# Total vegetation cover soil protection Region:NRM West Gippsland VIC

# 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:

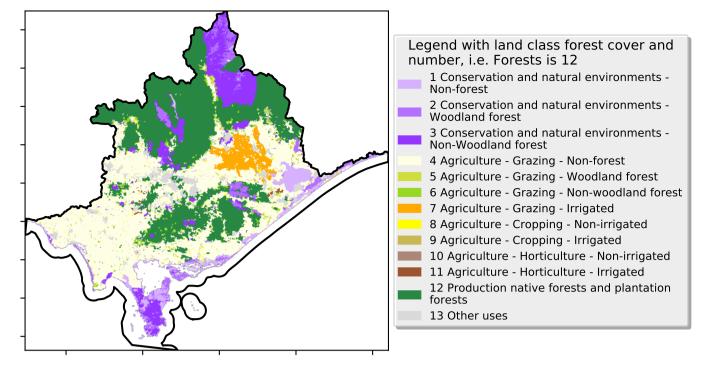
https://doi.org/10.4225/08/5848a3f19a7b3



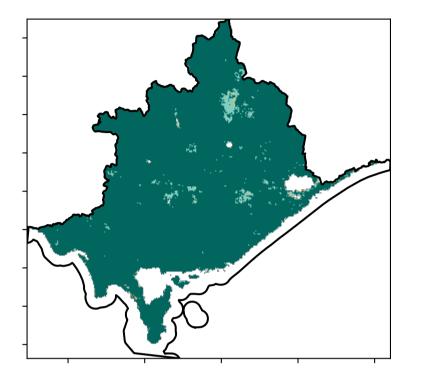
# **Vegetation Cover Oct 2019**

### Land use and forest cover

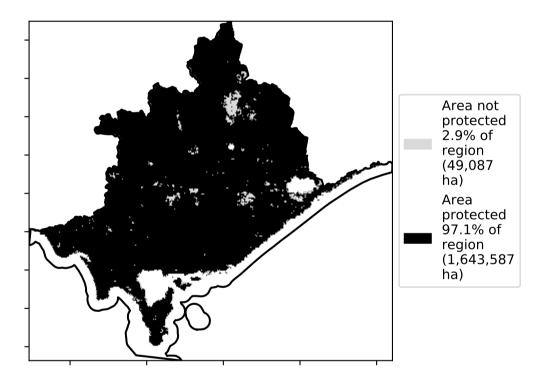
### Proportion of each land class in area

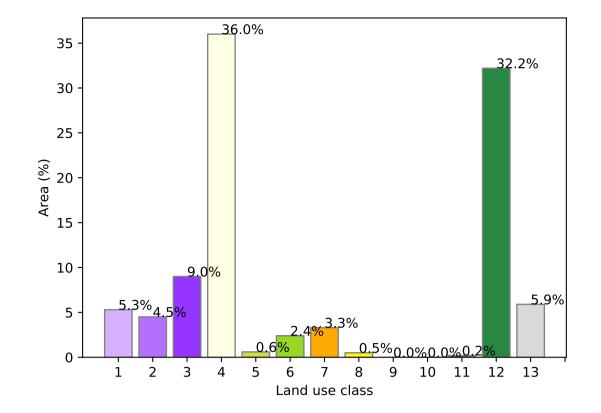


### **Total Vegetation Cover [%]**

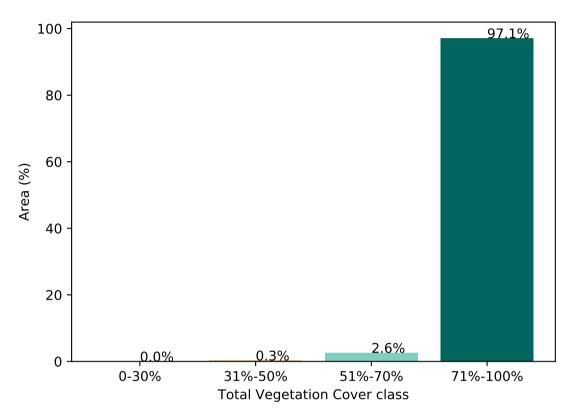


### % Area protected from water erosion (>70%)

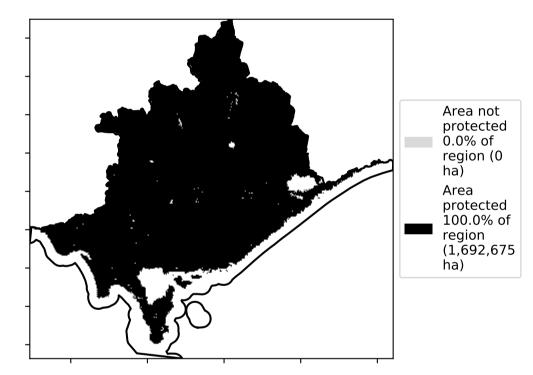




### Proportion of vegetation cover class in area



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



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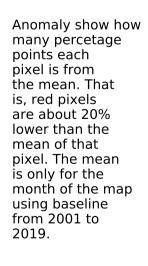
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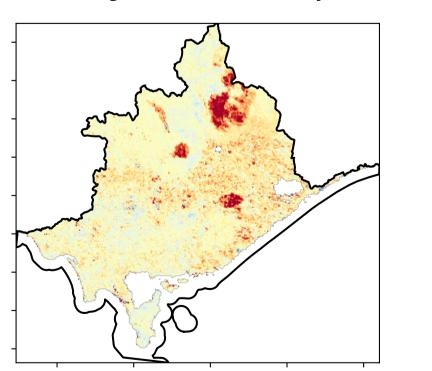
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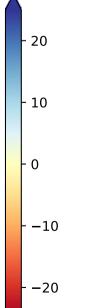
2<sup>35</sup>

**Total Vegetation Cover Anomaly [%]** 

**Total Vegetation Cover Decile [%]** 







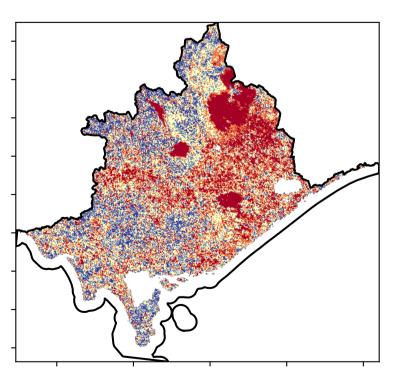
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52% 70%

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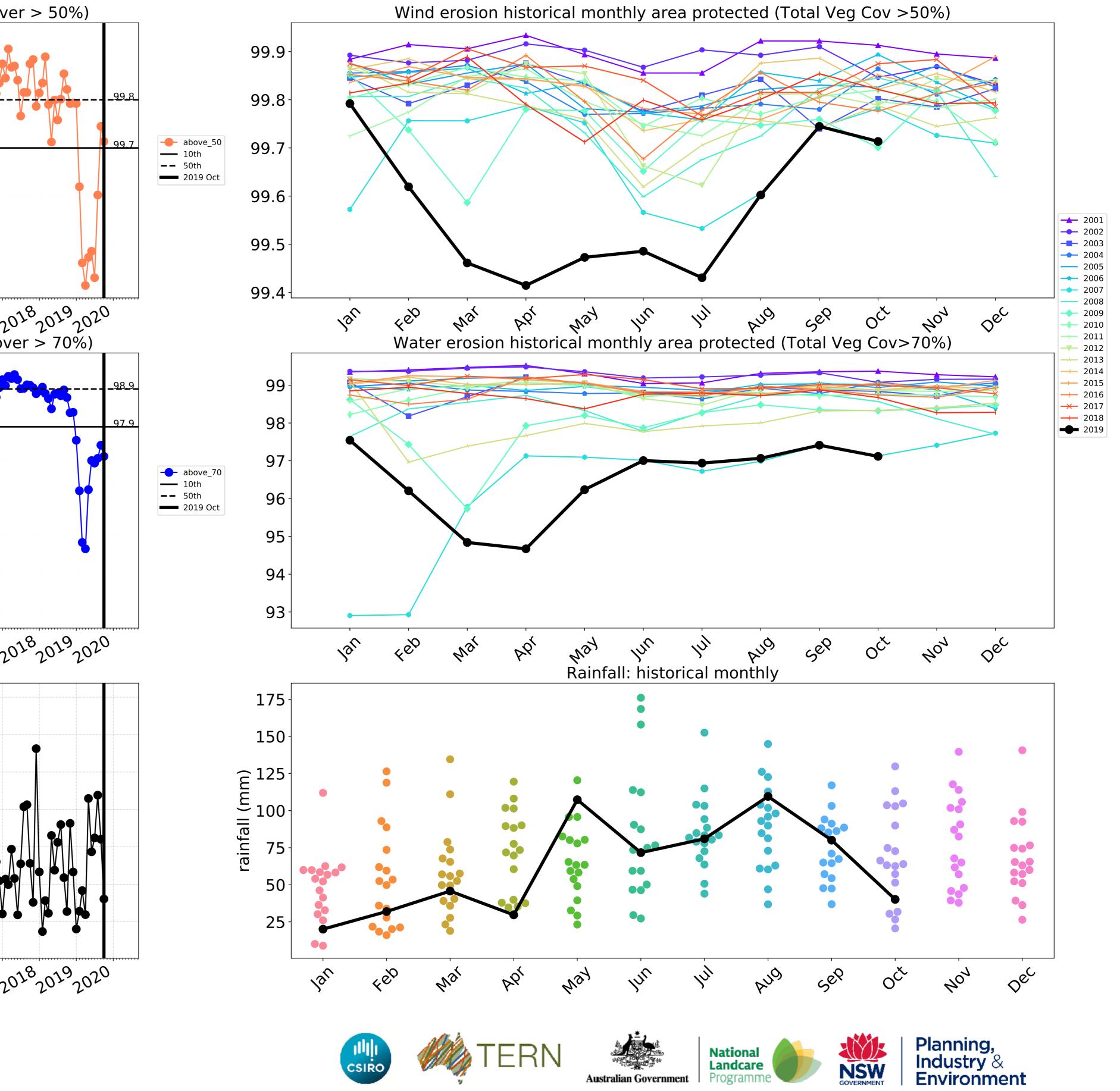
0.30%

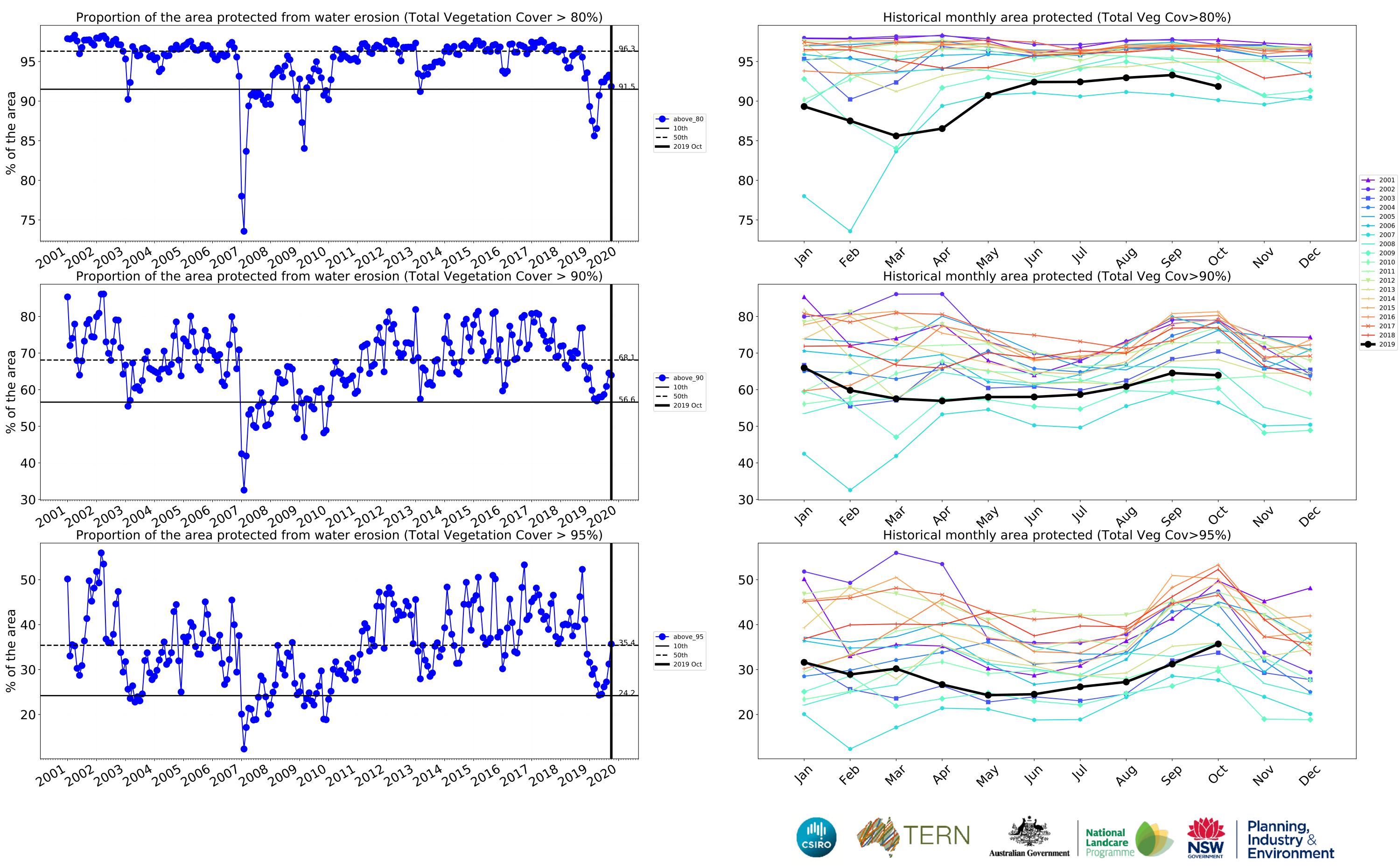
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



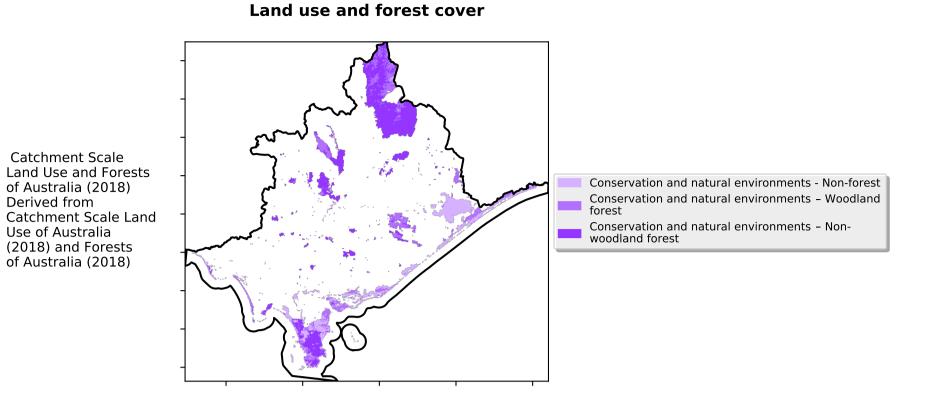


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%) 99.9 99. ea % of the au % 09.6 99.5 99.4  $\frac{20^{2} 20^{2} 20^{3} 20^{4} 20^{5} 20^{6} 20^{1} 20^{8} 20^{9} 20^{1$ 99 98 area 97 96 th of 8 95 94 93  $\frac{200^{1}200^{2}200^{3}200^{4}200^{5}200^{6}200^{1}200^{8}200^{9}20^{10}20^{12}20^{12}20^{13}20^{14}20^{15}20^{16}20^{12}20^{18}20^{19}20^{20}}{Monthly rainfall from 2001 to 2019}$ 175 [150 125 100 75 50 25 20012002200320042005200620012008200920102011201220132014201520162011201820192020



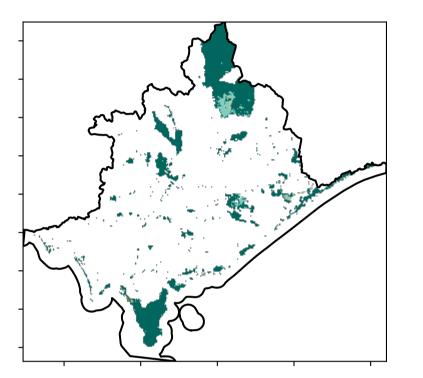


## **Conservation and natural environments**

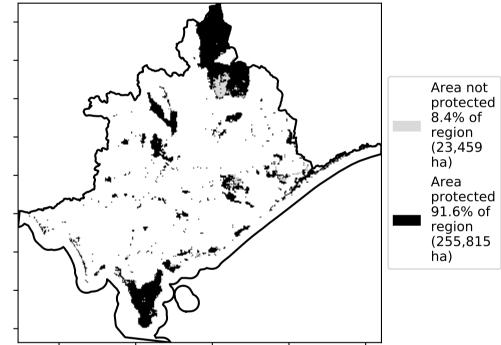


**Total Vegetation Cover [%]** 

Derived from



% Area protected from water erosion (>70%)



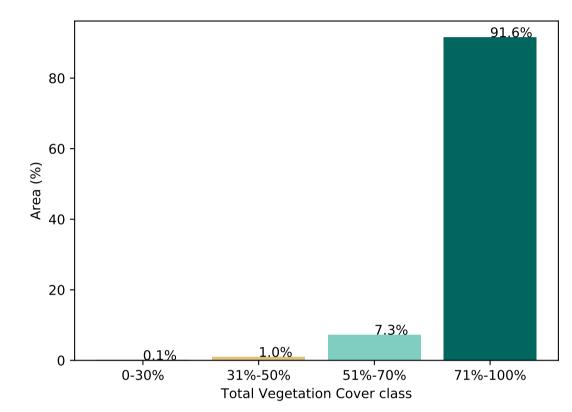
0.30%

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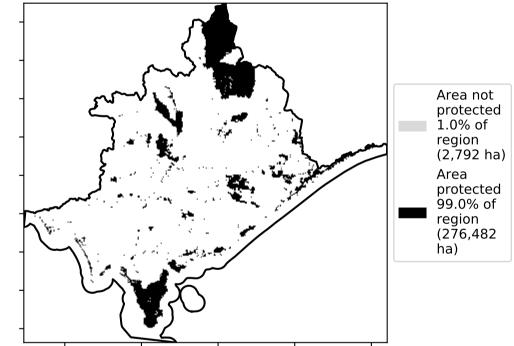
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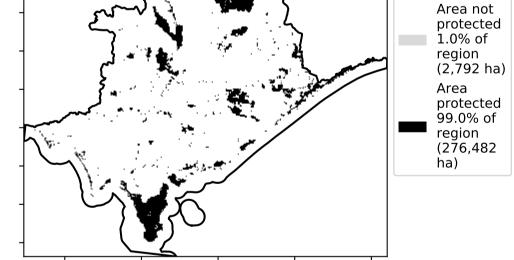
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% Area protected from wind erosion (>50%)





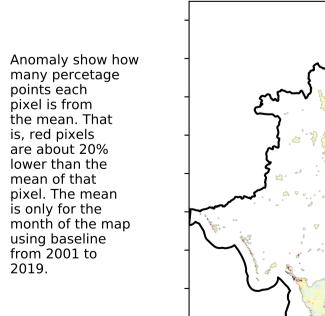
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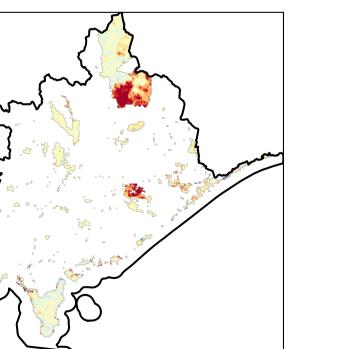
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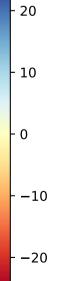
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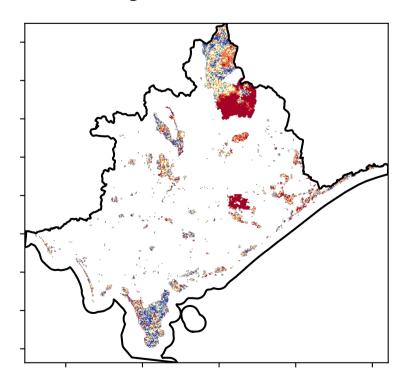
**Total Vegetation Cover Anomaly [%]** 







Total Vegetation Cover Decile [%]

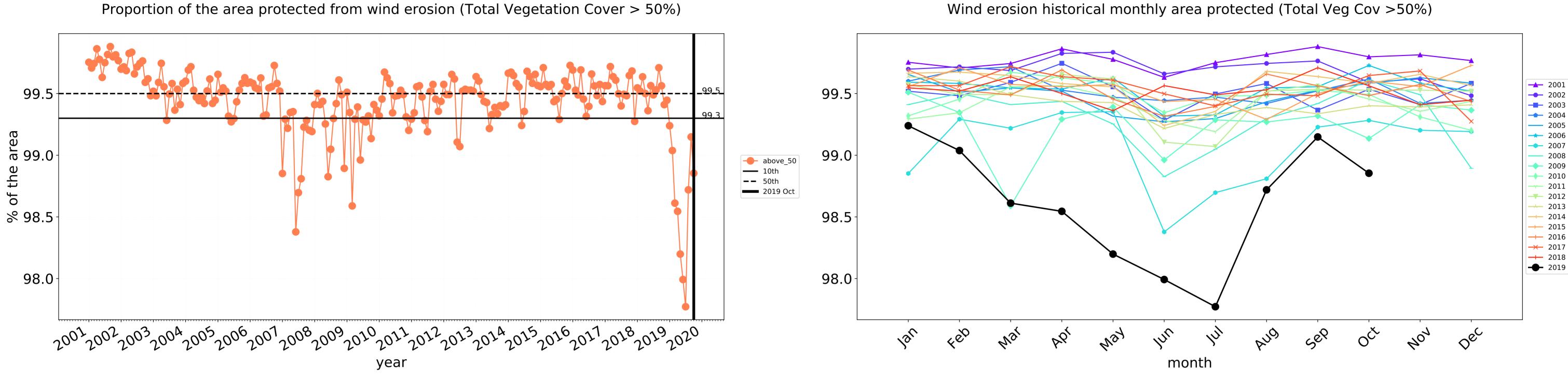




Deciles show where the pixel value lies in the

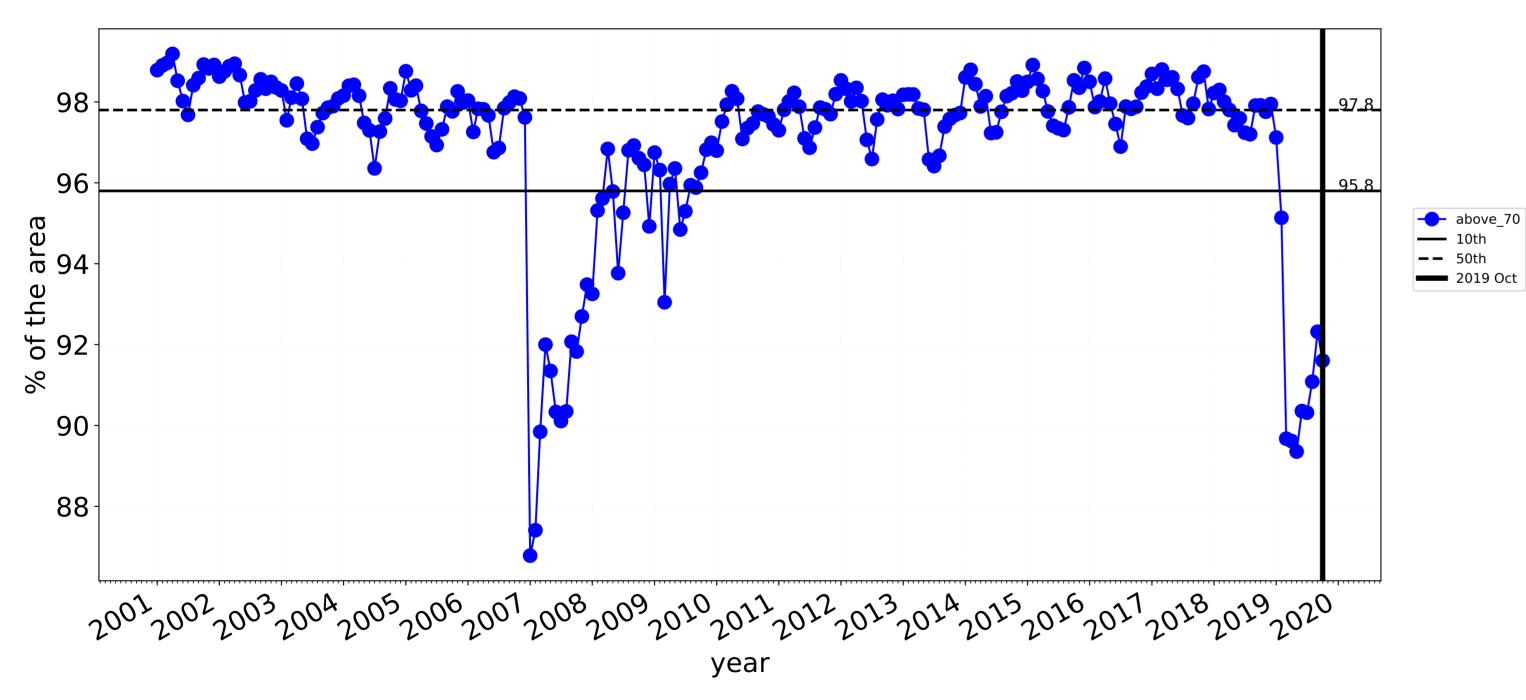
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

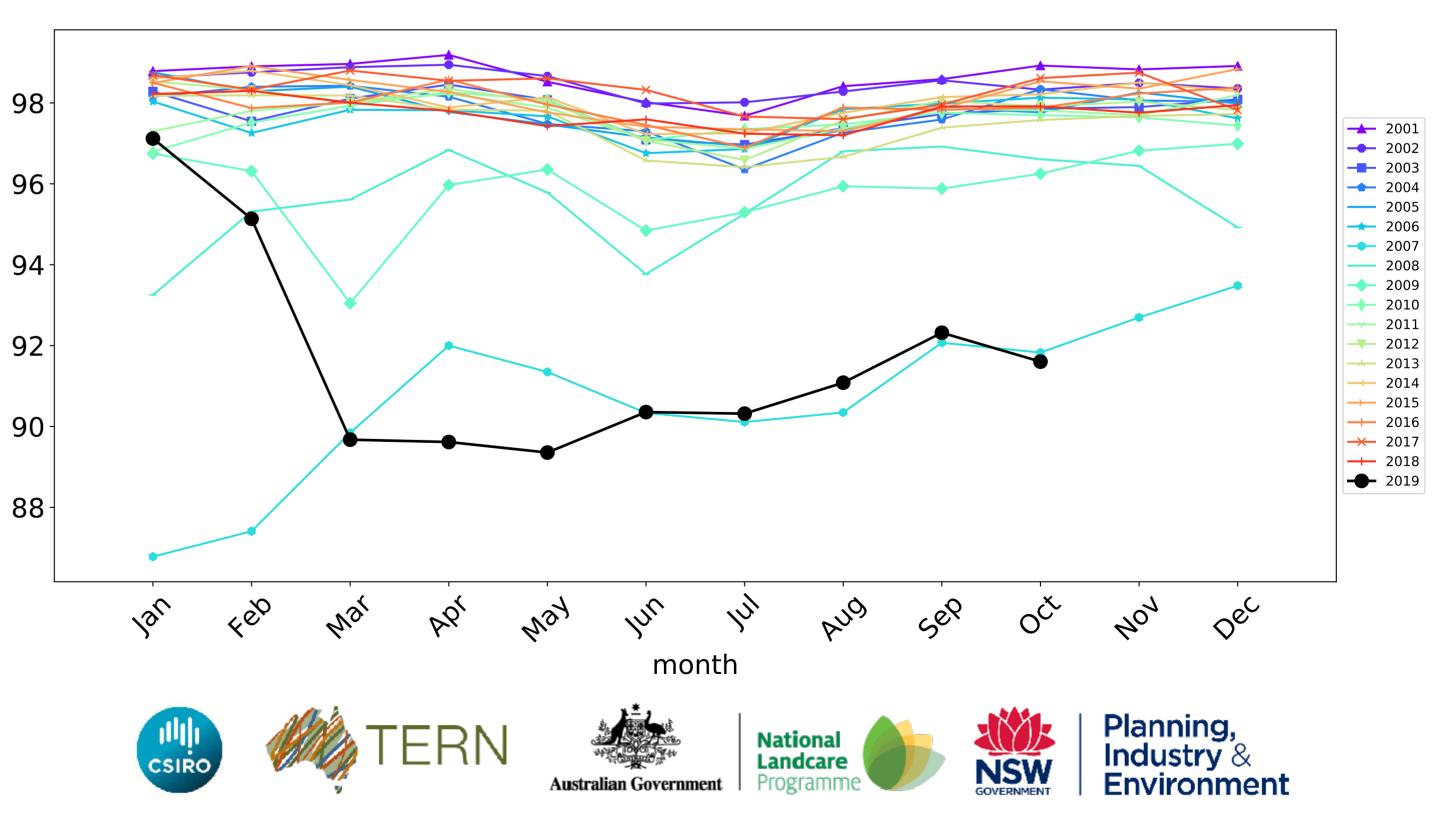
records for that month of the map using baseline from 2001 to 2019.



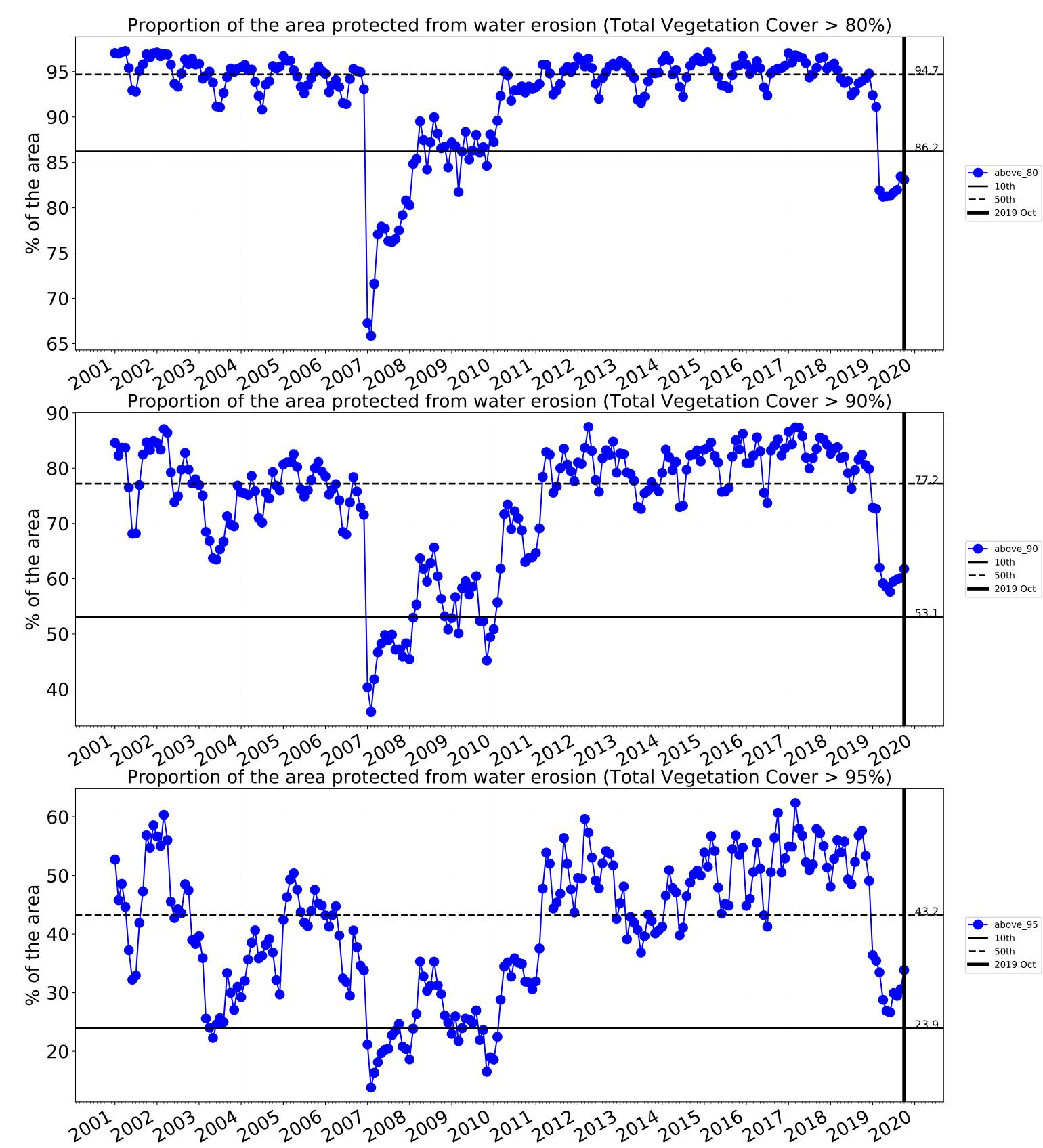
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

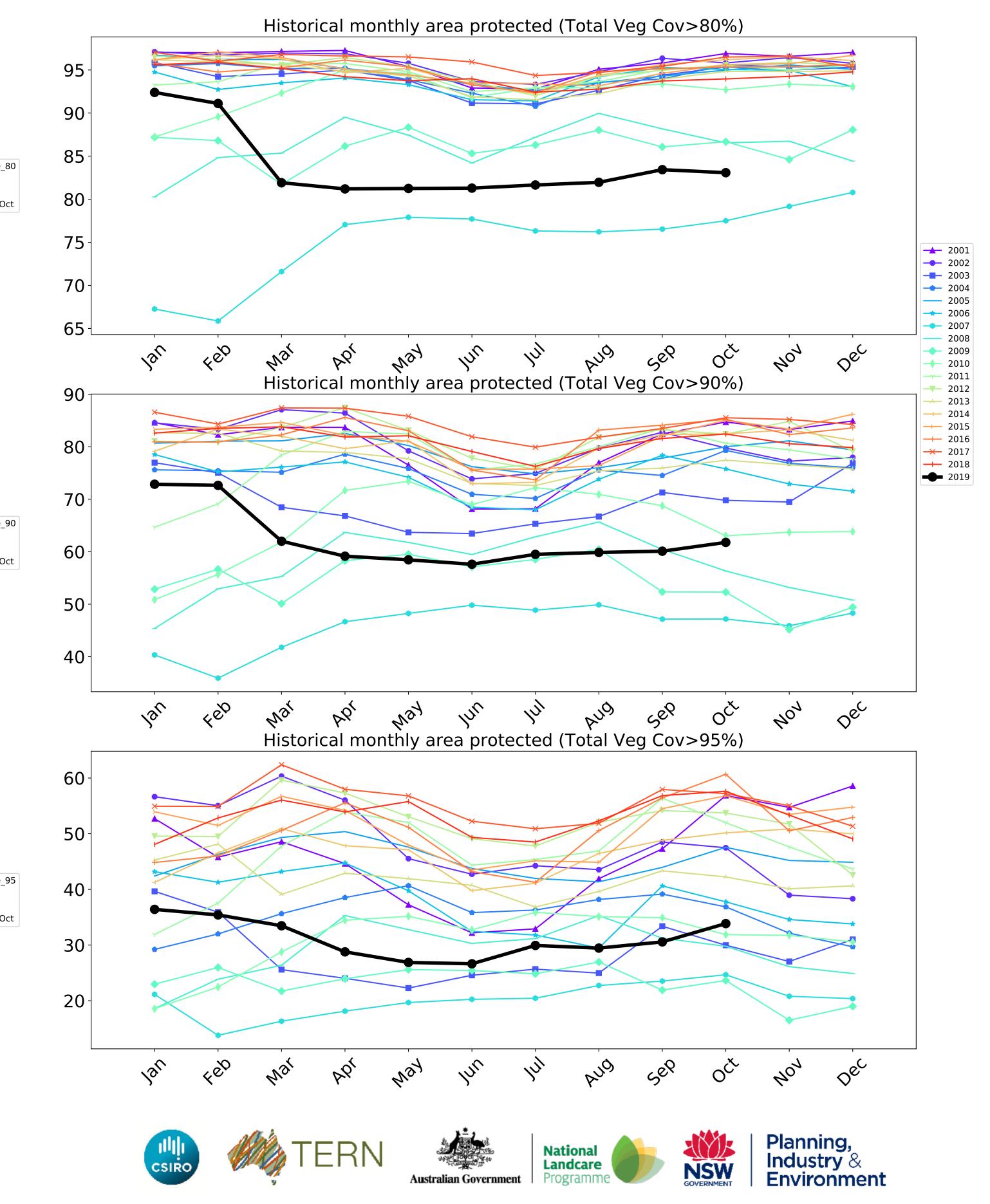
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



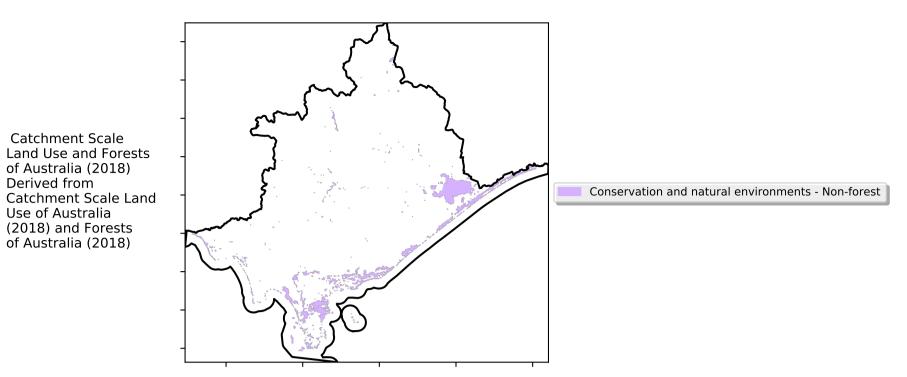


Water erosion historical monthly area protected (Total Veg Cov>70%)



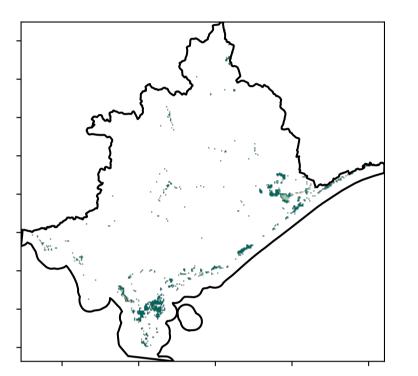


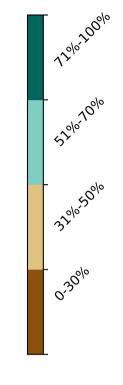
### **Conservation and natural environments non forest**



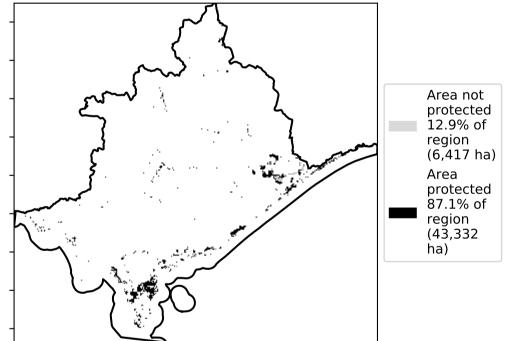
Land use and forest cover

**Total Vegetation Cover [%]** 

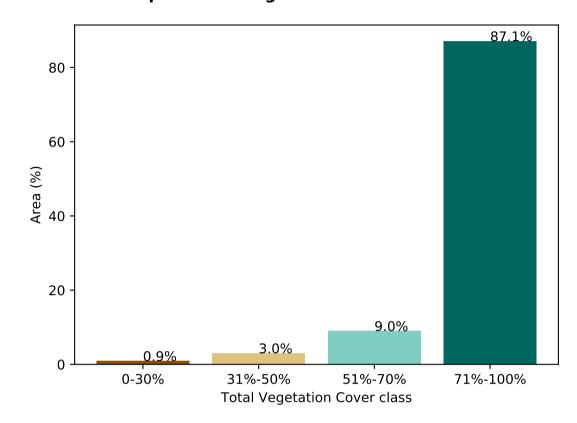




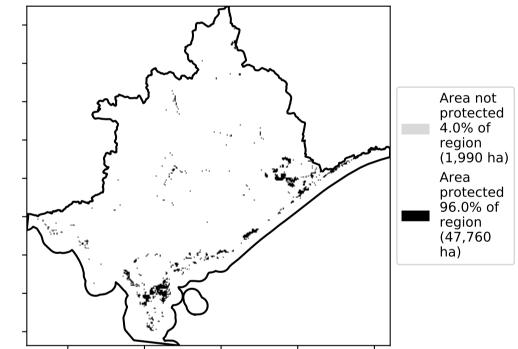
% Area protected from water erosion (>70%)



### Proportion of vegetation cover class in area



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



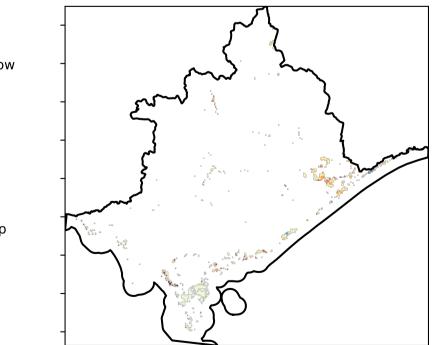
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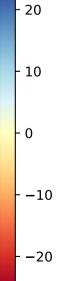
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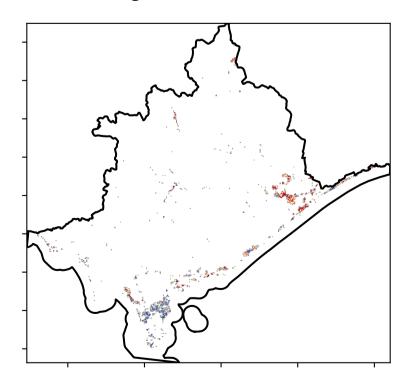
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**Total Vegetation Cover Anomaly [%]** 





Total Vegetation Cover Decile [%]





Deciles show where the pixel value lies in the

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

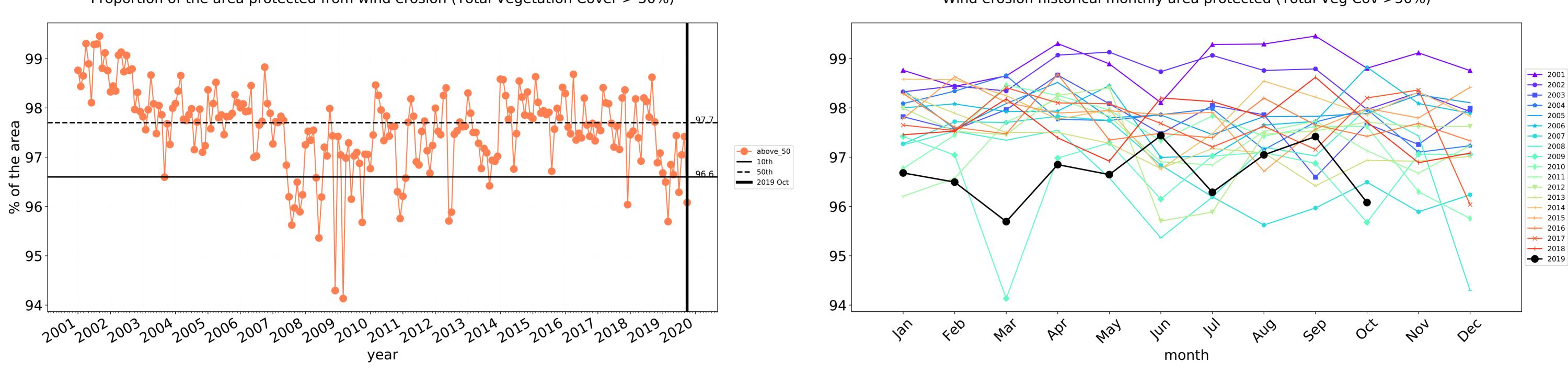
records for that month of the map using baseline from 2001 to 2019.

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

Derived from

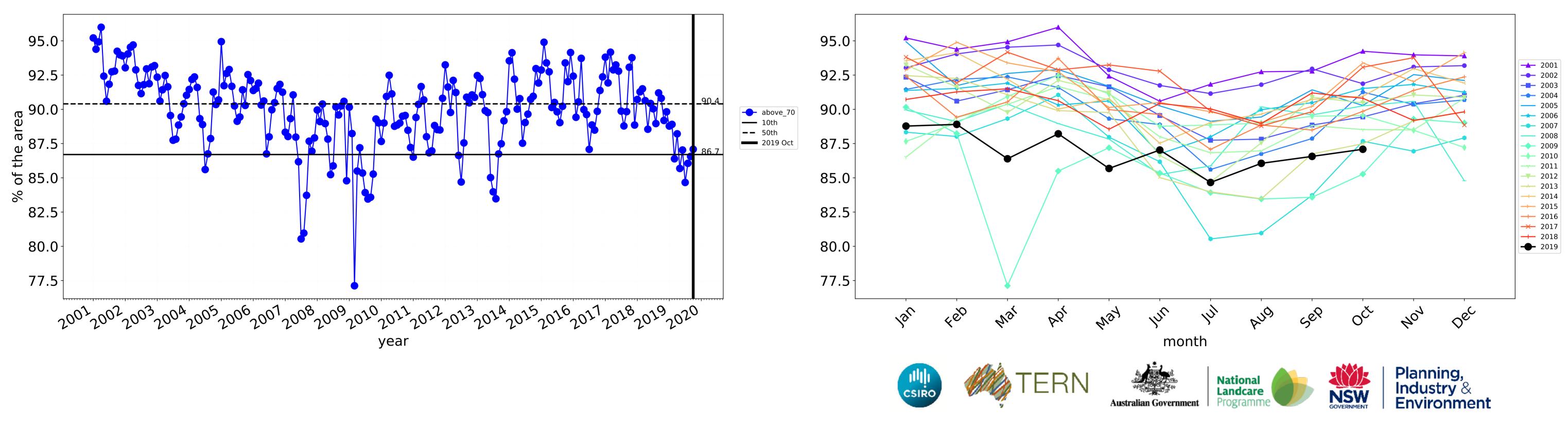
Use of Australia





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%)

Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)

— 10th **--** 50th **—** 2019 Oct

above 9

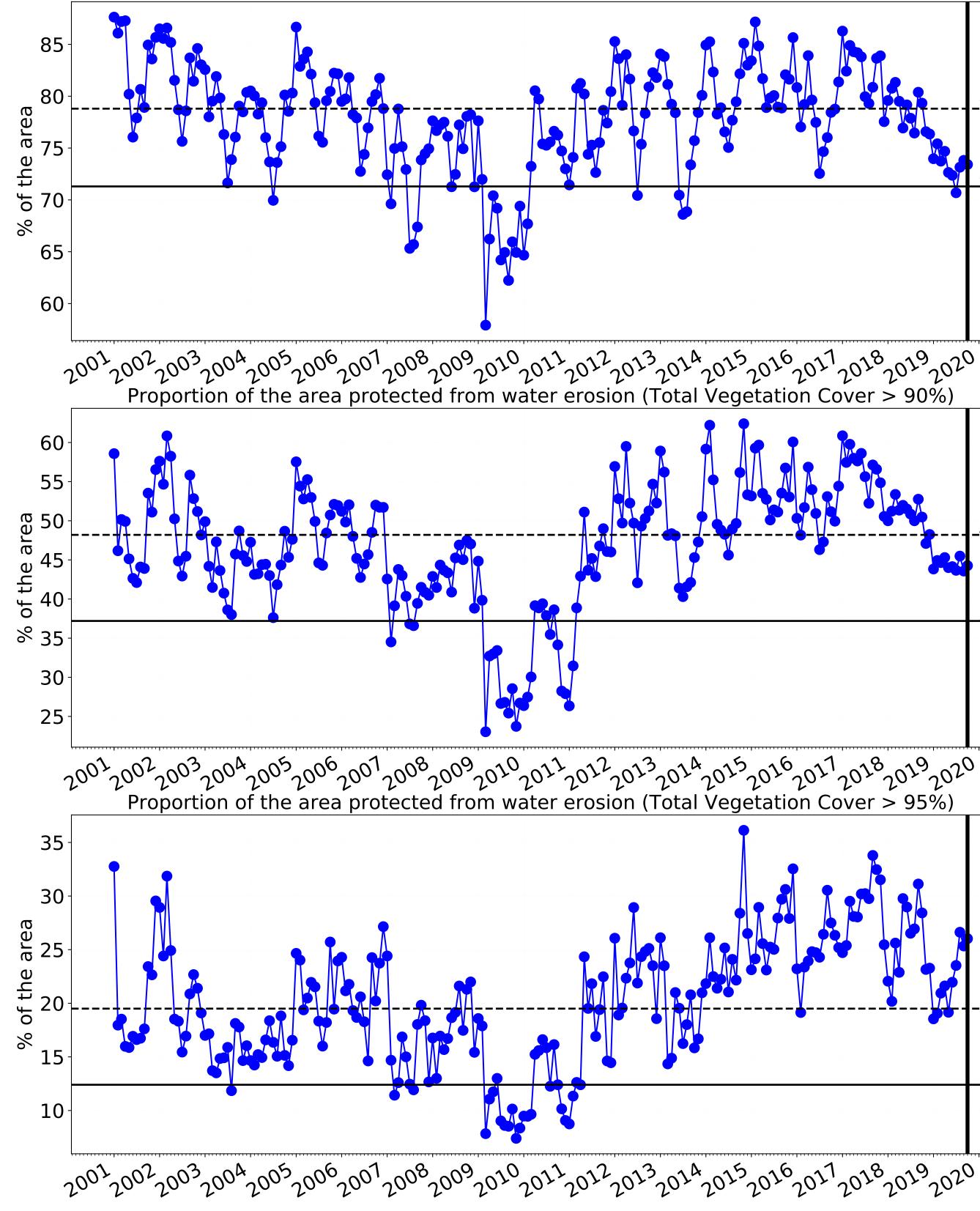
10th **——** 50th

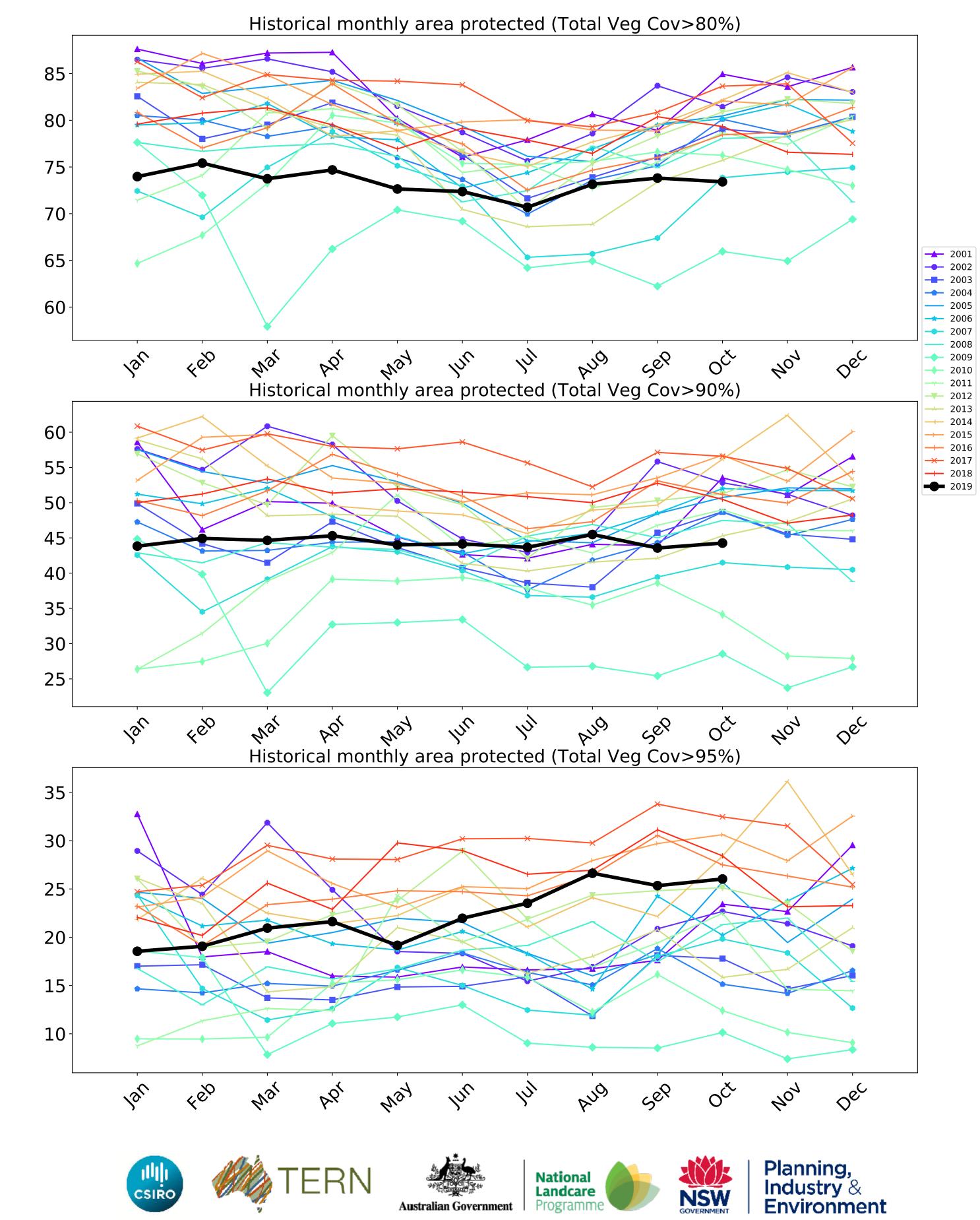
**—** 2019 Oct

---- above\_95

**——** 2019 Oct

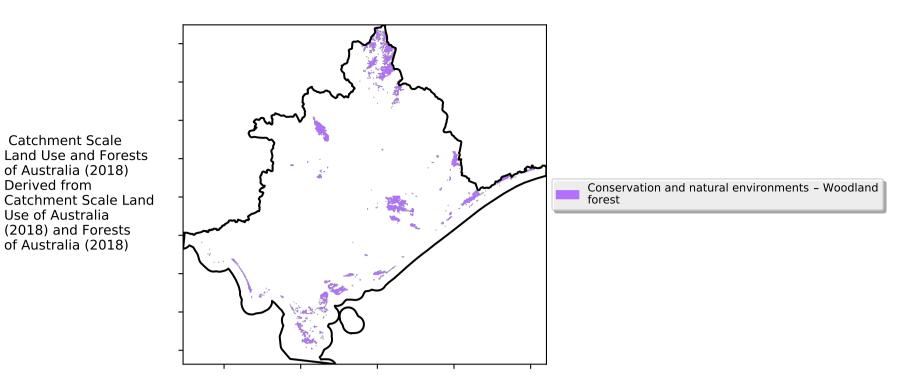
--- 10th -- 50th







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



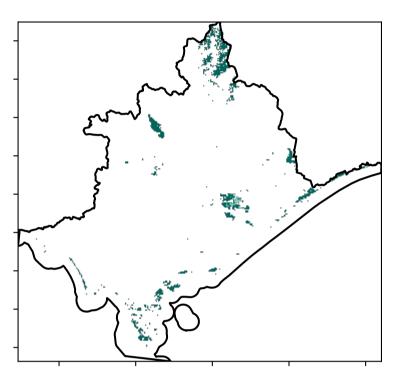
Land use and forest cover

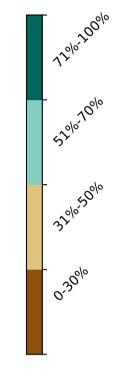
Catchment Scale

of Australia (2018) Derived from

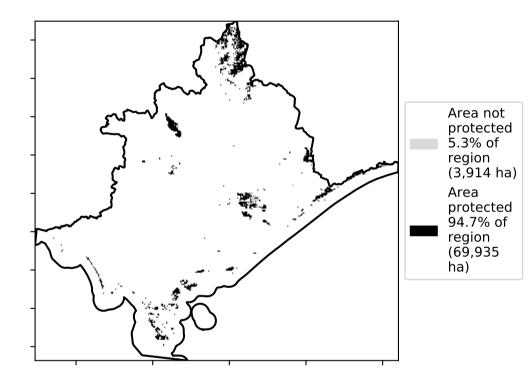
Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 

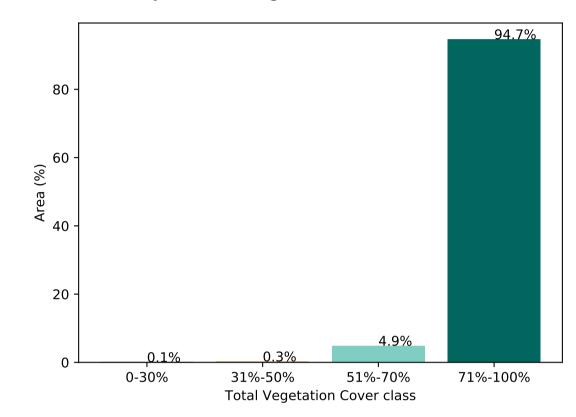




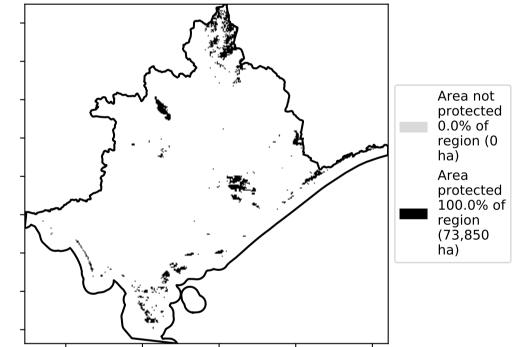
% Area protected from water erosion (>70%)







% Area protected from wind erosion (>50%)



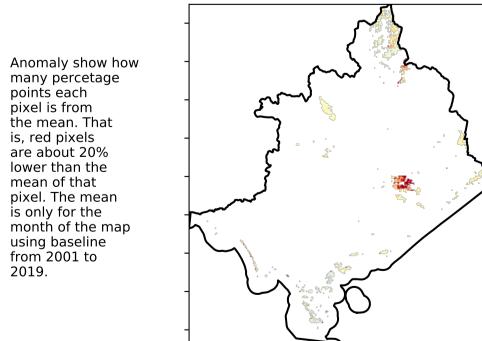
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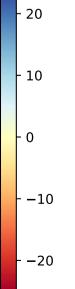
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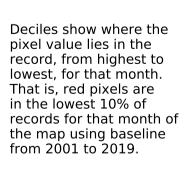
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**Total Vegetation Cover Anomaly [%]** 

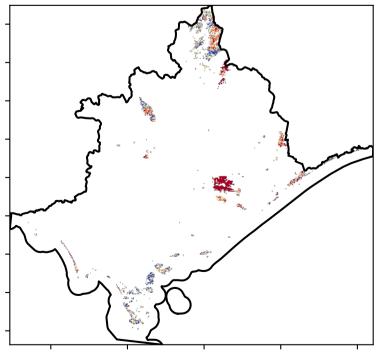




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Total Vegetation Cover Decile [%]





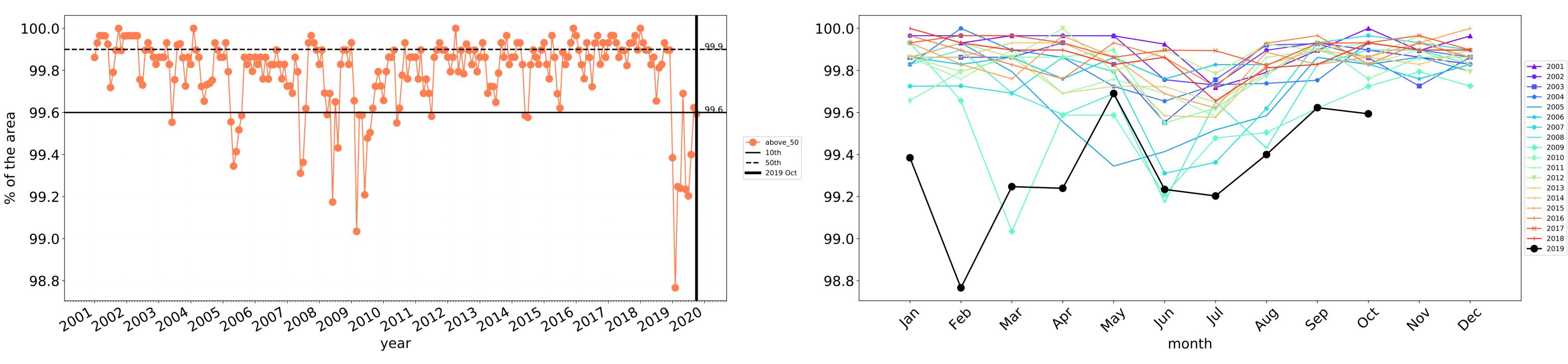
GOVERNMENT





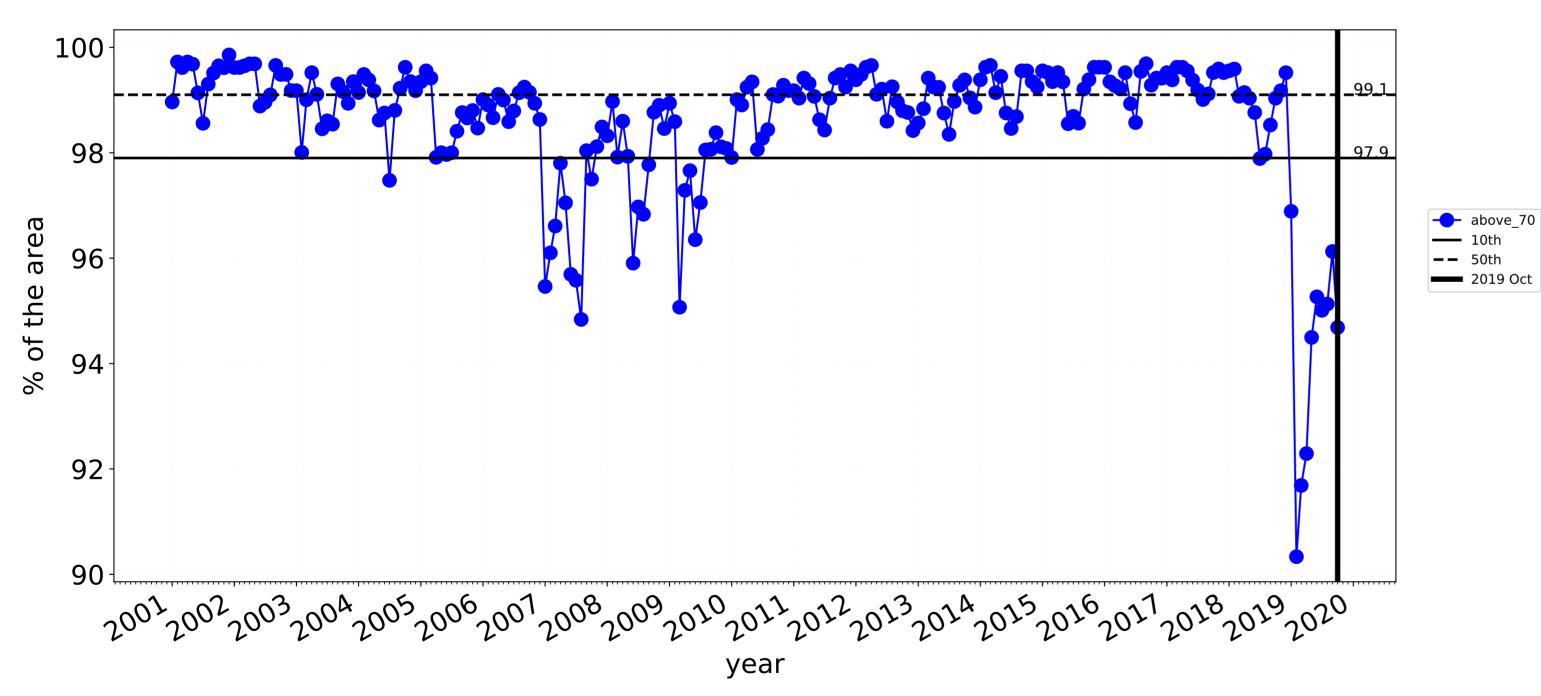
Australian Government





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

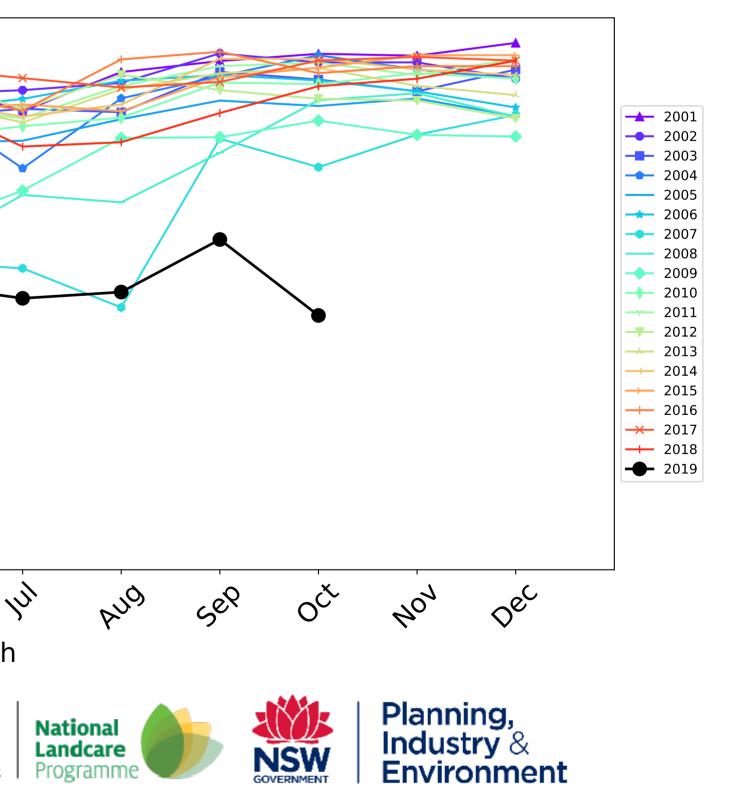
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

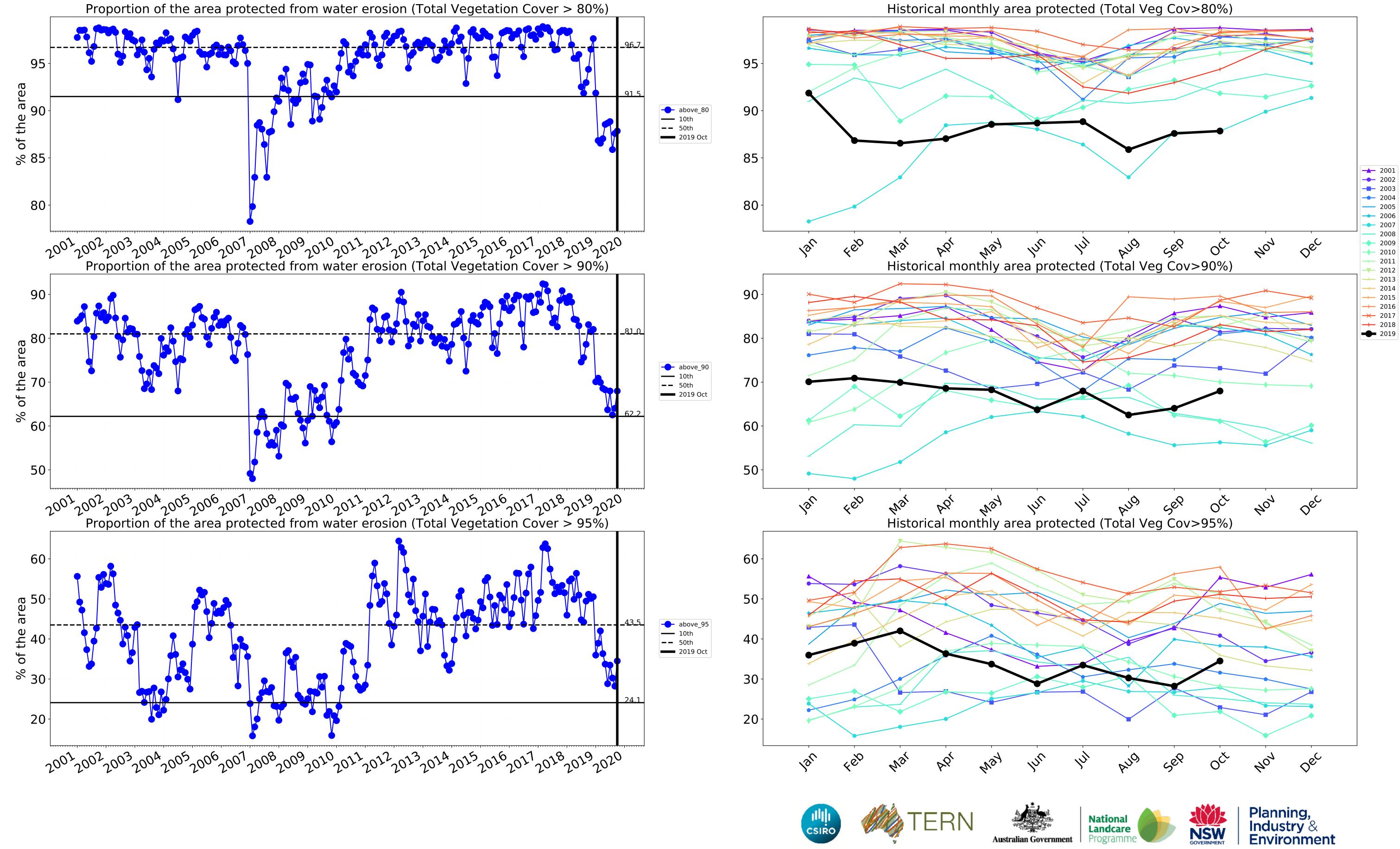


100-98 96 94 92 90 Jan feb In Mai May PQ month ERN (SOQ) CSIRC Australian Government

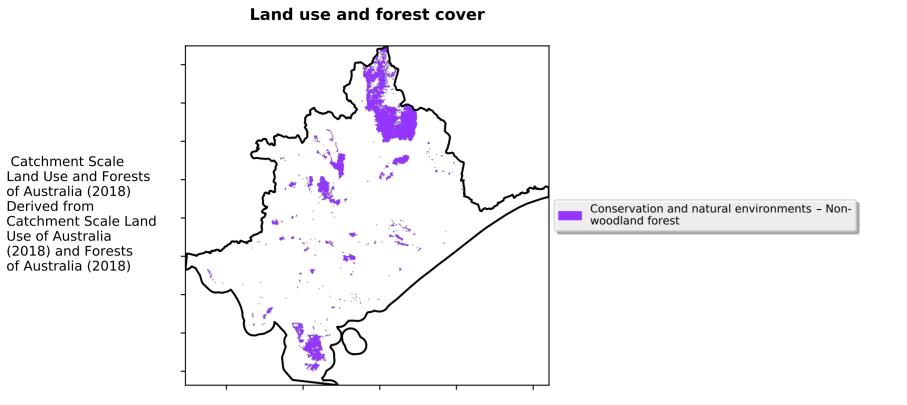
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

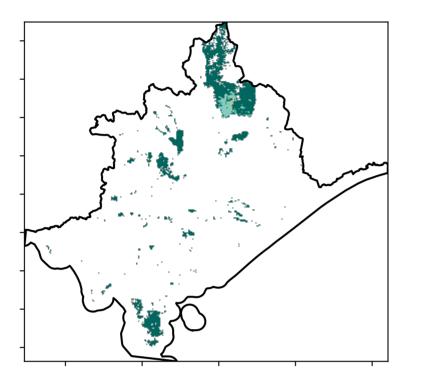




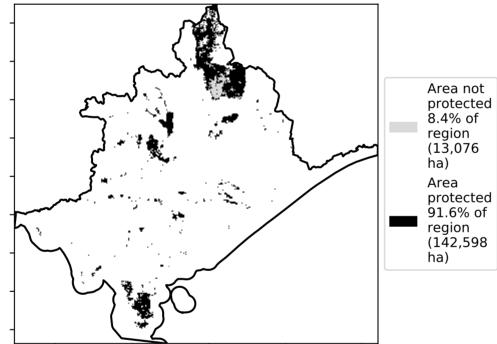
## **Conservation and natural environments Forest (non woodland)**

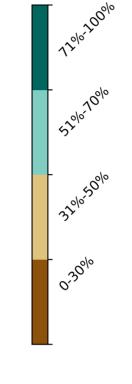


**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





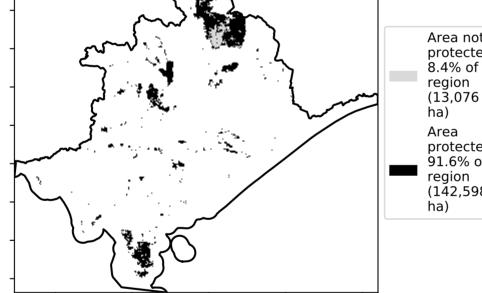
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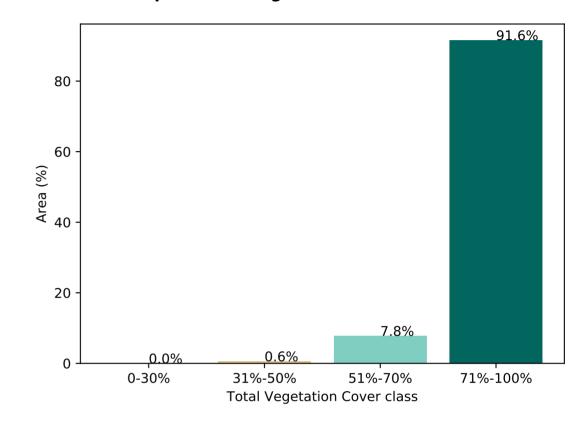
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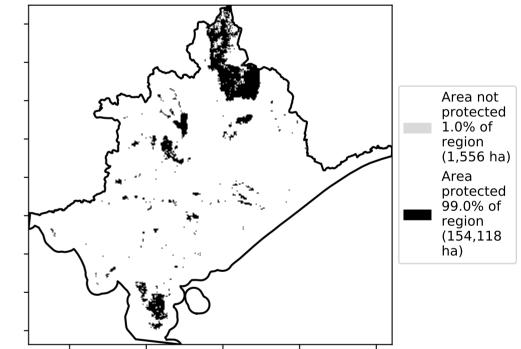
-20



Proportion of vegetation cover class in area

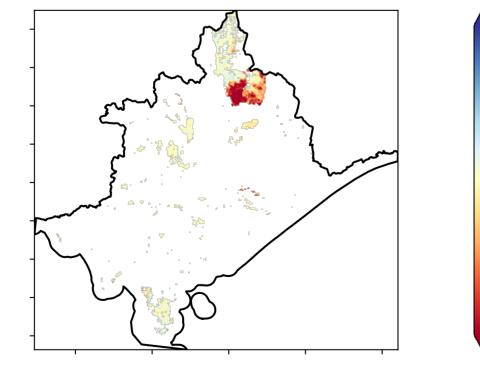


% Area protected from wind erosion (>50%)



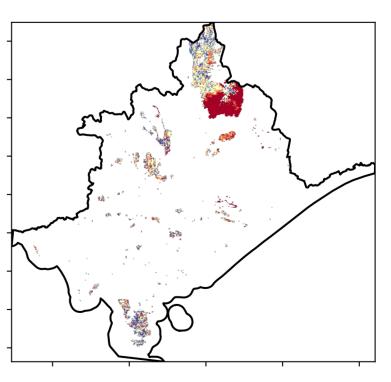
**Total Vegetation Cover Anomaly [%]** 

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.



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

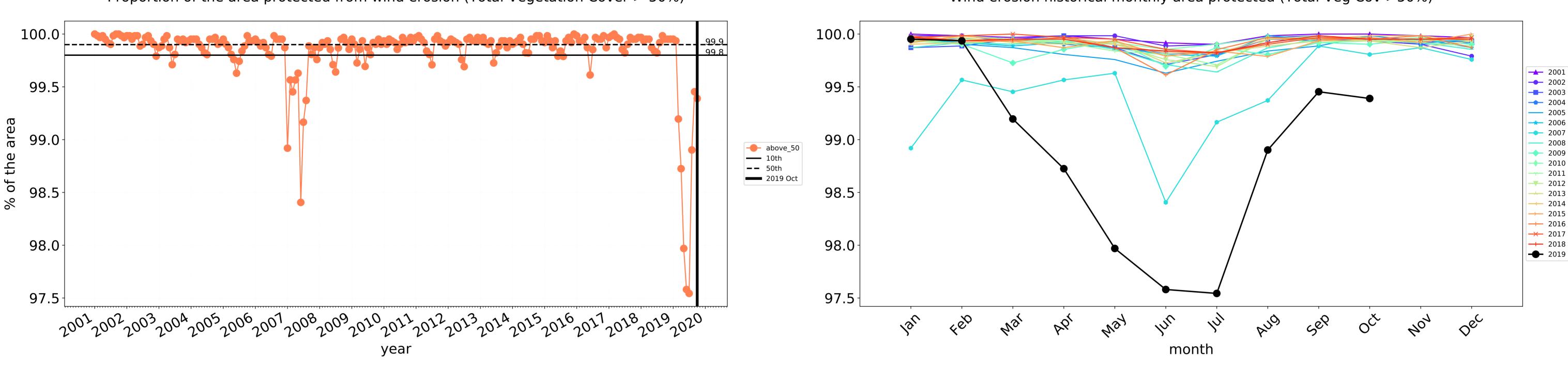
**Total Vegetation Cover Decile [%]** 





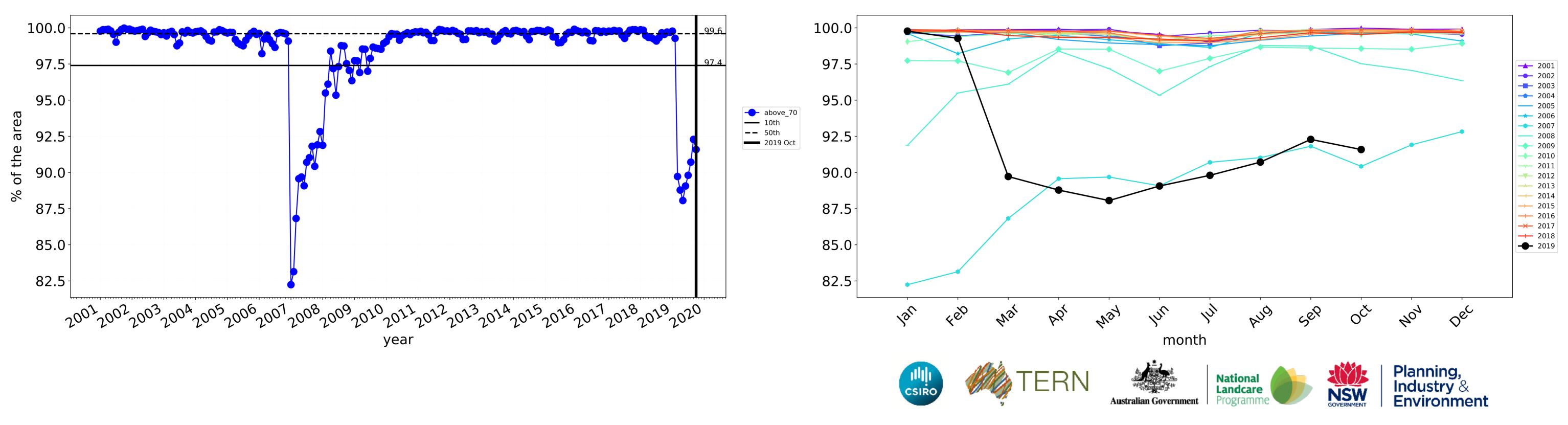


## **Conservation and natural environments Forest (non woodland) timeseries**



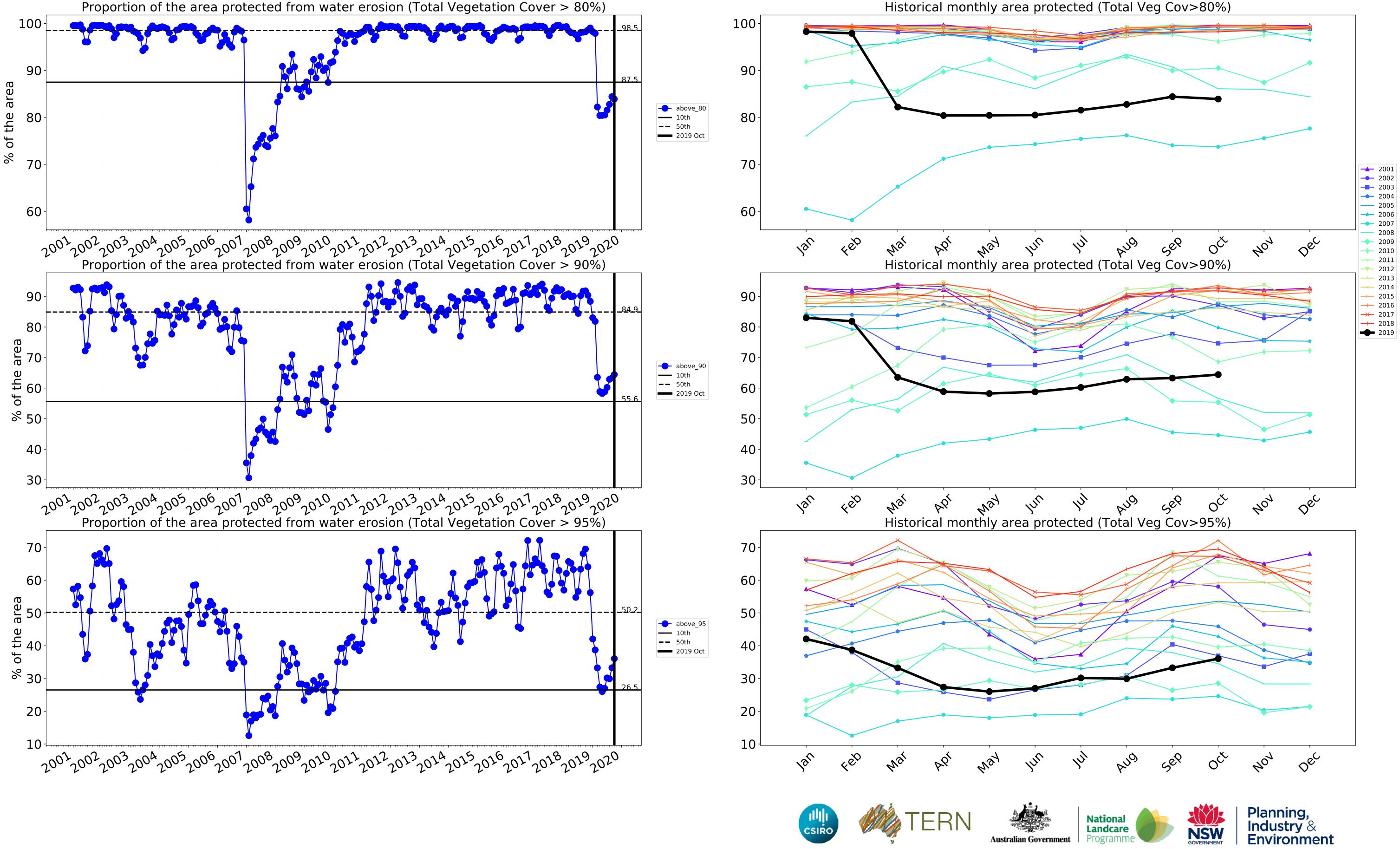
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

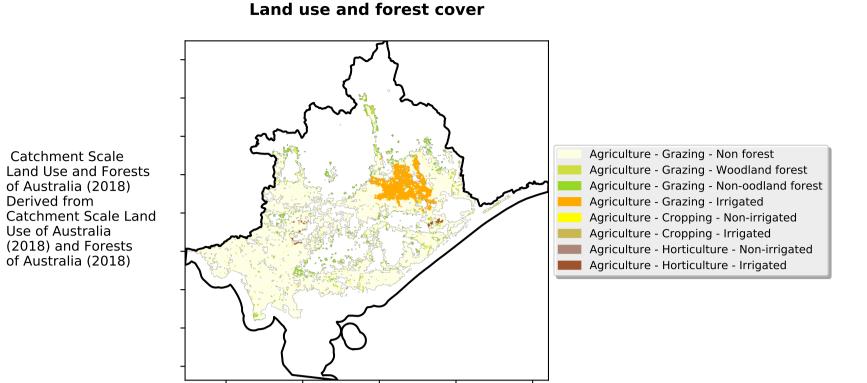


Wind erosion historical monthly area protected (Total Veg Cov >50%)

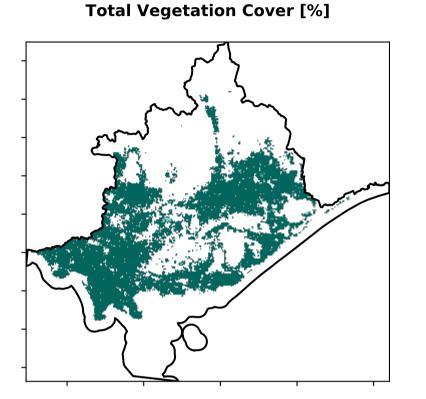
Water erosion historical monthly area protected (Total Veg Cov>70%)



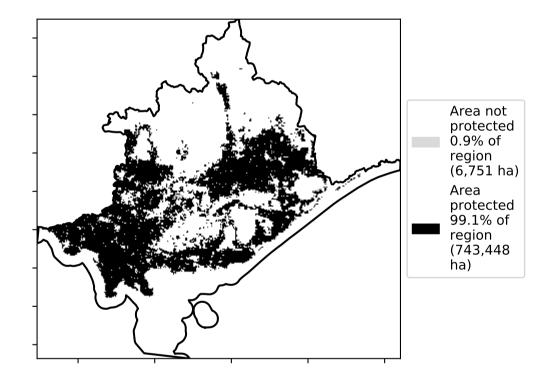
### Agriculture

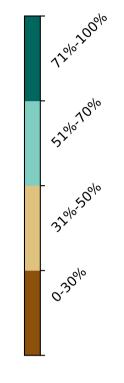


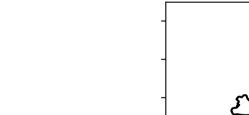
Derived from



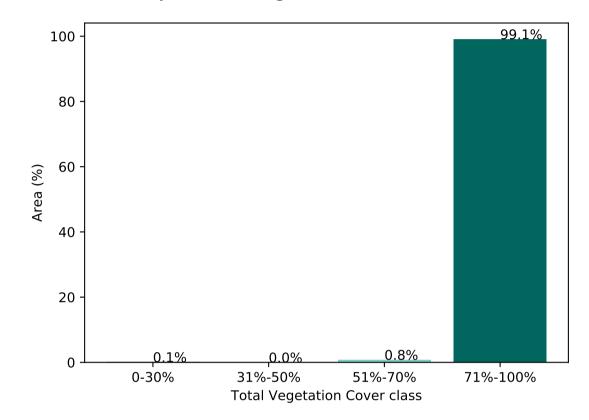
% Area protected from water erosion (>70%)



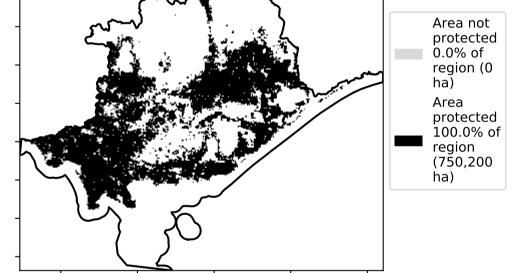




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



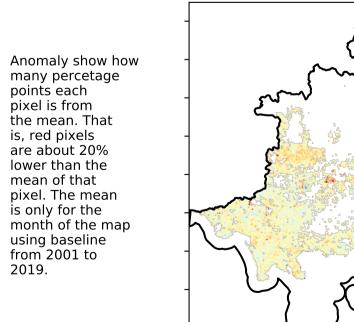
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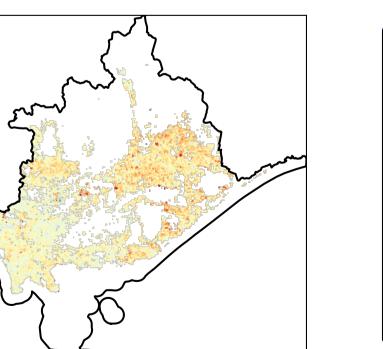
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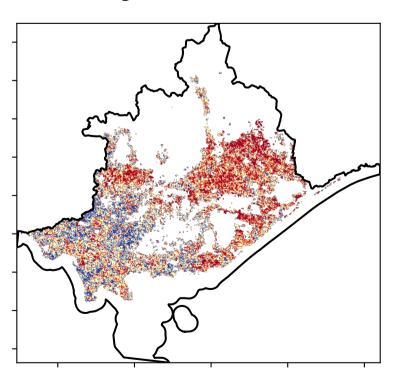
**Total Vegetation Cover Anomaly [%]** 





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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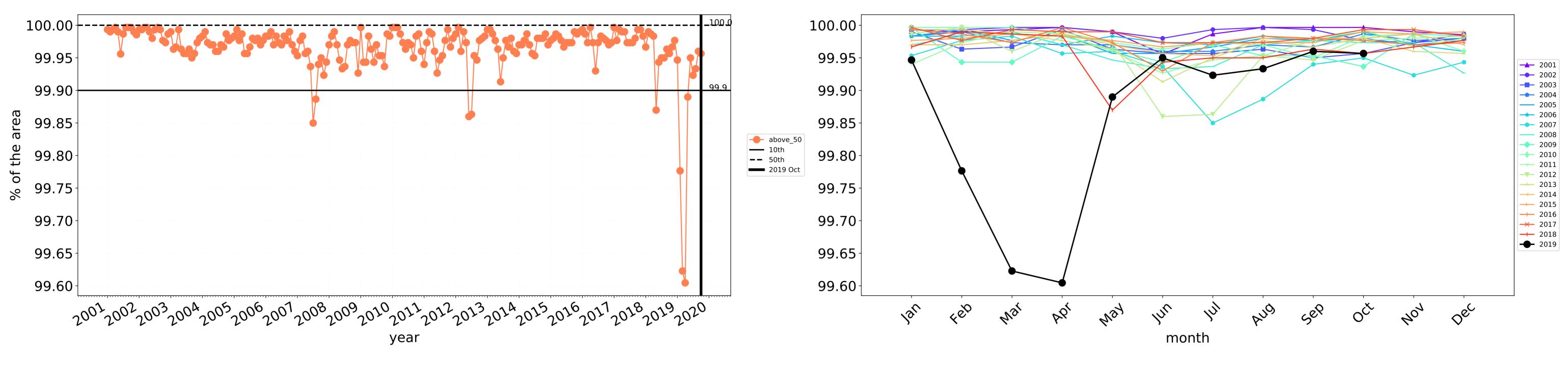
- 20

- 10

0

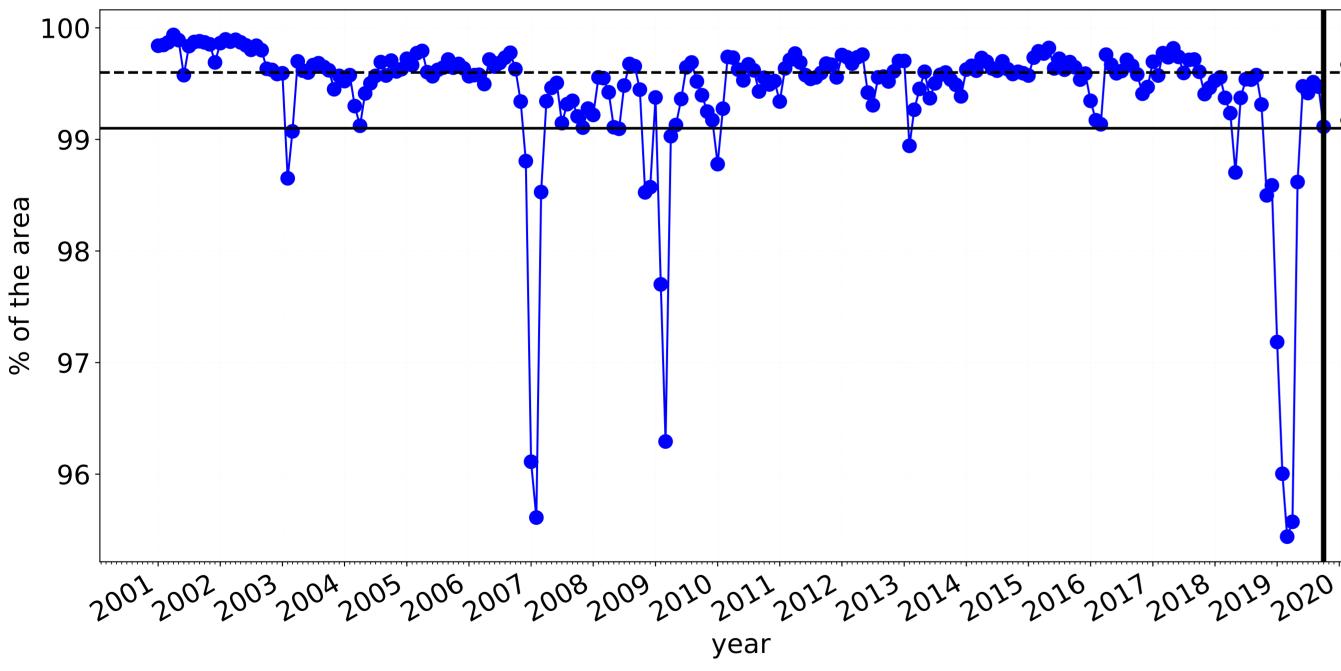
-10

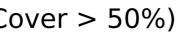
-20



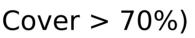
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



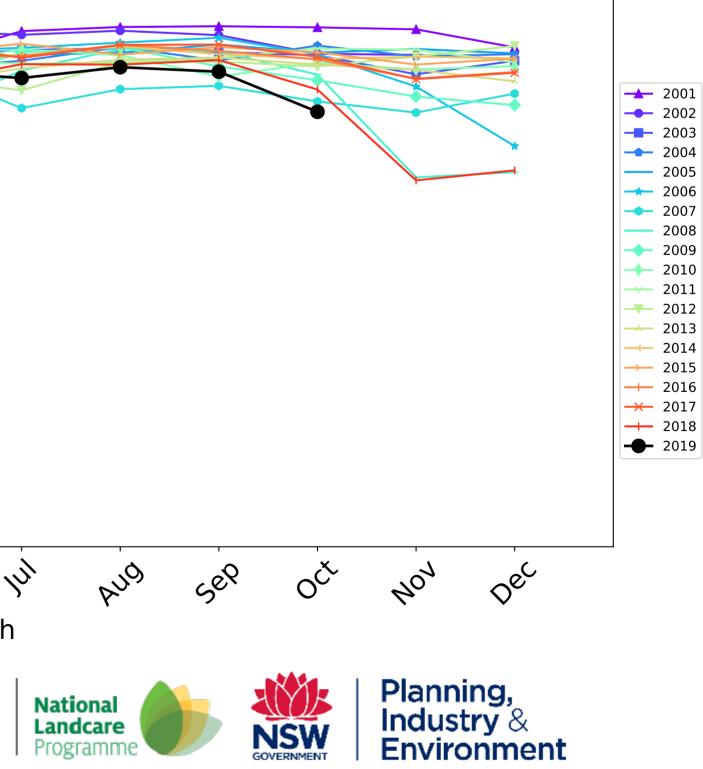


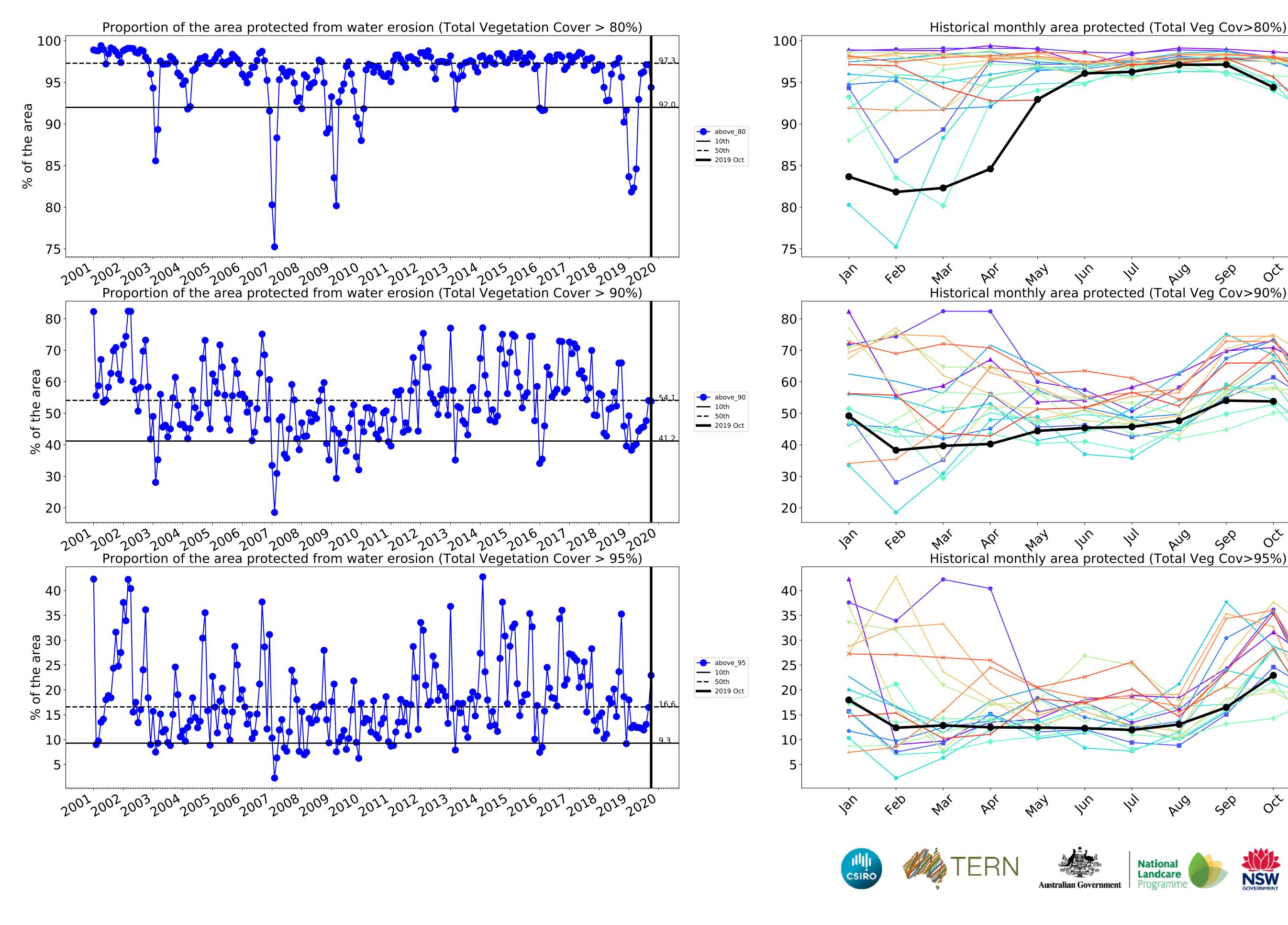
Wind erosion historical monthly area protected (Total Veg Cov >50%)

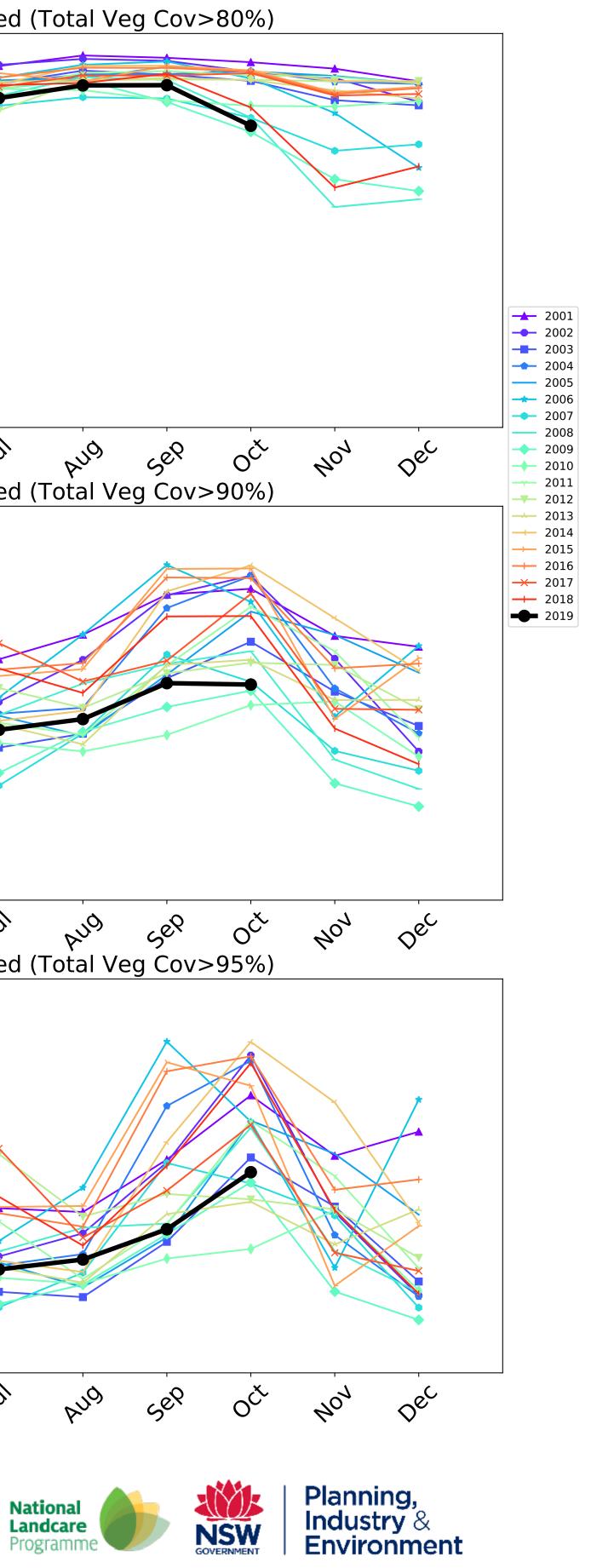


100 99 ---- above\_70 **—** 10th **--** 50th 98 **—** 2019 Oct 97 96 feb Jan May In PQ War month **FERN** 1 CON CSIRO Australian Government

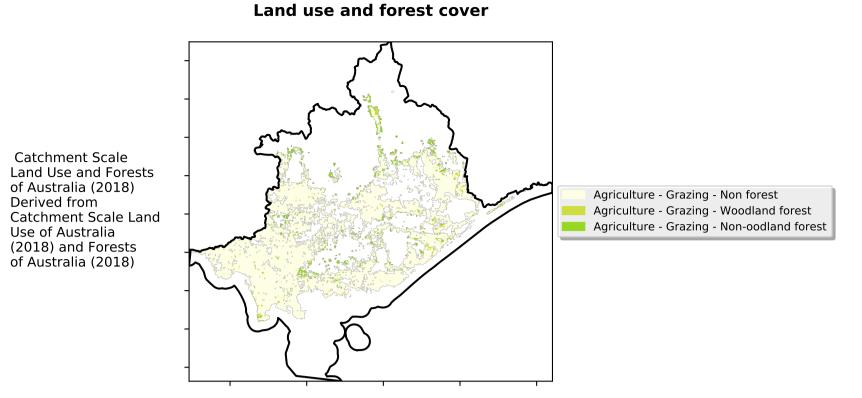
Water erosion historical monthly area protected (Total Veg Cov>70%)



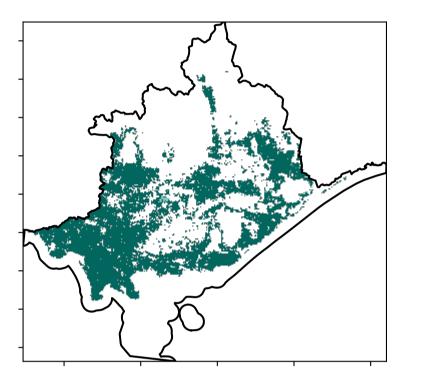


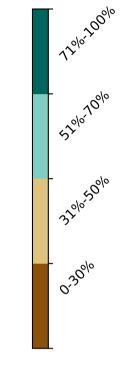


## Grazing

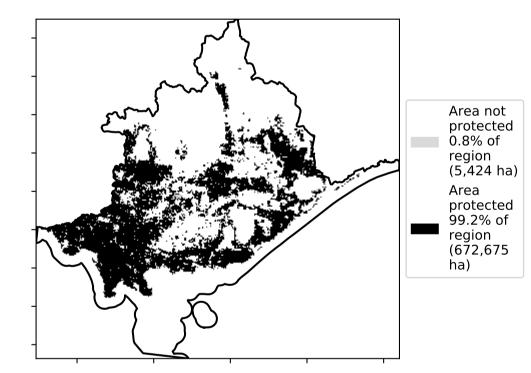


**Total Vegetation Cover [%]** 

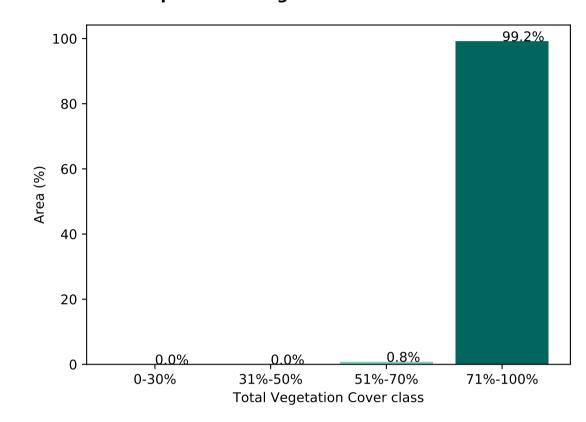




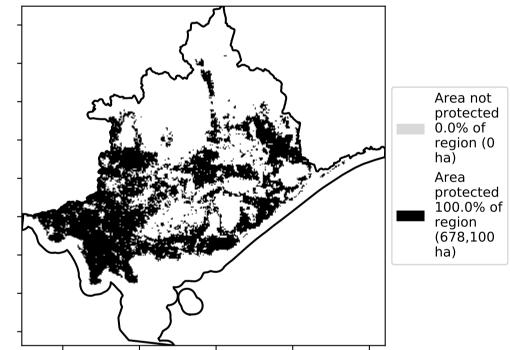
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



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



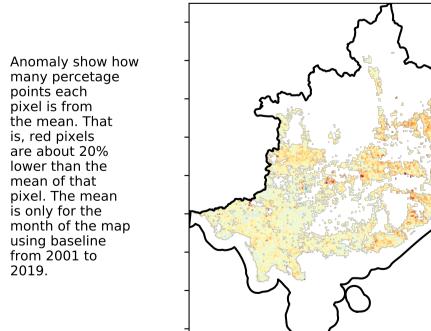
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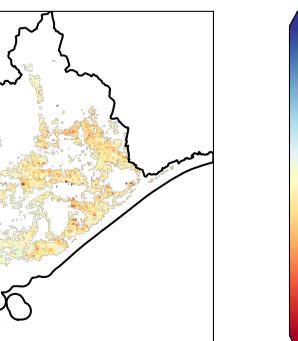
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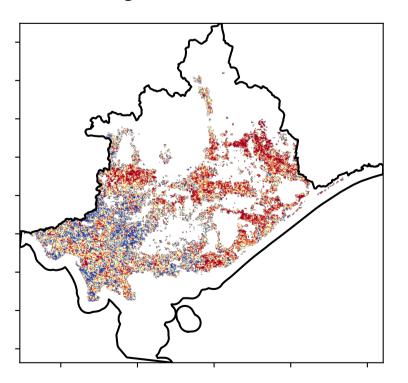
**Total Vegetation Cover Anomaly [%]** 





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

Total Vegetation Cover Decile [%]





20

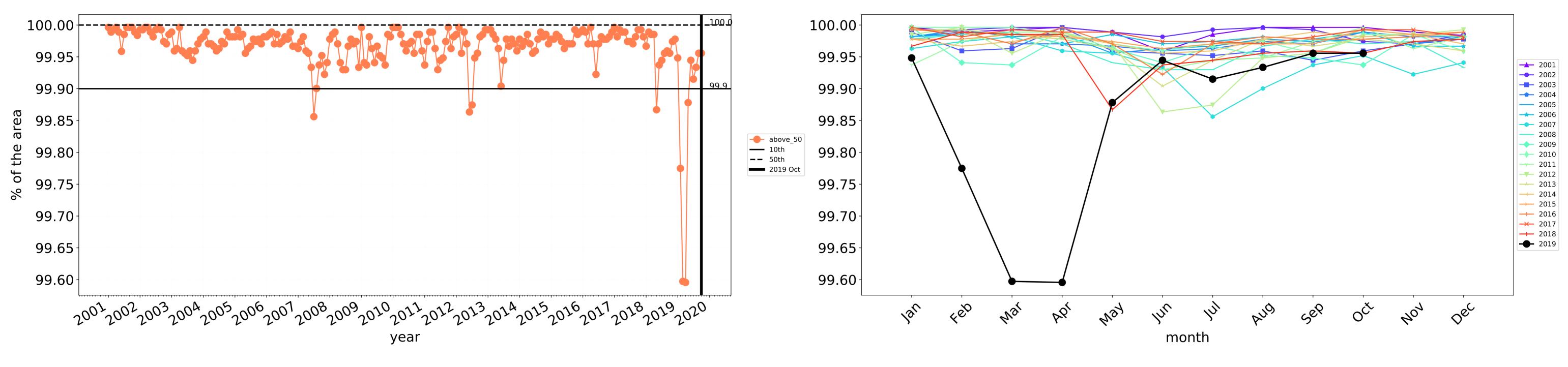
- 20

- 10

0

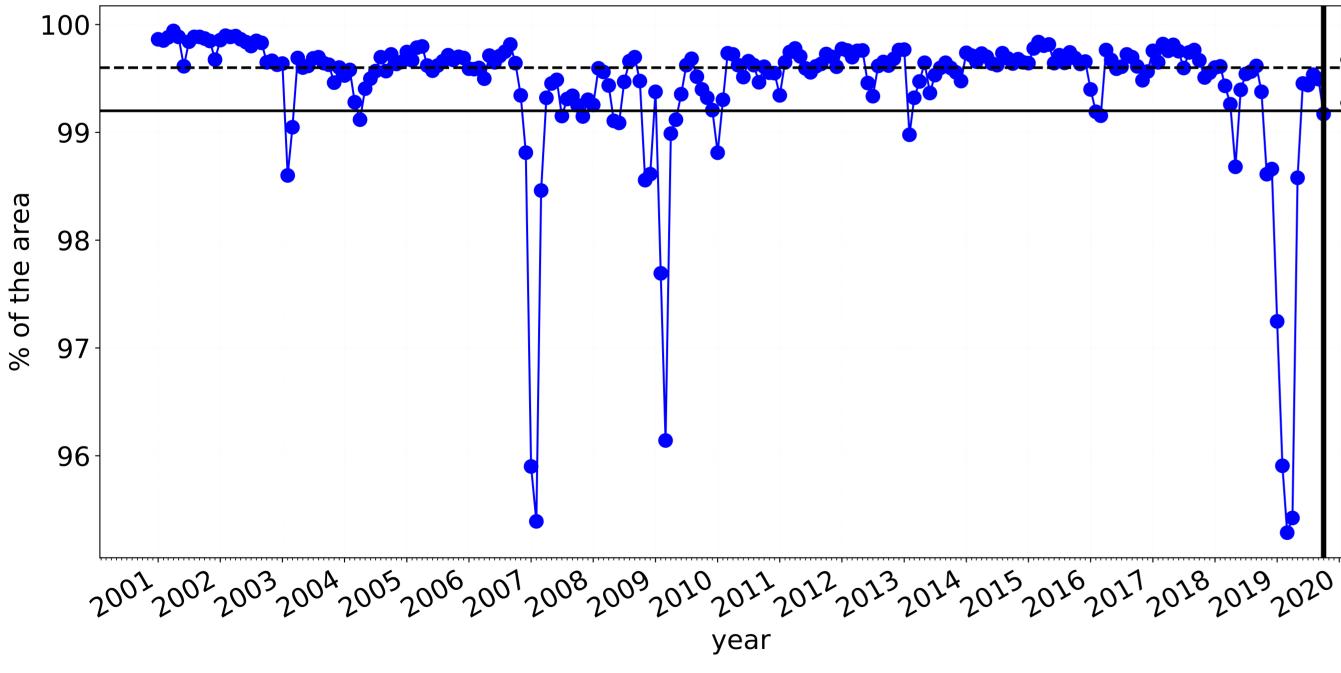
-10

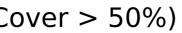
-20



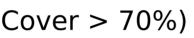
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



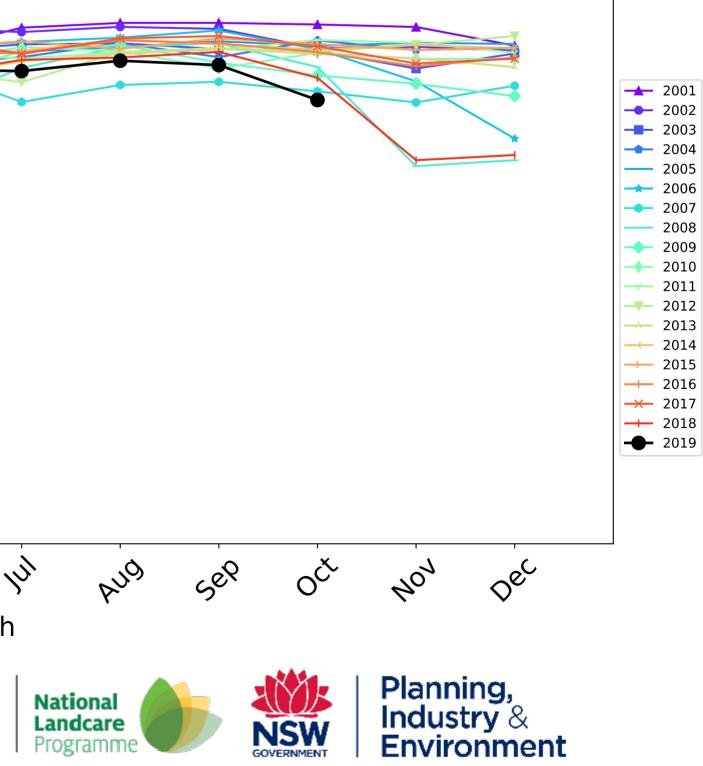


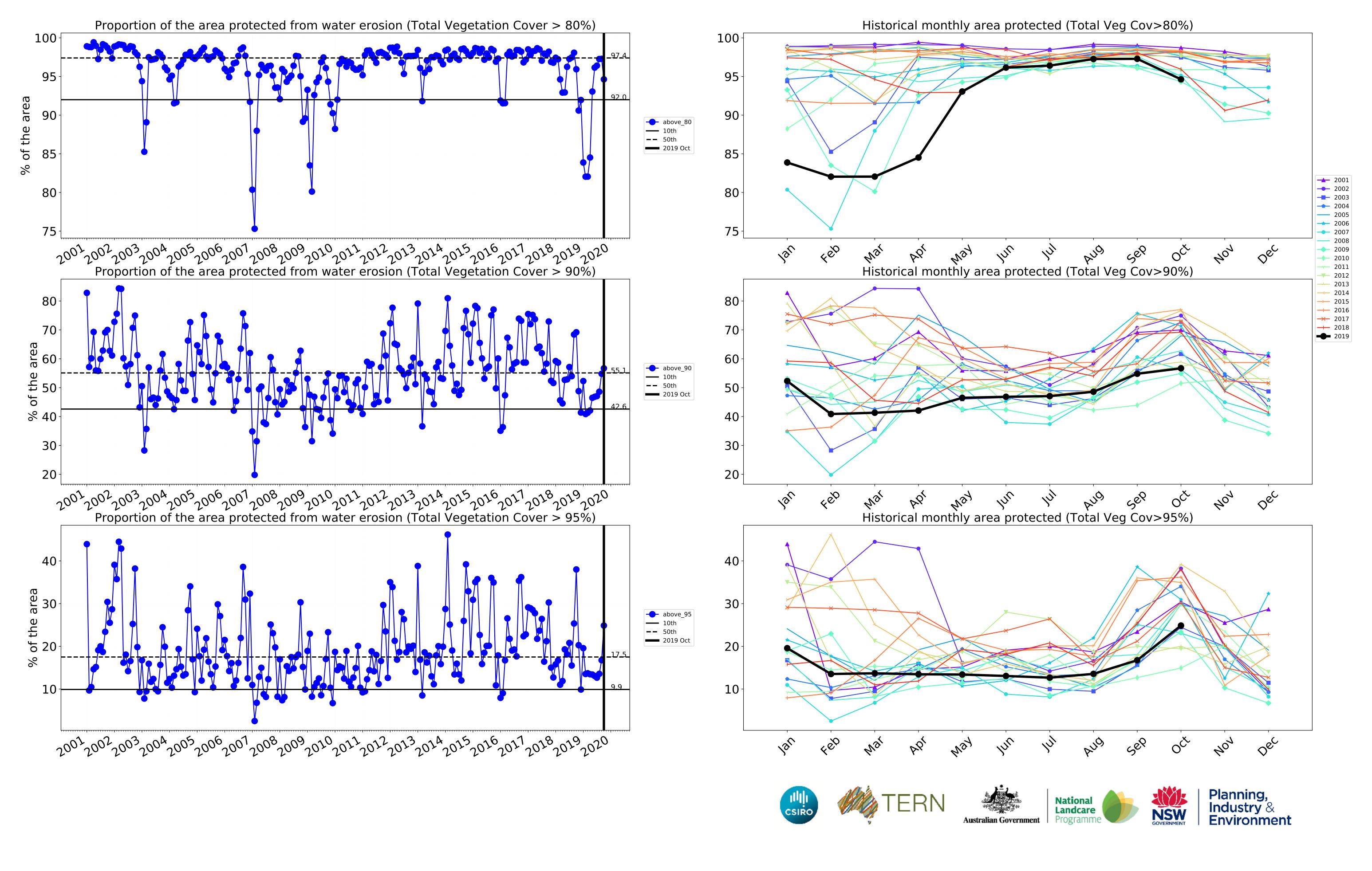
Wind erosion historical monthly area protected (Total Veg Cov >50%)



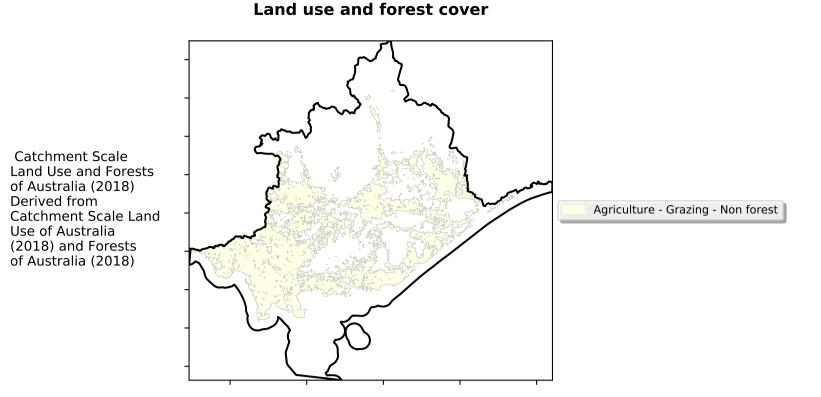
100 99 ---- above\_70 **—** 10th 98 **--** 50th **—** 2019 Oct 97 96 feb Jan May In PQ Mai month **FERN** CSIRO Australian Government

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

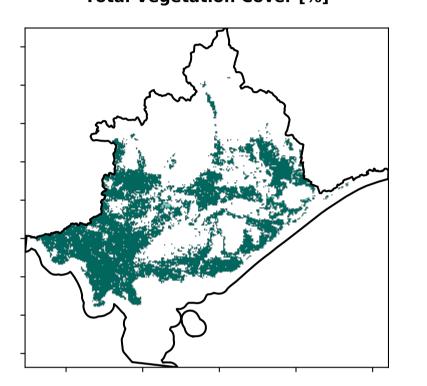




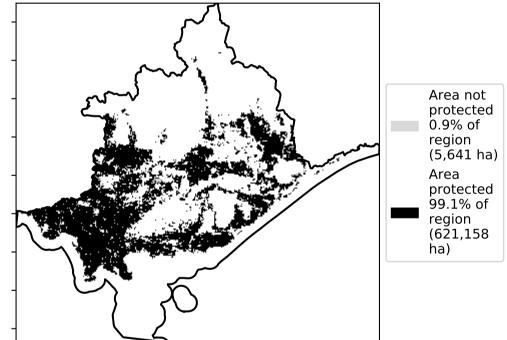
### **Grazing non forest**

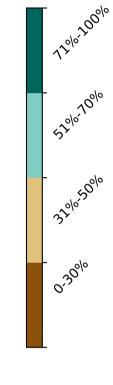


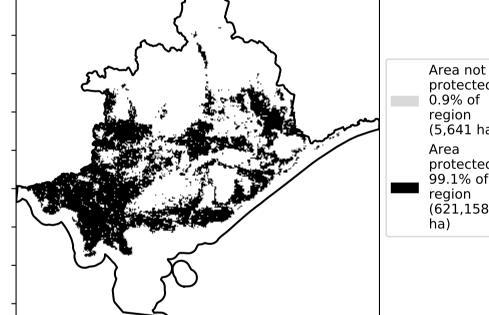
**Total Vegetation Cover [%]** 



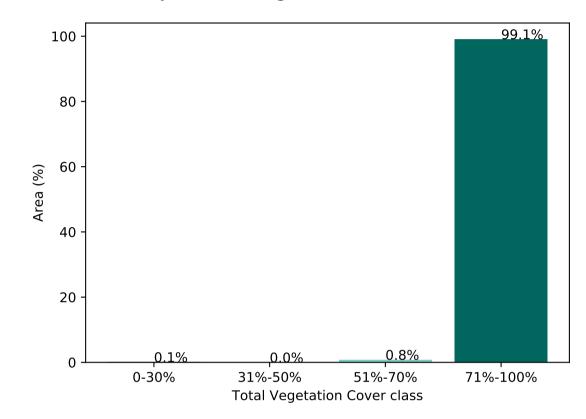
% Area protected from water erosion (>70%)



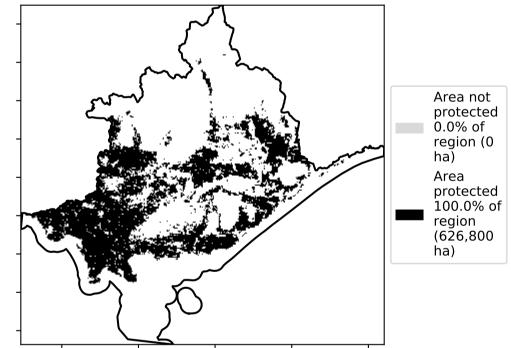




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



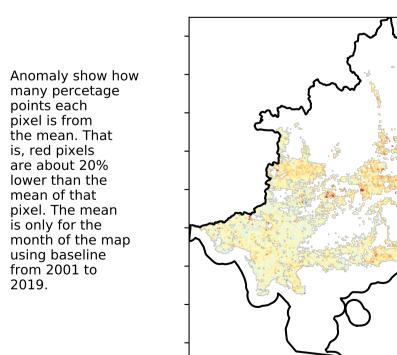
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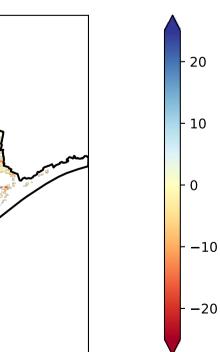
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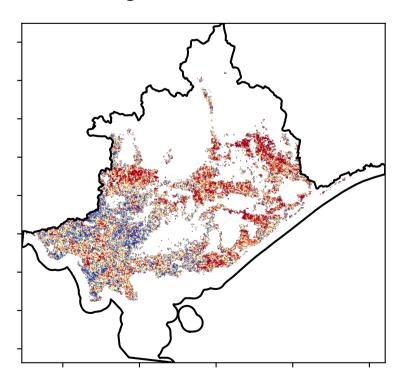
**Total Vegetation Cover Anomaly [%]** 



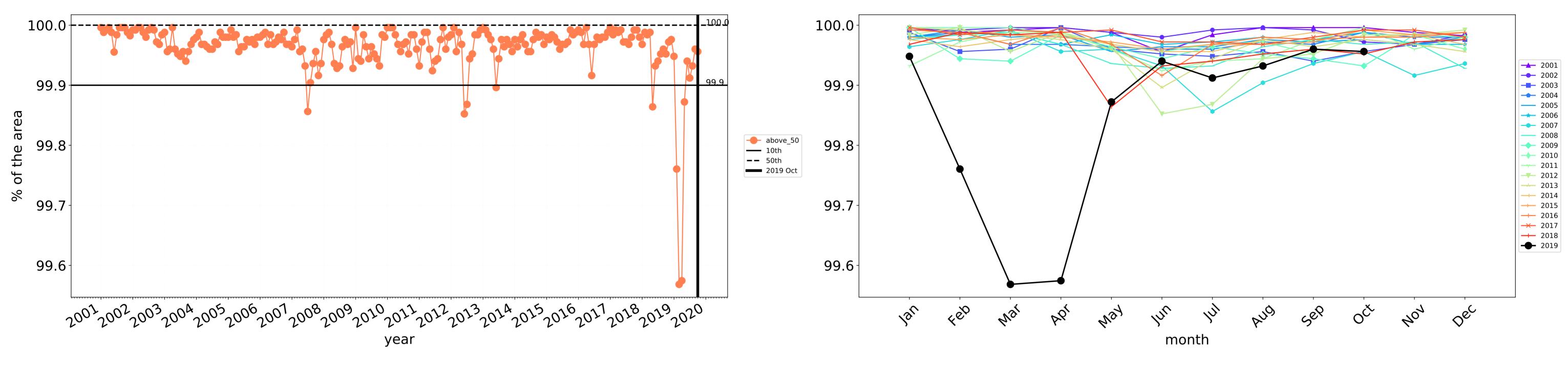


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

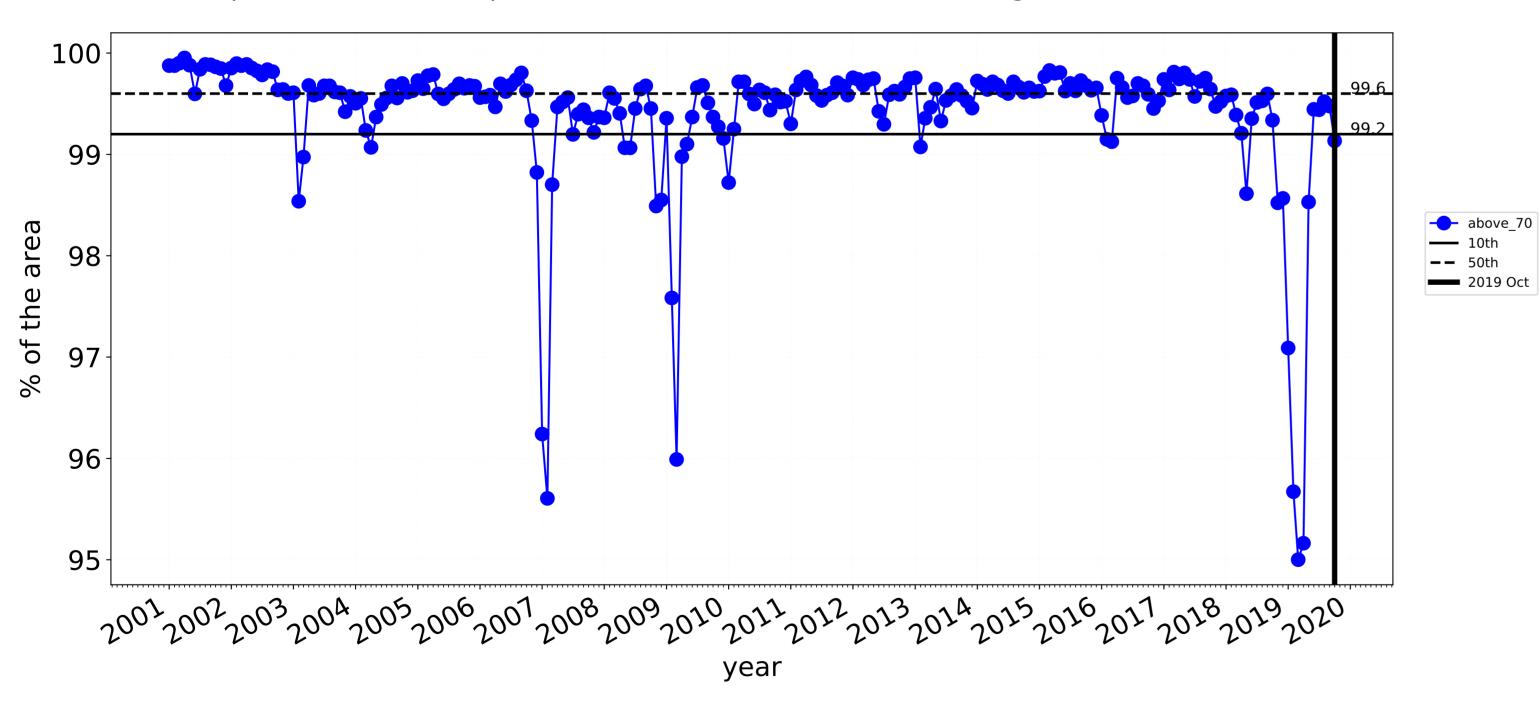






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

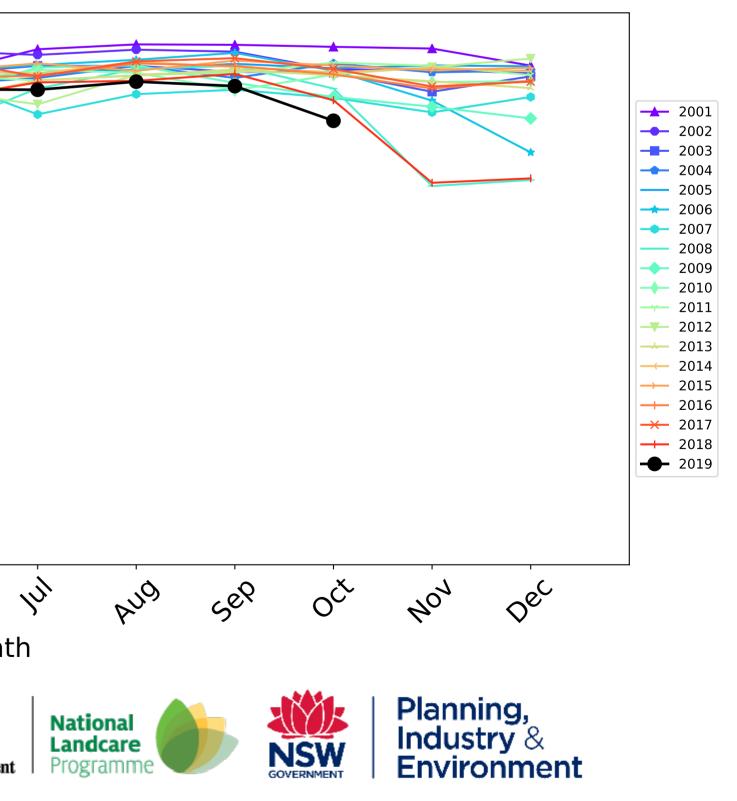
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

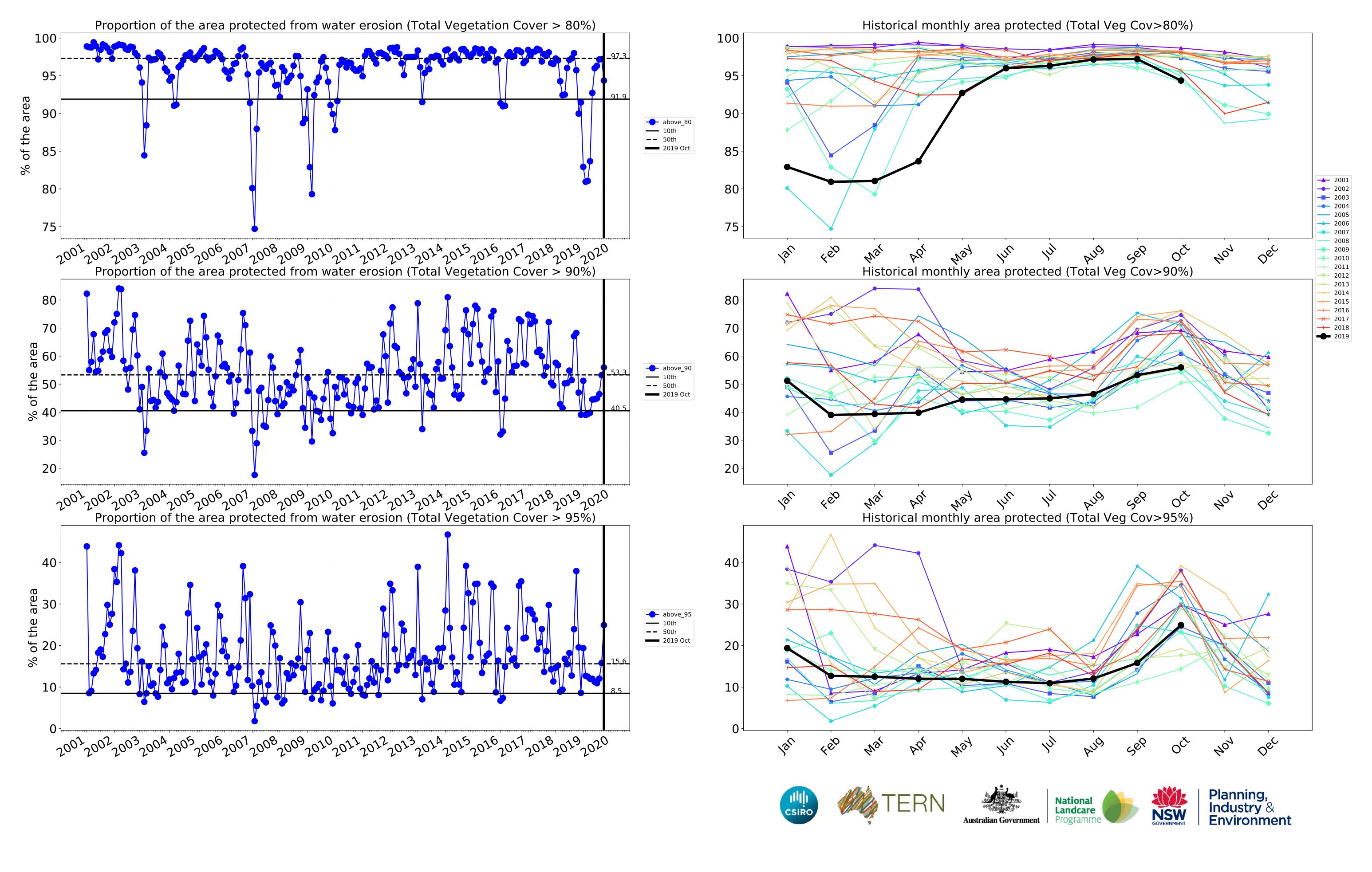


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100-99 98 97 96 95 Jan feb way In PQ Mai month TERN CSIRC Australian Government

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





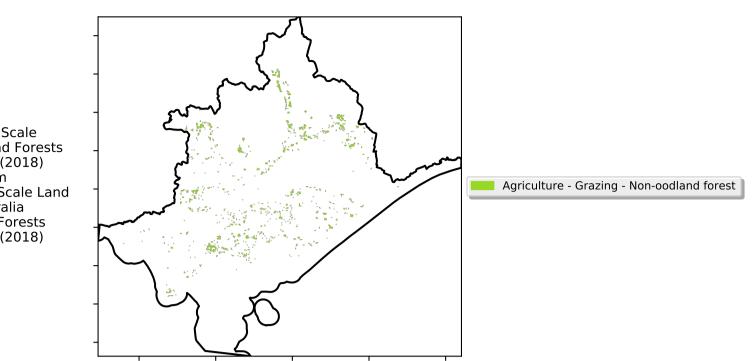
### Grazing - Forest (non woodland)

12%200%

· 52°10°70°10

320050010

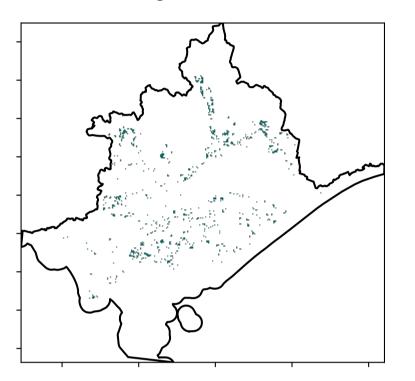
0.30%



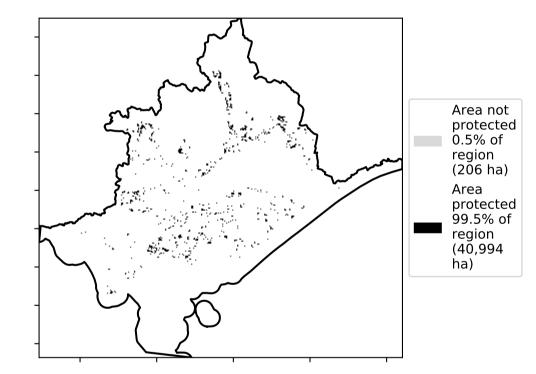
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 

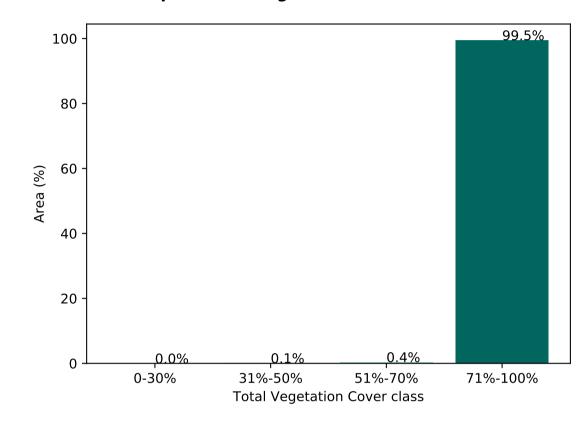
Land use and forest cover



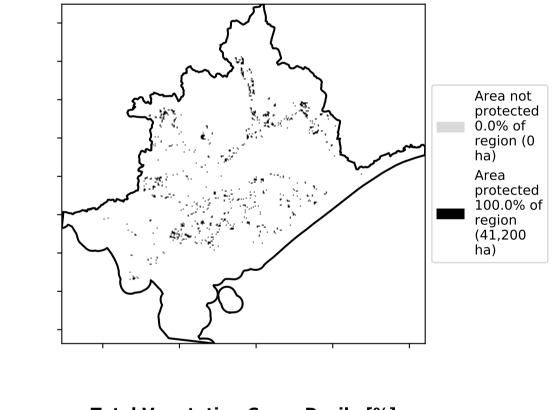
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



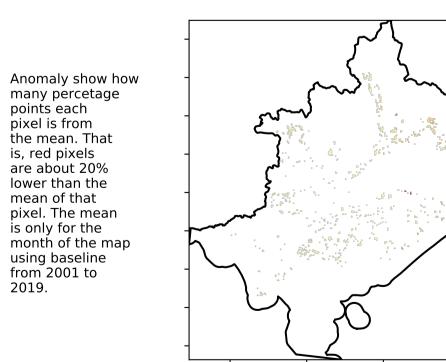
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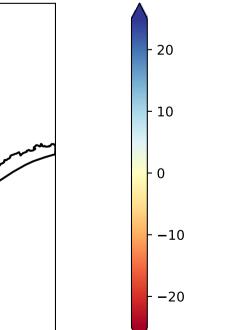
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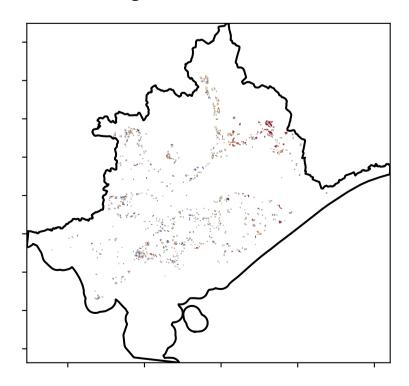
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**Total Vegetation Cover Anomaly [%]** 





Total Vegetation Cover Decile [%]

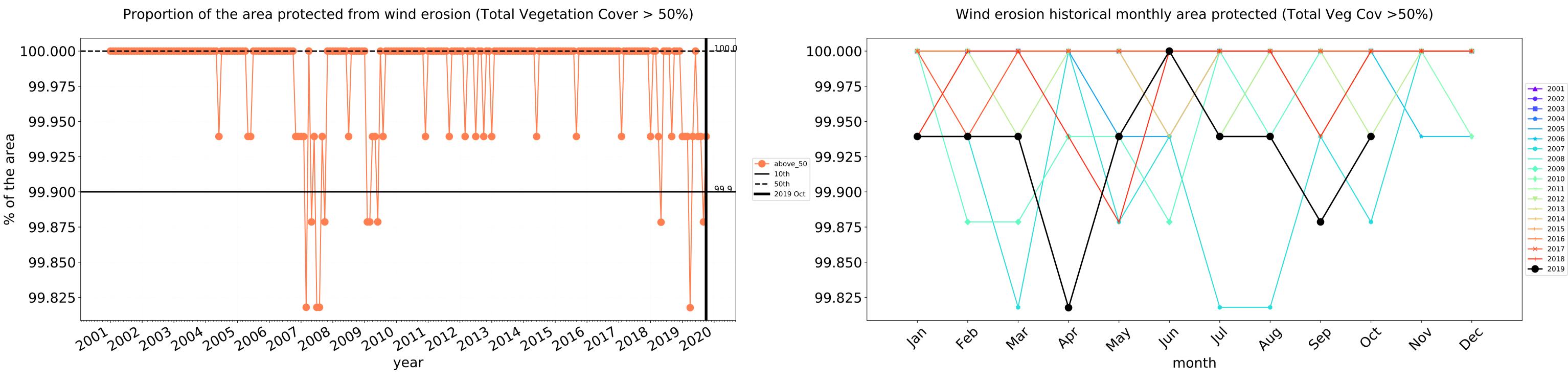




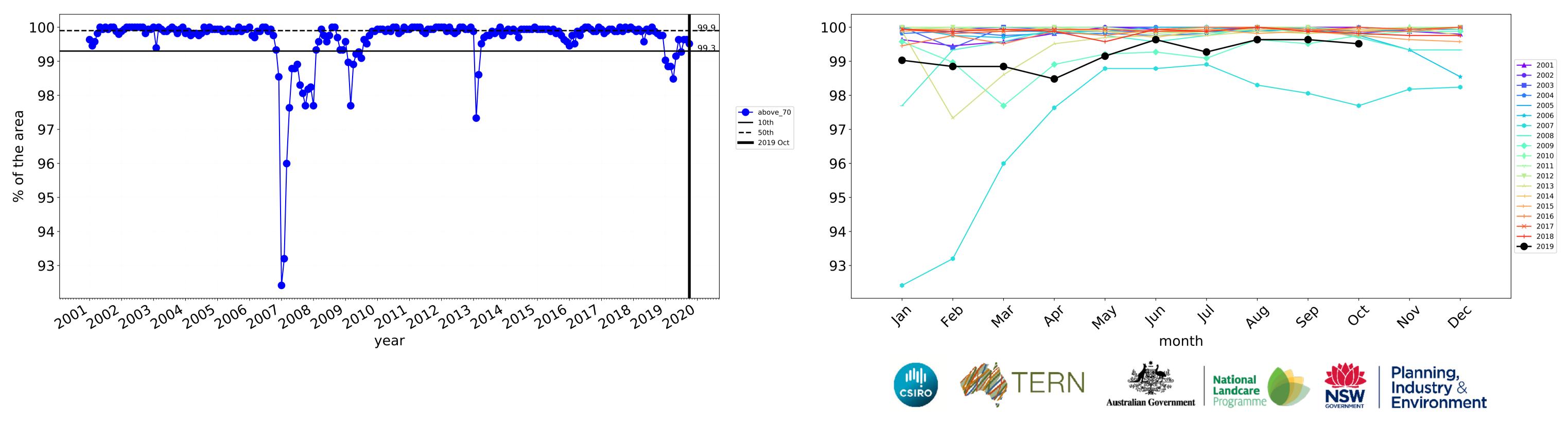
Deciles show where the pixel value lies in the

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

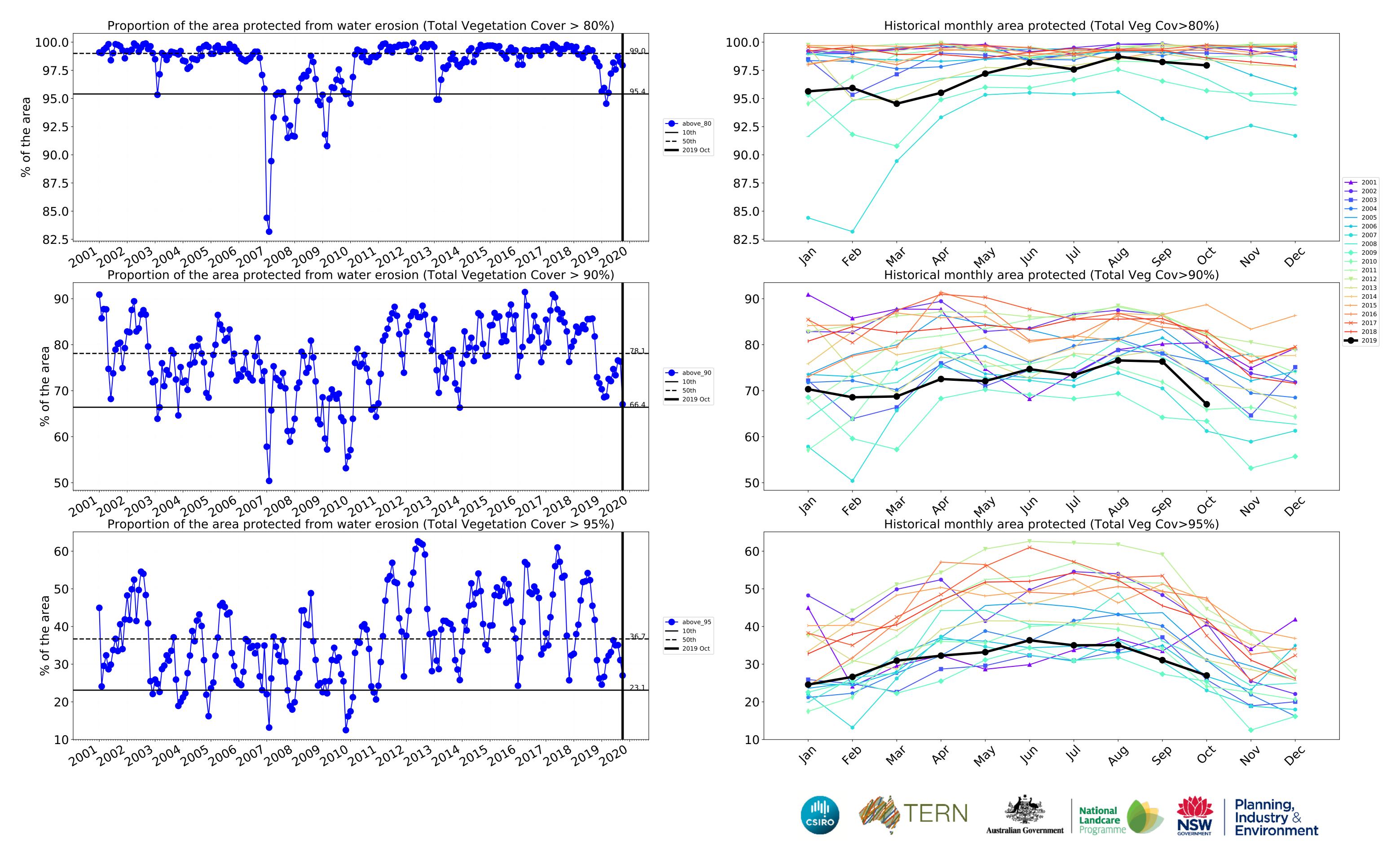
the map using baseline from 2001 to 2019.



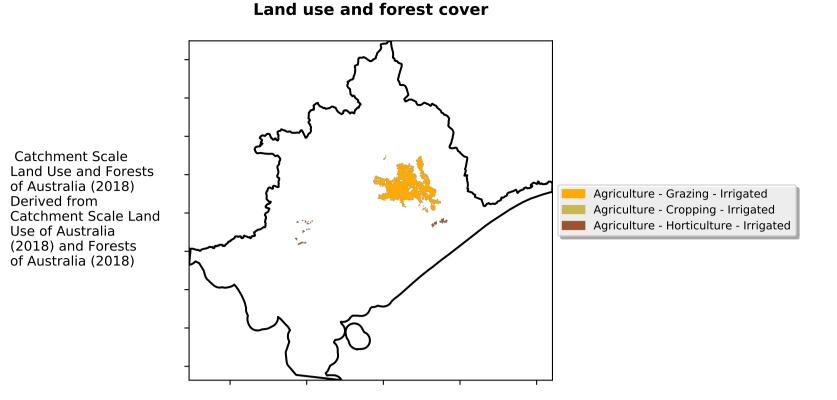
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



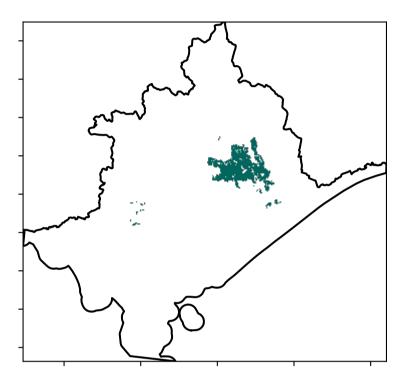
Water erosion historical monthly area protected (Total Veg Cov>70%)



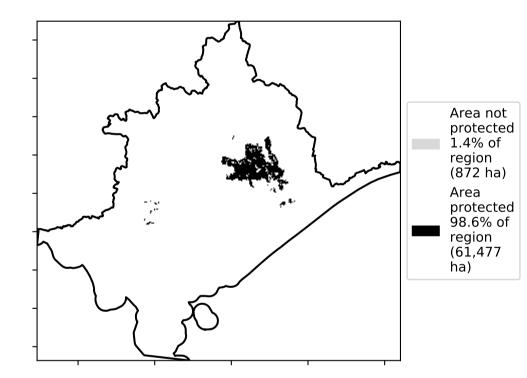
## Irrigation



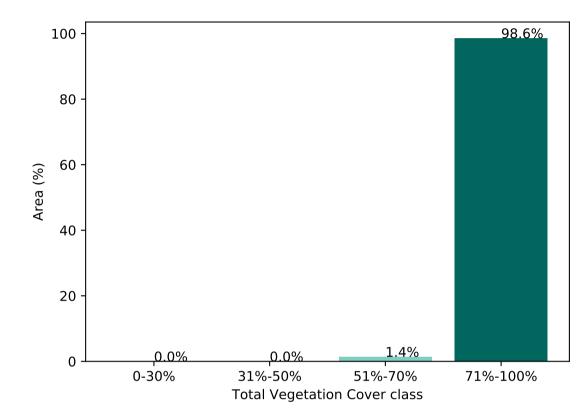
**Total Vegetation Cover [%]** 



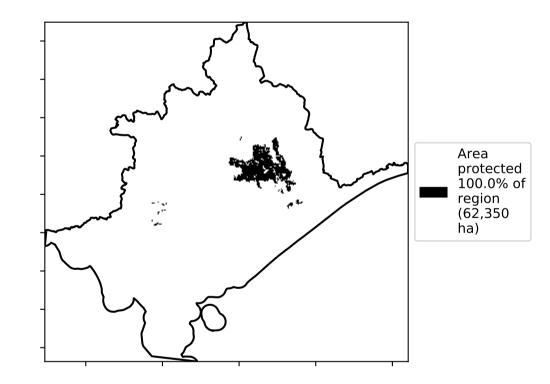








% Area protected from wind erosion (>50%)



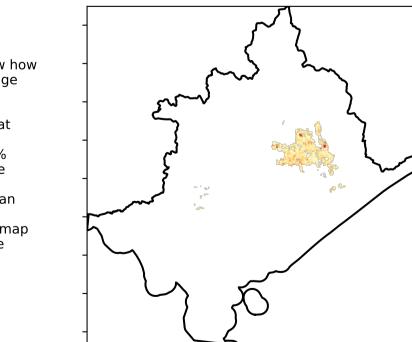
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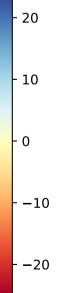
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**Total Vegetation Cover Anomaly [%]** 





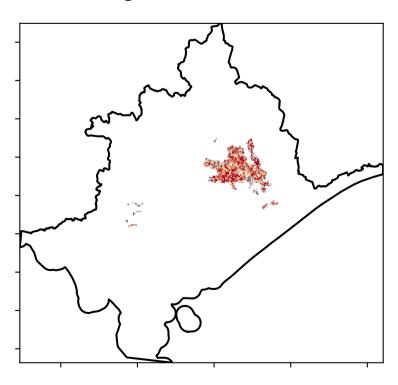
12º10-200010

52% TO%

320050010

0.30%

Total Vegetation Cover Decile [%]





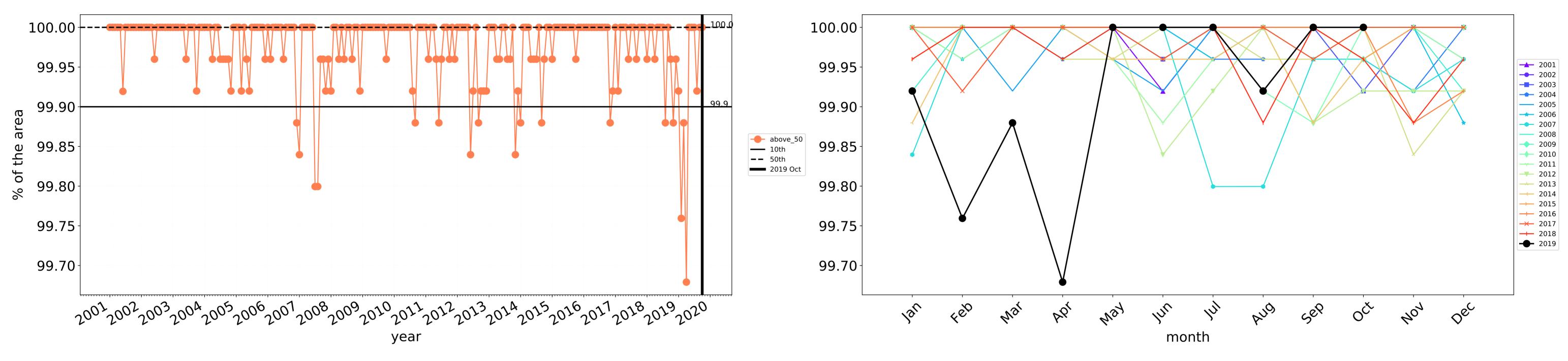
Deciles show where the pixel value lies in the

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.

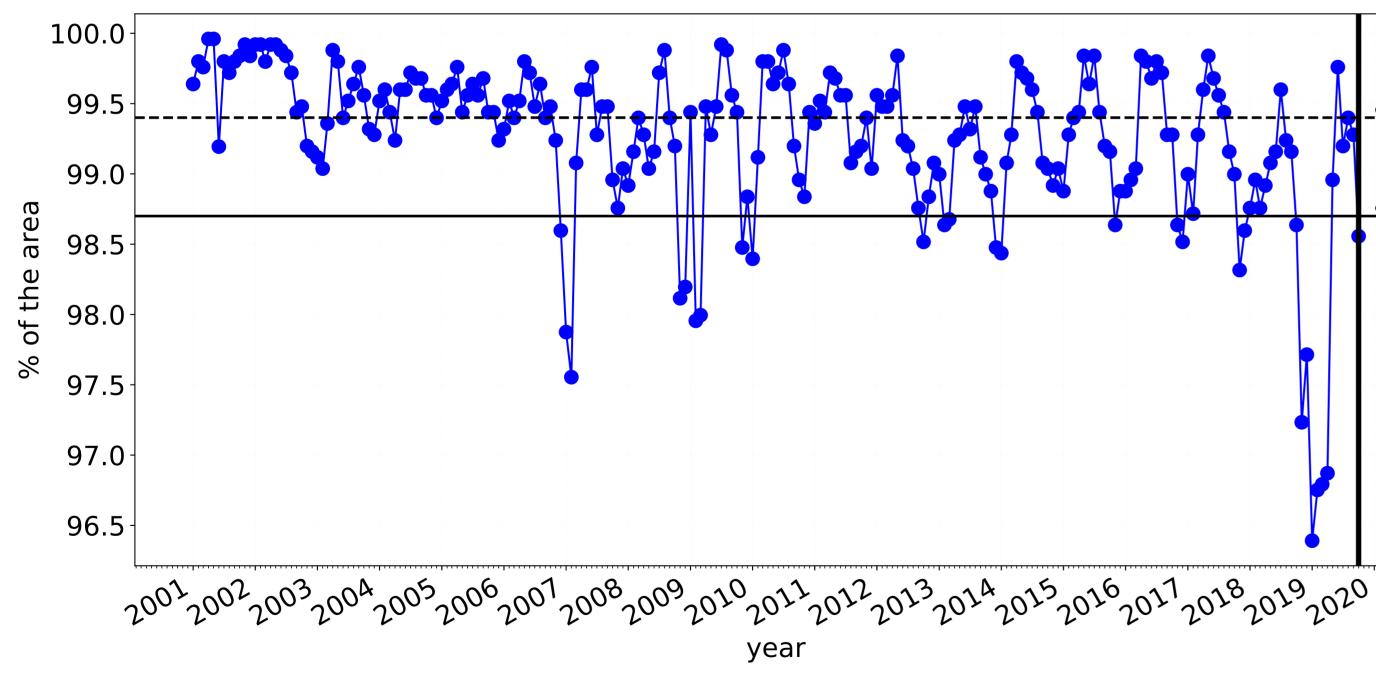
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

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

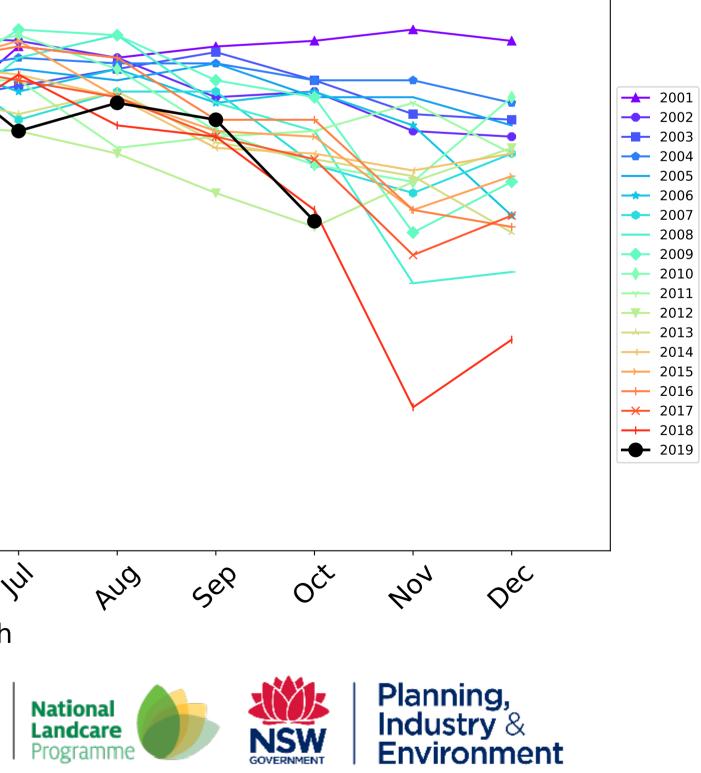


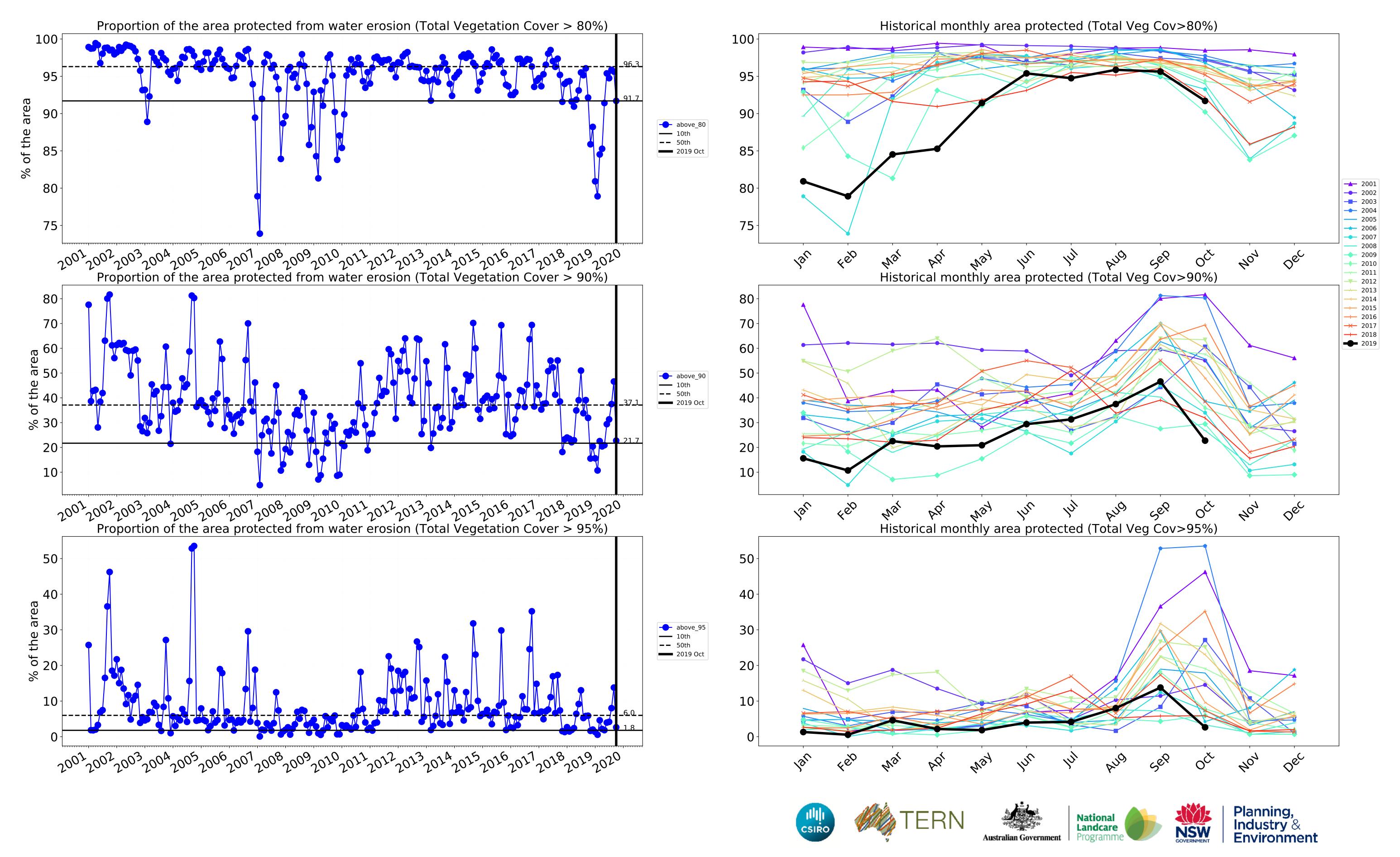


Wind erosion historical monthly area protected (Total Veg Cov >50%)

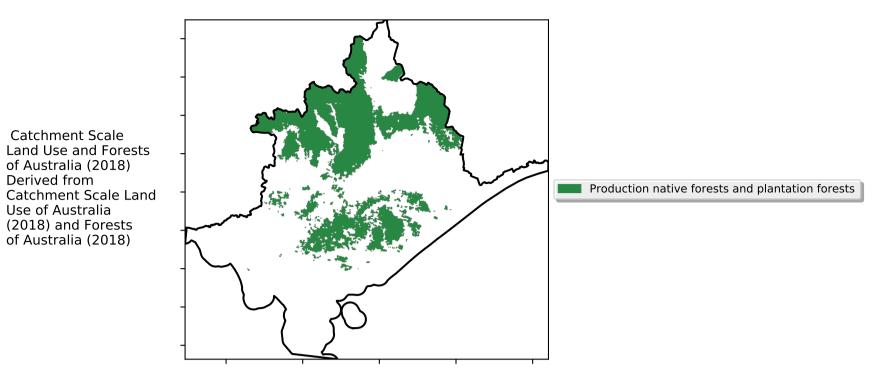
100.0-99.5 99.0 ---- above\_70 **—** 10th 98.5 **--** 50th **—** 2019 Oct 98.0 97.5 97.0 96.5 feb Jan May In PQ W31 month ERN CSIRO Australian Government

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



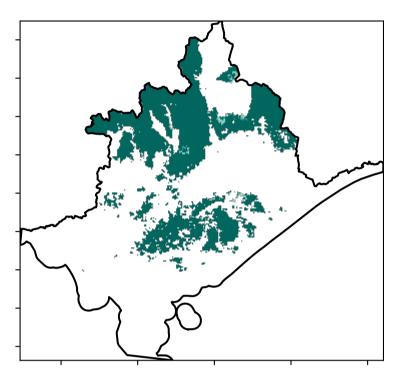


## **Production native forests and plantation forests**

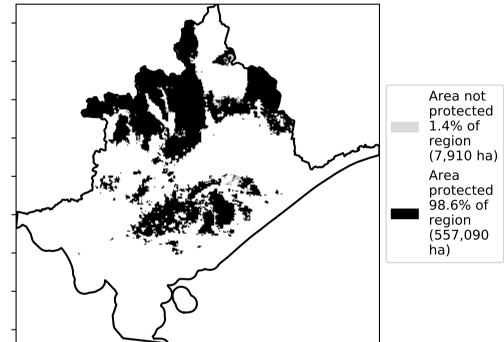


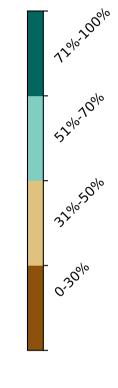
Land use and forest cover

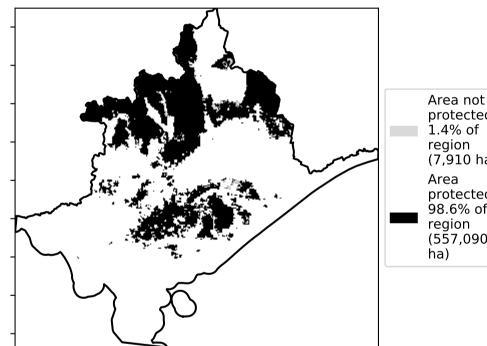
**Total Vegetation Cover [%]** 



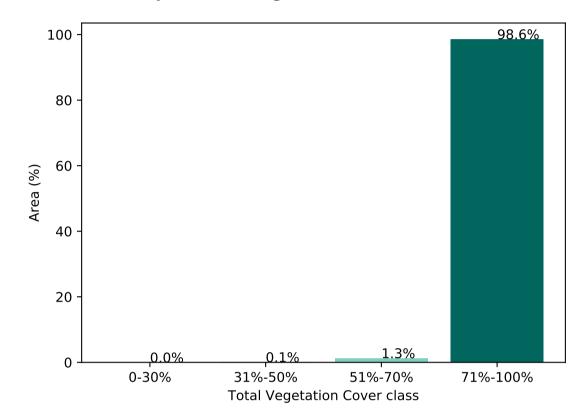
% Area protected from water erosion (>70%)



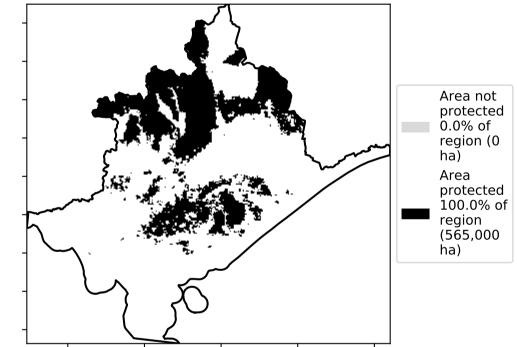








% Area protected from wind erosion (>50%)



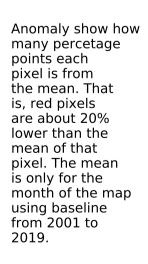
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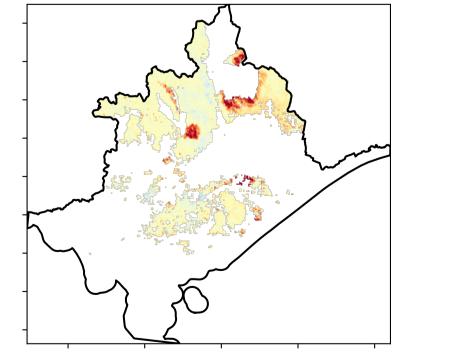
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**Total Vegetation Cover Anomaly [%]** 



Derived from



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.

- 20

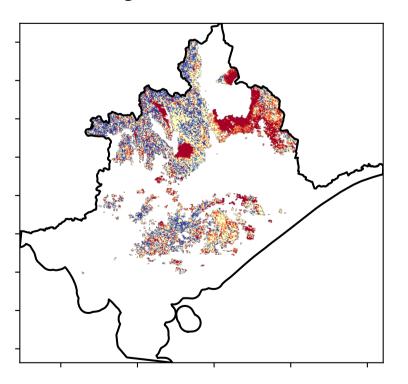
- 10

0

-10

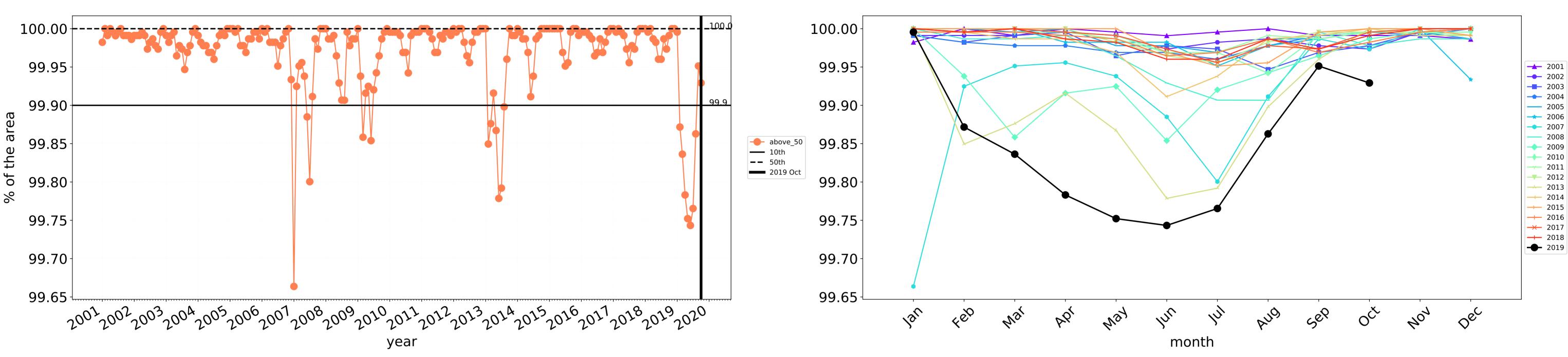
-20

Total Vegetation Cover Decile [%]



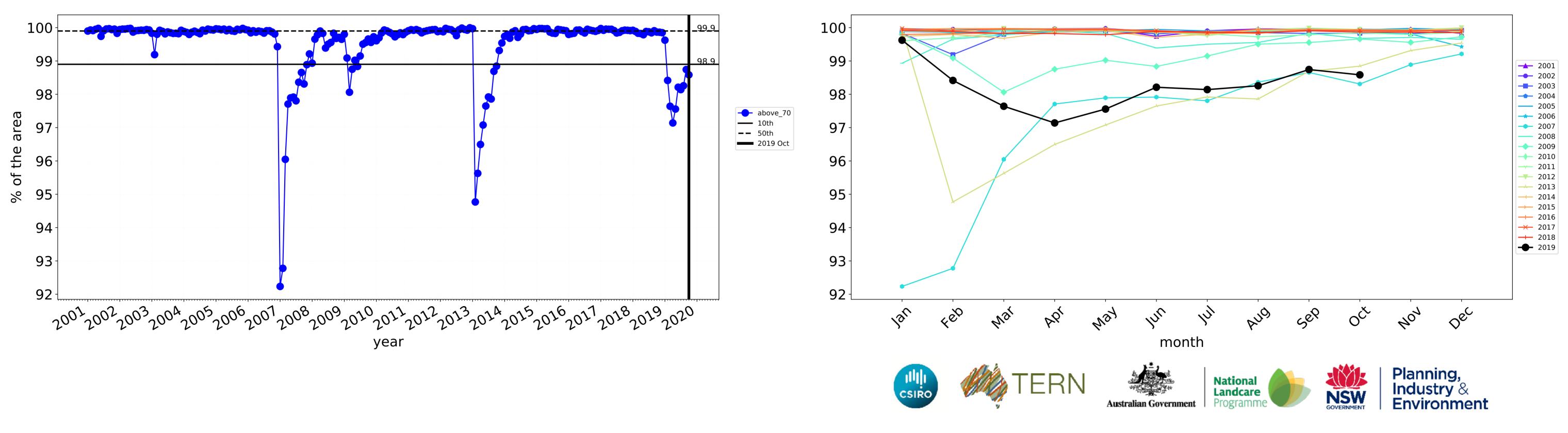


## Production native forests and plantation forests timeseries



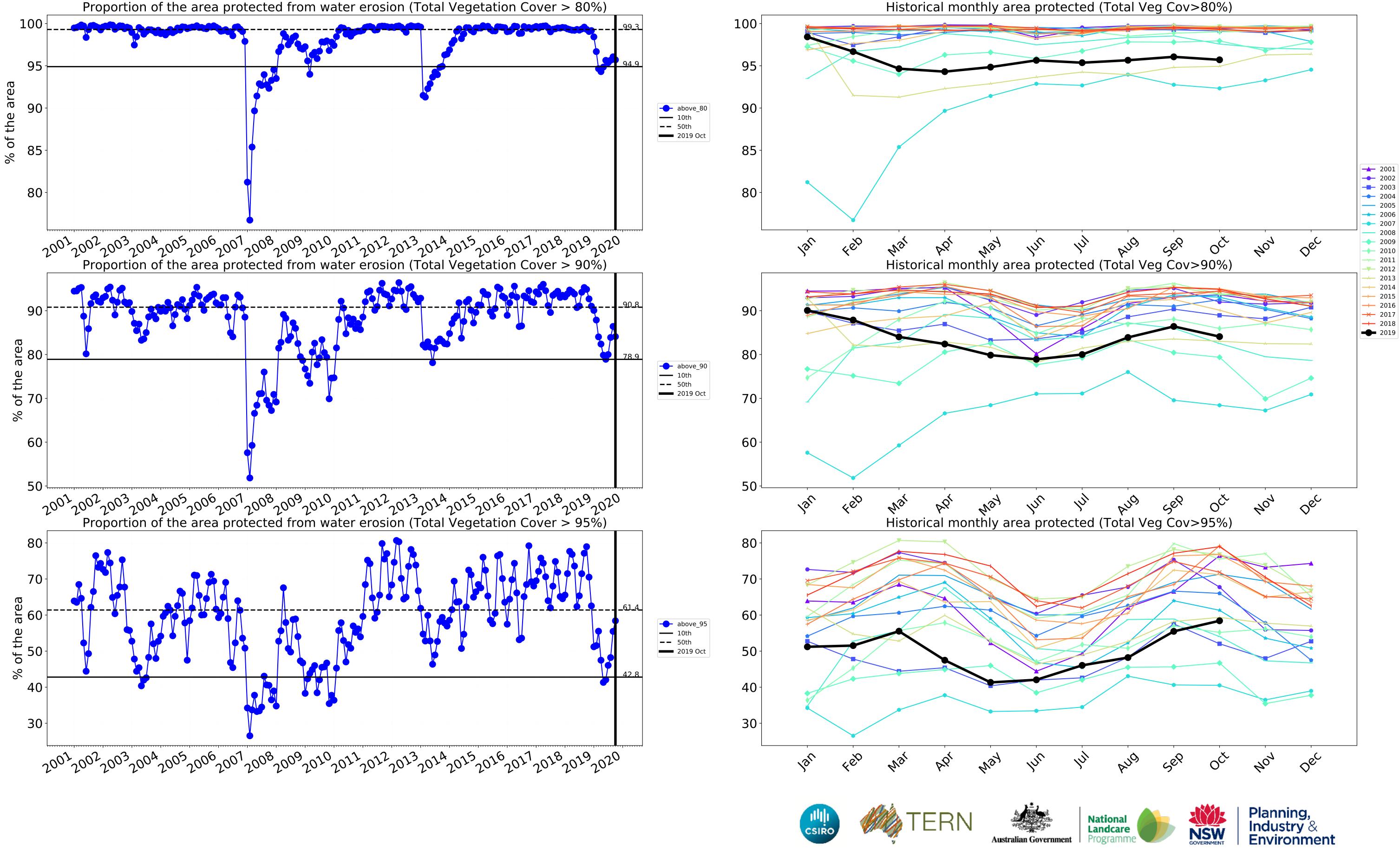
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



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

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



Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)

## West Gippsland (1,692,675 ha and no data 343,625 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	1,692,675	100.0% 1,692,075	99.7% 1,687,825	97.1% 1,643,875	91.9% 1,554,725	64.0% 1,082,575	35.7% 604,125
Conservation and natural environments	279,275	99.8% 278,750	98.9% 276,075	91.6% 255,825	83.1% 232,025	61.8% 172,525	33.9% 94,550
Conservation and natural environments non forest	49,750	99.1% 49,300	96.1% 47,800	87.1% 43,325	73.4% 36,525	44.3% 22,025	26.0% 12,950
Conservation and natural environments Woodland forest	73,850	99.9% 73,775	99.6% 73,550	94.7% 69,925	87.8% 64,875	68.0% 50,200	34.5% 25,475
Conservation and natural environments Forest (non woodland)	155,675	100.0% 155,675	99.4% 154,725	91.6% 142,575	83.9% 130,625	64.4% 100,300	36.1% 56,125
Agriculture	750,200	100.0% 750,175	100.0% 749,875	99.1% 743,550	94.4% 708,150	53.8% 403,525	22.9% 172,075
Grazing	678,100	100.0% 678,075	100.0% 677,800	99.2% 672,475	94.6% 641,725	56.7% 384,500	24.9% 168,575
Grazing non forest	626,800	100.0% 626,775	100.0% 626,525	99.1% 621,375	94.4% 591,475	56.0% 350,775	24.9% 156,175
Grazing - Forest (non woodland)	41,200	100.0% 41,200	99.9% 41,175	99.5% 41,000	97.9% 40,350	67.1% 27,625	27.0% 11,125
Irrigation	62,350	100.0% 62,350	100.0% 62,350	98.6% 61,450	91.7% 57,175	22.7% 14,175	2.6% 1,650
Production native forests and plantation forests	565,000	100.0% 565,000	99.9% 564,600	98.6% 557,000	95.7% 540,750	84.1% 475,100	58.4% 330,025

