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

# Date: July 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

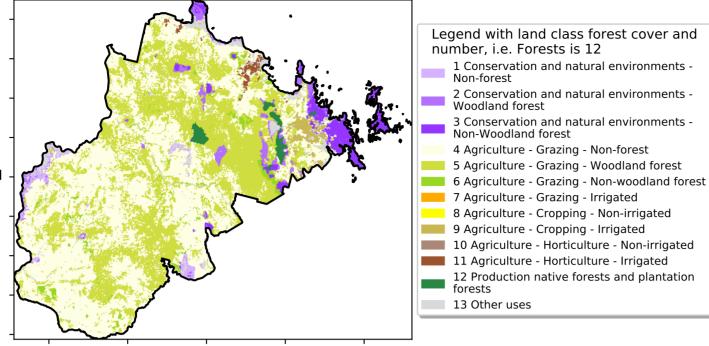


# **Vegetation Cover Jul 2021**

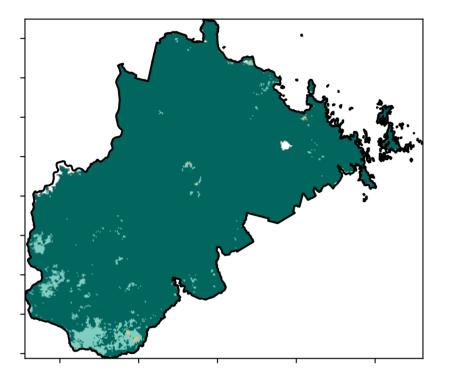
#### Land use and forest cover

### Proportion of each land class in area

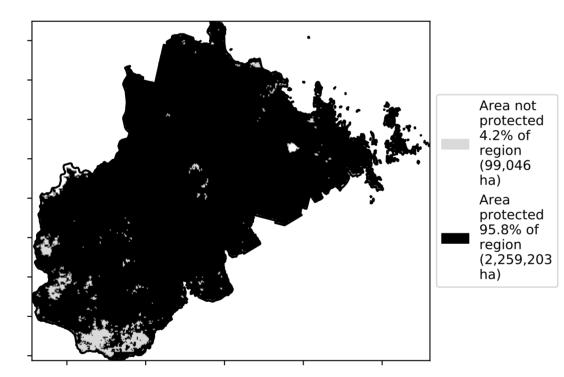


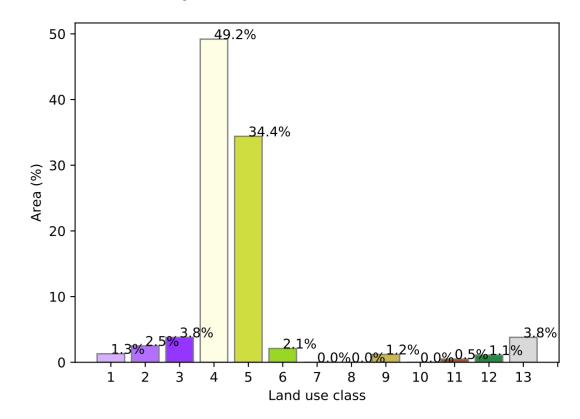


## **Total Vegetation Cover [%]**

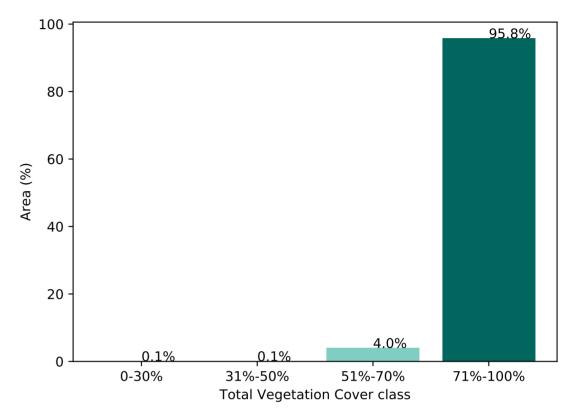


#### % Area protected from water erosion (>70%)





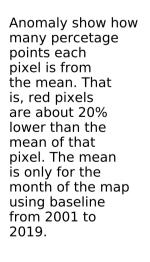
#### Proportion of vegetation cover class in area

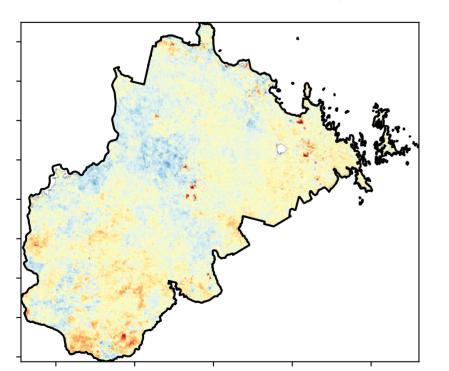


#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 





- 10 - 0 - -10

-20

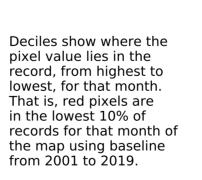
20

120/07/00%

52% 70%

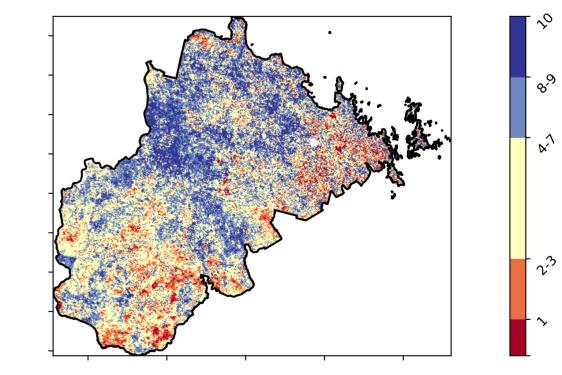
32%50%

0.30%

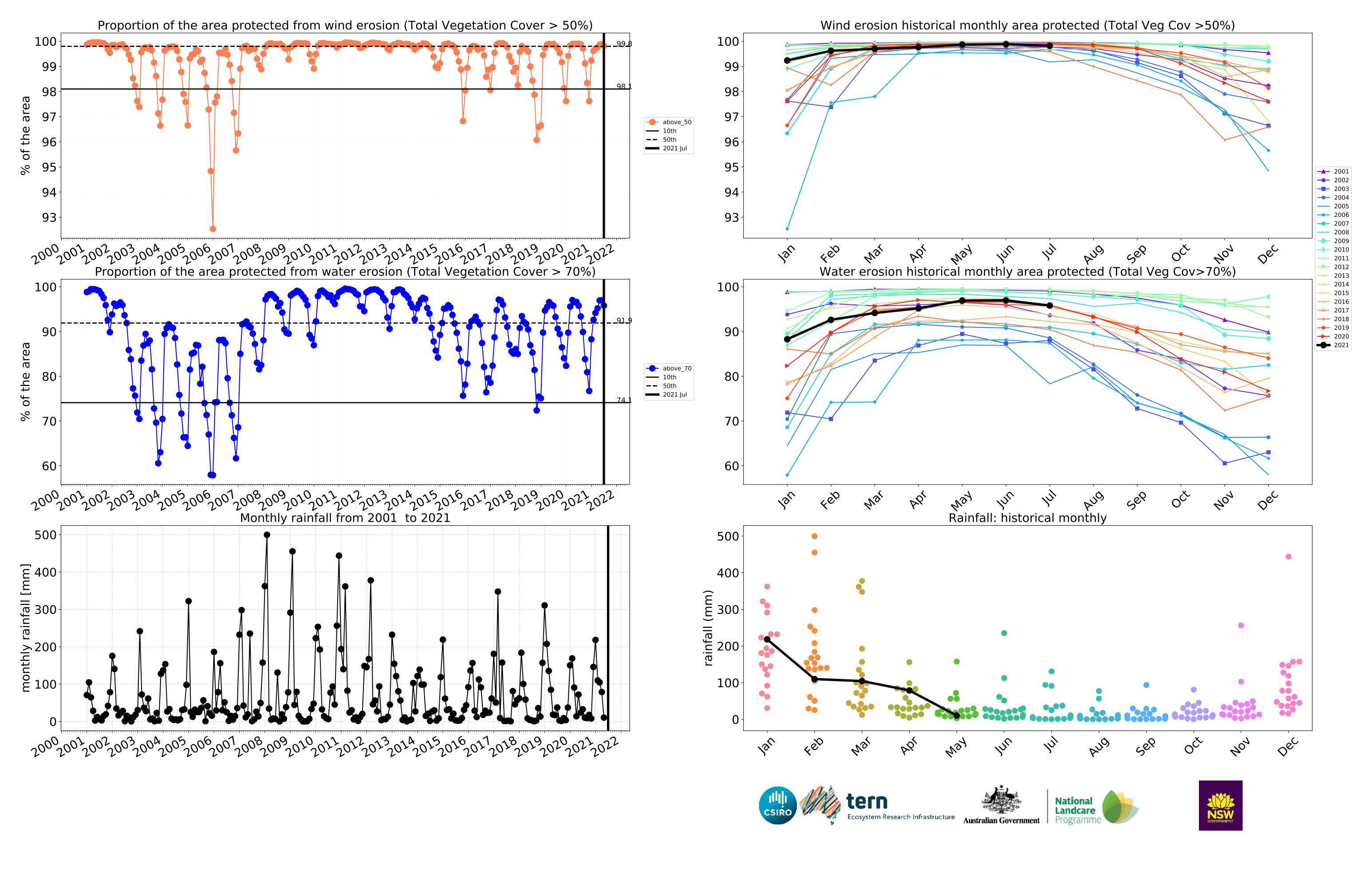


Protected 100.0% of region (2,358,250 ha)

**Total Vegetation Cover Decile [%]** 







## **Conservation and natural environments**

forest

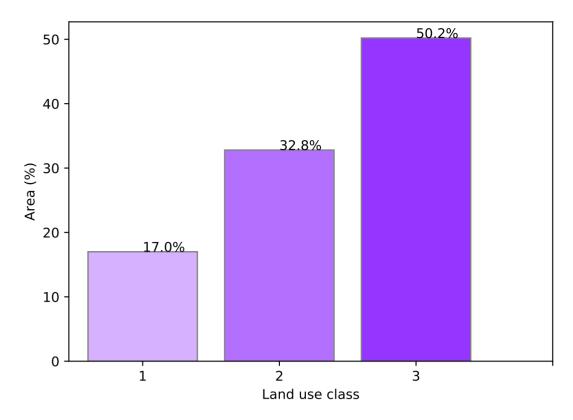
forest

woodland forest

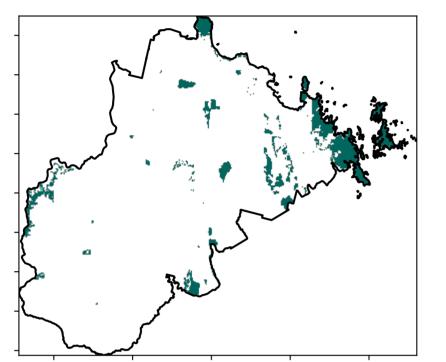
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Land use and forest cover

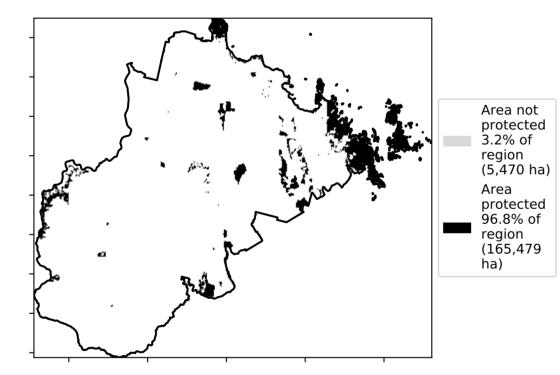
#### Proportion of each land class in area

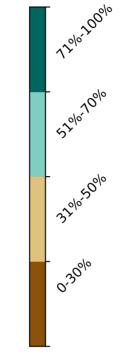


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)

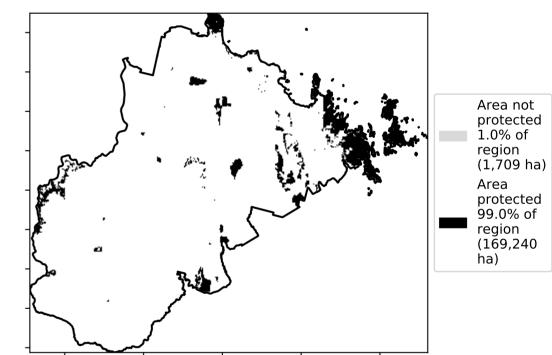




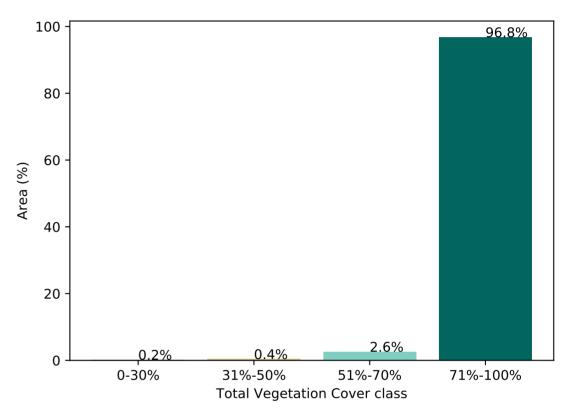
1 Conservation and natural environments - Non-

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%)



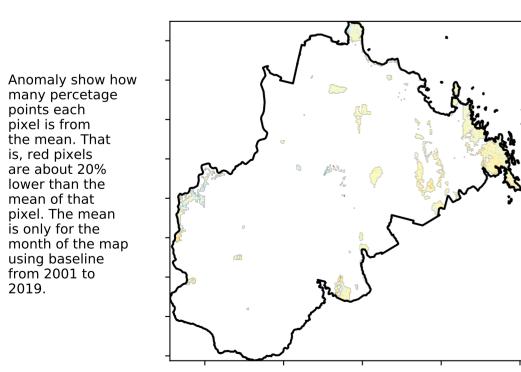
 $\sqrt{2}$ 

୍ଚ୍ଚ

A-1

2.3

**Total Vegetation Cover Anomaly [%]** 



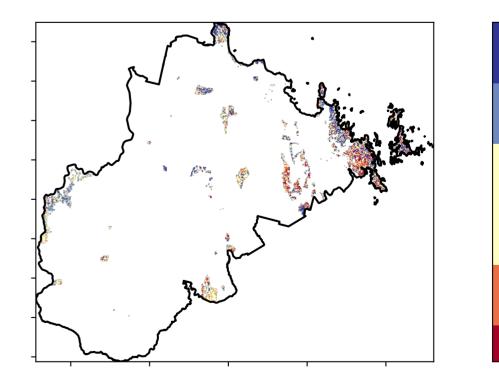
is, red pixels

mean of that

- 10 - 0 - -10

- 20

Total Vegetation Cover Decile [%]





Deciles show where the

pixel value lies in the

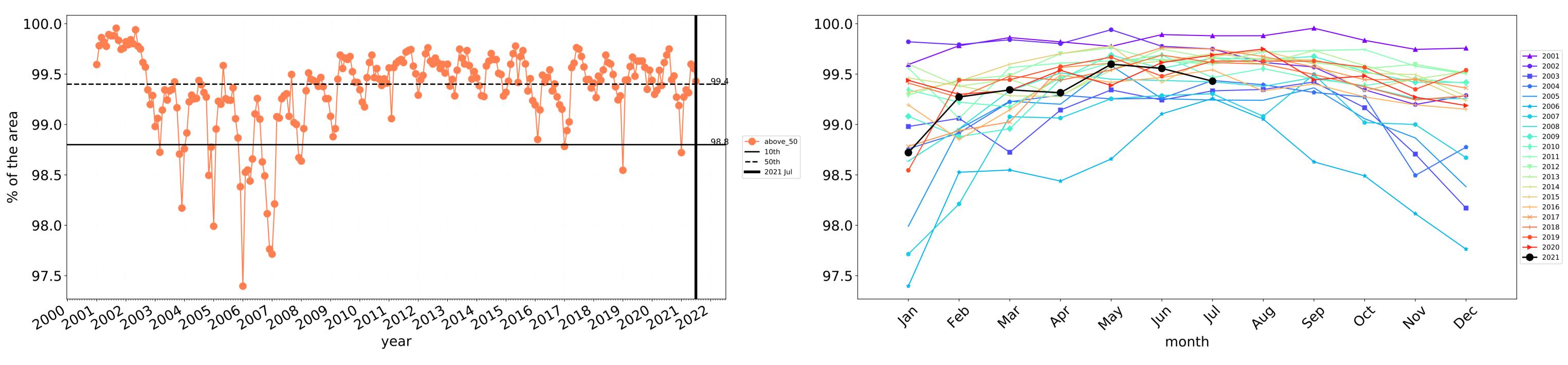
record, from highest to lowest, for that month. That is, red pixels are

records for that month of

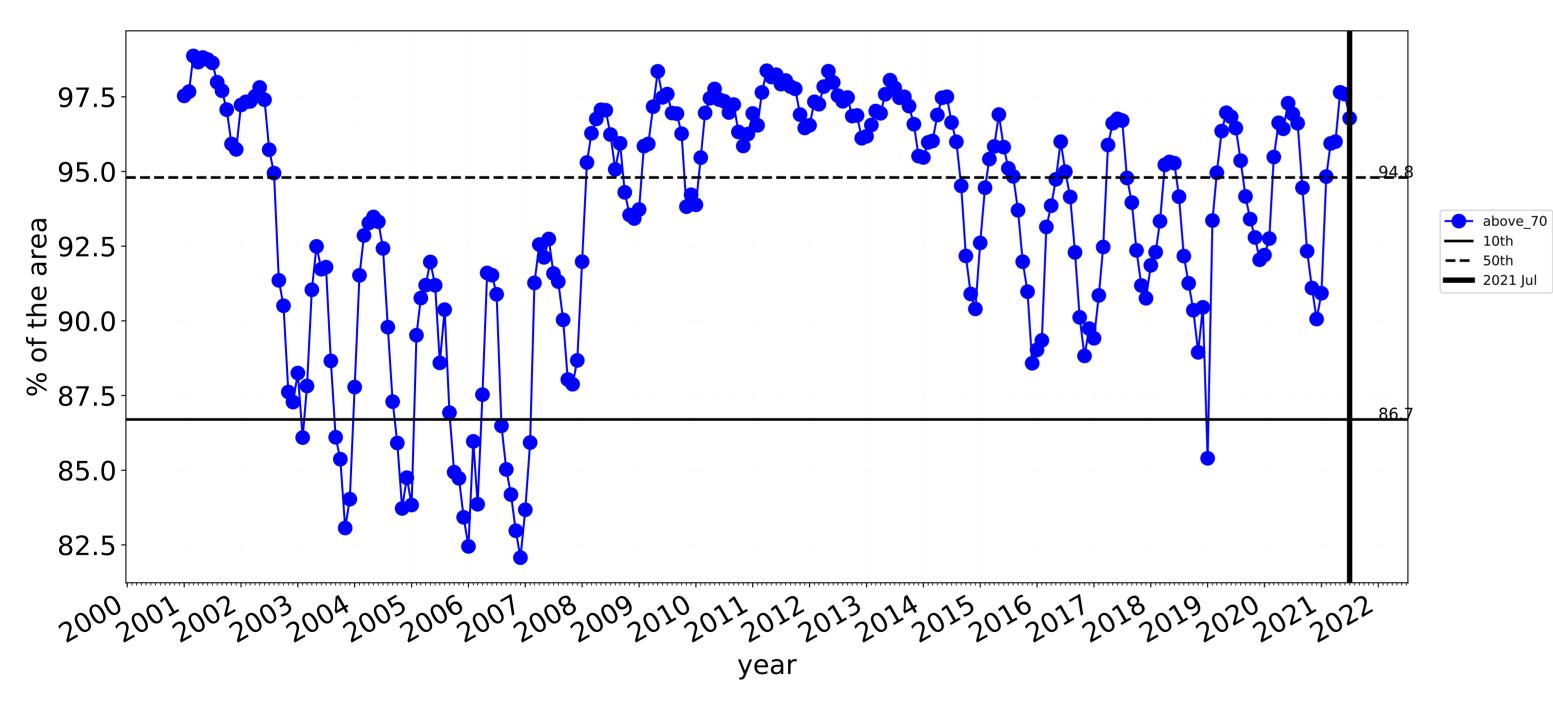
the map using baseline from 2001 to 2019.

in the lowest 10% of

-20



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 4eb May 1sh Wai PQ 1/2/ month tern Ecosystem Research Infrastructure Australian Government

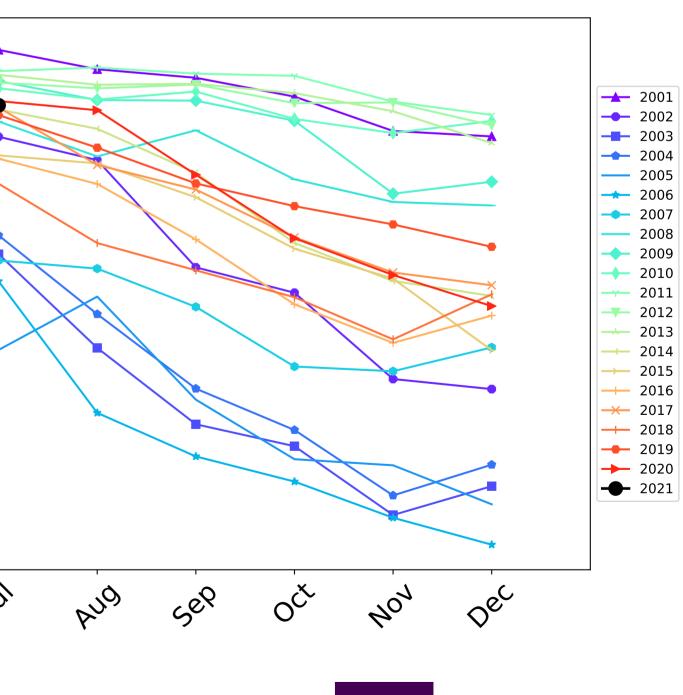
Wind erosion historical monthly area protected (Total Veg Cov >50%)

National

Landcare

Programme

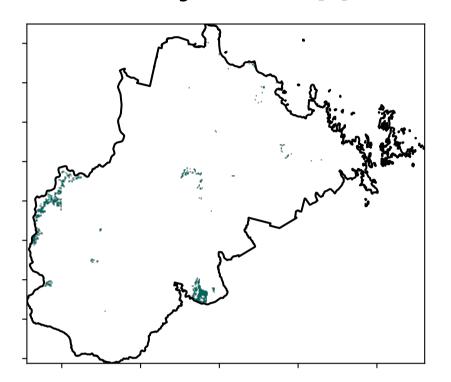
Water erosion historical monthly area protected (Total Veg Cov>70%)



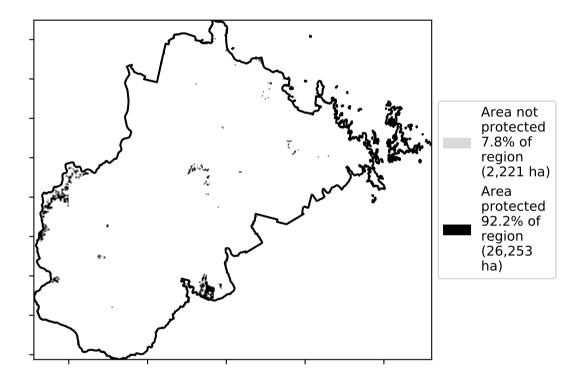
## **Conservation and natural environments non forest**

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

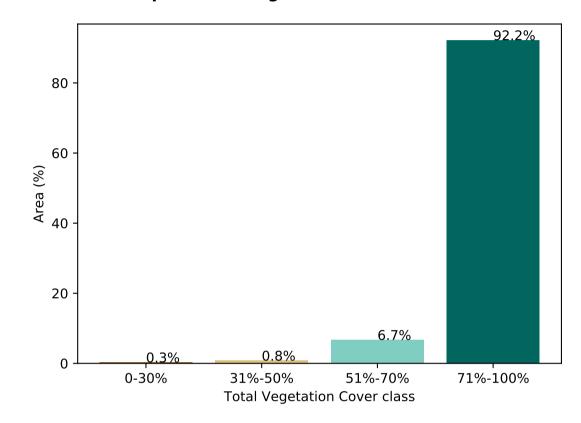
**Total Vegetation Cover [%]** 



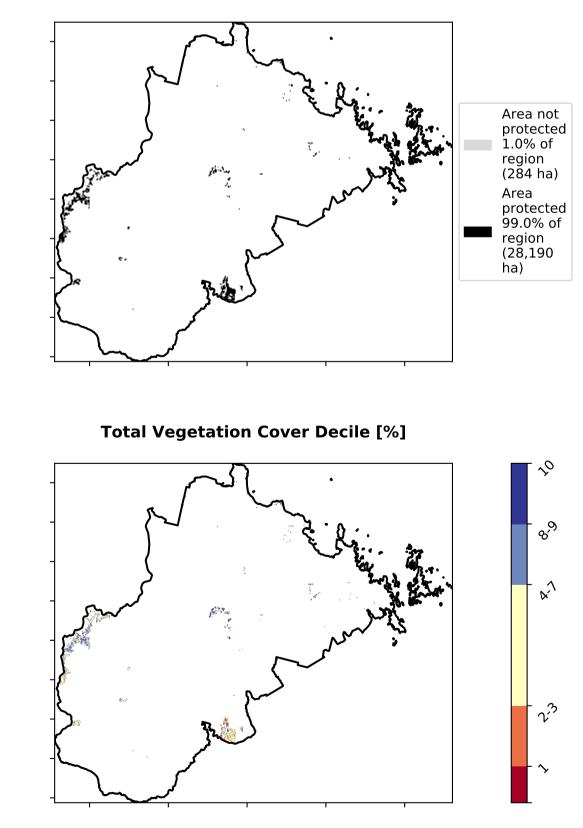
% Area protected from water erosion (>70%)



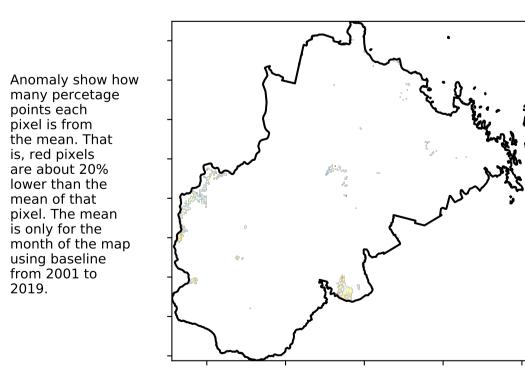
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



is, red pixels

- 10 0 -10

-20

- 20

12%-2000

52°1070°10

320050010

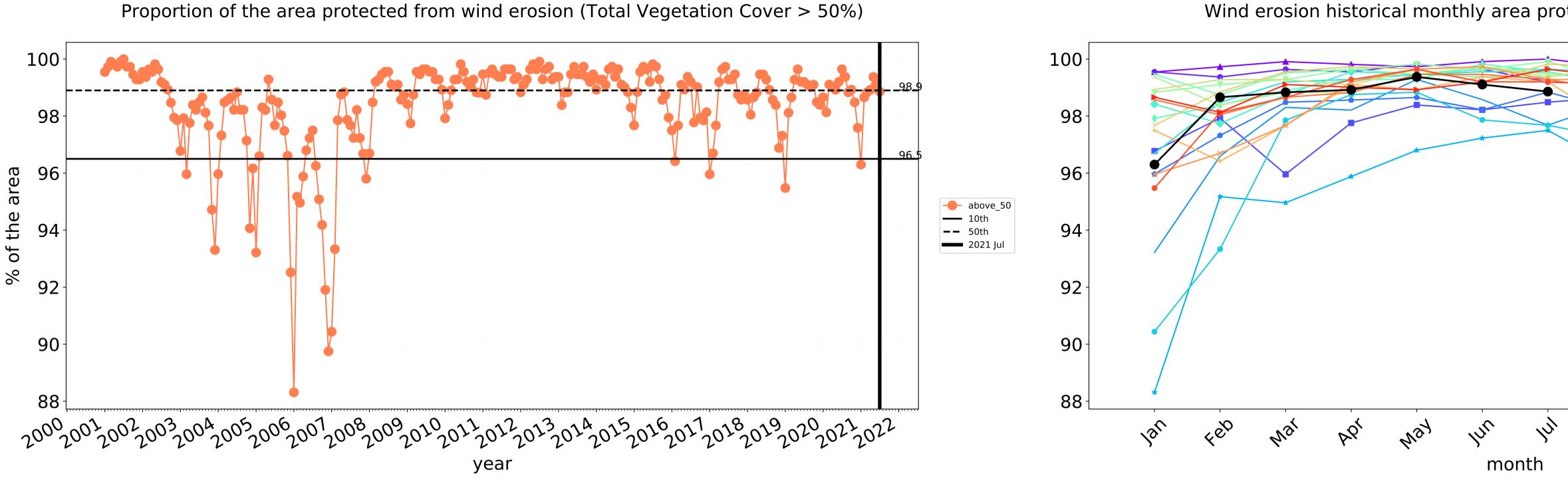
0.30%

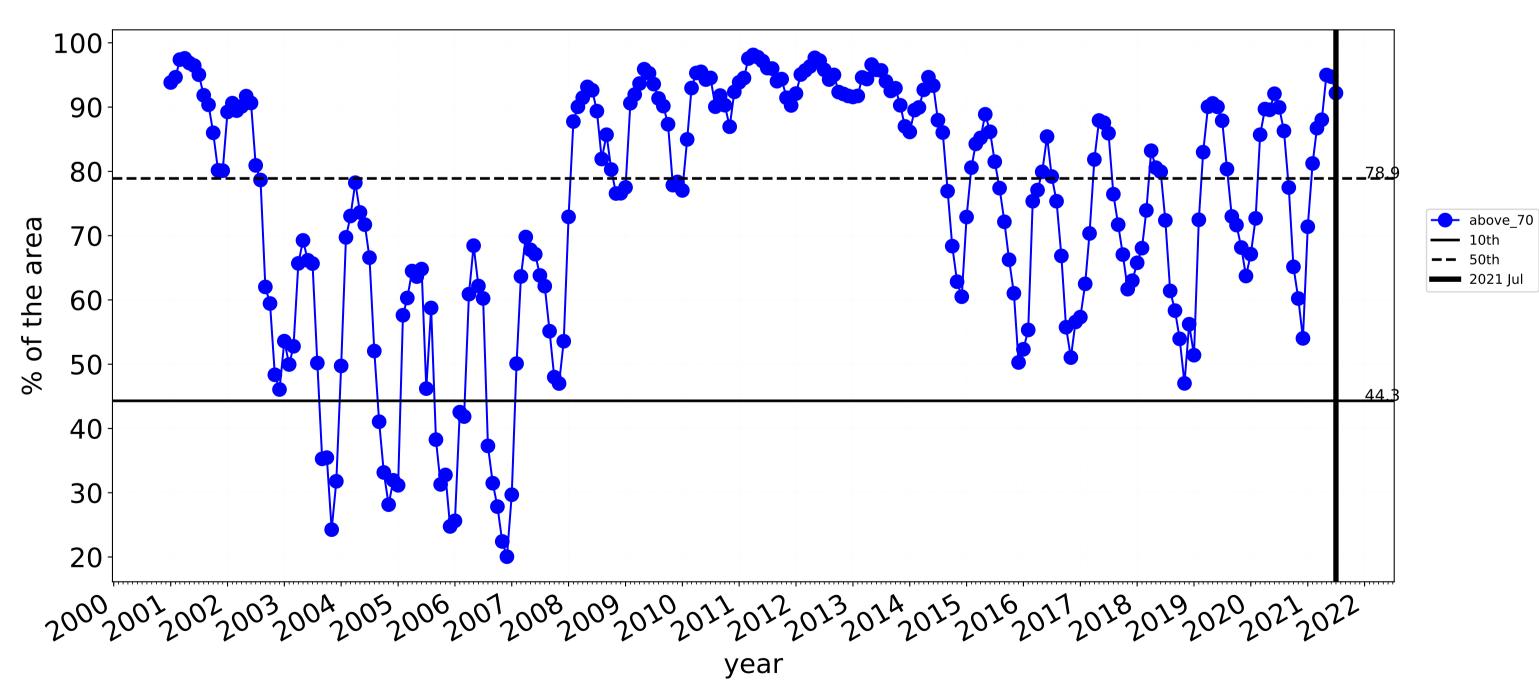


lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of

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

the map using baseline from 2001 to 2019.



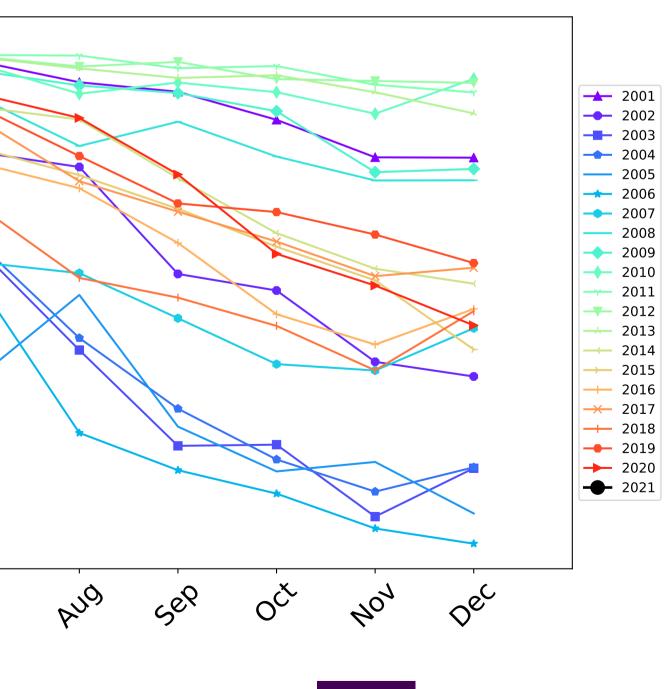


100-90 80 70-60 50 40 30-20lar 4eb way In war 1/1/ PQ1 month Ecosystem Research Infrastructure Australian Government

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

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

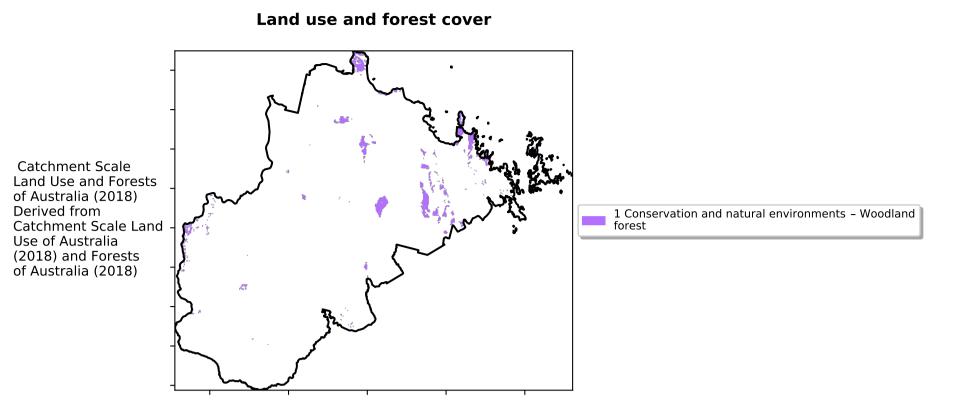
Water erosion historical monthly area protected (Total Veg Cov>70%)



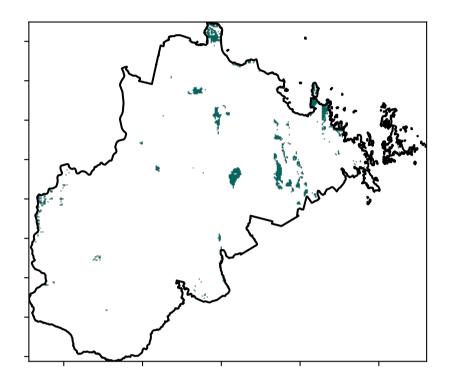




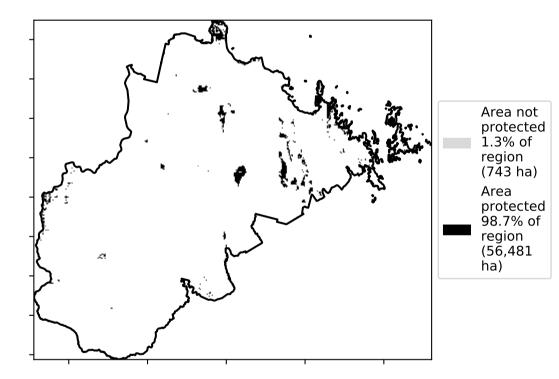
## **Conservation and natural environments Woodland forest**



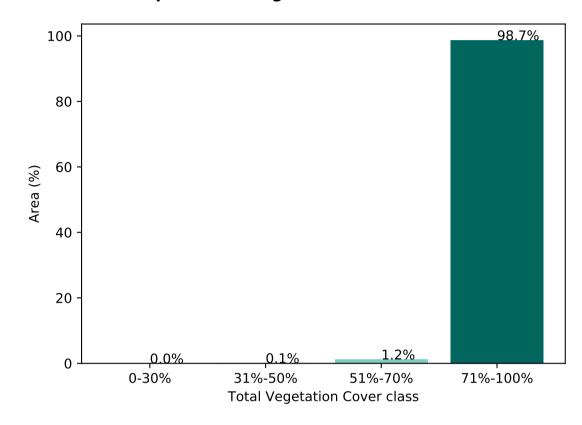
Total Vegetation Cover [%]



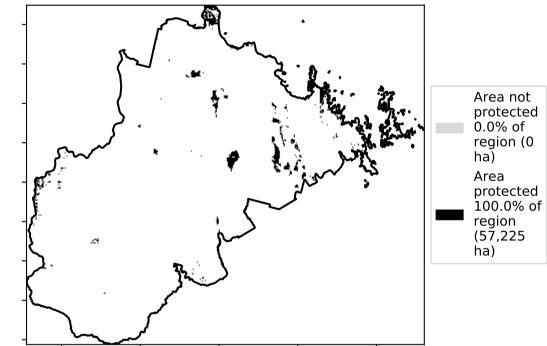
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



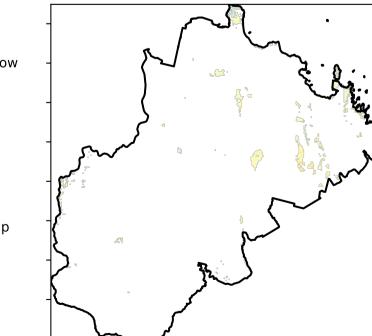
 $\sqrt{2}$ 

ଚ୍ଚ

A.1

· 2<sup>?3</sup>

**Total Vegetation Cover Anomaly [%]** 



- 10 0 -10

- 20

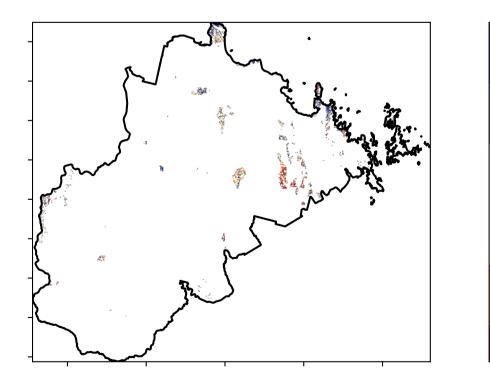
120010001

52°1070010

3201050010

0.30%

**Total Vegetation Cover Decile [%]** 





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



Deciles show where the pixel value lies in the

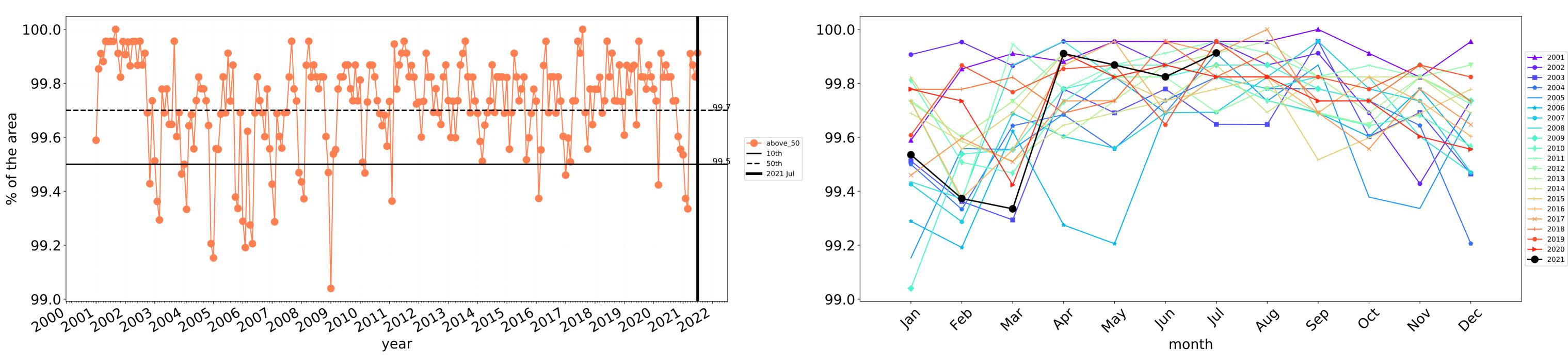
record, from highest to lowest, for that month. That is, red pixels are

records for that month of

the map using baseline from 2001 to 2019.

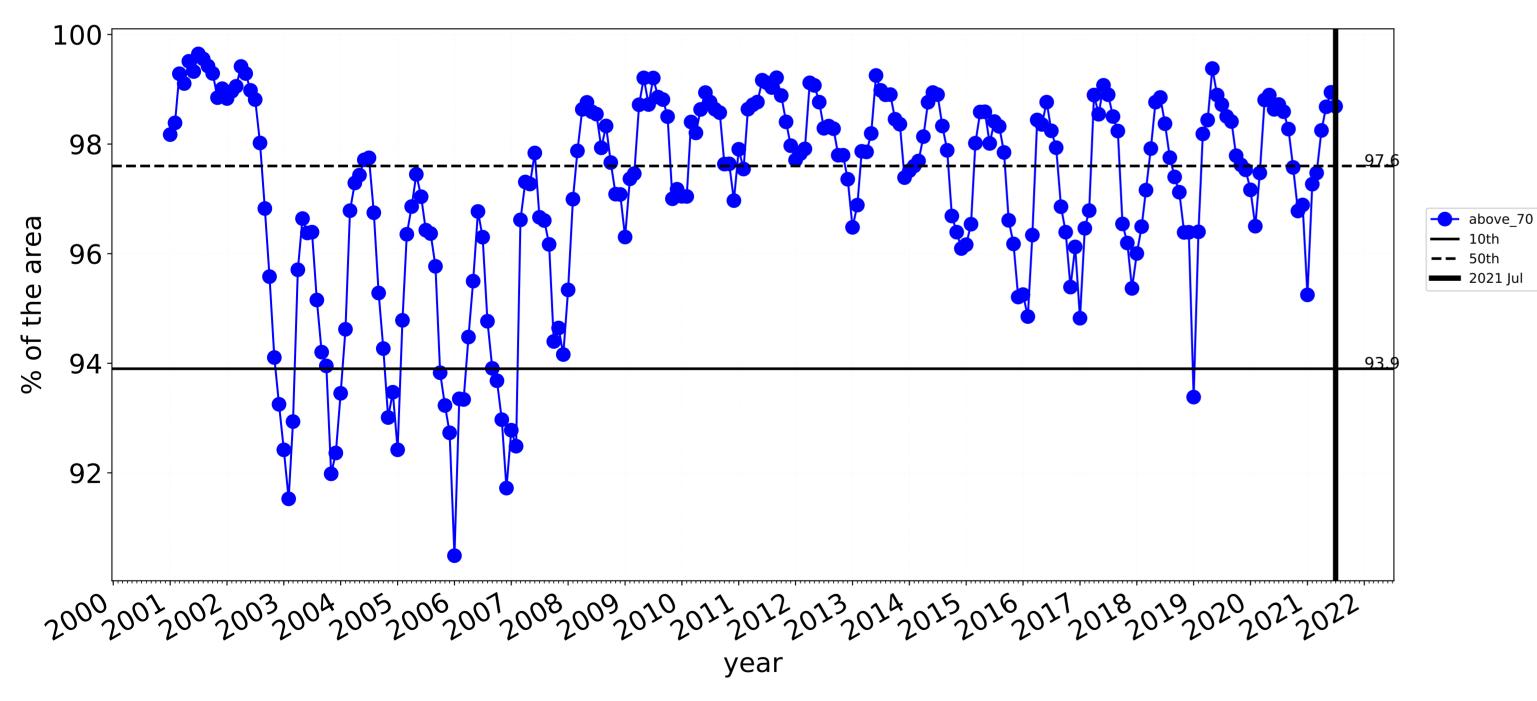
in the lowest 10% of

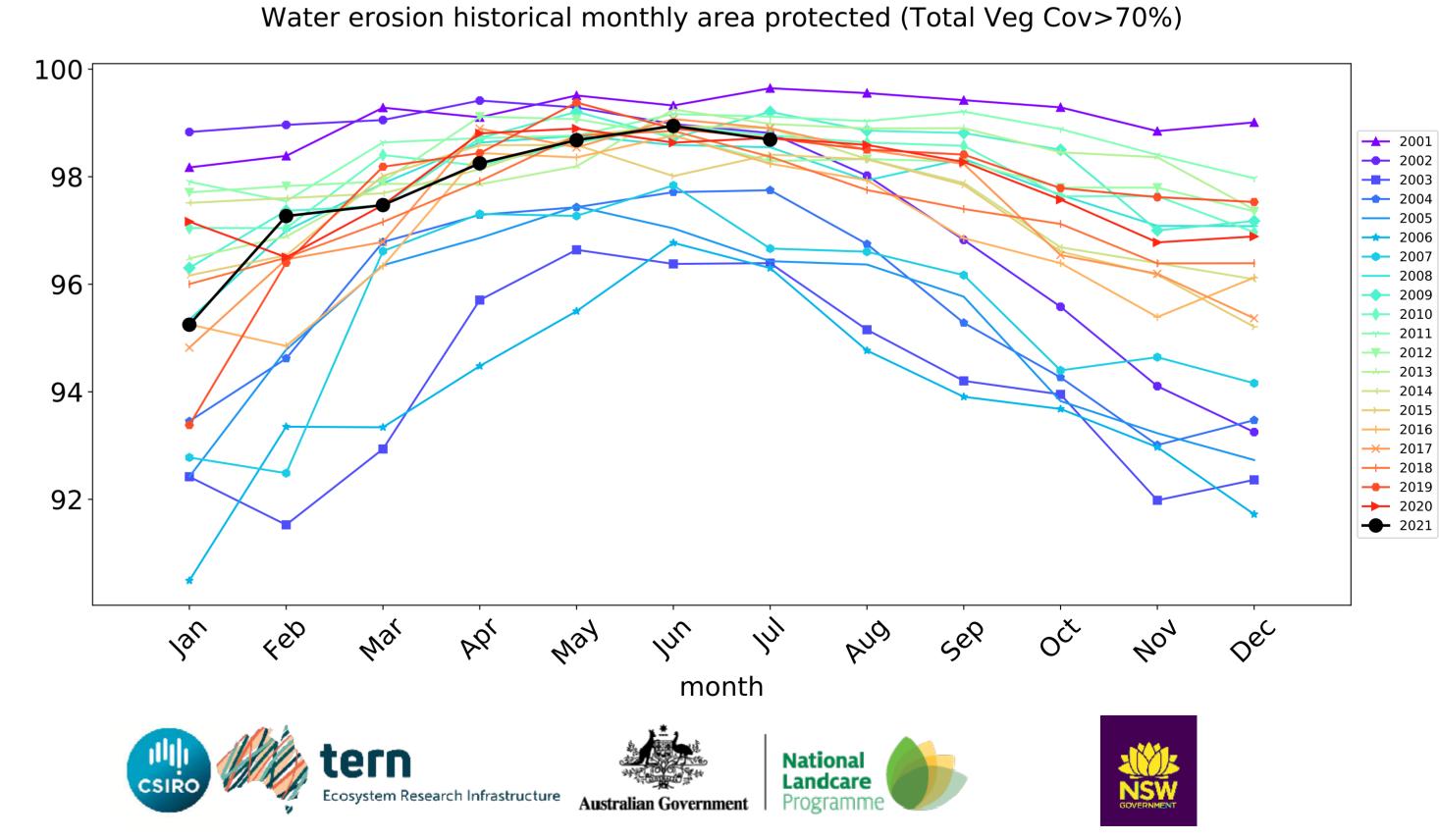




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

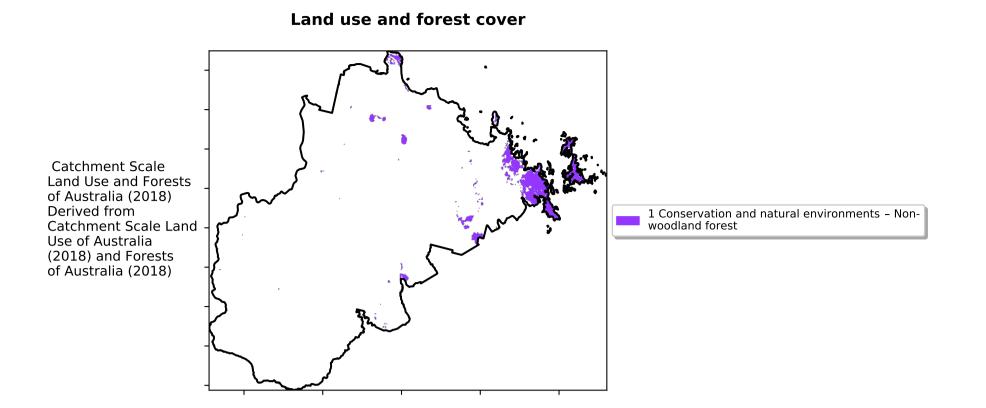




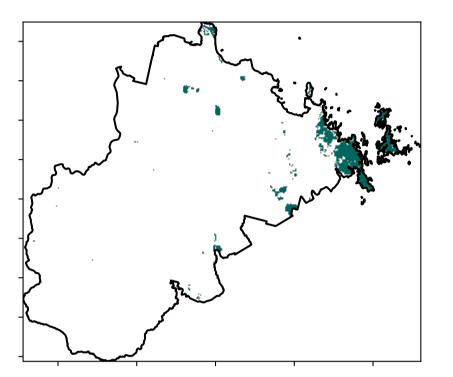


Wind erosion historical monthly area protected (Total Veg Cov >50%)

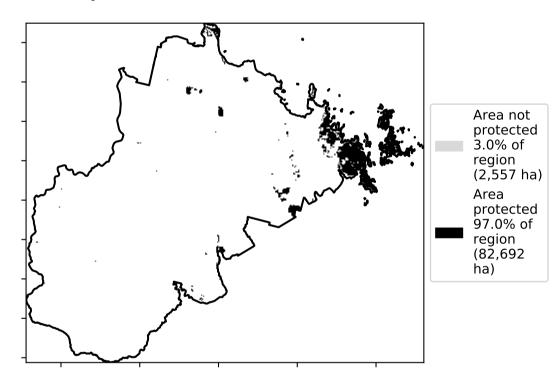
# **Conservation and natural environments Forest (non woodland)**

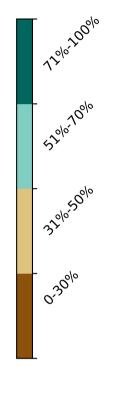


**Total Vegetation Cover [%]** 

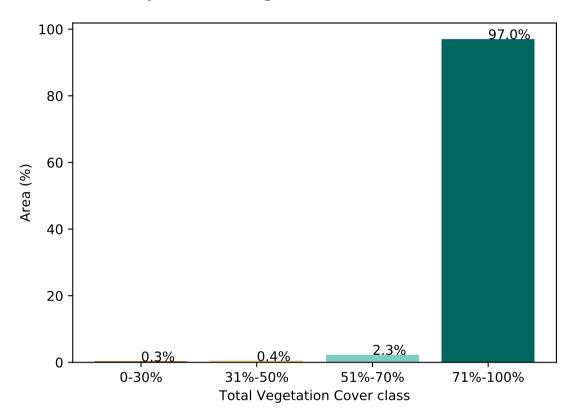


% Area protected from water erosion (>70%)

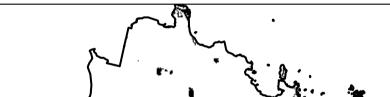




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





 $\sqrt{2}$ 

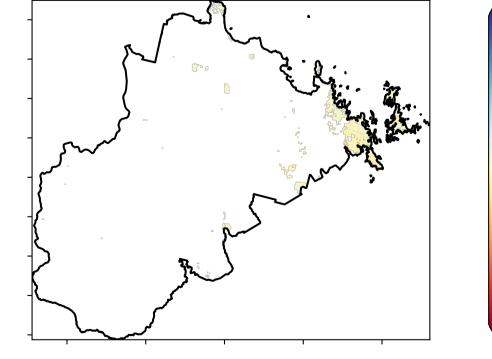
e S

A.1

• 2<sup>?3</sup>

Total Vegetation Cover Anomaly [%]

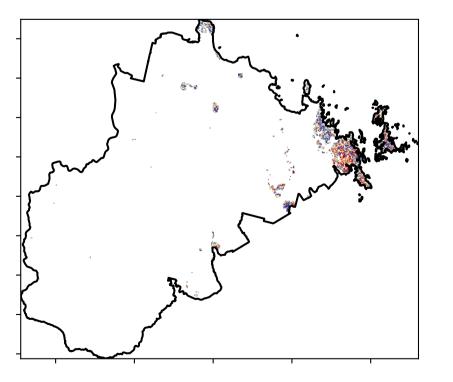
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.



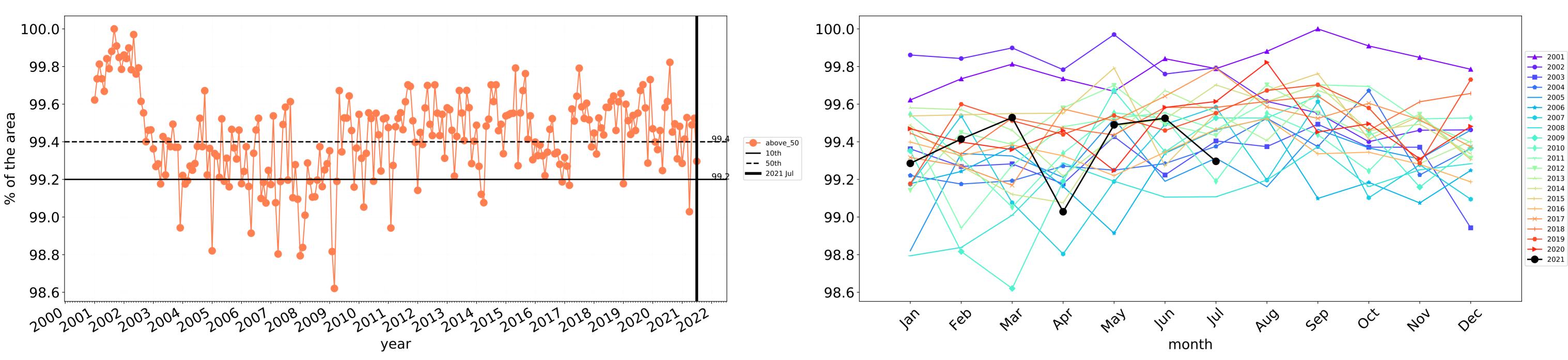
- 20 Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline - 10 0 the map using baseline from 2001 to 2019. -10-20

Area not protected 1.0% of region (852 ha) Area protected 99.0% of region (84,397 ha)

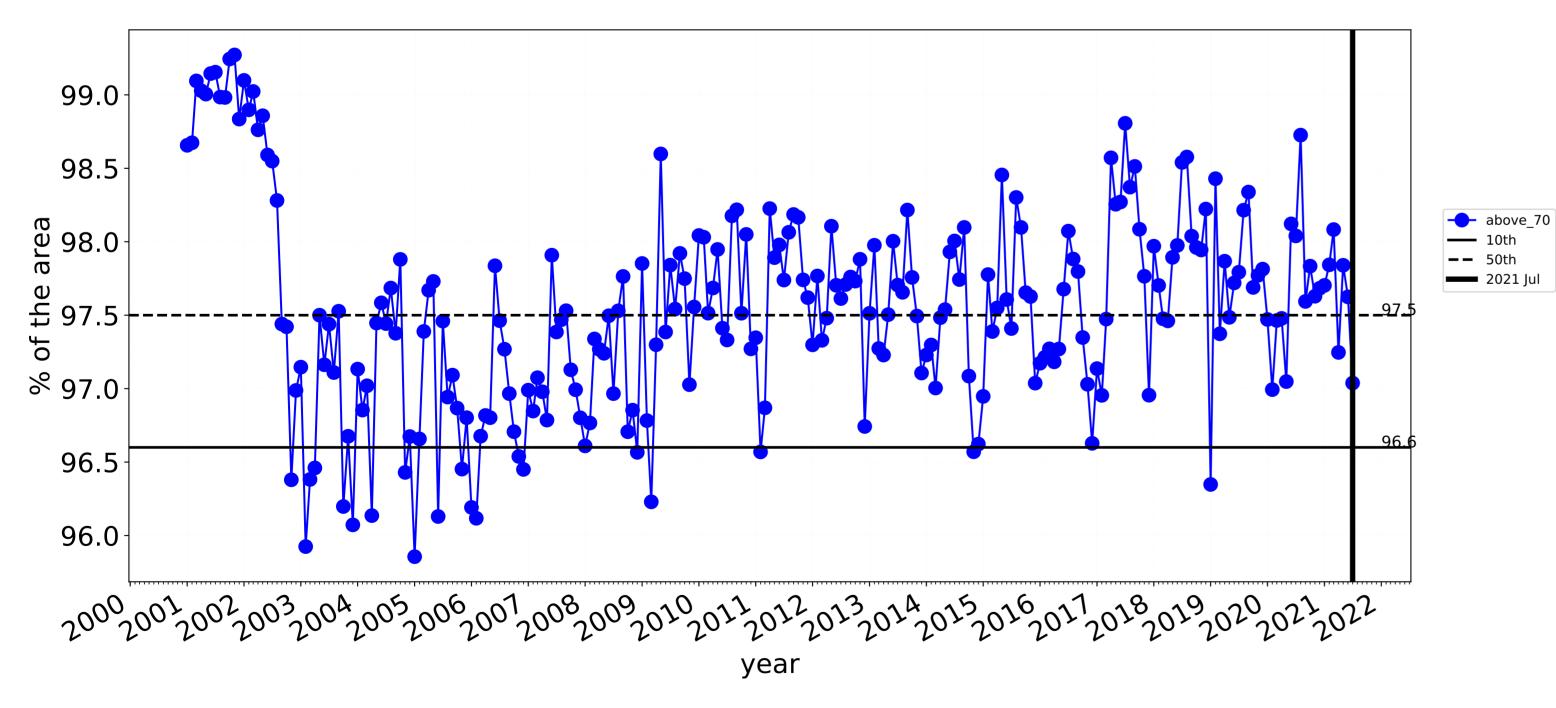
Total Vegetation Cover Decile [%]

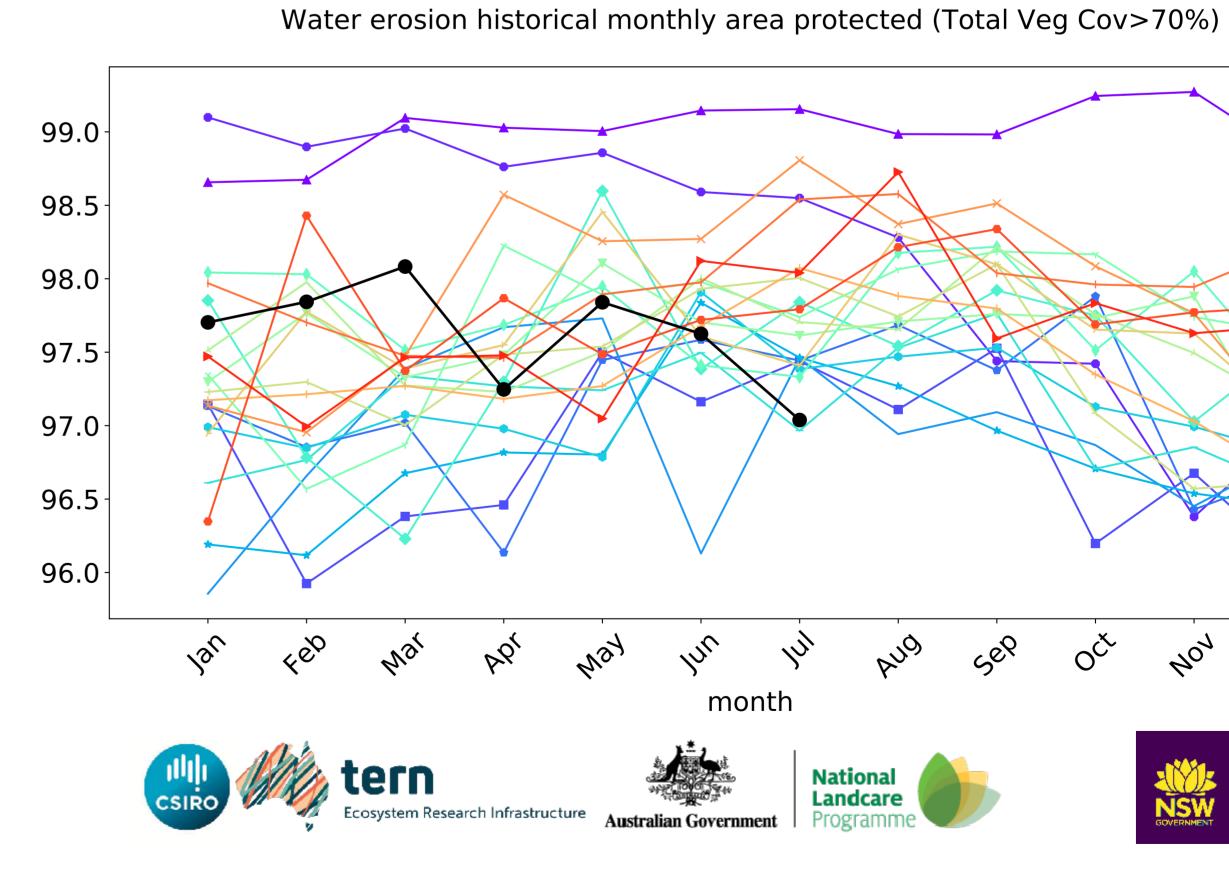






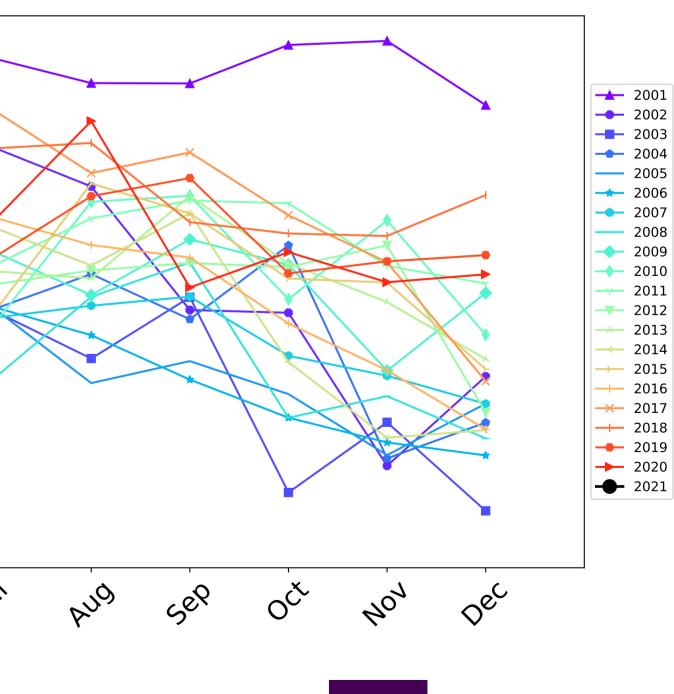
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





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





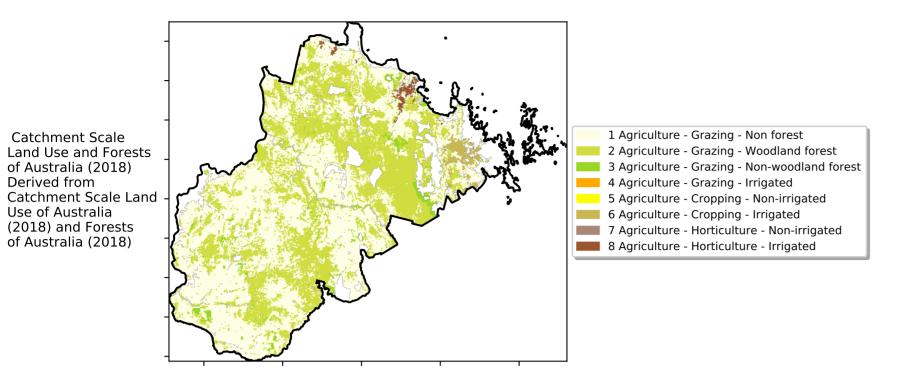




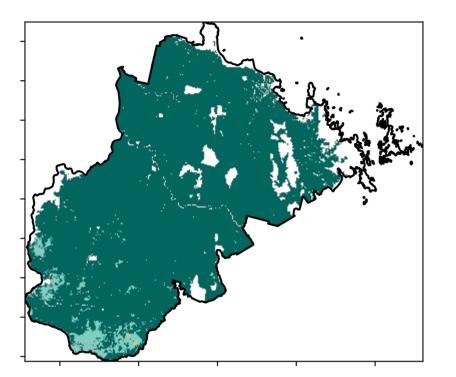
## Agriculture

Land use and forest cover

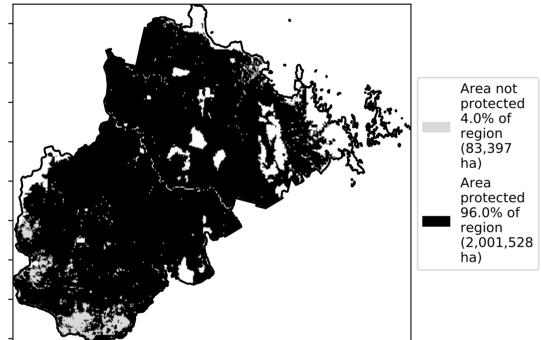


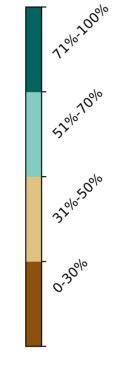


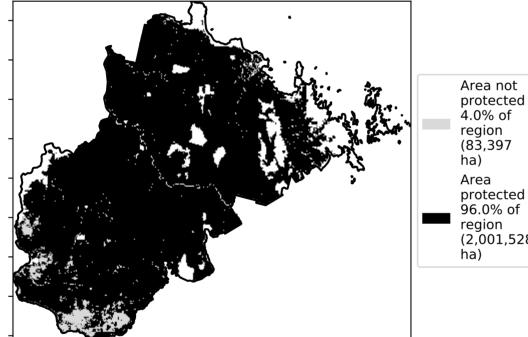
**Total Vegetation Cover [%]** 

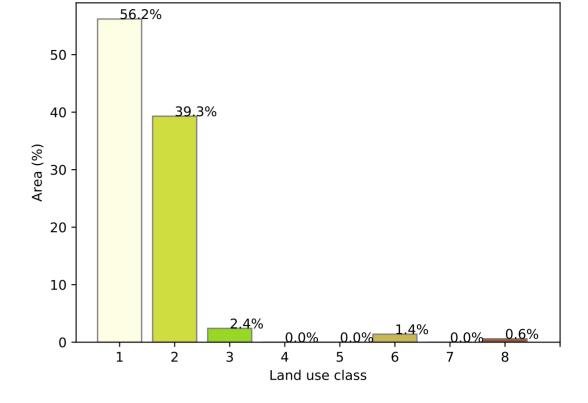


% Area protected from water erosion (>70%)

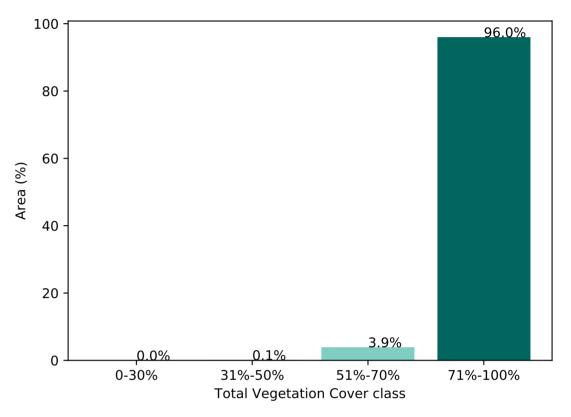




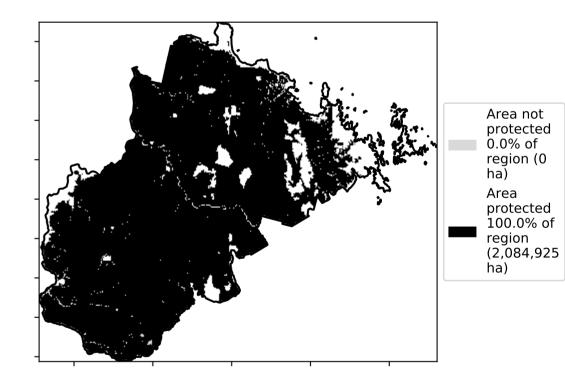




Proportion of vegetation cover class in area



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

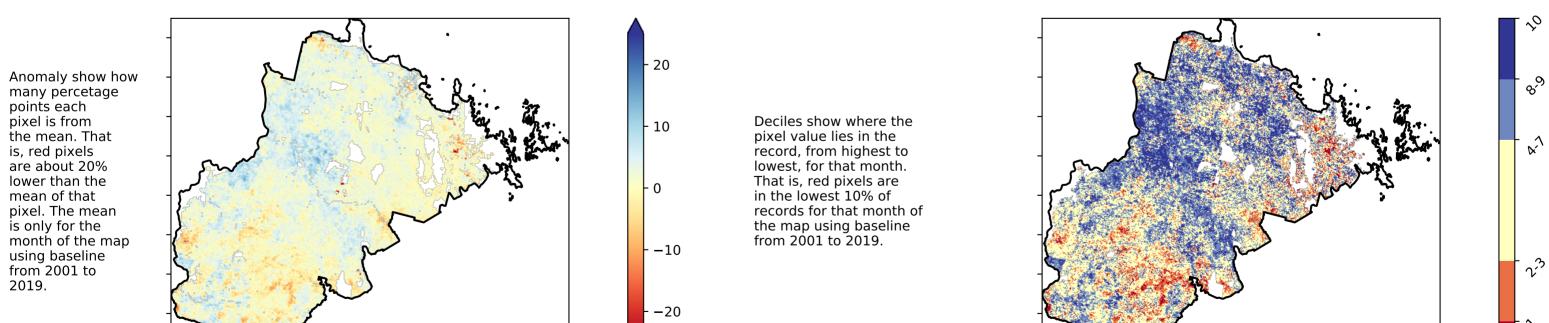


**Total Vegetation Cover Anomaly [%]** 

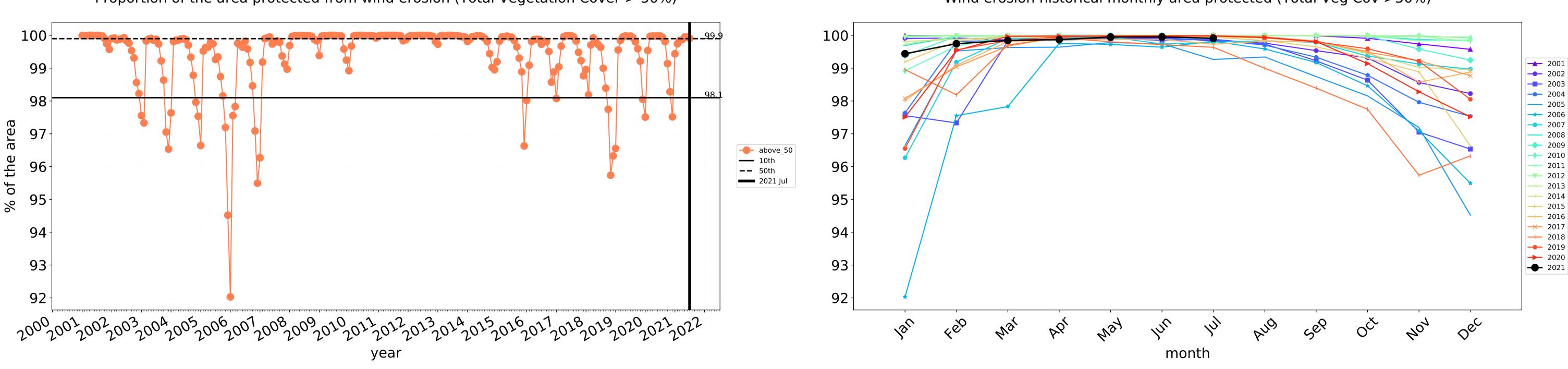
**Total Vegetation Cover Decile [%]** 

\$

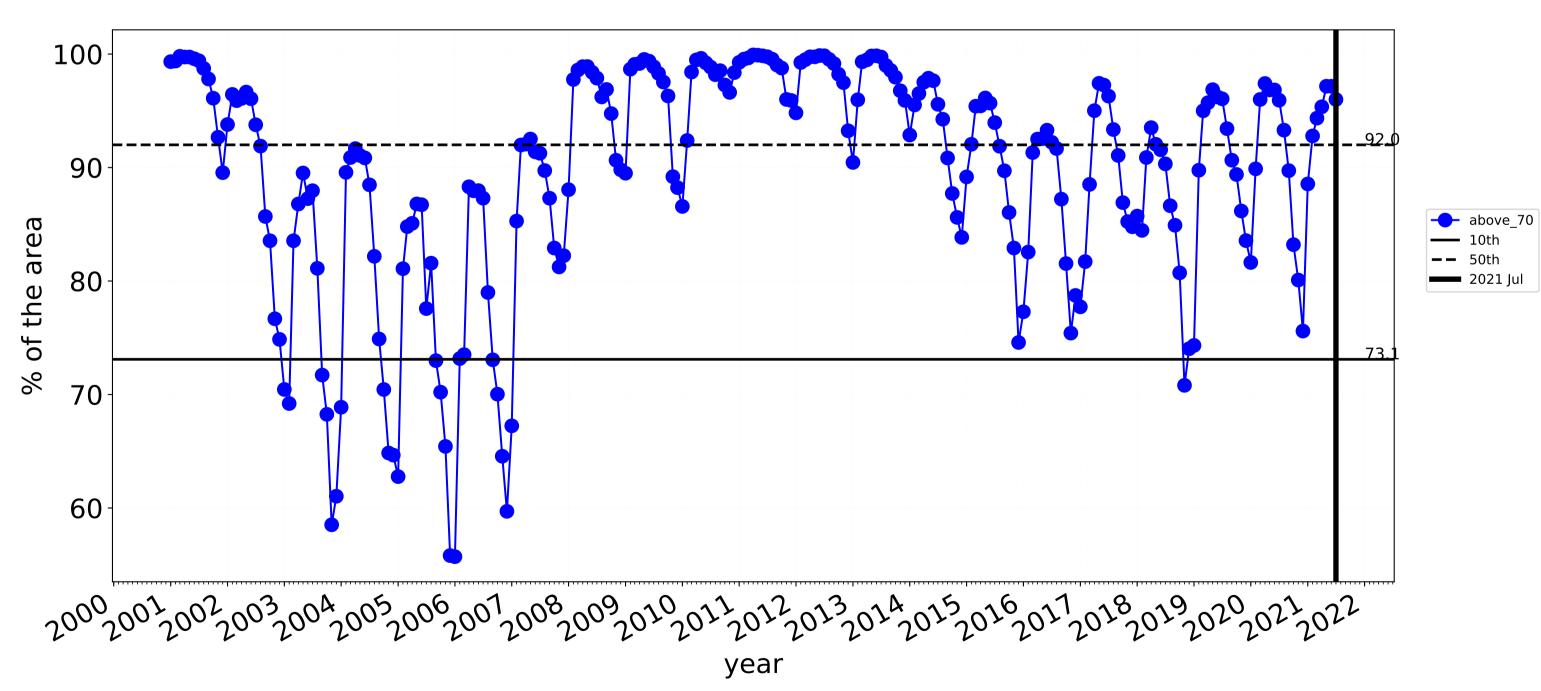
A.1







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



# **Agriculture timeseries**

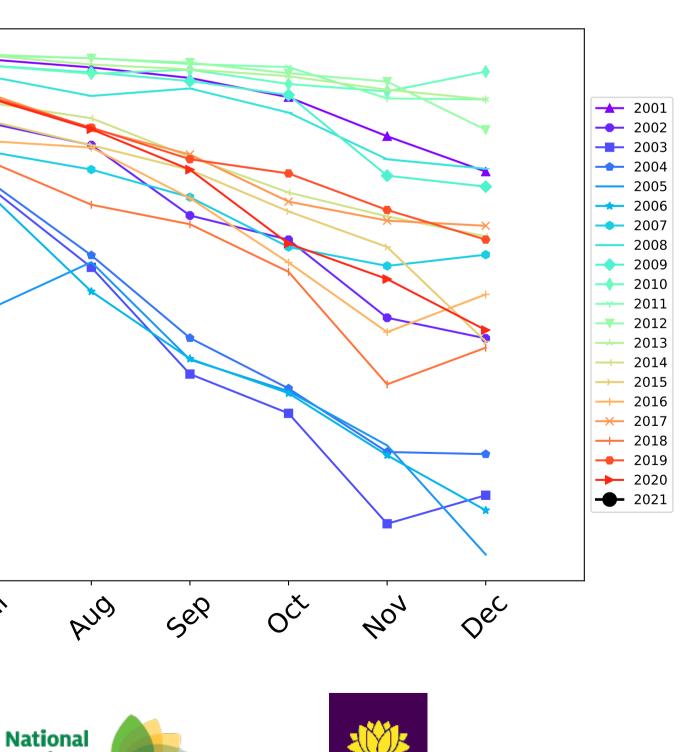
100-90 80 70-60 feb way In Mar Jan PQ 1's month CSIRO CONTACTO CONTACTOR C Australian Government

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

Landcare

Programm

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

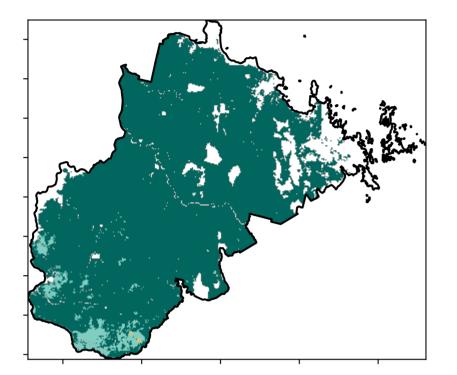


## Grazing

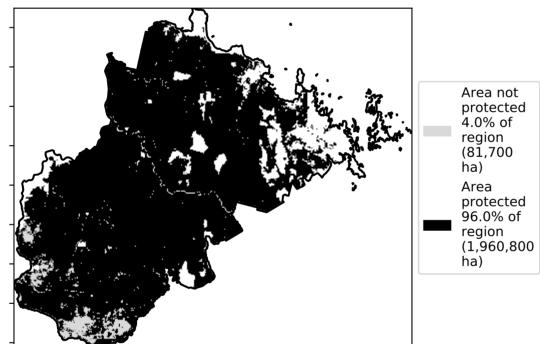
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest Use of Australia (2018) and Forests of Australia (2018)

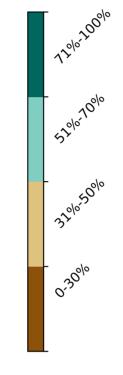
Land use and forest cover

**Total Vegetation Cover [%]** 

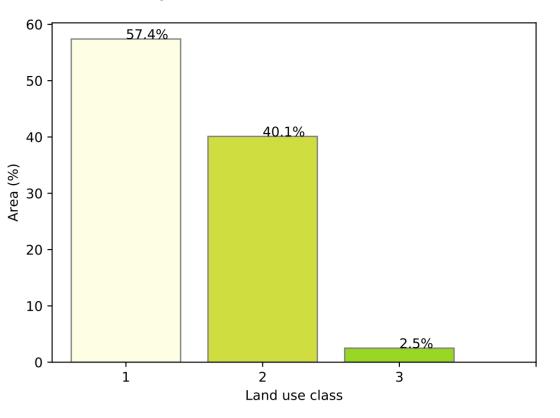


% Area protected from water erosion (>70%)



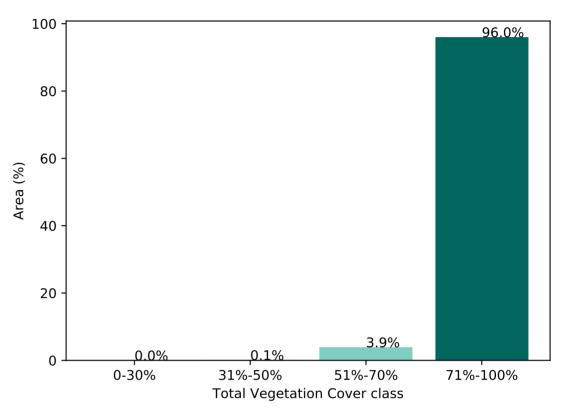




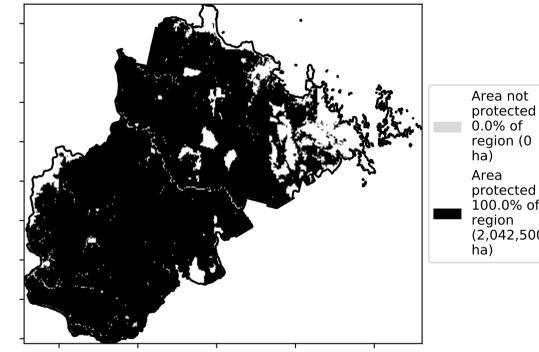


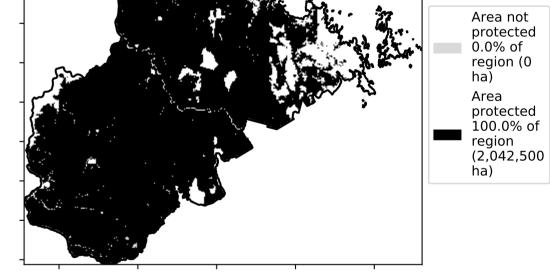
## Proportion of each land class in area

Proportion of vegetation cover class in area



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





\$

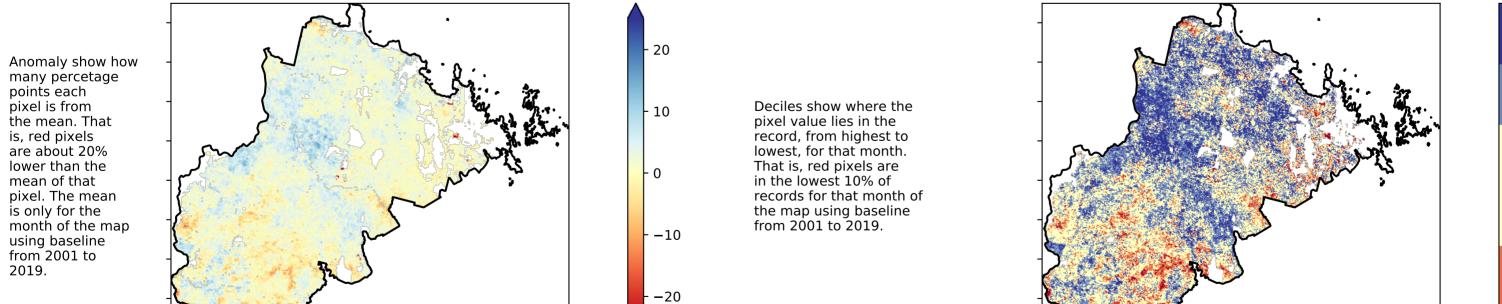
°,

A.1

2<sup>35</sup>

**Total Vegetation Cover Anomaly [%]** 

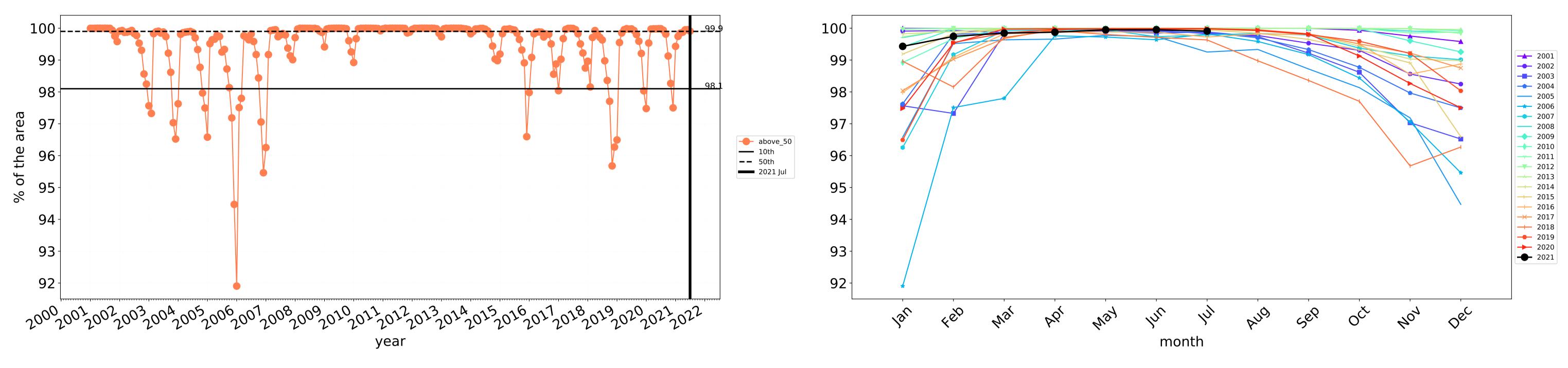
**Total Vegetation Cover Decile [%]** 



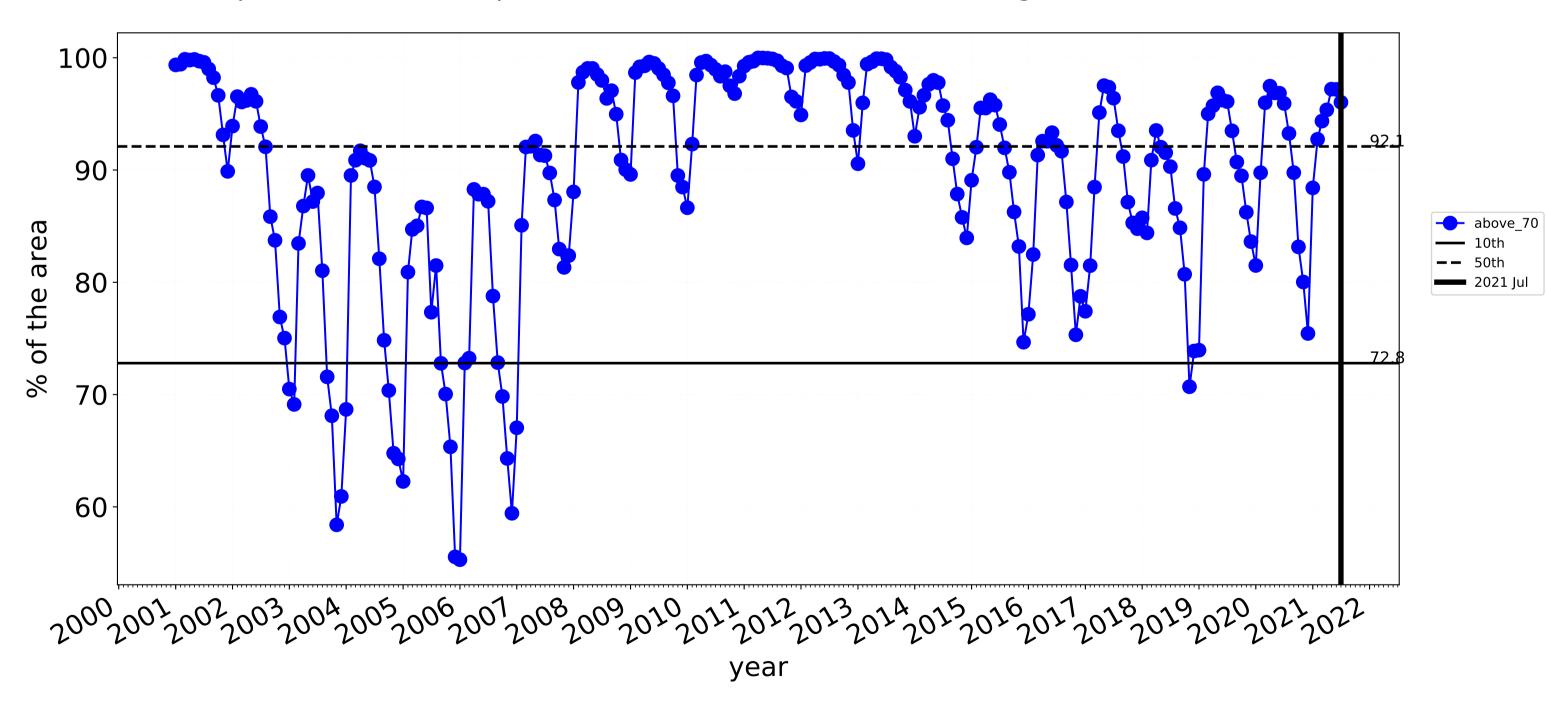


is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

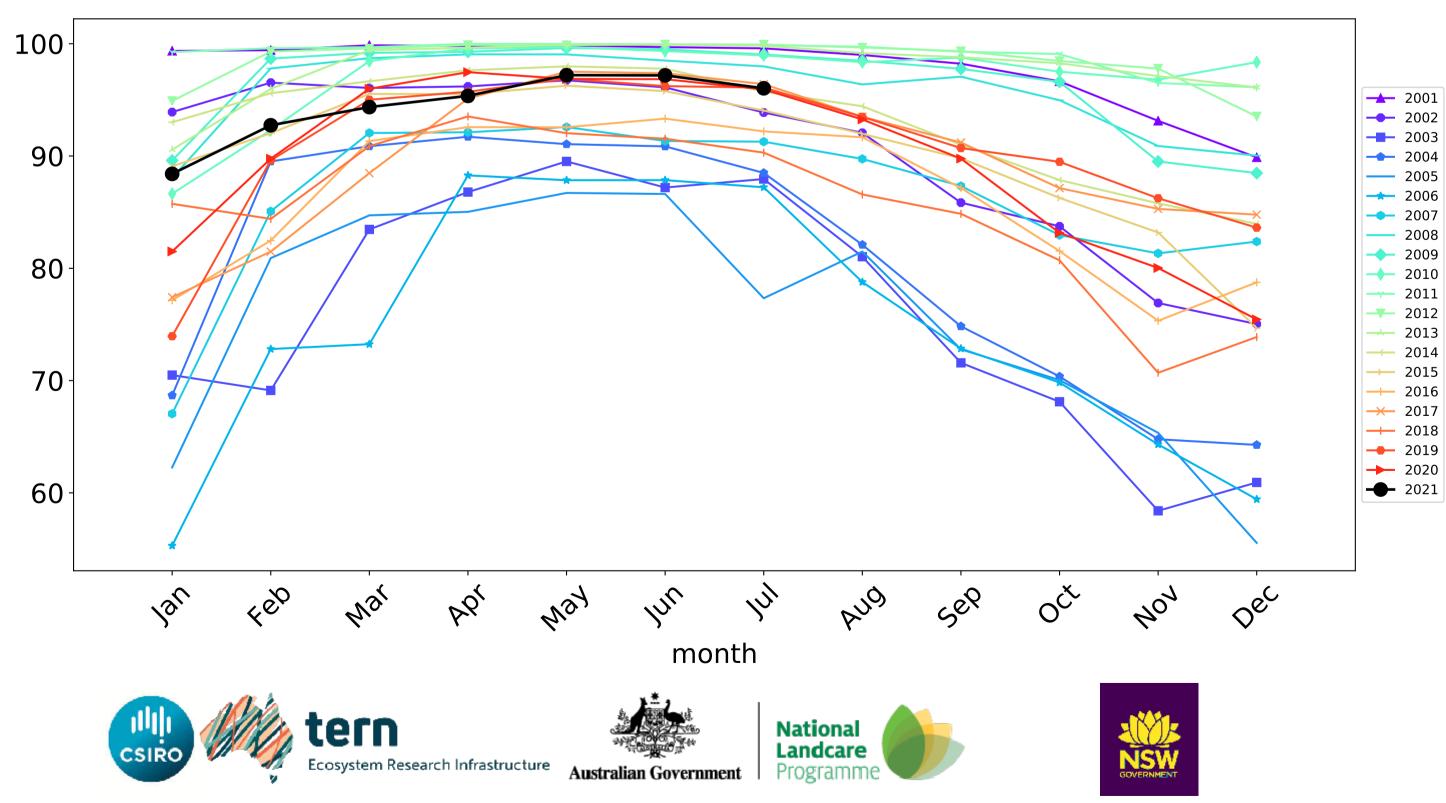


# Grazing timeseries

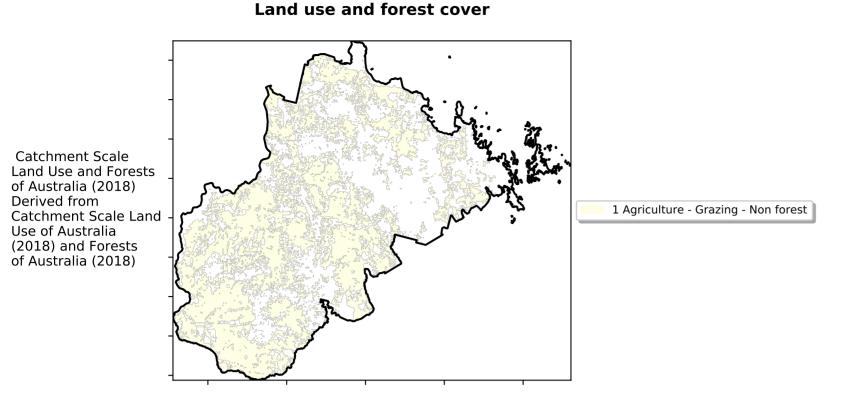


Wind erosion historical monthly area protected (Total Veg Cov >50%)

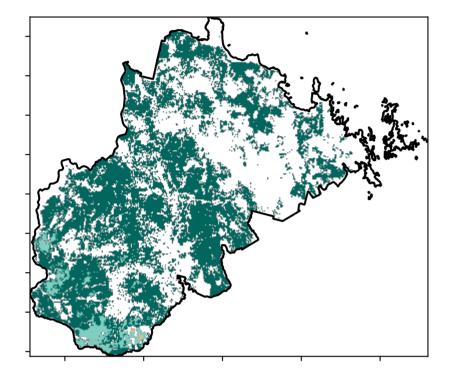
Water erosion historical monthly area protected (Total Veg Cov>70%)



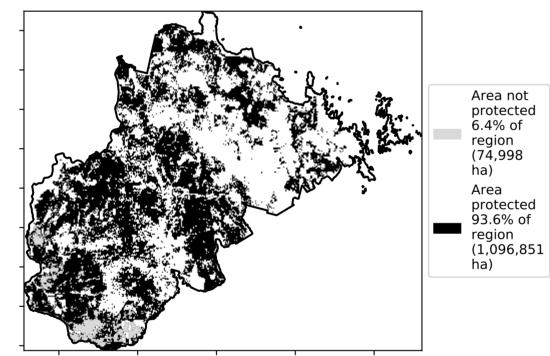
# **Grazing non forest**



Total Vegetation Cover [%]

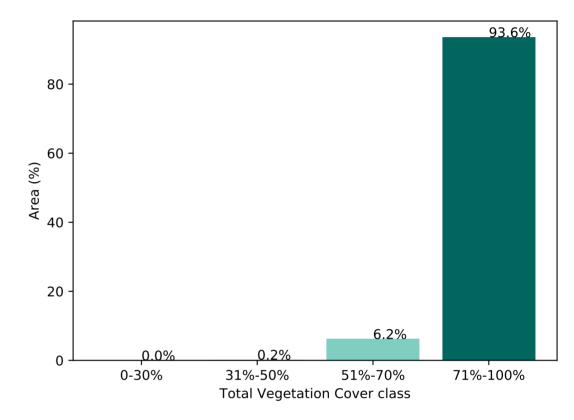


% Area protected from water erosion (>70%)

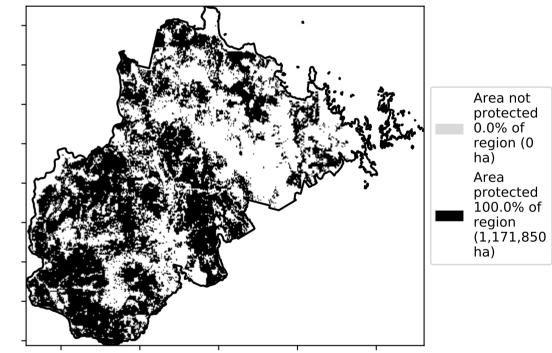


12%100% 5201000 32%50% 0.30%

Proportion of vegetation cover class in area



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



\$

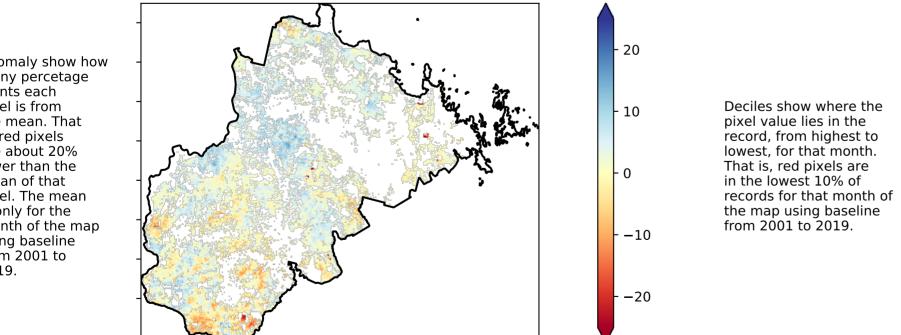
°,

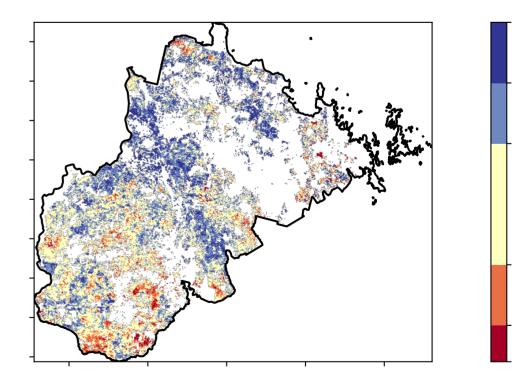
x.1

2<sup>35</sup>

**Total Vegetation Cover Anomaly [%]** 

**Total Vegetation Cover Decile [%]** 

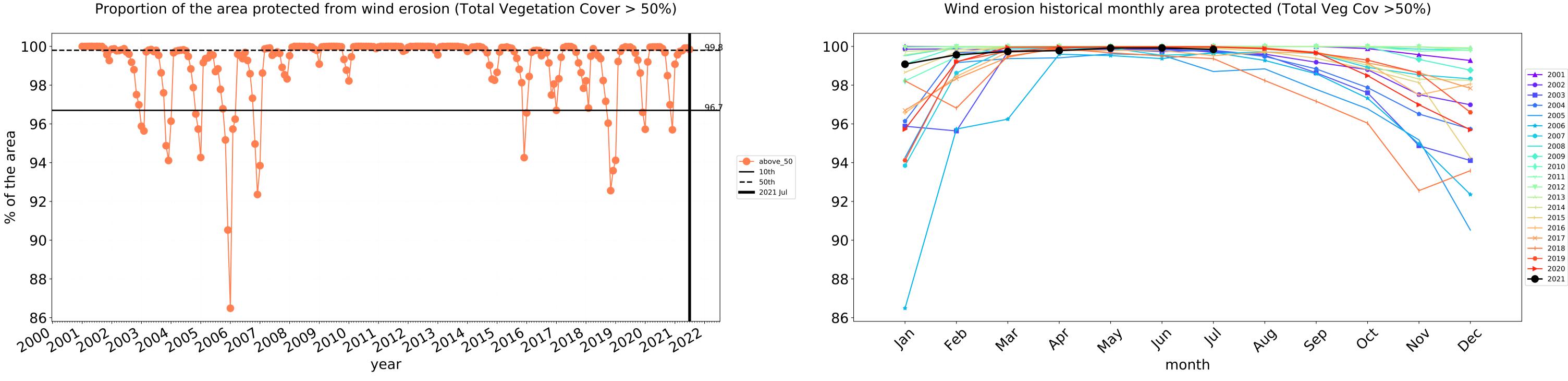




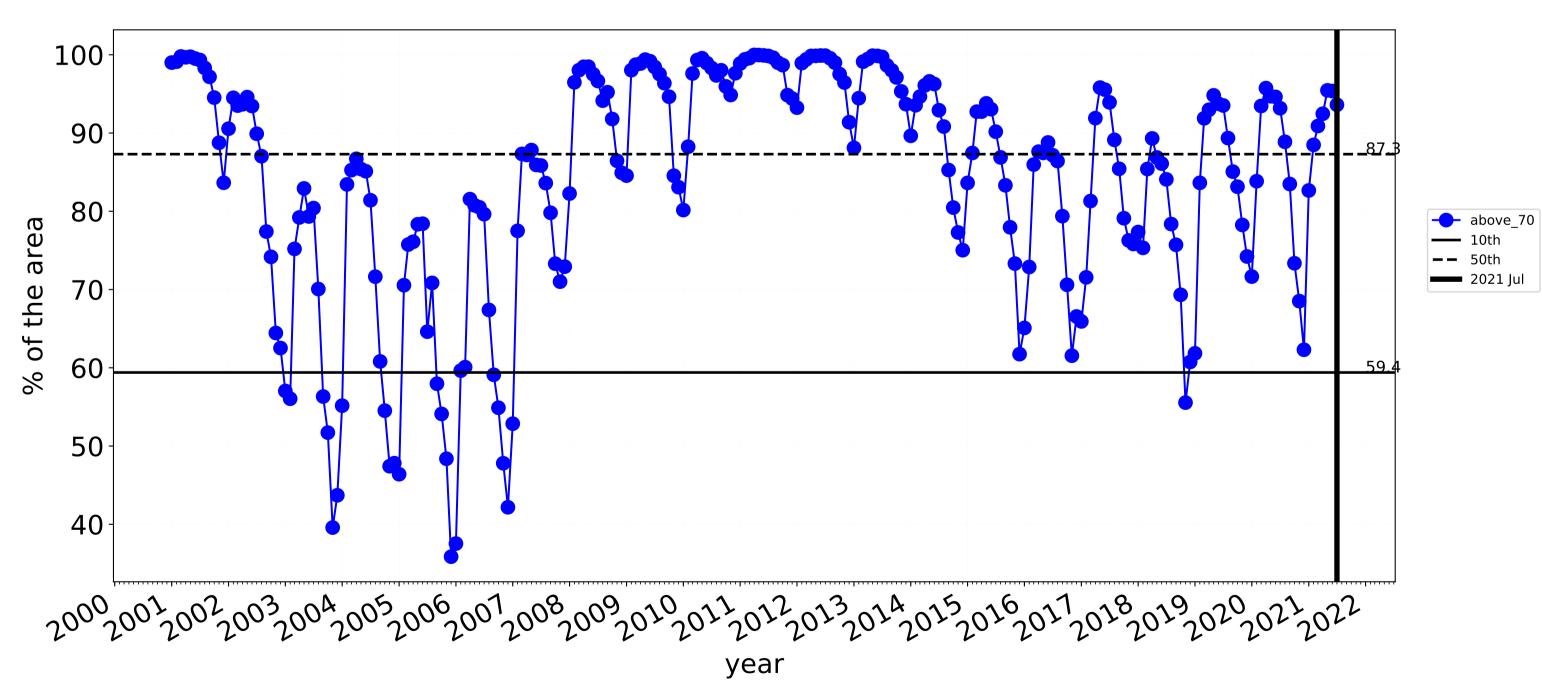


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline using baseline from 2001 to 2019.





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



# Grazing non forest timeseries

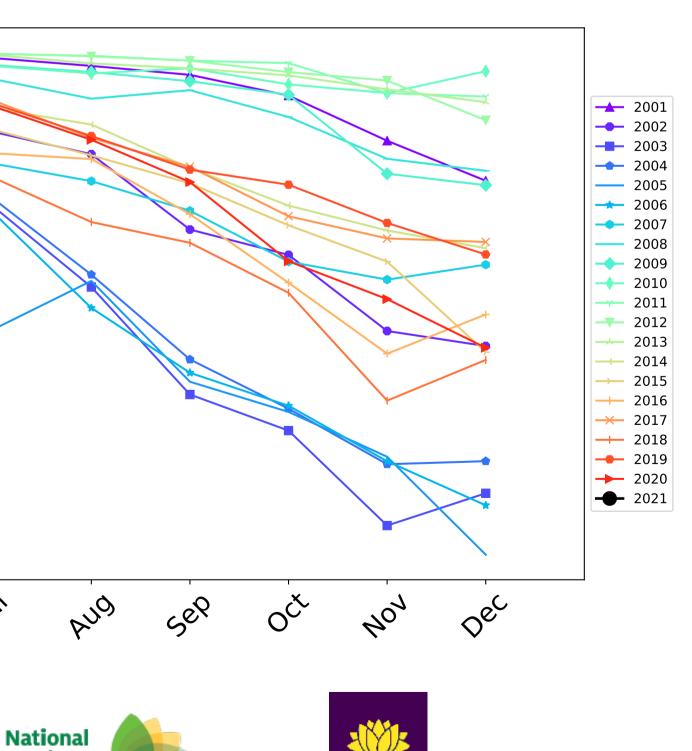
100 90-80-70-60 50 40 feb way In War Jan PQ 1's month CSIRO CONTRACTOR CONTR Australian Government

13

Landcare

Programm

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



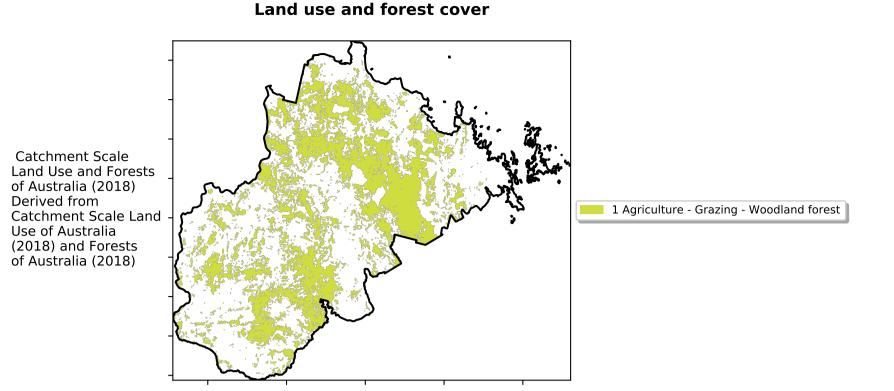
# **Grazing Woodland forest**

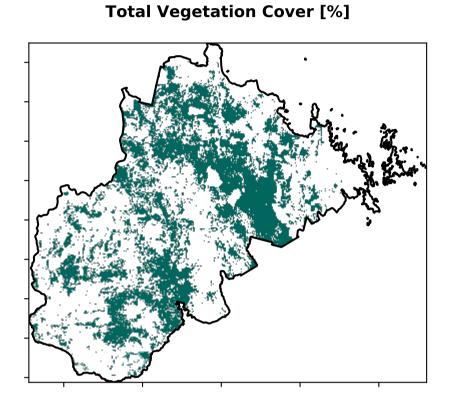
· 12%-200°

52°10'TOOL

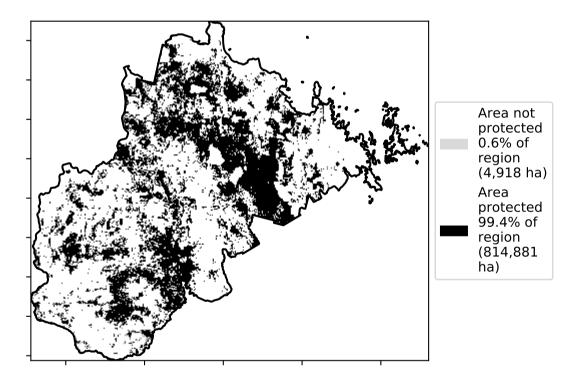
320050010

0.30%

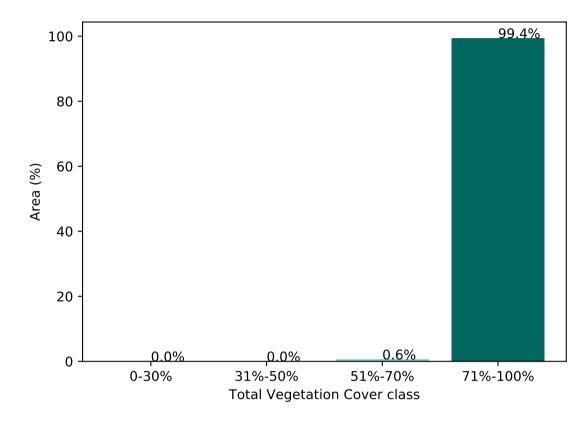




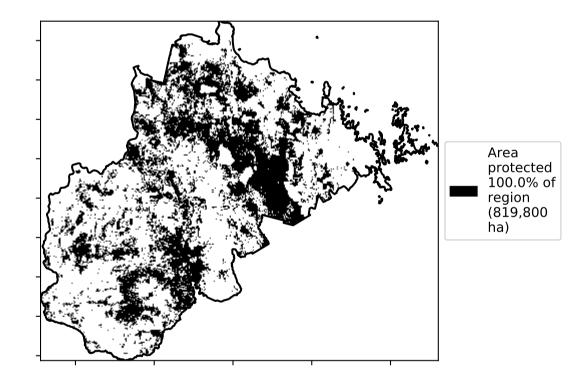
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

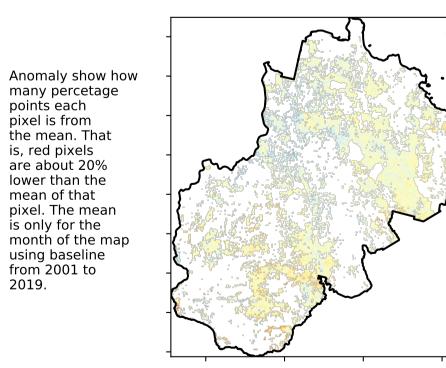


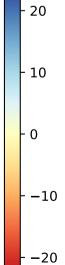
 $\sqrt{2}$ 

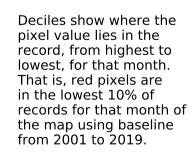
ຈິ

x.1

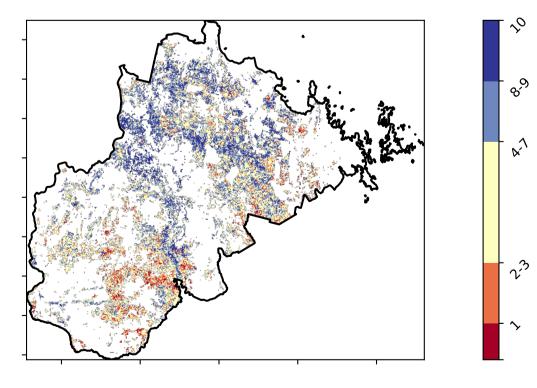
**Total Vegetation Cover Anomaly [%]** 





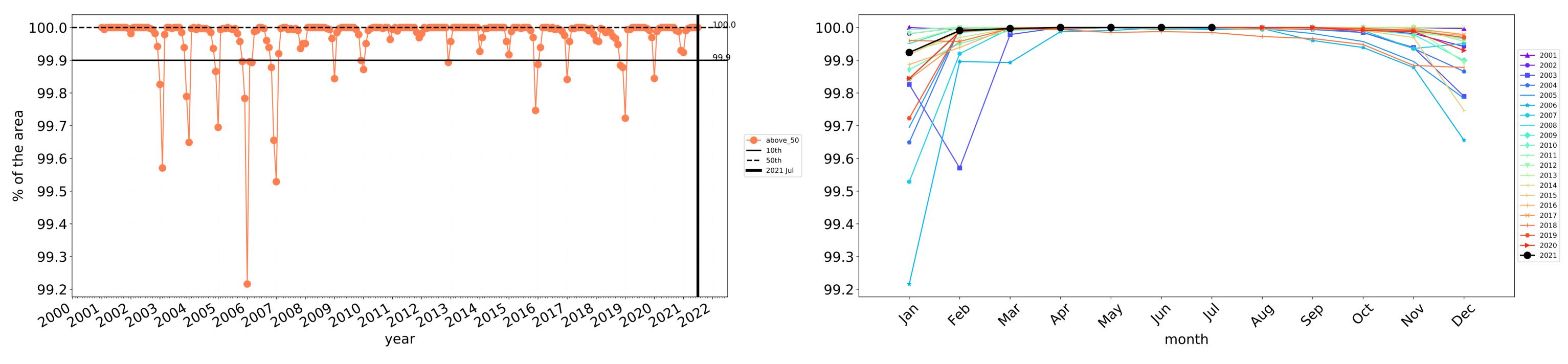


**Total Vegetation Cover Decile [%]** 

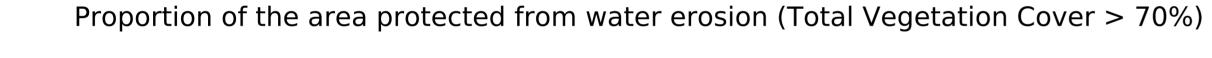


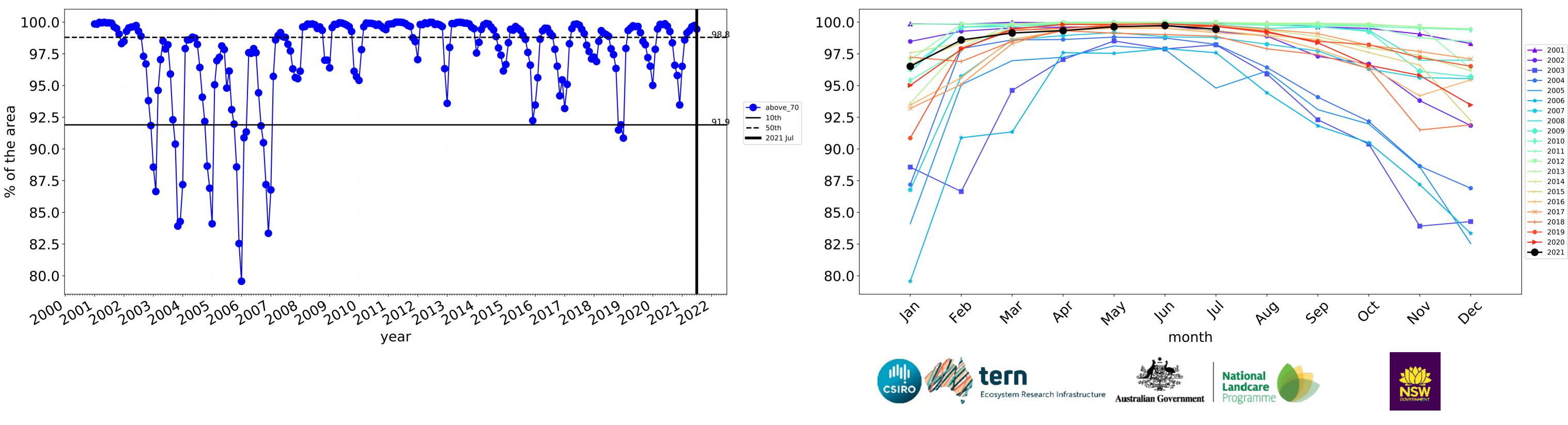


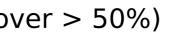
# **Grazing Woodland forest timeseries**



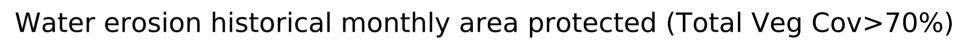
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



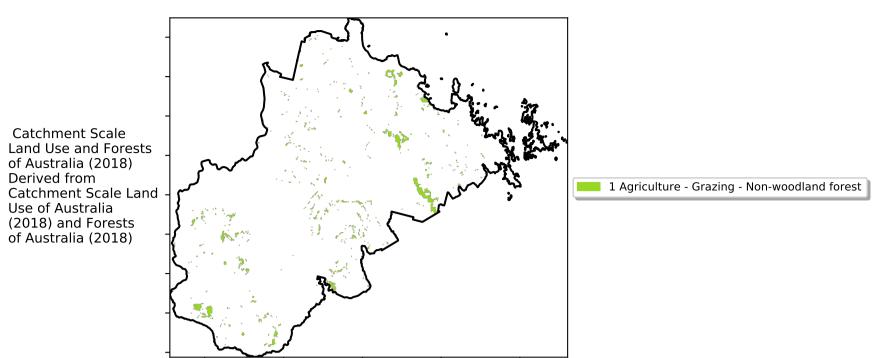




Wind erosion historical monthly area protected (Total Veg Cov >50%)

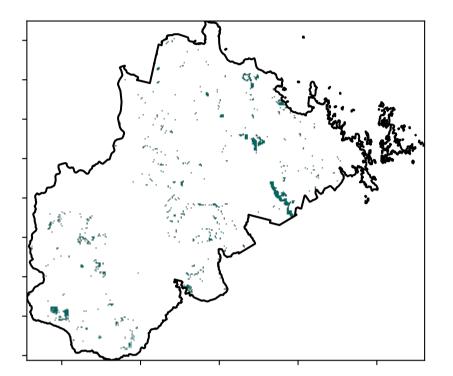


# Grazing - Forest (non woodland)

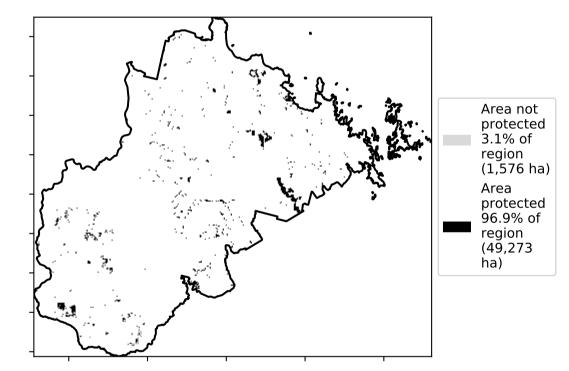


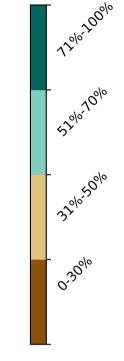
Land use and forest cover

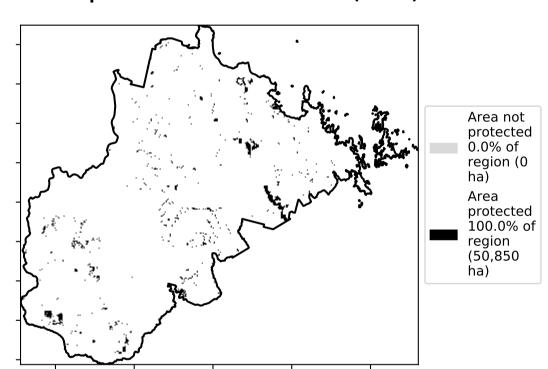
Total Vegetation Cover [%]



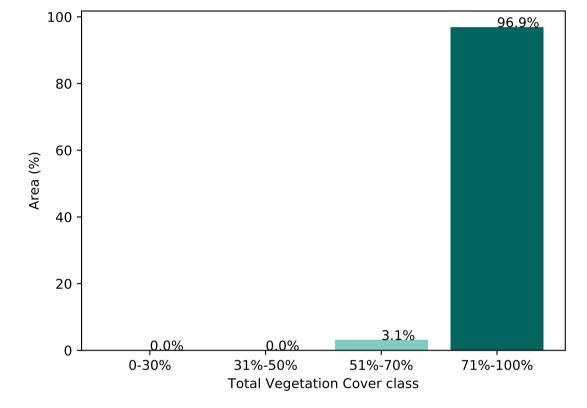
% Area protected from water erosion (>70%)







Proportion of vegetation cover class in area



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

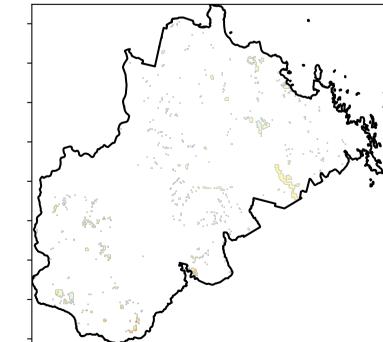
\$

ଚ୍ଚ

A.1

· 2<sup>?3</sup>

**Total Vegetation Cover Anomaly [%]** 

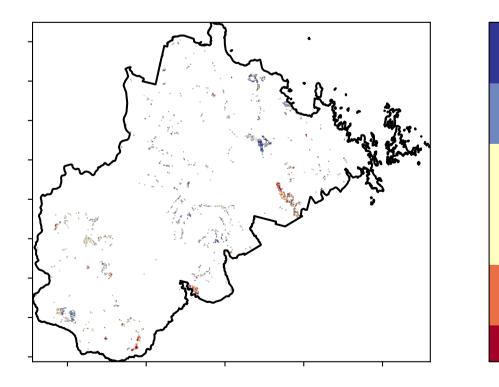


- 10 0 -10

-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

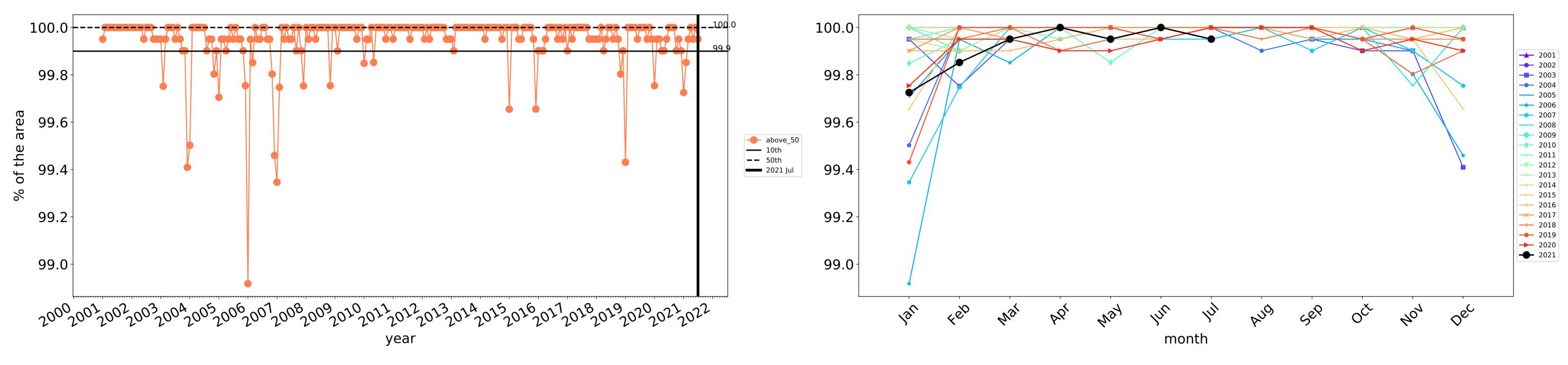
records for that month of

the map using baseline from 2001 to 2019.

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 map using baseline from 2001 to 2019.

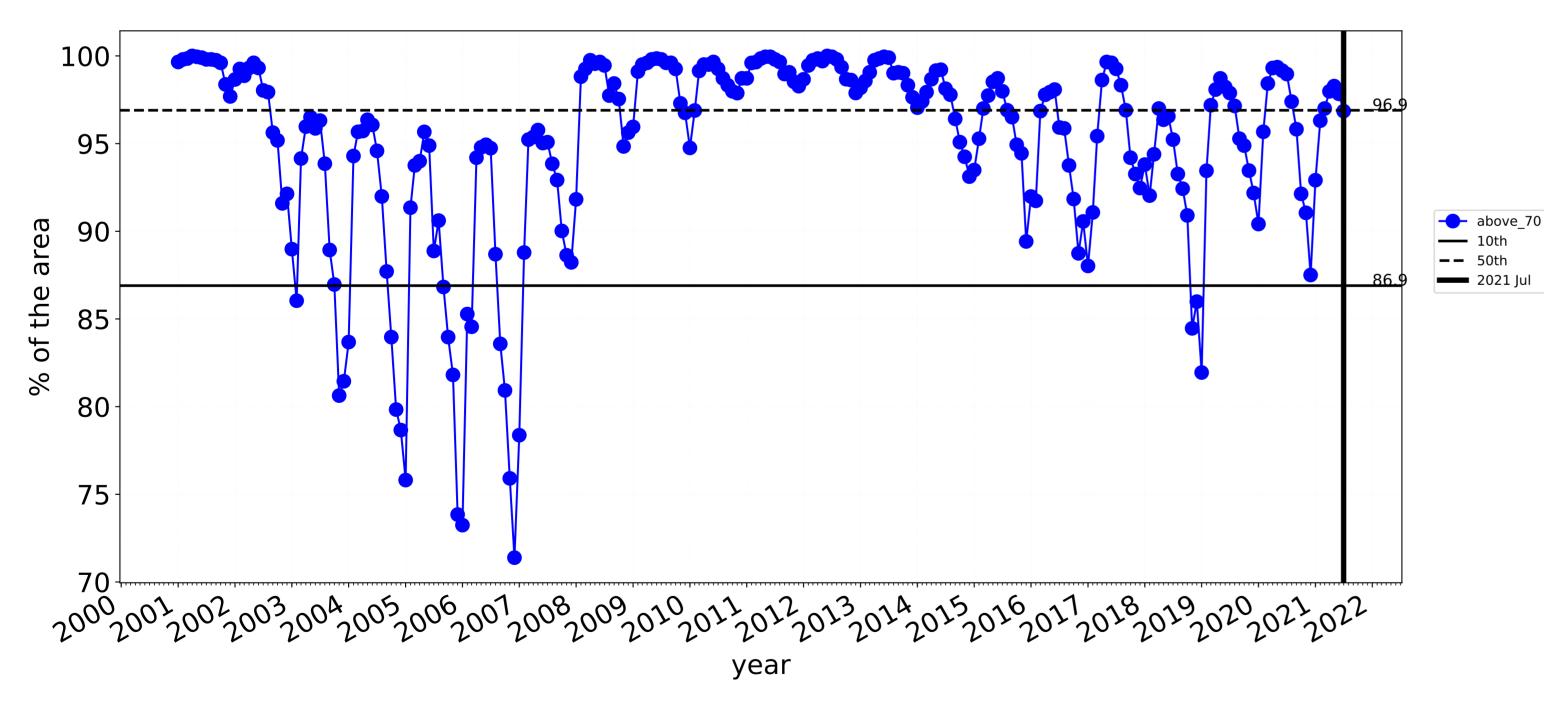


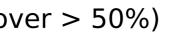
# Grazing - Forest (non woodland) timeseries



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

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



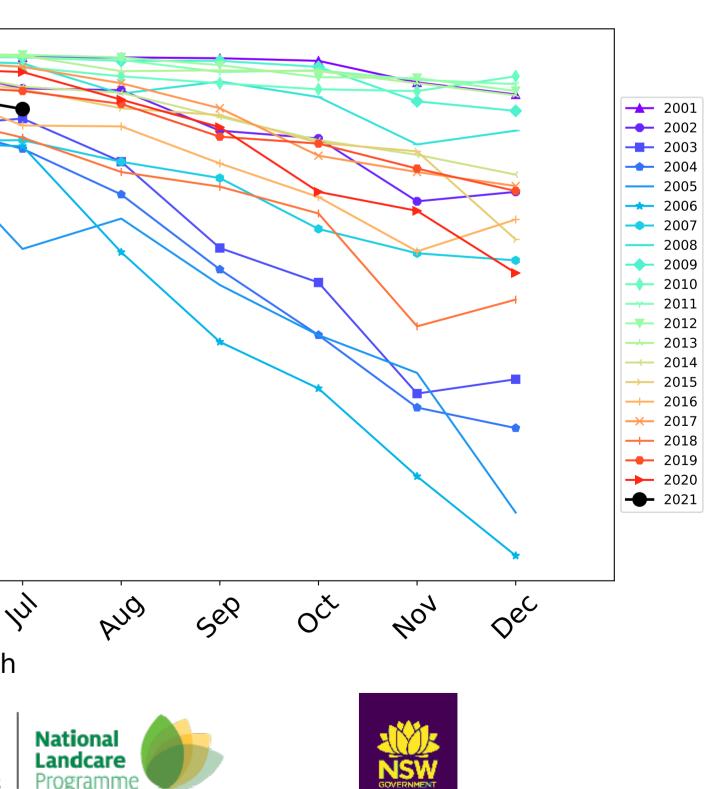


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

Programme

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

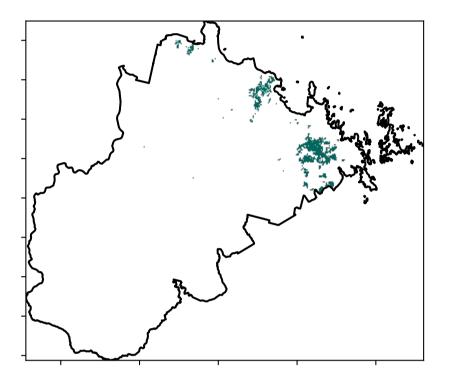


# Irrigation

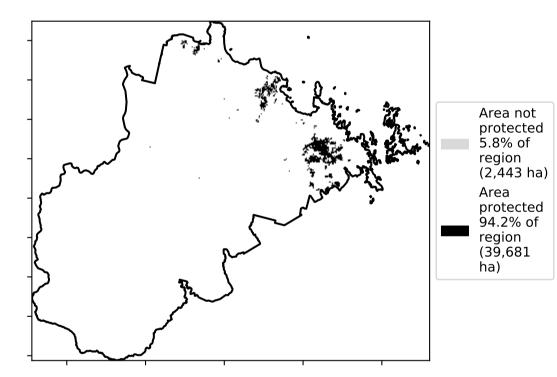
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

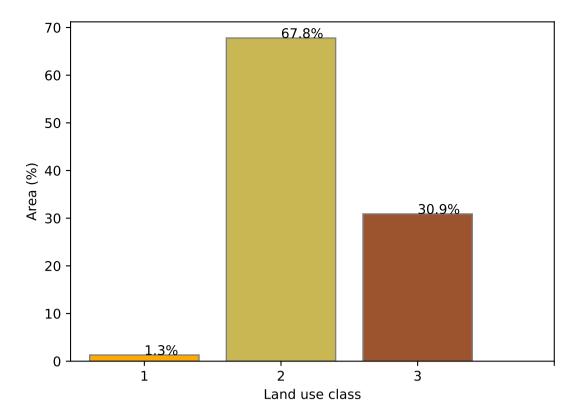
**Total Vegetation Cover [%]** 

Land use and forest cover



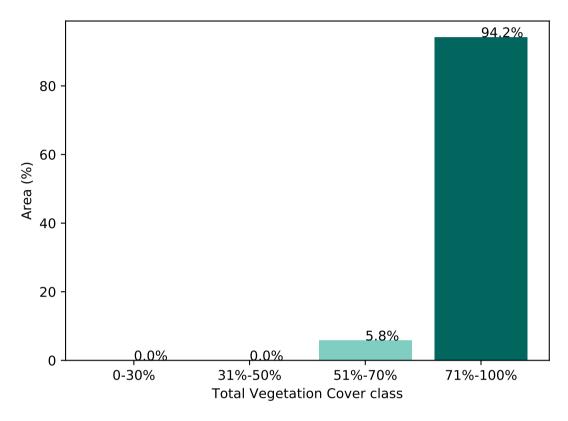
% Area protected from water erosion (>70%)



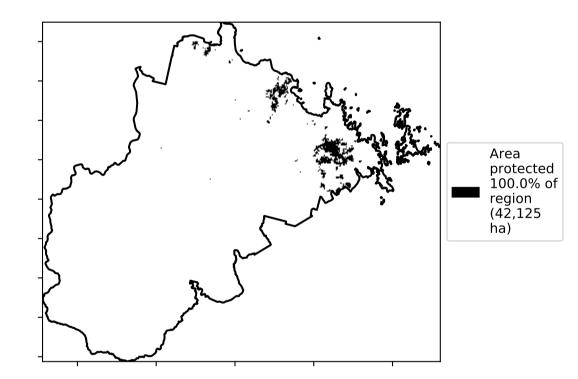


### Proportion of each land class in area

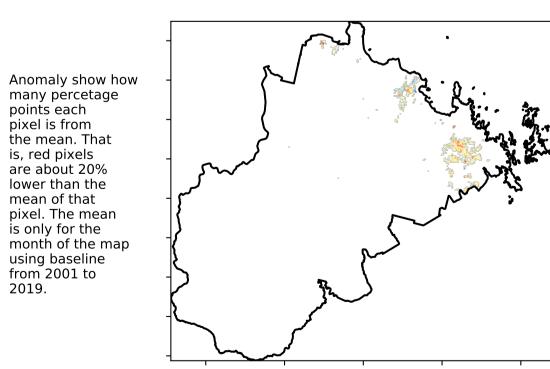
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



is, red pixels

mean of that

- 10 0 -10

-20

- 20

12% 100°1

52°10010

320050010

0.30%

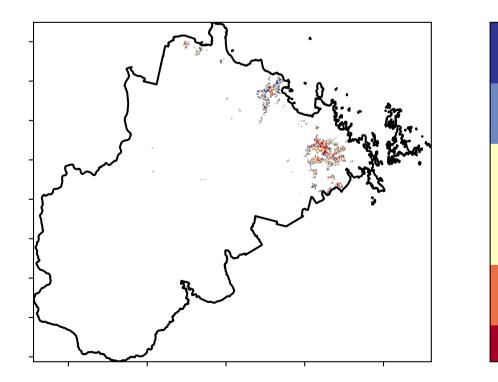
**Total Vegetation Cover Decile [%]** 

 $\sqrt{2}$ 

୍ଚ୍ଚ

A.1

· 2<sup>?3</sup>



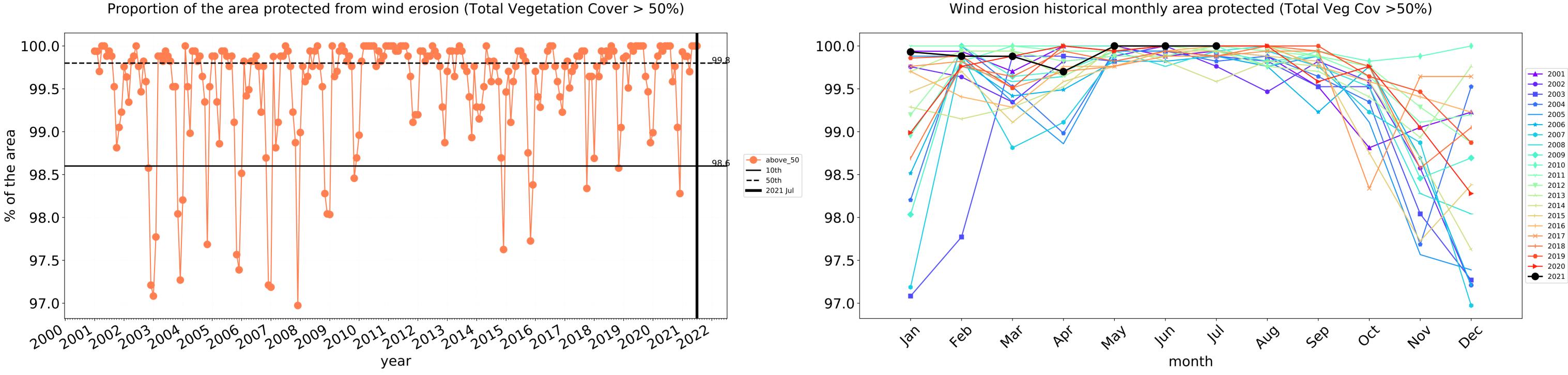


Deciles show where the pixel value lies in the

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

records for that month of

the map using baseline from 2001 to 2019.



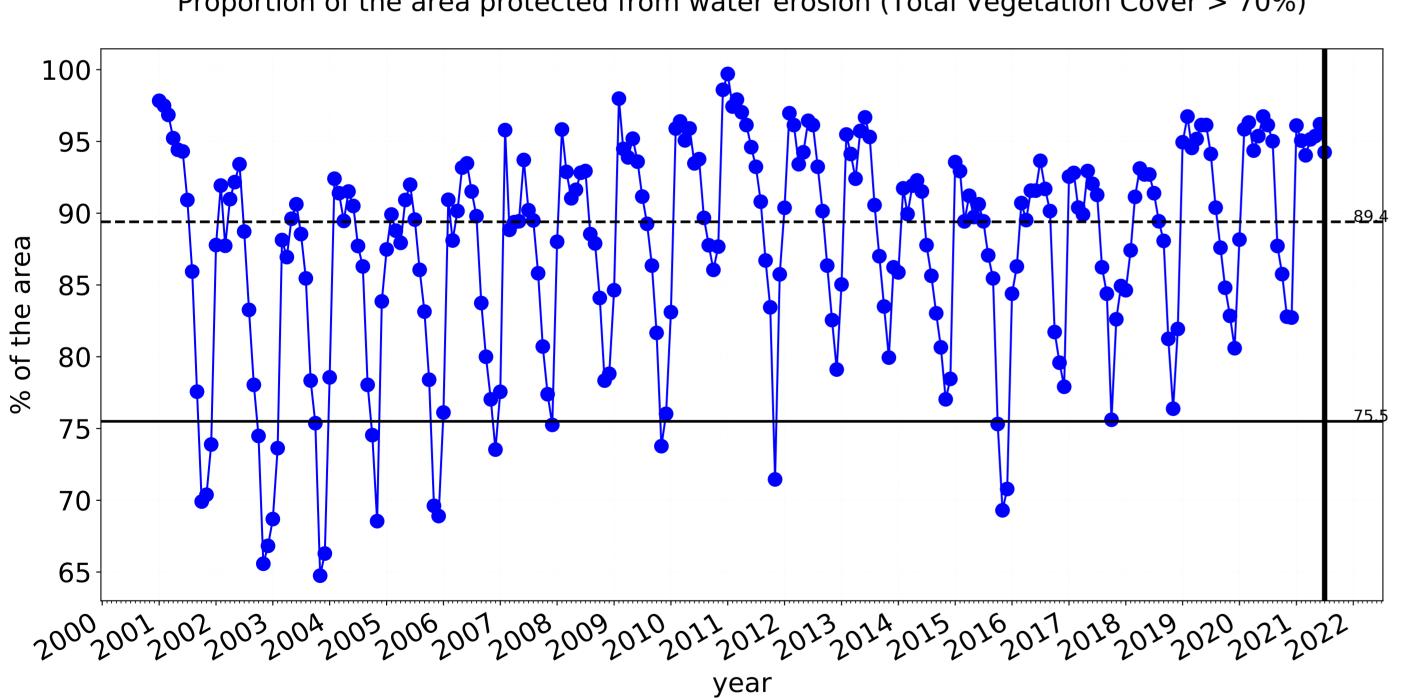
--- above\_70

**——** 10th

**——** 50th

**——** 2021 Jul

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



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

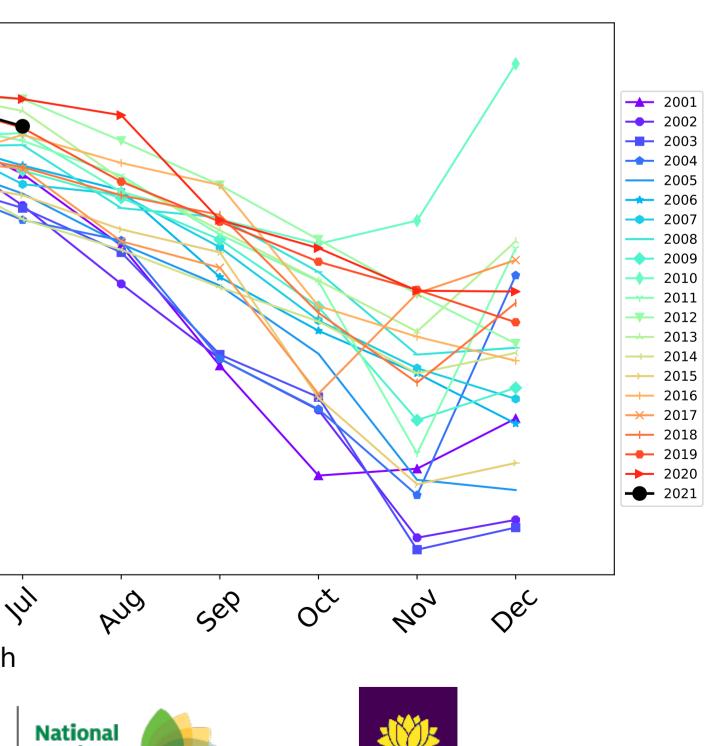
# Irrigation timeseries

100-95 90 85 80 75 70 65 Jan feb In May Mai Þb, month tern Ecosystem Research Infrastructure Australian Government

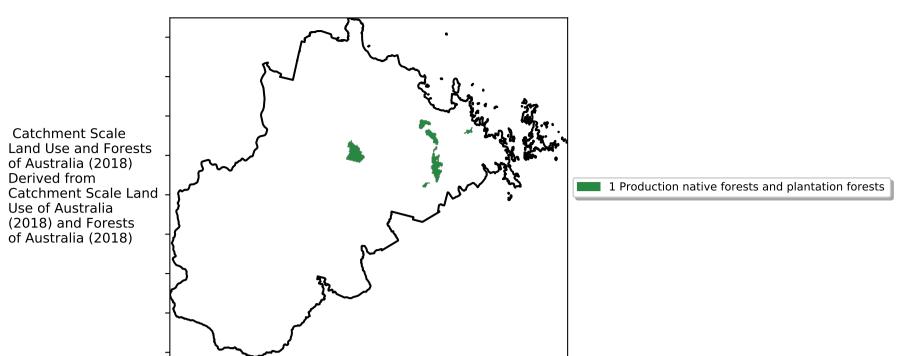
Landcare

Programme

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



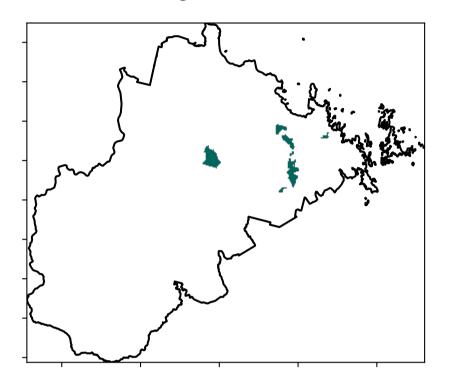
# **Production native forests and plantation forests**



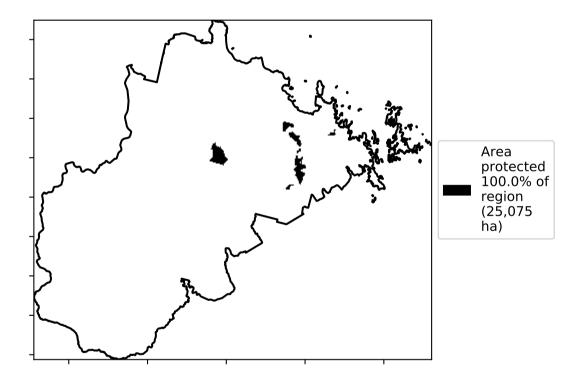
Catchment Scale Land

Total Vegetation Cover [%]

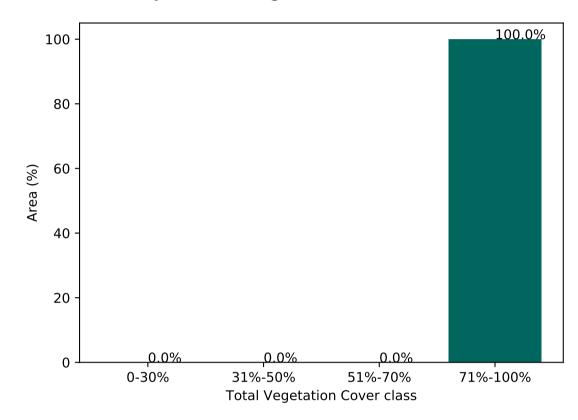
Land use and forest cover



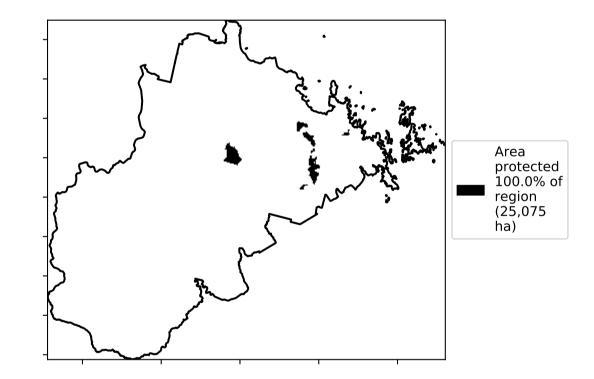








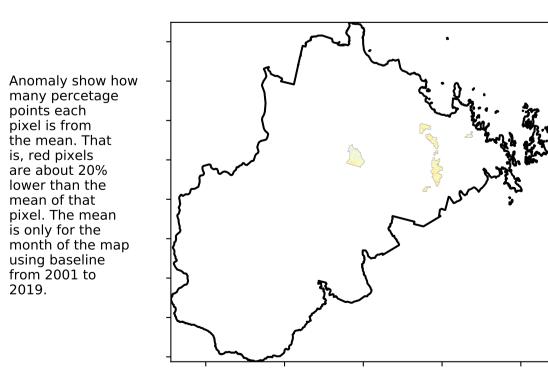
% Area protected from wind erosion (>50%)



 $\sqrt{2}$ 

A.1

**Total Vegetation Cover Anomaly [%]** 



is, red pixels

- 10 0 -10

-20

- 20

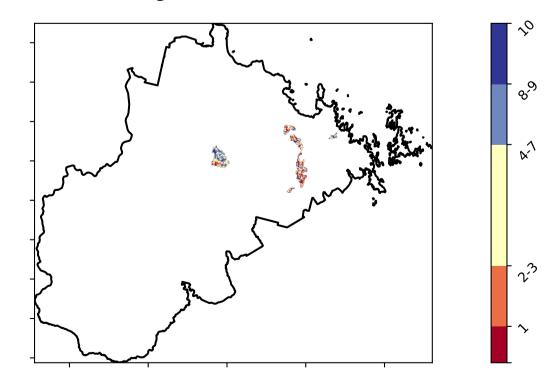
12001000

52°1070010

3201050010

0.30%

**Total Vegetation Cover Decile [%]** 





Deciles show where the pixel value lies in the

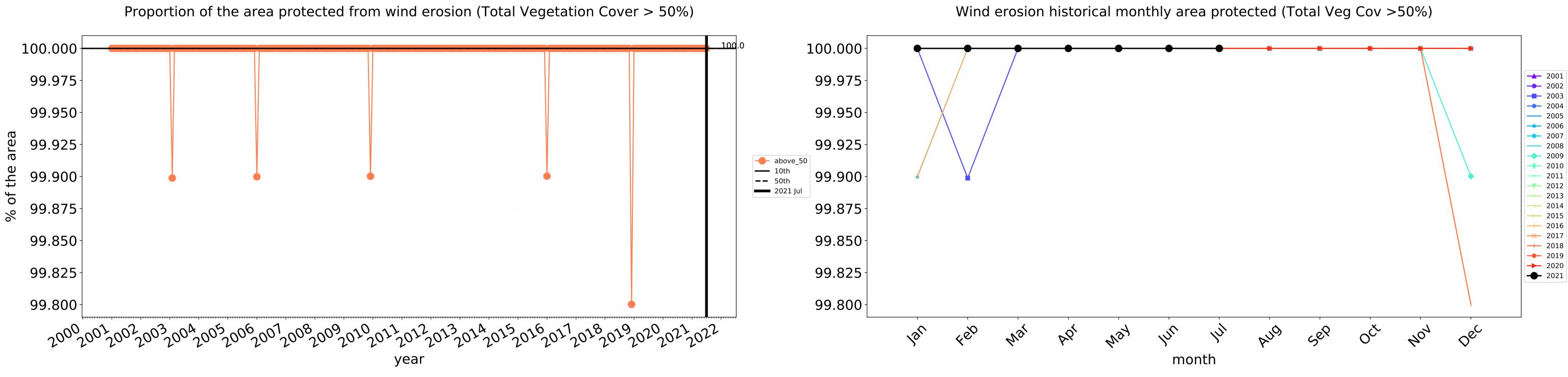
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

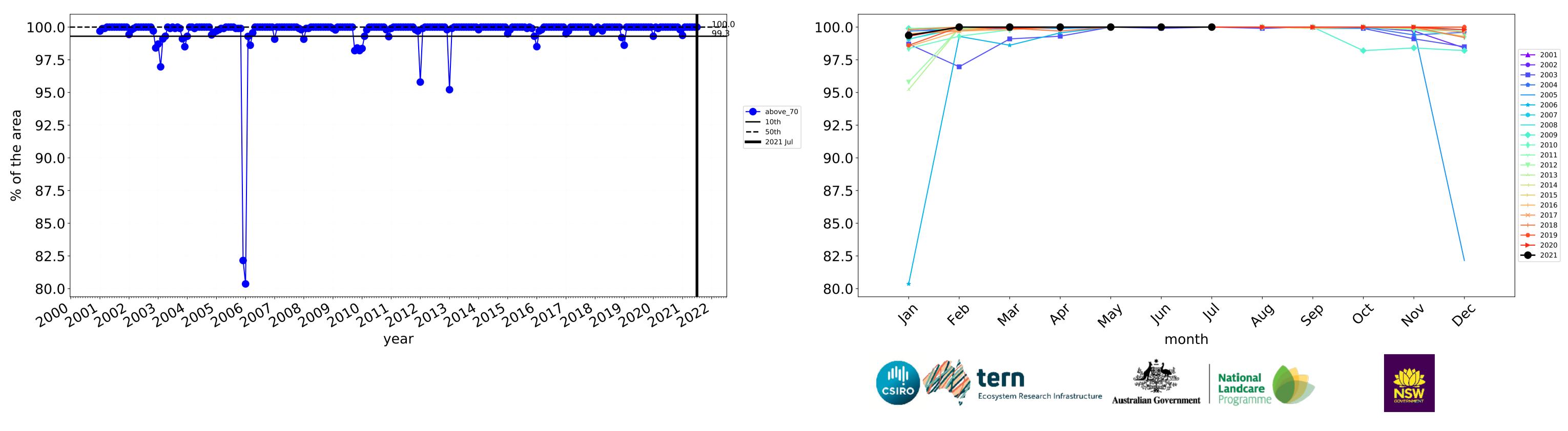
the map using baseline from 2001 to 2019.



# Production native forests and plantation forests timeseries



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



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

# Whitsunday\_(R) (2,358,250 ha and no data 23,626 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	2,358,250	100.0% 2,357,575	99.8% 2,354,050	95.8% 2,259,375	85.1% 2,007,600	47.7% 1,123,875	12.9% 304,425
Conservation and natural environments	170,950	99.8% 170,575	99.4% 169,975	96.8% 165,450	87.9% 150,275	60.7% 103,775	27.9% 47,625
Conservation and natural environments non forest	28,475	99.6% 28,375	98.9% 28,150	92.2% 26,250	55.6% 15,825	6.9% 1,975	1.3% 375
Conservation and natural environments Woodland forest	57,225	100.0% 57,225	99.9% 57,175	98.7% 56,475	94.3% 53,975	70.7% 40,450	25.1% 14,350
Conservation and natural environments Forest (non woodland)	85,250	99.7% 84,975	99.3% 84,650	97.0% 82,725	94.4% 80,475	72.0% 61,350	38.6% 32,900
Agriculture	2,084,925	100.0% 2,084,850	99.9% 2,083,050	96.0% 2,001,450	85.5% 1,783,525	47.1% 982,250	11.8% 245,975
Grazing	2,042,500	100.0% 2,042,425	99.9% 2,040,625	96.0% 1,961,450	85.9% 1,754,475	47.7% 975,000	12.0% 244,725
Grazing non forest	1,171,850	100.0% 1,171,800	99.8% 1,170,000	93.6% 1,096,950	78.8% 923,175	37.2% 436,325	8.2% 95,700
Grazing Woodland forest	819,800	100.0% 819,800	100.0% 819,800	99.4% 815,250	95.9% 785,900	62.6% 512,800	17.0% 139,125
Grazing - Forest (non woodland)	50,850	100.0% 50,825	100.0% 50,825	96.9% 49,250	89.3% 45,400	50.9% 25,875	19.5% 9,900
Irrigation	42,125	100.0% 42,125	100.0% 42,125	94.2% 39,700	68.2% 28,750	16.9% 7,100	2.9% 1,225
Production native forests and plantation forests	25,075	100.0% 25,075	100.0% 25,075	100.0% 25,075	100.0% 25,075	86.3% 21,650	28.6% 7,175

