## Total vegetation cover soil protection Region:LGA Hinchinbrook\_(S) QLD

# **Date: October 2022**

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:

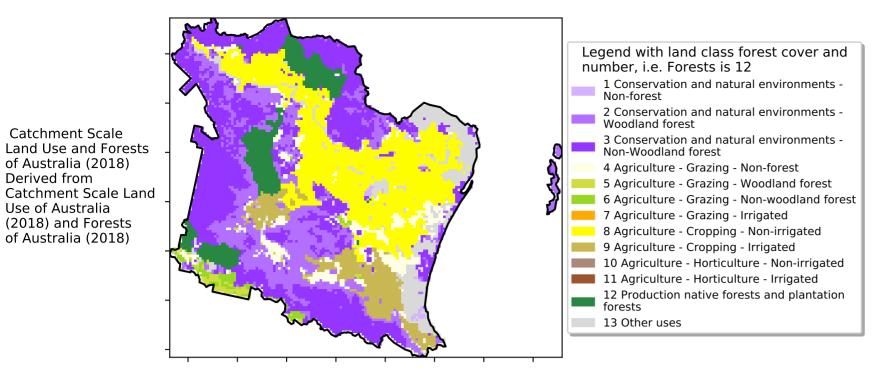
https://doi.org/10.4225/08/5848a3f19a7b3



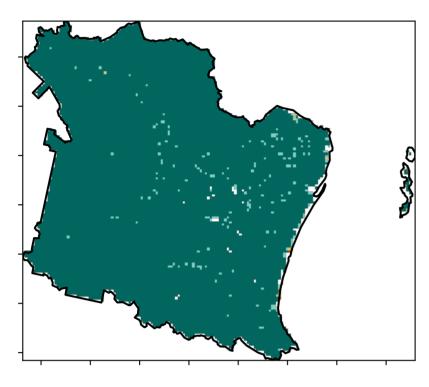
### **Vegetation Cover Oct 2022**

#### Land use and forest cover

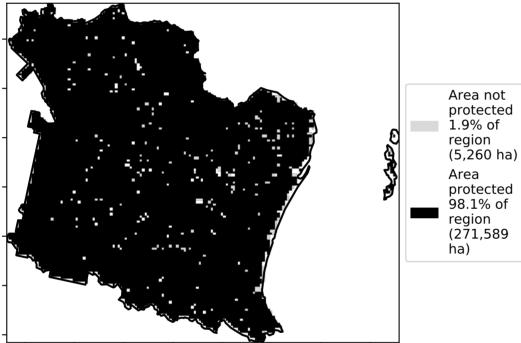
Proportion of each land class in area

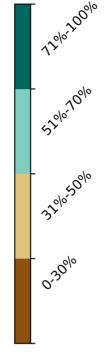


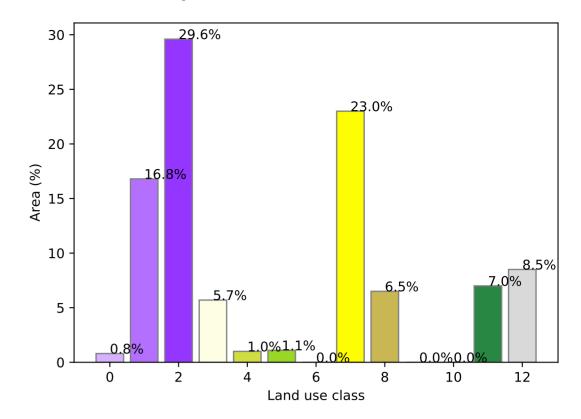
**Total Vegetation Cover [%]** 



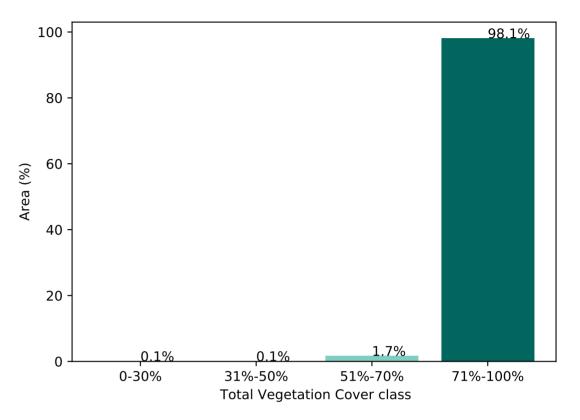
% Area protected from water erosion (>70%)



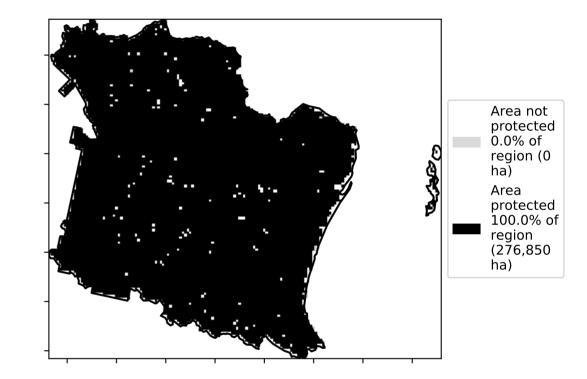




#### Proportion of vegetation cover class in area

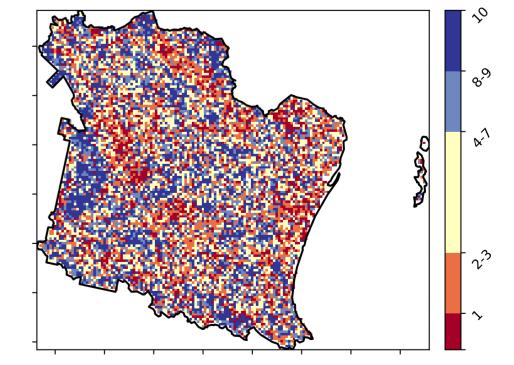


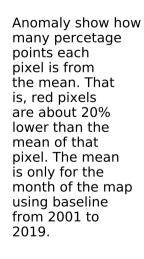
#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

**Total Vegetation Cover Decile [%]** 

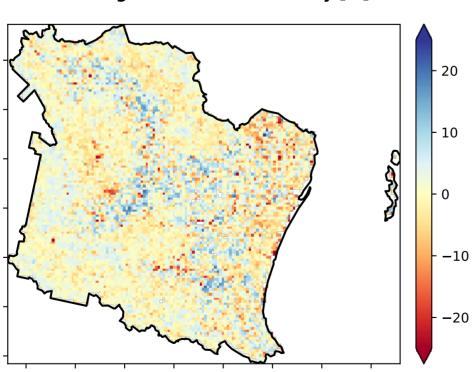




Catchment Scale

Derived from

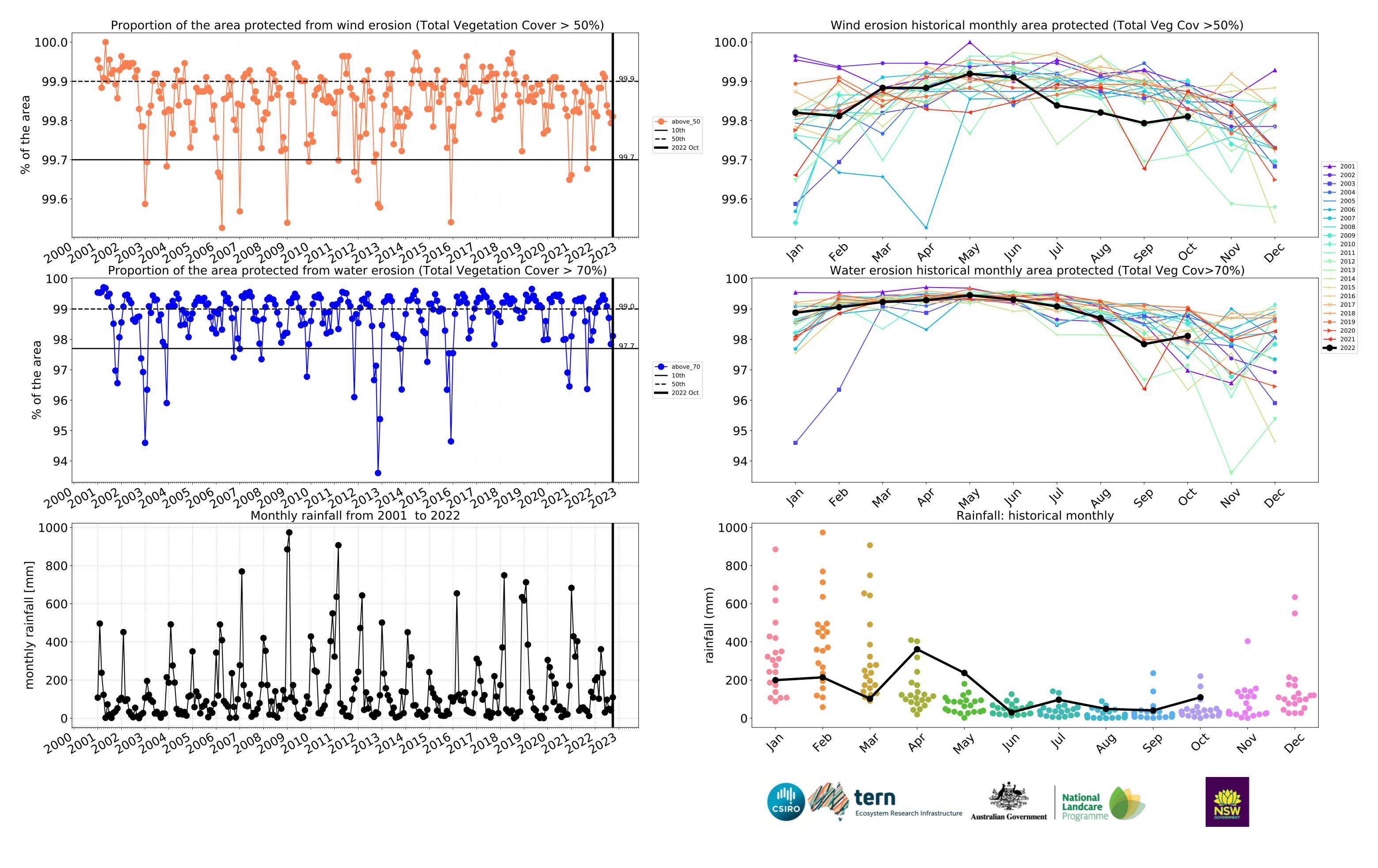
Use of Australia



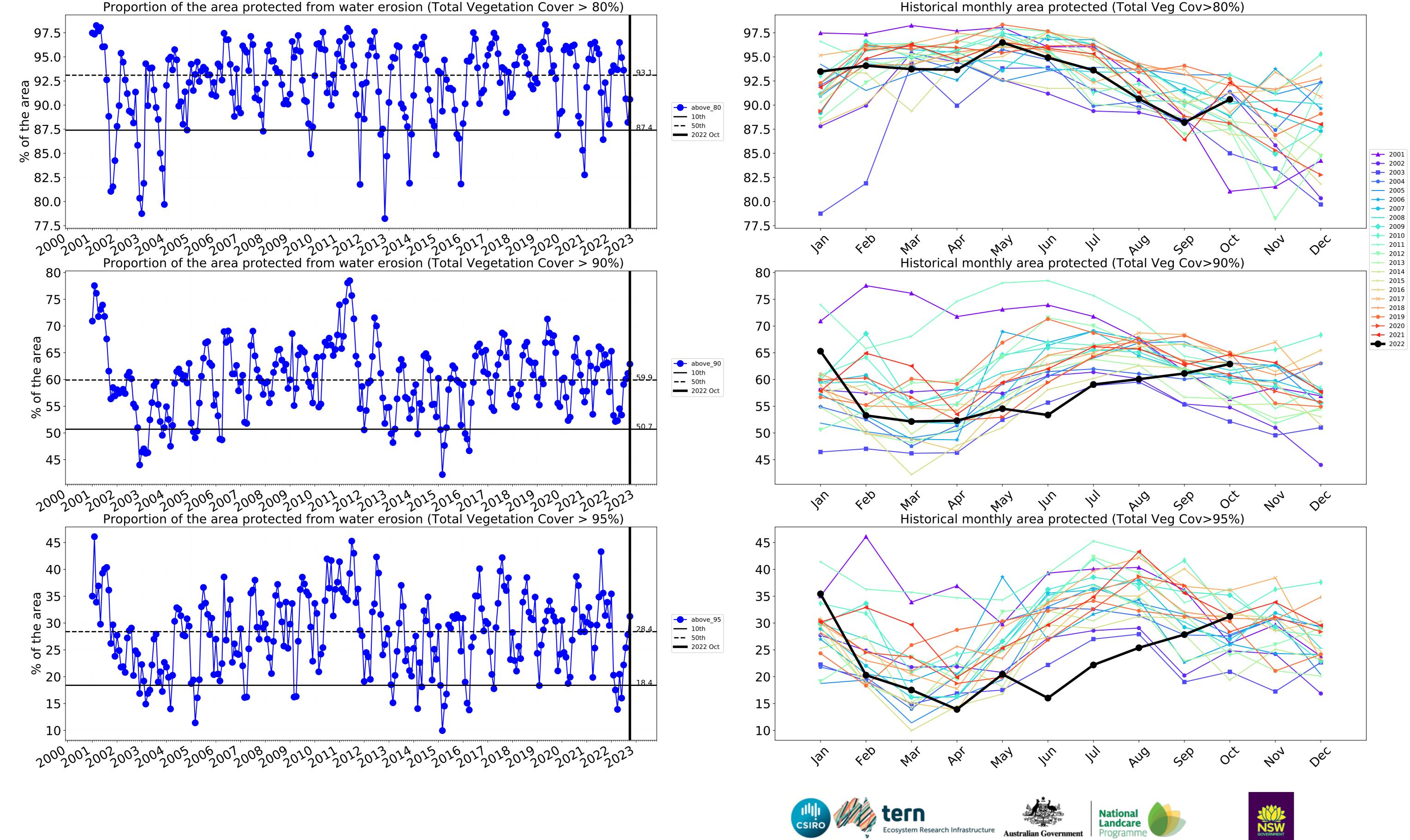
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.







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





### **Conservation and natural environments**

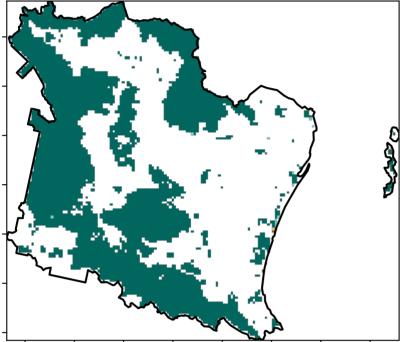
Ś

forest

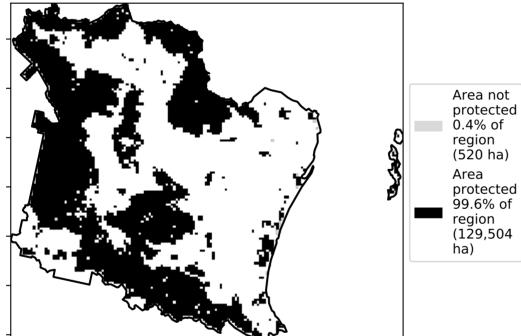
woodland forest

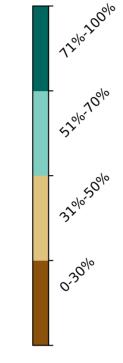
Land use and forest cover

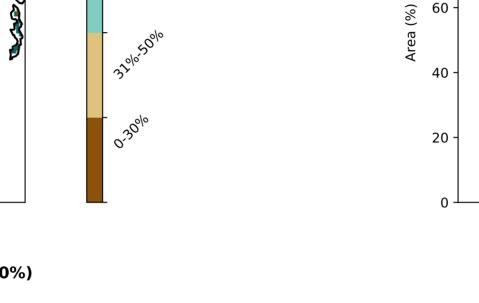
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





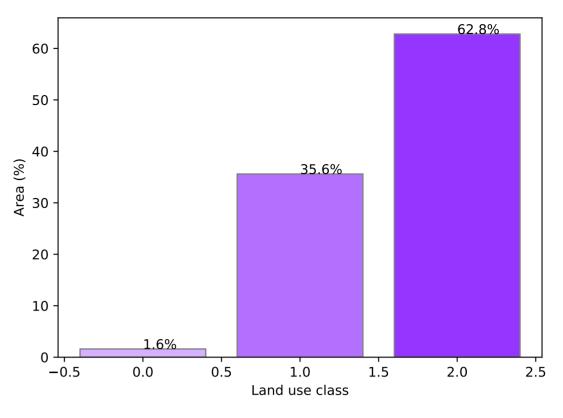


1 Conservation and natural environments - Non-forest

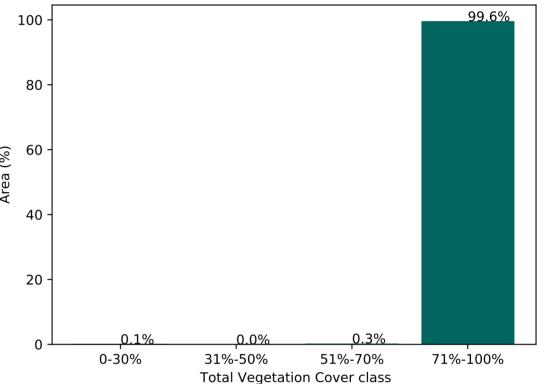
3 Conservation and natural environments - Non-

2 Conservation and natural environments - Woodland

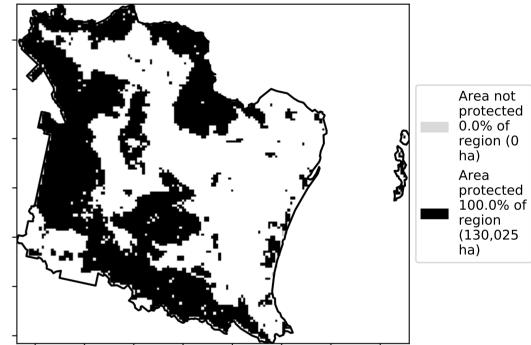
#### Proportion of each land class in area



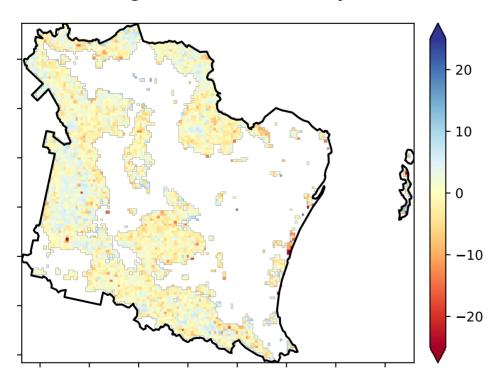
### Proportion of vegetation cover class in area



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

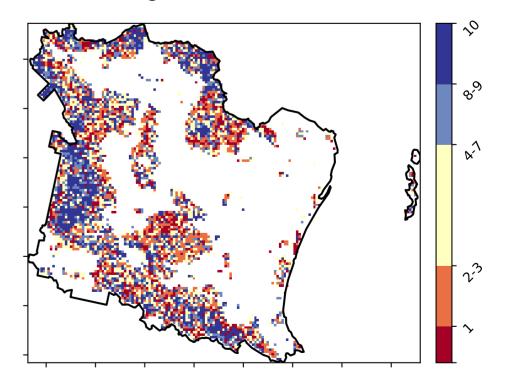


**Total Vegetation Cover Anomaly [%]** 



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

**Total Vegetation Cover Decile [%]** 







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

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

Derived from

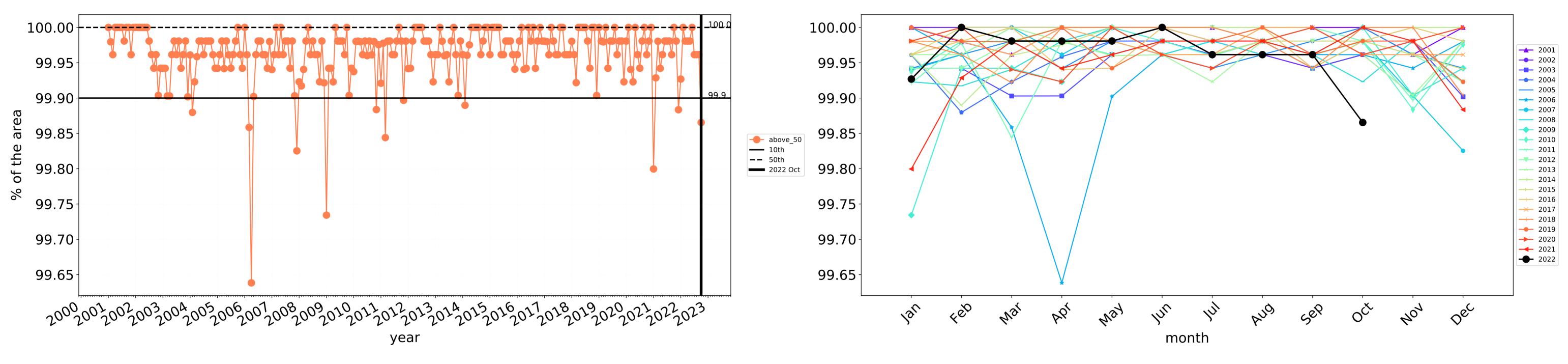
Use of Australia

(2018) and Forests

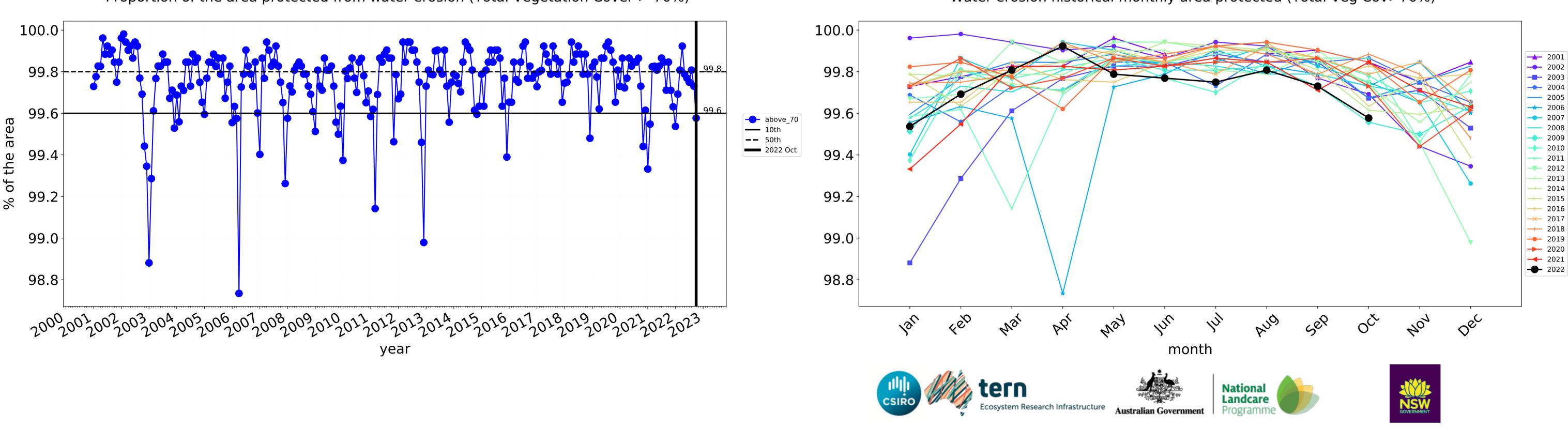
of Australia (2018)



3



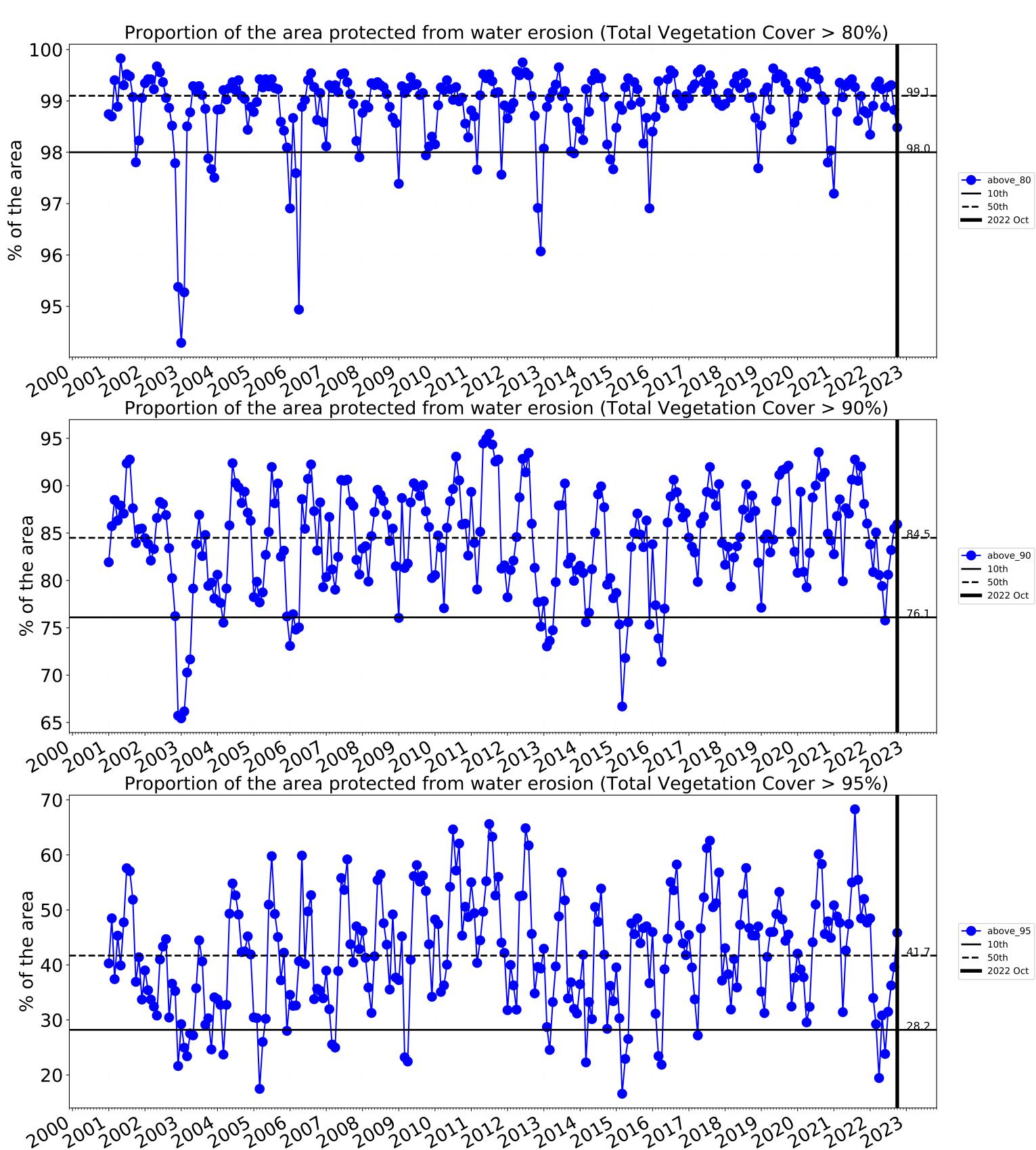
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

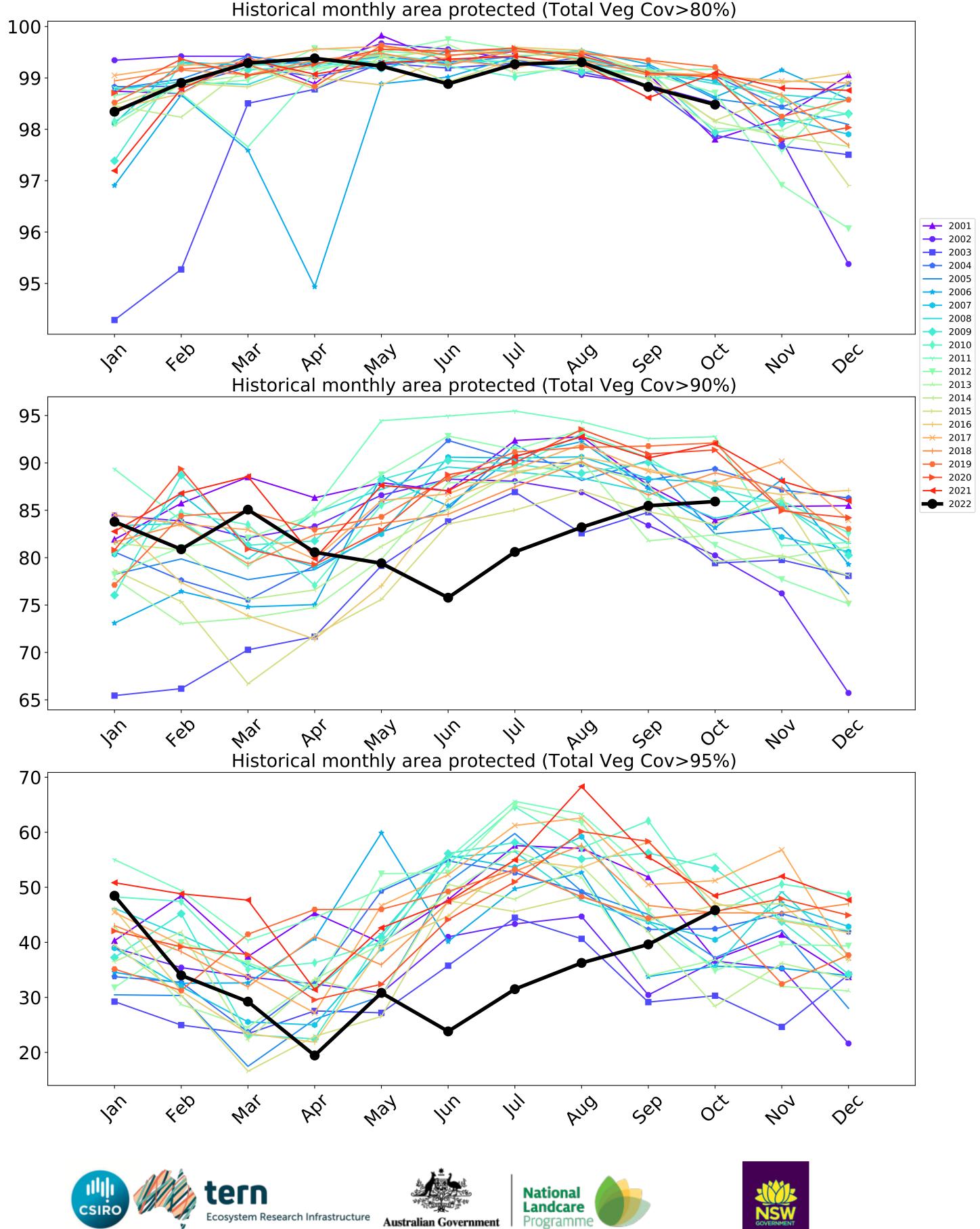


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

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

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







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

Land Use and Forests of Australia (2018) Ş 1 Conservation and natural environments - Woodland forest Catchment Scale Land (2018) and Forests of Australia (2018)

120001

52°1070°1

32%50

0.30%

Land use and forest cover

Catchment Scale

Derived from

Use of Australia

Anomaly show how many percetage points each pixel is from the mean That

the mean. That

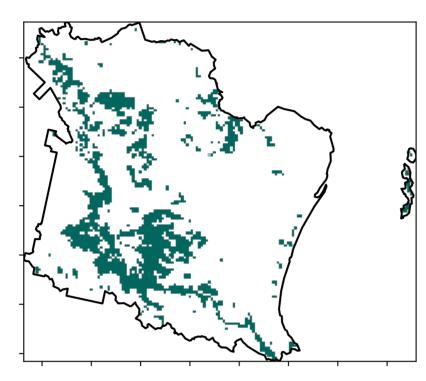
is, red pixels

are about 20% lower than the

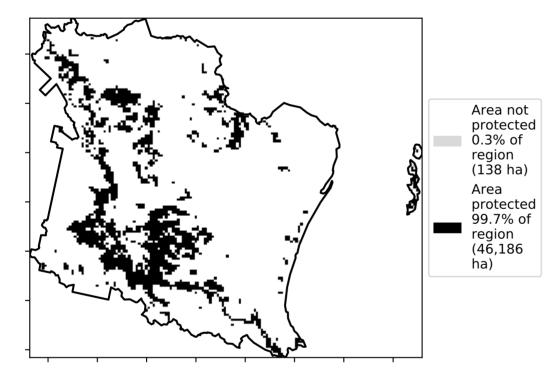
mean of that pixel. The mean is only for the month of the map

from 2001 to 2019.

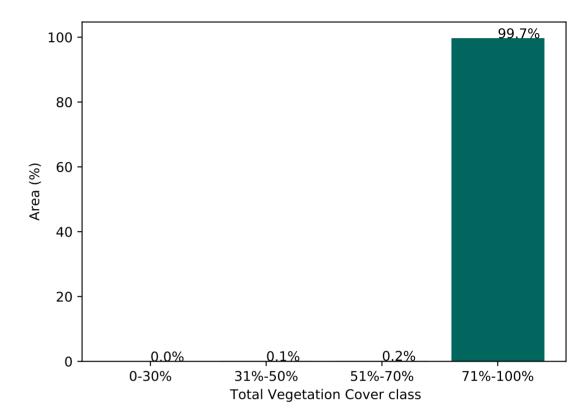
**Total Vegetation Cover [%]** 



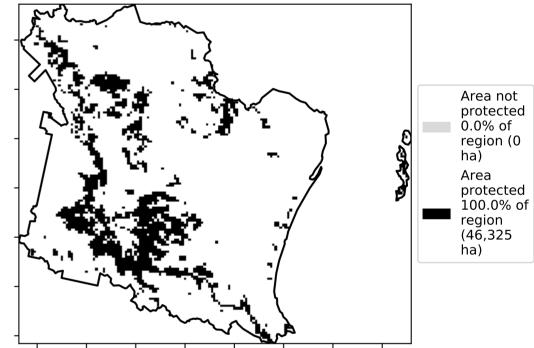
% Area protected from water erosion (>70%)



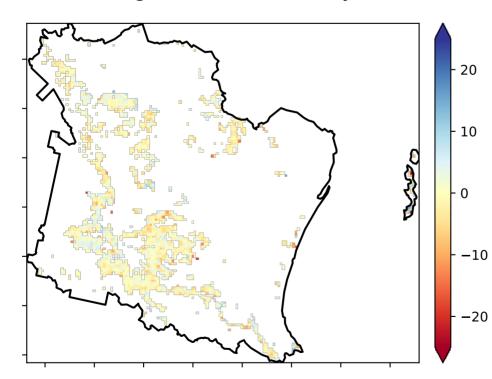




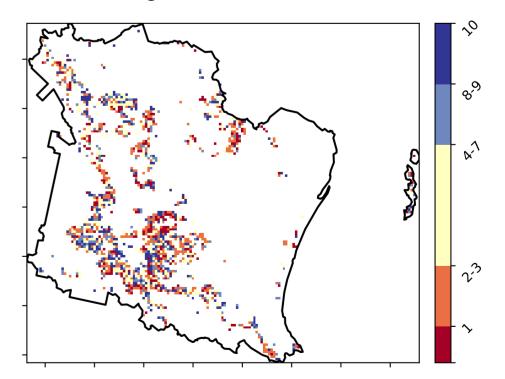
#### % Area protected from wind erosion (>50%)



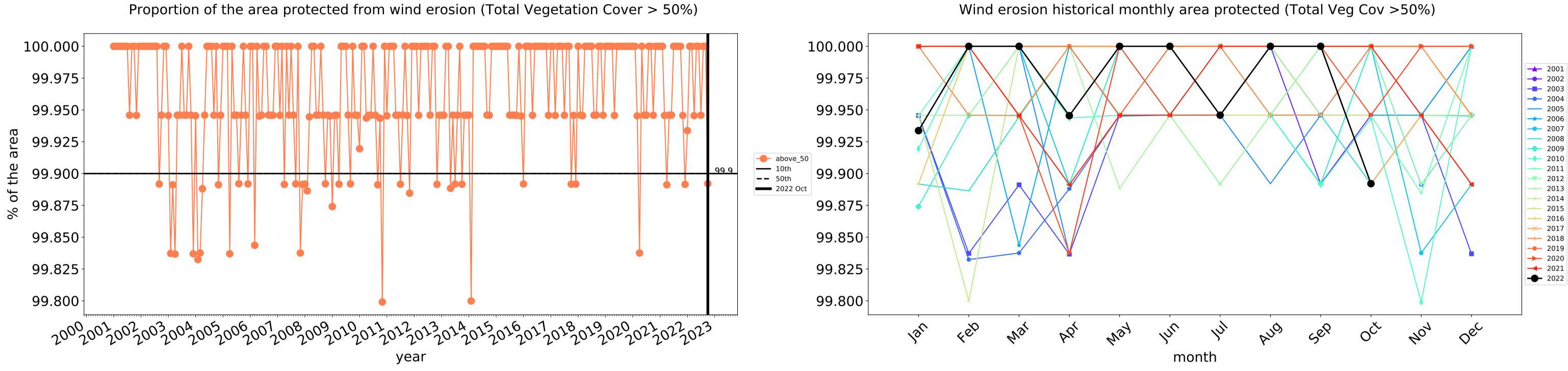
Total Vegetation Cover Anomaly [%]

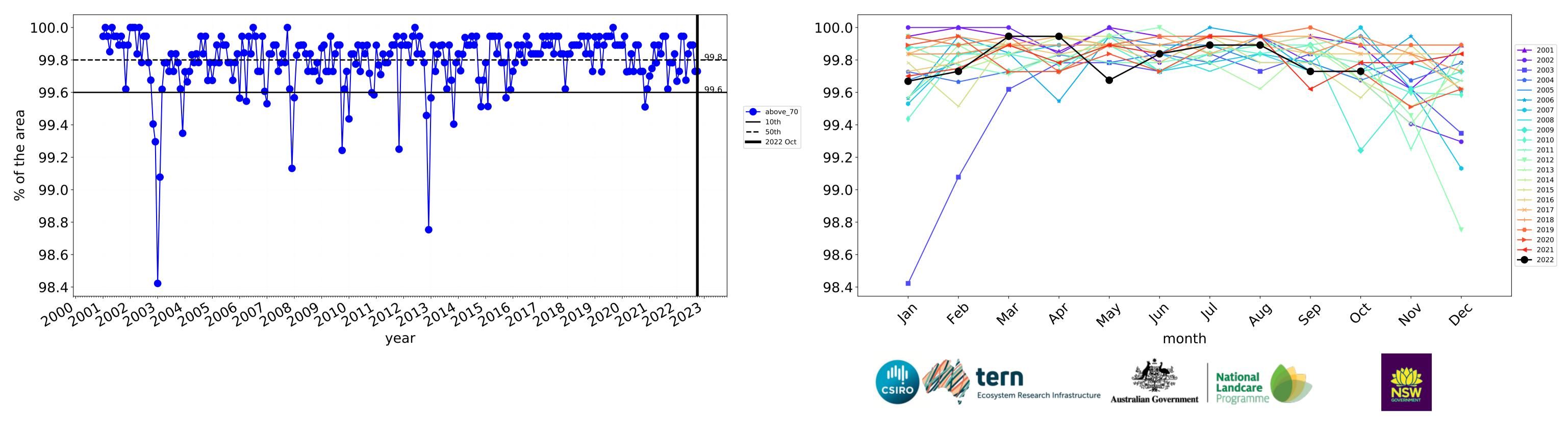


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

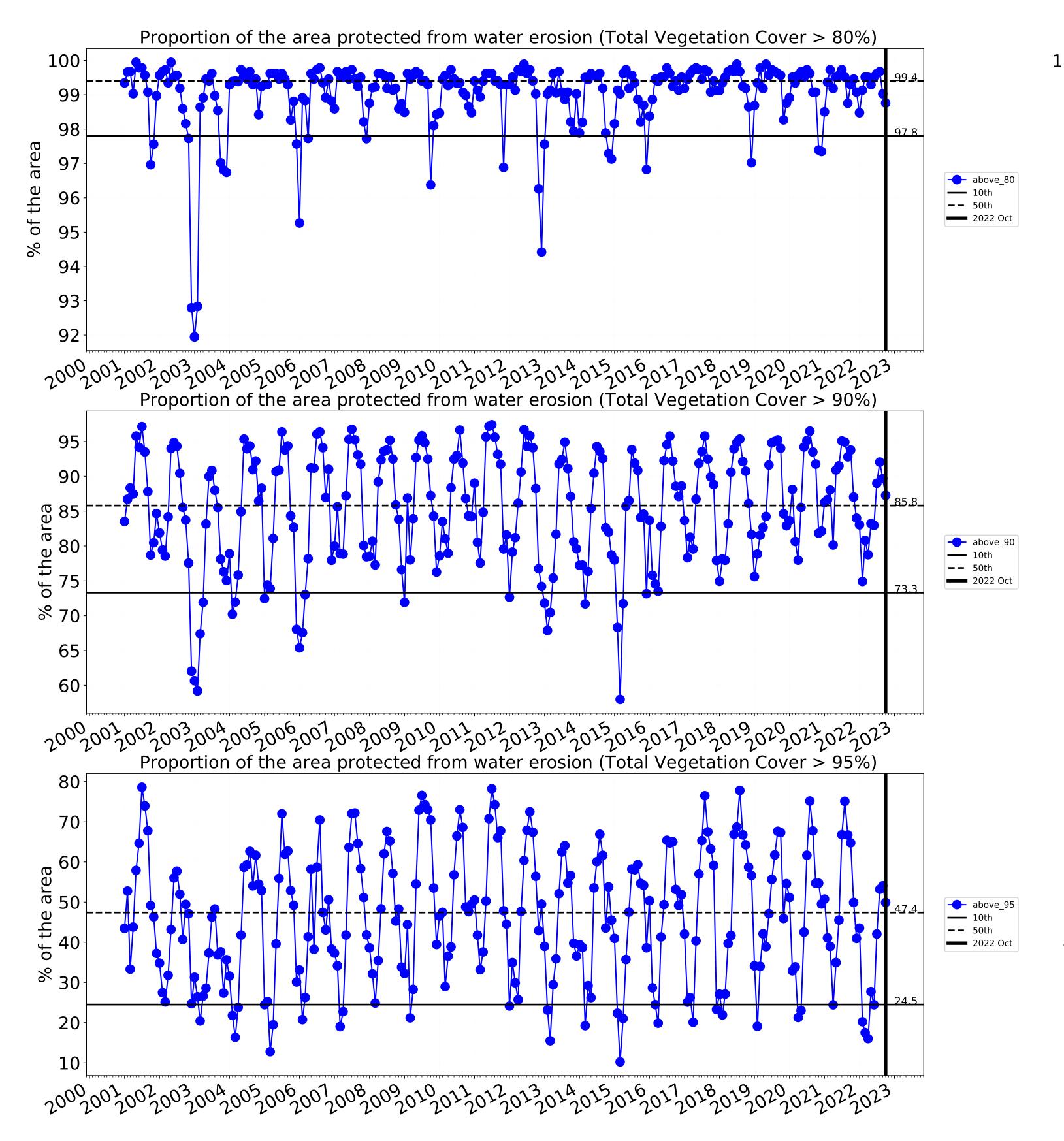


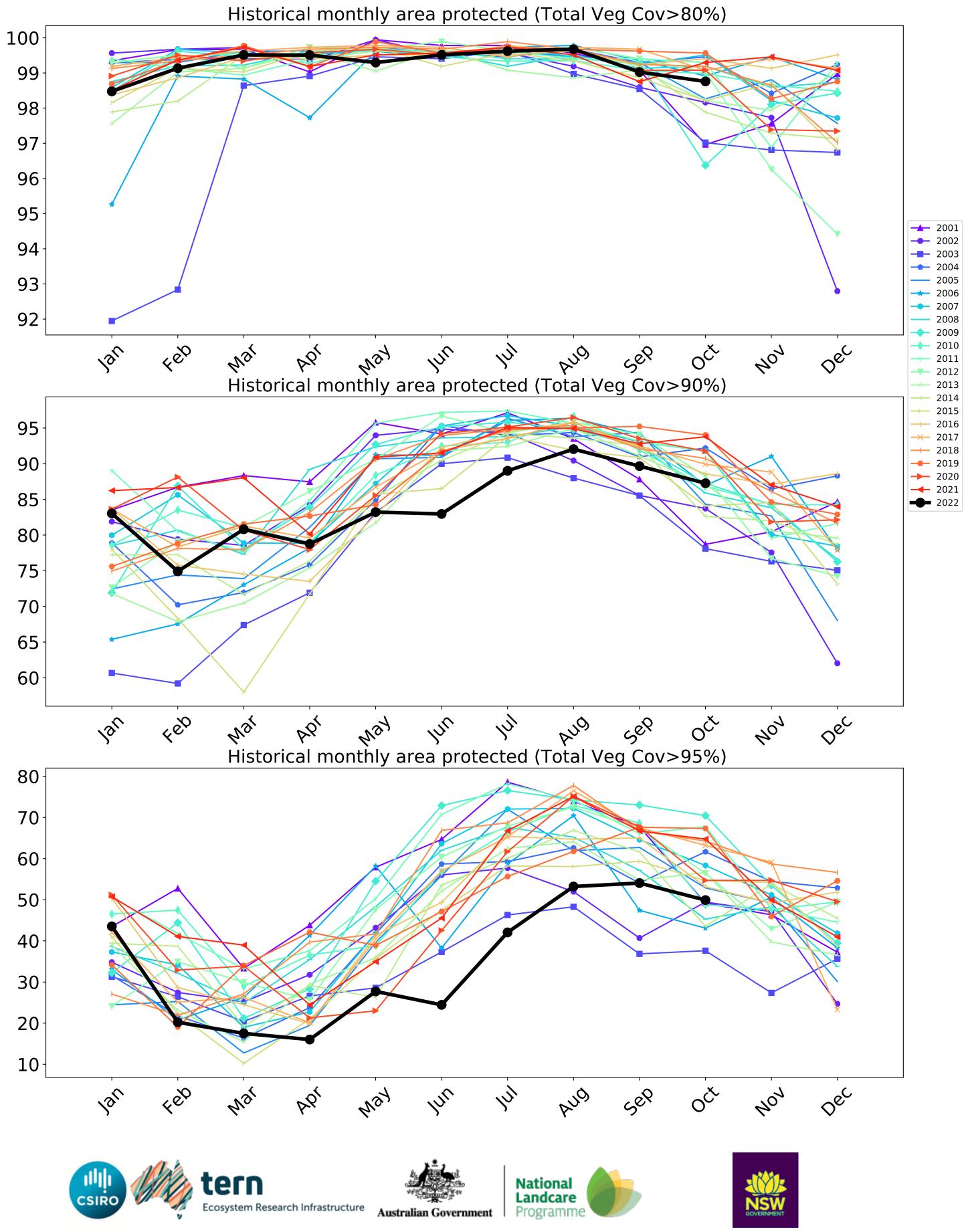












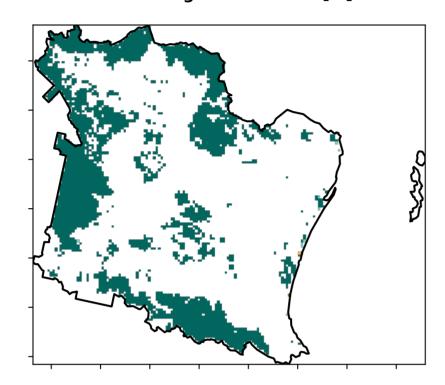


### **Conservation and natural environments Forest (non woodland)**

Land use and forest cover

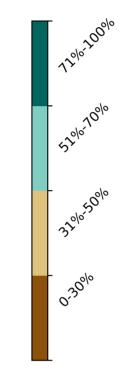
Catchment Scale Land Use and Forests of Australia (2018) Ş 1 Conservation and natural environments - Non-Catchment Scale Land woodland forest ٢ Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 



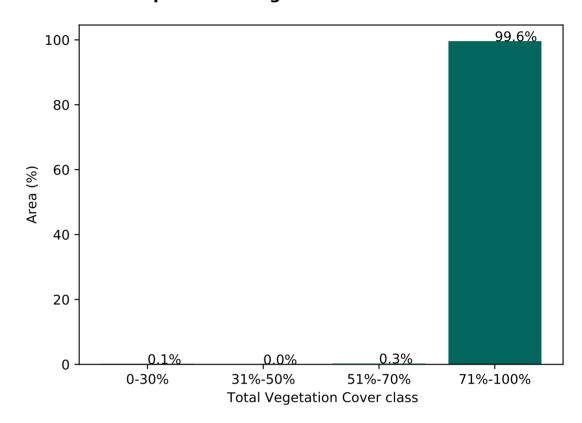
% Area protected from water erosion (>70%)



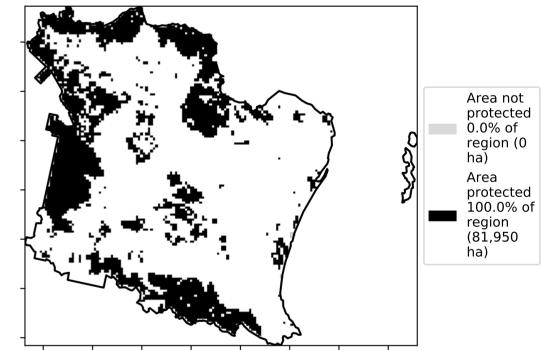




Proportion of vegetation cover class in area



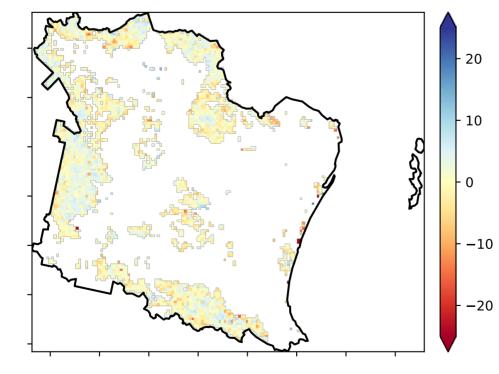
#### % Area protected from wind erosion (>50%)



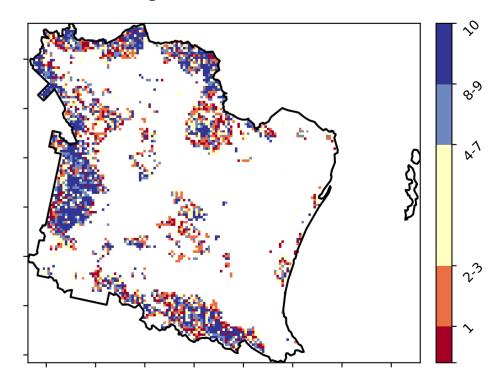
Total Vegetation Cover Anomaly [%]

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.

Derived from



Total Vegetation Cover Decile [%]

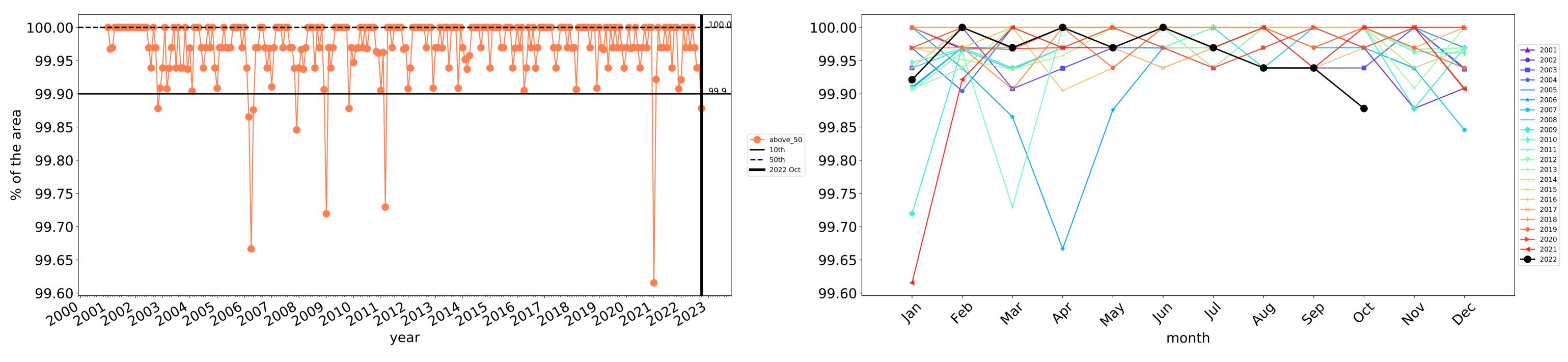




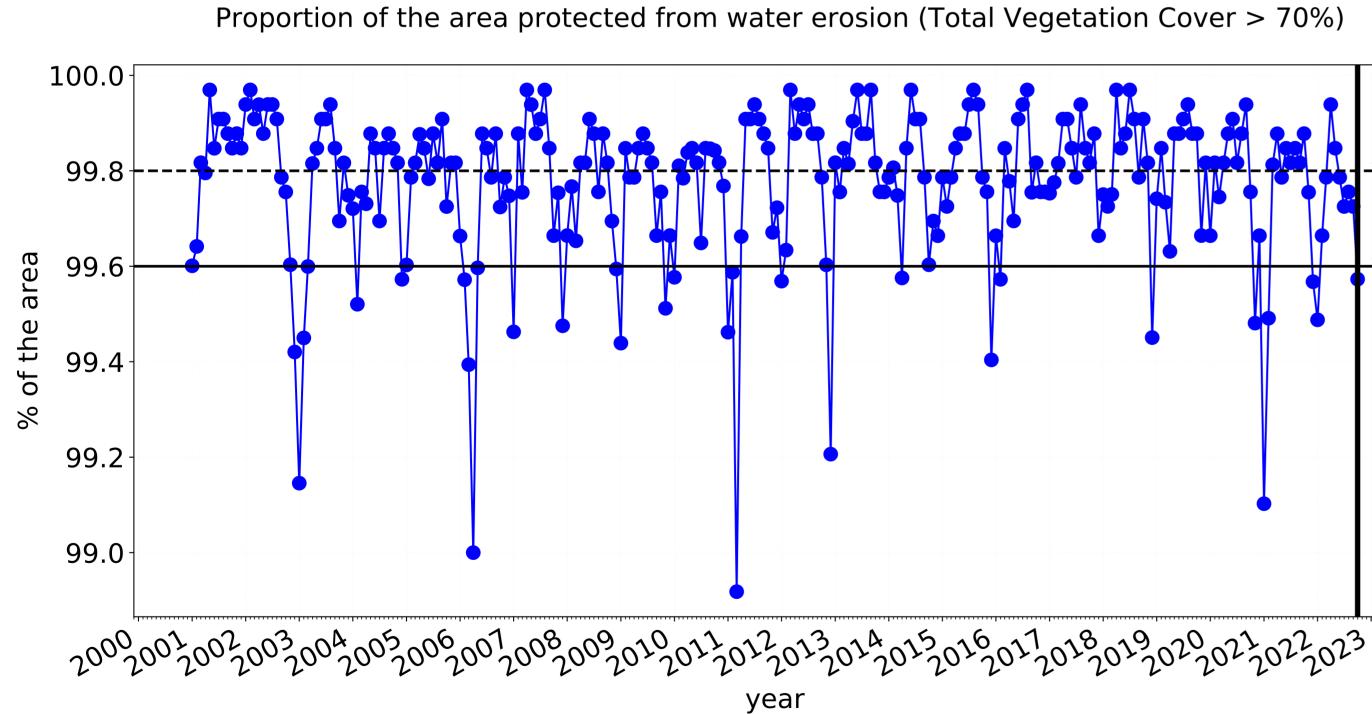
Deciles show where the pixel value lies in the

record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of

the map using baseline from 2001 to 2019.



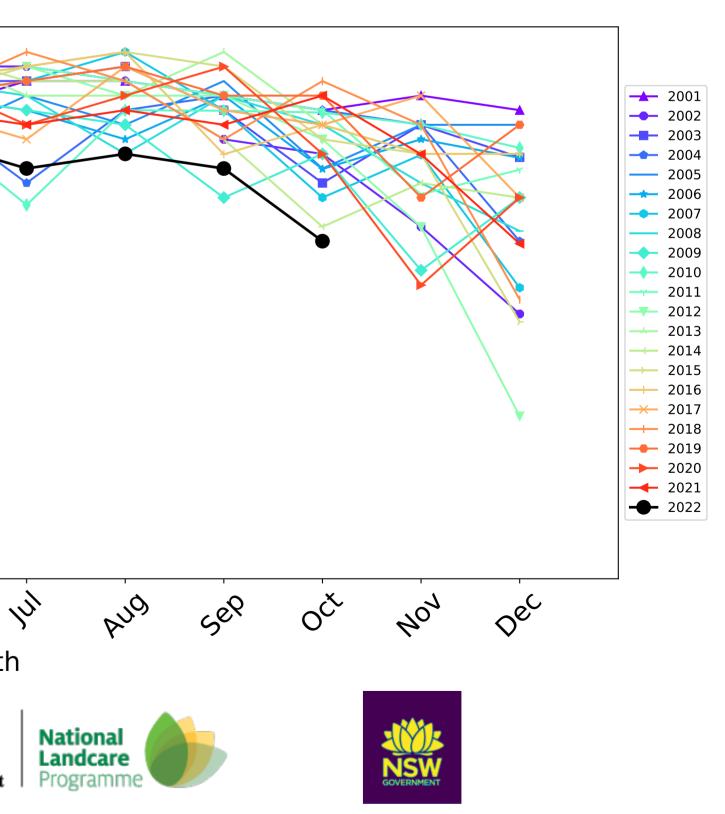
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

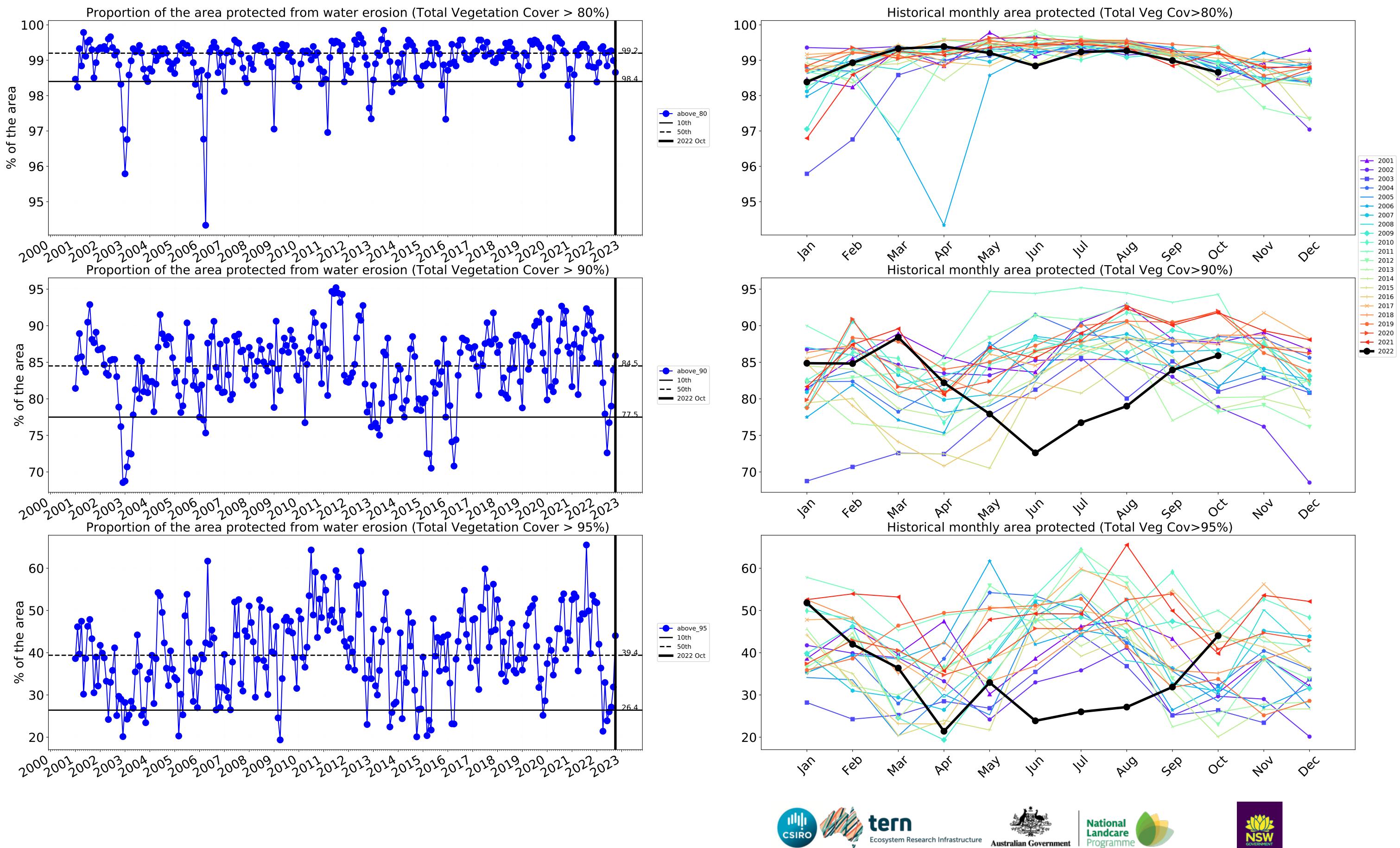


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0 99.8 ---- above\_70 99.6 **—** 10th **——** 50th **—** 2022 Oct 99.4 99.2 99.0 fed Jan May In PQ' Wal month mli tern Ecosystem Research Infrastructure Australian Government

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



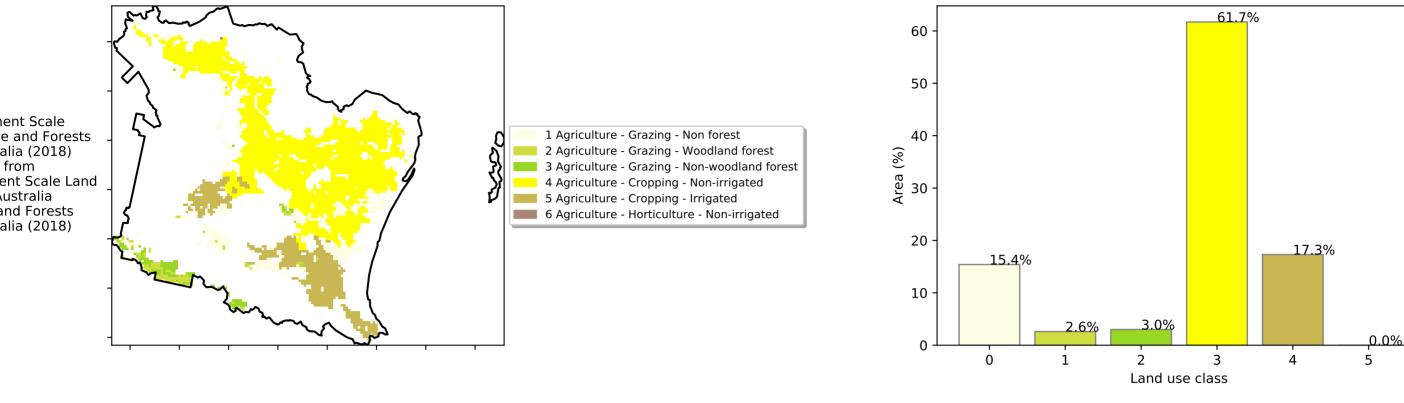




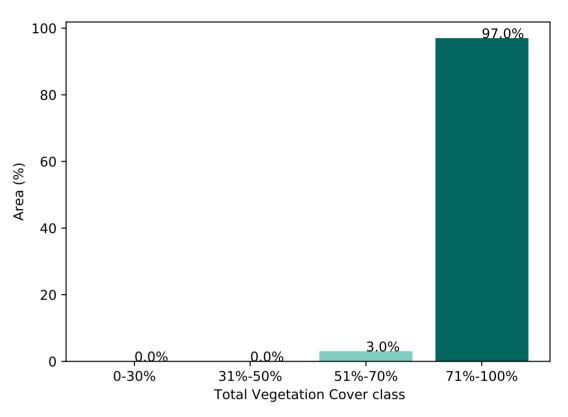
### Agriculture

Land use and forest cover

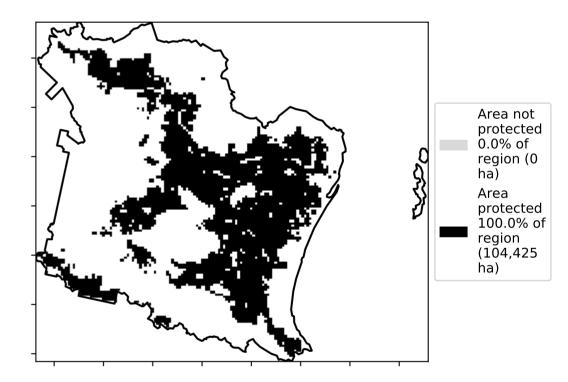
Proportion of each land class in area



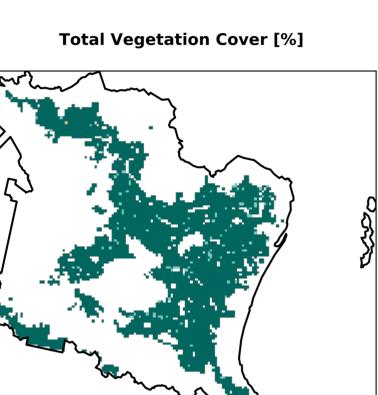
Proportion of vegetation cover class in area



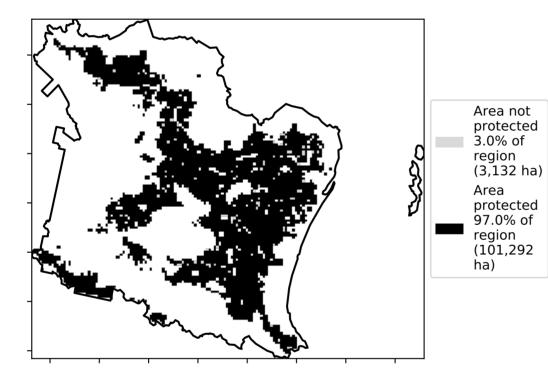
#### % Area protected from wind erosion (>50%)



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

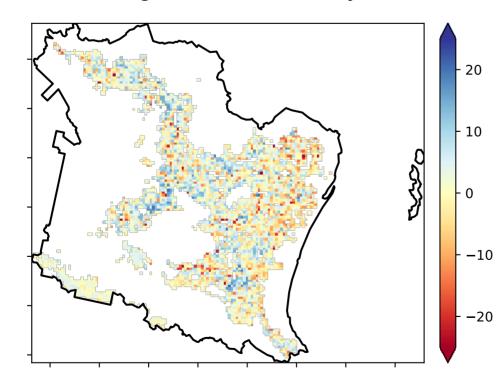


% Area protected from water erosion (>70%)



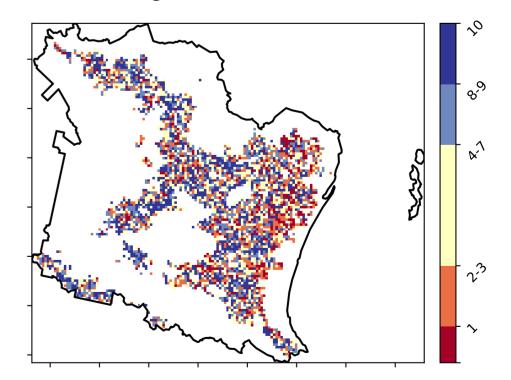
1200-2000 52°1070°1 32905001 0.30%

**Total Vegetation Cover Anomaly [%]** 



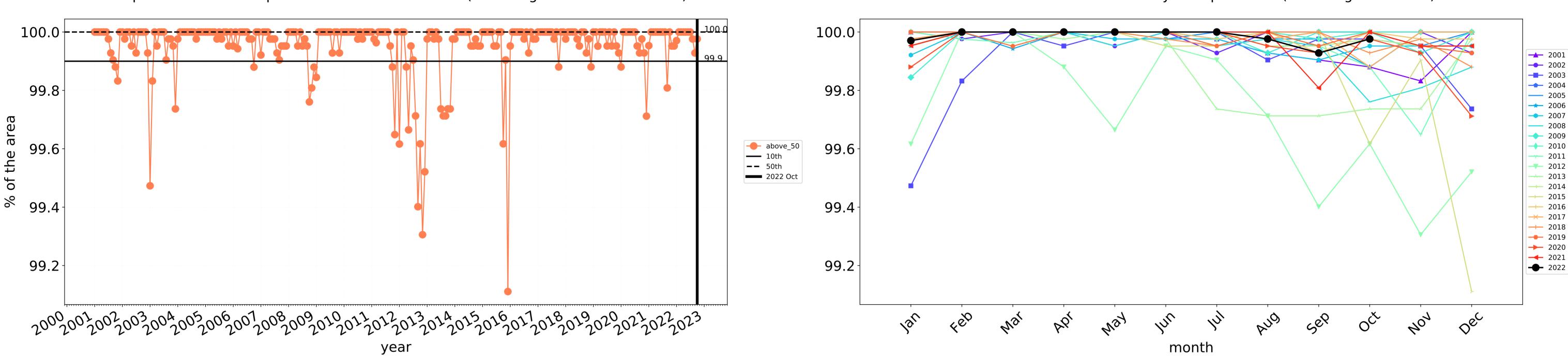
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 





Anomaly show how many percetage points each pixel is from the mean That 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 from 2001 to 2019.



--- above\_70

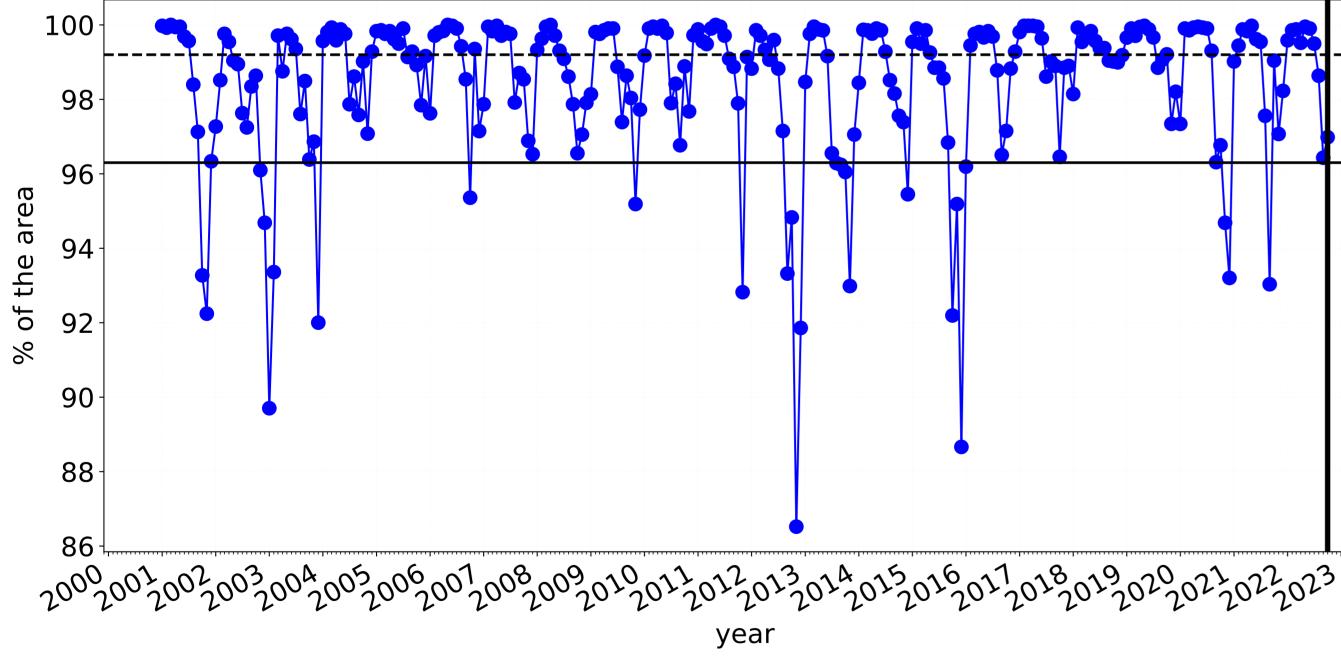
**—** 10th

**——** 50th

**—** 2022 Oct

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

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



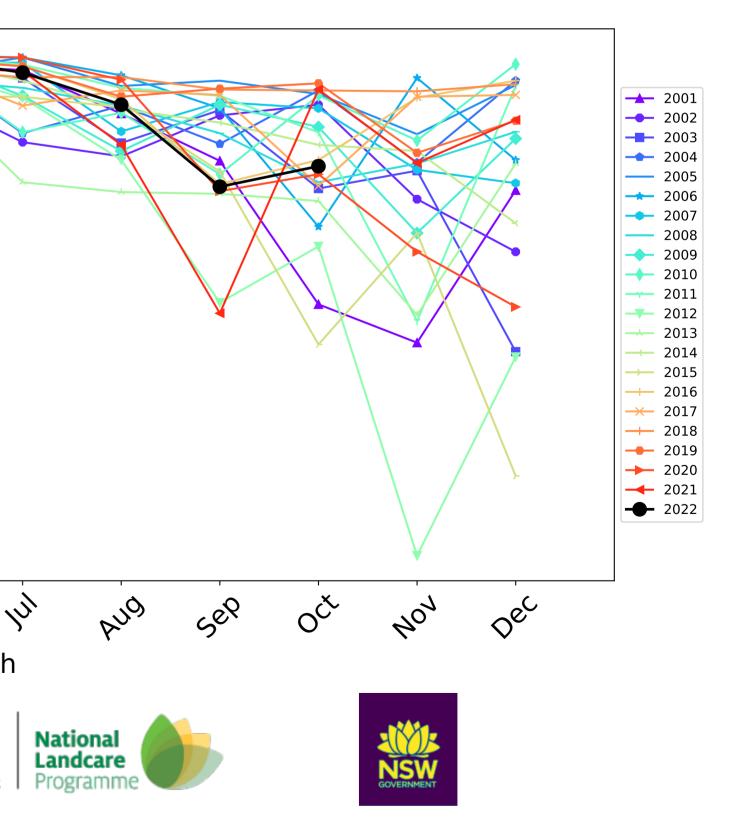
### Agriculture timeseries

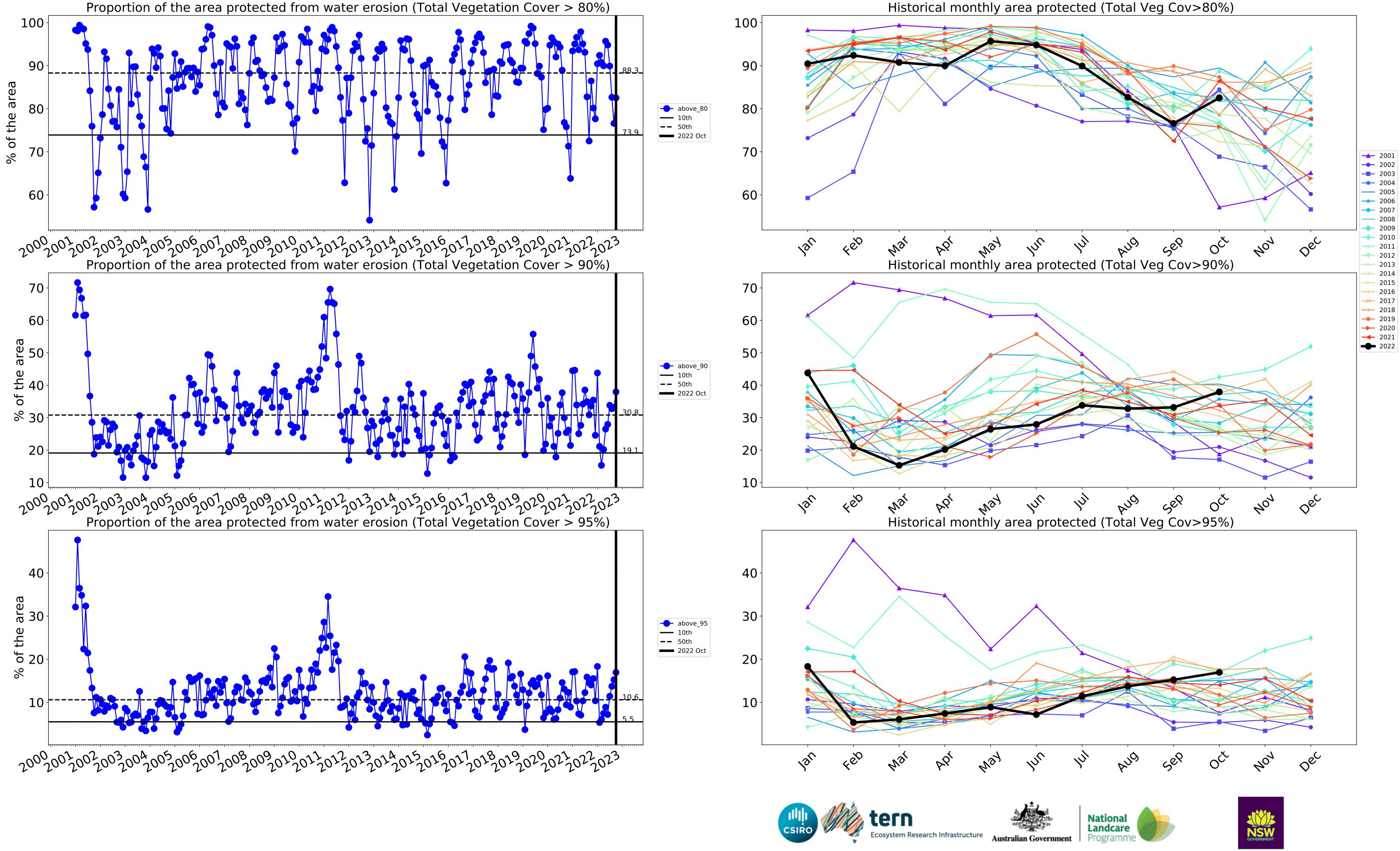
99.2

100 98 96 94 92 90 88 86 4eb lar way In Mai Þb, month tern Ecosystem Research Infrastructure Australian Government

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

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





### Grazing

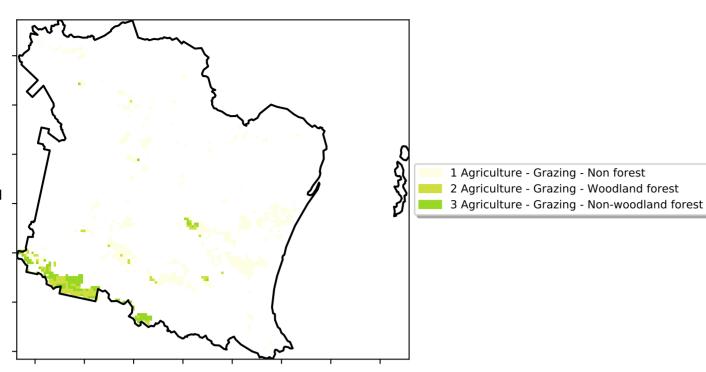
12%200%

52°1070°10

32%50%

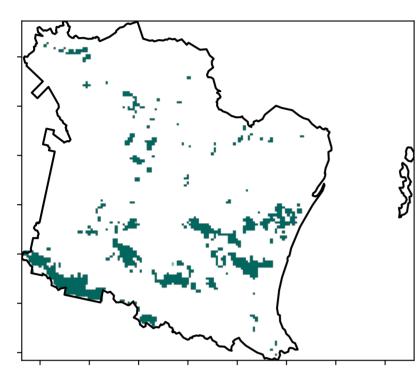
0.30%

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

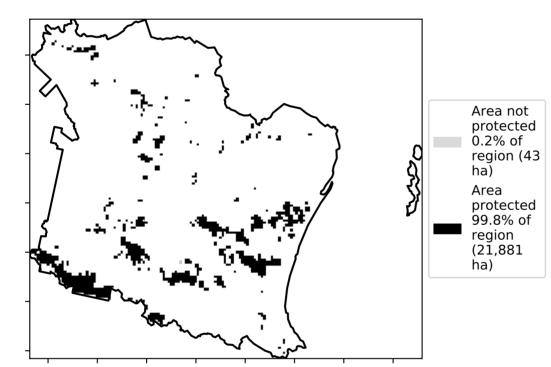


Land use and forest cover

**Total Vegetation Cover [%]** 



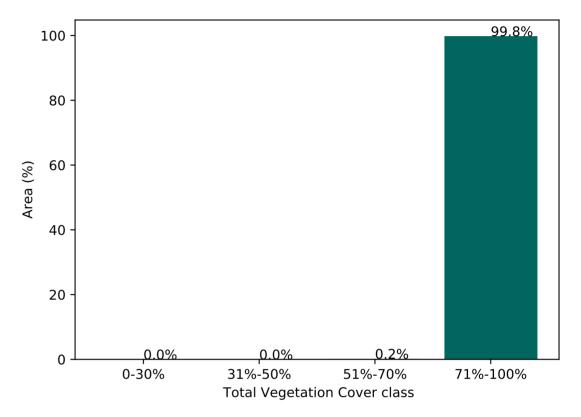
% Area protected from water erosion (>70%)



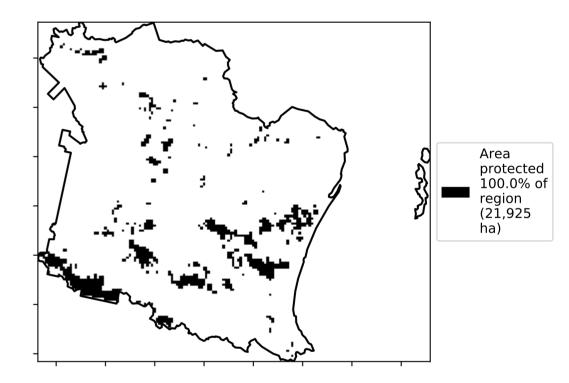
73.4% 70 60 50 Area (%) 30 20 14.4% 12.2% 10 0 0.5 1.0 1.5 2.0 2.5 -0.5 0.0 Land use class

#### Proportion of each land class in area

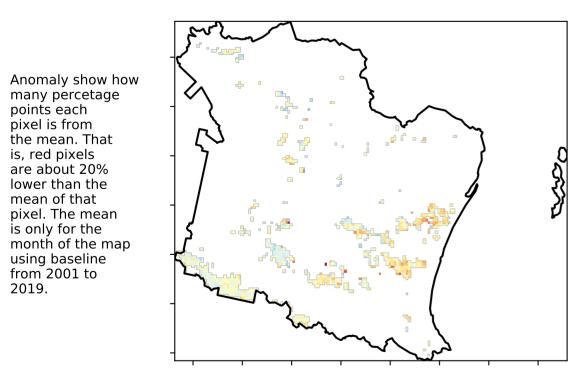
Proportion of vegetation cover class in area



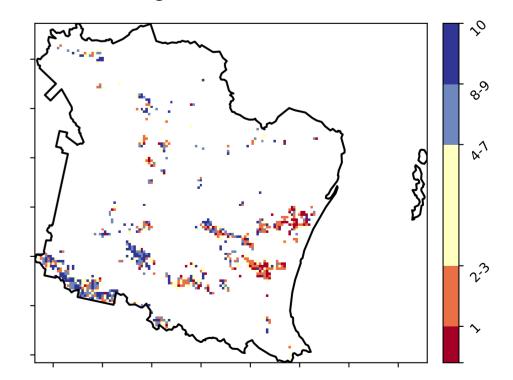
#### % Area protected from wind erosion (>50%)



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 [%]





12

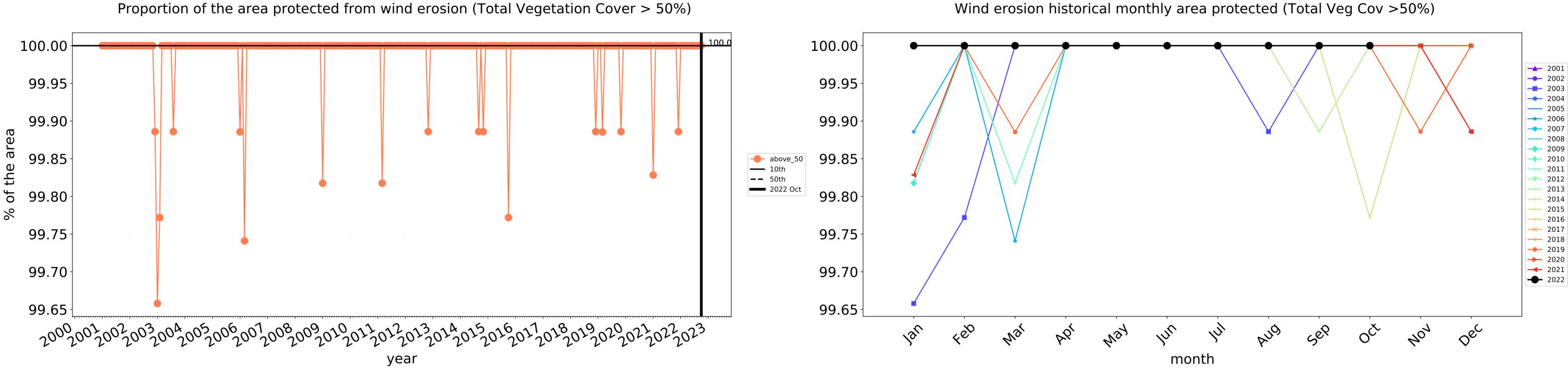
- 20

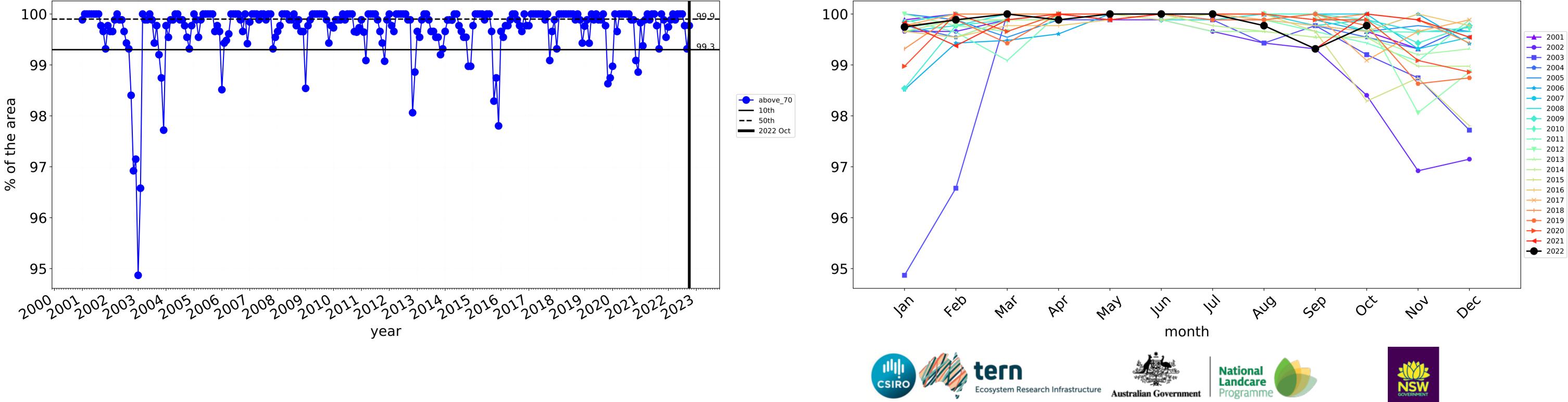
· 10

0

-10

-20

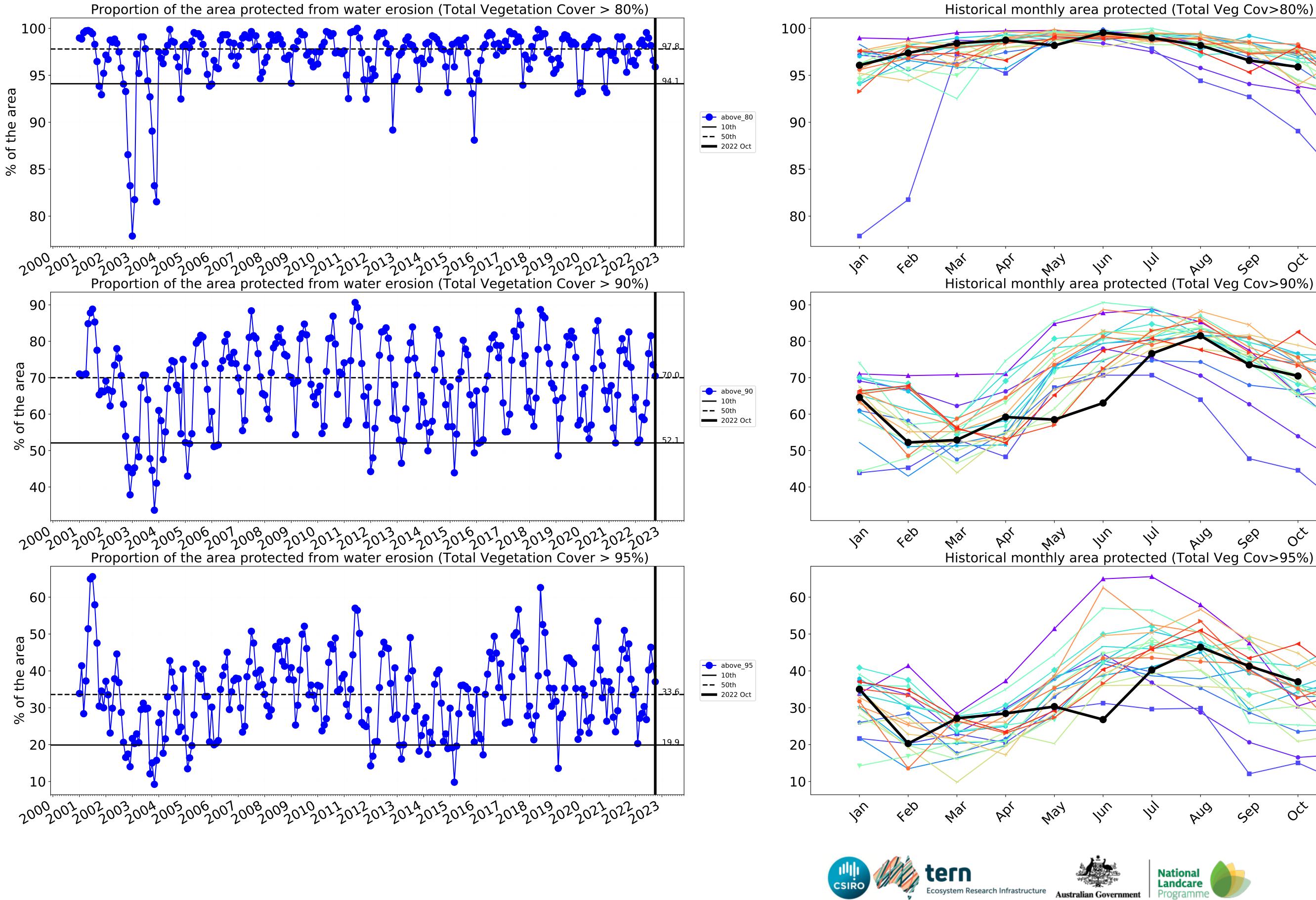


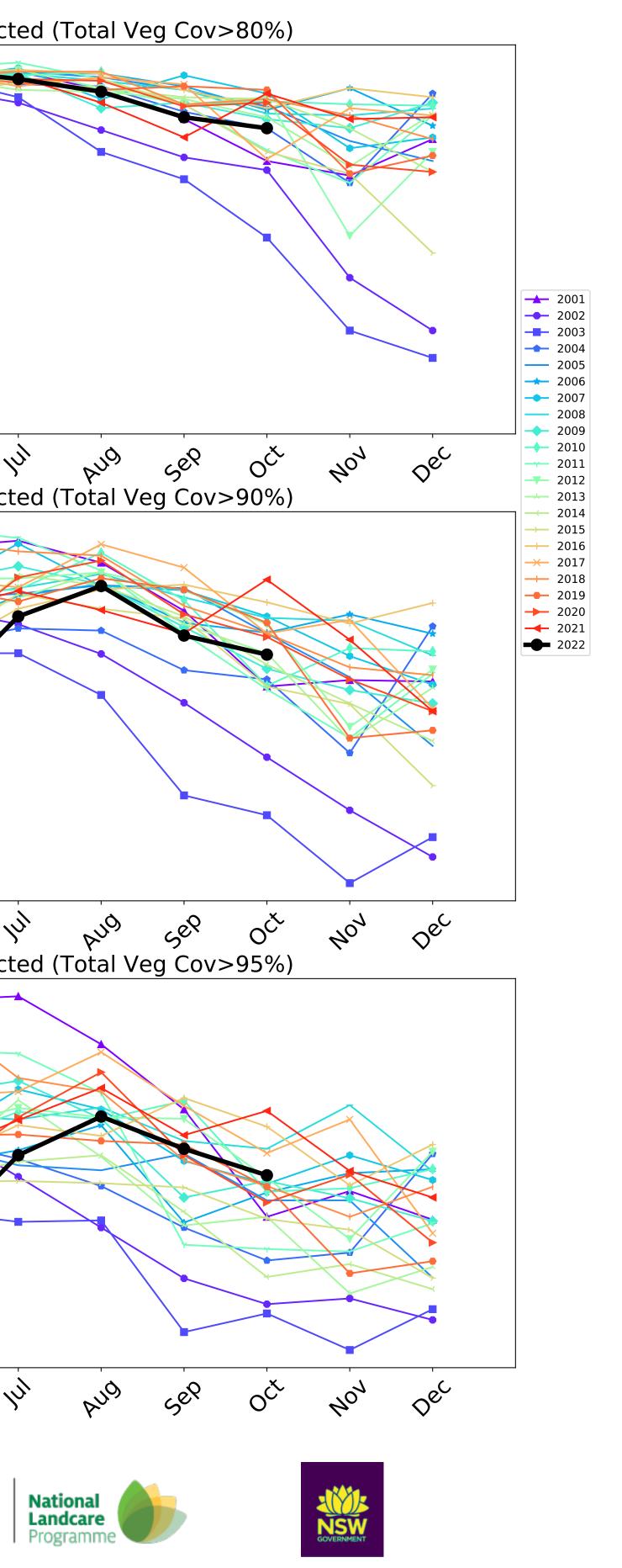


### Grazing timeseries



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





### **Grazing non forest**

12%200%

52°1070°10

32005001

0.30%

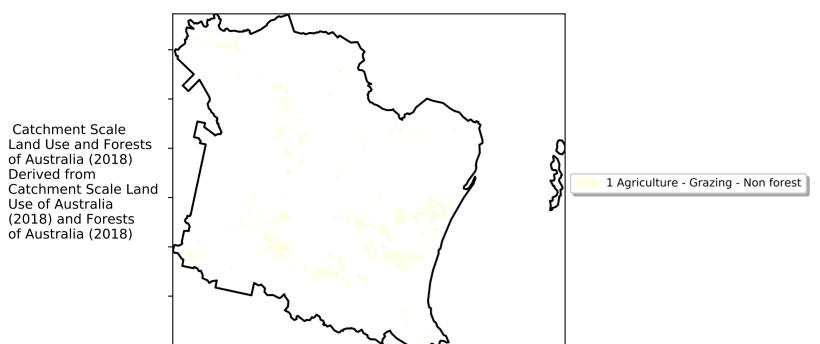
- 20

· 10

0

-10

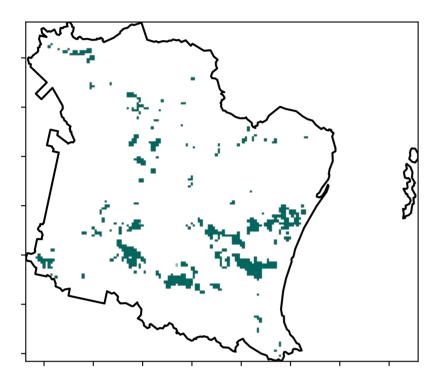
-20



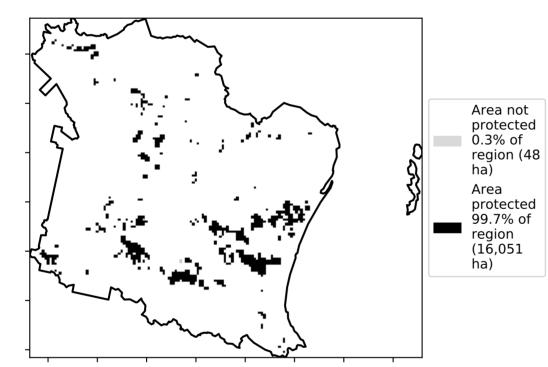
Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 

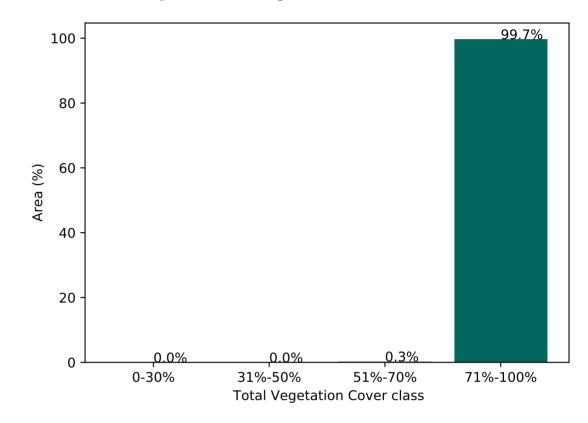
Land use and forest cover



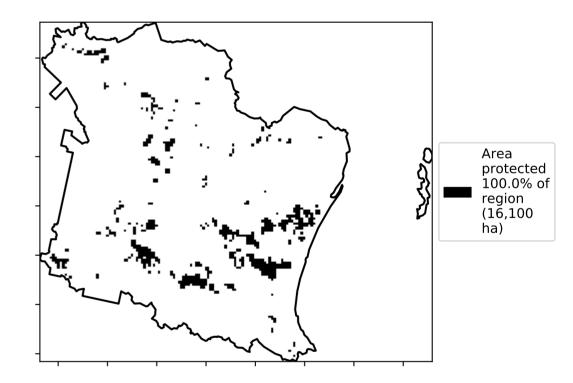
% Area protected from water erosion (>70%)



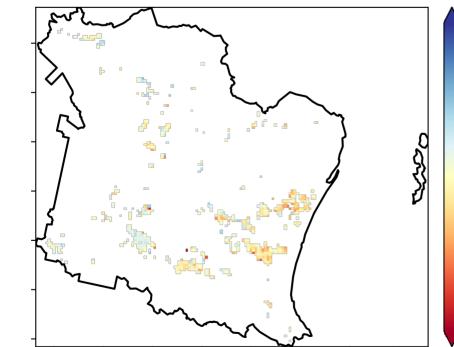
Proportion of vegetation cover class in area



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

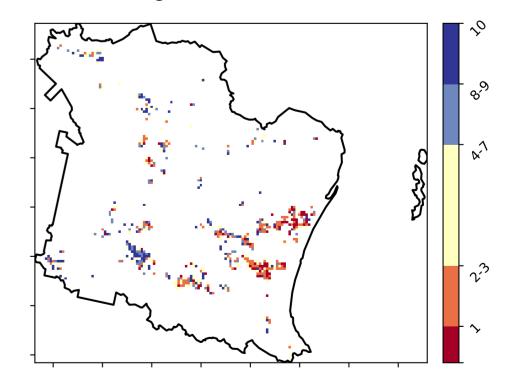


Total Vegetation Cover Anomaly [%]



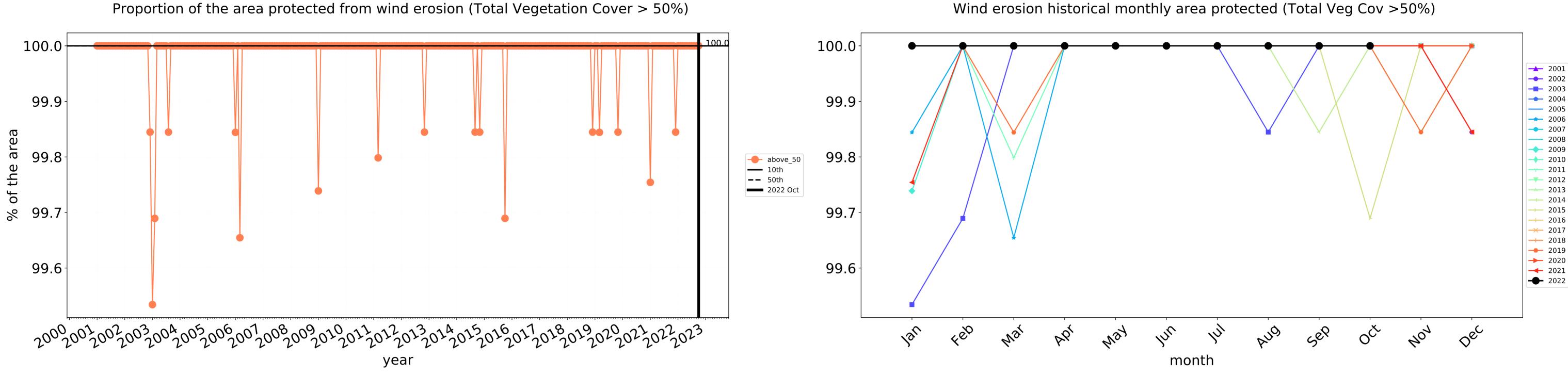
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

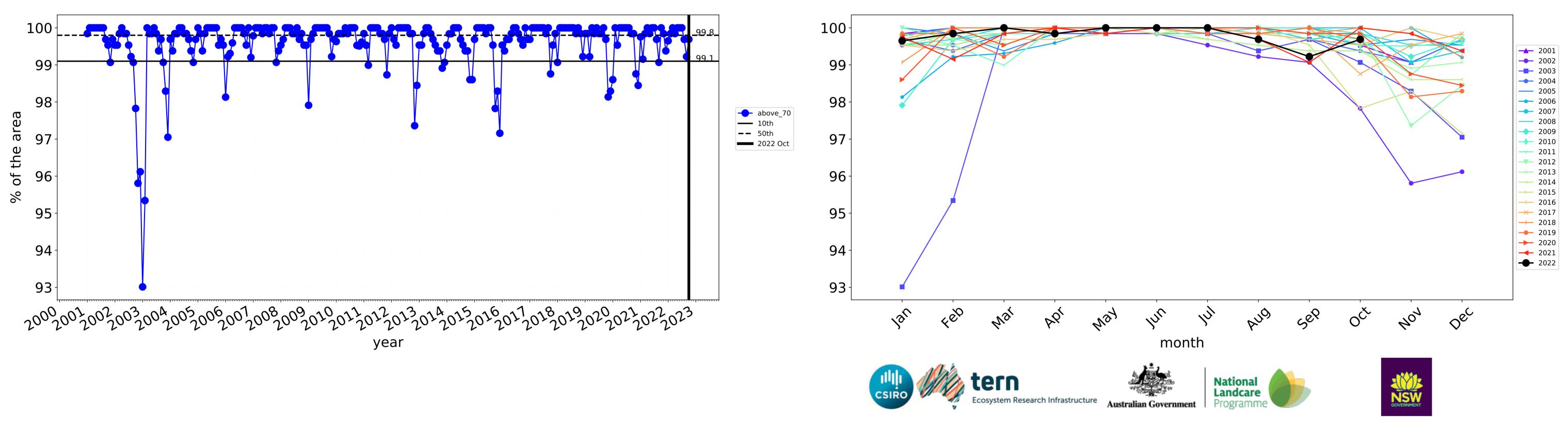
Total Vegetation Cover Decile [%]





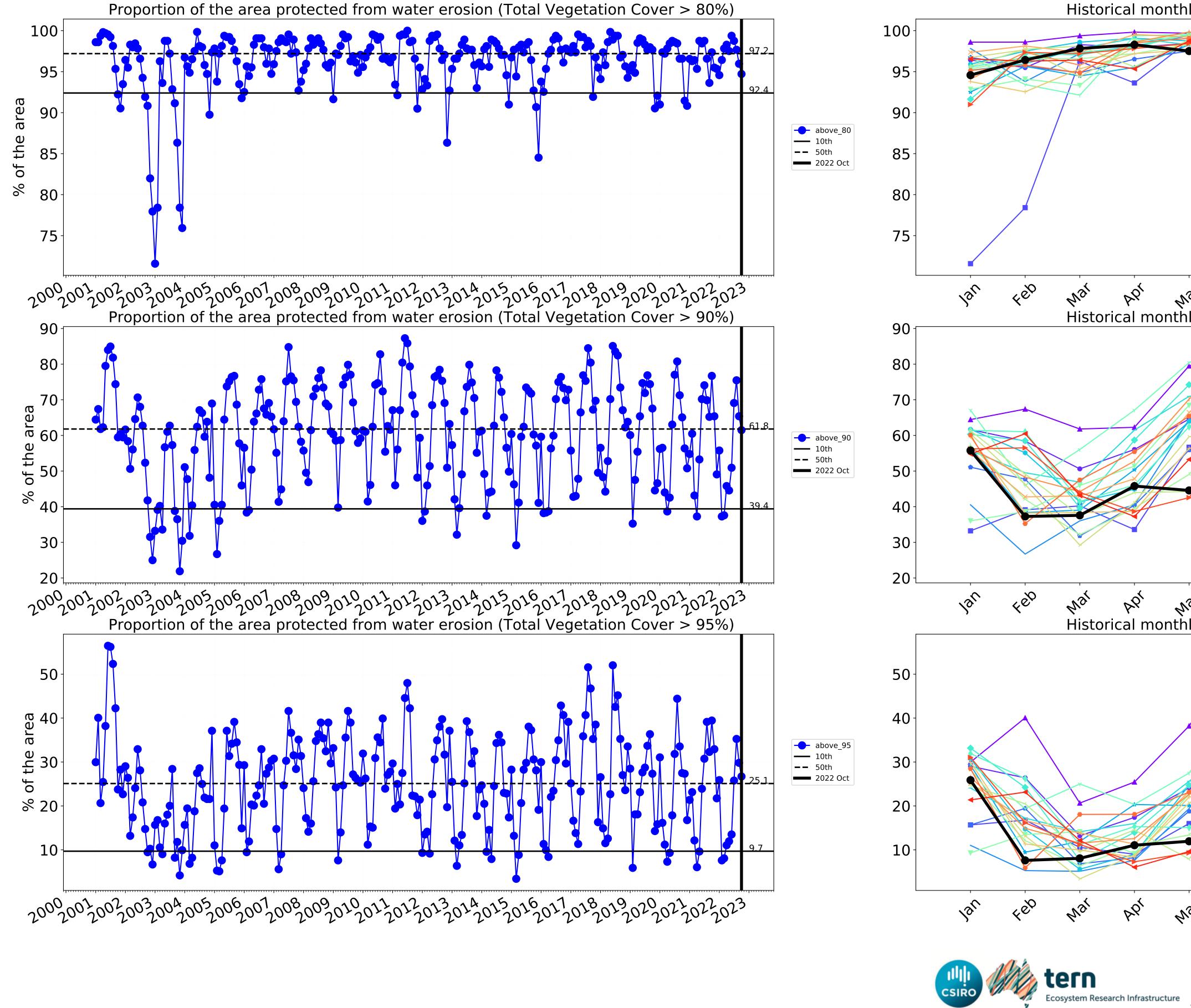
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





### Grazing non forest timeseries





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

Jur

In In

1<sup>1</sup>1

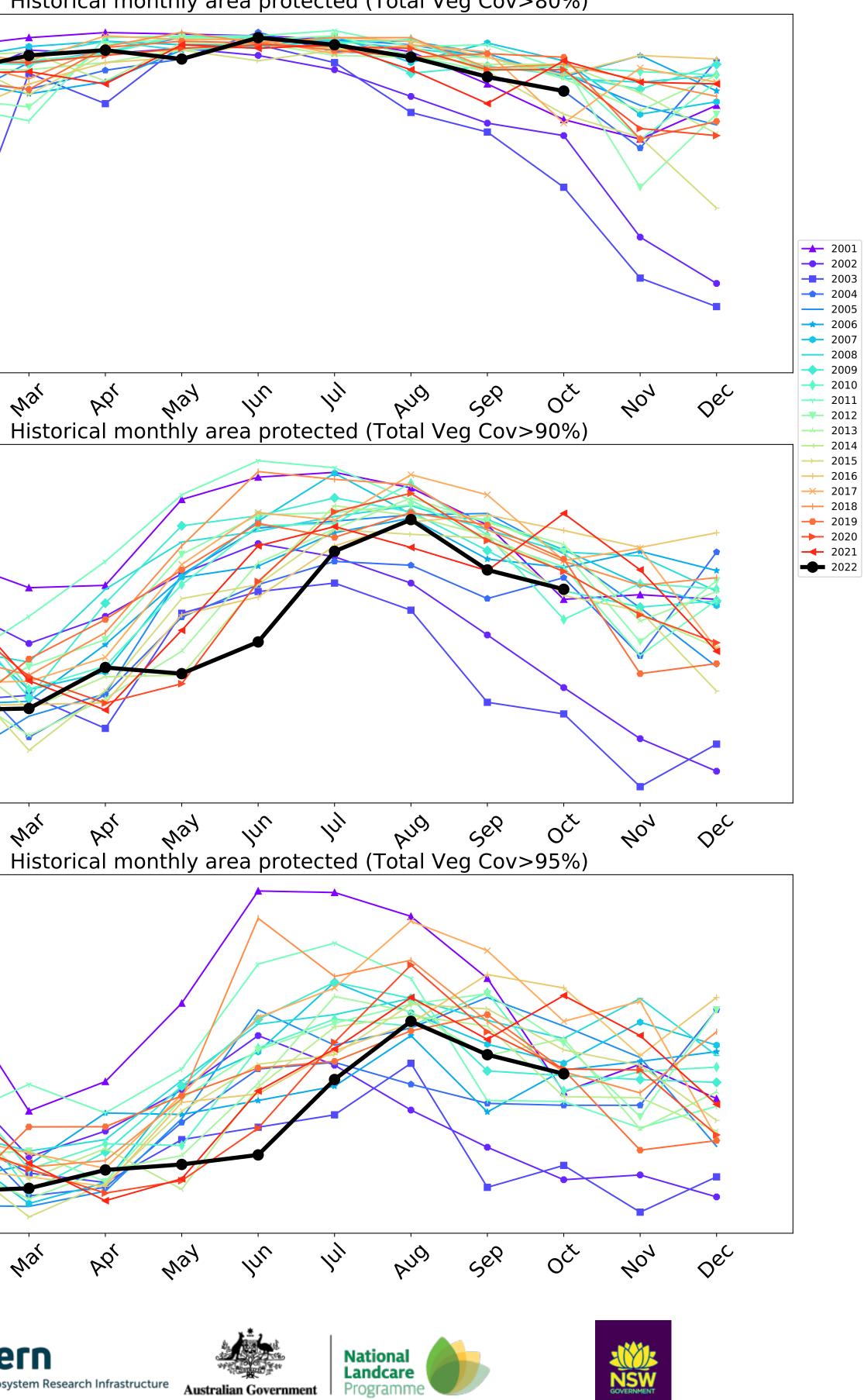
Australian Government

1/2/

NO

1<sup>1</sup>1

way



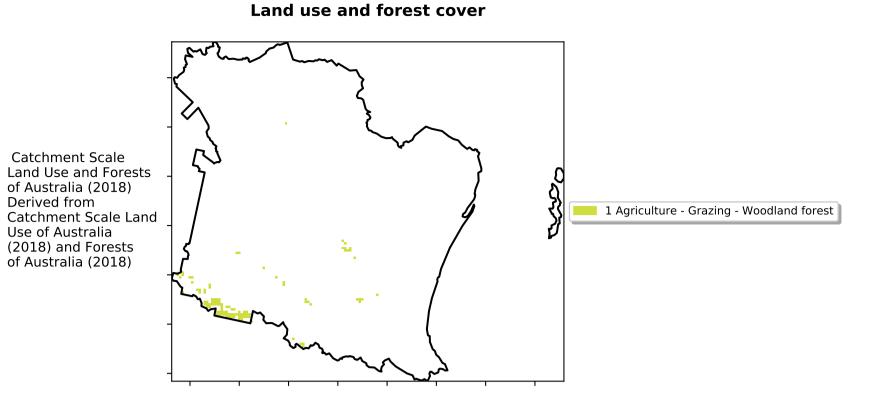
### **Grazing Woodland forest**

1200-2000

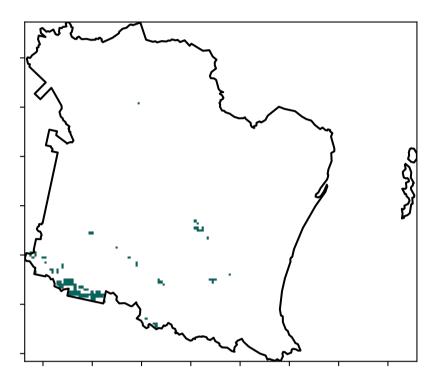
52°10°10°10

320050010

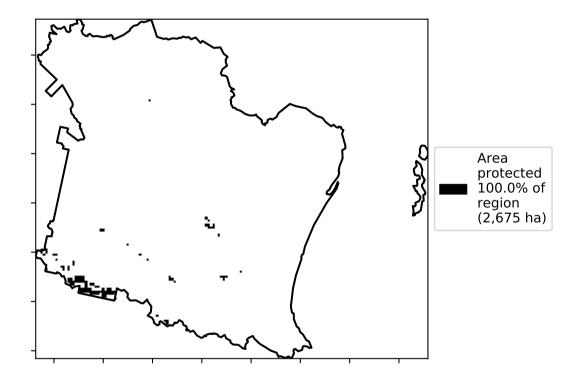
· 0.30%



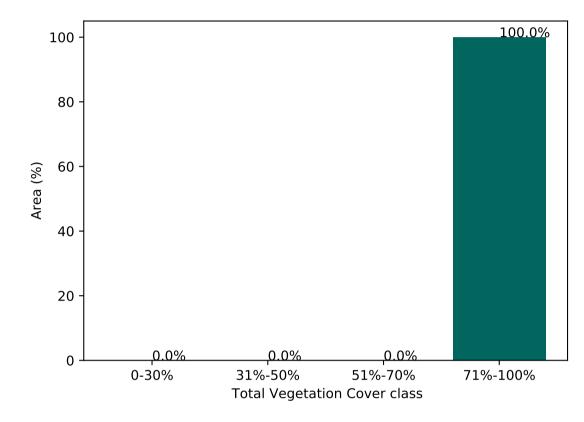
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

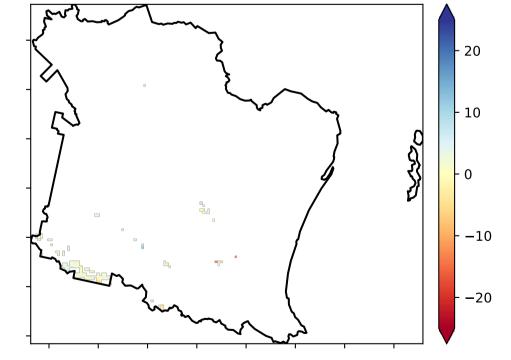


% Area protected from wind erosion (>50%)

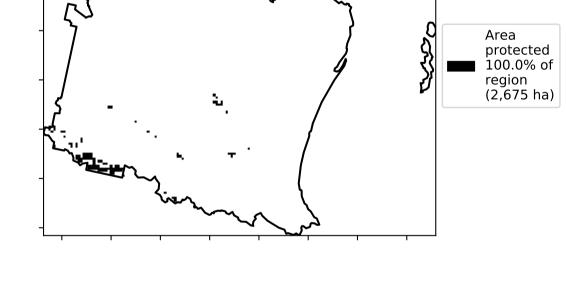


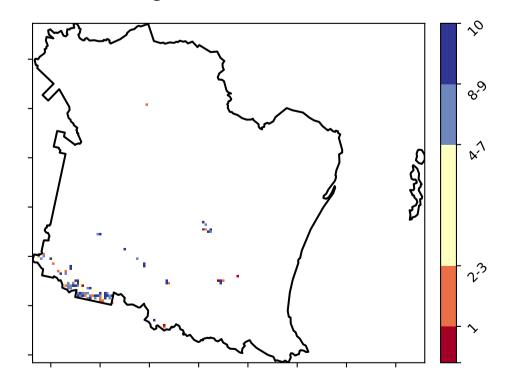
**Total Vegetation Cover Anomaly [%]** 

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.



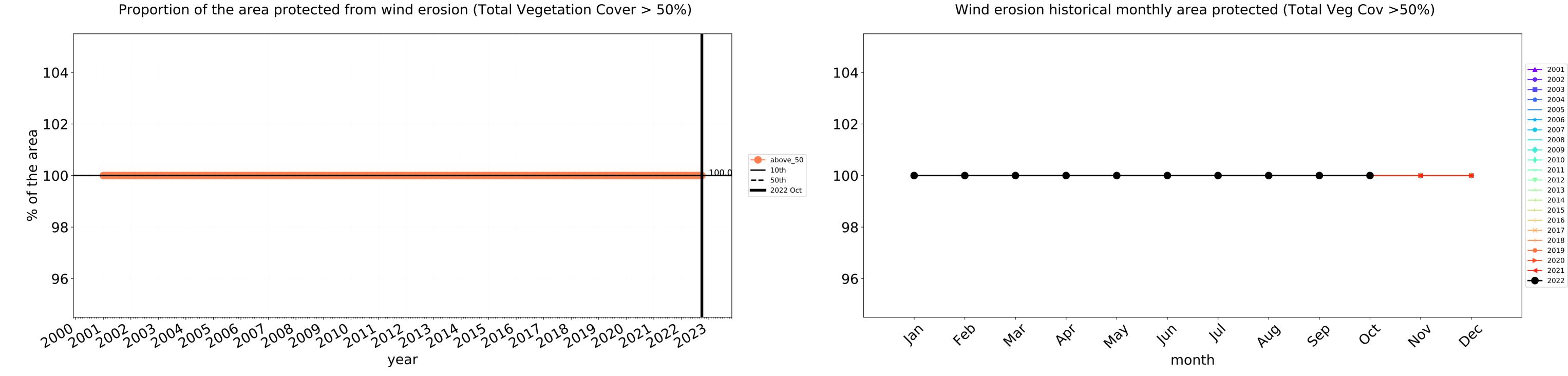
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



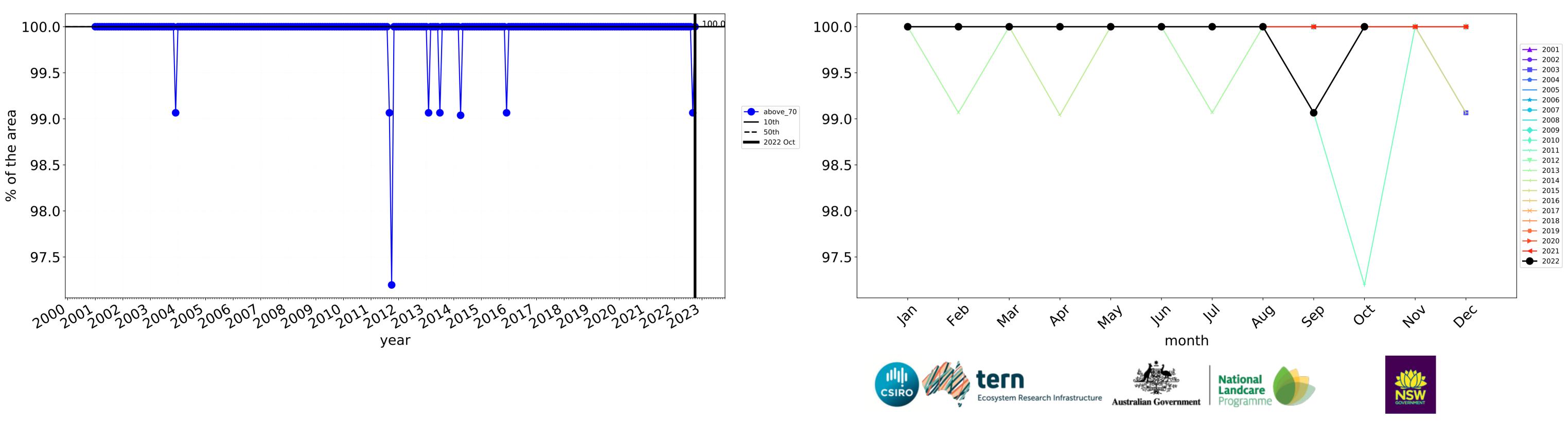




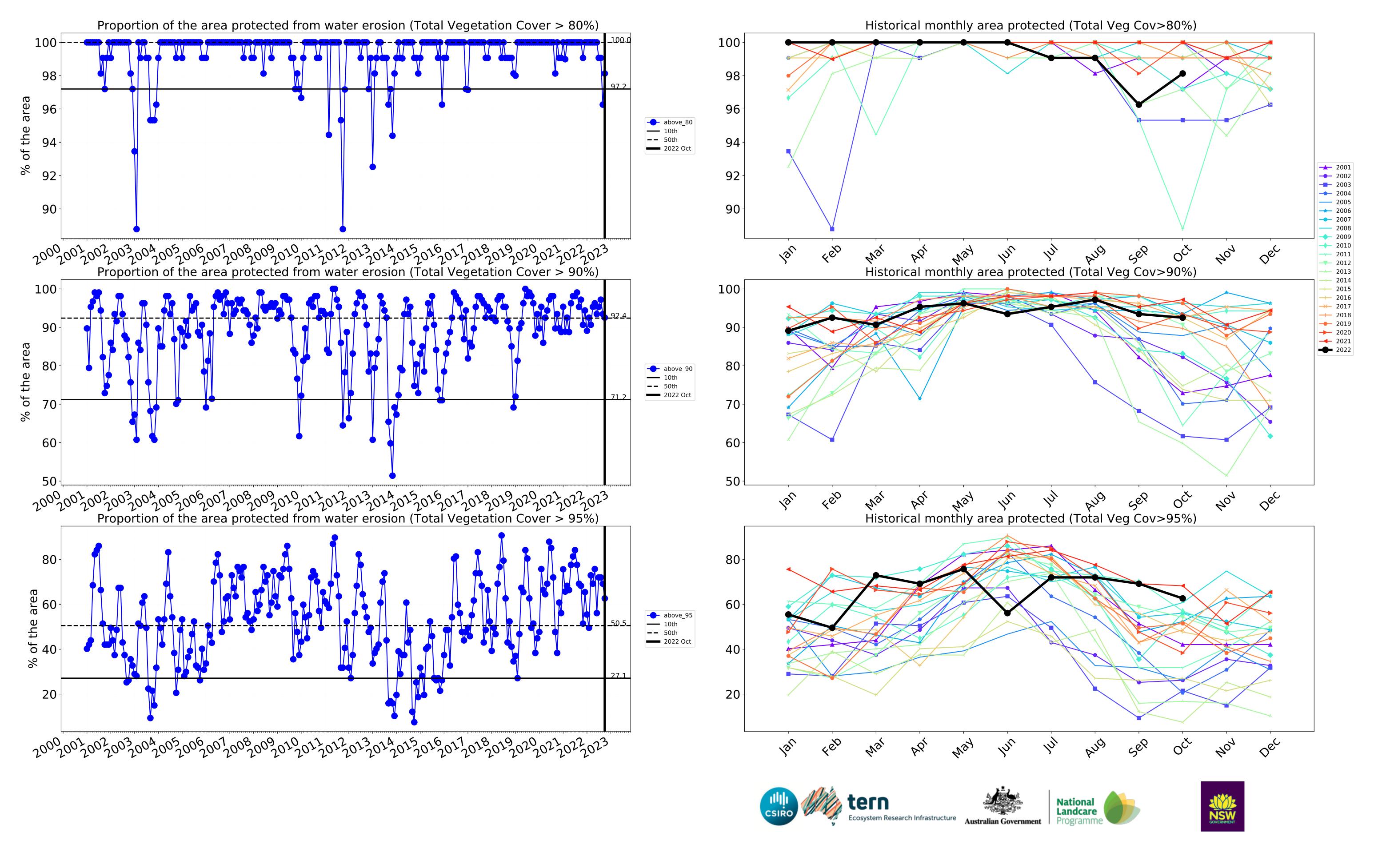
### Grazing Woodland forest timeseries



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



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



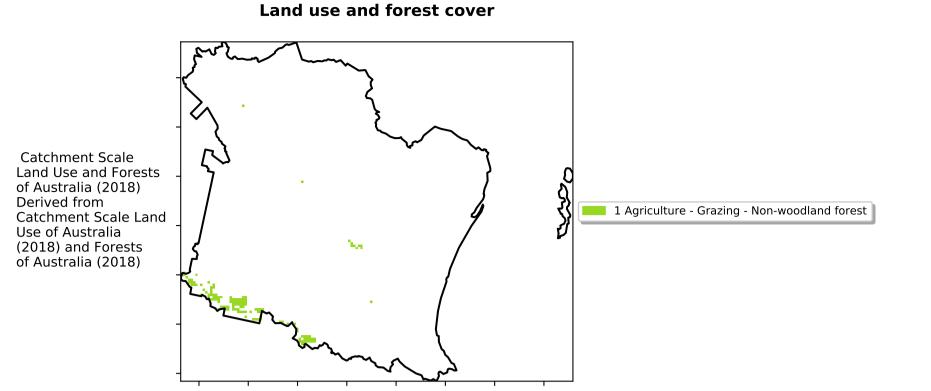
### Grazing - Forest (non woodland)

1200-2000

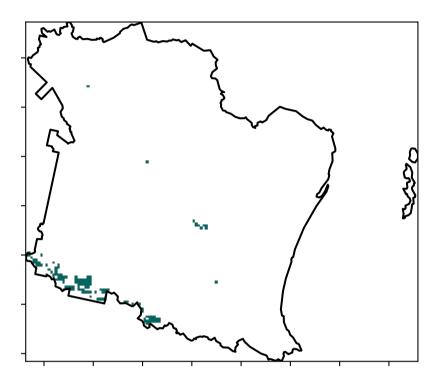
52°10010010

320050010

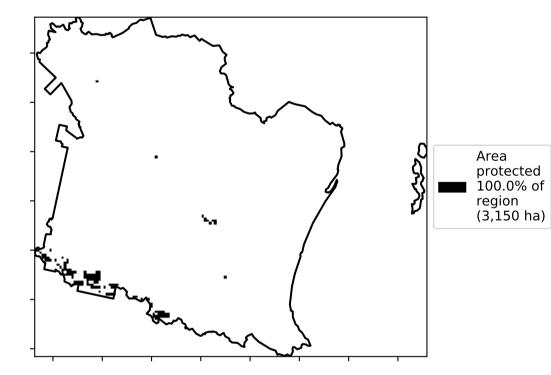
· 0.30%



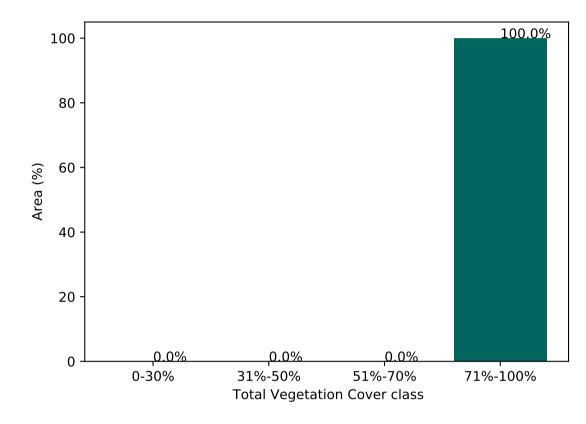
**Total Vegetation Cover [%]** 



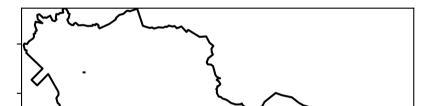
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

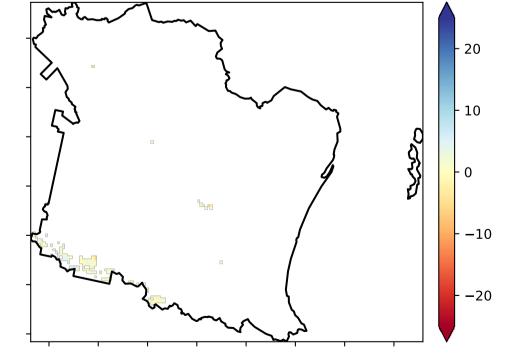


% Area protected from wind erosion (>50%)

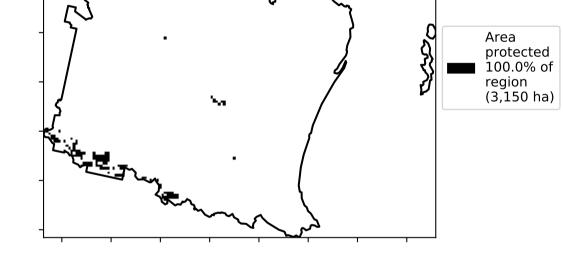


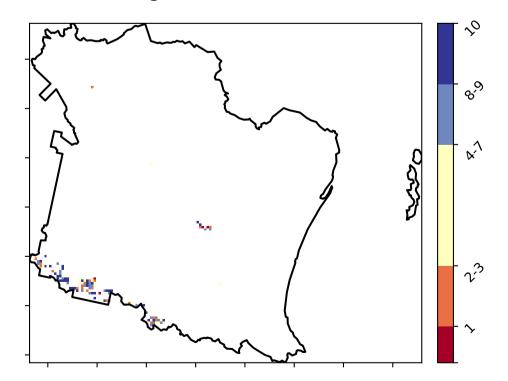
**Total Vegetation Cover Anomaly [%]** 

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.



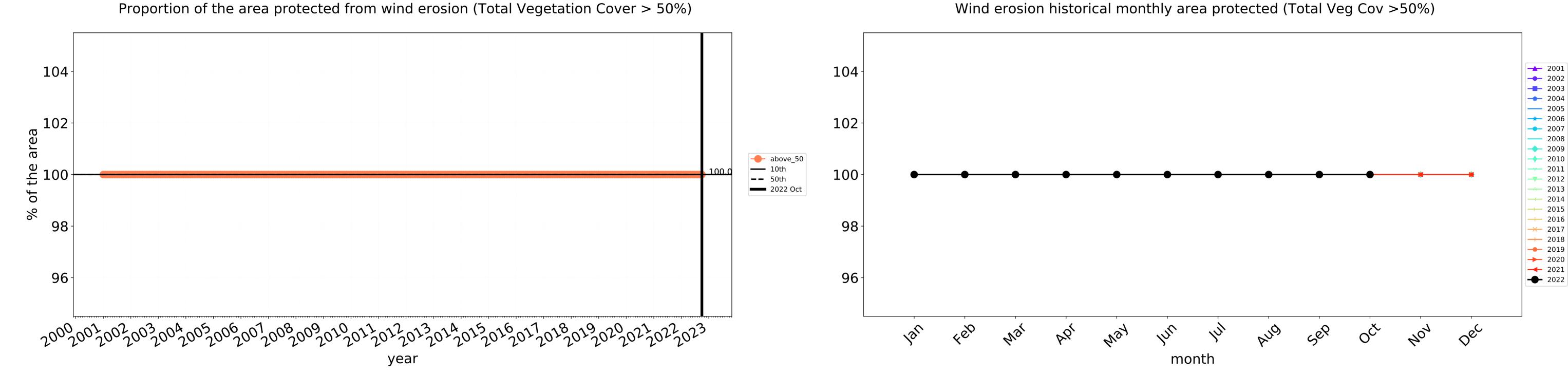
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



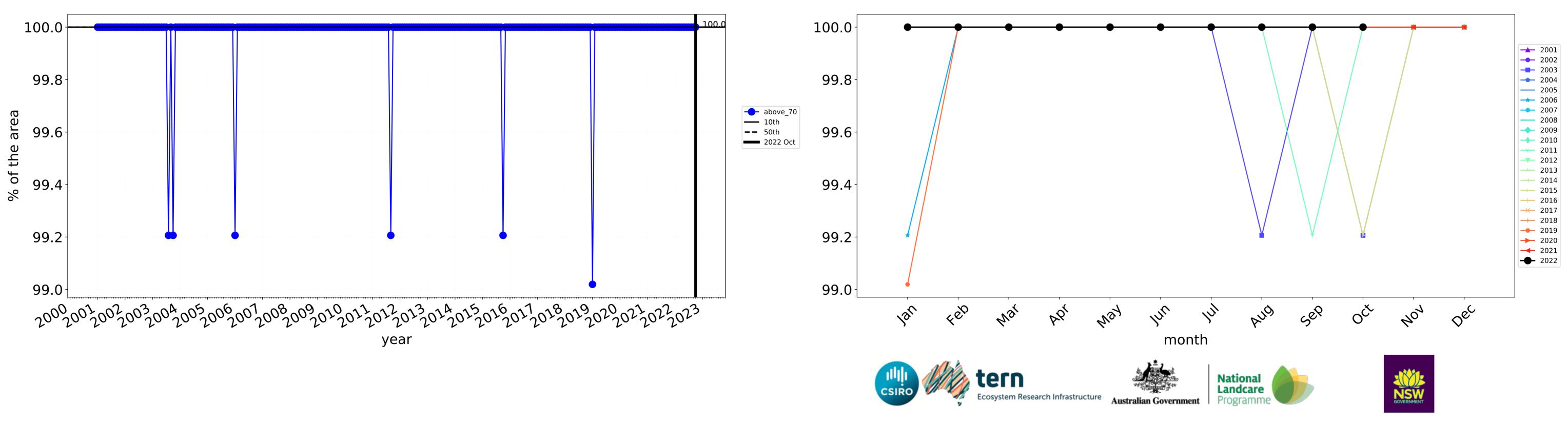




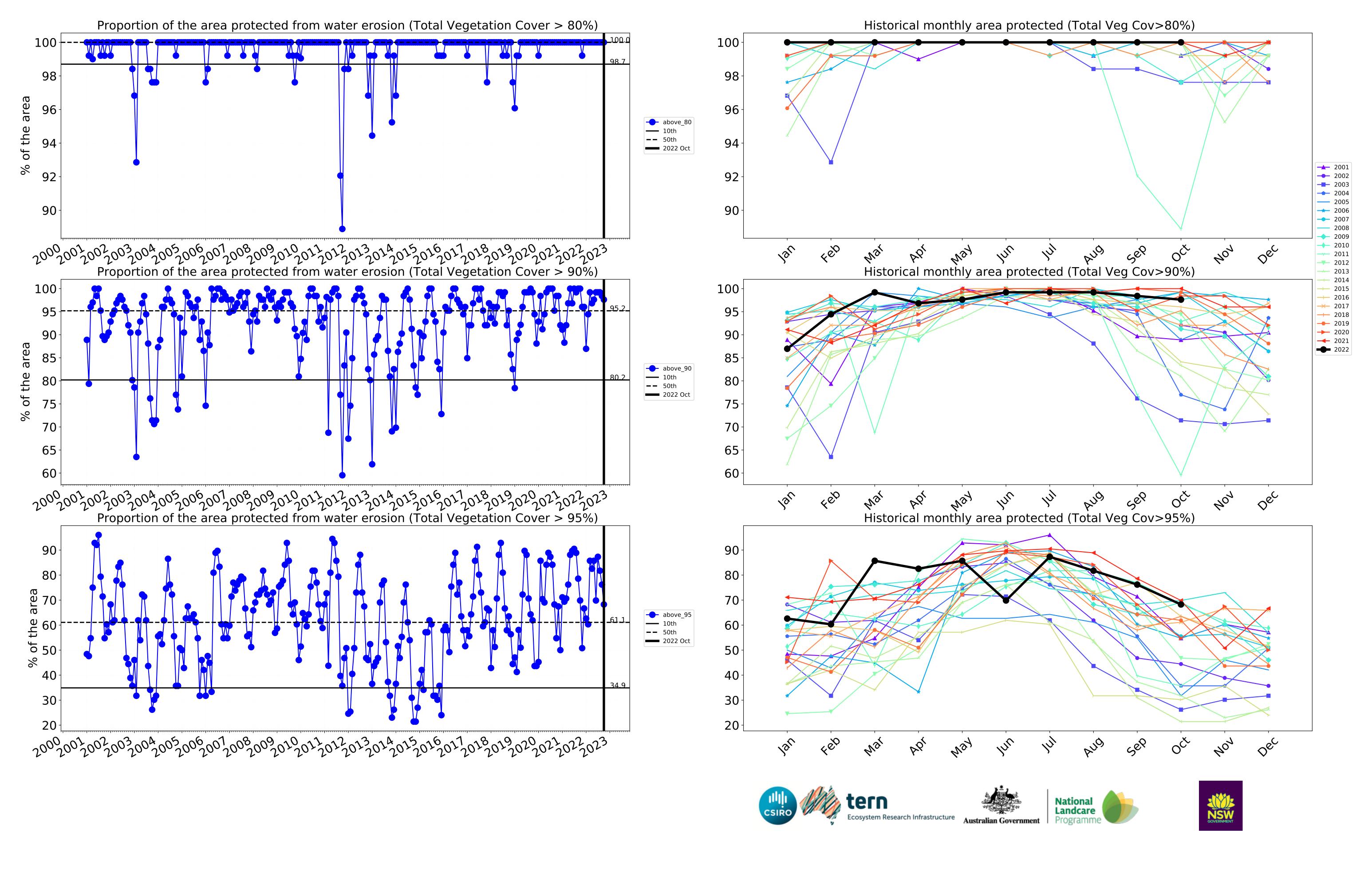
### Grazing - Forest (non woodland) timeseries



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



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



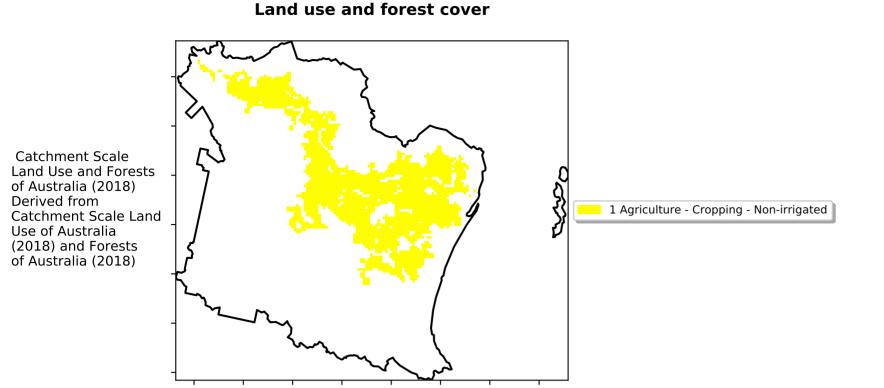
### Cropping

12%200%

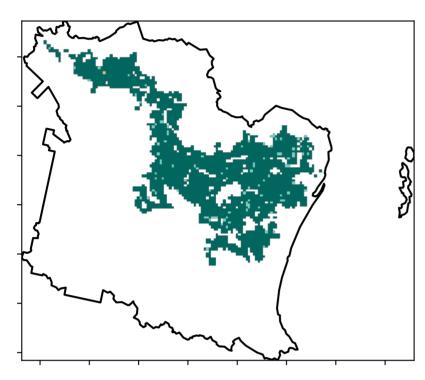
52%TON

32005001

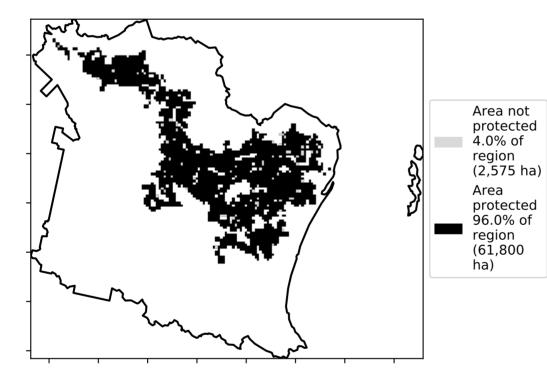
0.30%



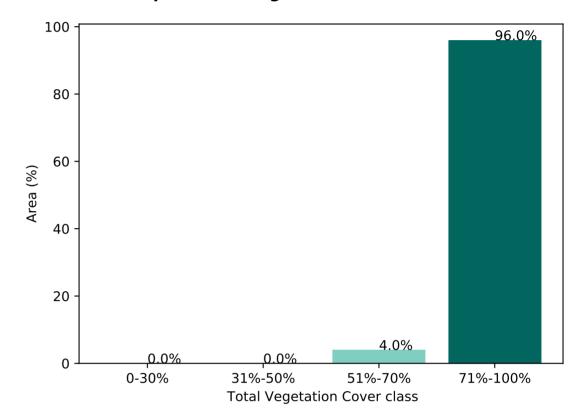
**Total Vegetation Cover [%]** 



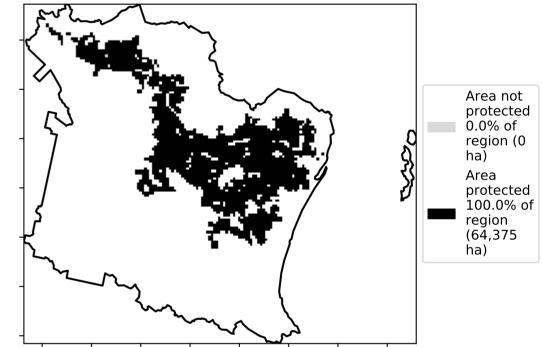
% Area protected from water erosion (>70%)



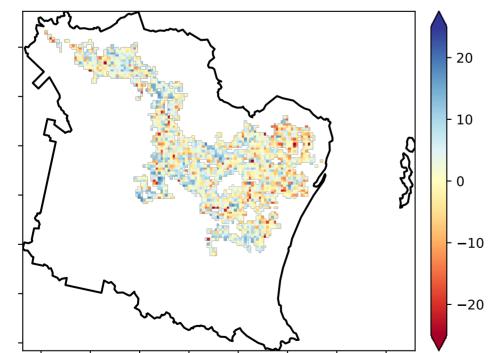
Proportion of vegetation cover class in area



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

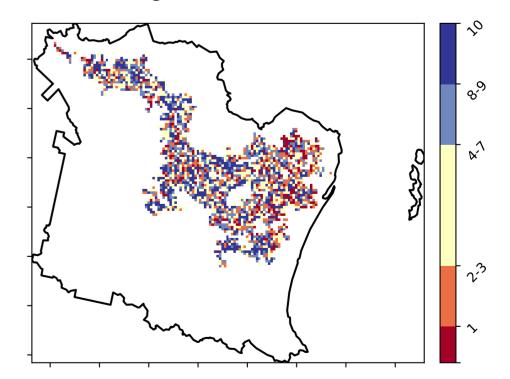


Total Vegetation Cover Anomaly [%]



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.

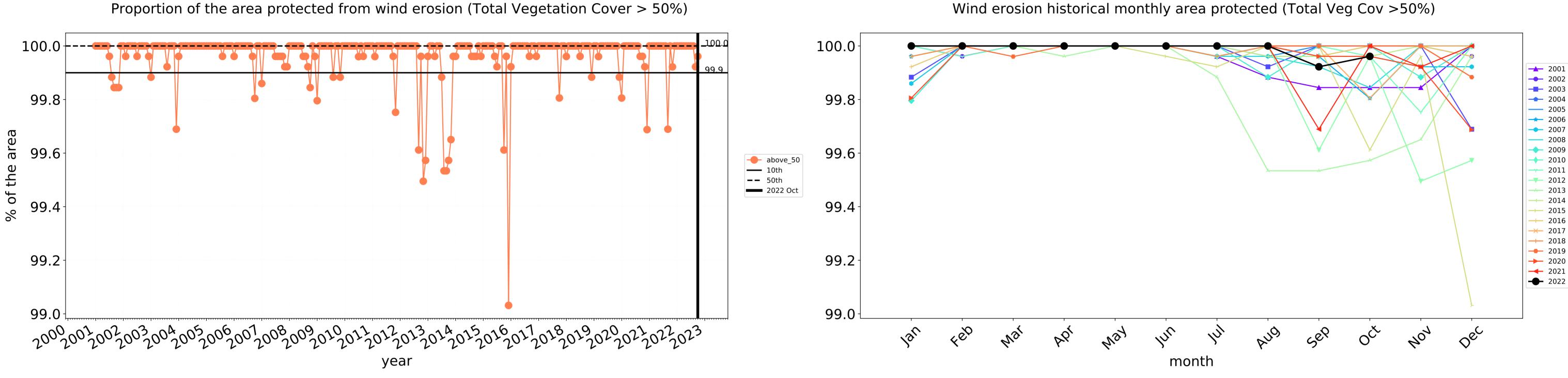
Total Vegetation Cover Decile [%]



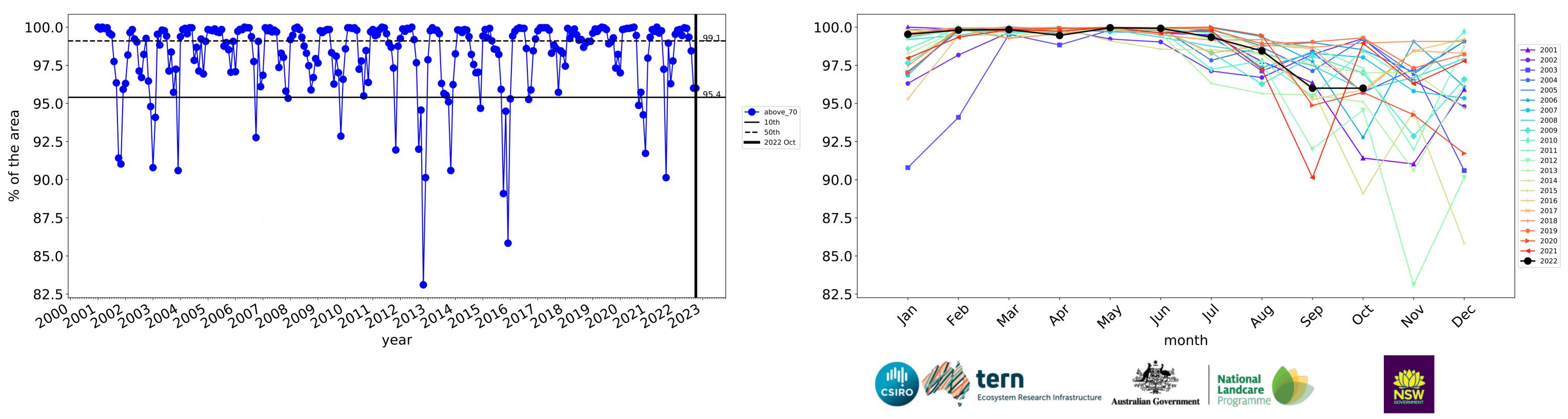


Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



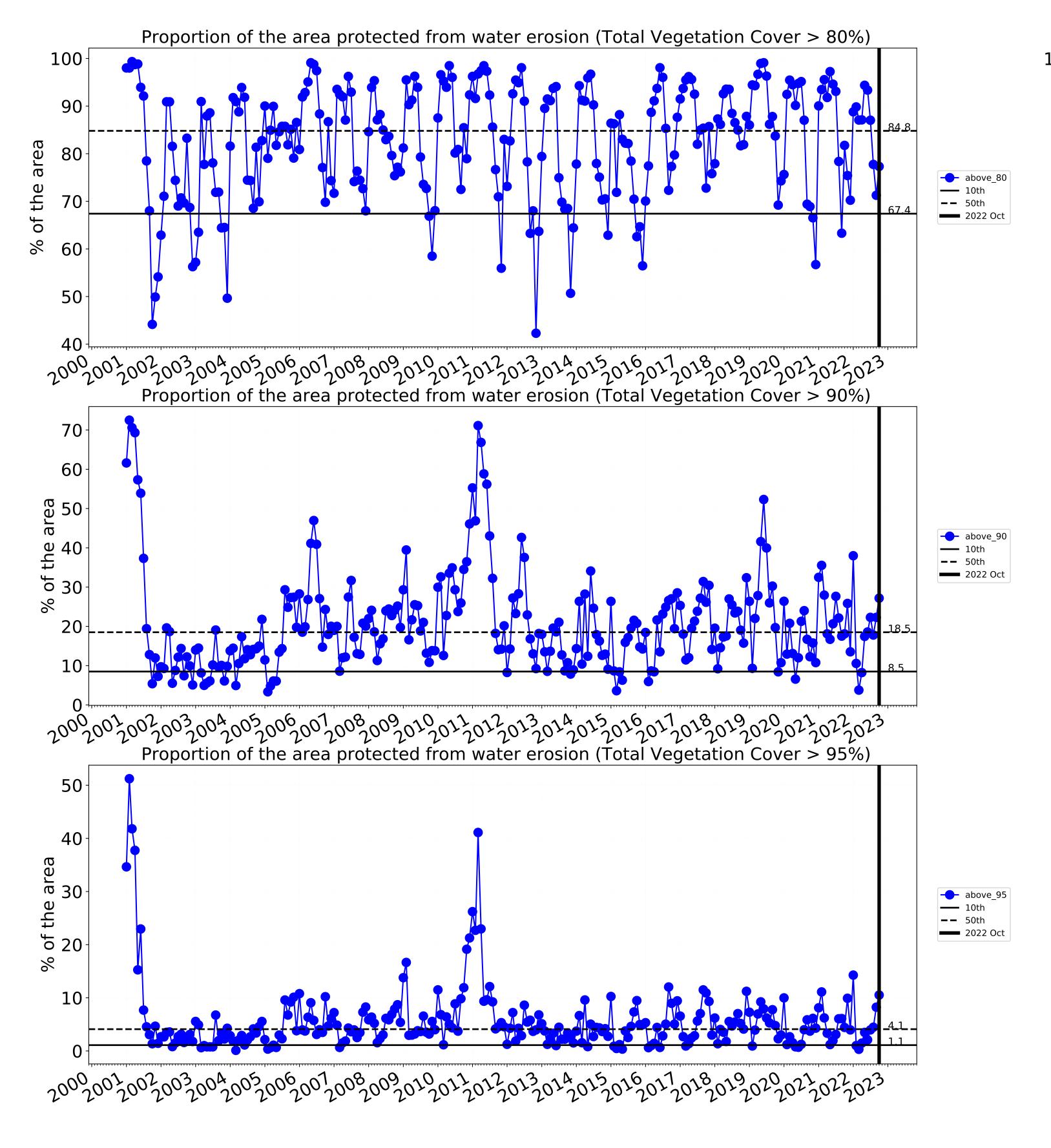


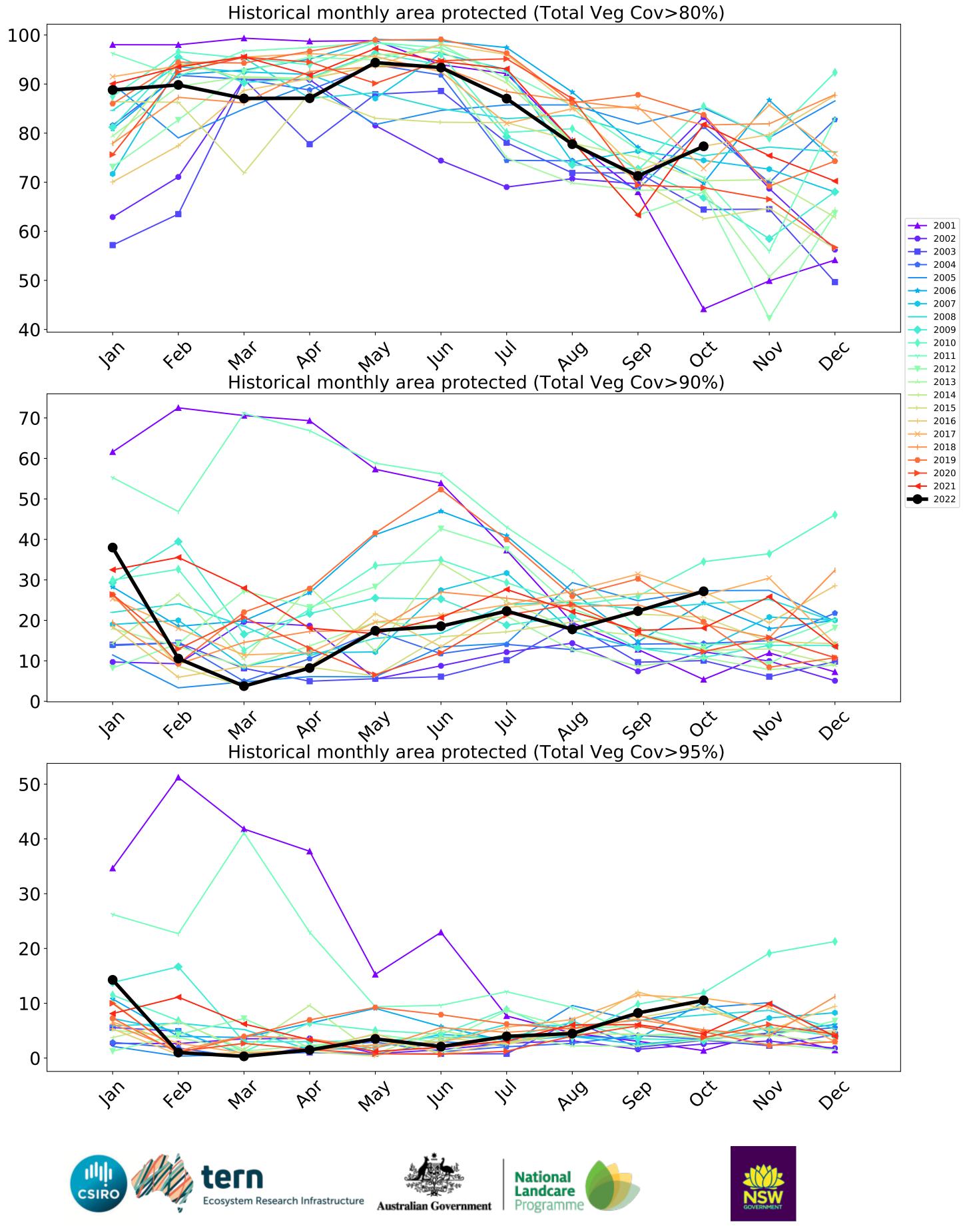
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



### **Cropping timeseries**

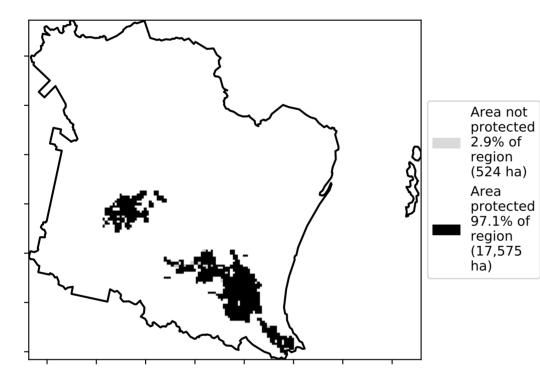
Water erosion historical monthly area protected (Total Veg Cov>70%)

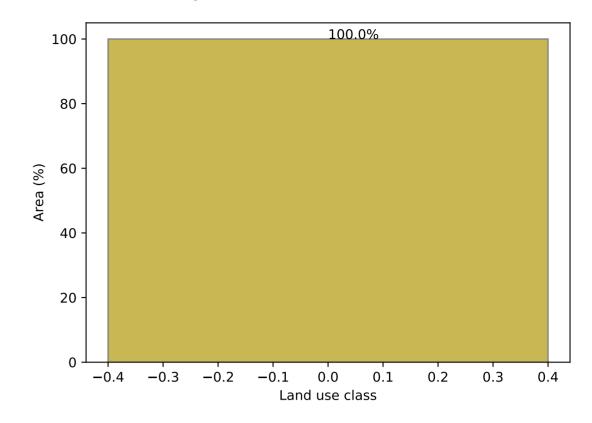




### Irrigation

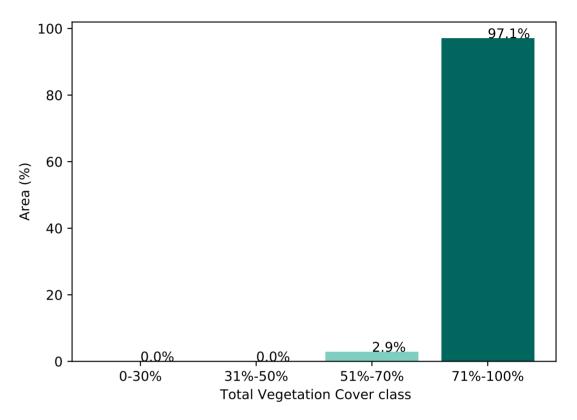
% Area protected from water erosion (>70%)





Proportion of each land class in area

Proportion of vegetation cover class in area

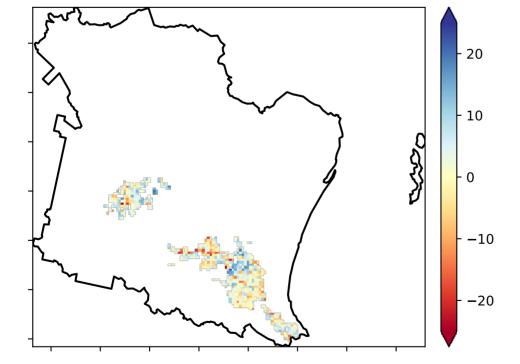


% Area protected from wind erosion (>50%)

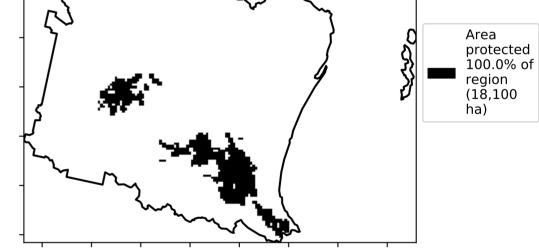


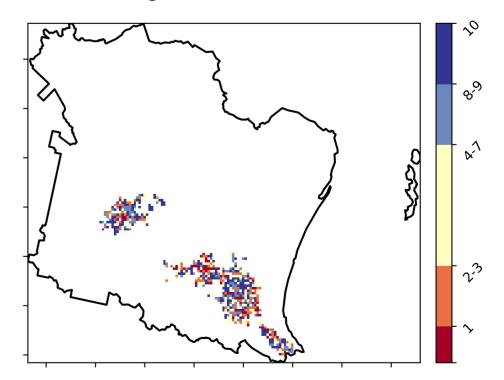
Total Vegetation Cover Anomaly [%]

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.

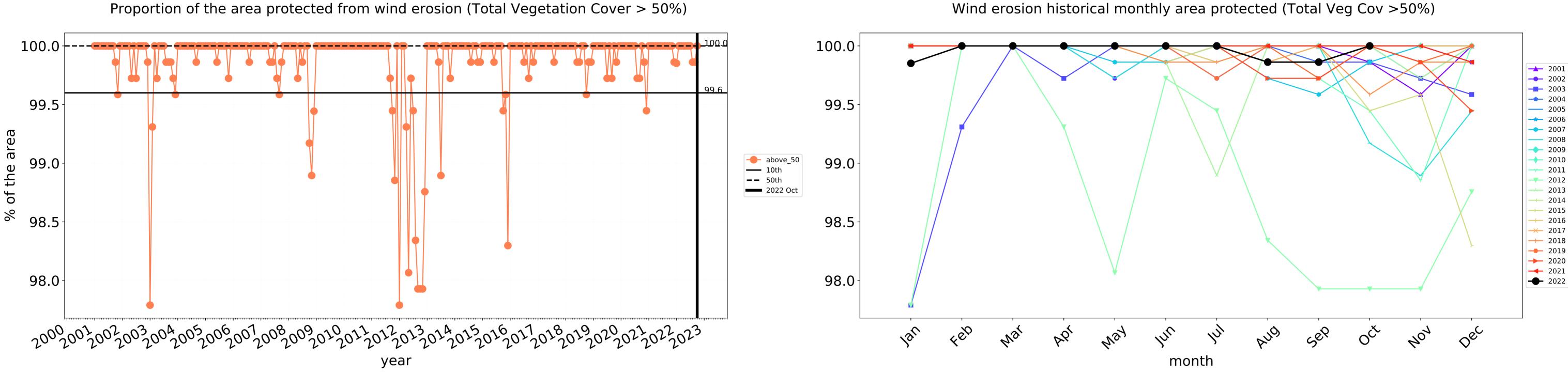


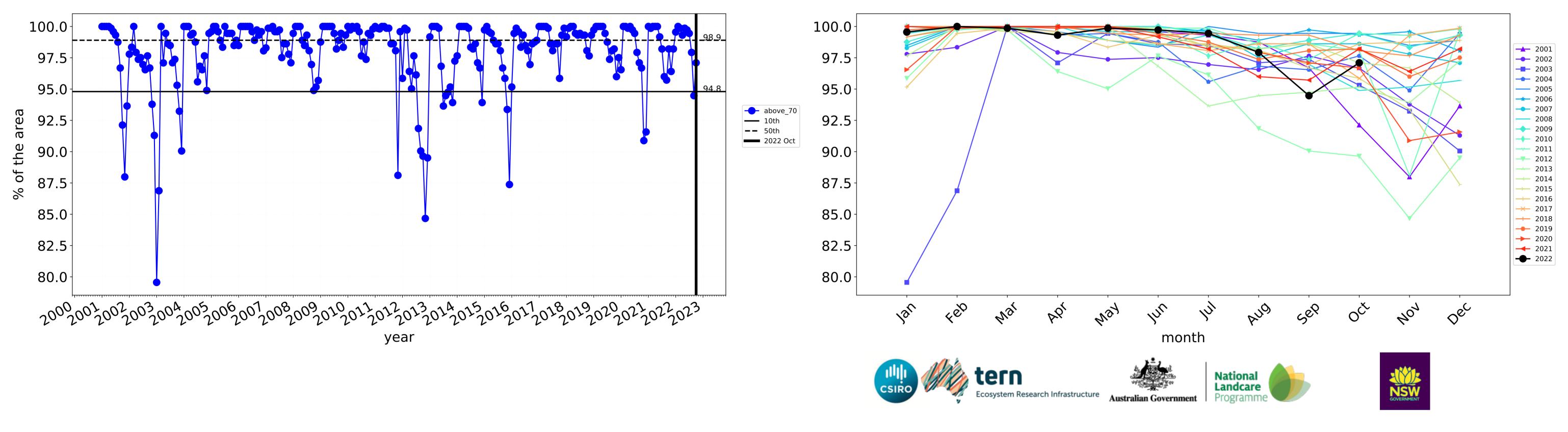
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



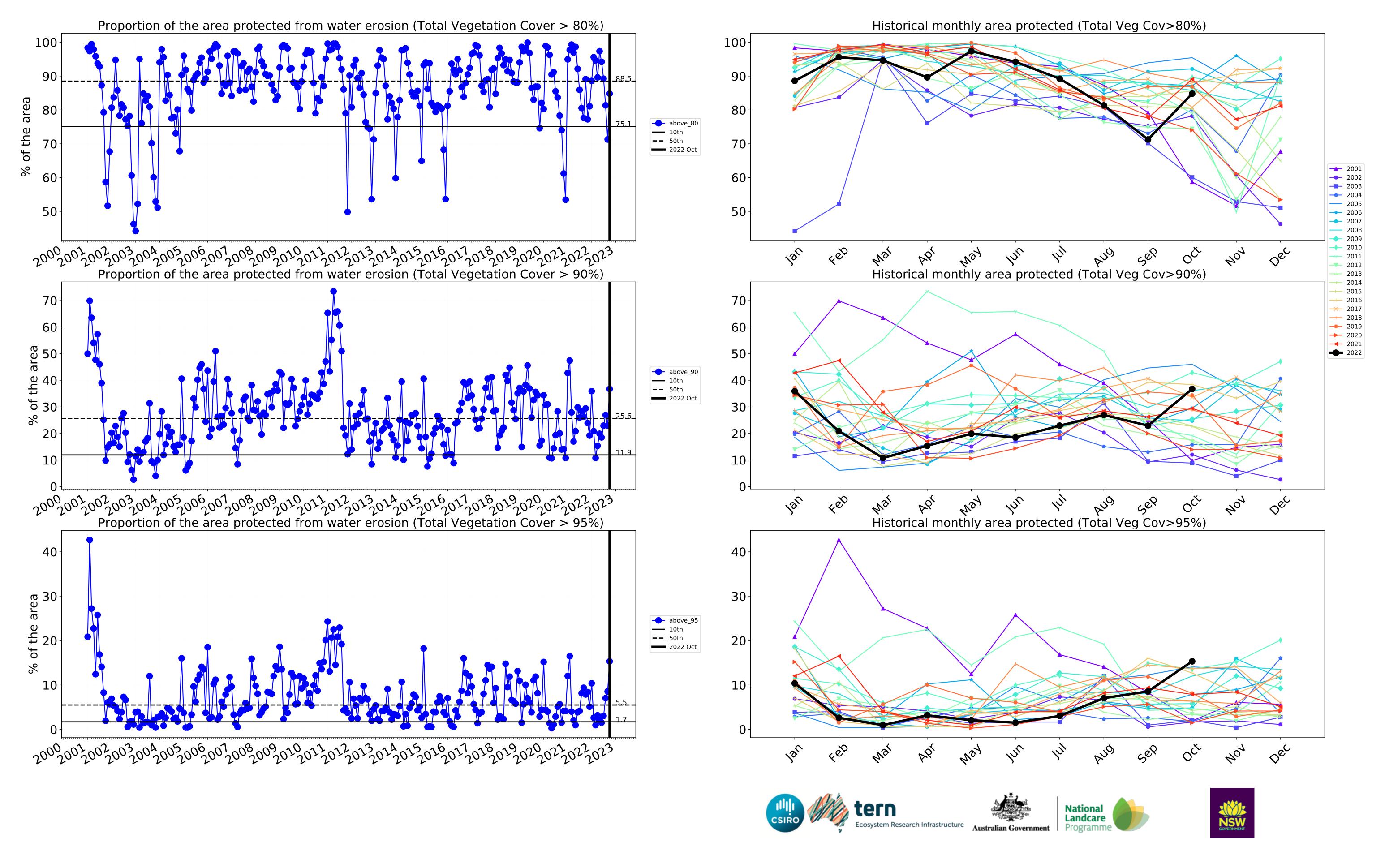








Water erosion historical monthly area protected (Total Veg Cov>70%)



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

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

12% 10%

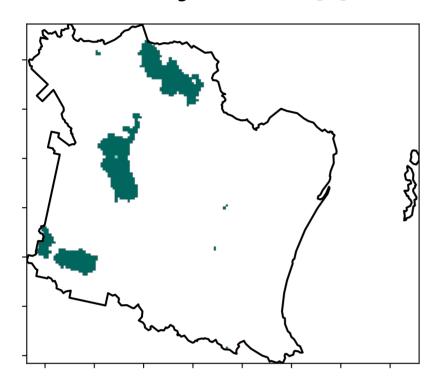
52°1070°1

32905001

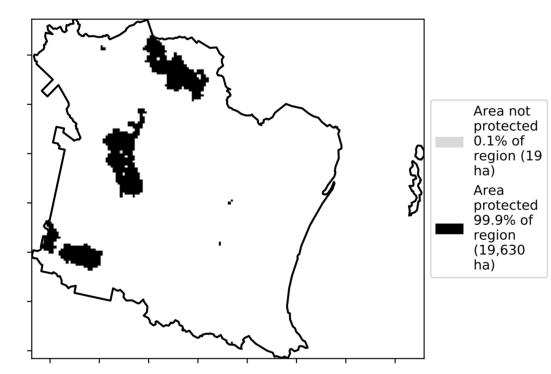
0.30%

Total Vegetation Cover [%]

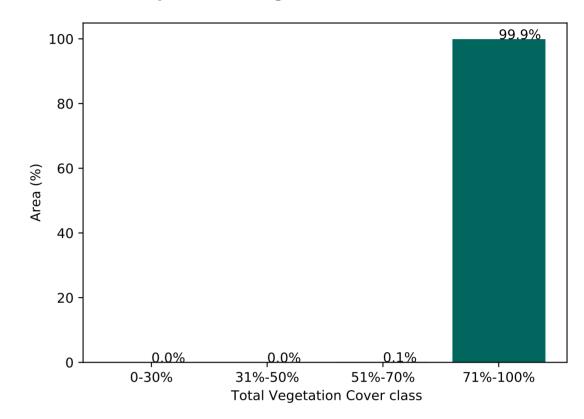
Land use and forest cover



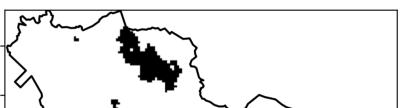
% Area protected from water erosion (>70%)





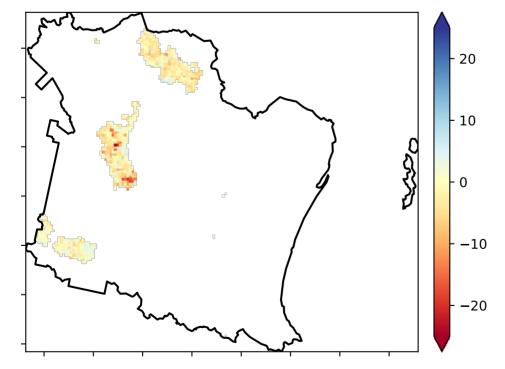


#### % Area protected from wind erosion (>50%)

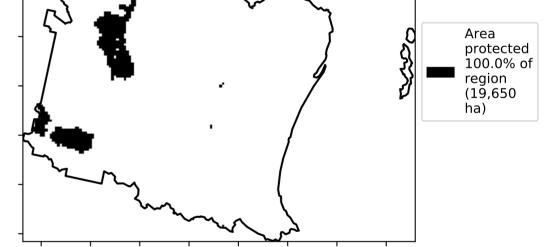


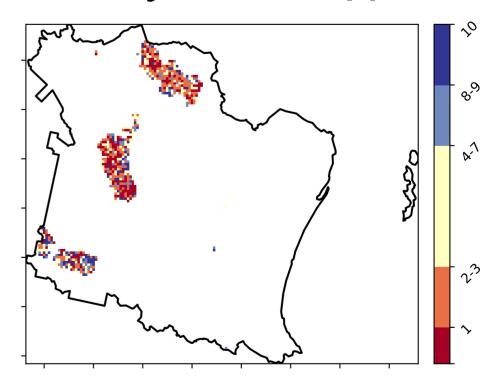
Total Vegetation Cover Anomaly [%]

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



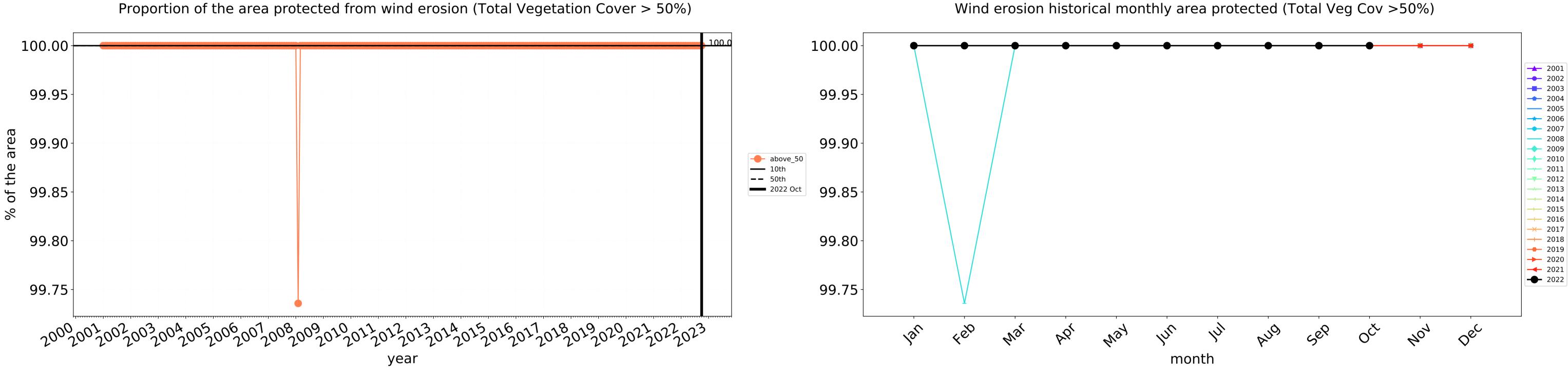
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



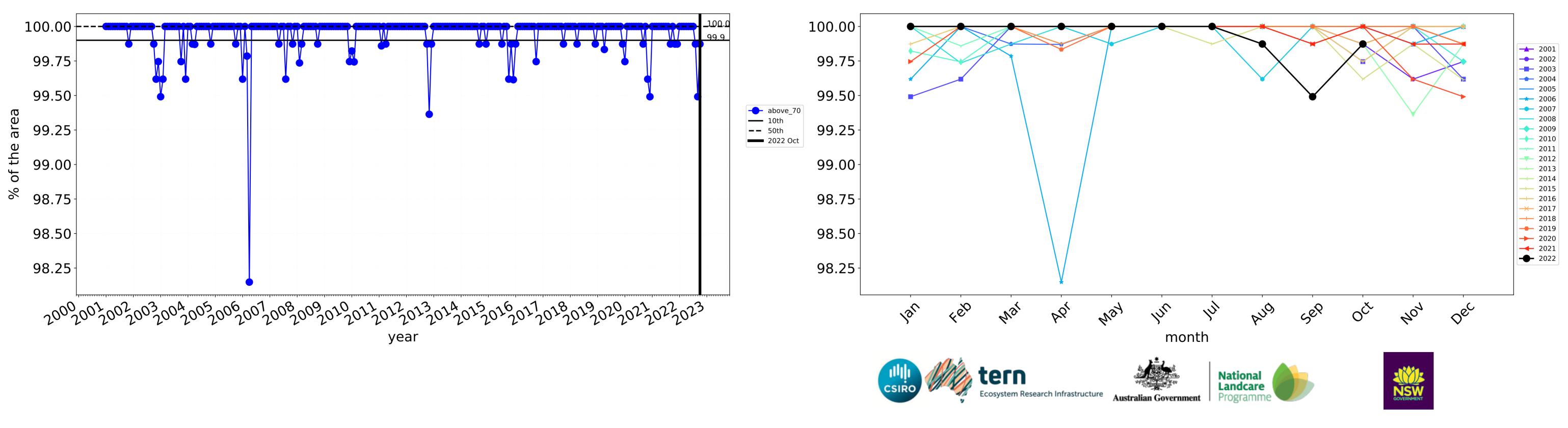




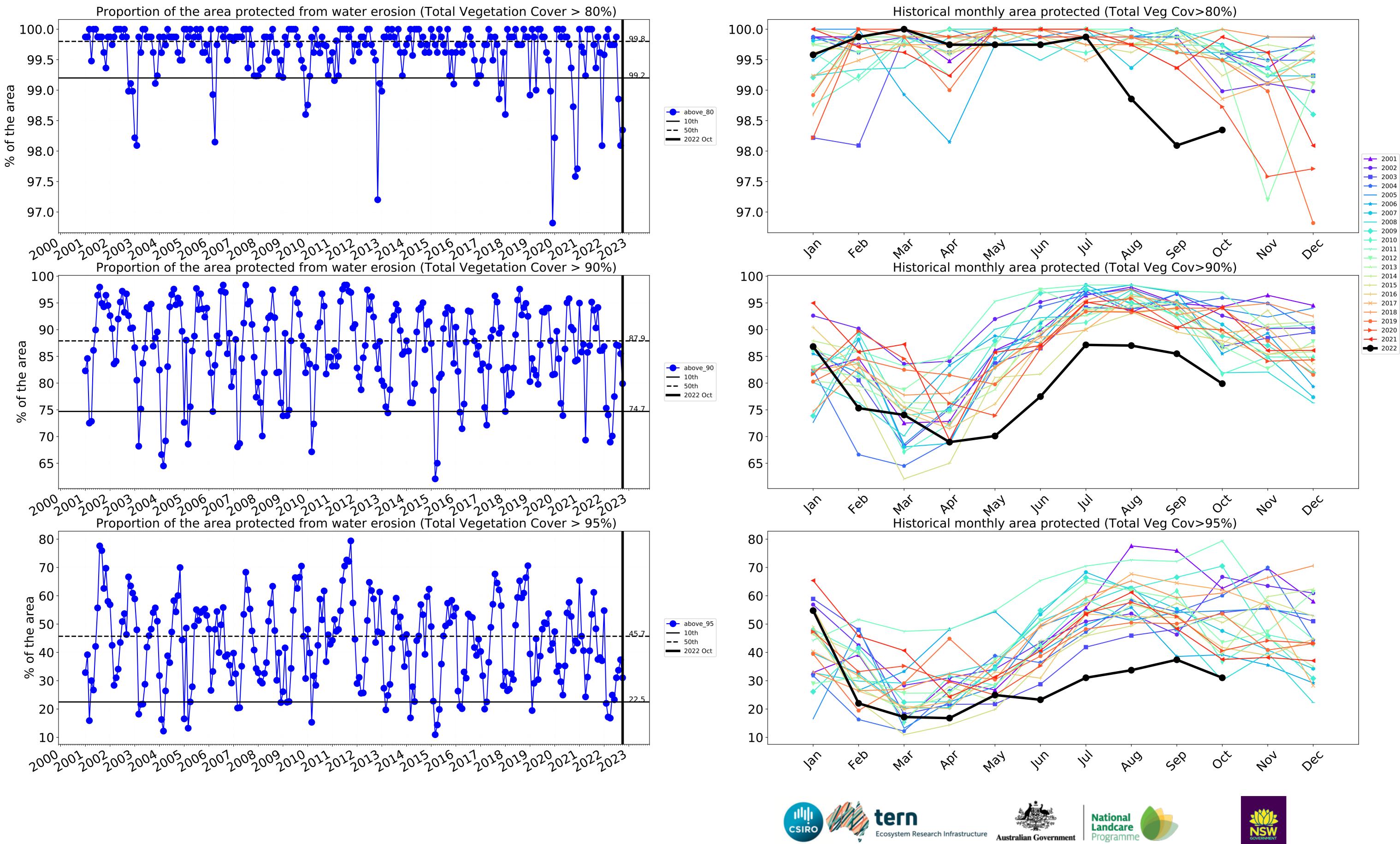
### **Production native forests and plantation forests timeseries**



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



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



# Hinchinbrook\_(S) (276,850 ha and no data 3,812 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	276,850	99.9% 276,650	99.8% 276,325	98.1% 271,625	90.6% 250,800	62.9% 174,100	31.2% 86,500
Conservation and natural environments	130,025	99.9% 129,900	99.9% 129,850	99.6% 129,475	98.5% 128,050	85.9% 111,725	45.8% 59,600
Conservation and natural environments Woodland forest	46,325	99.9% 46,300	99.9% 46,275	99.7% 46,200	98.8% 45,750	87.3% 40,425	49.9% 23,125
Conservation and natural environments Forest (non woodland)	81,950	99.9% 81,875	99.9% 81,850	99.6% 81,600	98.7% 80,850	85.9% 70,400	44.0% 36,075
Agriculture	104,425	100.0% 104,425	100.0% 104,400	97.0% 101,275	82.5% 86,175	37.9% 39,625	16.9% 17,700
Grazing	21,925	100.0% 21,925	100.0% 21,925	99.8% 21,875	95.9% 21,025	70.5% 15,450	37.1% 8,125
Grazing non forest	16,100	100.0% 16,100	100.0% 16,100	99.7% 16,050	94.7% 15,250	61.5% 9,900	26.7% 4,300
Grazing Woodland forest	2,675	100.0% 2,675	100.0% 2,675	100.0% 2,675	98.1% 2,625	92.5% 2,475	62.6% 1,675
Grazing - Forest (non woodland)	3,150	100.0% 3,150	100.0% 3,150	100.0% 3,150	100.0% 3,150	97.6% 3,075	68.3% 2,150
Cropping	64,375	100.0% 64,375	100.0% 64,350	96.0% 61,800	77.3% 49,775	27.2% 17,500	10.5% 6,775
Irrigation	18,100	100.0% 18,100	100.0% 18,100	97.1% 17,575	84.8% 15,350	36.7% 6,650	15.3% 2,775
Production native forests and plantation forests	19,650	100.0% 19,650	100.0% 19,650	99.9% 19,625	98.3% 19,325	79.9% 15,700	31.0% 6,100

