## Total vegetation cover soil protection Region:NRM Riverina NSW

# Date: August 2001

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:

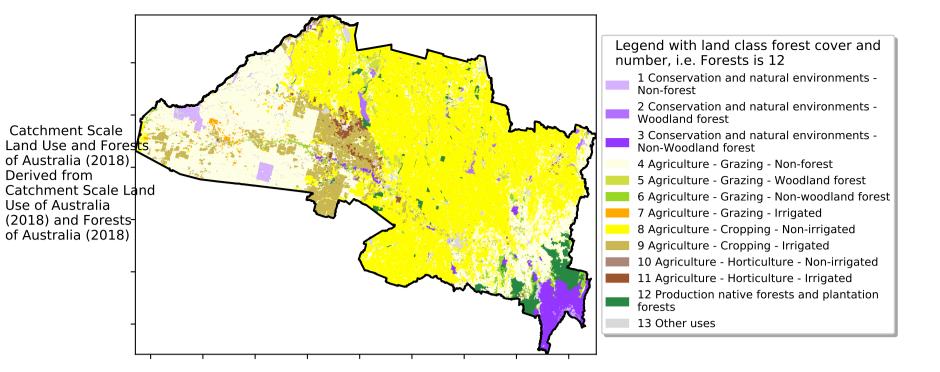
https://doi.org/10.4225/08/5848a3f19a7b3



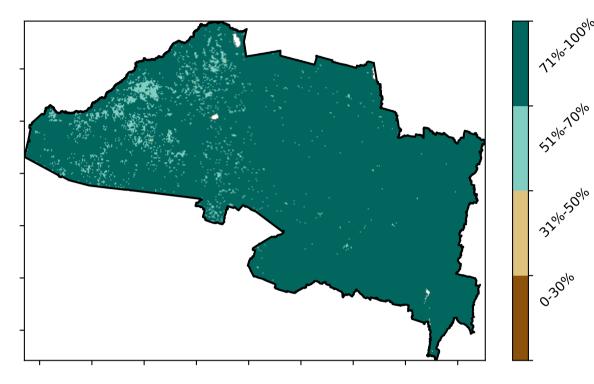
### **Vegetation Cover Aug 2001**

#### Land use and forest cover

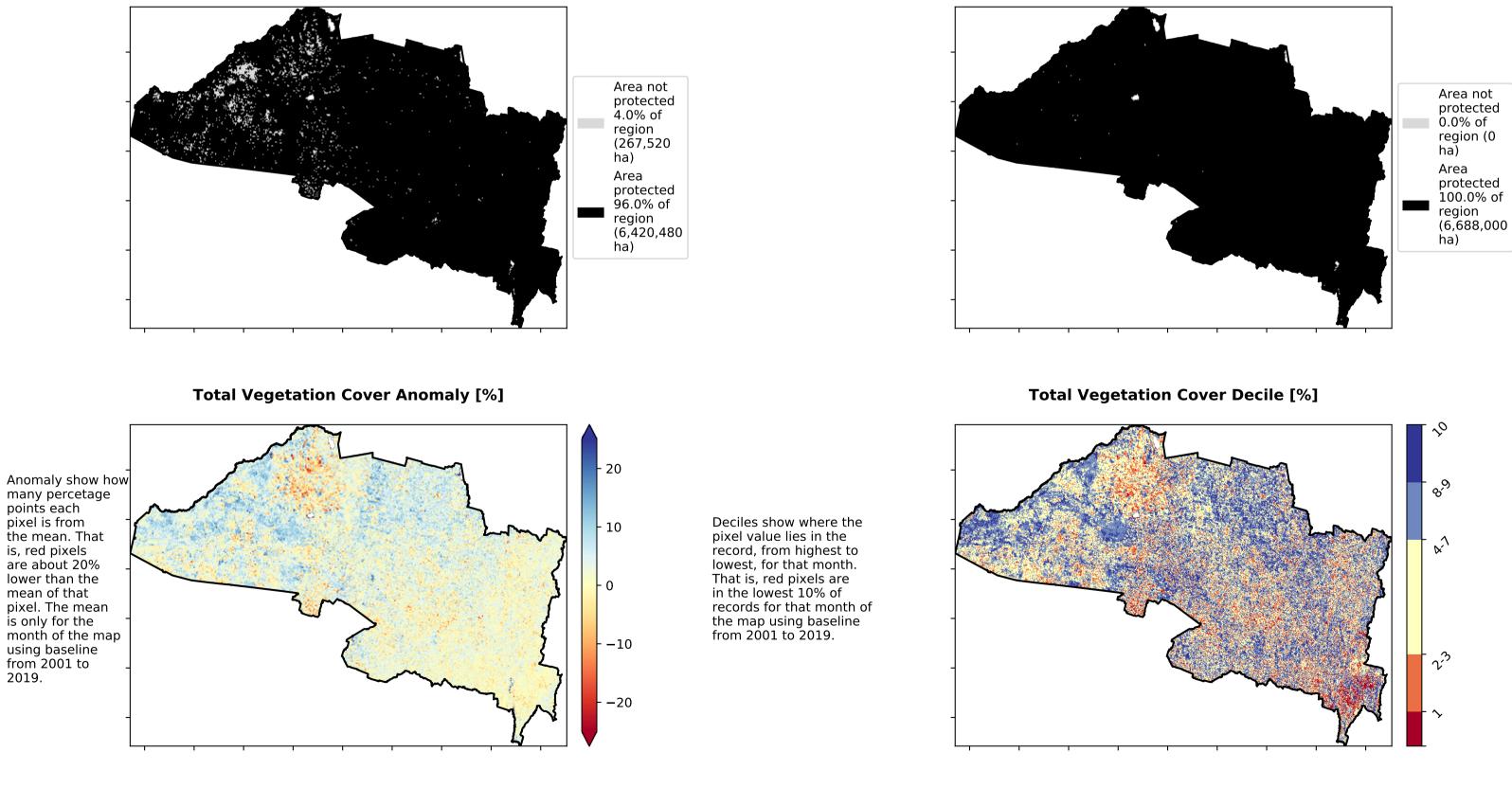
#### Proportion of each land class in area

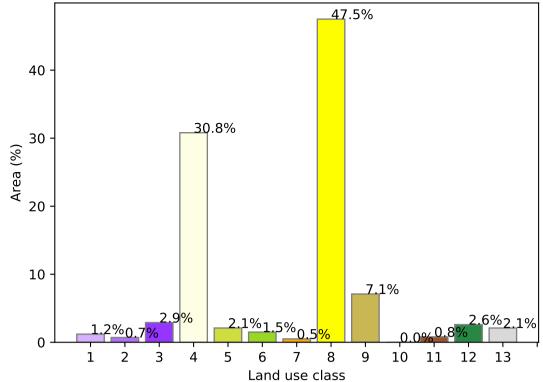


**Total Vegetation Cover [%]** 

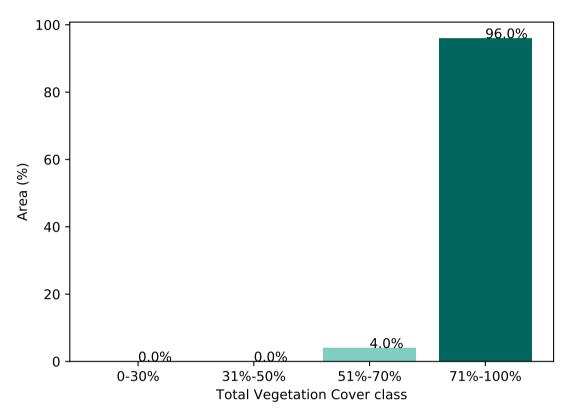


#### % Area protected from water erosion (>70%)

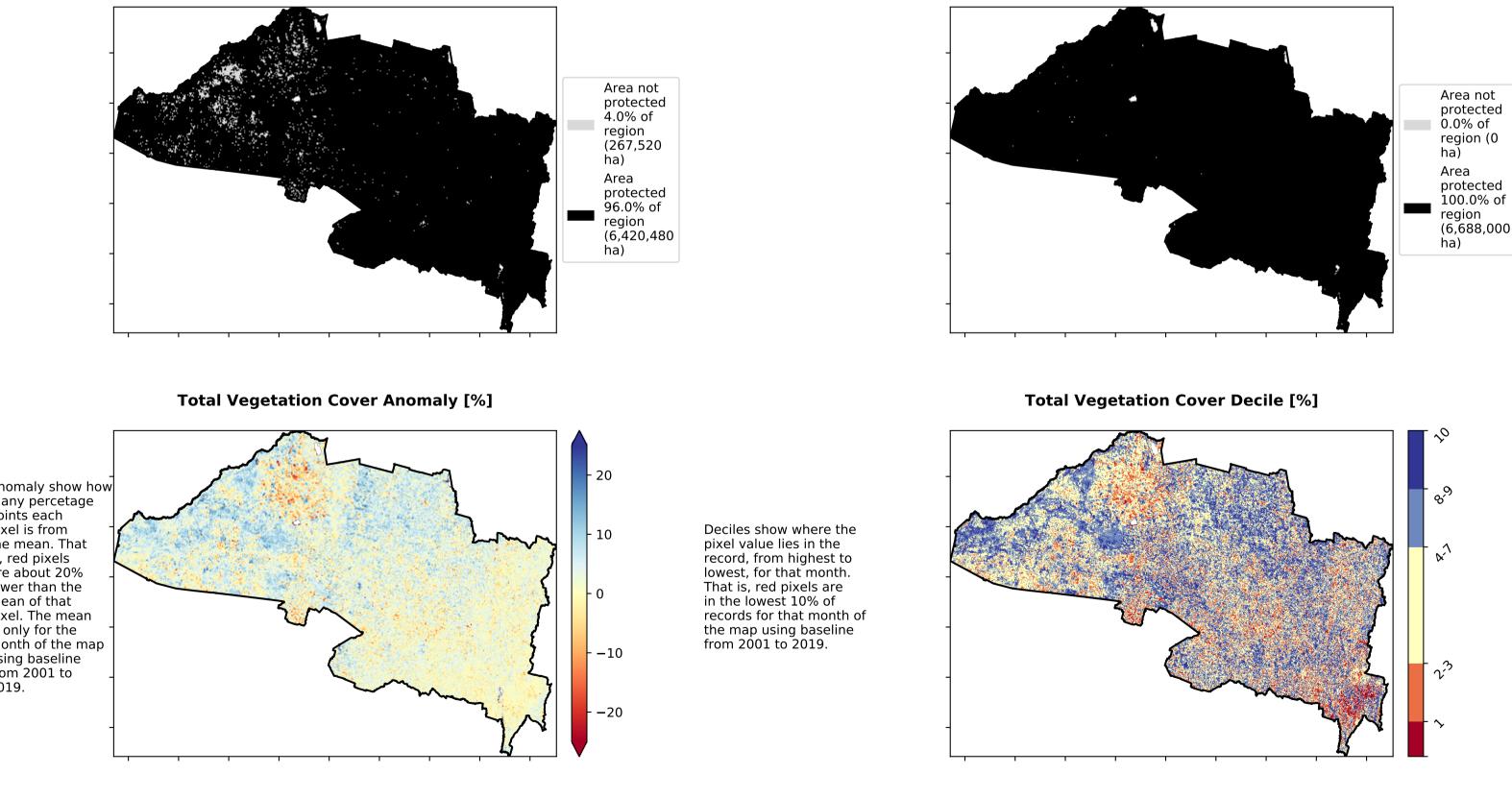




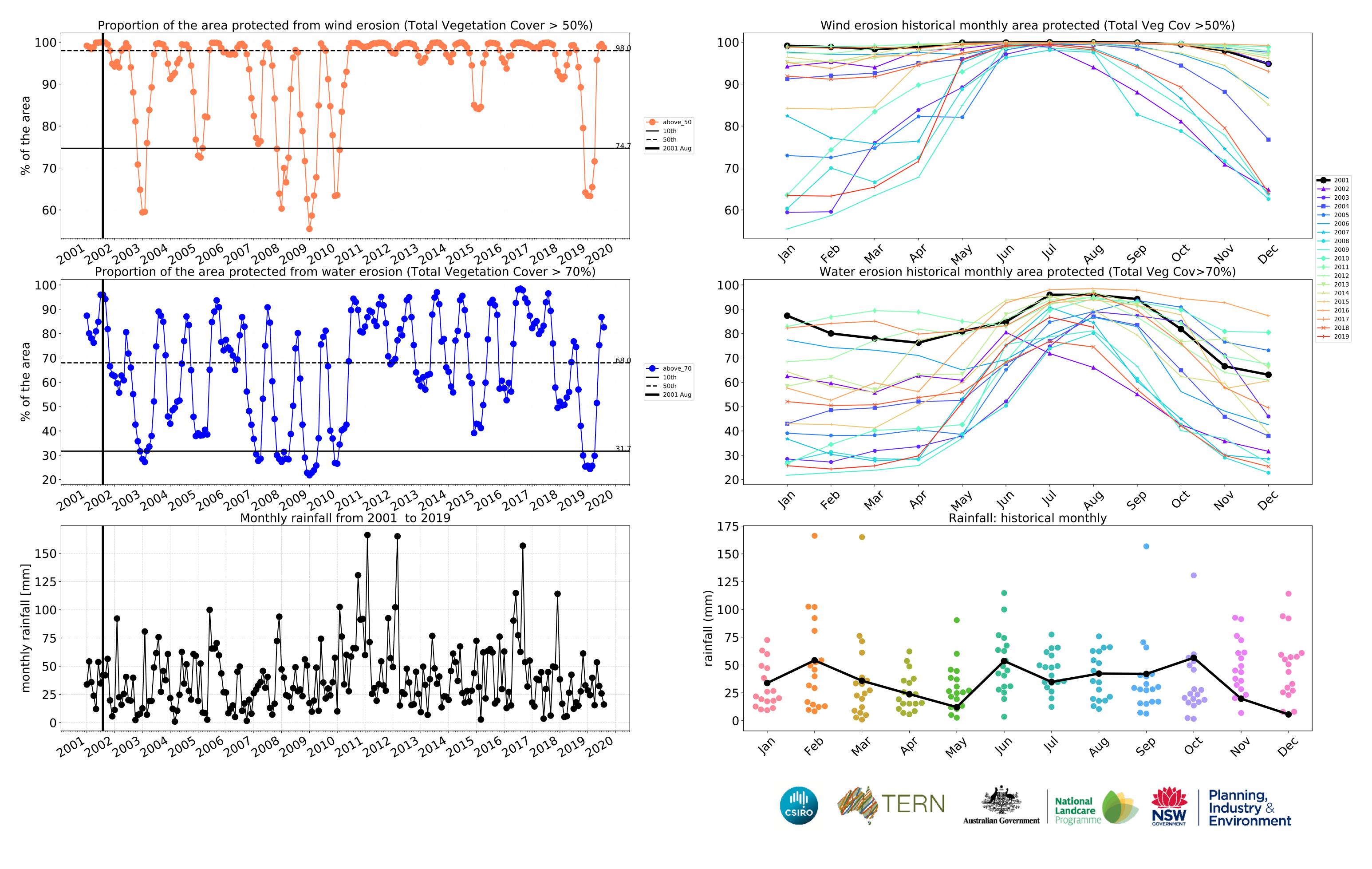
#### **Proportion of vegetation cover class in area**



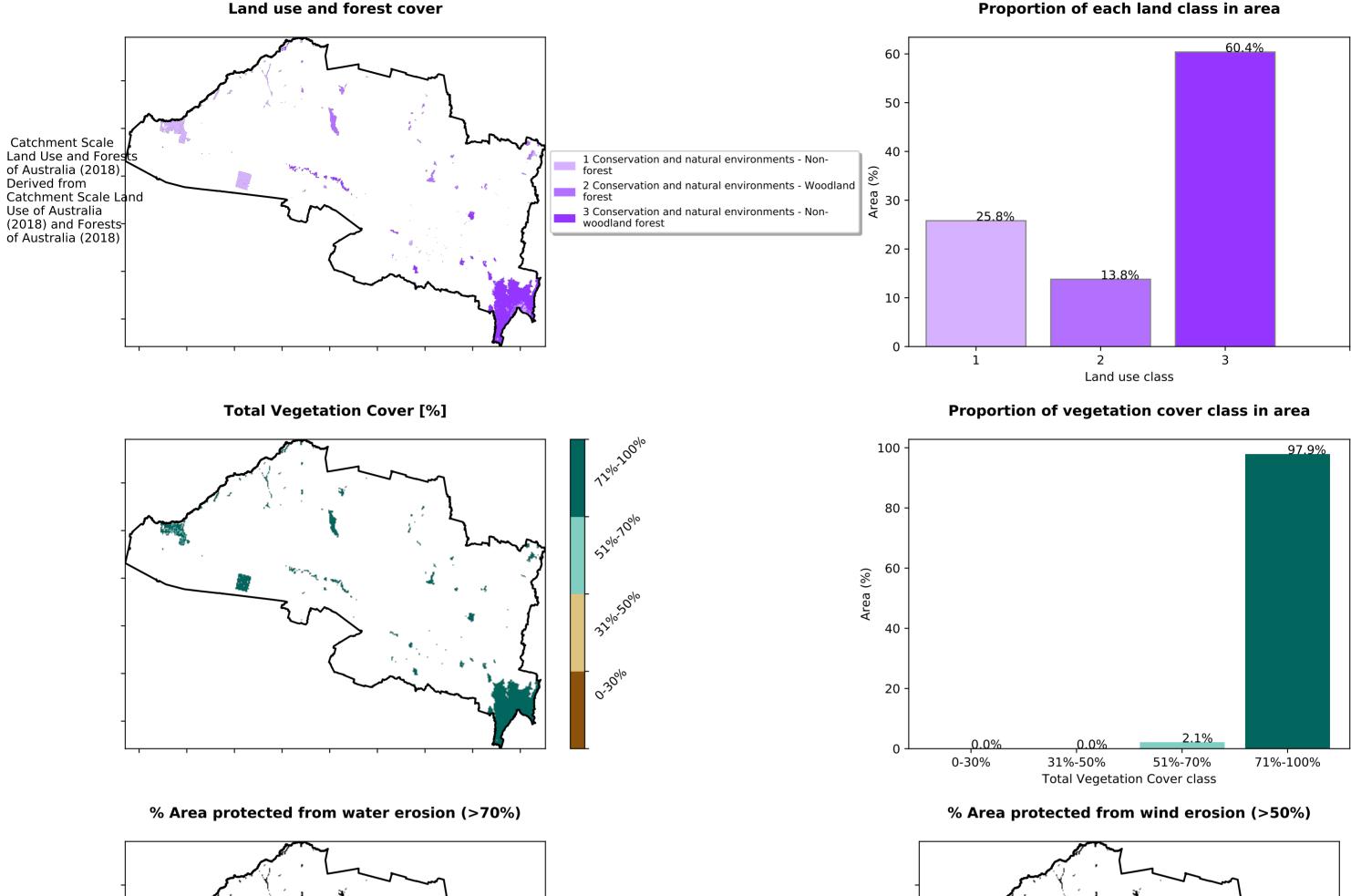
#### % Area protected from wind erosion (>50%)



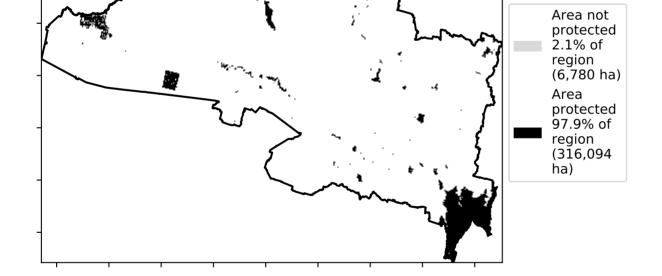




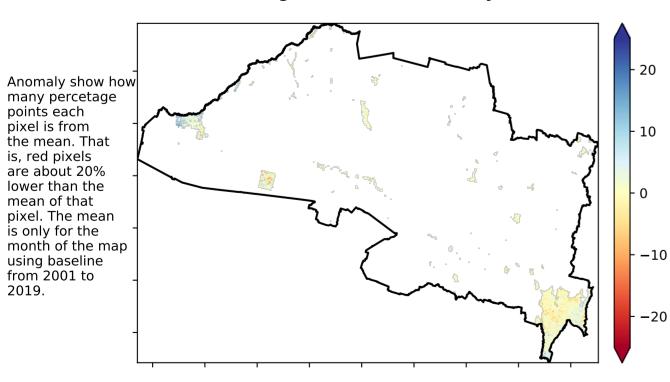
#### **Conservation and natural environments**



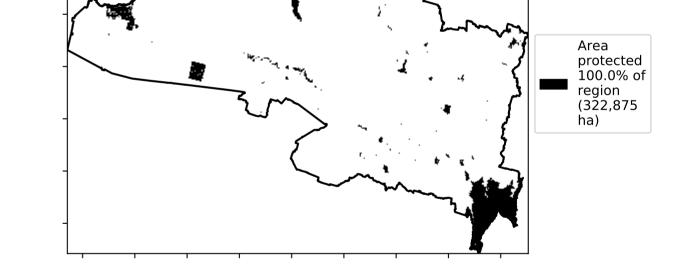
Proportion of each land class in area

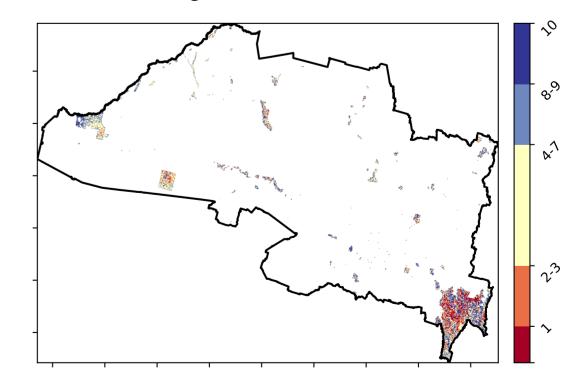


**Total Vegetation Cover Anomaly [%]** 



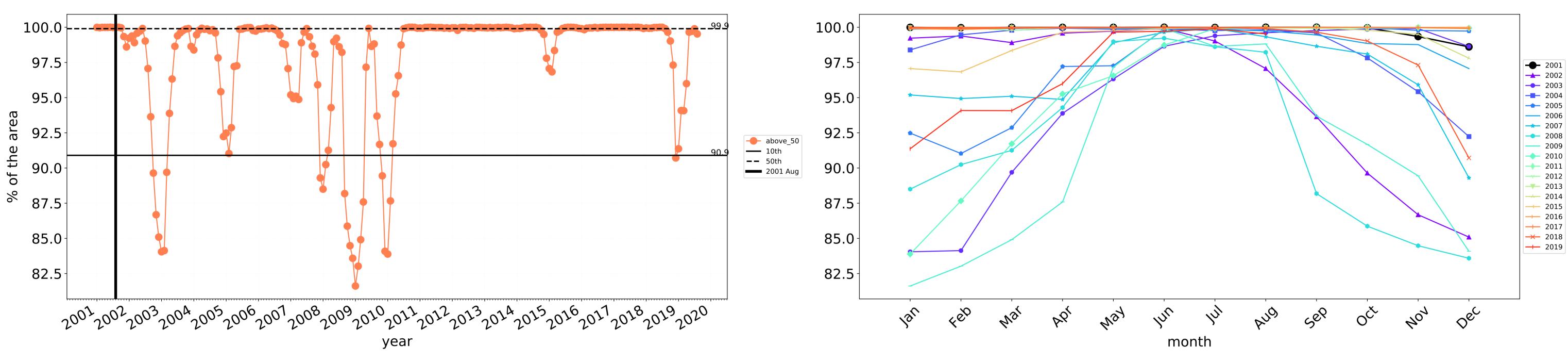
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





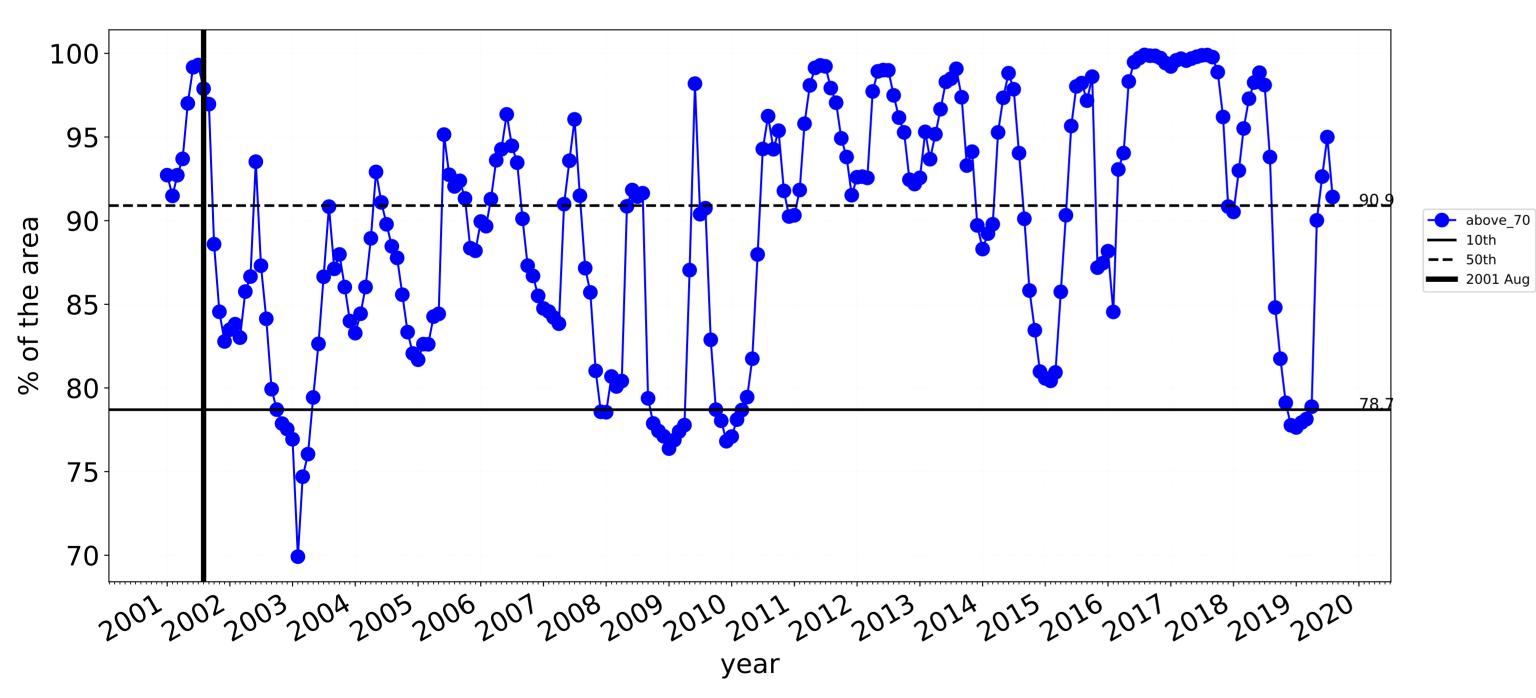


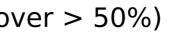
#### **Conservation and natural environments timeseries**



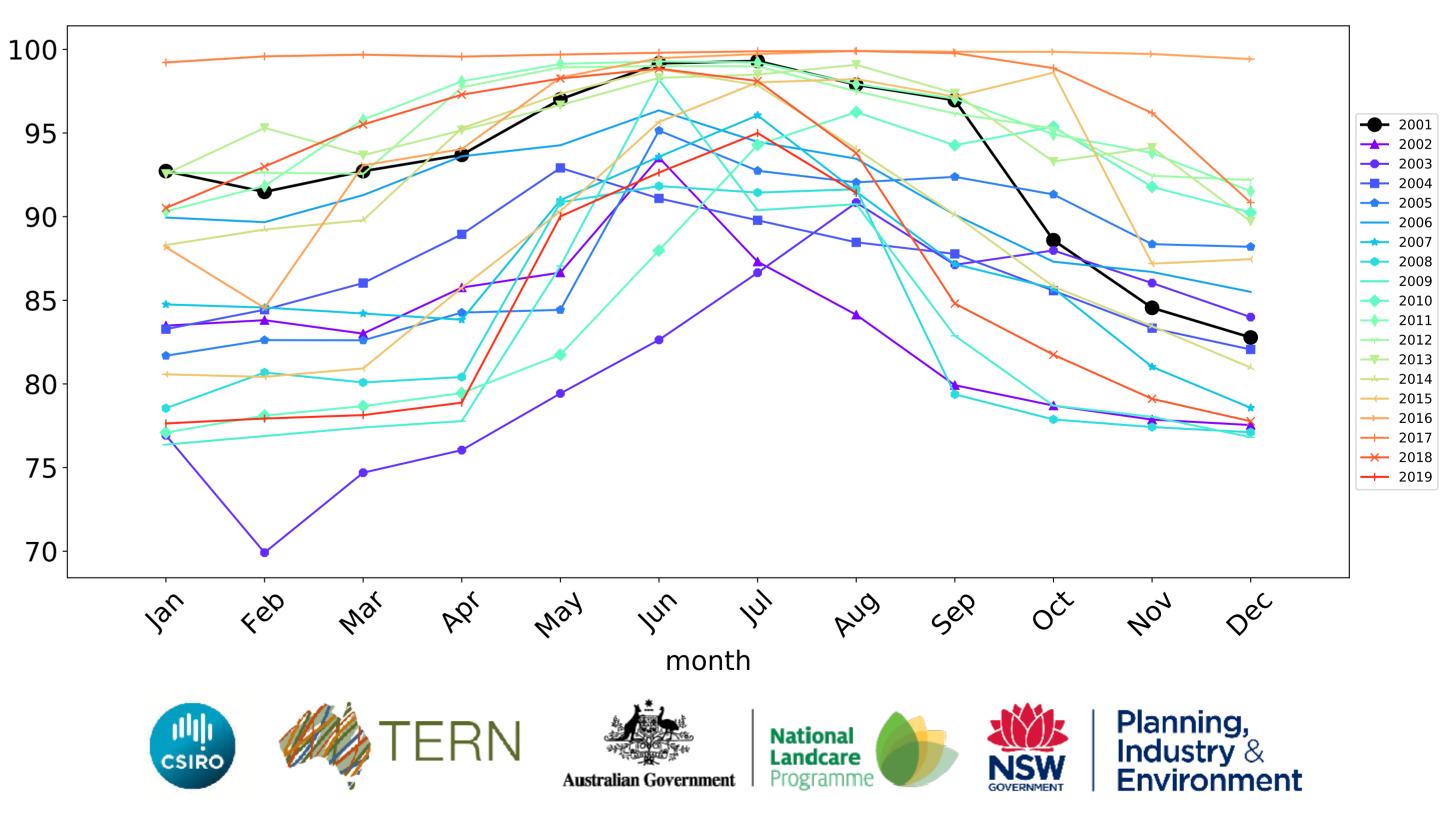
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

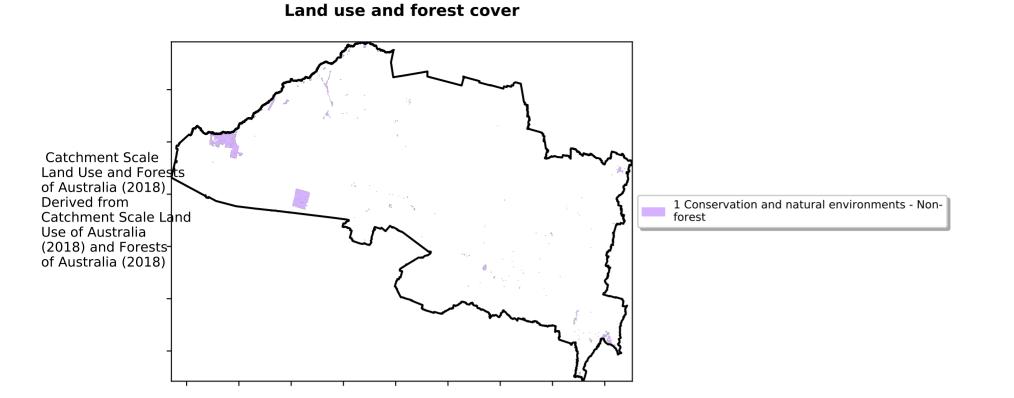




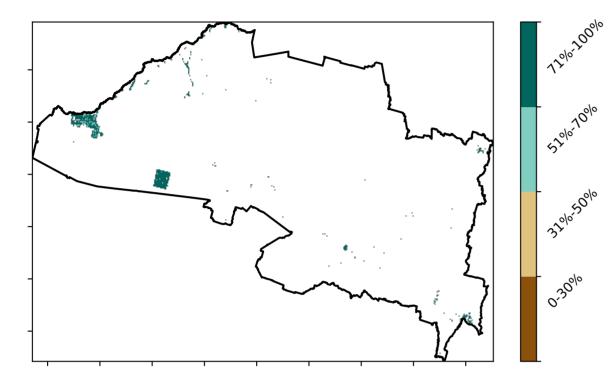
Wind erosion historical monthly area protected (Total Veg Cov >50%)



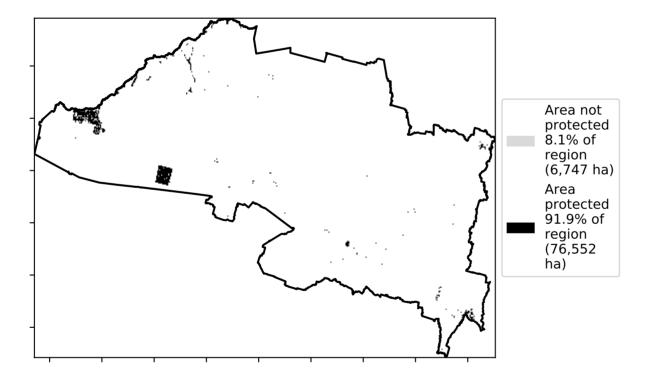
#### **Conservation and natural environments non forest**



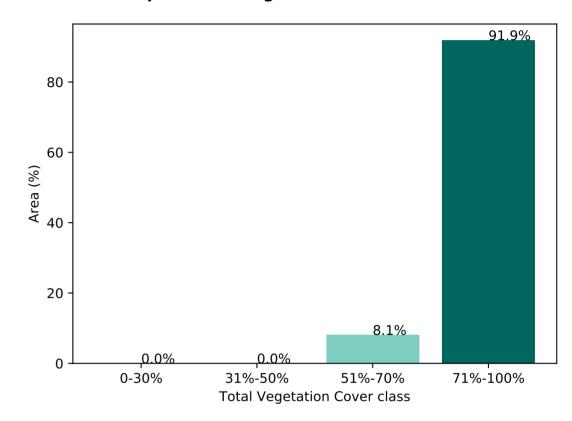
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



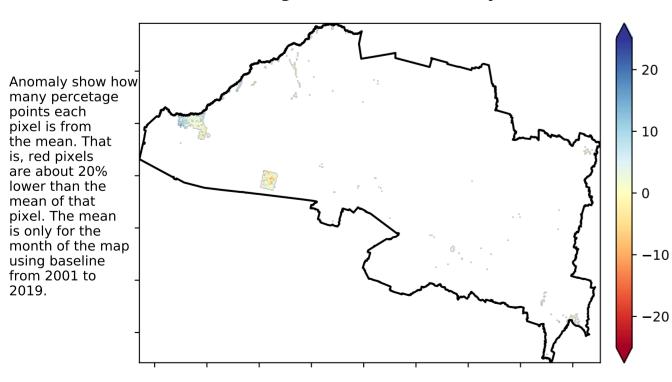




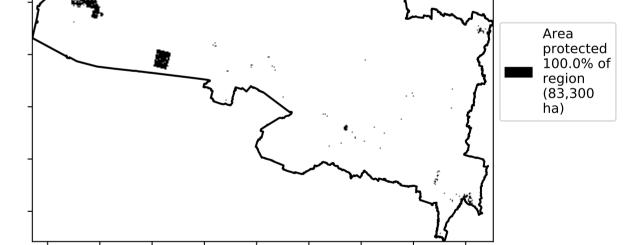
% Area protected from wind erosion (>50%)

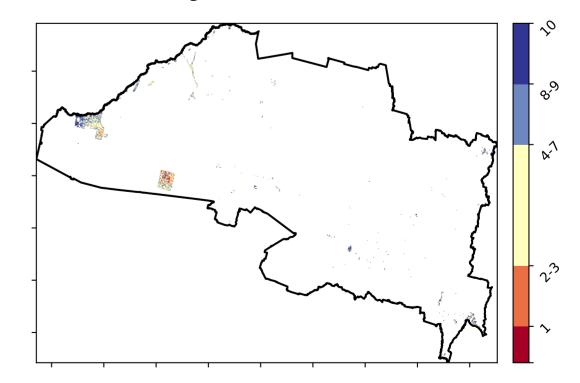


Total Vegetation Cover Anomaly [%]



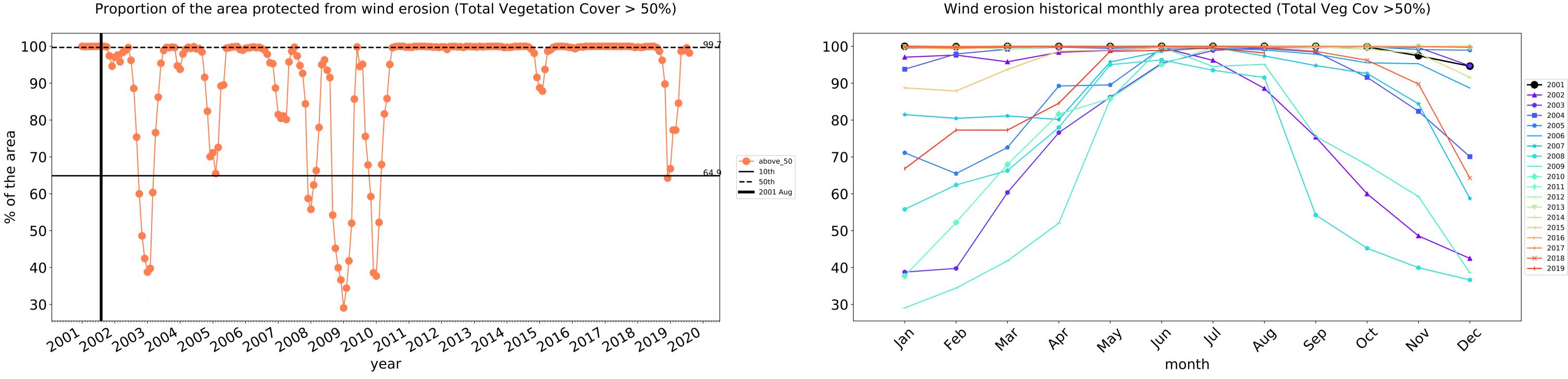
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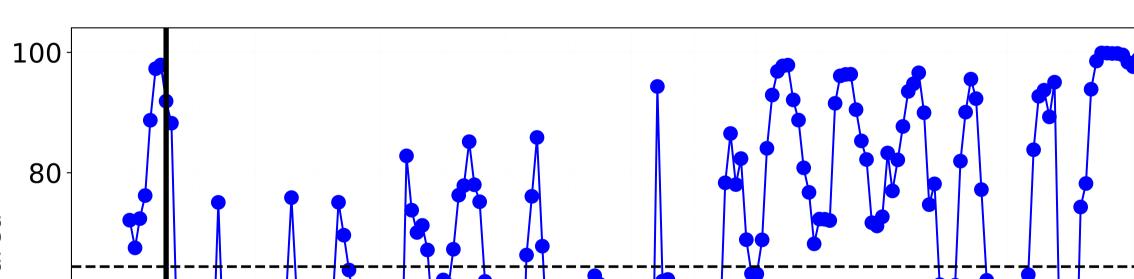




### **Conservation and natural environments non forest timeseries**



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



area

60

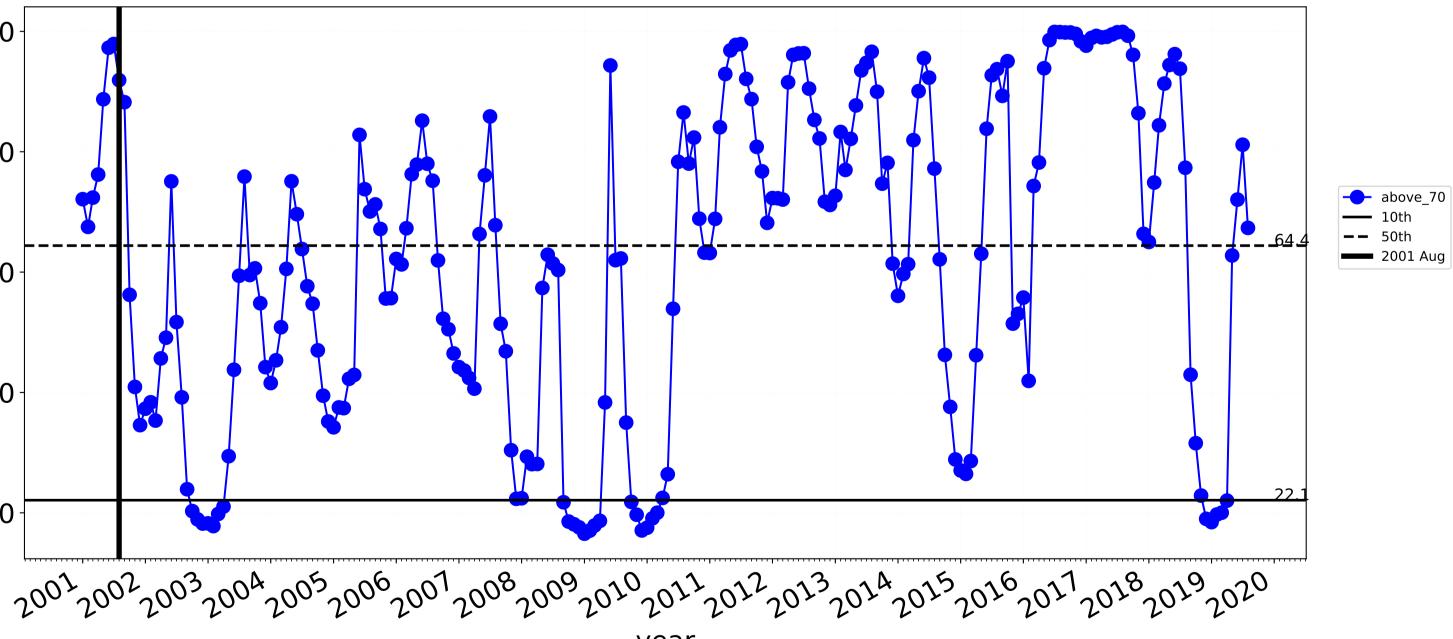
40

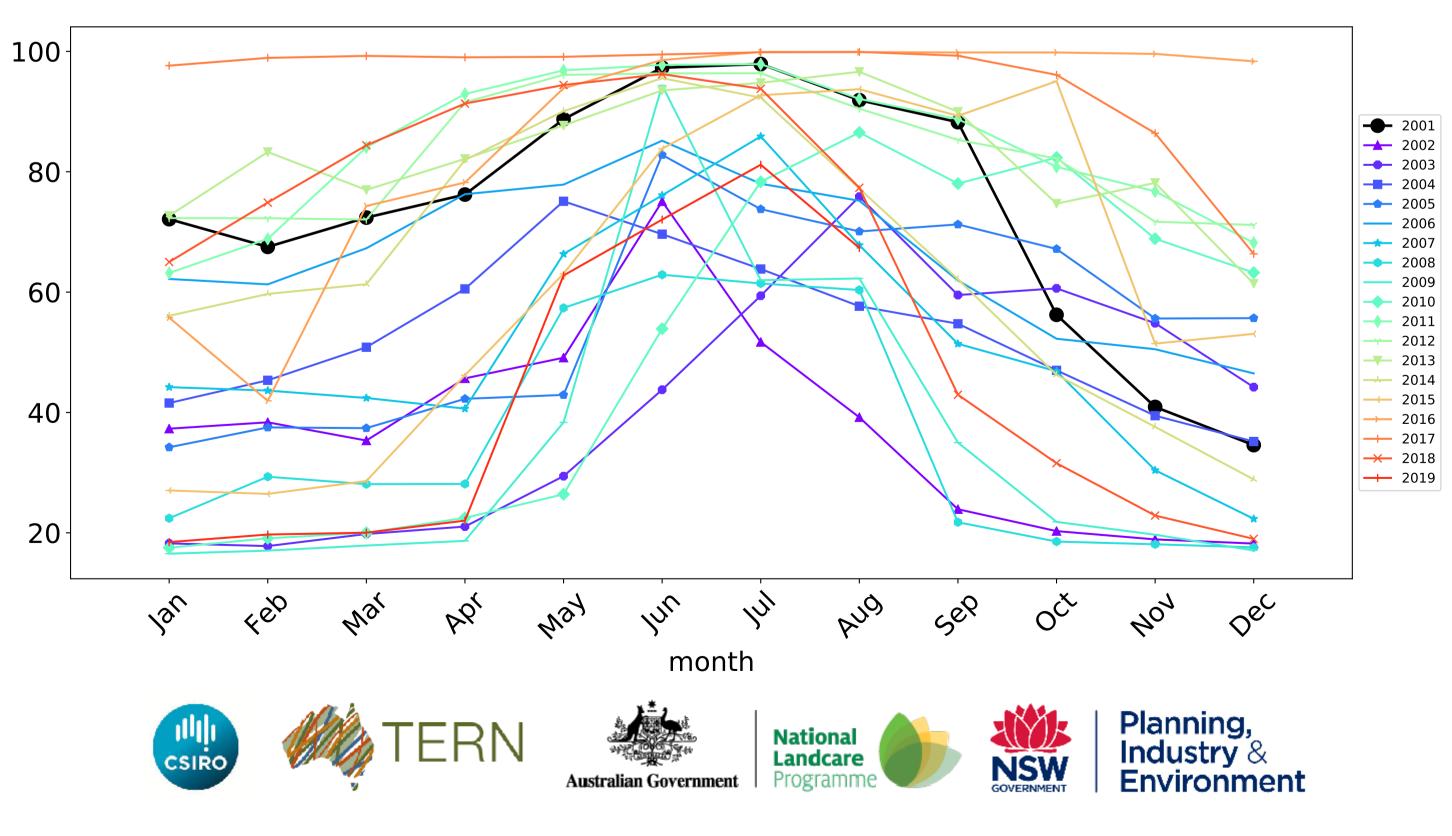
20

% of the

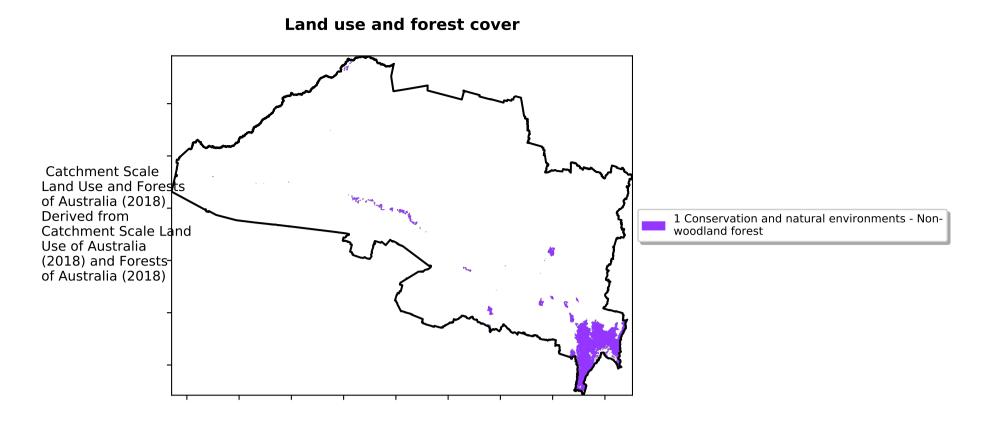
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

year

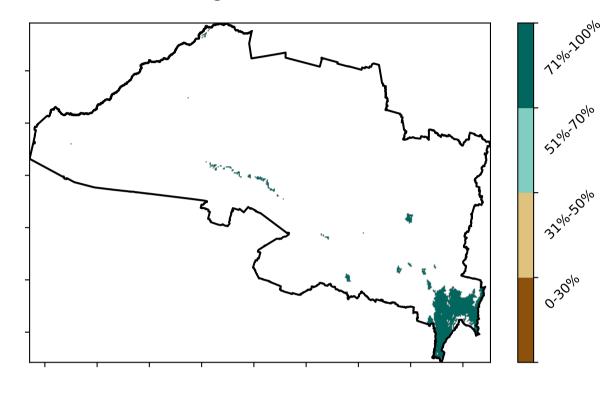




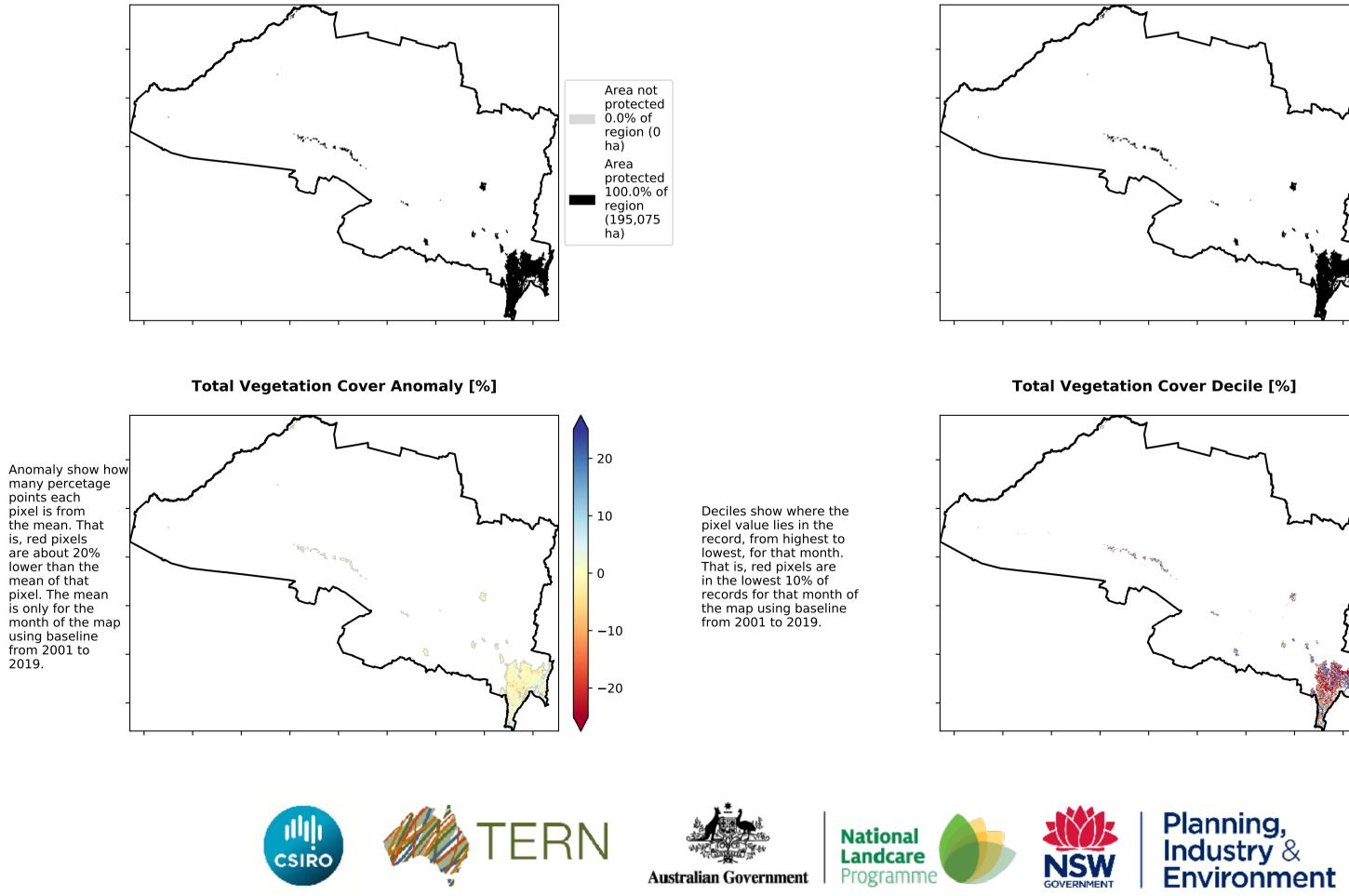
#### **Conservation and natural environments Forest (non woodland)**



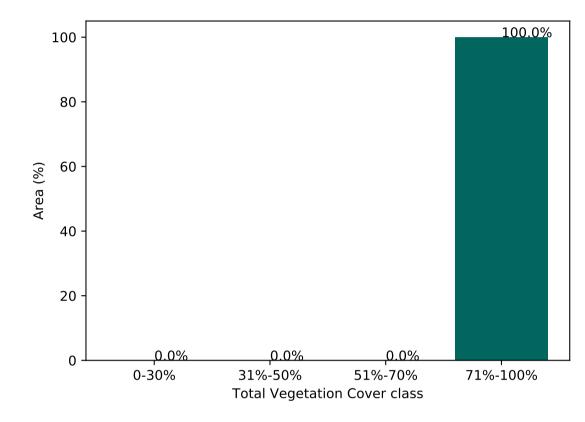
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

Area

ha)

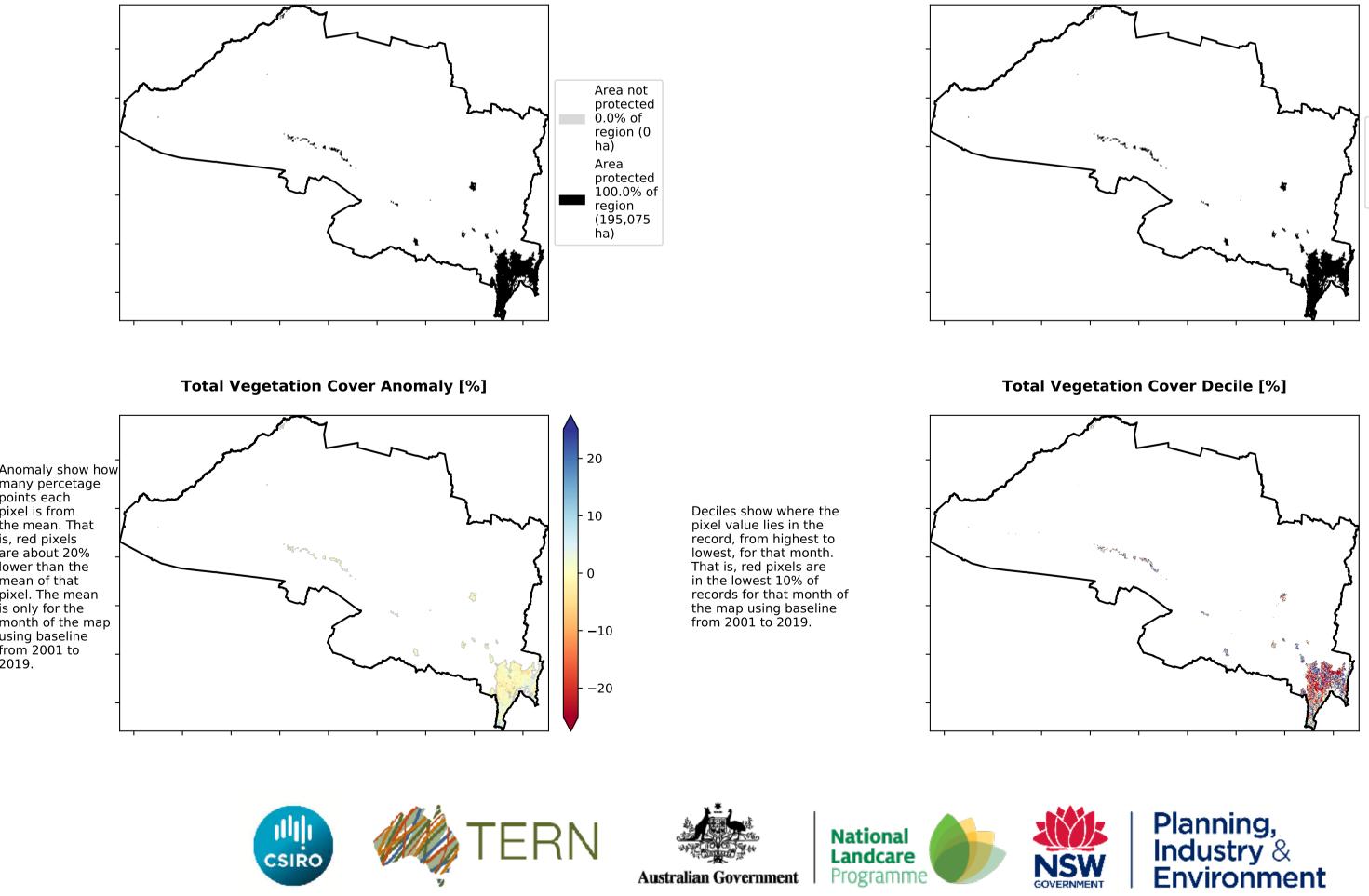
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A-1

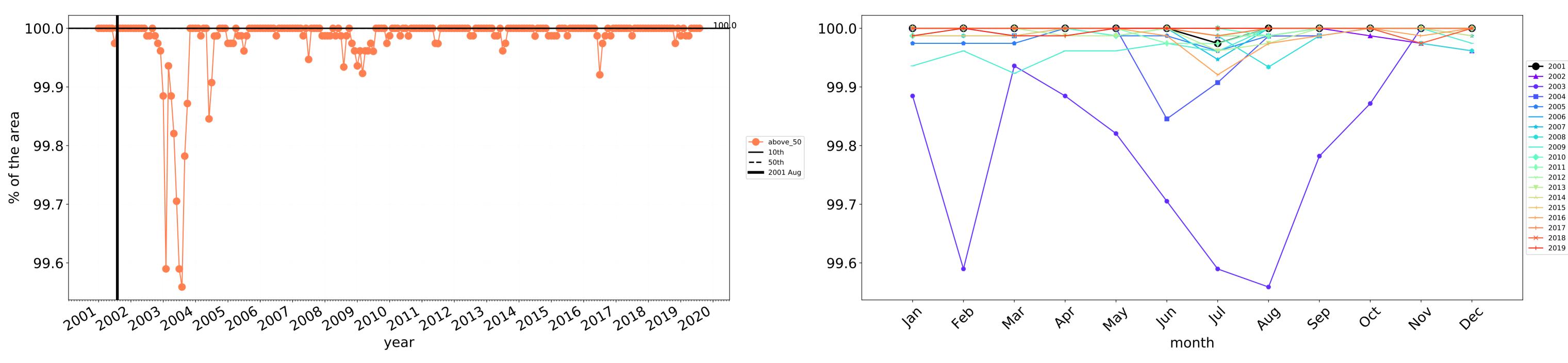
1 2<sup>3</sup>

protected 100.0% of

region (195,075

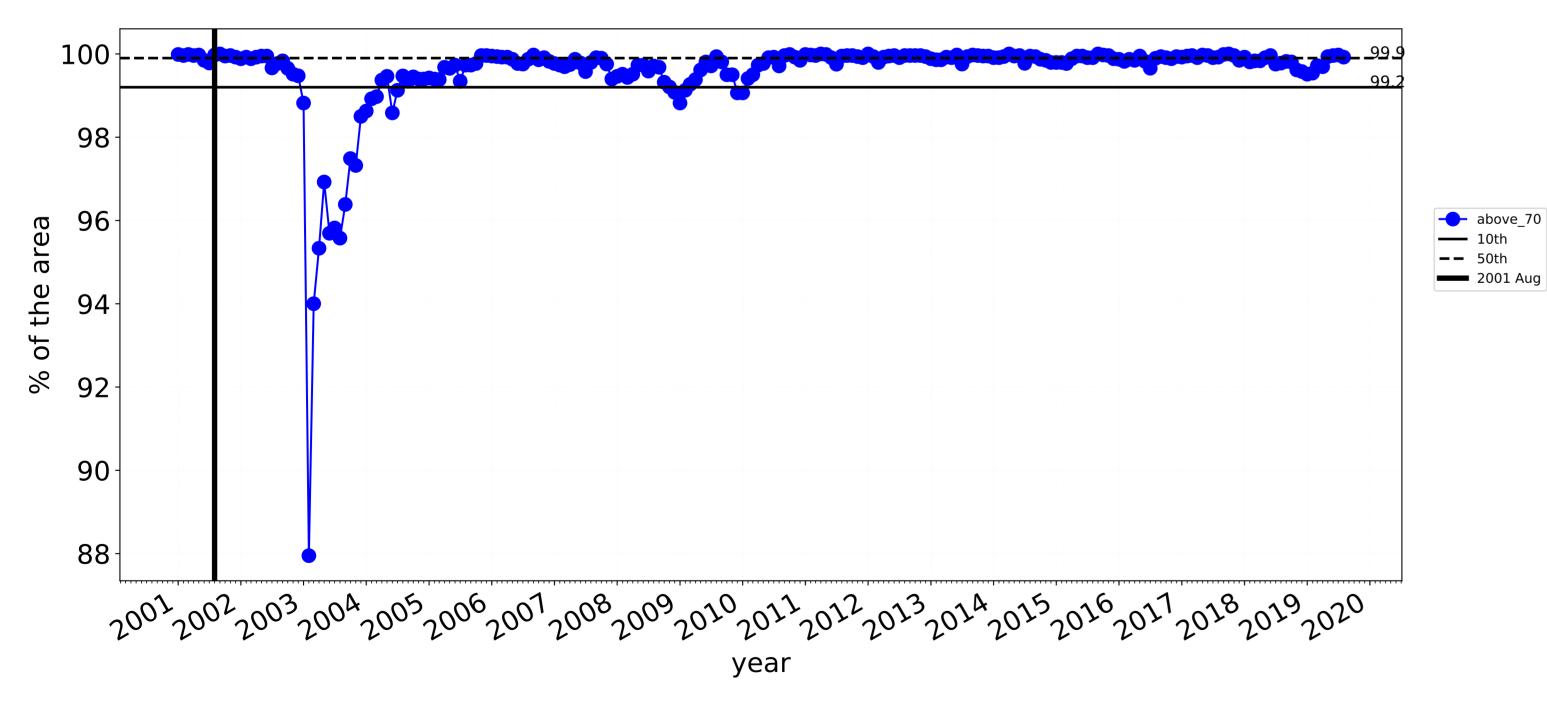


### **Conservation and natural environments Forest (non woodland) timeseries**

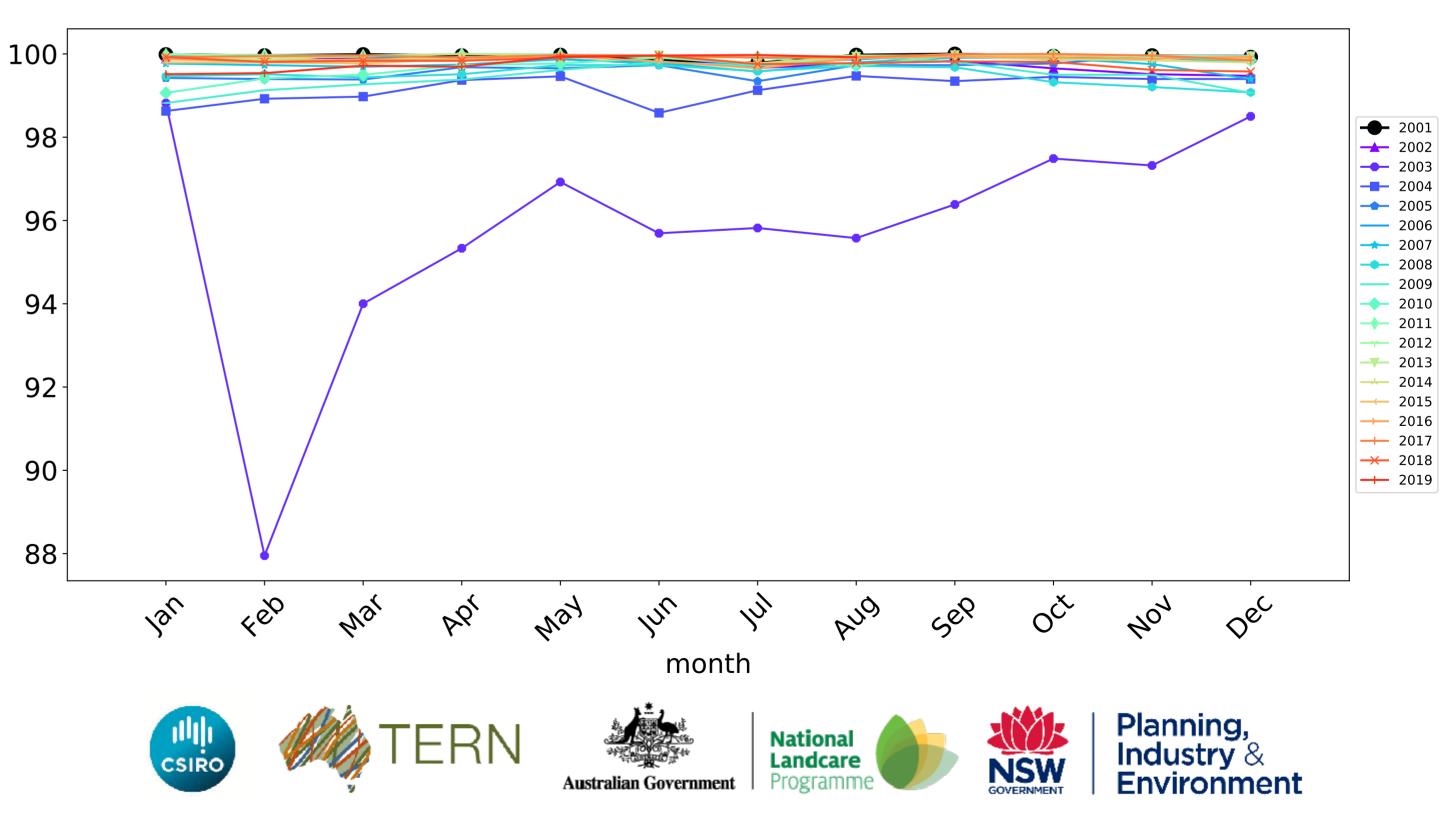


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



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



9

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

#### Agriculture

Land use and forest cover

Proportion of each land class in area

<u>52.</u>5%

<u>7.9</u>%

6

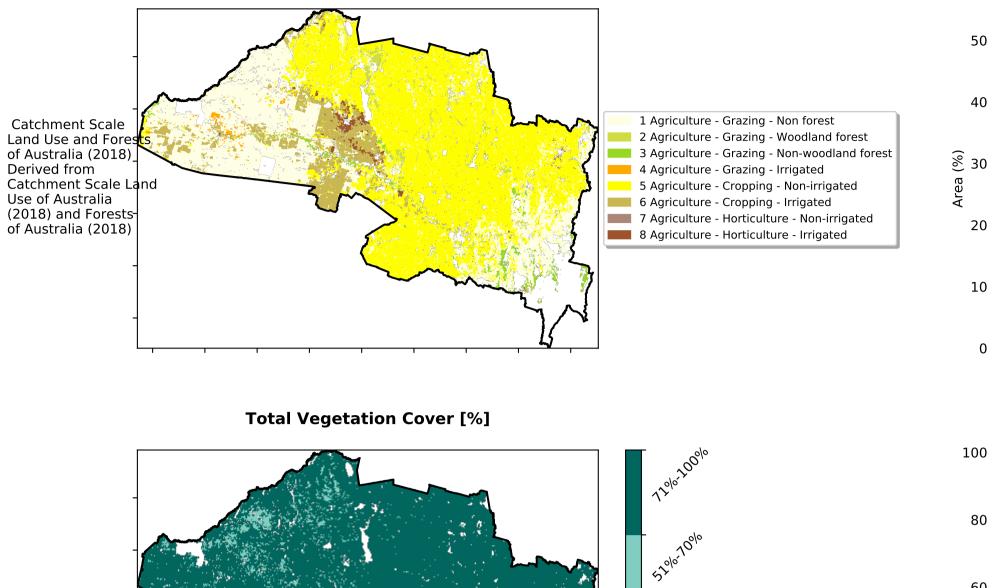
0.9%

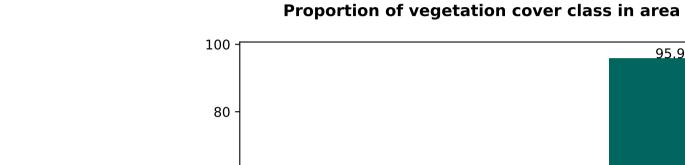
8

95.9%

0.0%

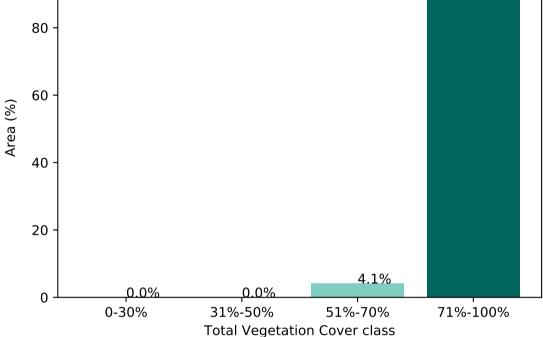
7





<u>34.</u>1%

1



0.6%

4

5

Land use class

3

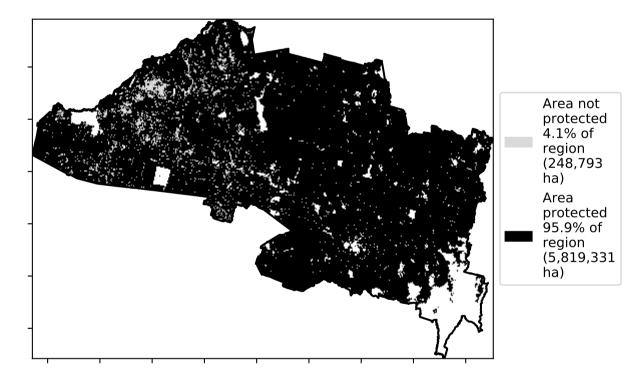
2

% Area protected from wind erosion (>50%)

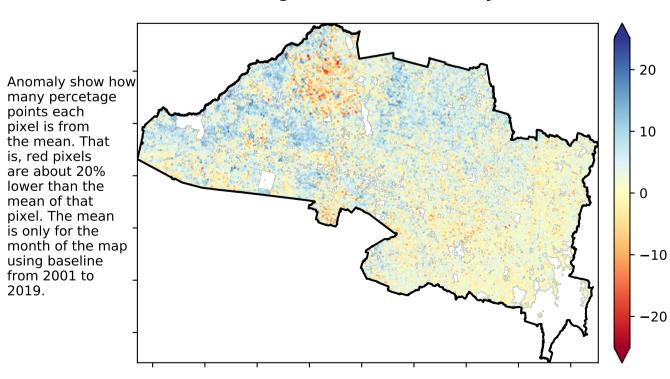


32%5001 0-30%

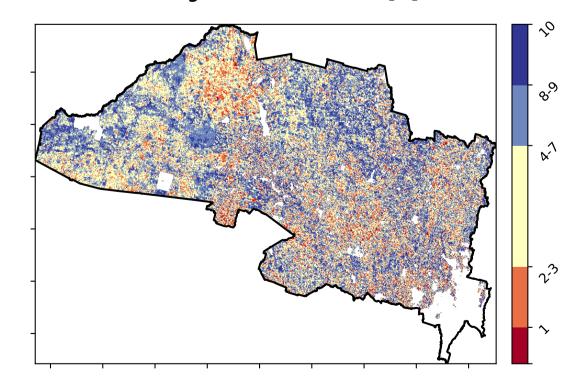
% Area protected from water erosion (>70%)



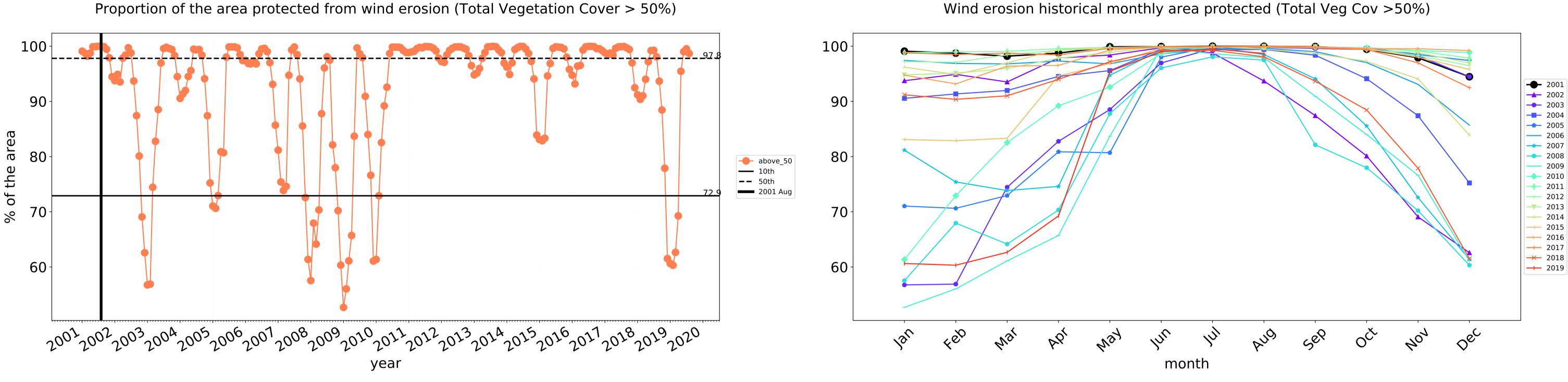
**Total Vegetation Cover Anomaly [%]** 



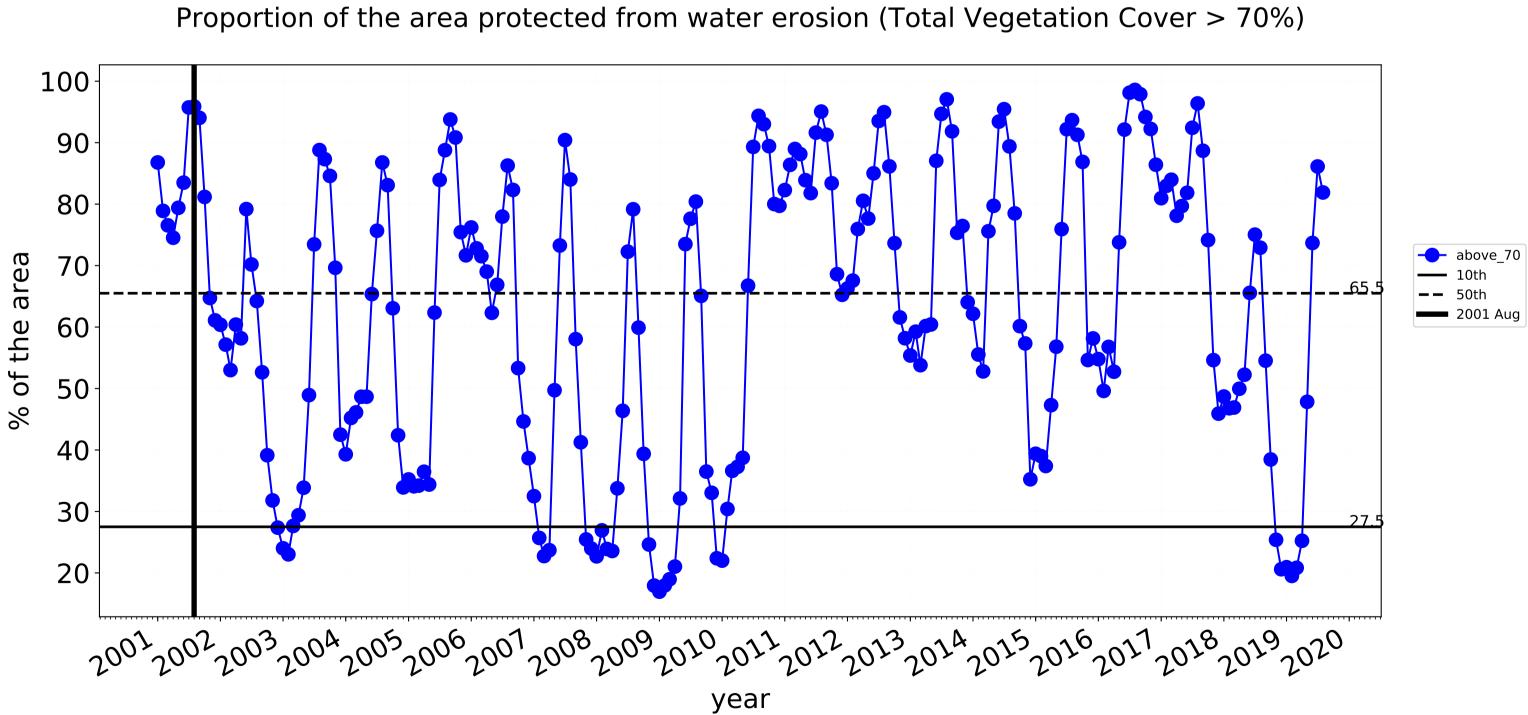
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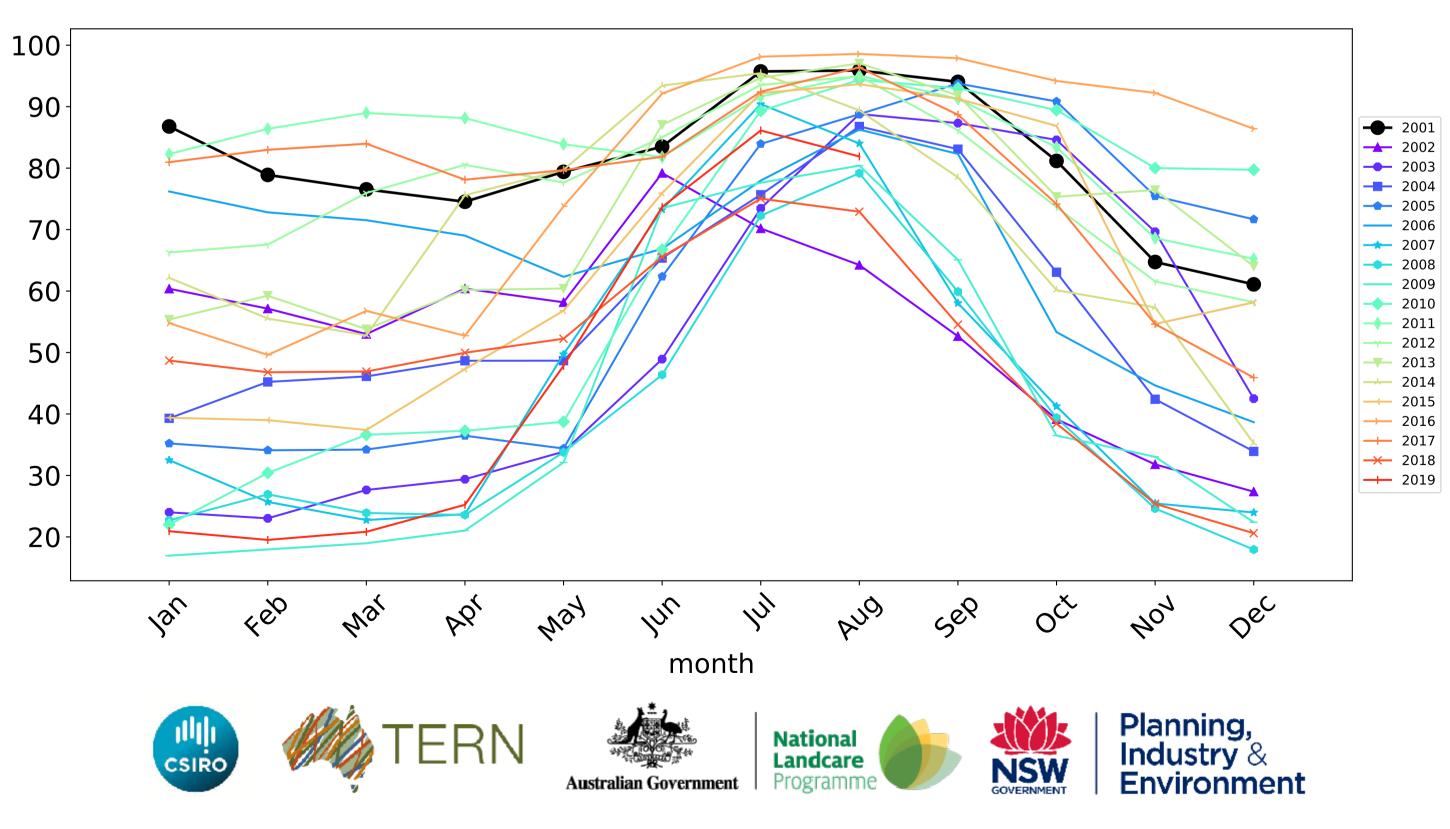


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



### **Agriculture timeseries**

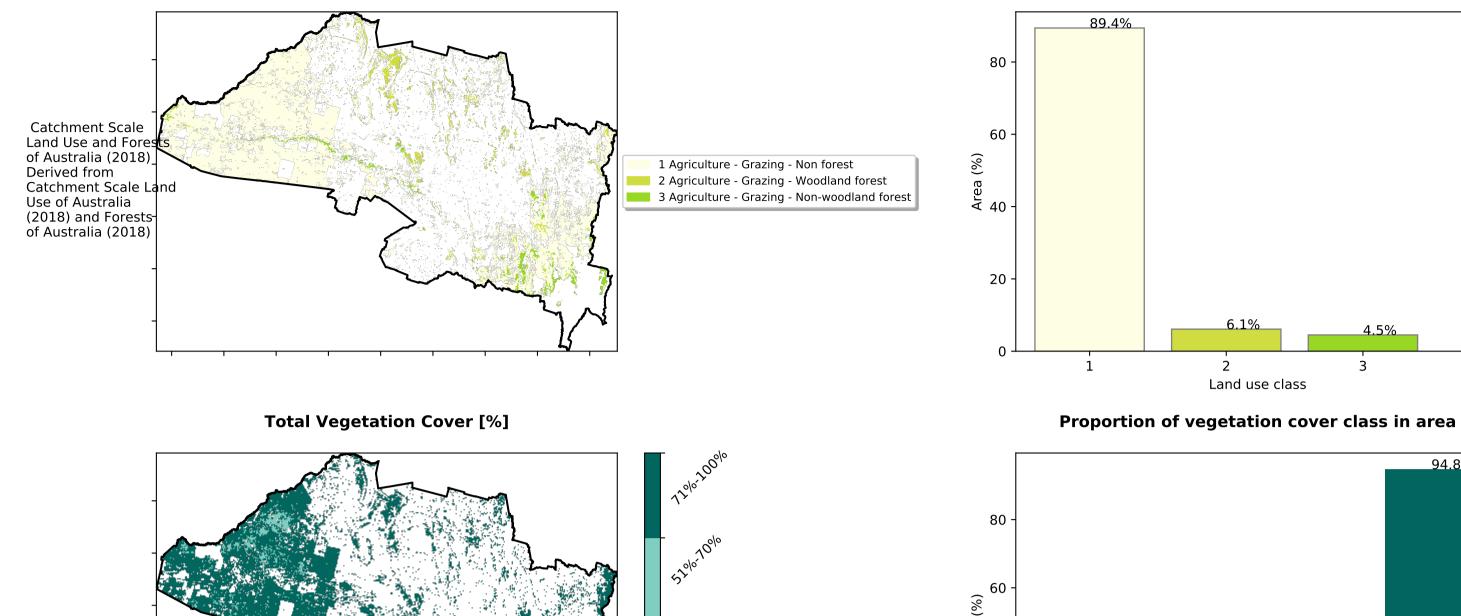
Water erosion historical monthly area protected (Total Veg Cov>70%)

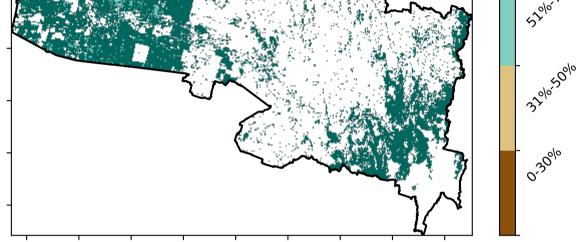


#### Grazing

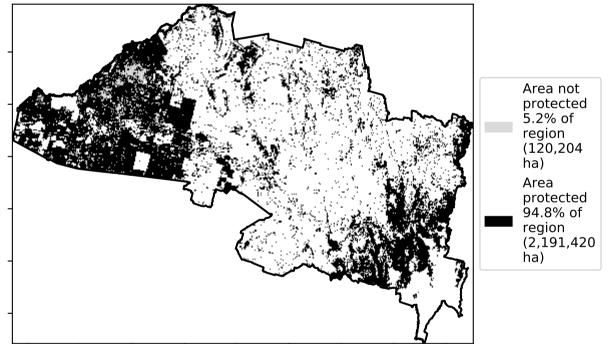
Land use and forest cover

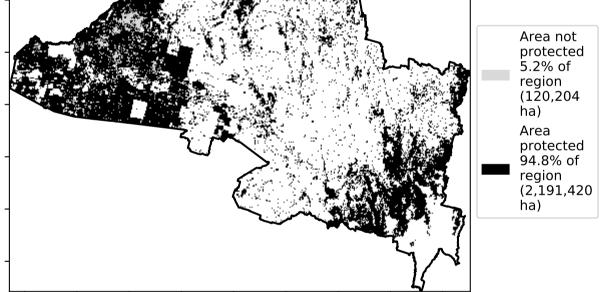
Proportion of each land class in area

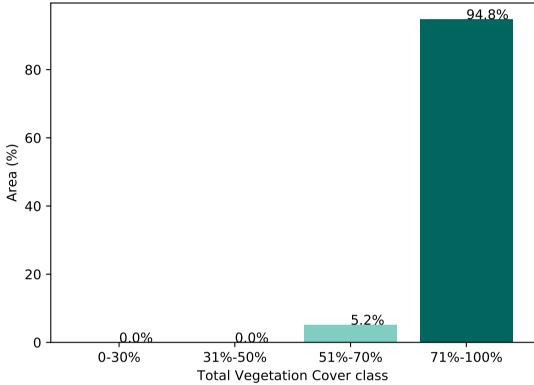




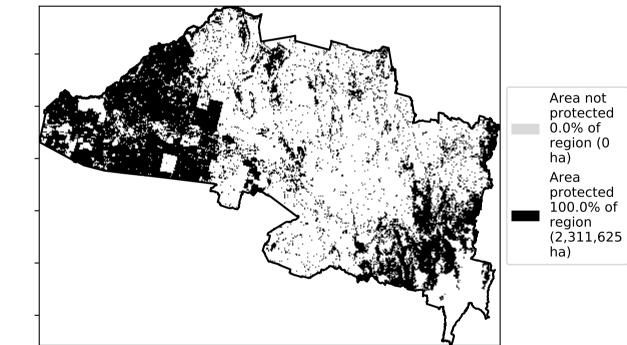
% Area protected from water erosion (>70%)



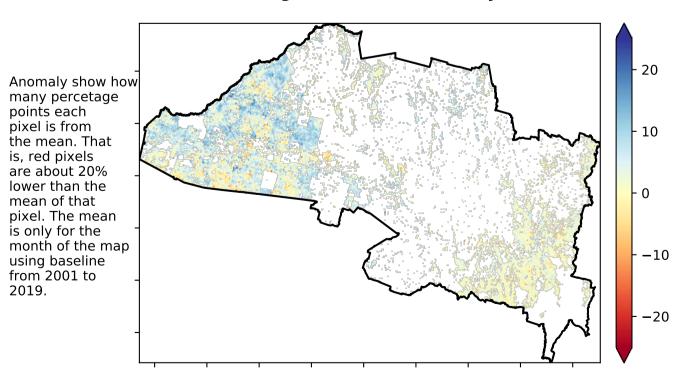




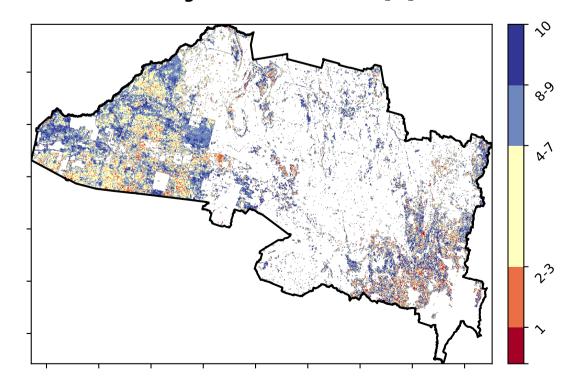
% Area protected from wind erosion (>50%)



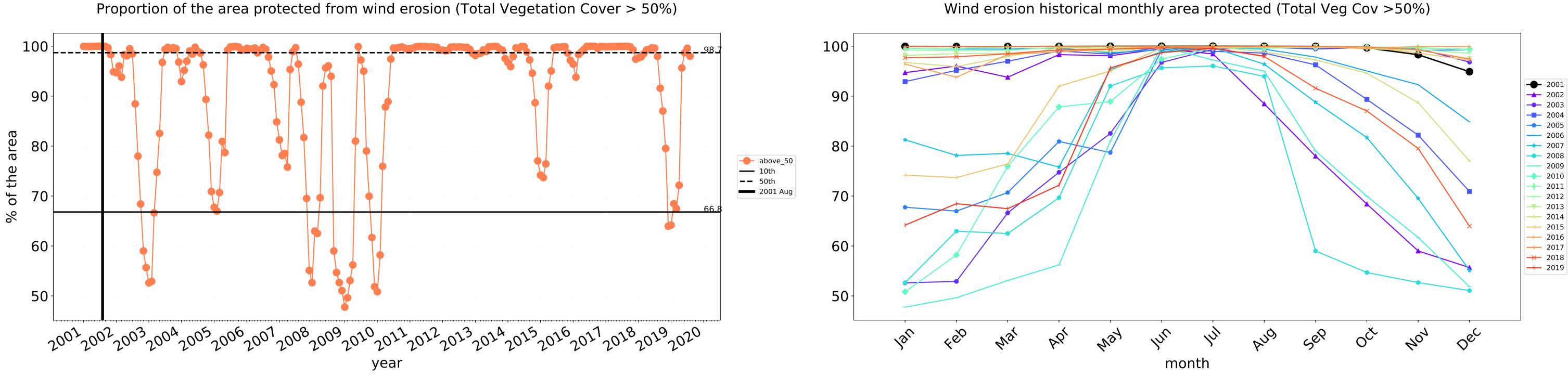
**Total Vegetation Cover Anomaly [%]** 



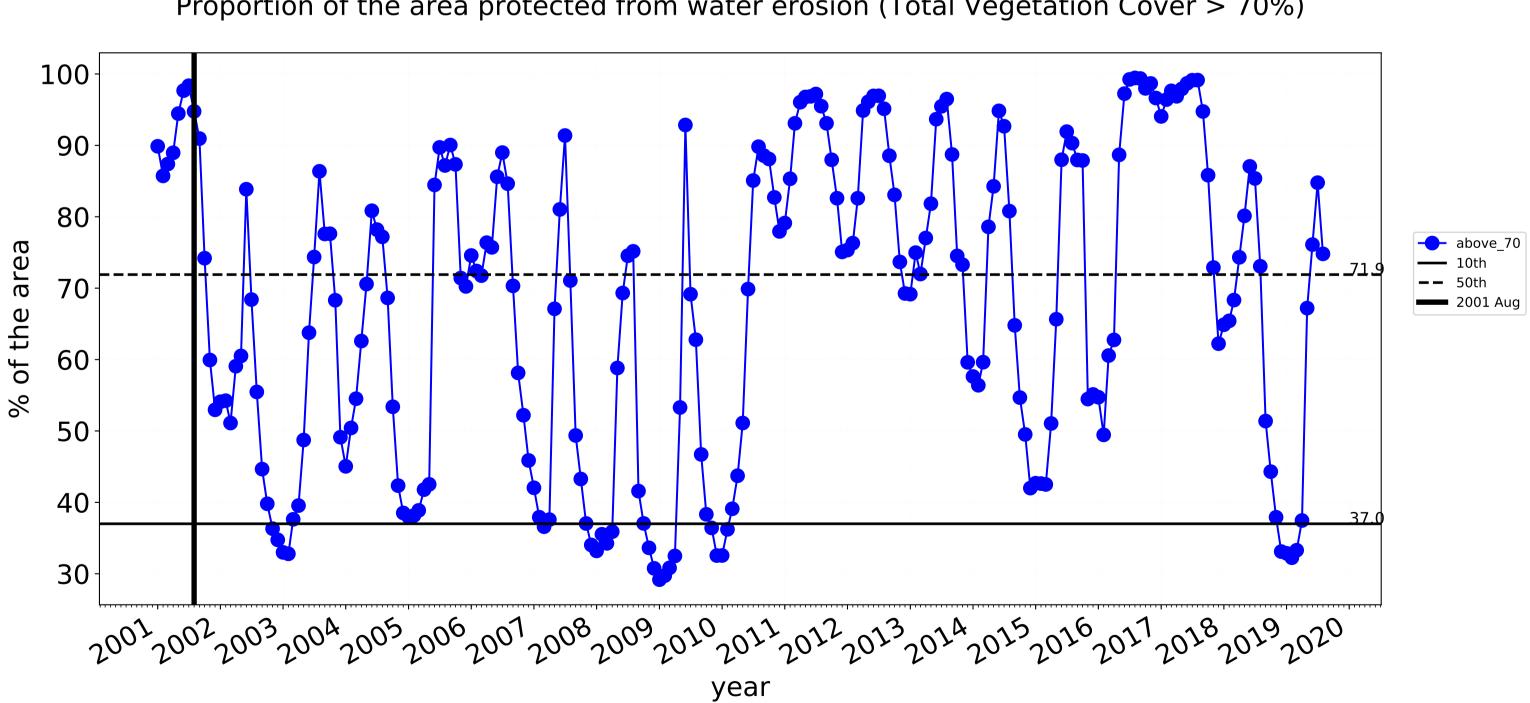
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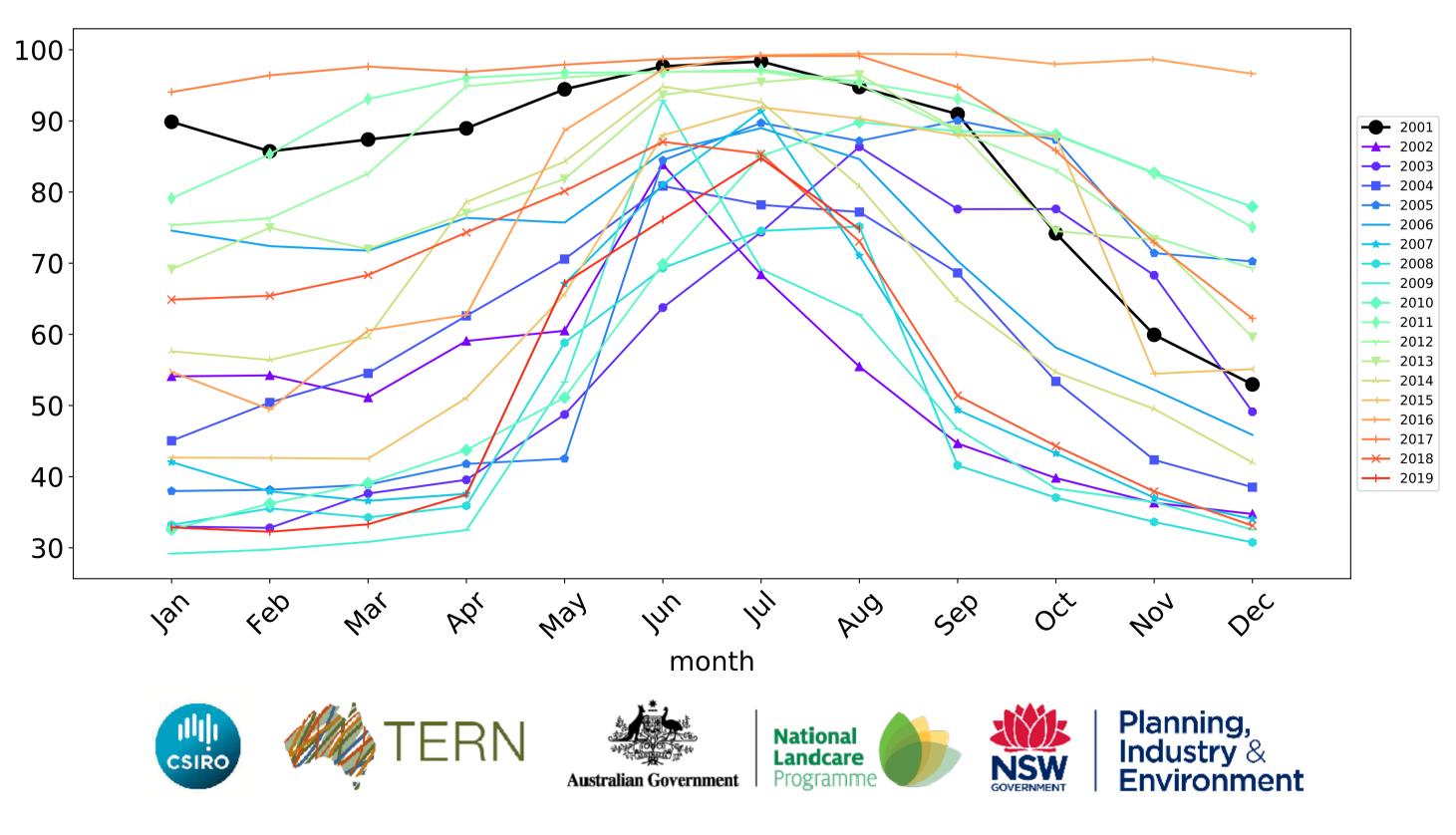
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

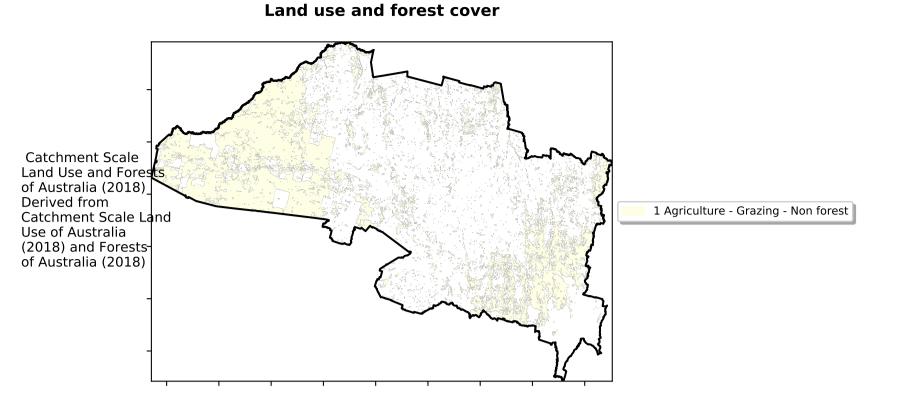
#### Grazing timeseries

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

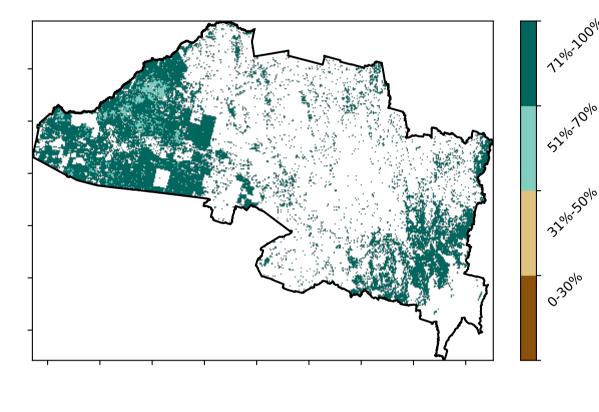


13

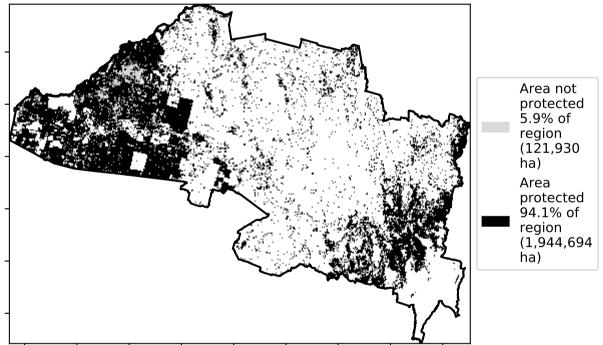
#### **Grazing non forest**



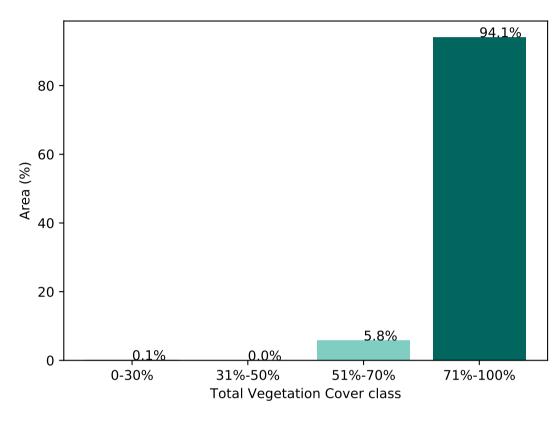
Total Vegetation Cover [%]



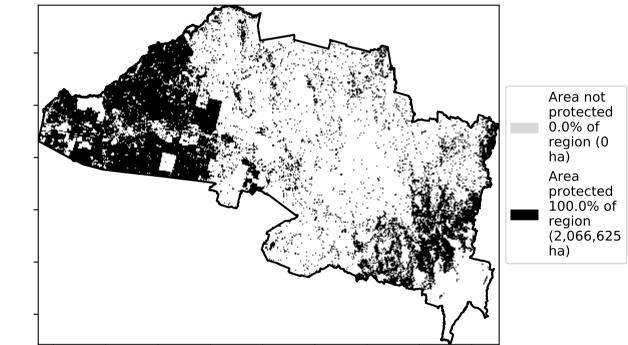
% Area protected from water erosion (>70%)



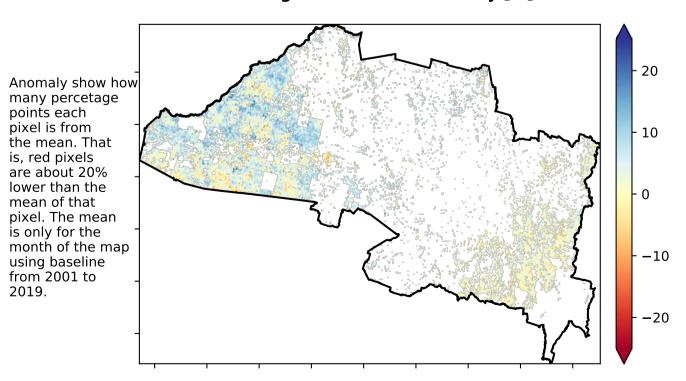
Proportion of vegetation cover class in area



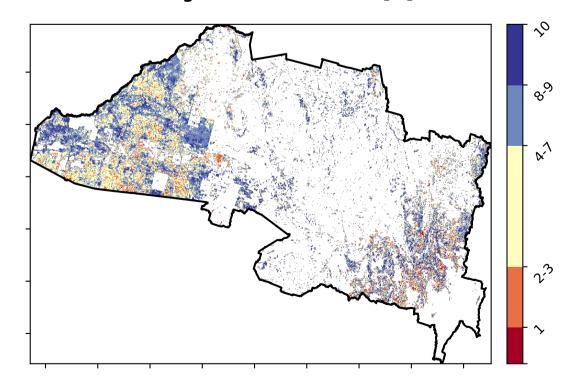
% Area protected from wind erosion (>50%)



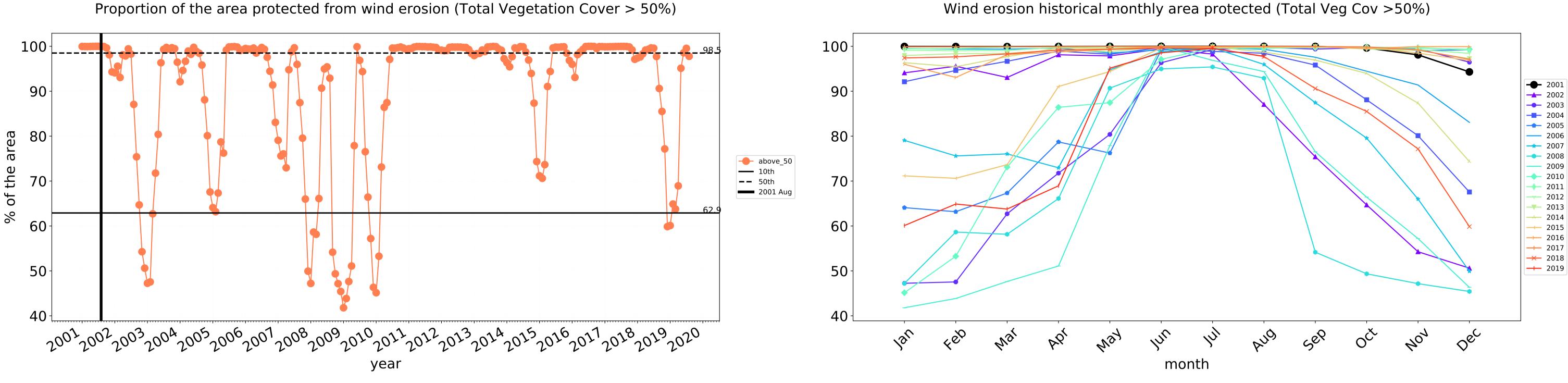
**Total Vegetation Cover Anomaly [%]** 



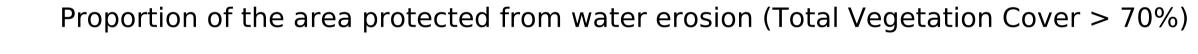
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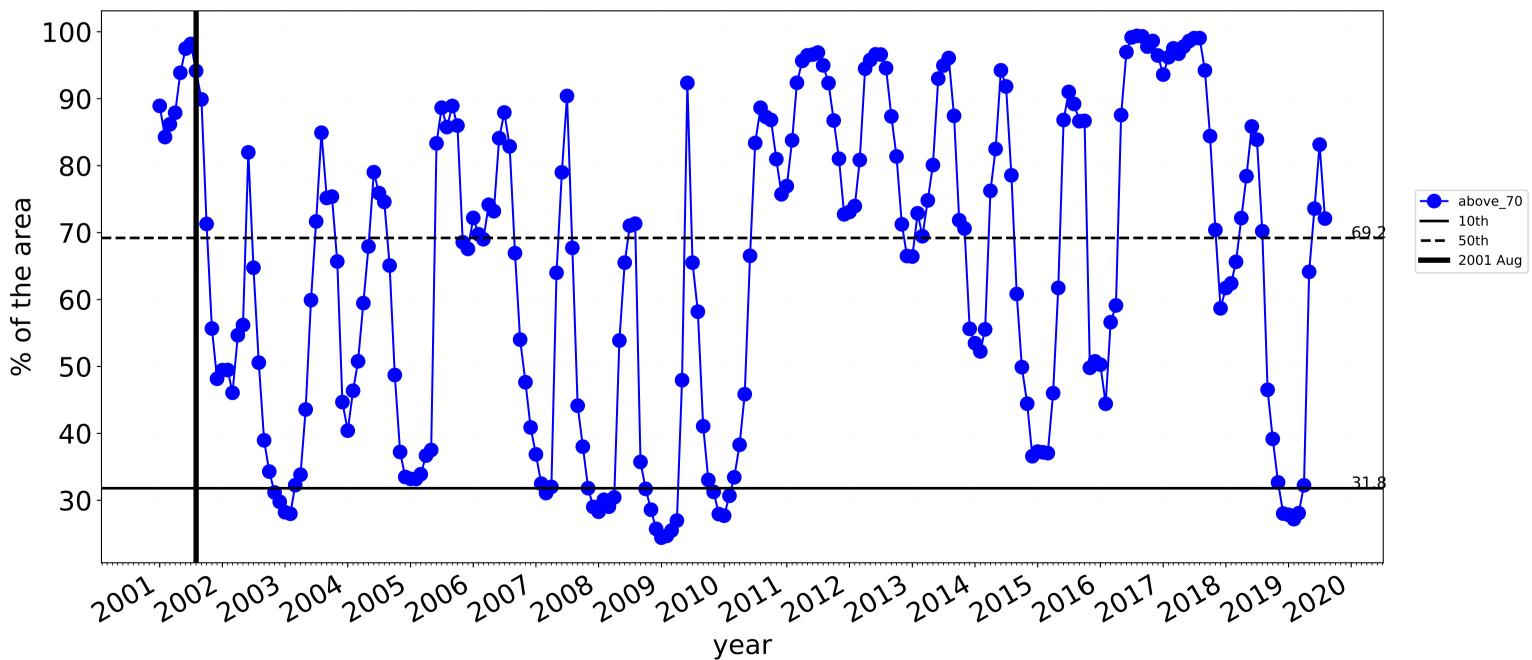




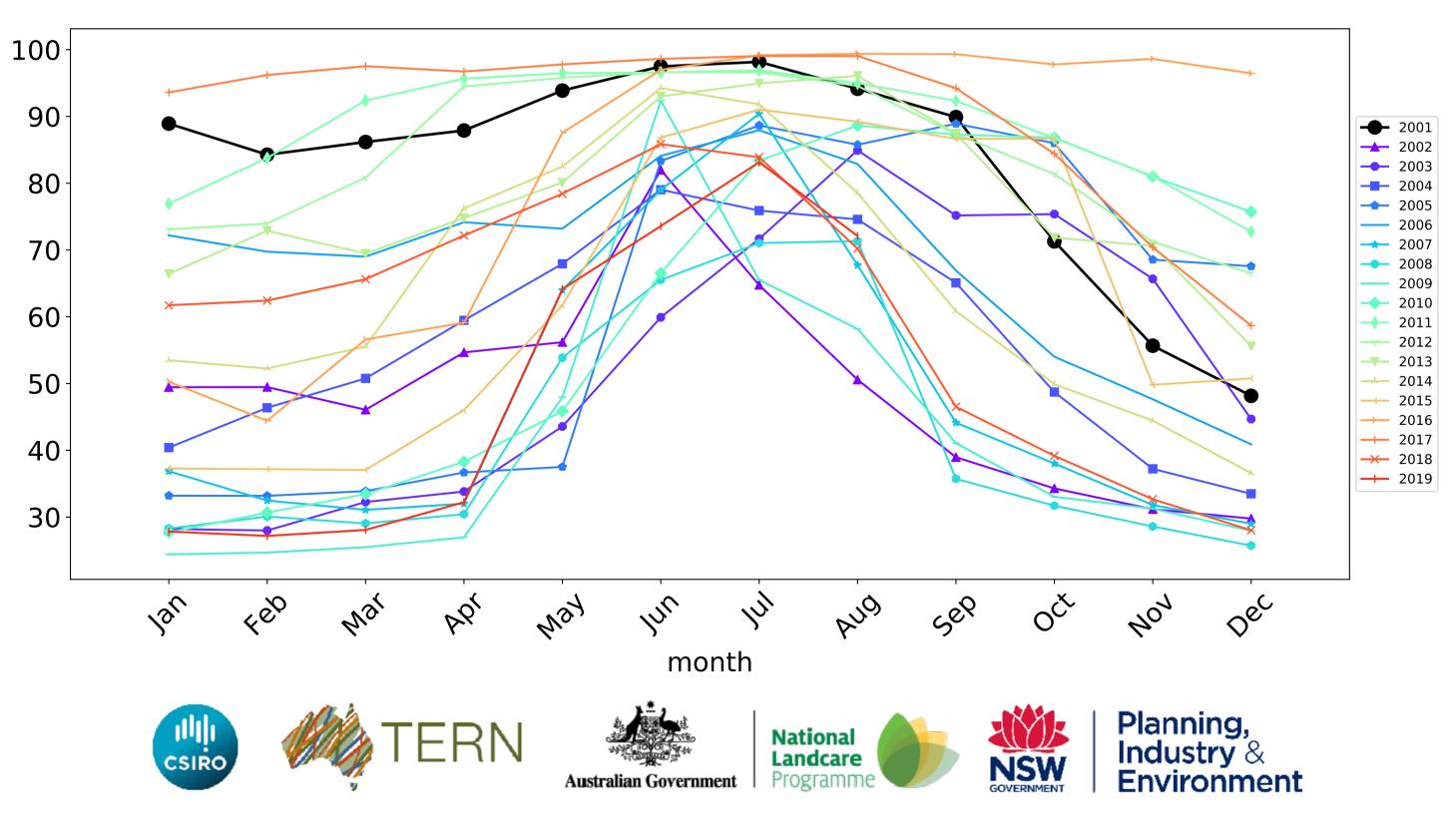


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

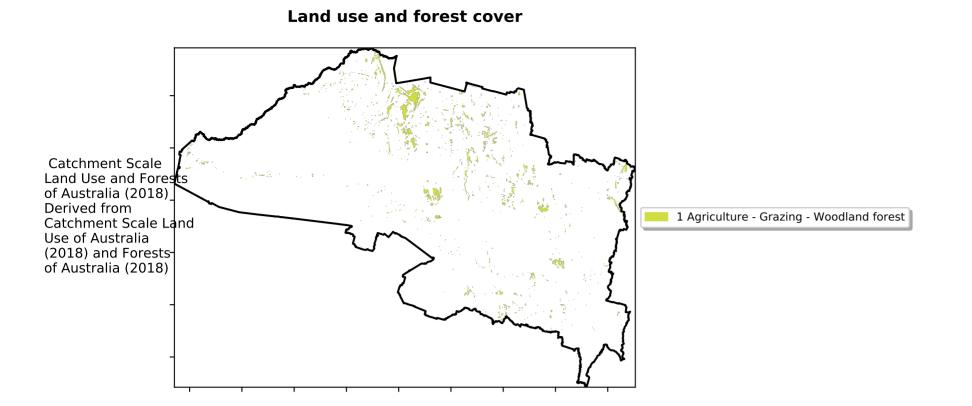




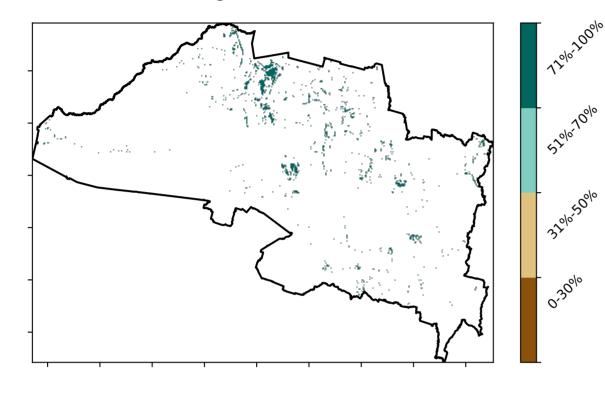
### Grazing non forest timeseries



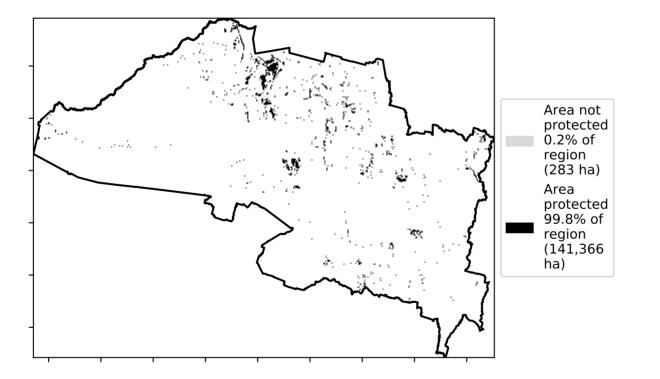
#### **Grazing Woodland forest**



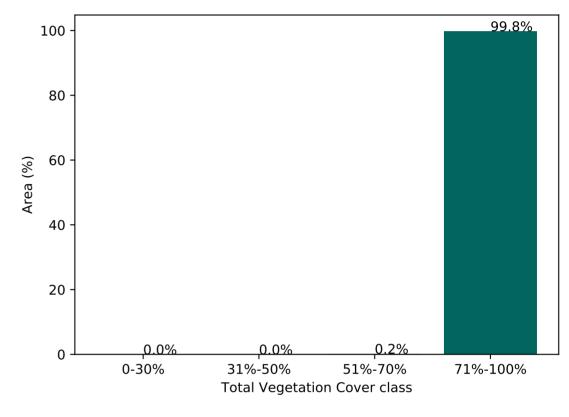
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



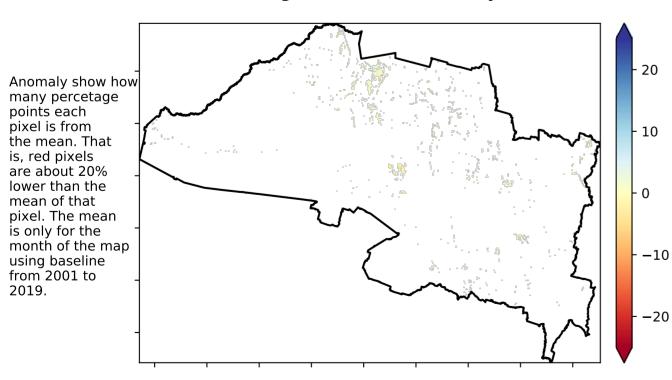
Proportion of vegetation cover class in area



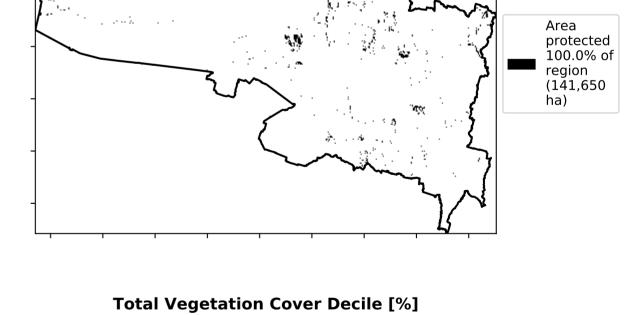
% Area protected from wind erosion (>50%)

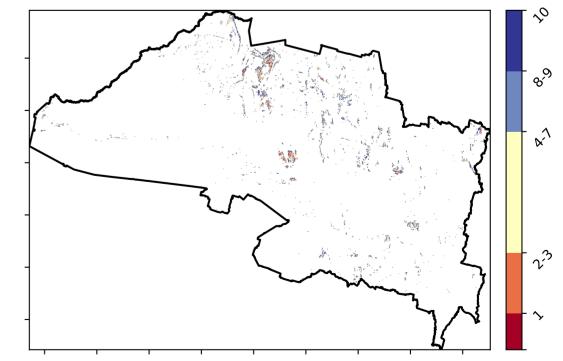


**Total Vegetation Cover Anomaly [%]** 



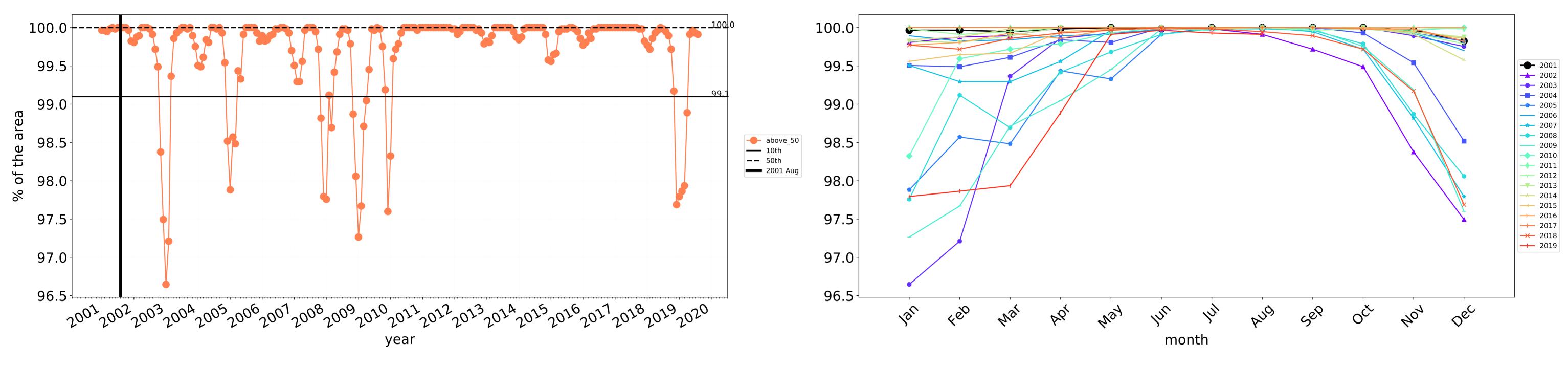
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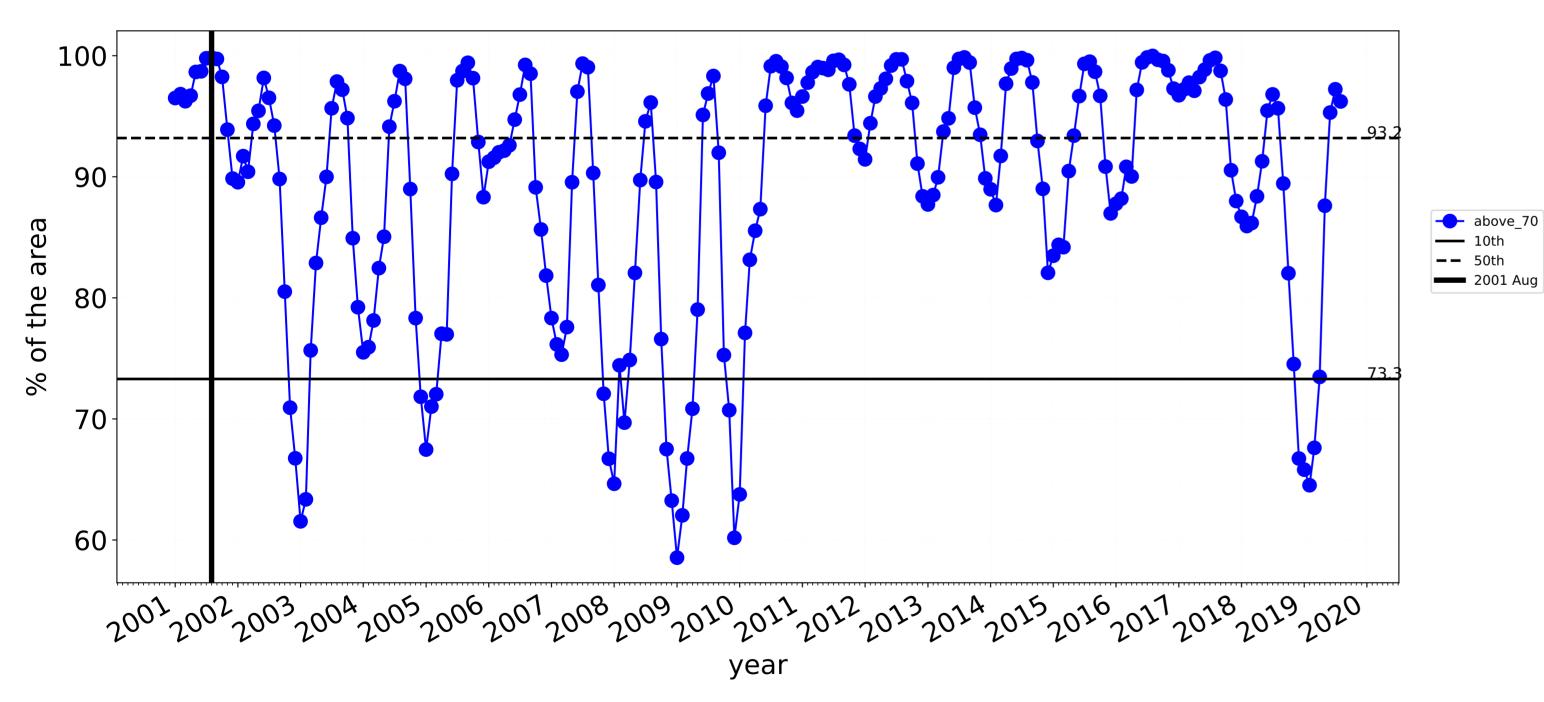


10



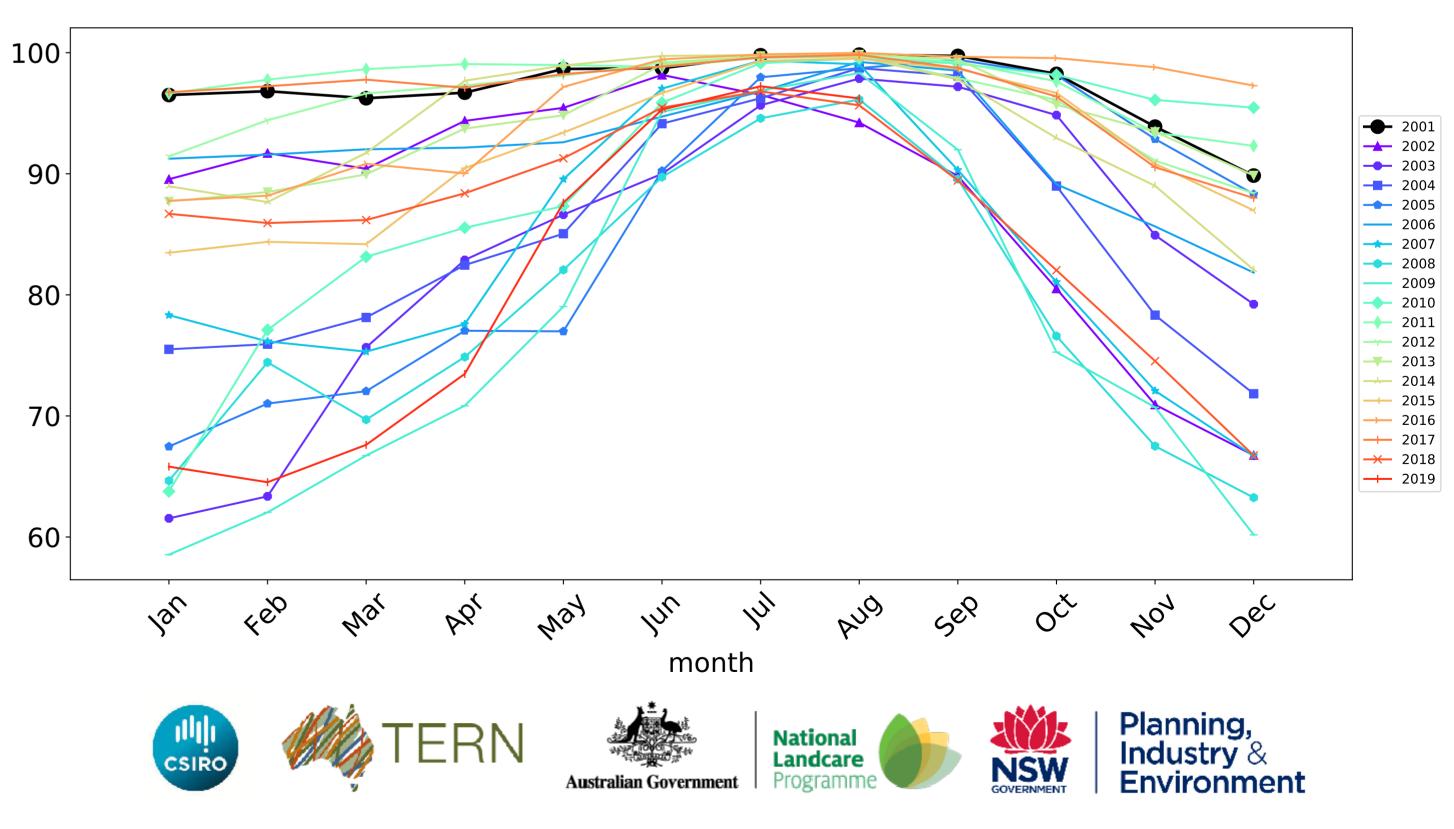
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

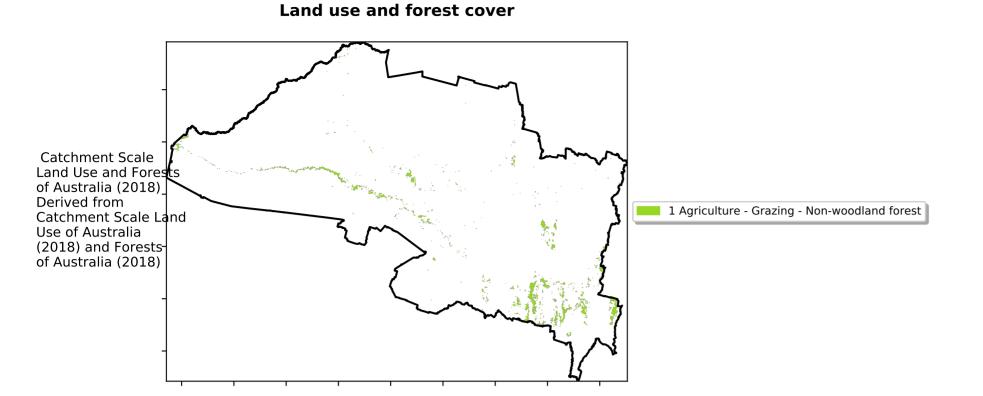




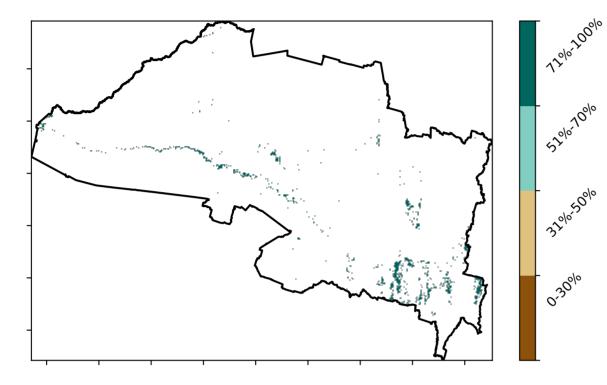
Wind erosion historical monthly area protected (Total Veg Cov >50%)



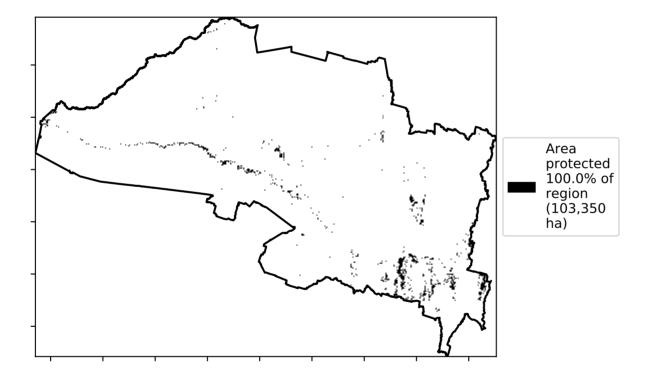
#### Grazing - Forest (non woodland)



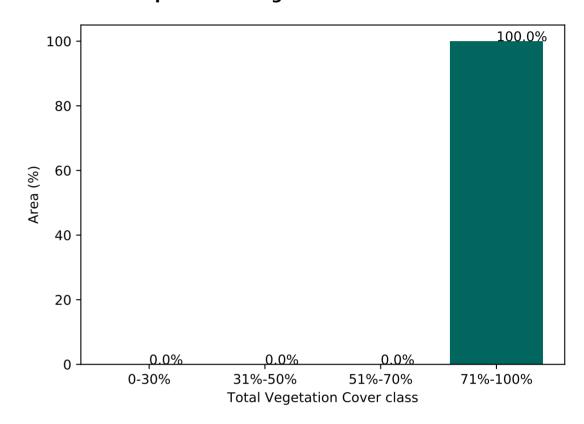
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



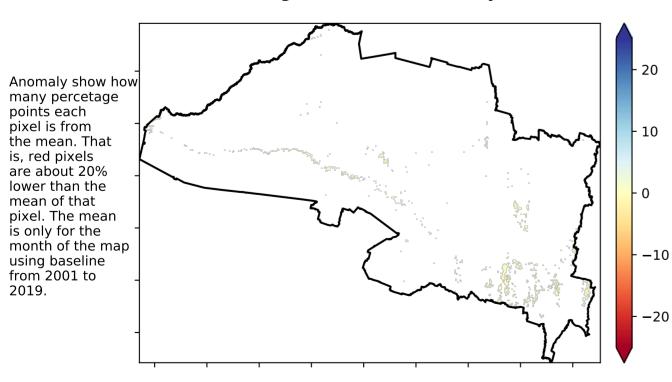
Proportion of vegetation cover class in area



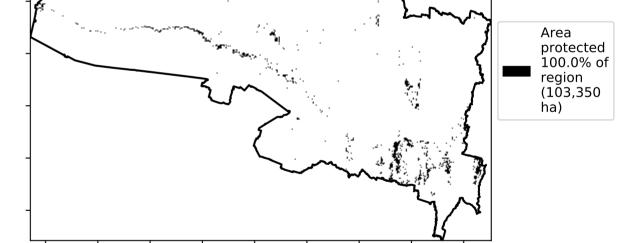
% Area protected from wind erosion (>50%)

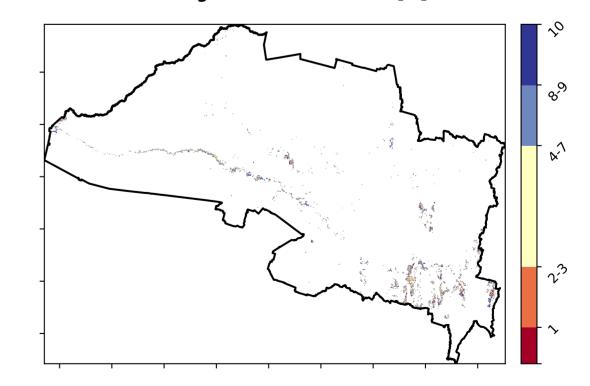


**Total Vegetation Cover Anomaly [%]** 

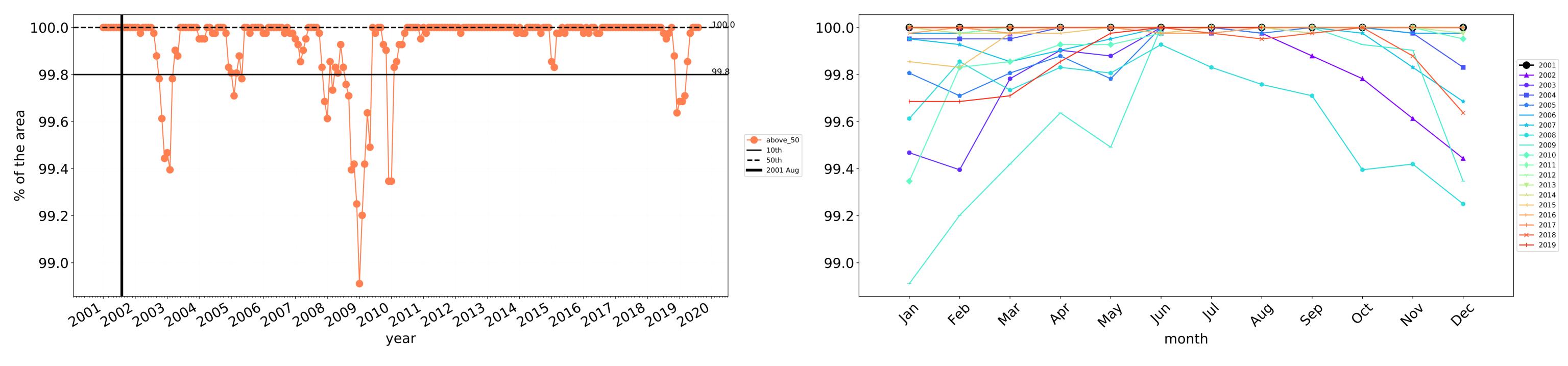


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



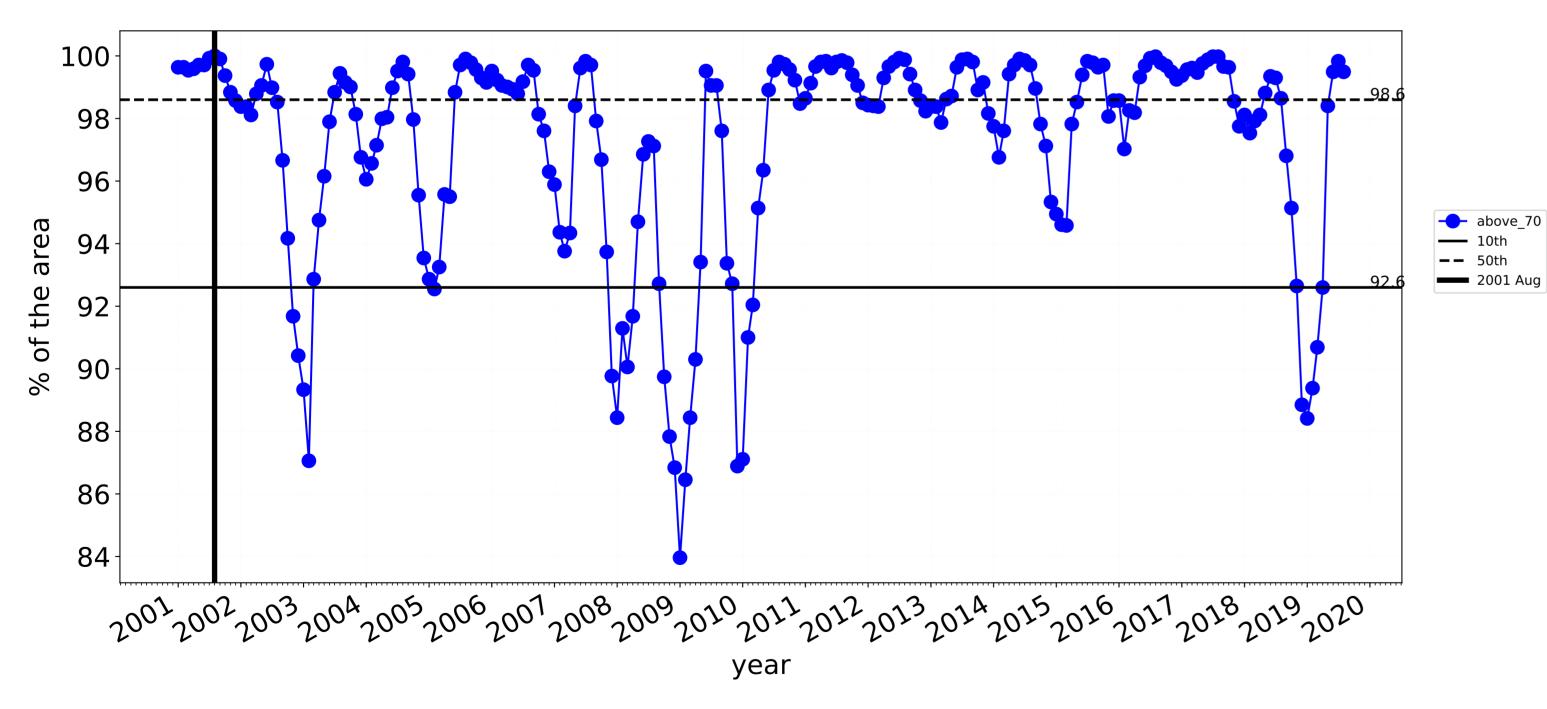


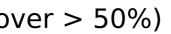




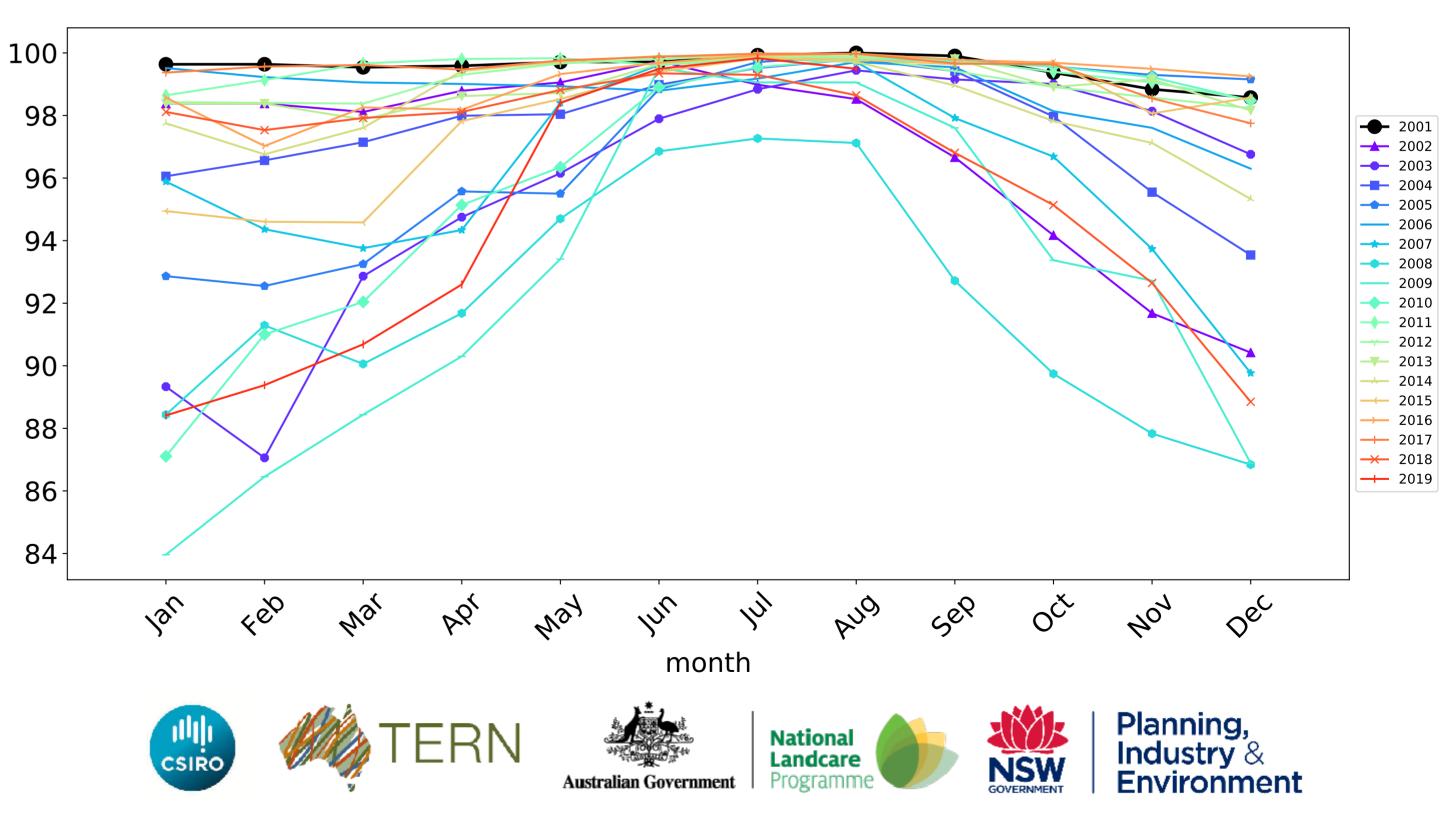
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

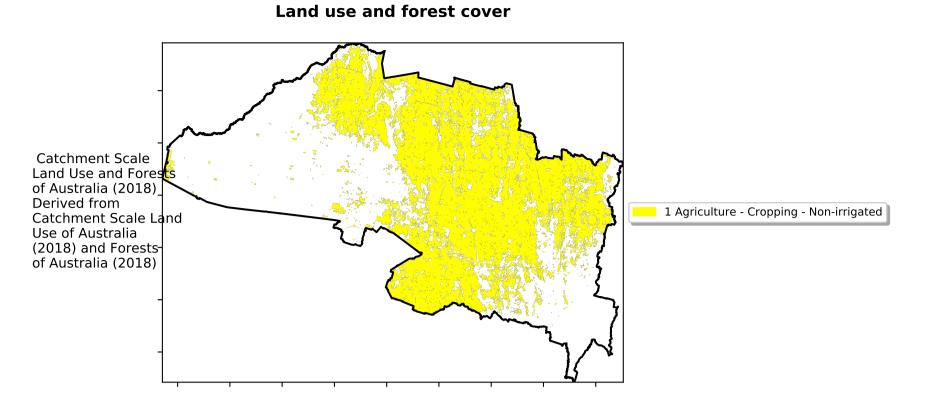




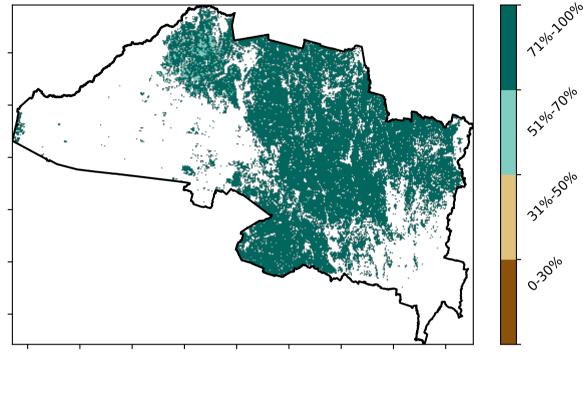
Wind erosion historical monthly area protected (Total Veg Cov >50%)



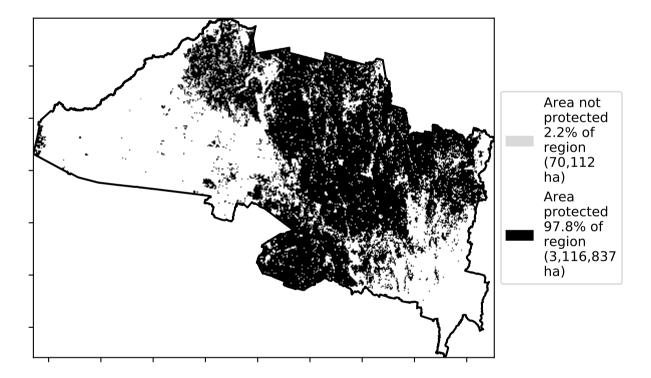
#### Cropping



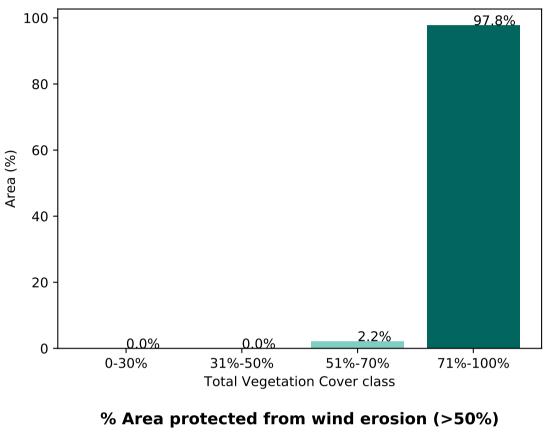
Total Vegetation Cover [%]

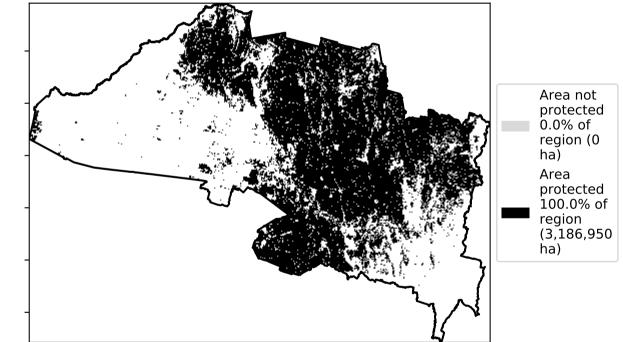


% Area protected from water erosion (>70%)

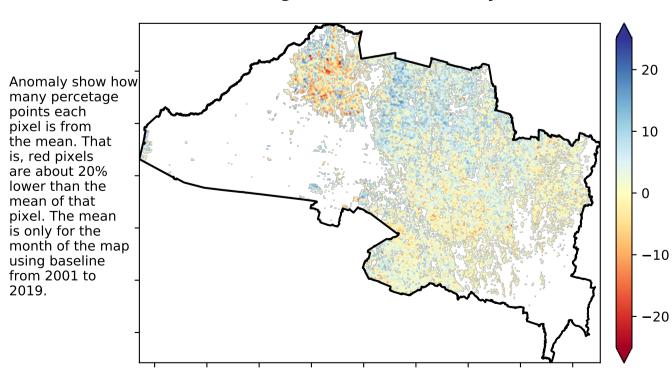


Proportion of vegetation cover class in area

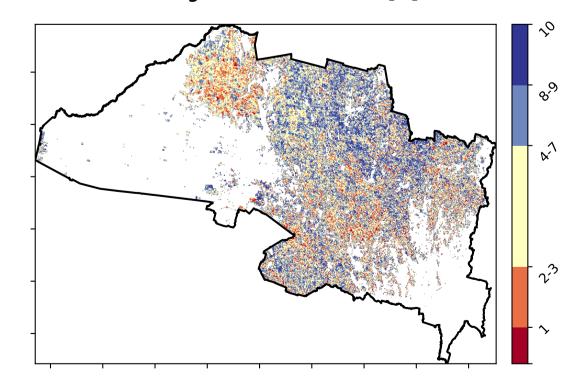




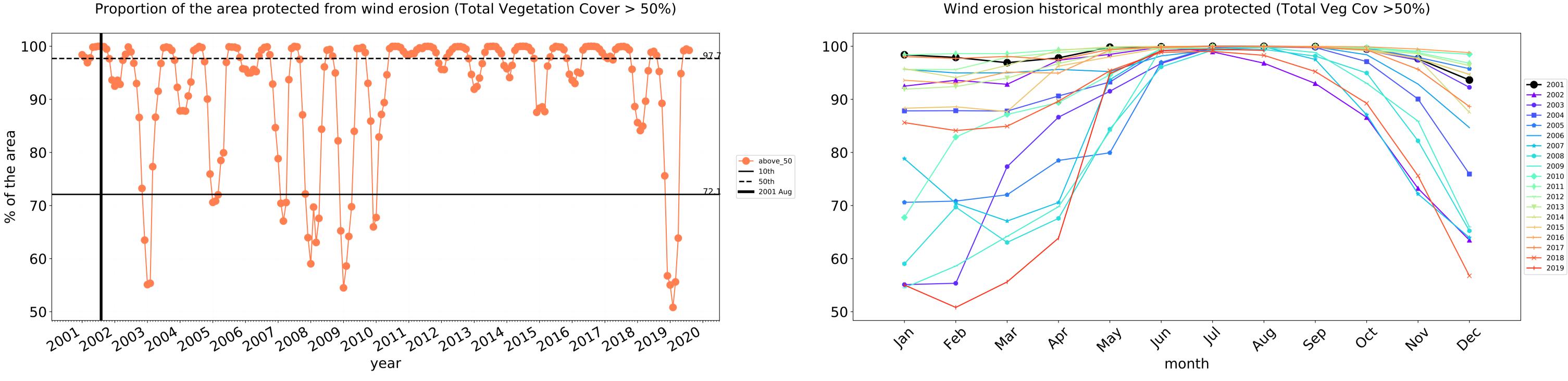
**Total Vegetation Cover Anomaly [%]** 



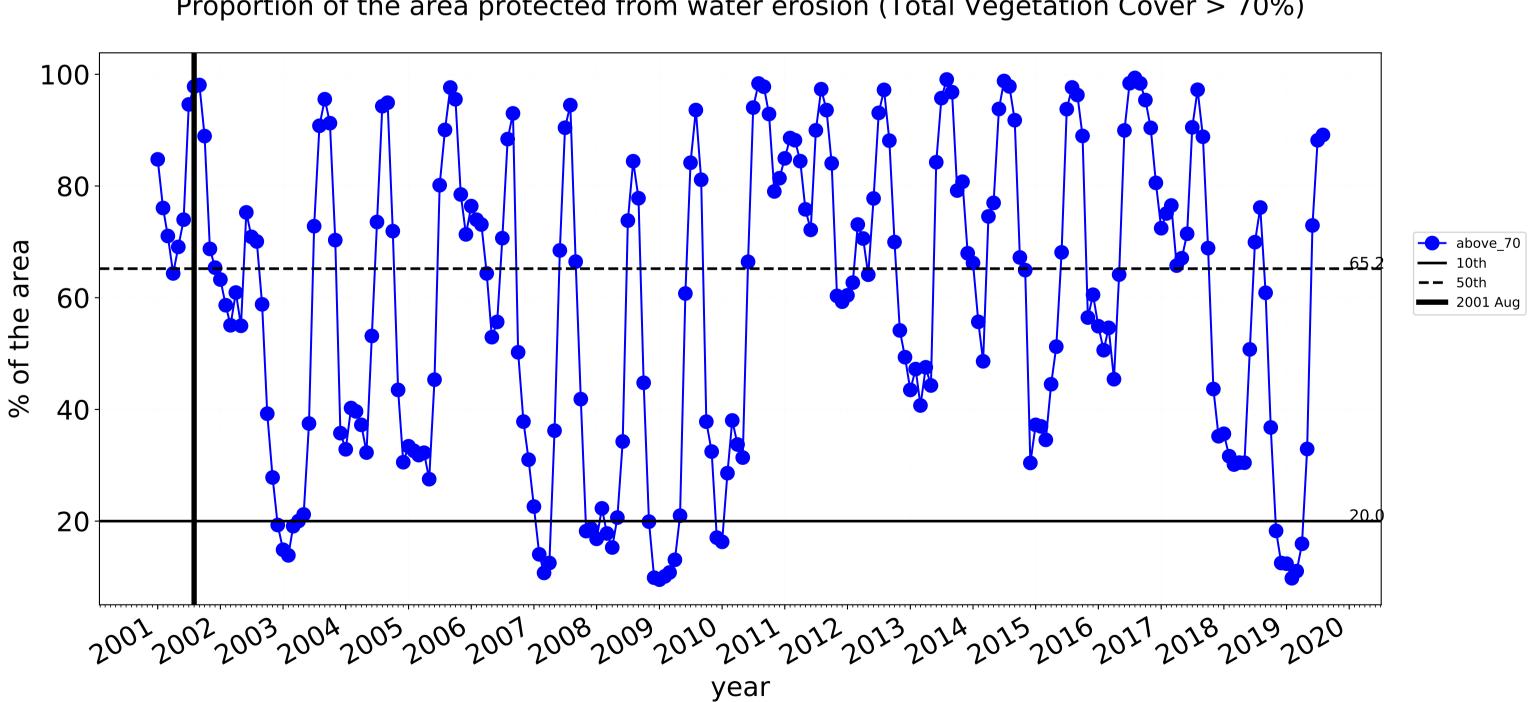
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.





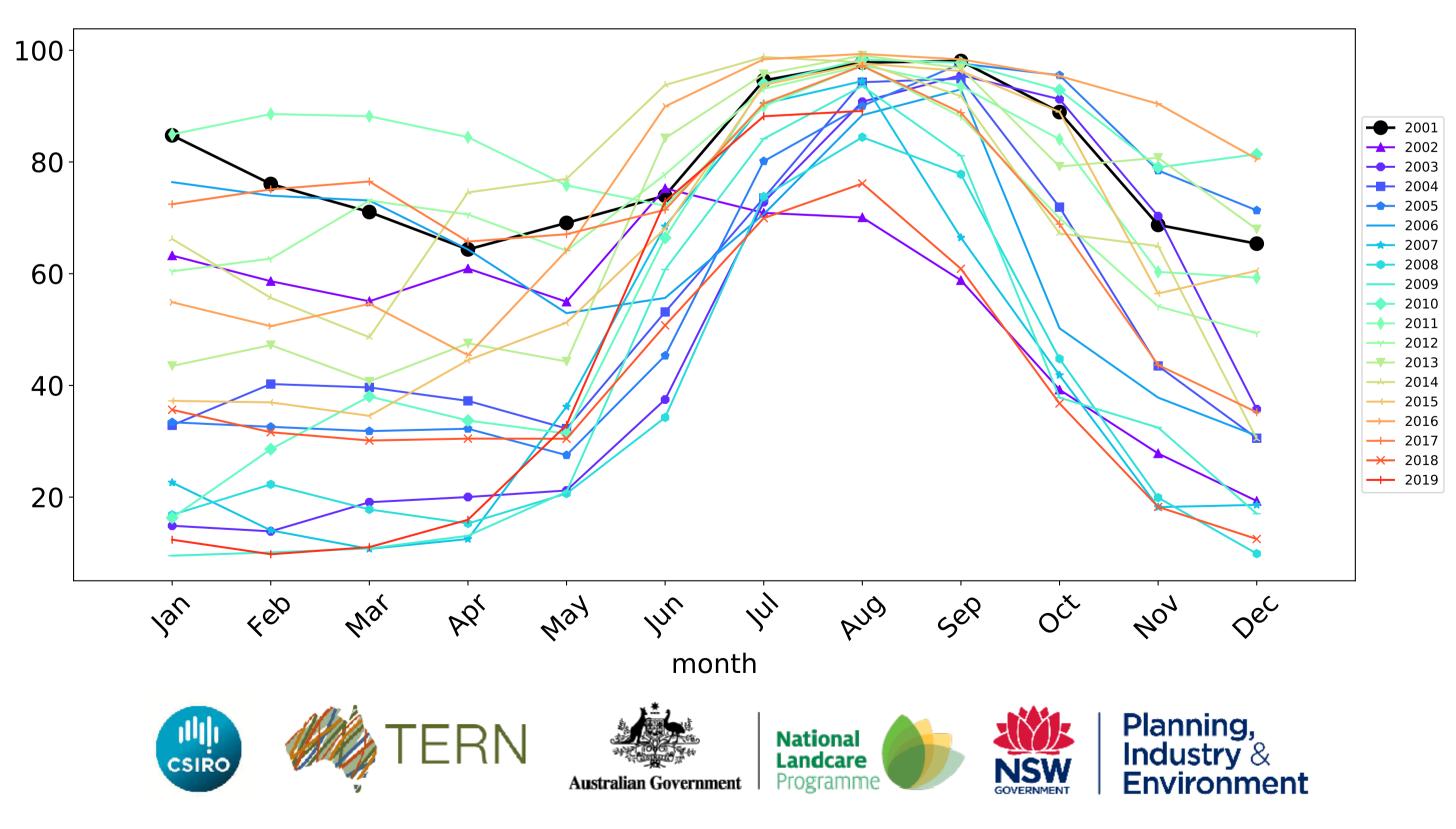


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



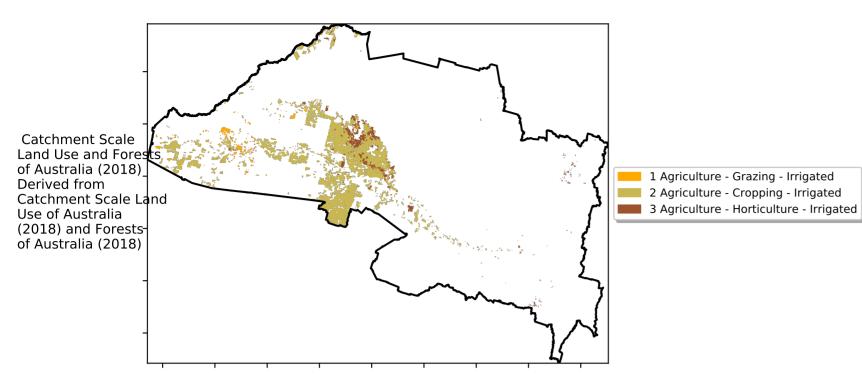
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

### **Cropping timeseries**

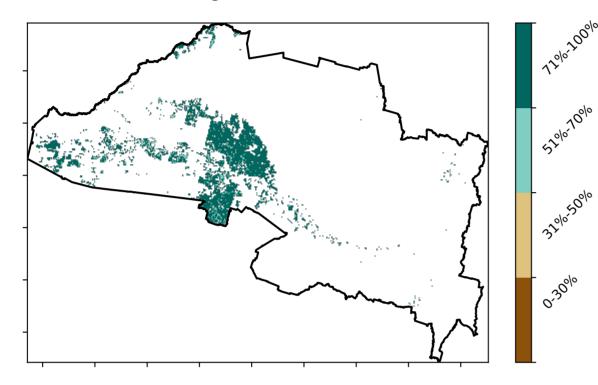


#### Irrigation

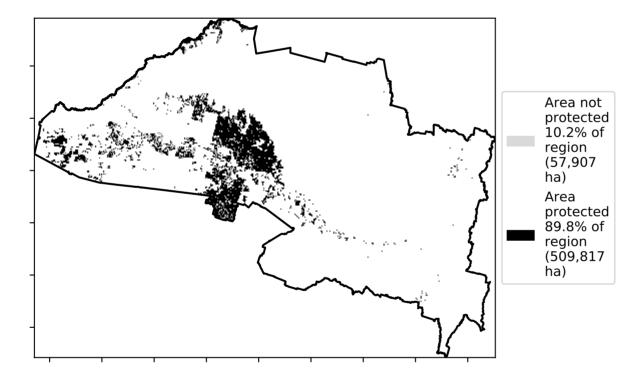
Land use and forest cover

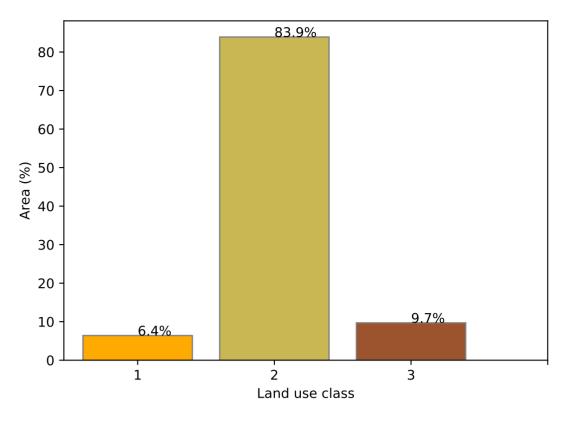


**Total Vegetation Cover [%]** 



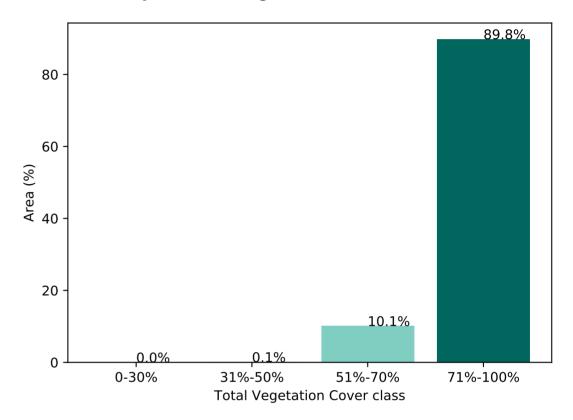
% Area protected from water erosion (>70%)



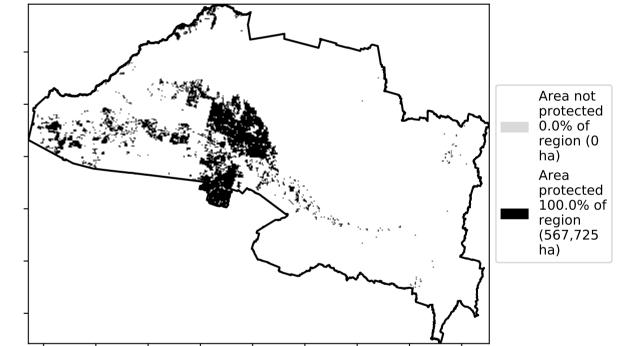


#### Proportion of each land class in area

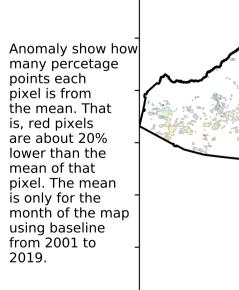
Proportion of vegetation cover class in area

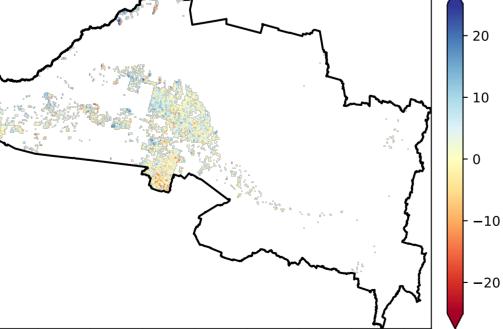


#### % Area protected from wind erosion (>50%)

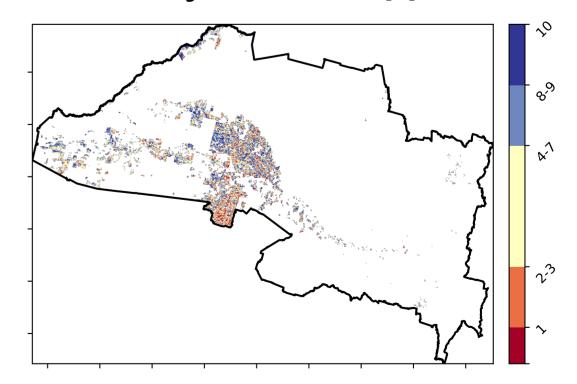


**Total Vegetation Cover Anomaly [%]** 

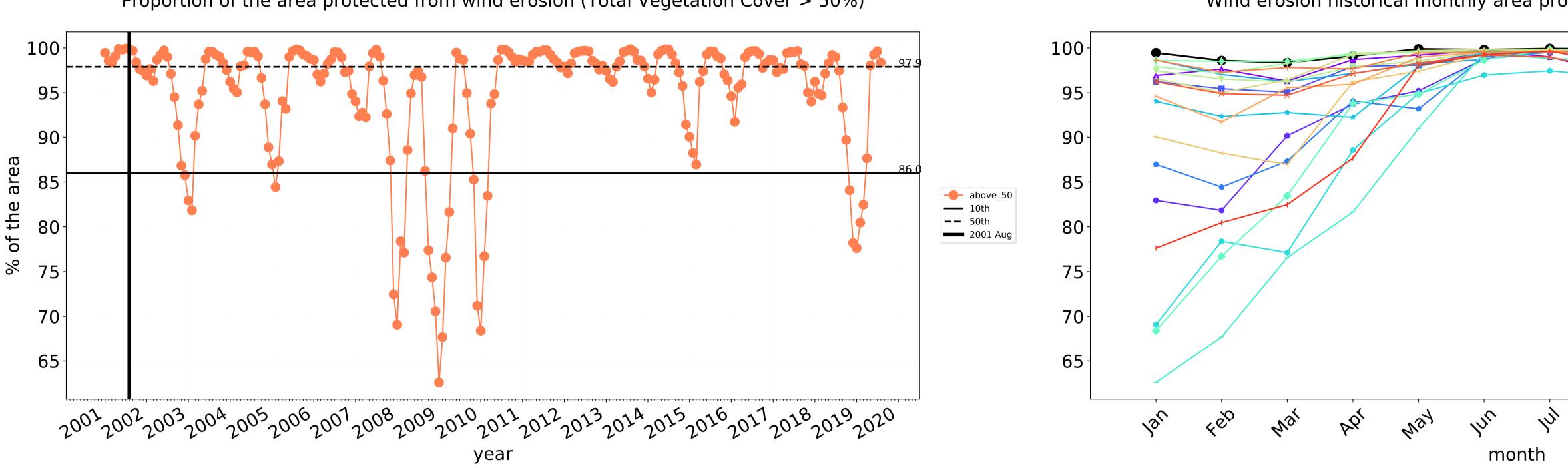




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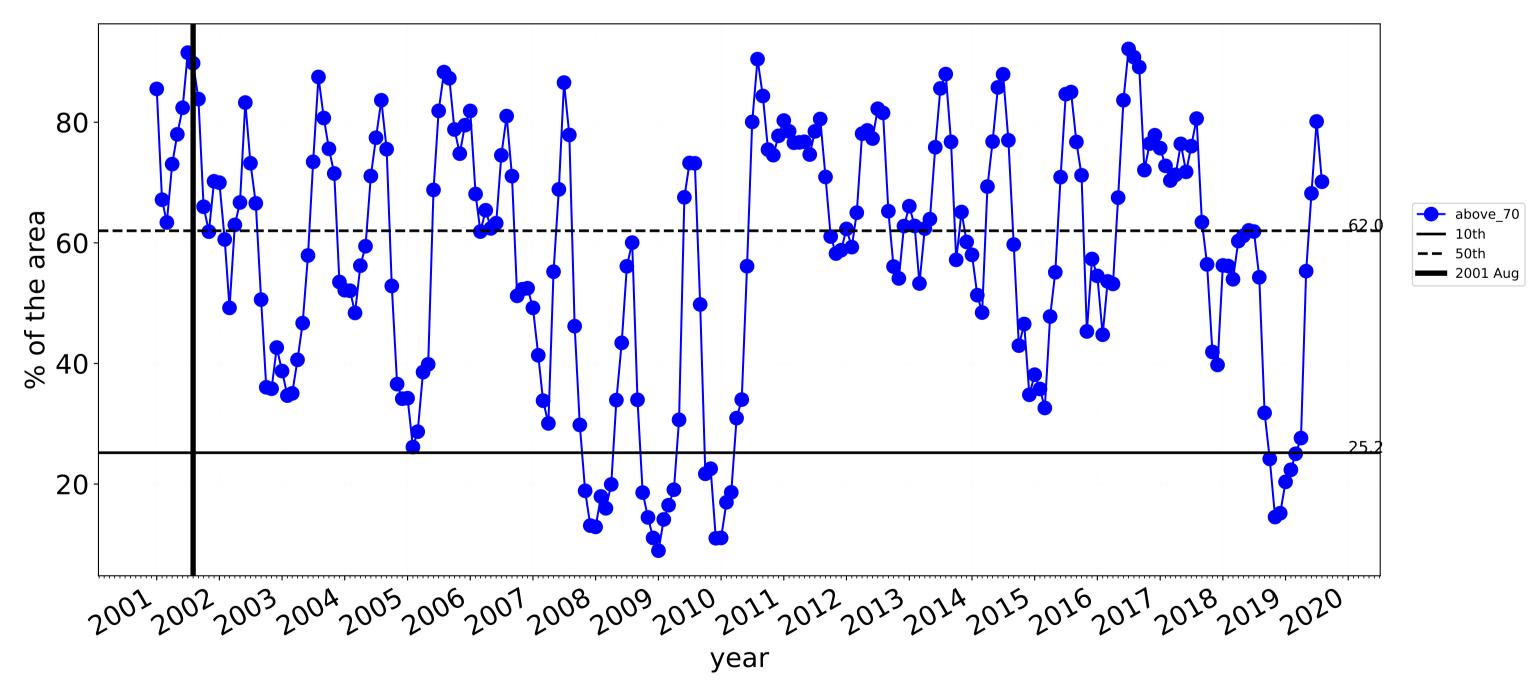




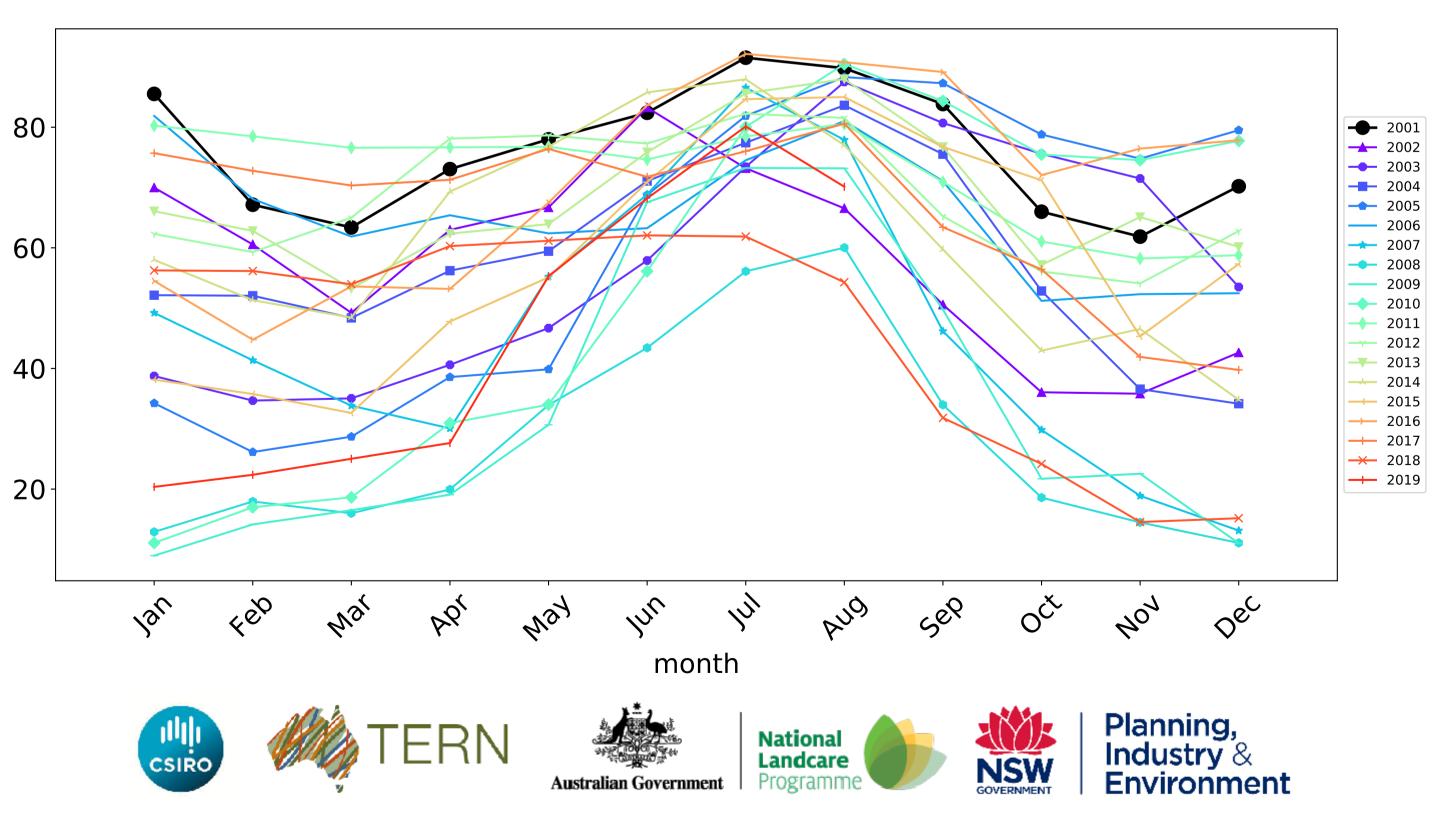


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





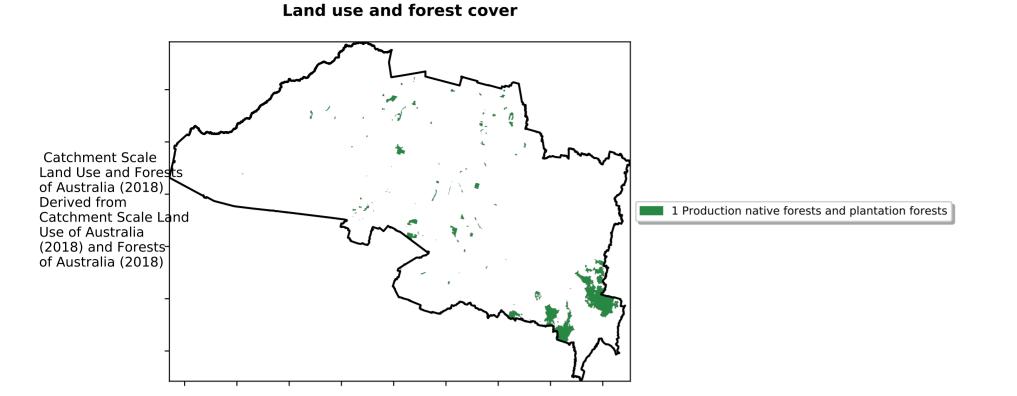
### Irrigation timeseries



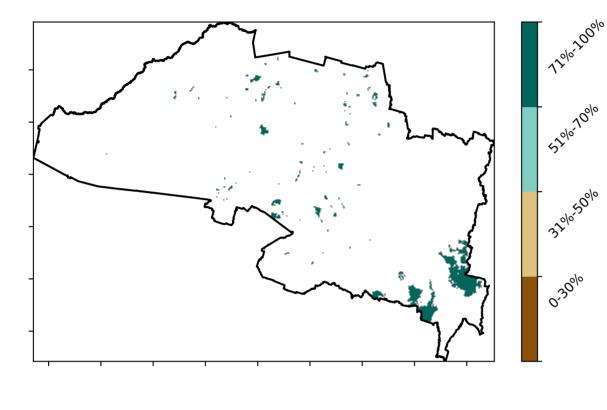
**→** 2001**→** 2002 **—** 2003 ---- 2004 **---** 2005 \_\_\_\_ 2006 **----** 2007 --- 2008 - 2009 **---** 2010 **—** 2011 2012 <mark>→</mark> 2014 <mark>→</mark> 2015 **→** 2016 <del>---</del> 2017 **→** 2018 **→** 2019 Dec AUG Sel 401 OČ

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

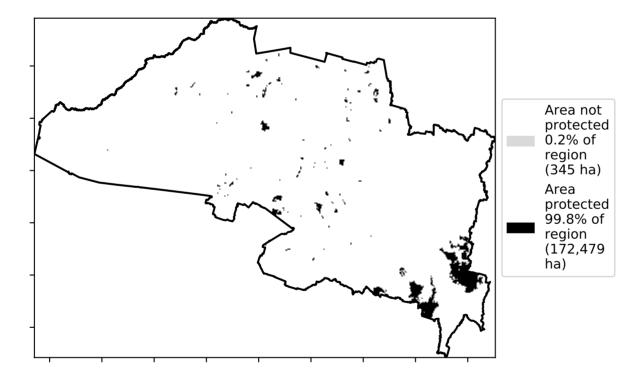
#### **Production native forests and plantation forests**



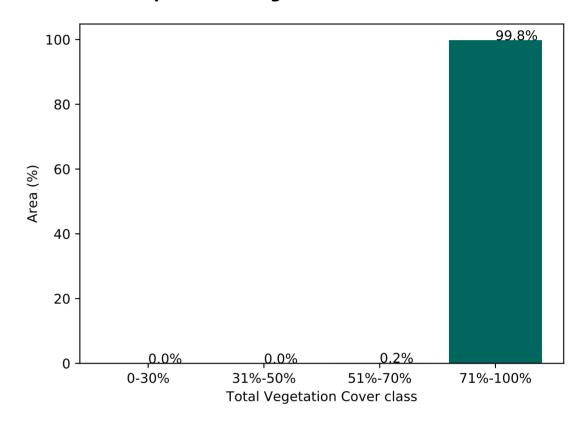
Total Vegetation Cover [%]



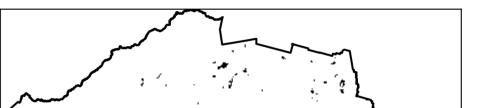
% Area protected from water erosion (>70%)



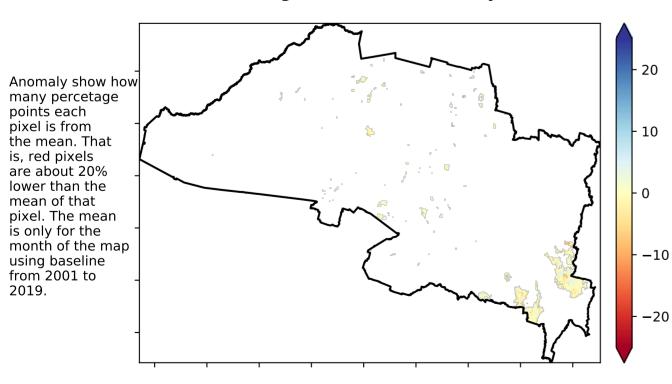




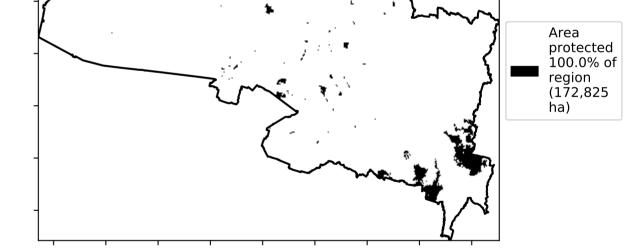
% Area protected from wind erosion (>50%)



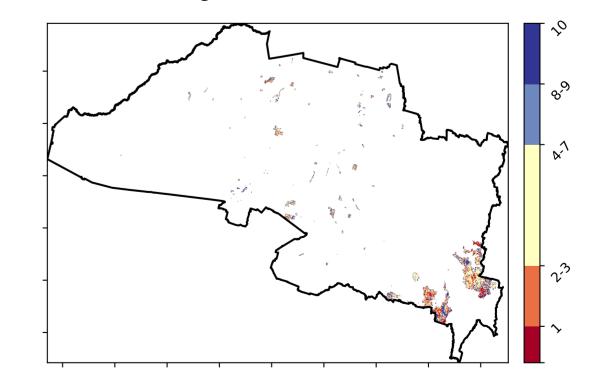
Total Vegetation Cover Anomaly [%]



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.

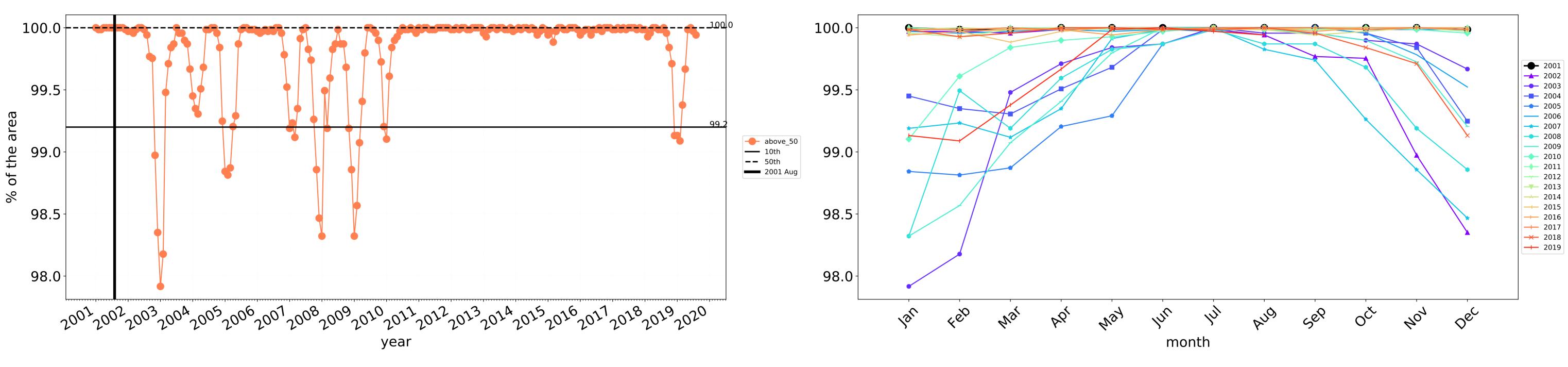


**Total Vegetation Cover Decile [%]** 





from 2001 to 2



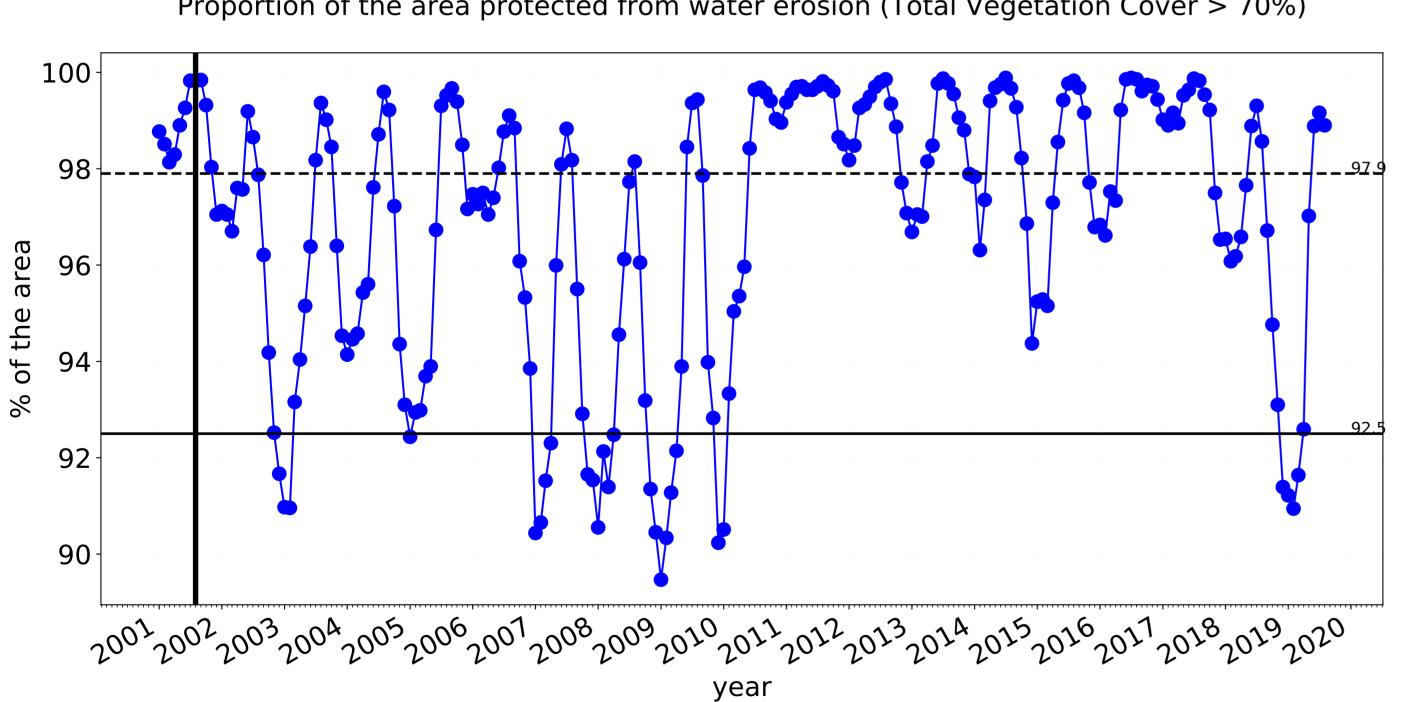
---- above\_70

**—** 2001 Aug

**—** 10th

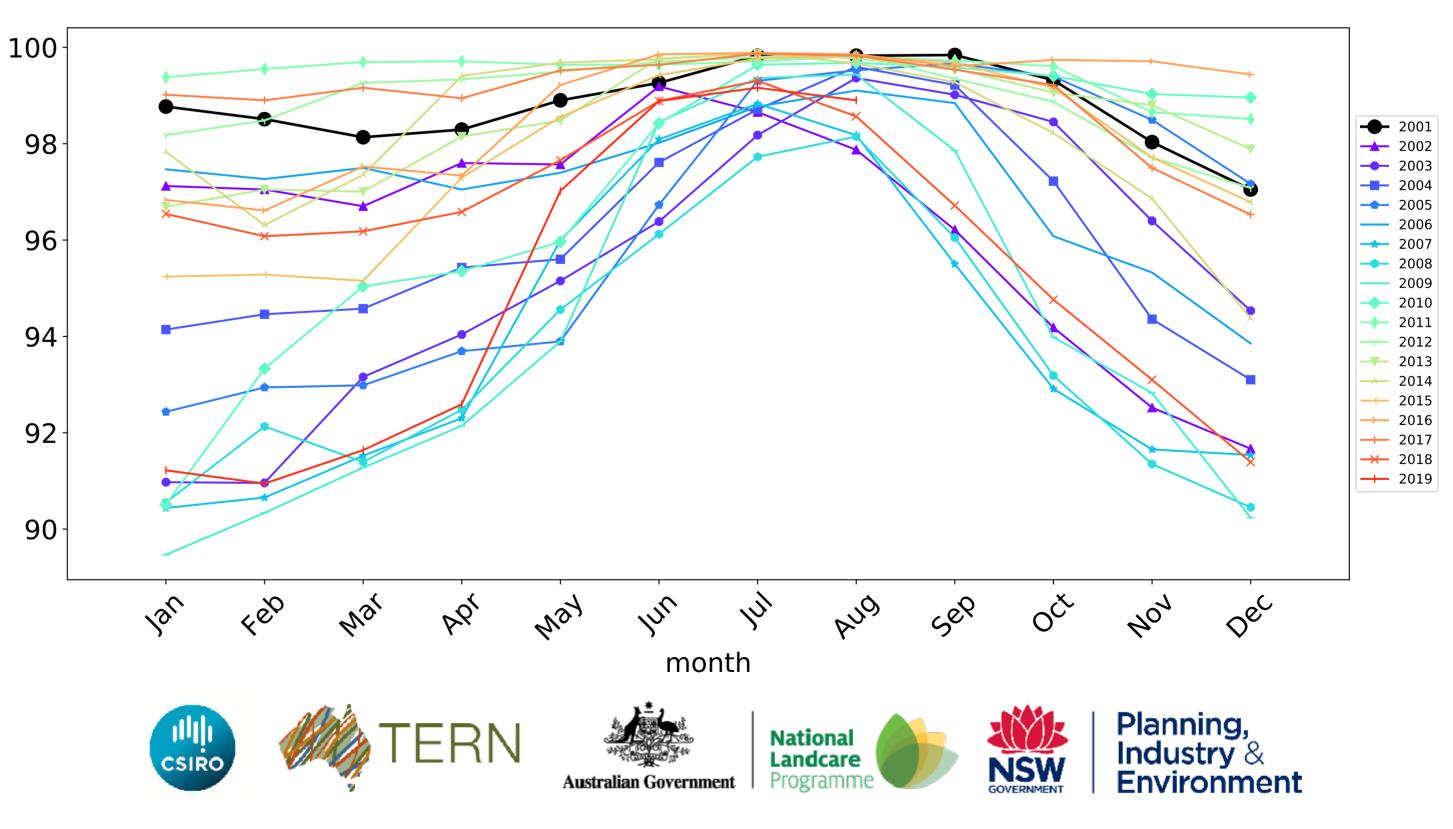
**——** 50th

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%)



# Riverina (6,688,000 ha and no data 20,335 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	6,688,000	100.0% 6,687,001	100.0% 6,684,978	96.0% 6,419,028	78.0% 5,219,220	26.6% 1,776,853	5.5% 367,326
Conservation and natural environments	322,875	100.0% 322,875	100.0% 322,875	97.9% 316,050	88.9% 287,150	67.7% 218,600	30.4% 98,025
Conservation and natural environments non forest	83,300	100.0% 83,300	100.0% 83,300	91.9% 76,550	59.1% 49,250	18.5% 15,400	7.2% 5,975
Conservation and natural environments Forest (non woodland)	195,075	100.0% 195,075	100.0% 195,075	100.0% 195,025	99.5% 194,050	87.9% 171,450	44.0% 85,825
Agriculture	6,068,125	100.0% 6,067,925	100.0% 6,066,500	95.9% 5,818,750	77.2% 4,681,600	23.2% 1,407,800	3.3% 200,625
Grazing	2,311,625	100.0% 2,311,625	100.0% 2,311,175	94.8% 2,190,500	72.6% 1,677,725	29.4% 680,000	4.6% 106,700
Grazing non forest	2,066,625	100.0% 2,066,625	100.0% 2,066,175	94.1% 1,945,725	69.7% 1,439,550	25.9% 534,850	3.8% 78,575
Grazing Woodland forest	141,650	100.0% 141,650	100.0% 141,650	99.8% 141,425	96.3% 136,450	50.5% 71,575	6.2% 8,750
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,350	100.0% 103,350	98.4% 101,725	71.2% 73,575	18.7% 19,375
Cropping	3,186,950	100.0% 3,186,875	100.0% 3,186,425	97.8% 3,116,800	84.9% 2,706,450	21.7% 692,075	2.8% 88,025
Irrigation	567,725	100.0% 567,600	99.9% 567,075	89.8% 509,725	52.3% 296,975	6.3% 35,675	1.0% 5,900
Production native forests and plantation forests	172,825	100.0% 172,825	100.0% 172,825	99.8% 172,525	98.6% 170,450	77.8% 134,450	38.5% 66,500

