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

# Date: August 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

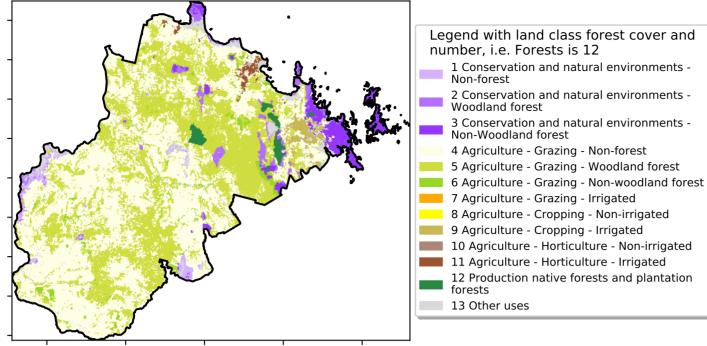


# **Vegetation Cover Aug 2021**

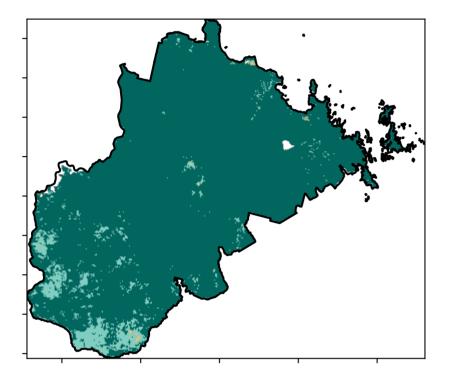
#### Land use and forest cover

#### Proportion of each land class in area

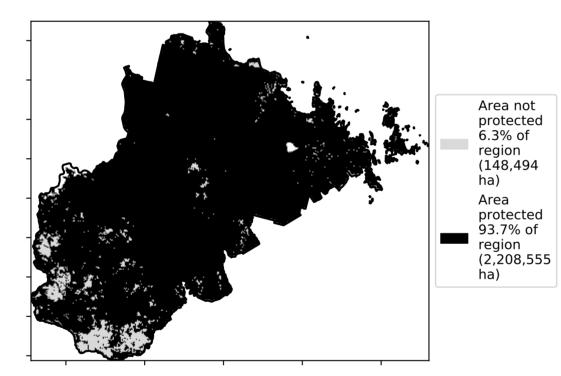


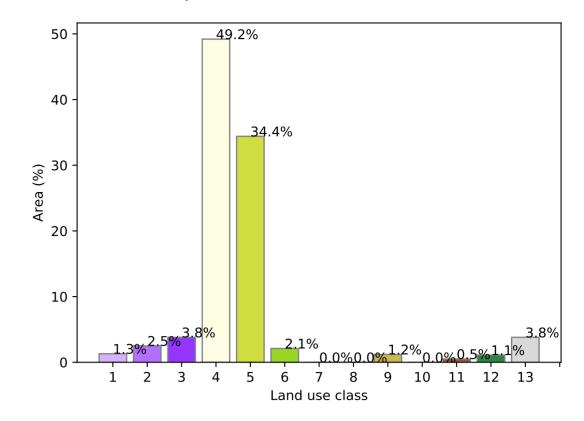


### **Total Vegetation Cover [%]**

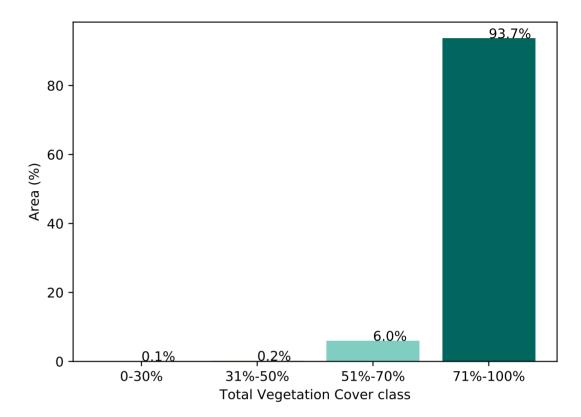


#### % Area protected from water erosion (>70%)

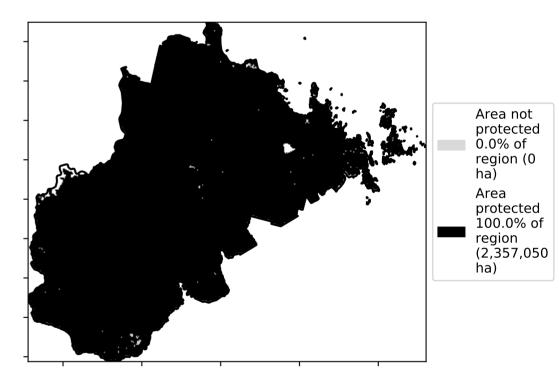




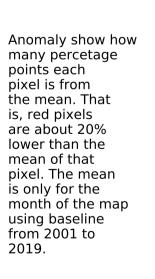
#### Proportion of vegetation cover class in area

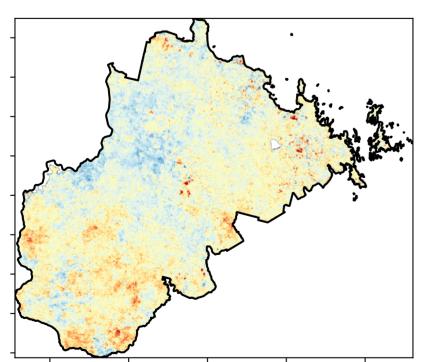


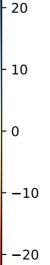
#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 







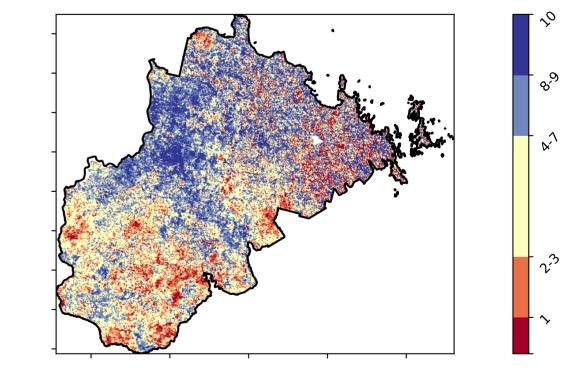
12%200%

52% 70%

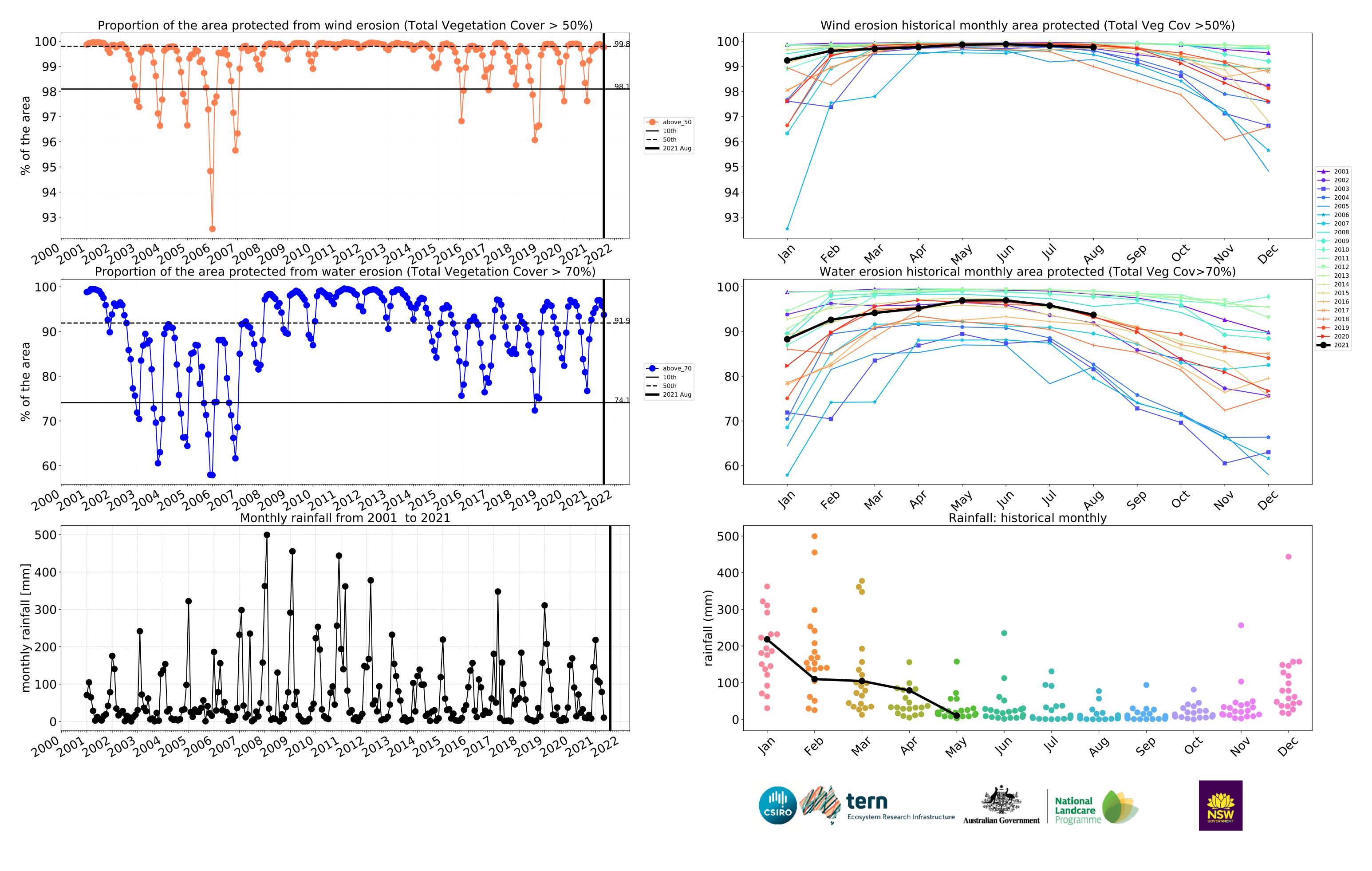
32%50%

0.30%

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







### **Conservation and natural environments**

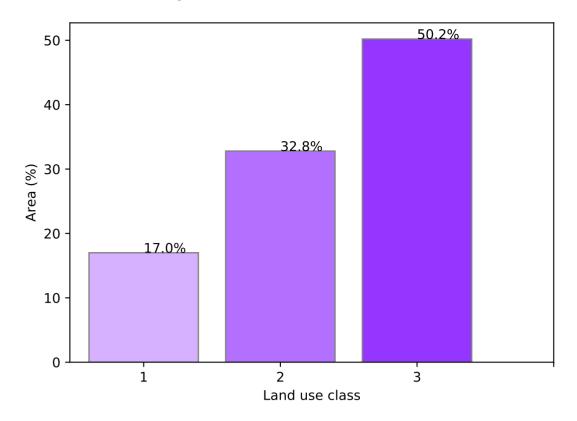
forest

forest

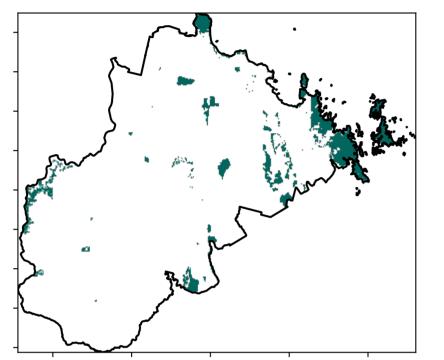
woodland forest

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

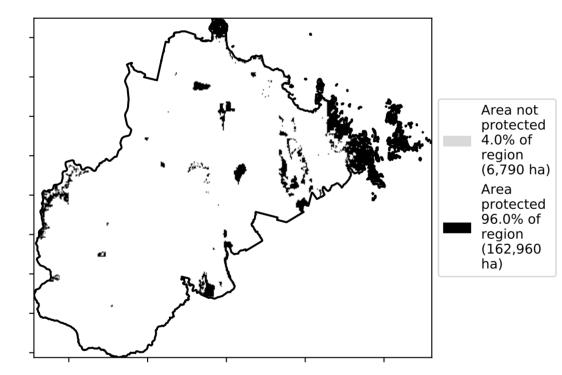
#### Proportion of each land class in area

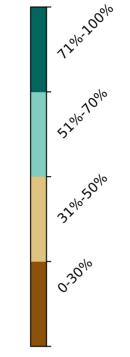


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)

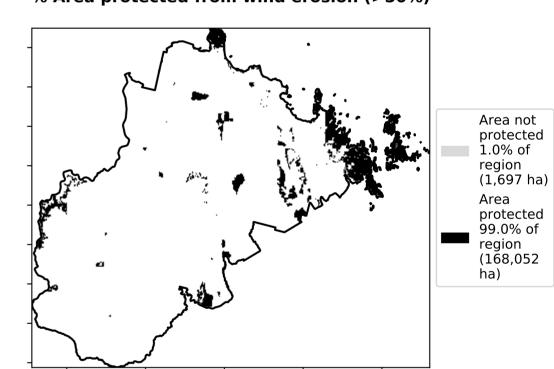




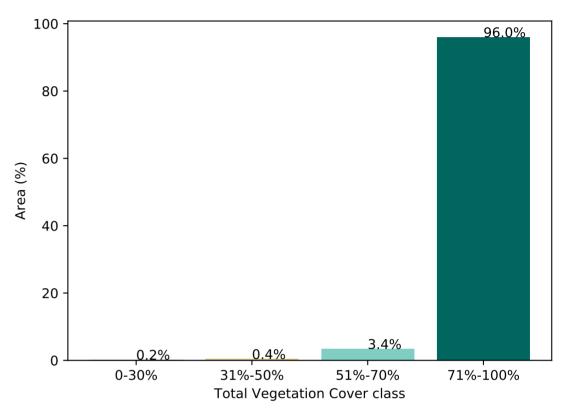
1 Conservation and natural environments - Non-

3 Conservation and natural environments - Non-

2 Conservation and natural environments - Woodland

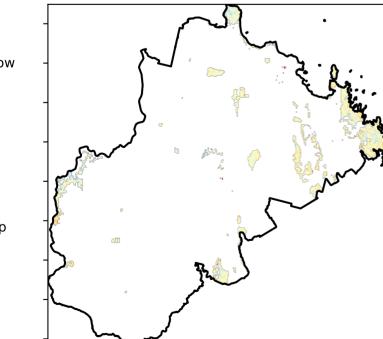


Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

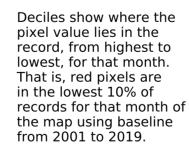
**Total Vegetation Cover Anomaly [%]** 



- 10 - 0 - -10

-20

- 20



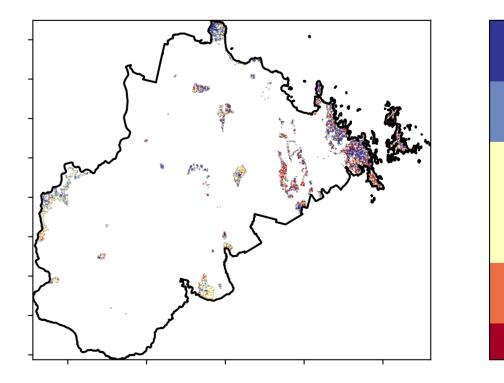
Total Vegetation Cover Decile [%]

 $\sqrt{2}$ 

୍ଚ୍ଚ

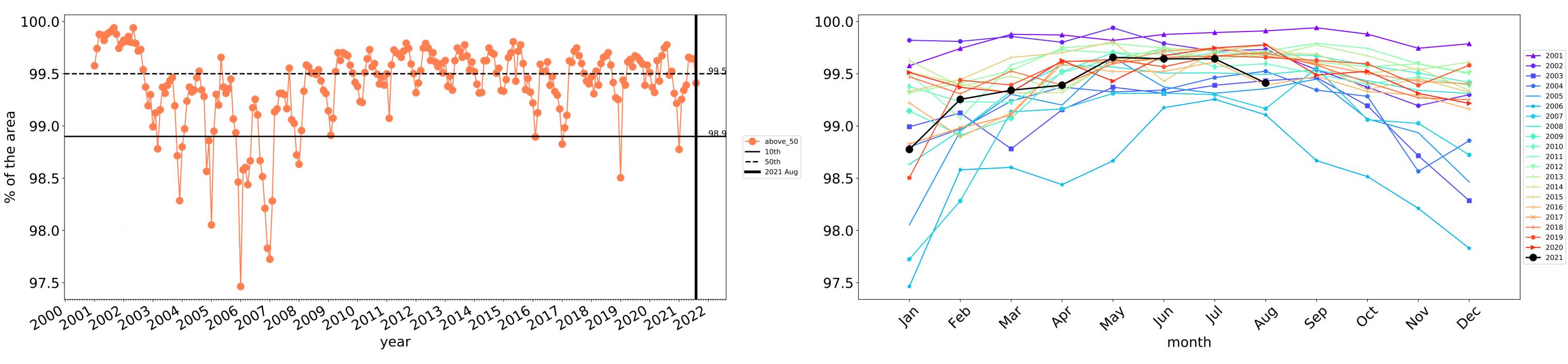
A-1

2.3

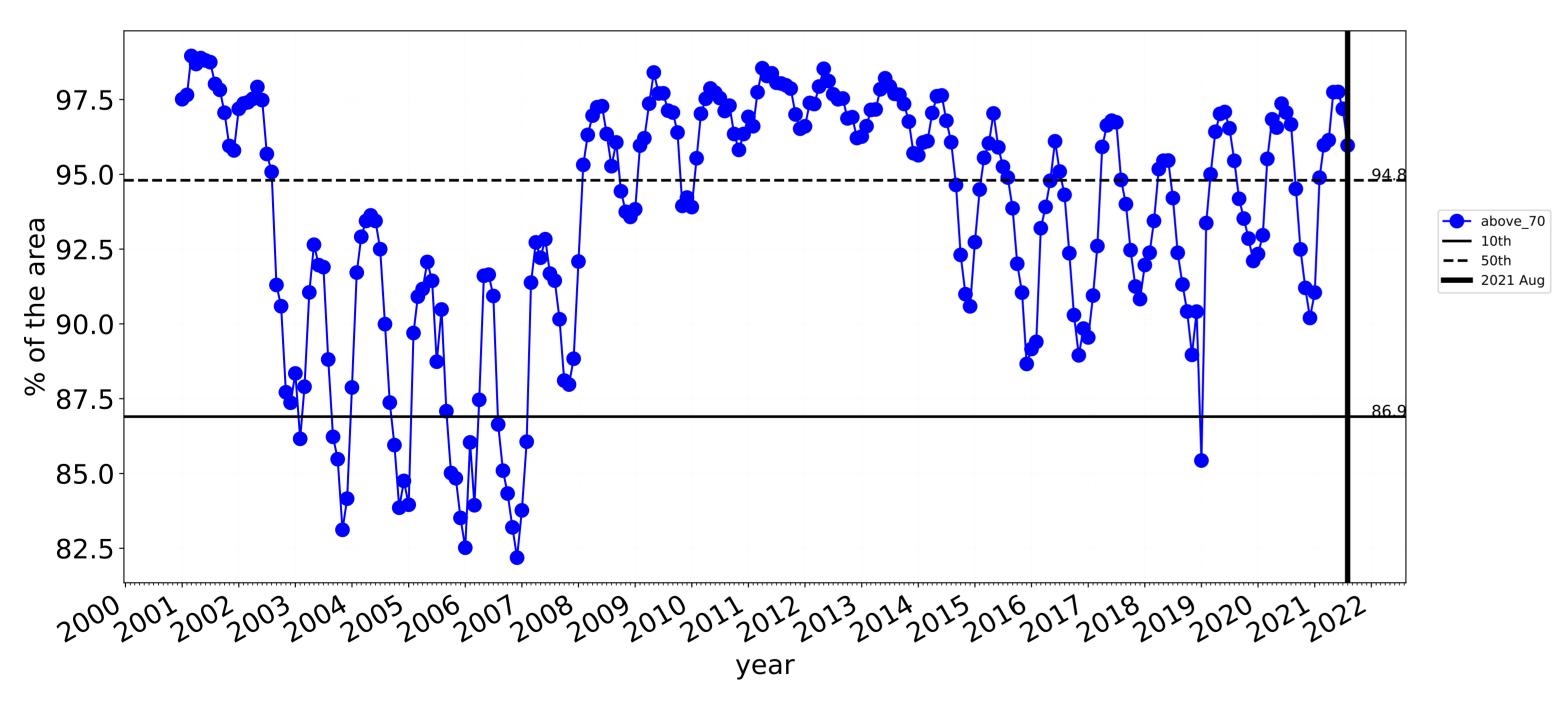




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



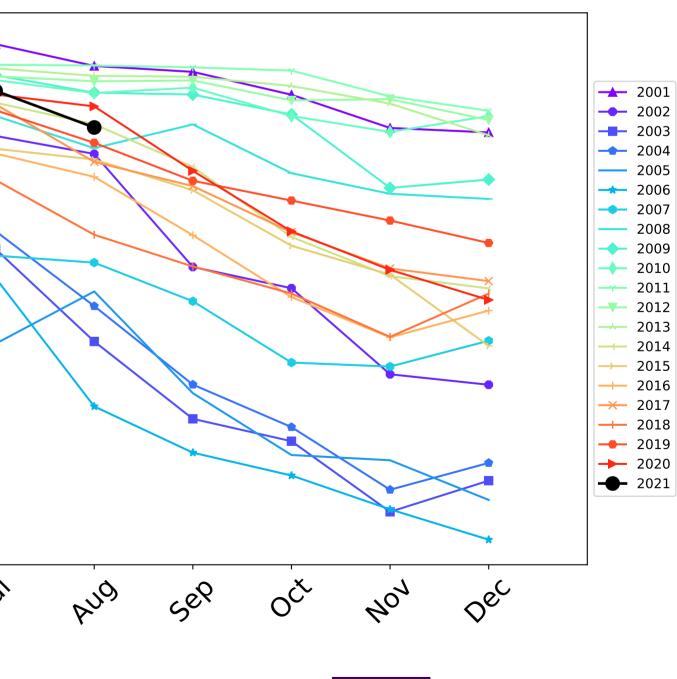
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



97.5 95.0 92.5 90.0-87.5 85.0-82.5 Jan 4er In May Wai PQ 1's month tern Ecosystem Research Infrastructure Australian Government

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

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



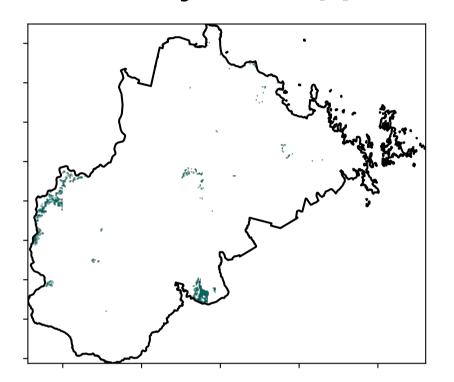




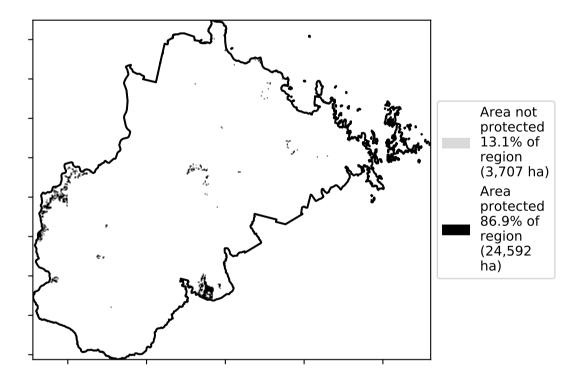
### **Conservation and natural environments non forest**

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

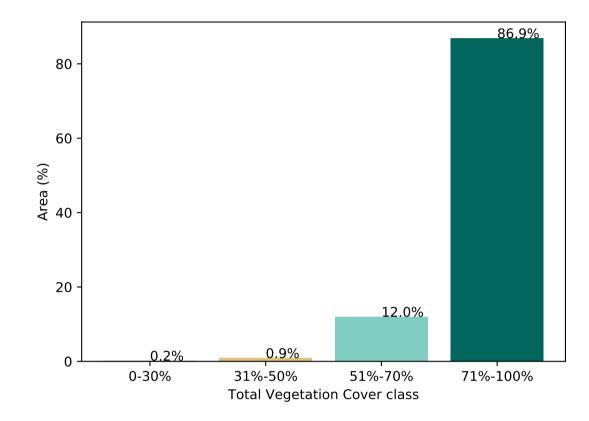
**Total Vegetation Cover [%]** 



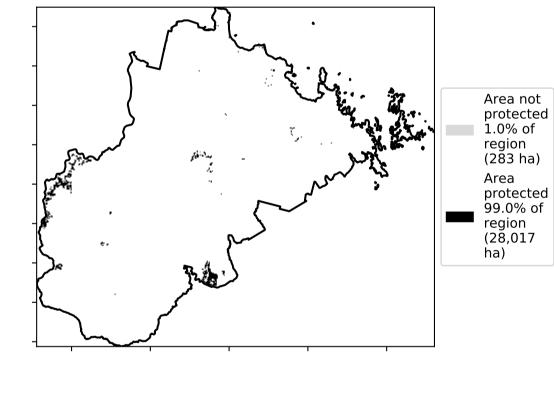
% Area protected from water erosion (>70%)



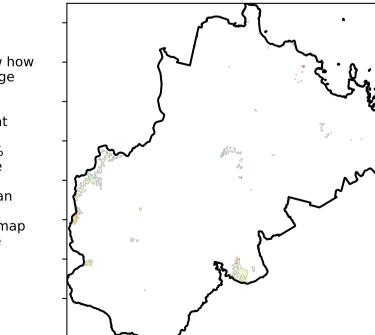
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



- 10 0 -10

- 20

1210-20091

52°1070010

320050010

0.30%

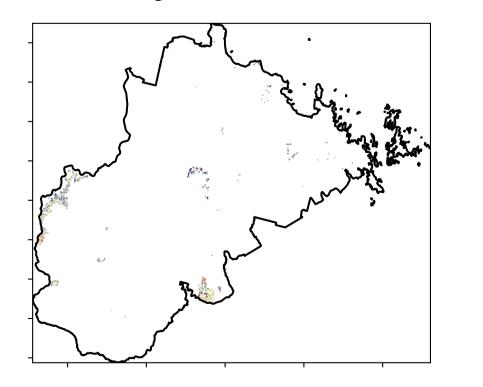
**Total Vegetation Cover Decile [%]** 

\$

<sub>ଚ</sub>ି)

A.1

2?



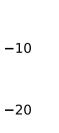


Deciles show where the pixel value lies in the record, from highest to

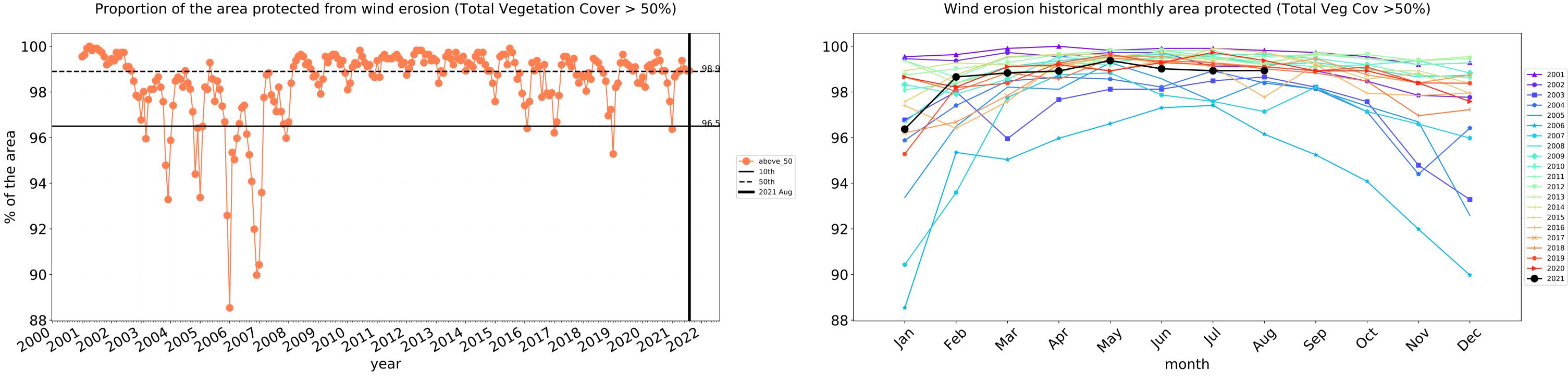
lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of

the map using baseline from 2001 to 2019.

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

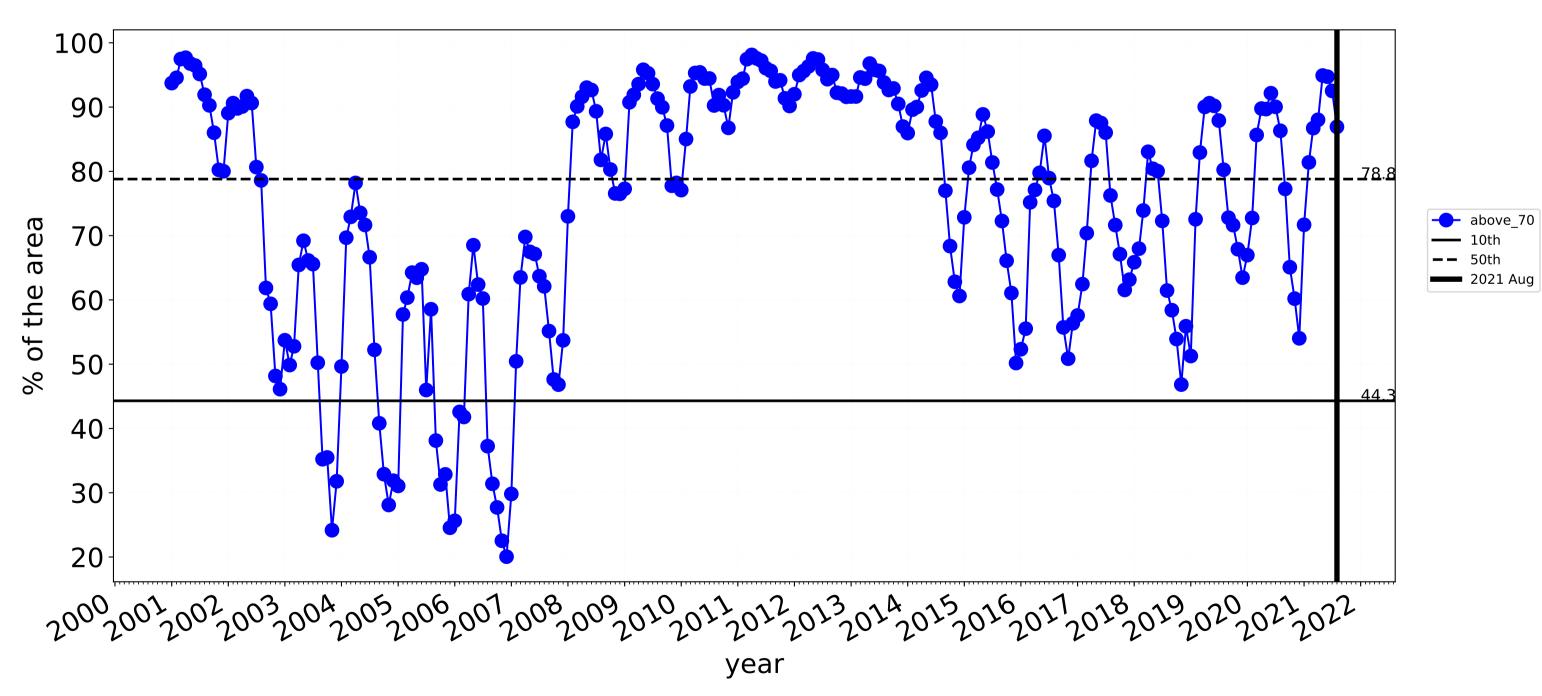


# **Conservation and natural environments non forest timeseries**

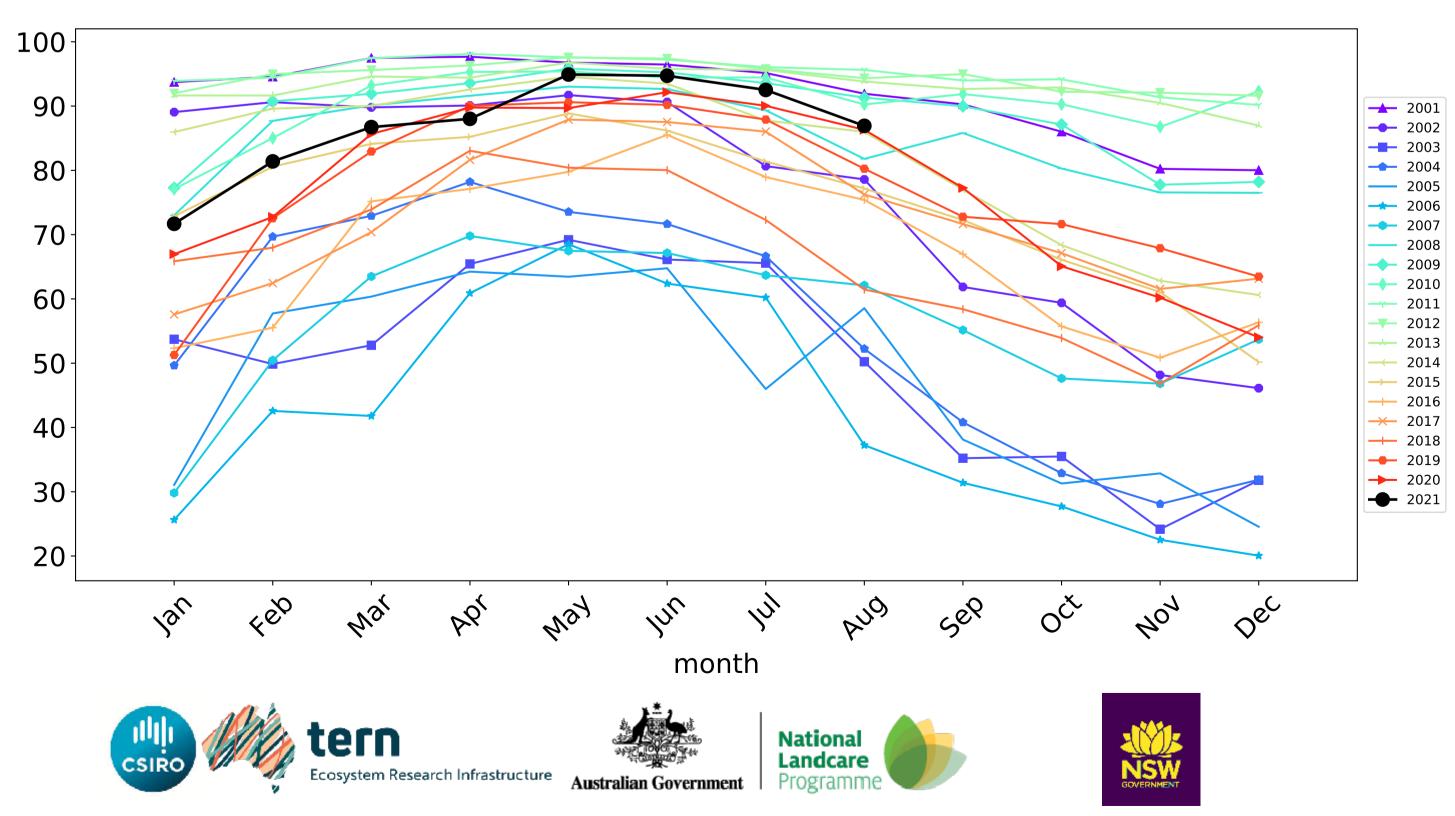


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

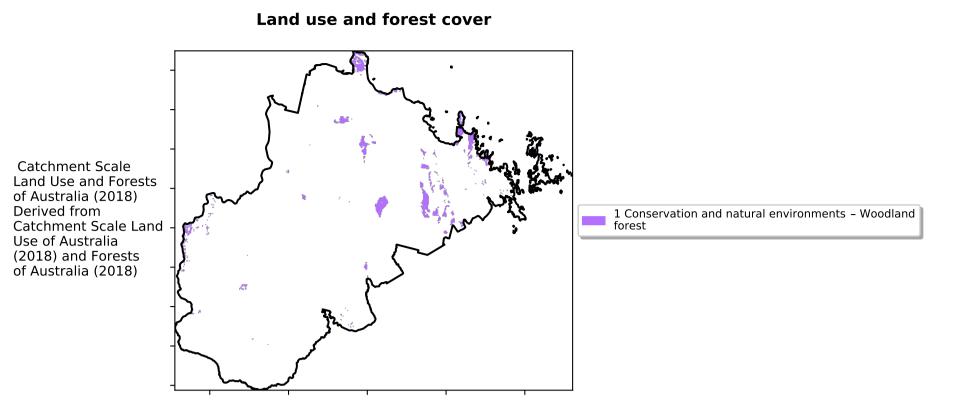
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



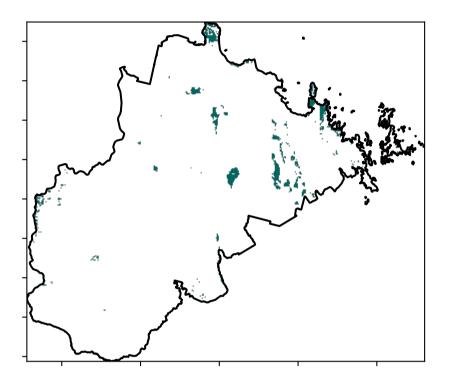
Water erosion historical monthly area protected (Total Veg Cov>70%)



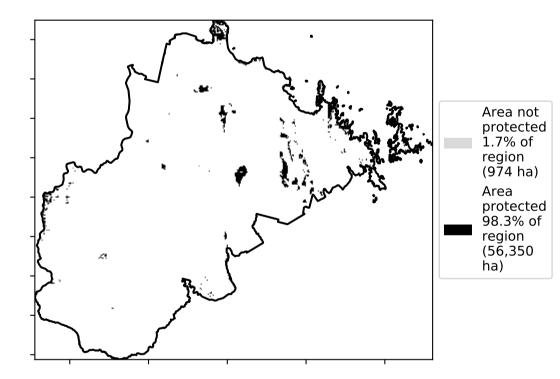
### **Conservation and natural environments Woodland forest**



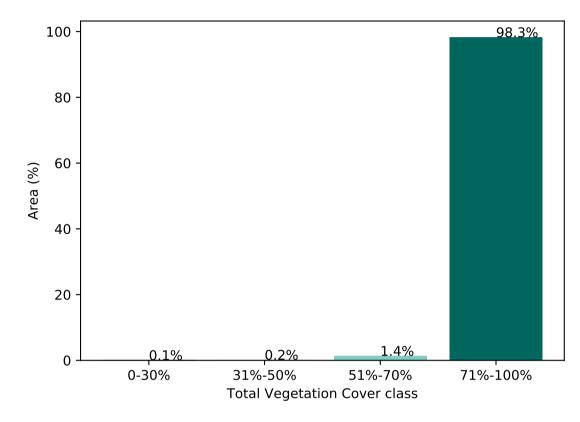
**Total Vegetation Cover [%]** 



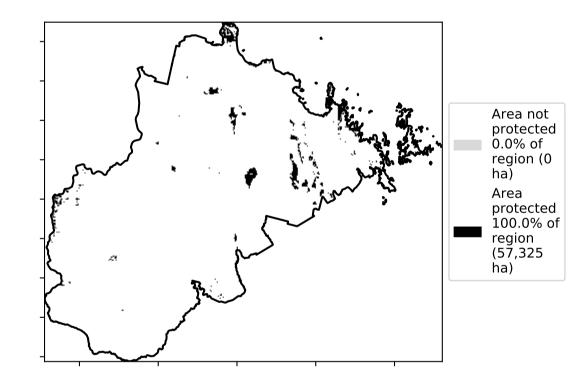
% Area protected from water erosion (>70%)



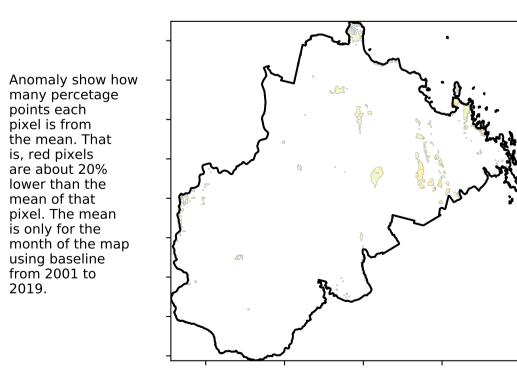
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



is, red pixels

mean of that

- 10 0 -10

-20

- 20

120010001

52°1070010

3201050010

0.30%

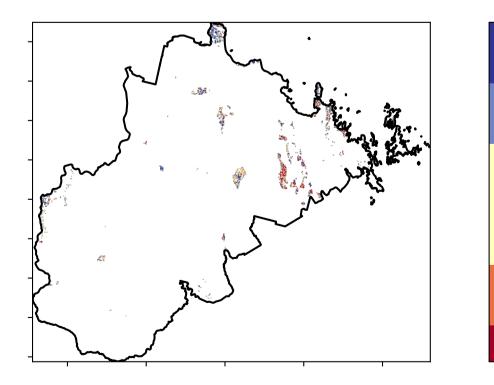
**Total Vegetation Cover Decile [%]** 

 $\sqrt{2}$ 

ଚ୍ଚ

A.1

· 2<sup>?3</sup>





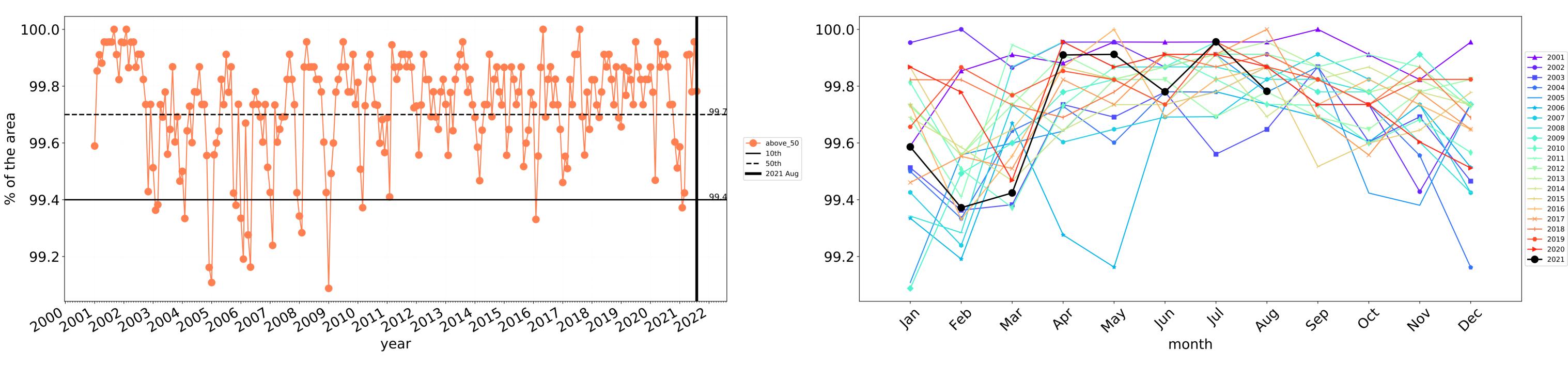
Deciles show where the pixel value lies in the

record, from highest to lowest, for that month. That is, red pixels are

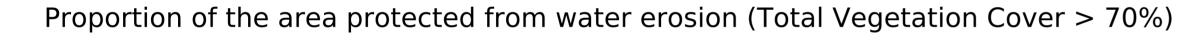
records for that month of

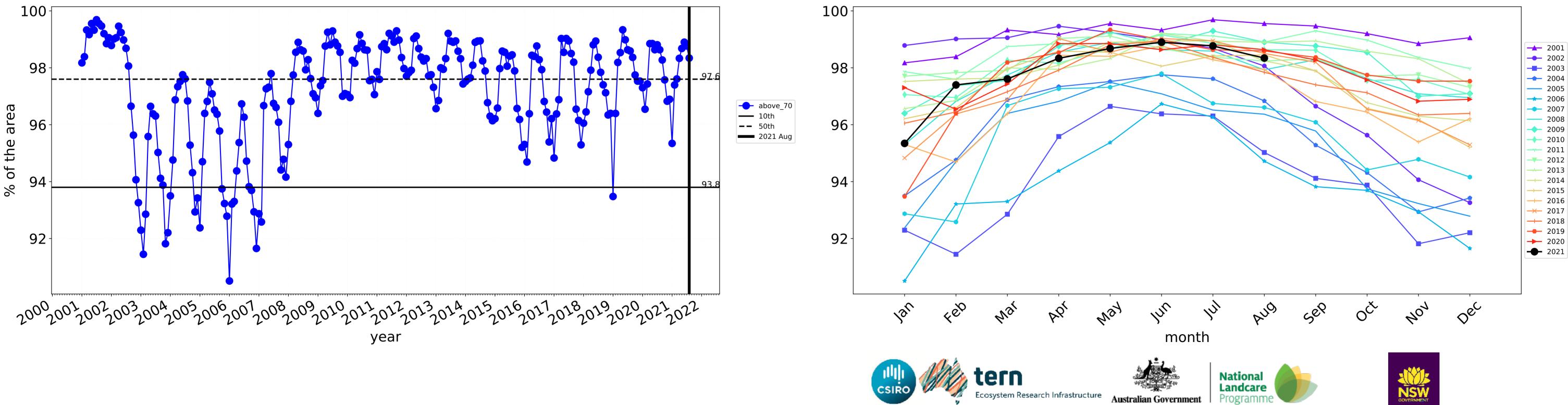
the map using baseline from 2001 to 2019.

in the lowest 10% of



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

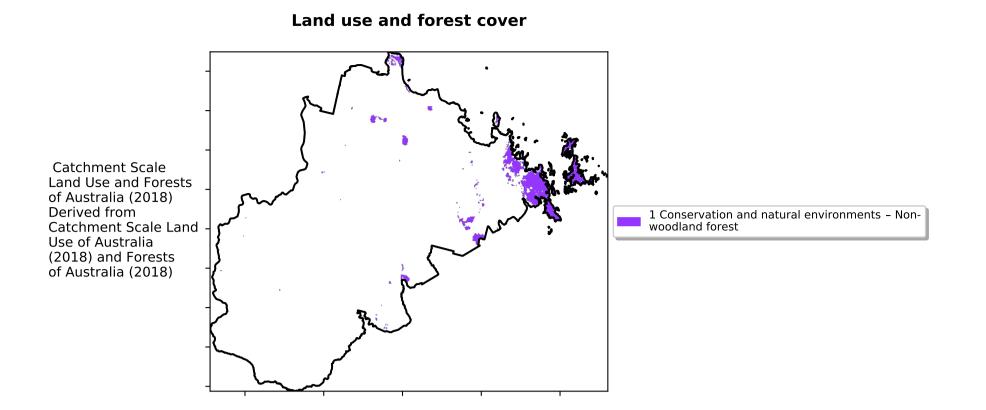




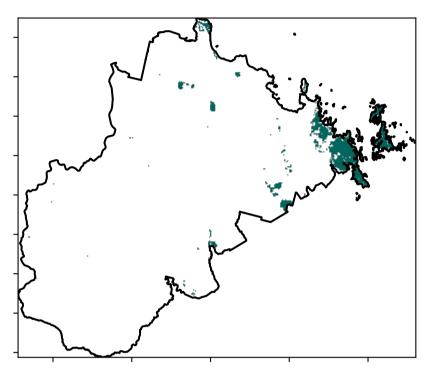
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

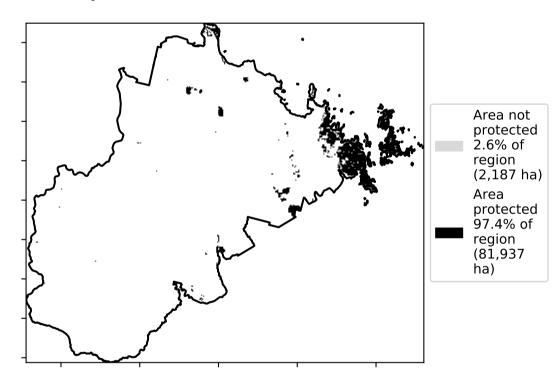
# **Conservation and natural environments Forest (non woodland)**

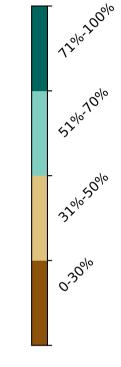


**Total Vegetation Cover [%]** 

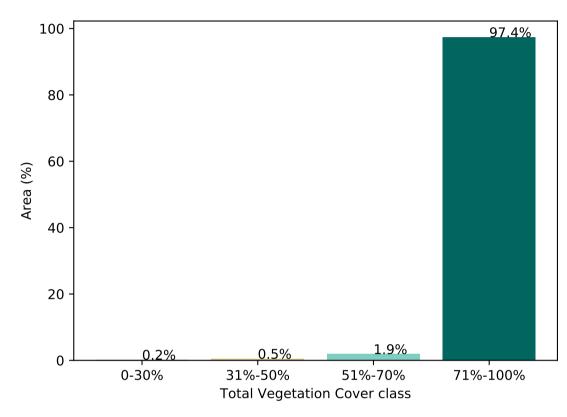


% Area protected from water erosion (>70%)

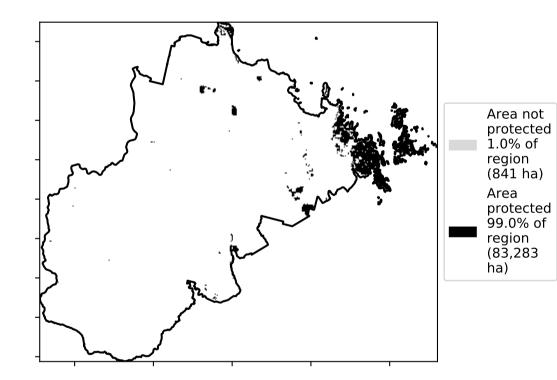




Proportion of vegetation cover class in area

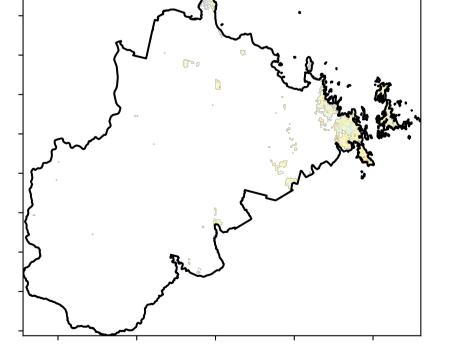


### % Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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



- 20 - 10 - 0 - -10 - -20

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

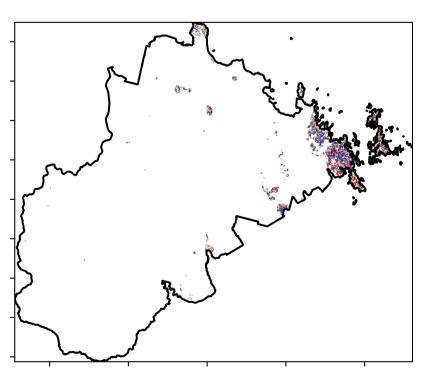
Total Vegetation Cover Decile [%]

 $\sqrt{2}$ 

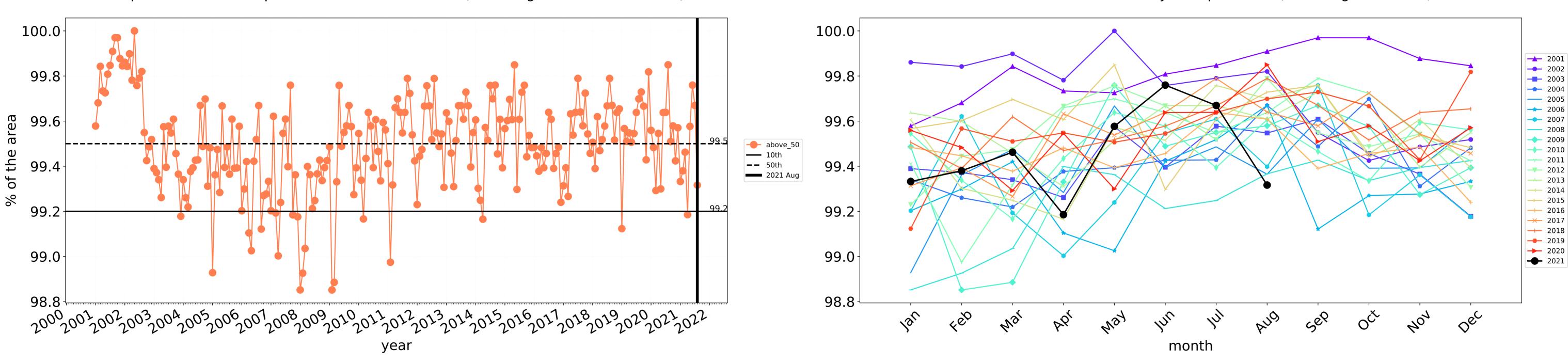
e S

A.1

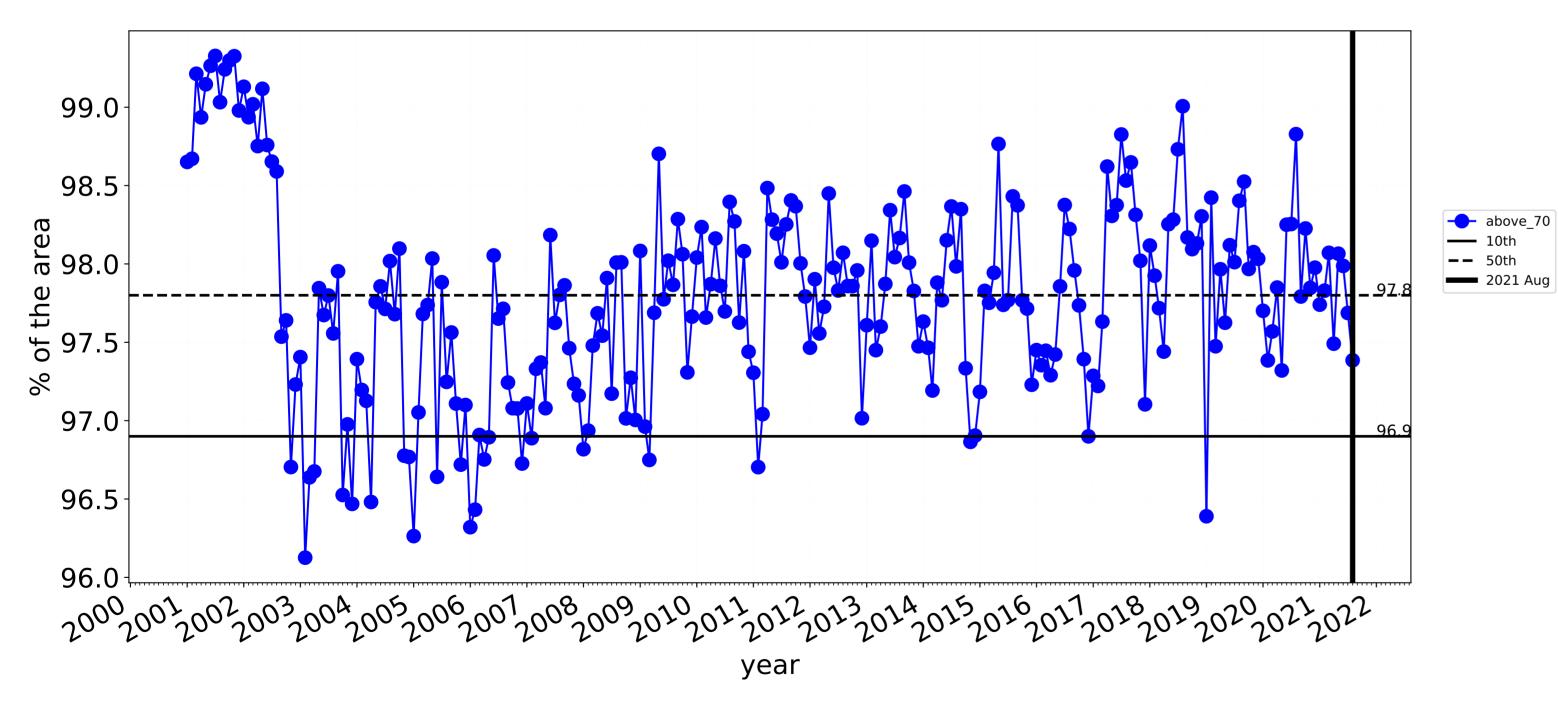
• 2<sup>?3</sup>

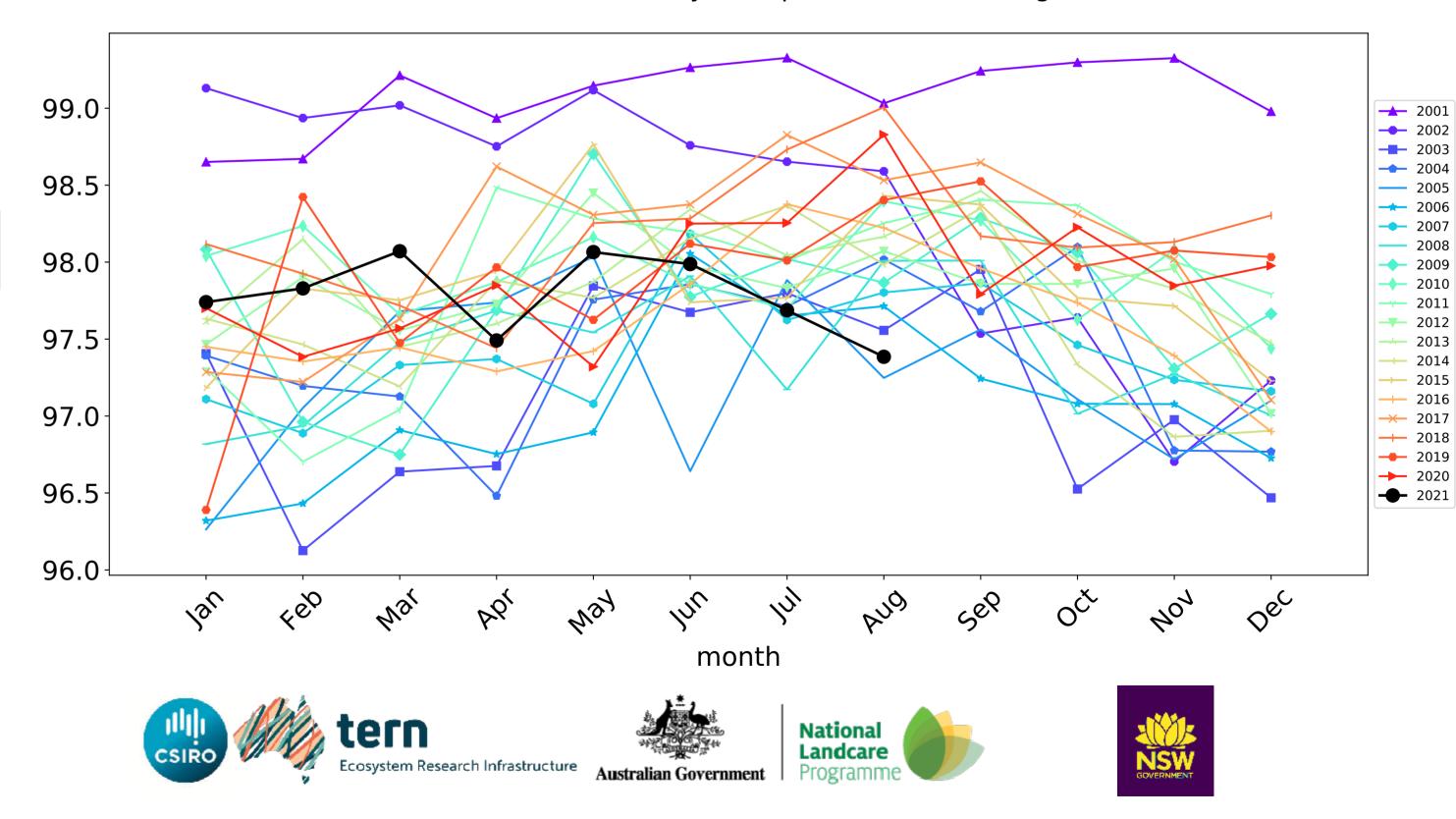






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





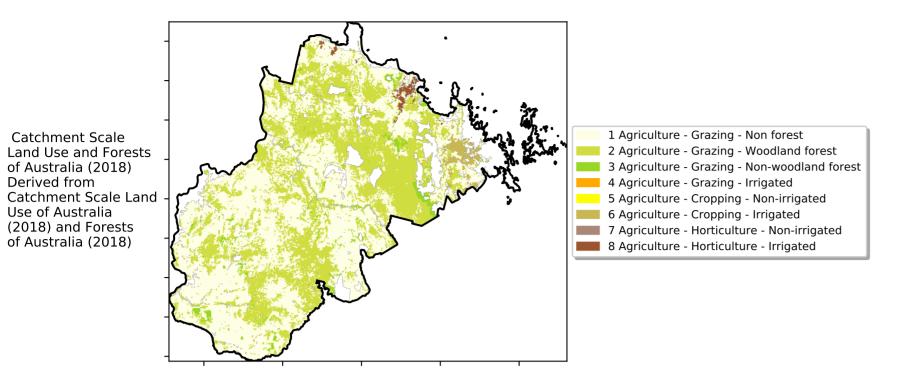
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

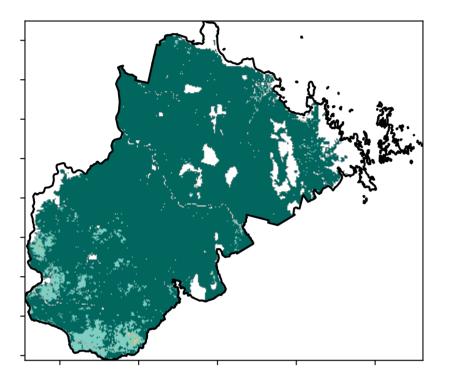
# Agriculture

Land use and forest cover

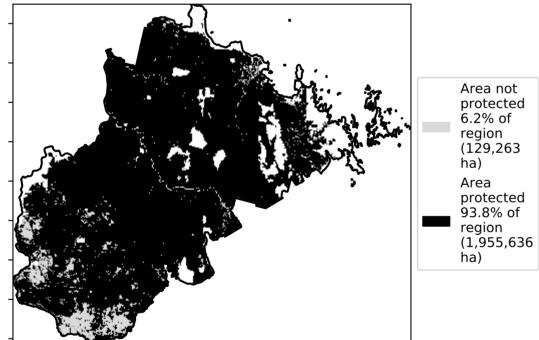


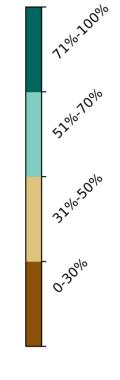


**Total Vegetation Cover [%]** 

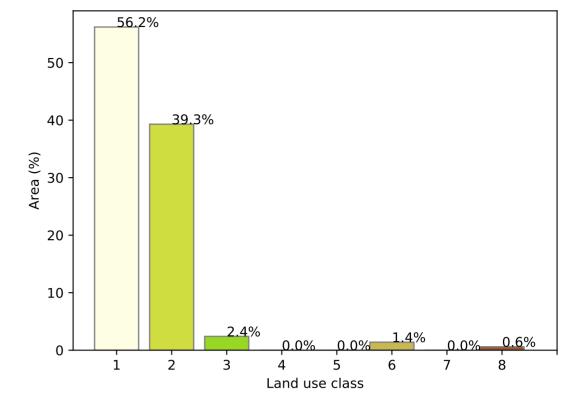


% Area protected from water erosion (>70%)

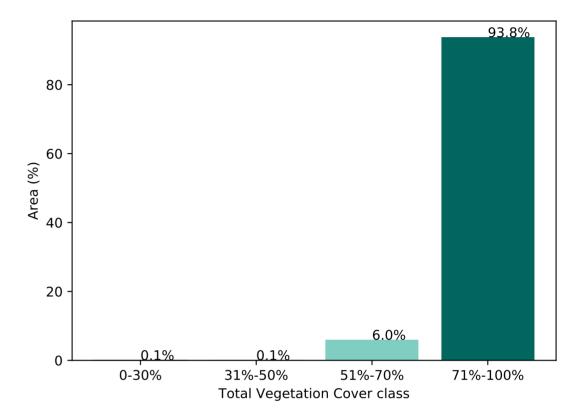




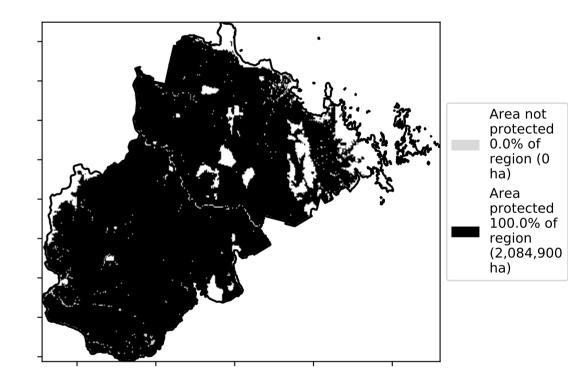




### Proportion of vegetation cover class in area

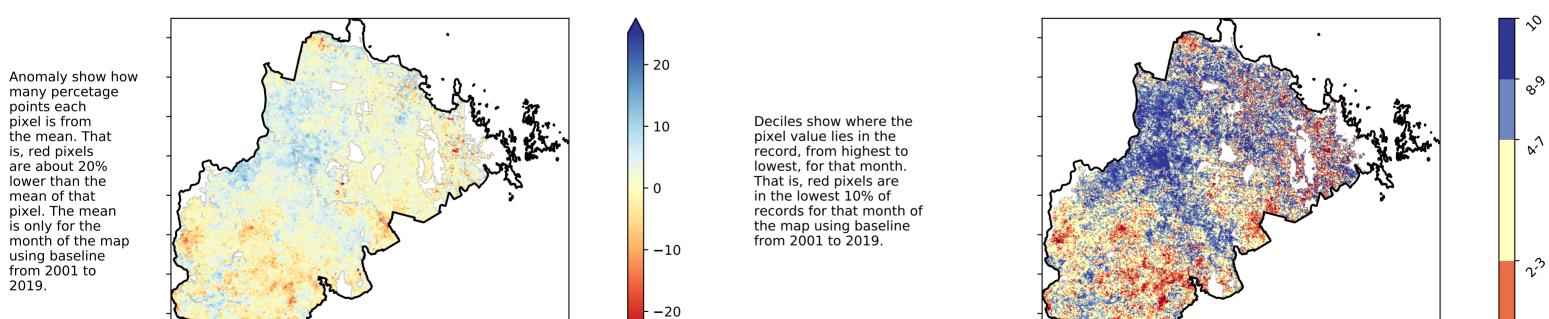


### % Area protected from wind erosion (>50%)

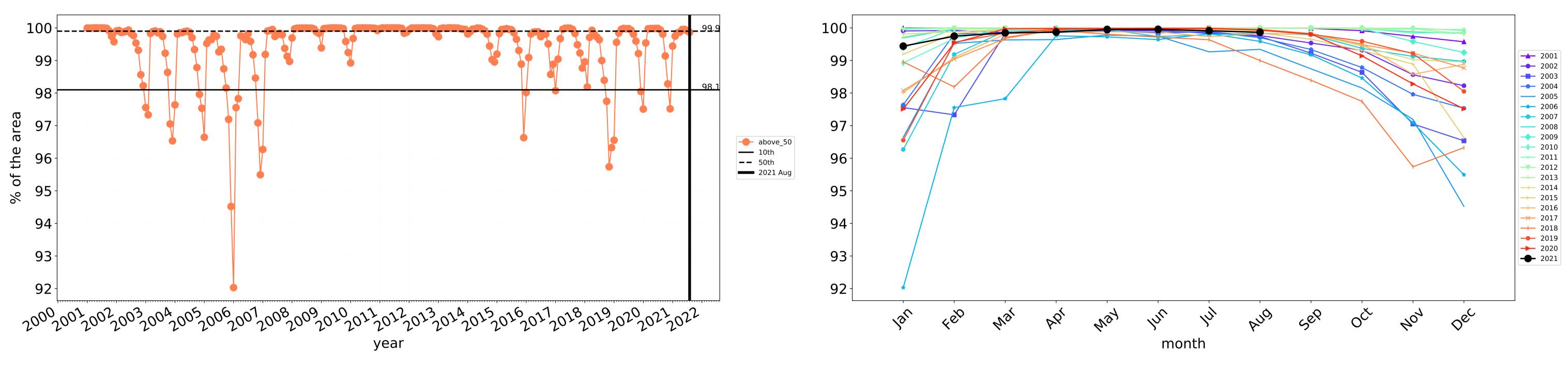


**Total Vegetation Cover Anomaly [%]** 

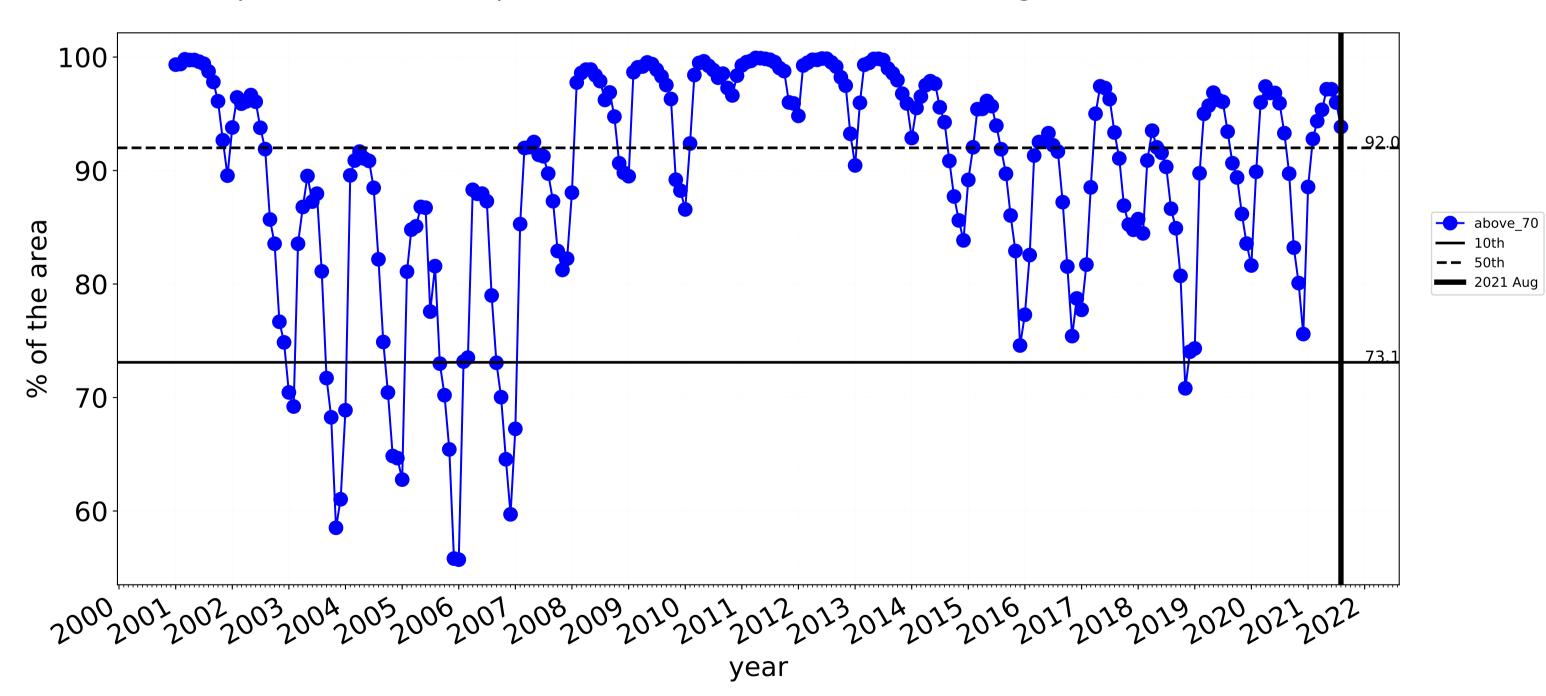
**Total Vegetation Cover Decile [%]** 







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

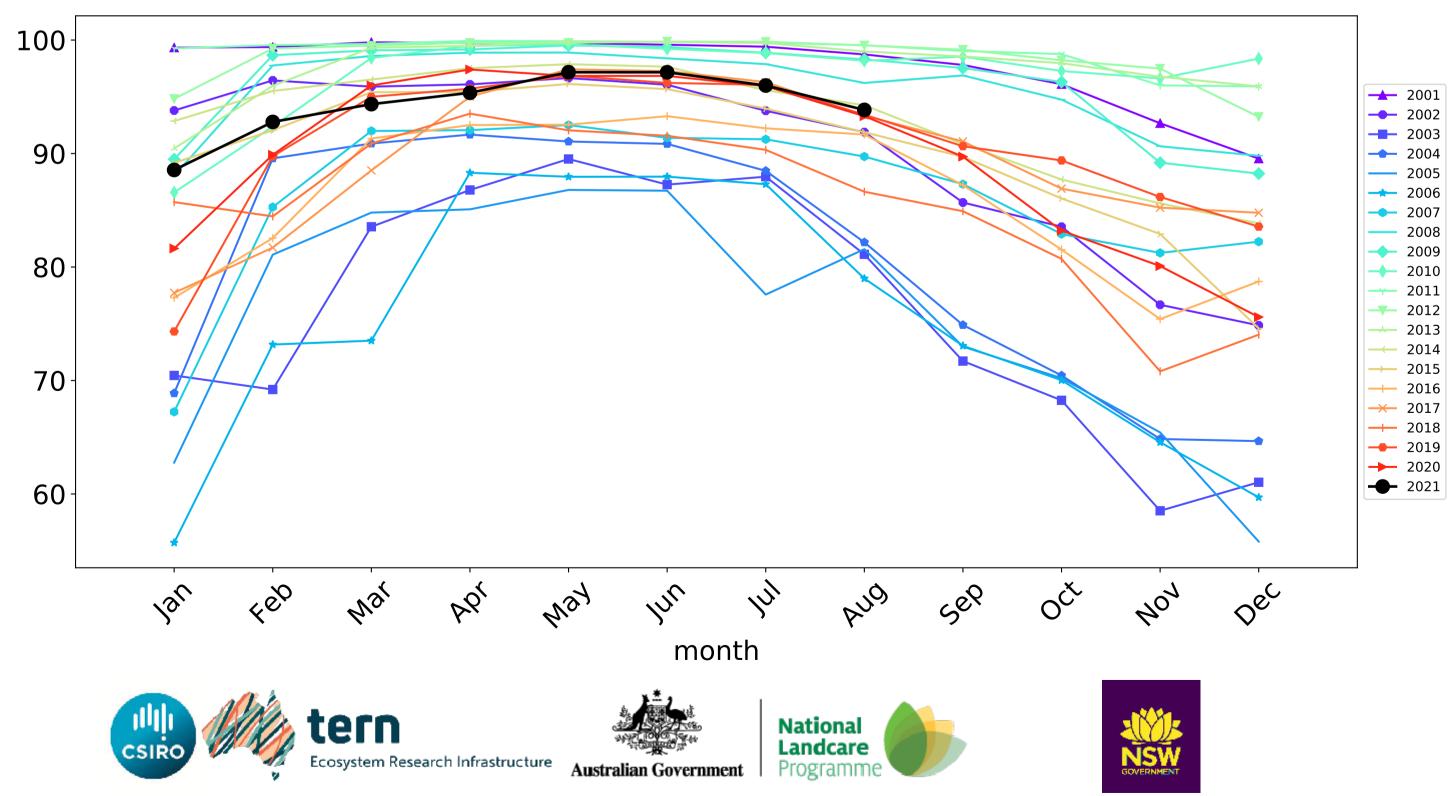


# **Agriculture timeseries**



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

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

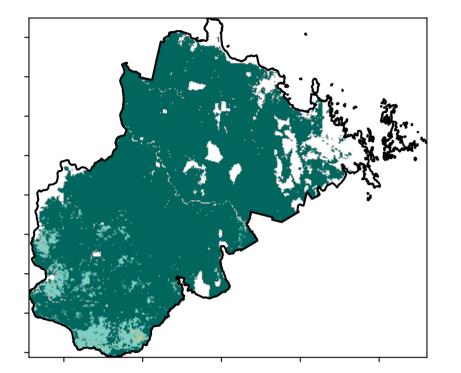


### Grazing

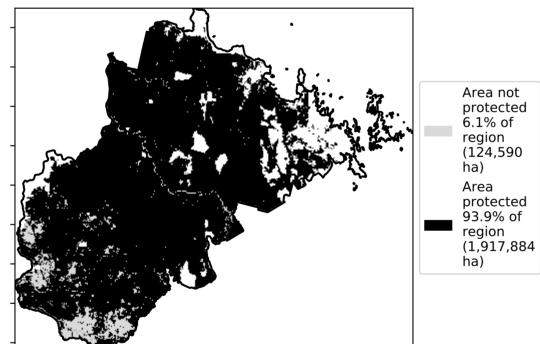
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest Use of Australia (2018) and Forests of Australia (2018)

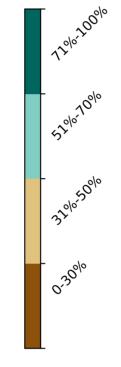
Land use and forest cover

**Total Vegetation Cover [%]** 

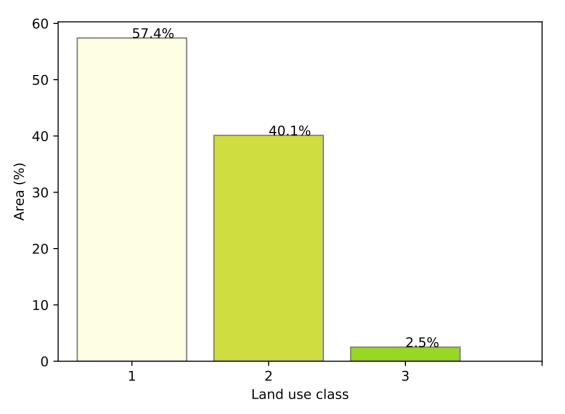


% Area protected from water erosion (>70%)



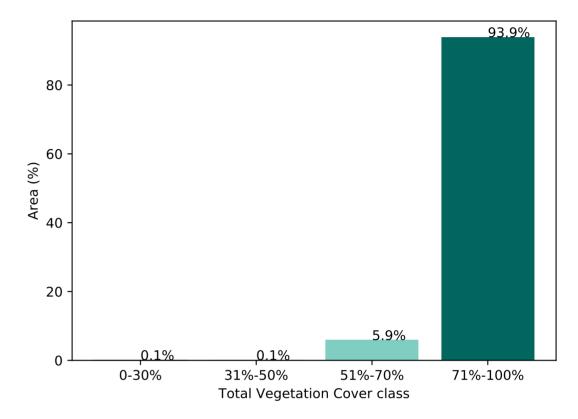




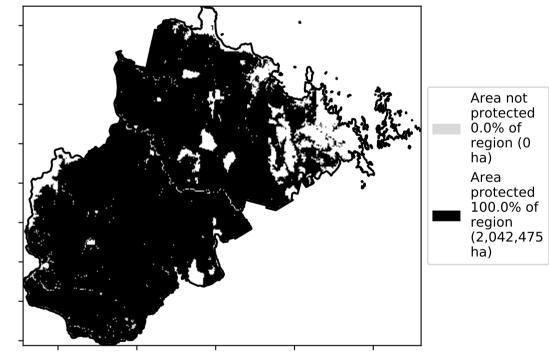


### Proportion of each land class in area

Proportion of vegetation cover class in area

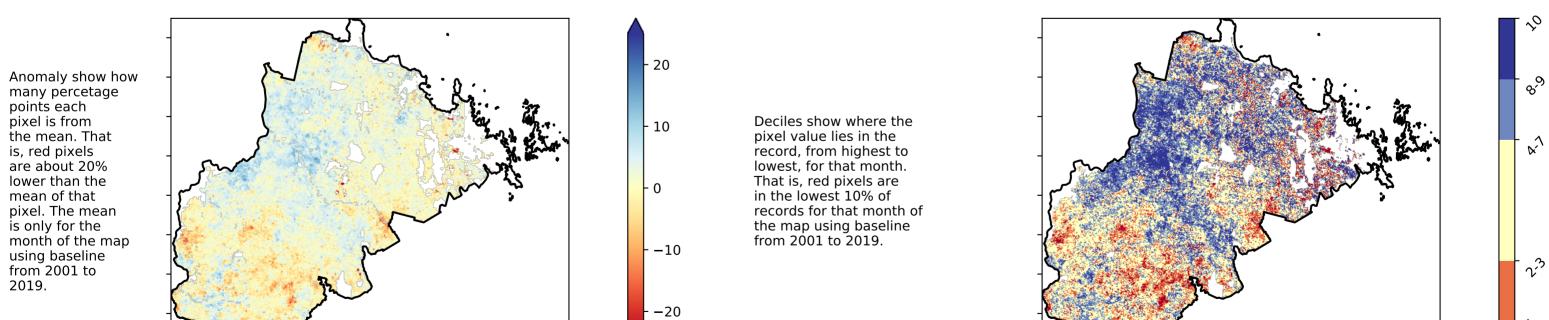


### % Area protected from wind erosion (>50%)

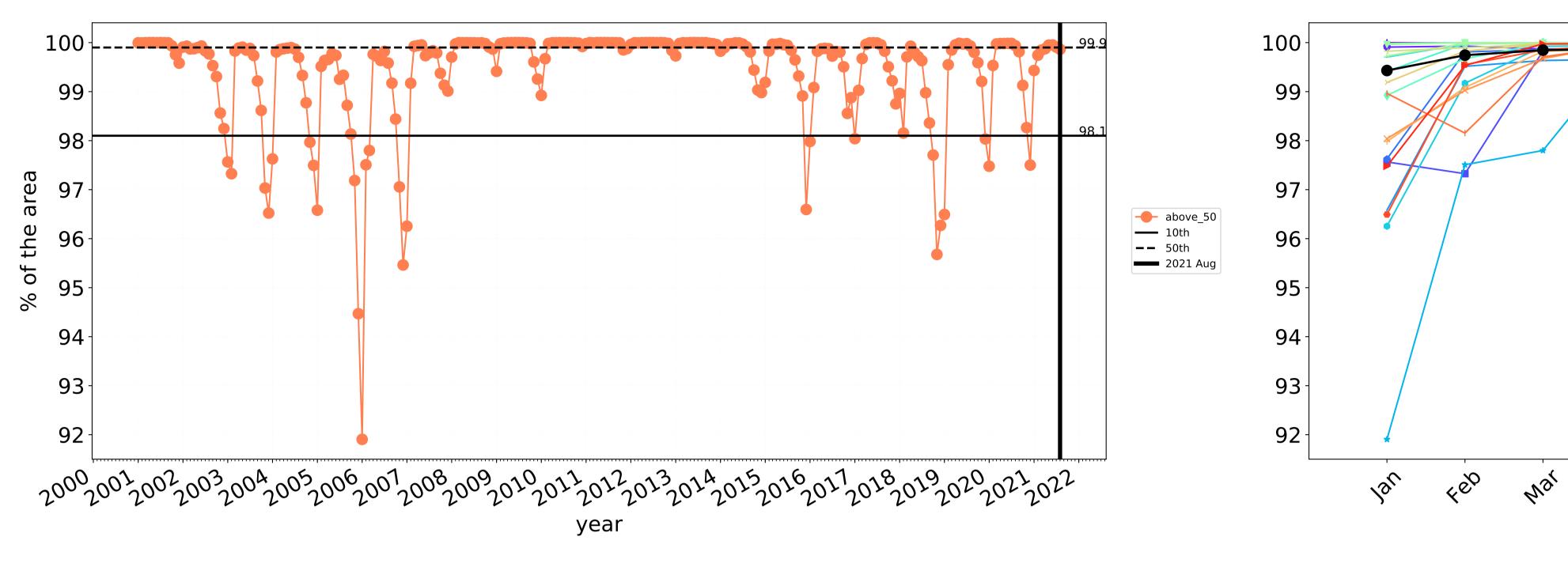


**Total Vegetation Cover Anomaly [%]** 

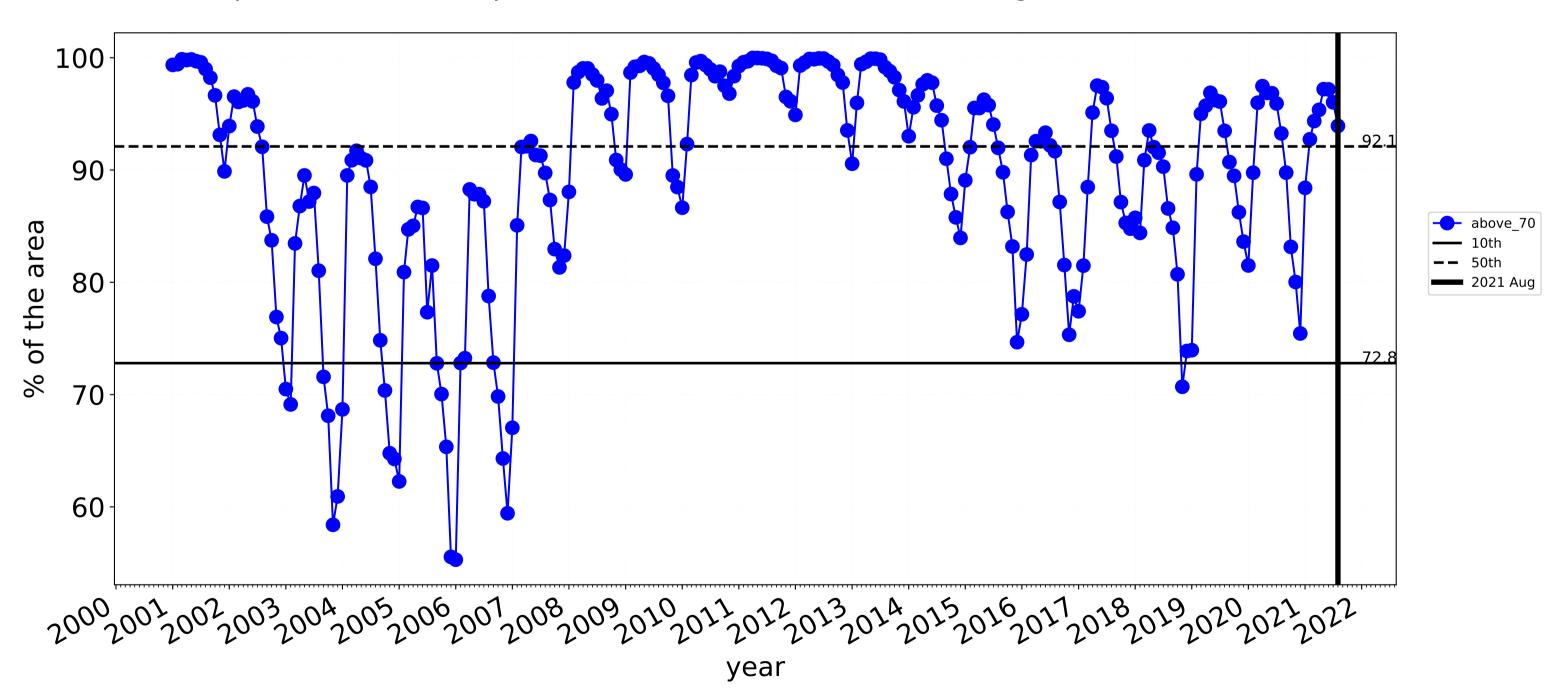
**Total Vegetation Cover Decile [%]** 







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



# Grazing timeseries



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

100-90 80-70-60 4er way In War Jan PQ 1st month CSIRO Australian Government

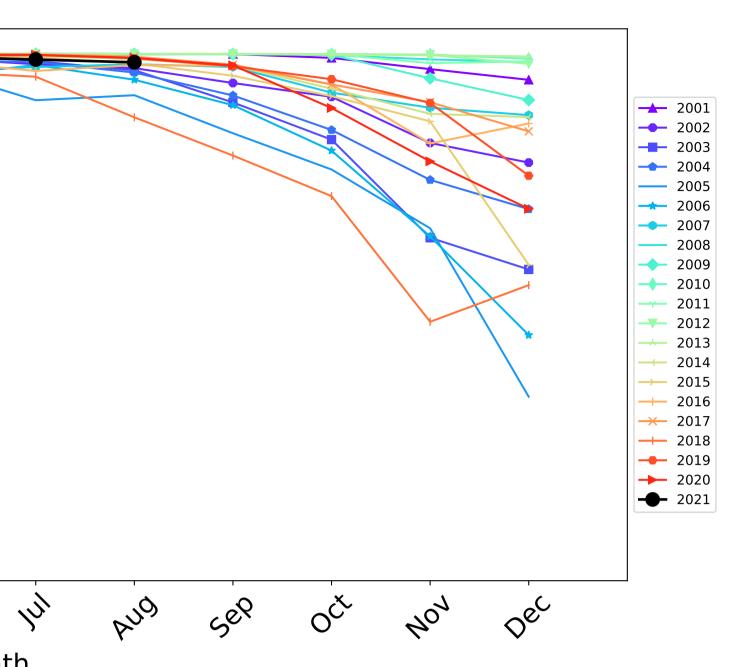
Water erosion historical monthly area protected (Total Veg Cov>70%)

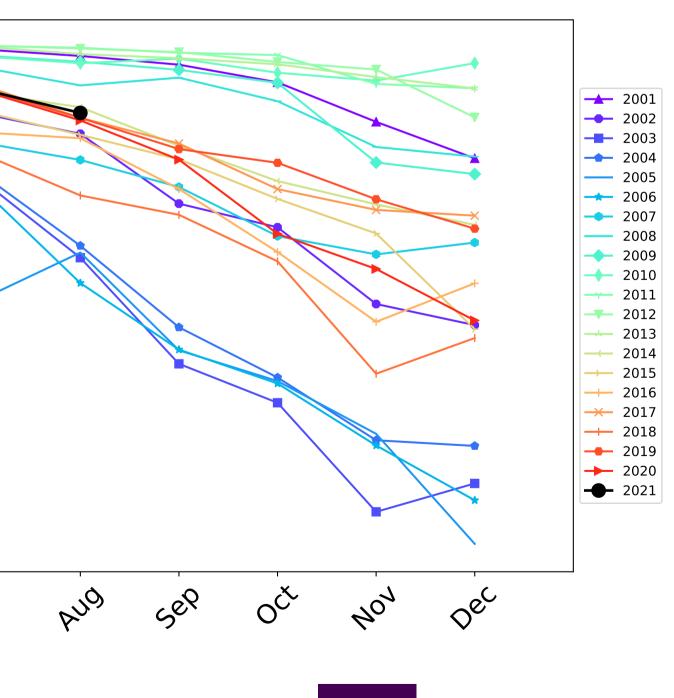
way

PQ

In

month

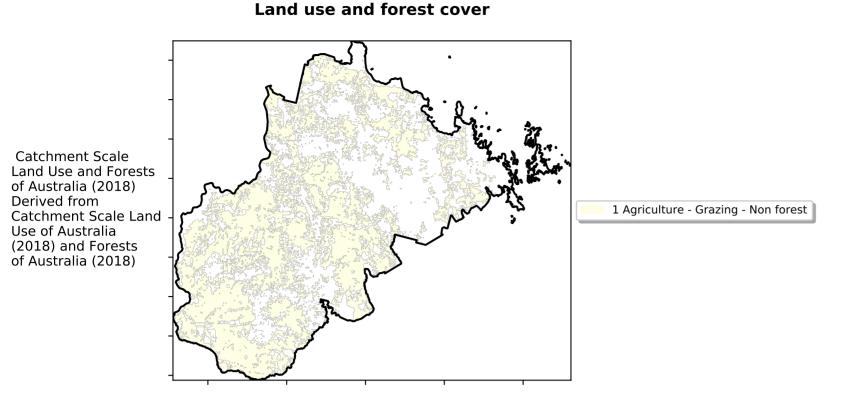




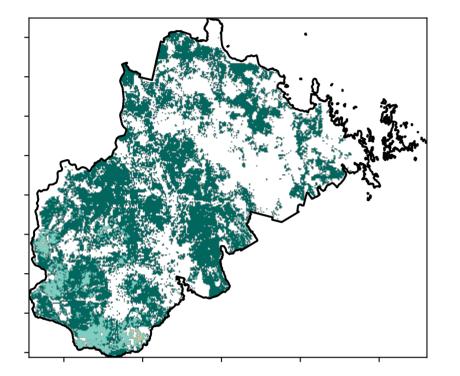




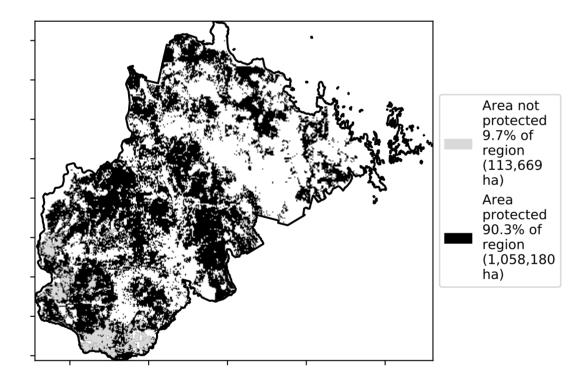
# **Grazing non forest**



Total Vegetation Cover [%]

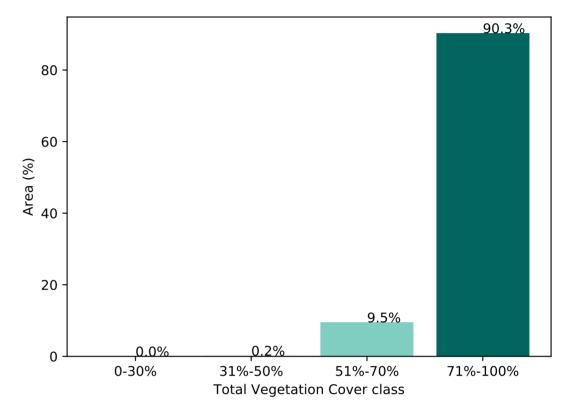


% Area protected from water erosion (>70%)

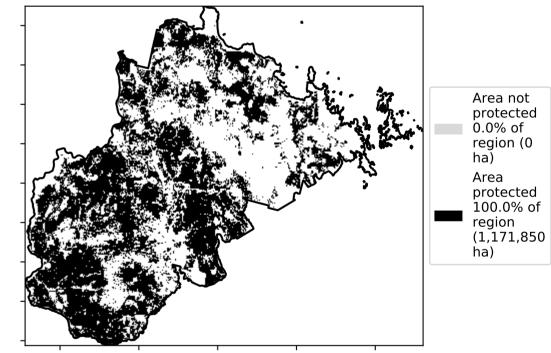


12%100% 5201000 3201050010 0.30%

Proportion of vegetation cover class in area



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



\$

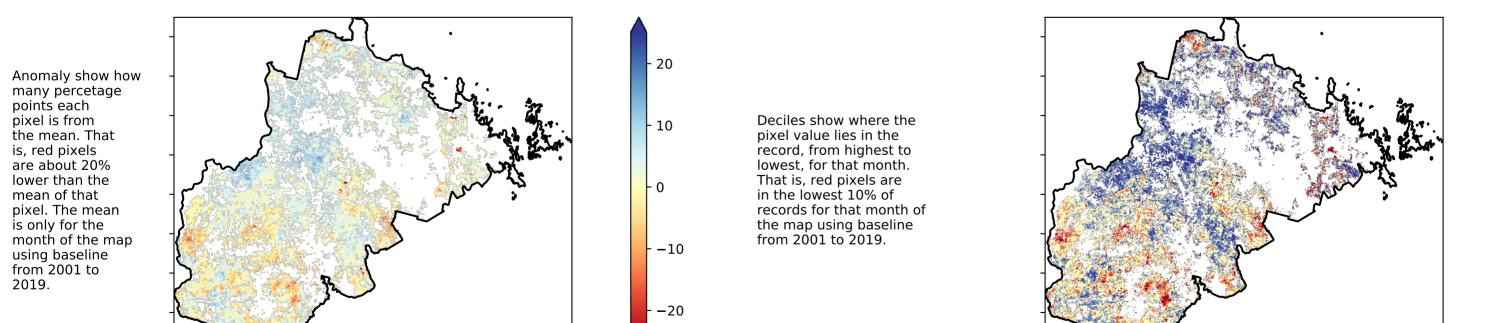
°,

x.1

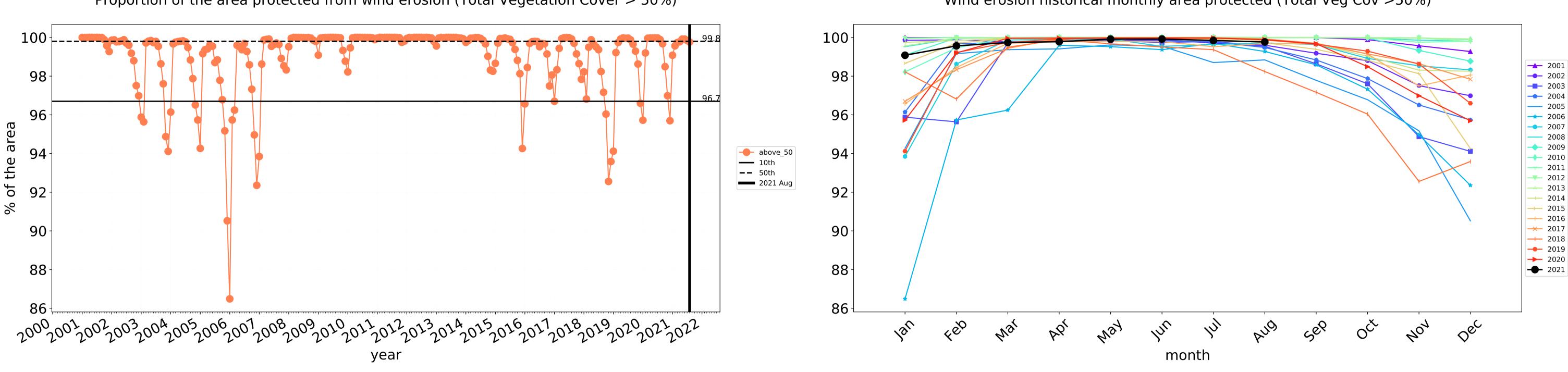
2<sup>35</sup>

**Total Vegetation Cover Anomaly [%]** 

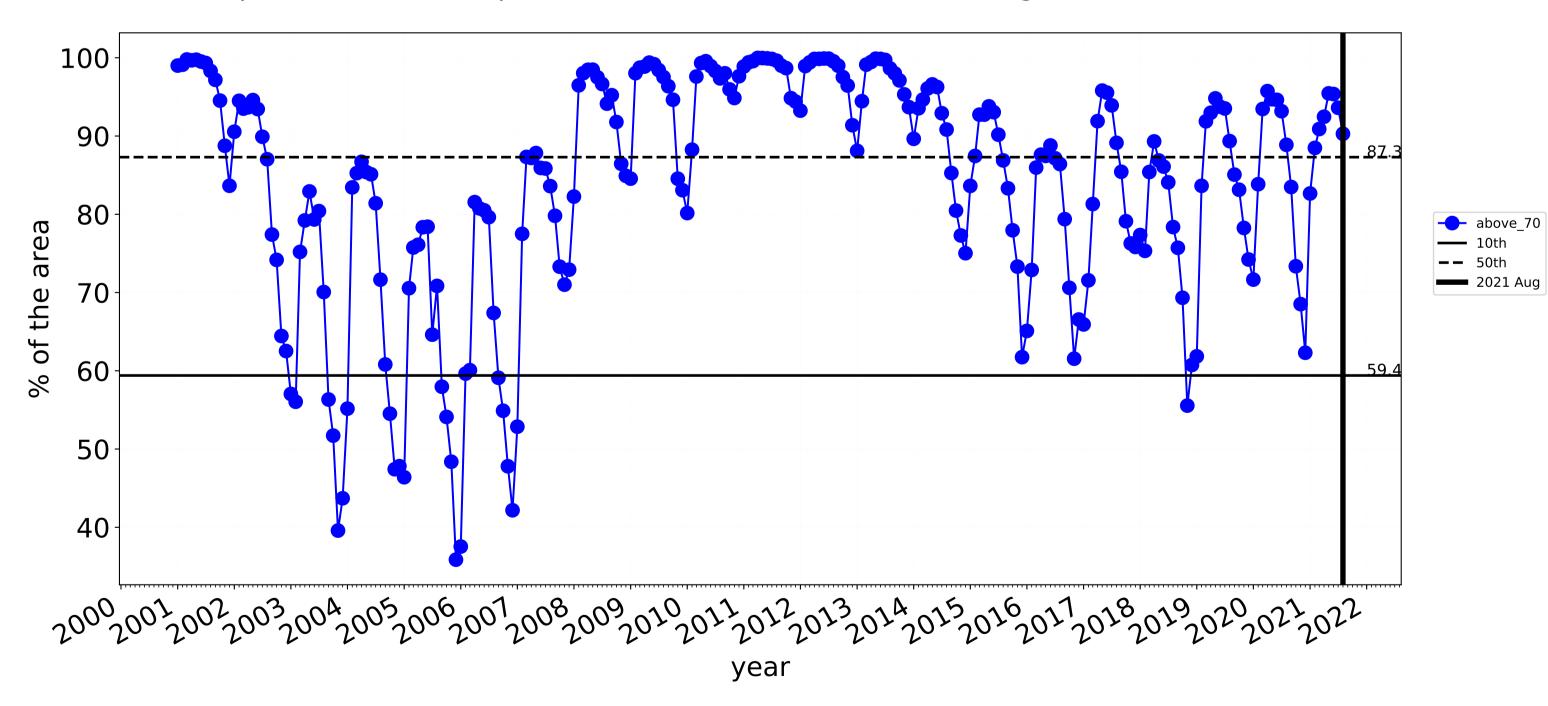
**Total Vegetation Cover Decile [%]** 



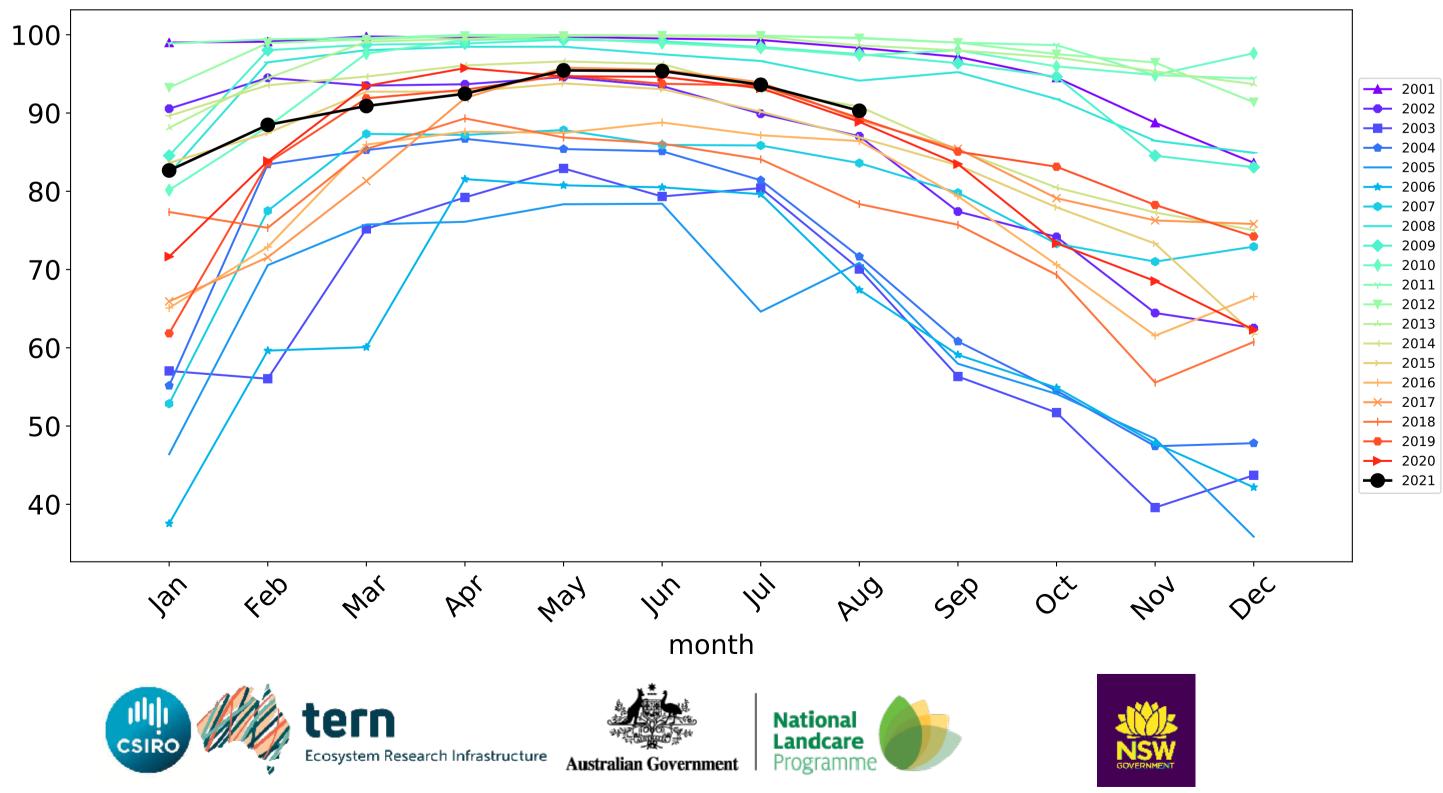




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



# Grazing non forest timeseries



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

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

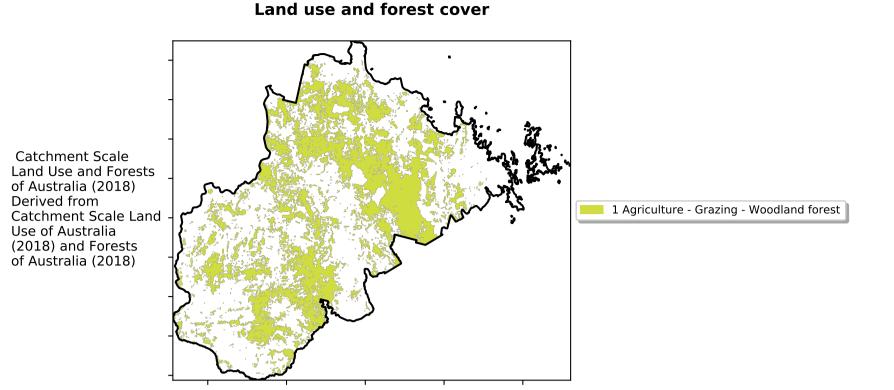
# **Grazing Woodland forest**

12%200%

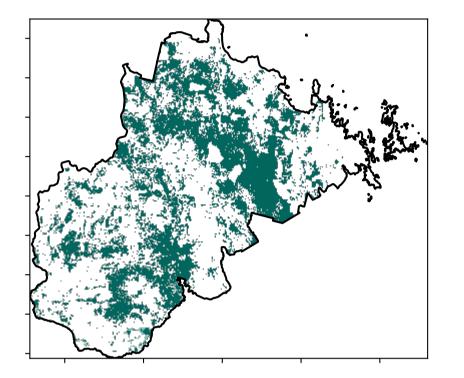
52% TON

320050010

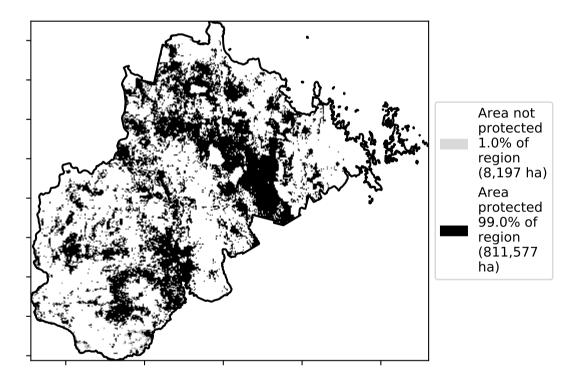
0.30%



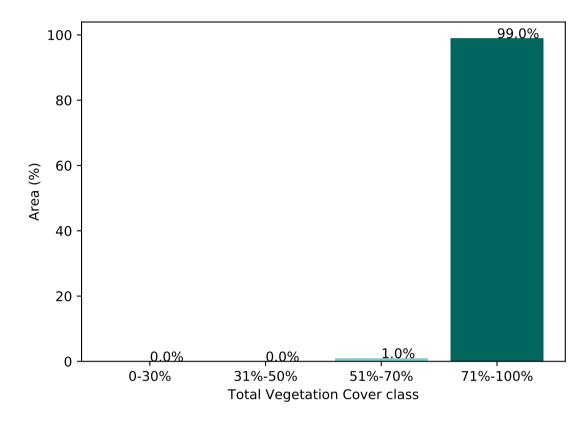
**Total Vegetation Cover [%]** 



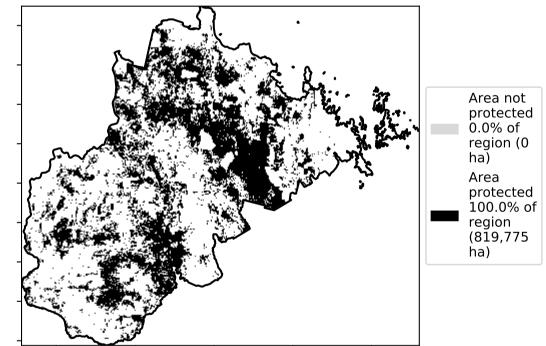
% Area protected from water erosion (>70%)



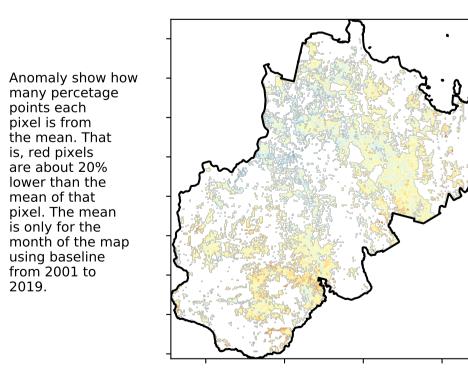
Proportion of vegetation cover class in area

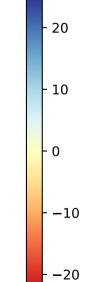


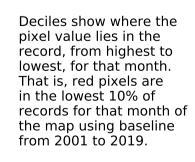
### % Area protected from wind erosion (>50%)



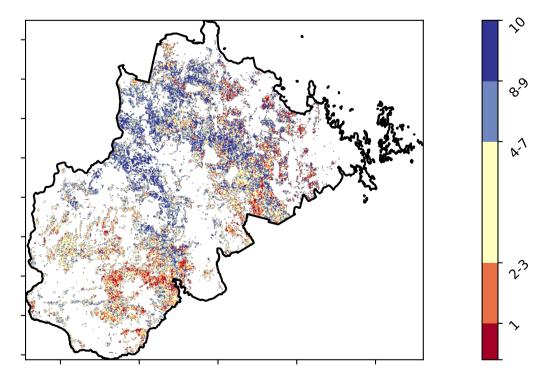
**Total Vegetation Cover Anomaly [%]** 







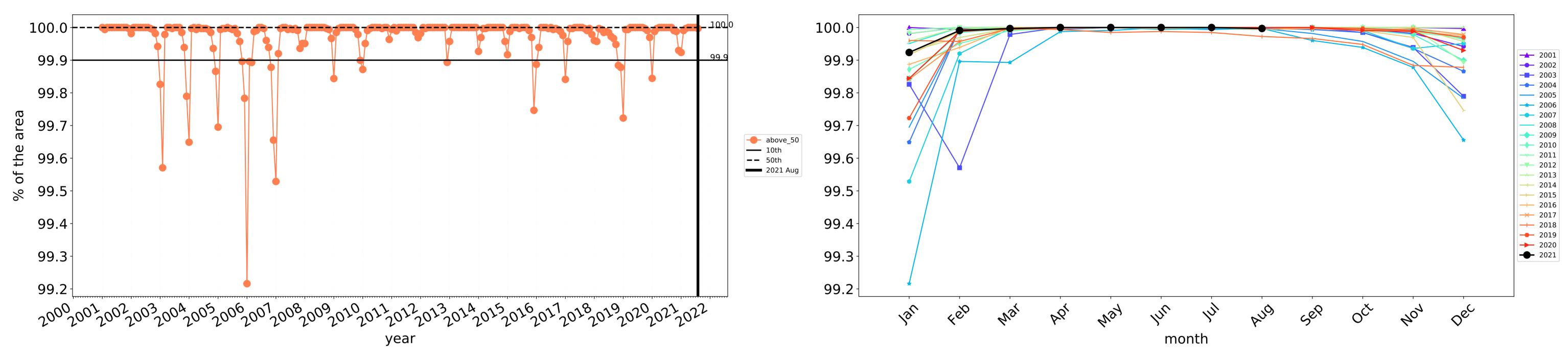
**Total Vegetation Cover Decile [%]** 



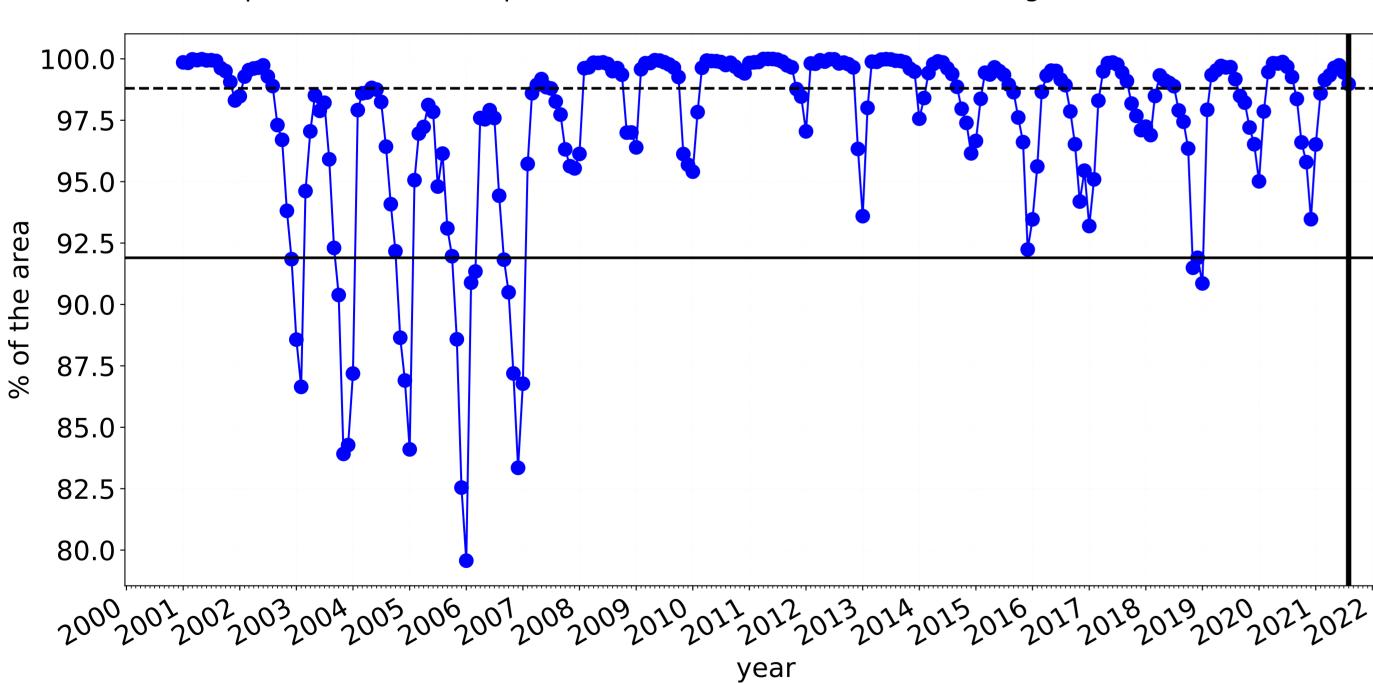


18

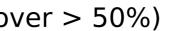
# **Grazing Woodland forest timeseries**



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



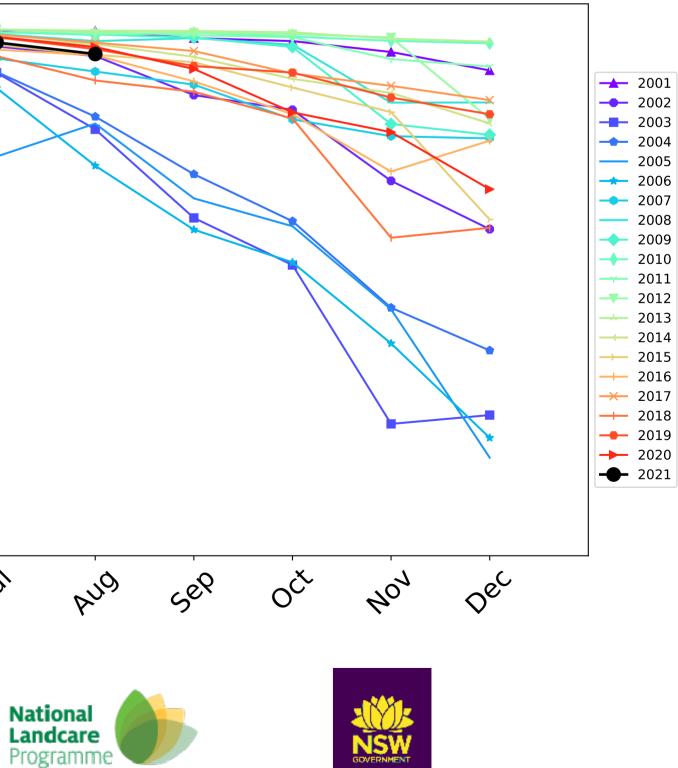
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



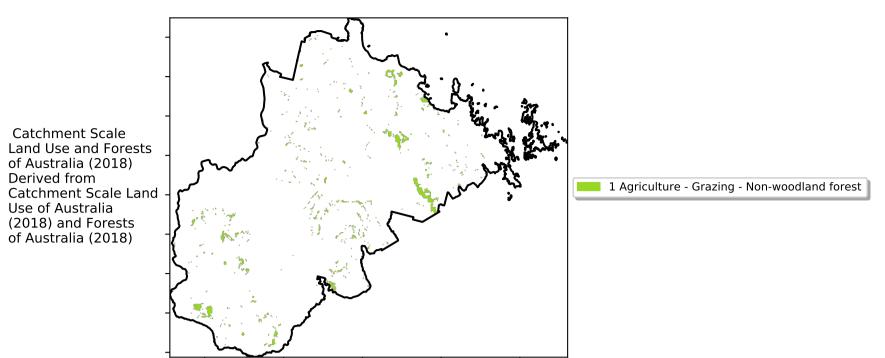
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0 97.5 95.0 ---- above\_70 92.5 **—** 10th **——** 50th **——** 2021 Aug 90.0 87.5 85.0 82.5 80.0-Jan 4eb way In 1st PQ Mai month tern Ecosystem Research Infrastructure Australian Government

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

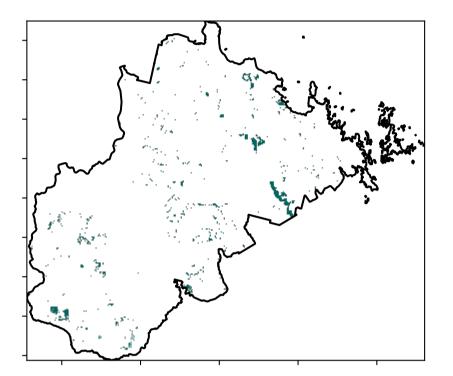


# Grazing - Forest (non woodland)

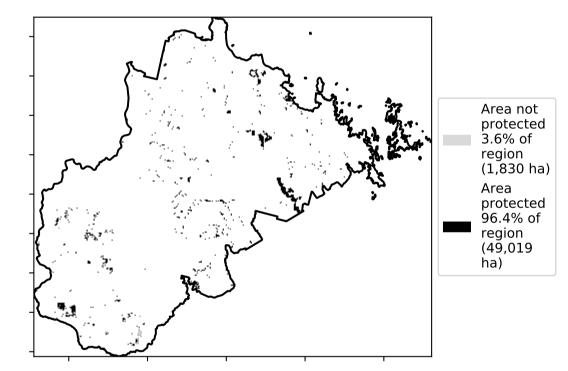


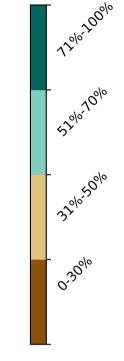
Land use and forest cover

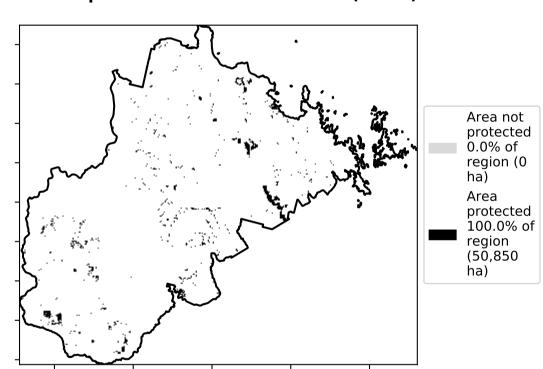
**Total Vegetation Cover [%]** 



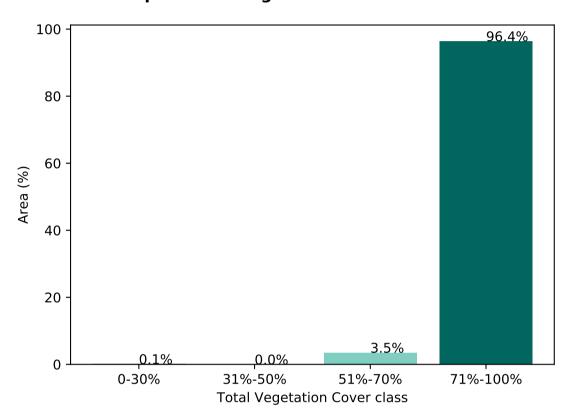
% Area protected from water erosion (>70%)







### Proportion of vegetation cover class in area



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

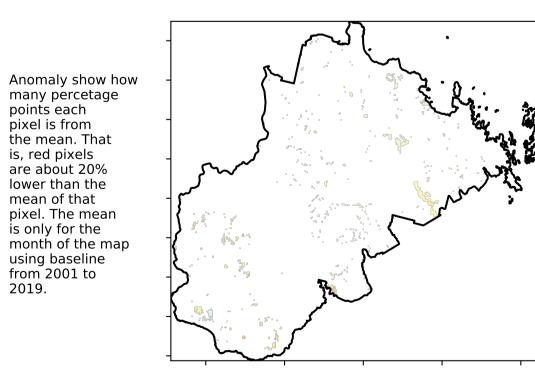
\$

ଚ୍ଚ

A.1

· 2<sup>?3</sup>

**Total Vegetation Cover Anomaly [%]** 



is, red pixels are about 20% lower than the

mean of that pixel. The mean

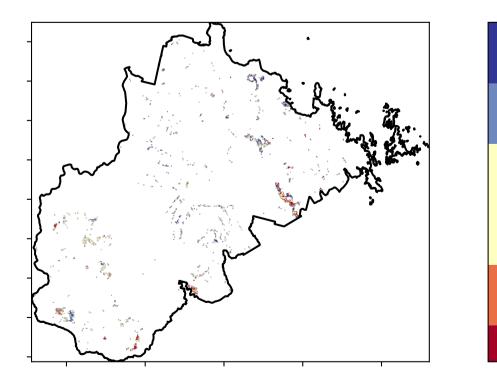
using baseline from 2001 to 2019.

- 10 0 -10

-20

- 20

**Total Vegetation Cover Decile [%]** 



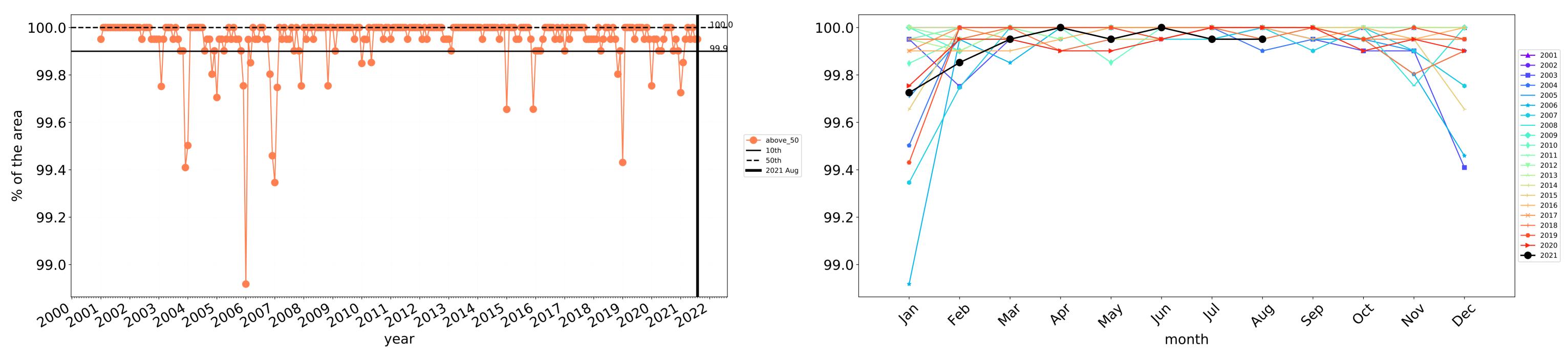


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

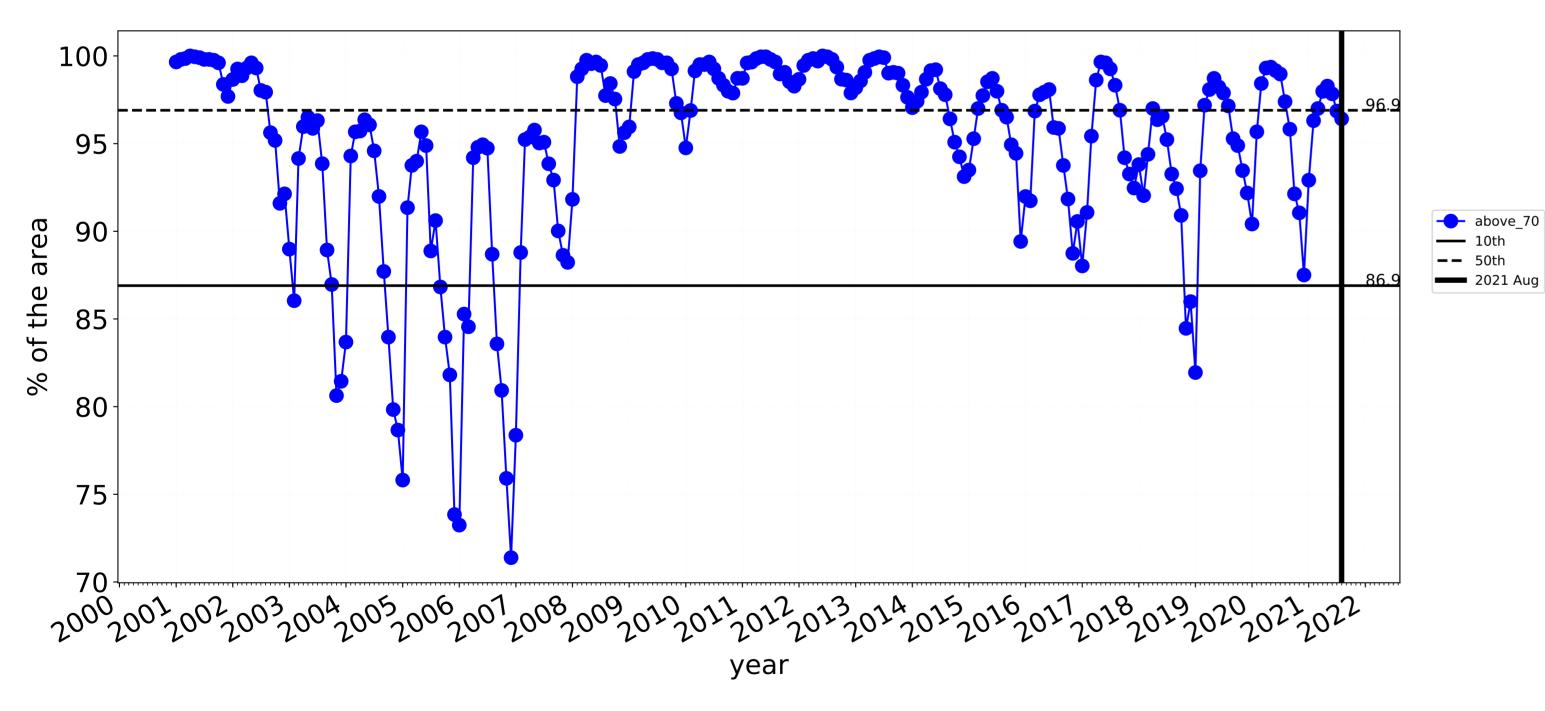
the map using baseline from 2001 to 2019.

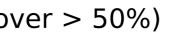
# Grazing - Forest (non woodland) timeseries



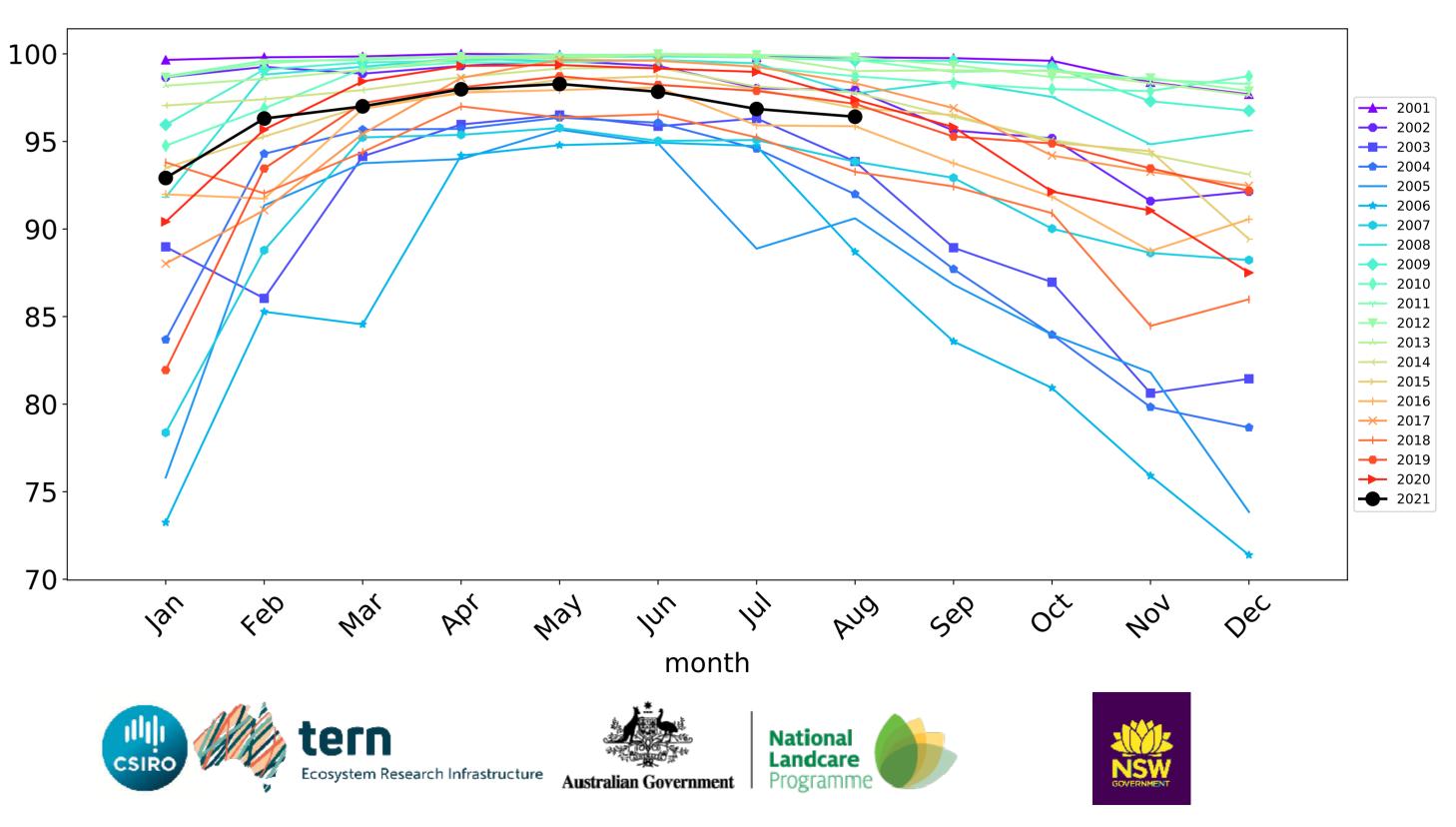
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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





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



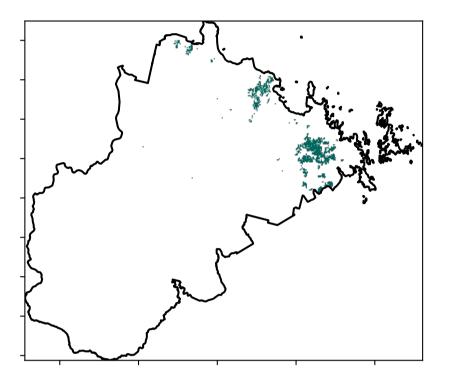
Water erosion historical monthly area protected (Total Veg Cov>70%)

# Irrigation

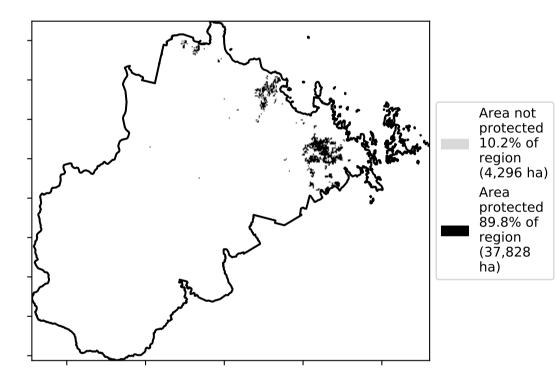
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

**Total Vegetation Cover [%]** 

Land use and forest cover



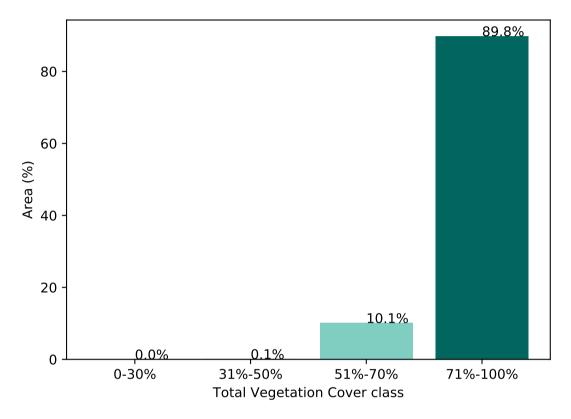
% Area protected from water erosion (>70%)



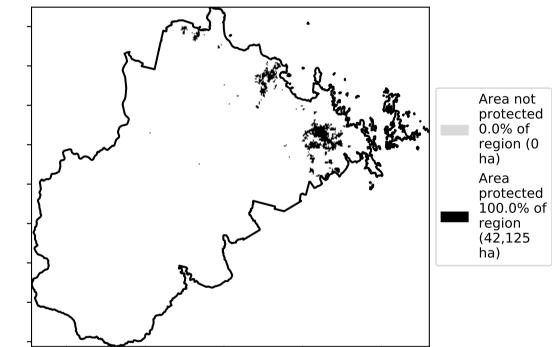
70 · 67.8% 60 50 40 Area (%) 05 30 30.9% 20 10 1.3% 0 2 3 1 Land use class

### Proportion of each land class in area

Proportion of vegetation cover class in area



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



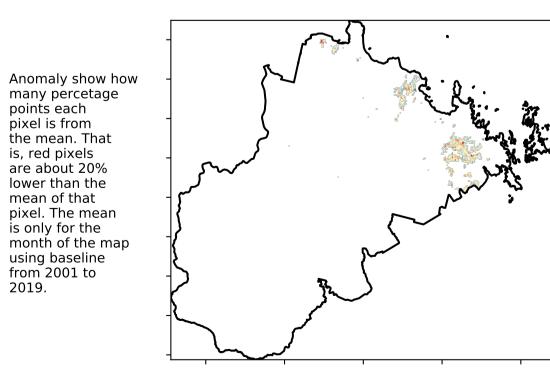
 $\sqrt{2}$ 

ଚ,୍ଚ

A.1

· 2<sup>?3</sup>

**Total Vegetation Cover Anomaly [%]** 



is, red pixels

mean of that

- 10 0 -10

-20

- 20

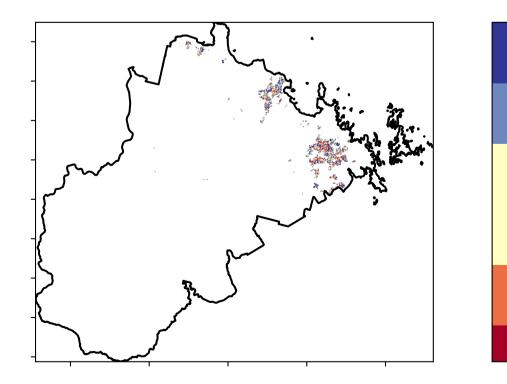
12%200%

52°10010

32005000

0.30%

**Total Vegetation Cover Decile [%]** 





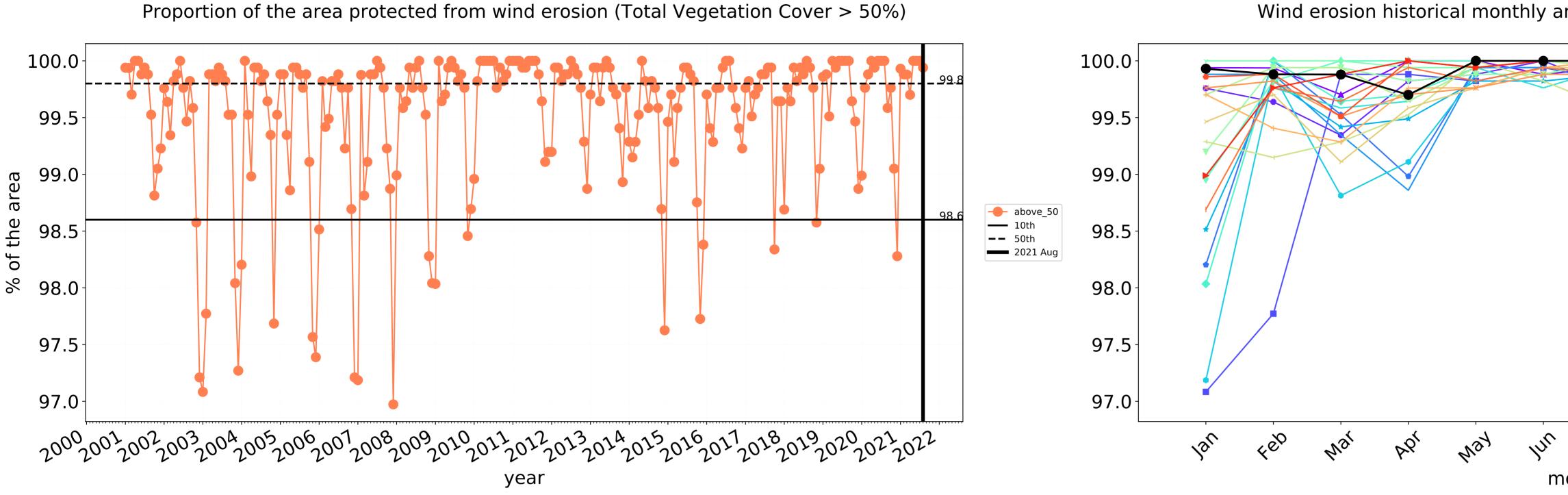
Deciles show where the pixel value lies in the

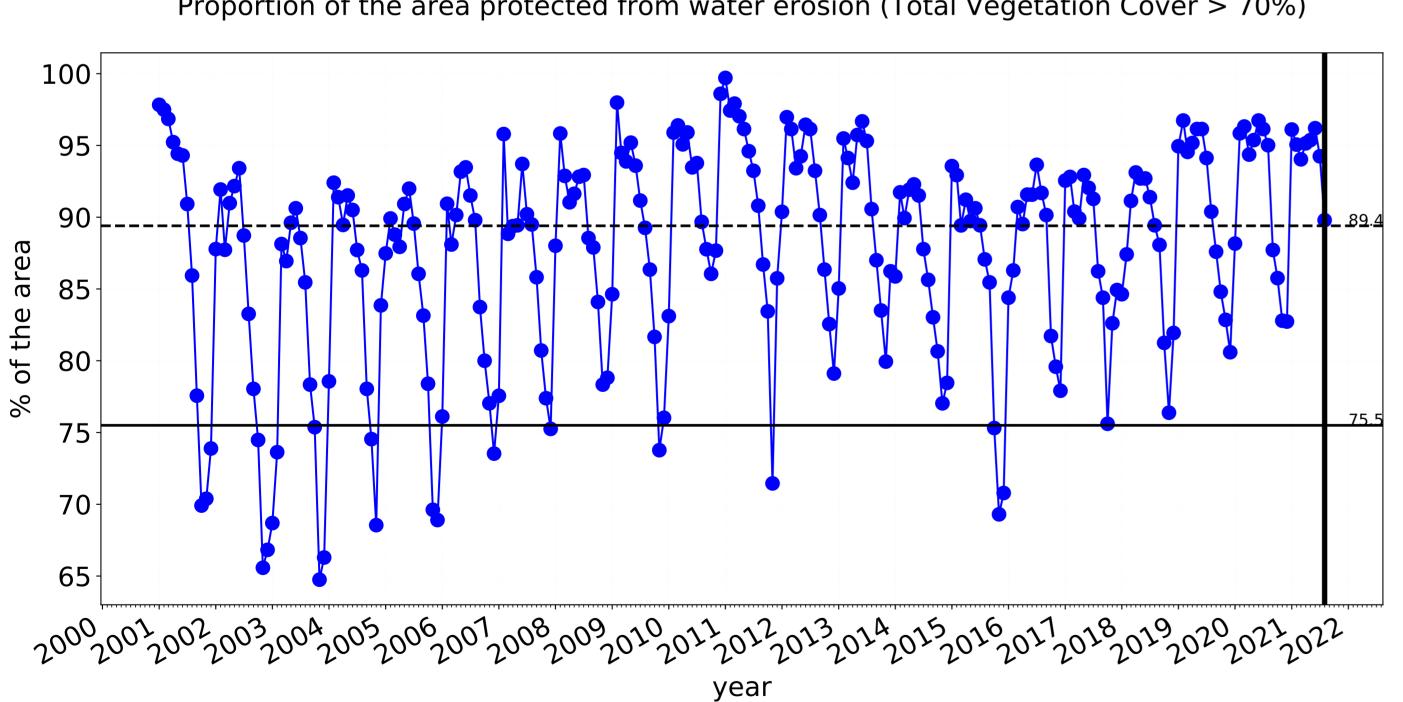
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

22





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

# Irrigation timeseries

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

--- above\_70

**——** 2021 Aug

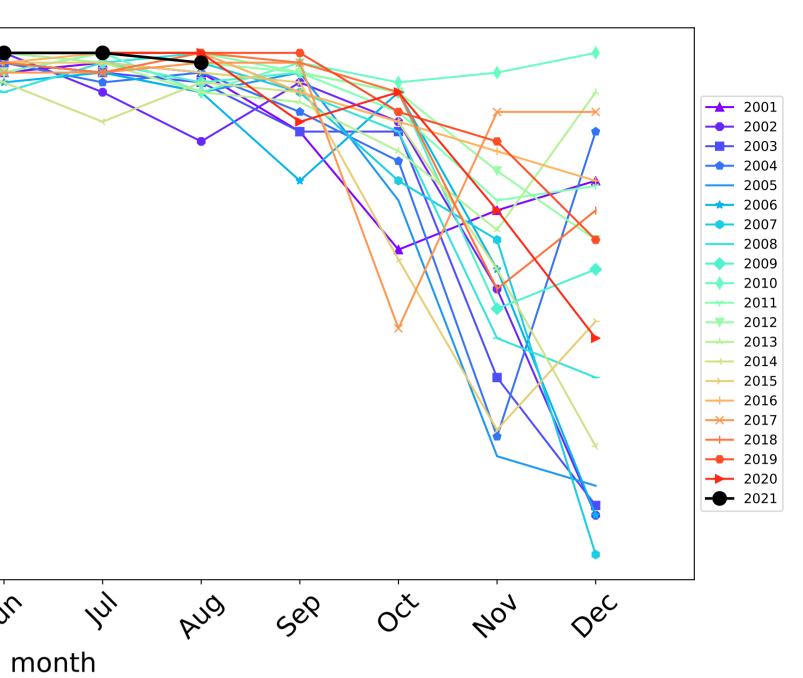
**——** 10th

**——** 50th

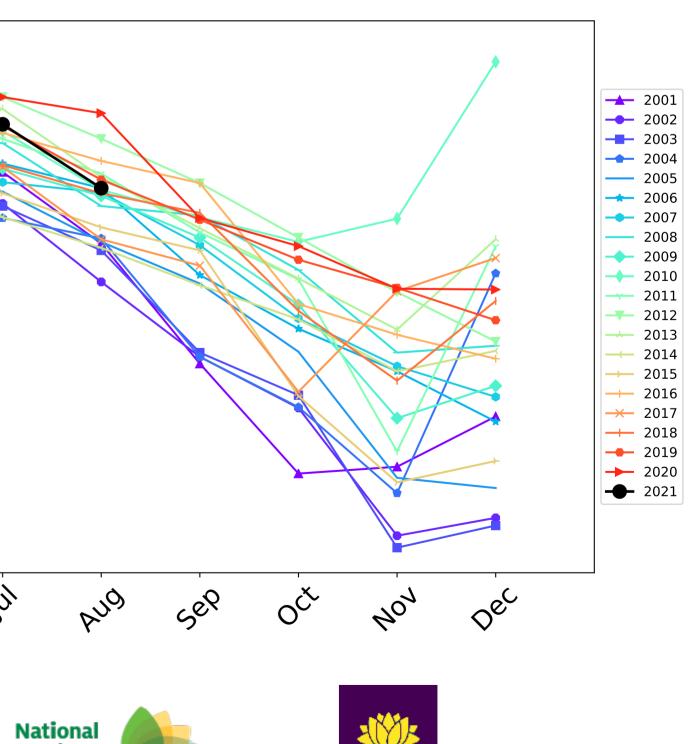
100-95 90 85 80 75 70 65 Jan feb In way Mai PQ1 1/2/ month tern Ecosystem Research Infrastructure Australian Government

Landcare

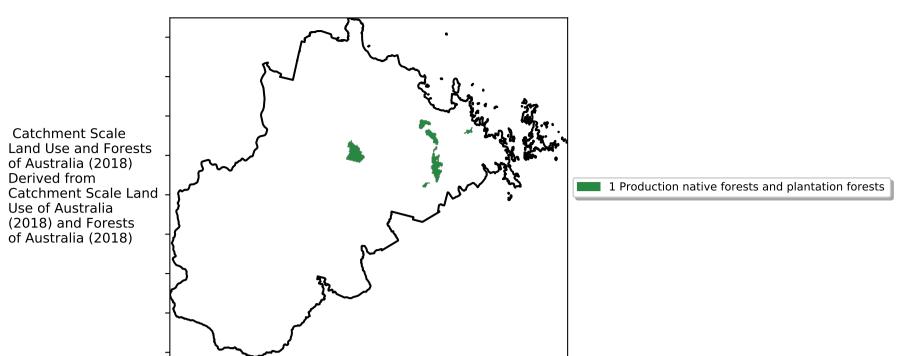
Programme



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



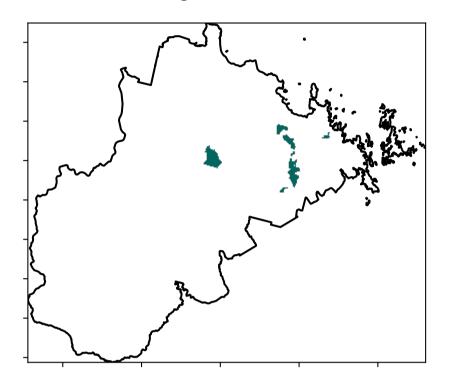
# **Production native forests and plantation forests**



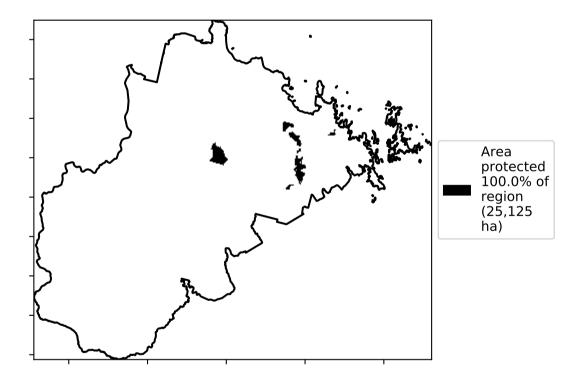
Catchment Scale Land

Total Vegetation Cover [%]

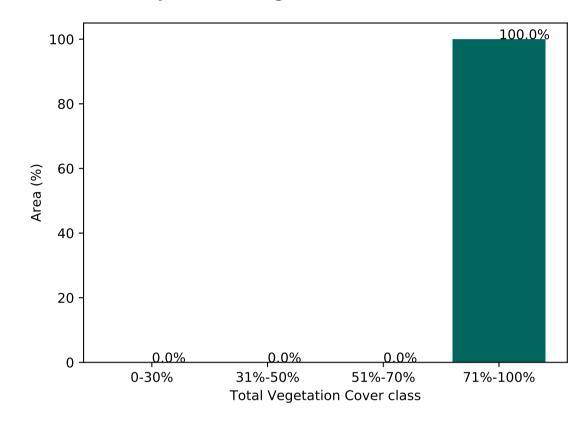
Land use and forest cover



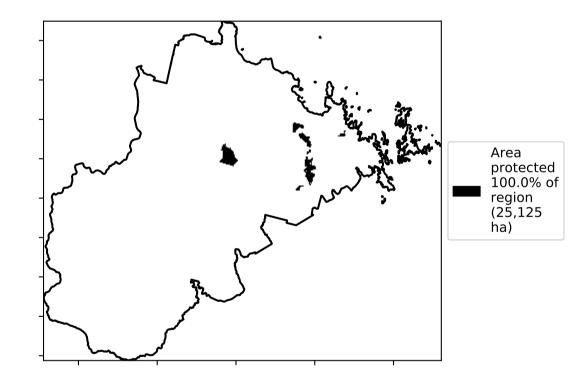




Proportion of vegetation cover class in area



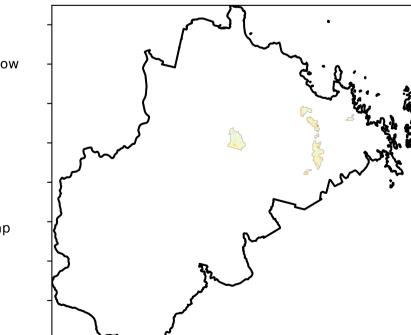
% Area protected from wind erosion (>50%)



 $\sqrt{2}$ 

A.1

**Total Vegetation Cover Anomaly [%]** 



- 10 0 -10

-20

- 20

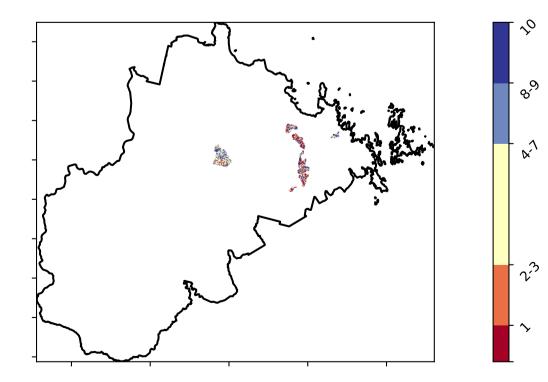
12001000

52°1070010

3201050010

0.30%

**Total Vegetation Cover Decile [%]** 





Deciles show where the pixel value lies in the

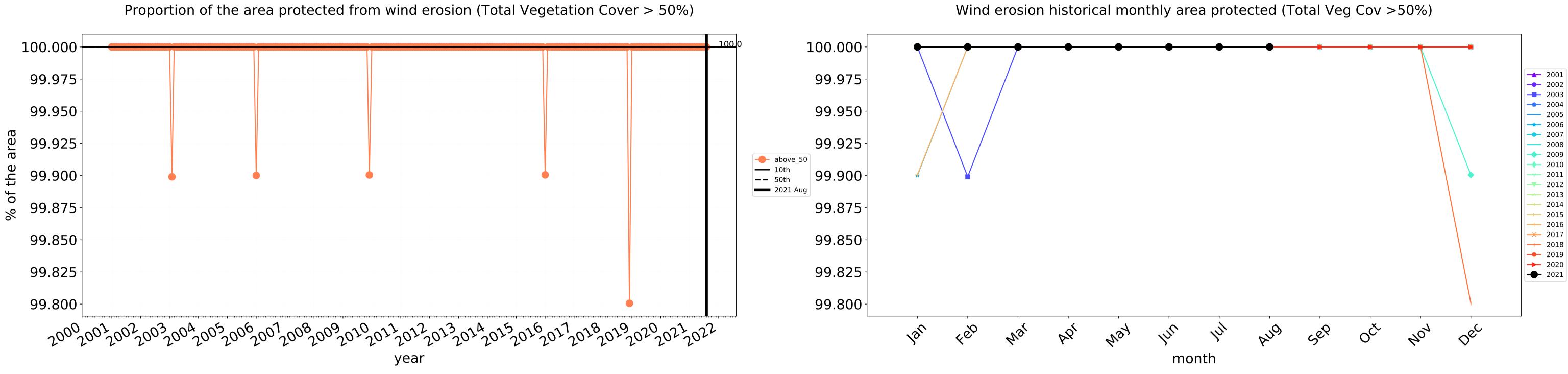
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

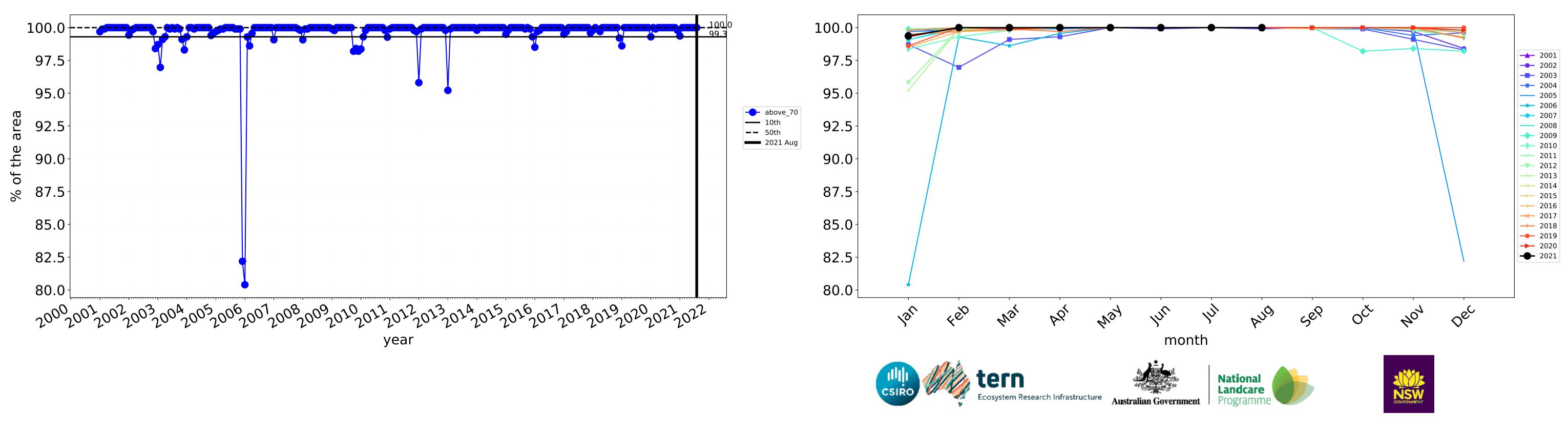
records for that month of

the map using baseline from 2001 to 2019.

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







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

# Whitsunday\_(R) (2,357,050 ha and no data 24,826 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	2,357,050	100.0% 2,356,525	99.8% 2,351,375	93.7% 2,209,525	78.7% 1,855,400	40.1% 945,650	11.2% 264,225
Conservation and natural environments	169,750	99.9% 169,500	99.4% 168,750	96.0% 162,900	85.0% 144,325	59.5% 101,000	29.4% 49,825
Conservation and natural environments non forest	28,300	99.8% 28,250	98.9% 28,000	86.9% 24,600	41.7% 11,800	4.5% 1,275	1.1% 325
Conservation and natural environments Woodland forest	57,325	100.0% 57,300	99.8% 57,200	98.3% 56,375	92.4% 52,950	66.6% 38,175	25.2% 14,425
Conservation and natural environments Forest (non woodland)	84,125	99.8% 83,950	99.3% 83,550	97.4% 81,925	94.6% 79,575	73.2% 61,550	41.7% 35,075
Agriculture	2,084,900	100.0% 2,084,875	99.9% 2,082,100	93.8% 1,956,550	78.7% 1,640,550	38.8% 808,150	9.6% 199,775
Grazing	2,042,475	100.0% 2,042,450	99.9% 2,039,700	93.9% 1,918,425	79.0% 1,613,625	39.1% 798,200	9.6% 196,600
Grazing non forest	1,171,850	100.0% 1,171,825	99.8% 1,169,125	90.3% 1,058,025	69.6% 815,350	28.9% 338,350	6.5% 76,675
Grazing Woodland forest	819,775	100.0% 819,775	100.0% 819,750	99.0% 811,375	92.1% 755,350	53.5% 438,200	13.5% 110,350
Grazing - Forest (non woodland)	50,850	100.0% 50,850	100.0% 50,825	96.4% 49,025	84.4% 42,925	42.6% 21,650	18.8% 9,575
Irrigation	42,125	100.0% 42,125	99.9% 42,100	89.8% 37,825	63.2% 26,625	23.2% 9,775	7.5% 3,150
Production native forests and plantation forests	25,125	100.0% 25,125	100.0% 25,125	100.0% 25,125	99.8% 25,075	79.9% 20,075	34.6% 8,700

