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

# Date: May 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:

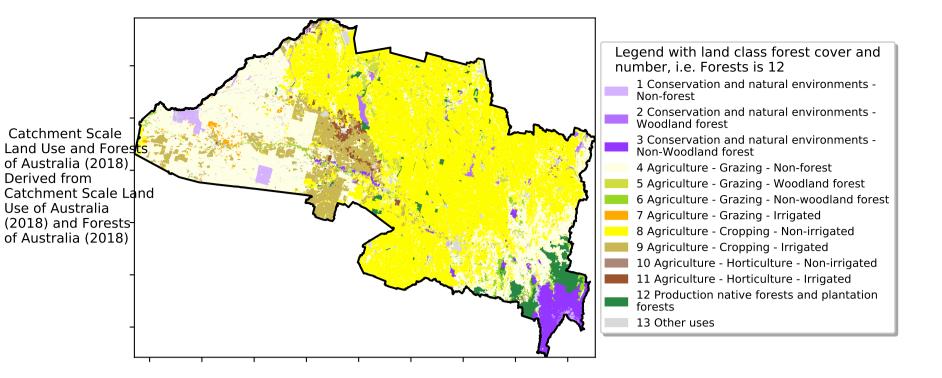
https://doi.org/10.4225/08/5848a3f19a7b3



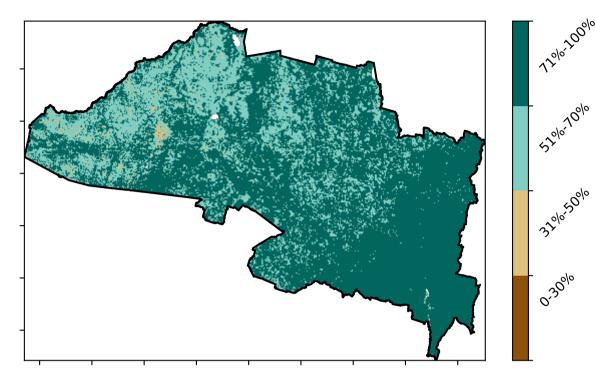
# **Vegetation Cover May 2021**

Land use and forest cover

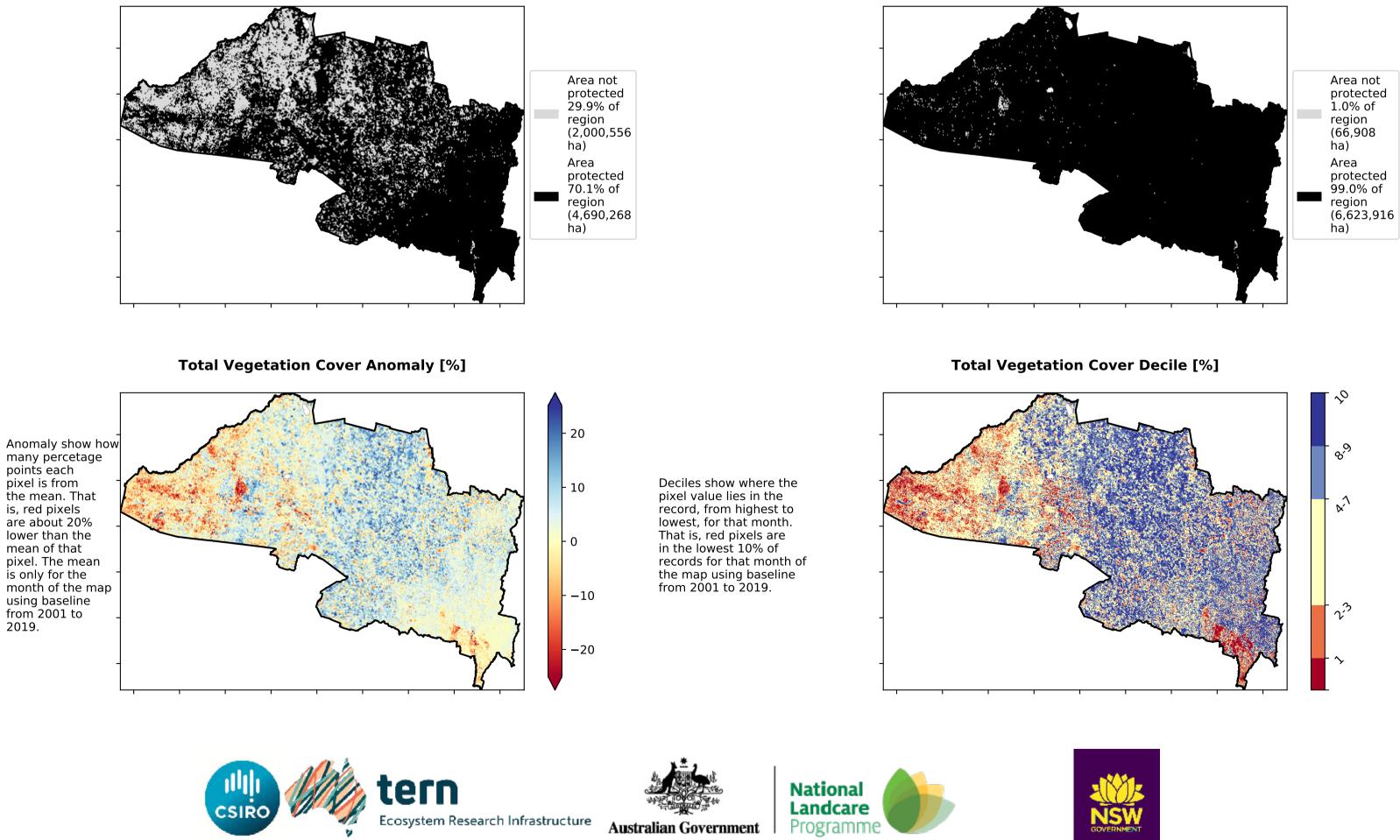
#### Proportion of each land class in area

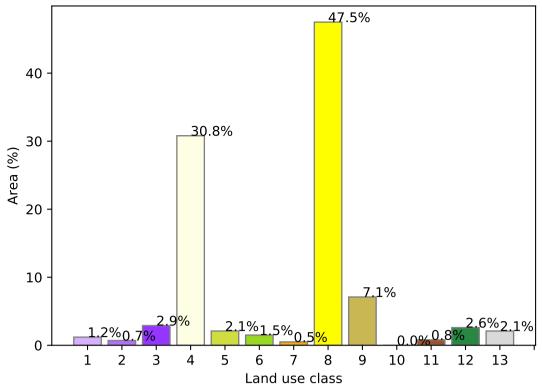


**Total Vegetation Cover [%]** 

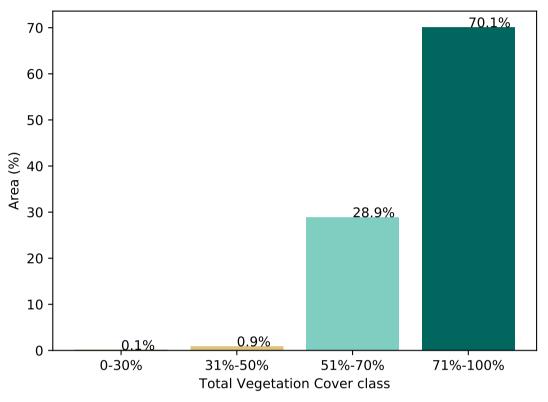


#### % Area protected from water erosion (>70%)

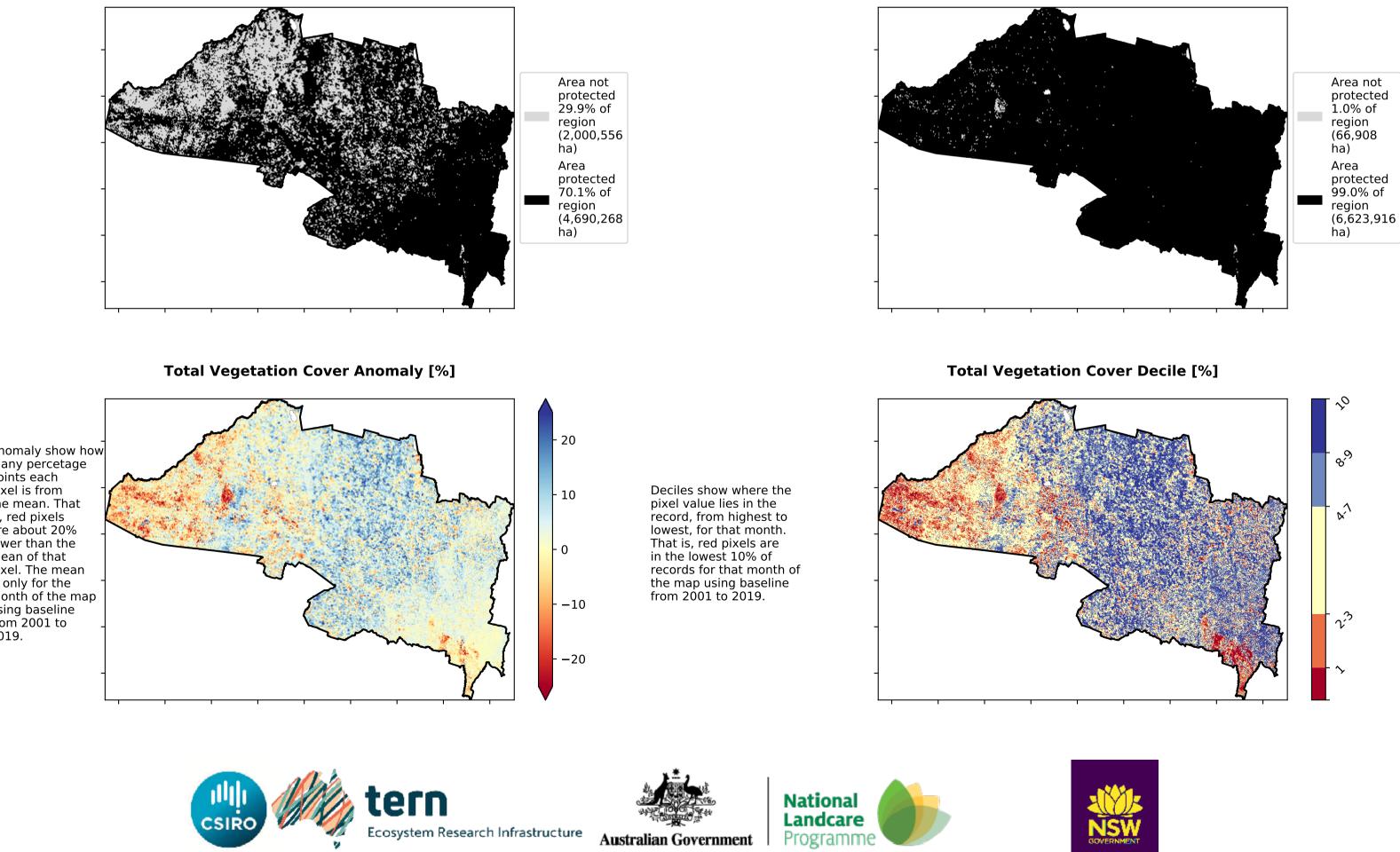


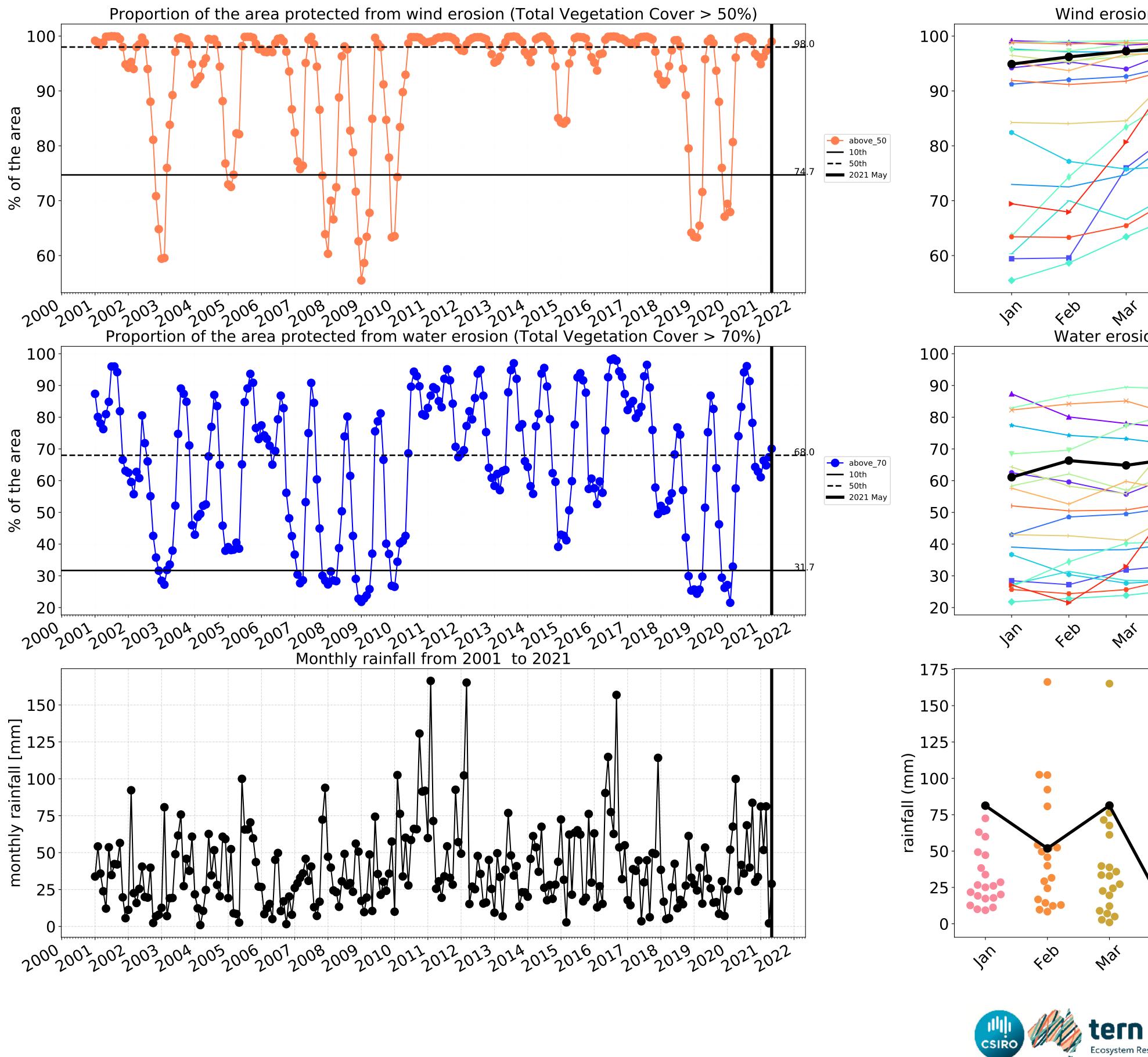


#### **Proportion of vegetation cover class in area**



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





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

261

2

P.Q

Ecosystem Research Infrastructure

JU,

JUJ

Nay

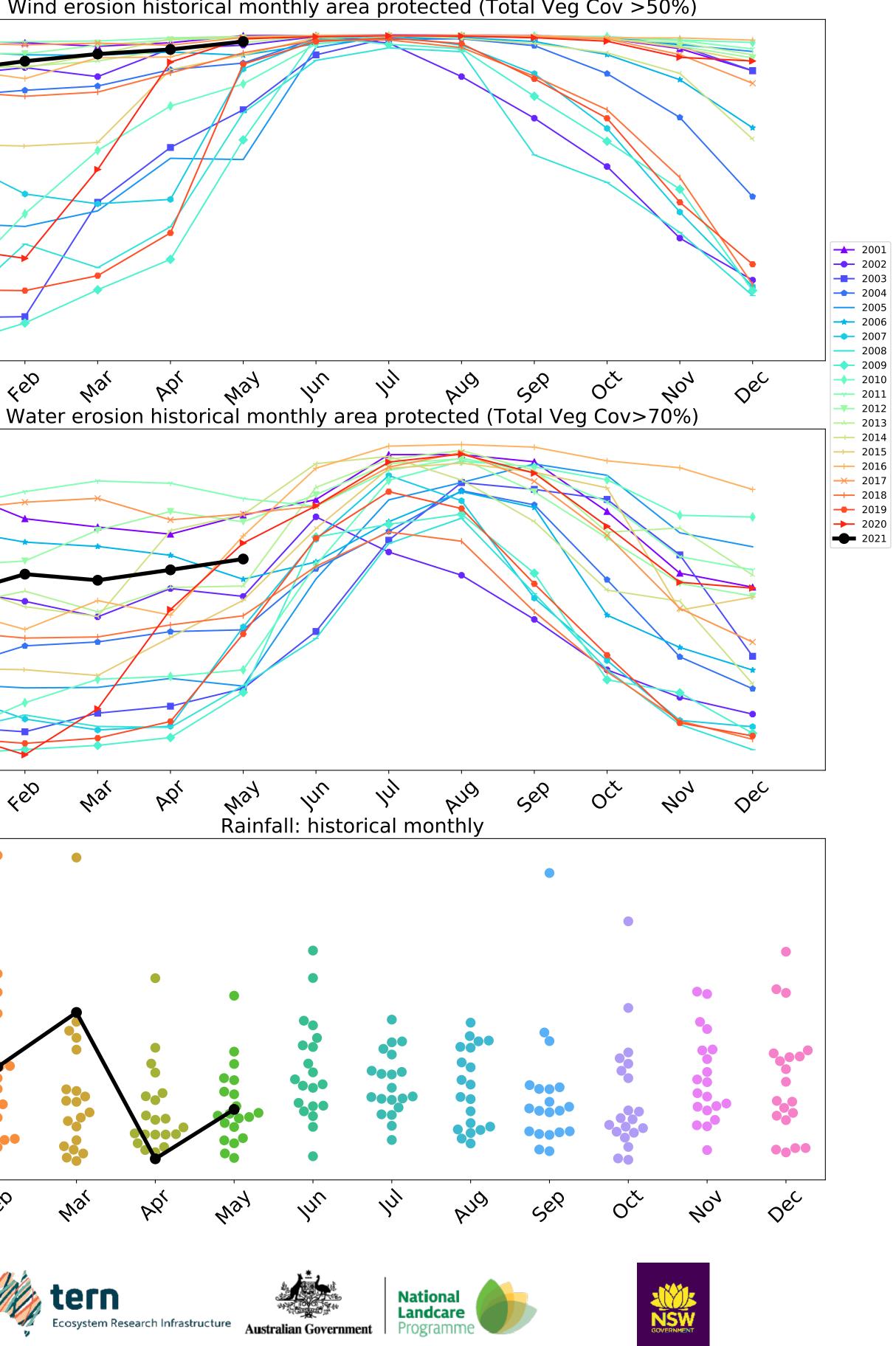
1<sup>1</sup>1

way

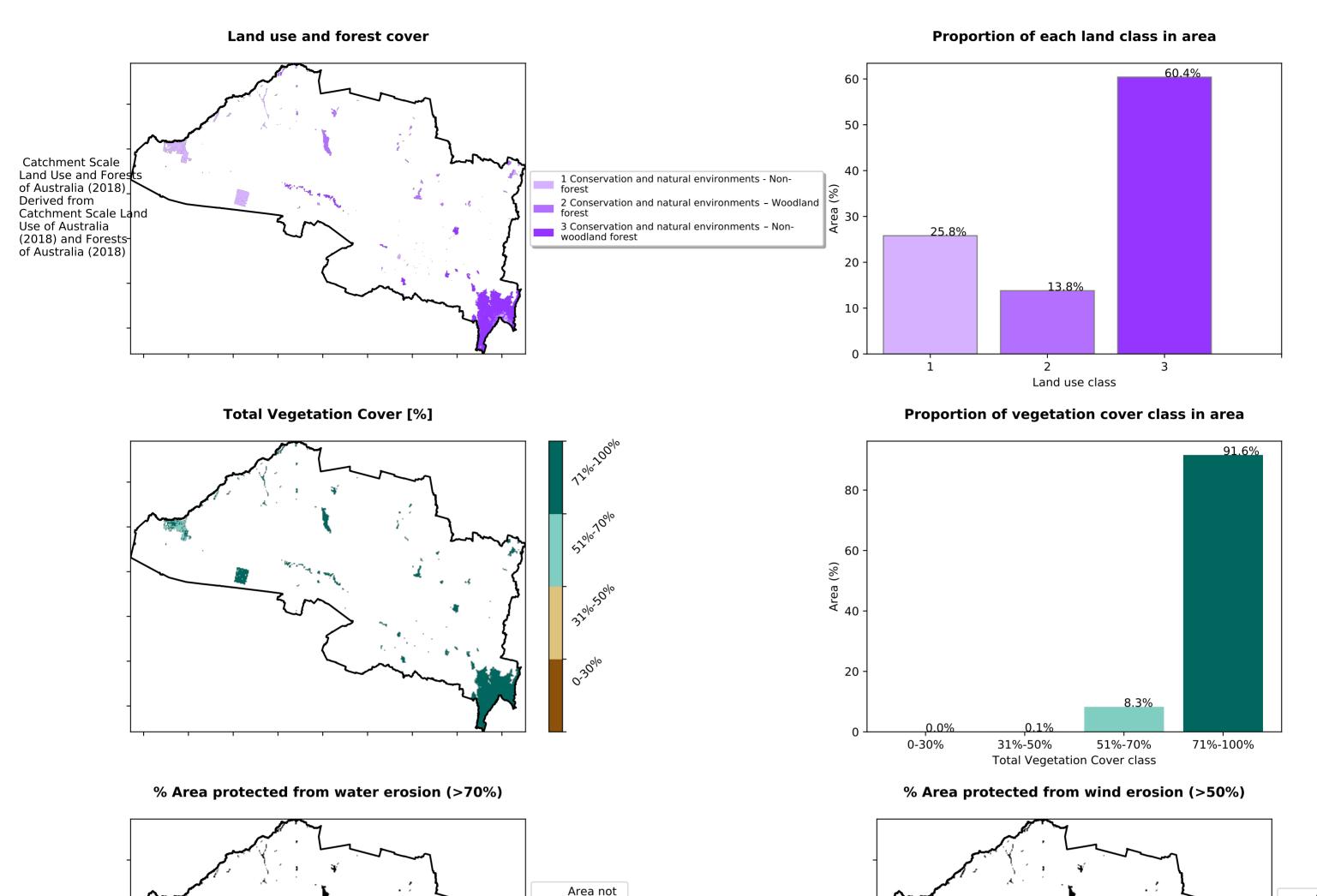
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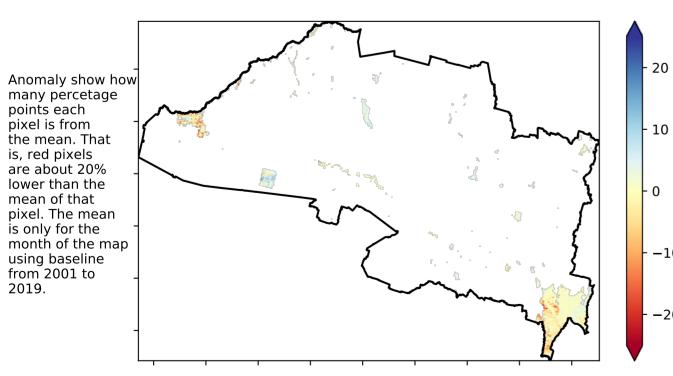


#### **Conservation and natural environments**

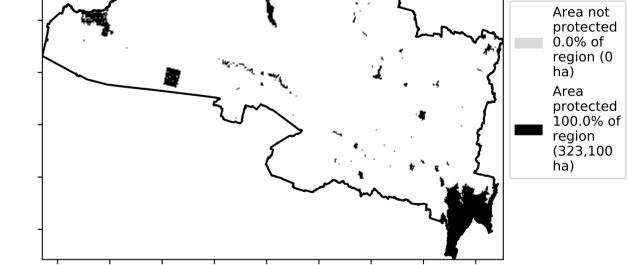




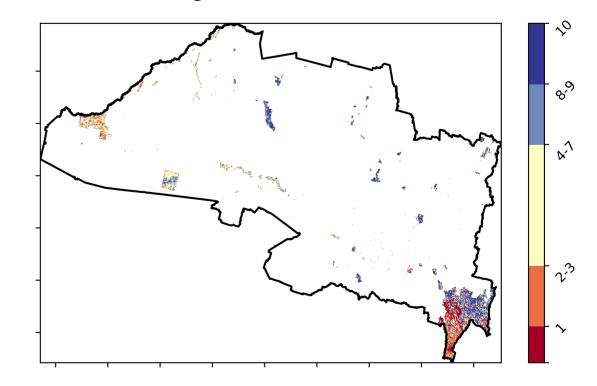
**Total Vegetation Cover Anomaly [%]** 



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 [%]** 

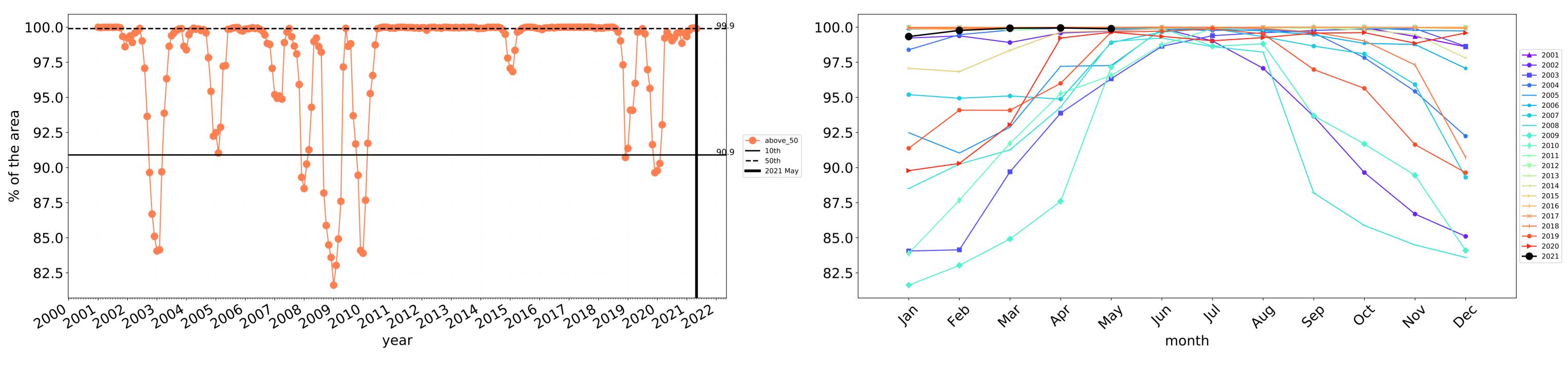




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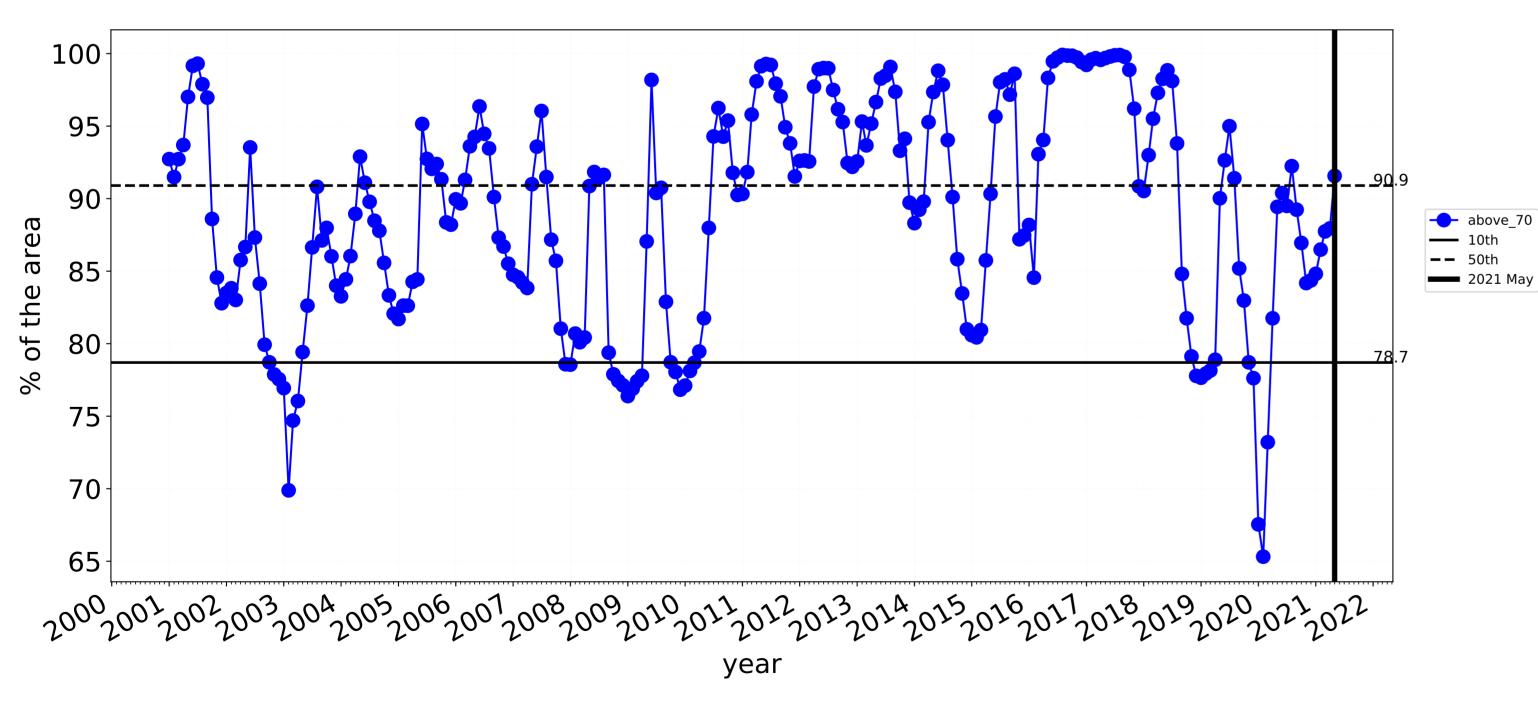
-10

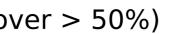
-20



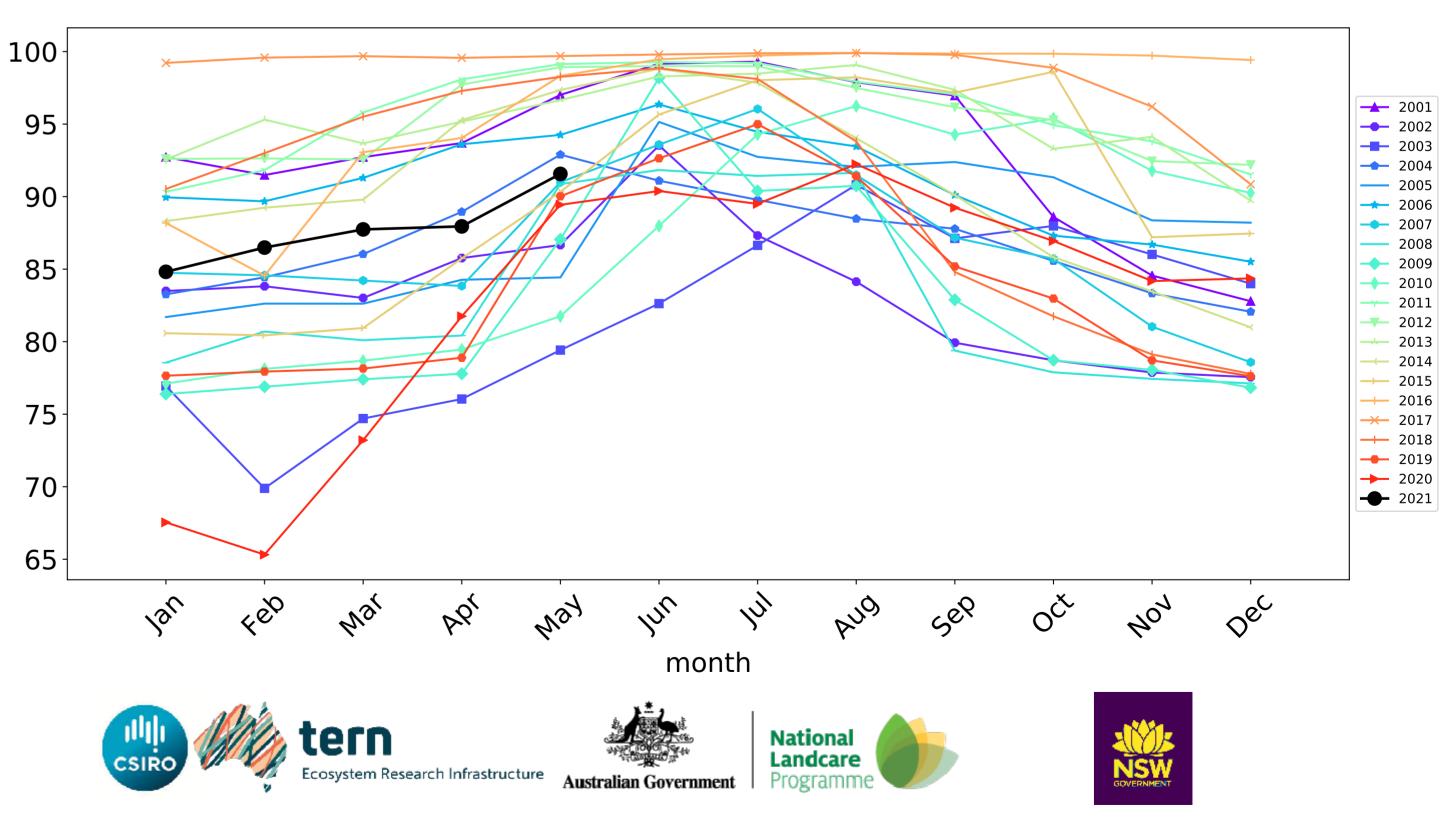
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



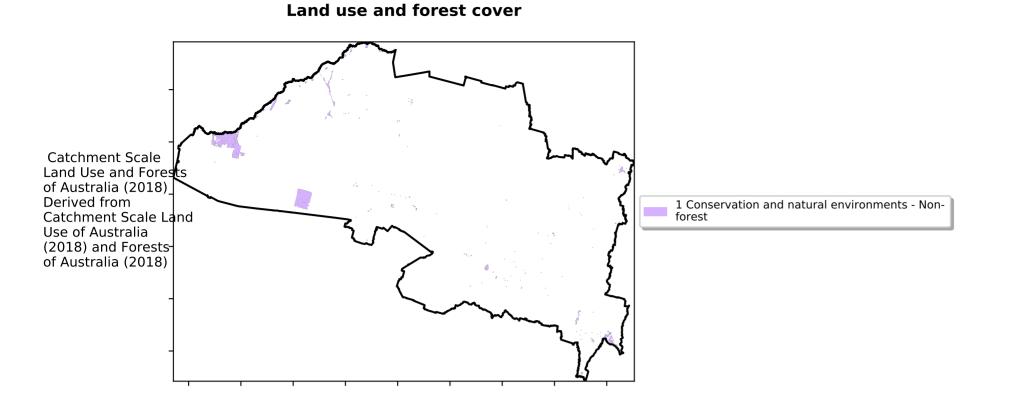




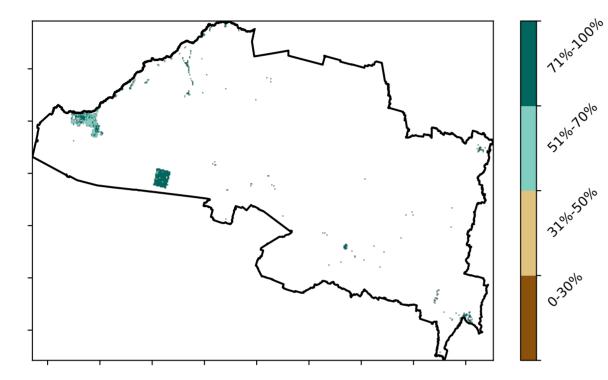
Wind erosion historical monthly area protected (Total Veg Cov >50%)



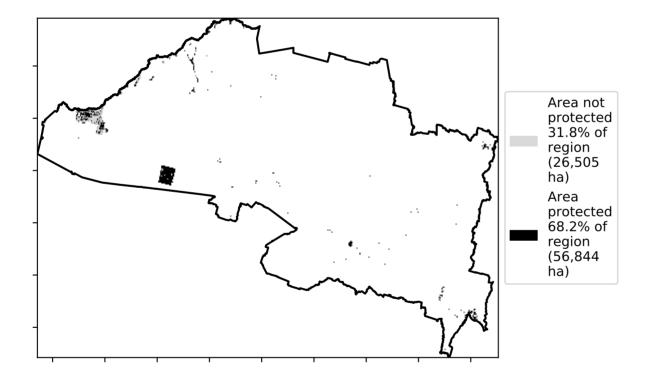
#### **Conservation and natural environments non forest**



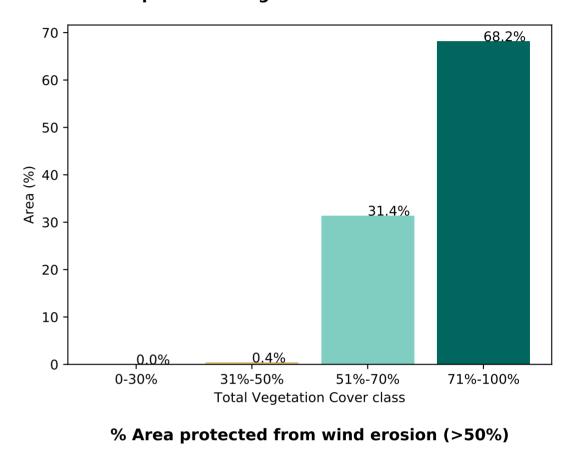
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)

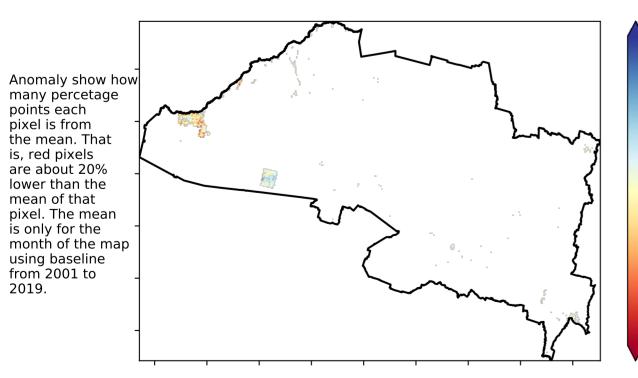


Proportion of vegetation cover class in area

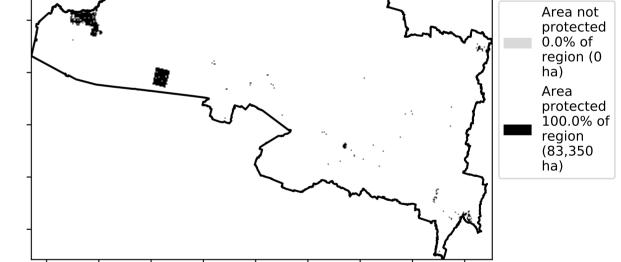




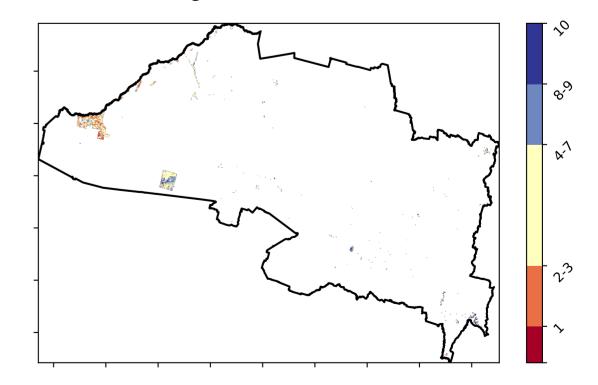
**Total Vegetation Cover Anomaly [%]** 



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 from 2001 to 2019.



**Total Vegetation Cover Decile [%]** 





- 20

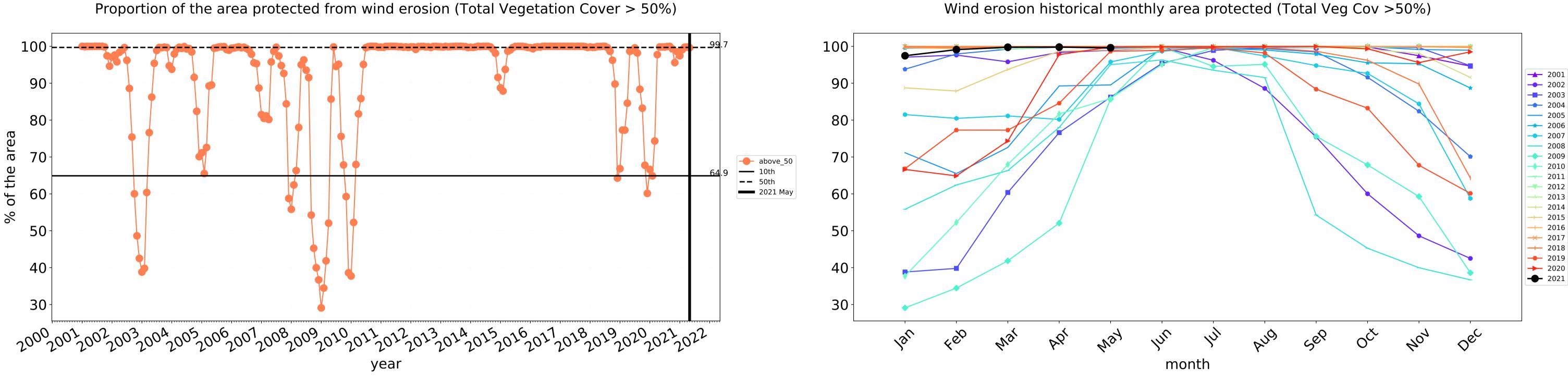
10

0

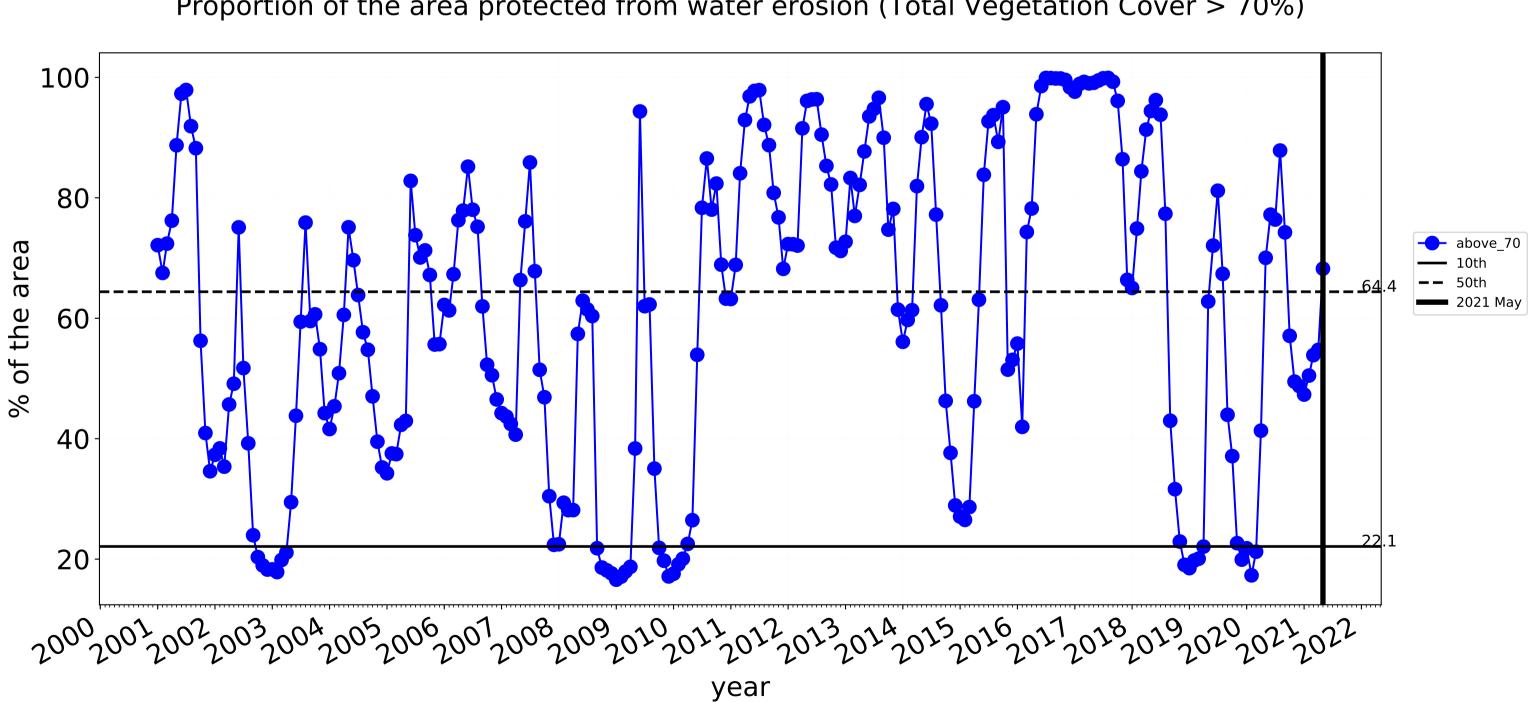
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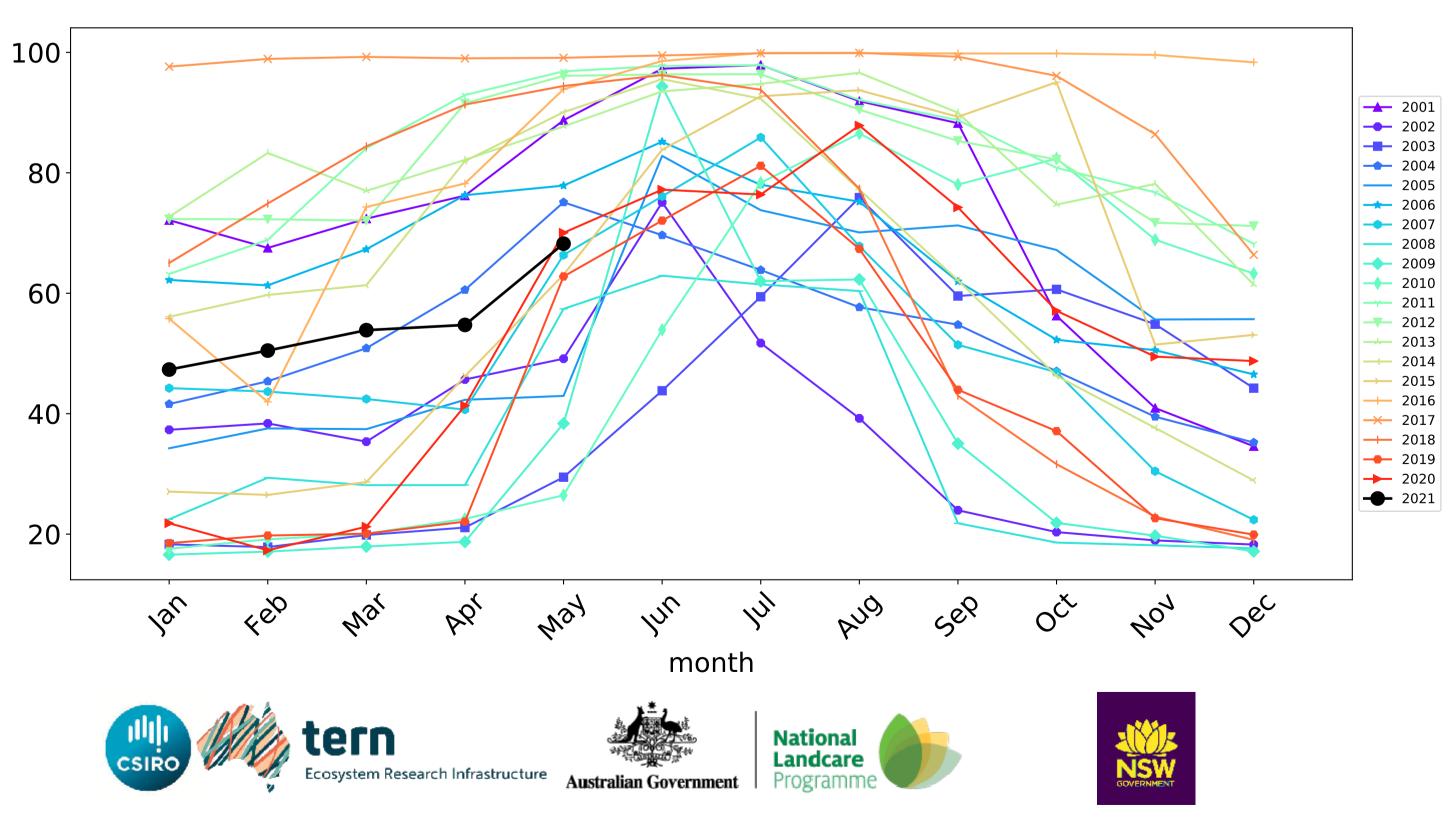
### **Conservation and natural environments non forest timeseries**



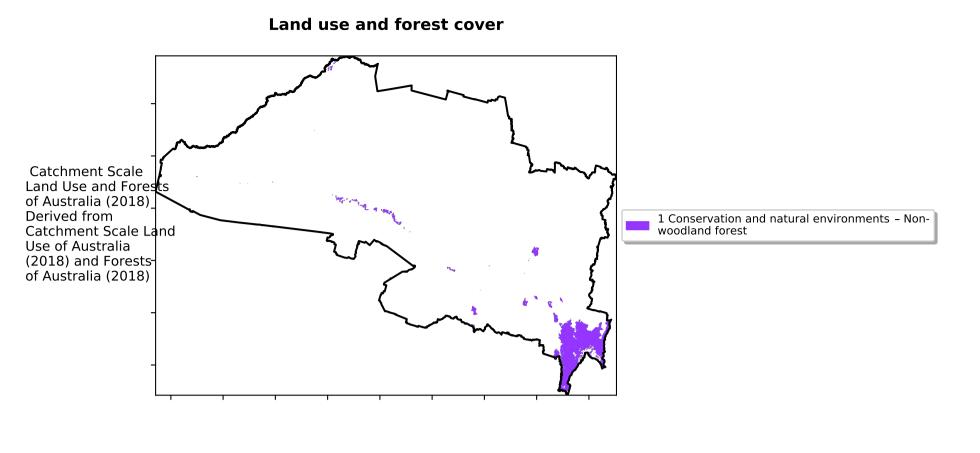
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



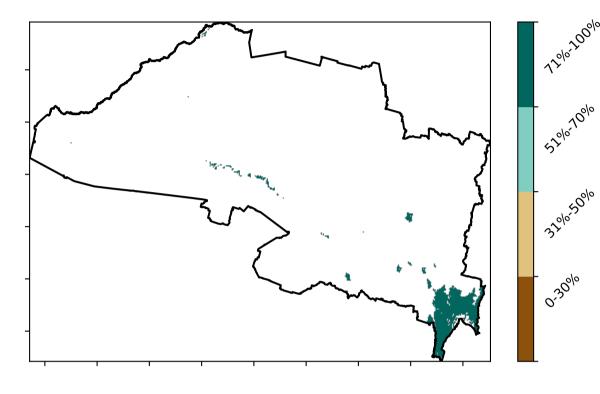
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



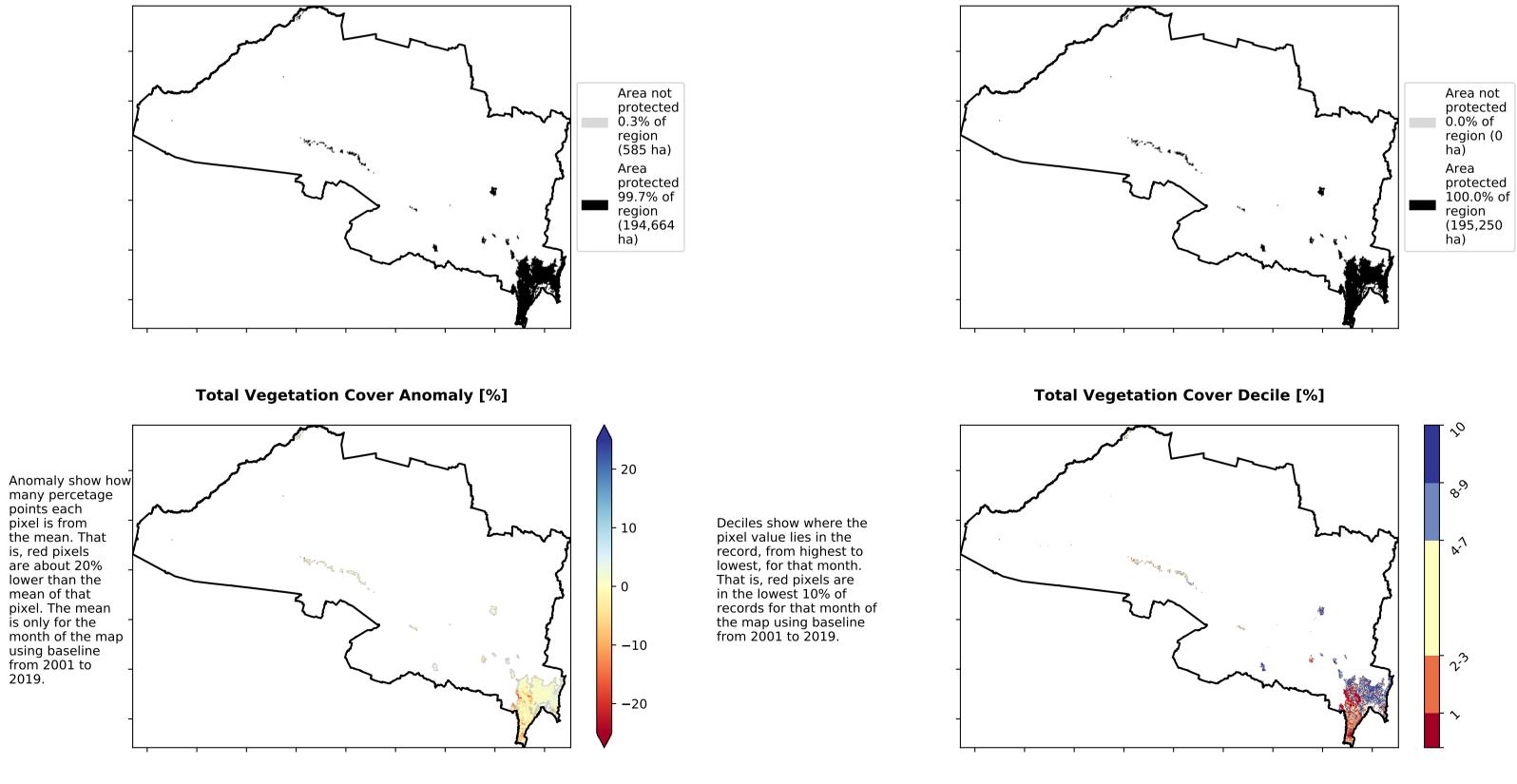
#### **Conservation and natural environments Forest (non woodland)**



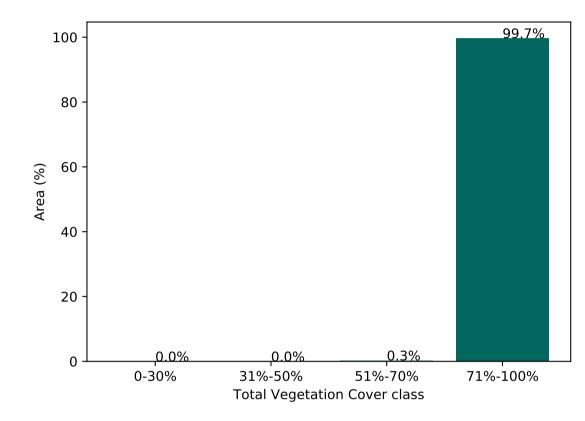
**Total Vegetation Cover [%]** 



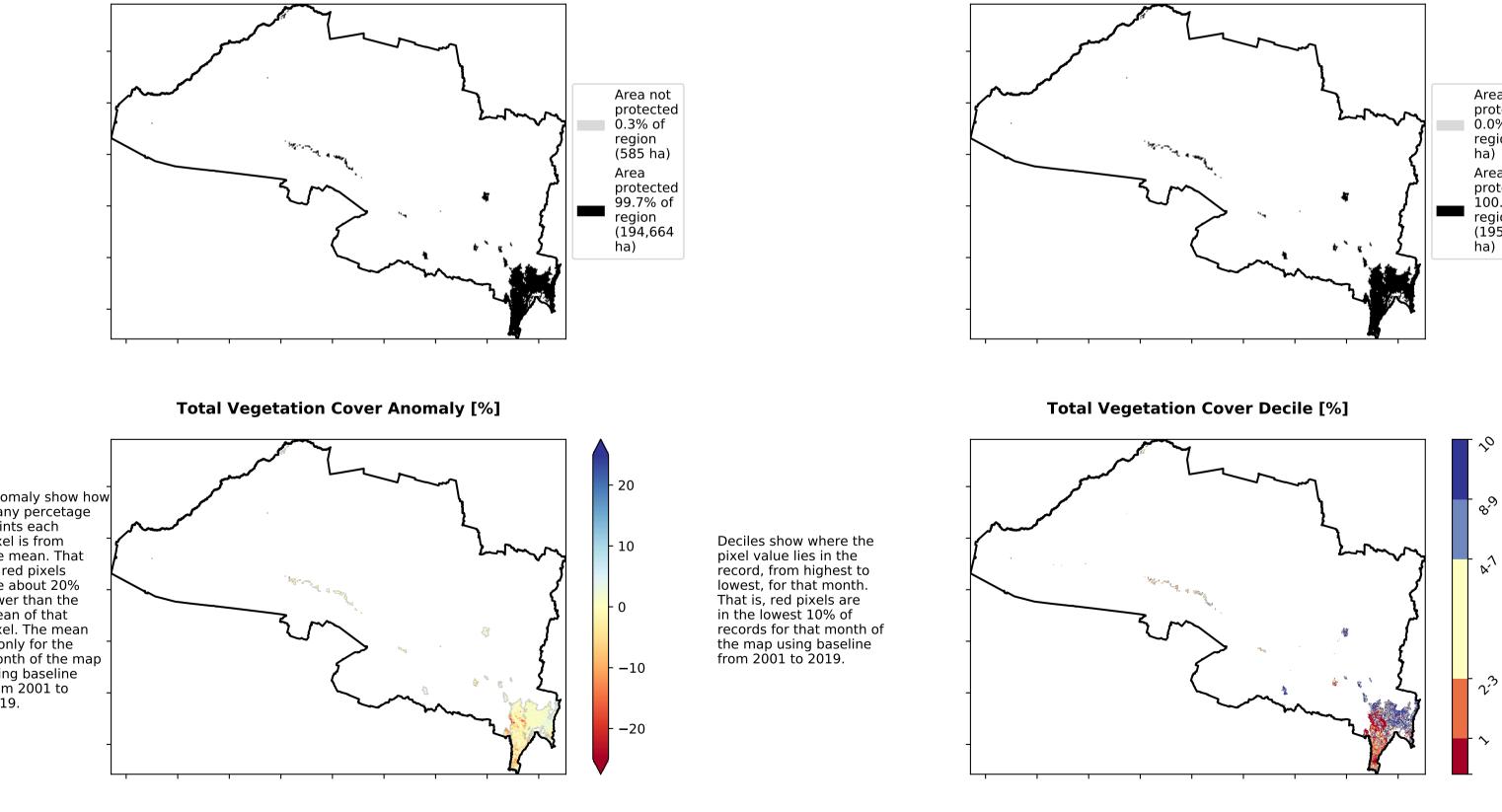
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

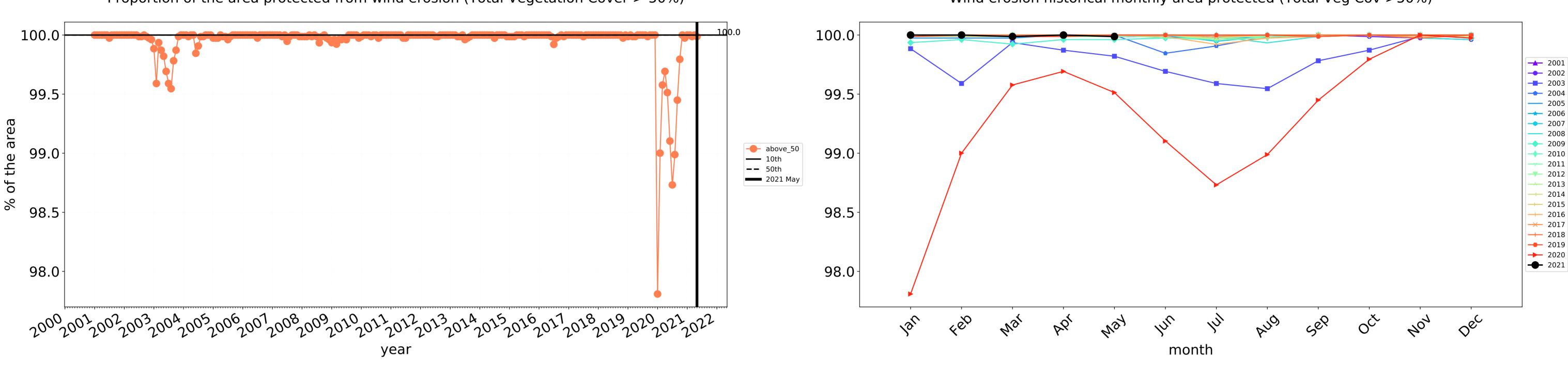


% Area protected from wind erosion (>50%)



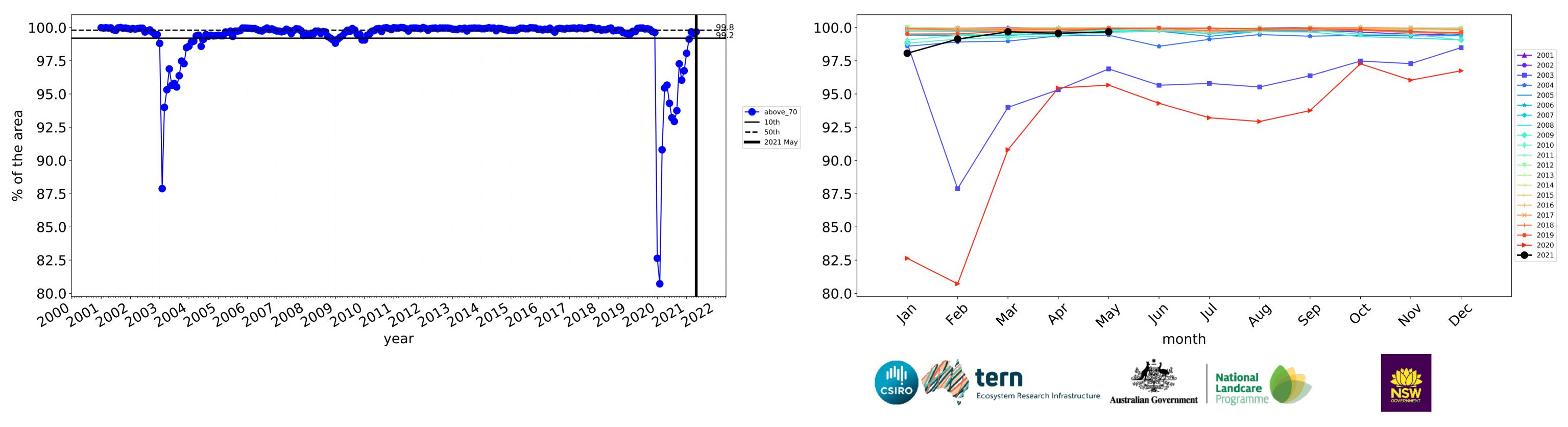


### **Conservation and natural environments Forest (non woodland) timeseries**



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

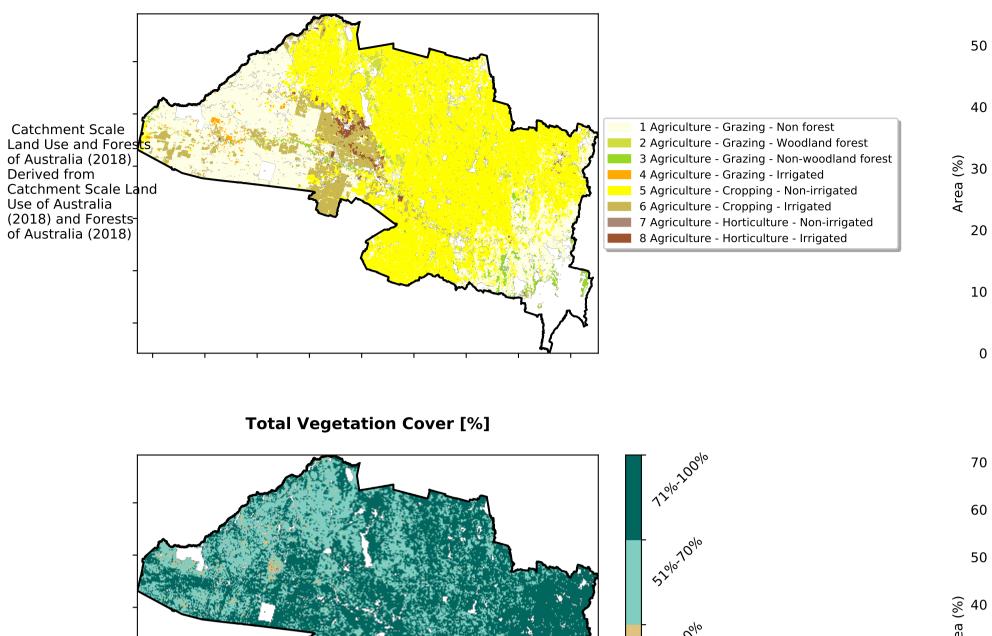
Proportion of each land class in area

<u>34.</u>1%

0

1

<u>52.</u>5%



Proportion of vegetation cover class in area

5

Land use class

0.6%

4

3

2

<u>7.9</u>%

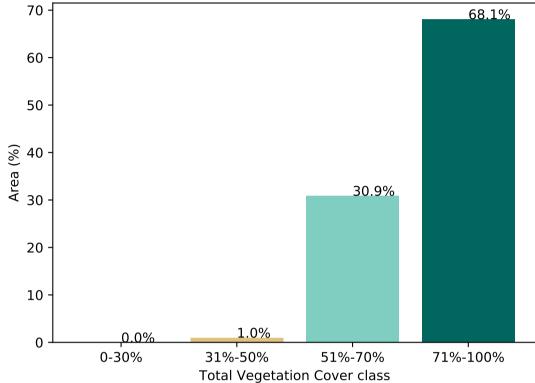
6

0.9%

8

0.0%

7



% Area protected from wind erosion (>50%)



32%50% 0-30%

% Area protected from water erosion (>70%)



20

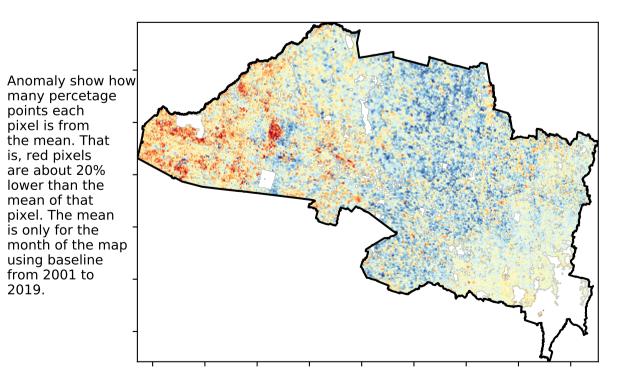
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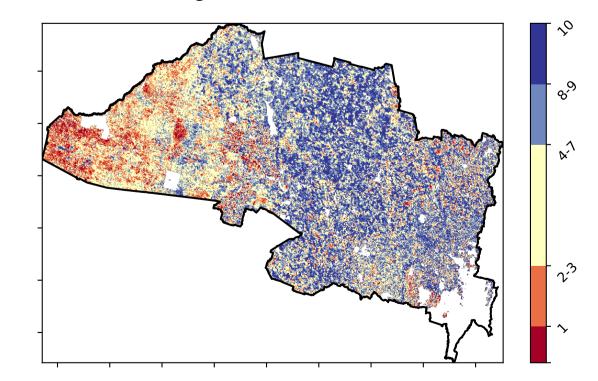
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**Total Vegetation Cover Anomaly [%]** 

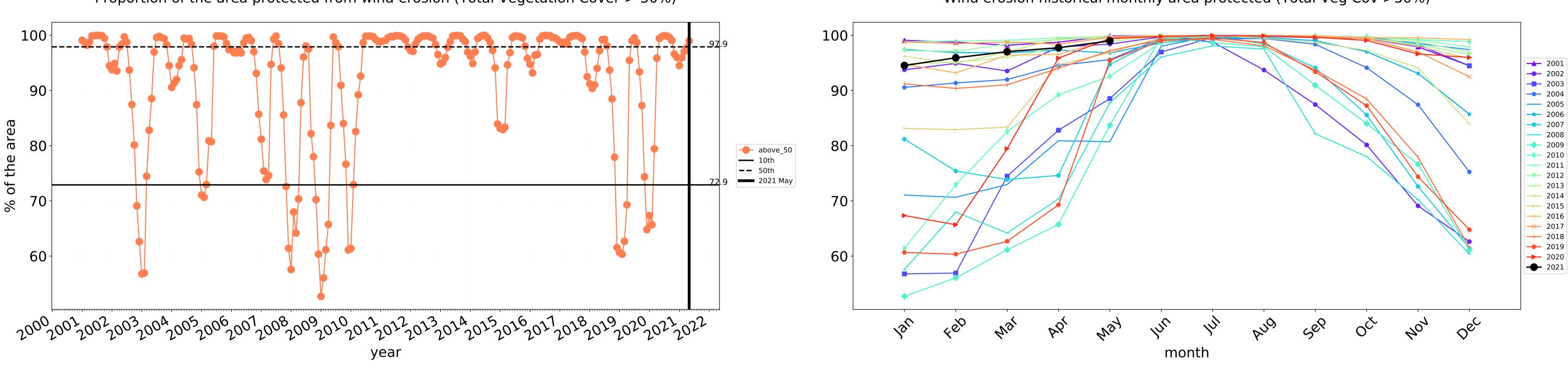


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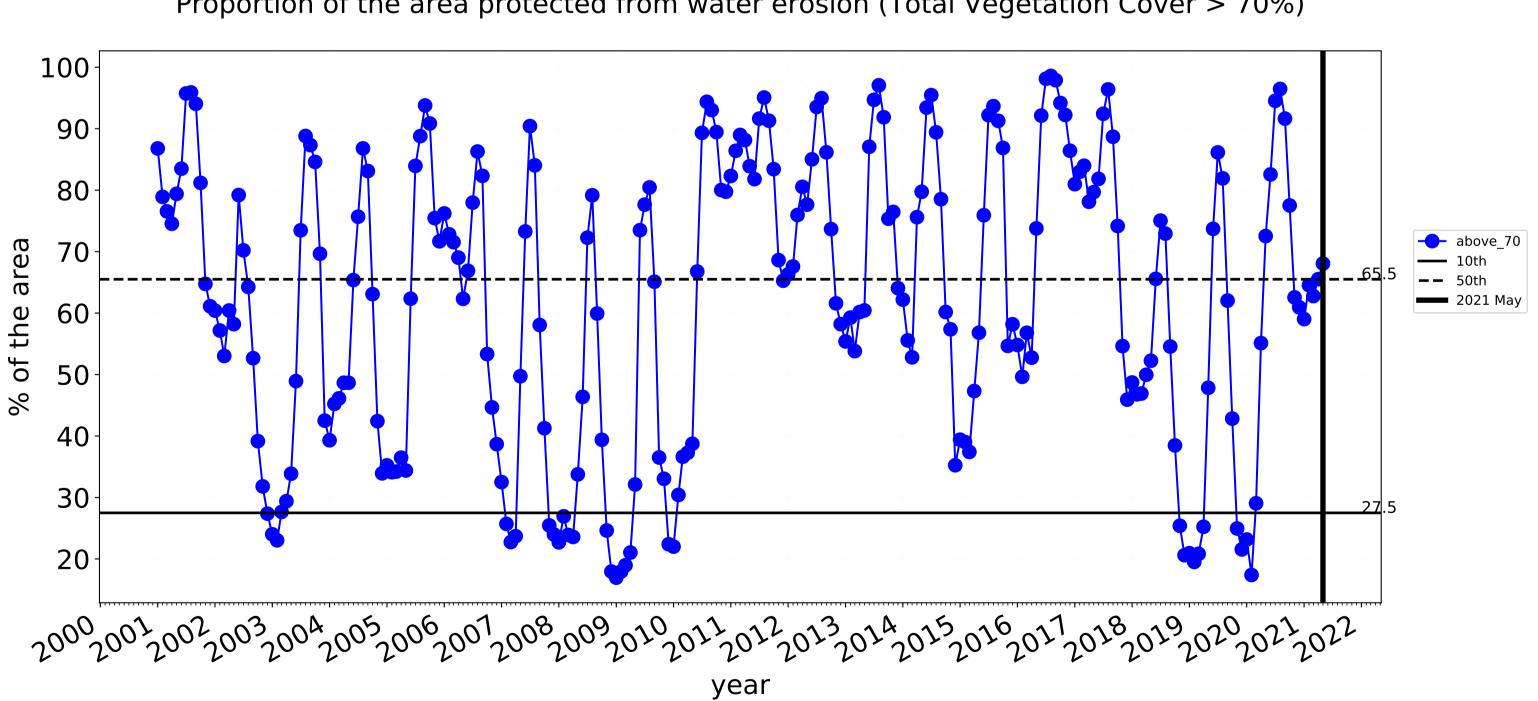
**Total Vegetation Cover Decile [%]** 







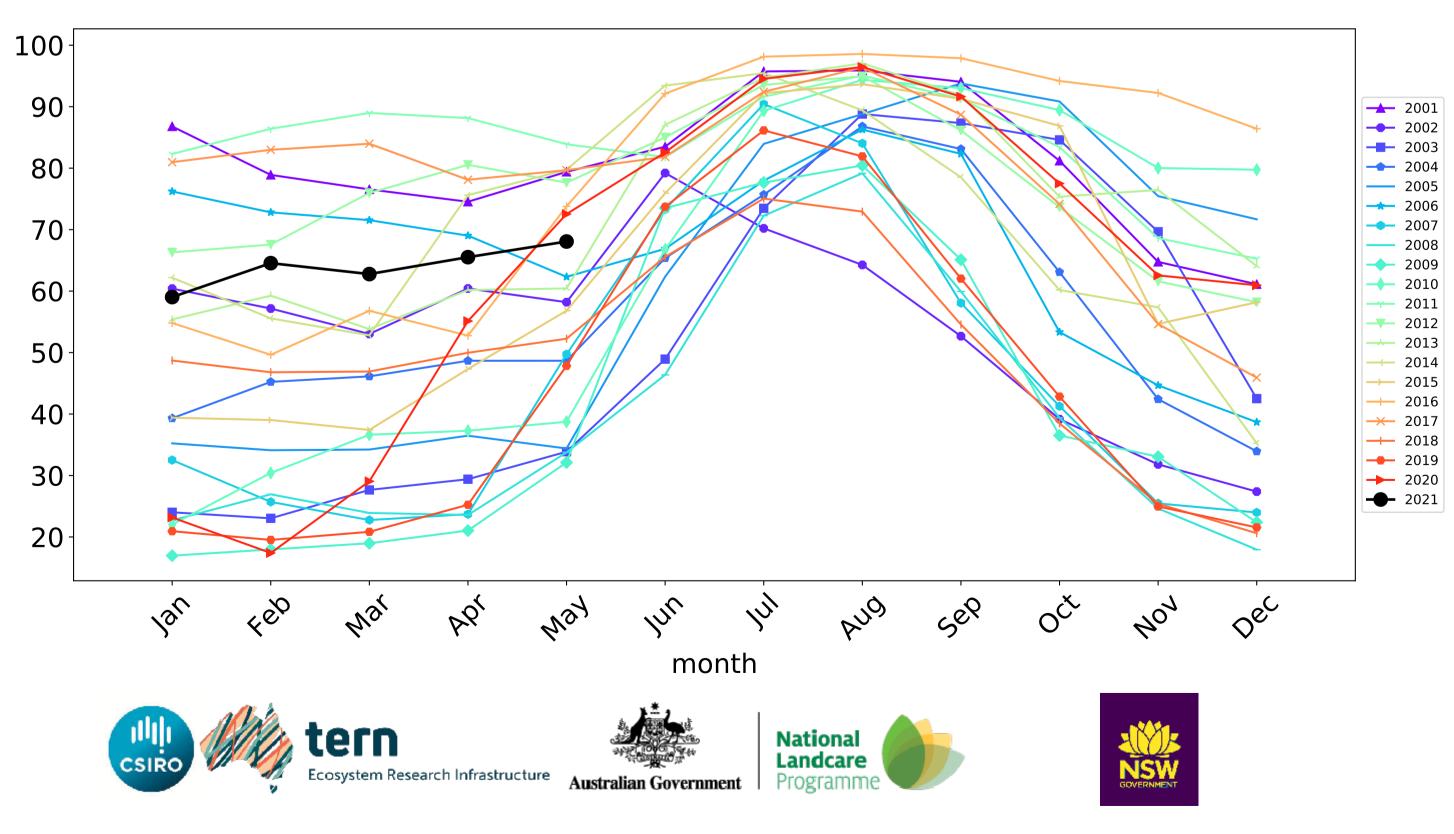
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

# **Agriculture timeseries**

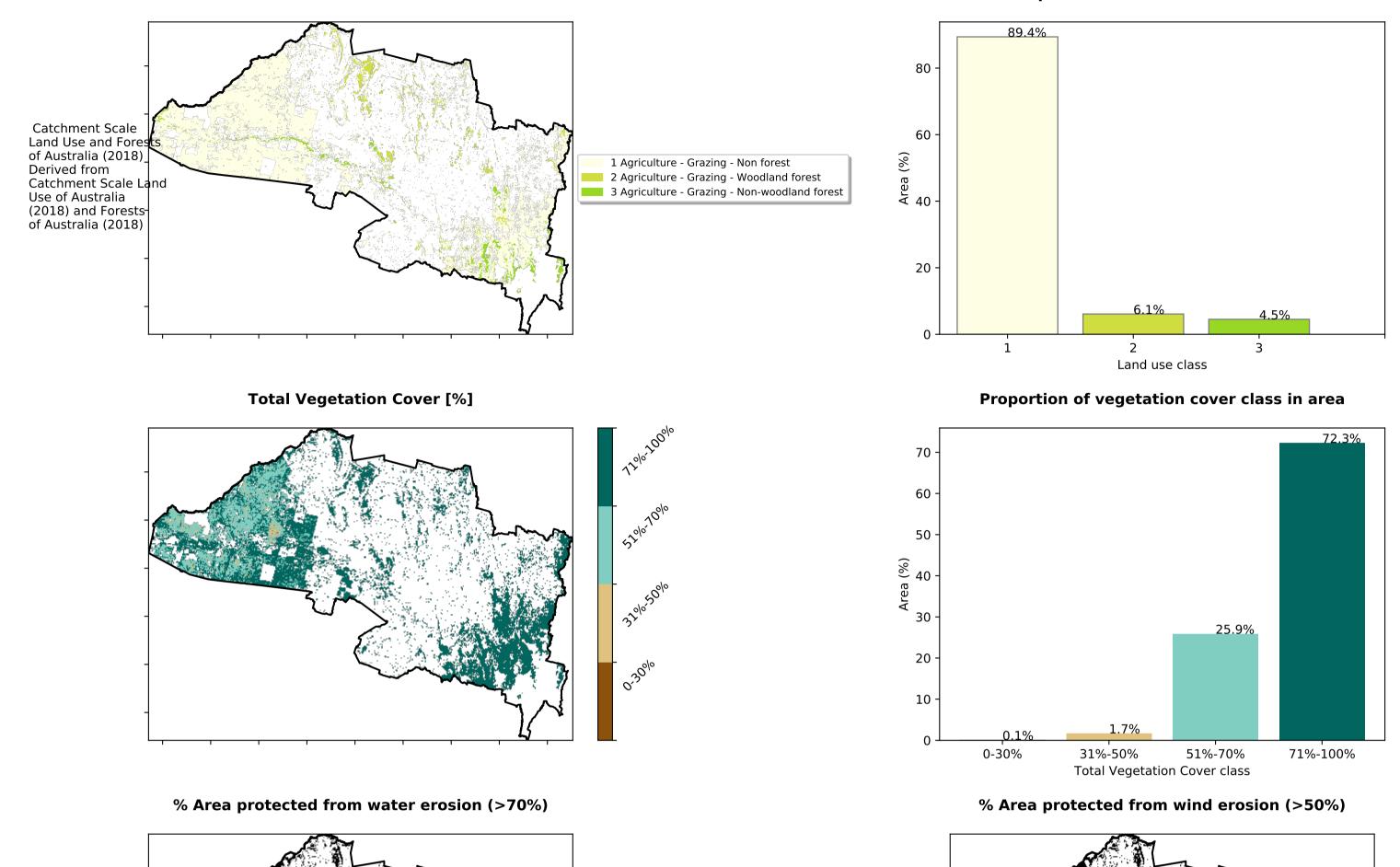
Wind erosion historical monthly area protected (Total Veg Cov >50%)



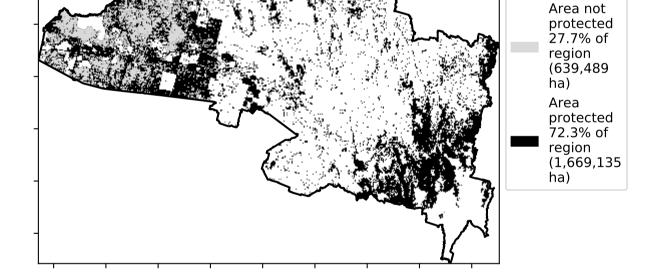
### Grazing

Land use and forest cover

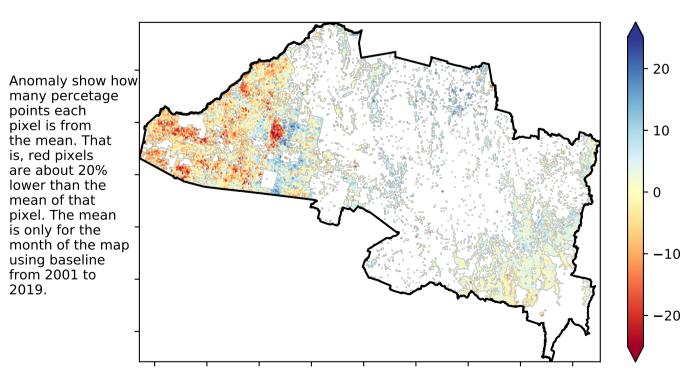
Proportion of each land class in area



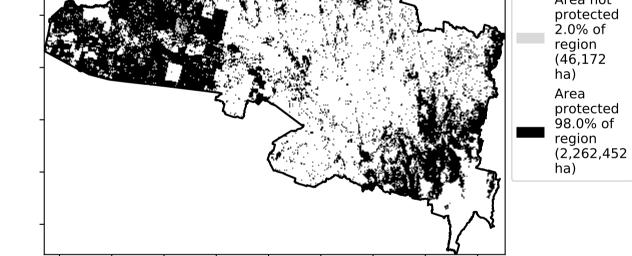




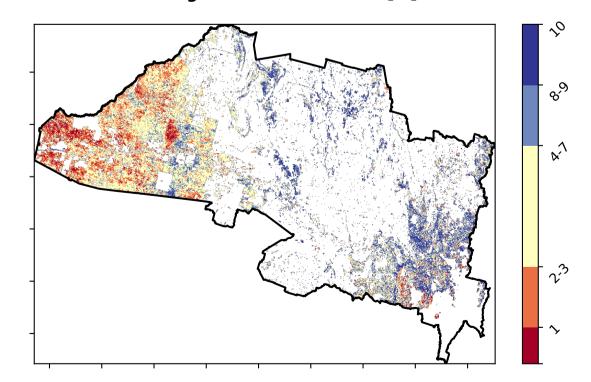
**Total Vegetation Cover Anomaly [%]** 



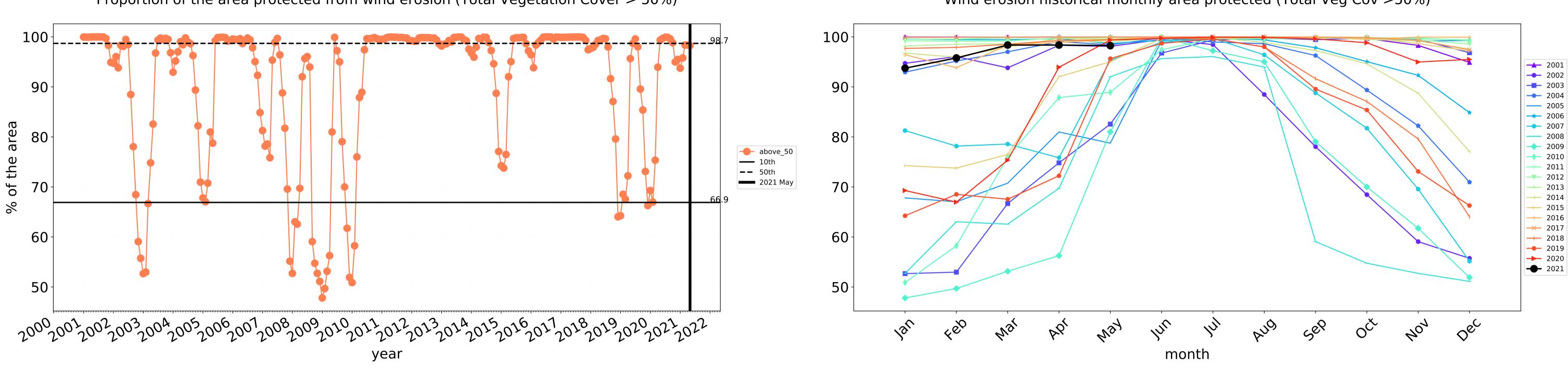
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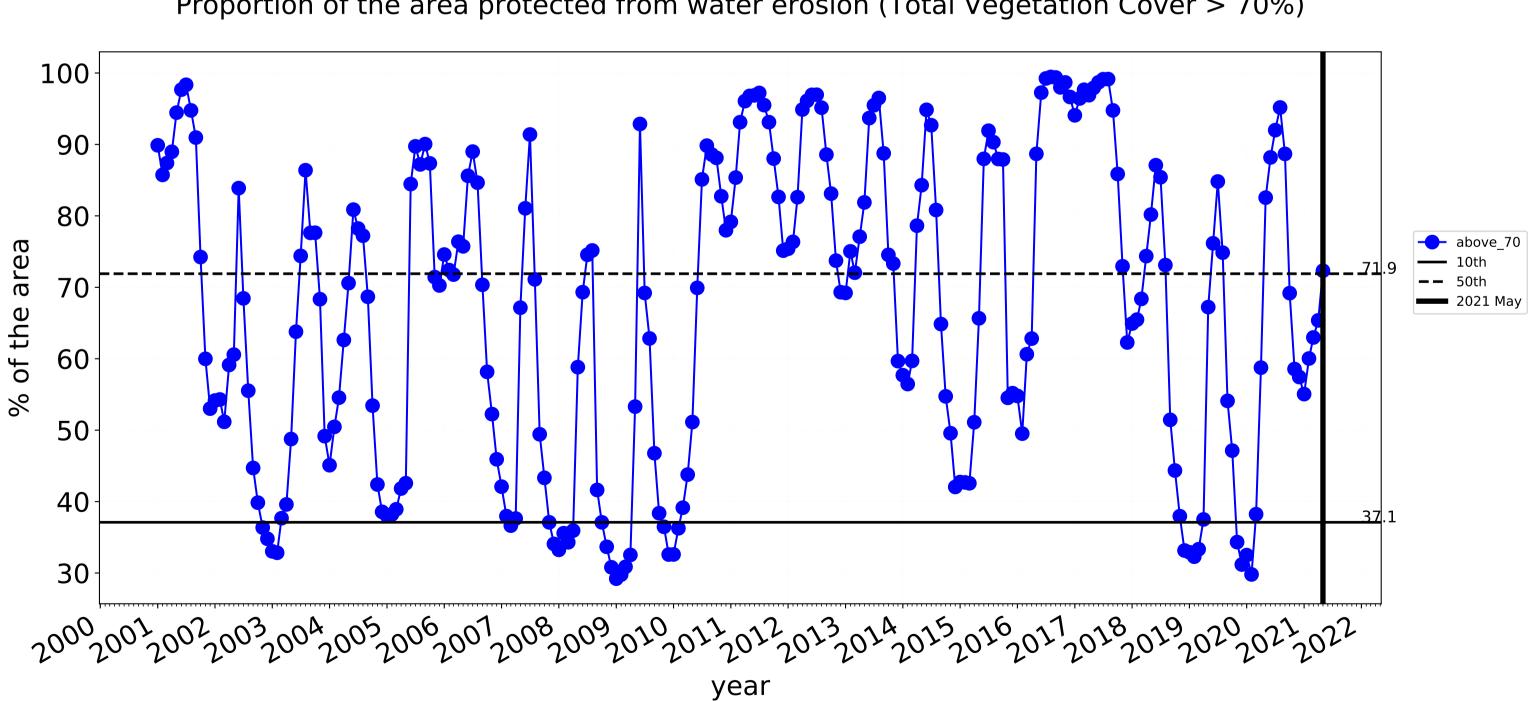
**Total Vegetation Cover Decile [%]** 







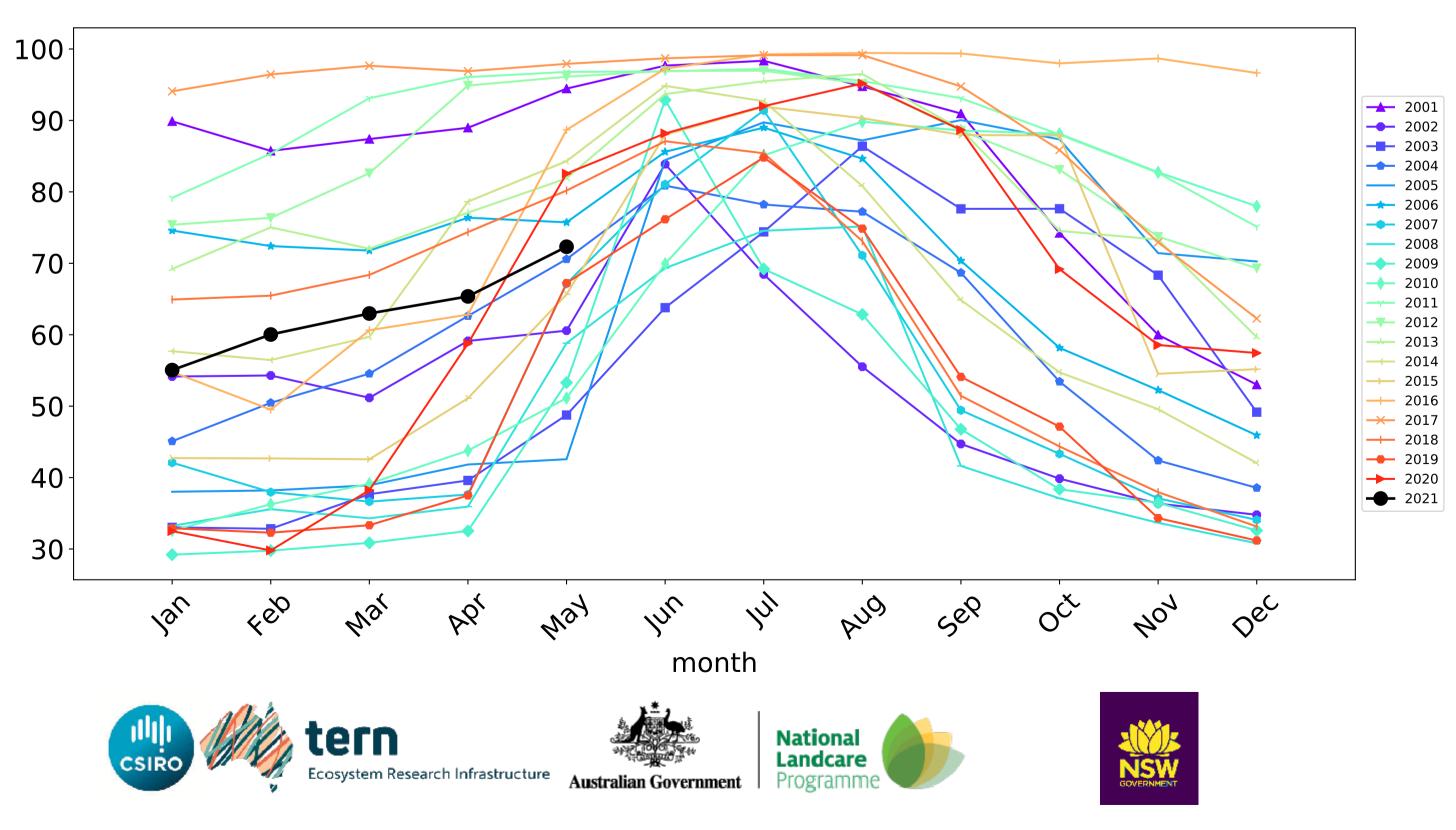
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



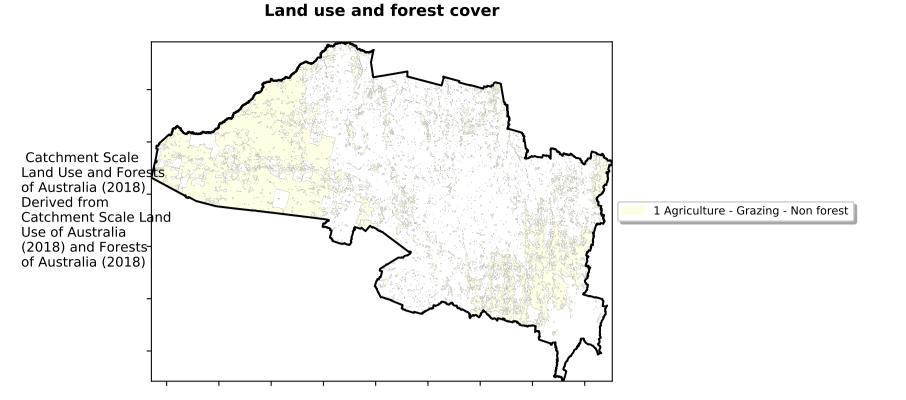
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

### Grazing timeseries

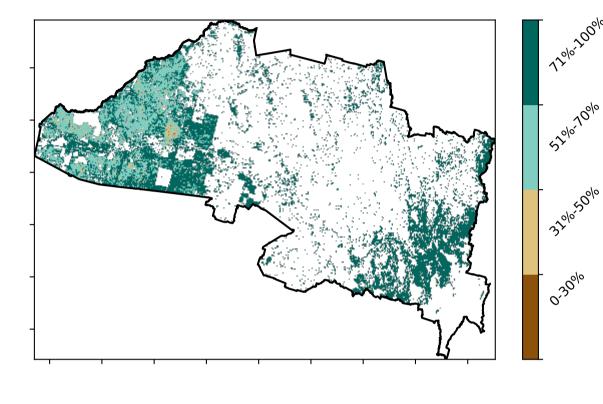
Wind erosion historical monthly area protected (Total Veg Cov >50%)



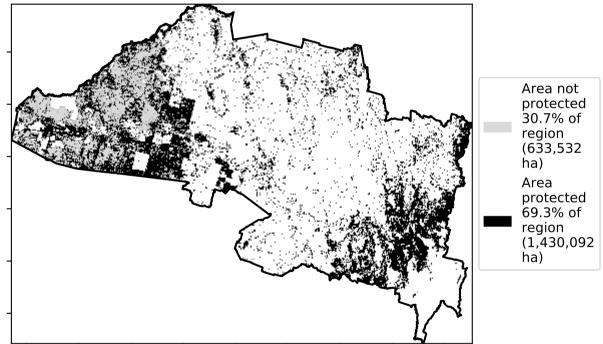
#### **Grazing non forest**



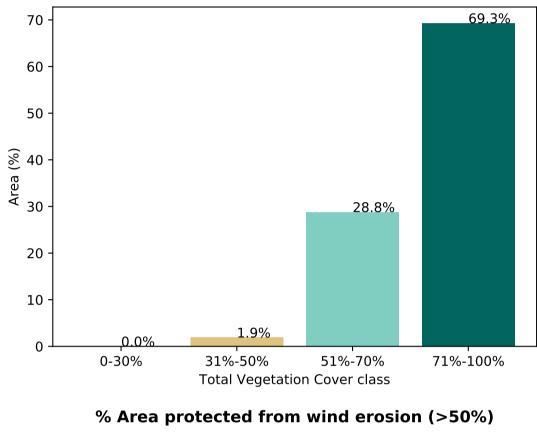
Total Vegetation Cover [%]

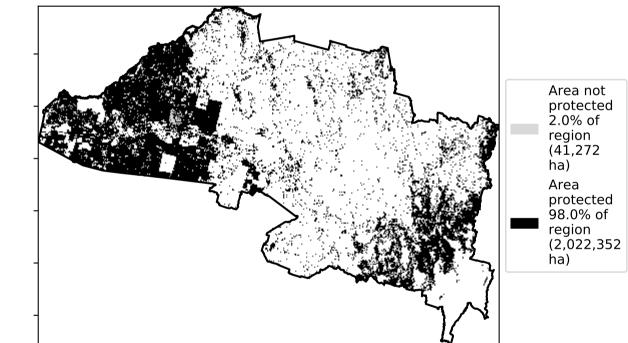


% Area protected from water erosion (>70%)

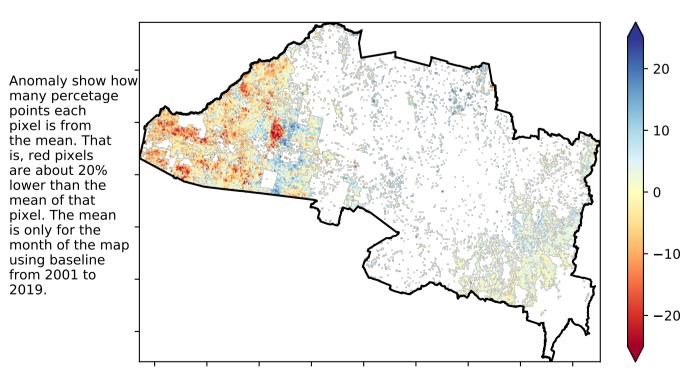


Proportion of vegetation cover class in area



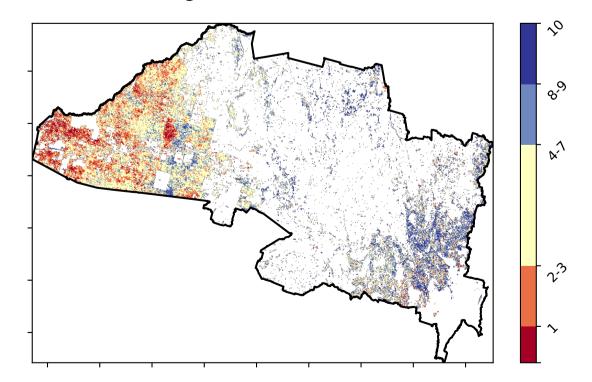


**Total Vegetation Cover Anomaly [%]** 

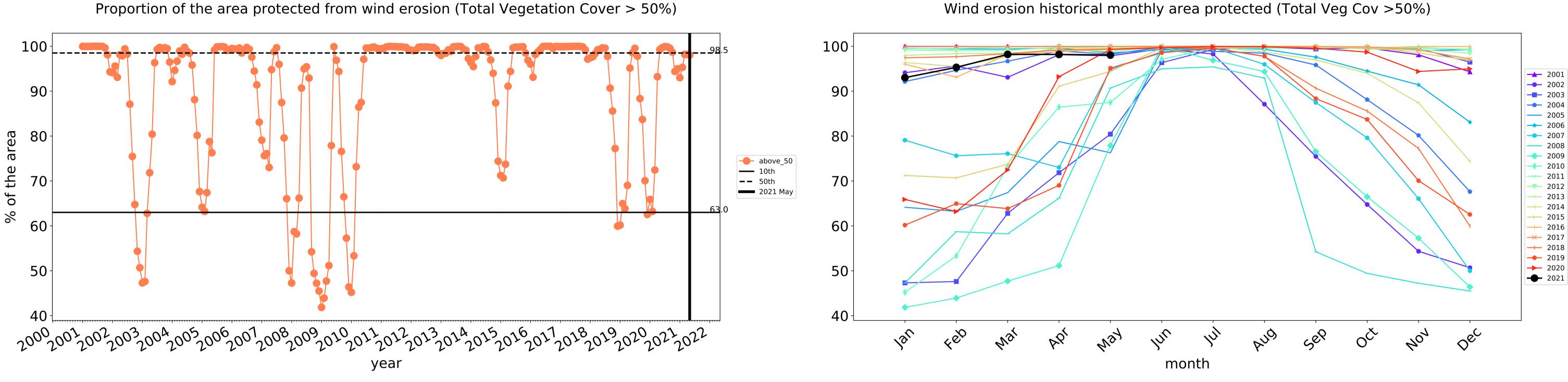


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

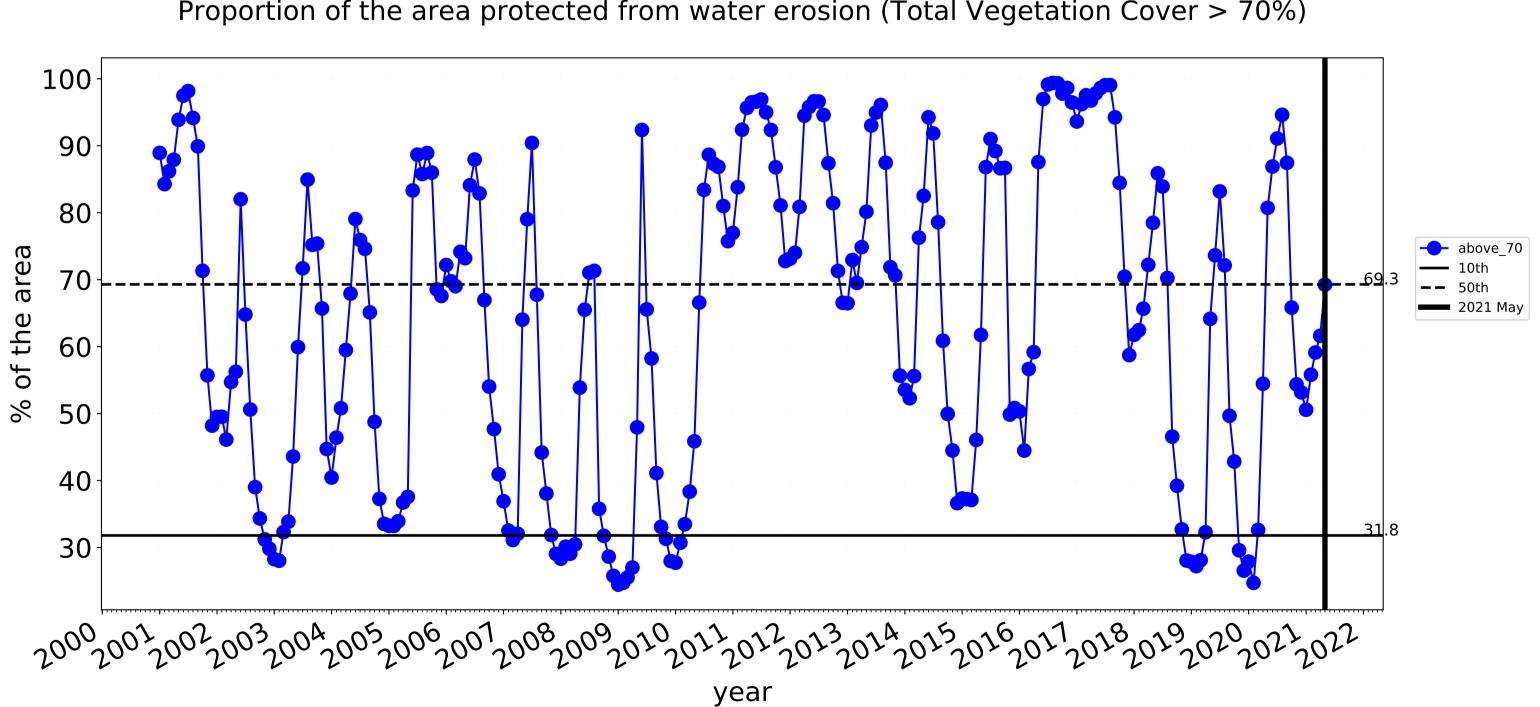
**Total Vegetation Cover Decile [%]** 





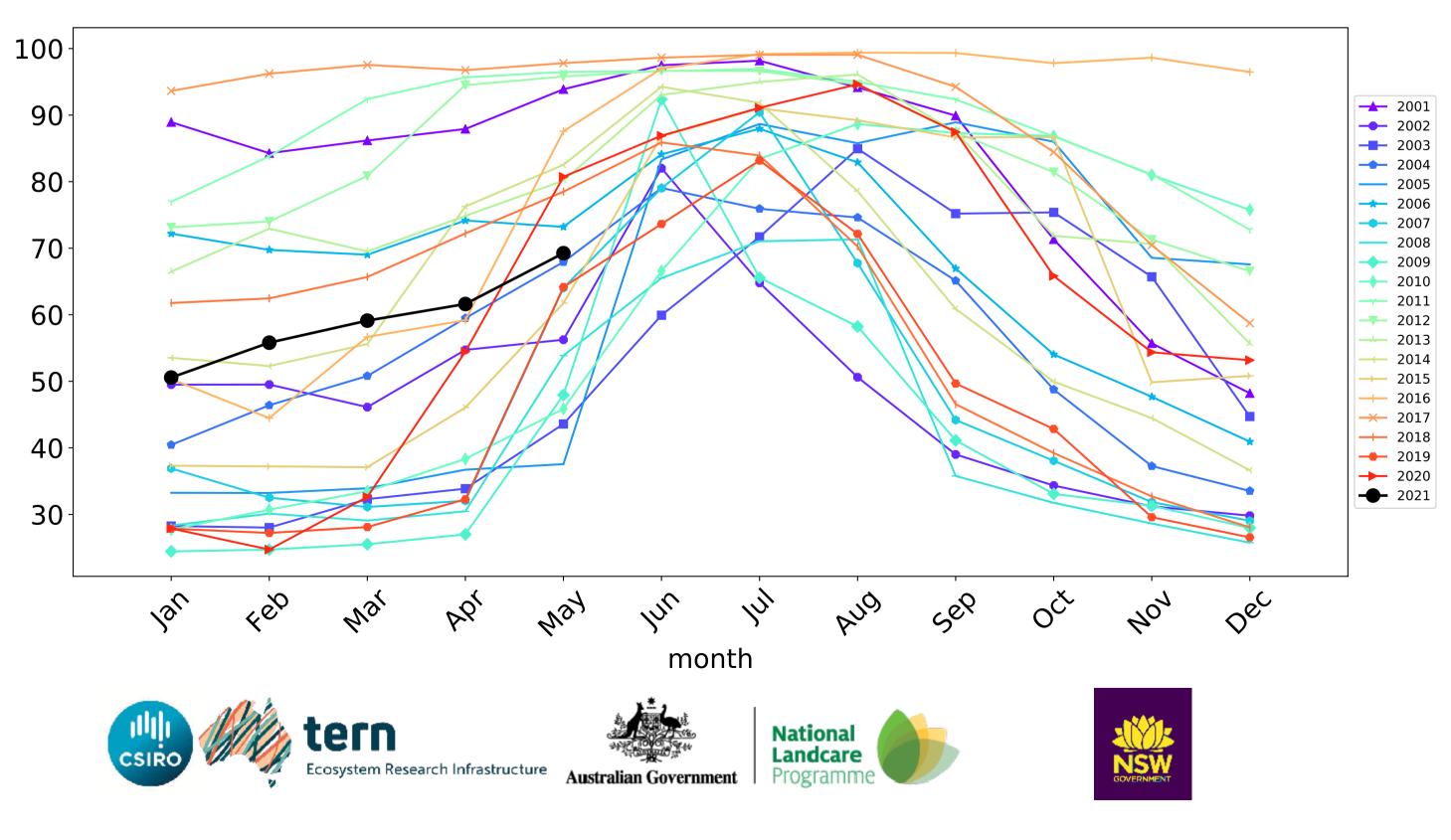


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

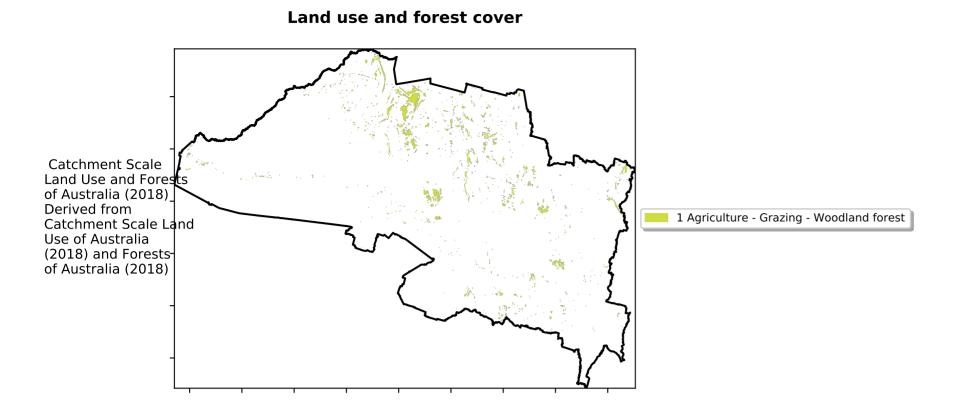


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

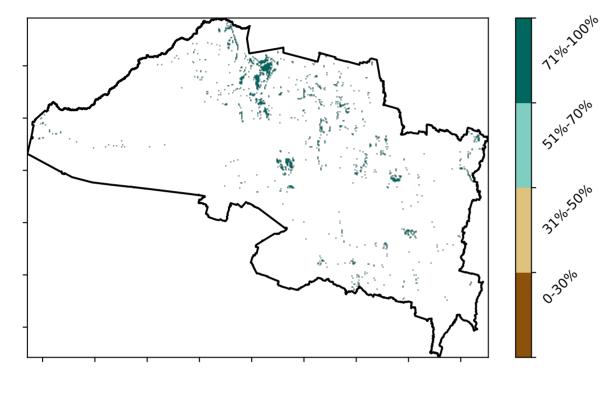
### Grazing non forest timeseries



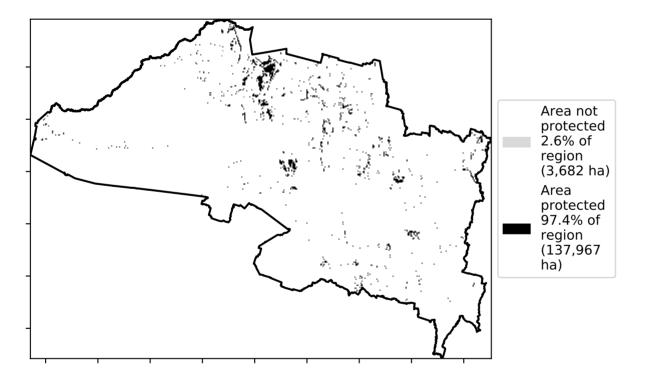
#### **Grazing Woodland forest**



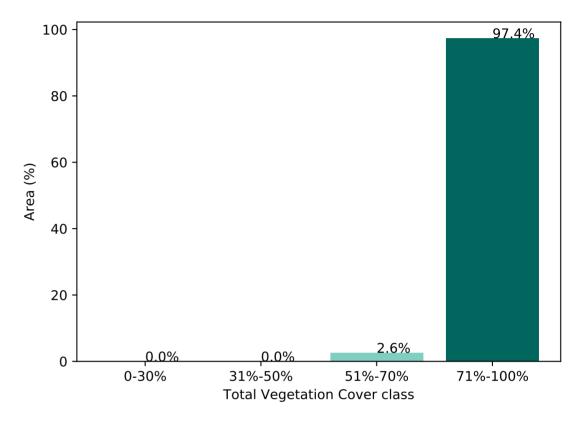
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



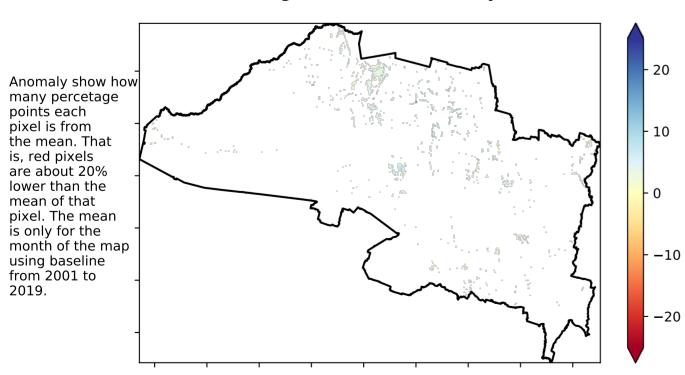
Proportion of vegetation cover class in area



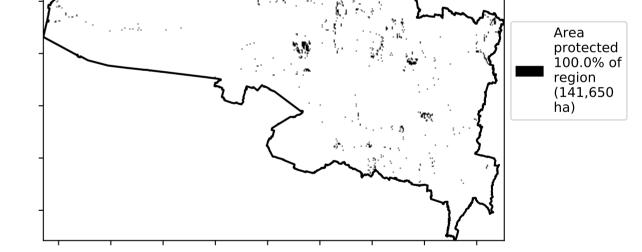
% Area protected from wind erosion (>50%)



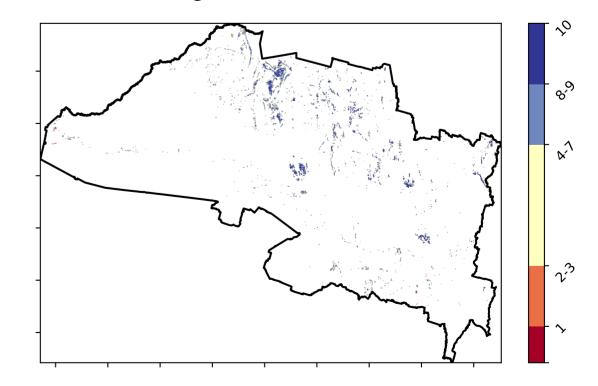
**Total Vegetation Cover Anomaly [%]** 



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.

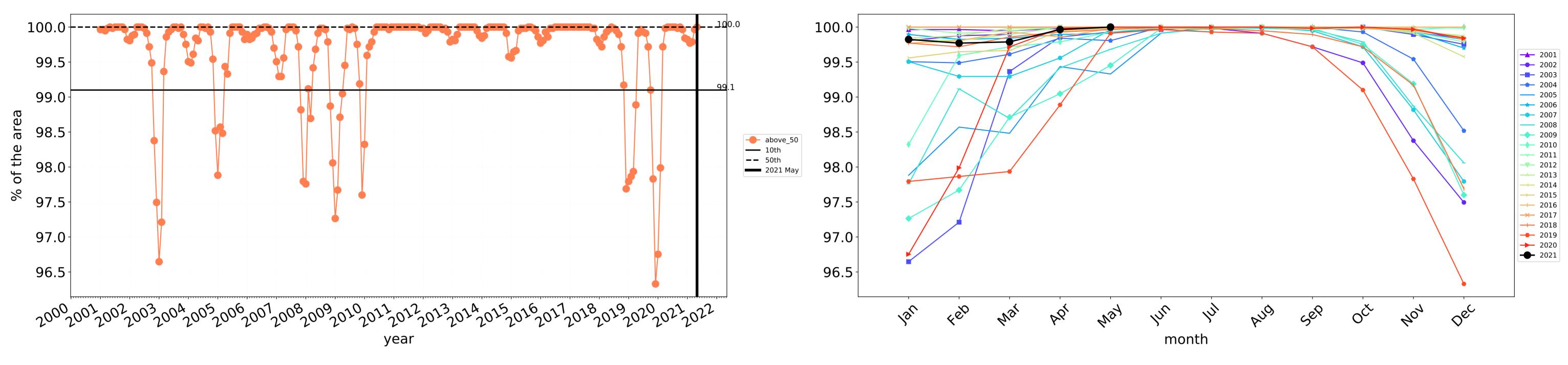


**Total Vegetation Cover Decile [%]** 



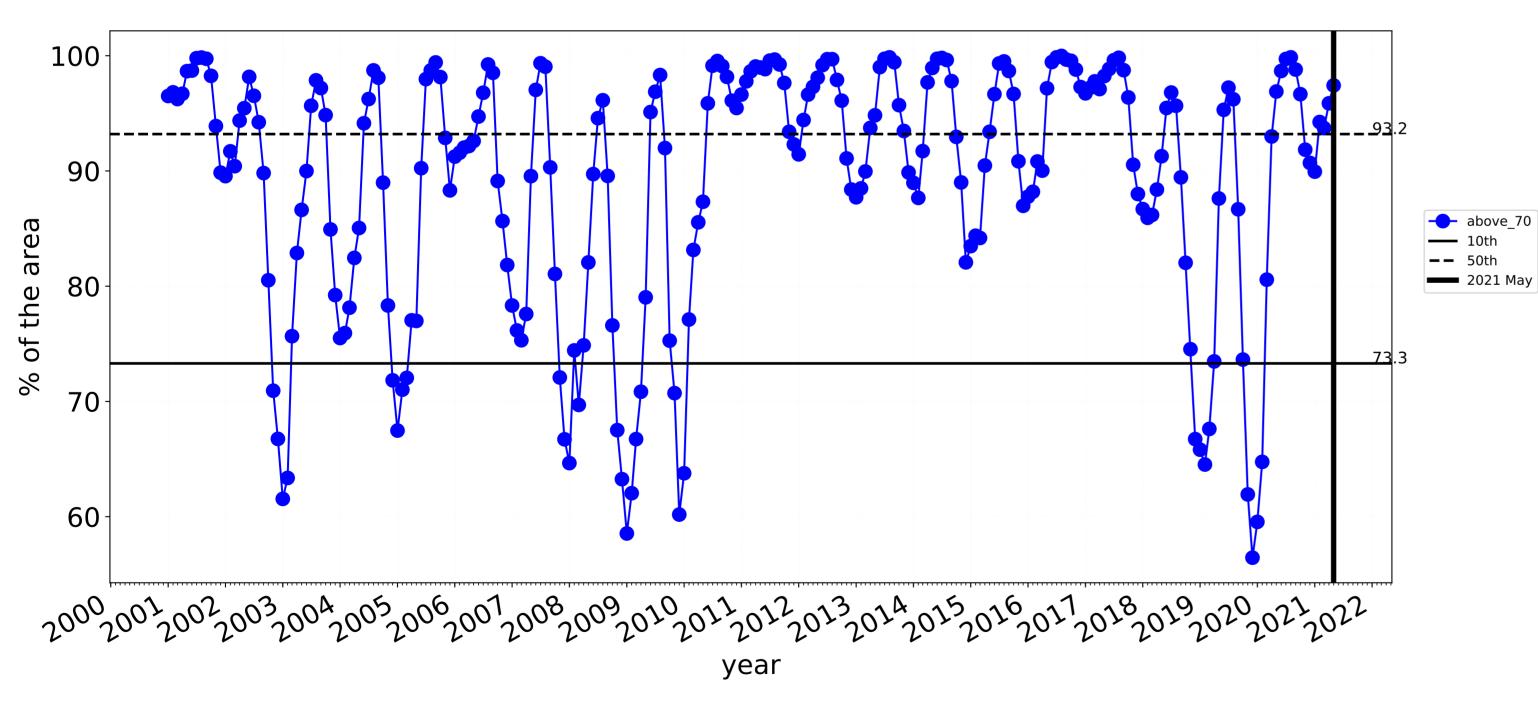


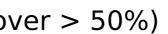
-10



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



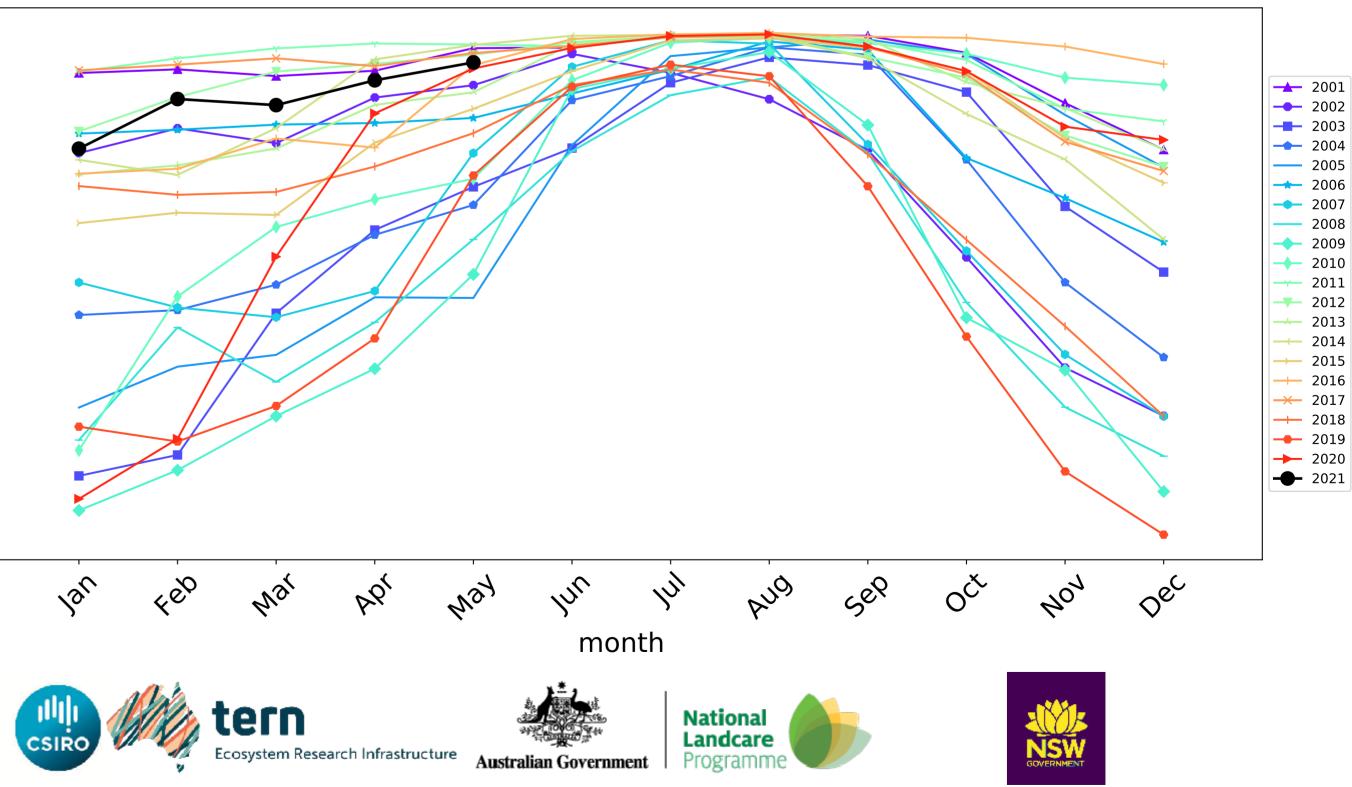




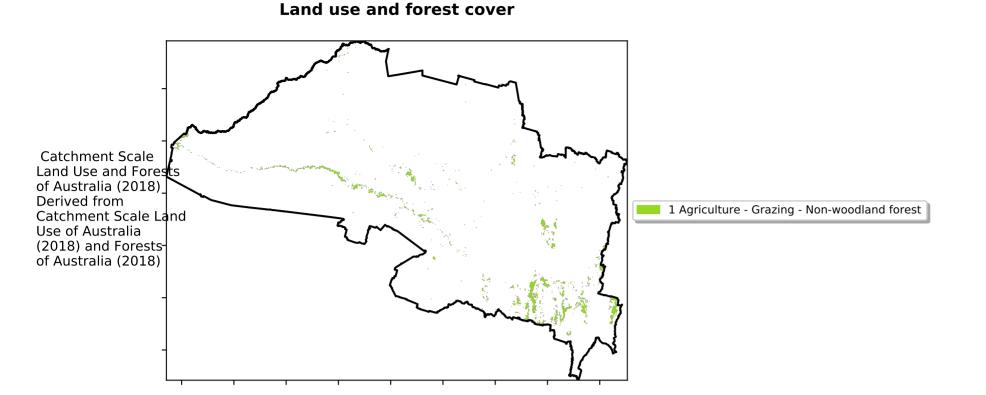
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 90 80 70-60 Jan feb

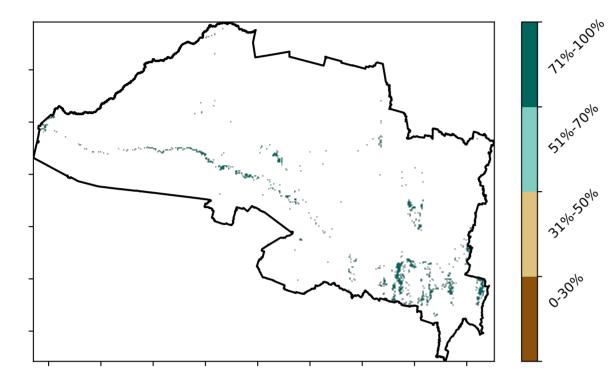
Water erosion historical monthly area protected (Total Veg Cov>70%)



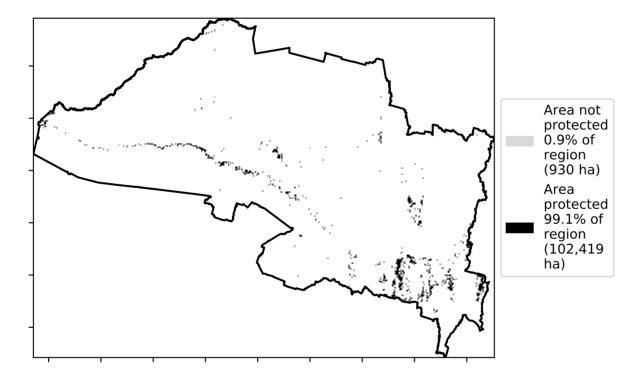
#### Grazing - Forest (non woodland)



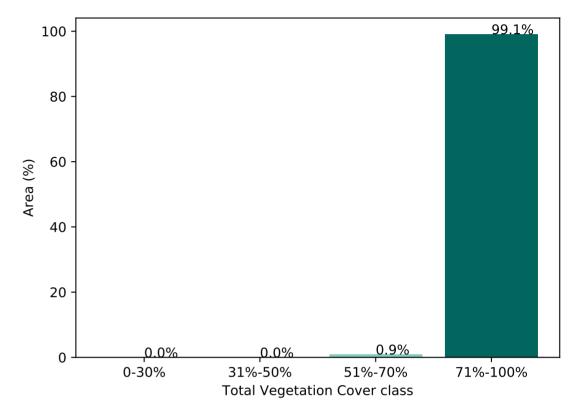
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



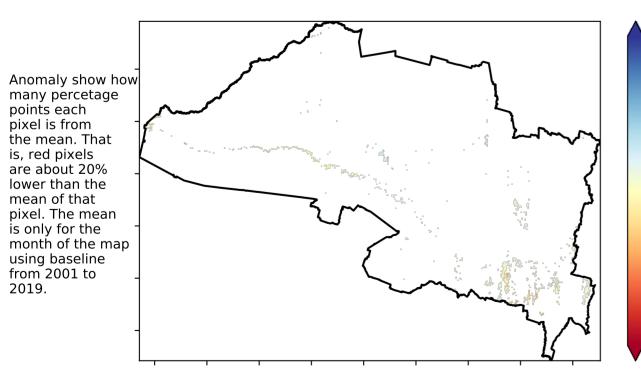
Proportion of vegetation cover class in area



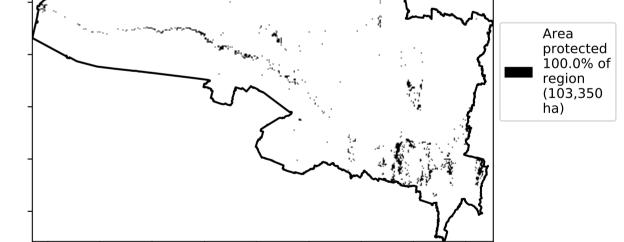
% Area protected from wind erosion (>50%)



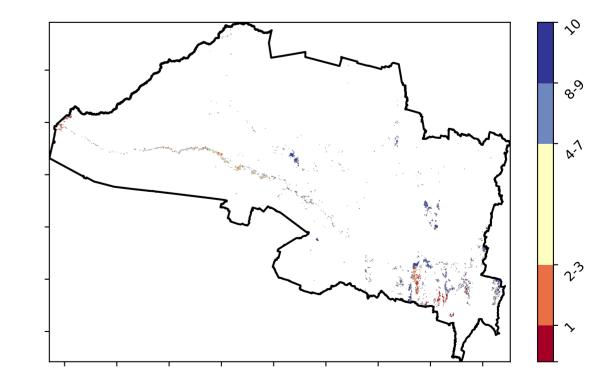
**Total Vegetation Cover Anomaly [%]** 



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**Total Vegetation Cover Decile [%]** 





18

- 20

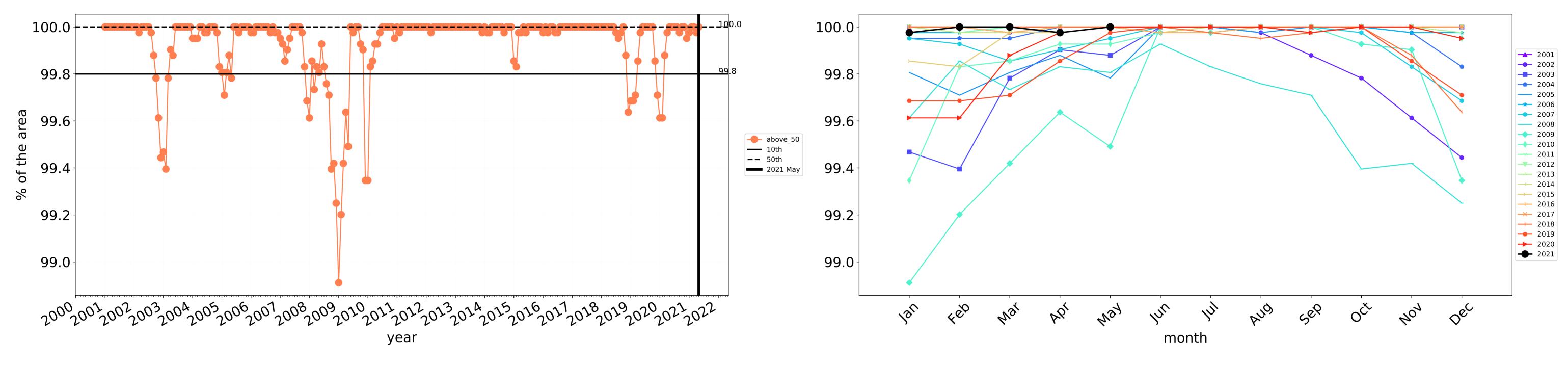
10

0

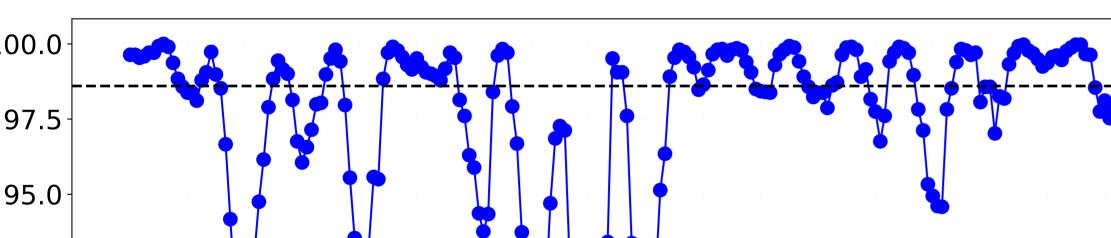
-10

-20

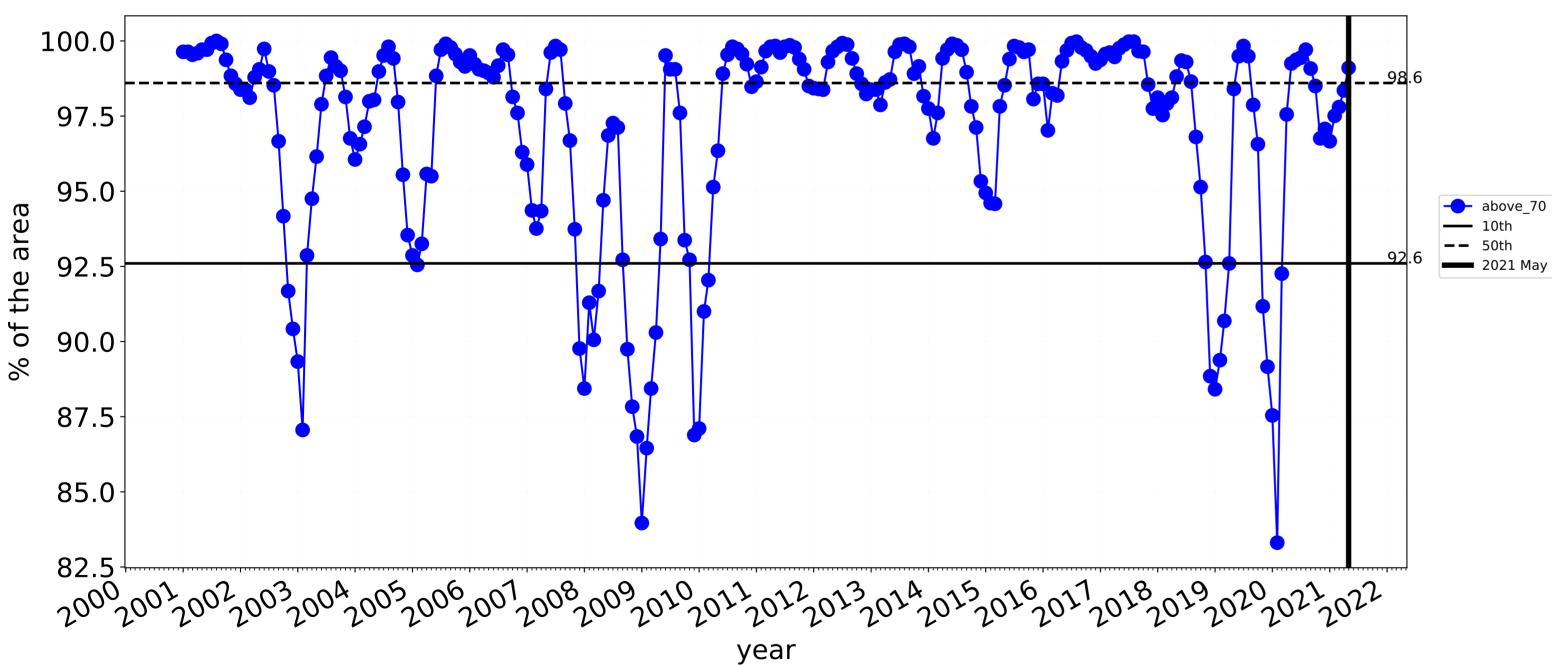


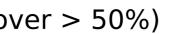


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

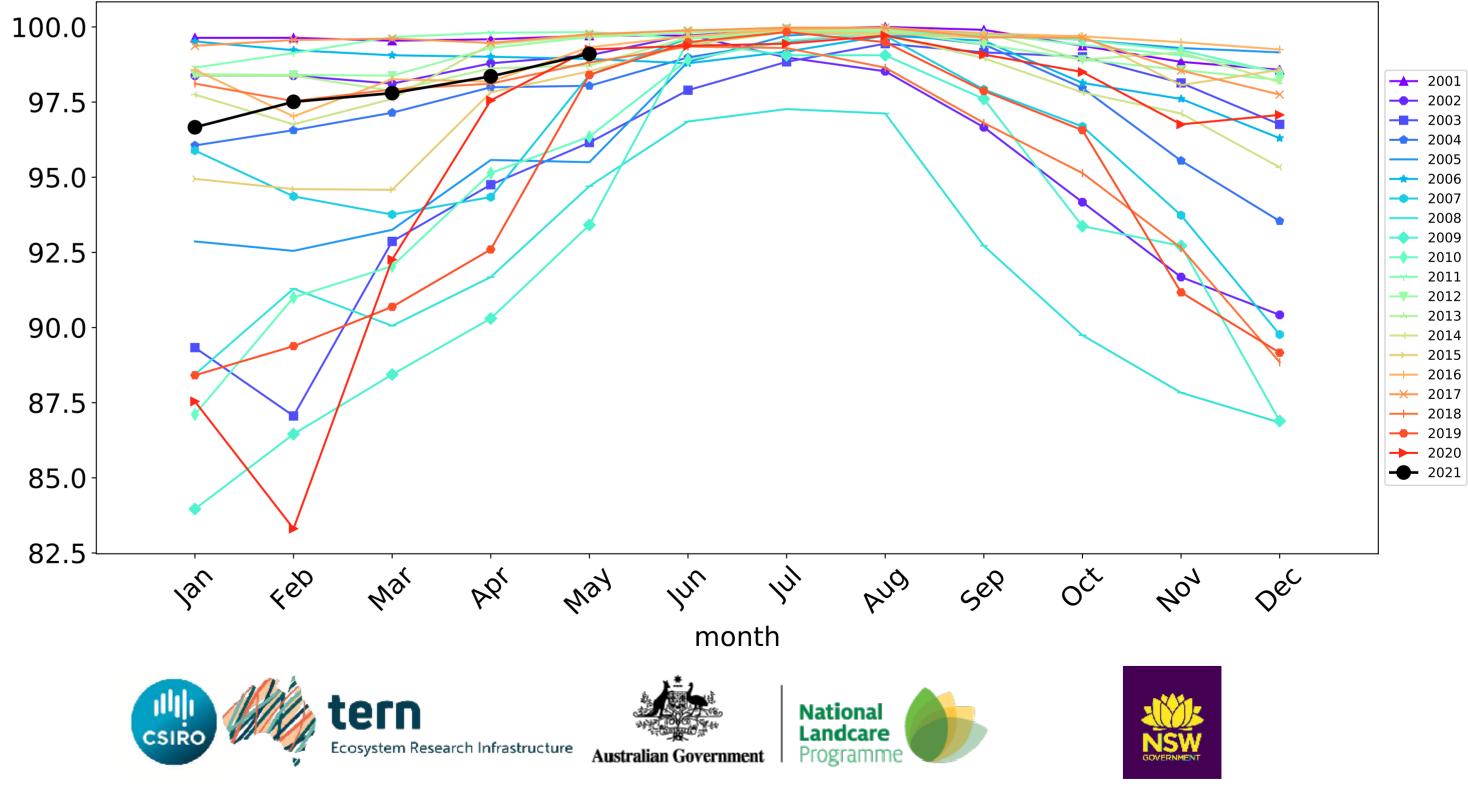


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



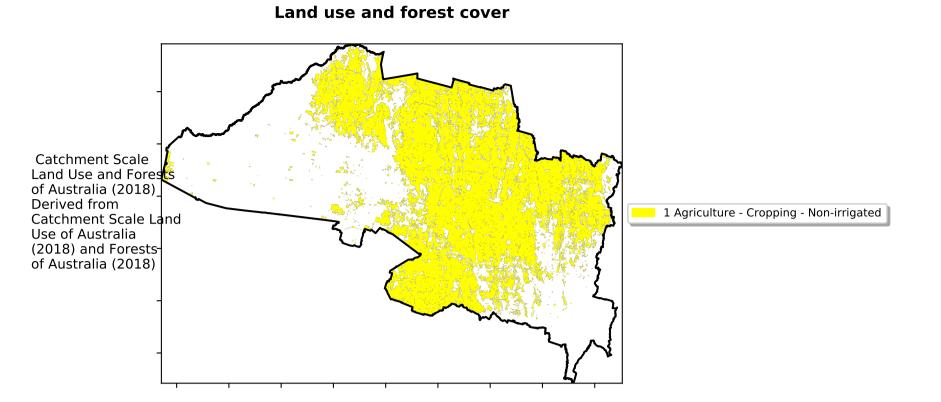


Wind erosion historical monthly area protected (Total Veg Cov >50%)

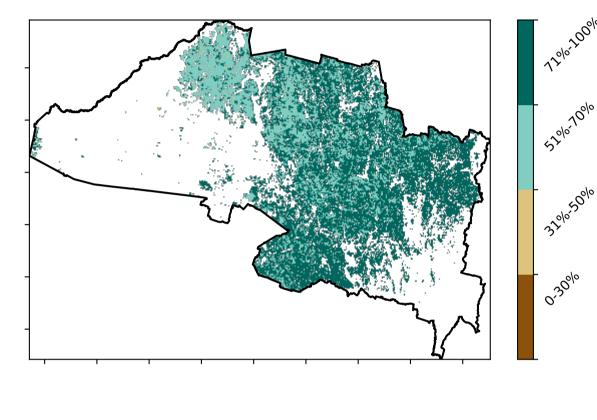


Water erosion historical monthly area protected (Total Veg Cov>70%)

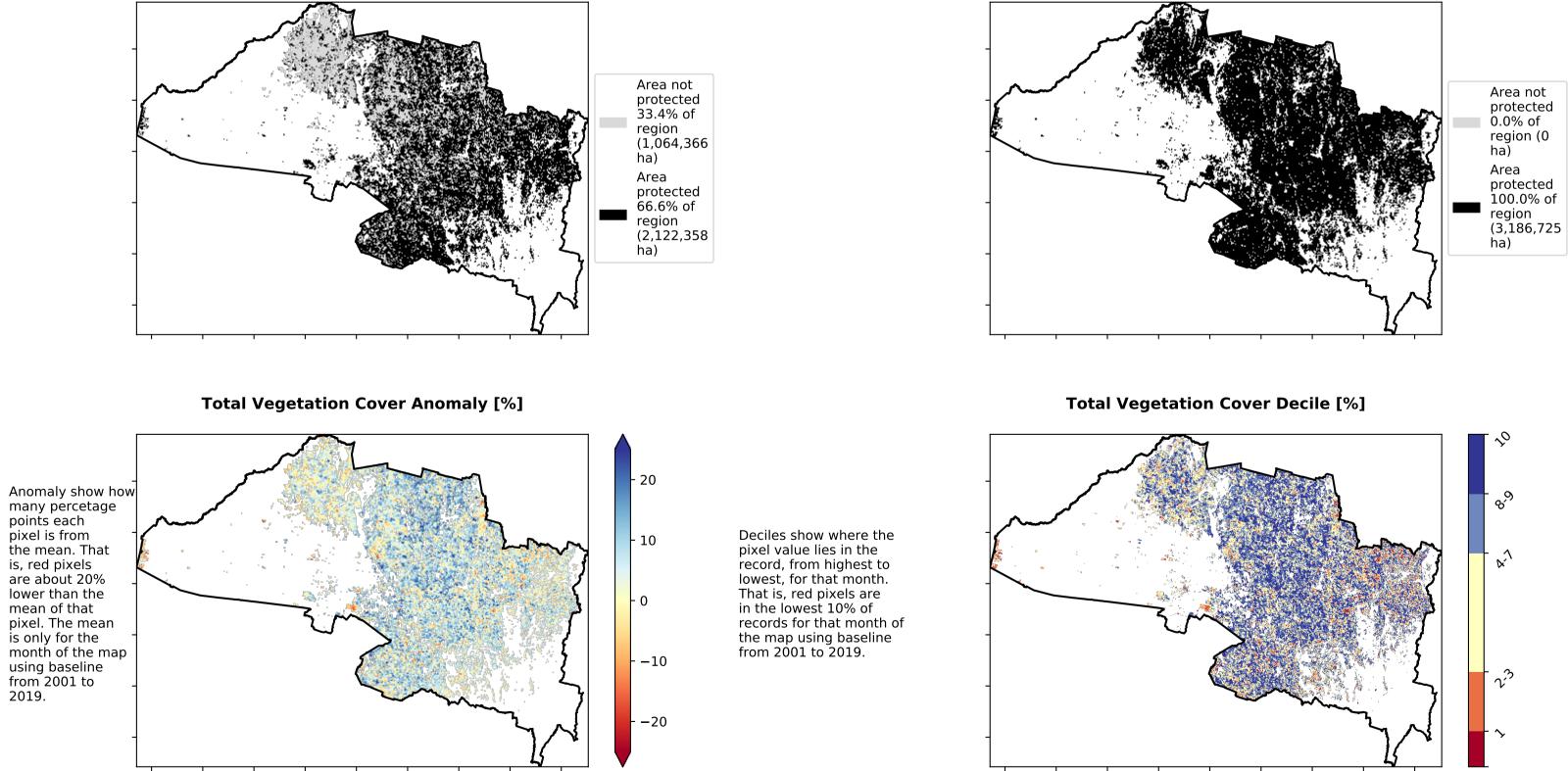
### Cropping



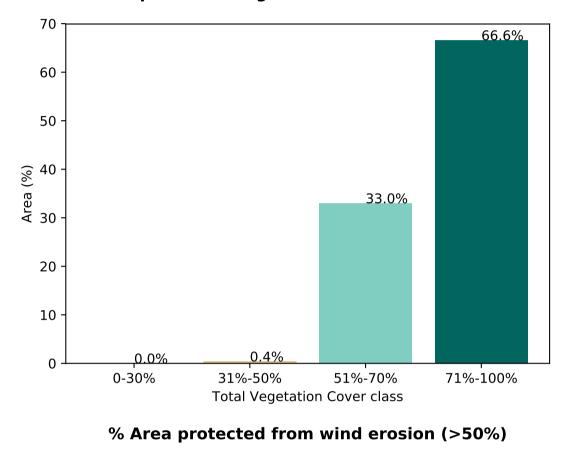
Total Vegetation Cover [%]

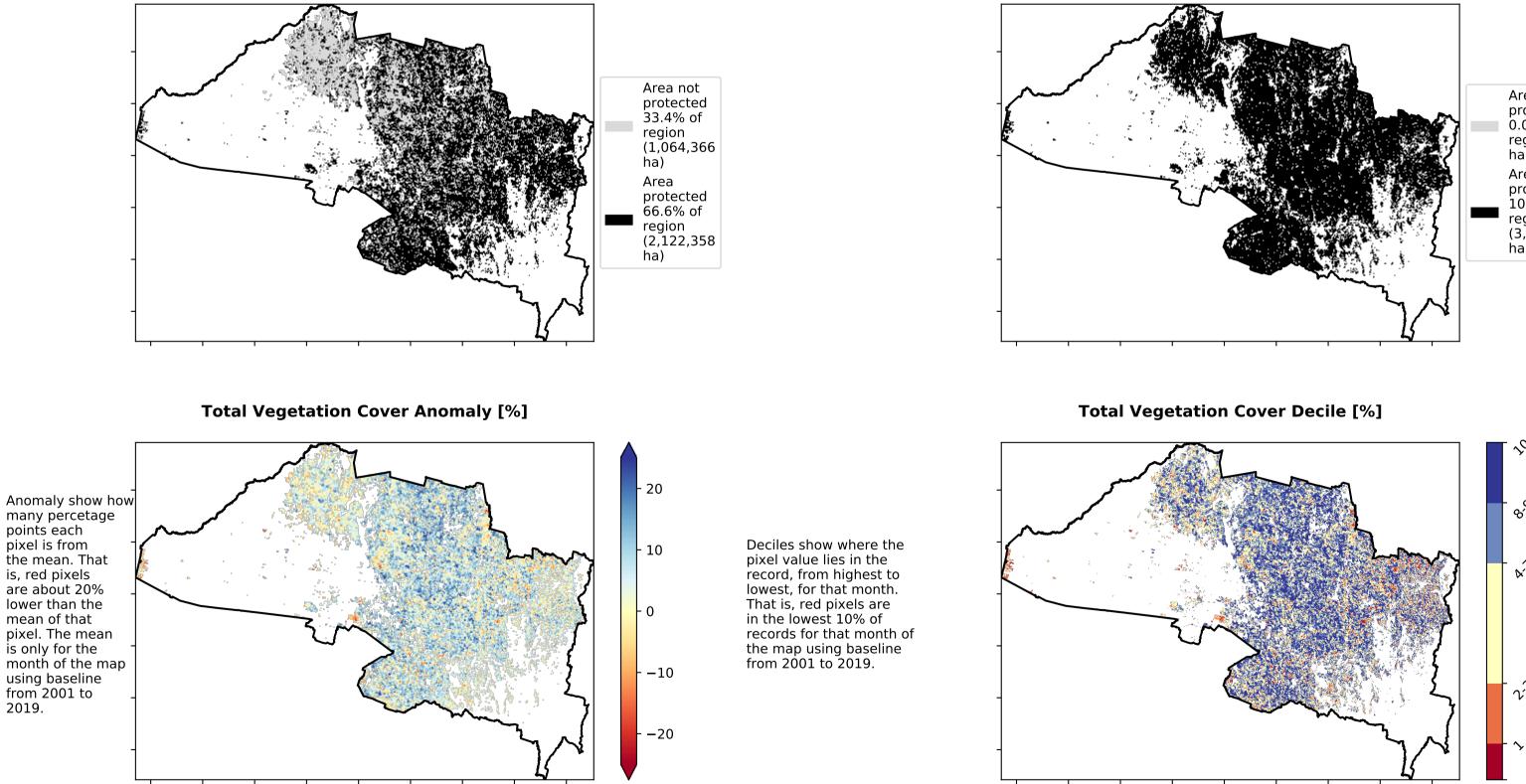


% Area protected from water erosion (>70%)

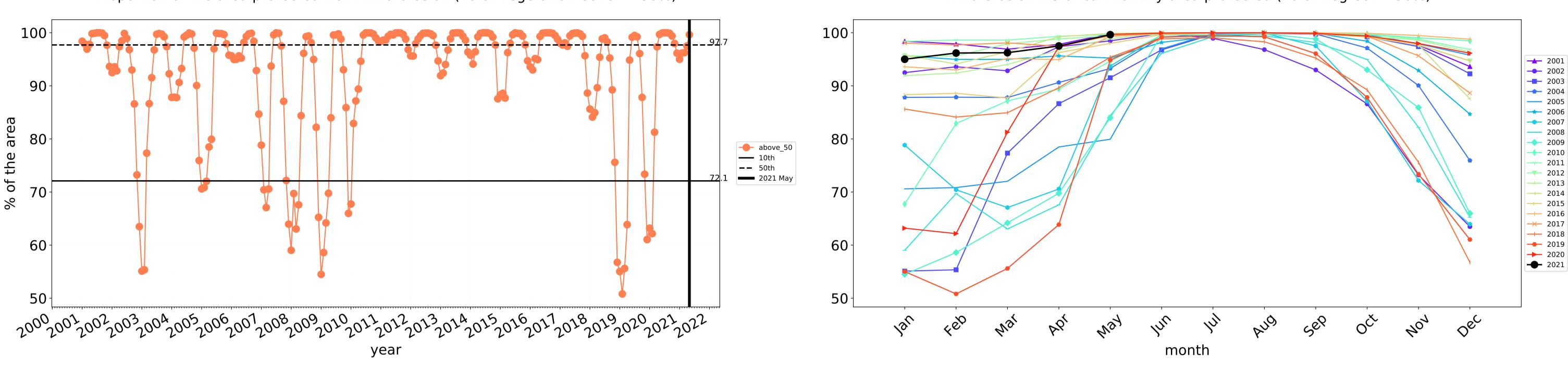


Proportion of vegetation cover class in area

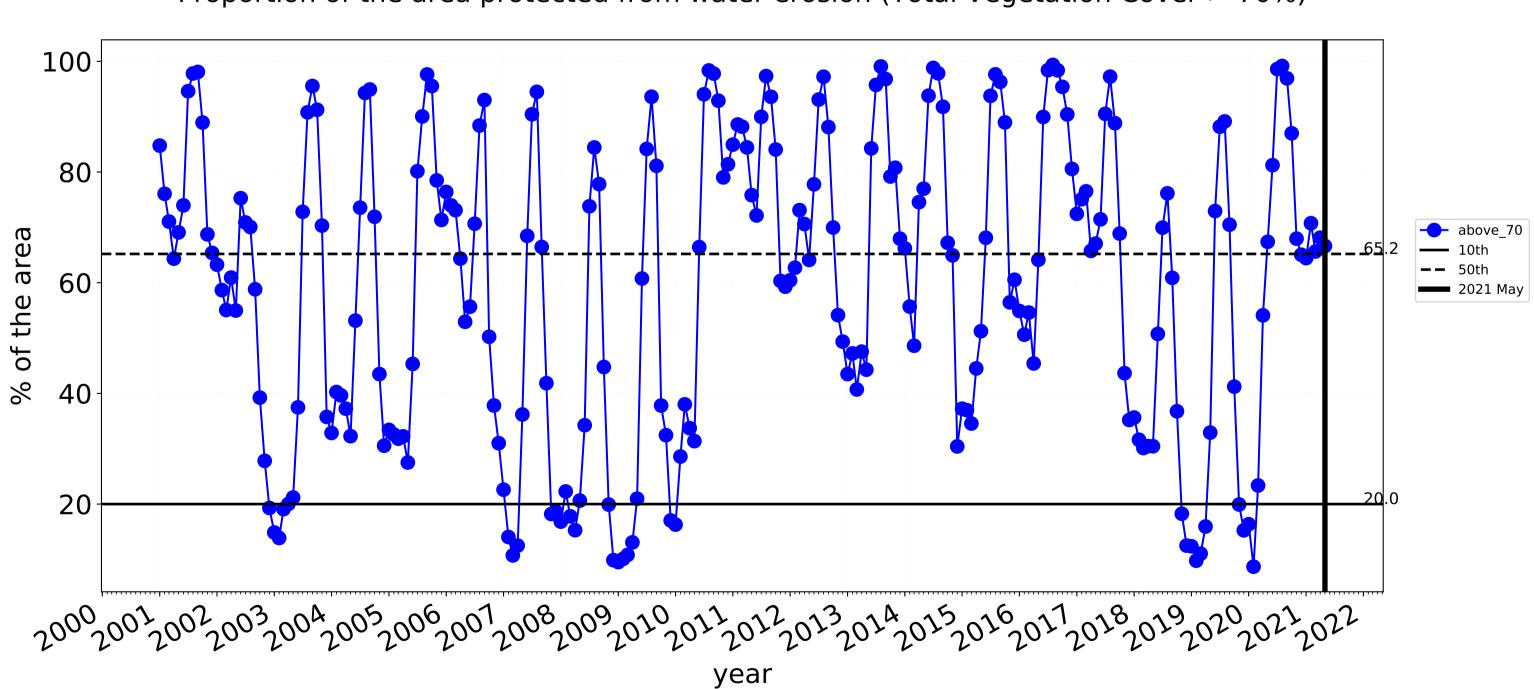






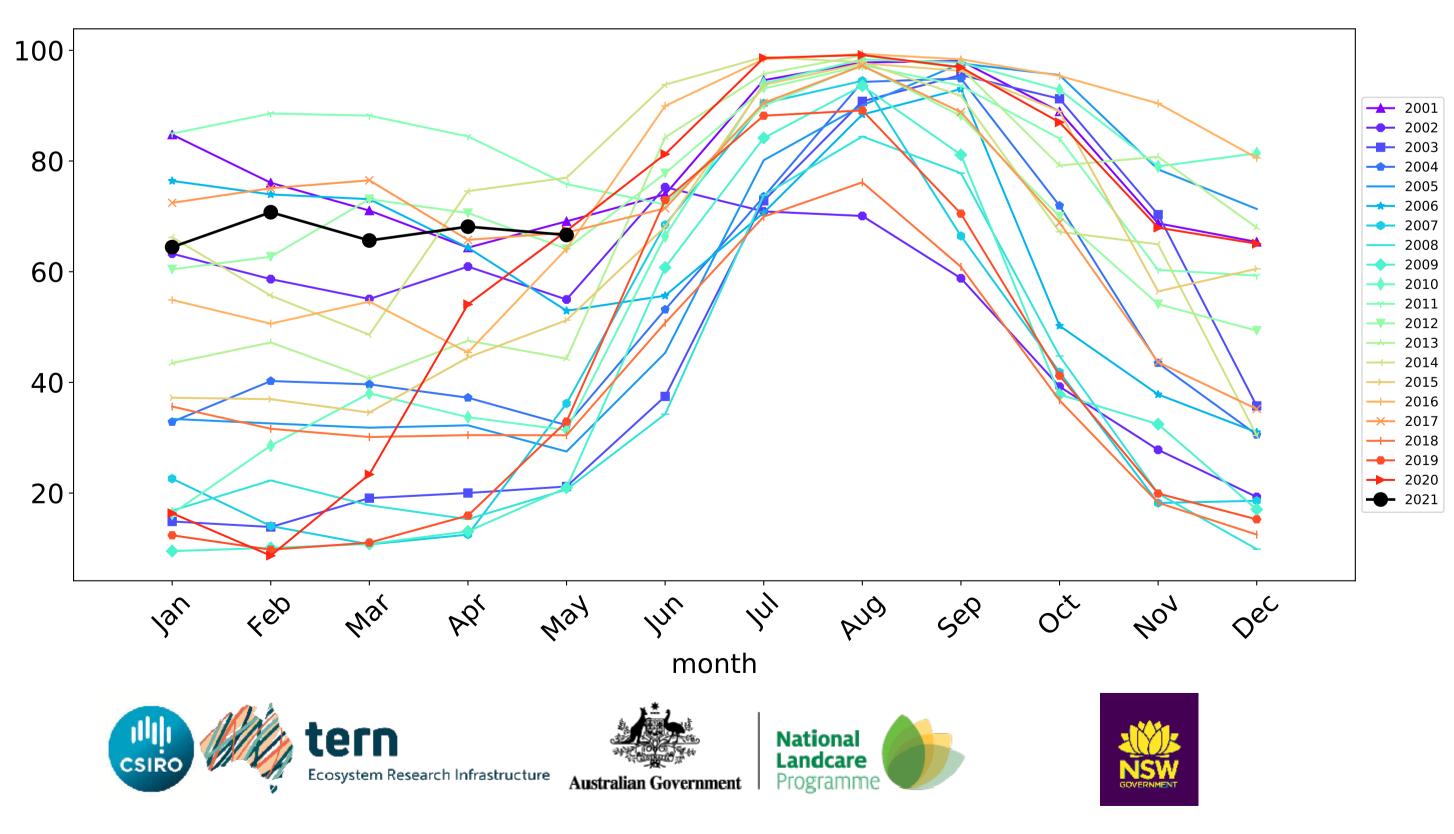


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

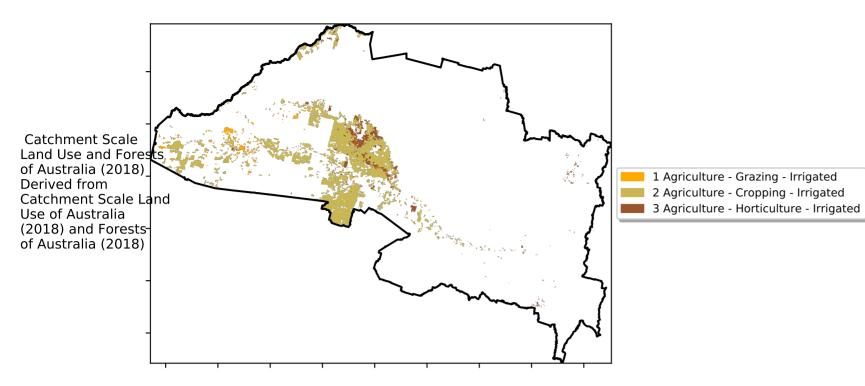
# **Cropping timeseries**



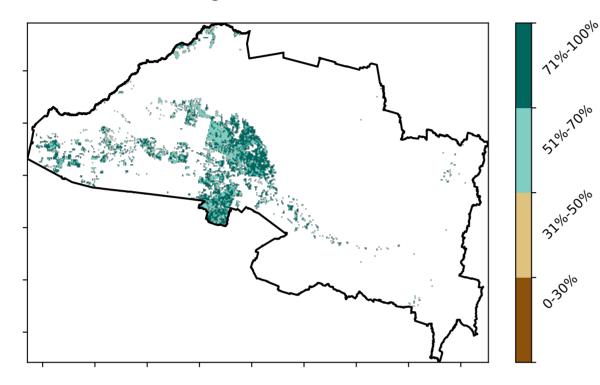
Wind erosion historical monthly area protected (Total Veg Cov >50%)

#### Irrigation

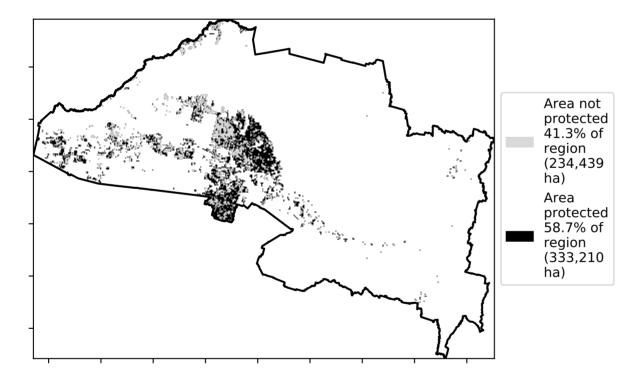
Land use and forest cover

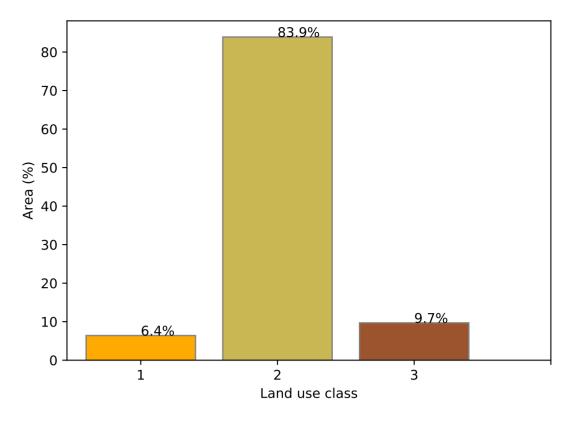


**Total Vegetation Cover [%]** 



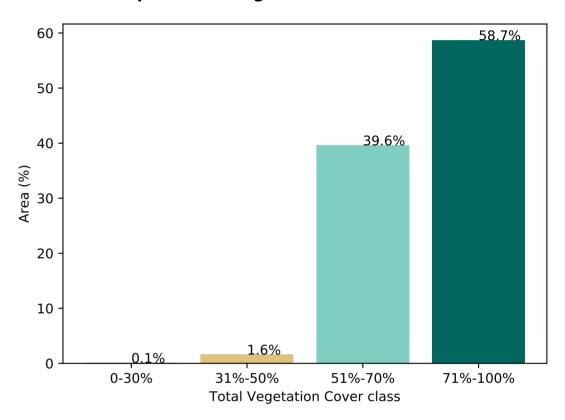
% Area protected from water erosion (>70%)



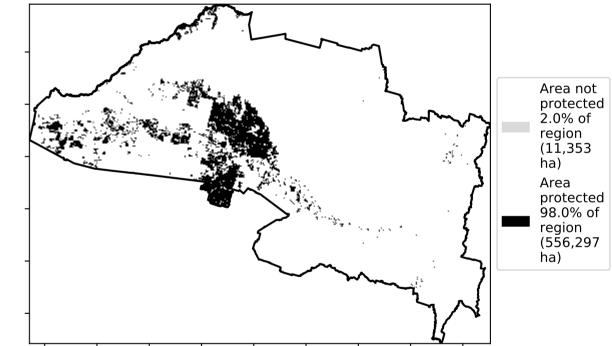


#### Proportion of each land class in area

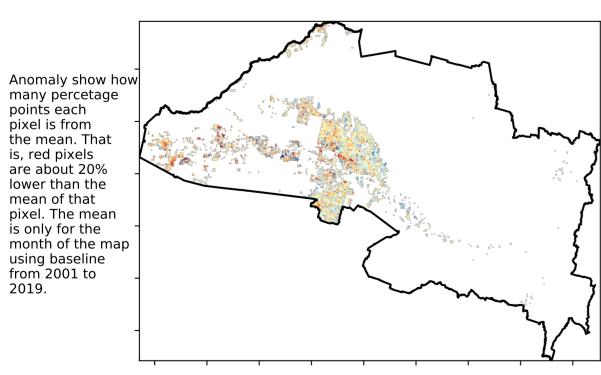
Proportion of vegetation cover class in area



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

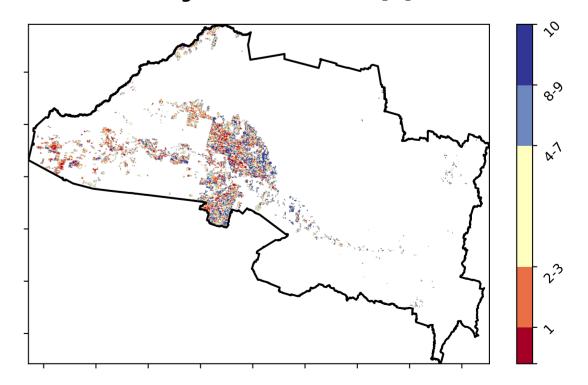


Total Vegetation Cover Anomaly [%]



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 baseling the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]





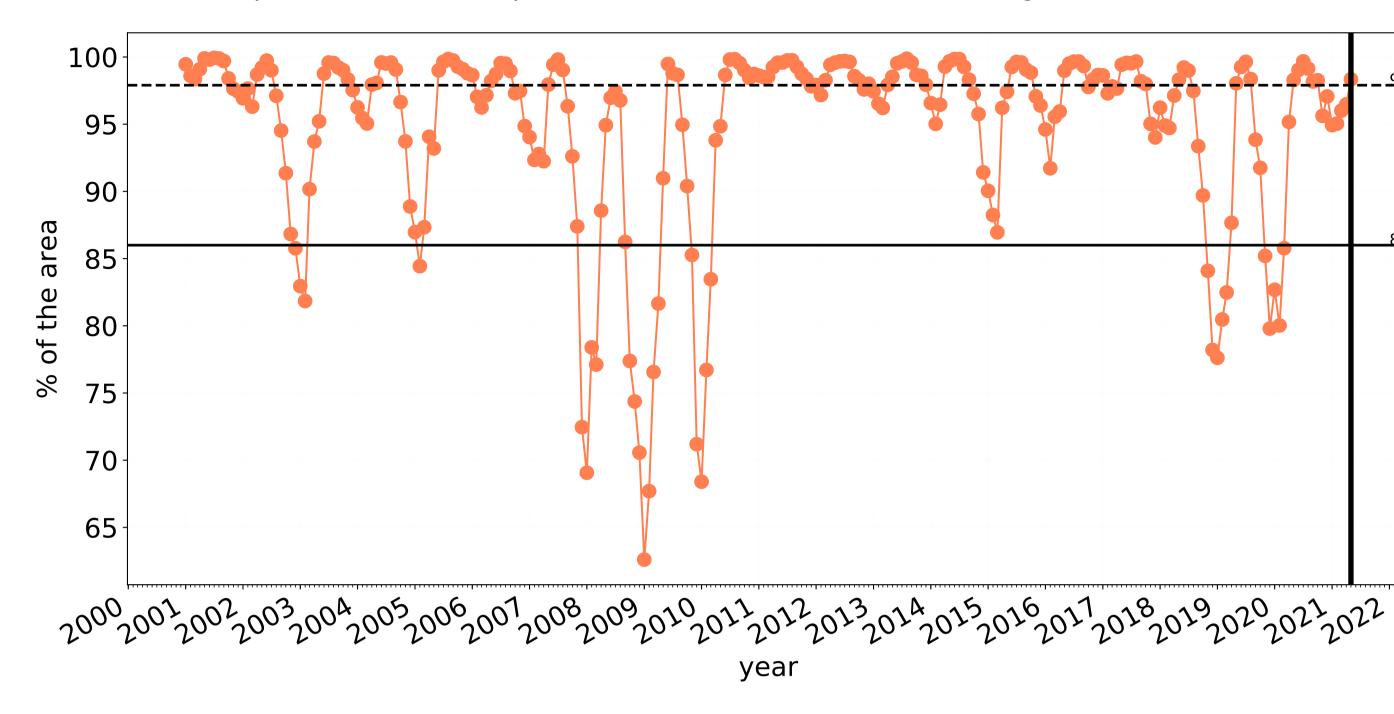
- 20

- 10

- 0

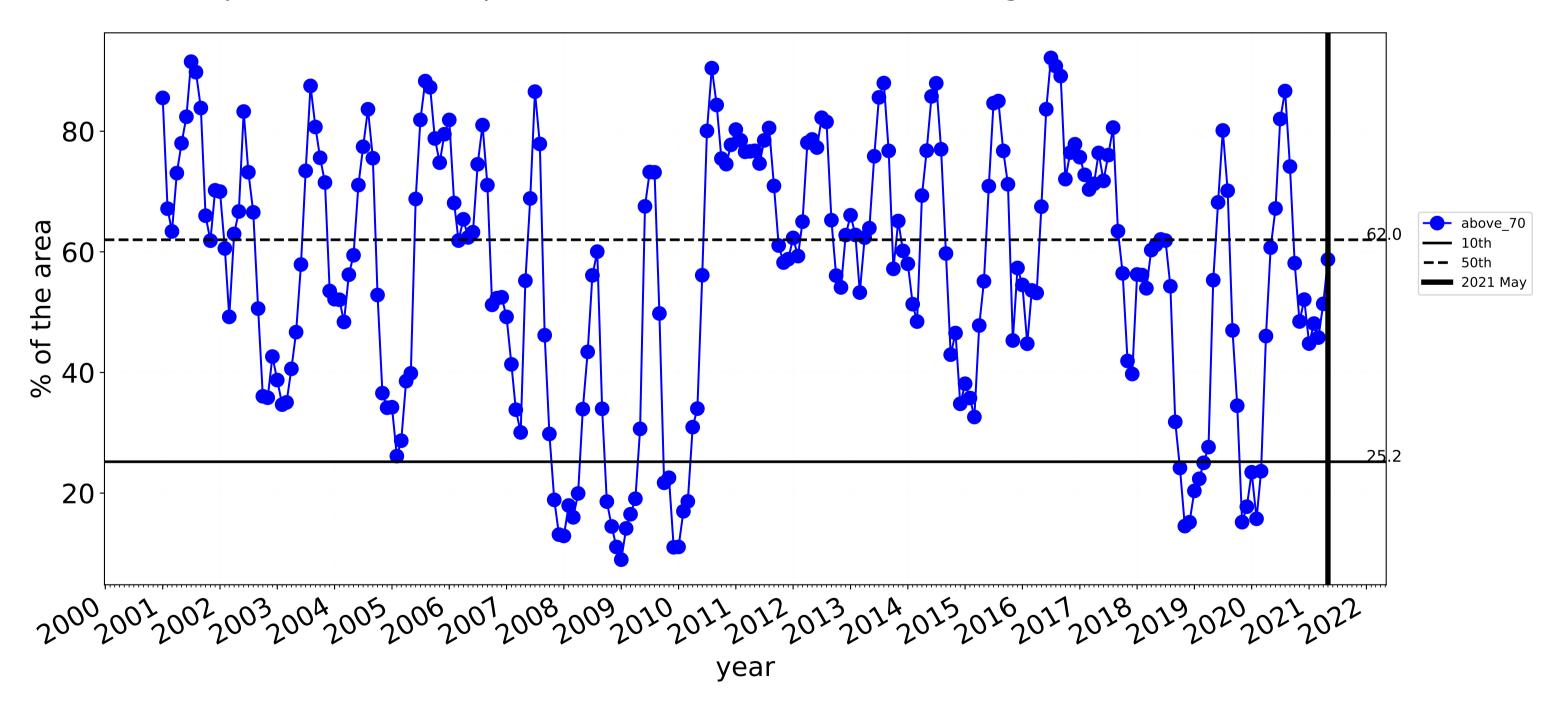
-10

-20



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

**——** 50th

—— 2021 May

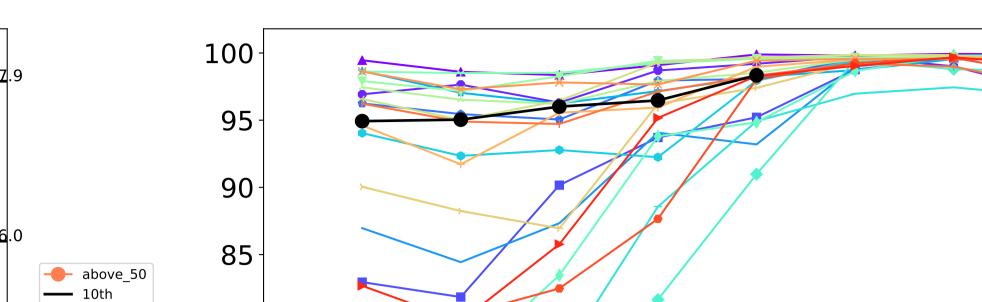
80

75

70

65





4eb

War

Jan

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

In

1<sup>j</sup>

month

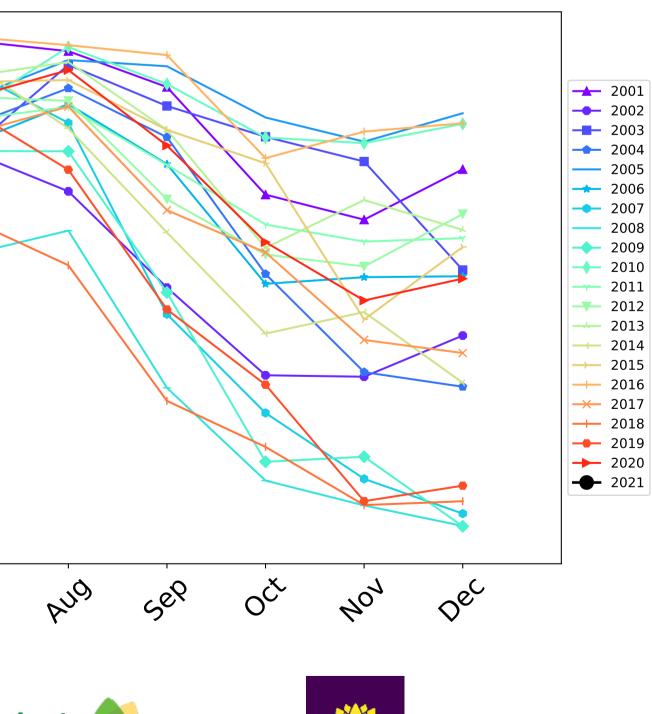
way

PQ

80-60-40 20 feb mat In Jan 1's Mai 291 month CSIRO CONTRACTOR CONTR Australian Government

**\_\_\_** 2001 --- 2002 ---- 2003 **---** 2004 \_\_\_\_ 2005 **----** 2006 **---** 2007 2008 **---** 2009 **---** 2010 - 2011 ---- 2012 --- 2013 **→** 2014 <mark>→</mark> 2015 <mark>→</mark> 2016 <del>→</del> 2017 → 2018
→ 2019
→ 2020
→ 2021 Dec AUG Sel 404 OČ

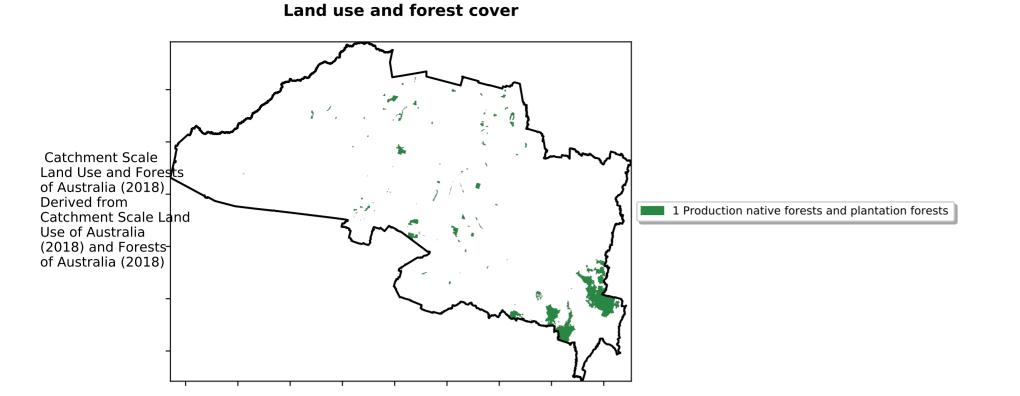
Water erosion historical monthly area protected (Total Veg Cov>70%)



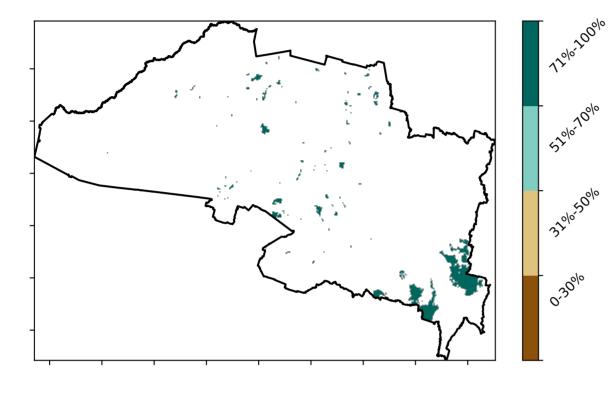




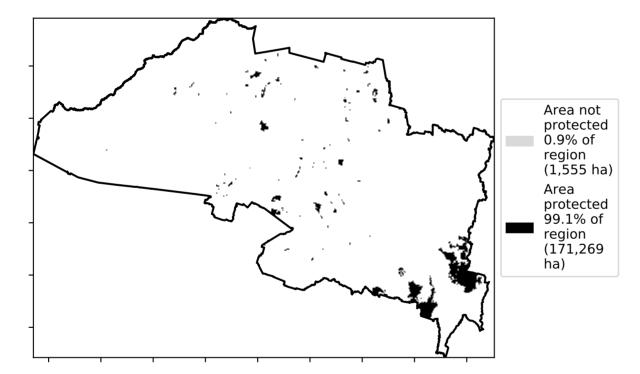
# **Production native forests and plantation forests**



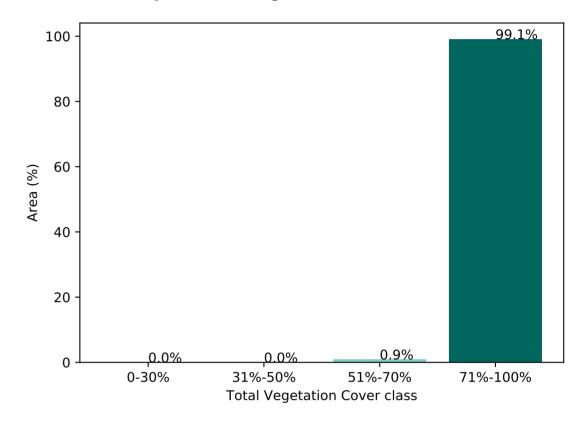
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



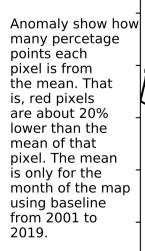


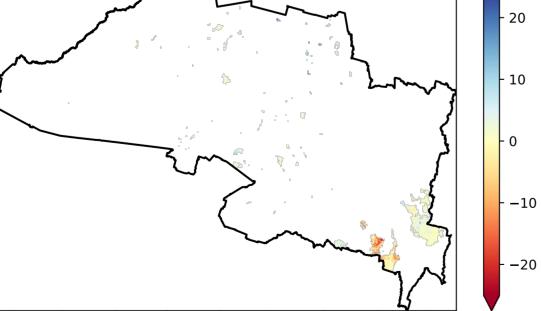


#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

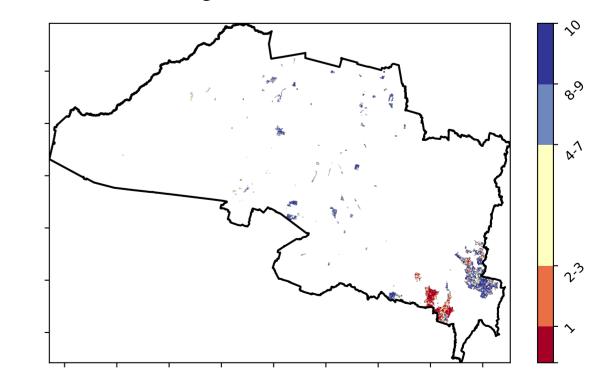




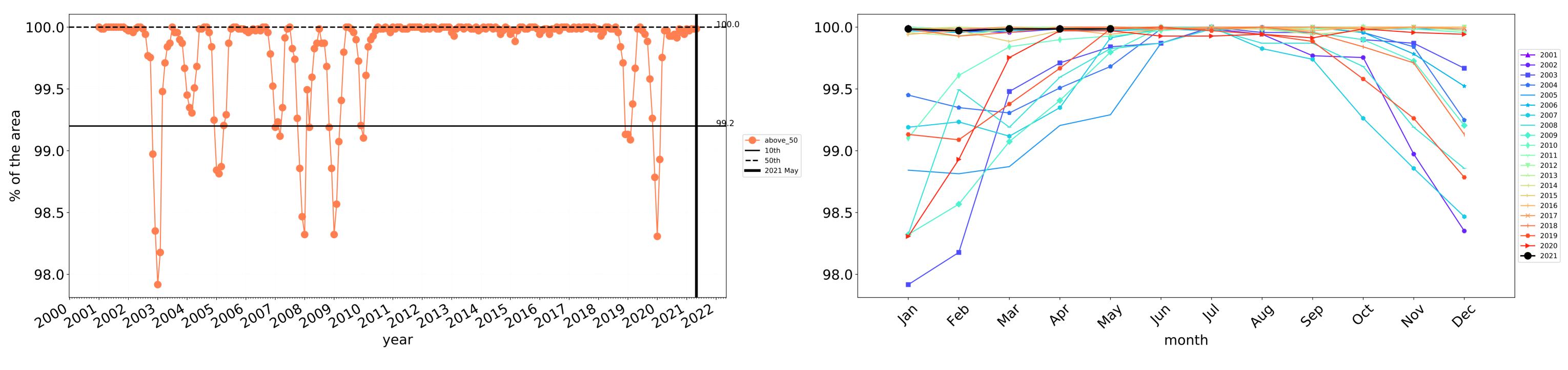
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.



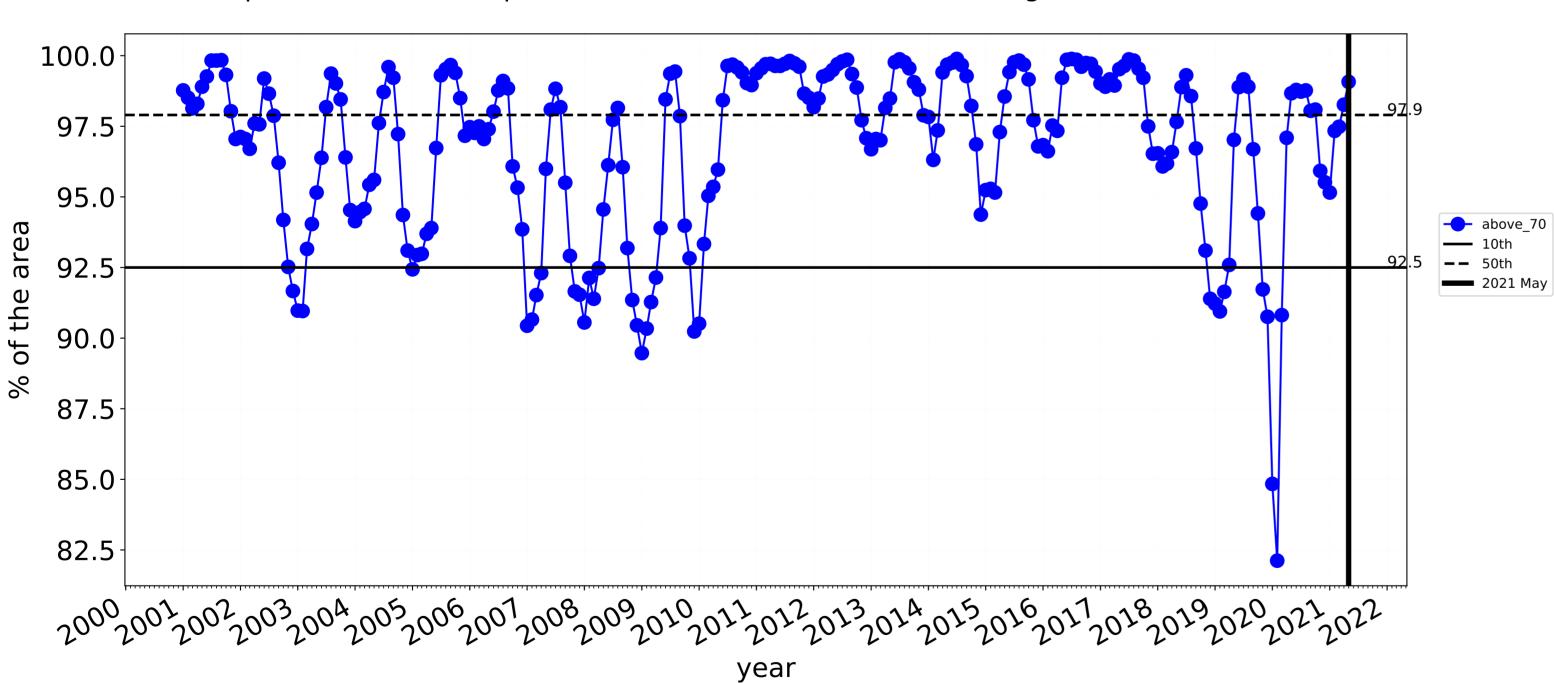
**Total Vegetation Cover Decile [%]** 





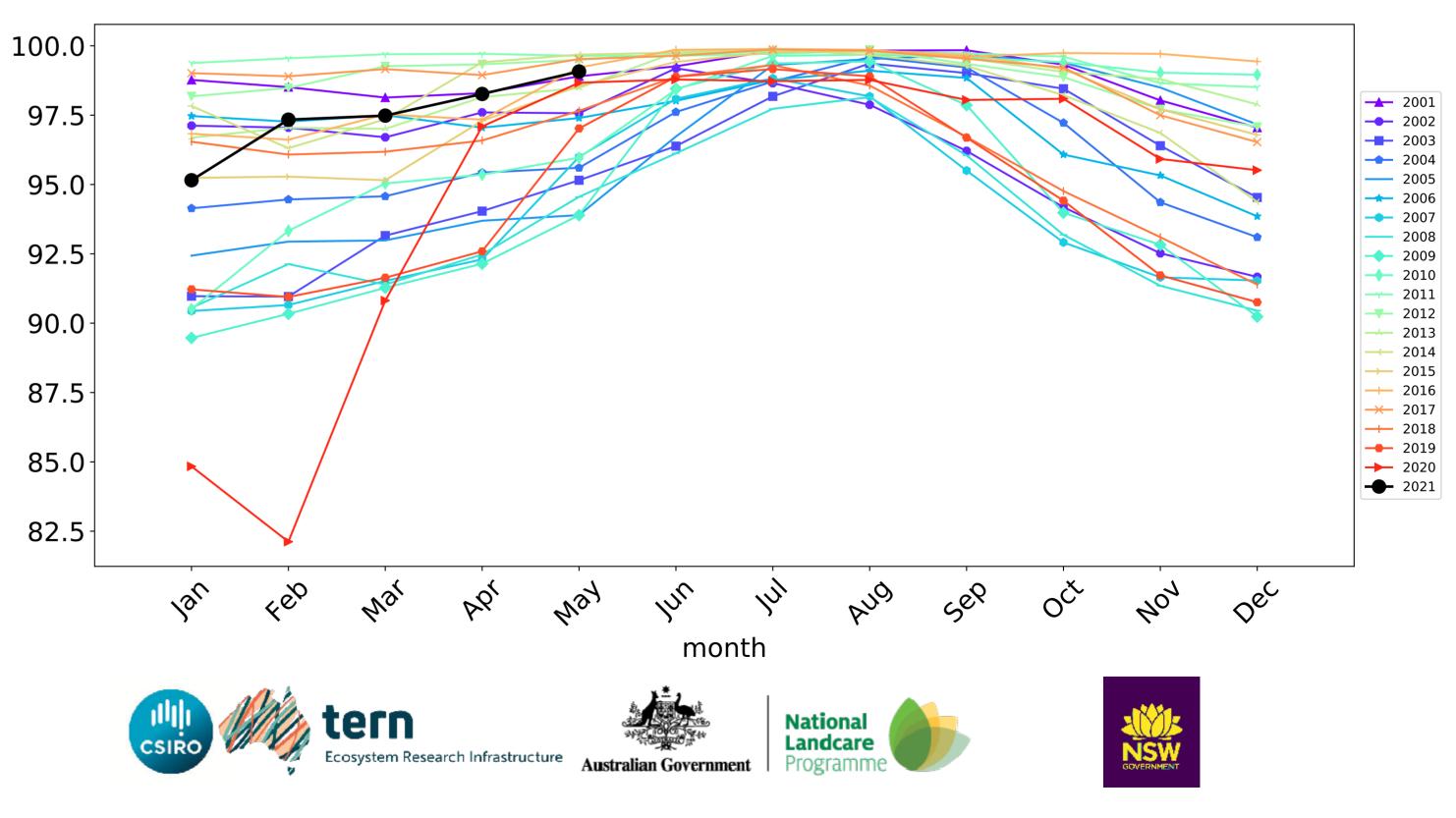


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

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



# Riverina (6,690,825 ha and no data 17,510 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	6,690,825	100.0% 6,688,825	99.0% 6,625,375	70.1% 4,688,975	43.0% 2,877,900	16.5% 1,106,500	5.6% 375,525
Conservation and natural environments	323,100	100.0% 323,100	99.9% 322,750	91.6% 295,850	82.4% 266,150	62.3% 201,300	37.8% 122,000
Conservation and natural environments non forest	83,350	100.0% 83,350	99.6% 83,025	68.2% 56,875	39.5% 32,900	17.4% 14,525	7.4% 6,200
Conservation and natural environments Forest (non woodland)	195,250	100.0% 195,250	100.0% 195,225	99.7% 194,625	97.5% 190,325	79.2% 154,625	52.8% 103,050
Agriculture	6,064,825	100.0% 6,063,100	99.0% 6,003,075	68.1% 4,128,000	39.5% 2,397,050	12.7% 769,475	2.7% 163,525
Grazing	2,308,625	99.9% 2,307,375	98.2% 2,268,025	72.3% 1,669,575	47.8% 1,102,500	22.5% 520,400	5.7% 132,275
Grazing non forest	2,063,625	99.9% 2,062,375	98.0% 2,023,025	69.3% 1,429,150	43.0% 887,125	19.3% 398,125	4.2% 87,400
Grazing Woodland forest	141,650	100.0% 141,650	100.0% 141,650	97.4% 138,000	84.4% 119,575	42.0% 59,500	11.2% 15,800
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,350	99.1% 102,425	92.7% 95,800	60.7% 62,775	28.1% 29,075
Cropping	3,186,725	100.0% 3,186,625	99.6% 3,175,000	66.6% 2,123,550	36.4% 1,159,325	7.2% 230,125	0.8% 24,900
Irrigation	567,650	99.9% 567,275	98.3% 558,225	58.7% 333,325	23.7% 134,700	3.3% 18,875	1.1% 6,350
Production native forests and plantation forests	172,825	100.0% 172,825	100.0% 172,800	99.1% 171,225	93.8% 162,025	73.2% 126,450	51.5% 88,975

