## Total vegetation cover soil protection Region:LGA Bundaberg\_(R) QLD

# Date: October 2021

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:

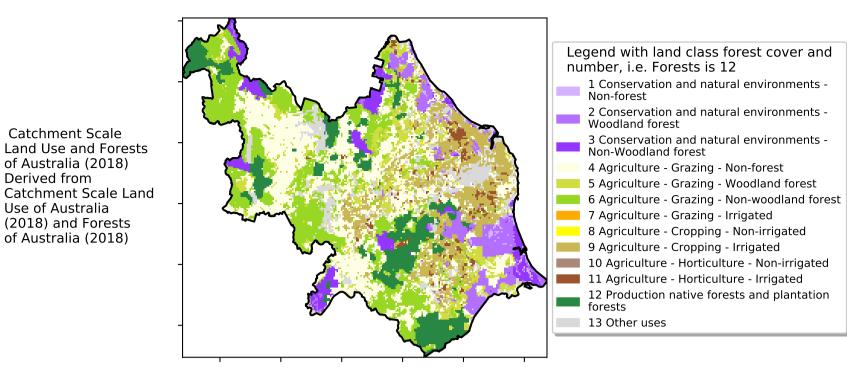
https://doi.org/10.4225/08/5848a3f19a7b3



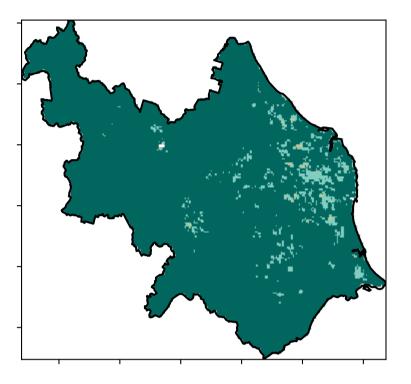
# **Vegetation Cover Oct 2021**

#### Land use and forest cover

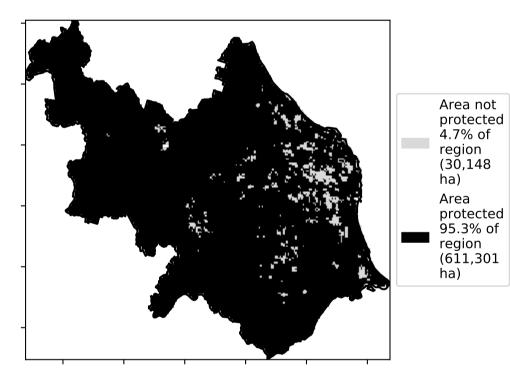
#### Proportion of each land class in area

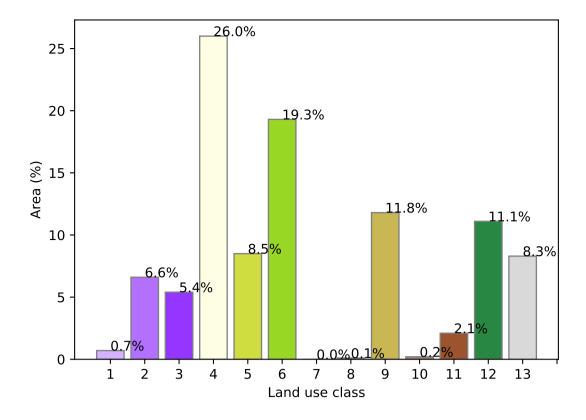


### **Total Vegetation Cover [%]**

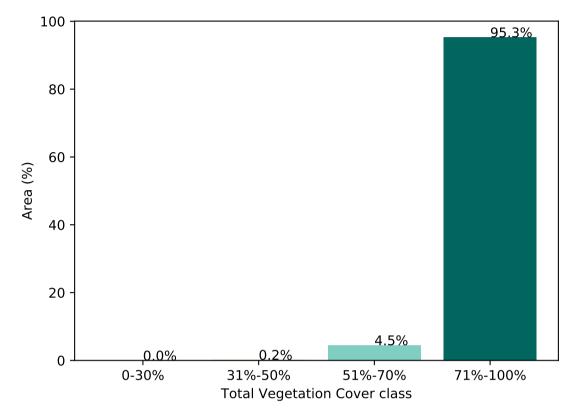


#### % Area protected from water erosion (>70%)

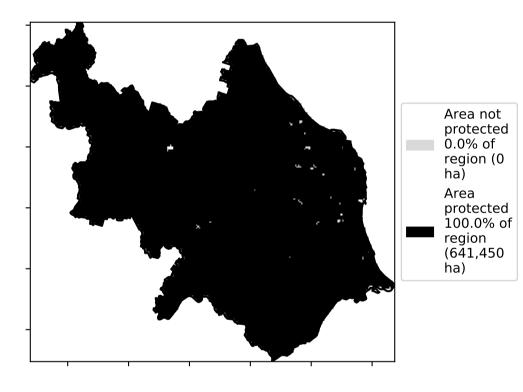




#### Proportion of vegetation cover class in area



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



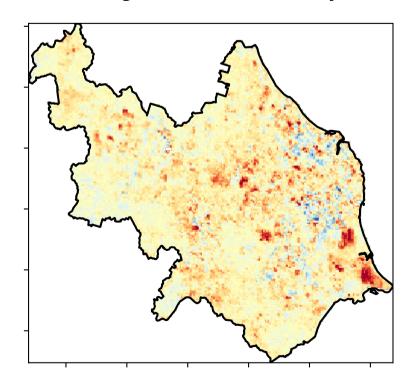
 $\sqrt{2}$ 

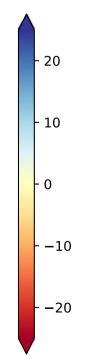
\$<sup>0</sup>

A-1

2?

**Total Vegetation Cover Anomaly [%]** 





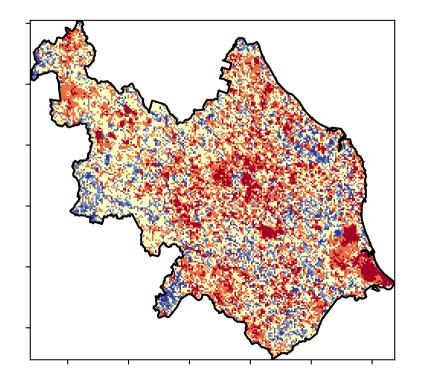
12º10-20010

· 52% 70%

3201050010

0-30%

**Total Vegetation Cover Decile [%]** 





Deciles show where the

record, from highest to lowest, for that month.

in the lowest 10% of records for that month of

the map using baseline

from 2001 to 2019.

That is, red pixels are

pixel value lies in the

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

of Australia (2018)

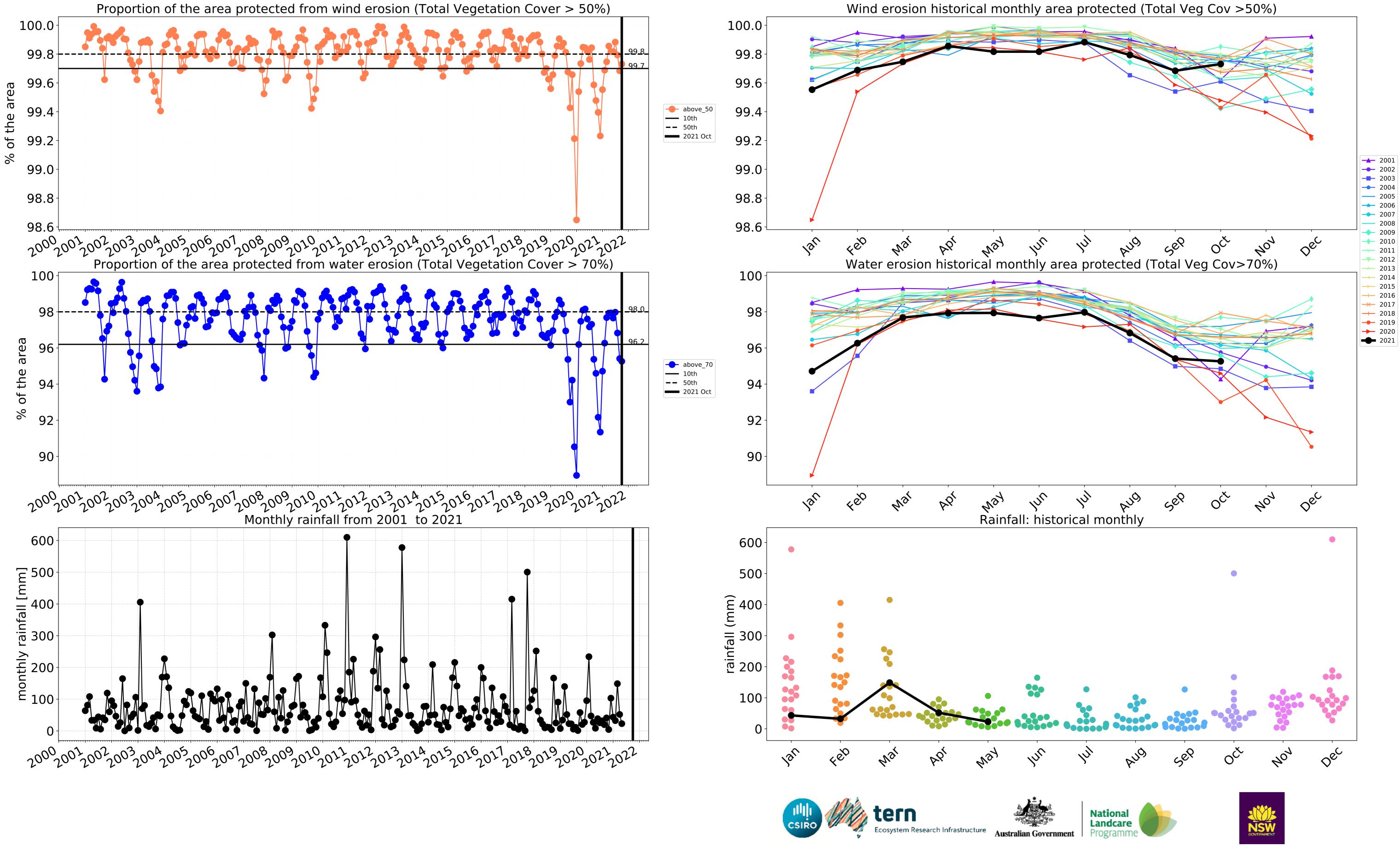
(2018) and Forests

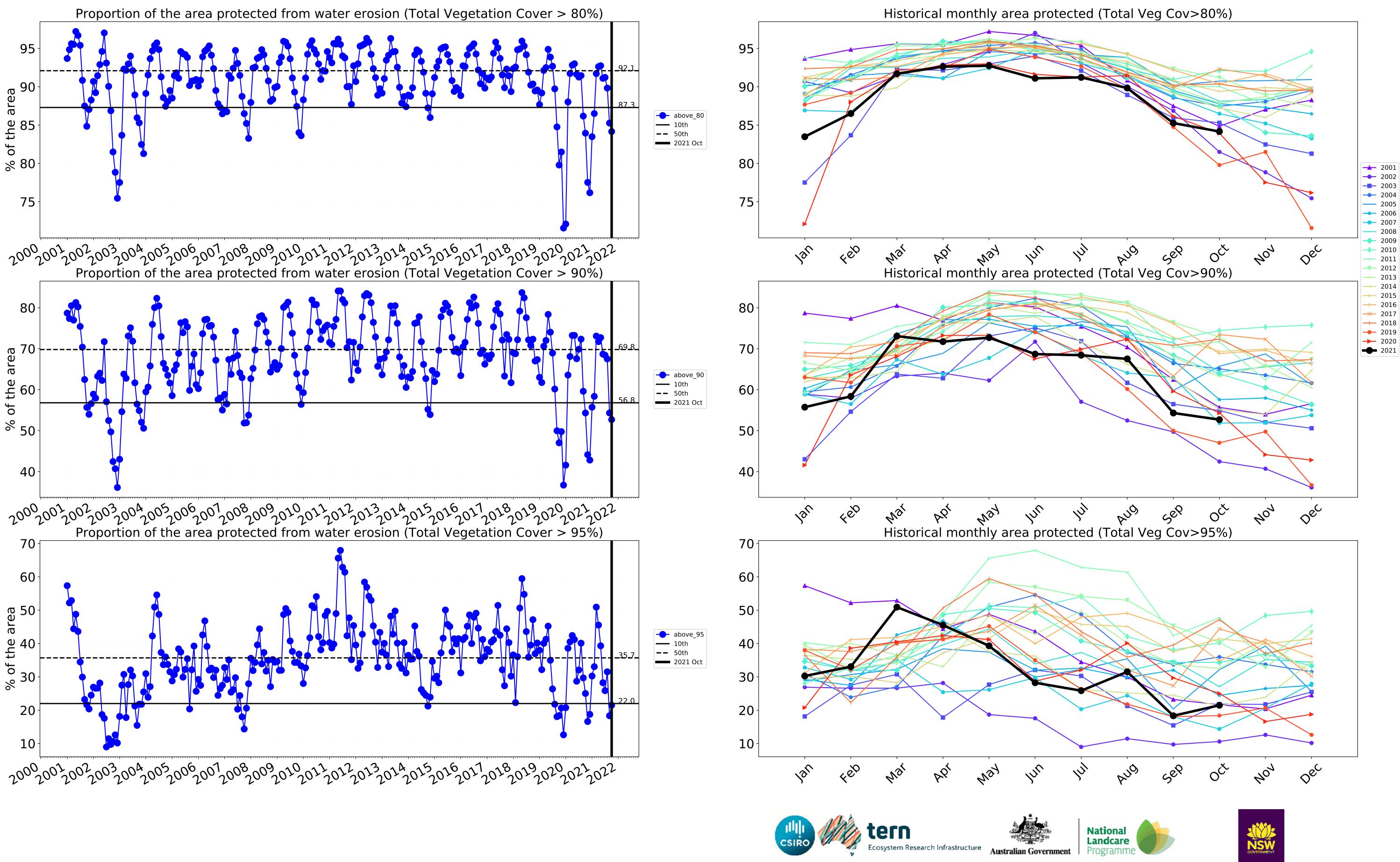
of Australia (2018)

Derived from

Use of Australia

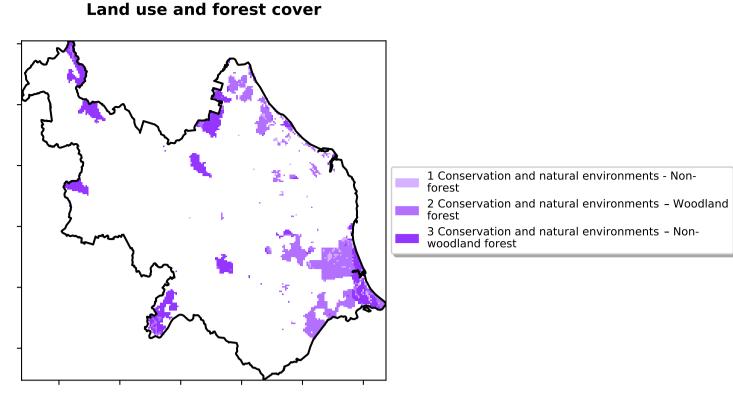




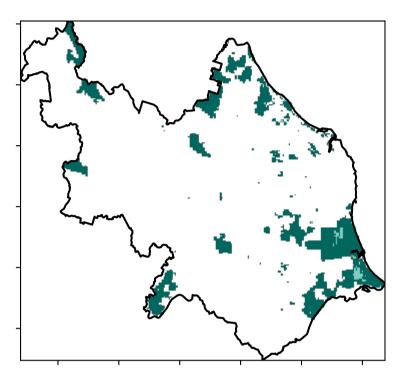


### **Conservation and natural environments**

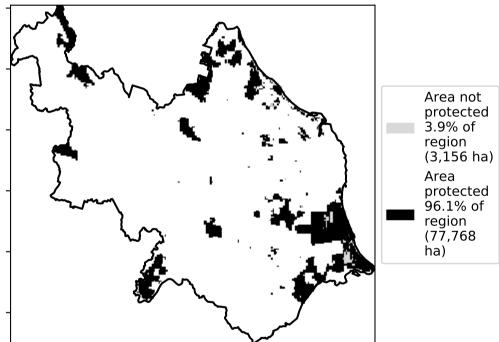
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



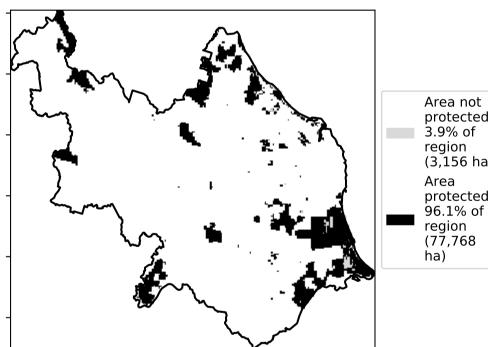
**Total Vegetation Cover [%]** 



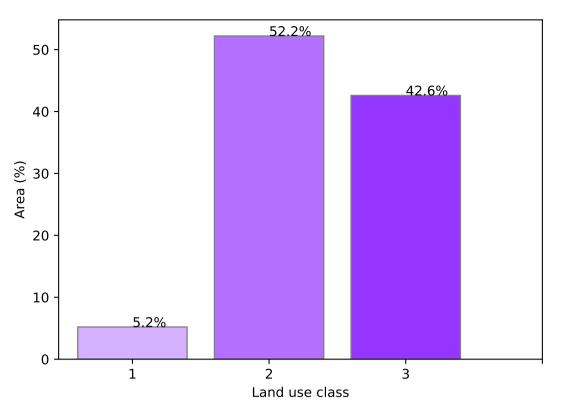
% Area protected from water erosion (>70%)



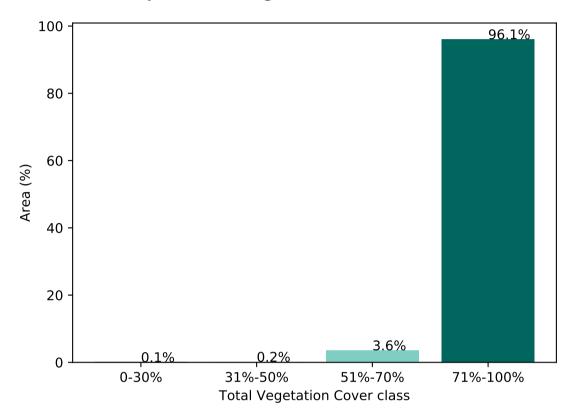
12%20001 · 52°10'70°10 32°10'50°10 0.30%



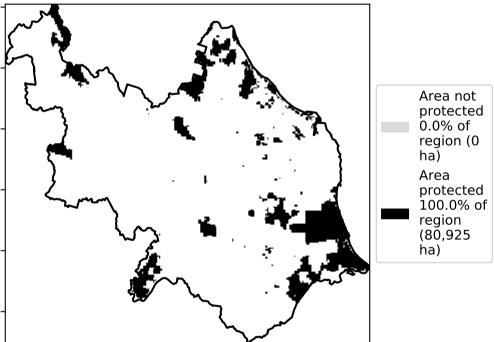
Proportion of each land class in area



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



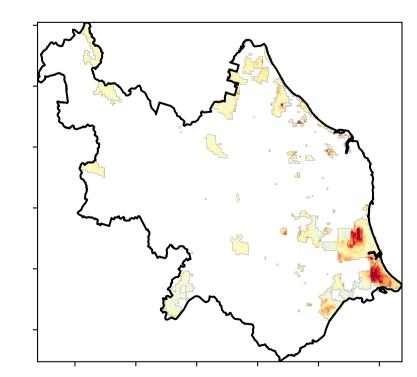
\$

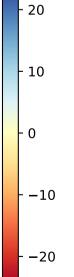
ۍ ک

A-1

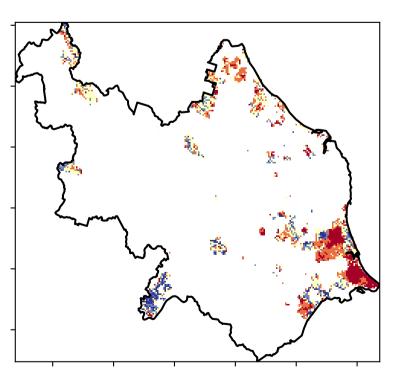
2?3

**Total Vegetation Cover Anomaly [%]** 





Total Vegetation Cover Decile [%]





Deciles show where the pixel value lies in the

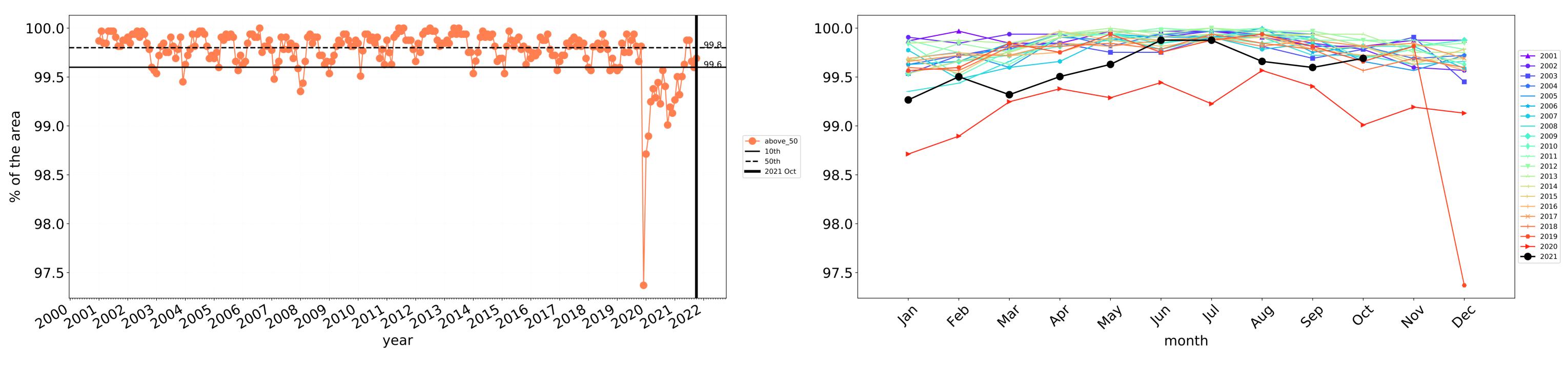
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

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





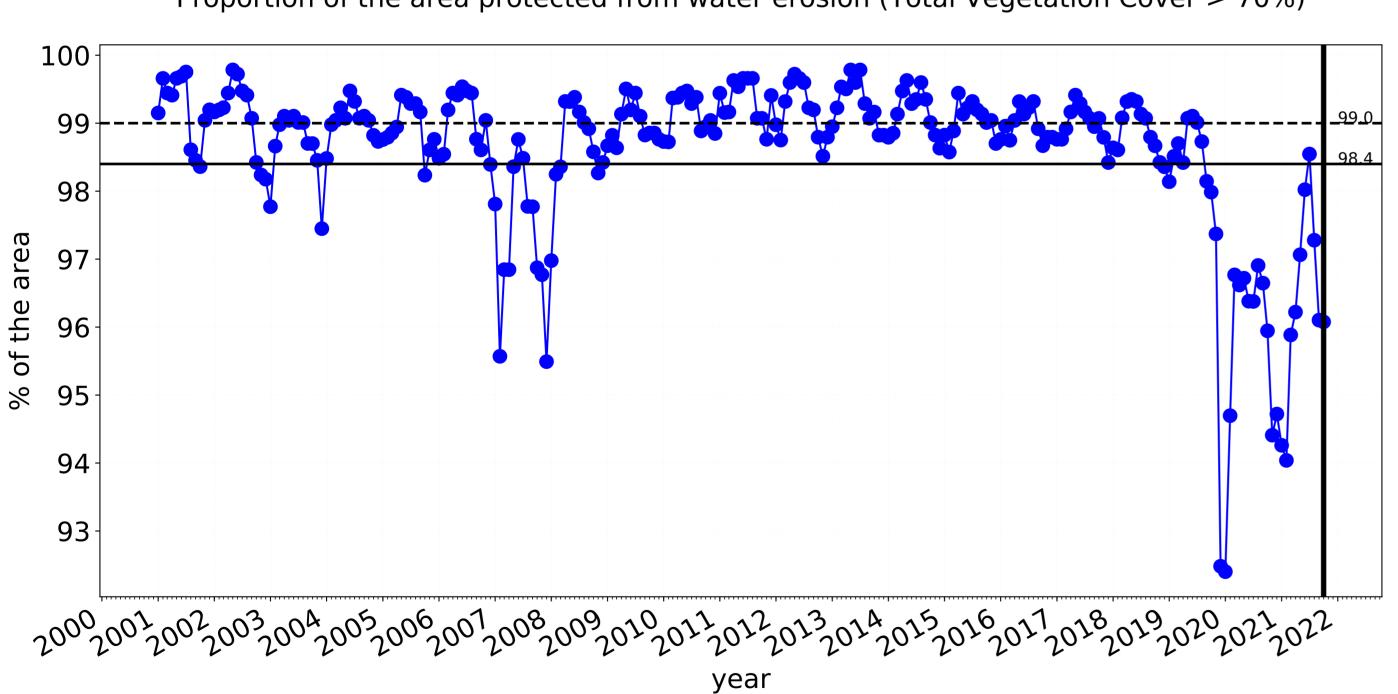
---- above\_70

**——** 10th

**——** 50th

**—** 2021 Oct

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

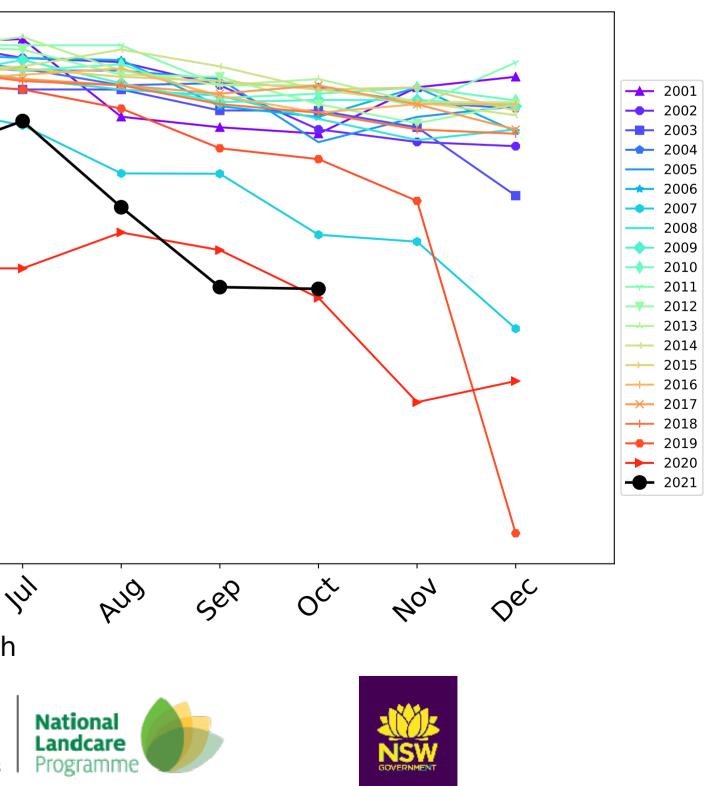


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

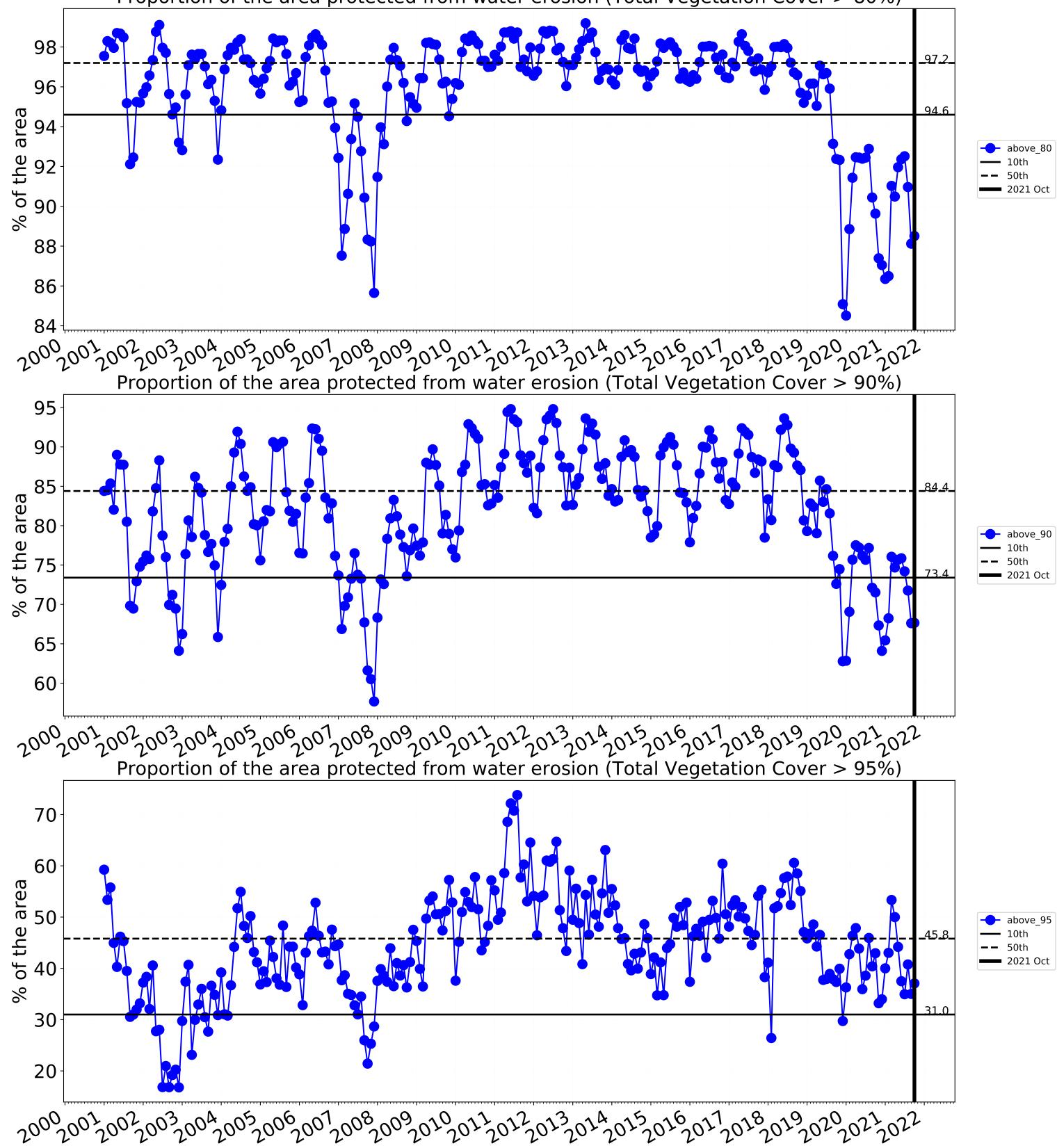
100-99 98 97 96 95 94 93 Jan 4eb way PQ In Mai month 111 tern Ecosystem Research Infrastructure Australian Government

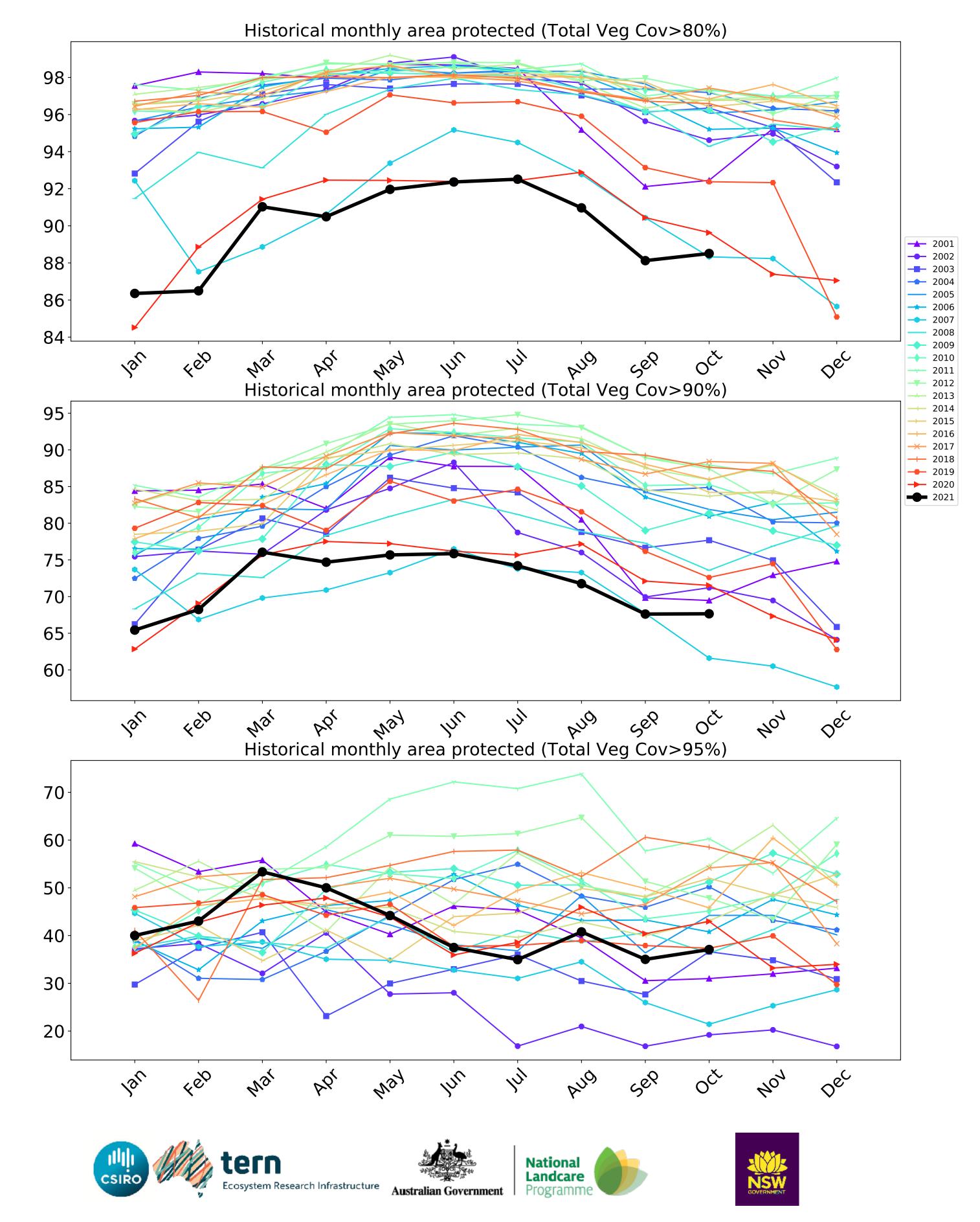
Water erosion historical monthly area protected (Total Veg Cov>70%)

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



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



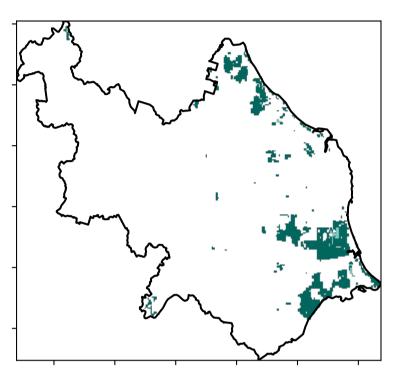


### **Conservation and natural environments Woodland forest**

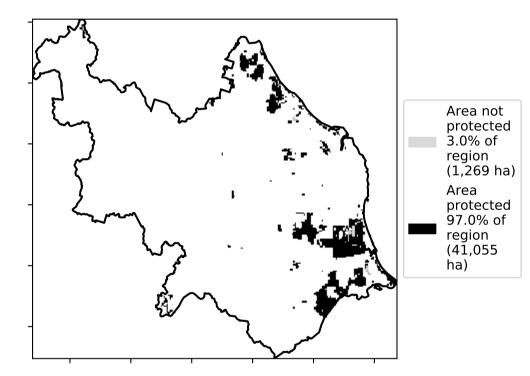
Land Use and Forests of Australia (2018) 1 Conservation and natural environments – Woodland forest Catchment Scale Land

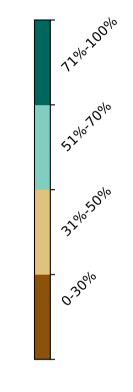
Land use and forest cover

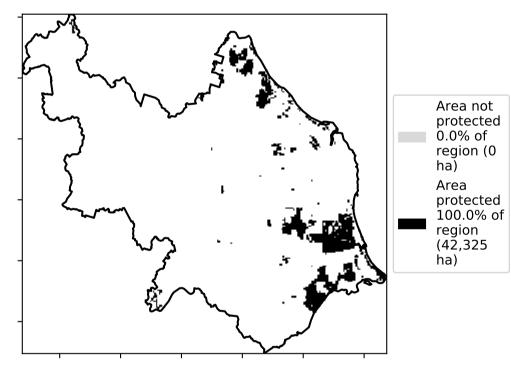
**Total Vegetation Cover [%]** 



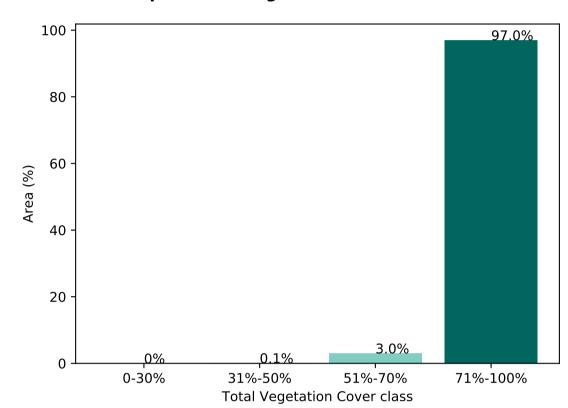
% Area protected from water erosion (>70%)







### Proportion of vegetation cover class in area



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



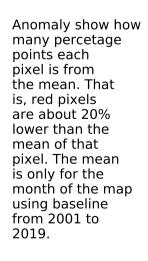
\$

ۍ ک

A-1

2?3

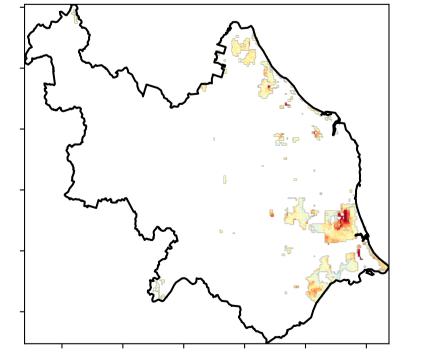
**Total Vegetation Cover Anomaly [%]** 



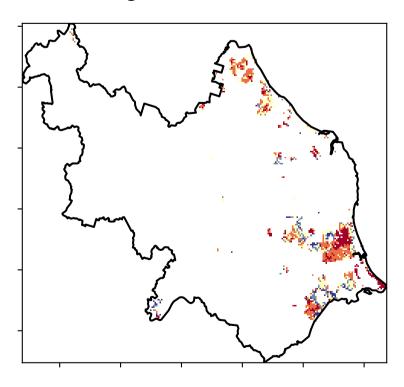
Catchment Scale

Derived from

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



- 20 - 10 0 -10-20 Total Vegetation Cover Decile [%]





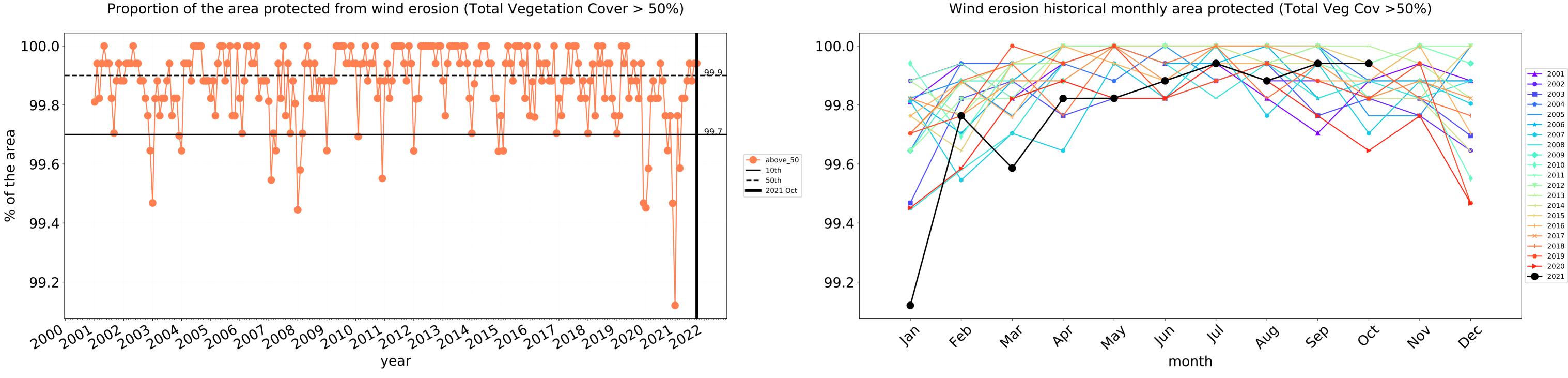
Deciles show where the pixel value lies in the

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

records for that month of

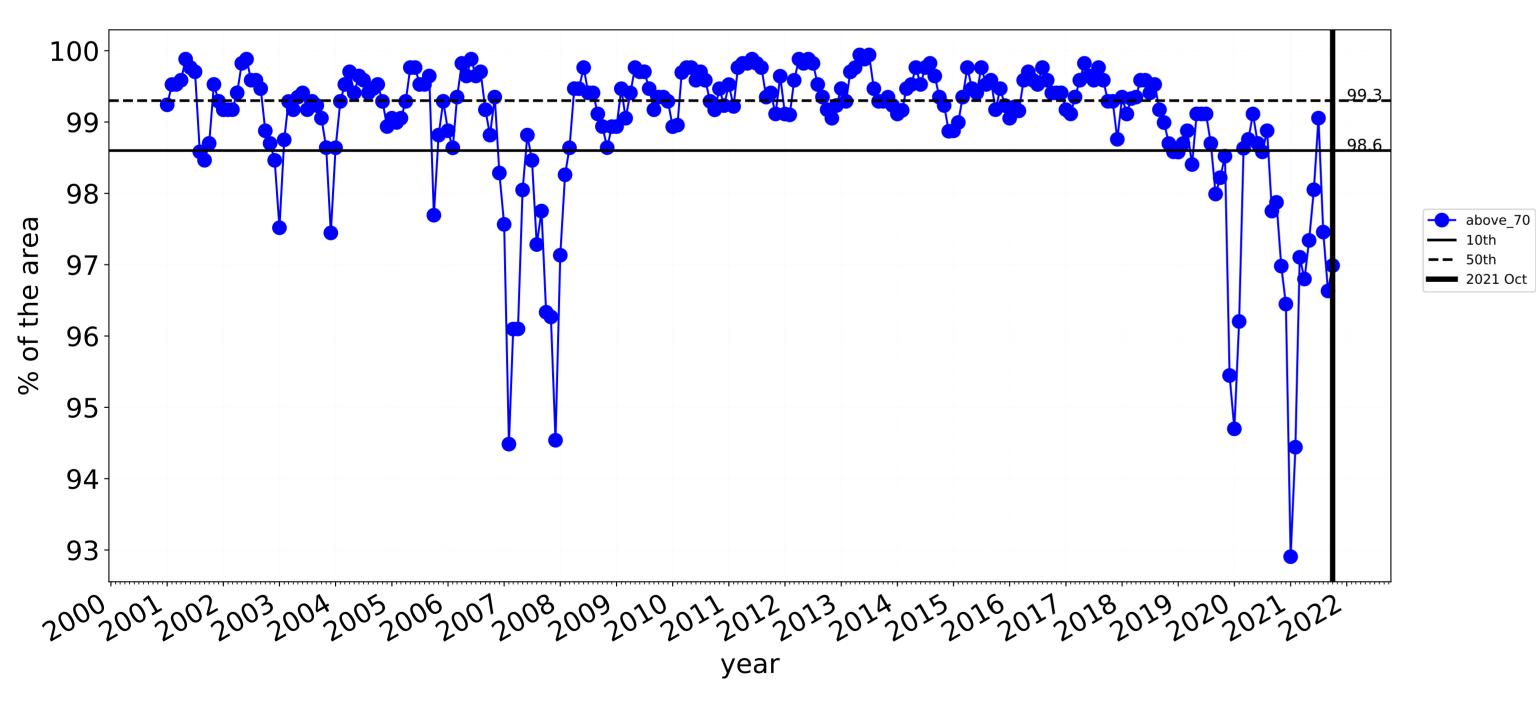
the map using baseline from 2001 to 2019.

8



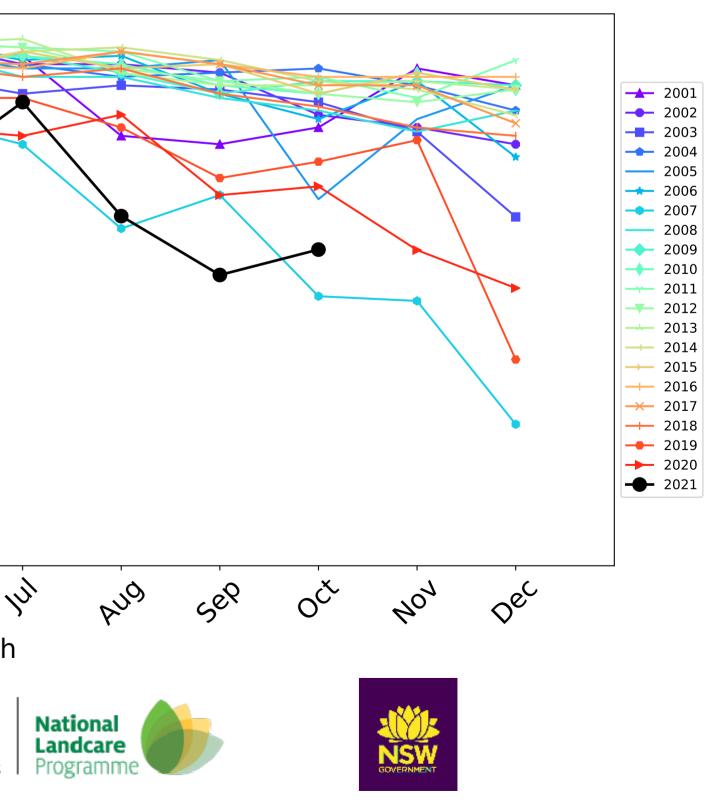
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

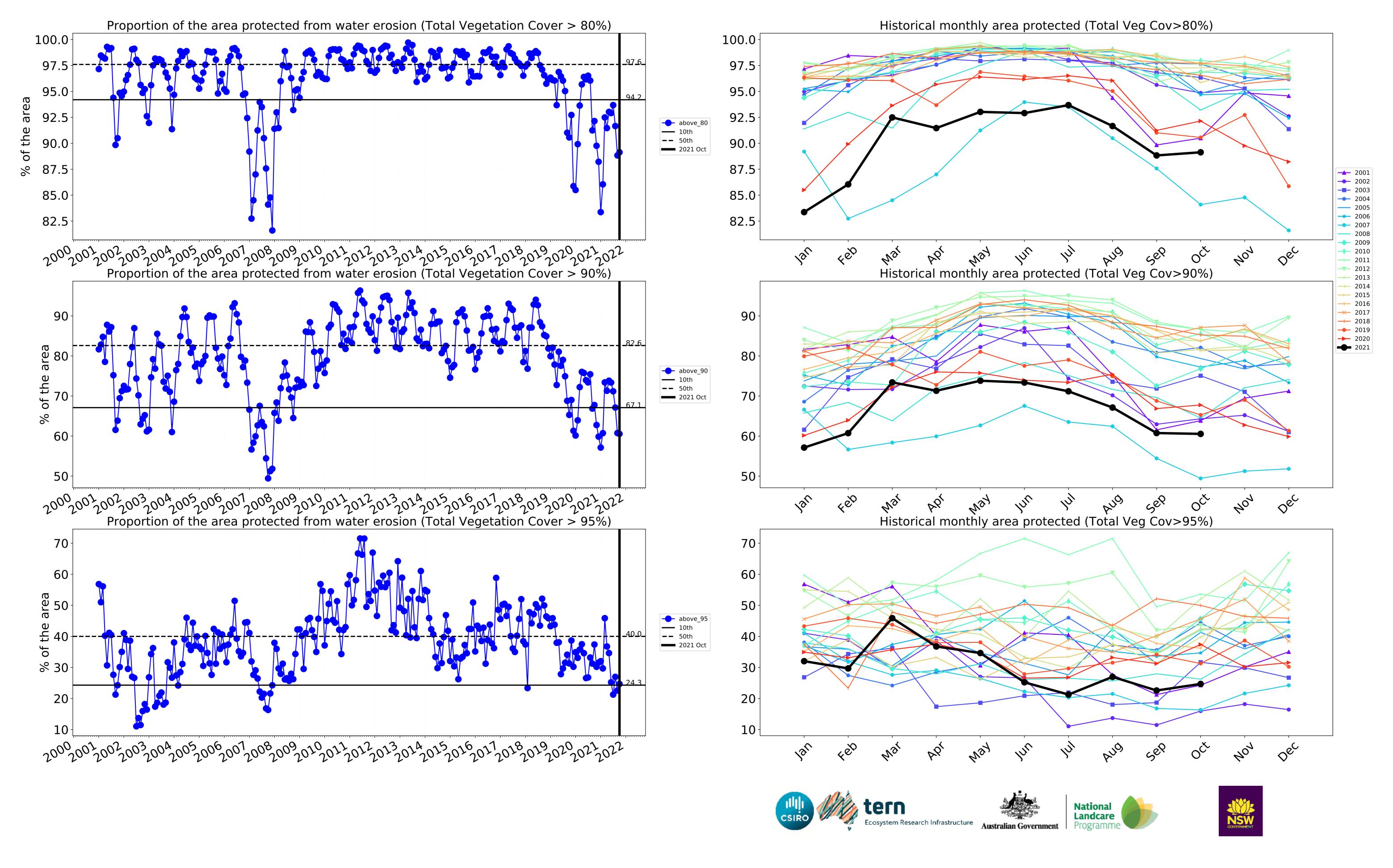




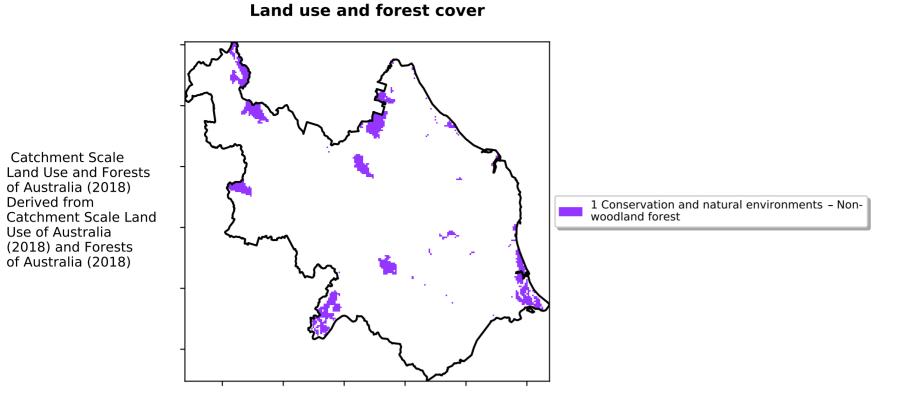
100-99 98 97 96 95 94 93 Jan 4eb May In Mai PQ1 month W tern Ecosystem Research Infrastructure Australian Government

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

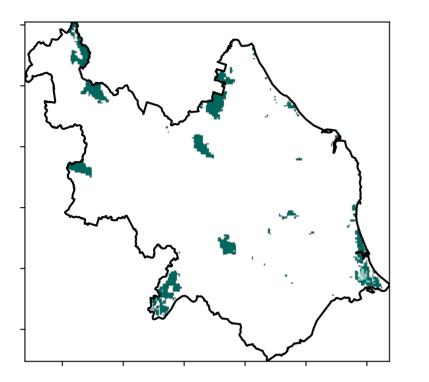




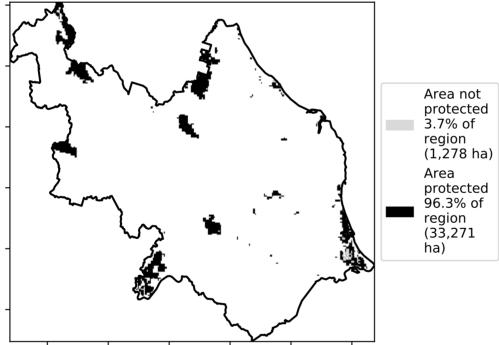
### **Conservation and natural environments Forest (non woodland)**

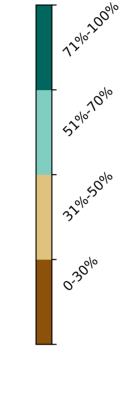


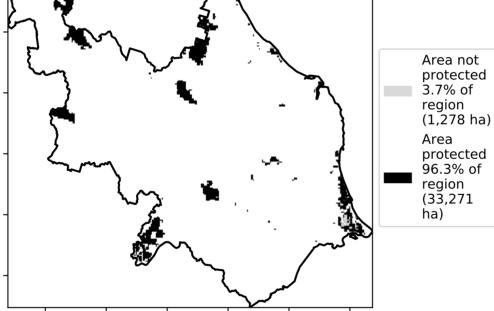
**Total Vegetation Cover [%]** 



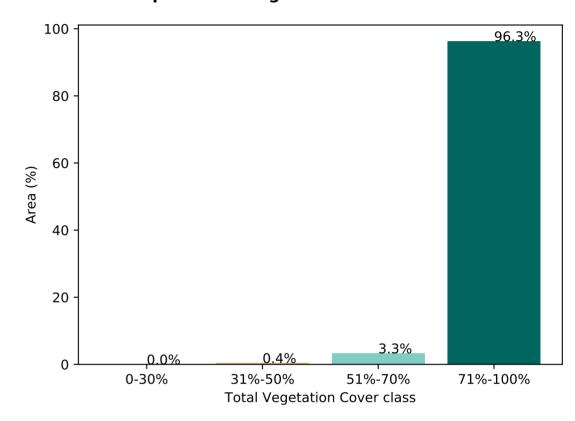
% Area protected from water erosion (>70%)



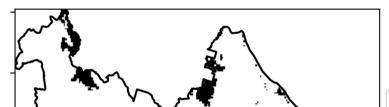




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



 $\hat{\mathcal{O}}$ 

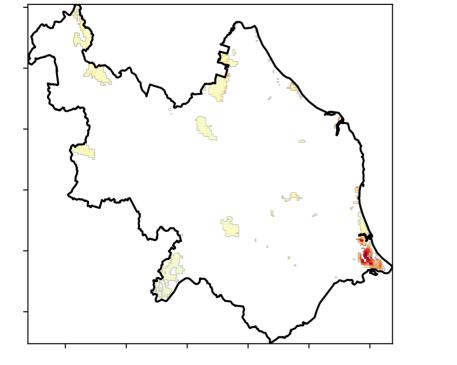
୍ଚ୍

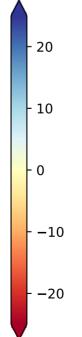
A.1

2?

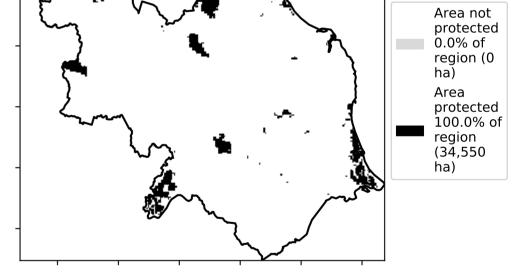
**Total Vegetation Cover Anomaly [%]** 

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.

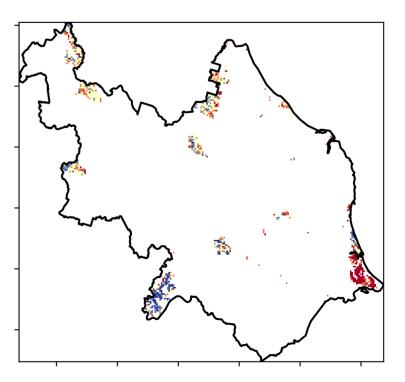




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

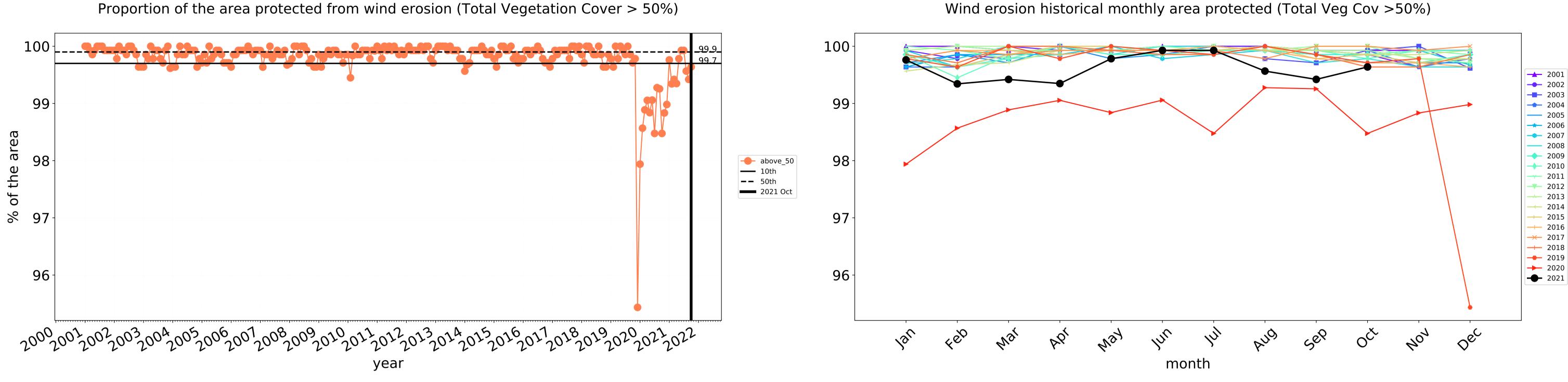


**Total Vegetation Cover Decile [%]** 



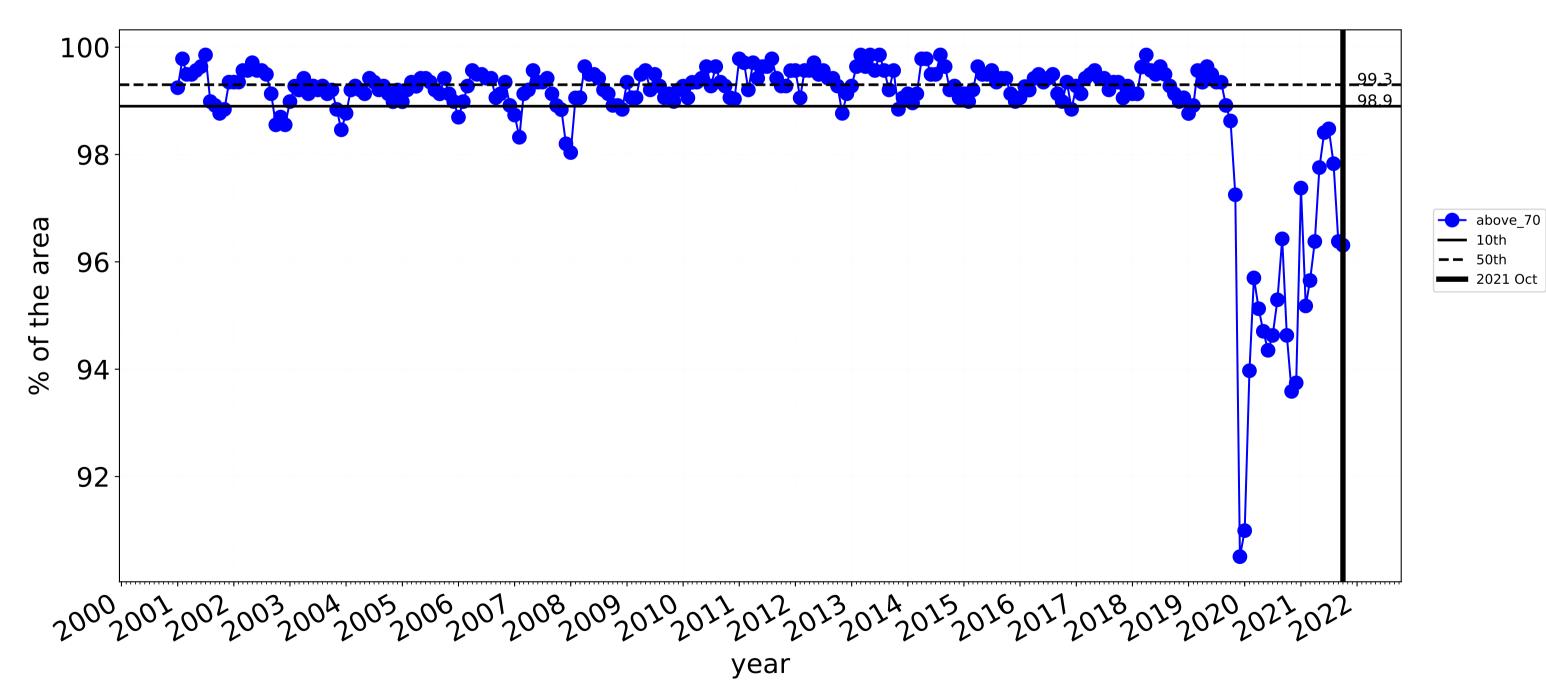


### **Conservation and natural environments Forest (non woodland) timeseries**

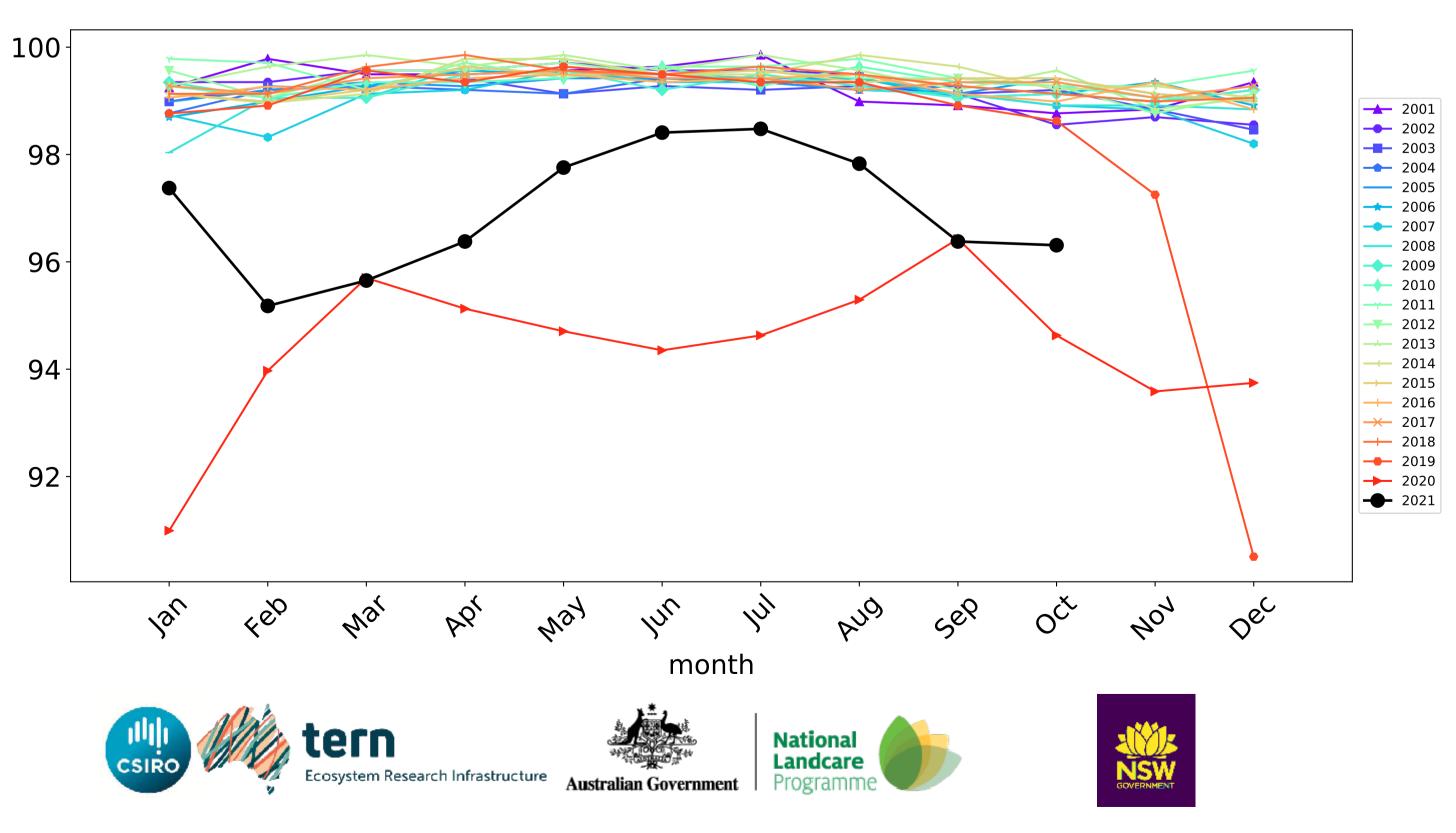


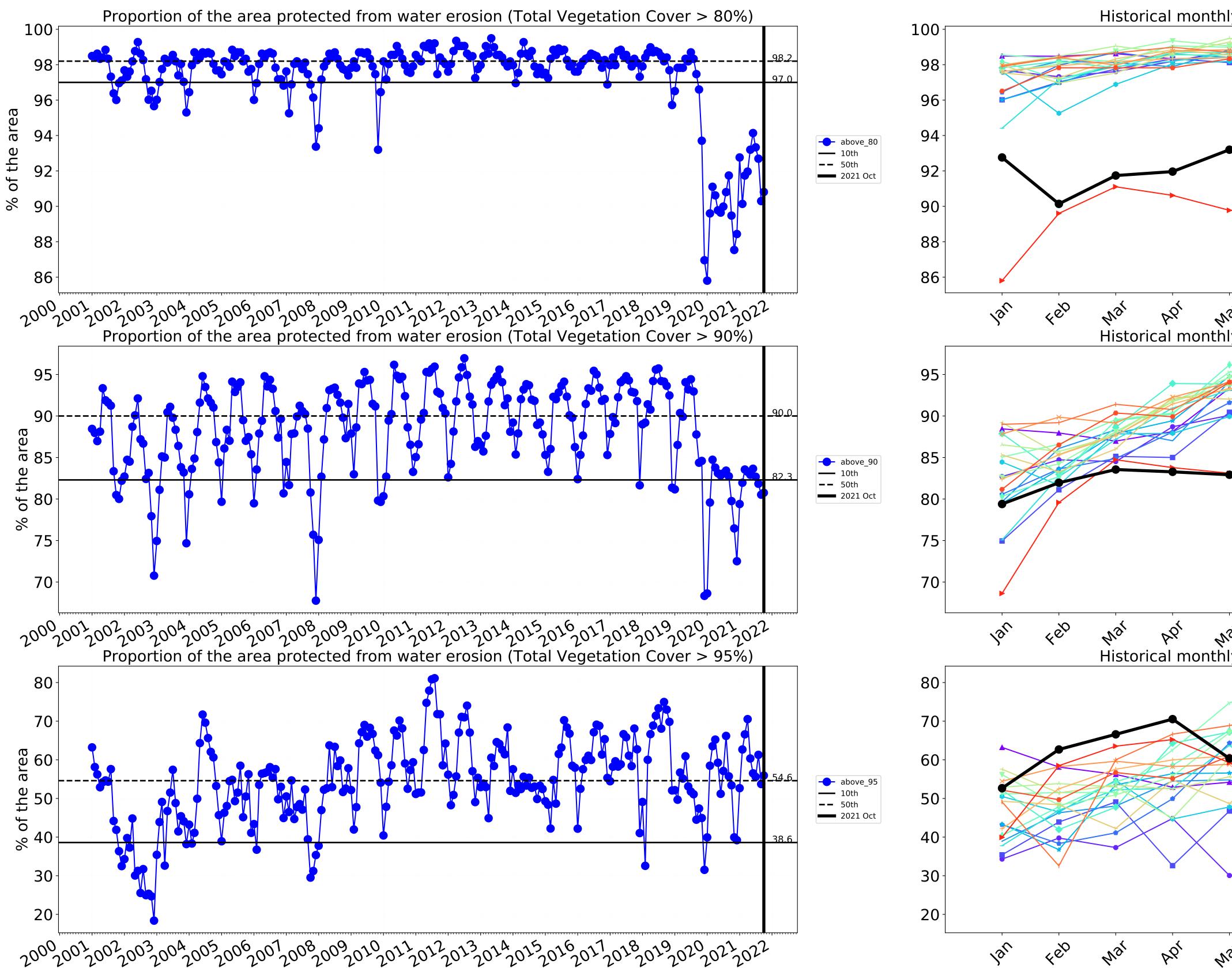
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

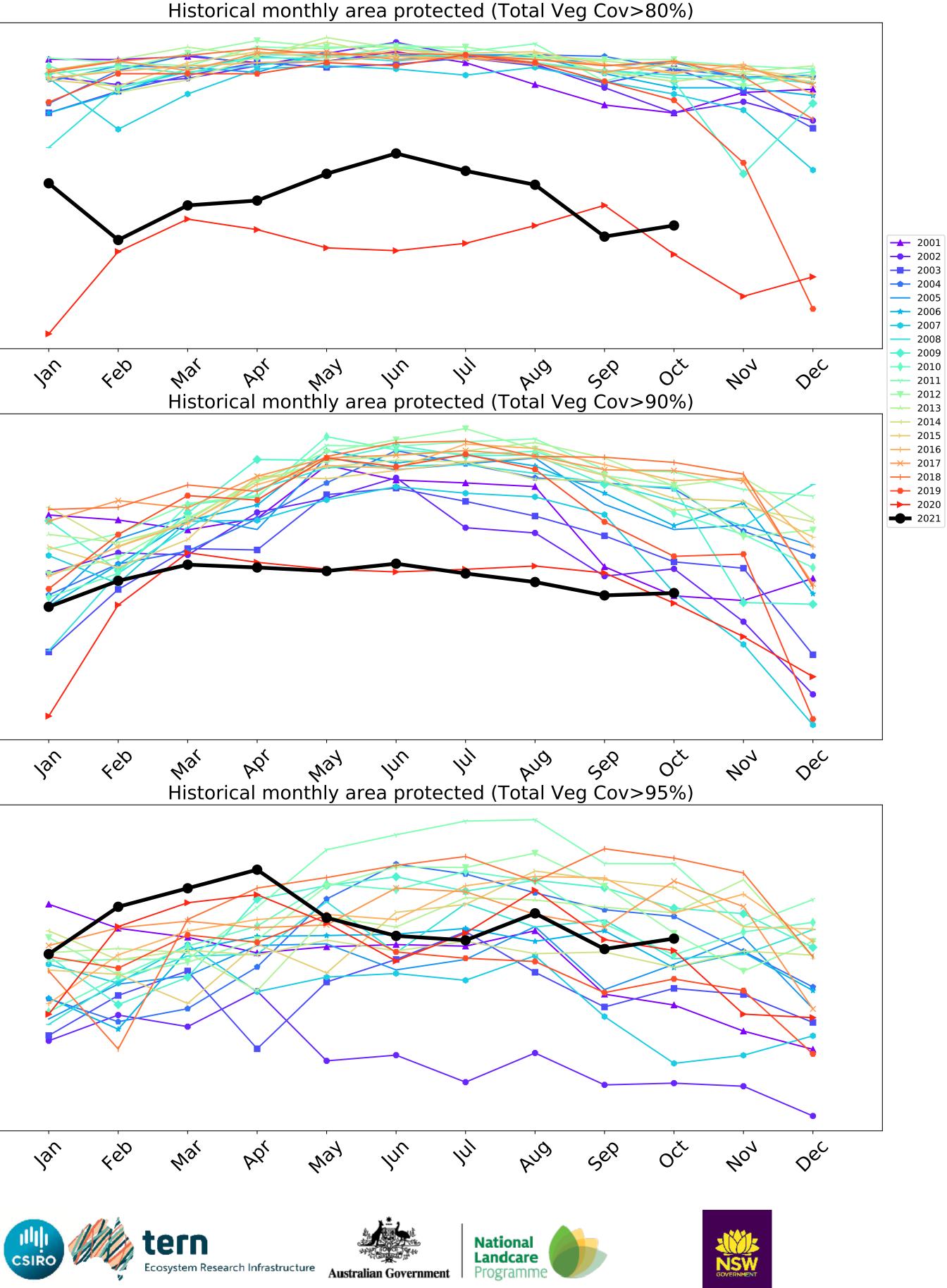
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

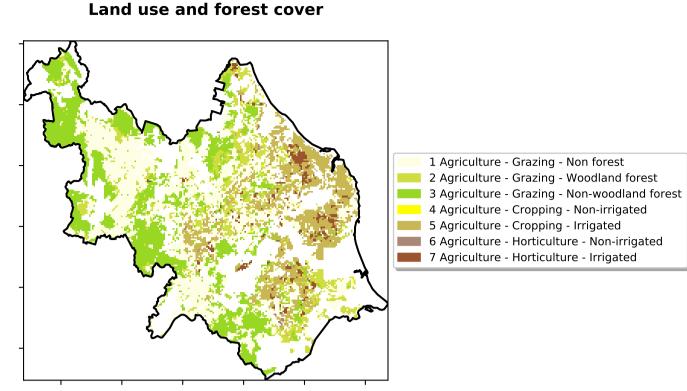




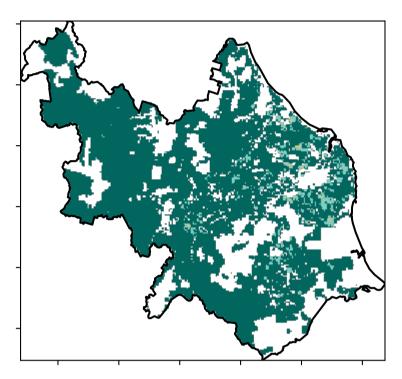


### Agriculture

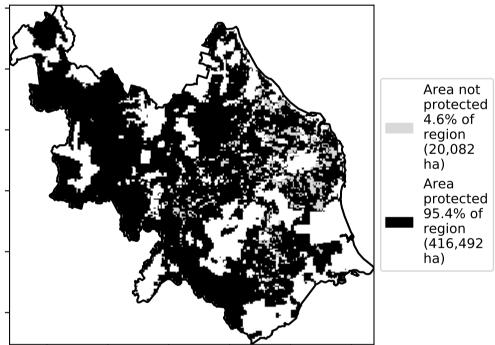
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

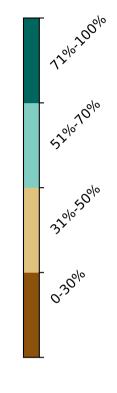


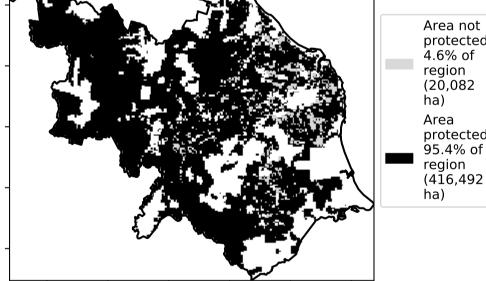
**Total Vegetation Cover [%]** 



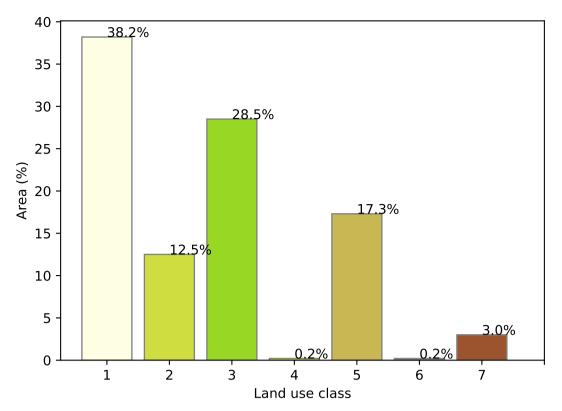
% Area protected from water erosion (>70%)



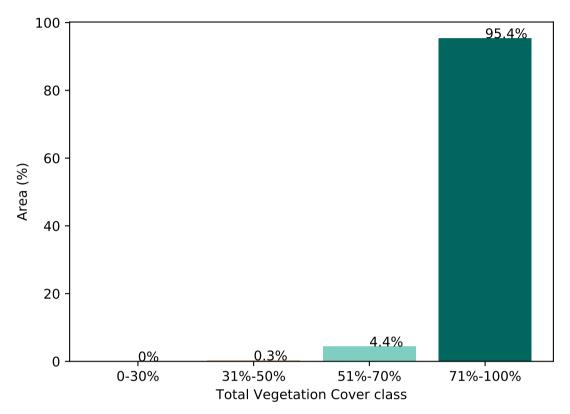




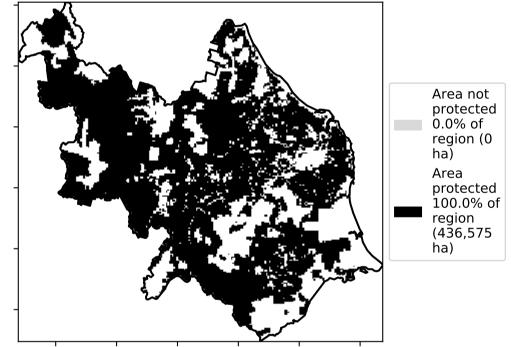
Proportion of each land class in area



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



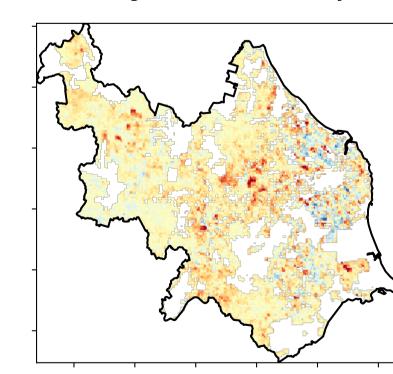
\$

°,

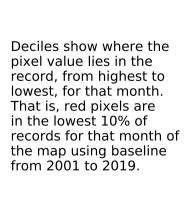
x.1

2?

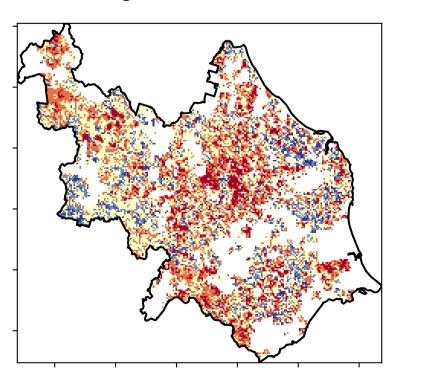
**Total Vegetation Cover Anomaly [%]** 



- 20 - 10 0 -10-20



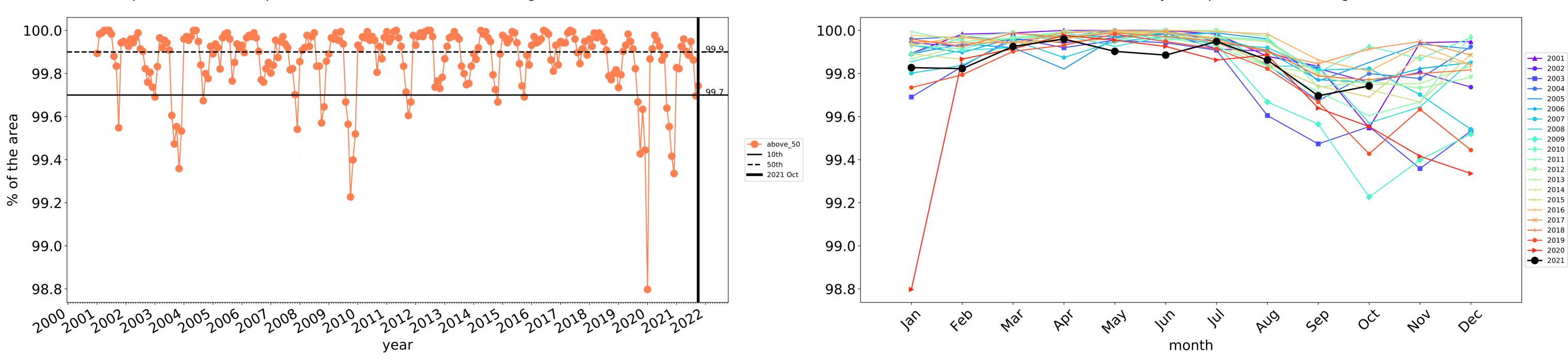
**Total Vegetation Cover Decile [%]** 





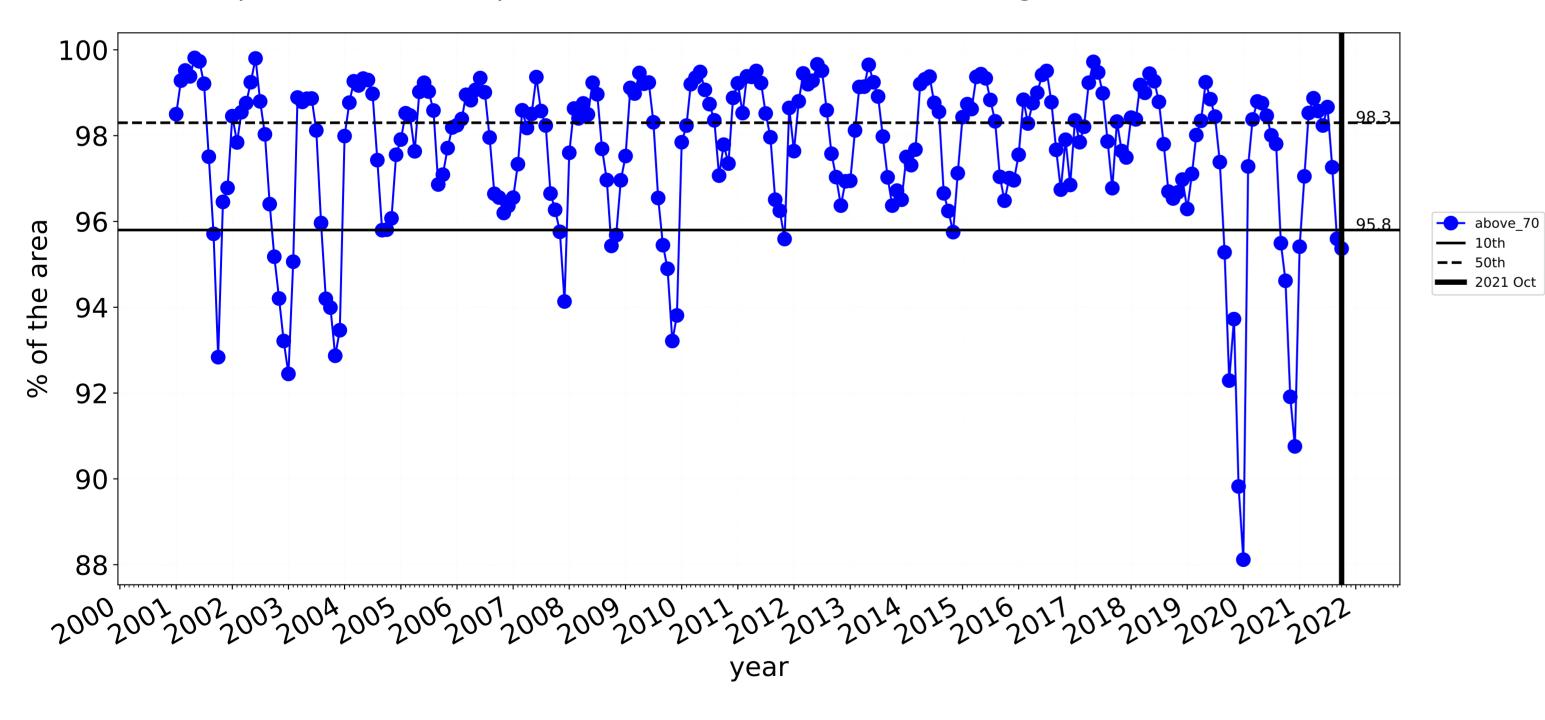
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.





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

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

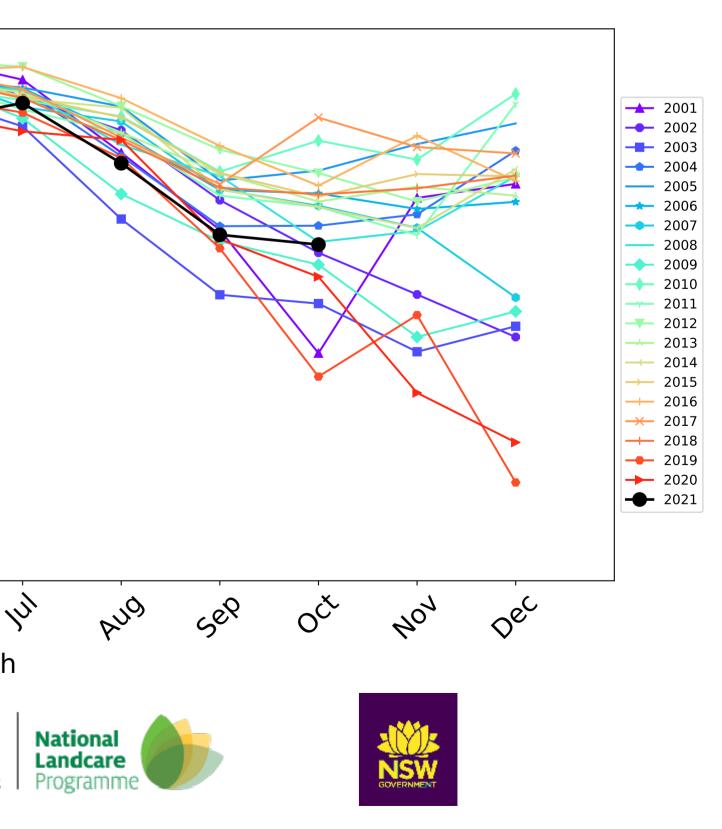


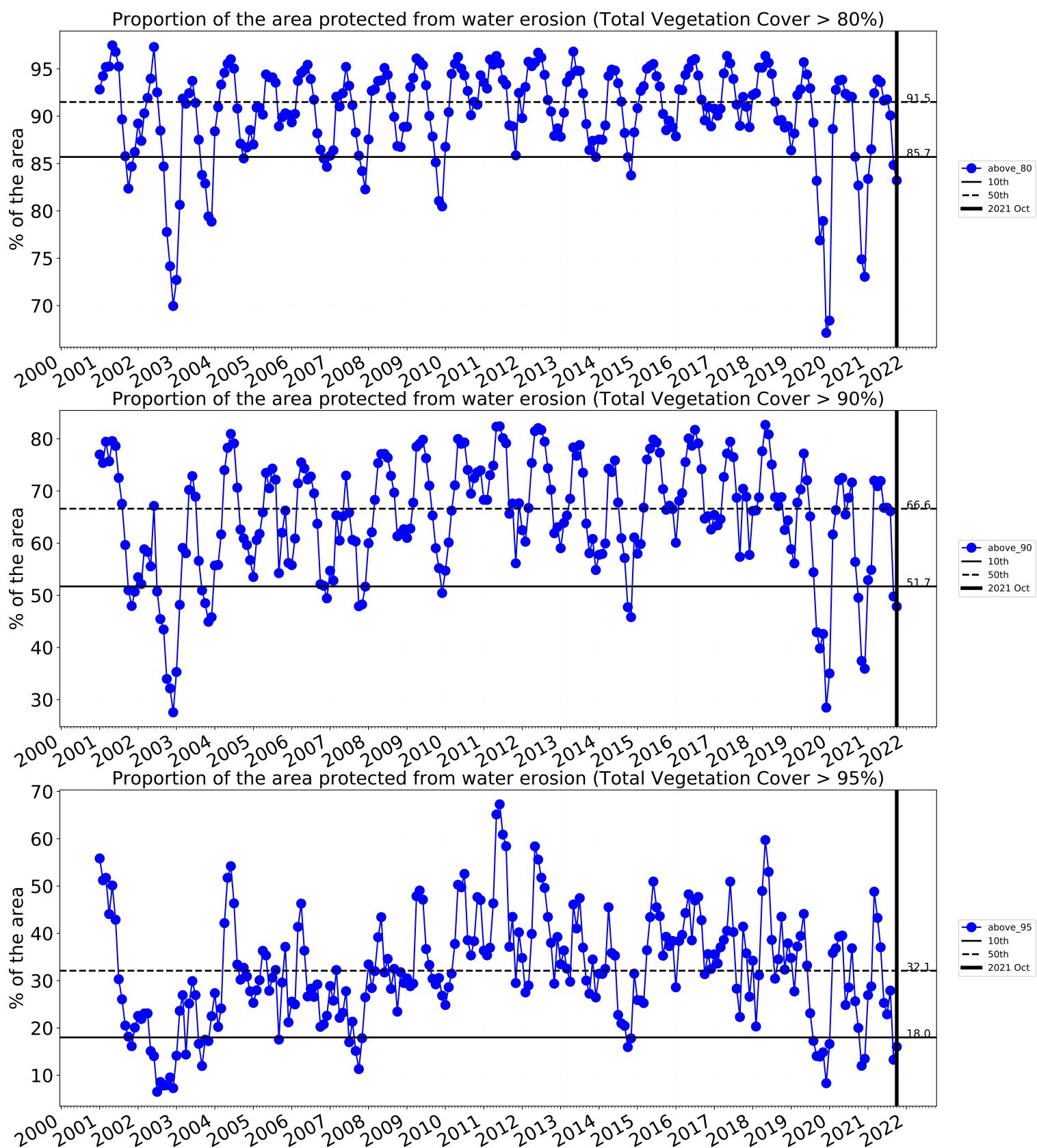
### Agriculture timeseries

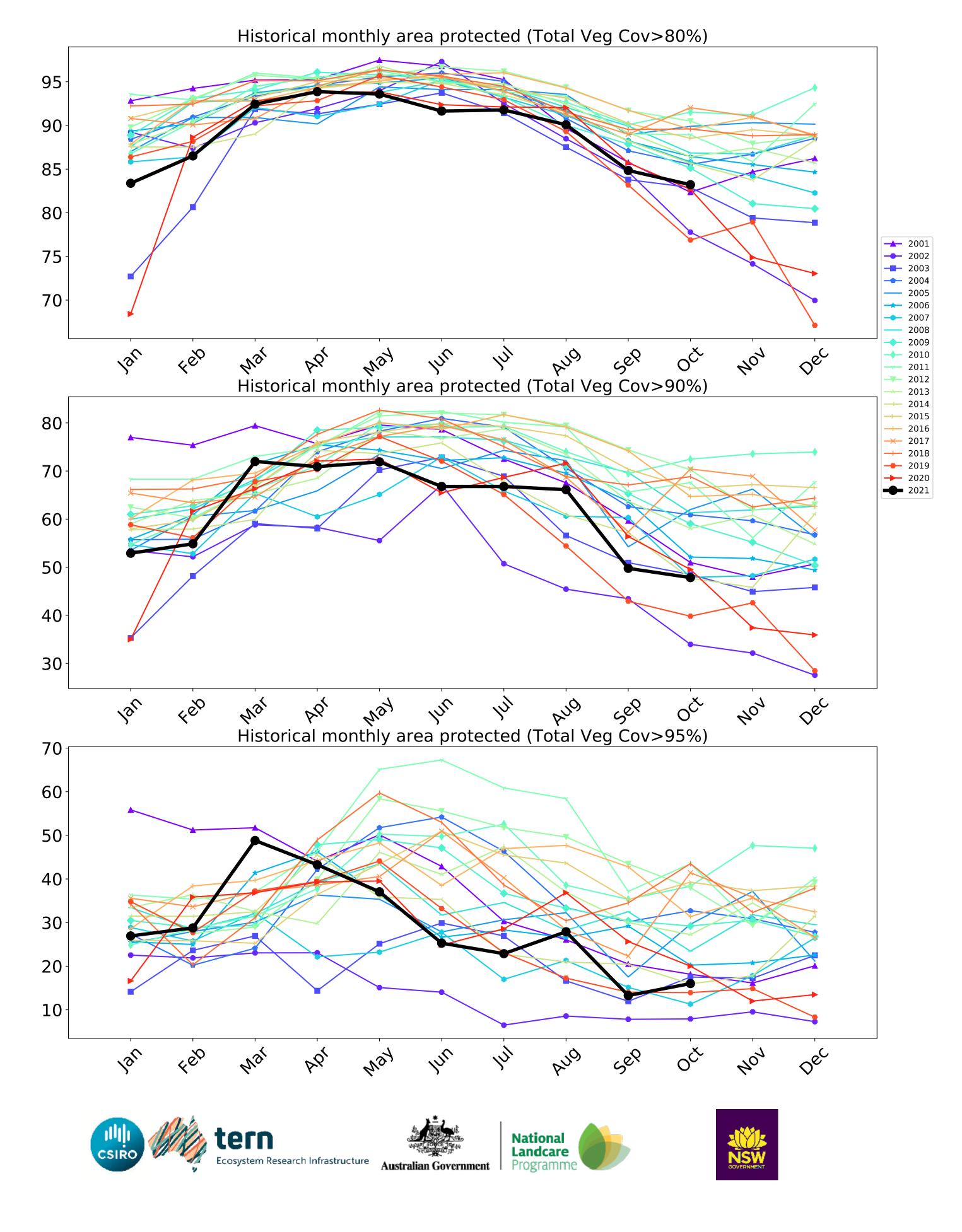
100-98 96 94 92 90 88 Jan 4eb In May Mai Þ6, month tern Ecosystem Research Infrastructure Australian Government

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

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





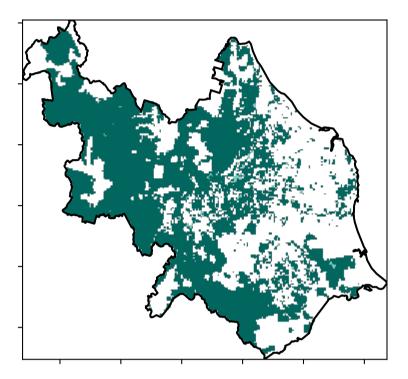


### Grazing

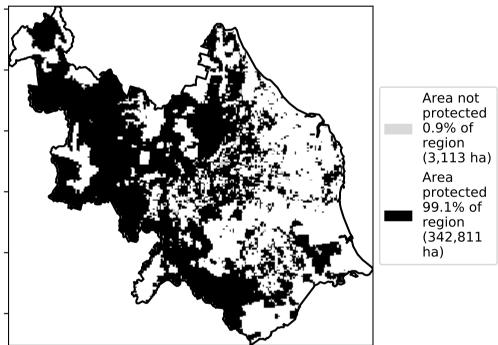
Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 3 Agriculture - Grazing - Non-woodland forest

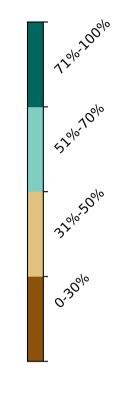
Land use and forest cover

**Total Vegetation Cover [%]** 

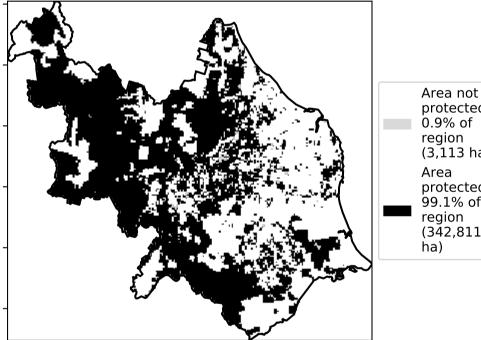


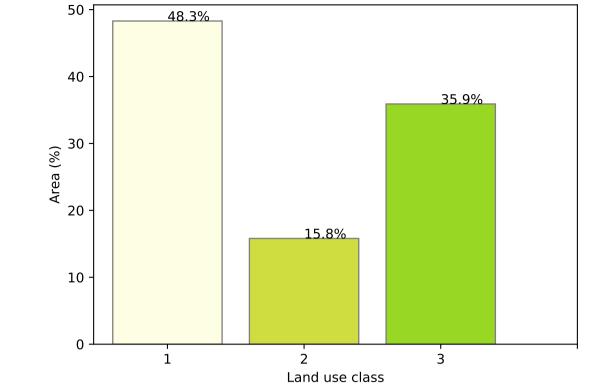
% Area protected from water erosion (>70%)





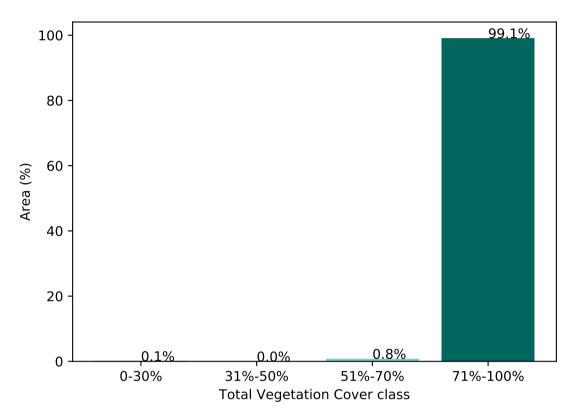
1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest



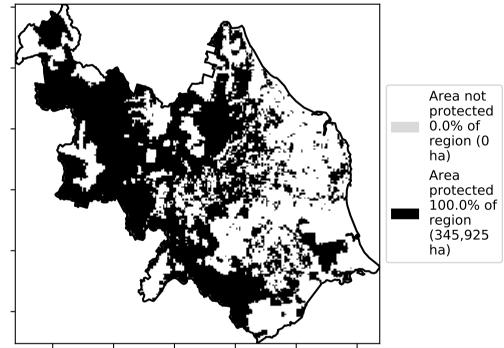


#### Proportion of each land class in area

### Proportion of vegetation cover class in area



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



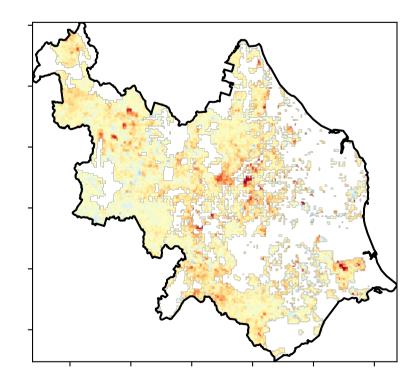
\$

ۍ ک

A.1

2?

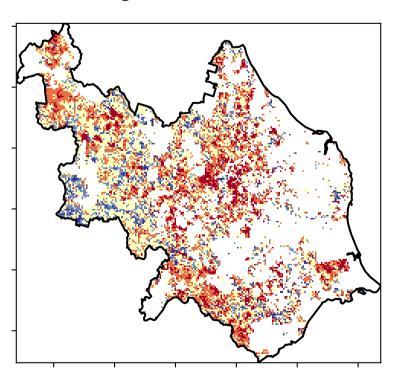
**Total Vegetation Cover Anomaly [%]** 



- 10 0 -10-20

- 20

Total Vegetation Cover Decile [%]





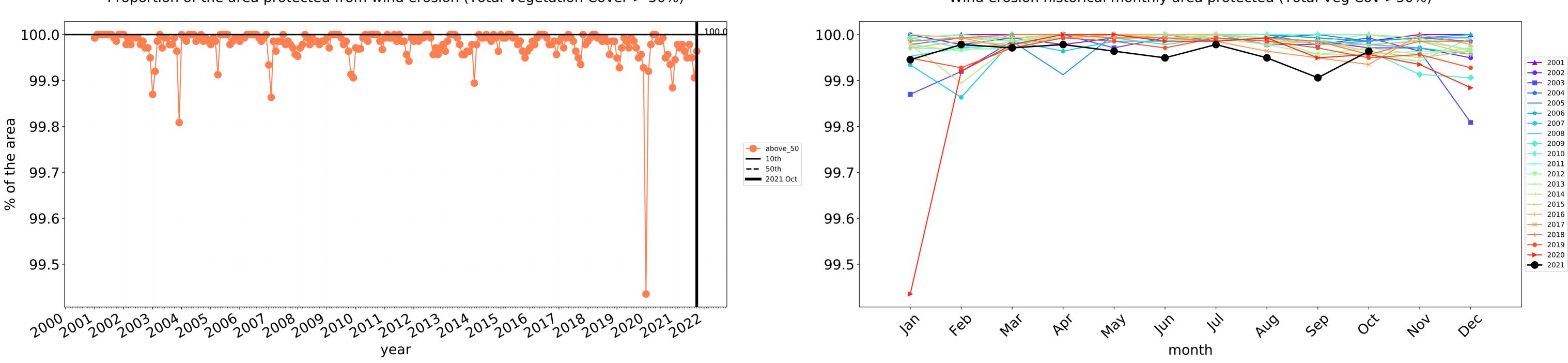
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline

the map using baseline from 2001 to 2019.

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

Catchment Scale Land Use and Forests of Australia (2018)

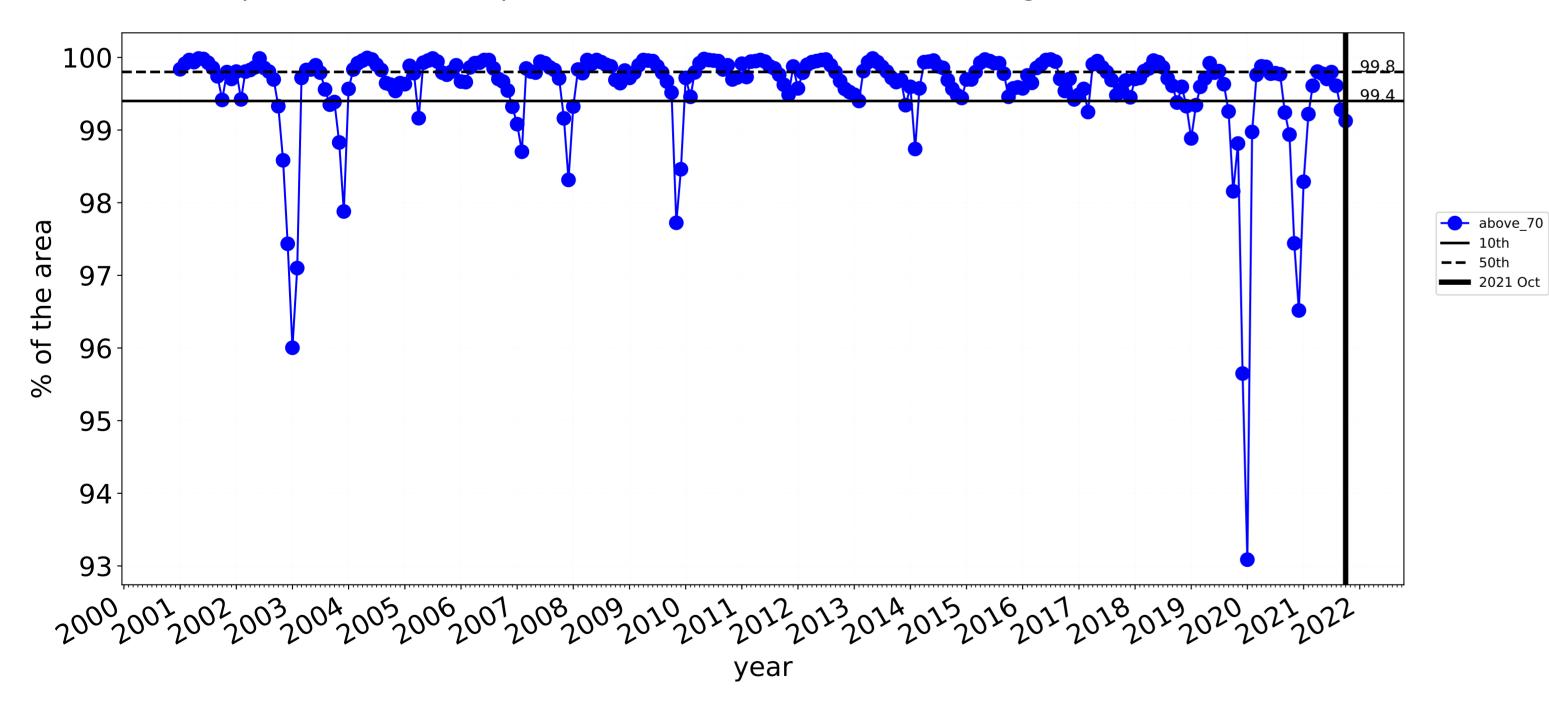




100

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

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

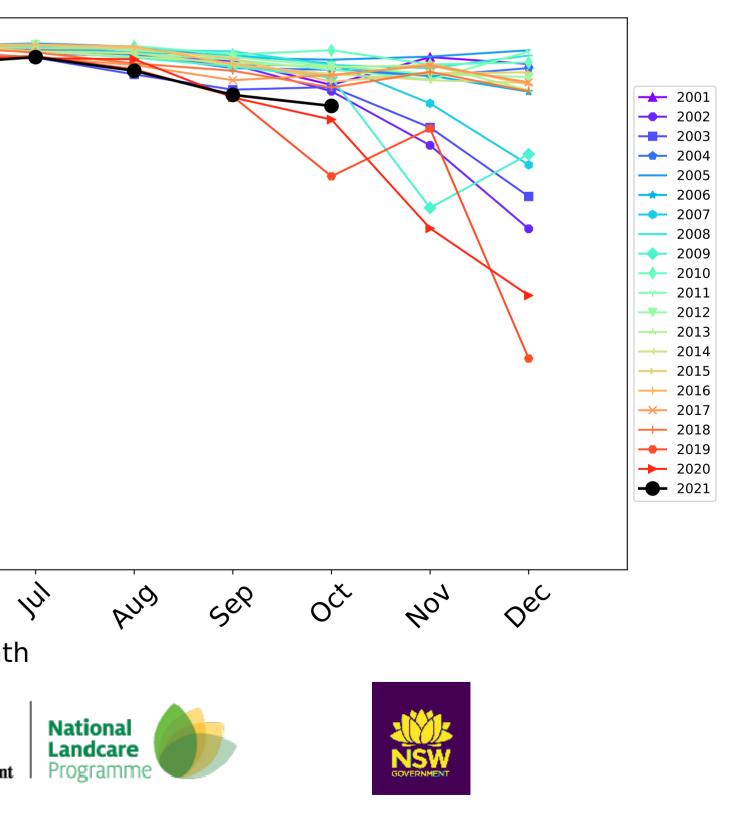


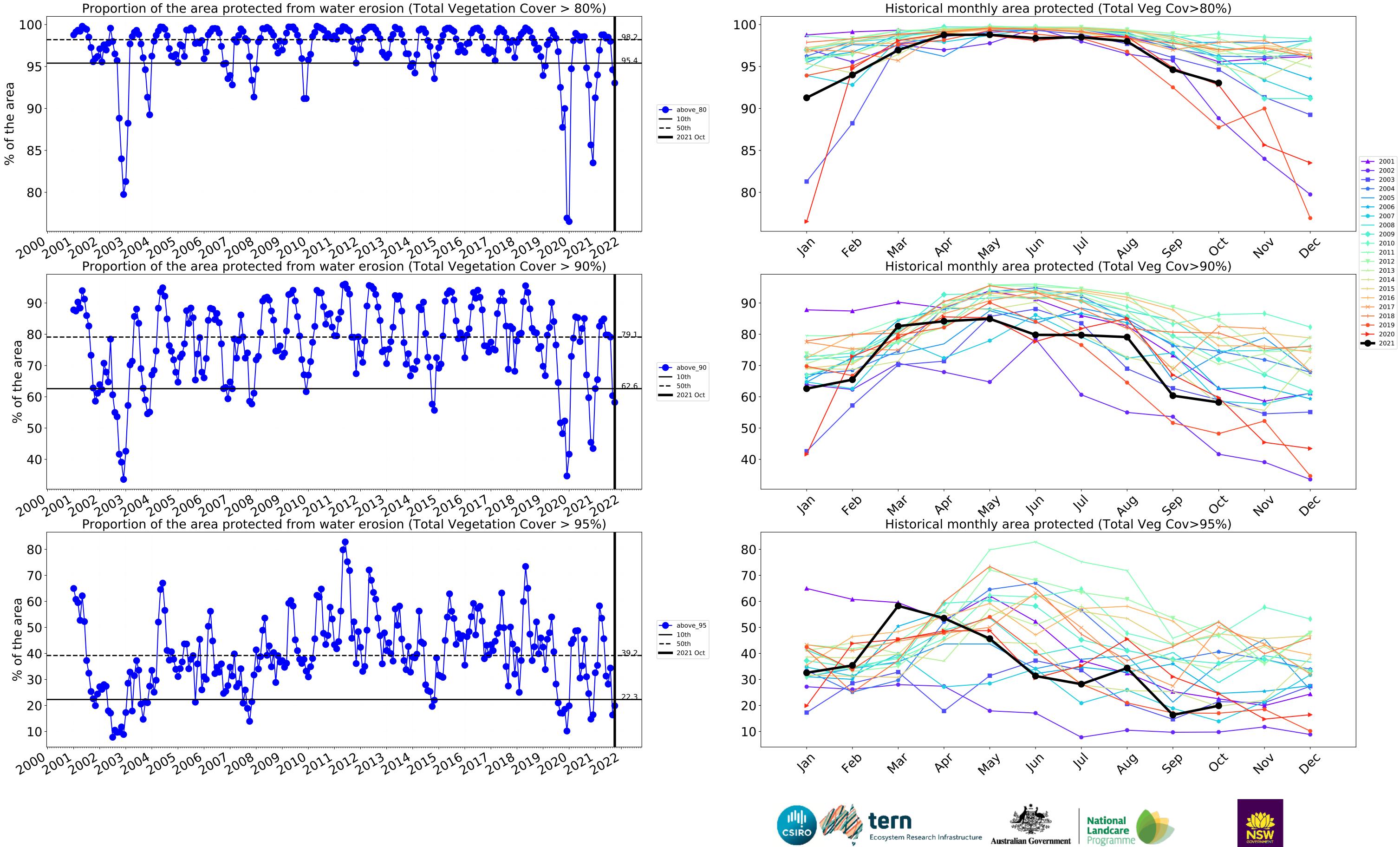
99 98 97 96 95 94 93-Jan 4eb Mai way In Þb, month

tern Ecosystem Research Infrastructure Australian Government

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

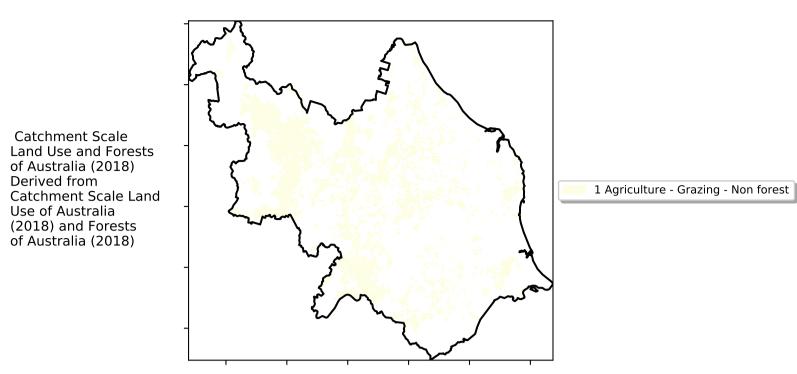
Water erosion historical monthly area protected (Total Veg Cov>70%)



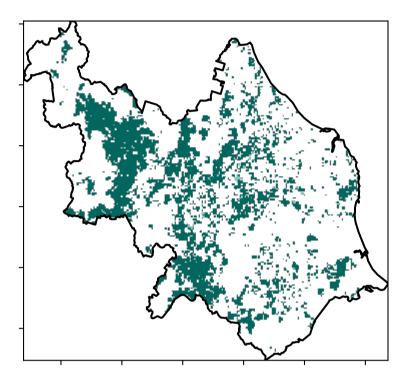


### **Grazing non forest**

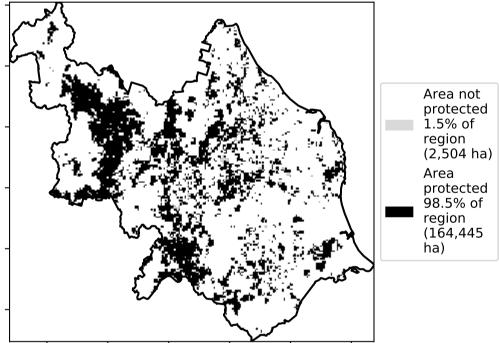
Land use and forest cover

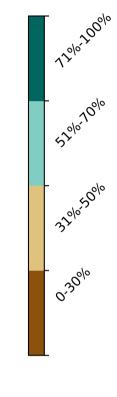


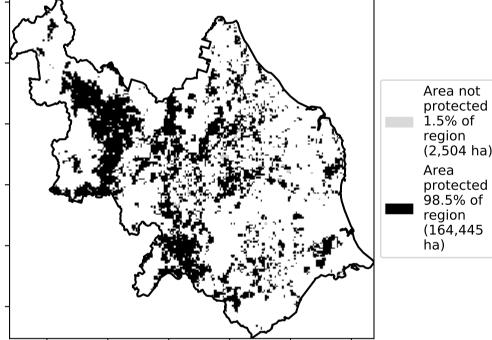
**Total Vegetation Cover [%]** 



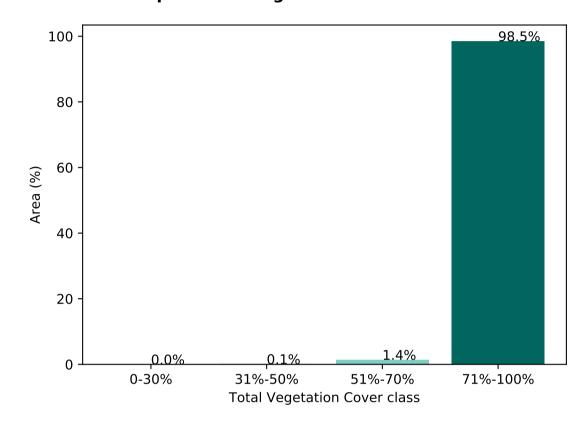




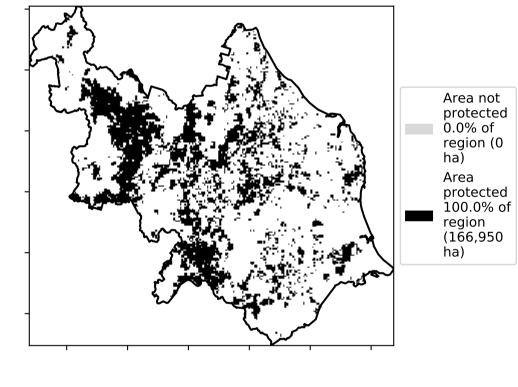




Proportion of vegetation cover class in area



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



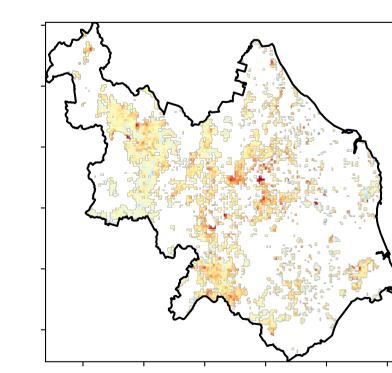
\$

ଚ୍ଚ

A-1

2?3

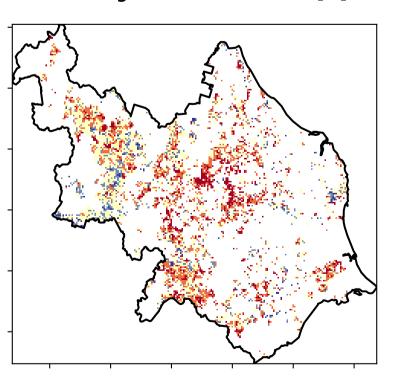
**Total Vegetation Cover Anomaly [%]** 



- 10 0 -10-20

- 20

Total Vegetation Cover Decile [%]



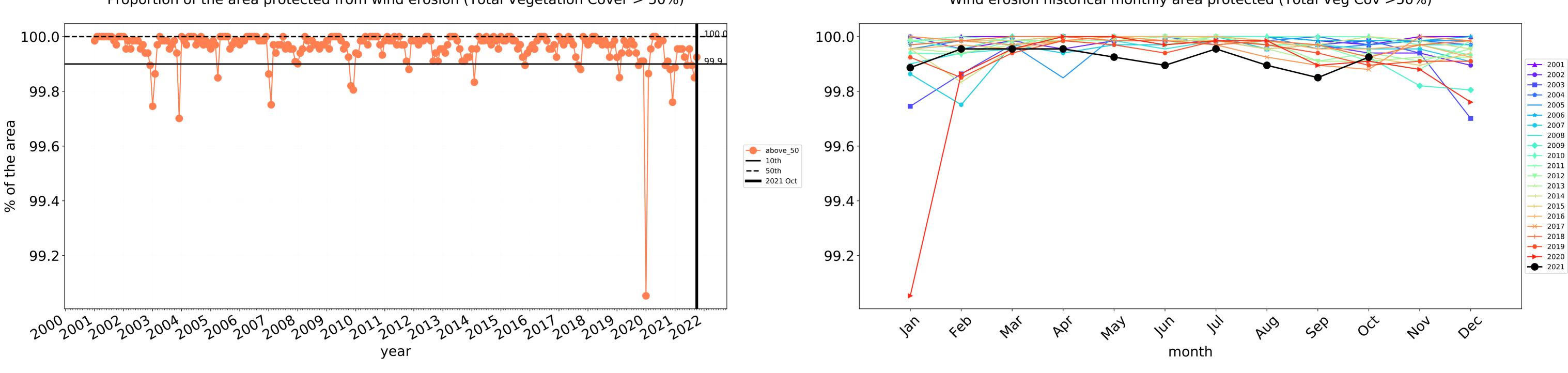


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline

the map using baseline from 2001 to 2019.

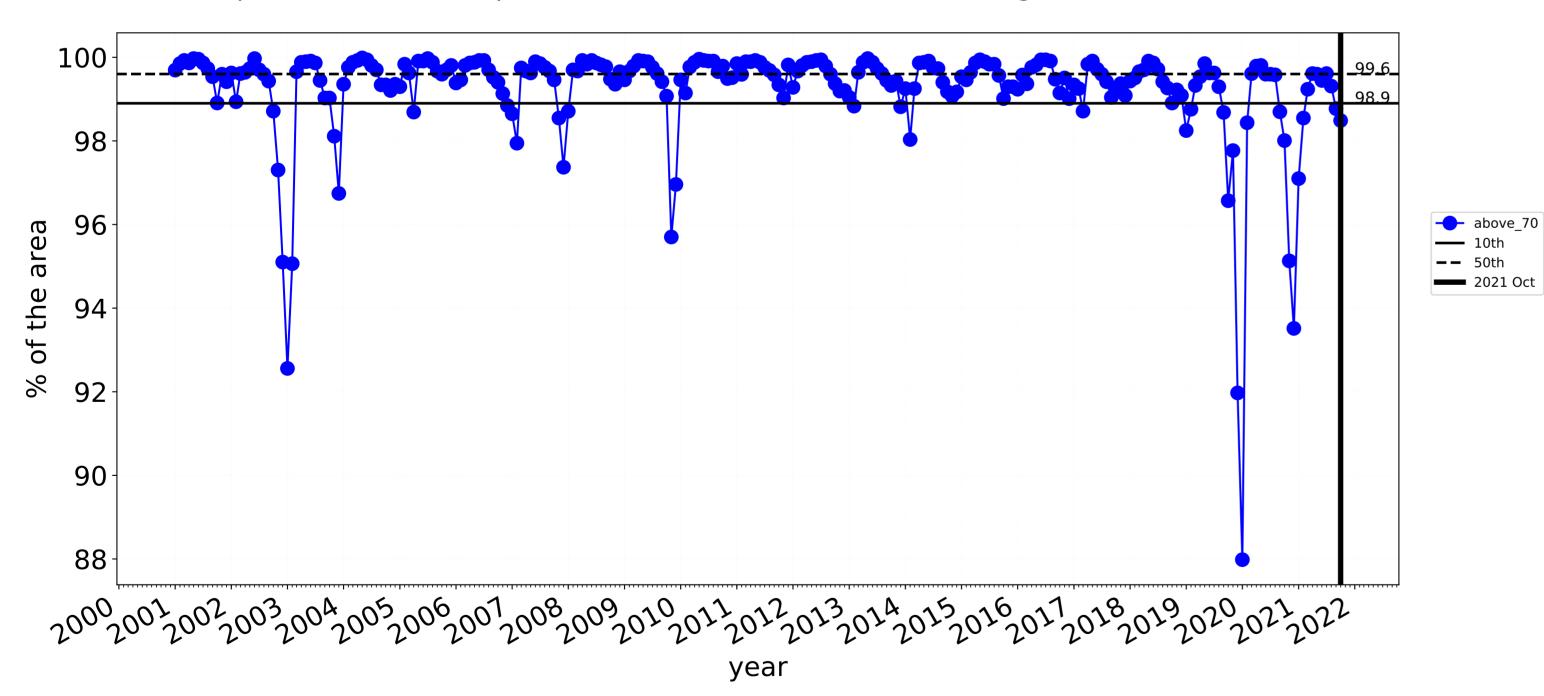
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

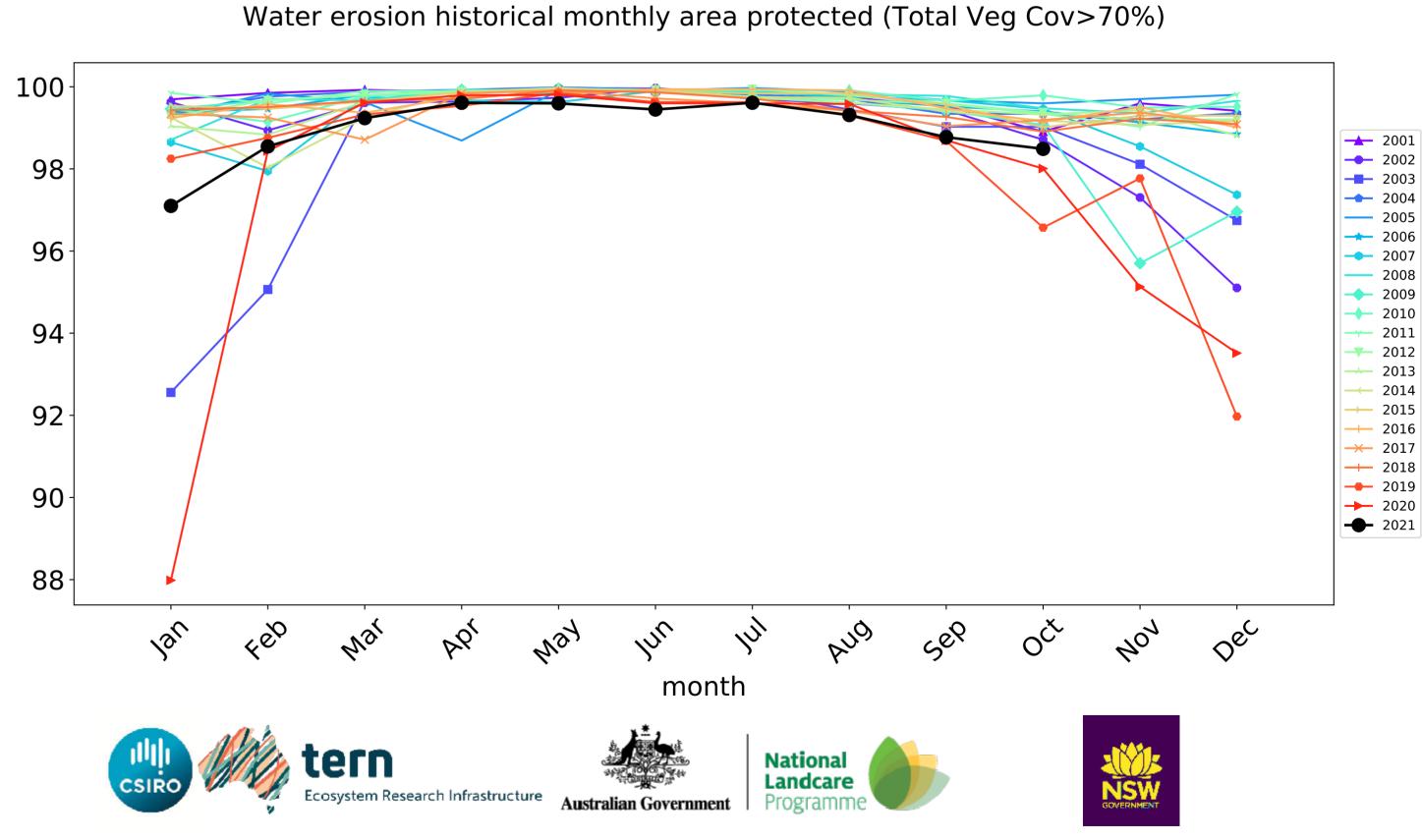




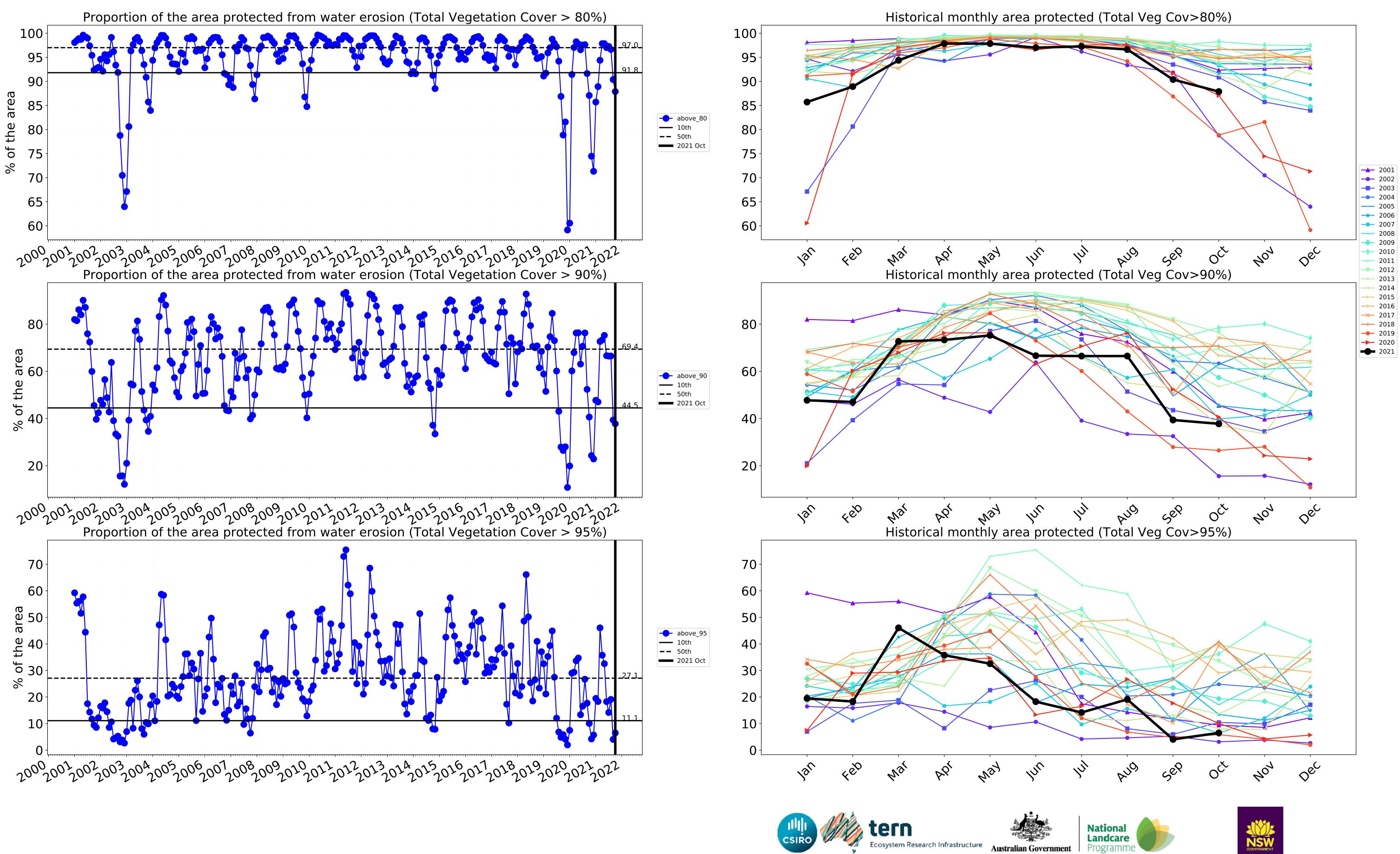
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



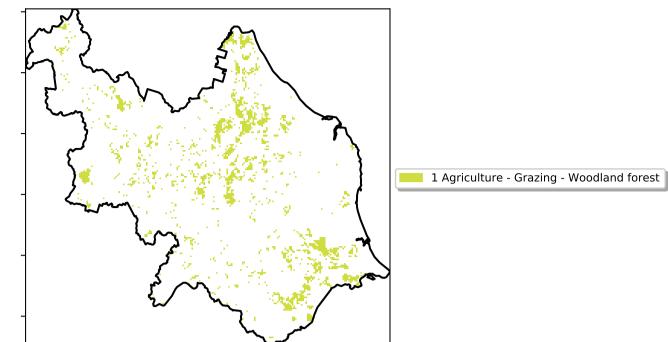


Wind erosion historical monthly area protected (Total Veg Cov >50%)



Australian Government

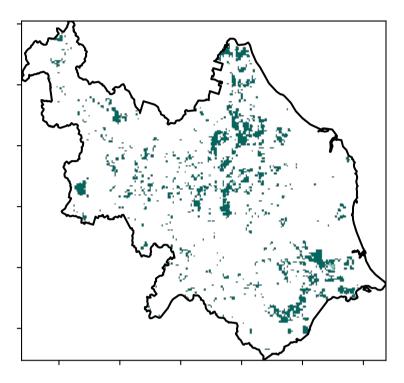
### **Grazing Woodland forest**

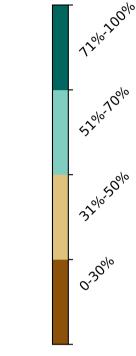


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

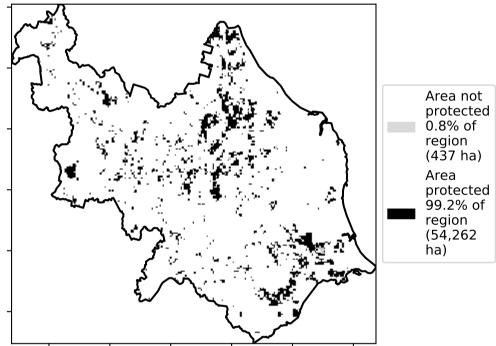
**Total Vegetation Cover [%]** 

Land use and forest cover

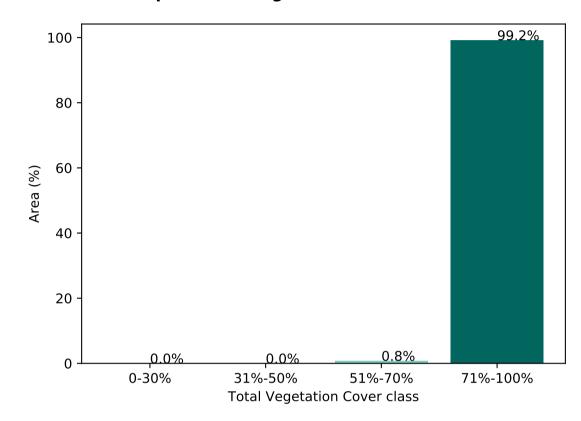




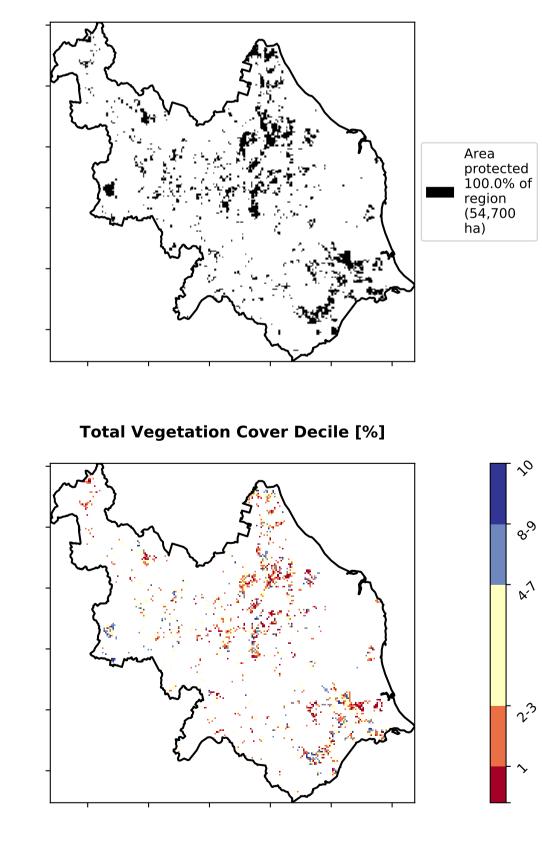
% Area protected from water erosion (>70%)



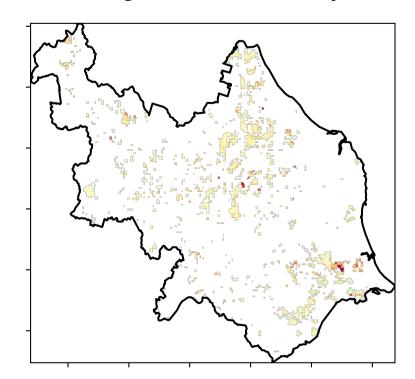




#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



- 10 0 -10-20

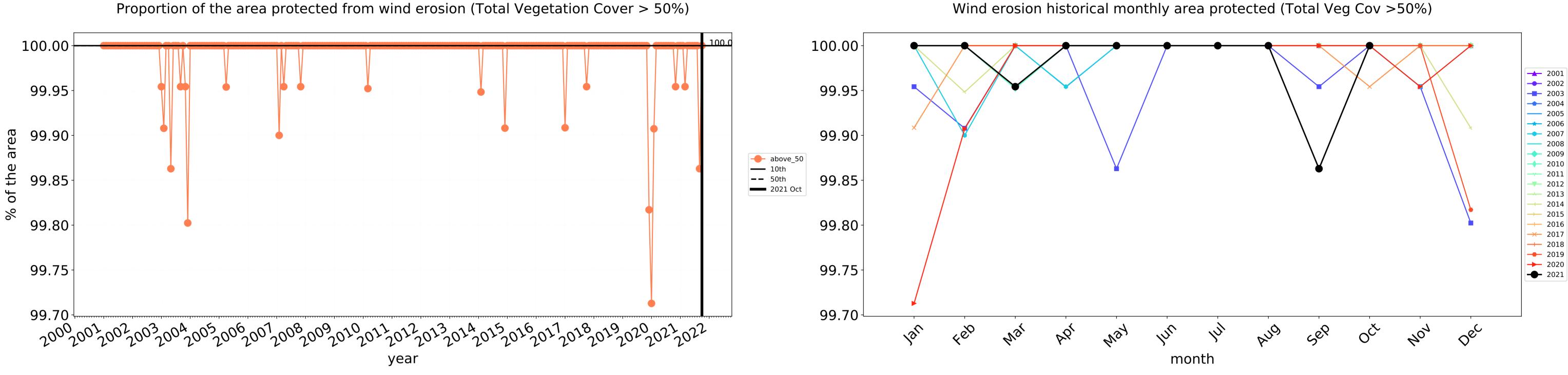
- 20



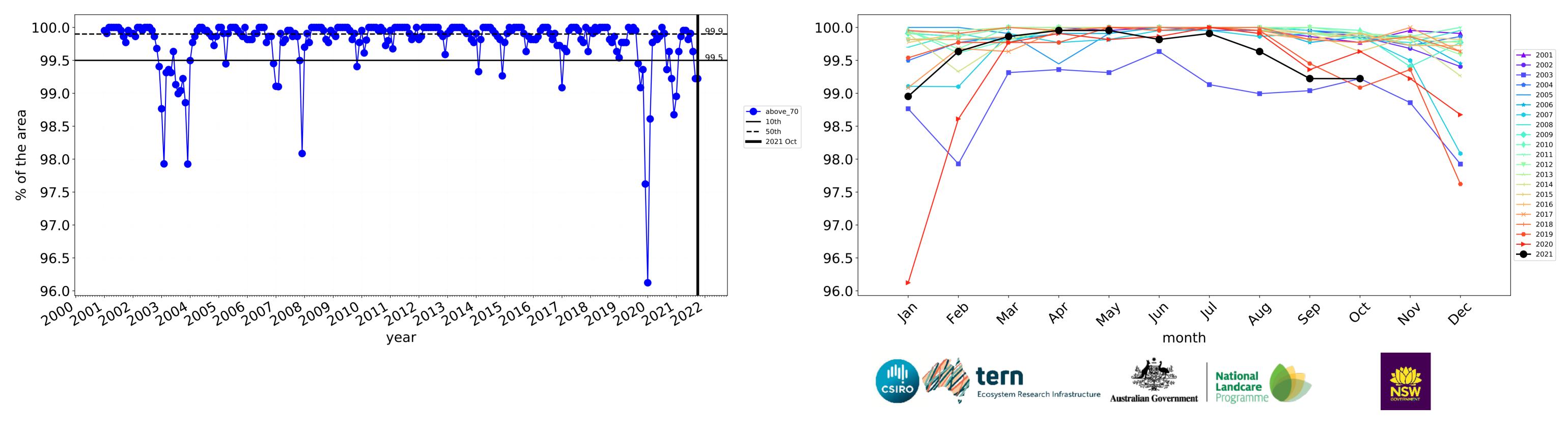
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline

the map using baseline from 2001 to 2019.

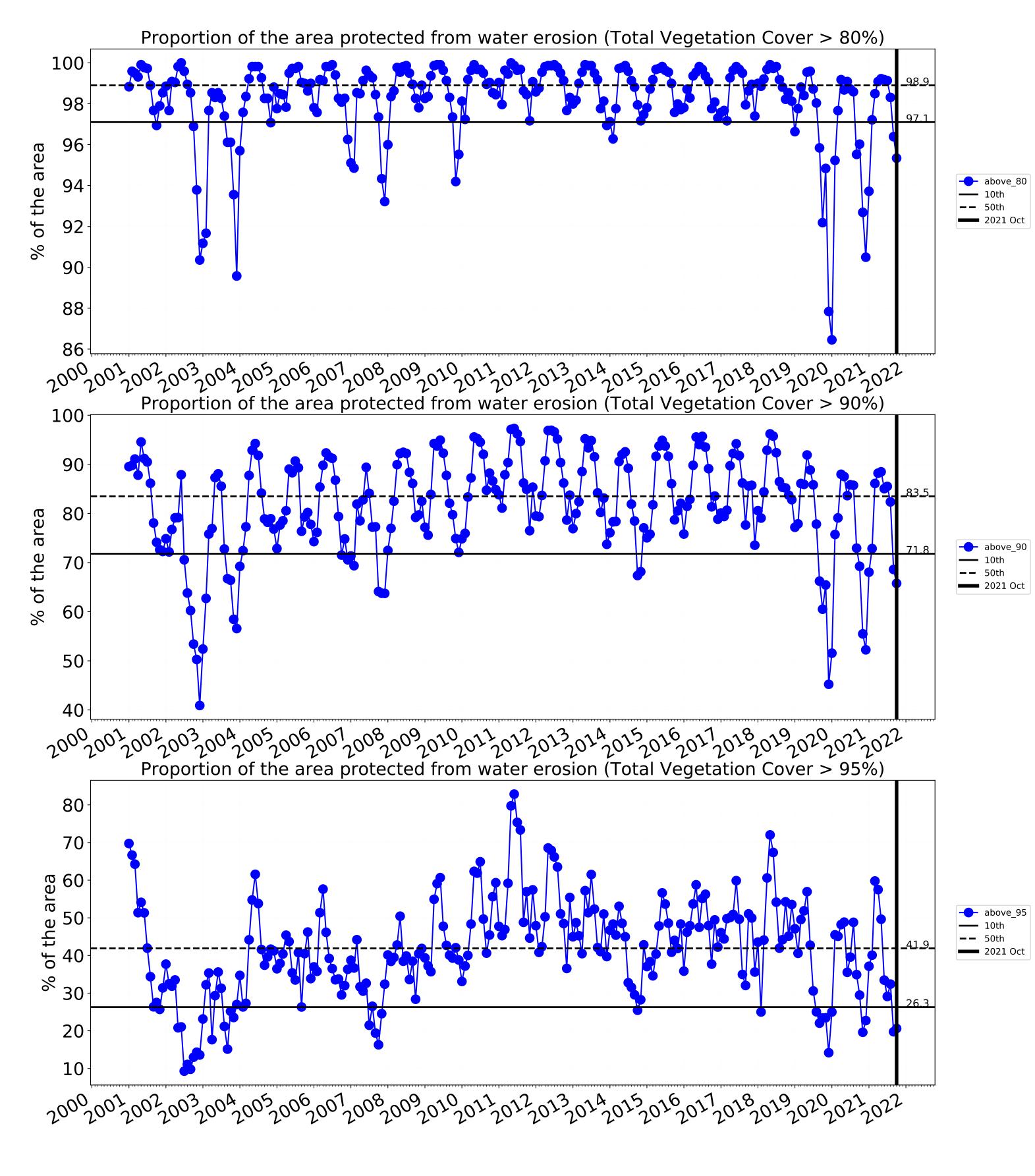
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

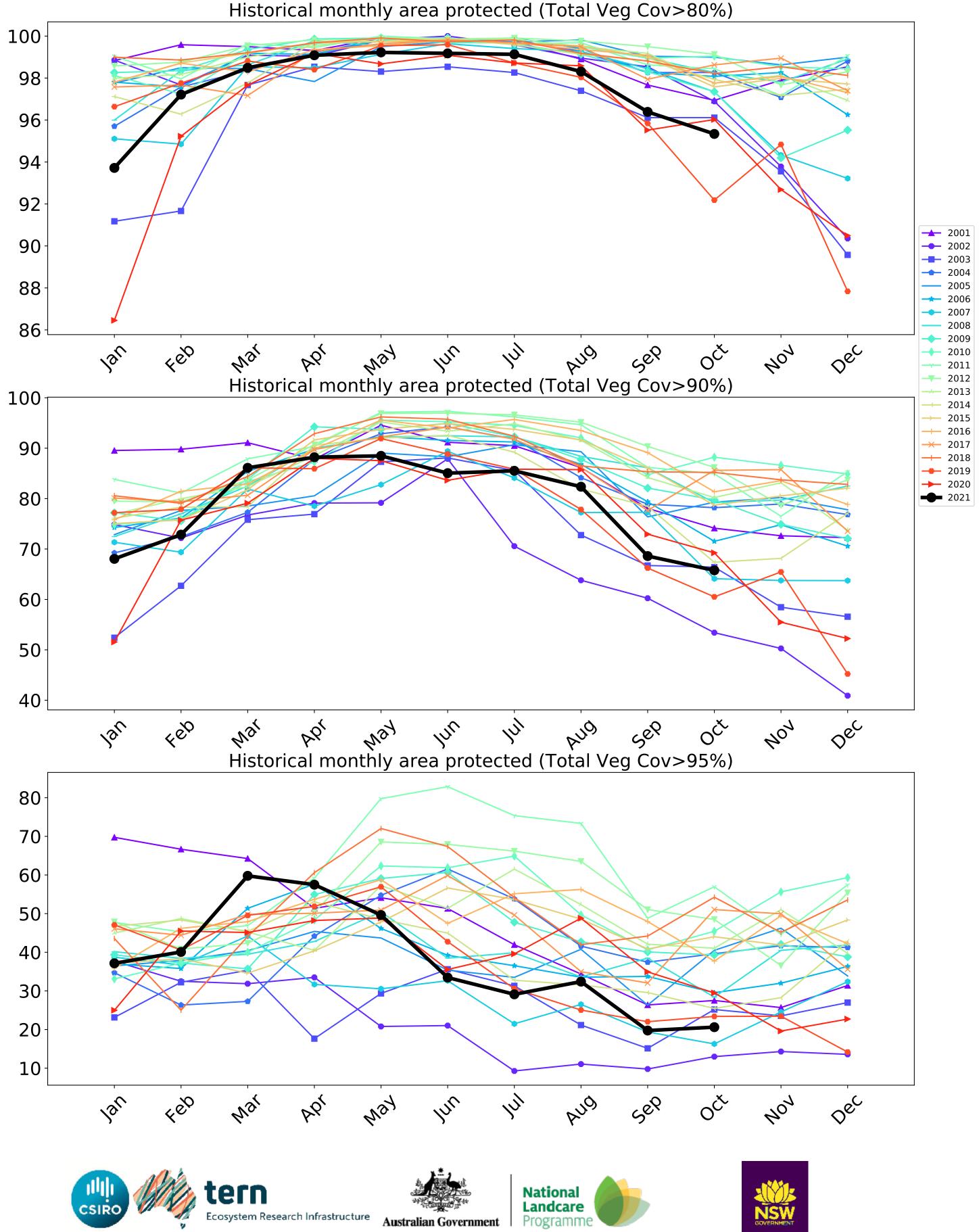


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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







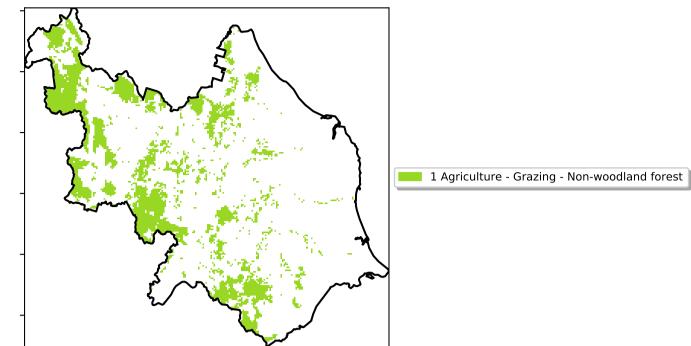
### Grazing - Forest (non woodland)

12%200%

· 52°10'70°10

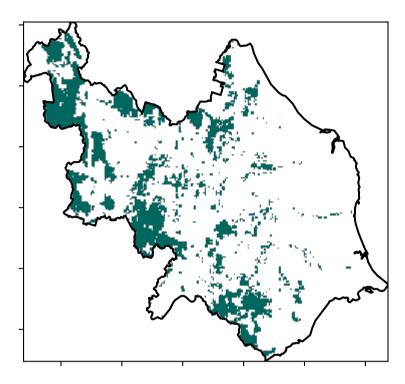
3201050010

0-30%

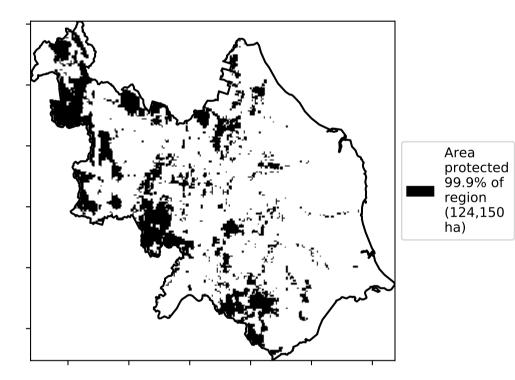


**Total Vegetation Cover [%]** 

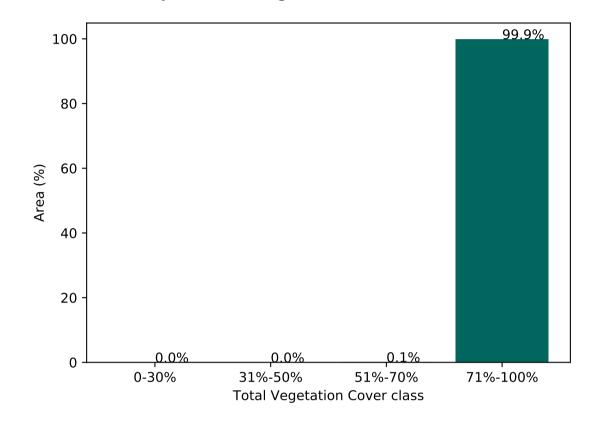
Land use and forest cover



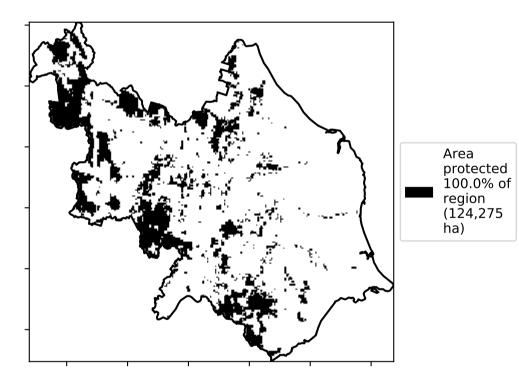
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



~

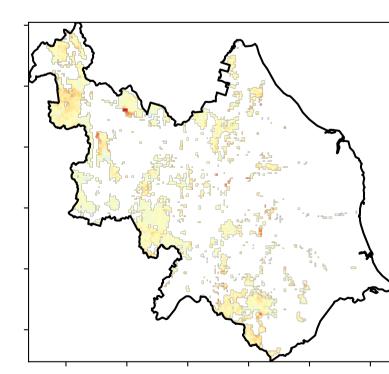
ۍ ک

A-1

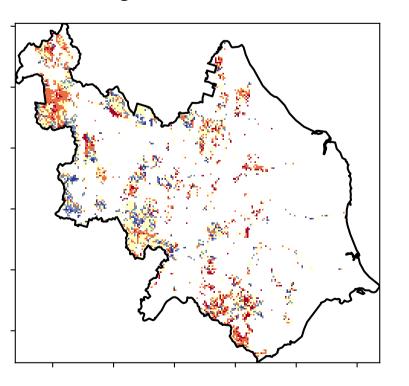
2?3

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 [%]** 



- 20 - 10 - 0 - --10 - --20 Total Vegetation Cover Decile [%]



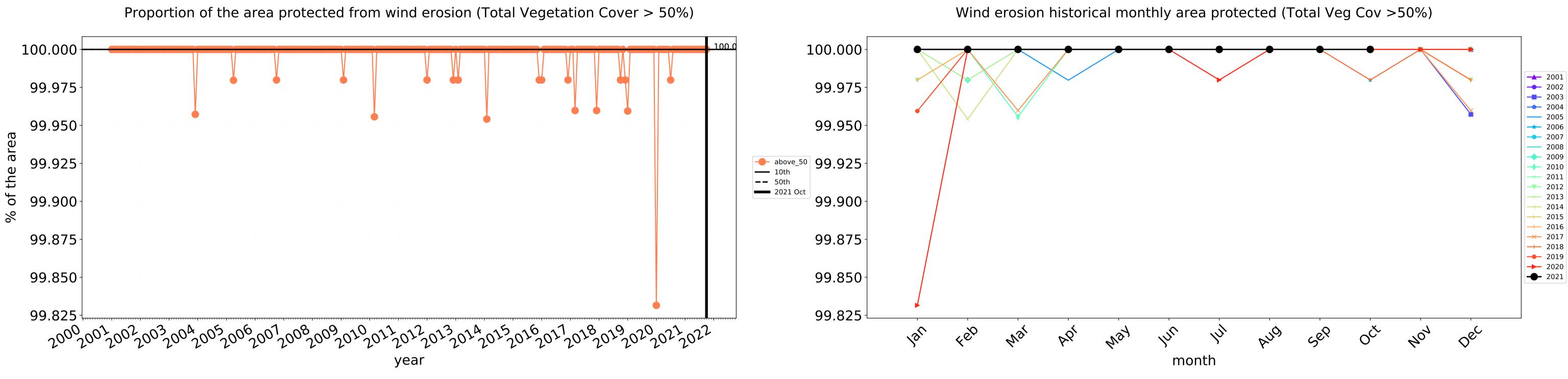


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline

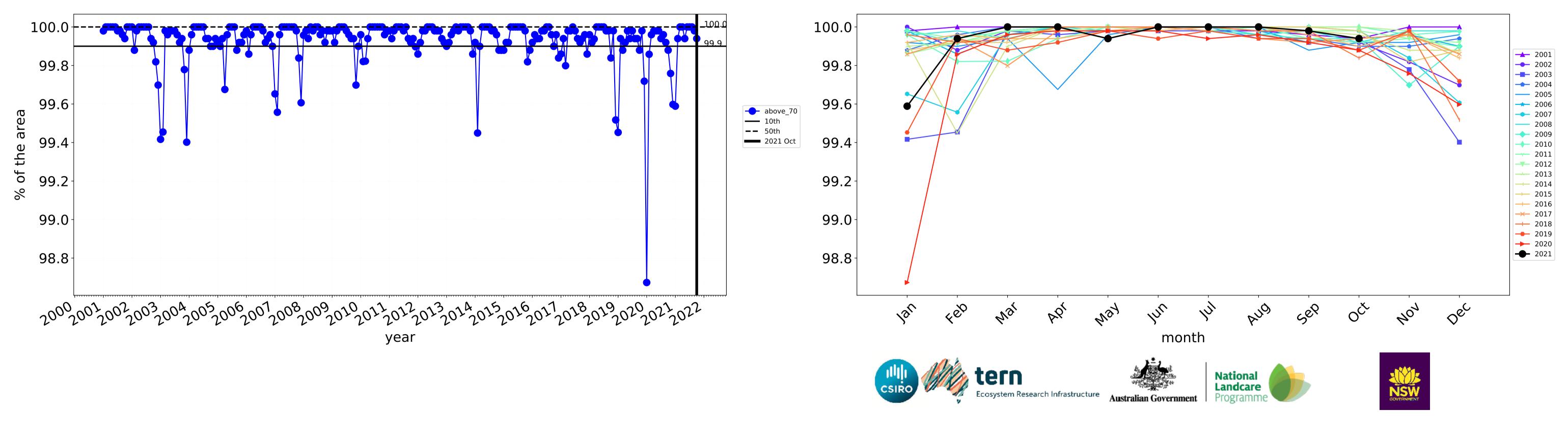
the map using baseline from 2001 to 2019.

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



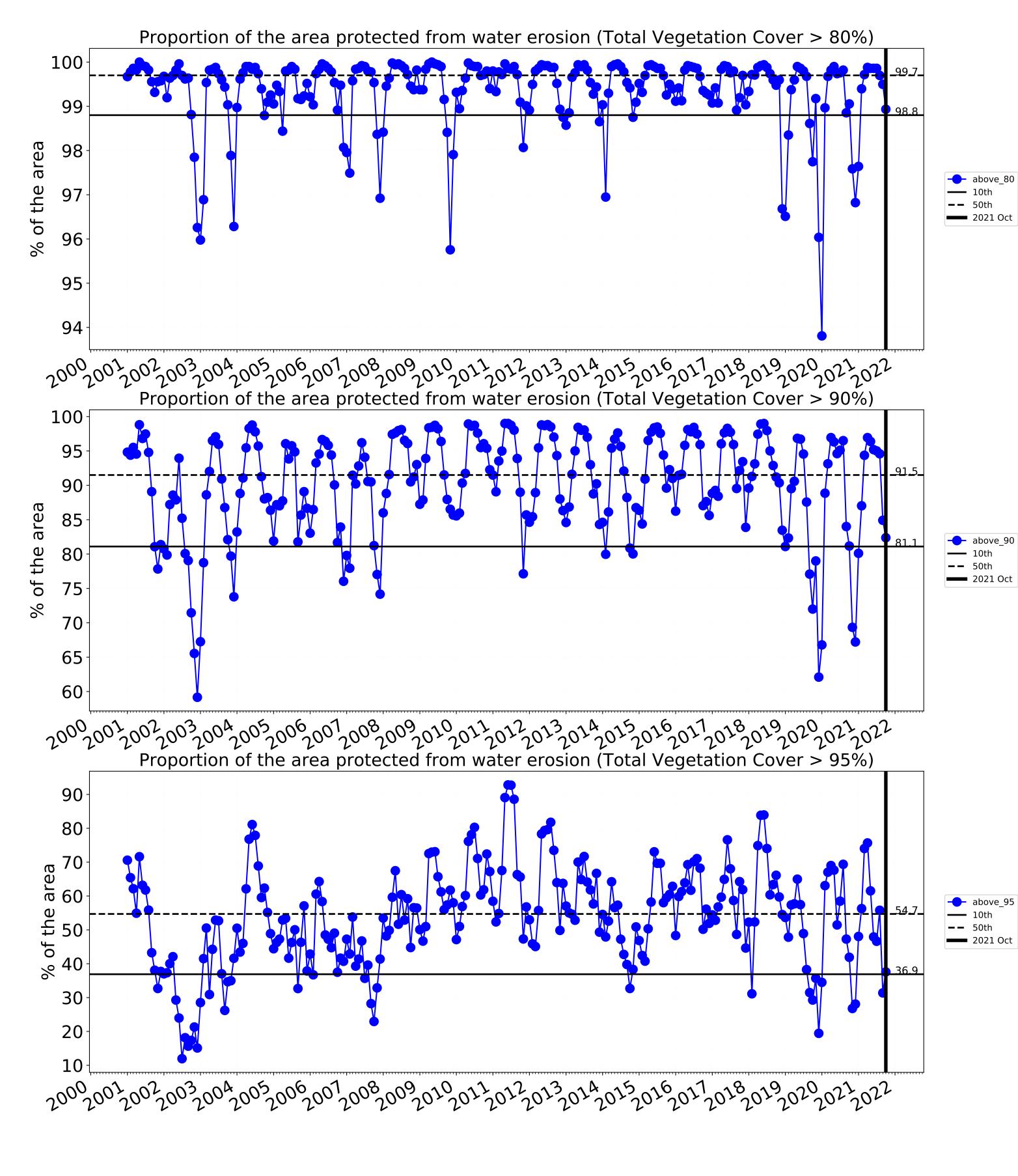


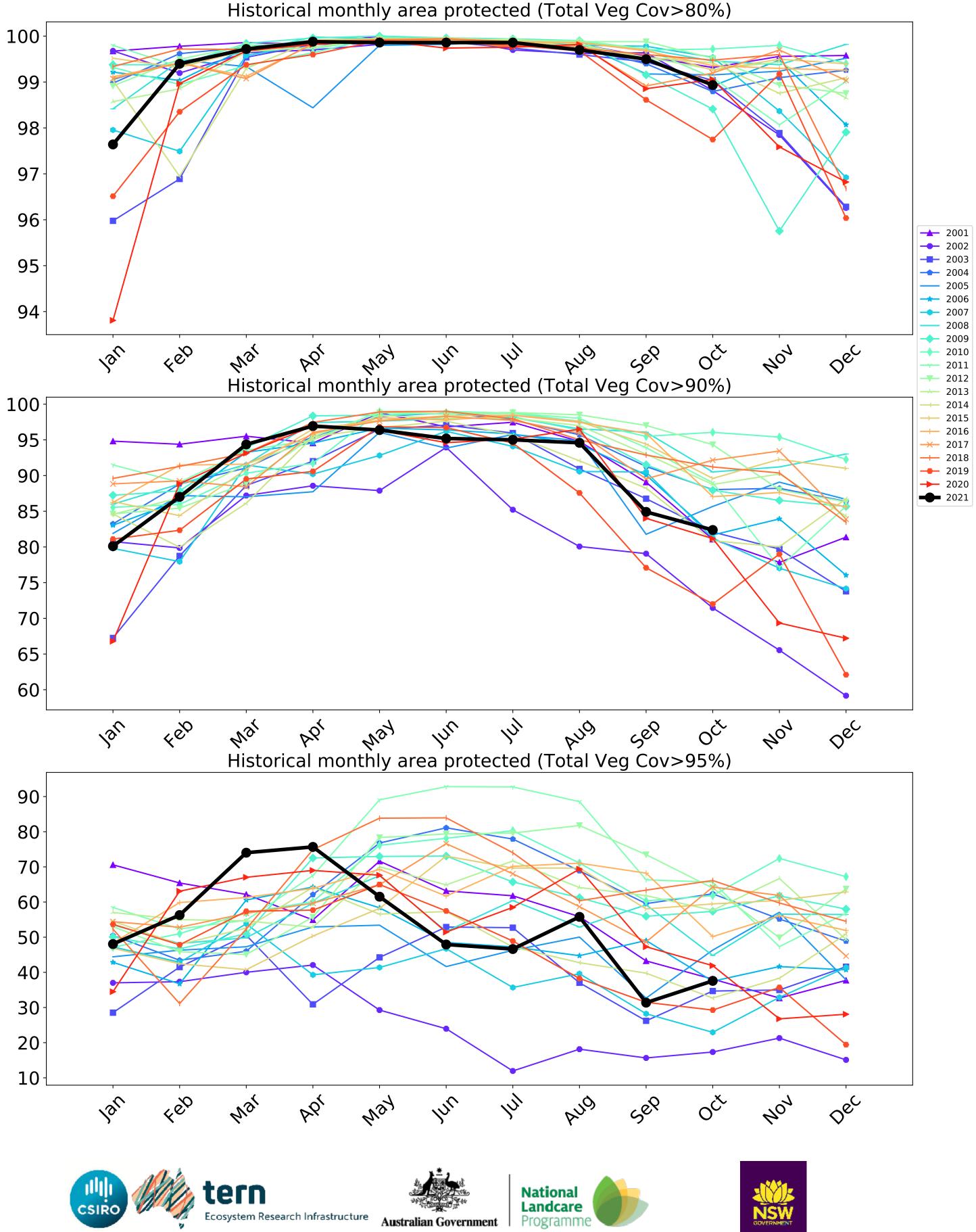
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



### Grazing - Forest (non woodland) timeseries

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

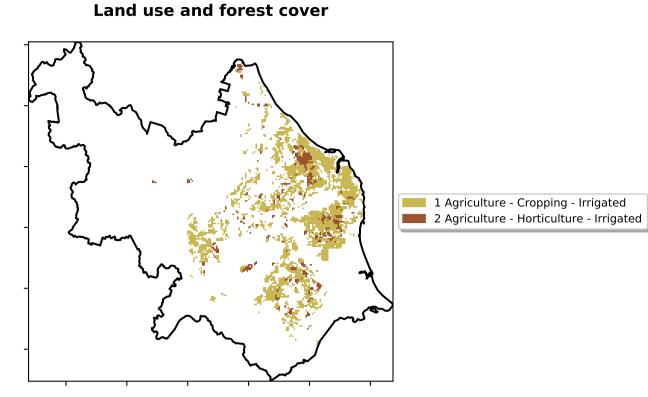




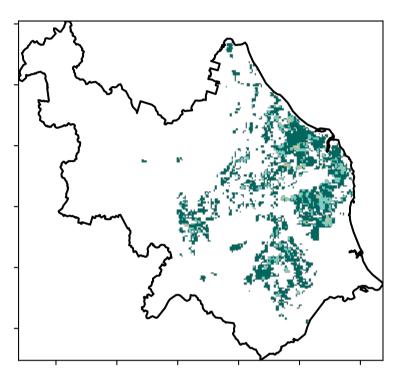
**8** 

### Irrigation

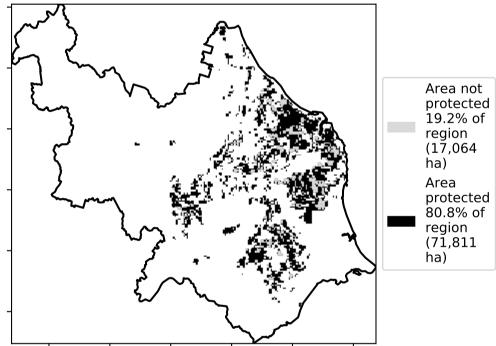
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

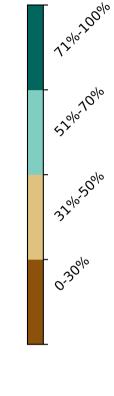


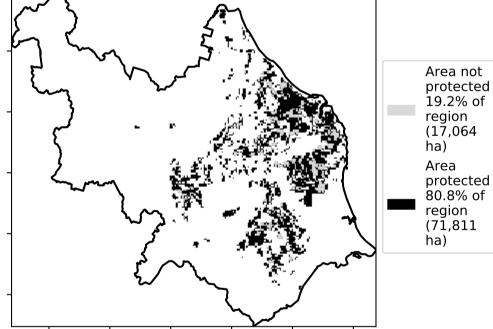
**Total Vegetation Cover [%]** 

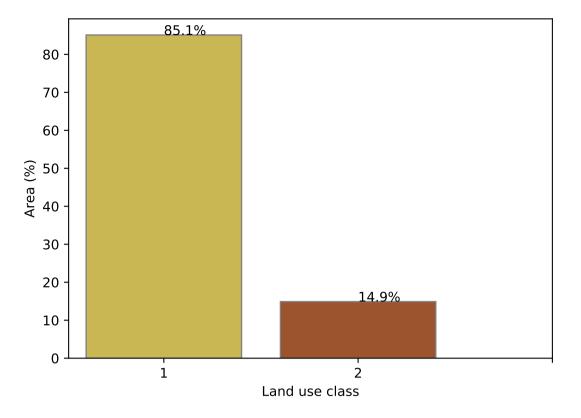






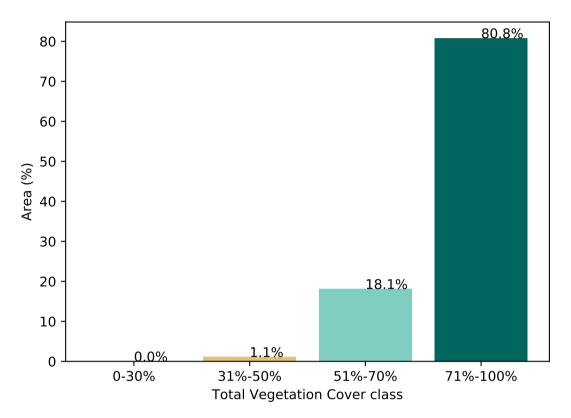




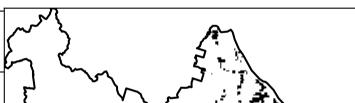


#### Proportion of each land class in area

Proportion of vegetation cover class in area



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



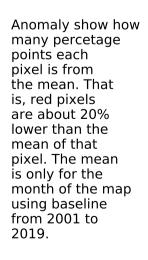
\$

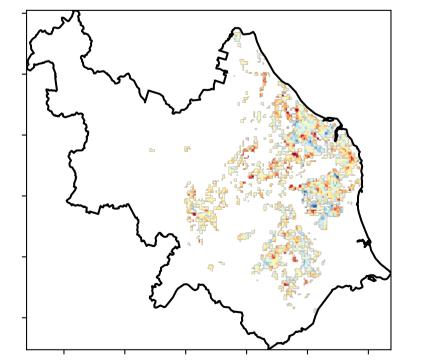
ۍ ک

A-1

2?

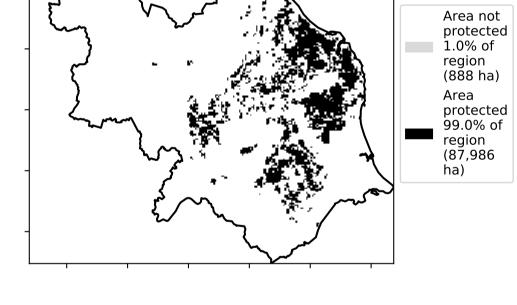
**Total Vegetation Cover Anomaly [%]** 



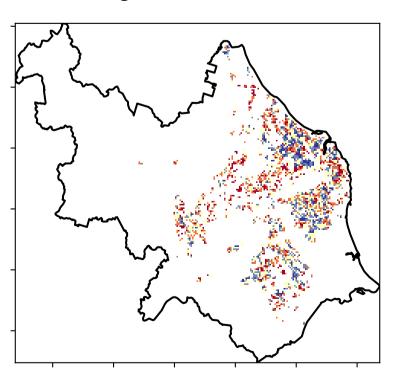


- 10 0 -10-20

- 20



Total Vegetation Cover Decile [%]

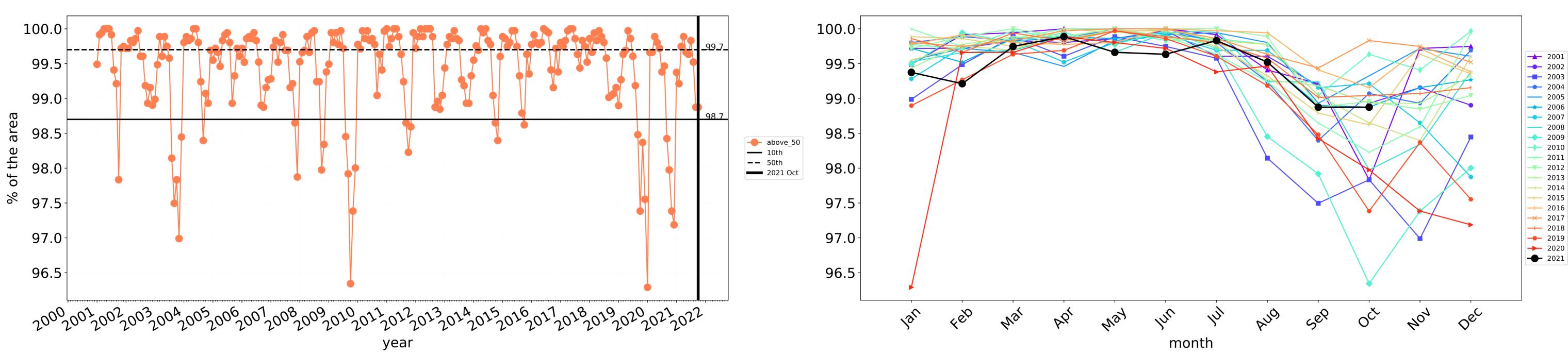




Deciles show where the pixel value lies in the

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.



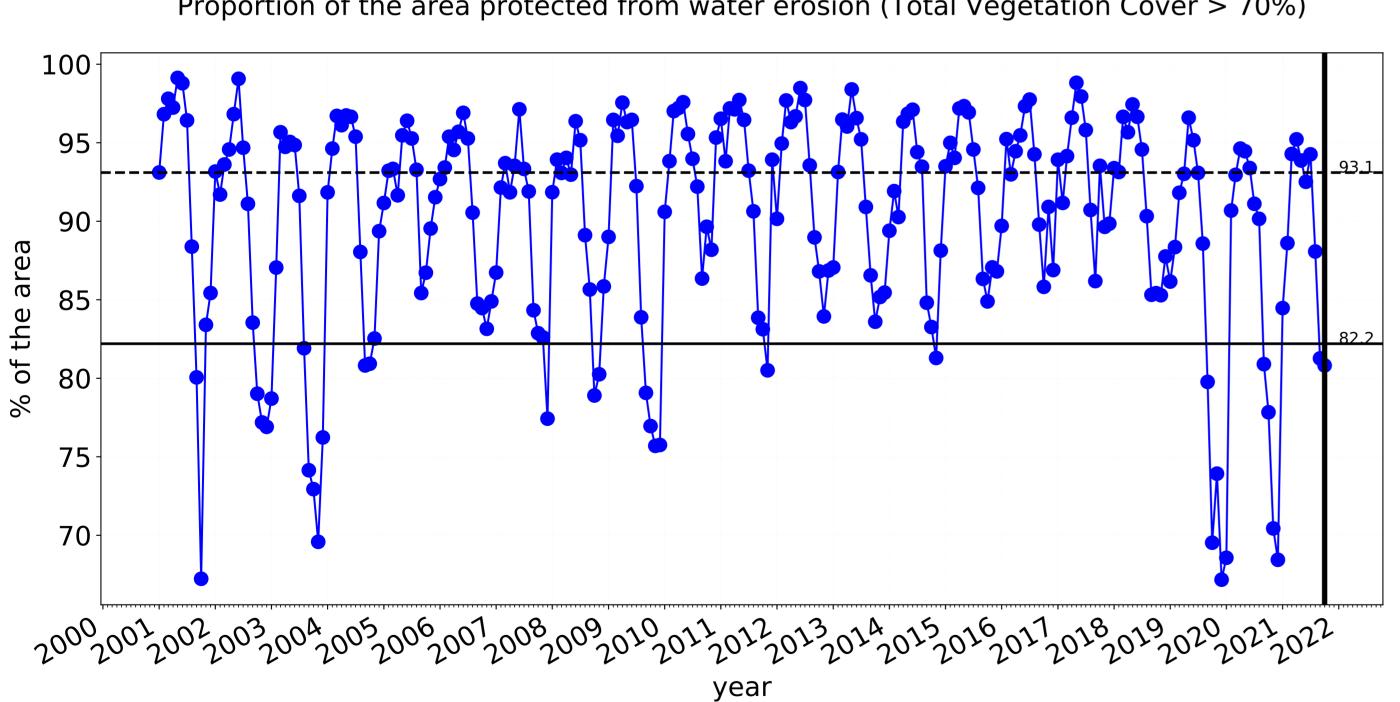
--- above\_70

**—** 10th

**——** 50th

**—** 2021 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%)

### Irrigation timeseries

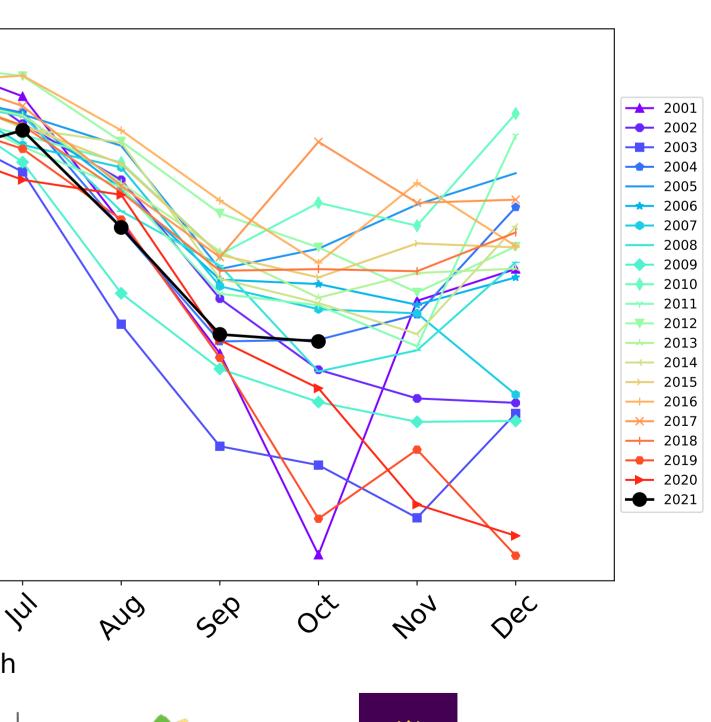
100-95 90 85 80 75 70 Jan 4eb In May Mai Þb, month tern Ecosystem Research Infrastructure Australian Government

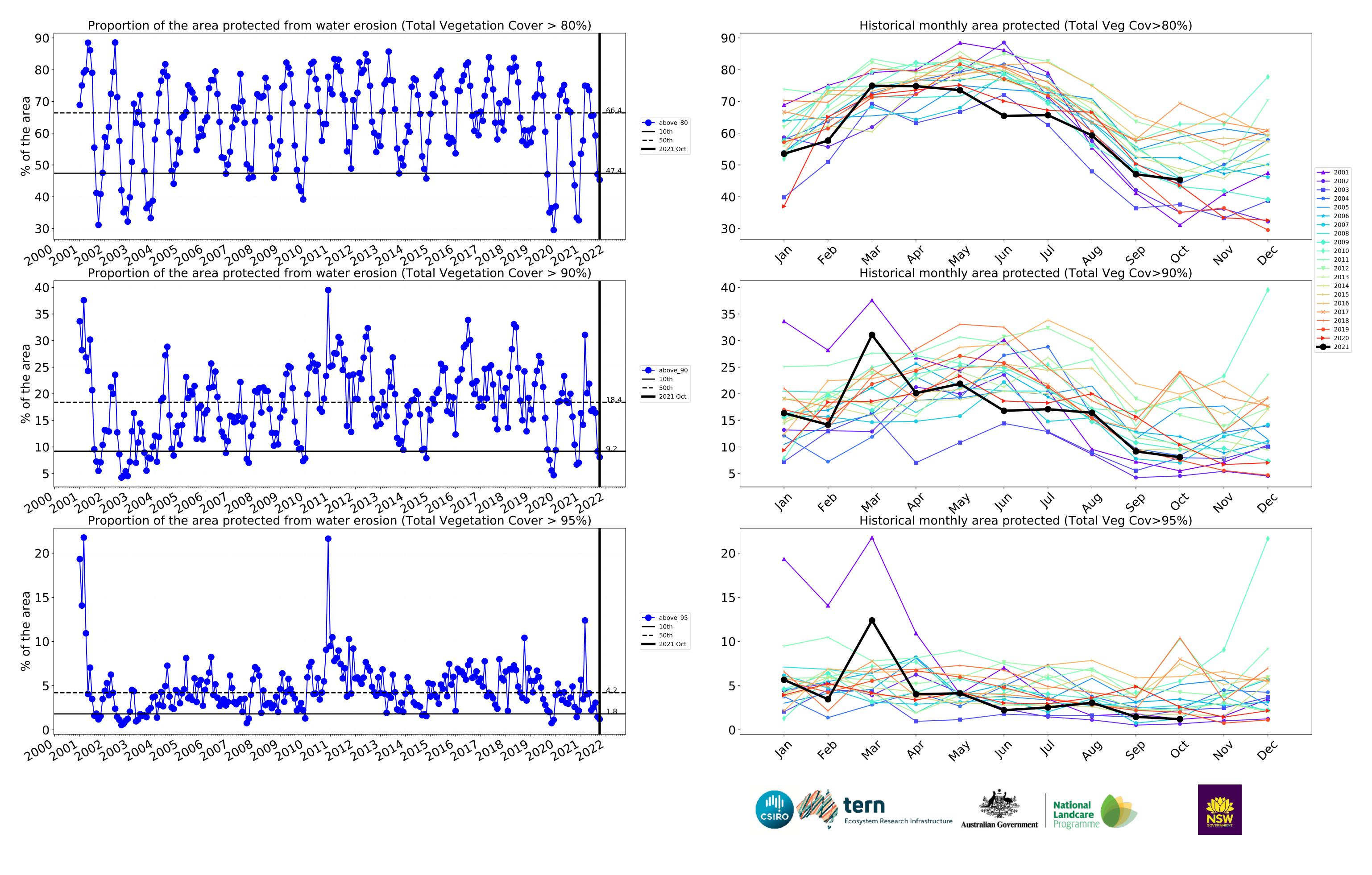
Water erosion historical monthly area protected (Total Veg Cov>70%)

National Landcare

Programme

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



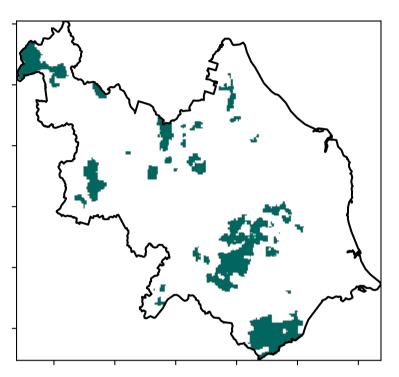


### **Production native forests and plantation forests**

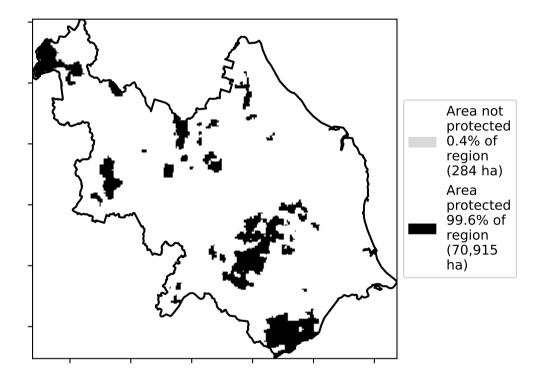
1 Production native forests and plantation forests

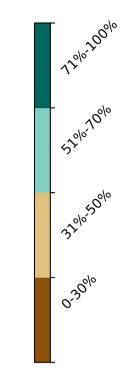
Land use and forest cover

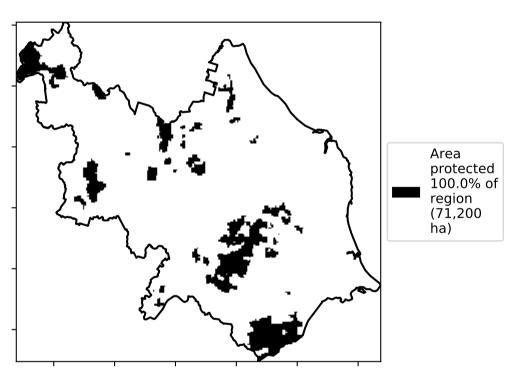
**Total Vegetation Cover [%]** 



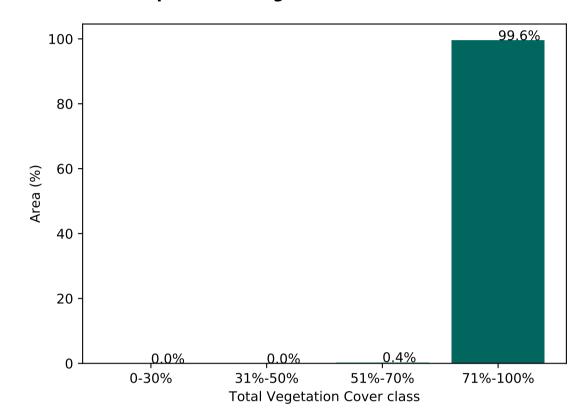






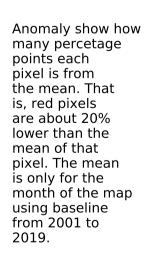


#### Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

**Total Vegetation Cover Anomaly [%]** 

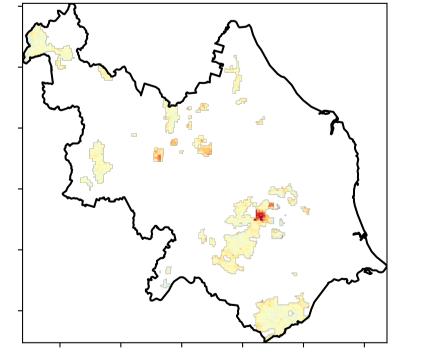


Catchment Scale Land Use and Forests of Australia (2018)

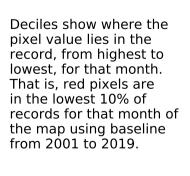
Catchment Scale Land

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

Derived from







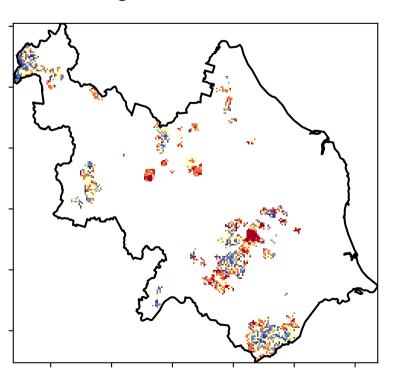
Total Vegetation Cover Decile [%]

\$

ଚ୍ଚ

A-1

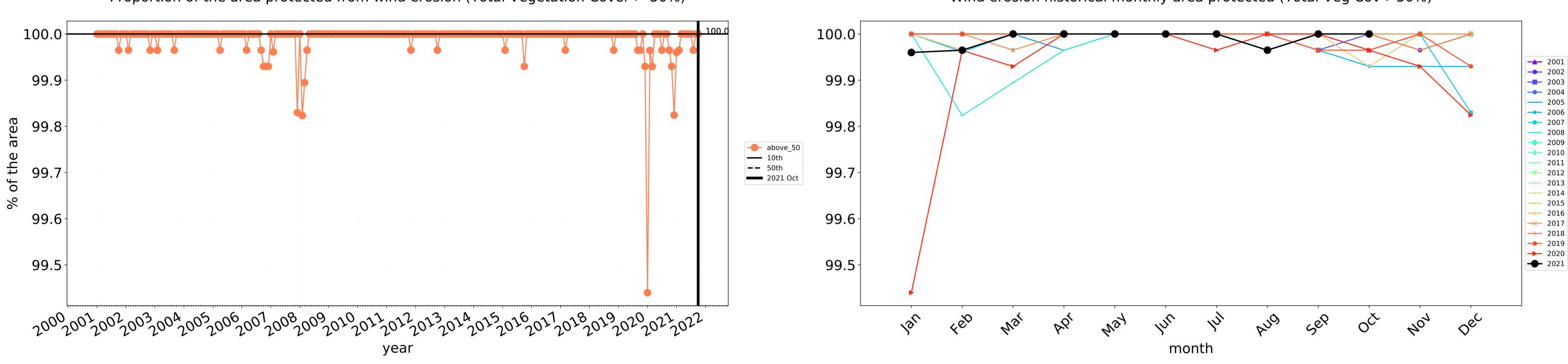
2?3





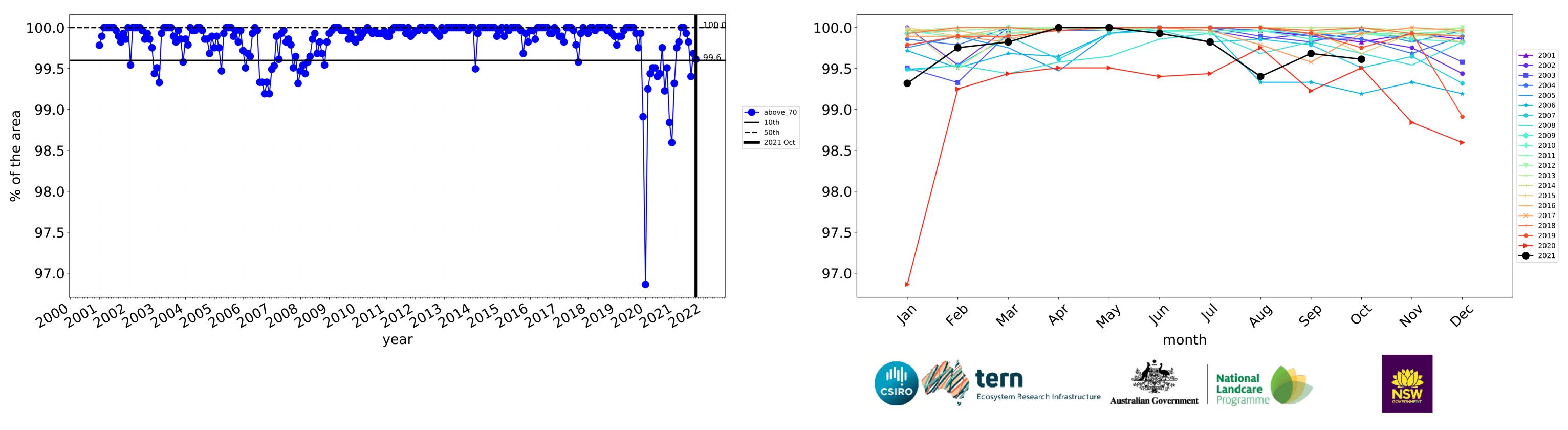
32

### Production native forests and plantation forests timeseries



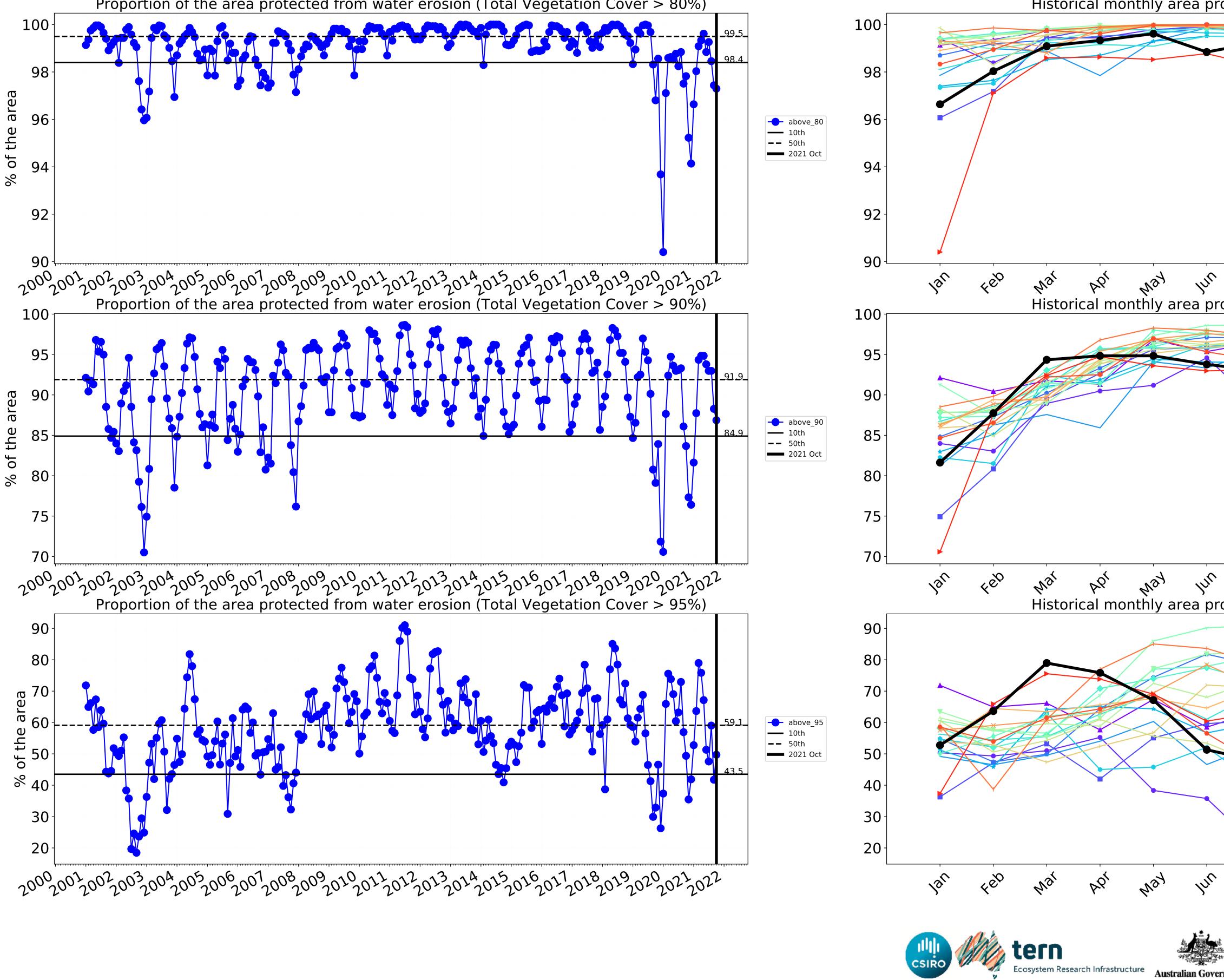
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

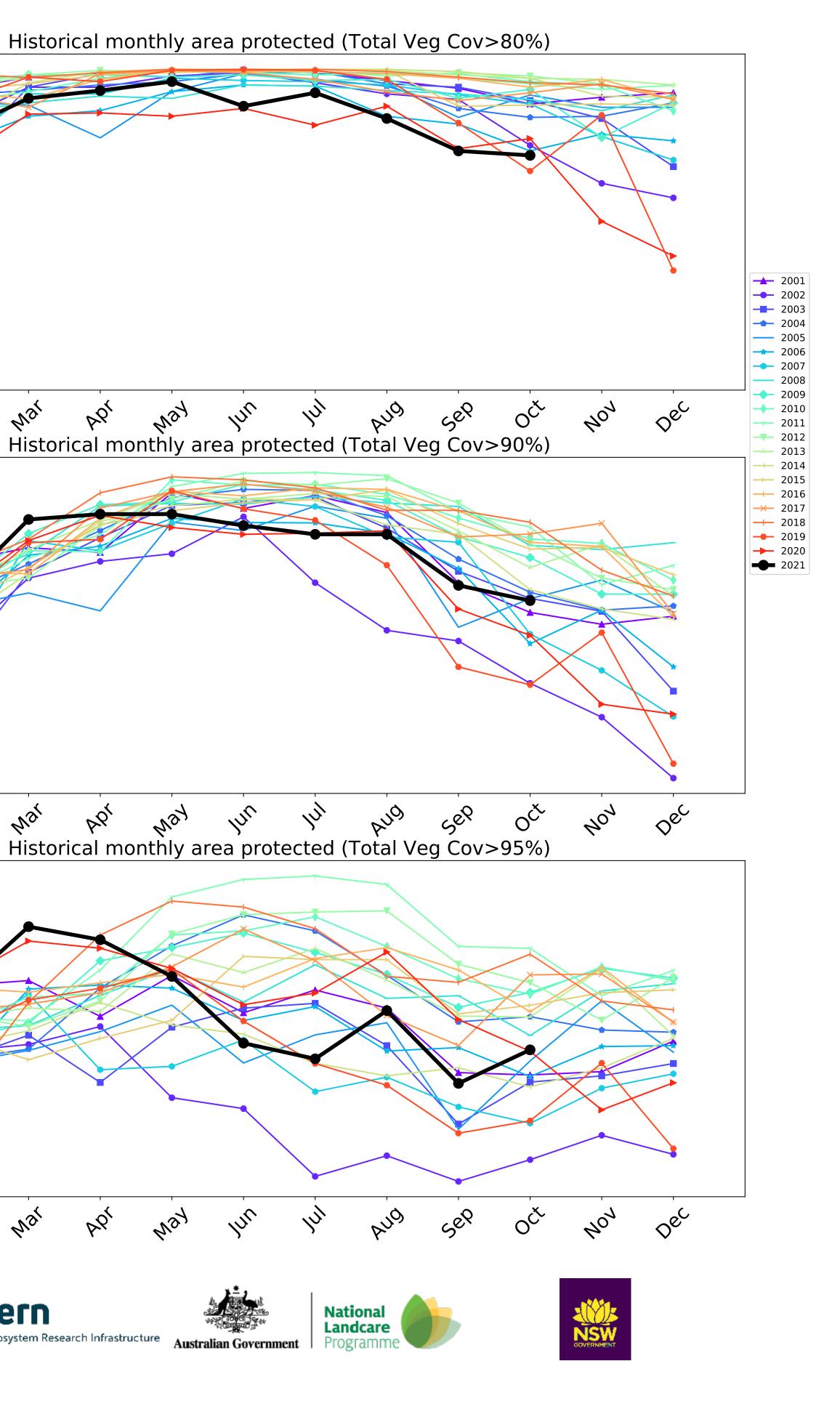


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



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



# Bundaberg\_(R) (641,450 ha and no data 1,976 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

Land use and forest cover Class	area(ha)	above_30	above_50	above_70	above_80	above_90	above_95
Entire region	641,450	100.0% 641,300	99.7% 639,725	95.3% 611,050	84.2% 539,875	52.7% 338,000	21.5% 137,775
Conservation and natural environments	80,925	99.9% 80,875	99.7% 80,675	96.1% 77,750	88.5% 71,625	67.7% 54,750	37.1% 30,000
Conservation and natural environments Woodland forest	42,325	100.0% 42,325	99.9% 42,300	97.0% 41,050	89.1% 37,725	60.5% 25,625	24.7% 10,450
Conservation and natural environments Forest (non woodland)	34,550	100.0% 34,550	99.6% 34,425	96.3% 33,275	90.8% 31,375	80.8% 27,900	55.9% 19,325
Agriculture	436,575	100.0% 436,575	99.7% 435,450	95.4% 416,350	83.2% 363,300	47.8% 208,875	16.0% 69,925
Grazing	345,925	100.0% 345,925	100.0% 345,800	99.1% 342,900	93.0% 321,825	58.2% 201,400	19.9% 68,825
Grazing non forest	166,950	100.0% 166,950	99.9% 166,825	98.5% 164,425	87.9% 146,725	37.8% 63,050	6.5% 10,850
Grazing Woodland forest	54,700	100.0% 54,700	100.0% 54,700	99.2% 54,275	95.3% 52,150	65.8% 35,975	20.6% 11,275
Grazing - Forest (non woodland)	124,275	100.0% 124,275	100.0% 124,275	99.9% 124,200	98.9% 122,950	82.4% 102,375	37.6% 46,700
Irrigation	88,875	100.0% 88,875	98.9% 87,875	80.8% 71,825	45.3% 40,275	8.1% 7,175	1.2% 1,075
Production native forests and plantation forests	71,200	100.0% 71,200	100.0% 71,200	99.6% 70,925	97.3% 69,275	86.9% 61,850	49.7% 35,400

