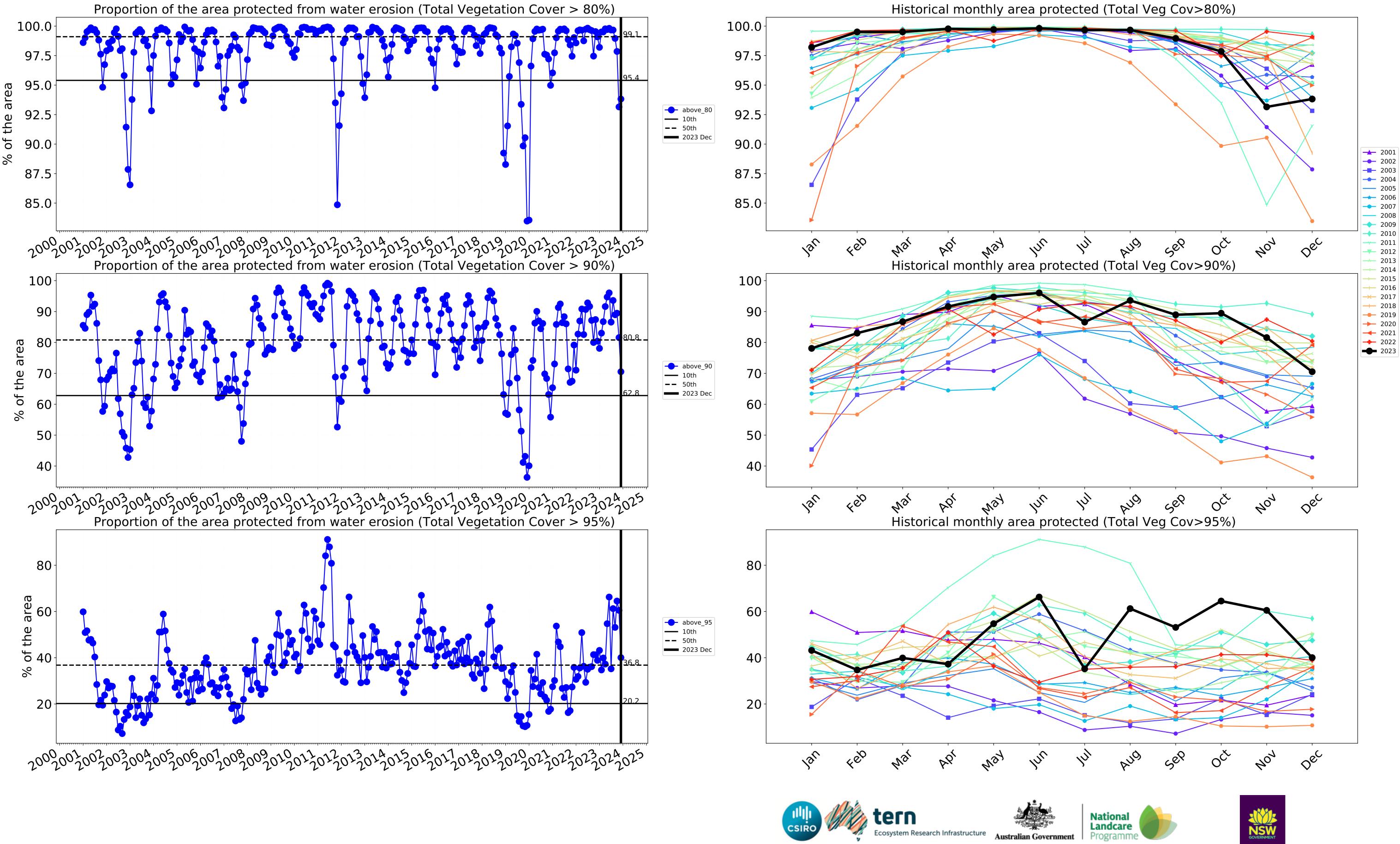
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



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

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



Grazing - Forest (non woodland)

7200-200010

5201070010

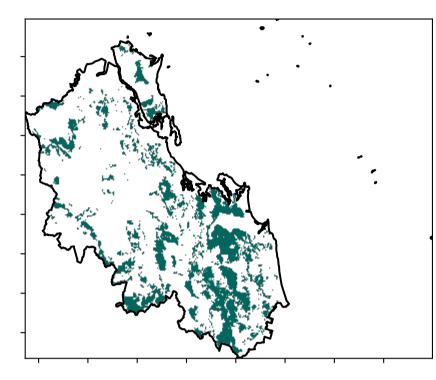
3201050010

0.30%

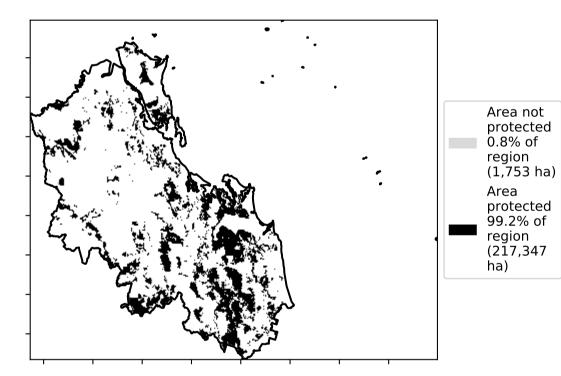
Catchment Scale -Land Use and Forests of Australia (2018) Derived from -Catchment Scale Land 1 Agriculture - Grazing - Non-woodland forest Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]

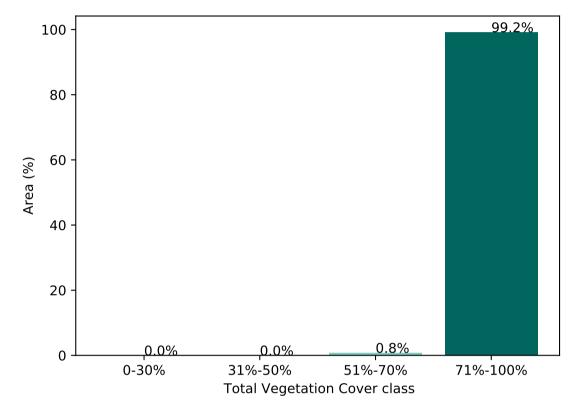
Land use and forest cover



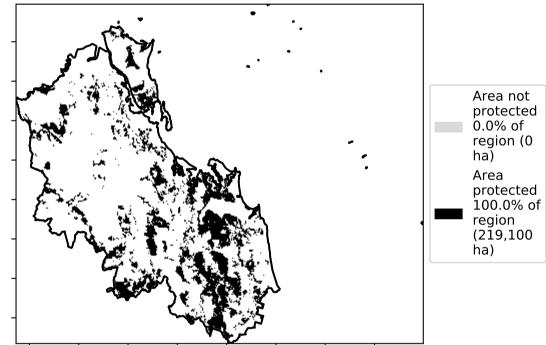
% Area protected from water erosion (>70%)



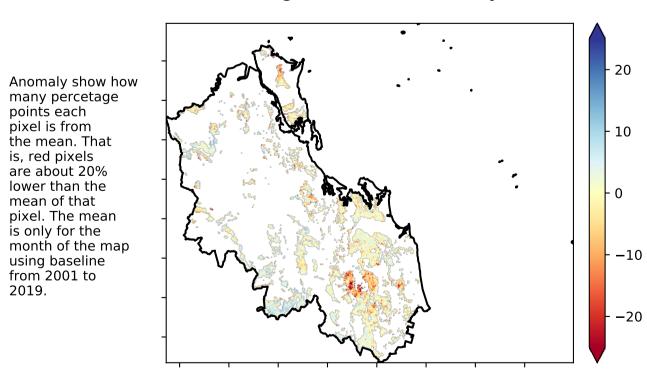
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

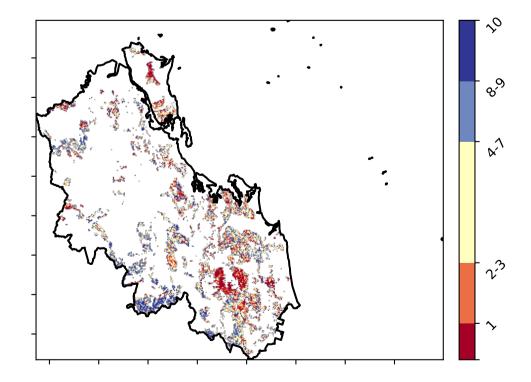


Total Vegetation Cover Anomaly [%]

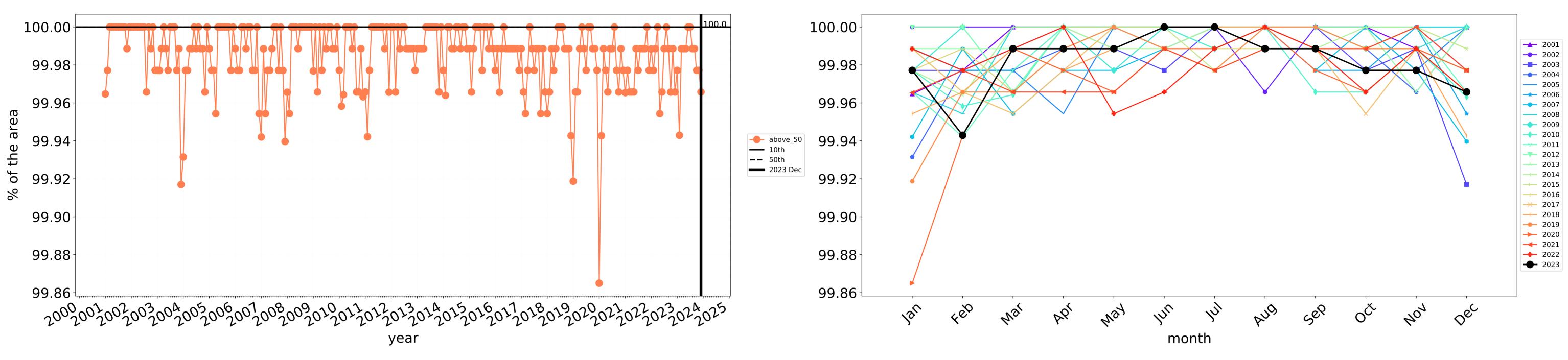


lower than the

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.

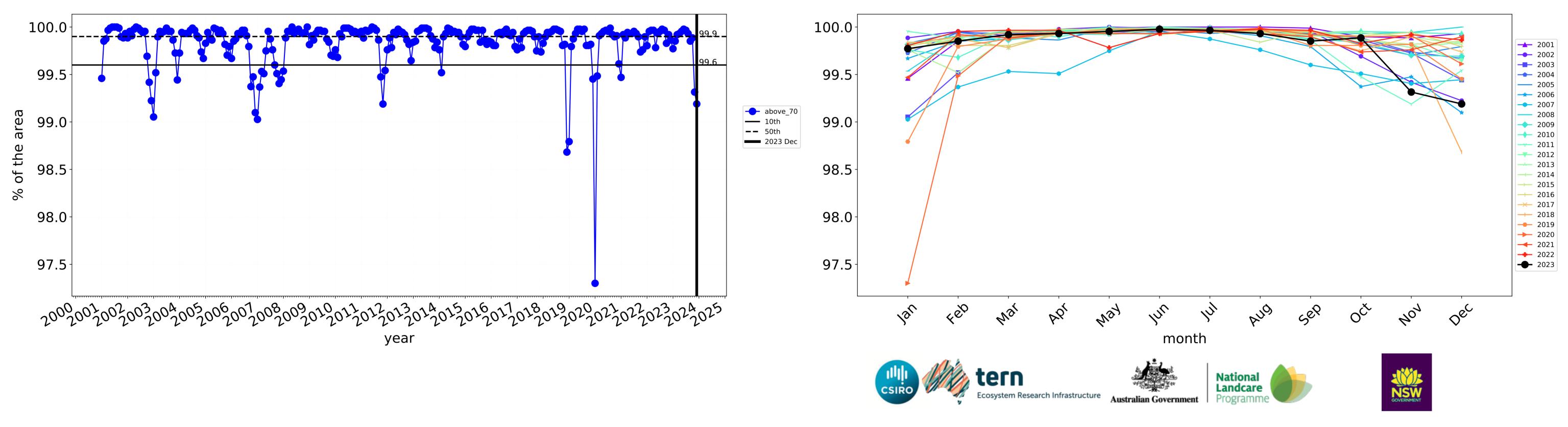






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

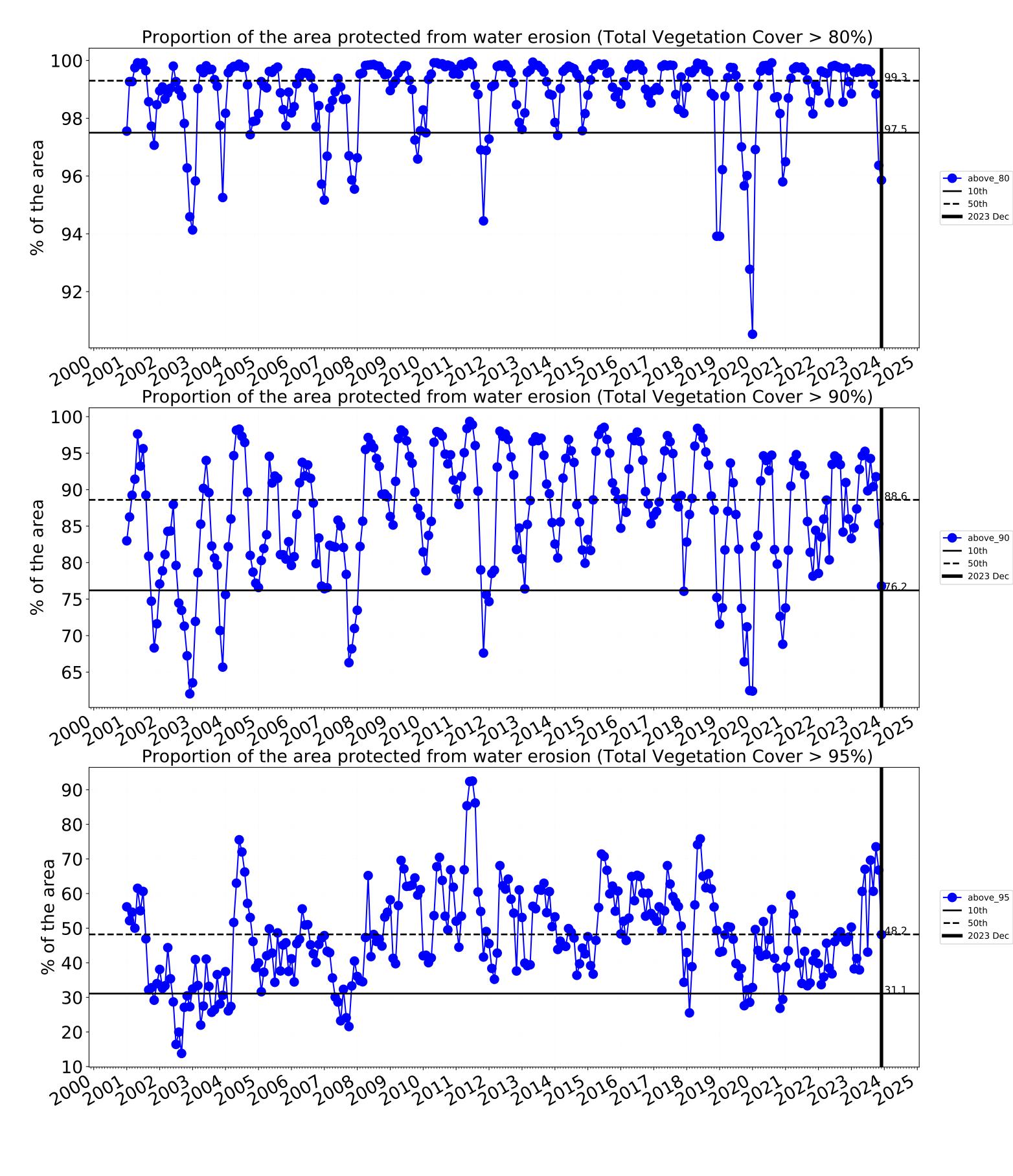
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

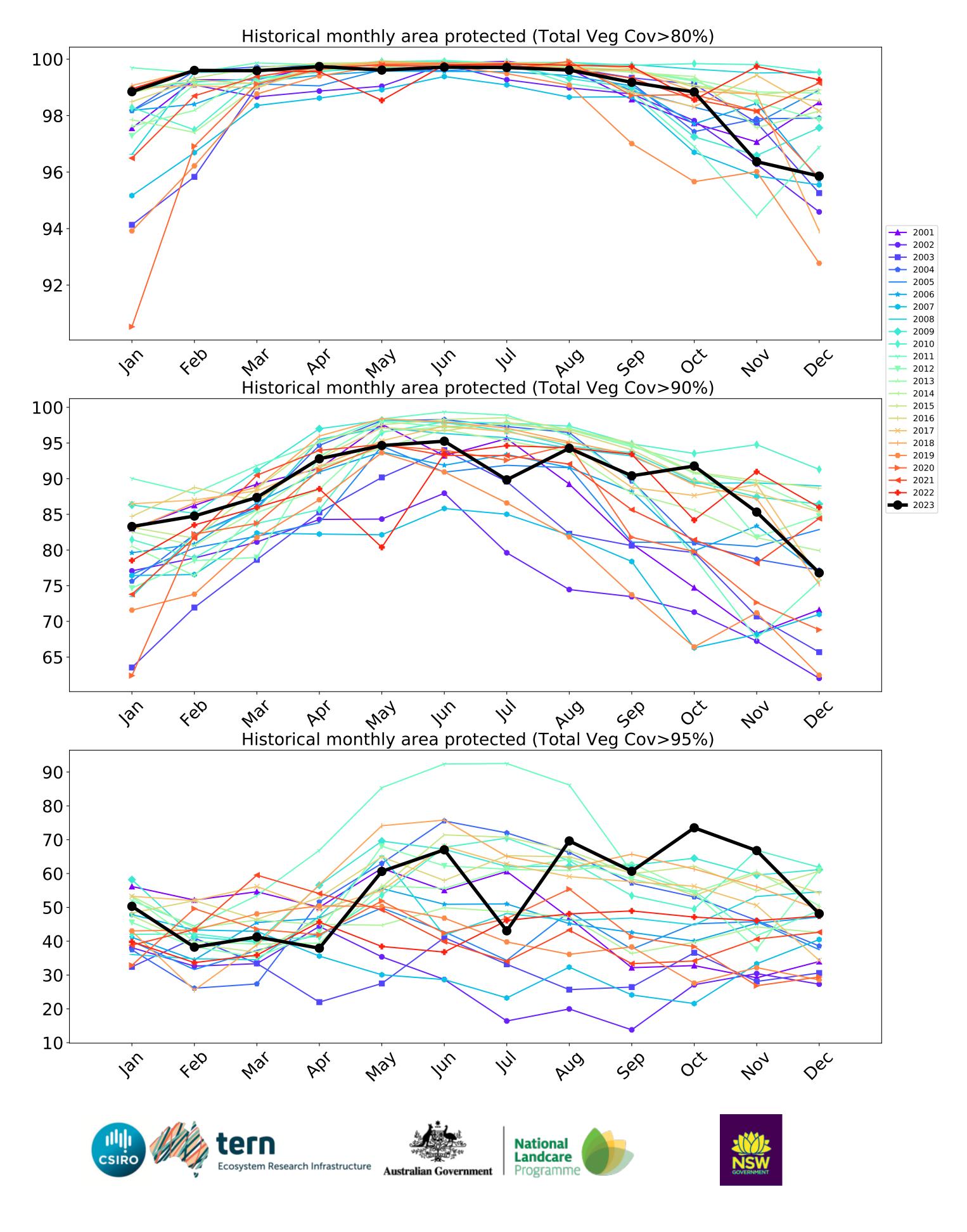




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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





Production native forests and plantation forests

rale Forests 018) ale Land ia rests 018) 1 Production native forests and plantation forests

12%200%

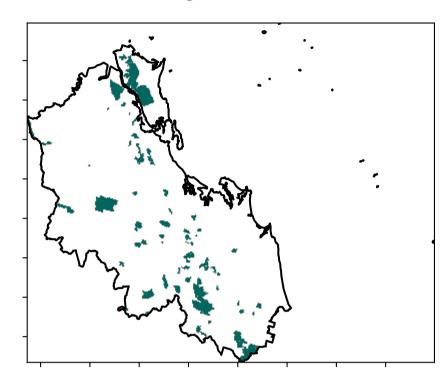
52% 70%

3201050010

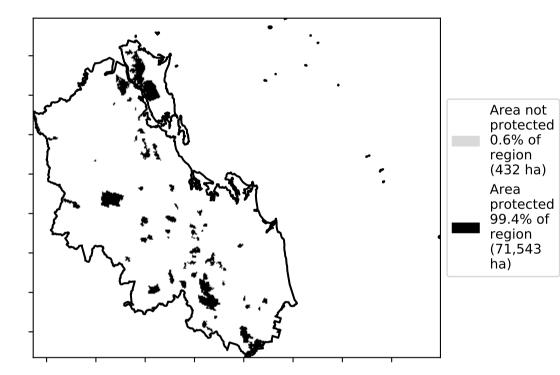
0.30%

Total Vegetation Cover [%]

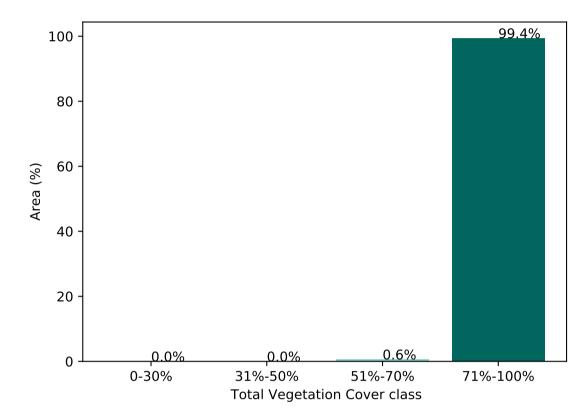
Land use and forest cover



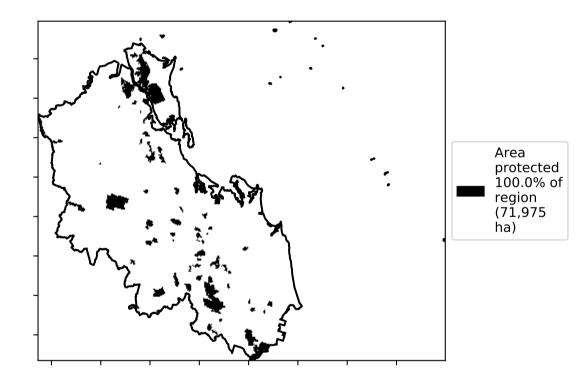
% Area protected from water erosion (>70%)





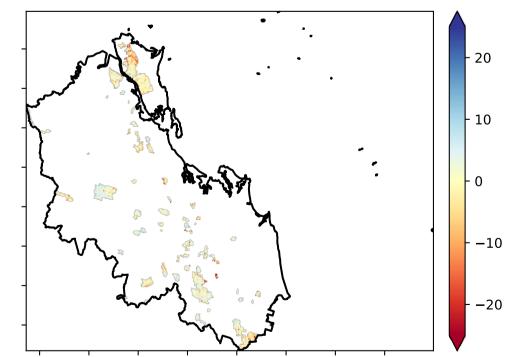


% Area protected from wind erosion (>50%)

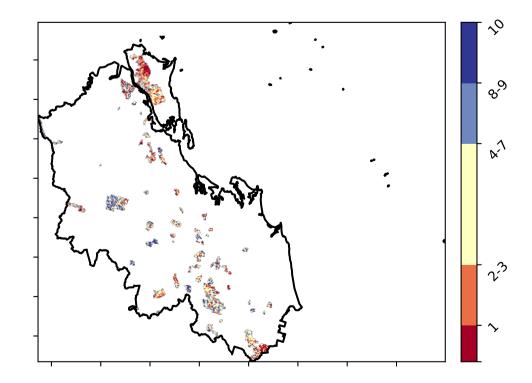


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Anomaly [%]



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

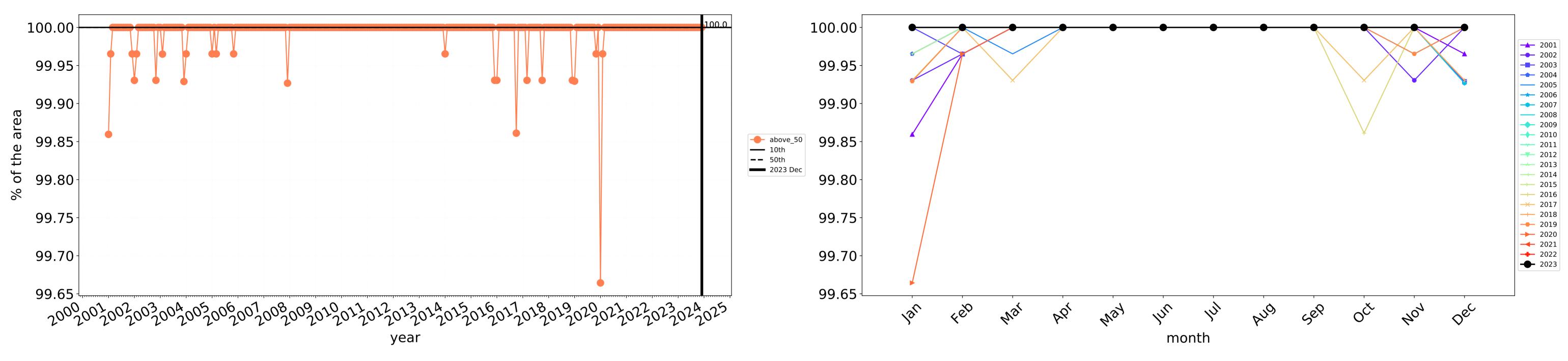




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

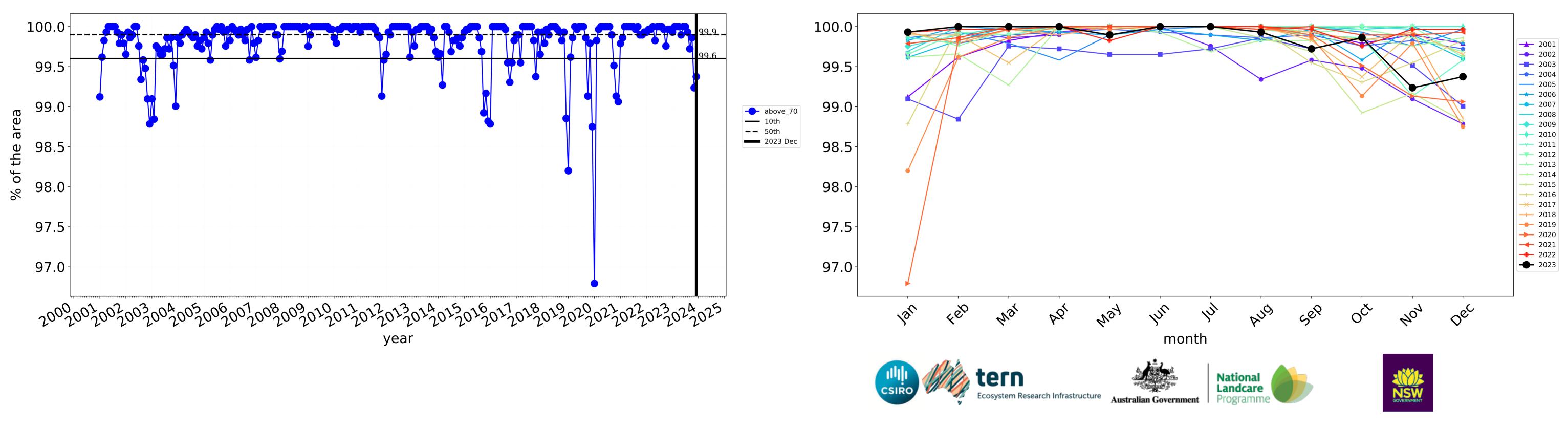


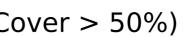
Production native forests and plantation forests timeseries



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

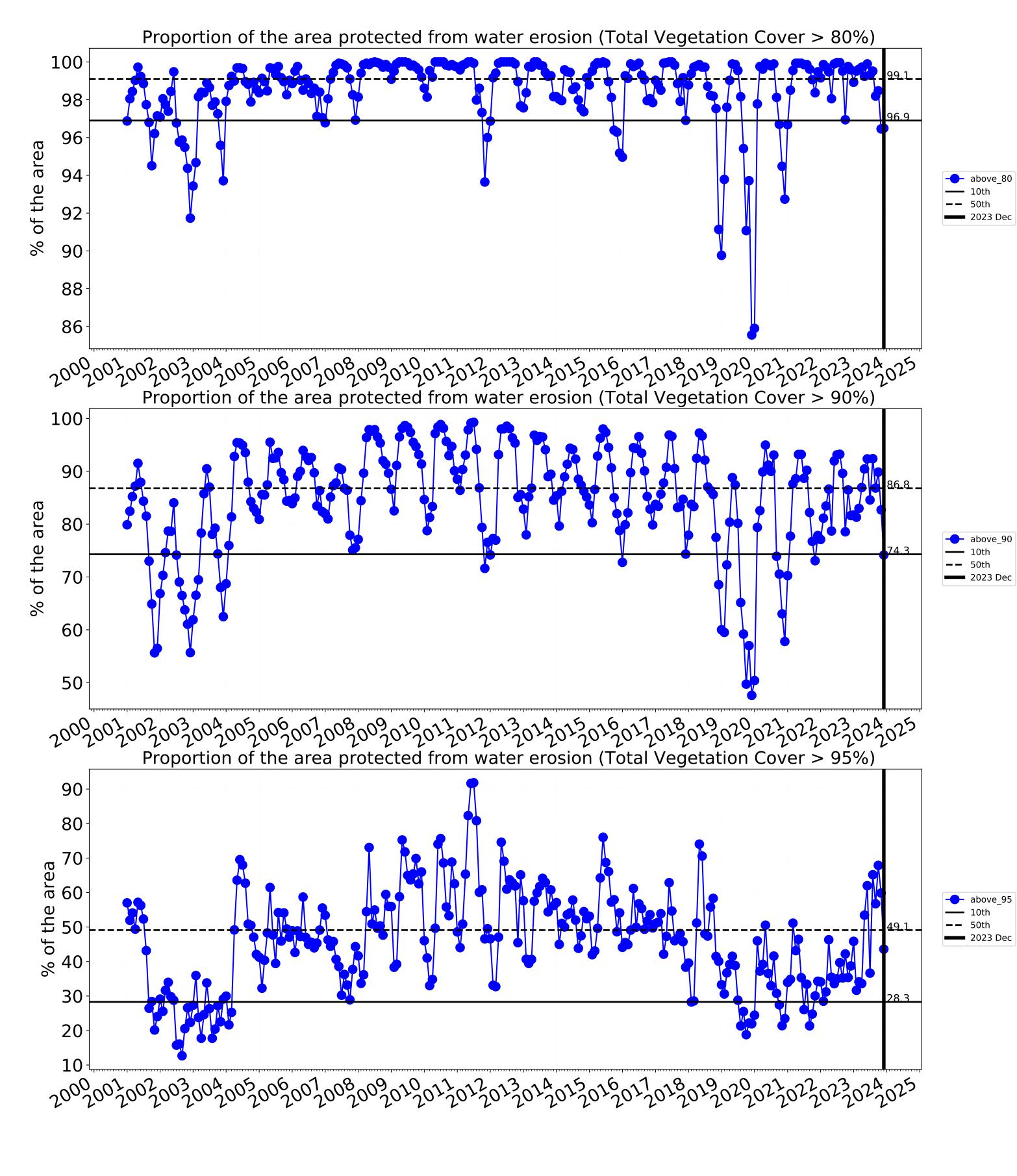
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



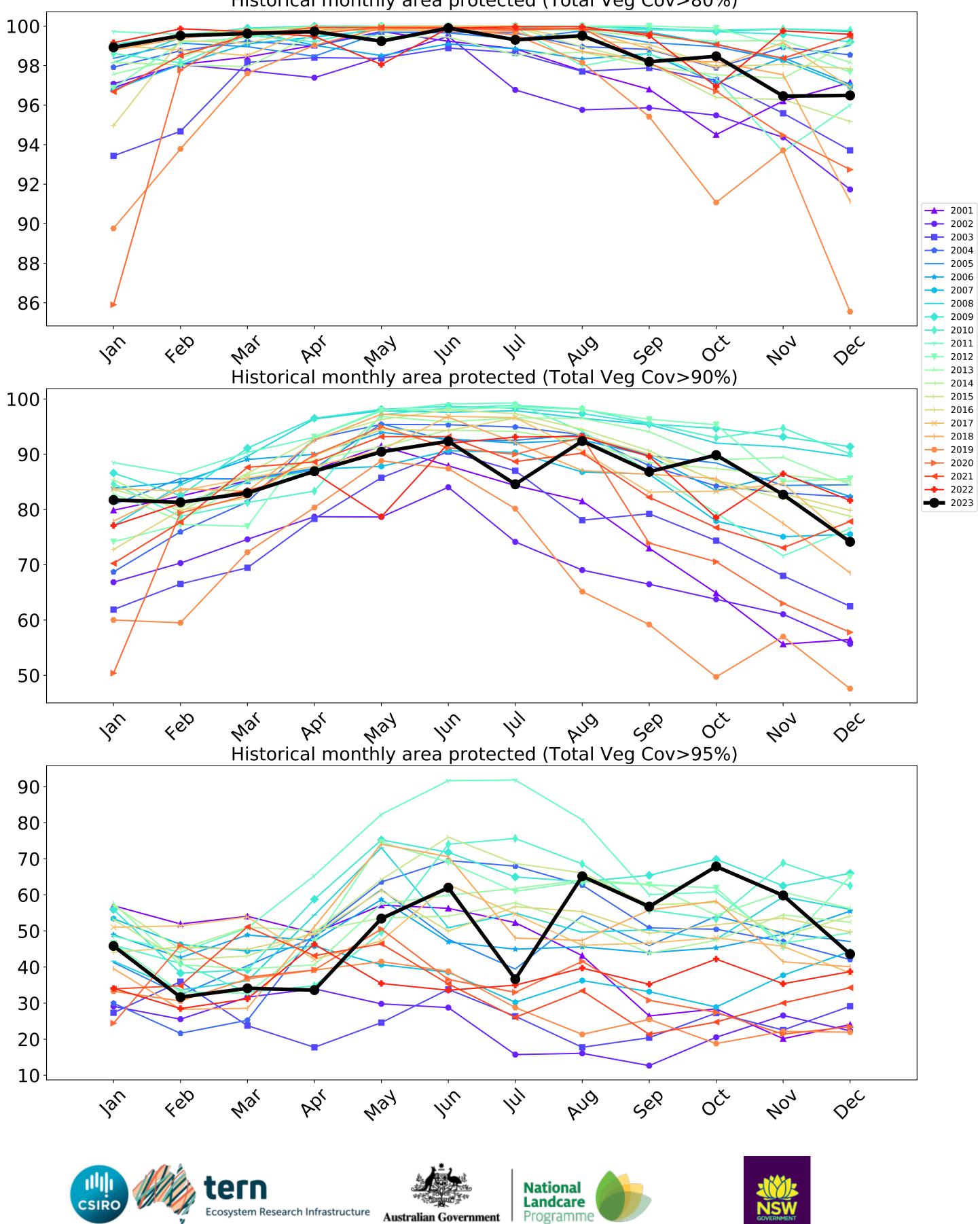


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



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





Gladstone_(R) (1,037,175 ha and no data 11,079 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

Land use and forest cover Class	area(ha)	above_30	above_50	above_70	above_80	above_90	above_95
Entire region	1,037,175	99.8% 1,035,475	99.3% 1,030,100	96.9% 1,004,600	90.6% 940,125	66.4% 688,600	37.7% 390,900
Conservation and natural environments	154,725	99.8% 154,375	99.1% 153,400	97.5% 150,850	94.1% 145,525	76.6% 118,525	45.8% 70,825
Conservation and natural environments Woodland forest	49,450	99.7% 49,300	98.5% 48,700	95.8% 47,350	90.6% 44,800	68.1% 33,675	37.2% 18,400
Conservation and natural environments Forest (non woodland)	100,825	99.9% 100,725	99.8% 100,625	99.2% 100,025	97.0% 97,850	82.6% 83,300	51.2% 51,575
Agriculture	734,425	100.0% 734,400	99.9% 733,825	98.7% 724,925	93.0% 682,850	67.2% 493,850	37.7% 276,950
Grazing	732,900	100.0% 732,875	99.9% 732,325	98.7% 723,650	93.0% 681,750	67.3% 493,200	37.7% 276,625
Grazing non forest	341,450	100.0% 341,450	99.9% 341,075	98.2% 335,450	90.8% 310,025	59.6% 203,375	29.9% 102,150
Grazing Woodland forest	172,350	100.0% 172,350	99.9% 172,225	99.1% 170,875	93.8% 161,700	70.5% 121,550	40.0% 69,025
Grazing - Forest (non woodland)	219,100	100.0% 219,075	100.0% 219,025	99.2% 217,325	95.9% 210,025	76.8% 168,275	48.1% 105,450
Production native forests and plantation forests	71,975	100.0% 71,975	100.0% 71,975	99.4% 71,525	96.5% 69,450	74.2% 53,375	43.6% 31,375

