# Total vegetation cover soil protection Region:NRM Hunter NSW

# **Date: September 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:

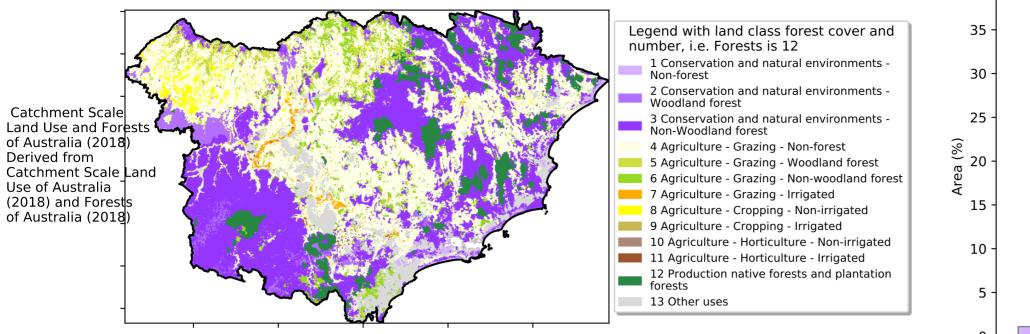
https://doi.org/10.4225/08/5848a3f19a7b3



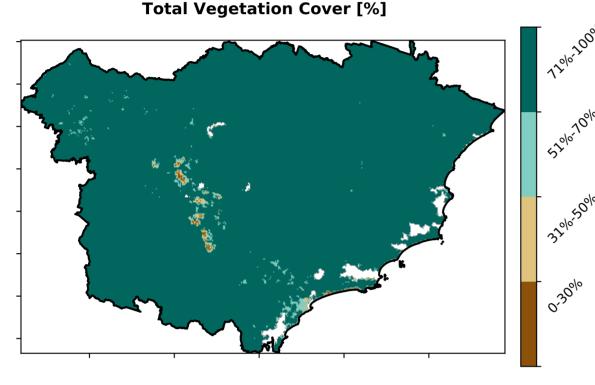
# **Vegetation Cover Sep 2023**

#### Land use and forest cover

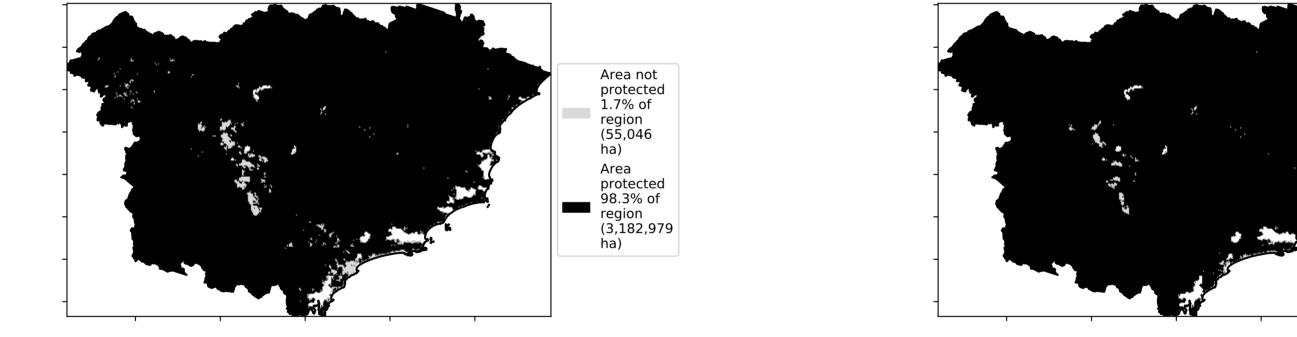
### Proportion of each land class in area

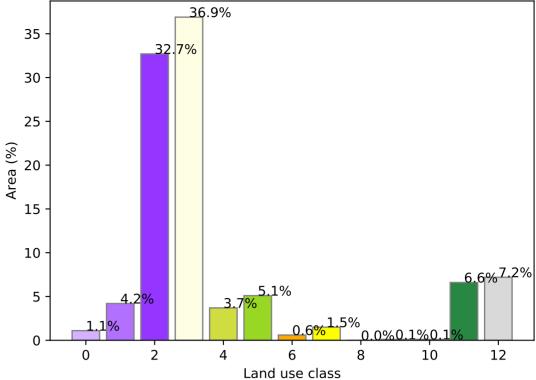




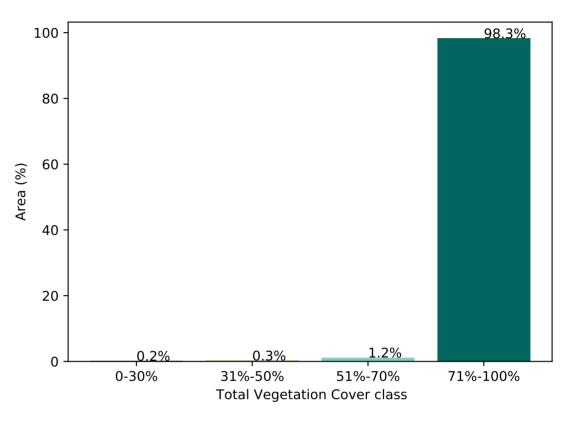


#### % Area protected from water erosion (>70%)

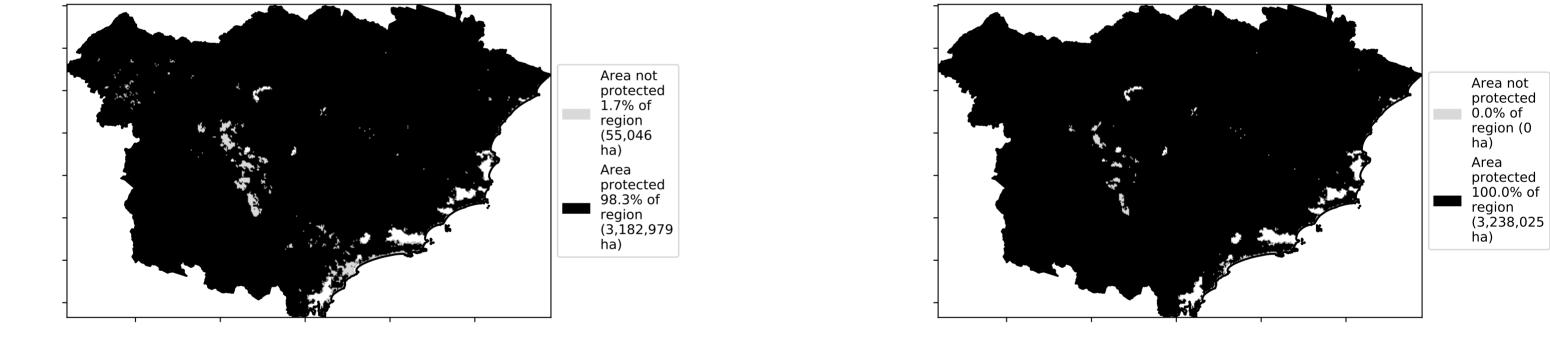




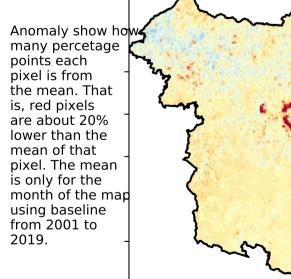
#### Proportion of vegetation cover class in area

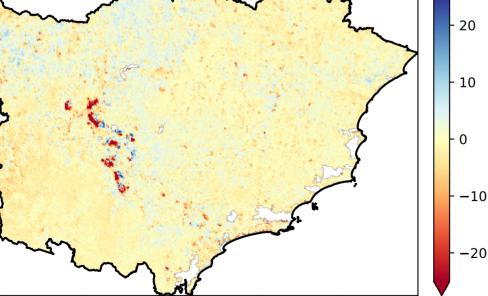


### % Area protected from wind erosion (>50%)



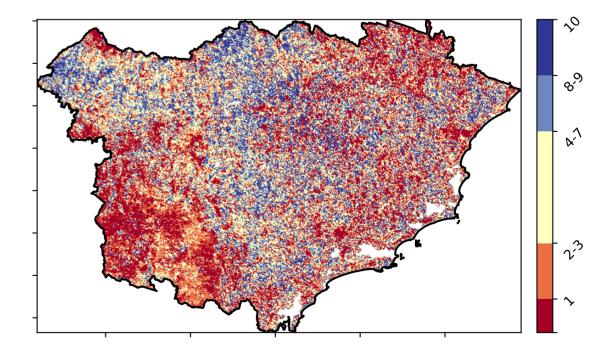




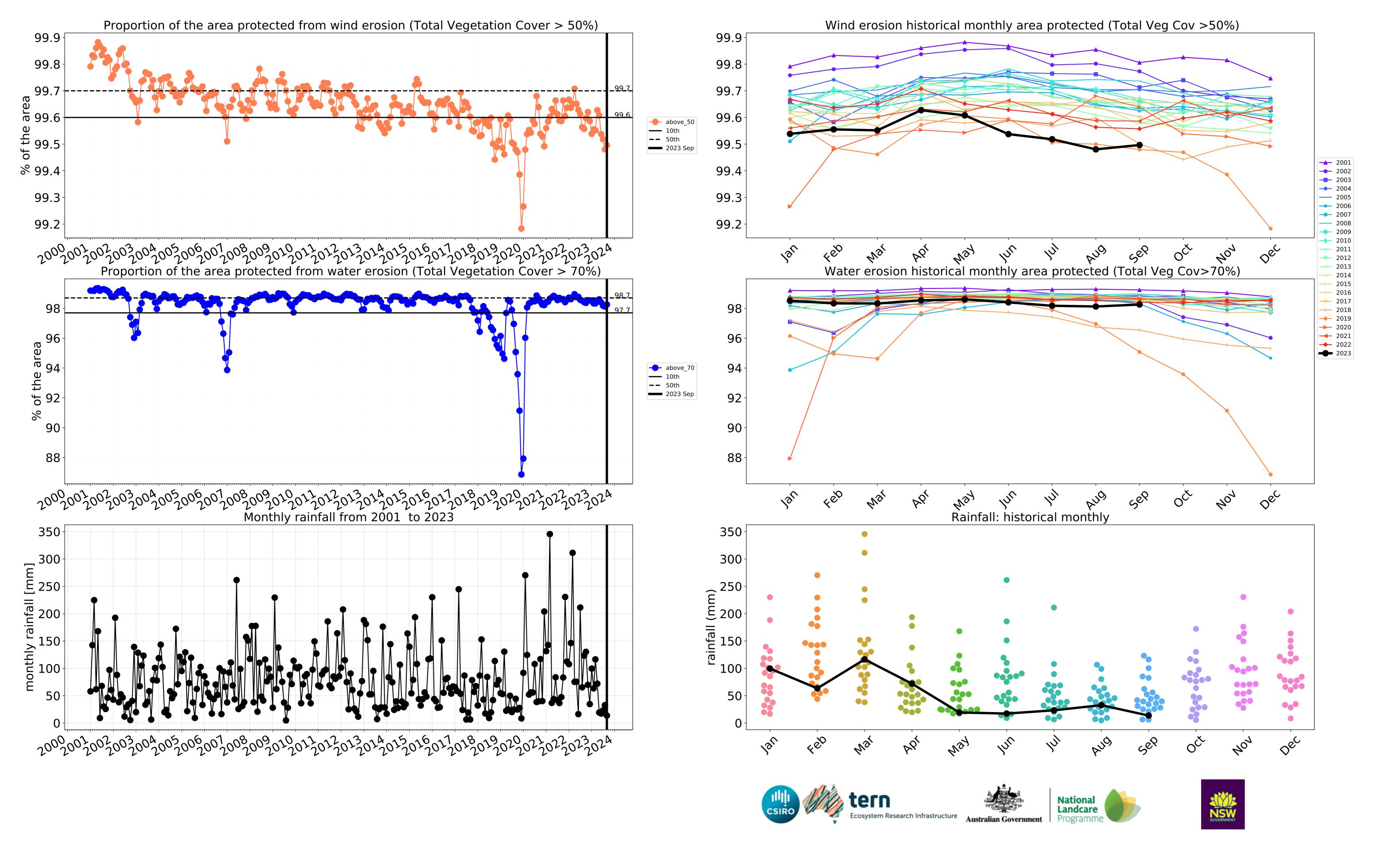


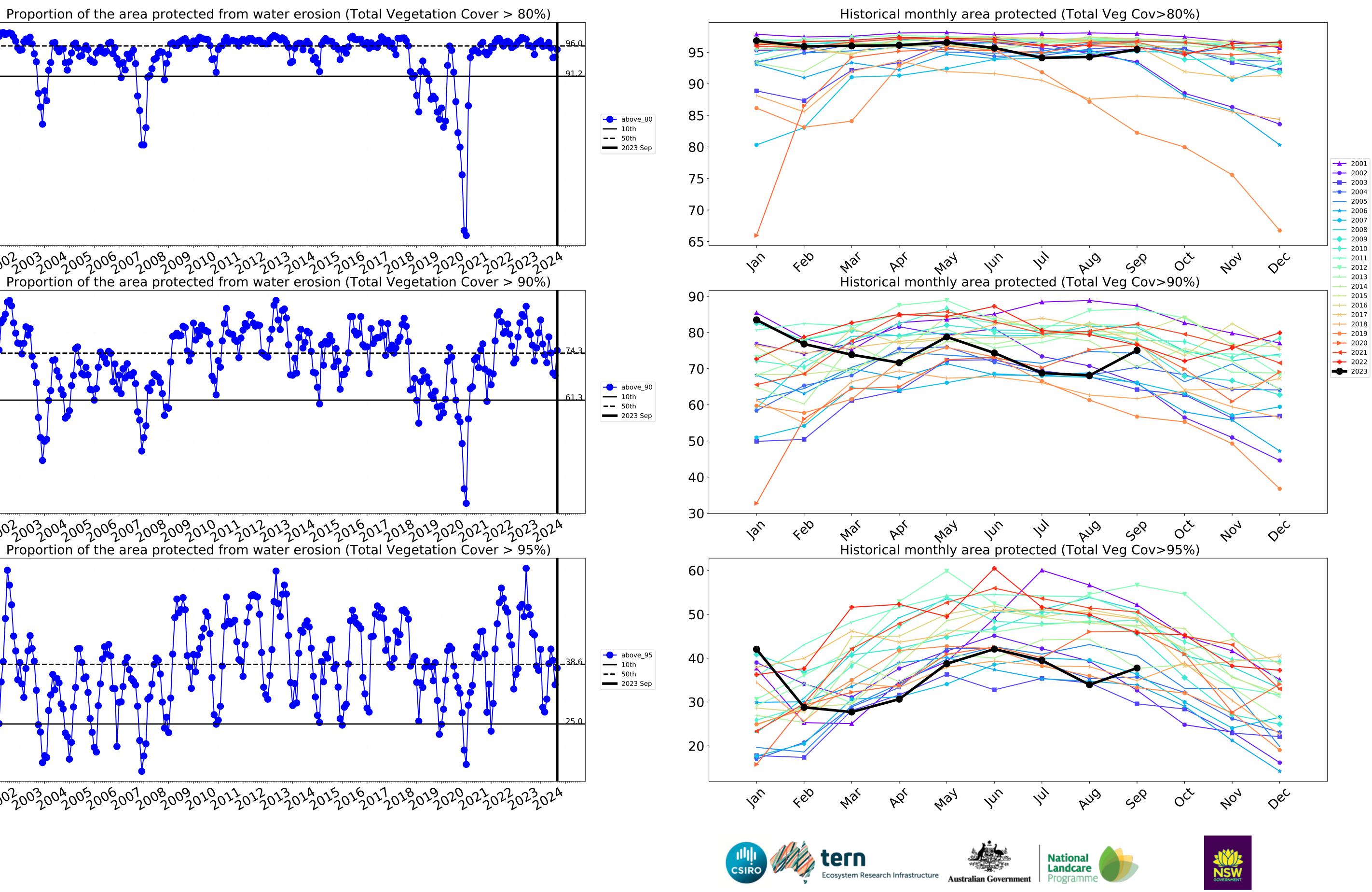
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

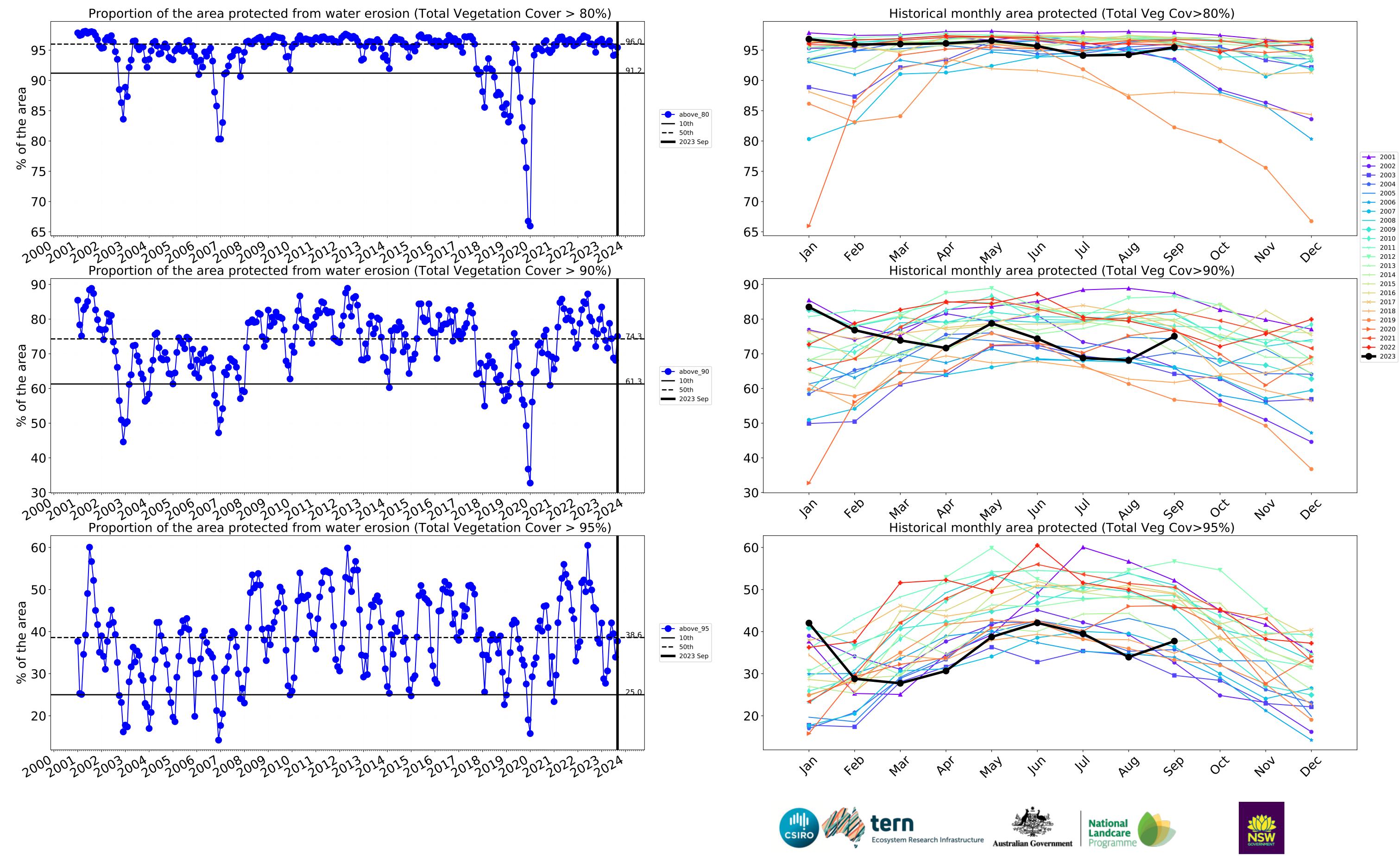




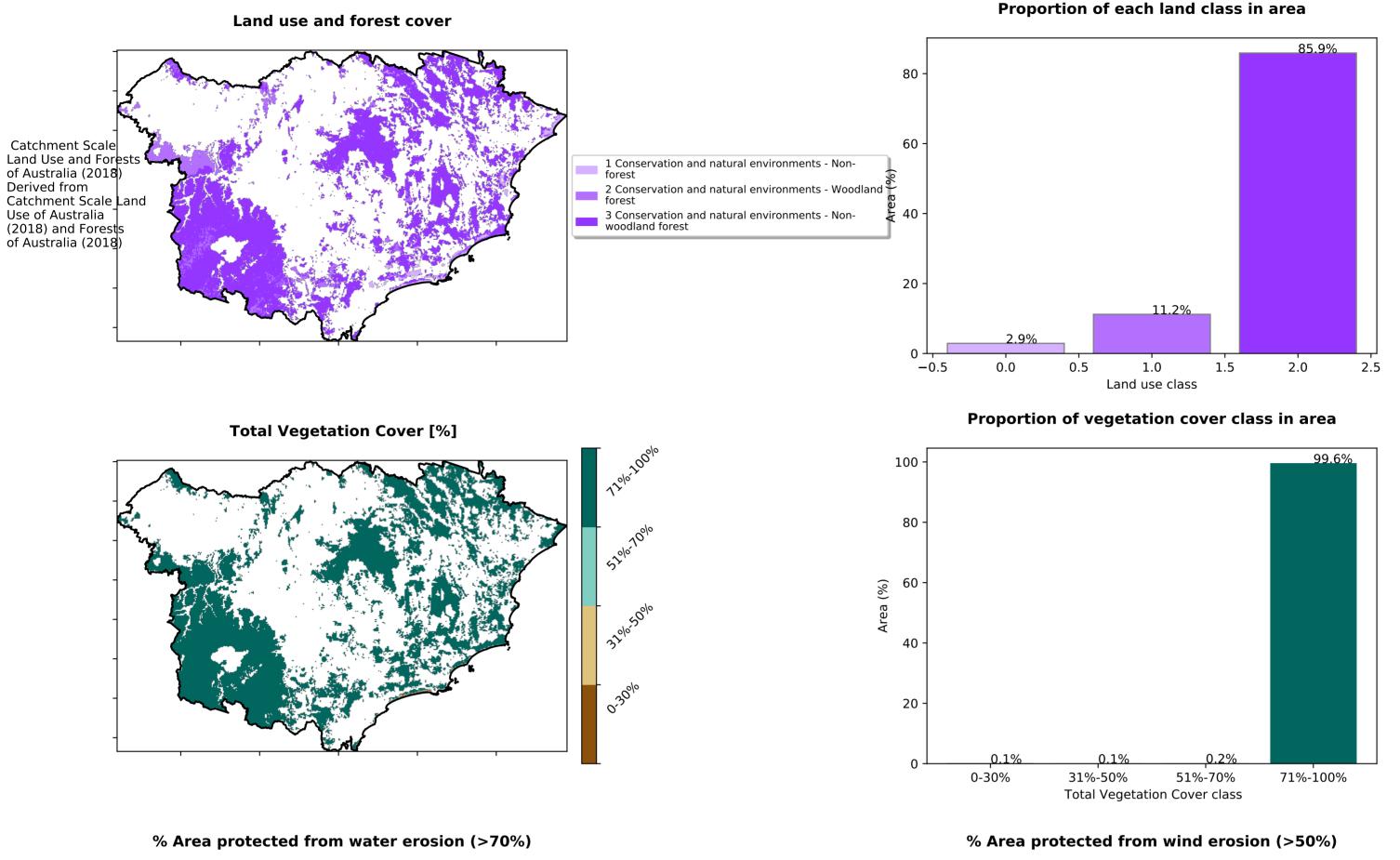


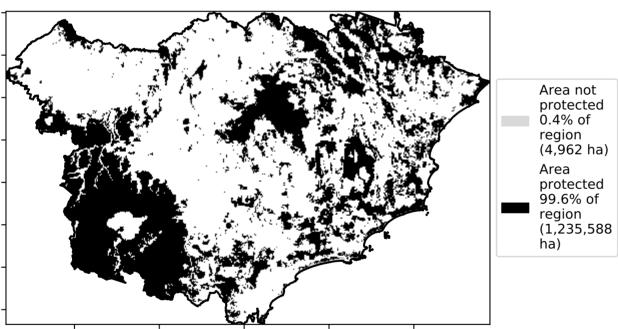


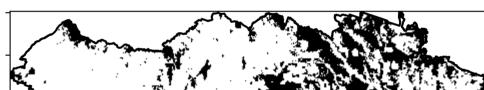




### **Conservation and natural environments**

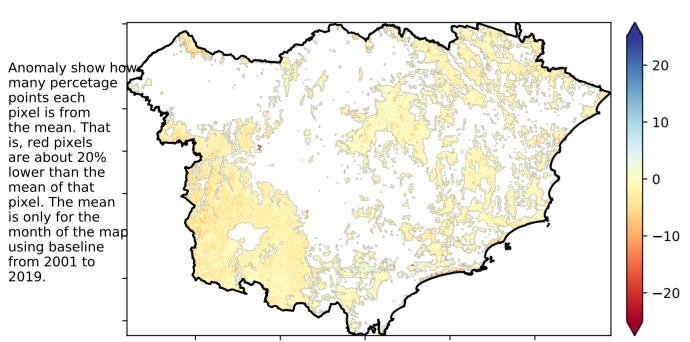






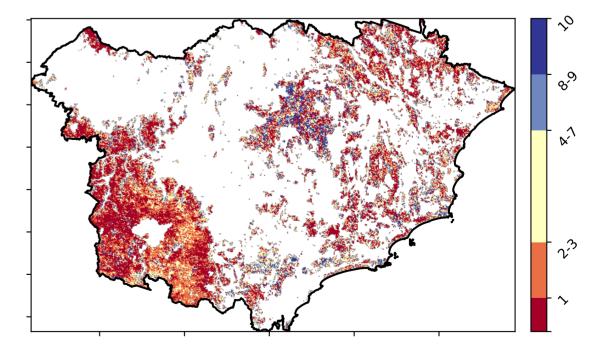
Area not protected 0.0% of region (0 ha) Area protected 100.0% of region (1,240,550 ha)

**Total Vegetation Cover Anomaly [%]** 

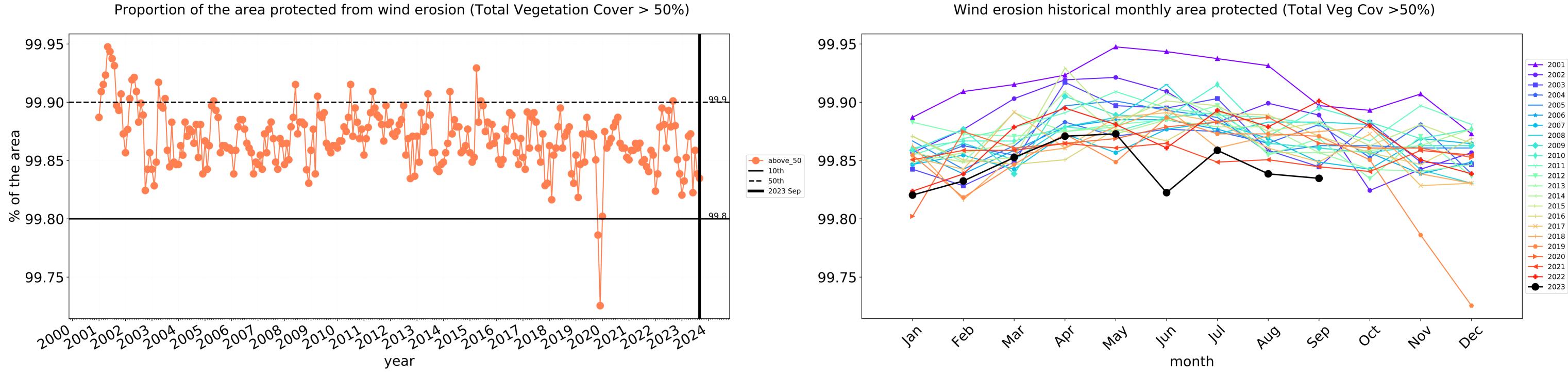


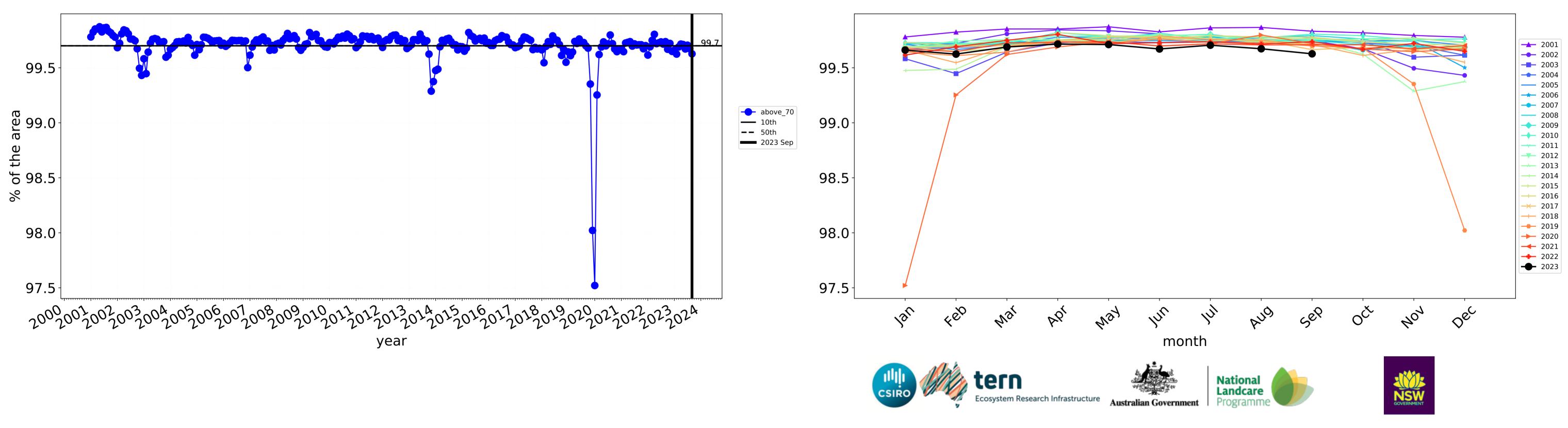
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

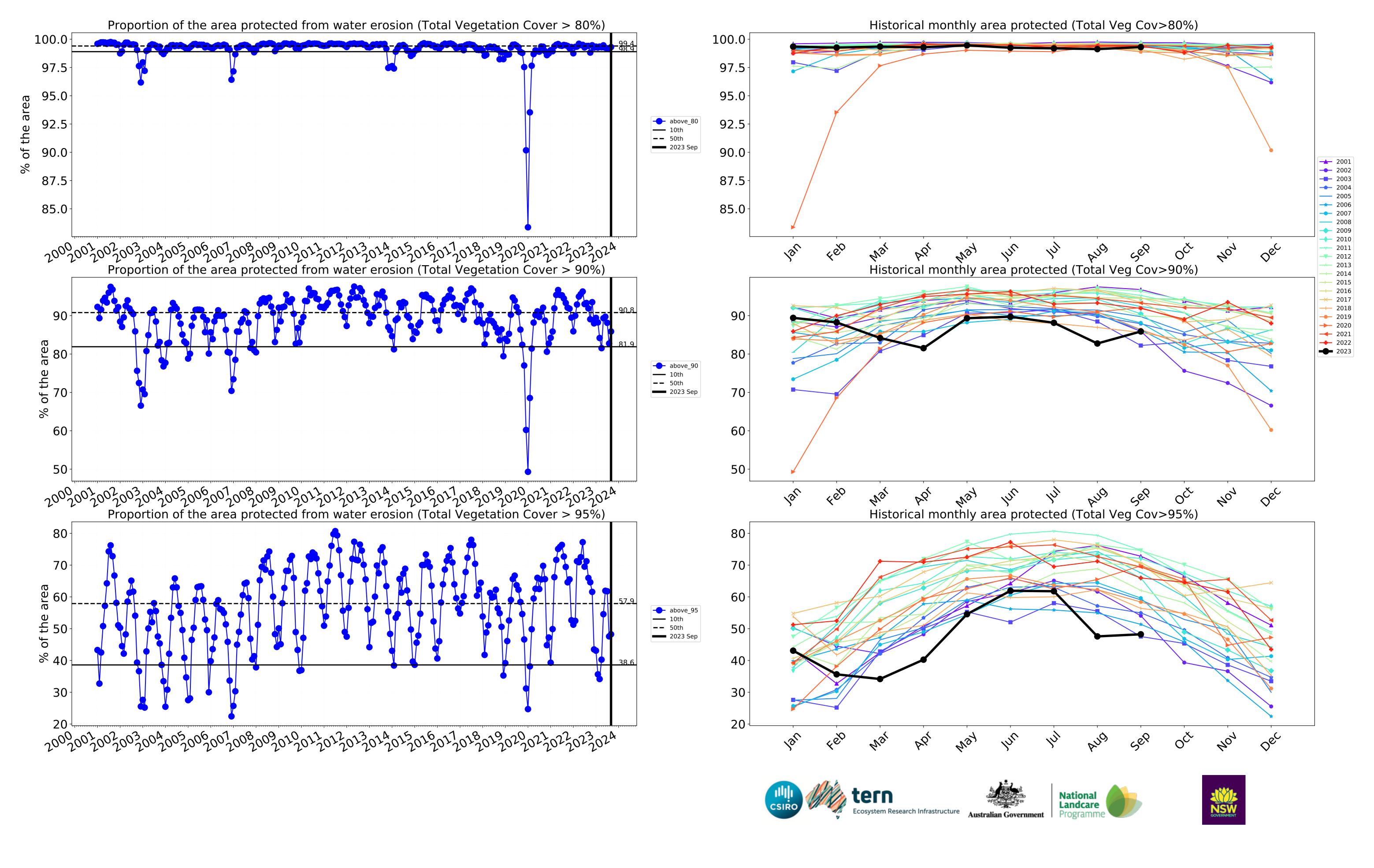




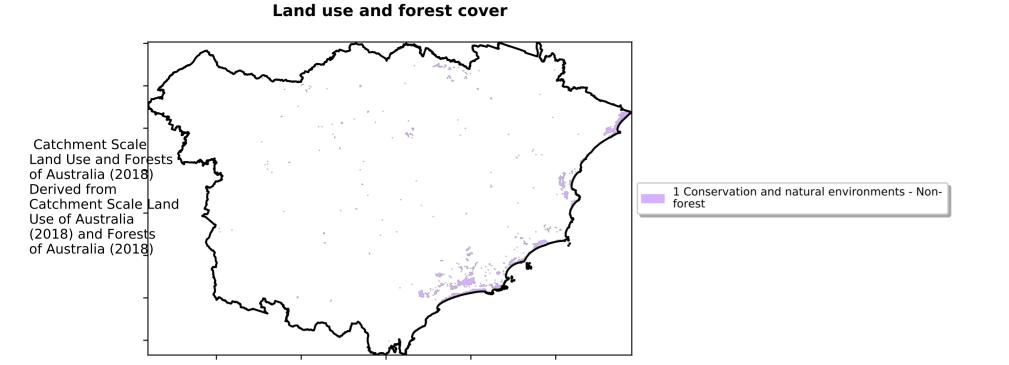




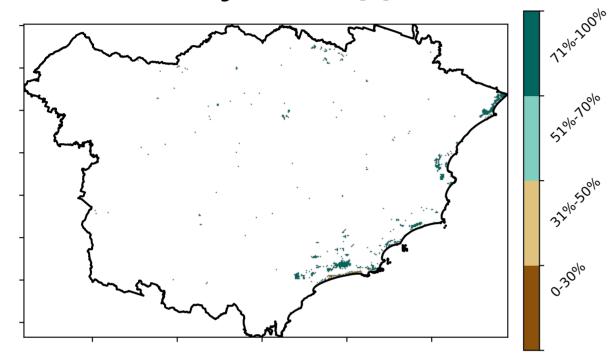
Water erosion historical monthly area protected (Total Veg Cov>70%)



### **Conservation and natural environments non forest**

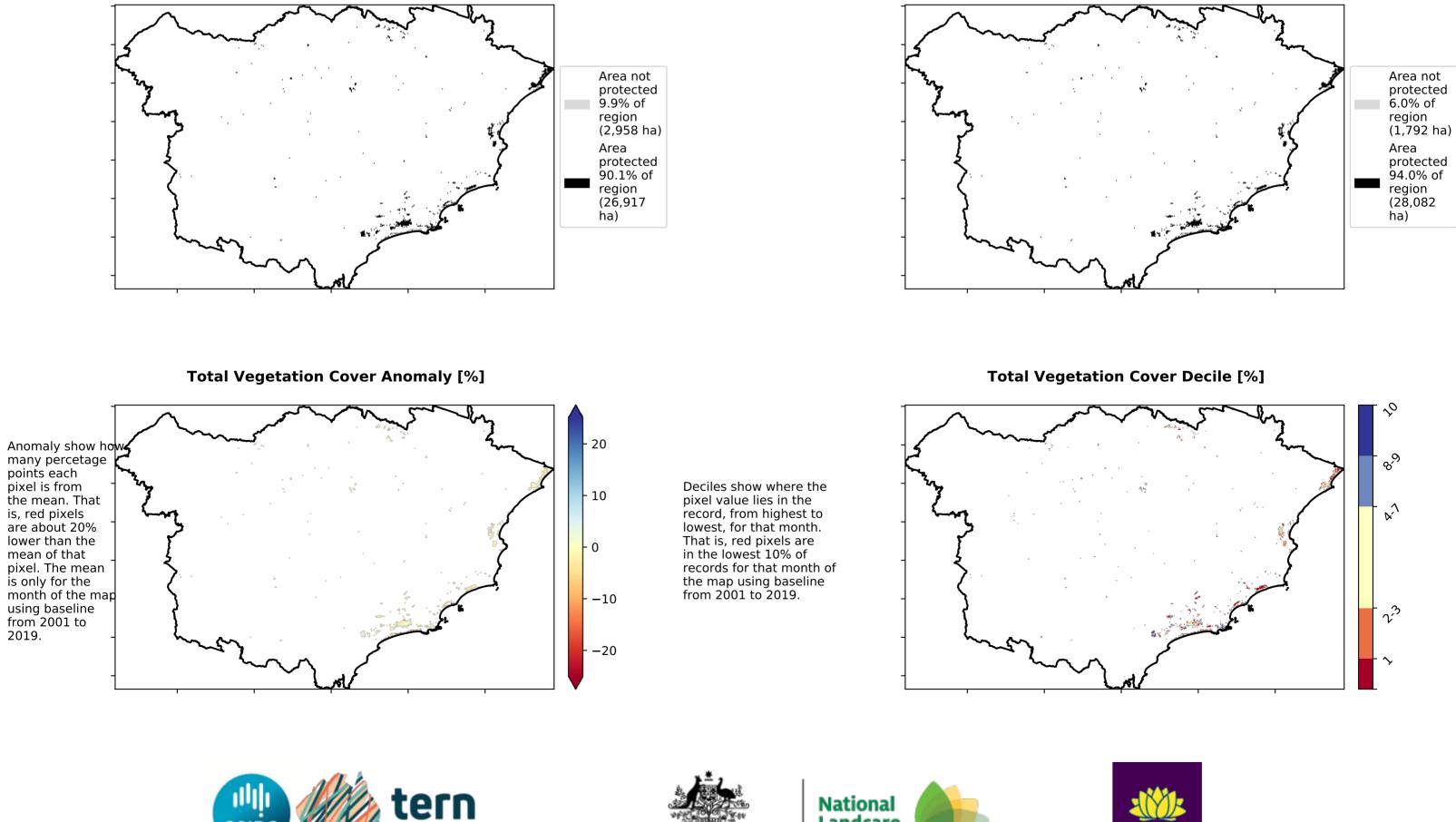


**Total Vegetation Cover [%]** 



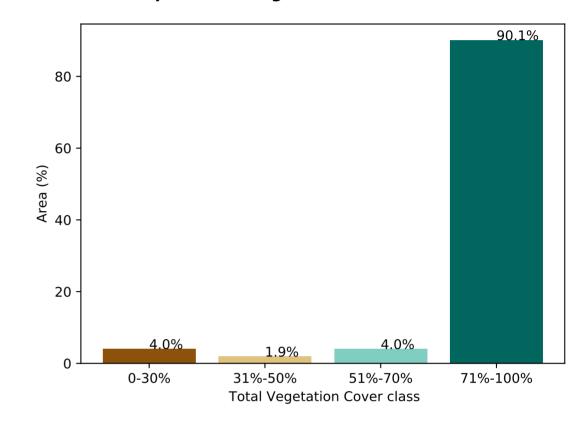
% Area protected from water erosion (>70%)

CSIRO

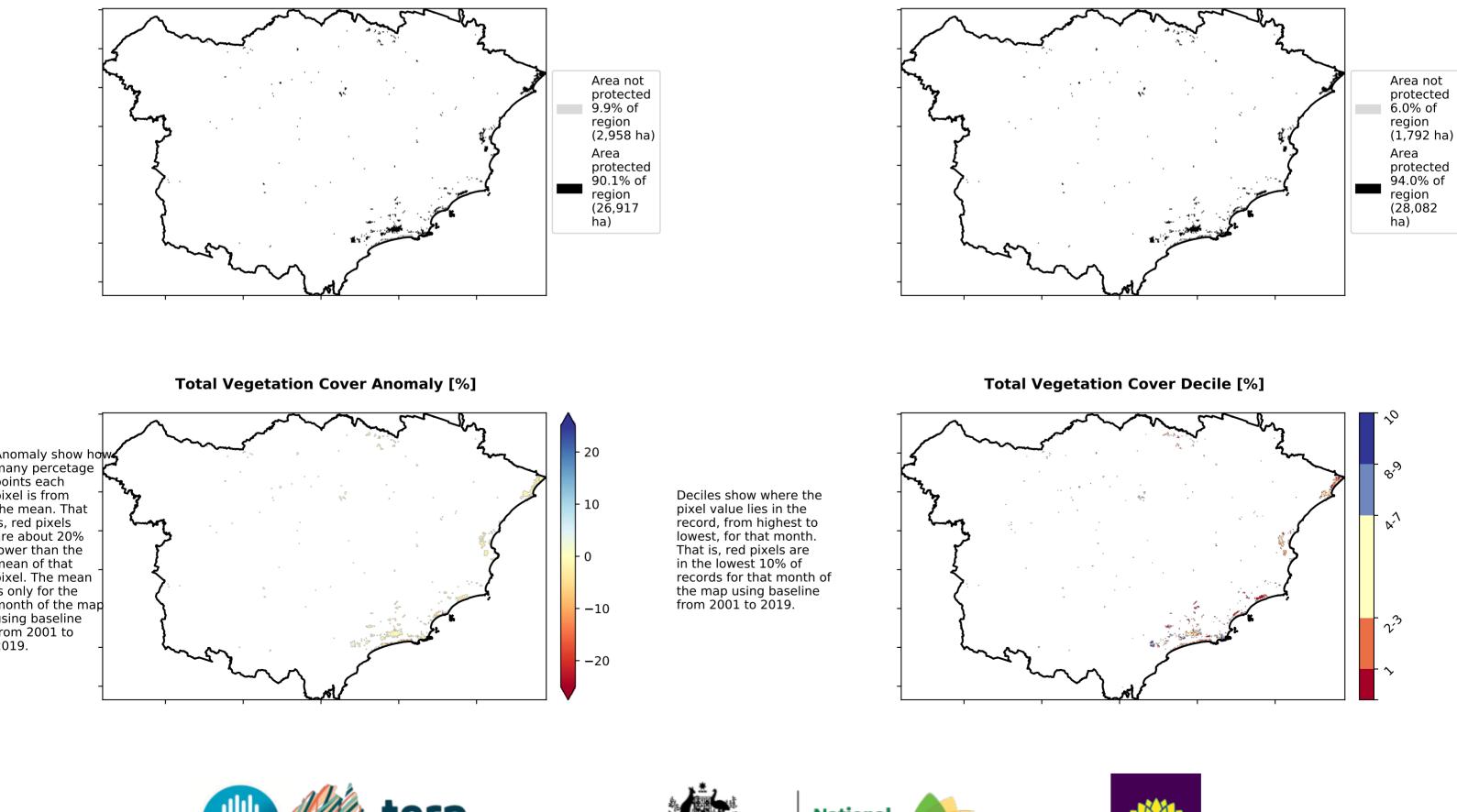


Landcare

Proportion of vegetation cover class in area

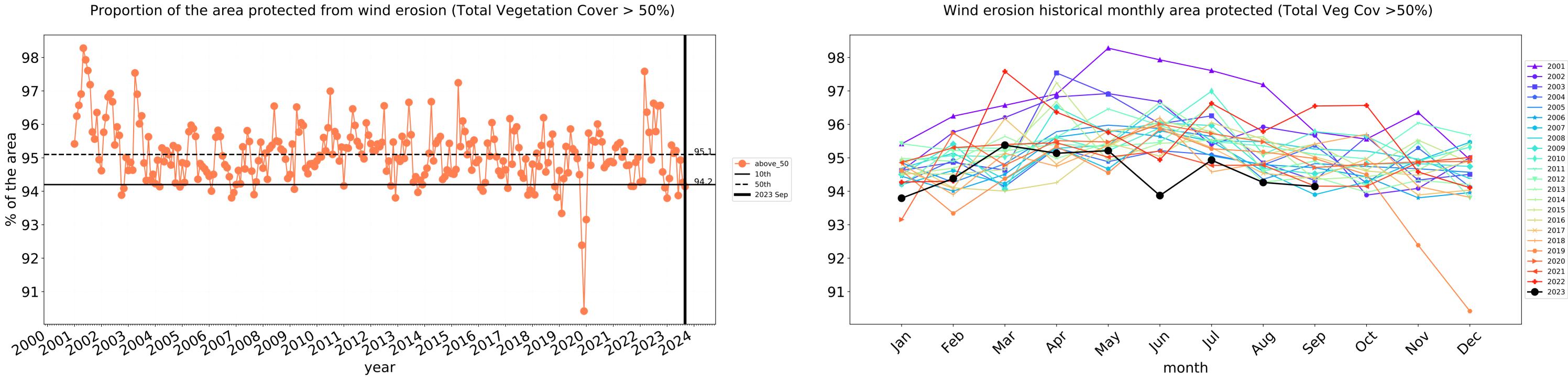


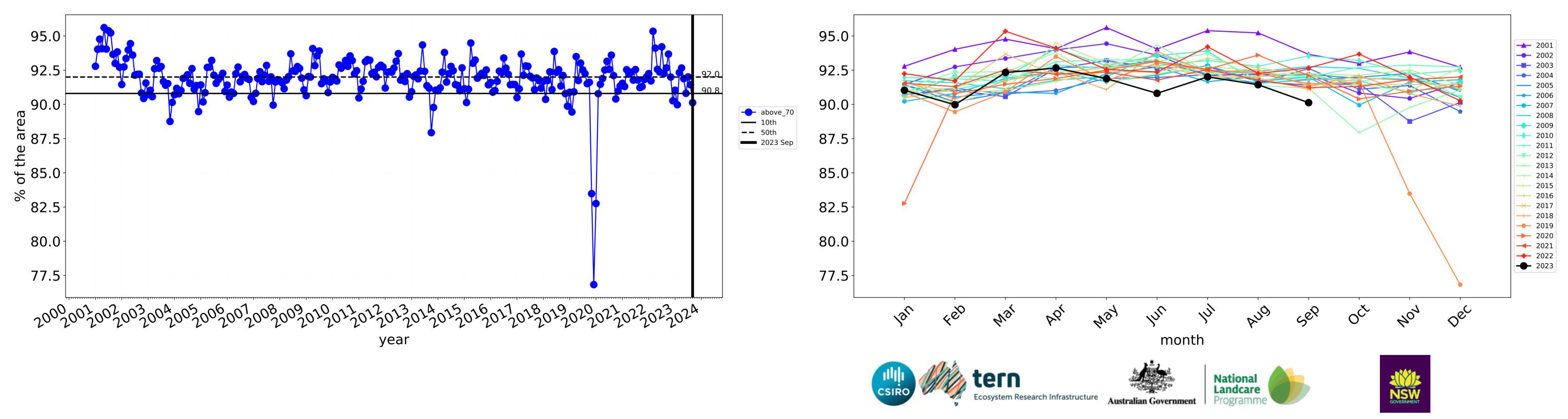
% Area protected from wind erosion (>50%)





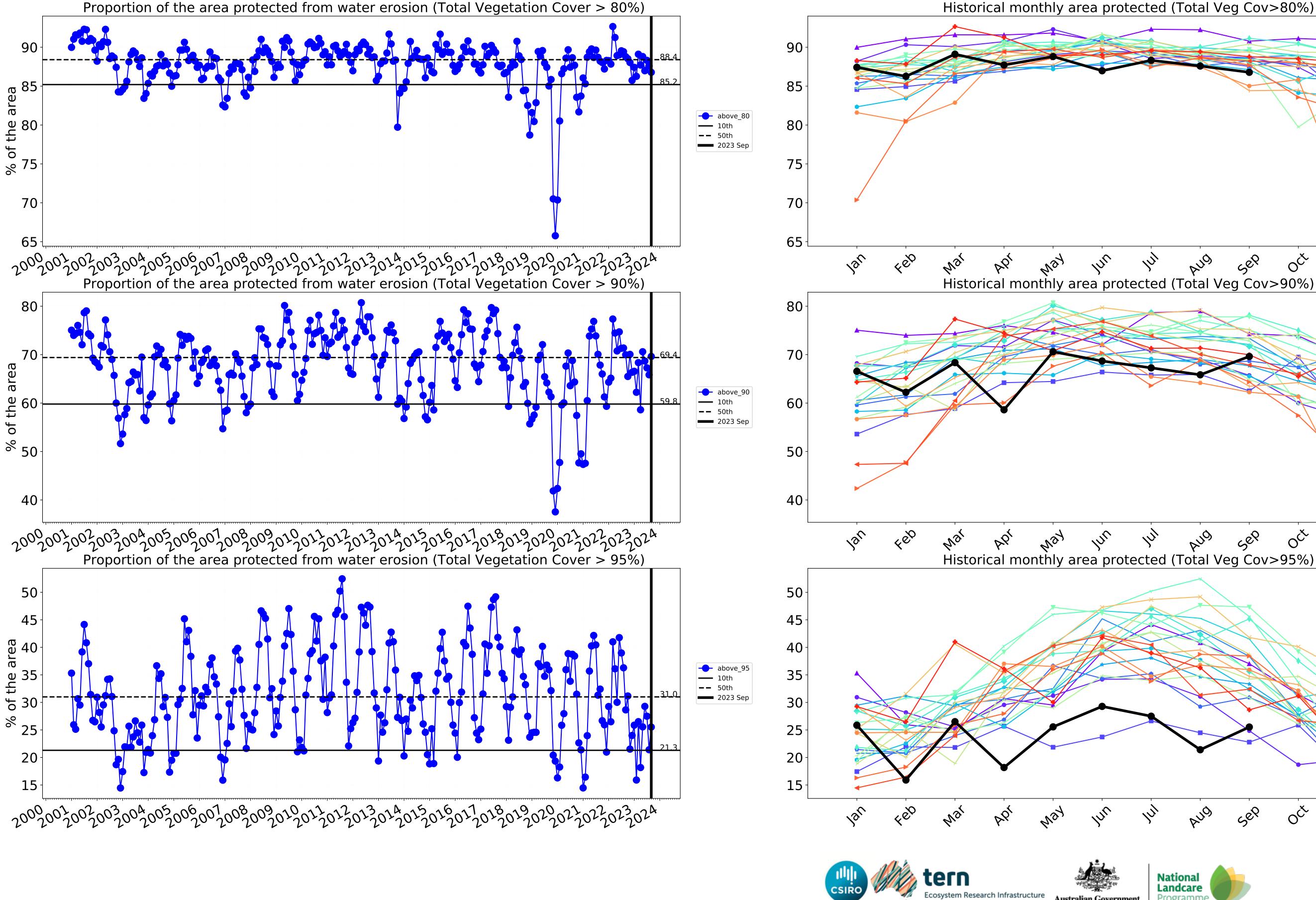
8





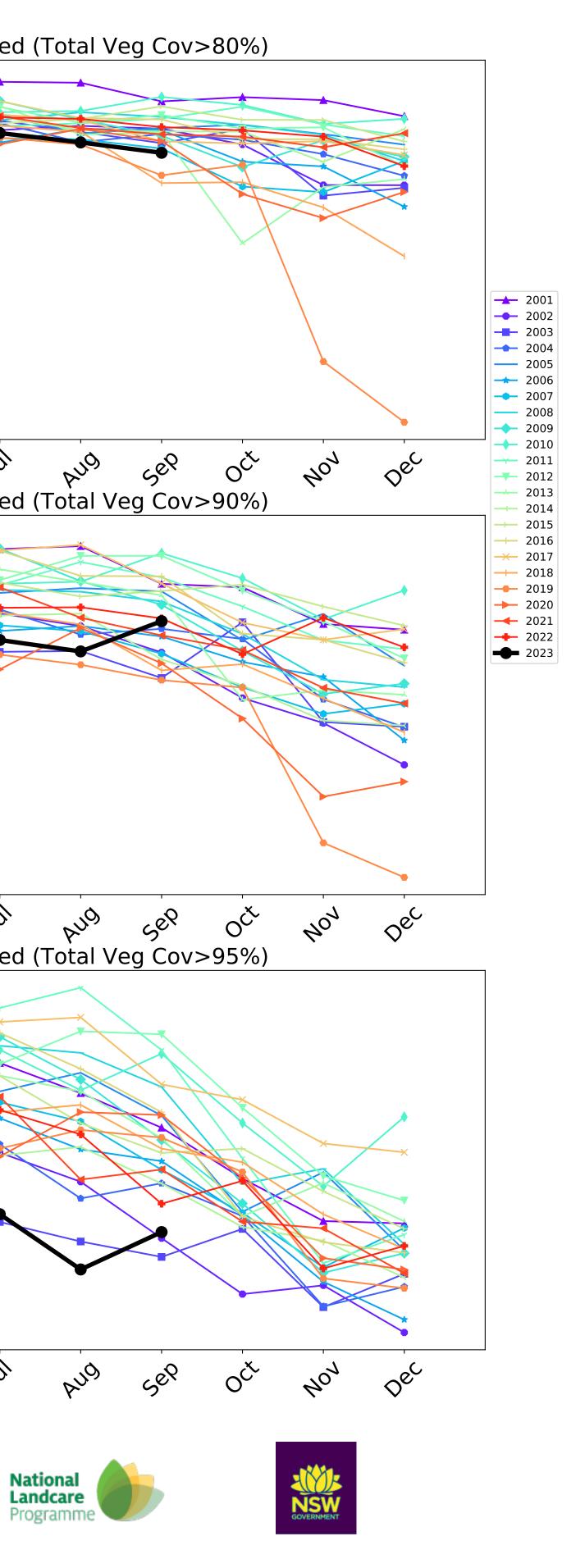


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)

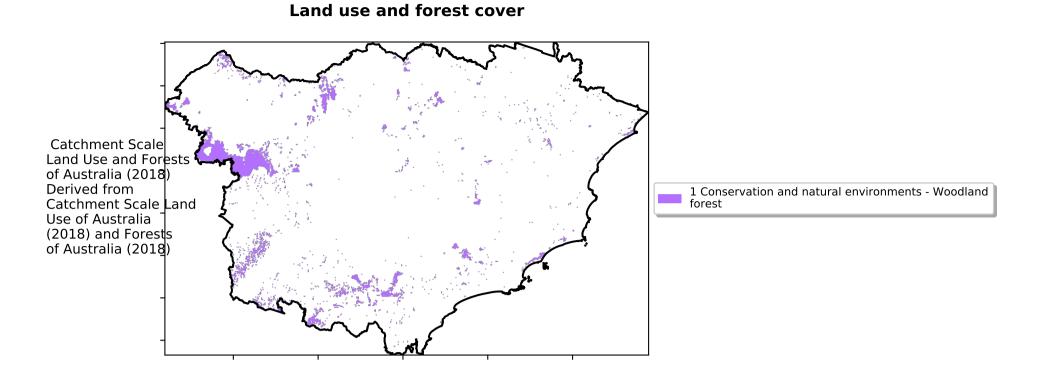


Australian Government

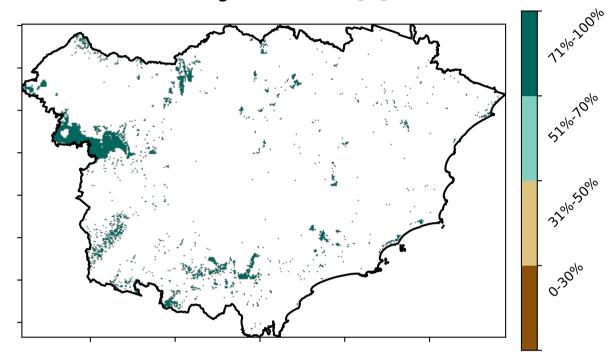
Ecosystem Research Infrastructure



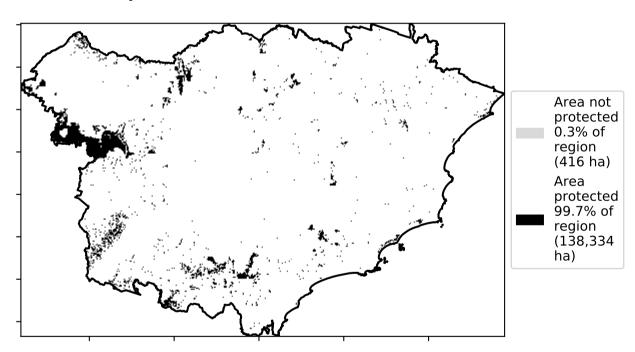
### **Conservation and natural environments Woodland forest**



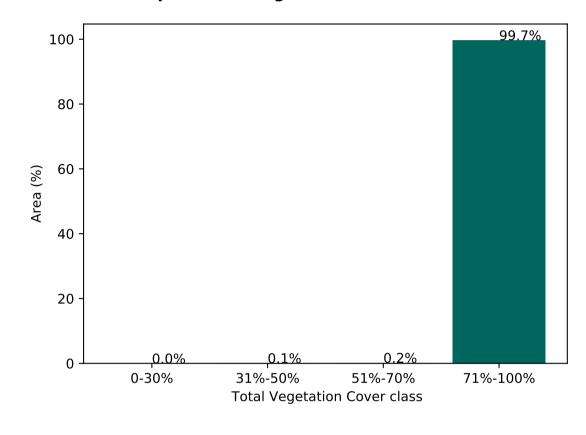
**Total Vegetation Cover [%]** 



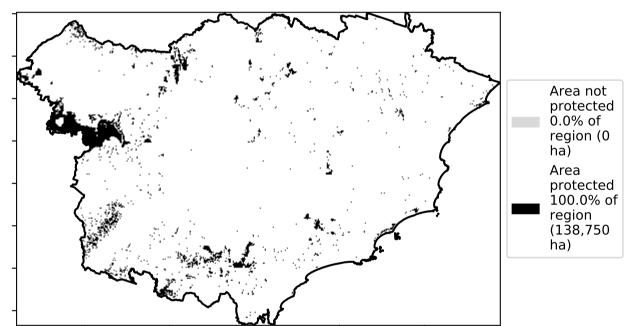
% Area protected from water erosion (>70%)



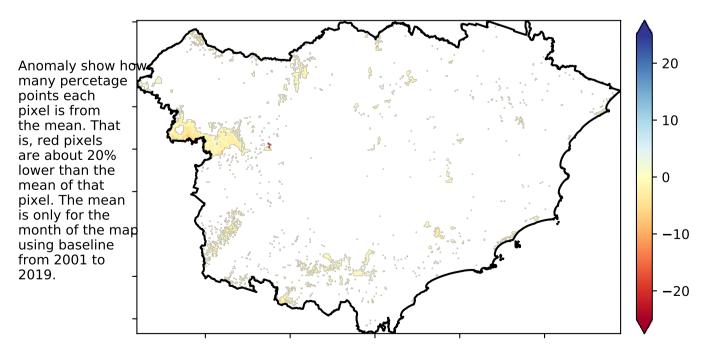
Proportion of vegetation cover class in area



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

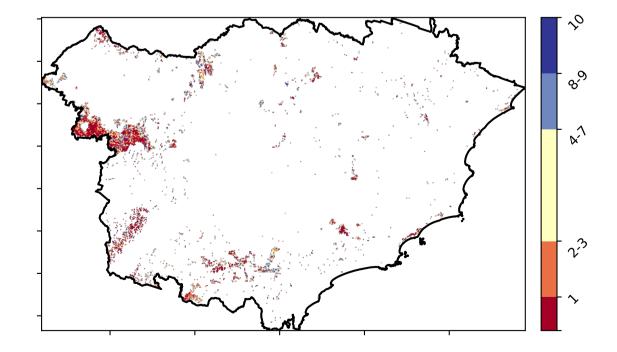


**Total Vegetation Cover Anomaly [%]** 



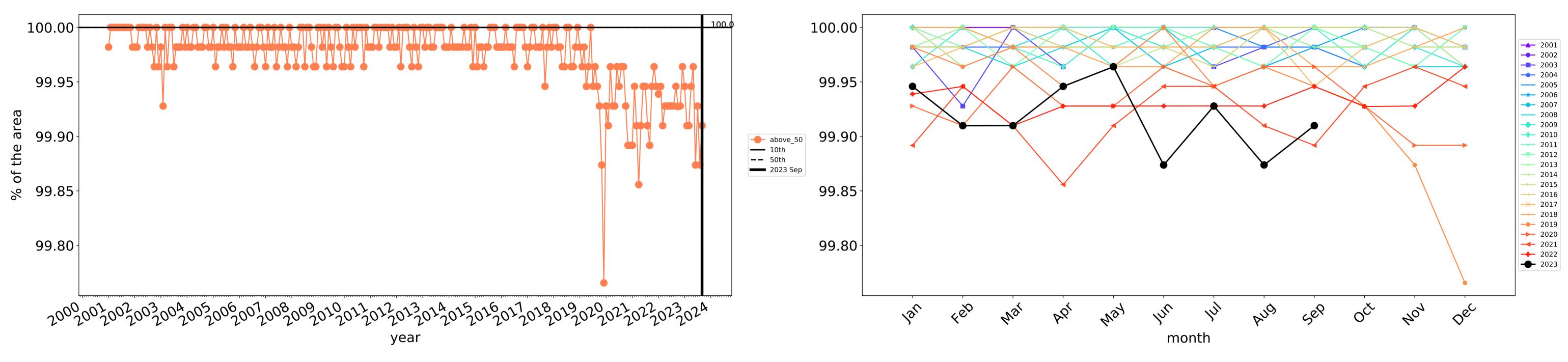
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

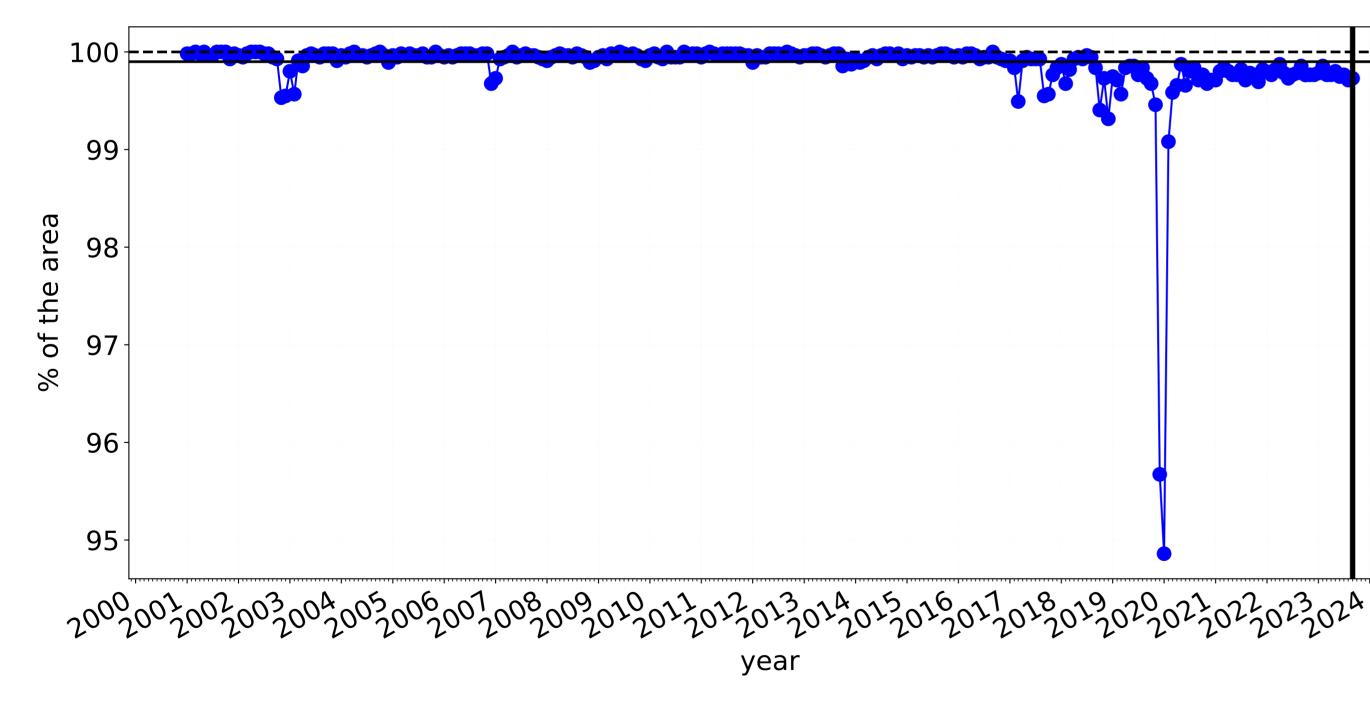




# **Conservation and natural environments Woodland forest timeseries**



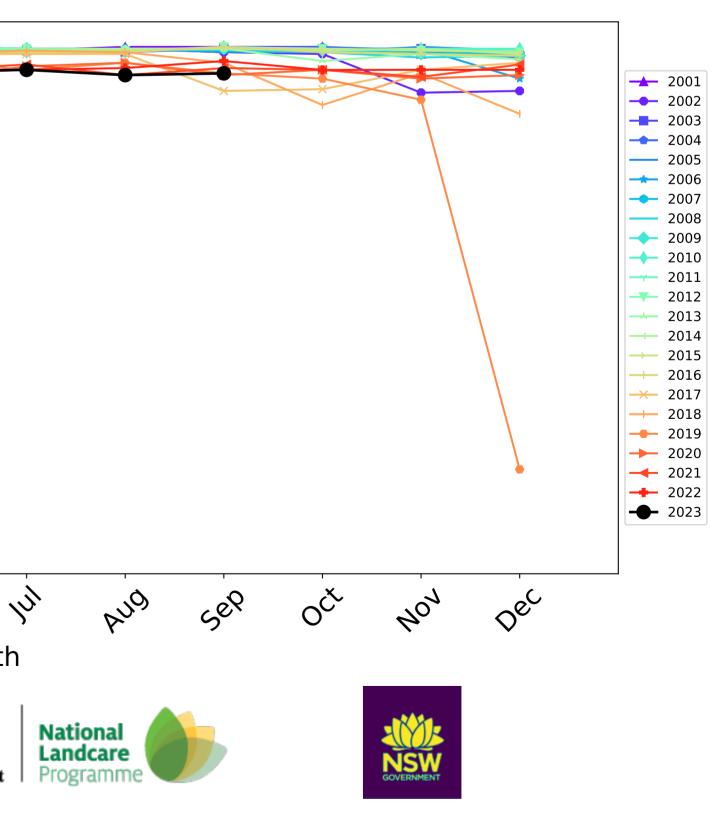
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

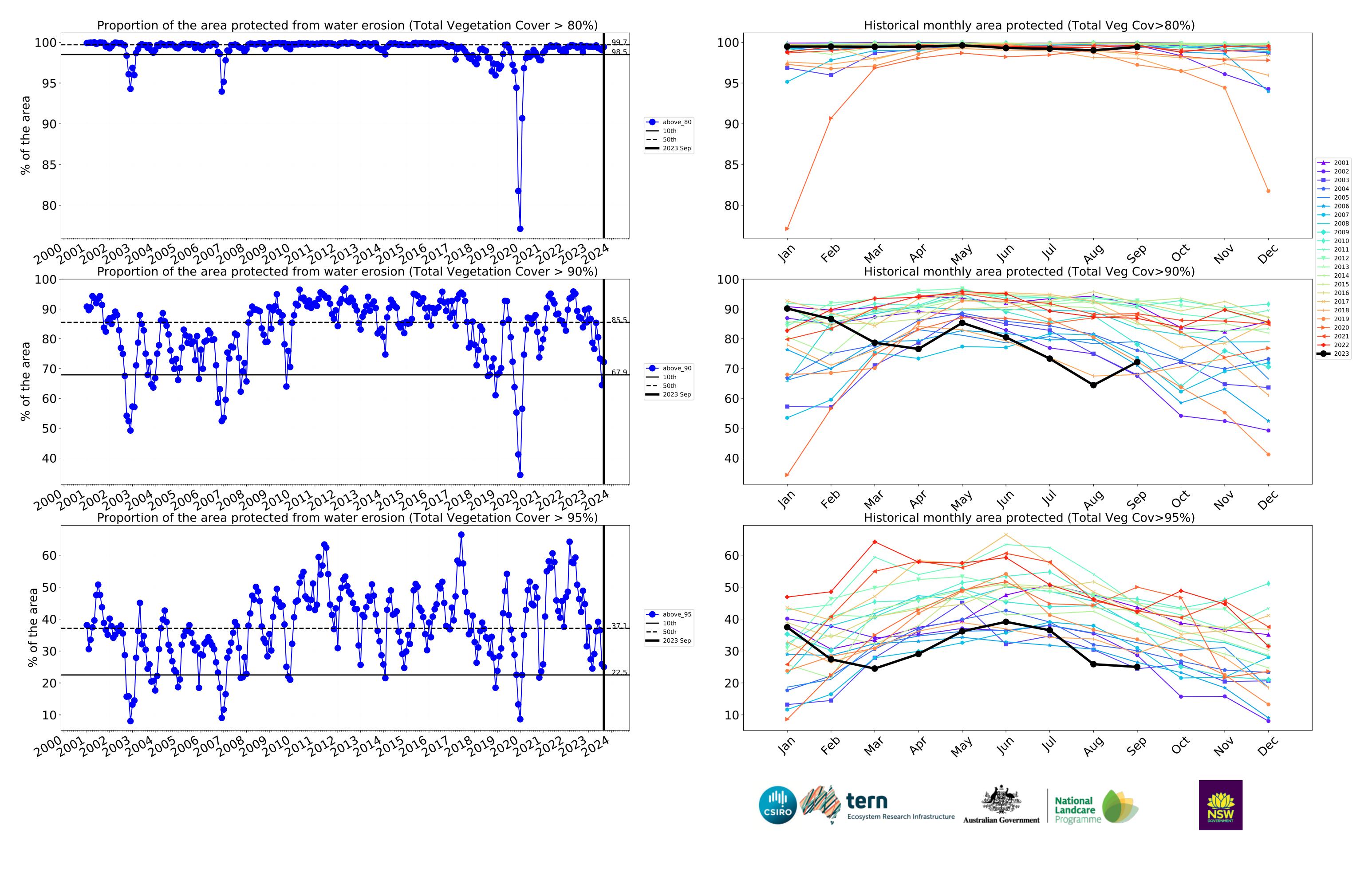


Wind erosion historical monthly area protected (Total Veg Cov >50%)

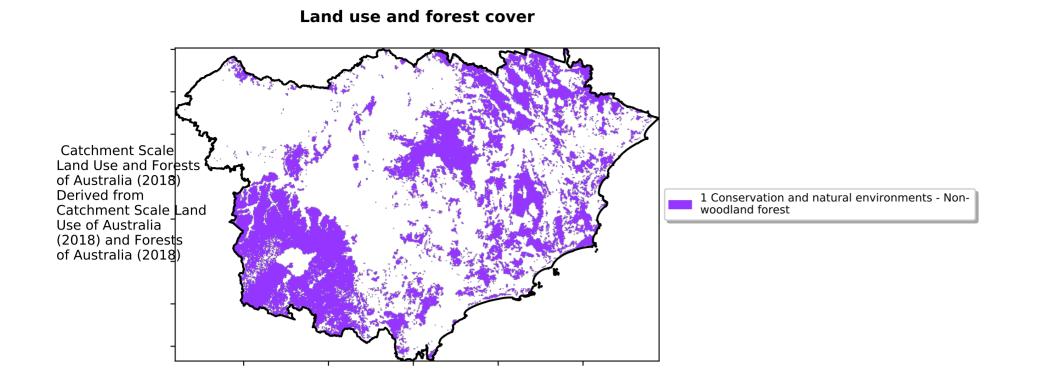
-<u>189</u> 100 99 ---- above\_70 **—** 10th 98 **--** 50th **—** 2023 Sep 97 96 95 4eb lar way In hyar. POL month tern Ecosystem Research Infrastructure Australian Government

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

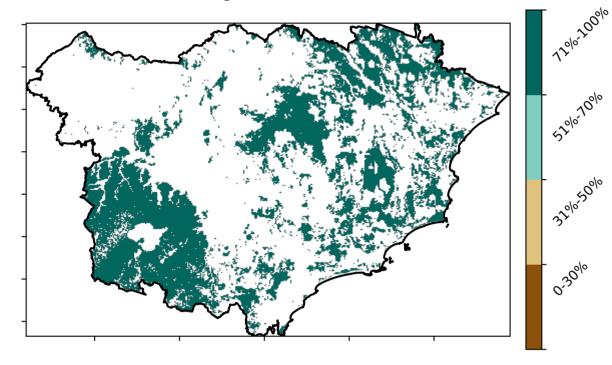




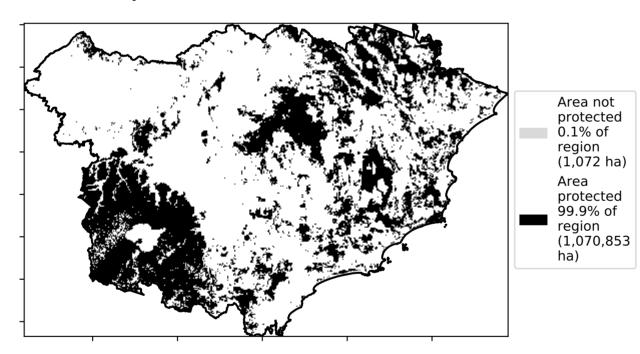
### **Conservation and natural environments Forest (non woodland)**



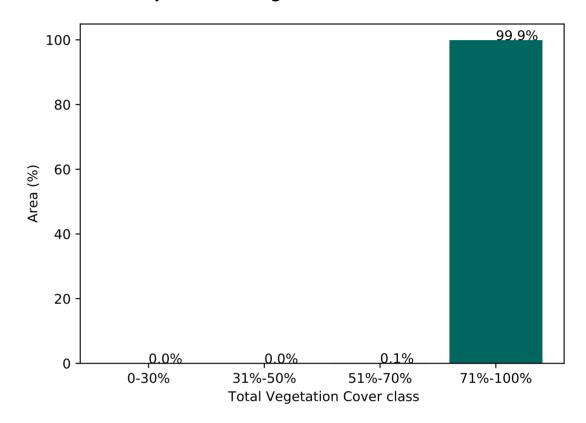
**Total Vegetation Cover [%]** 



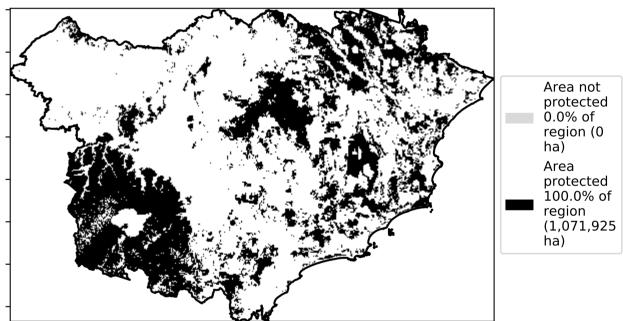
% Area protected from water erosion (>70%)



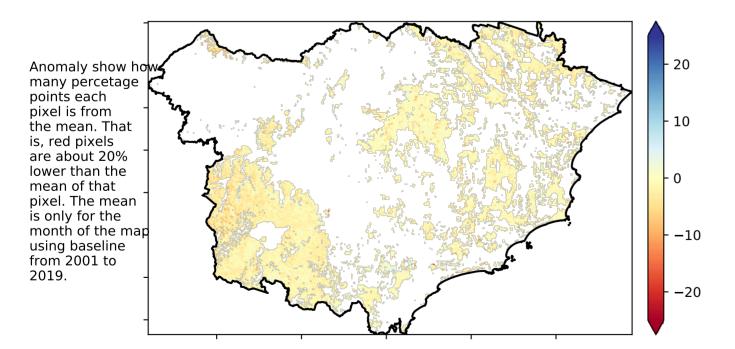
Proportion of vegetation cover class in area



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

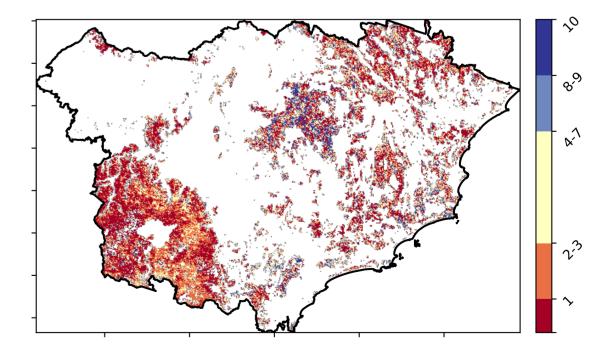


**Total Vegetation Cover Anomaly [%]** 

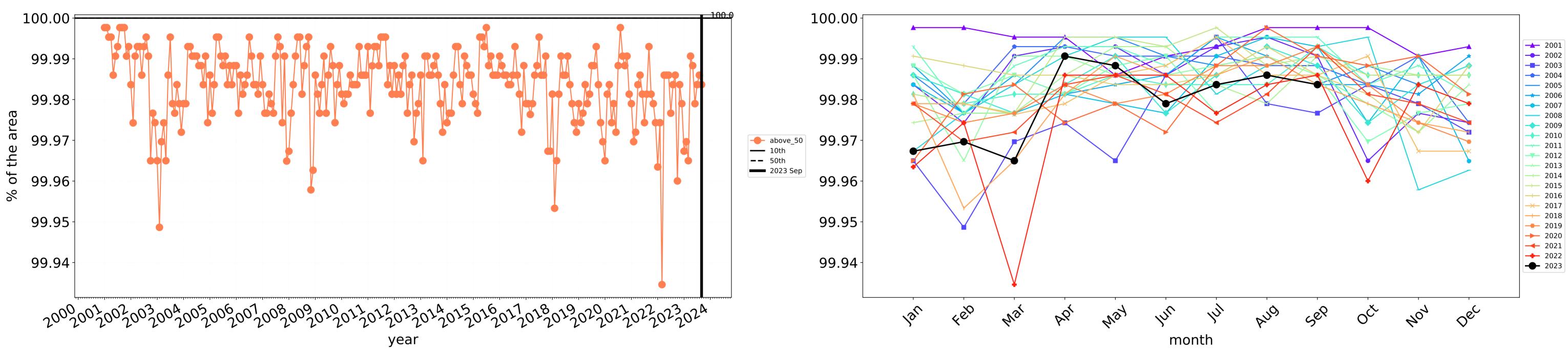


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

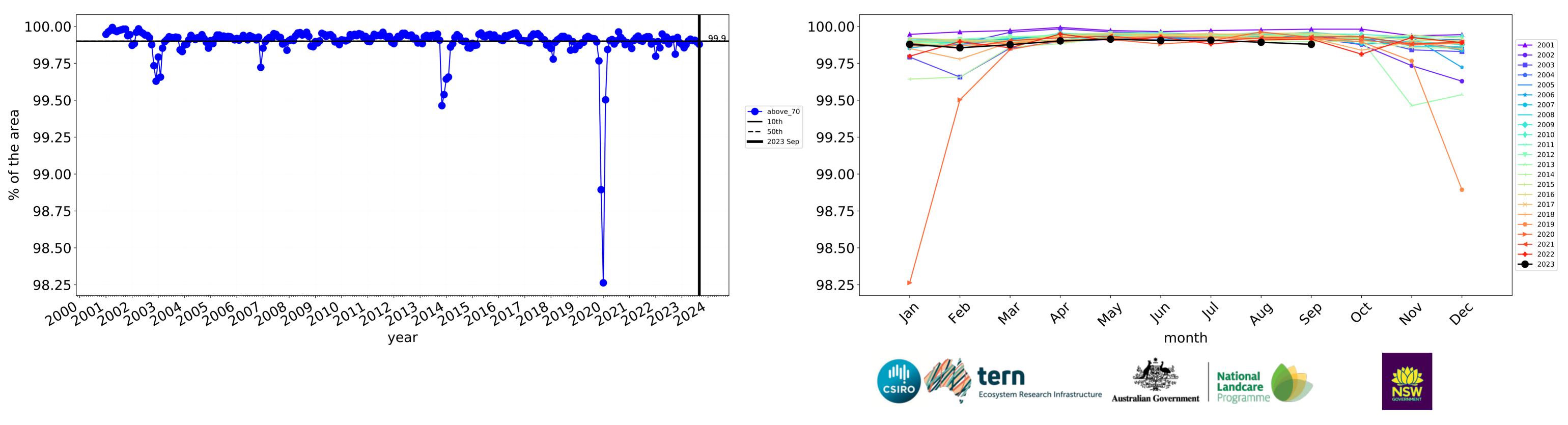
Total Vegetation Cover Decile [%]





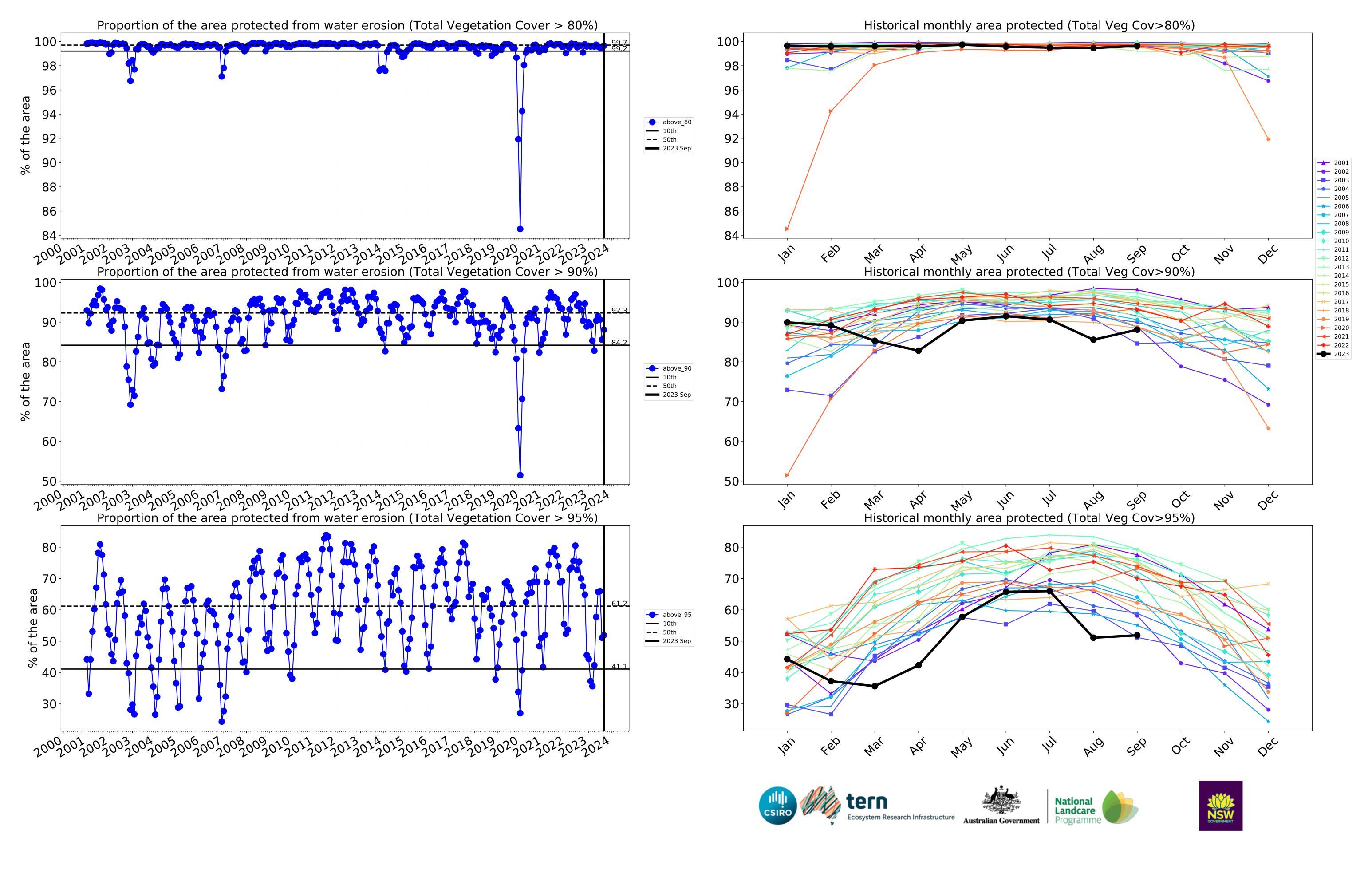


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



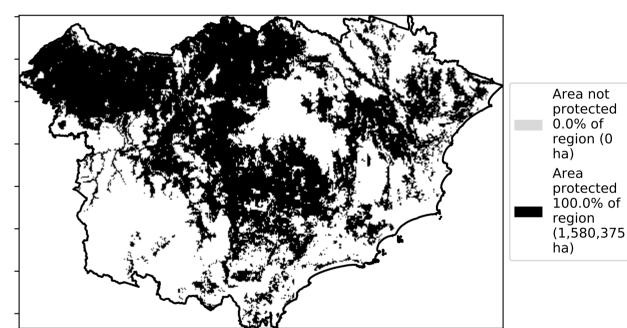
Water erosion historical monthly area protected (Total Veg Cov>70%)

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



# Agriculture

Land use and forest cover 80 -<u>76.</u>7% 70 -60 Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 50 2 Agriculture - Grazing - Woodland forest Area (%) 05 3 Agriculture - Grazing - Non-woodland forest Derived from 4 Agriculture - Grazing - Irrigated Catchment Scale Land 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests of Australia (2018) 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 30 8 Agriculture - Horticulture - Irrigated 20 10.7% 10 7.6% 0 0 1 2 3 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 1200,1000 100 80 52°10'10' 60 Area (%) 32010 40 0.30% 20 0.1% 0.0% 0 0-30% 31%-50% 51%-70% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)



0.6%

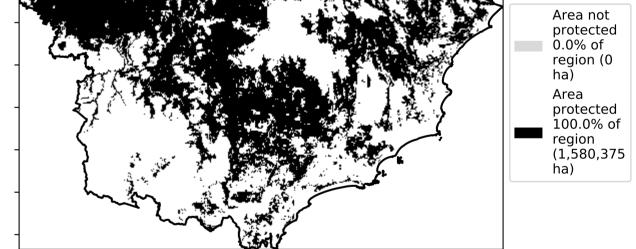
Proportion of each land class in area

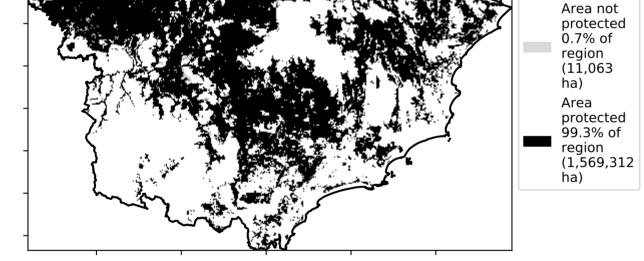
0.1%

0.2%

99.3%

71%-100%





**Total Vegetation Cover Anomaly [%]** 

Anomaly show how many percetage points each pixel is from the mean. That · 20 - 10 are about 20% lower than the mean of that 0 pixel. The mean is only for the month of the map using baseline from 2001 to 2019. -10

is, red pixels

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.

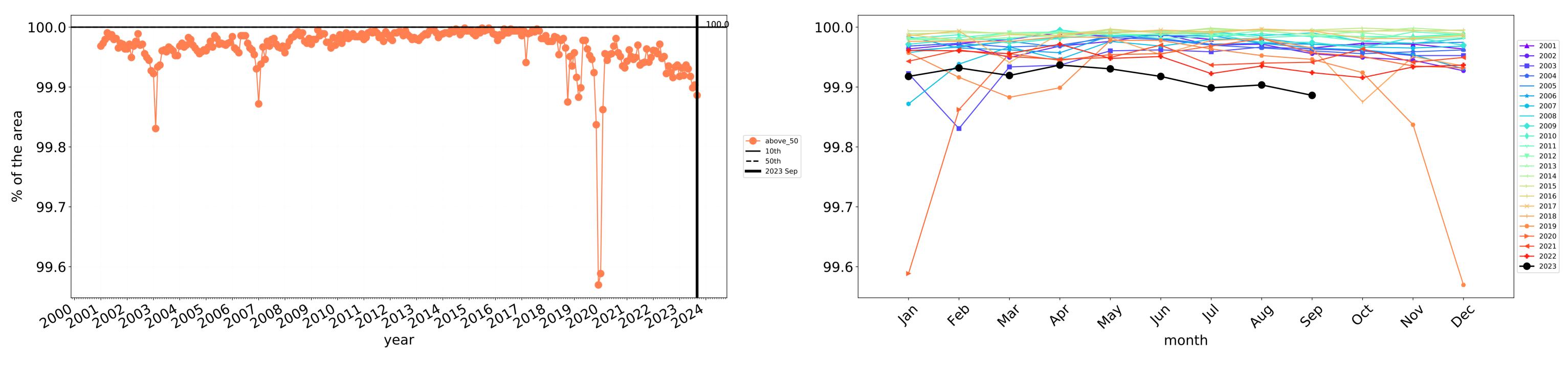
 $\hat{\mathcal{V}}$ ଚ୍ଚ A-1 · ~??

Total Vegetation Cover Decile [%]

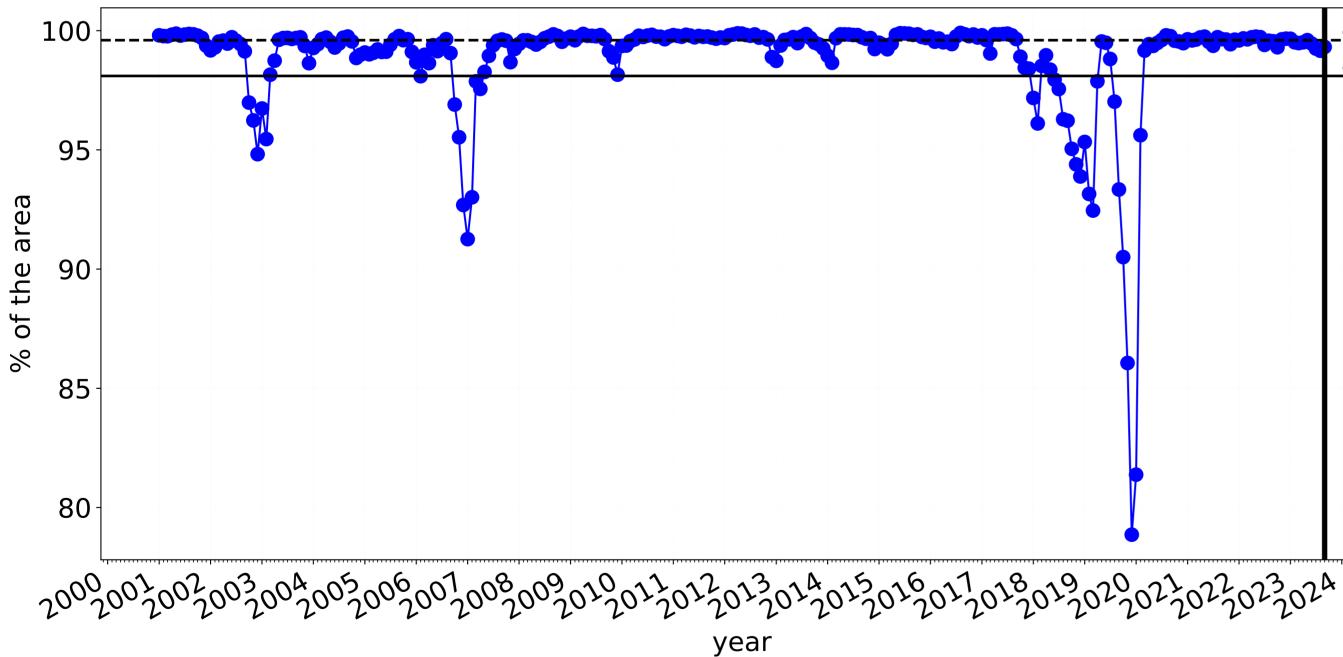


12

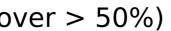
-20



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



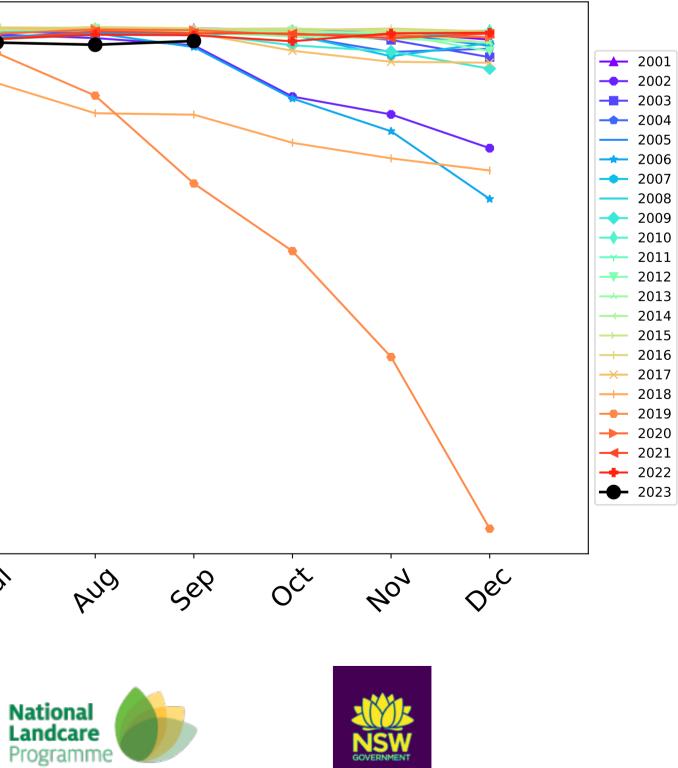
# **Agriculture timeseries**

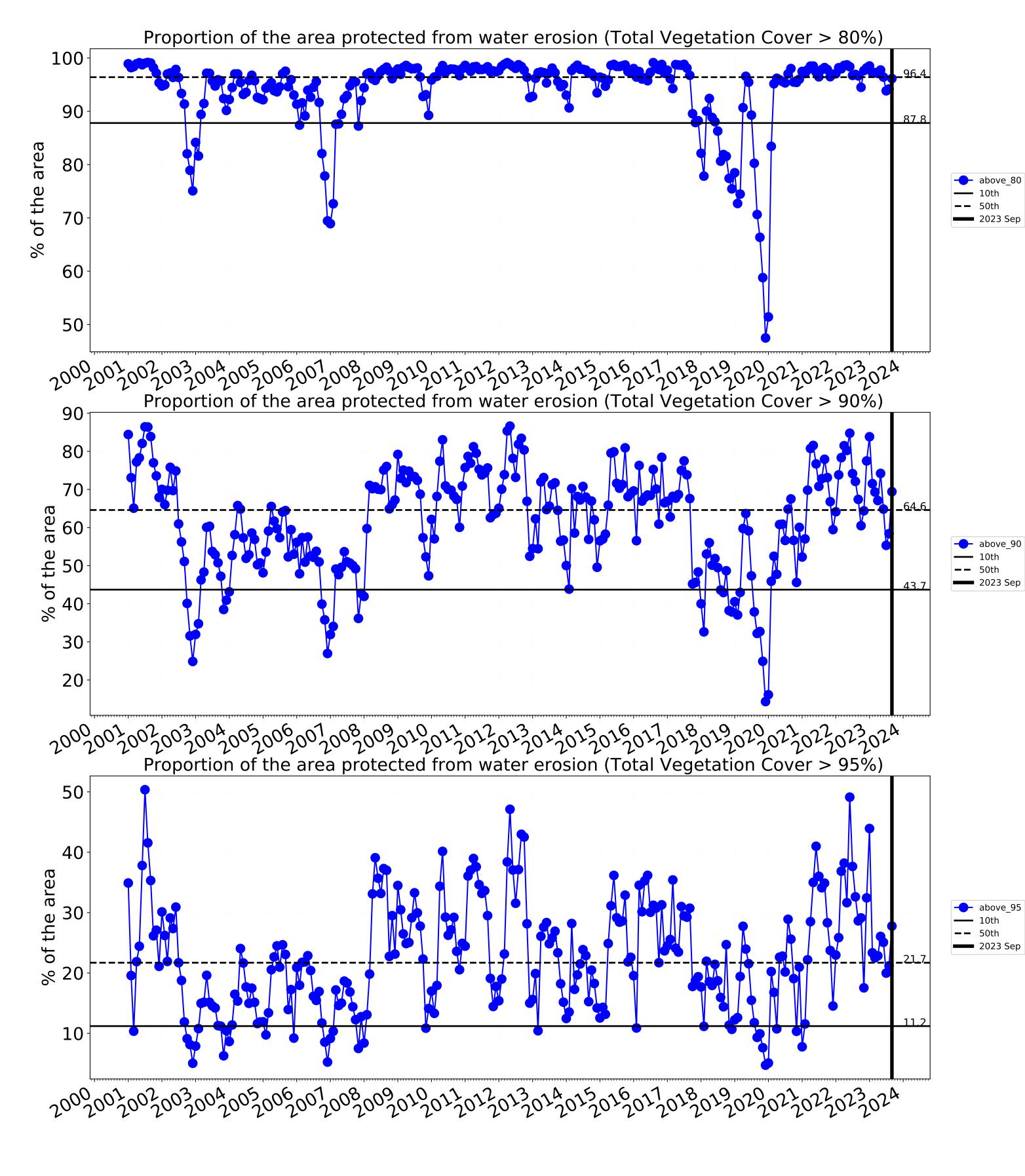


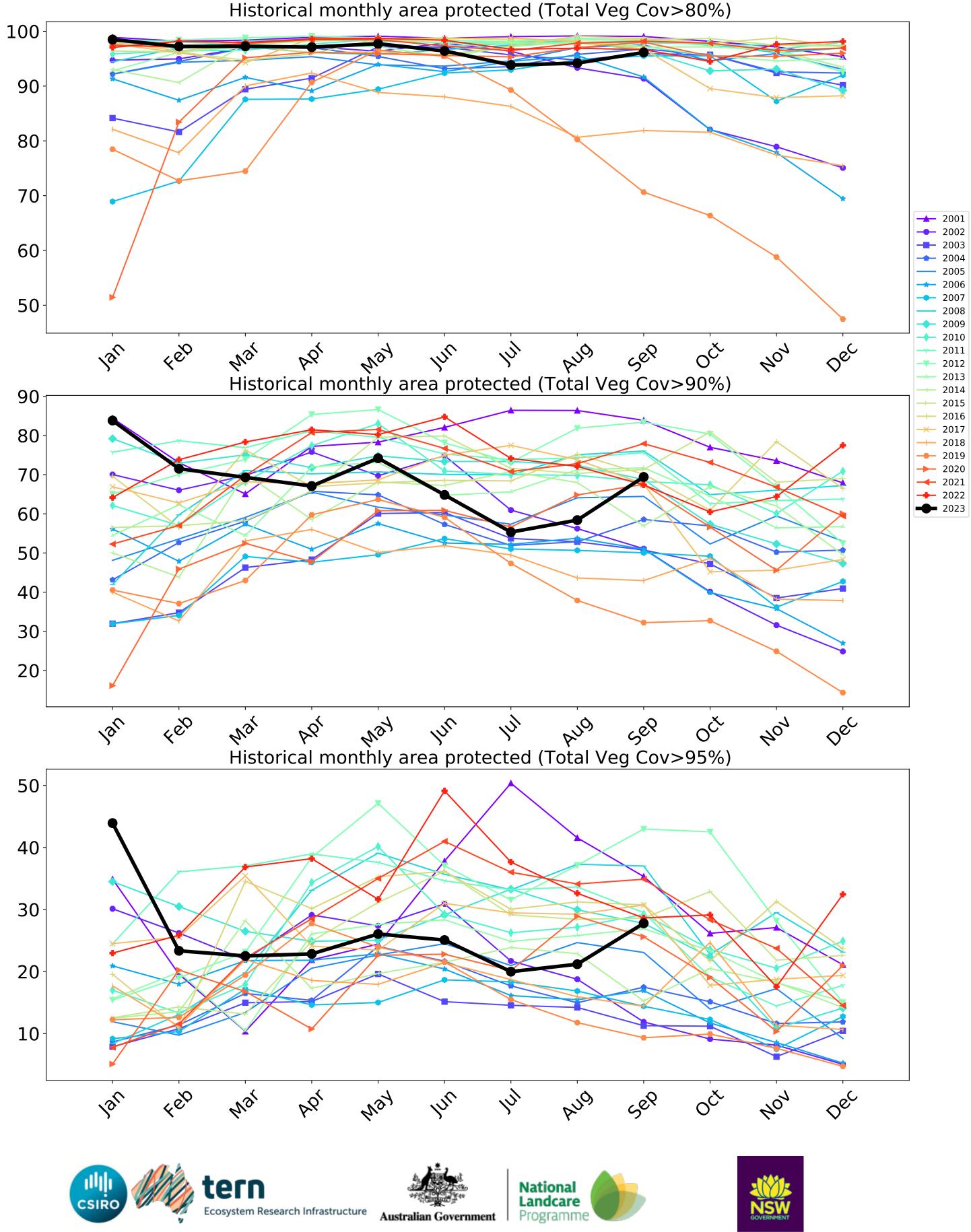
Wind erosion historical monthly area protected (Total Veg Cov >50%)

 $100^{-1}$ 99.6 98.1 95<sup>-</sup> ---- above\_70 **—** 10th **——** 50th **——** 2023 Sep 90 85 80 400 Par way In 1st P.Q War month tern Ecosystem Research Infrastructure Australian Government

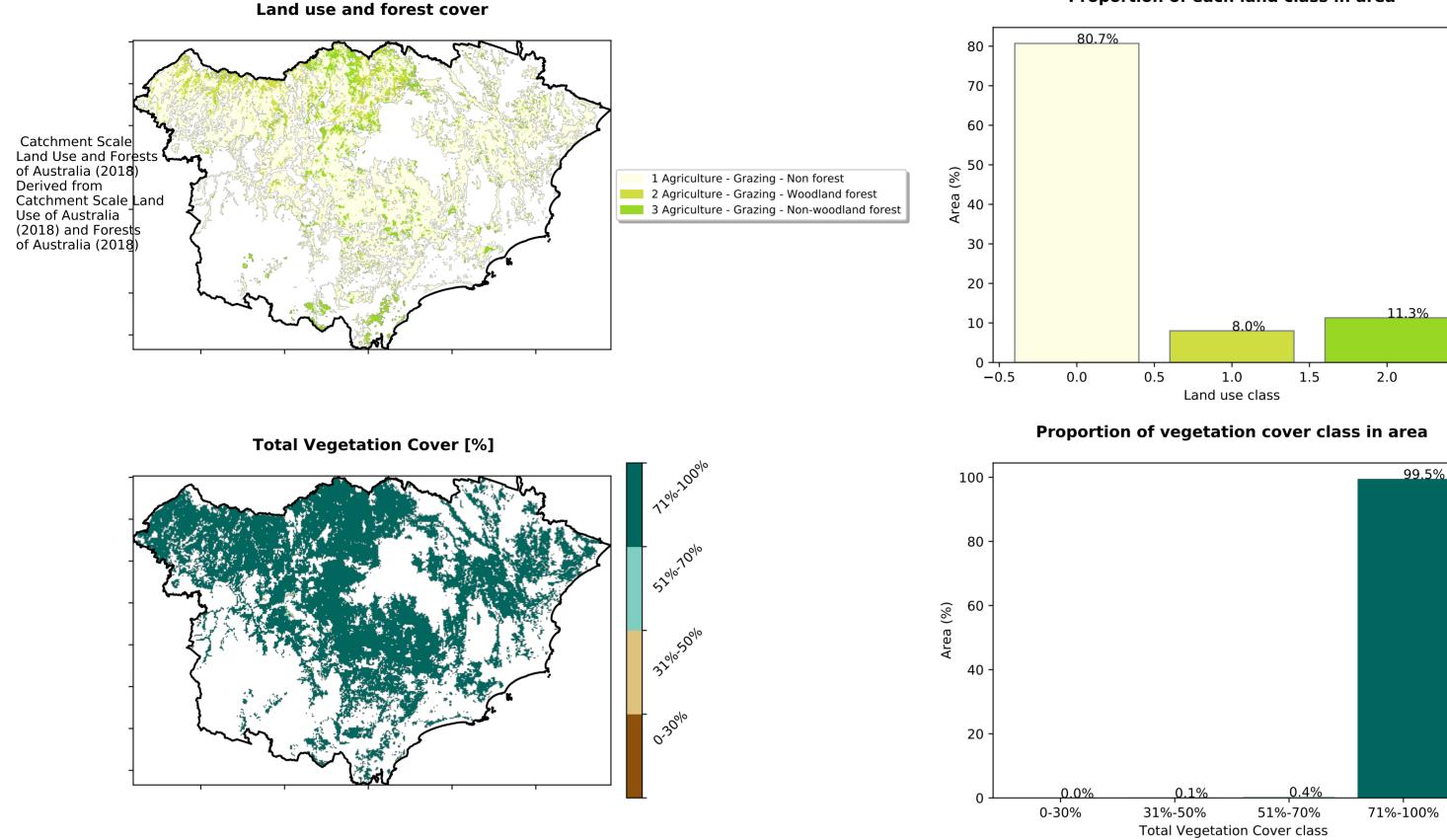
Water erosion historical monthly area protected (Total Veg Cov>70%)





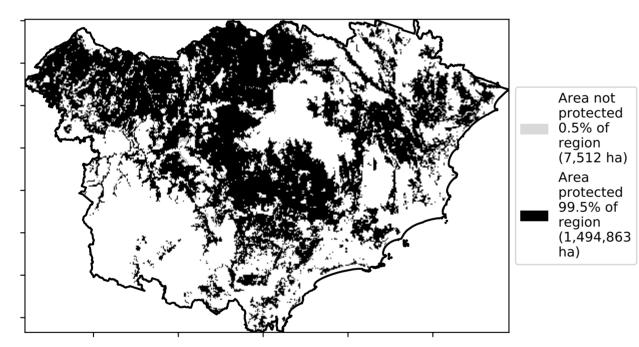


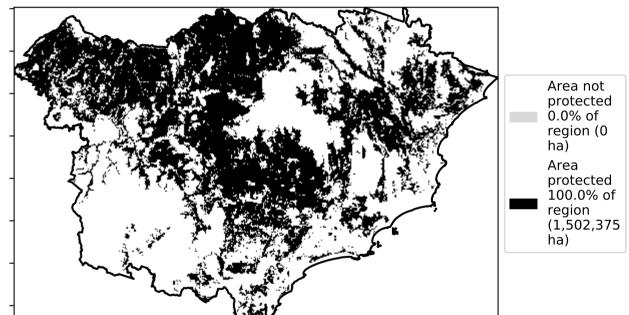
# Grazing



Proportion of each land class in area

% Area protected from water erosion (>70%)



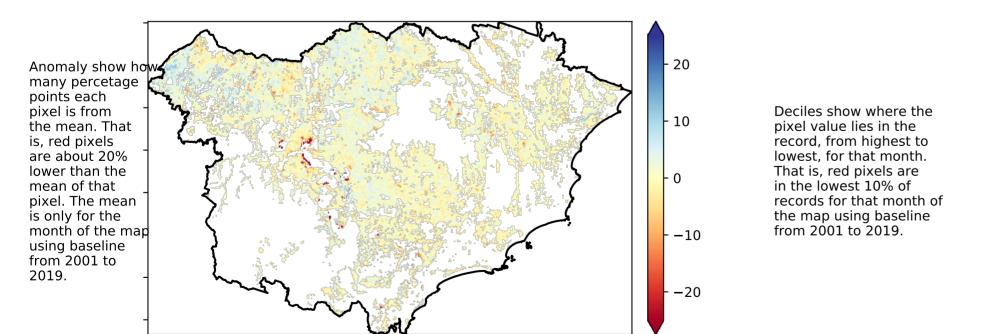


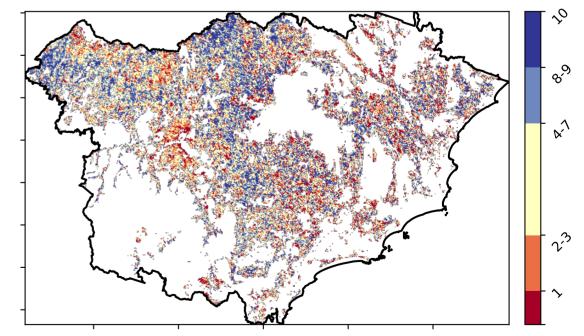
2.5

**Total Vegetation Cover Anomaly [%]** 

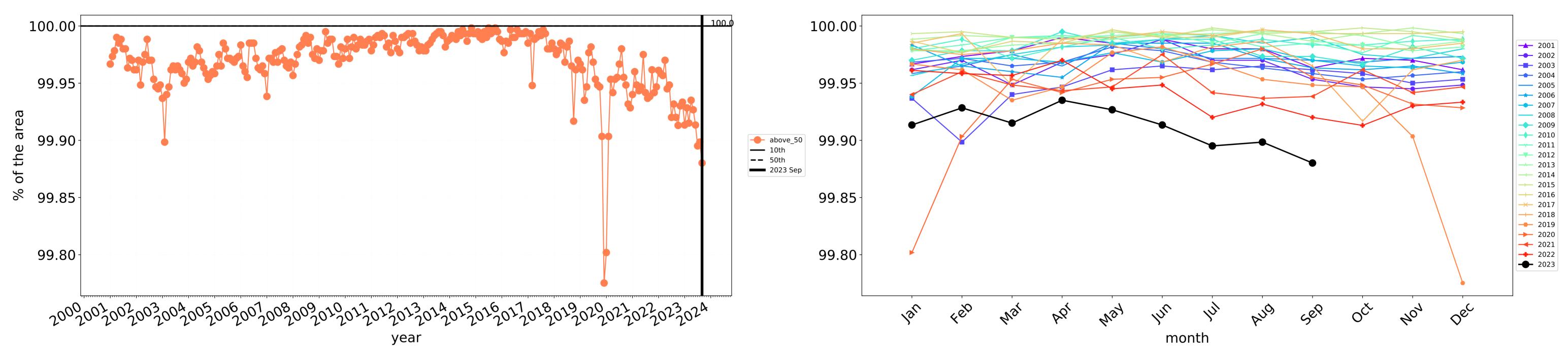
Total Vegetation Cover Decile [%]

% Area protected from wind erosion (>50%)

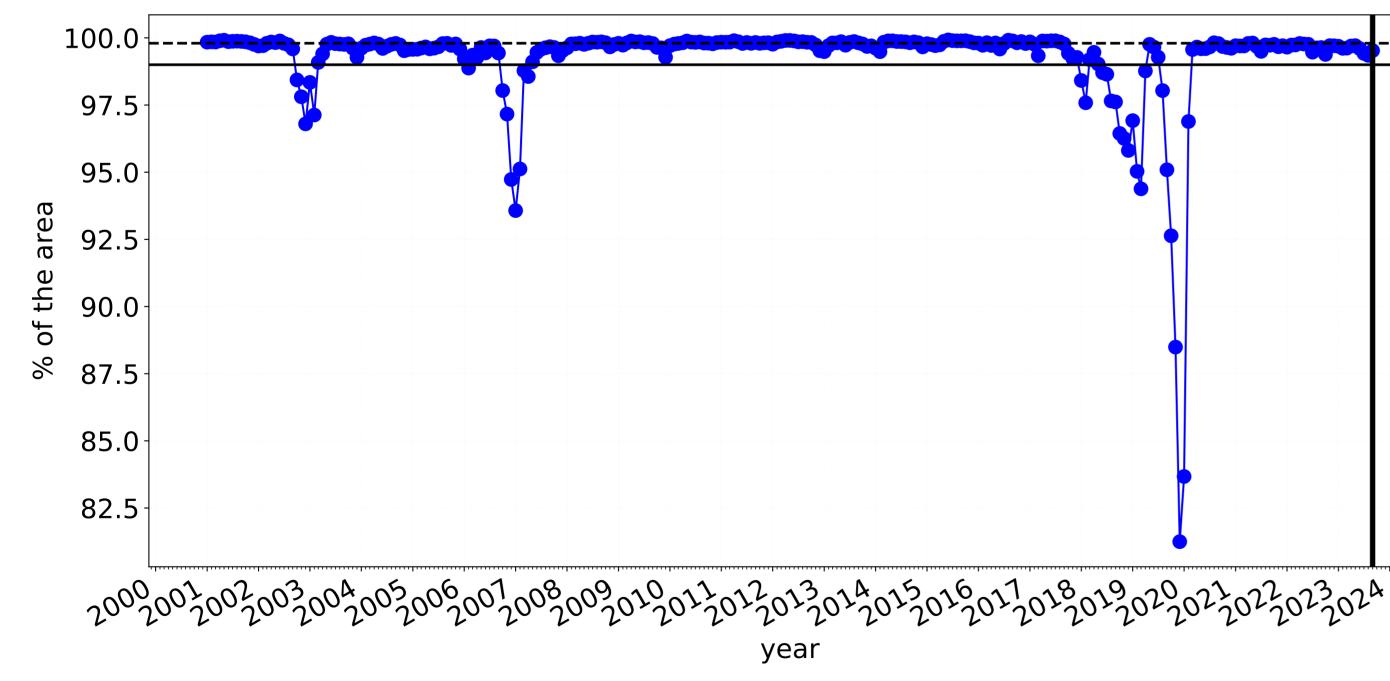








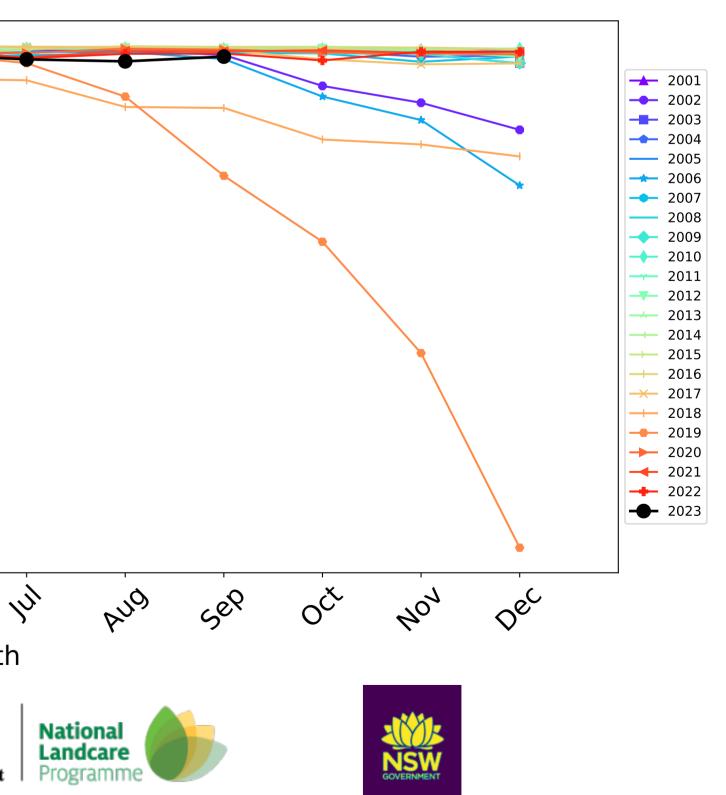
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

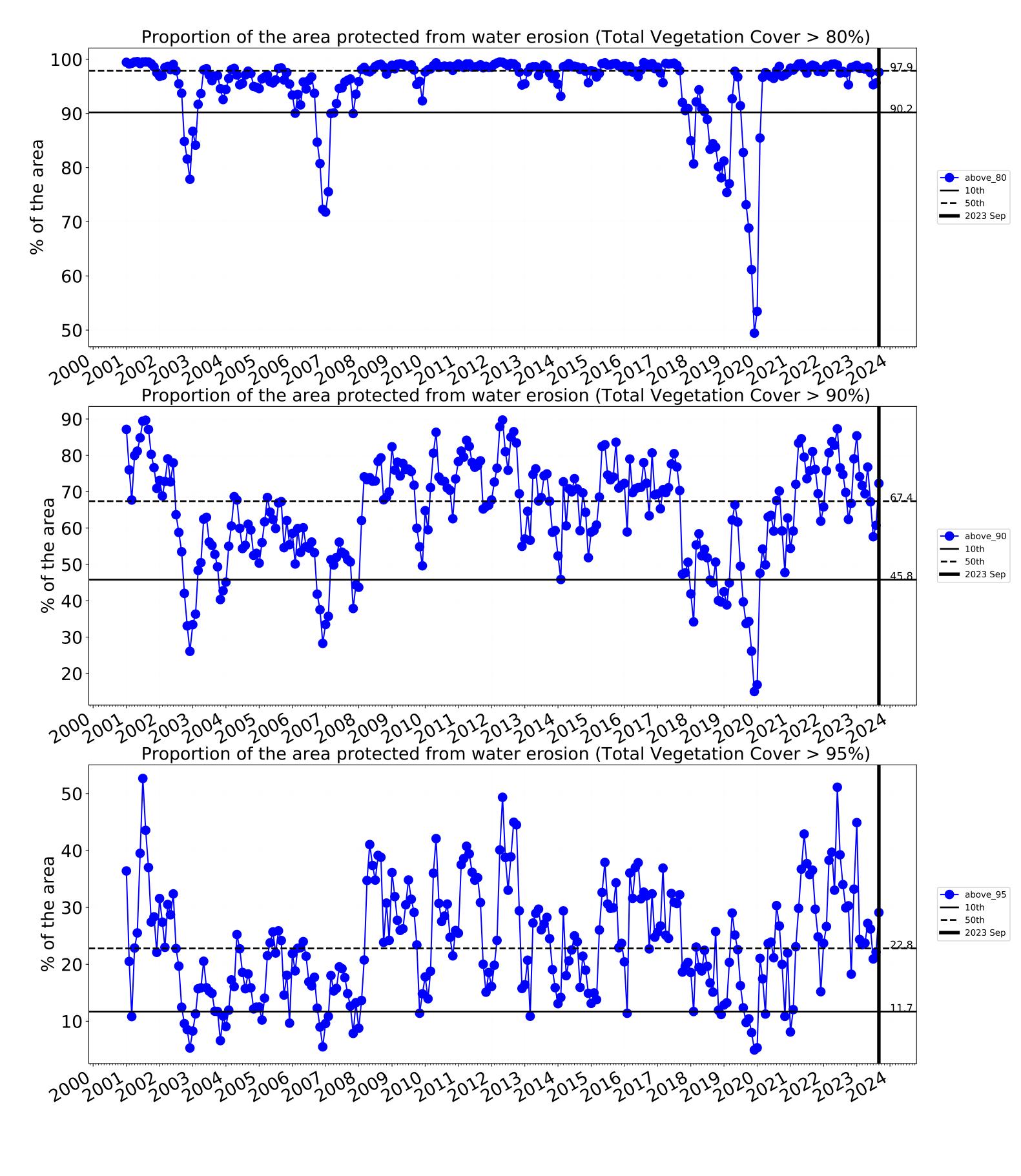


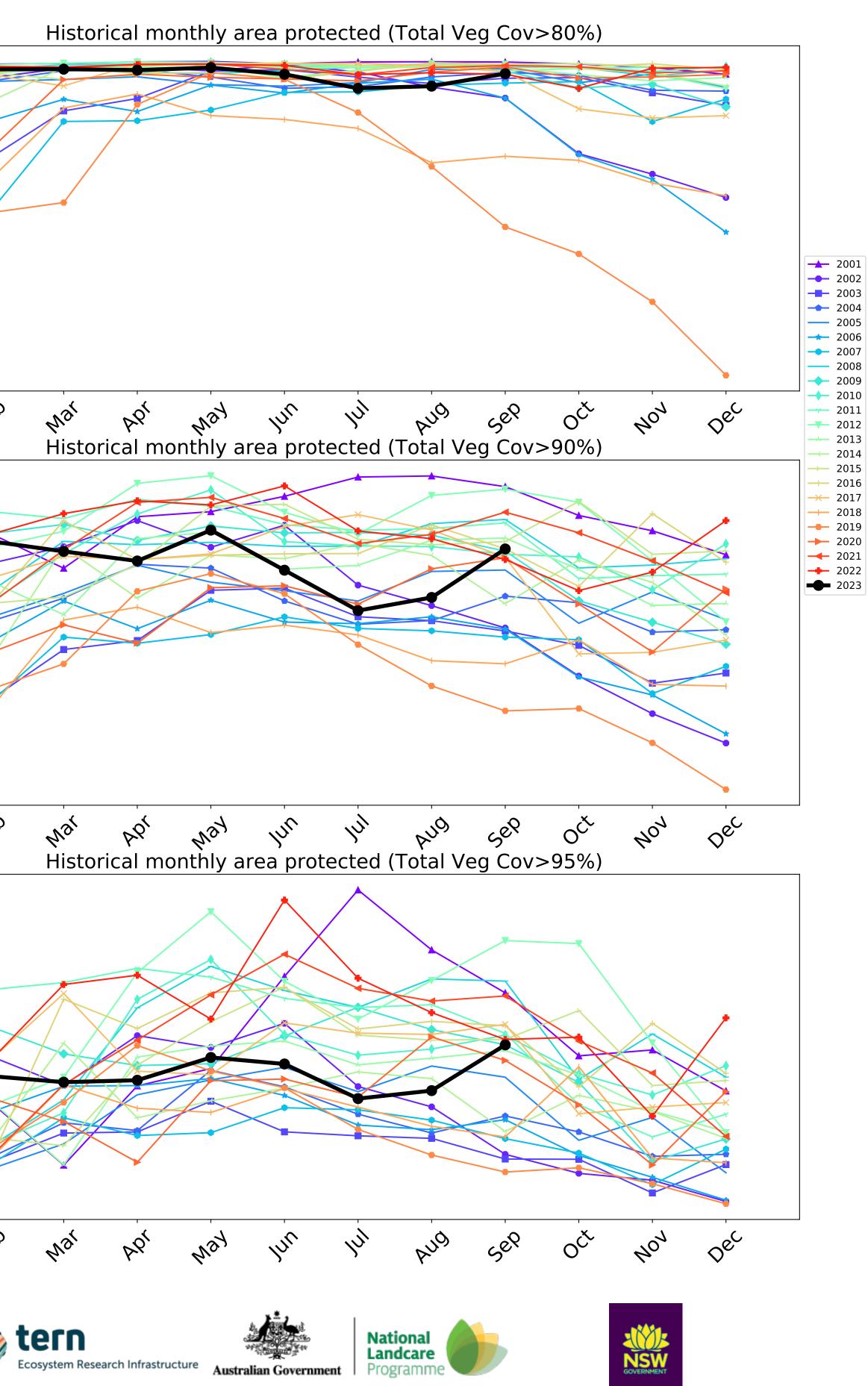
Wind erosion historical monthly area protected (Total Veg Cov >50%)

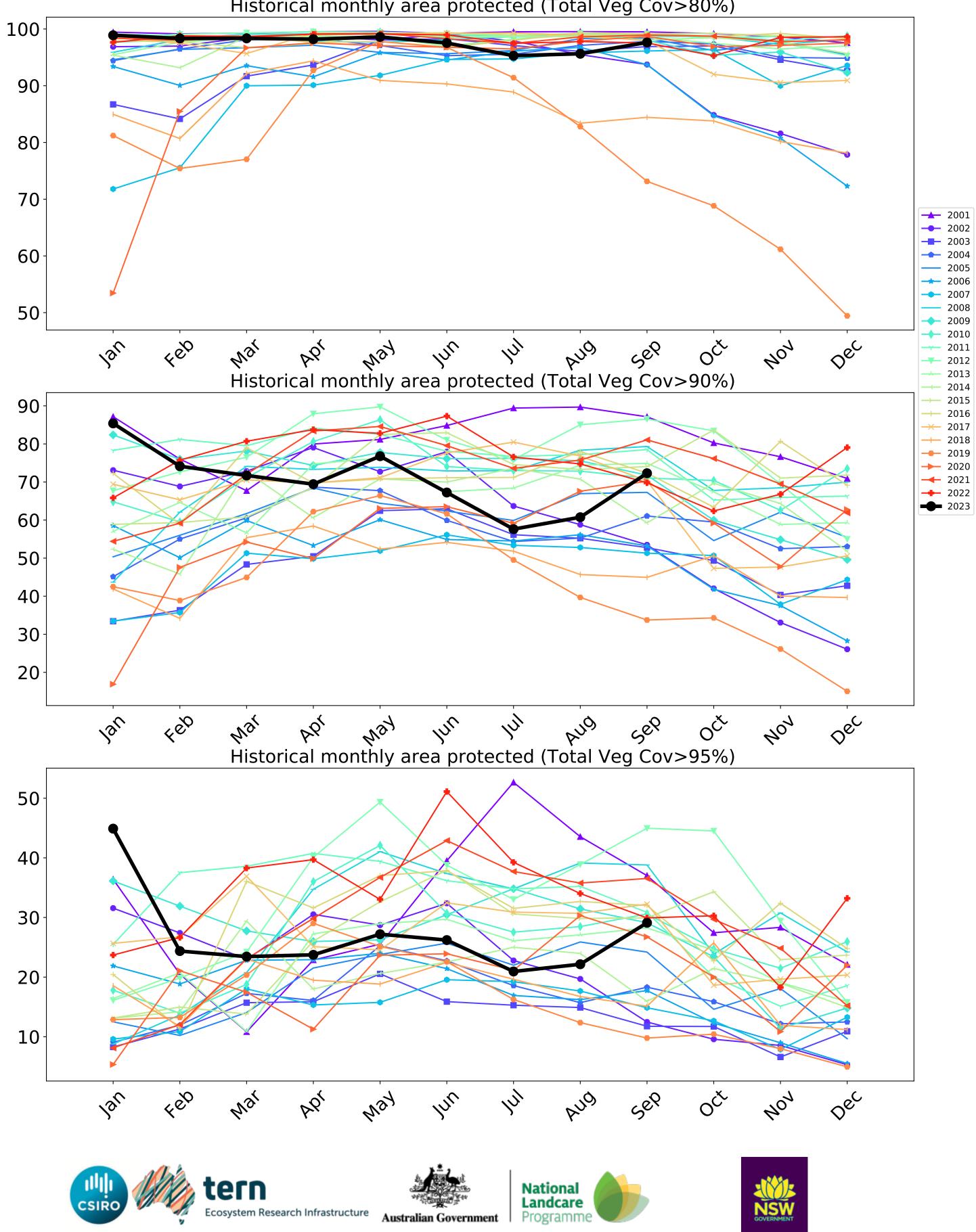
100.0-<u>99.8</u> 99.0 97.5 95.0 ---- above\_70 **—** 10th 92.5 **——** 50th 90.0 87.5 85.0 82.5 4eD lar way In PQ hyar. month tern Ecosystem Research Infrastructure Australian Government

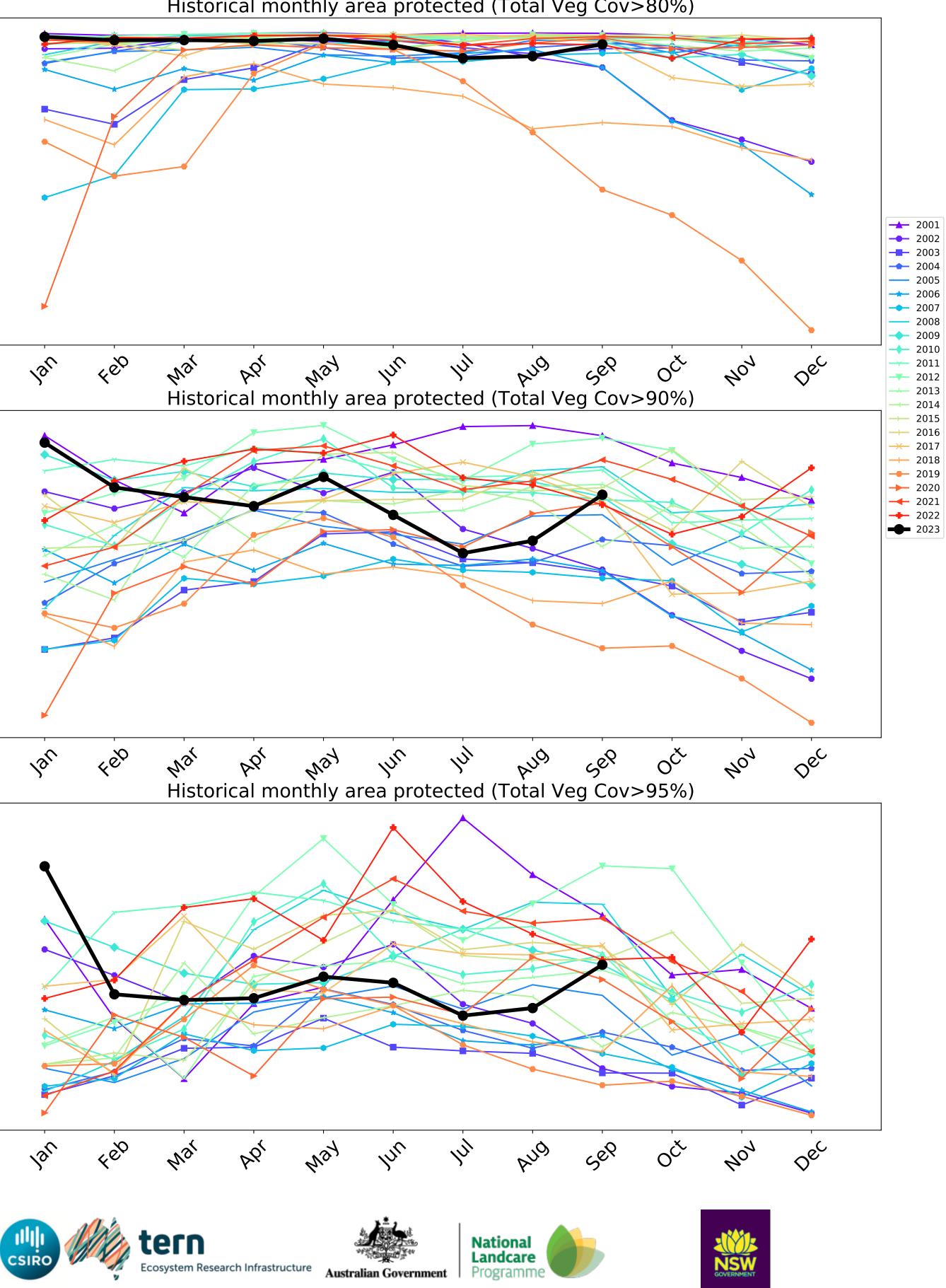
Water erosion historical monthly area protected (Total Veg Cov>70%)







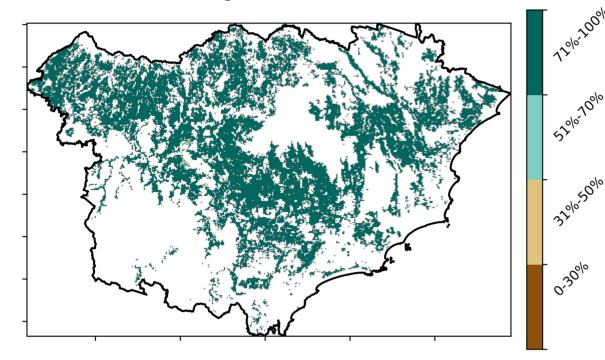




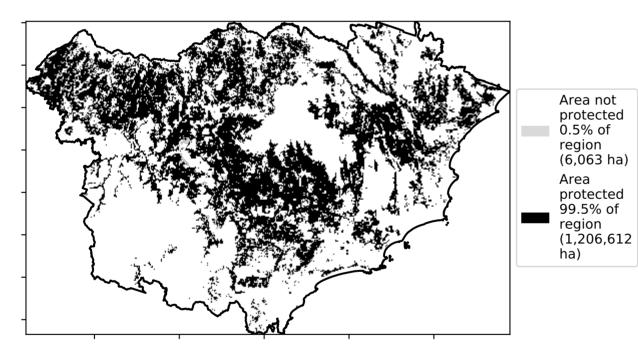
# **Grazing non forest**

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

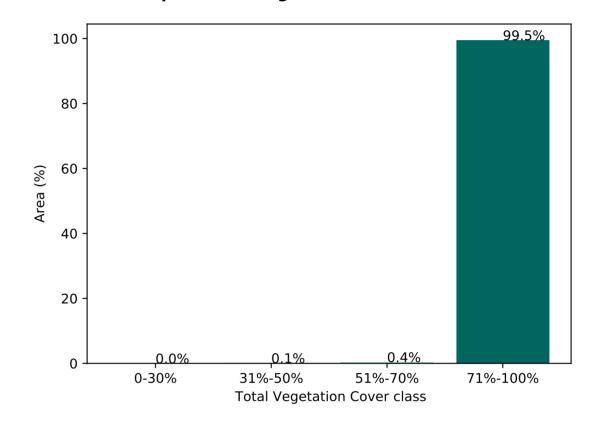
**Total Vegetation Cover [%]** 



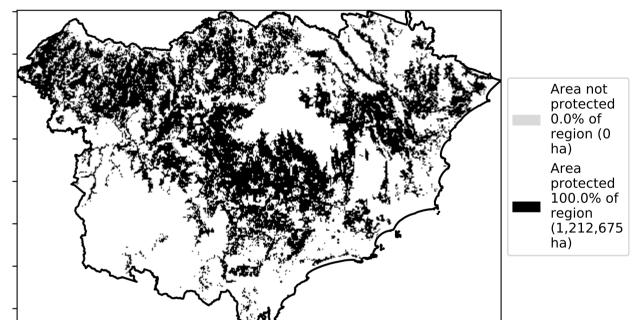
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



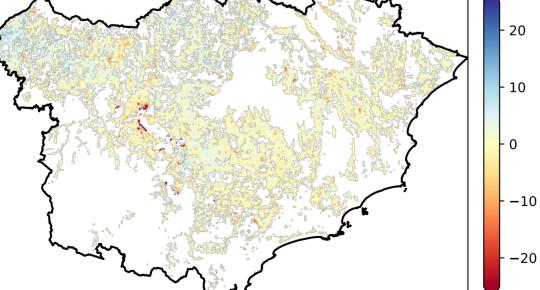
### % Area protected from wind erosion (>50%)



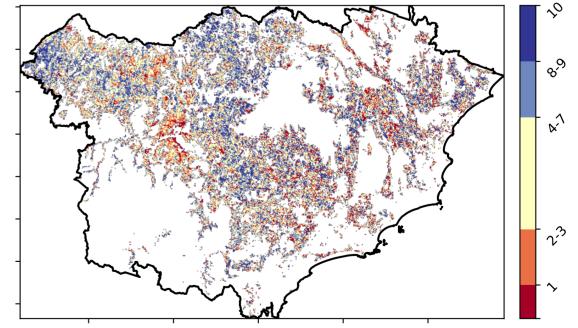
**Total Vegetation Cover Anomaly [%]** 

Total Vegetation Cover Decile [%]

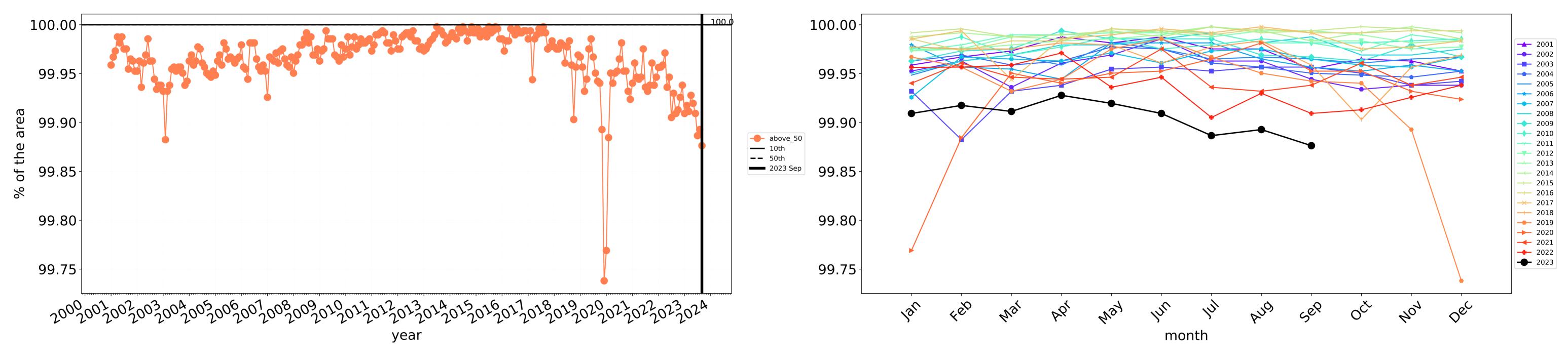
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



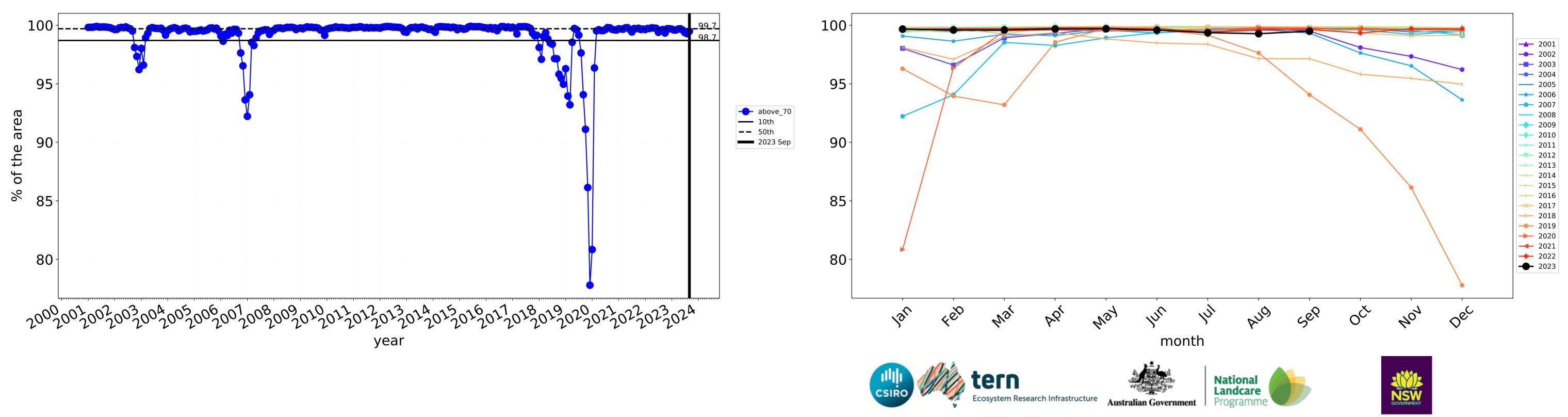
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



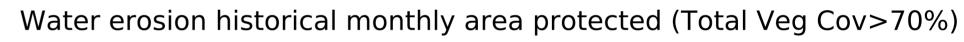




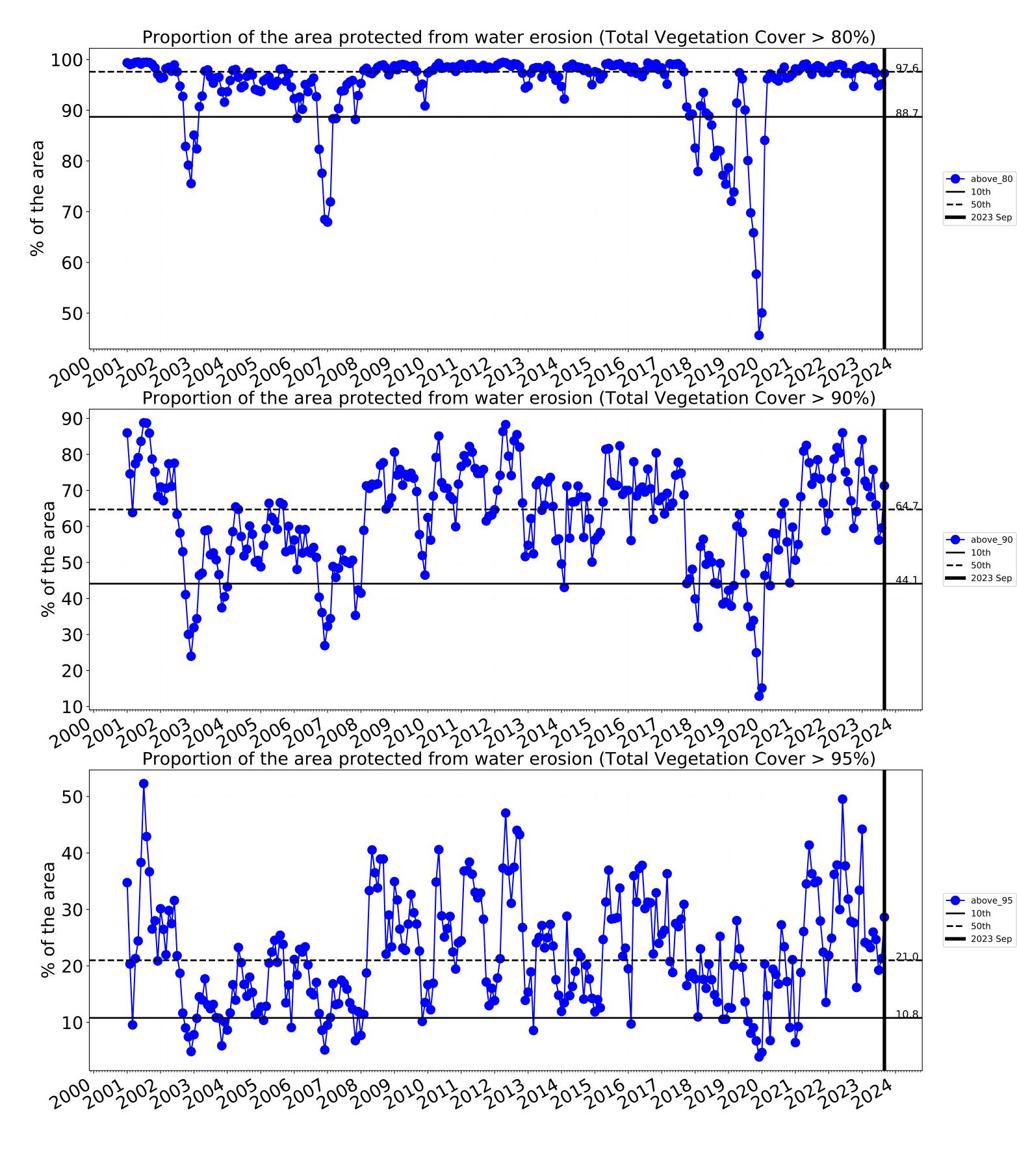
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

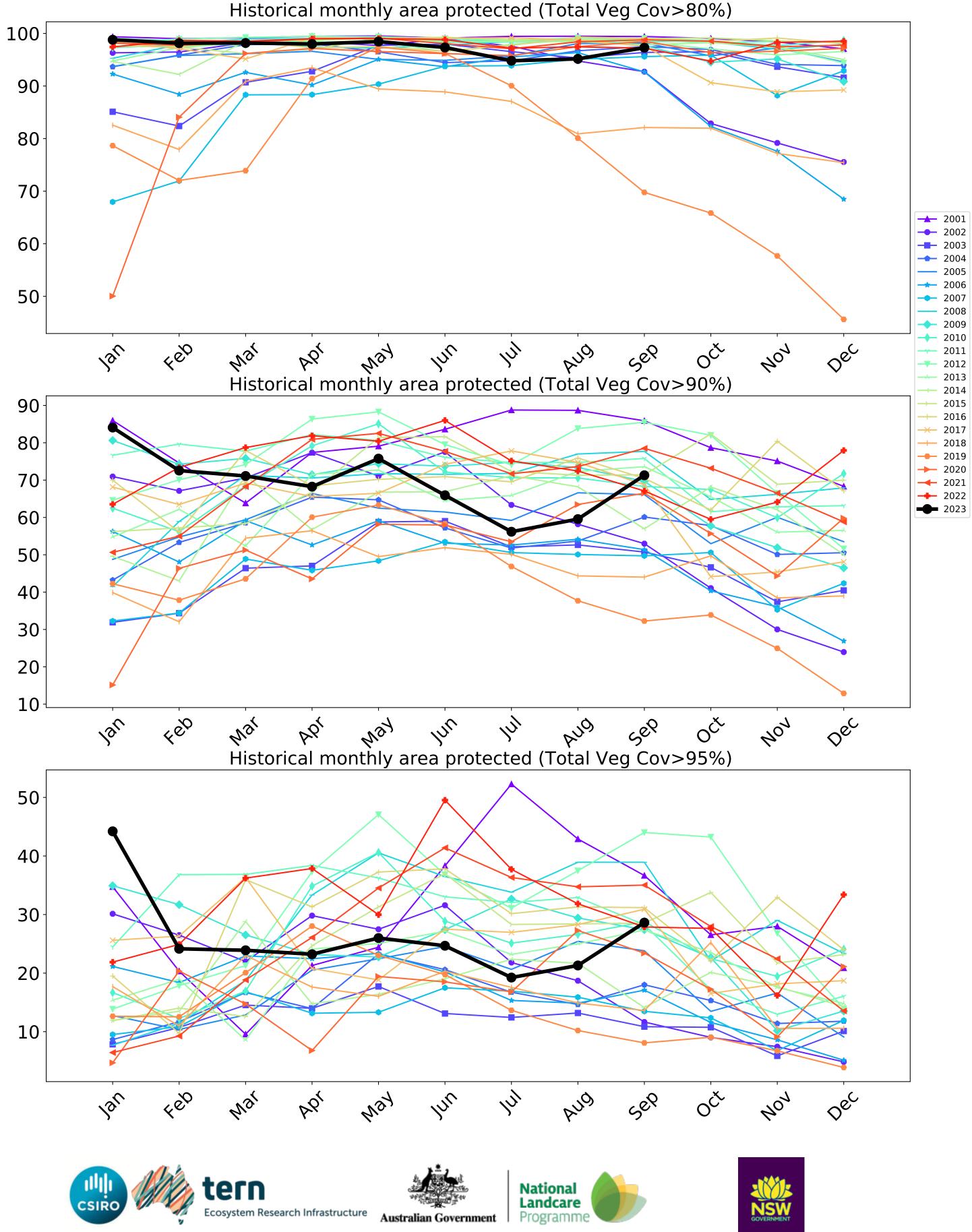


Wind erosion historical monthly area protected (Total Veg Cov >50%)



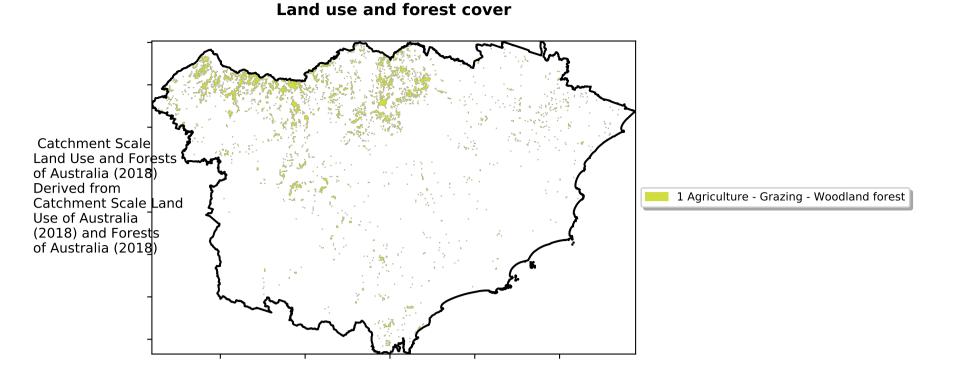




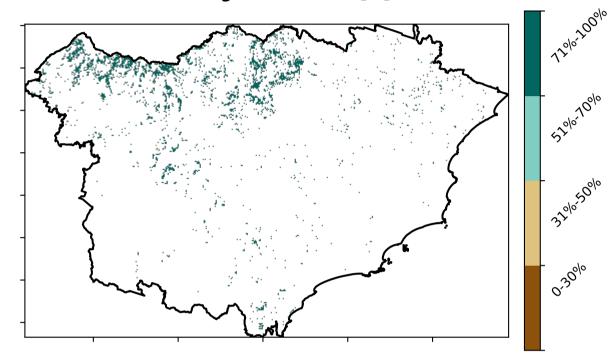




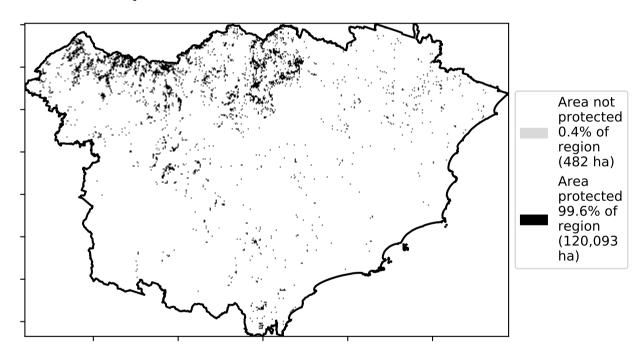
# **Grazing Woodland forest**



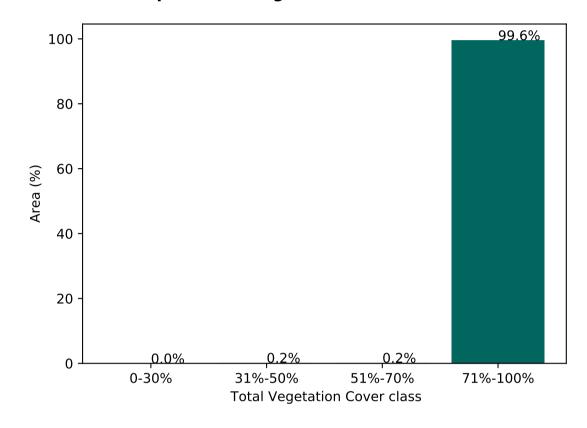
Total Vegetation Cover [%]



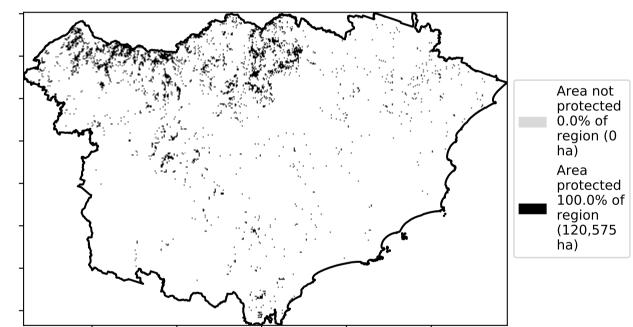
% Area protected from water erosion (>70%)



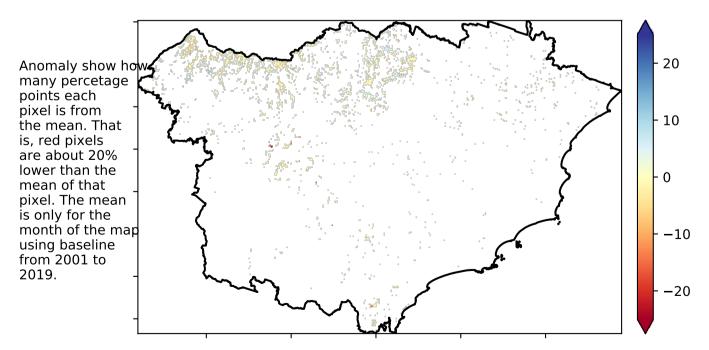
Proportion of vegetation cover class in area



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

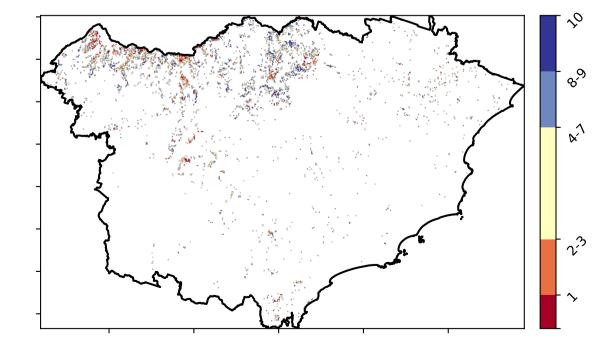


**Total Vegetation Cover Anomaly [%]** 

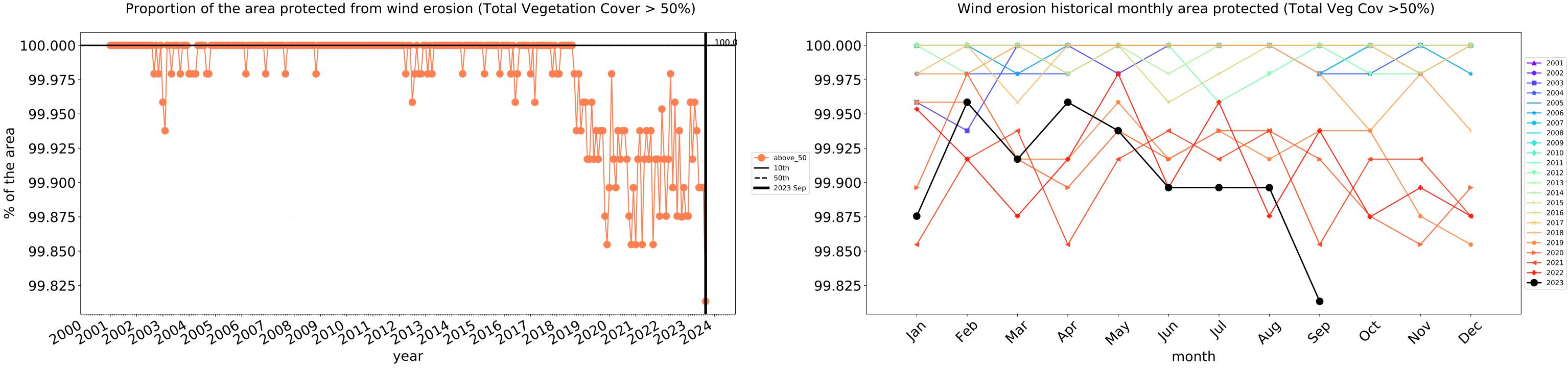


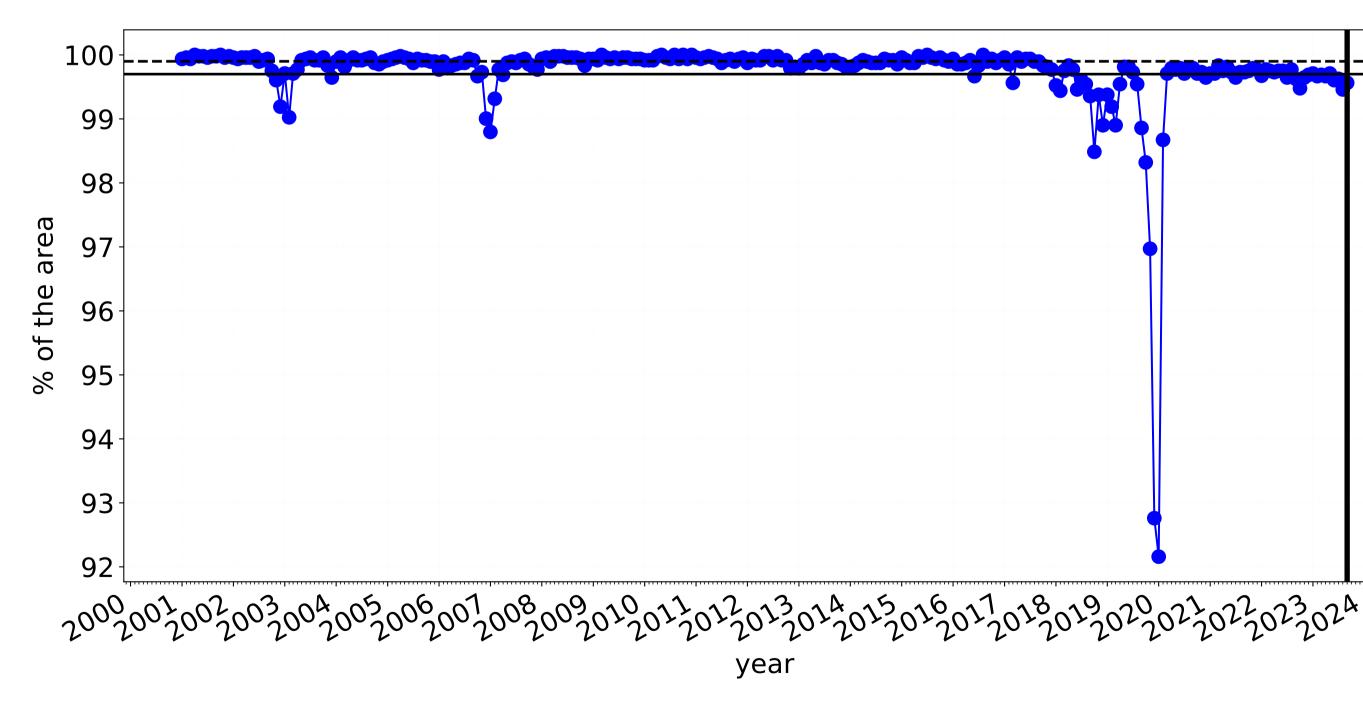
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

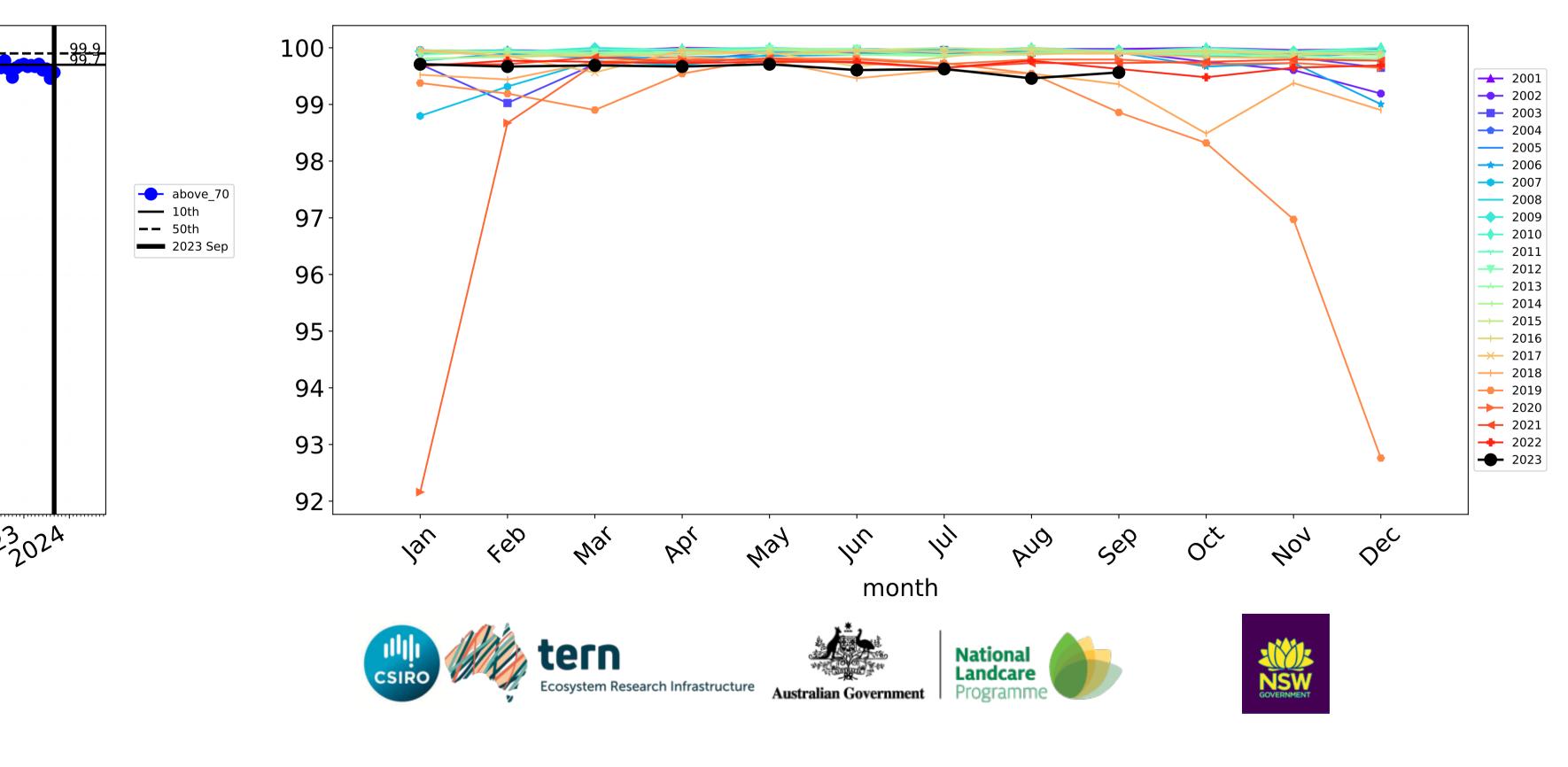
**Total Vegetation Cover Decile [%]** 



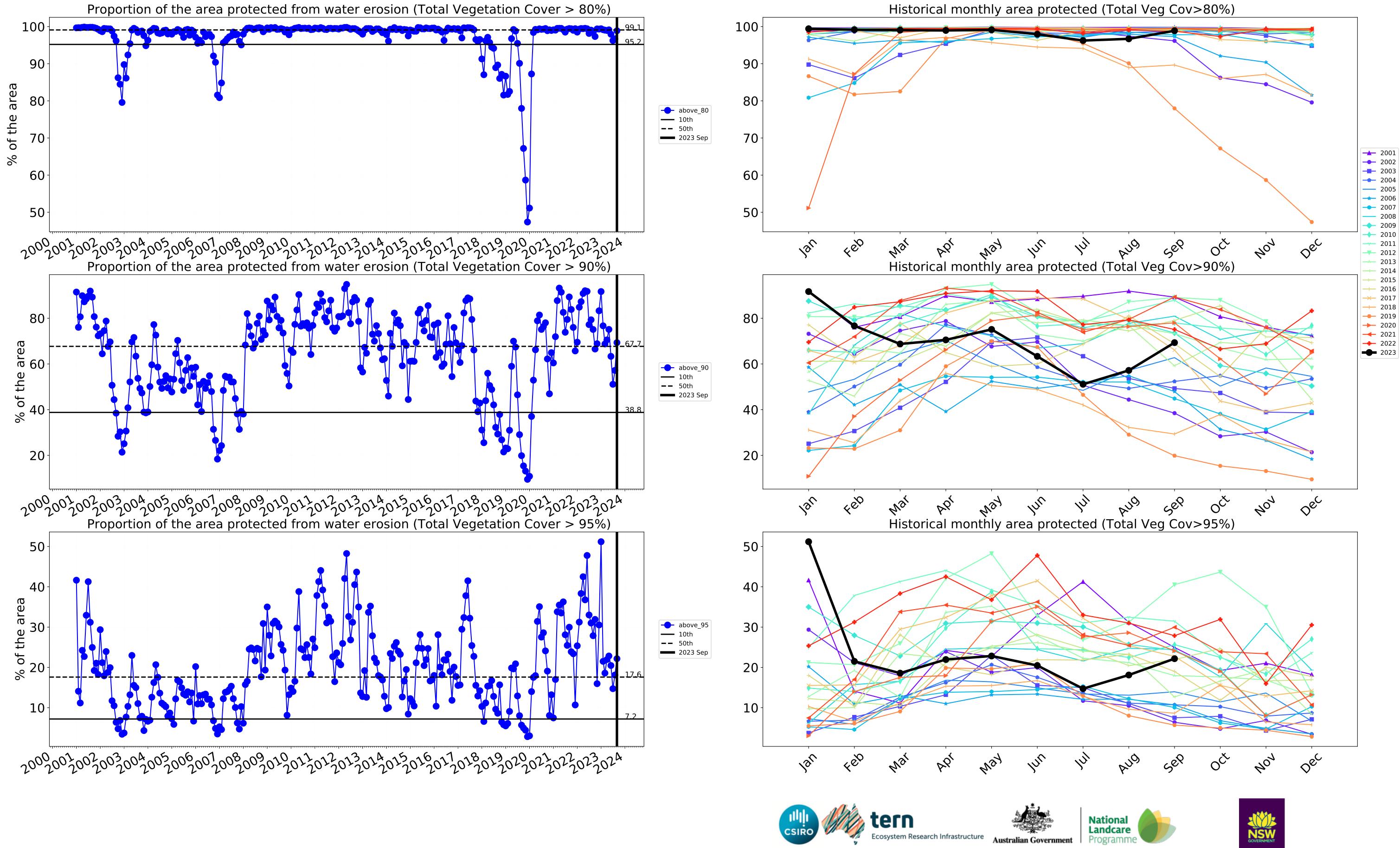




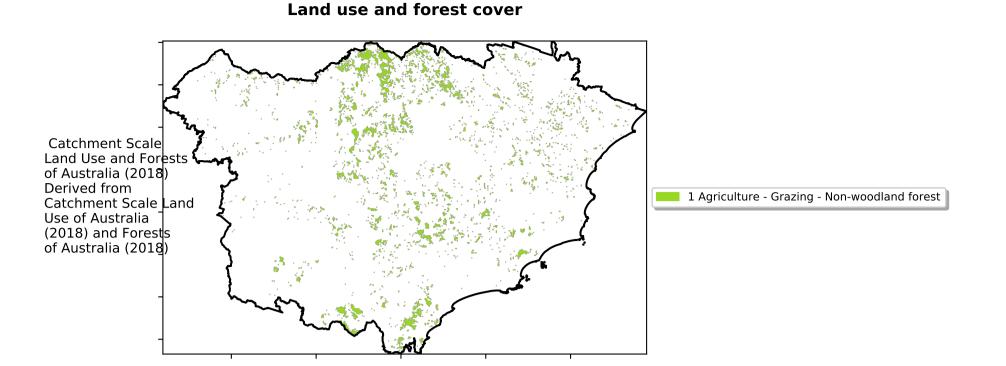




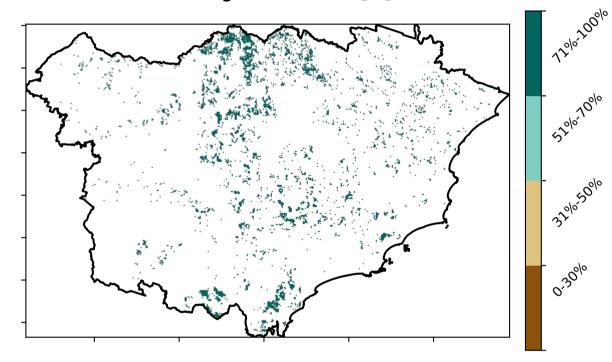
Water erosion historical monthly area protected (Total Veg Cov>70%)



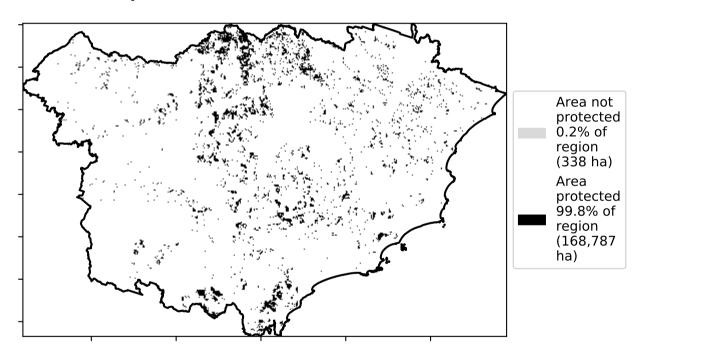
# Grazing - Forest (non woodland)



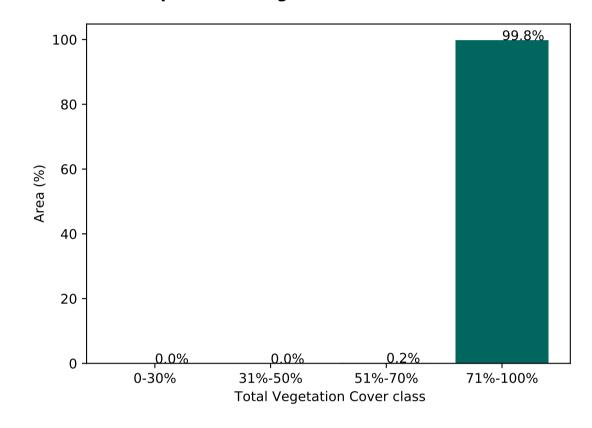
Total Vegetation Cover [%]



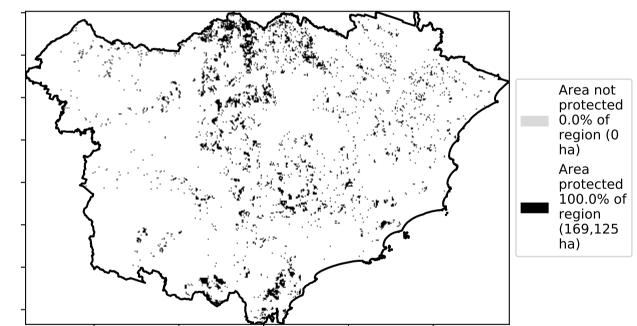
% Area protected from water erosion (>70%)



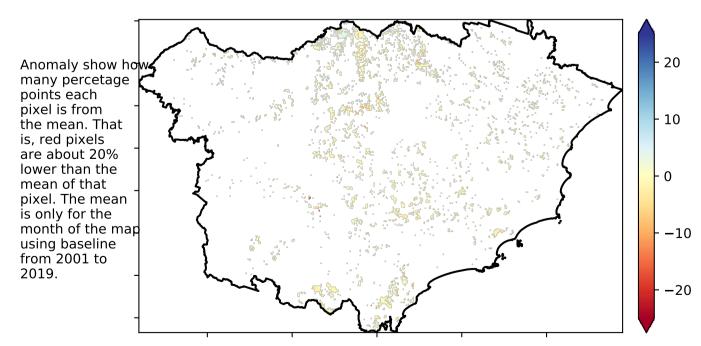
Proportion of vegetation cover class in area



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

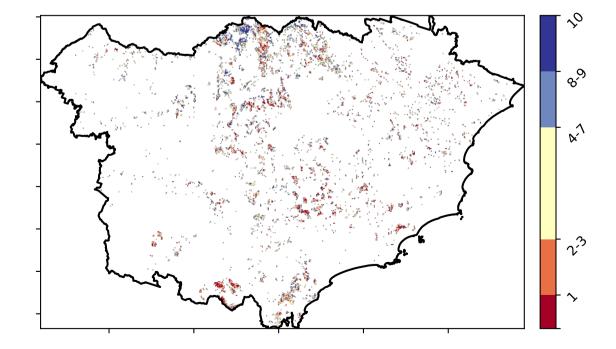


**Total Vegetation Cover Anomaly [%]** 

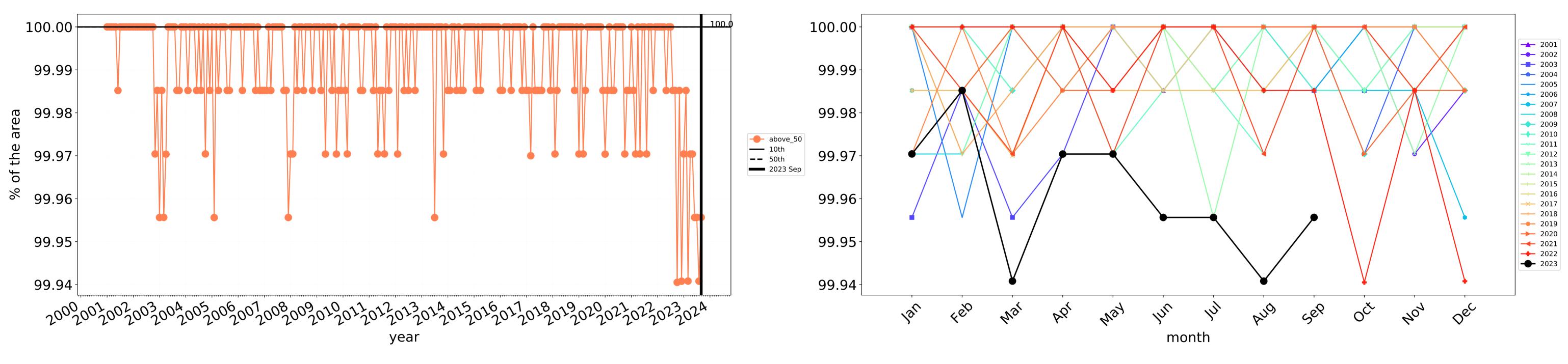


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

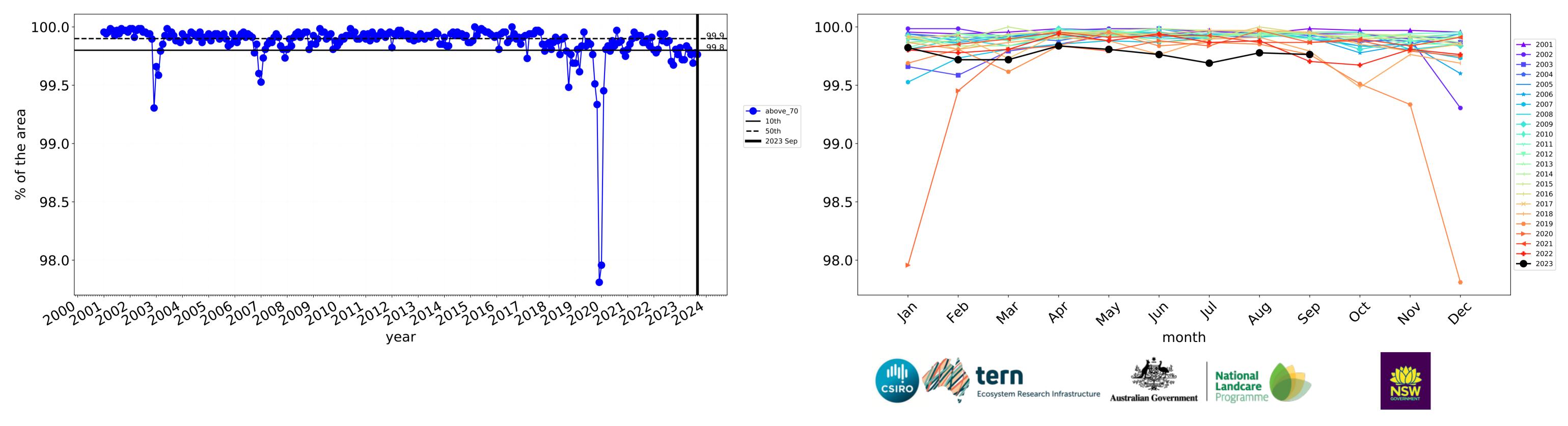
**Total Vegetation Cover Decile [%]** 

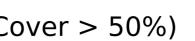






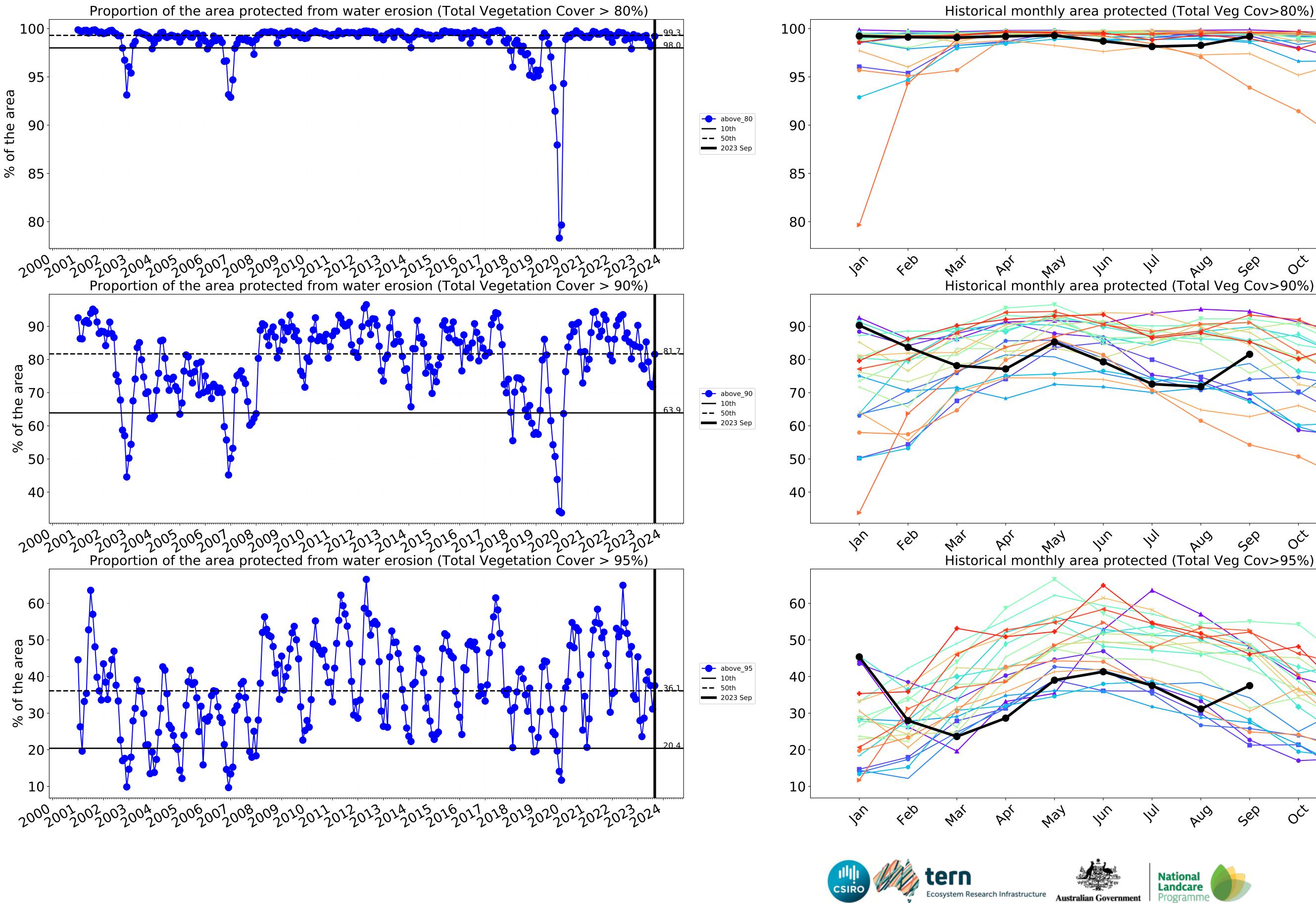
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

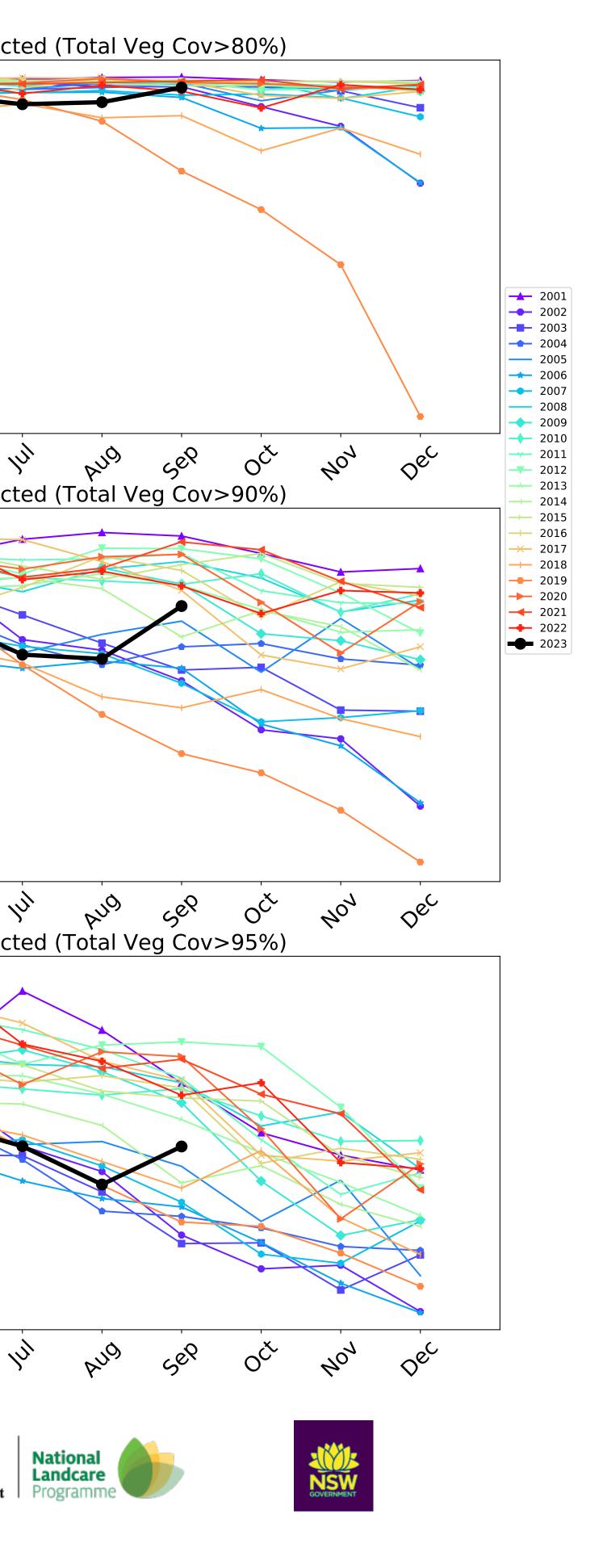




Wind erosion historical monthly area protected (Total Veg Cov >50%)

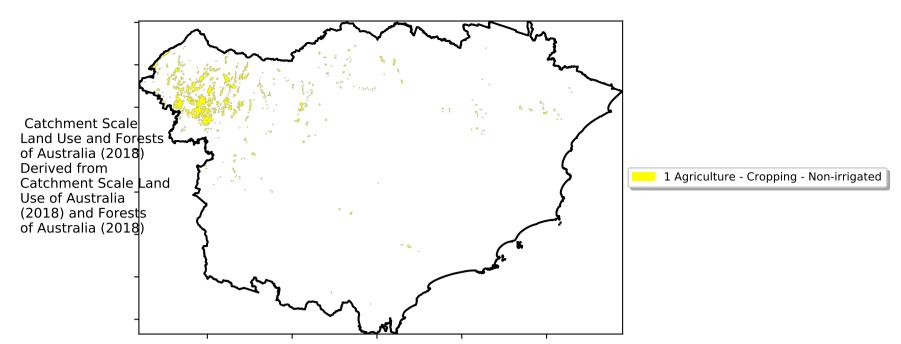
Water erosion historical monthly area protected (Total Veg Cov>70%)



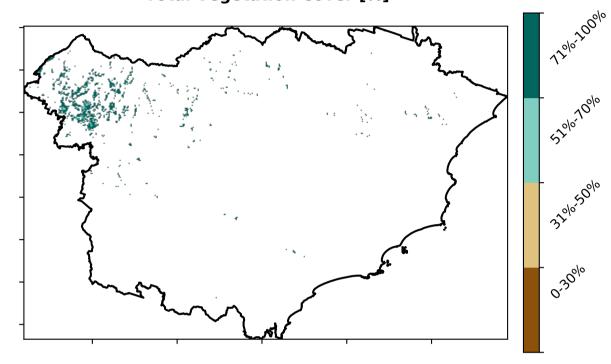


# Cropping

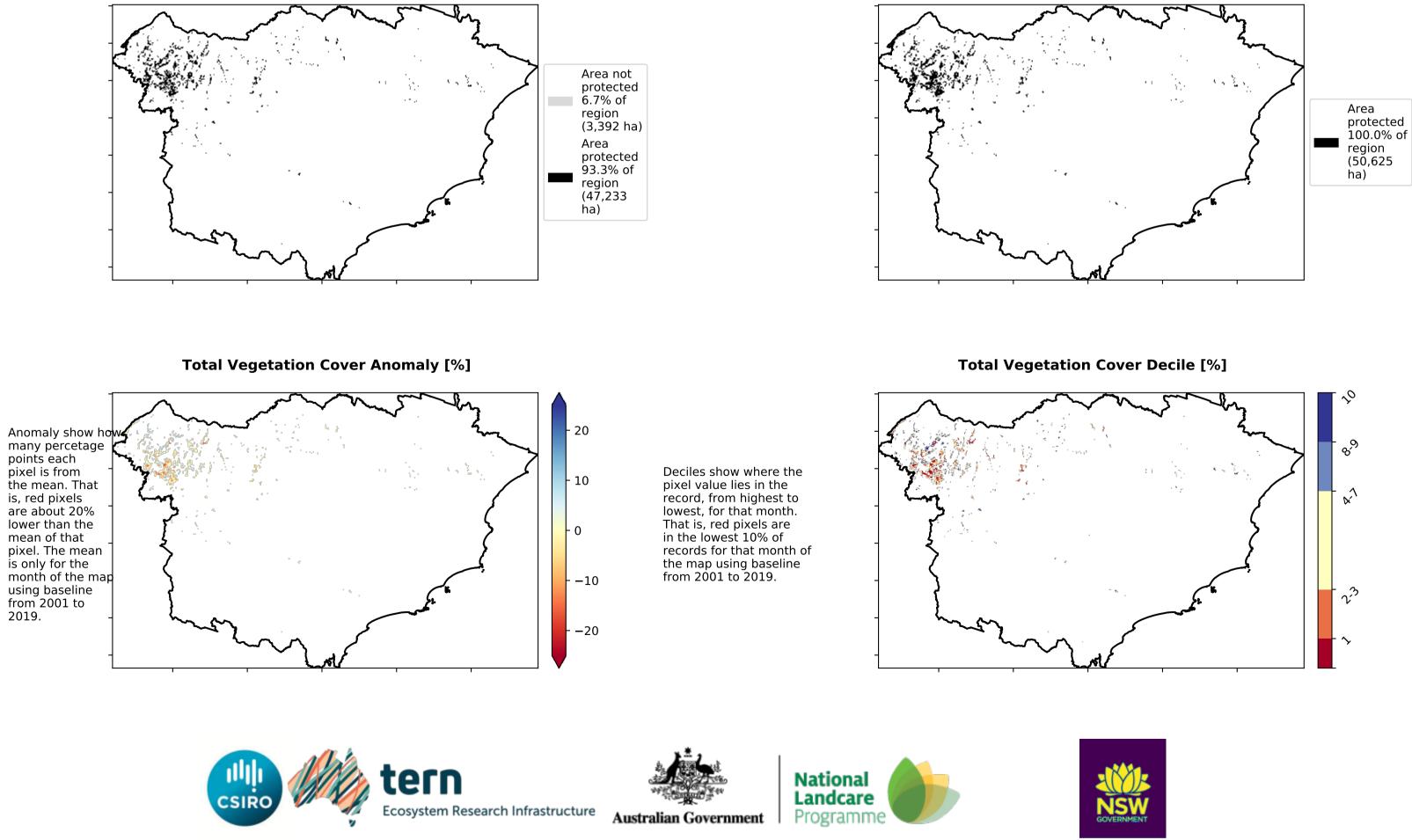
Land use and forest cover



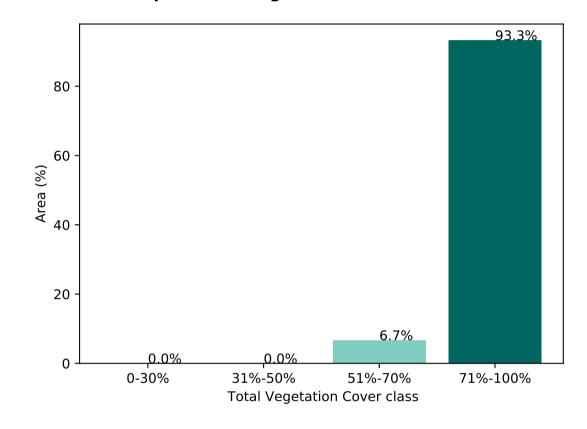
**Total Vegetation Cover [%]** 



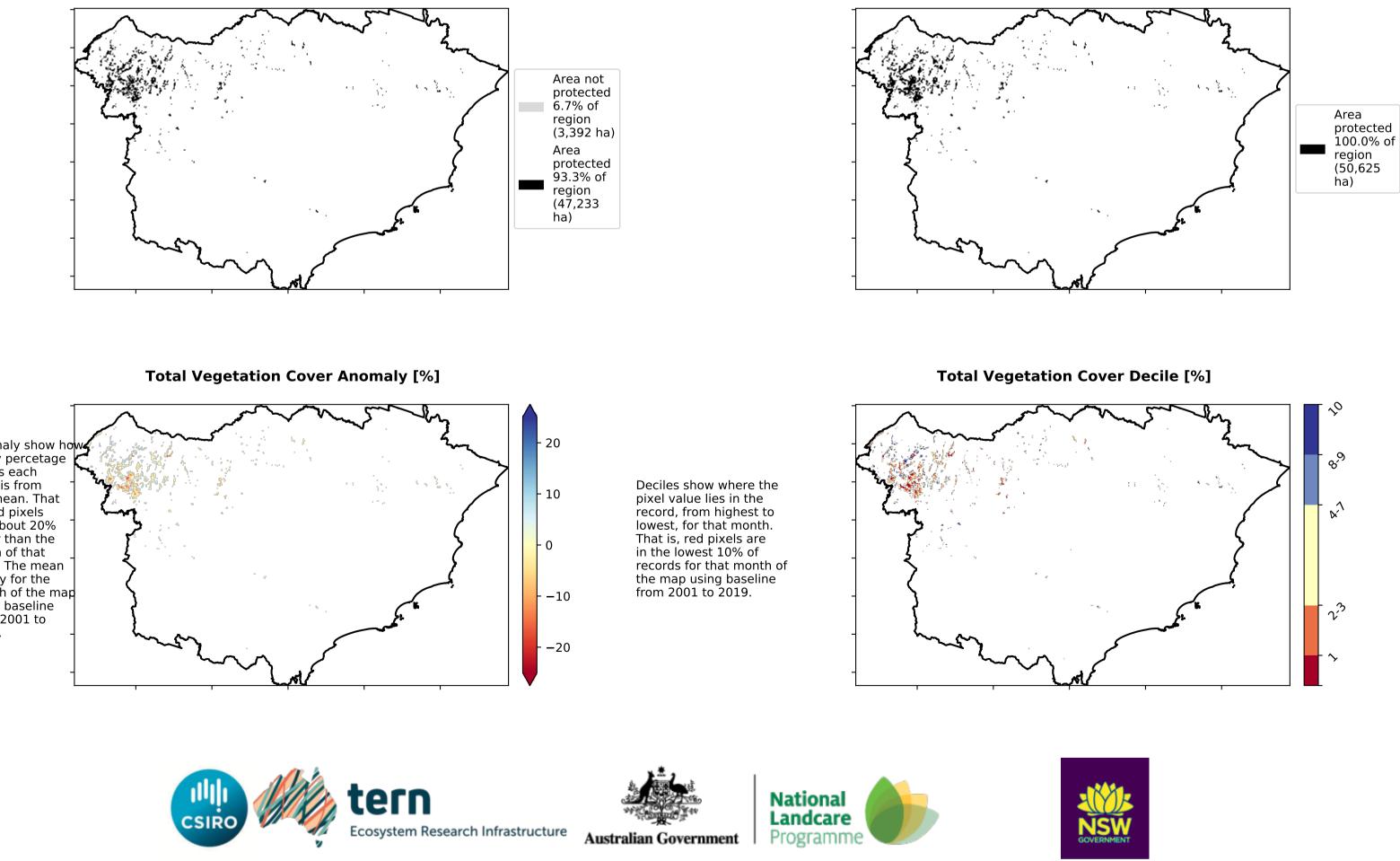
% Area protected from water erosion (>70%)

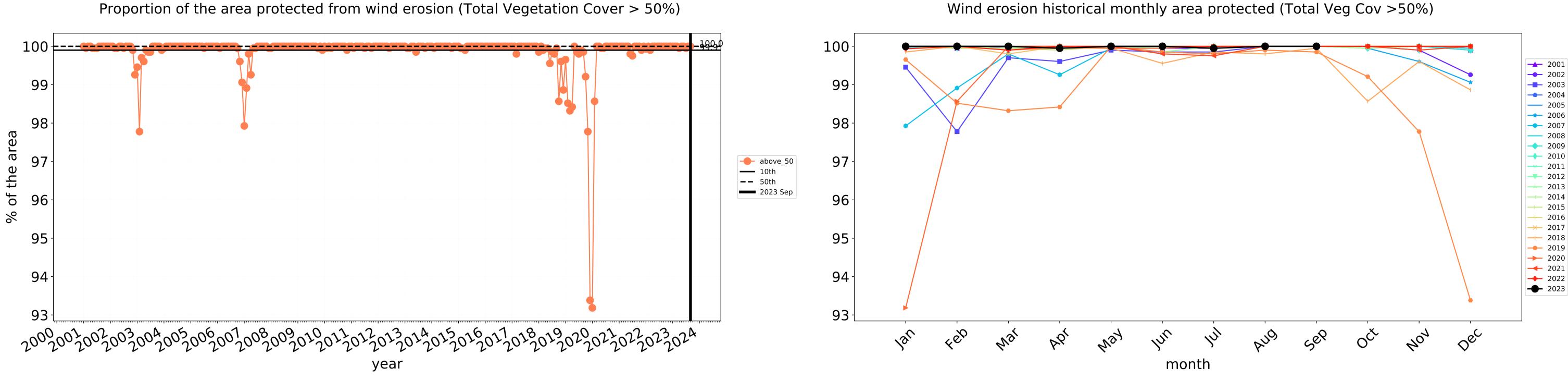


Proportion of vegetation cover class in area

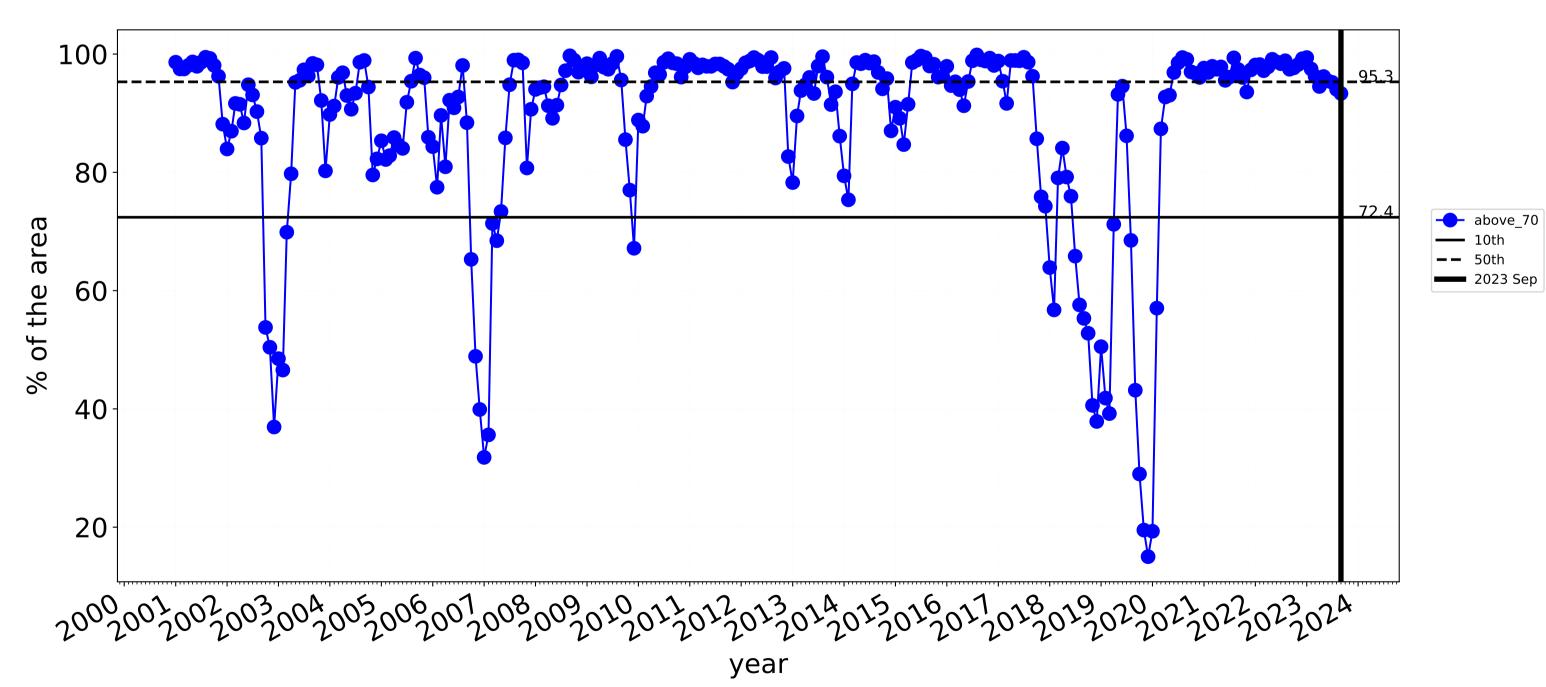


### % Area protected from wind erosion (>50%)



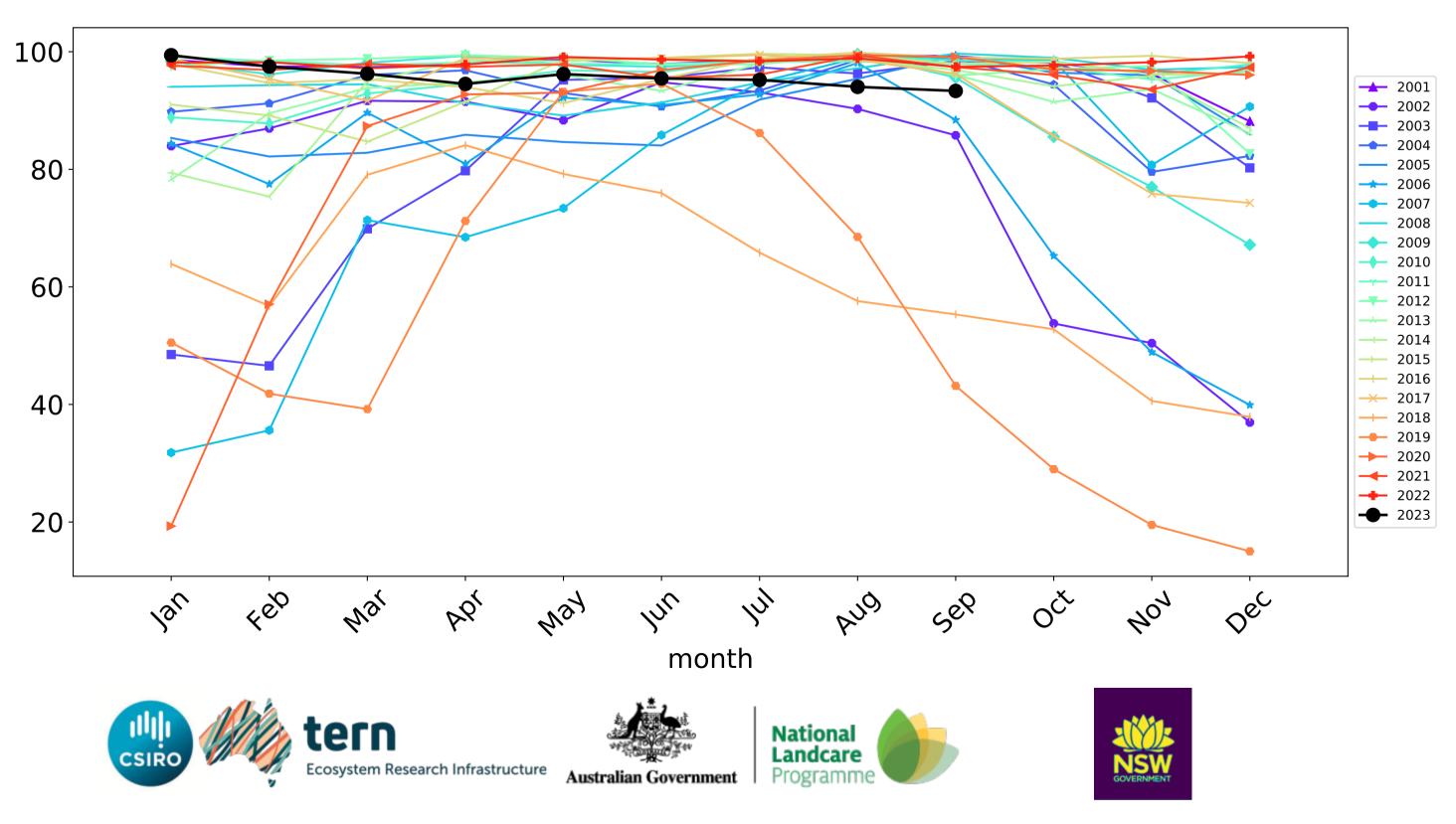


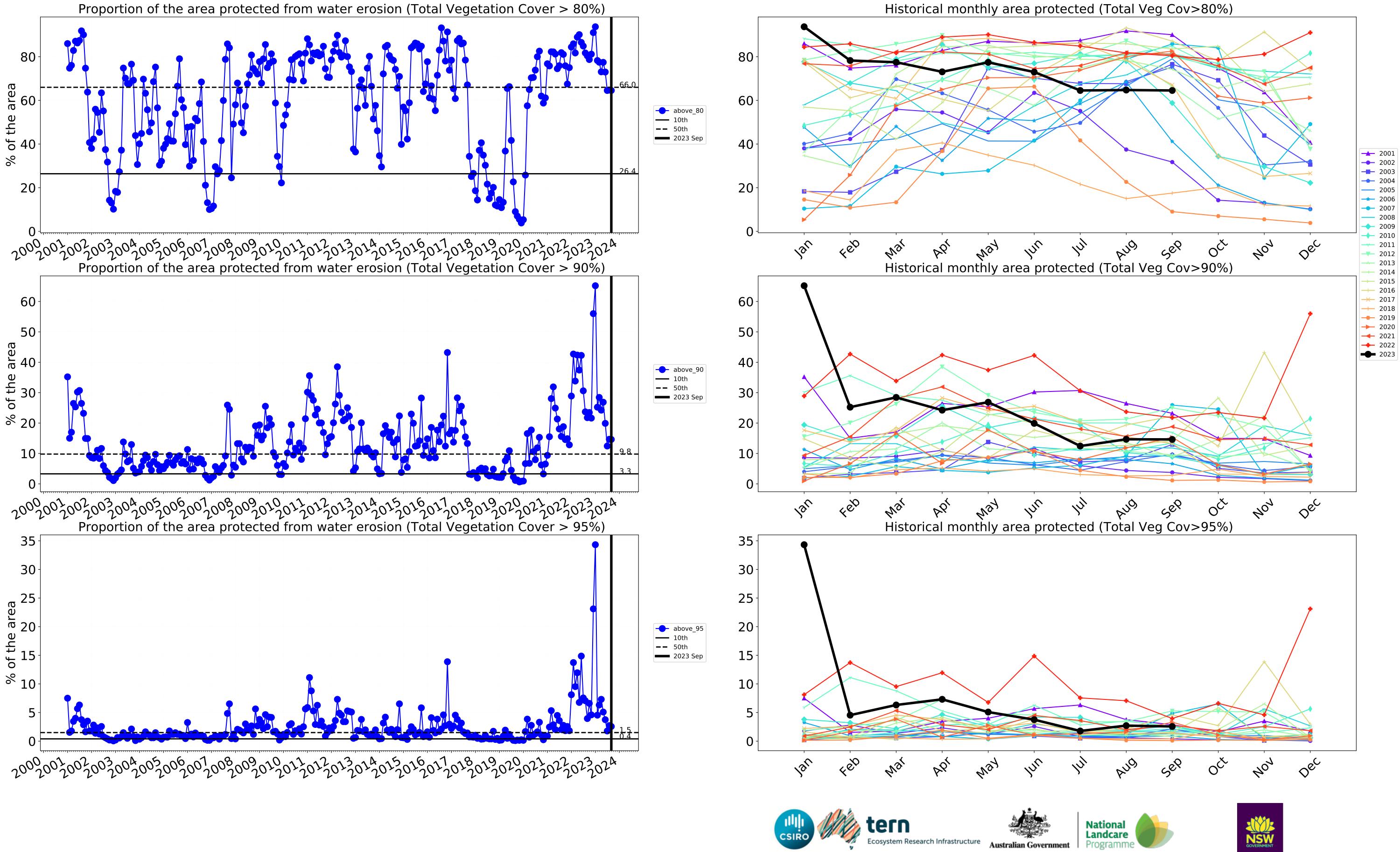
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



# **Cropping timeseries**

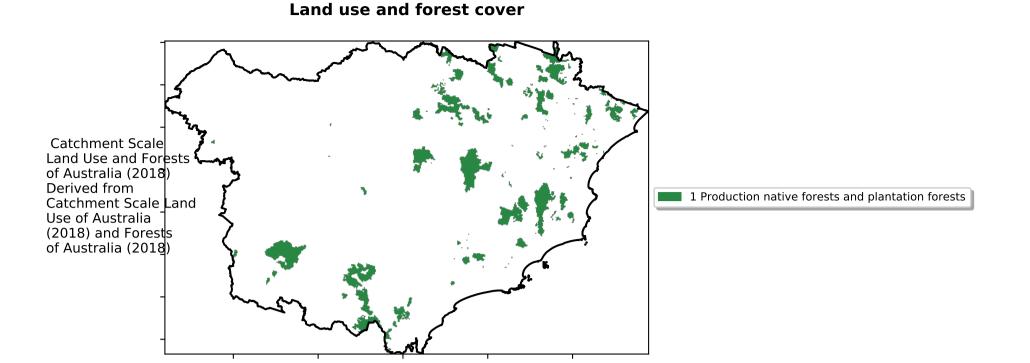
Water erosion historical monthly area protected (Total Veg Cov>70%)



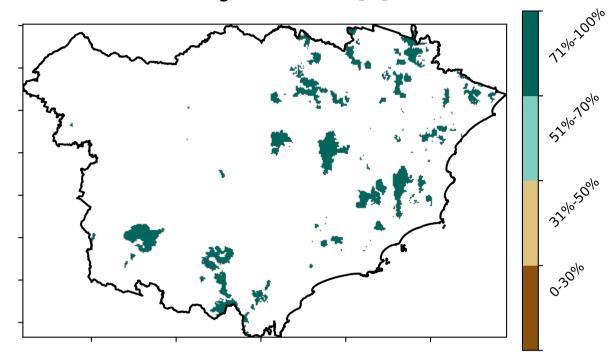




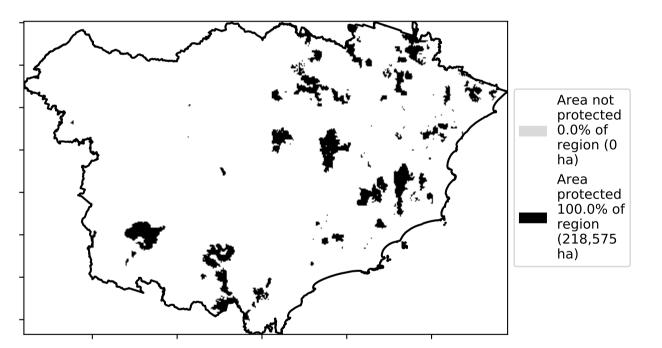
# **Production native forests and plantation forests**



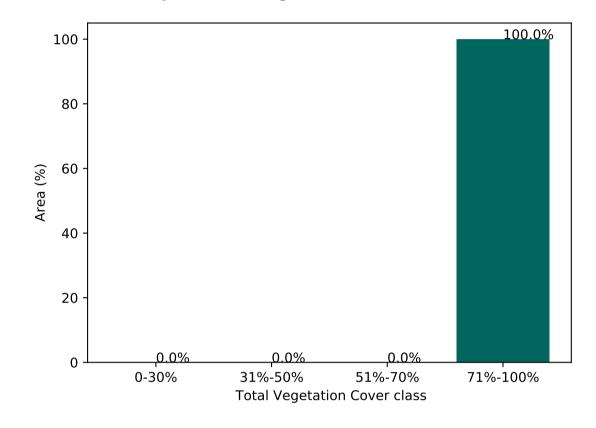
Total Vegetation Cover [%]



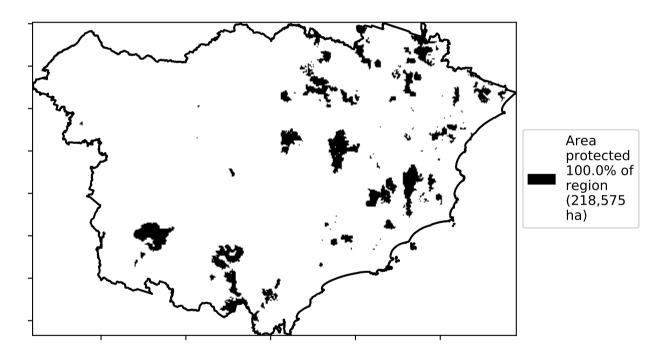
% Area protected from water erosion (>70%)



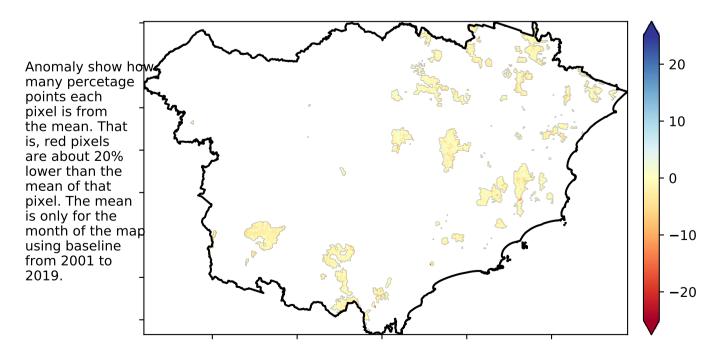
Proportion of vegetation cover class in area



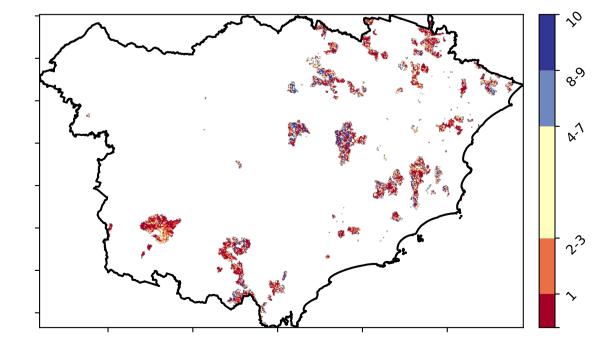
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

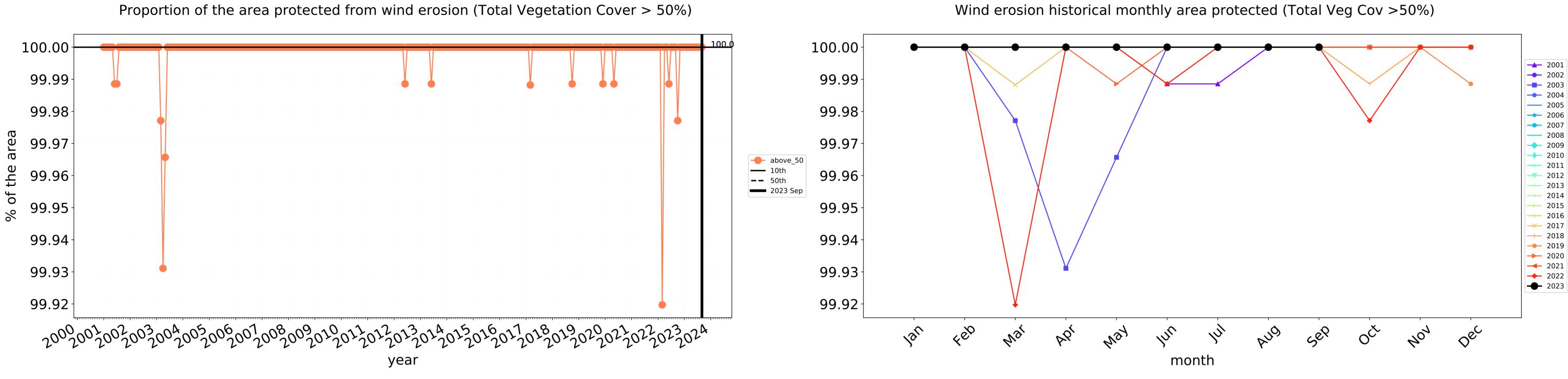


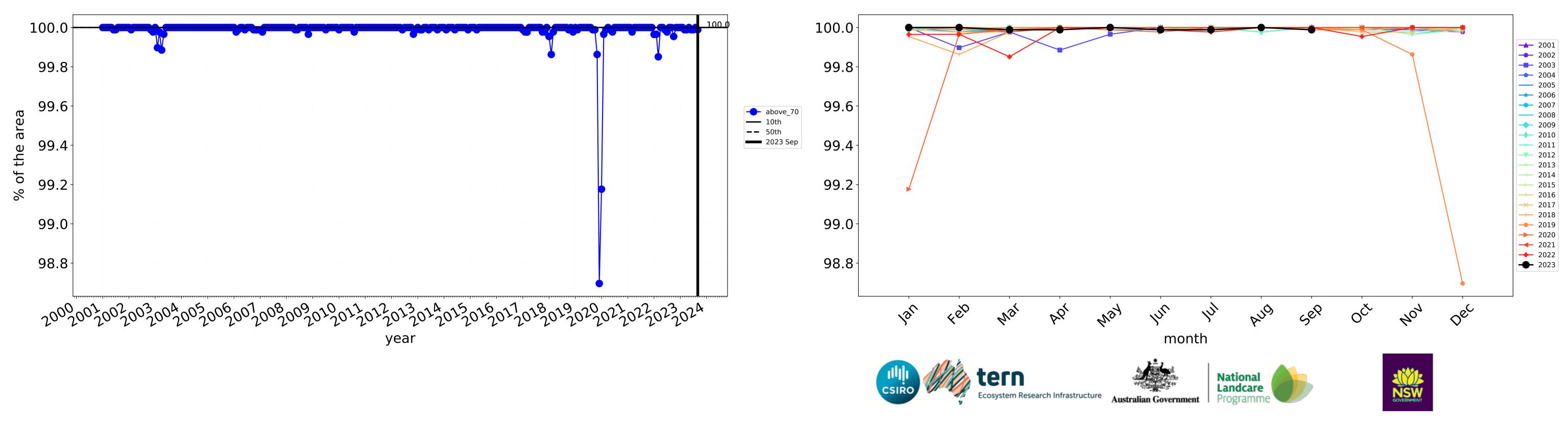
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. **Total Vegetation Cover Decile [%]** 



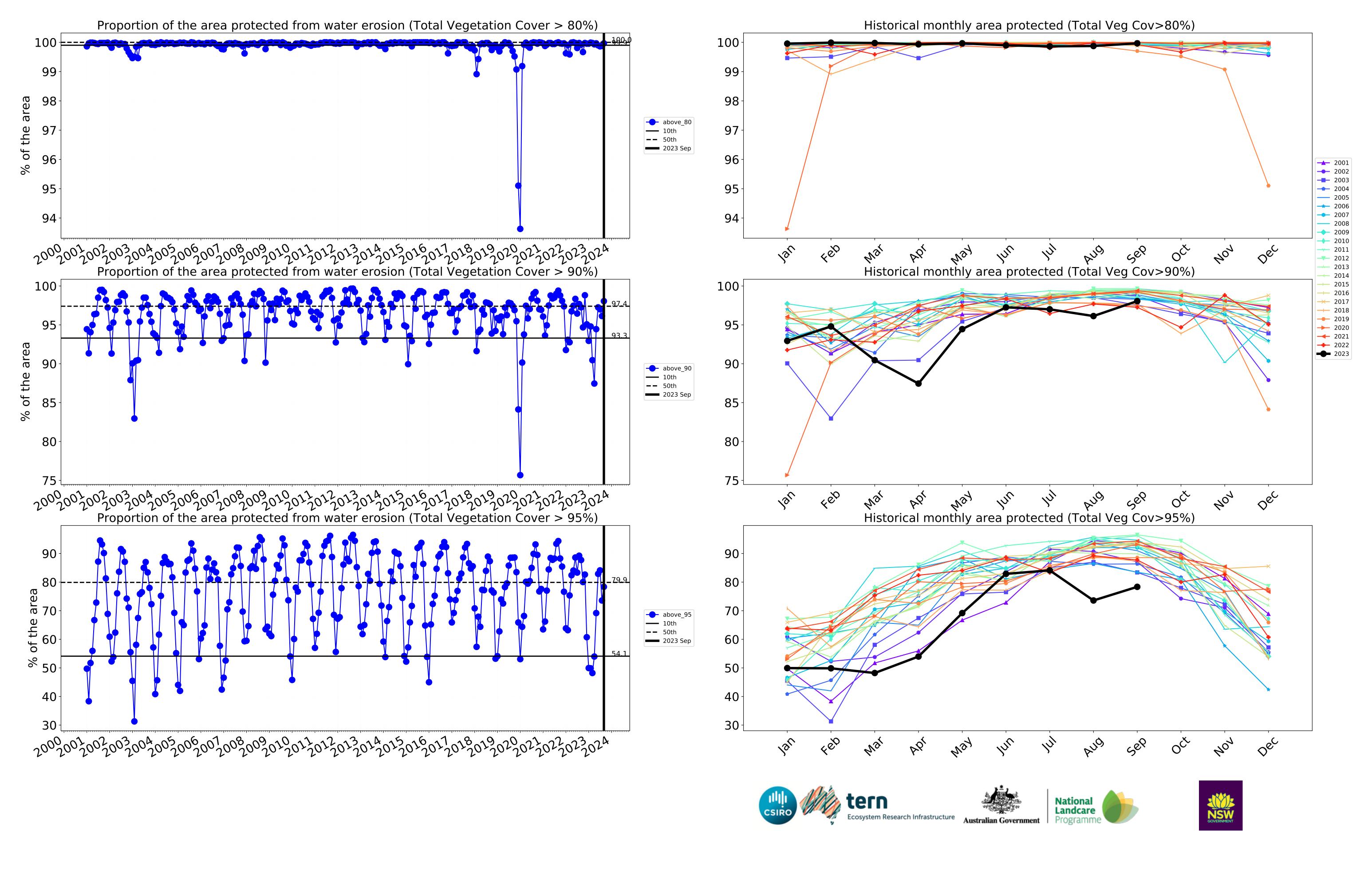


# Production native forests and plantation forests timeseries





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



# Hunter (3,238,025 ha and no data 62,400 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

Land use and forest cover Class	area(ha)	above_30	above_50	above_70	above_80	above_90	above_95
Entire region	3,238,025	99.8% 3,232,825	99.5% 3,221,725	98.3% 3,181,625	95.4% 3,090,450	75.1% 2,430,700	37.7% 1,222,225
Conservation and natural environments	1,240,550	99.9% 1,239,325	99.8% 1,238,500	99.6% 1,235,925	99.3% 1,231,925	85.9% 1,065,375	48.2% 598,450
Conservation and natural environments non forest	29,875	96.1% 28,700	94.1% 28,125	90.1% 26,925	86.8% 25,925	69.6% 20,800	25.5% 7,625
Conservation and natural environments Woodland forest Conservation and	138,750	100.0% 138,725	99.9% 138,625	99.7% 138,375	99.4% 137,950	72.2% 100,150	25.0% 34,700
natural environments Forest (non woodland)	1,071,925	100.0% 1,071,900	100.0% 1,071,750	99.9% 1,070,625	99.6% 1,068,050	88.1% 944,425	51.9% 556,125
Agriculture	1,580,375	100.0% 1,580,100	99.9% 1,578,575	99.3% 1,569,550	96.1% 1,519,350	69.4% 1,097,075	27.8% 438,875
Grazing	1,502,375	100.0% 1,502,100	99.9% 1,500,575	99.5% 1,495,250	97.6% 1,466,800	72.3% 1,086,150	29.1% 437,275
Grazing non forest	1,212,675	100.0% 1,212,450	99.9% 1,211,175	99.5% 1,206,475	97.3% 1,179,800	71.3% 864,575	28.6% 347,100
Grazing Woodland forest	120,575	100.0% 120,550	99.8% 120,350	99.6% 120,050	98.9% 119,225	69.3% 83,600	22.2% 26,725
Grazing - Forest (non woodland)	169,125	100.0% 169,100	100.0% 169,050	99.8% 168,725	99.2% 167,775	81.6% 137,975	37.5% 63,450
Cropping	50,625	100.0% 50,625	100.0% 50,625	93.3% 47,250	64.5% 32,675	14.6% 7,400	2.6% 1,300
Production native forests and plantation forests	218,575	100.0% 218,575	100.0% 218,575	100.0% 218,550	100.0% 218,500	98.1% 214,325	78.3% 171,250

