## Total vegetation cover soil protection Region:LGA Indigo\_(S) VIC

# **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**

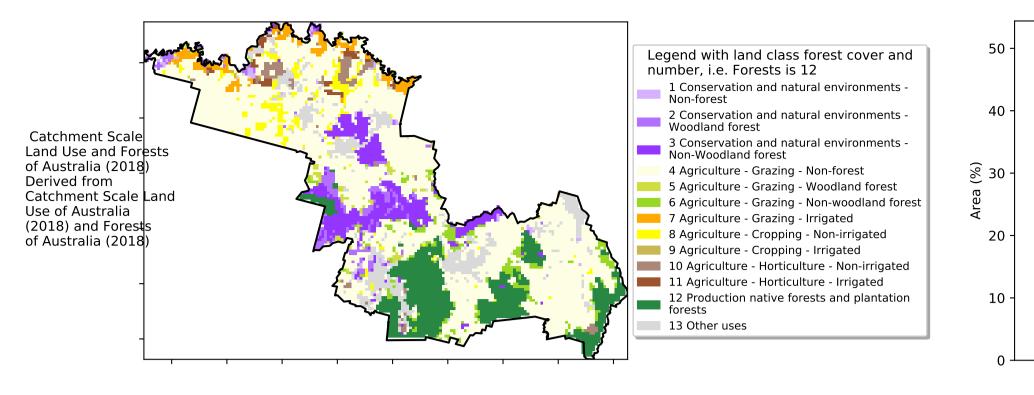
#### Land use and forest cover

#### Proportion of each land class in area

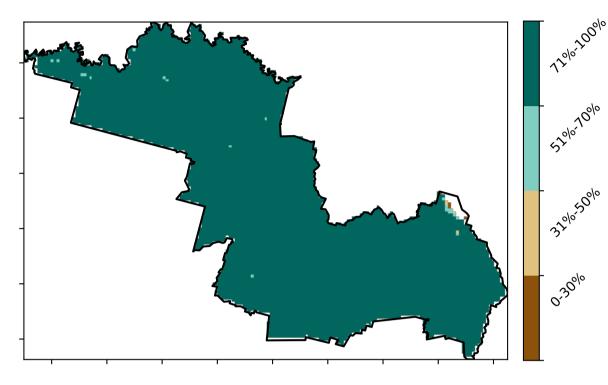
51.8%

0

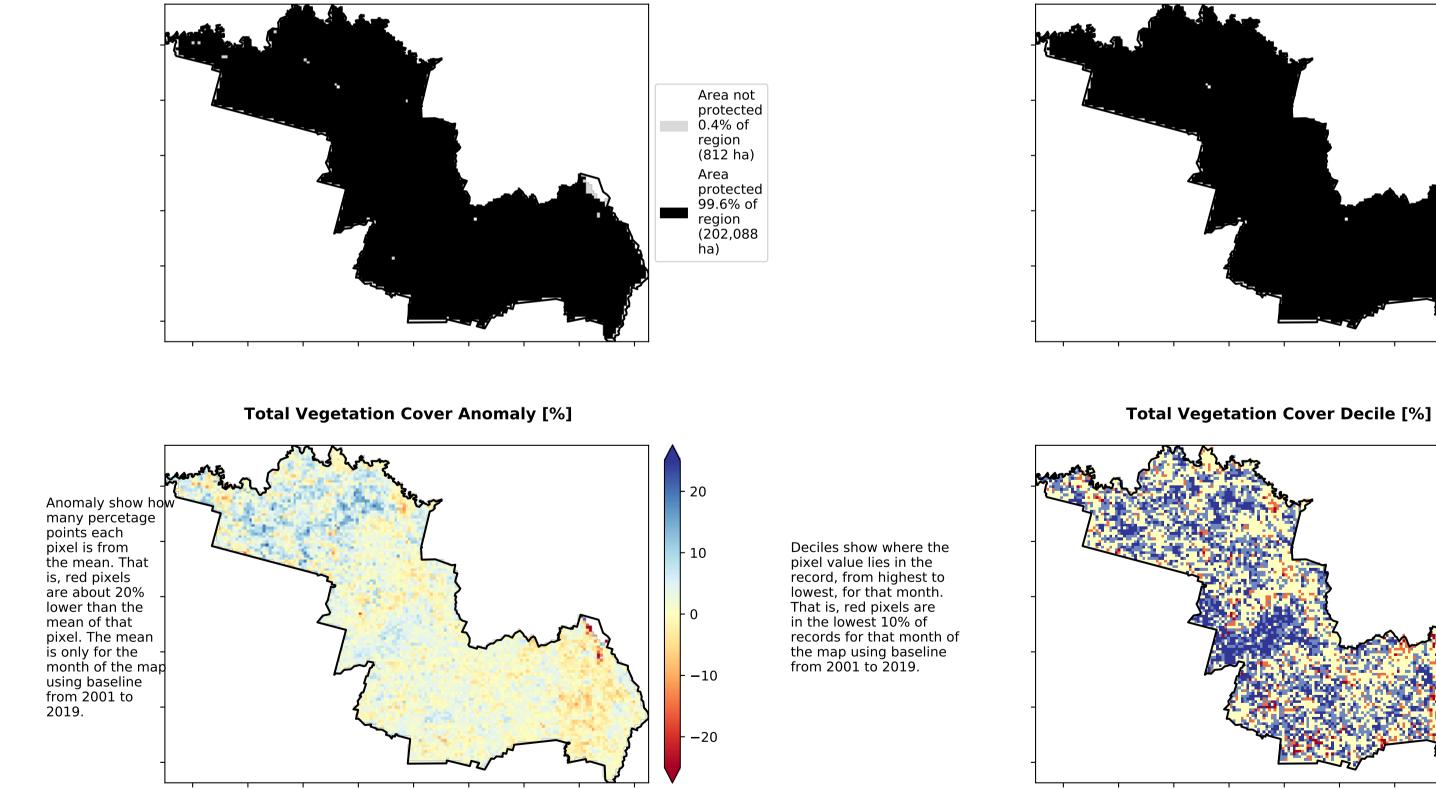
2



**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



**Proportion of vegetation cover class in area** 

6

Land use class

<mark>3.</mark>6%<u>3.0%</u>3.3%

8

13.1%

1.9%

10

9.3%

12

region (202,900

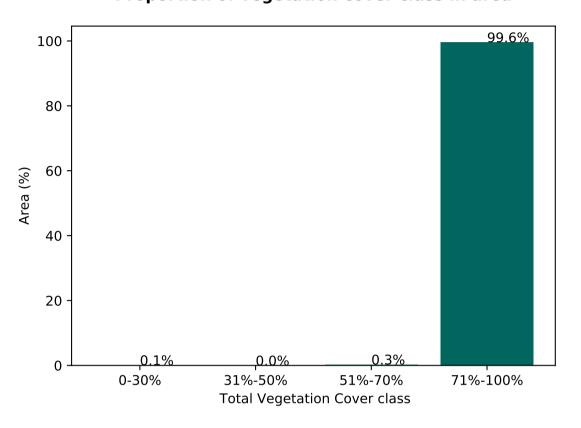
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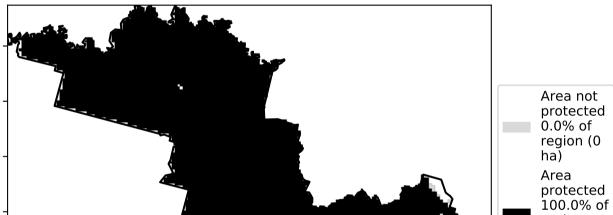
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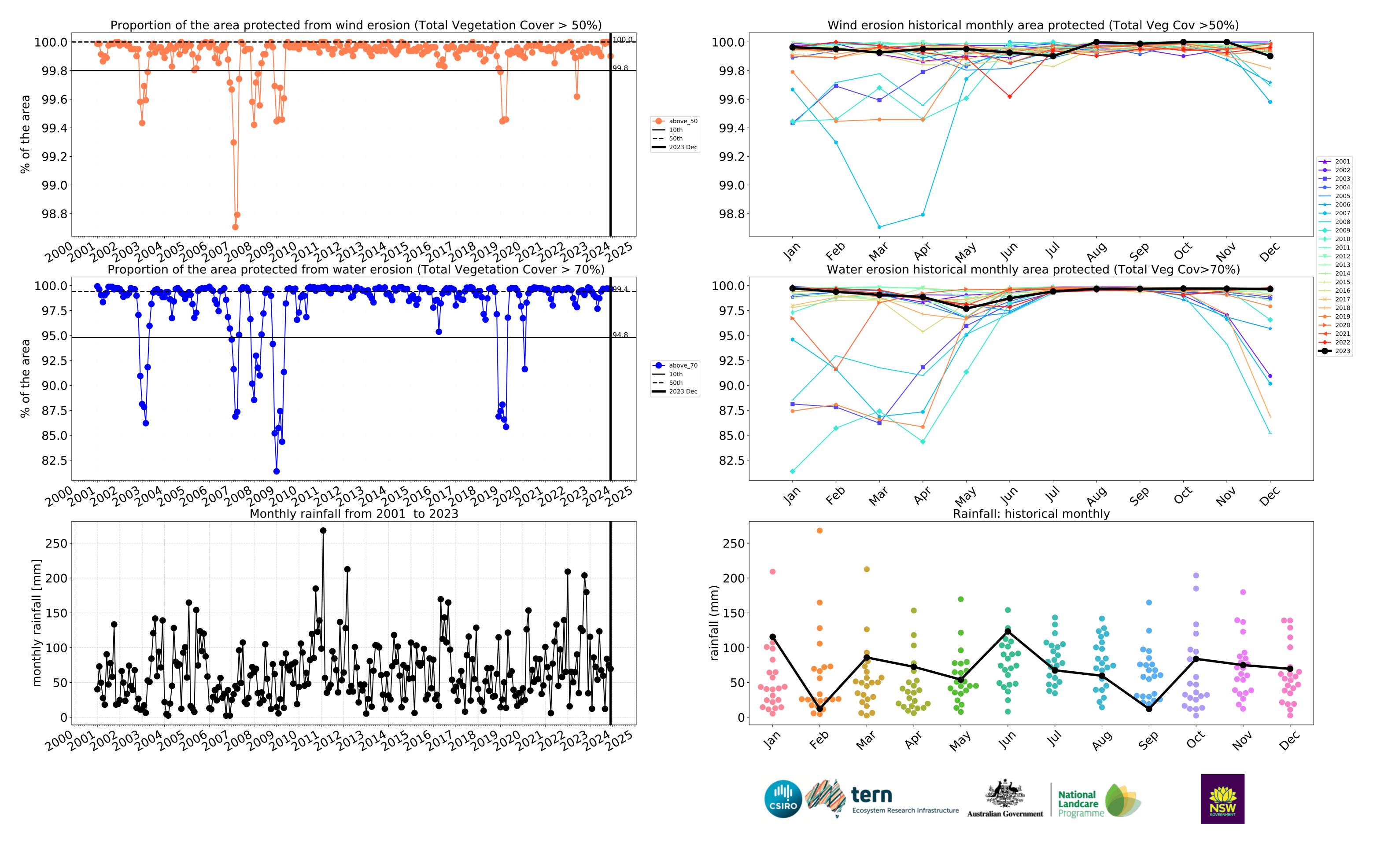
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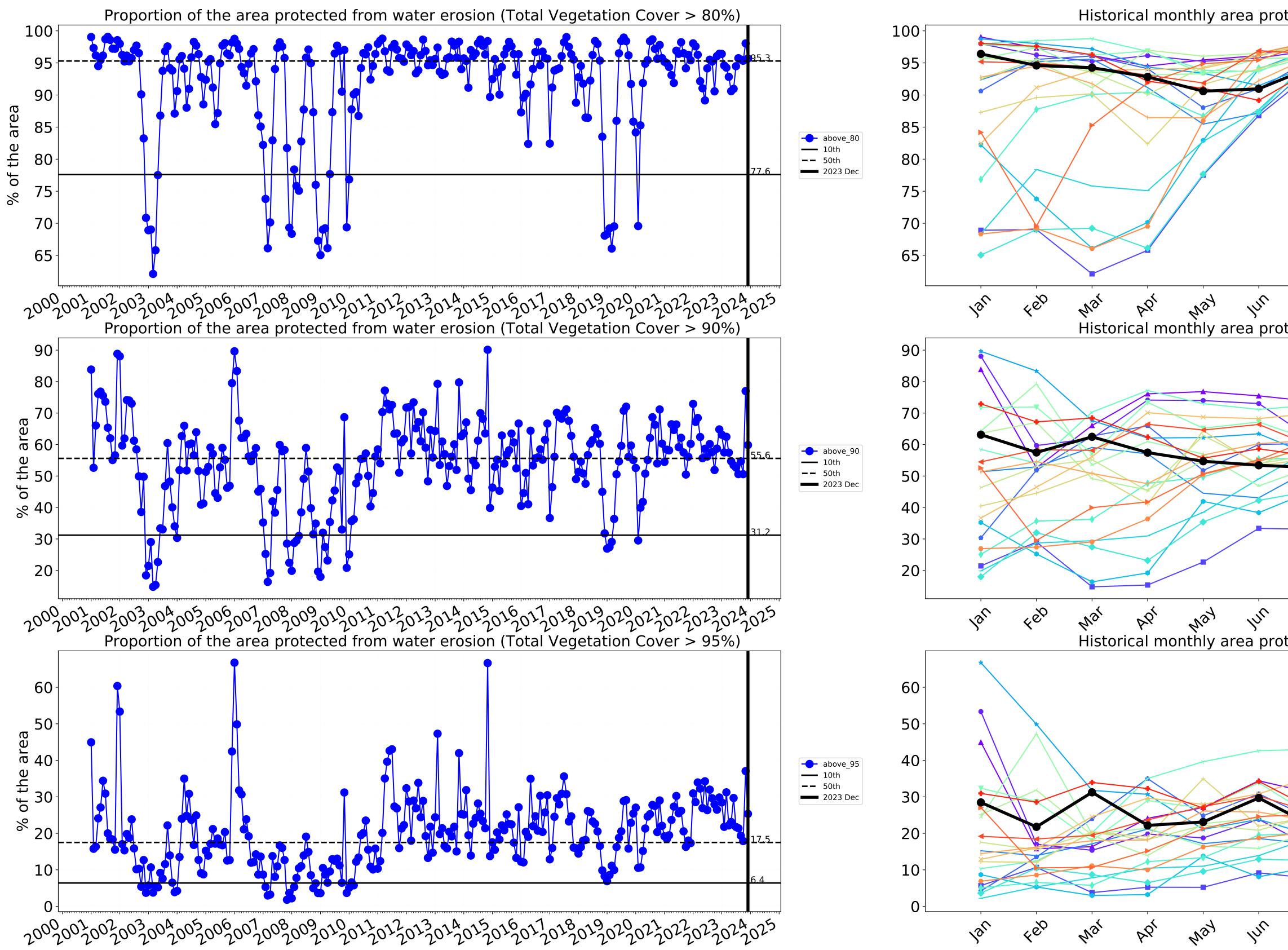


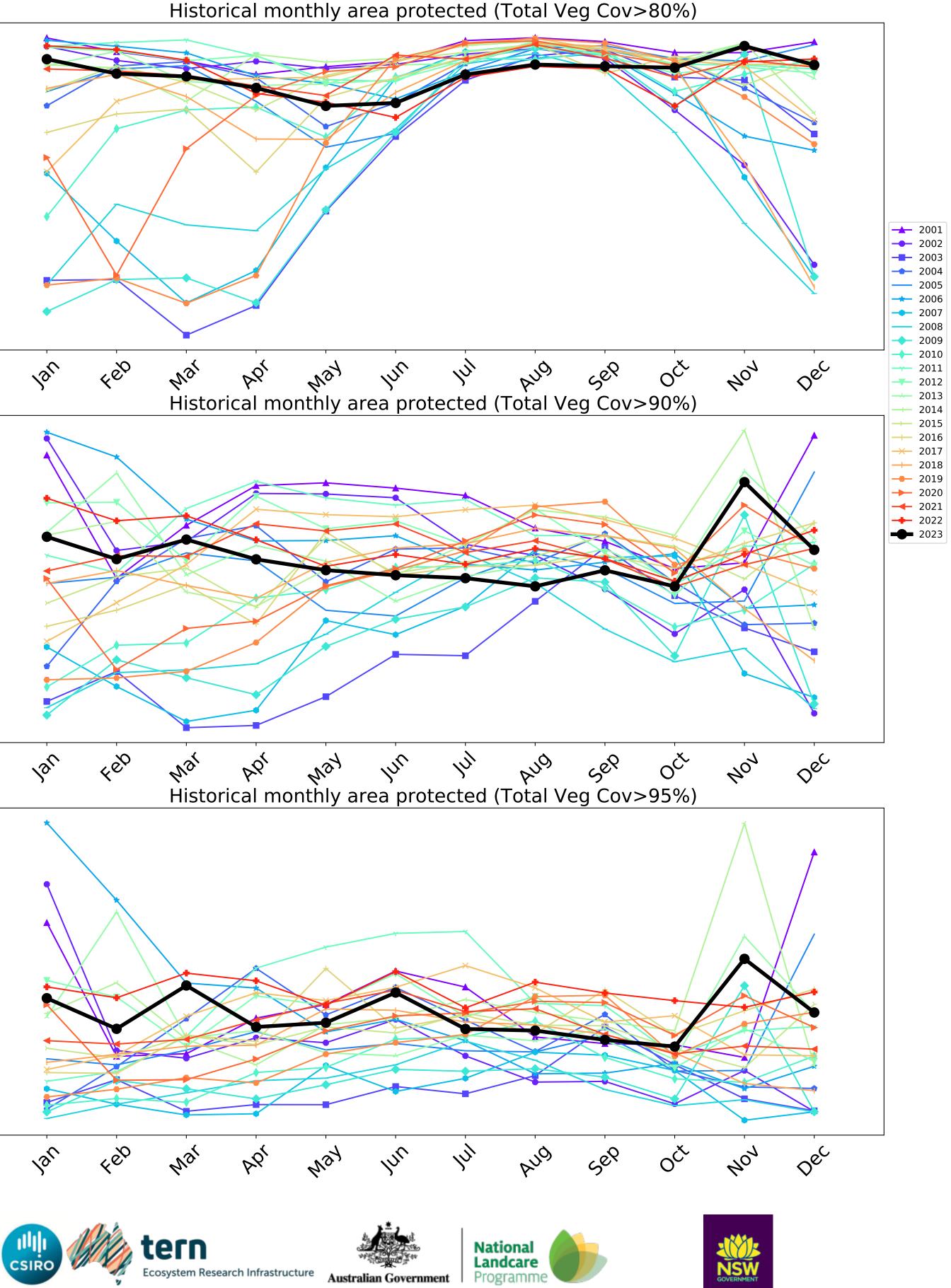
#### % Area protected from wind erosion (>50%)







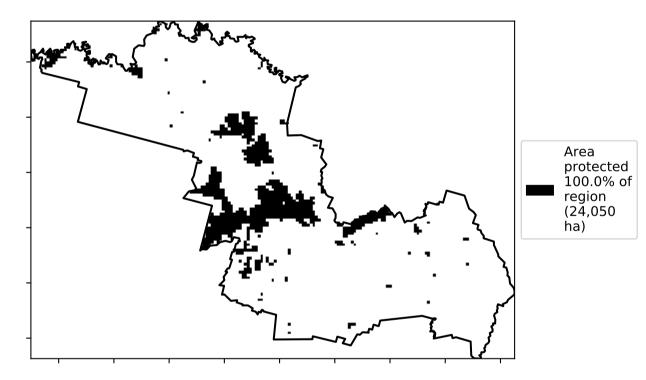




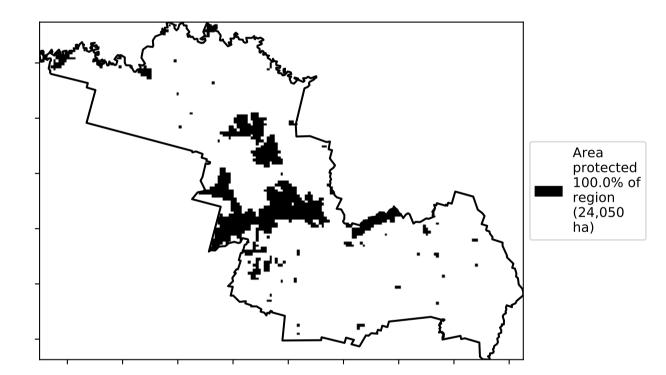
#### **Conservation and natural environments**

Proportion of each land class in area Land use and forest cover 69.3% 70 60 · 50 · Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland 40 ea Catchment Scale Land forest Use of Australia (2018) and Forests of Australia (2018) 3 Conservation and natural environments - Non-woodland forest 30 24.5% 20 · 10 6.1% 0 1.5 -0.5 0.0 0.5 1.02.0 2.5 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 12%200% 100.0% 100 80 52°10'10°1 Area (%) 60 · 32005001 40 1 0.30% 20 · 0.0% 0.0% 0.0% 0 51%-70% 0-30% 31%-50% 71%-100% Total Vegetation Cover class

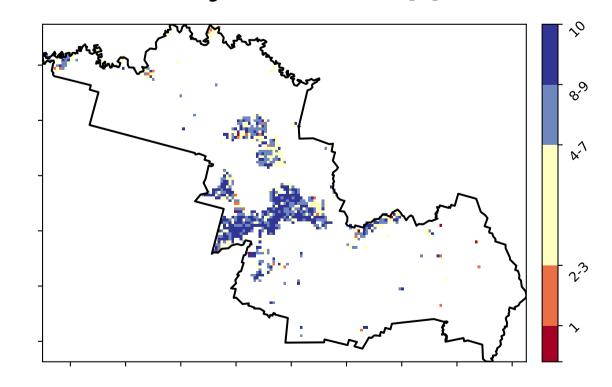
% Area protected from water erosion (>70%)



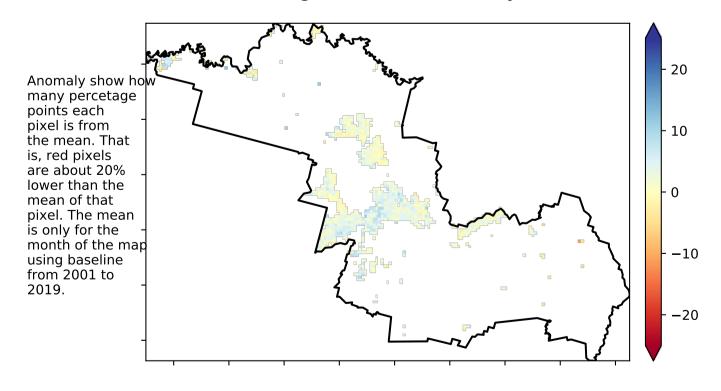




Total Vegetation Cover Decile [%]



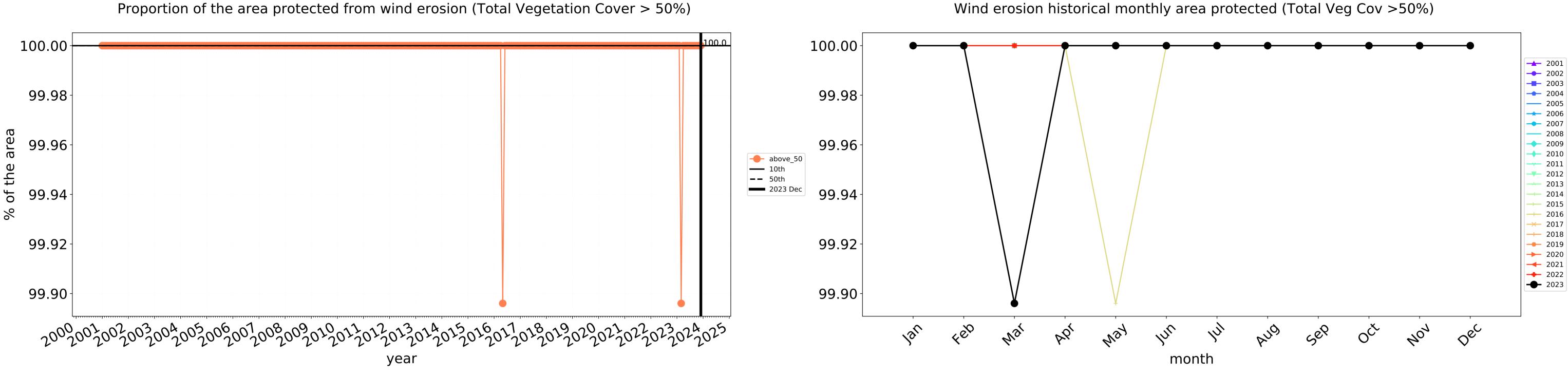
**Total Vegetation Cover Anomaly [%]** 



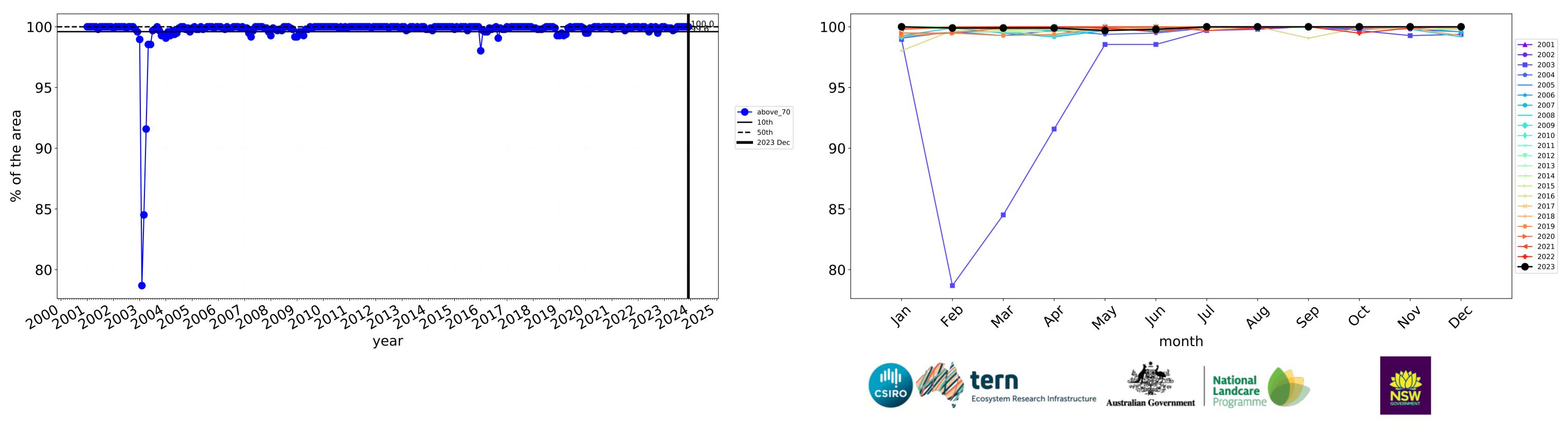
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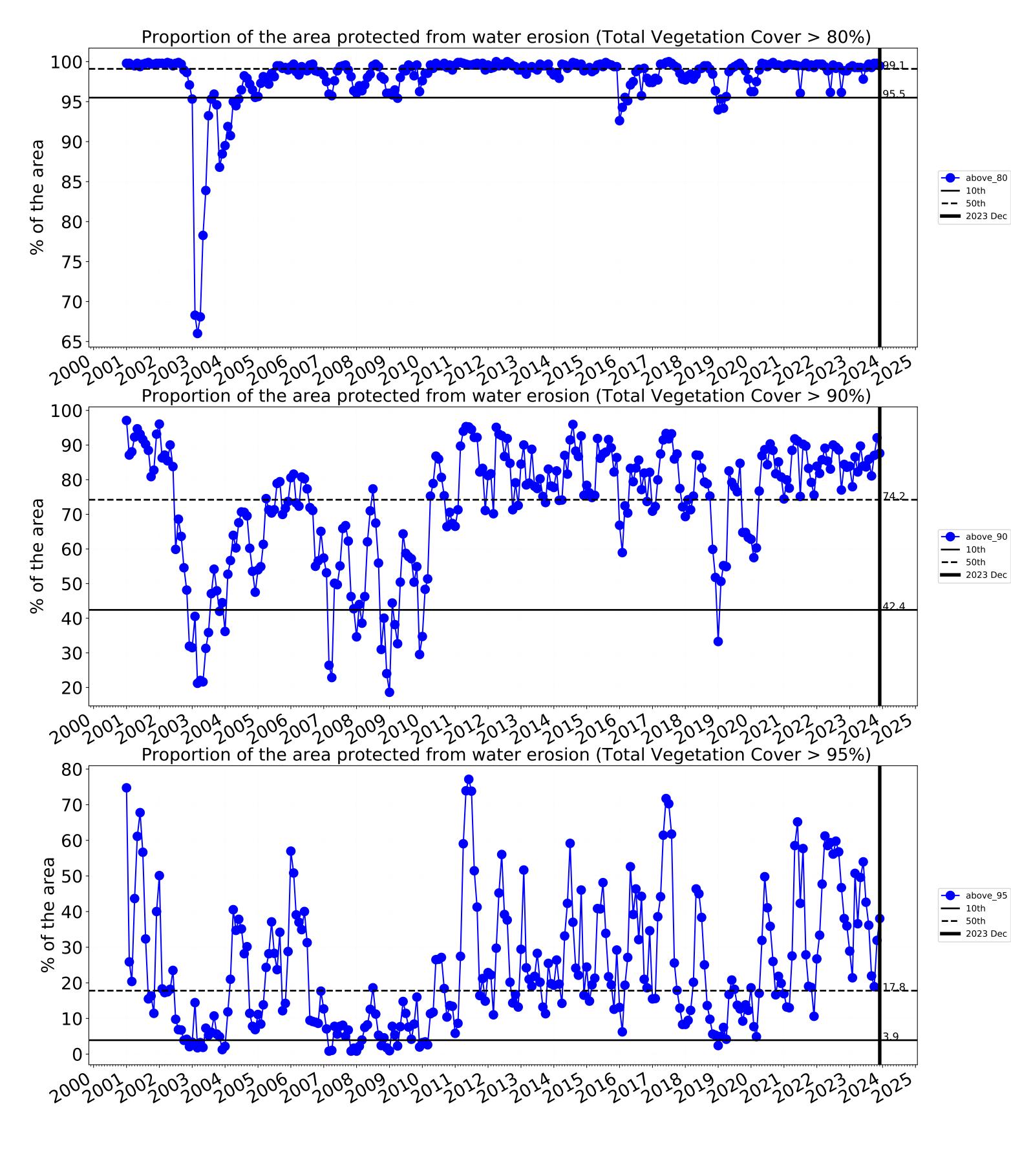
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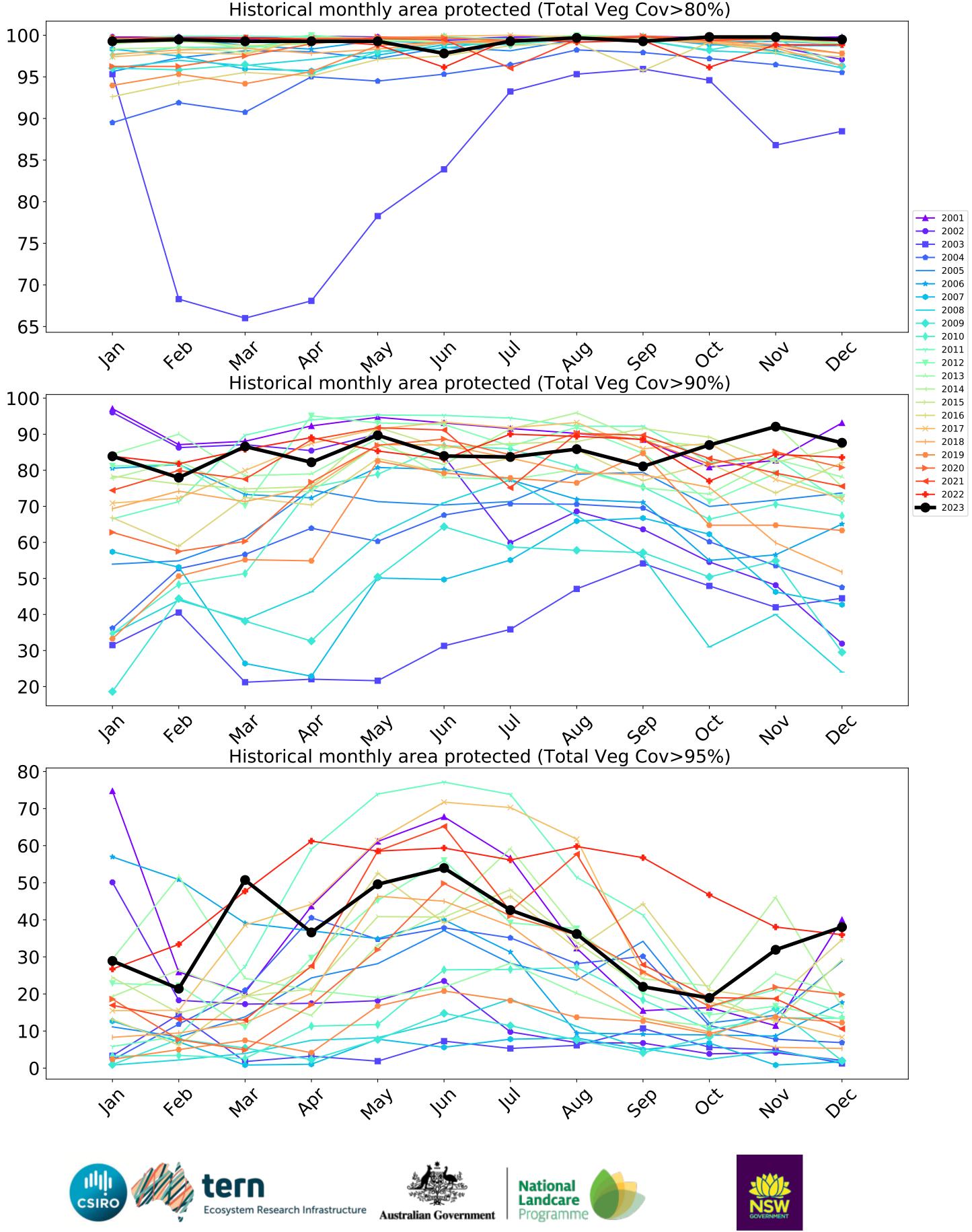


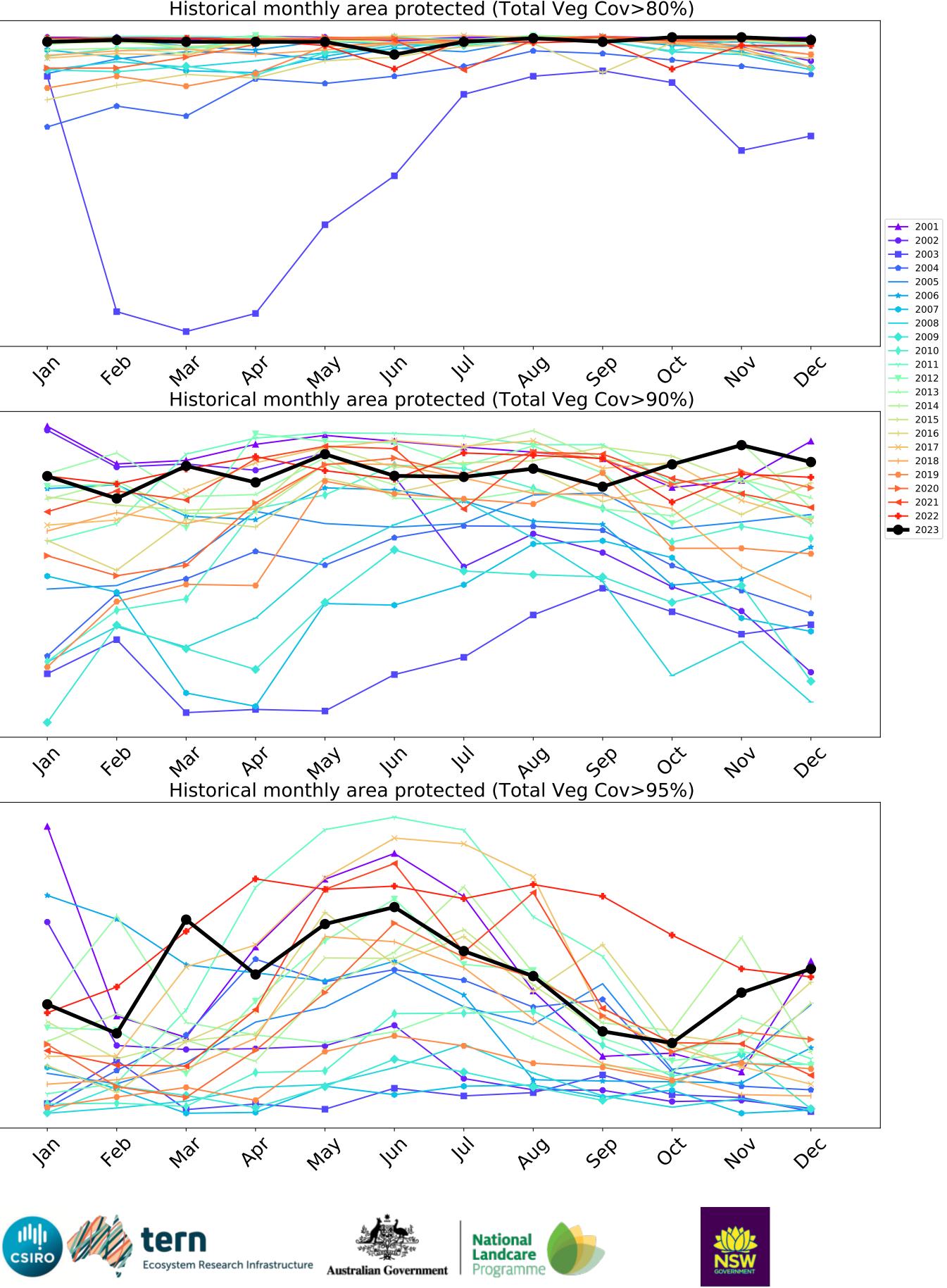
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



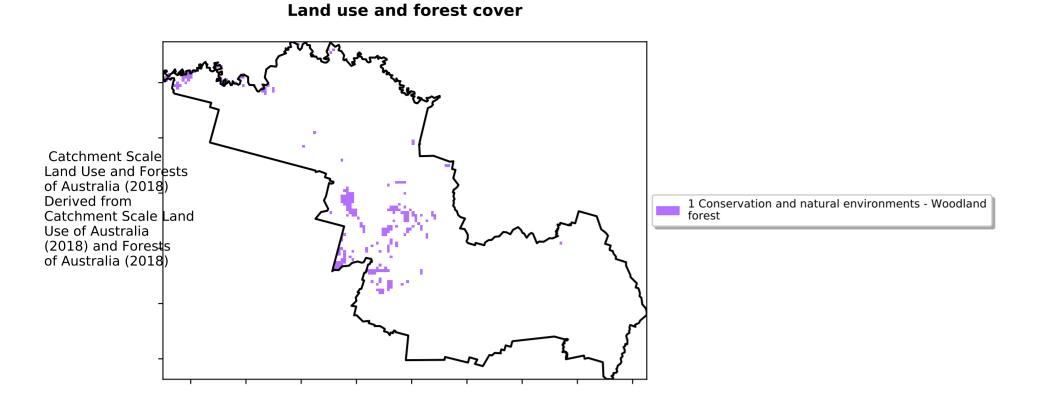
Water erosion historical monthly area protected (Total Veg Cov>70%)



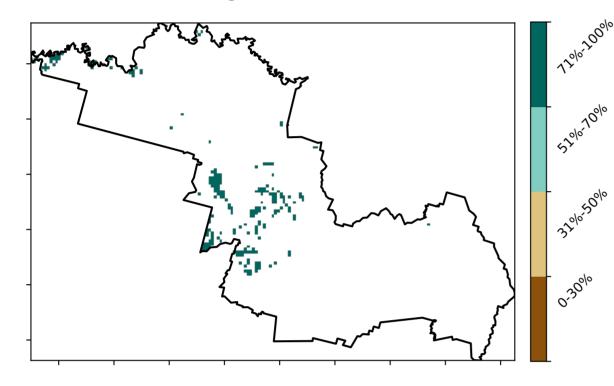




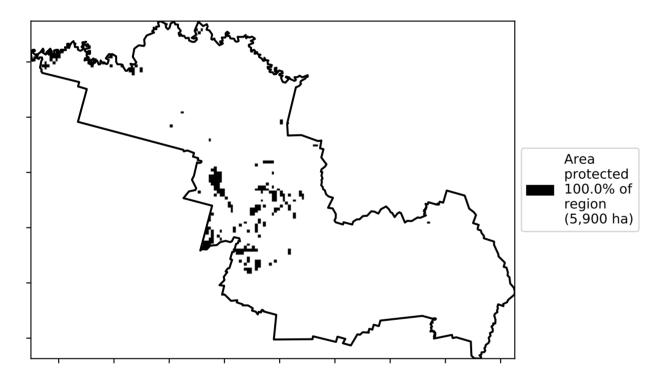
#### **Conservation and natural environments Woodland forest**



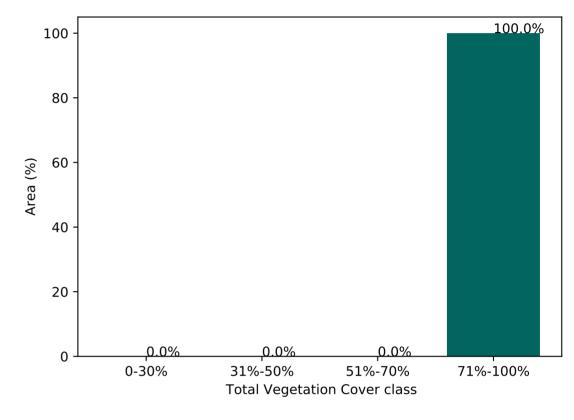
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



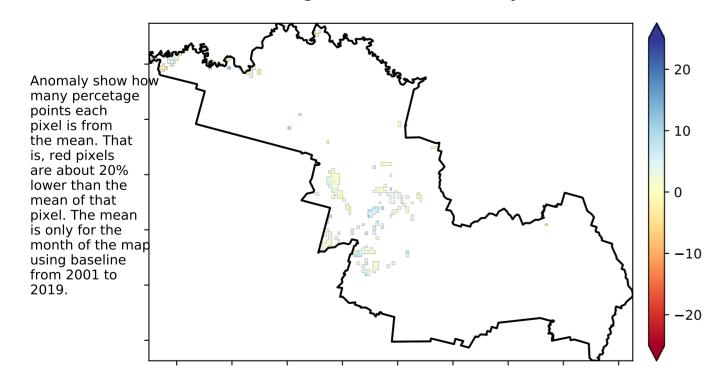
Proportion of vegetation cover class in area



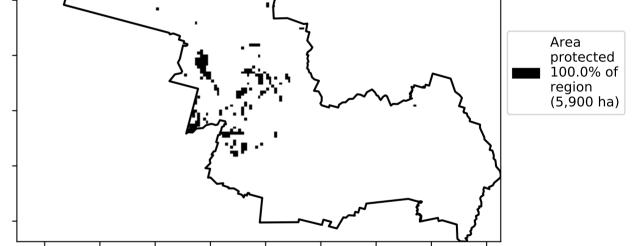
% Area protected from wind erosion (>50%)



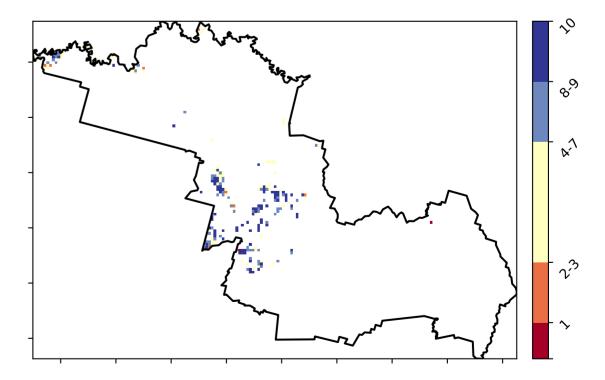
Total Vegetation Cover Anomaly [%]



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.

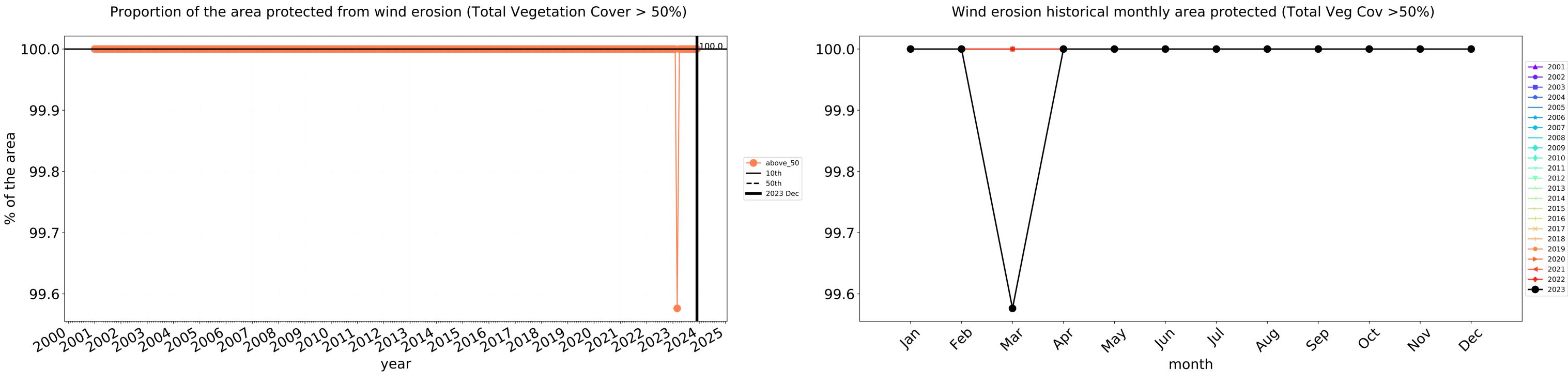


**Total Vegetation Cover Decile [%]** 

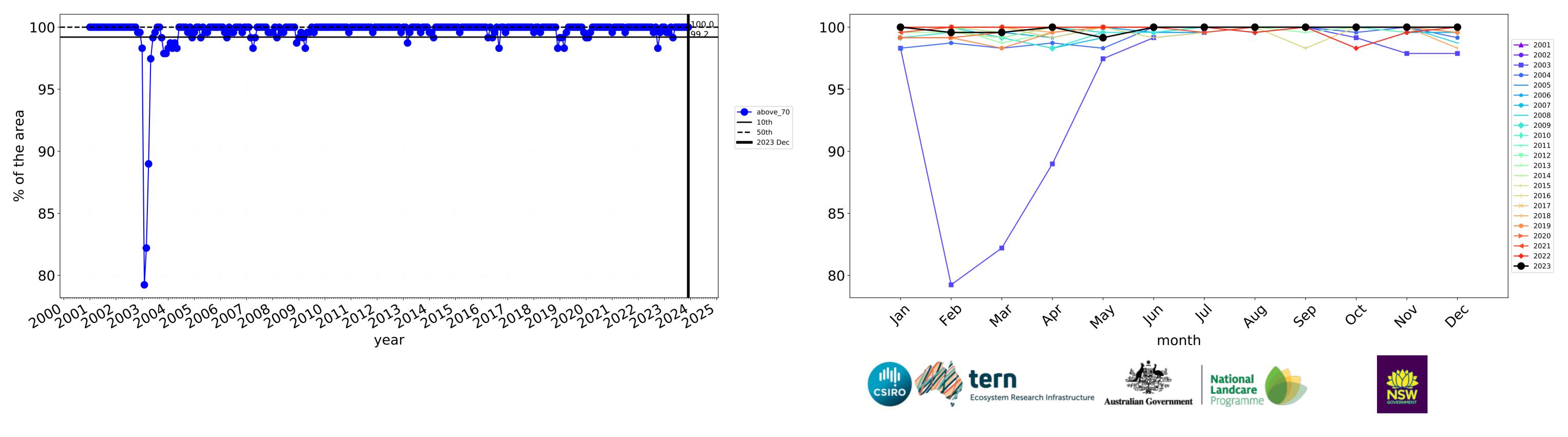




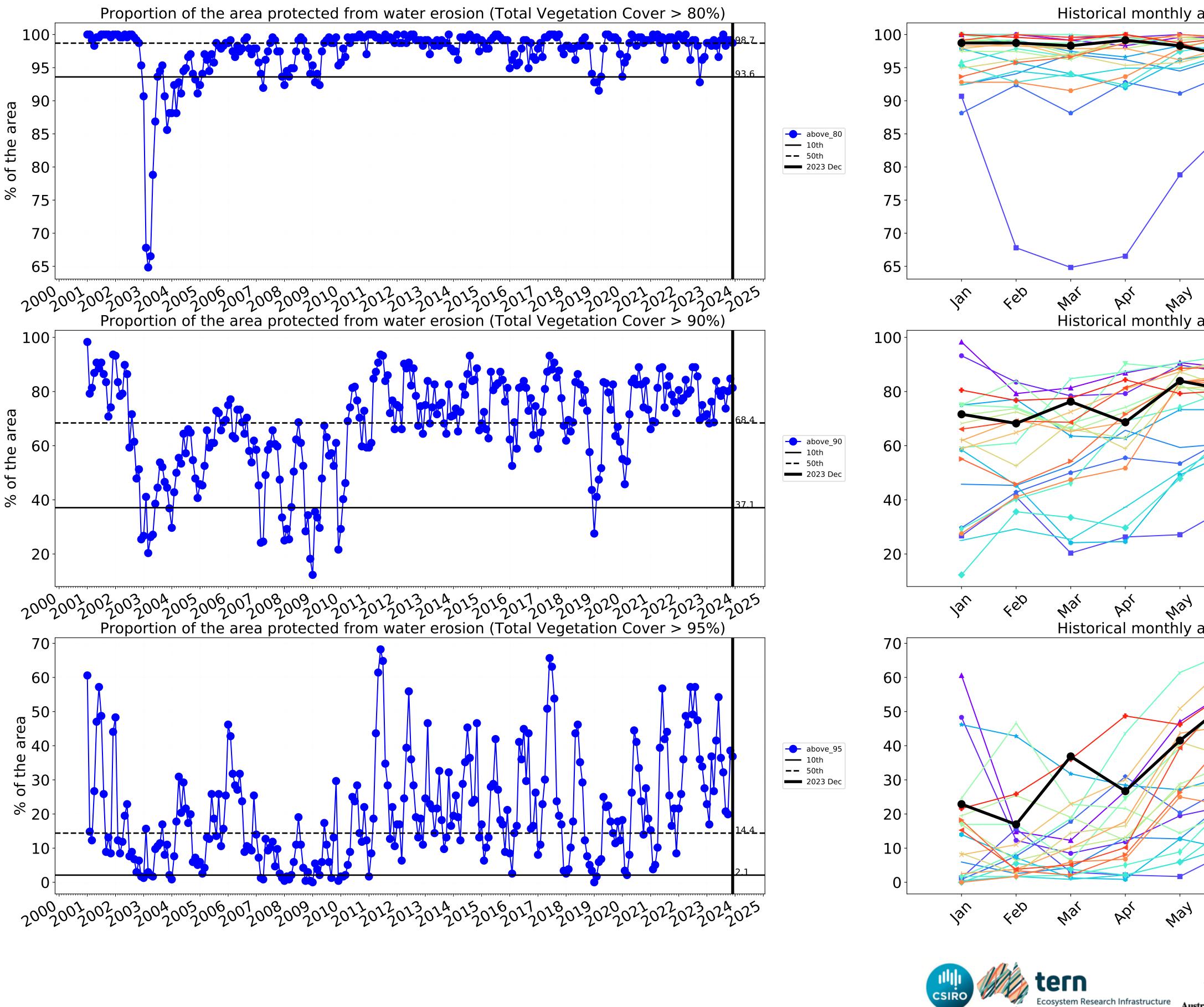
### **Conservation and natural environments Woodland forest timeseries**



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



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



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

In

Jul

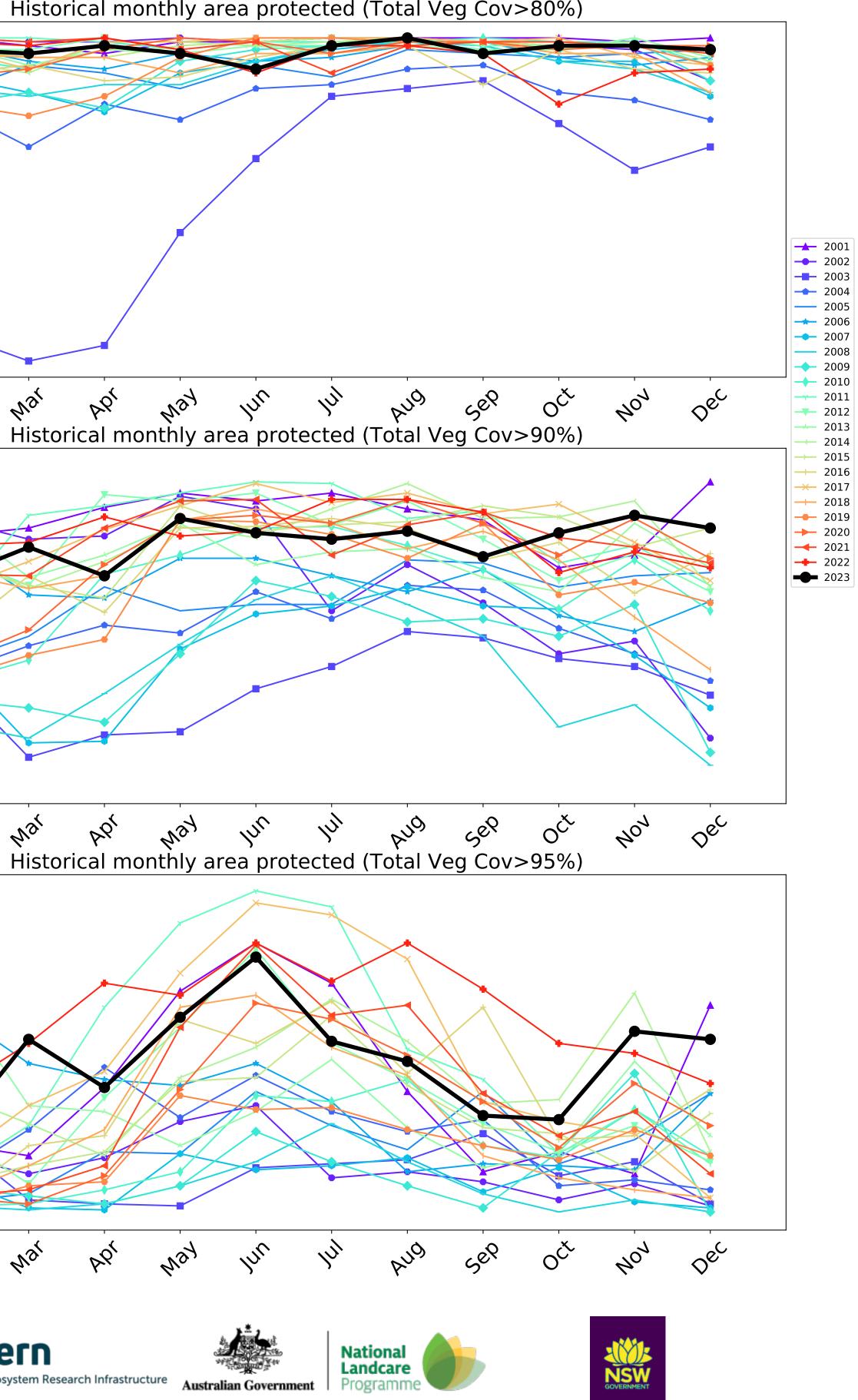
Jur

Australian Government

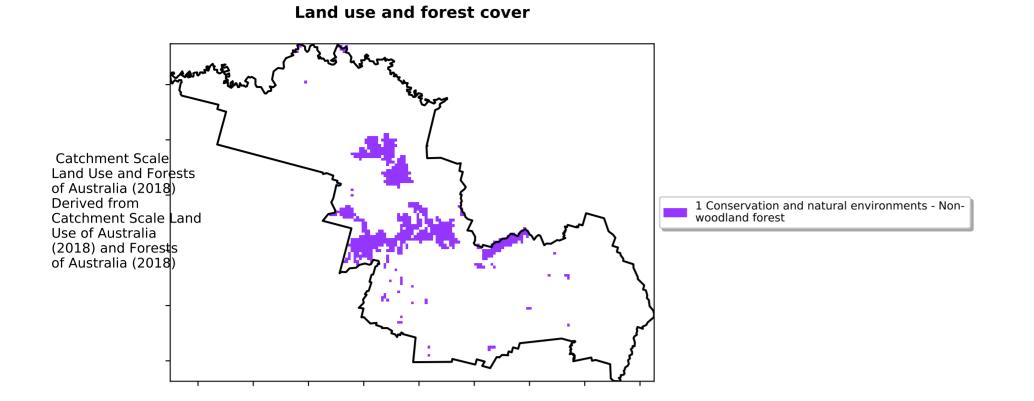
In I

1/2/

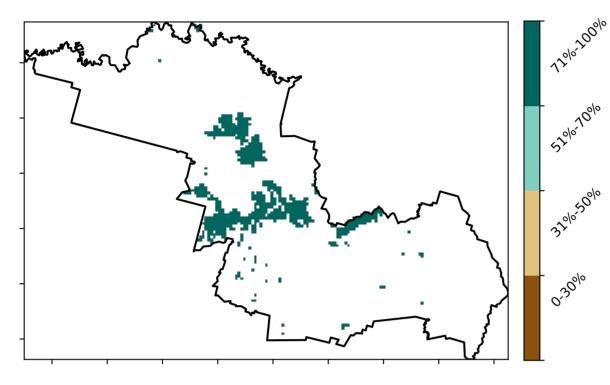
Ecosystem Research Infrastructure



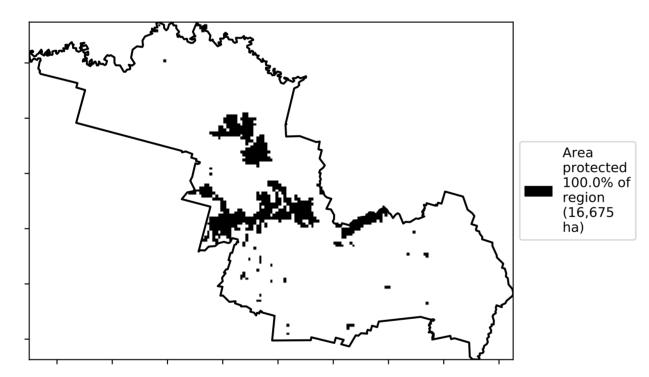
#### **Conservation and natural environments Forest (non woodland)**



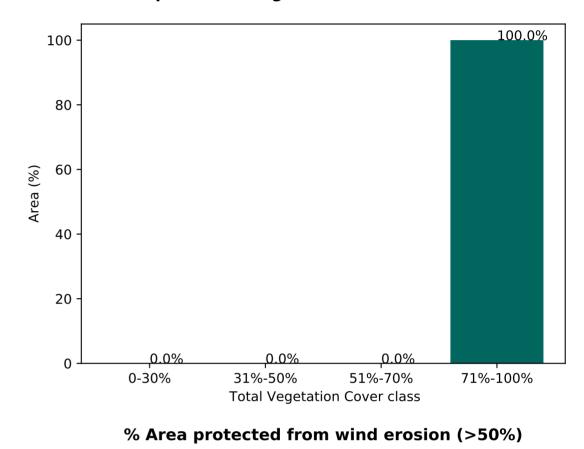
**Total Vegetation Cover [%]** 

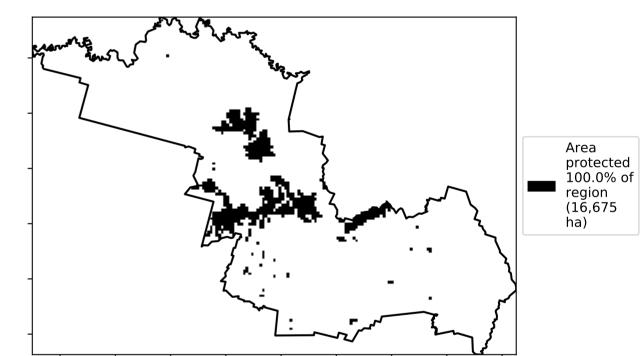


% Area protected from water erosion (>70%)

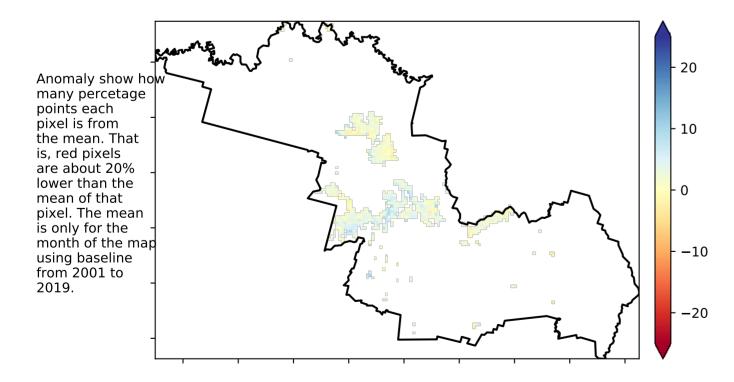


Proportion of vegetation cover class in area

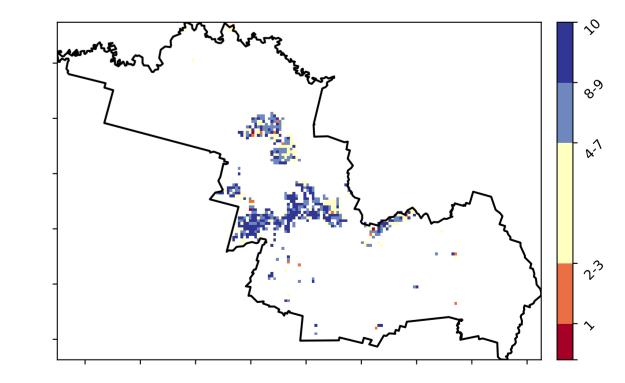




Total Vegetation Cover Anomaly [%]



Total Vegetation Cover Decile [%]

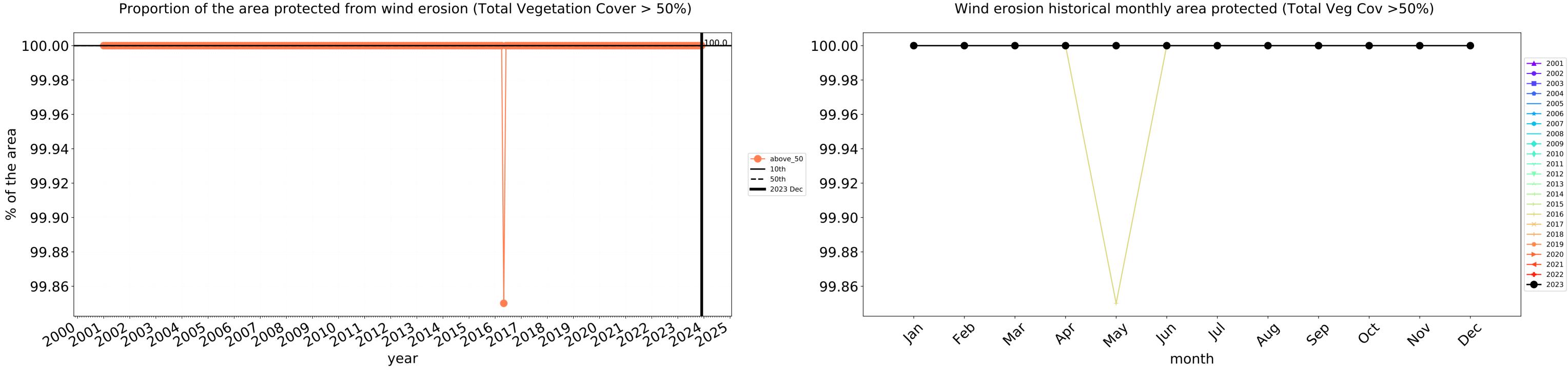




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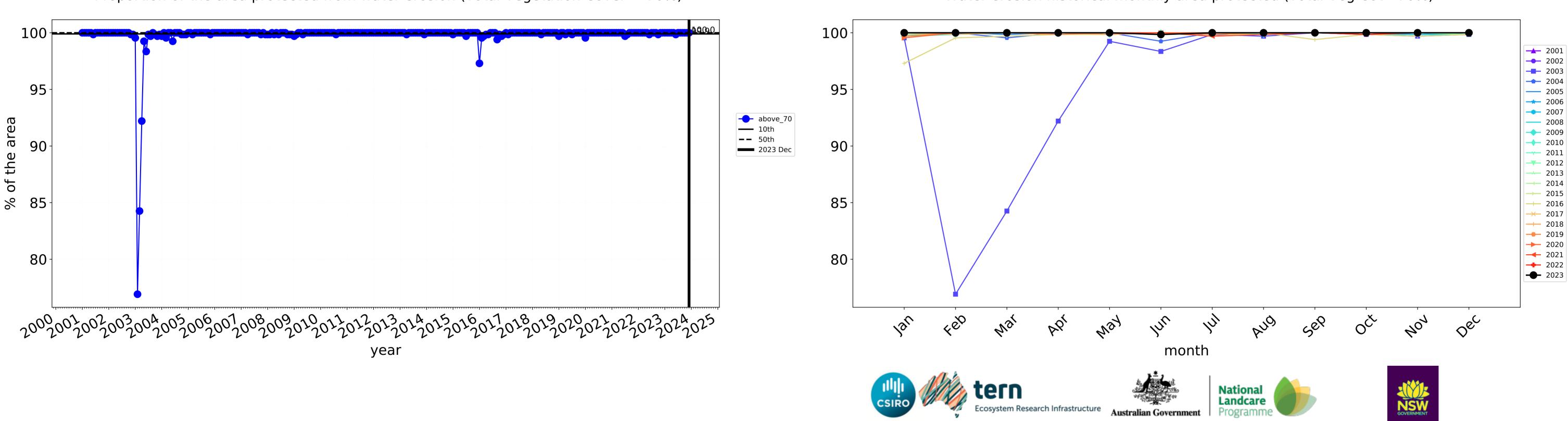
the map using baseline from 2001 to 2019.

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

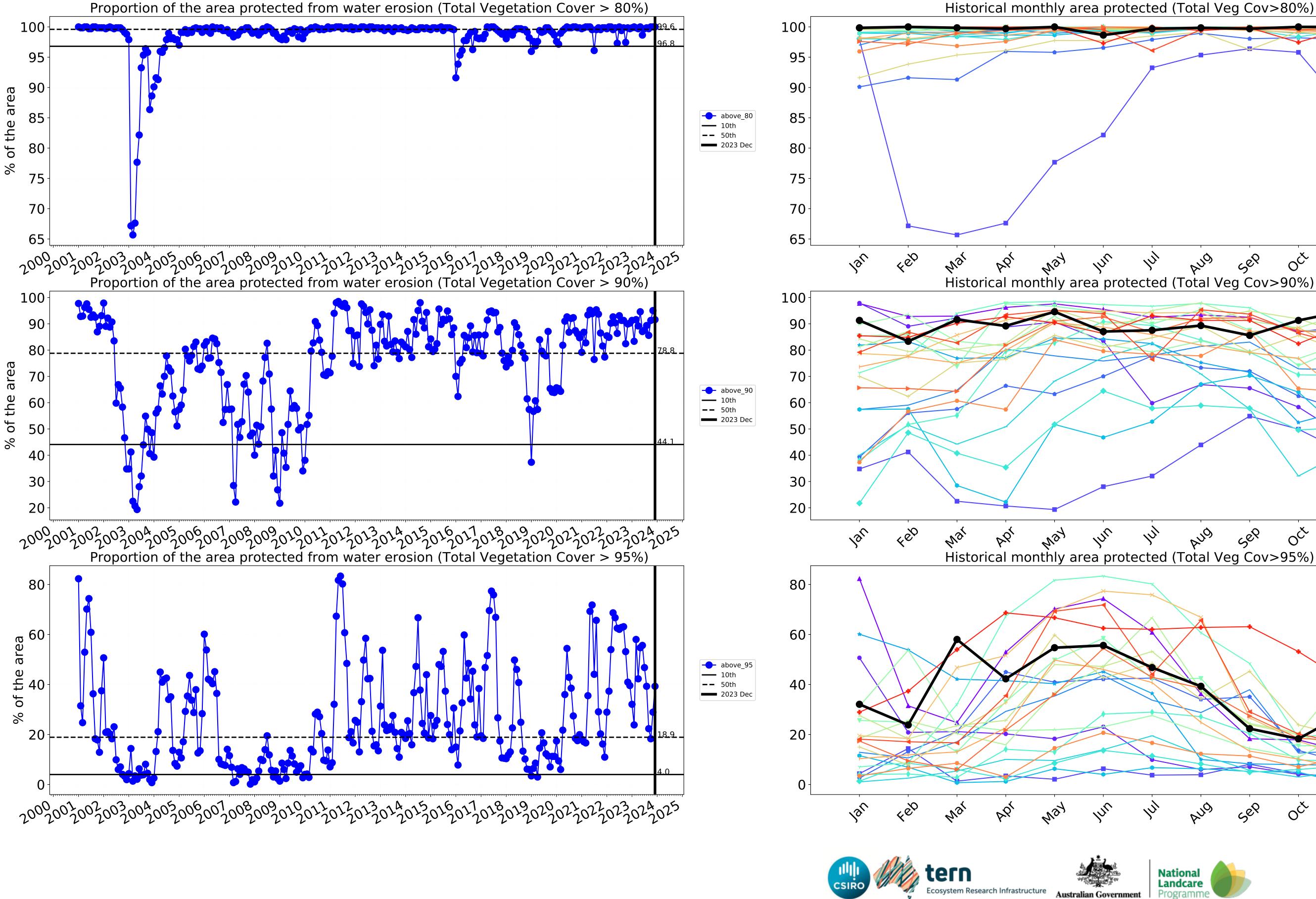


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



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



13

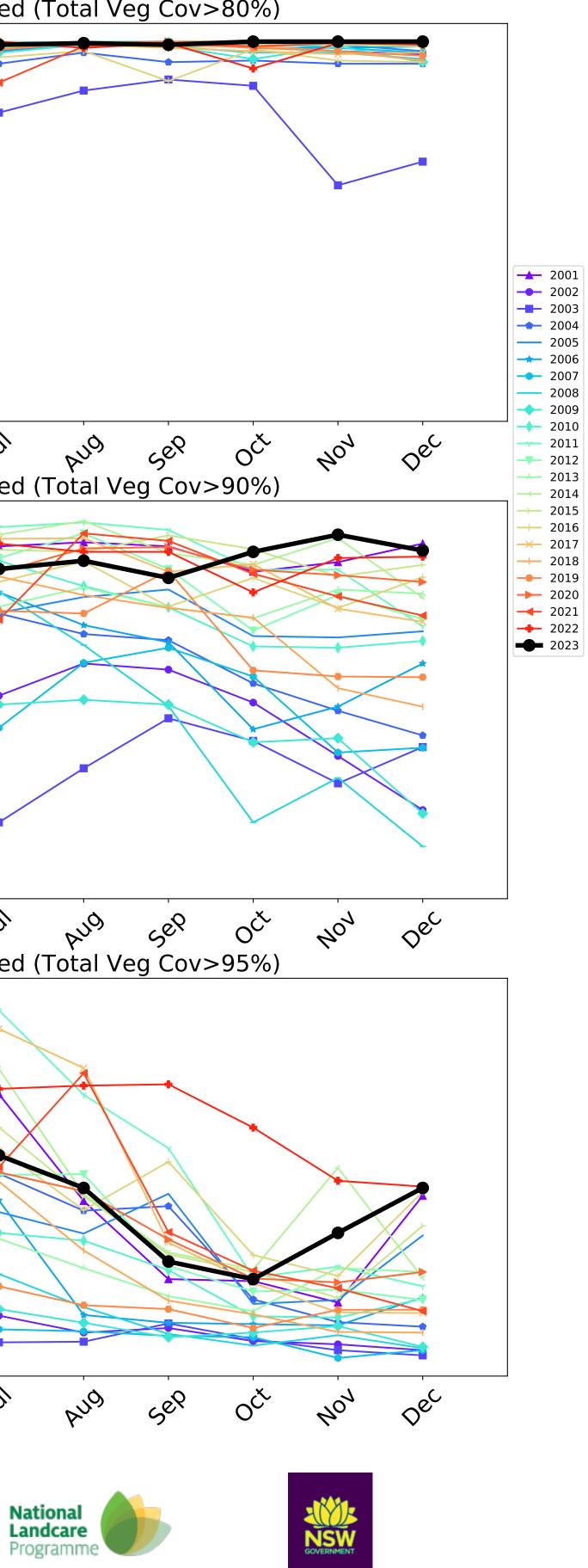
Australian Government

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

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1st

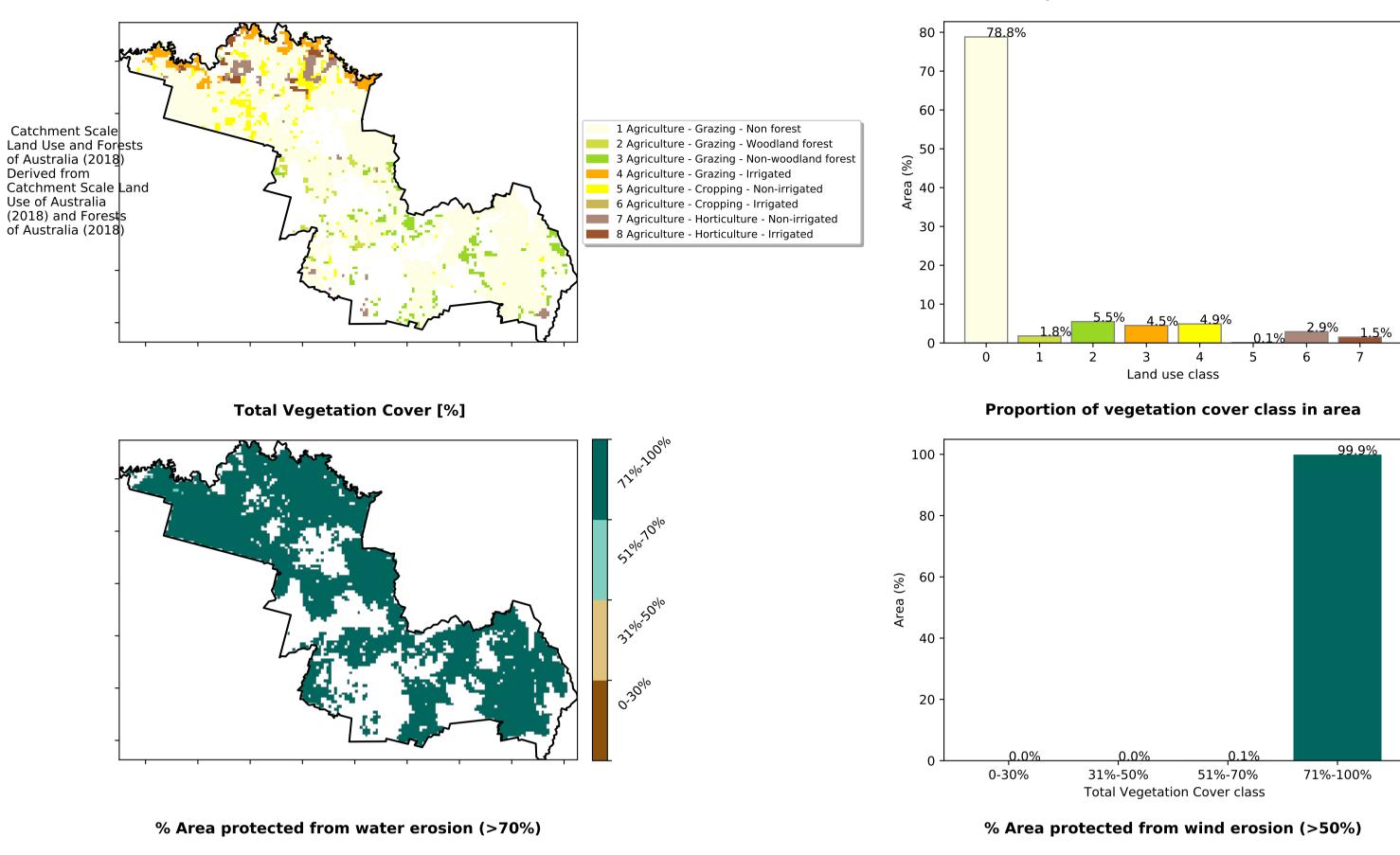
12

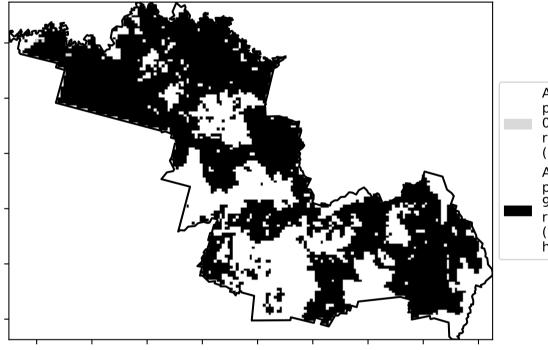


#### Agriculture

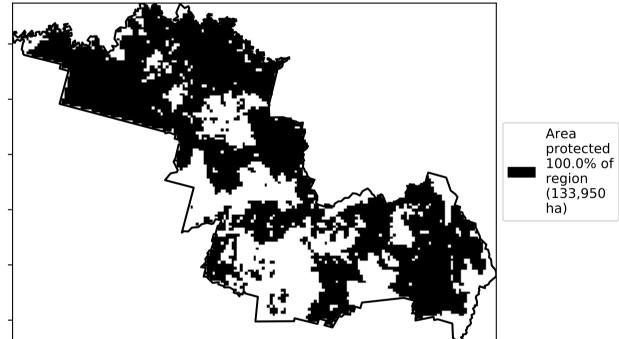
Land use and forest cover

#### Proportion of each land class in area

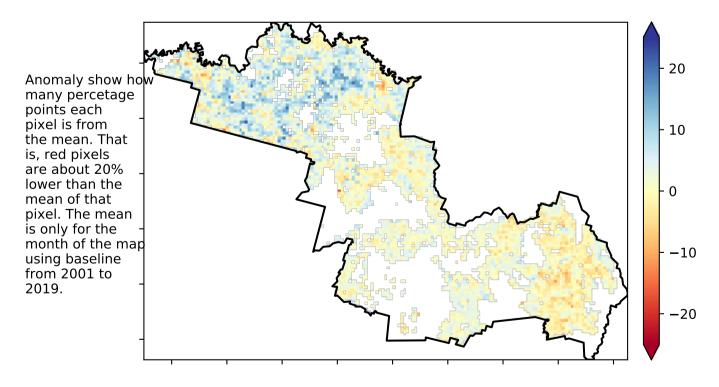




Area not protected 0.1% of region (134 ha) Area protected 99.9% of region (133,816 ha)

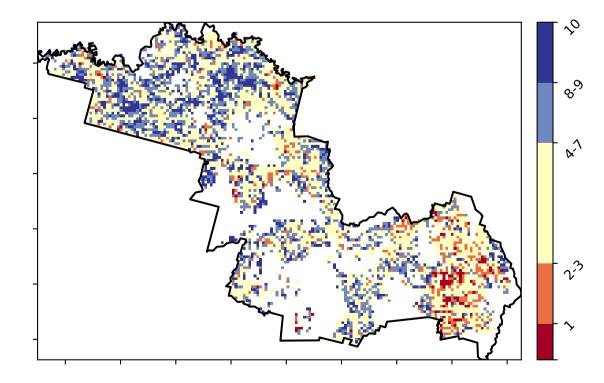


**Total Vegetation Cover Anomaly [%]** 

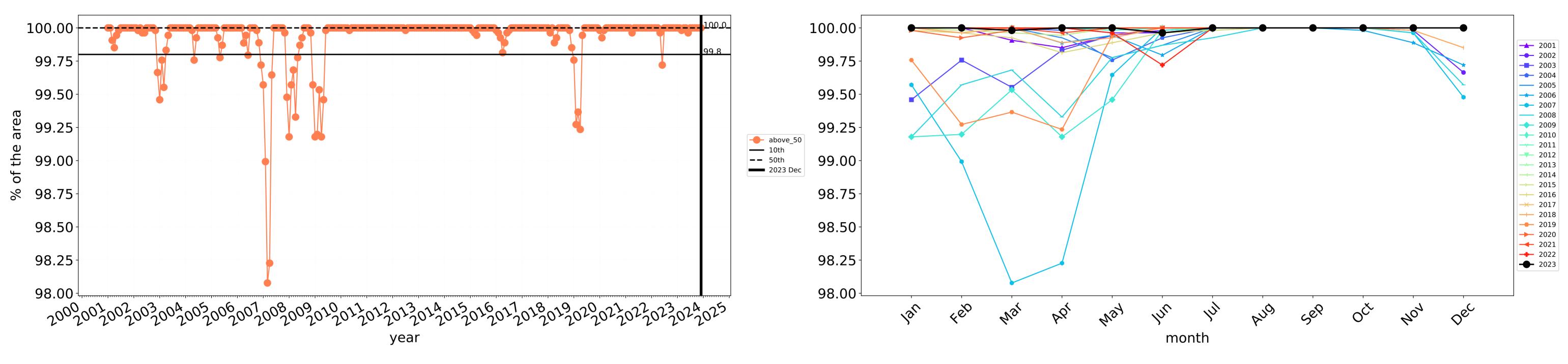


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

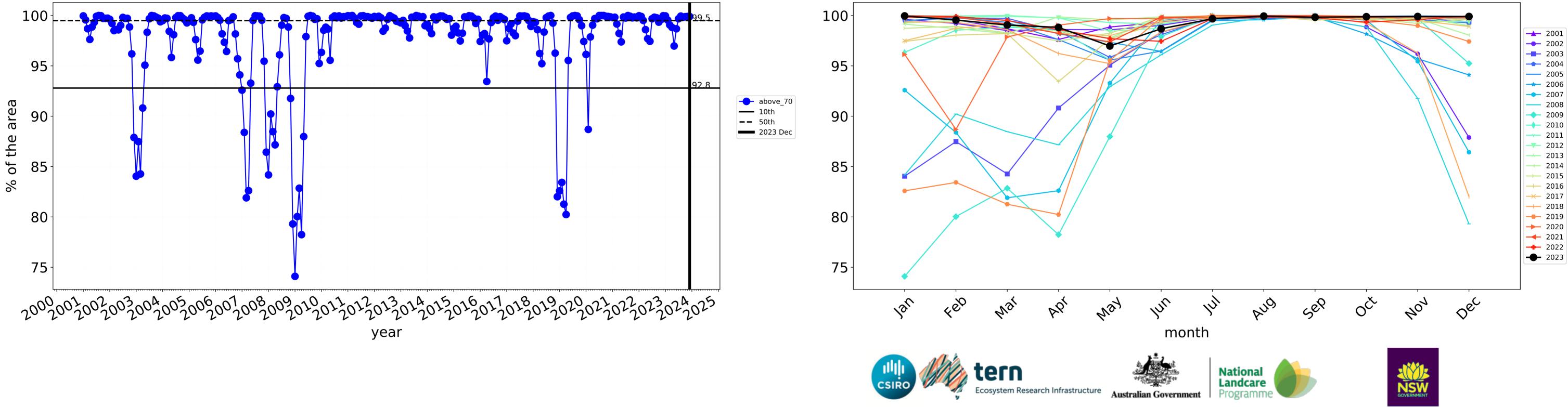






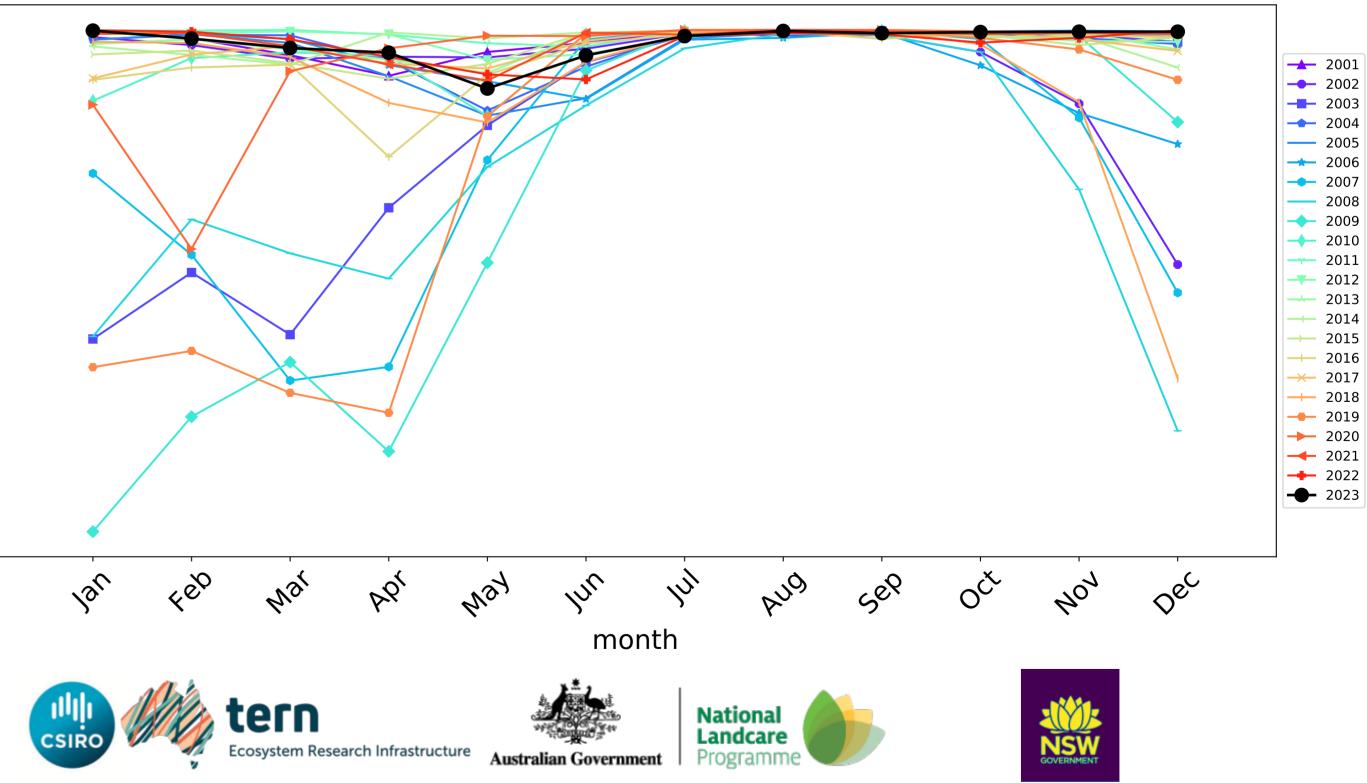
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

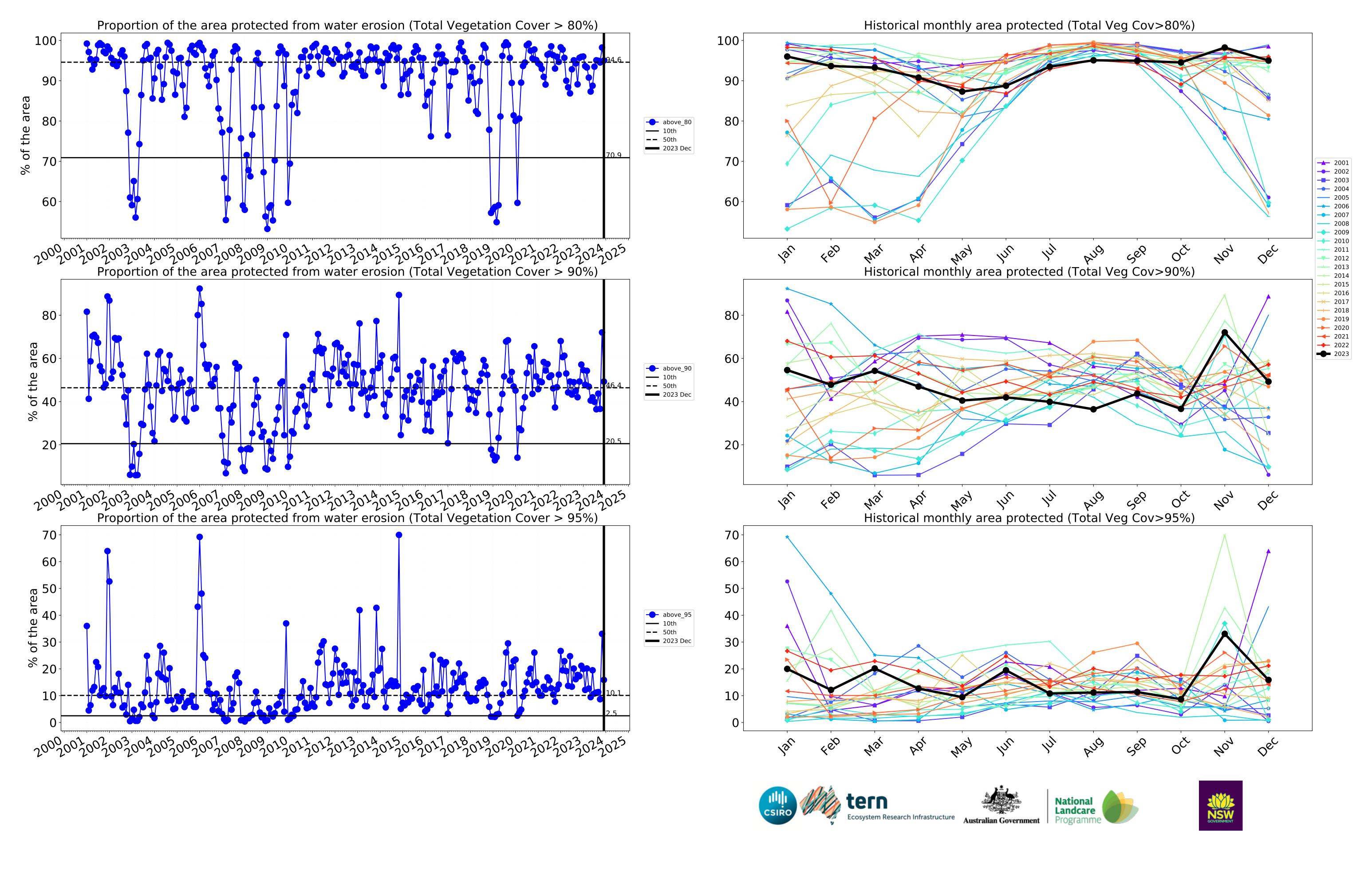




Wind erosion historical monthly area protected (Total Veg Cov >50%)



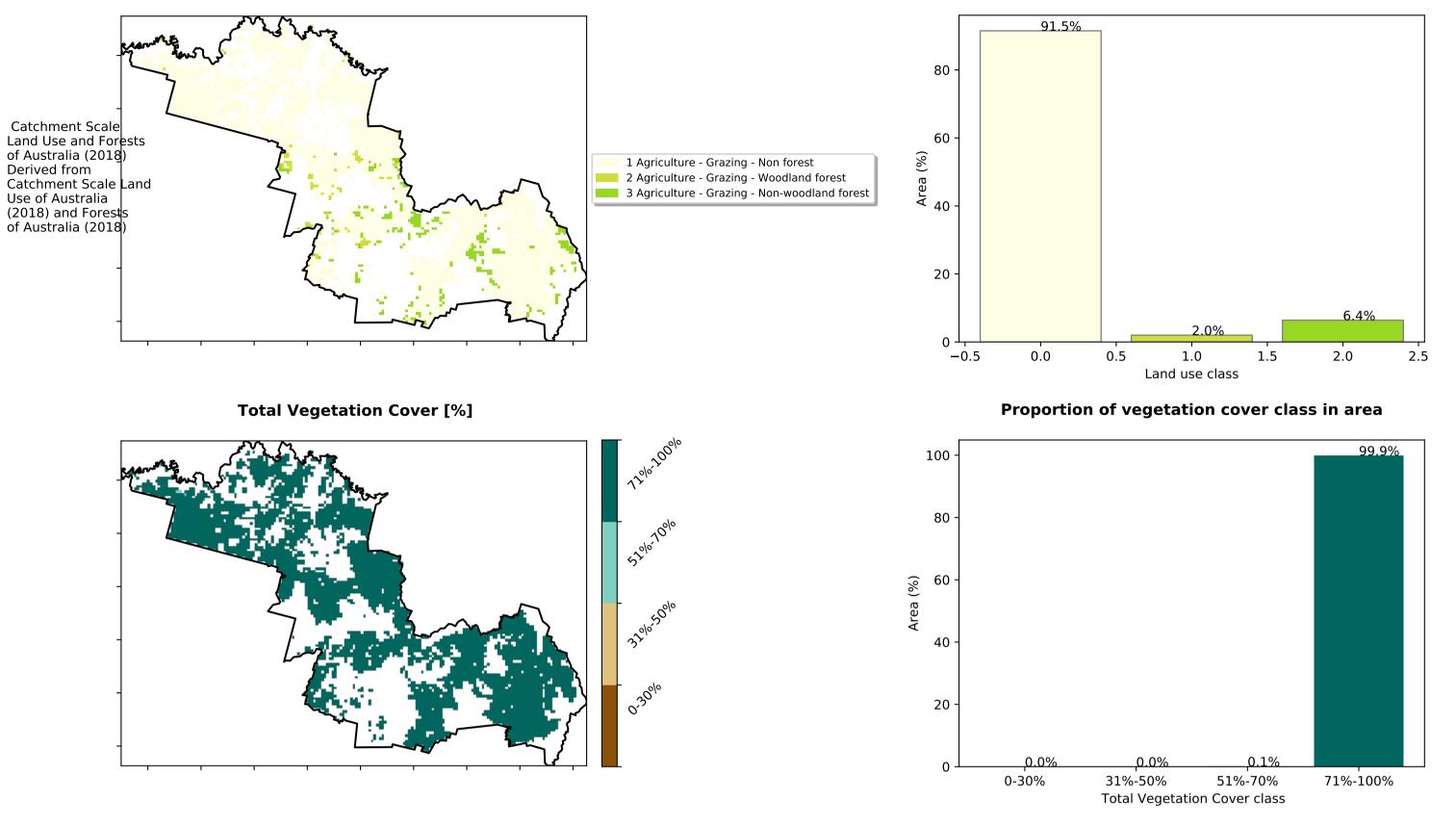




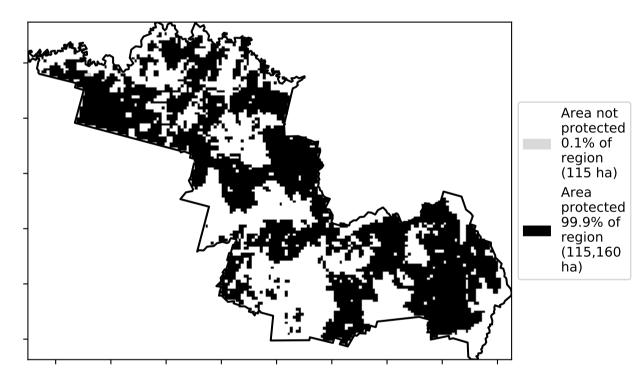
#### Grazing

Land use and forest cover

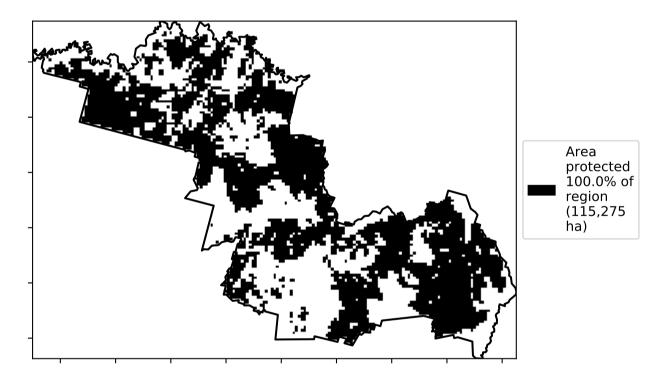




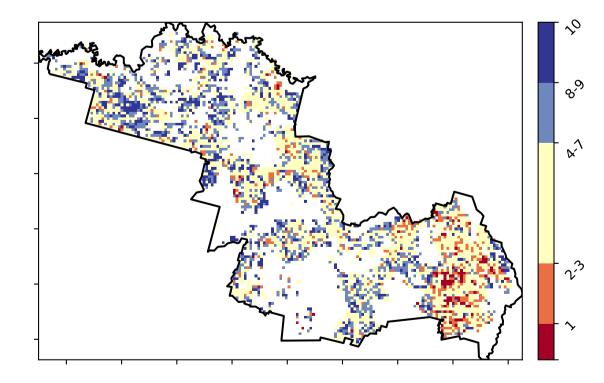
% Area protected from water erosion (>70%)



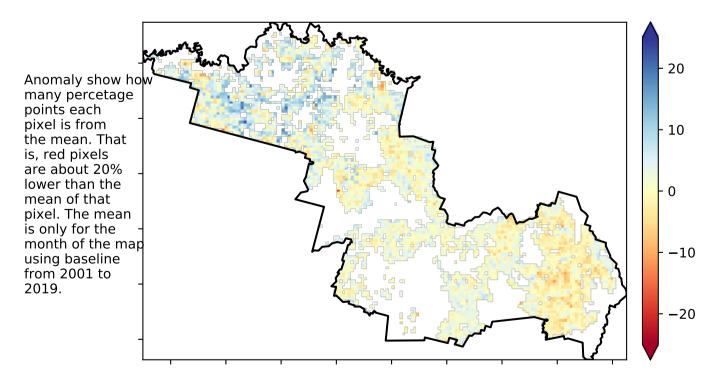
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



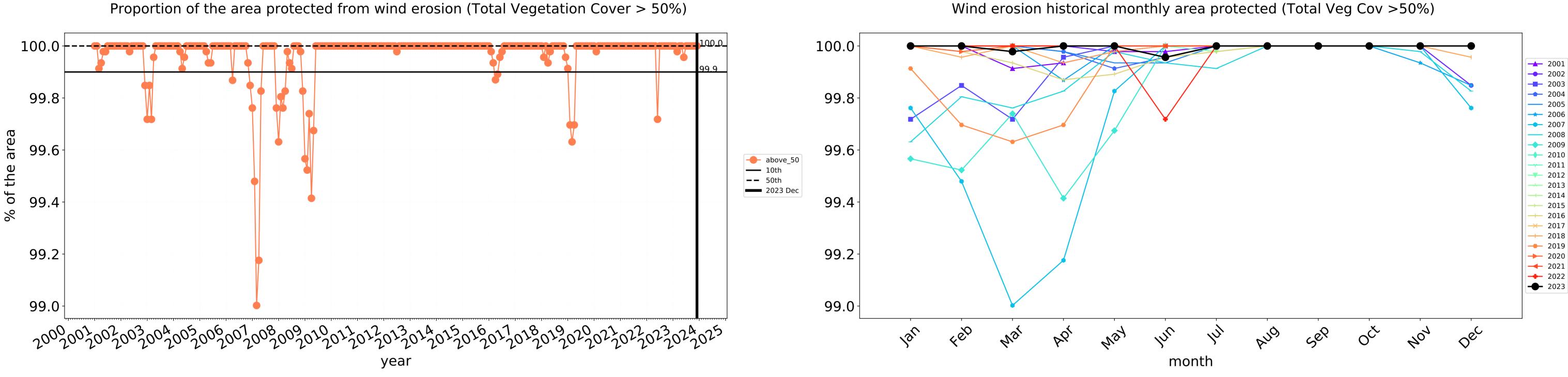
Total Vegetation Cover Anomaly [%]



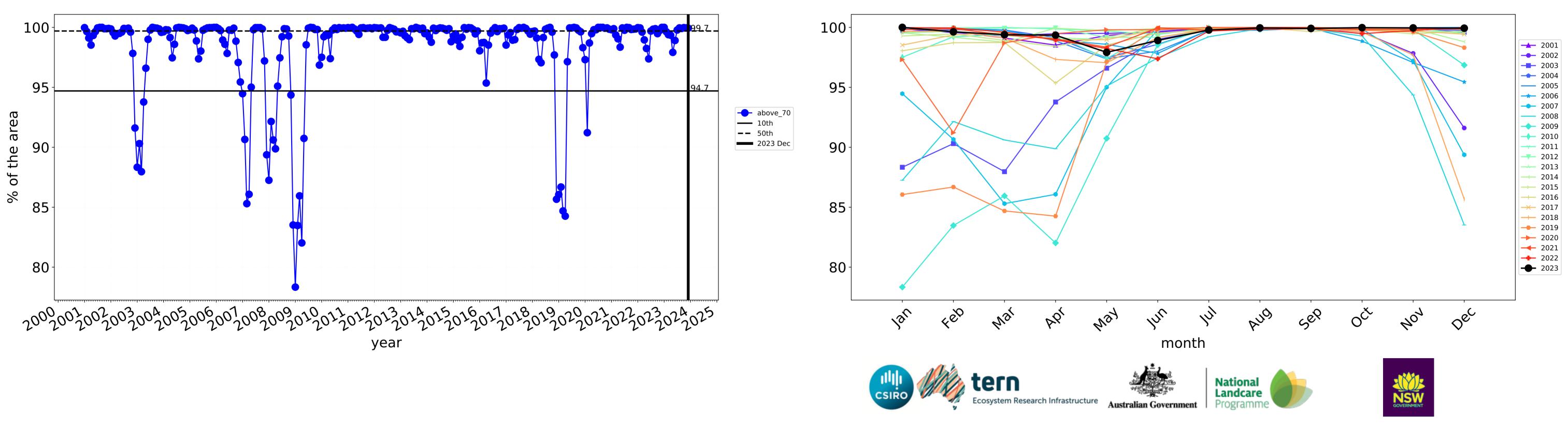


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline

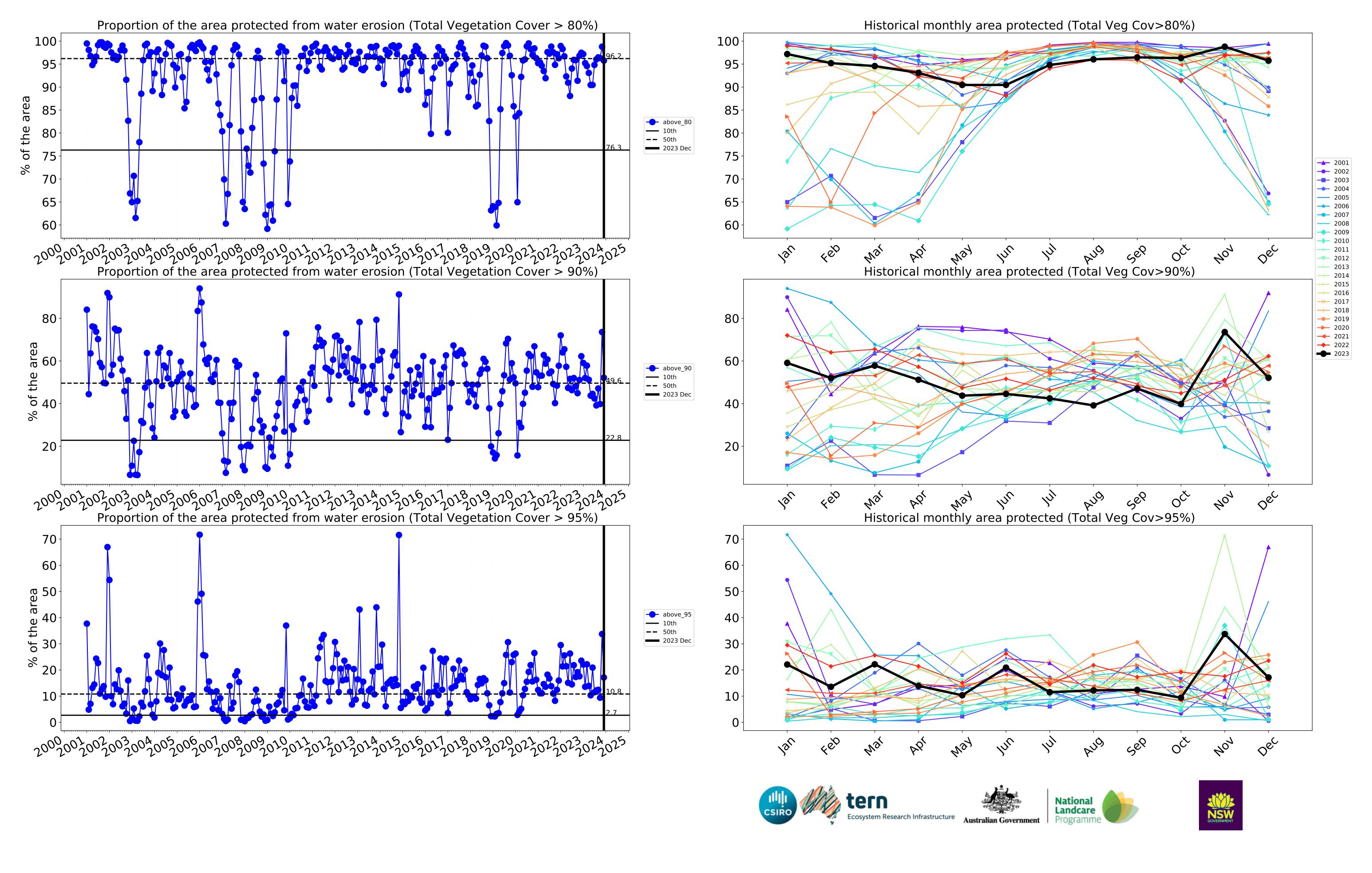
the map using baseline from 2001 to 2019.



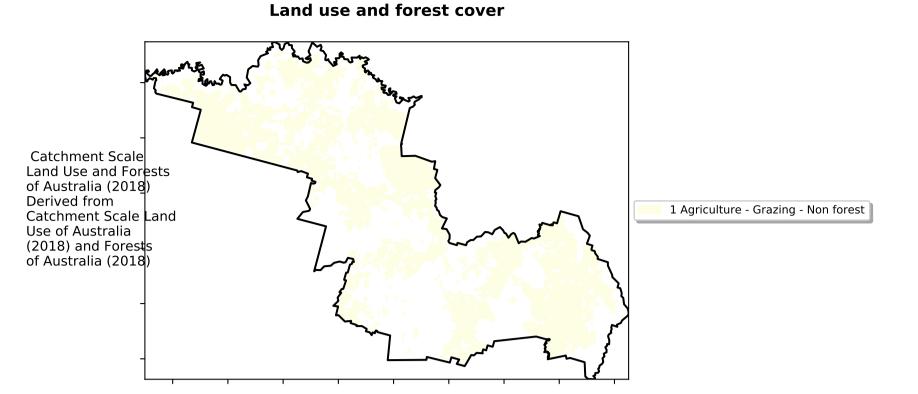
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



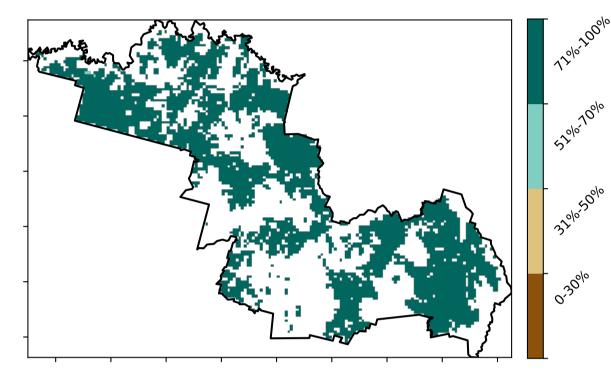




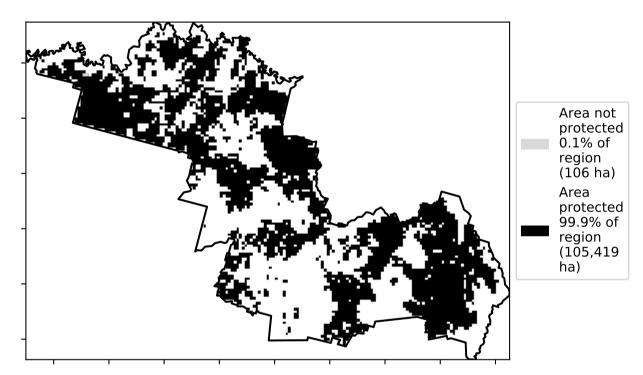
#### **Grazing non forest**



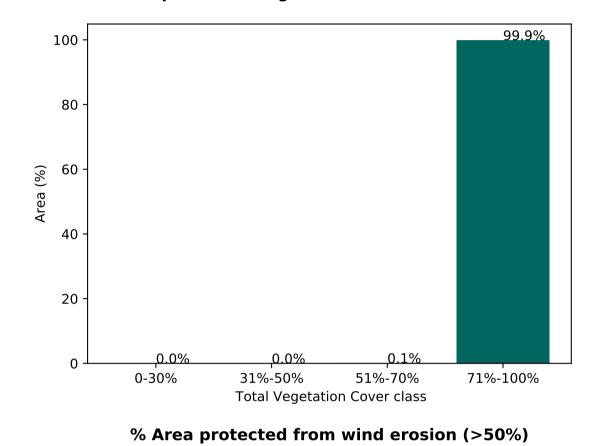
Total Vegetation Cover [%]

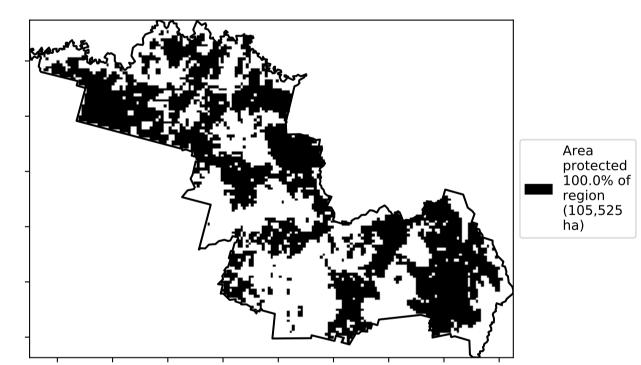


% Area protected from water erosion (>70%)

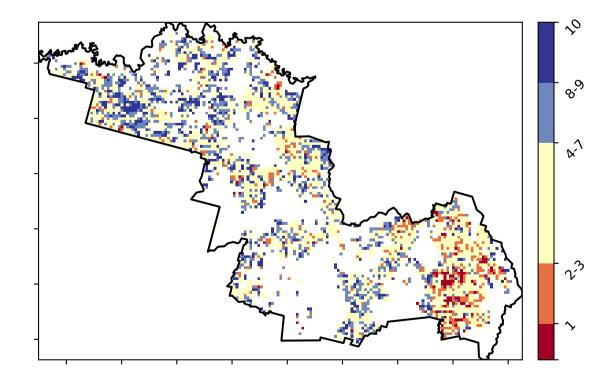


Proportion of vegetation cover class in area

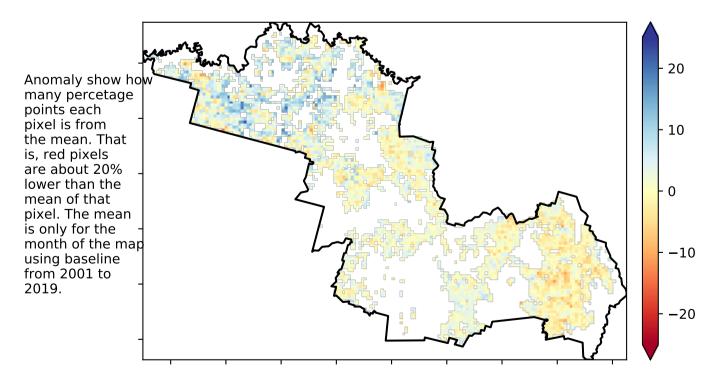




Total Vegetation Cover Decile [%]



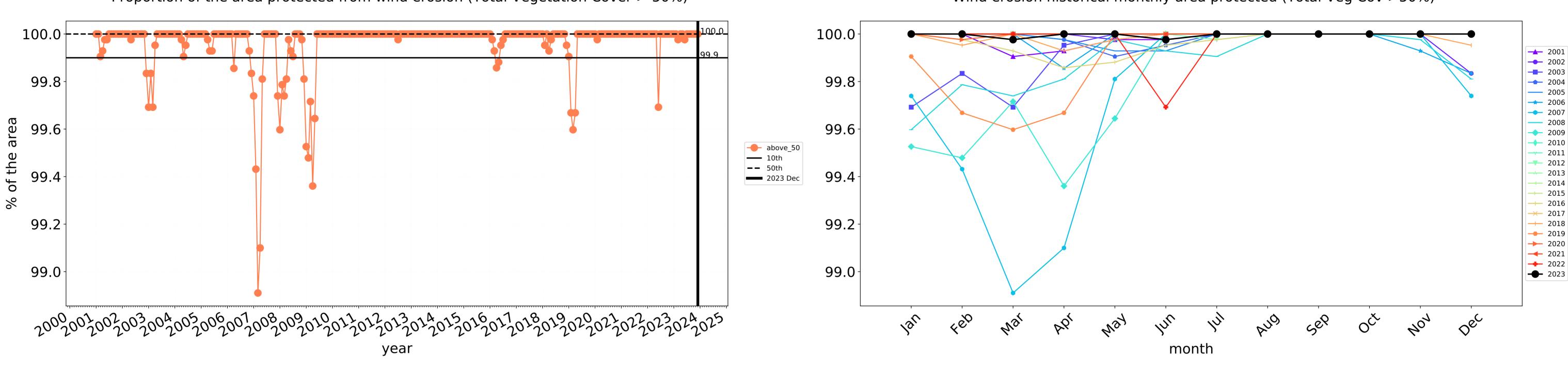
**Total Vegetation Cover Anomaly [%]** 





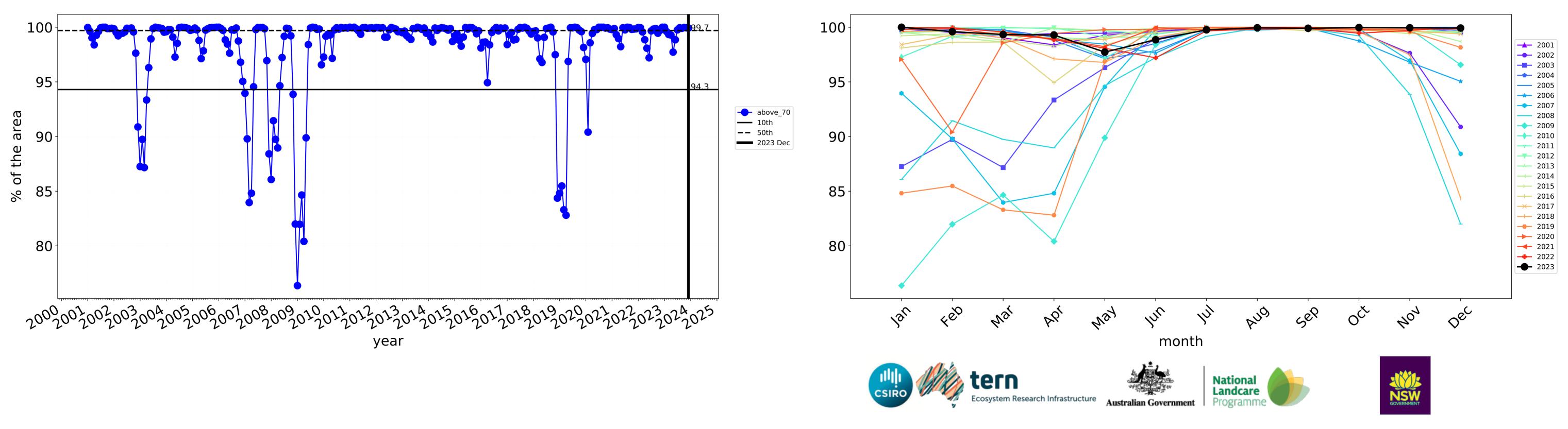
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

20



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

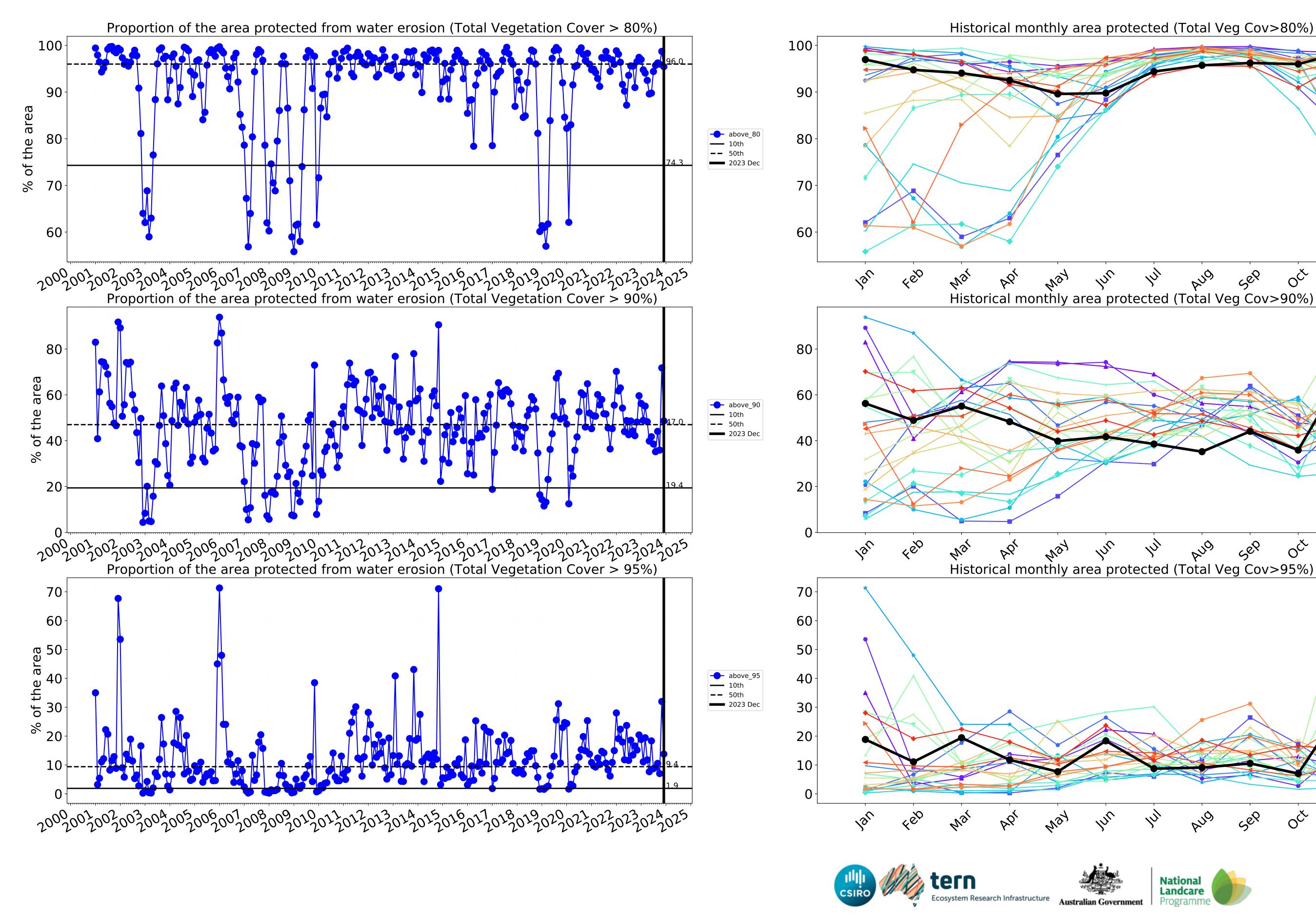
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

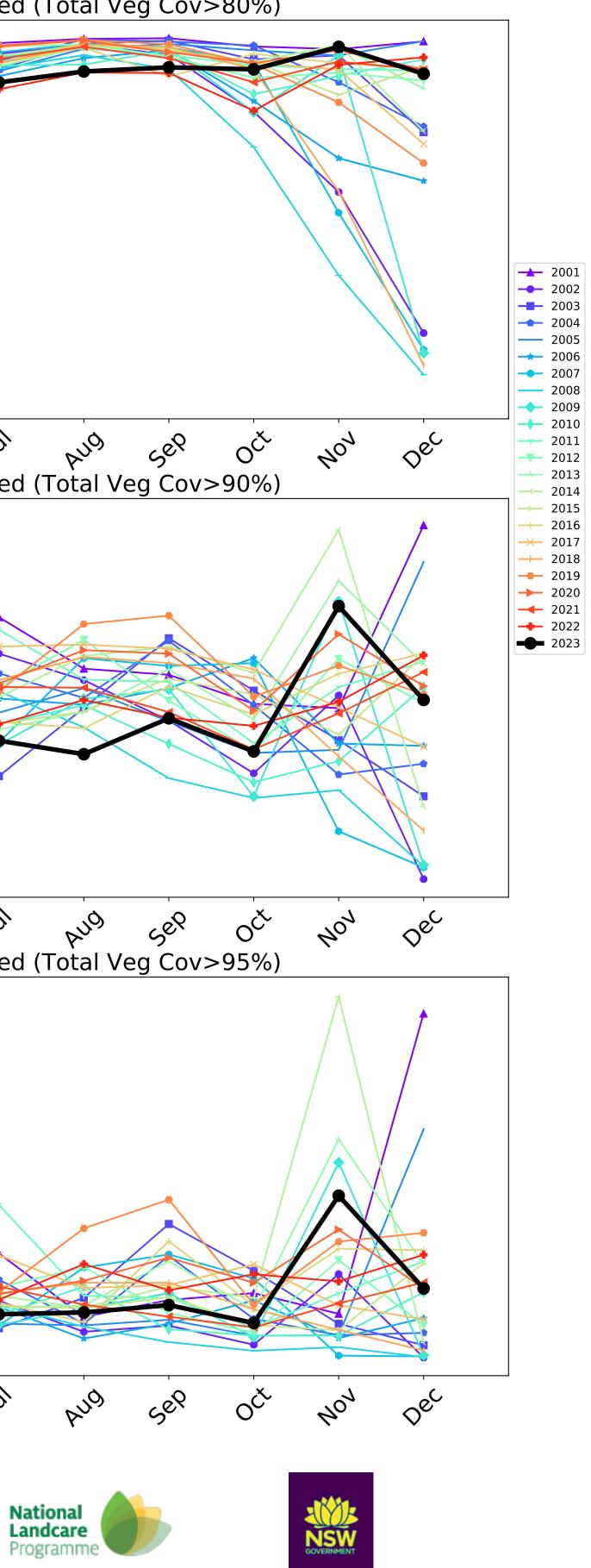


### Grazing non forest timeseries

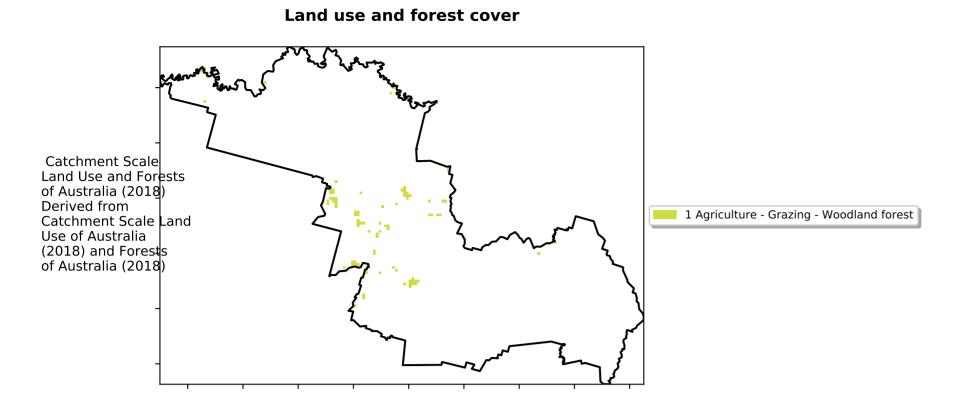
Water erosion historical monthly area protected (Total Veg Cov>70%)

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

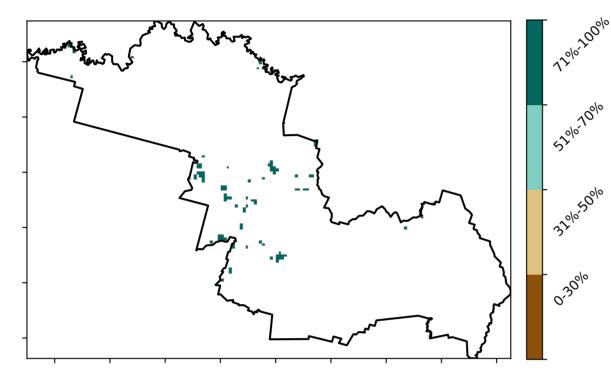




#### **Grazing Woodland forest**



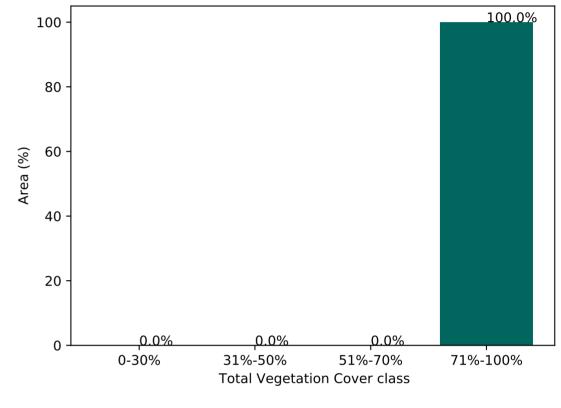
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)

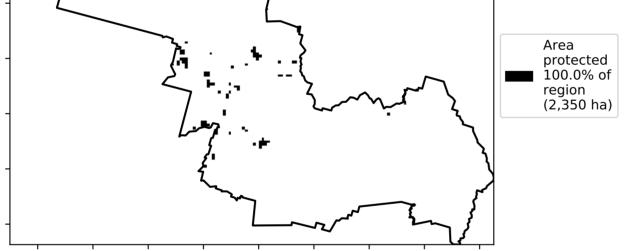


Proportion of vegetation cover class in area

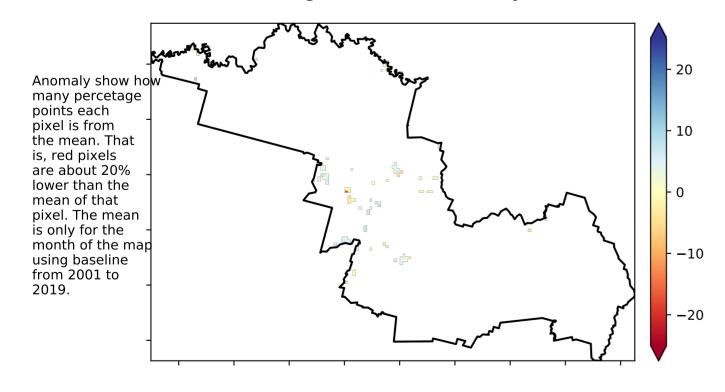


#### % Area protected from wind erosion (>50%)

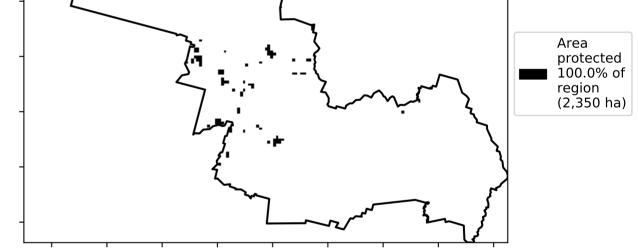




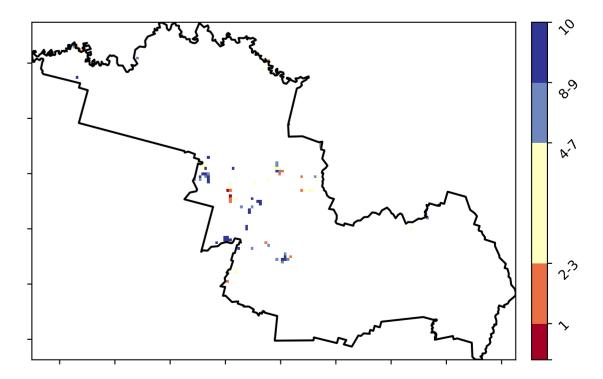
Total Vegetation Cover Anomaly [%]



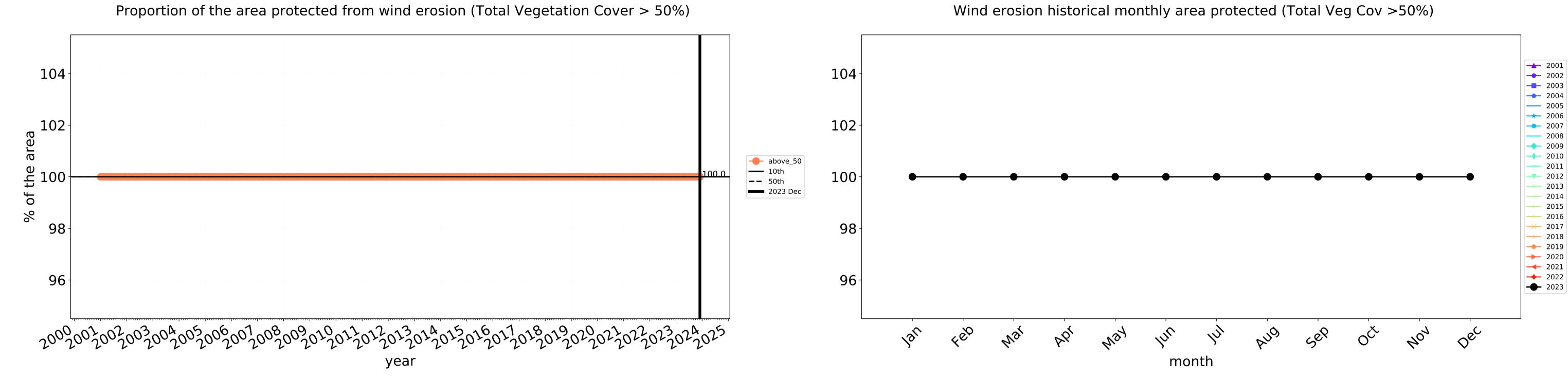
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



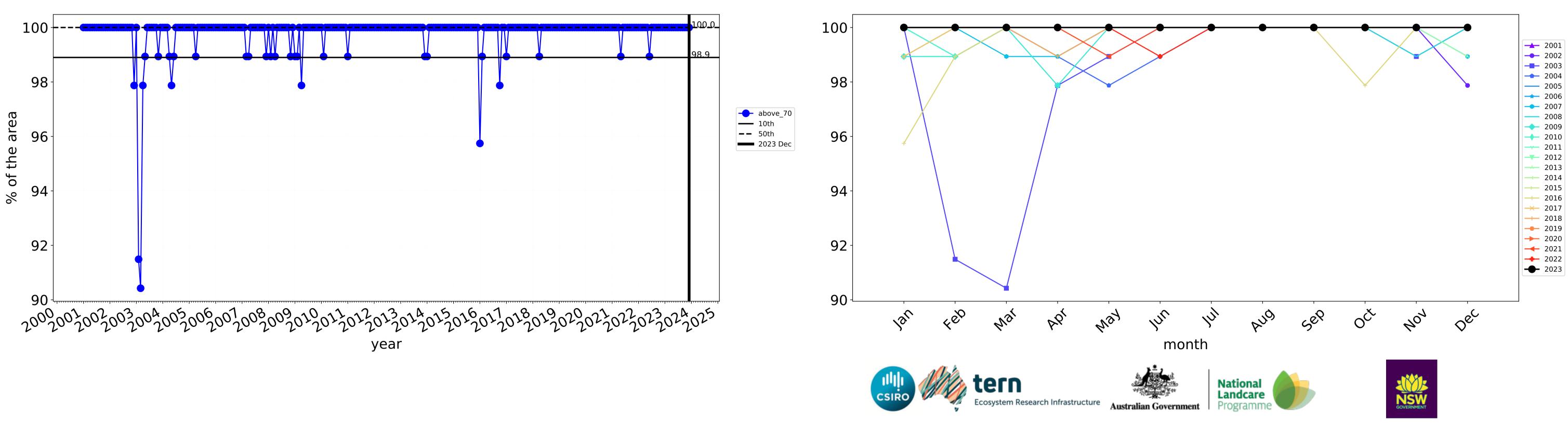
**Total Vegetation Cover Decile [%]** 





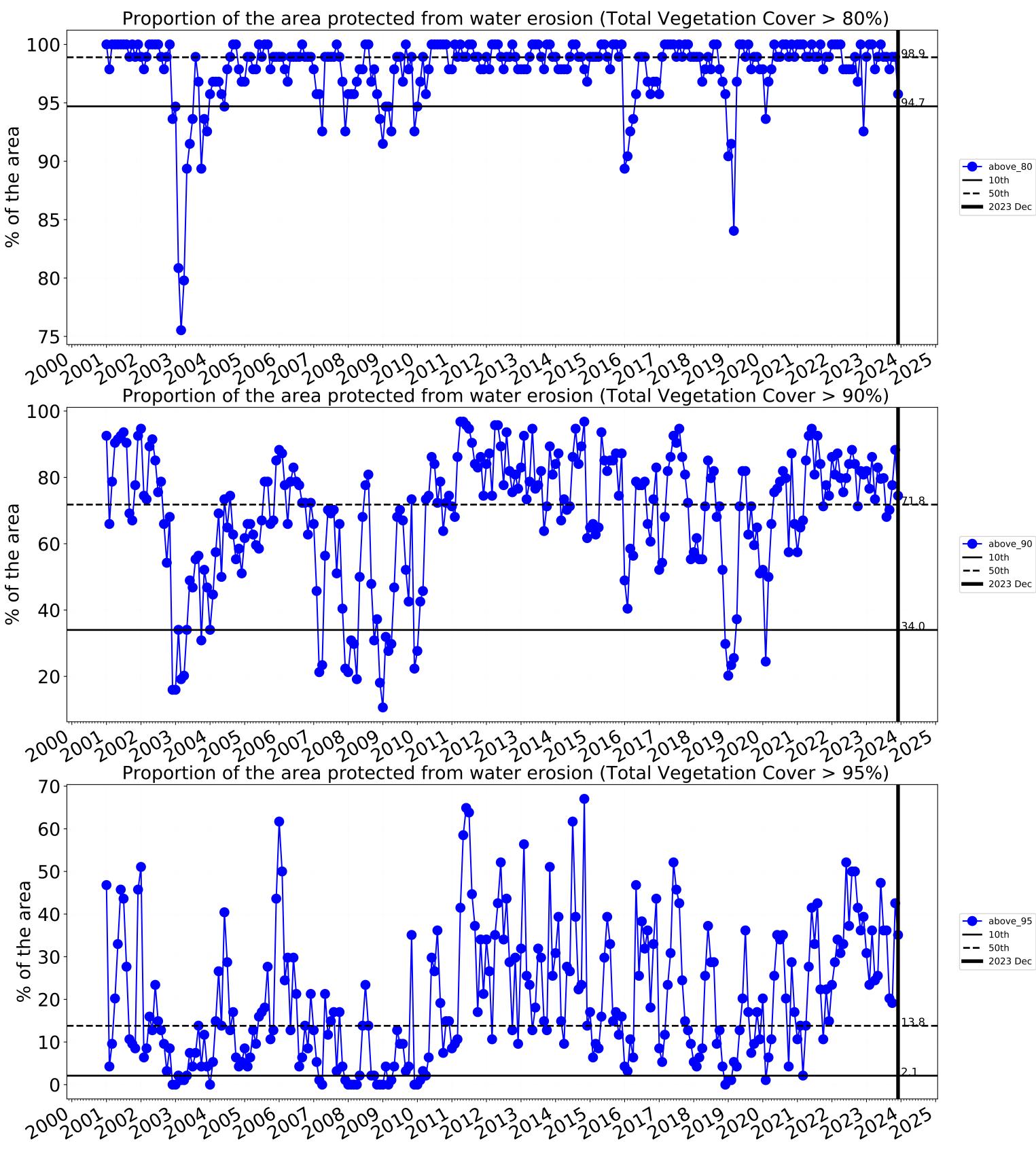


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

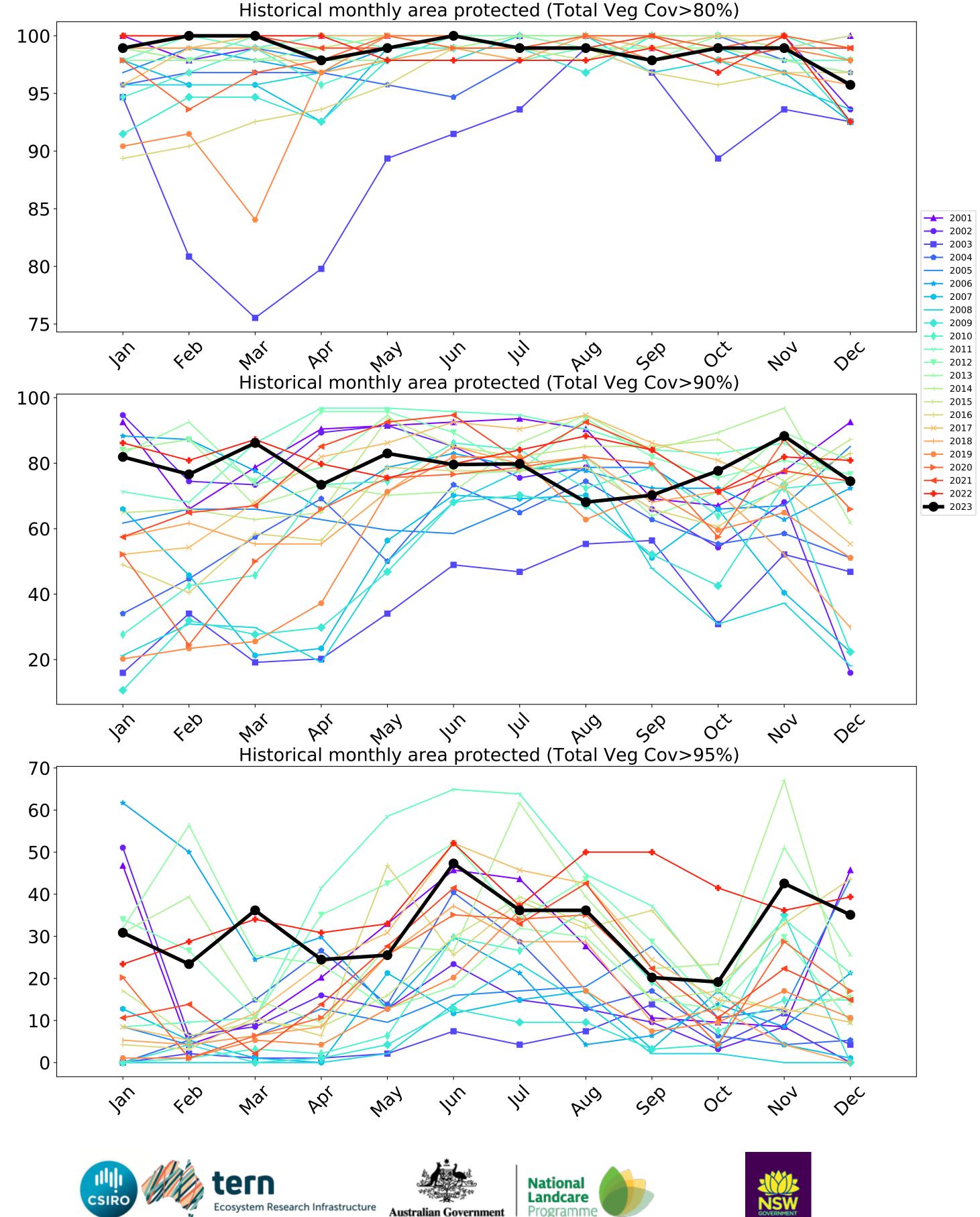


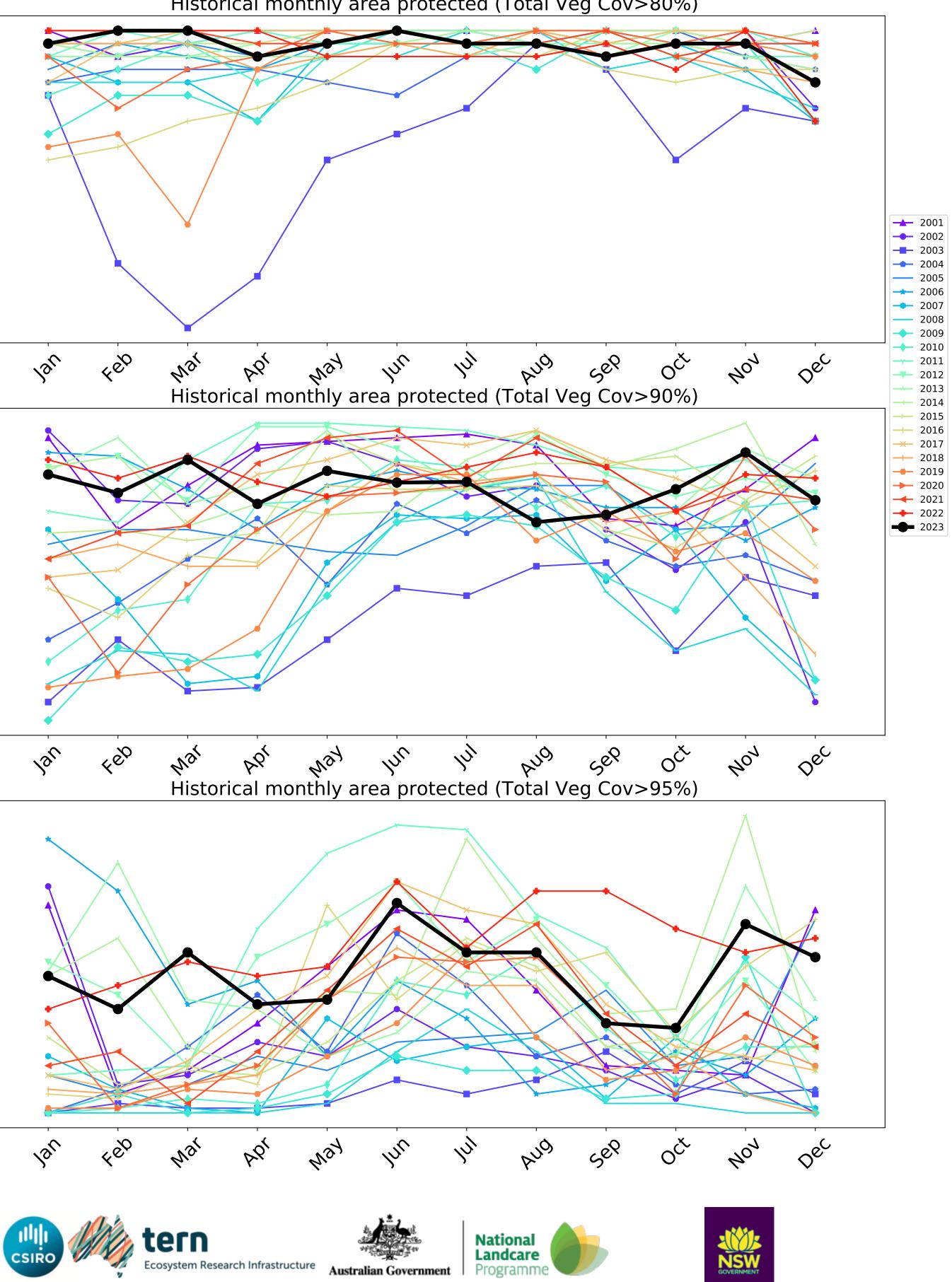
### Grazing Woodland forest timeseries

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

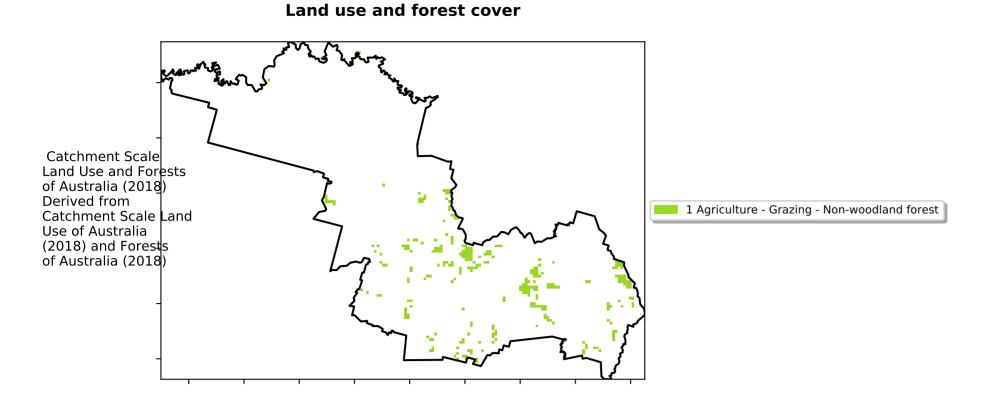


above\_90

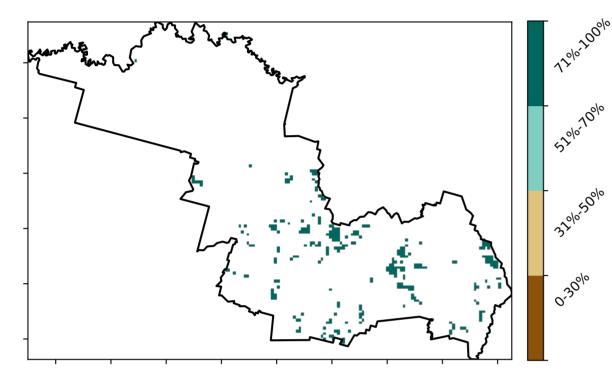




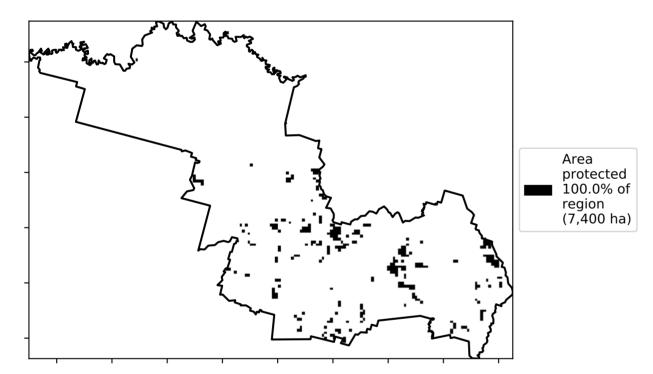
#### Grazing - Forest (non woodland)



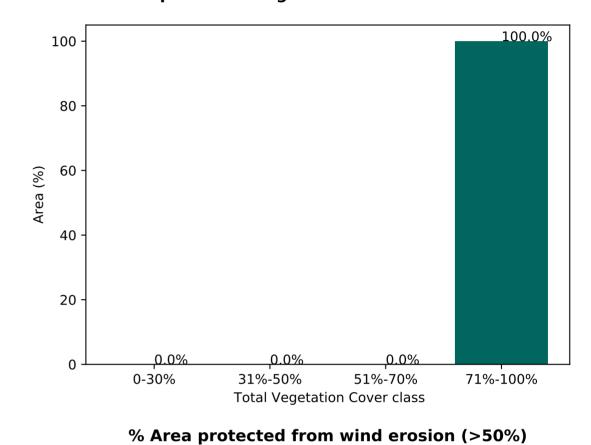
**Total Vegetation Cover [%]** 

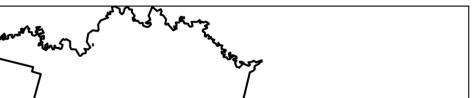


% Area protected from water erosion (>70%)

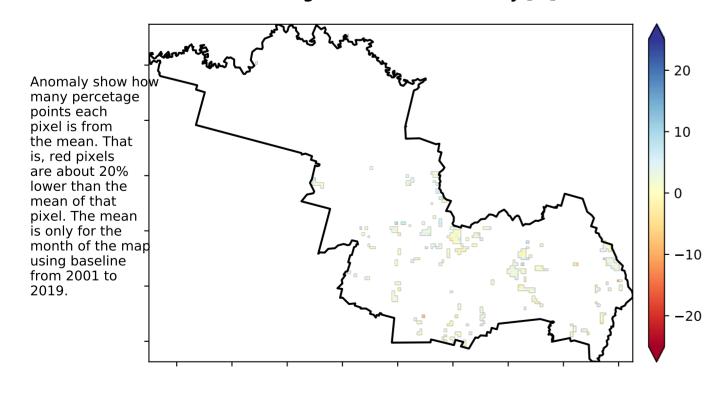


Proportion of vegetation cover class in area

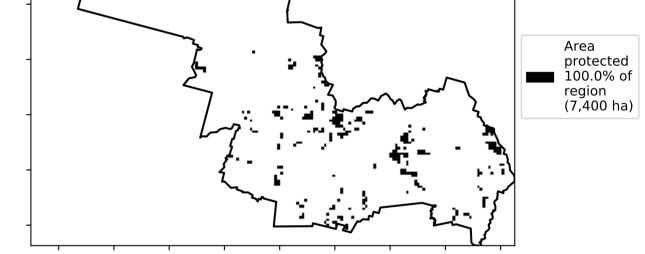




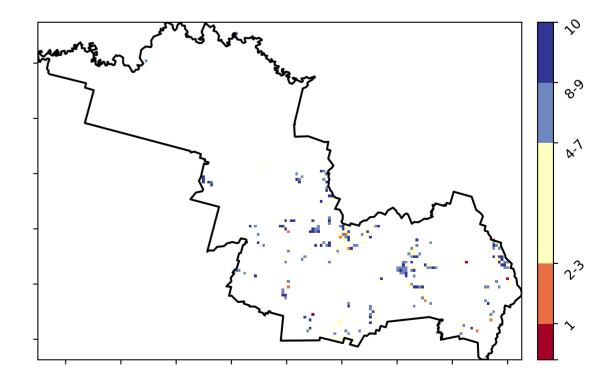
**Total Vegetation Cover Anomaly [%]** 



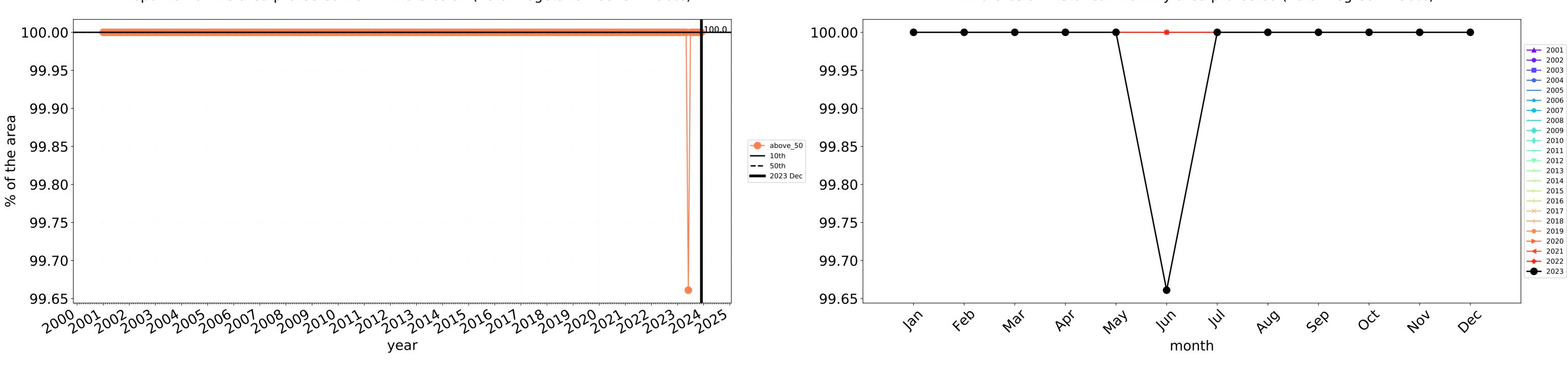
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.



Total Vegetation Cover Decile [%]

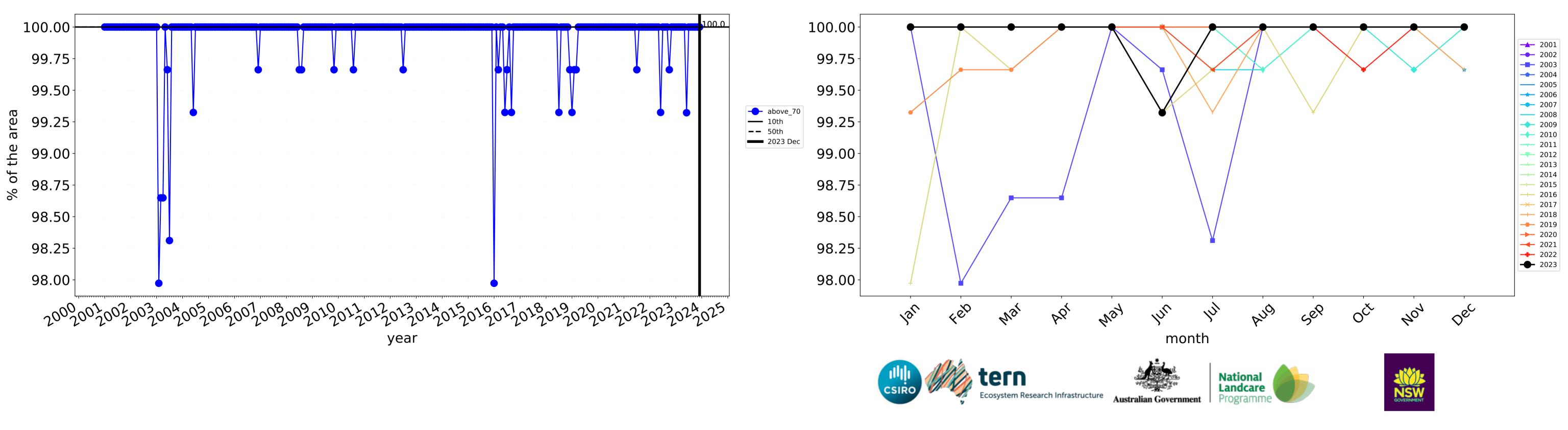






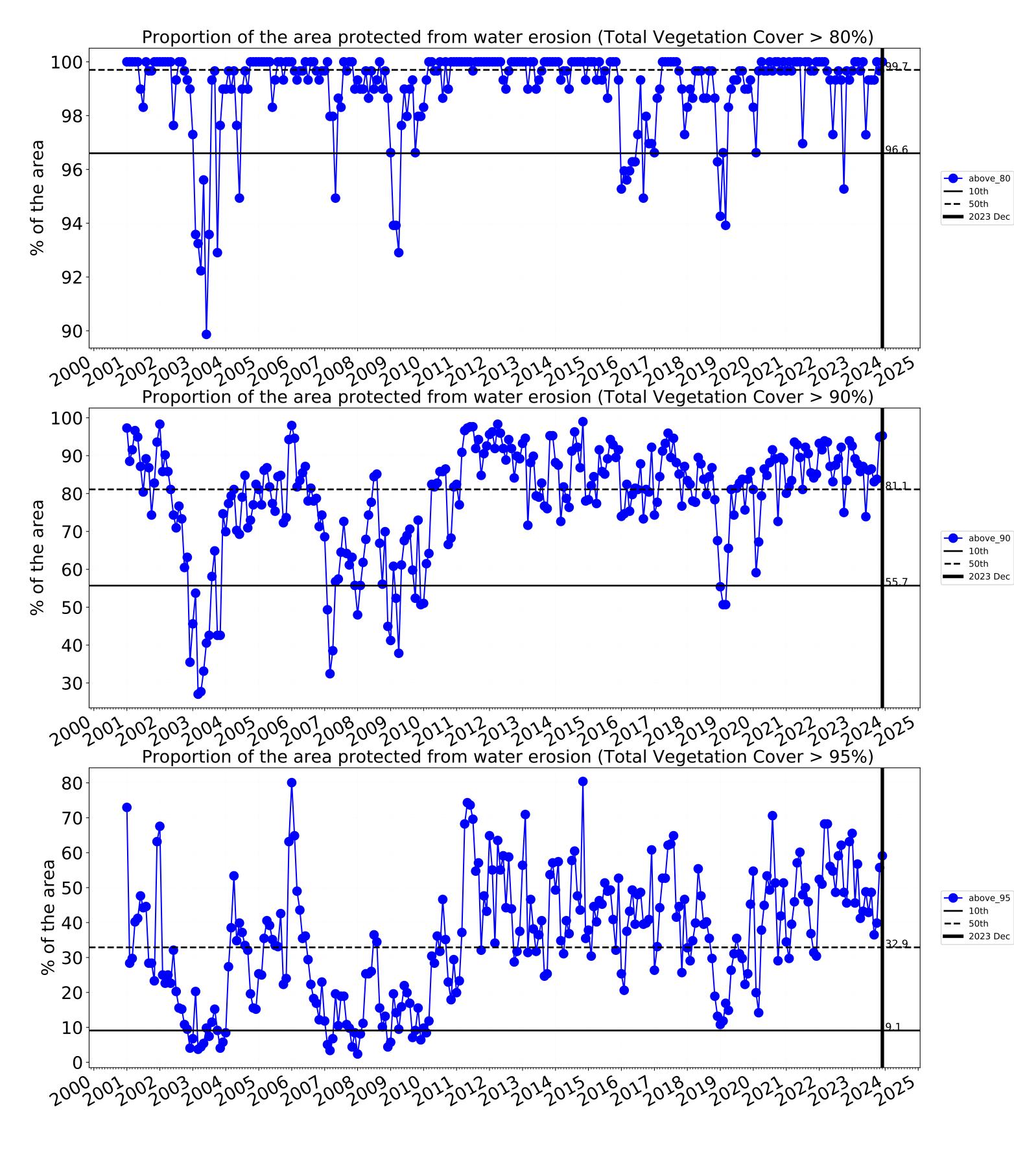
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



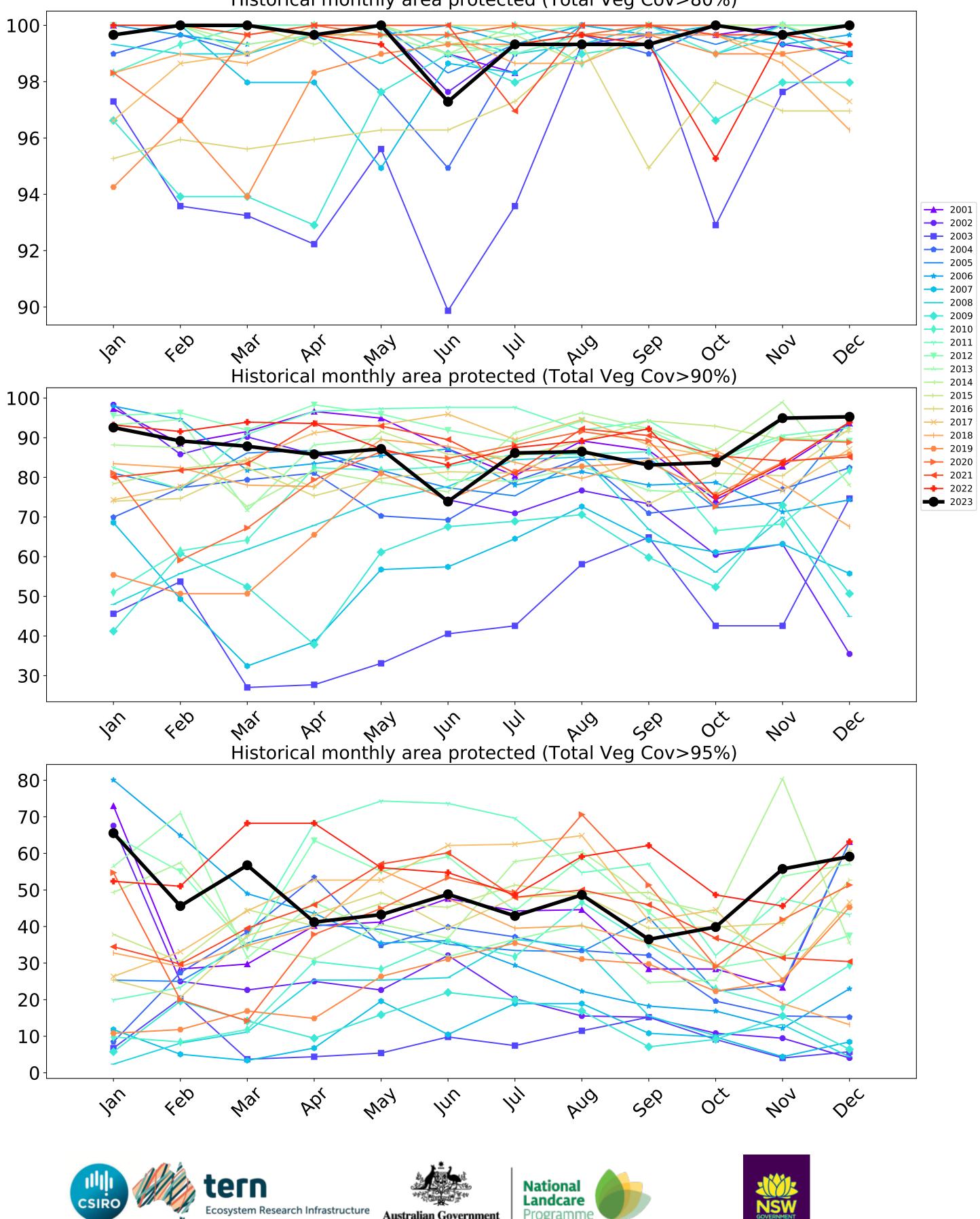


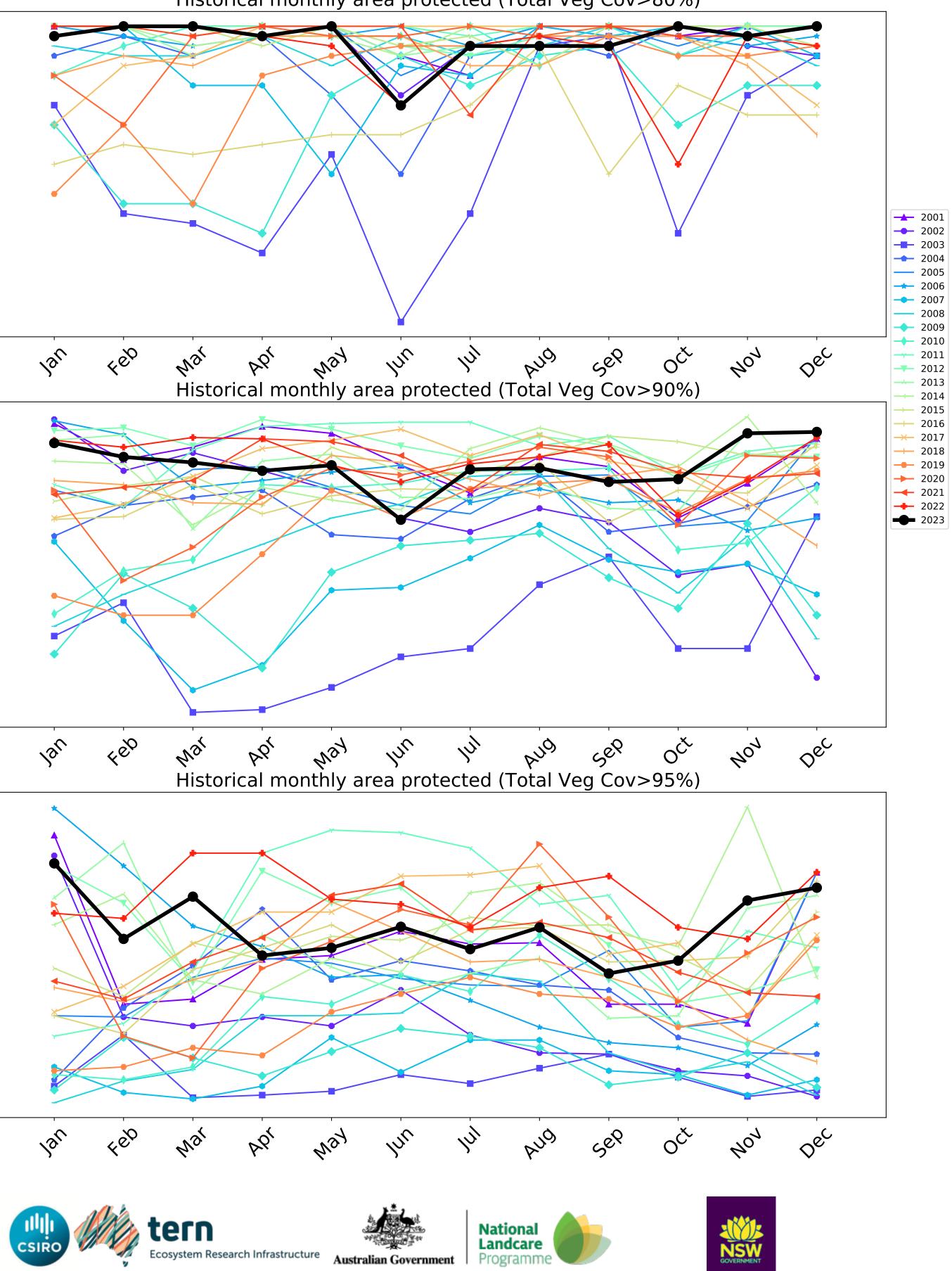
Water erosion historical monthly area protected (Total Veg Cov>70%)

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

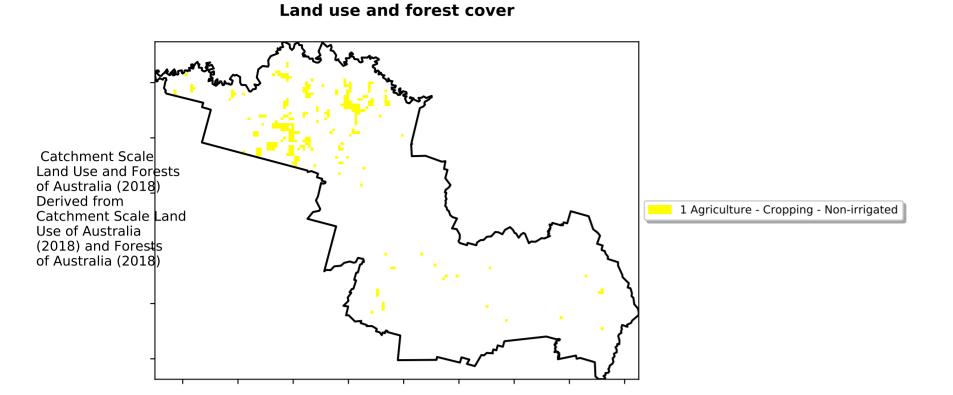


Historical monthly area protected (Total Veg Cov>80%)

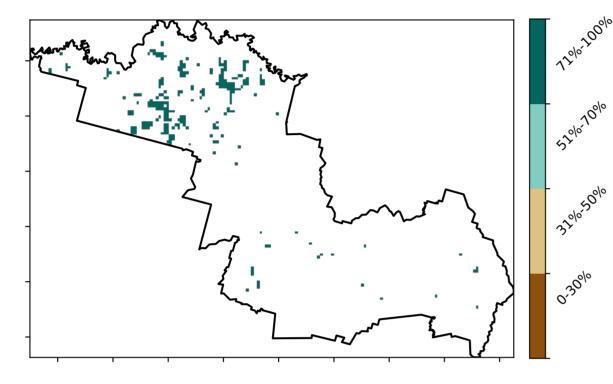




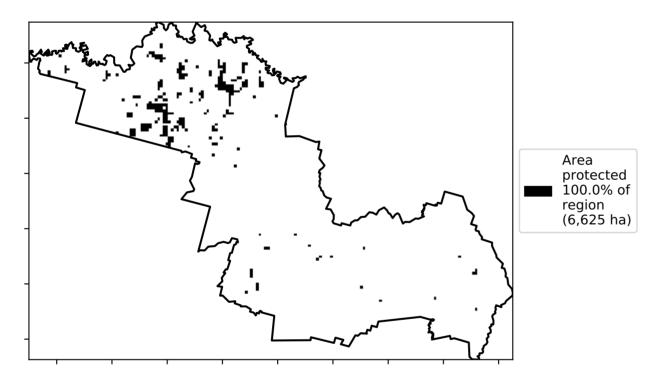
### Cropping



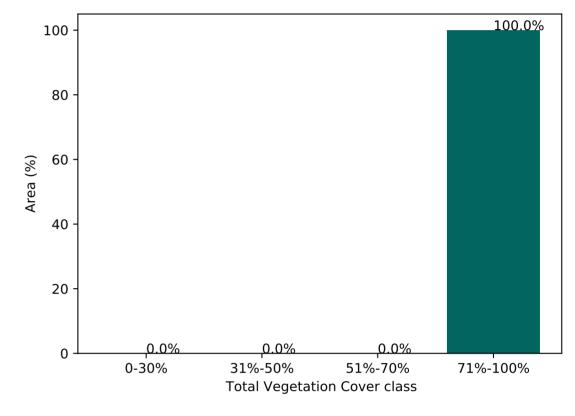
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



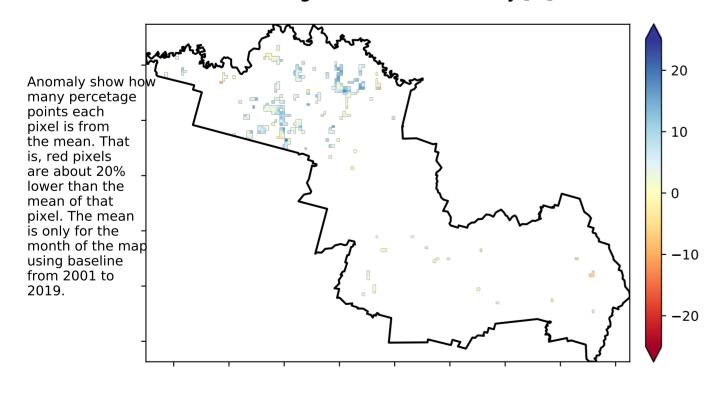
Proportion of vegetation cover class in area



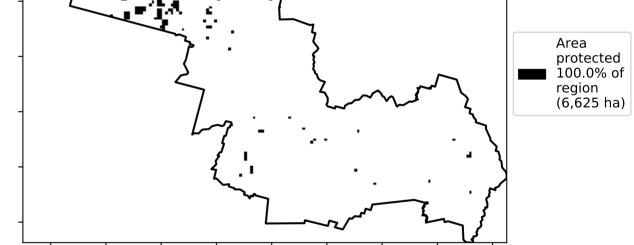
% Area protected from wind erosion (>50%)



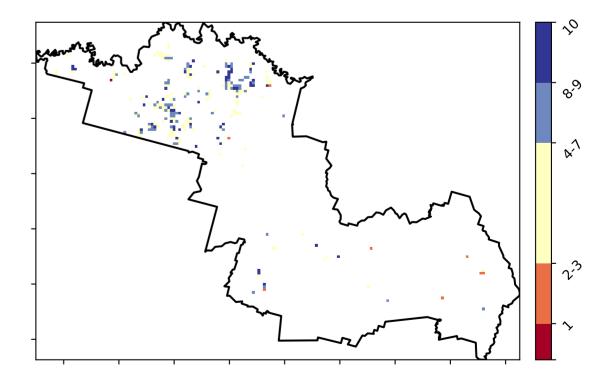
Total Vegetation Cover Anomaly [%]



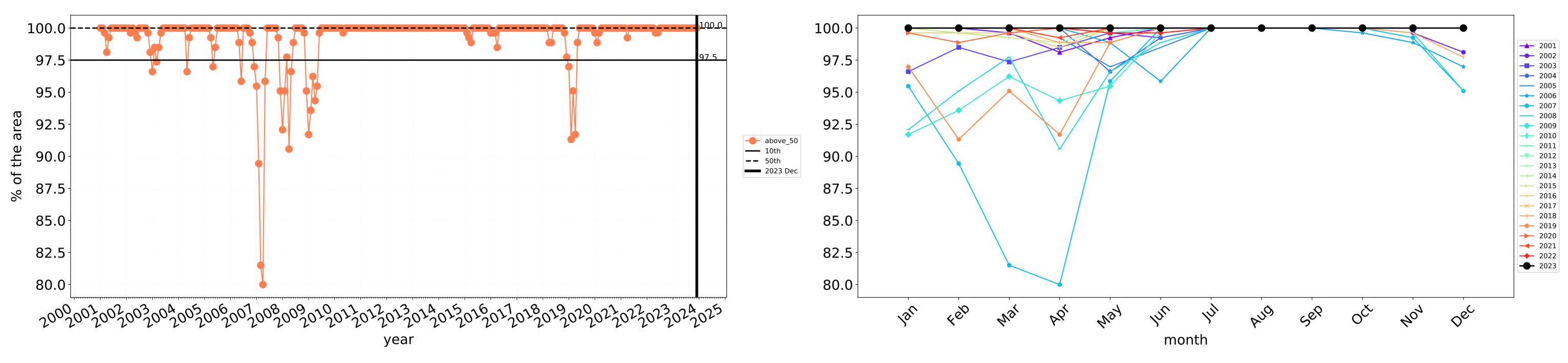
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



Total Vegetation Cover Decile [%]

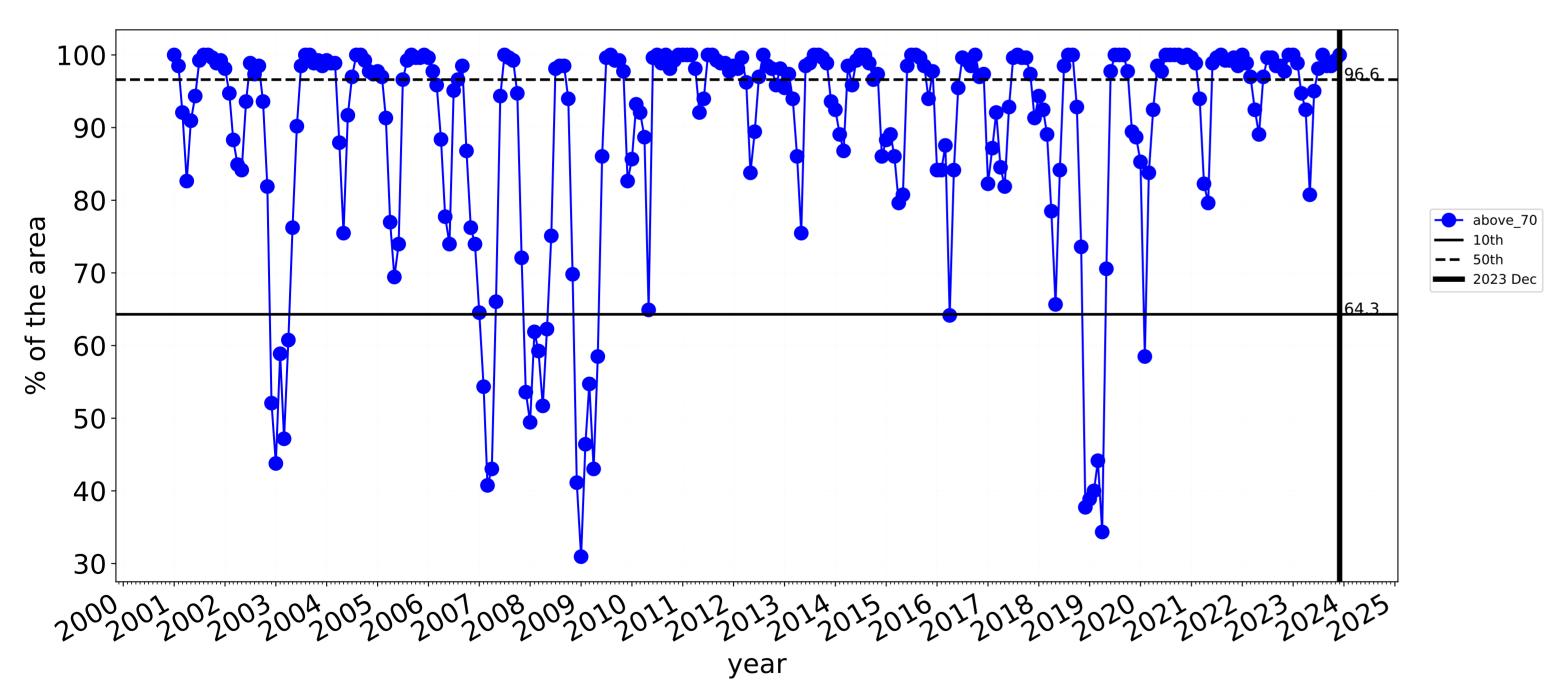




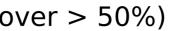


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





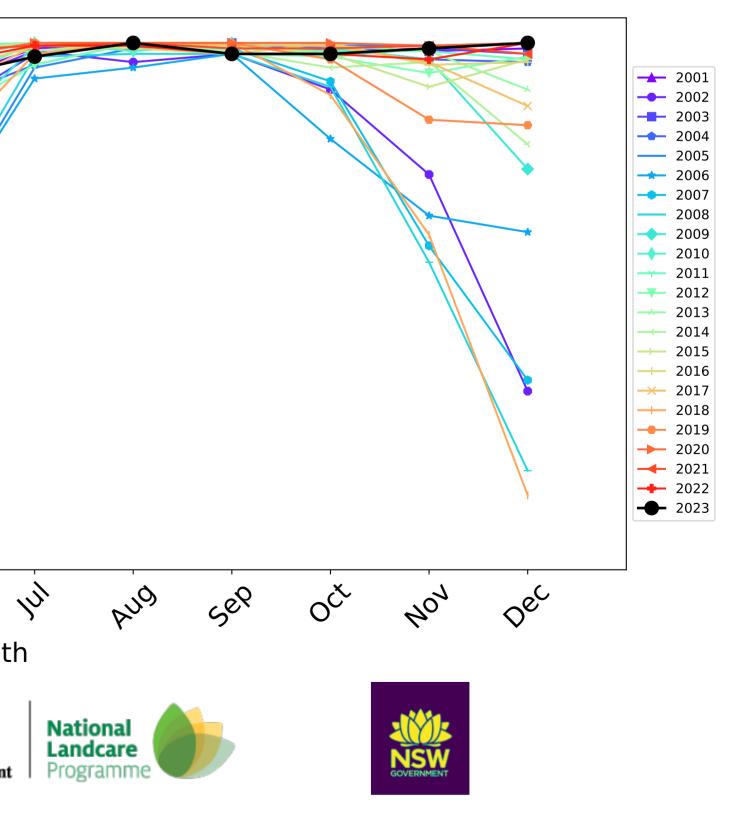
### **Cropping timeseries**

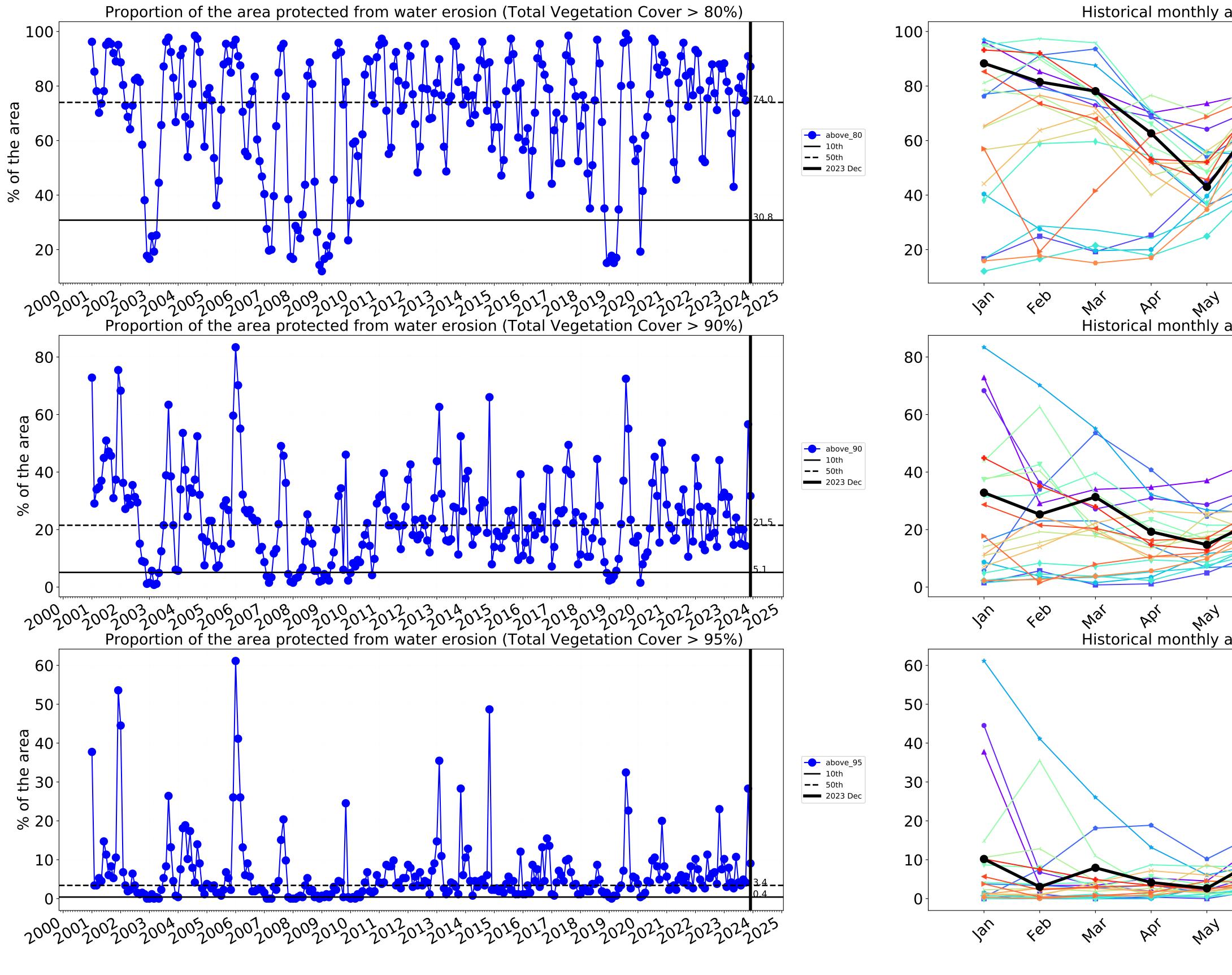


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 90 80 70-60 50 40 30 Jan 4eb May In Mai PQ month tern Ecosystem Research Infrastructure Australian Government

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

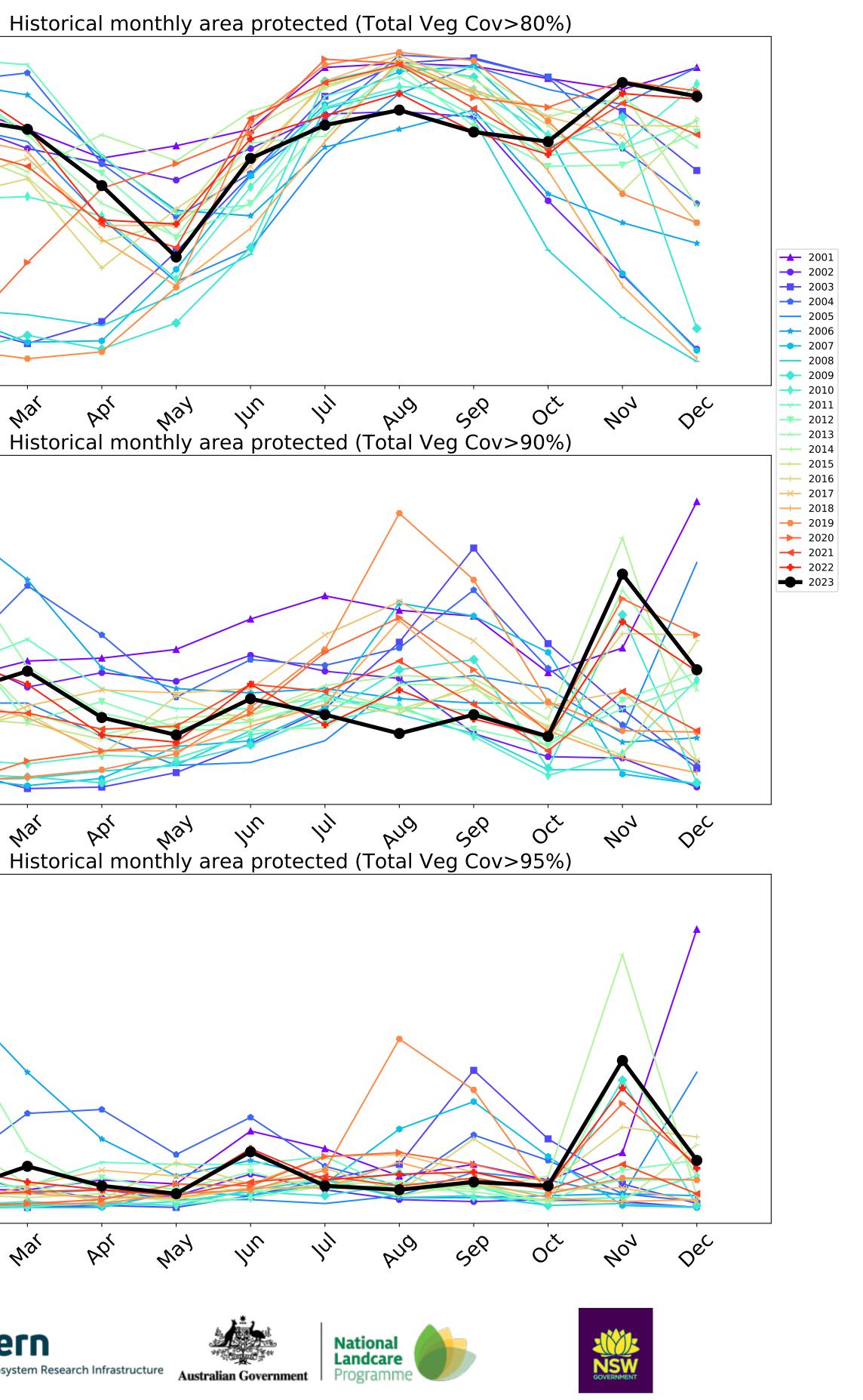




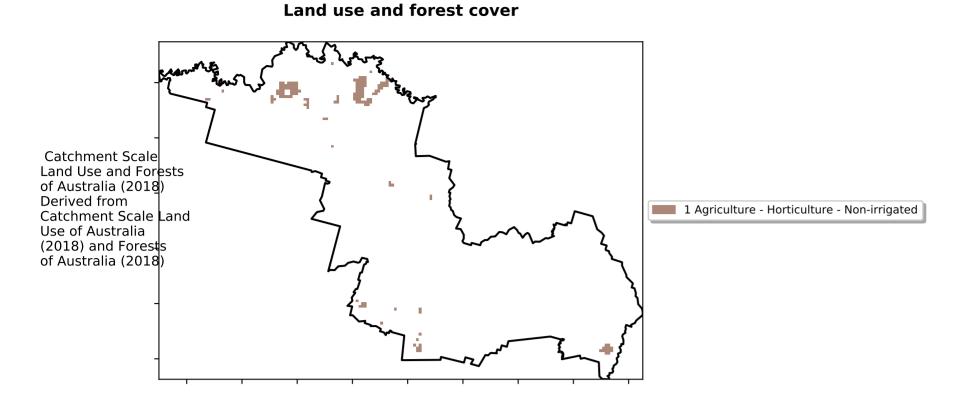
CSIRO **Ecosystem Research Infrastructure** Australian Government

Jul

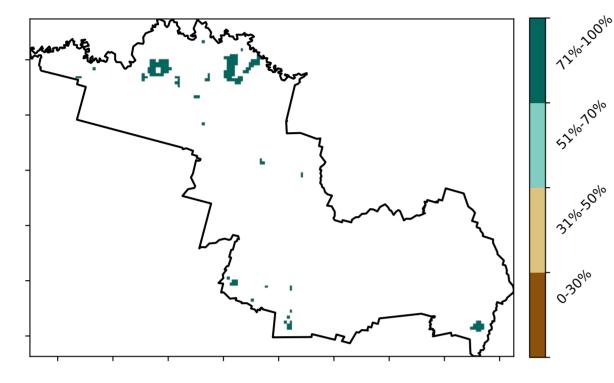
Jur



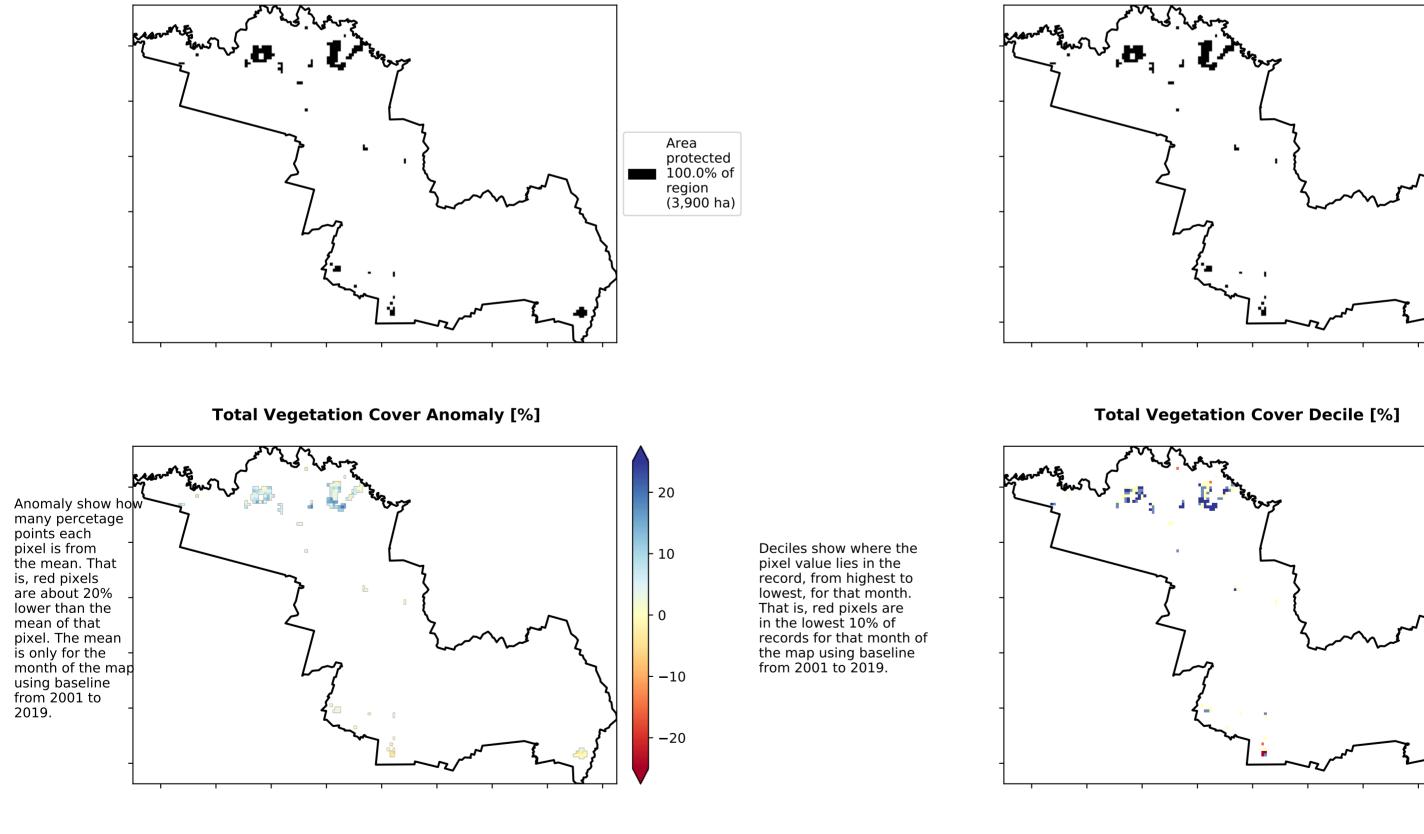
#### Horticulture



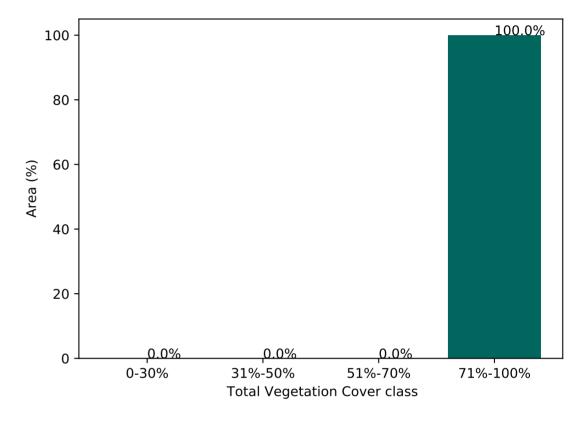
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

Area

5

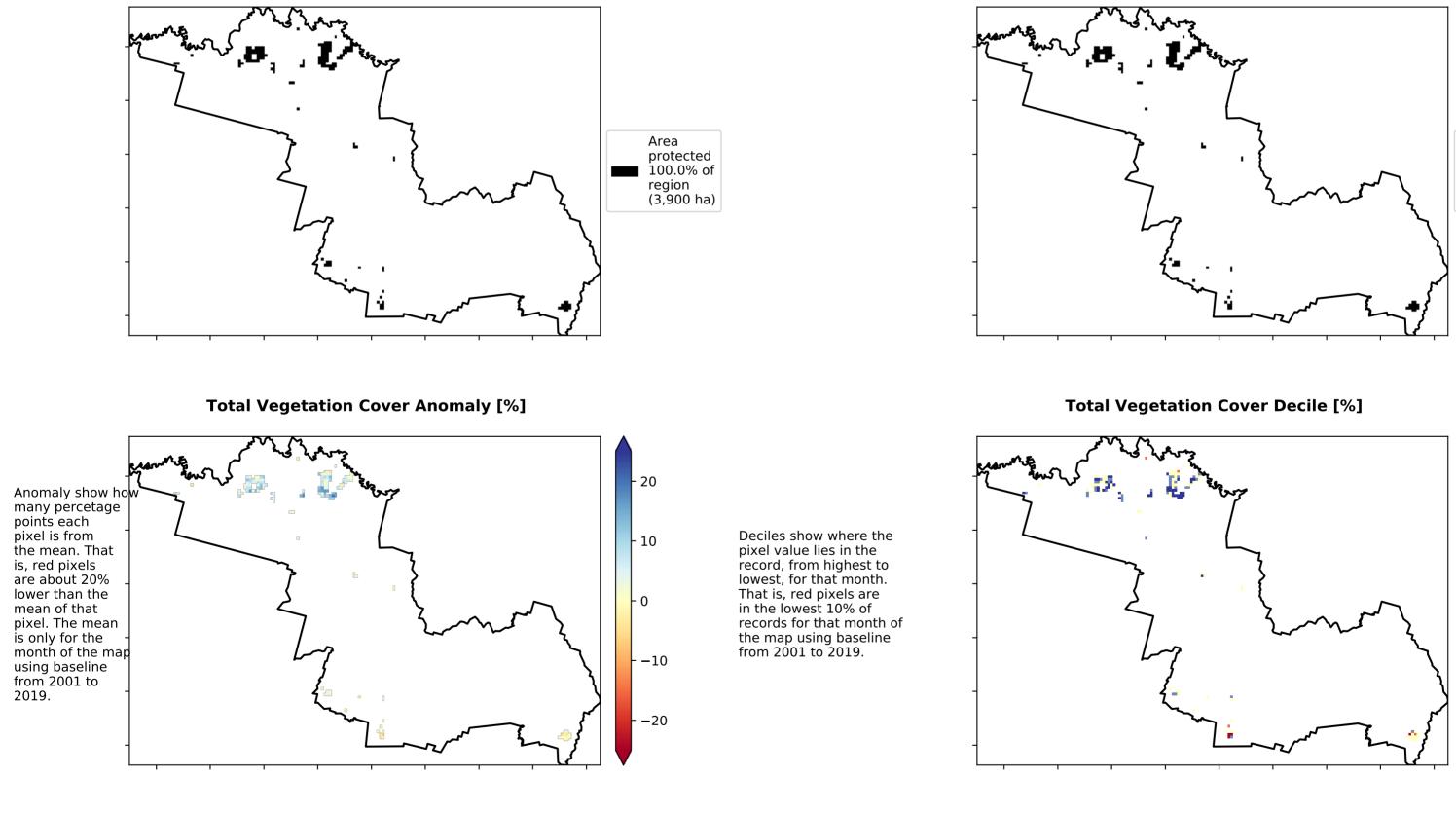
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A.1

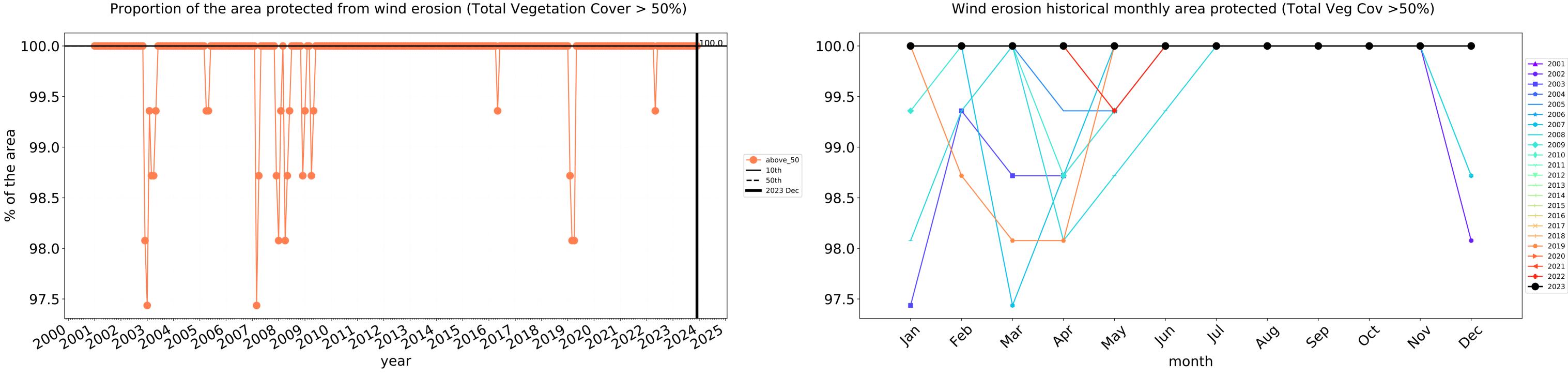
2?5

protected 100.0% of

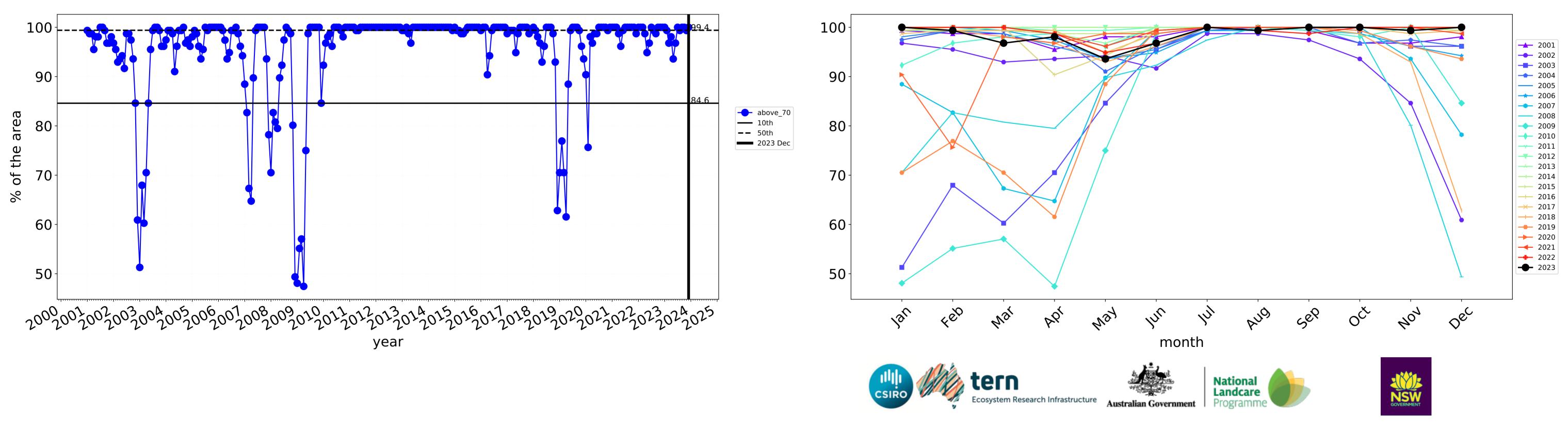
region (3,900 ha)





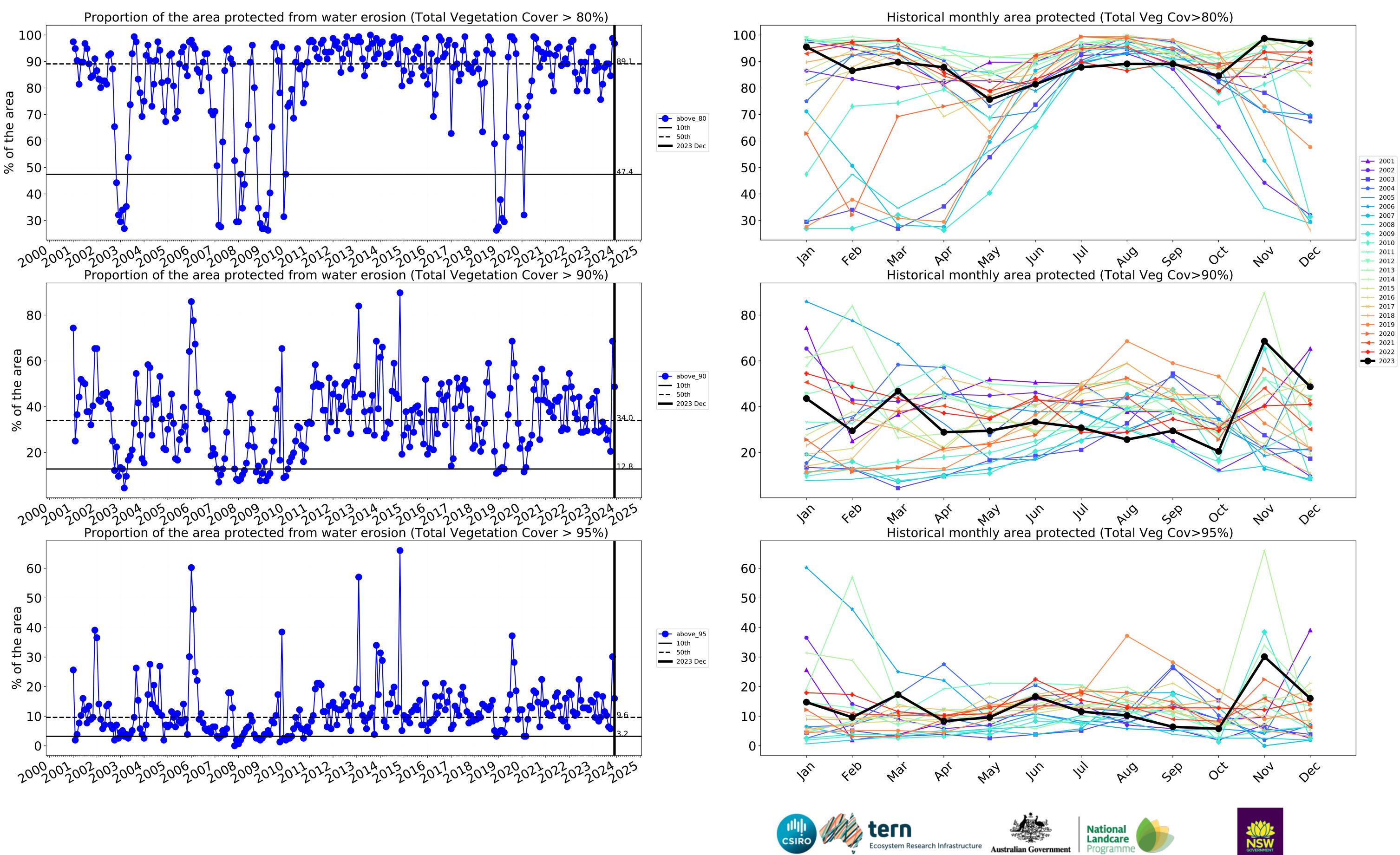


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



### Horticulture timeseries

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



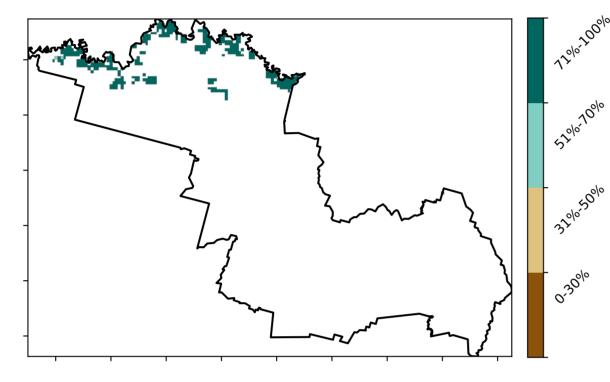


#### Irrigation

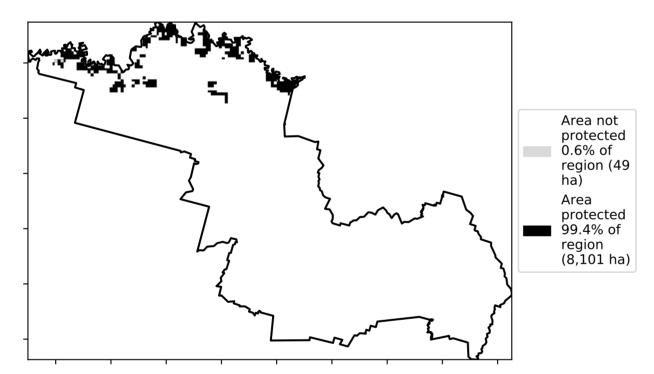
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) dus of Australia (2018) of Australia (2018)

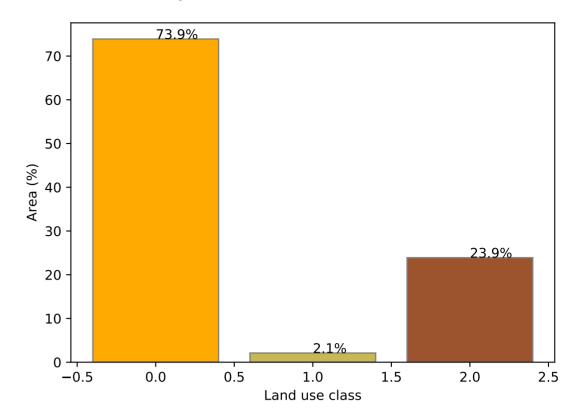
Land use and forest cover

Total Vegetation Cover [%]



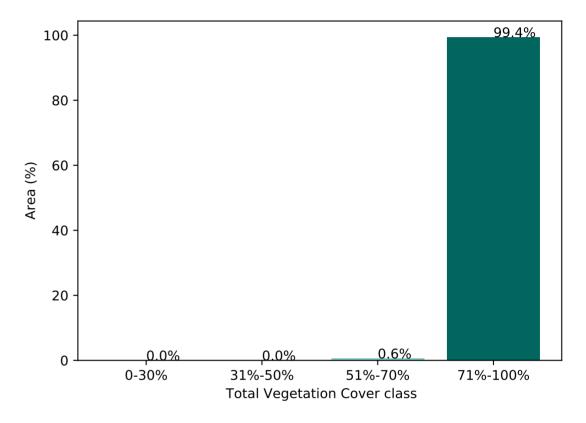
% Area protected from water erosion (>70%)





#### Proportion of each land class in area

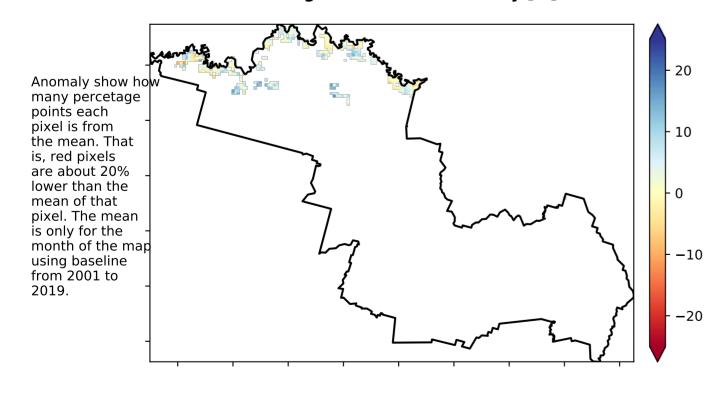
Proportion of vegetation cover class in area



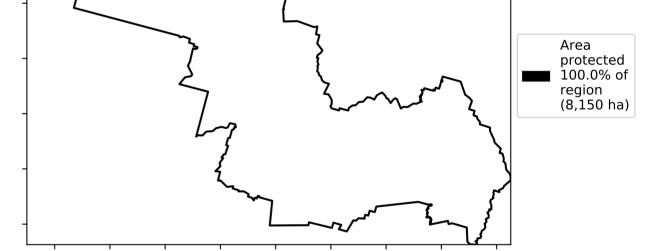
#### % Area protected from wind erosion (>50%)



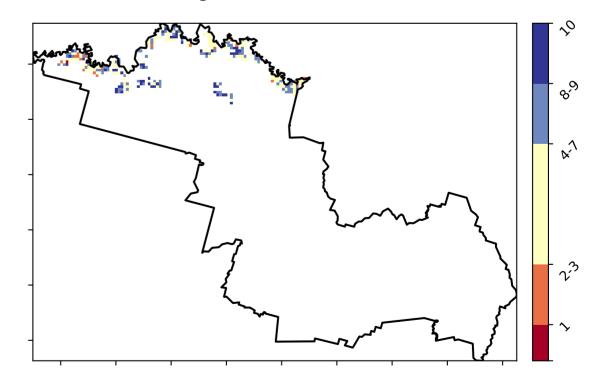
Total Vegetation Cover Anomaly [%]



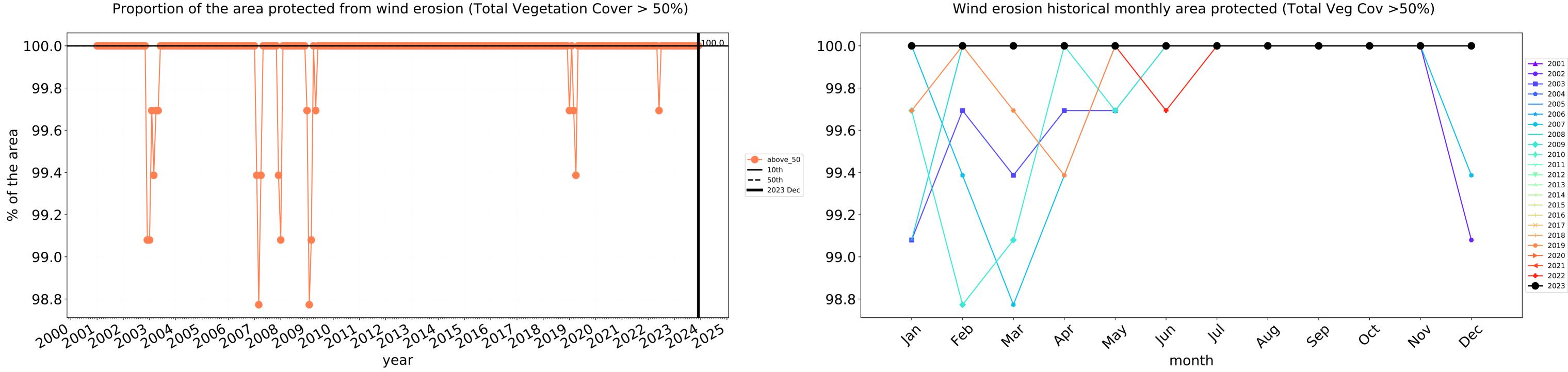
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



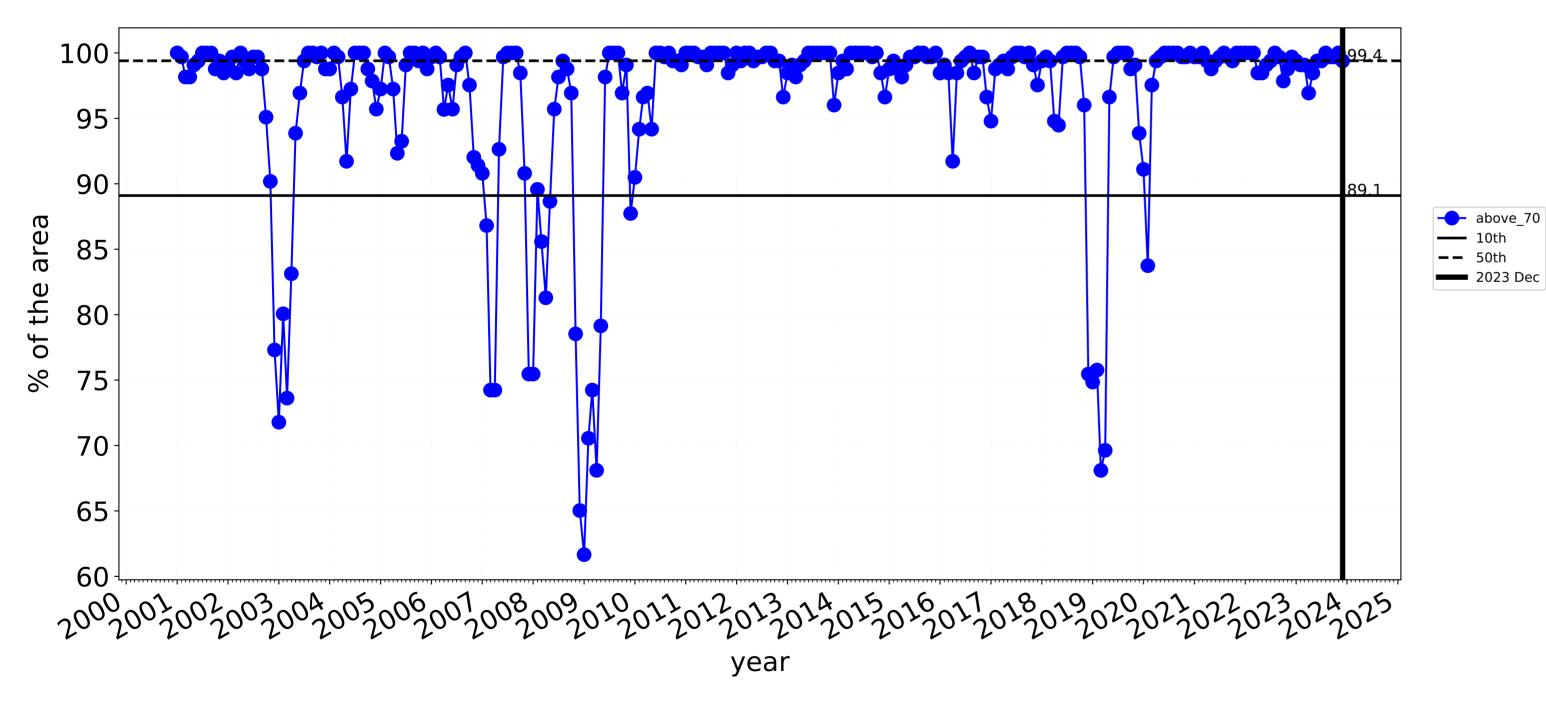
**Total Vegetation Cover Decile [%]** 



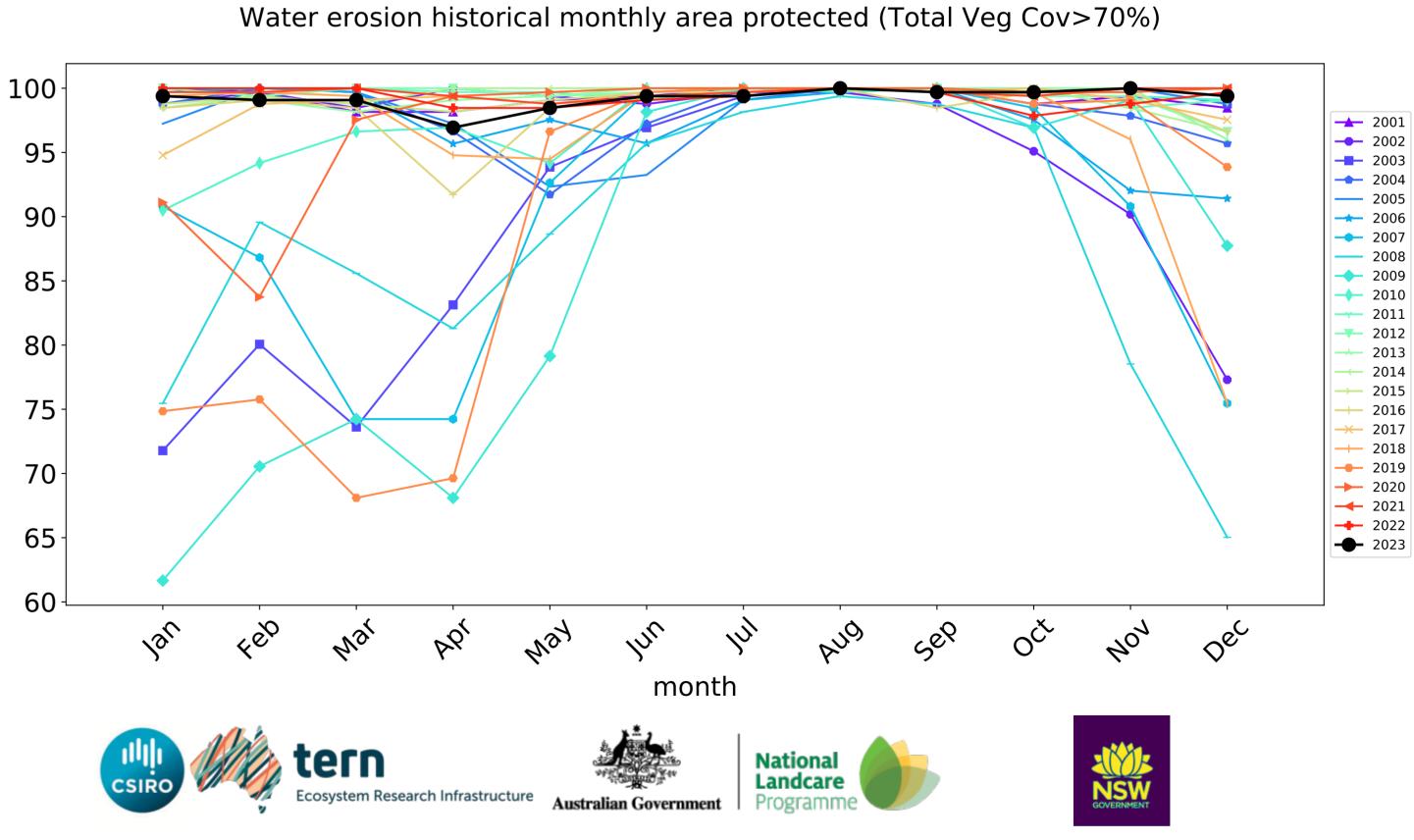


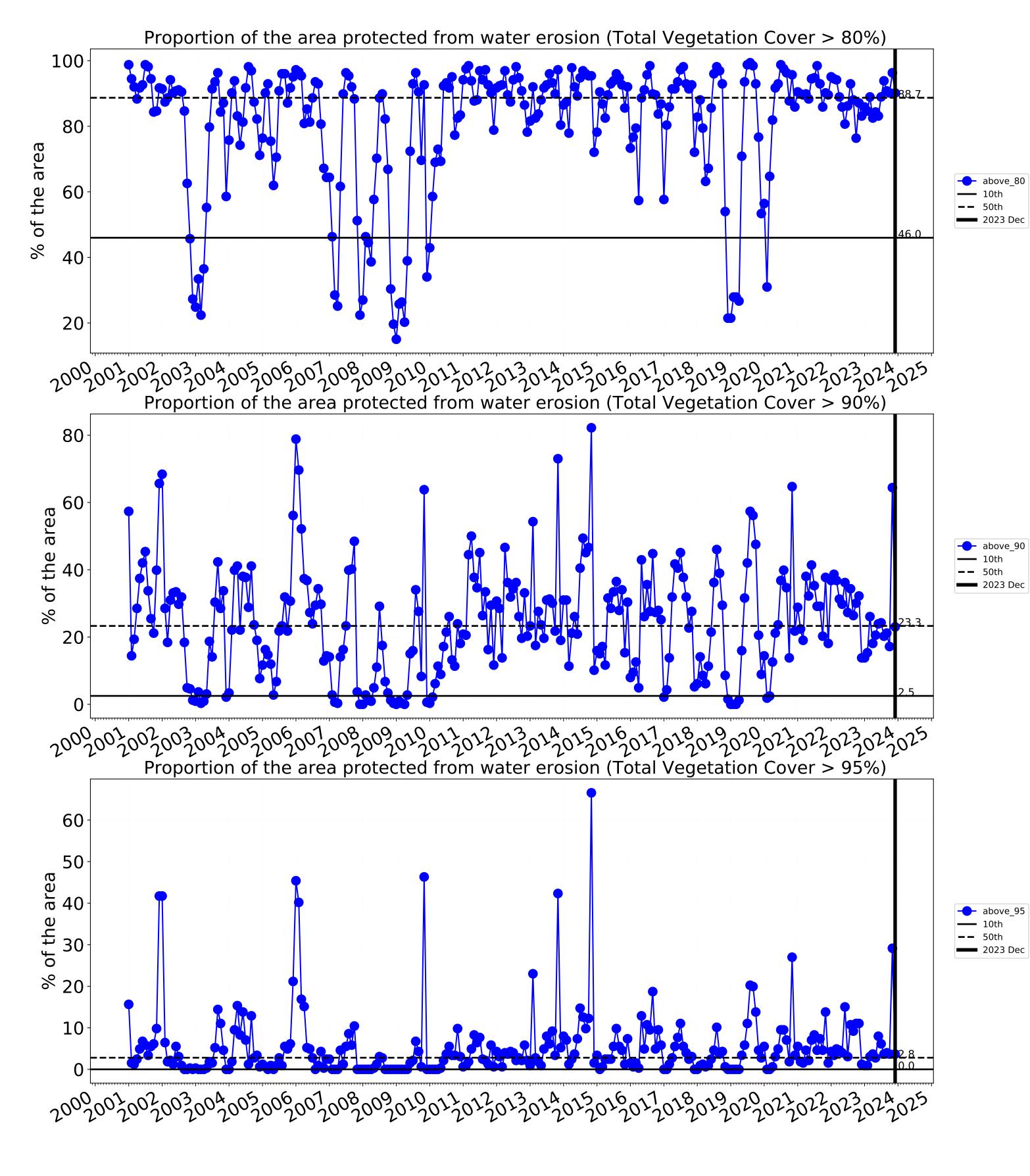


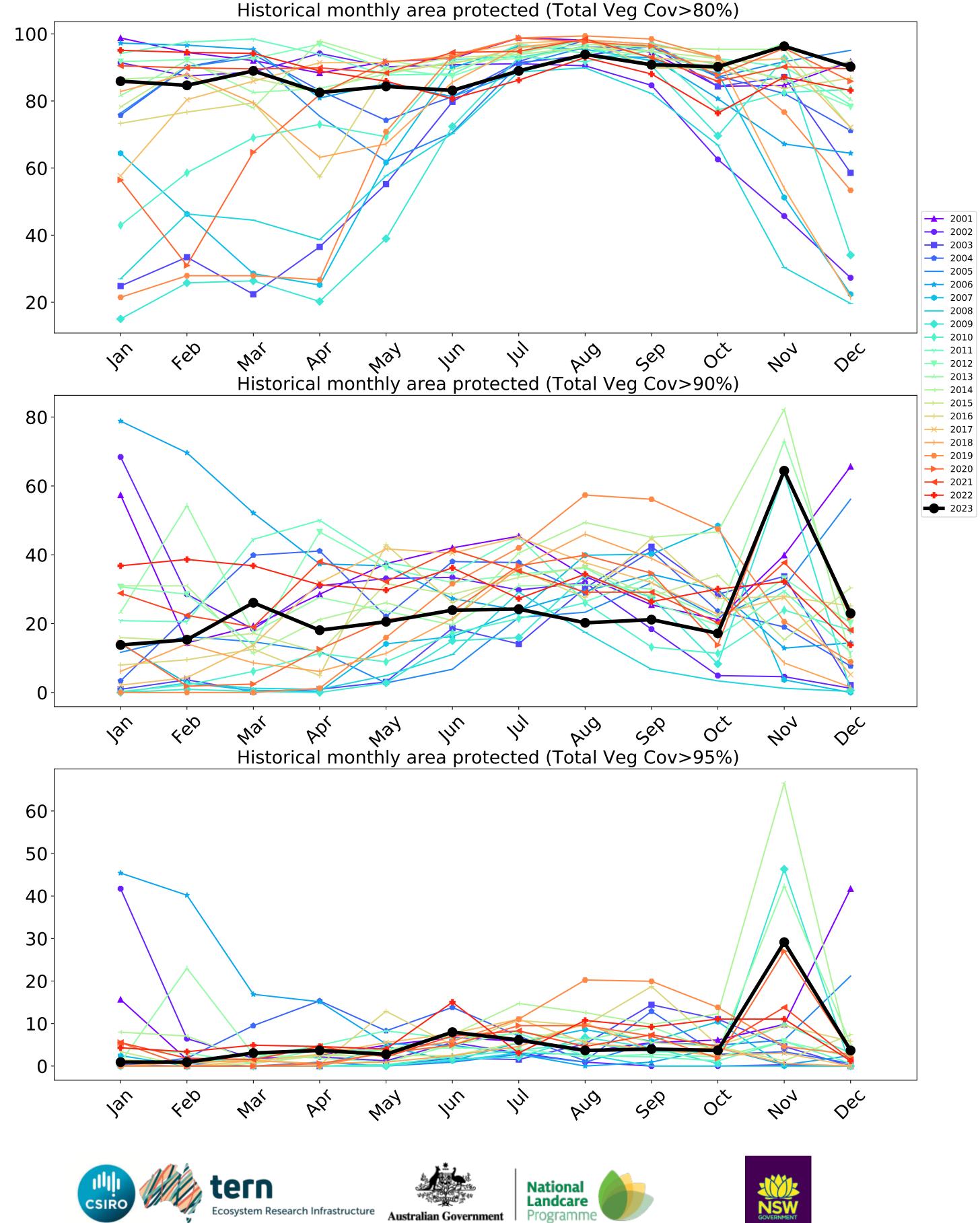
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



### Irrigation timeseries

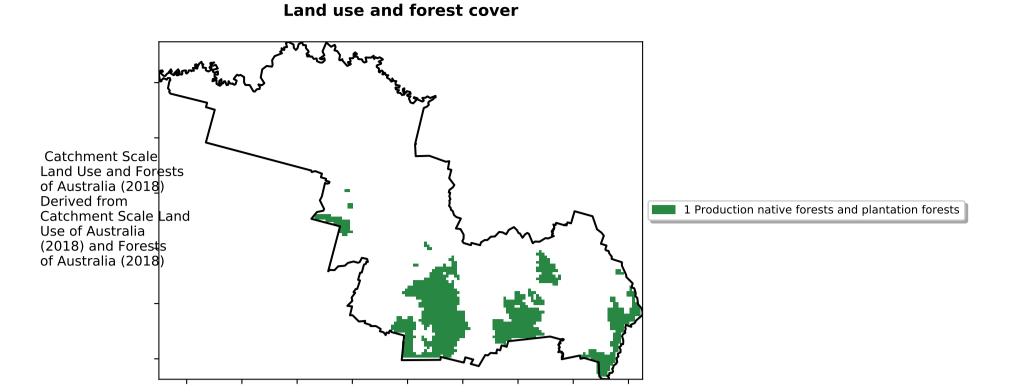




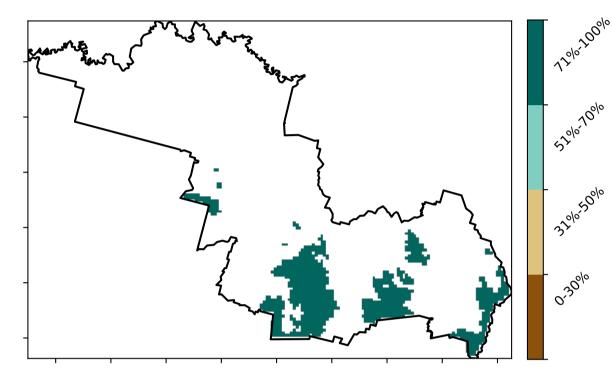


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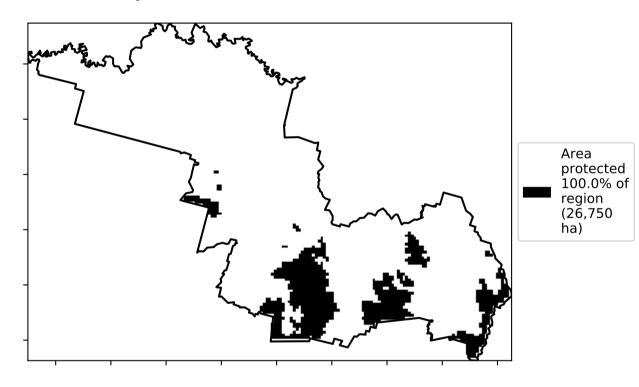
#### **Production native forests and plantation forests**



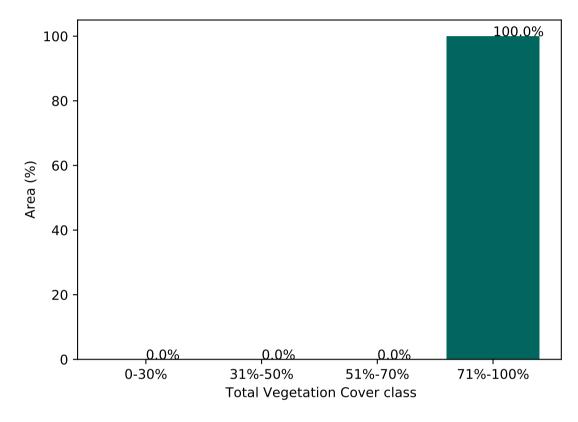
Total Vegetation Cover [%]



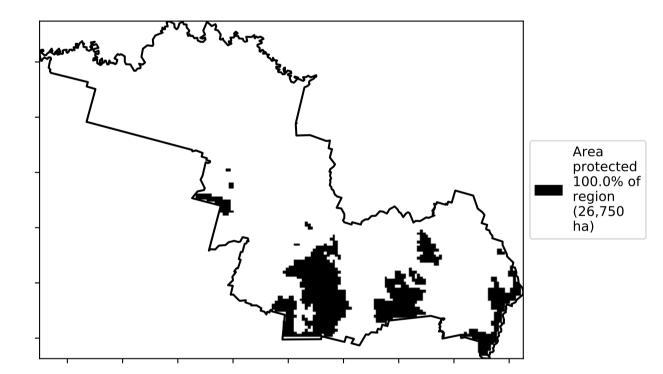
% Area protected from water erosion (>70%)



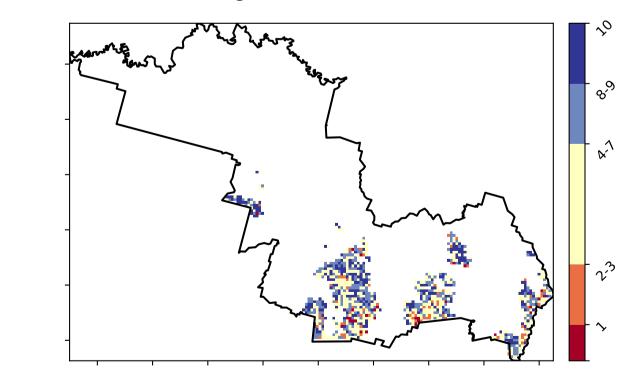
Proportion of vegetation cover class in area



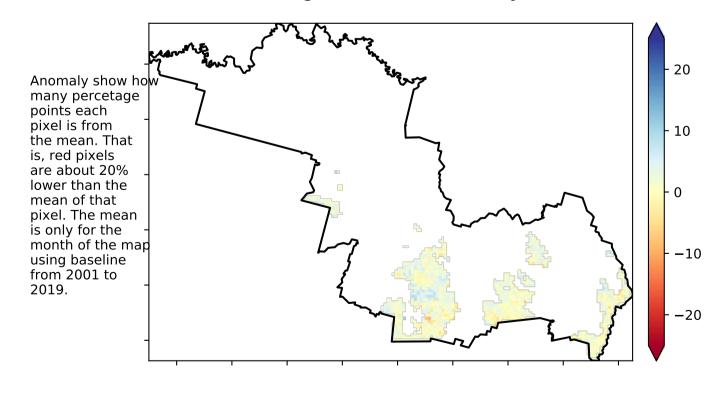
#### % Area protected from wind erosion (>50%)

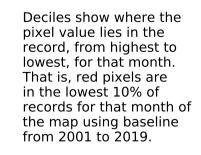


Total Vegetation Cover Decile [%]

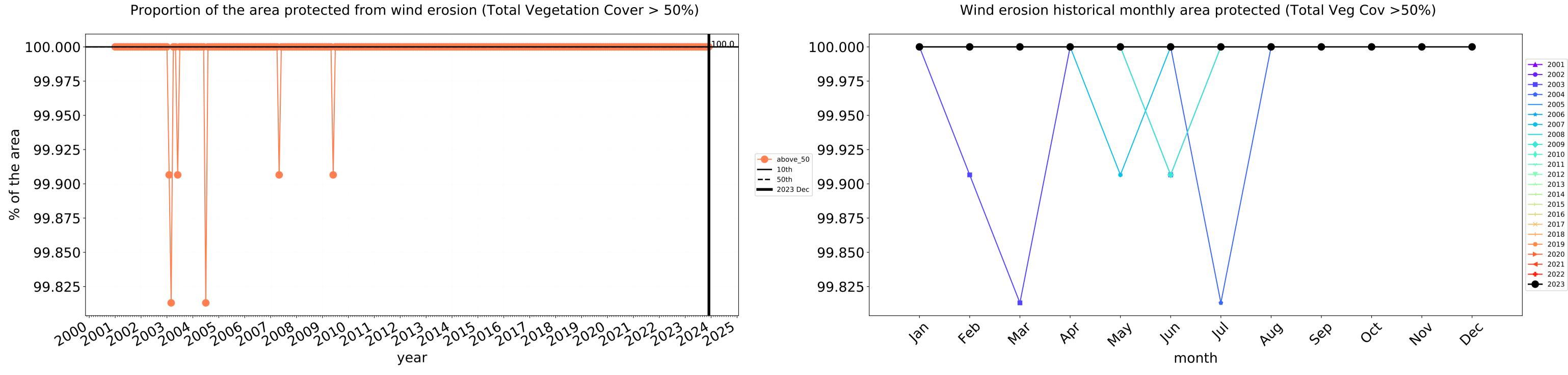


**Total Vegetation Cover Anomaly [%]** 

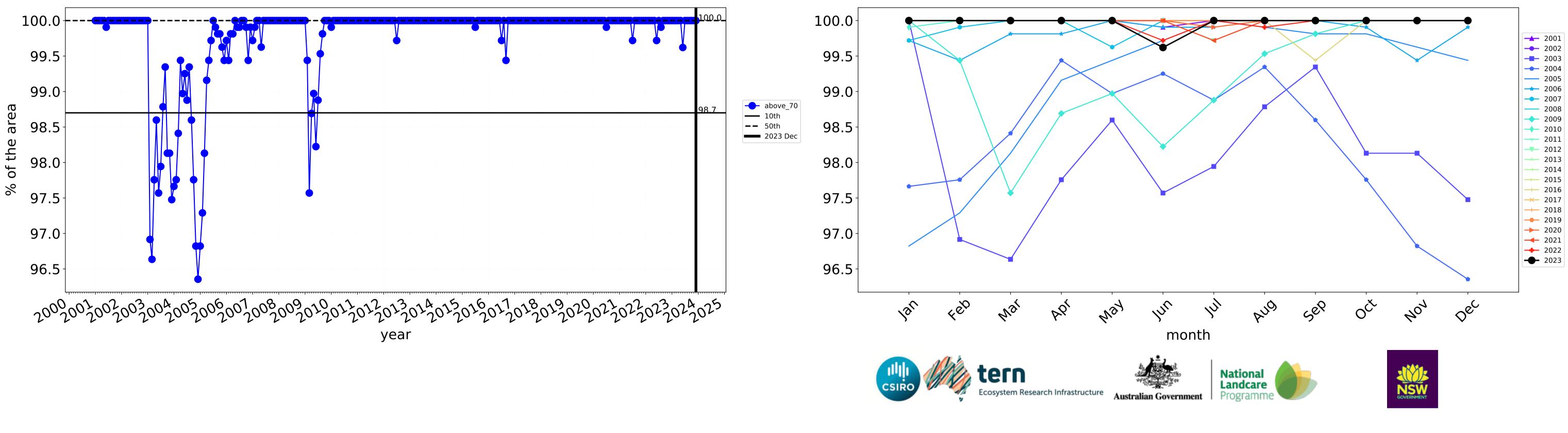


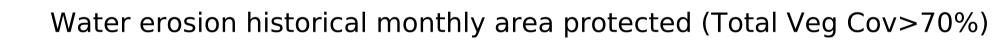


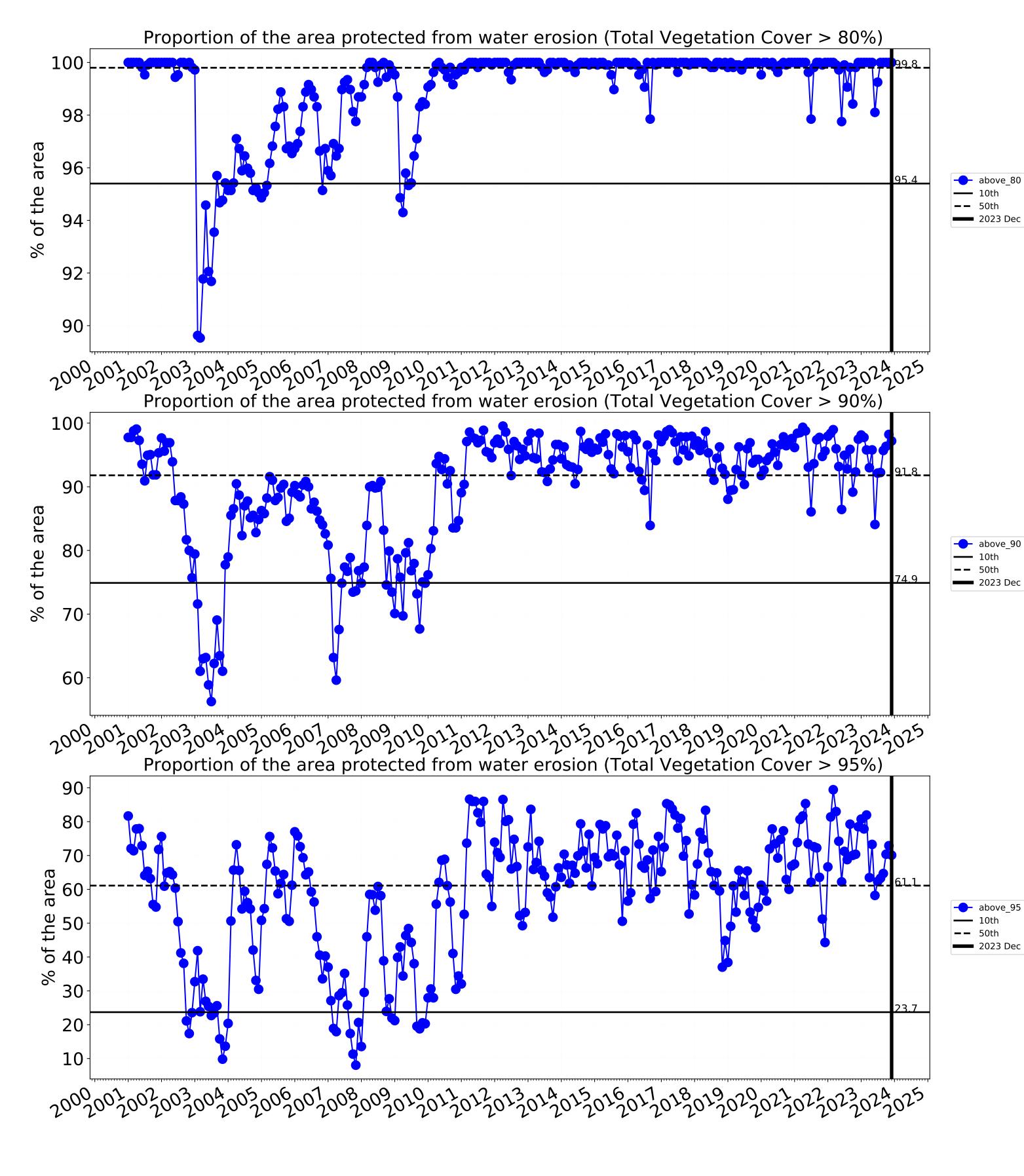


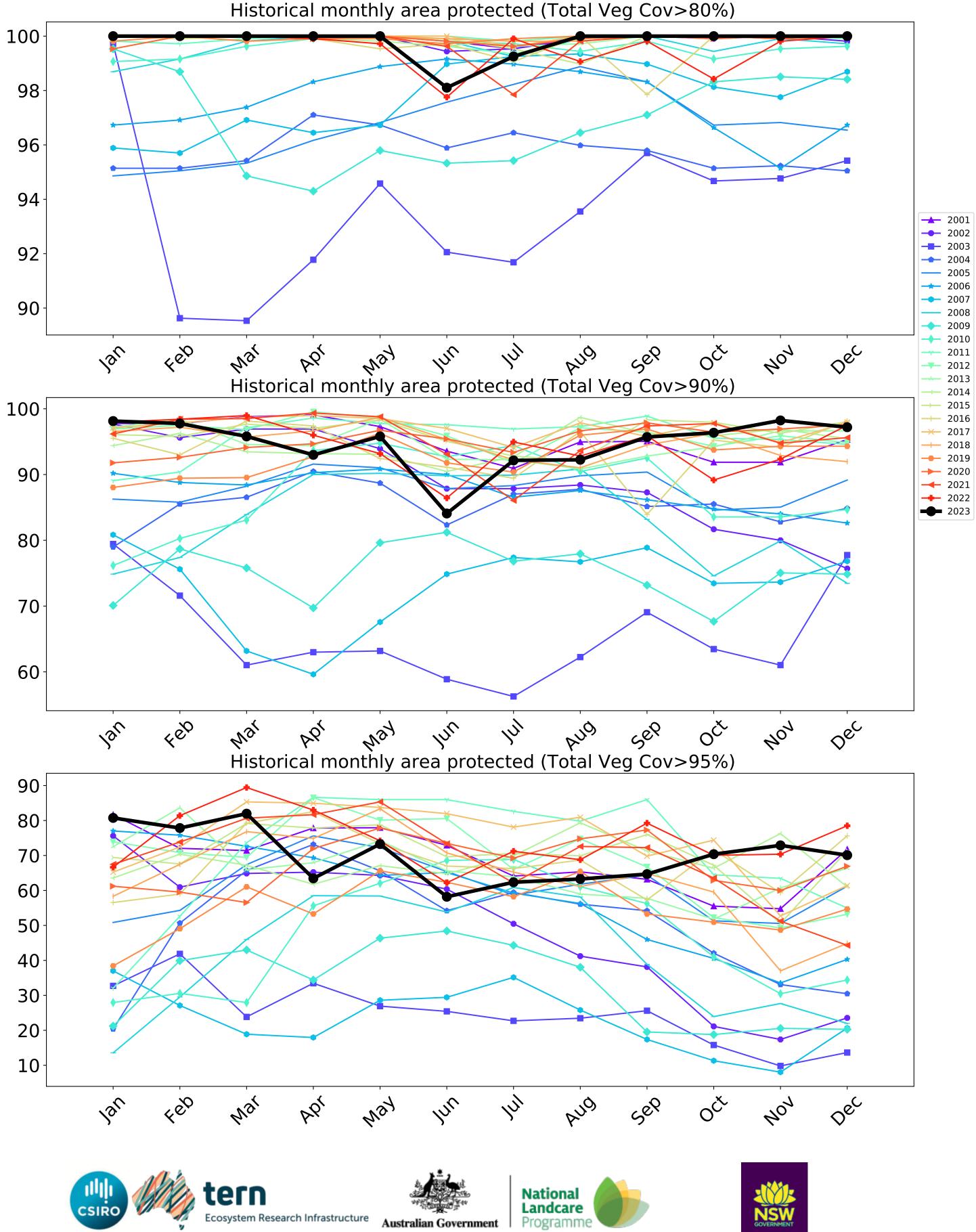


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)











# Indigo\_(S) (202,900 ha and no data 976 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	202,900	100.0% 202,800	99.9% 202,700	99.6% 202,175	95.7% 194,150	59.8% 121,400	25.3% 51,425
Conservation and natural environments	24,050	100.0% 24,050	100.0% 24,050	100.0% 24,050	99.5% 23,925	87.6% 21,075	38.0% 9,150
Conservation and natural environments Woodland forest	5,900	100.0% 5,900	100.0% 5,900	100.0% 5,900	98.7% 5,825	81.4% 4,800	36.9% 2,175
Conservation and natural environments Forest (non woodland)	16,675	100.0% 16,675	100.0% 16,675	100.0% 16,675	100.0% 16,675	91.6% 15,275	39.3% 6,550
Agriculture	133,950	100.0% 133,950	100.0% 133,950	99.9% 133,825	95.0% 127,275	49.3% 65,975	15.9% 21,275
Grazing	115,275	100.0% 115,275	100.0% 115,275	99.9% 115,200	95.7% 110,375	52.1% 60,100	17.1% 19,750
Grazing non forest	105,525	100.0% 105,525	100.0% 105,525	99.9% 105,450	95.5% 100,725	48.6% 51,300	13.8% 14,550
Grazing Woodland forest	2,350	100.0% 2,350	100.0% 2,350	100.0% 2,350	95.7% 2,250	74.5% 1,750	35.1% 825
Grazing - Forest (non woodland)	7,400	100.0% 7,400	100.0% 7,400	100.0% 7,400	100.0% 7,400	95.3% 7,050	59.1% 4,375
Cropping	6,625	100.0% 6,625	100.0% 6,625	100.0% 6,625	87.2% 5,775	31.7% 2,100	9.1% 600
Horticulture	3,900	100.0% 3,900	100.0% 3,900	100.0% 3,900	96.8% 3,775	48.7% 1,900	16.0% 625
Irrigation	8,150	100.0% 8,150	100.0% 8,150	99.4% 8,100	90.2% 7,350	23.0% 1,875	3.7% 300
Production native forests and plantation forests	26,750	100.0% 26,750	100.0% 26,750	100.0% 26,750	100.0% 26,750	97.2% 26,000	70.1% 18,750

