## **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: November 2008** 

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





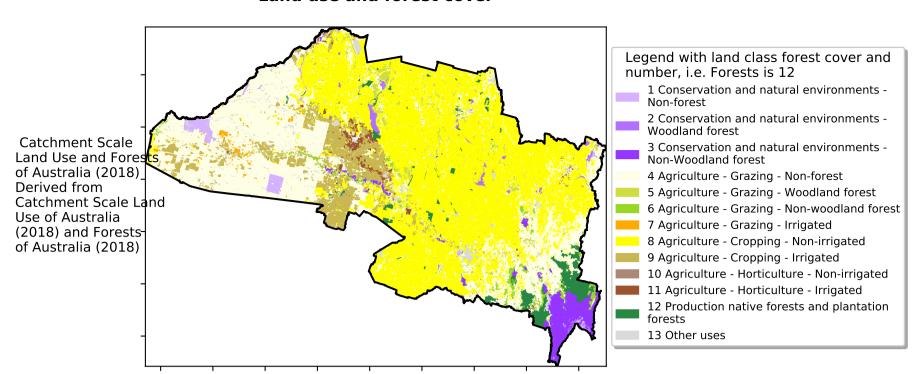




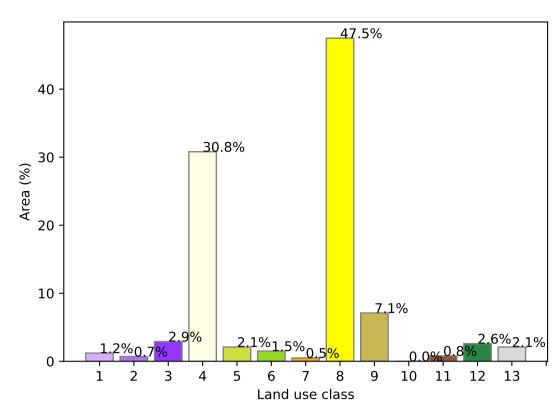


## **Vegetation Cover Nov 2008**

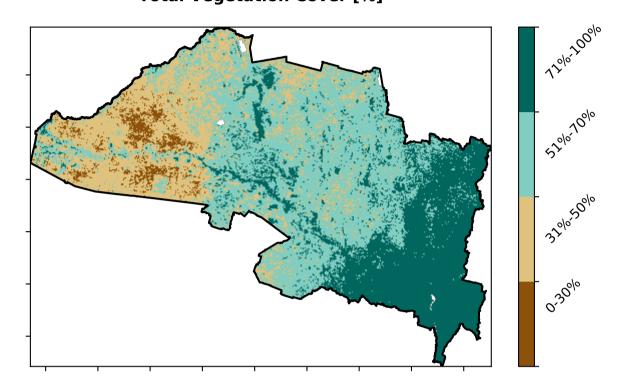
#### Land use and forest cover



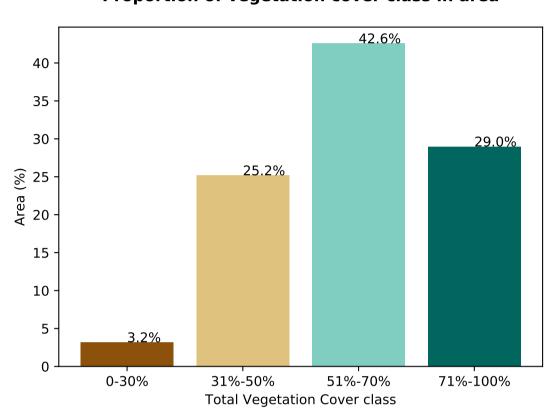
#### **Proportion of each land class in area**



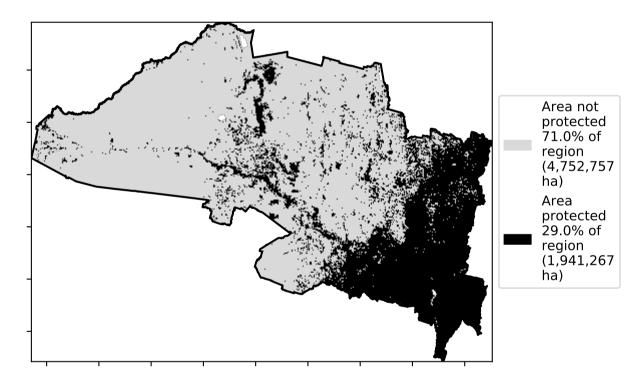
### **Total Vegetation Cover [%]**



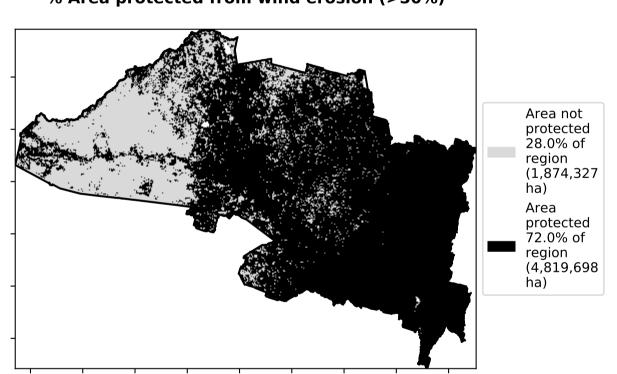
Proportion of vegetation cover class in area



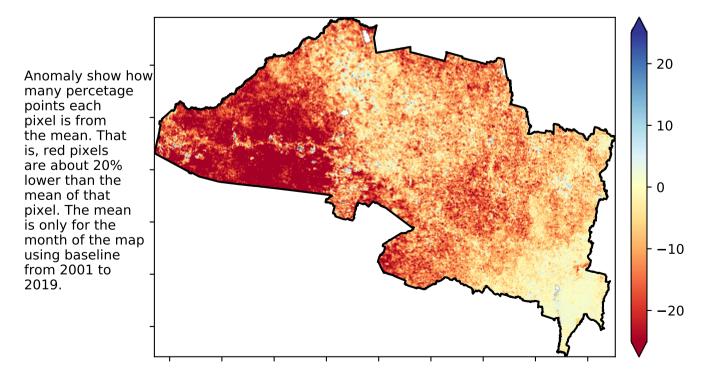
### % Area protected from water erosion (>70%)



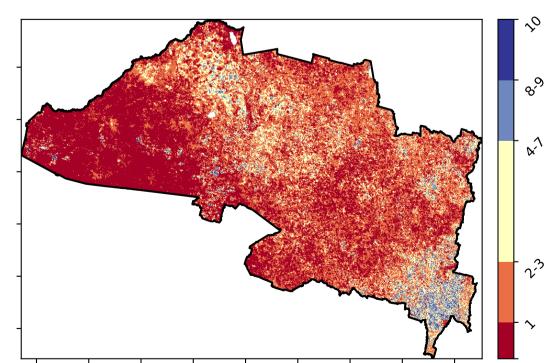
% Area protected from wind erosion (>50%)



## 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.





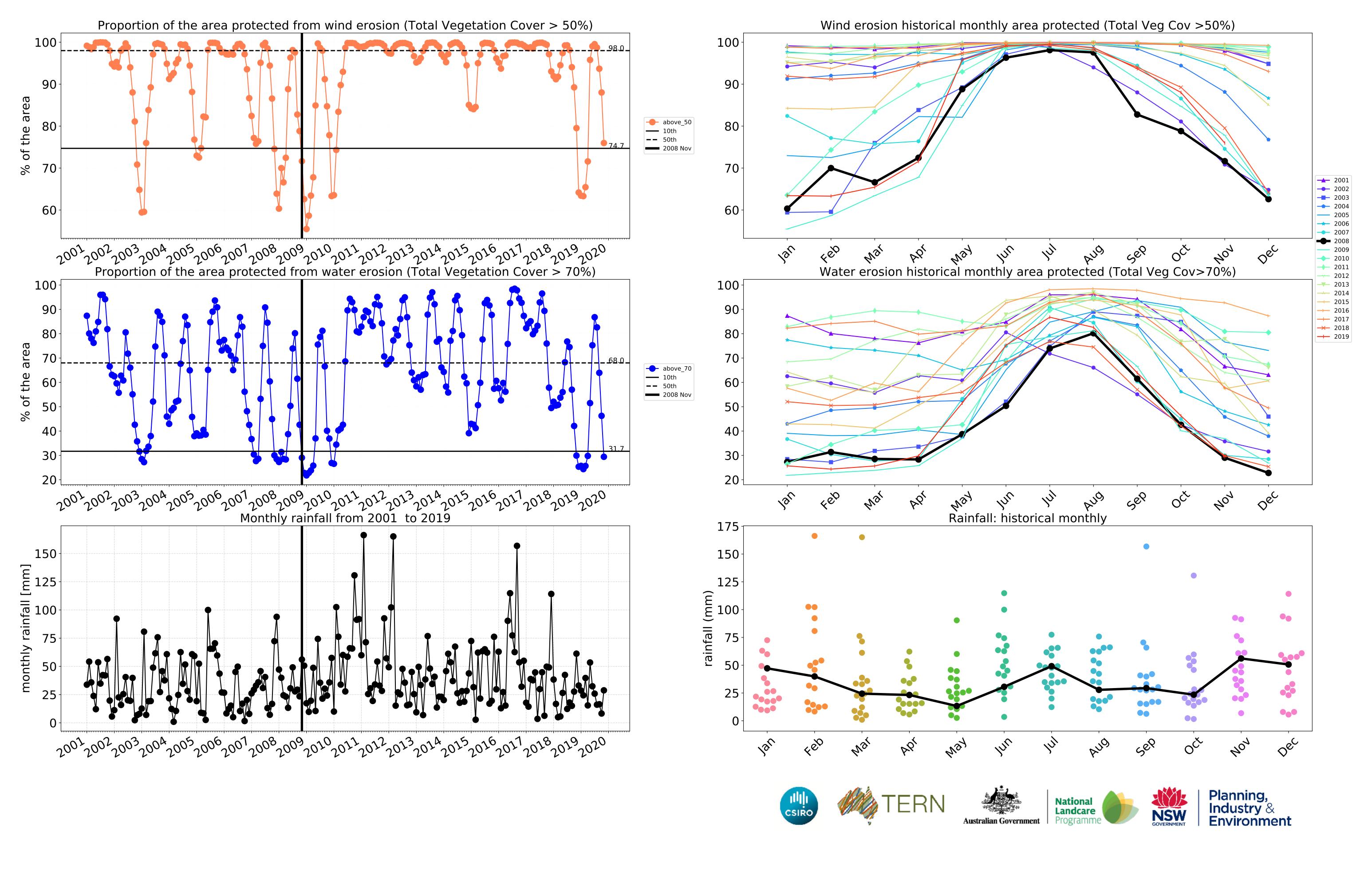












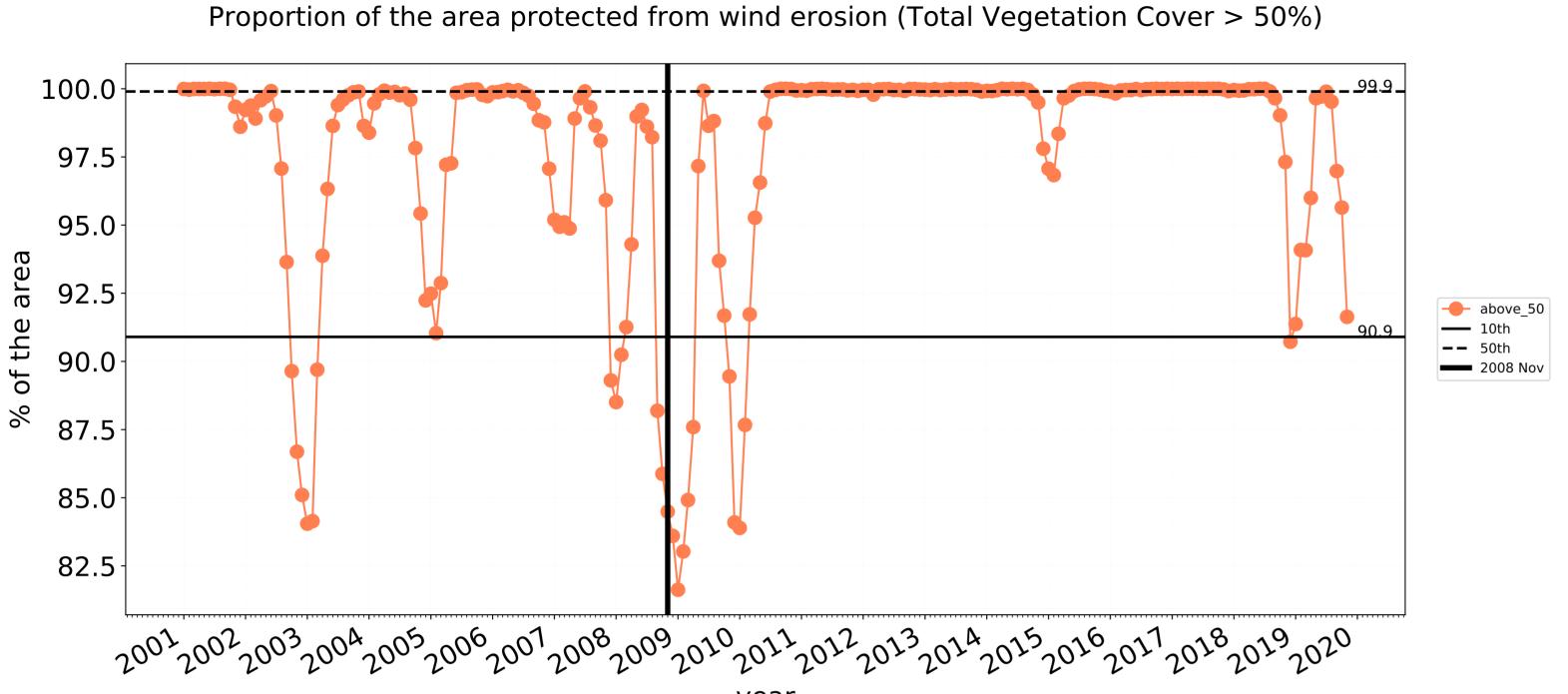
### **Conservation and natural environments**

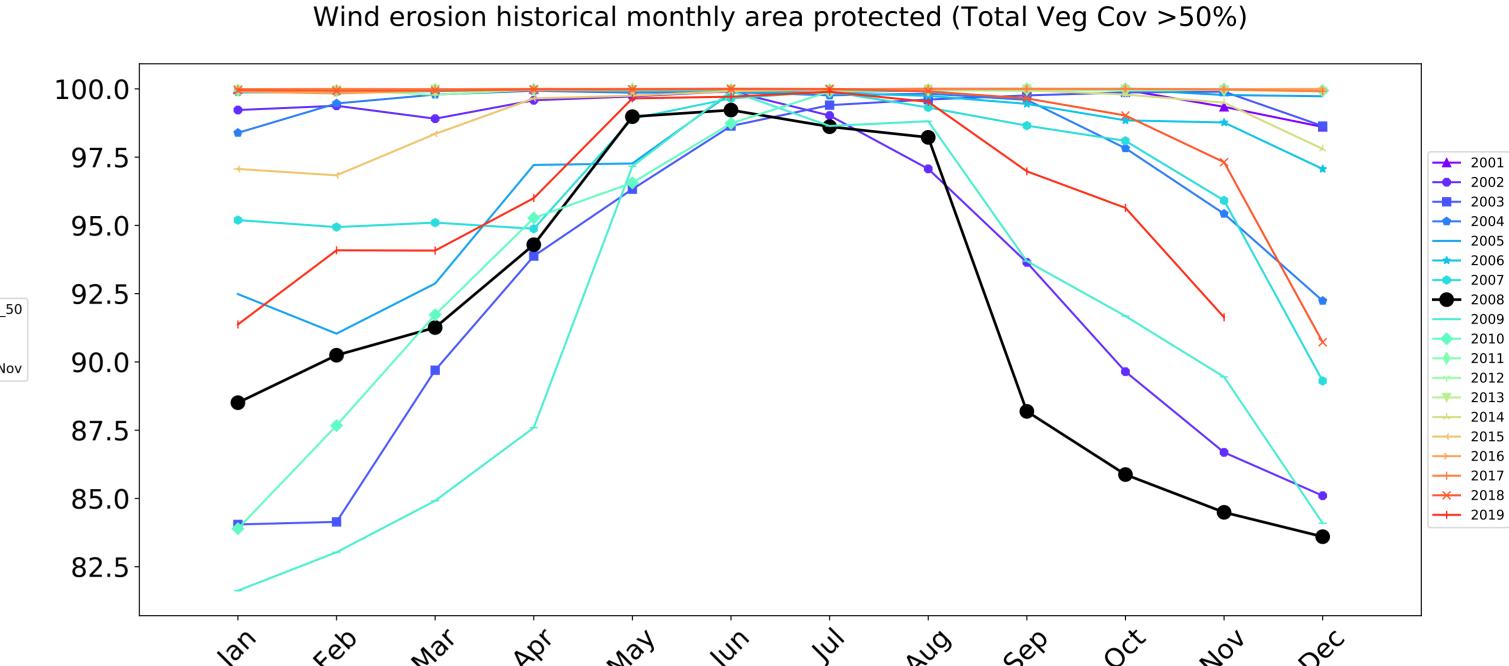
#### Land use and forest cover **Proportion of each land class in area** 60.4% 60 50 Catchment Scale Land Use and Forests of Australia (2018) 40 1 Conservation and natural environments - Non-Area (%) Derived from 2 Conservation and natural environments - Woodland Catchment Scale Land Use of Australia 3 Conservation and natural environments - Non-25.8% (2018) and Forestswoodland forest of Australia (2018) 20 13.8% 10 3 2 1 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 80 77.4% 70 60 50 30 20 14.7% 10 -7.0% 0-30% 31%-50% 51%-70% 71%-100% **Total Vegetation Cover class** % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%) Area not Area not protected 22.6% of protected 16.0% of region (73,014 region (51,692 ha) ha) Area Area protected protected 77.4% of 84.0% of region (271,383 region (250,060 ha) ha) **Total Vegetation Cover Decile [%] Total Vegetation Cover Anomaly [%]** - 20 Anomaly show how many percetage points each pixel is from Deciles show where the - 10 pixel value lies in the the mean. That is, red pixels record, from highest to lowest, for that month. That is, red pixels are are about 20% lower than the mean of that in the lowest 10% of pixel. The mean records for that month of the map using baseline from 2001 to 2019. is only for the month of the map using baseline from 2001 to 2019. -10 **-**20 Planning, Industry & Environment

Australian Government

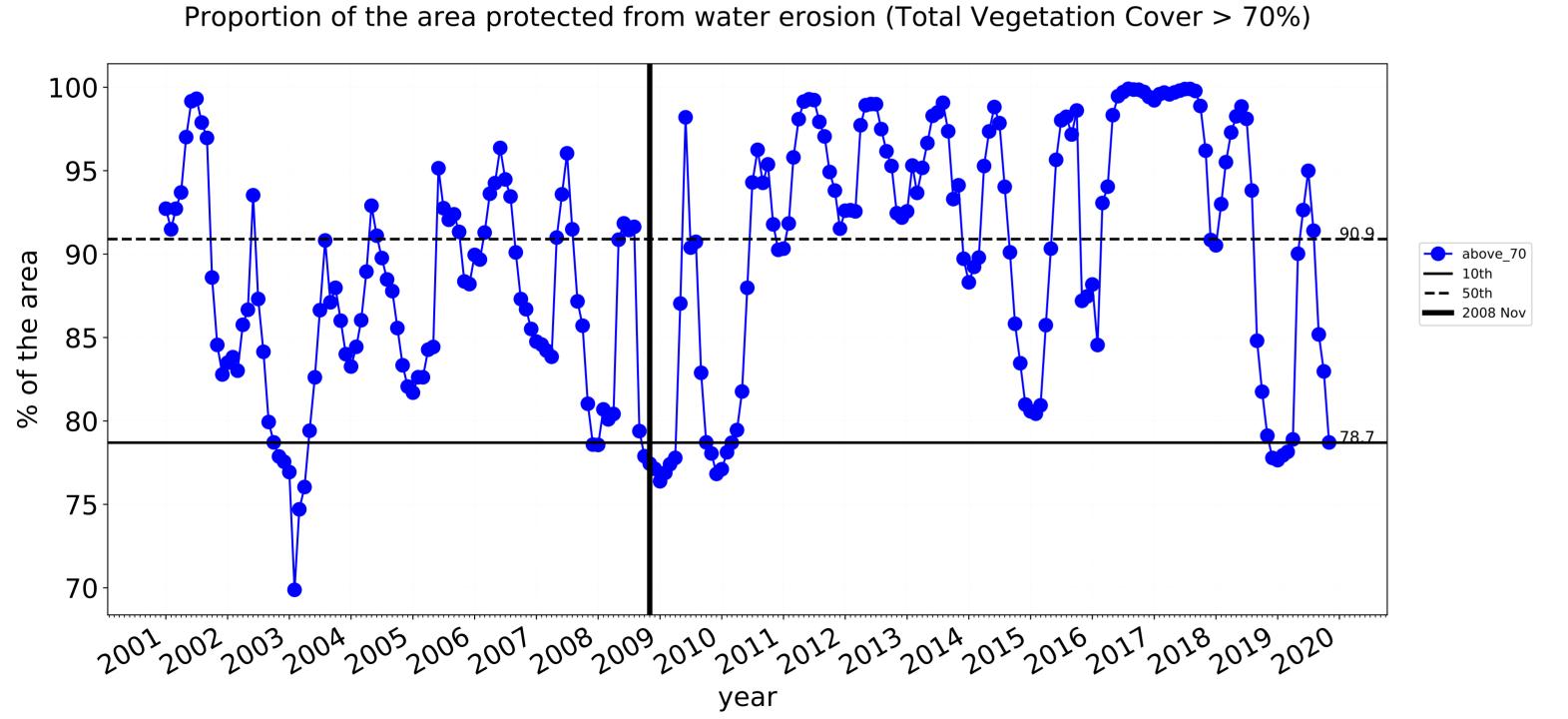
National Landcare Programme

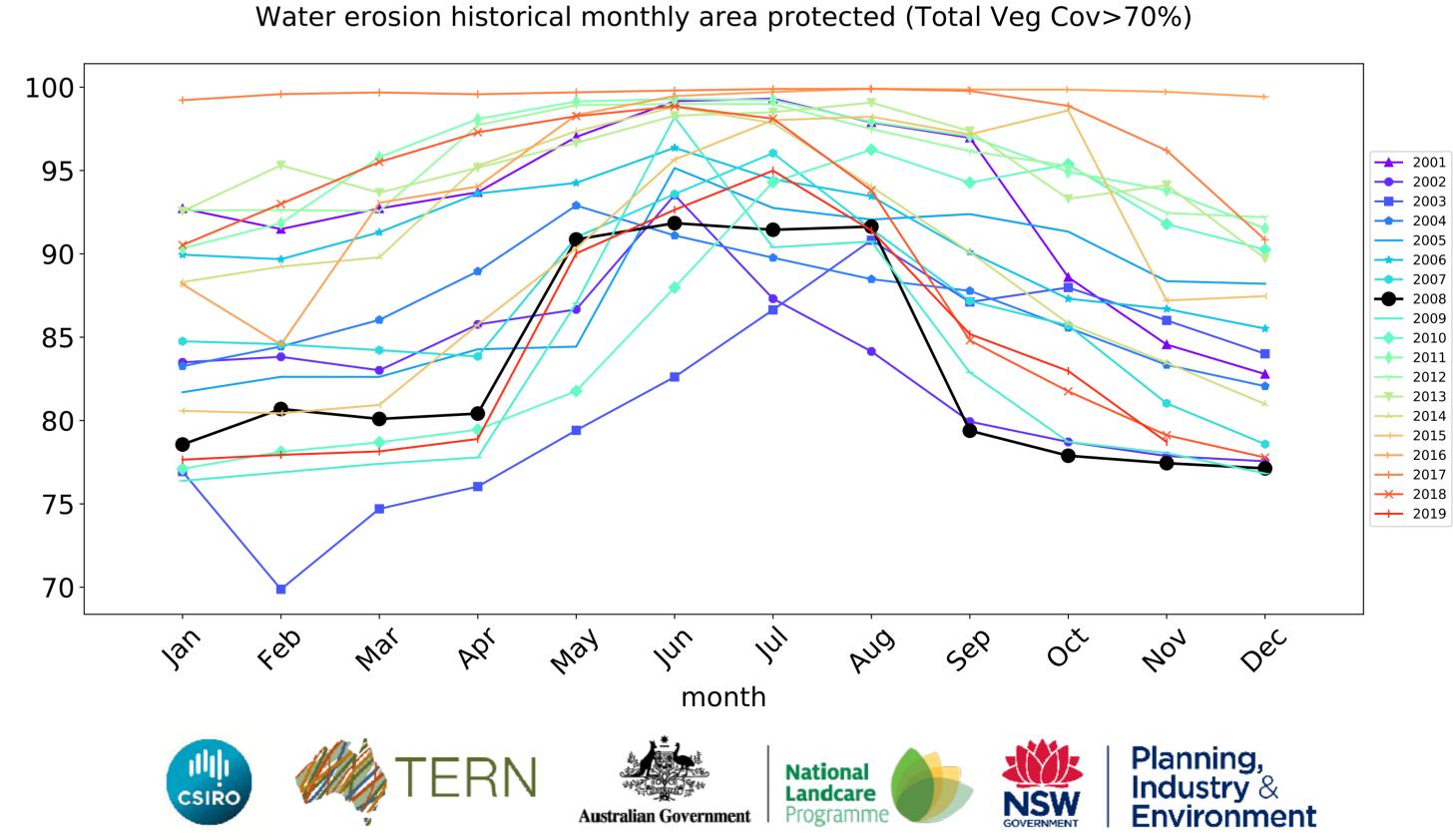
### **Conservation and natural environments timeseries**





month

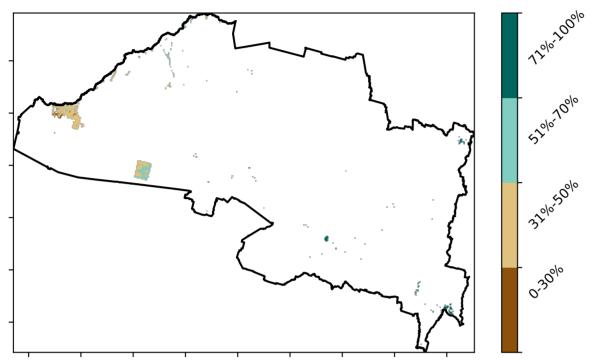




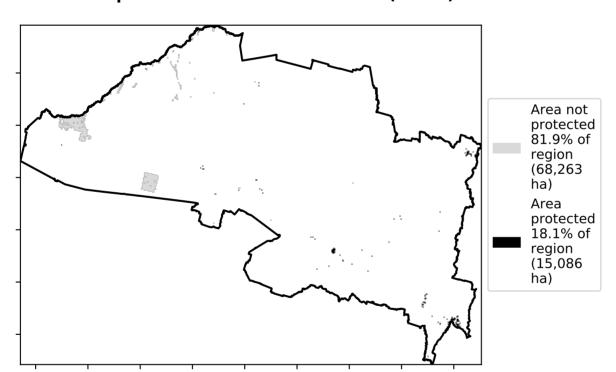
### **Conservation and natural environments non forest**

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

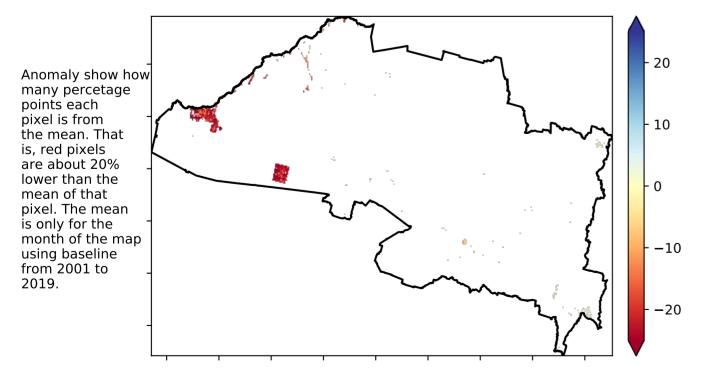
## Total Vegetation Cover [%]



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

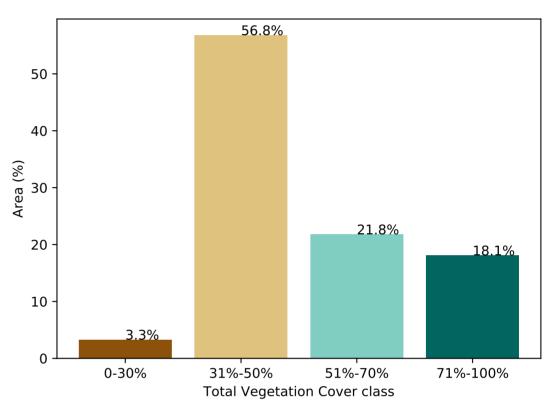


### Total Vegetation Cover Anomaly [%]

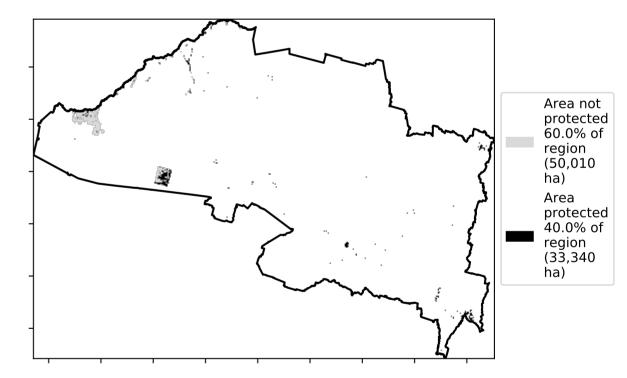


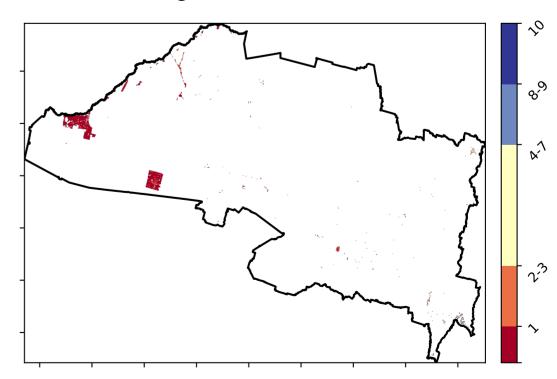
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area



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









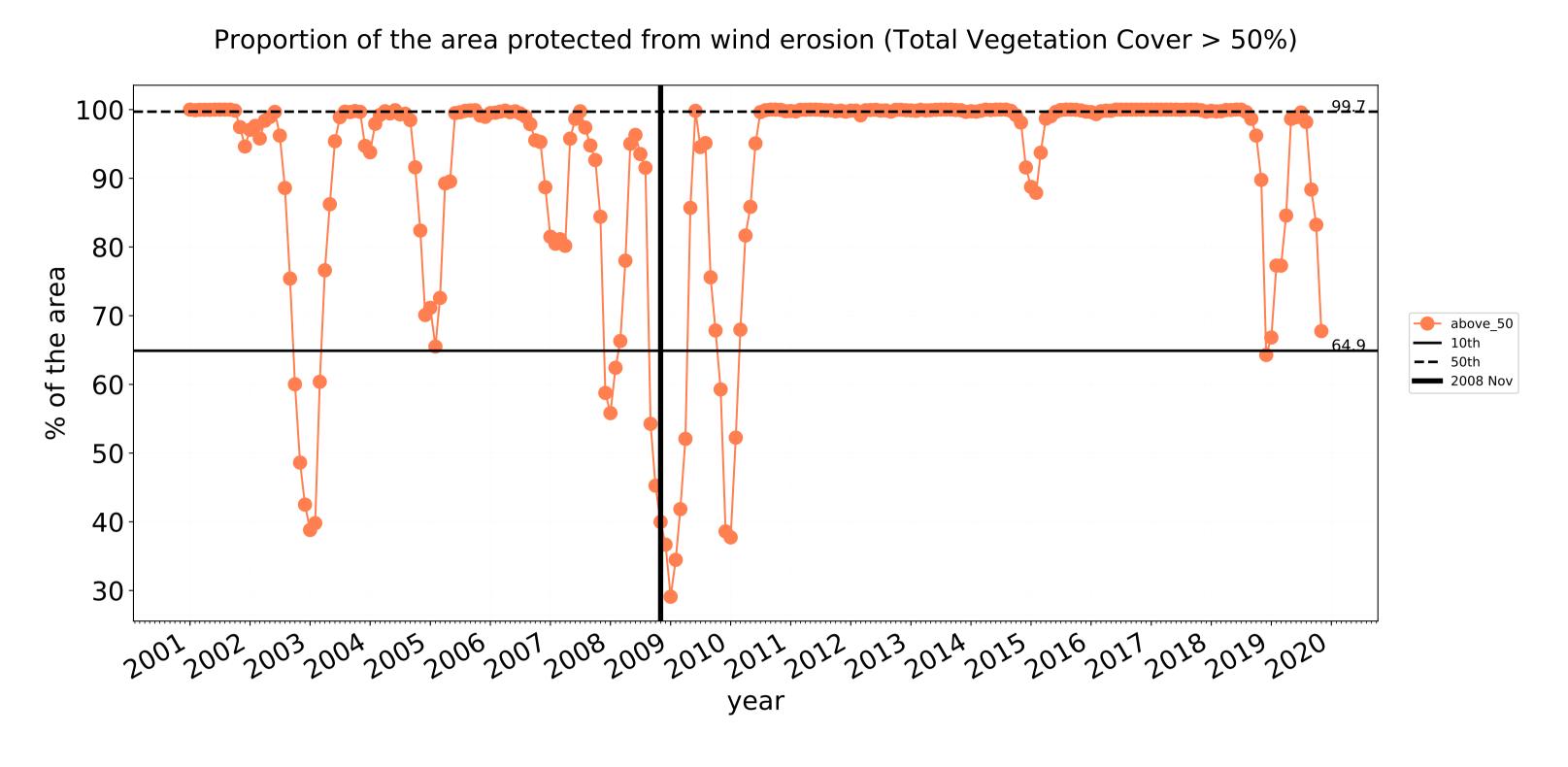


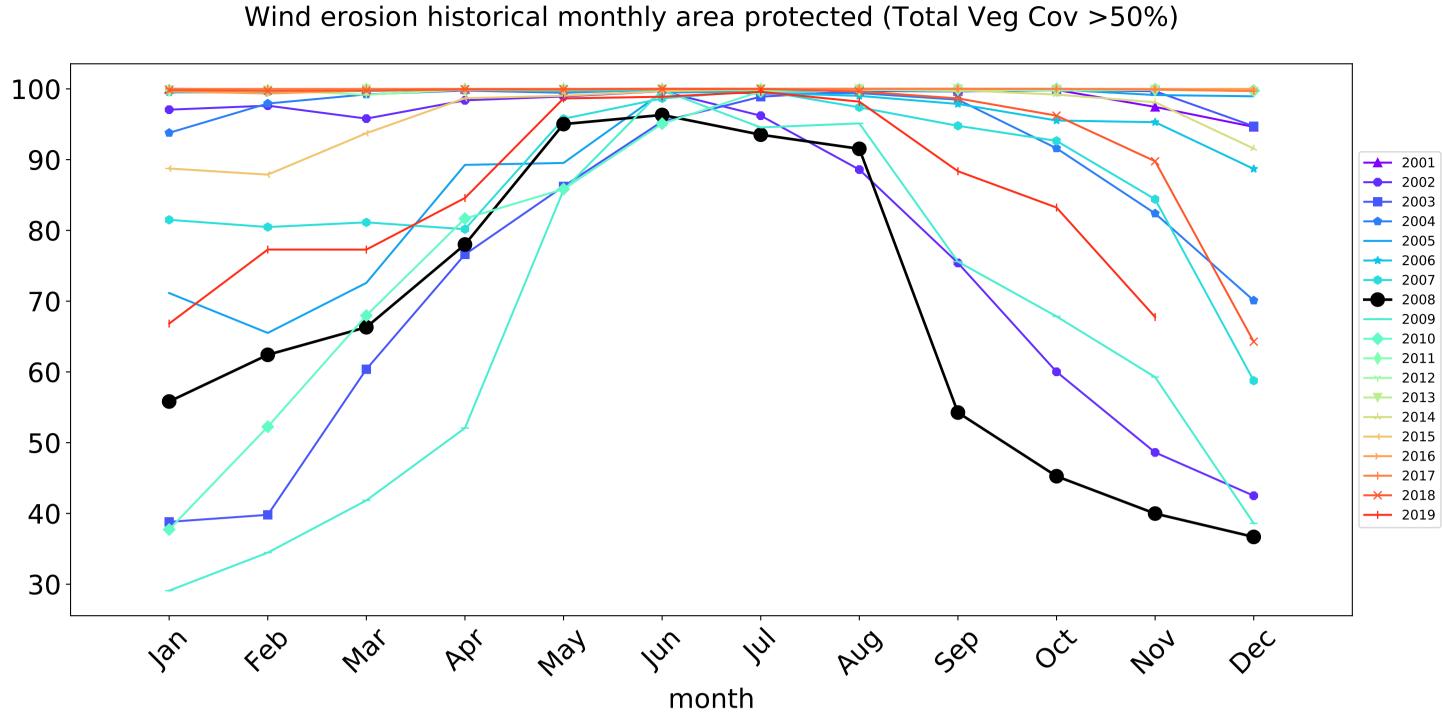


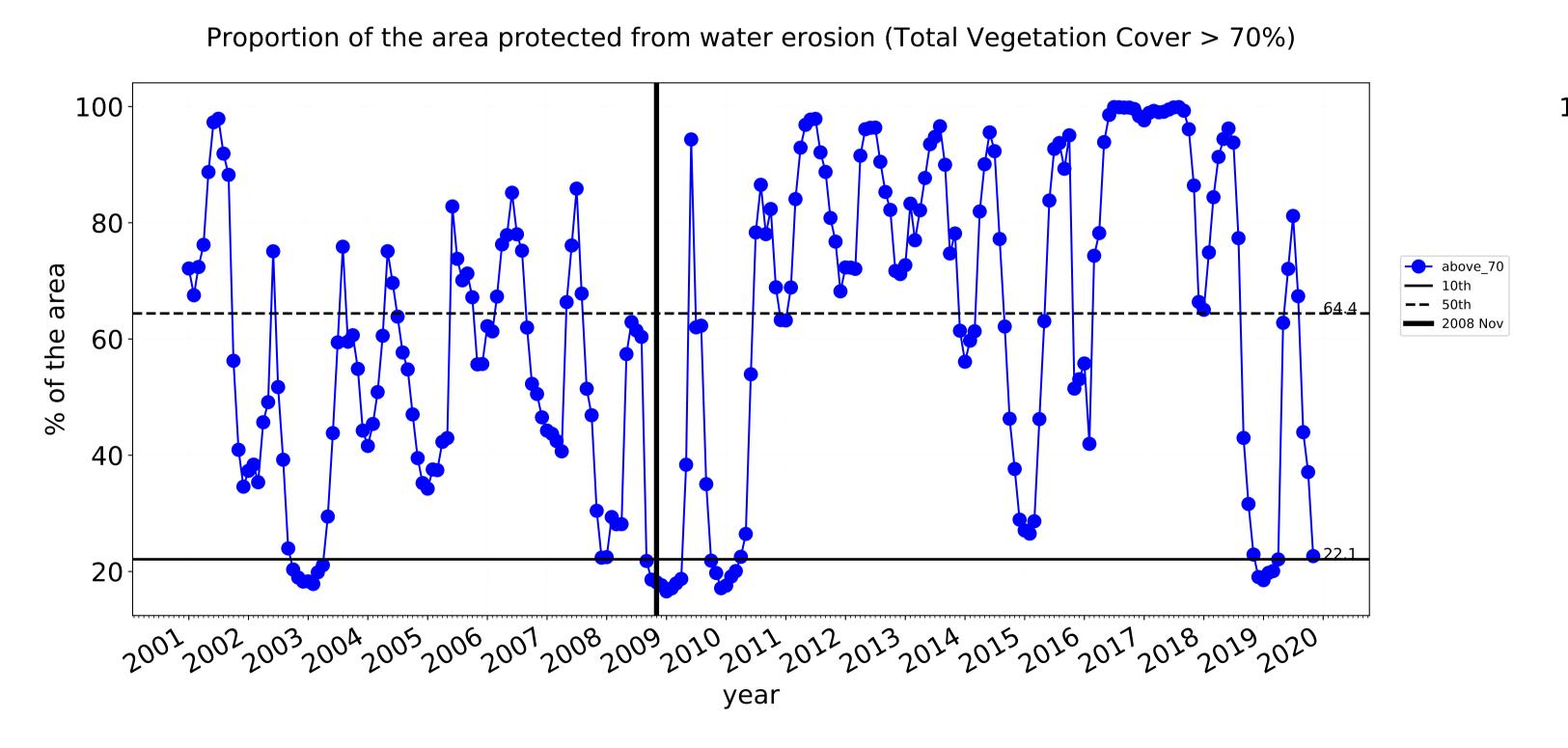


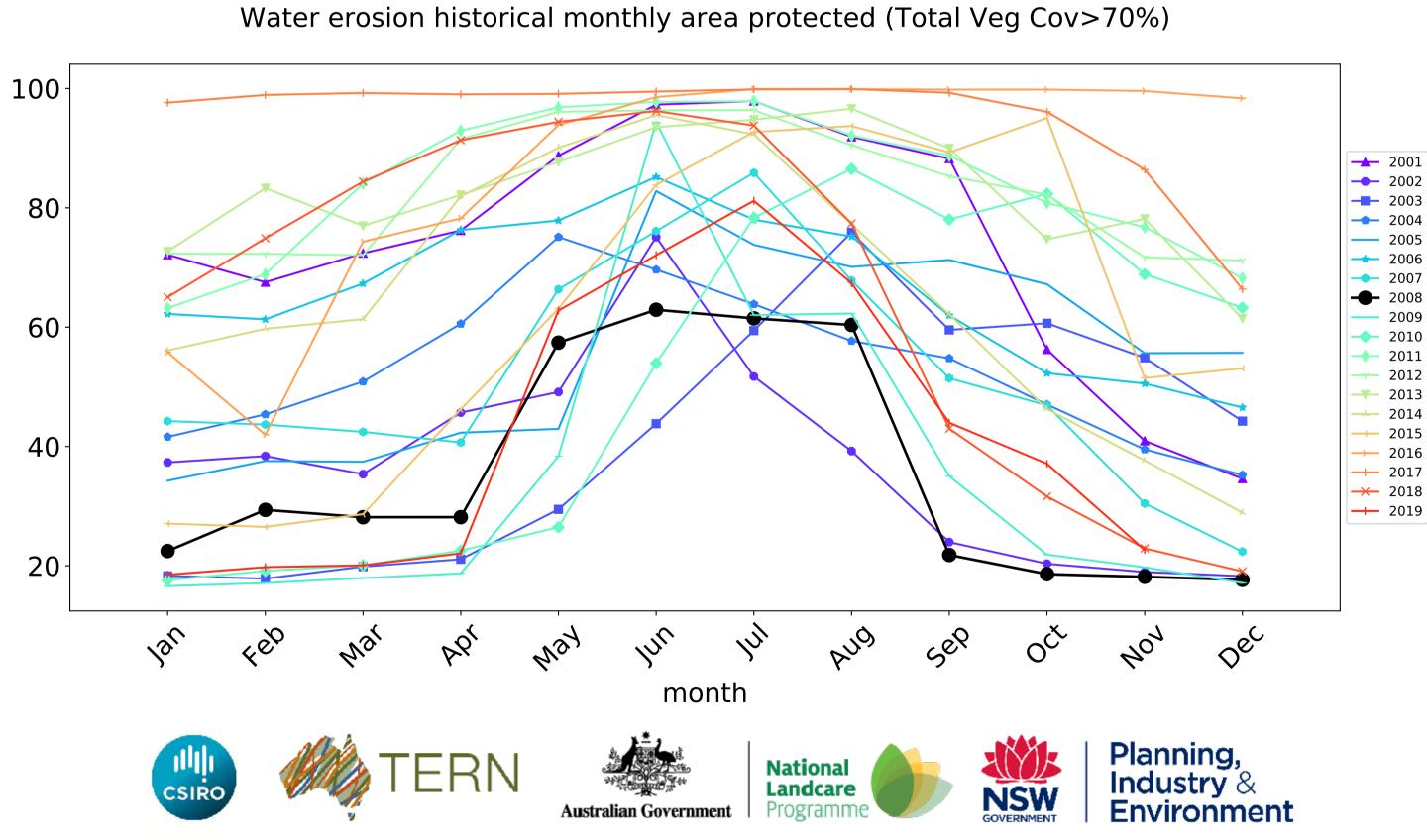


## **Conservation and natural environments non forest timeseries**

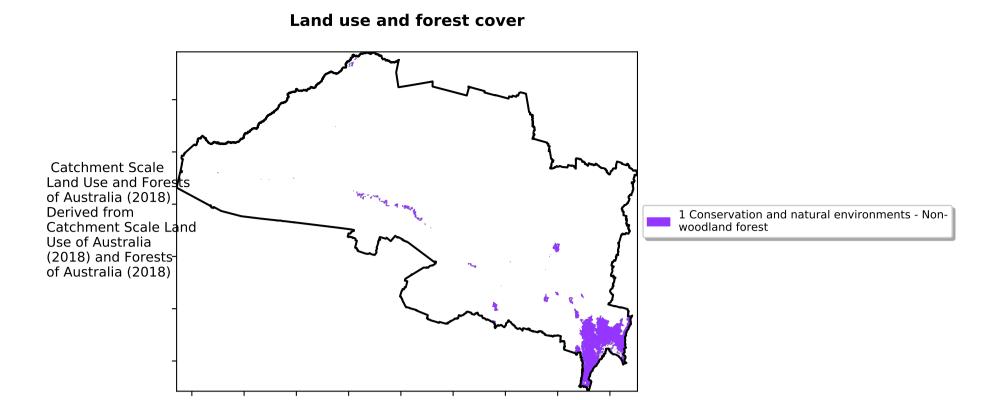




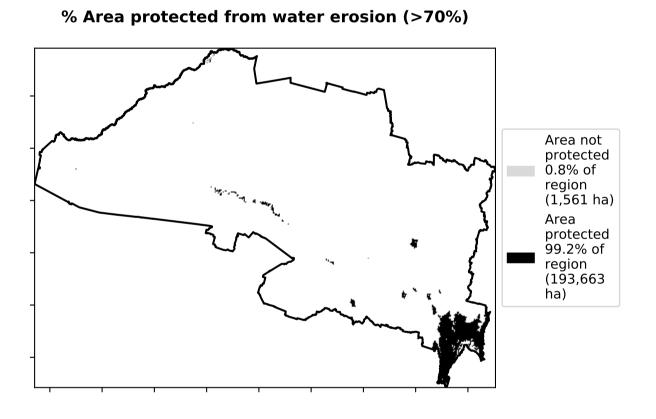


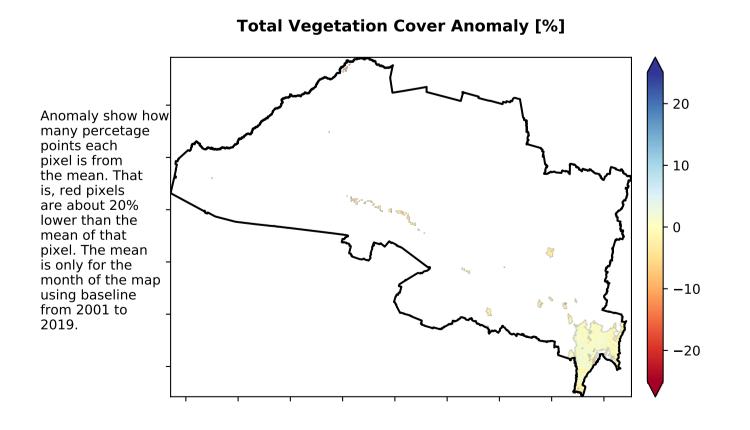


## **Conservation and natural environments Forest (non woodland)**

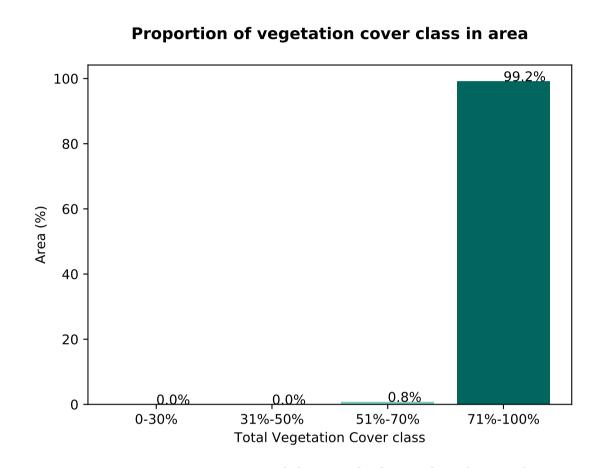


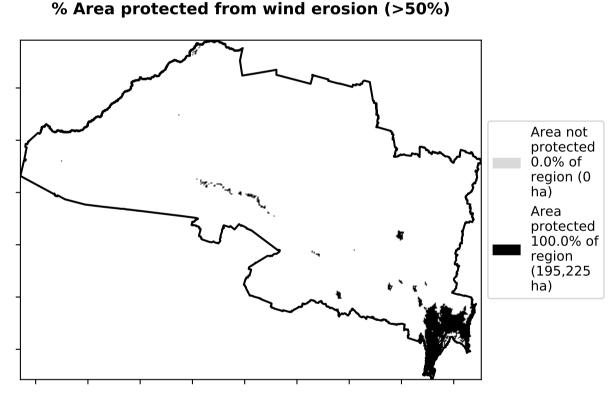
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trolo Indolo Trol

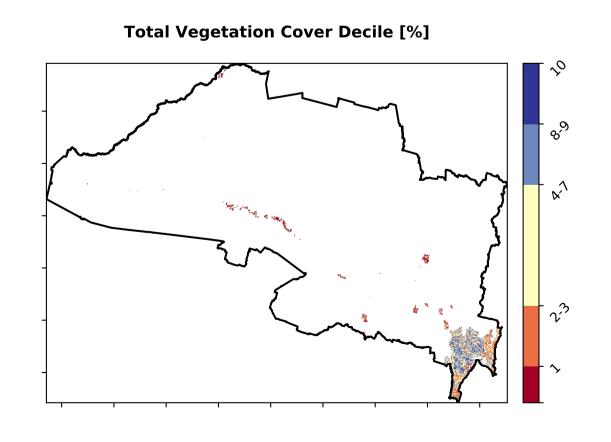




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









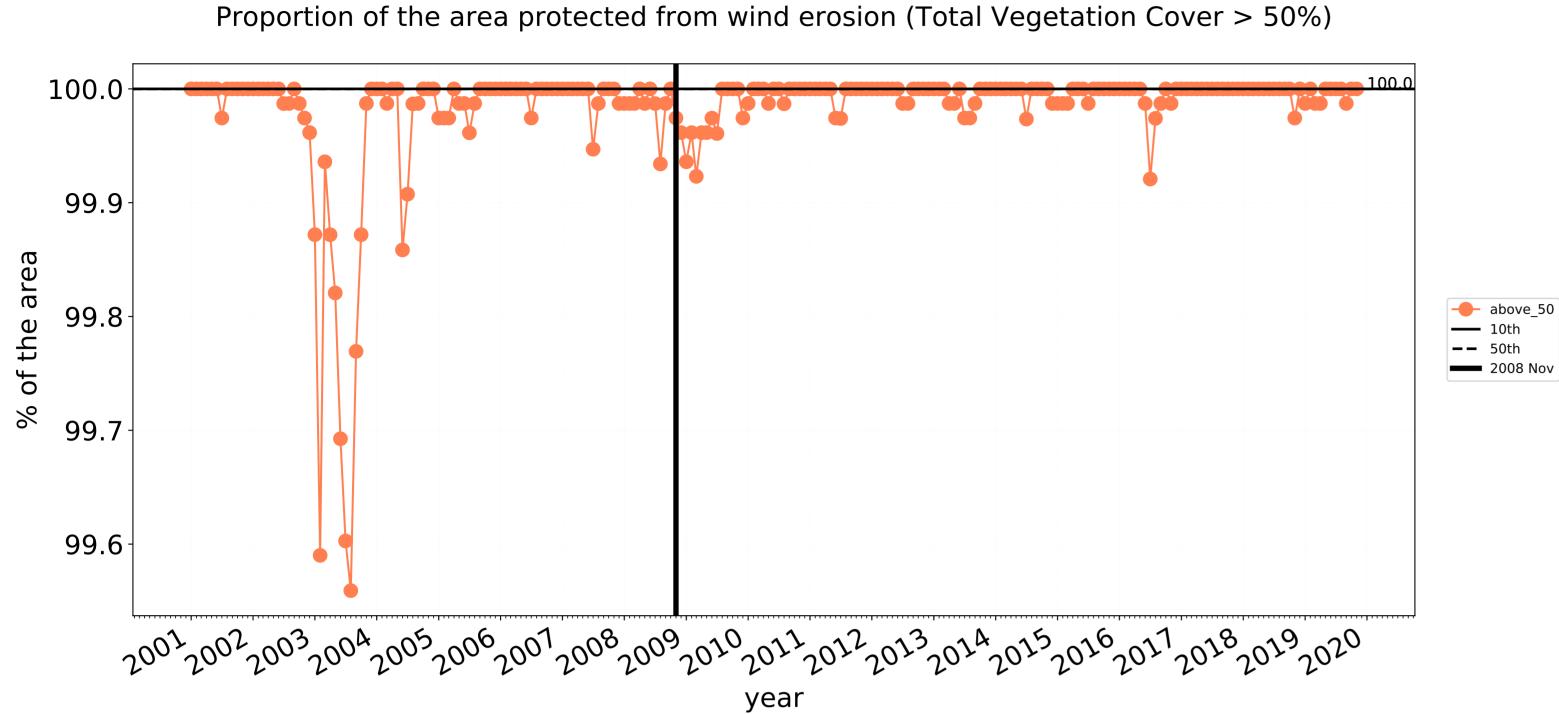


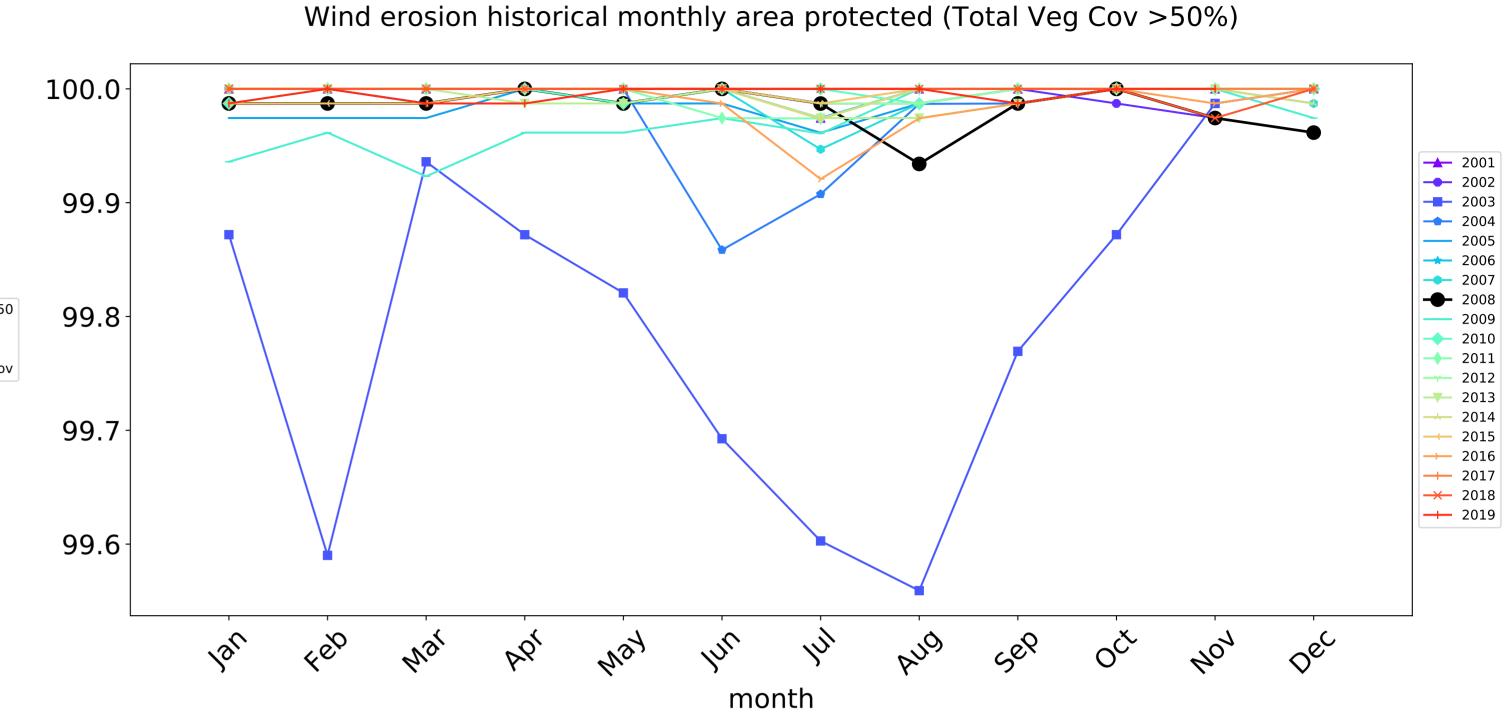


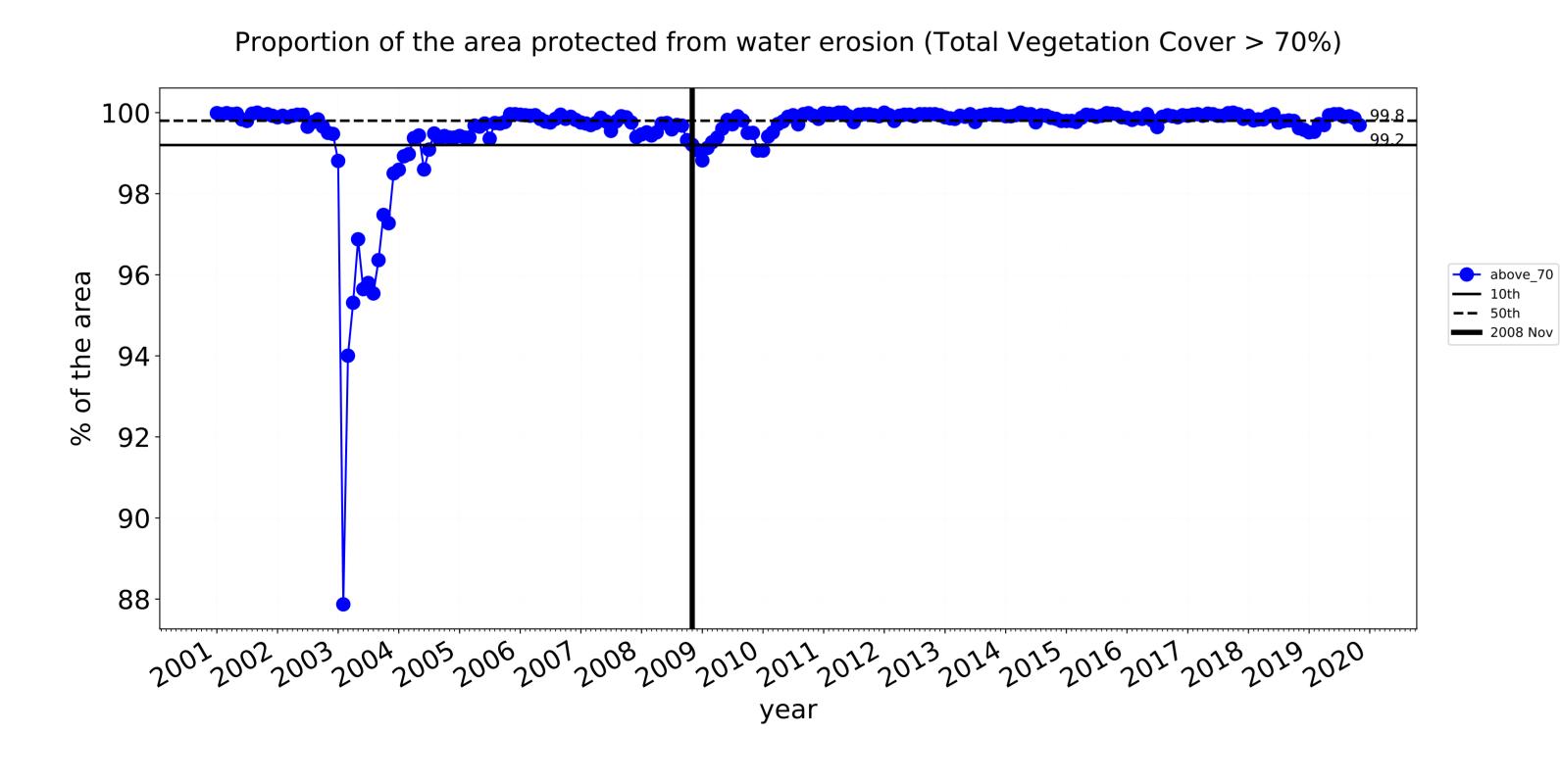


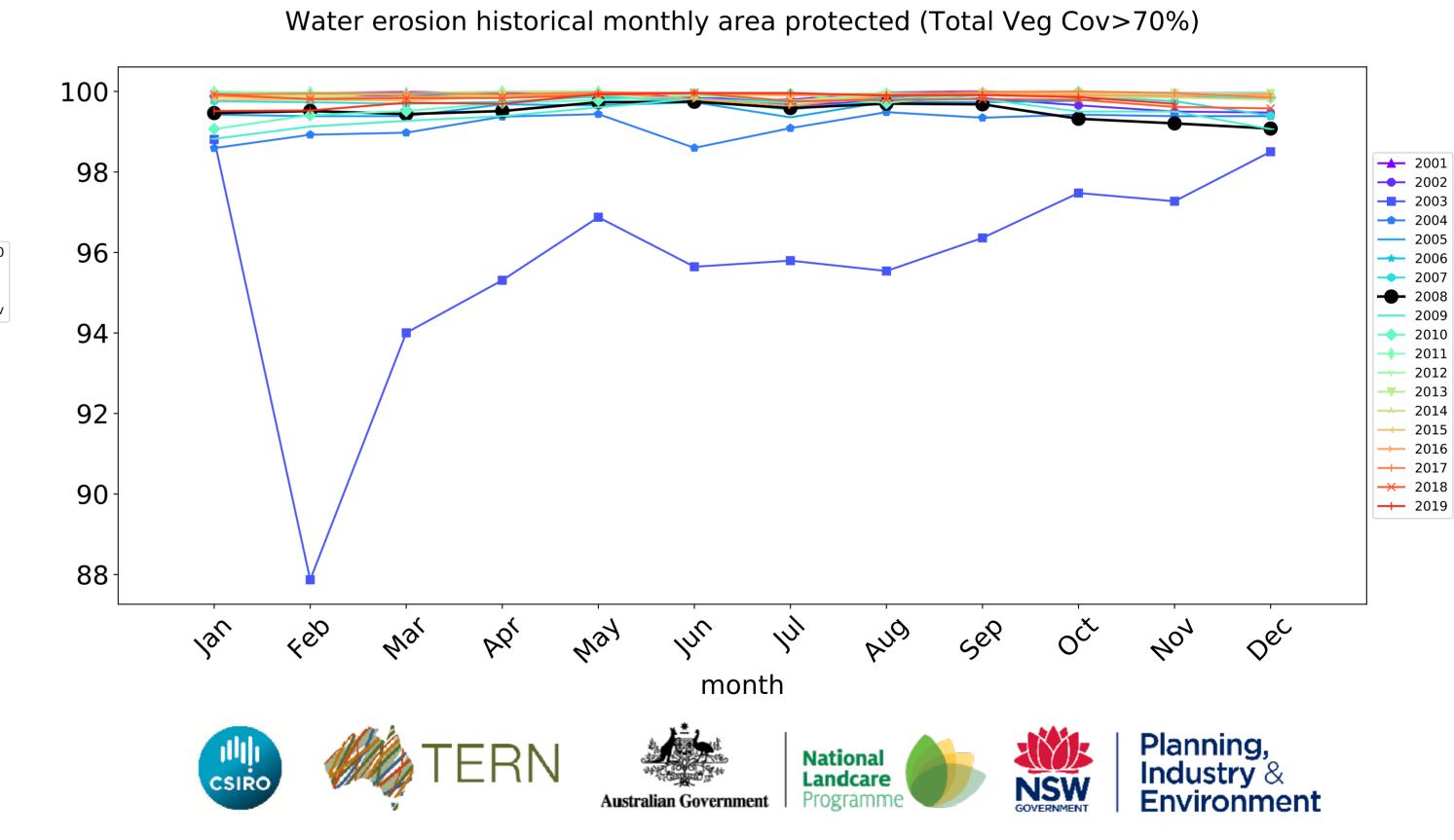








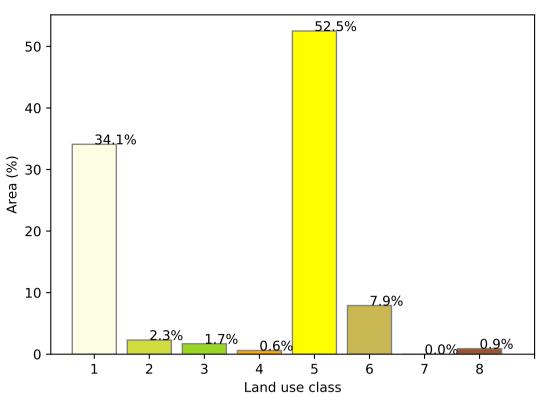




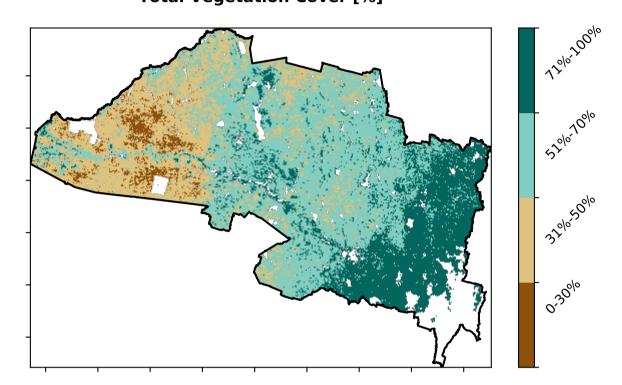
## **Agriculture**

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

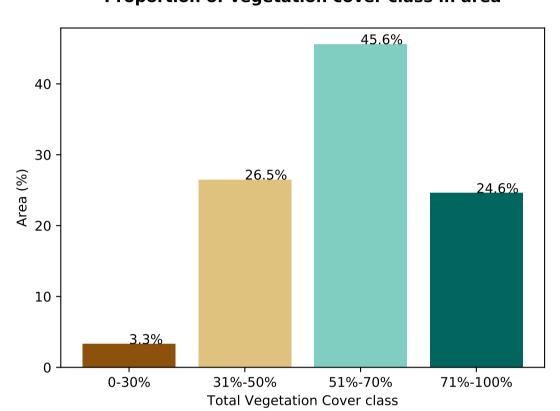
## Proportion of each land class in area



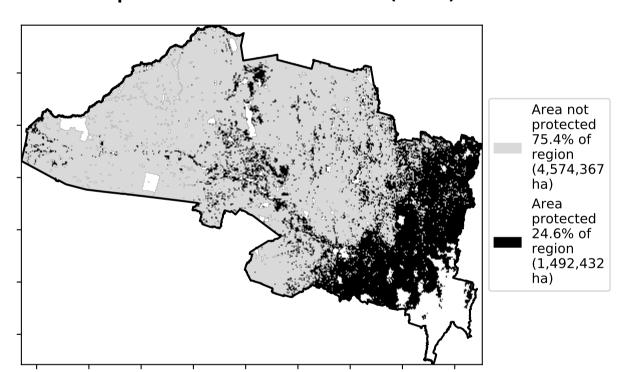
**Total Vegetation Cover [%]** 



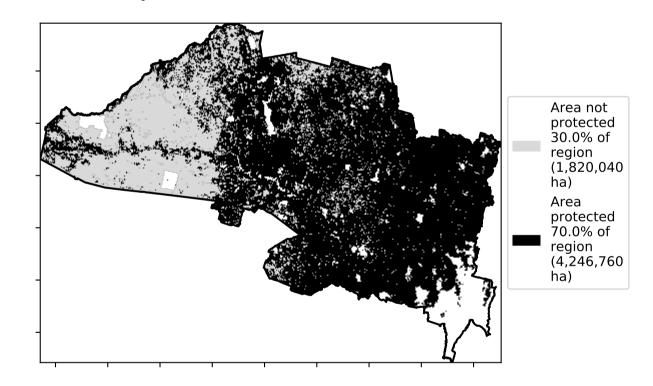
Proportion of vegetation cover class in area



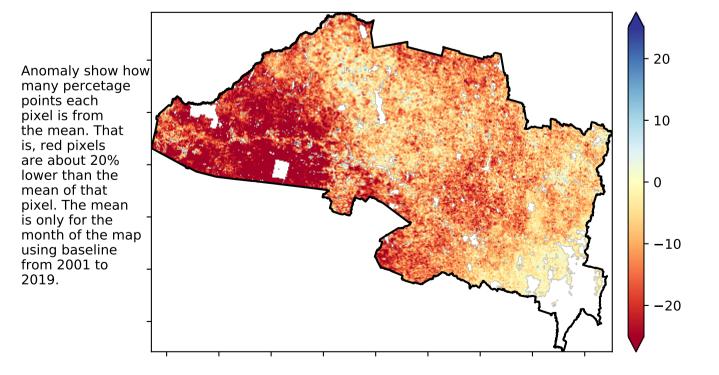
% Area protected from water erosion (>70%)



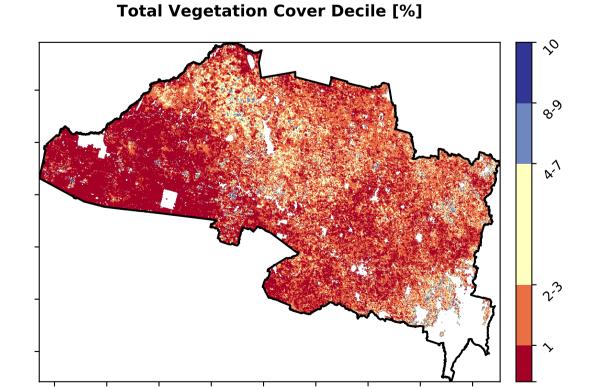
% Area protected from wind erosion (>50%)



**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.







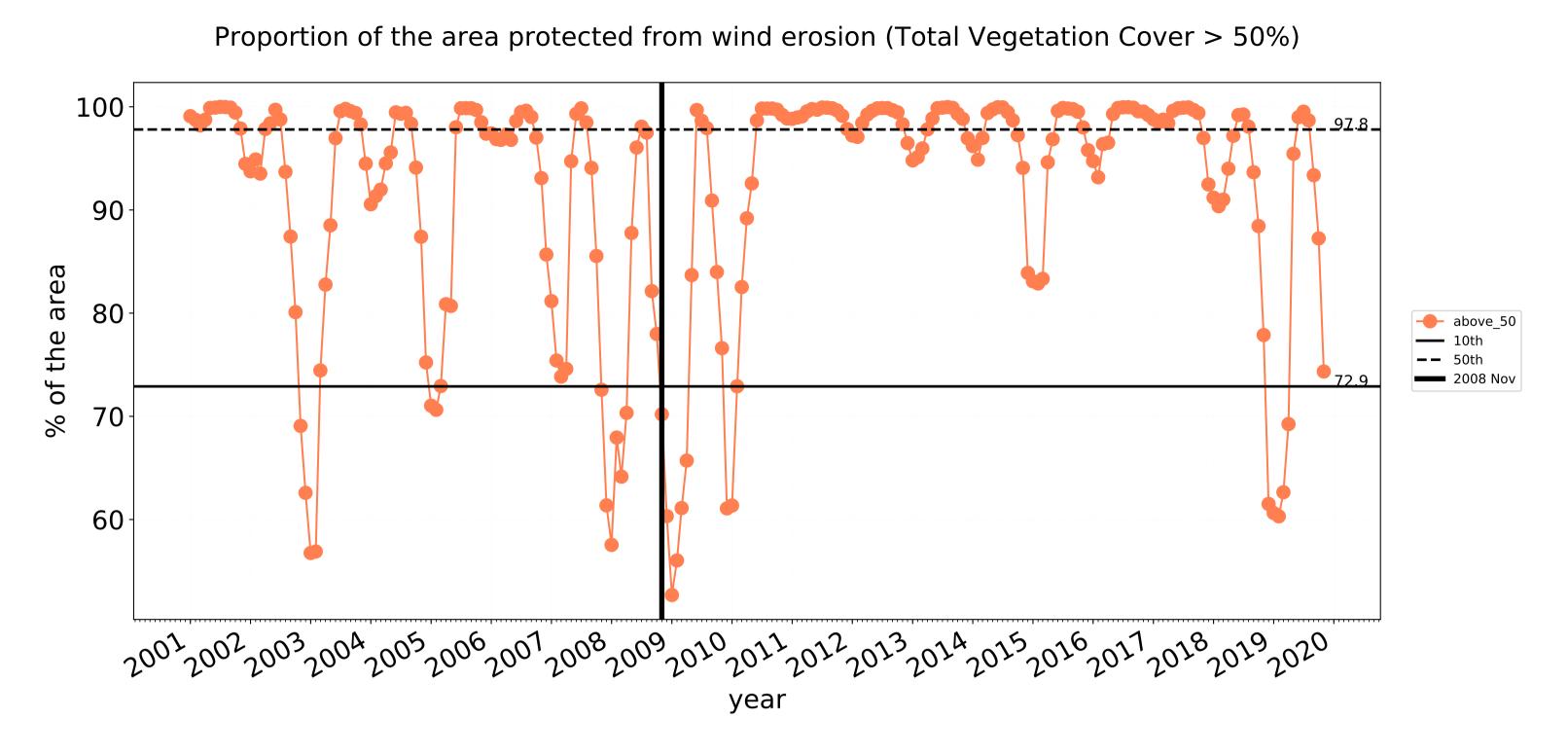


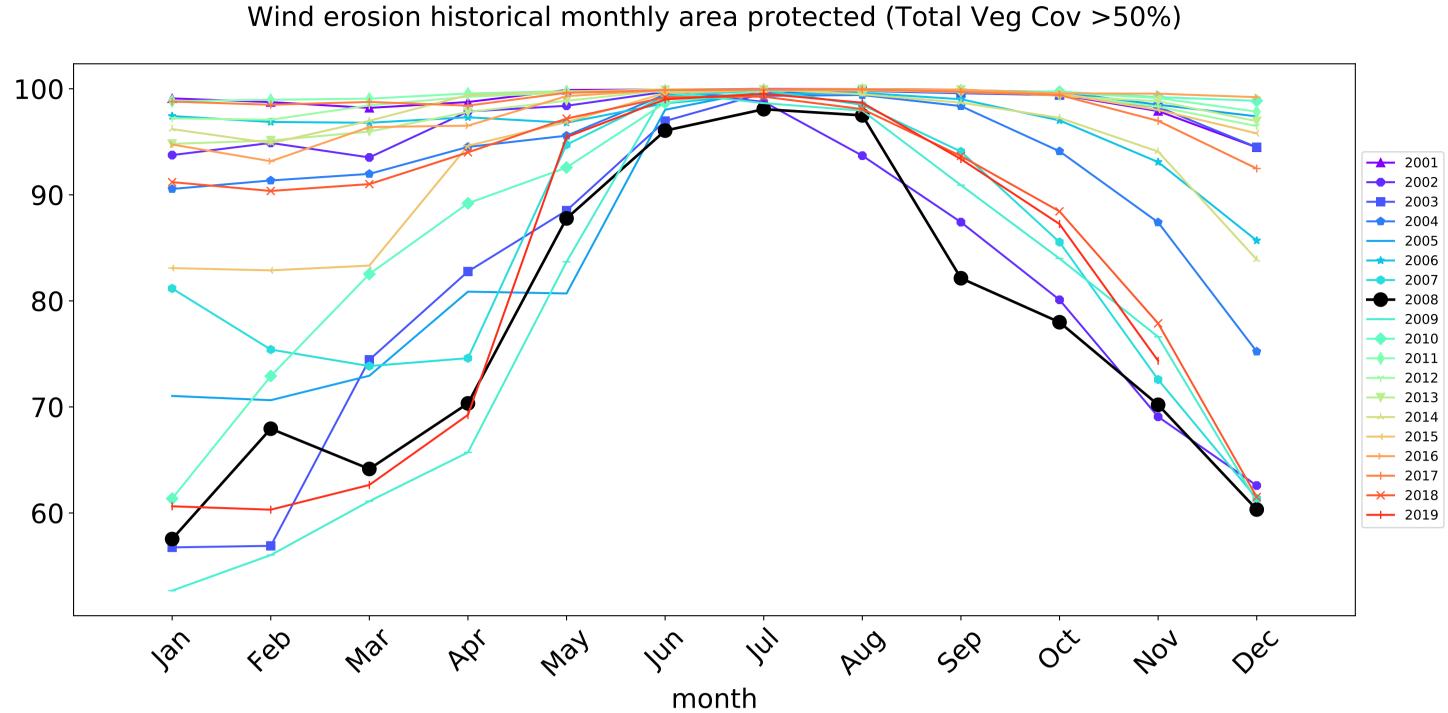


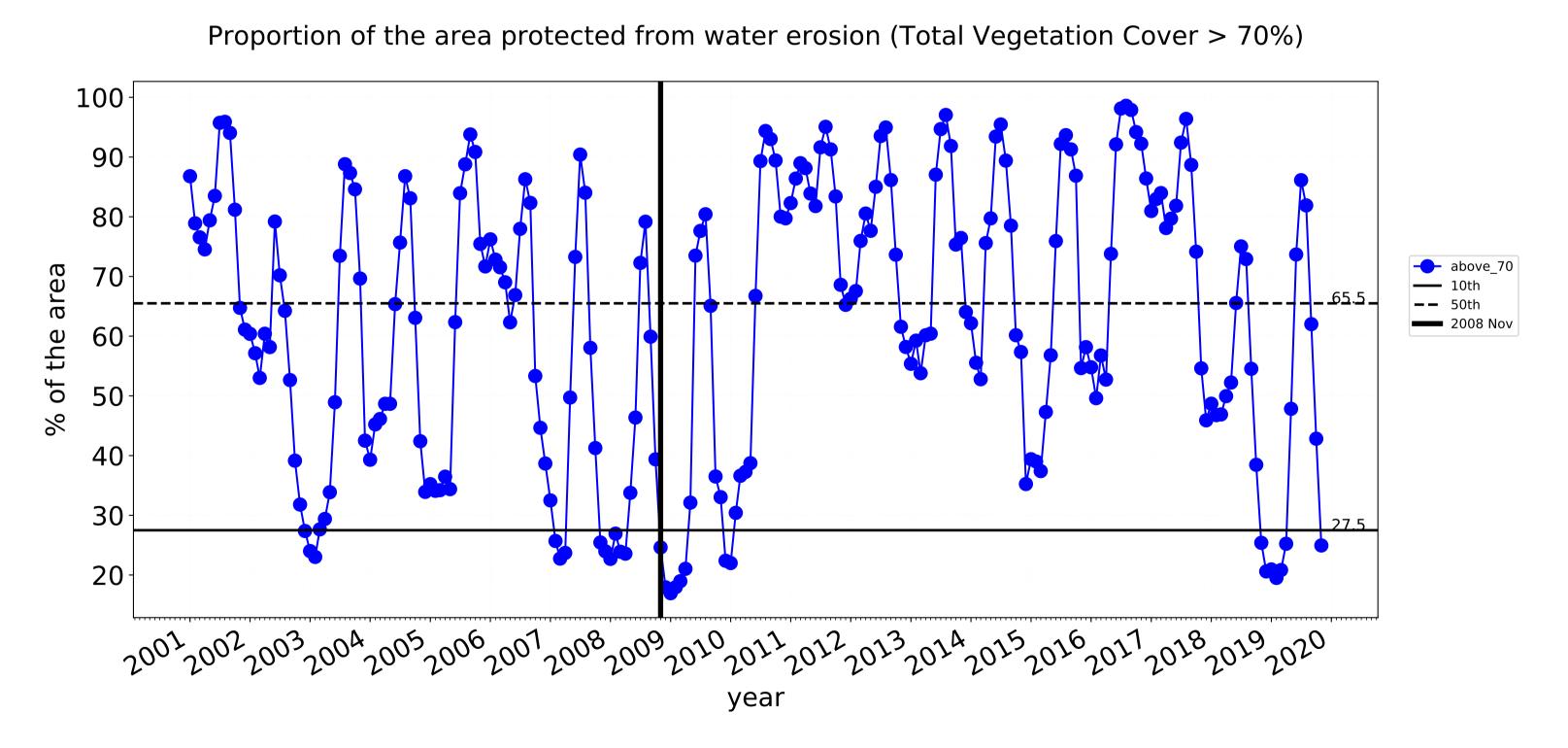


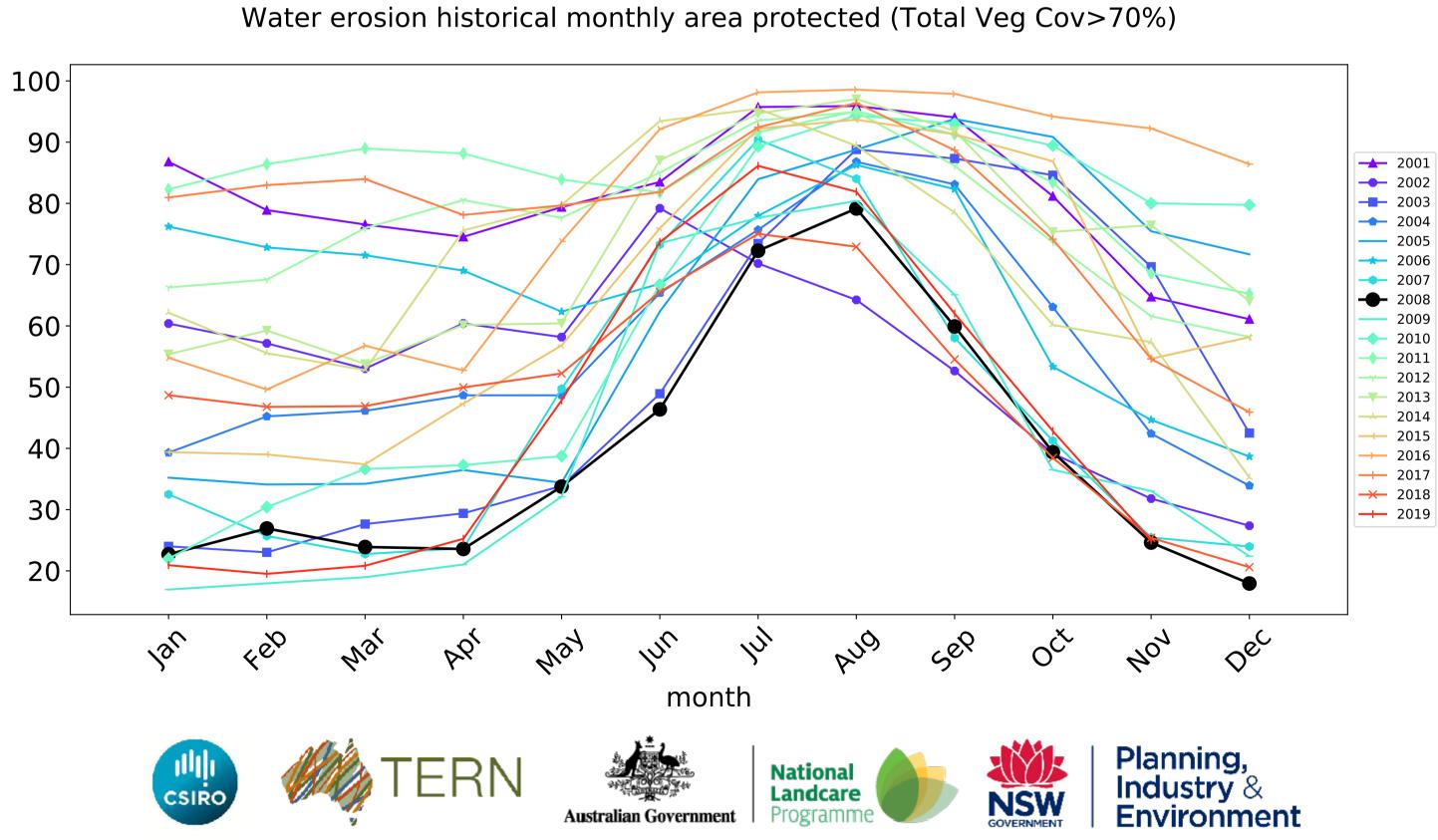


## **Agriculture timeseries**

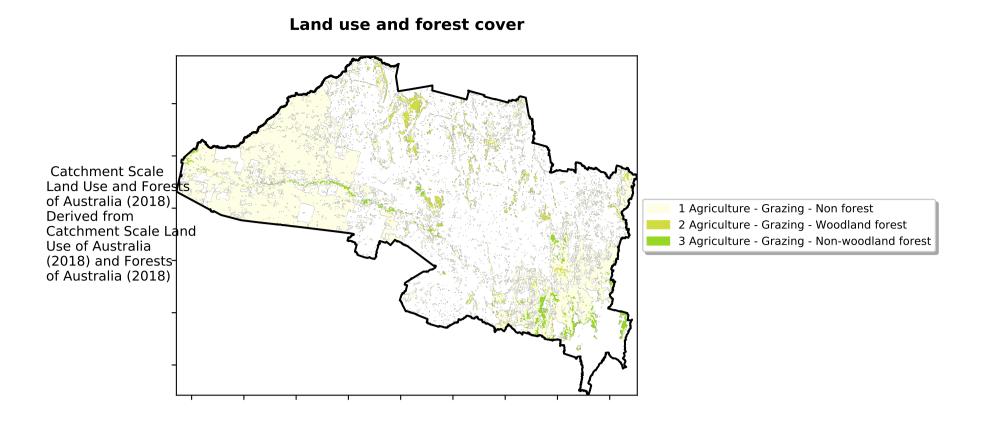




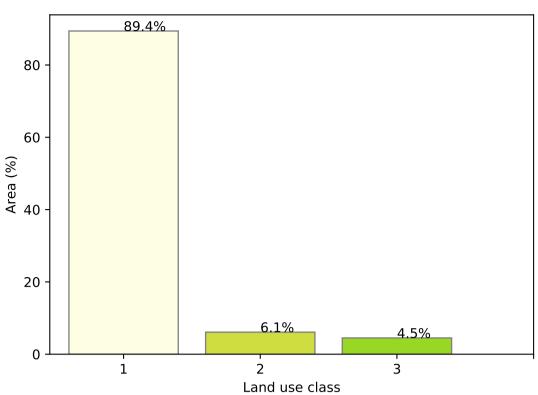




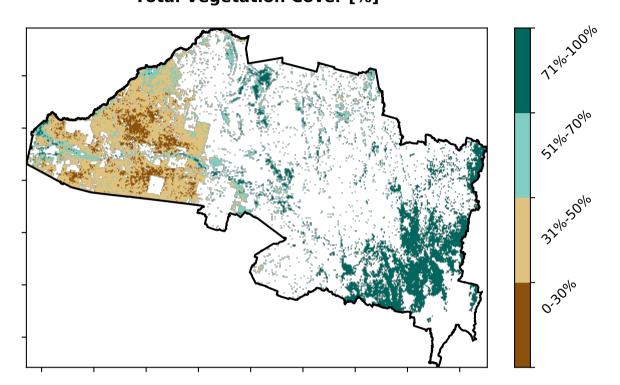
## **Grazing**



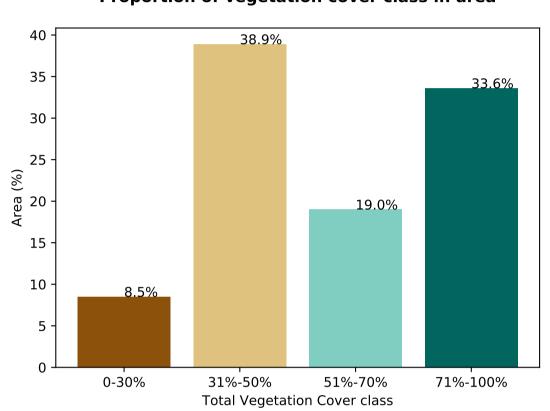
## Proportion of each land class in area



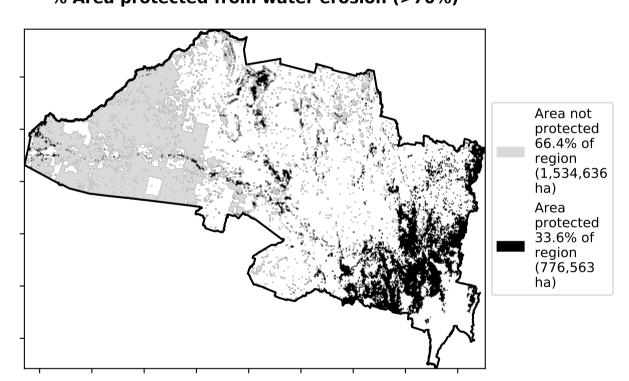
**Total Vegetation Cover [%]** 



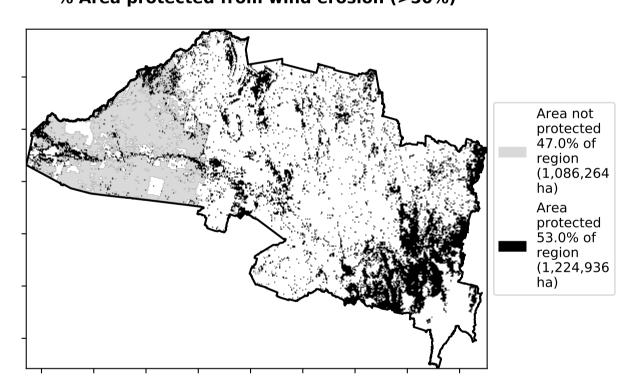
Proportion of vegetation cover class in area



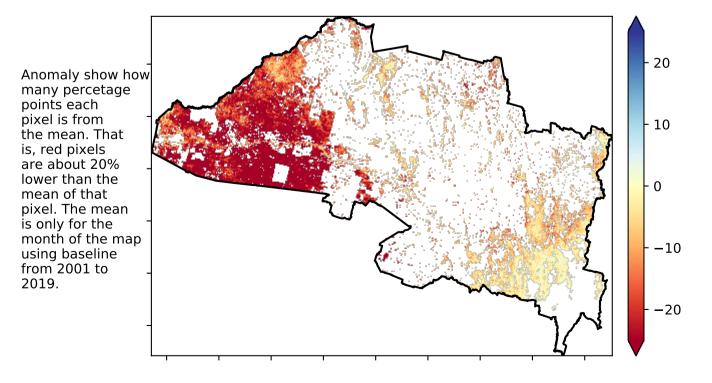
% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

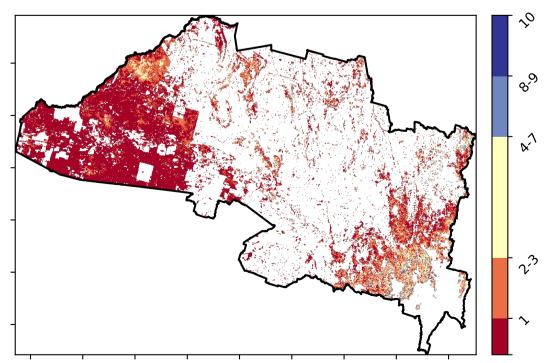


Total Vegetation Cover Anomaly [%]



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.

Total Vegetation Cover Decile [%]







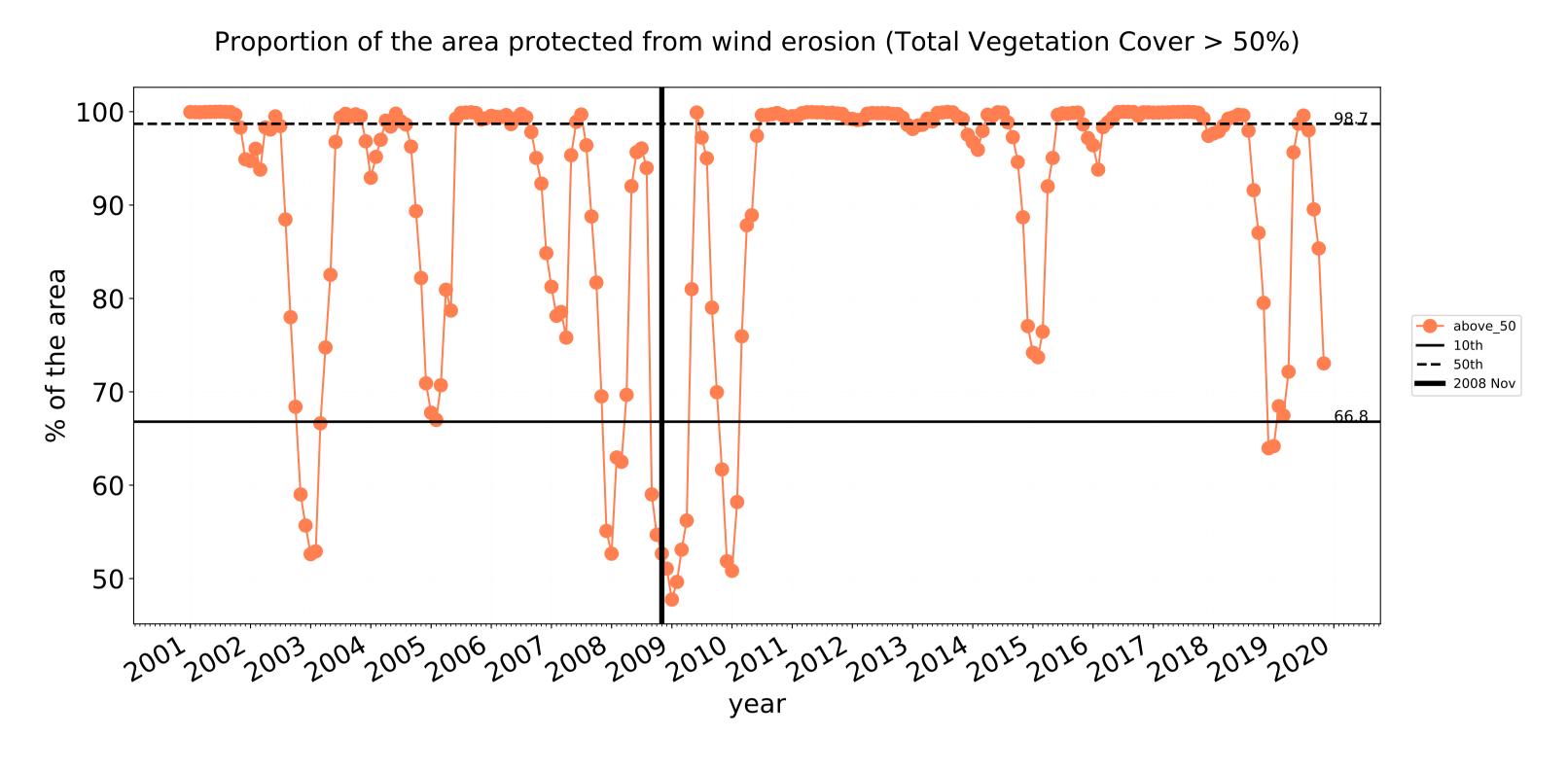


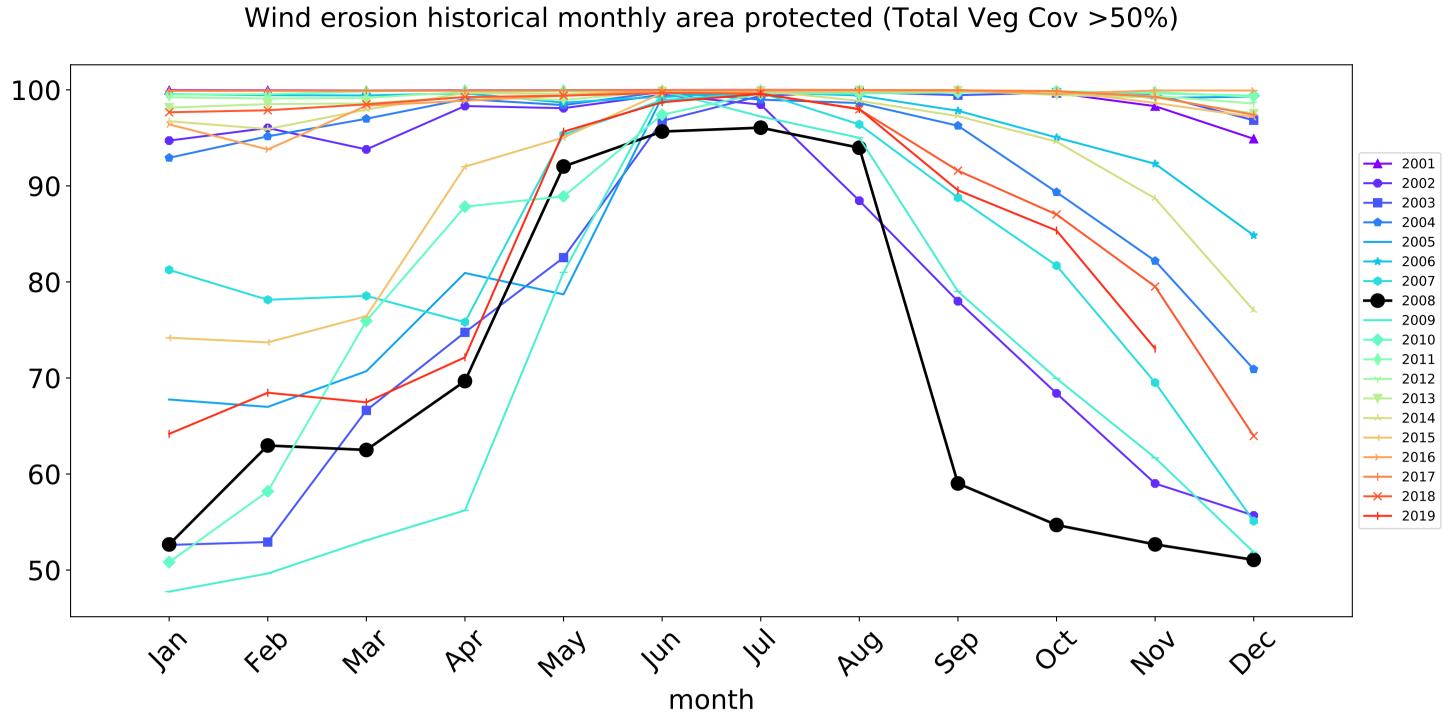


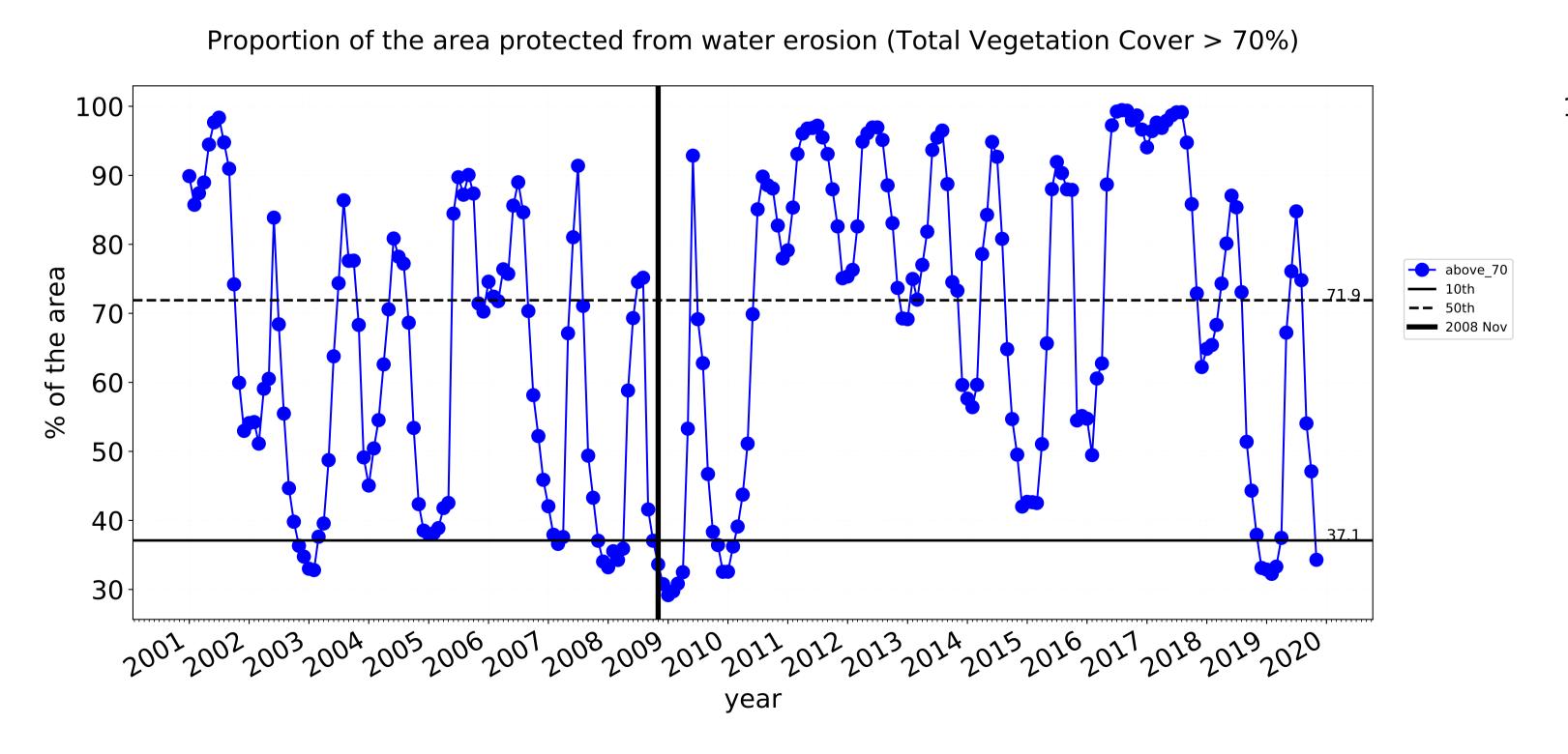


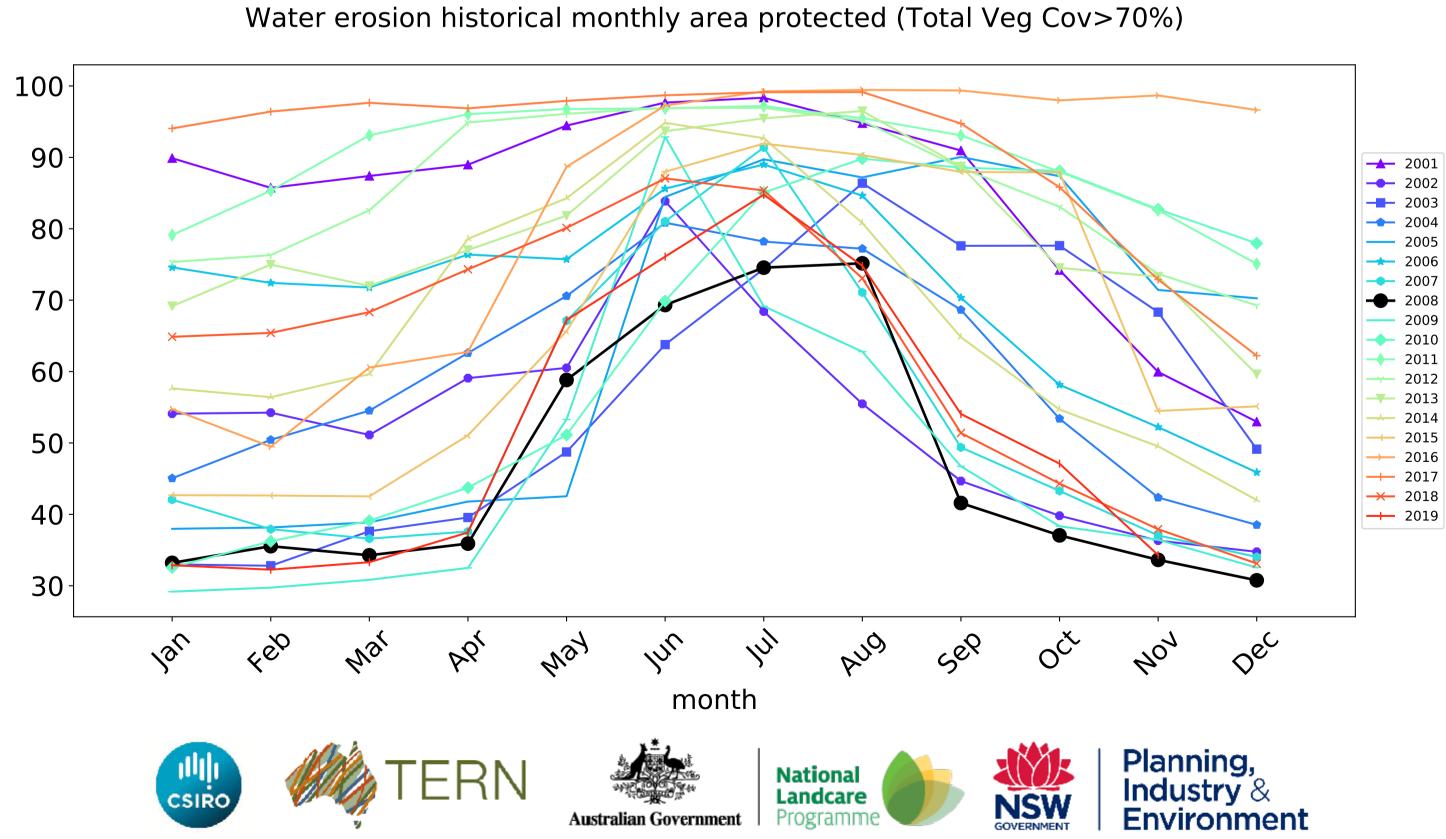


## **Grazing timeseries**



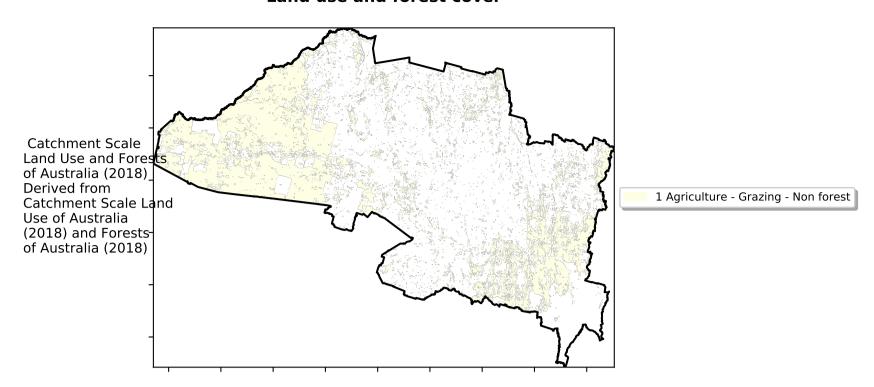




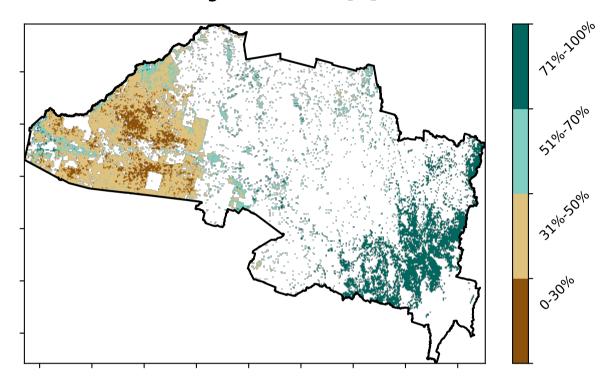


## **Grazing non forest**

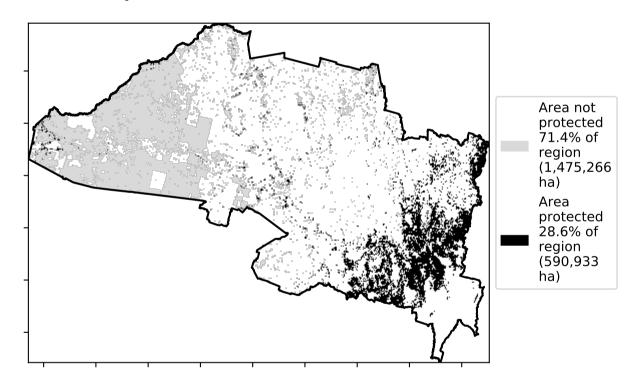
#### Land use and forest cover



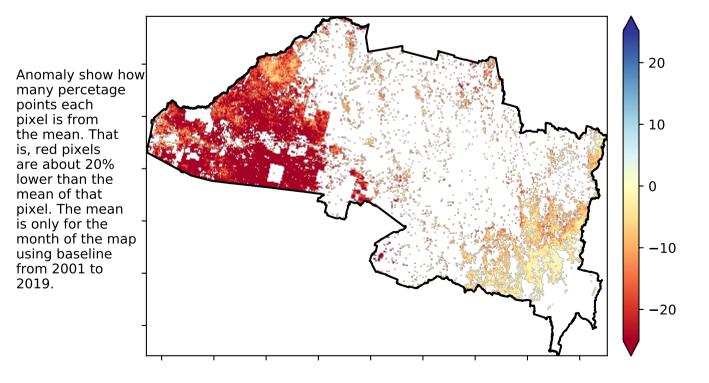
#### **Total Vegetation Cover [%]**



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

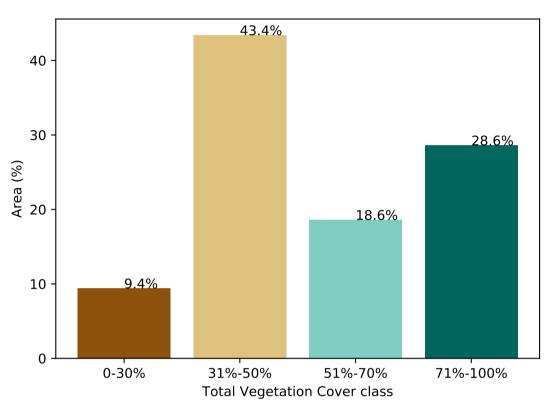


### **Total Vegetation Cover Anomaly [%]**

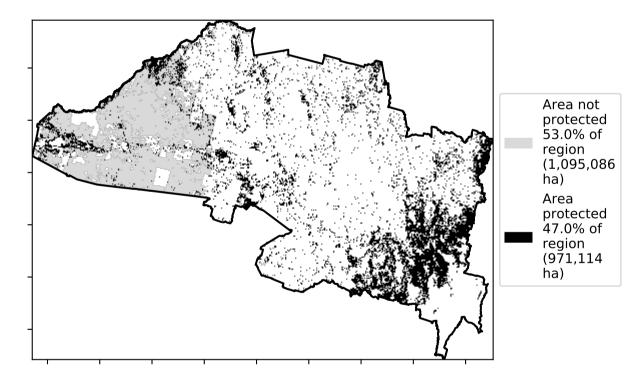


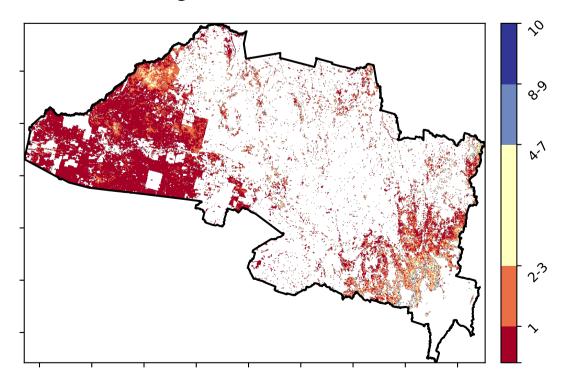
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









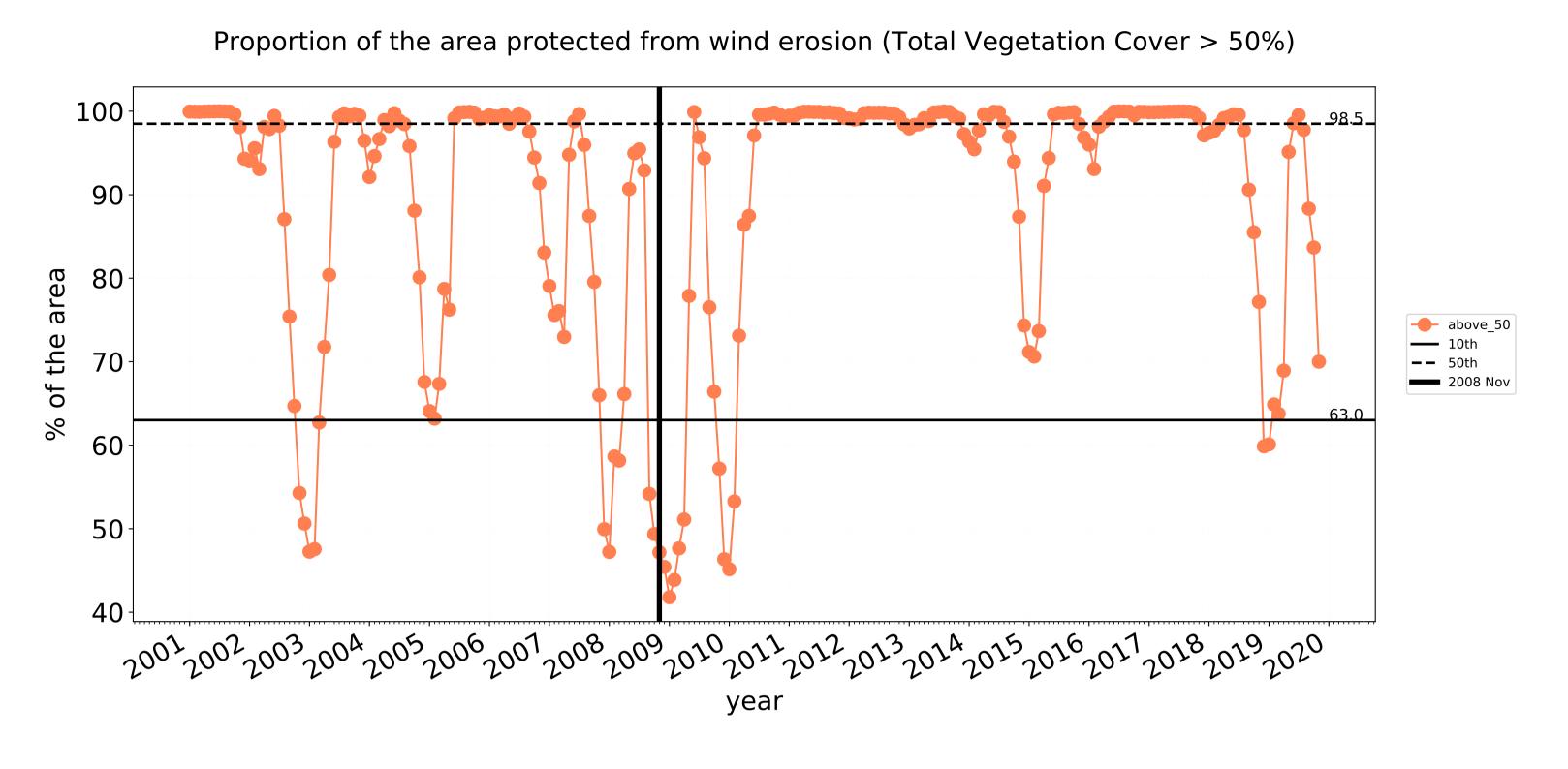


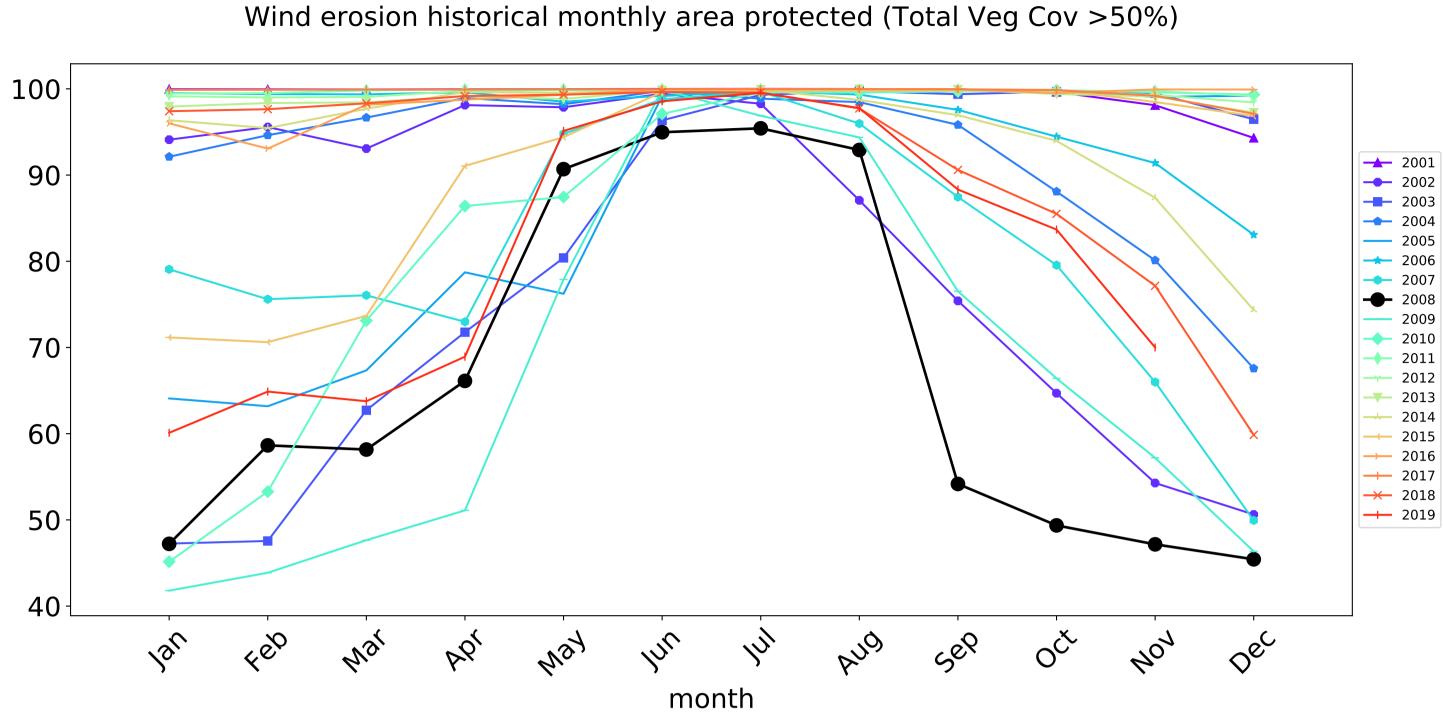


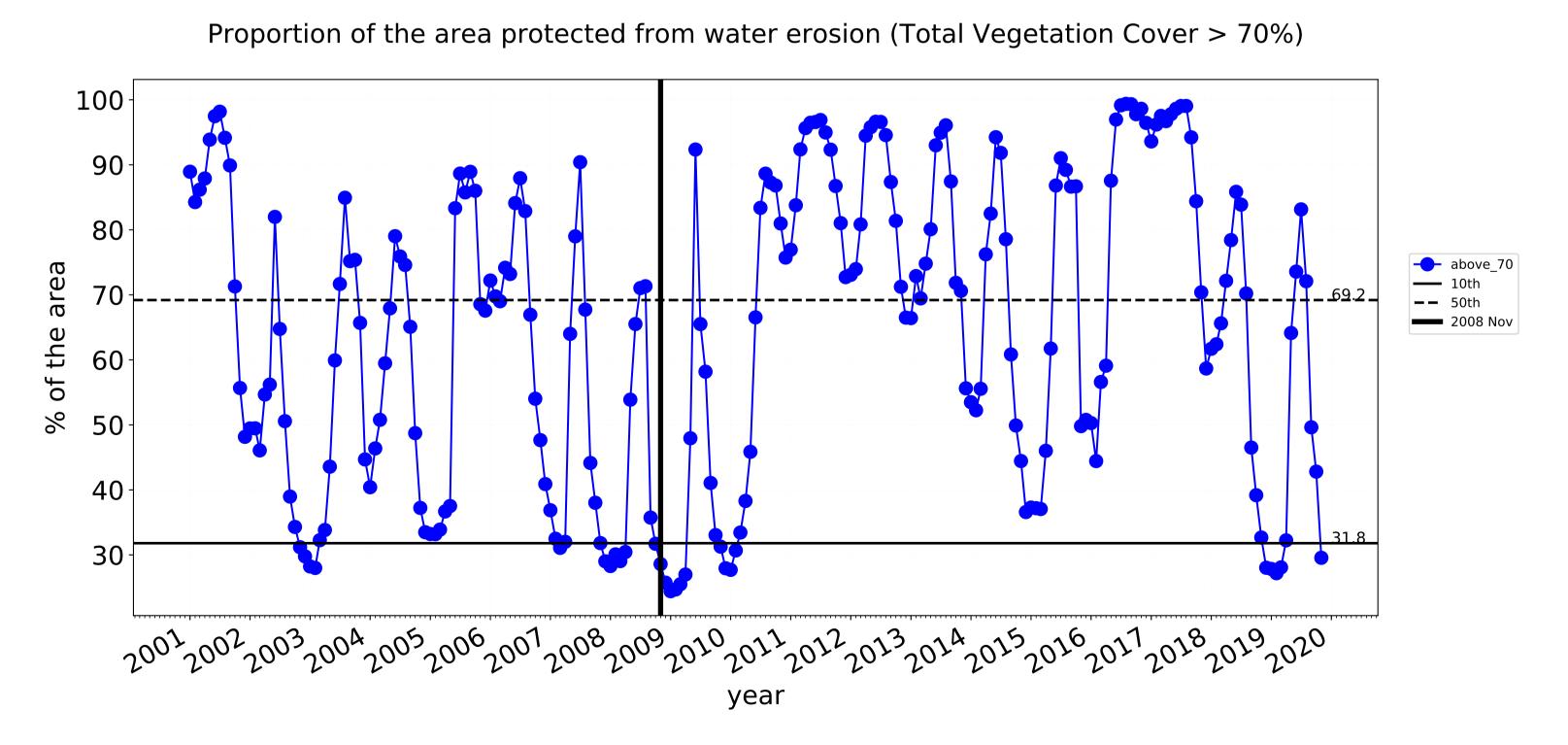


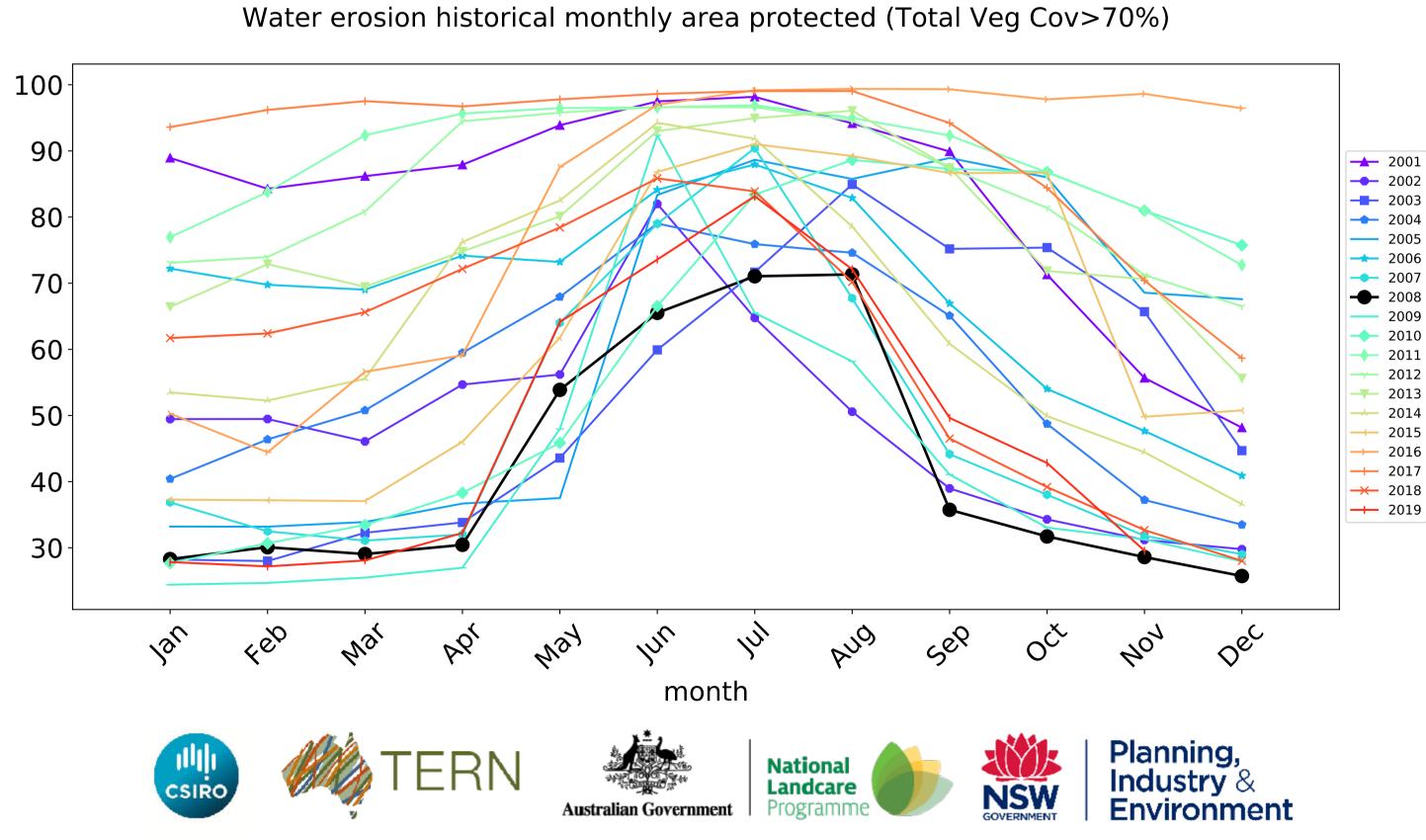


## **Grazing non forest timeseries**



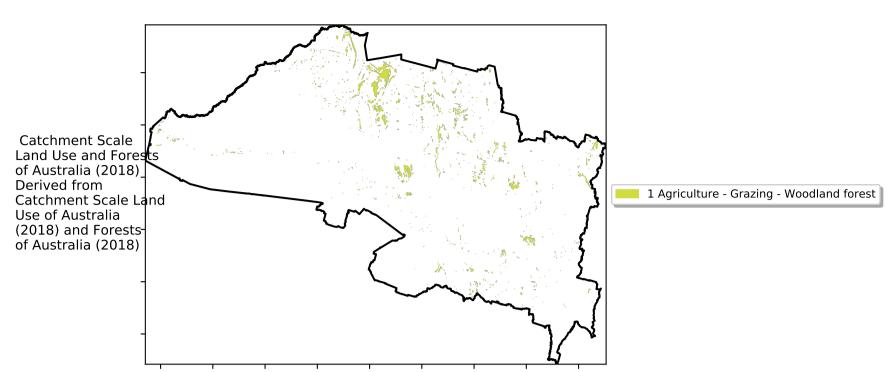




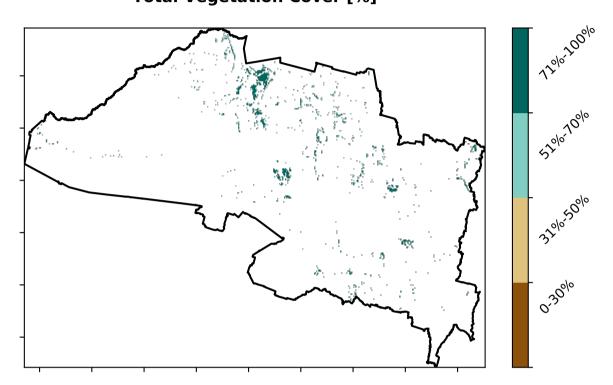


## **Grazing Woodland forest**

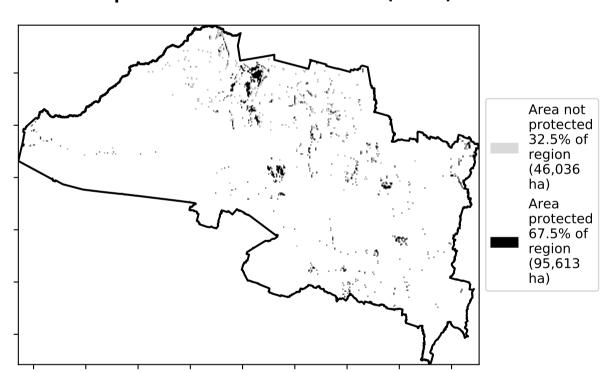
#### Land use and forest cover



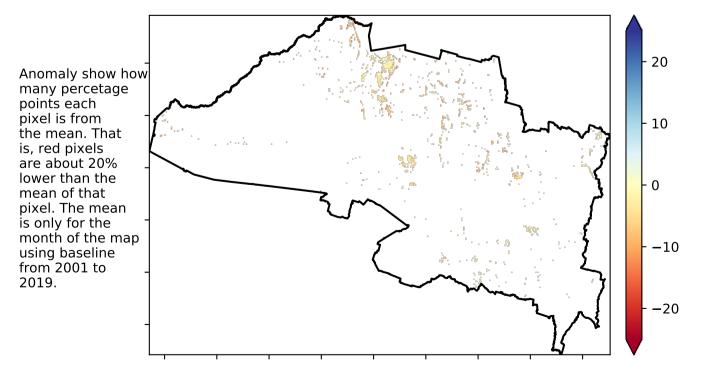
#### **Total Vegetation Cover [%]**



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

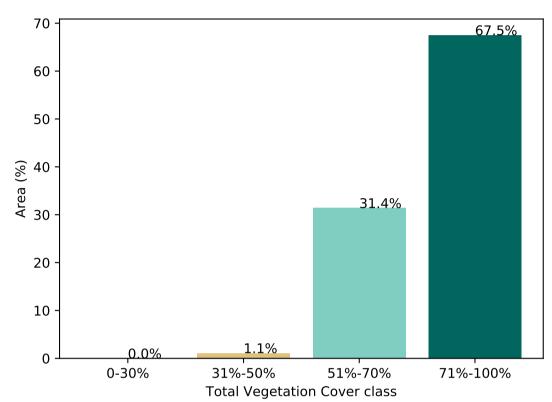


### Total Vegetation Cover Anomaly [%]

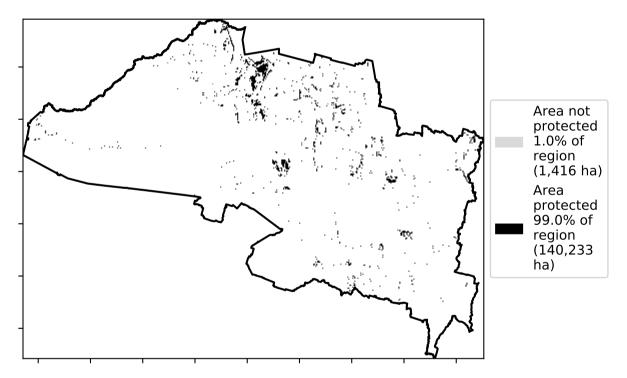


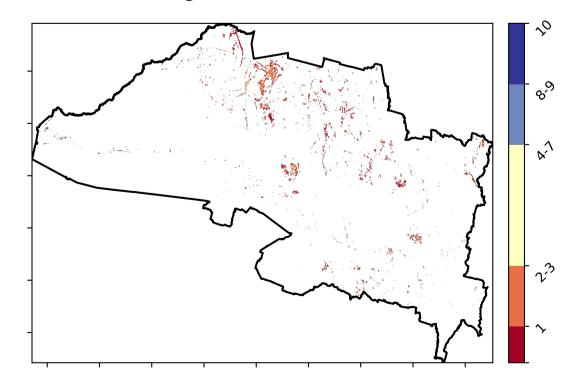
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









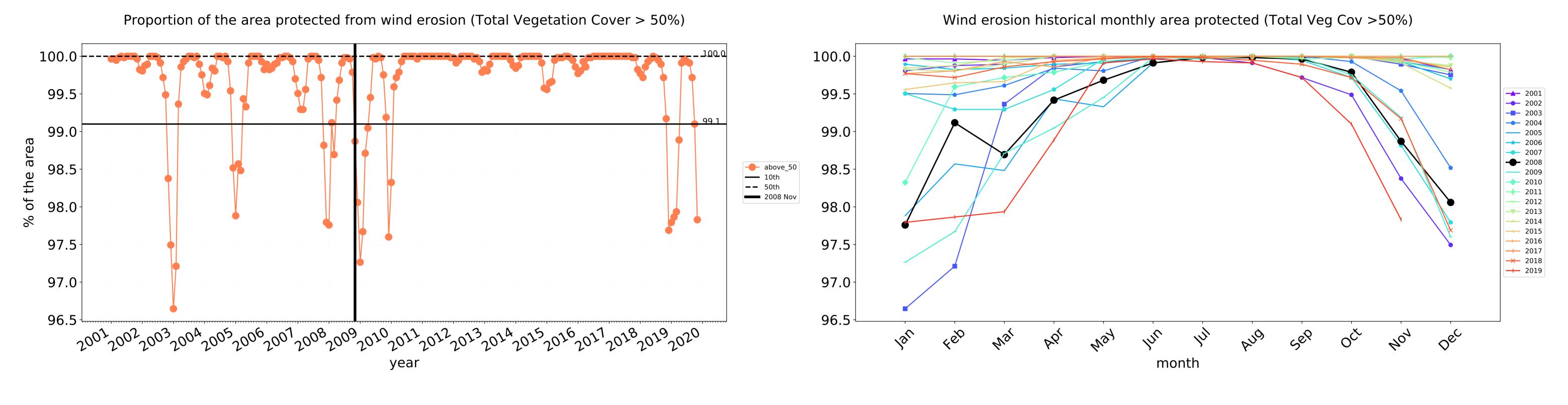


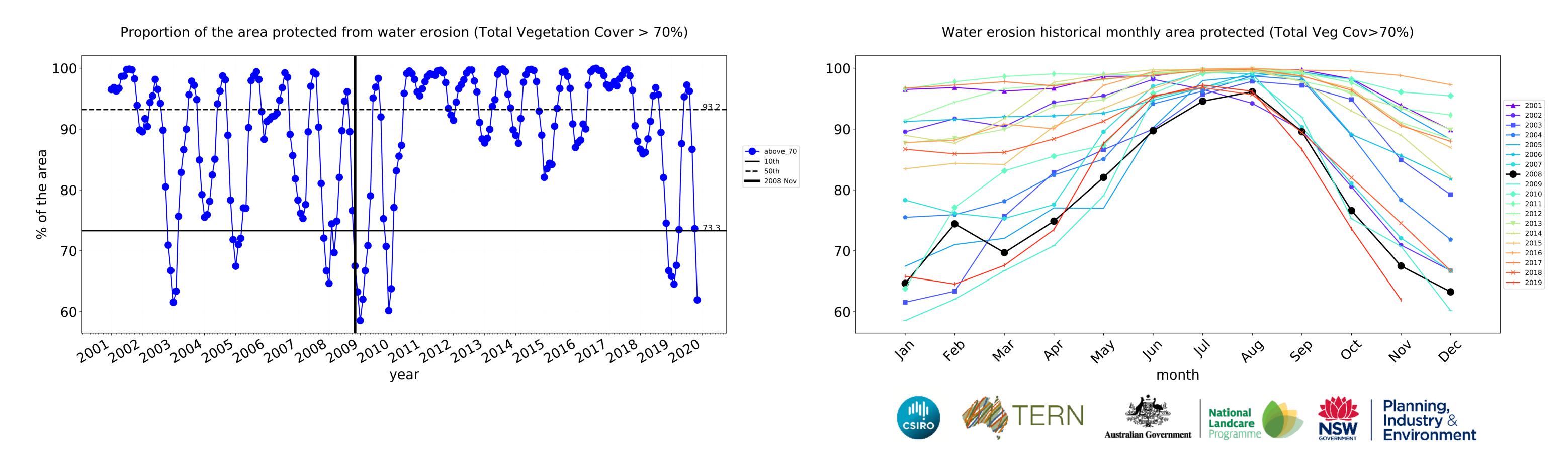






## **Grazing Woodland forest timeseries**



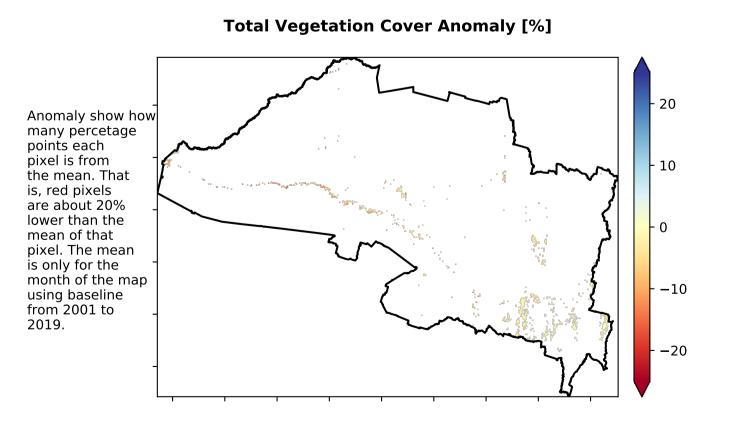


## **Grazing - Forest (non woodland)**

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

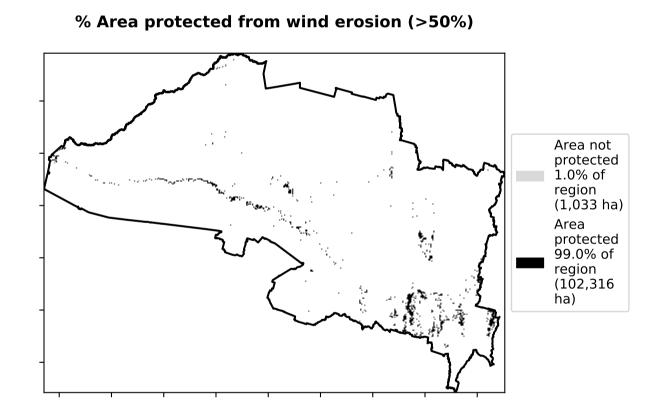
## Total Vegetation Cover [%] Trolo Idal Tr

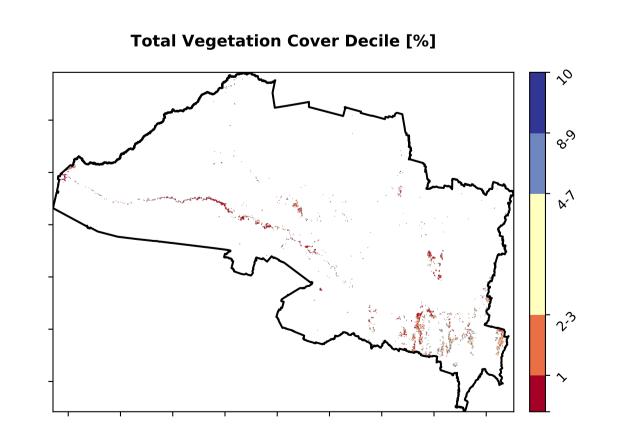
## % Area protected from water erosion (>70%) Area not protected 12.2% of region (12,608 ha) Area protected 87.8% of region (90,741 ha)



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.

## 







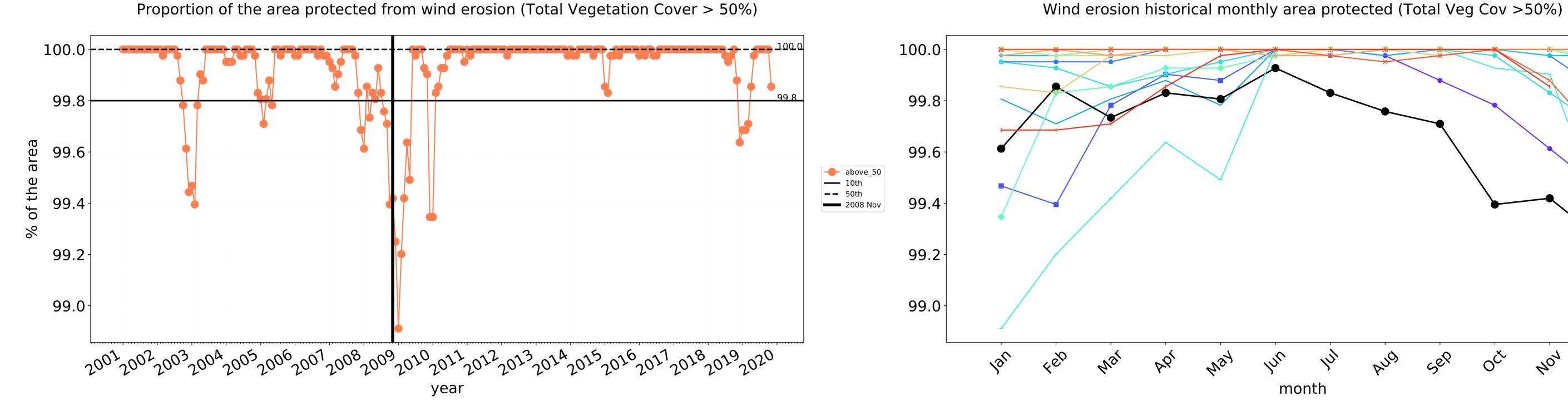


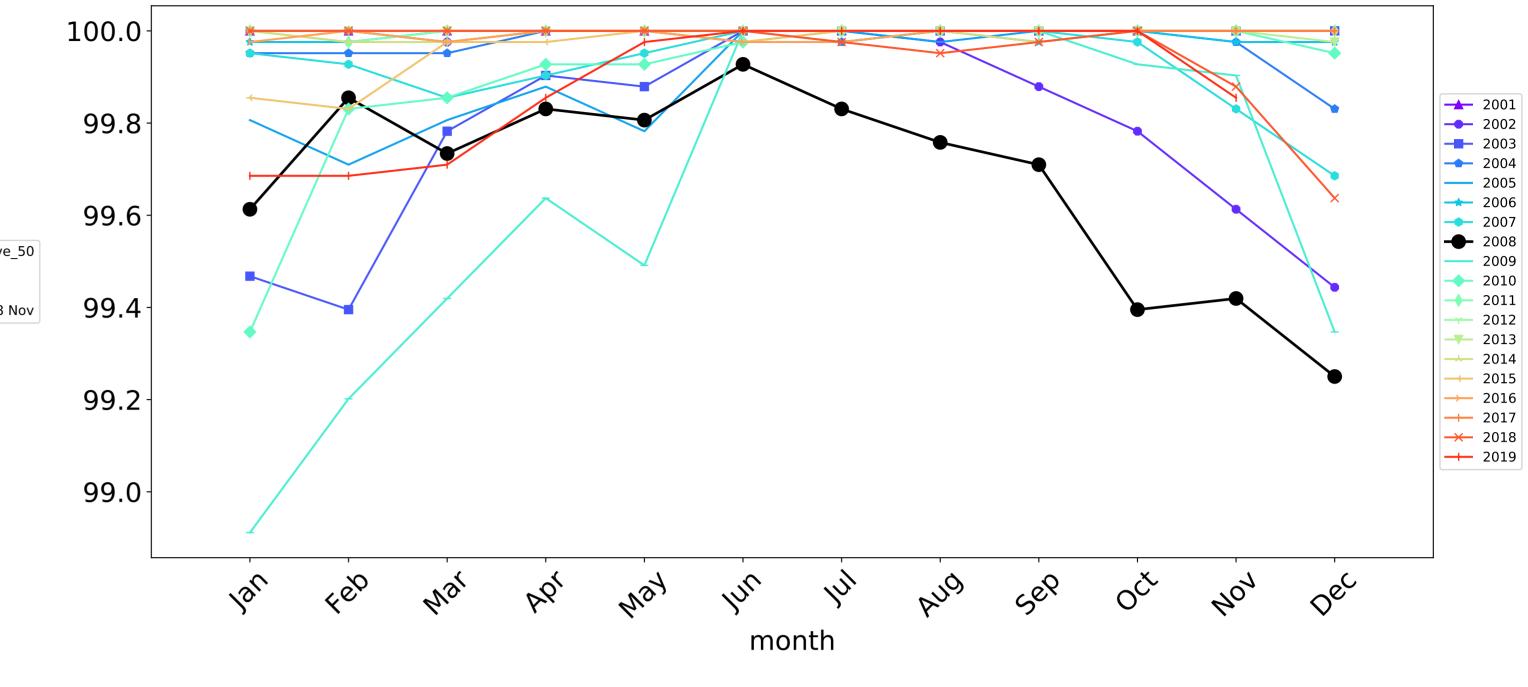


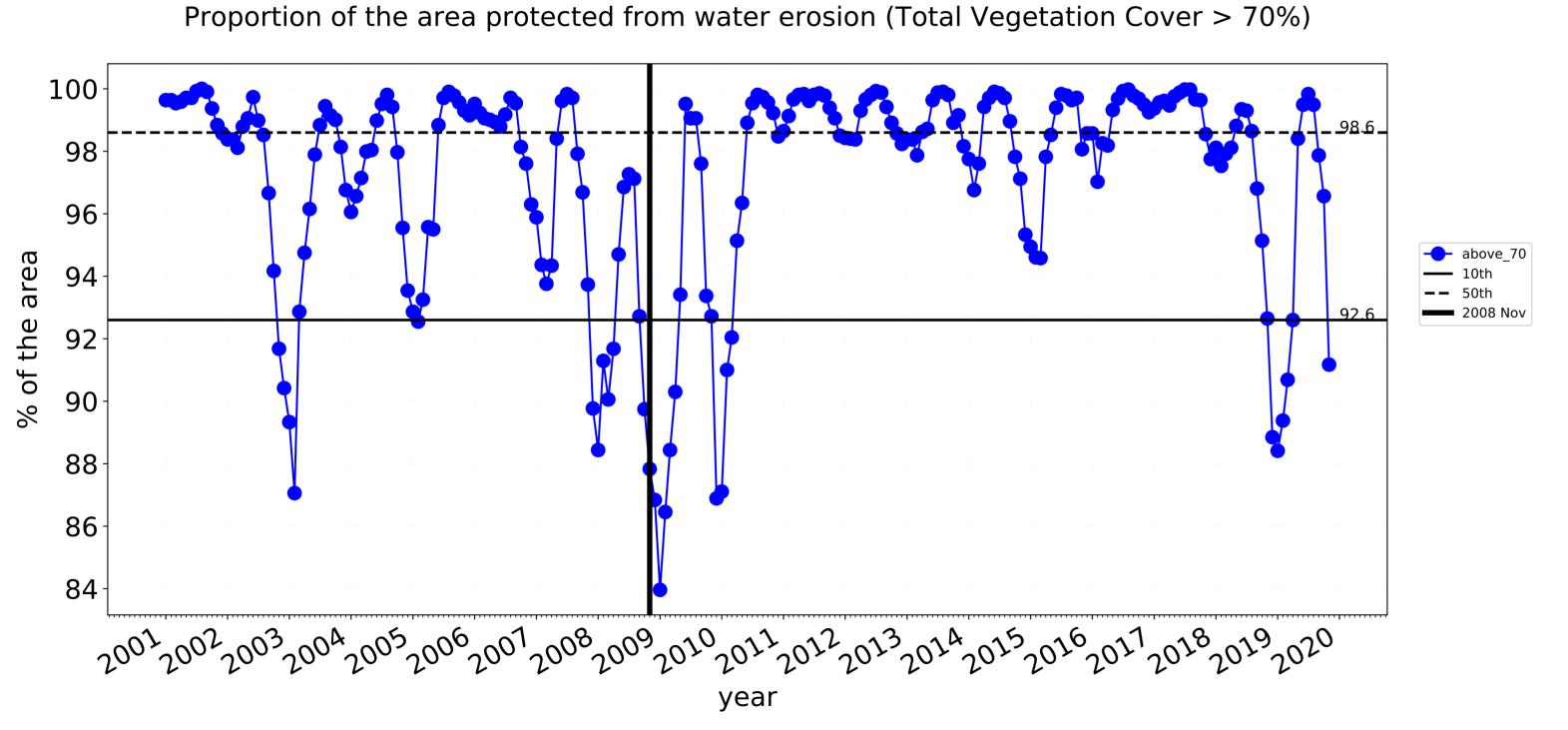


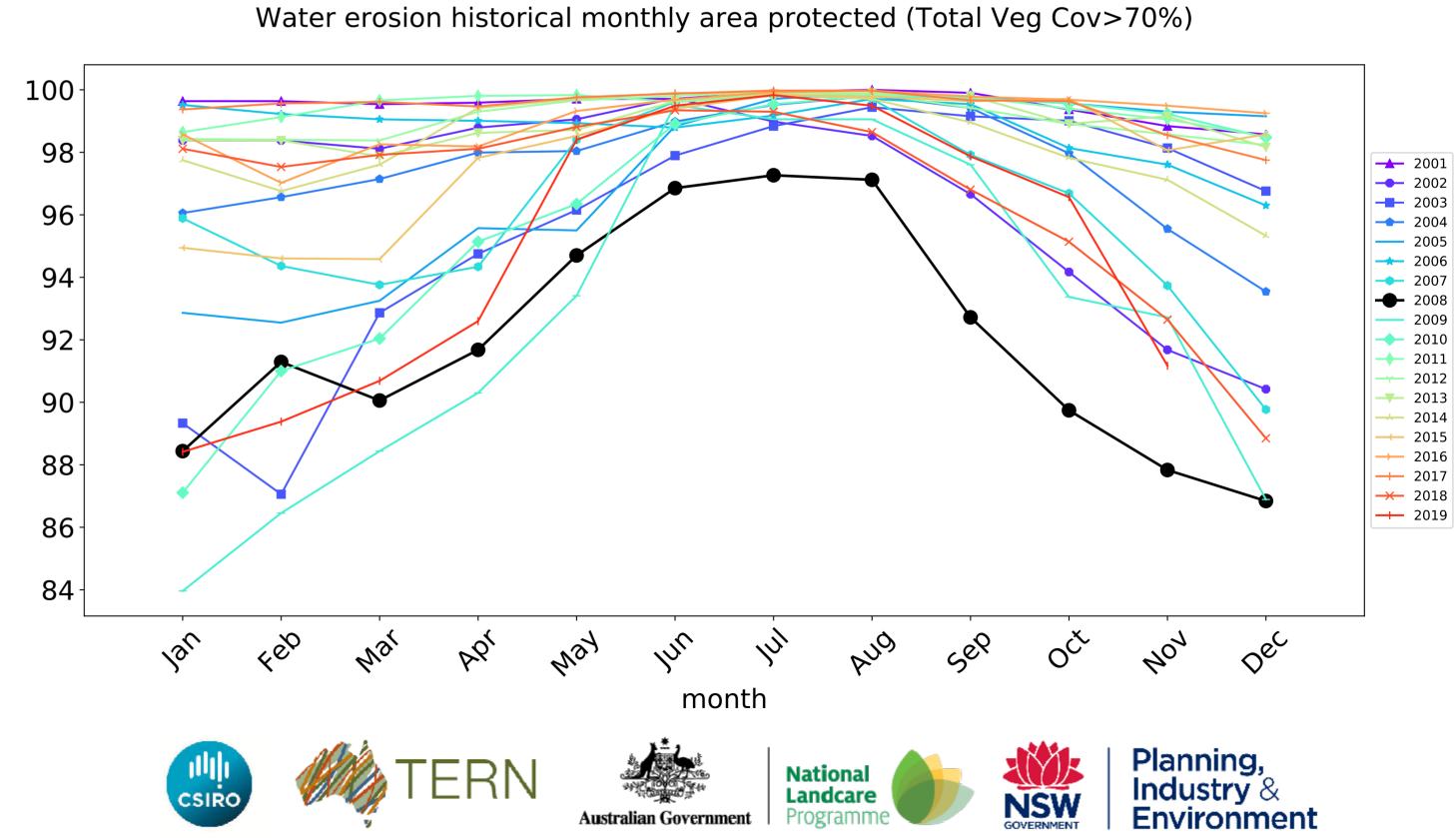






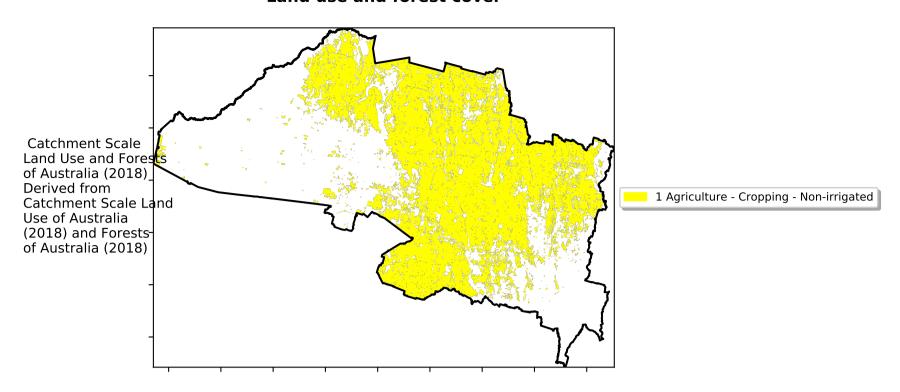




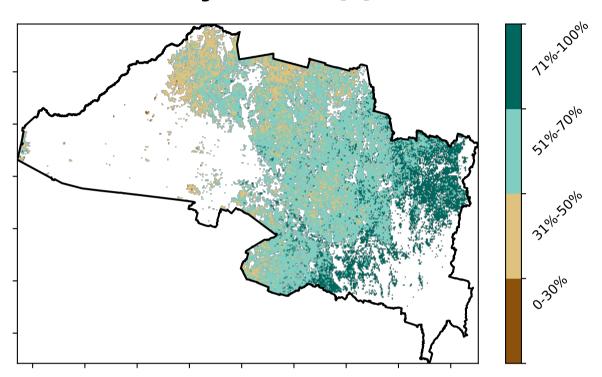


## **Cropping**

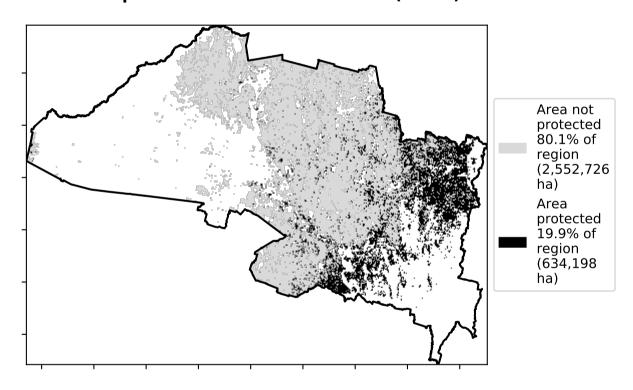
#### Land use and forest cover



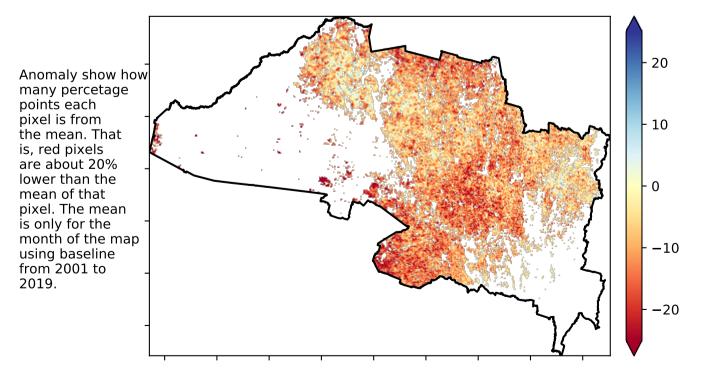
#### **Total Vegetation Cover [%]**



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

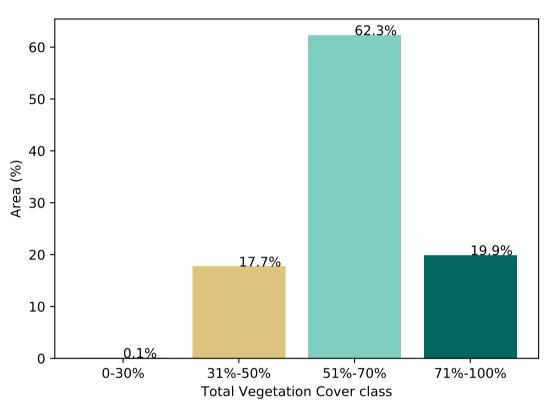


### Total Vegetation Cover Anomaly [%]

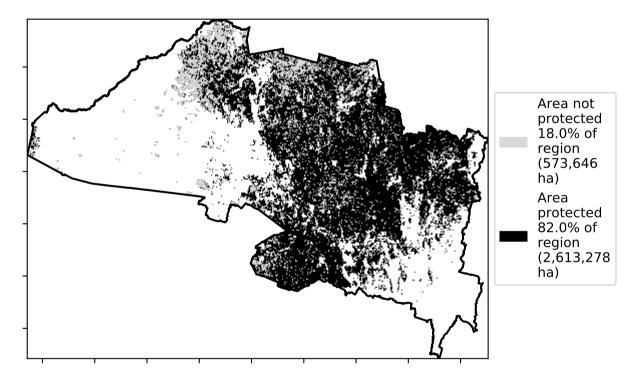


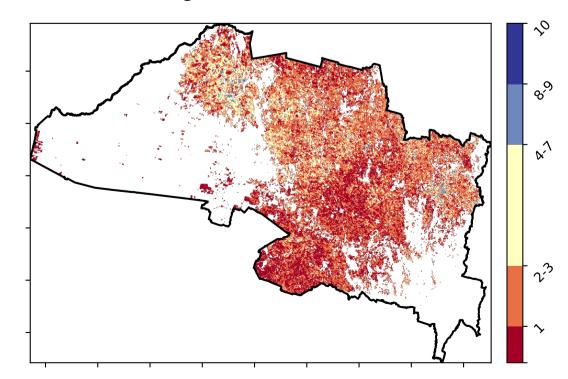
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









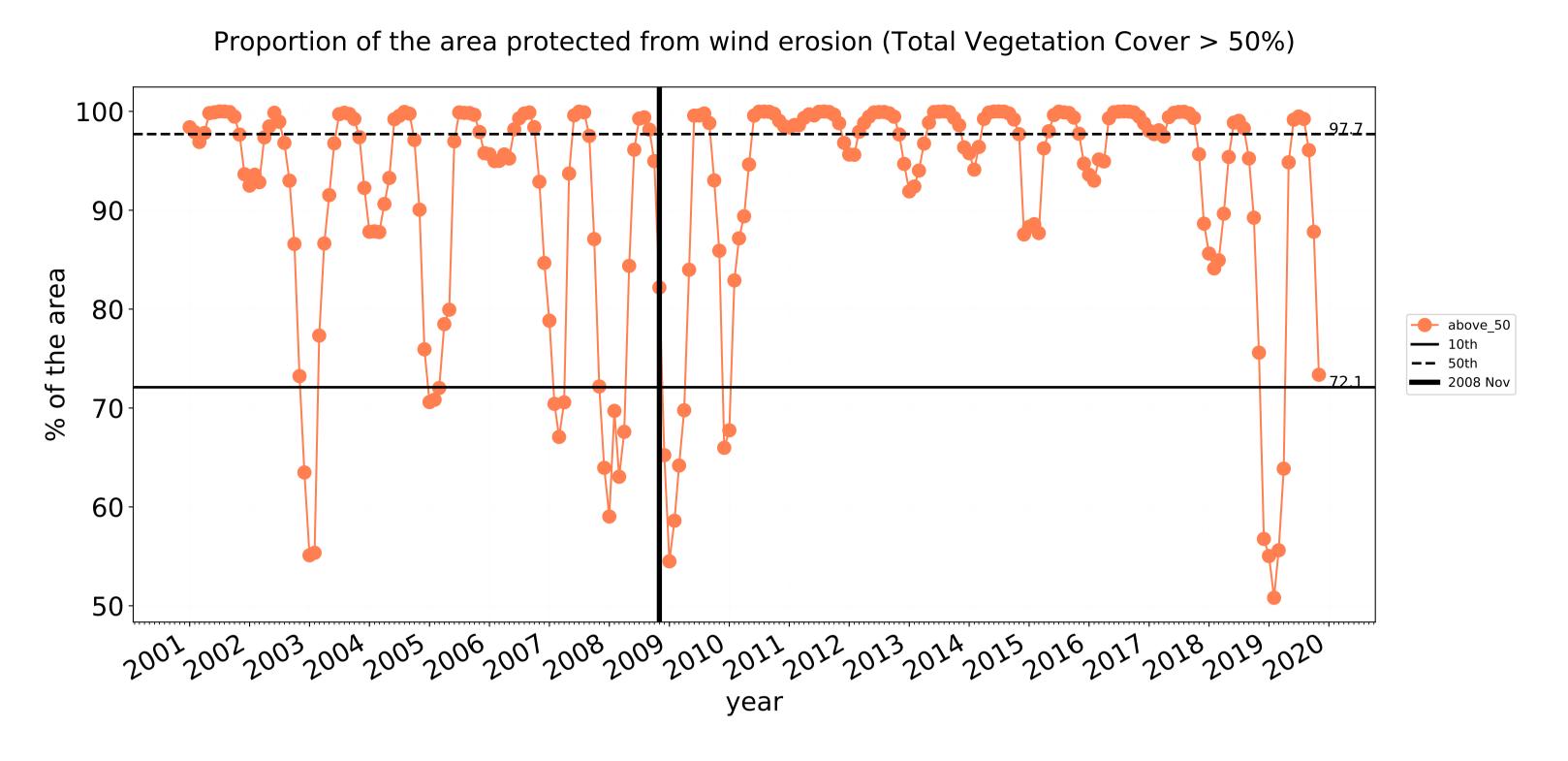


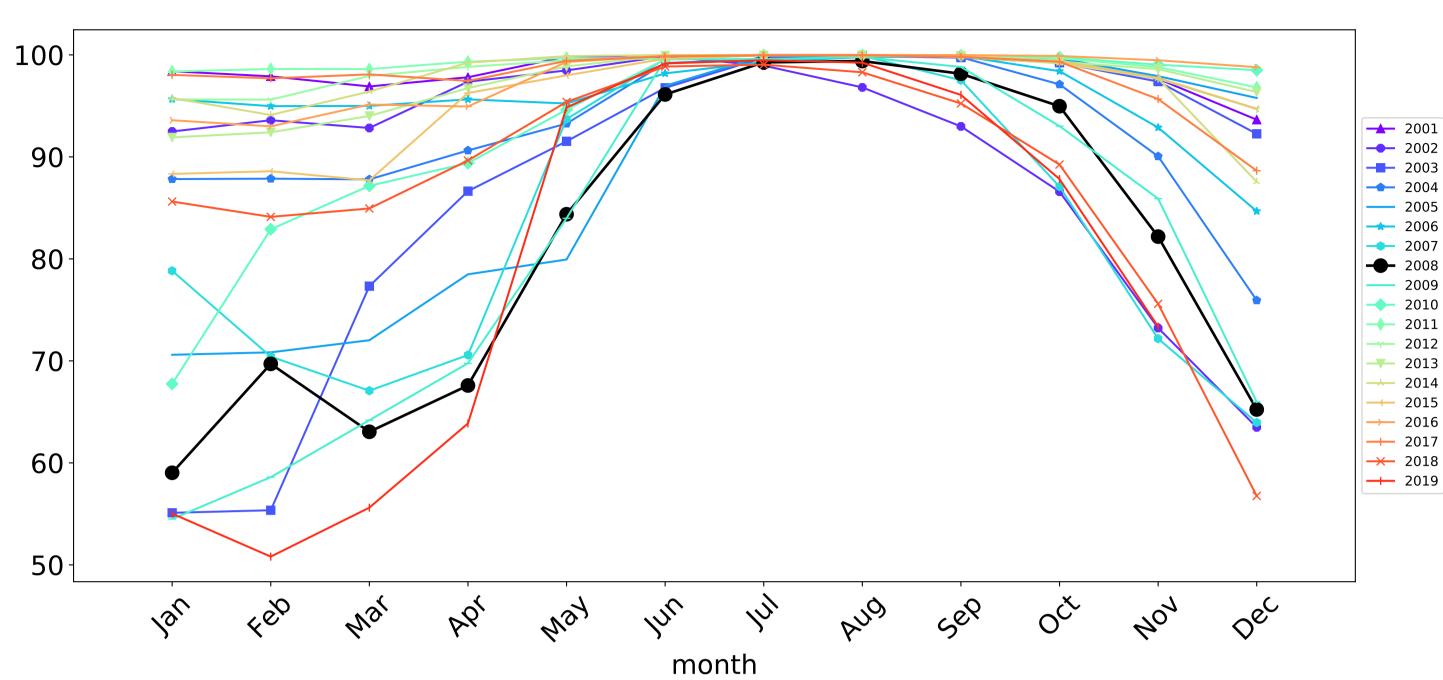




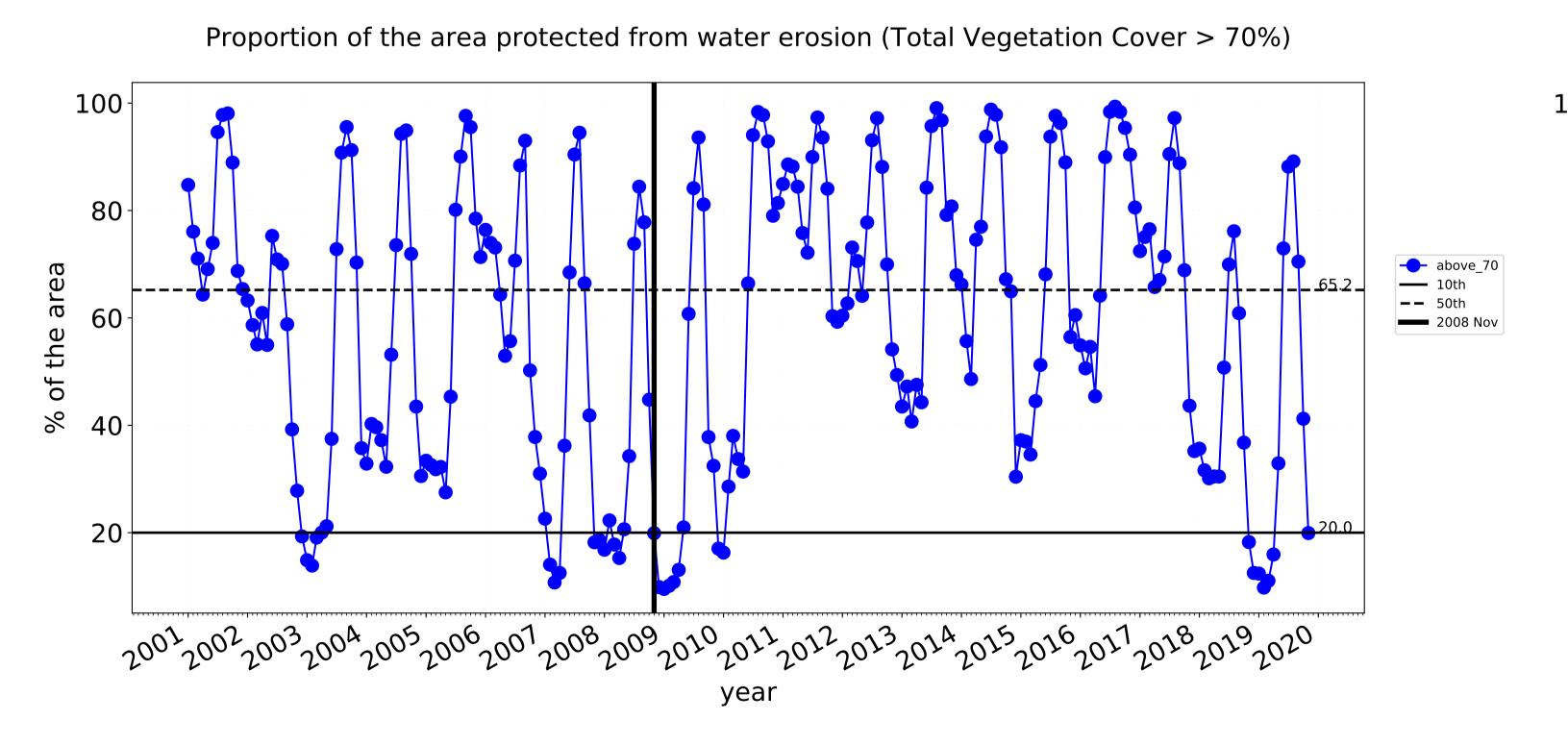


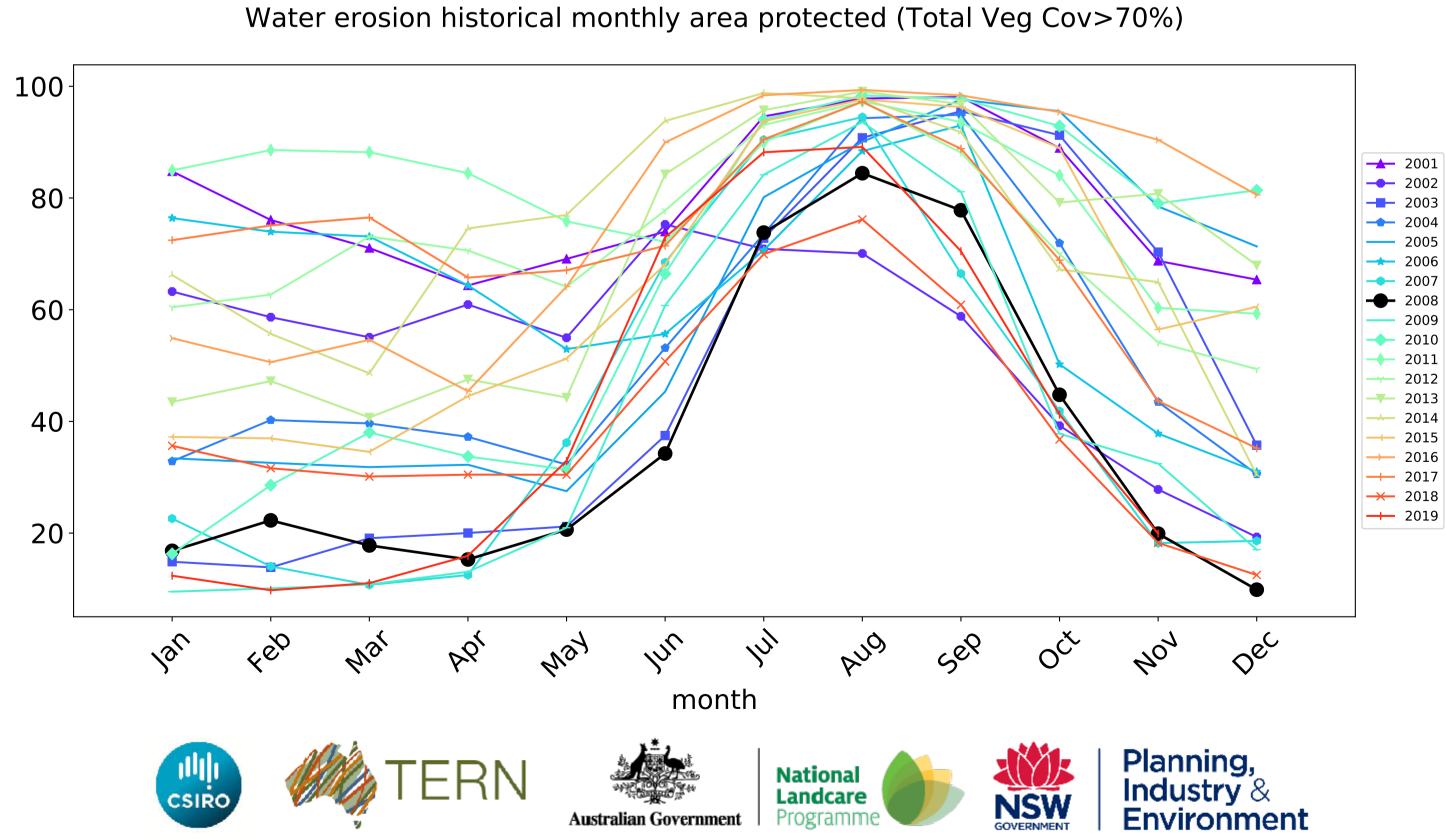
## **Cropping timeseries**



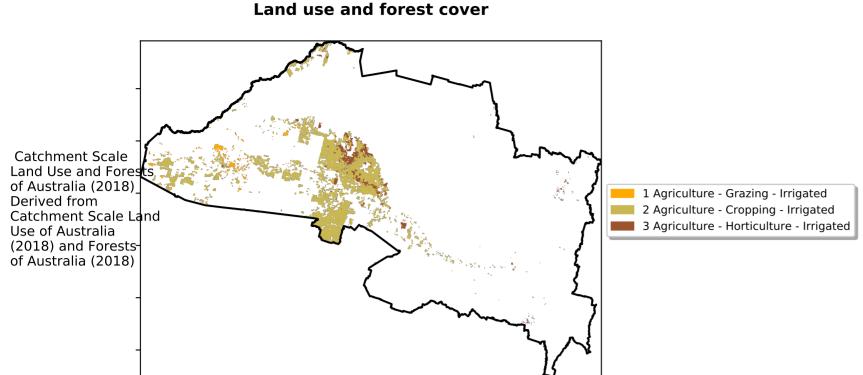


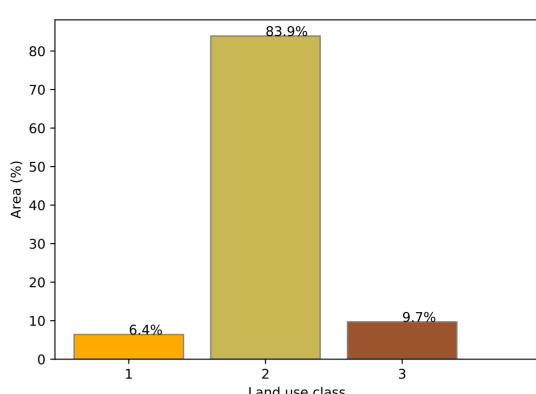
Wind erosion historical monthly area protected (Total Veg Cov >50%)

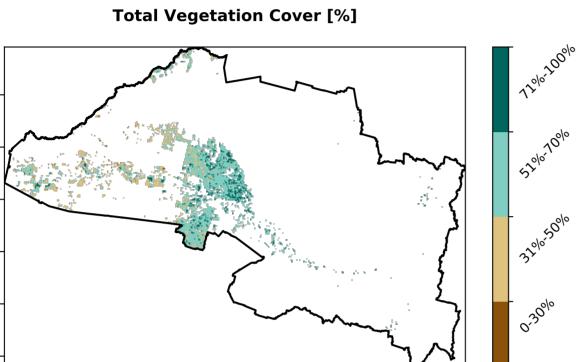


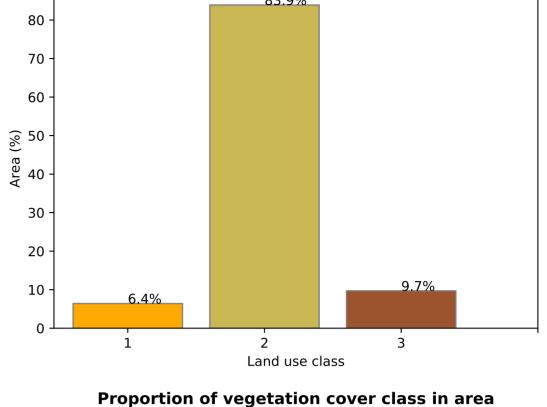


## Irrigation



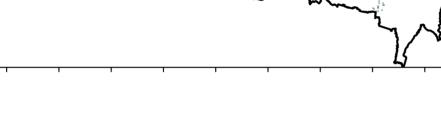




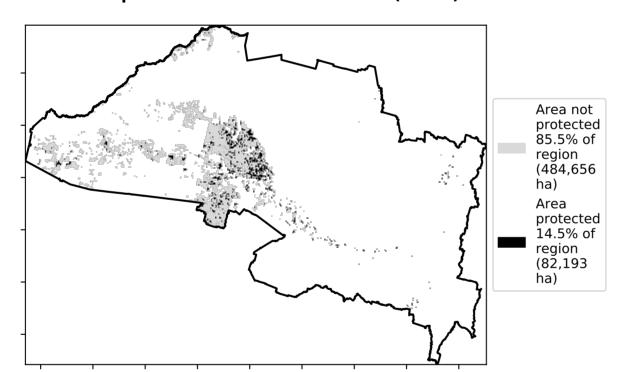


**Proportion of each land class in area** 

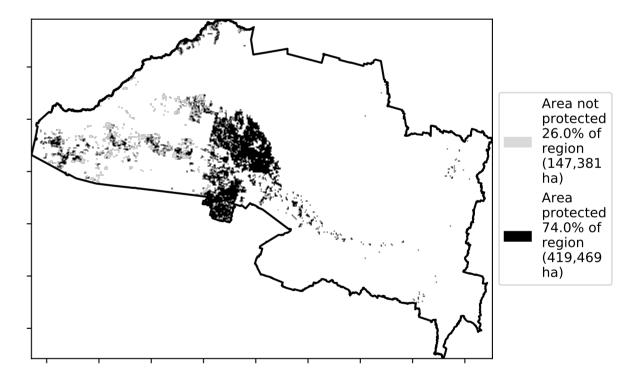
## 59.9% 60 50 40 Area (%) . 08 24.9% 20 14.5% 10 71%-100% 0-30% 31%-50% 51%-70% **Total Vegetation Cover class**

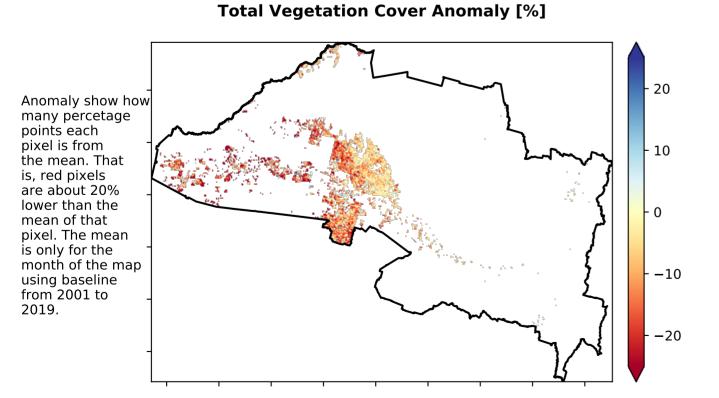


% Area protected from water erosion (>70%)

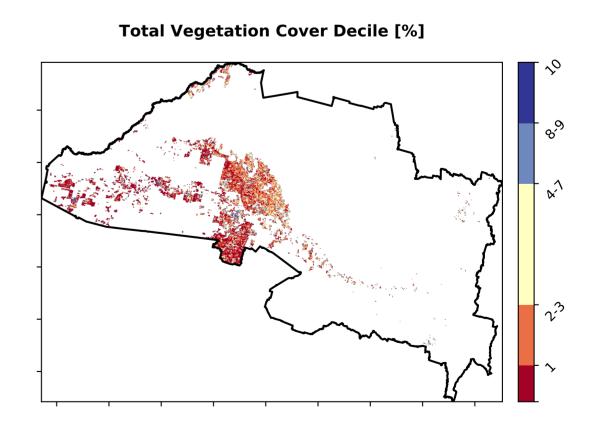


% Area protected from wind erosion (>50%)





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.





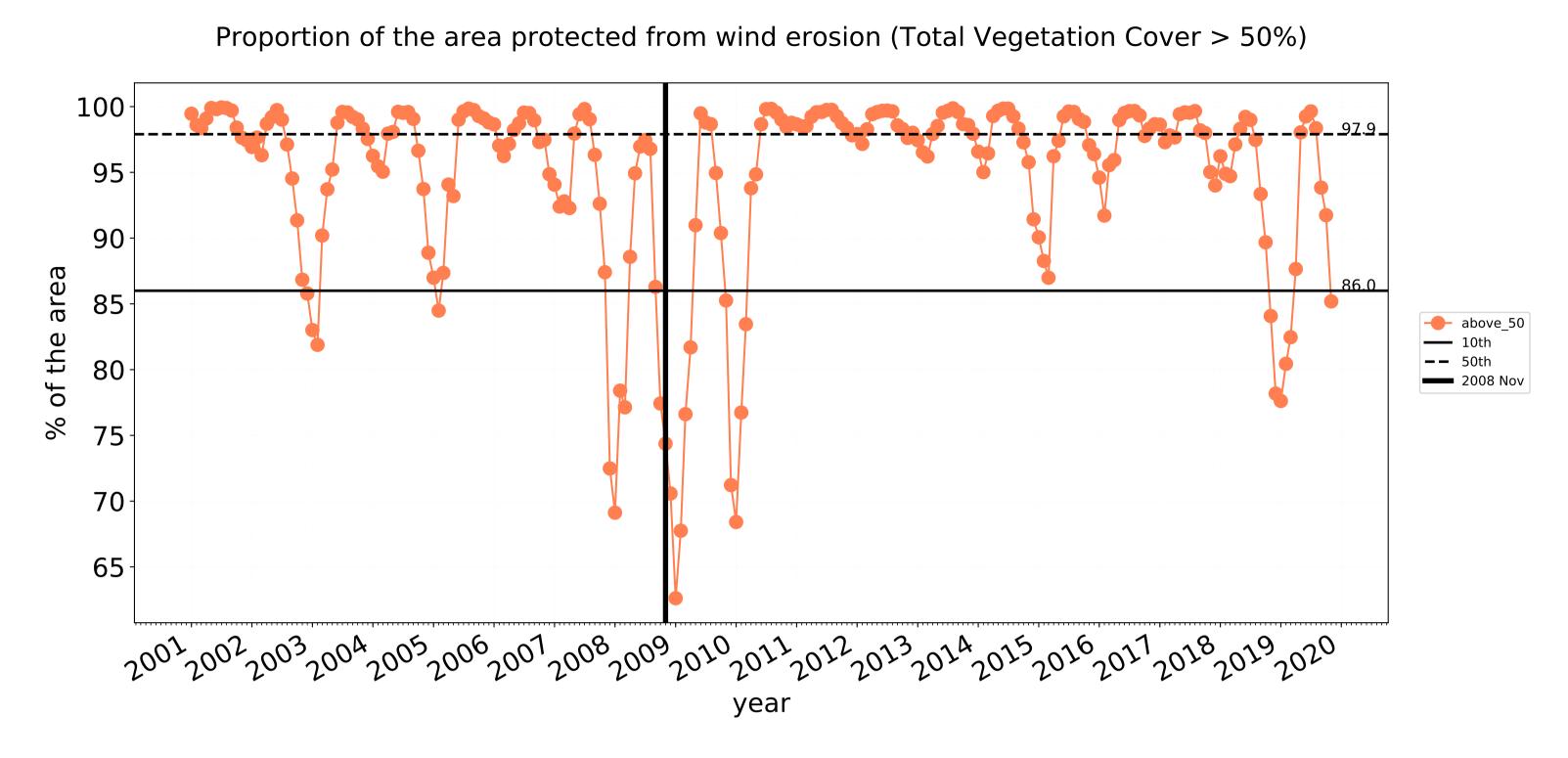


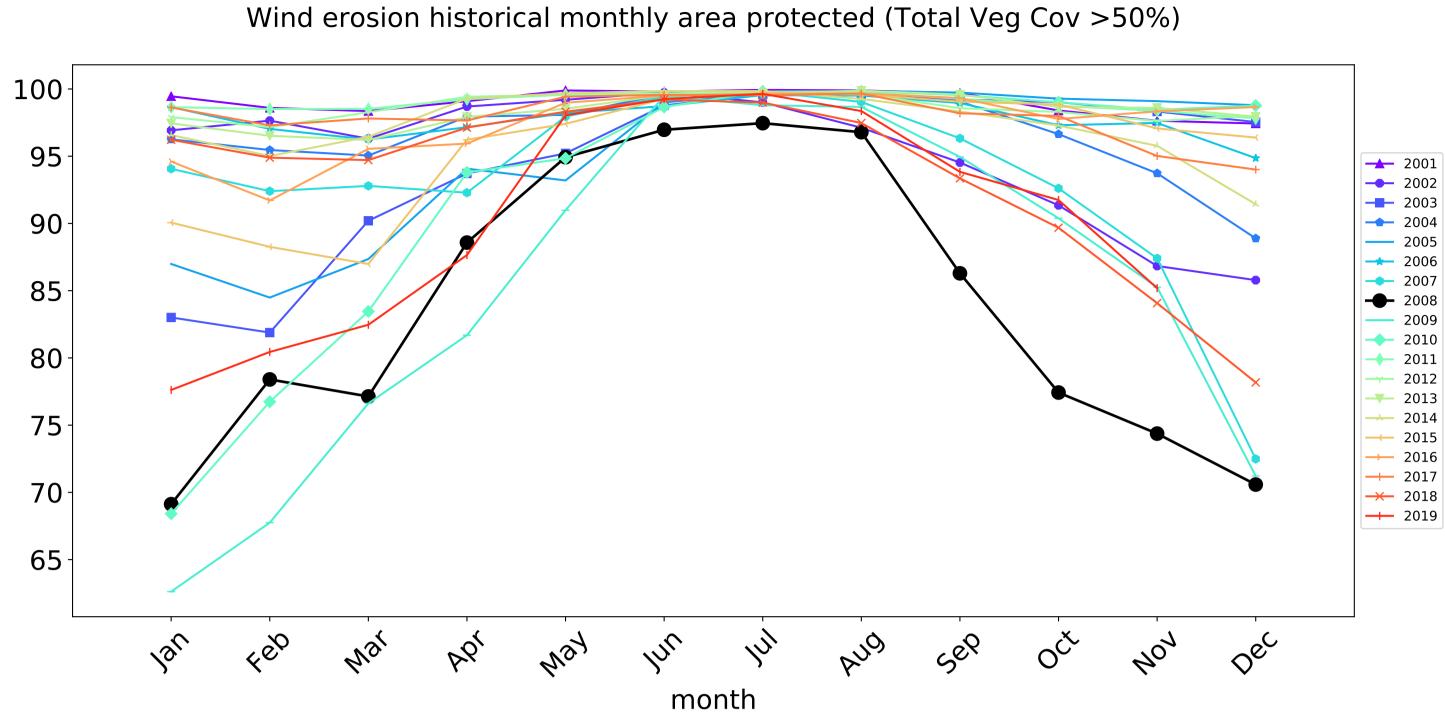


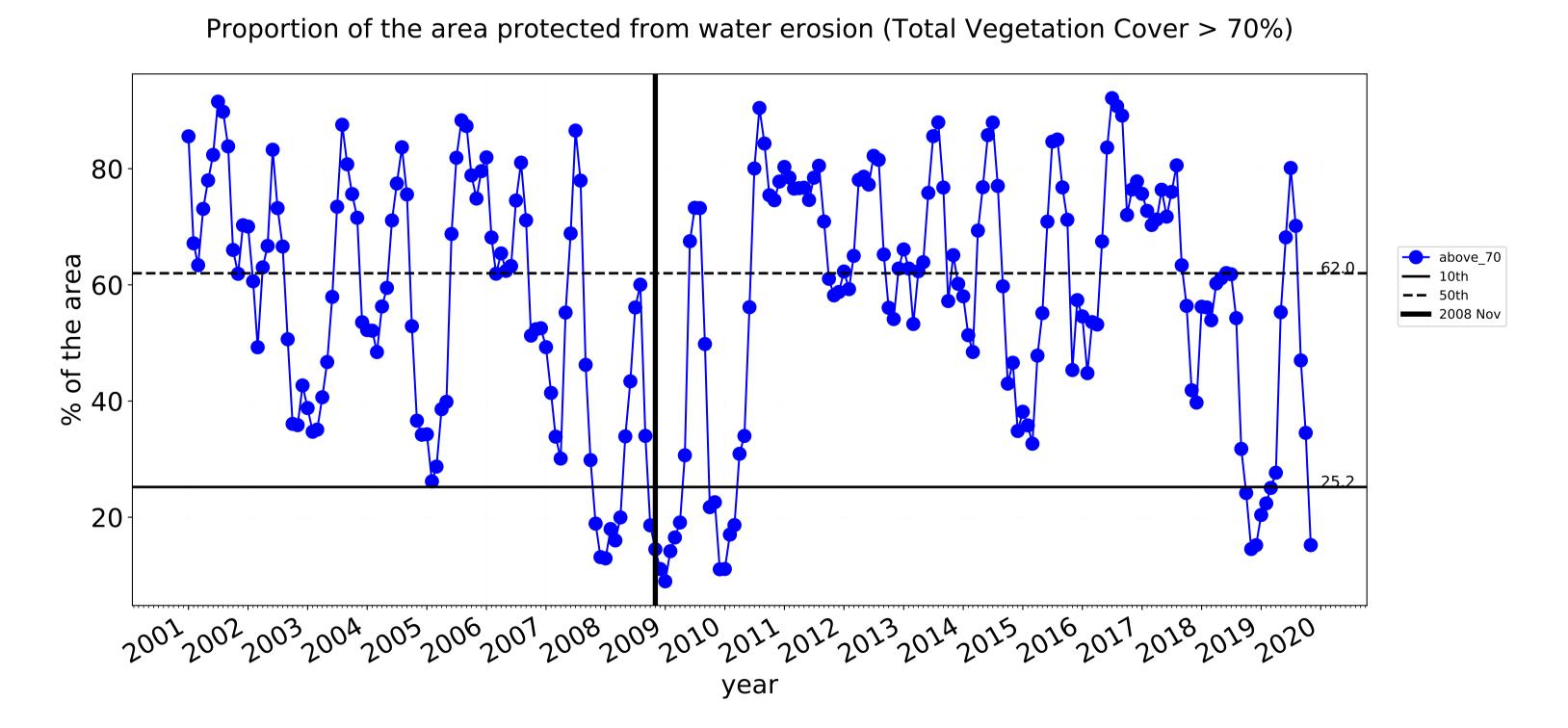


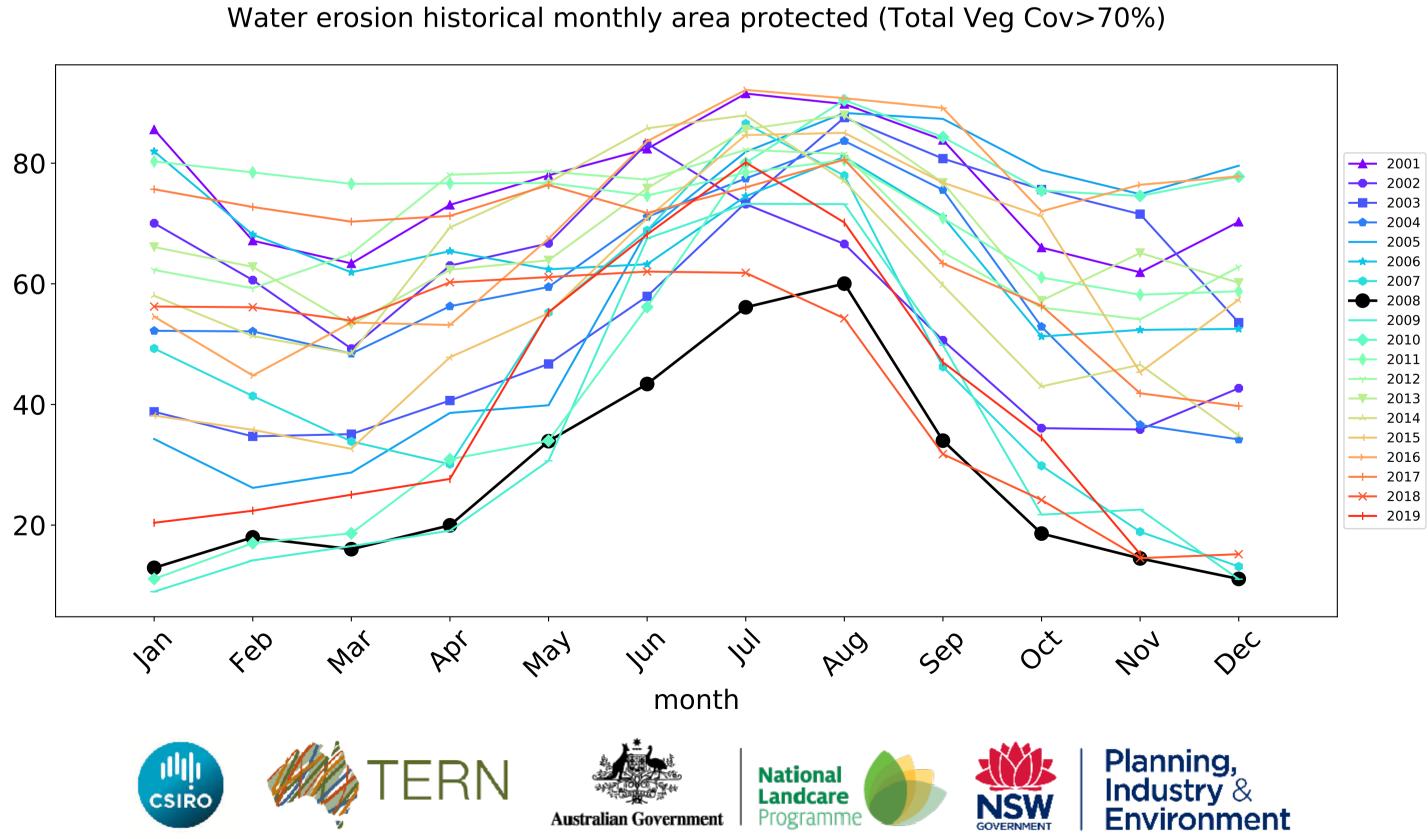










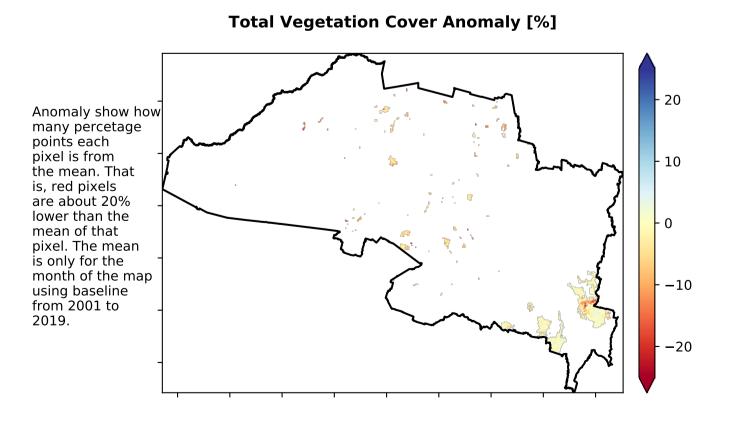


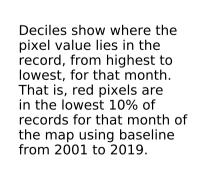
## **Production native forests and plantation forests**

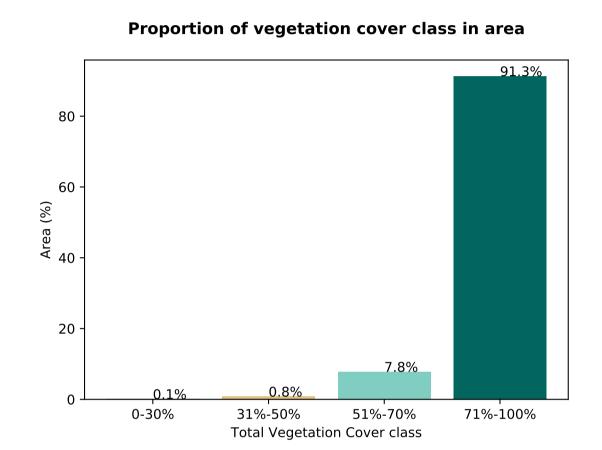
## Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 1 Production native forests and plantation forests of Australia (2018)

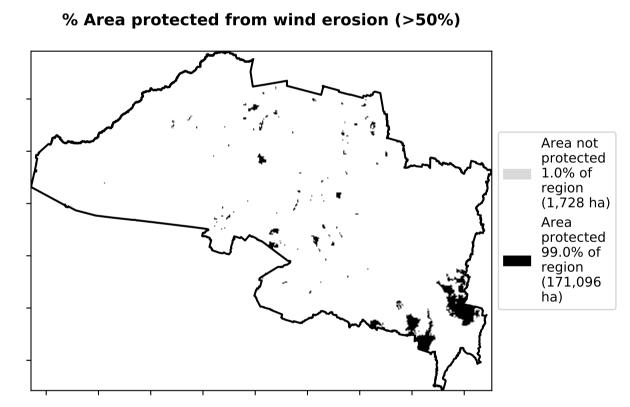
## Total Vegetation Cover [%]

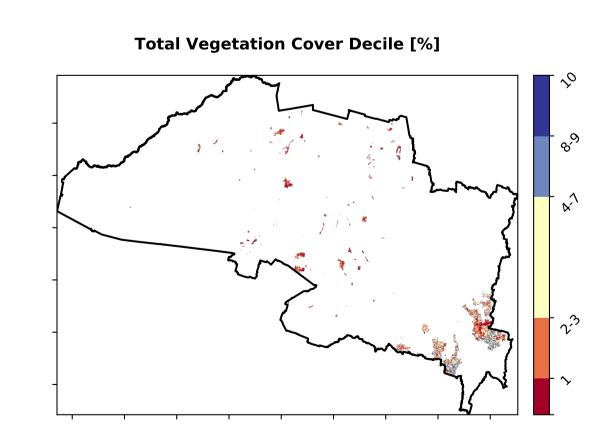
## Area not protected 8.7% of region (15,035 ha) Area protected 91.3% of region (157,789 ha)















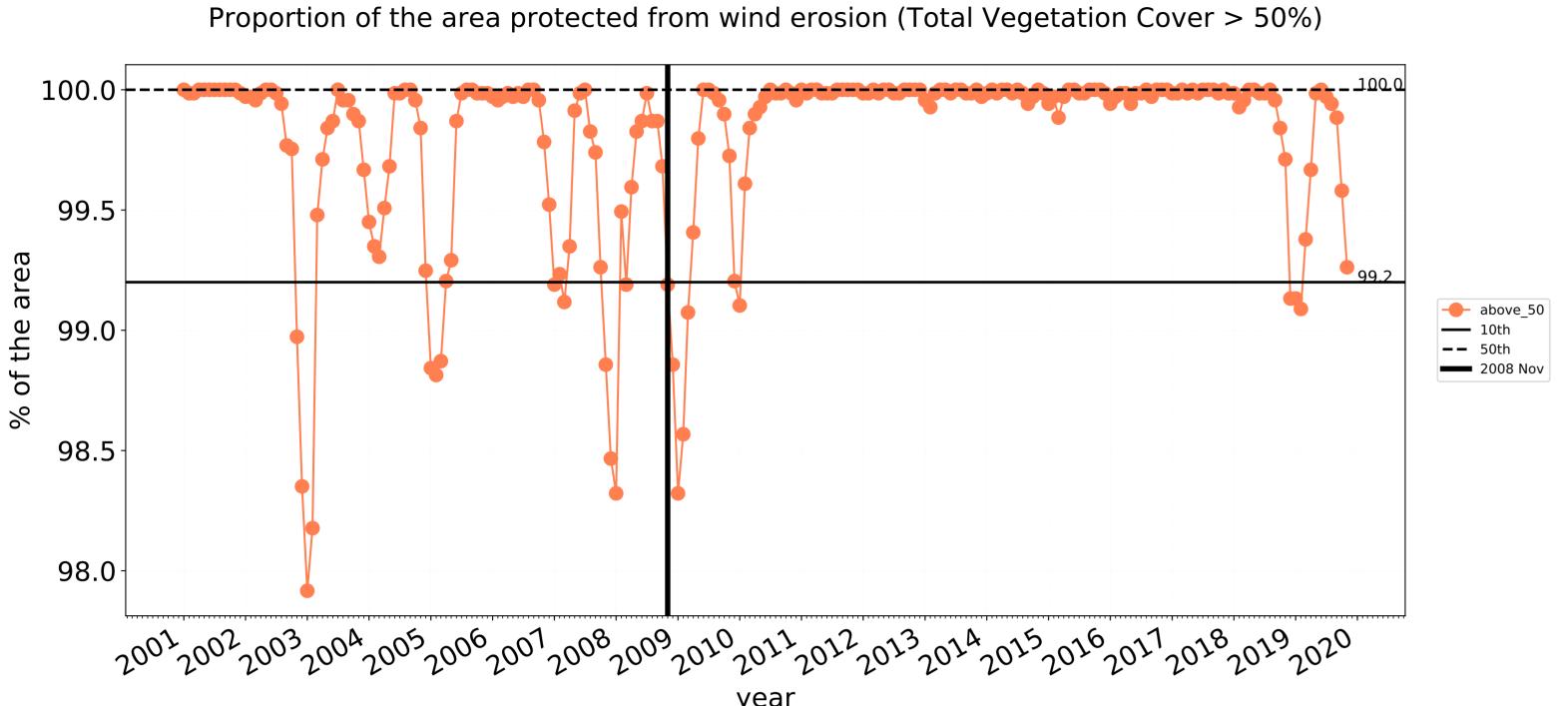


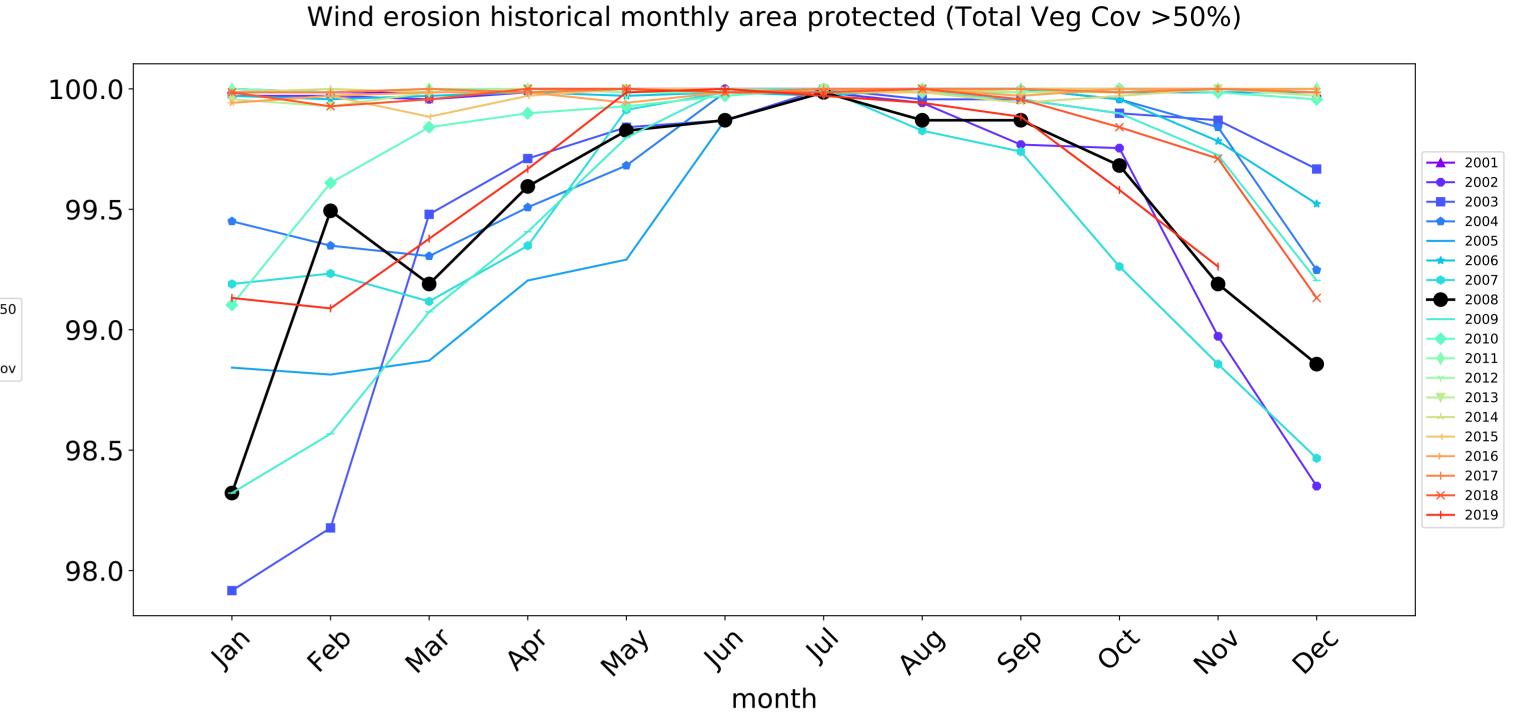


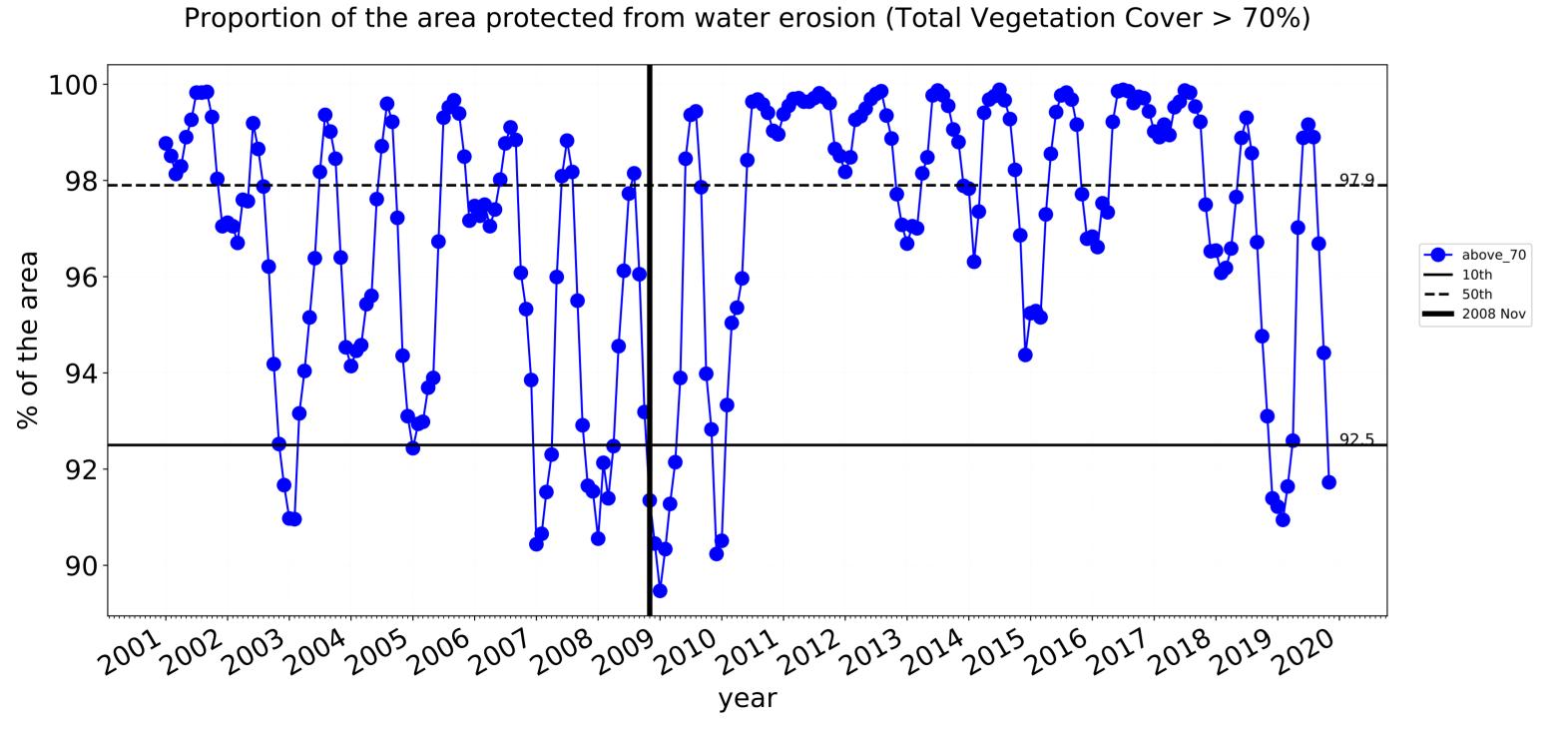


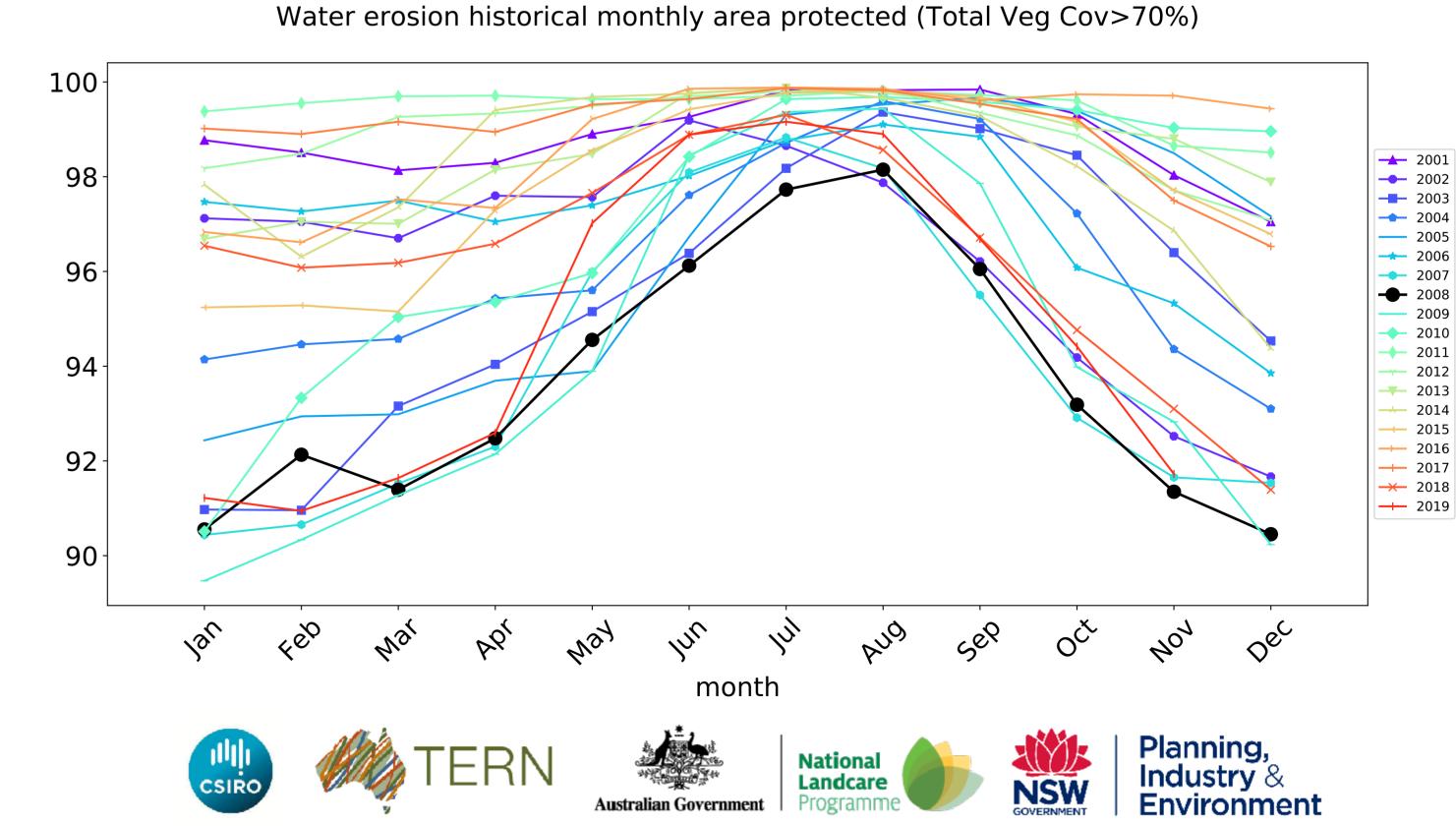


## **Production native forests and plantation forests timeseries**









## 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	96.8% 6,482,841	71.6% 4,795,870	29.0% 1,944,287	16.9% 1,128,606	5.8% 389,862	2.0% 133,021
Conservation and natural environments	323,075	99.2% 320,375	84.5% 272,975	77.4% 250,200	71.1% 229,825	48.7% 157,350	22.9% 74,100
Conservation and natural environments non forest	83,350	96.8% 80,650	40.0% 33,325	18.1% 15,125	13.8% 11,500	9.6% 7,975	5.2% 4,375
Conservation and natural environments Forest (non woodland)	195,225	100.0% 195,225	100.0% 195,175	99.2% 193,675	96.6% 188,600	72.9% 142,250	34.8% 67,950
Agriculture	6,066,800	96.7% 5,863,950	70.2% 4,258,875	24.6% 1,493,850	12.3% 745,425	2.2% 133,550	0.3% 15,625
Grazing	2,311,200	91.6% 2,116,825	52.7% 1,217,300	33.6% 777,225	23.4% 541,100	5.2% 120,050	0.6% 14,175
Grazing non forest	2,066,200	90.6% 1,871,825	47.2% 974,500	28.6% 590,825	20.5% 422,550	4.4% 90,725	0.4% 8,900
Grazing Woodland forest	141,650	100.0% 141,650	98.9% 140,050	67.5% 95,625	33.0% 46,775	3.3% 4,675	0.5% 675
Grazing - Forest (non woodland)	103,350	100.0% 103,350	99.4% 102,750	87.8% 90,775	69.4% 71,775	23.9% 24,650	4.5% 4,600
Cropping	3,186,925	99.9% 3,182,825	82.2% 2,619,125	19.9% 634,375	6.1% 193,375	0.4% 12,725	0.0% 1,375
Irrigation	566,850	99.2% 562,475	74.4% 421,575	14.5% 82,050	1.9% 10,875	0.1% 775	0.0% 75
Production native forests and plantation forests	172,825	100.0% 172,825	99.2% 171,425	91.3% 157,875	79.8% 137,875	56.0% 96,700	24.9% 43,000











