# Total vegetation cover soil protection Region:LGA Singleton\_(A) NSW

# Date: January 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:

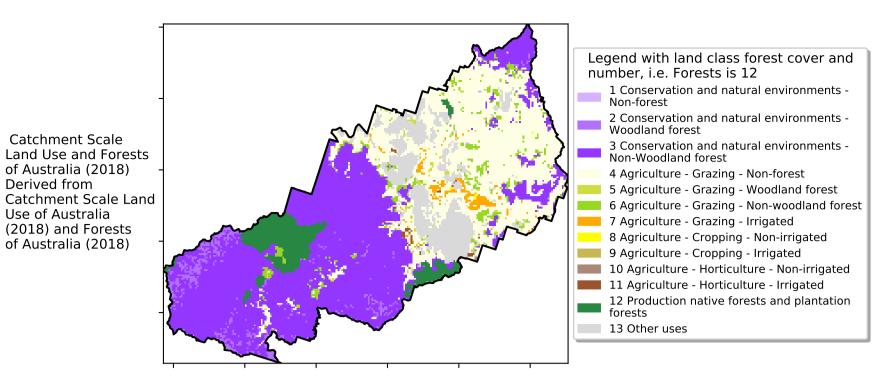
https://doi.org/10.4225/08/5848a3f19a7b3



## **Vegetation Cover Jan 2021**

#### Land use and forest cover

Proportion of each land class in area



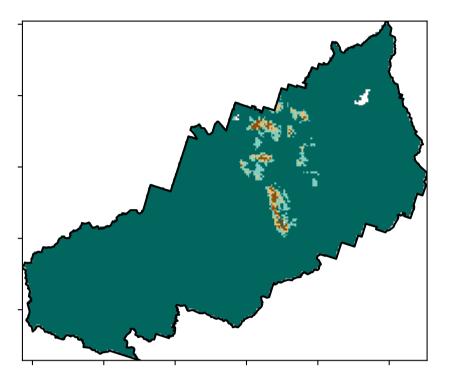
12%100%

52% 70%

320050010

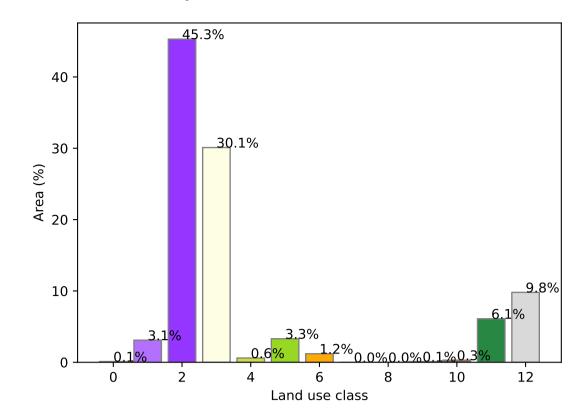
0.30%

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

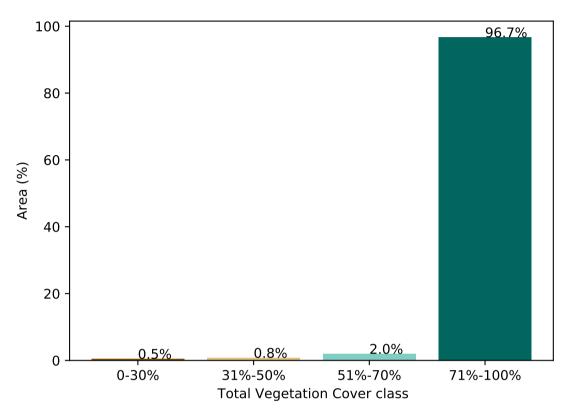


#### % Area protected from water erosion (>70%)





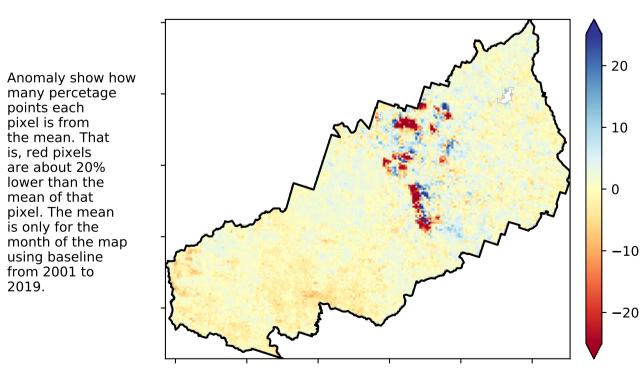
#### Proportion of vegetation cover class in area



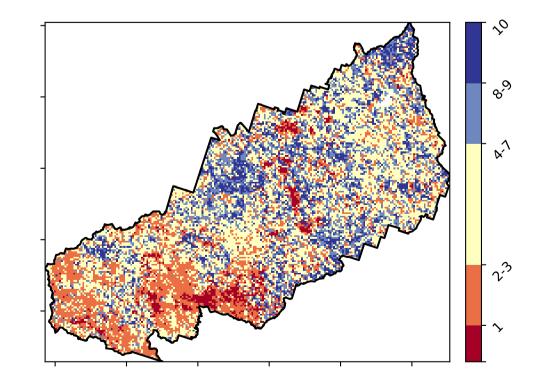
#### % Area protected from wind erosion (>50%)



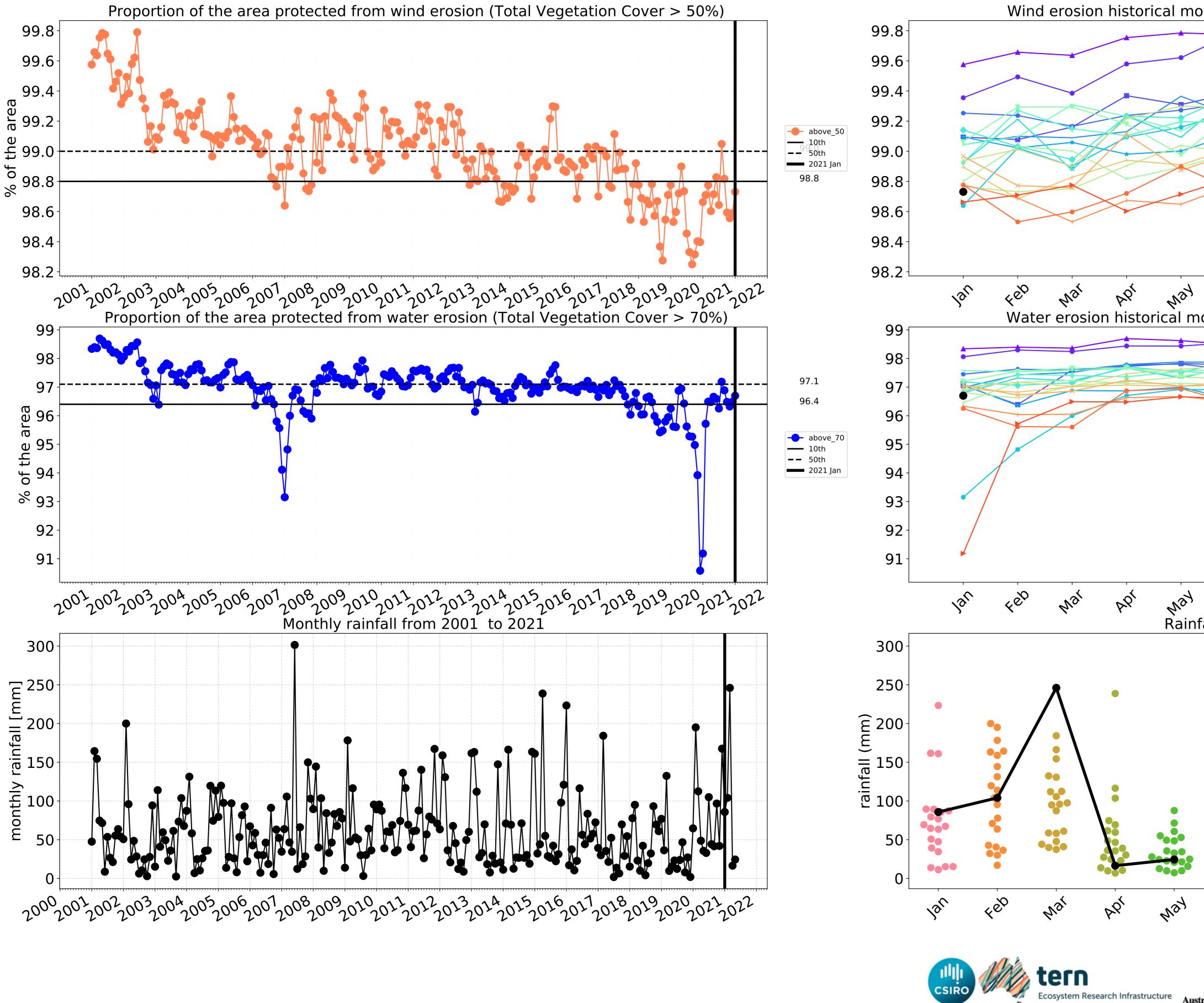
**Total Vegetation Cover Anomaly [%]** 



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.





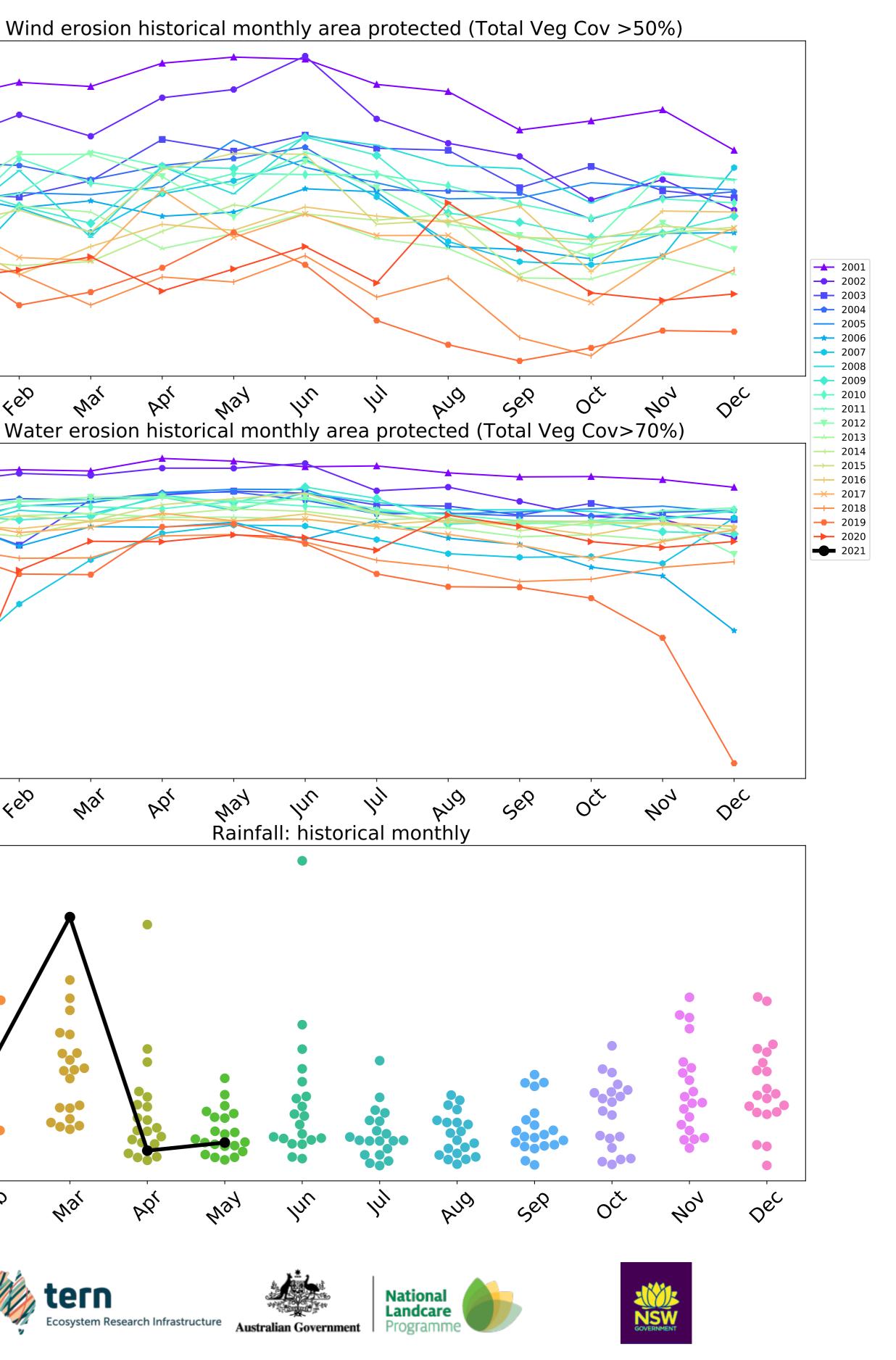


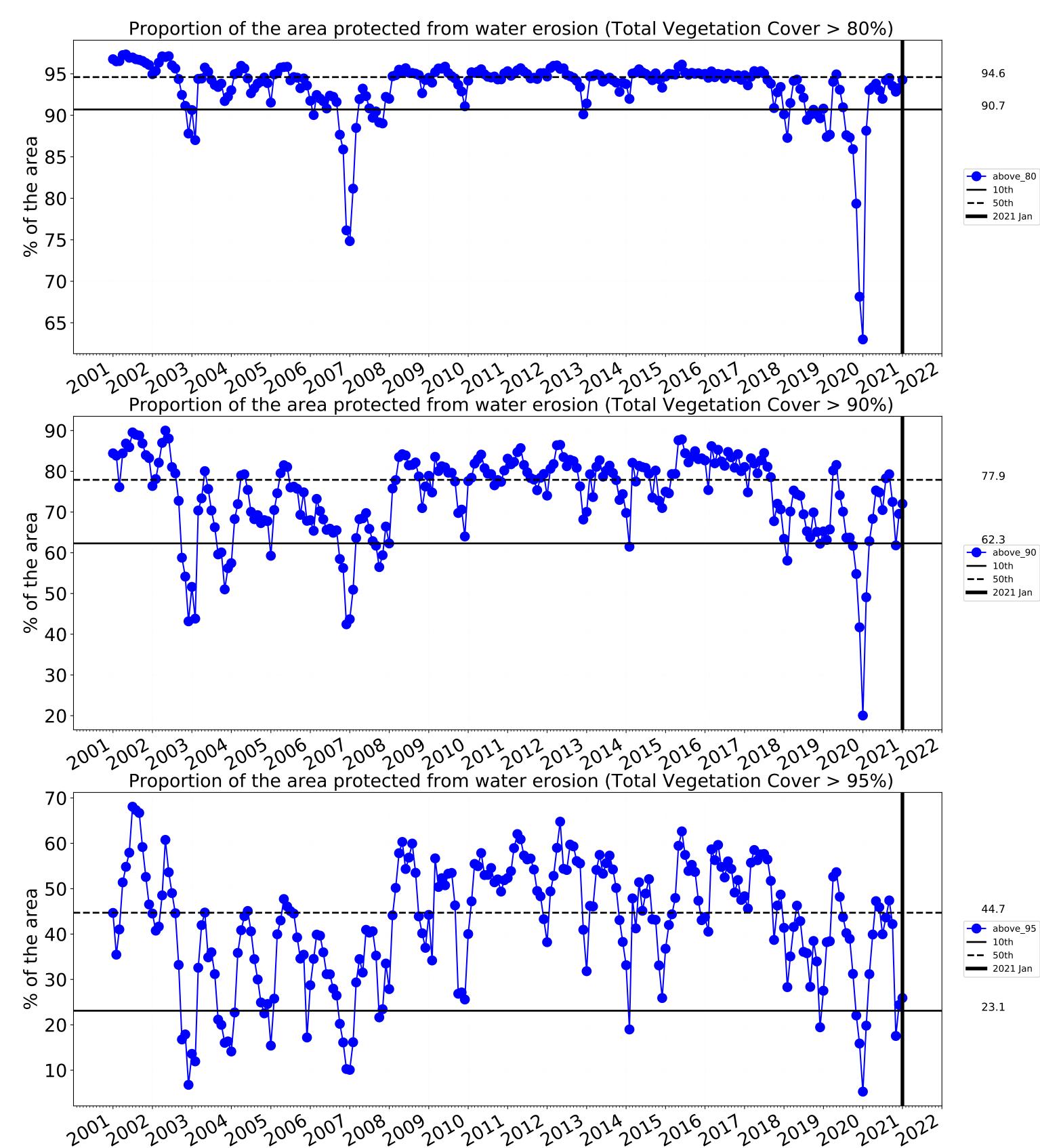
In

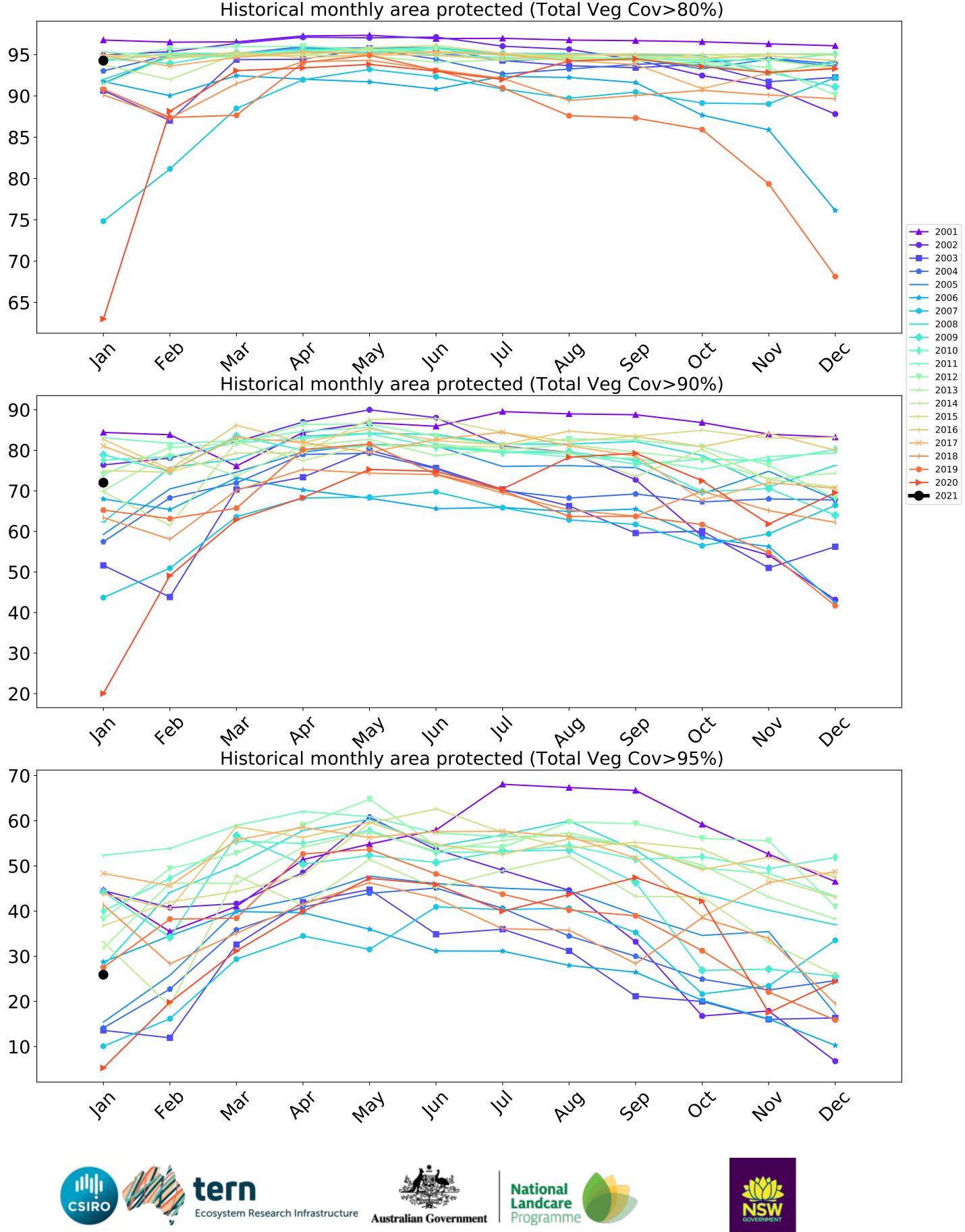
In

In

Ecosystem Research Infrastructure









## **Conservation and natural environments**

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

are about 20% lower than the

mean of that

pixel. The mean

using baseline from 2001 to 2019.

is only for the month of the map

Land use and forest cover

1 Conservation and natural environments - Nonforest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Nonwoodland forest

12%200%

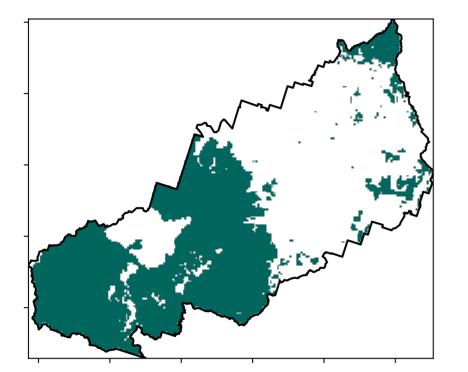
52% 70%

320050010

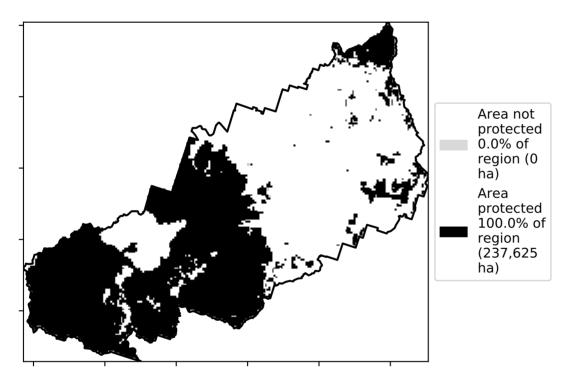
0.30%

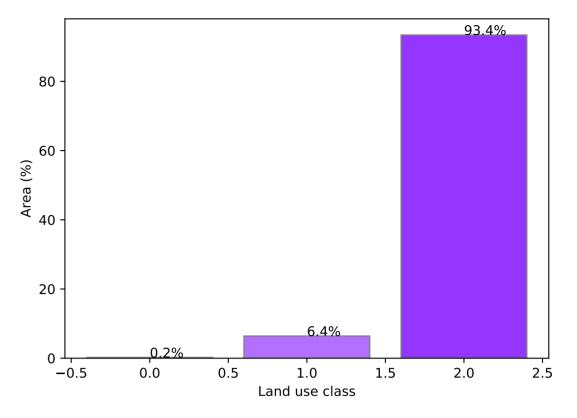
Catchment Scale Land

**Total Vegetation Cover [%]** 



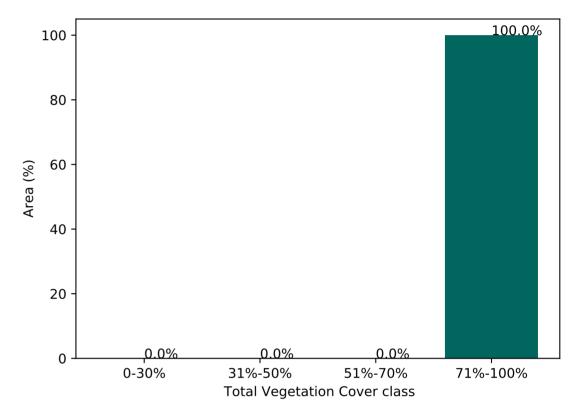
% Area protected from water erosion (>70%)





#### Proportion of each land class in area

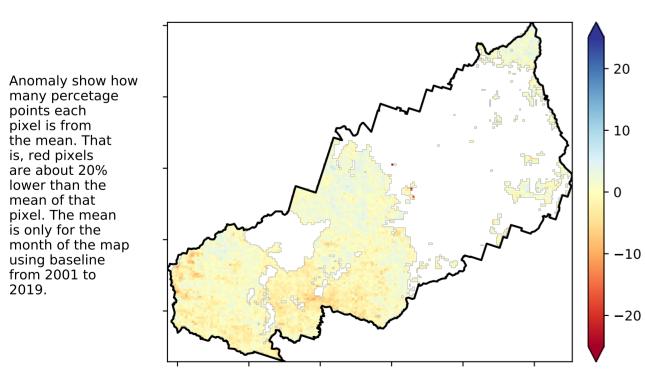
Proportion of vegetation cover class in area



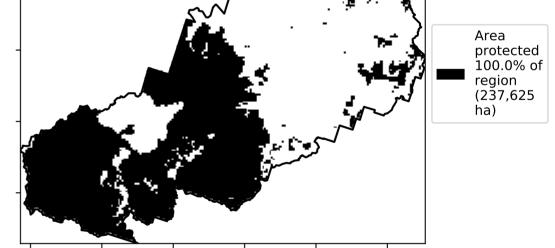
#### % Area protected from wind erosion (>50%)

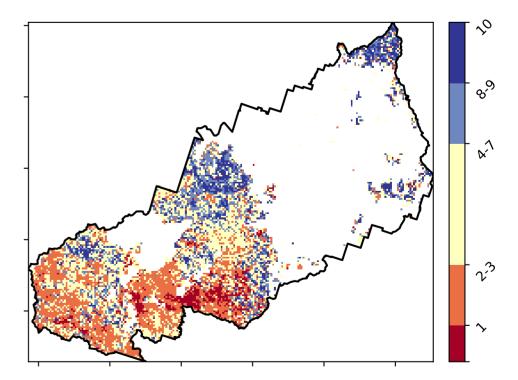


**Total Vegetation Cover Anomaly [%]** 

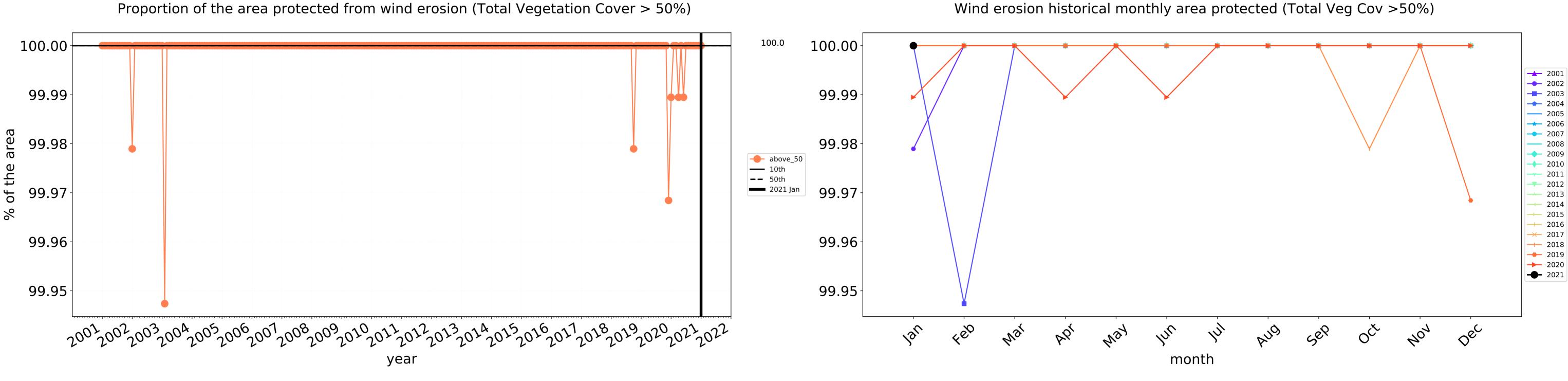


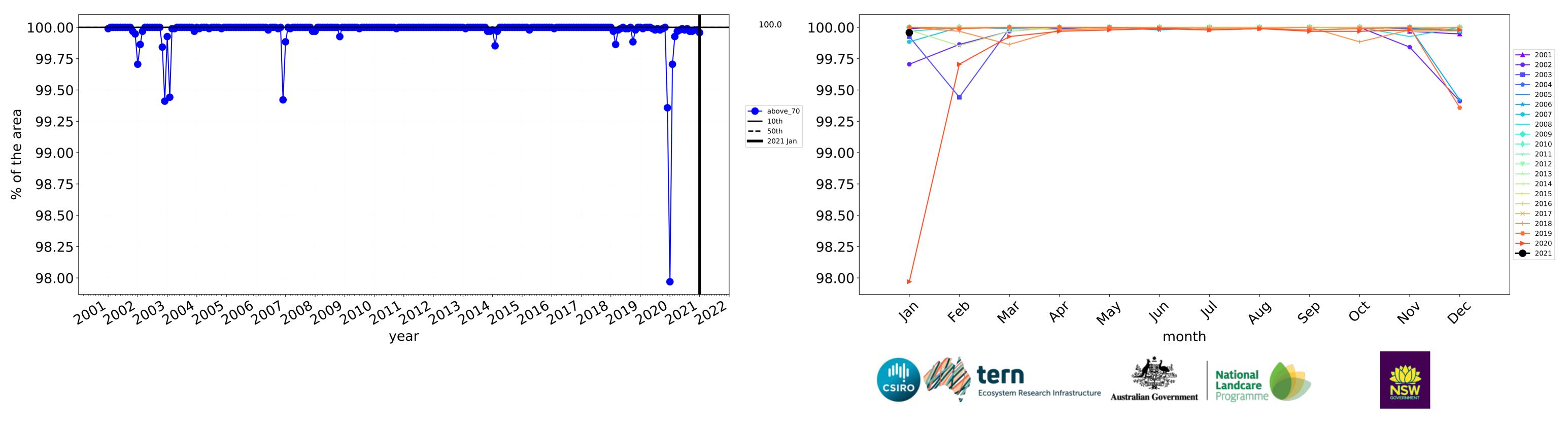
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



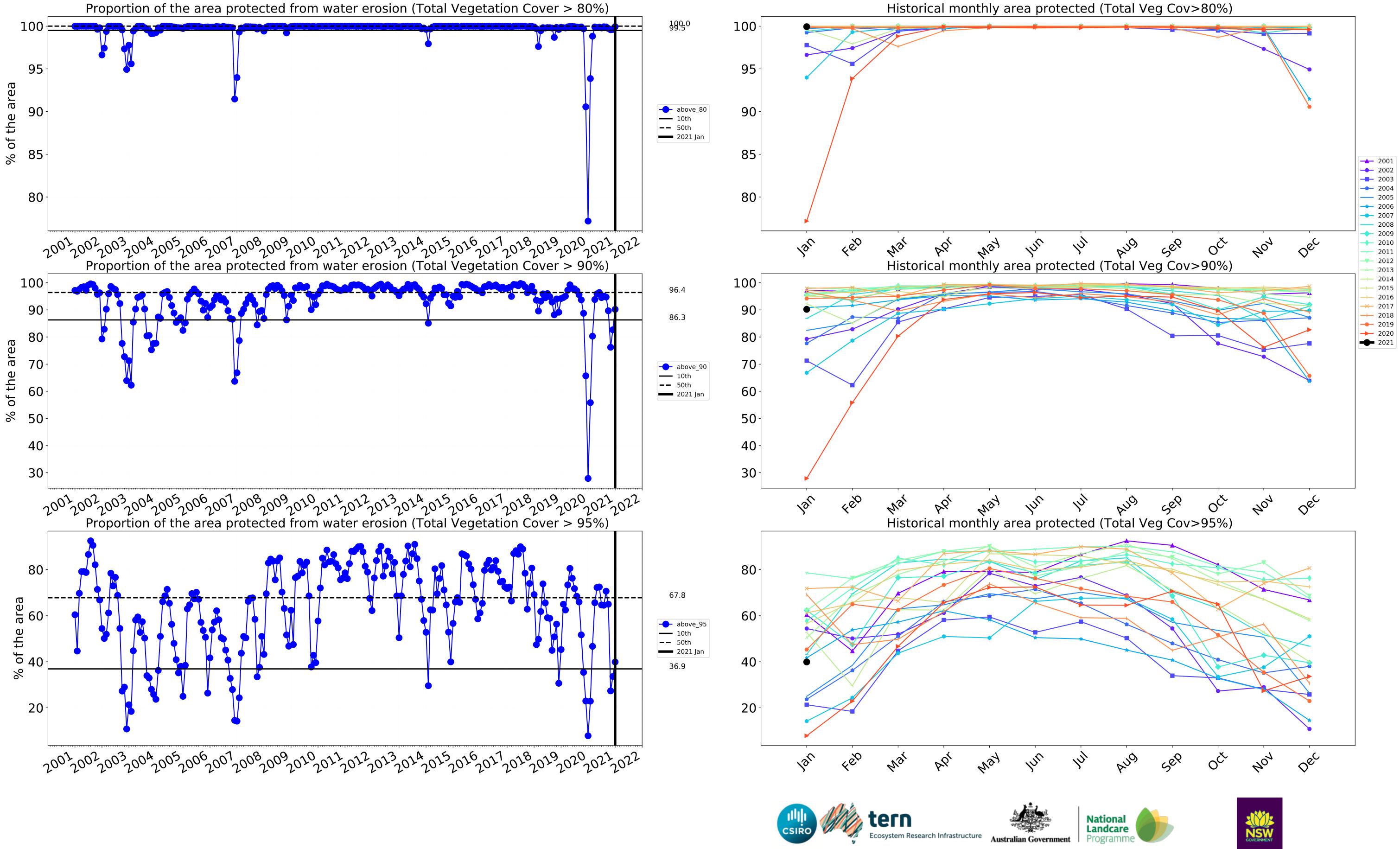








Water erosion historical monthly area protected (Total Veg Cov>70%)



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

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

12%100%

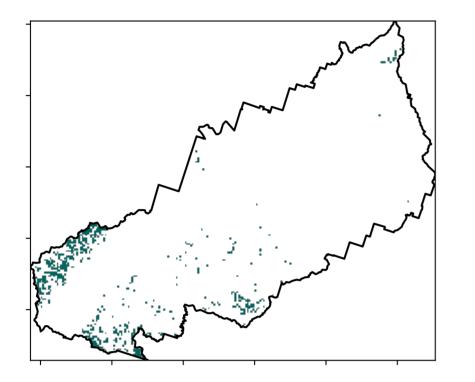
520070010

320050010

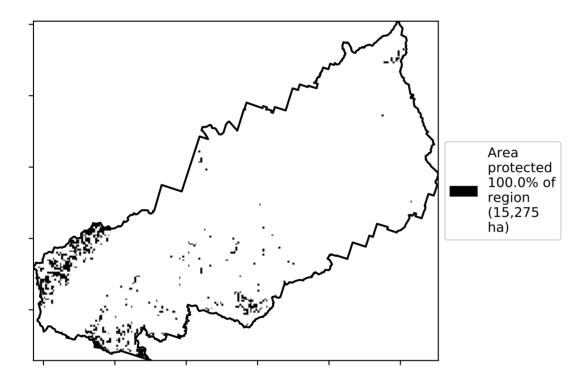
0.30%

**Total Vegetation Cover [%]** 

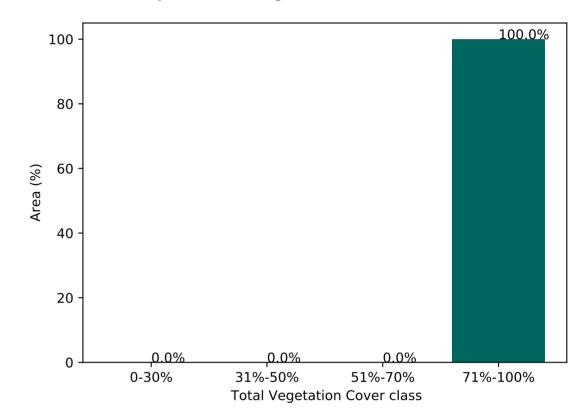
Land use and forest cover



% Area protected from water erosion (>70%)



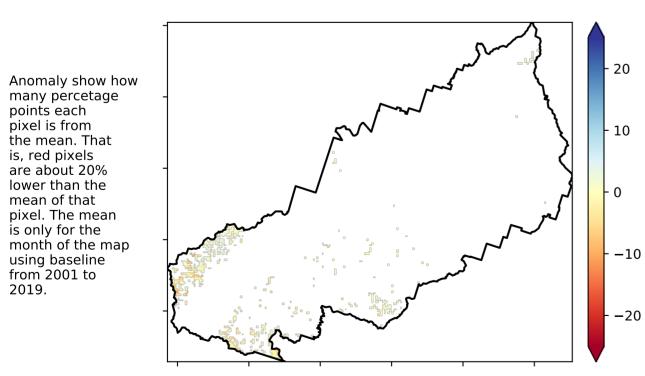




#### % Area protected from wind erosion (>50%)



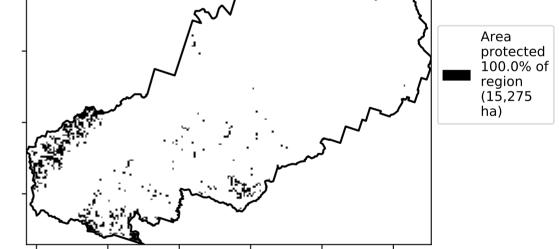
**Total Vegetation Cover Anomaly [%]** 



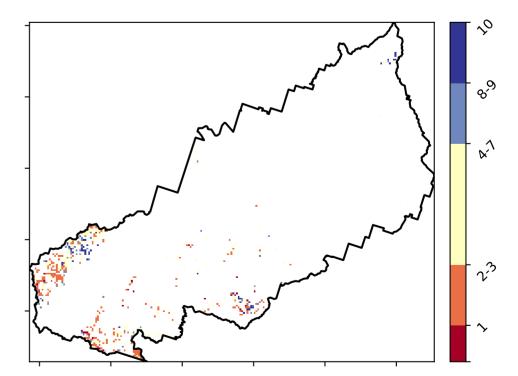
lower than the

mean of that

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



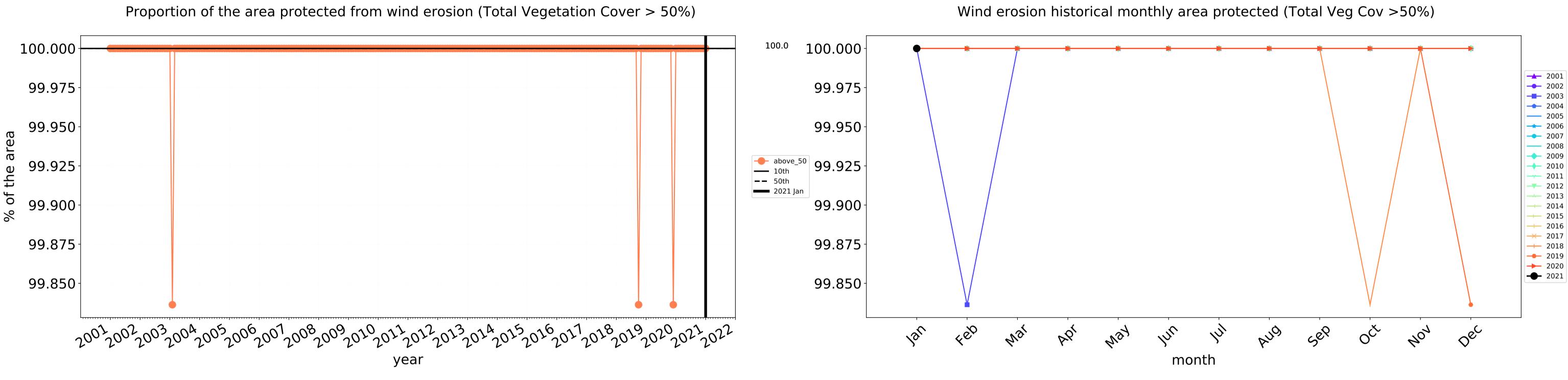
Total Vegetation Cover Decile [%]

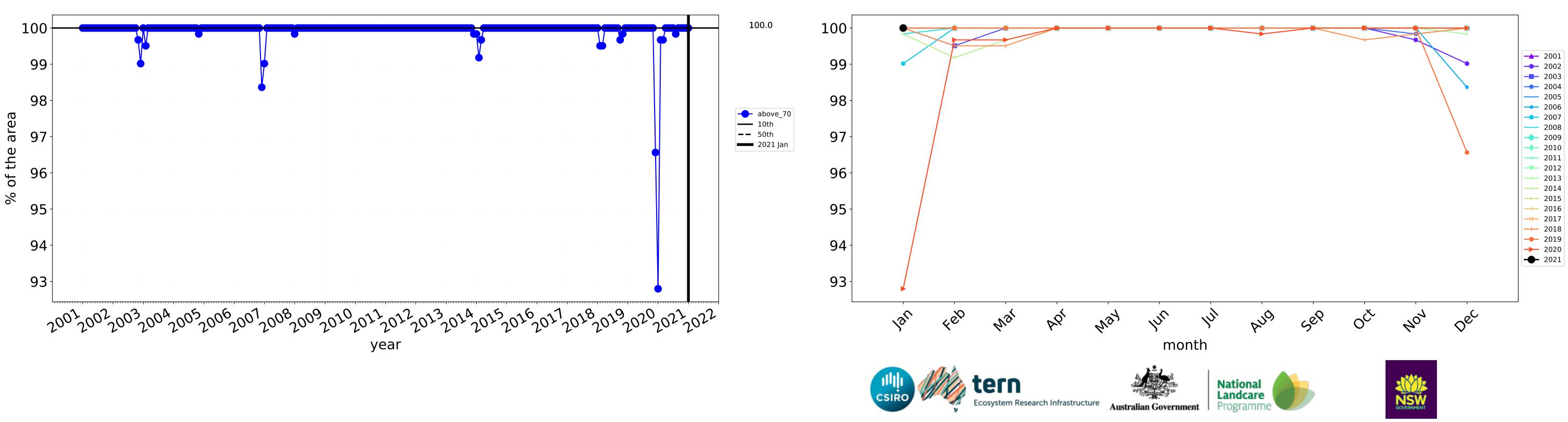


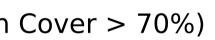


8

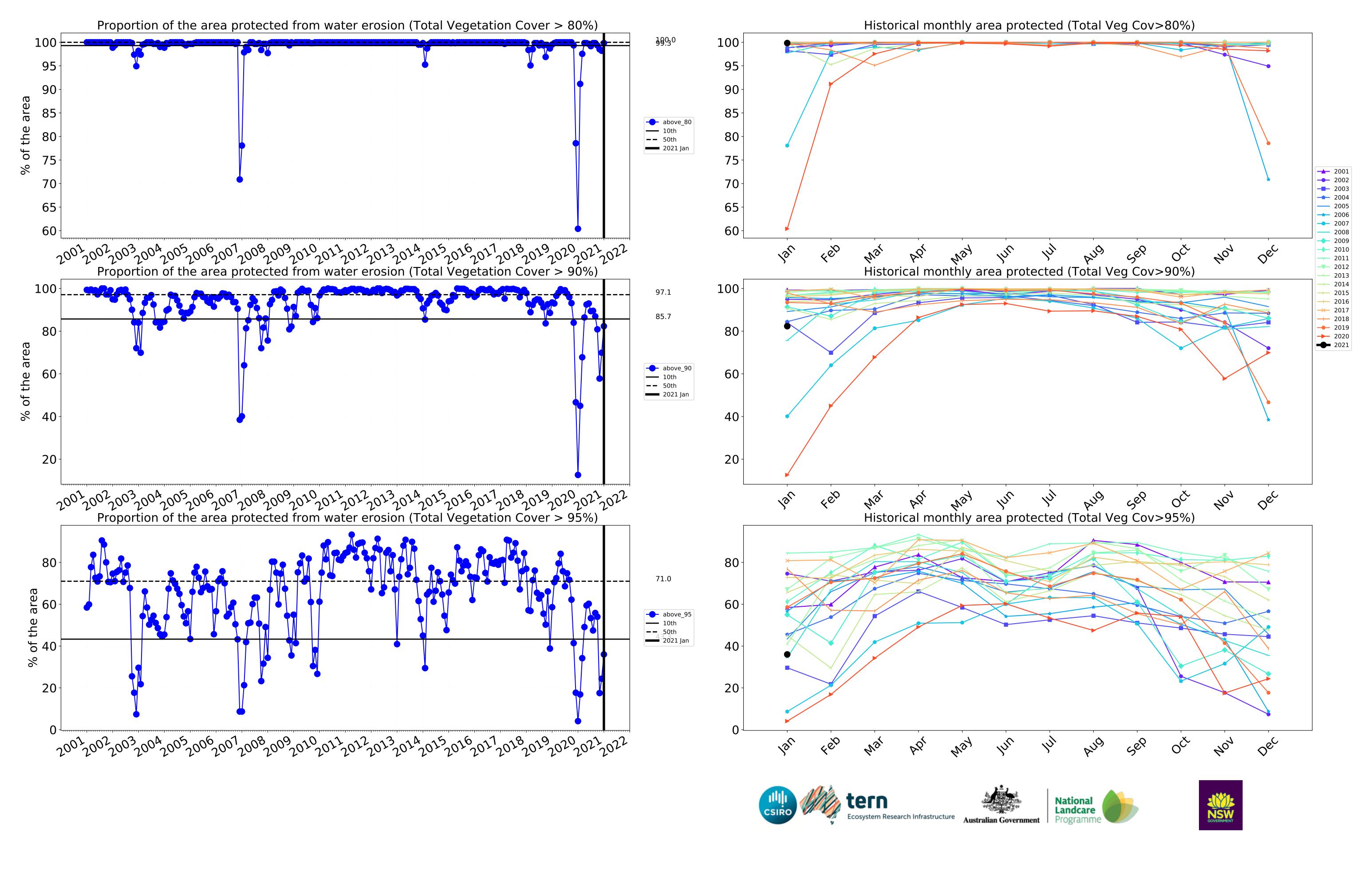
## **Conservation and natural environments Woodland forest timeseries**







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



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

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

12%200%

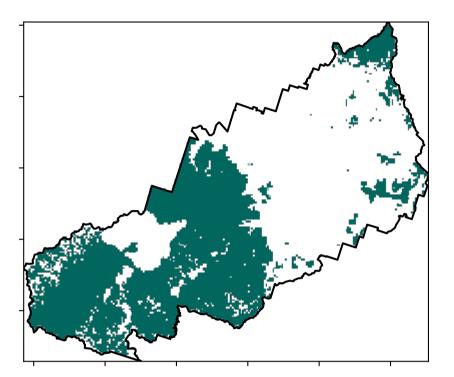
52% 70%

500%

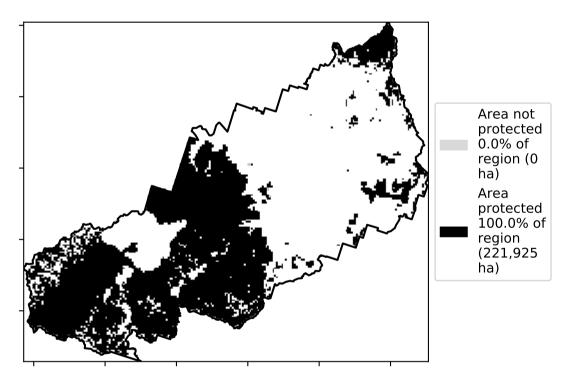
3200

. 0.30%

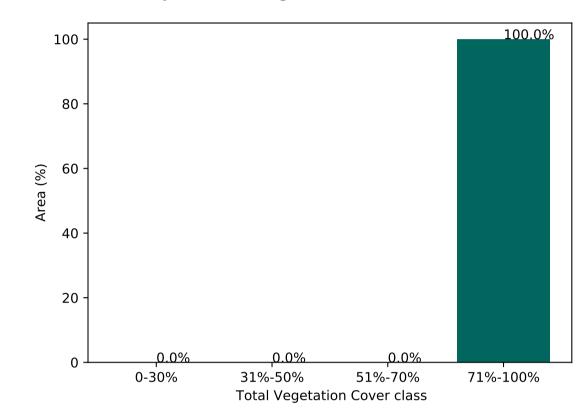
Total Vegetation Cover [%]



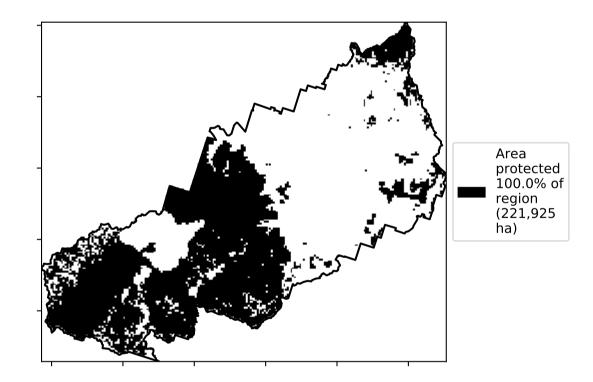
% Area protected from water erosion (>70%)



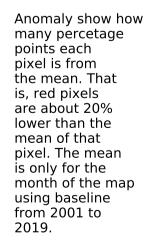


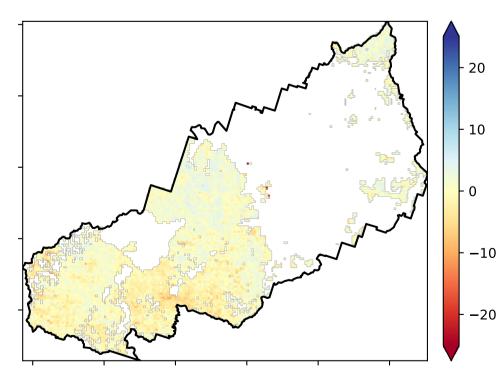


% Area protected from wind erosion (>50%)

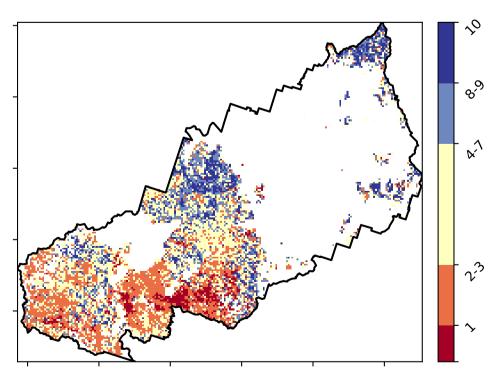


Total Vegetation Cover Anomaly [%]



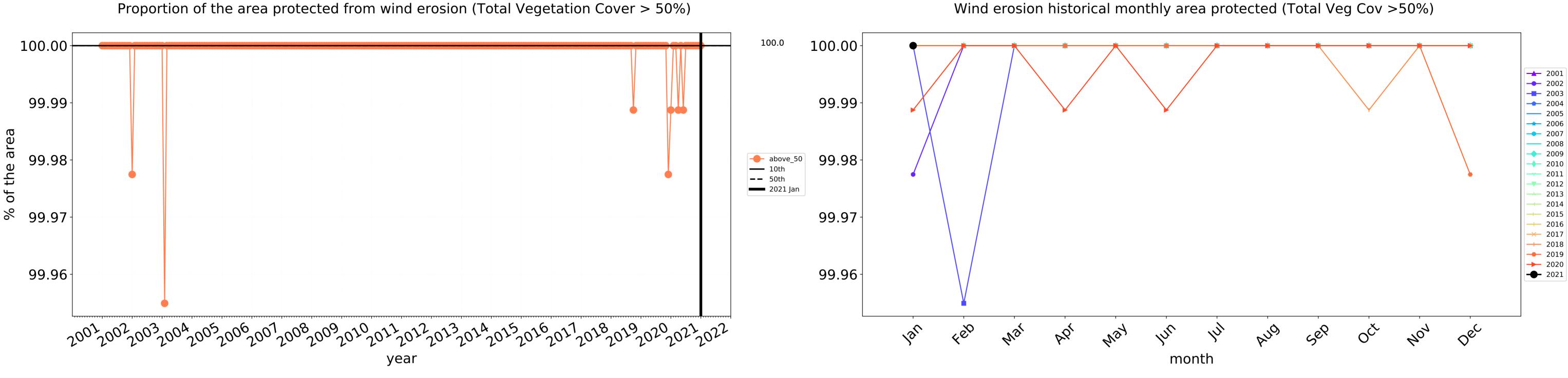


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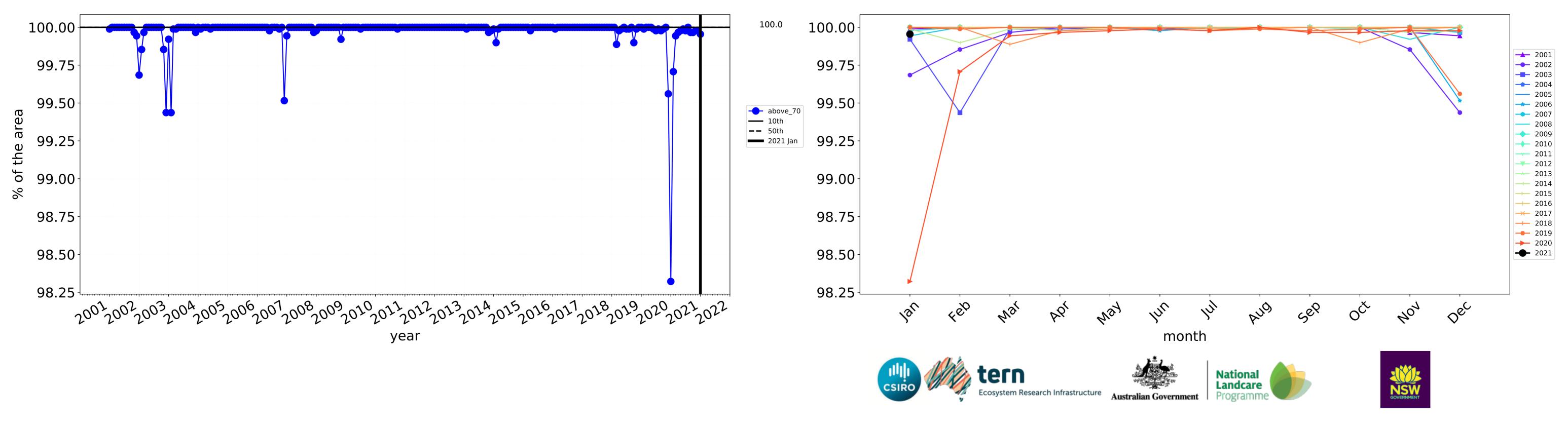




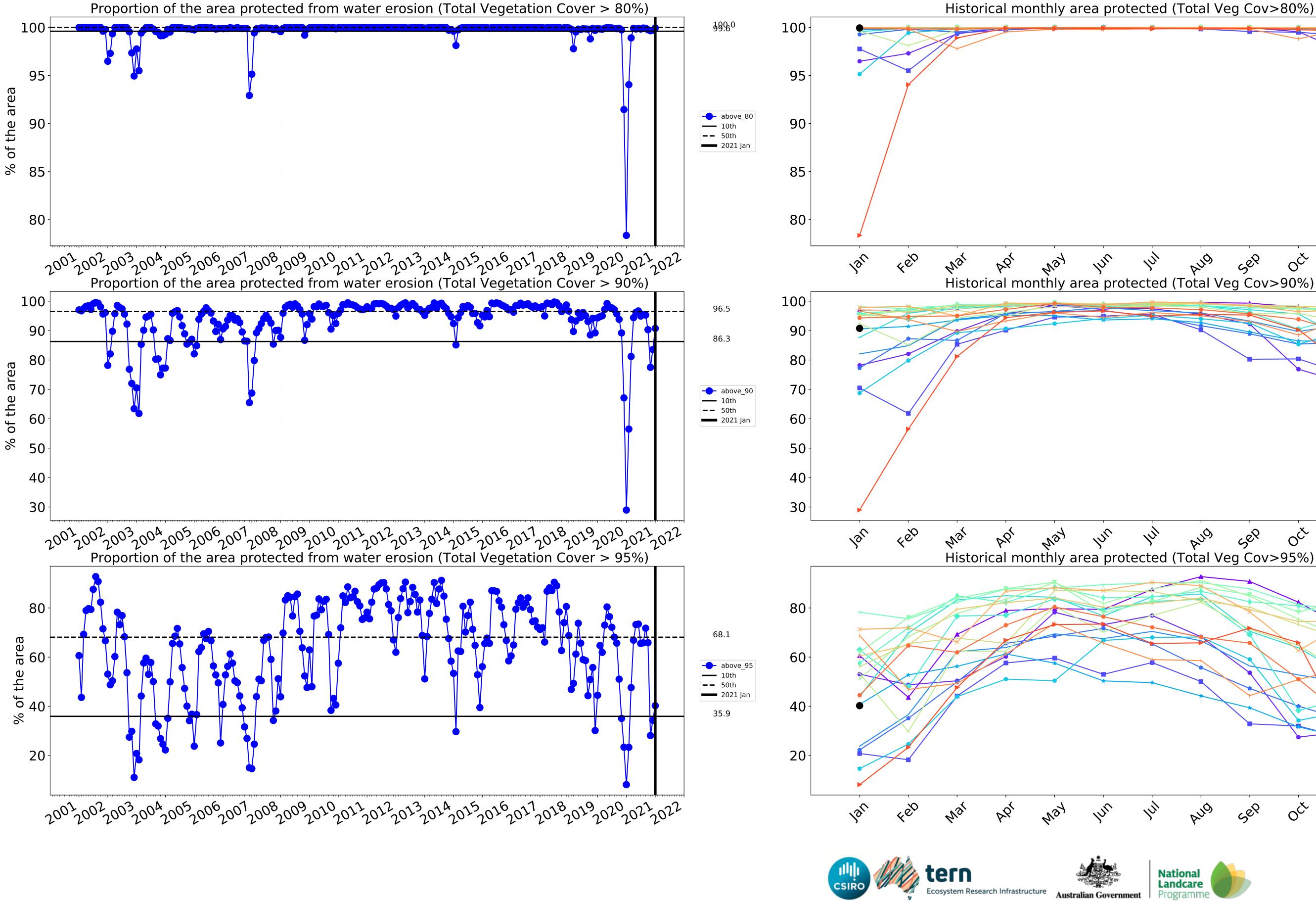
## **Conservation and natural environments Forest (non woodland) timeseries**

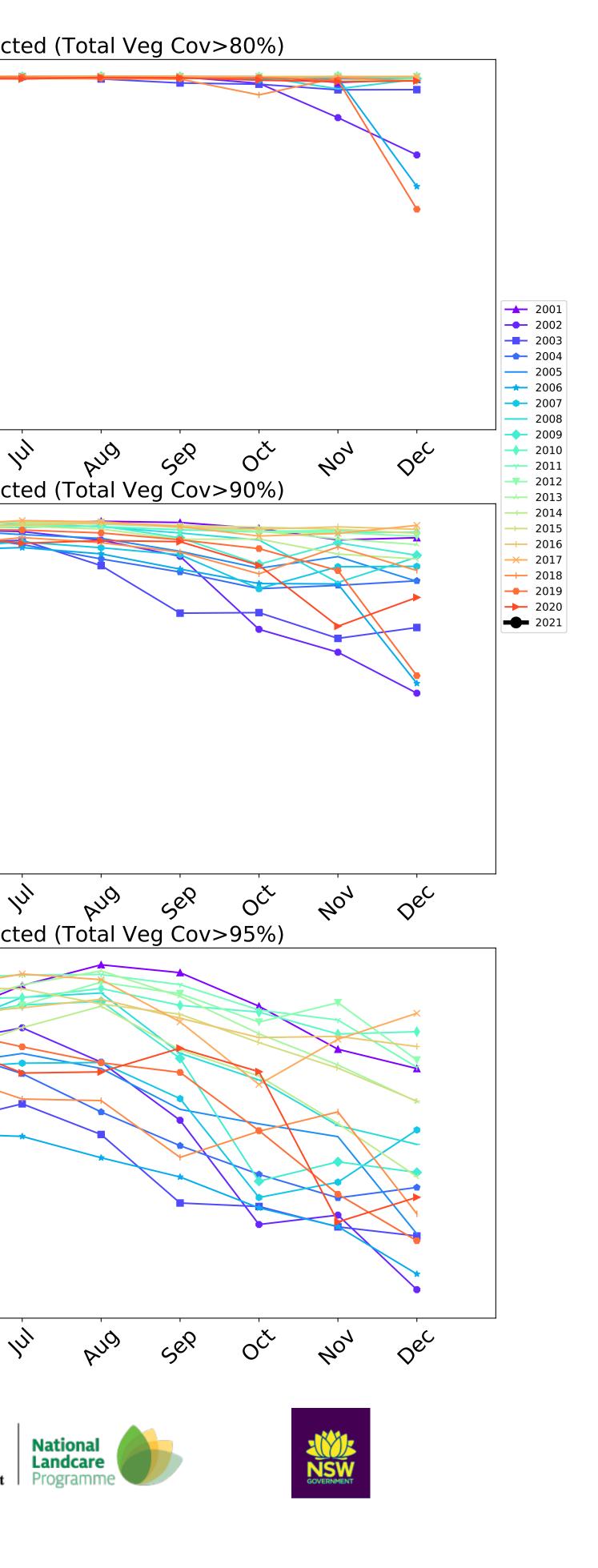


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

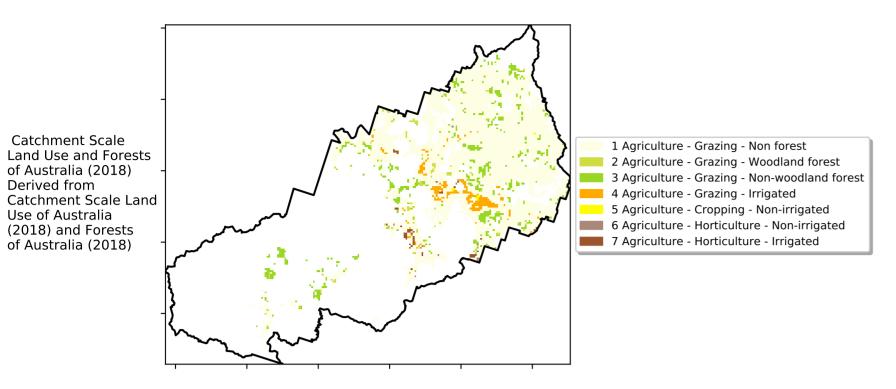




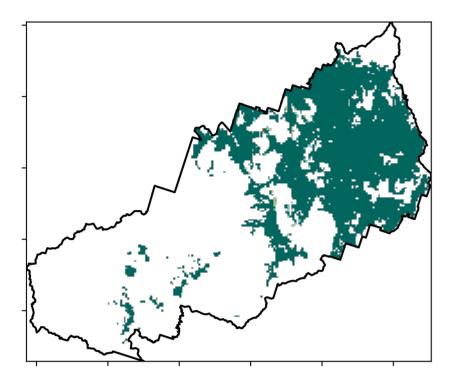
## Agriculture

Land use and forest cover

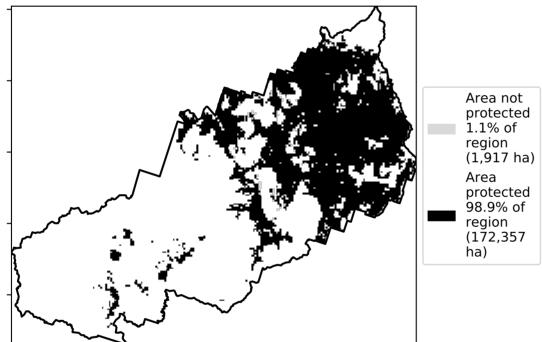


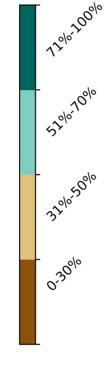


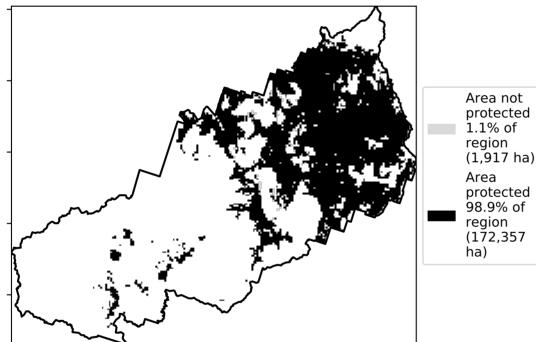
**Total Vegetation Cover [%]** 

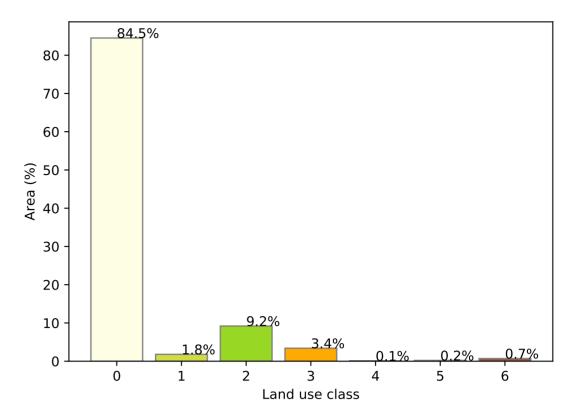


% Area protected from water erosion (>70%)

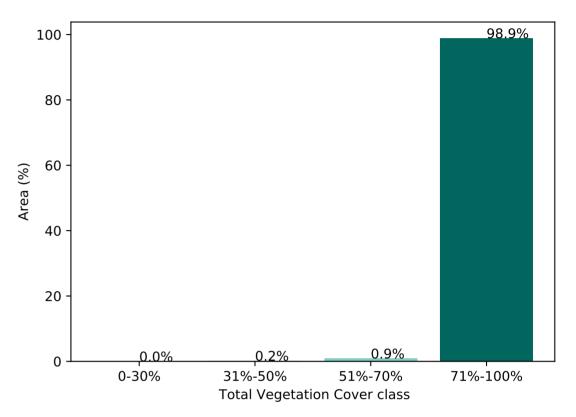




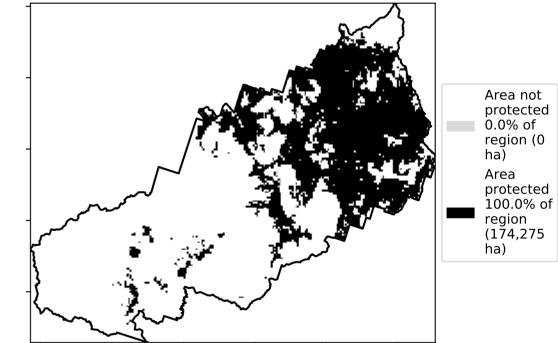




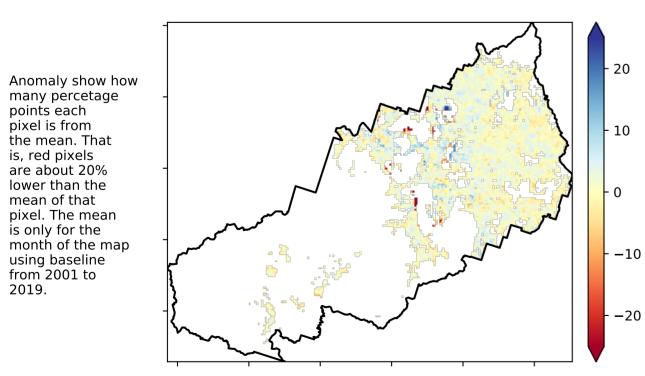
## Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



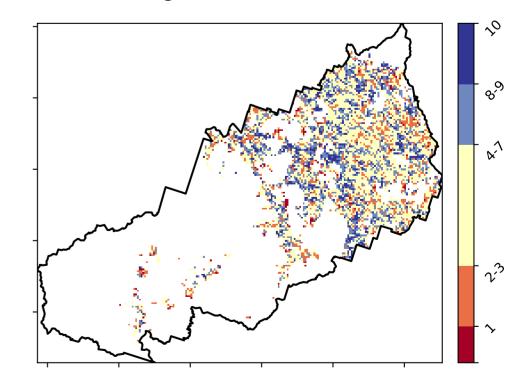
is, red pixels are about 20% lower than the

mean of that

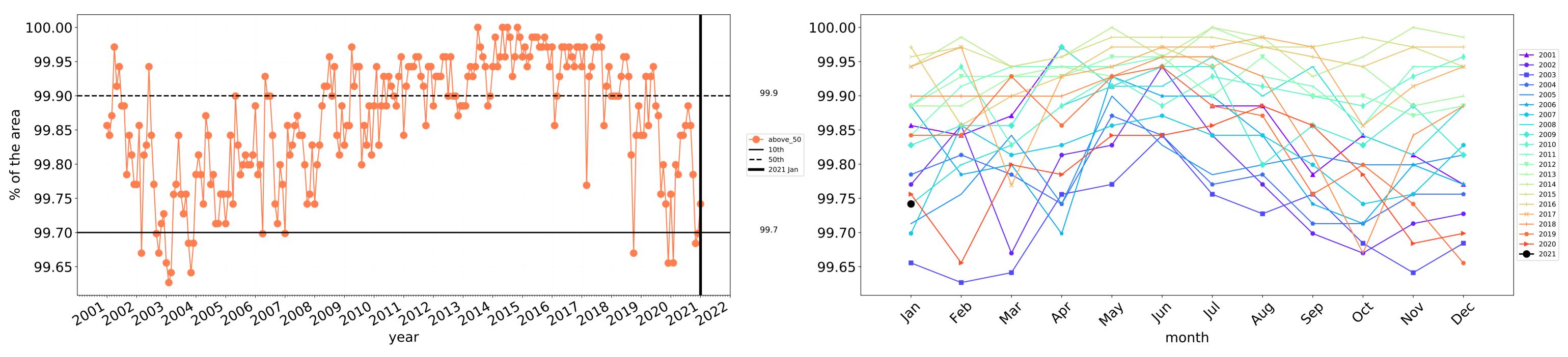
pixel. The mean

using baseline from 2001 to 2019.

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

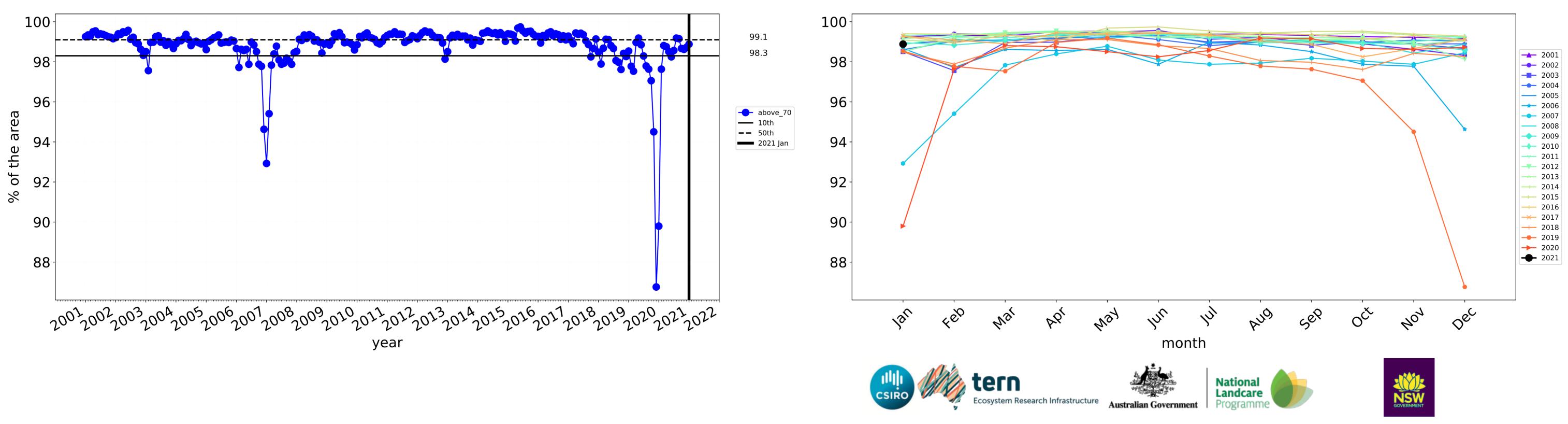






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

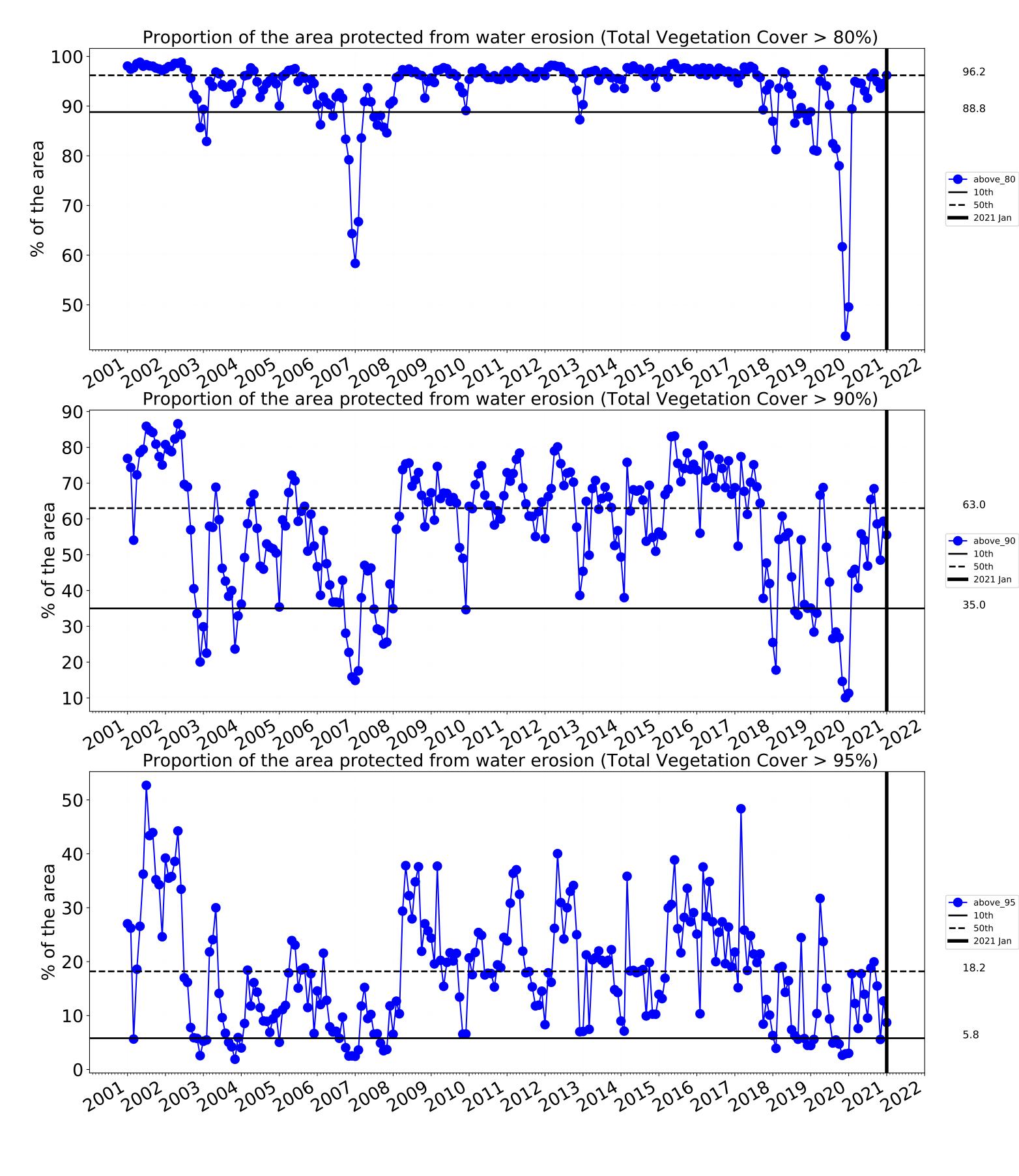




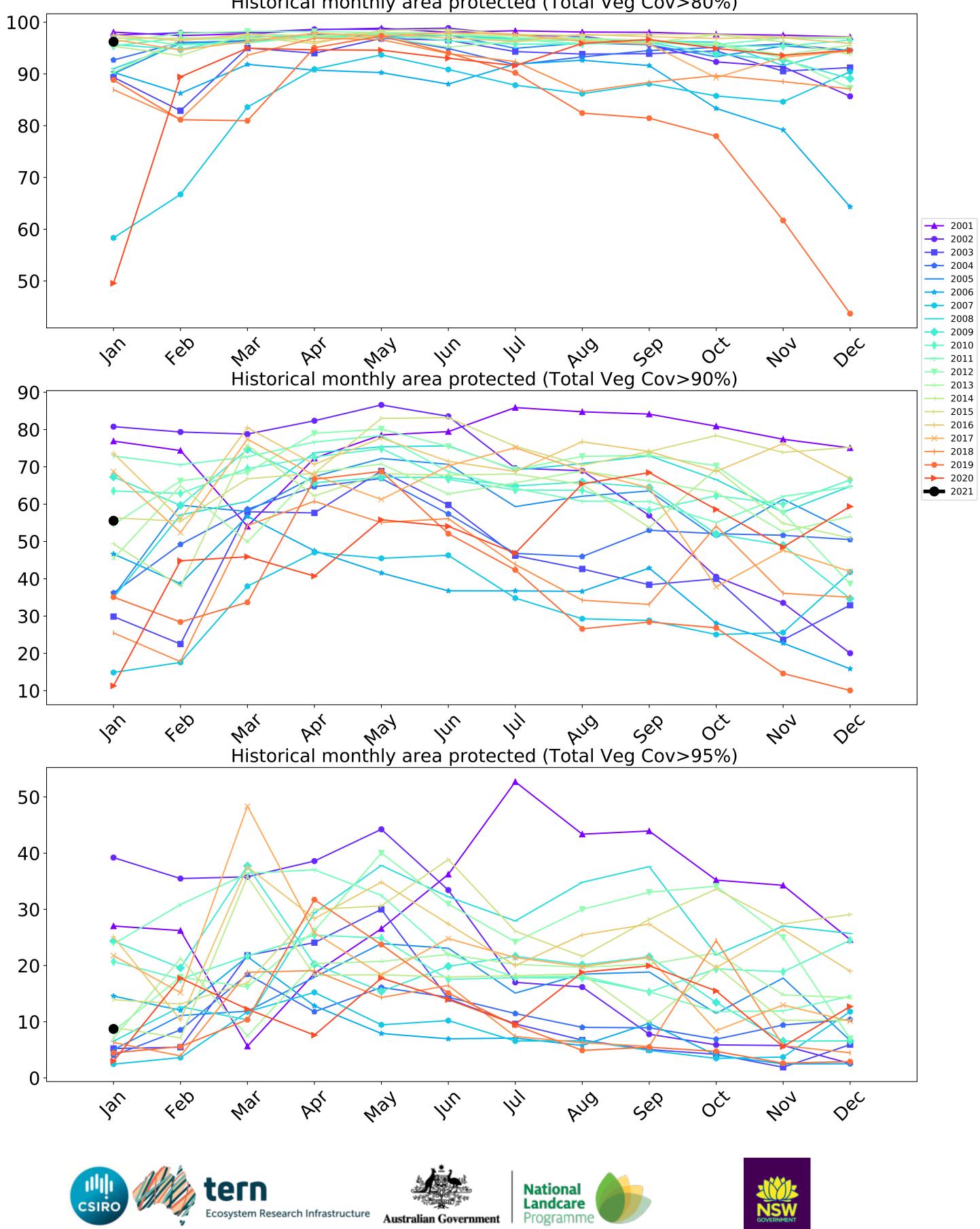
## **Agriculture timeseries**

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

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



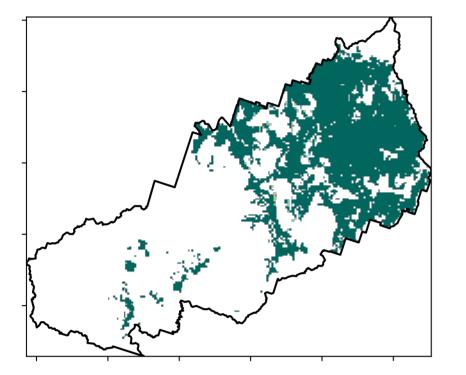
Historical monthly area protected (Total Veg Cov>80%)



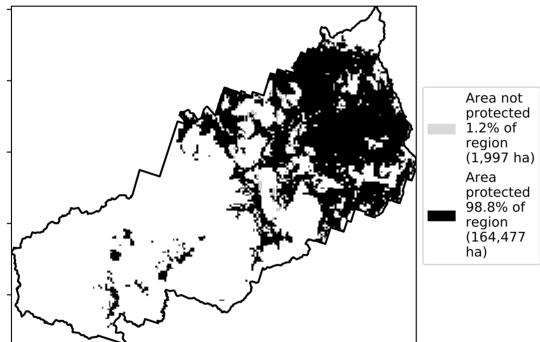
## Grazing

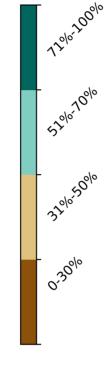
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) -Derived from Catchment Scale Land 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest Use of Australia (2018) and Forests of Australia (2018)

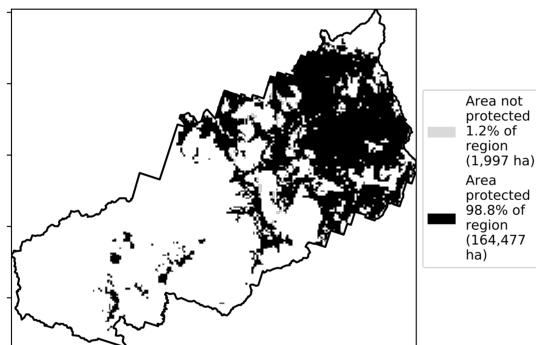
**Total Vegetation Cover [%]** 



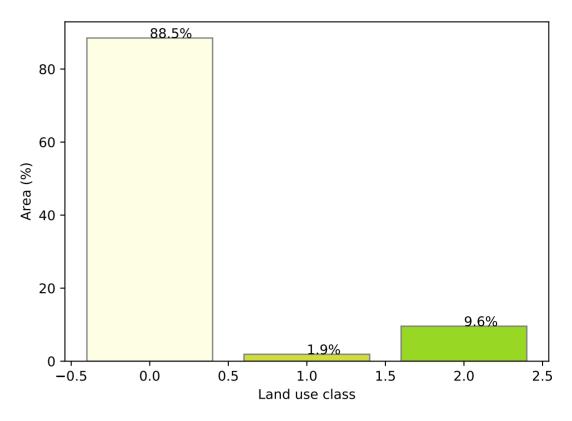
% Area protected from water erosion (>70%)



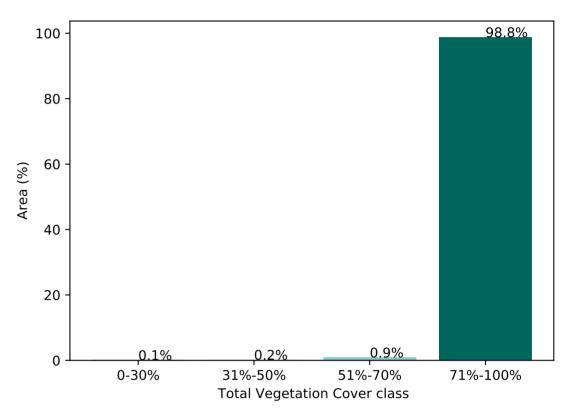




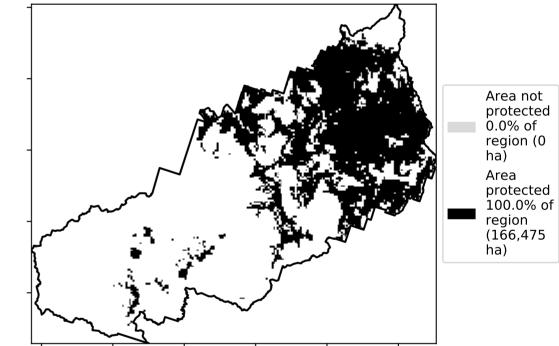
Proportion of each land class in area



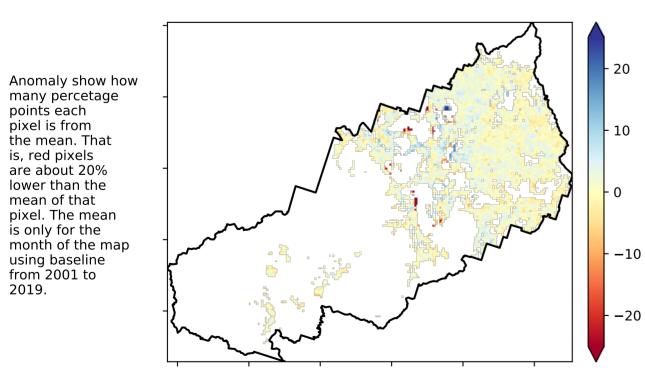
Proportion of vegetation cover class in area



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

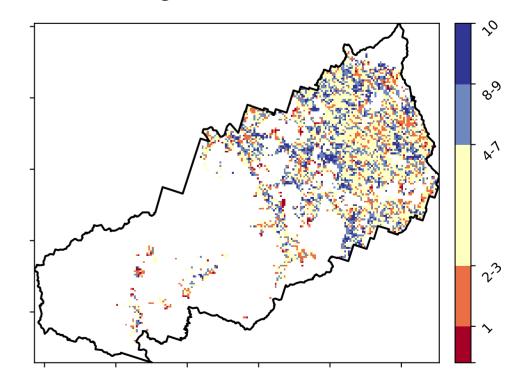


**Total Vegetation Cover Anomaly [%]** 

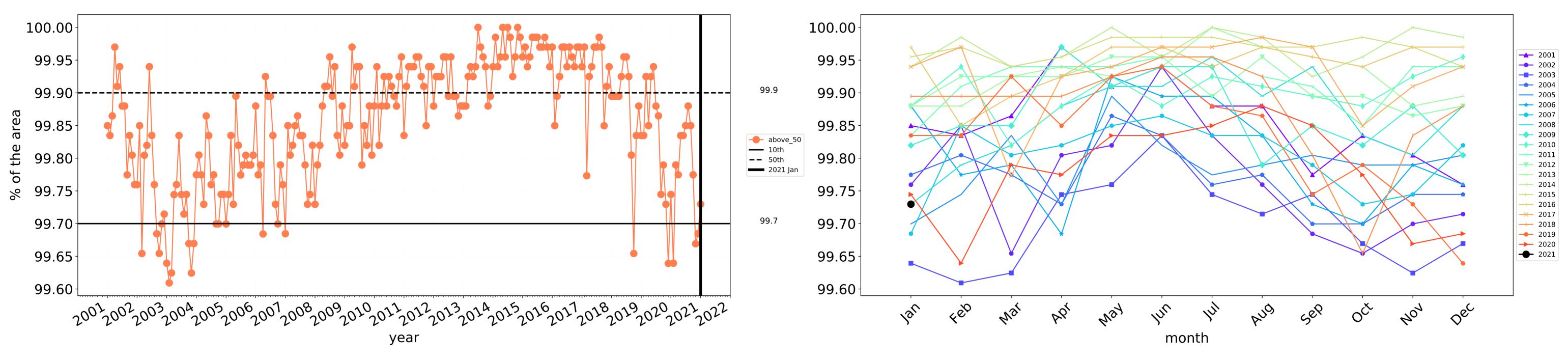


mean of that

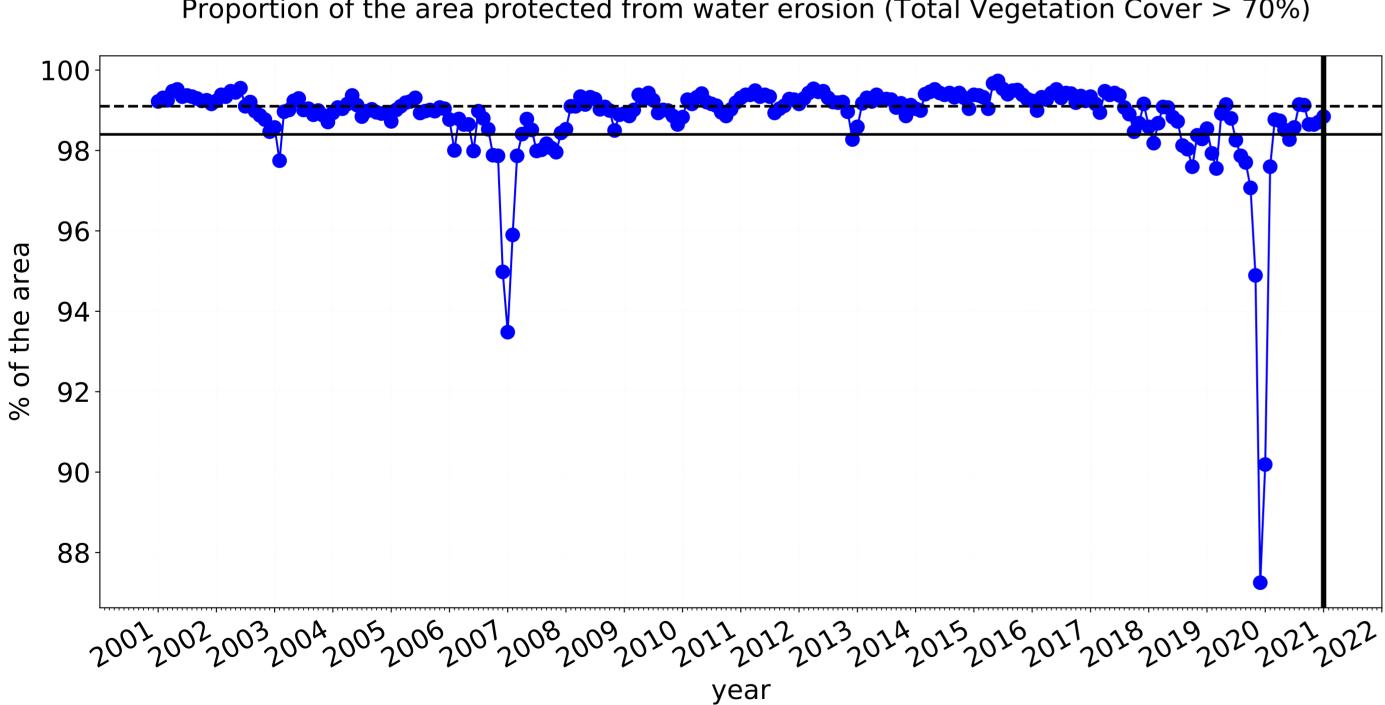
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.







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

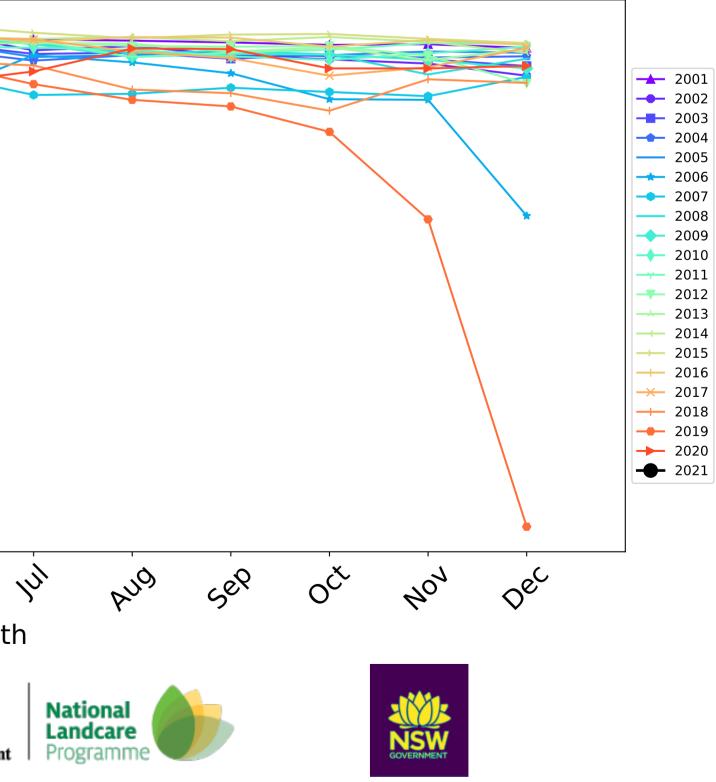


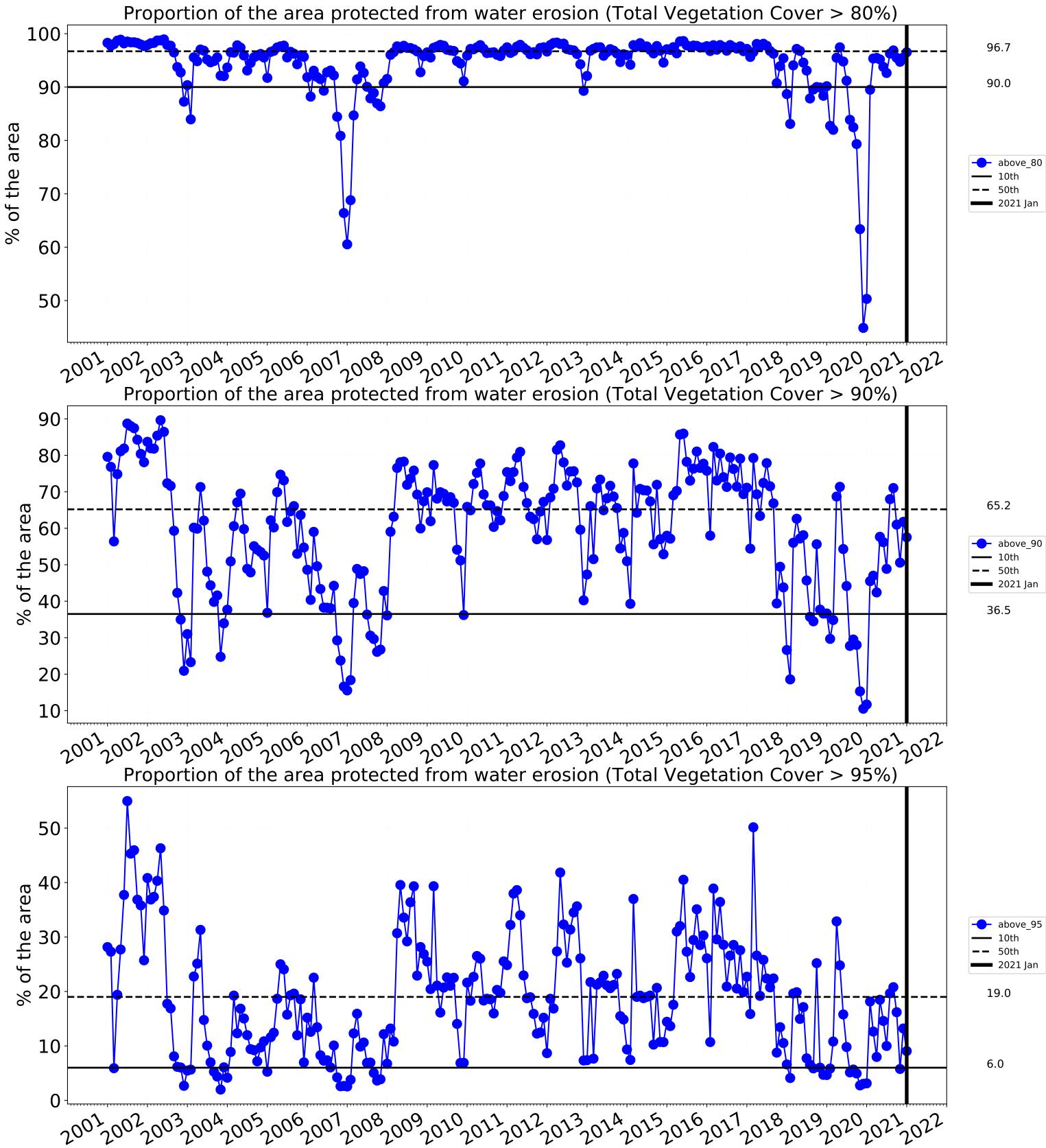
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

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

100-99.1 98.4 98 96 ---- above\_70 **—** 10th **--** 50th **——** 2021 Jan 94 92 90 88 feb lar May Inu hay . PQ month tern Ecosystem Research Infrastructure Australian Government

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







96.7

90.0

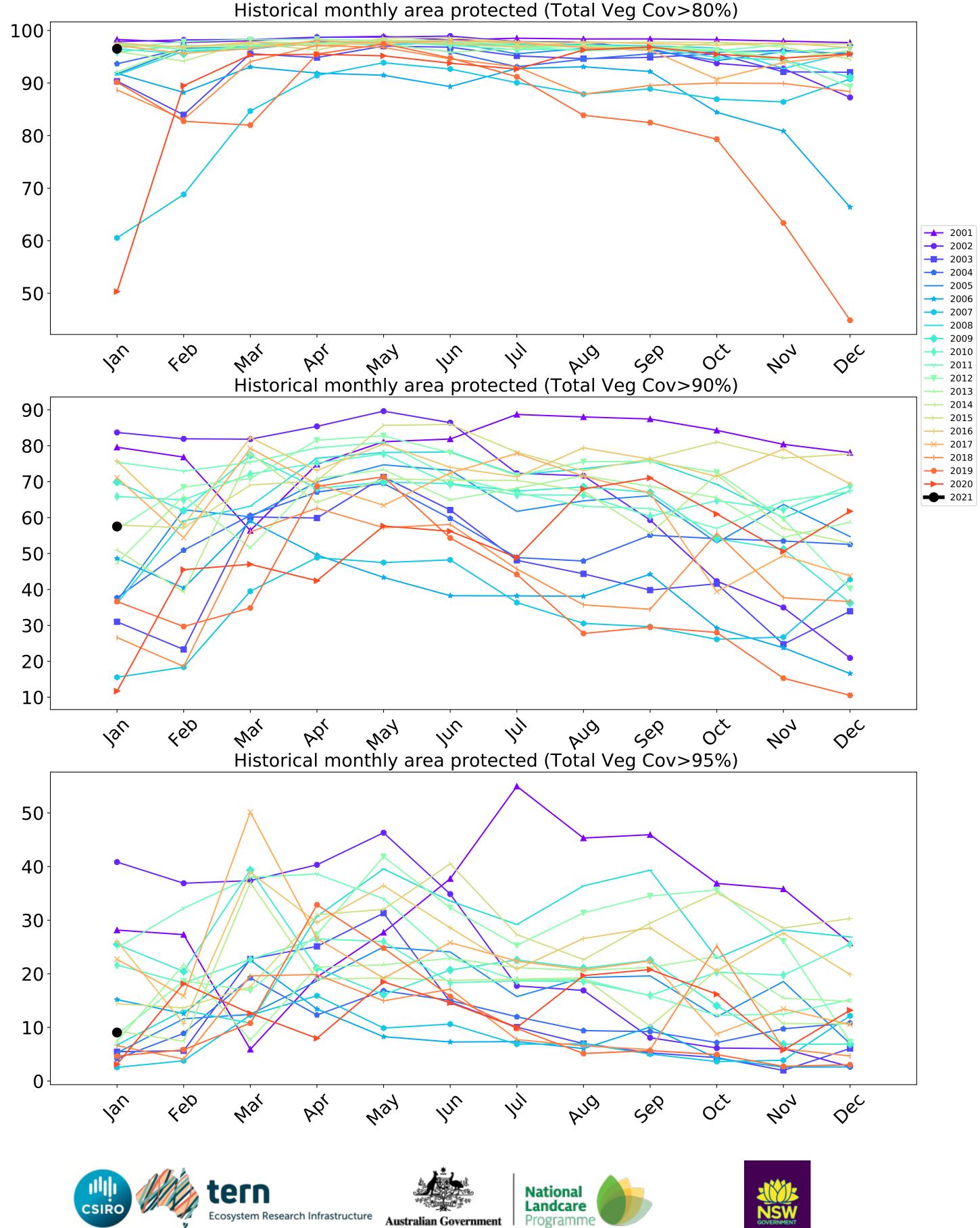
65.2

36.5

19.0

6.0

---- above 90





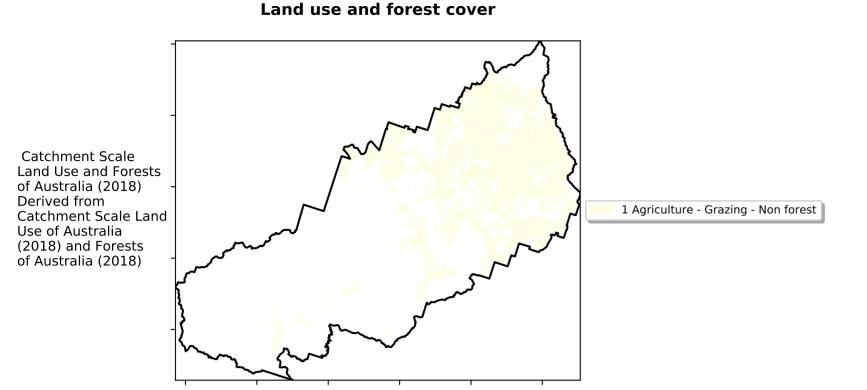
## **Grazing non forest**

12%200%

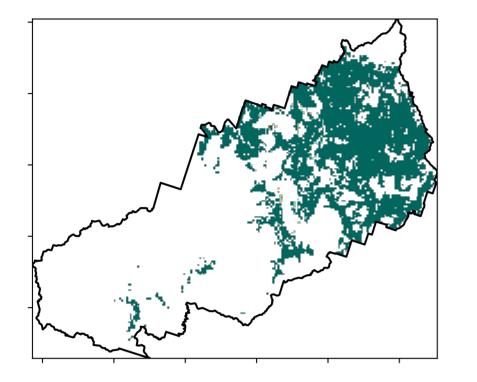
52°1010°1

320050010

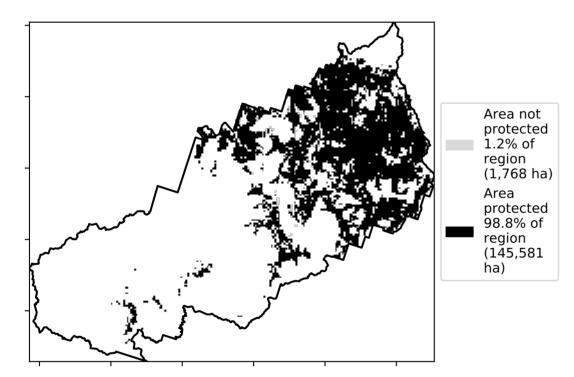
0.30%



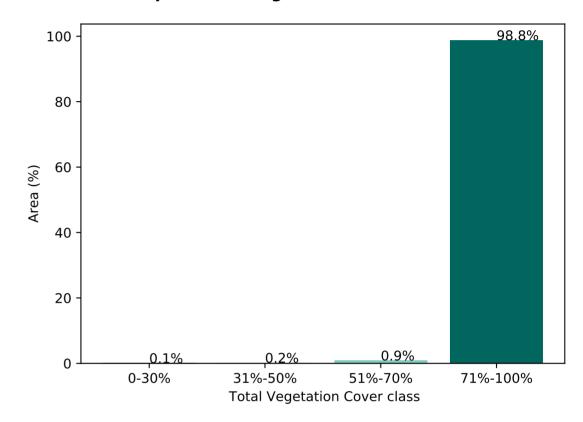
**Total Vegetation Cover [%]** 



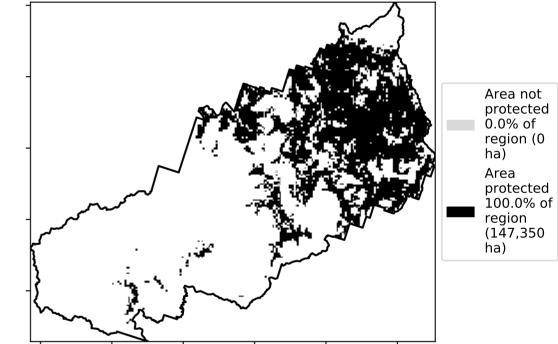
% Area protected from water erosion (>70%)



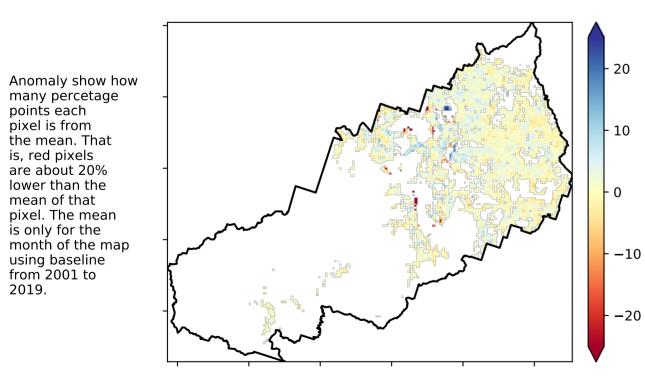
Proportion of vegetation cover class in area



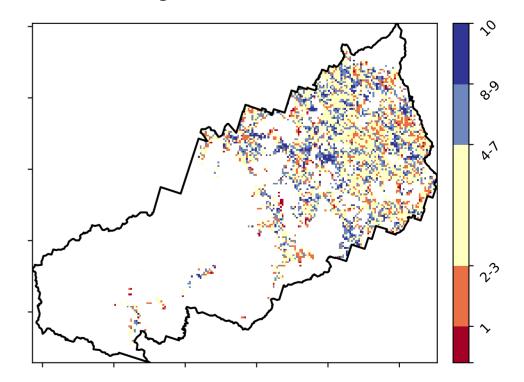
#### % Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

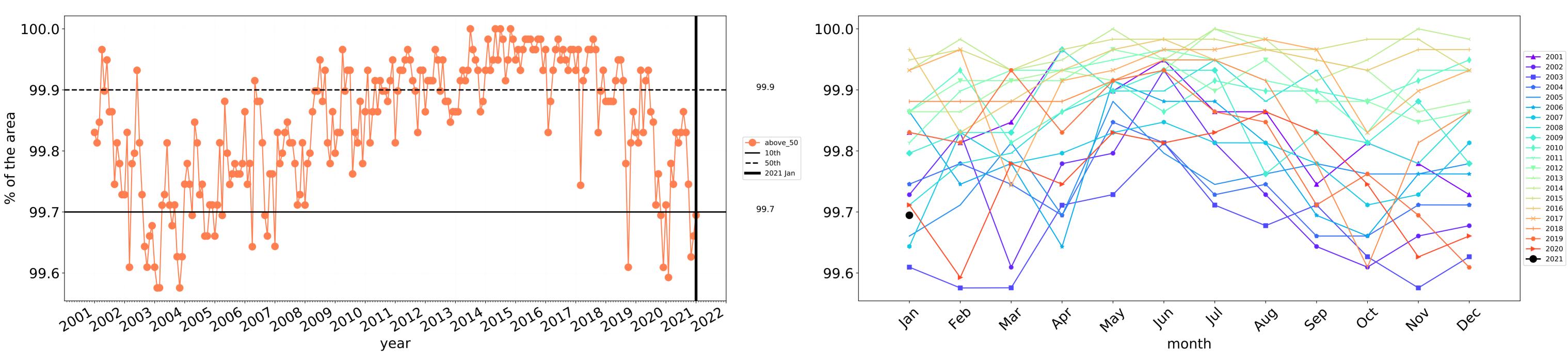


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



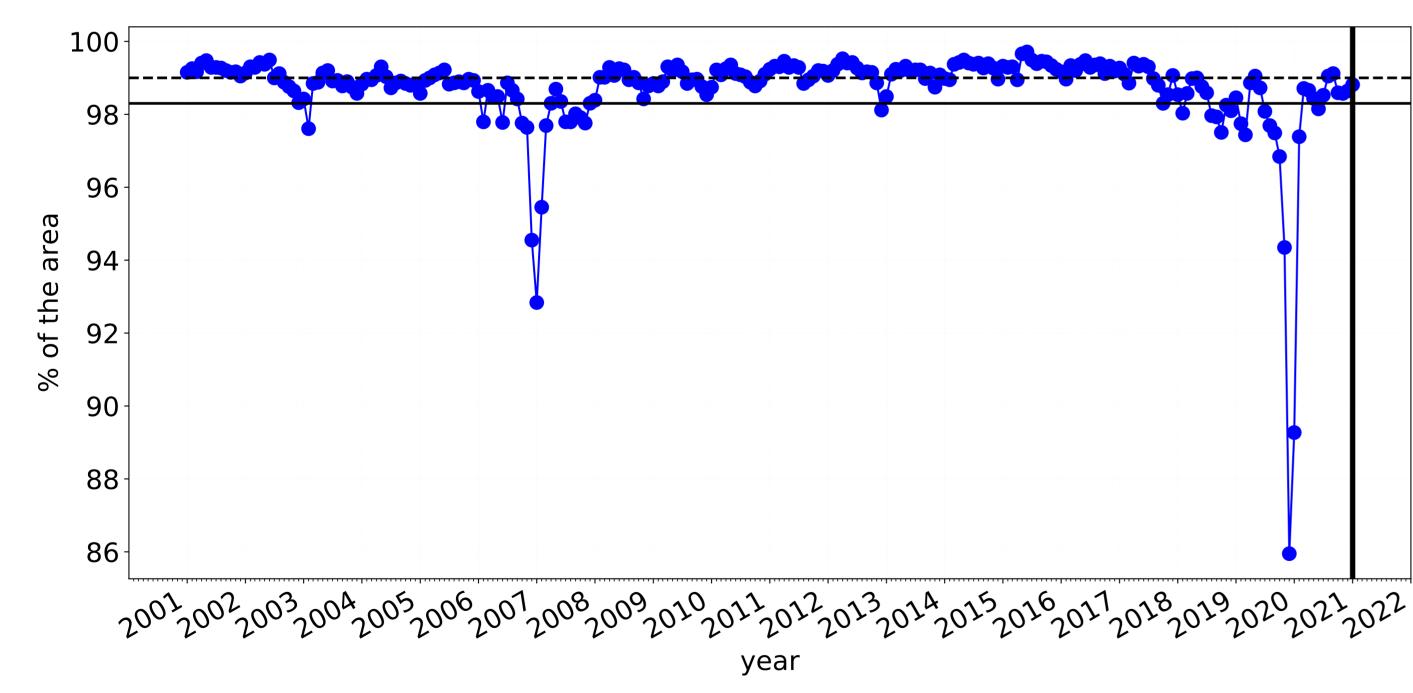




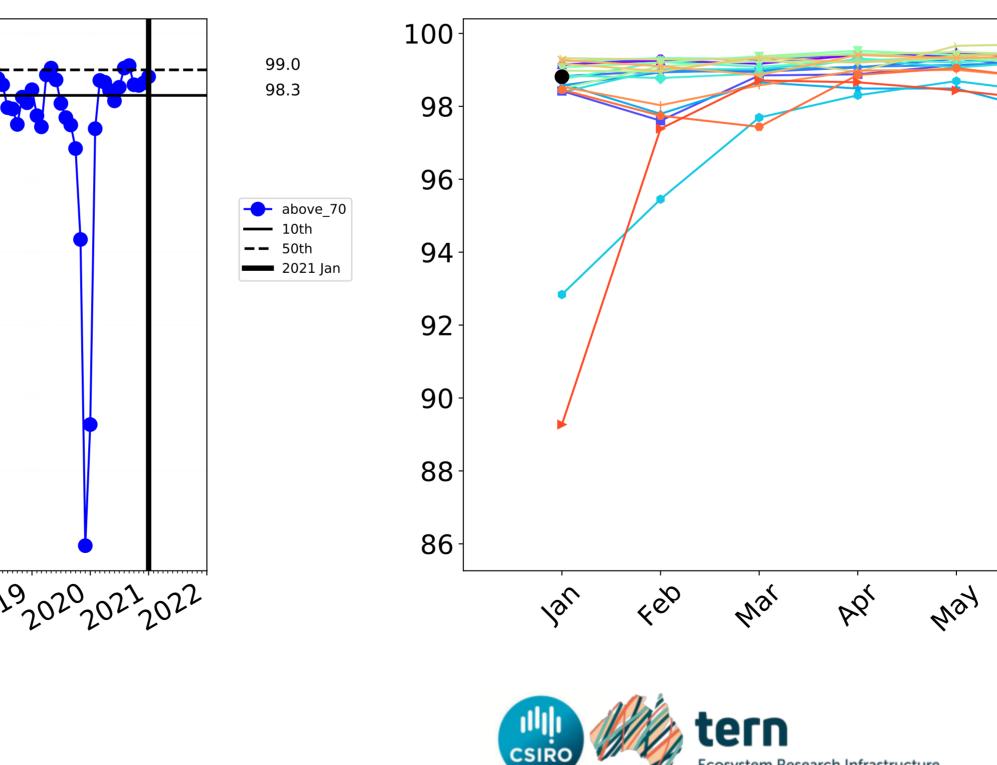


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



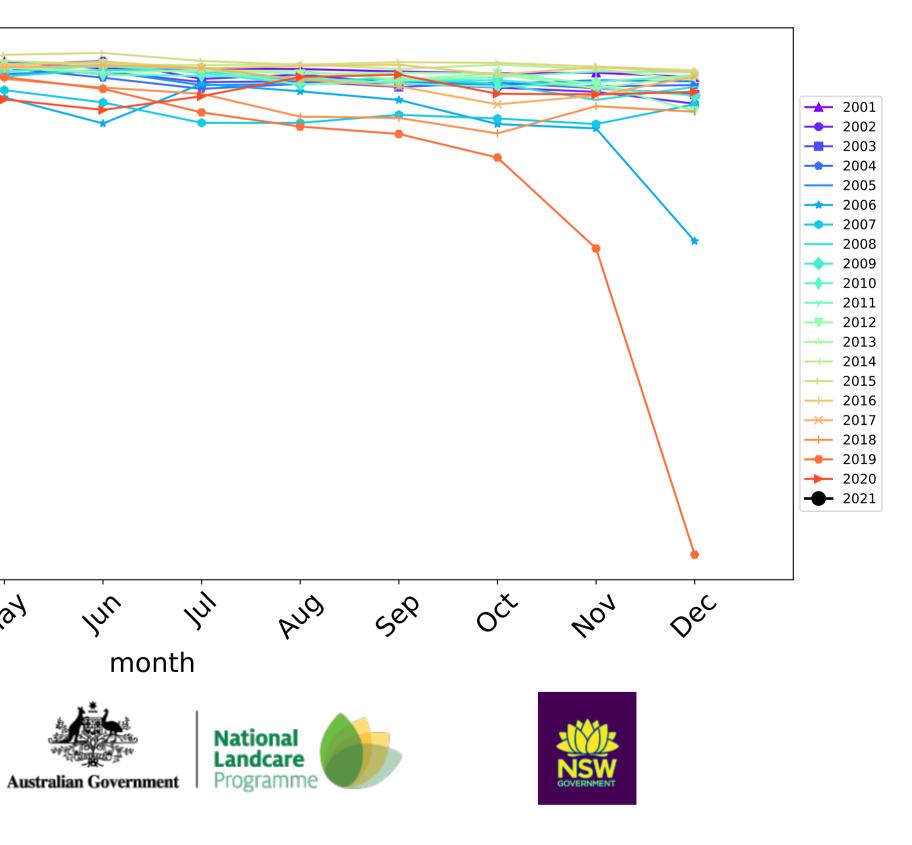
Wind erosion historical monthly area protected (Total Veg Cov >50%)

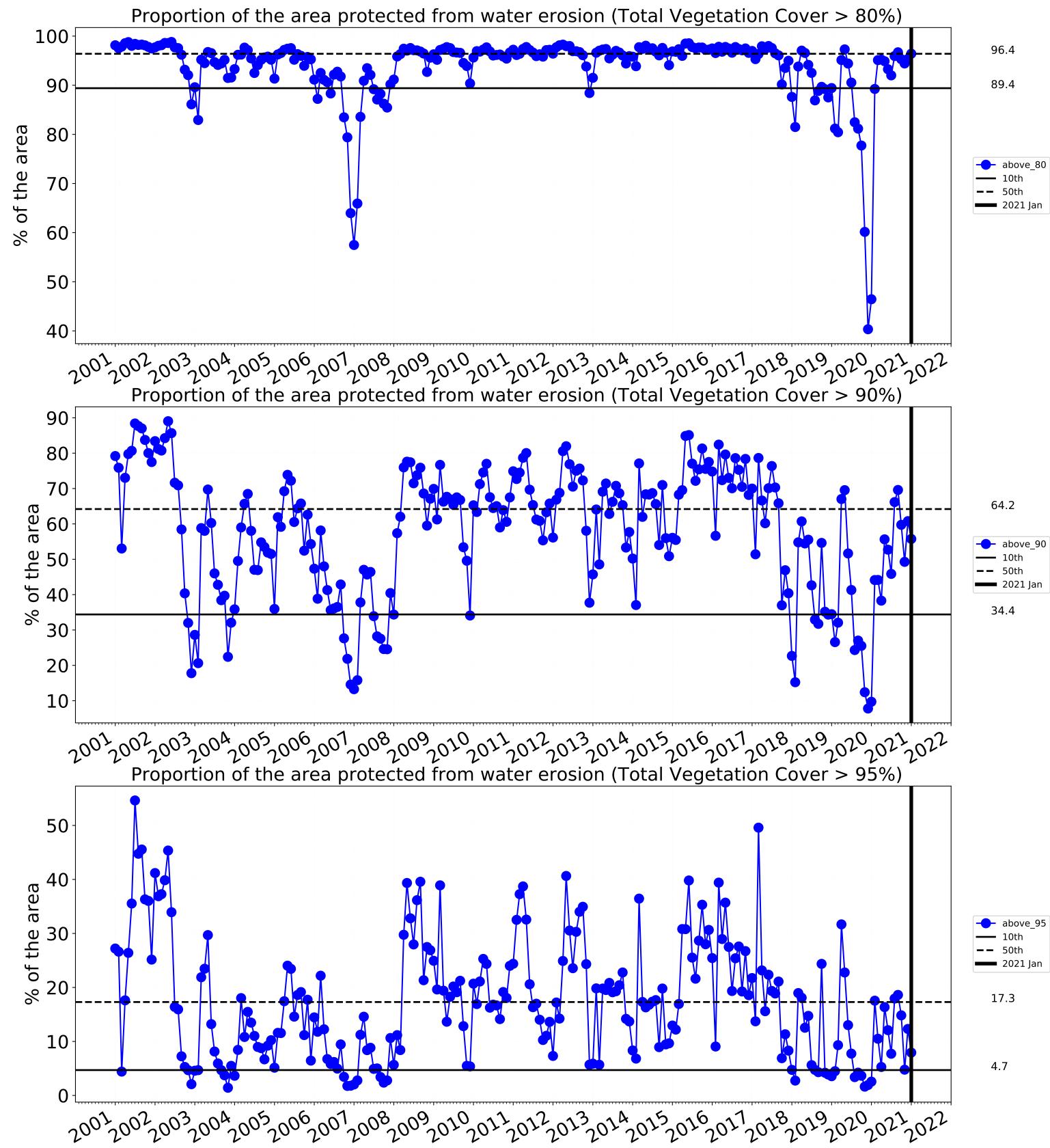


Water erosion historical monthly area protected (Total Veg Cov>70%)

Ecosystem Research Infrastructure

In





96.4

89.4

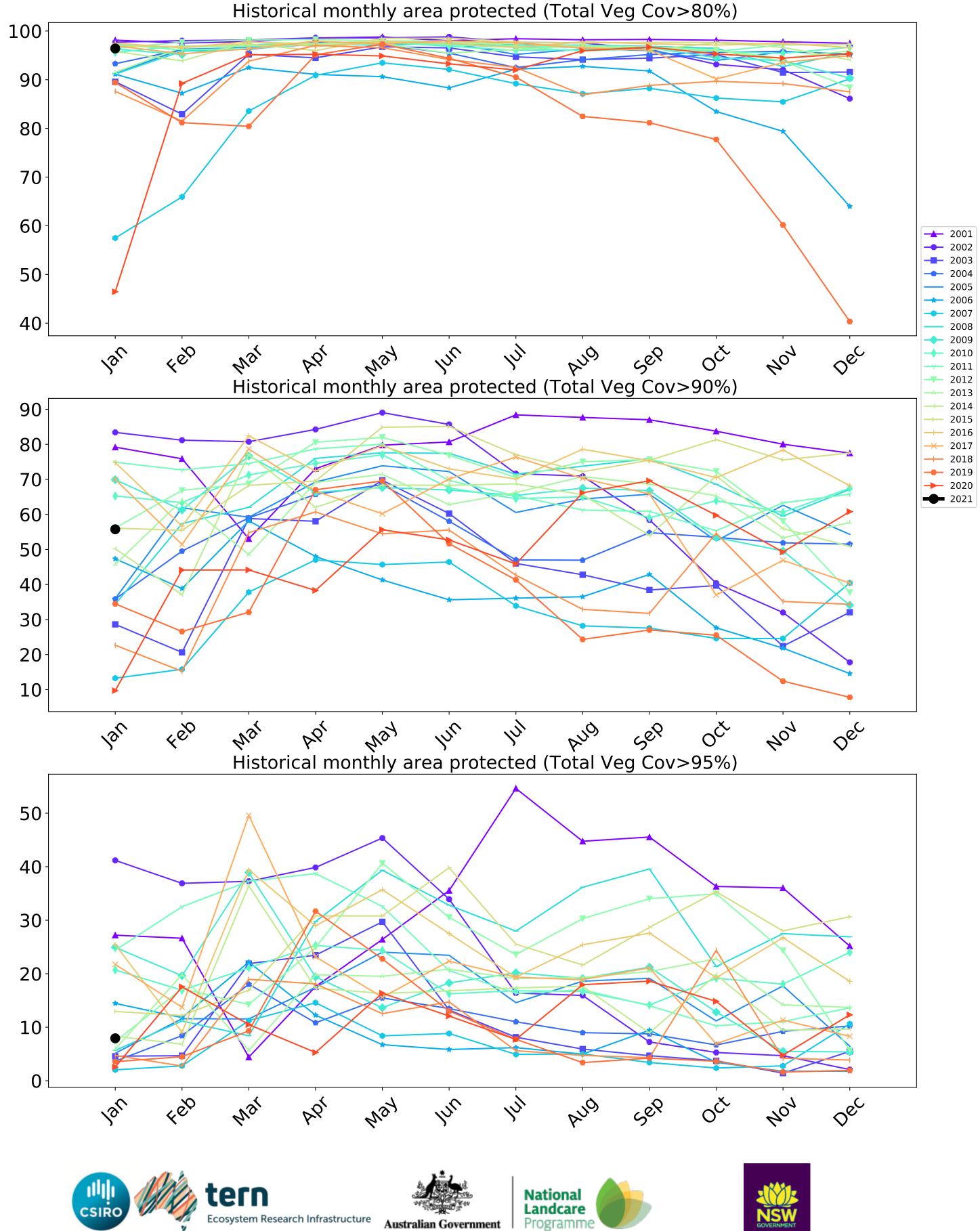
64.2

34.4

17.3

4.7

above\_90





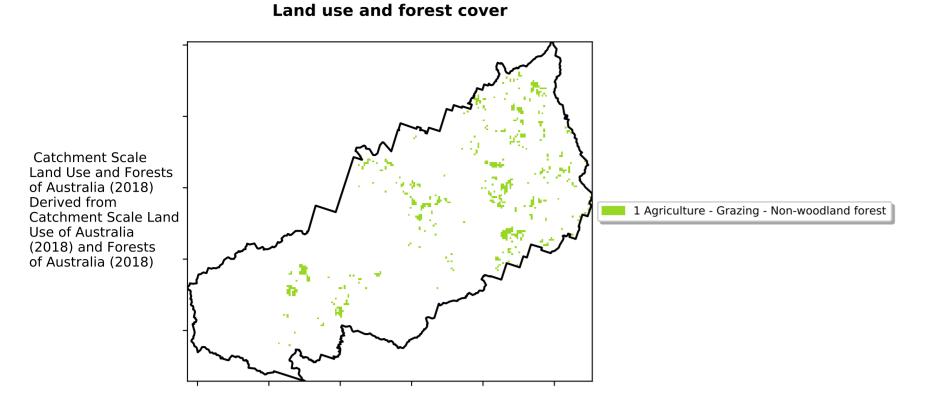
## **Grazing - Forest (non woodland)**

12/07/00/

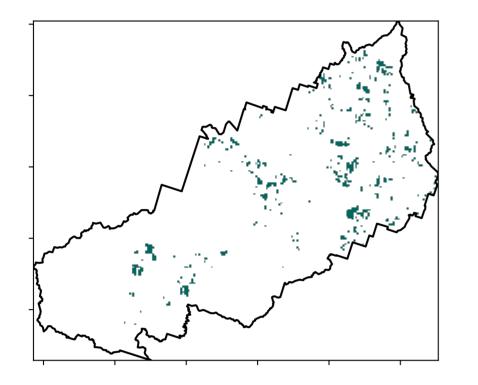
52010010

· 32°10,50°10

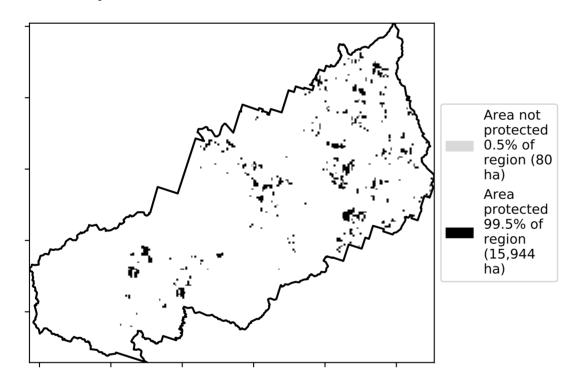
0.30%



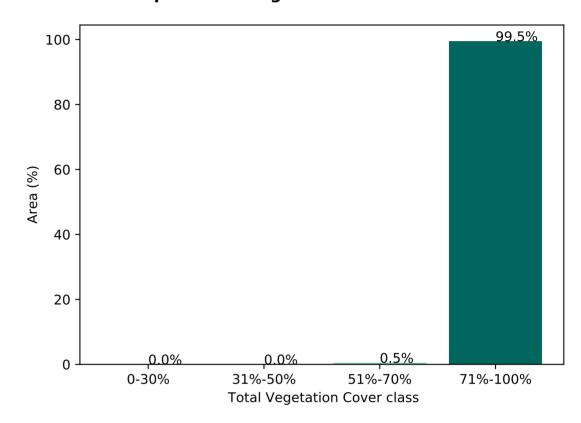
Total Vegetation Cover [%]



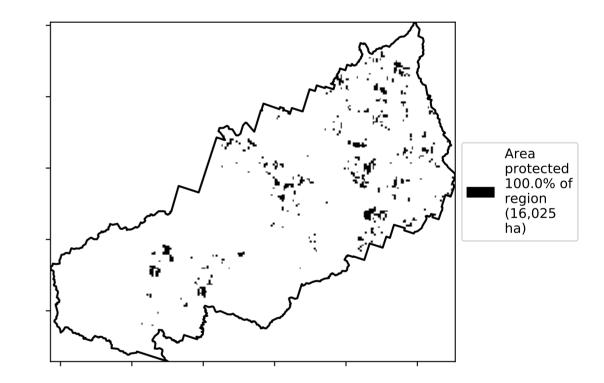
% Area protected from water erosion (>70%)



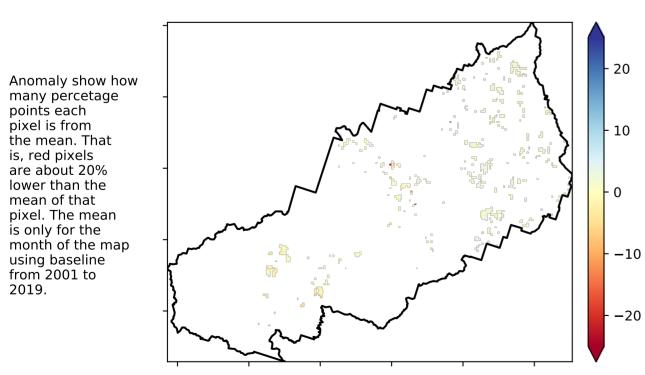
Proportion of vegetation cover class in area



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

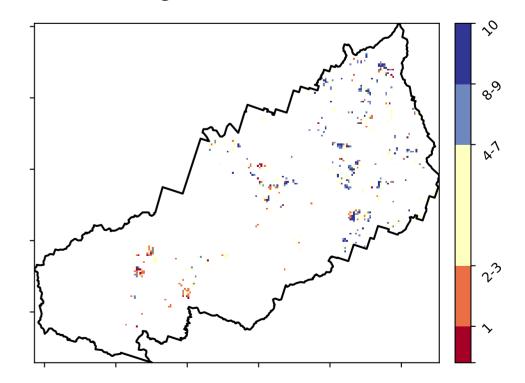


Total Vegetation Cover Anomaly [%]

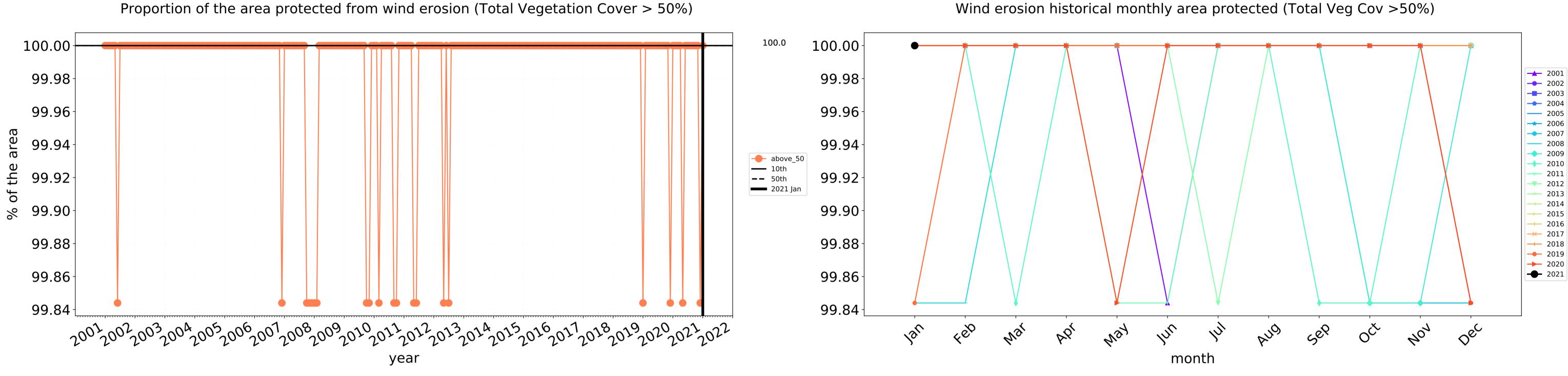


lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

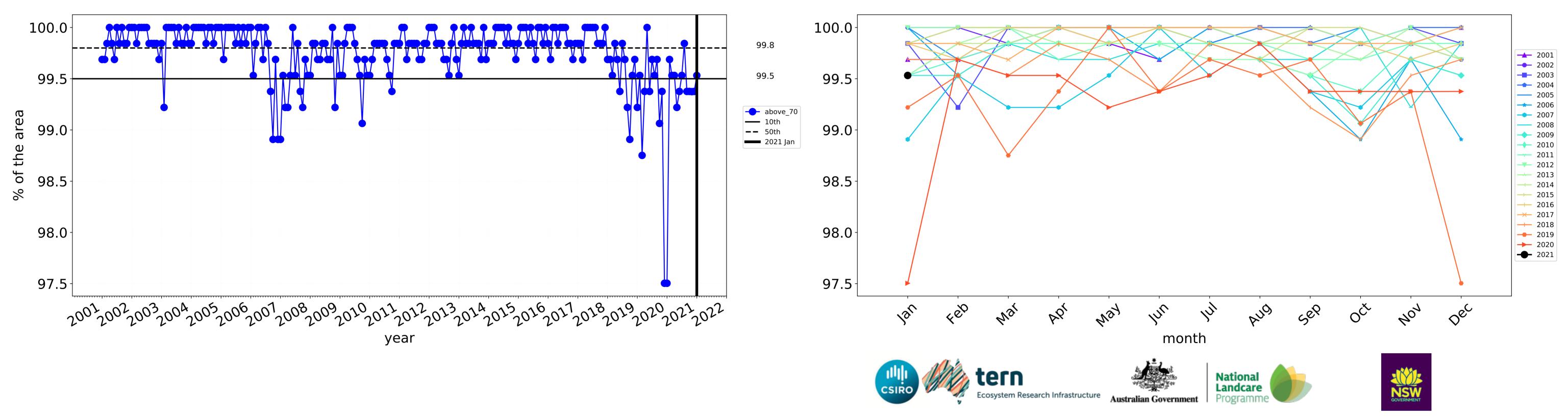
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



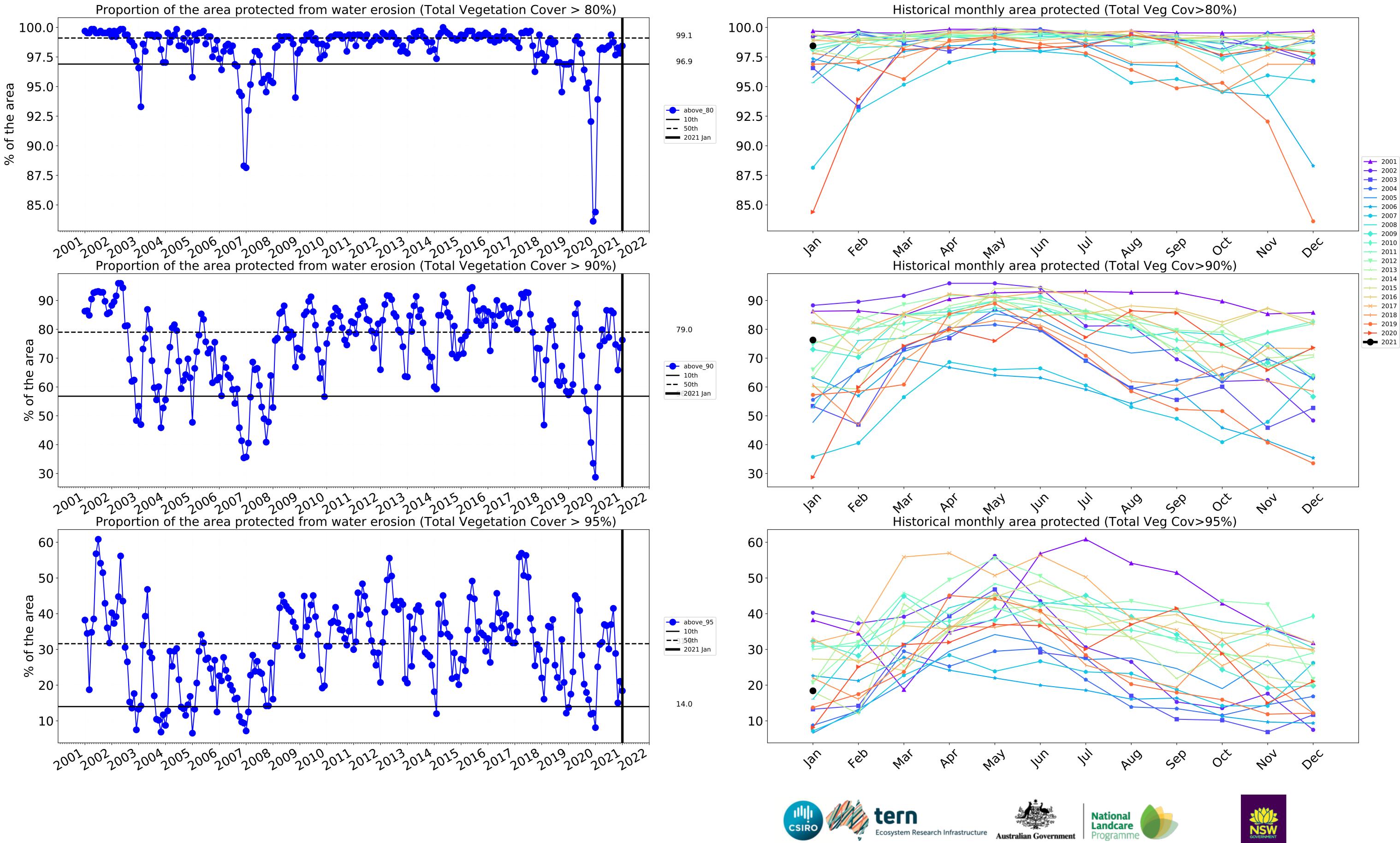




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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



## Irrigation

12%100%

· 52°10 TO°10

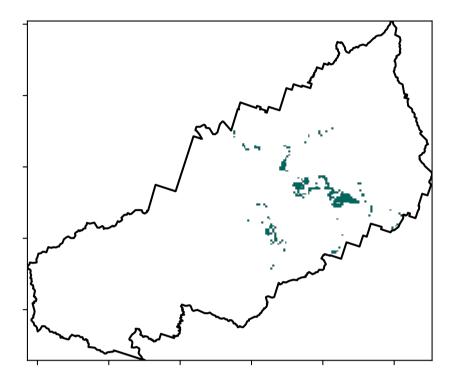
32°10,50°10

0.30%

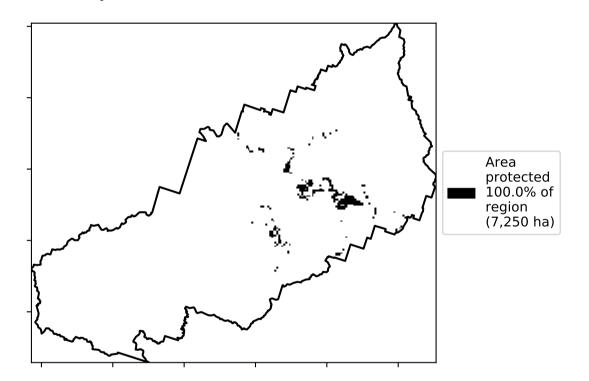
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land 1 Agriculture - Grazing - Irrigated 2 Agriculture - Horticulture - Irrigated Use of Australia (2018) and Forests of Australia (2018)

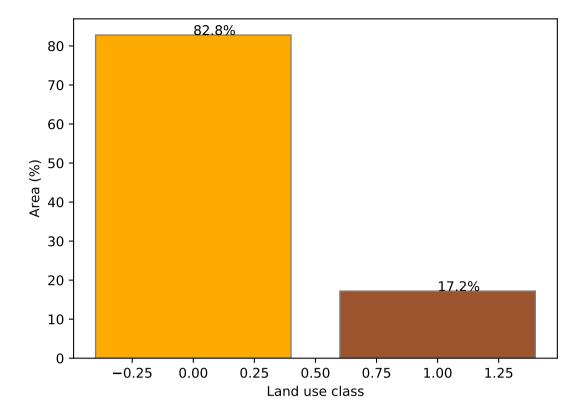
Land use and forest cover

**Total Vegetation Cover [%]** 



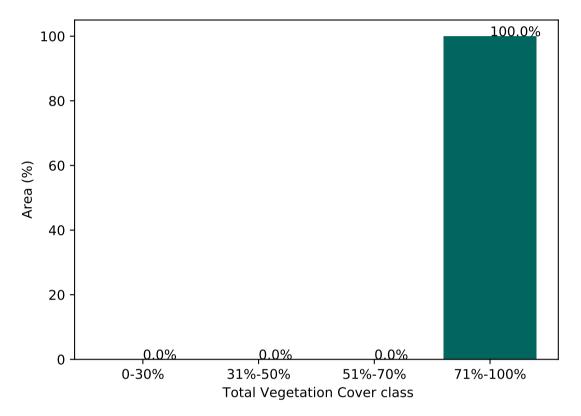
% Area protected from water erosion (>70%)





#### Proportion of each land class in area

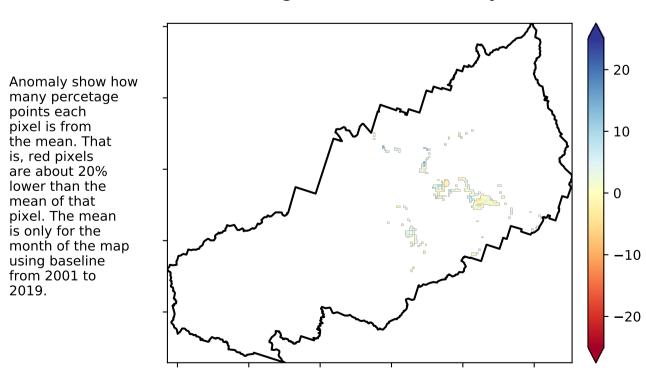
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



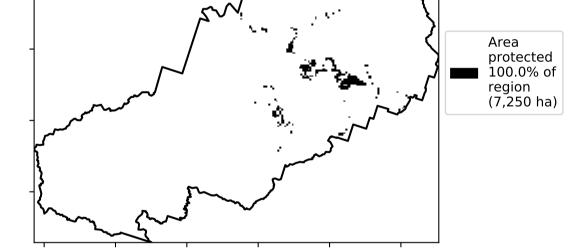
are about 20% lower than the

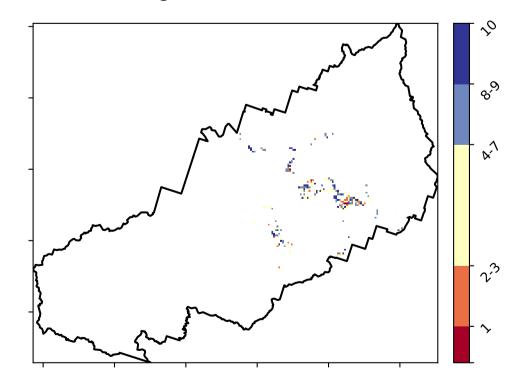
mean of that

pixel. The mean

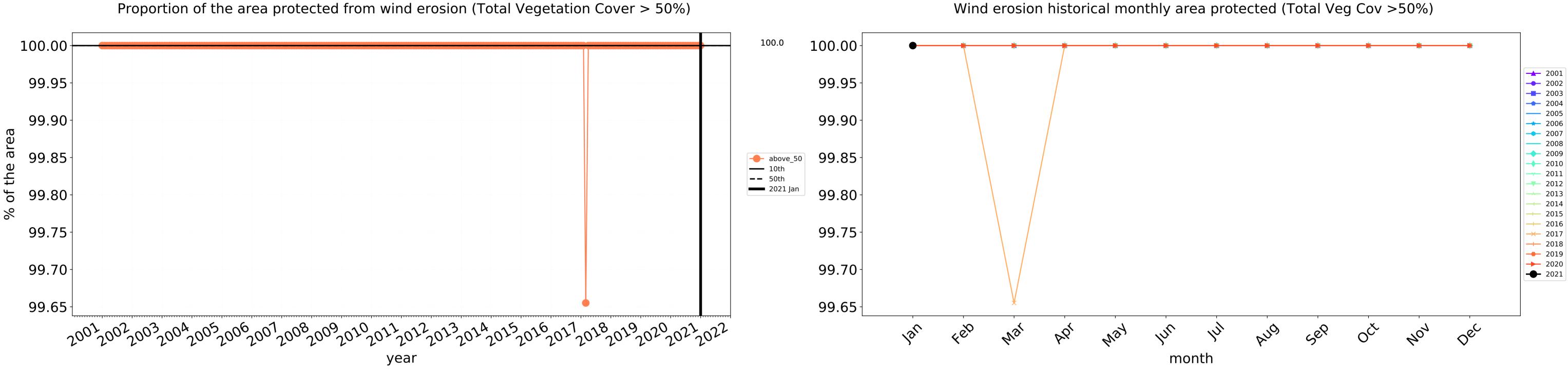
using baseline from 2001 to 2019.

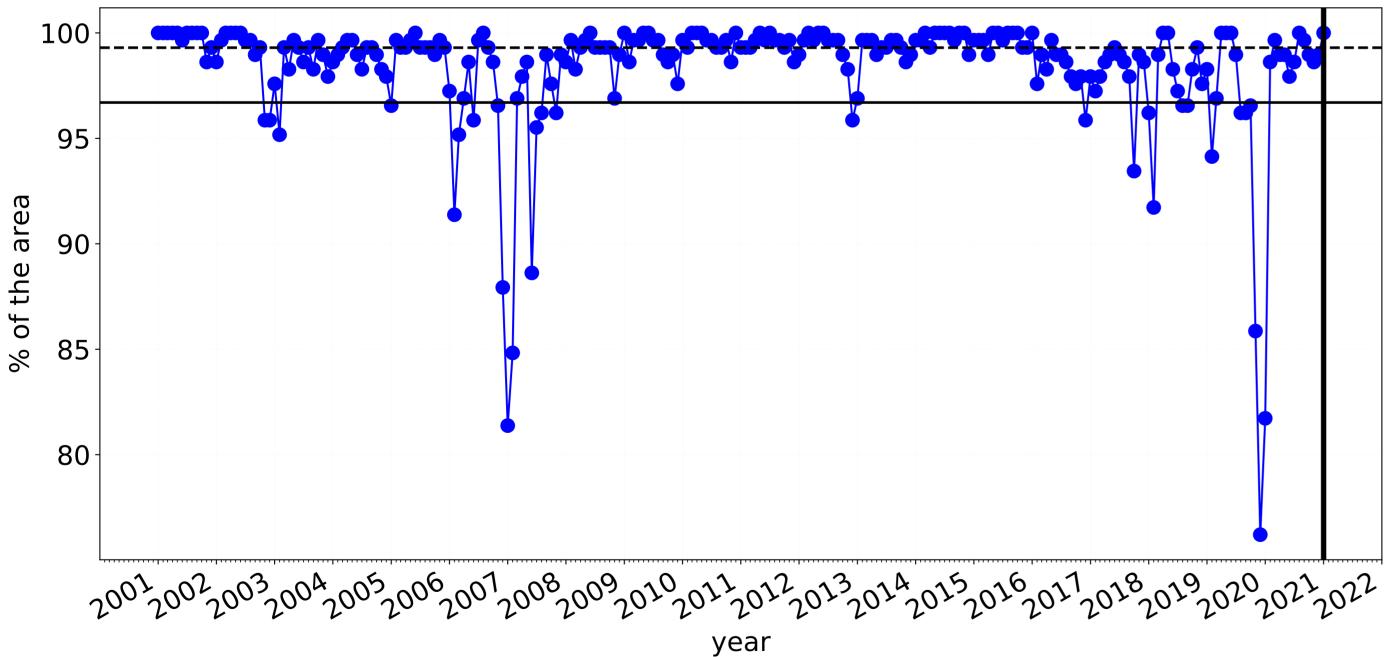
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





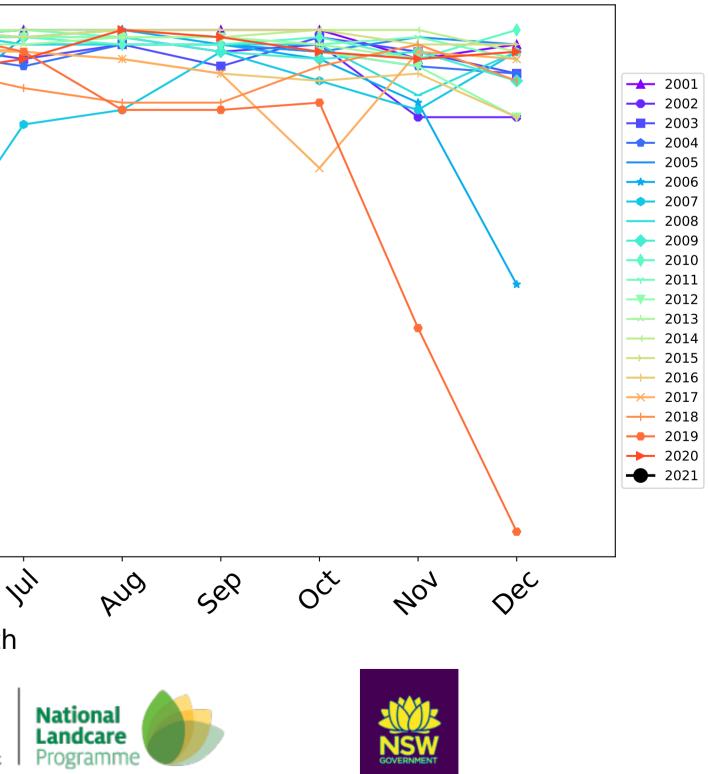


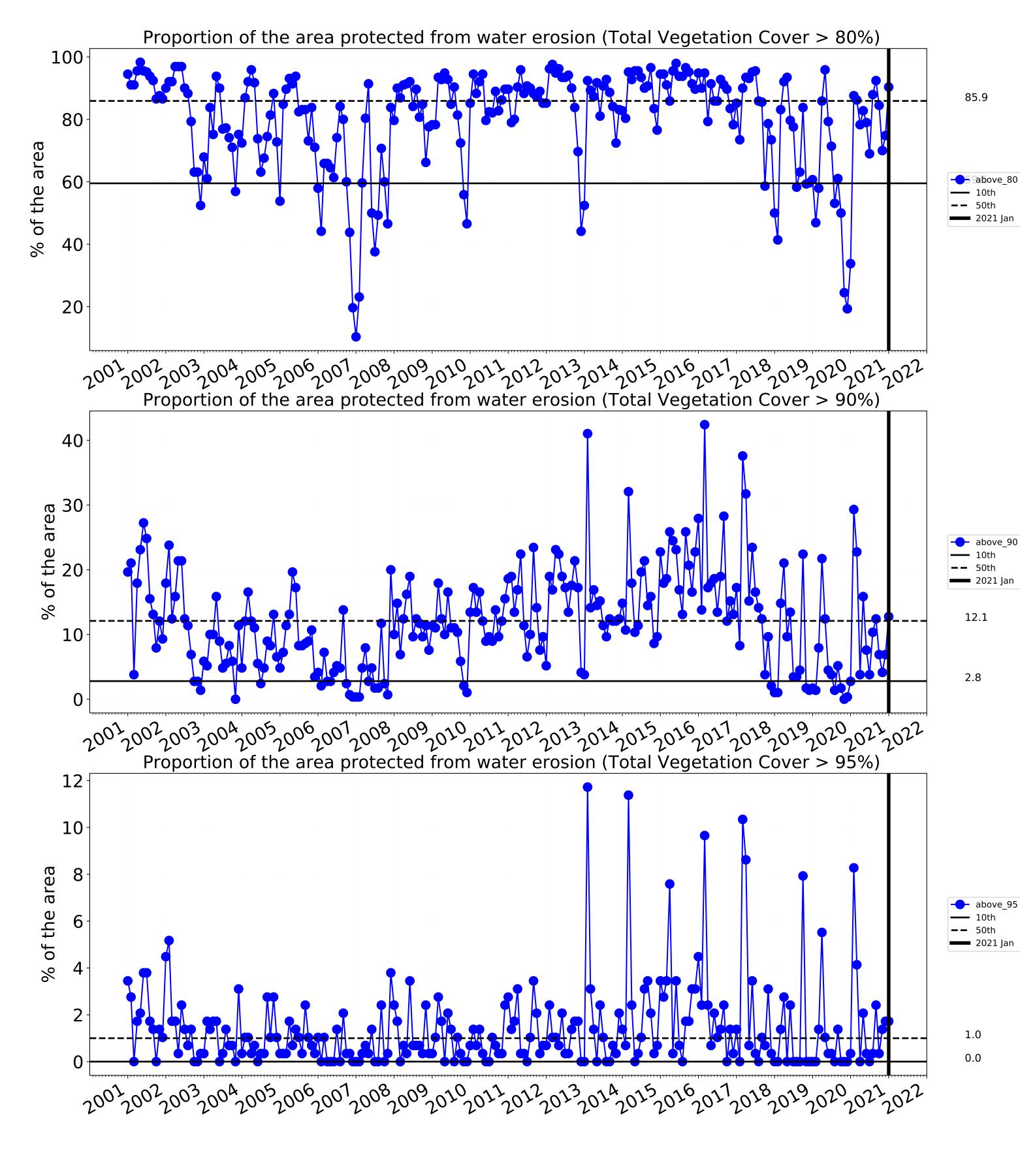


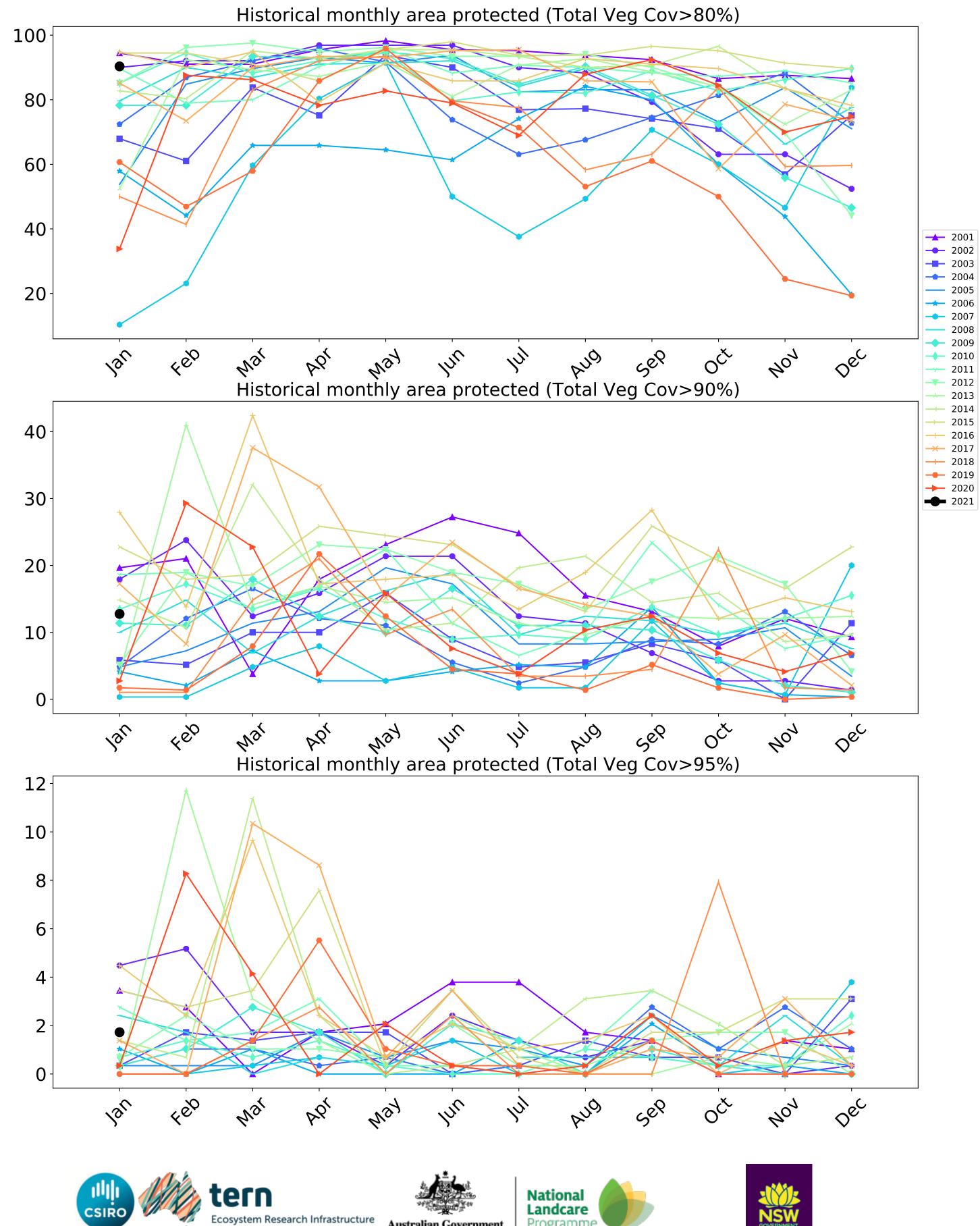


100 99.3 96.7 95 ---- above\_70 **—** 10th **——** 50th 90 **——** 2021 Jan 85 80 4eD Jan May hay . 1sh PQ month tern Ecosystem Research Infrastructure Australian Government

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



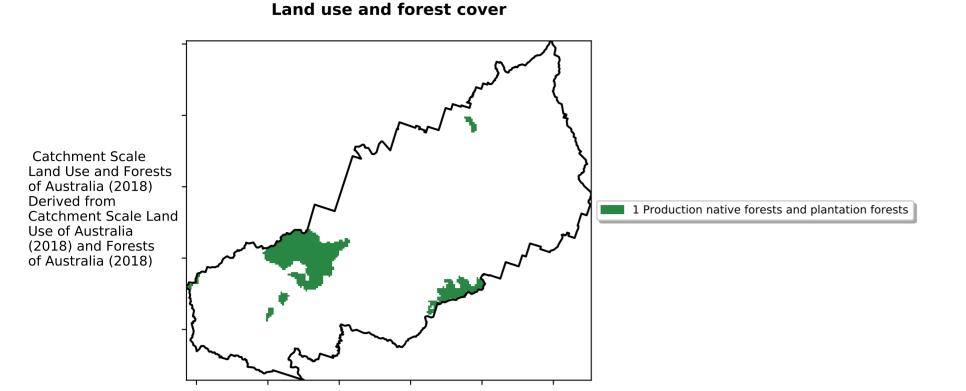




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## **Production native forests and plantation forests**



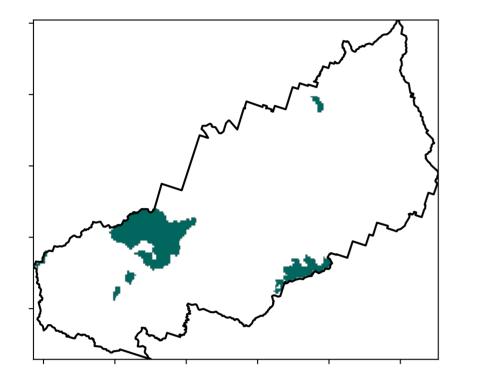
12%200%

52% 70%

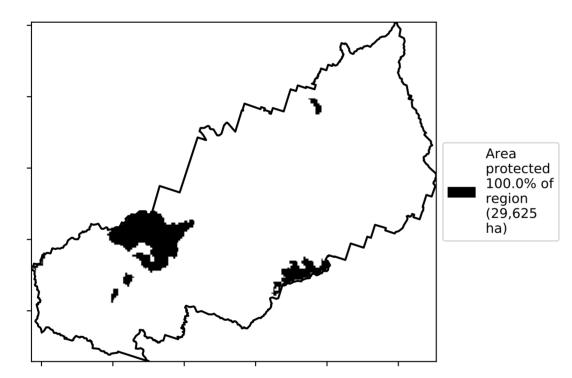
320050010

0.30%

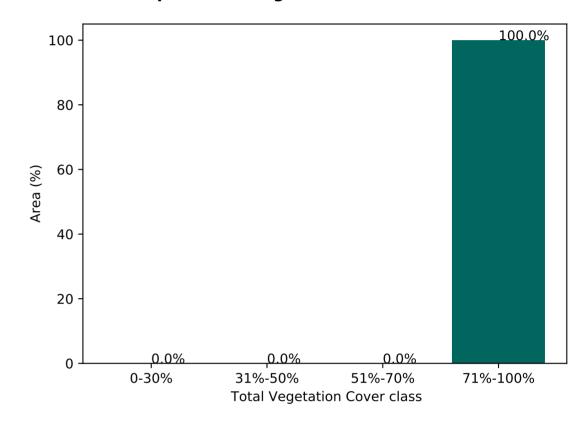
**Total Vegetation Cover [%]** 



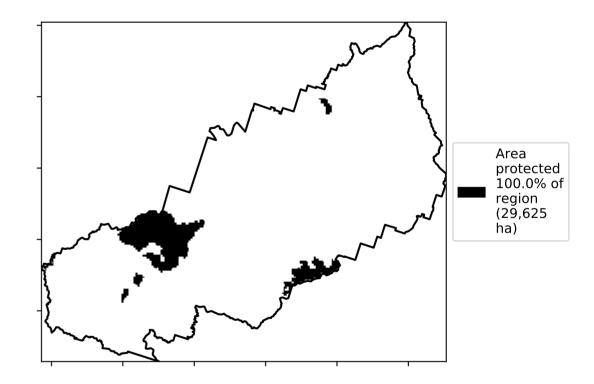
% Area protected from water erosion (>70%)



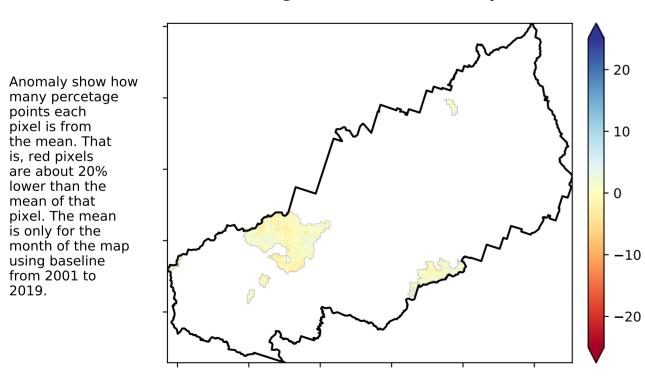
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



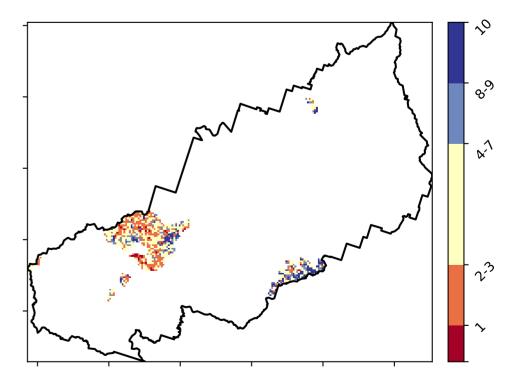
are about 20% lower than the

mean of that

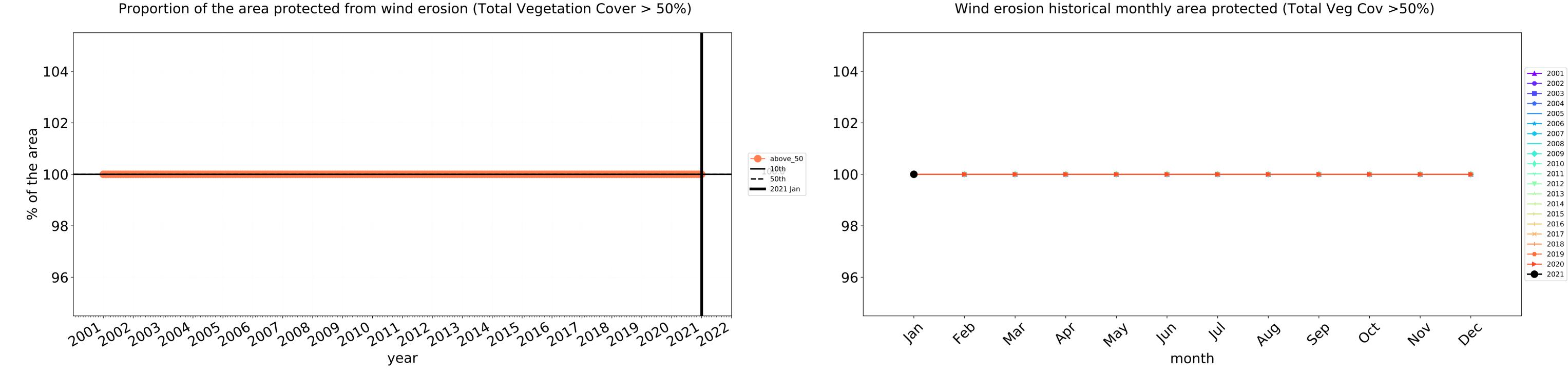
pixel. The mean

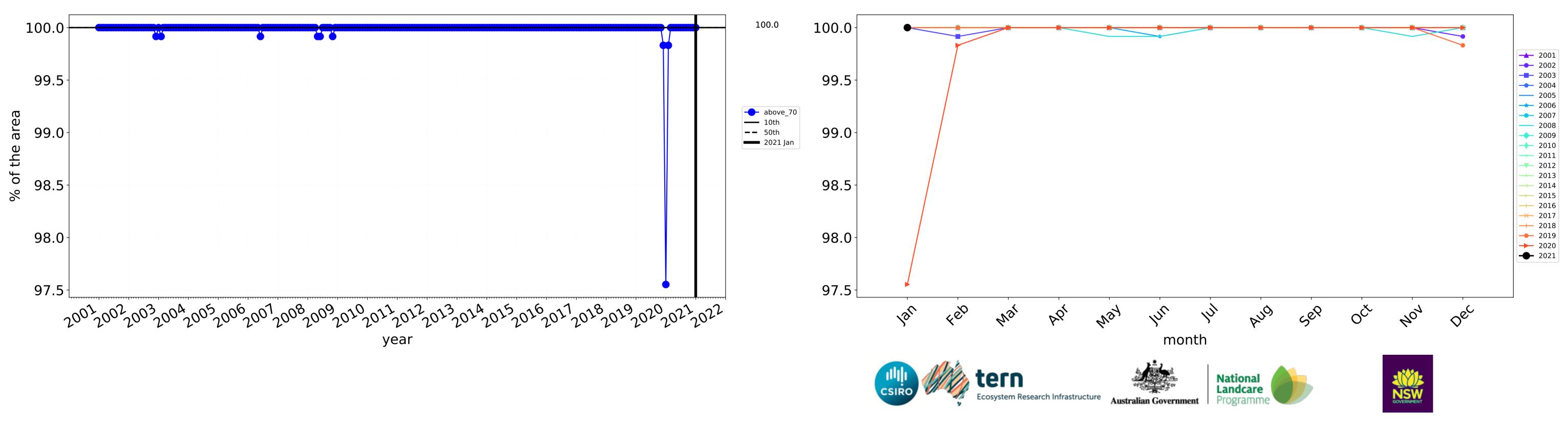
using baseline from 2001 to 2019.

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.

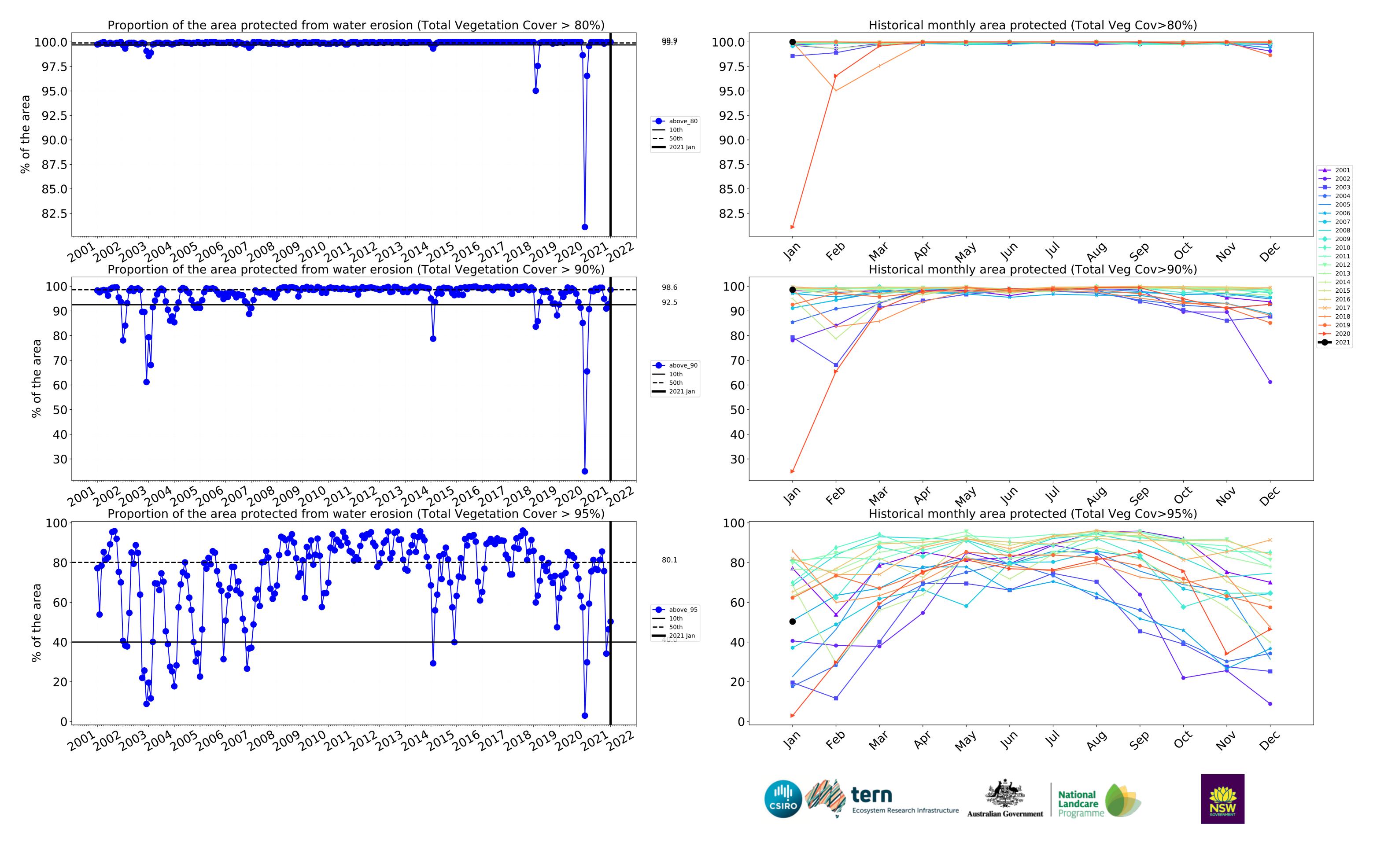








Water erosion historical monthly area protected (Total Veg Cov>70%)



# Singleton\_(A) (488,425 ha and no data 851 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	488,425	99.5% 486,100	98.7% 482,225	96.7% 472,300	94.3% 460,450	72.0% 351,800	25.9% 126,550
Conservation and natural environments	237,625	100.0% 237,625	100.0% 237,625	100.0% 237,525	99.9% 237,475	90.2% 214,325	39.9% 94,825
Conservation and natural environments Woodland forest	15,275	100.0% 15,275	100.0% 15,275	100.0% 15,275	99.8% 15,250	82.3% 12,575	36.0% 5,500
Conservation and natural environments Forest (non woodland)	221,925	100.0% 221,925	100.0% 221,925	100.0% 221,825	99.9% 221,800	90.8% 201,450	40.2% 89,300
Agriculture	174,275	99.9% 174,175	99.7% 173,825	98.9% 172,325	96.2% 167,675	55.5% 96,800	8.7% 15,200
Grazing	166,475	99.9% 166,375	99.7% 166,025	98.8% 164,550	96.5% 160,675	57.5% 95,775	9.1% 15,075
Grazing non forest	147,350	99.9% 147,250	99.7% 146,900	98.8% 145,600	96.4% 142,075	55.8% 82,150	7.9% 11,700
Grazing - Forest (non woodland)	16,025	100.0% 16,025	100.0% 16,025	99.5% 15,950	98.4% 15,775	76.3% 12,225	18.4% 2,950
Irrigation	7,250	100.0% 7,250	100.0% 7,250	100.0% 7,250	90.3% 6,550	12.8% 925	1.7% 125
Production native forests and plantation forests	29,625	100.0% 29,625	100.0% 29,625	100.0% 29,625	100.0% 29,625	98.6% 29,200	50.3% 14,900

