# Total vegetation cover soil protection Region:NRM Mackay Whitsunday QLD

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 cover class that 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













**Date: October 2019** 

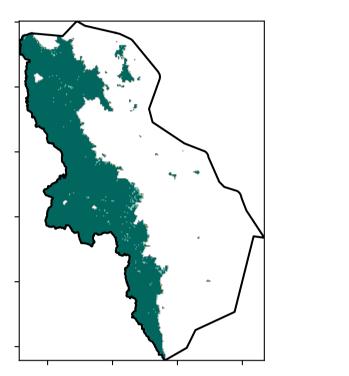
# **Vegetation Cover Oct 2019**

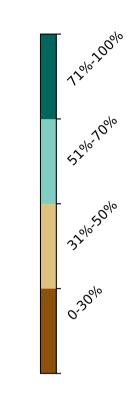
### Land use and forest cover

# Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - Woodland forest 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

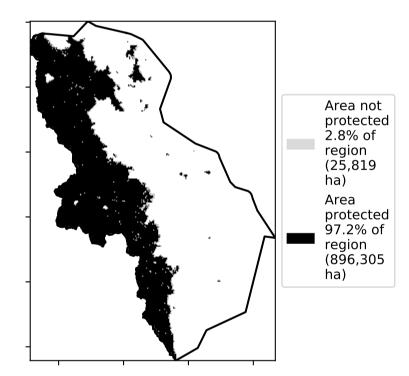
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

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



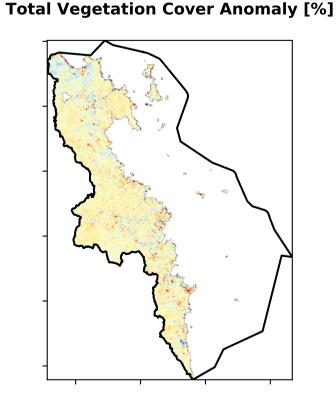


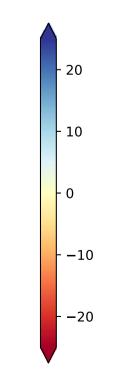
% Area protected from water erosion (>70%)



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

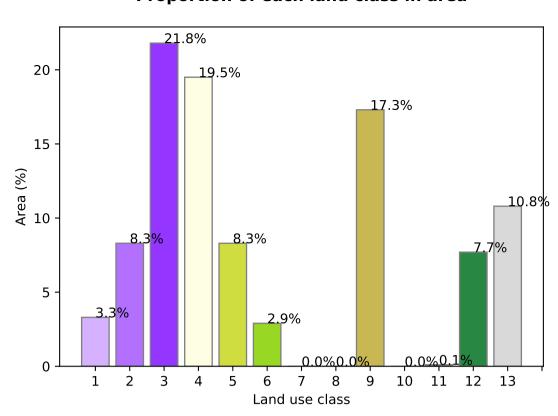
2019.



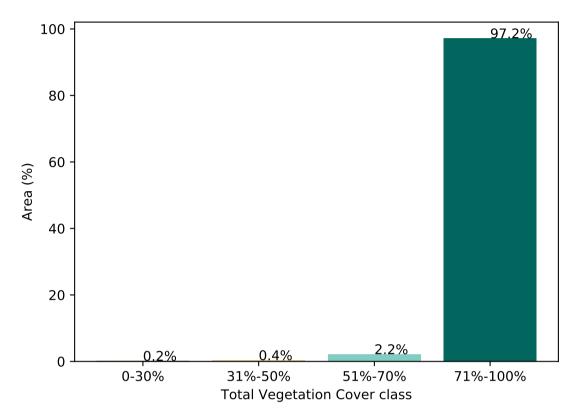


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

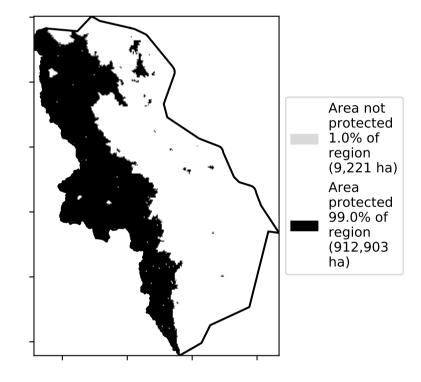
### Proportion of each land class in area



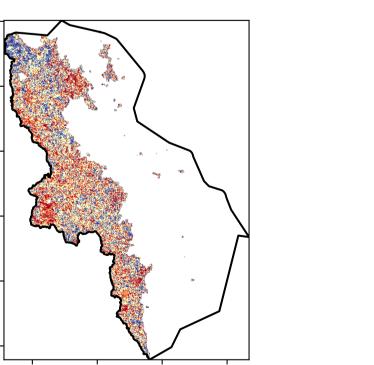
**Proportion of vegetation cover class in area** 



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]





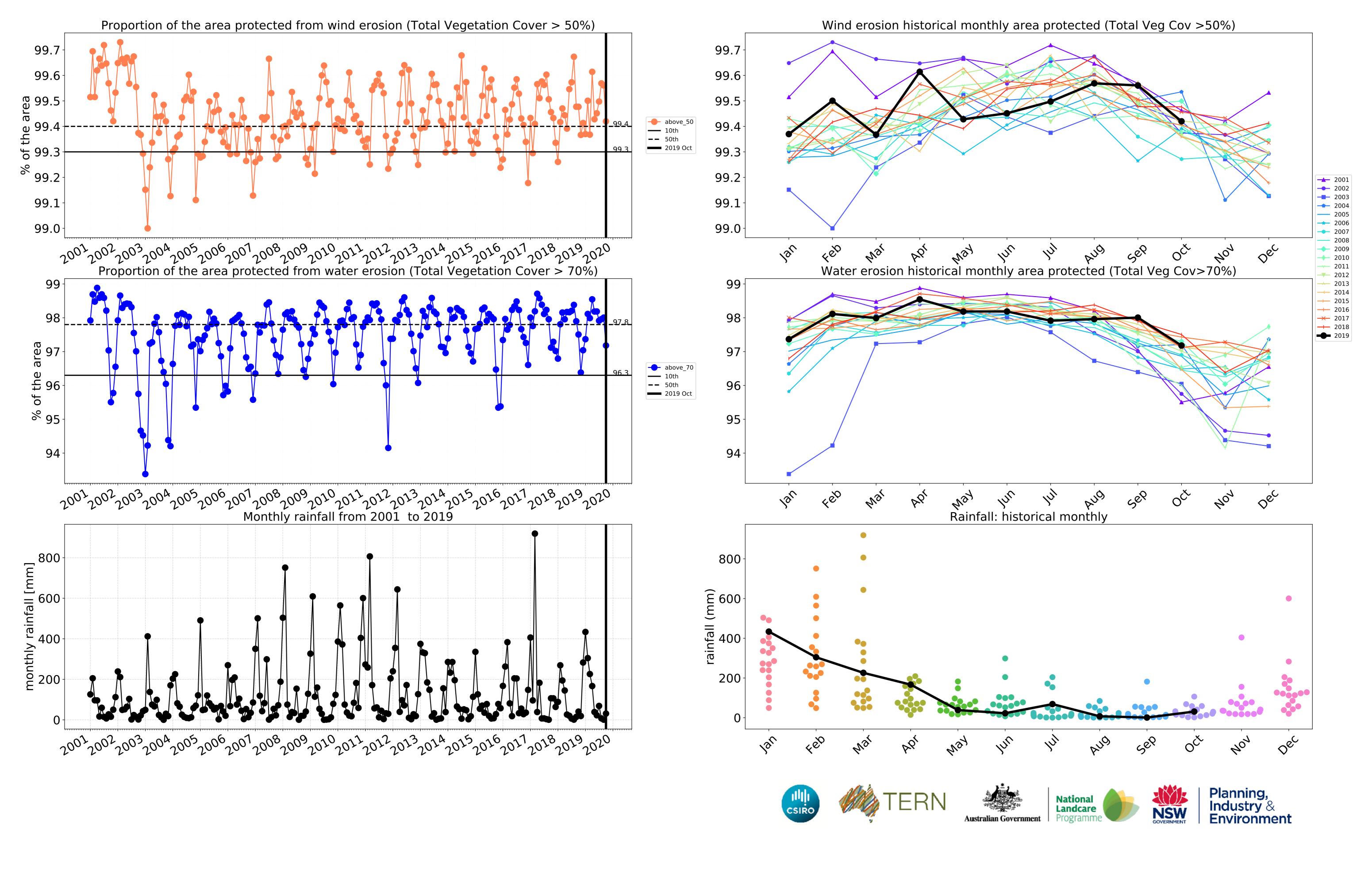


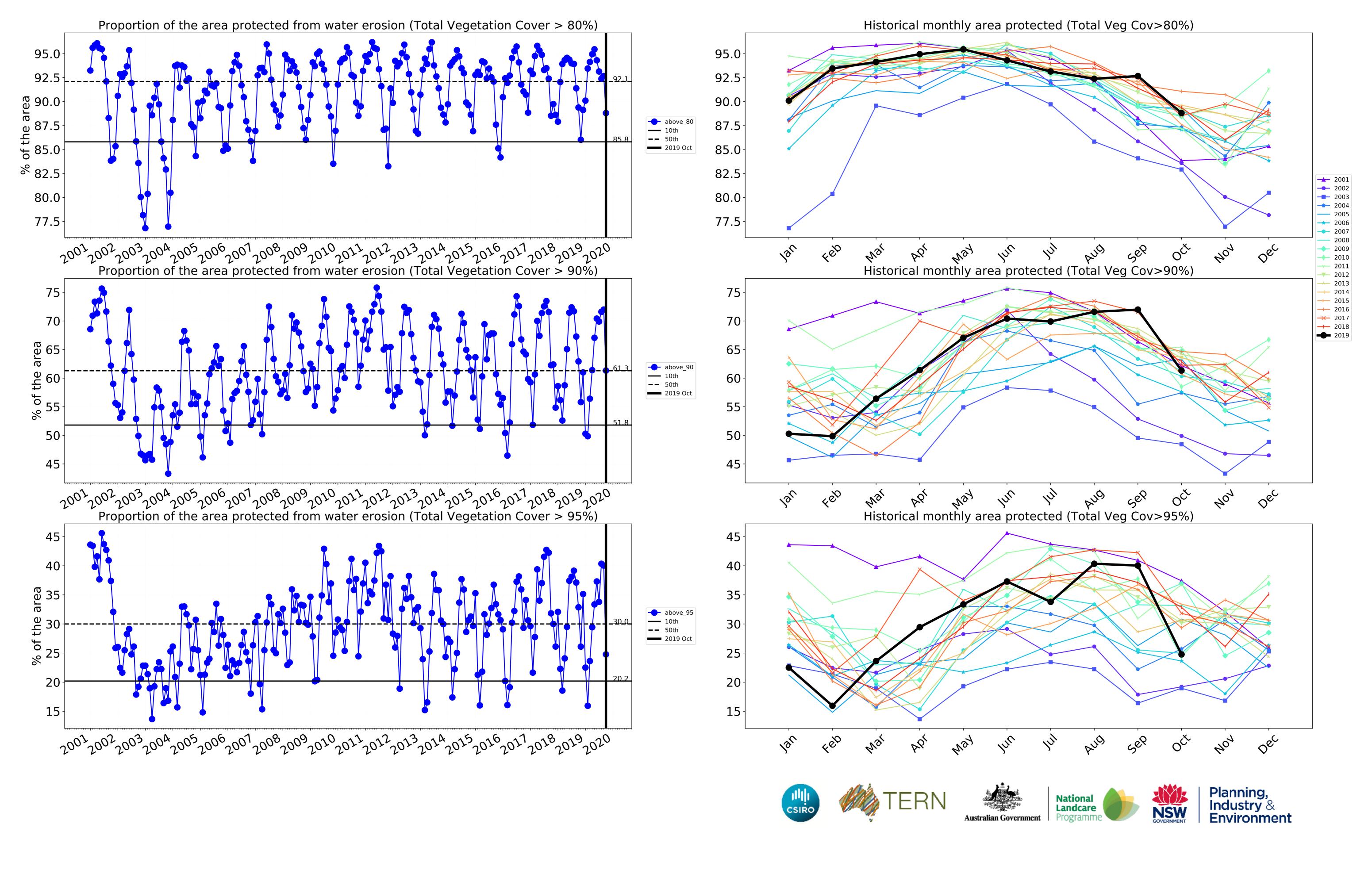








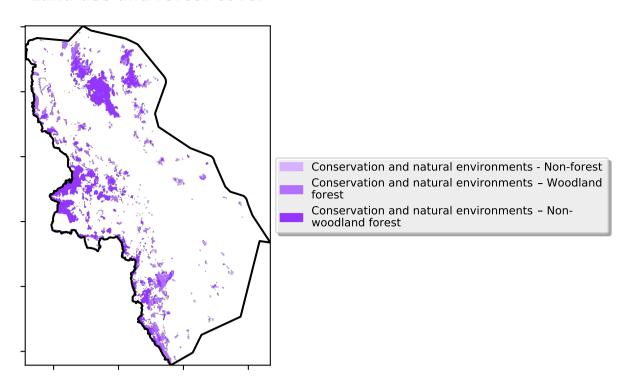




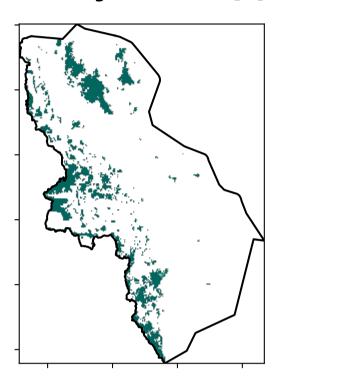
### **Conservation and natural environments**

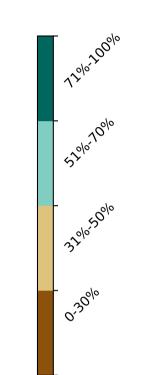
### Land use and forest cover

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

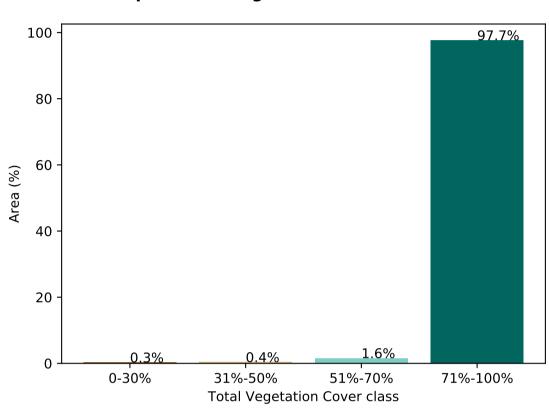


### **Total Vegetation Cover [%]**

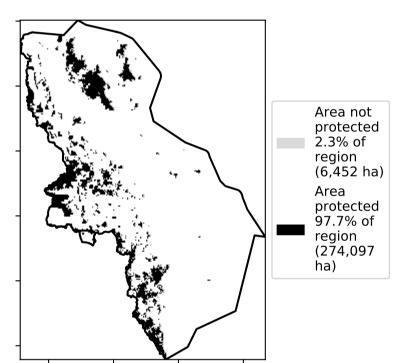




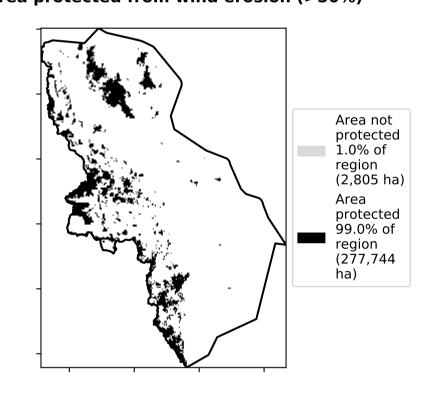
### **Proportion of vegetation cover class in area**



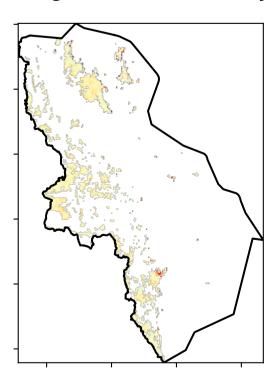
### % Area protected from water erosion (>70%)

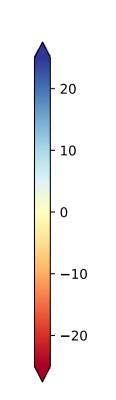


% Area protected from wind erosion (>50%)



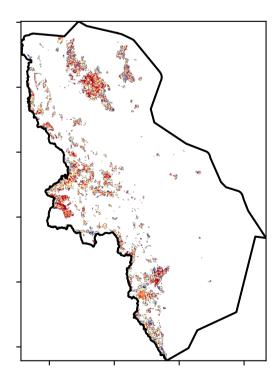
### **Total Vegetation Cover Anomaly [%]**

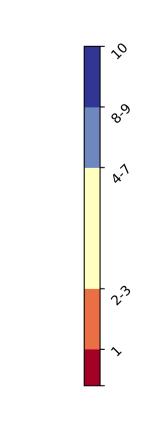




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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.







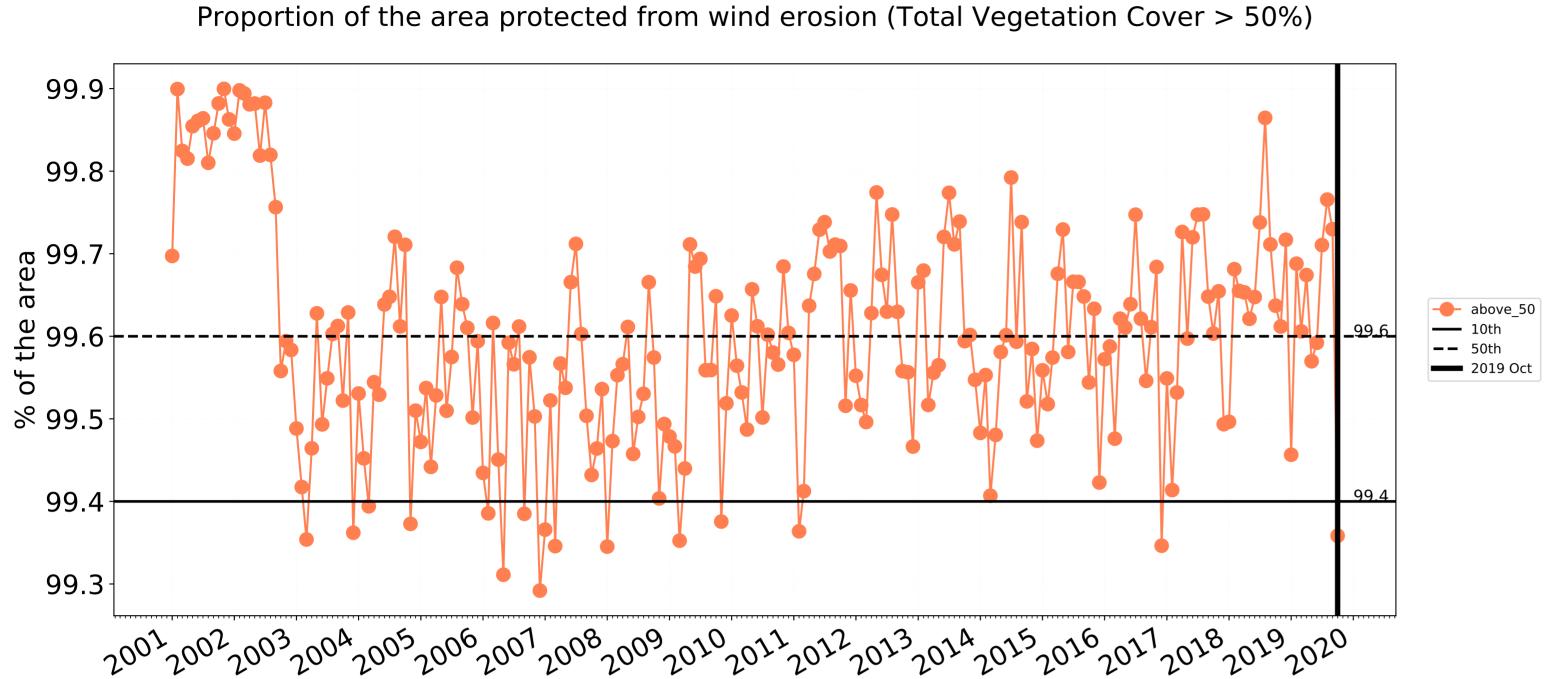


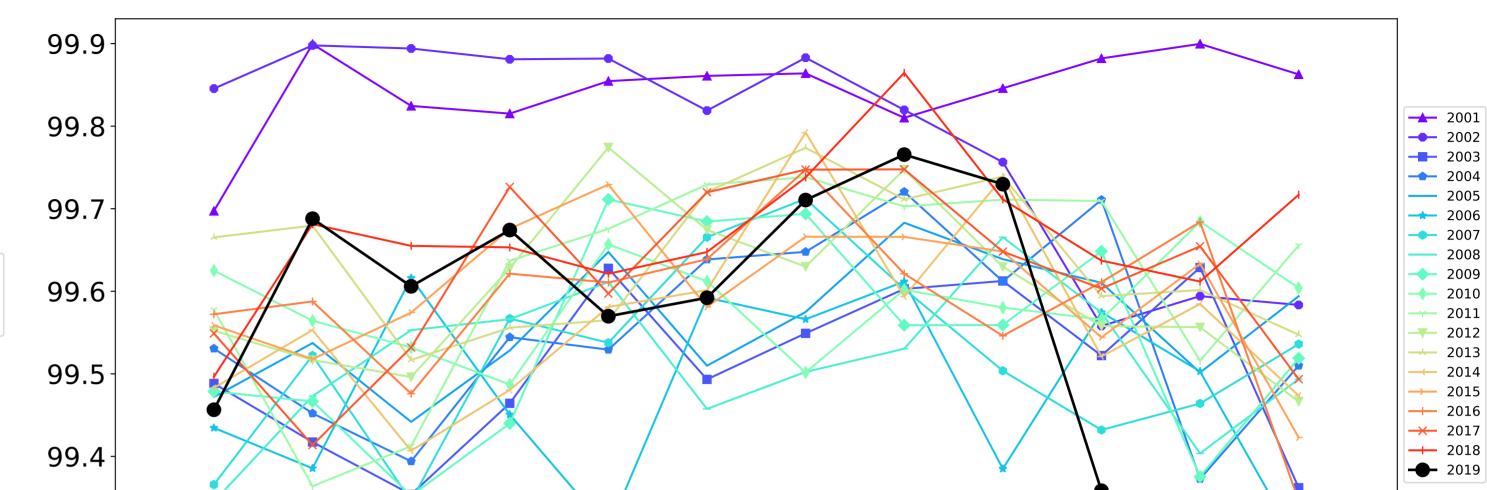




### **Conservation and natural environments timeseries**

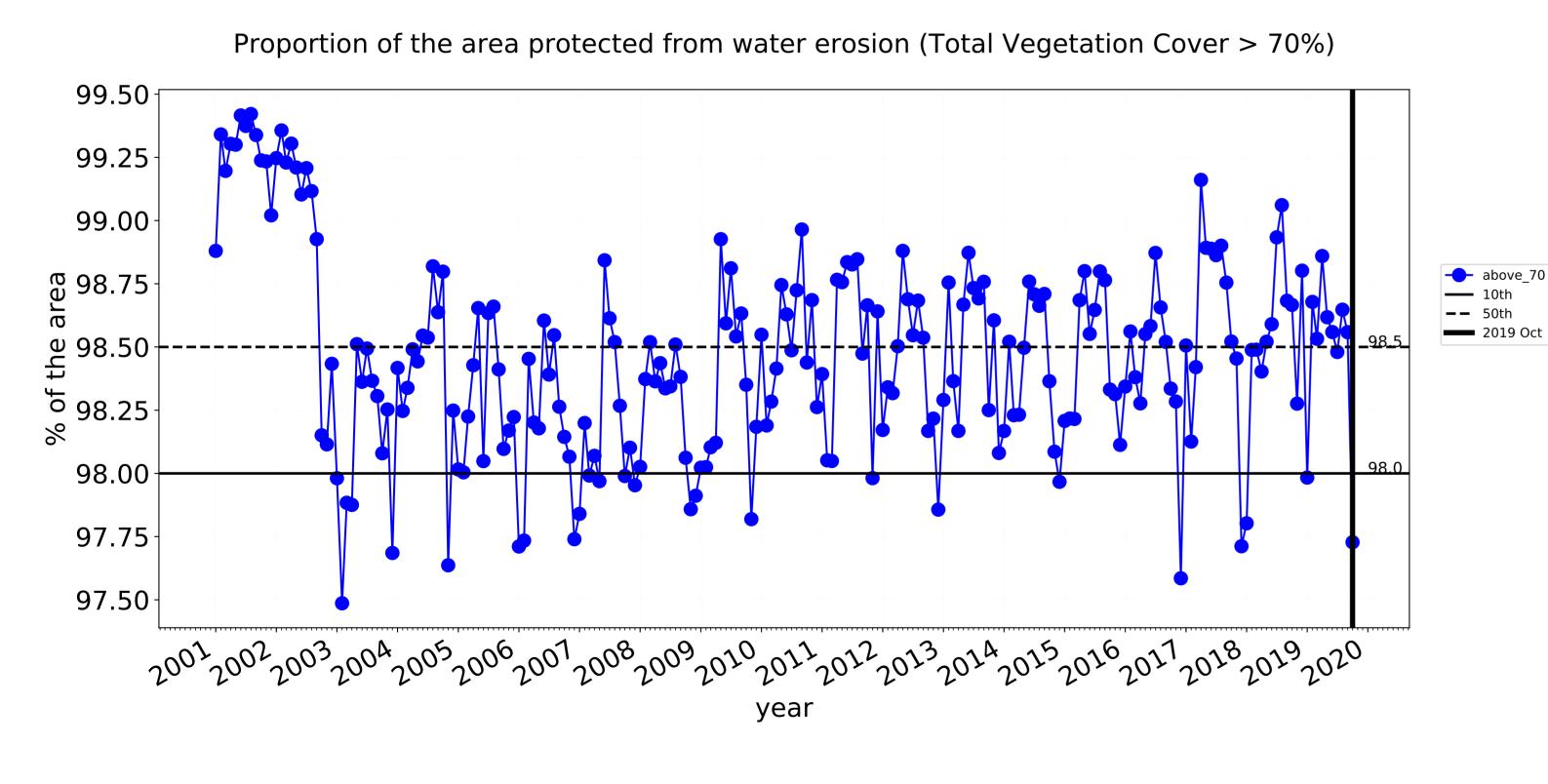
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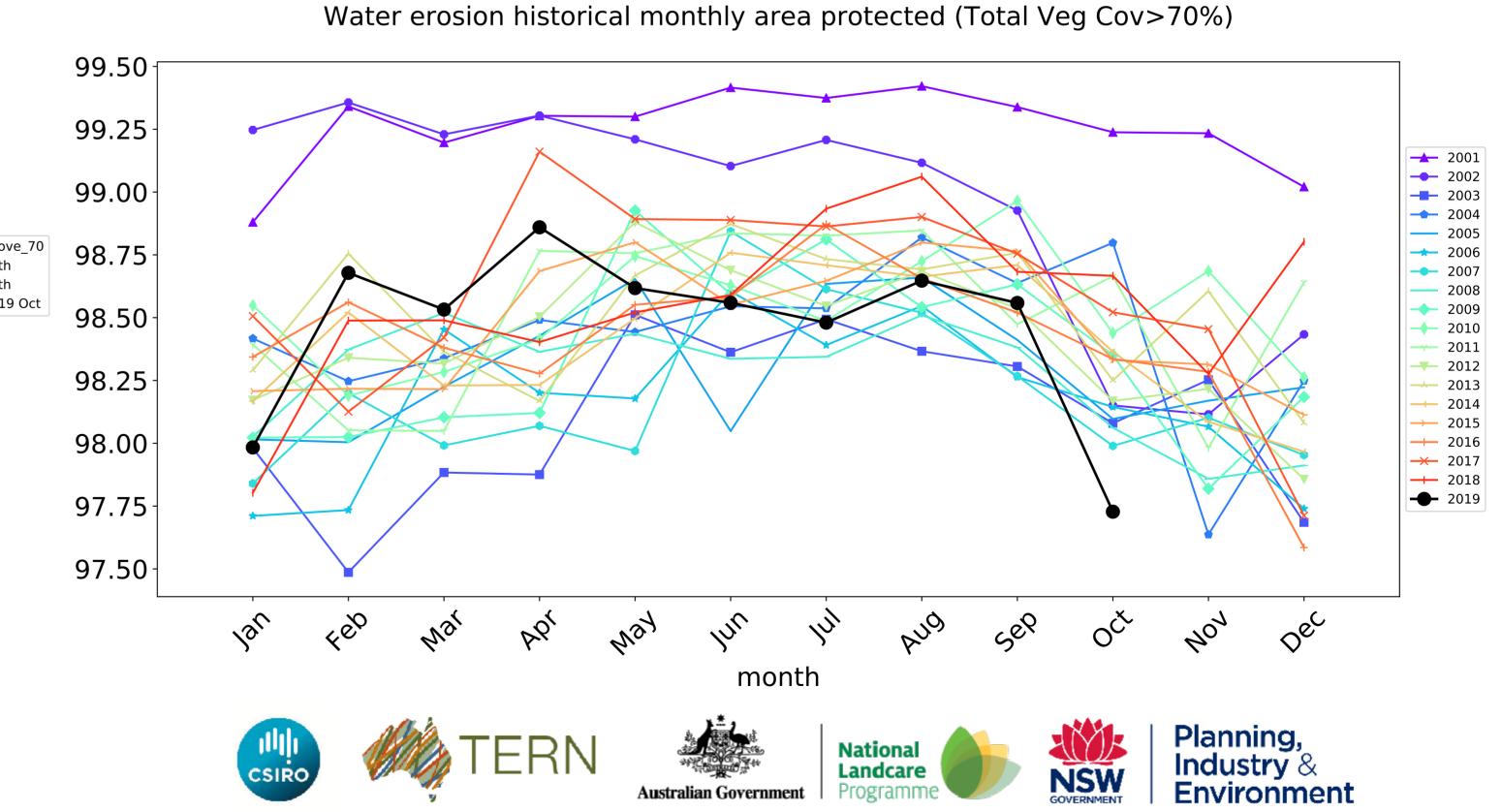


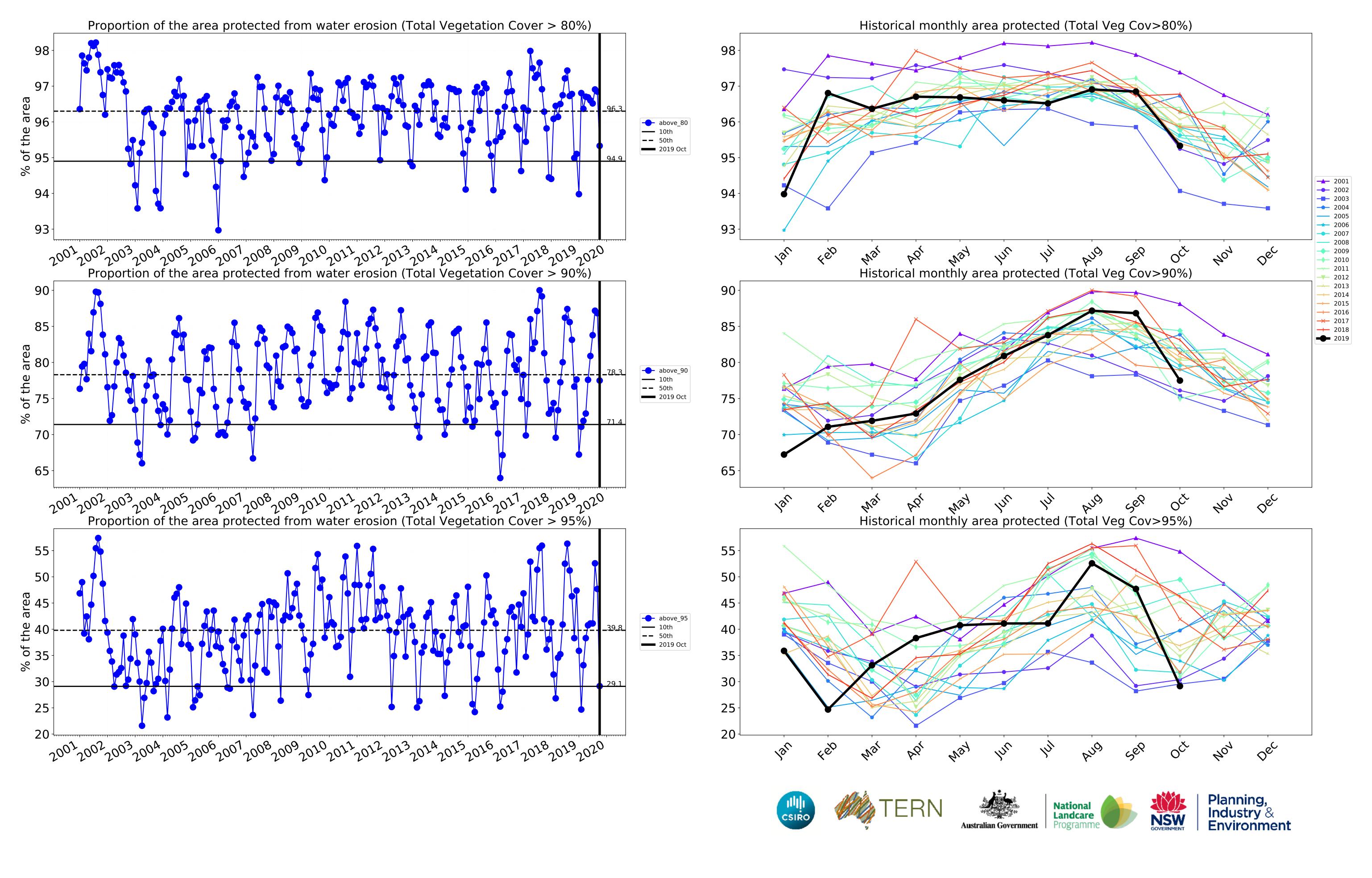


month

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







### **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)

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the

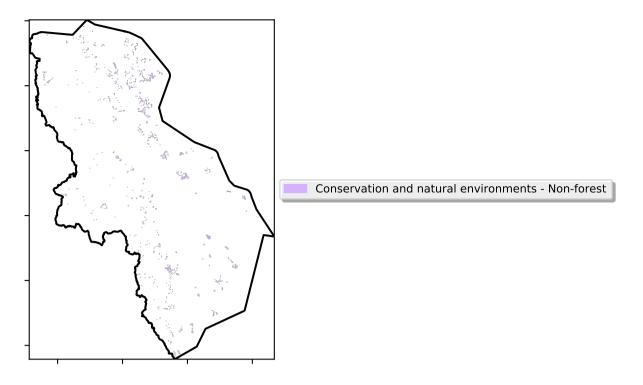
mean of that

pixel. The mean

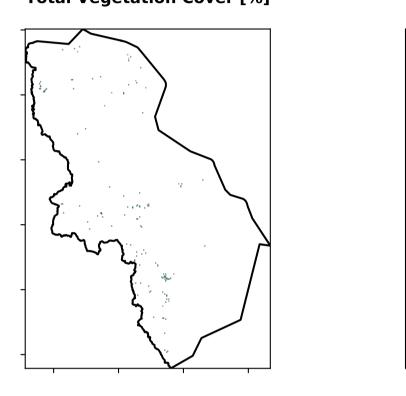
using baseline from 2001 to 2019.

is only for the month of the map

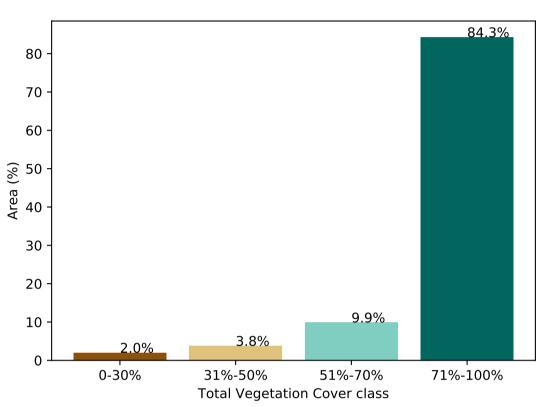
the mean. That



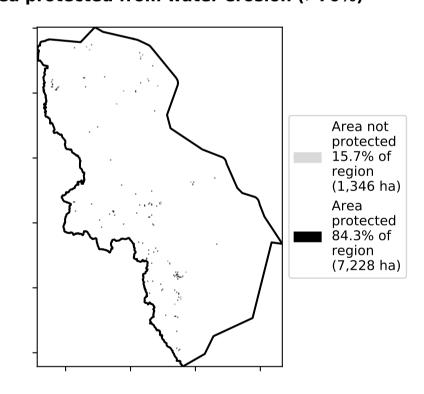
### **Total Vegetation Cover [%]**



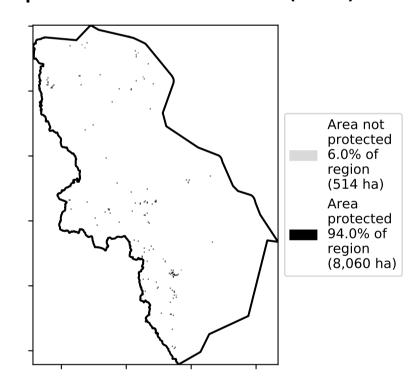
# **Proportion of vegetation cover class in area**



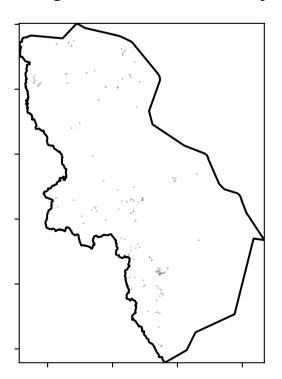
### % Area protected from water erosion (>70%)

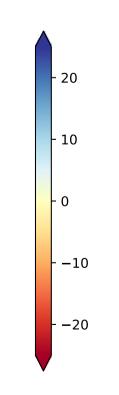


% Area protected from wind erosion (>50%)



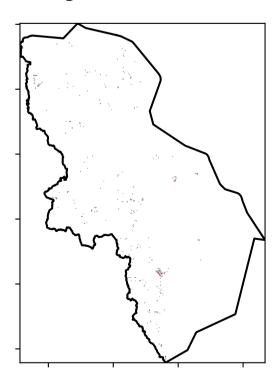
### **Total Vegetation Cover Anomaly [%]**

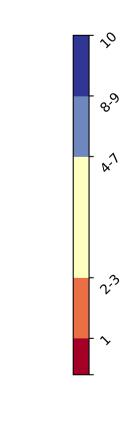




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### **Total Vegetation Cover Decile [%]**









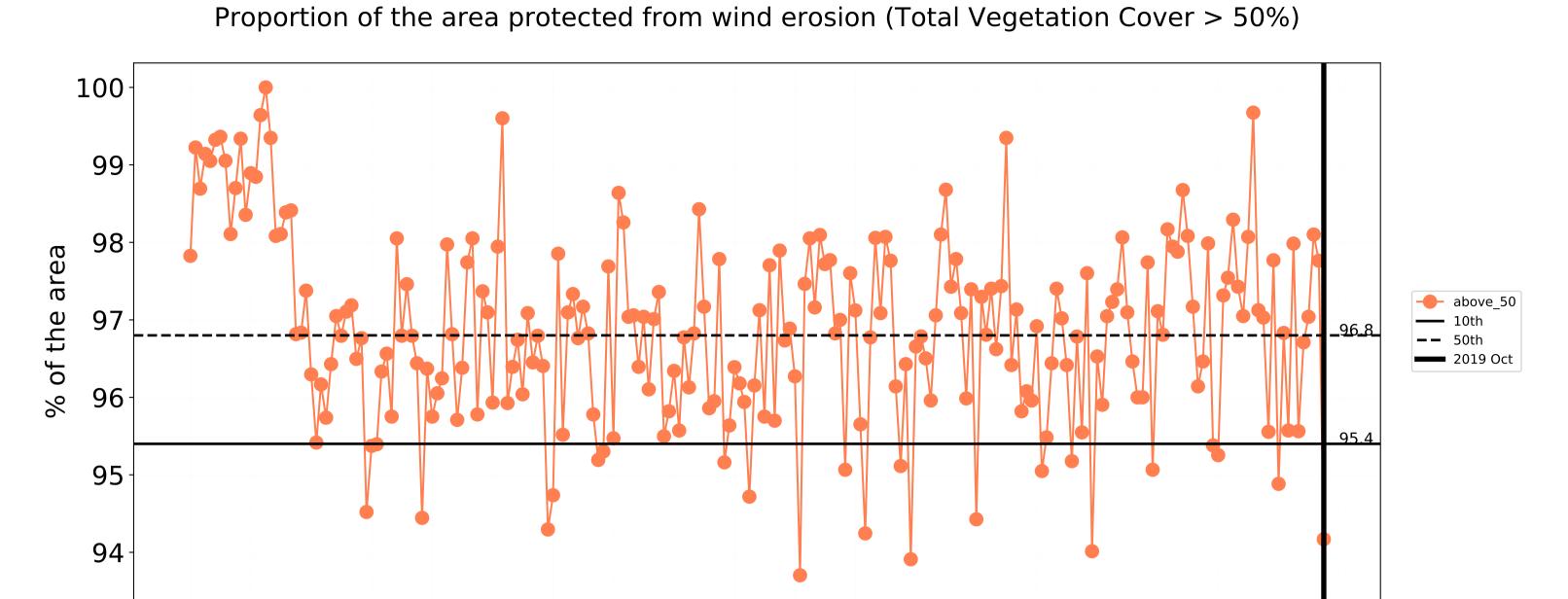




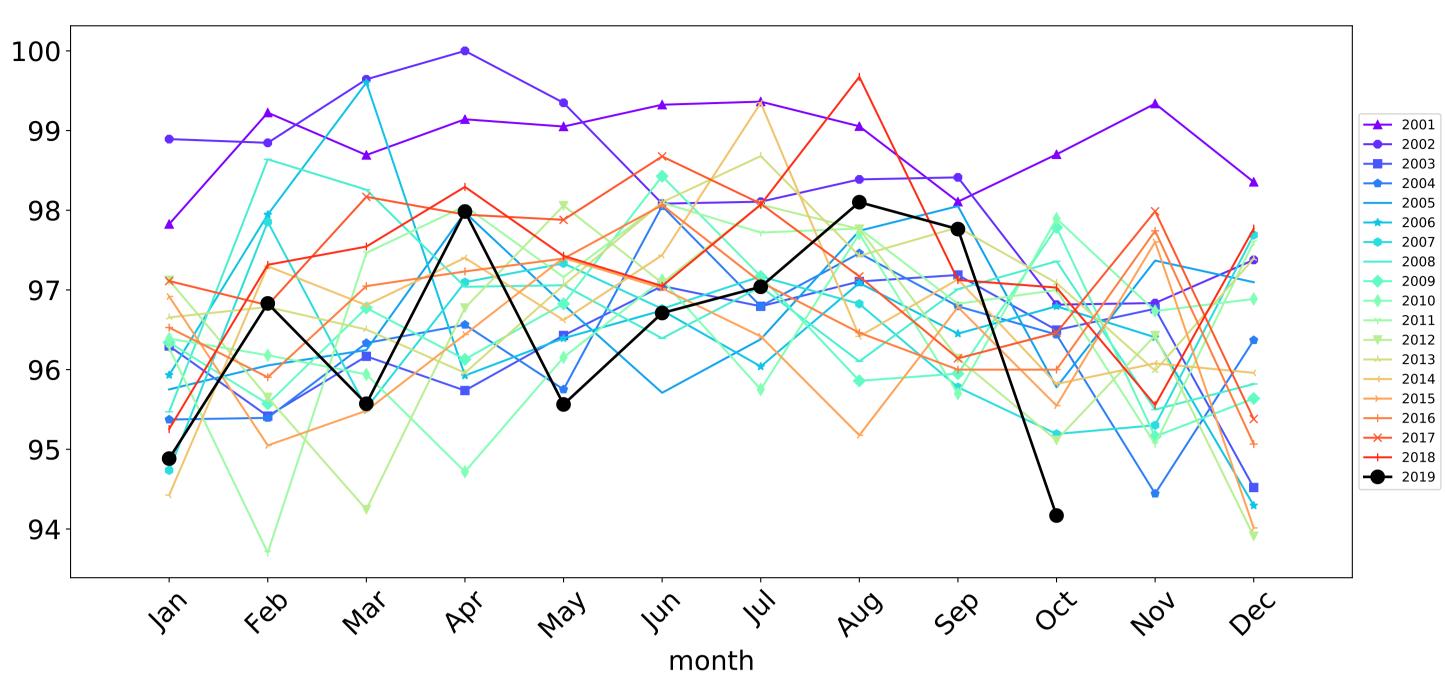




### **Conservation and natural environments non forest timeseries**

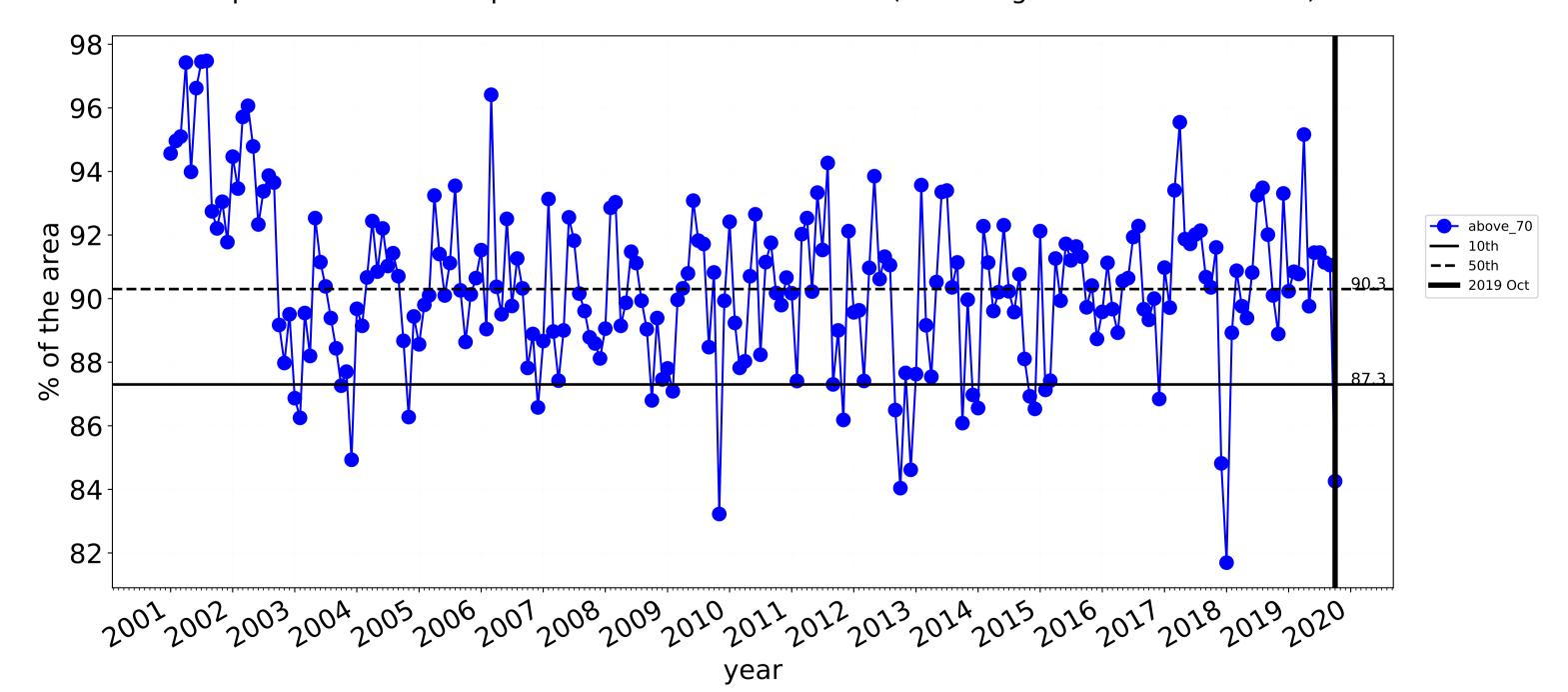


### Wind erosion historical monthly area protected (Total Veg Cov >50%)

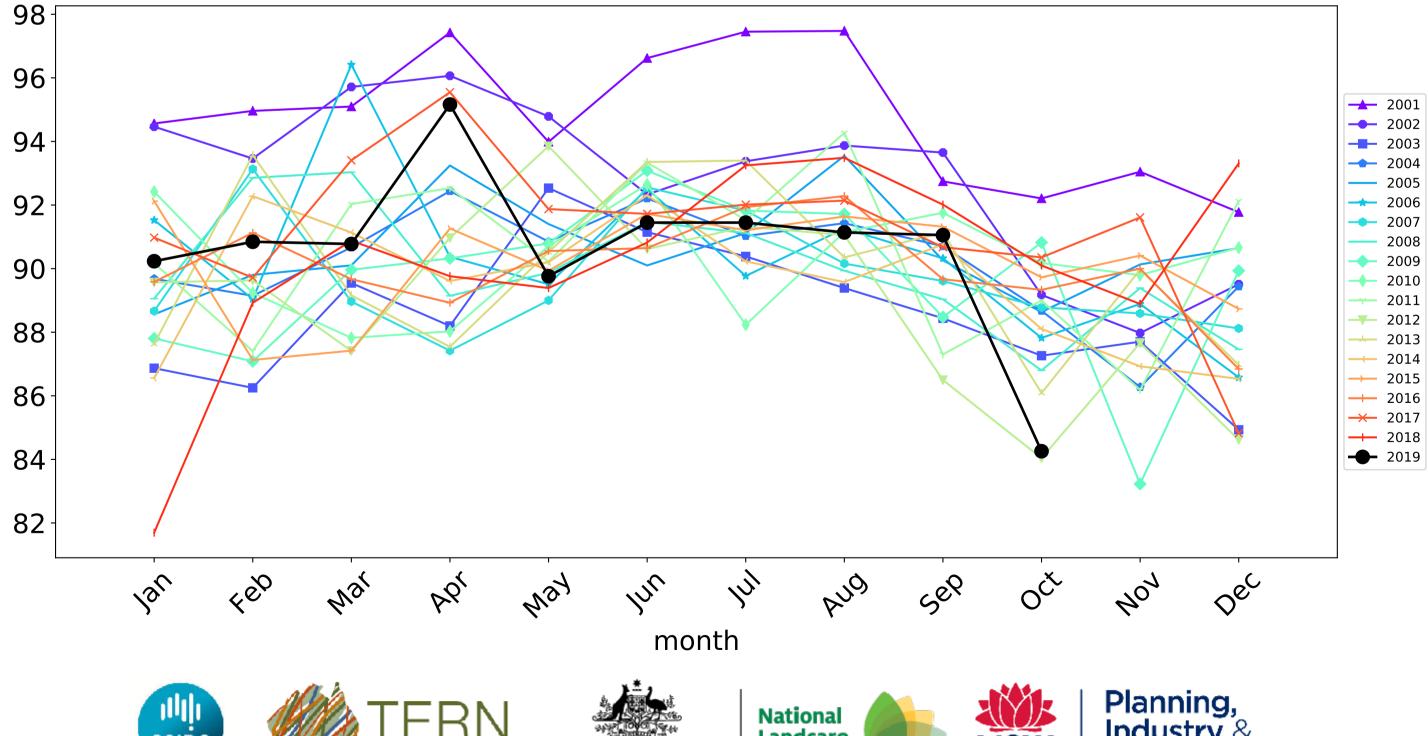




20012002200320042005200620012008200920102011201220132014201520162011201820192020



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





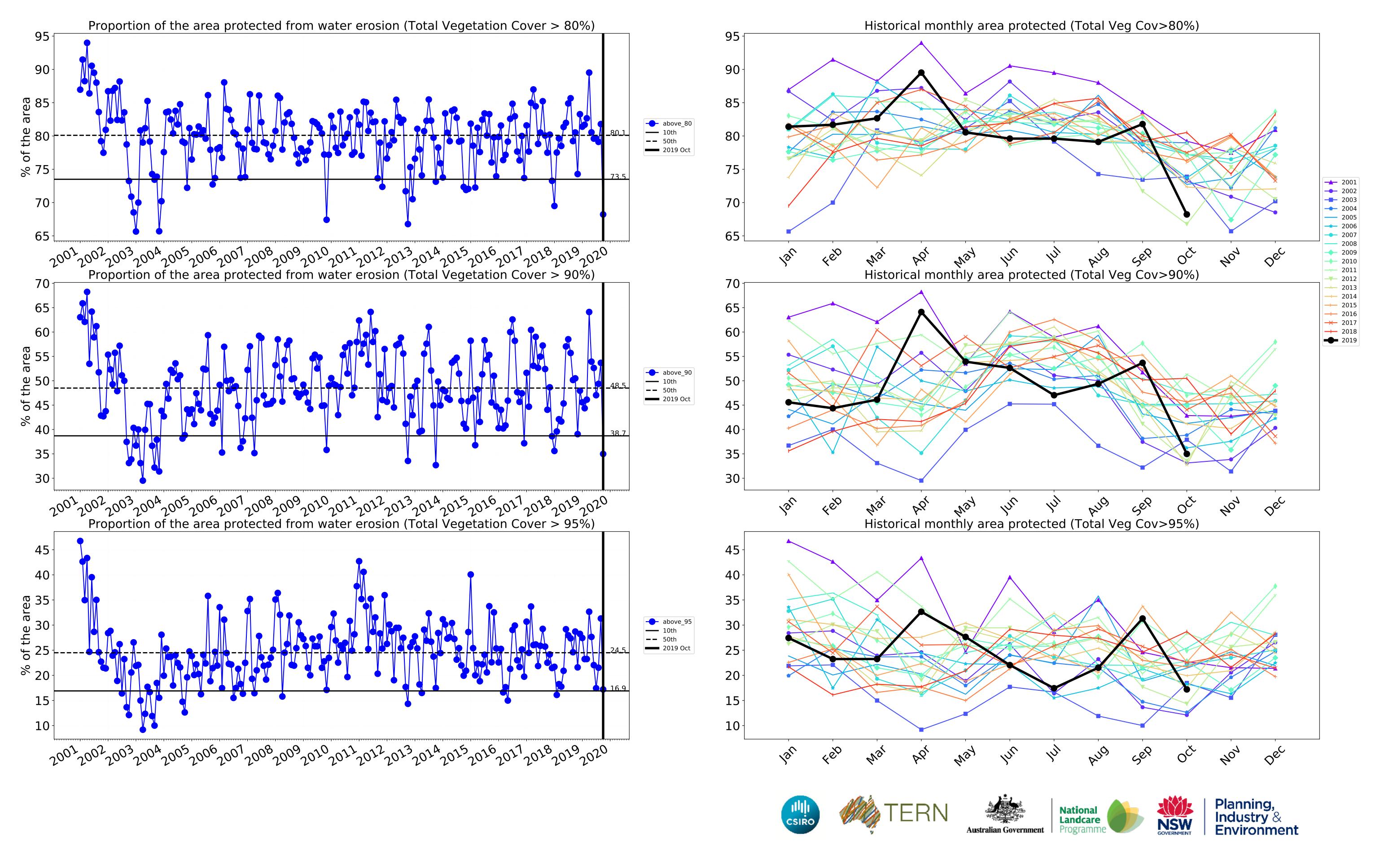












### **Conservation and natural environments Woodland forest**

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

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

Anomaly show how many percetage points each

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using baseline from 2001 to 2019.

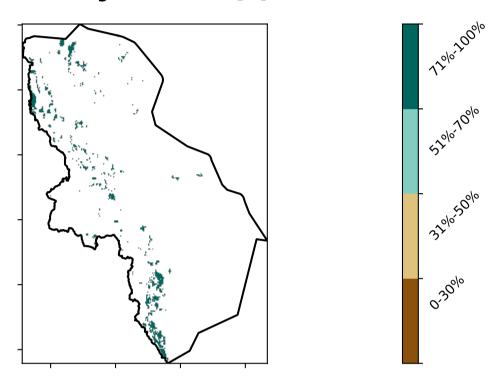
is only for the month of the map

the mean. That

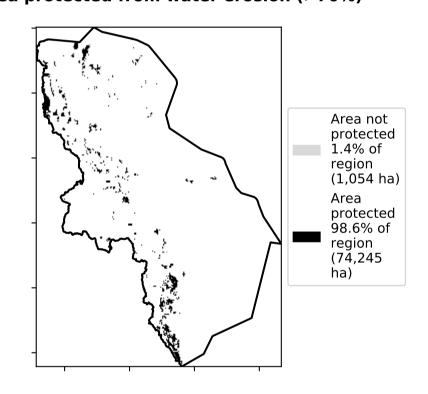
# Conservation and natural environments – Woodland forest

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

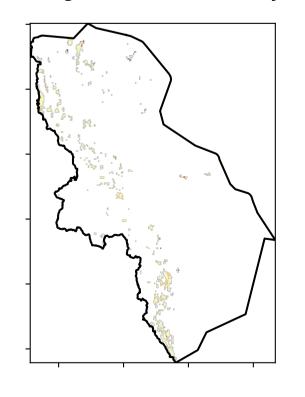
Land use and forest cover



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



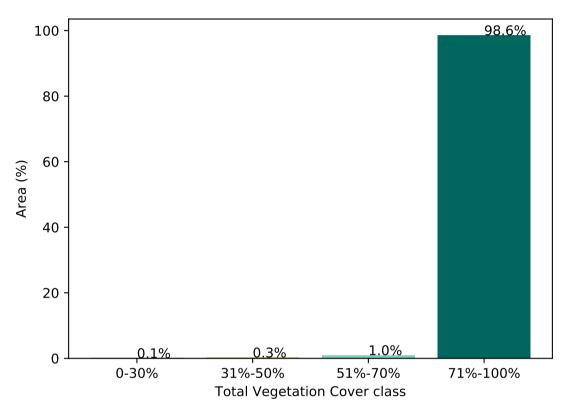
### **Total Vegetation Cover Anomaly [%]**



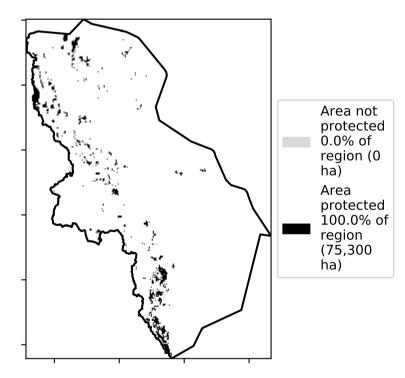
- 20 - 10 - 0 - -10 - -20

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

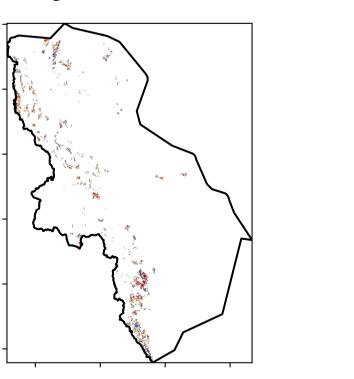
### Proportion of vegetation cover class in area



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



### Total Vegetation Cover Decile [%]





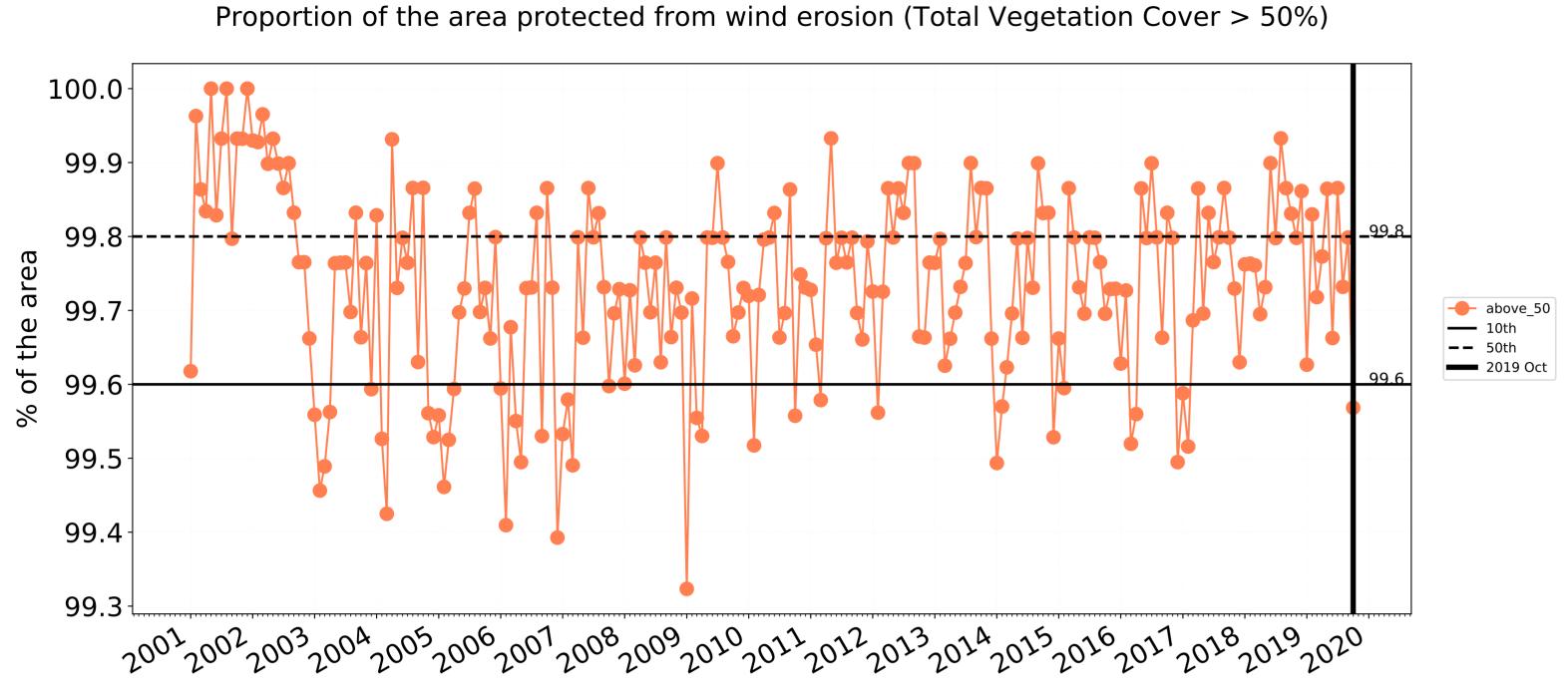




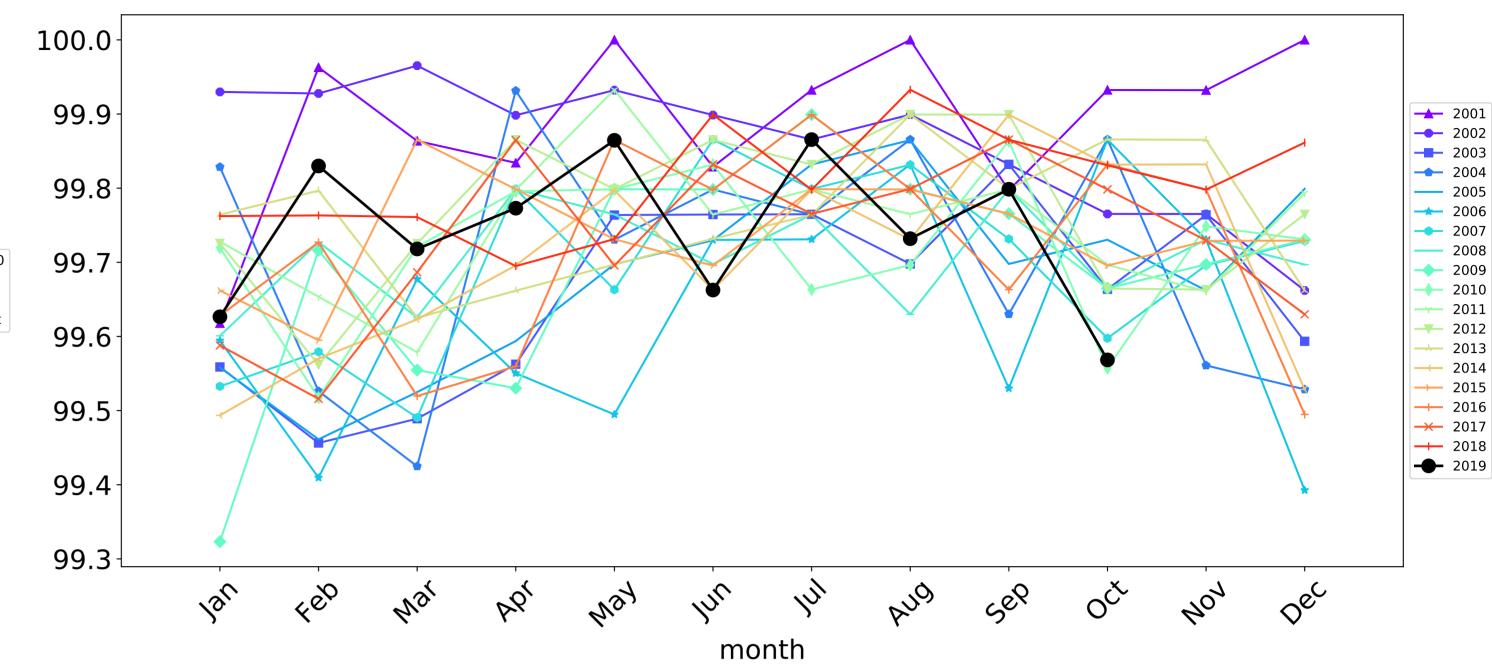


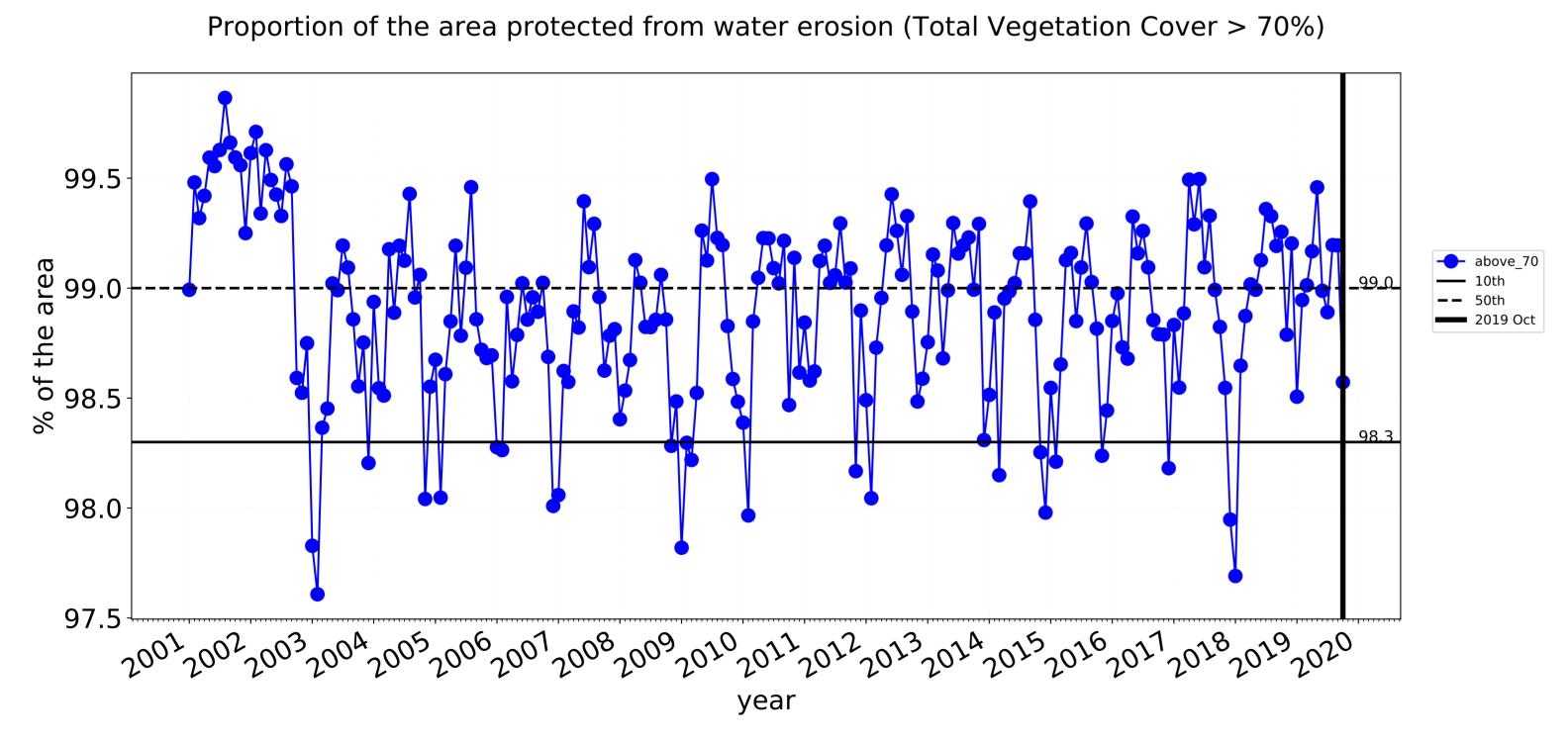


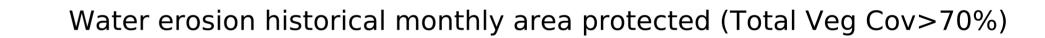


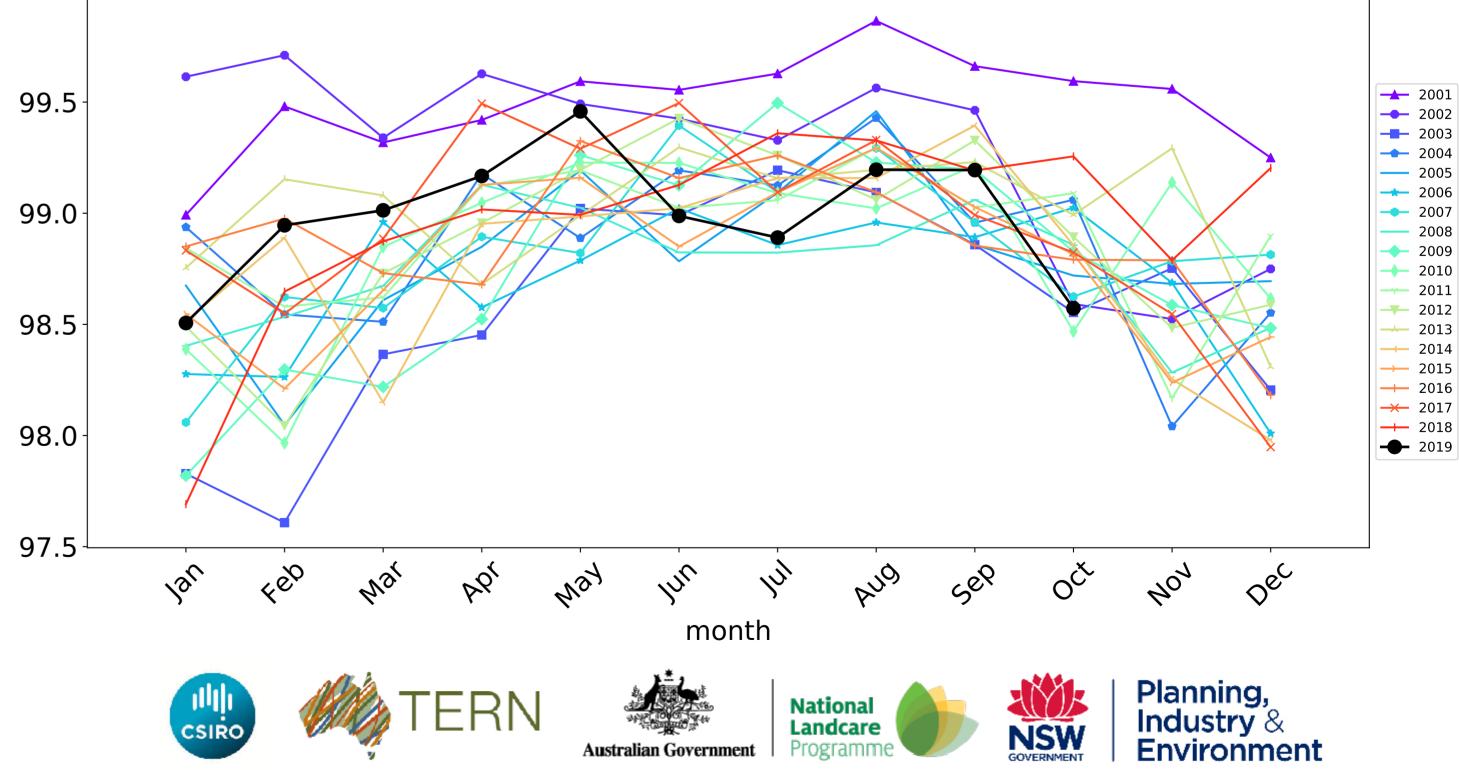


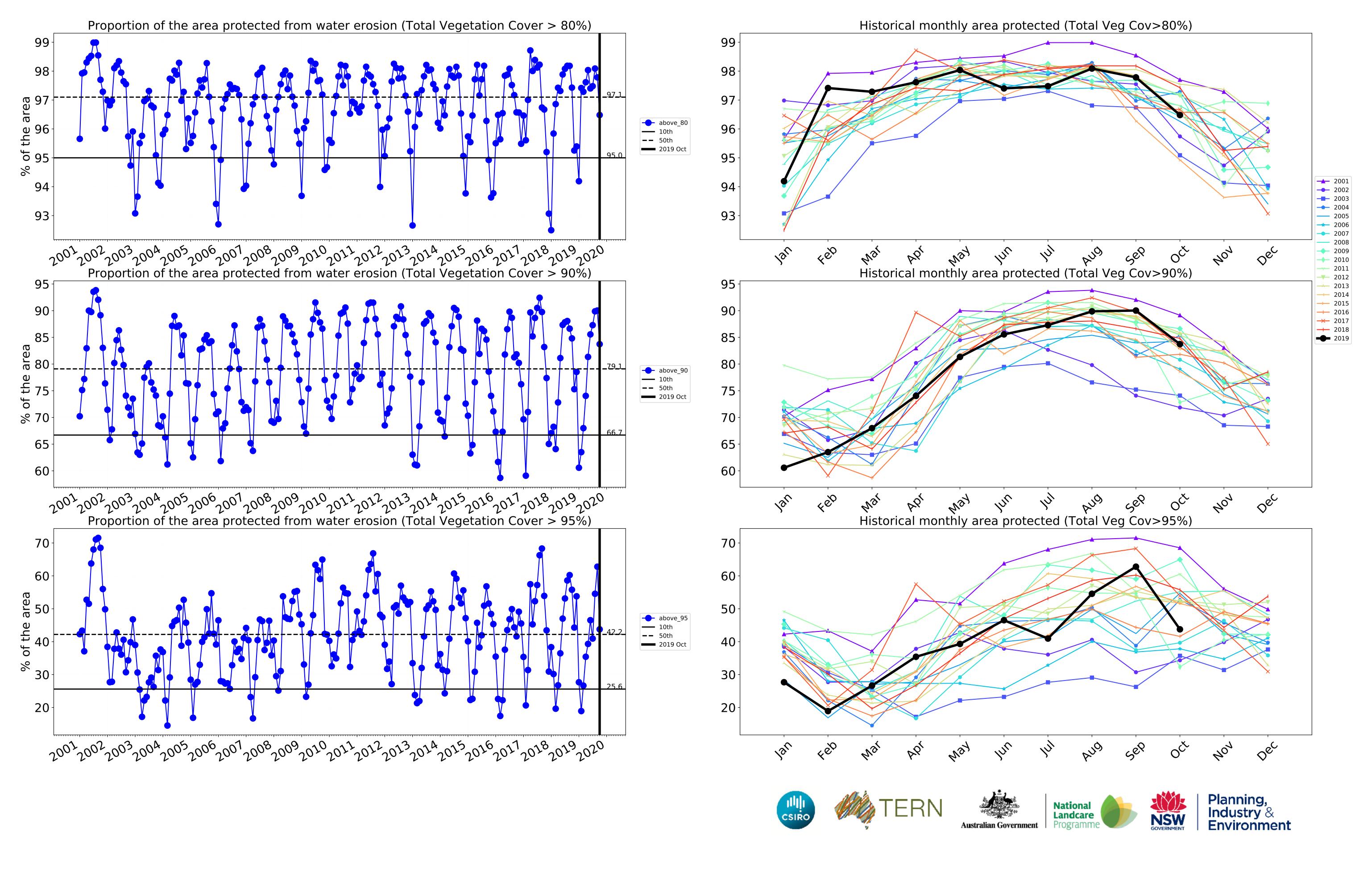








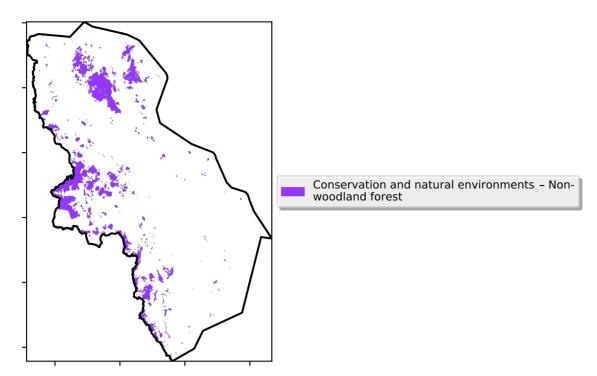




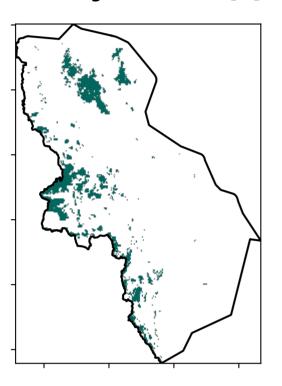
### **Conservation and natural environments Forest (non woodland)**

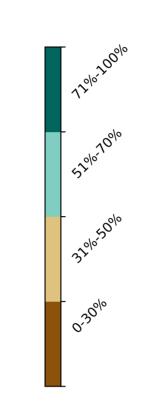
### Land use and forest cover

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

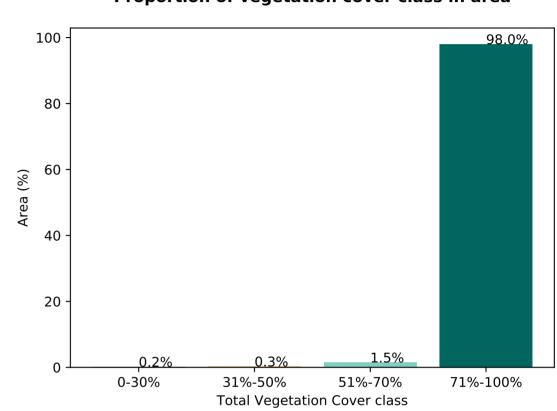


### **Total Vegetation Cover [%]**

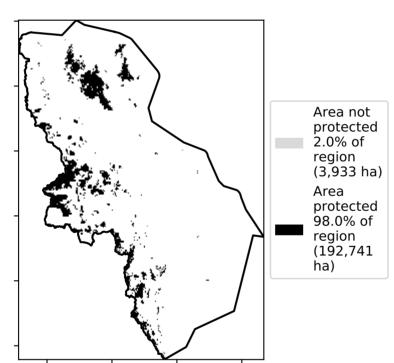




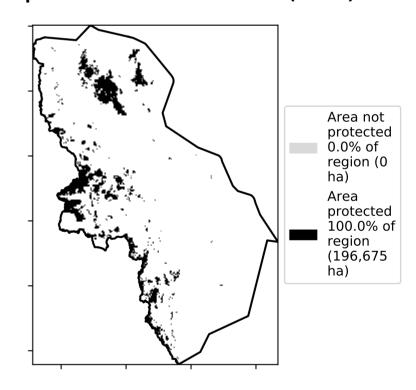
### Proportion of vegetation cover class in area



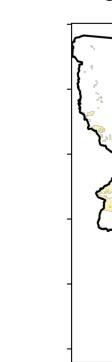
% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



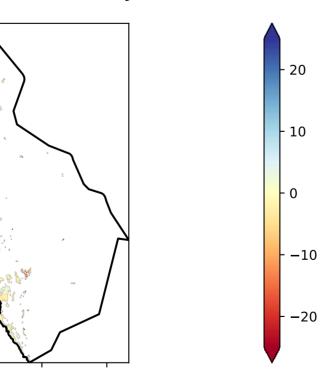
Anomaly show how many percetage points each

pixel is from the mean. That

pixel. The mean

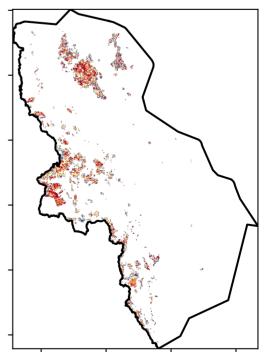
is only for the month of the map using baseline from 2001 to 2019.

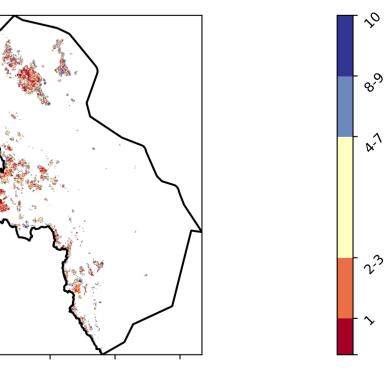
is, red pixels are about 20% lower than the mean of that



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**Total Vegetation Cover Decile [%]** 







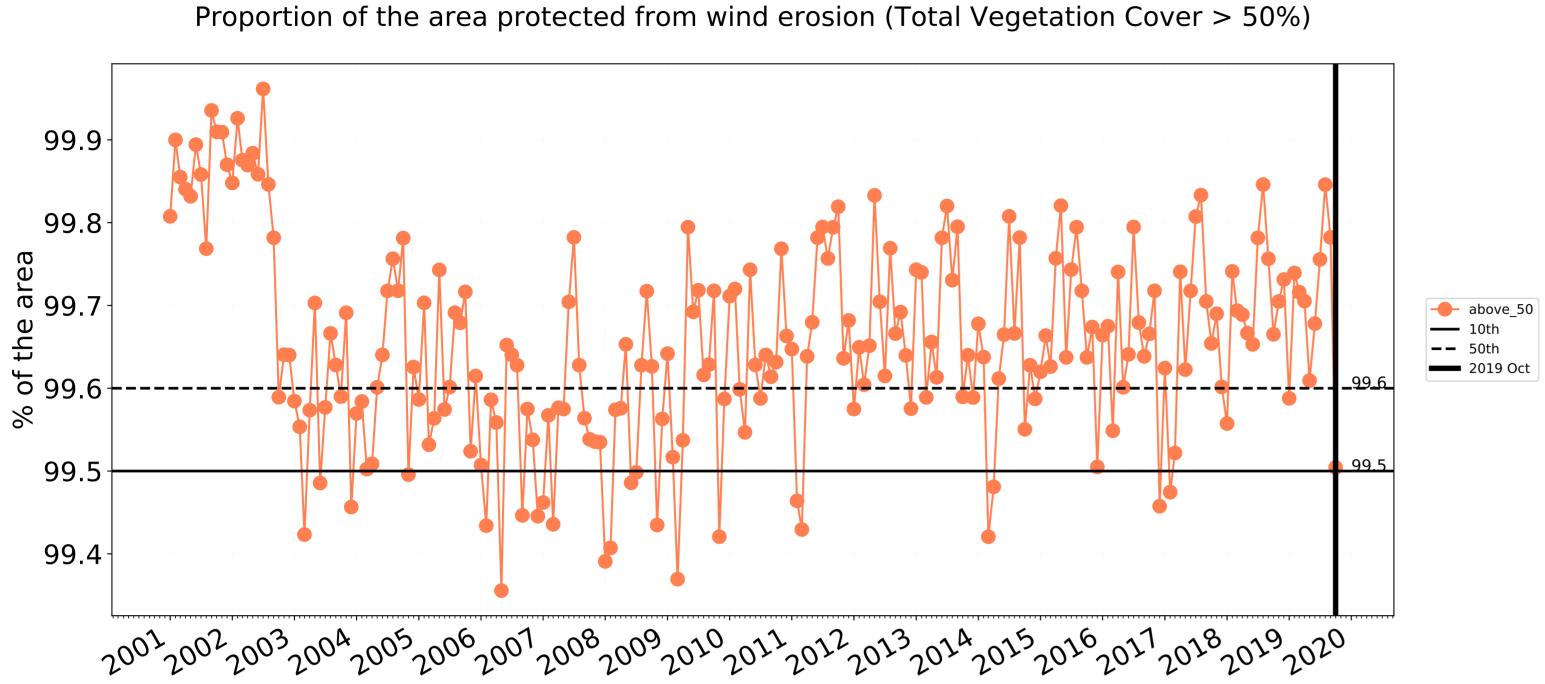




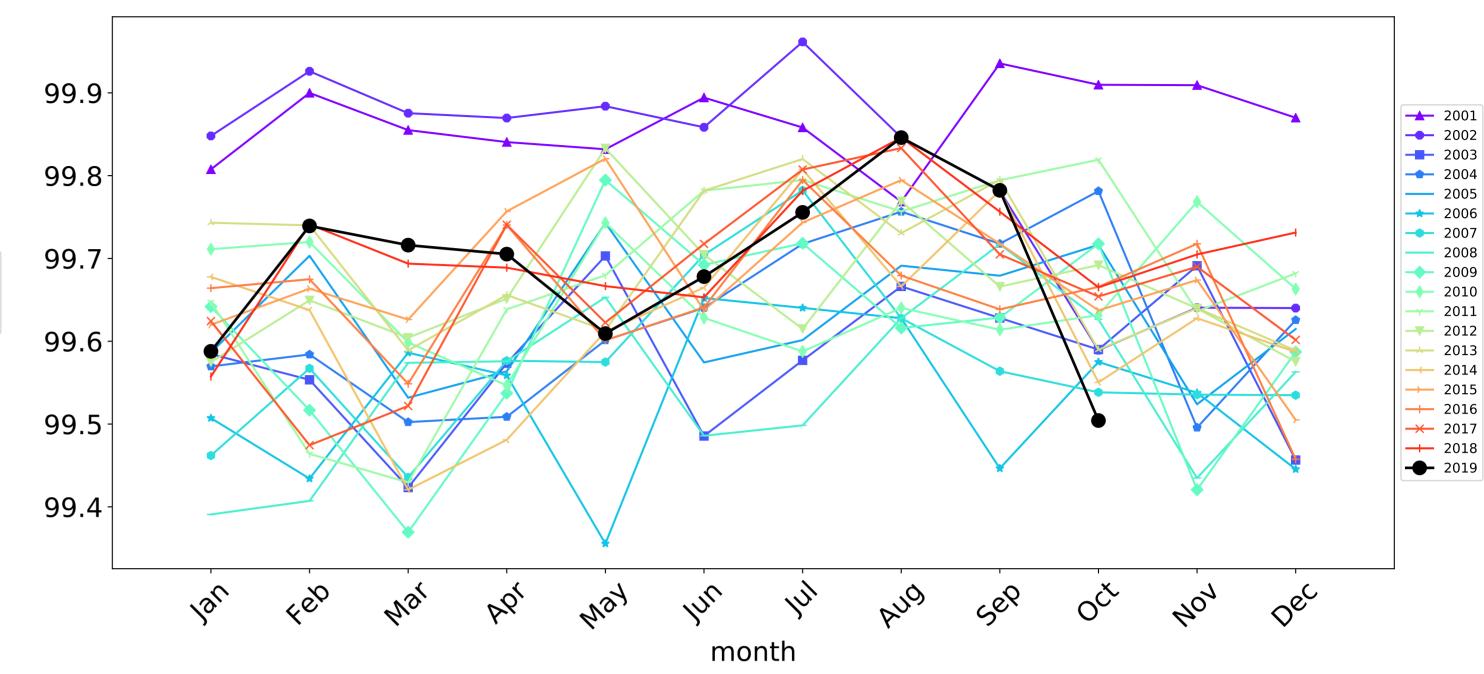


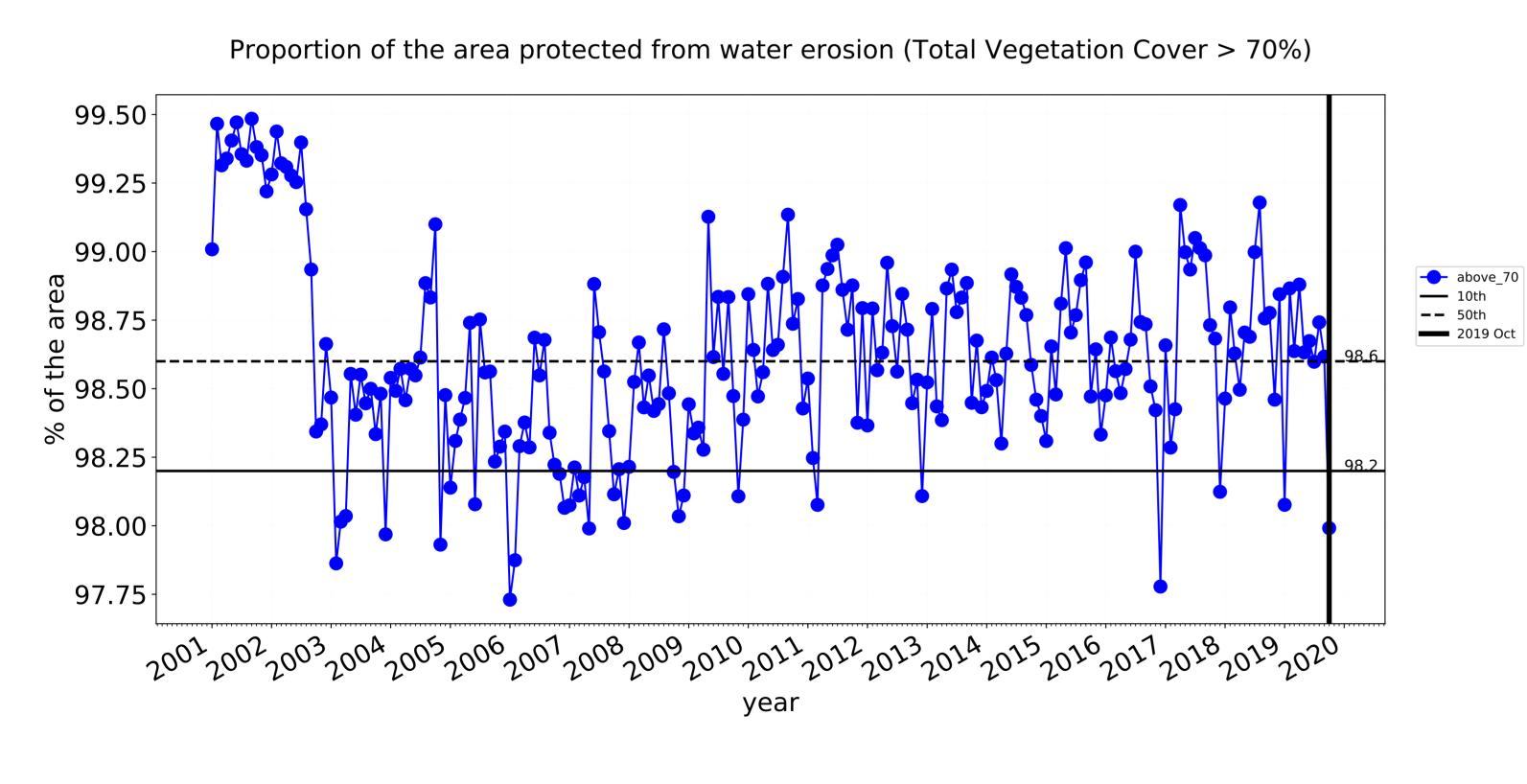


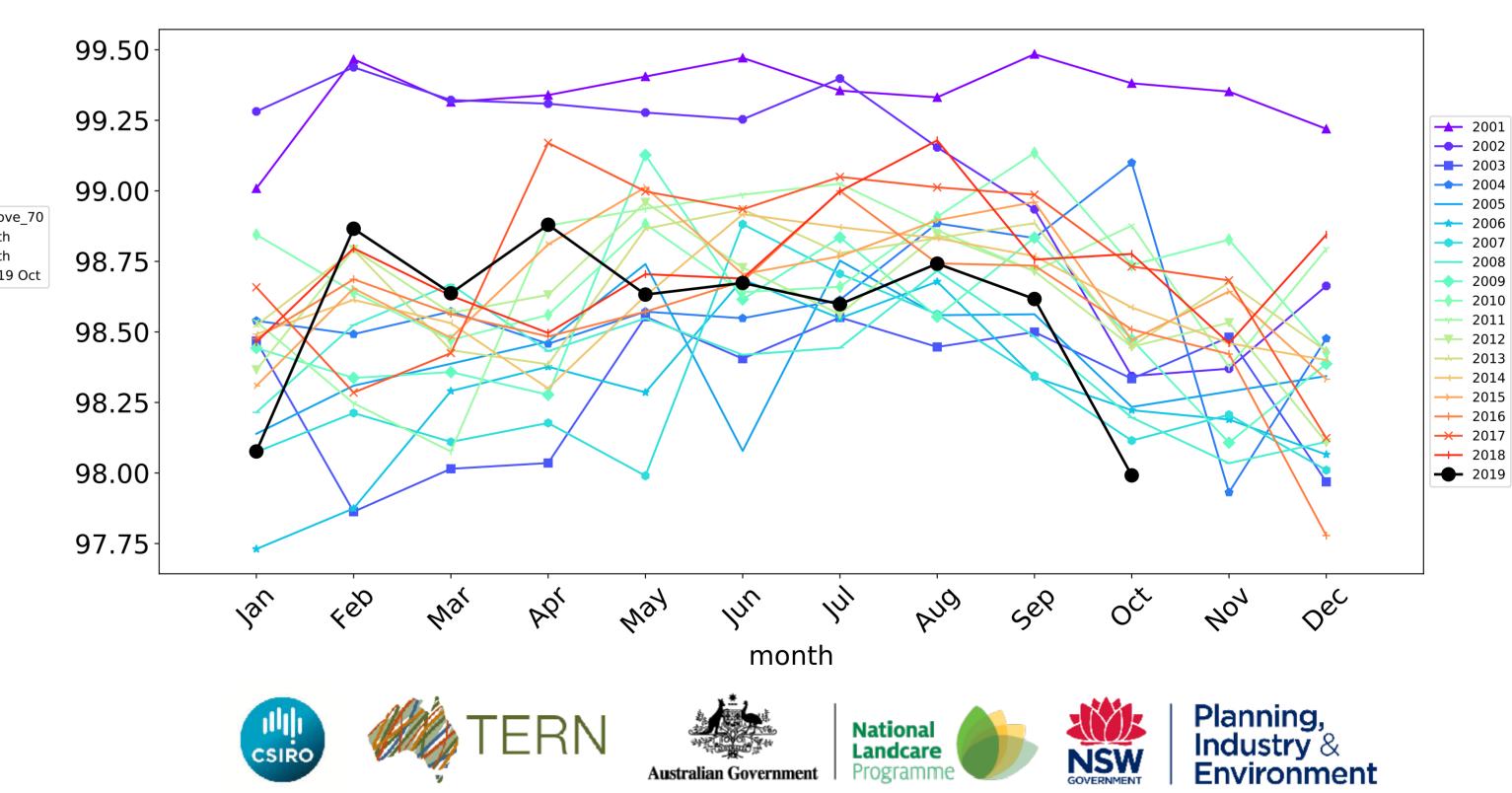




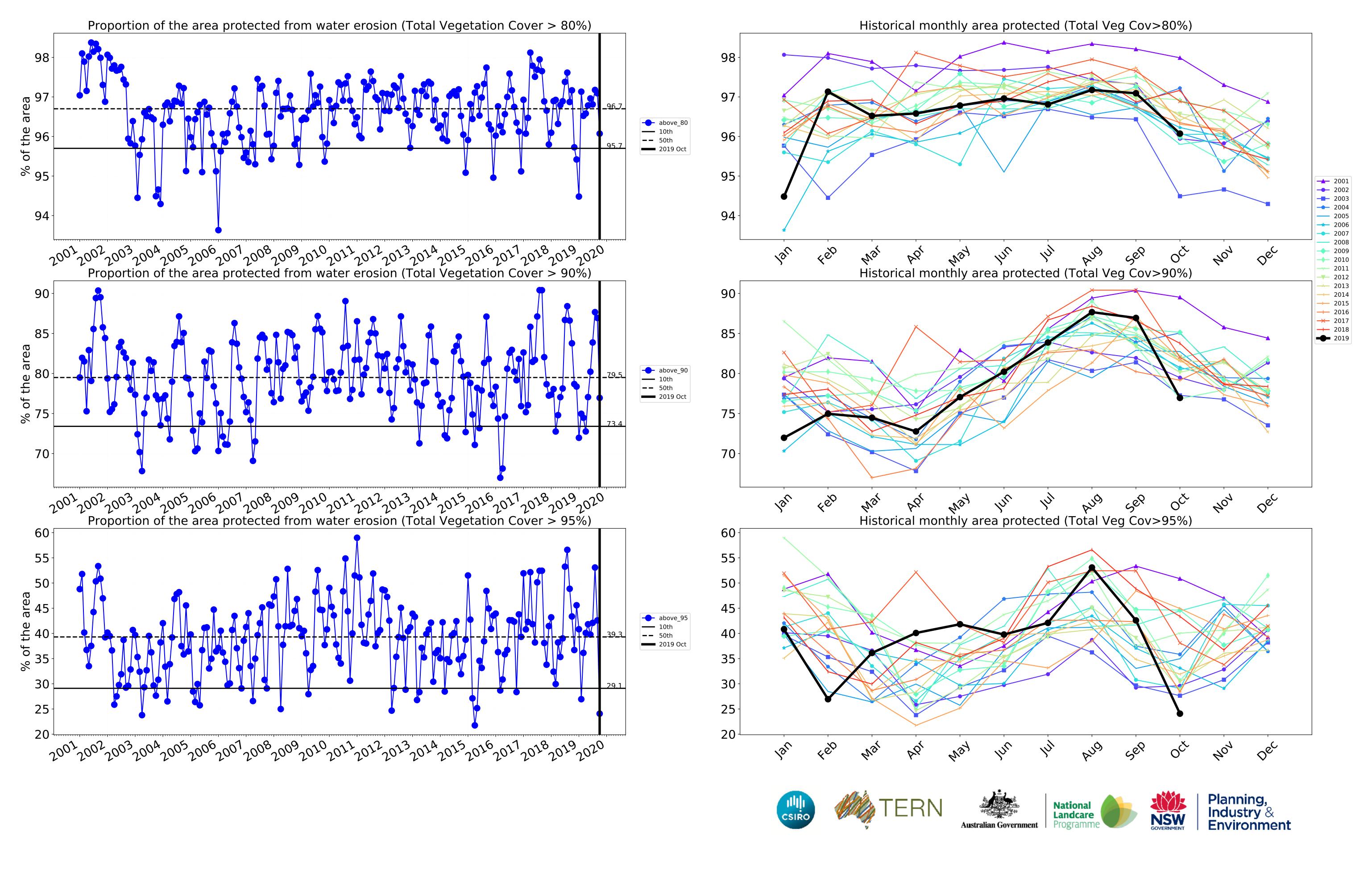
### Wind erosion historical monthly area protected (Total Veg Cov >50%)







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



### **Agriculture**

### Land use and forest cover

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

Anomaly show how many percetage points each

pixel is from

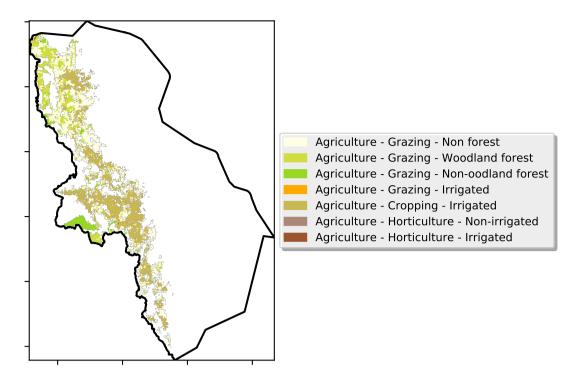
is, red pixels are about 20% lower than the

mean of that pixel. The mean

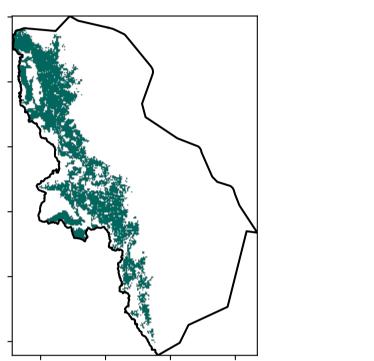
is only for the month of the map

using baseline from 2001 to 2019.

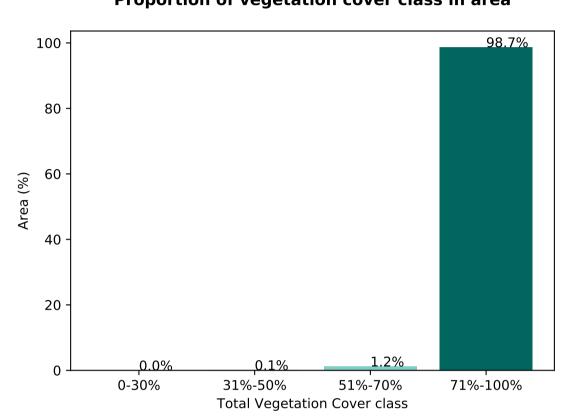
the mean. That



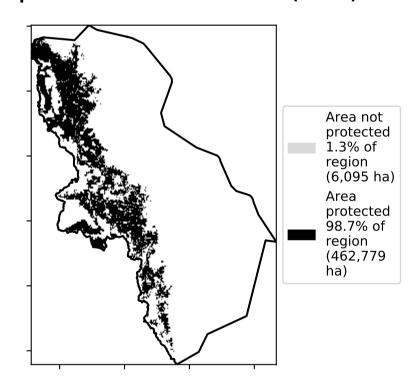
### **Total Vegetation Cover [%]**



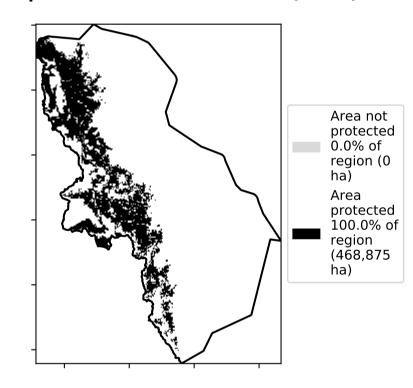
### **Proportion of vegetation cover class in area**



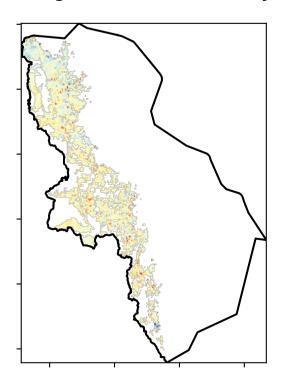
% Area protected from water erosion (>70%)

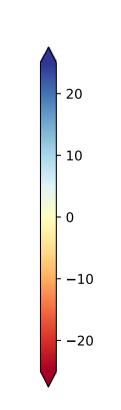


% Area protected from wind erosion (>50%)



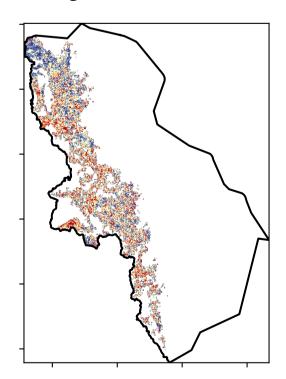
**Total Vegetation Cover Anomaly [%]** 

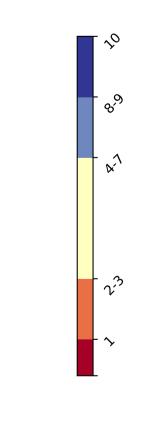




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 









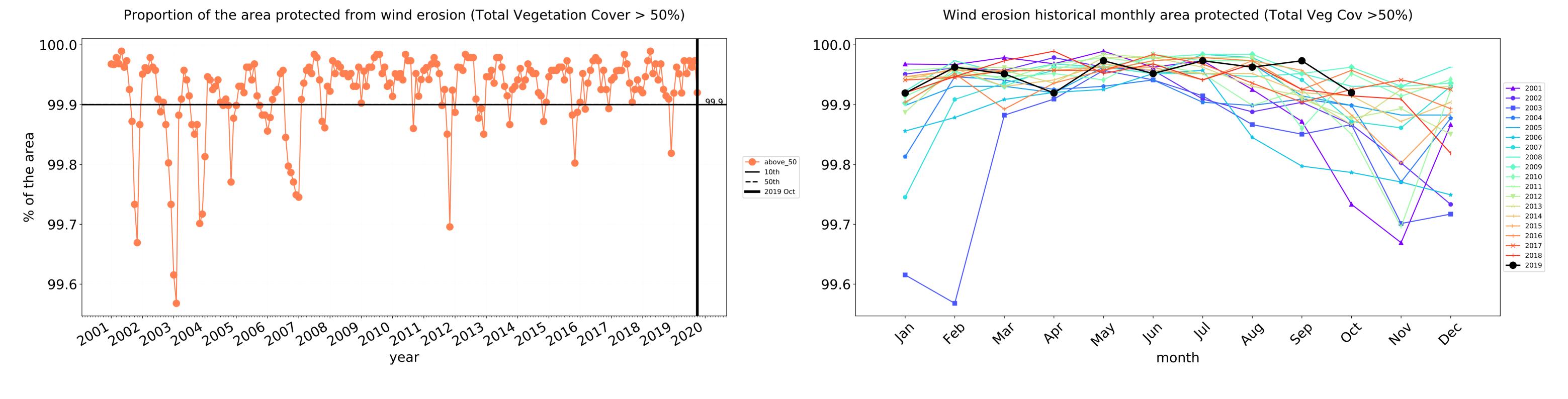


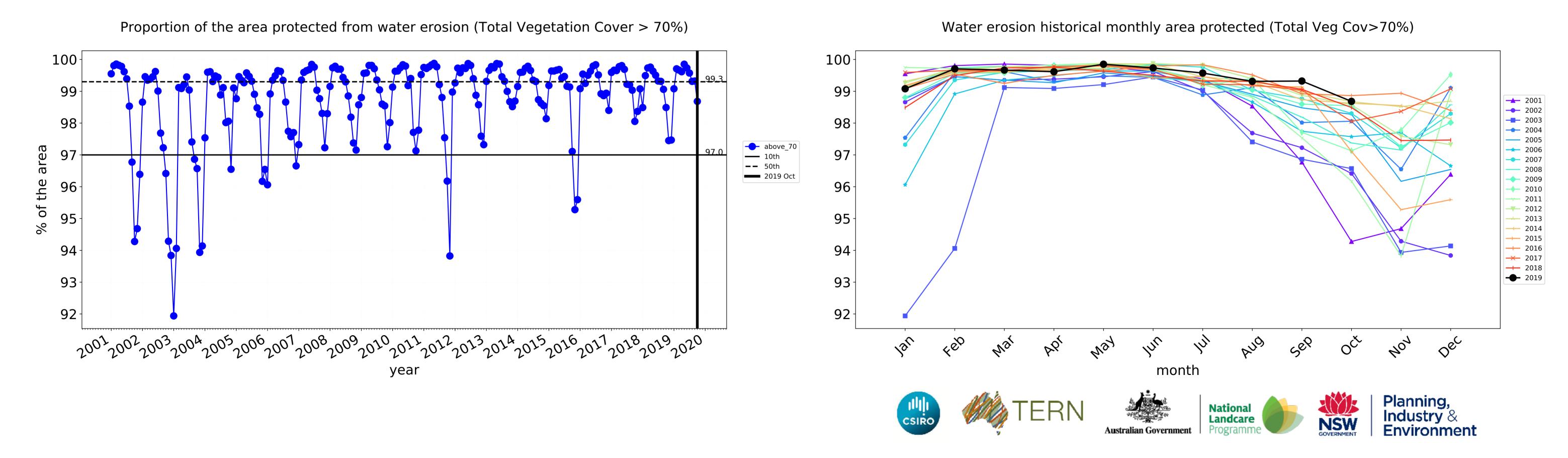


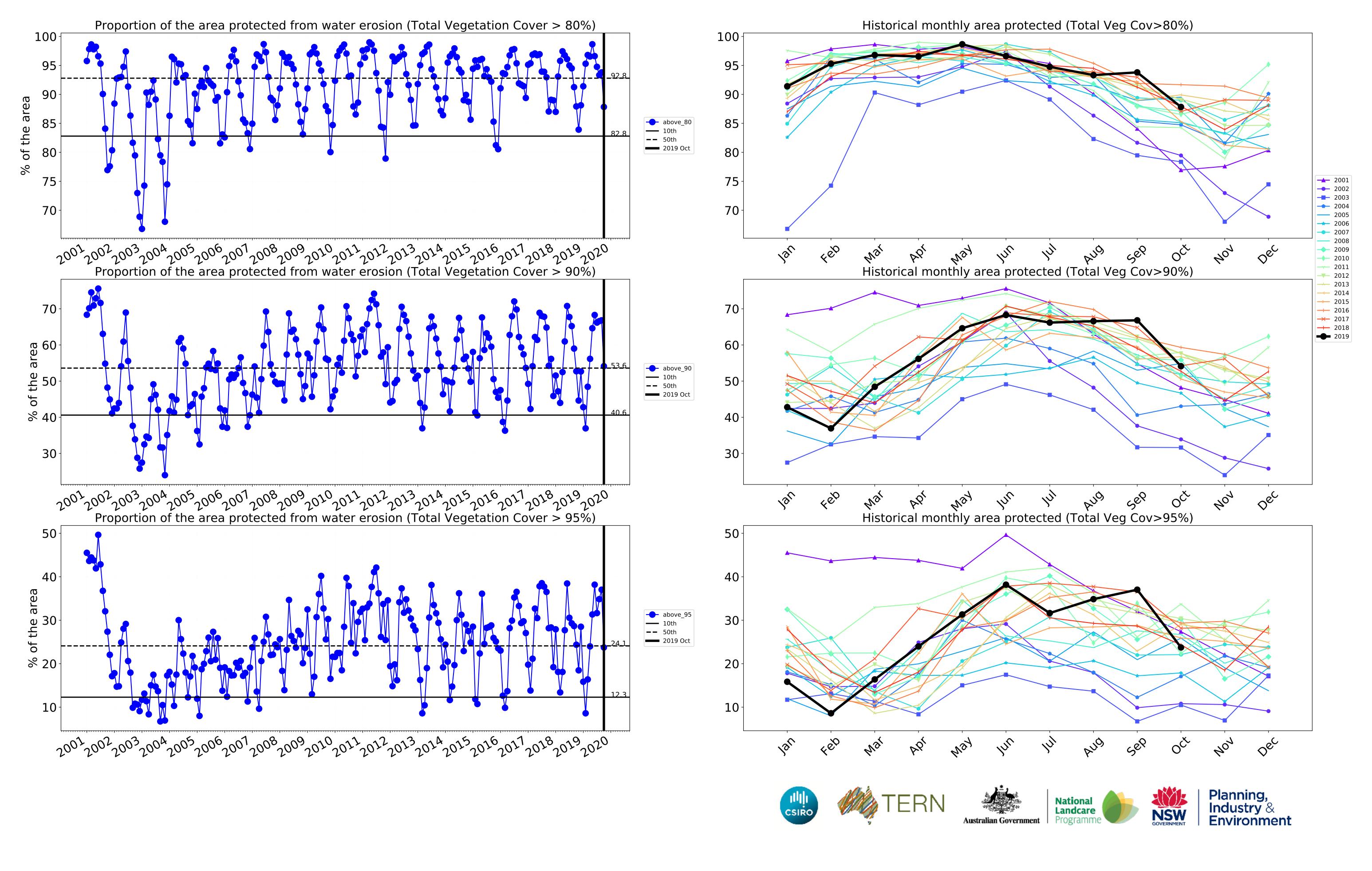




### **Agriculture timeseries**







### **Grazing**

### 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)

Anomaly show how many percetage points each

pixel is from

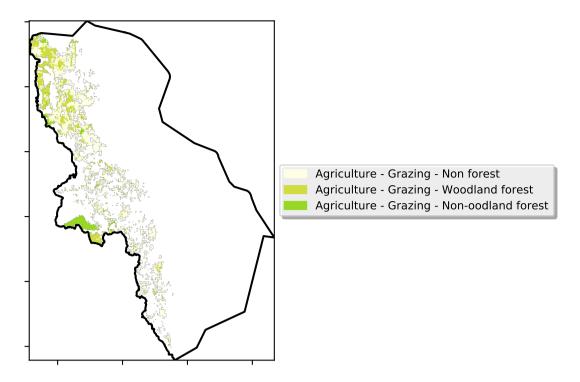
is, red pixels are about 20% lower than the

mean of that pixel. The mean

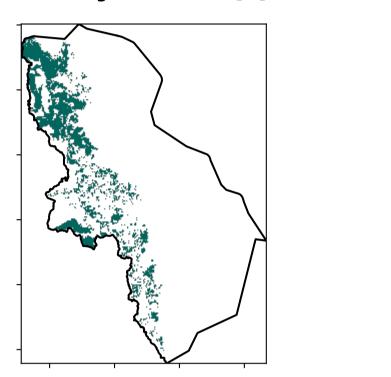
is only for the month of the map

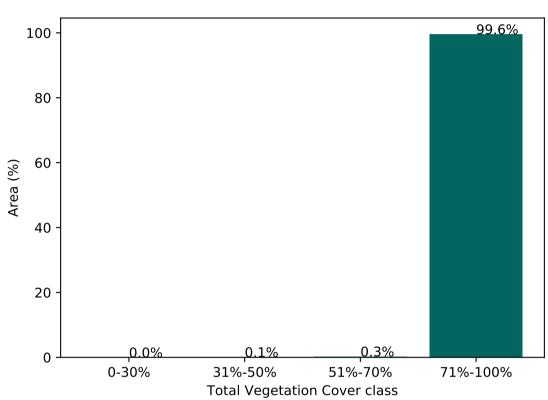
using baseline from 2001 to 2019.

the mean. That



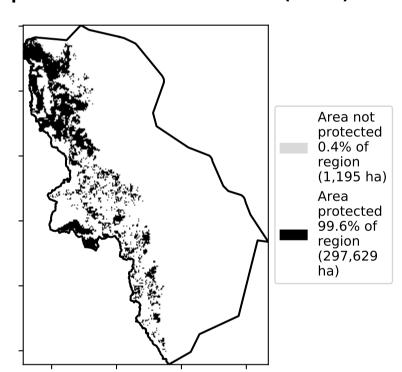
### **Total Vegetation Cover [%]**



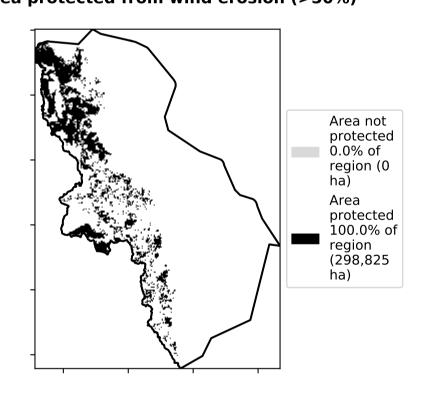


**Proportion of vegetation cover class in area** 

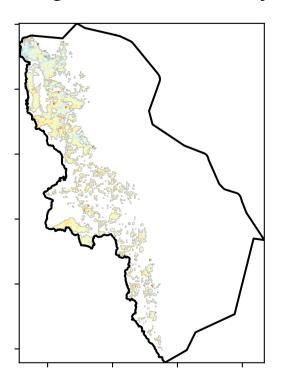
### % Area protected from water erosion (>70%)

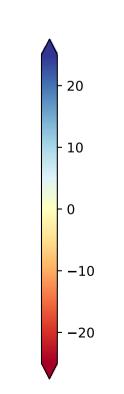


% Area protected from wind erosion (>50%)



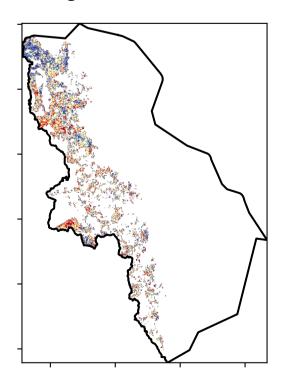
### **Total Vegetation Cover Anomaly [%]**

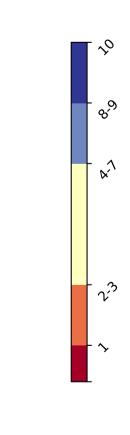




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 









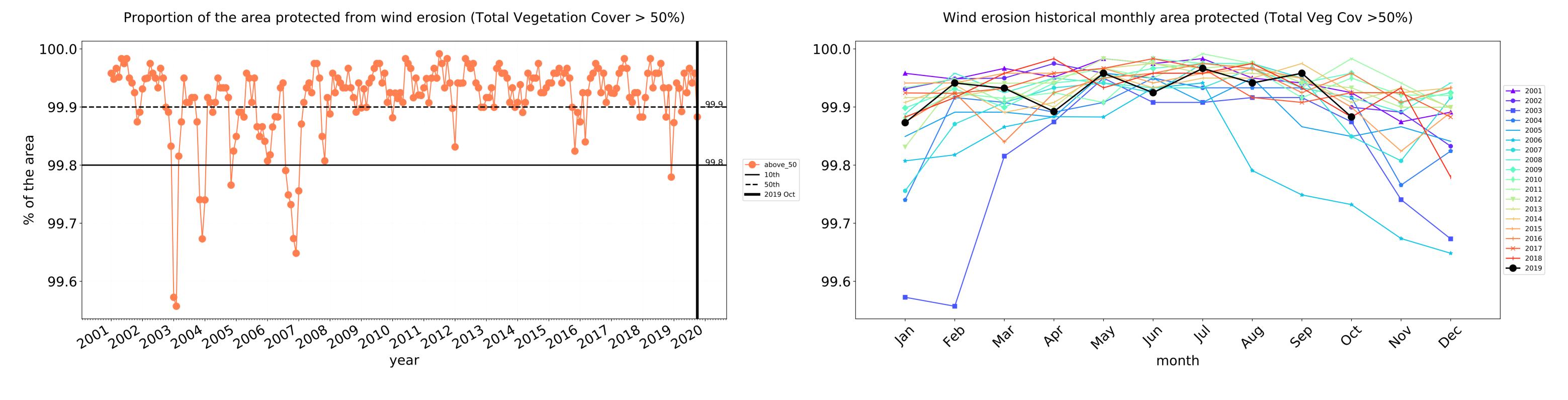


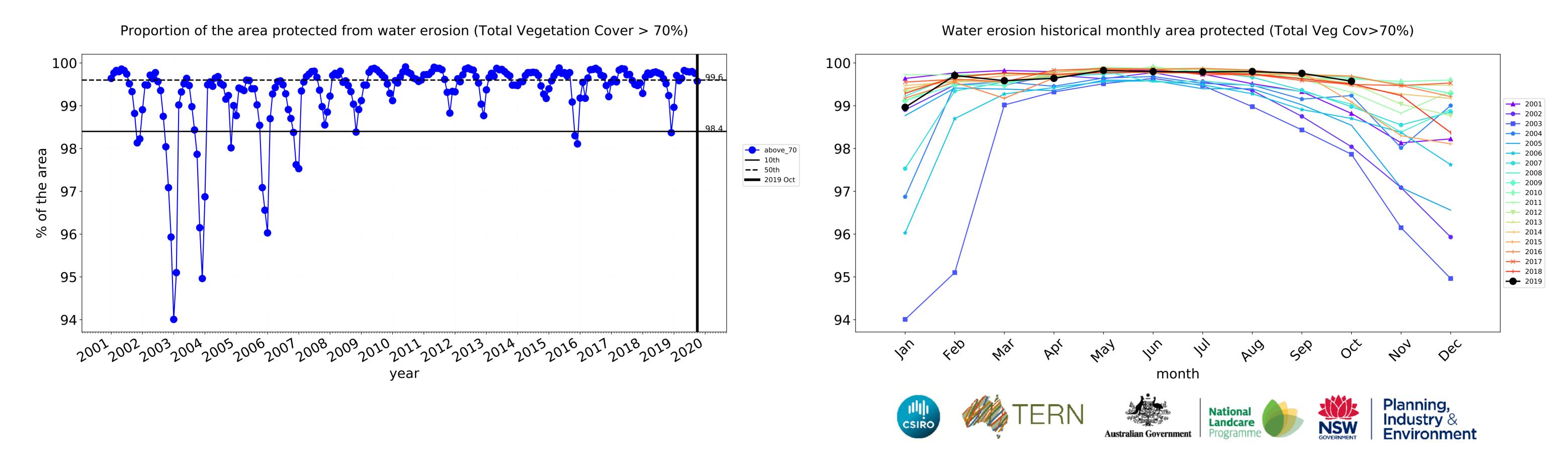


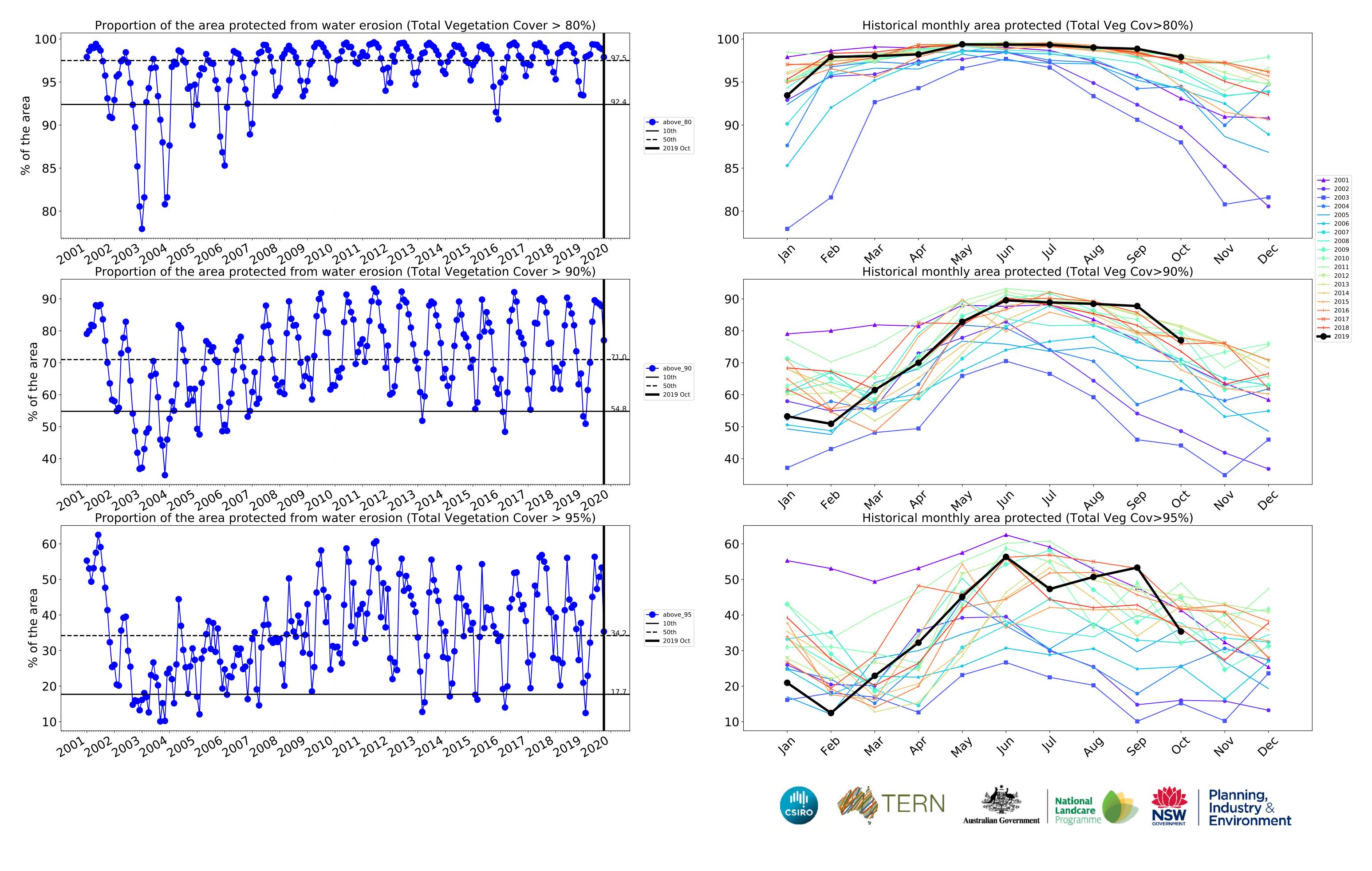




### **Grazing timeseries**







### **Grazing 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)

Anomaly show how many percetage points each

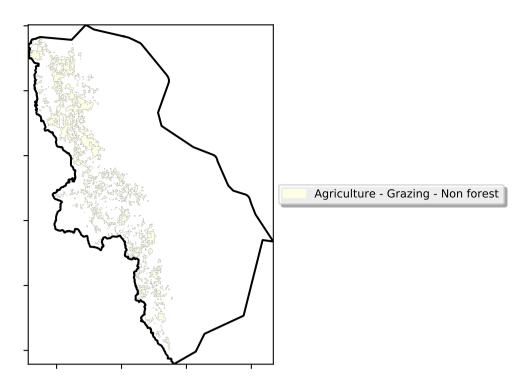
pixel is from

is, red pixels are about 20% lower than the mean of that pixel. The mean

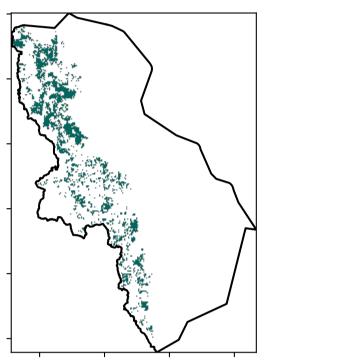
the mean. That

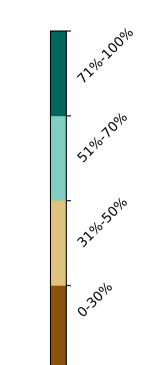
is only for the month of the map

using baseline from 2001 to 2019.

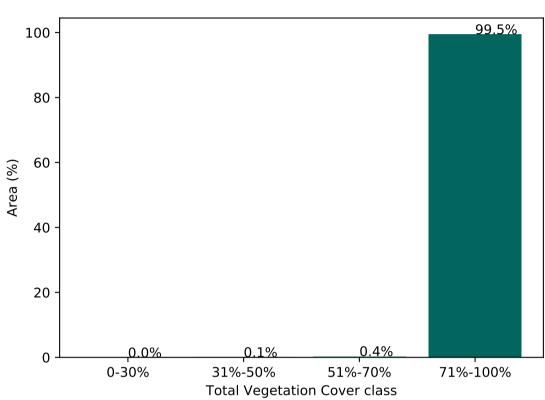


### **Total Vegetation Cover [%]**

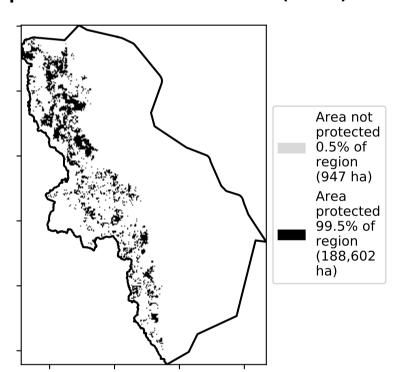




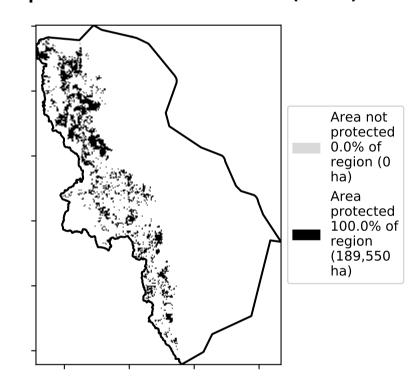
### Proportion of vegetation cover class in area



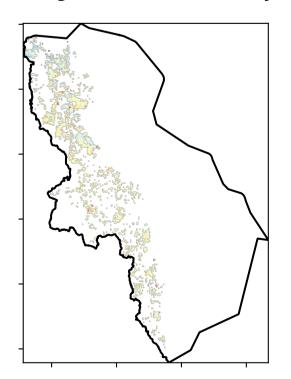
### % Area protected from water erosion (>70%)

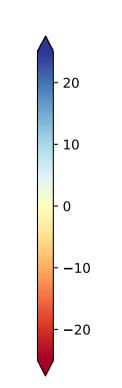


% Area protected from wind erosion (>50%)



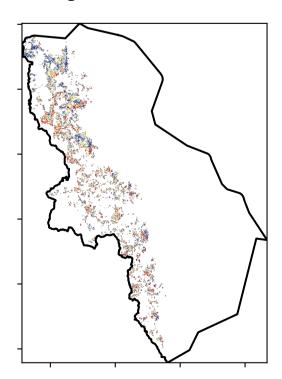
### **Total Vegetation Cover Anomaly [%]**

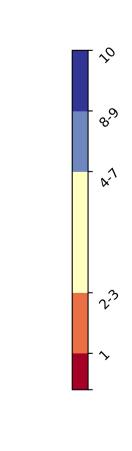




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 









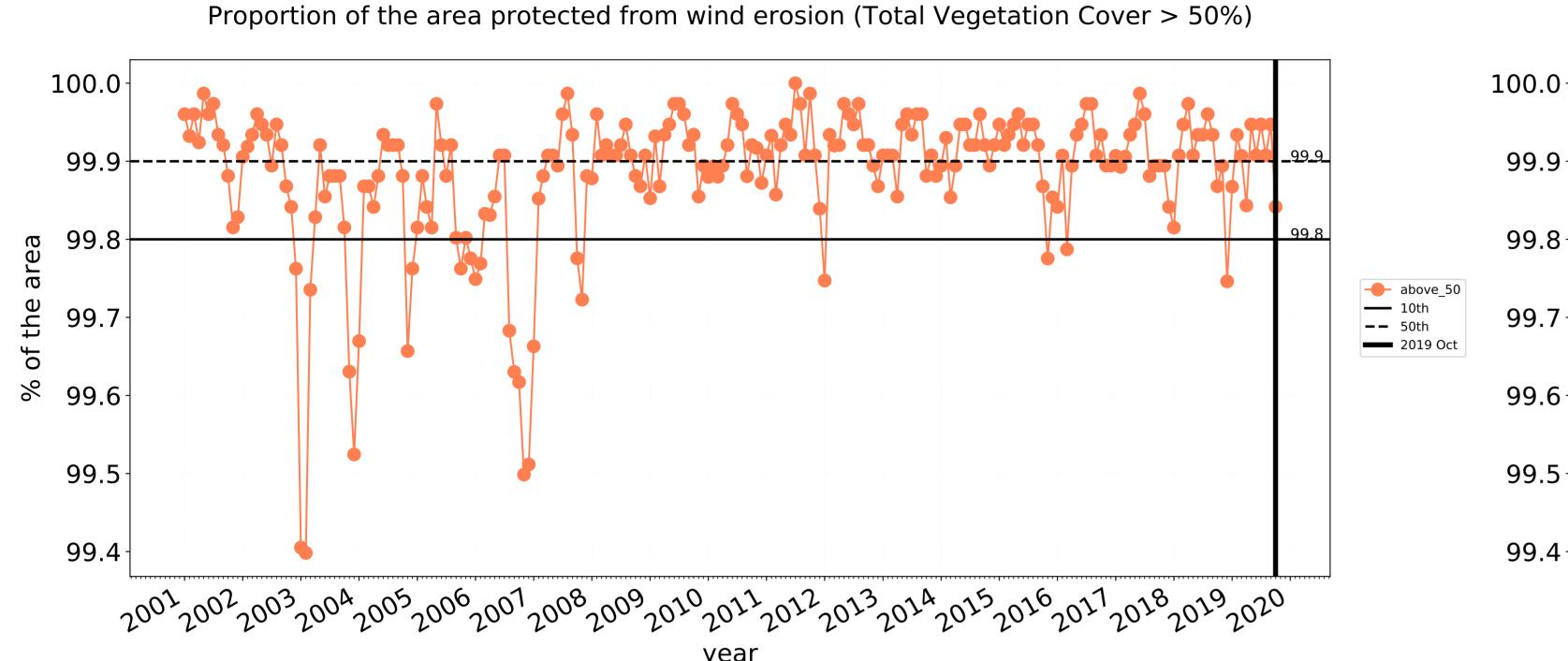


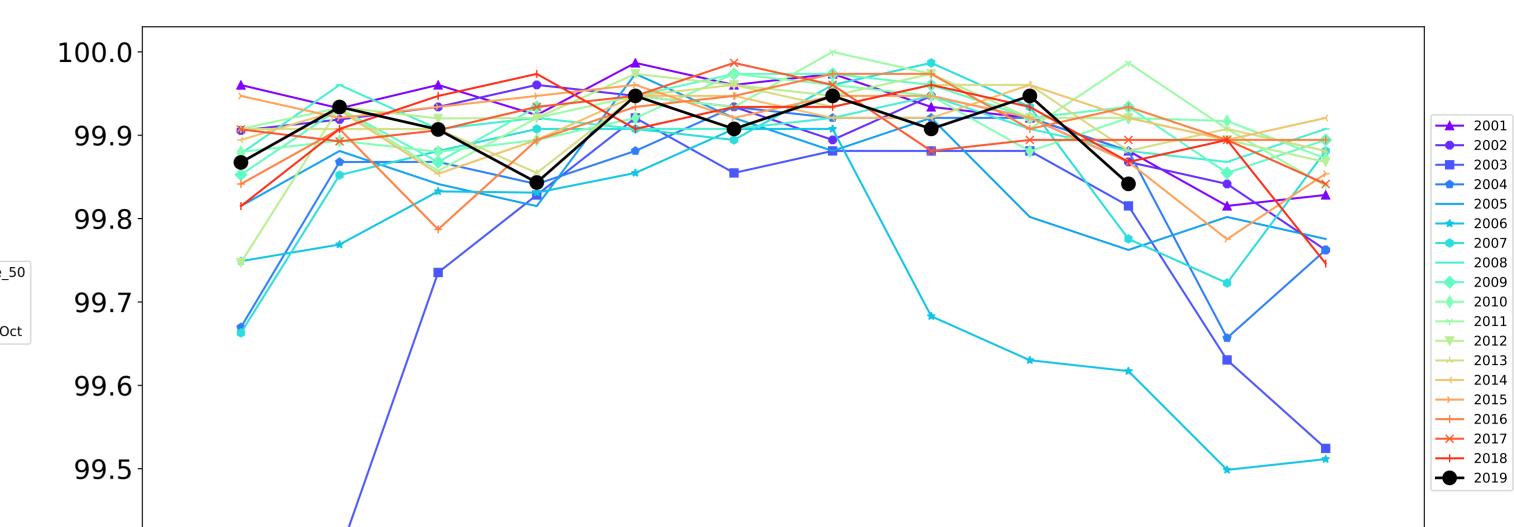






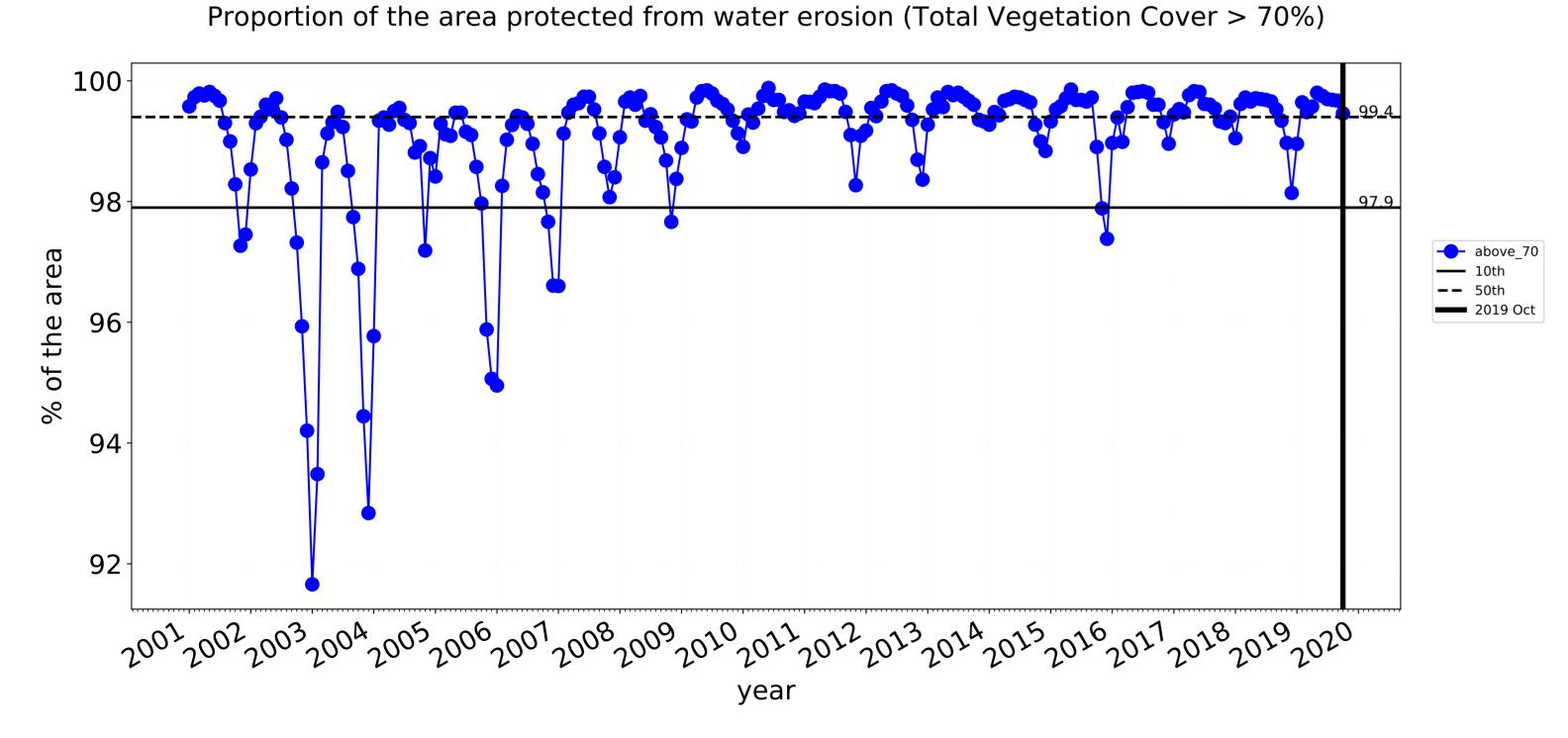
### **Grazing non forest timeseries**

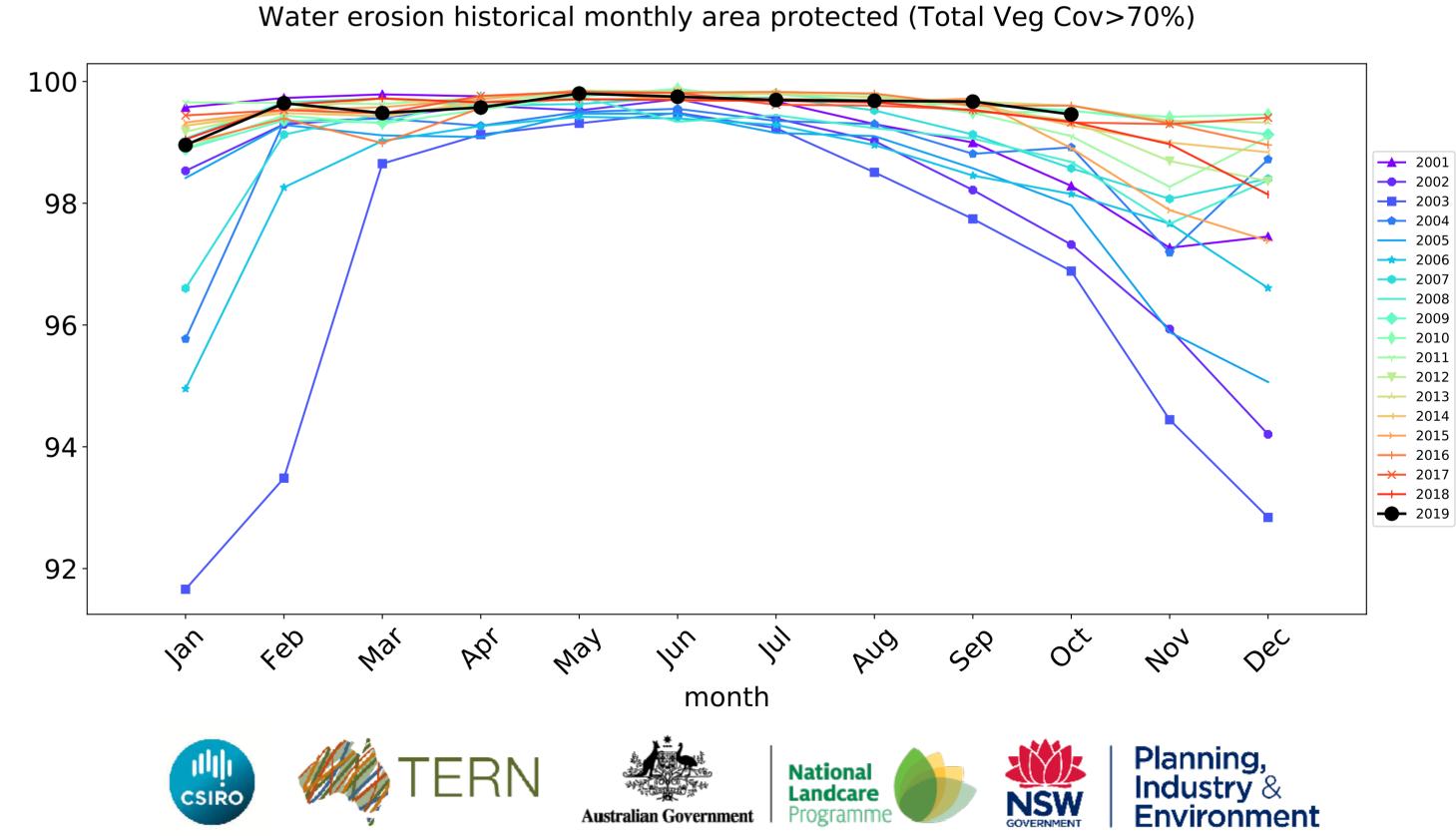


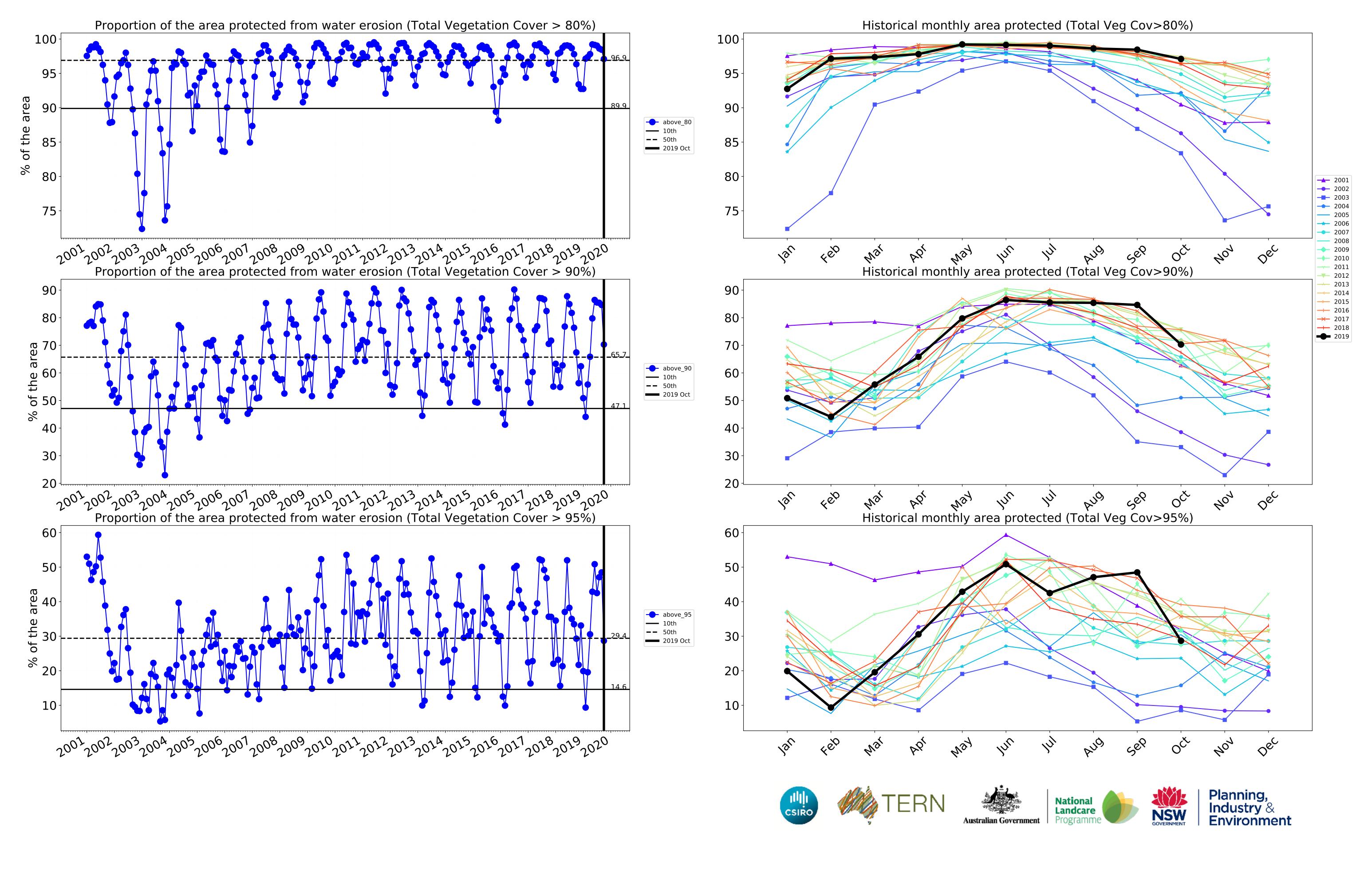


month

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







### **Grazing Woodland 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)

Anomaly show how many percetage points each

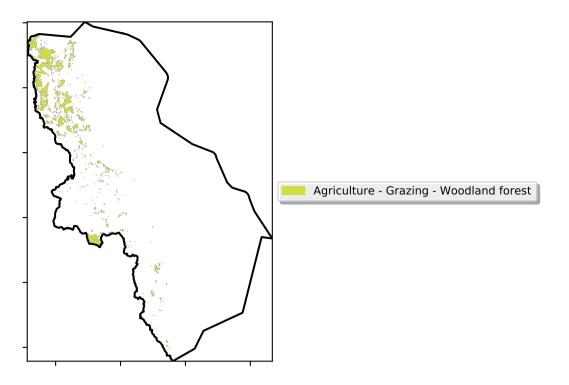
pixel is from

is, red pixels are about 20% lower than the mean of that pixel. The mean

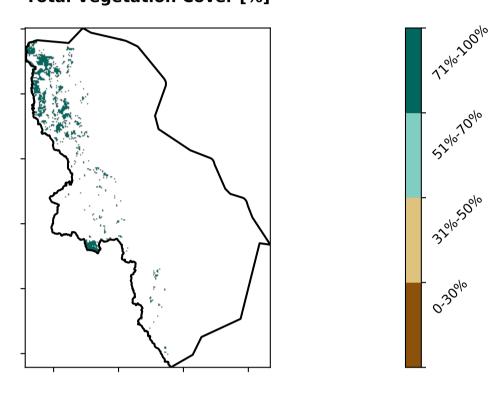
the mean. That

is only for the month of the map

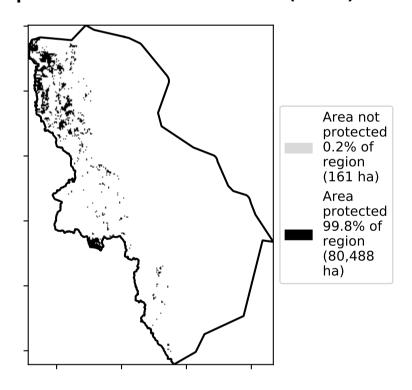
using baseline from 2001 to 2019.



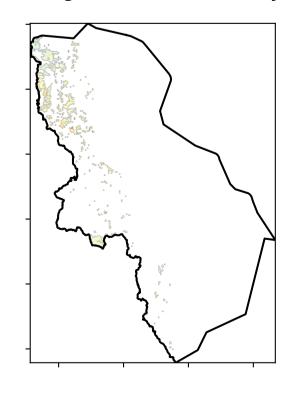
### **Total Vegetation Cover [%]**



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



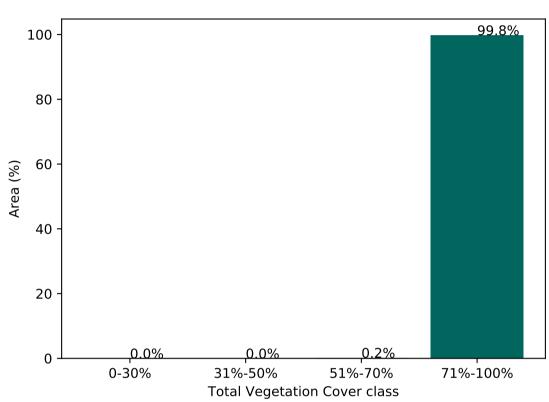
### **Total Vegetation Cover Anomaly [%]**



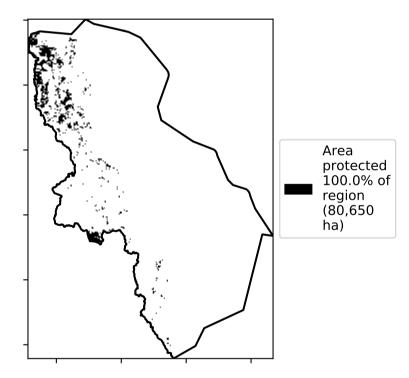
- 20 - 10 - 0 - -10 - -20

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

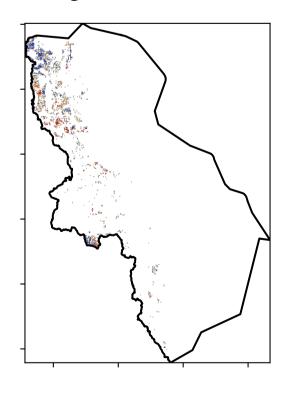
### **Proportion of vegetation cover class in area**

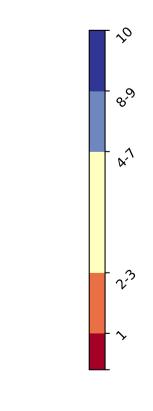


### % Area protected from wind erosion (>50%)



### Total Vegetation Cover Decile [%]









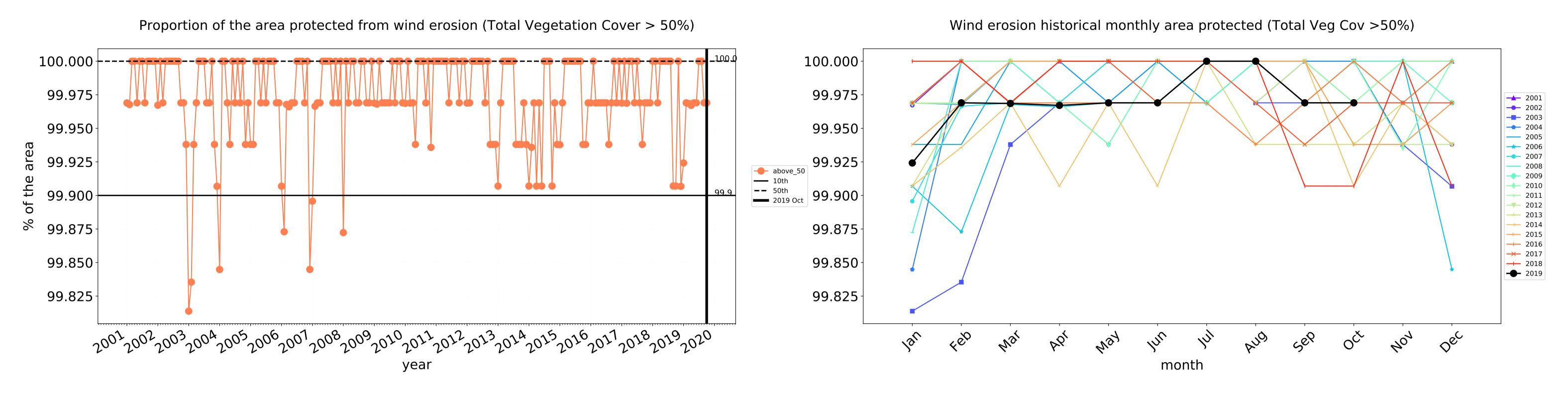


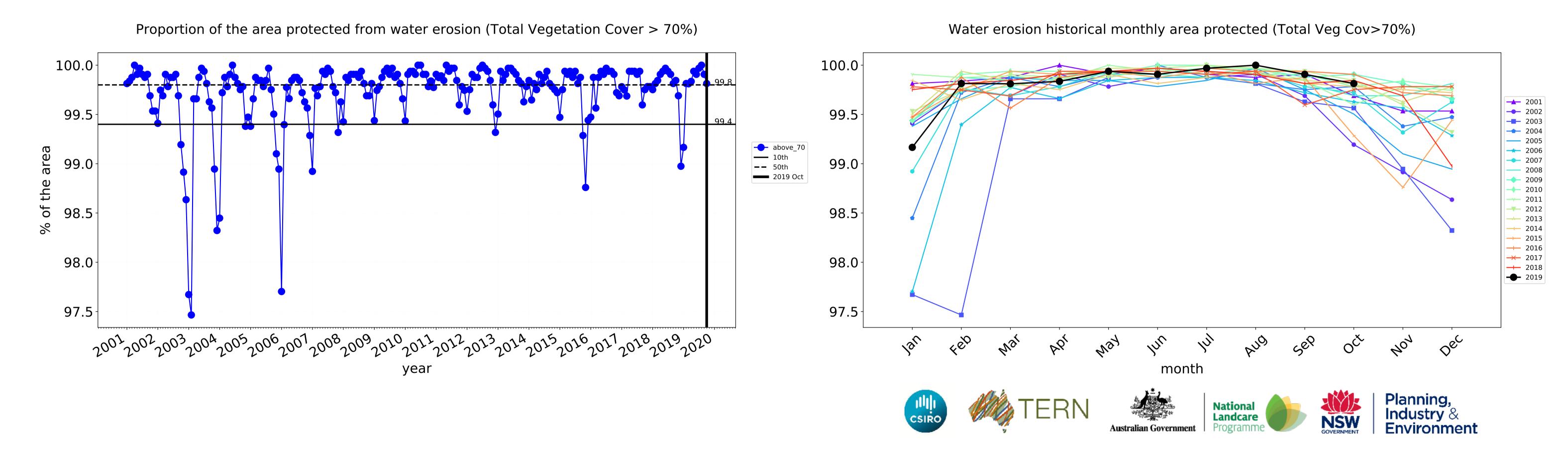


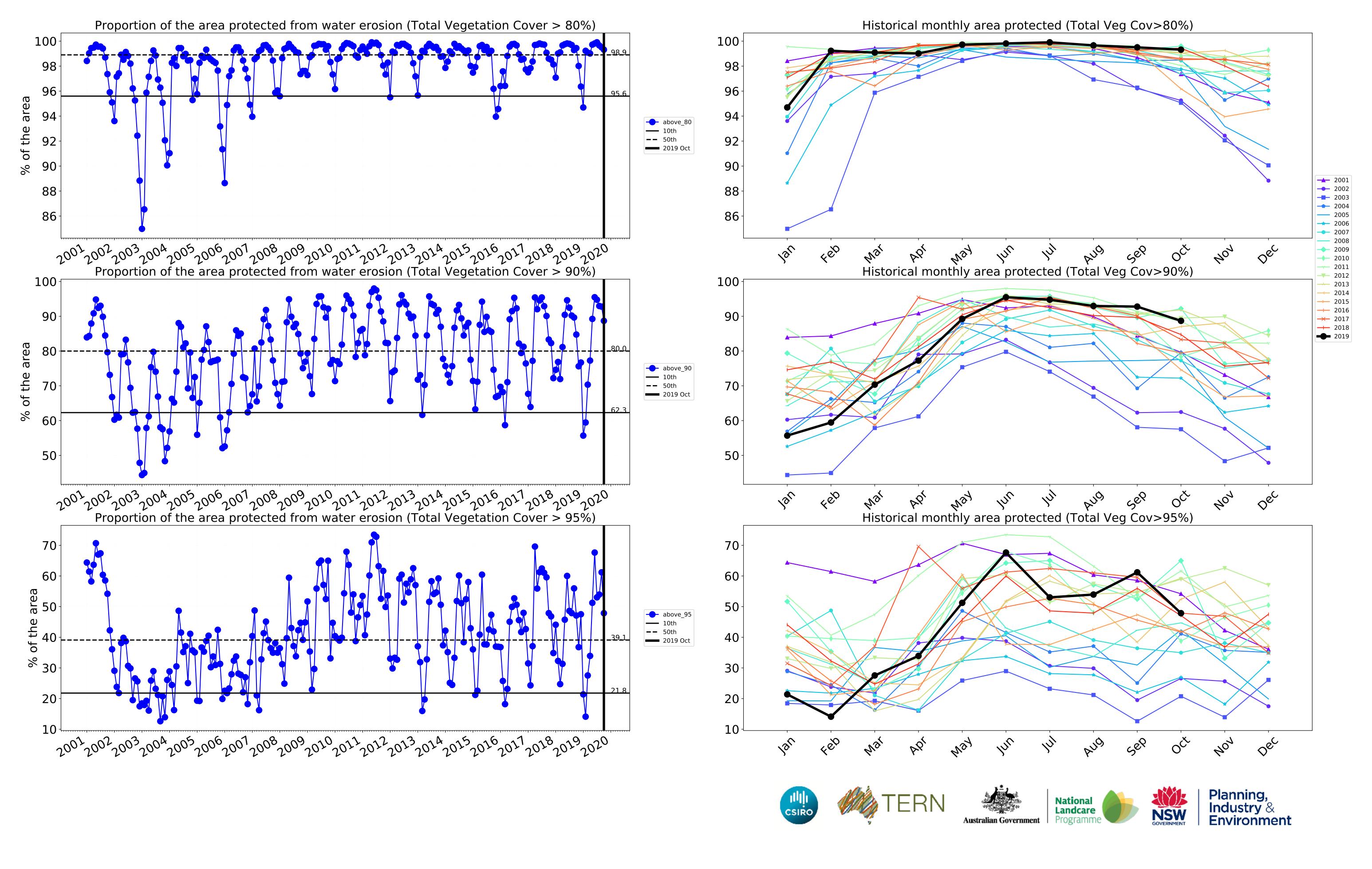




### **Grazing Woodland forest timeseries**







### **Grazing - Forest (non woodland)**

### 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)

Anomaly show how many percetage points each

pixel is from

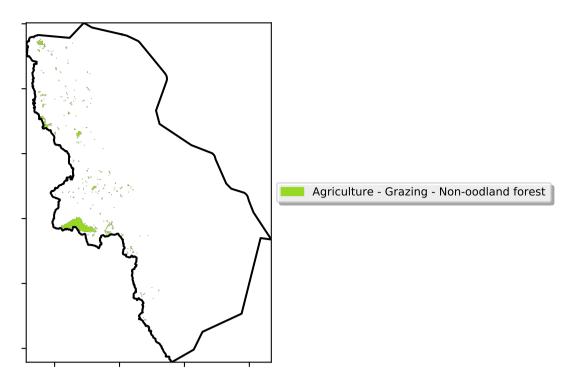
is, red pixels are about 20% lower than the mean of that

the mean. That

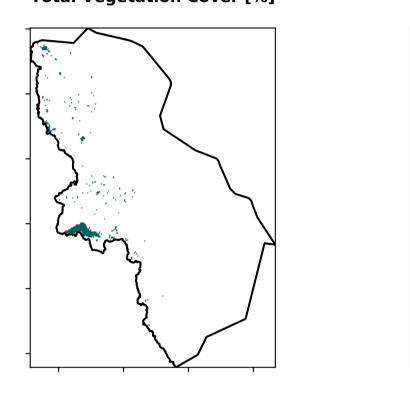
pixel. The mean

using baseline from 2001 to 2019.

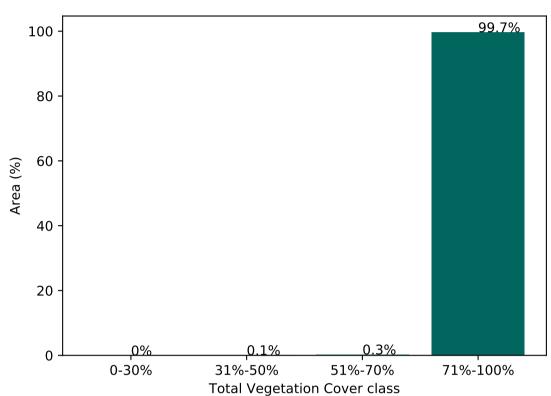
is only for the month of the map



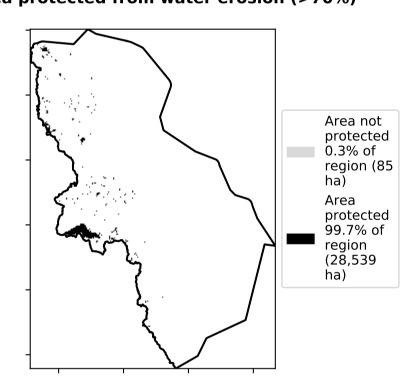
### **Total Vegetation Cover [%]**



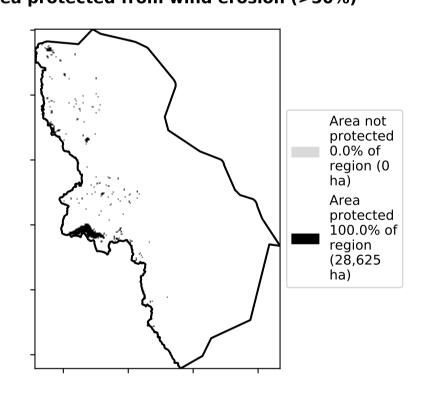
# **Proportion of vegetation cover class in area**



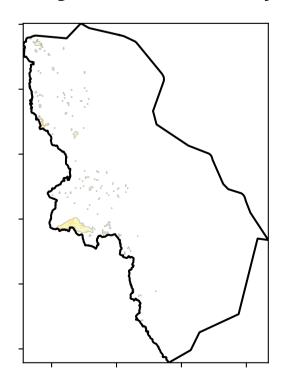
### % Area protected from water erosion (>70%)

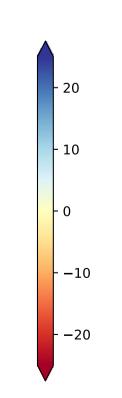


% Area protected from wind erosion (>50%)



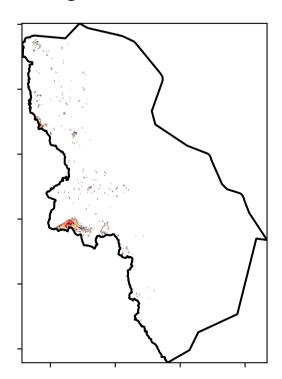
### **Total Vegetation Cover Anomaly [%]**

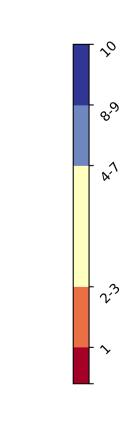




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 







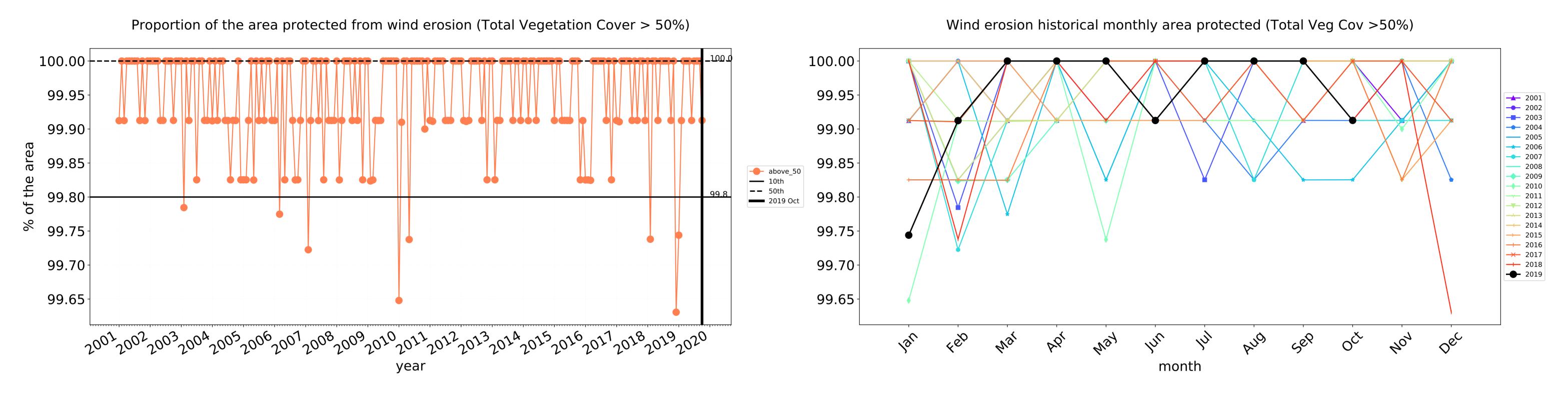


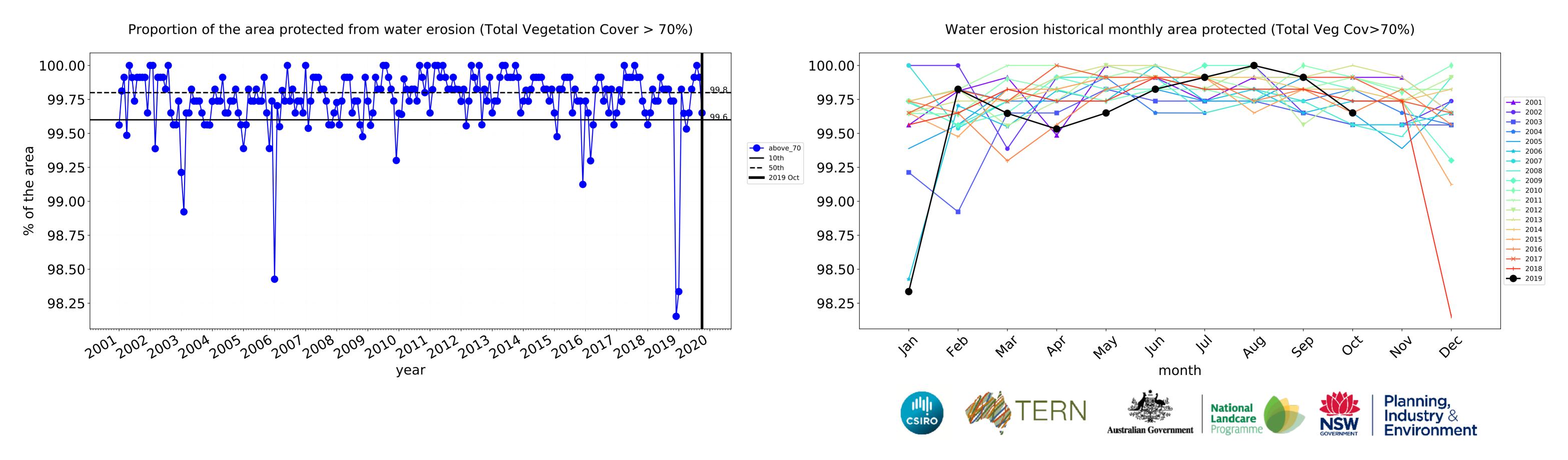


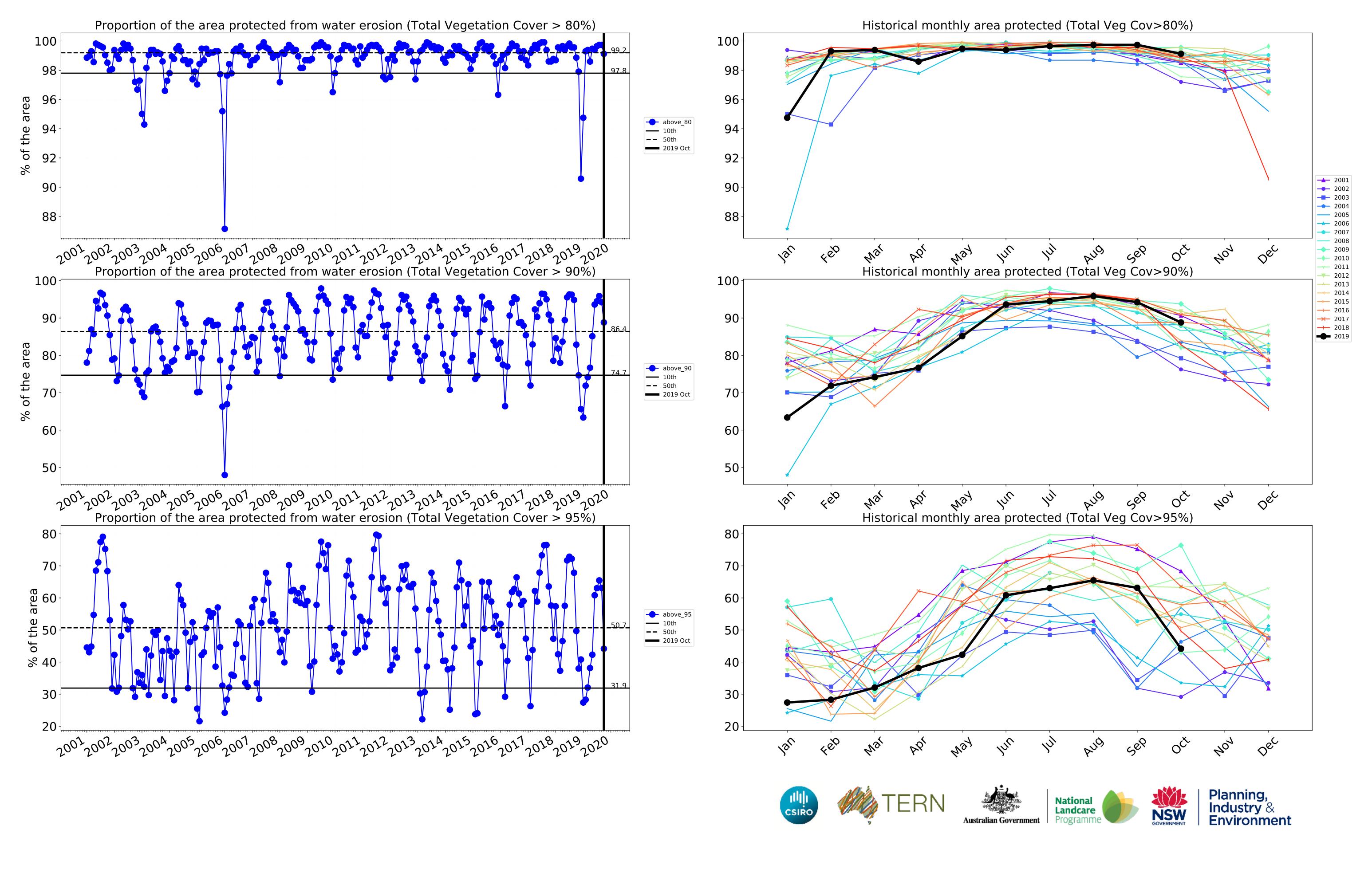












## Irrigation

### 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)

Anomaly show how many percetage points each

pixel is from

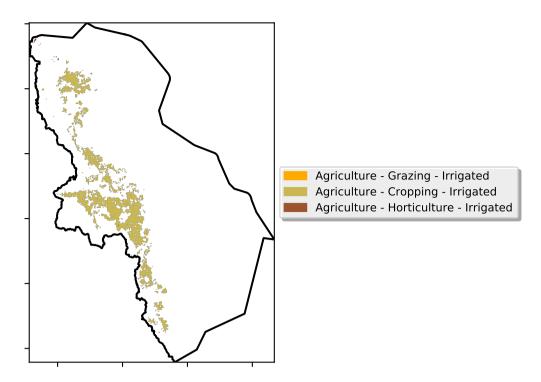
is, red pixels are about 20% lower than the

mean of that pixel. The mean

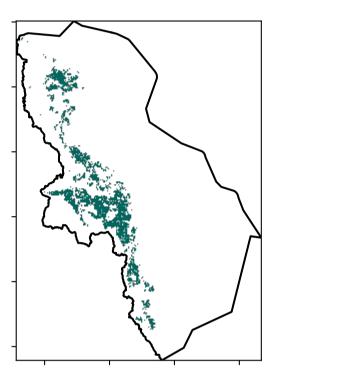
is only for the month of the map

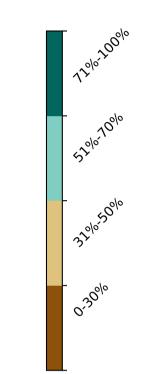
using baseline from 2001 to 2019.

the mean. That

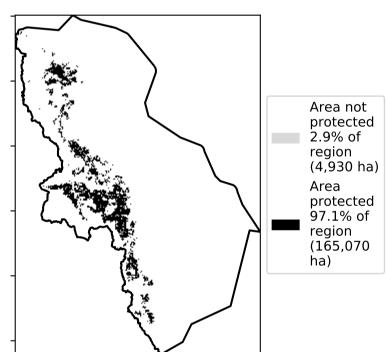


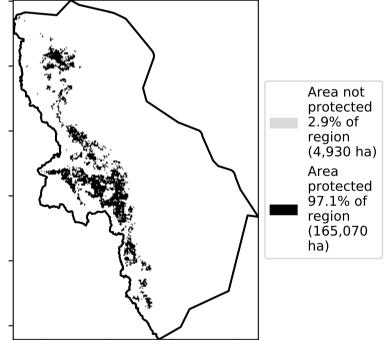
### **Total Vegetation Cover [%]**



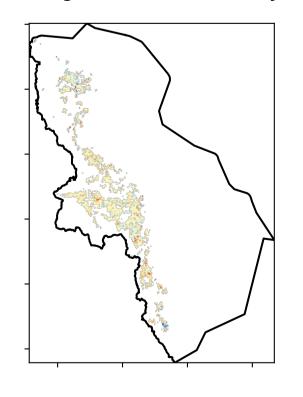


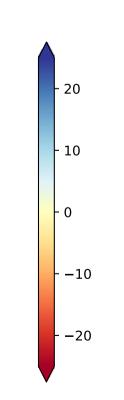
### % Area protected from water erosion (>70%)





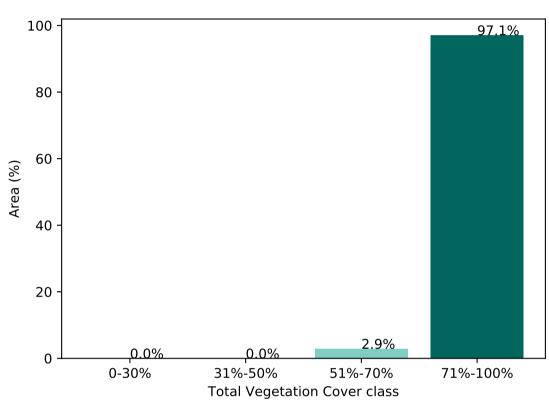
### **Total Vegetation Cover Anomaly [%]**



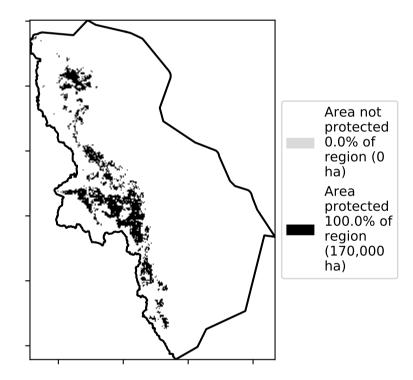


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

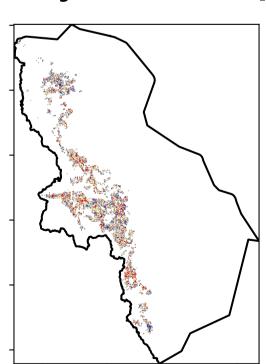
### **Proportion of vegetation cover class in area**

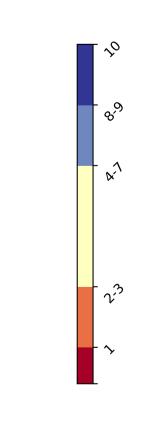


### % Area protected from wind erosion (>50%)



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









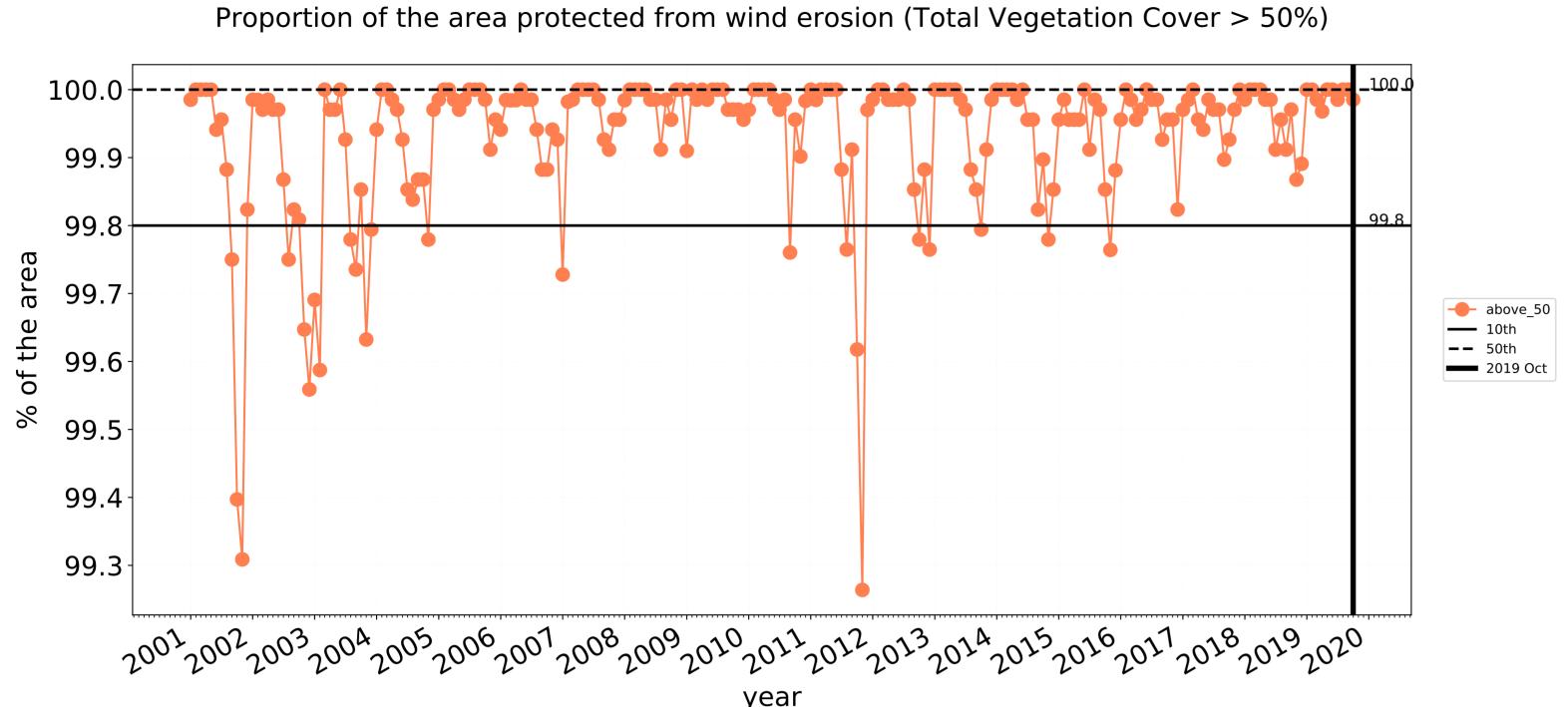


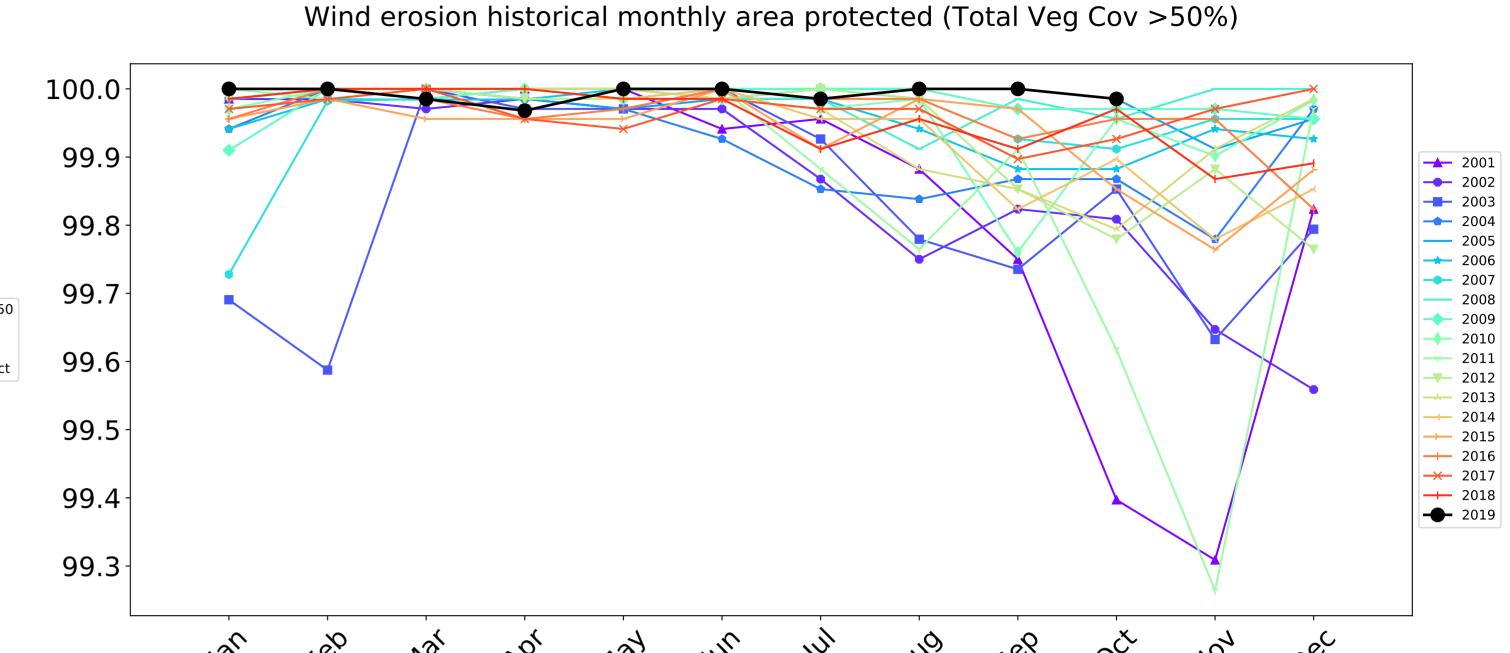




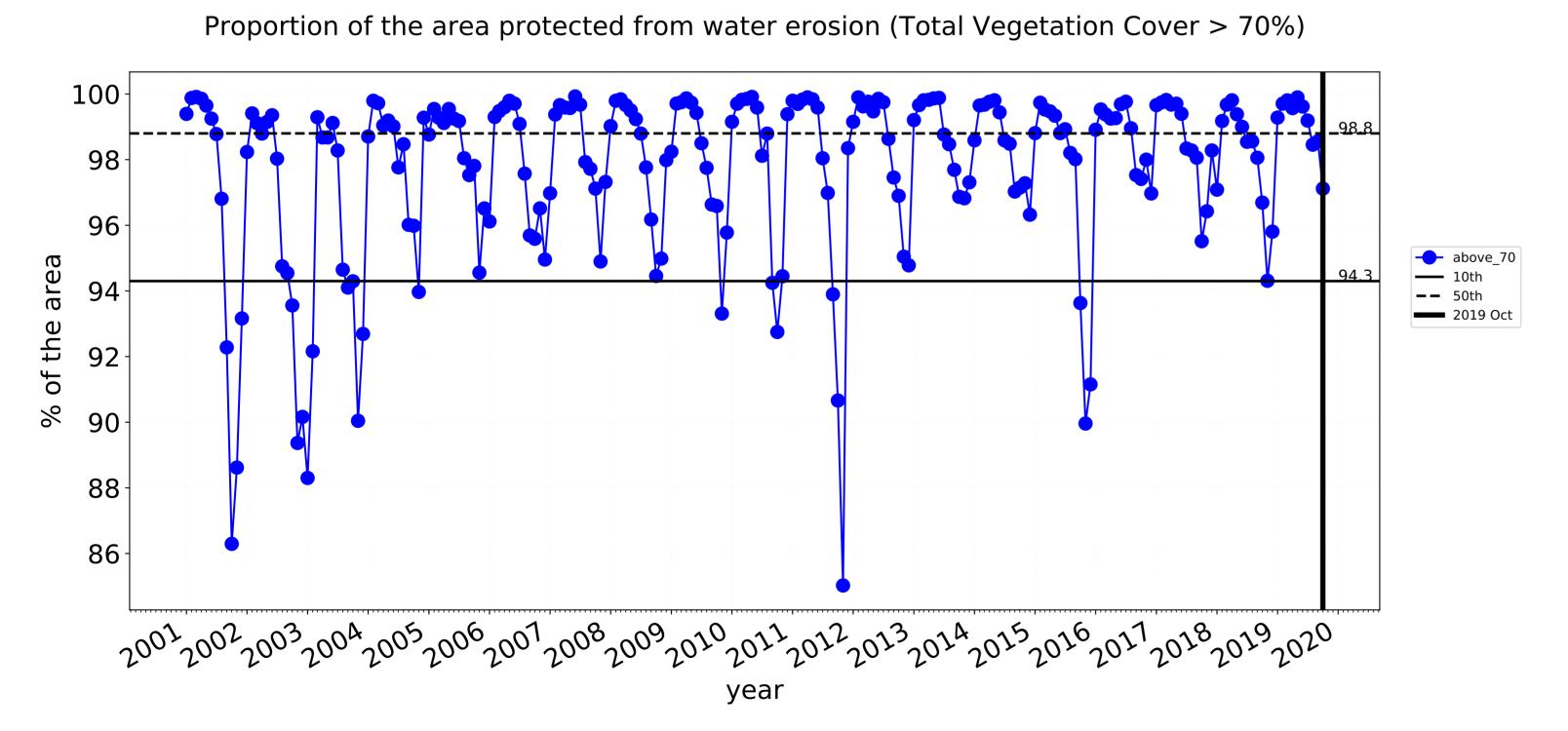


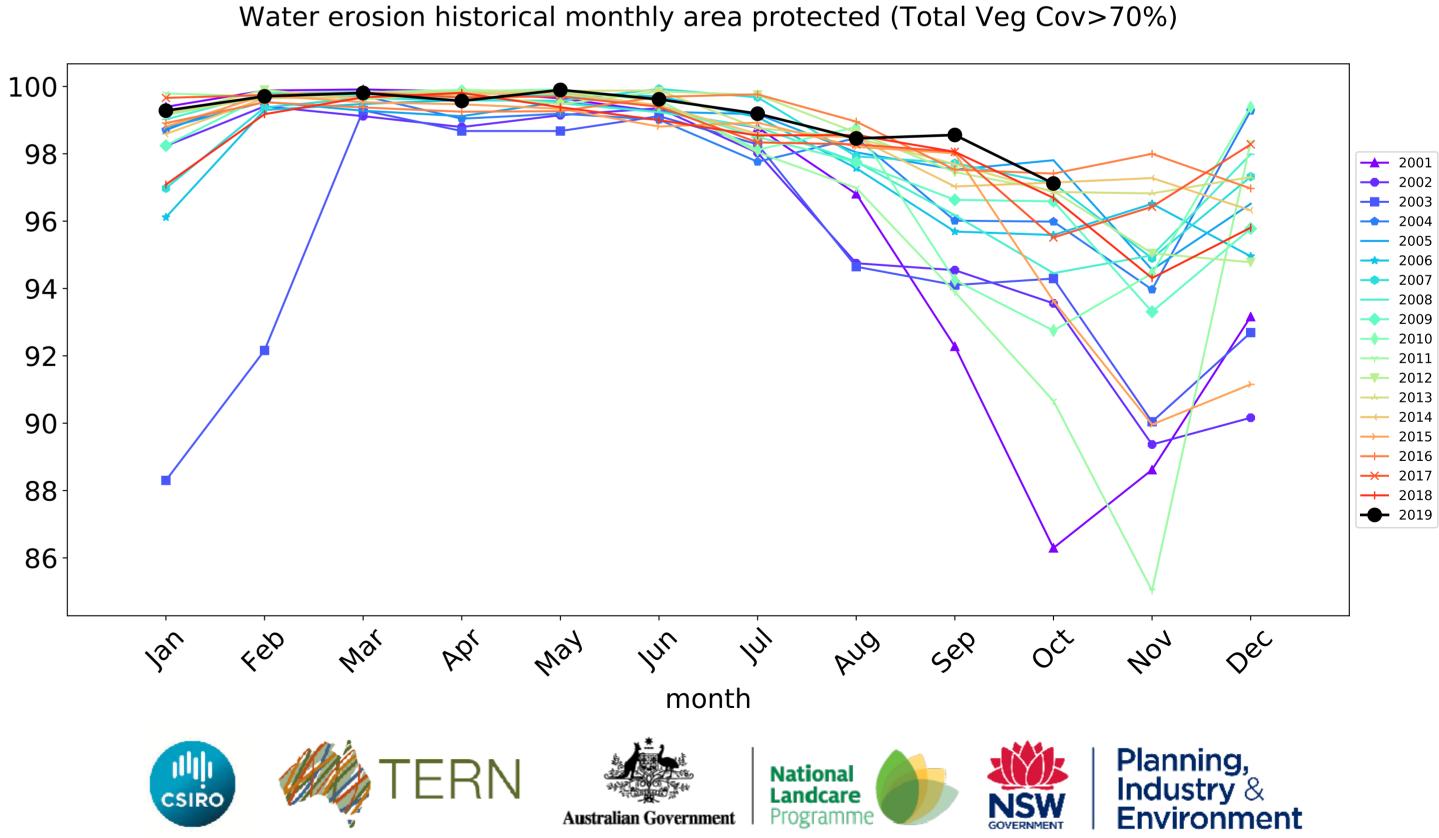
## Irrigation timeseries

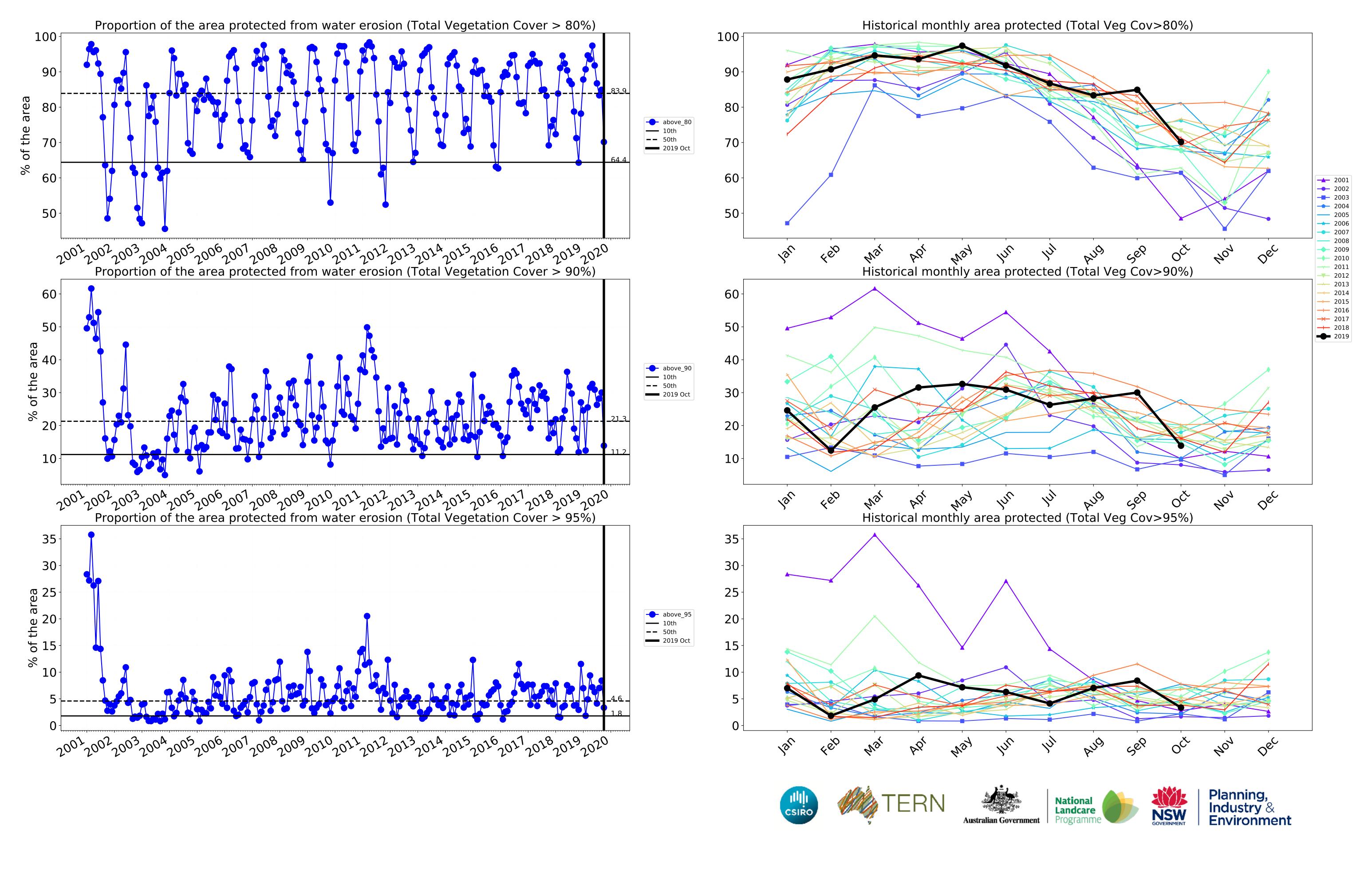




month



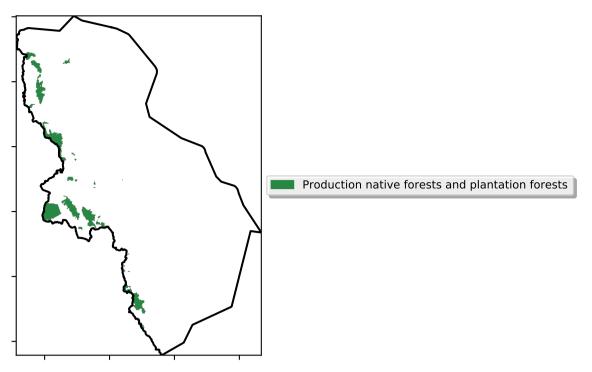




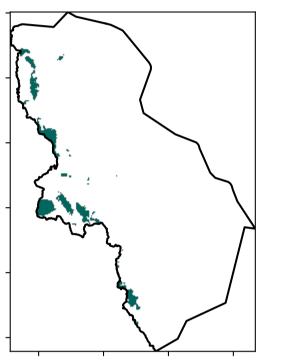
### **Production native forests and plantation forests**

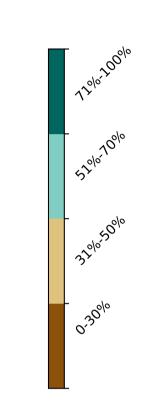
### Land use and forest cover

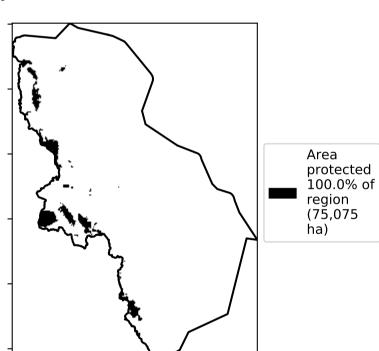
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

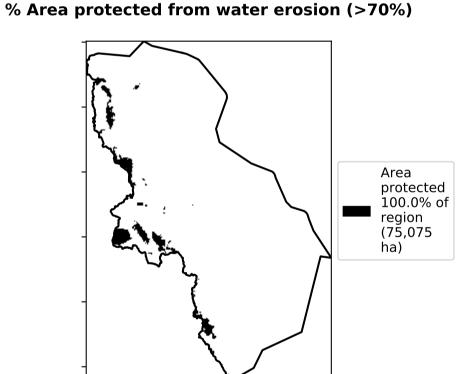


### **Total Vegetation Cover [%]**

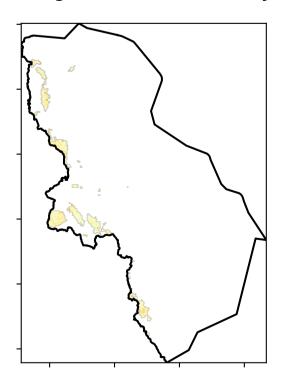


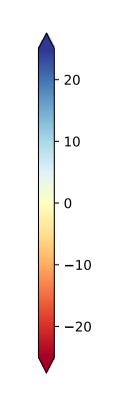






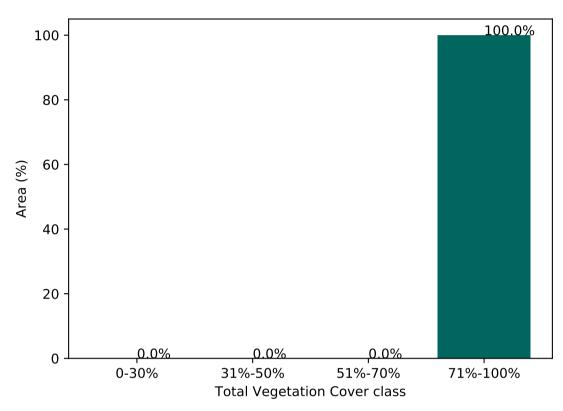
### **Total Vegetation Cover Anomaly [%]**



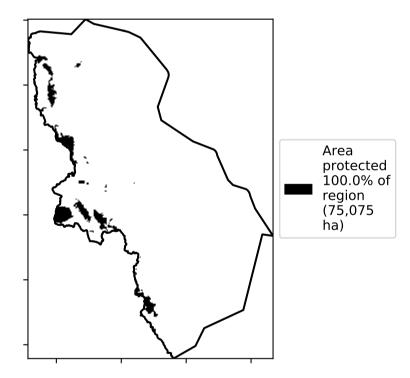


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

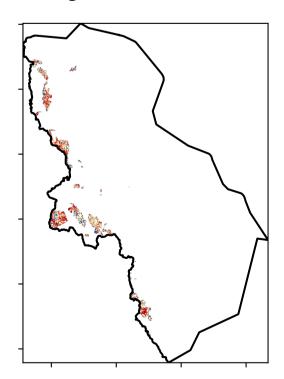
### **Proportion of vegetation cover class in area**

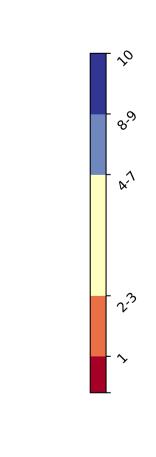


### % Area protected from wind erosion (>50%)



### **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.





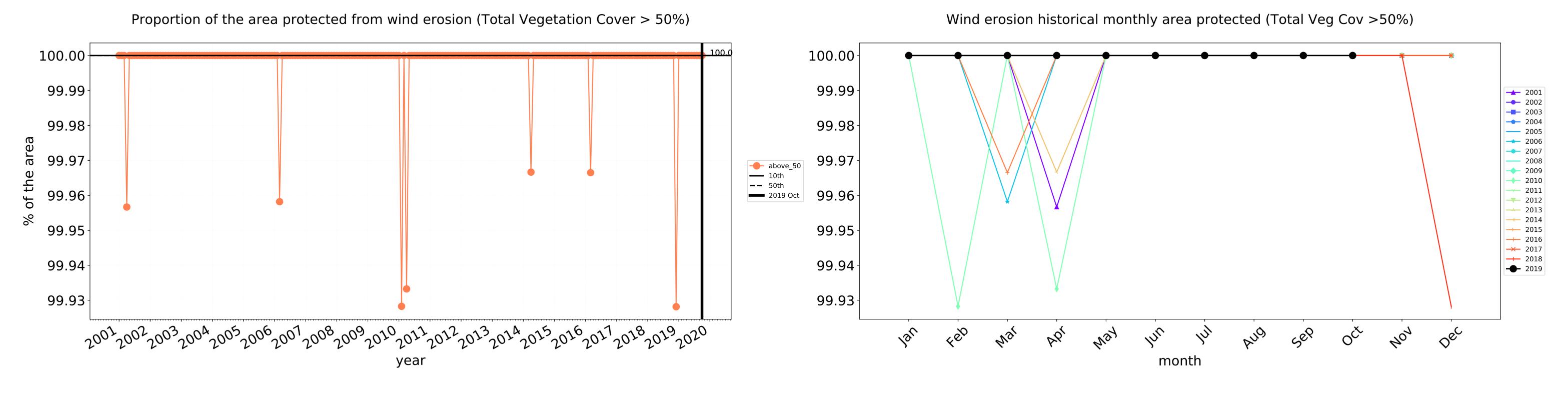


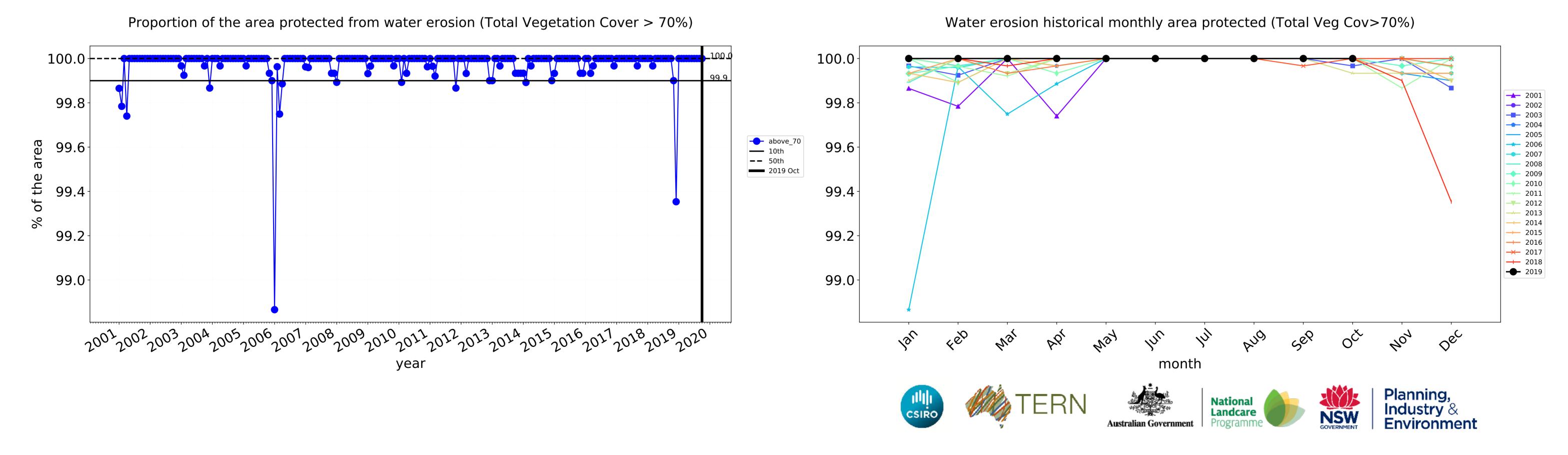


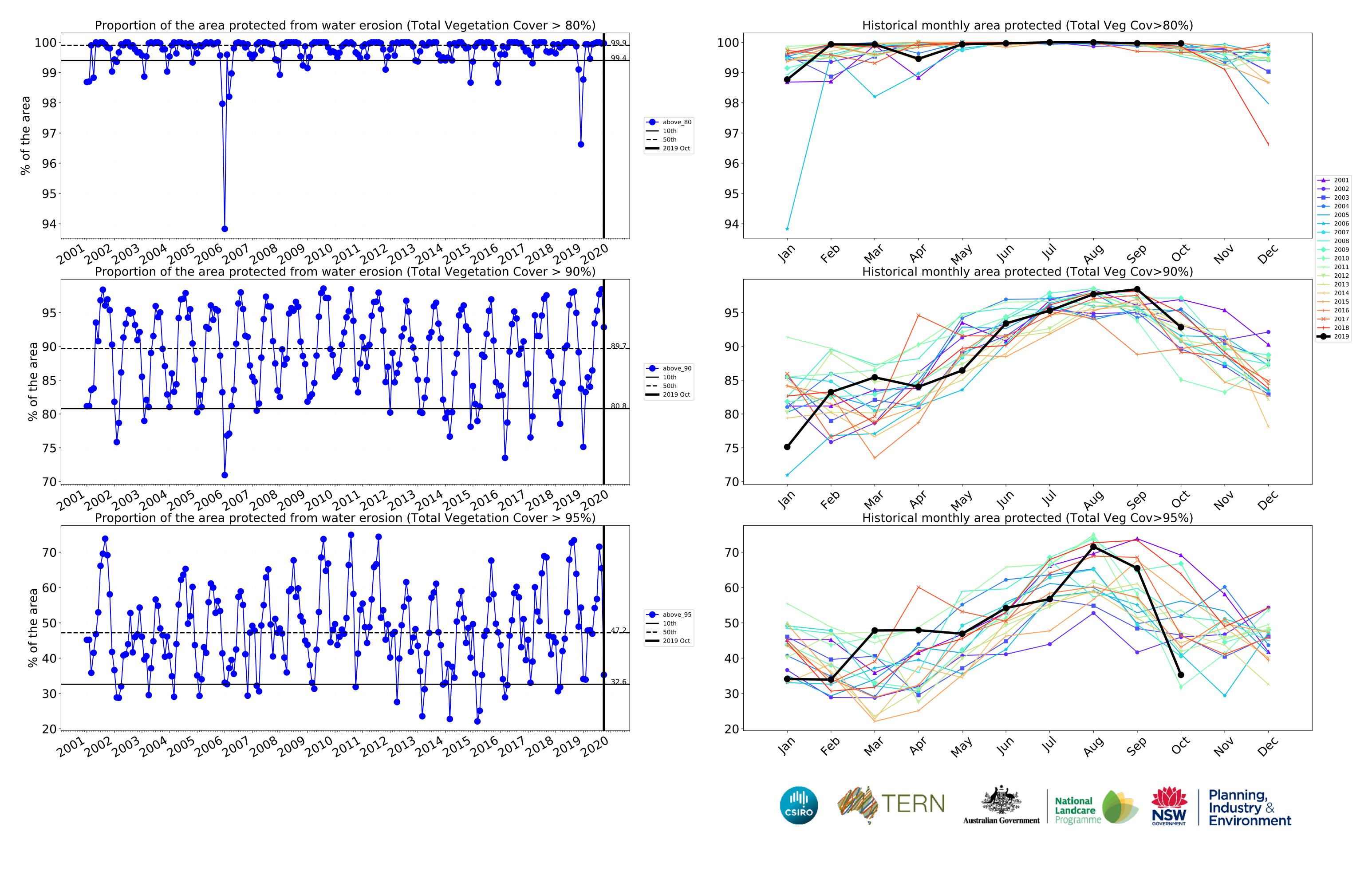




### **Production native forests and plantation forests timeseries**







# Mackay Whitsunday (922,125 ha and no data 1,525,170 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	922,125	99.8% 920,300	99.4% 916,775	97.2% 896,125	88.8% 818,875	61.3% 565,575	24.8% 228,450
Conservation and natural environments	280,550	99.8% 279,975	99.4% 278,750	97.7% 274,175	95.3% 267,450	77.5% 217,400	29.1% 81,775
Conservation and natural environments non forest	8,575	98.0% 8,400	94.2% 8,075	84.3% 7,225	68.2% 5,850	35.0% 3,000	17.2% 1,475
Conservation and natural environments Woodland forest	75,300	99.9% 75,200	99.6% 74,975	98.6% 74,225	96.5% 72,650	83.7% 63,050	43.8% 32,950
Conservation and natural environments Forest (non woodland)	196,675	99.8% 196,375	99.5% 195,700	98.0% 192,725	96.1% 188,950	77.0% 151,350	24.1% 47,350
Agriculture	468,875	100.0% 468,775	99.9% 468,500	98.7% 462,700	87.8% 411,825	54.1% 253,775	23.7% 111,300
Grazing	298,825	100.0% 298,725	99.9% 298,475	99.6% 297,550	97.9% 292,525	77.0% 230,175	35.3% 105,600
Grazing non forest	189,550	99.9% 189,450	99.8% 189,250	99.5% 188,525	97.1% 184,050	70.3% 133,225	28.7% 54,350
Grazing Woodland forest	80,650	100.0% 80,650	100.0% 80,625	99.8% 80,500	99.3% 80,100	88.7% 71,525	47.9% 38,600
Grazing - Forest (non woodland)	28,625	100.0% 28,625	99.9% 28,600	99.7% 28,525	99.1% 28,375	88.8% 25,425	44.2% 12,650
Irrigation	170,000	100.0% 170,000	100.0% 169,975	97.1% 165,100	70.1% 119,250	13.9% 23,600	3.4% 5,700
Production native forests and plantation forests	75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	100.0% 75,050	92.8% 69,700	35.3% 26,475











