# Total vegetation cover soil protection Region:LGA Lithgow\_(C) NSW

# Date: October 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:

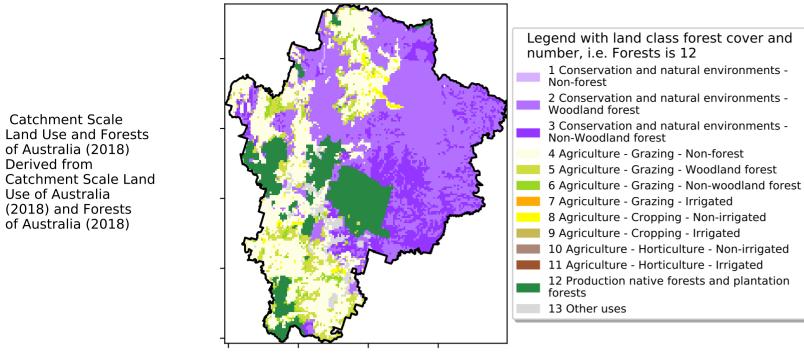
https://doi.org/10.4225/08/5848a3f19a7b3



# **Vegetation Cover Oct 2023**

#### Land use and forest cover

#### Proportion of each land class in area



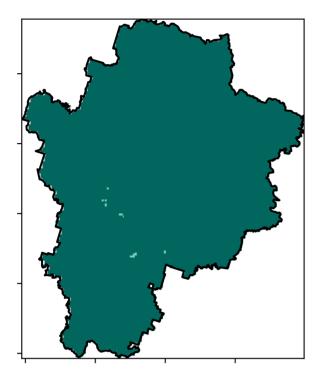
1200-20000

· 52% 70%

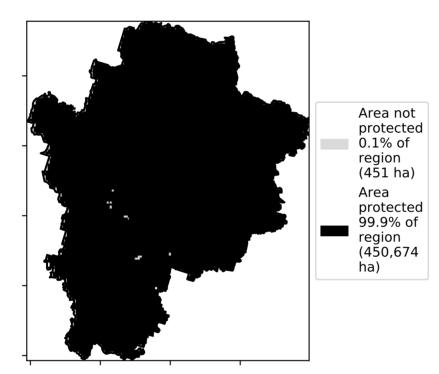
32%50%

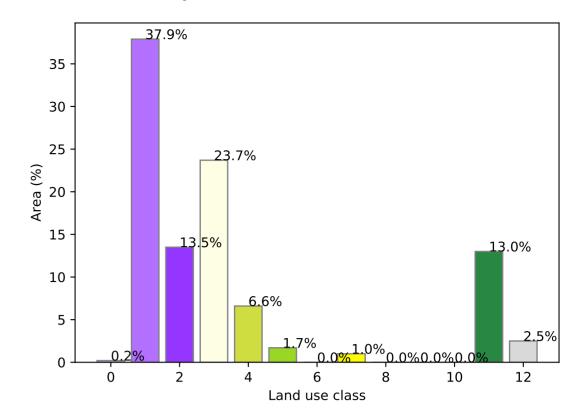
0.30%

#### **Total Vegetation Cover [%]**

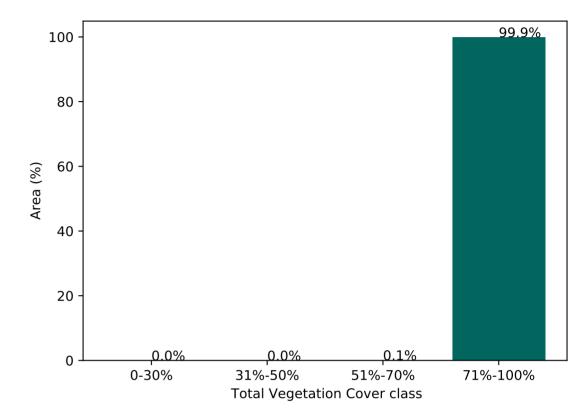


#### % Area protected from water erosion (>70%)

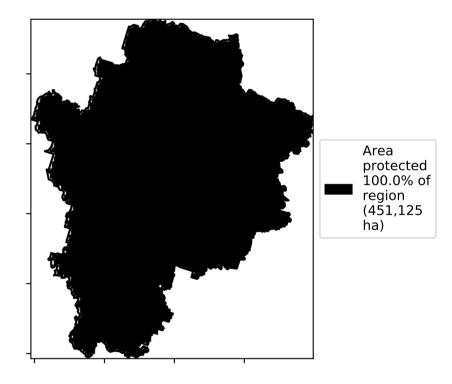




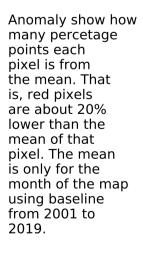
#### Proportion of vegetation cover class in area



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

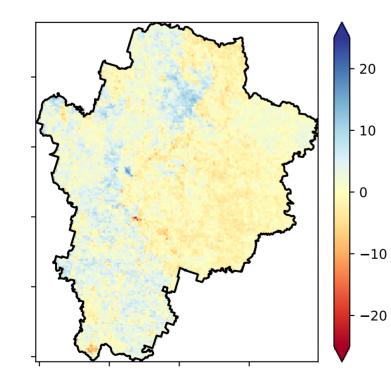


**Total Vegetation Cover Anomaly [%]** 



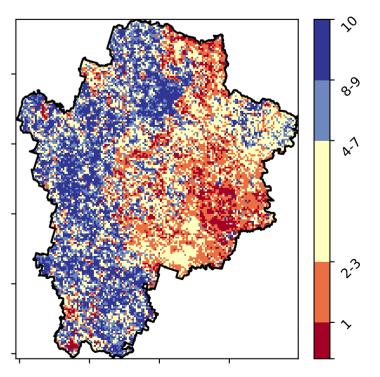
Derived from

Use of Australia



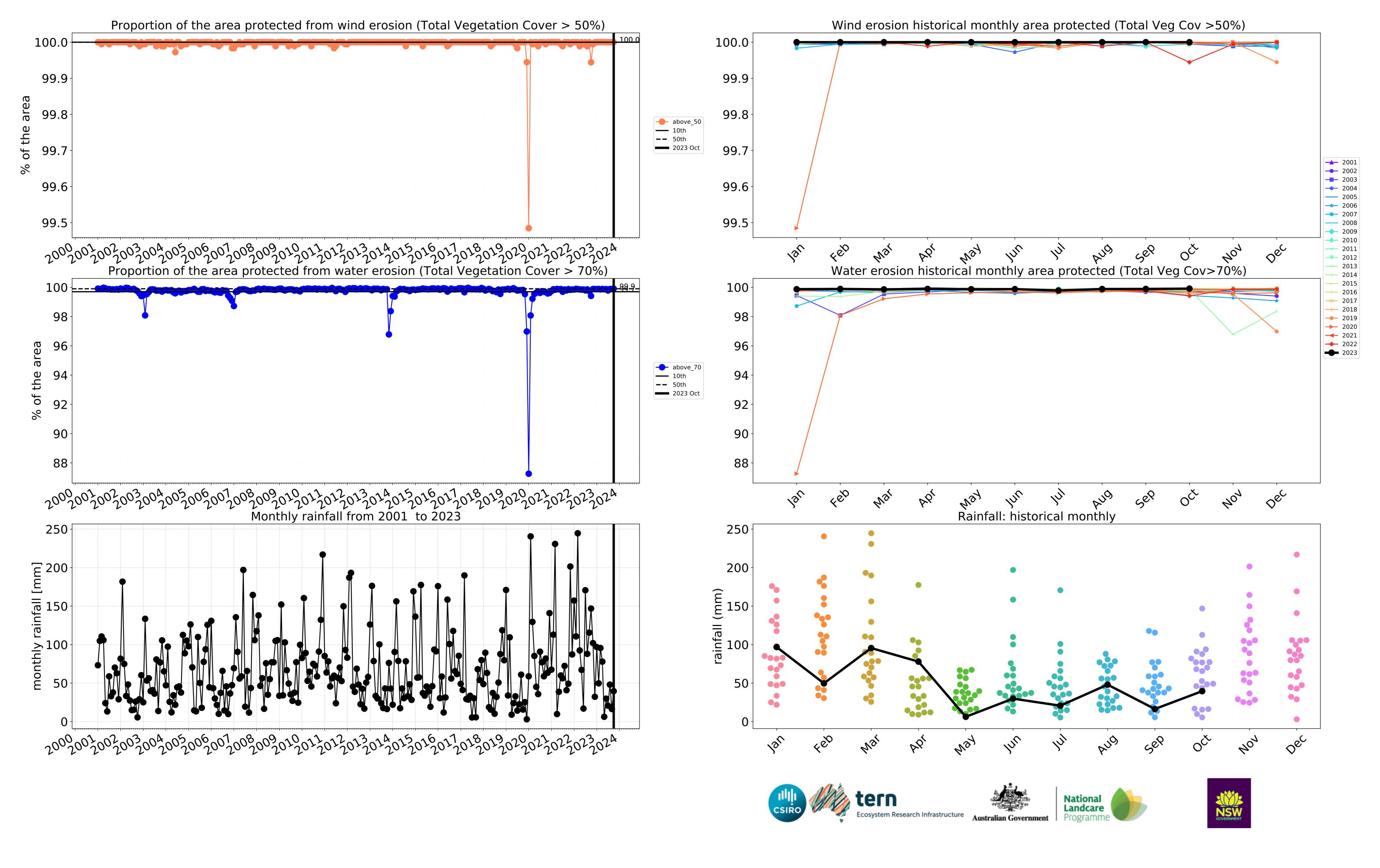
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

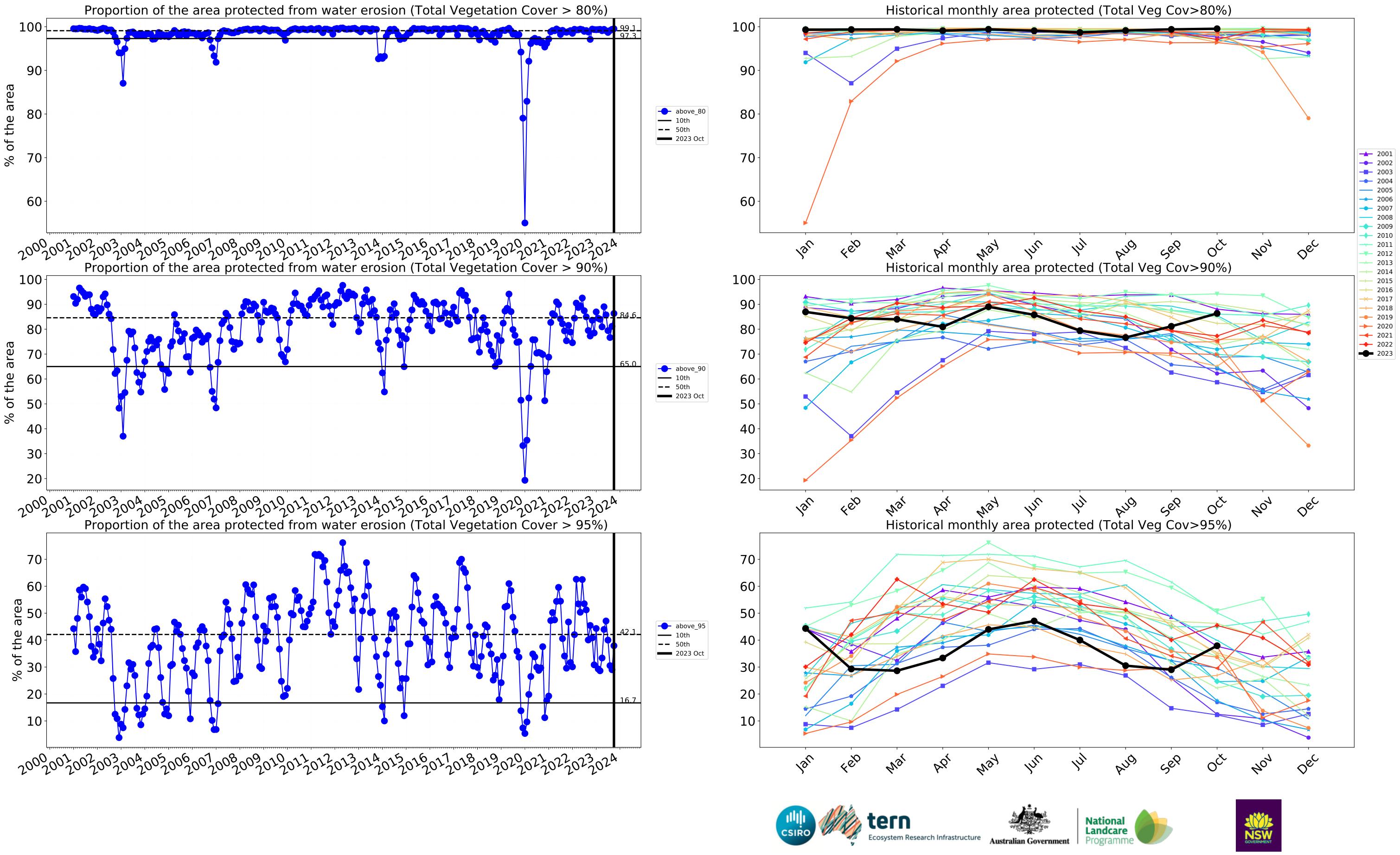
**Total Vegetation Cover Decile [%]** 





2







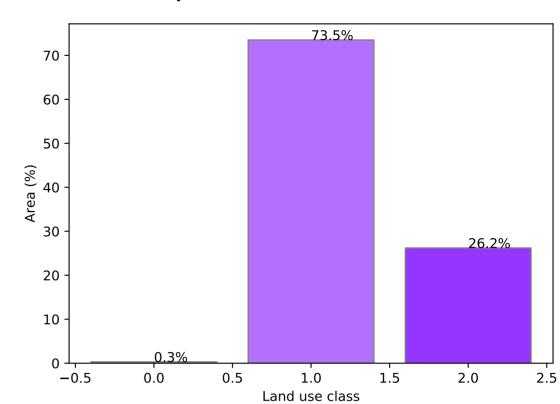
#### **Conservation and natural environments**

forest

forest

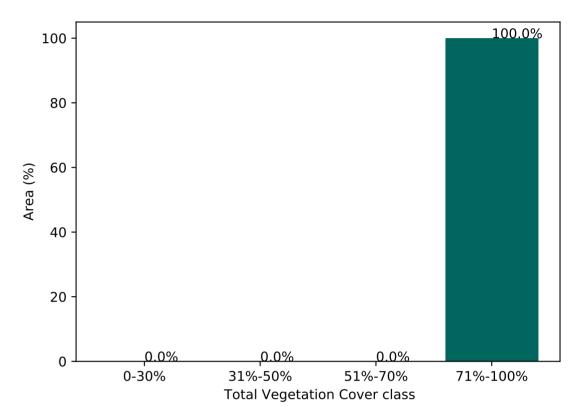
woodland forest

Land use and forest cover



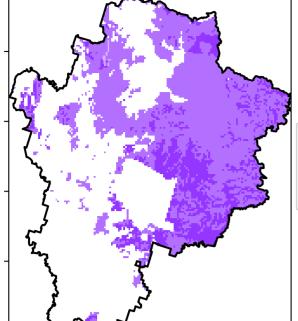
#### Proportion of each land class in area

Proportion of vegetation cover class in area

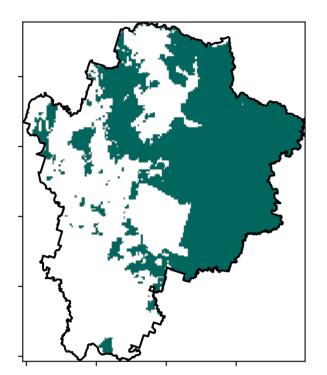


% Area protected from wind erosion (>50%)

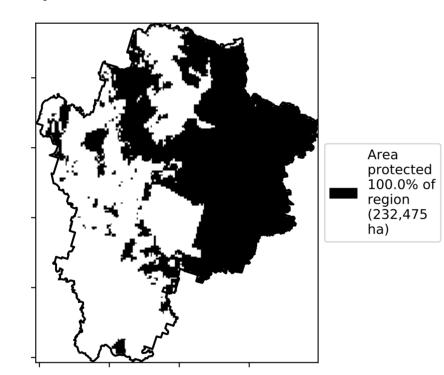


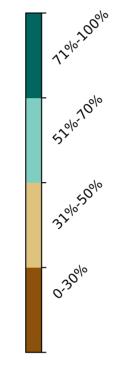


**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





1 Conservation and natural environments - Non-

3 Conservation and natural environments - Non-

2 Conservation and natural environments - Woodland

**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.

Catchment Scale

Derived from

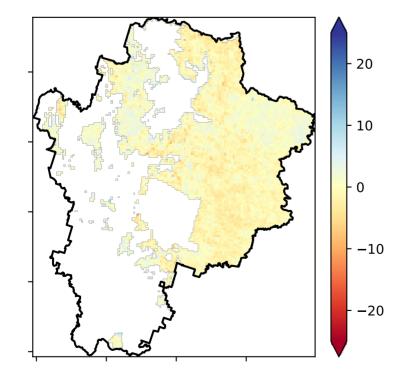
Use of Australia

(2018) and Forests

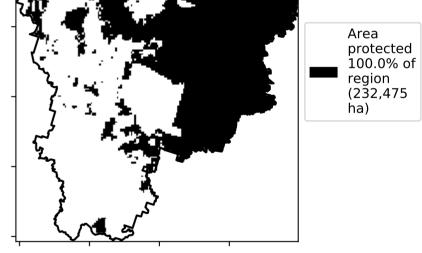
of Australia (2018)

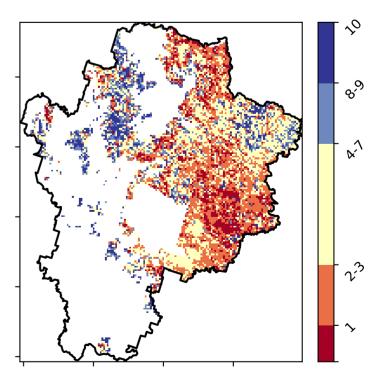
Land Use and Forests of Australia (2018)

Catchment Scale Land

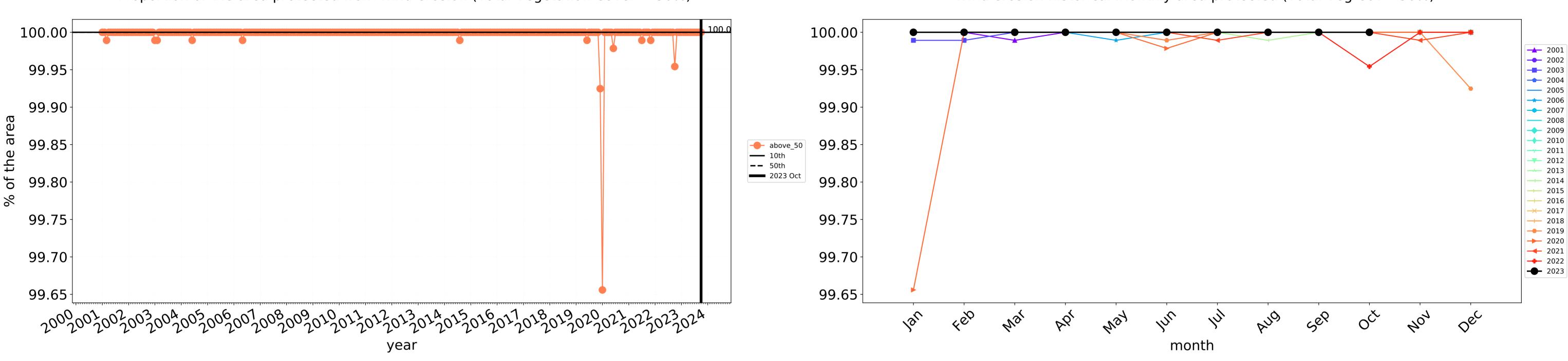


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

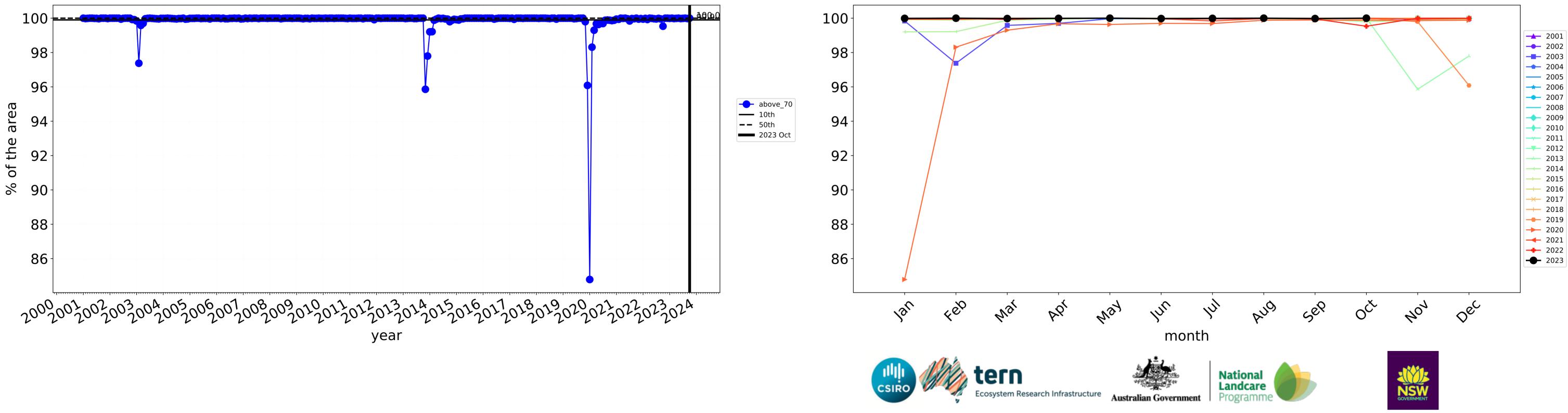


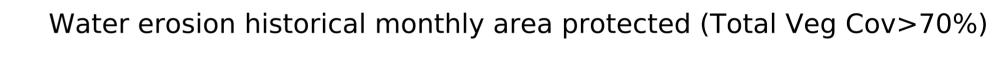




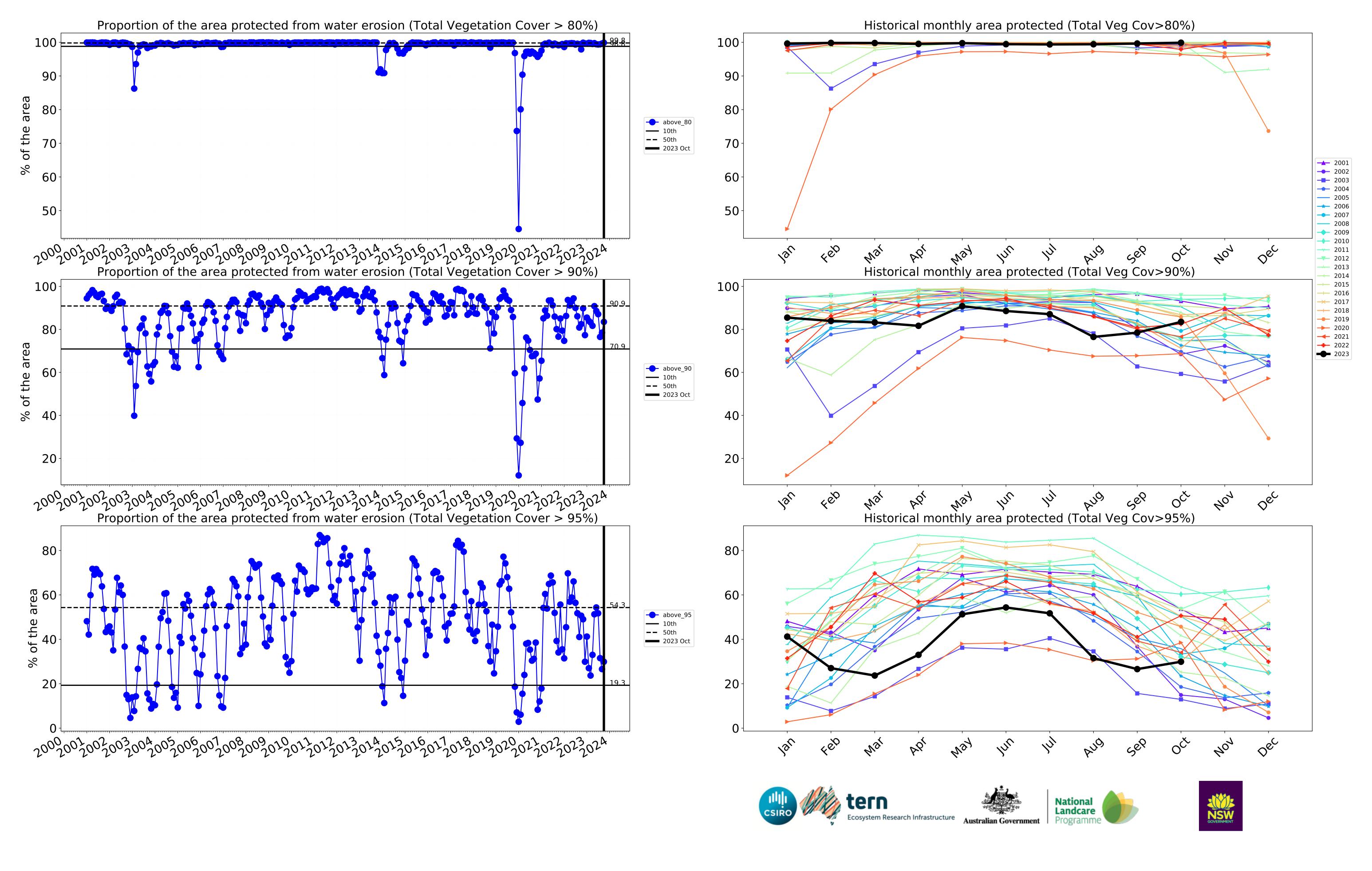


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



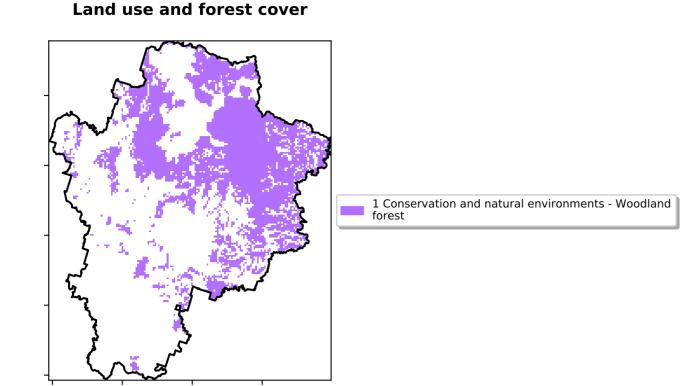


Wind erosion historical monthly area protected (Total Veg Cov >50%)

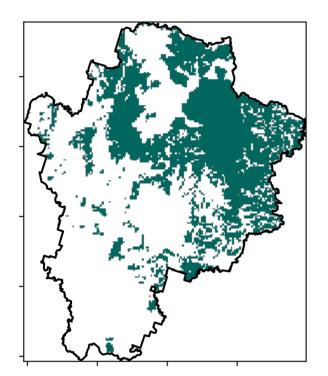


### **Conservation and natural environments Woodland forest**

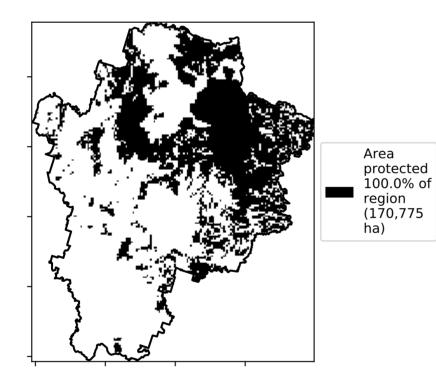
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

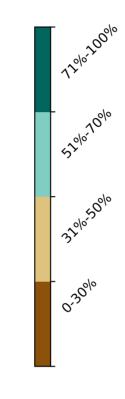


**Total Vegetation Cover [%]** 

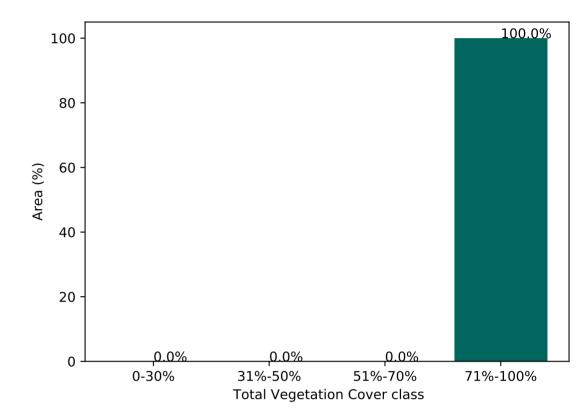


% Area protected from water erosion (>70%)





Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

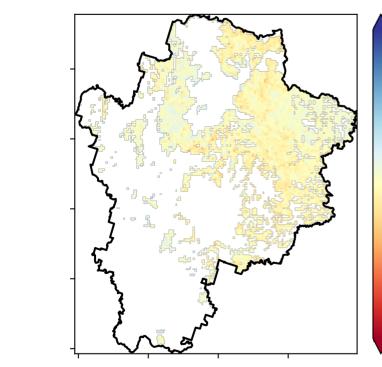
20

· 10

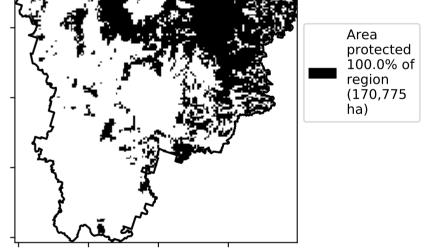
0

-10

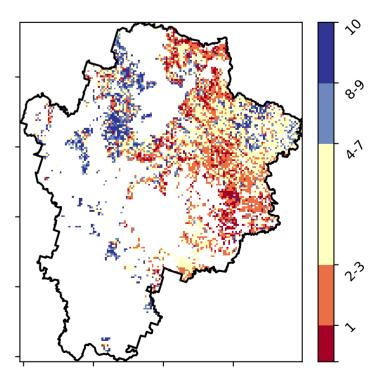
-20



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 [%]

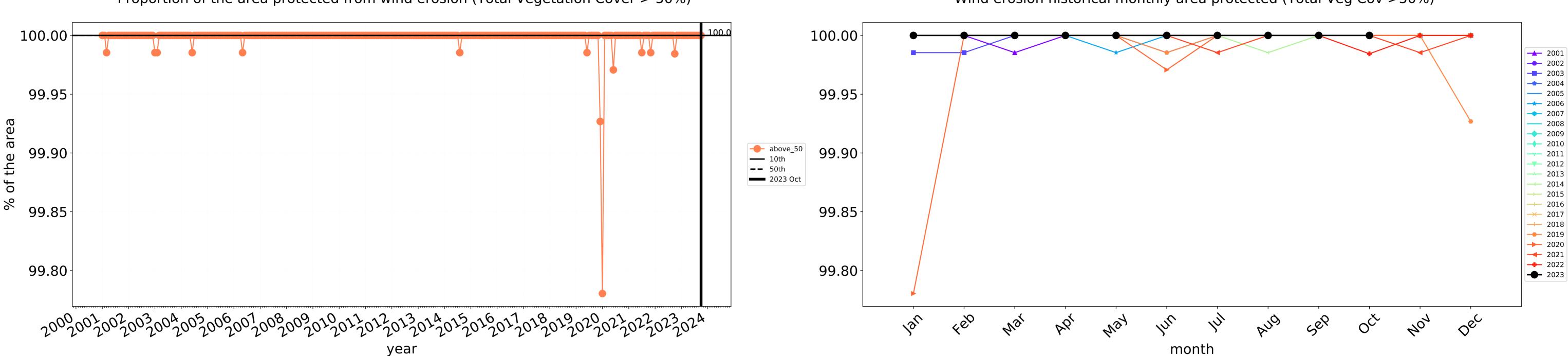




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

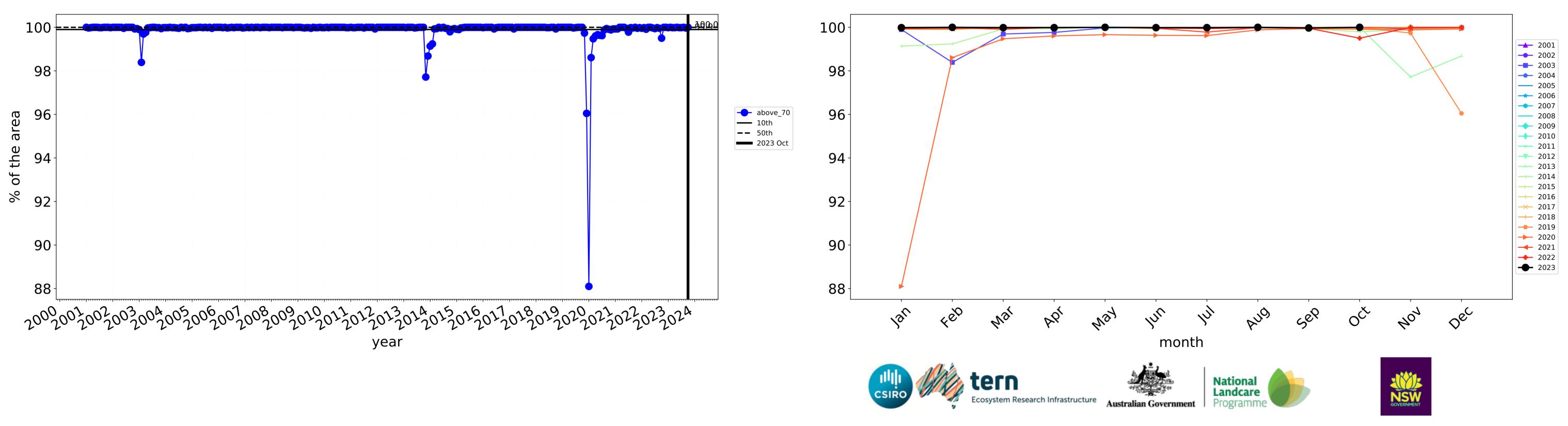
8

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



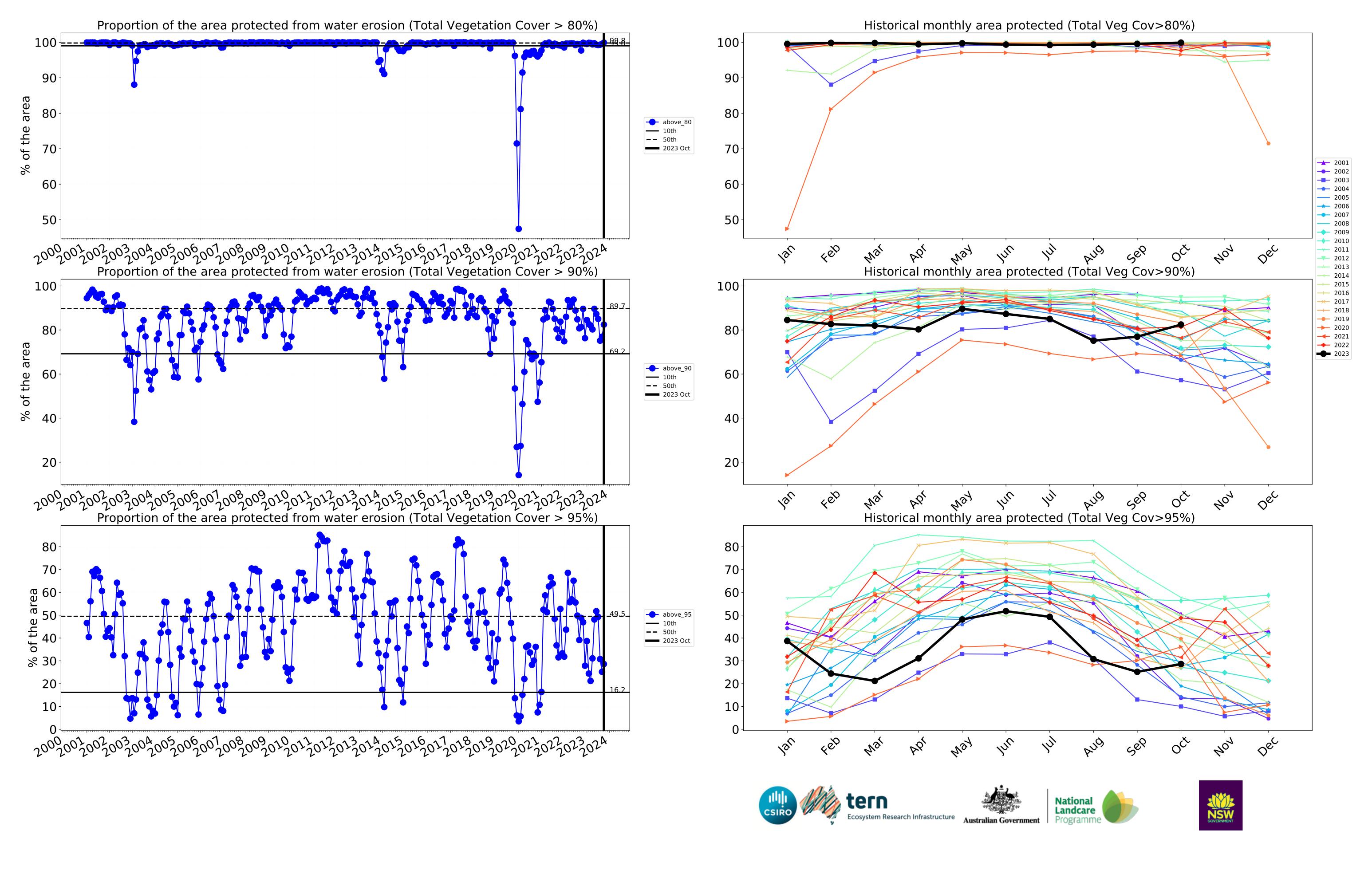
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



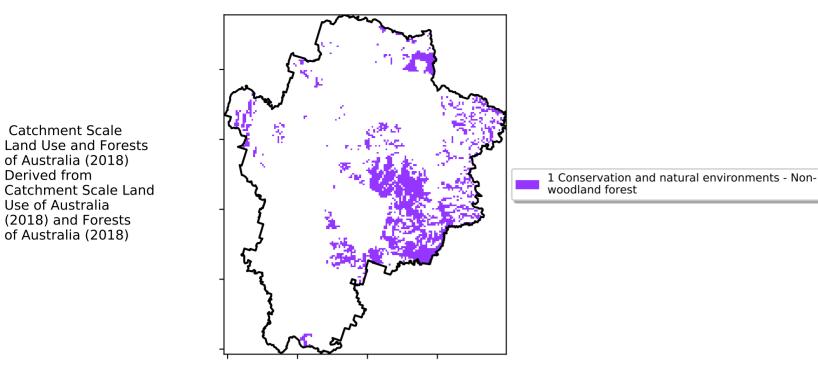


Wind erosion historical monthly area protected (Total Veg Cov >50%)

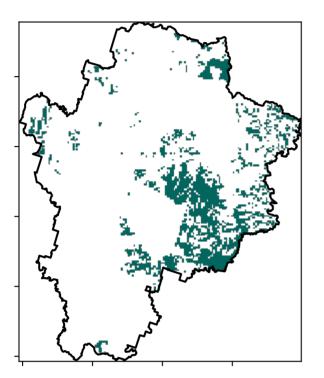


#### **Conservation and natural environments Forest (non woodland)**

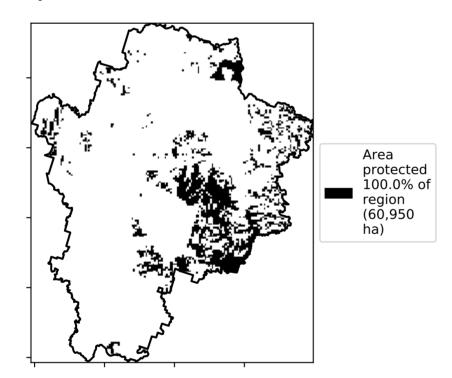
Land use and forest cover

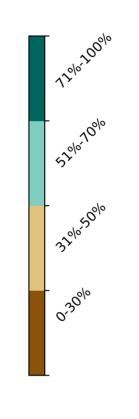


**Total Vegetation Cover [%]** 

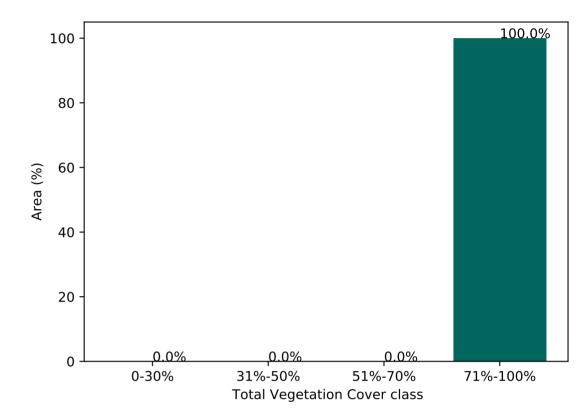


% Area protected from water erosion (>70%)

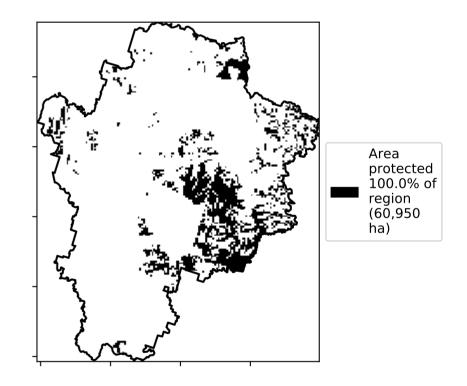




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

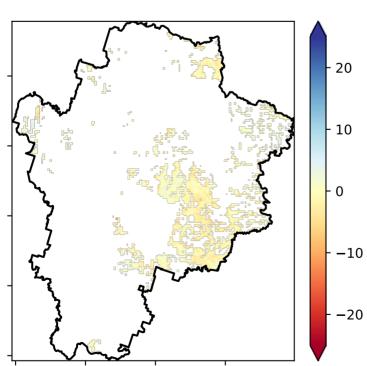


**Total Vegetation Cover Anomaly [%]** 

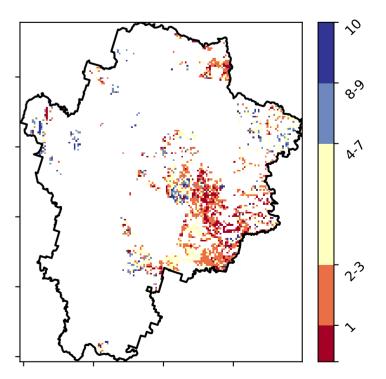
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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

Use of Australia (2018) and Forests of Australia (2018)

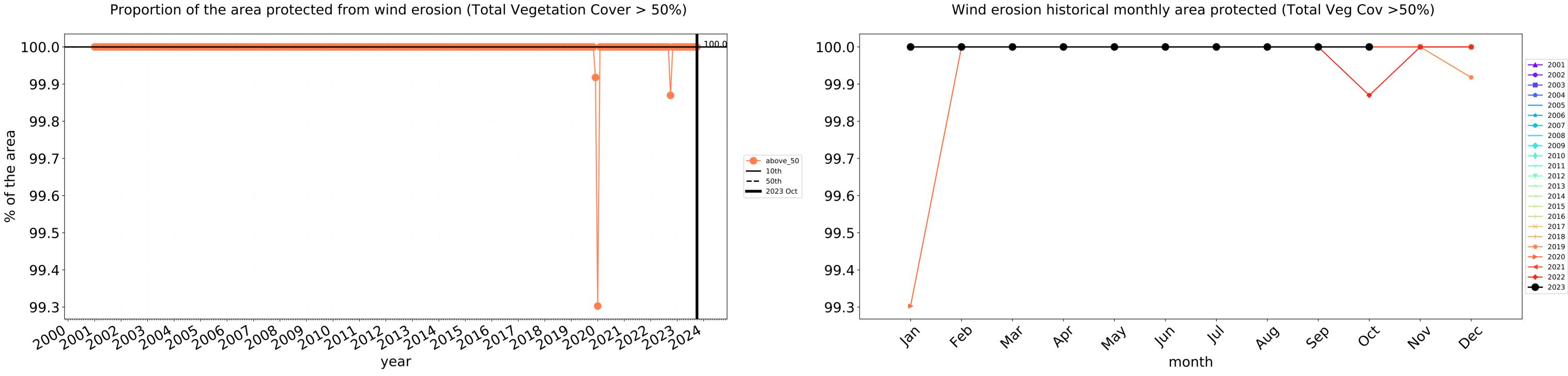


Deciles show where the pixel value lies in the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

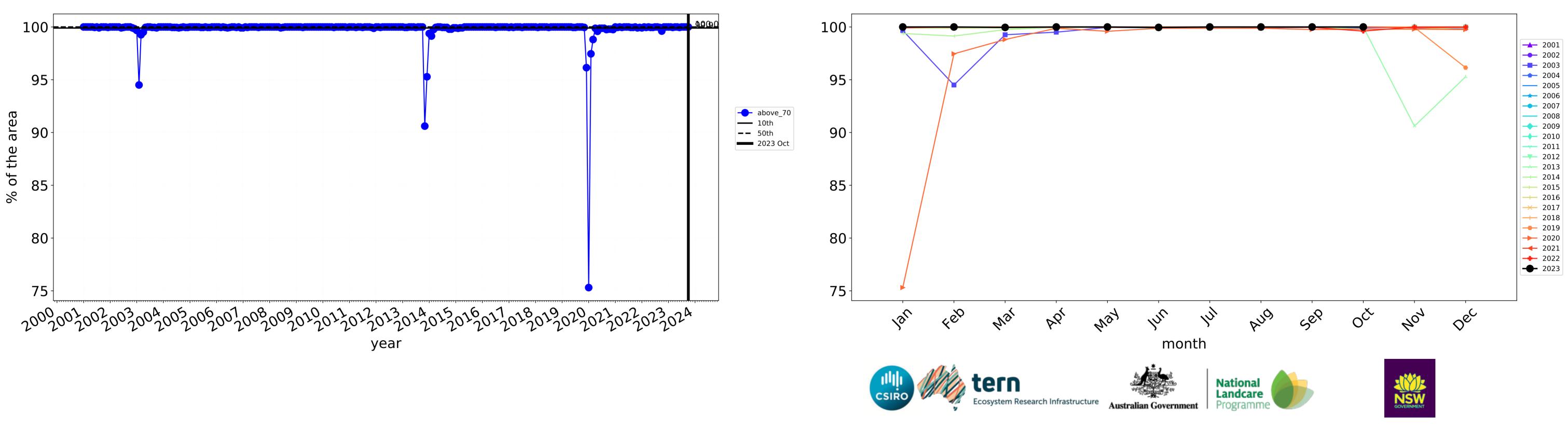




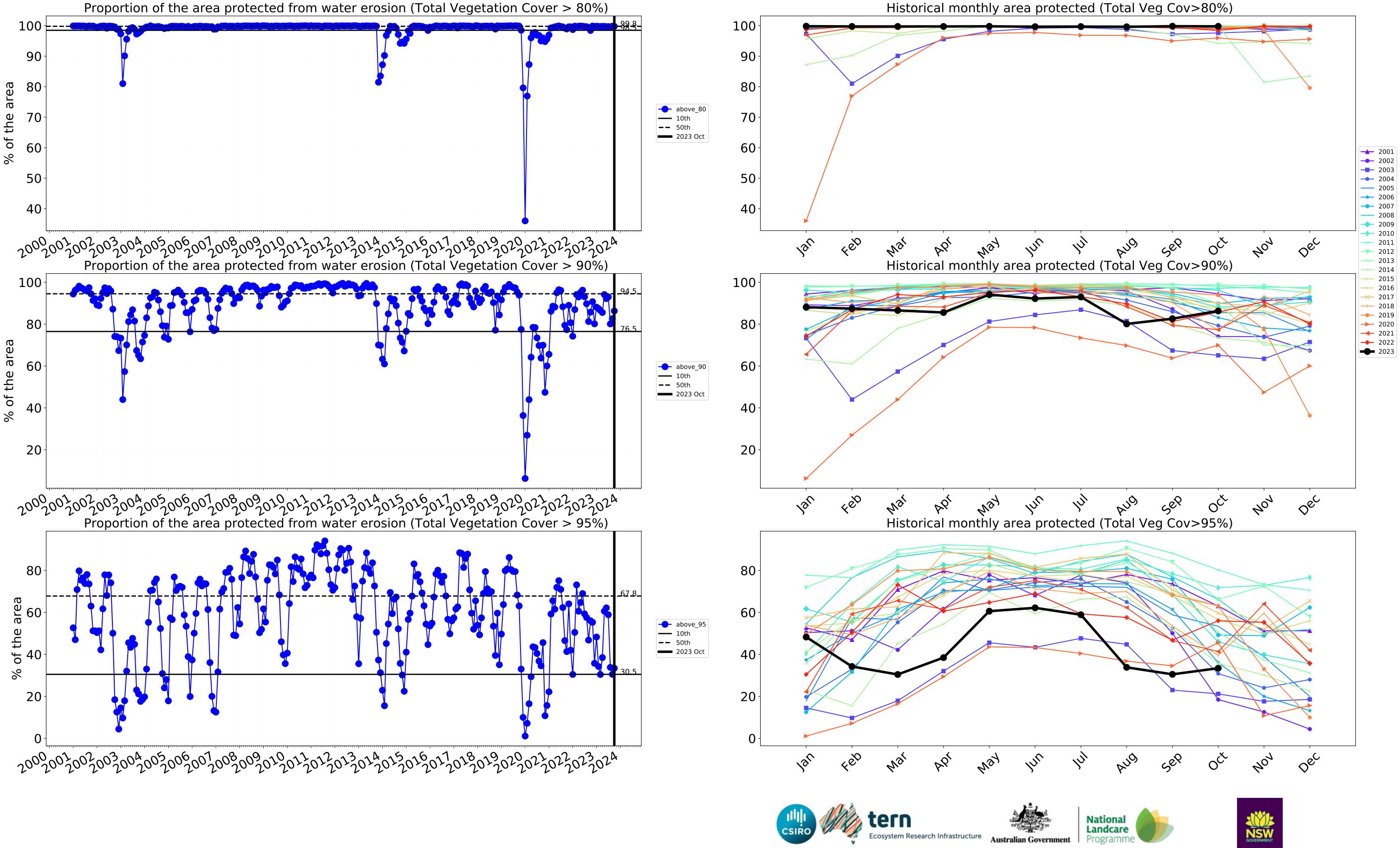
# **Conservation and natural environments Forest (non woodland) timeseries**



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

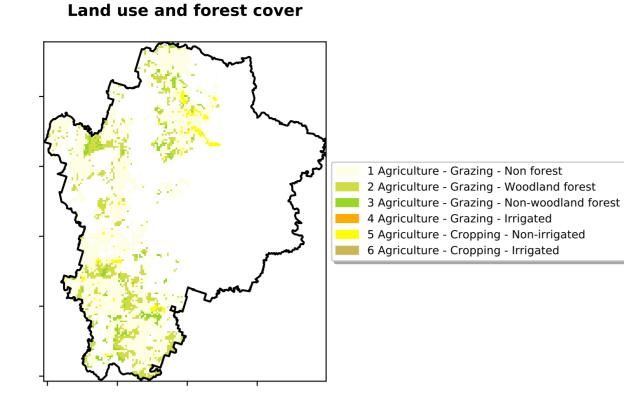


Water erosion historical monthly area protected (Total Veg Cov>70%)



#### Agriculture

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



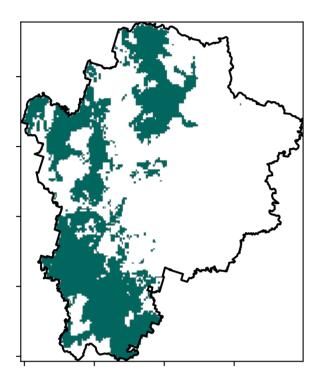
12%-200%

· 52% 70%

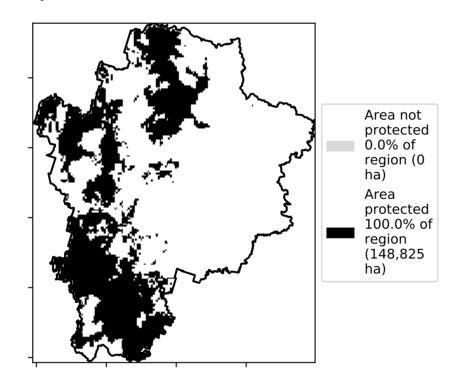
32905001

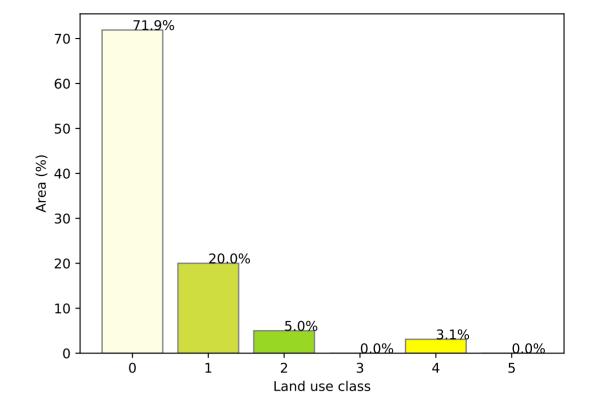
0-30%

**Total Vegetation Cover [%]** 



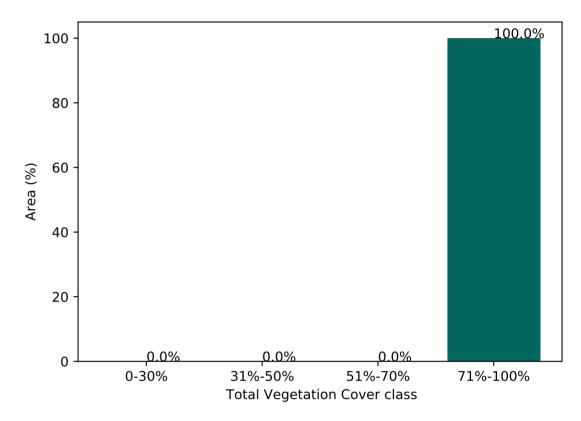
% Area protected from water erosion (>70%)





#### Proportion of each land class in area

Proportion of vegetation cover class in area

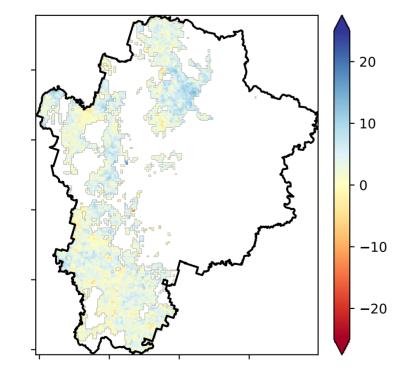


% Area protected from wind erosion (>50%)

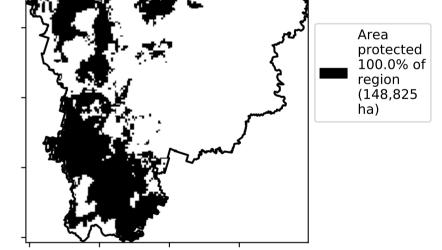


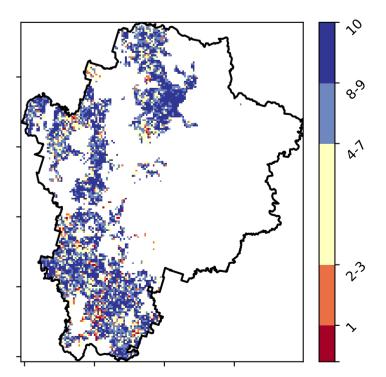
Total Vegetation Cover Anomaly [%]

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

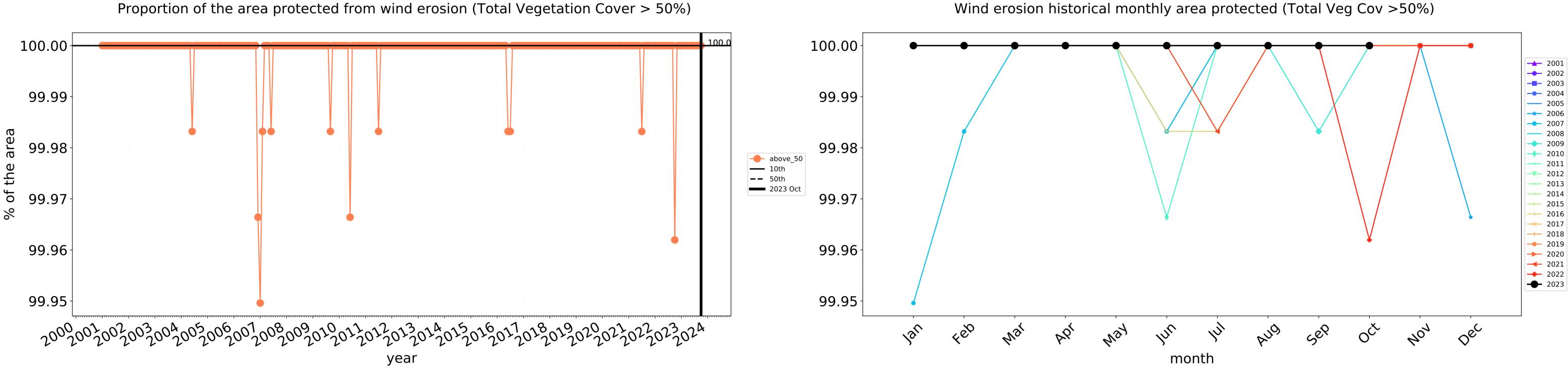


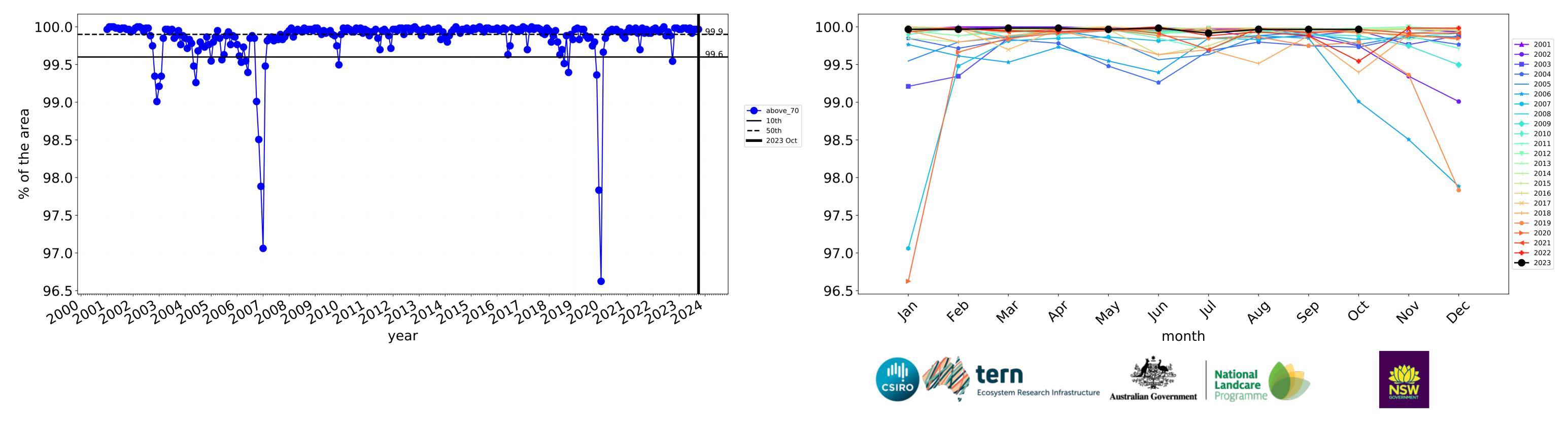
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





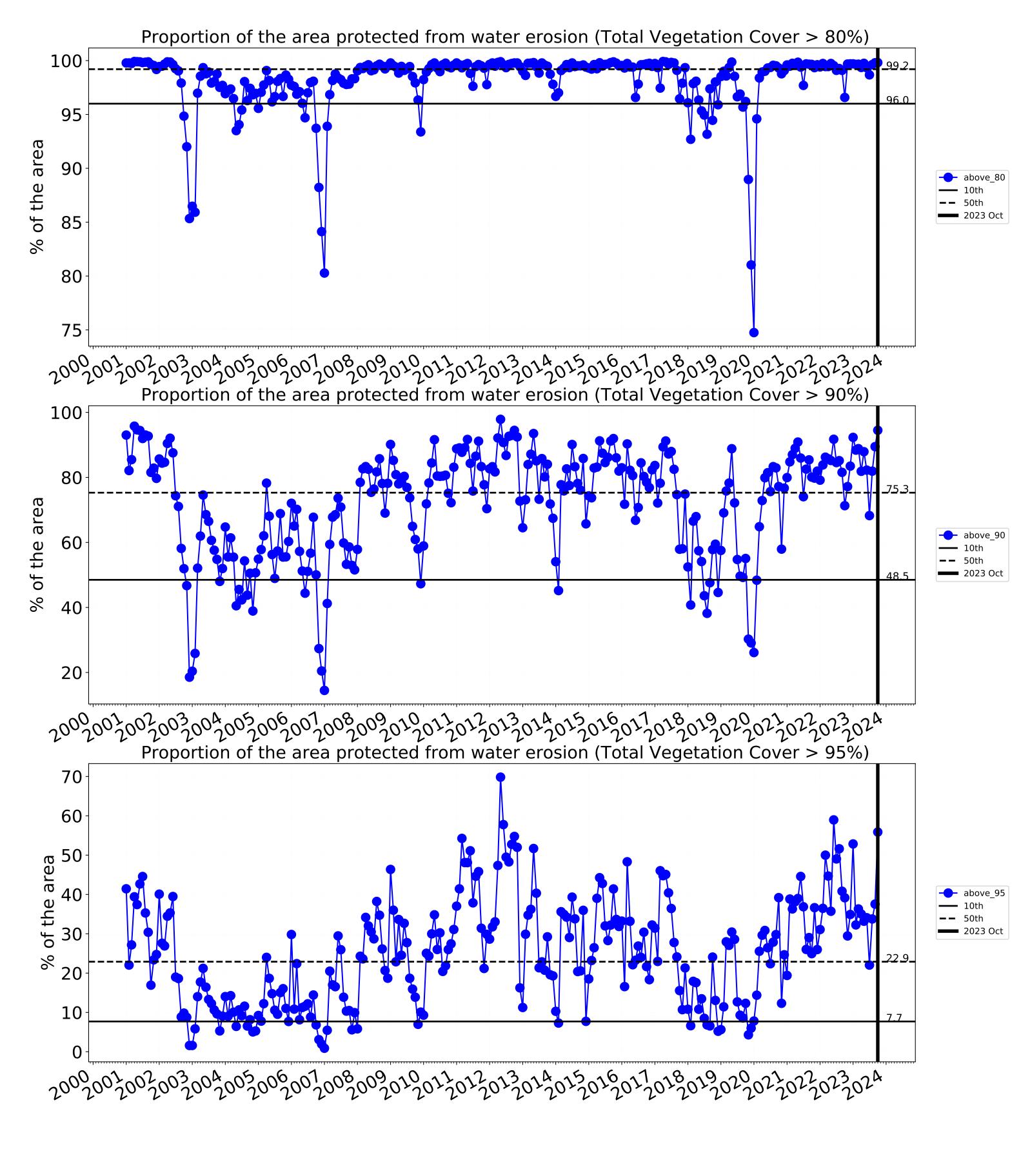


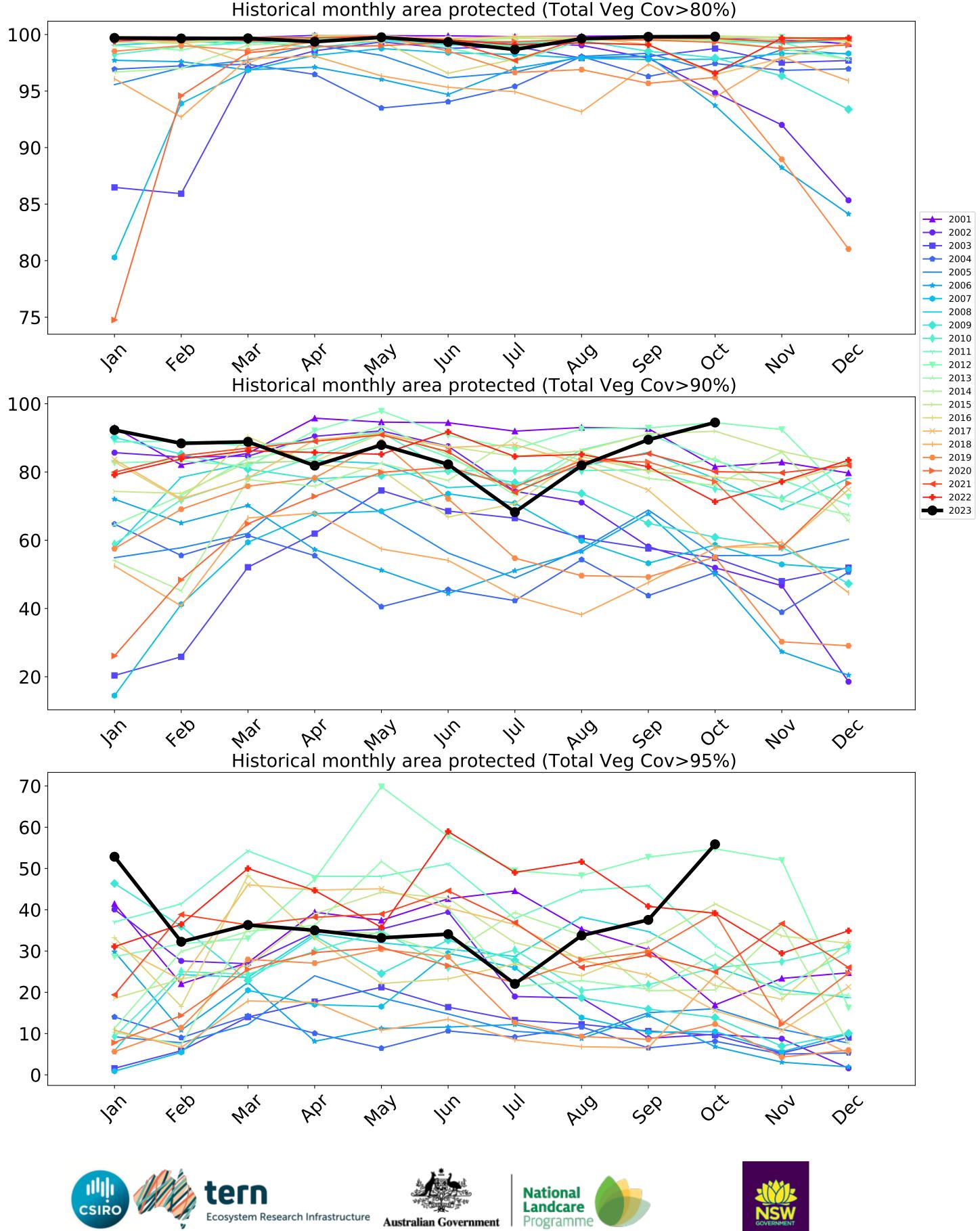




# Agriculture timeseries

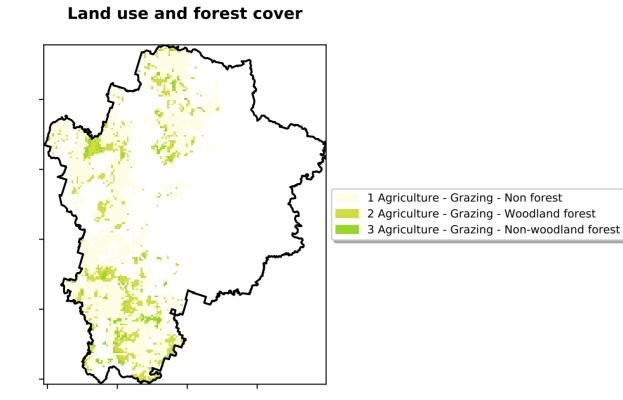
Water erosion historical monthly area protected (Total Veg Cov>70%)





#### Grazing

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



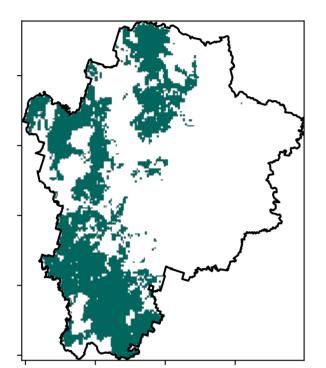
12%100%

· 52% 70%

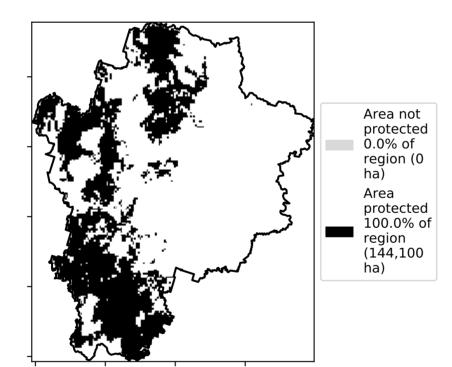
32905001

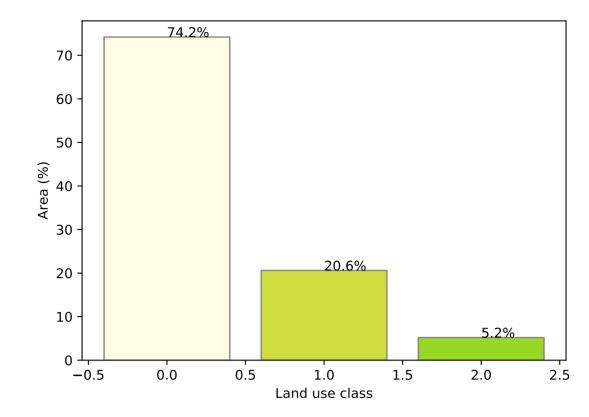
0-30%

**Total Vegetation Cover [%]** 



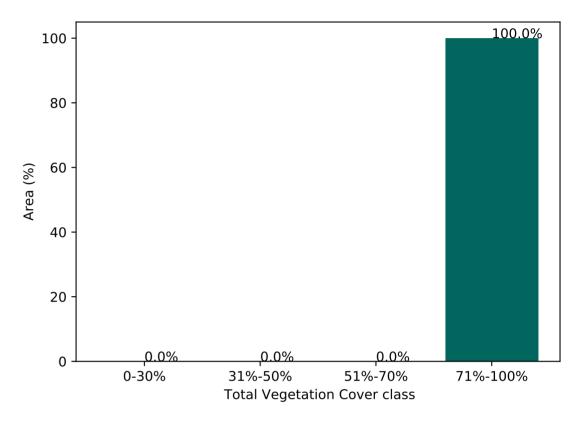
% Area protected from water erosion (>70%)





Proportion of each land class in area

Proportion of vegetation cover class in area

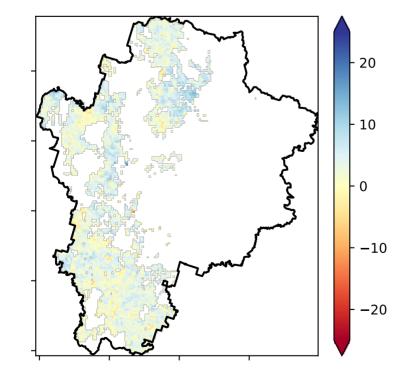


% Area protected from wind erosion (>50%)

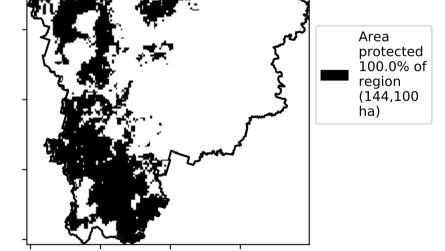


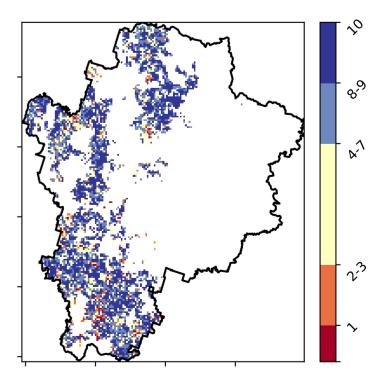
**Total Vegetation Cover Anomaly [%]** 

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

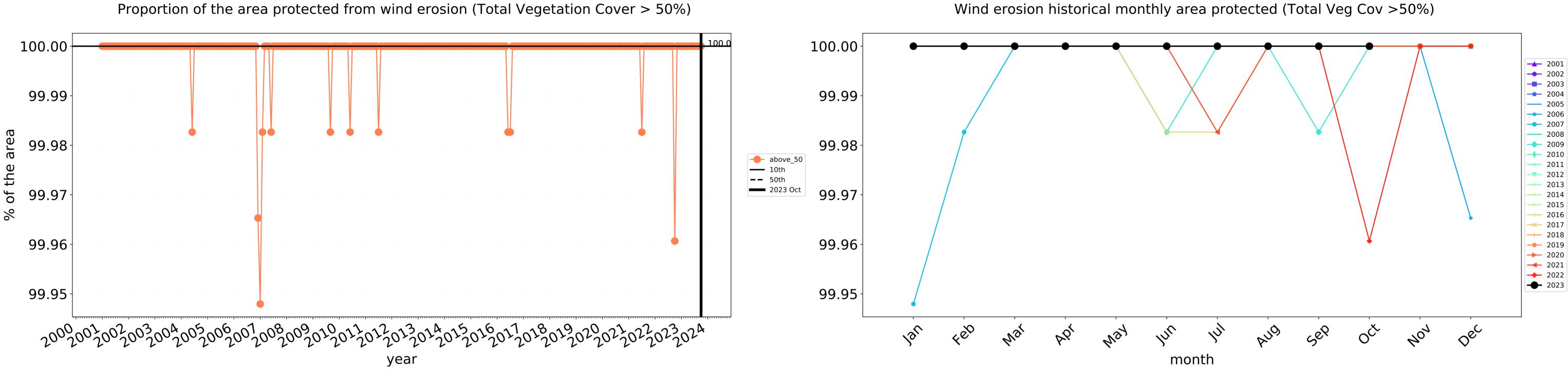


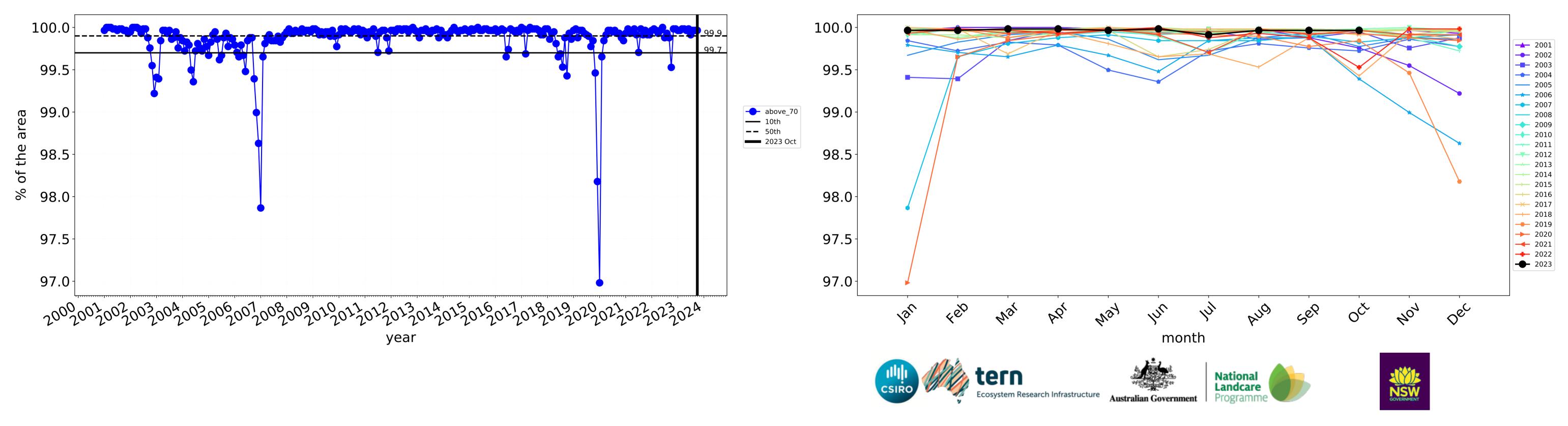
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





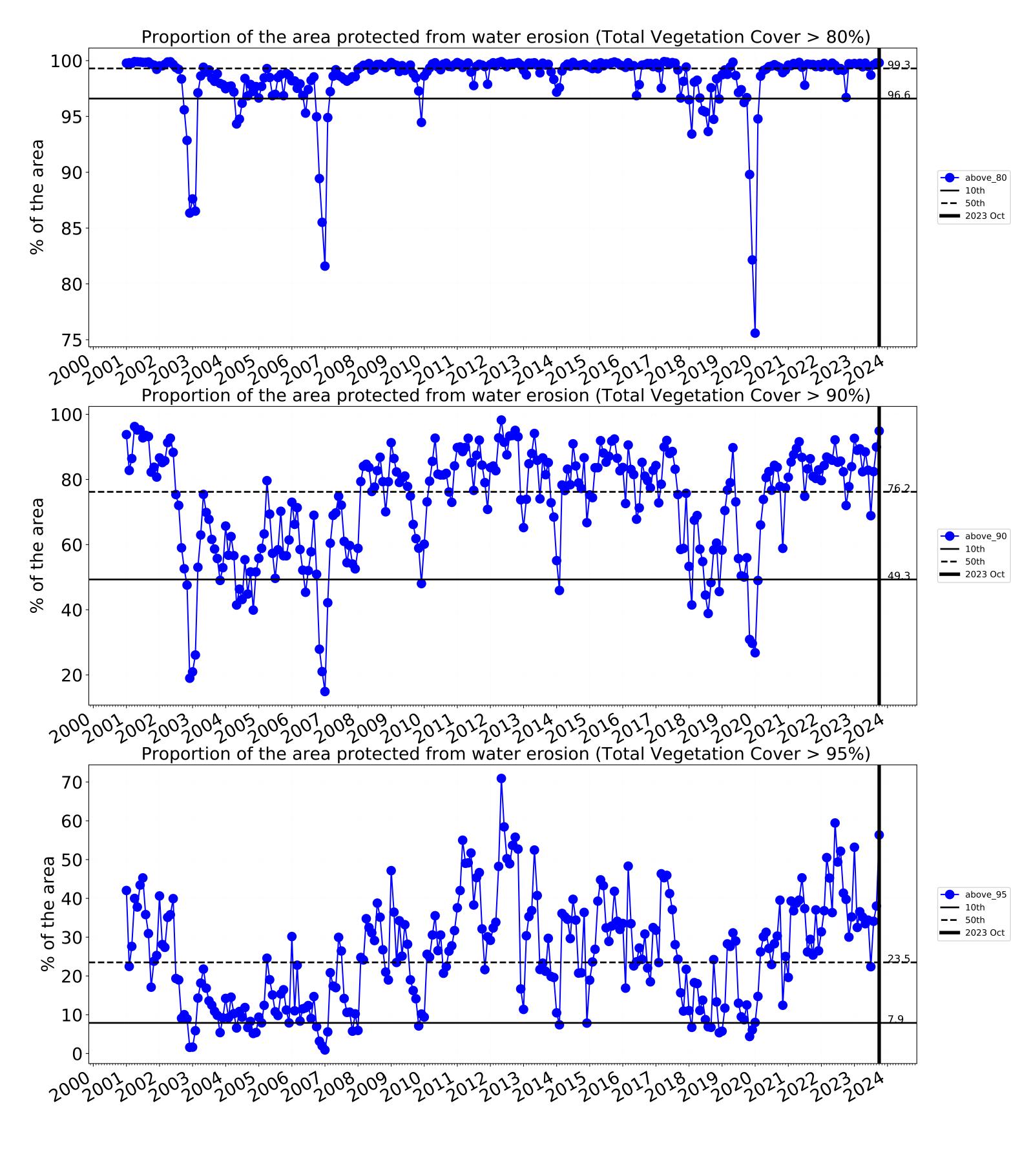


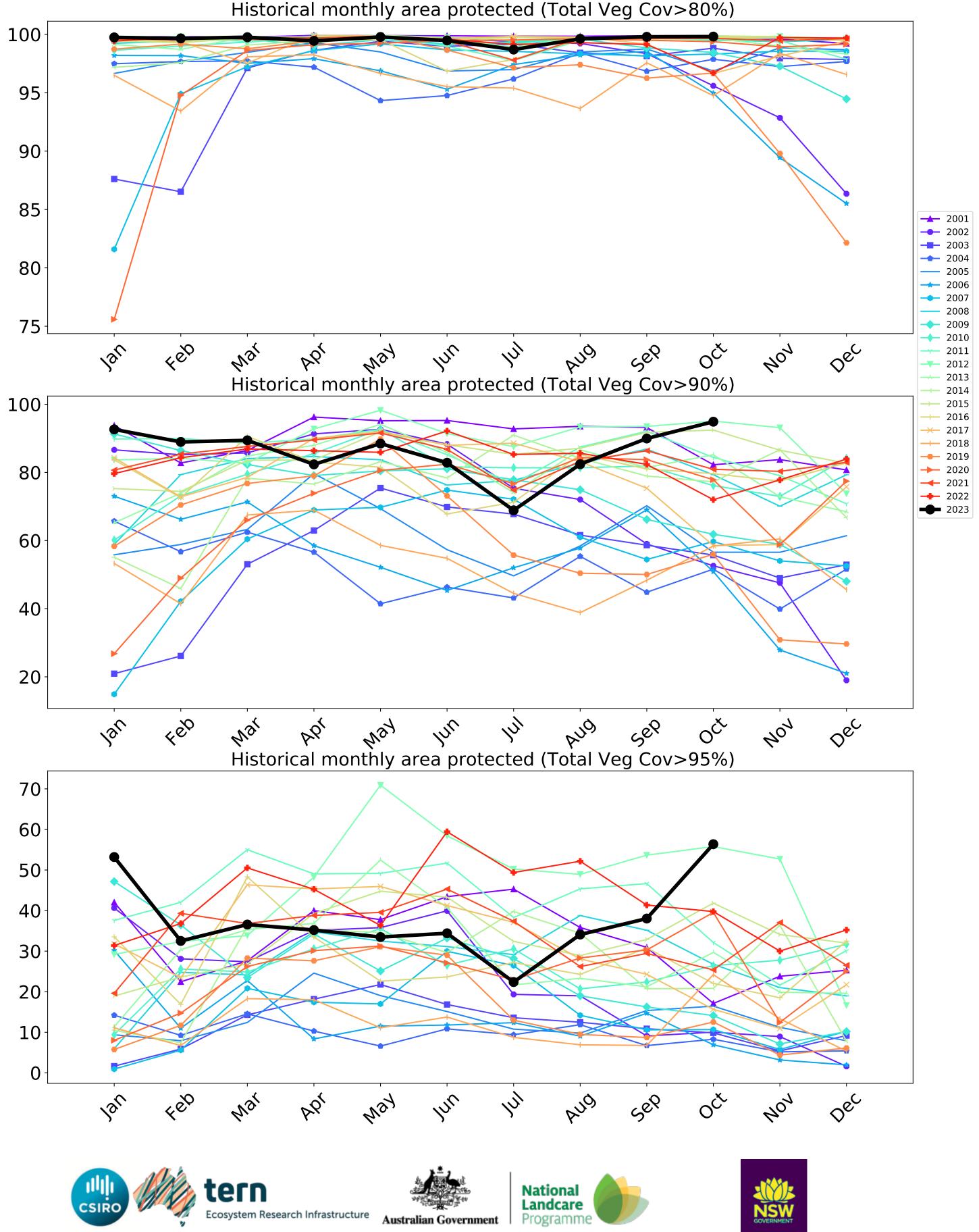


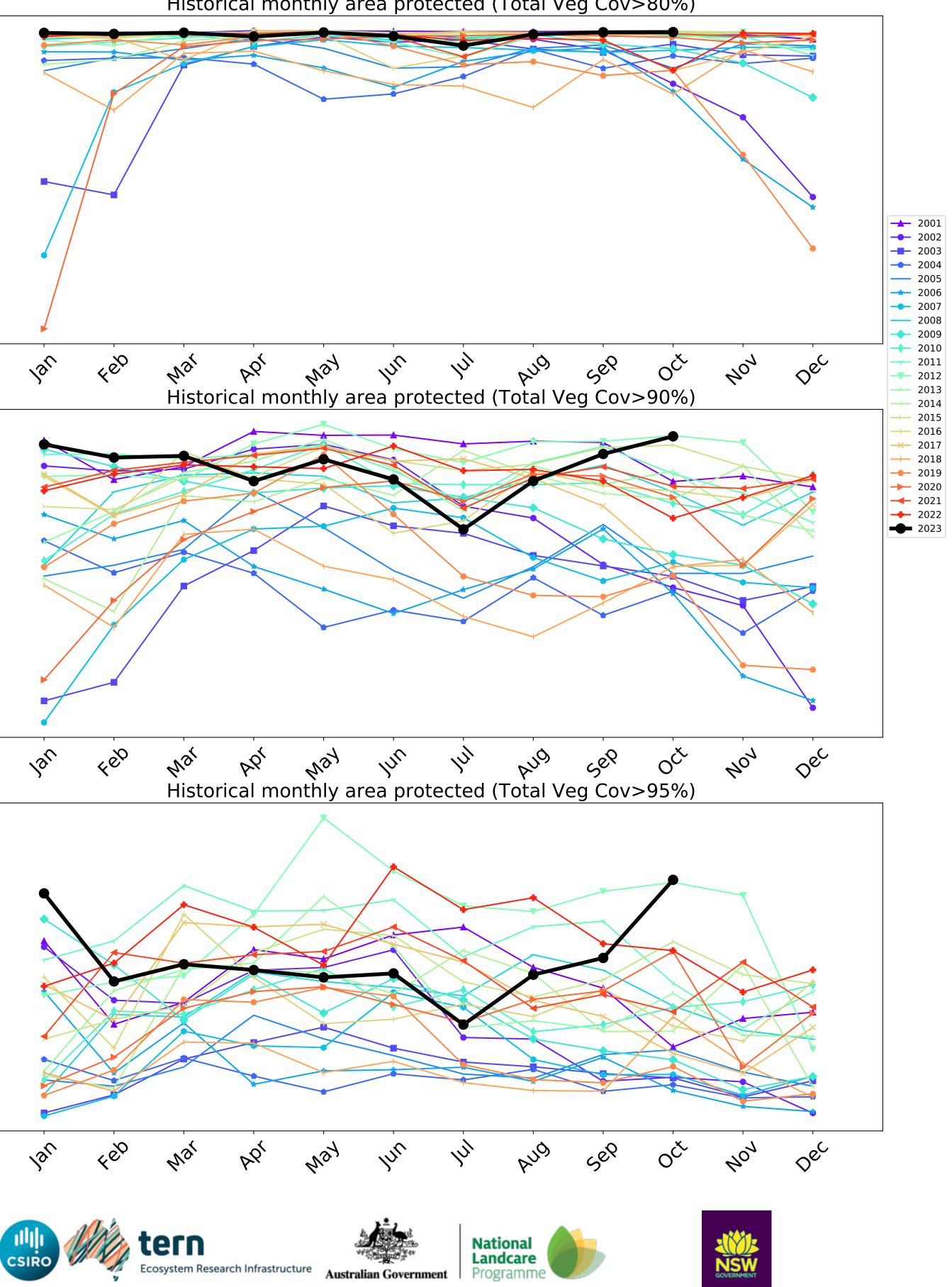


# Grazing timeseries

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

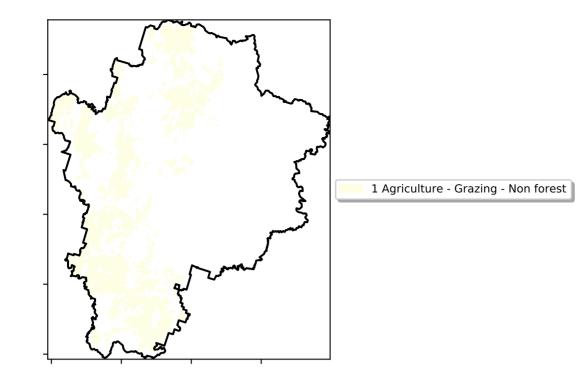




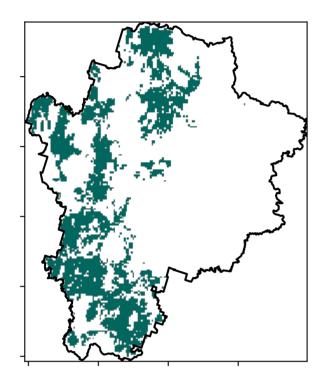


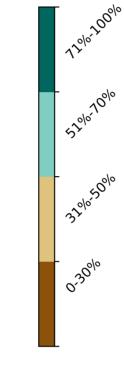
#### **Grazing non forest**

Land use and forest cover

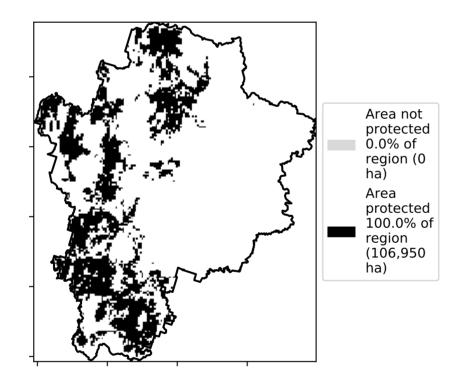


**Total Vegetation Cover [%]** 

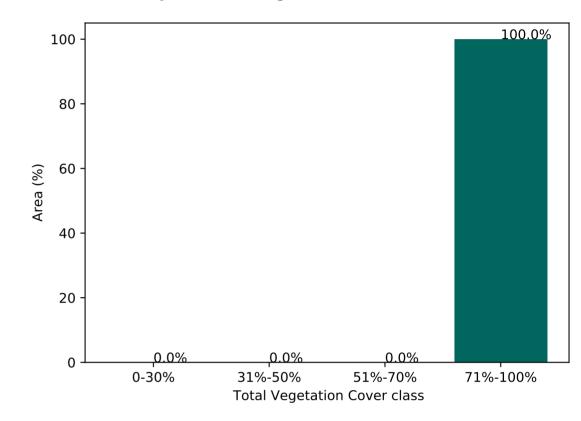




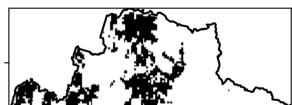
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



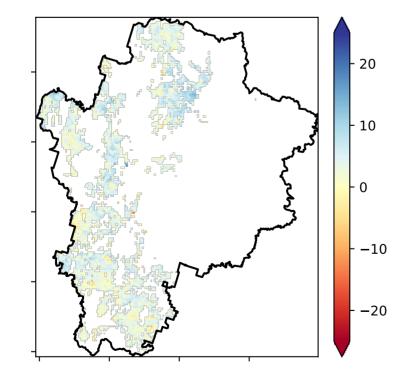
% Area protected from wind erosion (>50%)



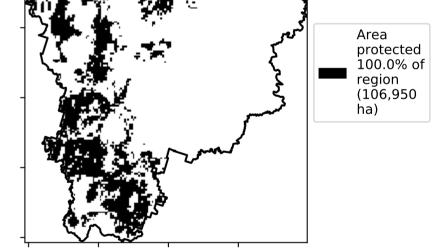
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

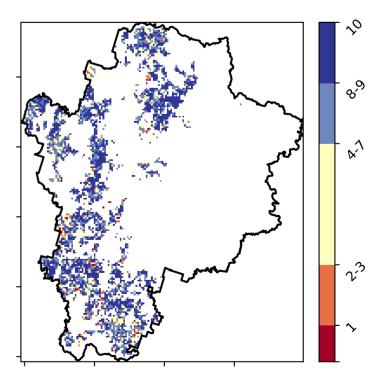
**Total Vegetation Cover Anomaly [%]** 

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

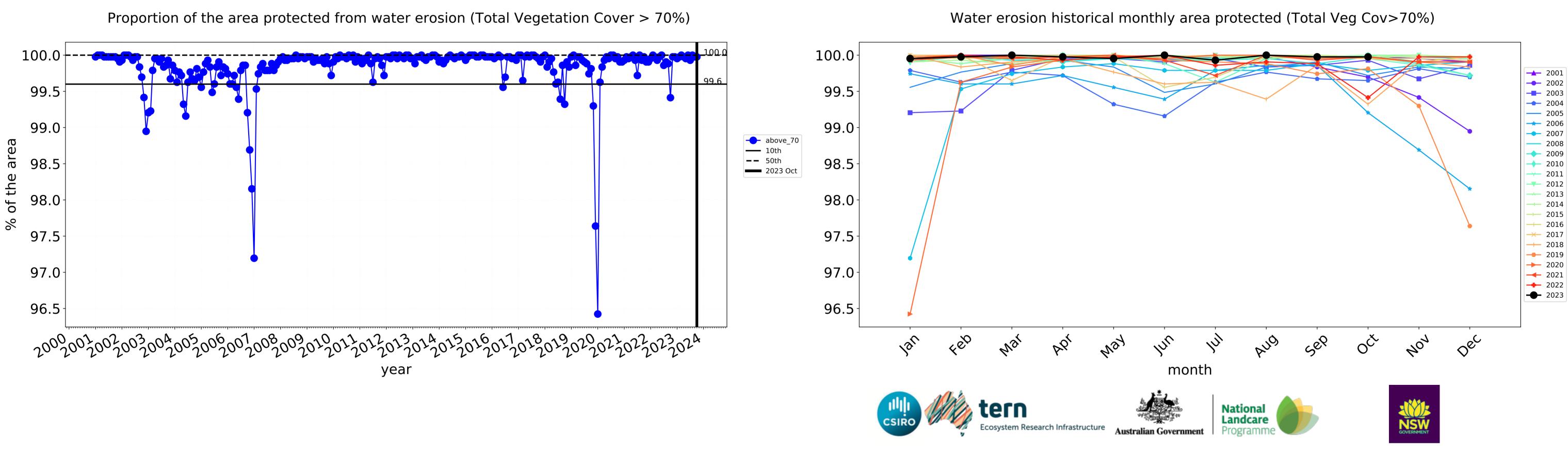


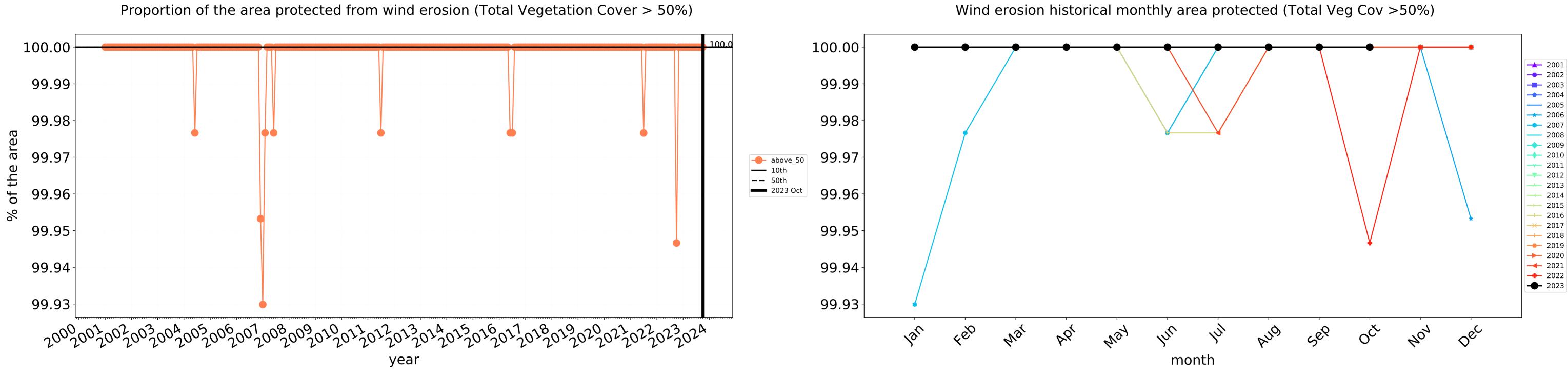
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

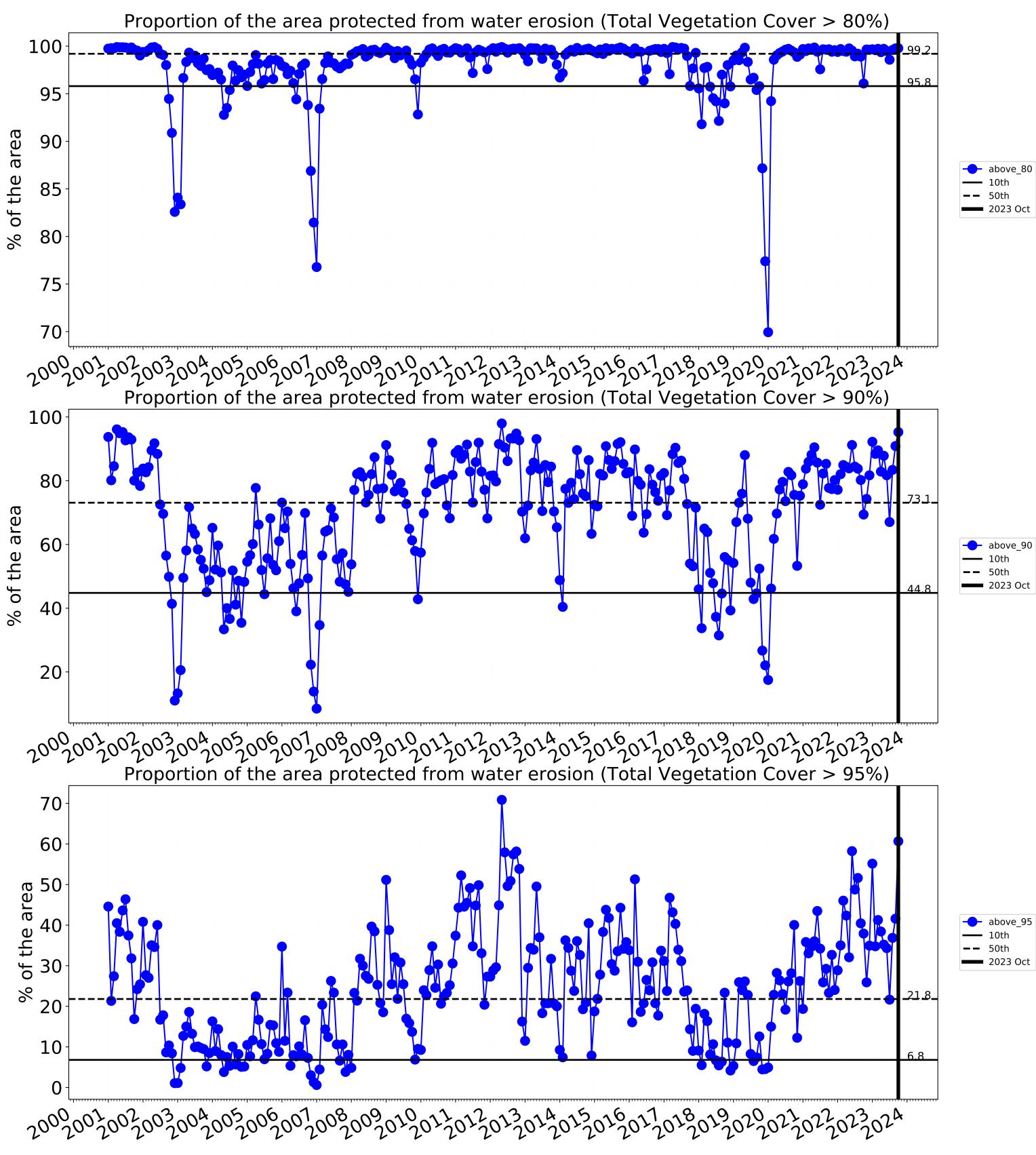




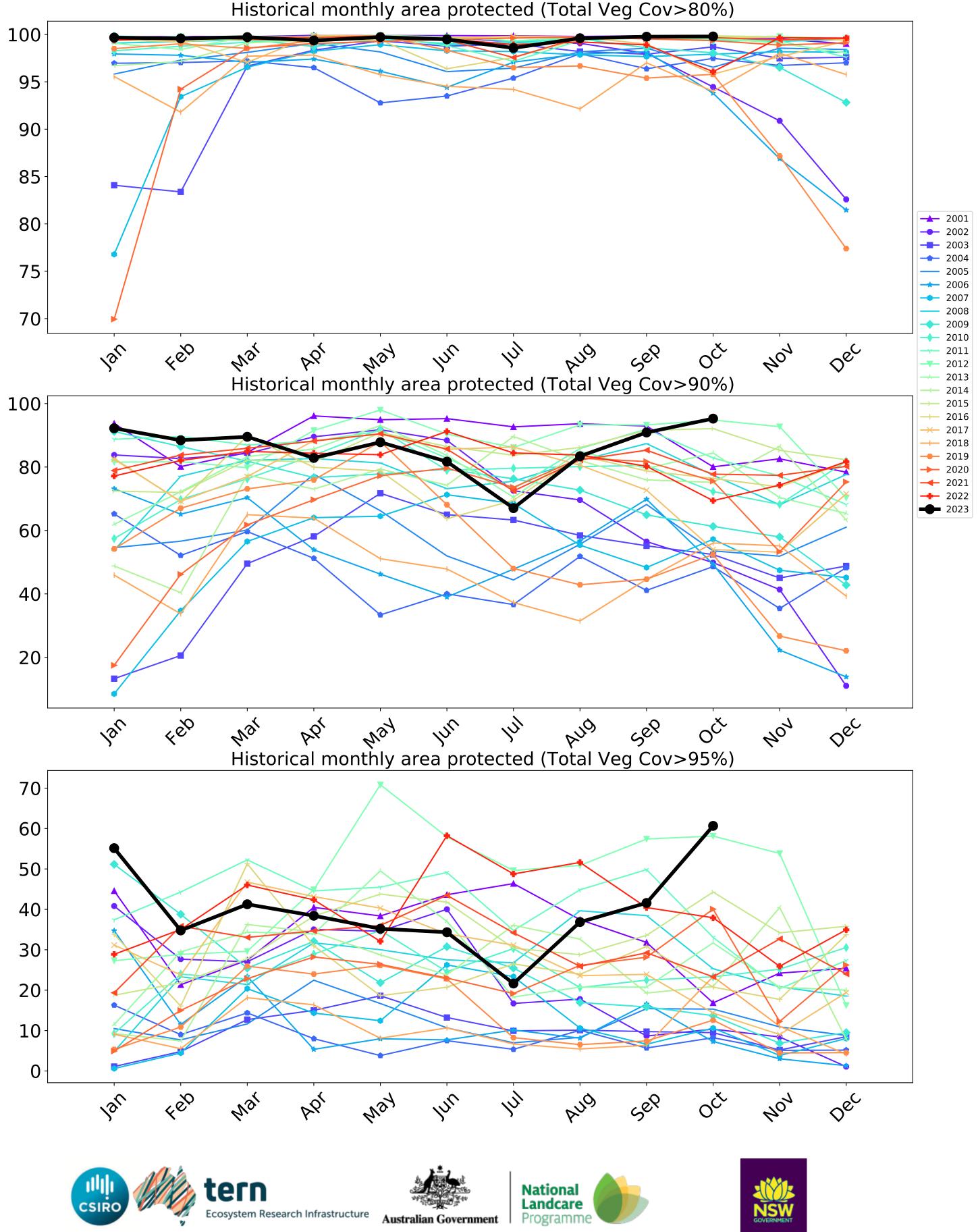


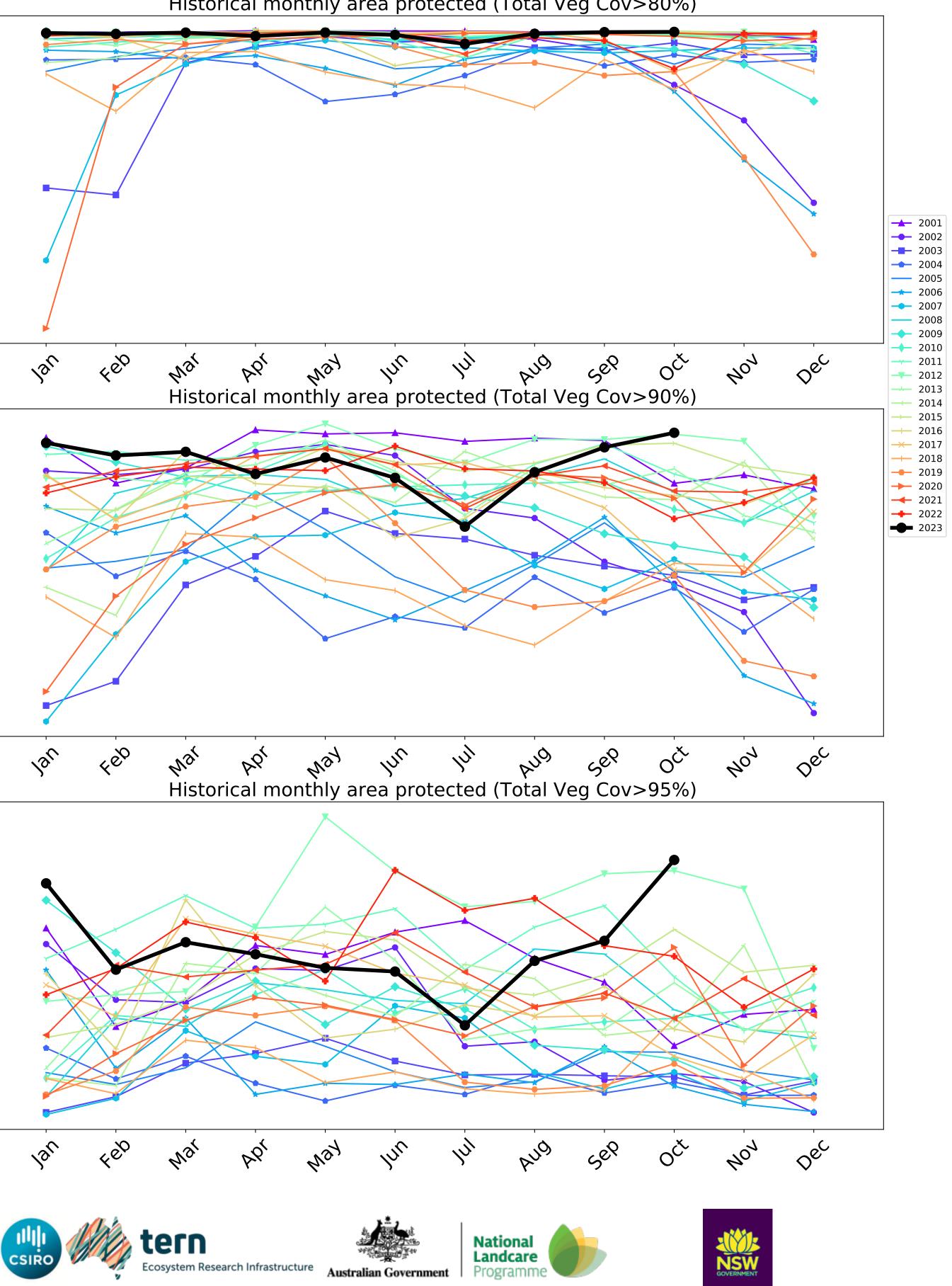






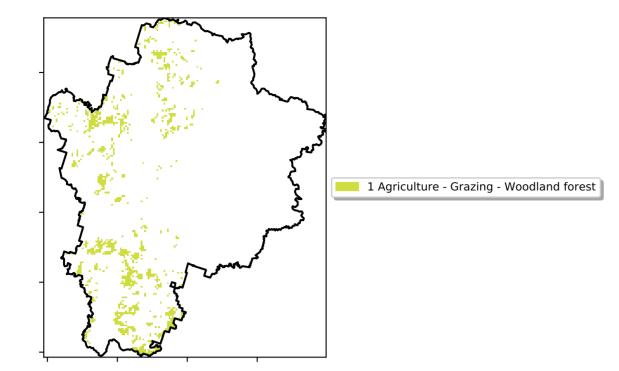
above 90



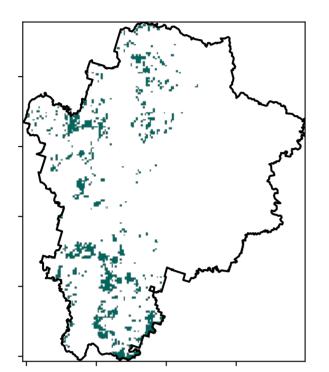


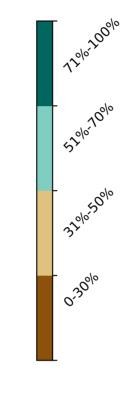
#### **Grazing Woodland forest**

Land use and forest cover

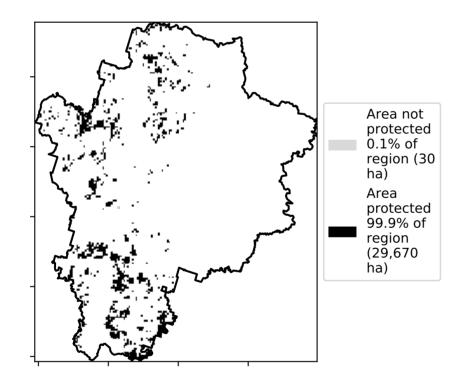


**Total Vegetation Cover [%]** 

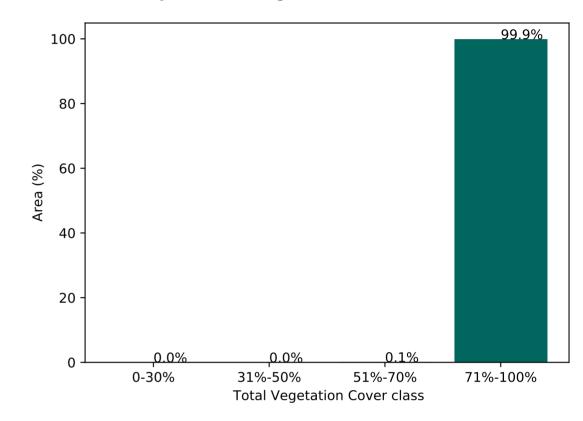




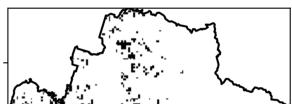
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



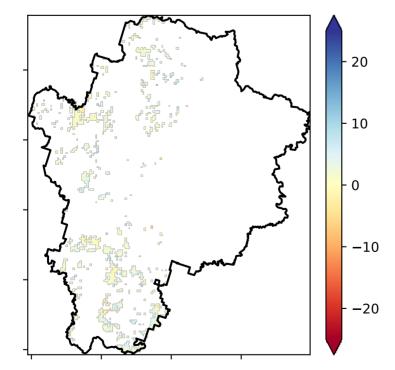
% Area protected from wind erosion (>50%)



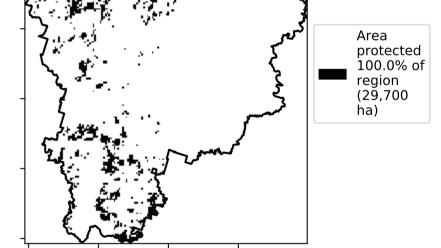
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

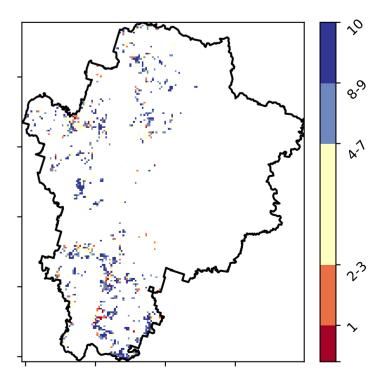
**Total Vegetation Cover Anomaly [%]** 

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

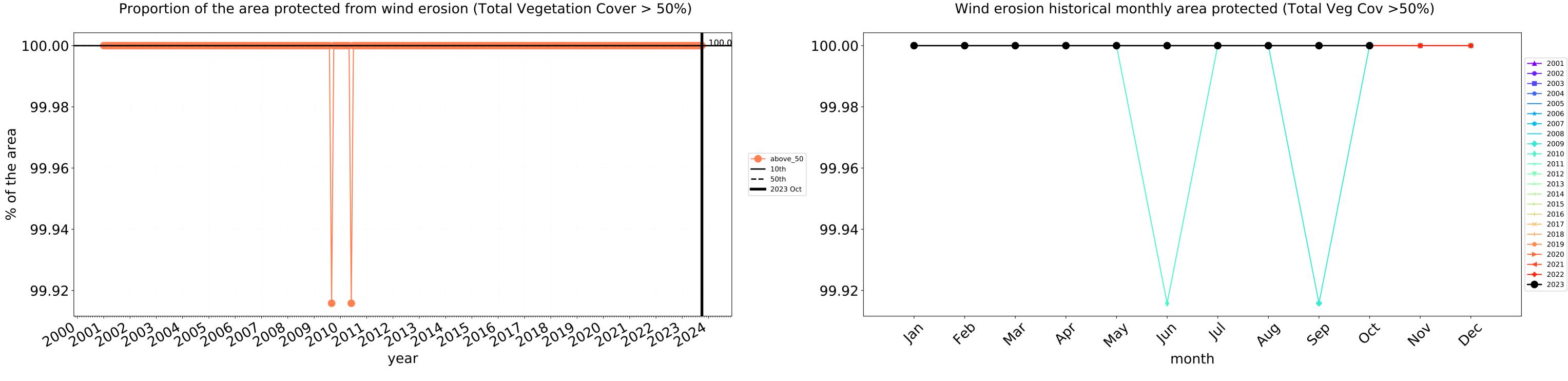


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

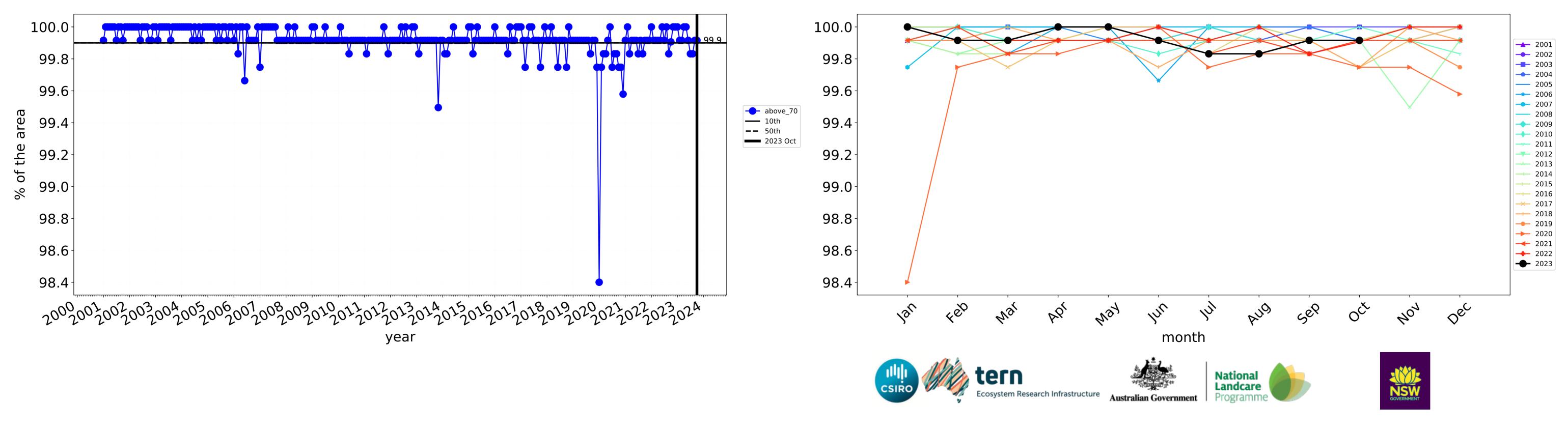




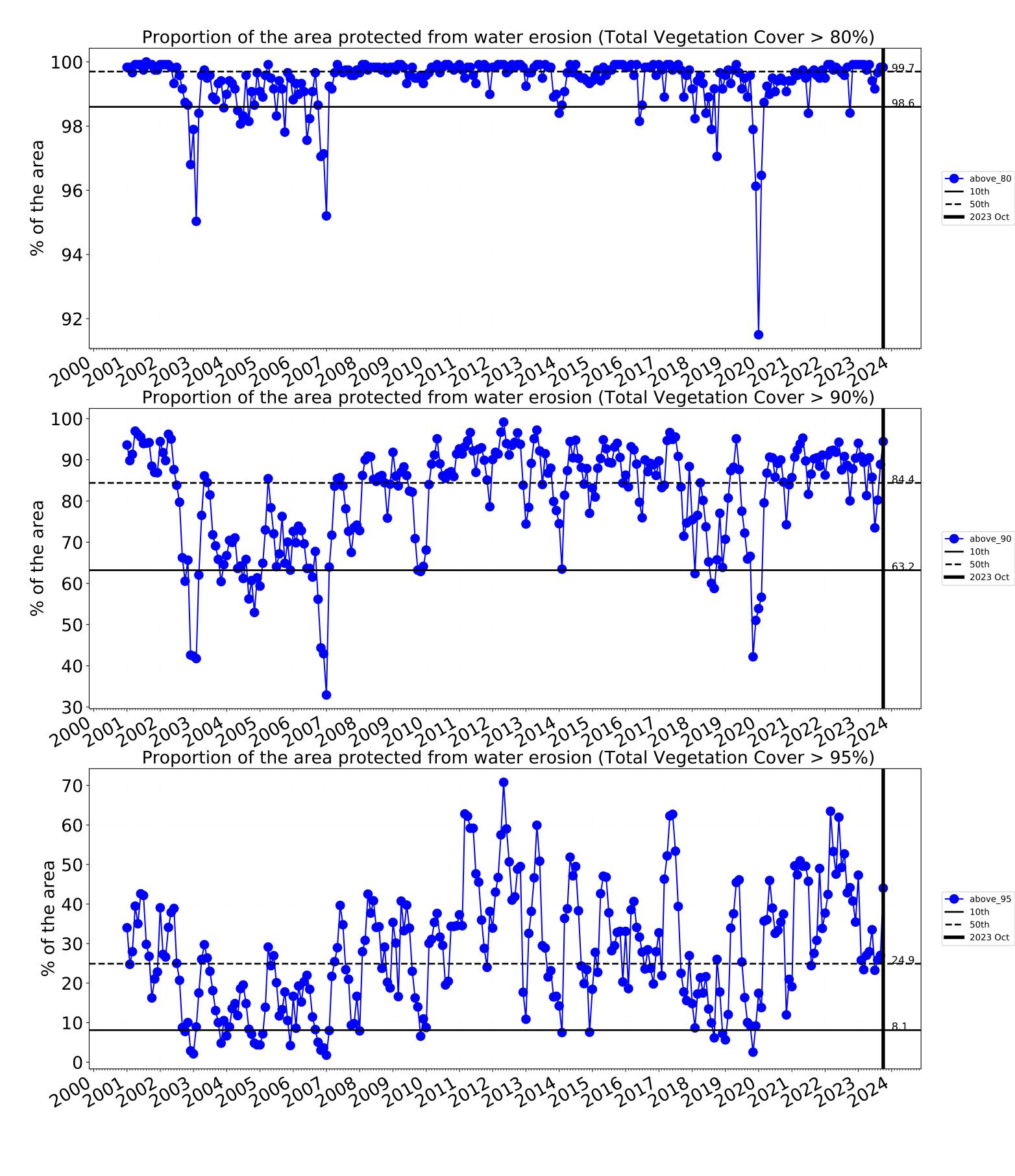


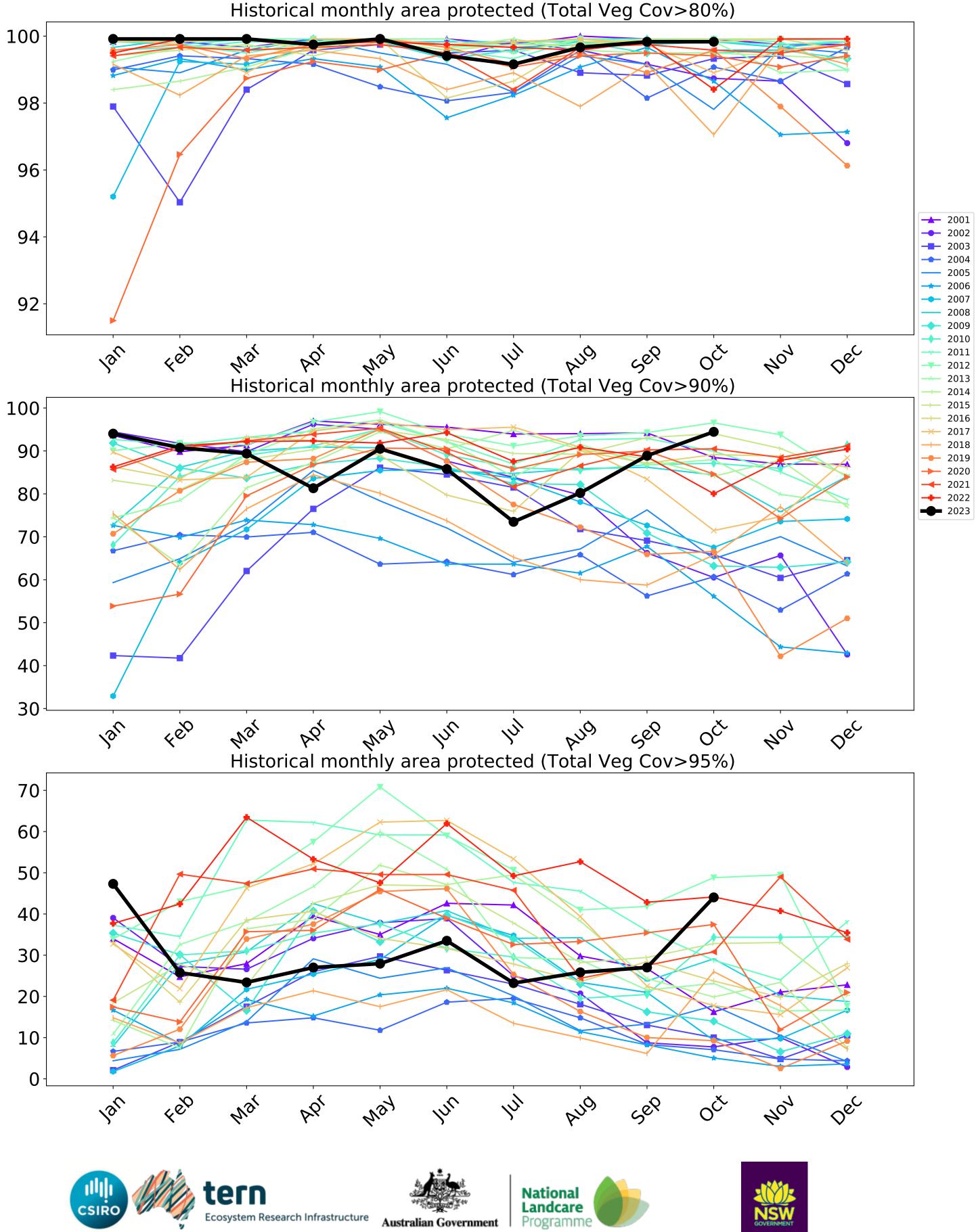


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



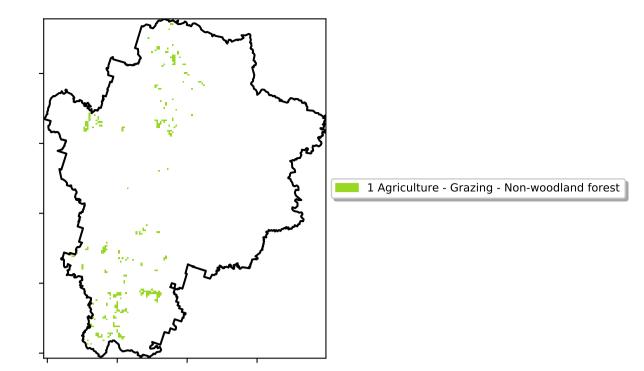
Water erosion historical monthly area protected (Total Veg Cov>70%)



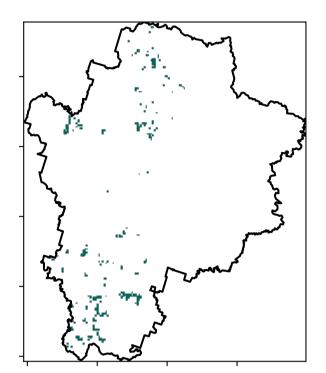


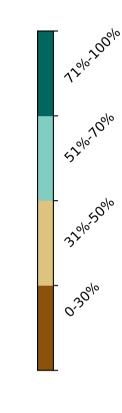
#### **Grazing - Forest (non woodland)**

Land use and forest cover

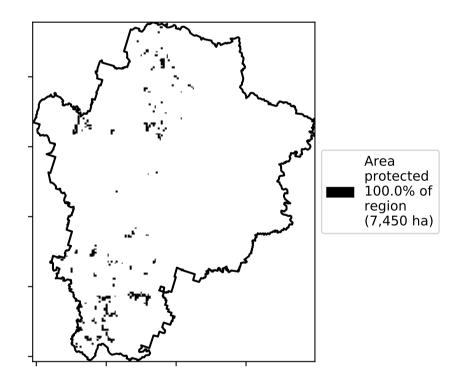


**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



· 20

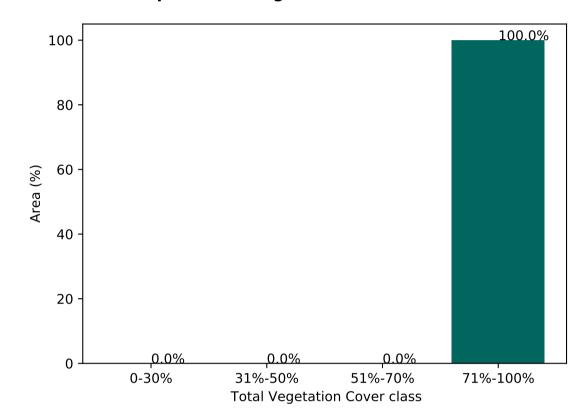
· 10

0

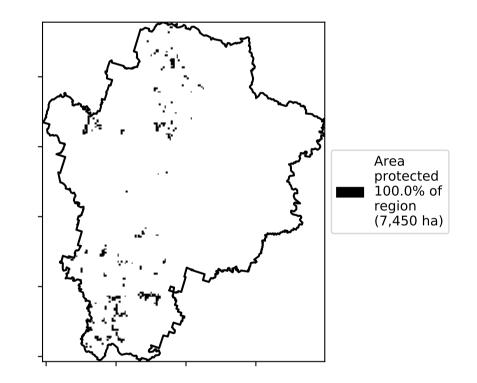
-10

-20

Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

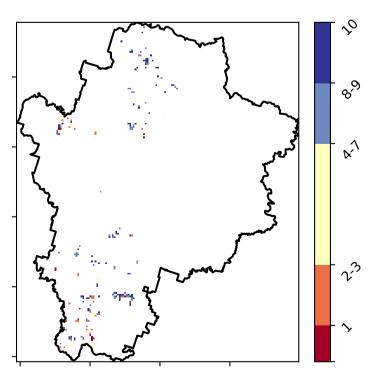




**Total Vegetation Cover Anomaly [%]** 

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 [%]





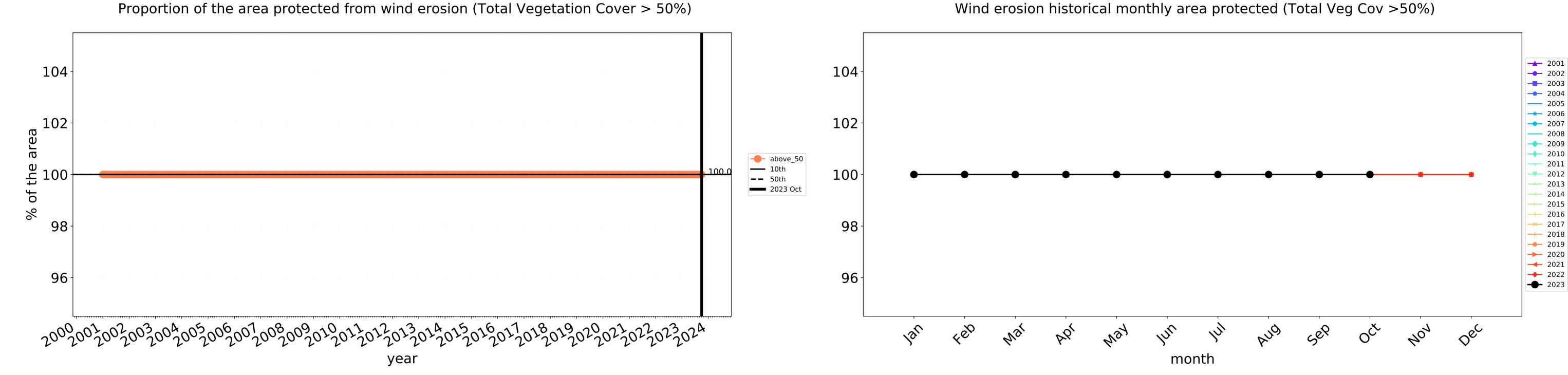
20

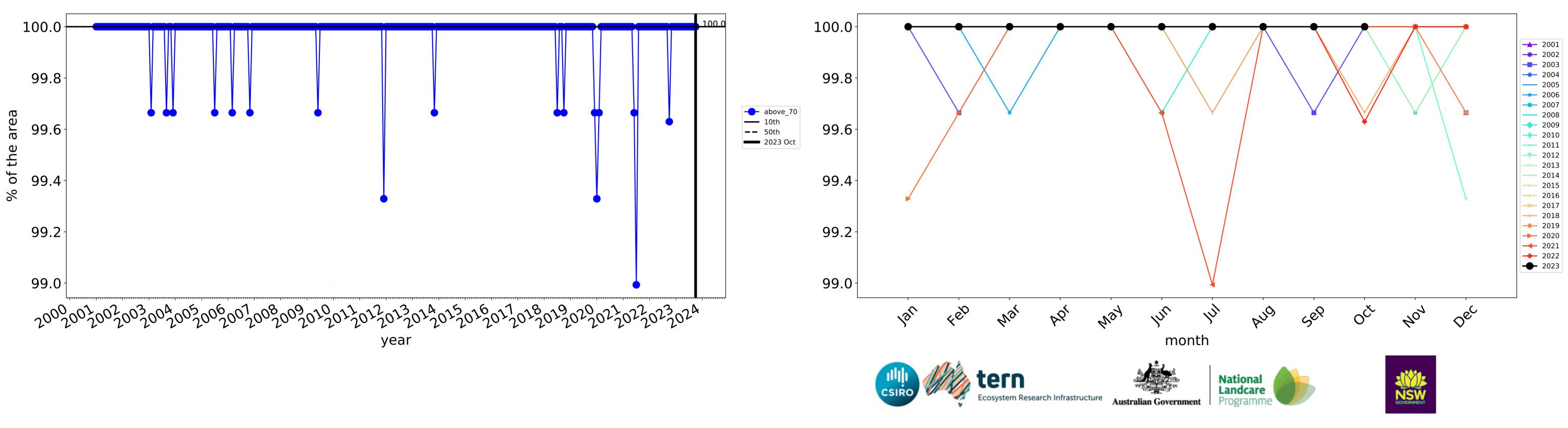
is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Anomaly show how many percetage points each

pixel is from

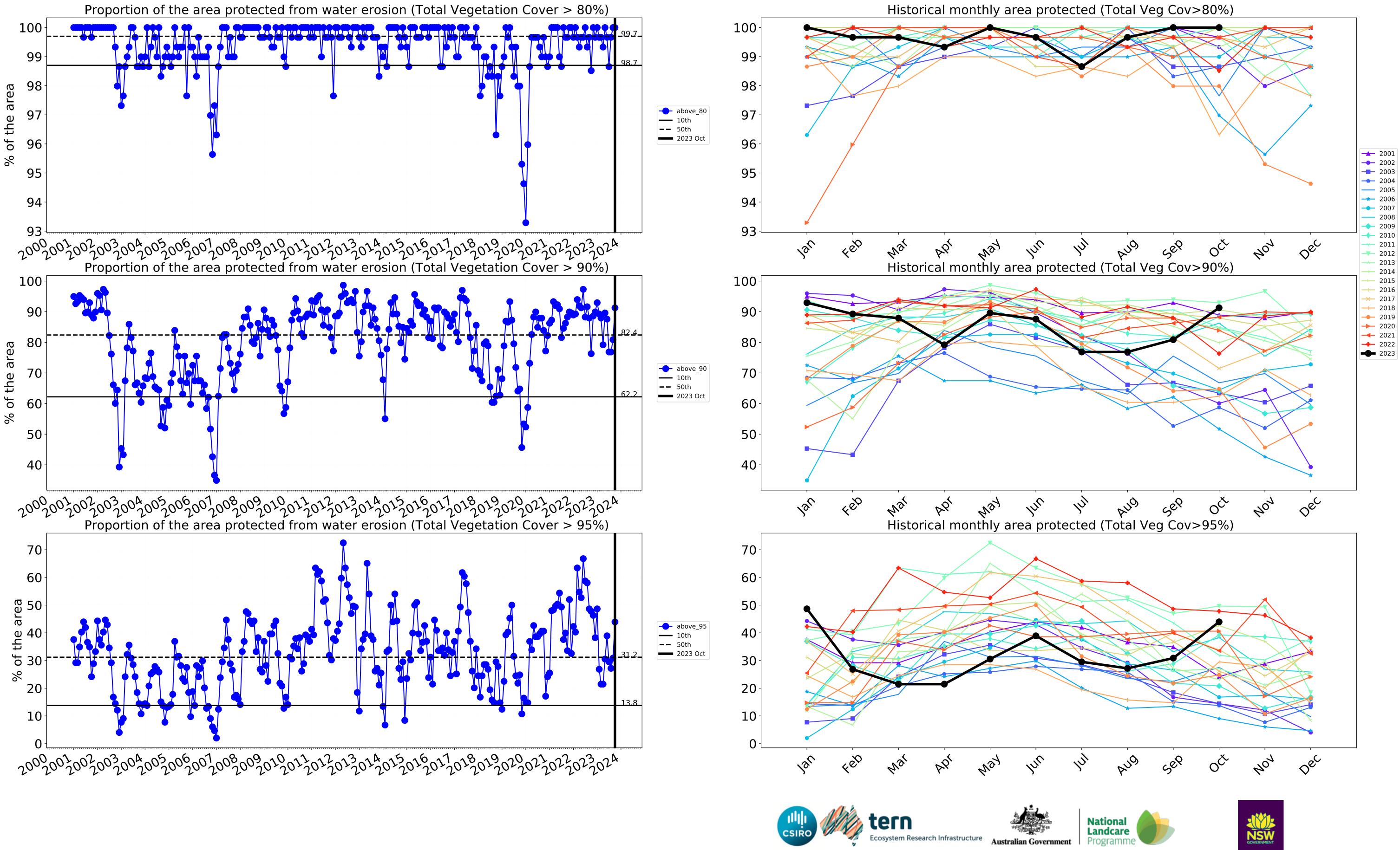
the mean. That





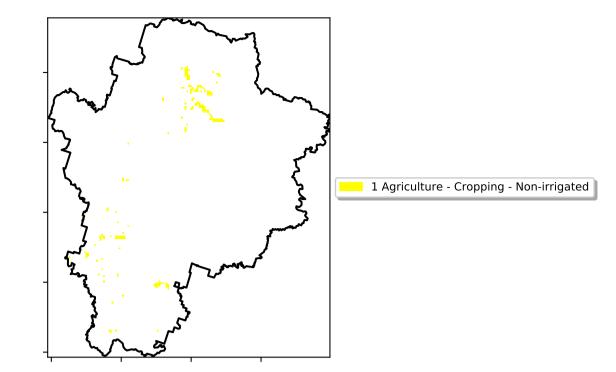
# Grazing - Forest (non woodland) timeseries

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

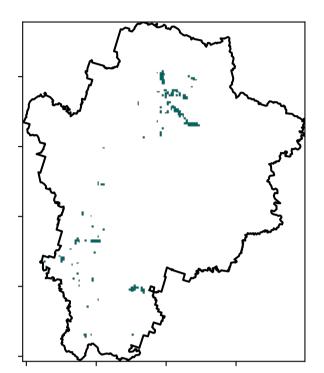


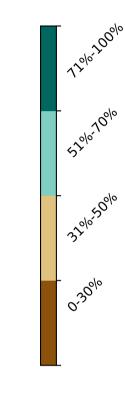
### Cropping

Land use and forest cover

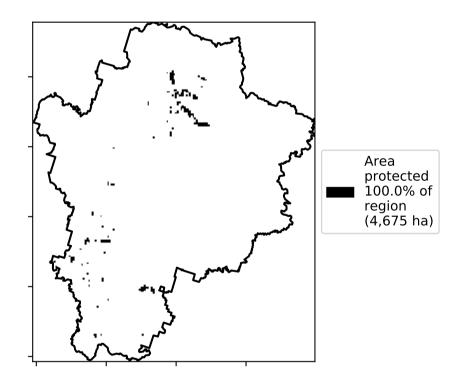


**Total Vegetation Cover [%]** 





% Area protected from water erosion (>70%)



- 20

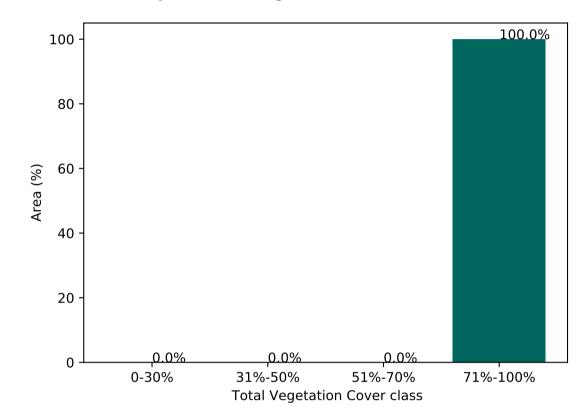
· 10

0

-10

-20

Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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

**Total Vegetation Cover Anomaly [%]** 

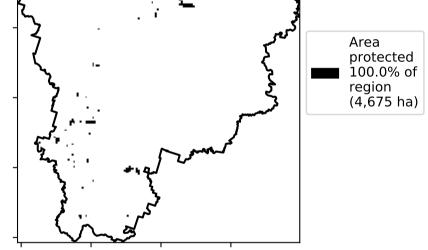
Anomaly show how many percetage points each pixel is from the mean That pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

the mean. That

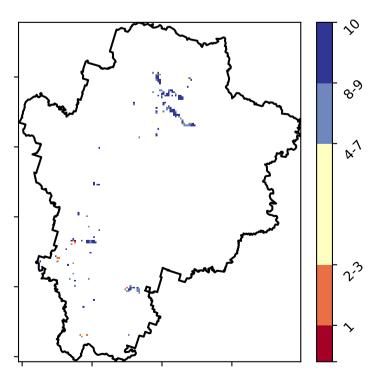
is, red pixels are about 20% lower than the

mean of that

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.

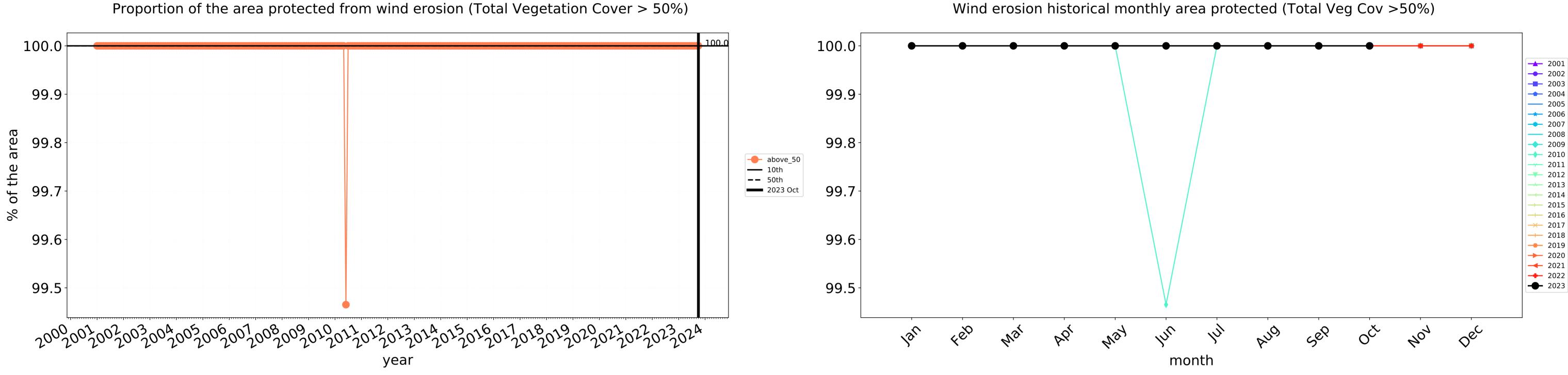


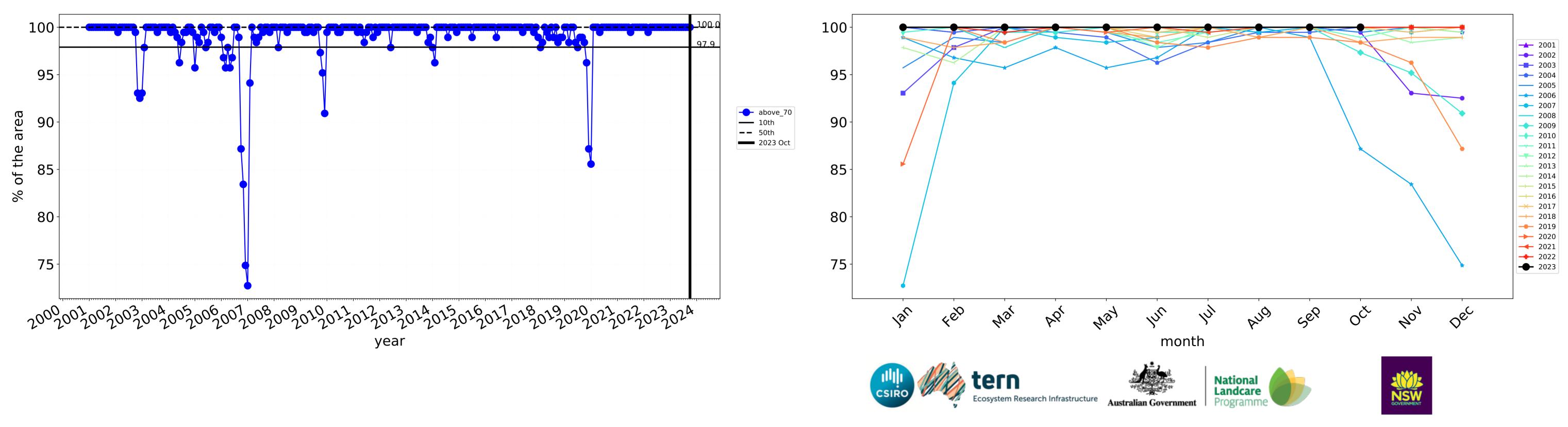
**Total Vegetation Cover Decile [%]** 





29

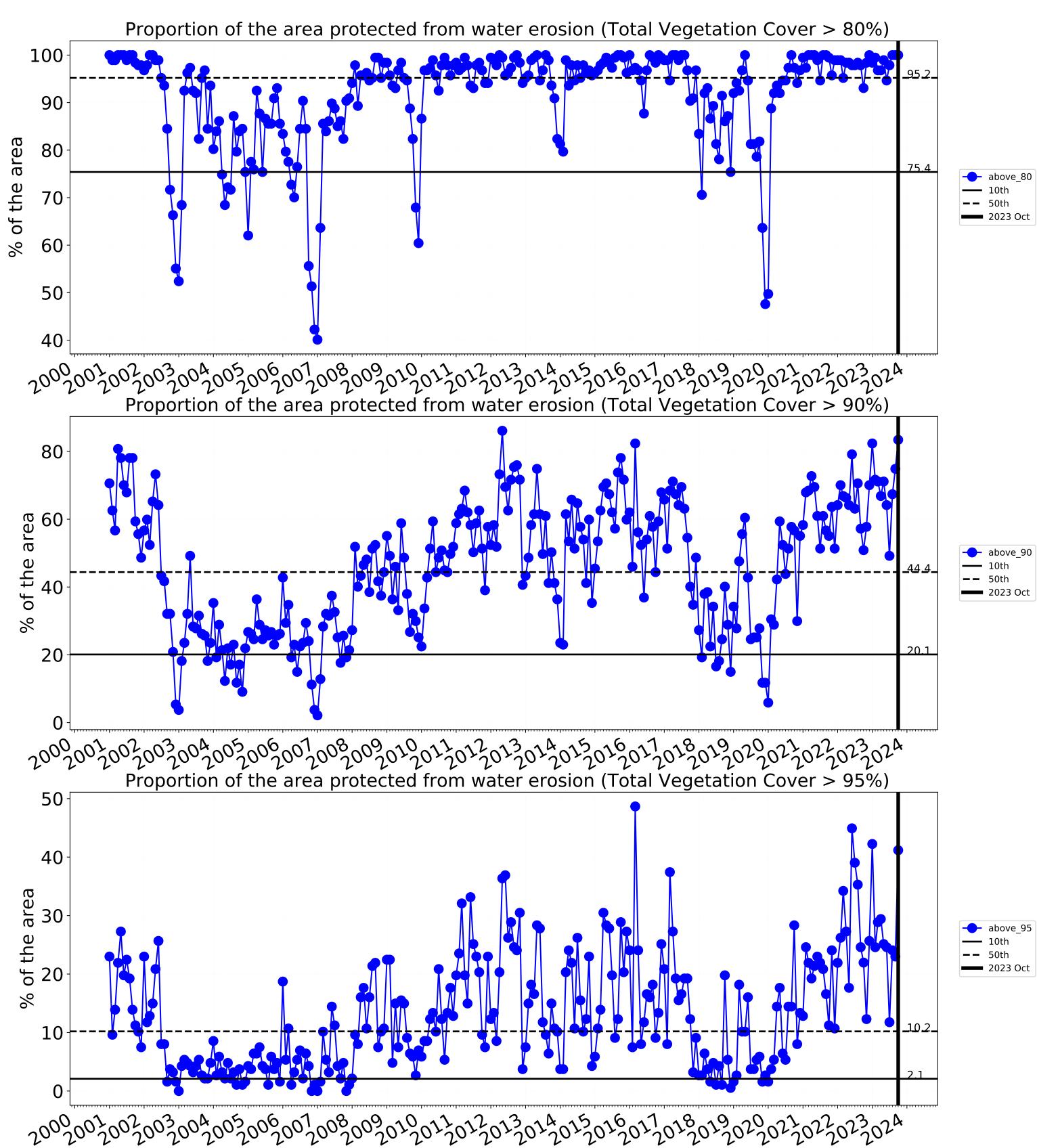


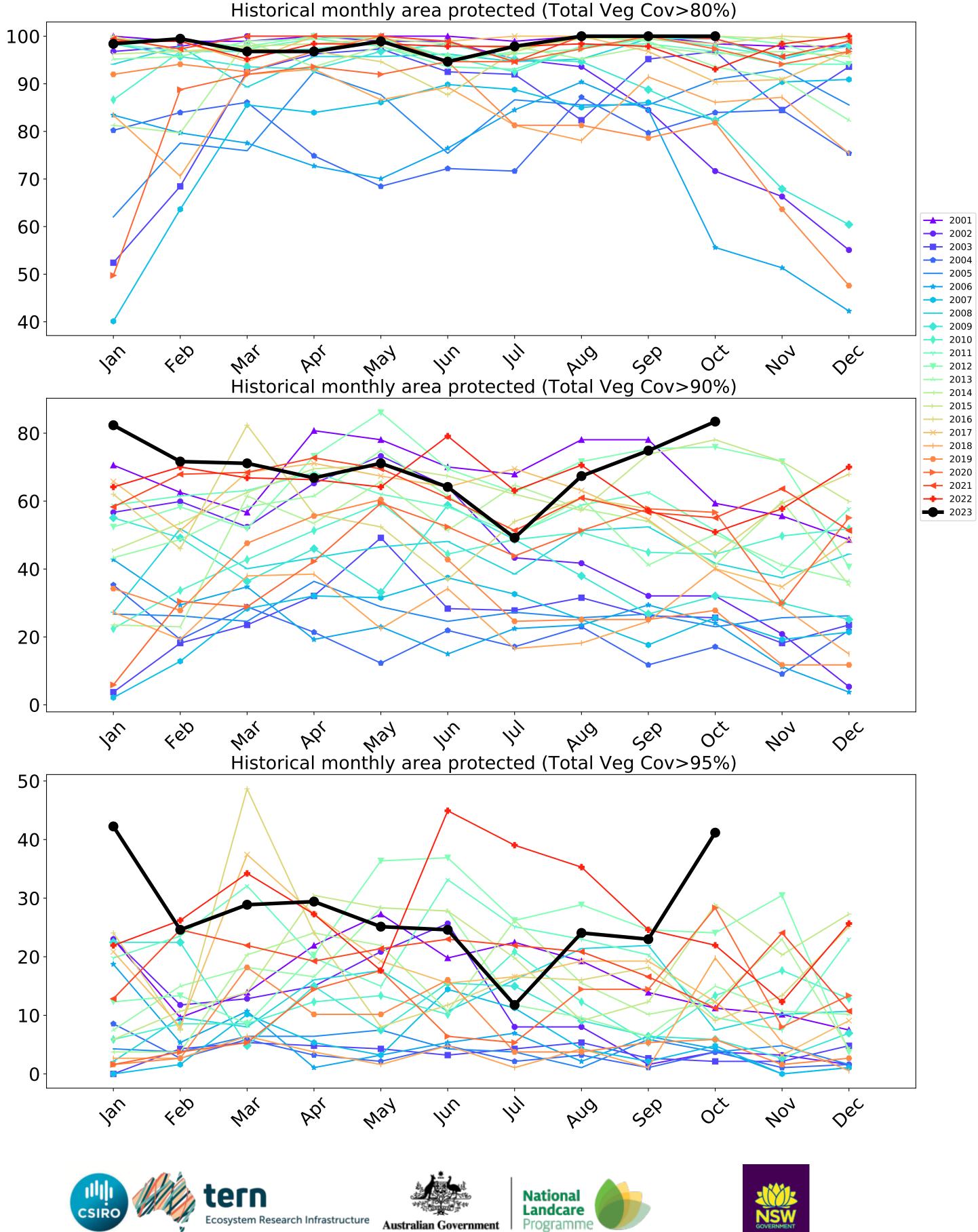


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

# **Cropping timeseries**

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

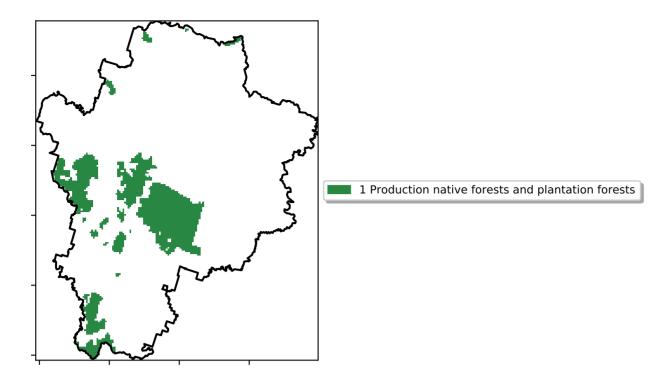




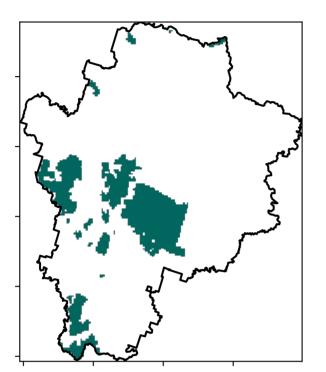
Ecosystem Research Infrastructure Australian Government

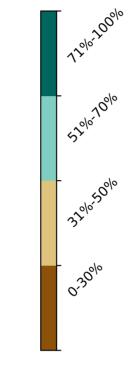
#### **Production native forests and plantation forests**

Land use and forest cover

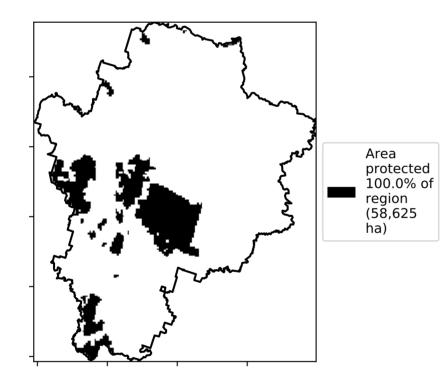


**Total Vegetation Cover [%]** 

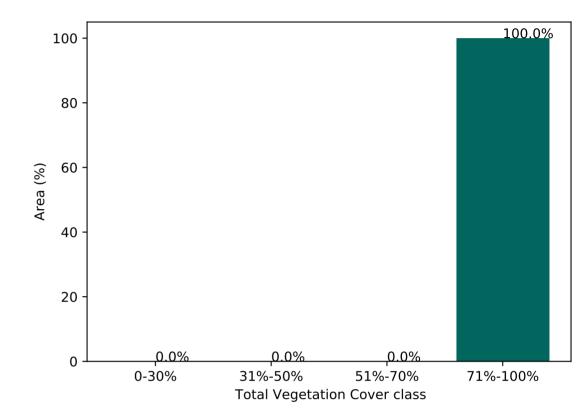




% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

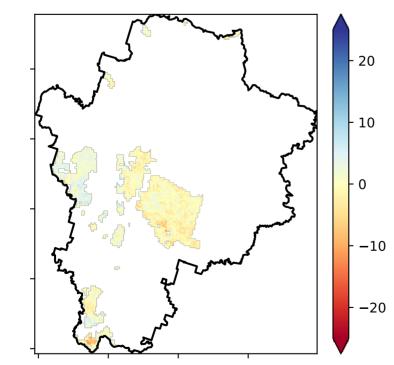
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Catchment Scale Land Use and Forests of Australia (2018)

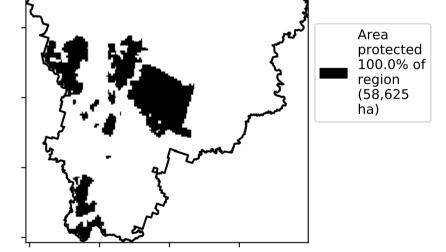
Catchment Scale Land

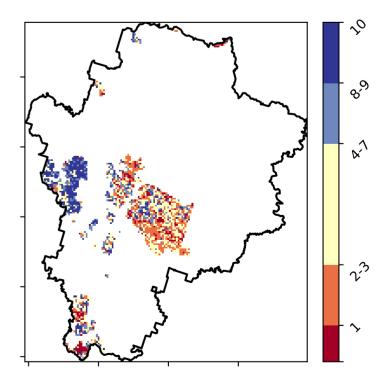
Derived from

Use of Australia (2018) and Forests of Australia (2018)



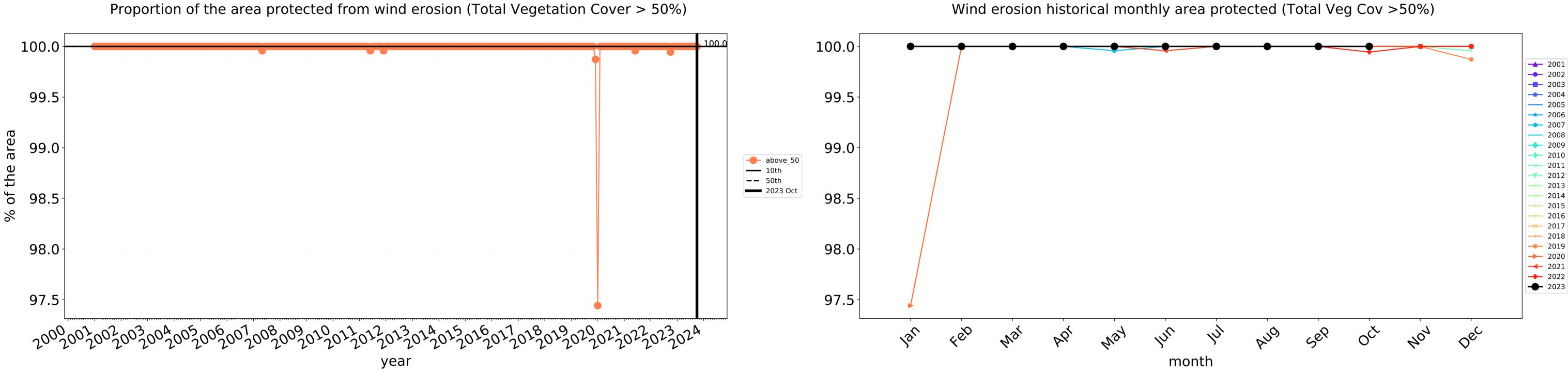
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



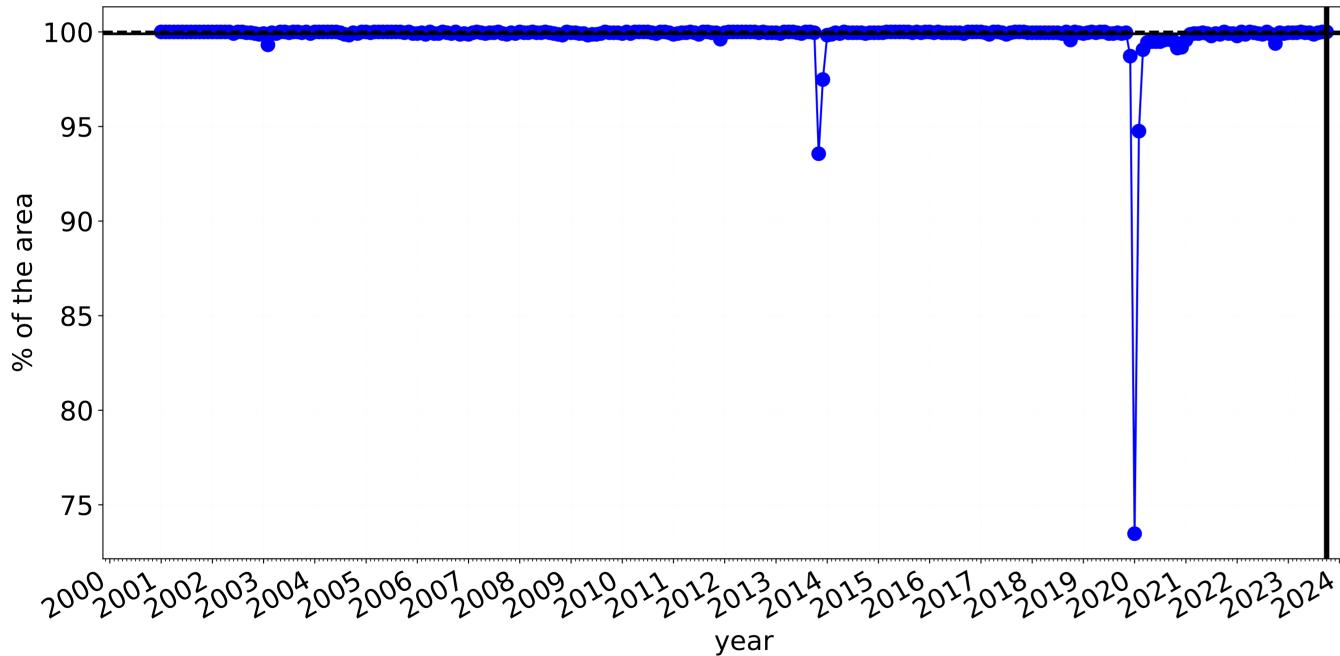




# Production native forests and plantation forests timeseries

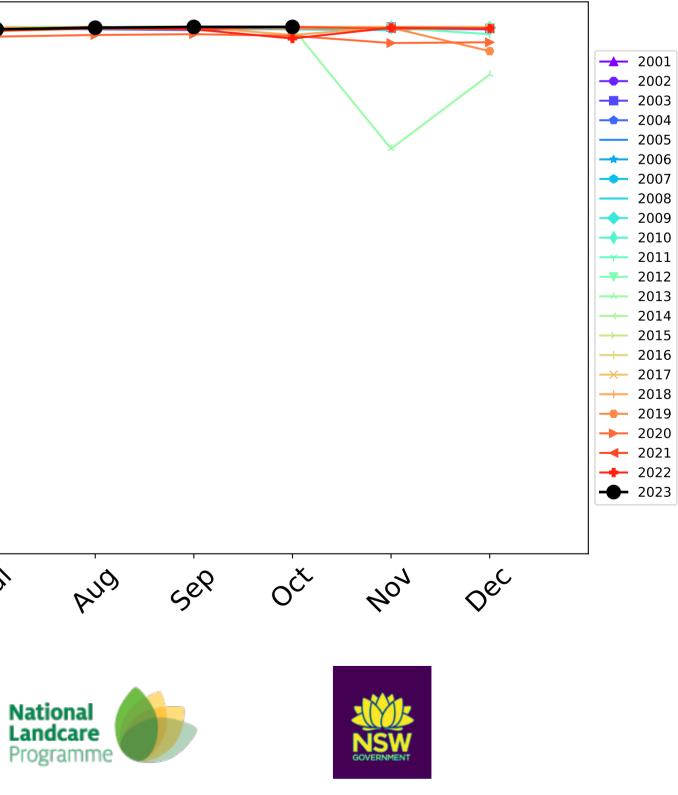


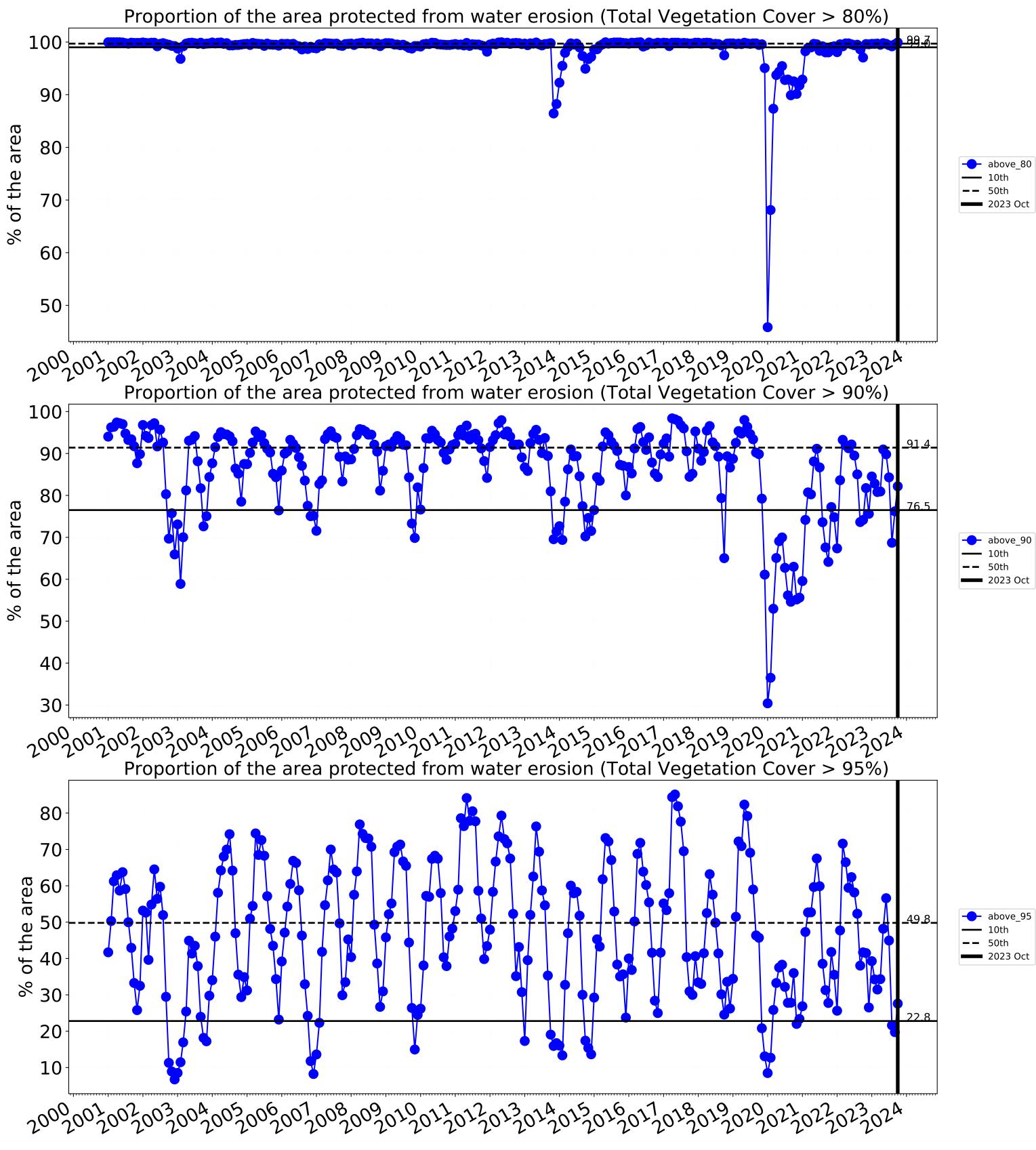
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

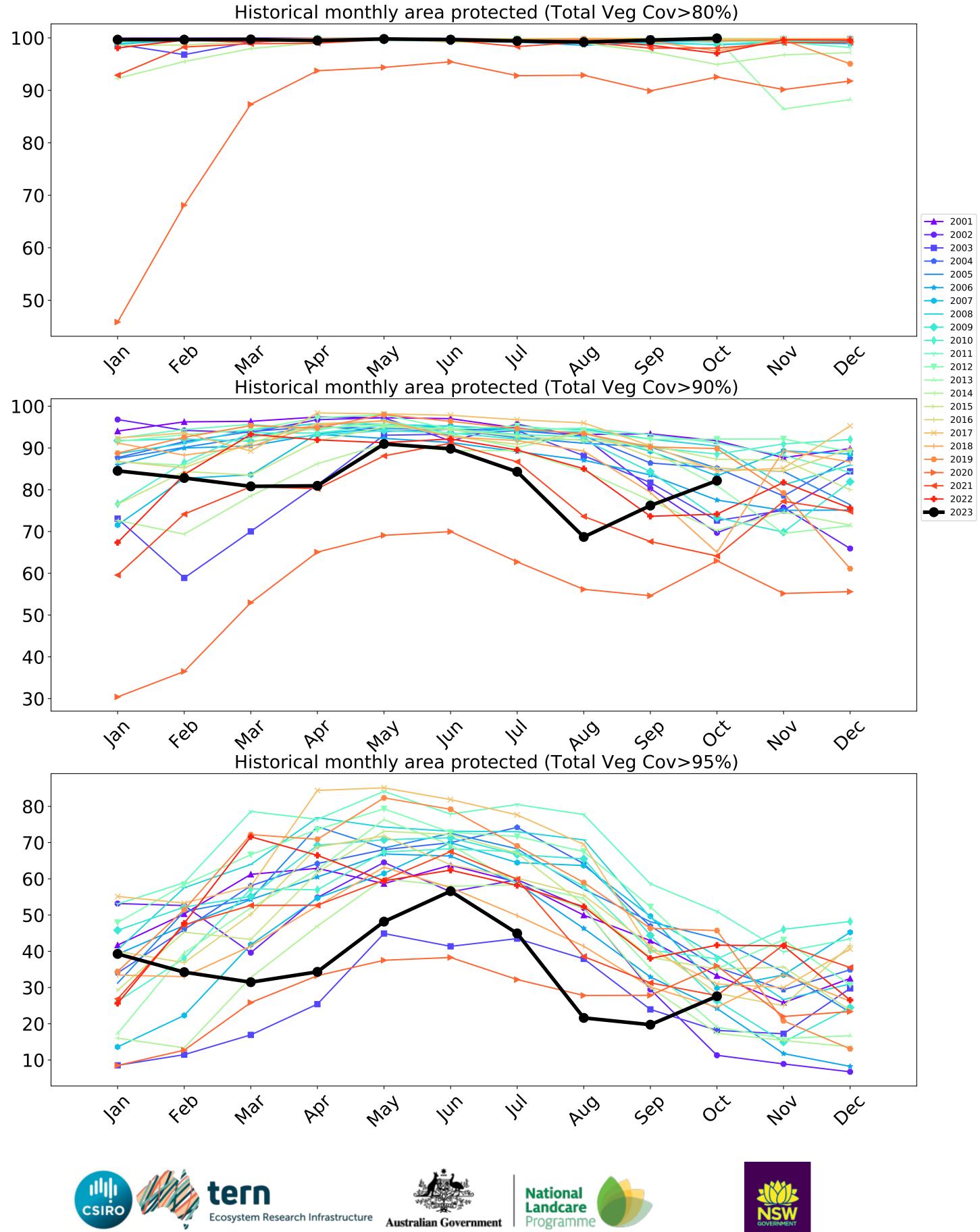


100 95 ---- above\_70 90 **—** 10th **——** 50th **—** 2023 Oct 85 80 75 Jan 4eb way In PQ War hy month tern Ecosystem Research Infrastructure Australian Government

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









above 90

# Lithgow\_(C) (451,125 ha and no data 155 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	451,125	100.0% 451,125	100.0% 451,125	99.9% 450,725	99.5% 449,075	86.3% 389,425	37.9% 171,050
Conservation and natural environments	232,475	100.0% 232,475	100.0% 232,475	100.0% 232,475	99.9% 232,200	83.5% 194,125	29.9% 69,525
Conservation and natural environments Woodland forest	170,775	100.0% 170,775	100.0% 170,775	100.0% 170,775	99.9% 170,625	82.4% 140,800	28.6% 48,850
Conservation and natural environments Forest (non woodland)	60,950	100.0% 60,950	100.0% 60,950	100.0% 60,950	99.8% 60,825	86.3% 52,600	33.4% 20,375
Agriculture	148,825	100.0% 148,825	100.0% 148,825	100.0% 148,775	99.8% 148,550	94.5% 140,650	55.9% 83,150
Grazing	144,100	100.0% 144,100	100.0% 144,100	100.0% 144,050	99.8% 143,825	94.9% 136,725	56.4% 81,225
Grazing non forest	106,950	100.0% 106,950	100.0% 106,950	100.0% 106,925	99.8% 106,725	95.3% 101,875	60.7% 64,875
Grazing Woodland forest	29,700	100.0% 29,700	100.0% 29,700	99.9% 29,675	99.8% 29,650	94.4% 28,050	44.0% 13,075
Grazing - Forest (non woodland)	7,450	100.0% 7,450	100.0% 7,450	100.0% 7,450	100.0% 7,450	91.3% 6,800	44.0% 3,275
Cropping	4,675	100.0% 4,675	100.0% 4,675	100.0% 4,675	100.0% 4,675	83.4% 3,900	41.2% 1,925
Production native forests and plantation forests	58,625	100.0% 58,625	100.0% 58,625	100.0% 58,625	99.9% 58,575	82.2% 48,175	27.6% 16,175

