### **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: December 2013** 

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





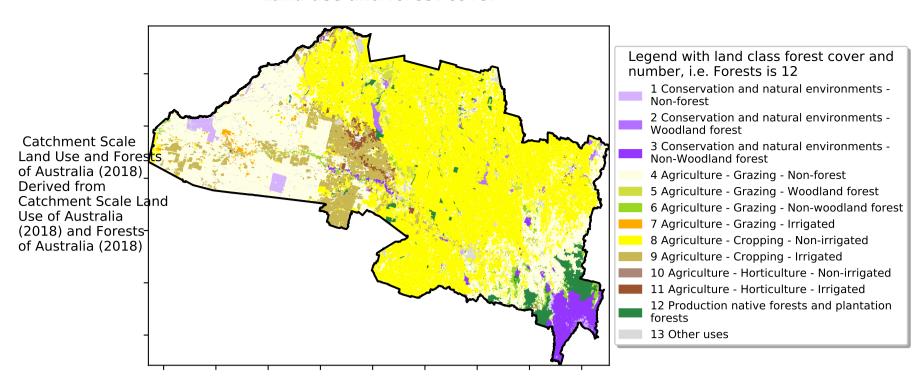




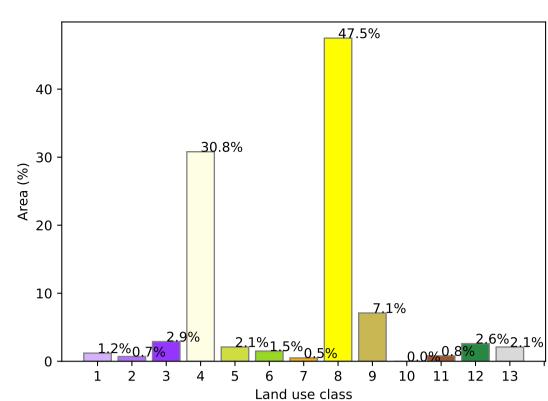


### **Vegetation Cover Dec 2013**

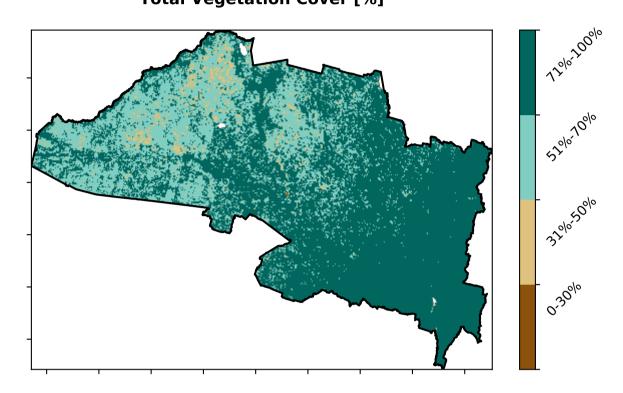
### Land use and forest cover



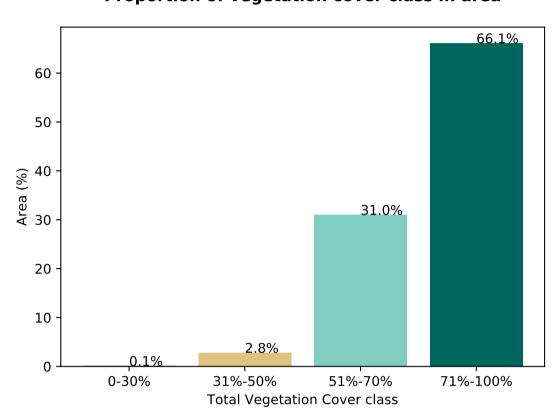
### **Proportion of each land class in area**



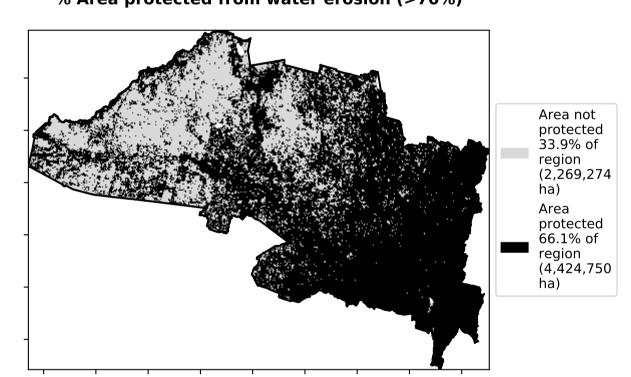
### Total Vegetation Cover [%]



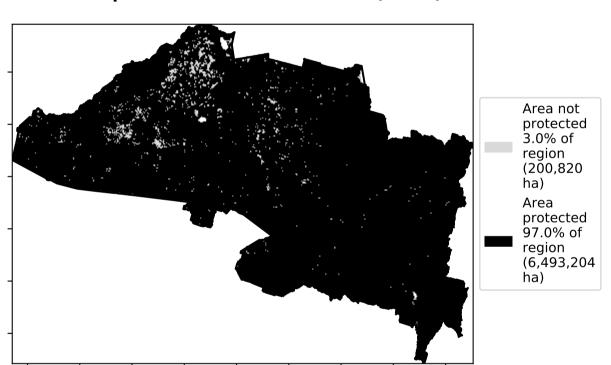
Proportion of vegetation cover class in area



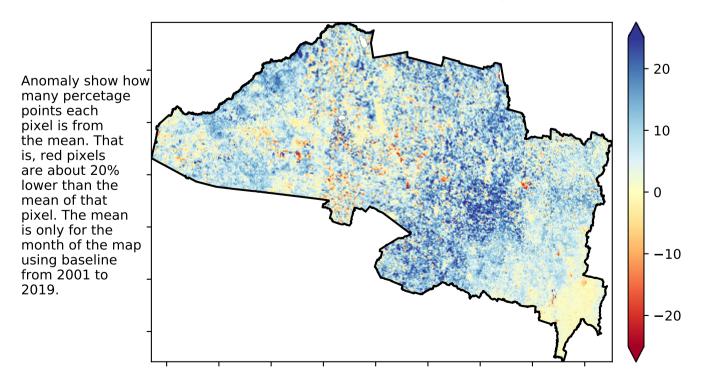
### % Area protected from water erosion (>70%)



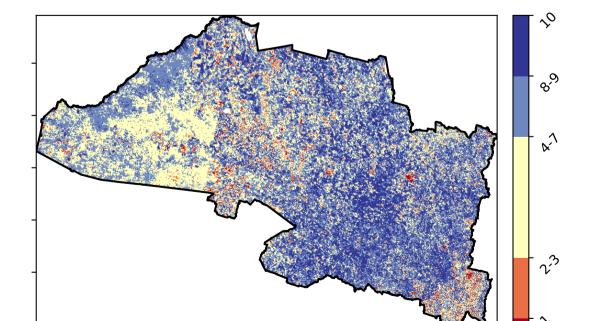
% Area protected from wind erosion (>50%)



### 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.



**Total Vegetation Cover Decile [%]** 



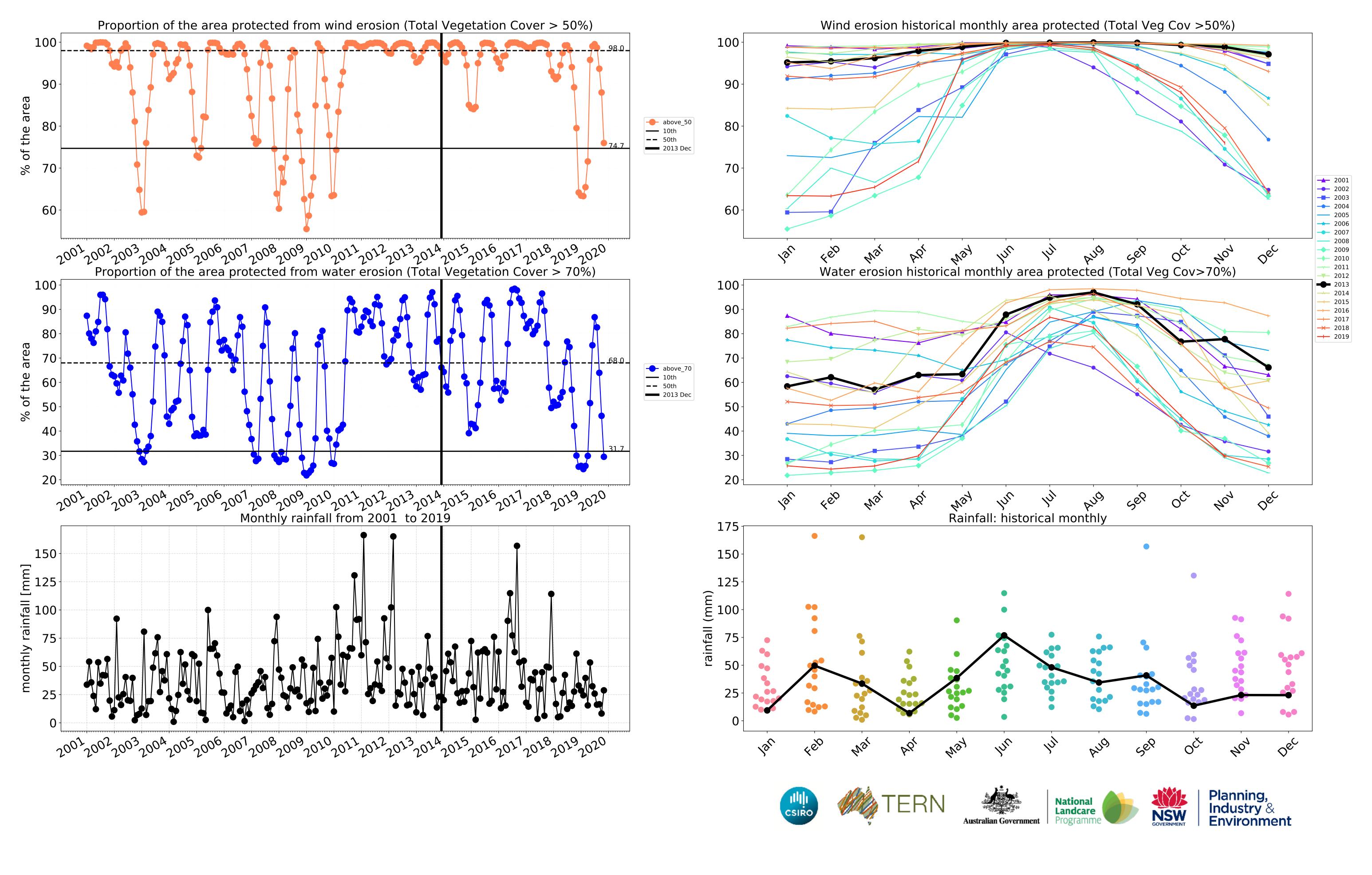




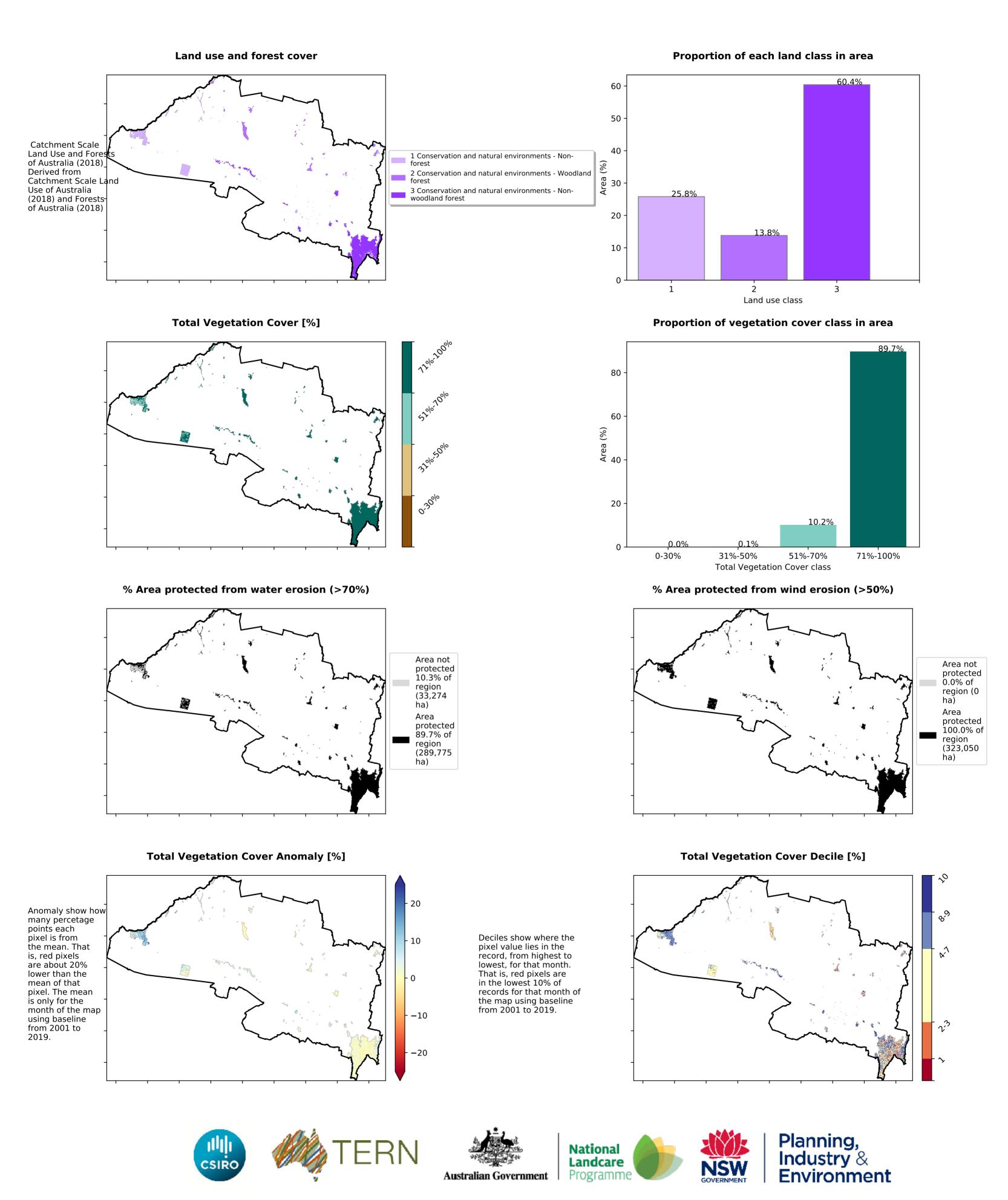




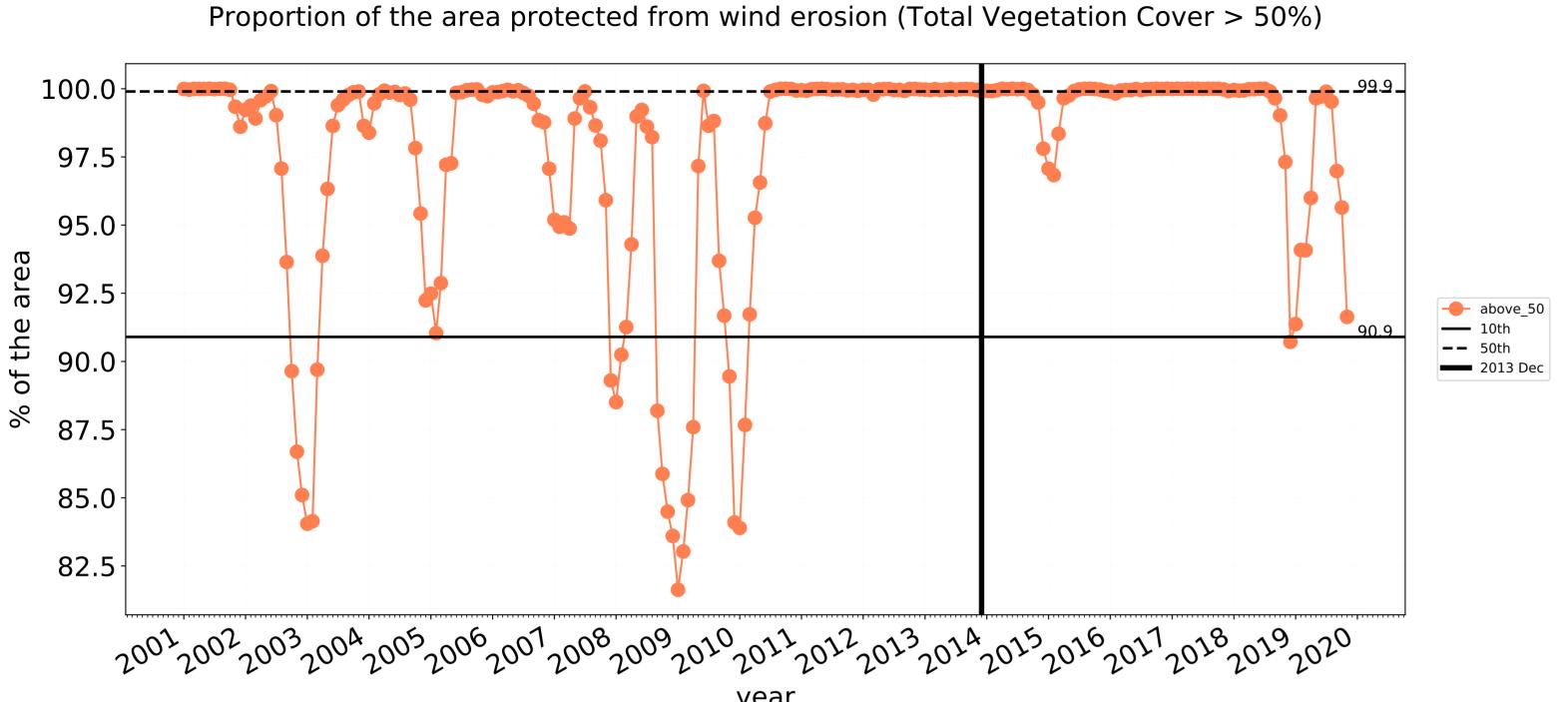


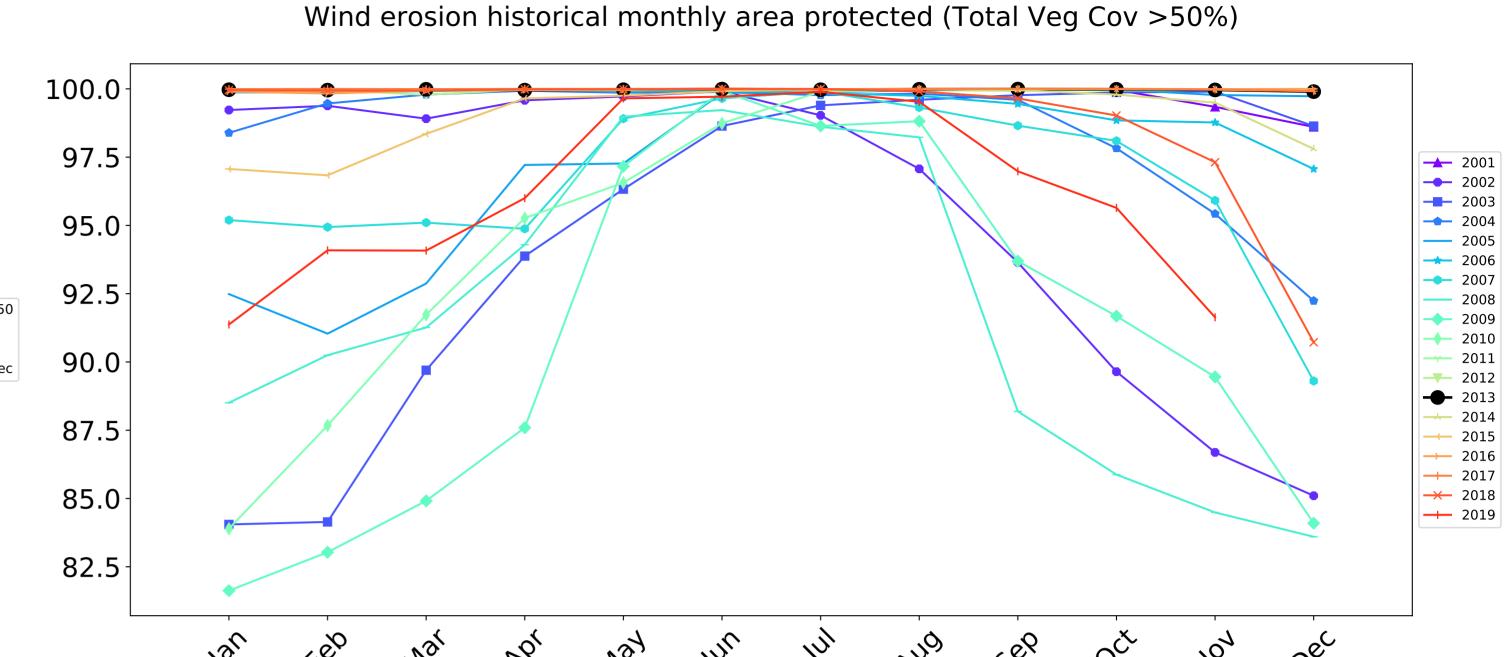


### **Conservation and natural environments**

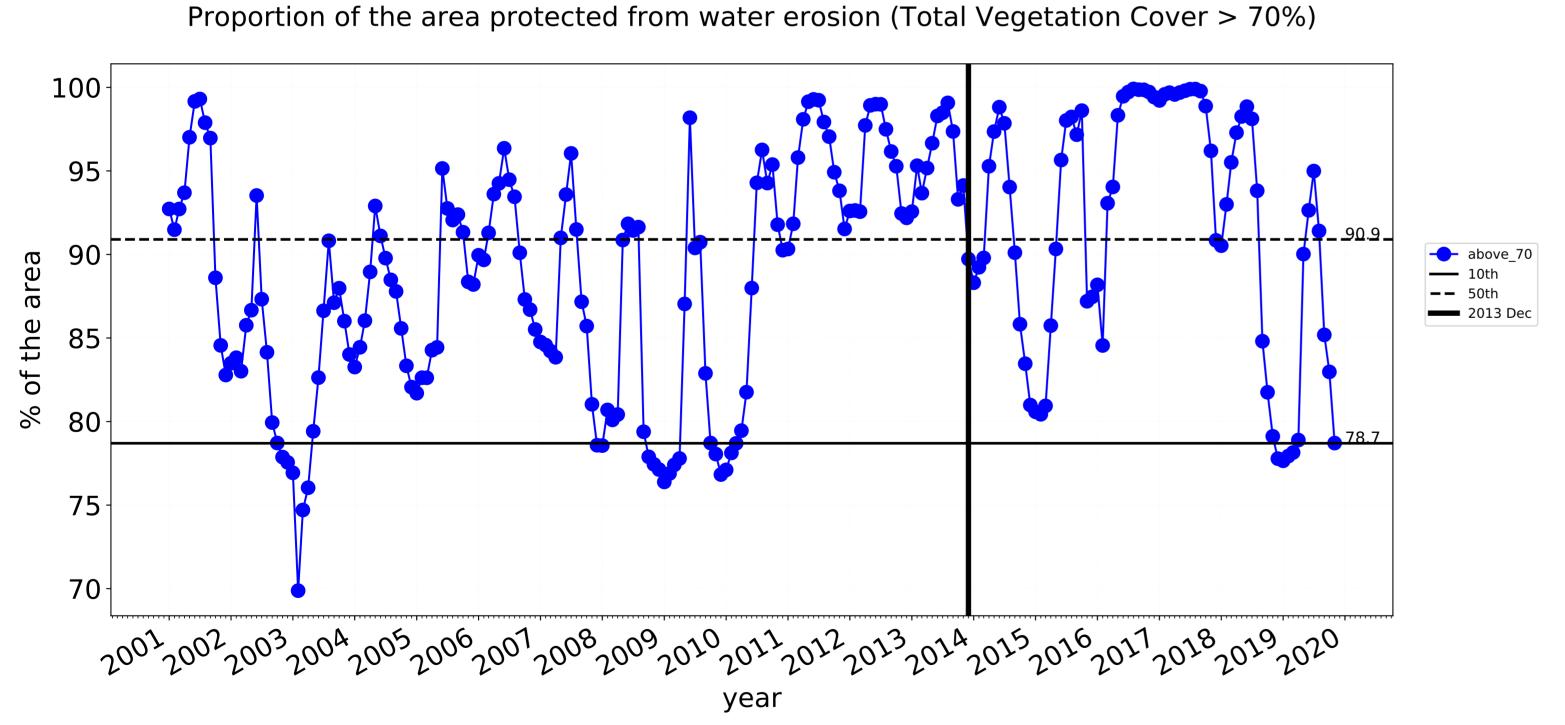


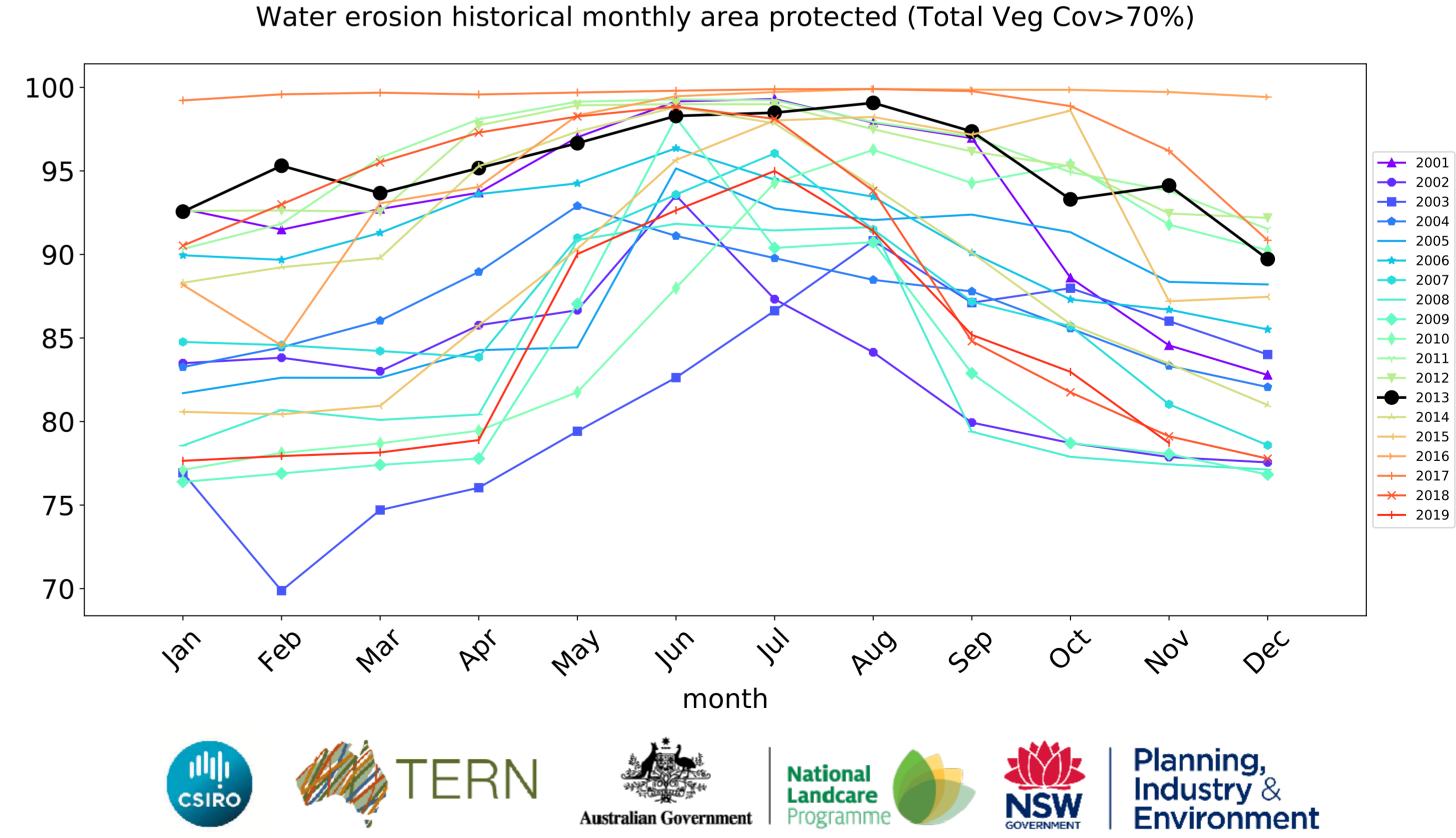
### **Conservation and natural environments timeseries**





month



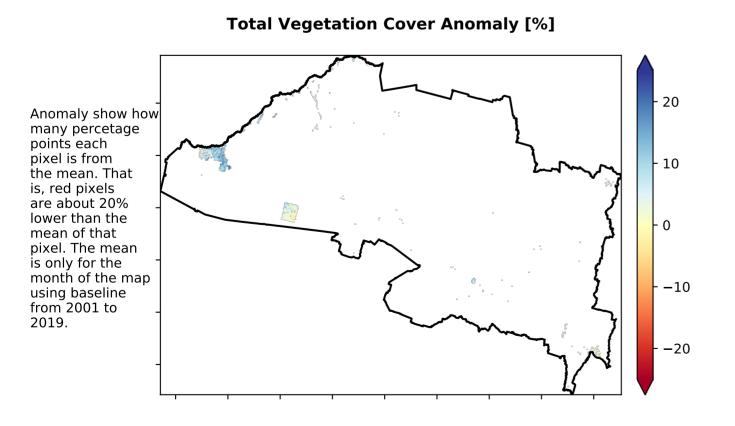


### **Conservation and natural environments non forest**

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

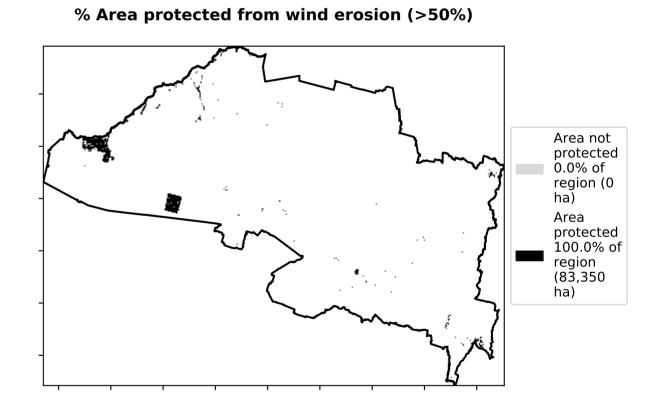
# Total Vegetation Cover [%]

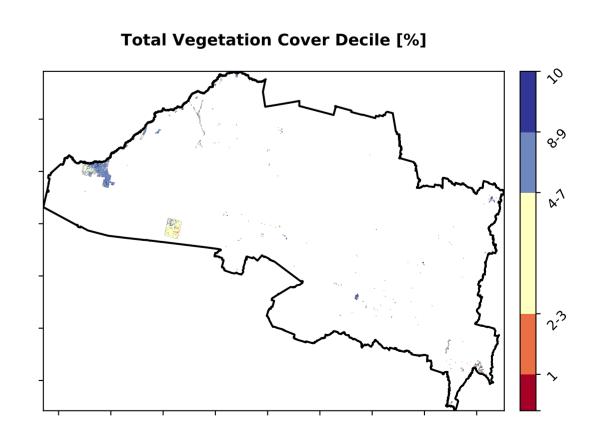
### % Area protected from water erosion (>70%) Area not protected 38.6% of region (32,173 ha) Area protected 61.4% of region (51,176 ha)



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.

# Proportion of vegetation cover class in area 60 - 61.4% 40 - 38.2% 20 - 10 - 0.1% 0.3% 0-30% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class









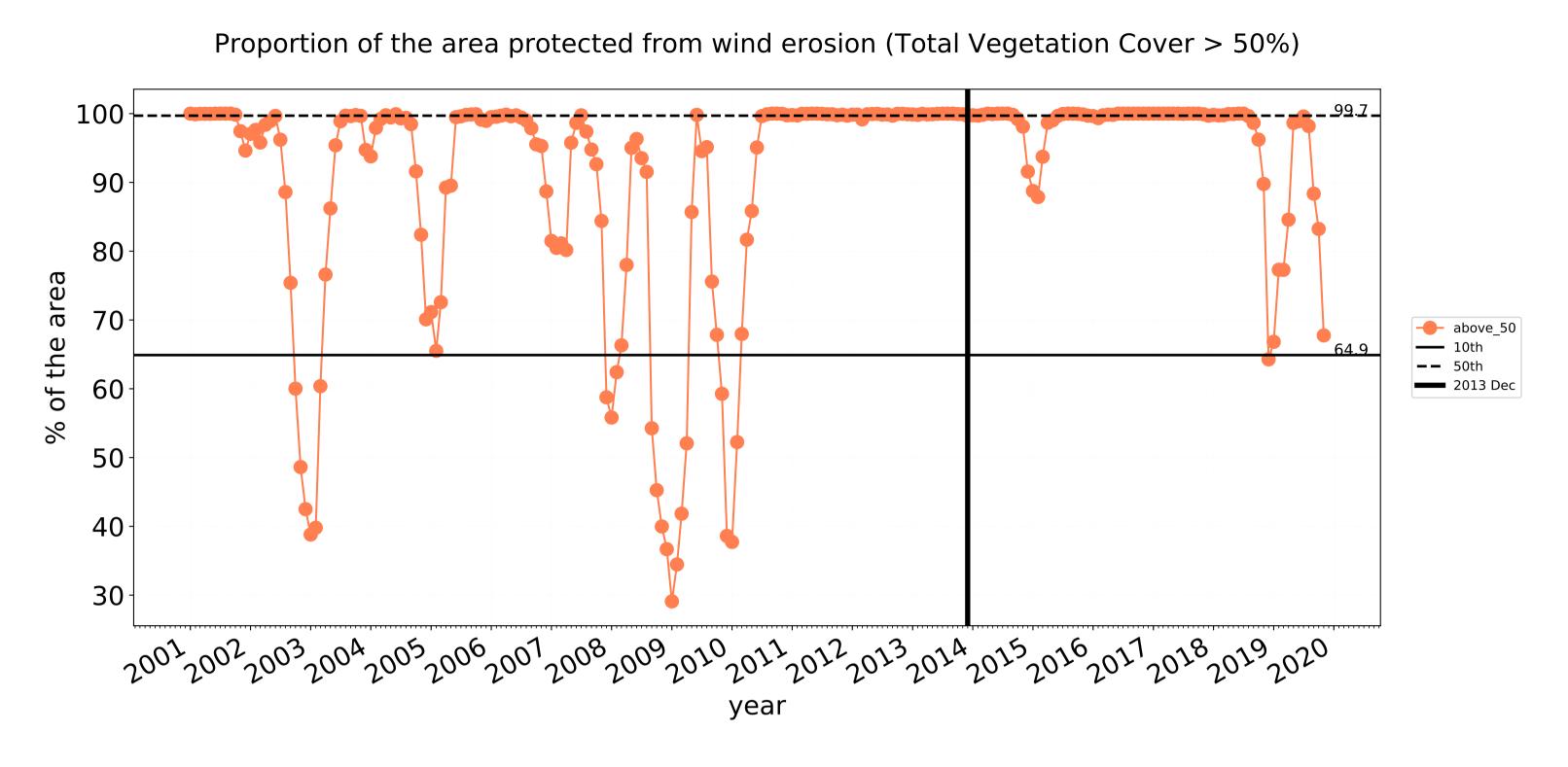


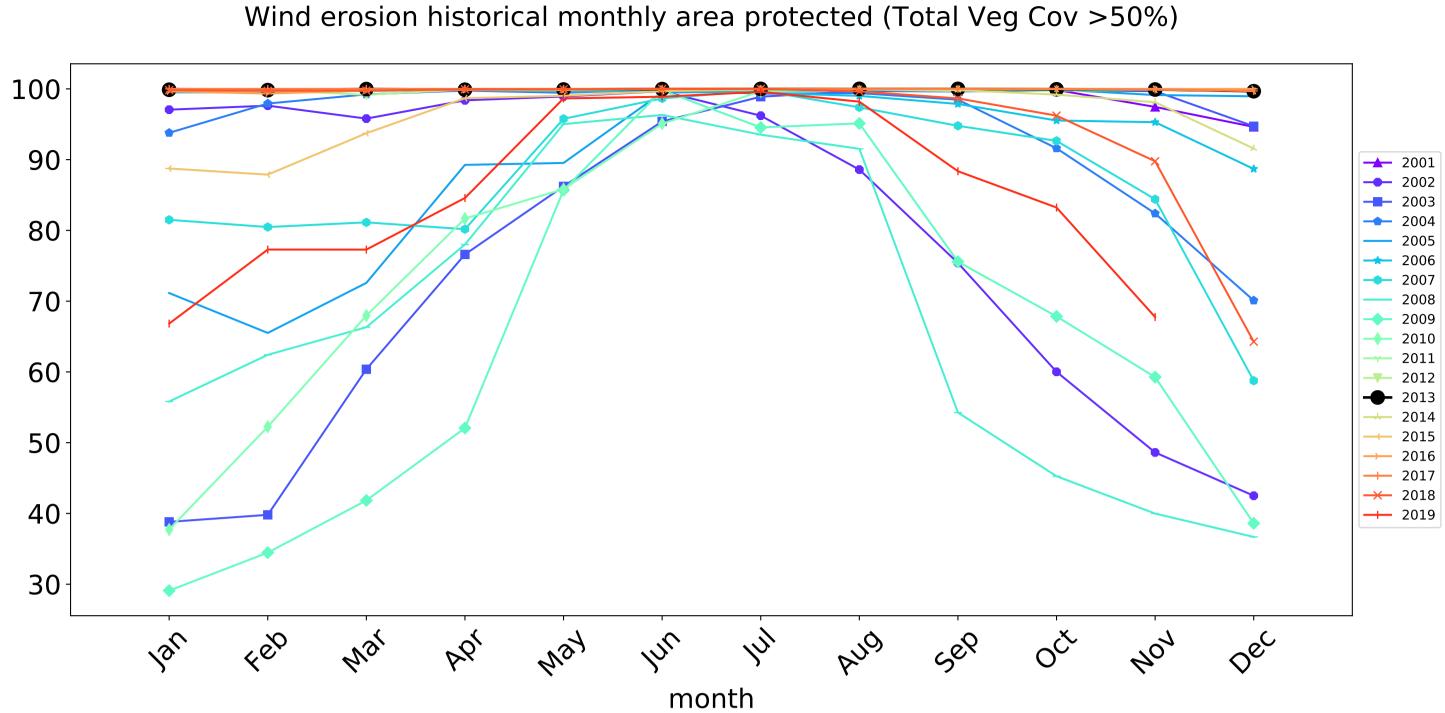


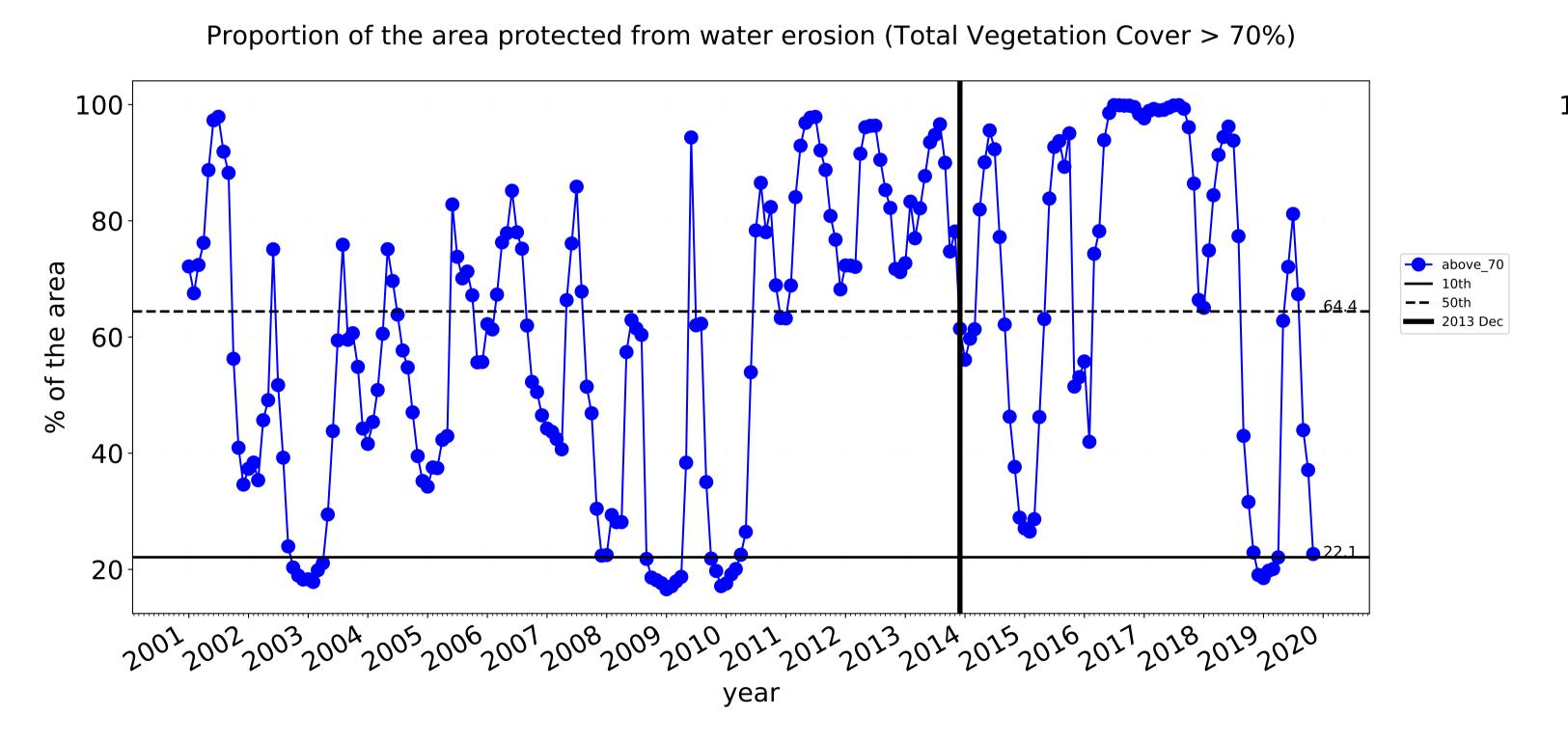


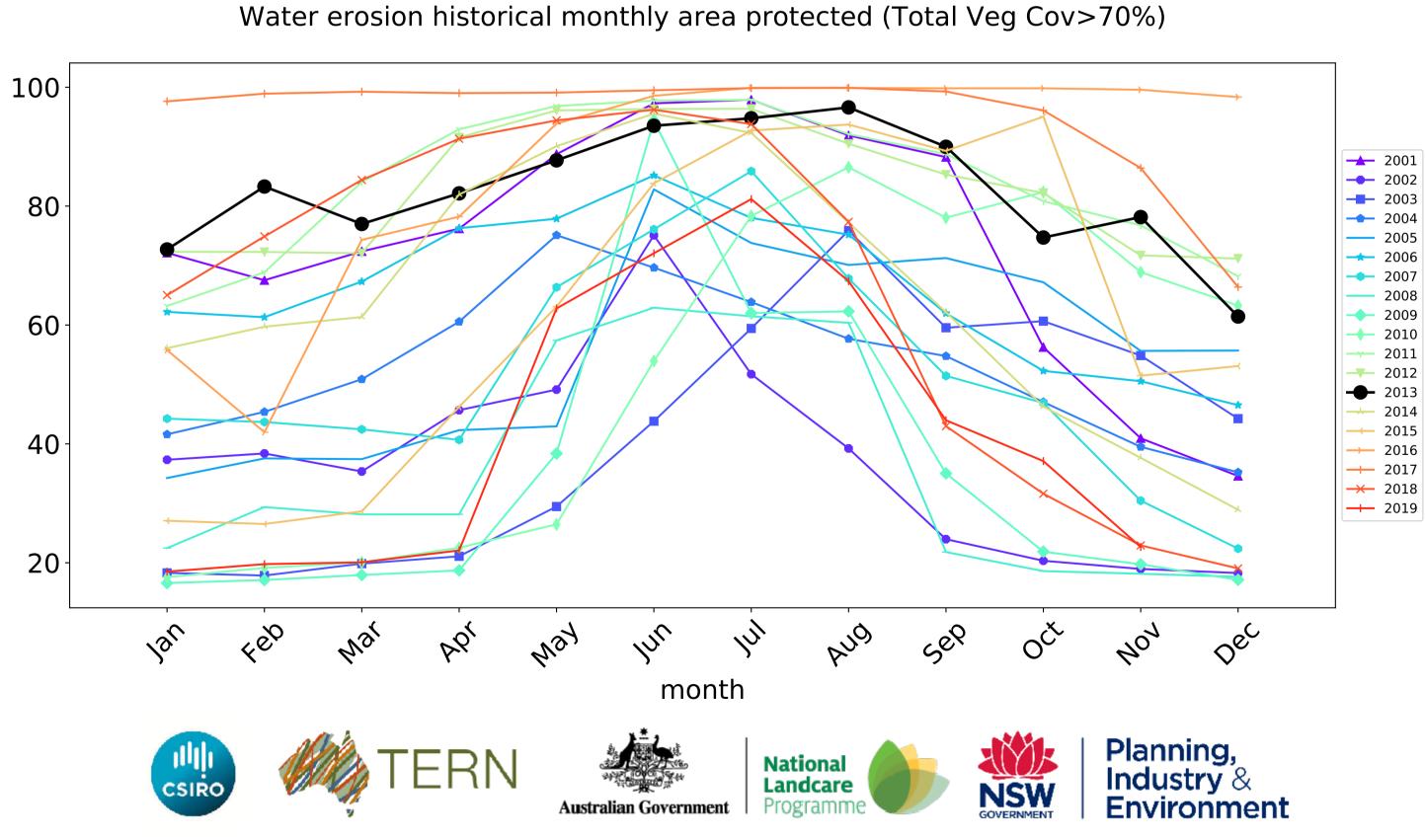


### **Conservation and natural environments non forest timeseries**

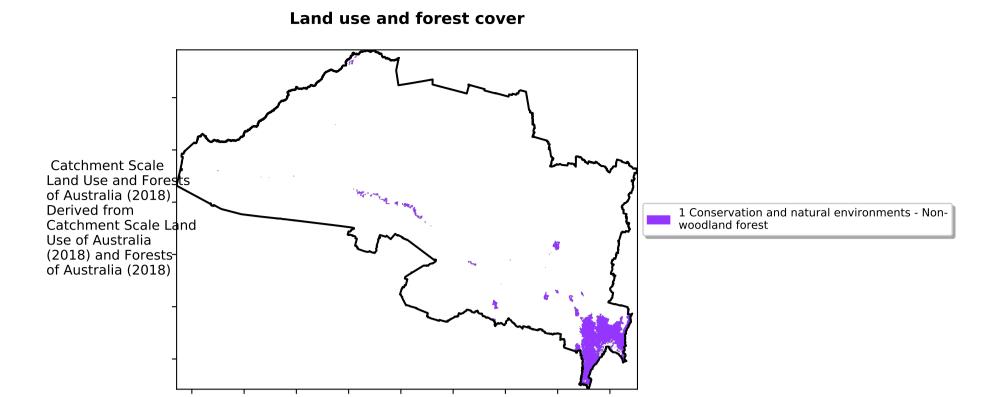




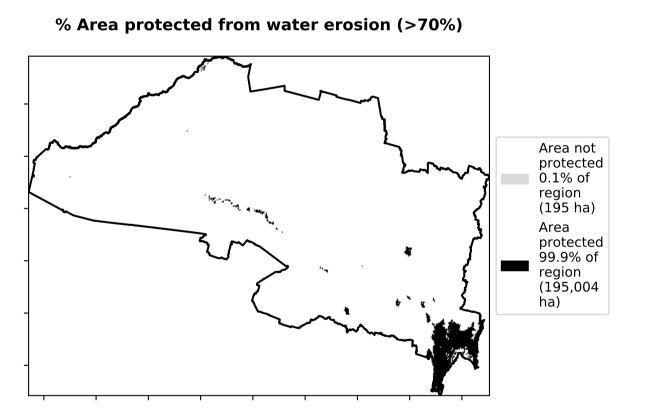


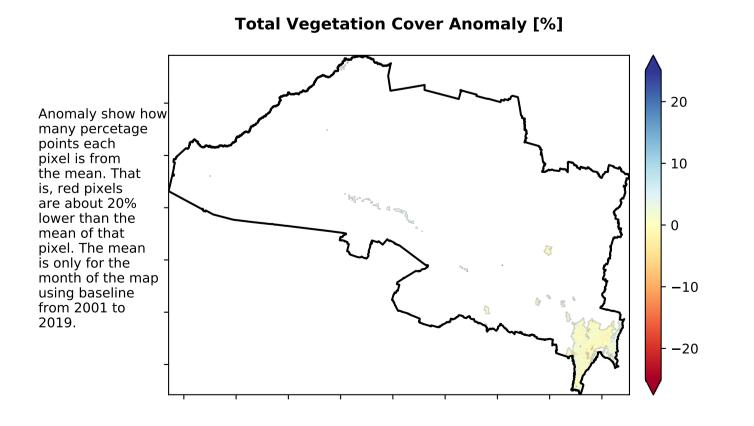


### **Conservation and natural environments Forest (non woodland)**

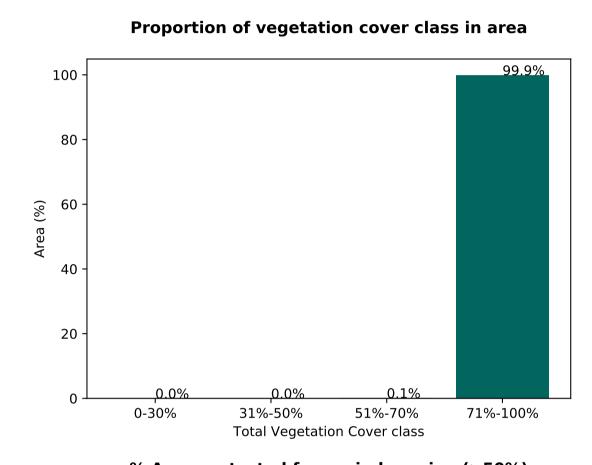


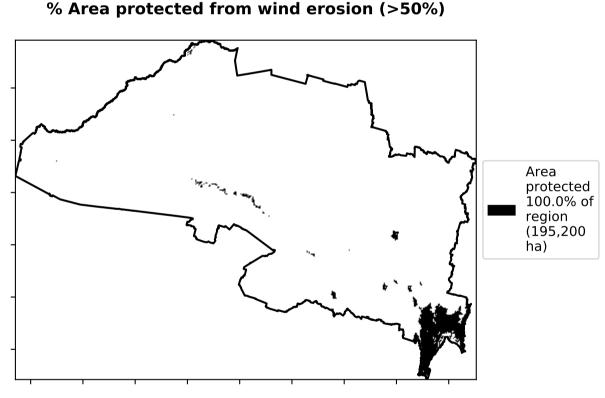
# Total Vegetation Cover [%] Trolo Indolo Tr

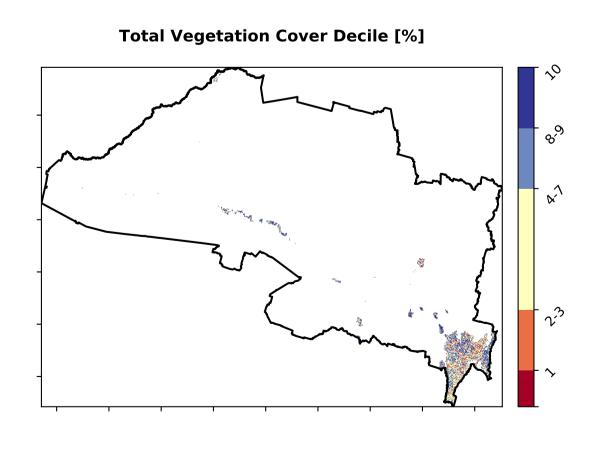




### Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









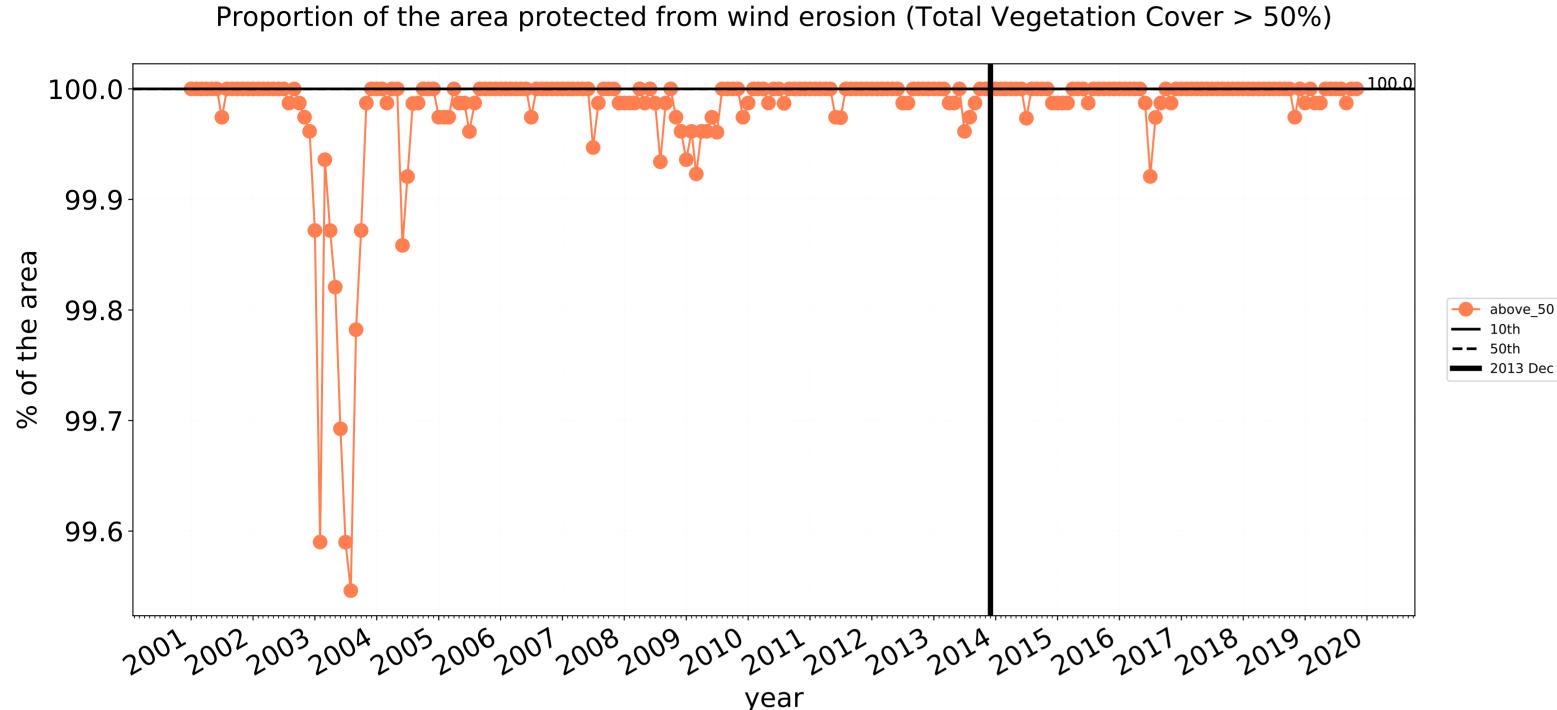


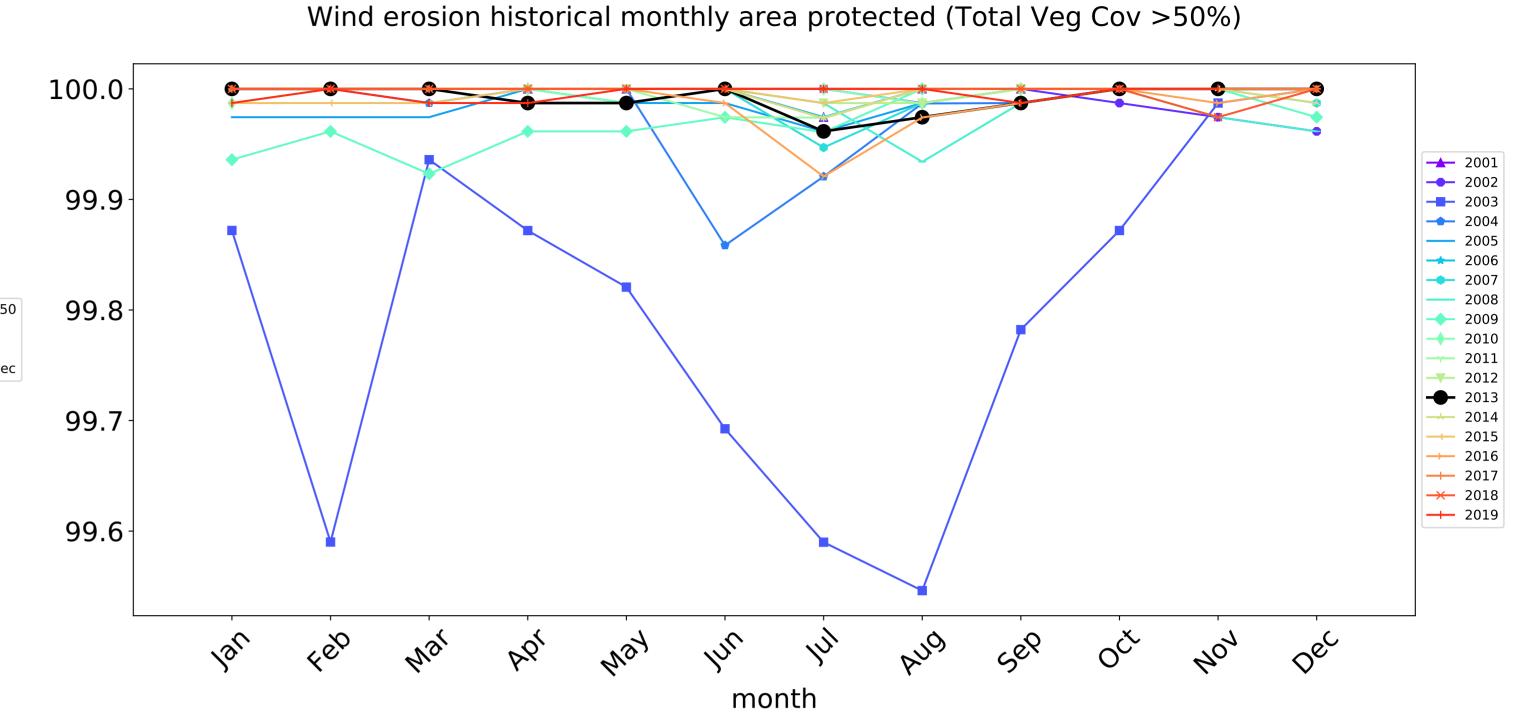


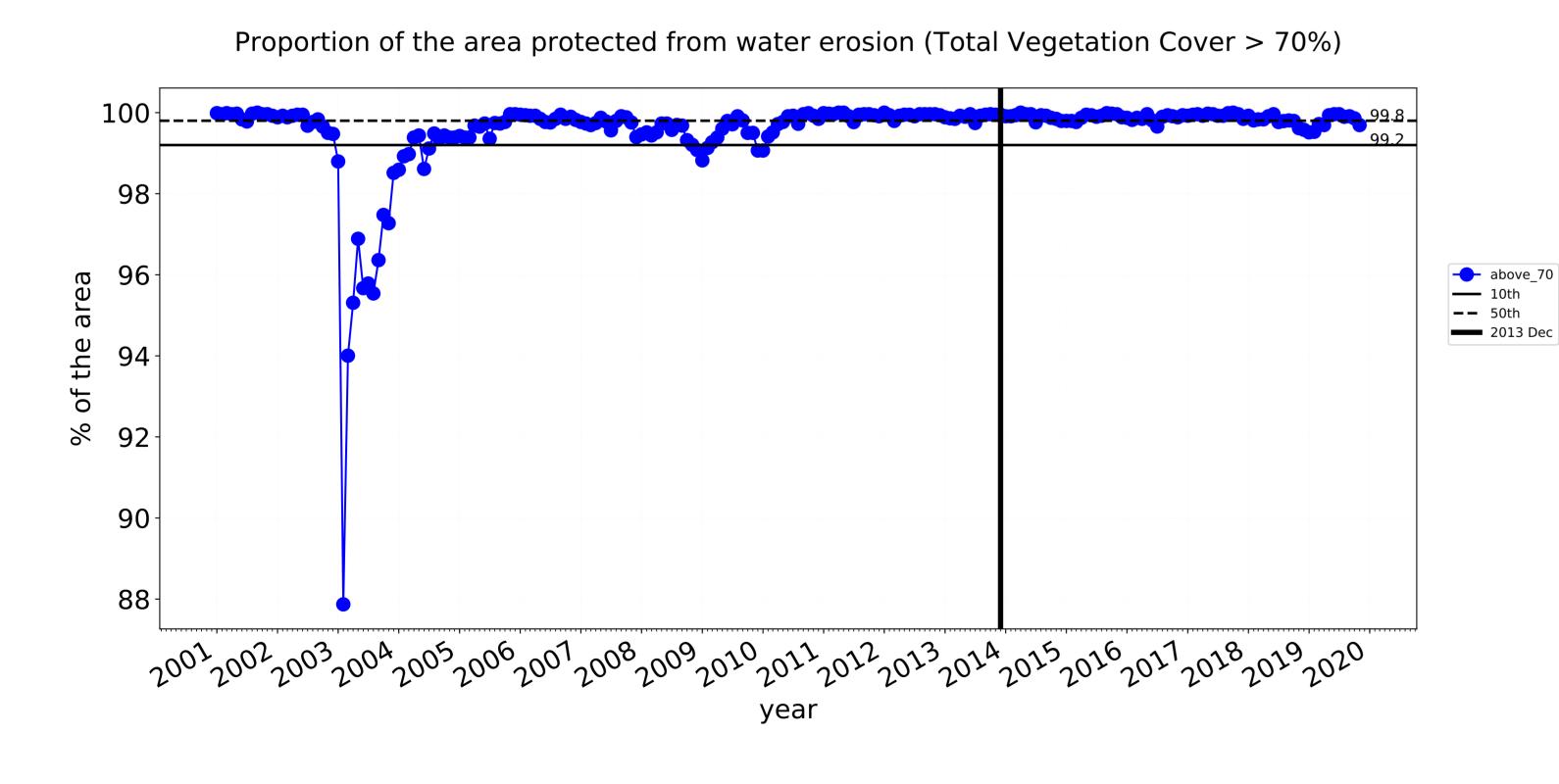


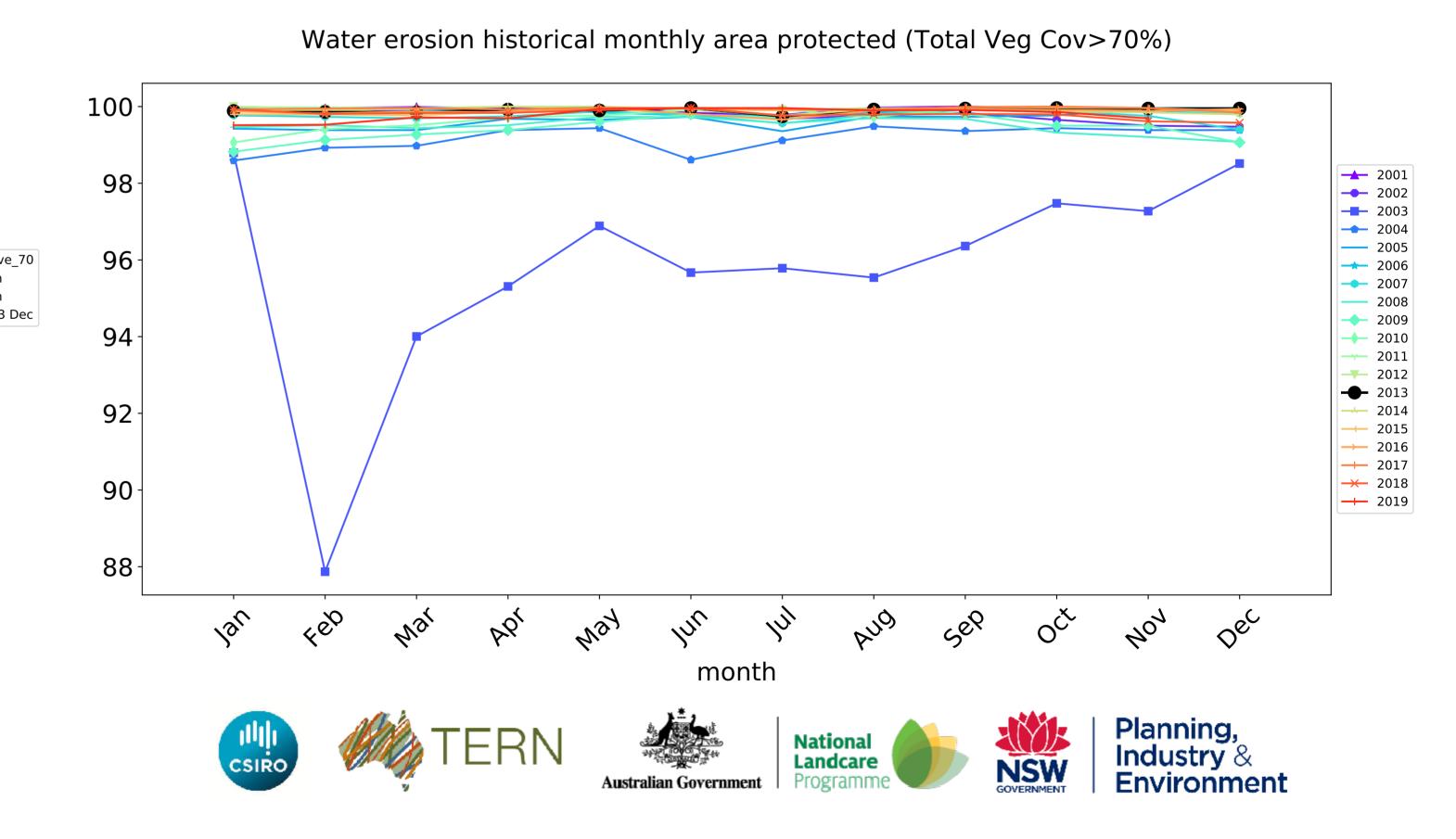










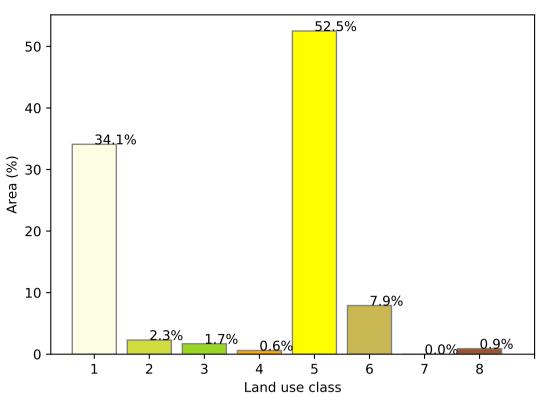


### **Agriculture**

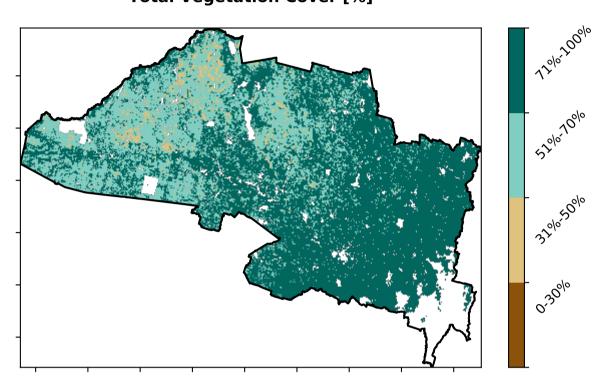
### Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest Derived from 4 Agriculture - Grazing - Irrigated Catchment Scale Land Use of Australia 5 Agriculture - Cropping - Non-irrigated 6 Agriculture - Cropping - Irrigated (2018) and Forests-7 Agriculture - Horticulture - Non-irrigated of Australia (2018) 8 Agriculture - Horticulture - Irrigated

### 50 40

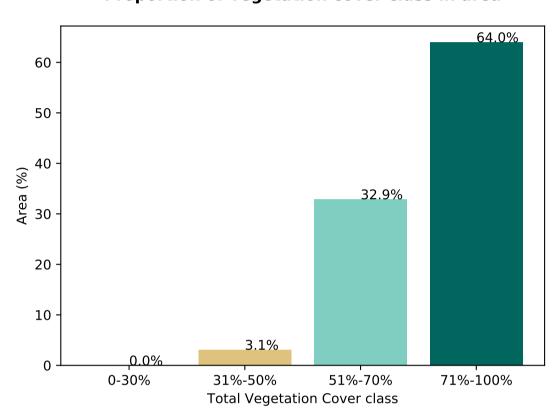
### **Proportion of each land class in area**



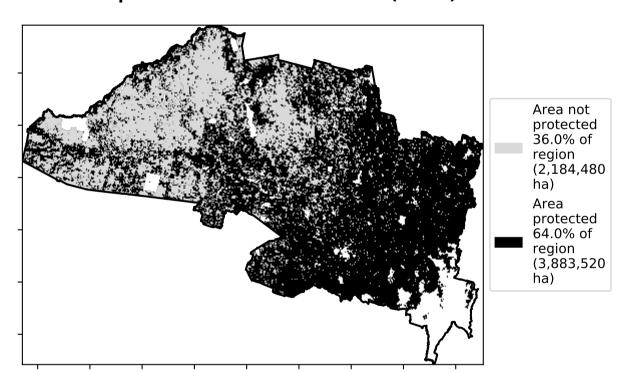
**Total Vegetation Cover [%]** 



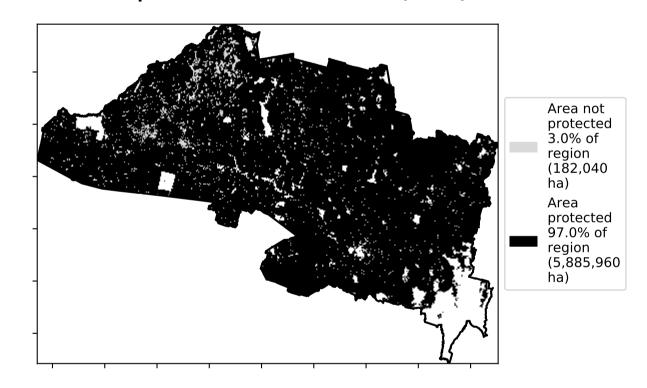
**Proportion of vegetation cover class in area** 



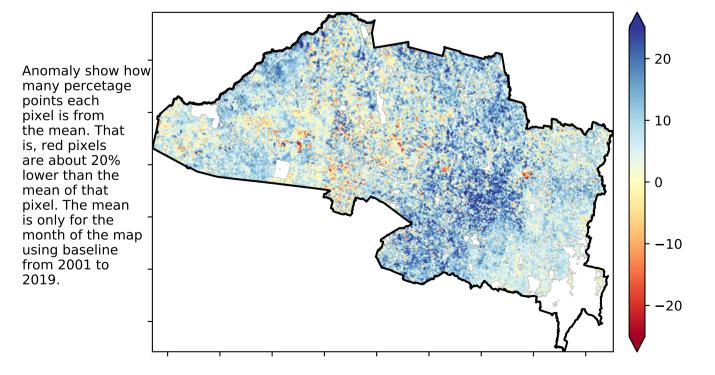
% Area protected from water erosion (>70%)



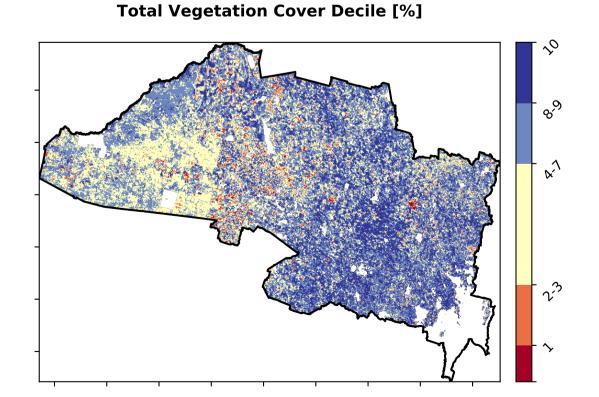
% Area protected from wind erosion (>50%)



**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 man using baseling. the map using baseline from 2001 to 2019.







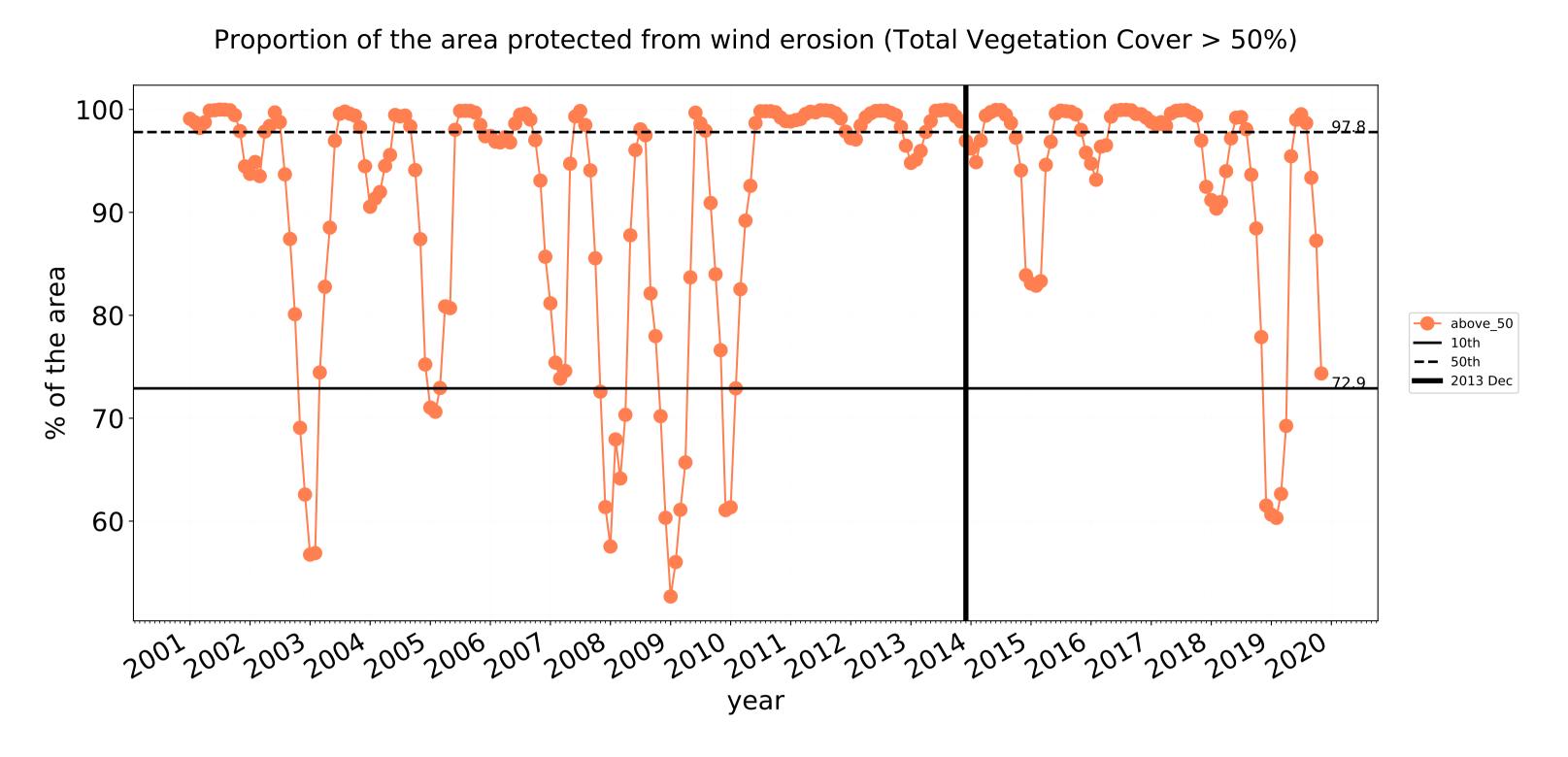


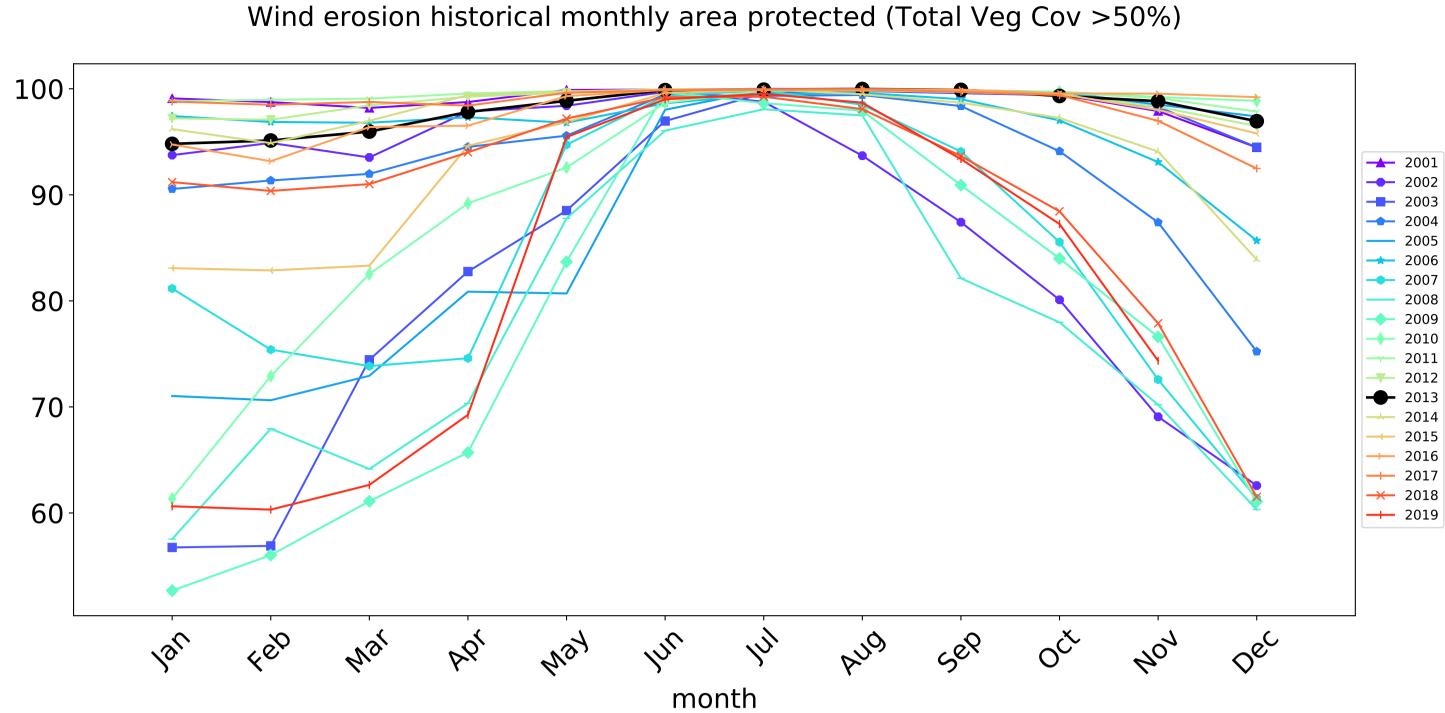


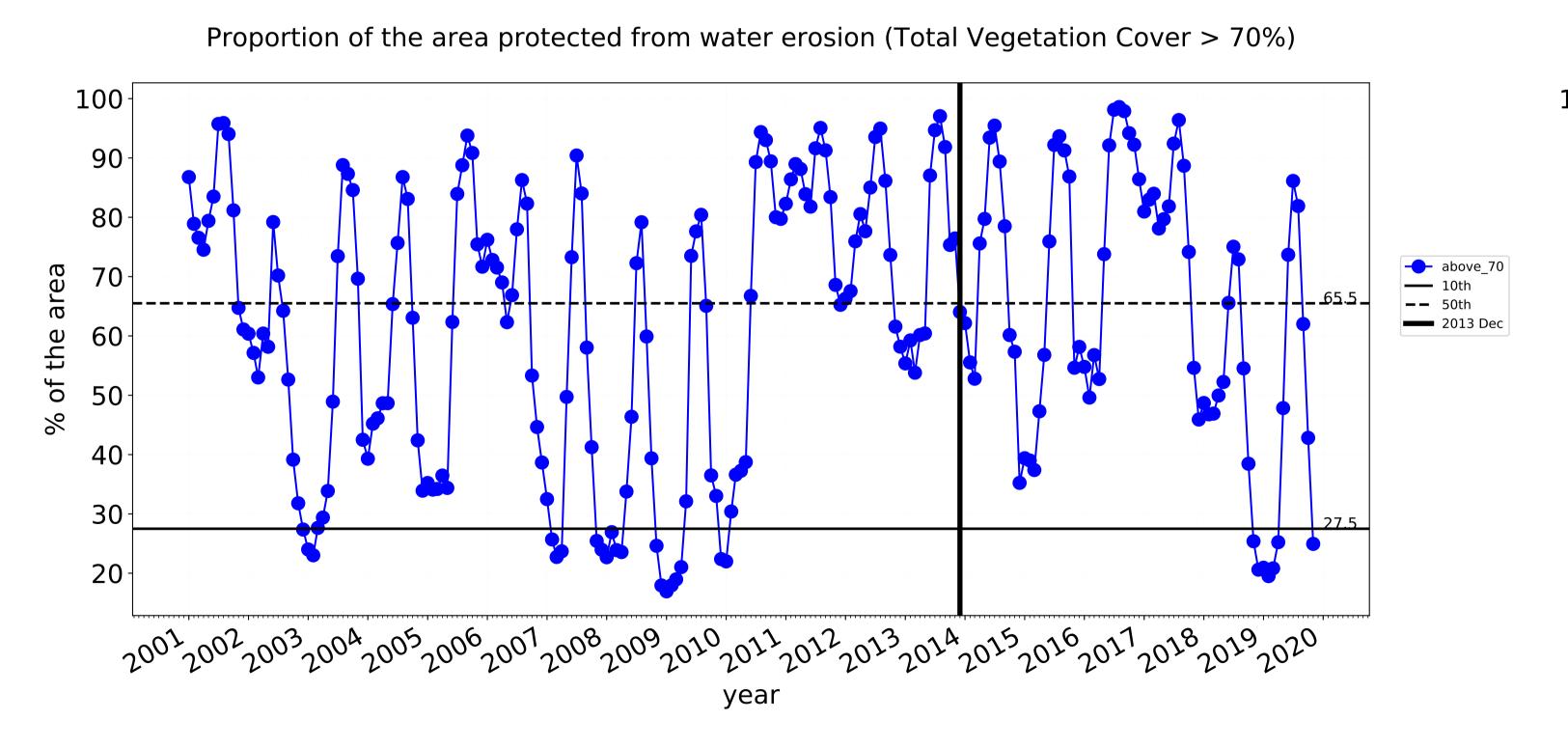


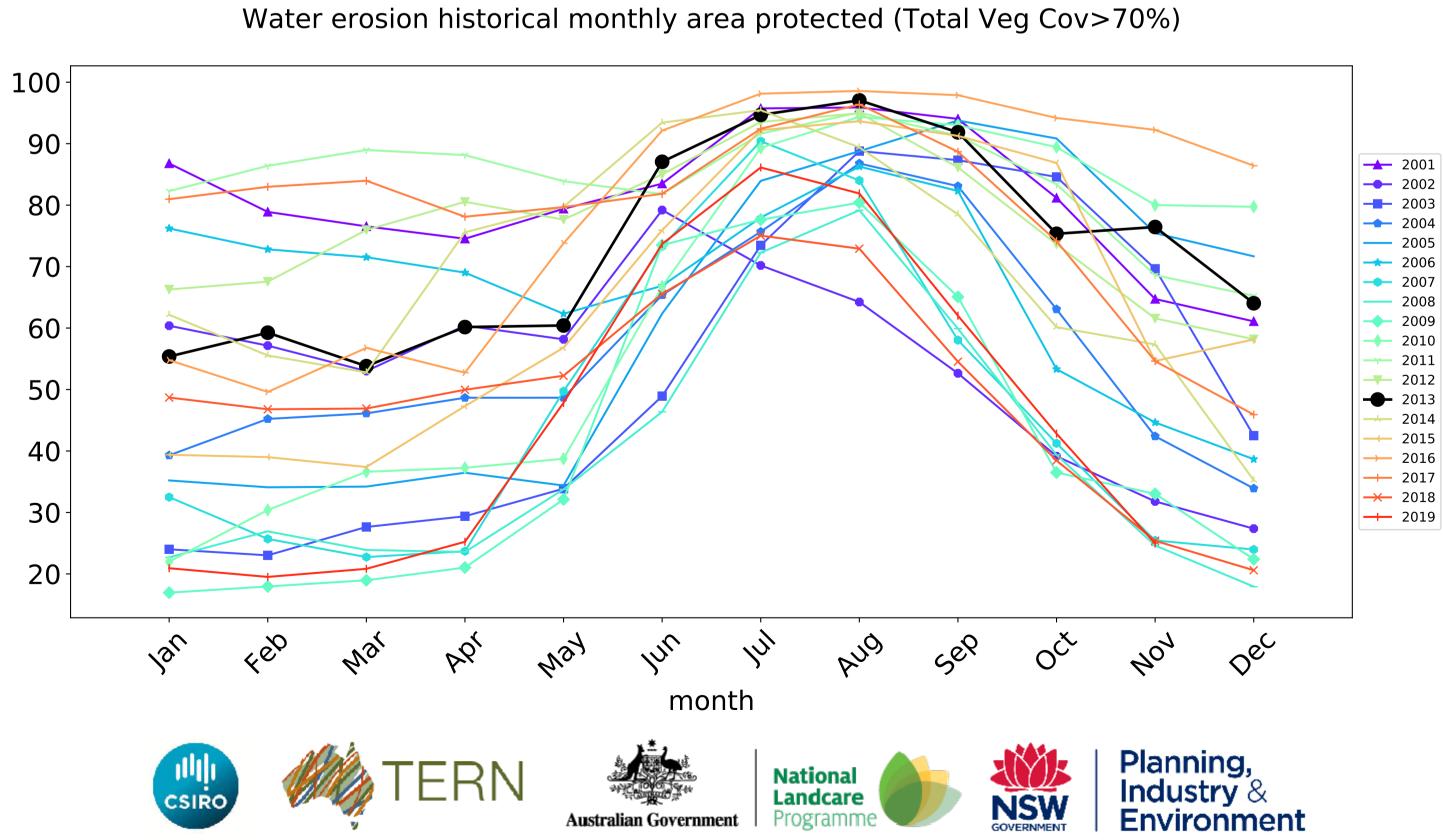


### **Agriculture timeseries**

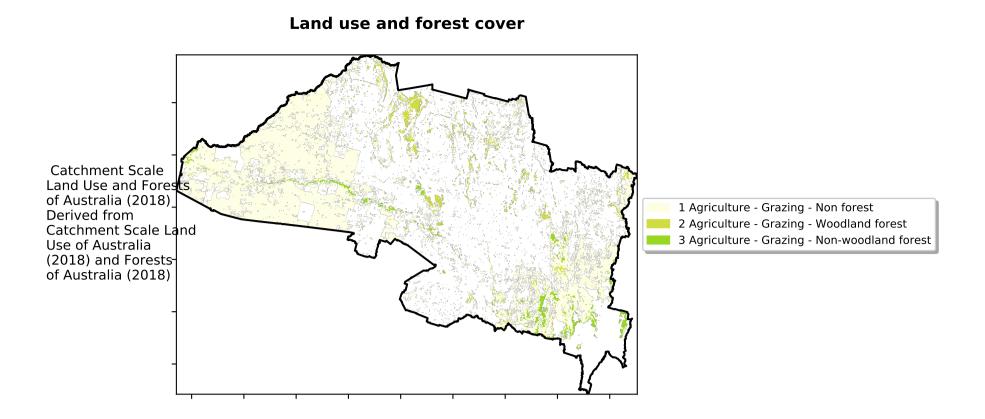




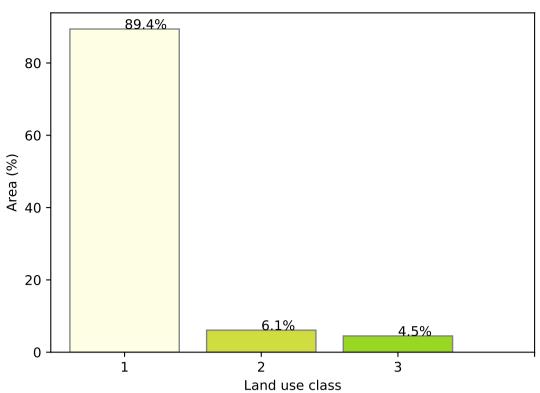




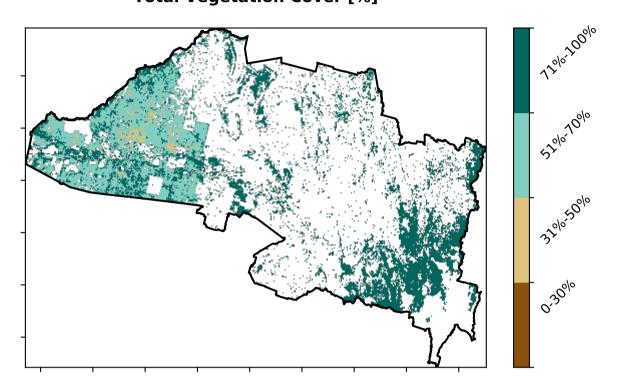
### **Grazing**



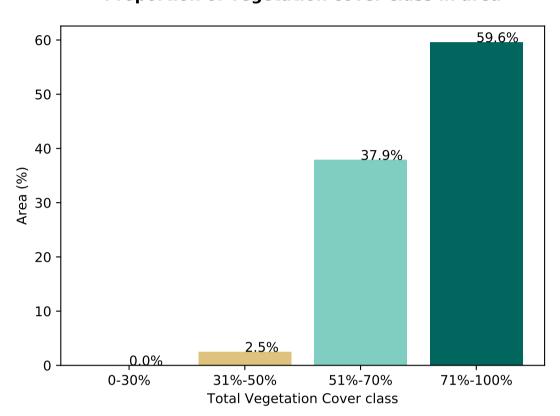
### Proportion of each land class in area



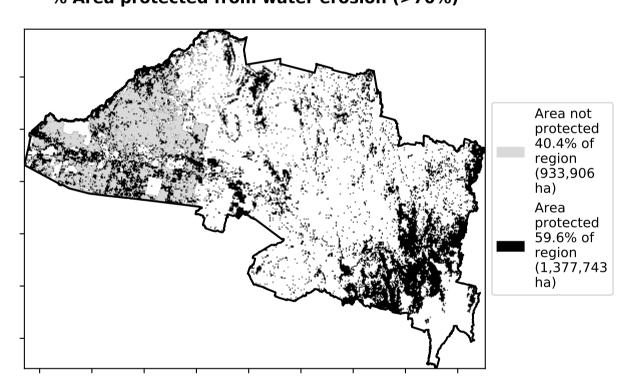
**Total Vegetation Cover [%]** 



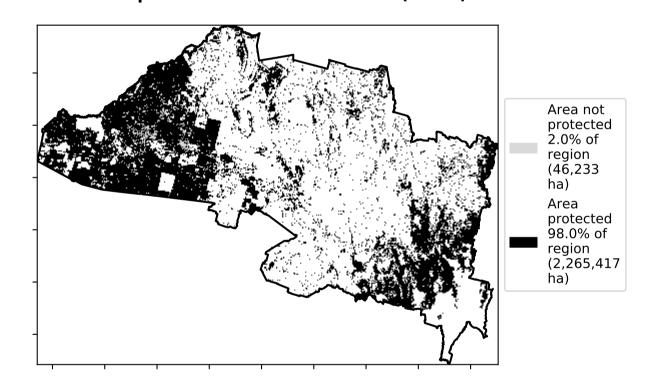
Proportion of vegetation cover class in area



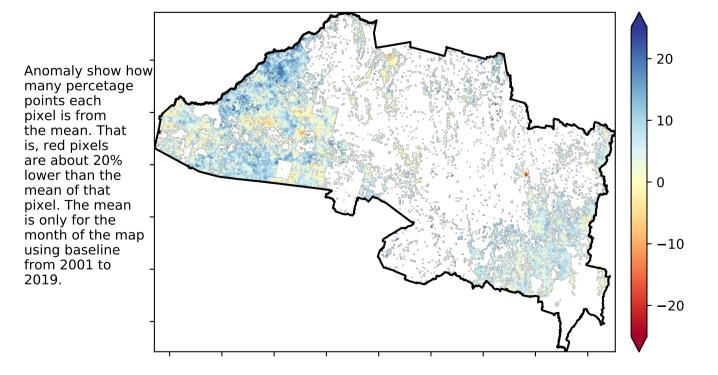
### % Area protected from water erosion (>70%)



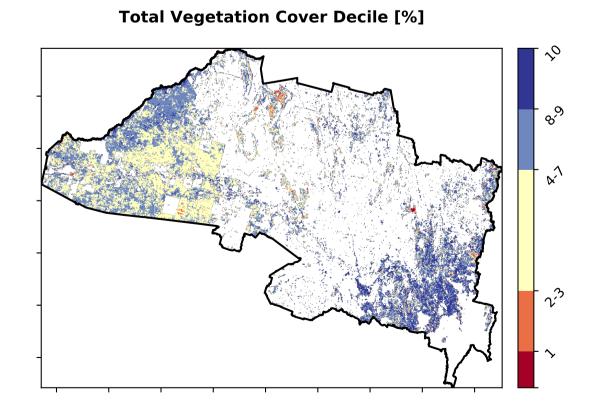
% Area protected from wind erosion (>50%)



### **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.







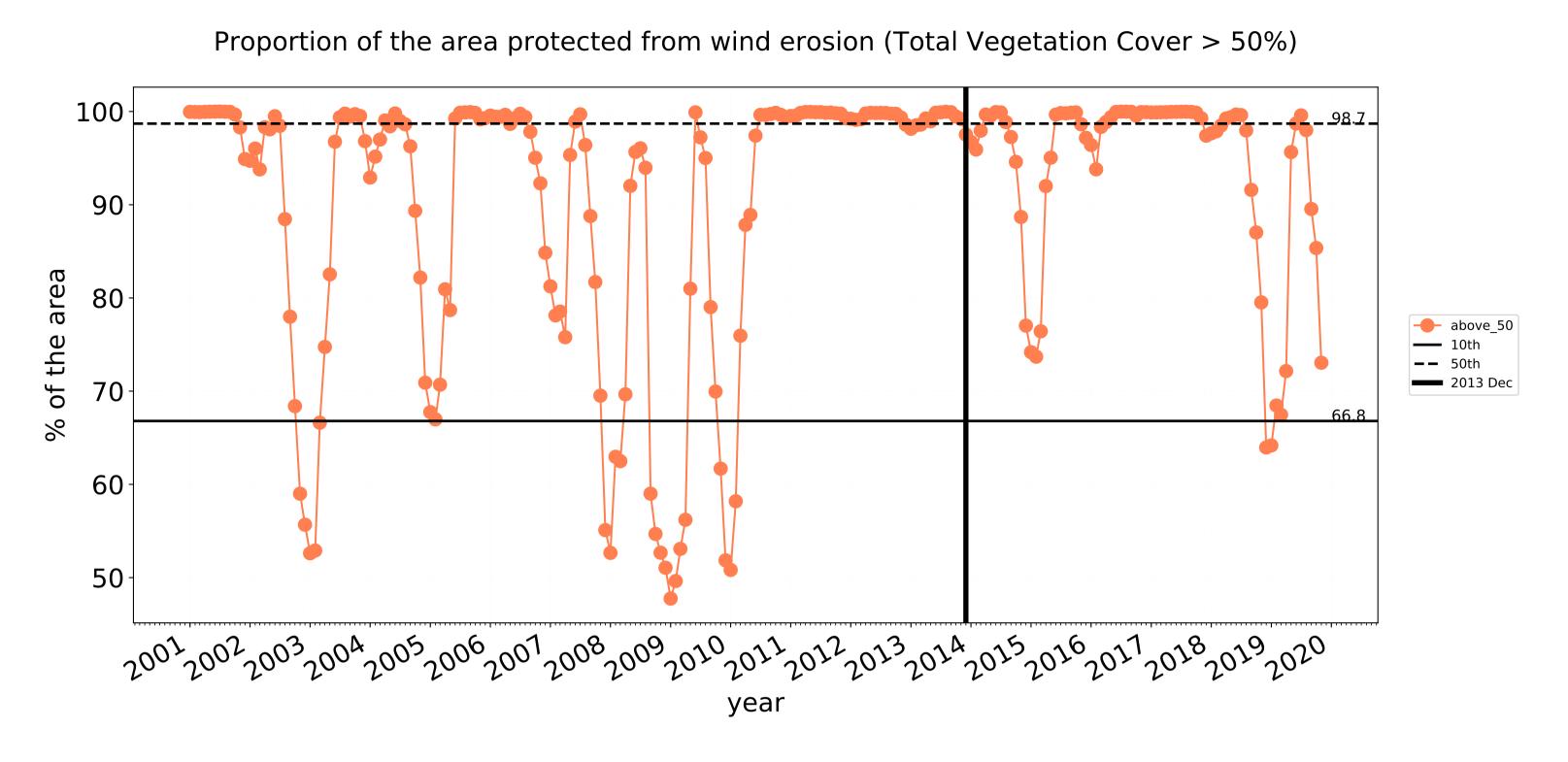


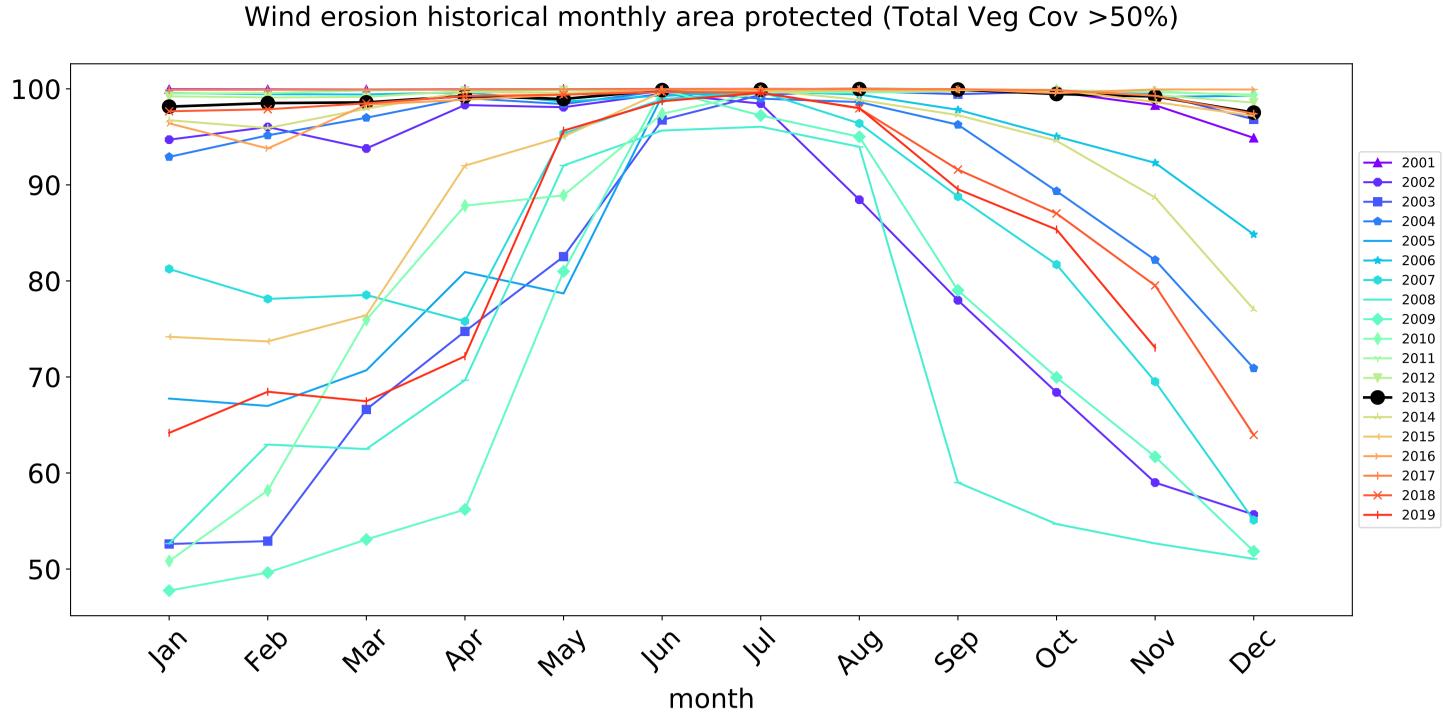


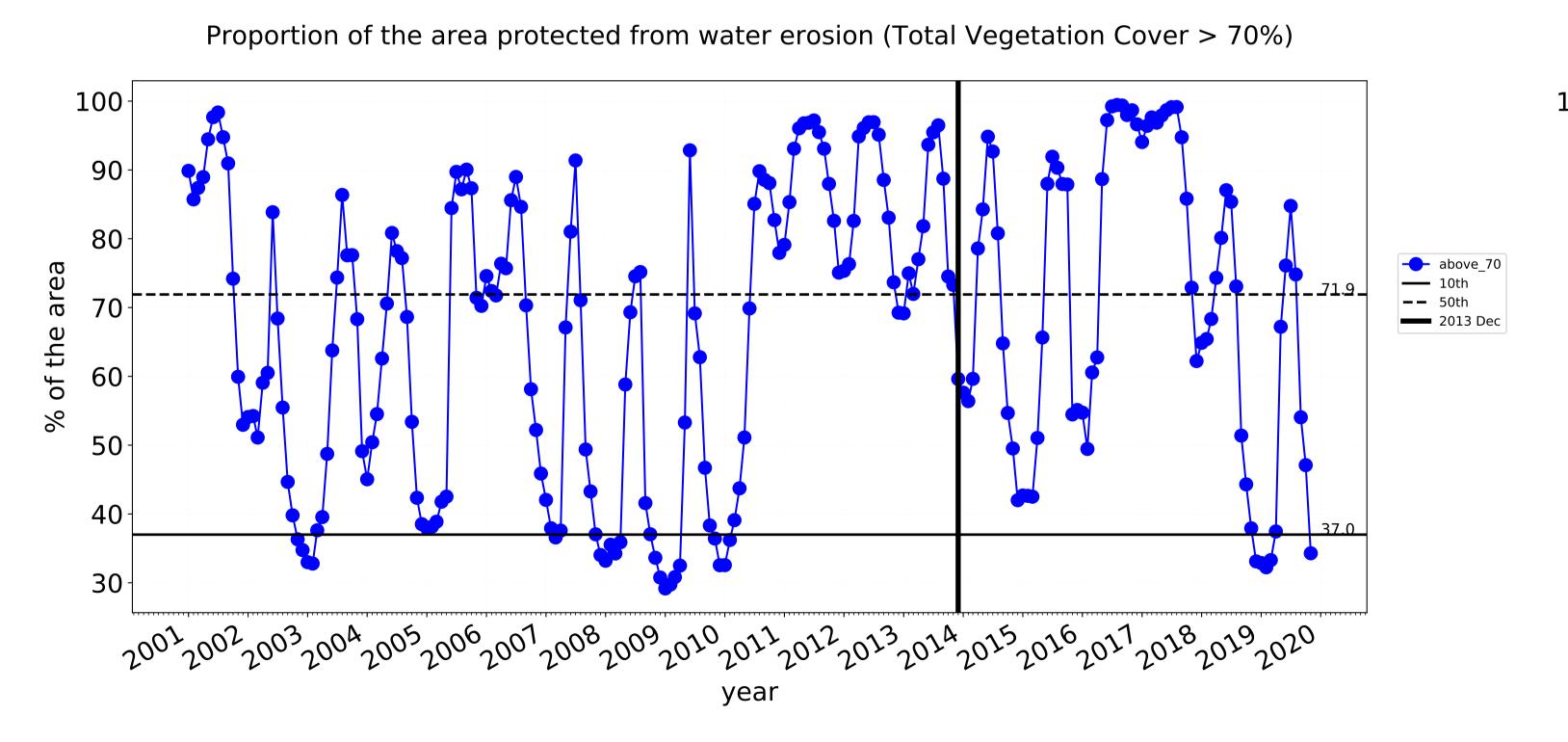


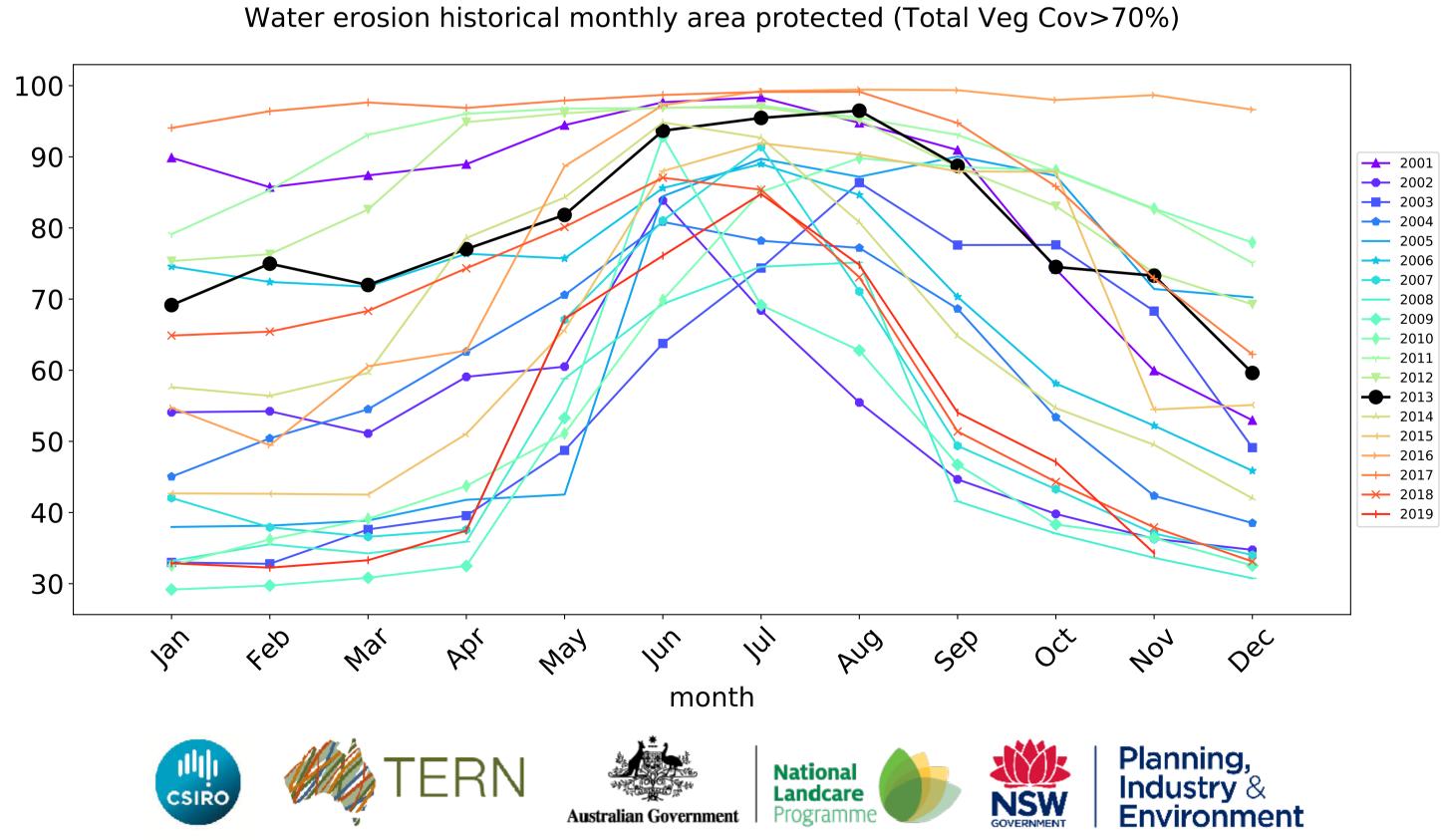


### **Grazing timeseries**



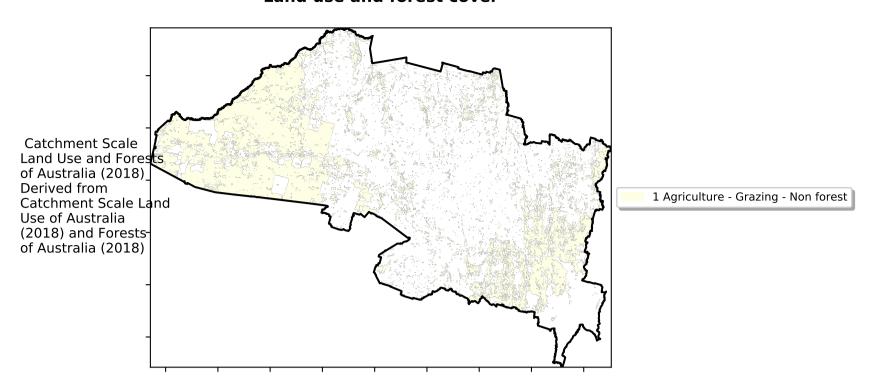




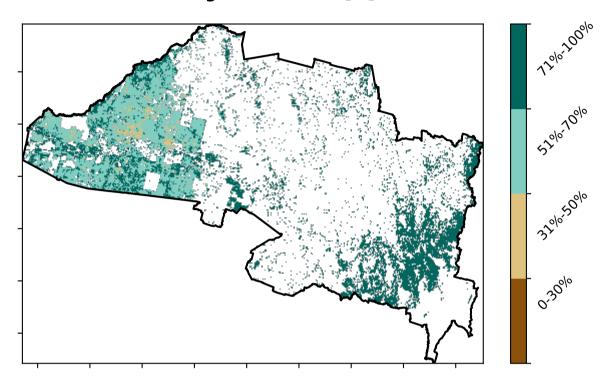


### **Grazing non forest**

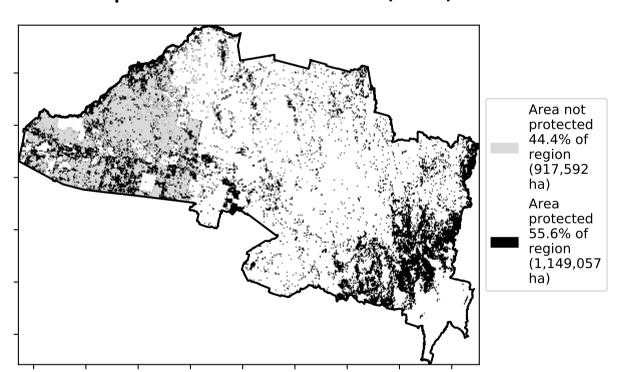
### Land use and forest cover



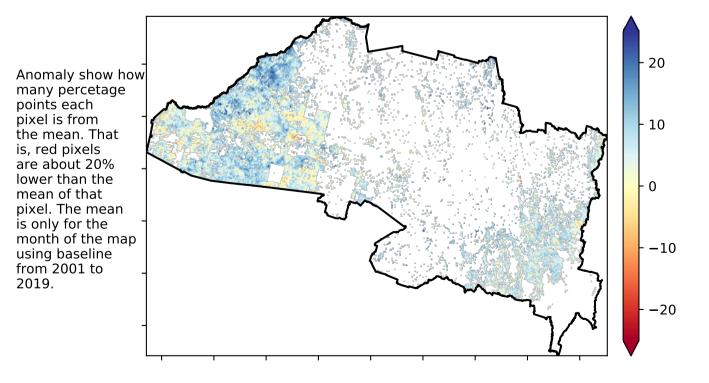
### **Total Vegetation Cover [%]**



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

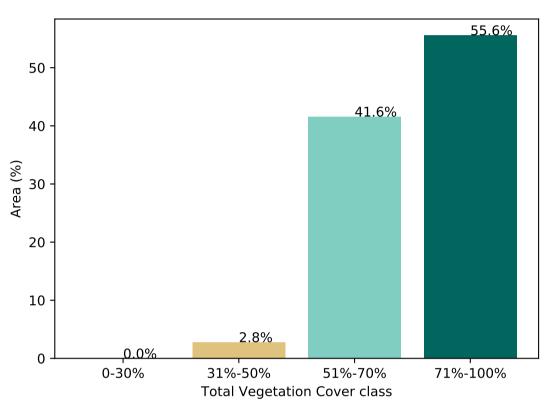


### Total Vegetation Cover Anomaly [%]

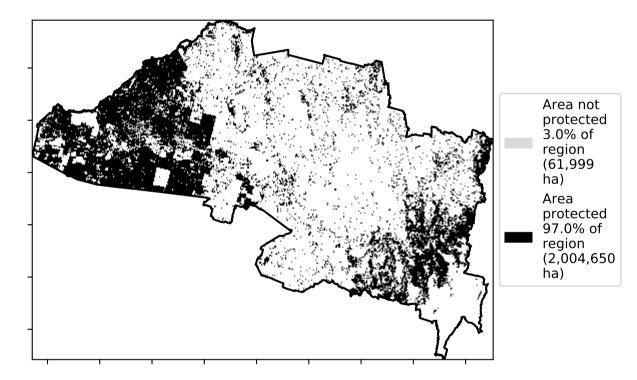


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

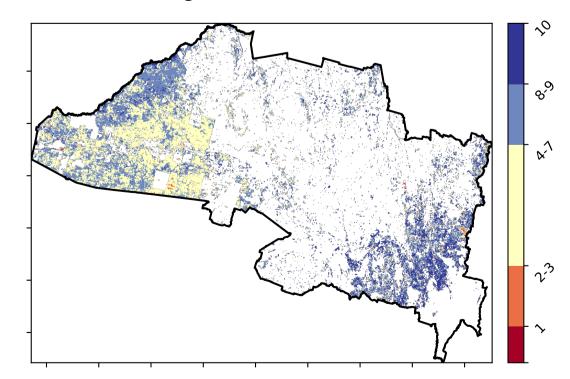
### **Proportion of vegetation cover class in area**



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



### Total Vegetation Cover Decile [%]







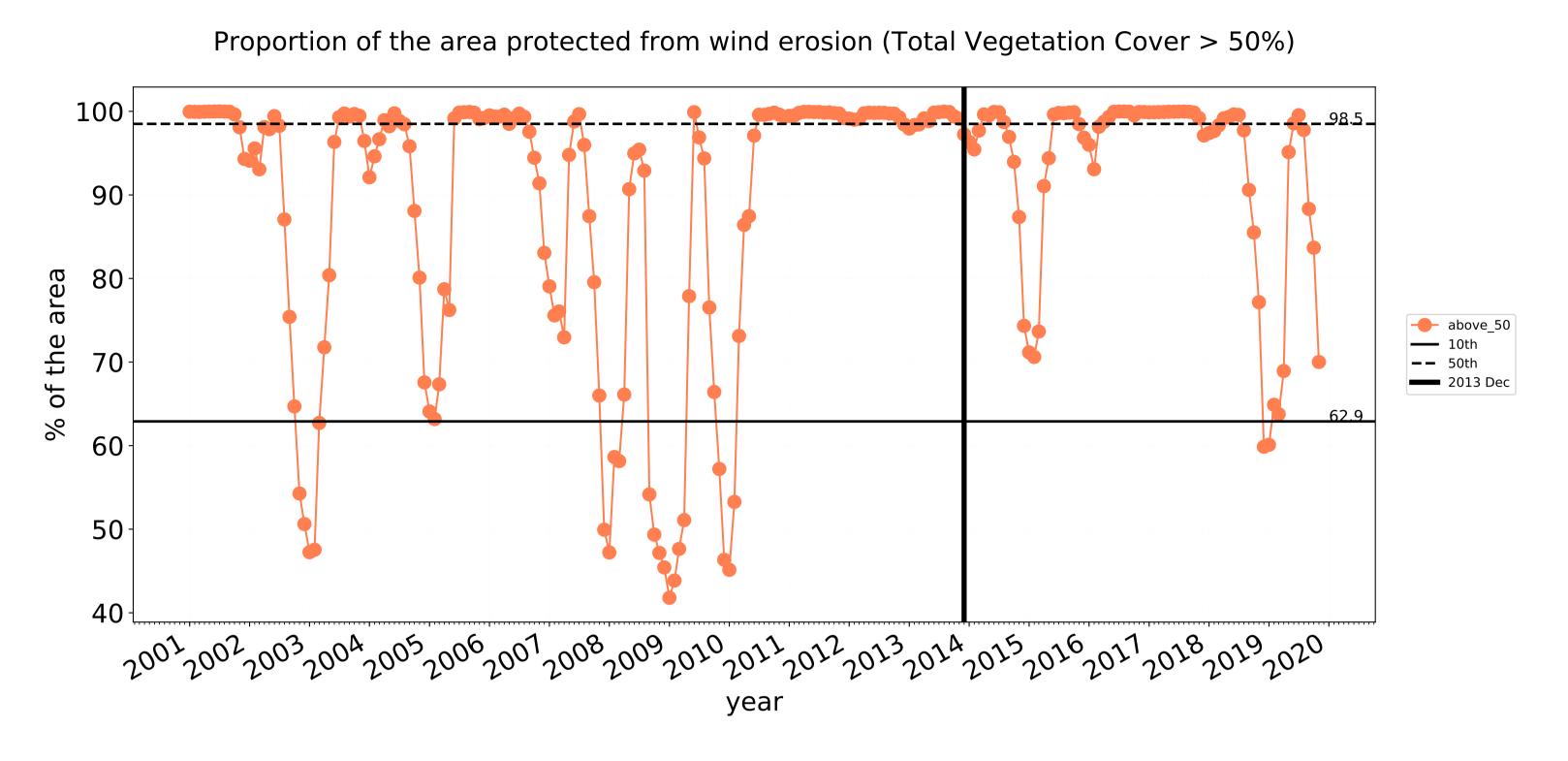


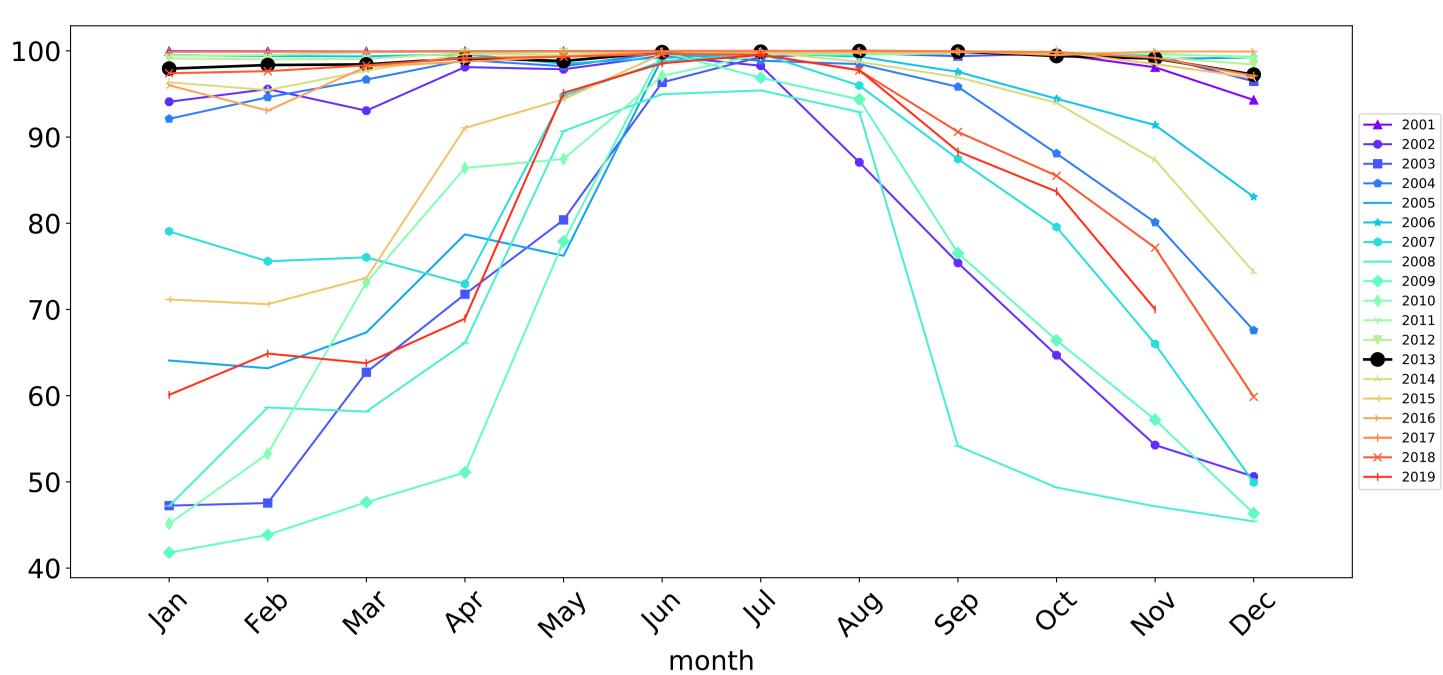




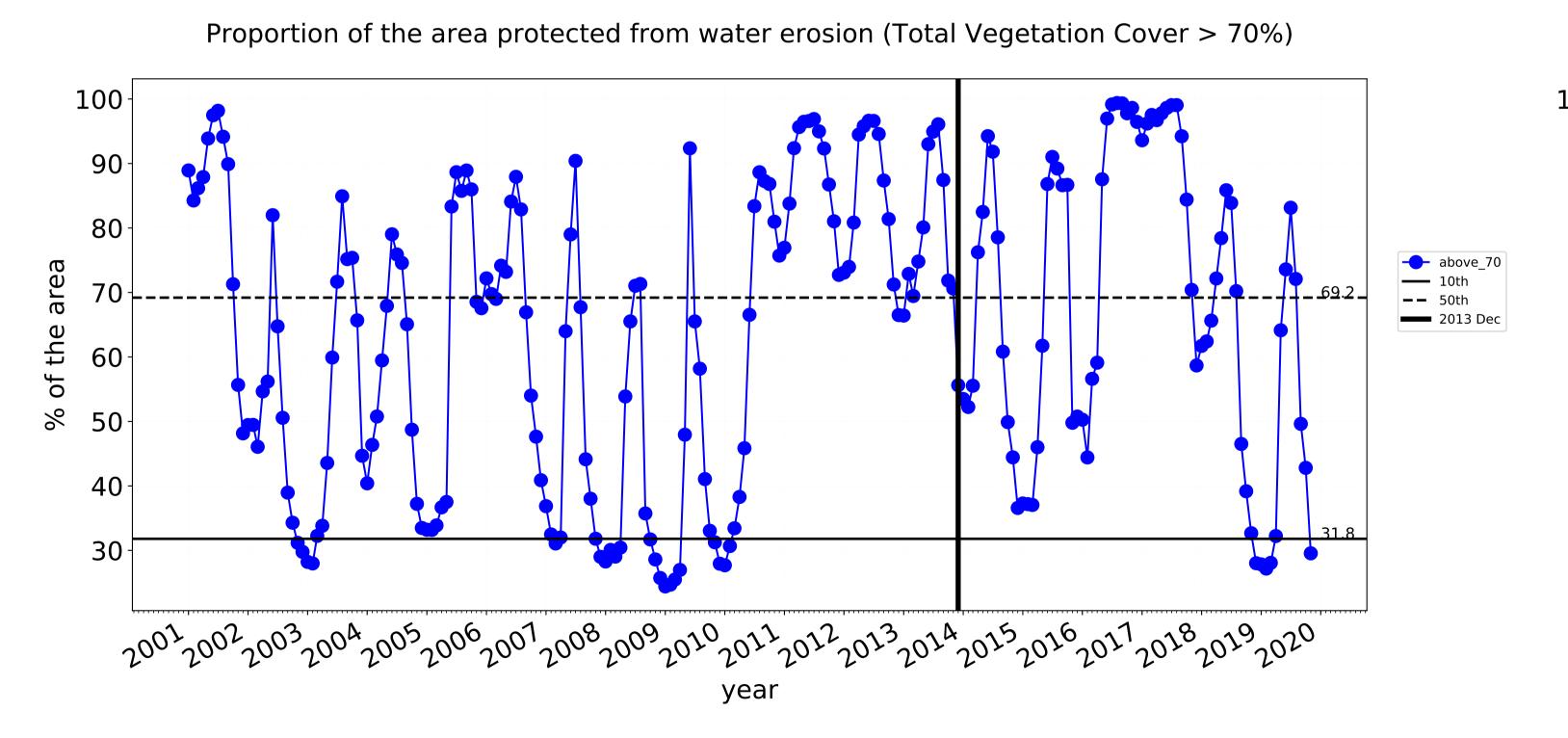


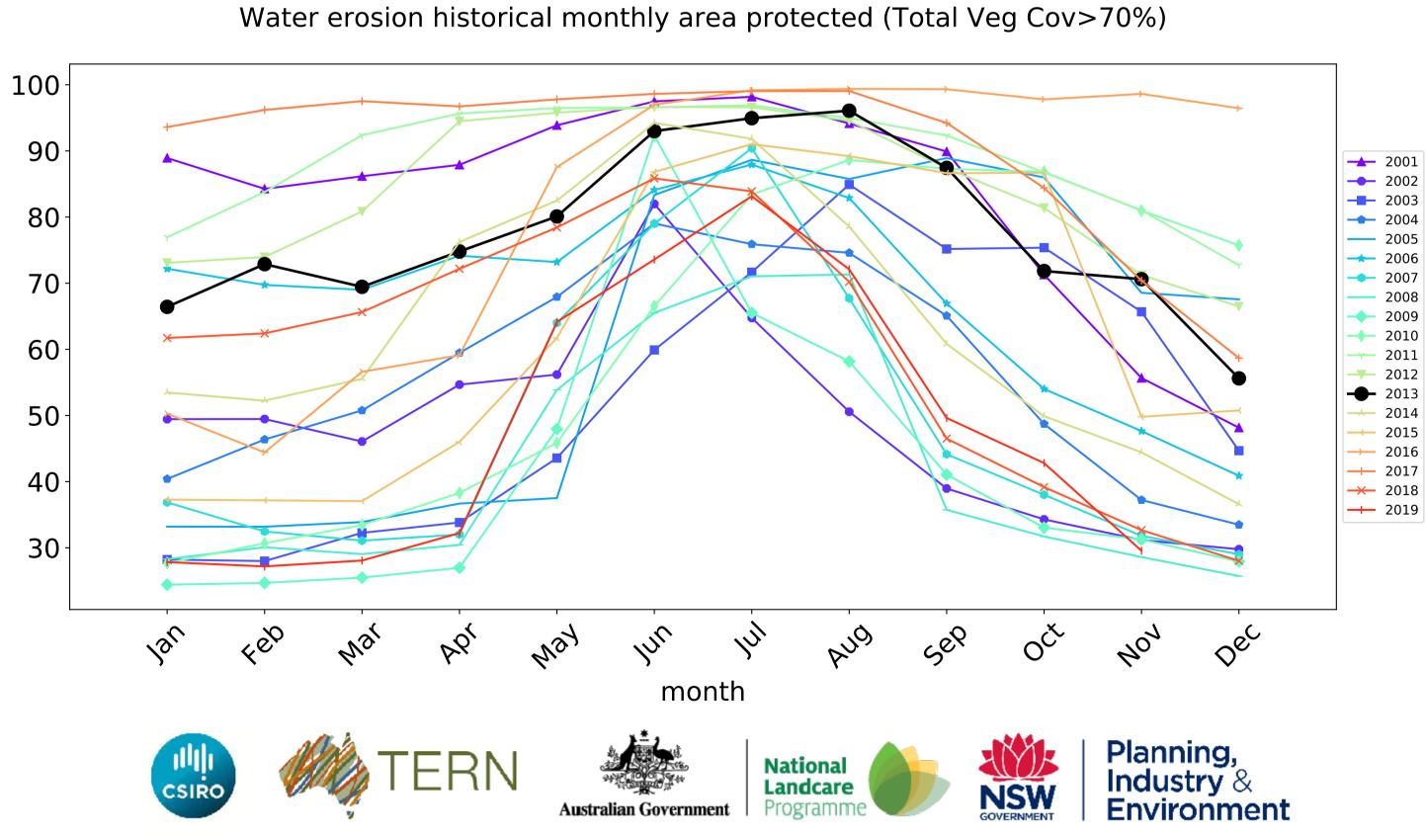
### **Grazing non forest timeseries**





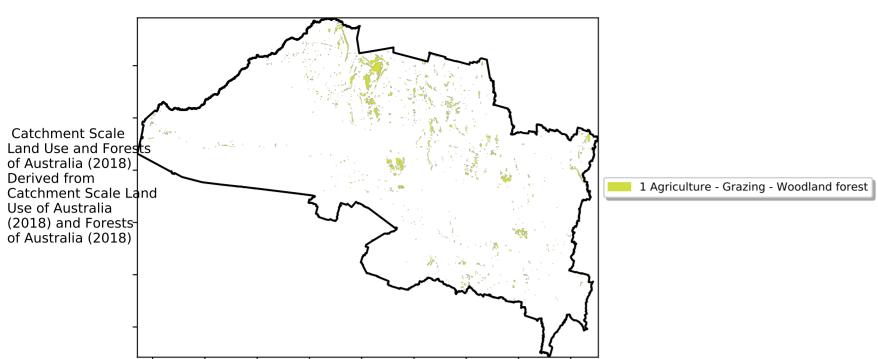
Wind erosion historical monthly area protected (Total Veg Cov >50%)



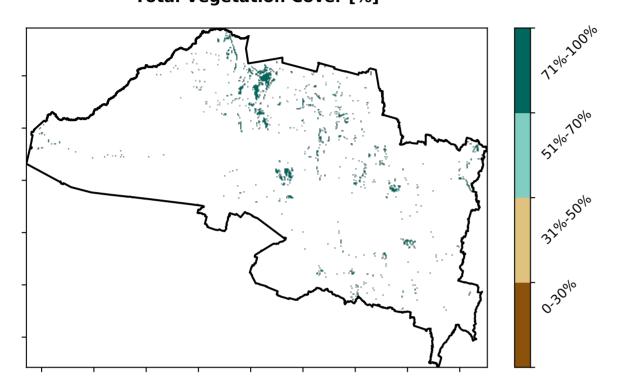


### **Grazing Woodland forest**

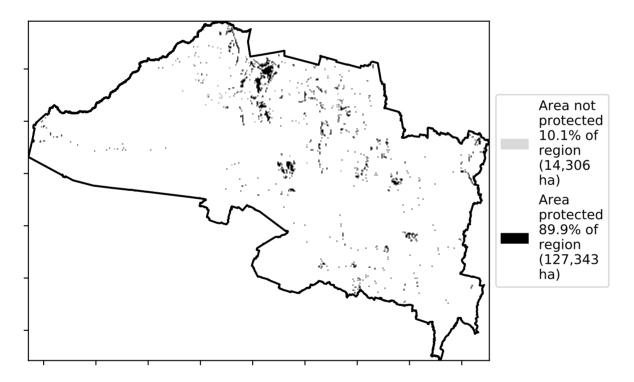
### Land use and forest cover



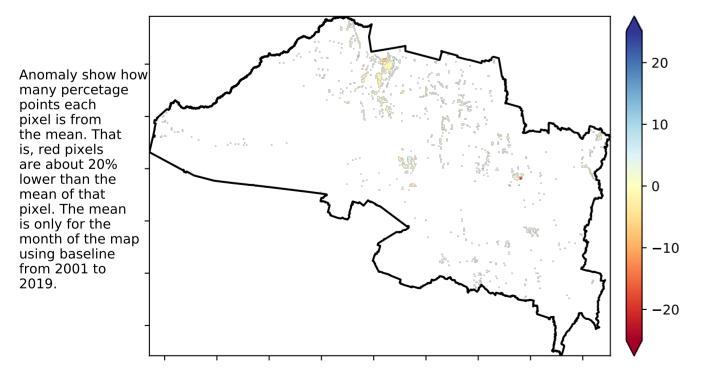
### **Total Vegetation Cover [%]**



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

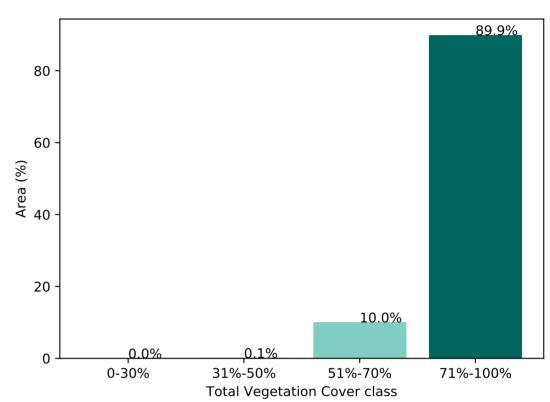


### Total Vegetation Cover Anomaly [%]

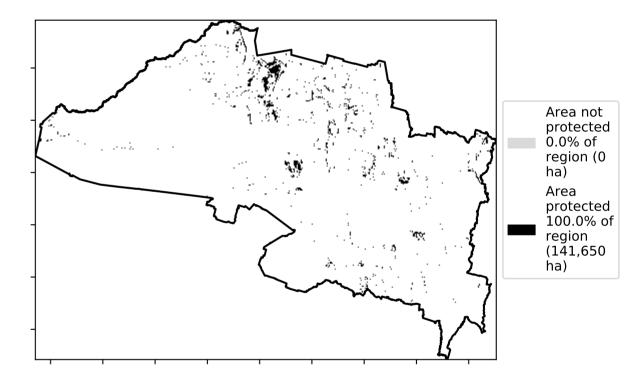


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

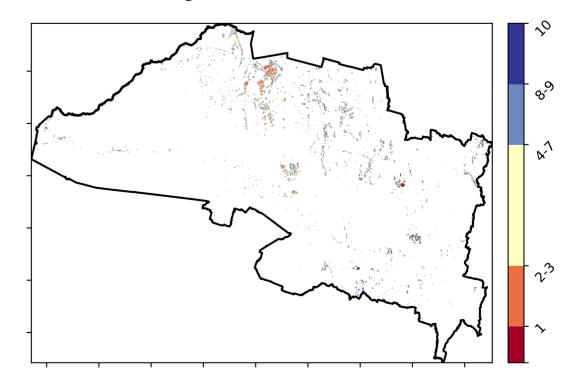
### Proportion of vegetation cover class in area



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



### Total Vegetation Cover Decile [%]







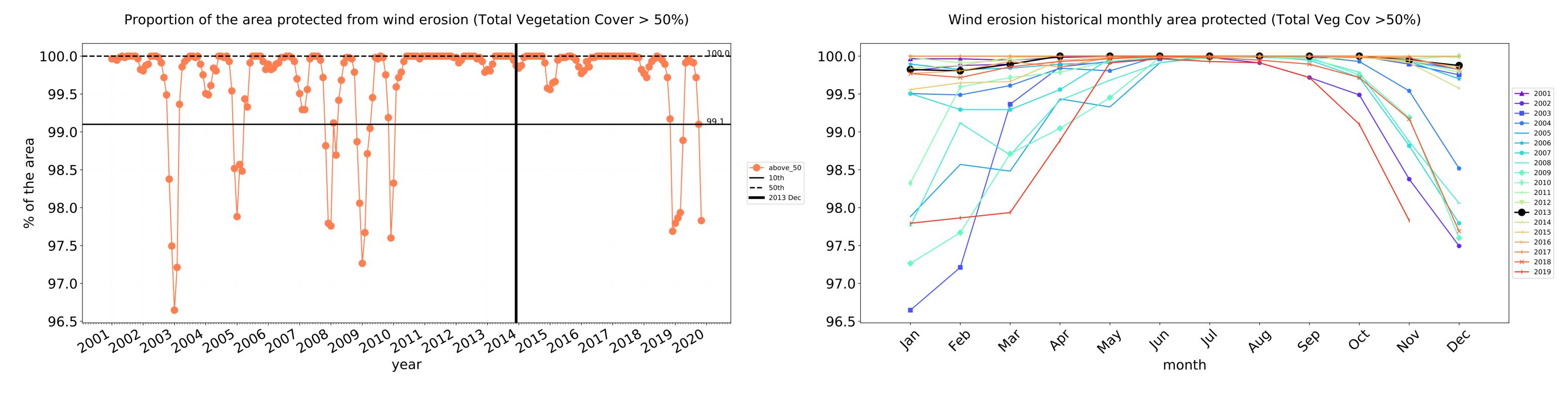


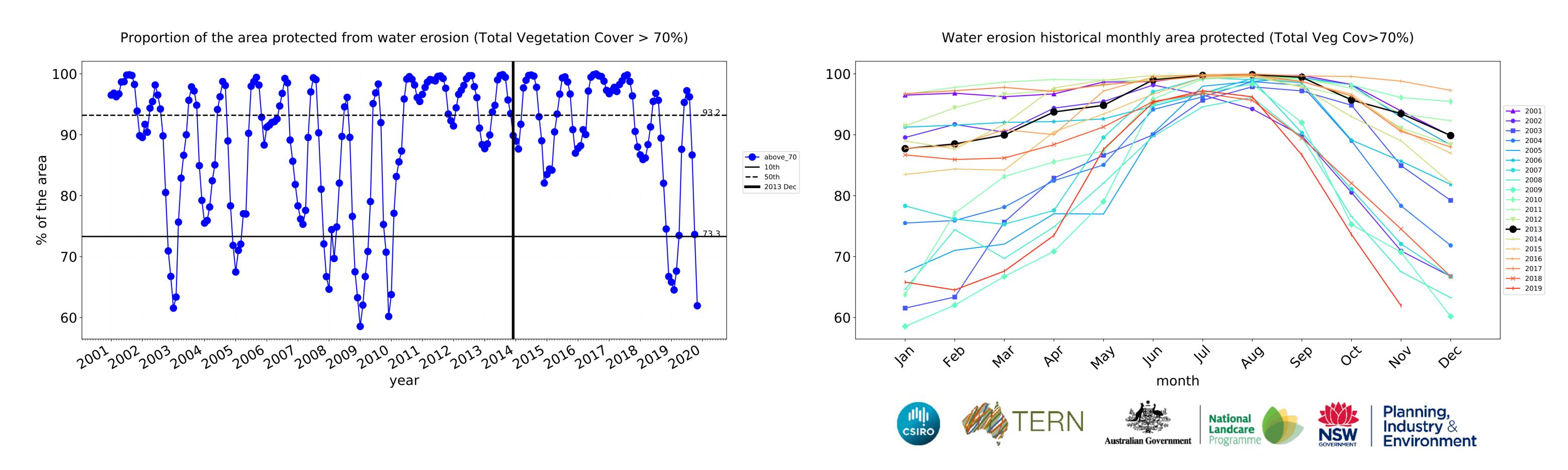






### **Grazing Woodland forest timeseries**



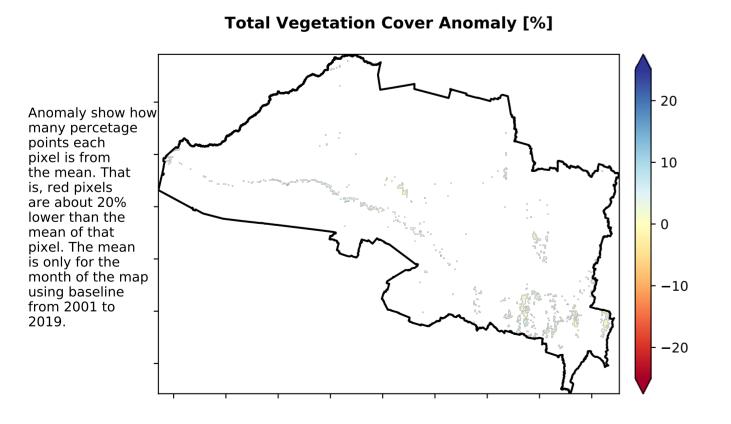


### **Grazing - Forest (non woodland)**

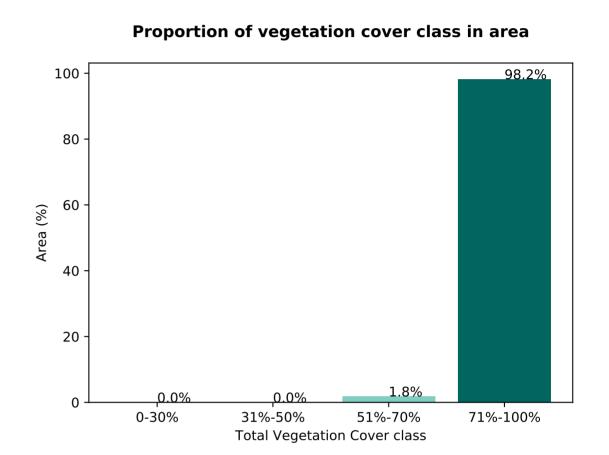
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 1 Agriculture - Grazing - Non-woodland forest of Australia (2018)

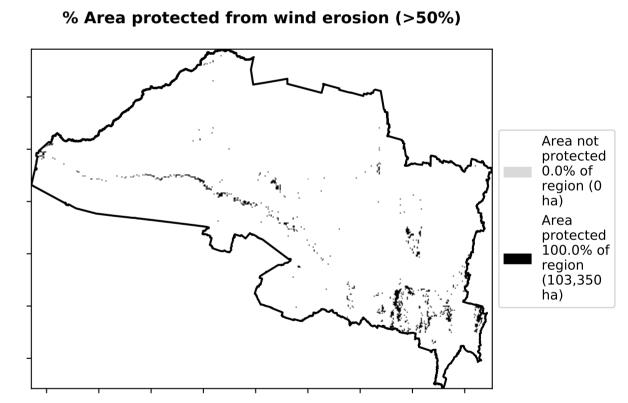
### Total Vegetation Cover [%]

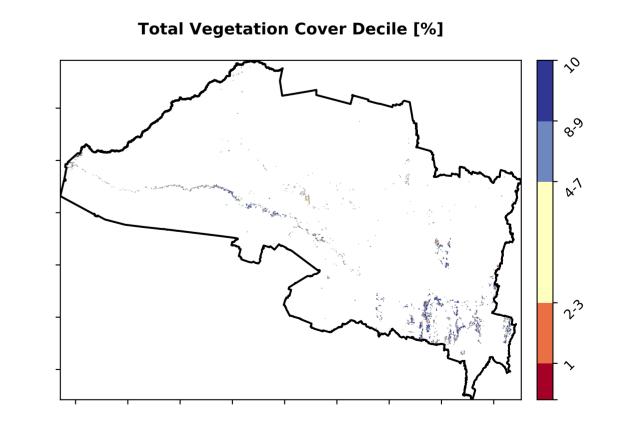
### Area not protected 1.8% of region (1,860 ha) Area protected 98.2% of region (101,489 ha)



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.









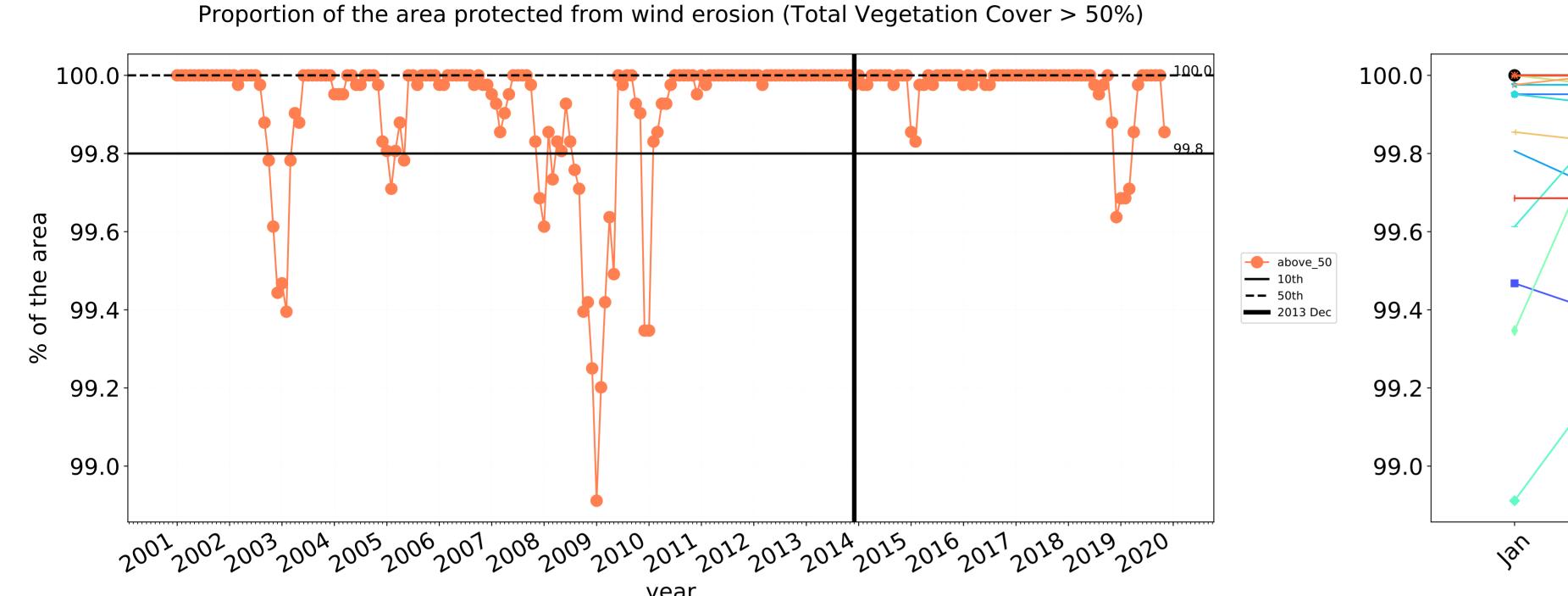


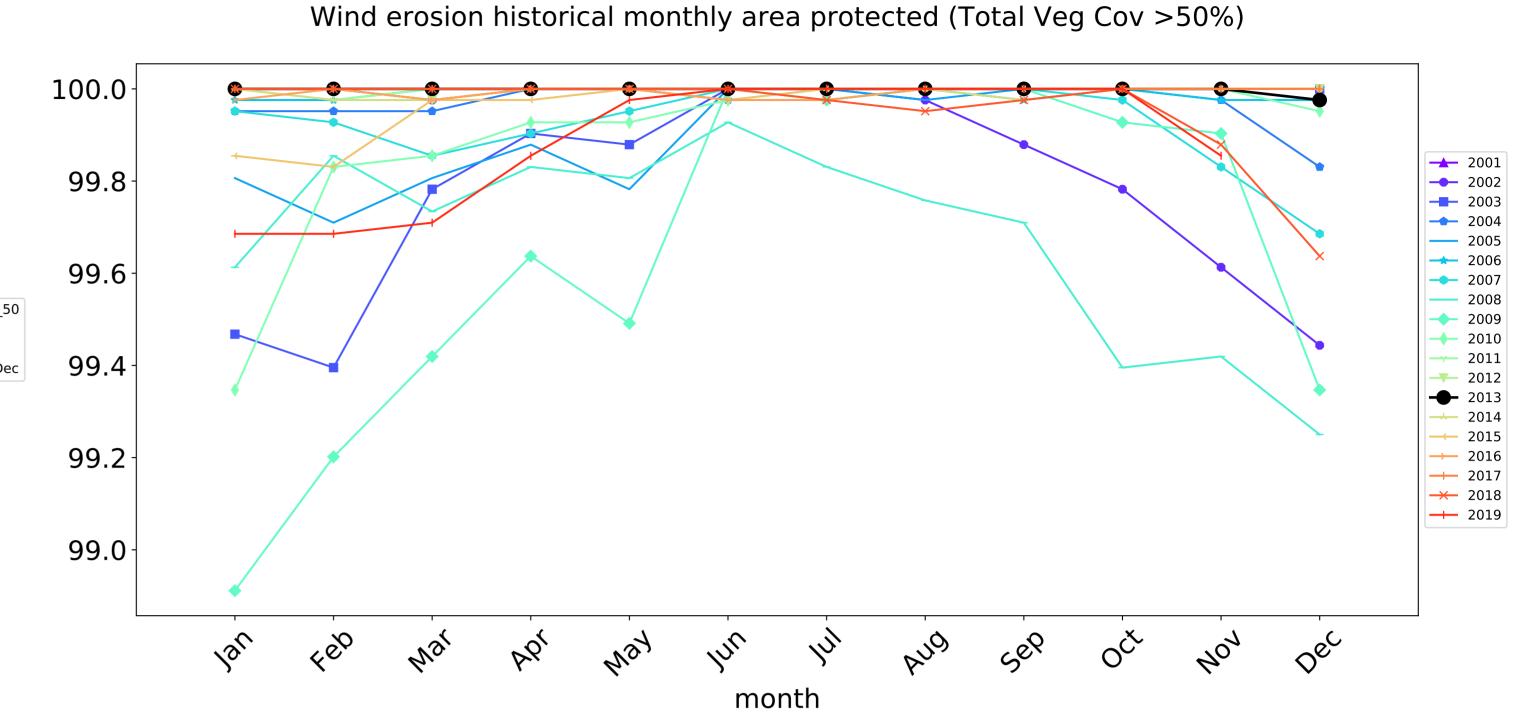


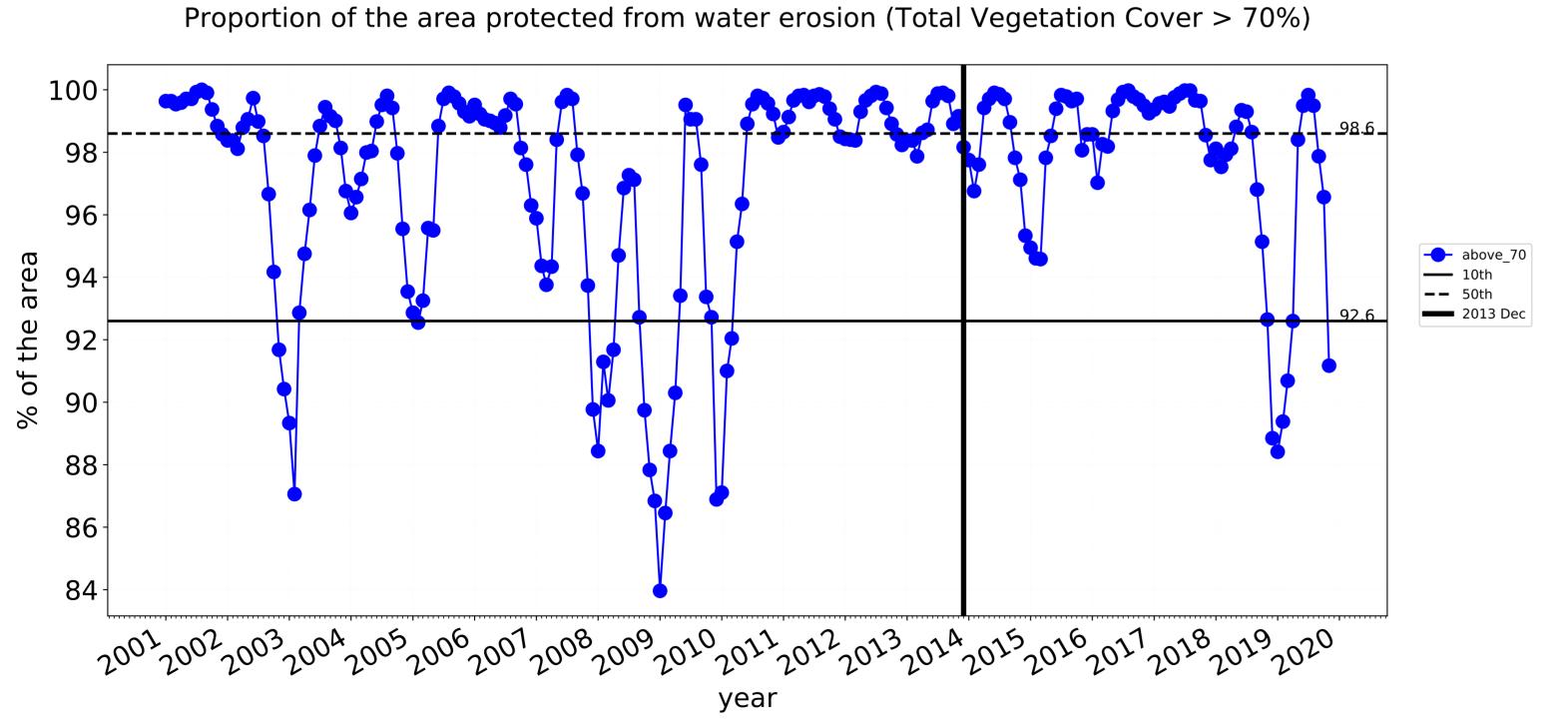


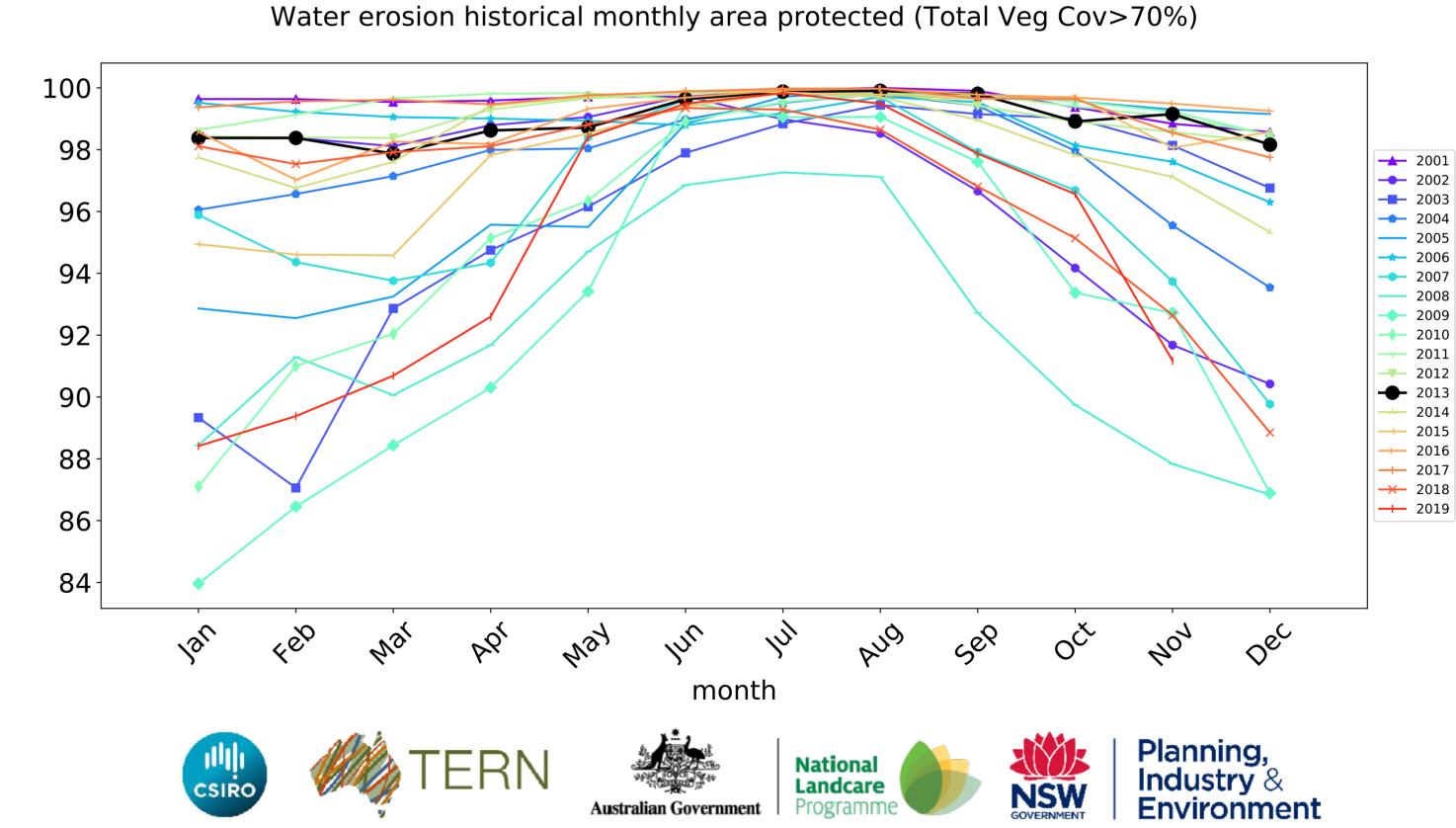






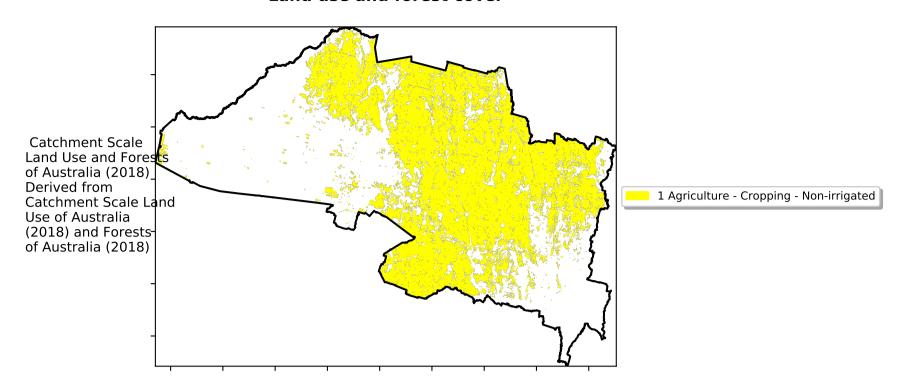




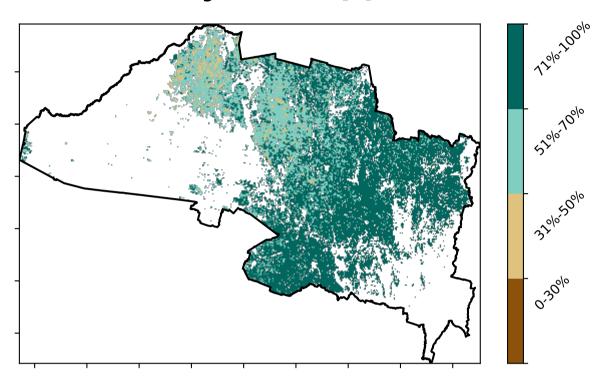


### **Cropping**

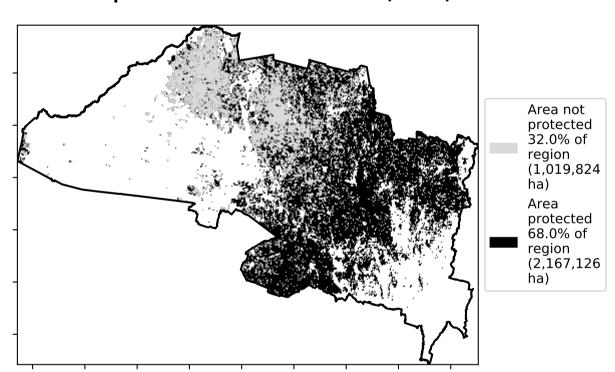
### Land use and forest cover



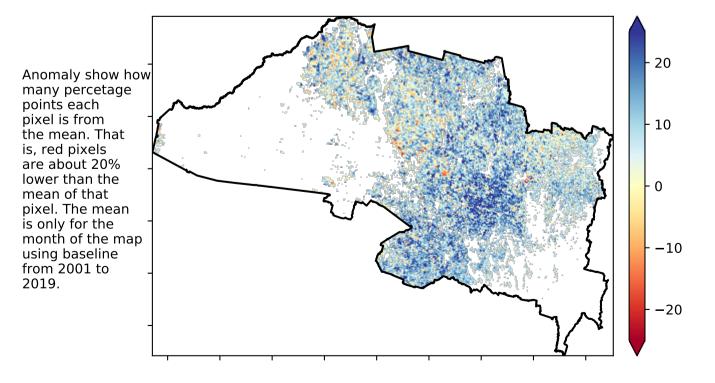
### Total Vegetation Cover [%]



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

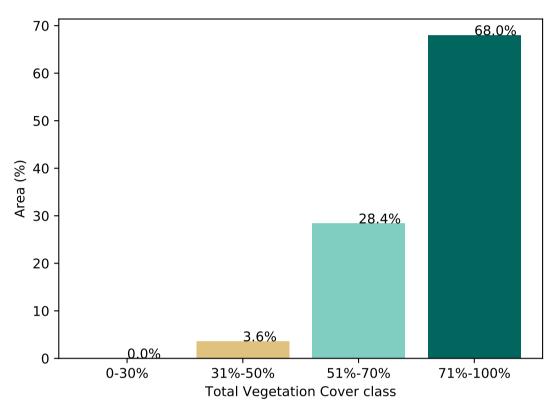


### Total Vegetation Cover Anomaly [%]

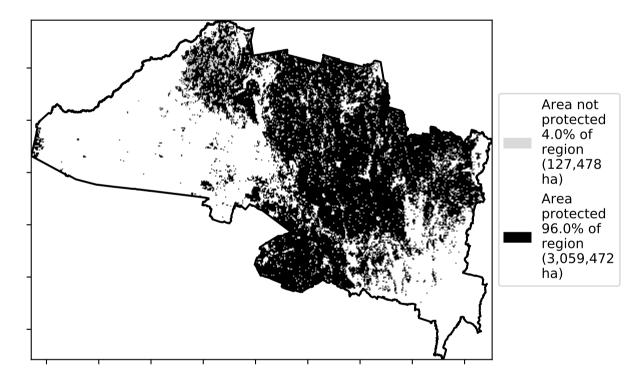


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

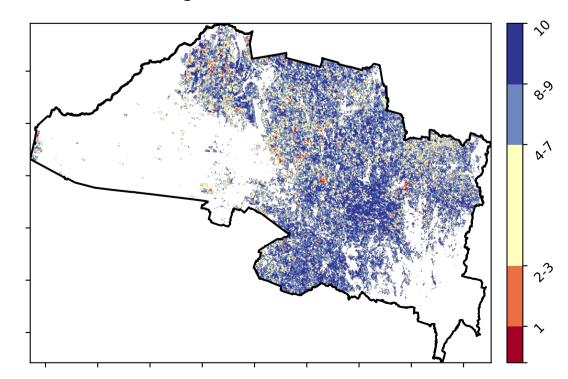
### Proportion of vegetation cover class in area



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



### Total Vegetation Cover Decile [%]







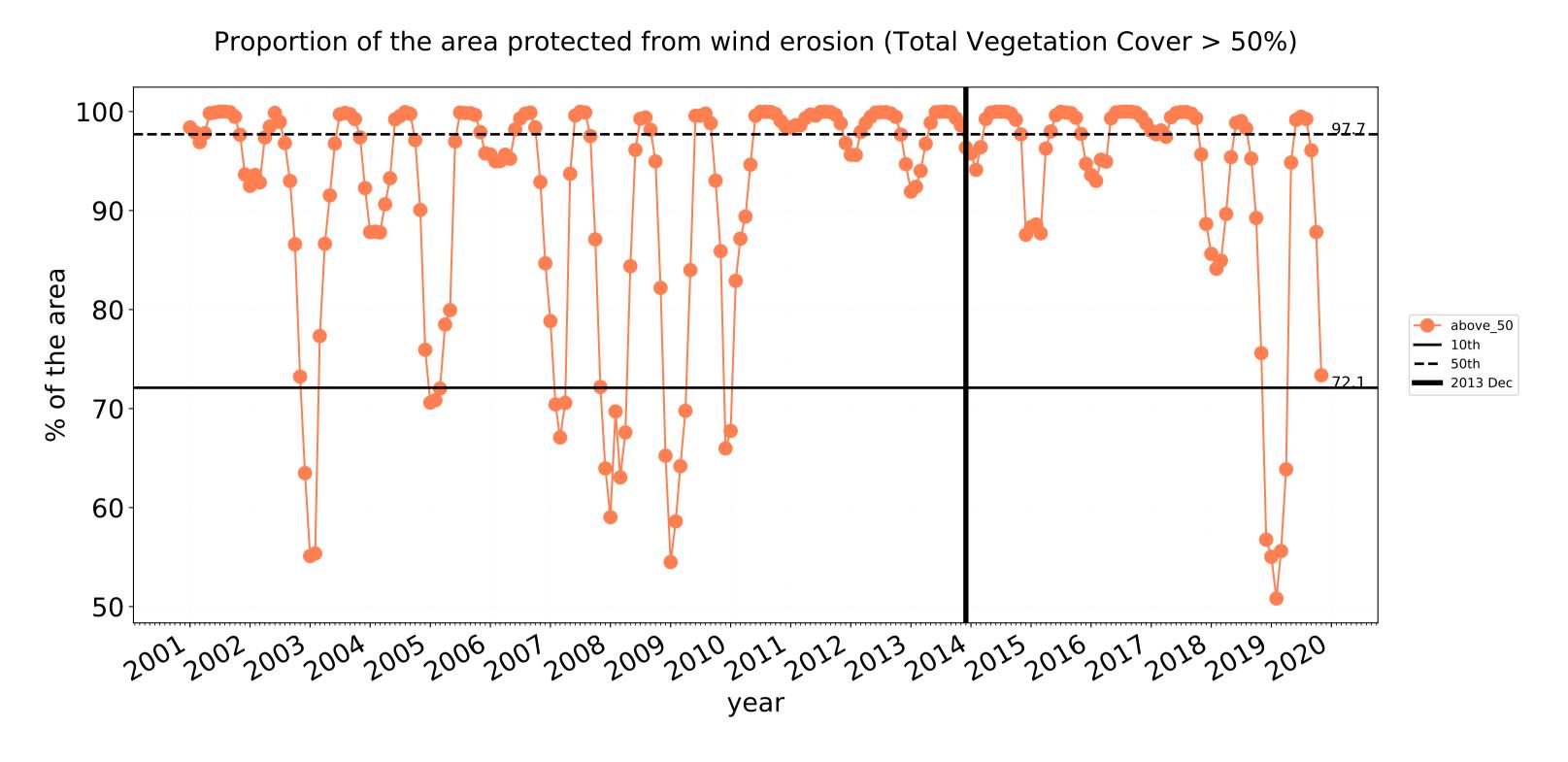


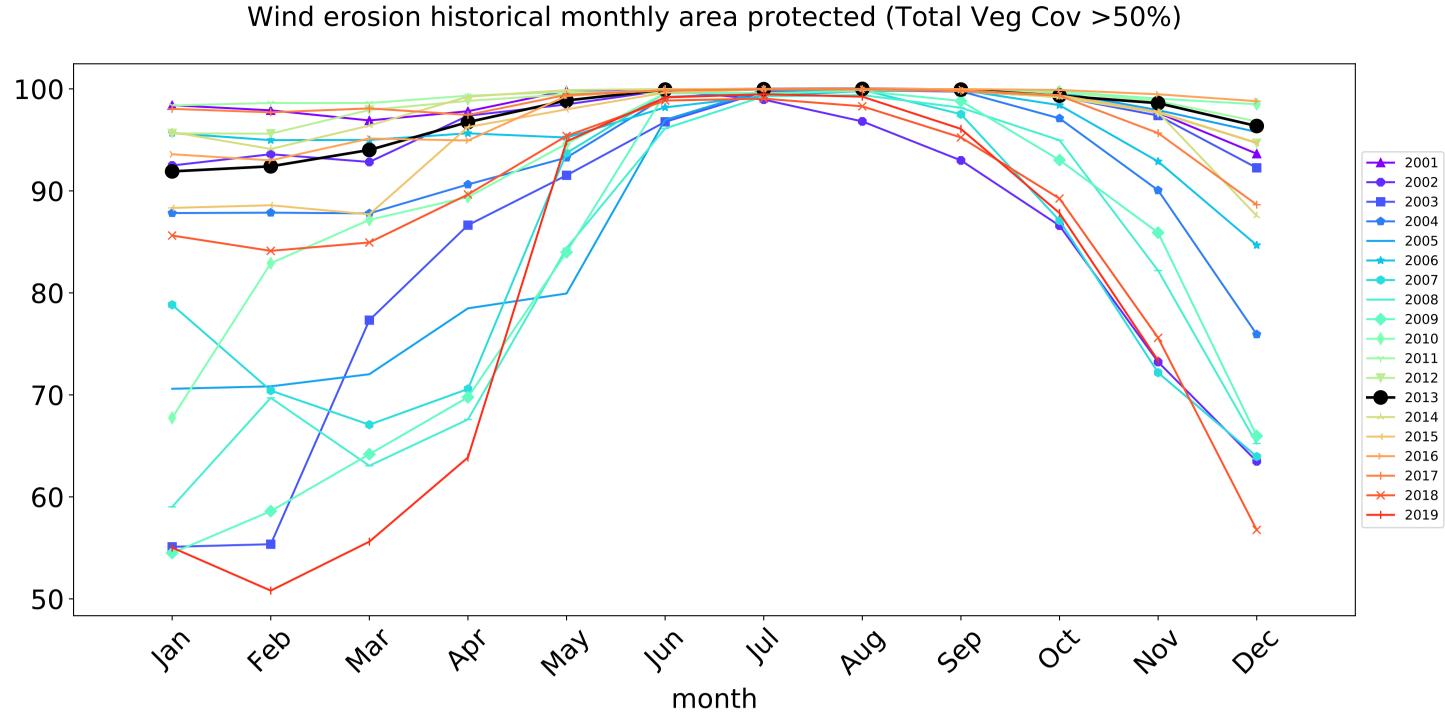


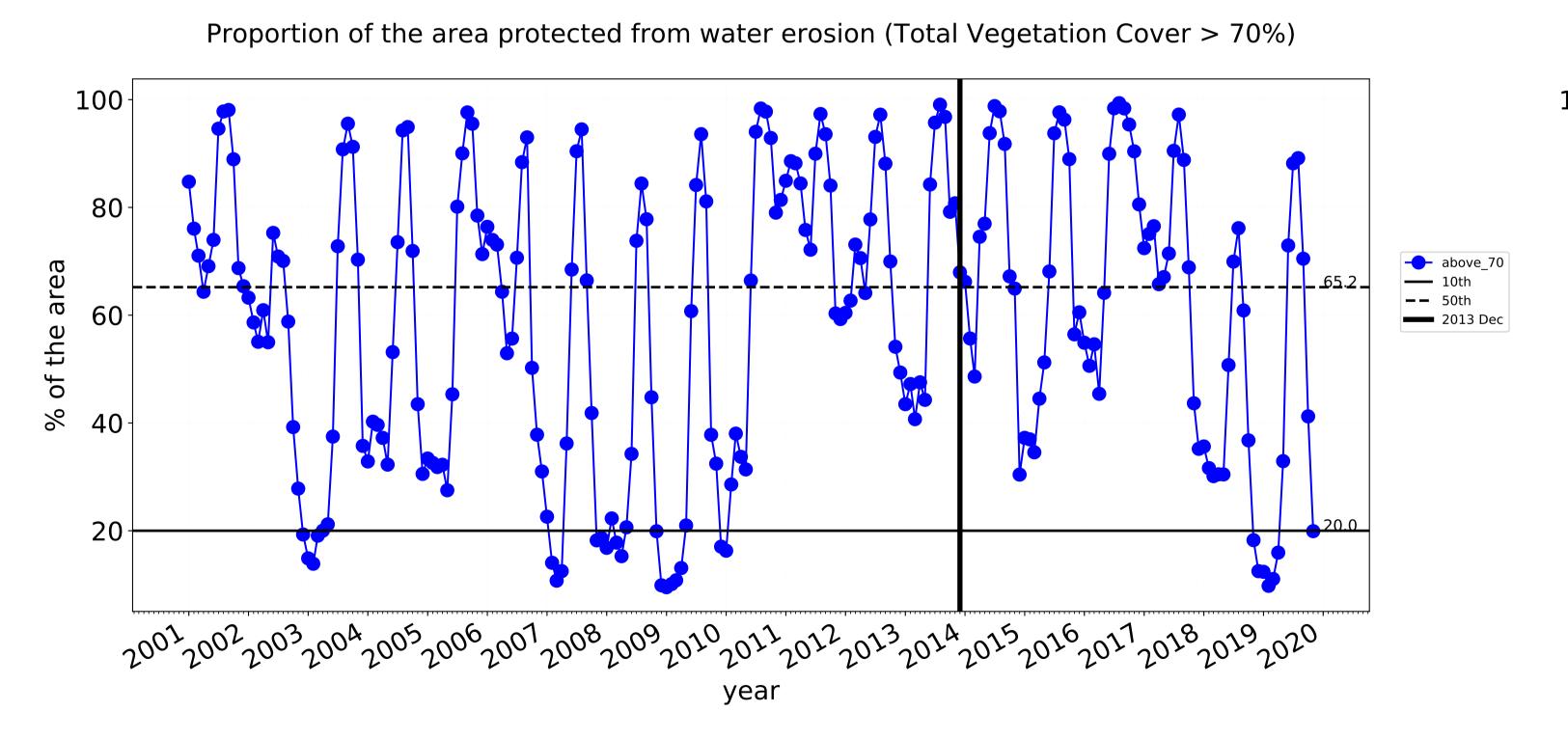


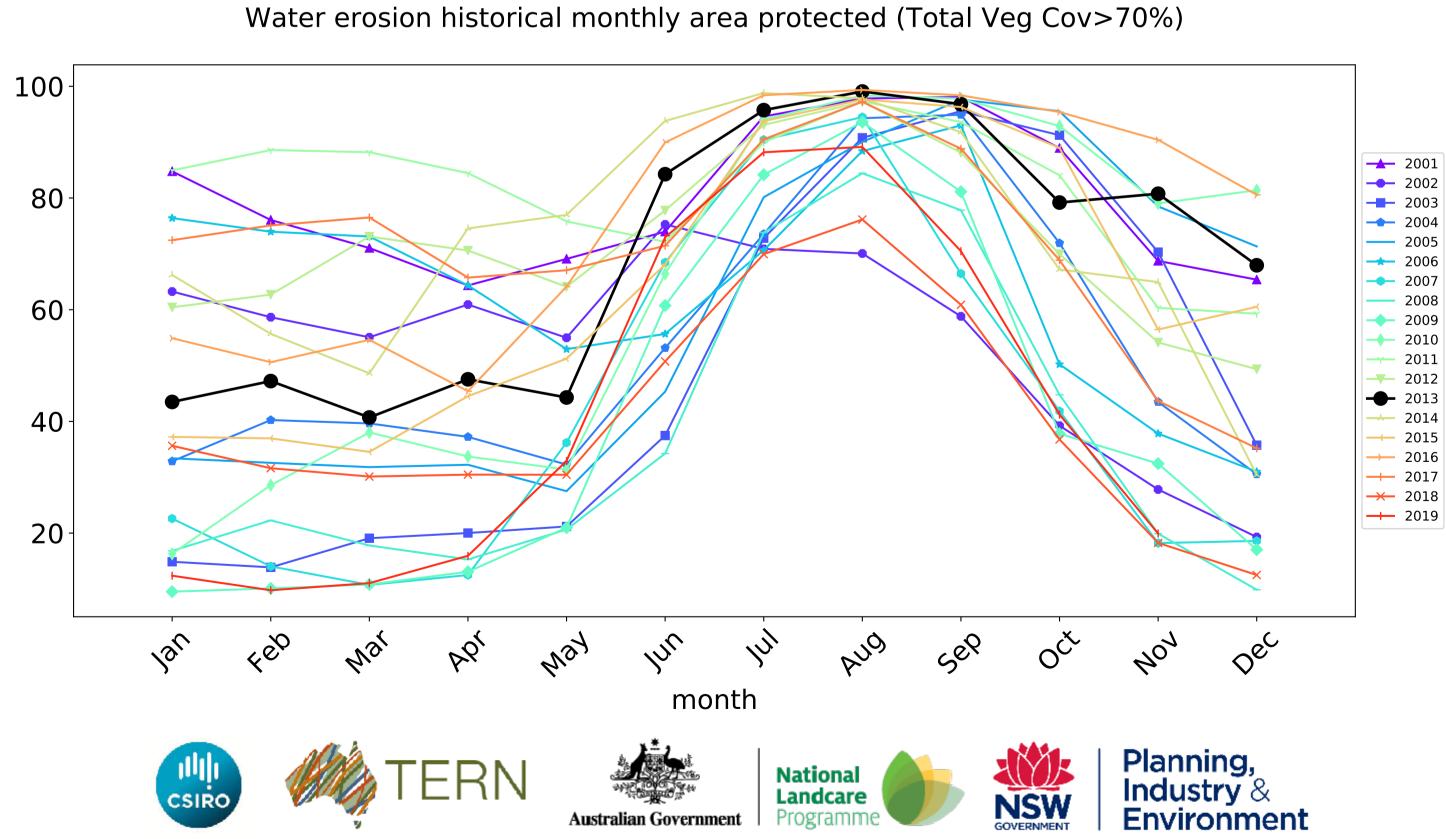


### **Cropping timeseries**

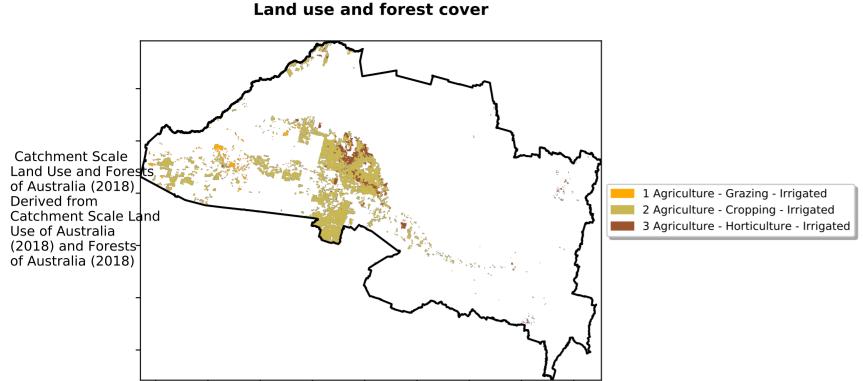


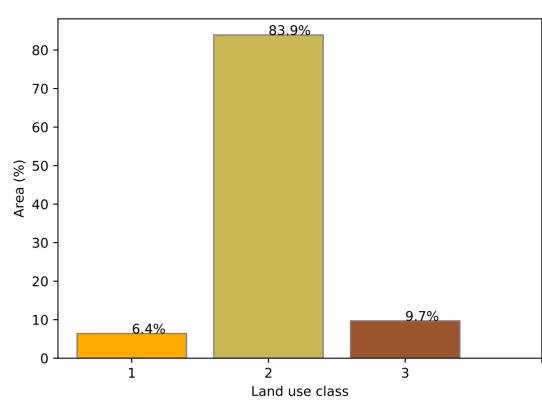


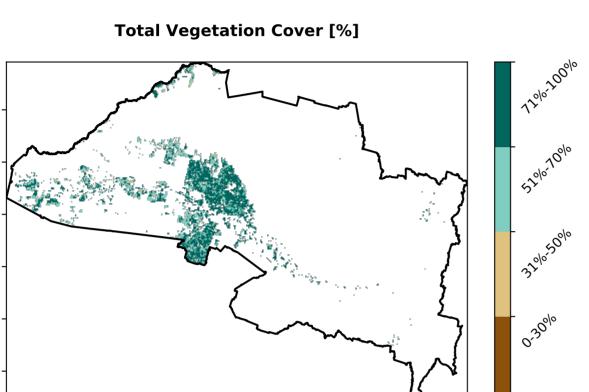


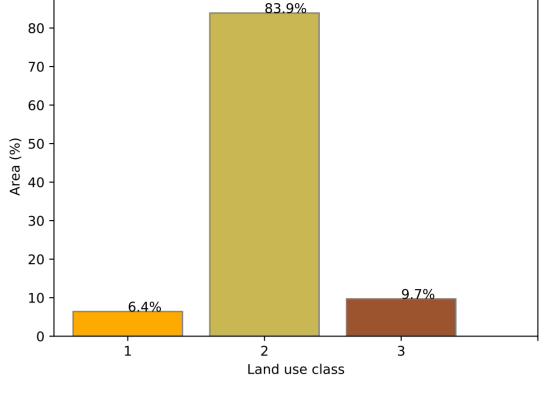


### Irrigation



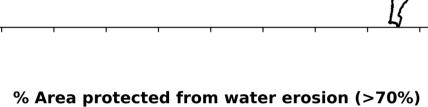


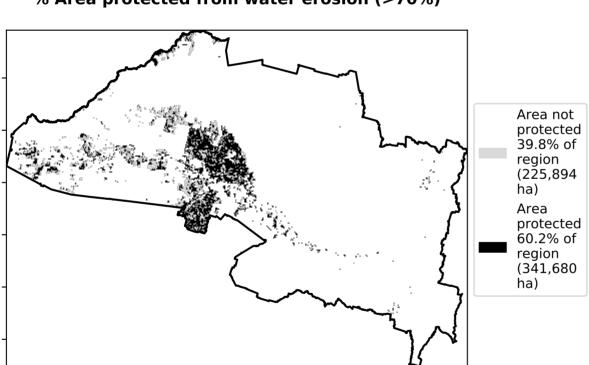




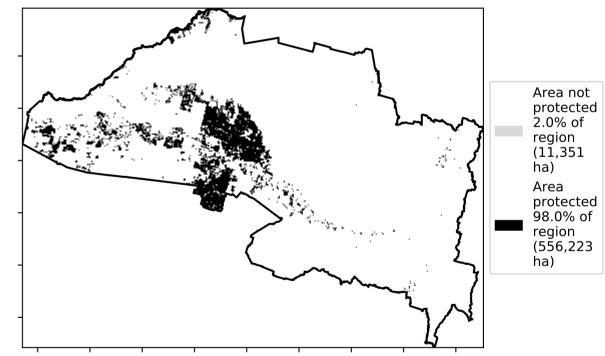
**Proportion of each land class in area** 

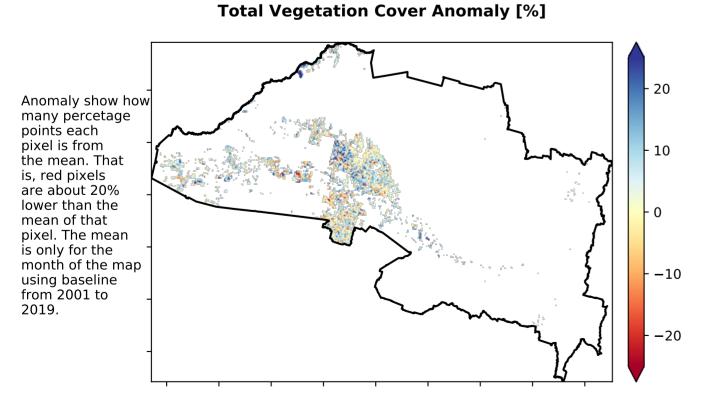
### **Proportion of vegetation cover class in area** 60.2% 60 · 50 40 37.8% Area (%) 20 10 2.1% 31%-50% 51%-70% 71%-100% 0-30% **Total Vegetation Cover class**



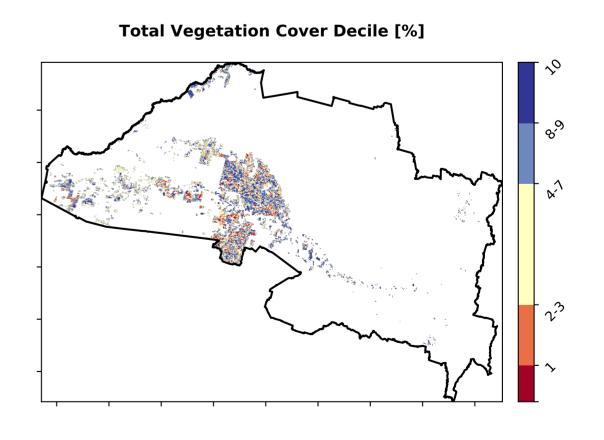


% Area protected from wind erosion (>50%)





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





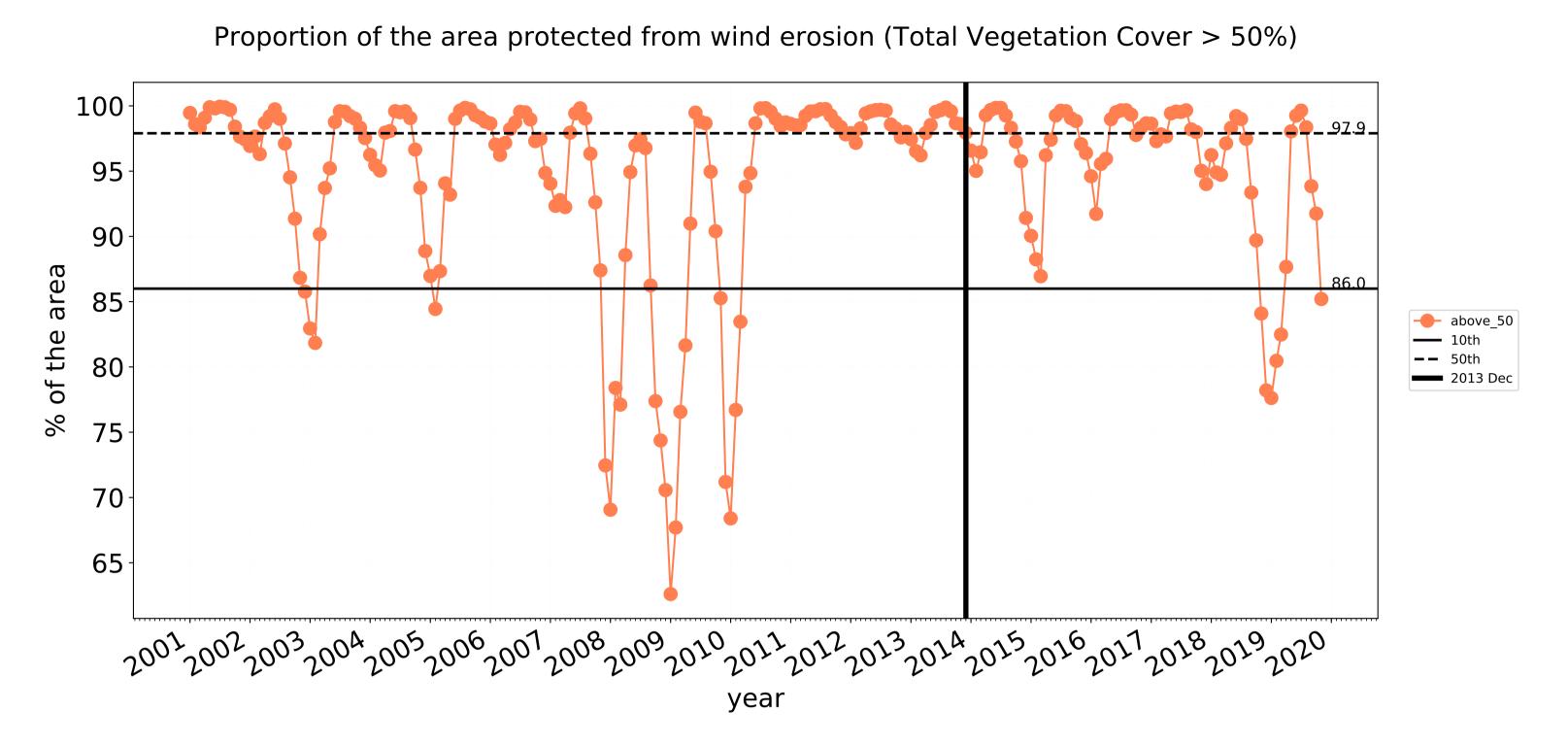


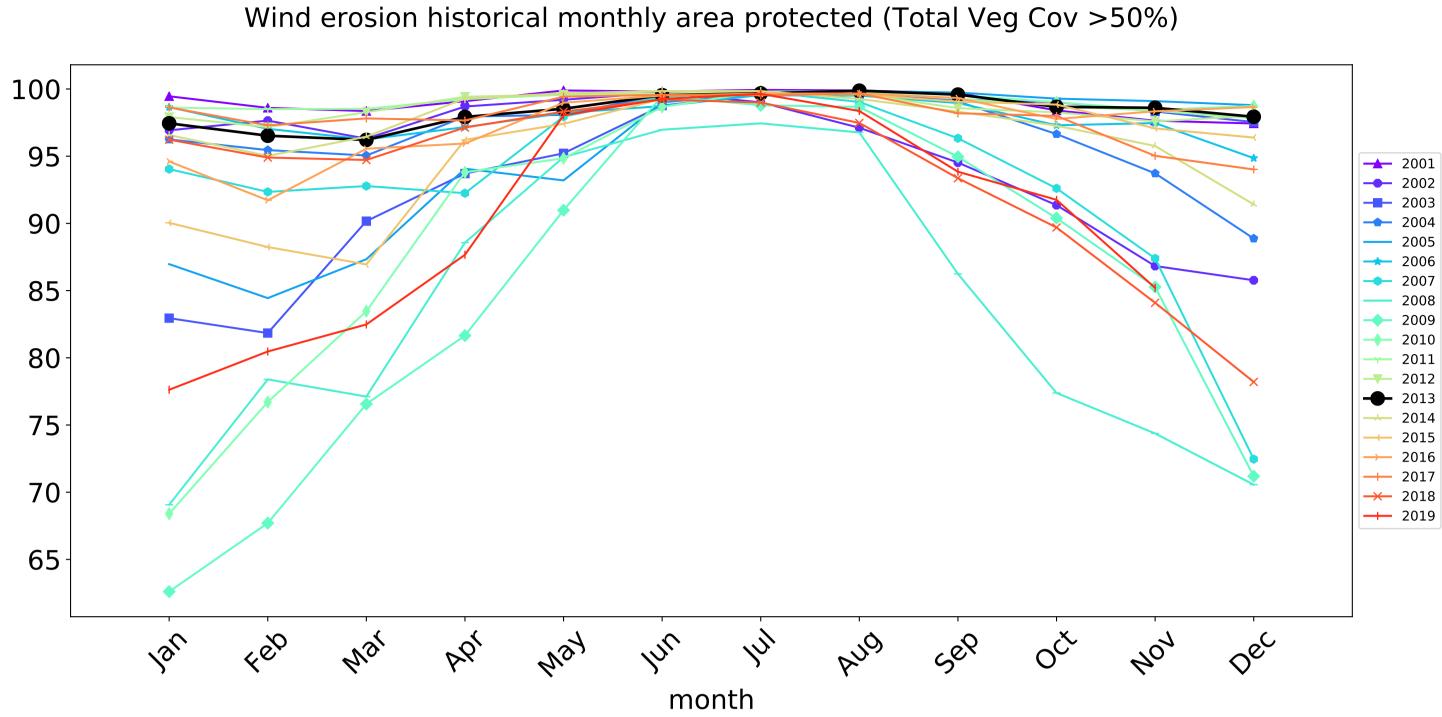


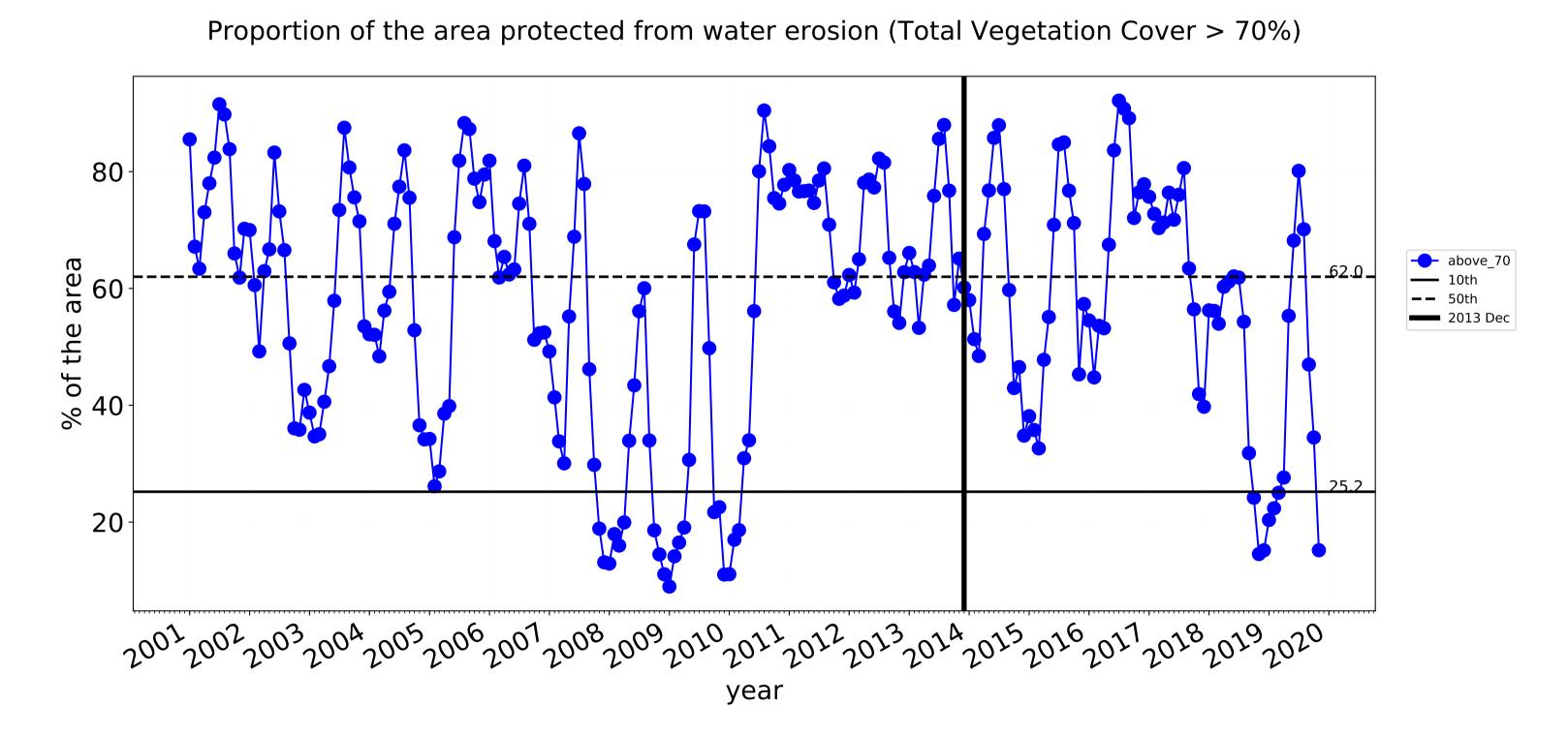


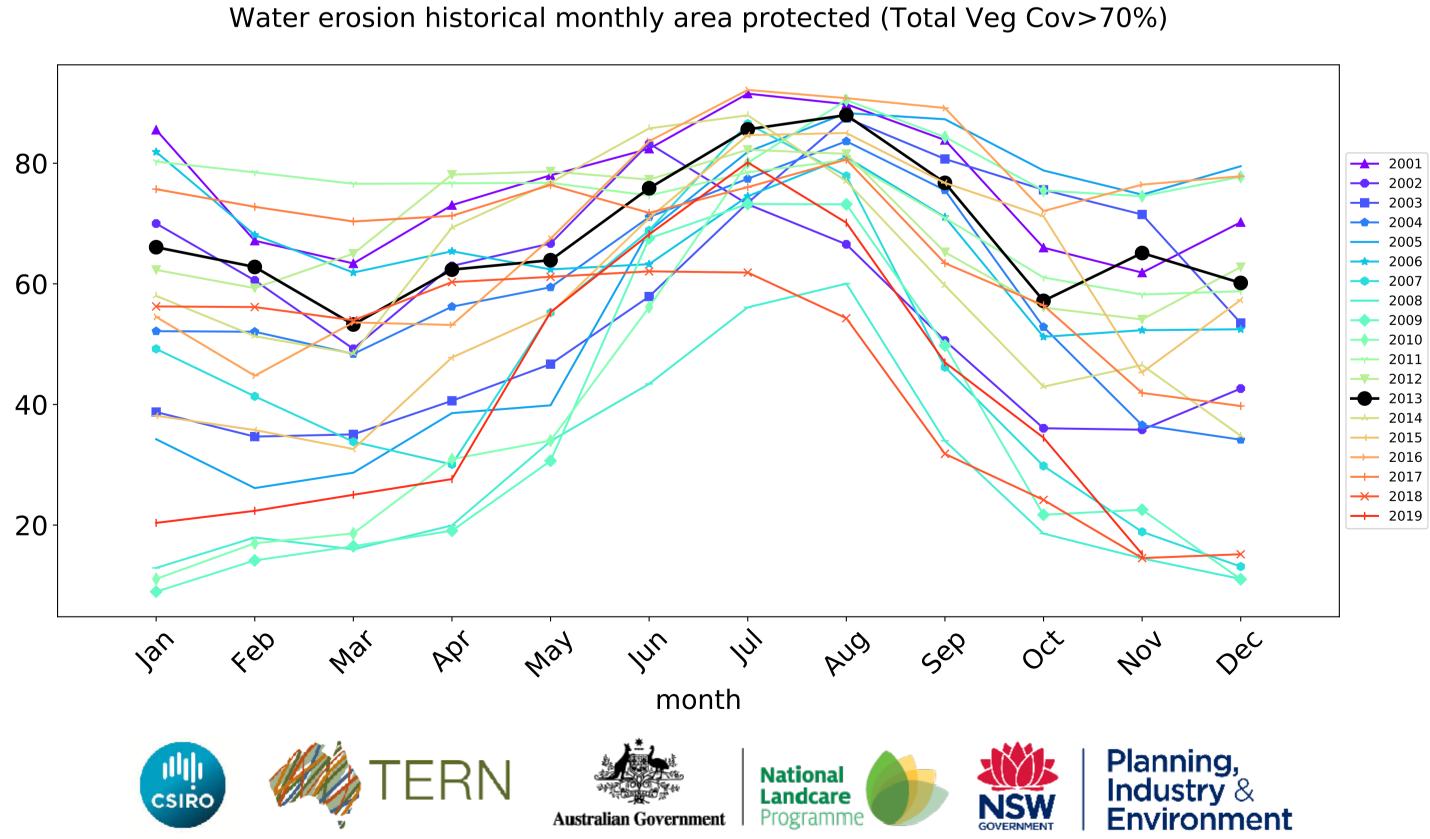










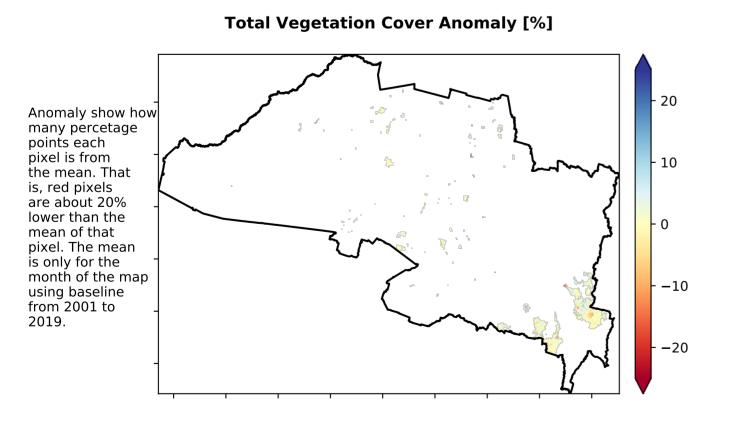


### **Production native forests and plantation forests**

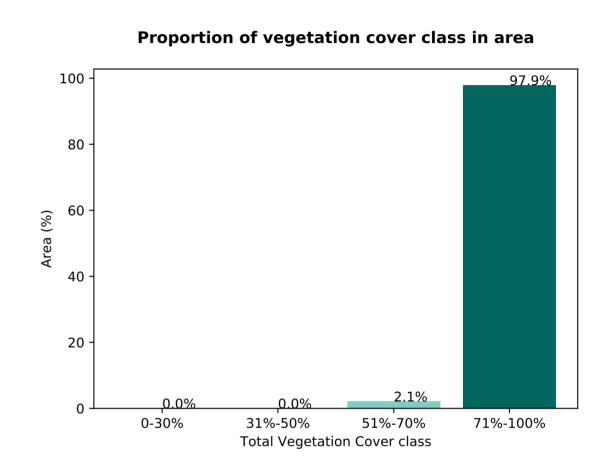
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) (2018) and Forests of Australia (2018)

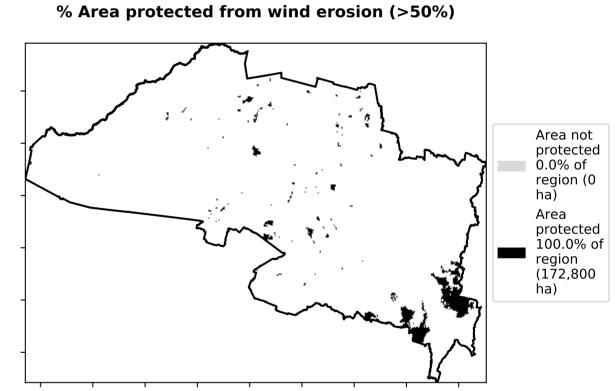
# Total Vegetation Cover [%]

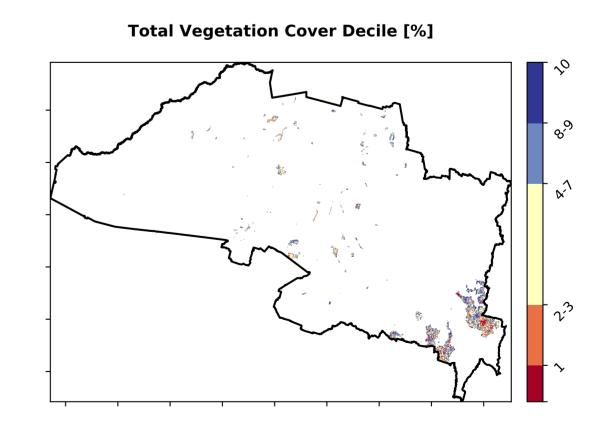
### Area not protected 2.1% of region (3,628 ha) Area protected 97.9% of region (169,171 ha)



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.











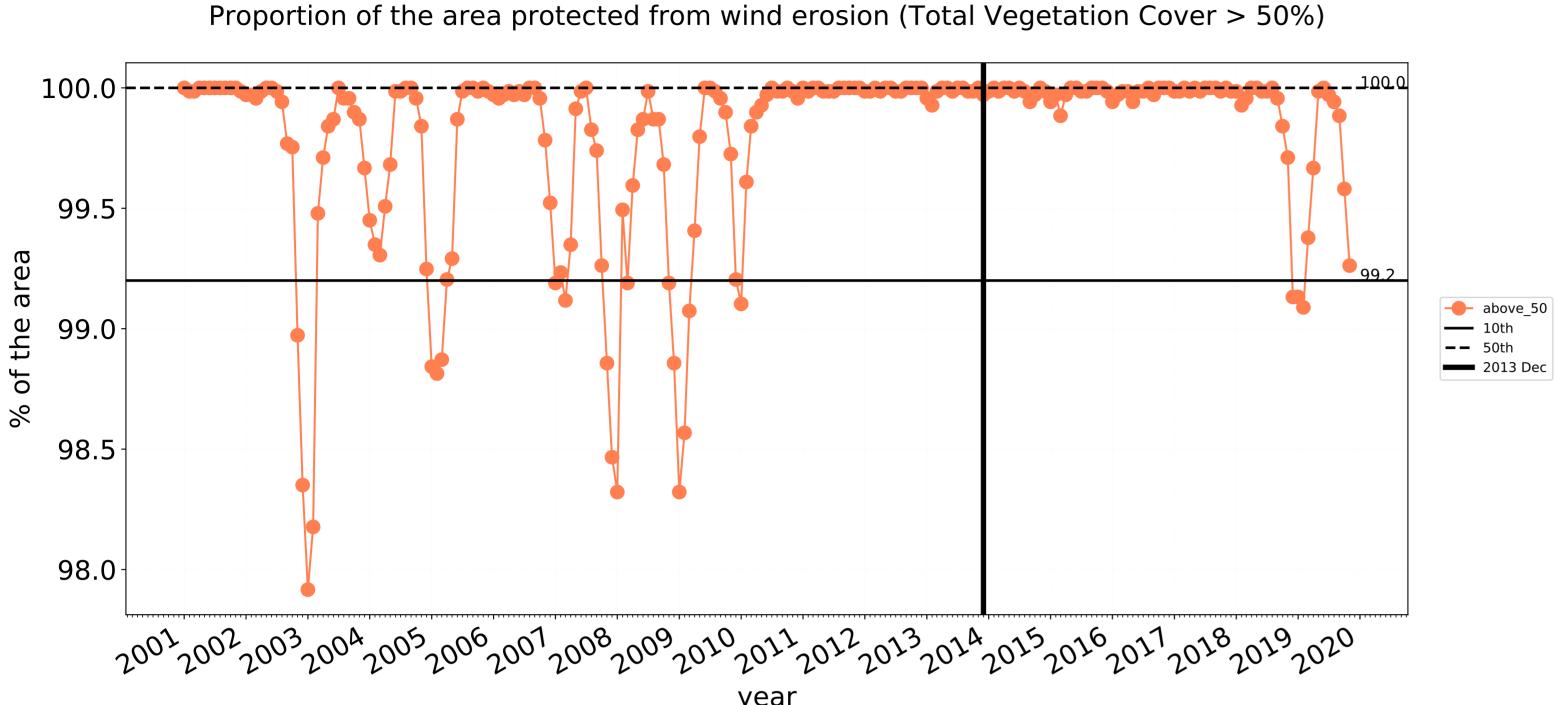


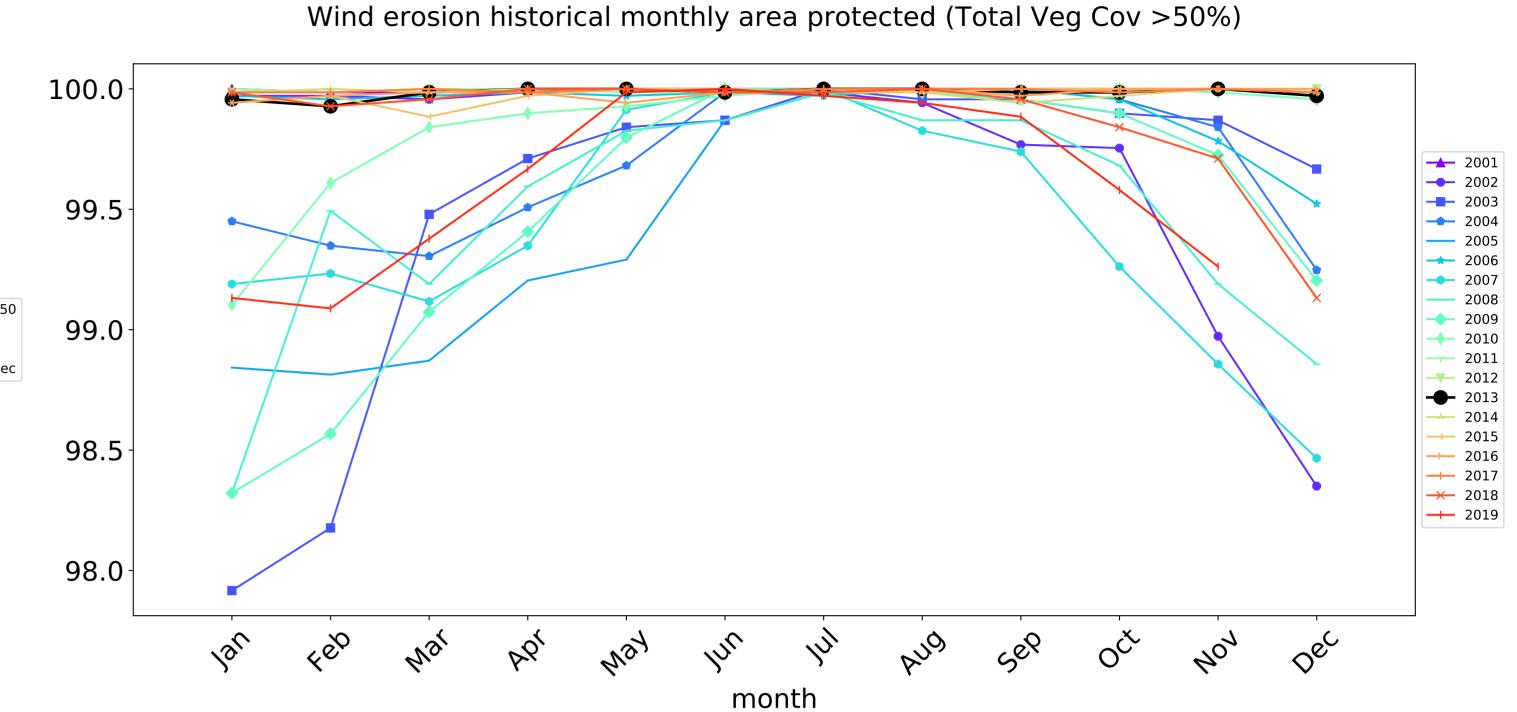


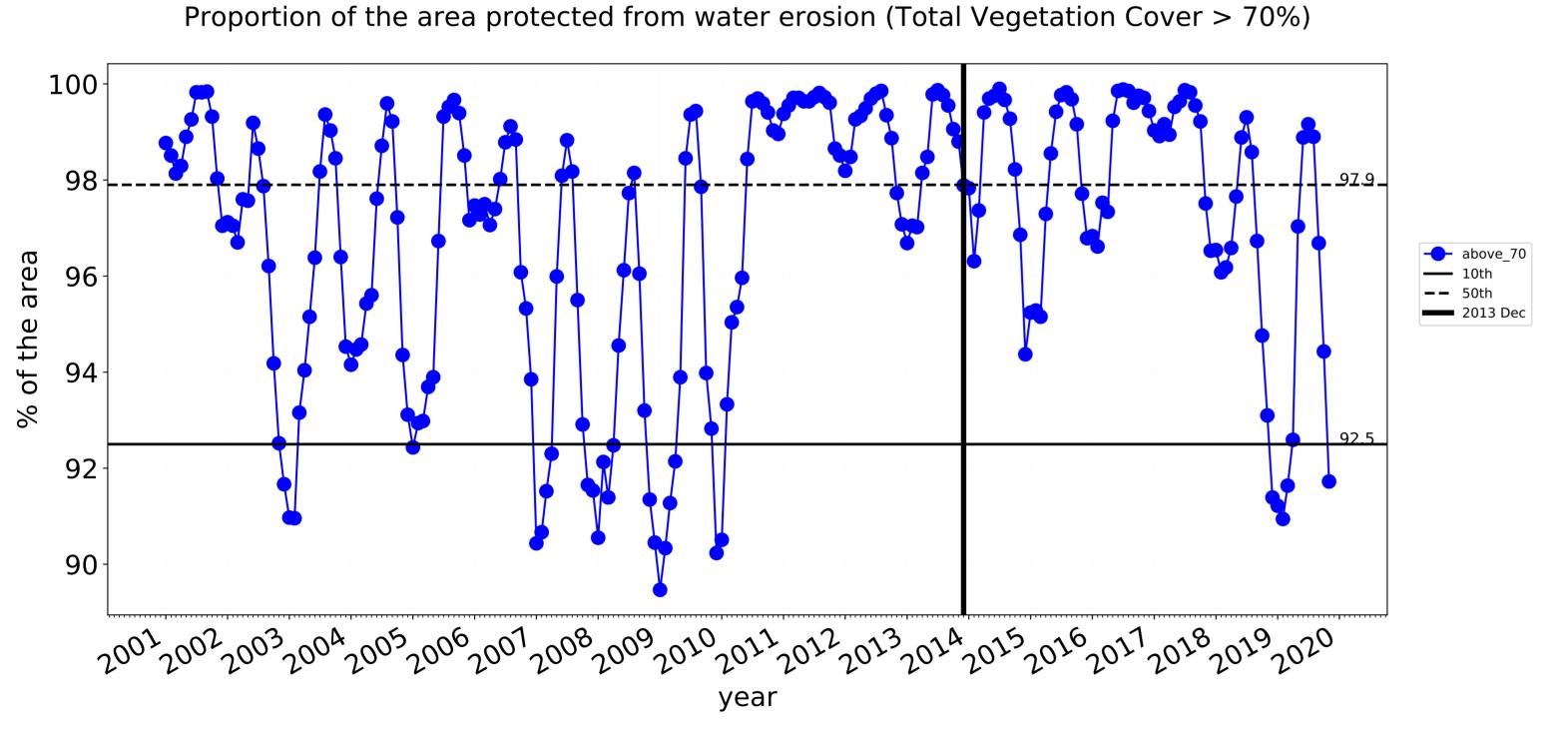


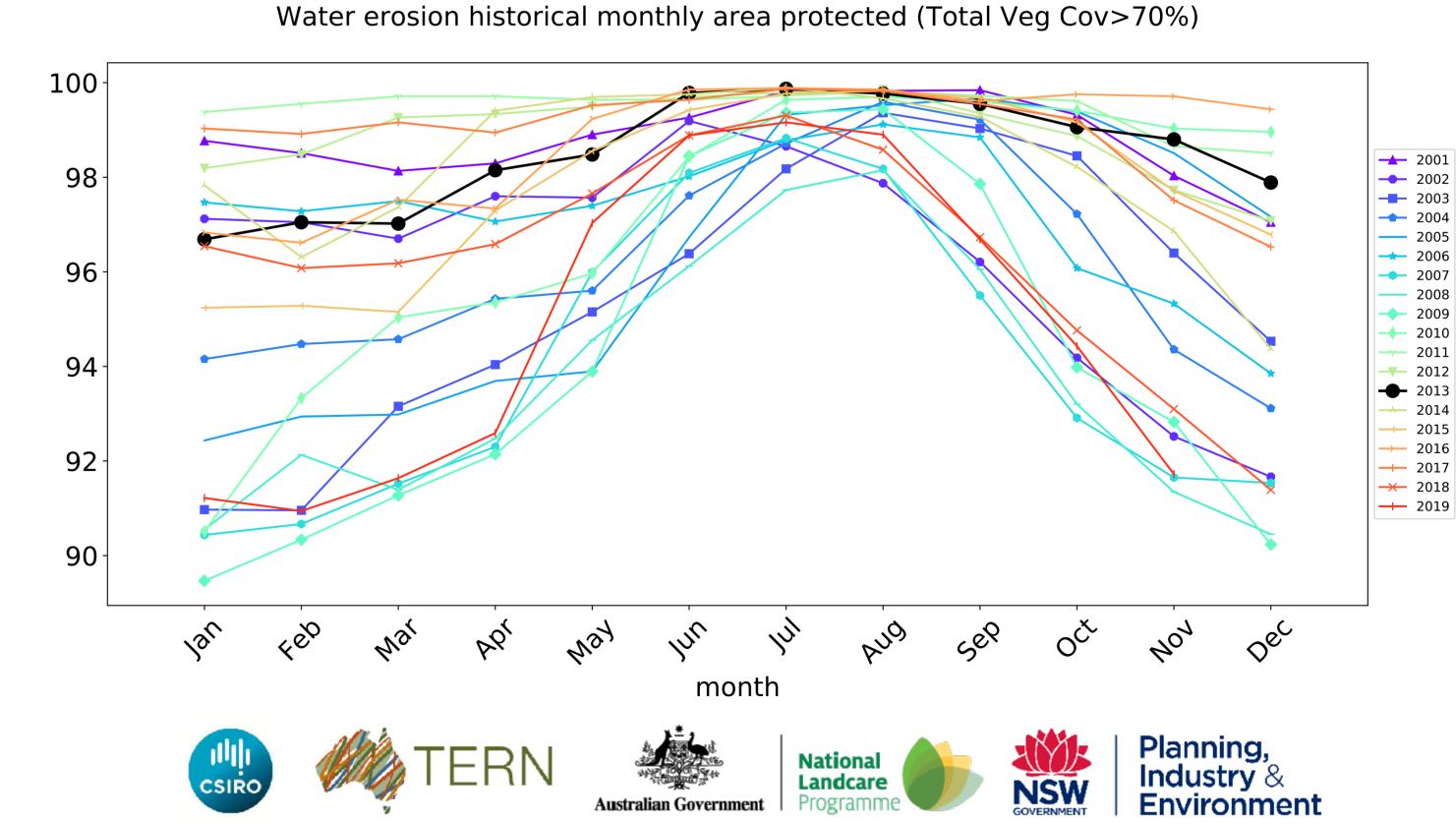


### **Production native forests and plantation forests timeseries**









### Riverina (6,694,025 ha and no data 14,310 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	6,694,025	100.0% 6,692,250	97.1% 6,501,550	66.1% 4,426,171	42.1% 2,817,606	21.6% 1,443,186	10.4% 696,383
Conservation and natural environments	323,050	100.0% 323,050	99.9% 322,725	89.7% 289,850	77.6% 250,750	61.6% 198,850	30.5% 98,500
Conservation and natural environments non forest	83,350	100.0% 83,350	99.7% 83,075	61.4% 51,200	22.1% 18,400	14.1% 11,725	8.1% 6,775
Conservation and natural environments Forest (non woodland)	195,200	100.0% 195,200	100.0% 195,200	99.9% 195,100	99.2% 193,600	89.8% 175,275	45.7% 89,175
Agriculture	6,068,000	100.0% 6,067,775	96.9% 5,882,475	64.0% 3,885,575	38.9% 2,363,425	18.4% 1,116,775	8.8% 533,575
Grazing	2,311,650	100.0% 2,311,575	97.5% 2,254,475	59.6% 1,378,050	38.2% 882,250	23.3% 538,000	12.2% 281,800
Grazing non forest	2,066,650	100.0% 2,066,575	97.2% 2,009,675	55.6% 1,149,300	34.4% 710,150	22.3% 461,125	12.1% 250,250
Grazing Woodland forest	141,650	100.0% 141,650	99.9% 141,475	89.9% 127,300	57.1% 80,900	12.2% 17,275	4.2% 5,950
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,325	98.2% 101,450	88.2% 91,200	57.7% 59,600	24.8% 25,600
Cropping	3,186,950	100.0% 3,186,800	96.4% 3,070,875	68.0% 2,165,625	41.8% 1,331,000	16.9% 539,375	7.4% 235,425
Irrigation	567,575	100.0% 567,575	97.9% 555,850	60.2% 341,425	26.4% 150,025	6.9% 39,325	2.9% 16,325
Production native forests and plantation forests	172,800	100.0% 172,800	100.0% 172,750	97.9% 169,150	90.4% 156,250	64.2% 110,925	33.5% 57,825











