# **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 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







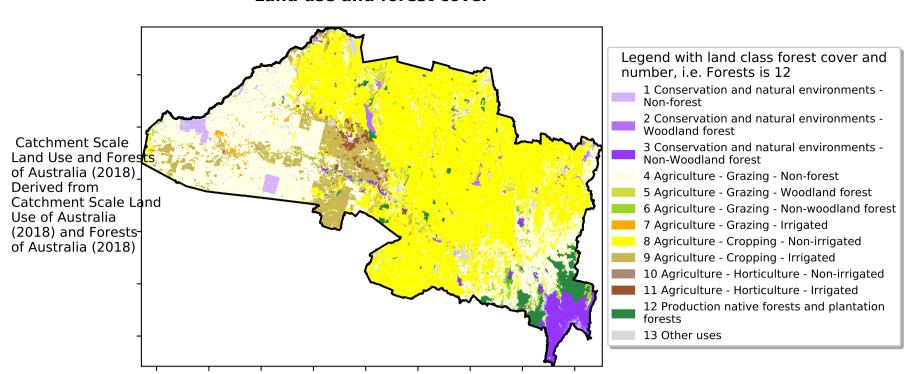




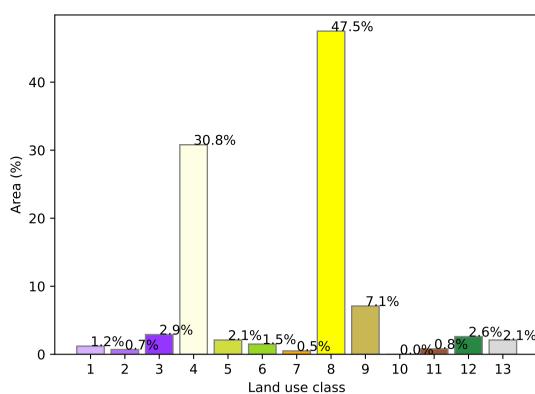


# **Vegetation Cover Dec 2010**

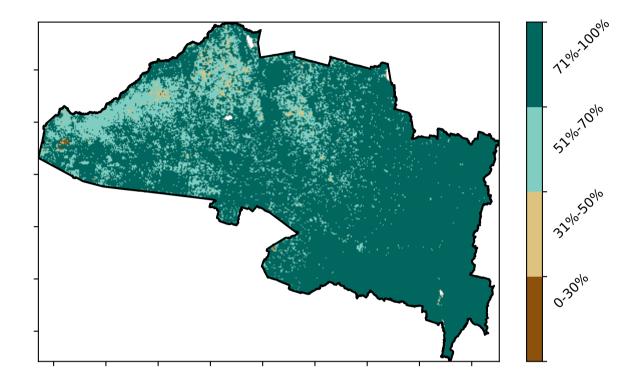
### Land use and forest cover



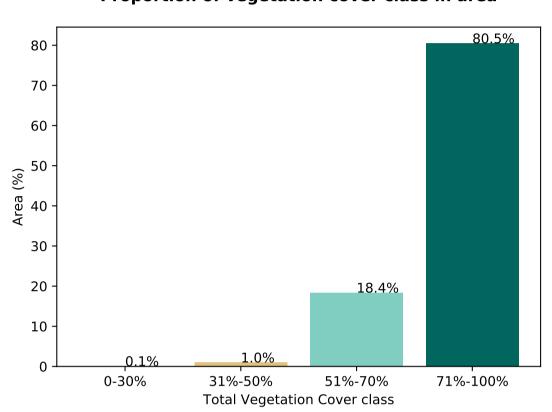
### Proportion of each land class in area



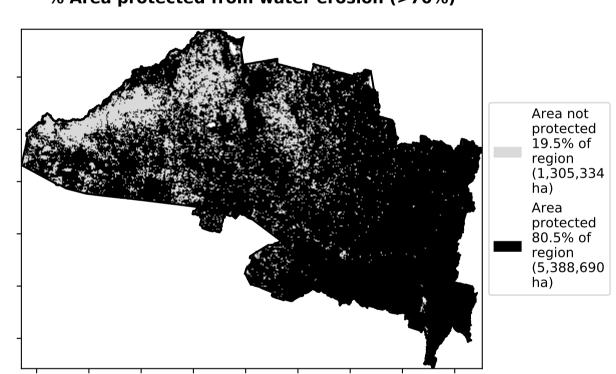
### **Total Vegetation Cover [%]**



Proportion of vegetation cover class in area



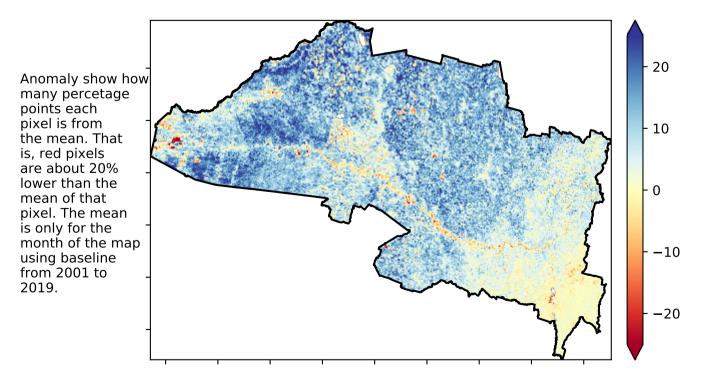
### % Area protected from water erosion (>70%)



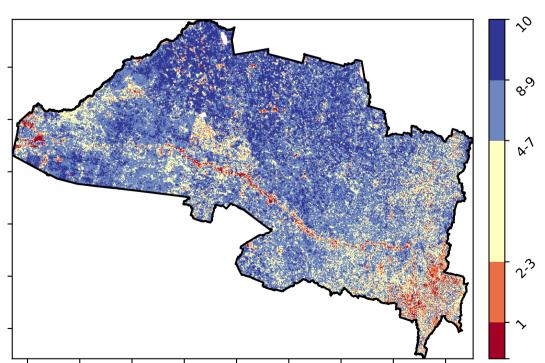
% Area protected from wind erosion (>50%)



## 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.





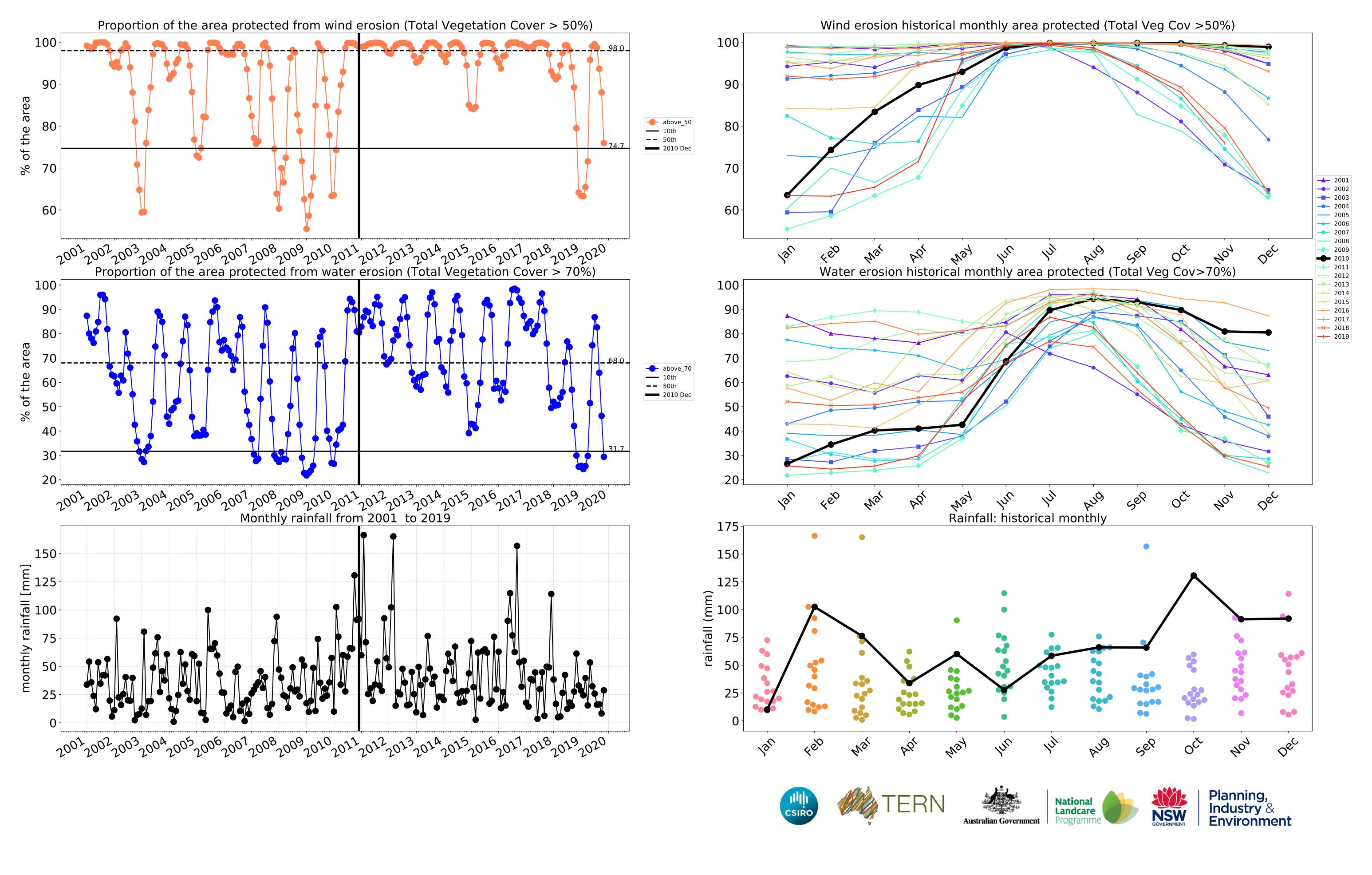




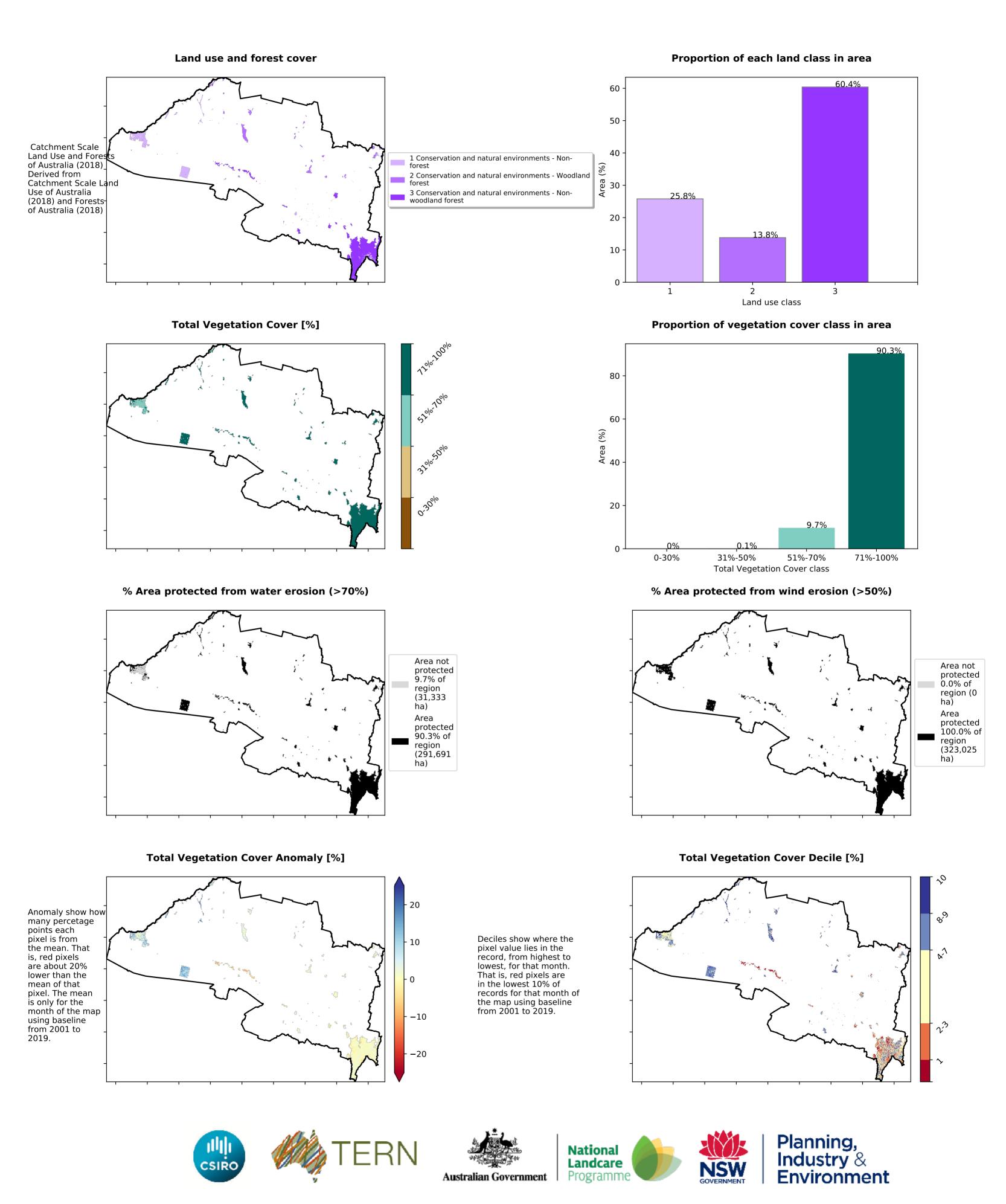




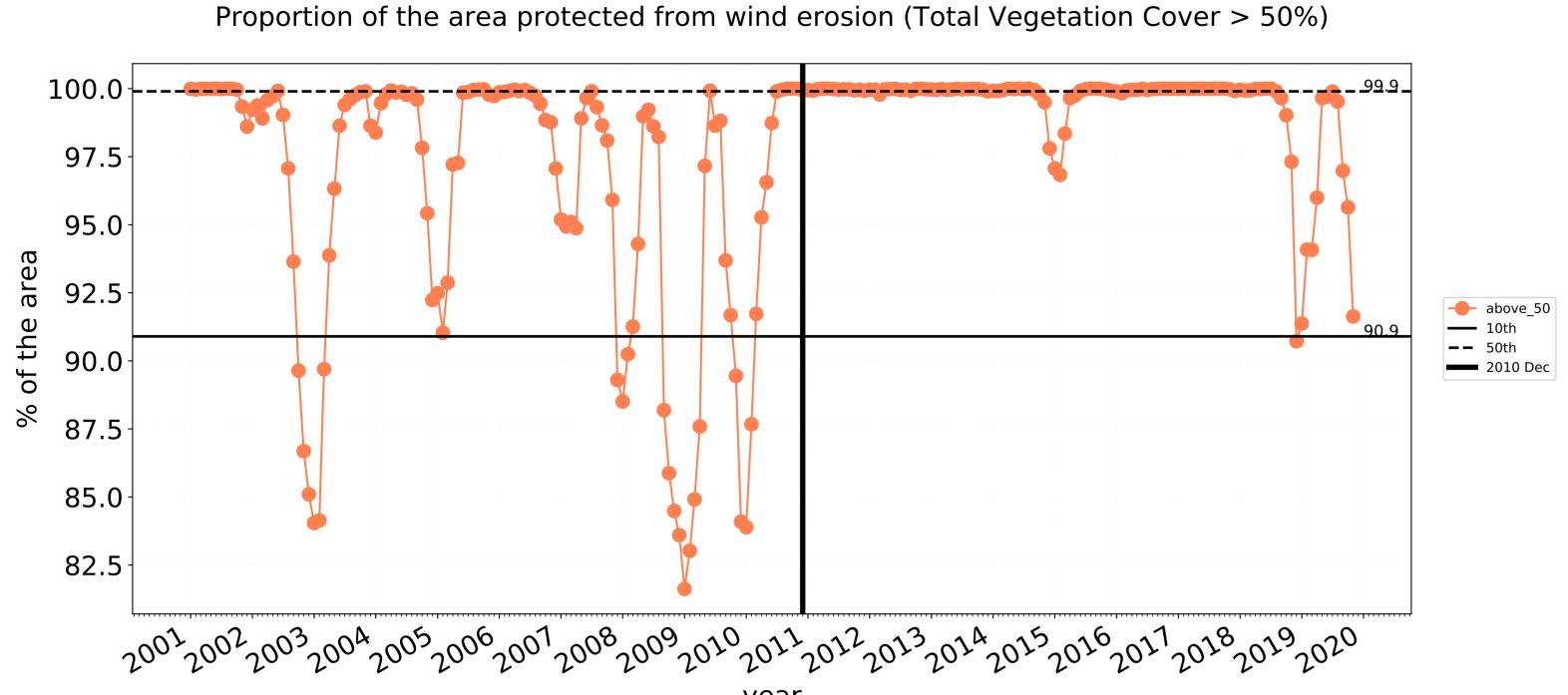


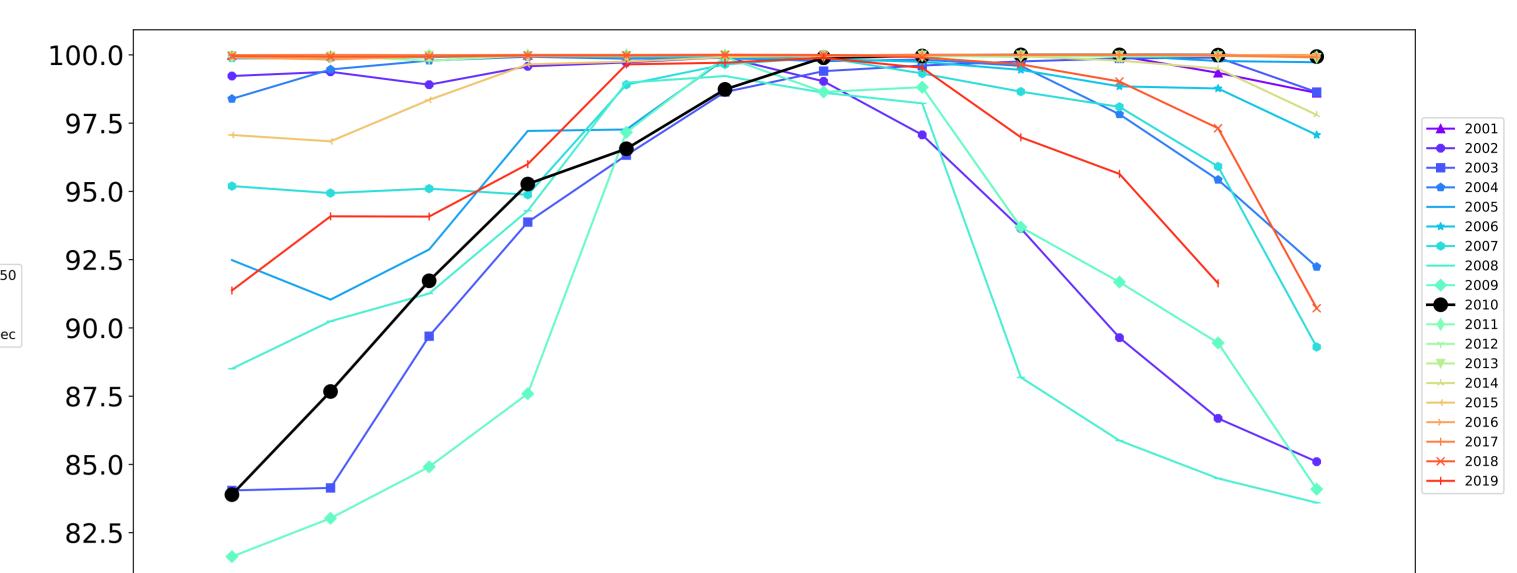


## **Conservation and natural environments**



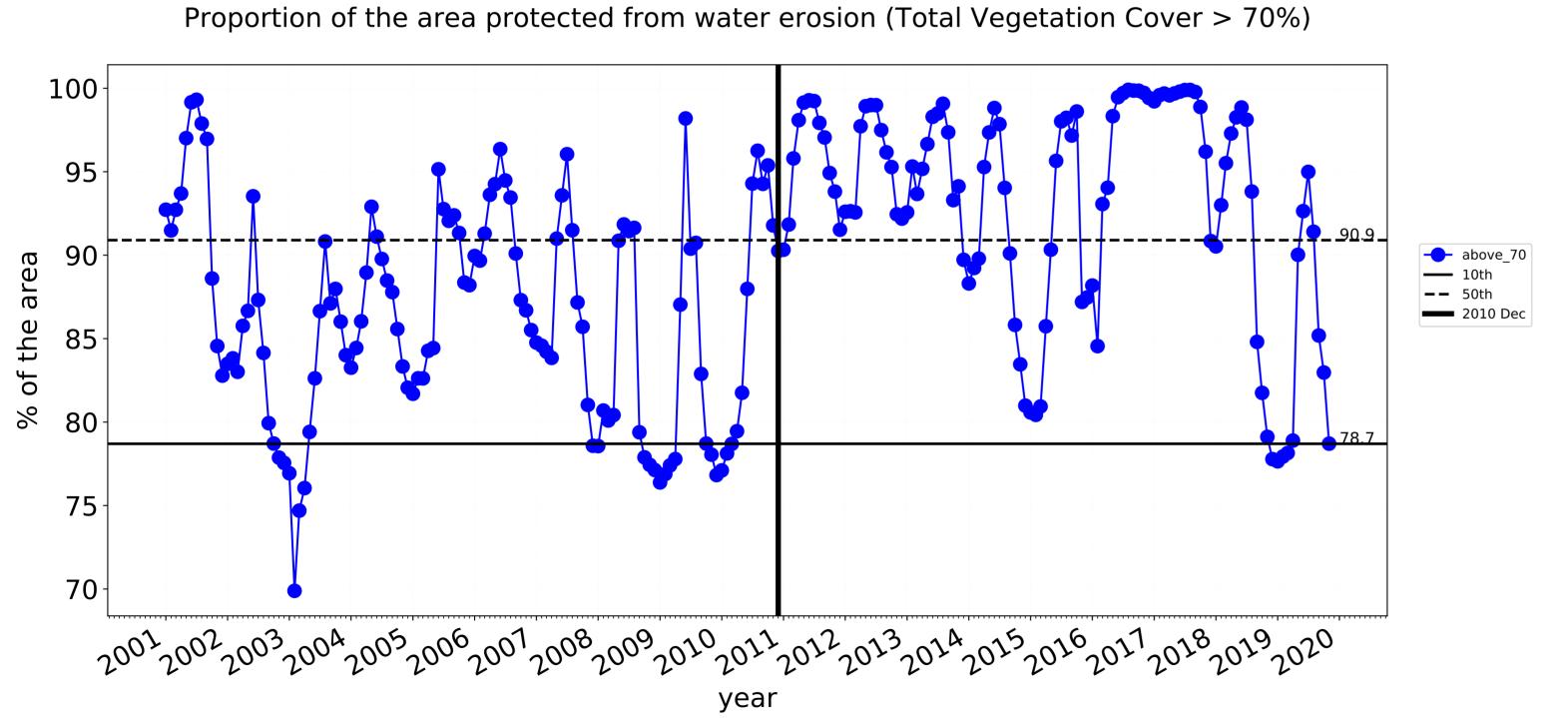
## **Conservation and natural environments timeseries**

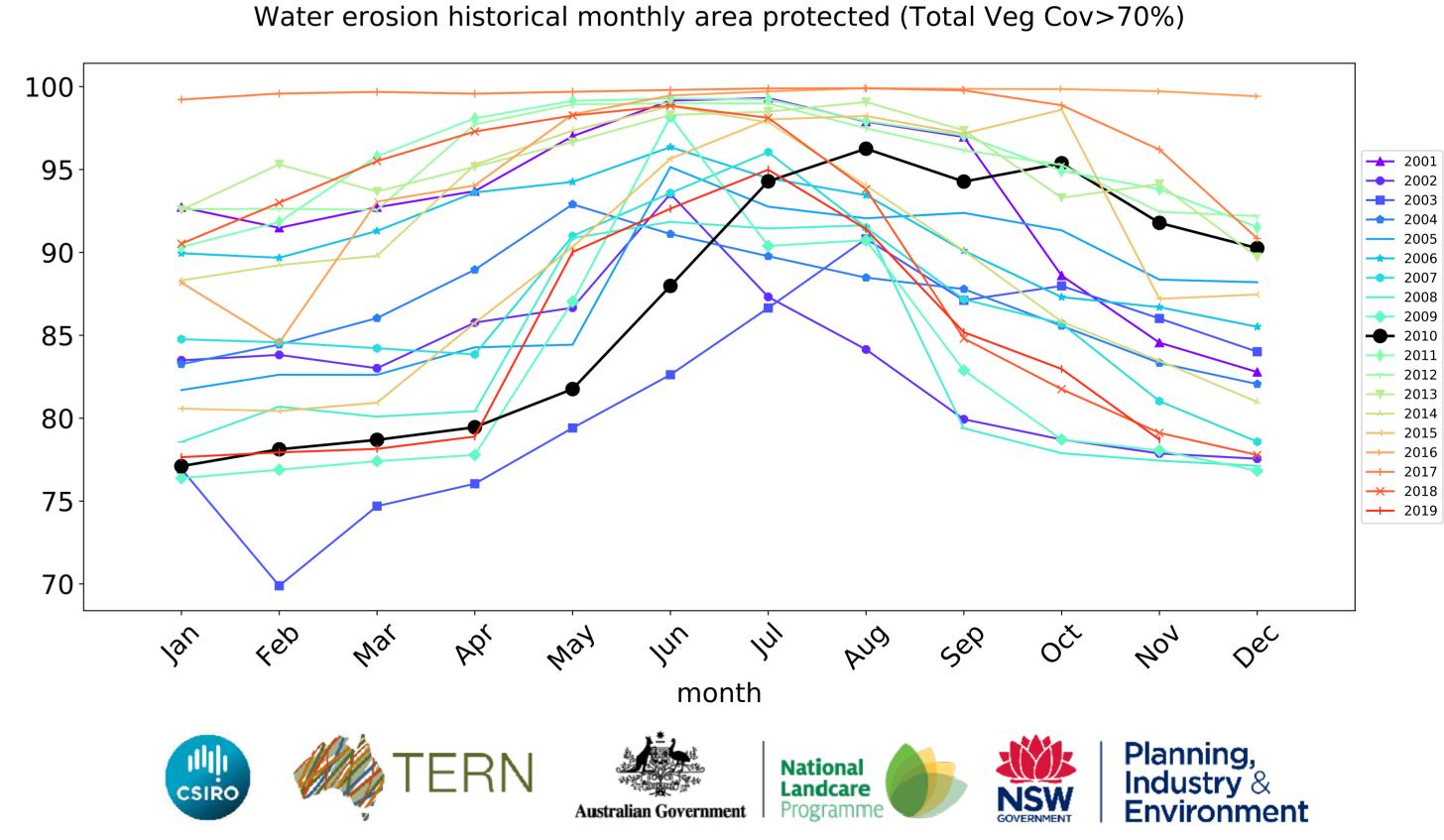




month

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



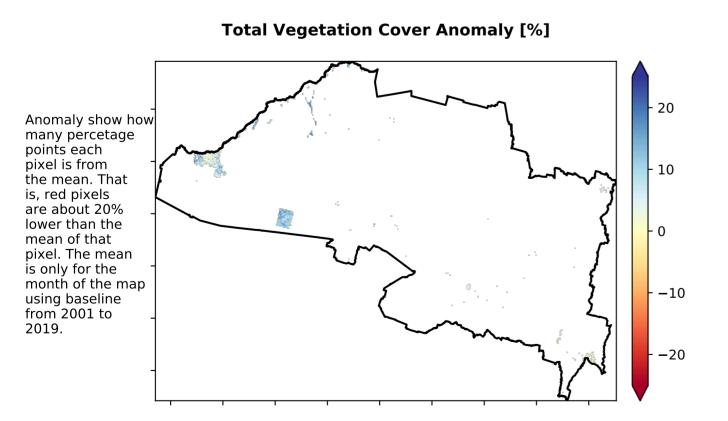


## **Conservation and natural environments non forest**

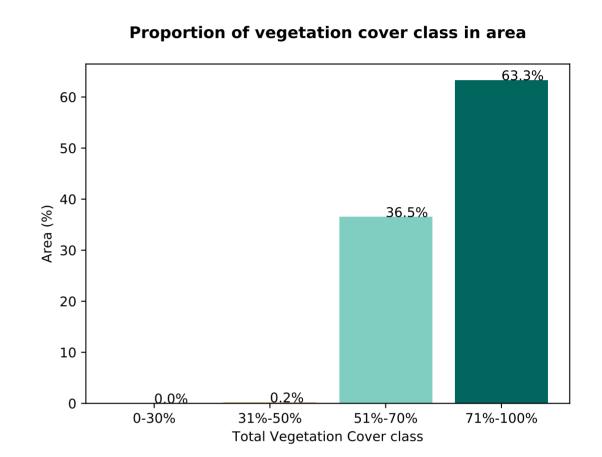
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Conservation and natural environments - Nonforest

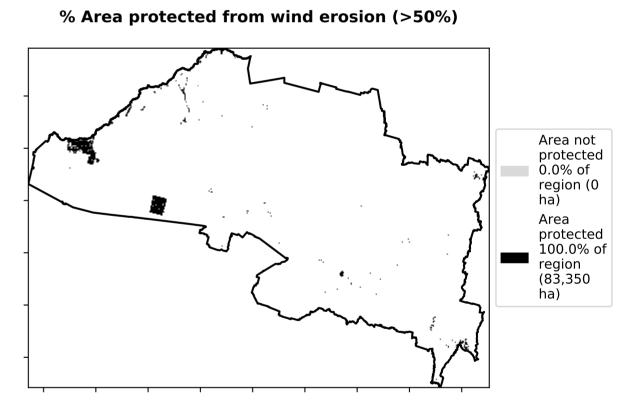
# Total Vegetation Cover [%]

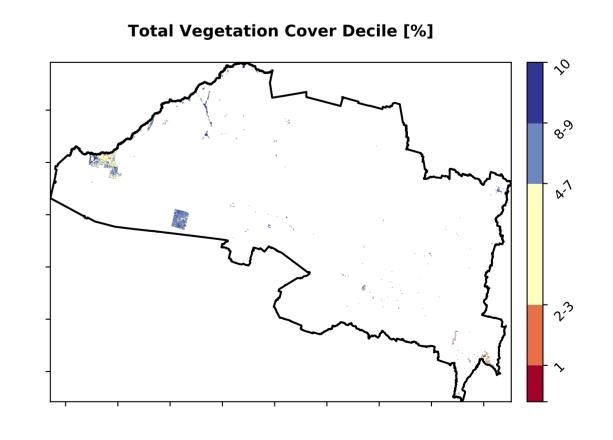
# % Area protected from water erosion (>70%) Area not protected 36.7% of region (30,589 ha) Area protected 63.3% of region (52,760 ha)



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









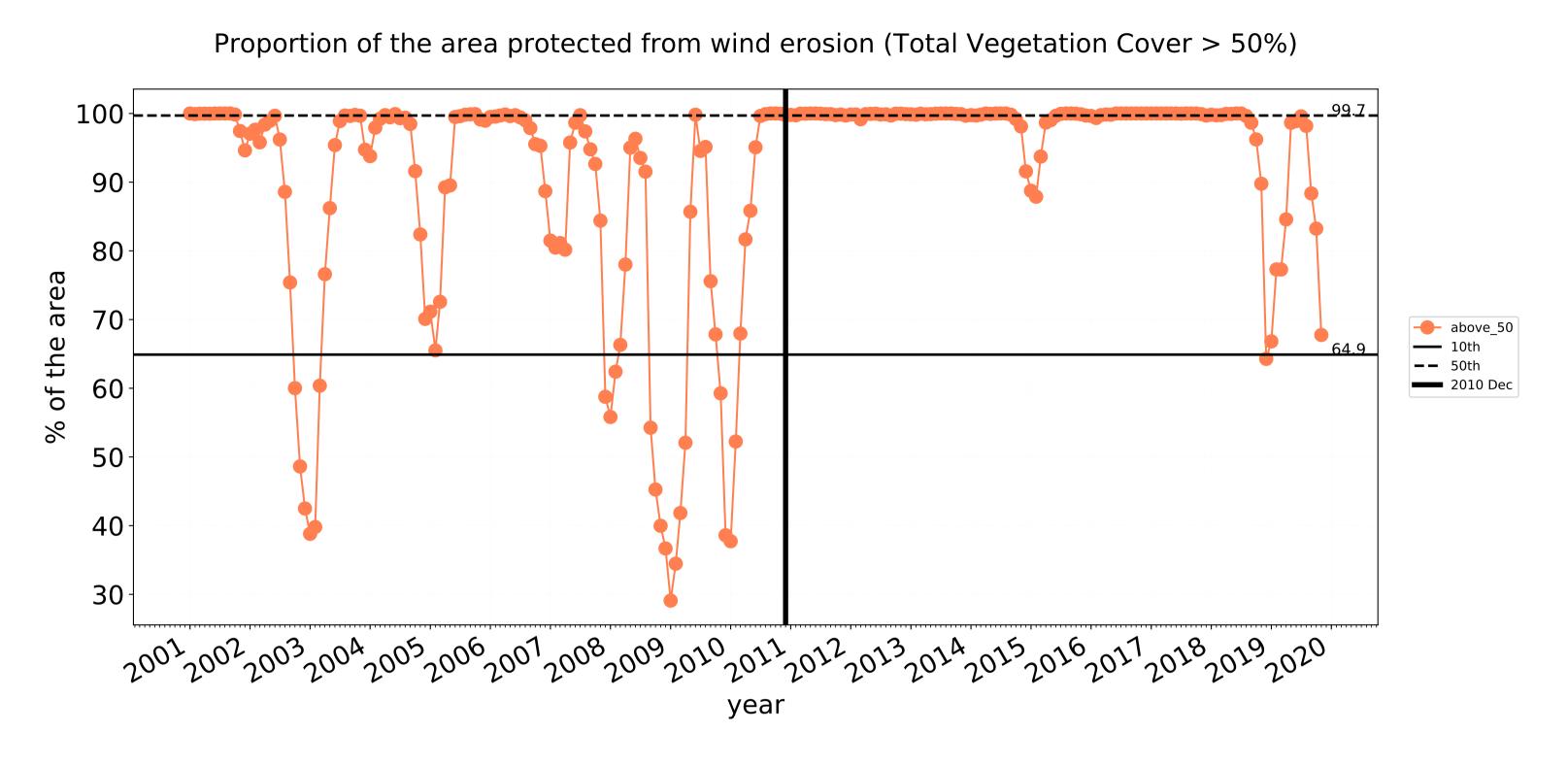


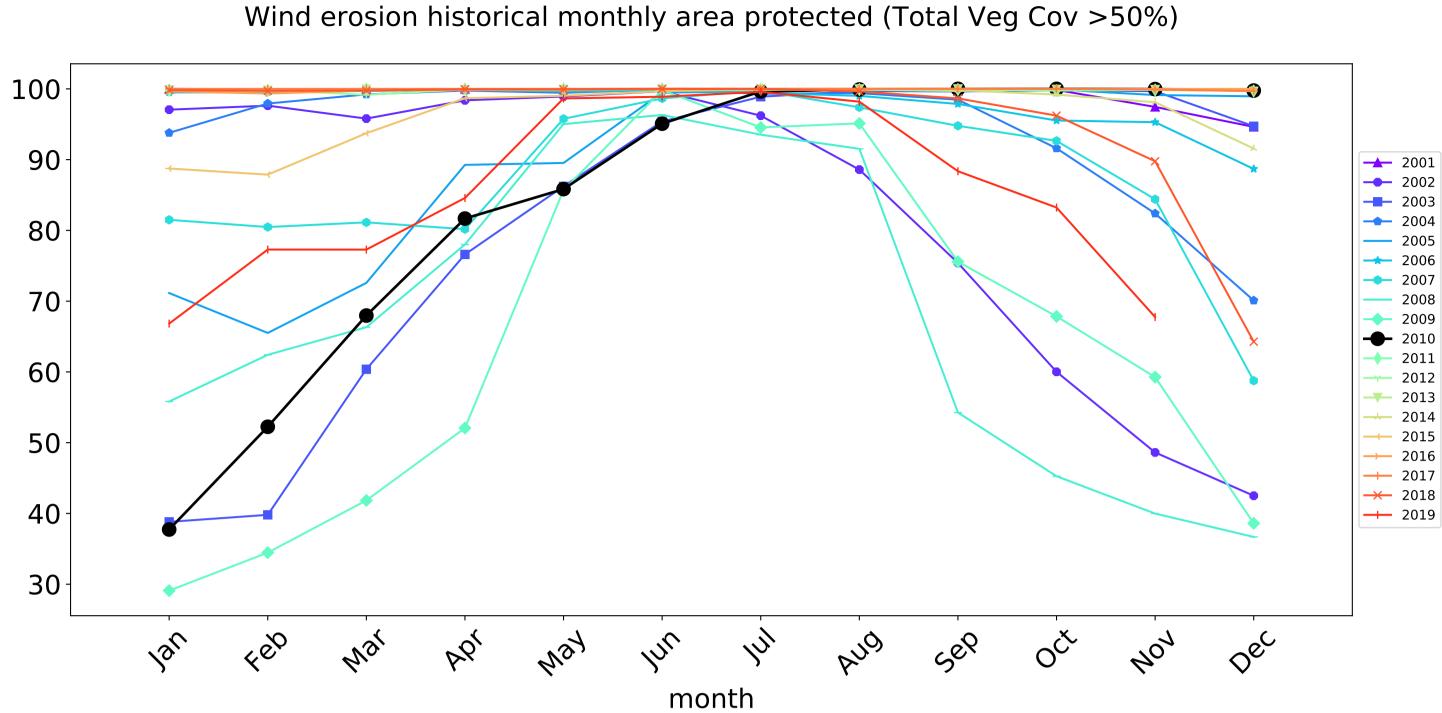


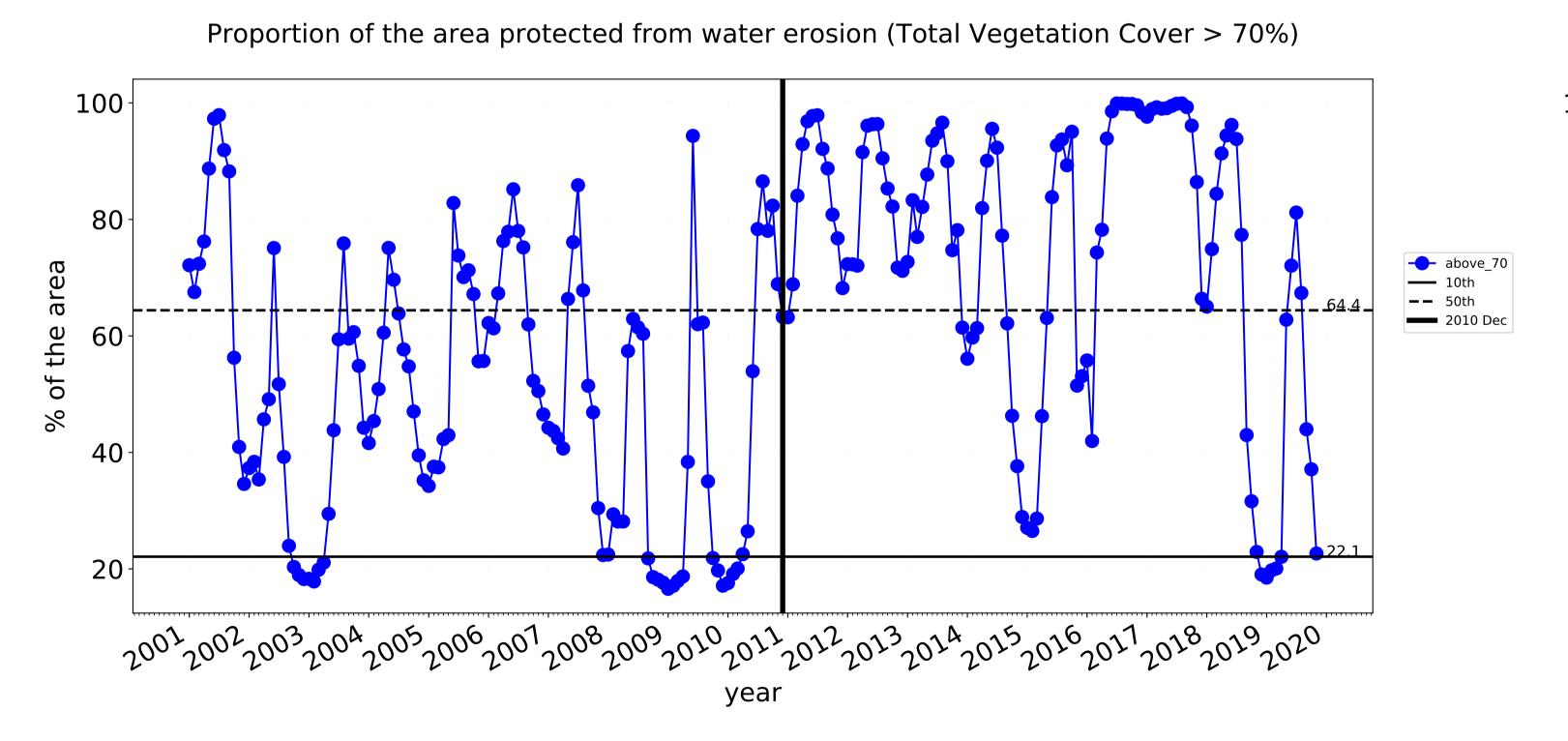


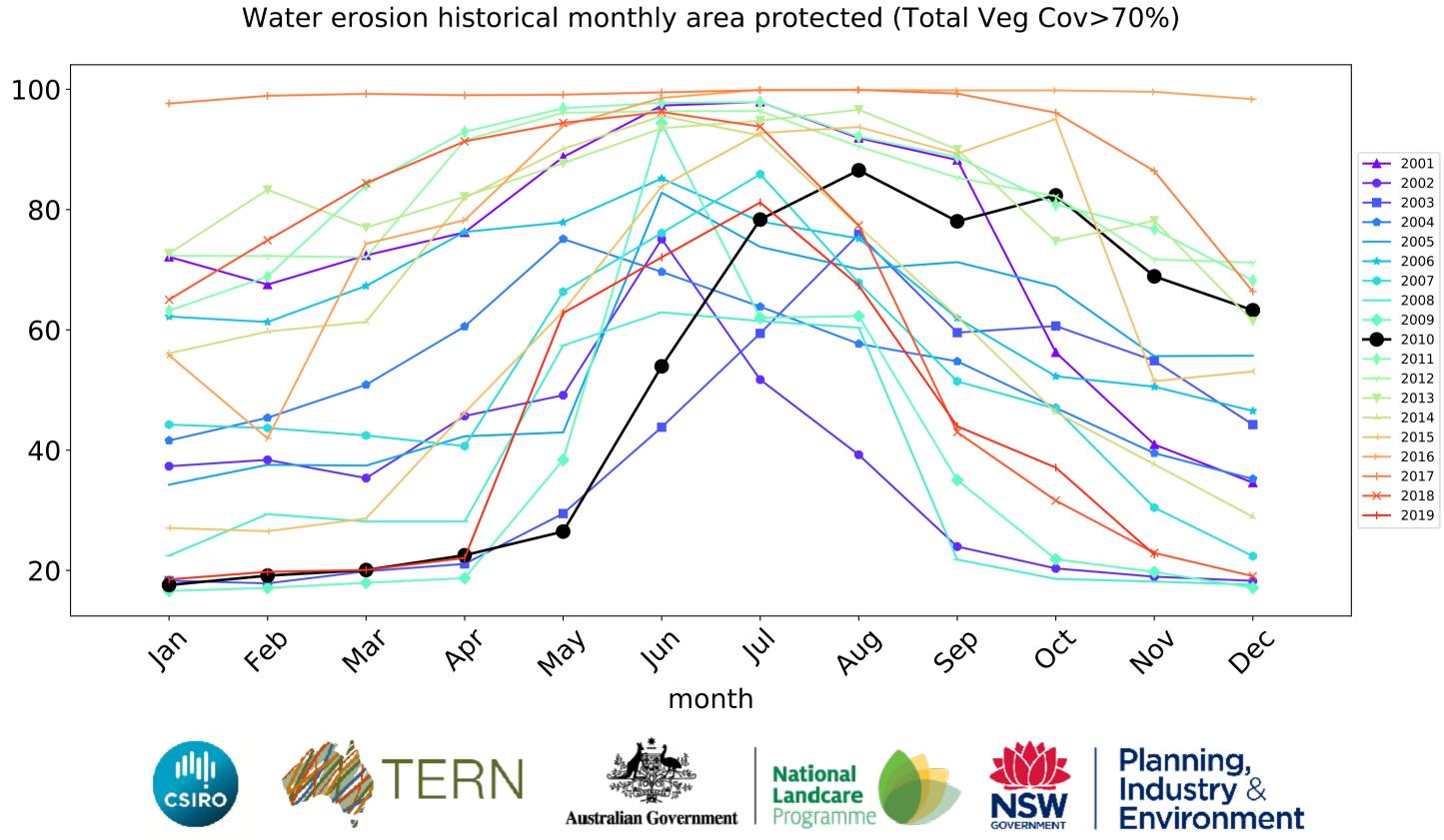


## **Conservation and natural environments non forest timeseries**

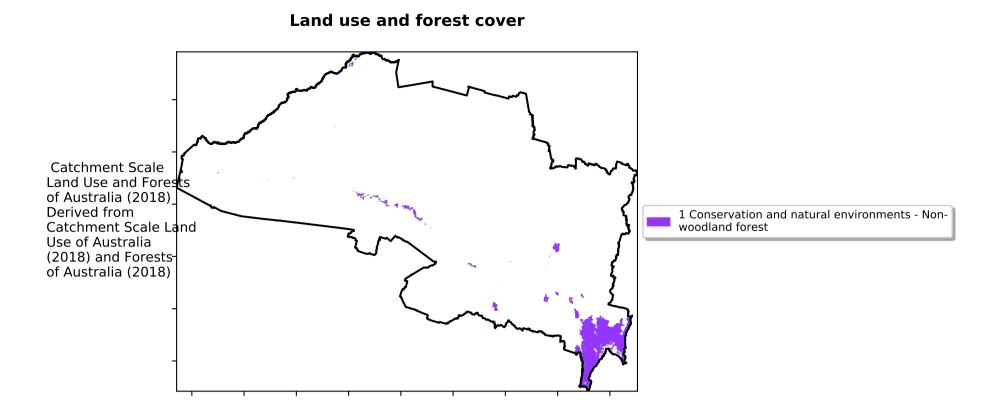




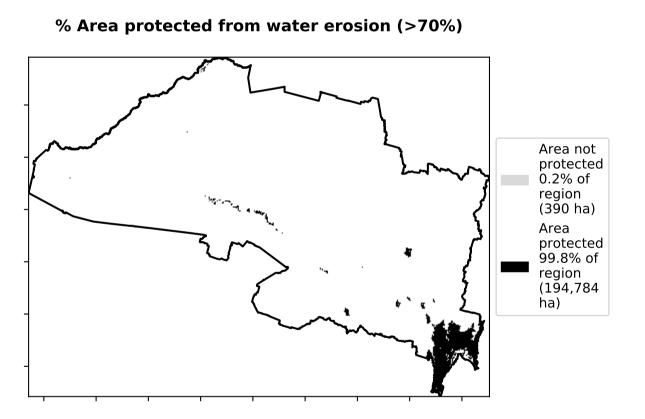


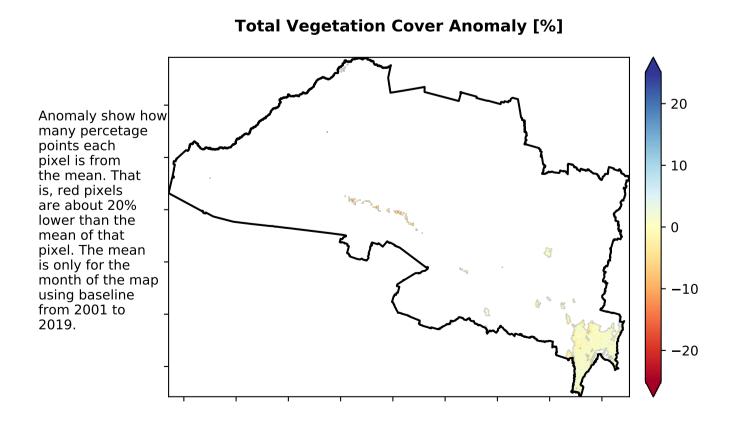


# **Conservation and natural environments Forest (non woodland)**

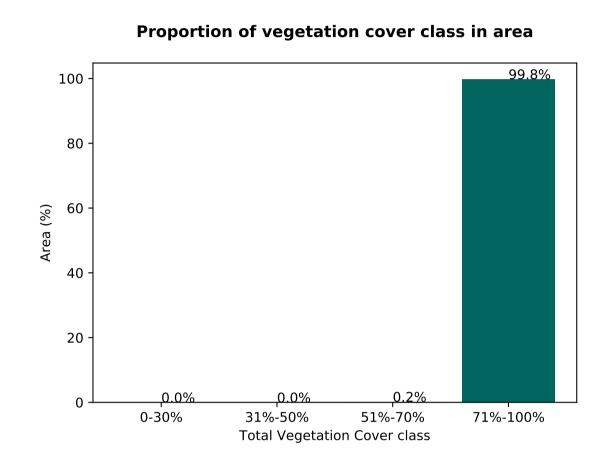


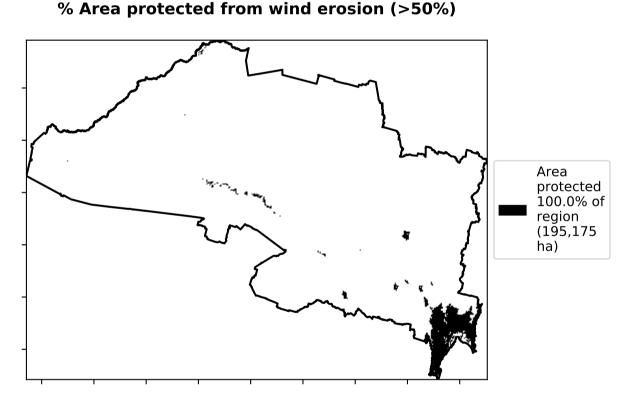
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trolo Indolo Trol

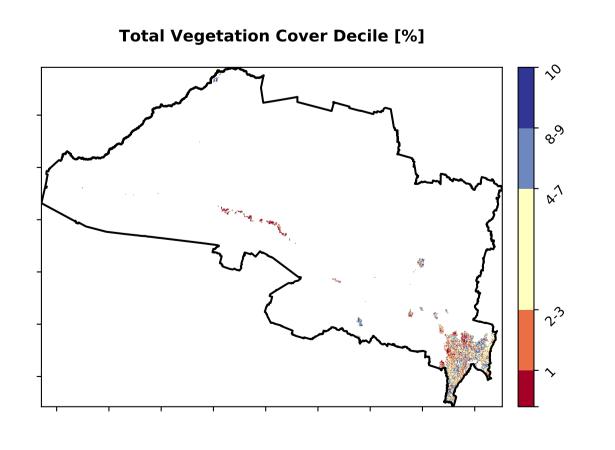




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









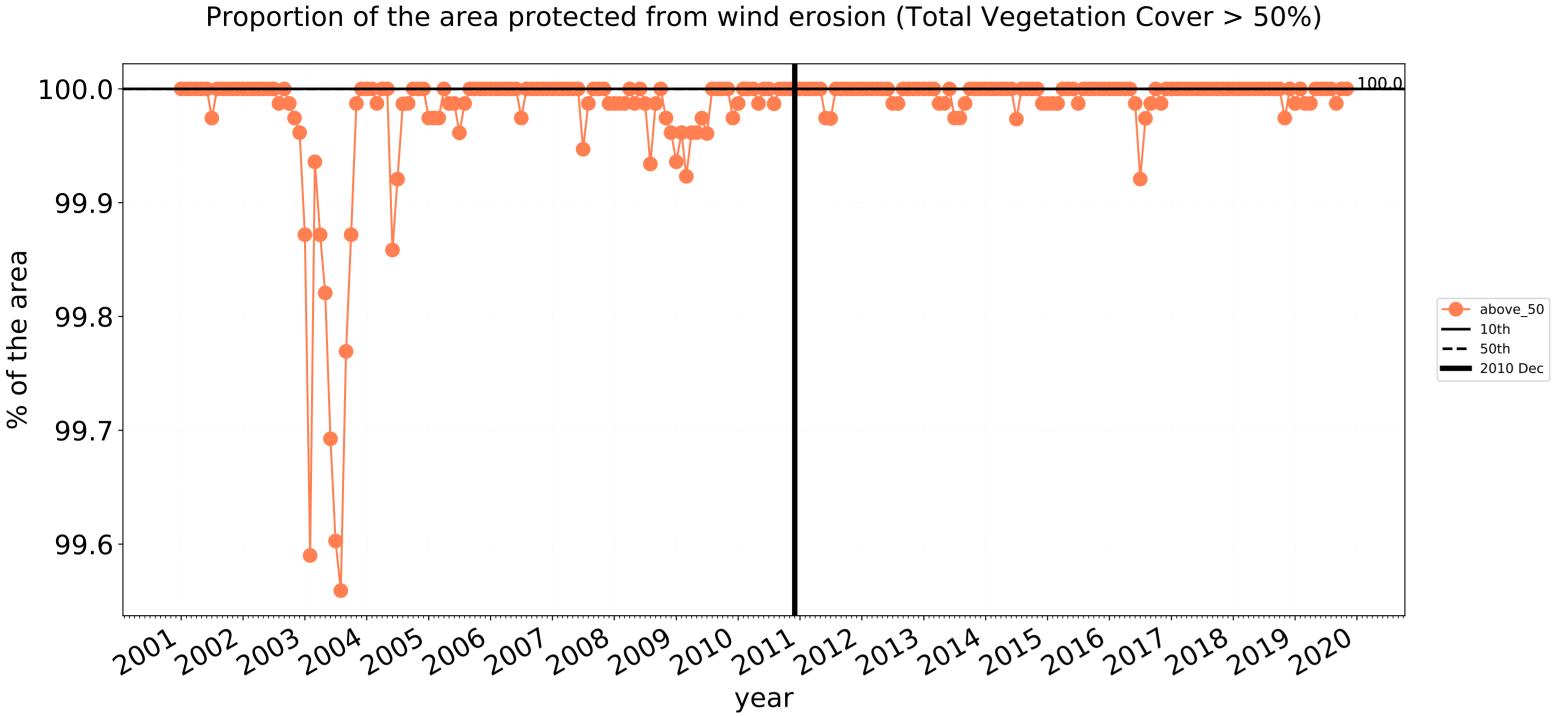


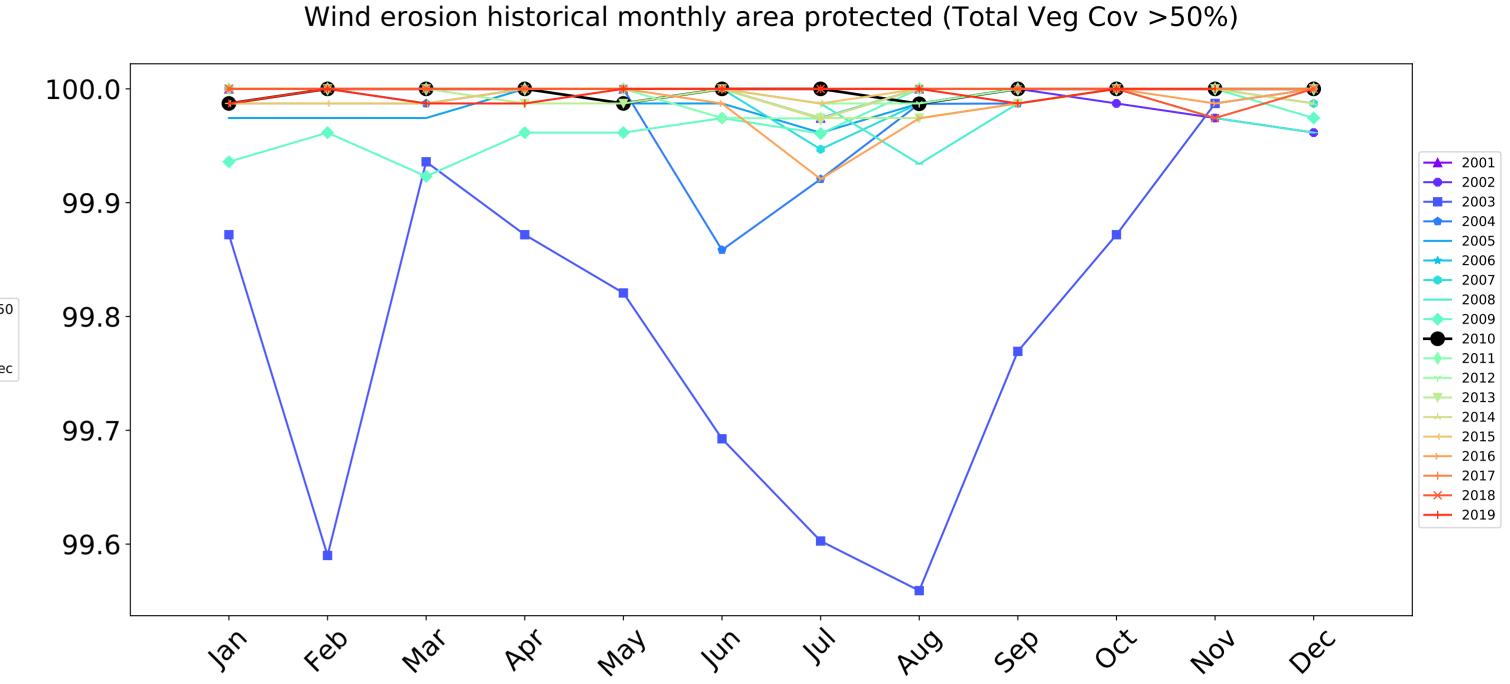




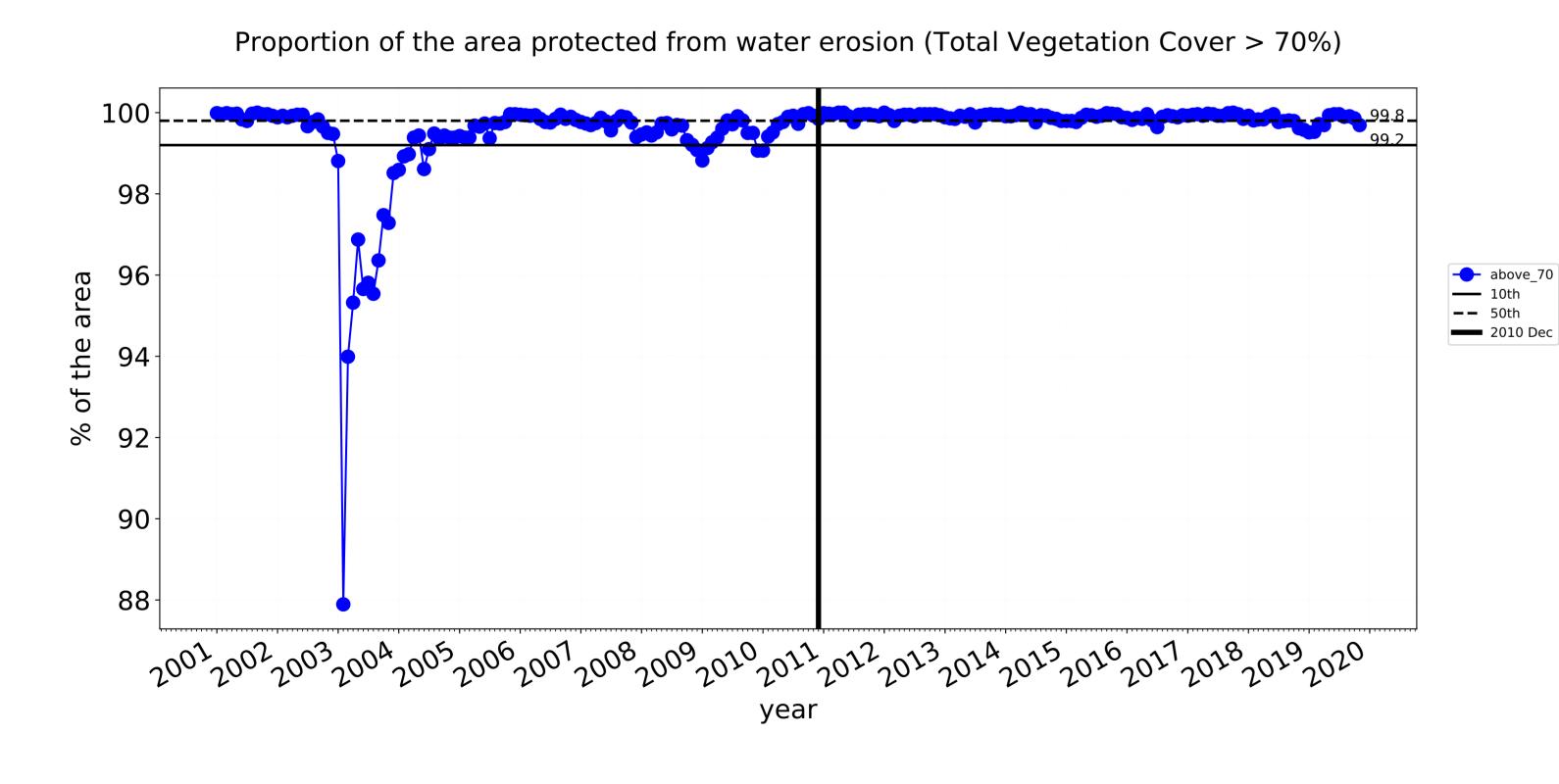


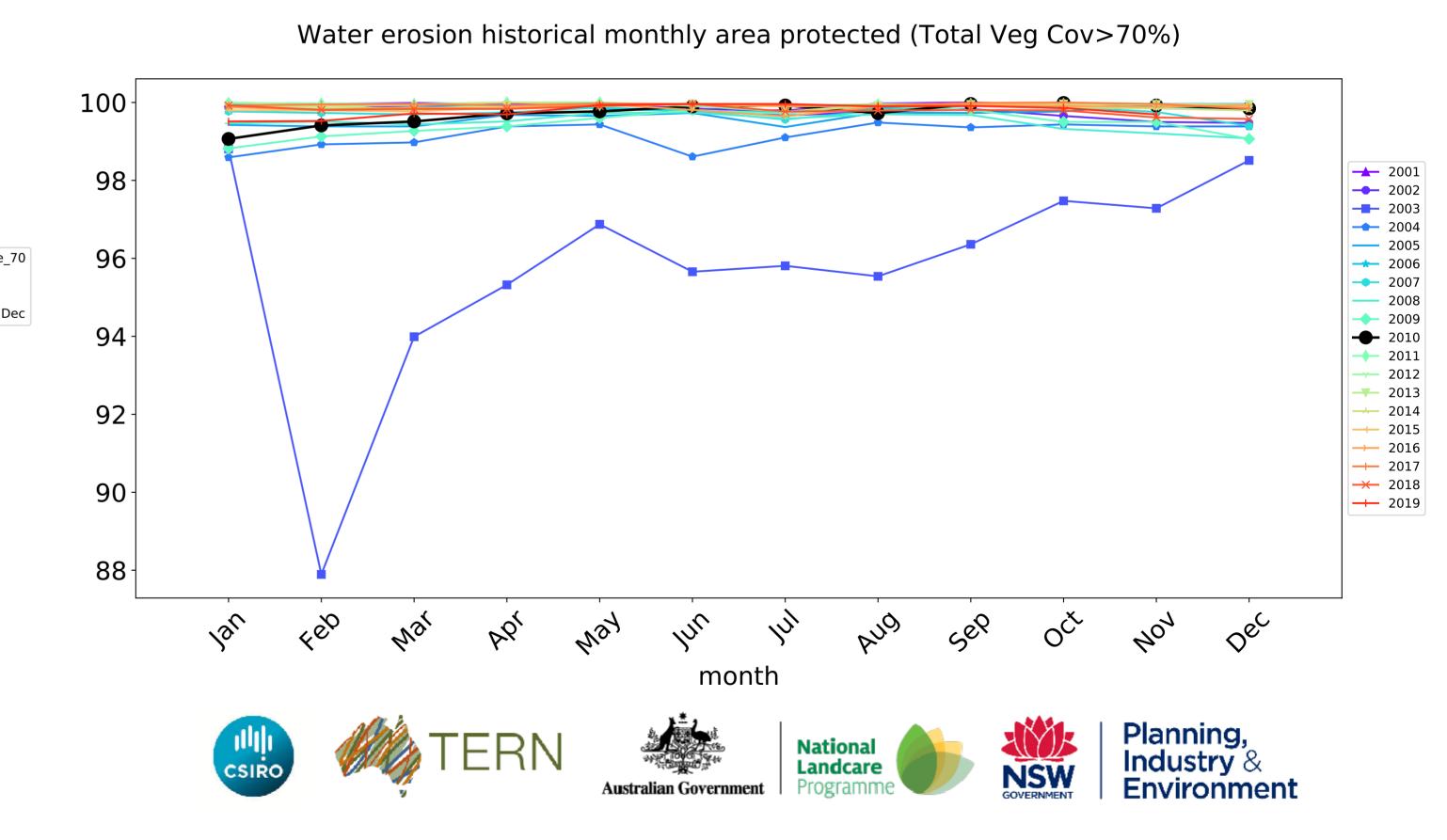






month

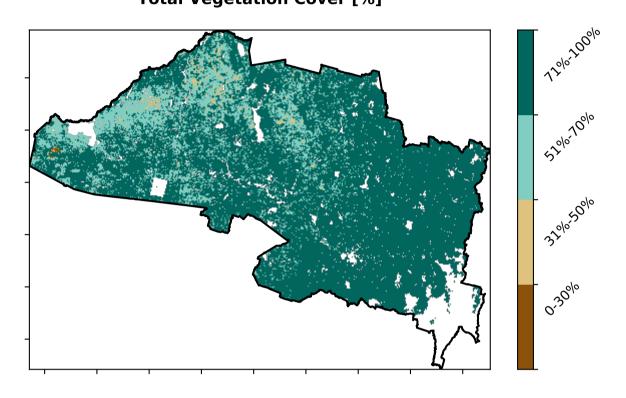




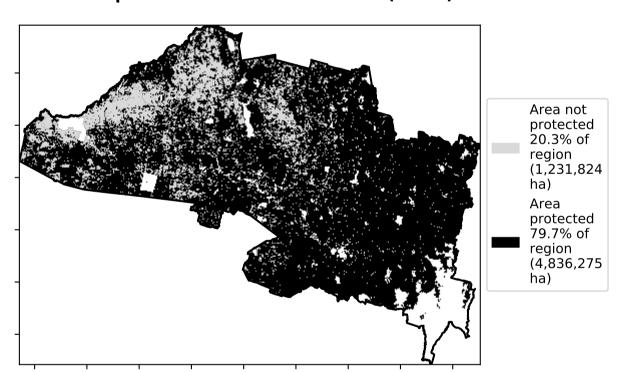
## **Agriculture**

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

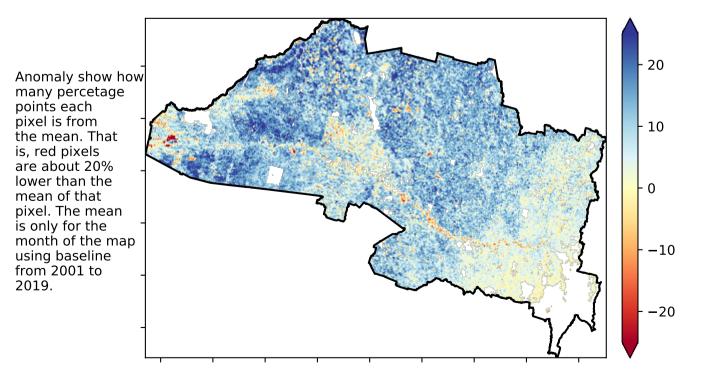
## Total Vegetation Cover [%]



% Area protected from water erosion (>70%)

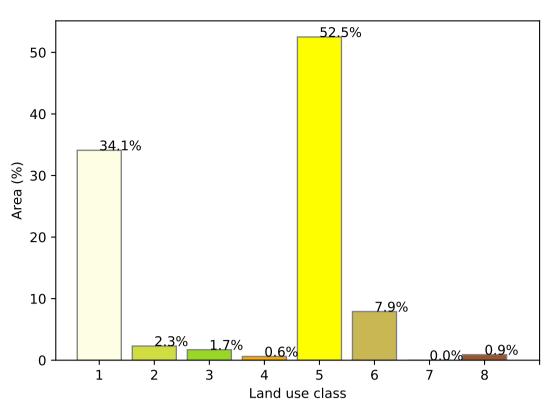


Total Vegetation Cover Anomaly [%]

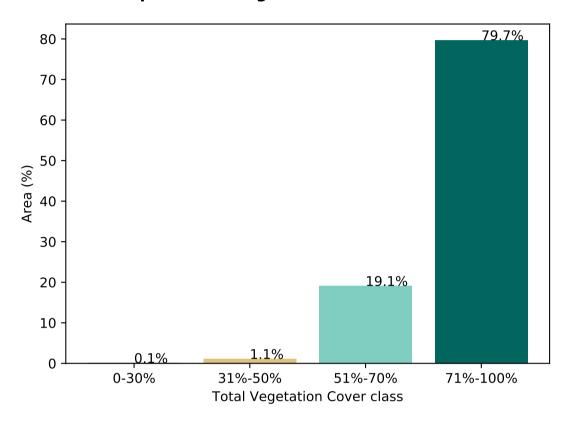


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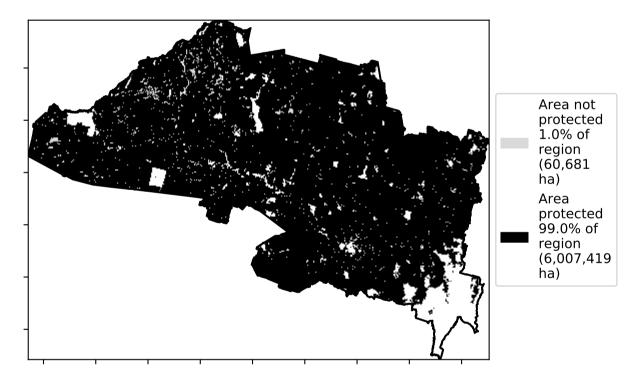
### Proportion of each land class in area

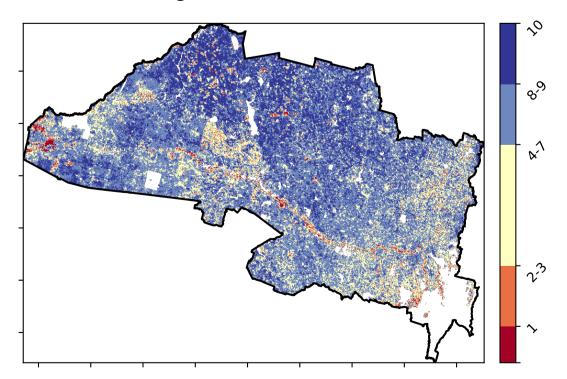


### **Proportion of vegetation cover class in area**



% Area protected from wind erosion (>50%)









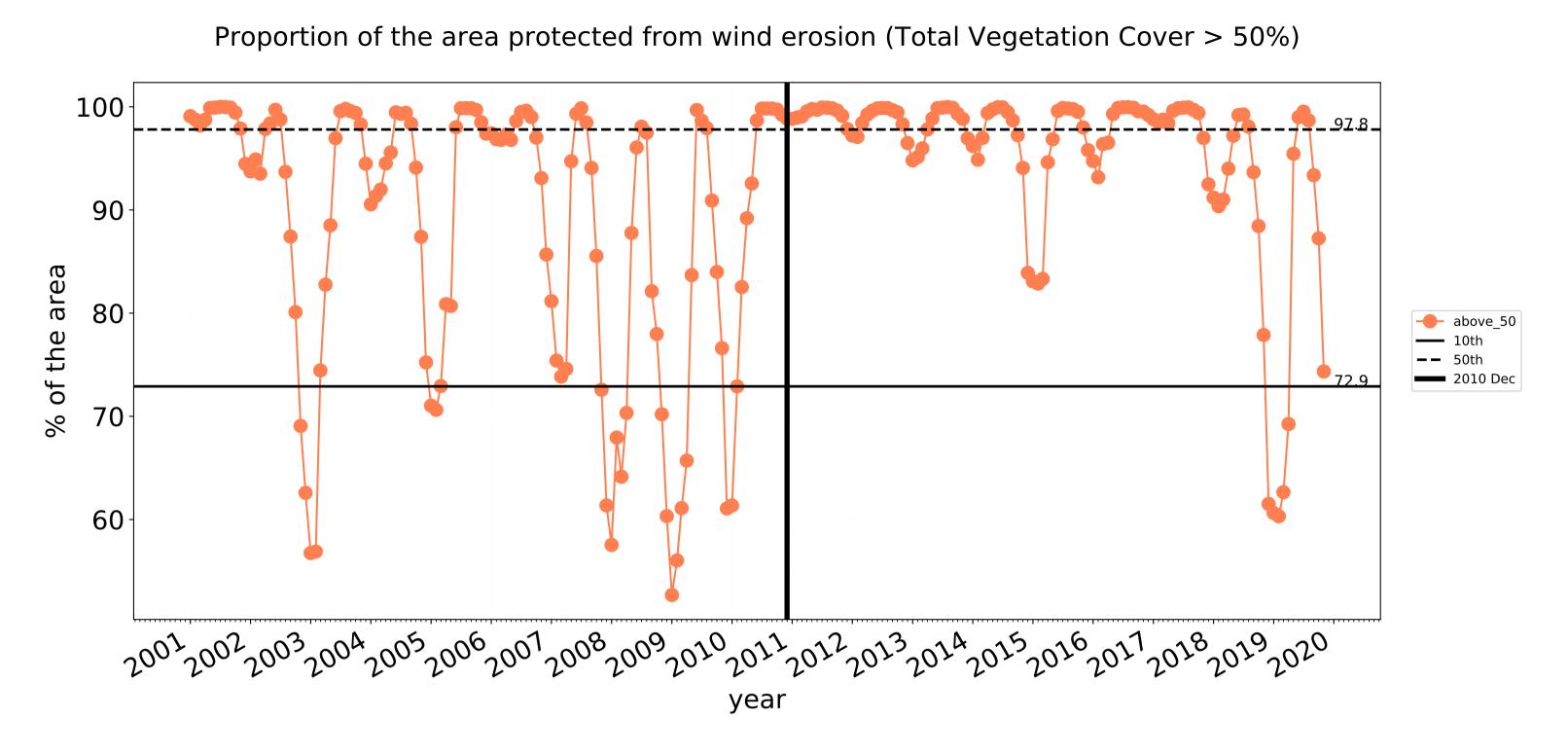


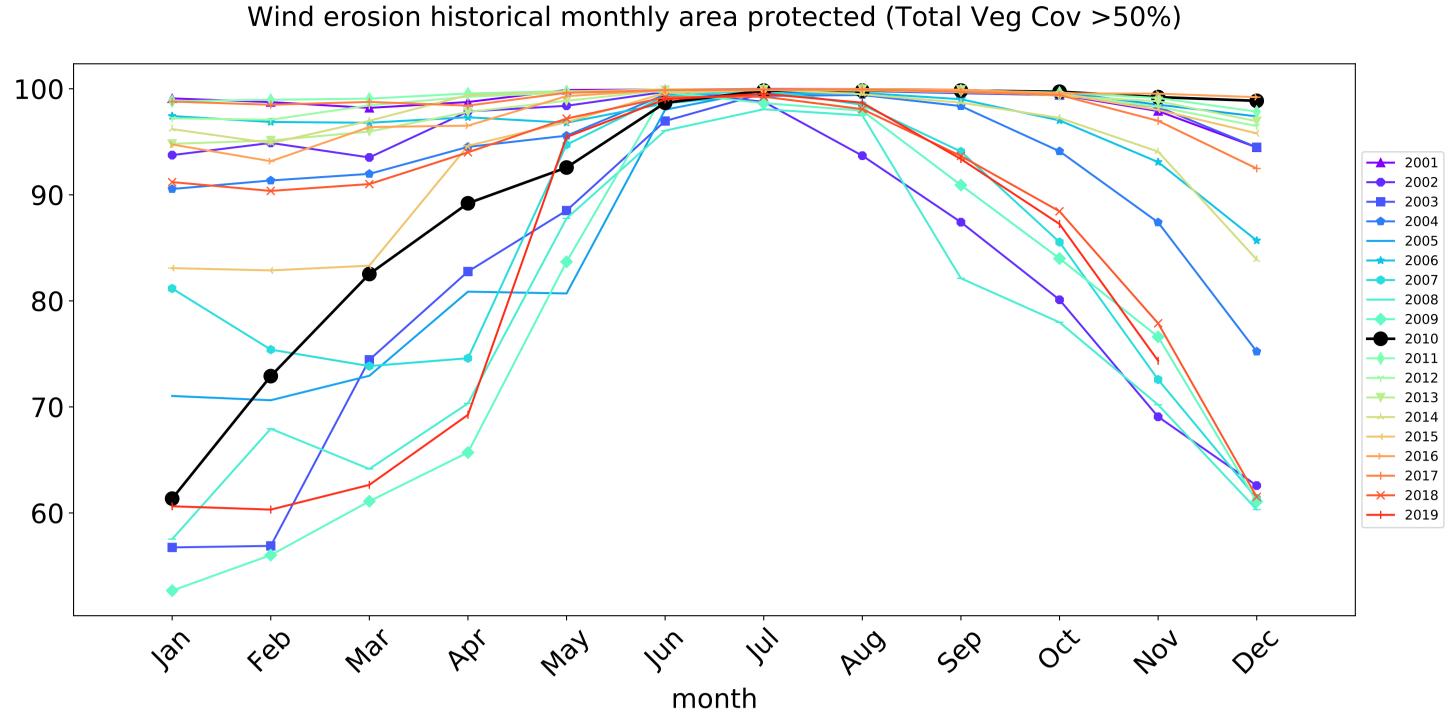


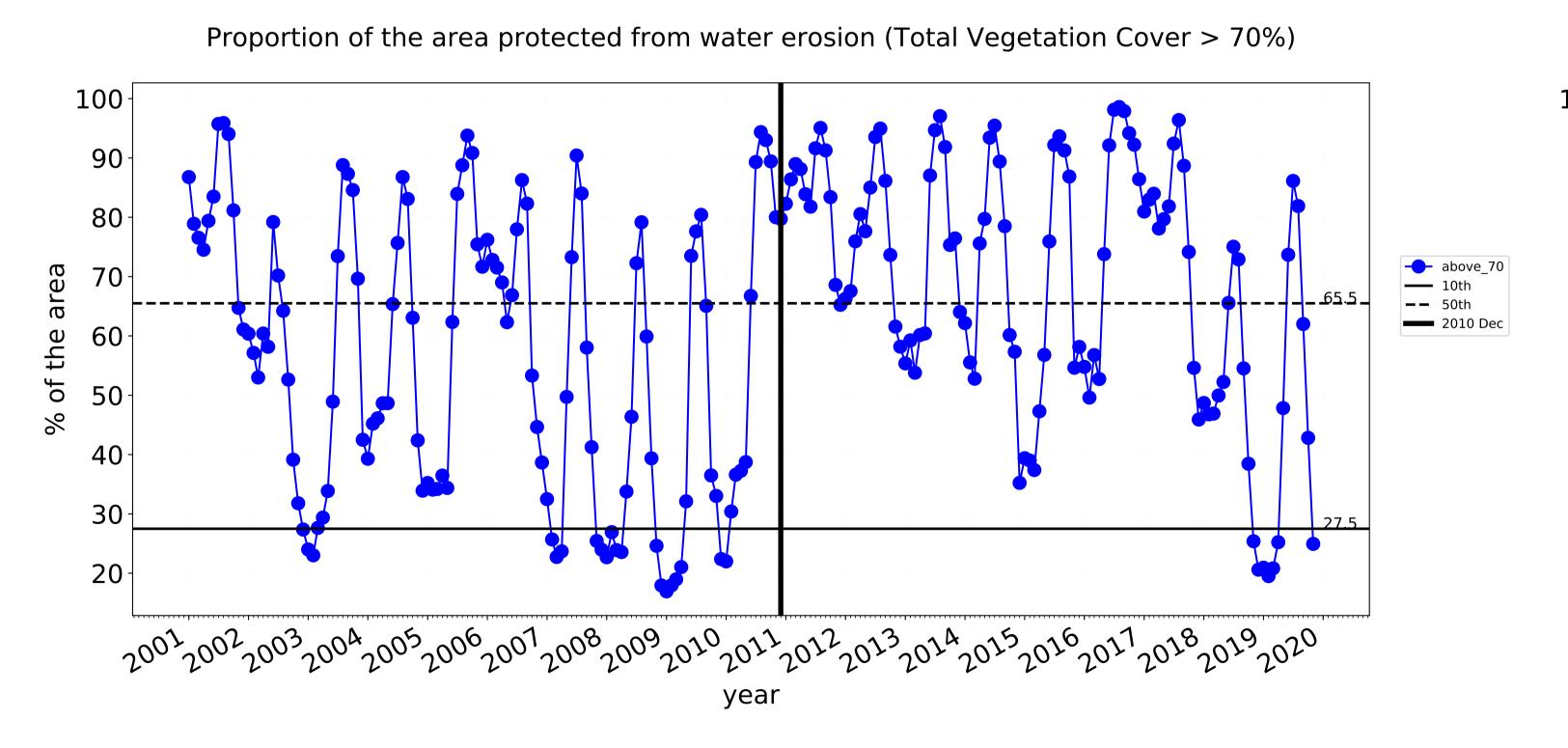


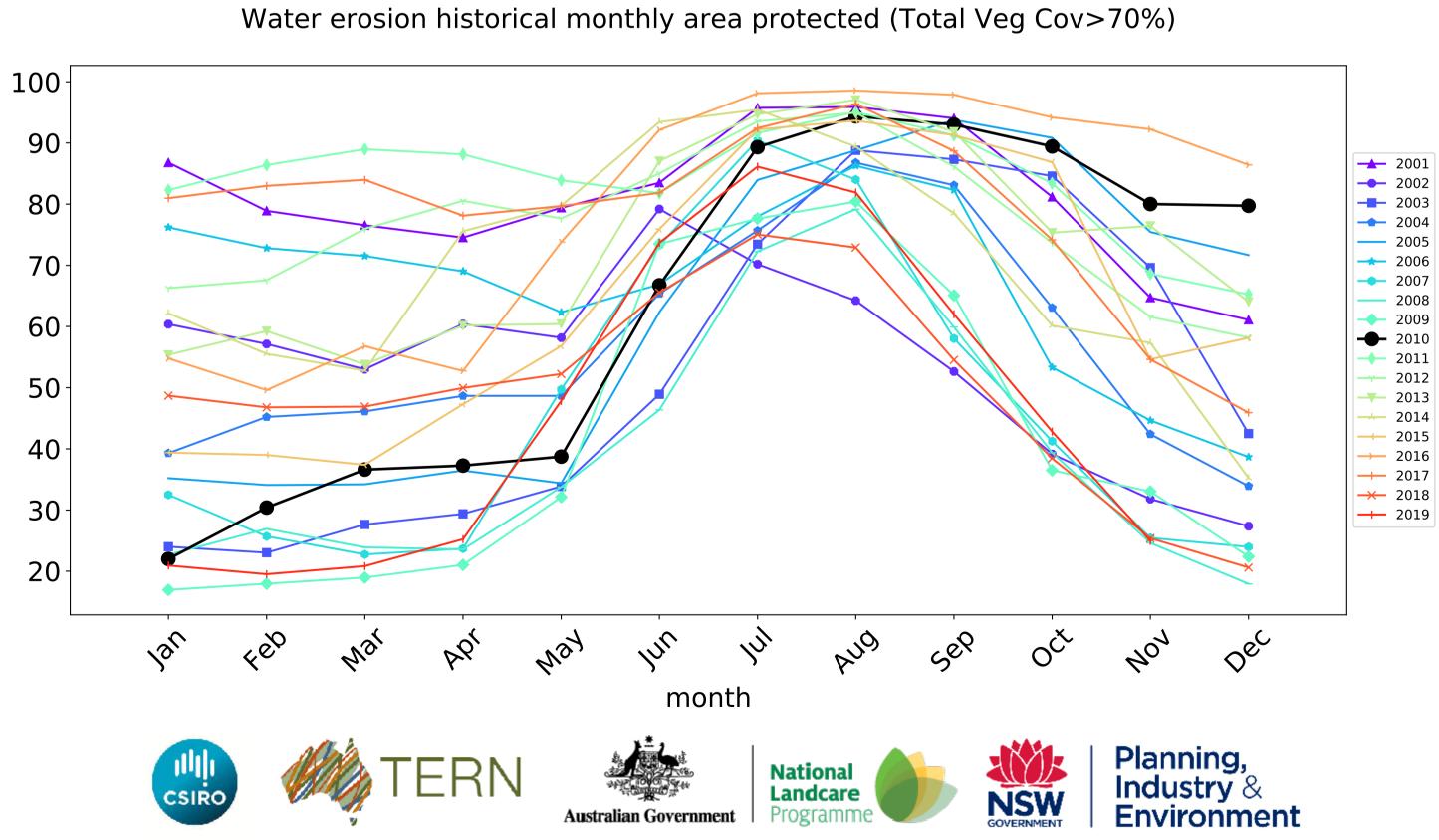


# **Agriculture timeseries**





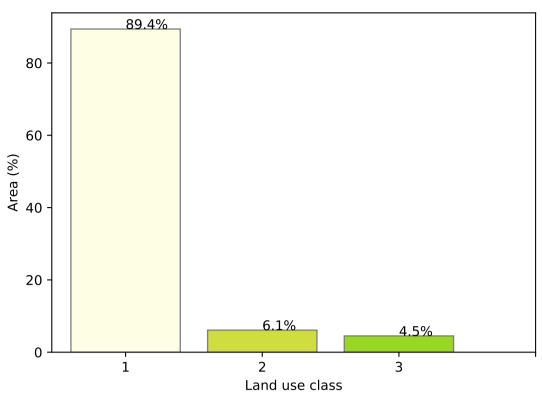




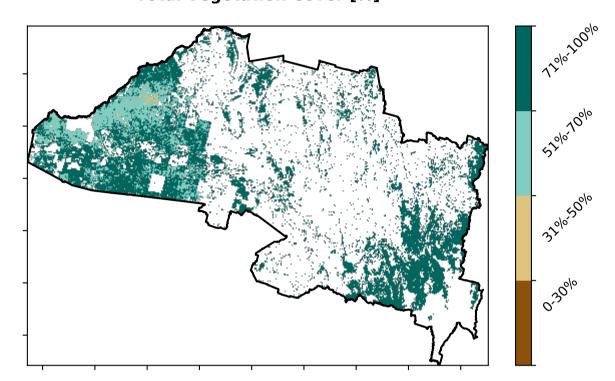
# **Grazing**

# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest of Australia (2018)

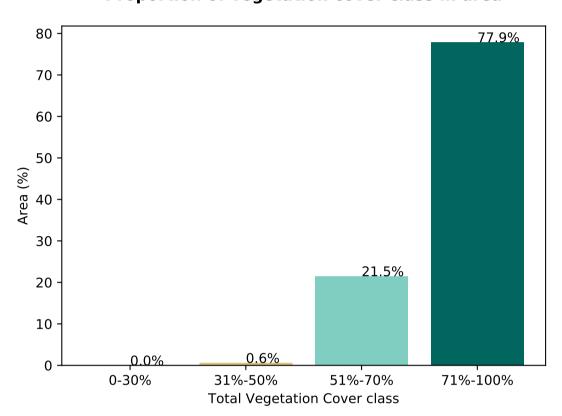
# Proportion of each land class in area



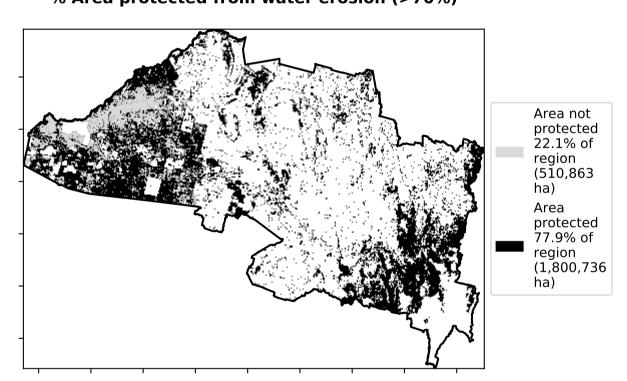




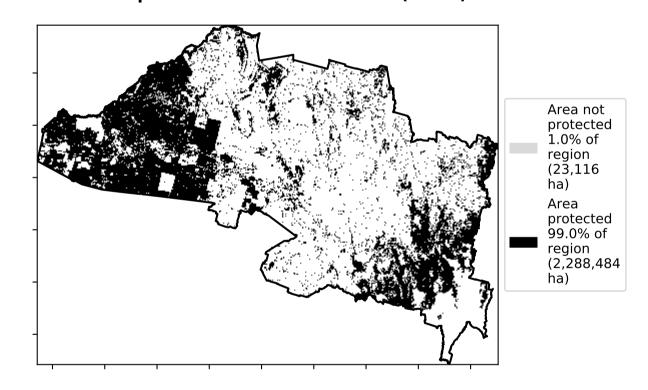
Proportion of vegetation cover class in area



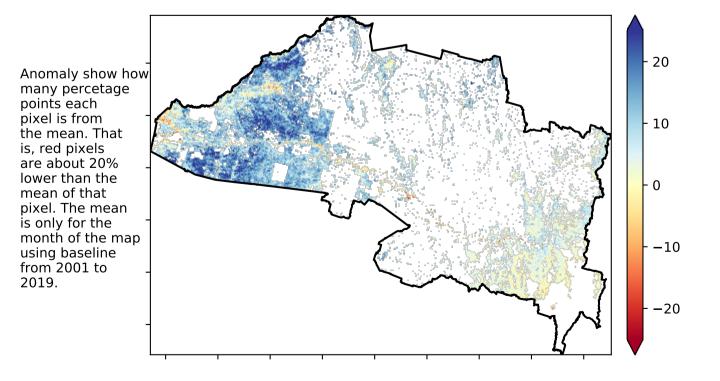
## % Area protected from water erosion (>70%)



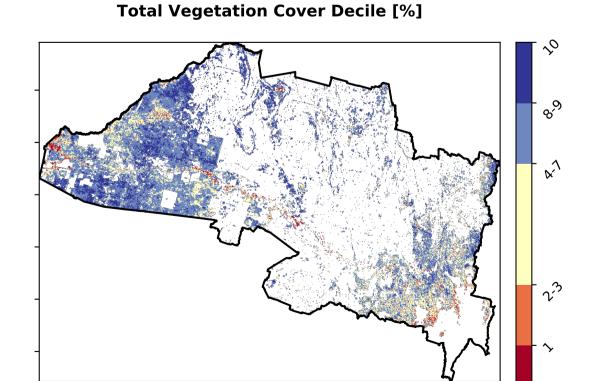
% Area protected from wind erosion (>50%)



### Total Vegetation Cover Anomaly [%]



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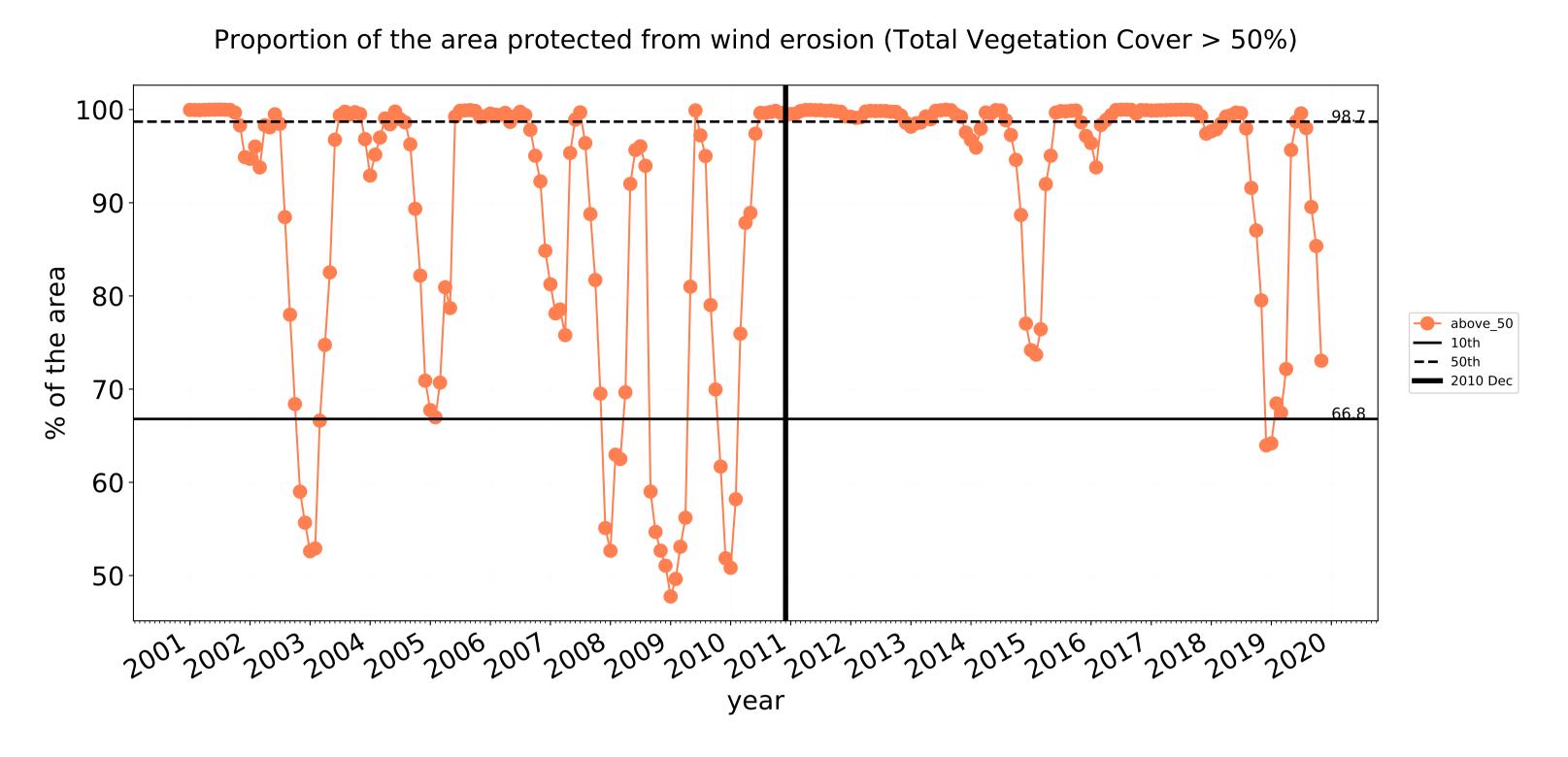


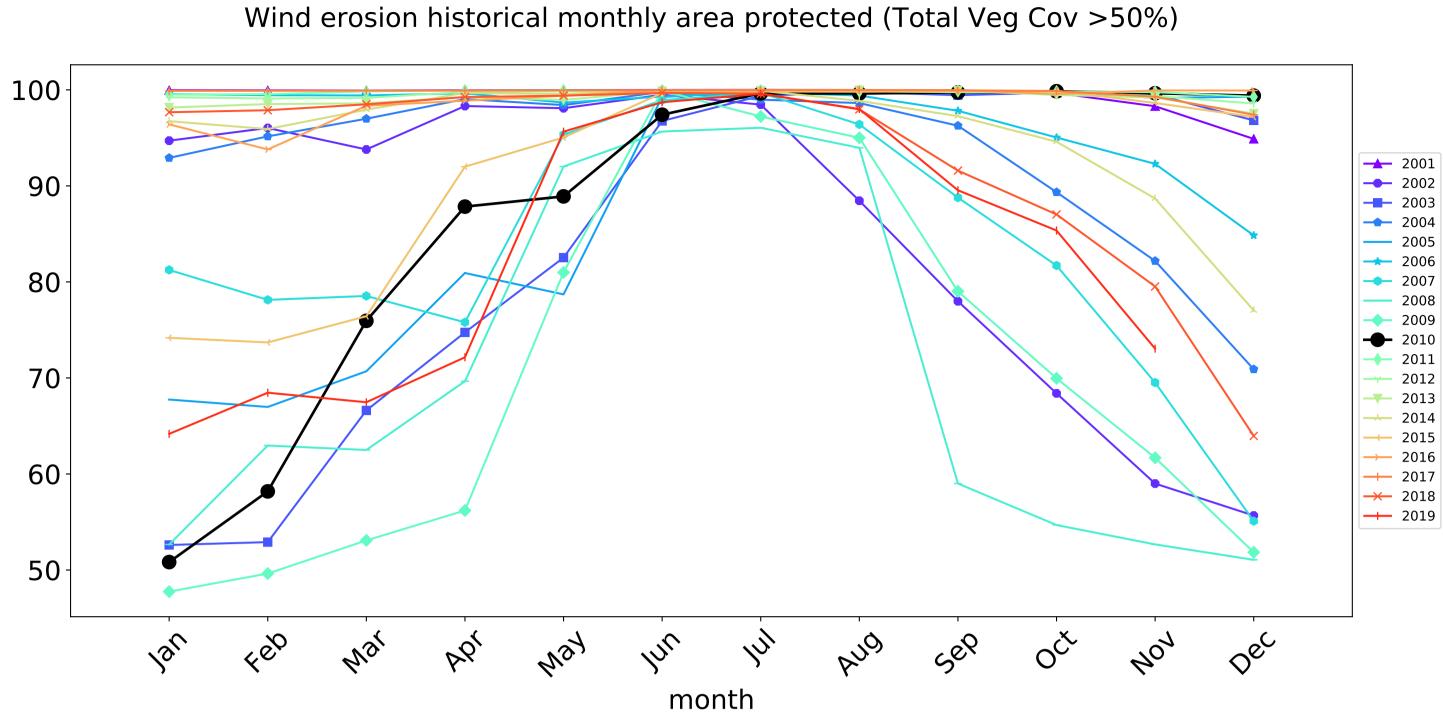


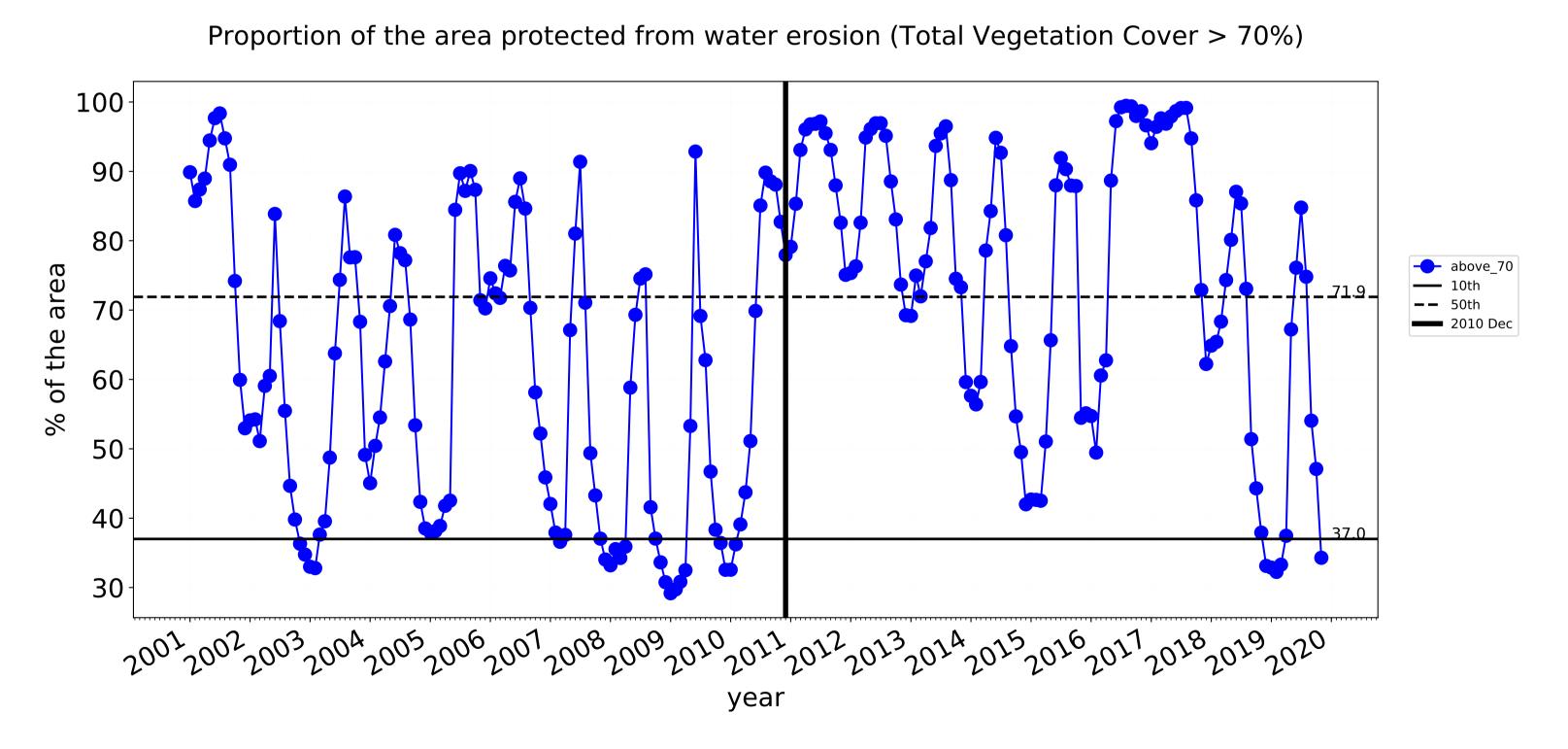


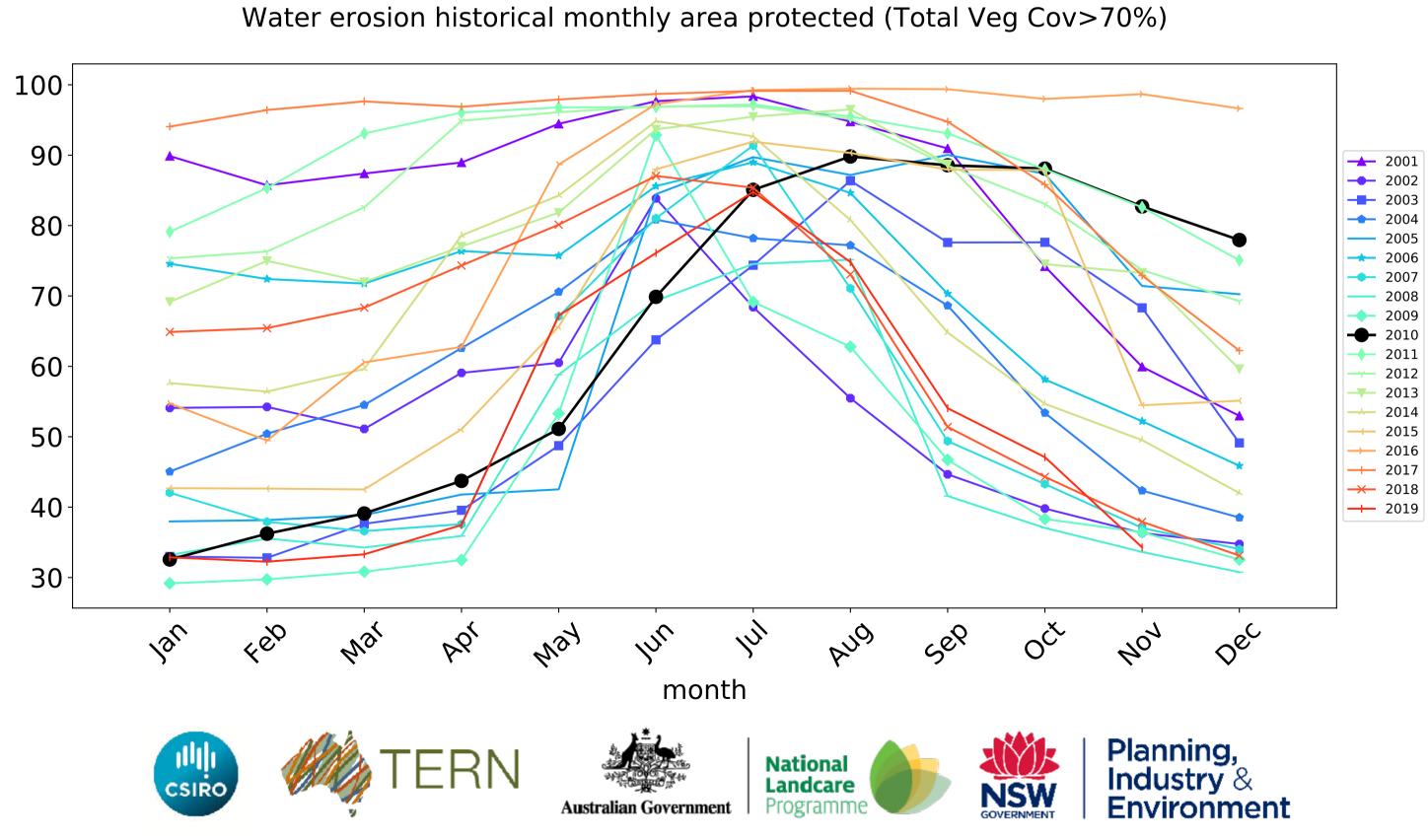


# **Grazing timeseries**



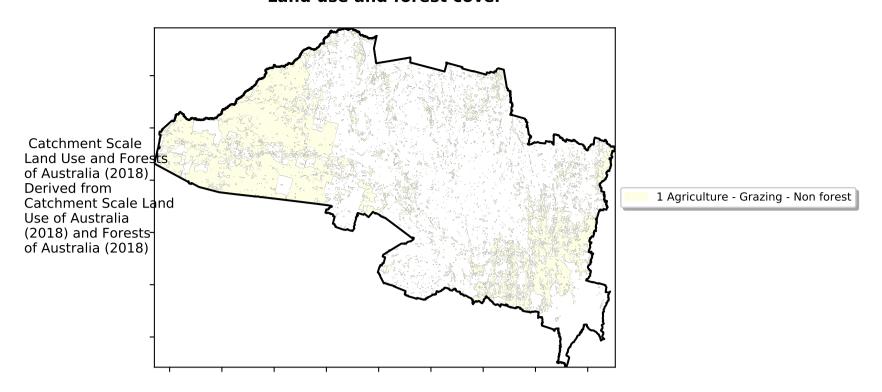




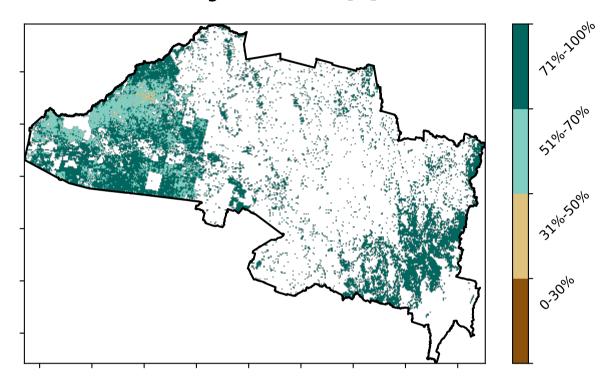


## **Grazing non forest**

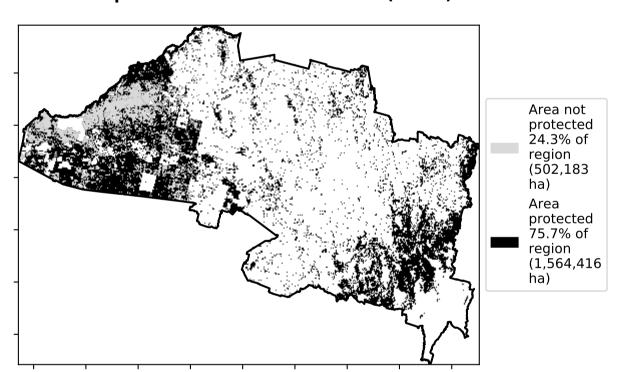
### Land use and forest cover



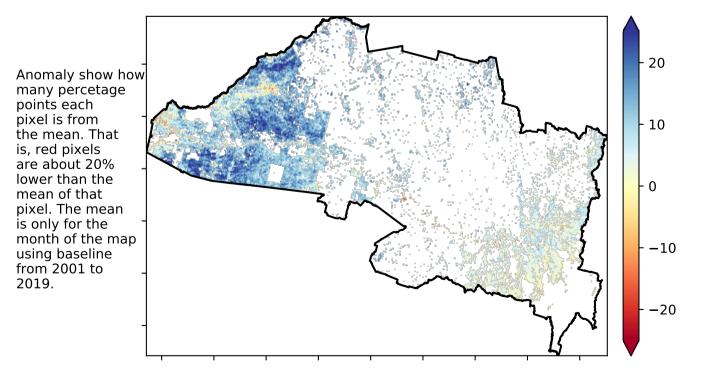
### **Total Vegetation Cover [%]**



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

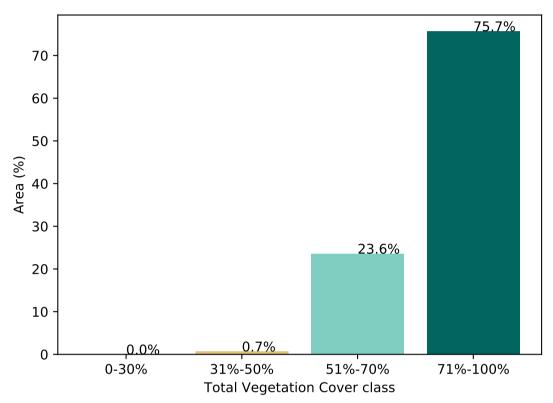


### Total Vegetation Cover Anomaly [%]

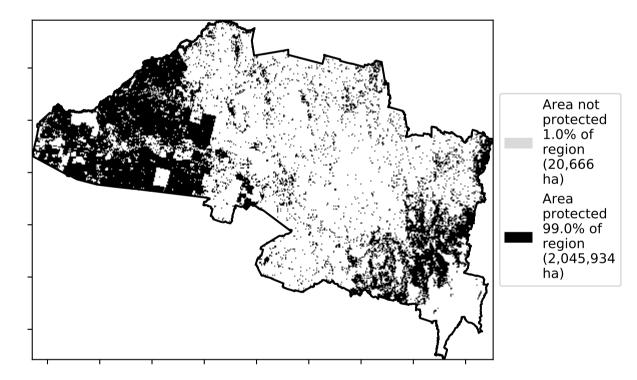


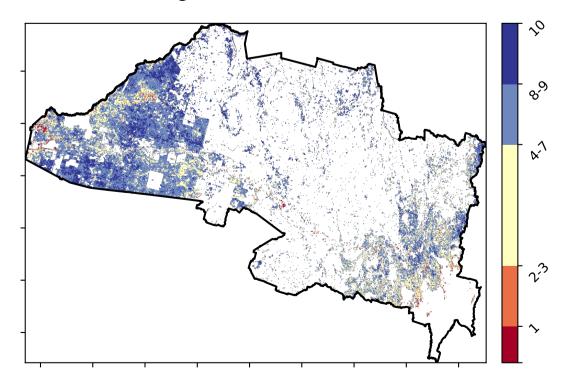
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## Proportion of vegetation cover class in area



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









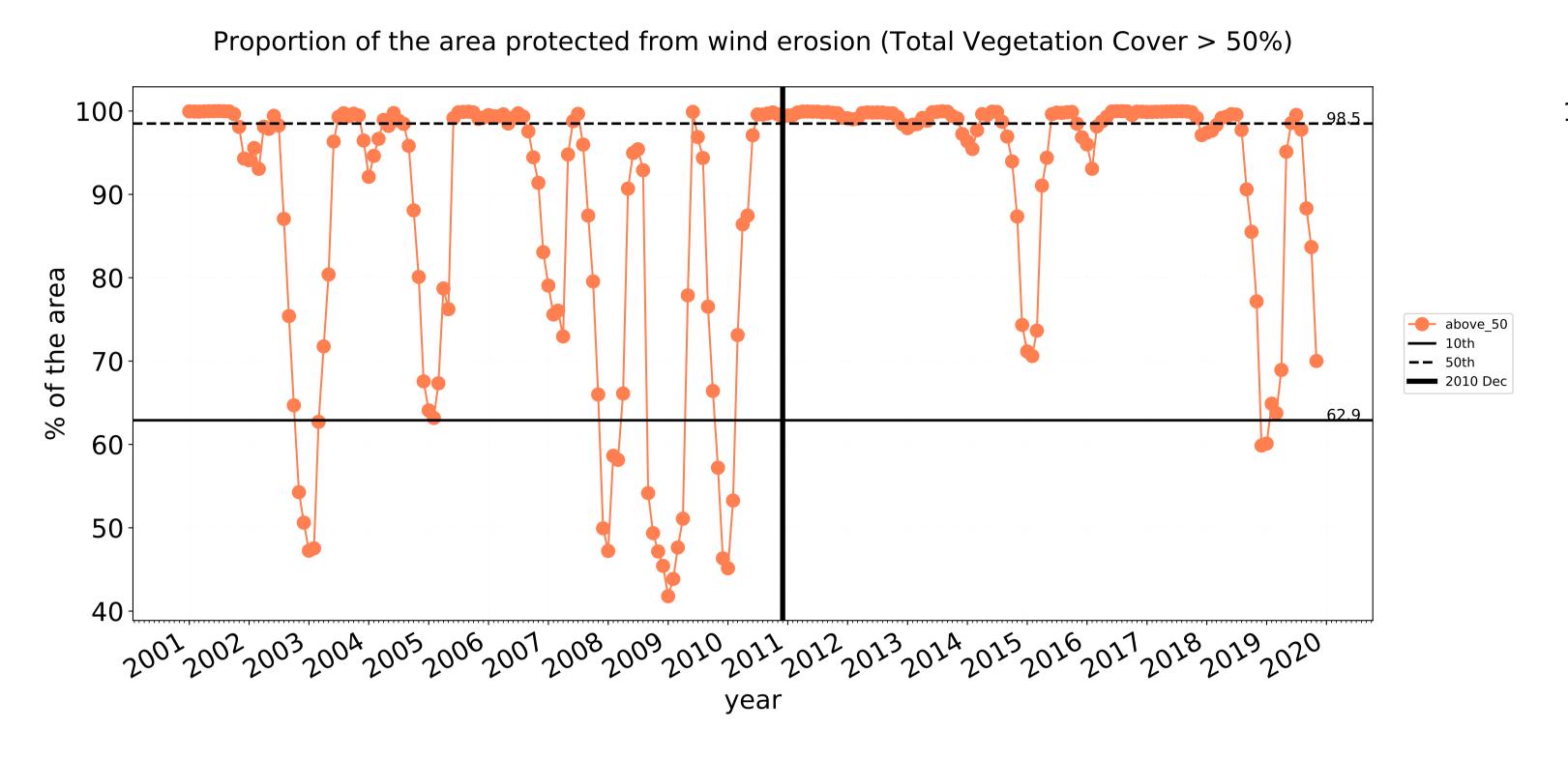


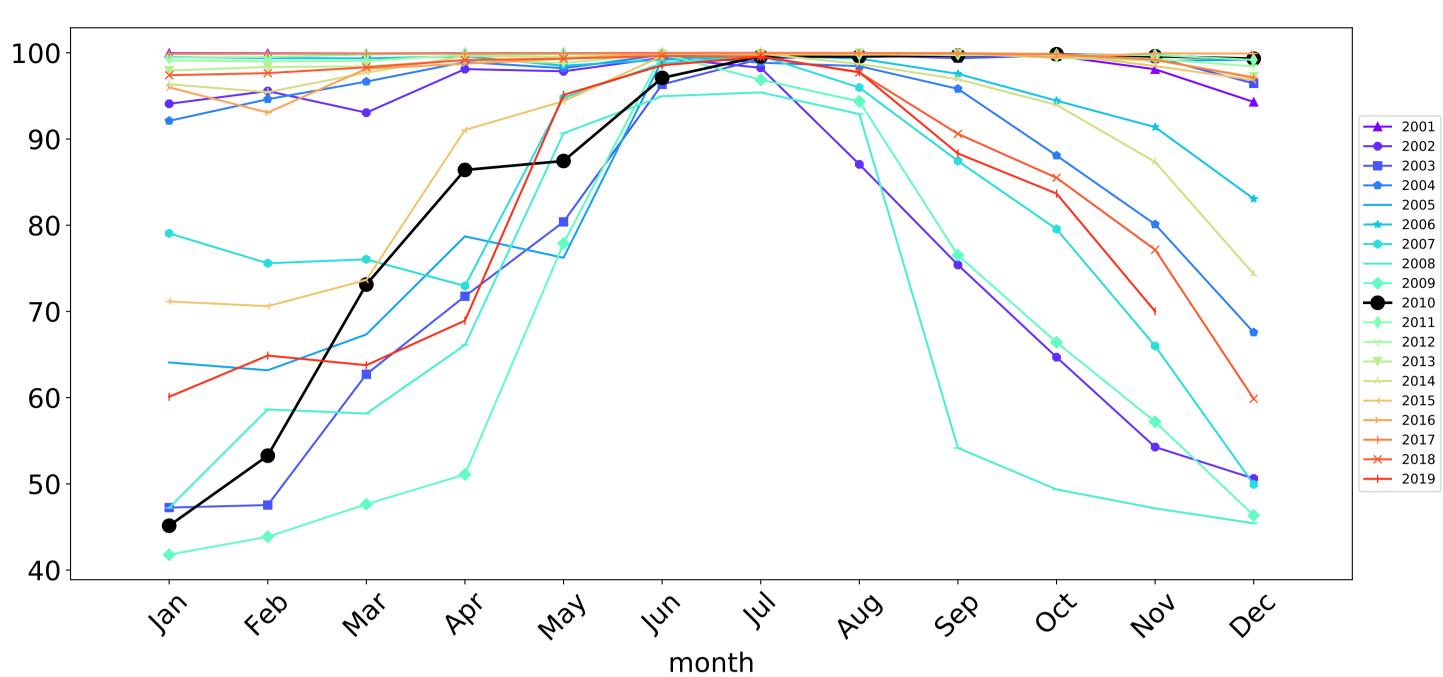




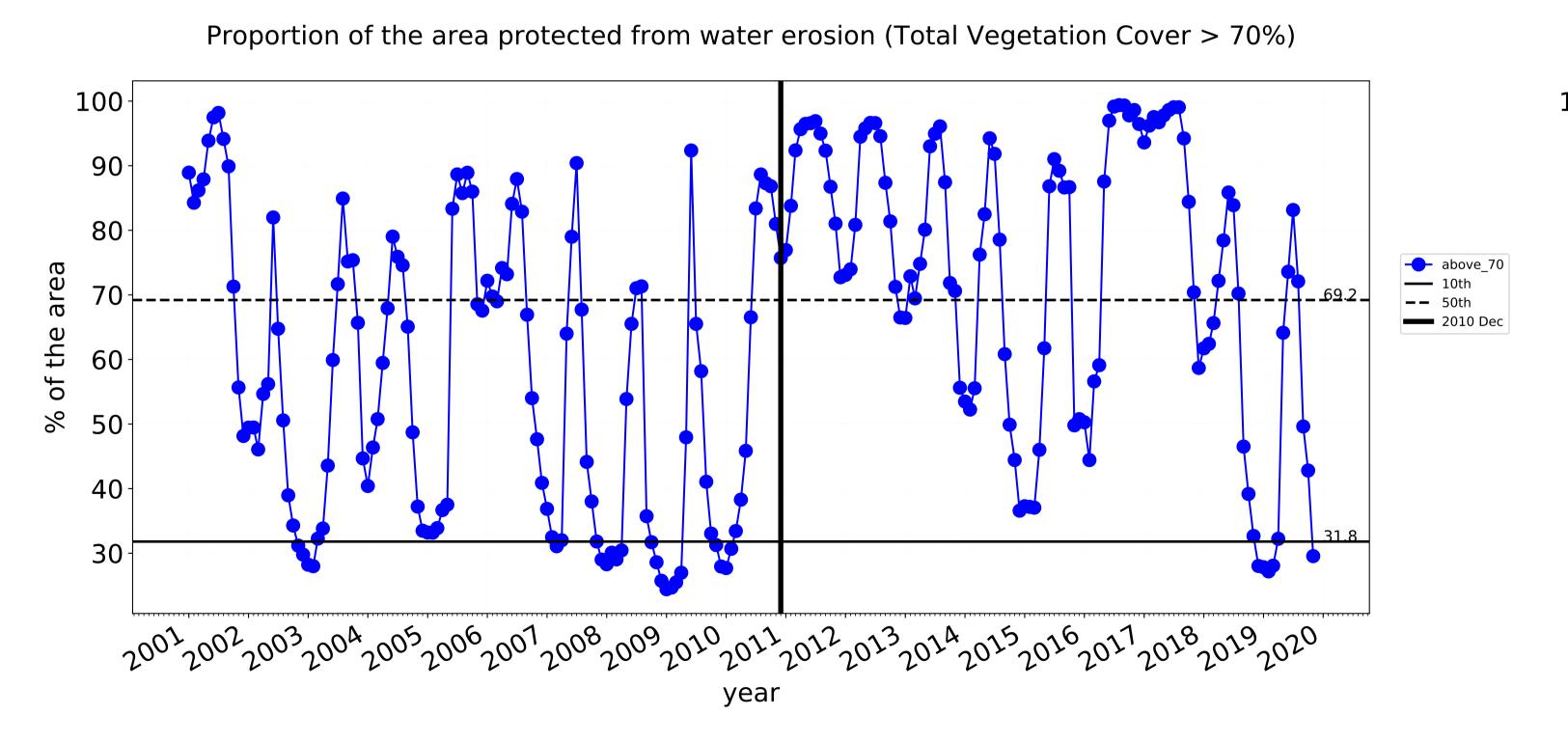


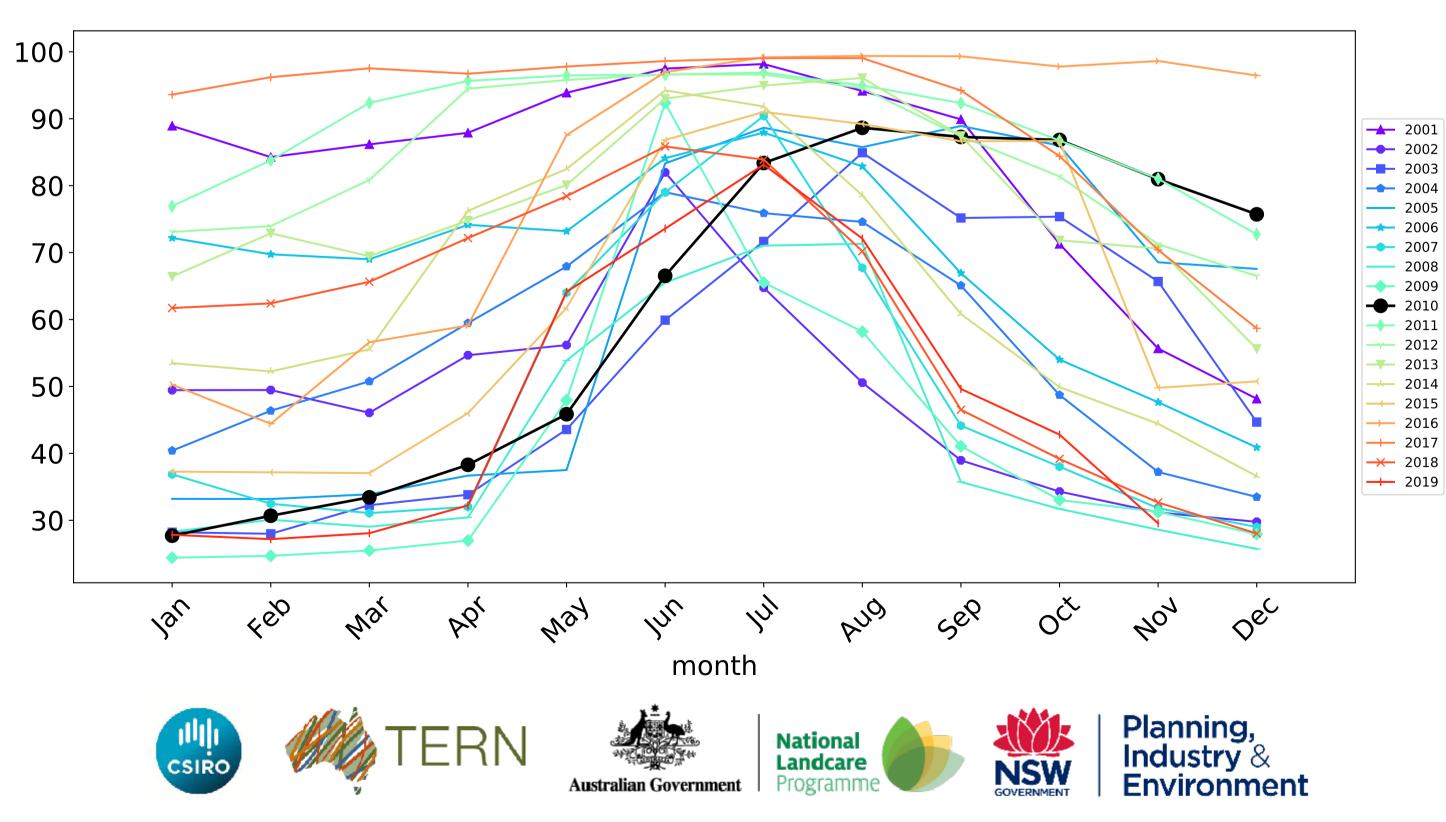
# **Grazing non forest timeseries**





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

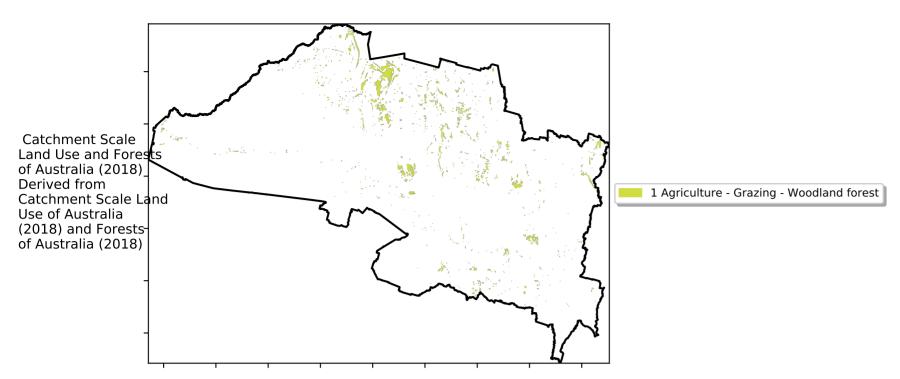




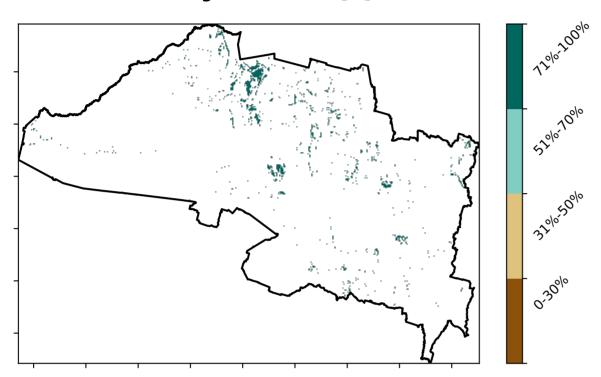
Water erosion historical monthly area protected (Total Veg Cov>70%)

# **Grazing Woodland forest**

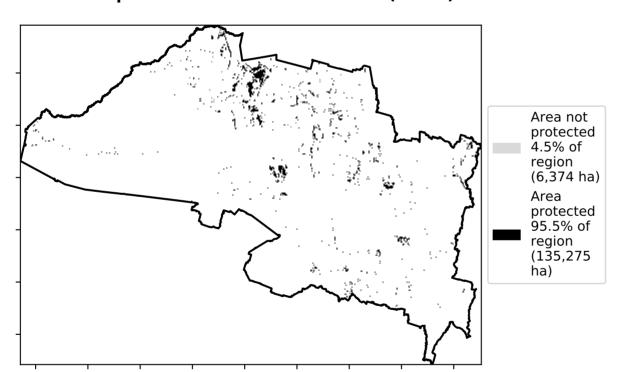
### Land use and forest cover



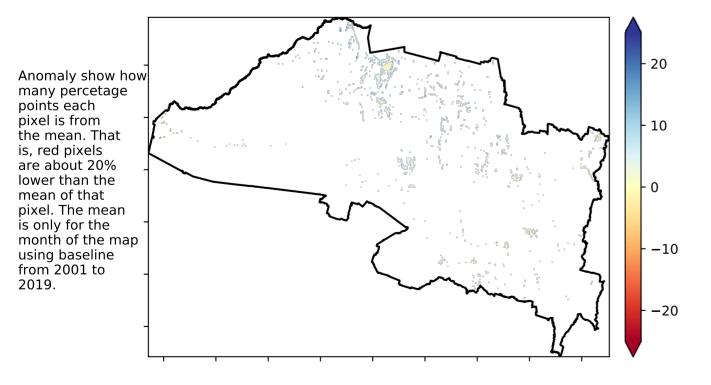
### **Total Vegetation Cover [%]**



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

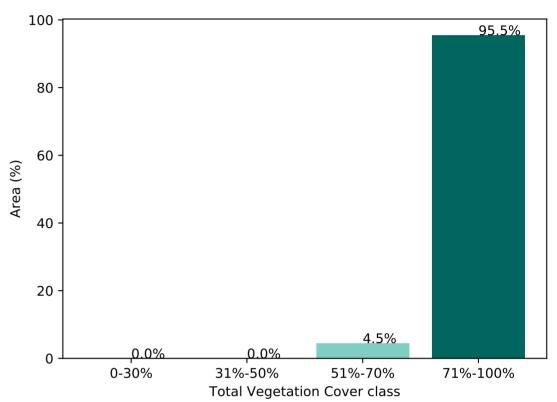


### Total Vegetation Cover Anomaly [%]

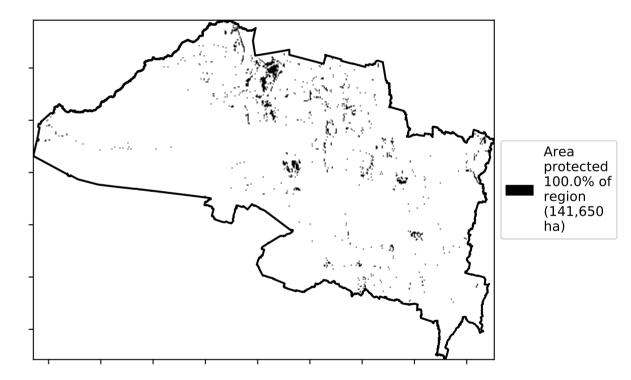


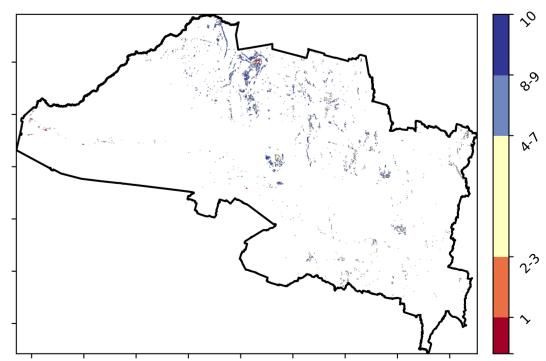
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









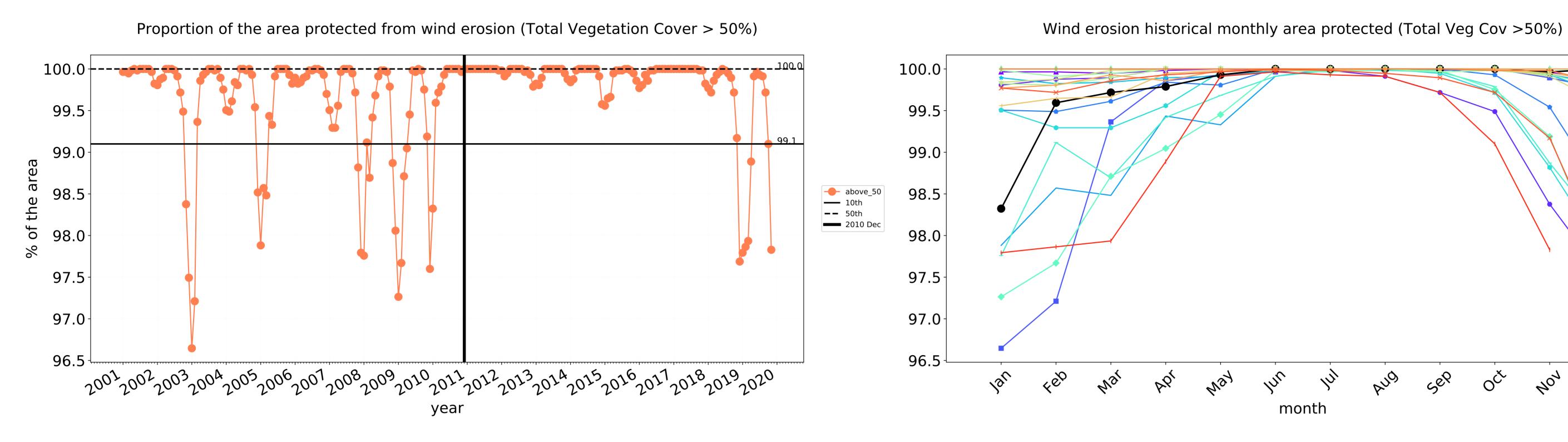


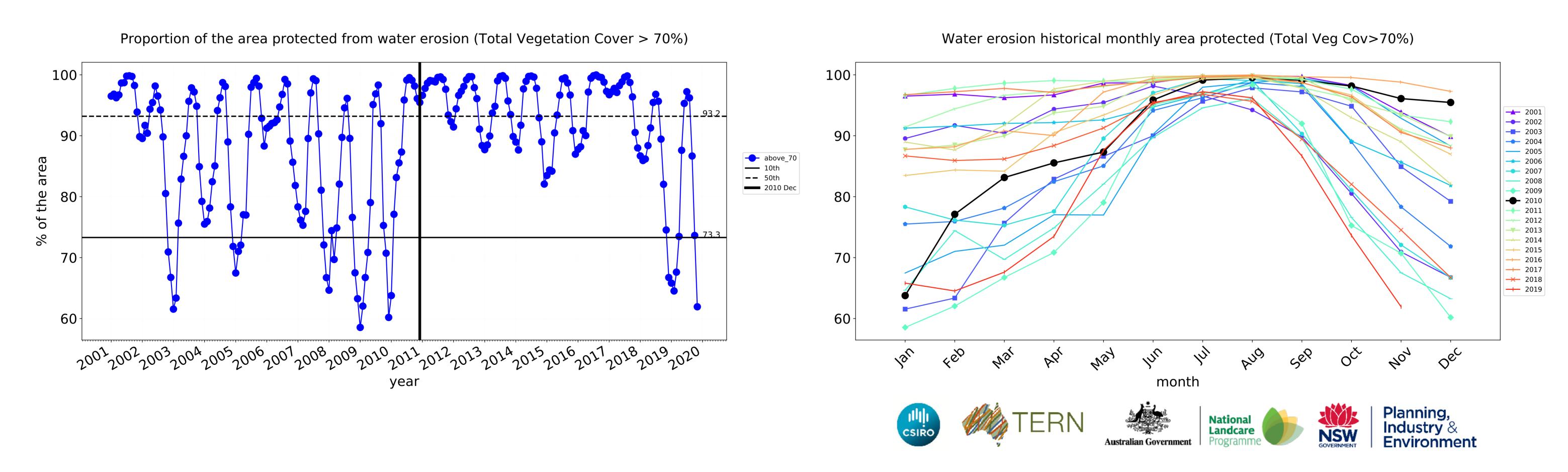






# **Grazing Woodland forest timeseries**





**→** 2011

**→** 2016

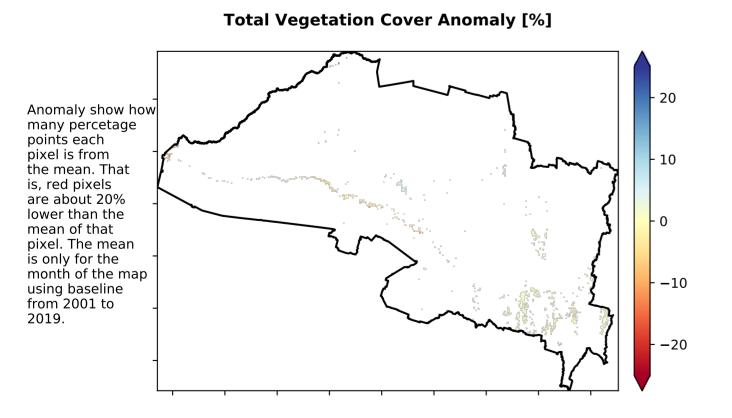
→ 2017→ 2018→ 2019

# **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)

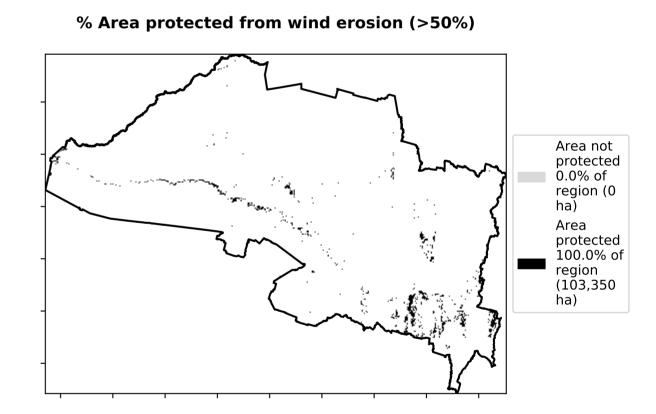
# Total Vegetation Cover [%]

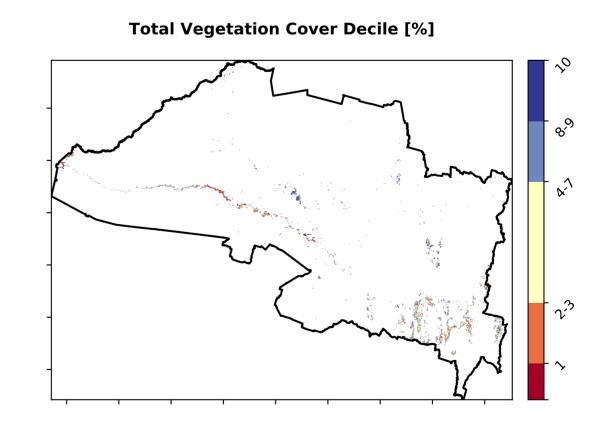
# % Area protected from water erosion (>70%) Area not protected 1.5% of region (1,550 ha) Area protected 98.5% of region (101,799 ha)



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 98.5% 98.5% 90.0% 0-30% 31%-50% Total Vegetation Cover class







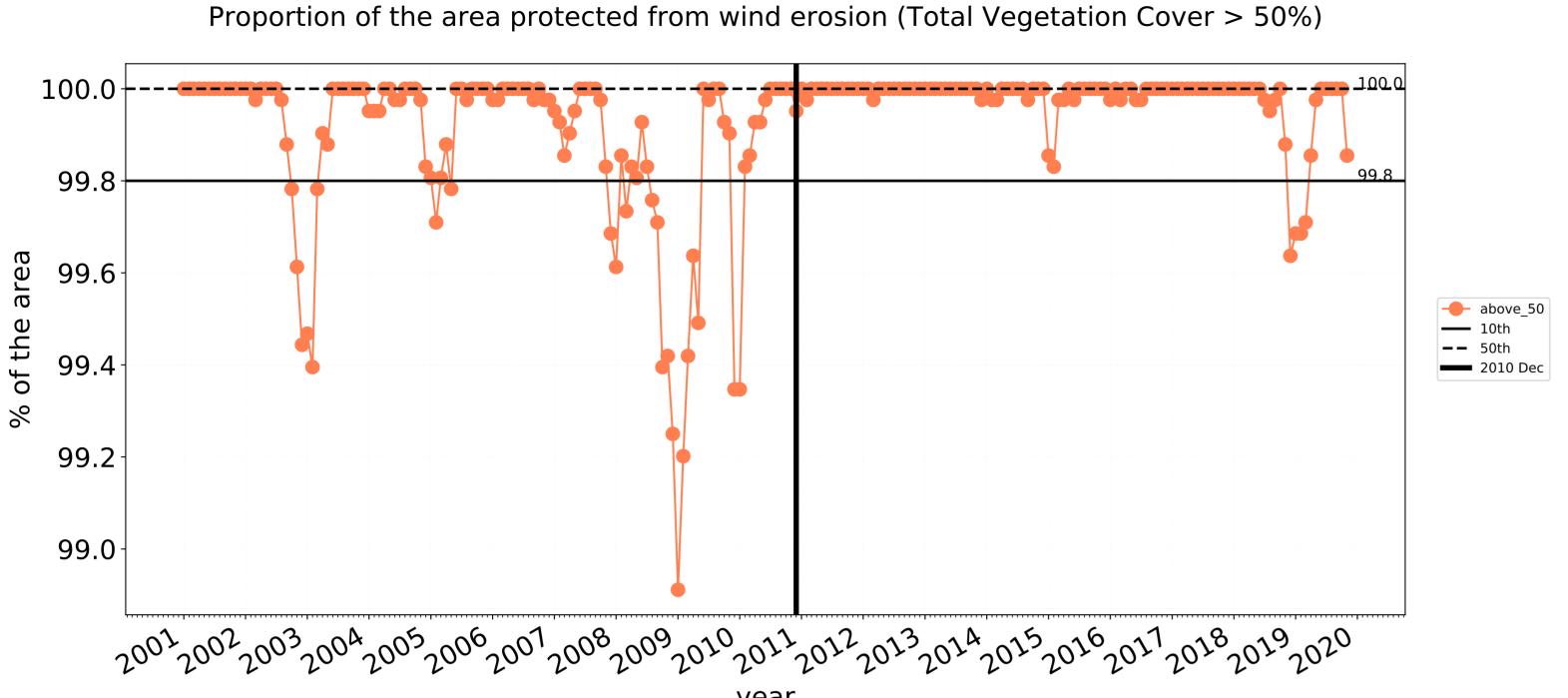


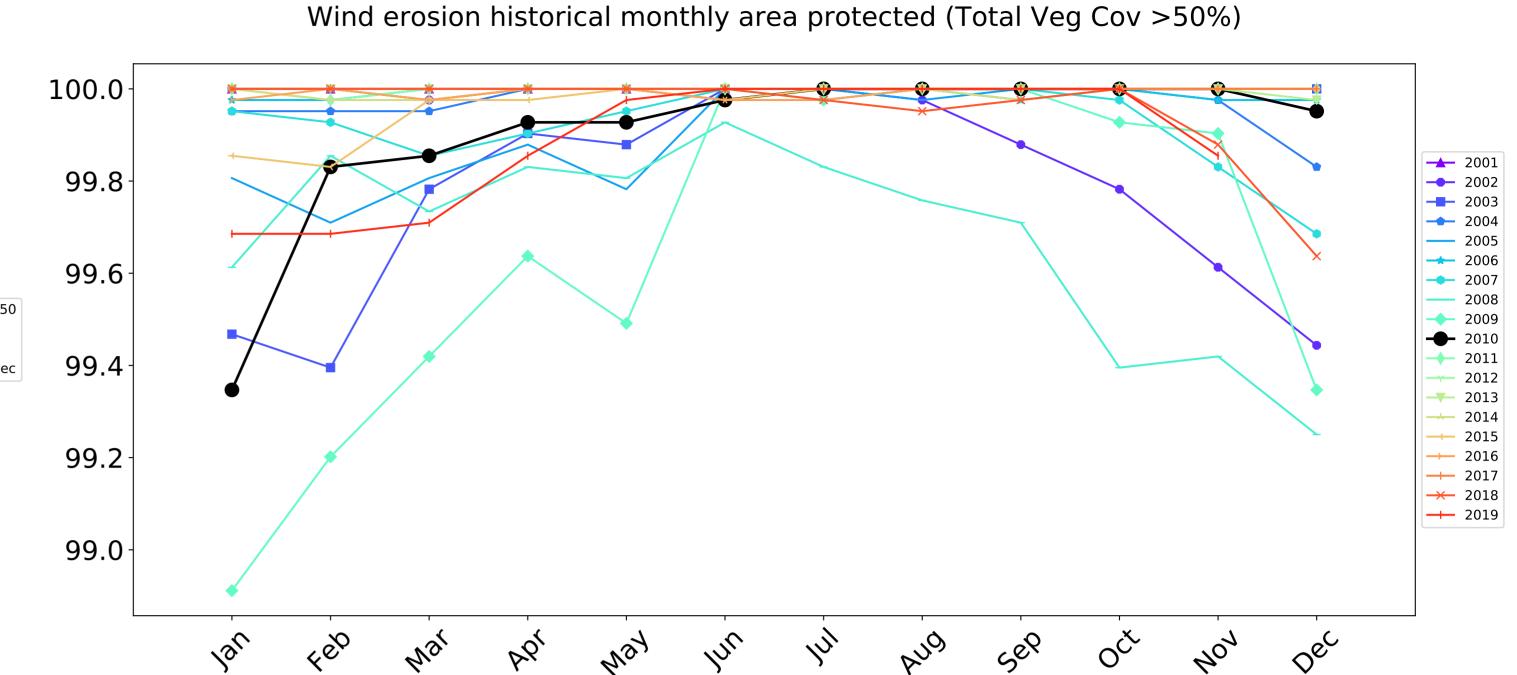




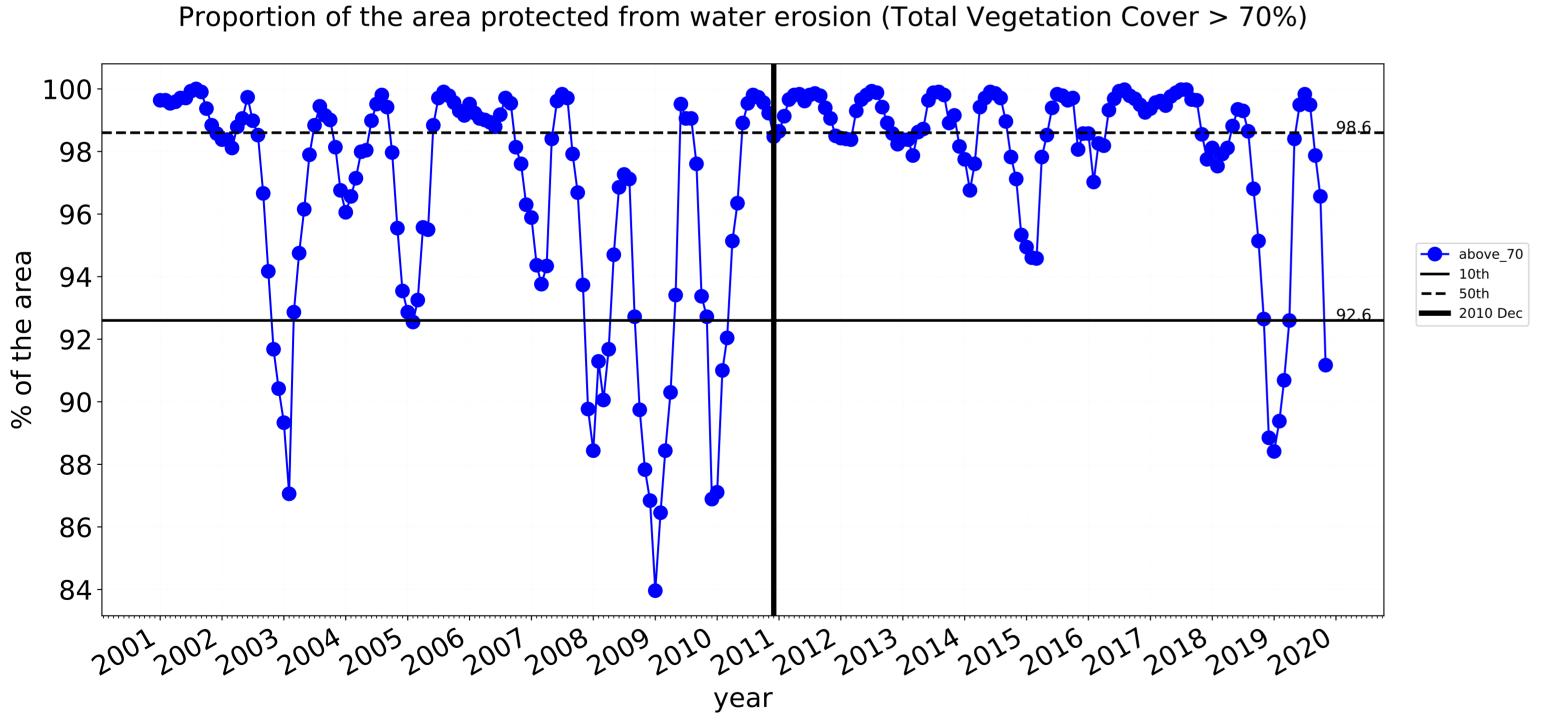


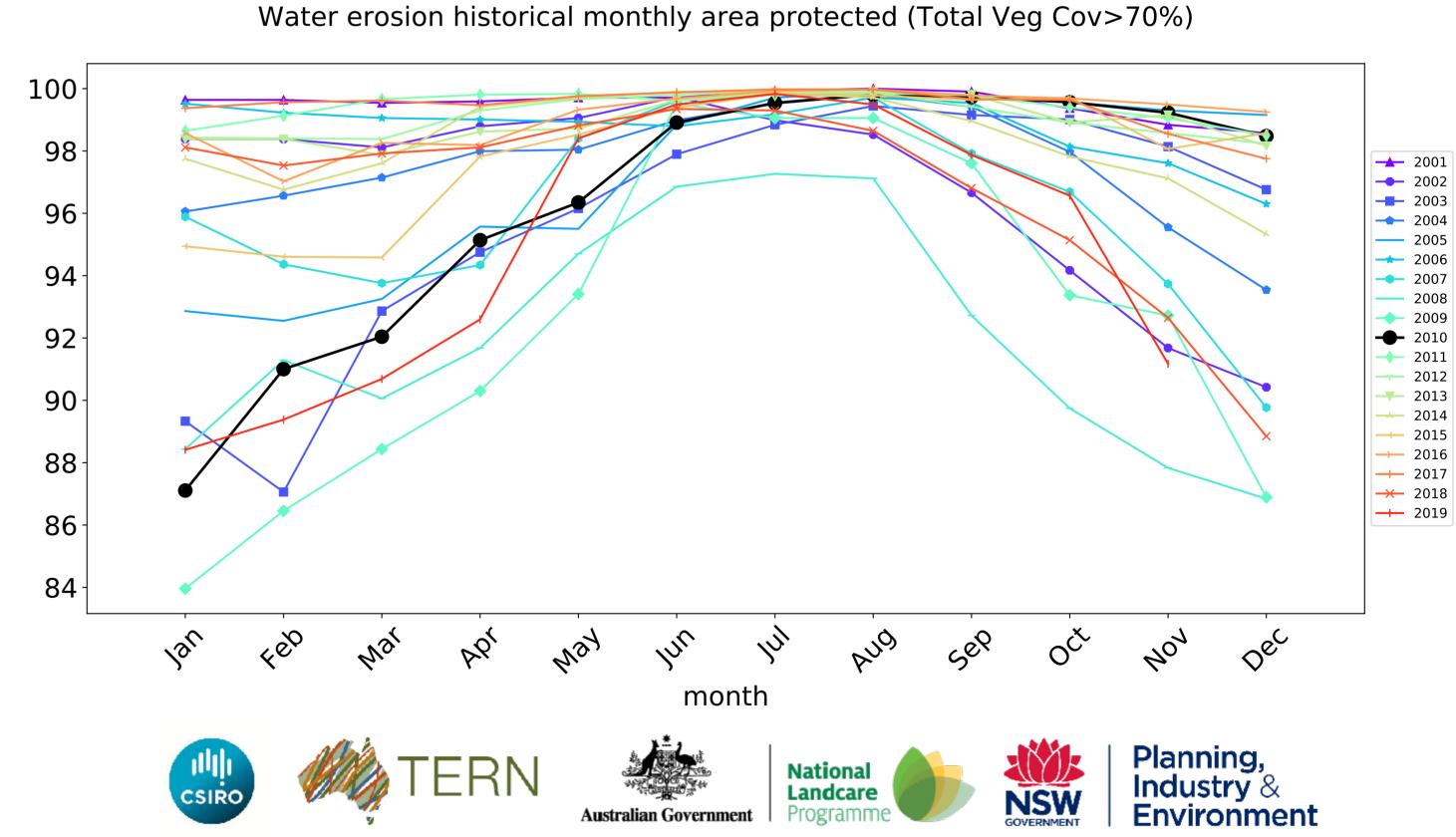






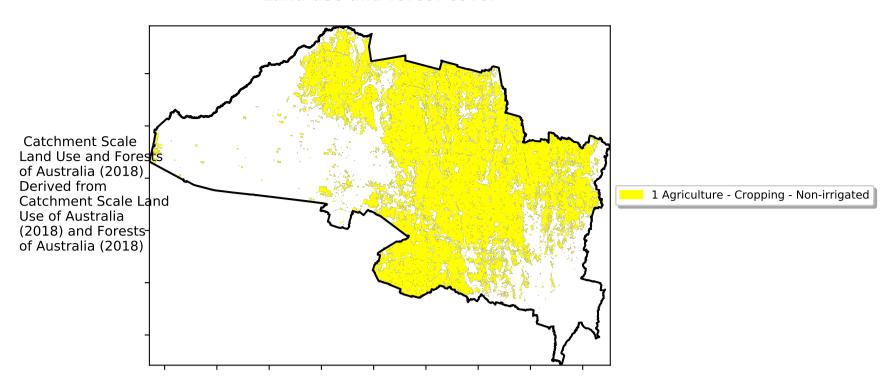
month



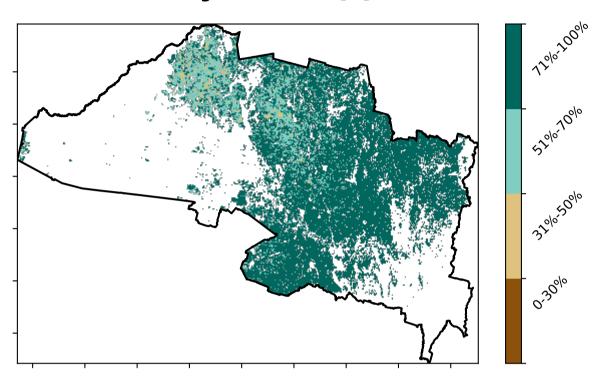


# **Cropping**

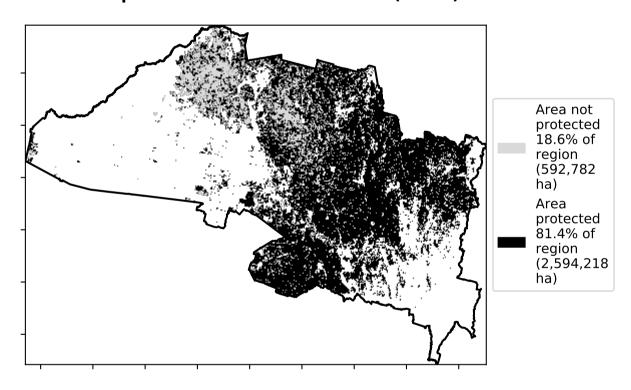
### Land use and forest cover



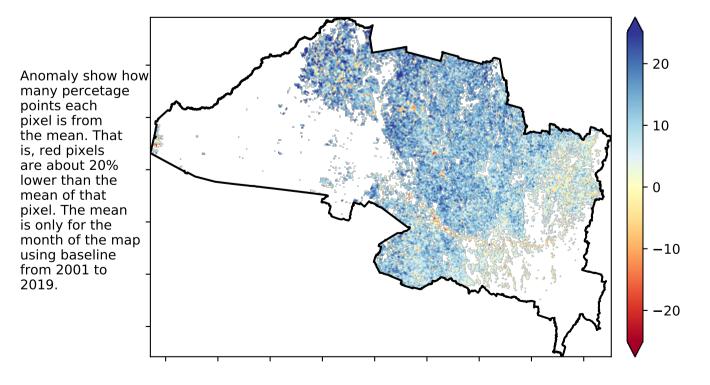
### **Total Vegetation Cover [%]**



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

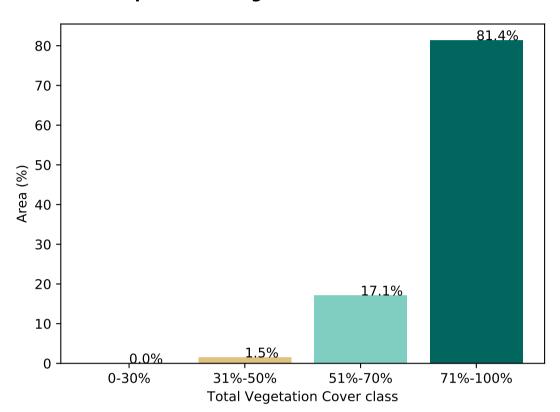


### Total Vegetation Cover Anomaly [%]

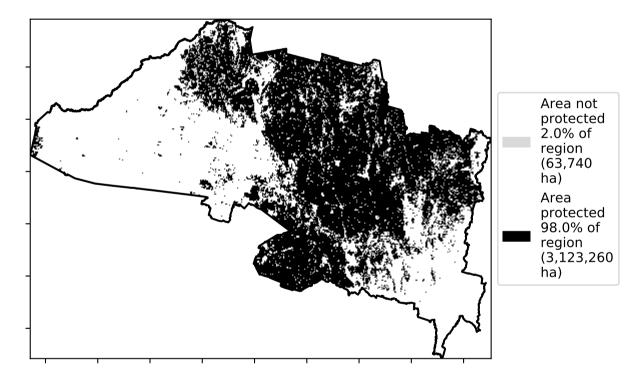


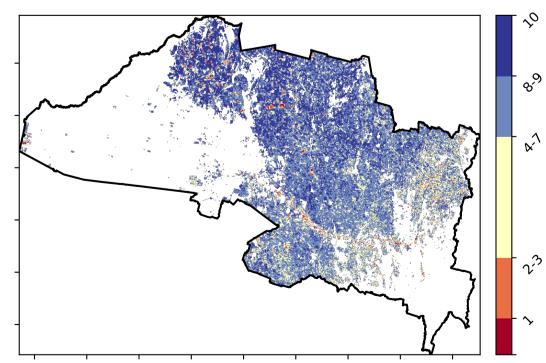
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









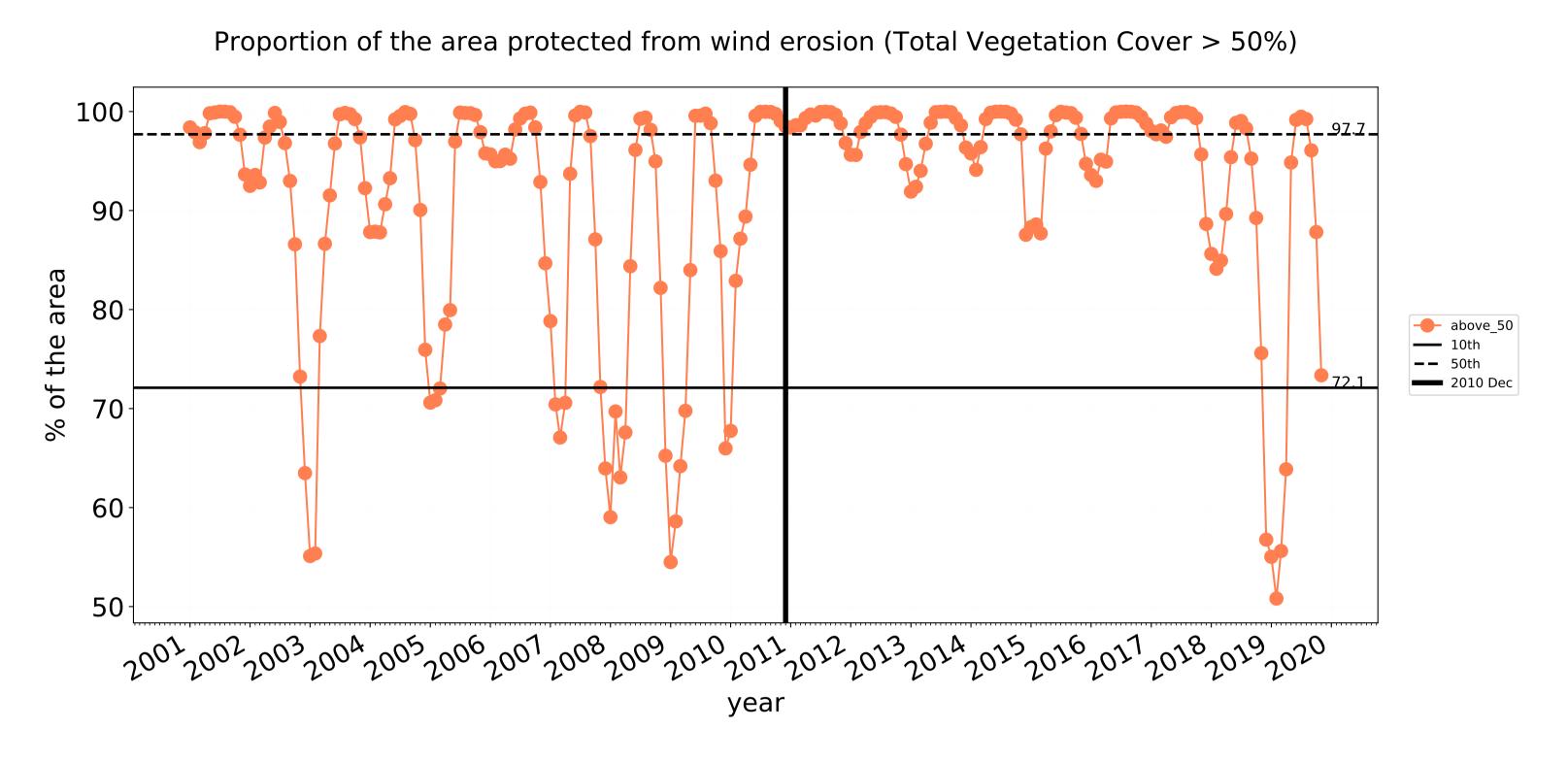


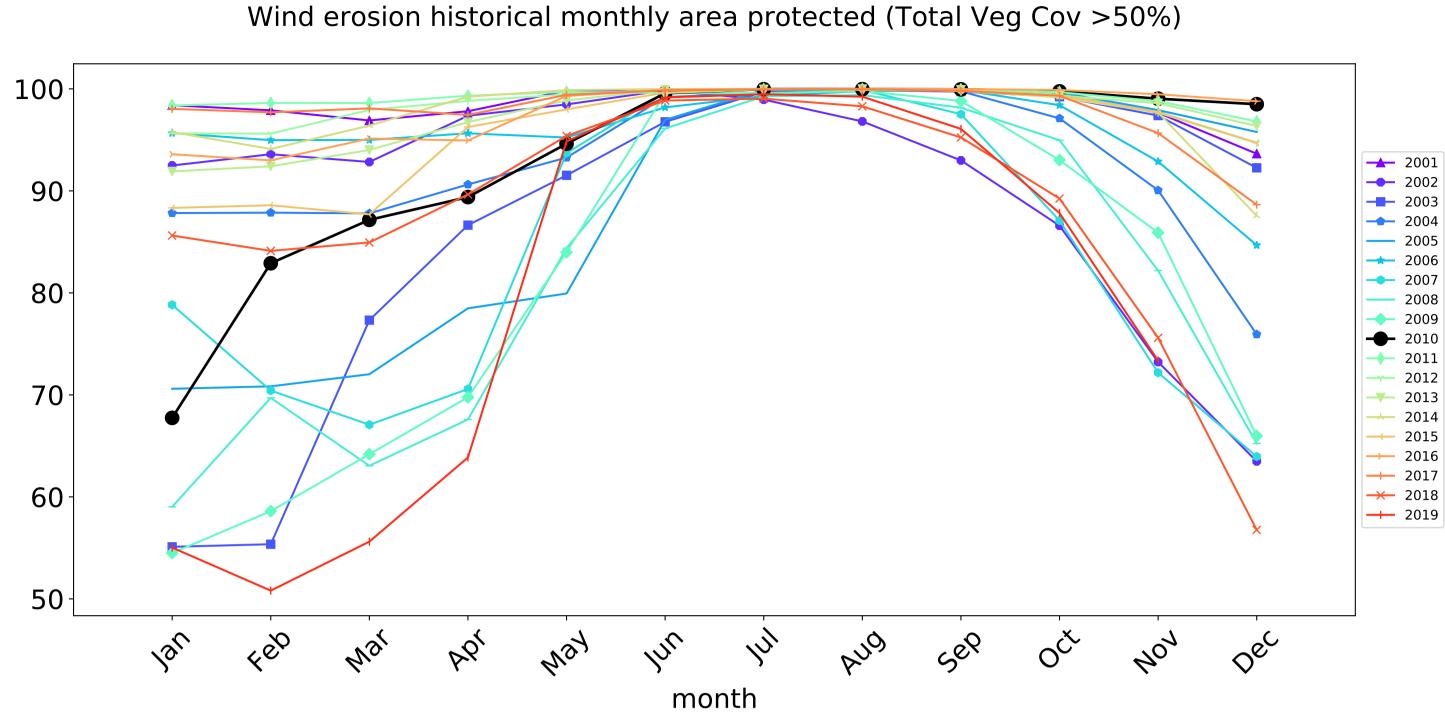


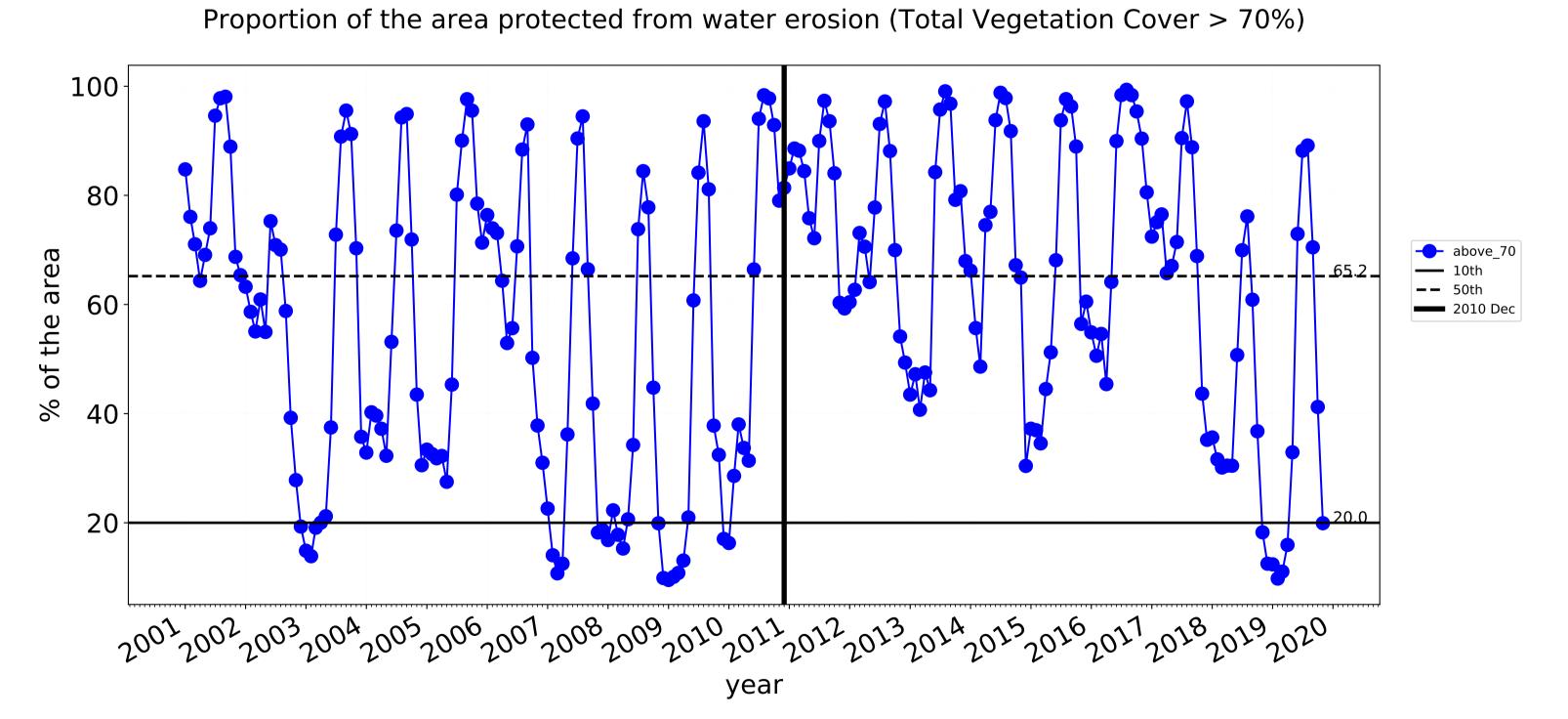


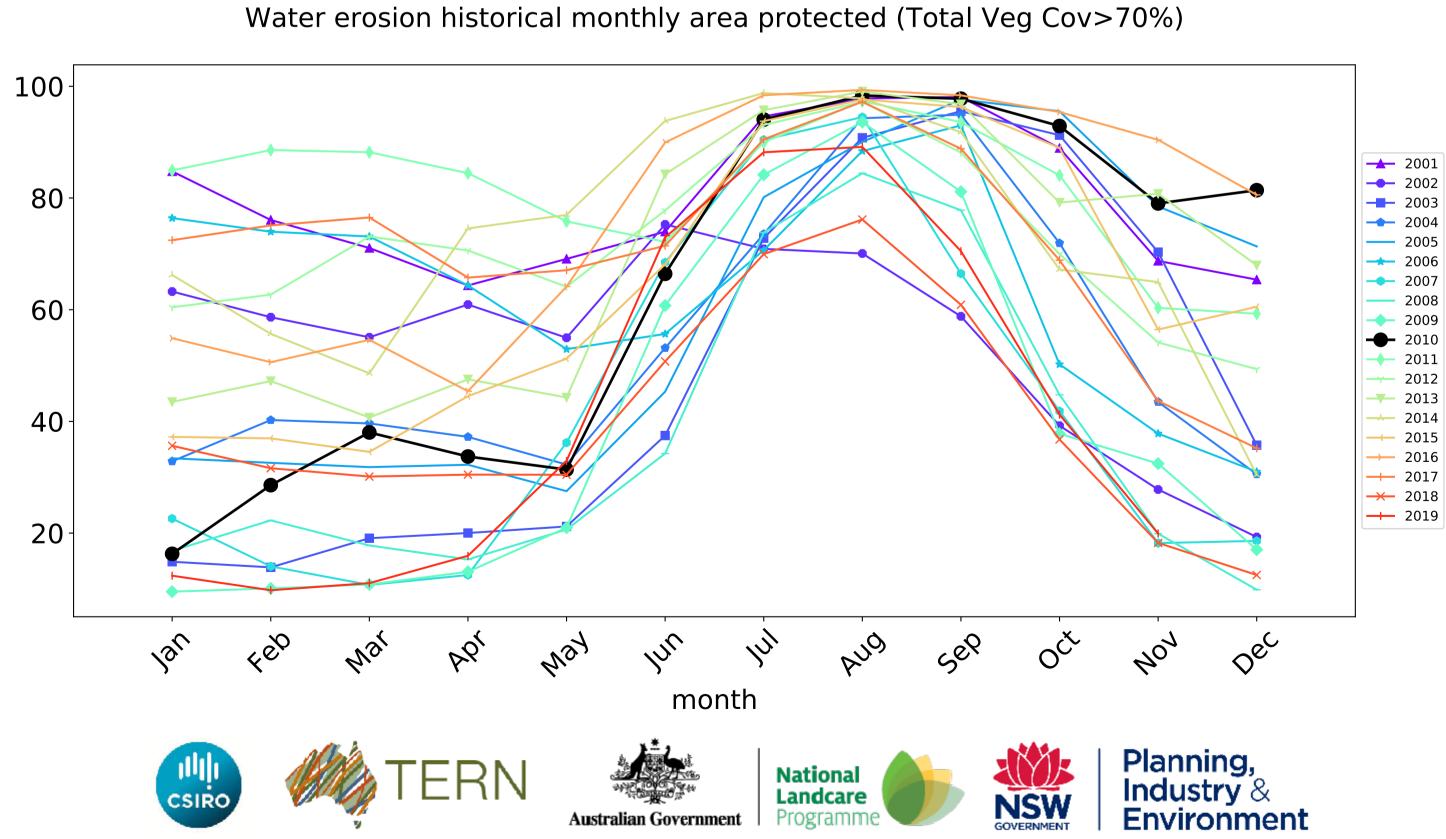


# **Cropping timeseries**



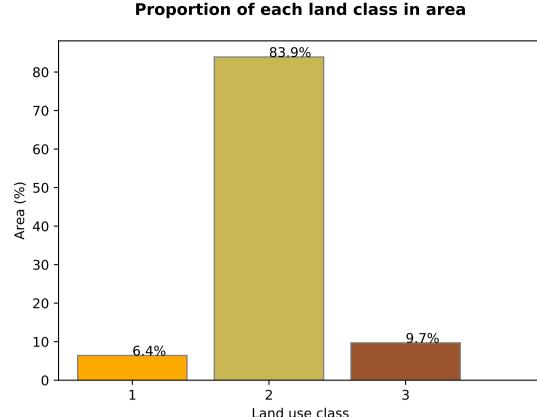


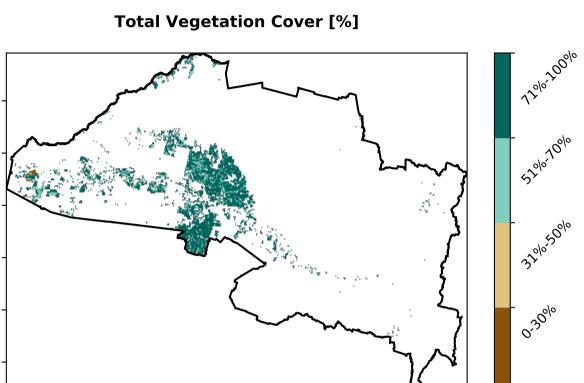


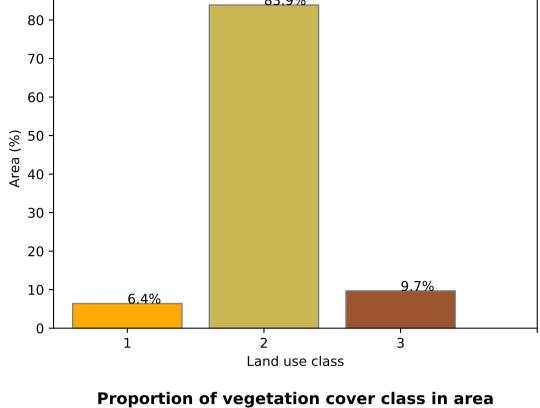


# **Irrigation**

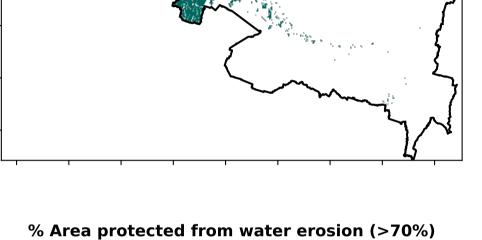
# Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forestsof Australia (2018) 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated



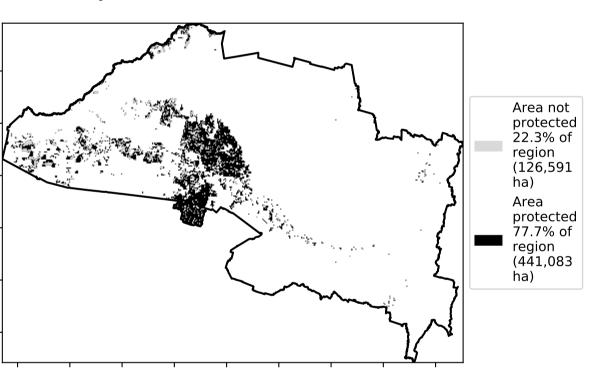


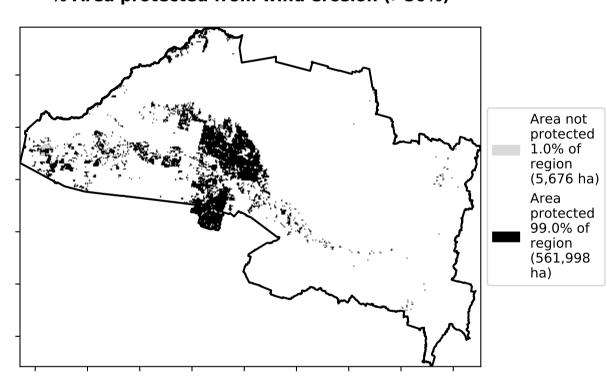


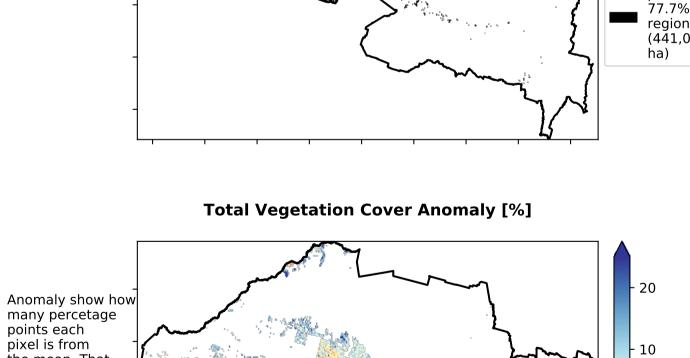
### 80 77.7% 70 60 50 Area (%) 30 21.0% 20 10 0.7% 51%-70% 0-30% 31%-50% 71%-100% **Total Vegetation Cover class**



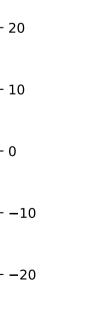
% Area protected from wind erosion (>50%)

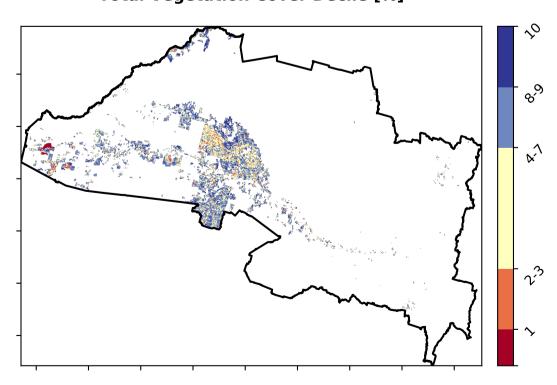






**Total Vegetation Cover Decile [%]** 







the mean. That

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

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





Deciles show where the pixel value lies in the

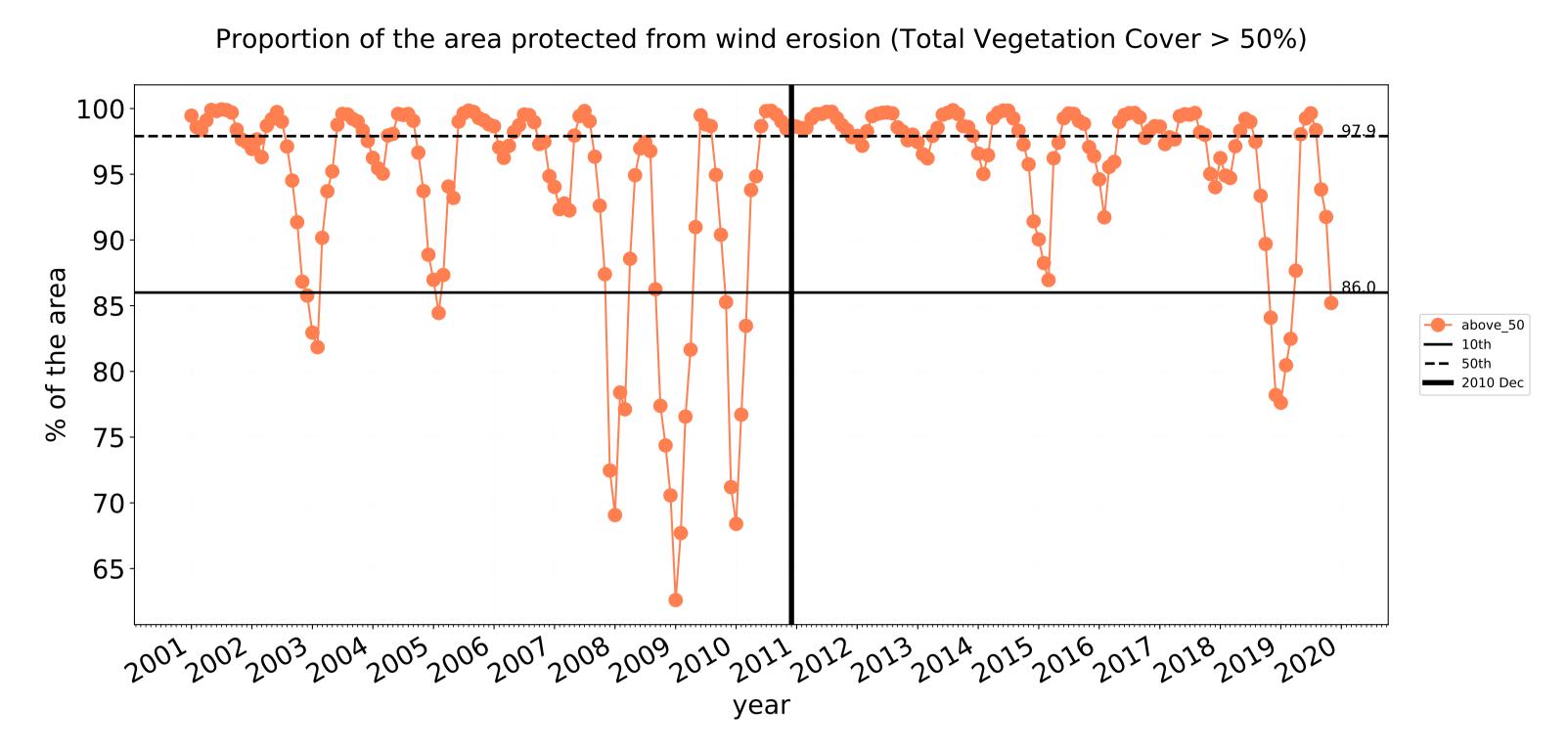
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseling.

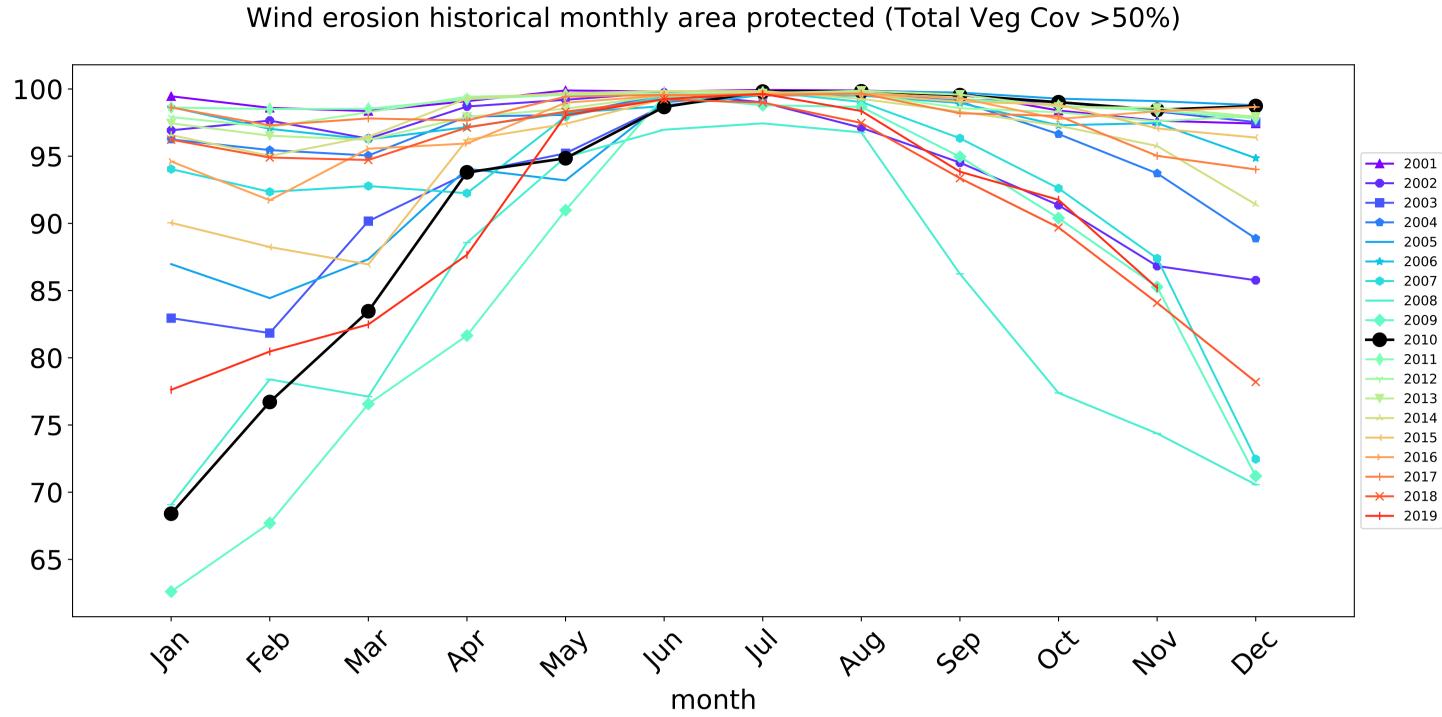
the map using baseline from 2001 to 2019.

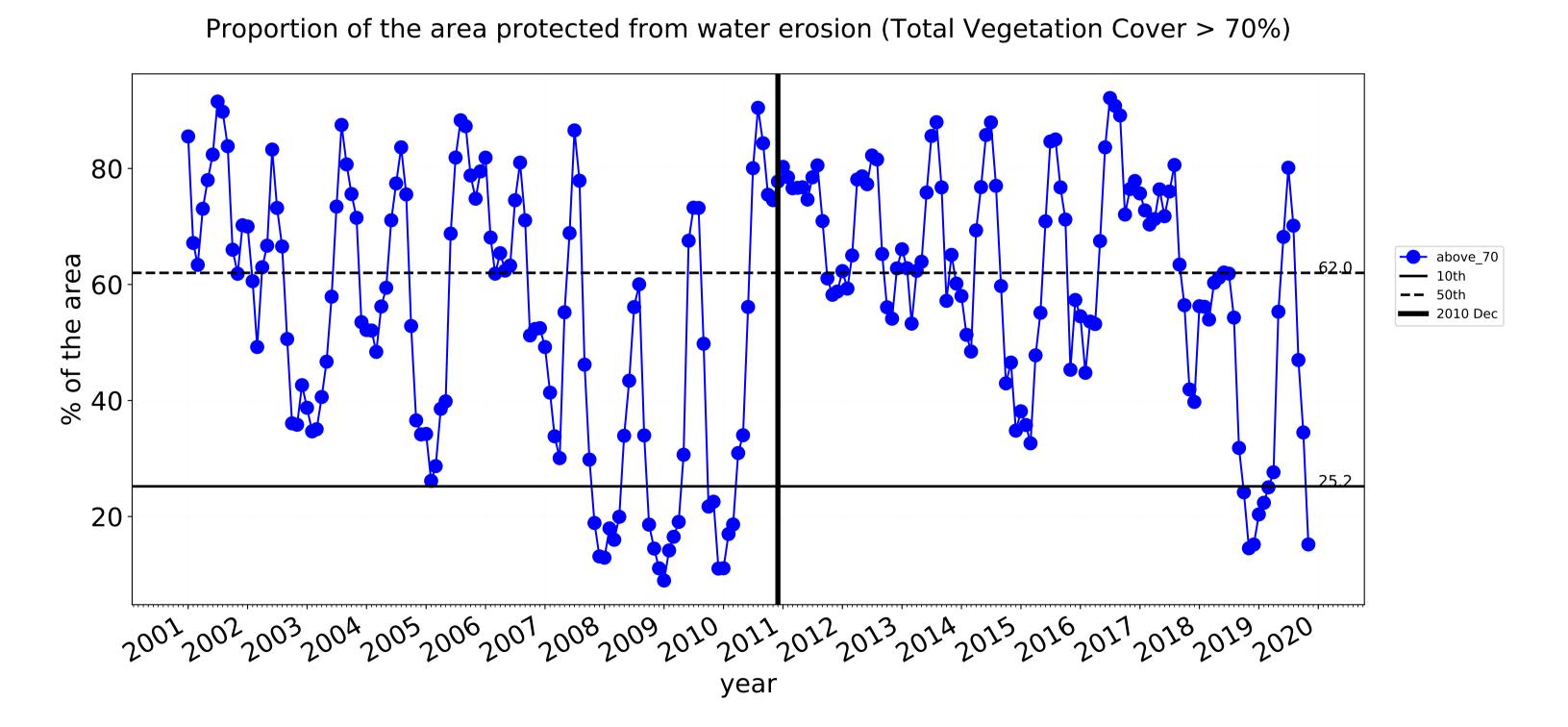


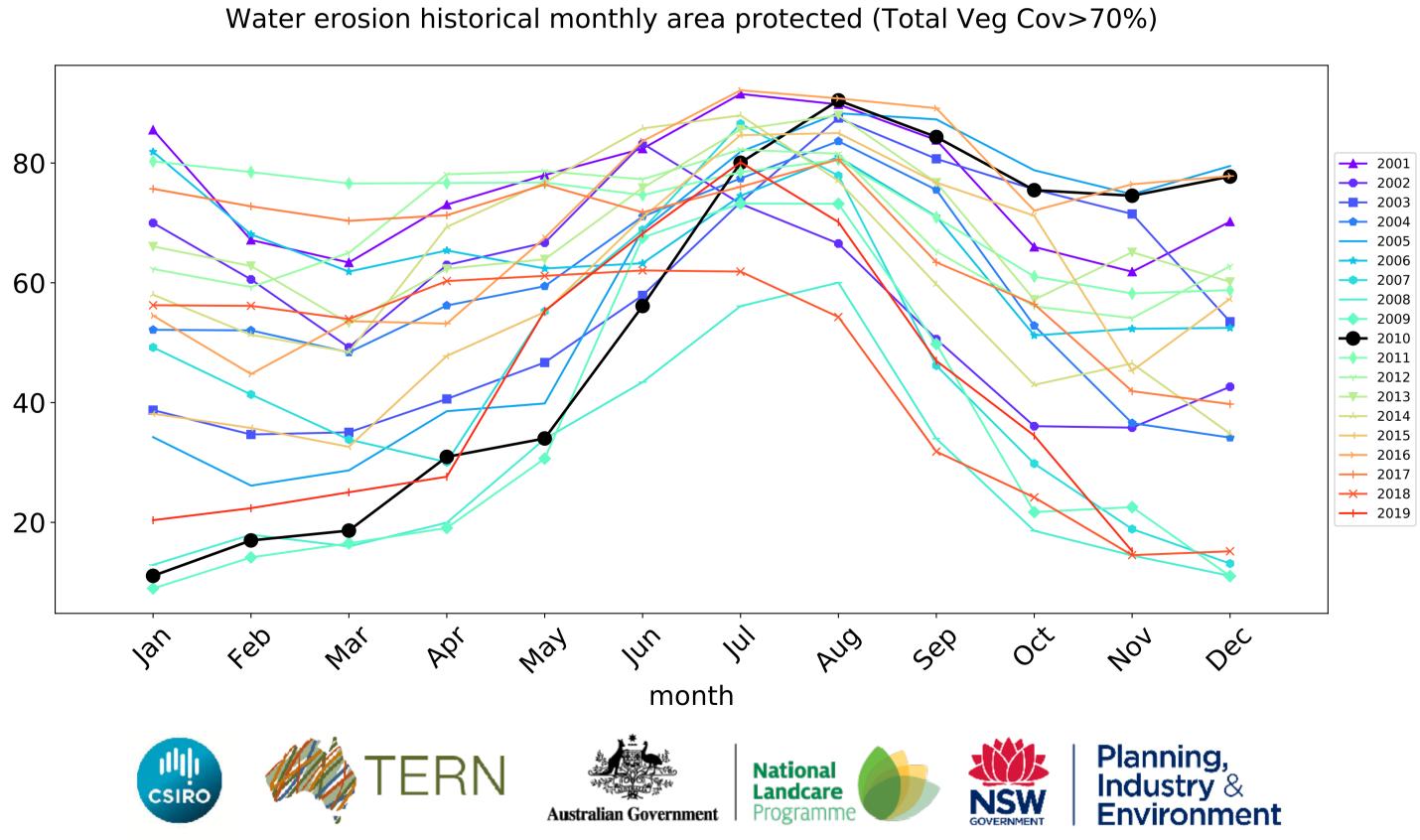










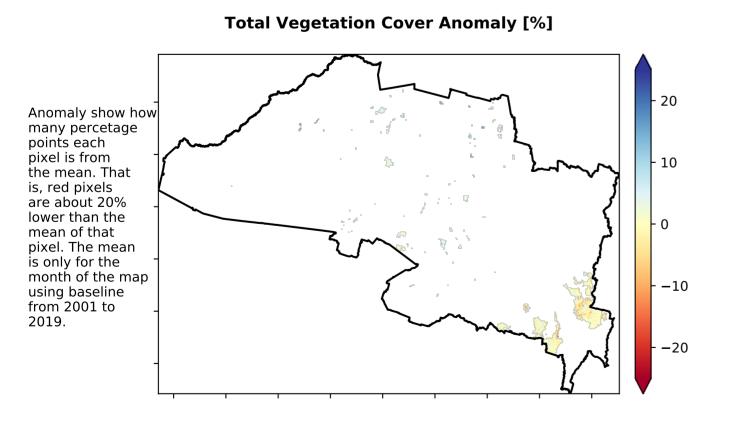


## **Production native forests and plantation forests**

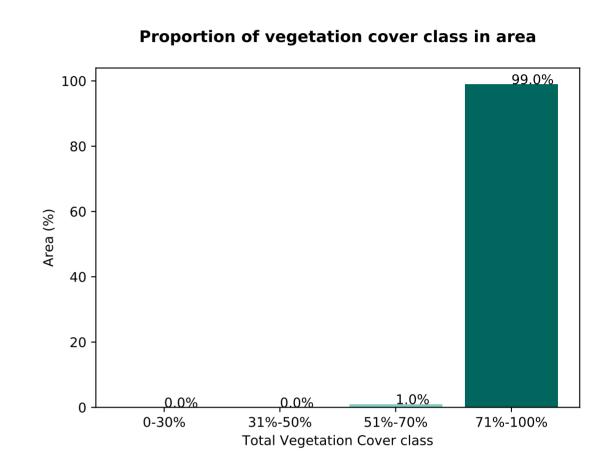
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) (2018) and Forests of Australia (2018)

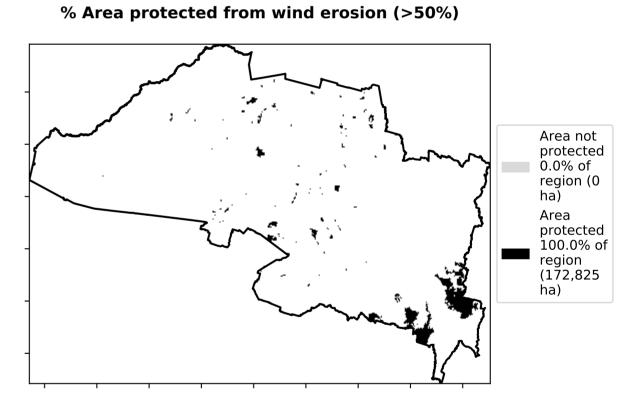
# Total Vegetation Cover [%]

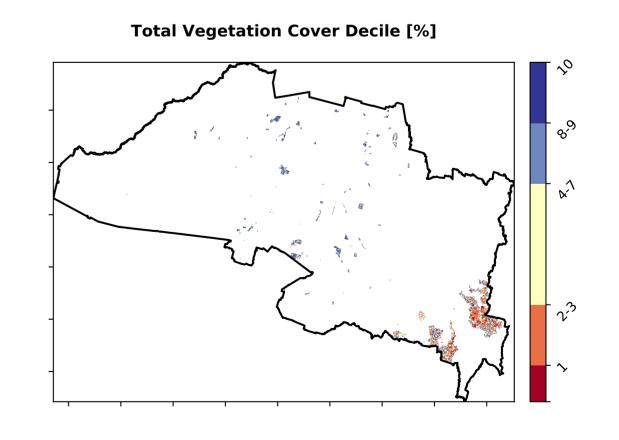
# Area not protected 1.0% of region (1,728 ha) Area protected 99.0% of region (171,096 ha)



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.











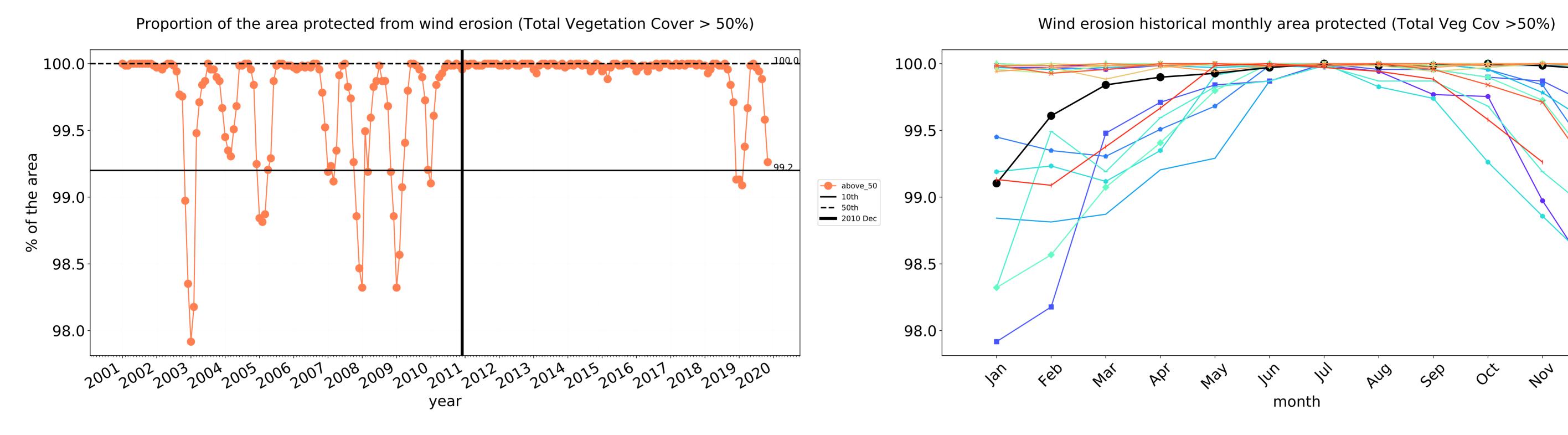


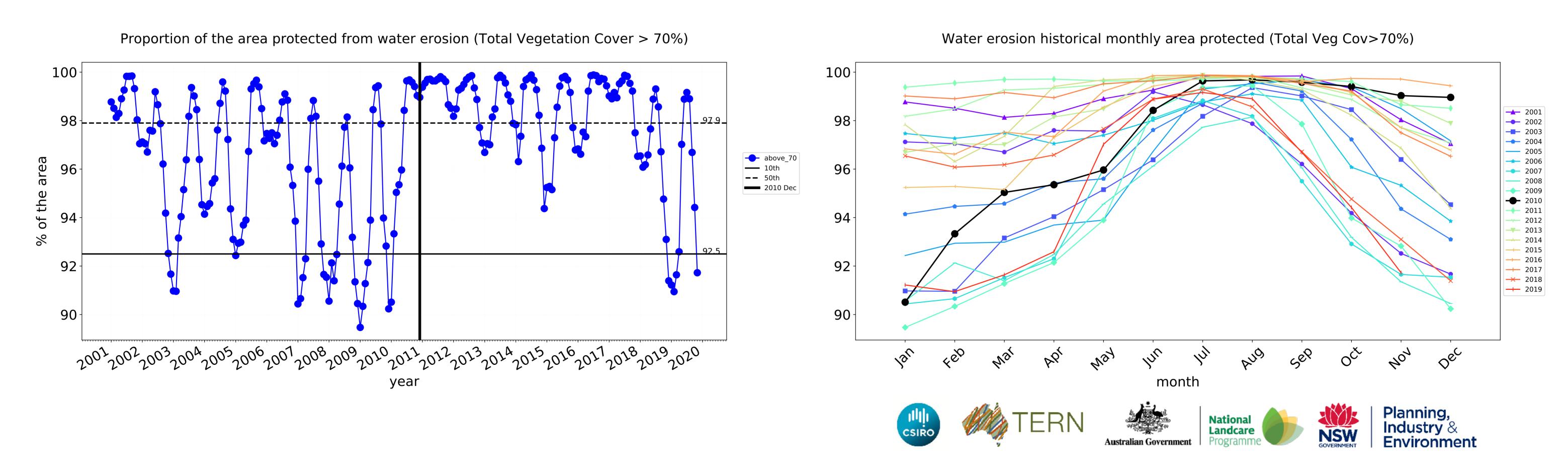






# **Production native forests and plantation forests timeseries**





2002 2003

<del>----</del> 2007

2009

**---** 2010

2012 2013

<del>←</del> 2015

→ 2016 → 2017 → 2018 → 2019

# 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	99.9% 6,688,451	98.9% 6,620,115	80.5% 5,388,493	44.0% 2,946,144	13.8% 926,159	3.8% 252,373
Conservation and natural environments	323,025	100.0% 323,025	99.9% 322,825	90.3% 291,550	81.1% 261,925	60.8% 196,375	25.9% 83,700
Conservation and natural environments non forest	83,350	100.0% 83,350	99.8% 83,150	63.3% 52,725	37.6% 31,350	12.1% 10,125	5.2% 4,350
Conservation and natural environments Forest (non woodland)	195,175	100.0% 195,175	100.0% 195,175	99.8% 194,875	97.1% 189,600	86.3% 168,425	39.2% 76,575
Agriculture	6,068,100	99.9% 6,064,050	98.9% 5,999,050	79.7% 4,837,975	40.9% 2,484,125	10.3% 622,825	2.0% 120,275
Grazing	2,311,600	100.0% 2,311,300	99.4% 2,297,625	77.9% 1,801,775	43.0% 993,400	19.1% 441,850	4.3% 99,275
Grazing non forest	2,066,600	100.0% 2,066,300	99.3% 2,052,675	75.7% 1,564,775	39.1% 807,525	17.8% 368,175	4.3% 87,900
Grazing Woodland forest	141,650	100.0% 141,650	100.0% 141,650	95.5% 135,225	72.2% 102,250	17.8% 25,275	1.9% 2,700
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,300	98.5% 101,775	80.9% 83,625	46.8% 48,400	8.4% 8,675
Cropping	3,187,000	100.0% 3,186,650	98.5% 3,139,100	81.4% 2,593,975	42.7% 1,360,300	5.5% 174,275	0.6% 20,150
Irrigation	567,675	99.4% 564,275	98.7% 560,500	77.7% 441,325	22.9% 130,050	1.2% 6,675	0.1% 850
Production native forests and plantation forests	172,825	100.0% 172,800	100.0% 172,750	99.0% 171,025	93.4% 161,425	58.4% 100,925	27.4% 47,275











