### **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 2010** 

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







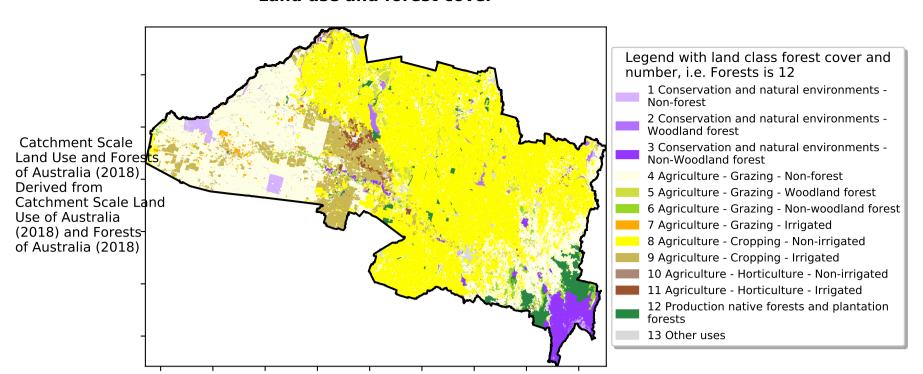




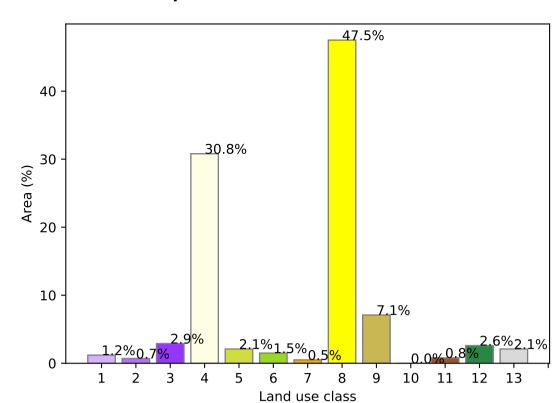


### **Vegetation Cover Nov 2010**

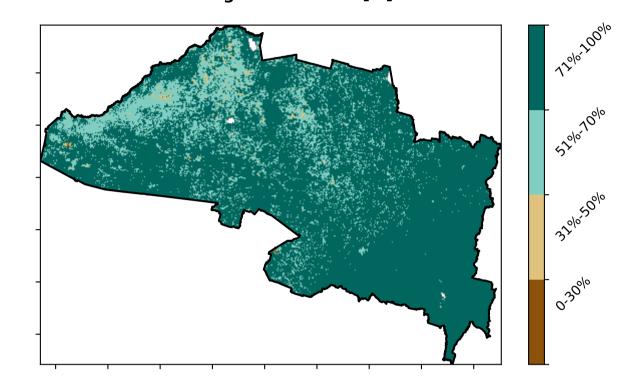
### Land use and forest cover



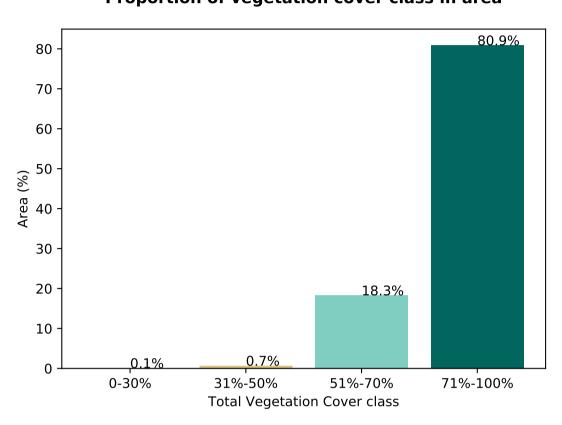
### Proportion of each land class in area



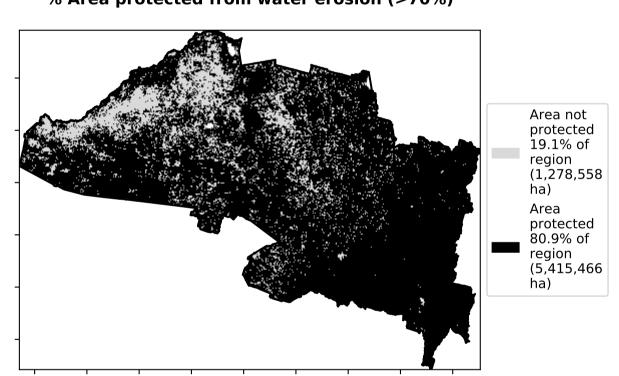
### **Total Vegetation Cover [%]**



Proportion of vegetation cover class in area



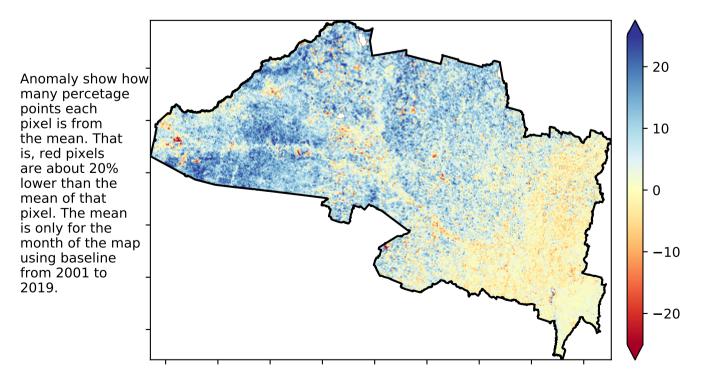
### % Area protected from water erosion (>70%)



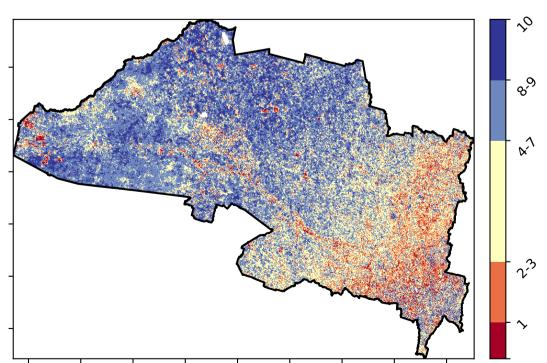
% Area protected from wind erosion (>50%)



### 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.





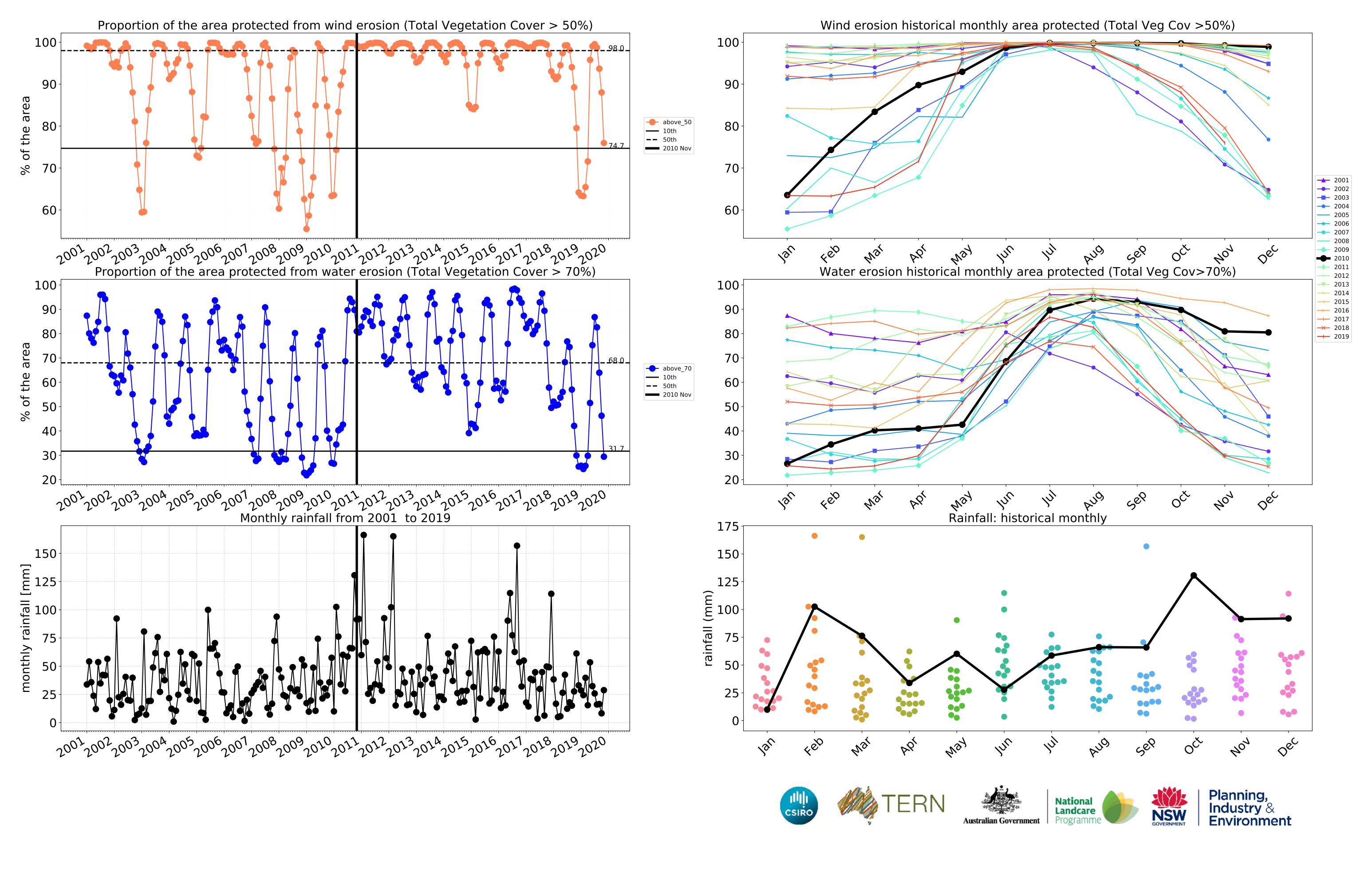




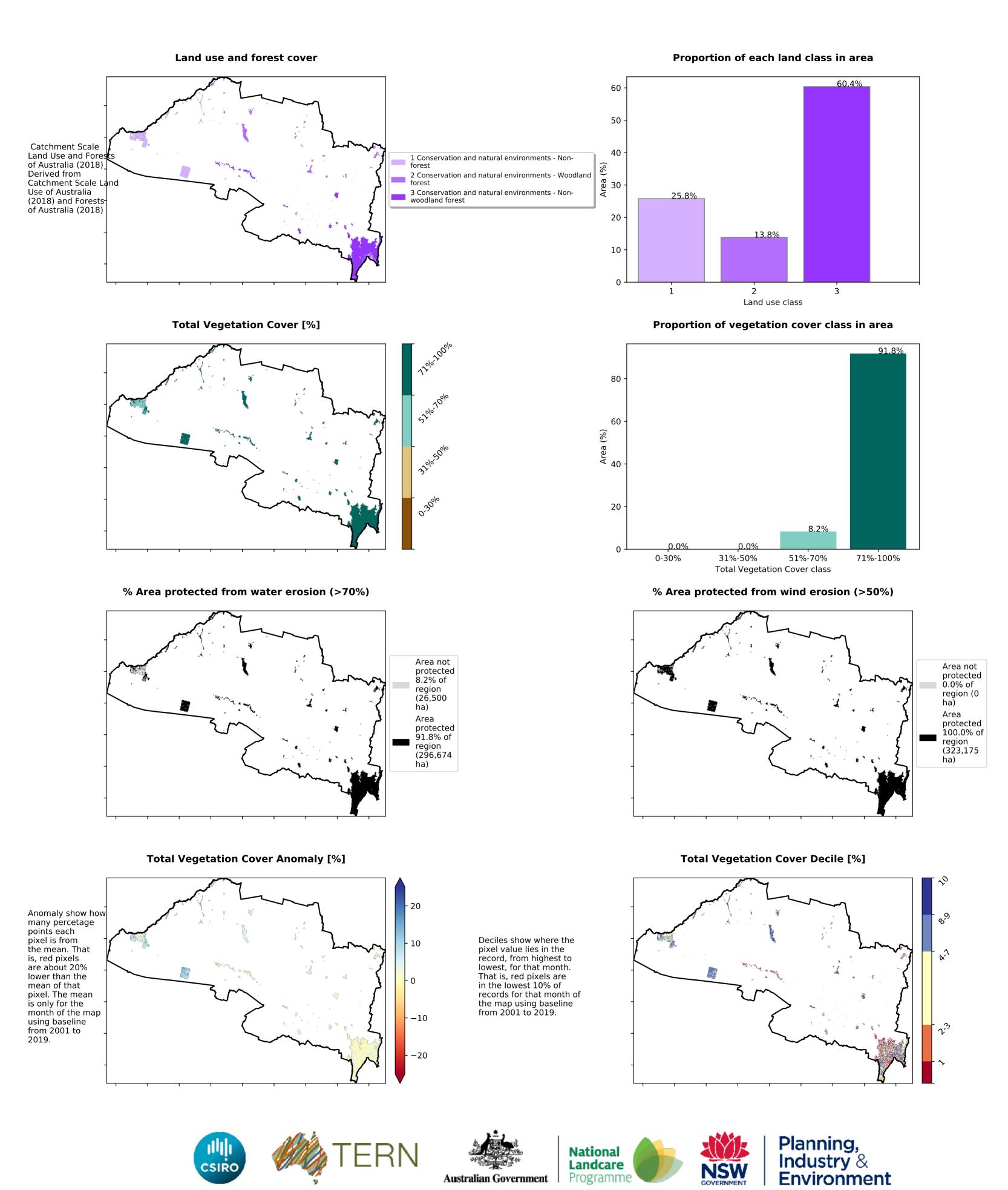






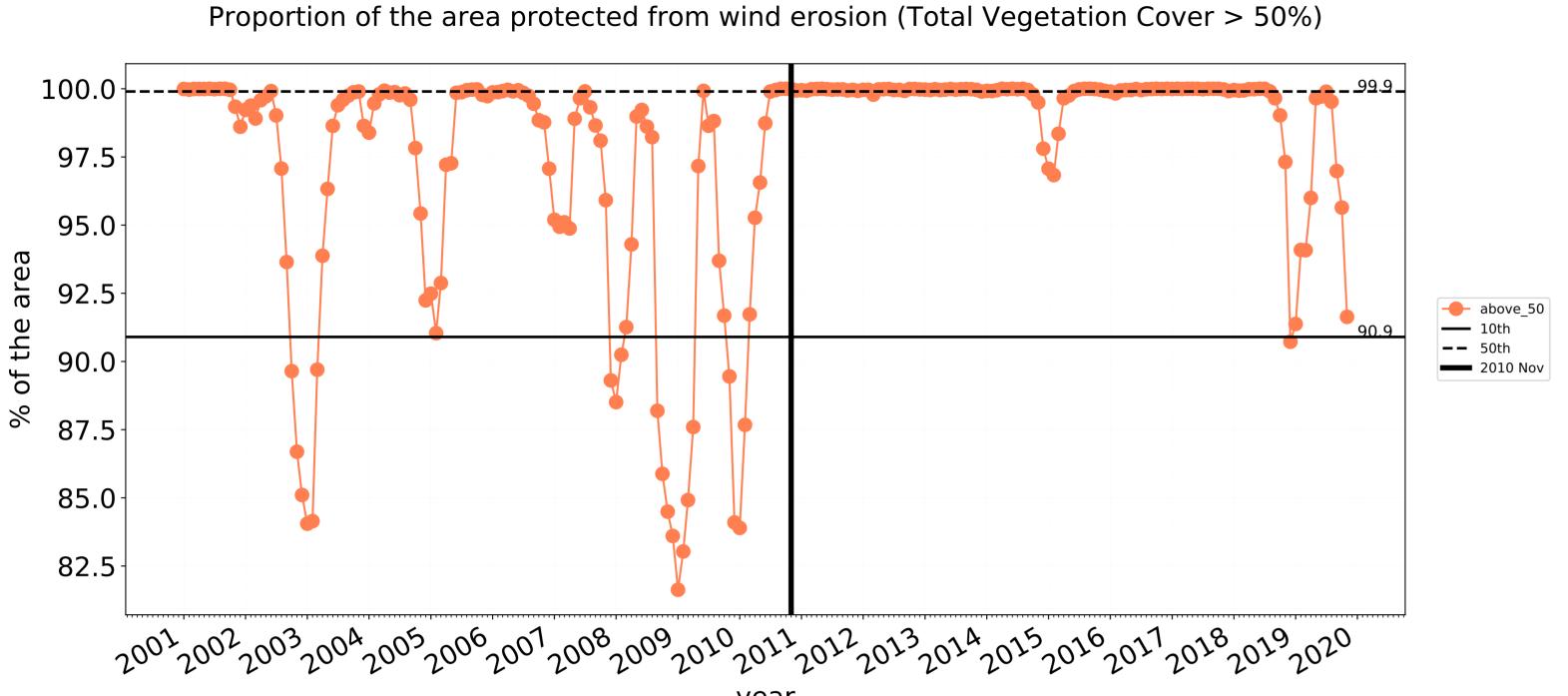


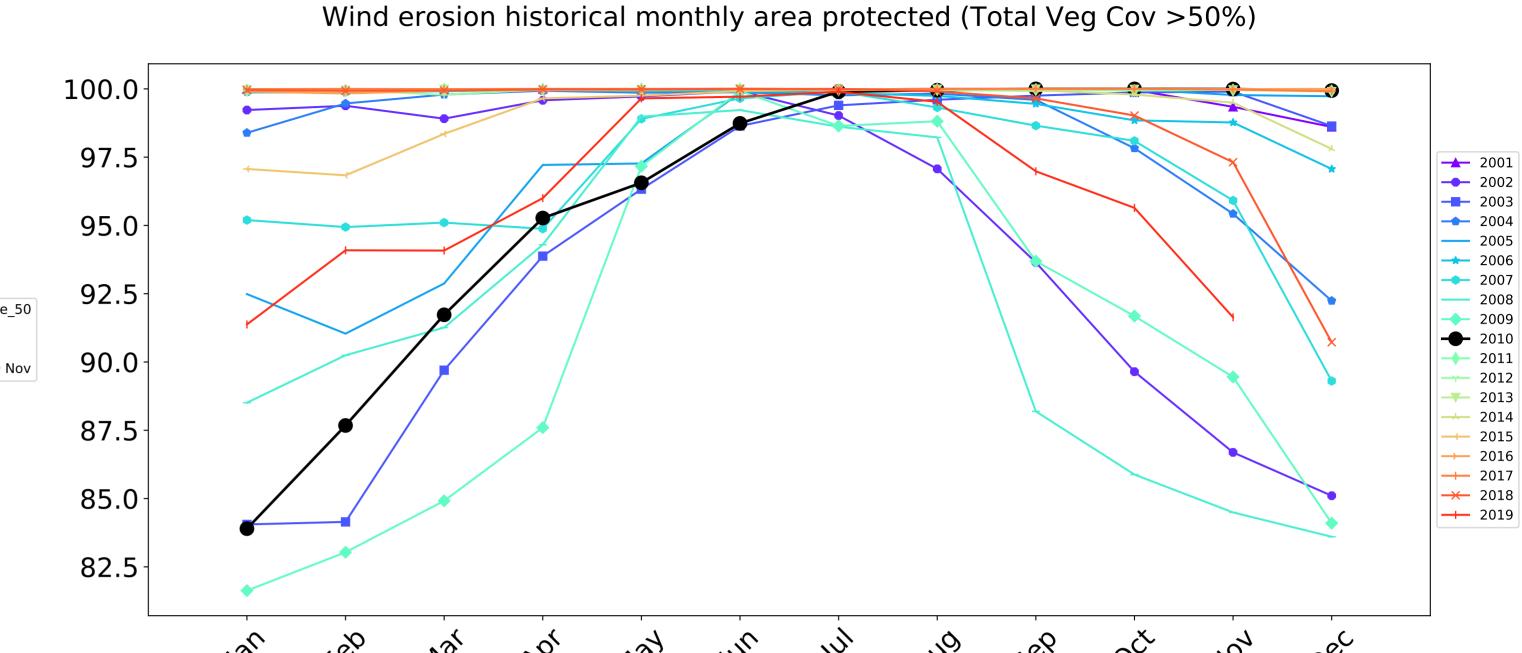
### **Conservation and natural environments**



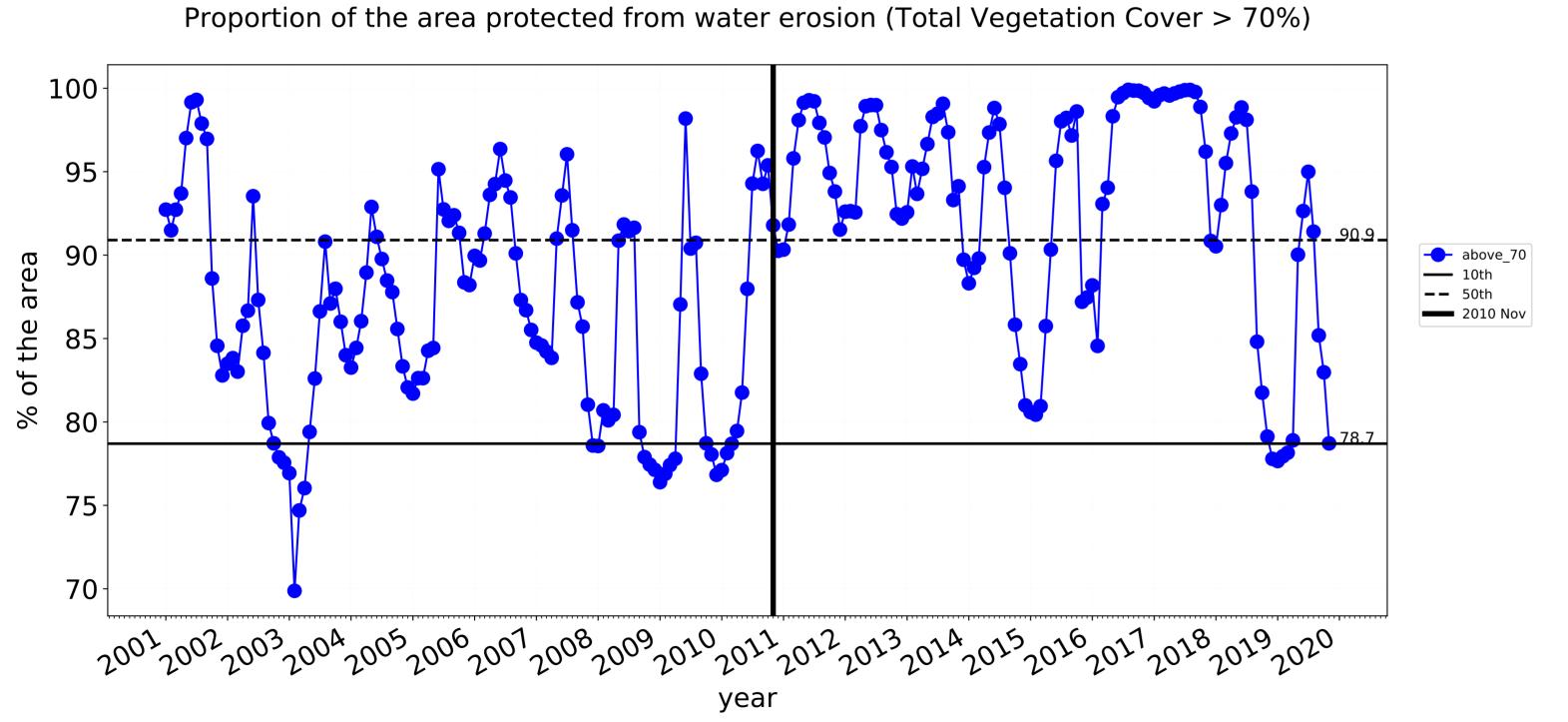


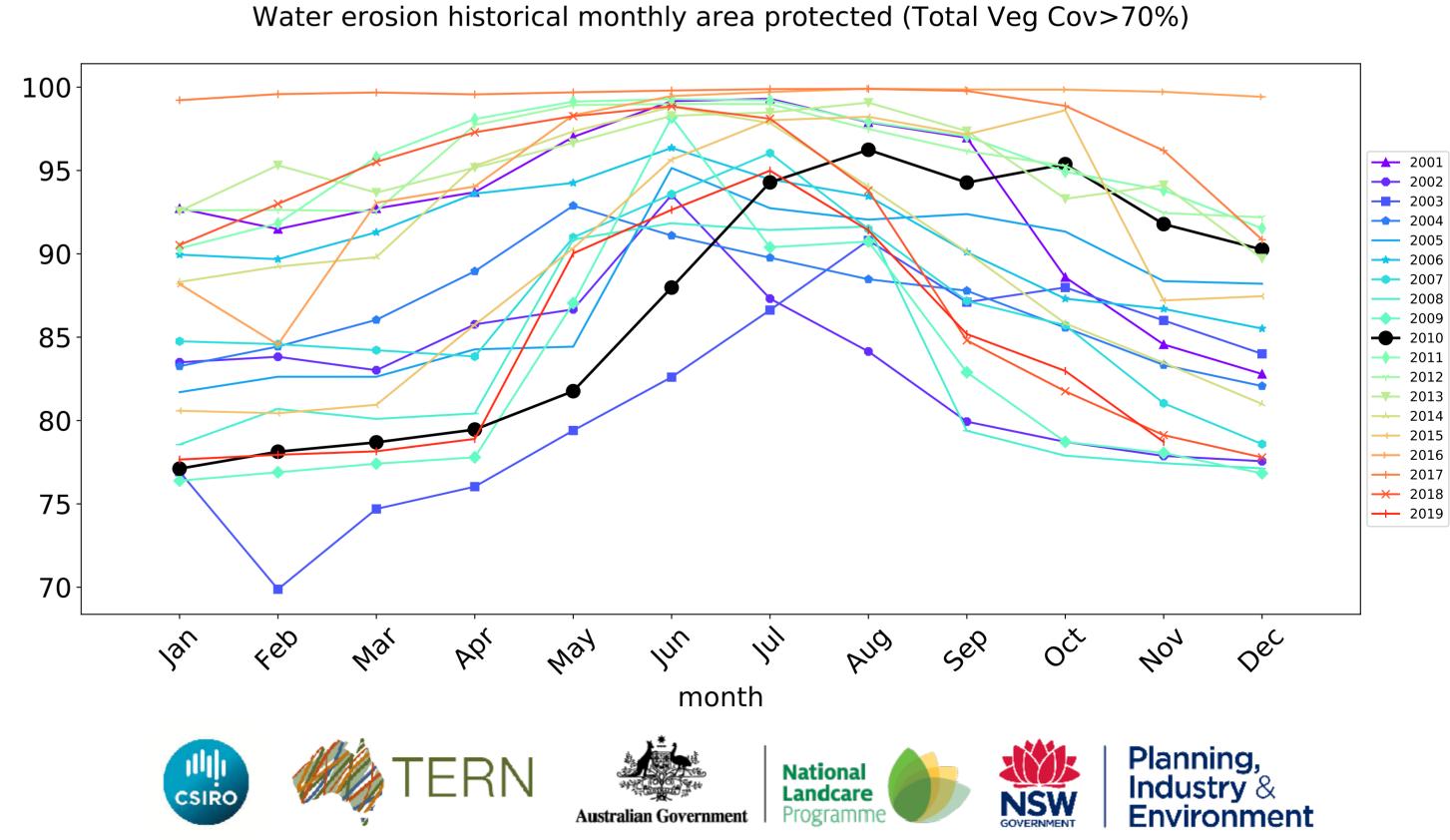
### **Conservation and natural environments timeseries**





month





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

### Land use and forest cover 1 Conservation and natural environments - Non-

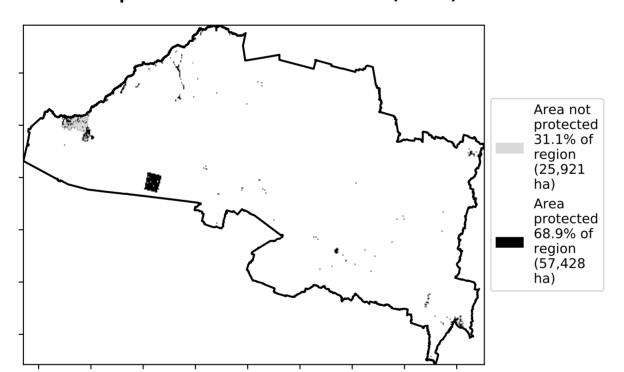
### % Area protected from water erosion (>70%)

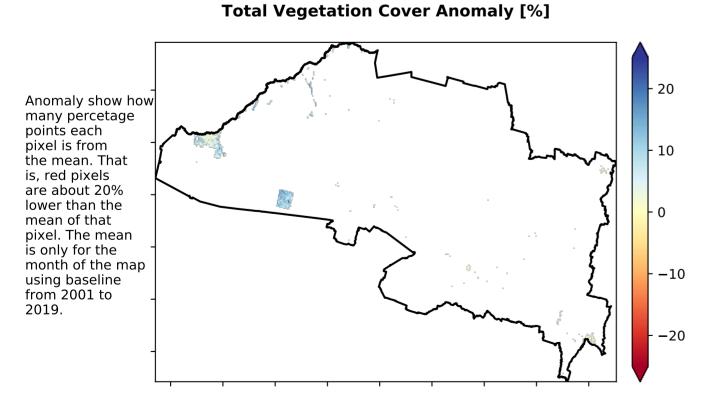
**Total Vegetation Cover [%]** 

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land Use of Australia (2018) and Forestsof Australia (2018)

Derived from



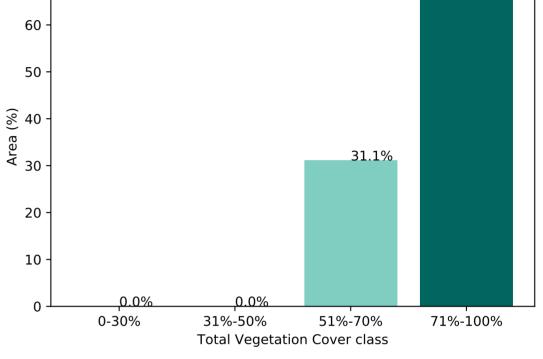


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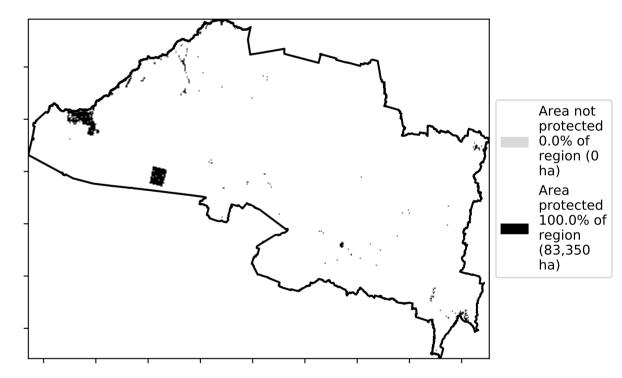
### 68.9% 31.1%

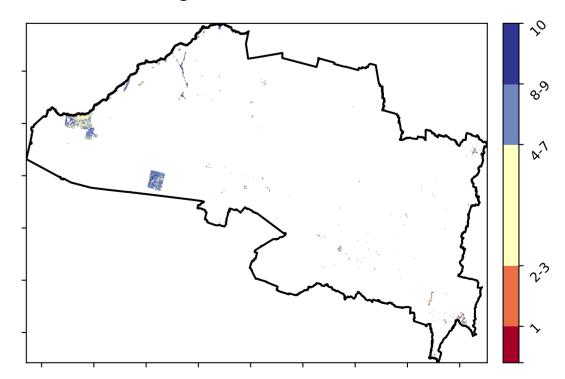
**Proportion of vegetation cover class in area** 

70



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









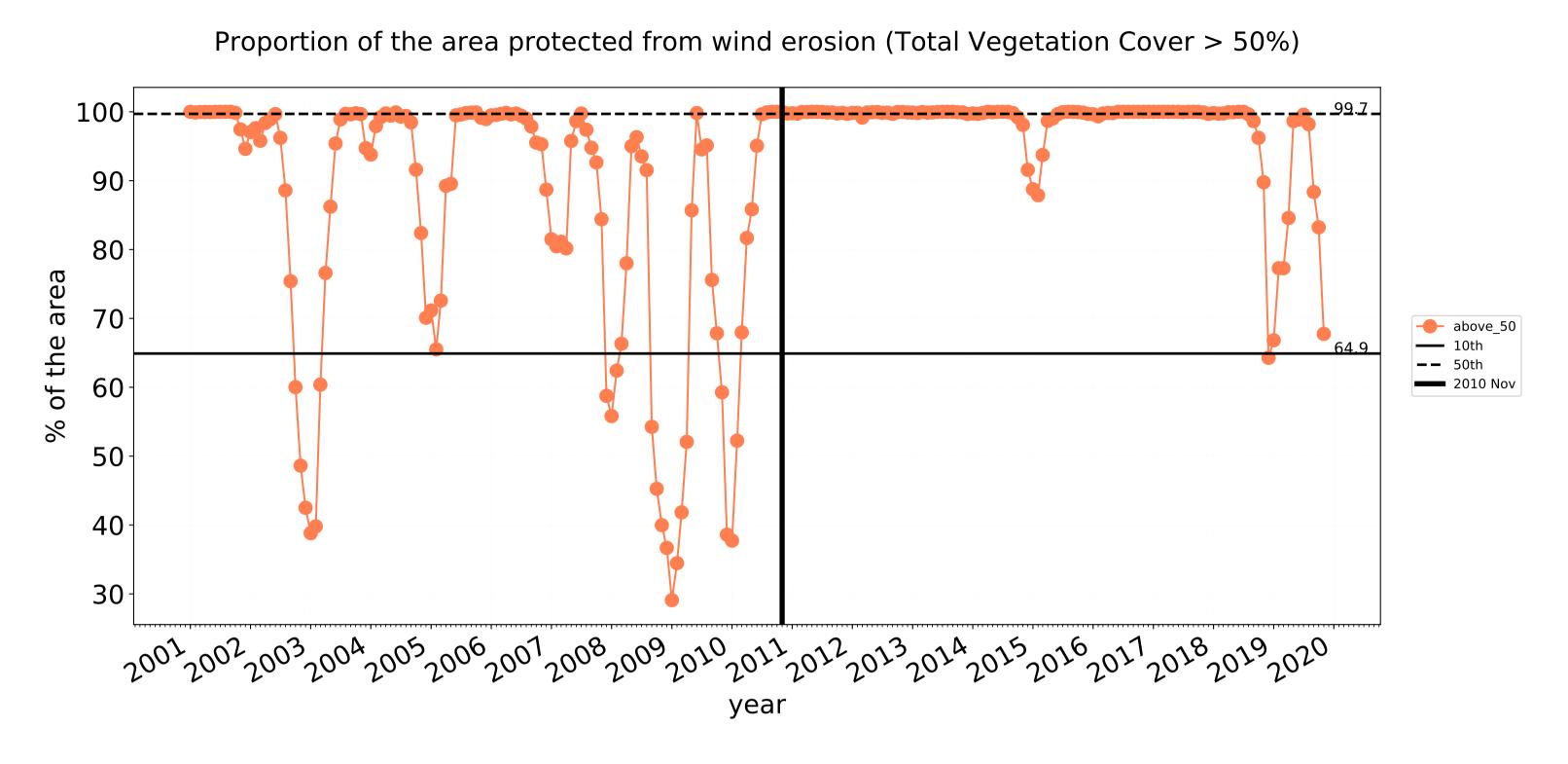


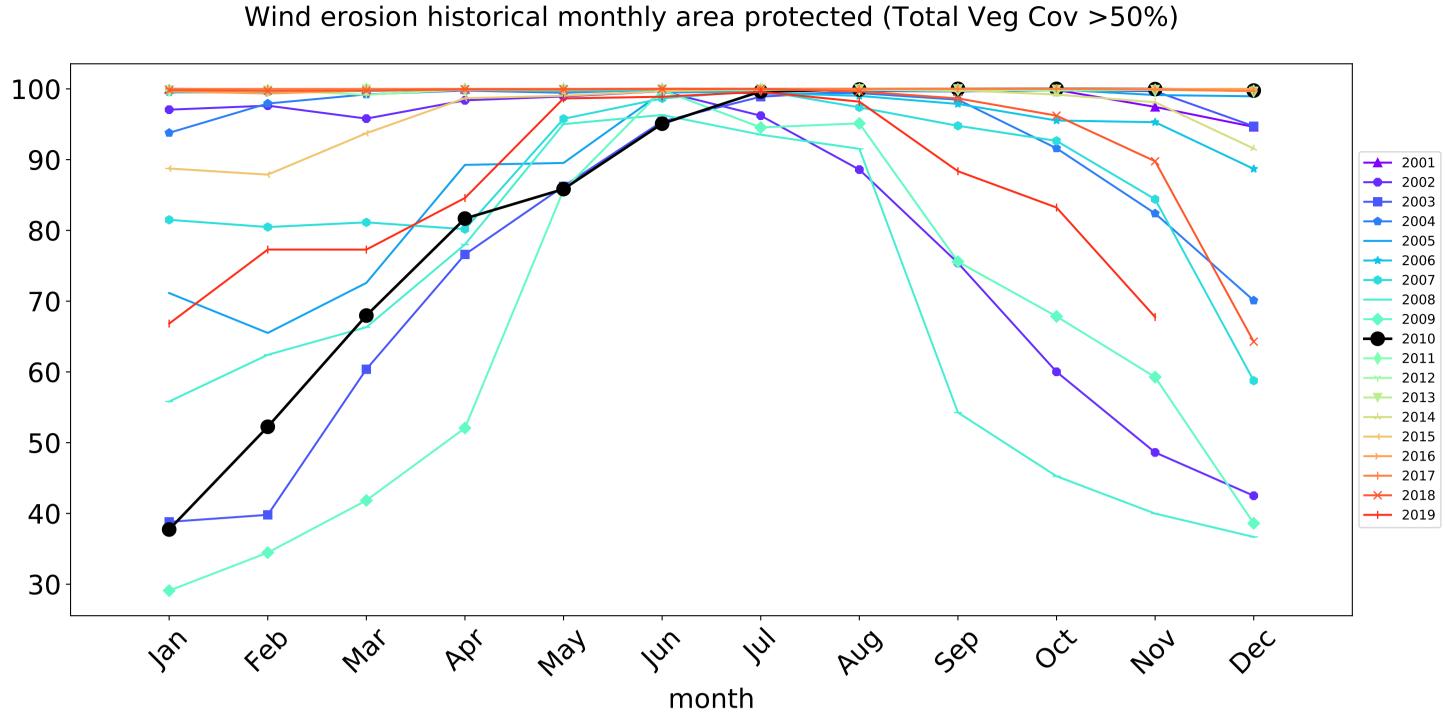


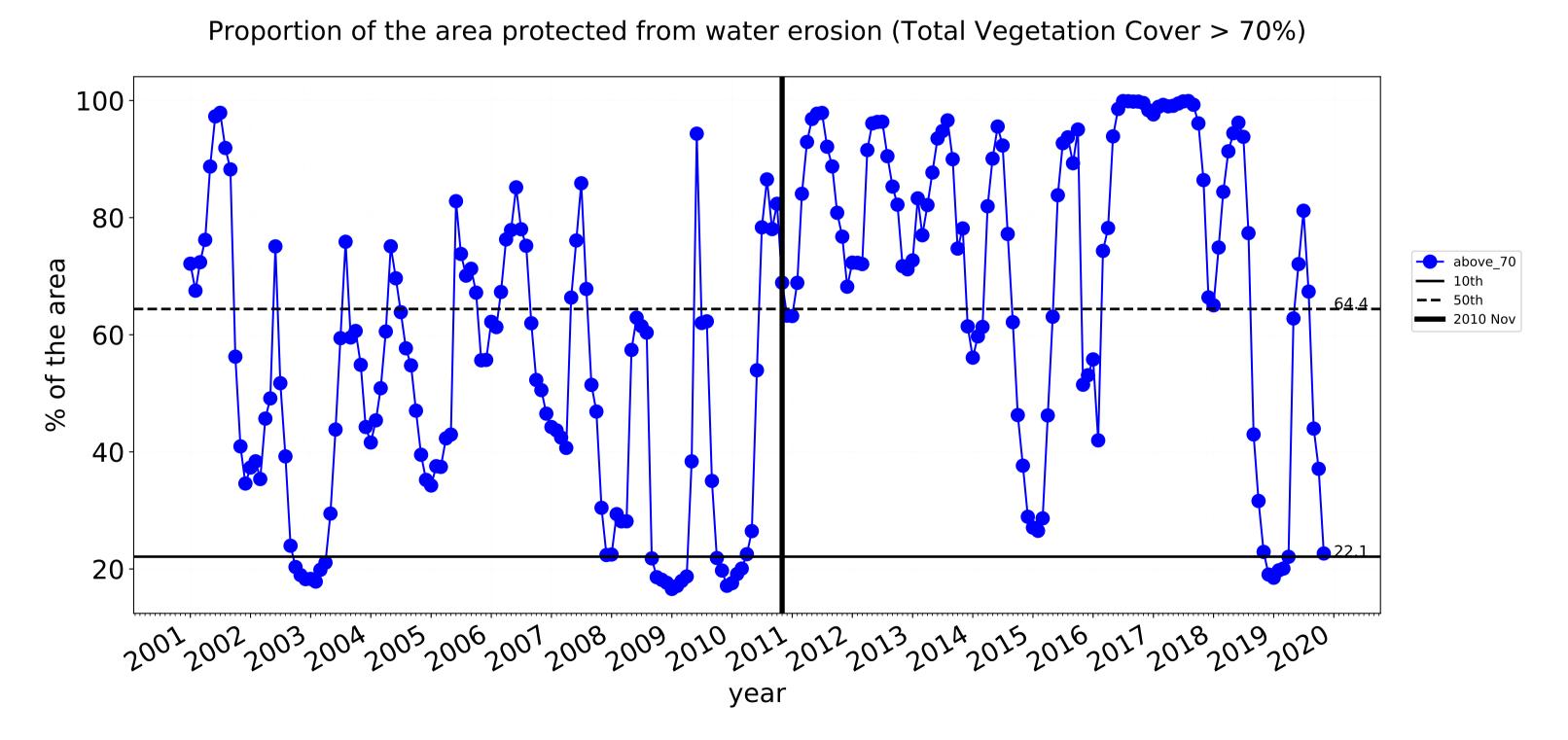


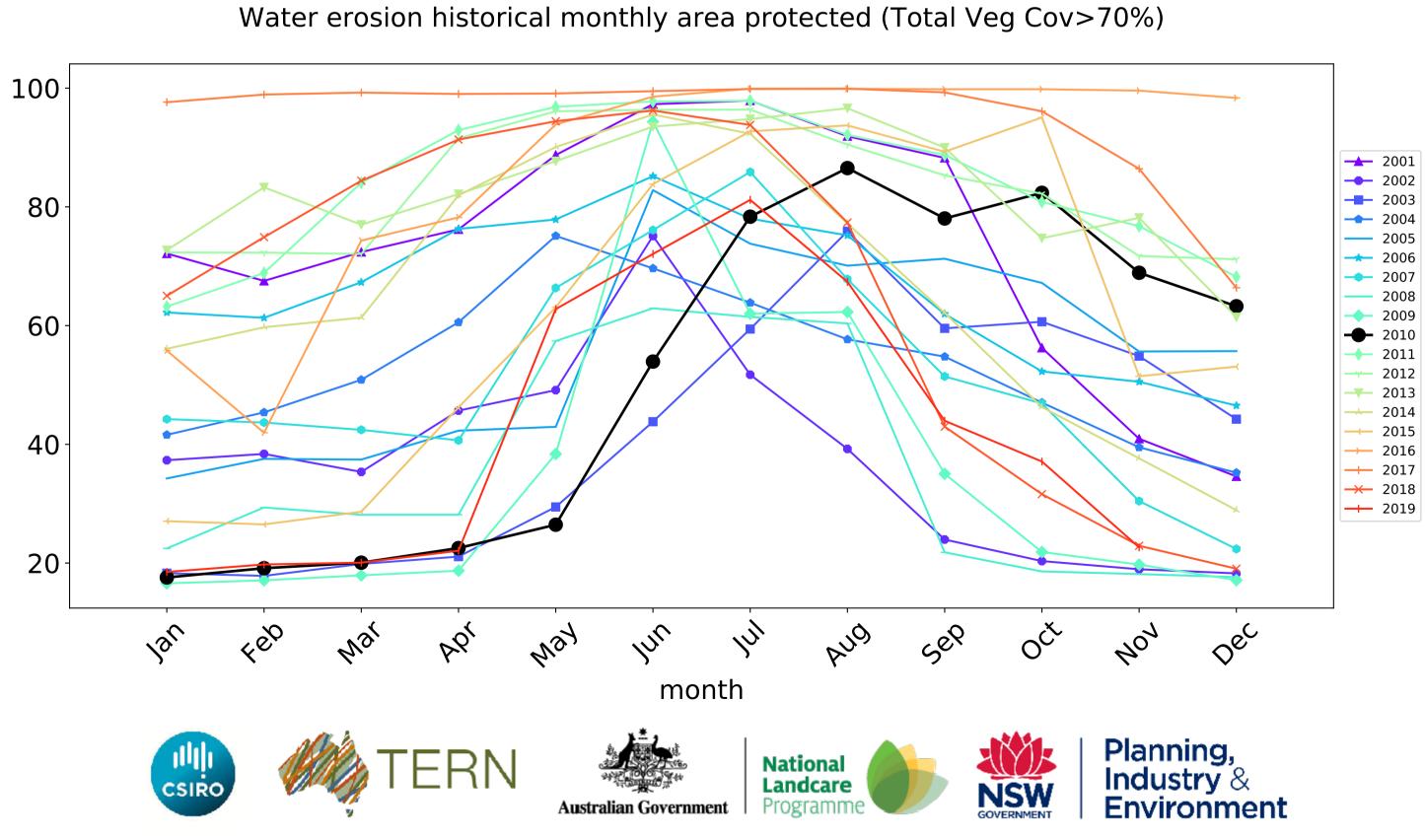


### **Conservation and natural environments non forest timeseries**

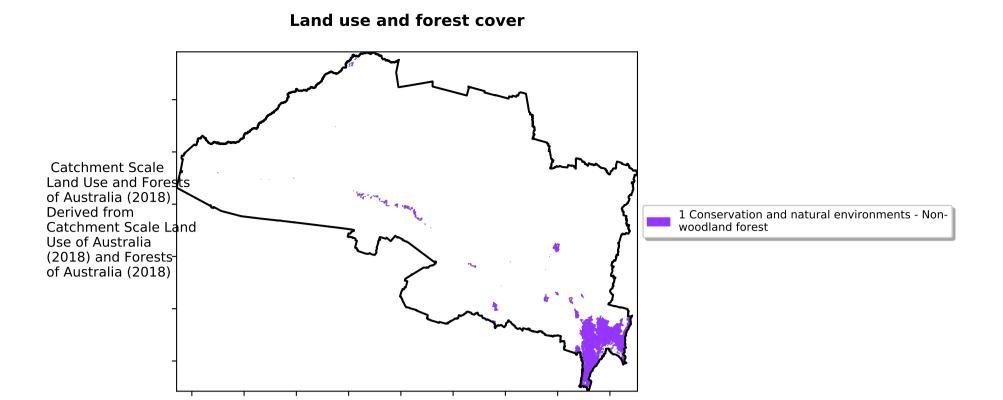




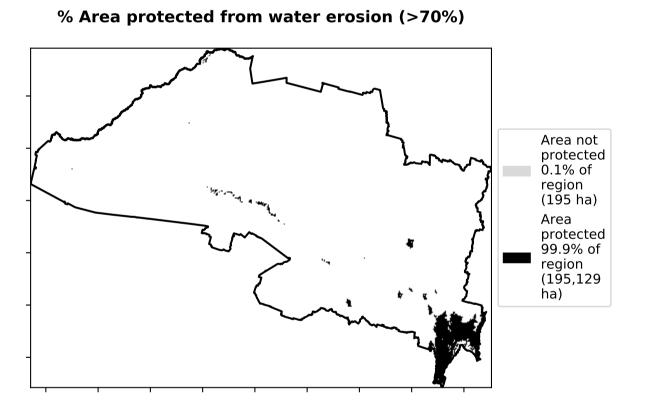


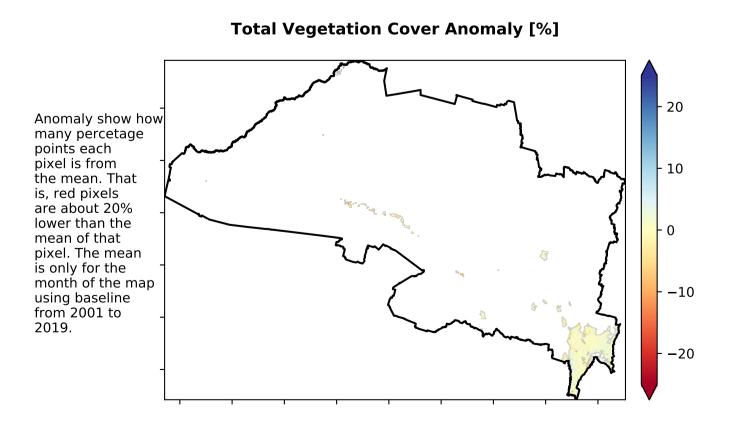


### **Conservation and natural environments Forest (non woodland)**

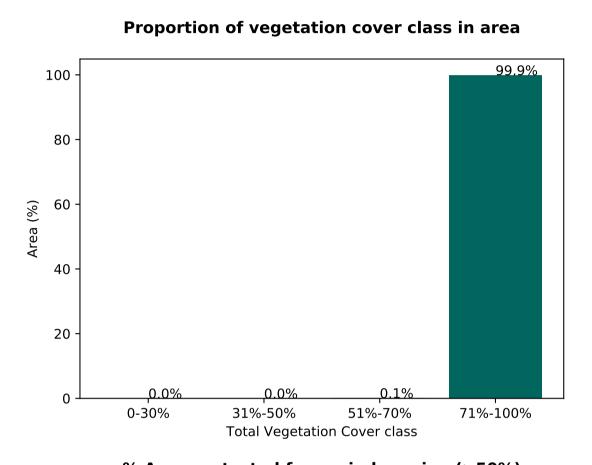


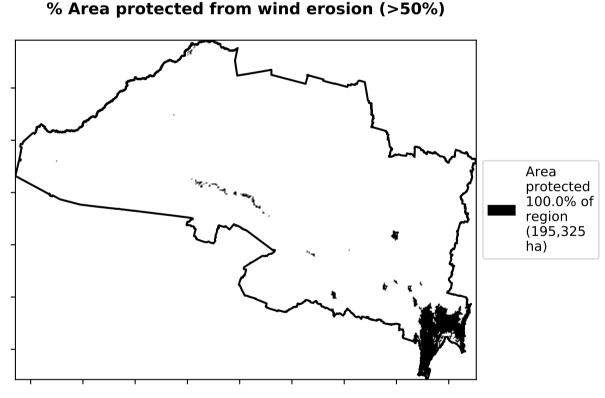
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trolo Indolo Trol

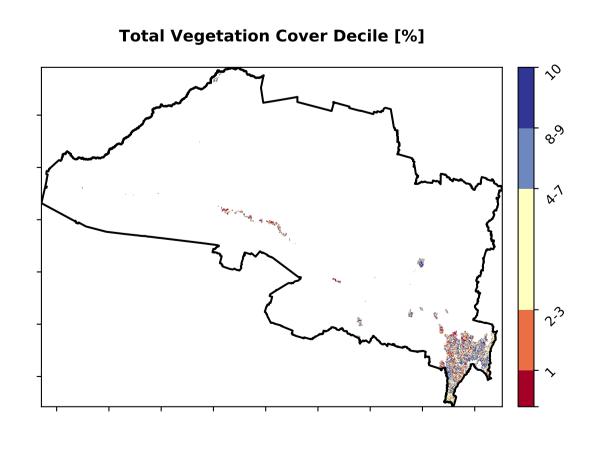




### Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









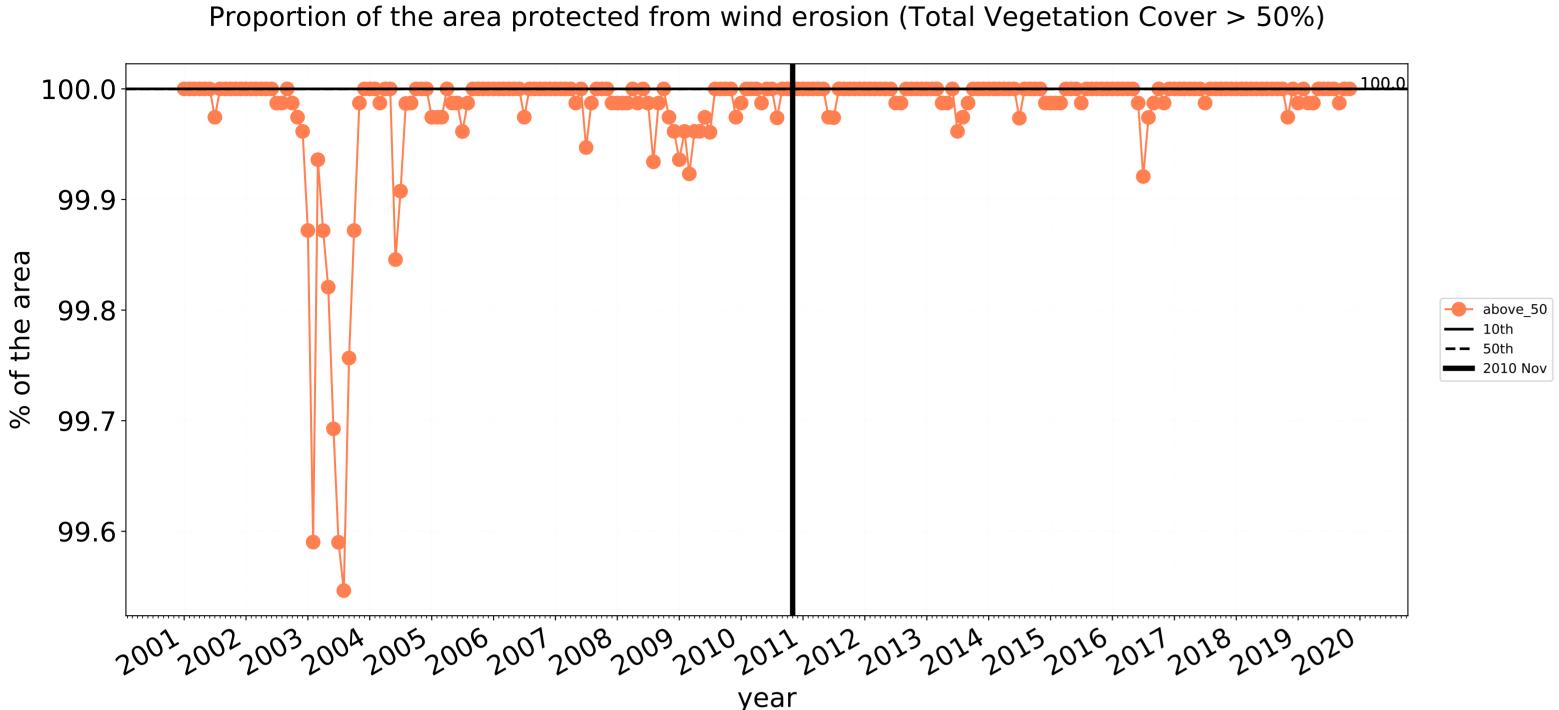


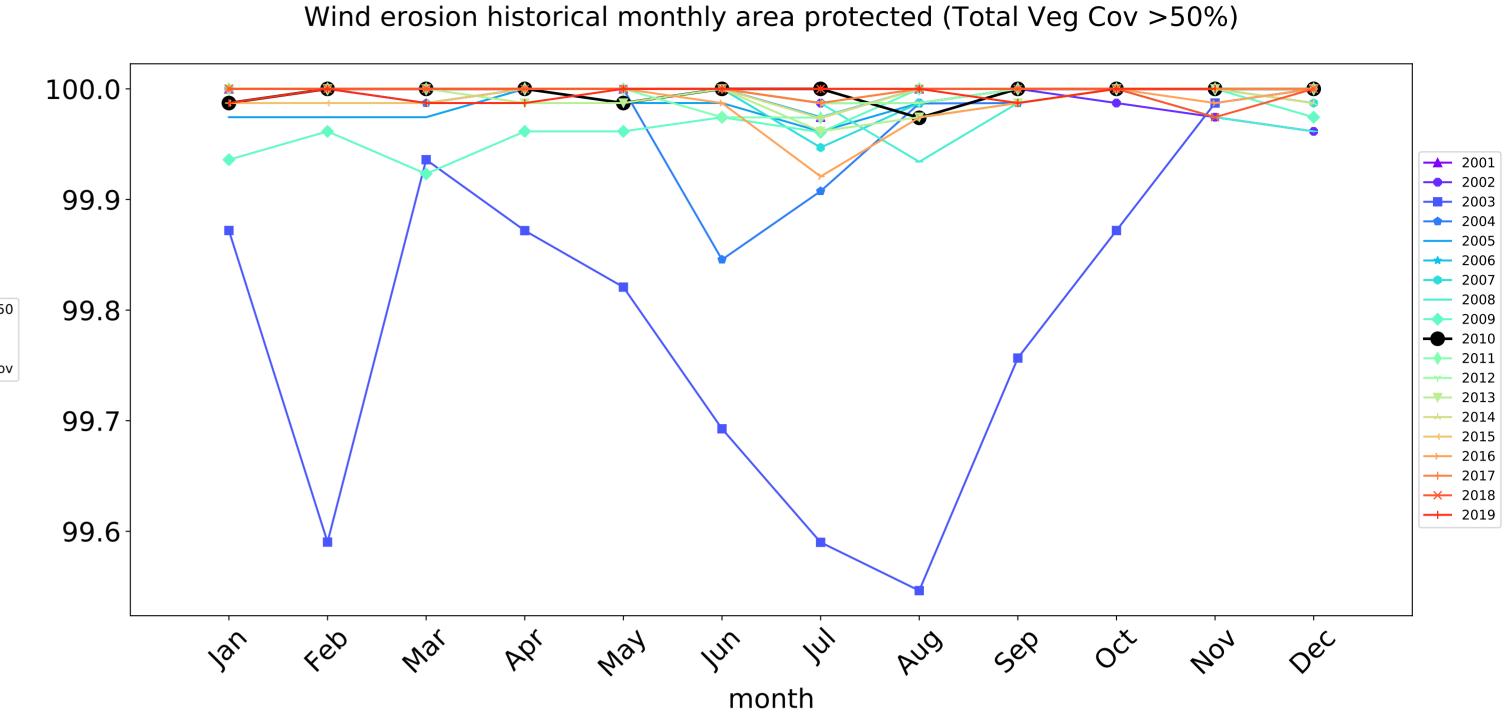


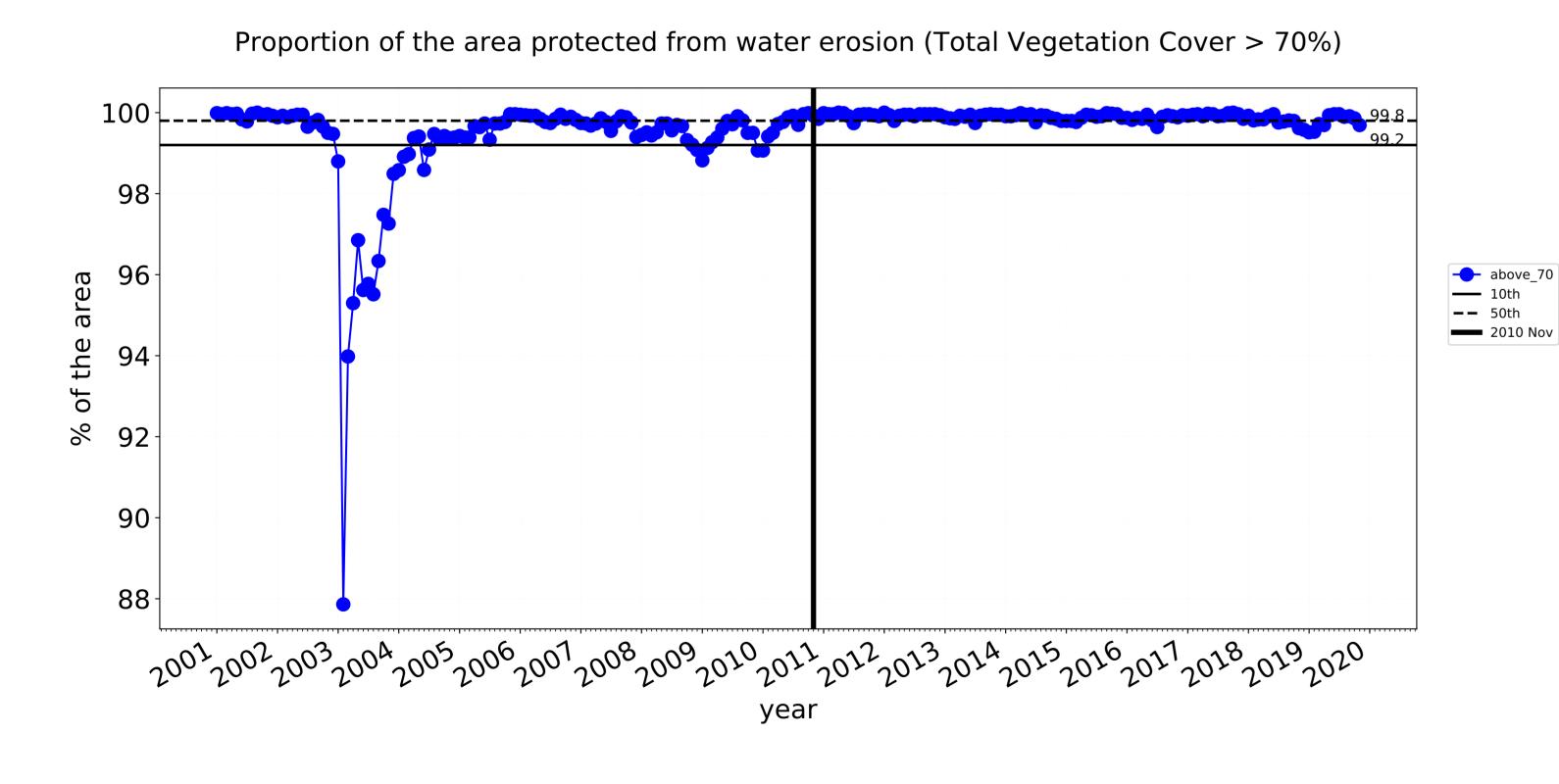


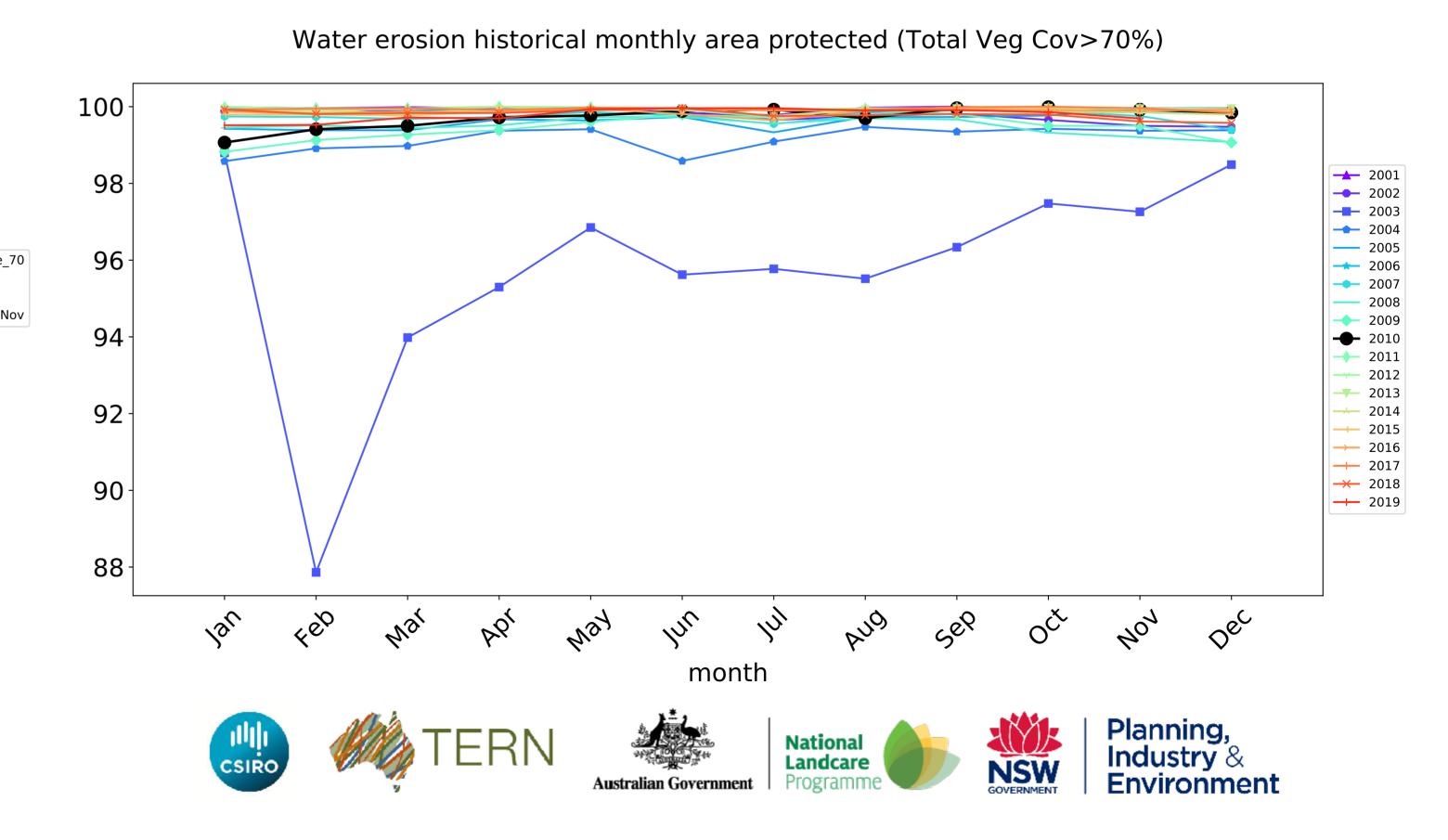












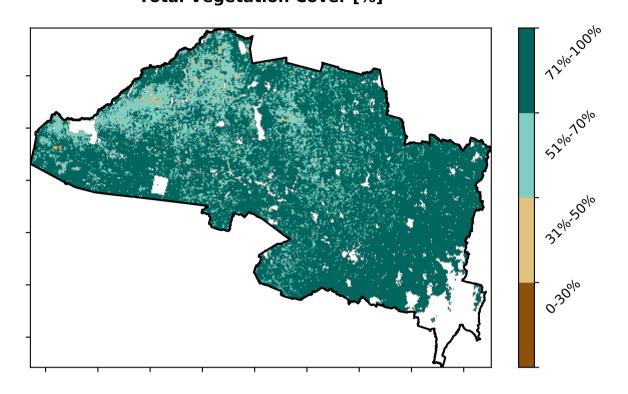
### **Agriculture**

# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 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 - Grazing - Non-irrigated 6 Agriculture - Grazing - Non-irrigated 7 Agriculture - Grazing - Non-irrigated 8 Agriculture - Horticulture - Non-irrigated 8 Agriculture - Horticulture - Horticulture - Irrigated

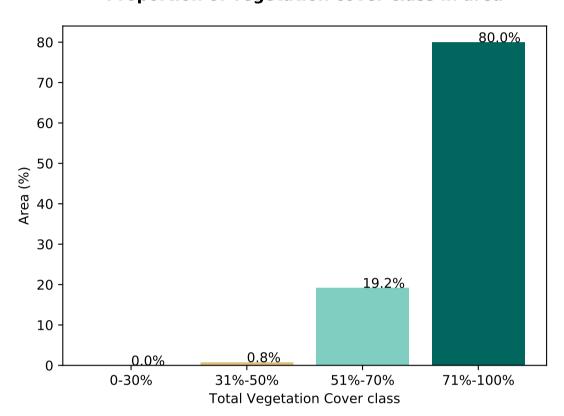
### 52.5% 40 - 34.1% 8 30 - 34.1% 20 - 10 - 2.3% 1.7% 0.6% 7.9% Land use class

**Proportion of each land class in area** 

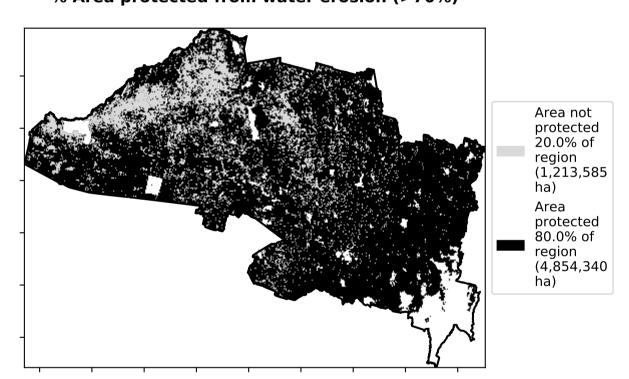
**Total Vegetation Cover [%]** 



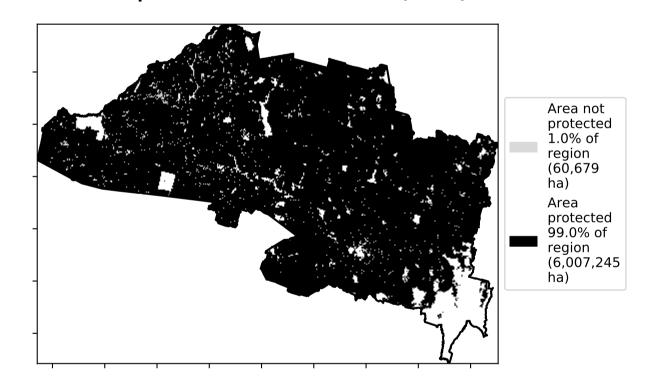
Proportion of vegetation cover class in area



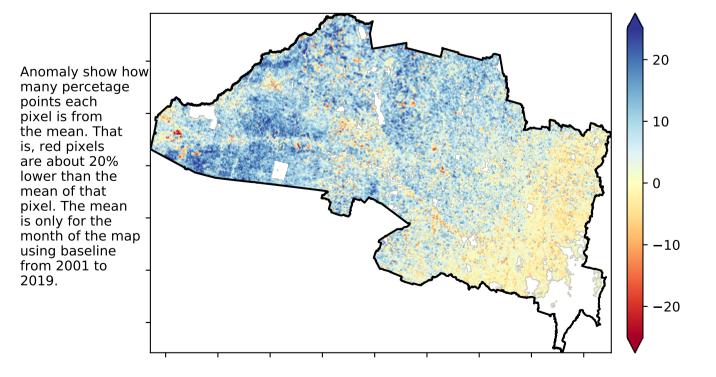
% Area protected from water erosion (>70%)



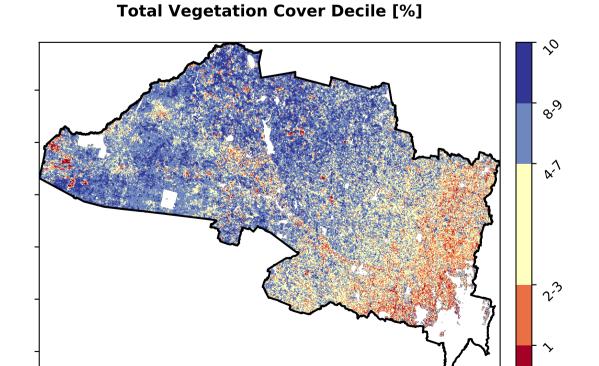
% Area protected from wind erosion (>50%)



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.







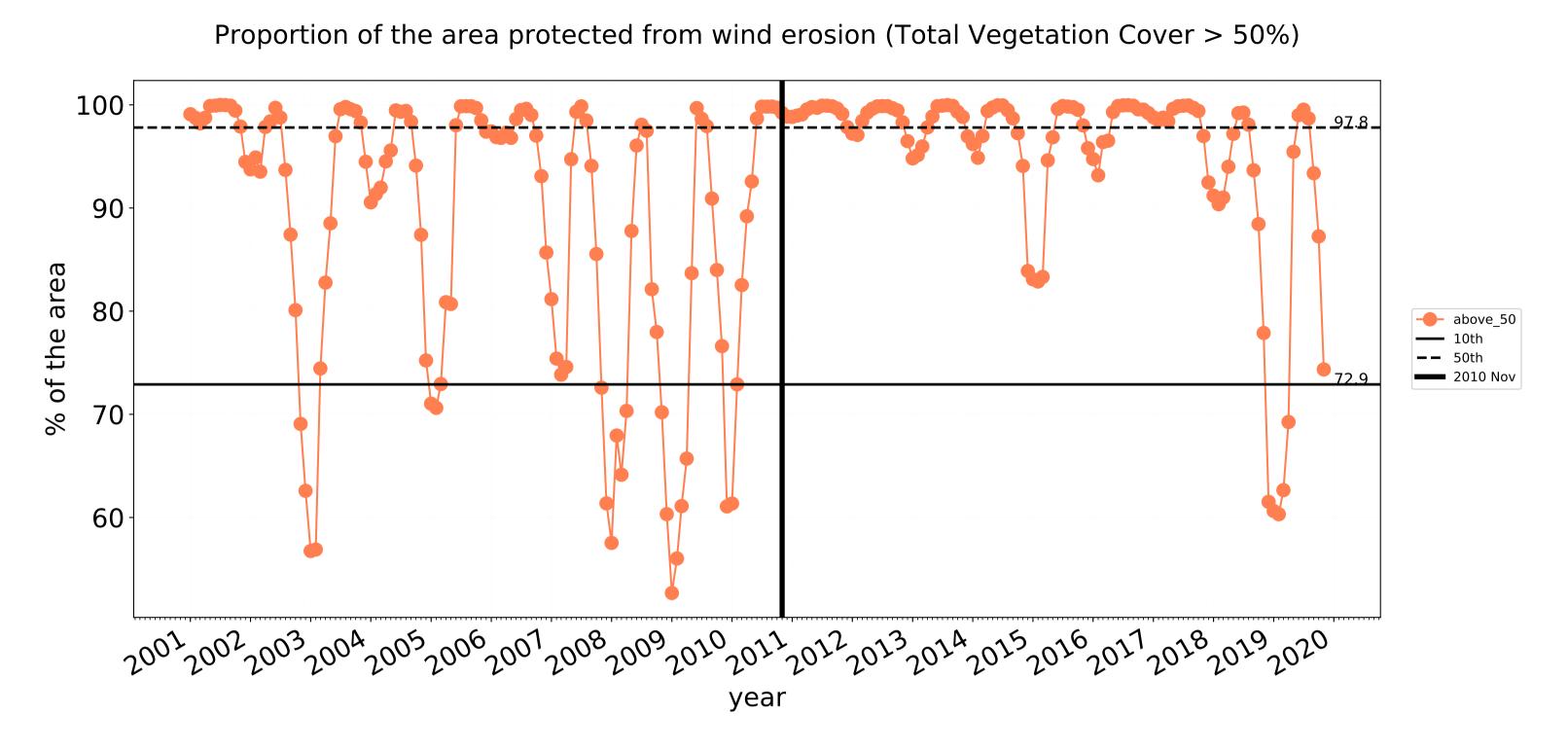






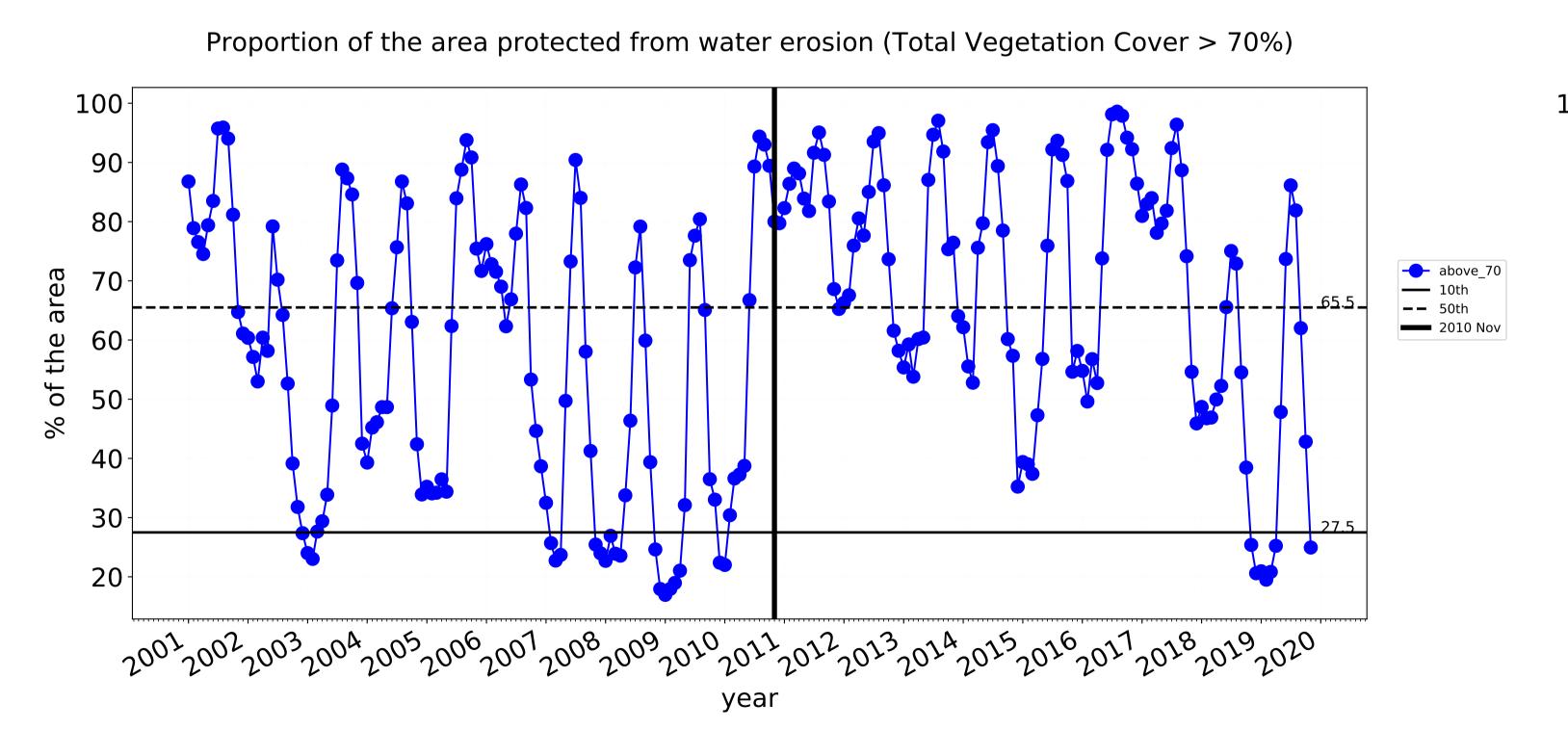


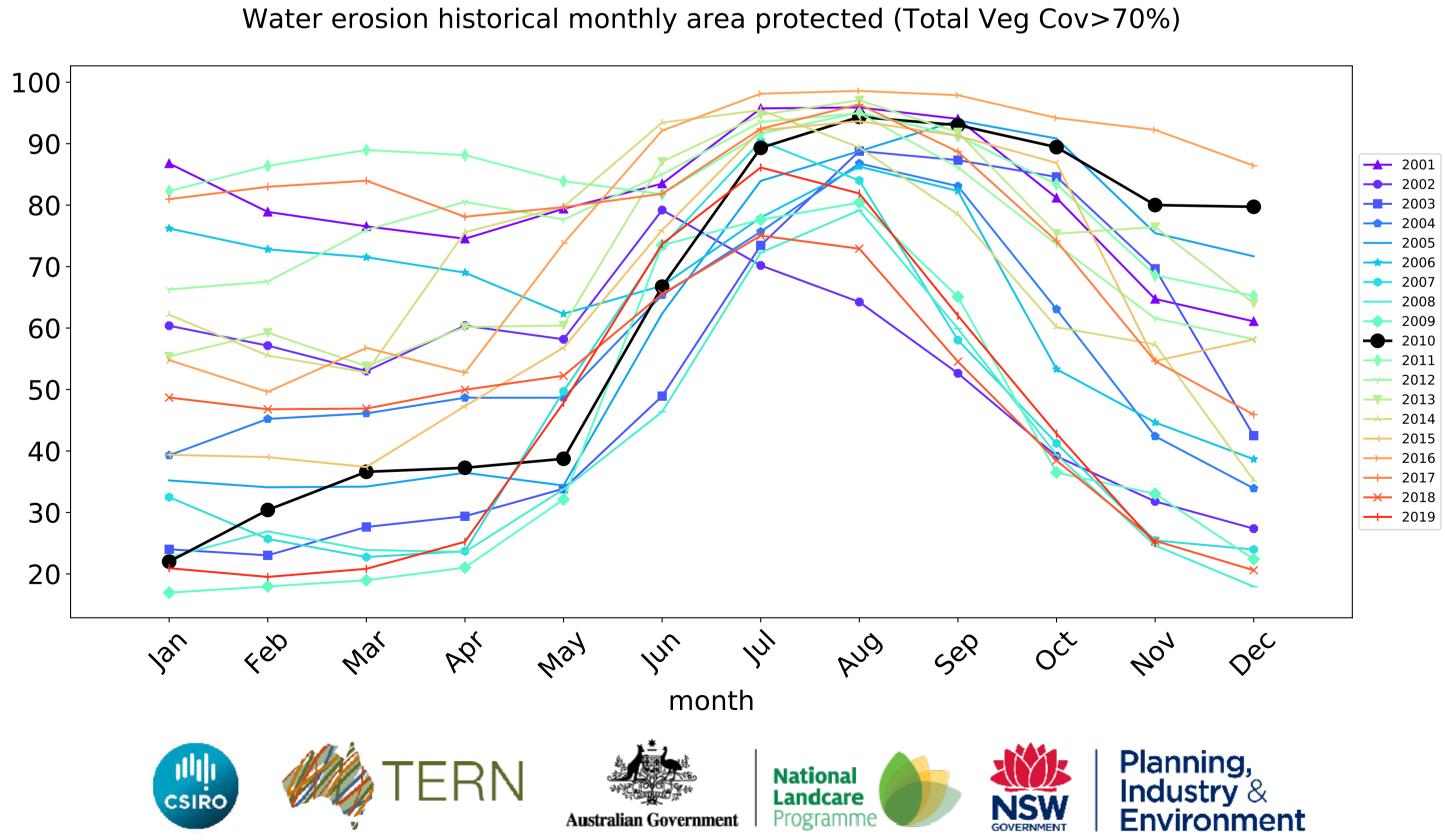
### **Agriculture timeseries**



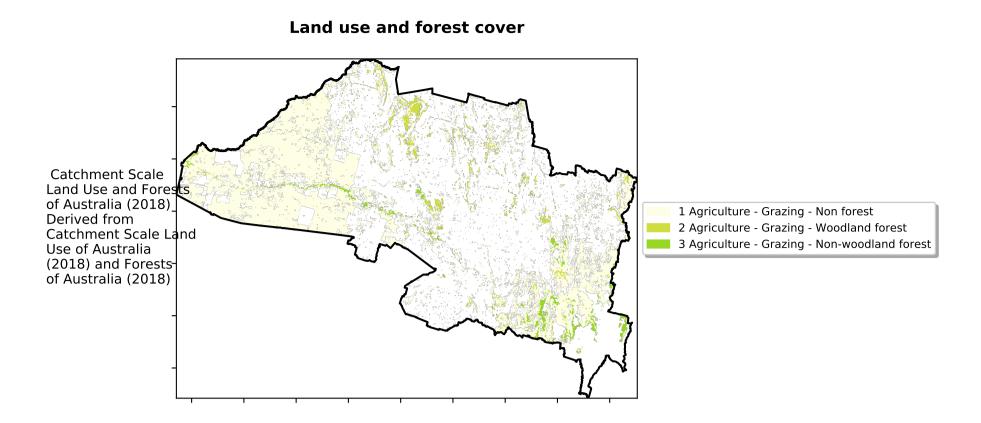
### Wind erosion historical monthly area protected (Total Veg Cov >50%) 100-90 2003 80 2009 2010 2012 2013 70-<del>←</del> 2015 **→** 2016 <del>×</del> 2018 60 <del>----</del> 2019

month

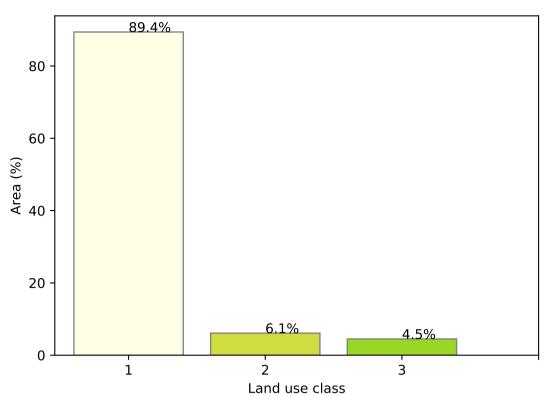




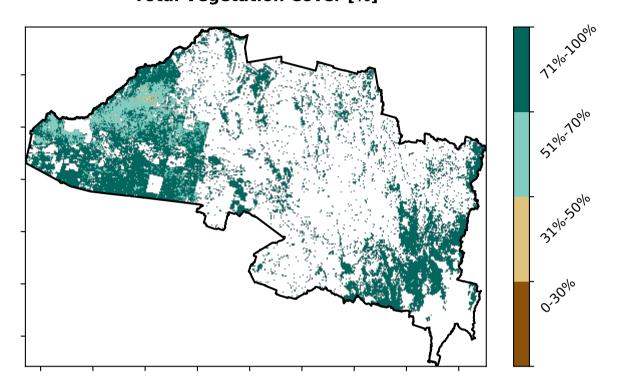
### **Grazing**



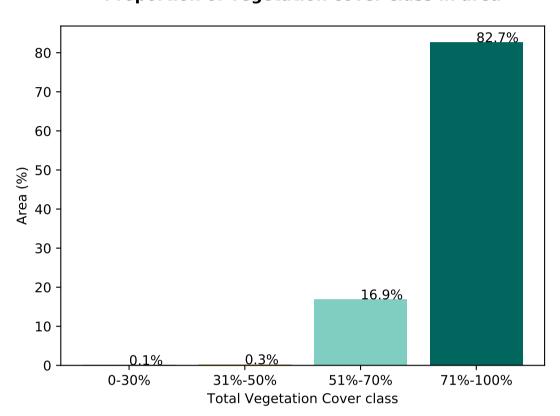
### Proportion of each land class in area



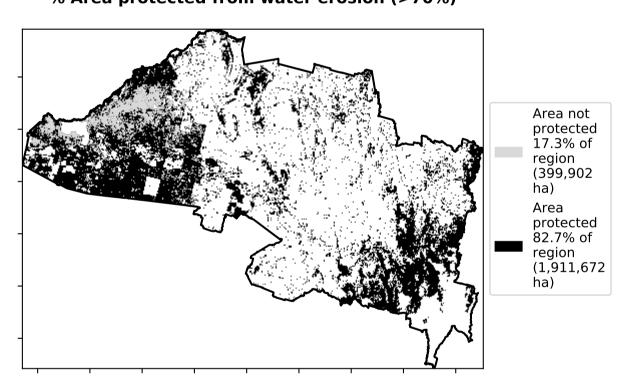
**Total Vegetation Cover [%]** 



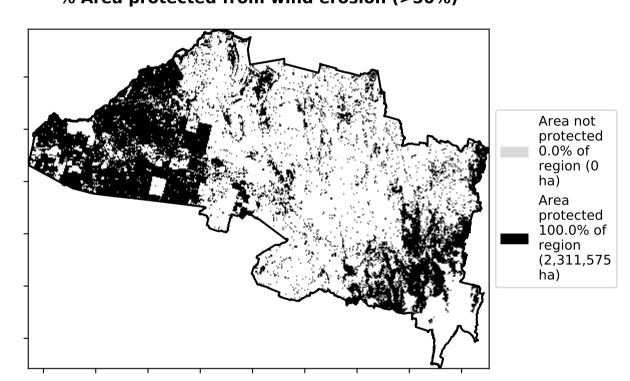
Proportion of vegetation cover class in area



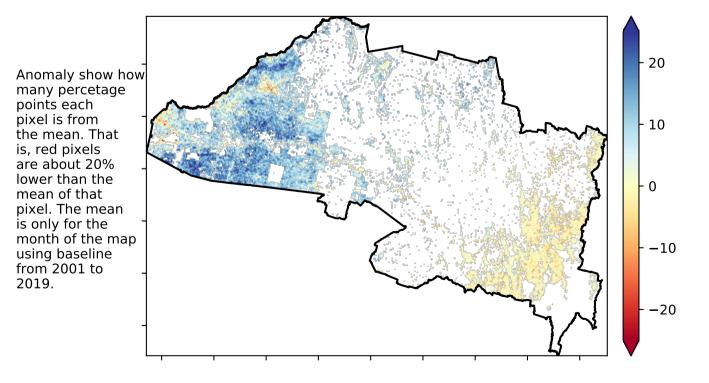
% Area protected from water erosion (>70%)



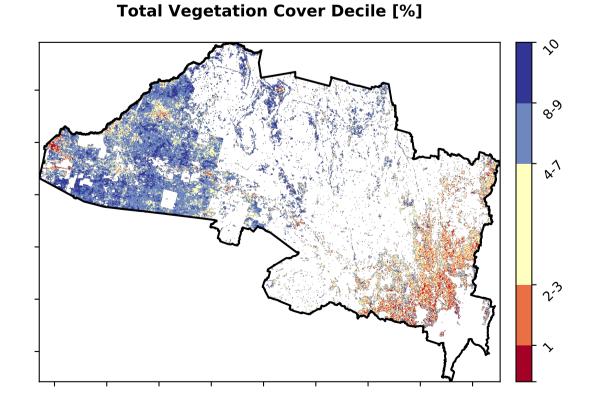
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



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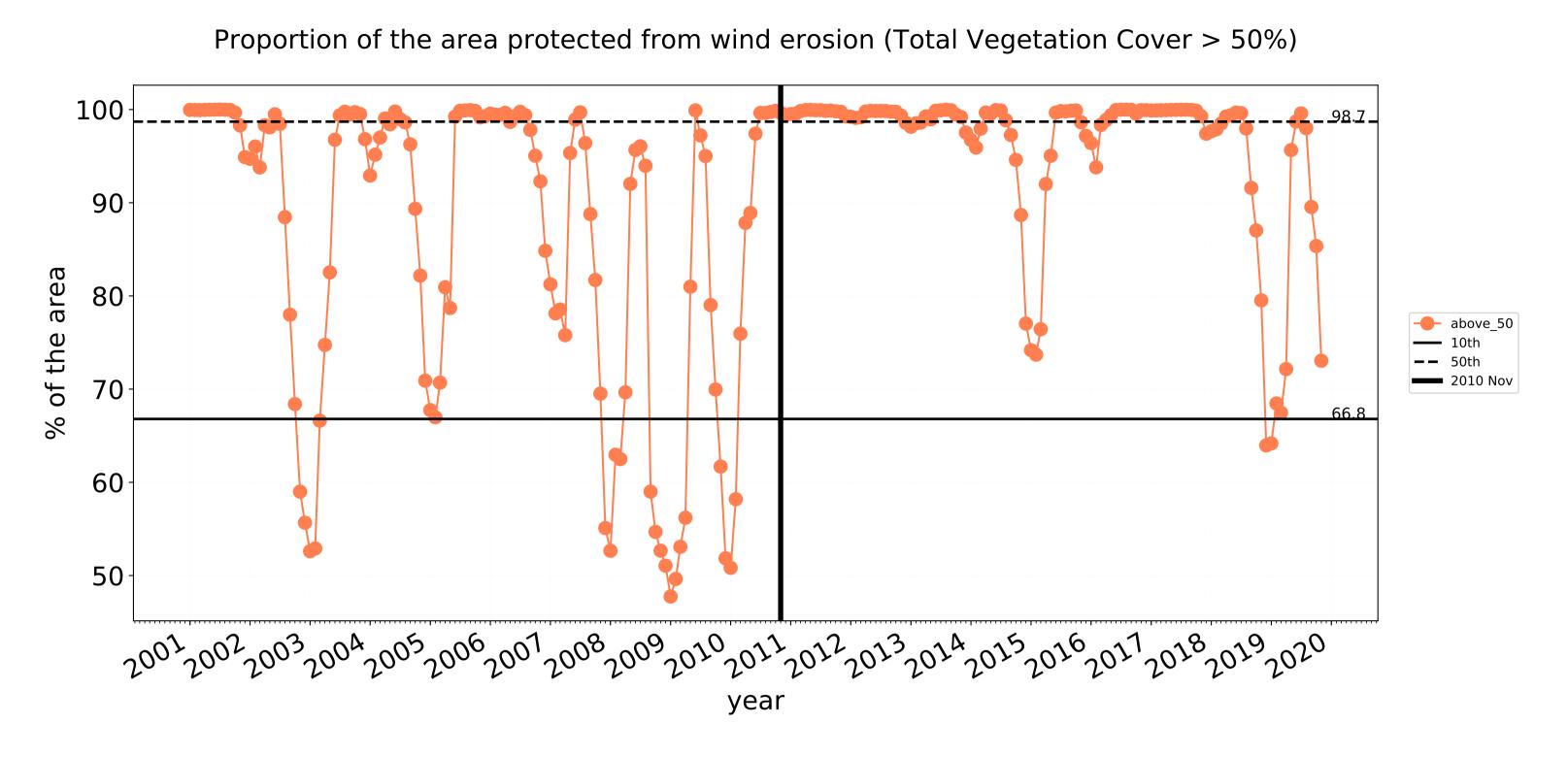


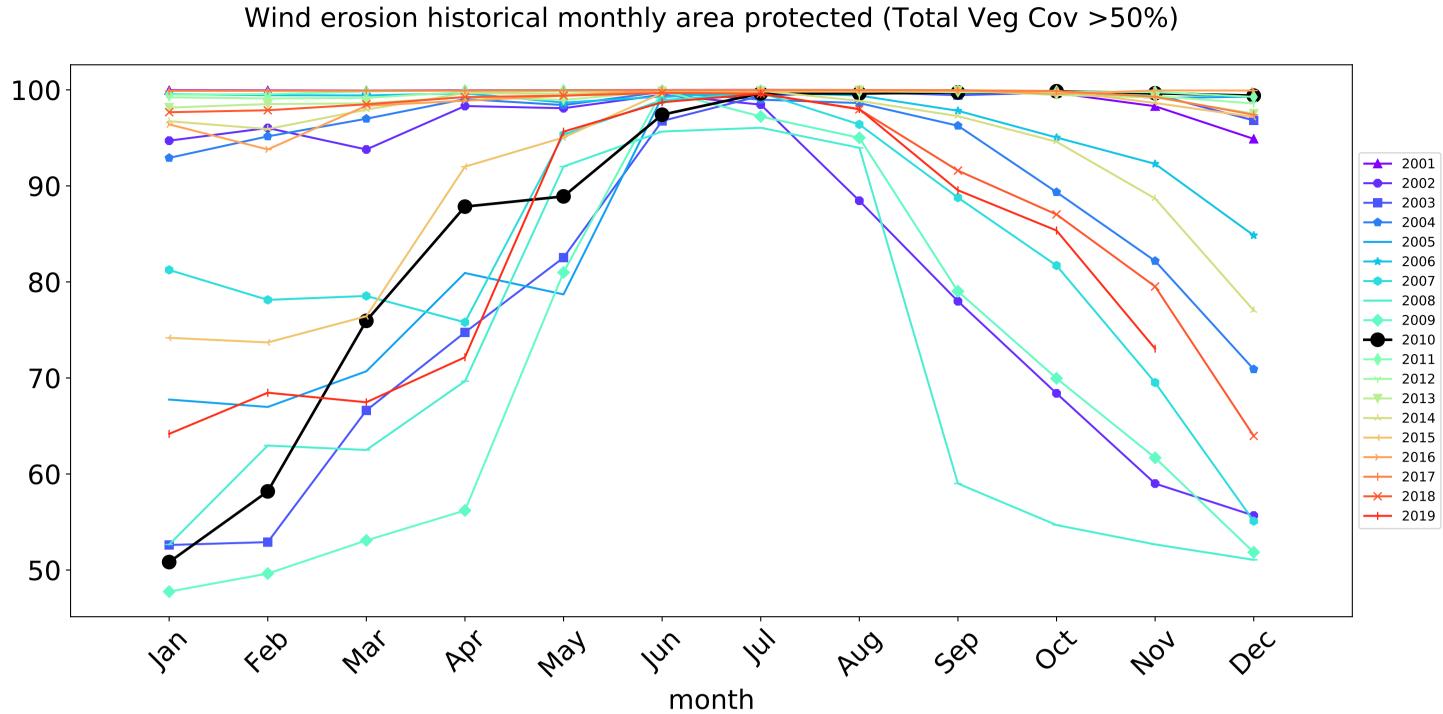


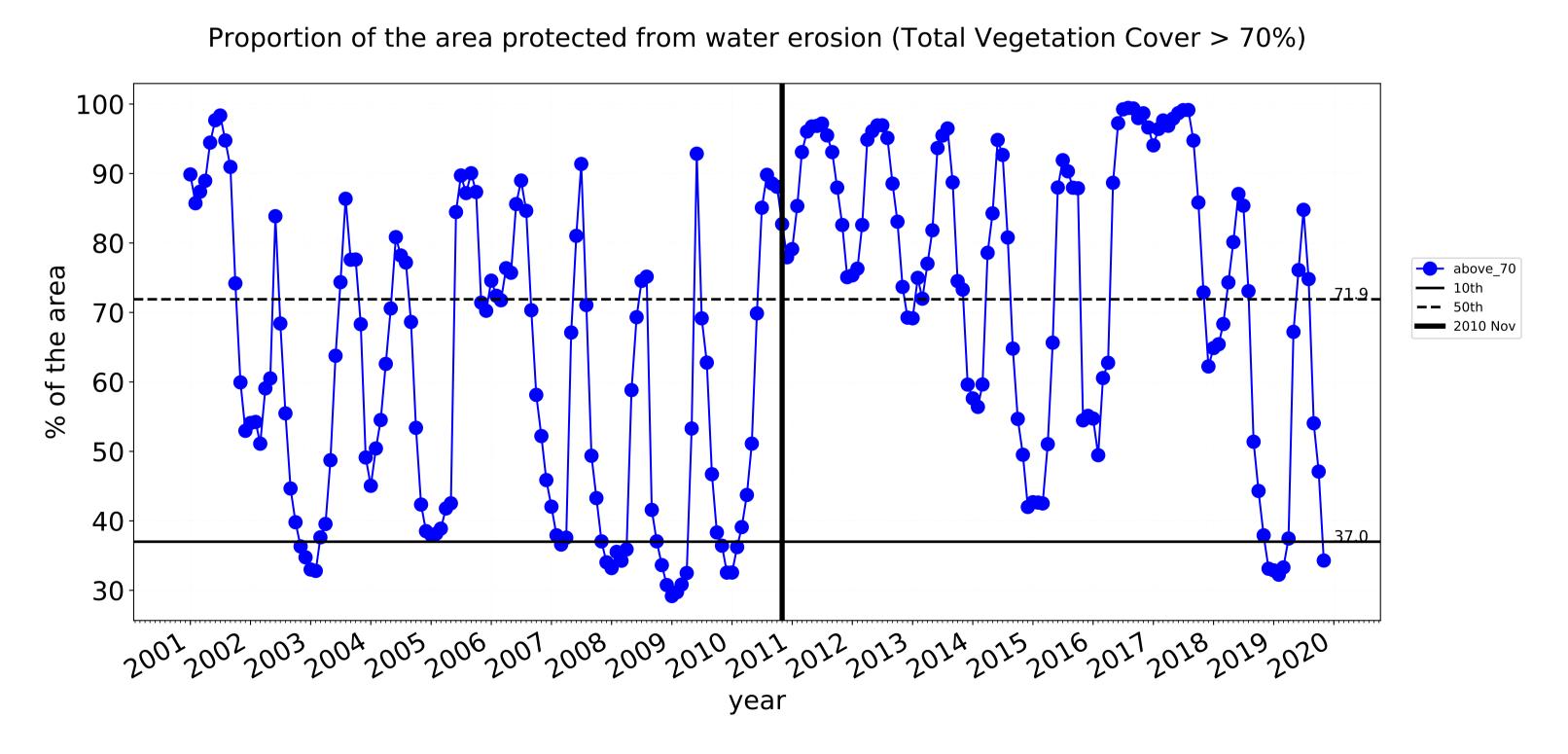


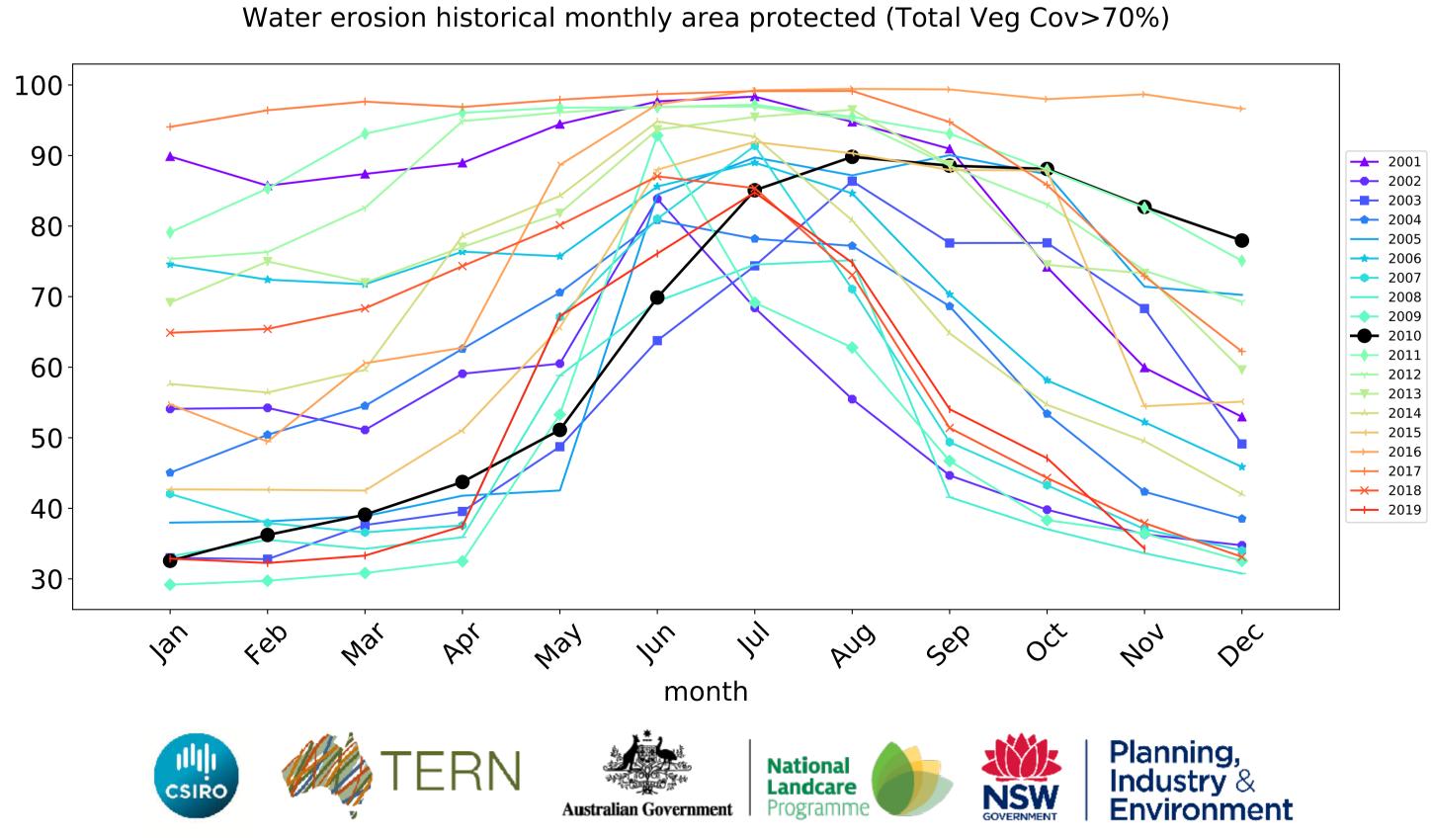


### **Grazing timeseries**



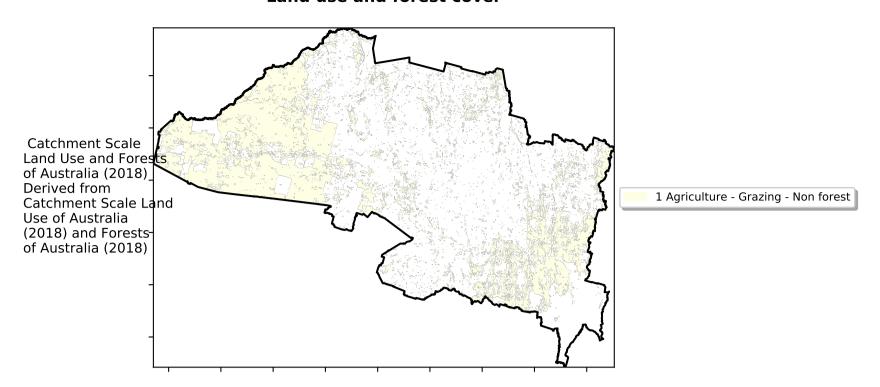




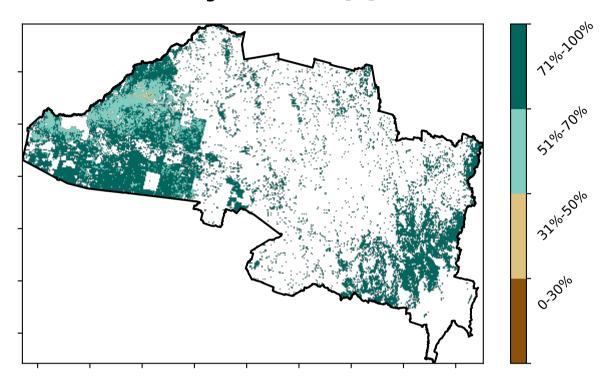


### **Grazing non forest**

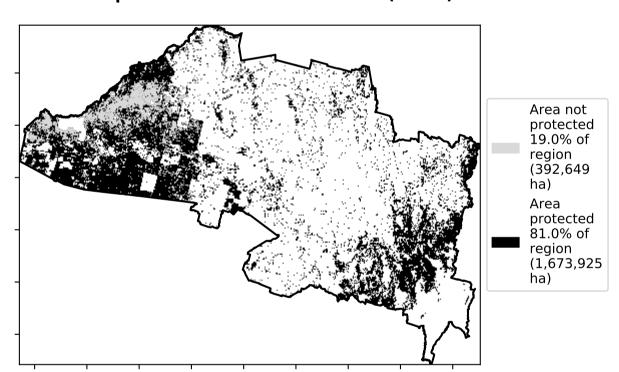
### Land use and forest cover



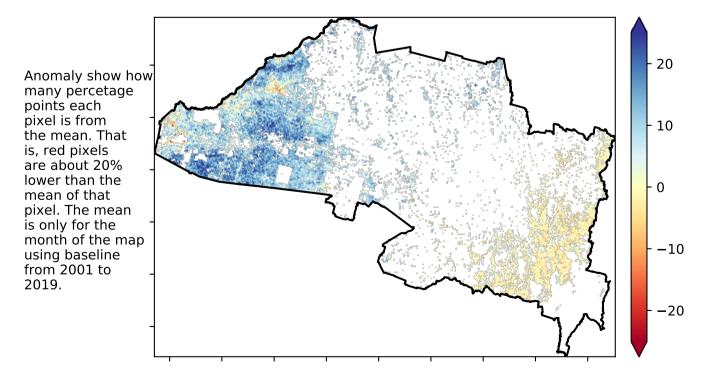
### **Total Vegetation Cover [%]**



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

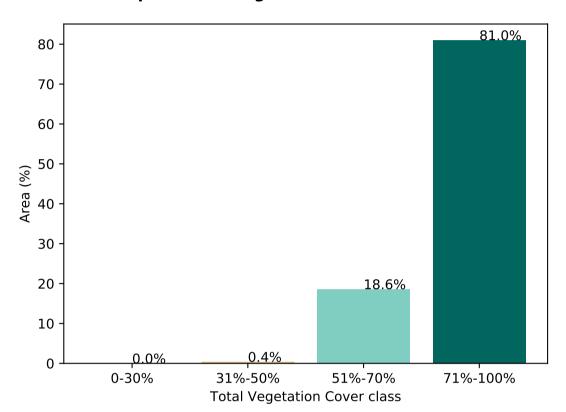


### Total Vegetation Cover Anomaly [%]

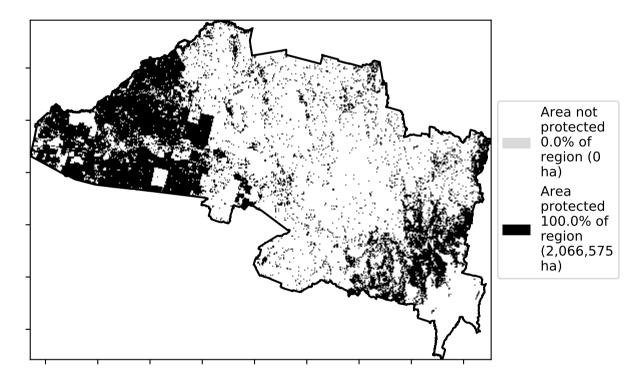


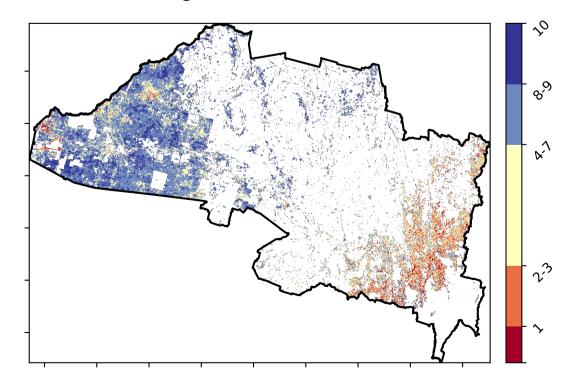
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### Proportion of vegetation cover class in area



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









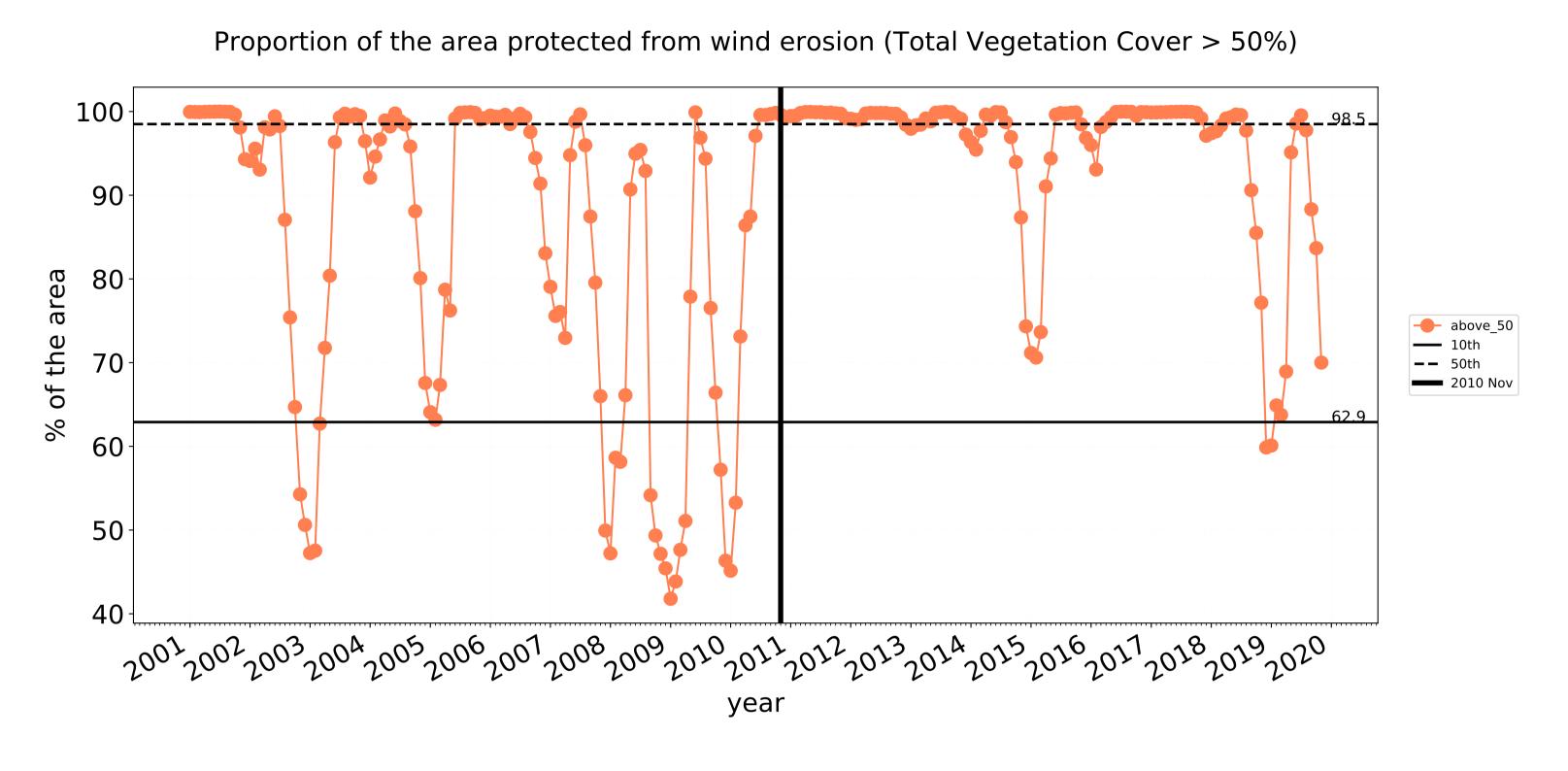


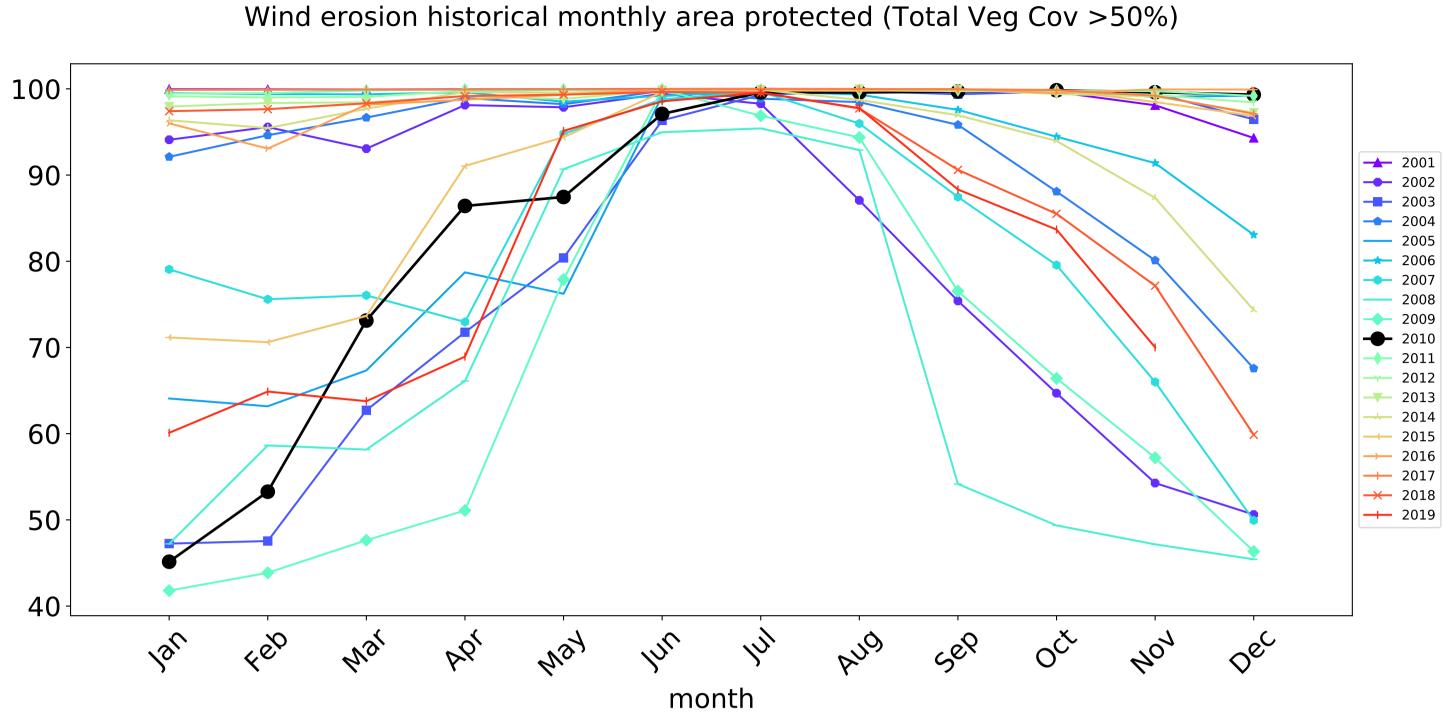


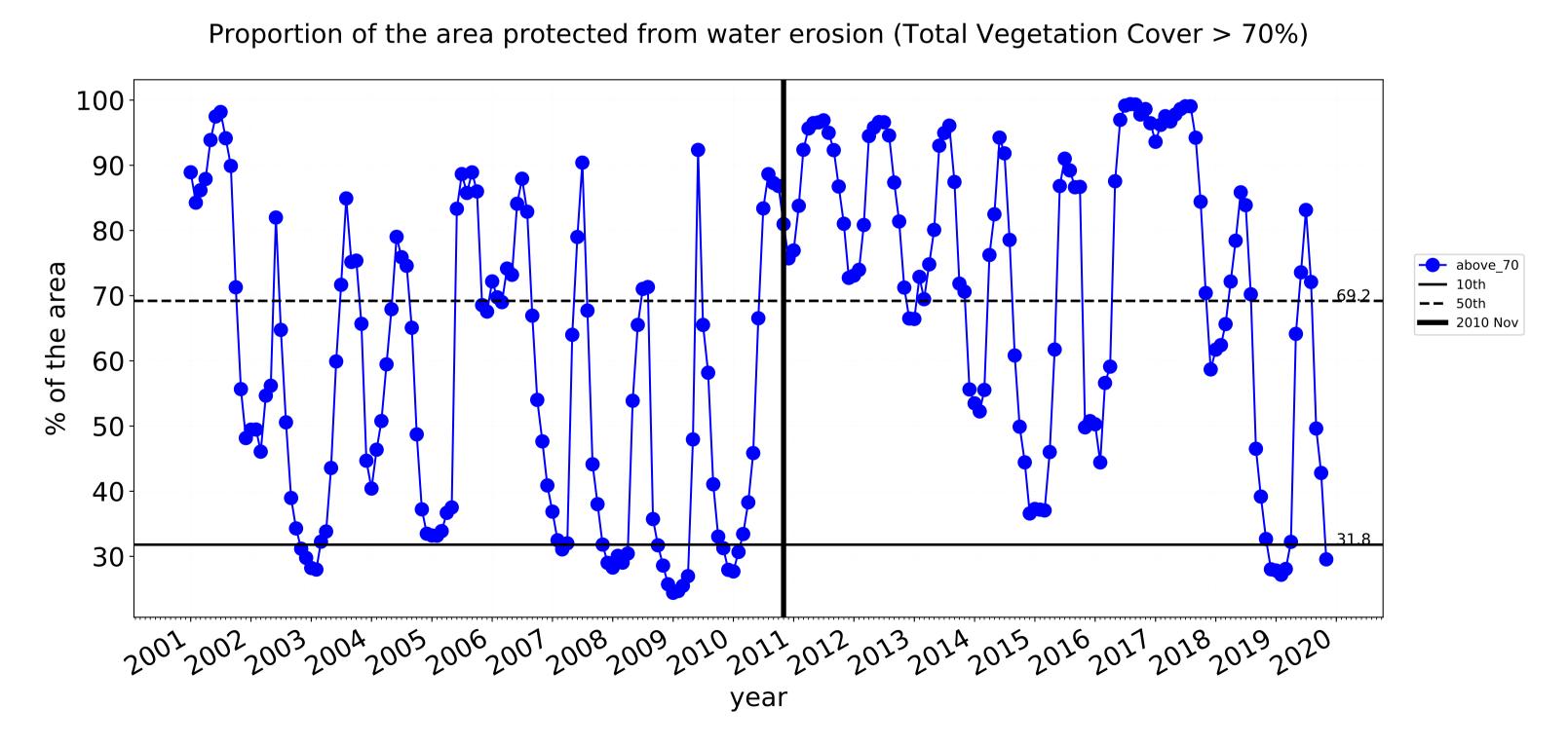


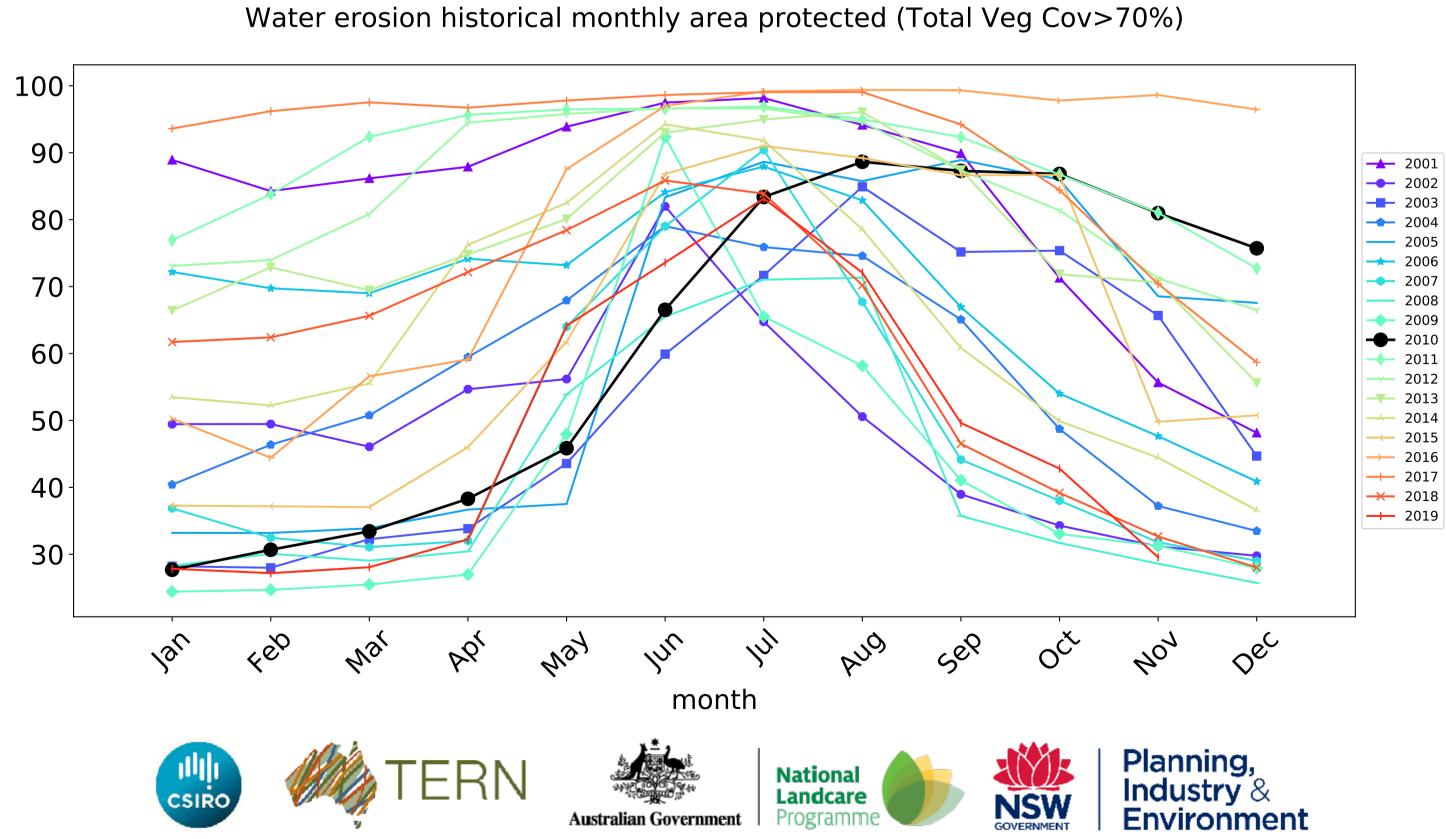


### **Grazing non forest timeseries**



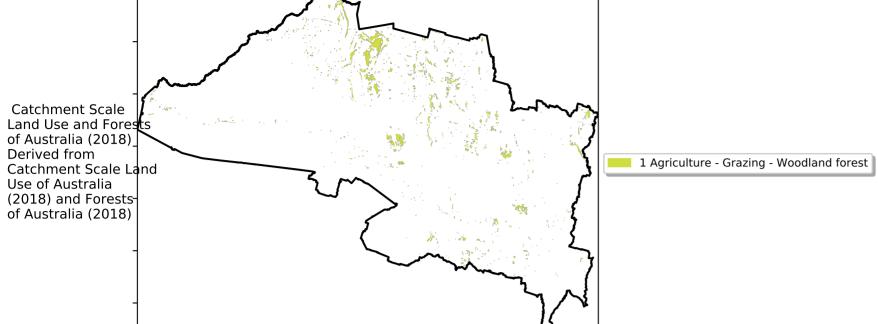




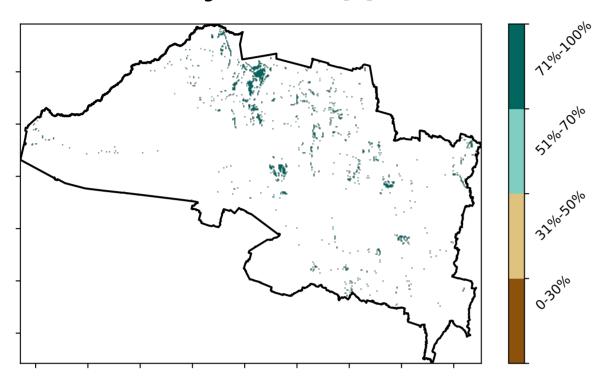


### **Grazing Woodland forest**

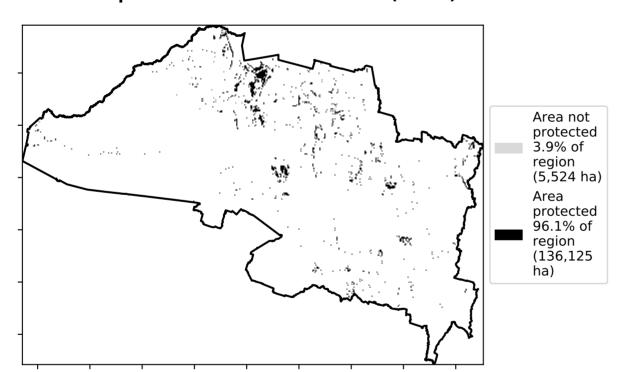
Land use and forest cover



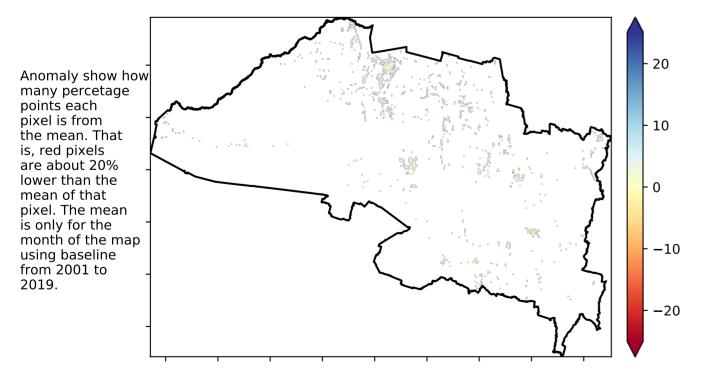
### **Total Vegetation Cover [%]**



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

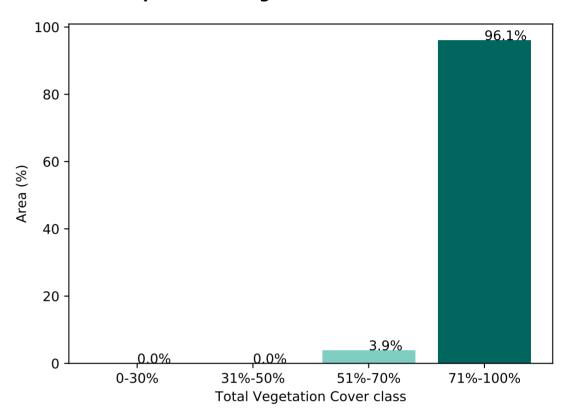


### **Total Vegetation Cover Anomaly [%]**

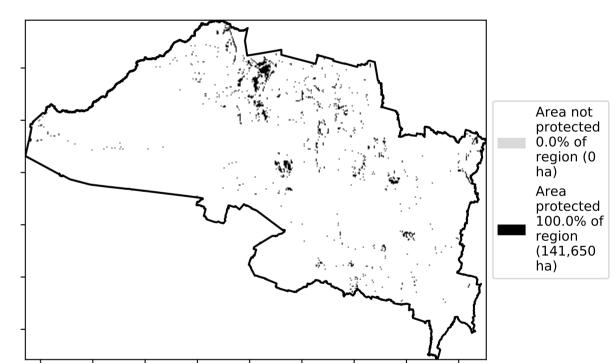


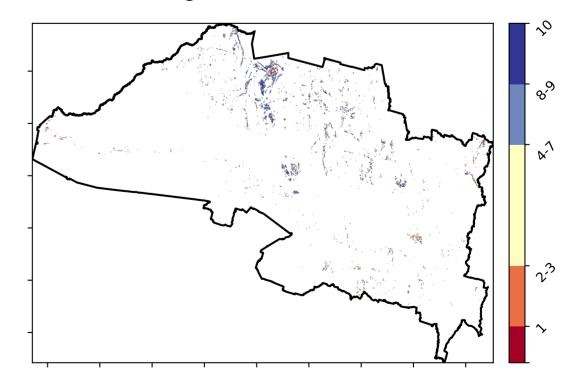
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### **Proportion of vegetation cover class in area**



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









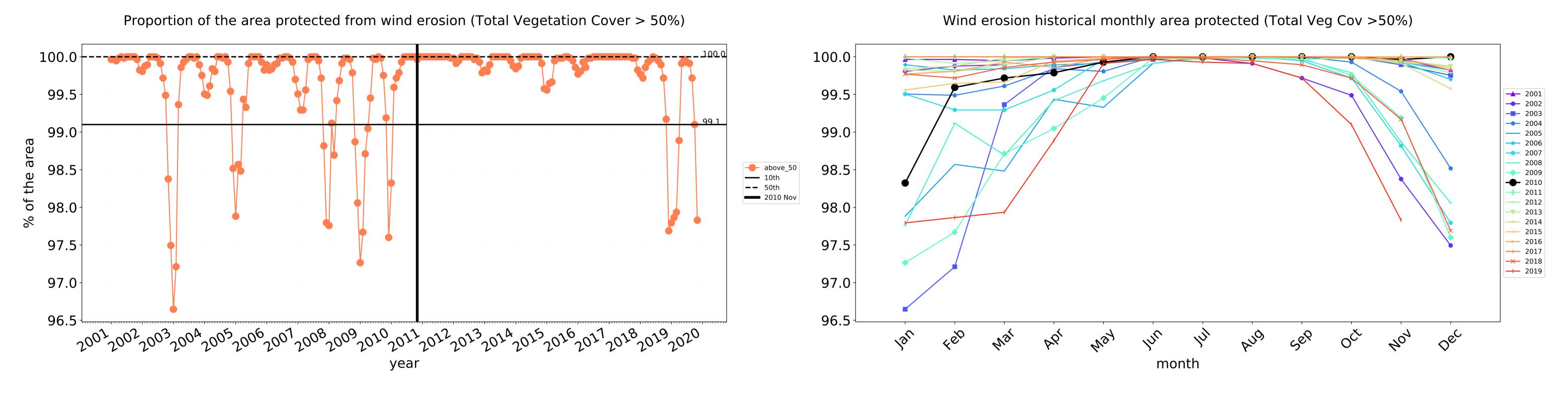


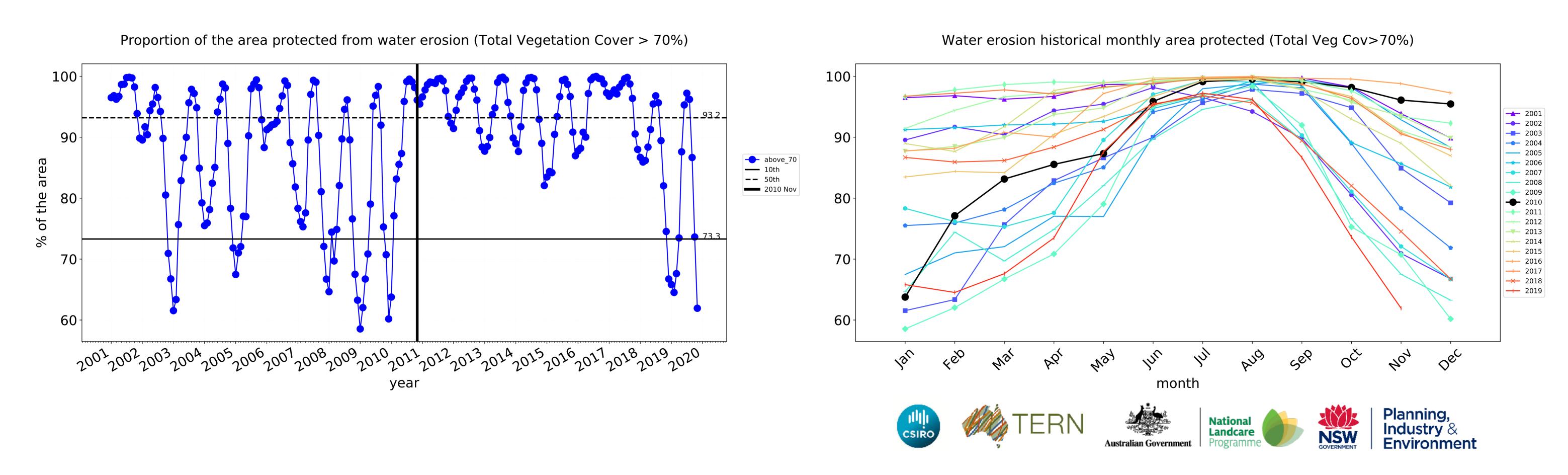






### **Grazing Woodland forest timeseries**



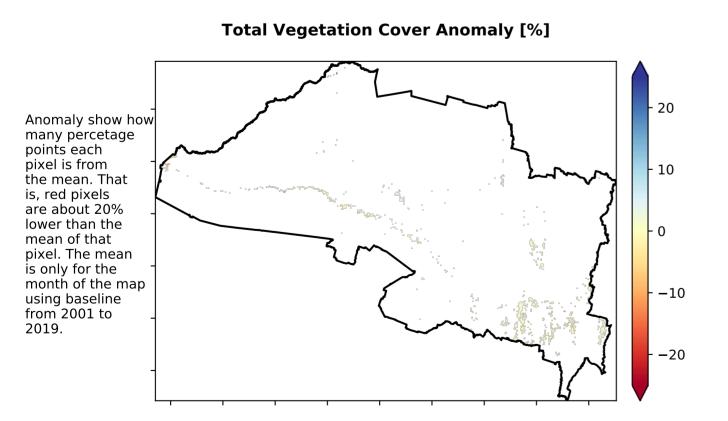


### **Grazing - Forest (non woodland)**

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

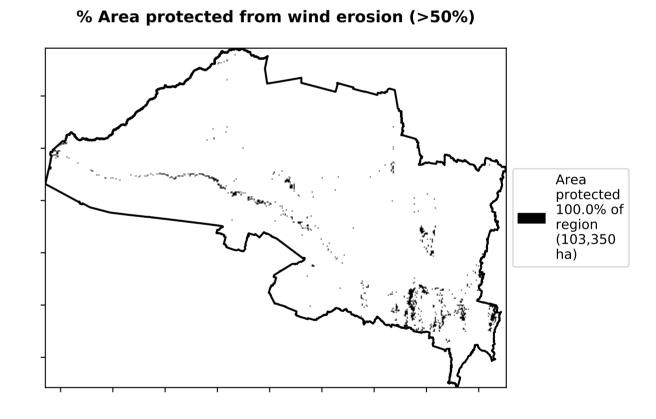
# Total Vegetation Cover [%]

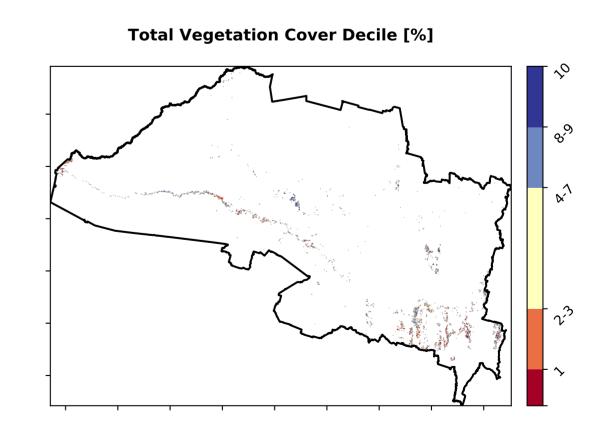
## % Area protected from water erosion (>70%) Area not protected 0.8% of region (826 ha) Area protected 99.2% of region (102,523 ha)



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 100 - 99.2% 80 - 99.2% 40 - 20 - 0.0% 0.0% 0.8% 0-30% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class







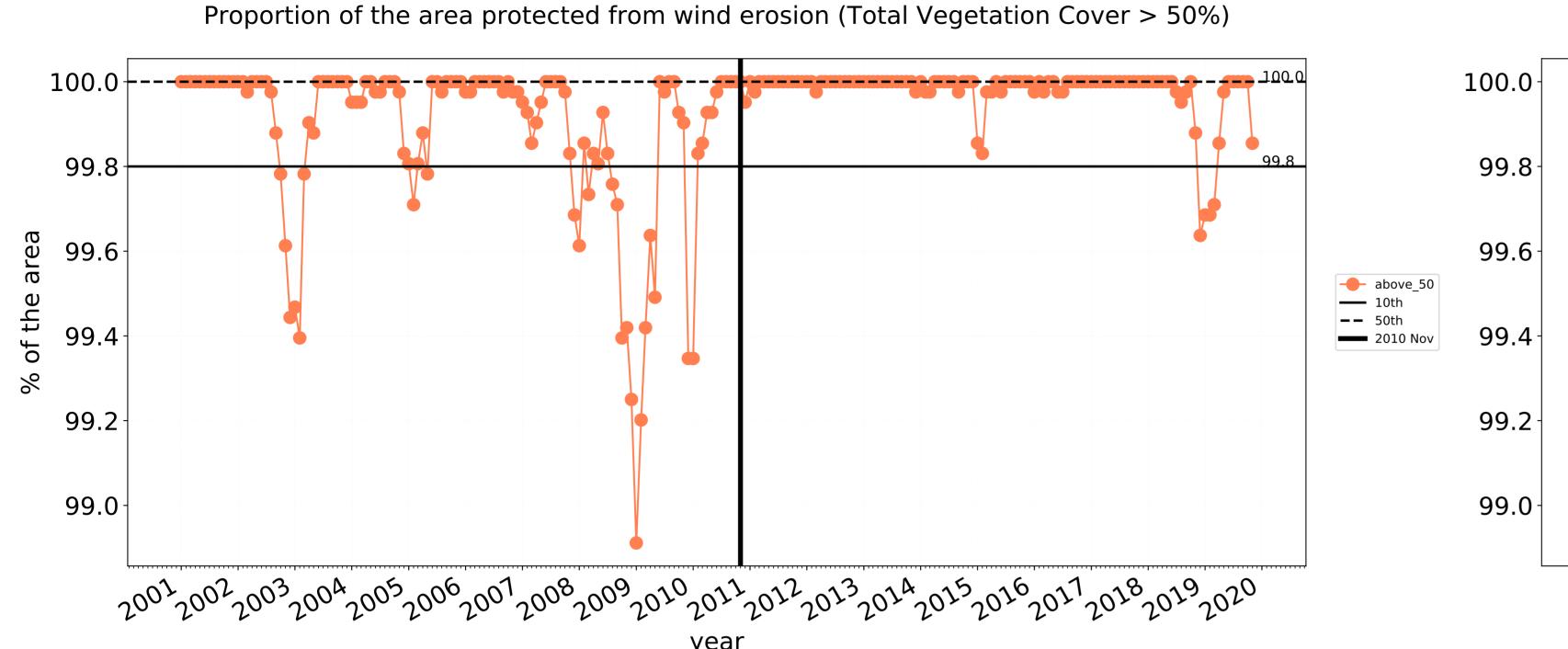


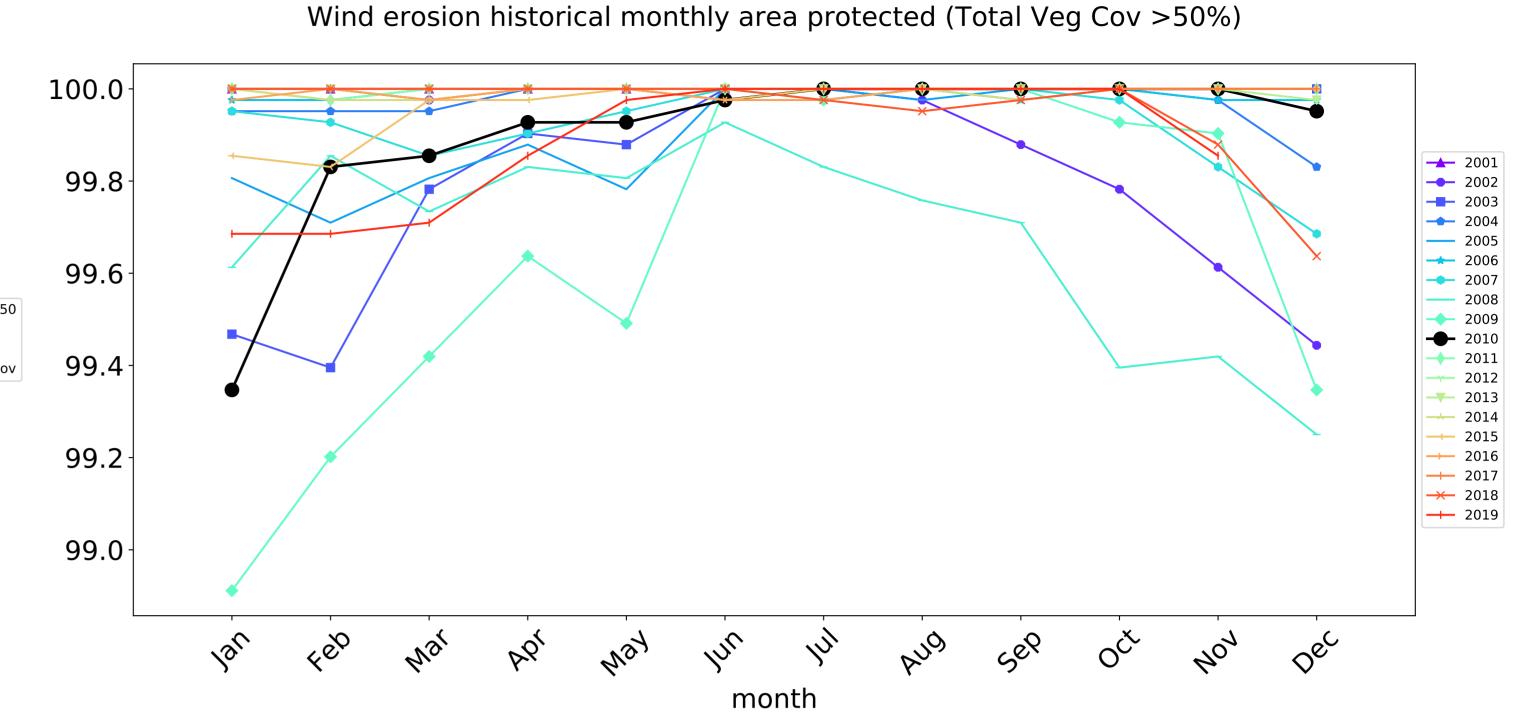


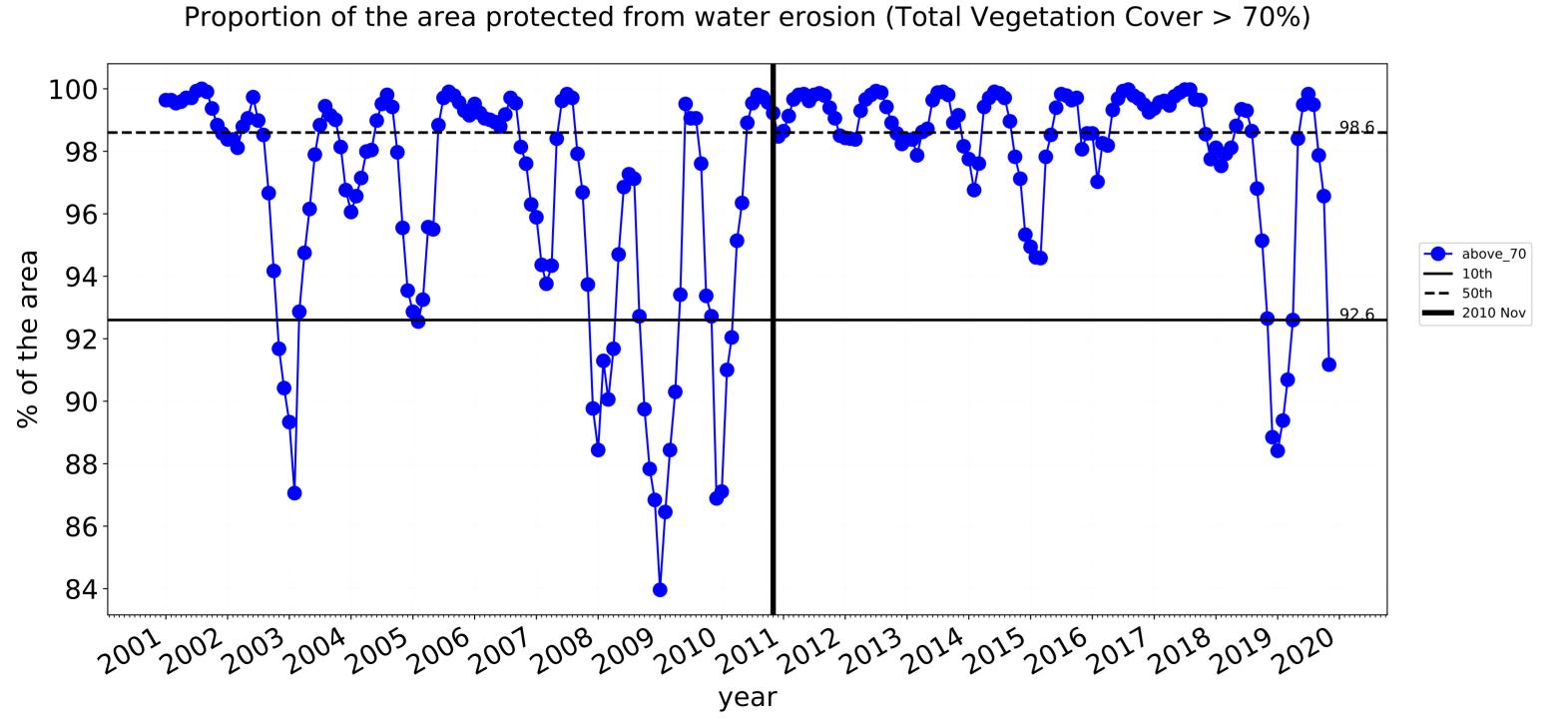


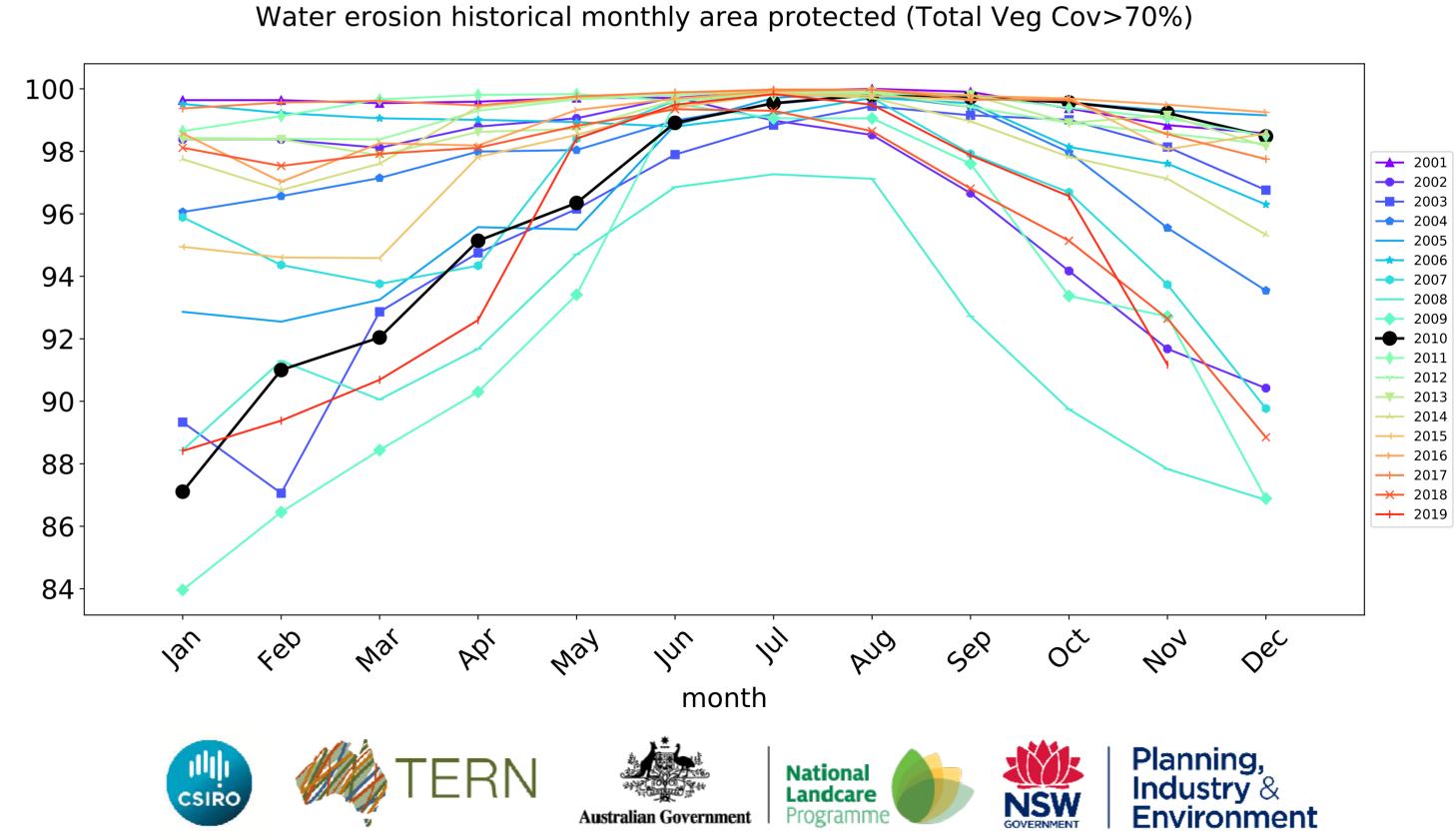






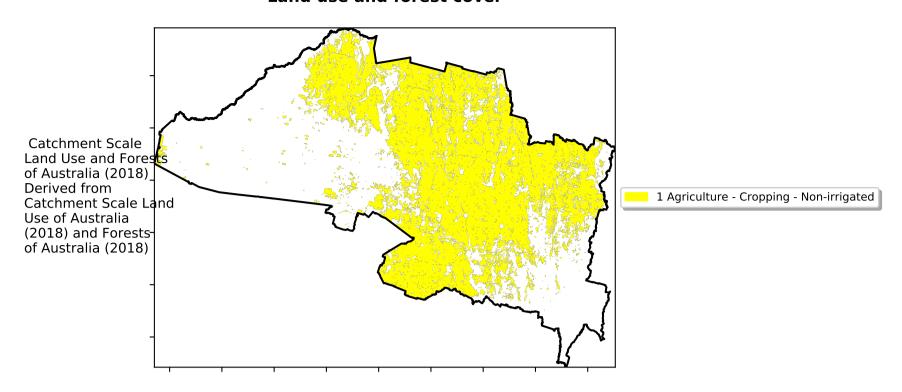




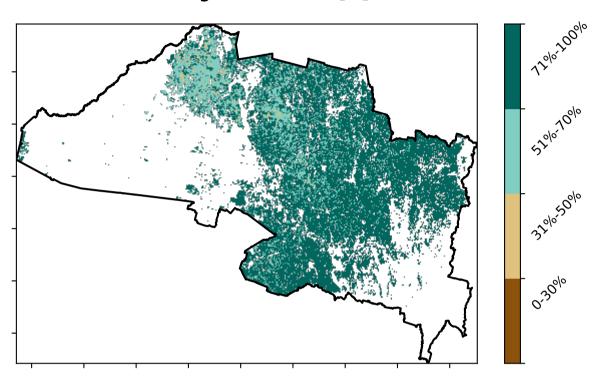


### **Cropping**

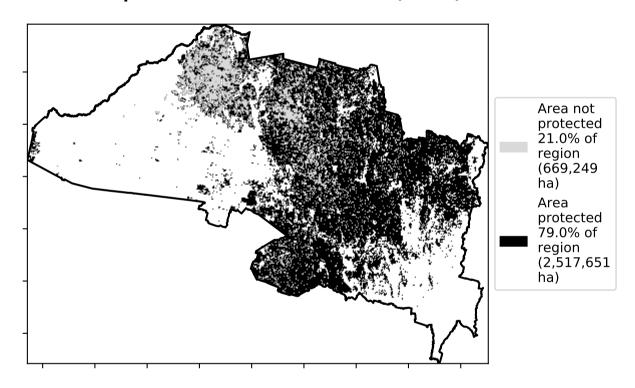
### Land use and forest cover



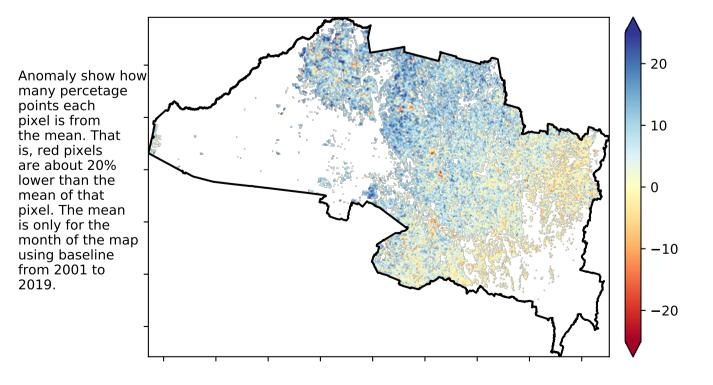
### **Total Vegetation Cover [%]**



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

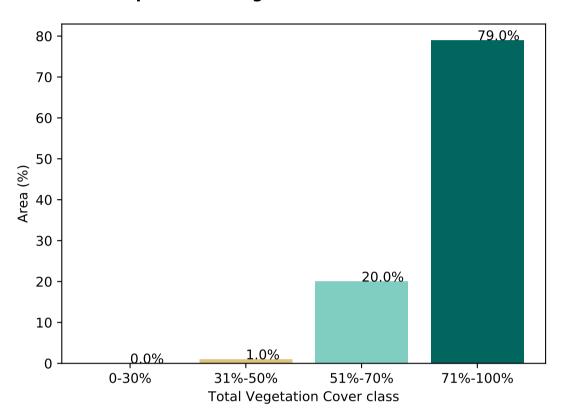


### Total Vegetation Cover Anomaly [%]

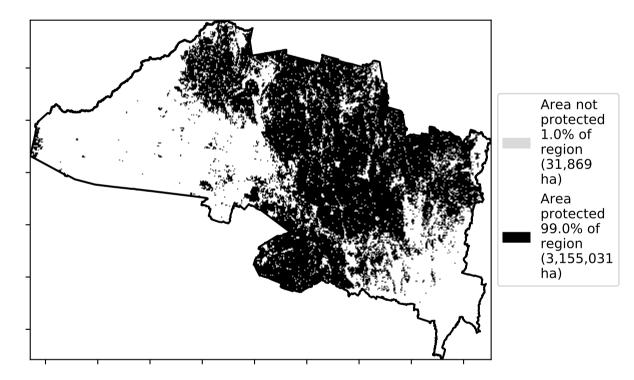


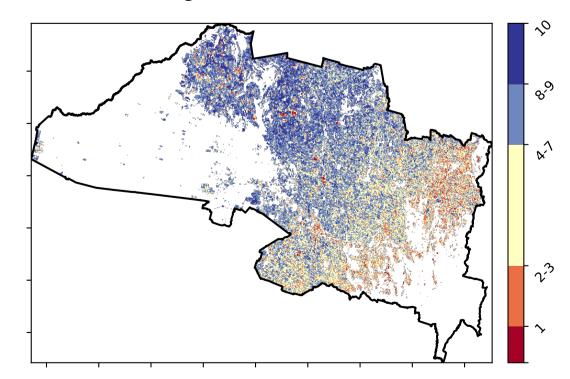
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









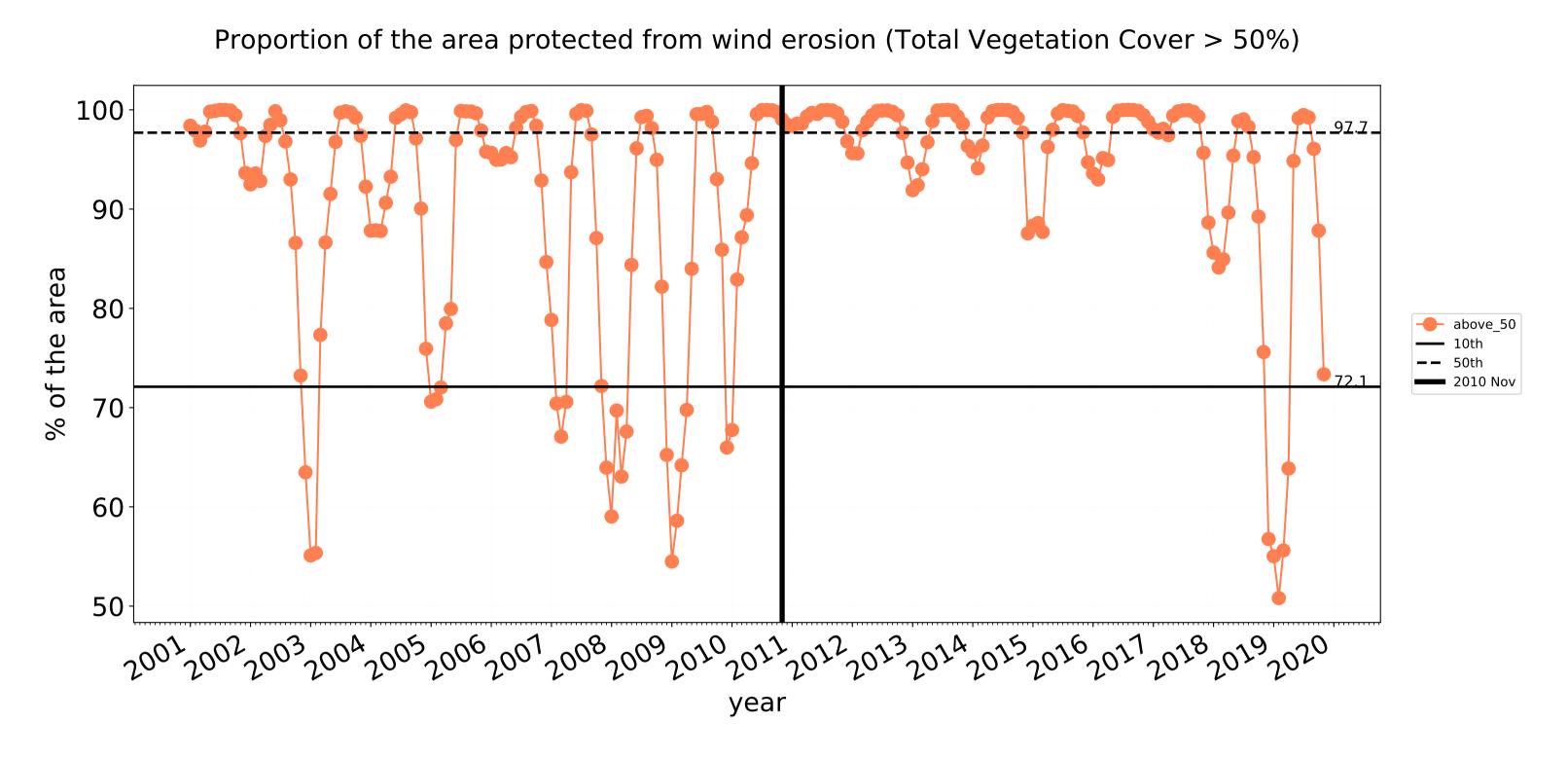


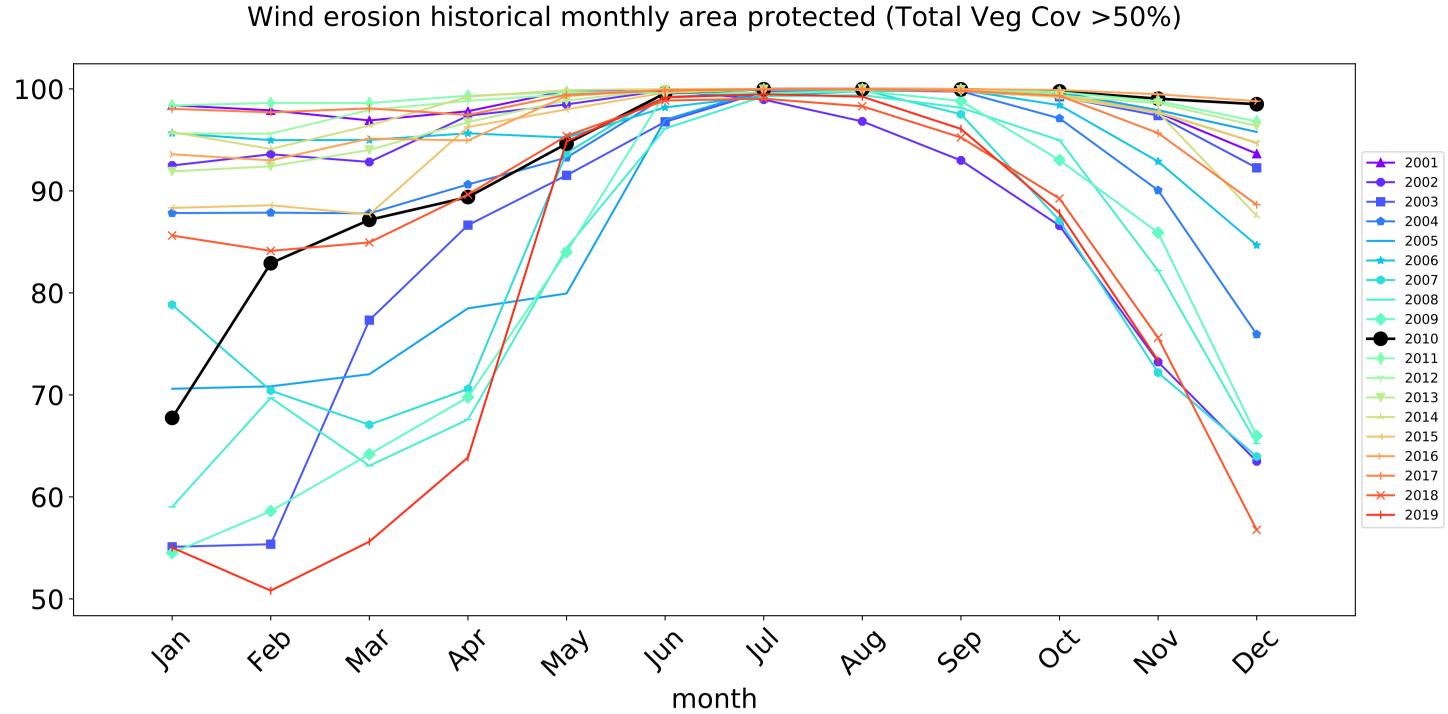


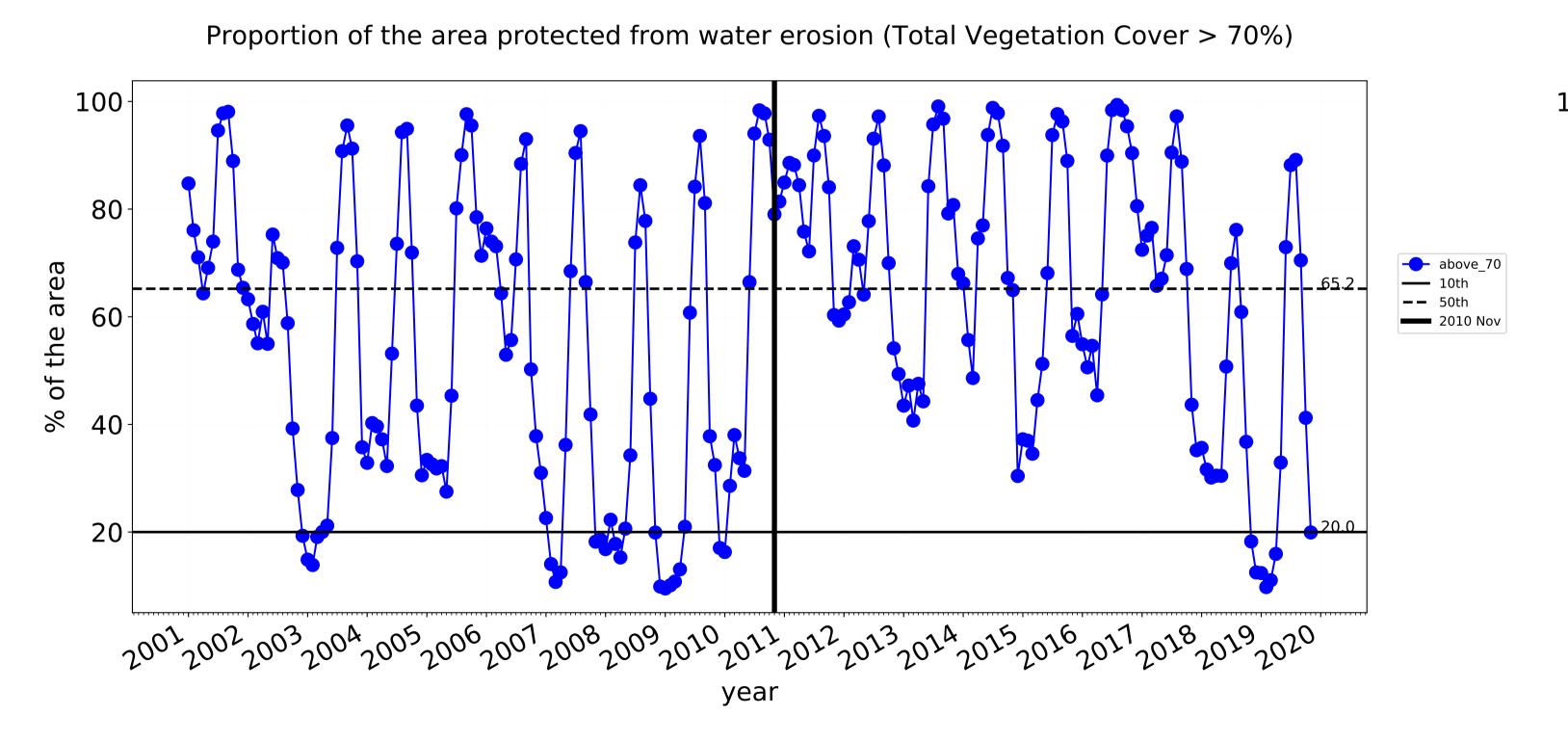


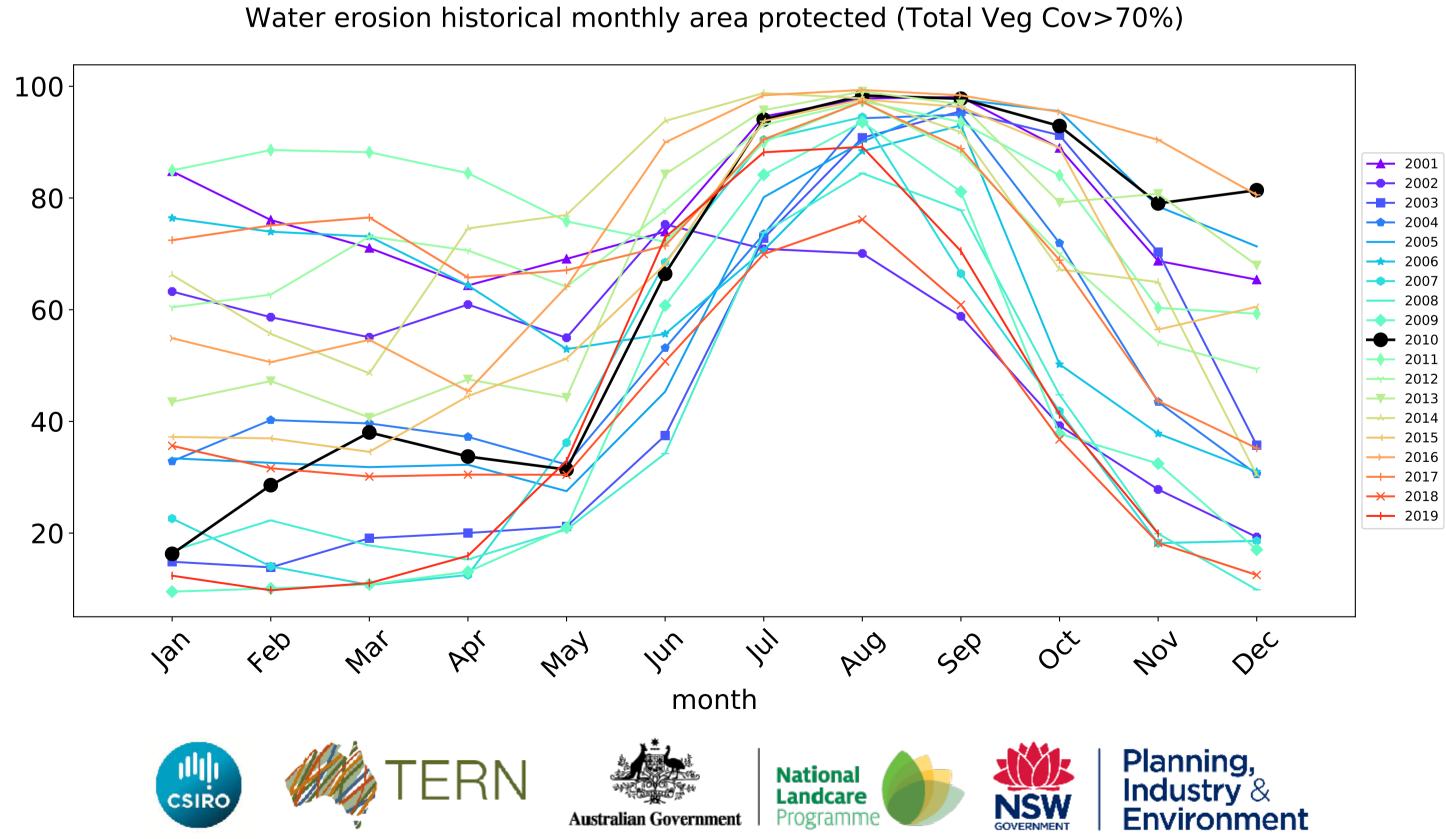


### **Cropping timeseries**



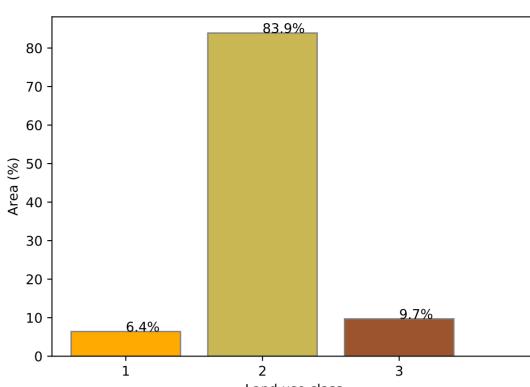




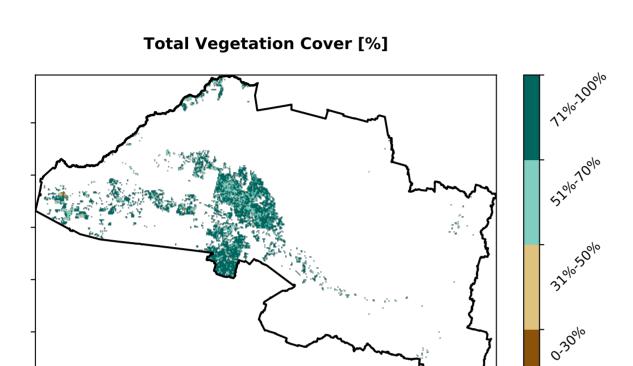


### Irrigation

### Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated



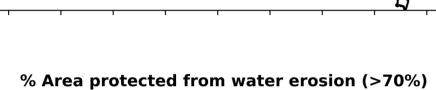
**Proportion of each land class in area** 

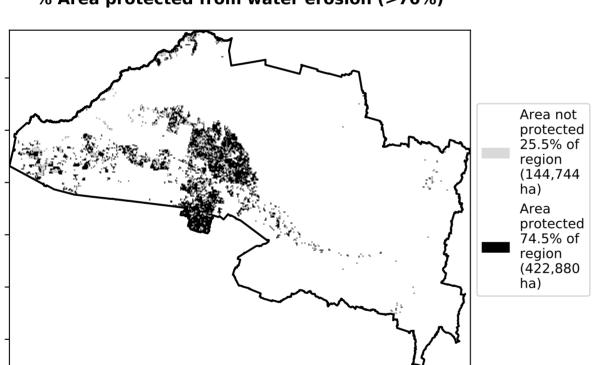


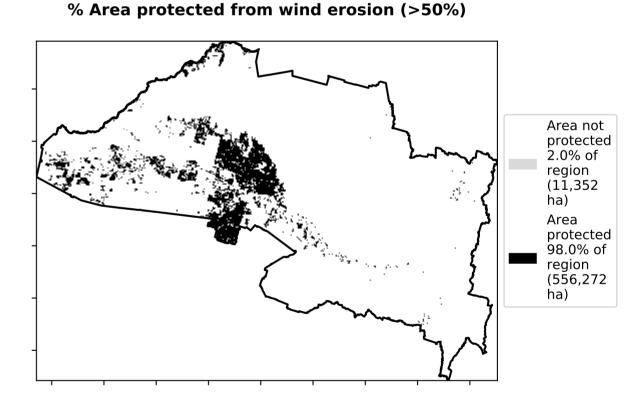
Land use class

Proportion of vegetation cover class in area

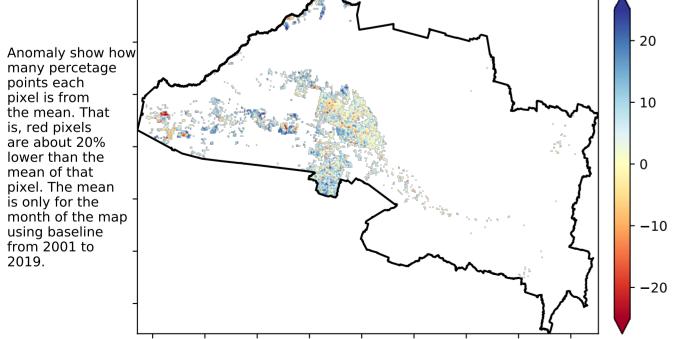
### 74.5% 70 60 50 Area (%) 30 -23.9% 20 10 1.3% 31%-50% 51%-70% 71%-100% 0-30% **Total Vegetation Cover class**



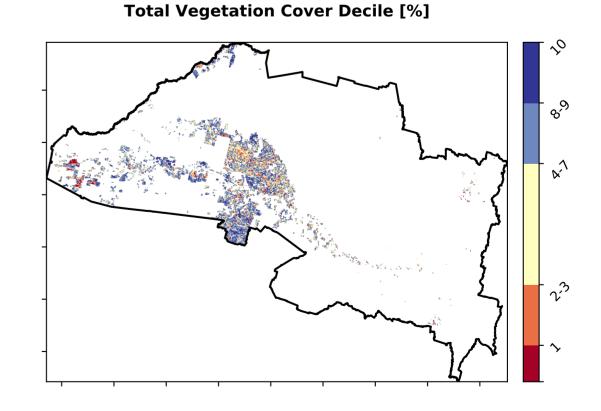








Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





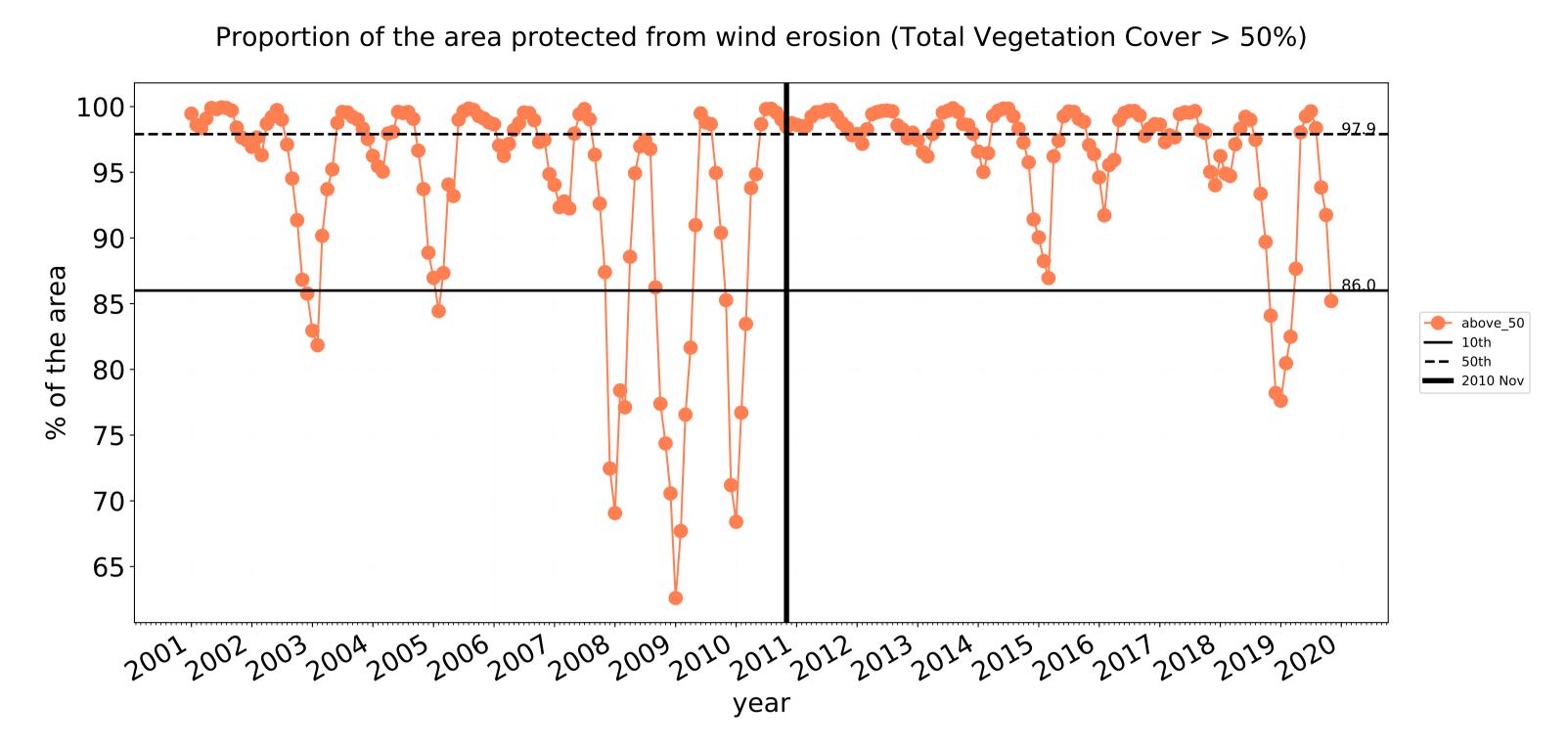


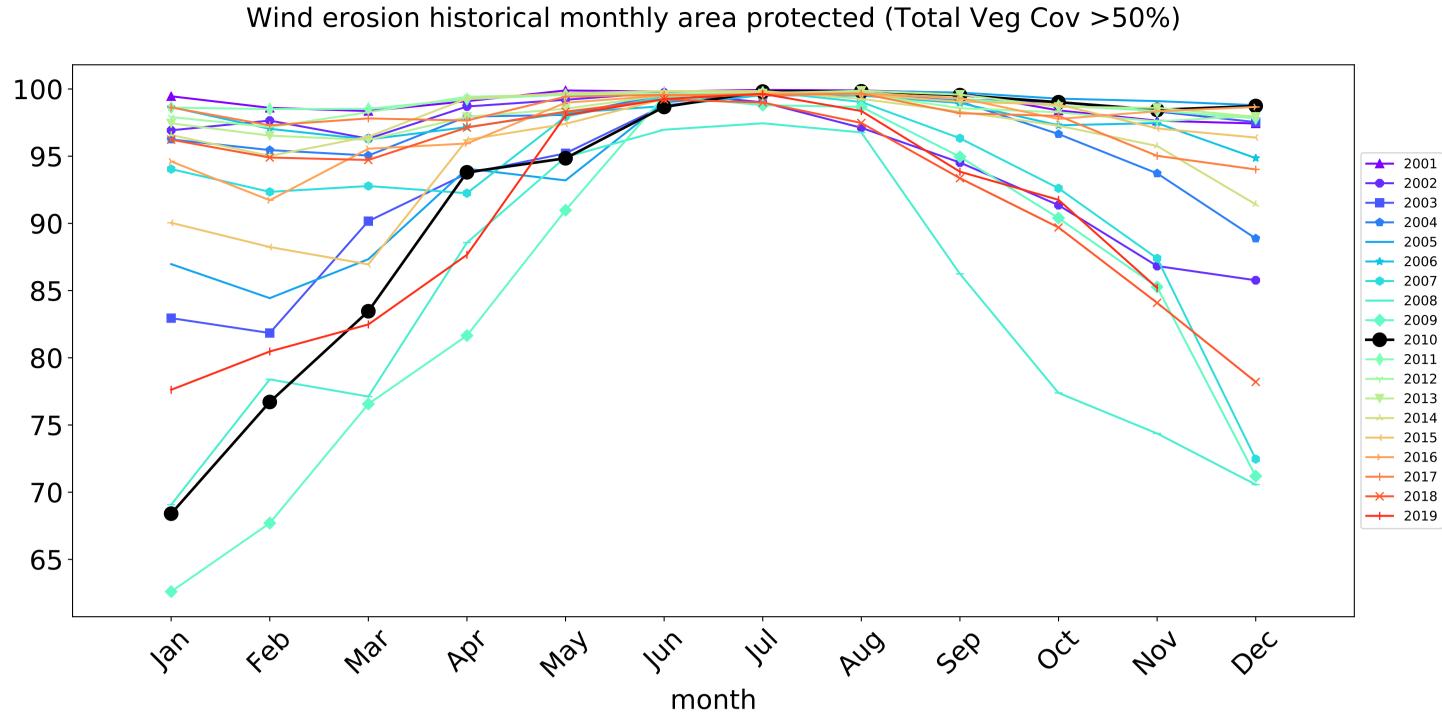


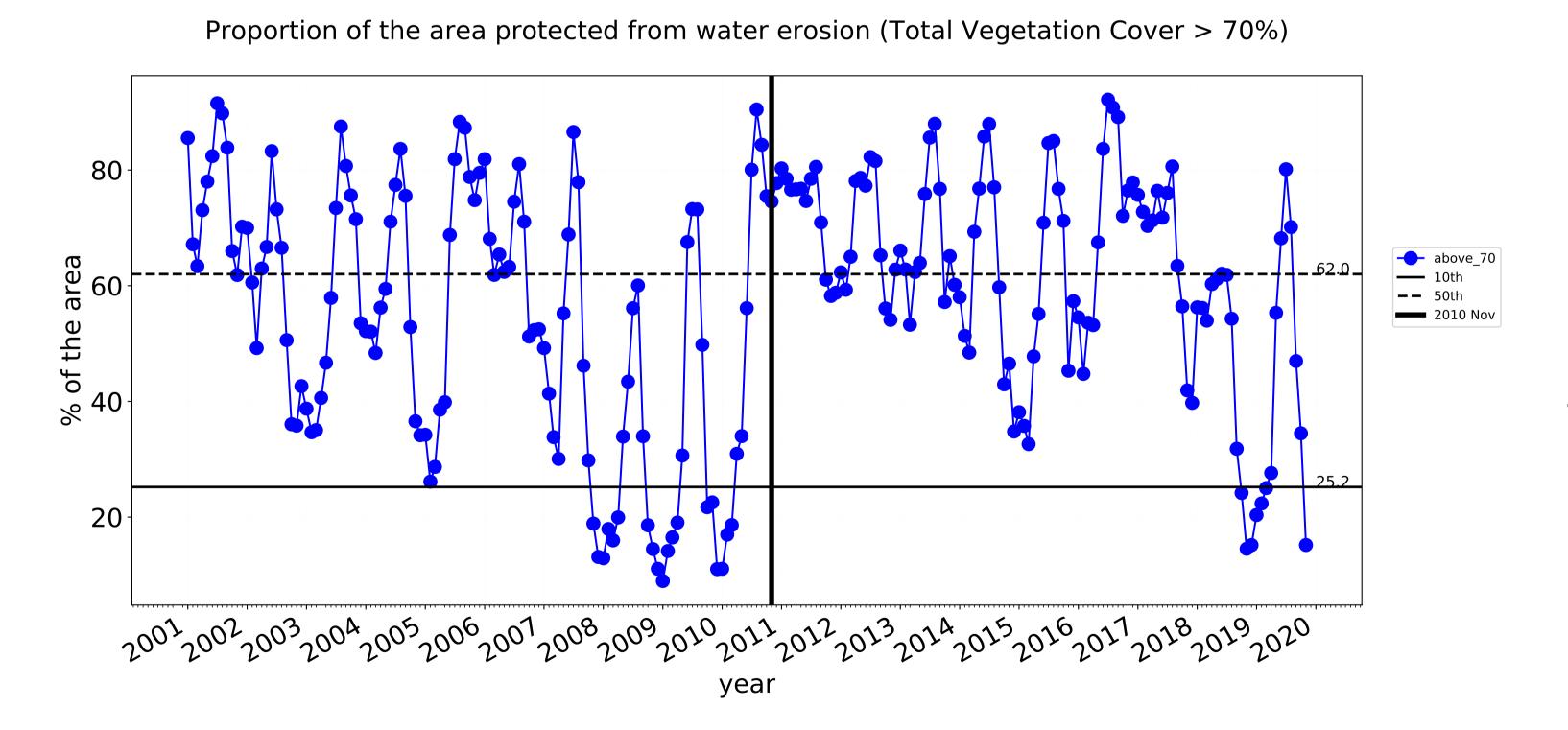


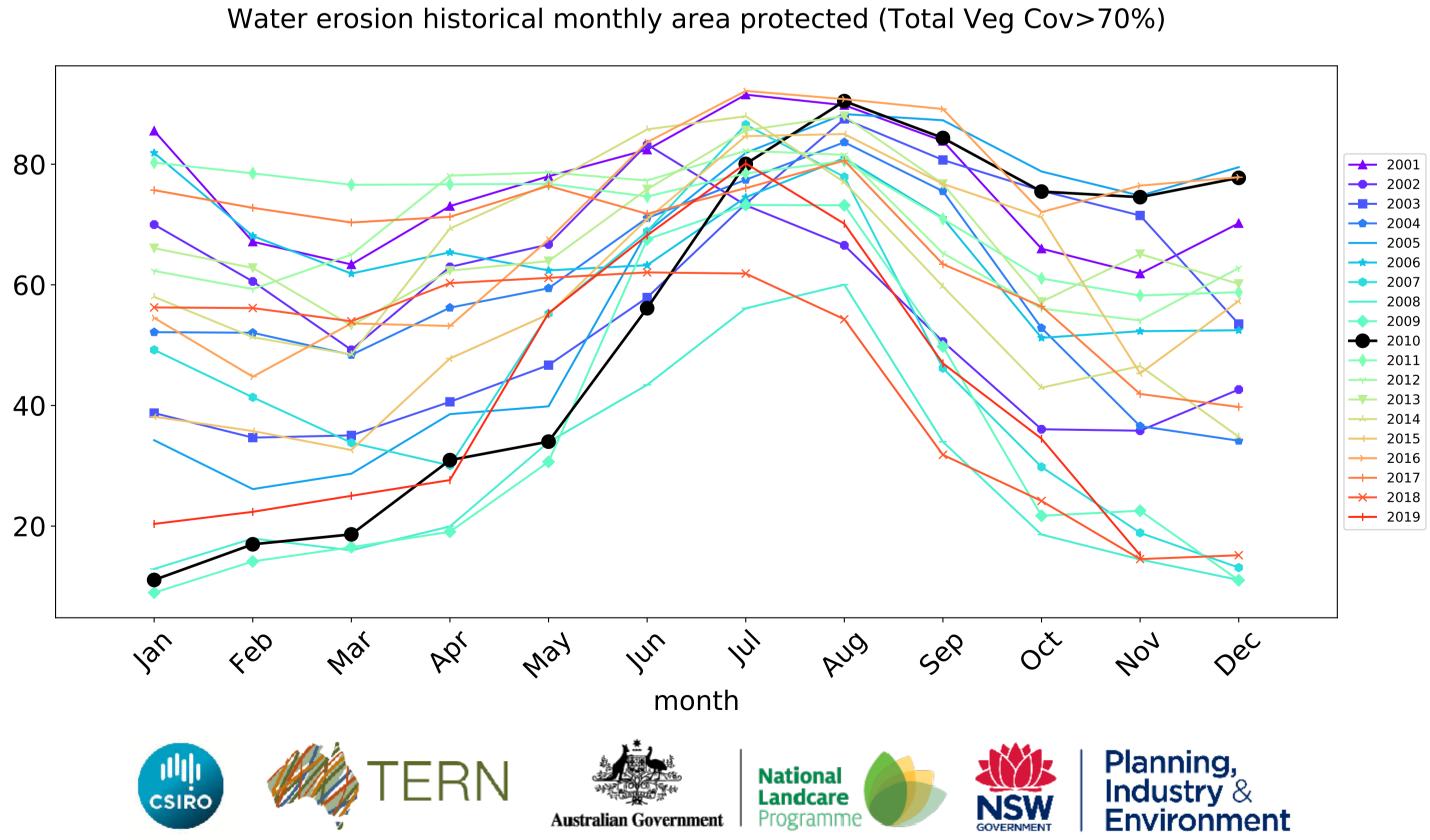










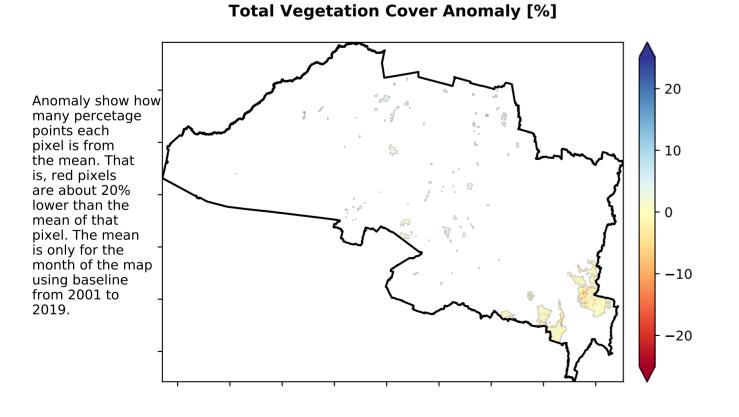


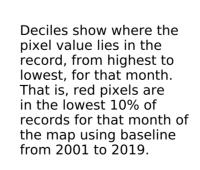
### **Production native forests and plantation forests**

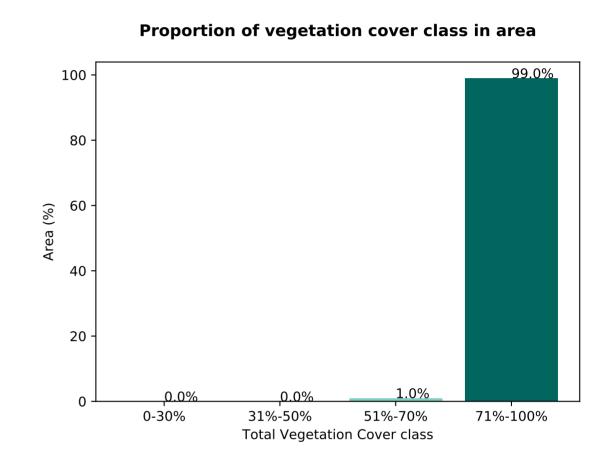
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 1 Production native forests and plantation forests of Australia (2018)

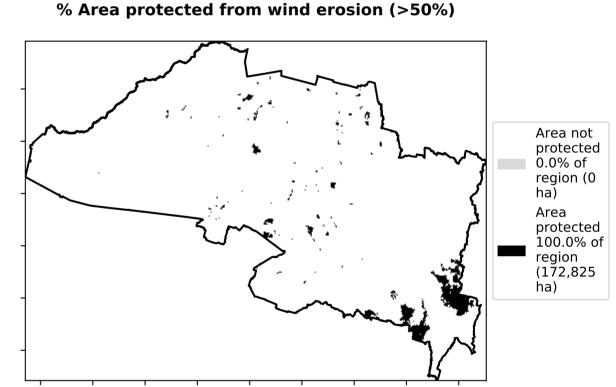
# Total Vegetation Cover [%] Troloradolo Tro

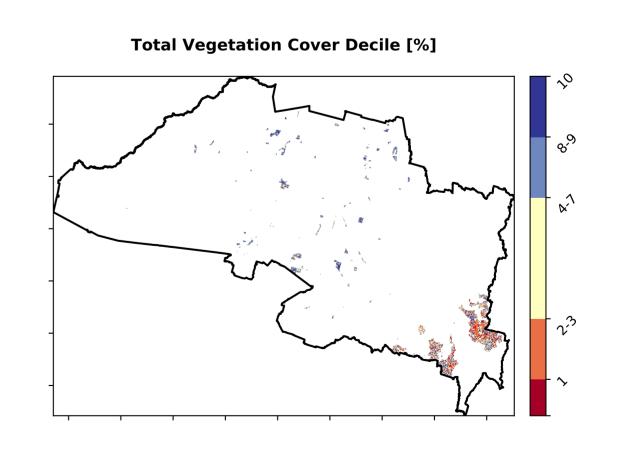
# Area not protected 1.0% of region (1,728 ha) Area protected 99.0% of region (171,096 ha)















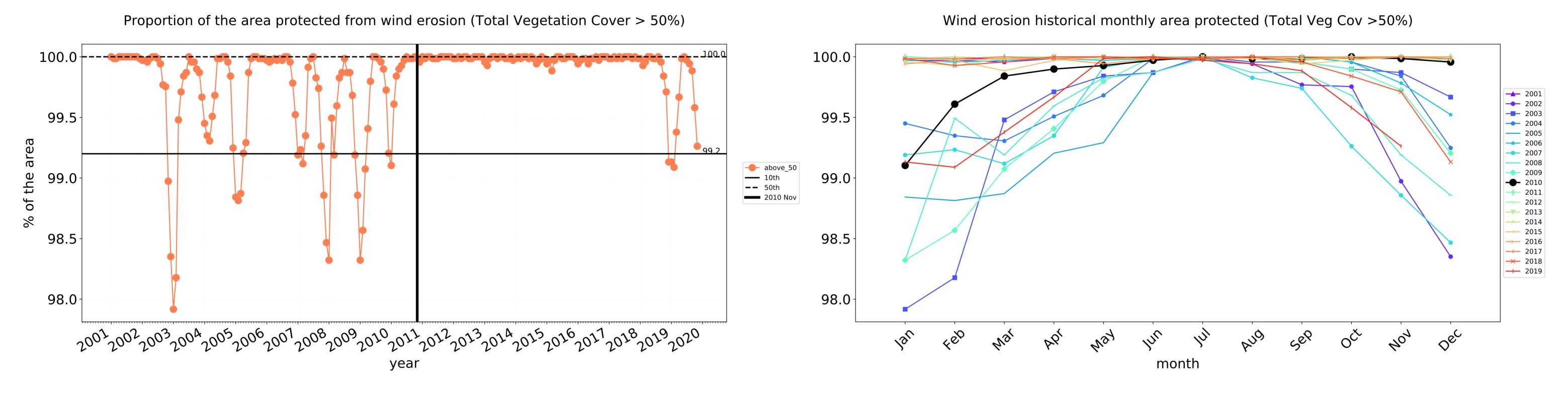


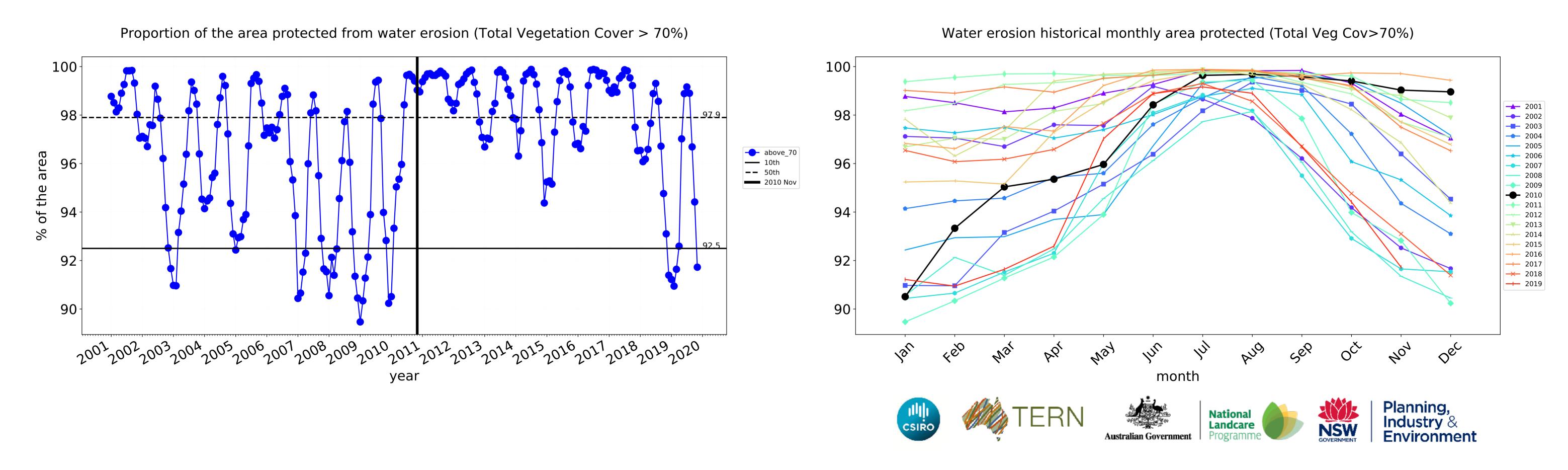






### **Production native forests and plantation forests timeseries**





### 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	100.0% 6,691,575	99.2% 6,643,209	80.9% 5,417,322	43.6% 2,921,557	11.1% 741,780	3.0% 202,860
Conservation and natural environments	323,175	100.0% 323,175	100.0% 323,150	91.8% 296,625	83.9% 271,050	60.4% 195,150	26.6% 86,025
Conservation and natural environments non forest	83,350	100.0% 83,350	100.0% 83,325	68.9% 57,425	44.5% 37,125	13.9% 11,550	6.3% 5,225
Conservation and natural environments Forest (non woodland)	195,325	100.0% 195,325	100.0% 195,325	99.9% 195,175	98.8% 192,900	84.0% 164,150	39.5% 77,100
Agriculture	6,067,925	100.0% 6,066,250	99.2% 6,020,300	80.0% 4,854,975	40.3% 2,444,150	7.2% 435,125	1.1% 64,925
Grazing	2,311,575	100.0% 2,311,450	99.6% 2,303,400	82.7% 1,912,025	49.1% 1,134,400	13.0% 301,100	1.9% 44,975
Grazing non forest	2,066,575	100.0% 2,066,450	99.6% 2,058,450	81.0% 1,673,350	45.5% 940,600	11.3% 233,875	1.6% 33,550
Grazing Woodland forest	141,650	100.0% 141,650	100.0% 141,600	96.1% 136,125	71.9% 101,900	17.6% 25,000	1.8% 2,575
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,350	99.2% 102,550	88.9% 91,900	40.9% 42,225	8.6% 8,850
Cropping	3,186,900	100.0% 3,186,875	99.0% 3,156,275	79.0% 2,518,525	36.2% 1,153,500	3.8% 120,750	0.6% 17,575
Irrigation	567,625	99.7% 566,100	98.4% 558,800	74.5% 423,100	27.5% 155,925	2.3% 13,275	0.4% 2,375
Production native forests and plantation forests	172,825	100.0% 172,825	100.0% 172,800	99.0% 171,150	93.1% 160,825	60.8% 105,025	29.1% 50,225











