### **Total vegetation cover soil protection Region:NRM Riverina NSW**

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:

Date: January 2005

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





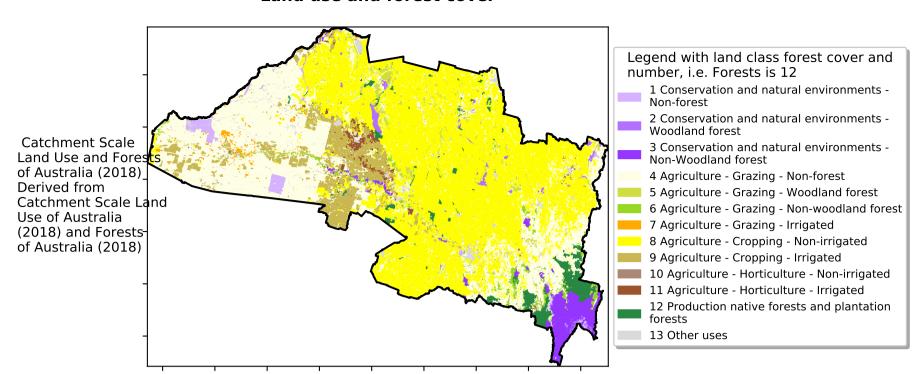




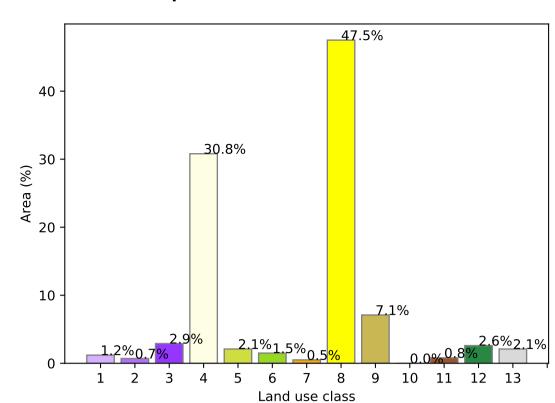


### **Vegetation Cover Jan 2005**

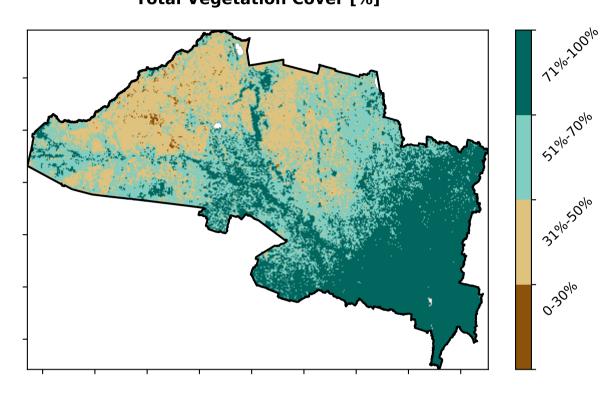
### Land use and forest cover



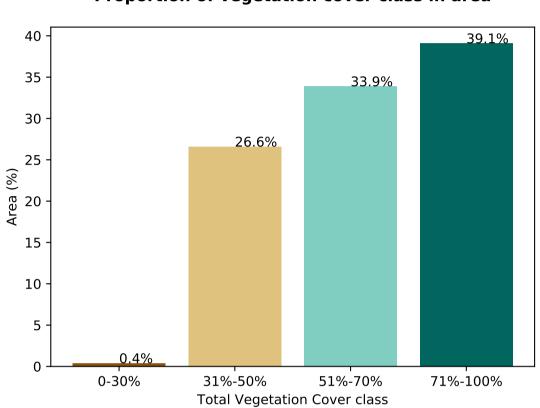
### Proportion of each land class in area



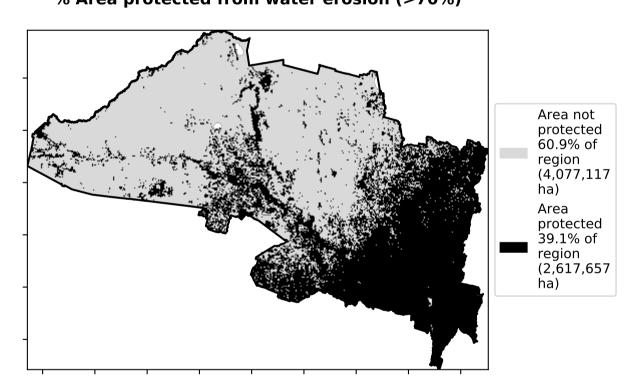
### Total Vegetation Cover [%]



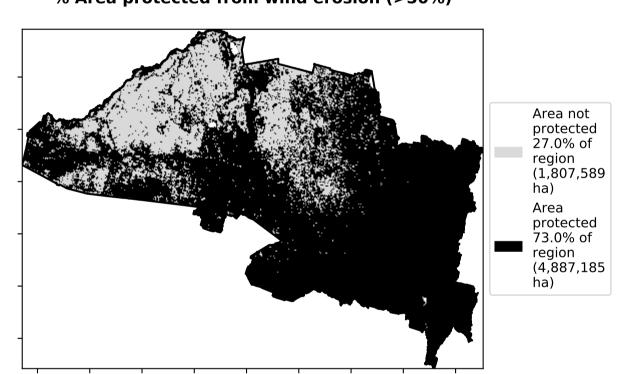
Proportion of vegetation cover class in area



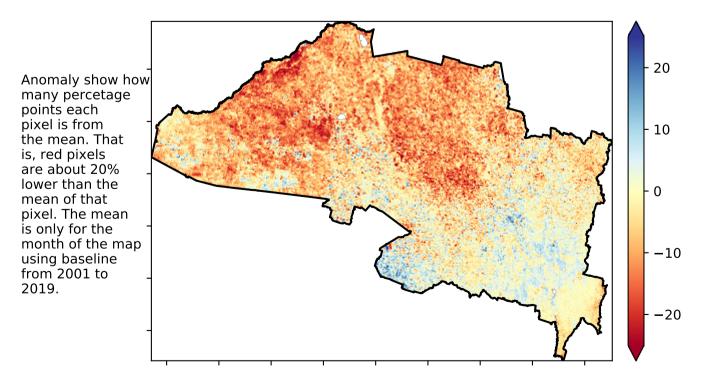
### % Area protected from water erosion (>70%)



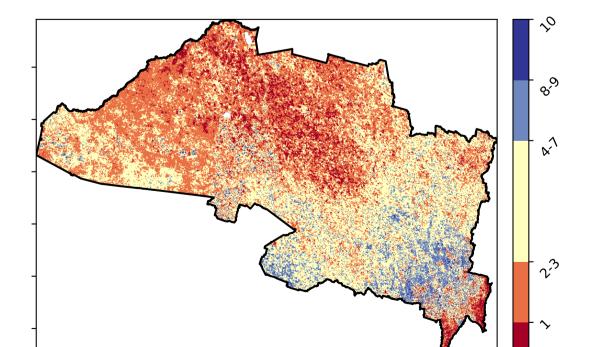
% Area protected from wind erosion (>50%)



### 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.





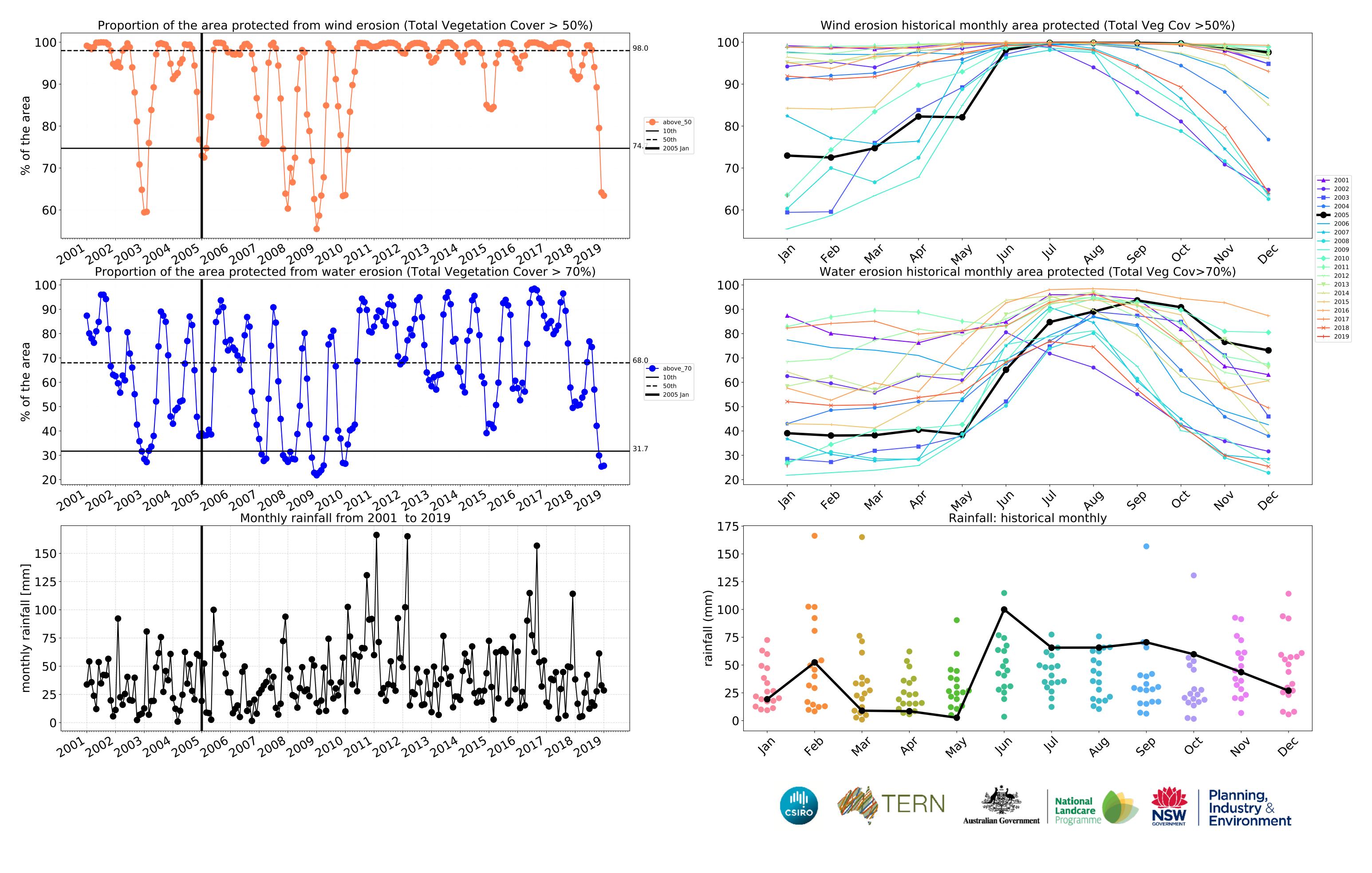




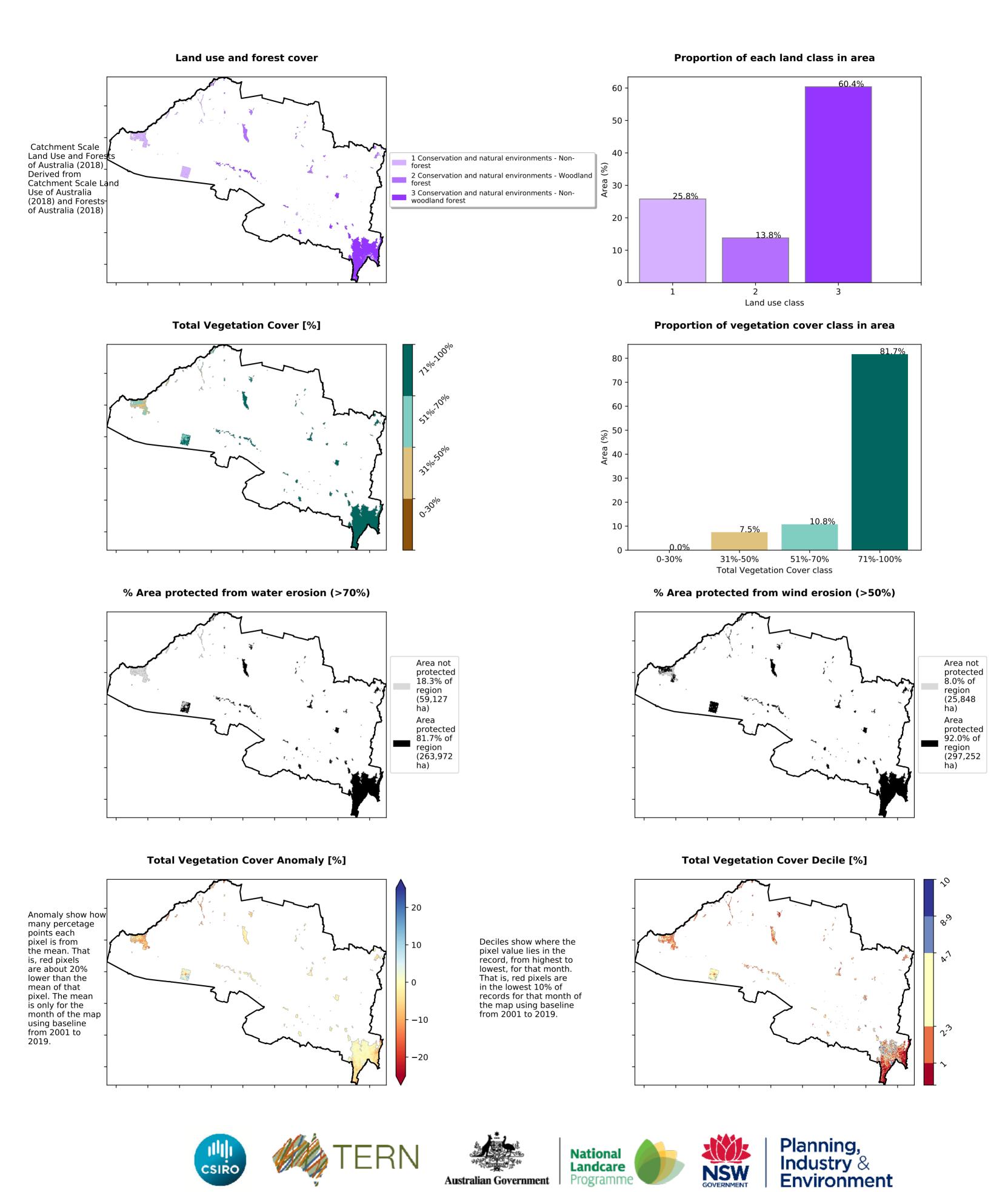




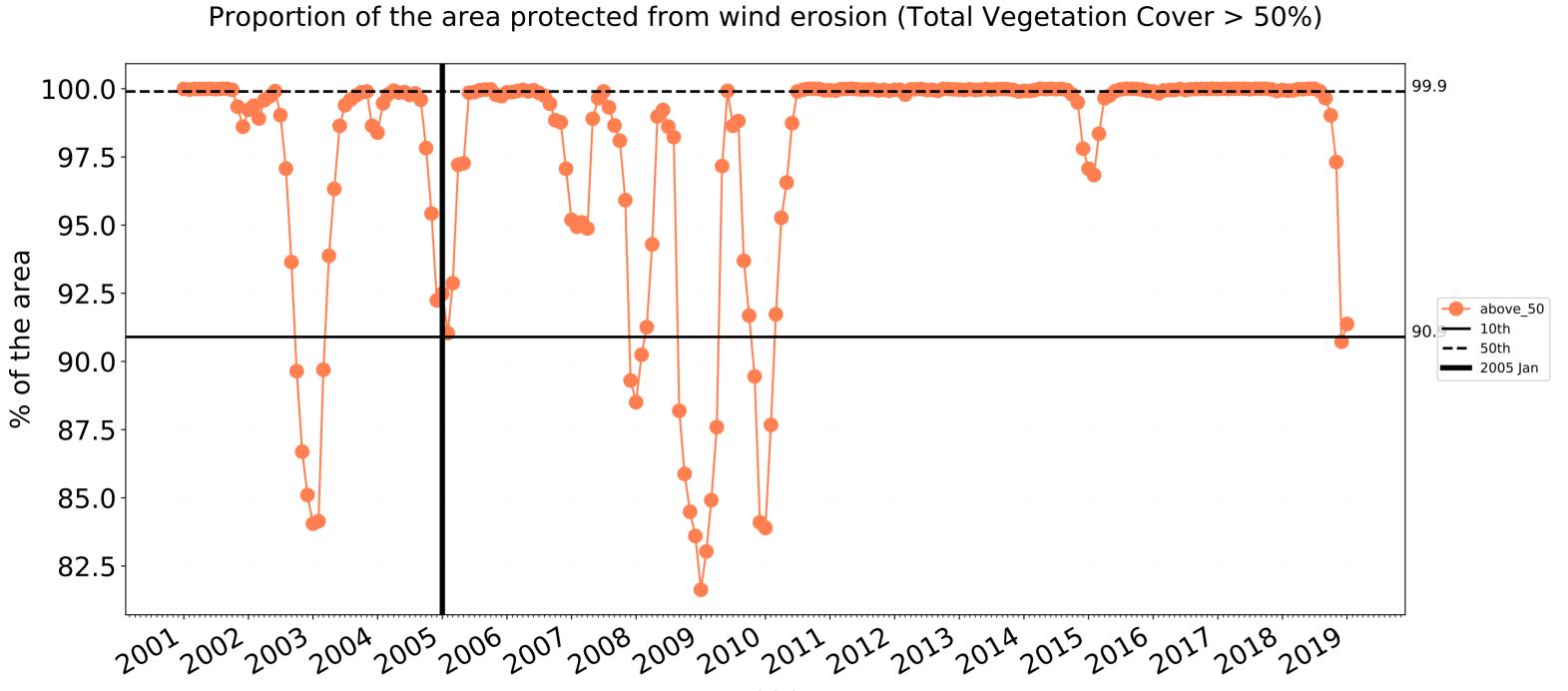


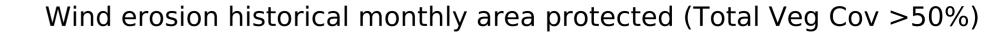


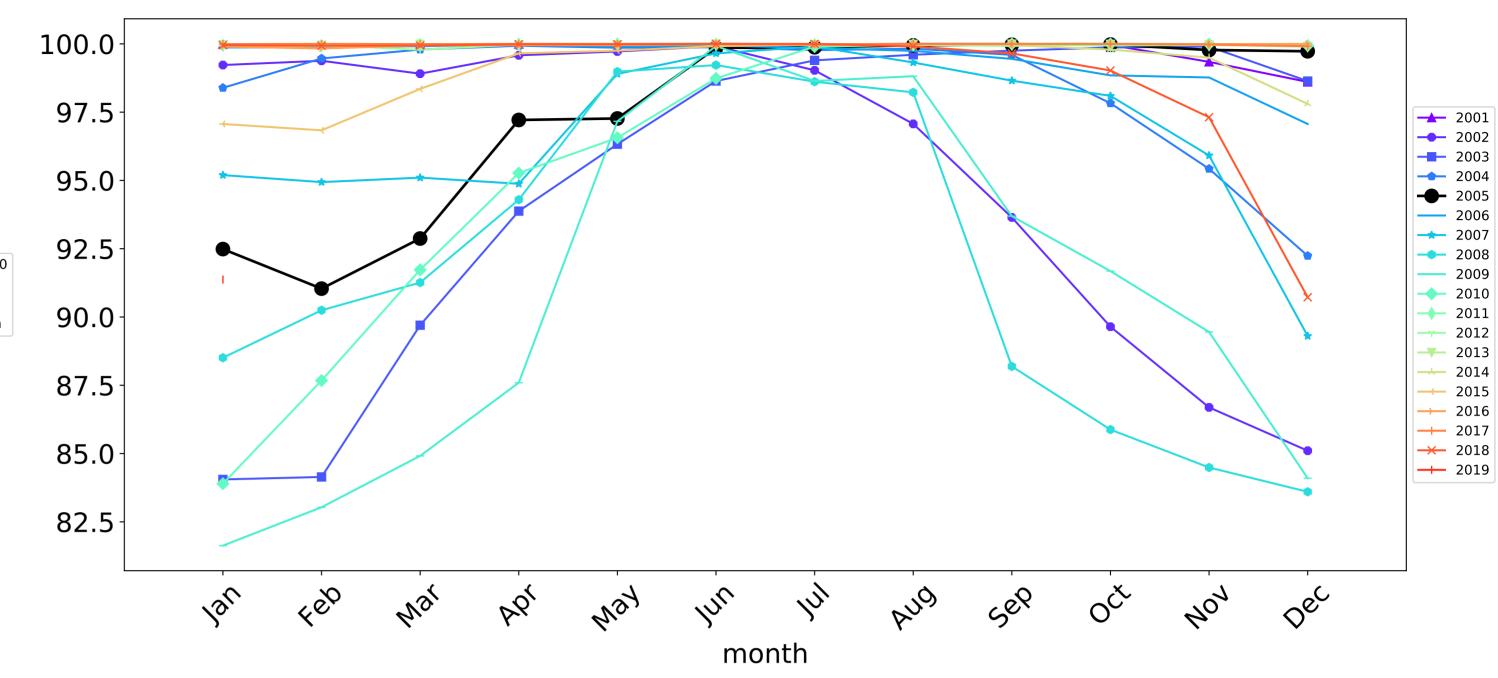
### **Conservation and natural environments**

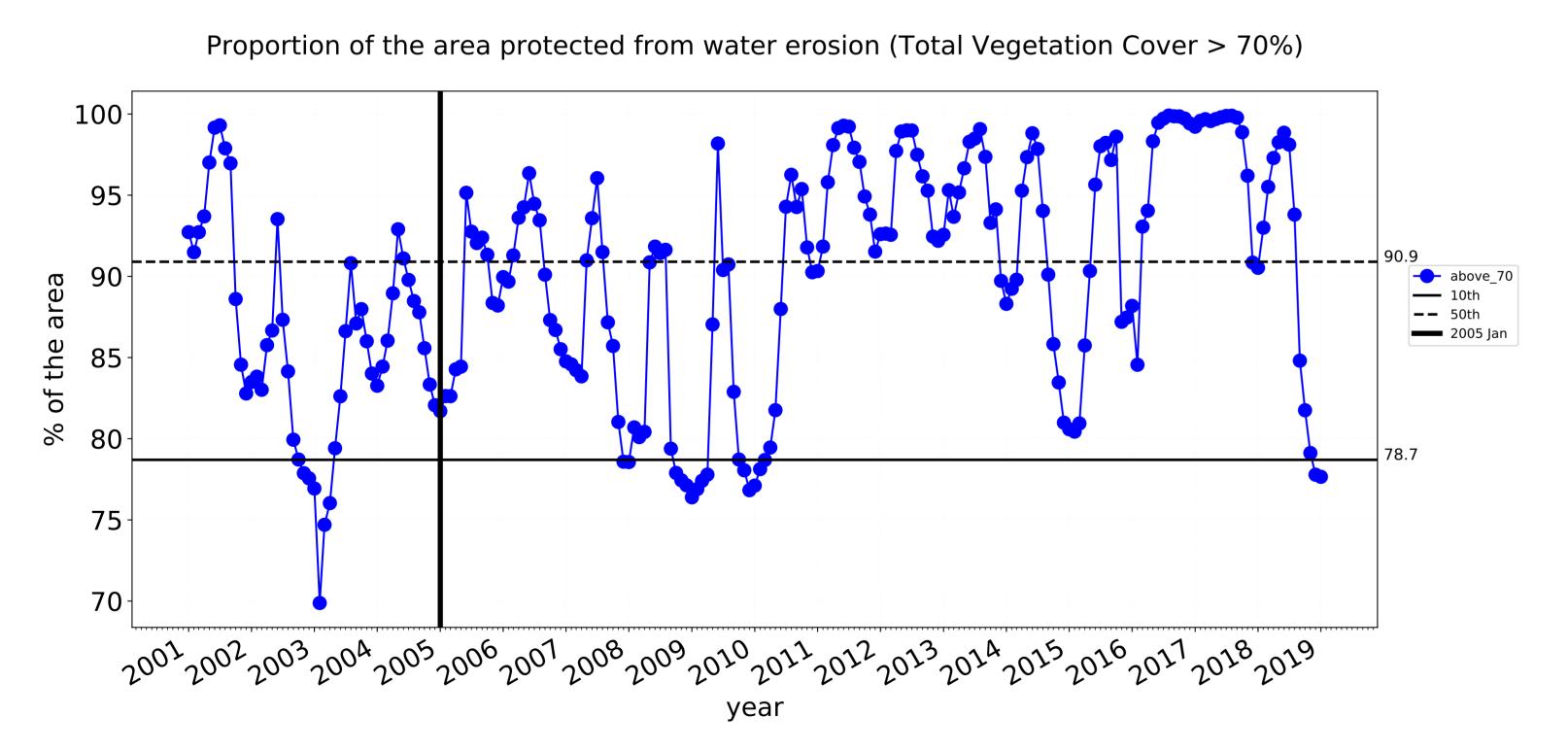


### **Conservation and natural environments timeseries**

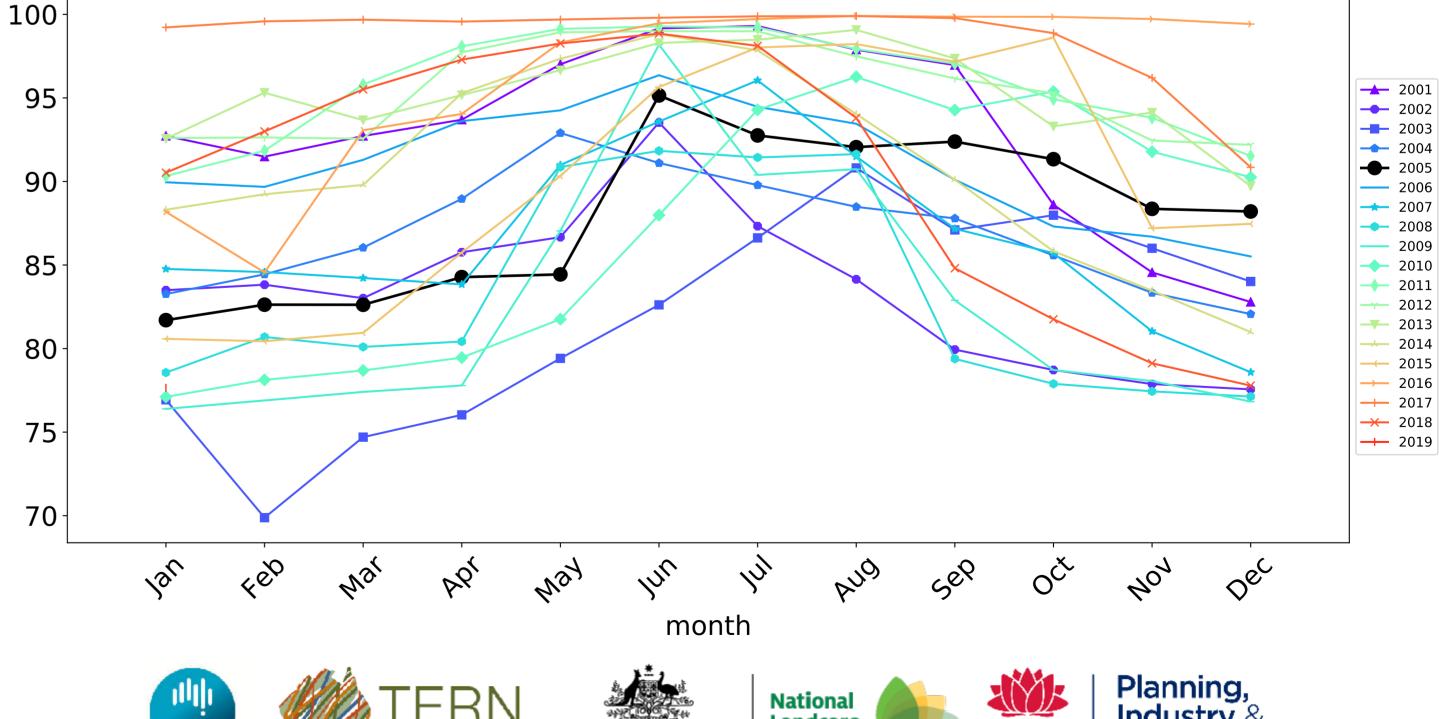








### Water erosion historical monthly area protected (Total Veg Cov>70%)









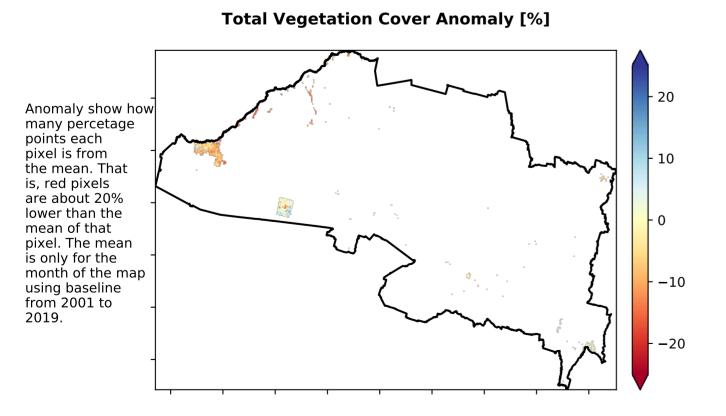


### **Conservation and natural environments non forest**

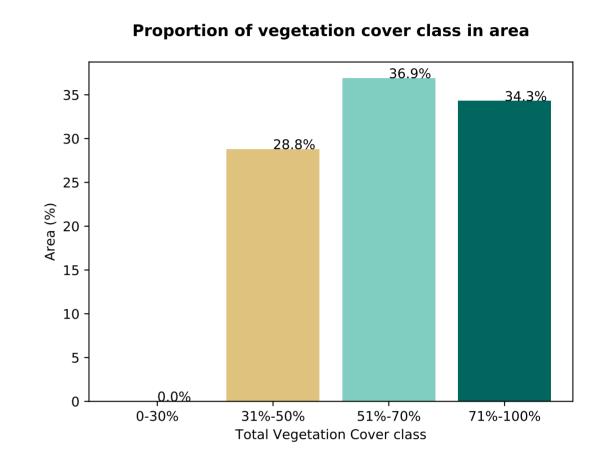
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) Of Australia (2018) 1 Conservation and natural environments - Nonforest forest

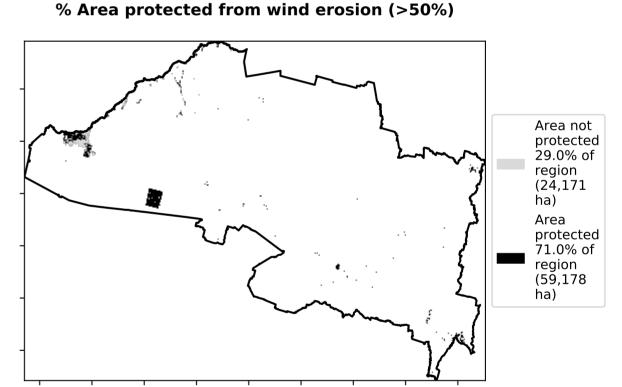
### Total Vegetation Cover [%]

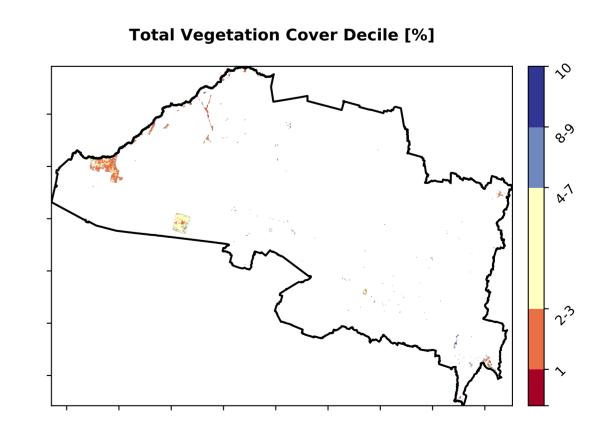
### % Area protected from water erosion (>70%) Area not protected 65.7% of region (54,760 ha) Area protected 34.3% of region (28,589 ha)



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.











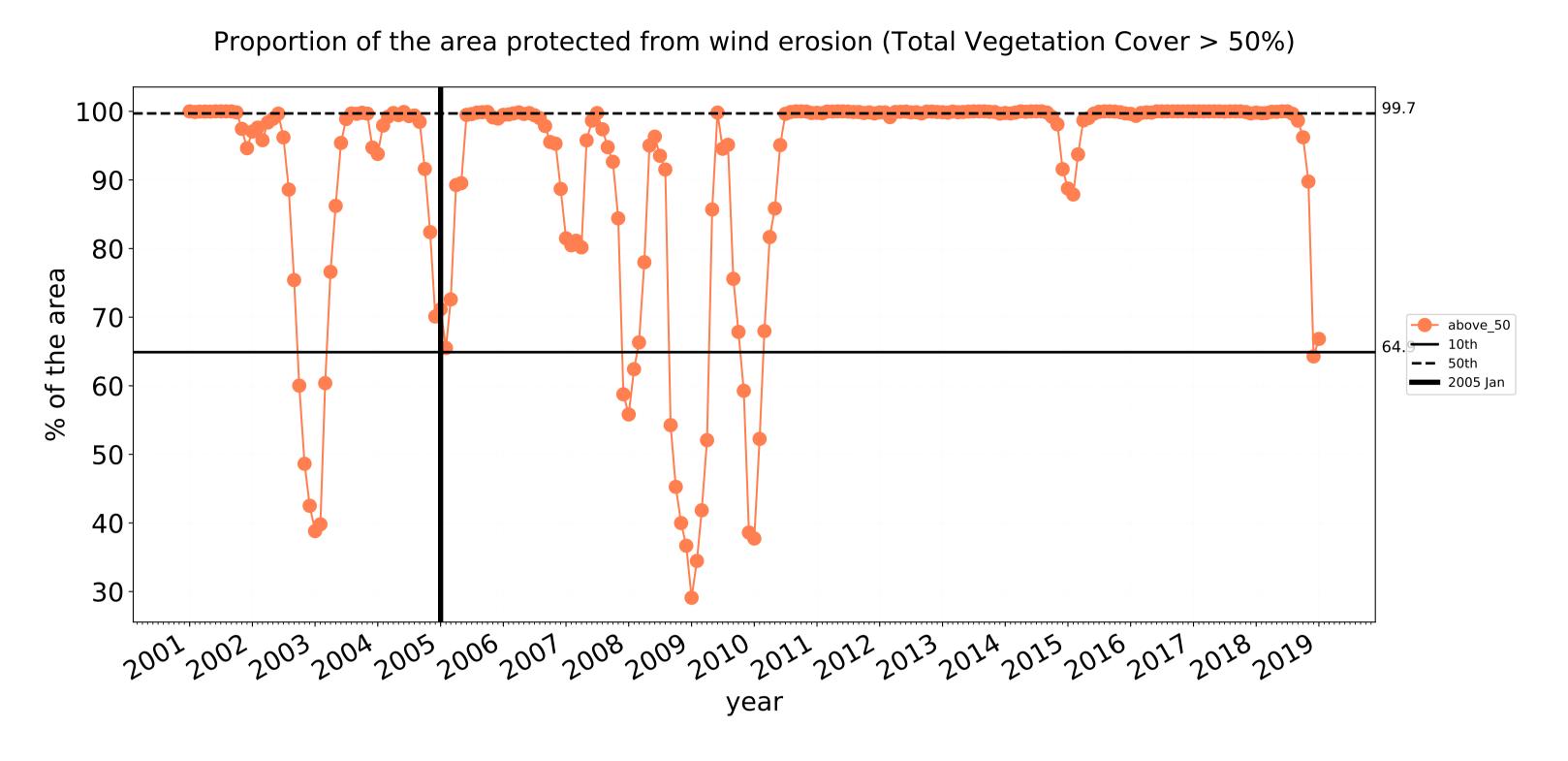


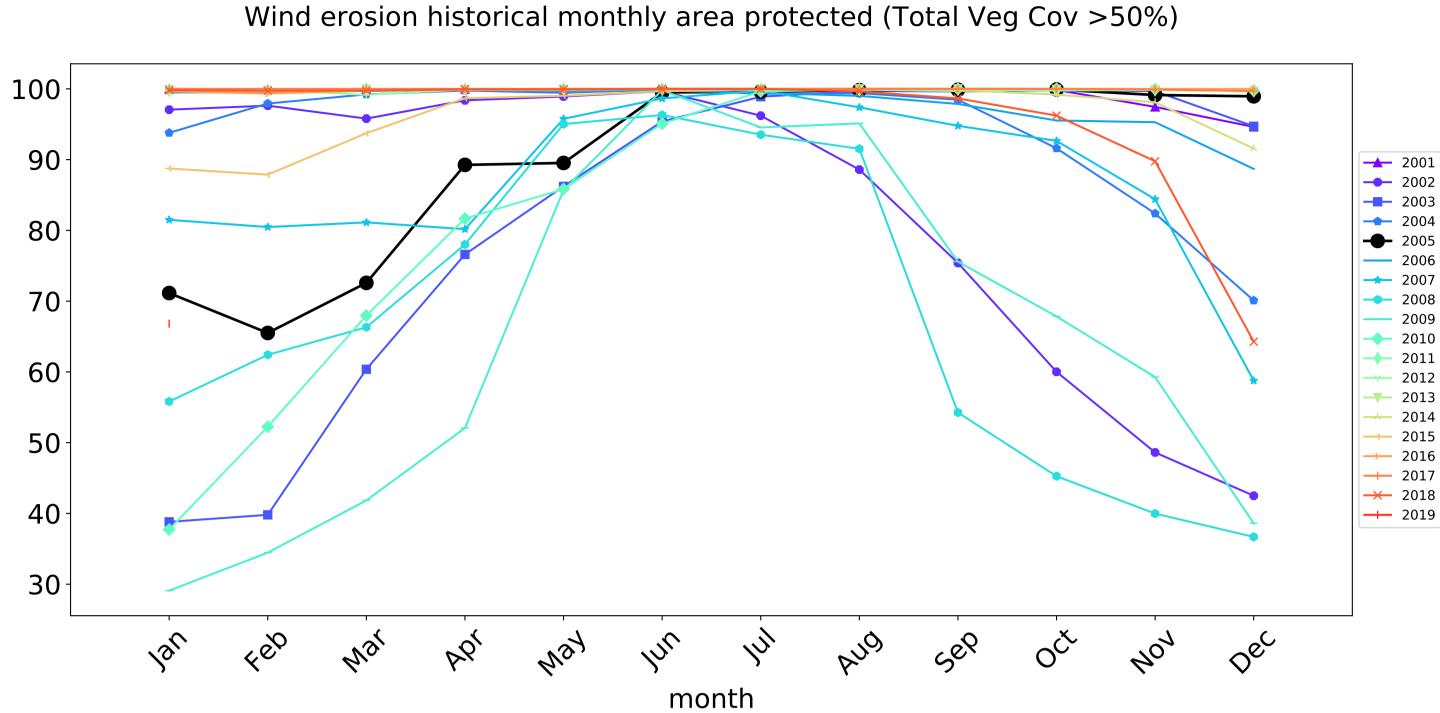


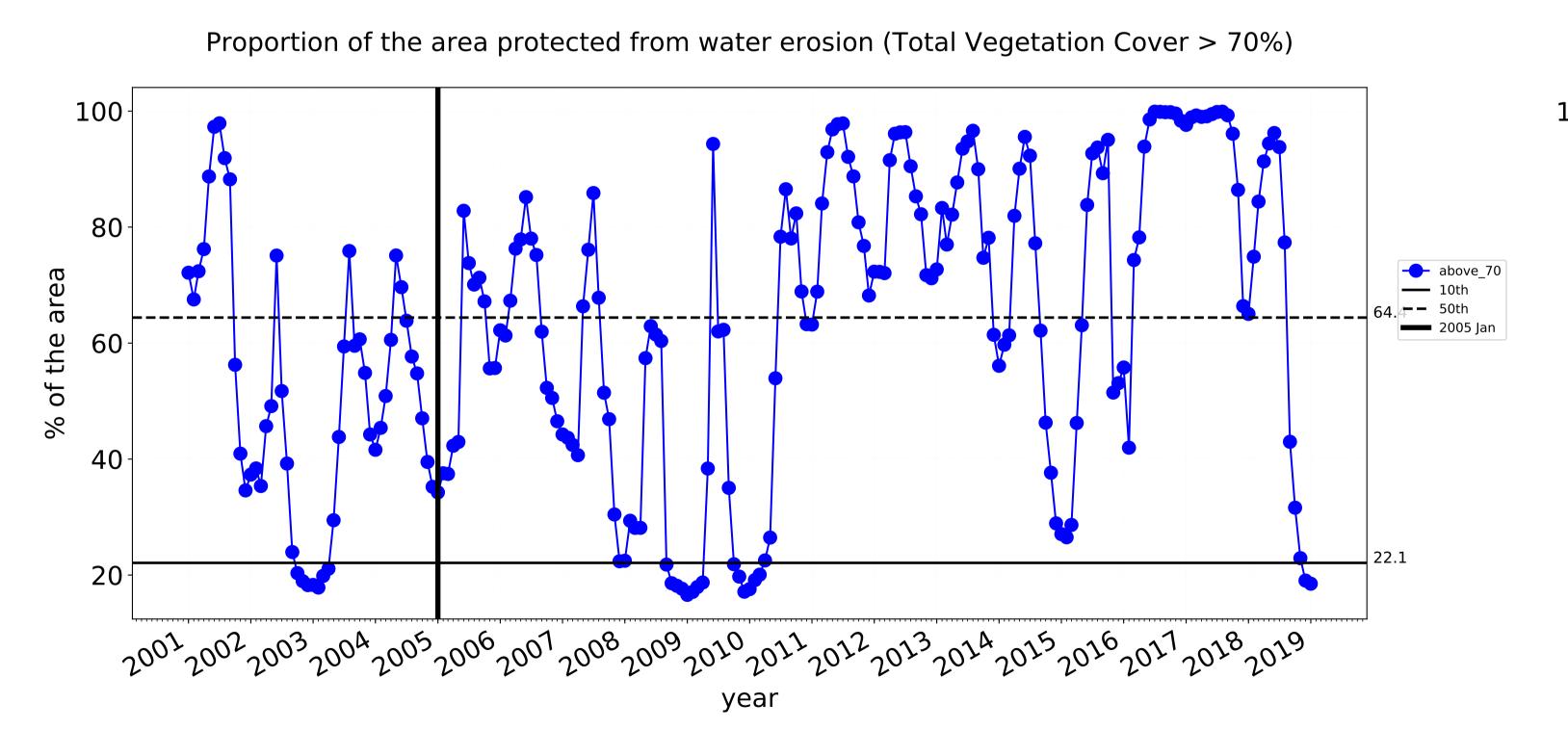


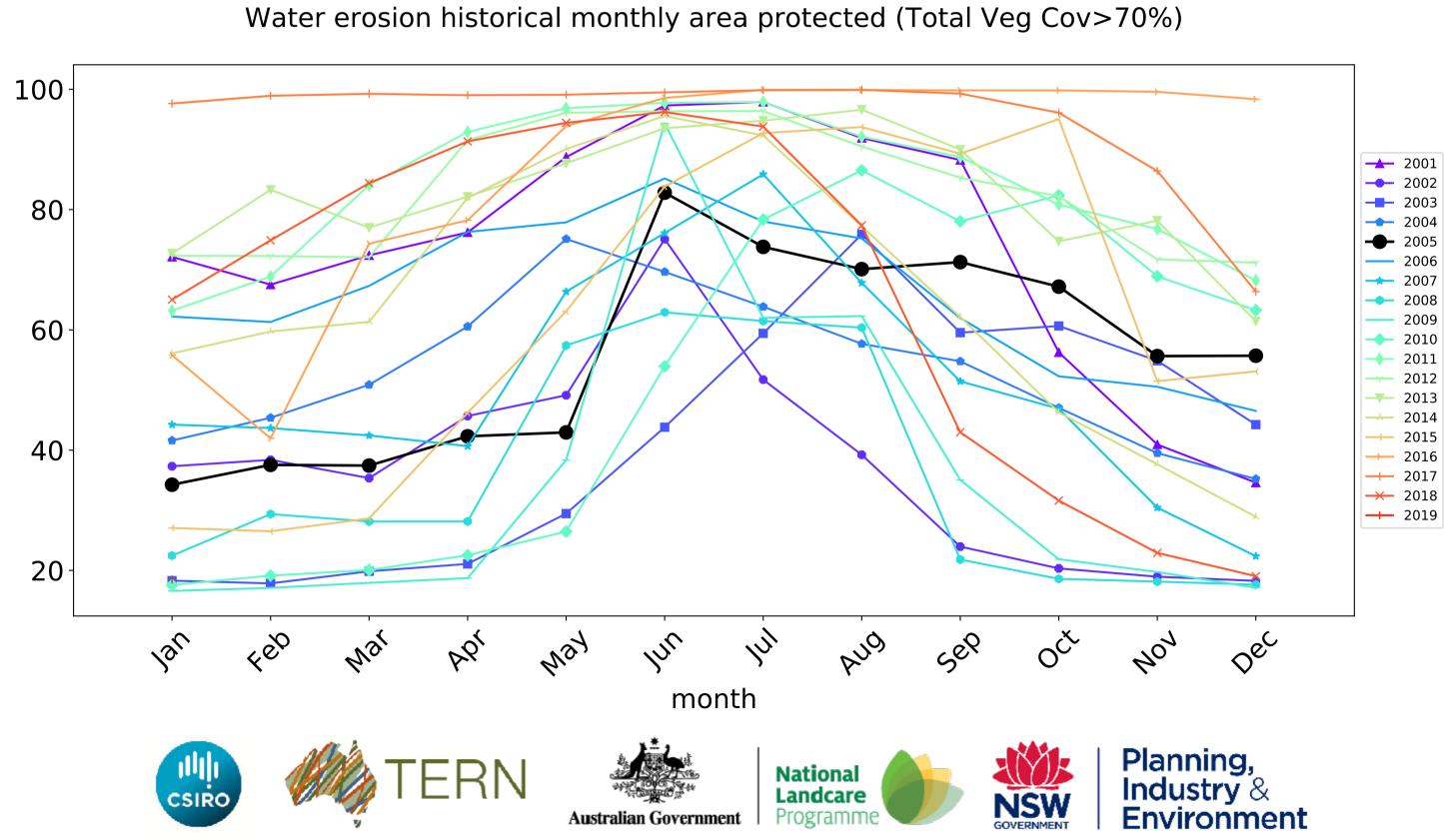


### **Conservation and natural environments non forest timeseries**

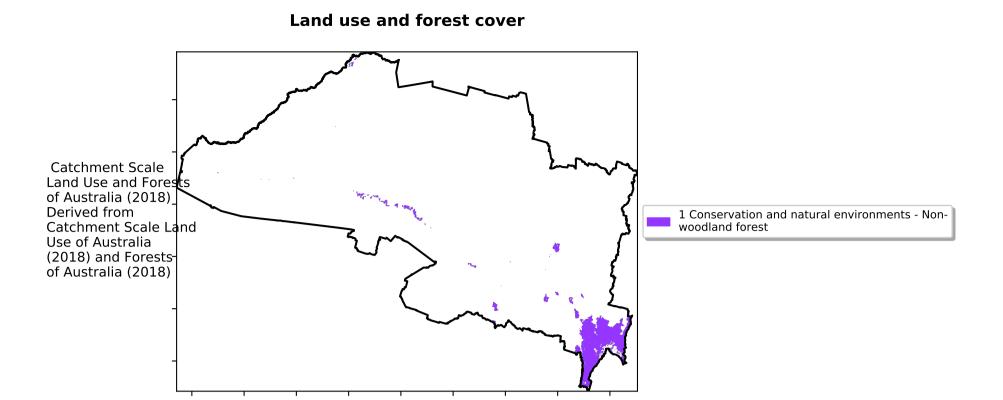




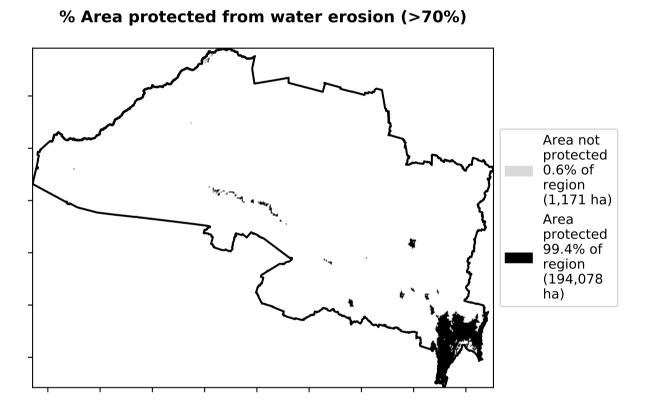


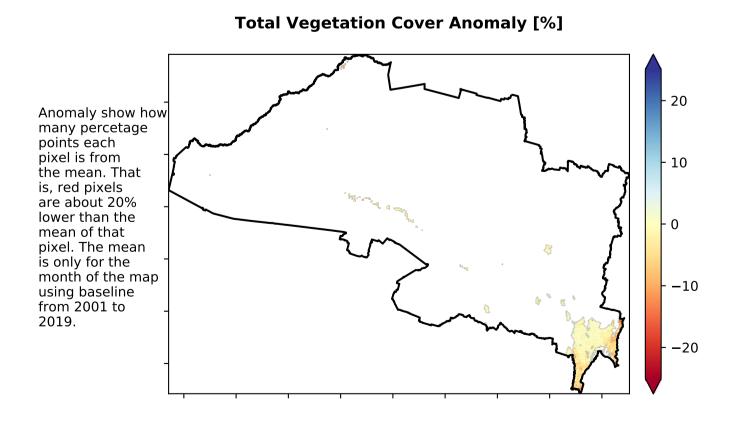


### **Conservation and natural environments Forest (non woodland)**

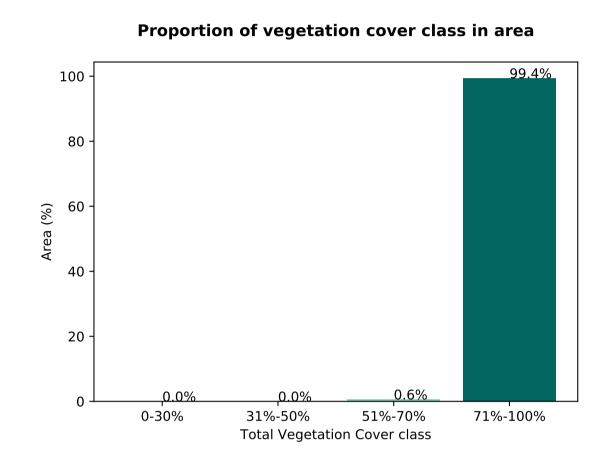


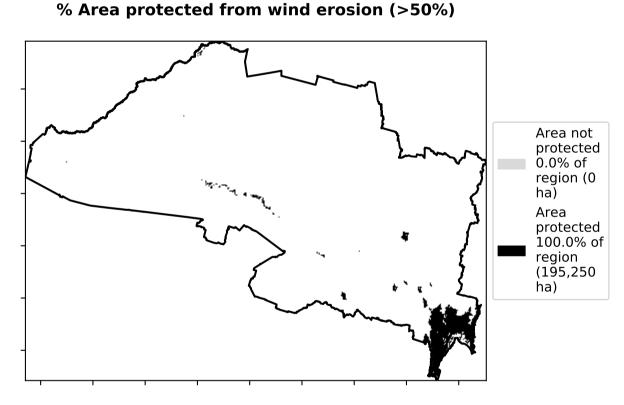
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trolo Indolo Trol

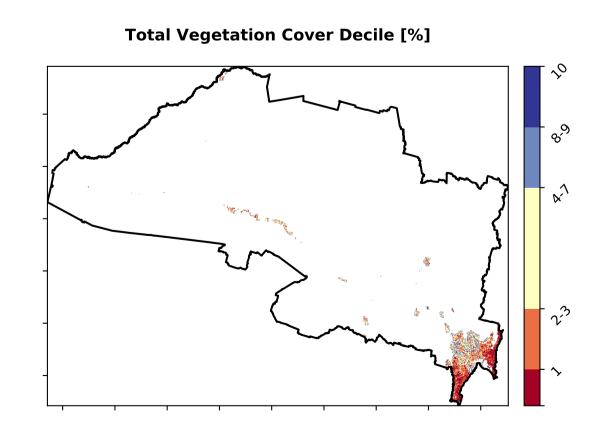




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









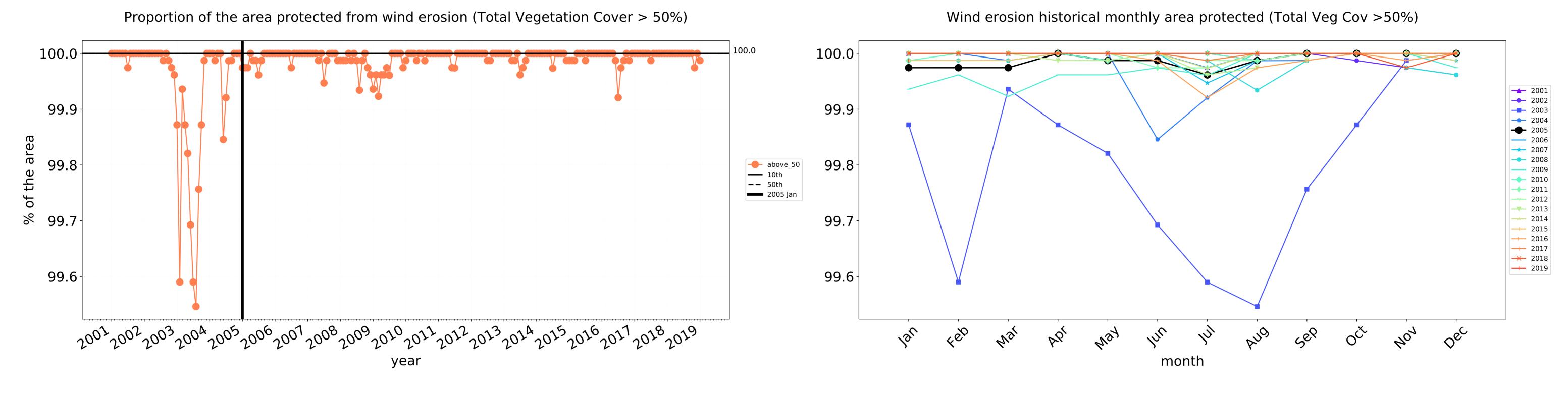


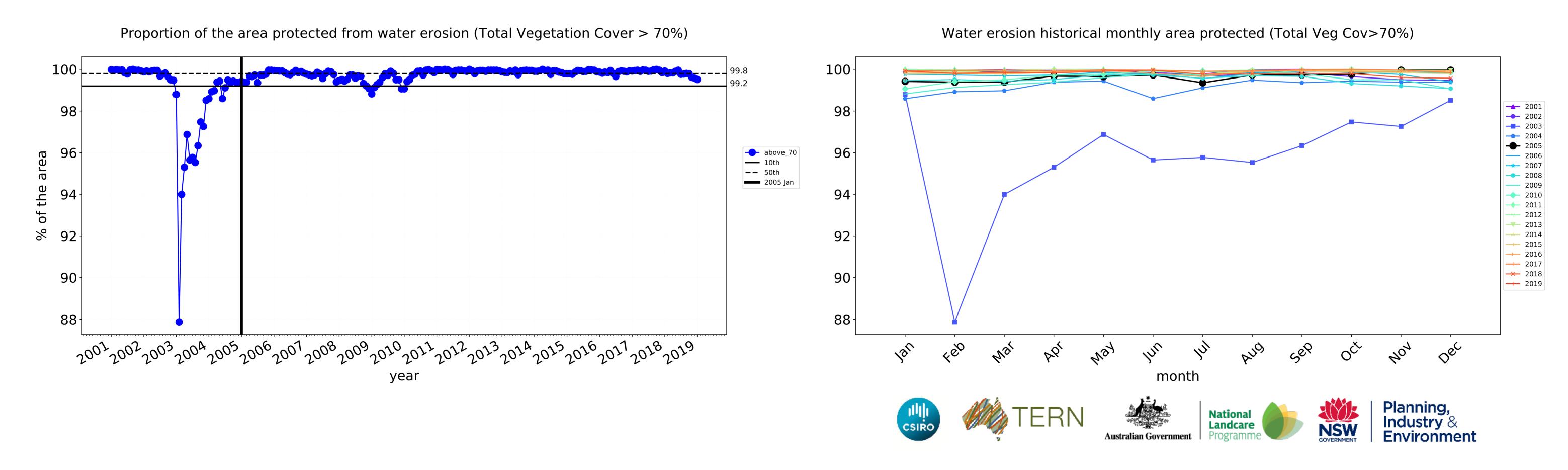








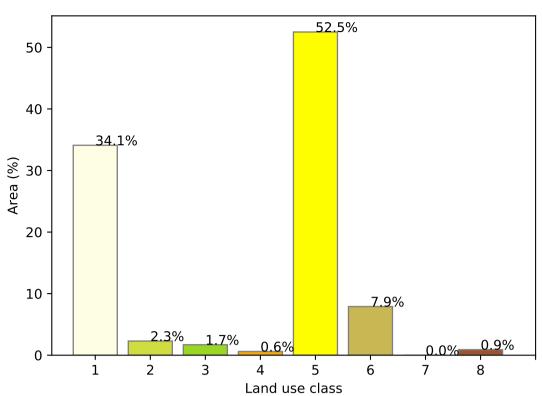




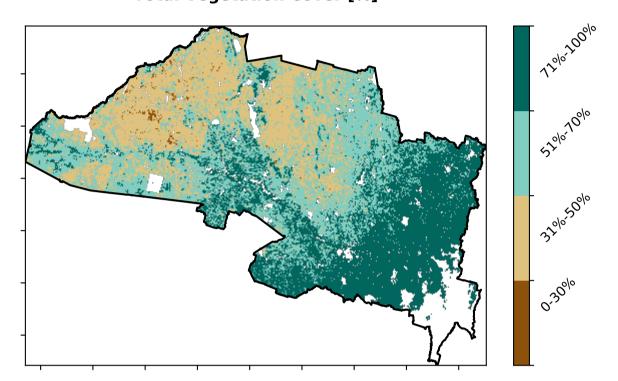
### **Agriculture**

# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) Sapriculture - Grazing - Non forest A Agriculture - Grazing - Non-woodland forest B A Agriculture - Grazing - Non-w

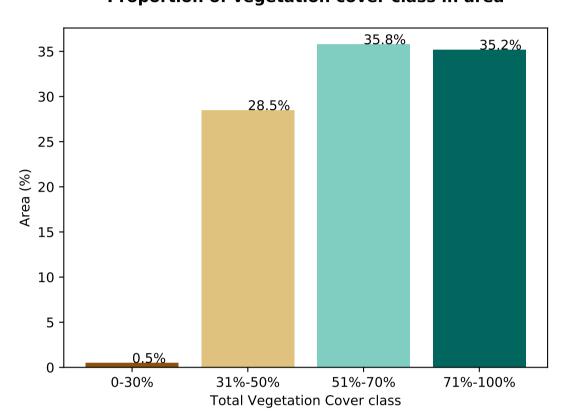
### Proportion of each land class in area



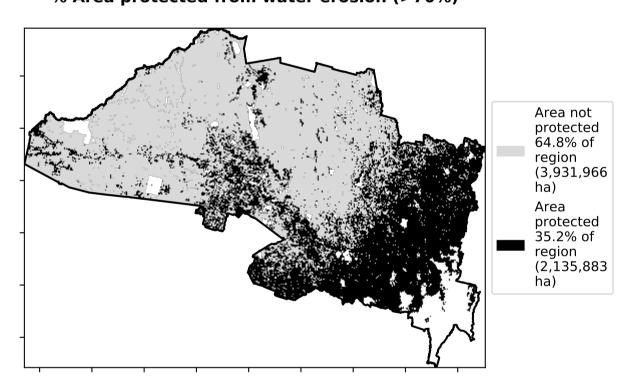




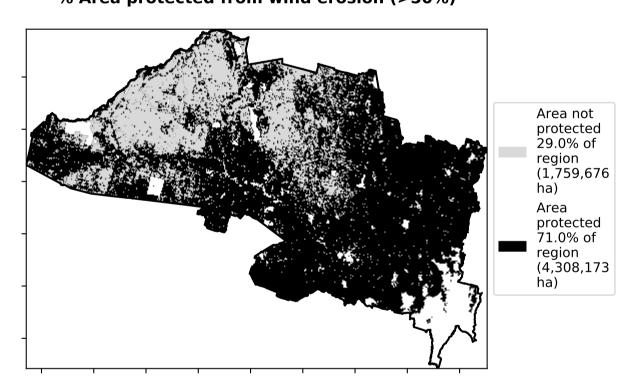
Proportion of vegetation cover class in area



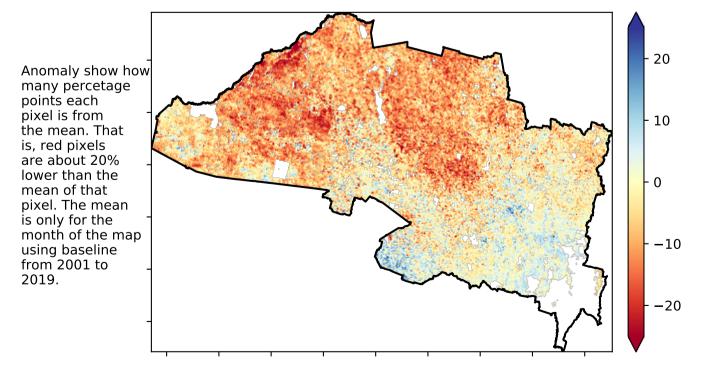
### % Area protected from water erosion (>70%)



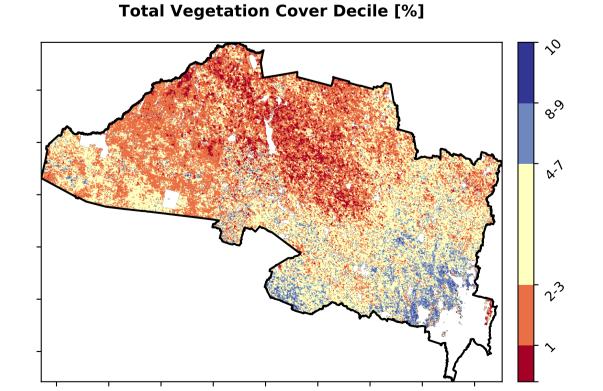
% Area protected from wind erosion (>50%)



### 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.







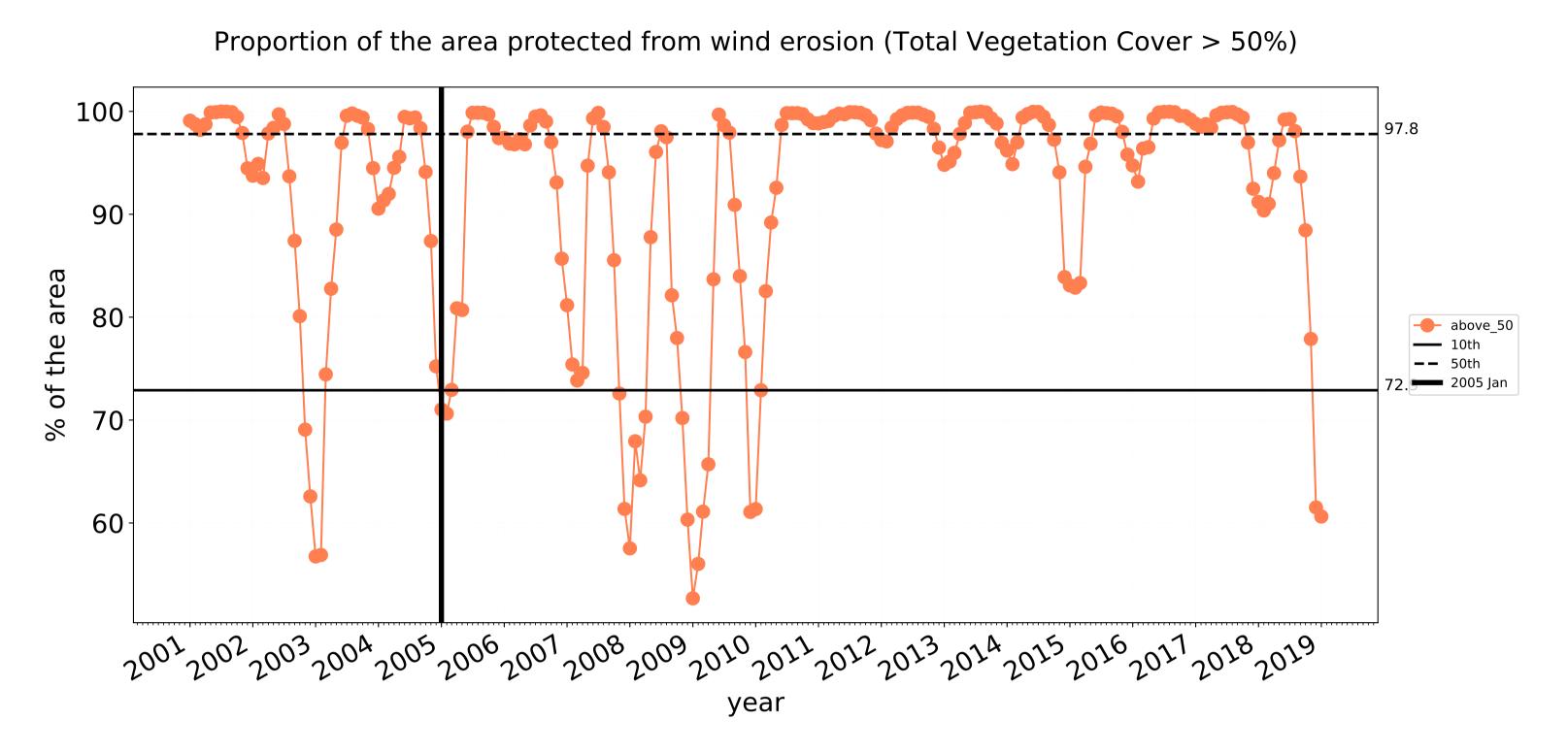


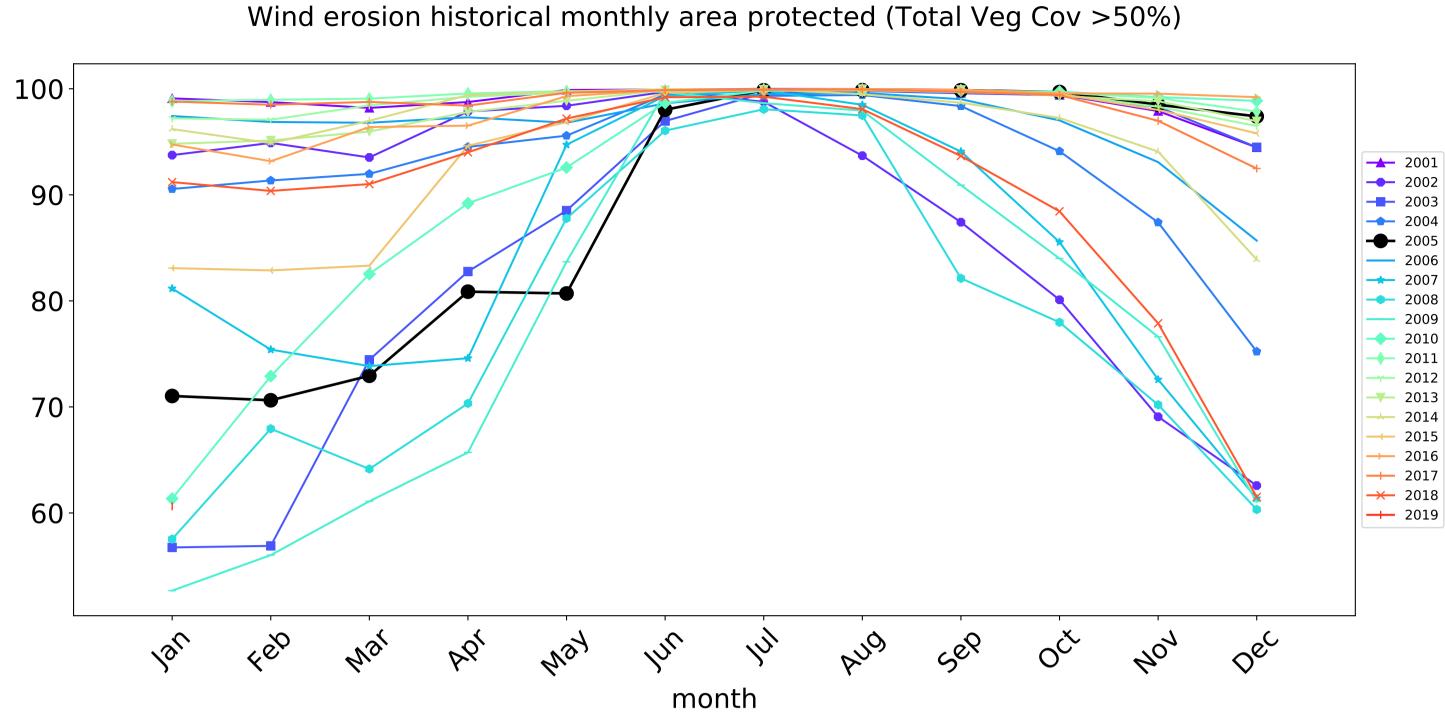


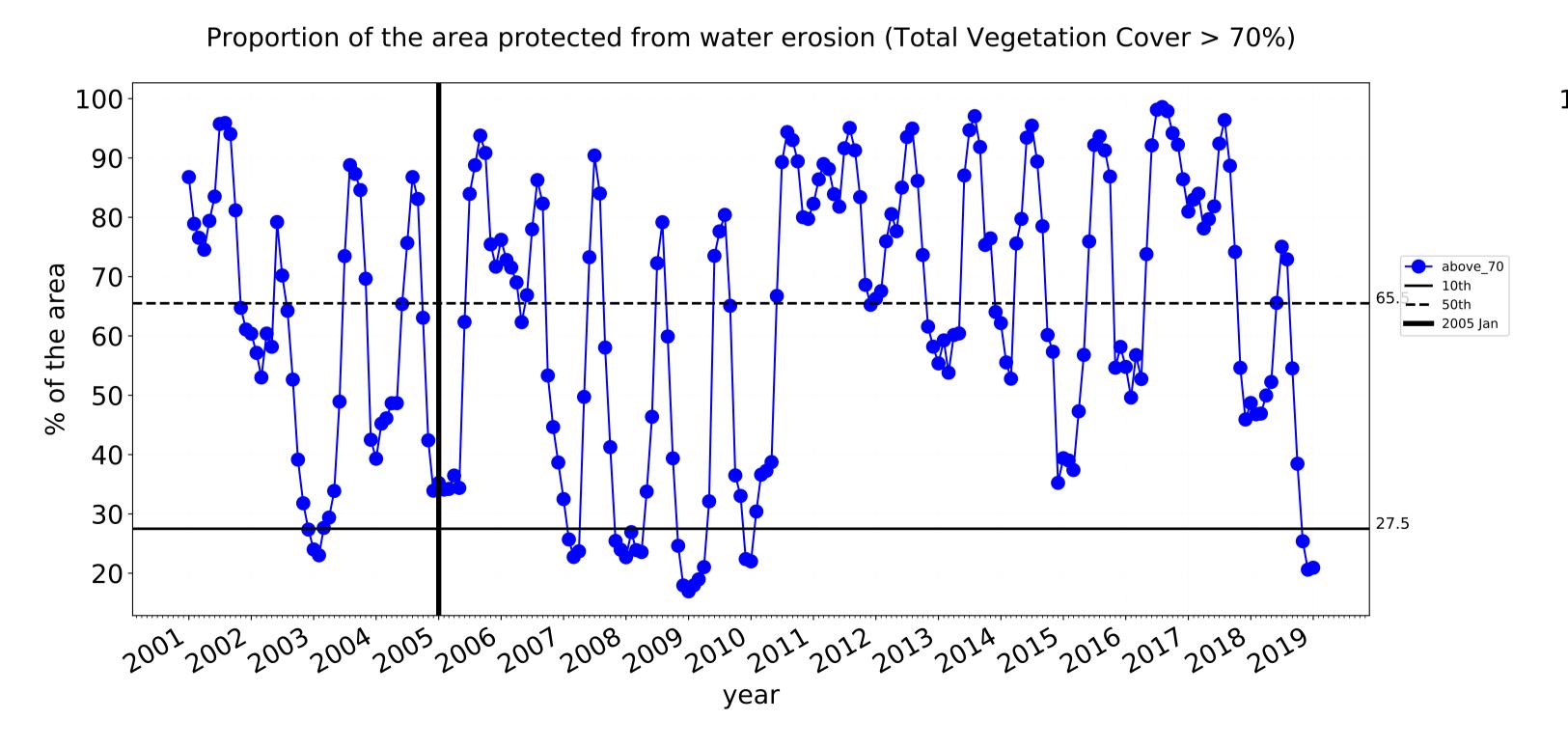


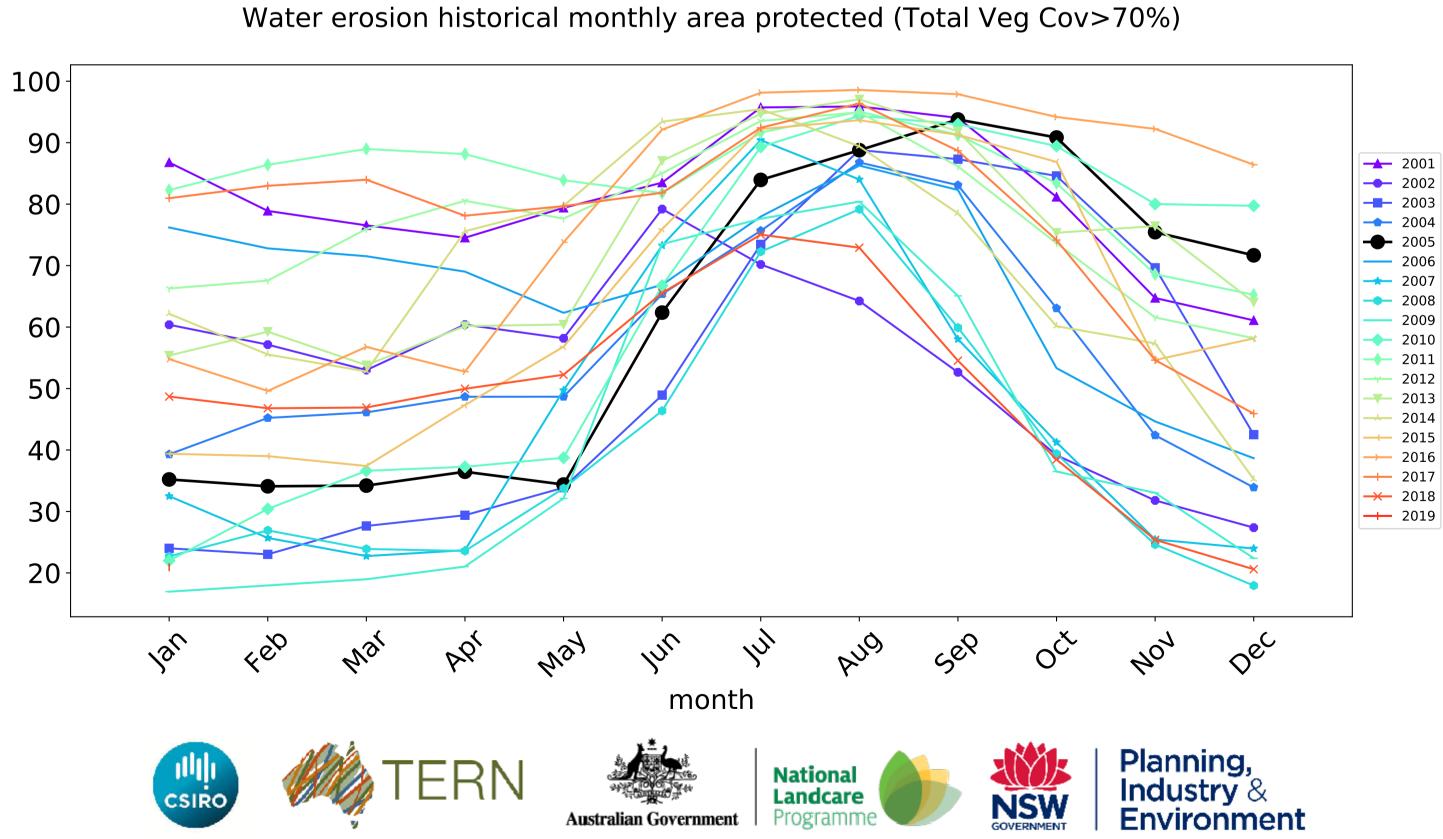


### **Agriculture timeseries**

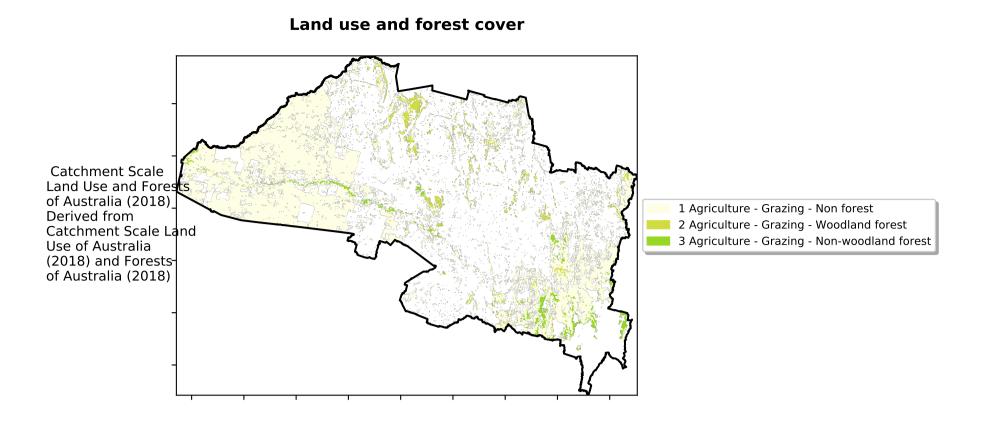




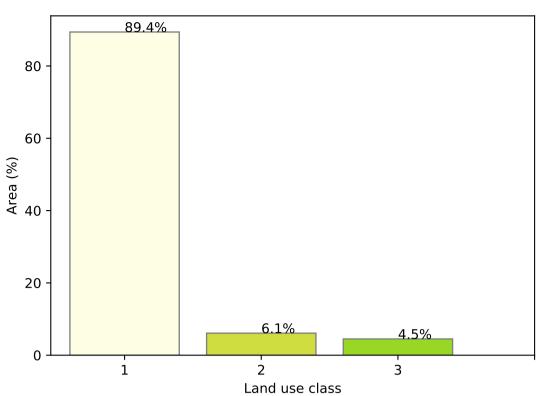




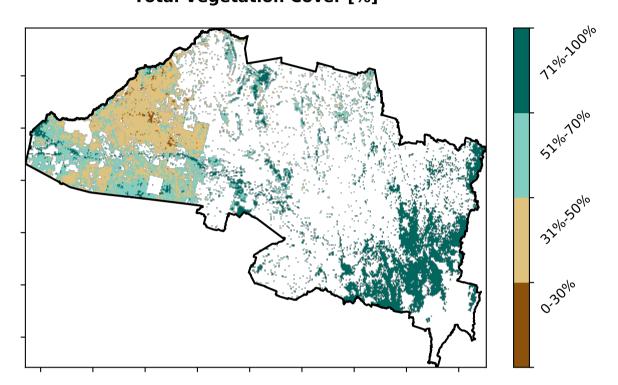
### **Grazing**



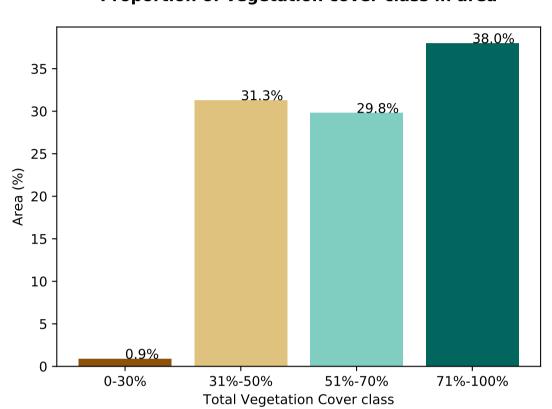
### Proportion of each land class in area



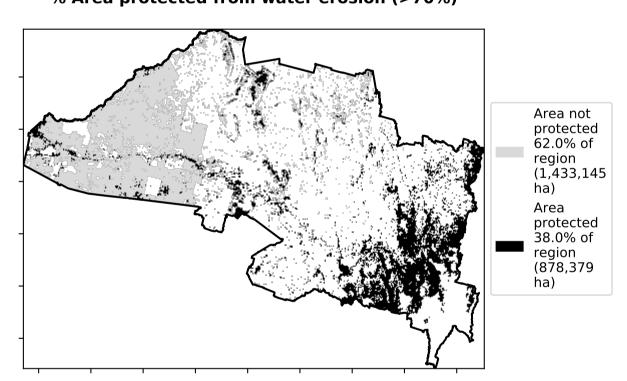
**Total Vegetation Cover [%]** 



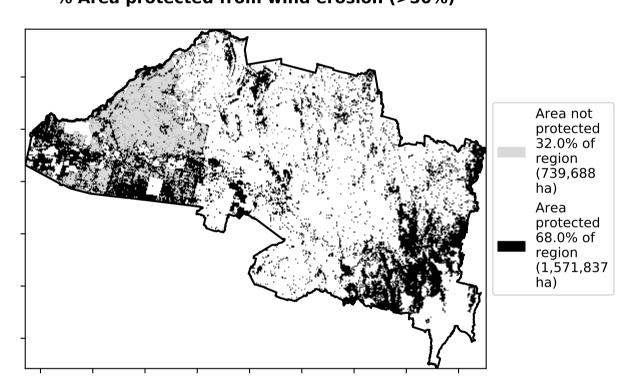
Proportion of vegetation cover class in area



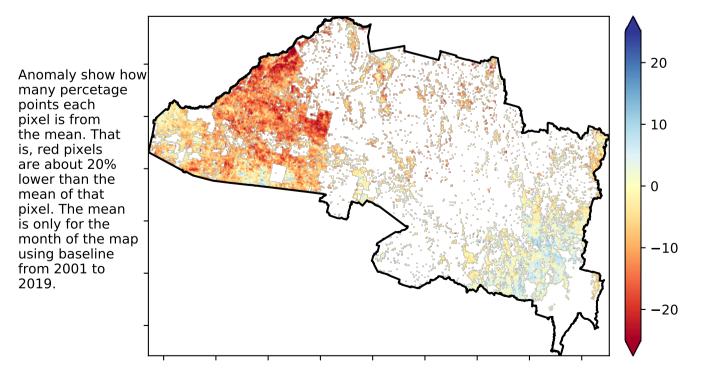
% Area protected from water erosion (>70%)



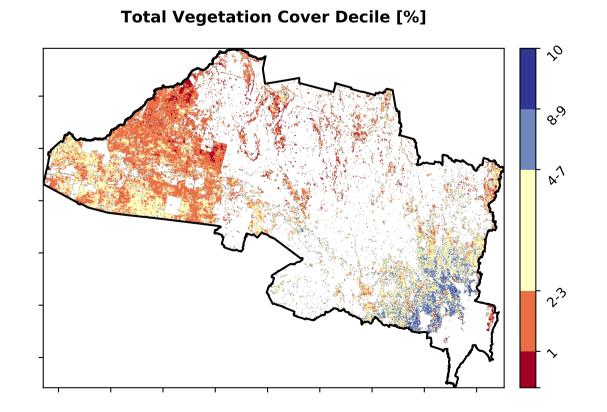
% Area protected from wind erosion (>50%)



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.







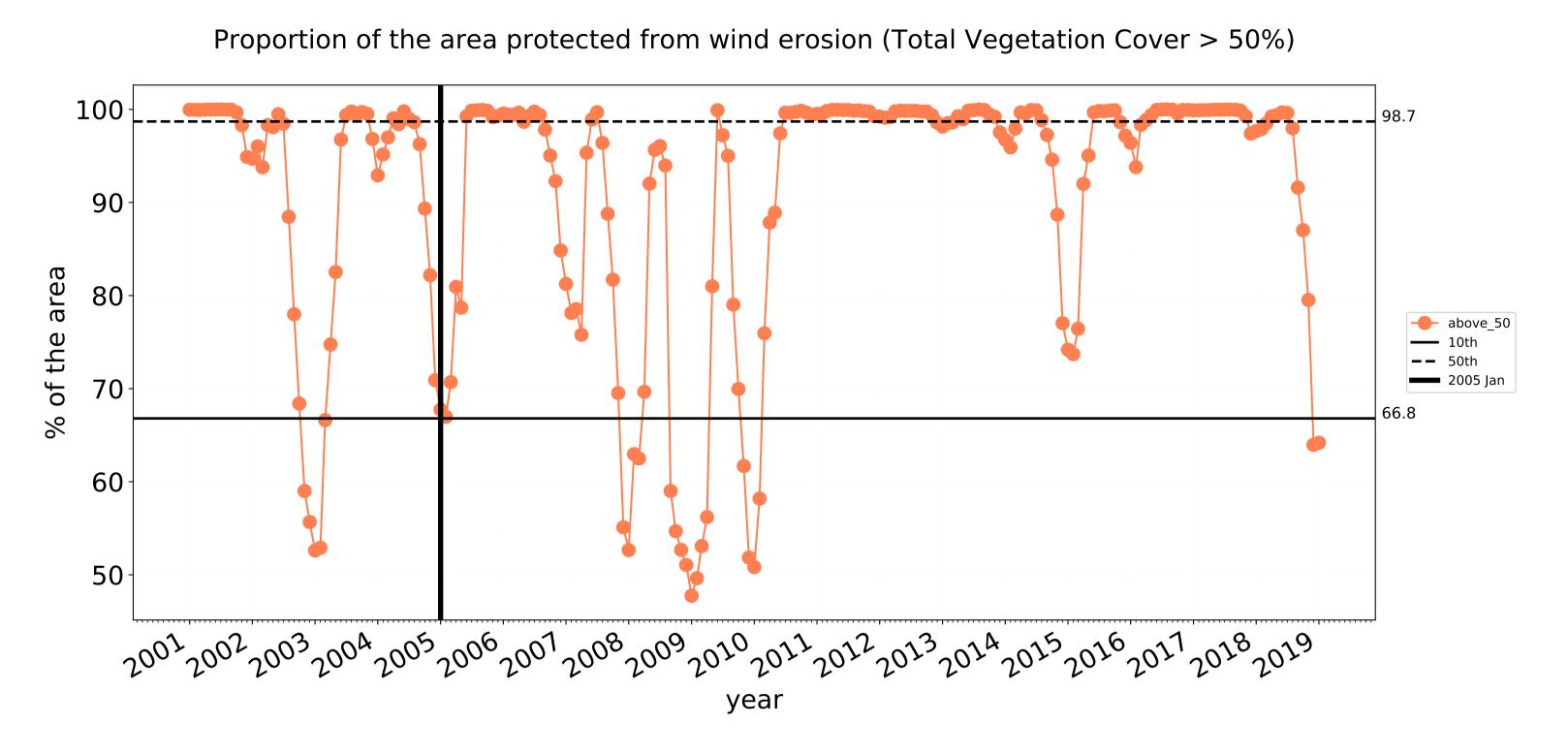


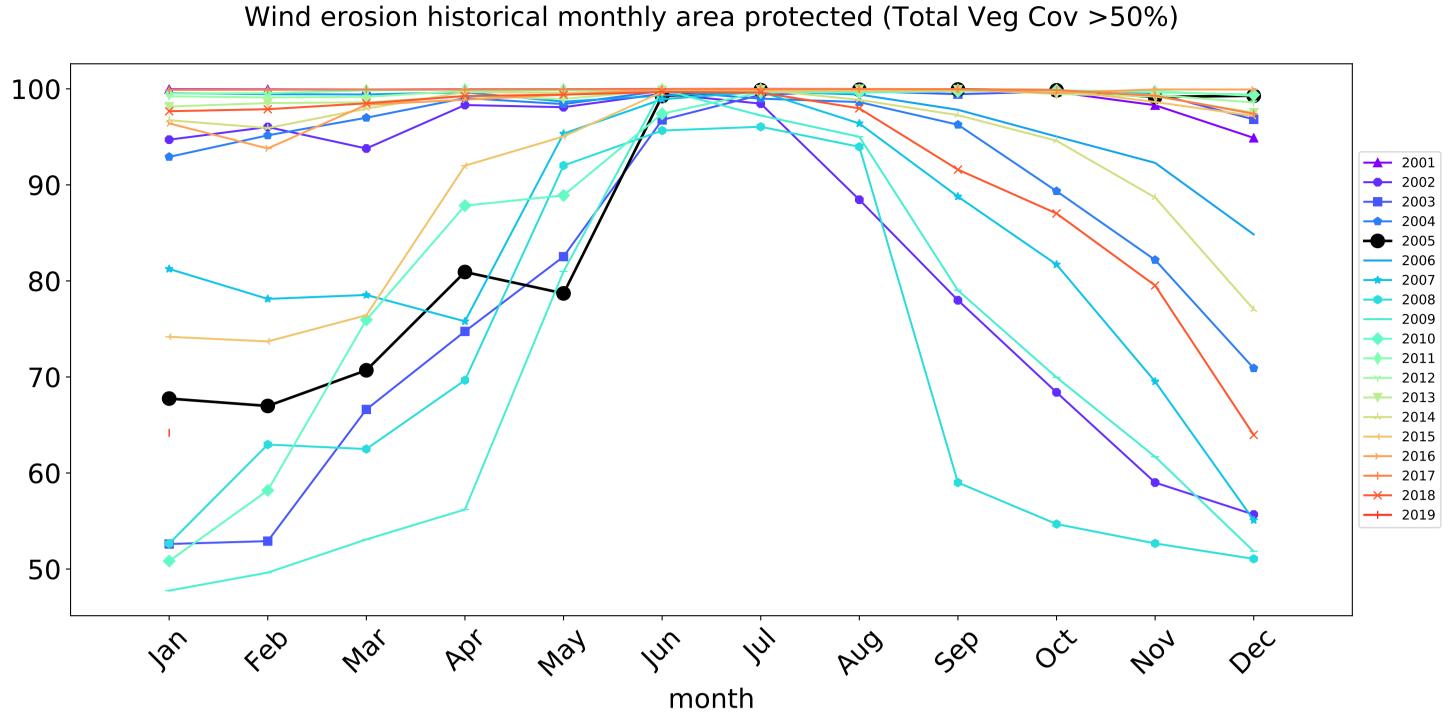


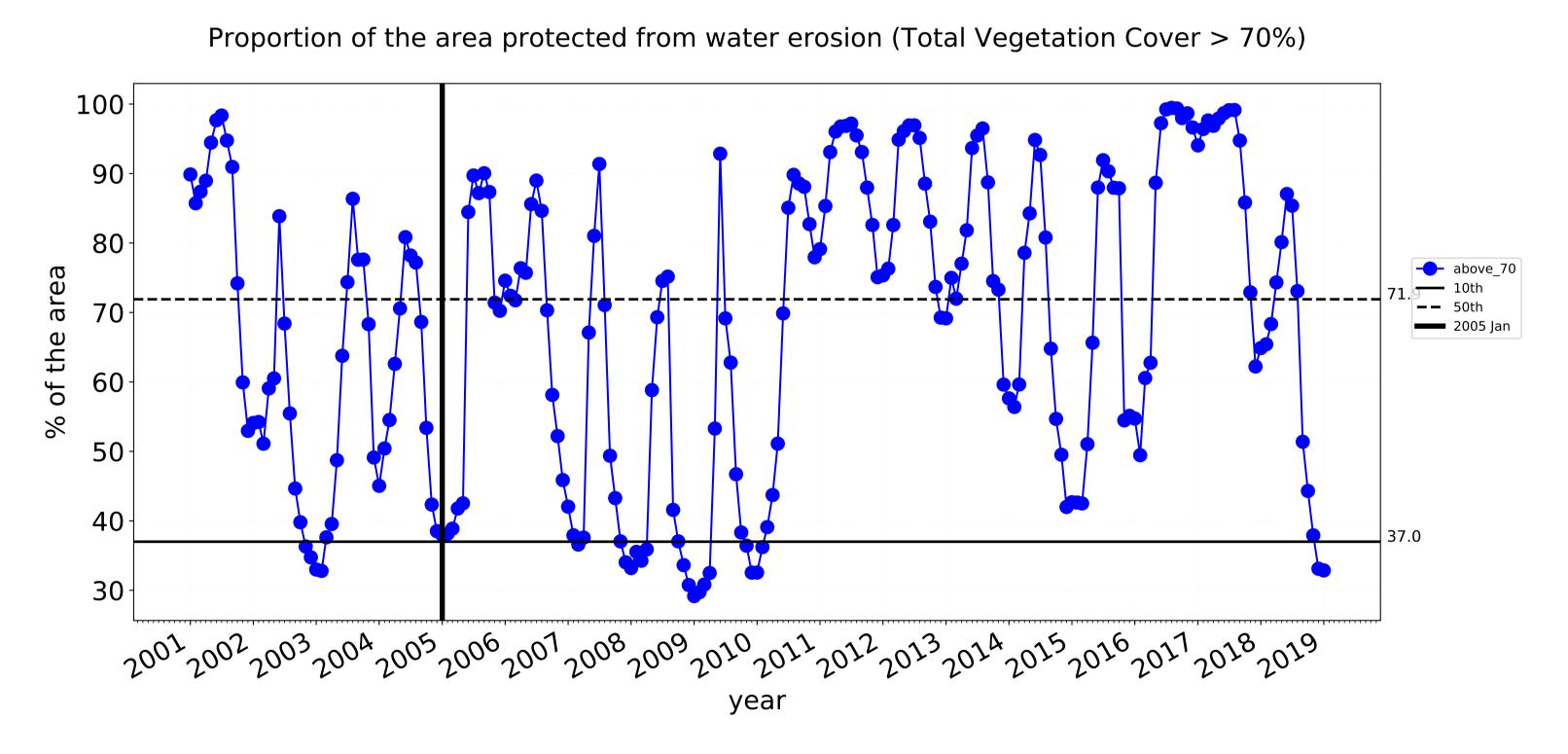


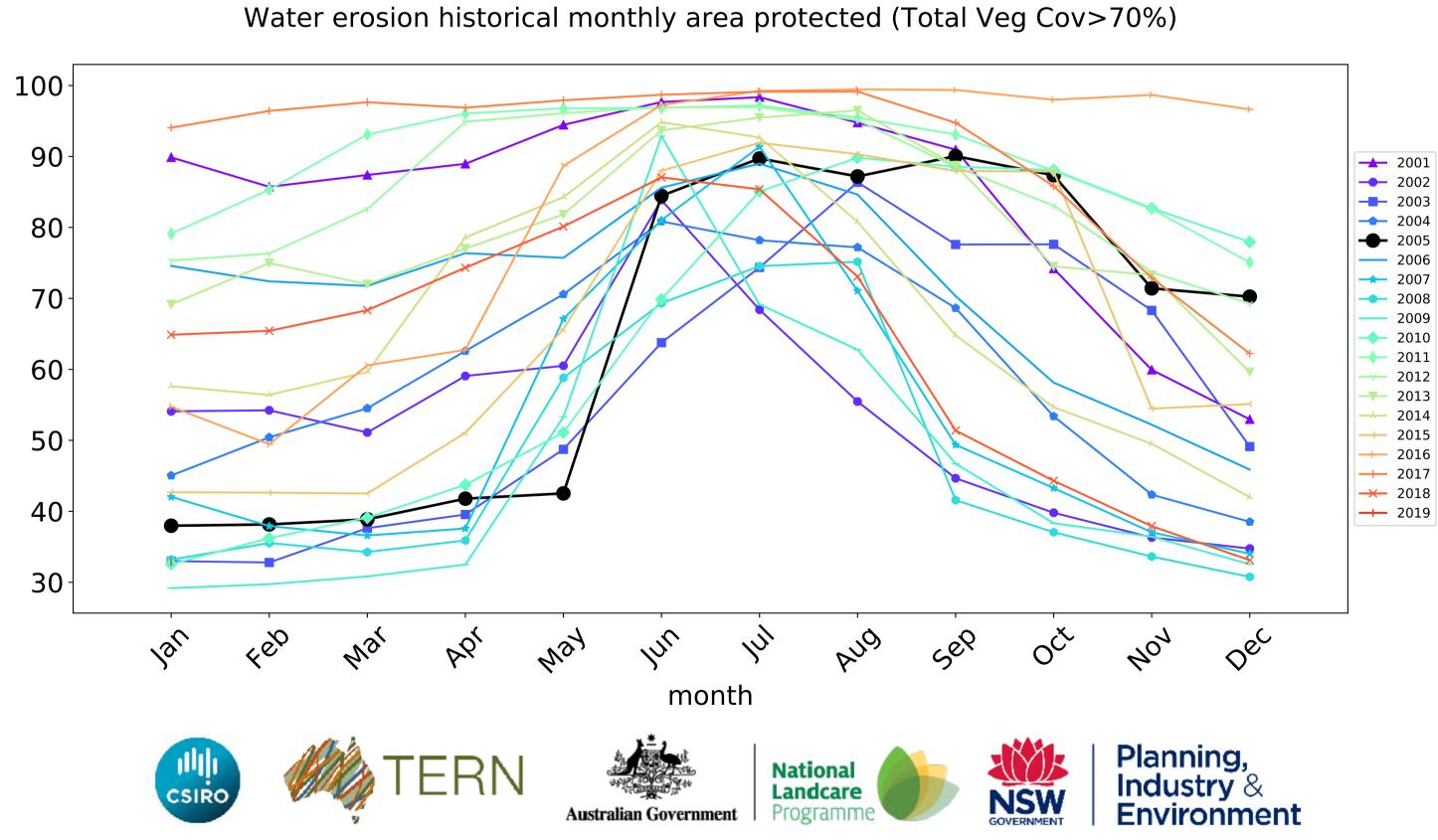


### **Grazing timeseries**



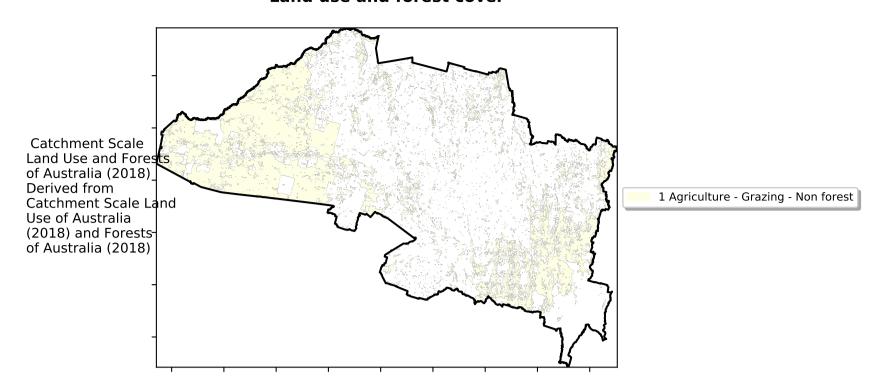




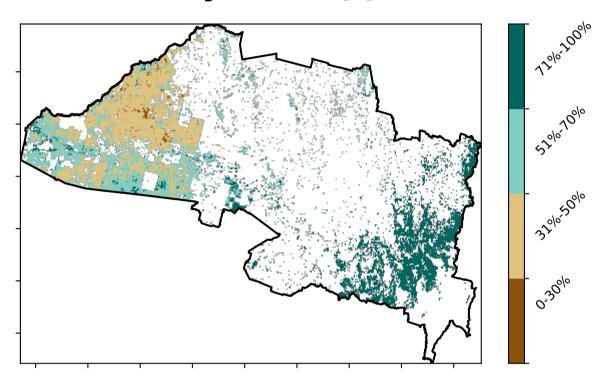


### **Grazing non forest**

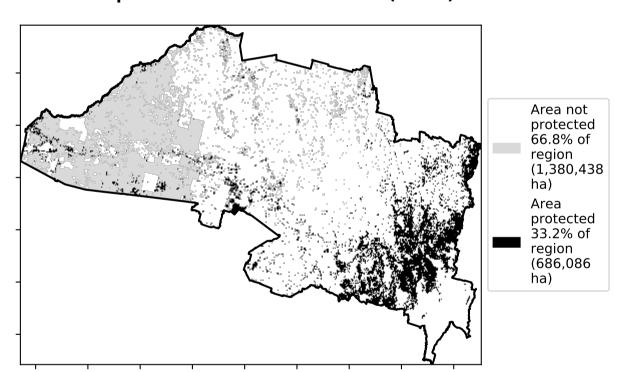
### Land use and forest cover



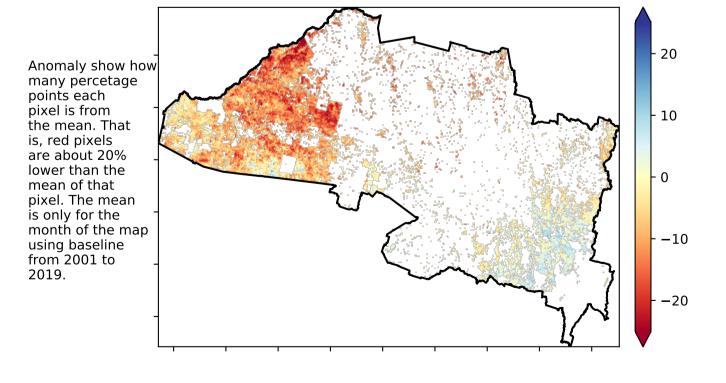
### **Total Vegetation Cover [%]**



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

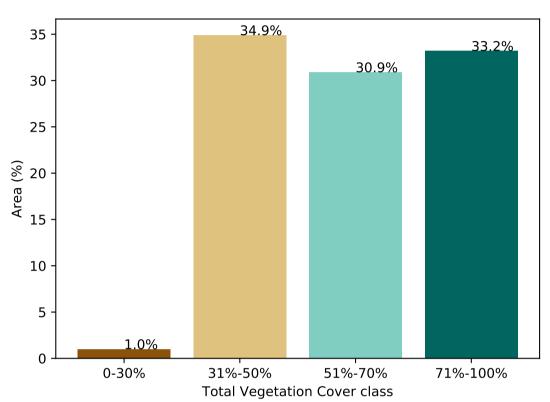


### Total Vegetation Cover Anomaly [%]

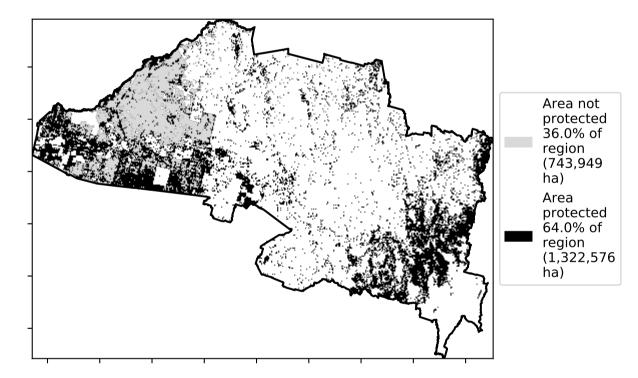


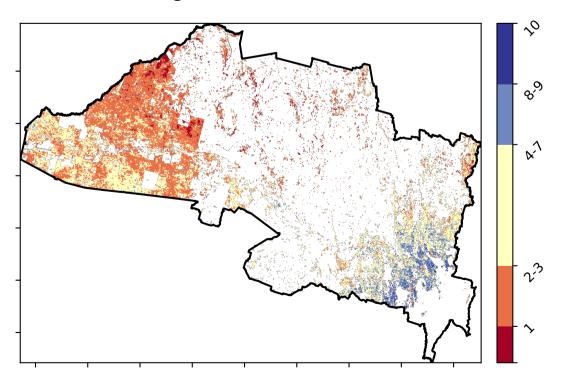
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









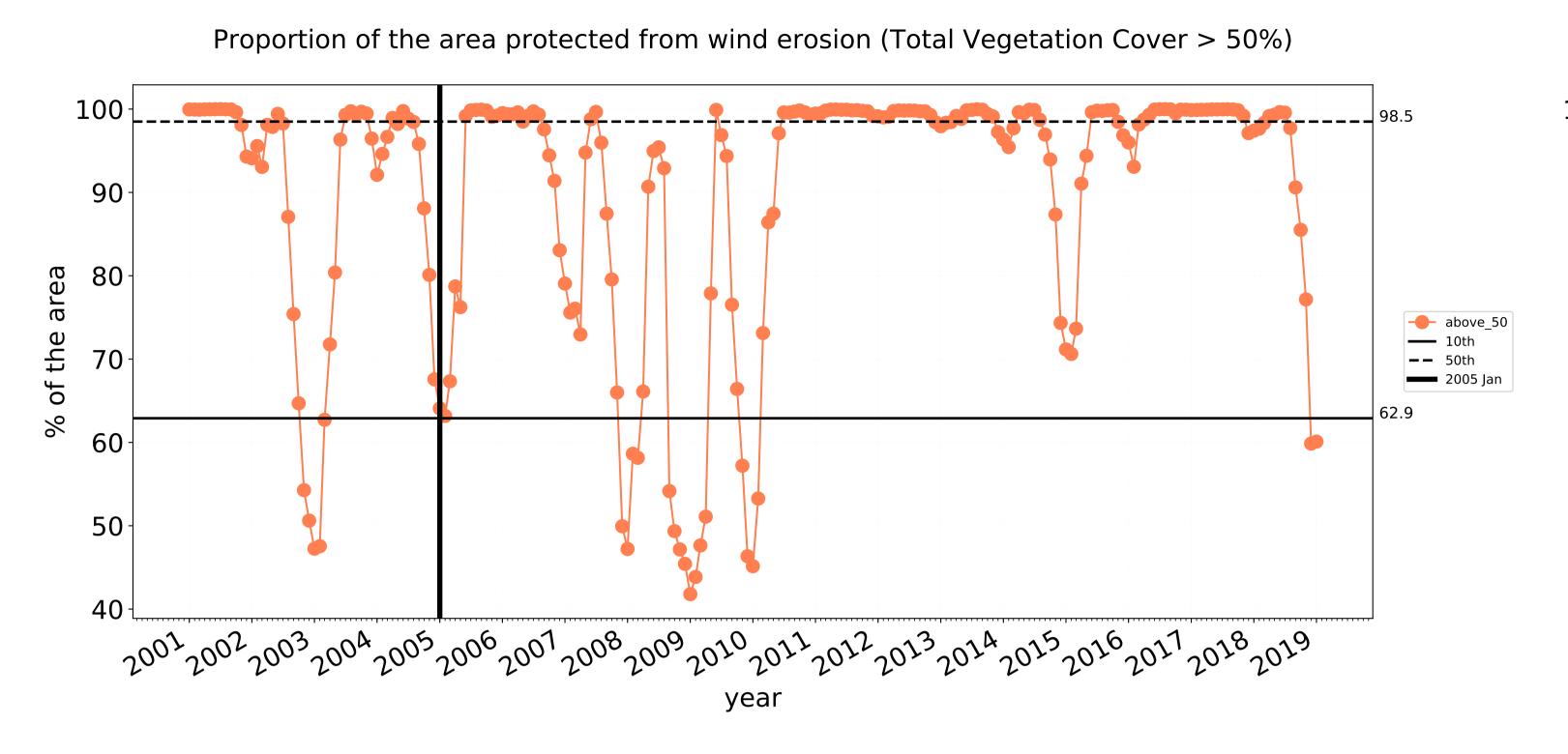


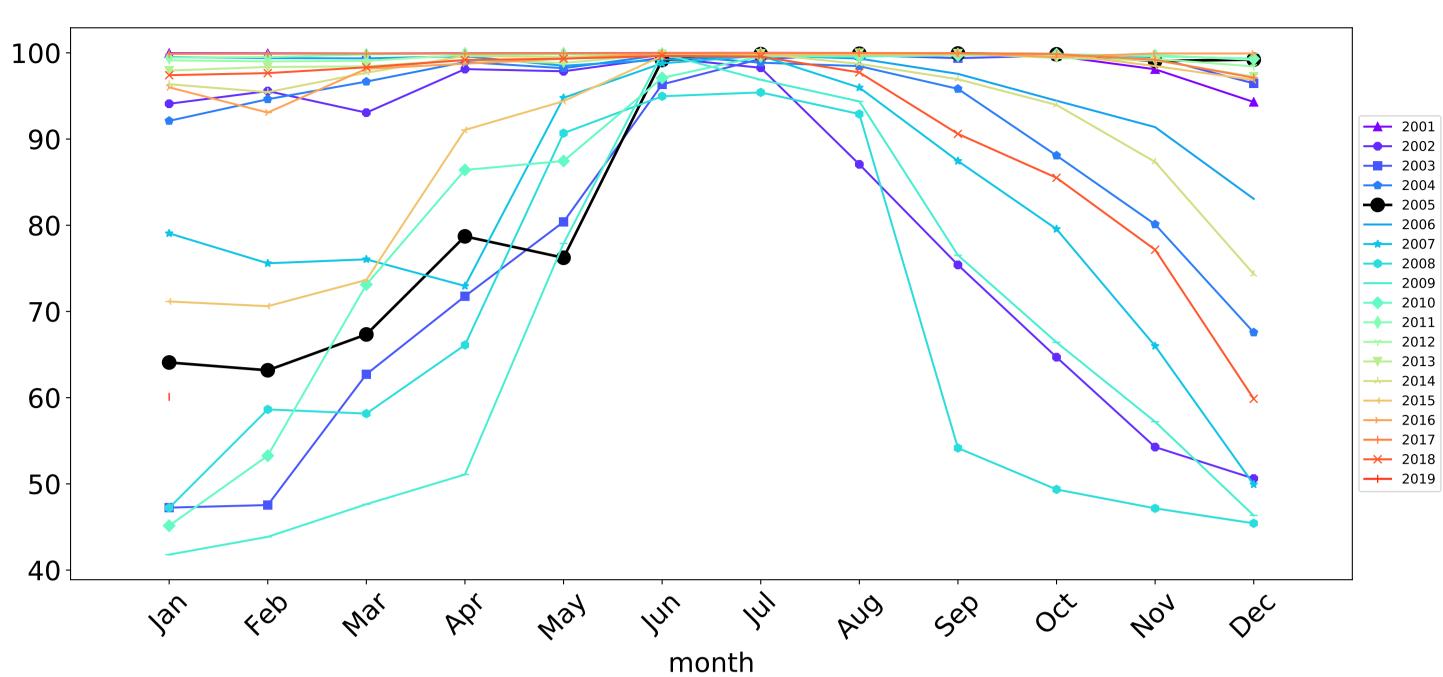




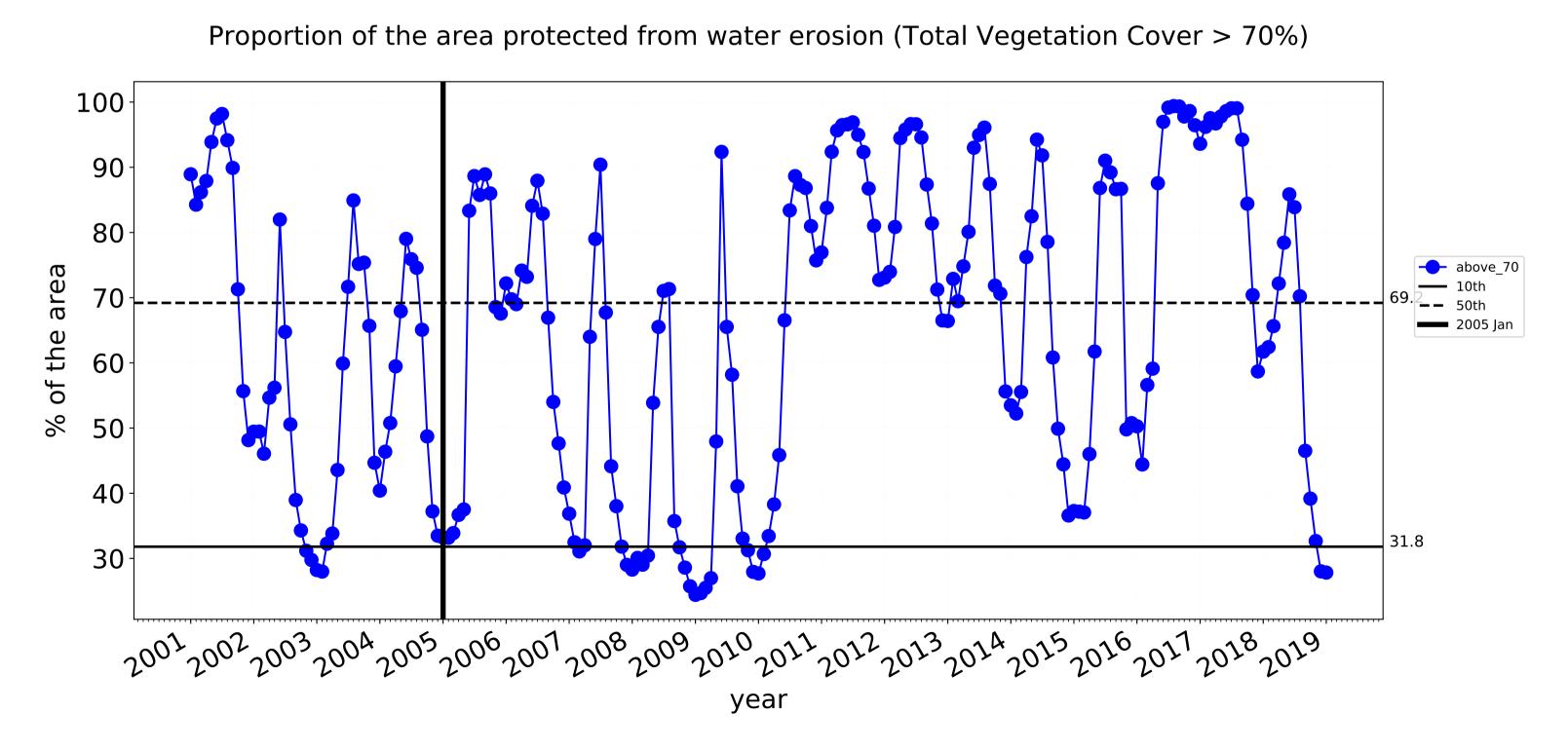


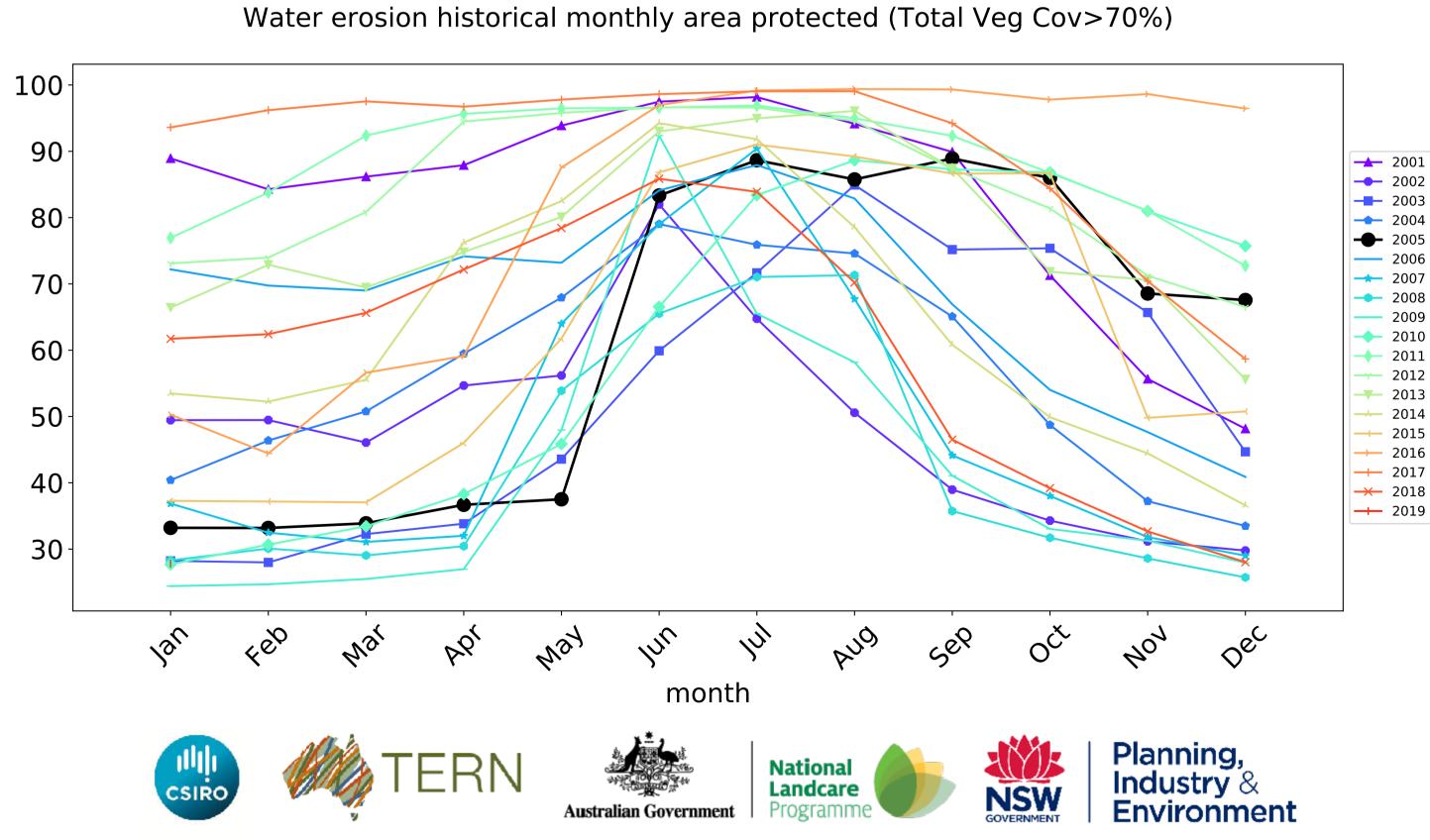
### **Grazing non forest timeseries**





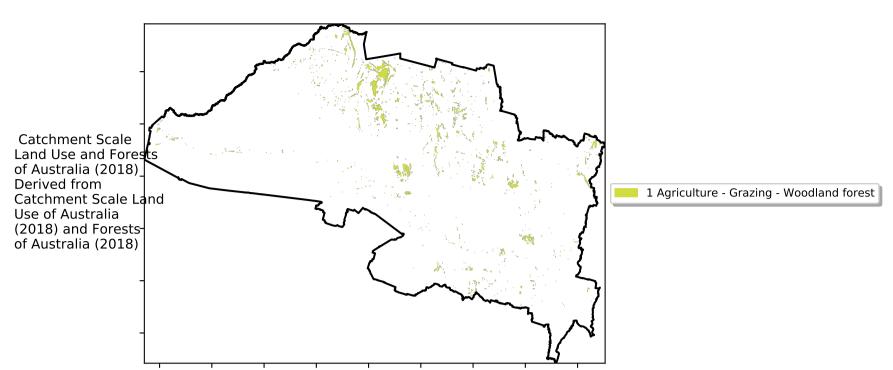
Wind erosion historical monthly area protected (Total Veg Cov >50%)



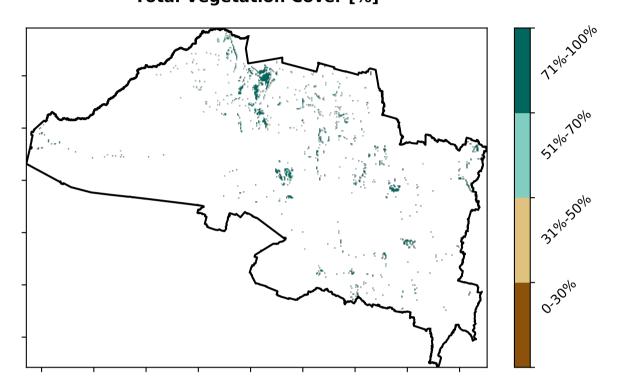


### **Grazing Woodland forest**

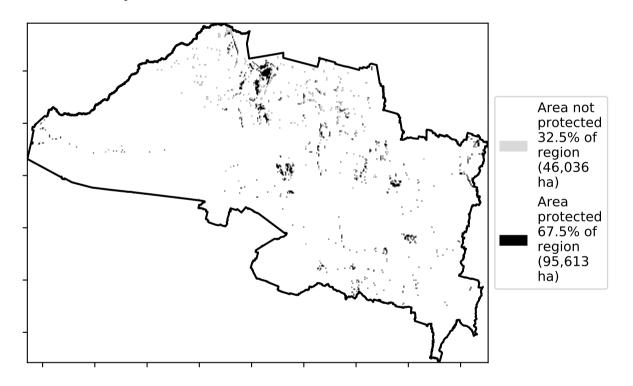
### Land use and forest cover



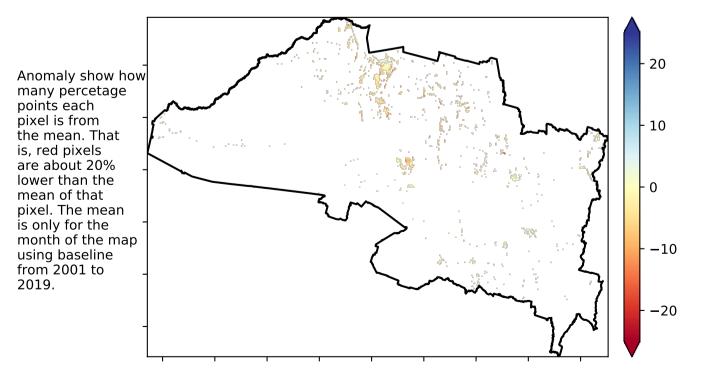
### **Total Vegetation Cover [%]**



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

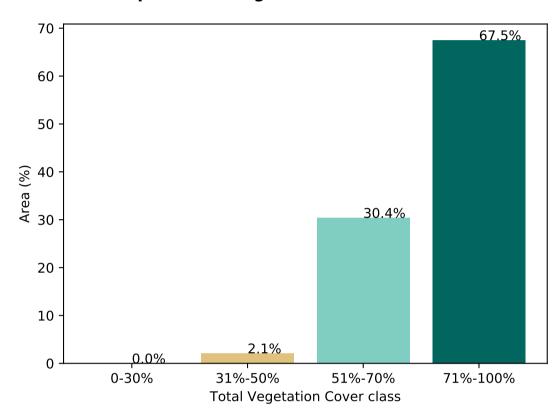


### Total Vegetation Cover Anomaly [%]

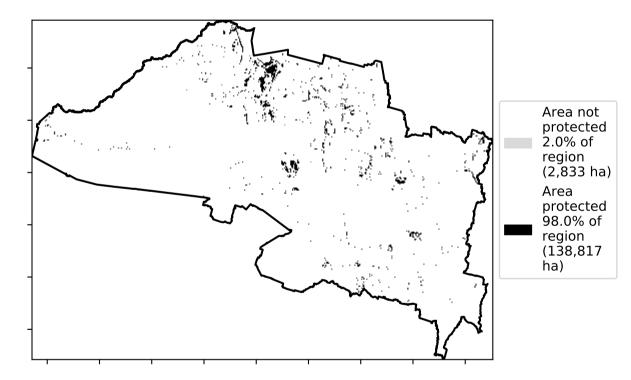


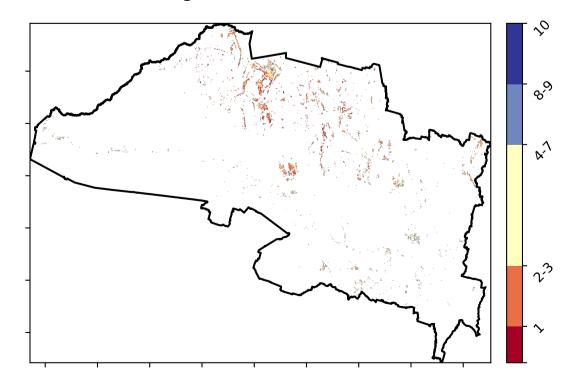
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









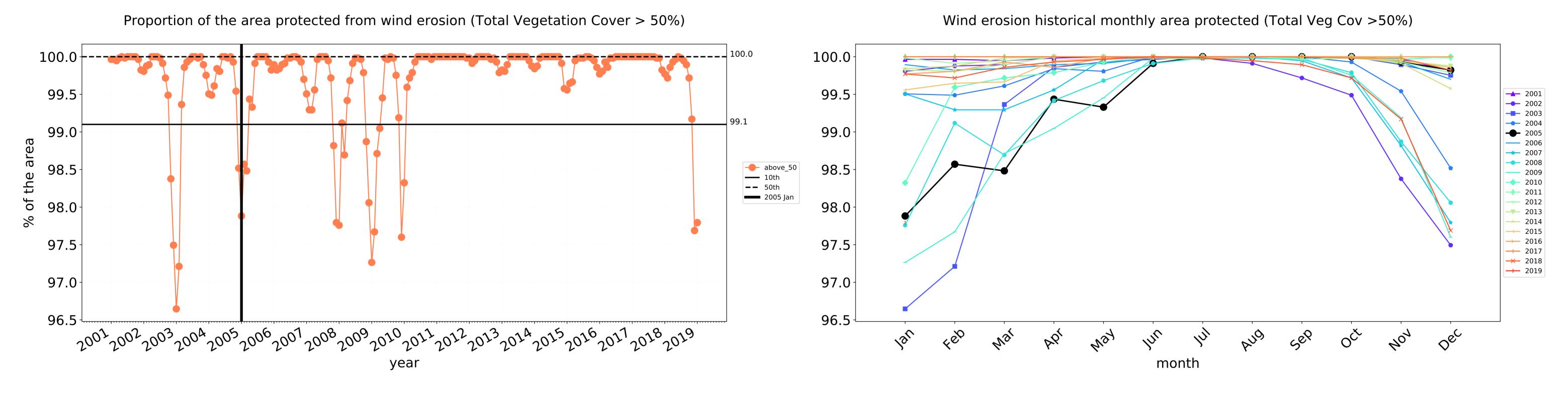


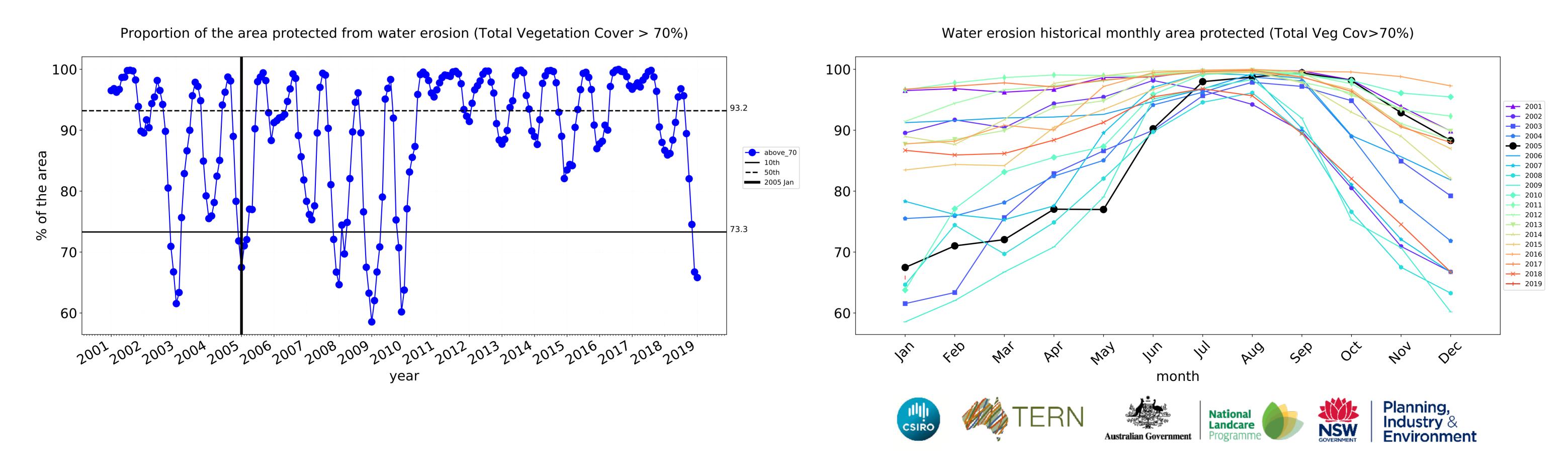






### **Grazing Woodland forest timeseries**



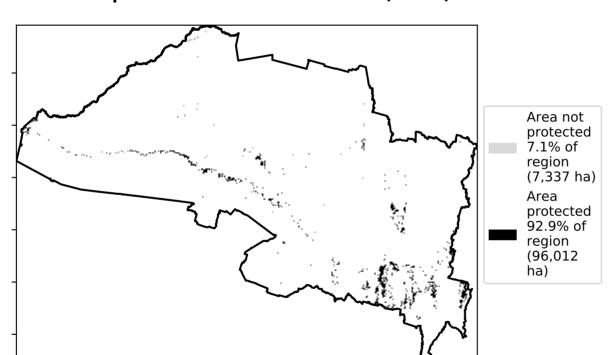


### **Grazing - Forest (non woodland)**

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

### Total Vegetation Cover [%]

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

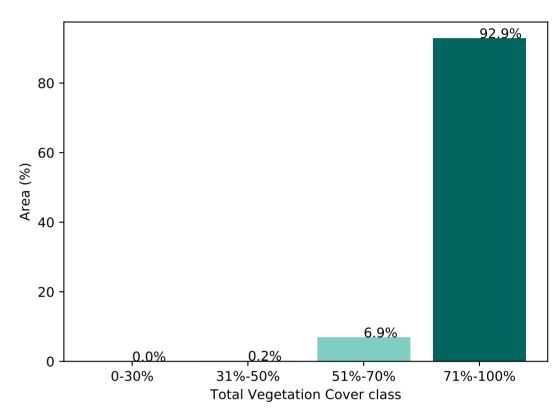


### Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

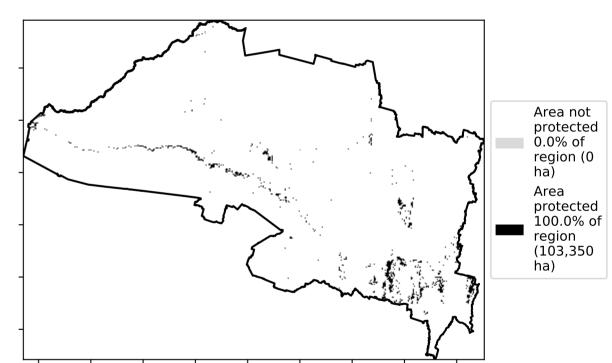
**Total Vegetation Cover Anomaly [%]** 

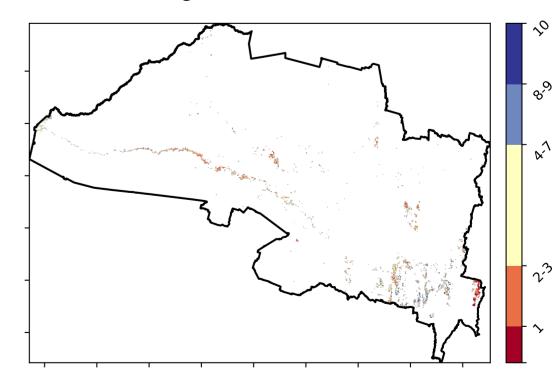
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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







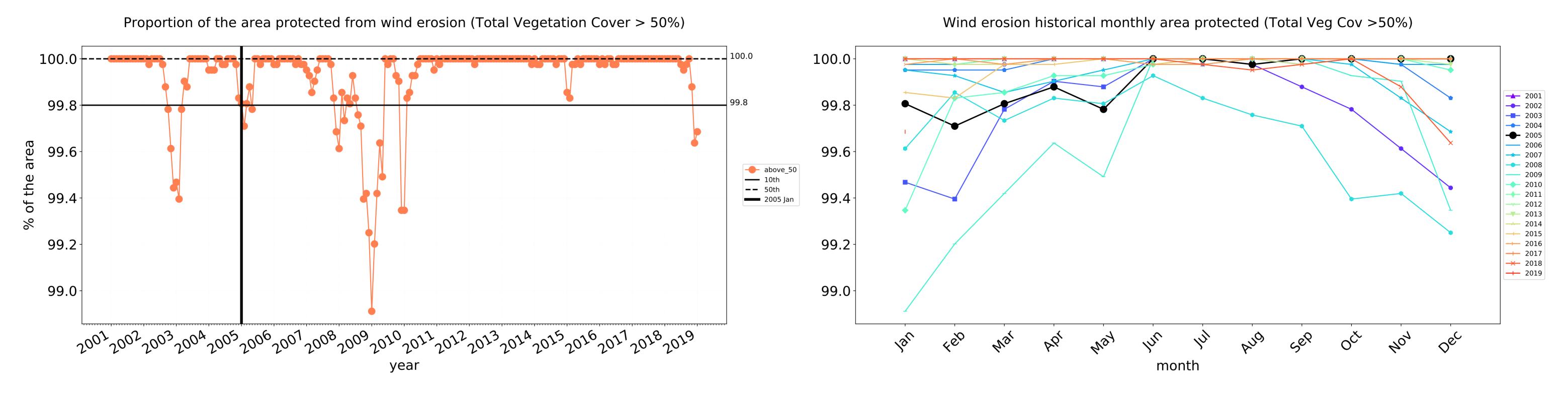


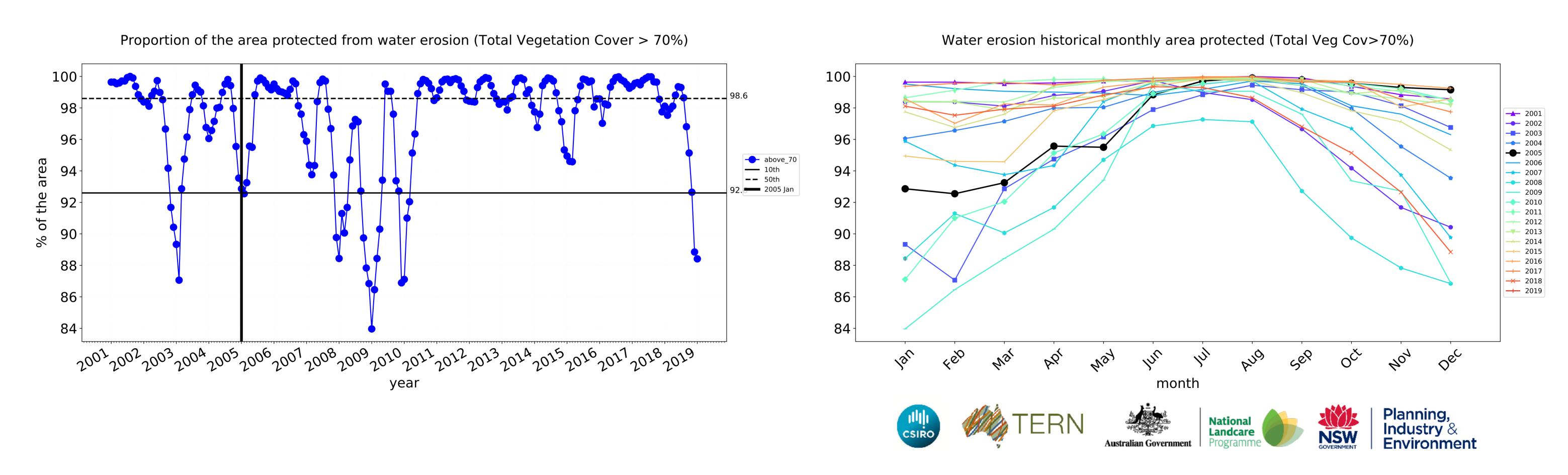






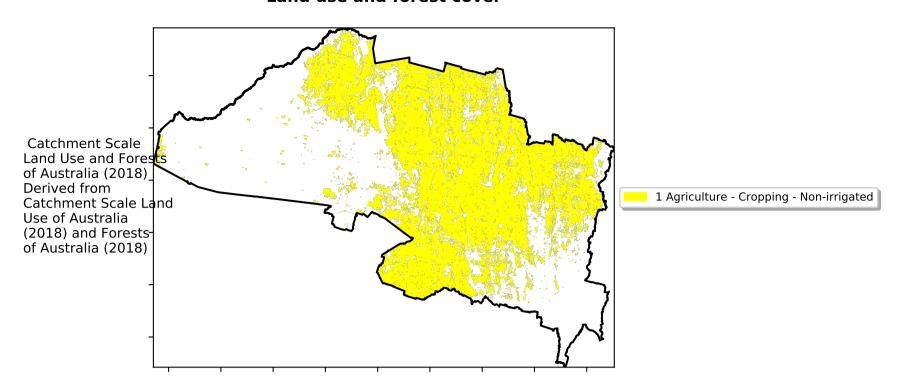




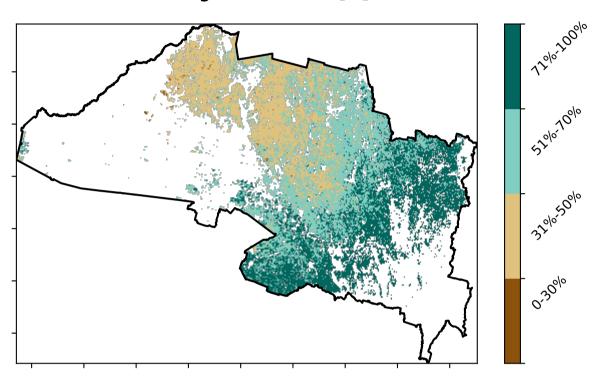


### **Cropping**

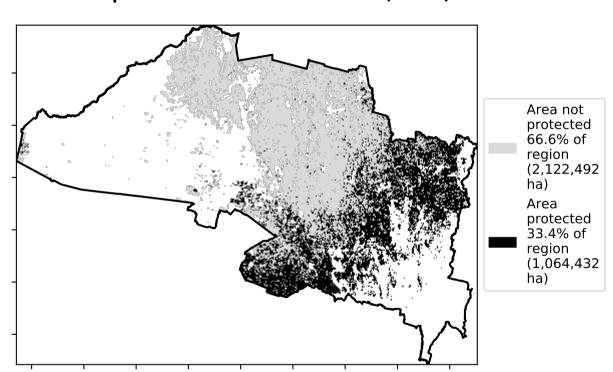
### Land use and forest cover



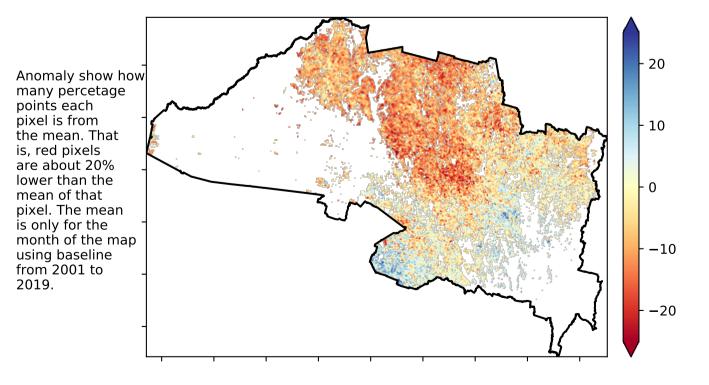
### **Total Vegetation Cover [%]**



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

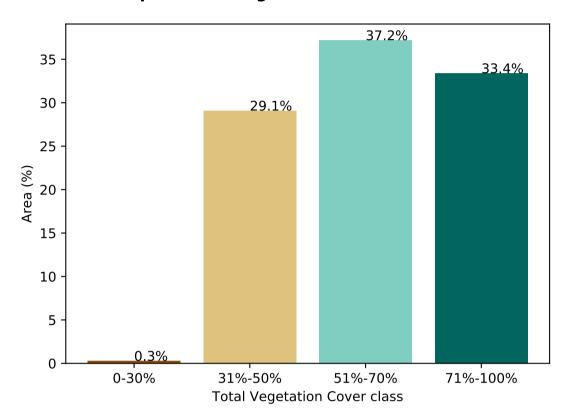


### Total Vegetation Cover Anomaly [%]

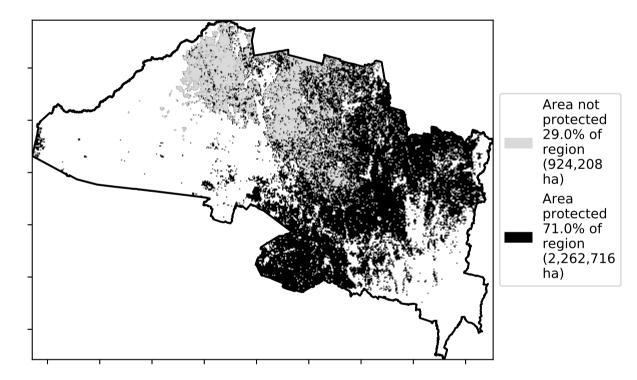


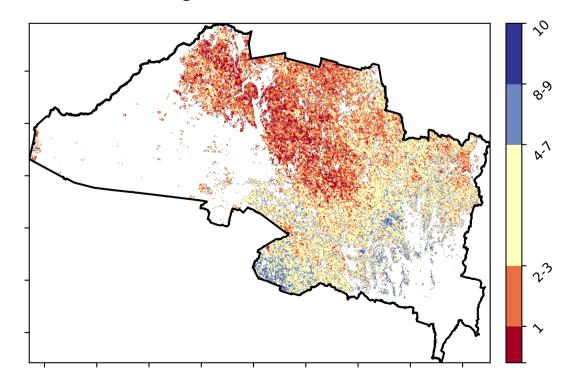
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









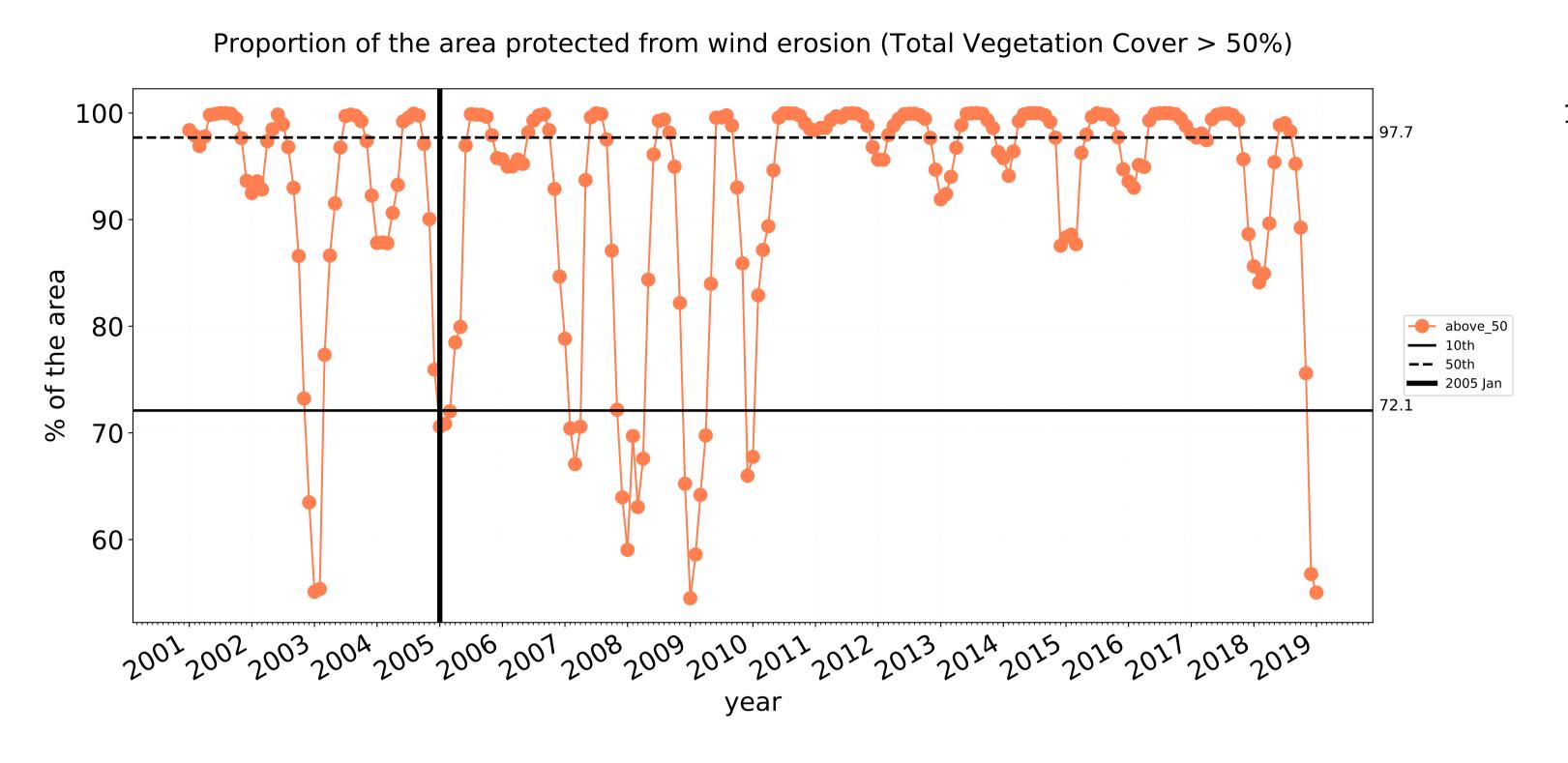


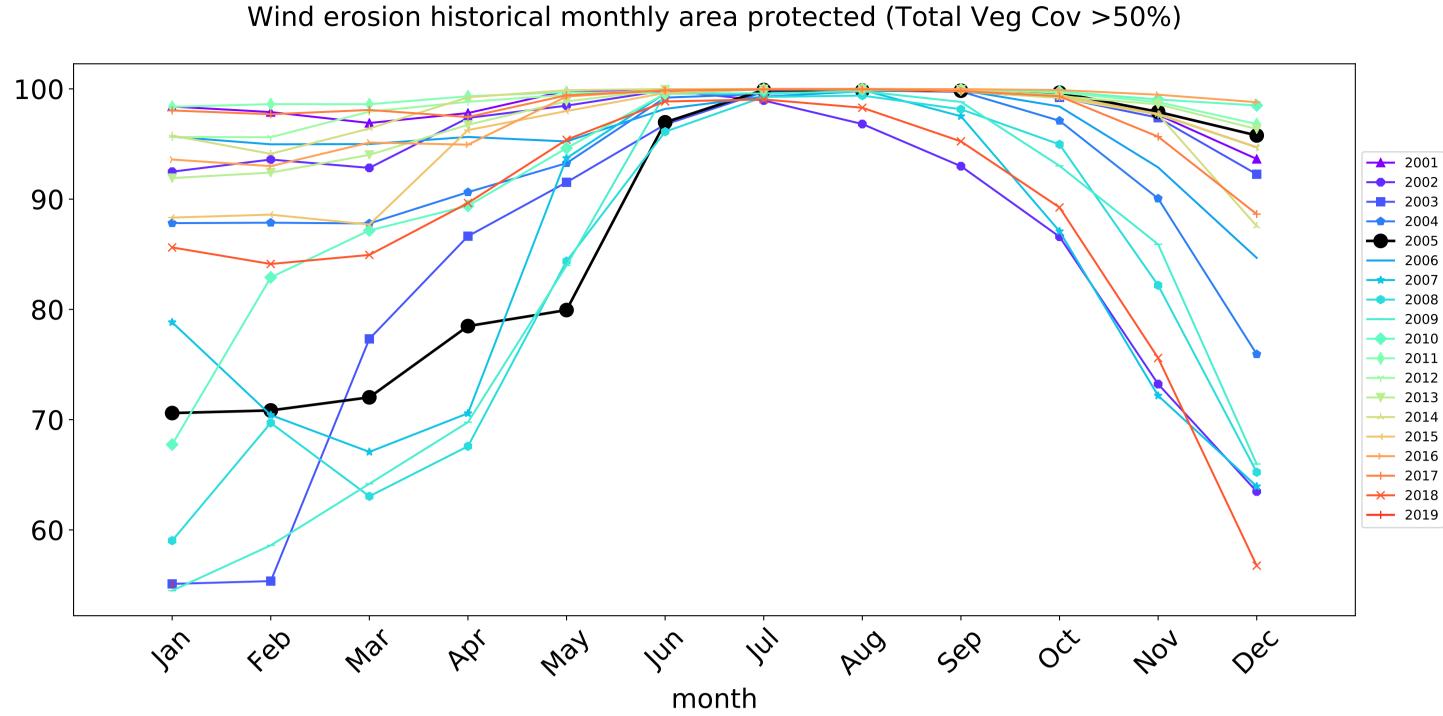


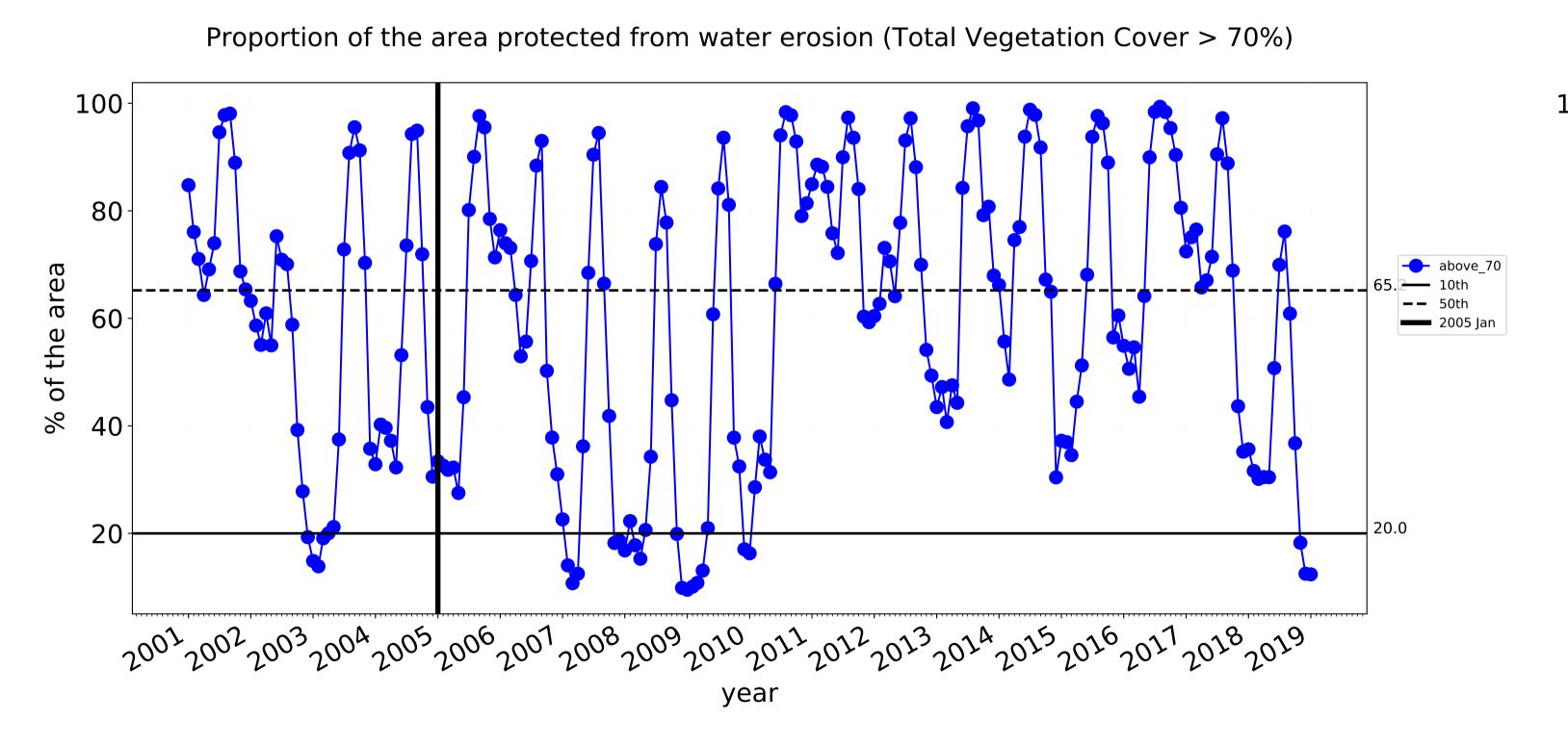


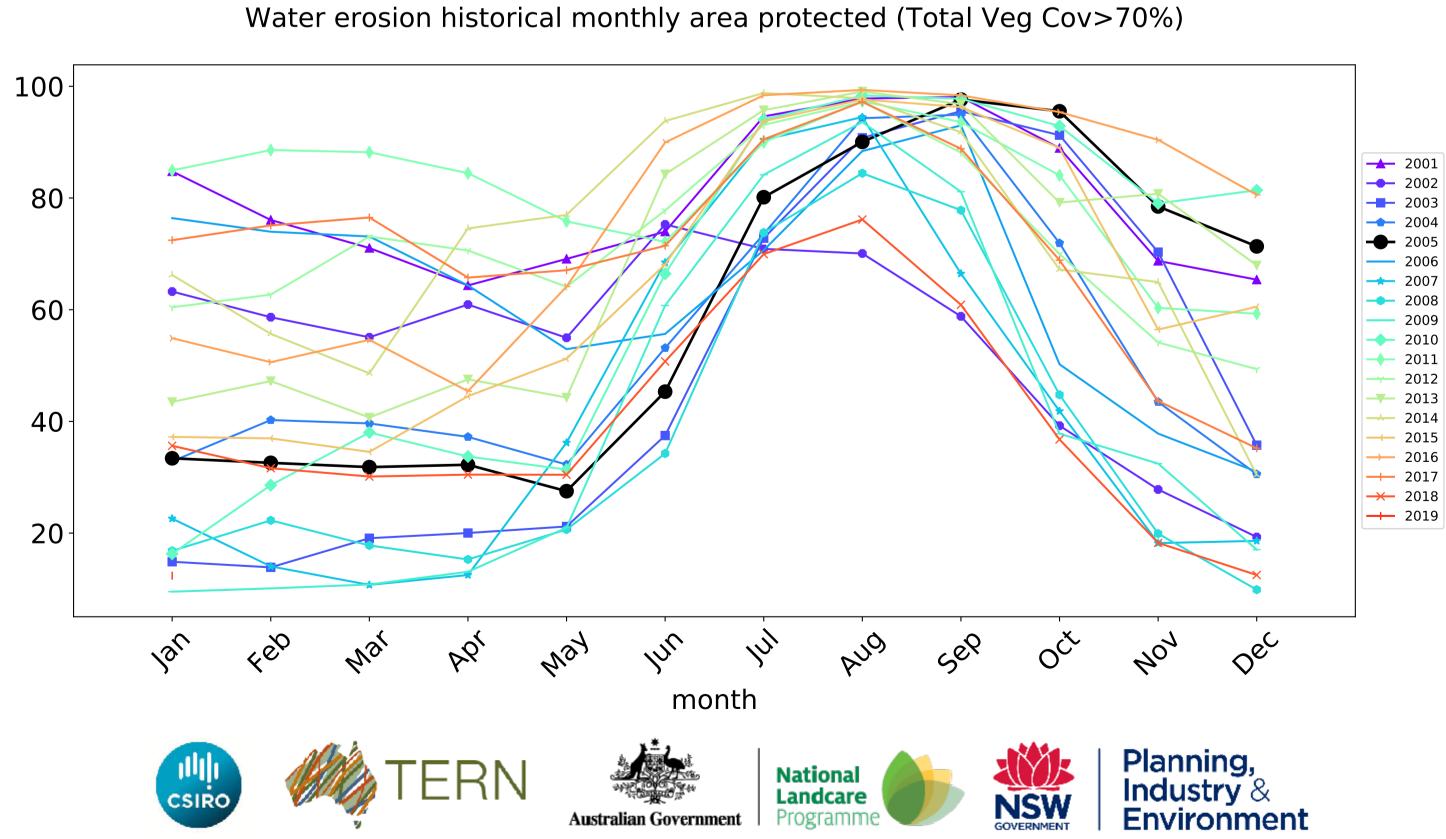


### **Cropping timeseries**

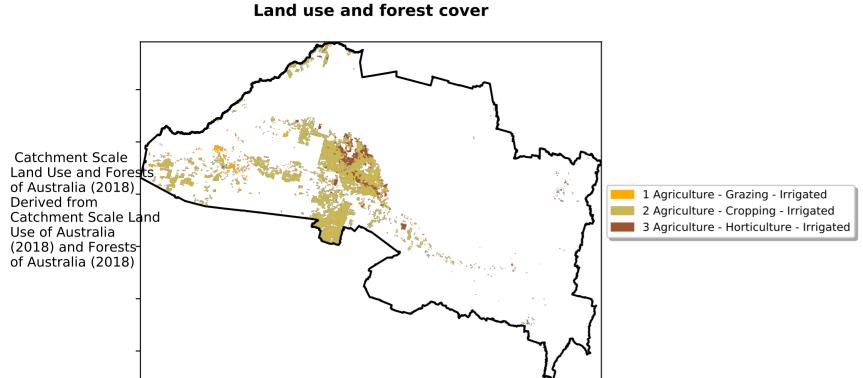


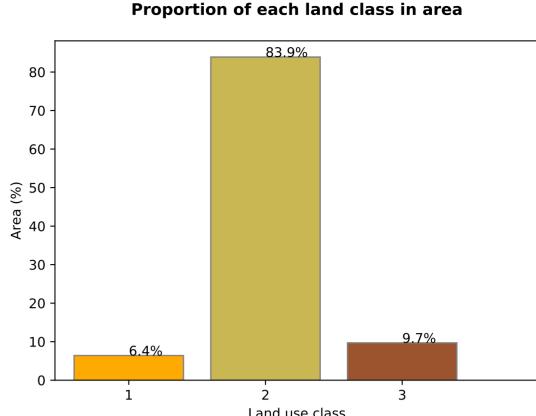


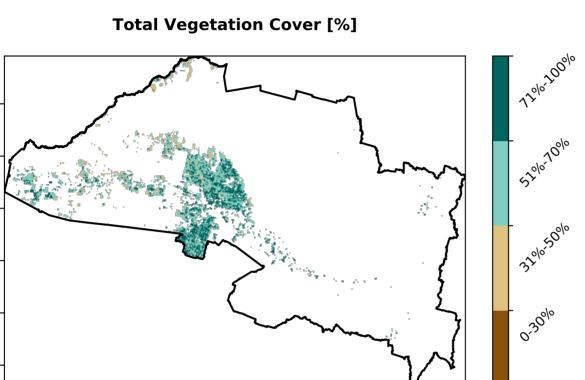


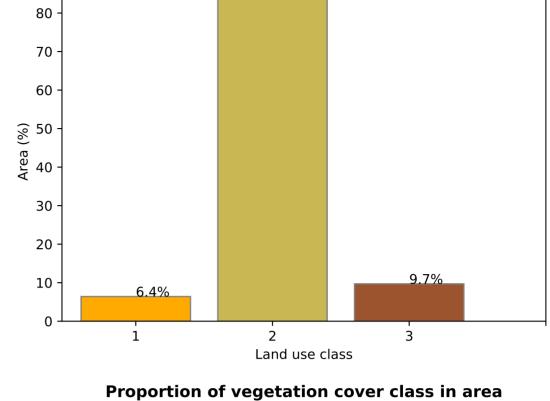


### Irrigation

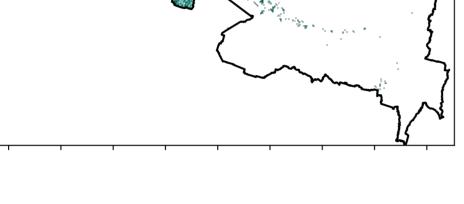




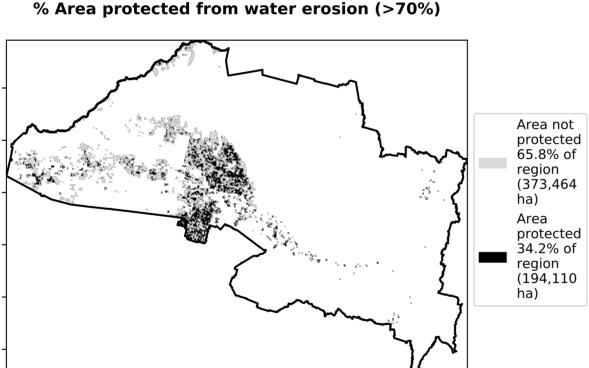


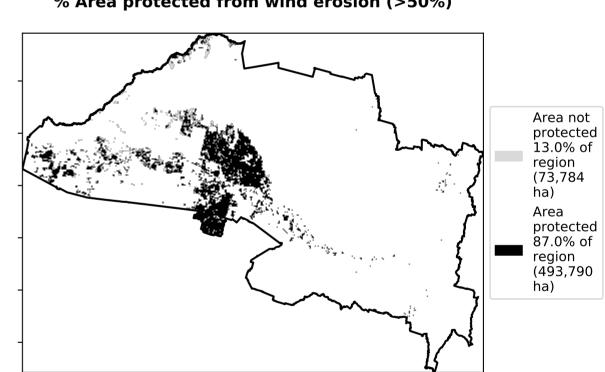


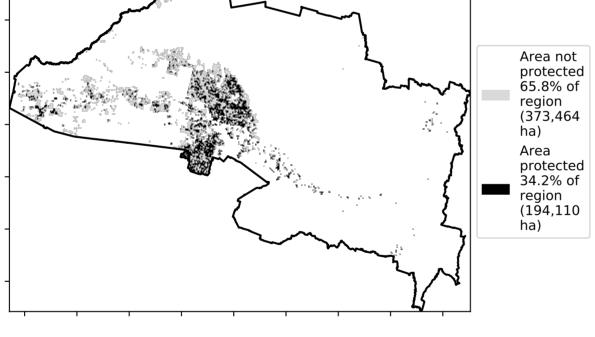
### 52.7% 50 40 34.2% Area (%) 00 20 -12.9% 10 31%-50% 51%-70% 71%-100% 0-30% **Total Vegetation Cover class**



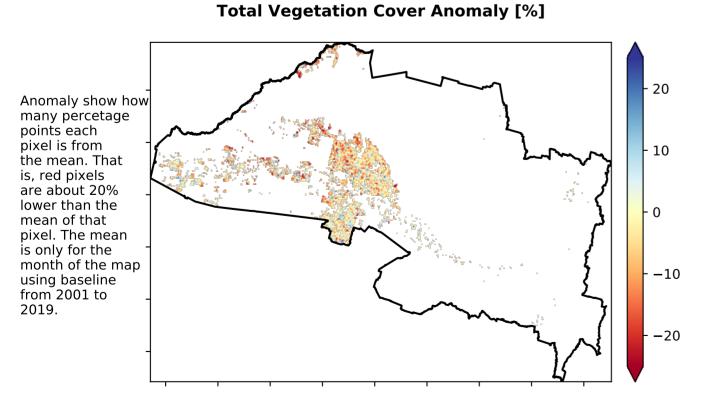
% Area protected from wind erosion (>50%)

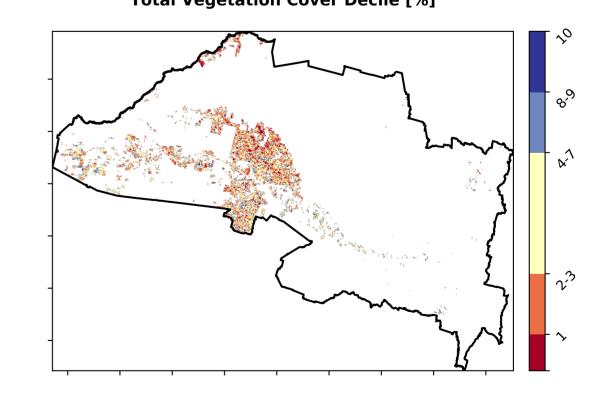






**Total Vegetation Cover Decile [%]** 





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.



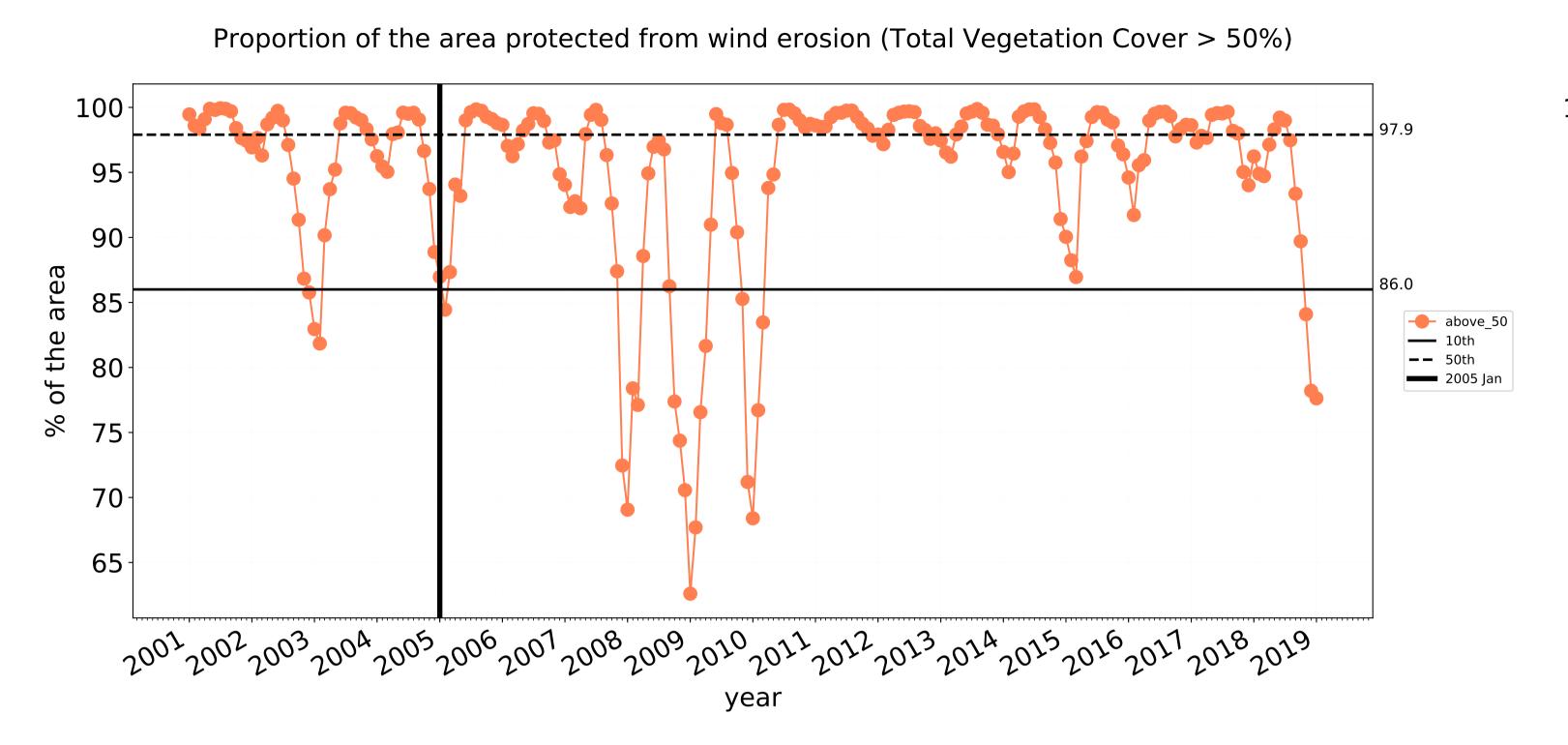


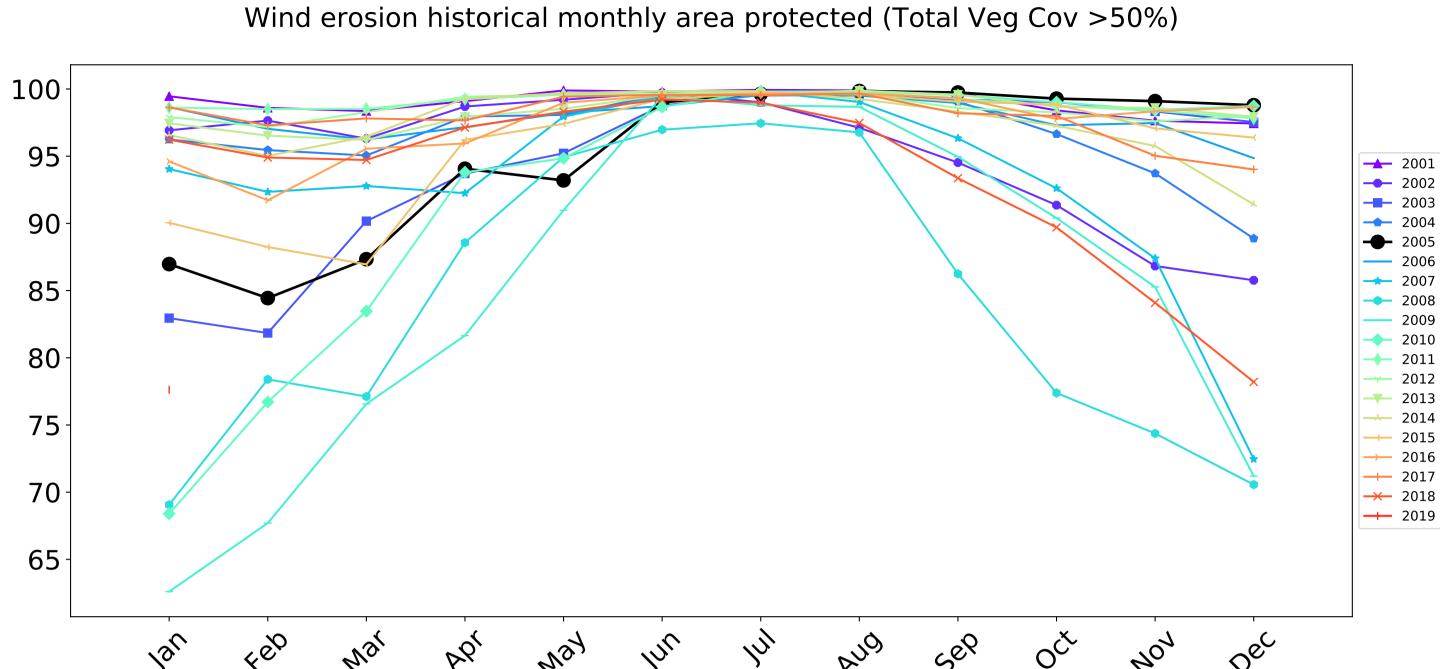




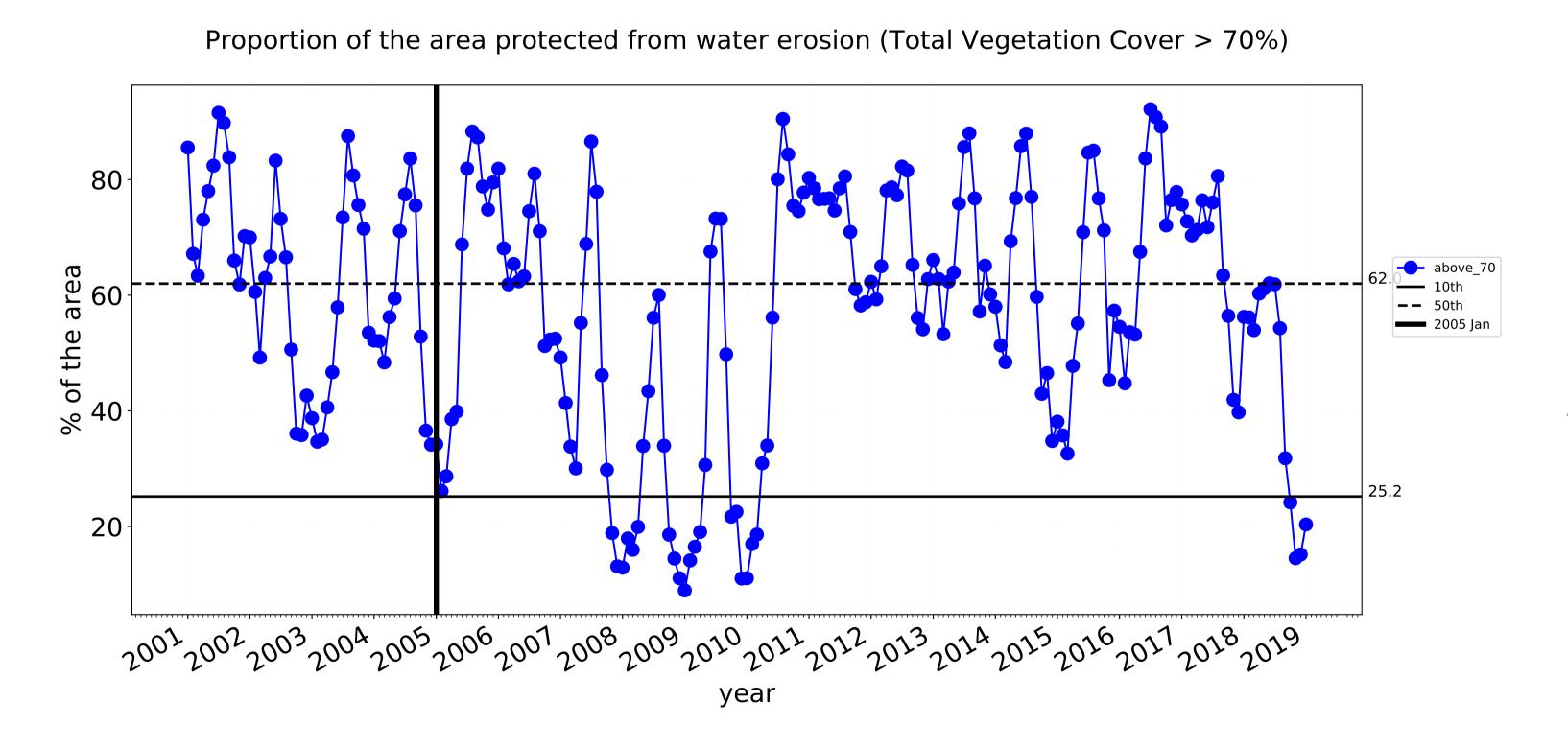


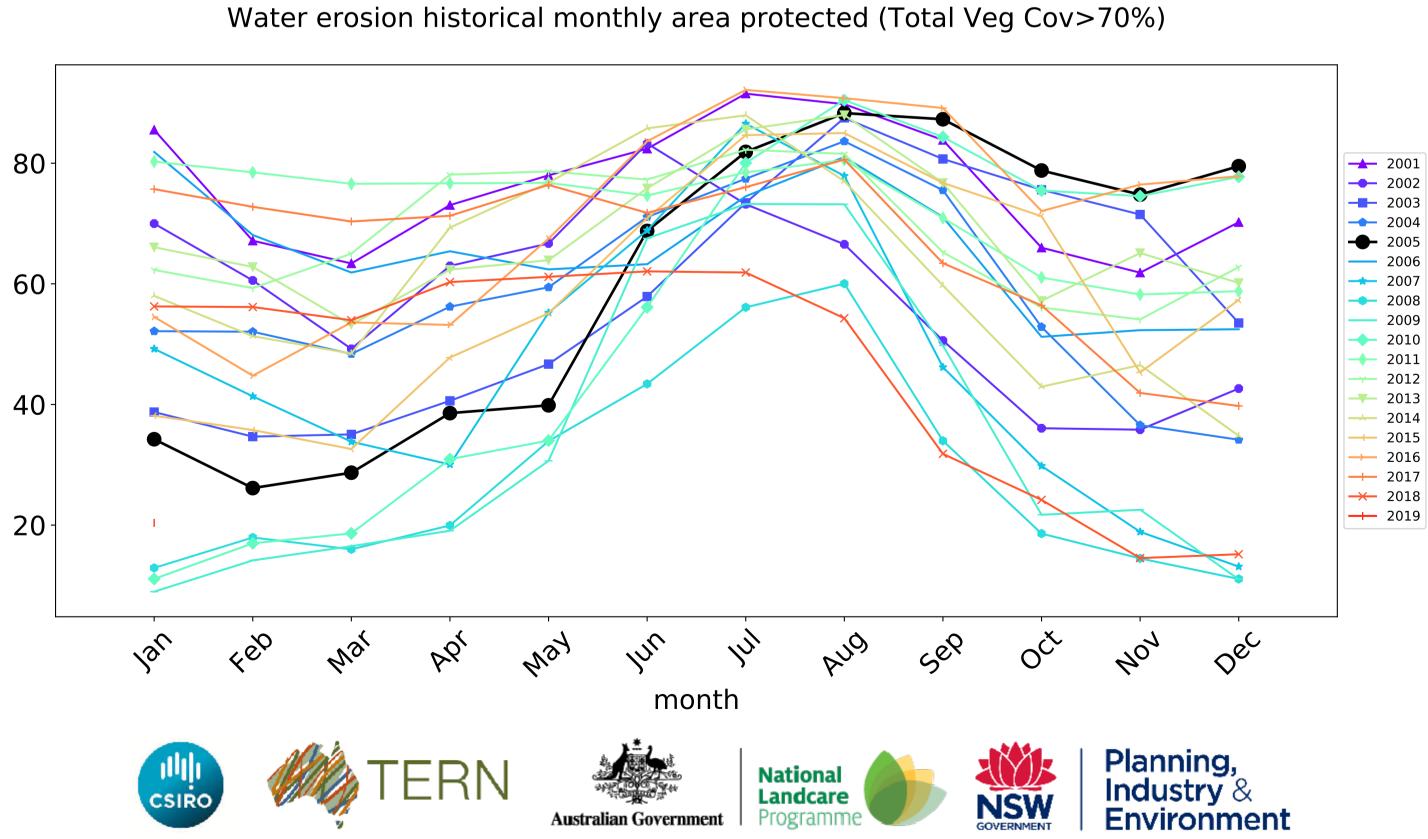






month



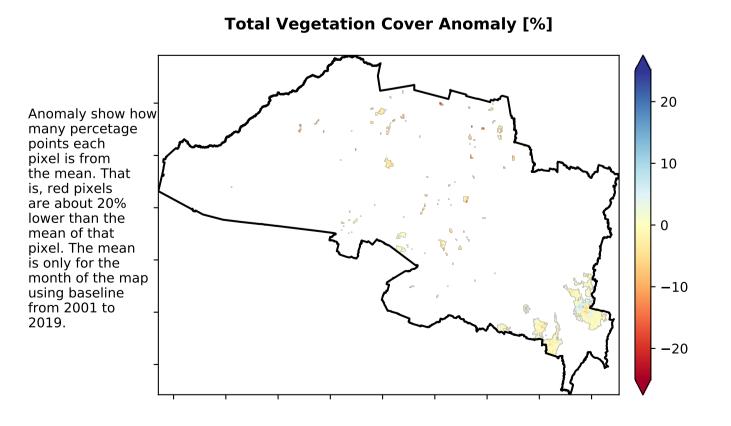


### **Production native forests and plantation forests**

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

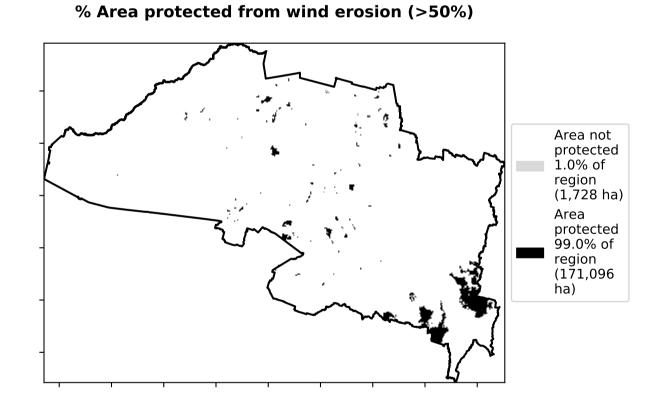
## Total Vegetation Cover [%]

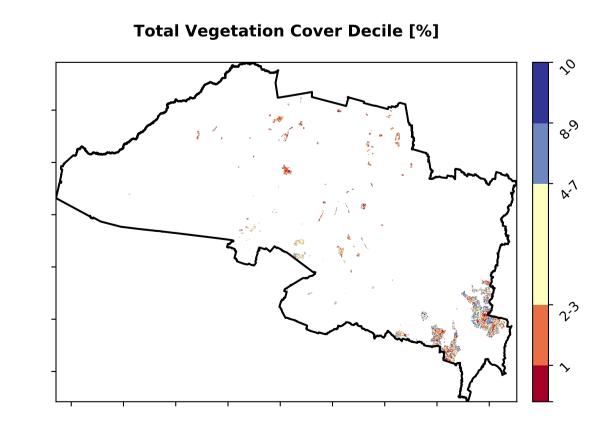
### % Area protected from water erosion (>70%) Area not protected 7.6% of region (13,134 ha) Area protected 92.4% of region (159,690 ha)



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.

# 80 - 92.4% 80 - 60 - 60 - 6.4% 20 - 0 - 1.2% 0-30% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class









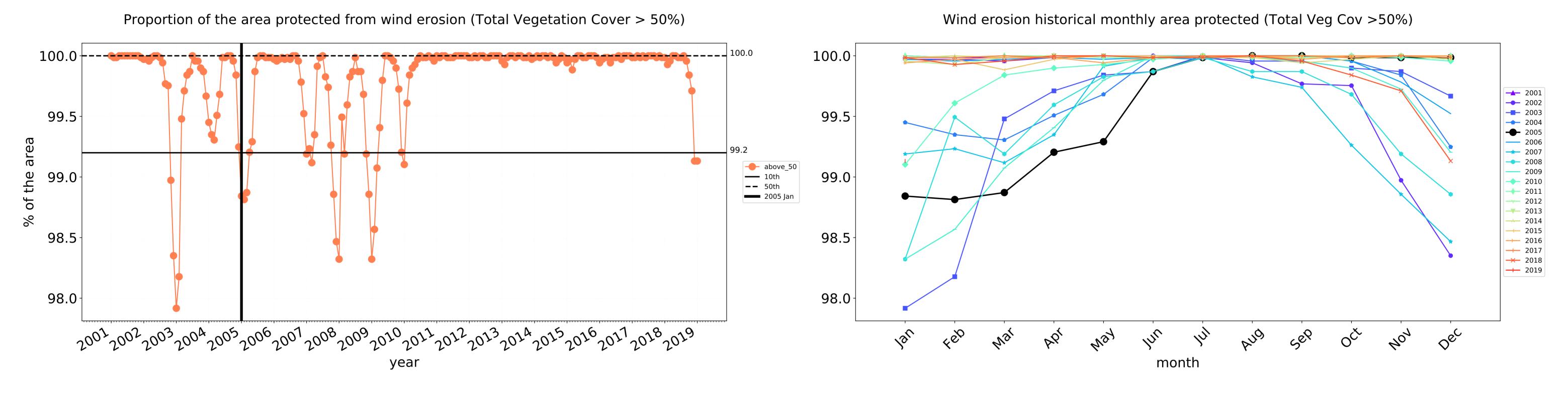


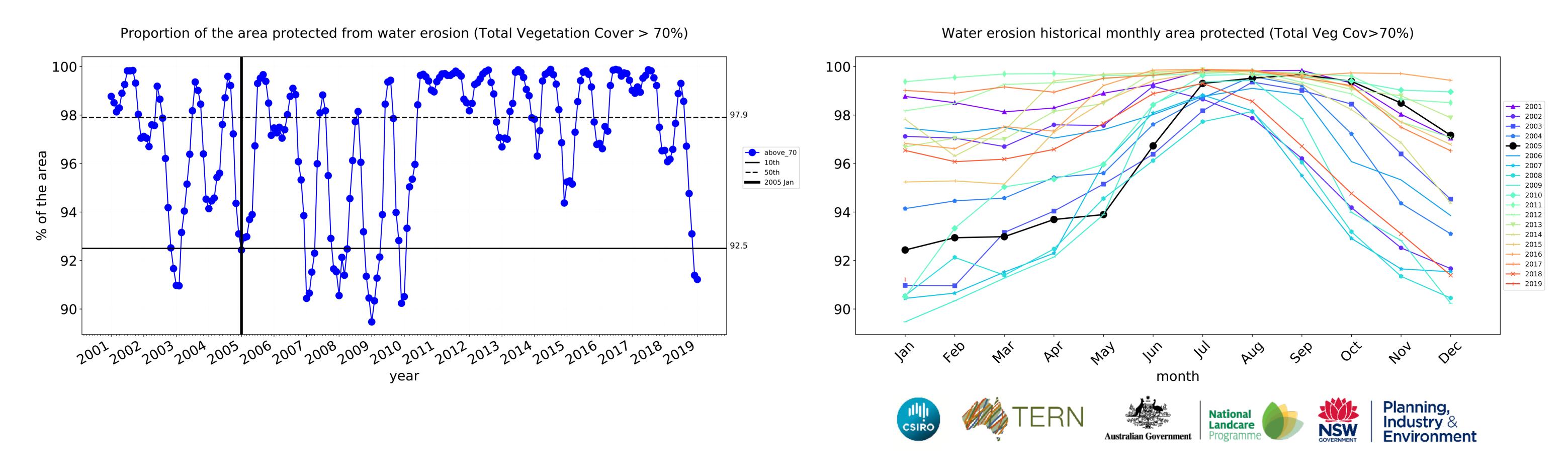






### **Production native forests and plantation forests timeseries**





### Riverina (6,694,775 ha and no data 13,560 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	6,694,775	99.5% 6,663,797	73.0% 4,884,914	39.1% 2,615,720	23.3% 1,562,091	9.2% 615,745	3.8% 251,818
Conservation and natural environments	323,100	100.0% 323,025	92.5% 298,825	81.7% 263,975	73.4% 237,150	43.9% 141,700	20.3% 65,650
Conservation and natural environments non forest	83,350	99.9% 83,275	71.1% 59,300	34.3% 28,550	19.9% 16,625	8.9% 7,400	4.8% 4,025
Conservation and natural environments Forest (non woodland)	195,250	100.0% 195,250	100.0% 195,200	99.4% 194,125	95.9% 187,250	64.5% 125,850	30.6% 59,725
Agriculture	6,067,850	99.5% 6,037,475	71.0% 4,310,075	35.2% 2,136,500	19.0% 1,154,975	6.0% 361,825	2.1% 125,325
Grazing	2,311,525	99.1% 2,290,175	67.8% 1,566,075	38.0% 877,675	28.4% 656,600	12.4% 285,775	4.8% 110,025
Grazing non forest	2,066,525	99.0% 2,045,175	64.1% 1,324,275	33.2% 686,125	25.5% 526,675	11.7% 241,325	4.7% 96,575
Grazing Woodland forest	141,650	100.0% 141,650	97.9% 138,650	67.5% 95,575	36.7% 52,000	5.6% 7,950	0.7% 925
Grazing - Forest (non woodland)	103,350	100.0% 103,350	99.8% 103,150	92.9% 95,975	75.4% 77,925	35.3% 36,500	12.1% 12,525
Cropping	3,186,925	99.7% 3,178,550	70.6% 2,249,875	33.4% 1,064,350	14.1% 450,025	2.2% 70,825	0.4% 13,800
Irrigation	567,575	99.9% 566,925	87.0% 493,625	34.2% 194,325	8.5% 48,225	0.9% 5,225	0.3% 1,500
Production native forests and plantation forests	172,825	100.0% 172,825	98.8% 170,825	92.4% 159,750	84.1% 145,275	62.4% 107,800	34.7% 60,050











