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

# Date: October 2019

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

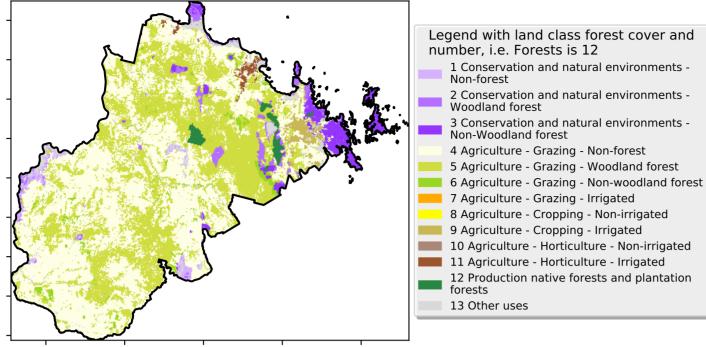


# **Vegetation Cover Oct 2019**

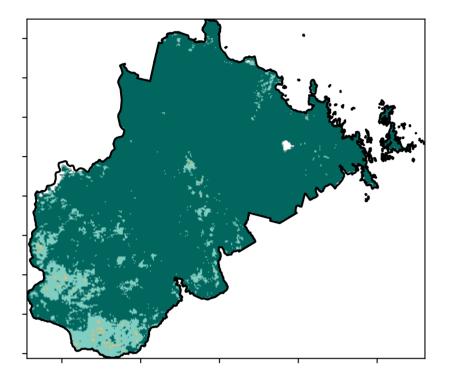
#### Land use and forest cover

#### Proportion of each land class in area

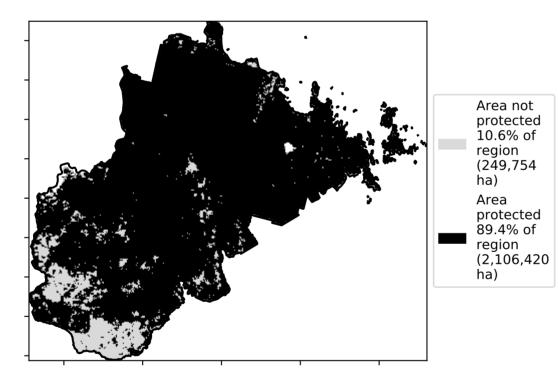


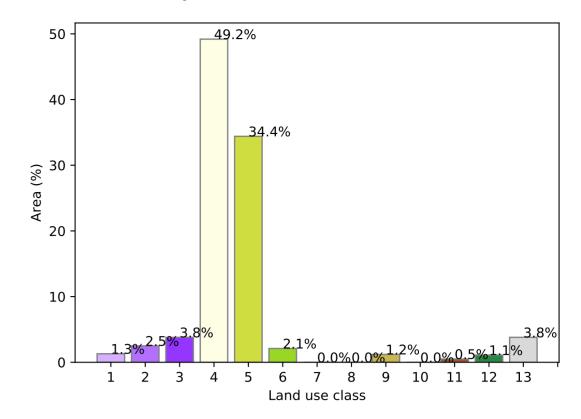


### **Total Vegetation Cover [%]**

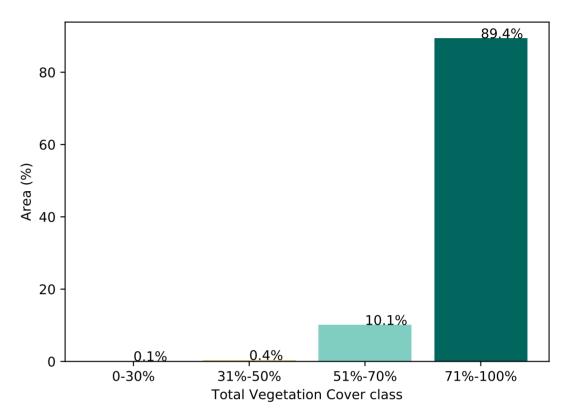


#### % Area protected from water erosion (>70%)

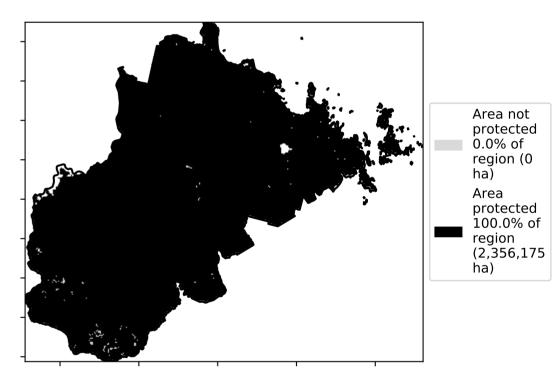




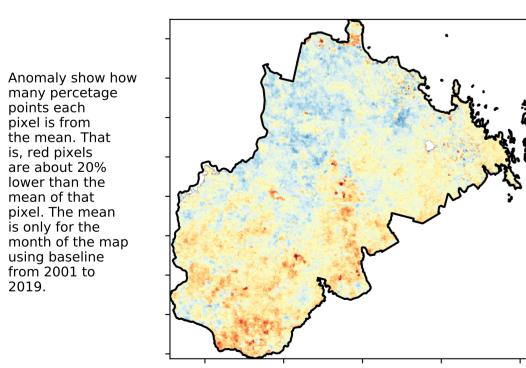
#### Proportion of vegetation cover class in area

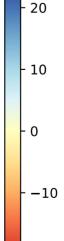


#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 





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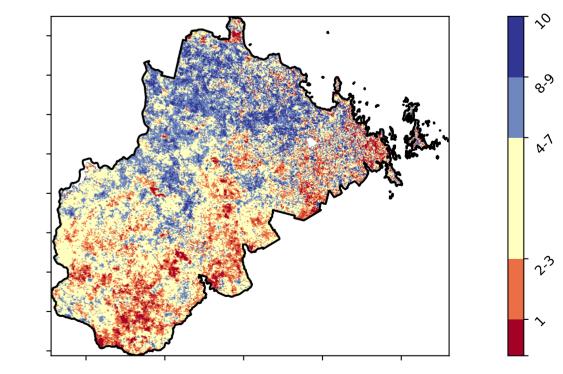
12%200%

52% 70%

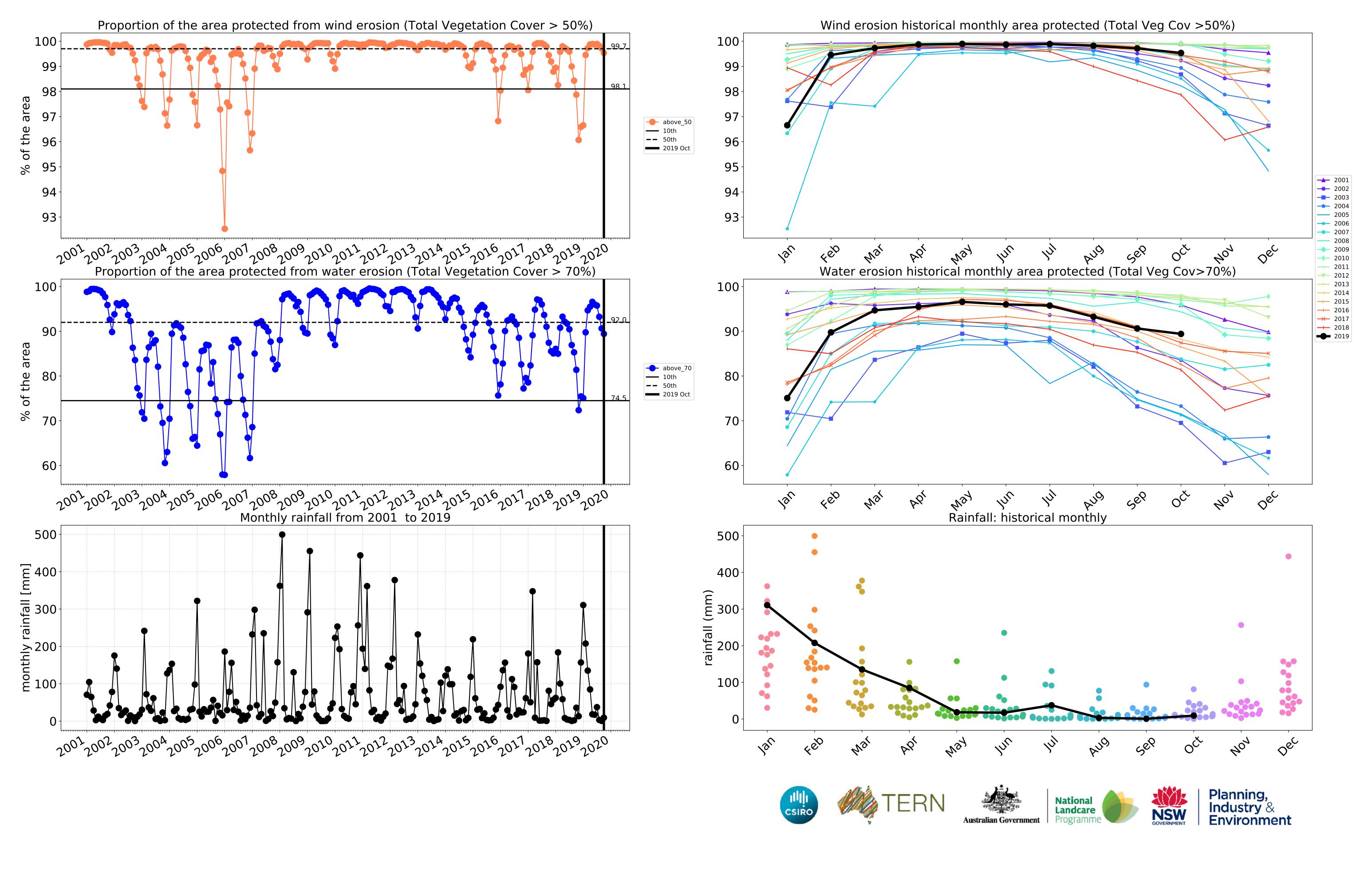
32%50%

0.30%

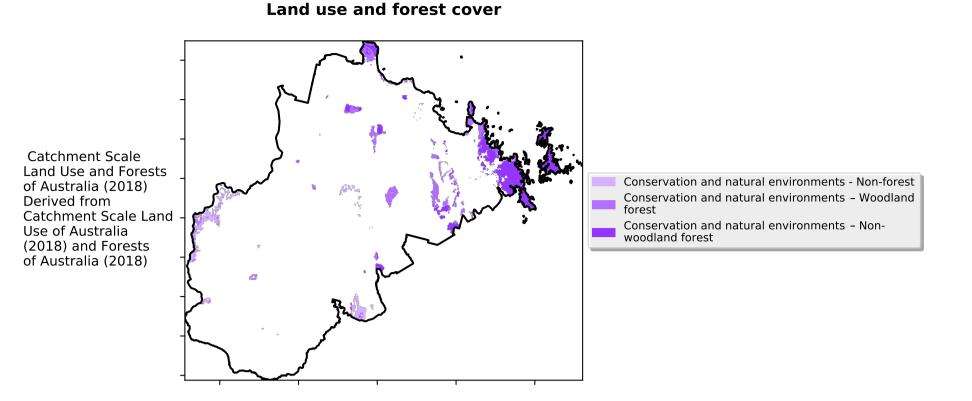
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. **Total Vegetation Cover Decile [%]** 



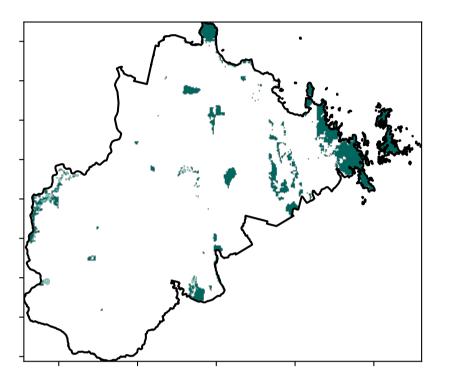




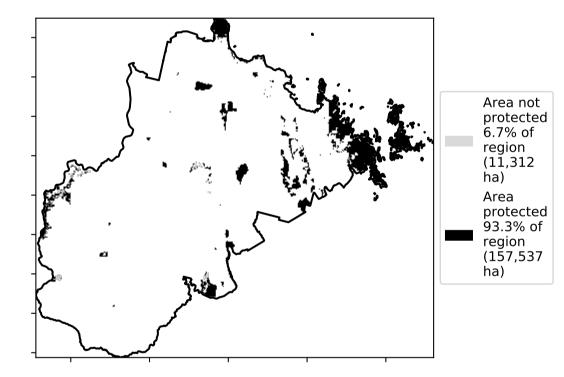
### **Conservation and natural environments**



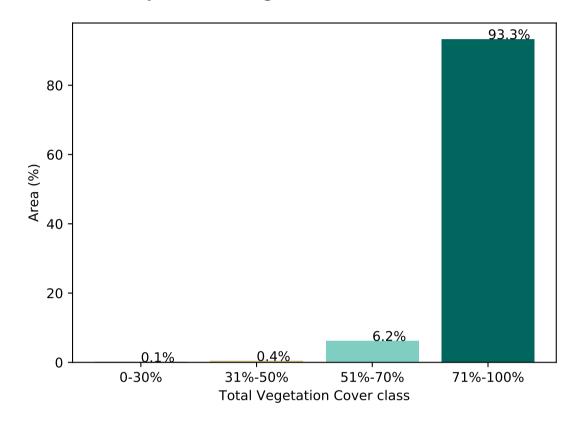
Total Vegetation Cover [%]



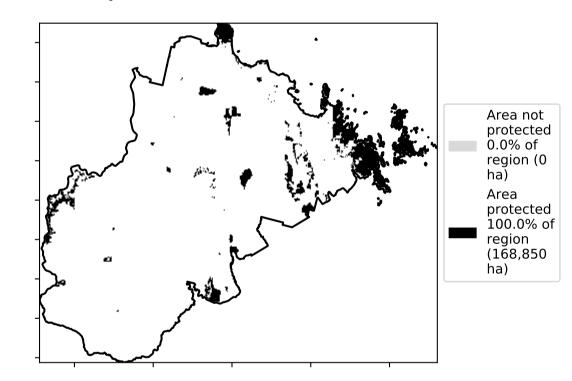
% Area protected from water erosion (>70%)



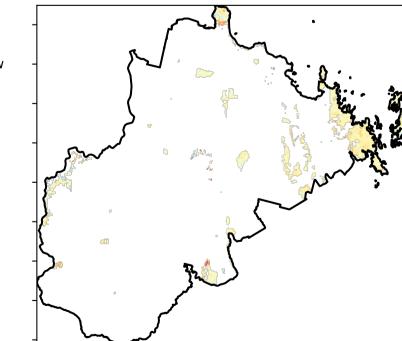




#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



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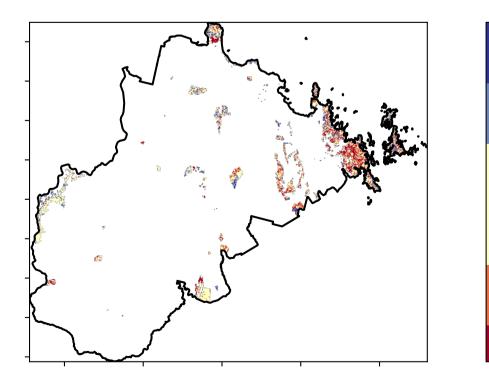
**Total Vegetation Cover Decile [%]** 

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Deciles show where the pixel value lies in the

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

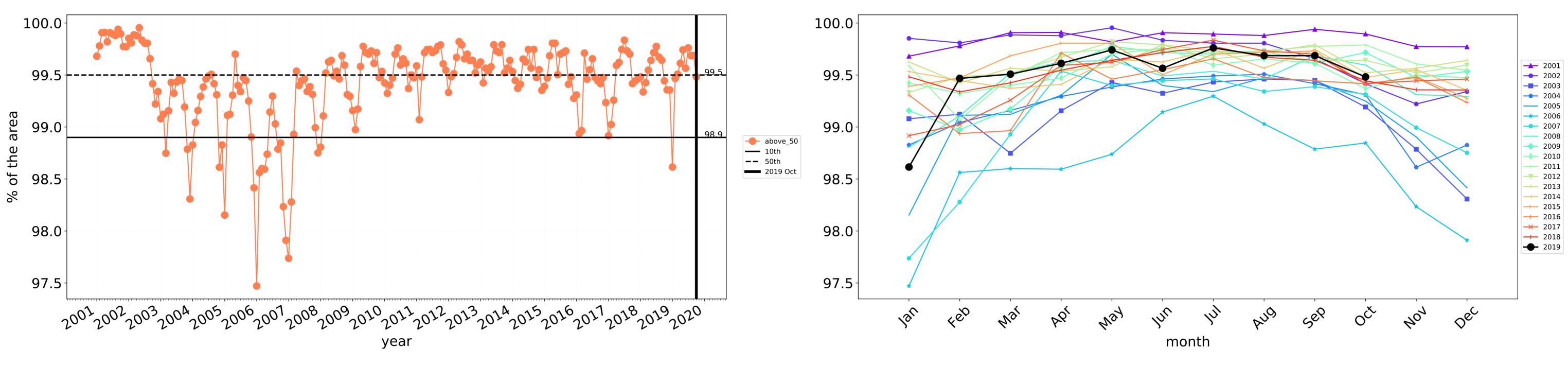
in the lowest 10% of

records for that month of

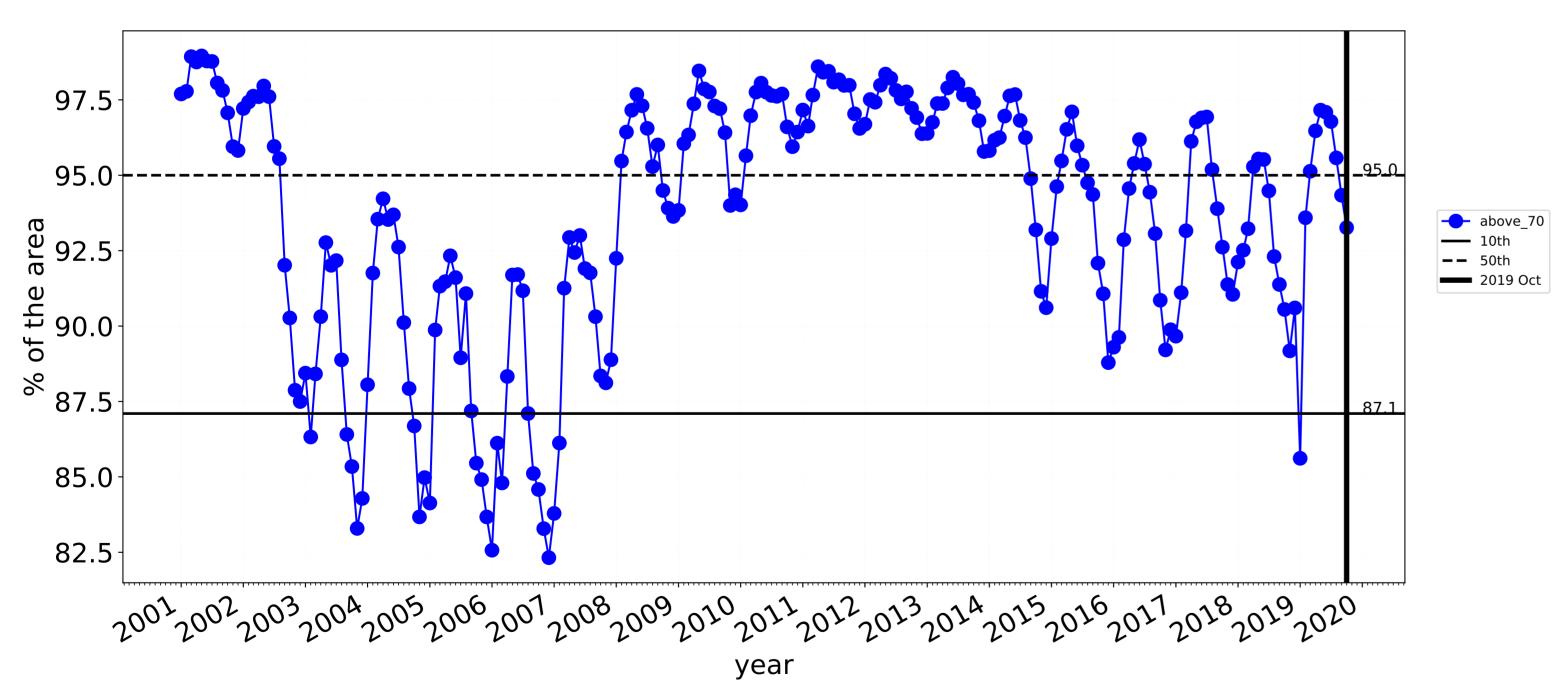
the map using baseline from 2001 to 2019.

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.





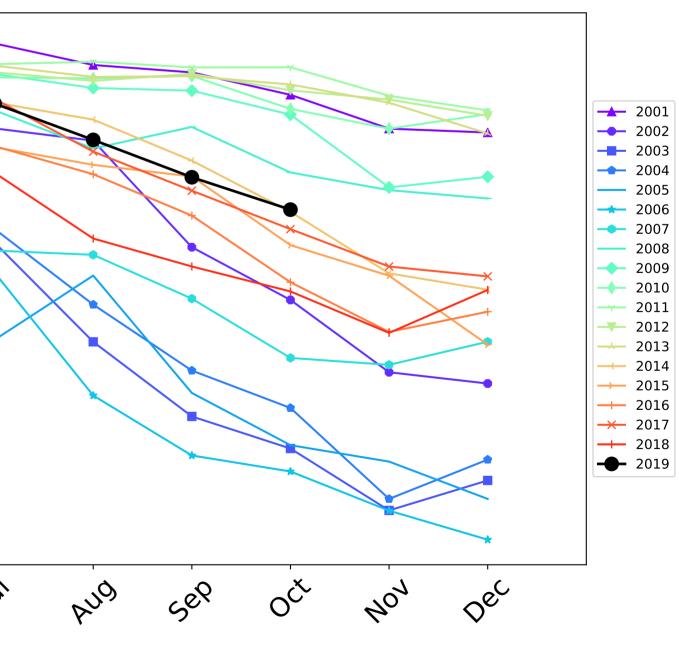
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



97.5 95.0 92.5 90.0 87.5 85.0-82.5 lar feb May PQ In In In Mai month ERN (SOR) Australian Government

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

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

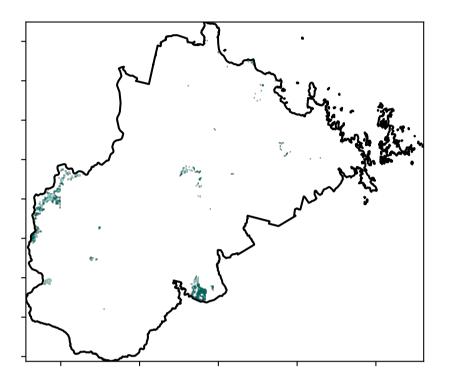




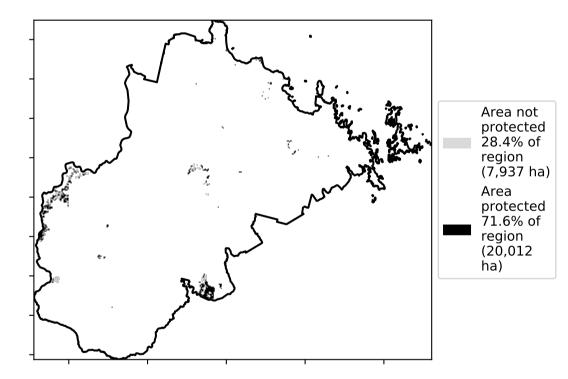
### **Conservation and natural environments non forest**

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) Conservation and natural environments - Non-forest

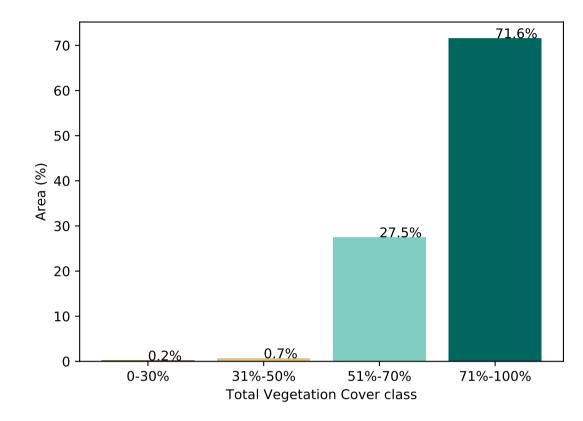
**Total Vegetation Cover [%]** 



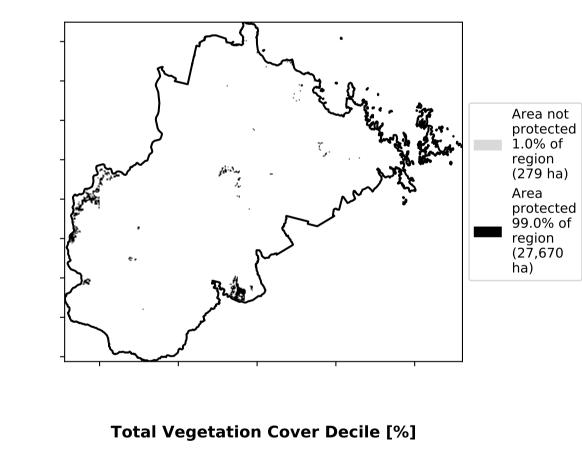
% Area protected from water erosion (>70%)



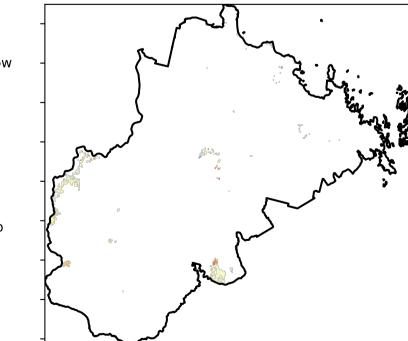
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



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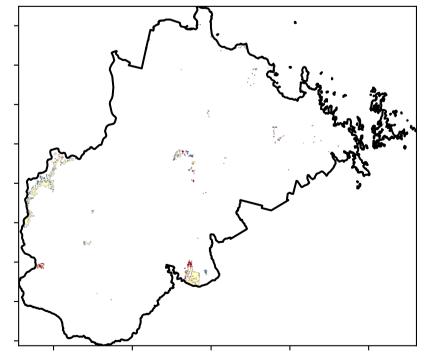
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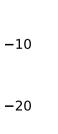
Deciles show where the pixel value lies in the

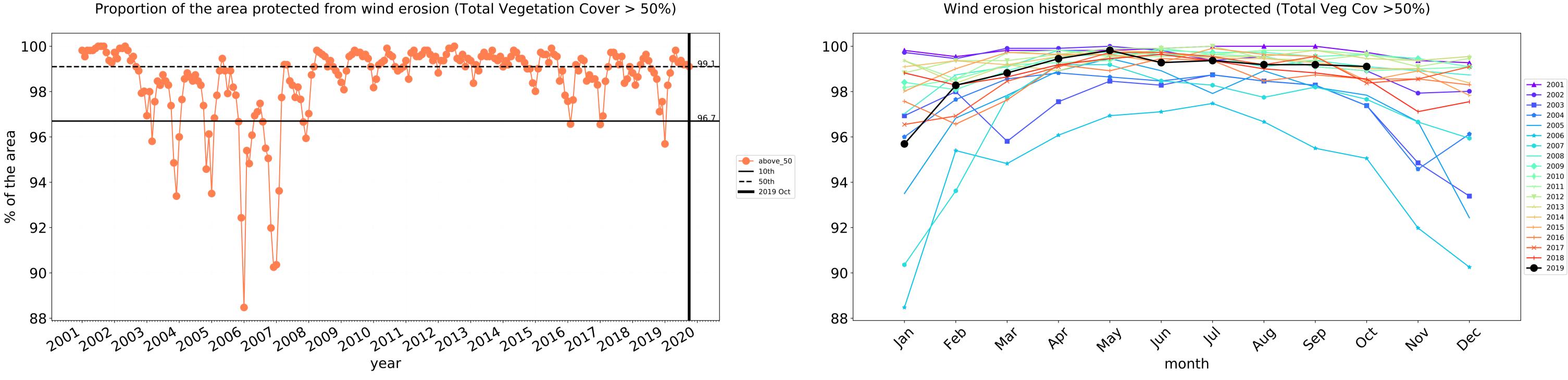
record, from highest to

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

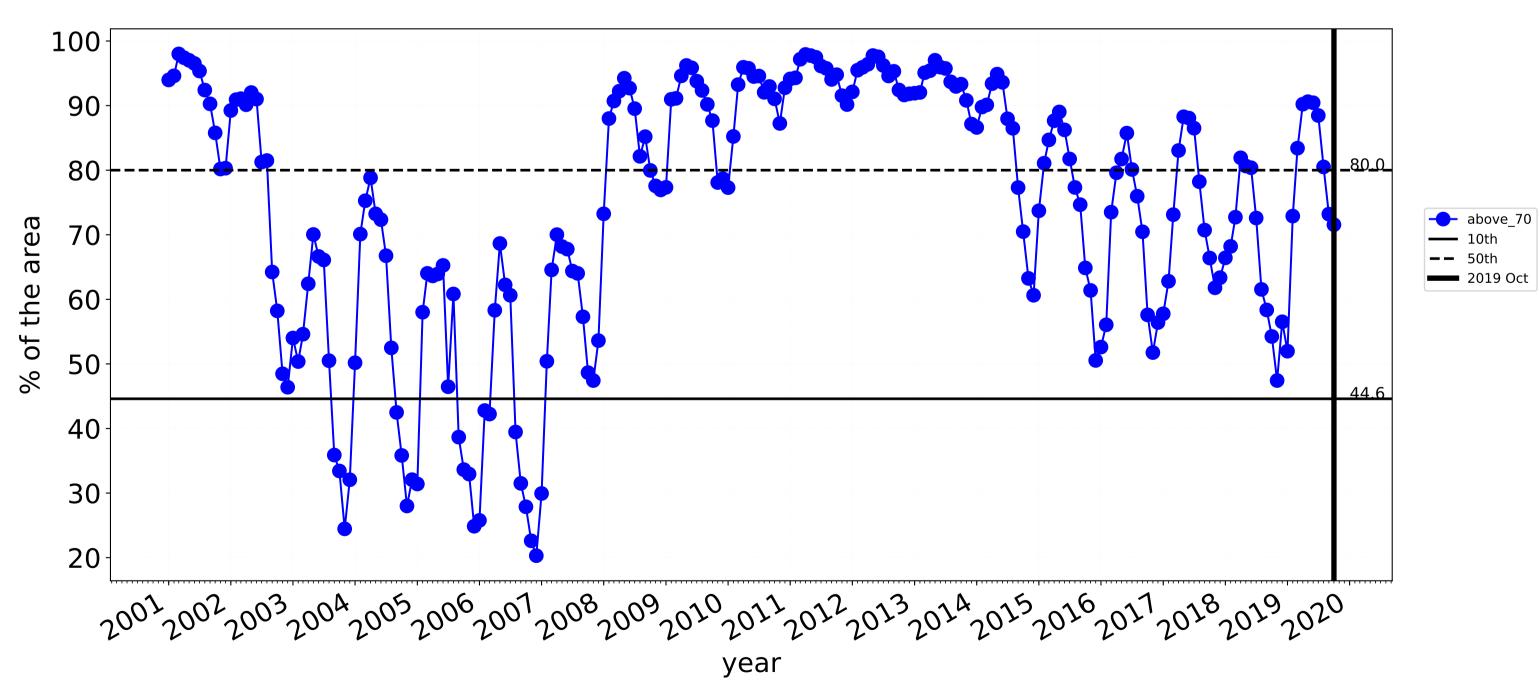
the map using baseline from 2001 to 2019.

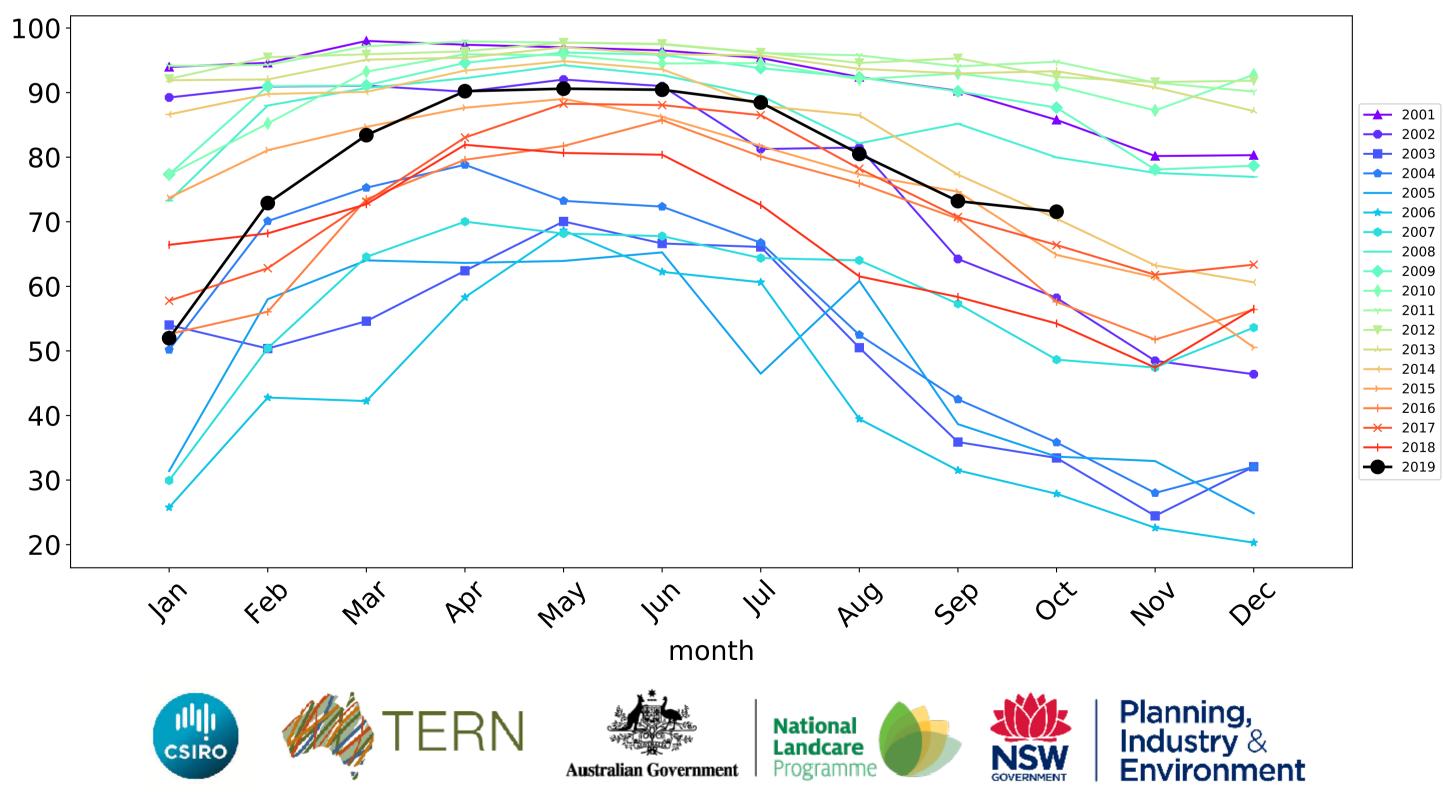
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

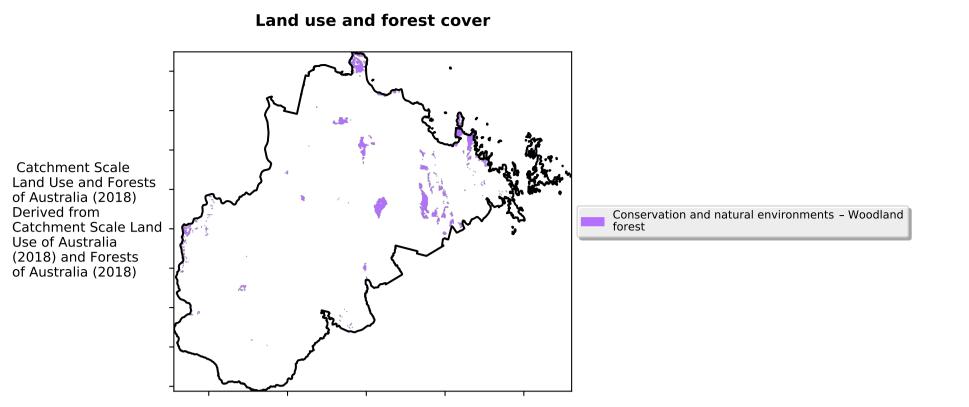




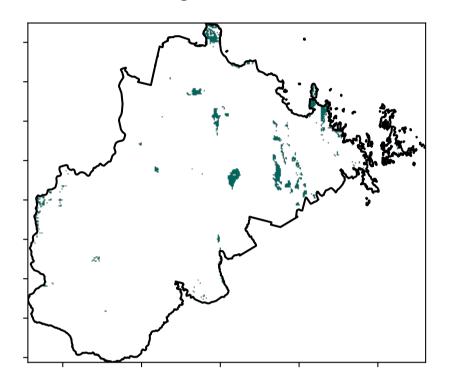
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Water erosion historical monthly area protected (Total Veg Cov>70%)

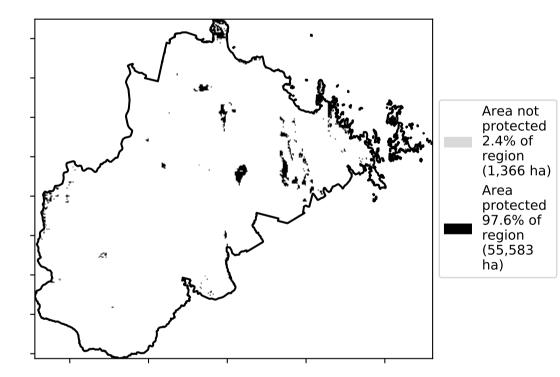
### **Conservation and natural environments Woodland forest**



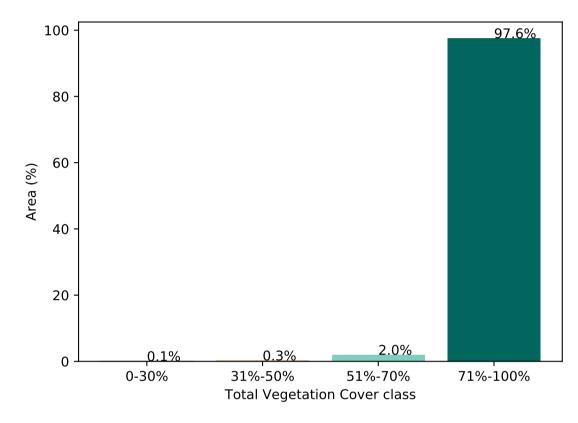
Total Vegetation Cover [%]



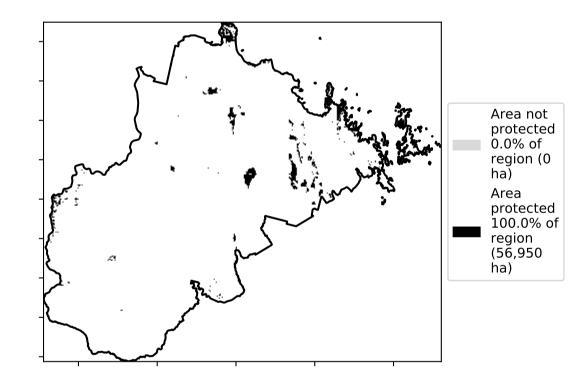
% Area protected from water erosion (>70%)



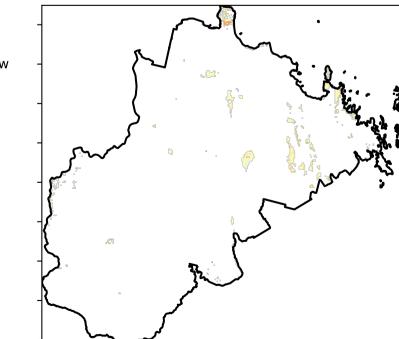
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



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- 20

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52°1070010

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0.30%

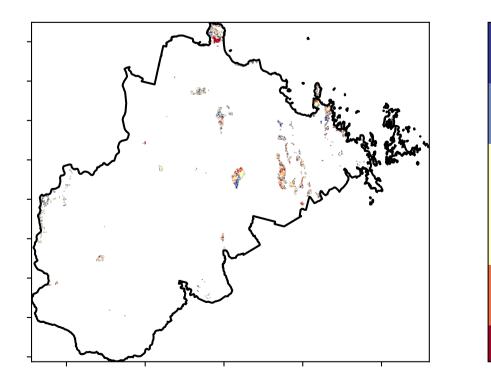
**Total Vegetation Cover Decile [%]** 

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Deciles show where the pixel value lies in the

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

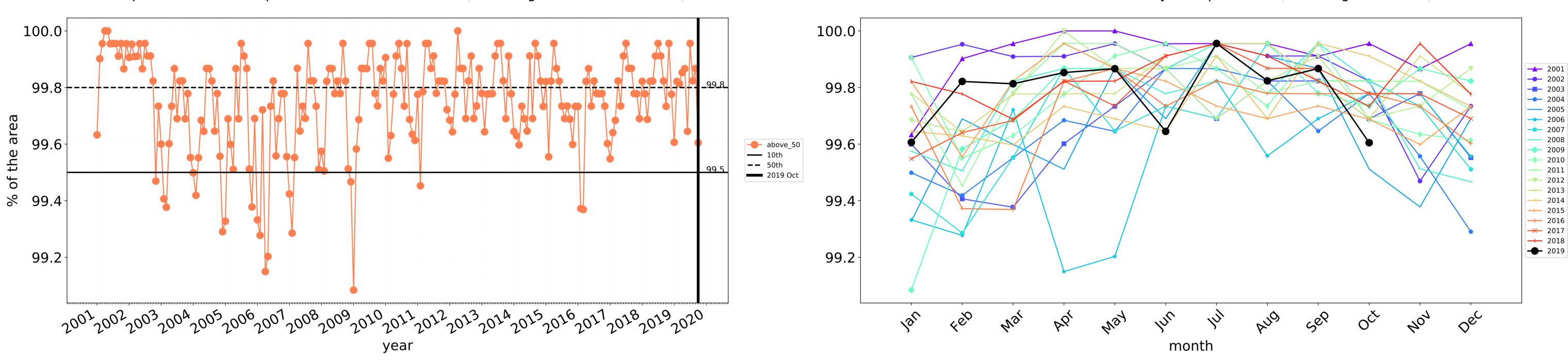
in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

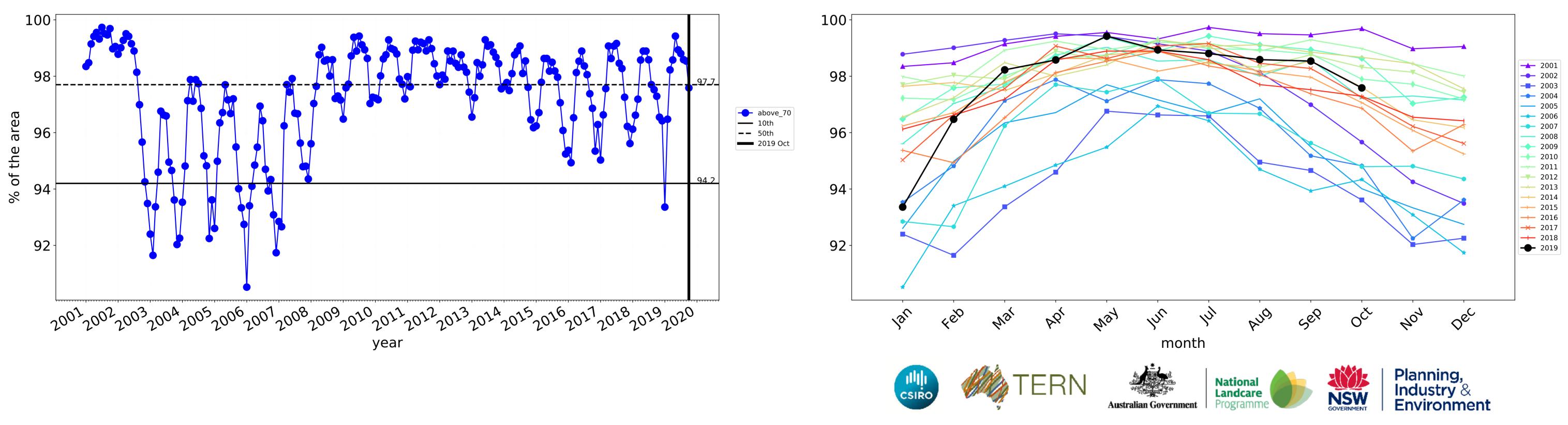
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

8



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

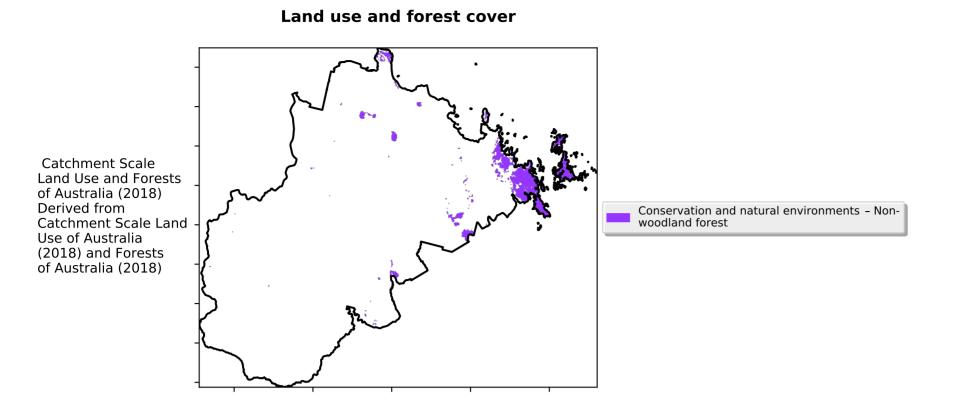
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



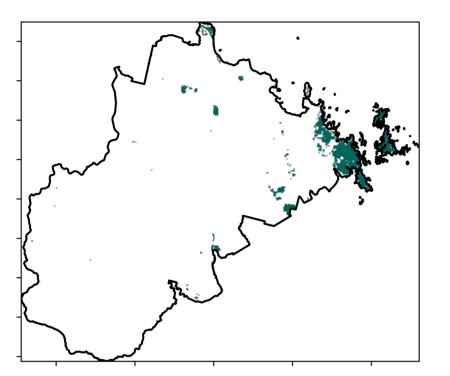
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

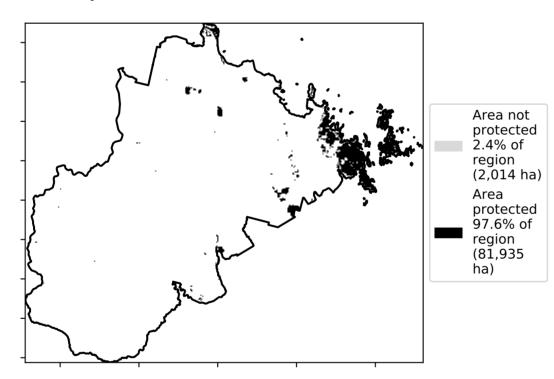
### **Conservation and natural environments Forest (non woodland)**

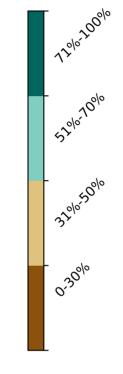


**Total Vegetation Cover [%]** 

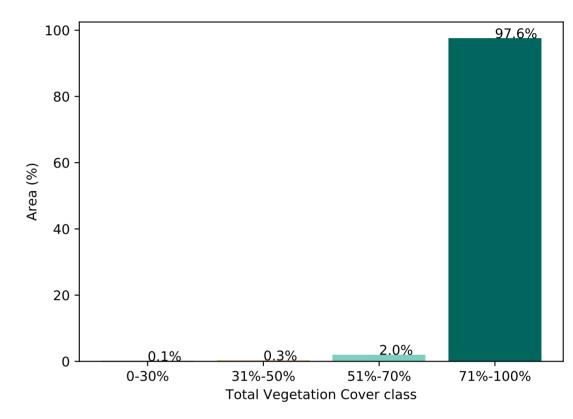


% Area protected from water erosion (>70%)

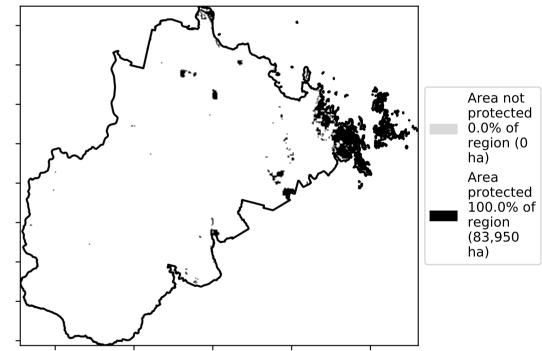




Proportion of vegetation cover class in area

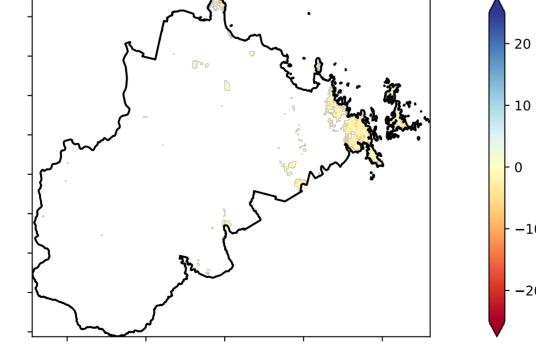


#### % Area protected from wind erosion (>50%)



**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.



CSIRO

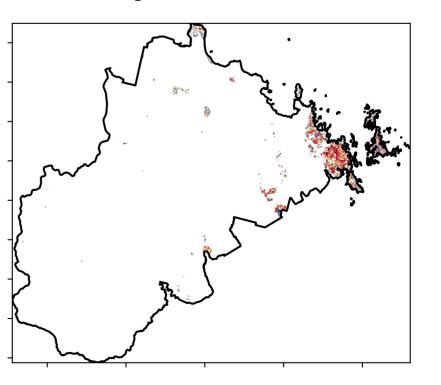
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

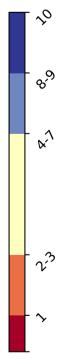
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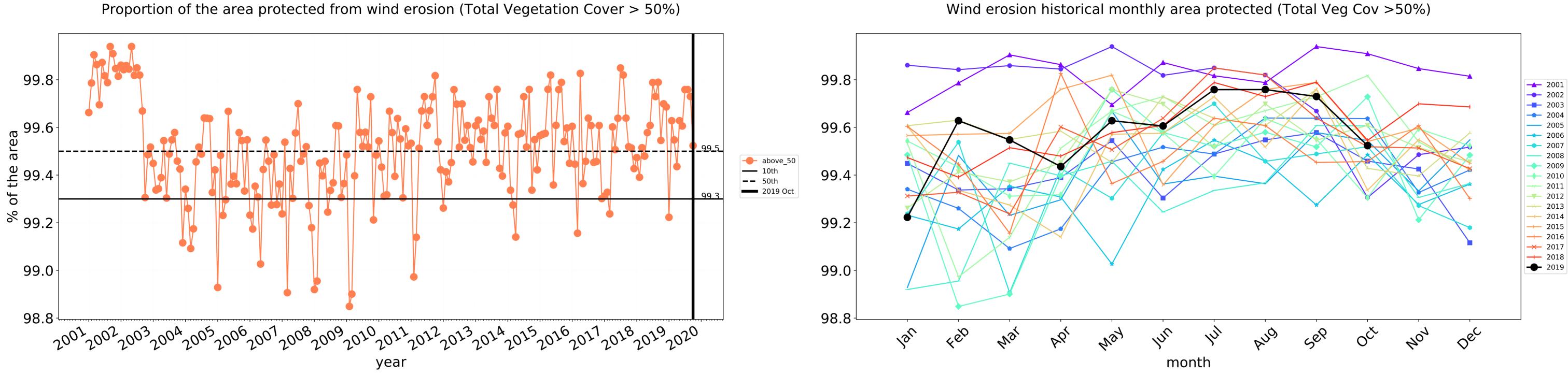
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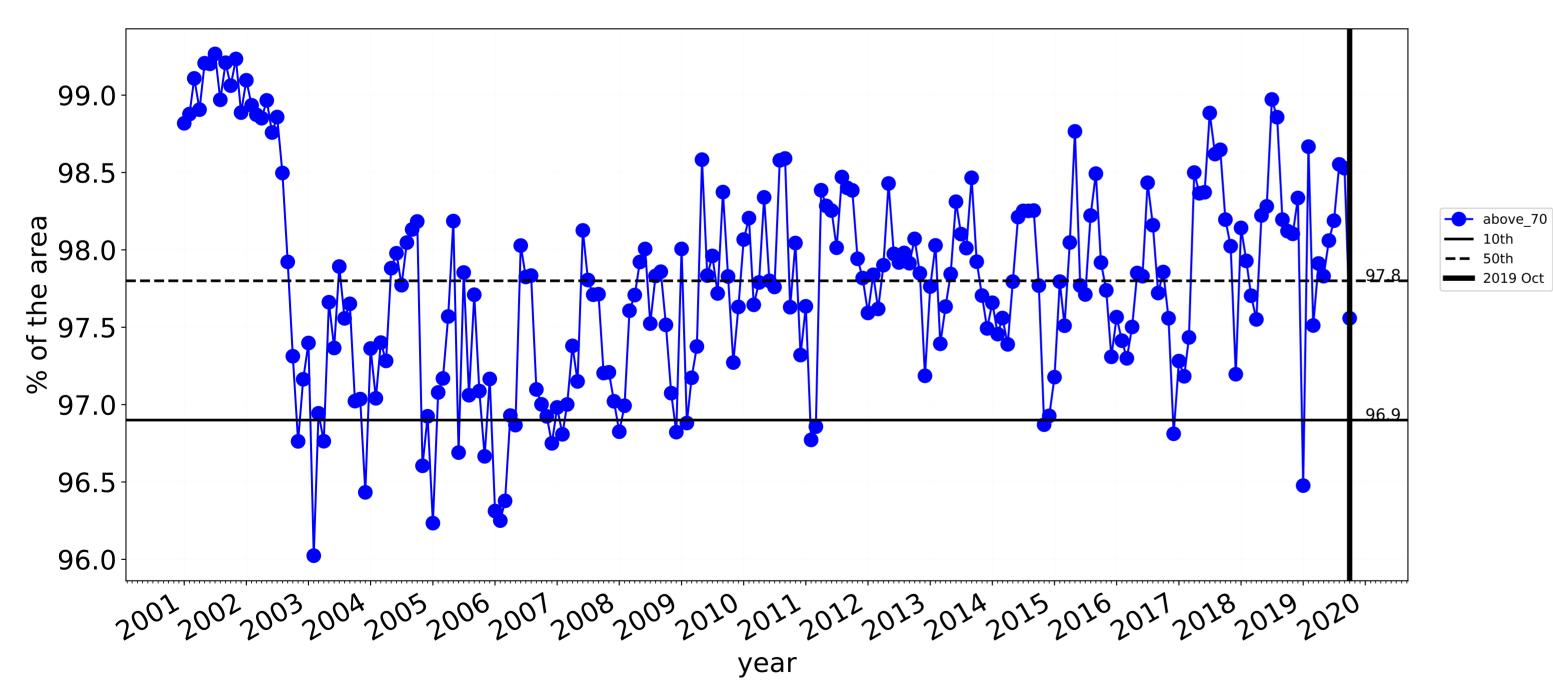
**Total Vegetation Cover Decile [%]** 

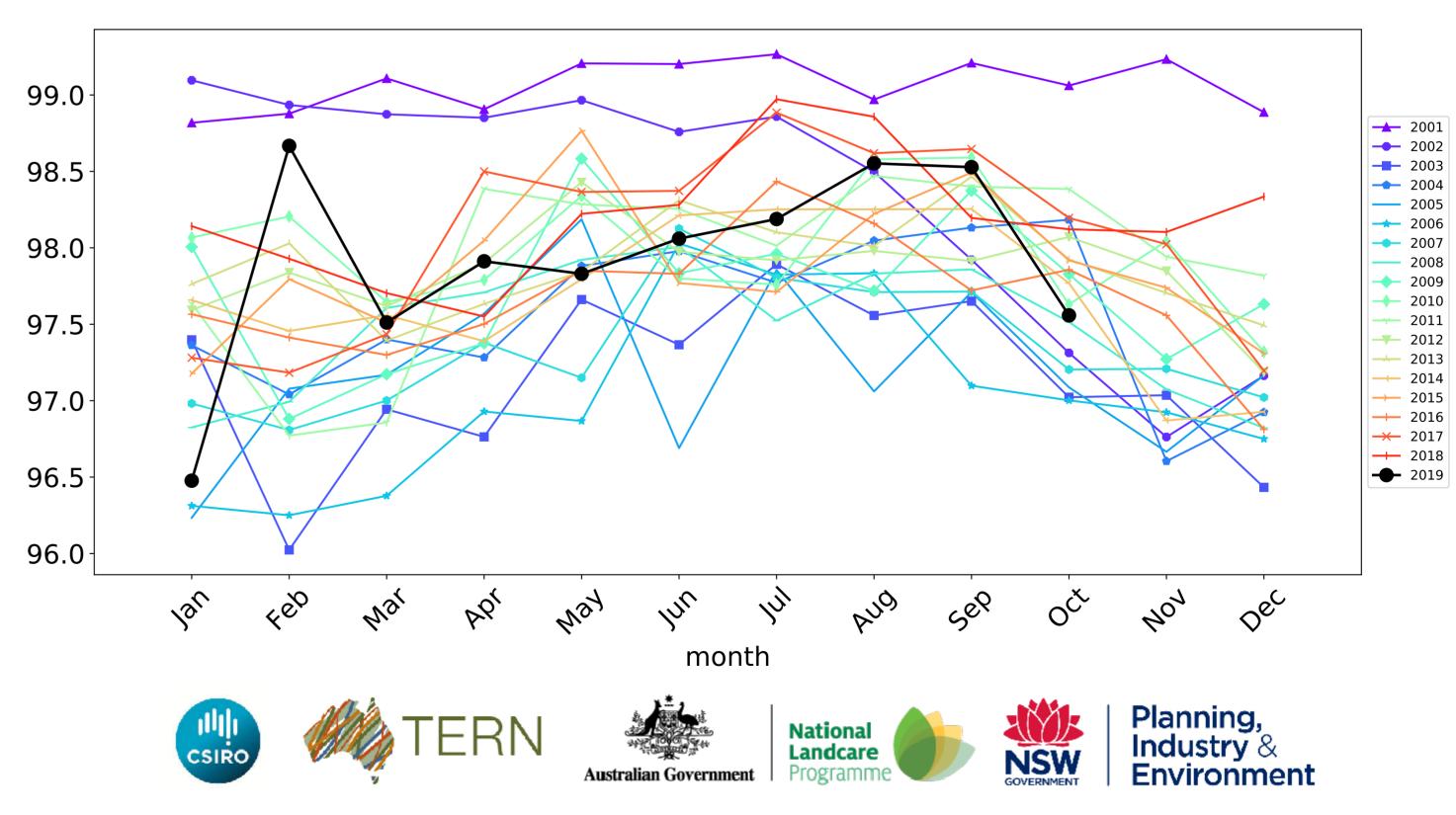








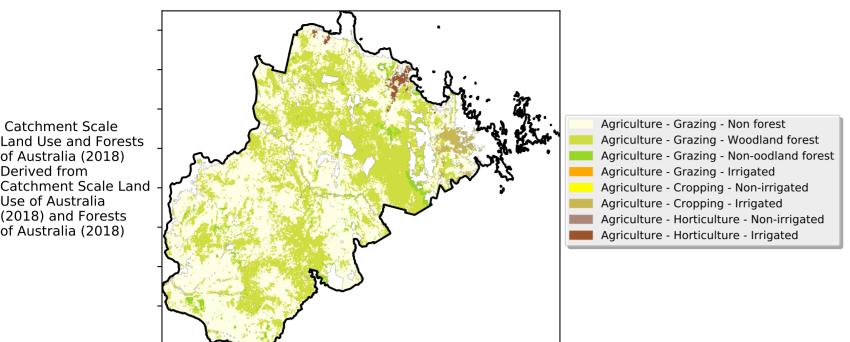




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Water erosion historical monthly area protected (Total Veg Cov>70%)

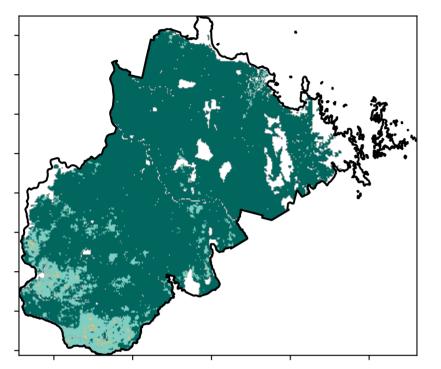
### Agriculture



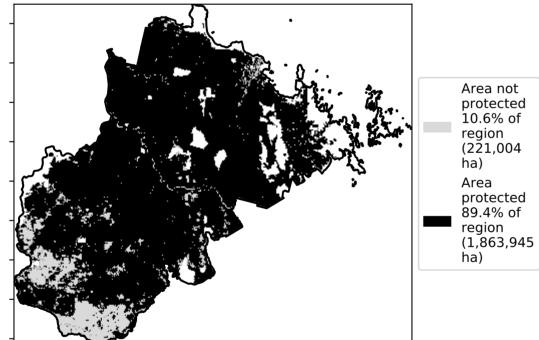
Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 

Land use and forest cover



% Area protected from water erosion (>70%)



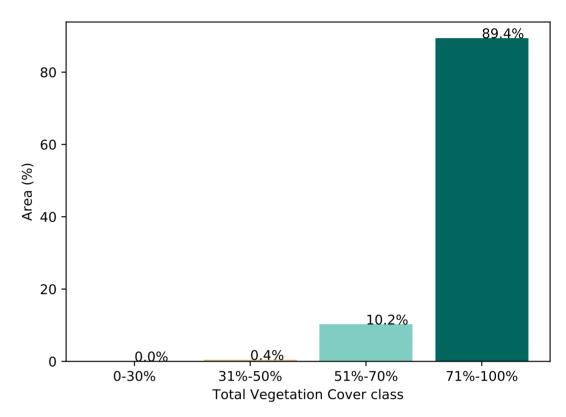
0.30%

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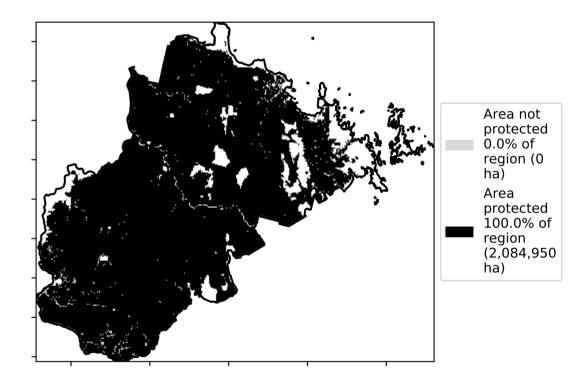
52% 70%

32%50%





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



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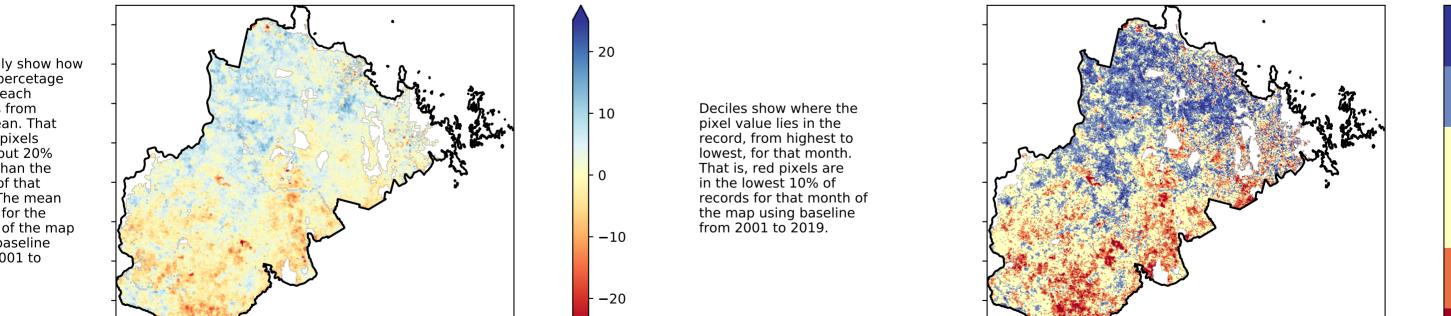
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**Total Vegetation Cover Anomaly [%]** 

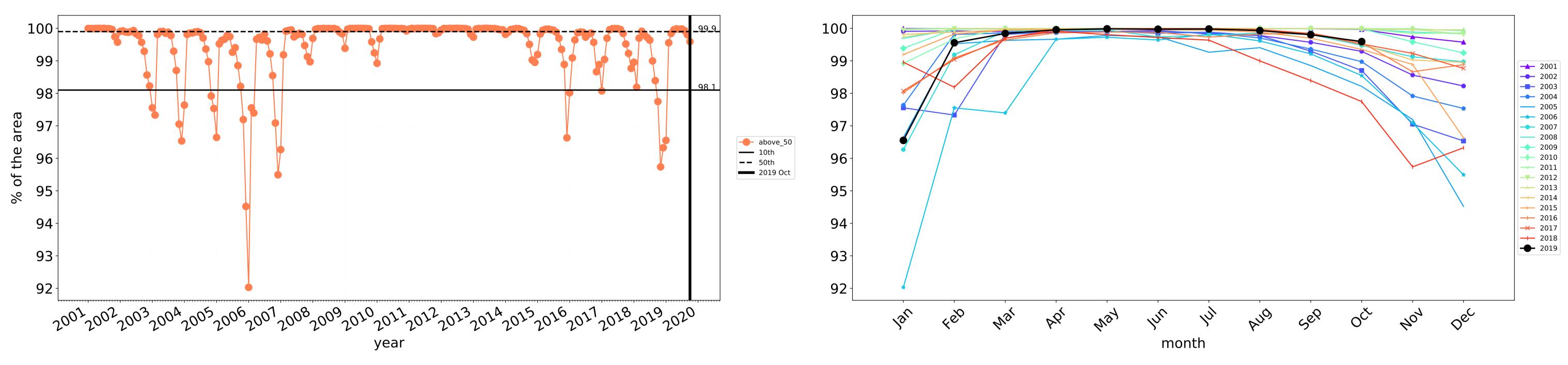
**Total Vegetation Cover Decile [%]** 



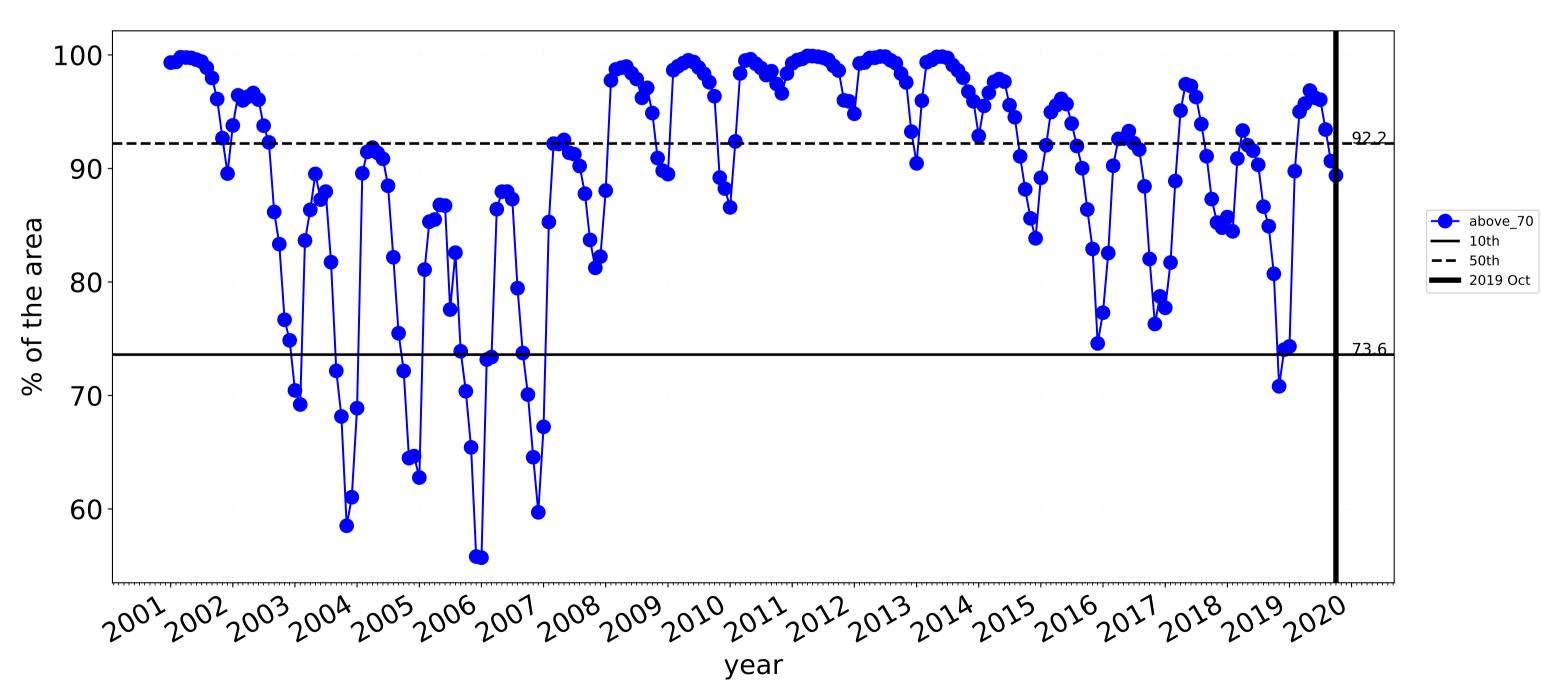


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.





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

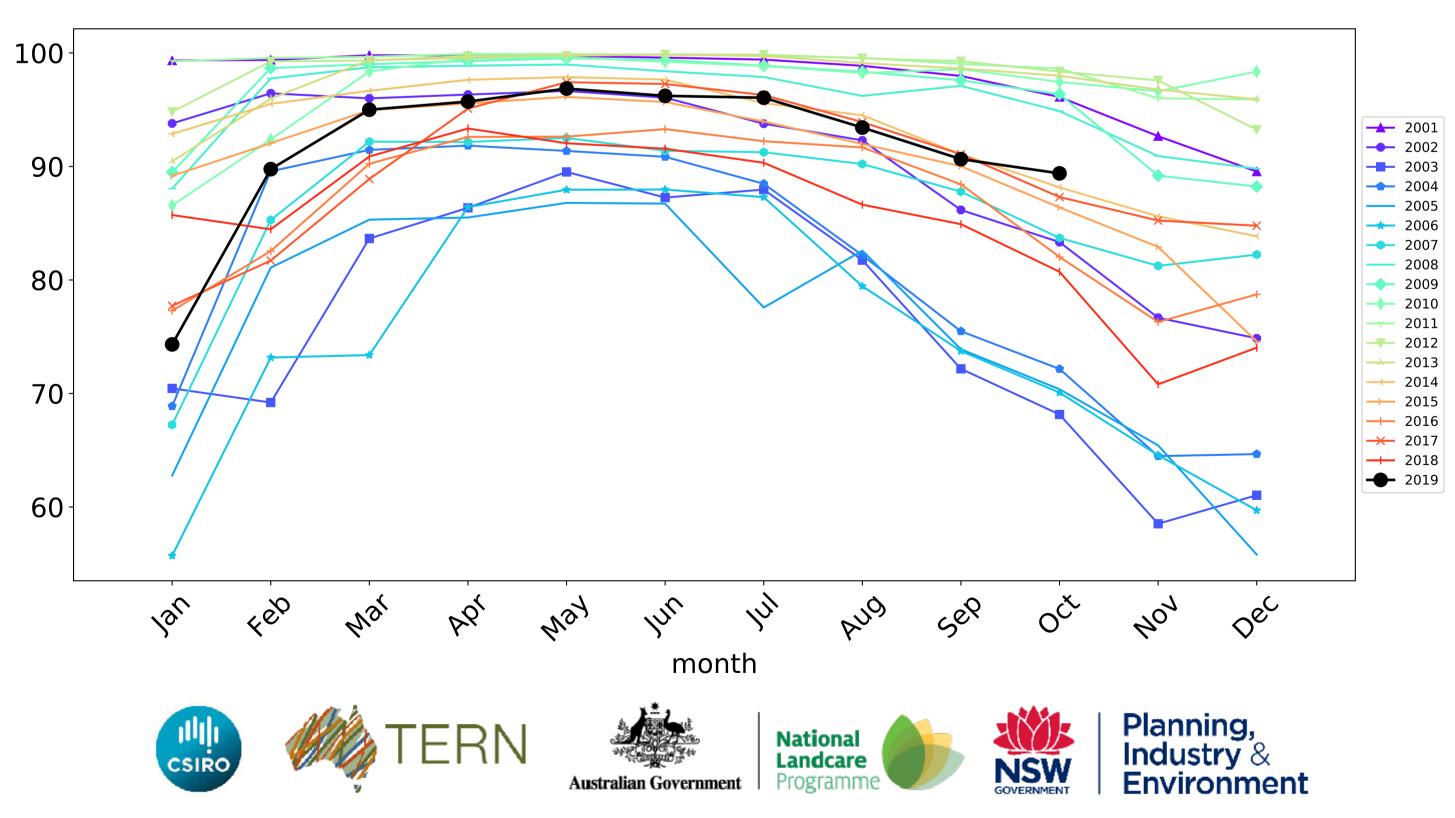


# **Agriculture timeseries**

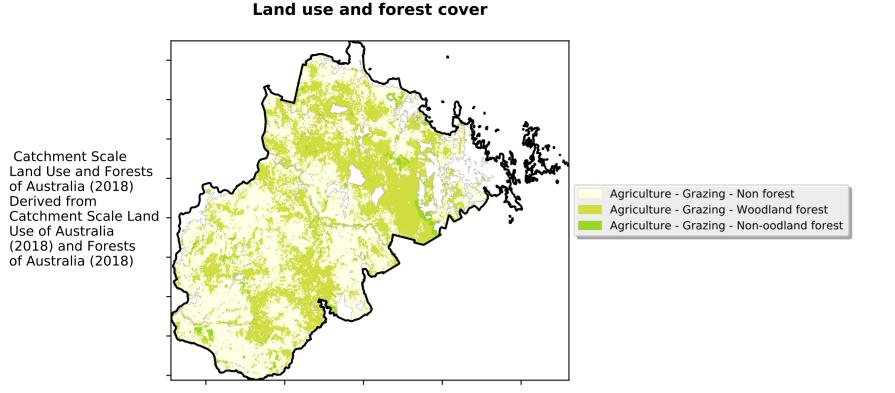


Wind erosion historical monthly area protected (Total Veg Cov >50%)

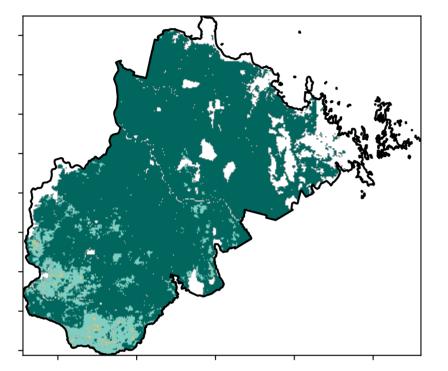
Water erosion historical monthly area protected (Total Veg Cov>70%)



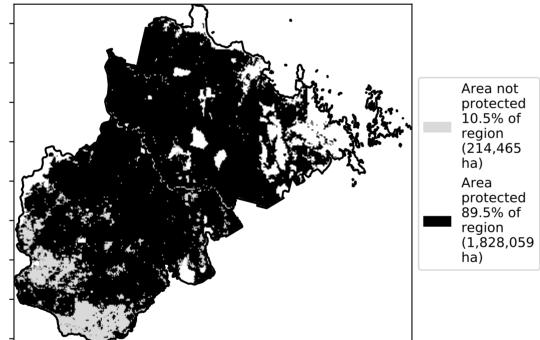
### Grazing

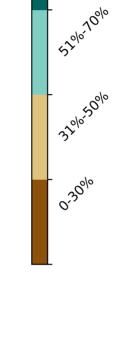


**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)

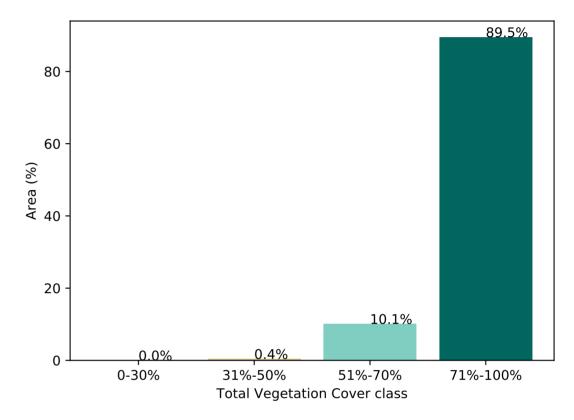




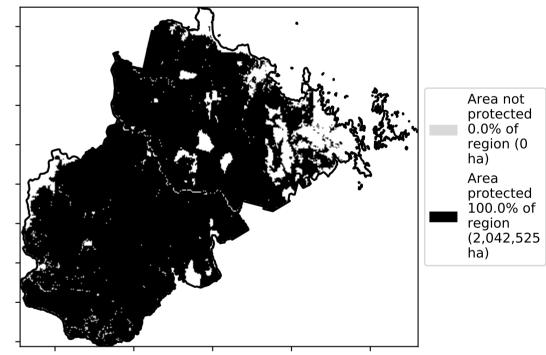
12%-200%



Proportion of vegetation cover class in area



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



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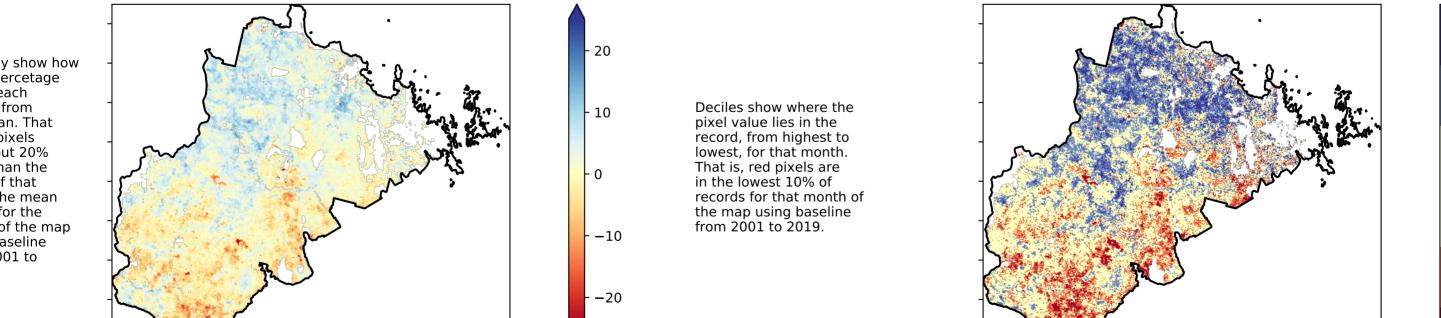
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**Total Vegetation Cover Anomaly [%]** 

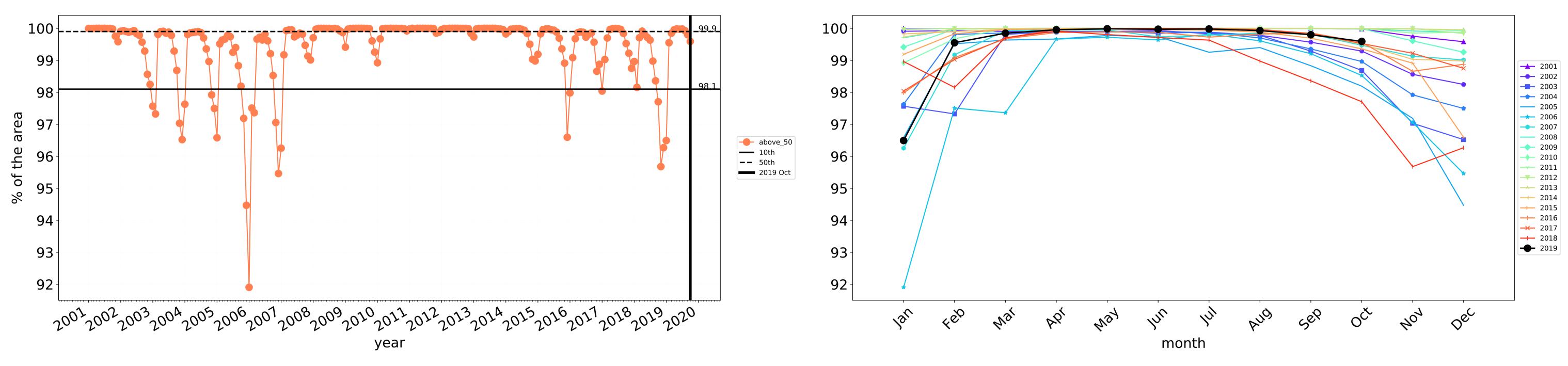
**Total Vegetation Cover Decile [%]** 



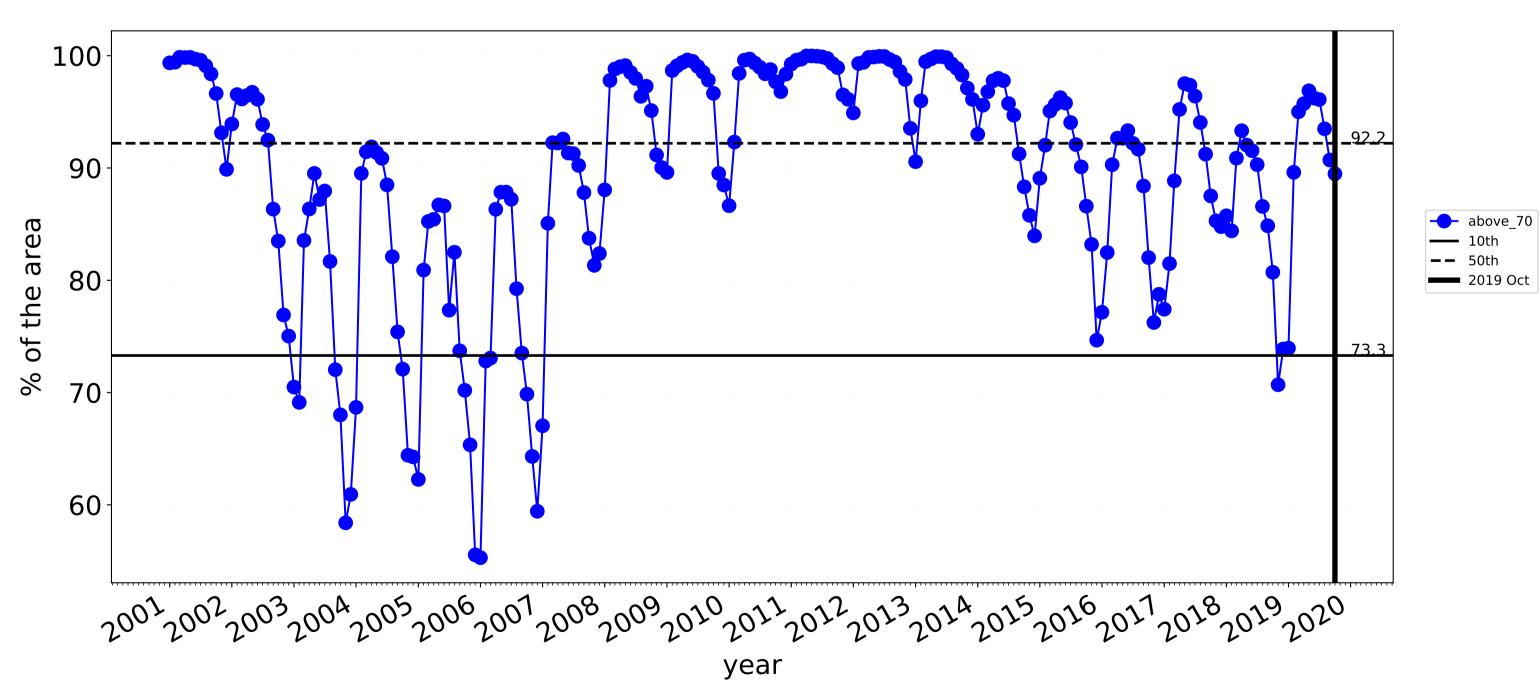


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

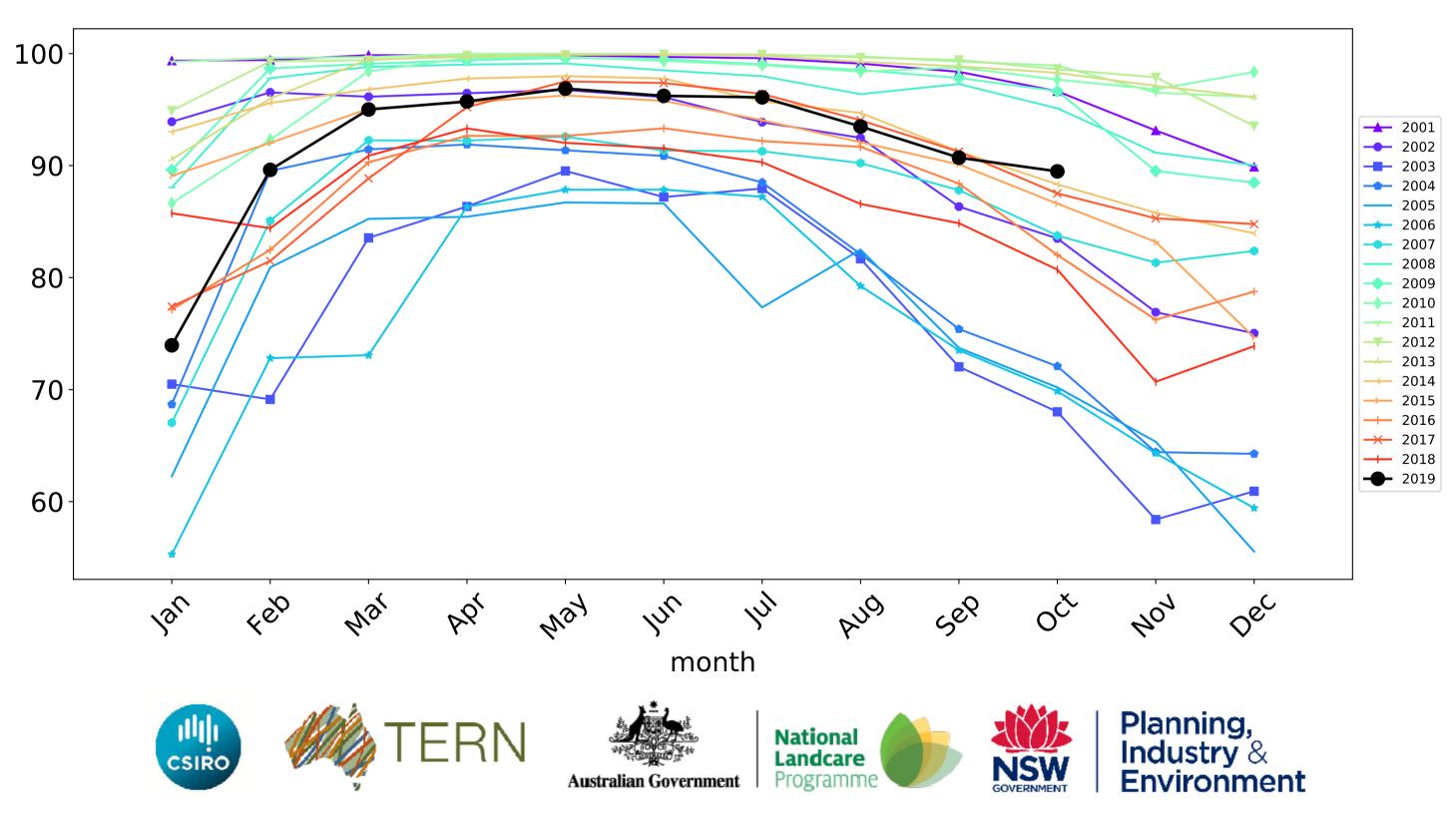


# Grazing timeseries

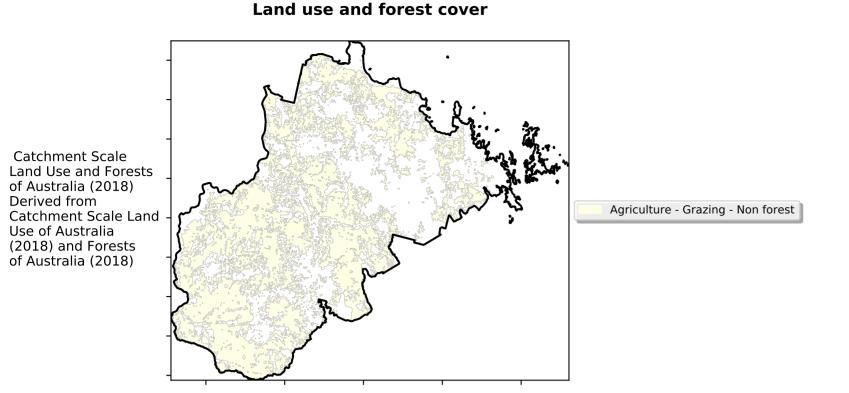


Wind erosion historical monthly area protected (Total Veg Cov >50%)

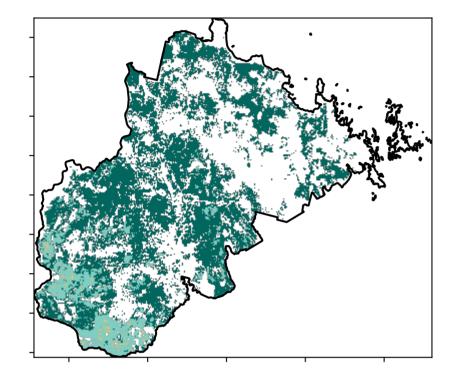
Water erosion historical monthly area protected (Total Veg Cov>70%)



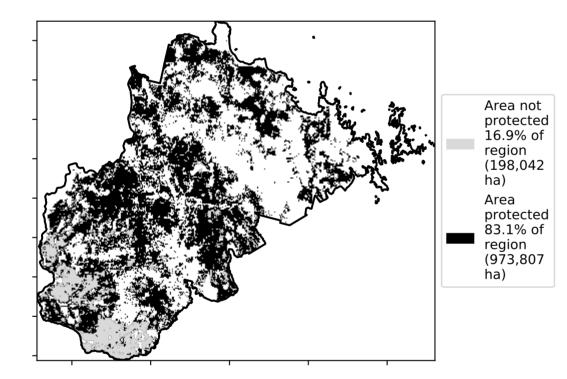
### **Grazing non forest**



**Total Vegetation Cover [%]** 

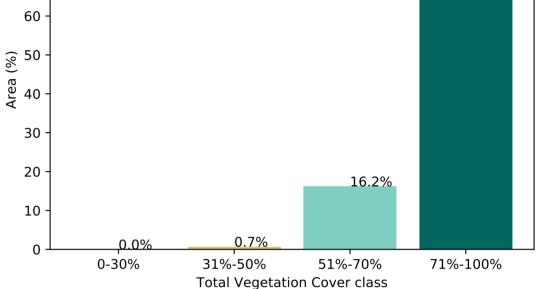


% Area protected from water erosion (>70%)

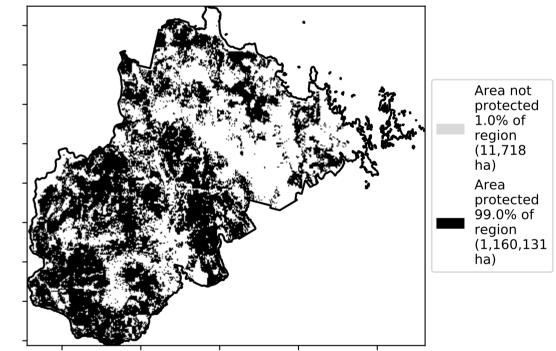


12%200% 52% 70% 32005000 0.30%

83.1%



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



Proportion of vegetation cover class in area

80

70 ·

\$

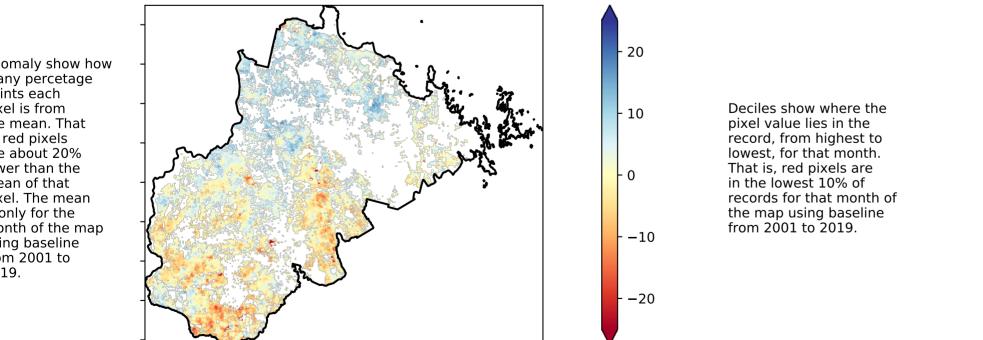
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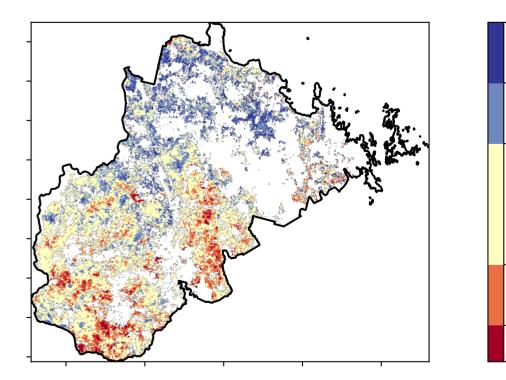
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**Total Vegetation Cover Anomaly [%]** 

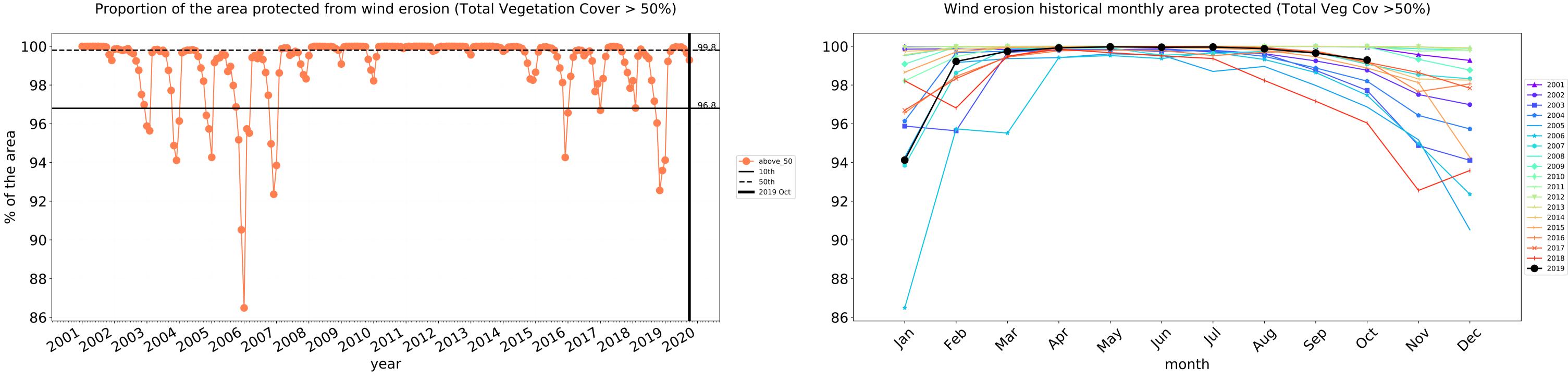
**Total Vegetation Cover Decile [%]** 



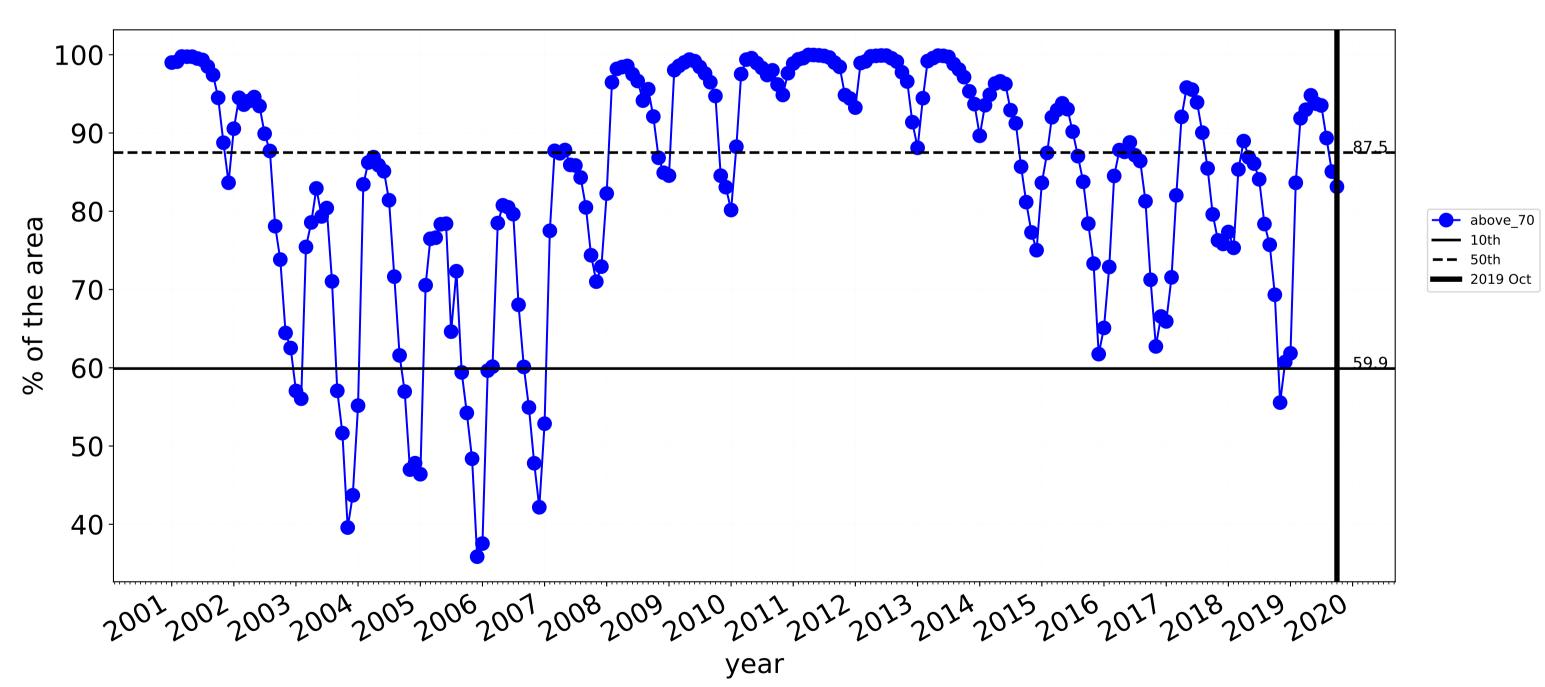




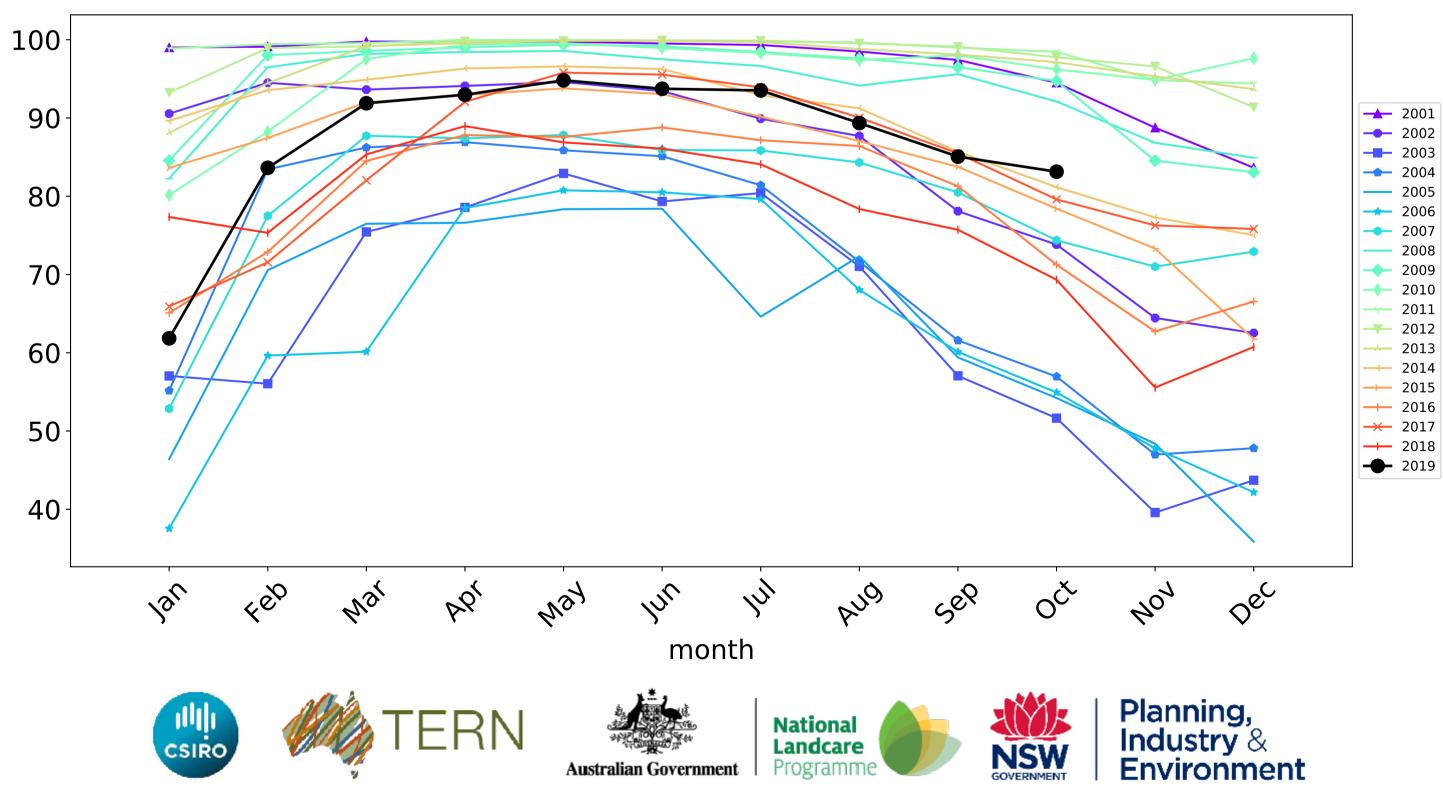
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.



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

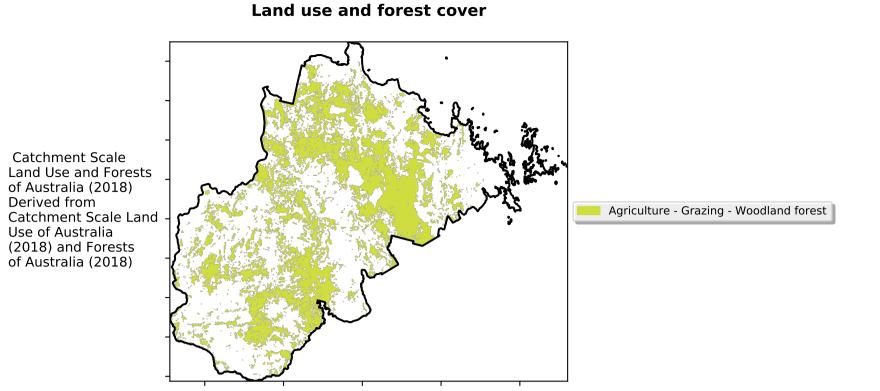


# Grazing non forest timeseries

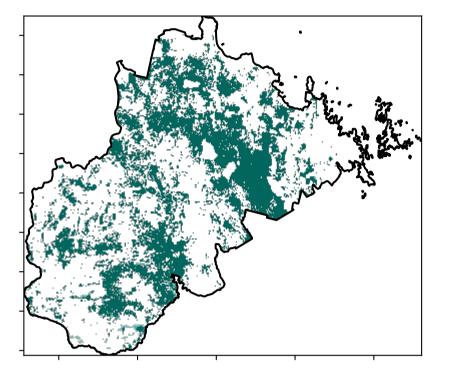


Water erosion historical monthly area protected (Total Veg Cov>70%)

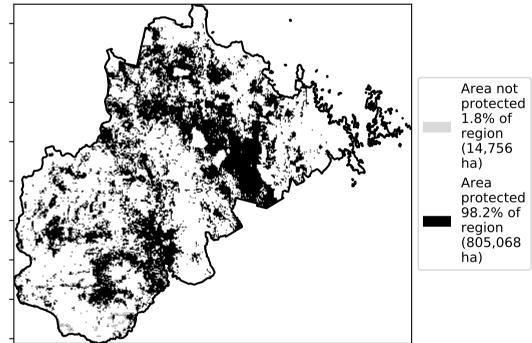
## **Grazing Woodland forest**



**Total Vegetation Cover [%]** 



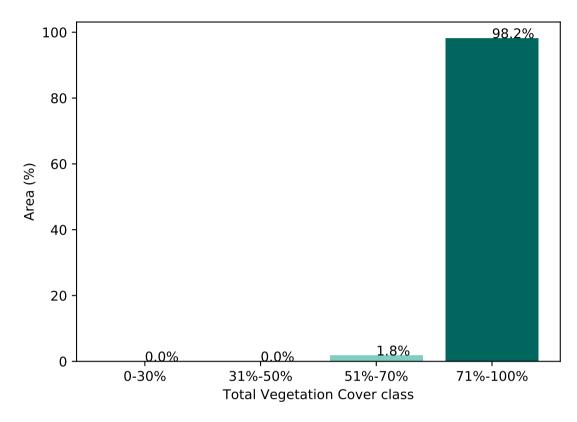
% Area protected from water erosion (>70%)



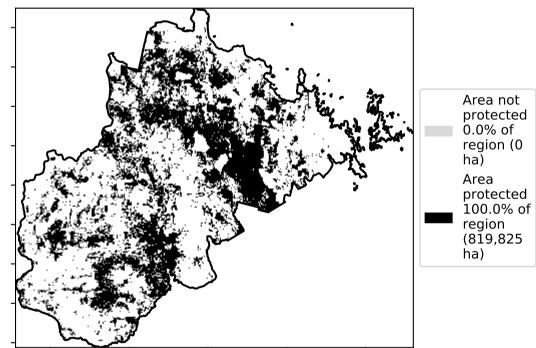
12000 52% TON 320050010 0.30%



Proportion of vegetation cover class in area



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

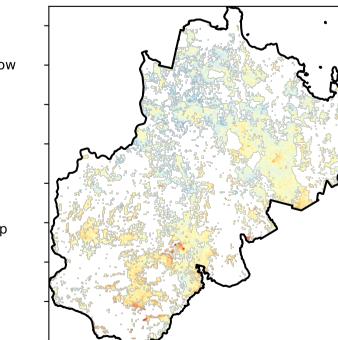


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**Total Vegetation Cover Anomaly [%]** 

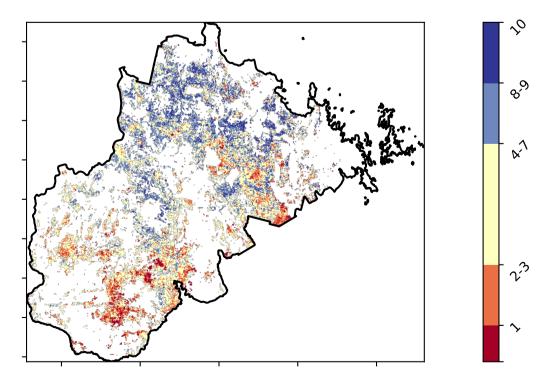


- 10 0 -10

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- 20

**Total Vegetation Cover Decile [%]** 





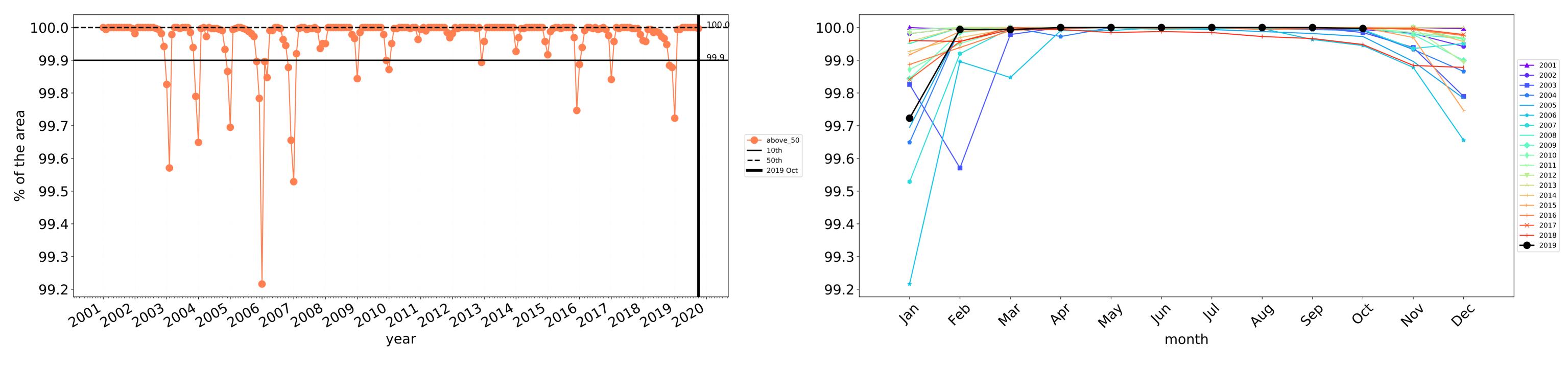
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline

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

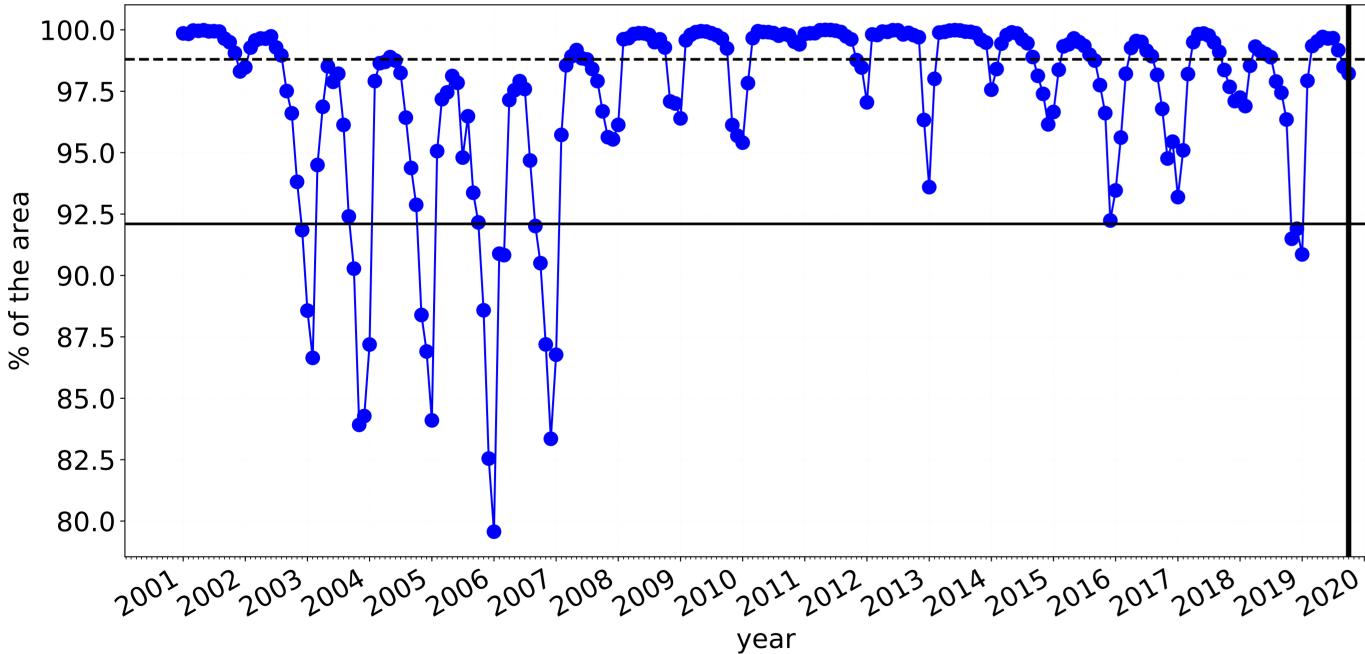


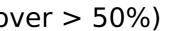
# **Grazing Woodland forest timeseries**



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

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

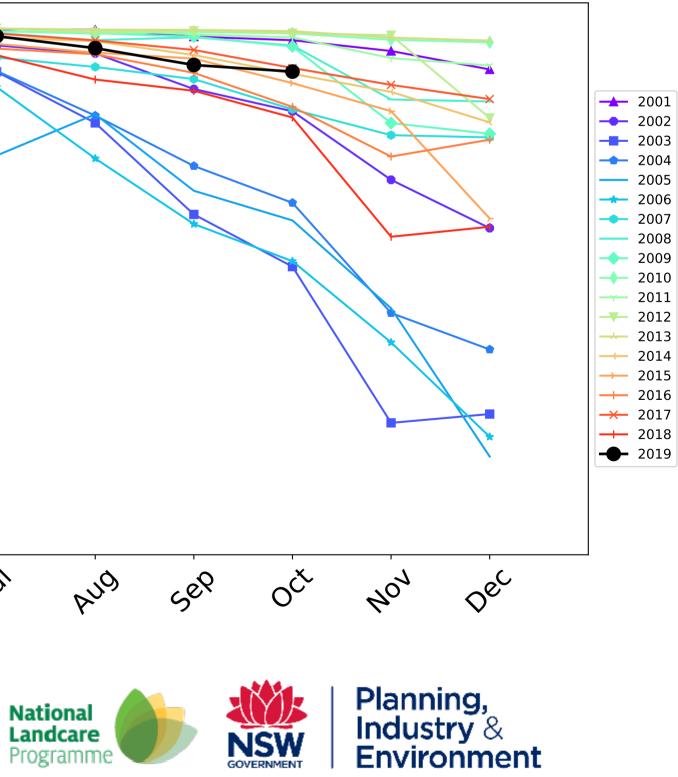




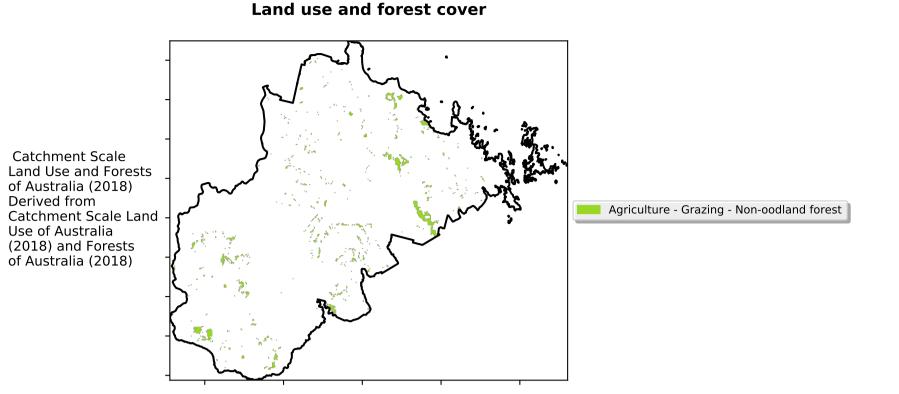
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0 97.5<sup>-</sup> 95.0 ---- above\_70 92.5 **—** 10th 921 **——** 50th **——** 2019 Oct 90.0 87.5 85.0-82.5 80.0-Jan feb May In PQ 1st Mai month ERN CSIRO (SOR) Programme Australian Government

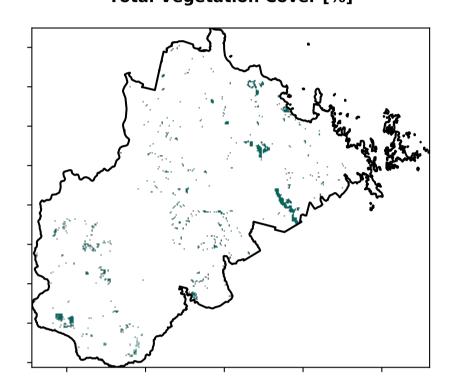
Water erosion historical monthly area protected (Total Veg Cov>70%)



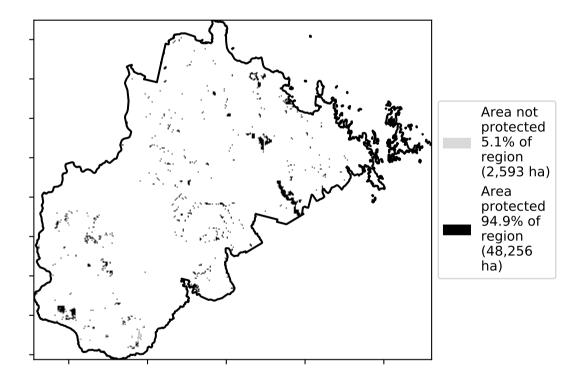
## Grazing - Forest (non woodland)

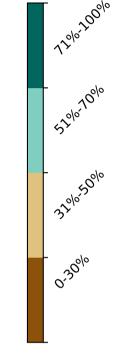


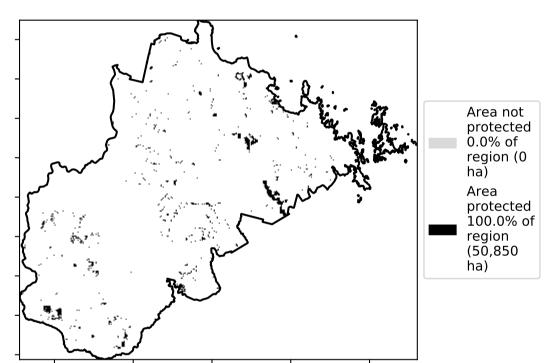
**Total Vegetation Cover [%]** 



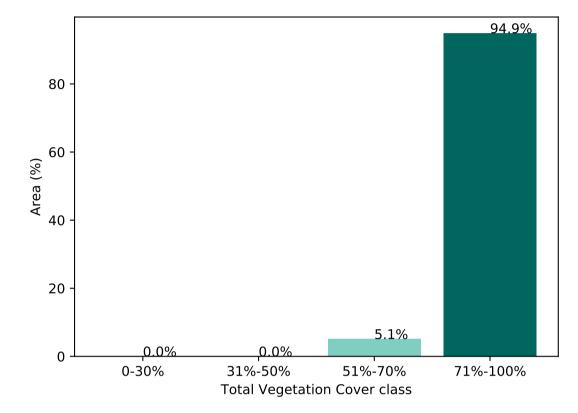
% Area protected from water erosion (>70%)







Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

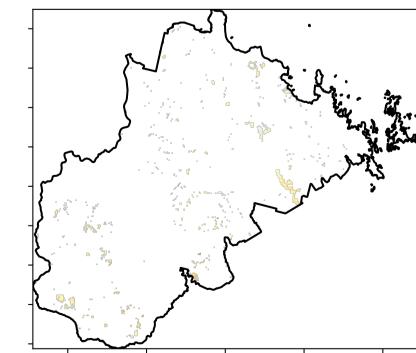
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**Total Vegetation Cover Anomaly [%]** 

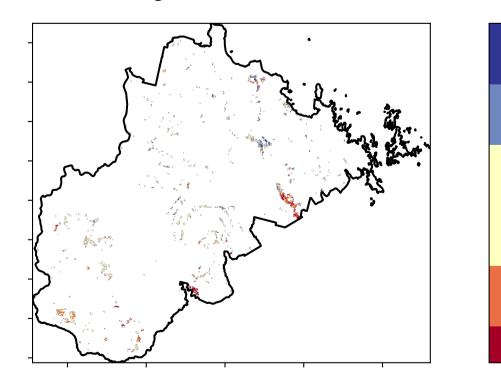


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- 20

**Total Vegetation Cover Decile [%]** 





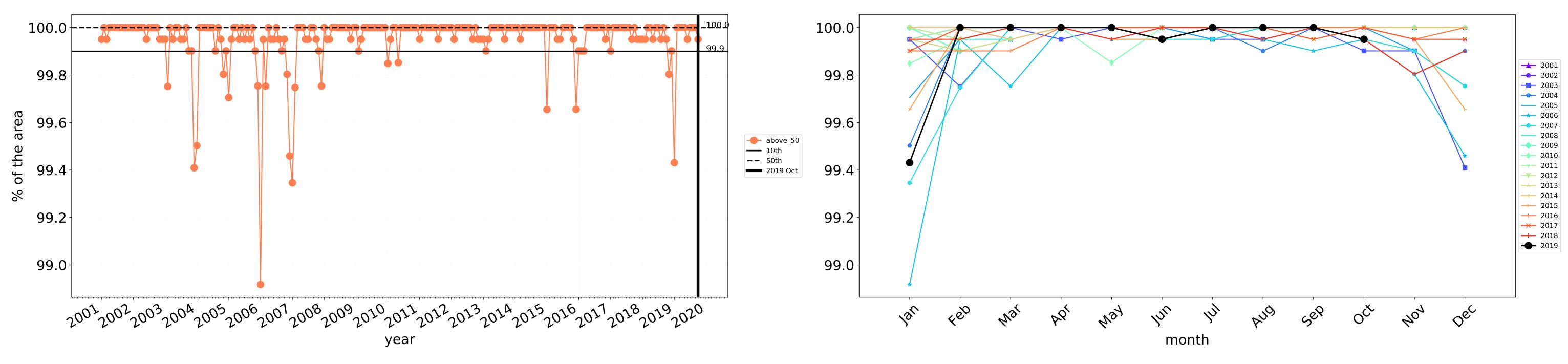
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

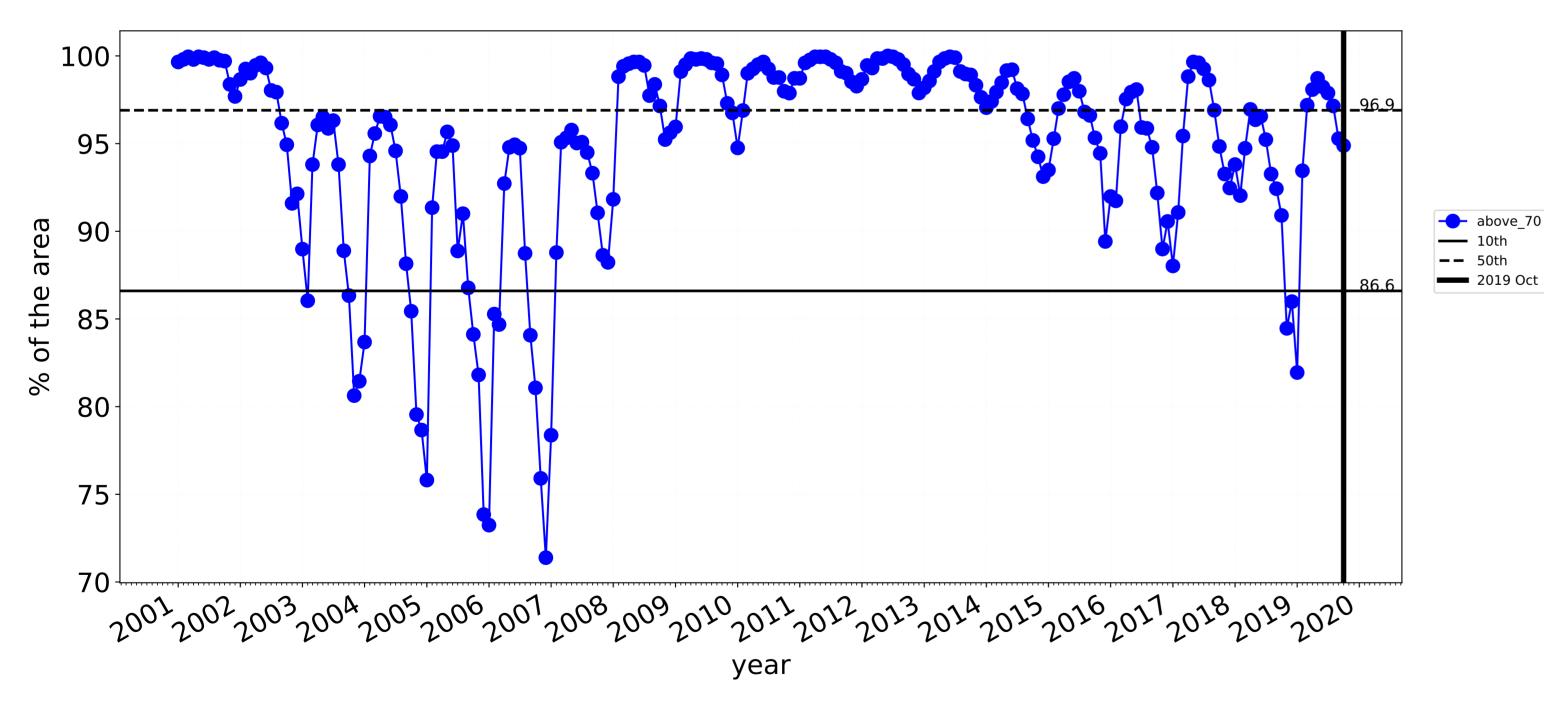
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

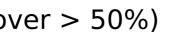
# Grazing - Forest (non woodland) timeseries



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

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

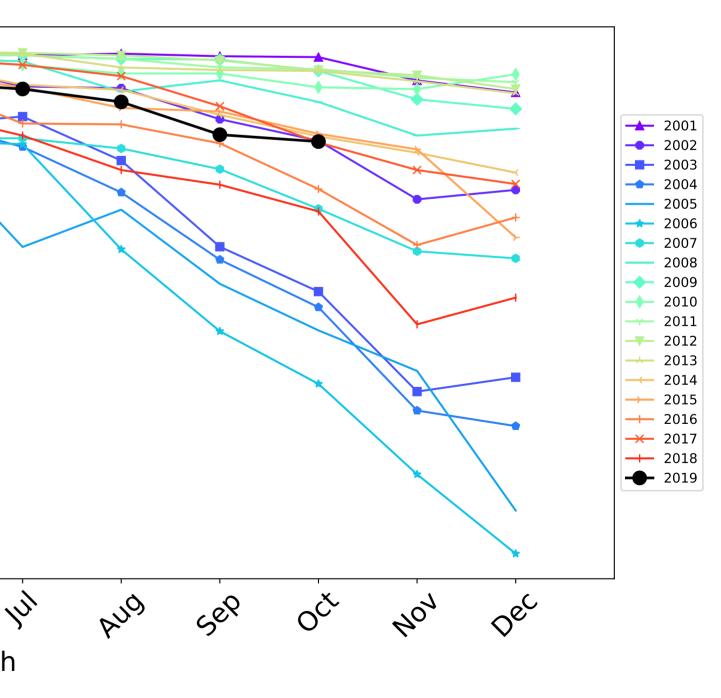




Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 95 90 85 80 75 70 4eb In Sal way Mai PQ1 month ERN (SOQ) CSIRO Australian Government

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





## Irrigation

12% 100°1

52°10010010

320050010

0.30%

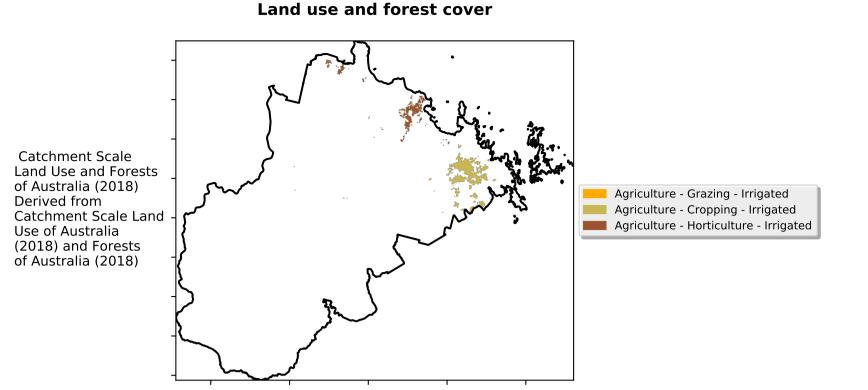
- 20

- 10

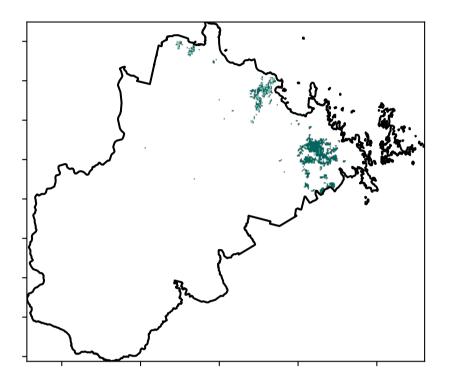
0

-10

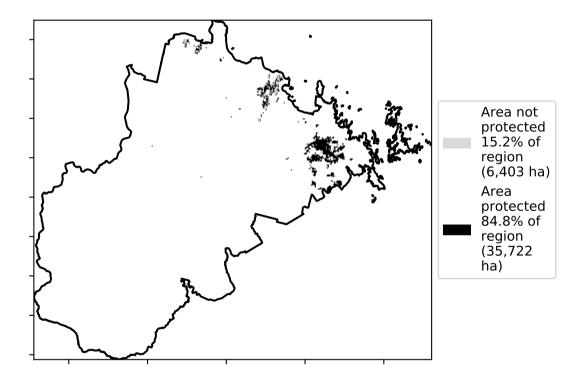
-20



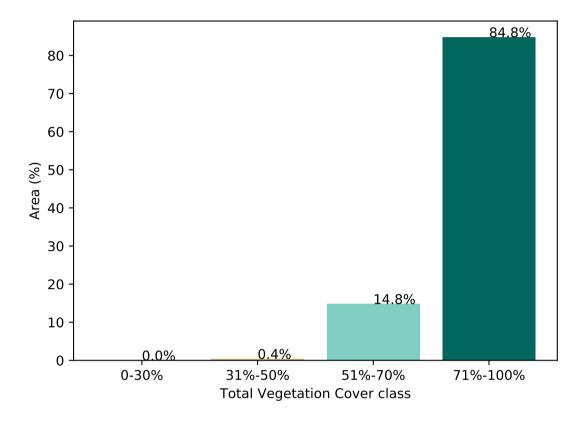
**Total Vegetation Cover [%]** 



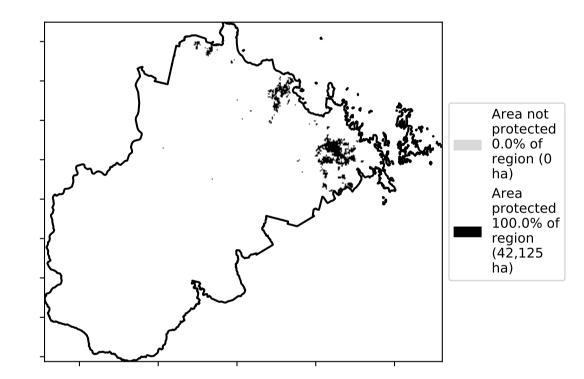
% Area protected from water erosion (>70%)



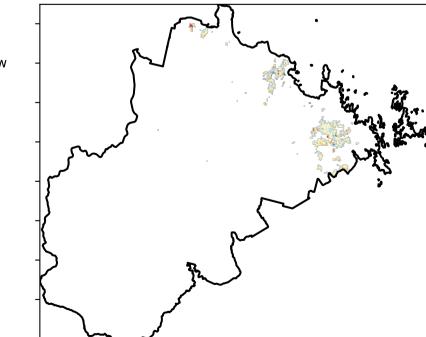
Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 

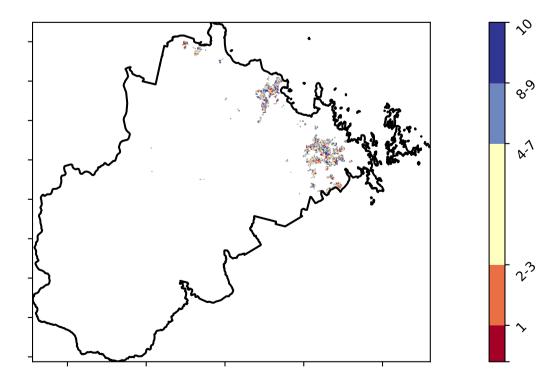


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

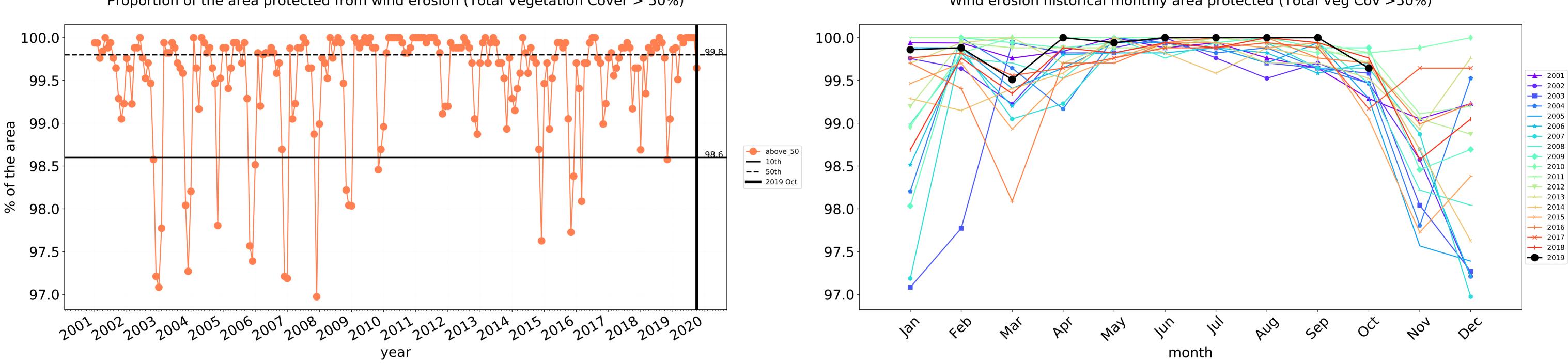
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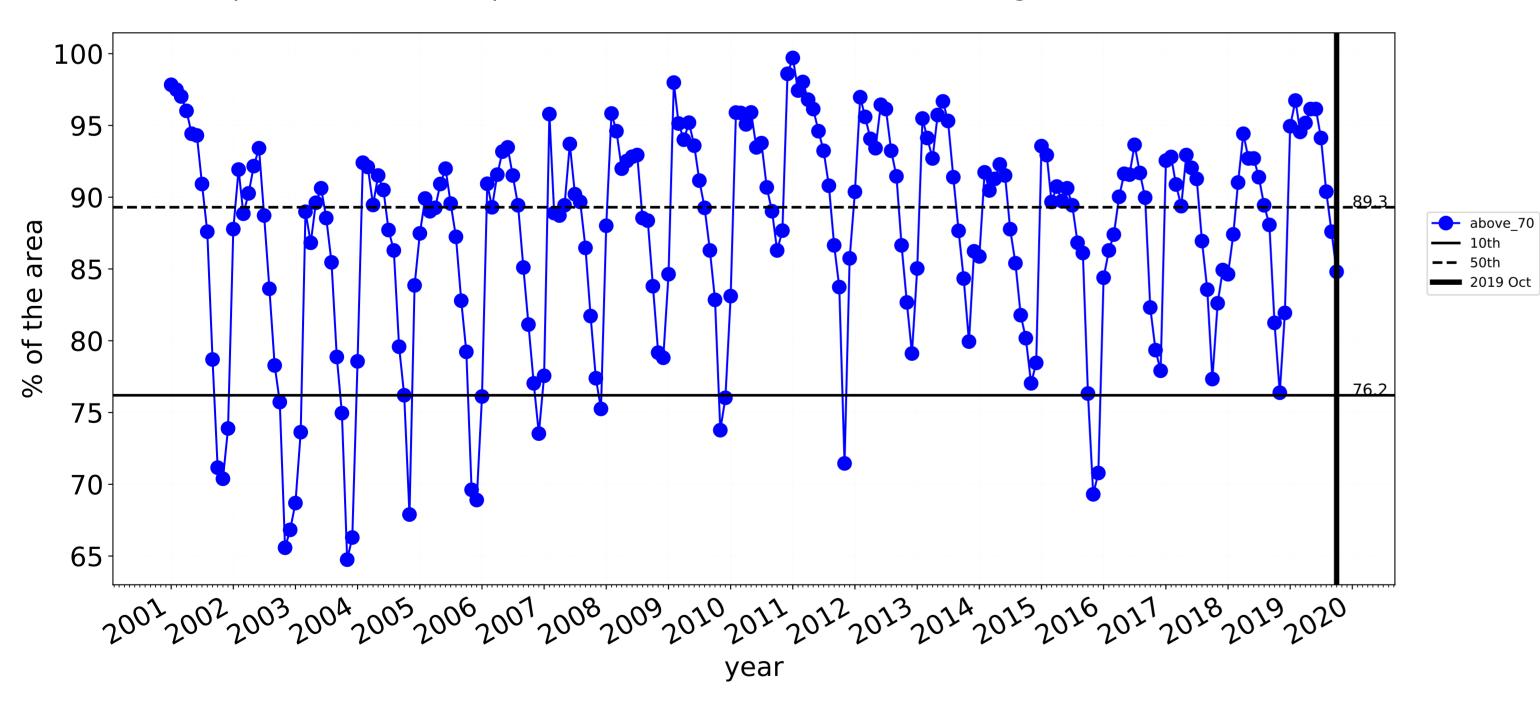


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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

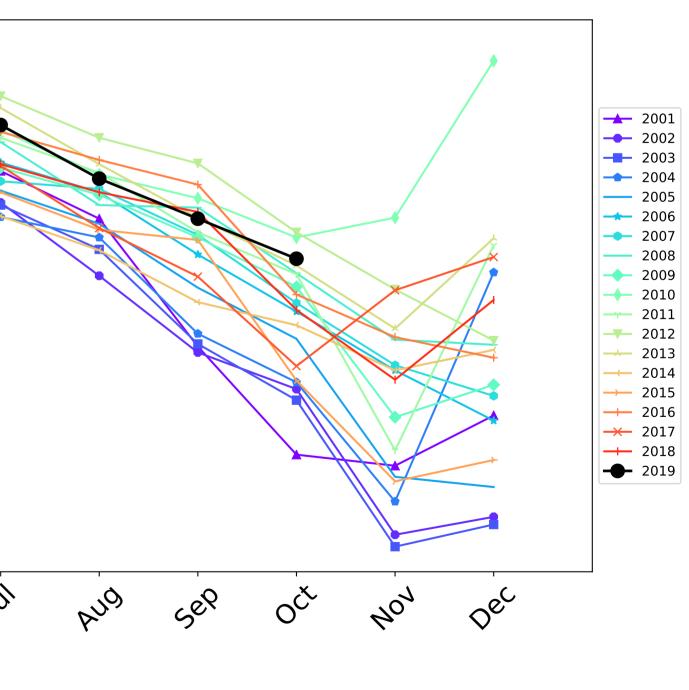
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



100-95 90 85 80 75 70 65 Jan fed In way 1/2/ Mal Þb, month ERN Australian Government

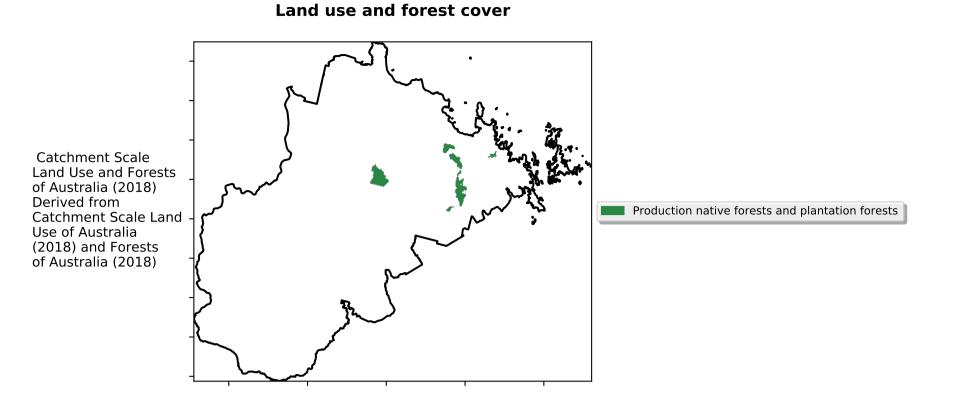
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

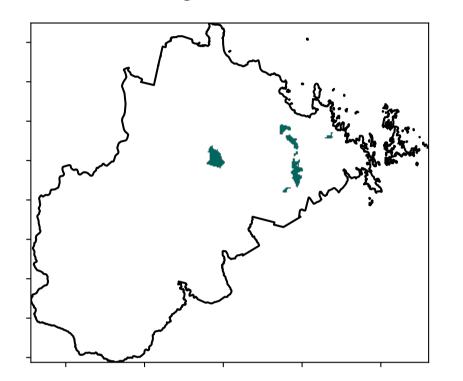




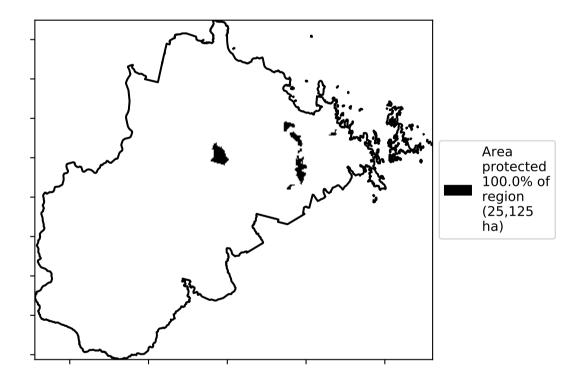
## **Production native forests and plantation forests**



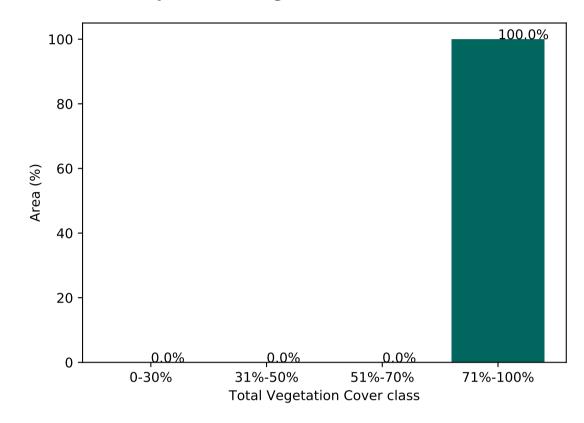
**Total Vegetation Cover [%]** 



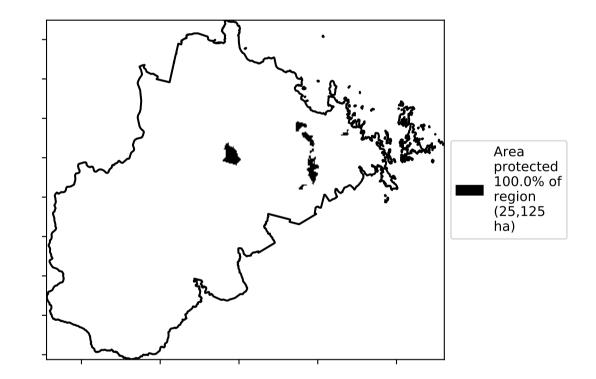
% Area protected from water erosion (>70%)







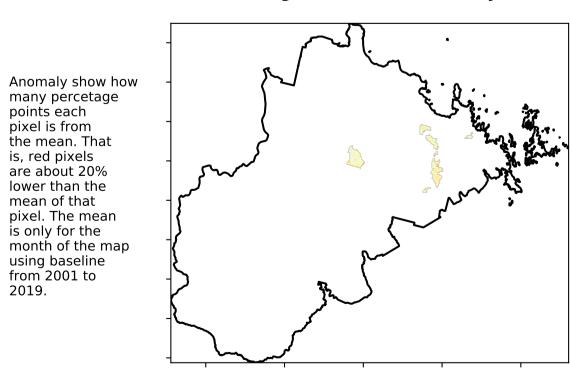
% Area protected from wind erosion (>50%)



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**Total Vegetation Cover Anomaly [%]** 



is, red pixels

mean of that

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-20

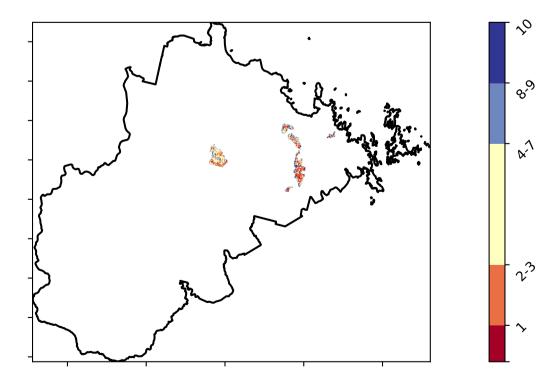
12% 200%

52°1070°10

320050010

0.30%

**Total Vegetation Cover Decile [%]** 



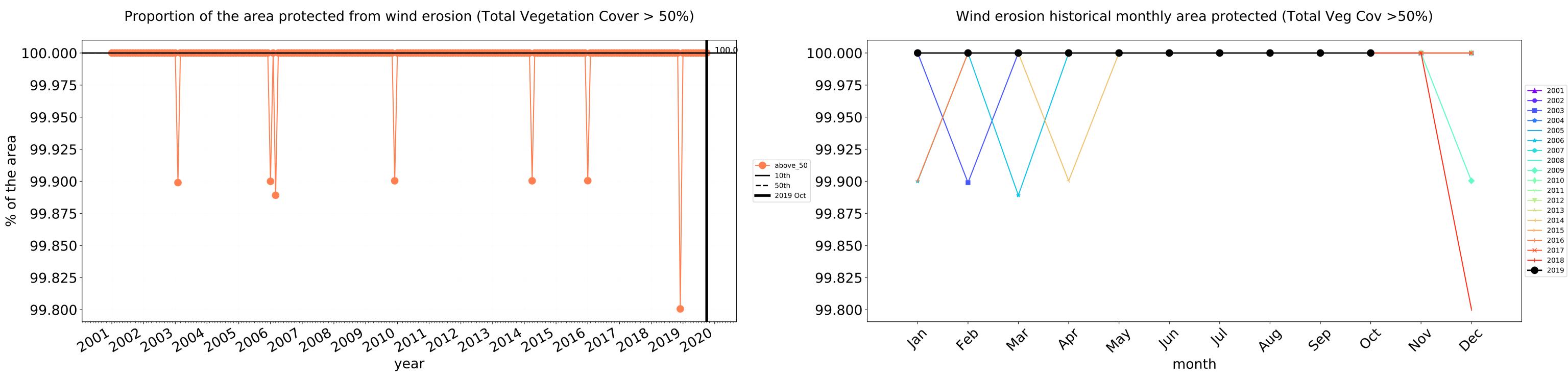


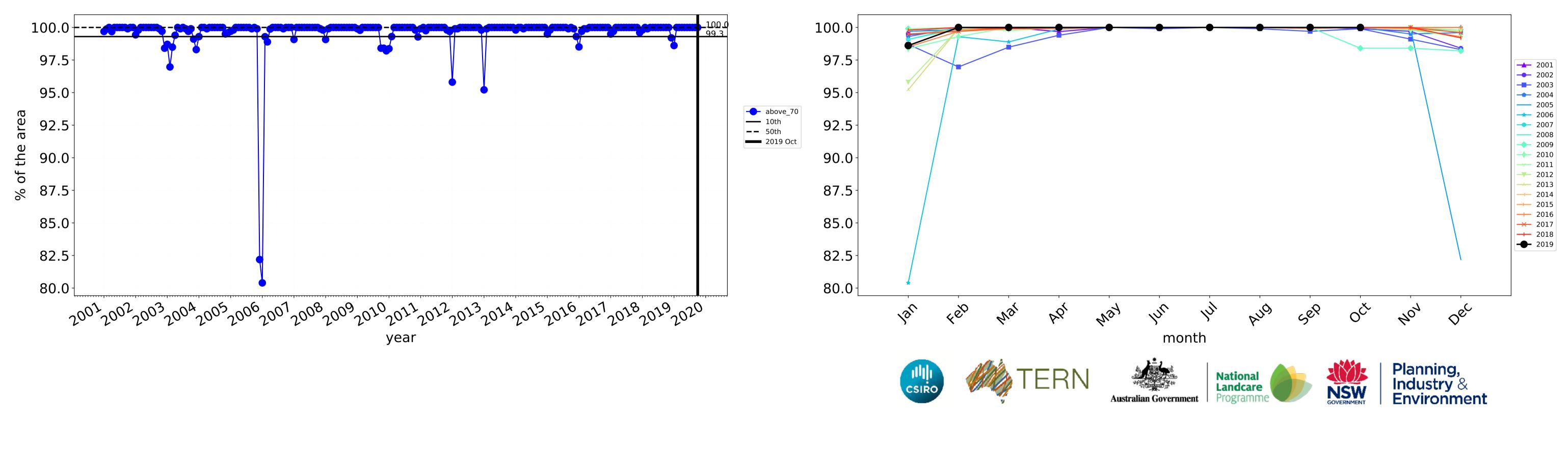
Deciles show where the pixel value lies in the

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.





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

# Whitsunday\_(R) (2,356,175 ha and no data 25,701 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	2,356,175	100.0% 2,355,725	99.5% 2,345,200	89.4% 2,106,900	69.4% 1,635,500	34.3% 807,800	10.2% 241,050
Conservation and natural environments	168,850	99.9% 168,625	99.5% 167,975	93.3% 157,475	81.3% 137,200	53.5% 90,400	18.0% 30,350
Conservation and natural environments non forest	27,950	99.8% 27,900	99.1% 27,700	71.6% 20,000	27.1% 7,575	3.8% 1,050	$1.4\% \\ 400$
Conservation and natural environments Woodland forest	56,950	99.9% 56,900	99.6% 56,725	97.6% 55,575	88.9% 50,625	61.8% 35,200	21.6% 12,300
Conservation and natural environments Forest (non woodland)	83,950	99.9% 83,825	99.5% 83,550	97.6% 81,900	94.1% 79,000	64.5% 54,150	21.0% 17,650
Agriculture	2,084,950	100.0% 2,084,925	99.6% 2,076,450	89.4% 1,863,750	68.8% 1,435,450	33.0% 687,150	9.7% 201,900
Grazing	2,042,525	100.0% 2,042,500	99.6% 2,034,175	89.5% 1,827,725	69.1% 1,411,600	33.4% 681,300	9.8% 200,225
Grazing non forest	1,171,850	100.0% 1,171,825	99.3% 1,163,550	83.1% 974,250	55.6% 651,975	21.9% 256,450	5.4% 63,600
Grazing Woodland forest	819,825	100.0% 819,825	100.0% 819,800	98.2% 805,225	88.0% 721,850	49.6% 406,625	16.0% 130,900
Grazing - Forest (non woodland)	50,850	100.0% 50,850	100.0% 50,825	94.9% 48,250	74.3% 37,775	35.8% 18,225	11.3% 5,725
Irrigation	42,125	100.0% 42,125	99.6% 41,975	84.8% 35,725	56.1% 23,625	13.8% 5,800	4.0% 1,675
Production native forests and plantation forests	25,125	100.0% 25,125	100.0% 25,125	100.0% 25,125	99.9% 25,100	75.3% 18,925	18.8% 4,725

