### **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: April 2009

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





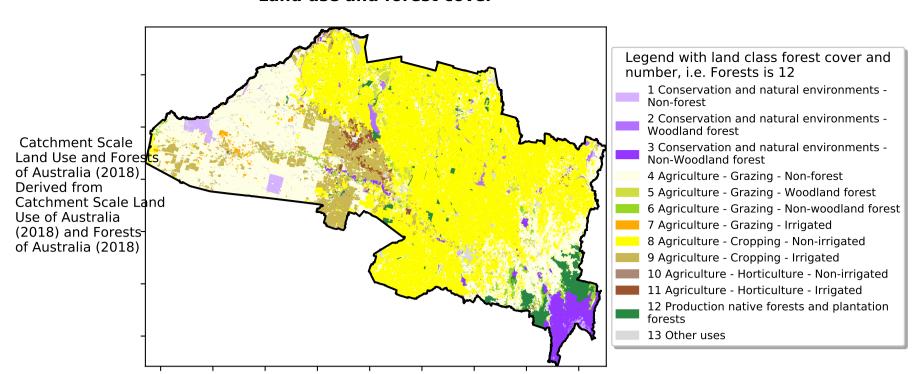




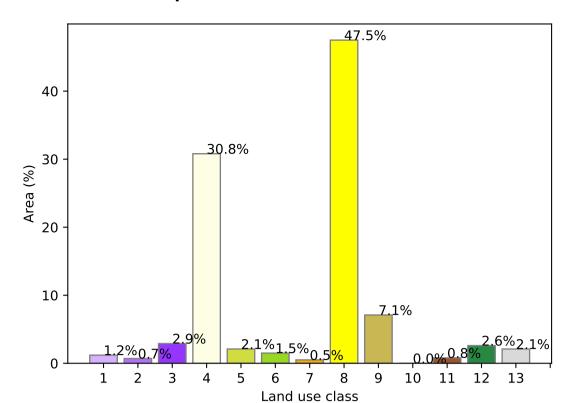


### **Vegetation Cover Apr 2009**

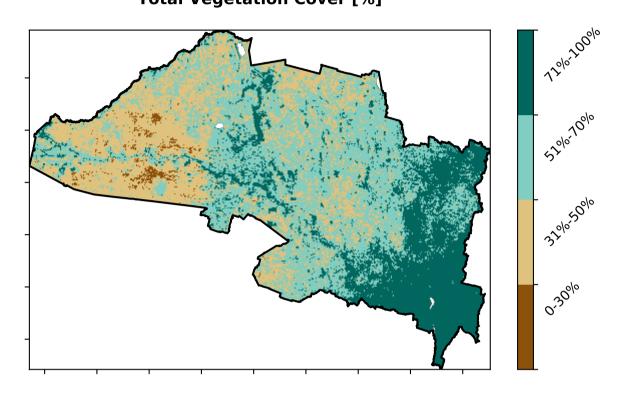
### Land use and forest cover



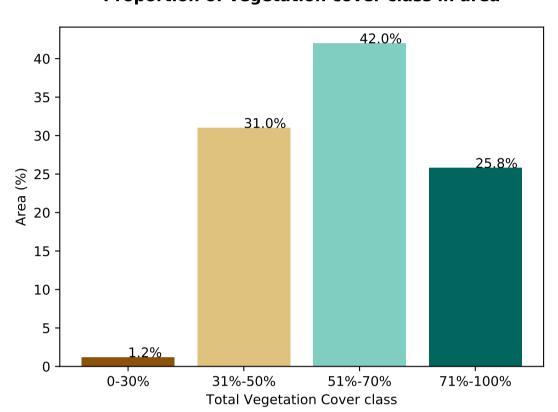
### Proportion of each land class in area



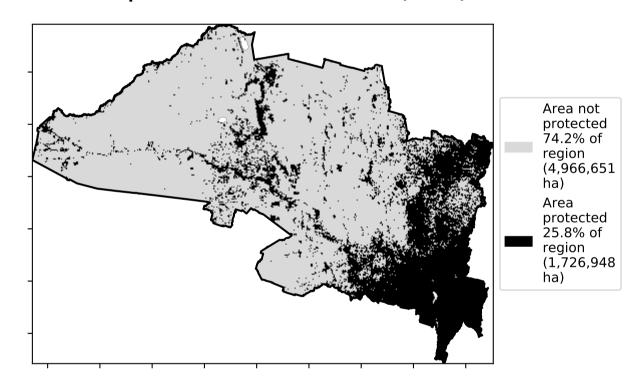
### Total Vegetation Cover [%]



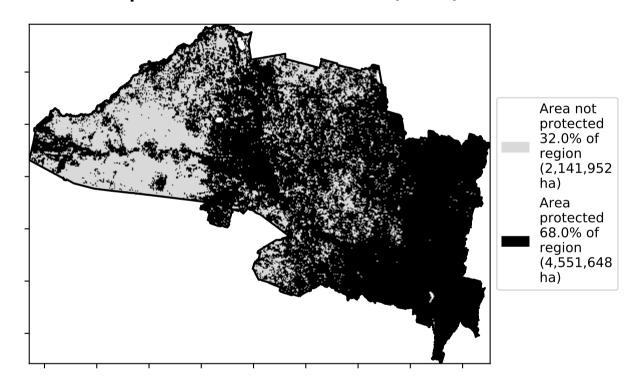
Proportion of vegetation cover class in area



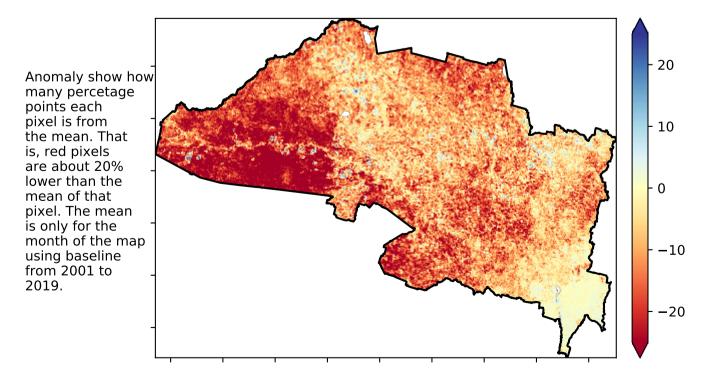
### % Area protected from water erosion (>70%)



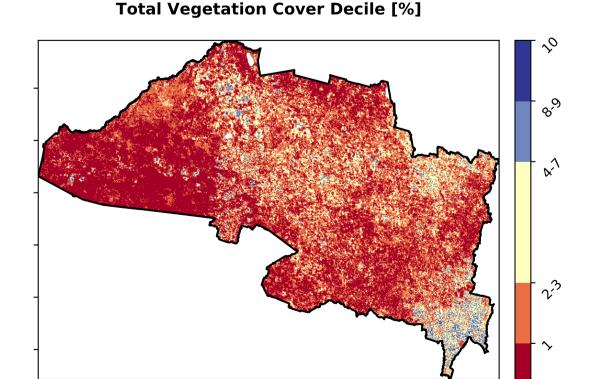
% Area protected from wind erosion (>50%)



### Total Vegetation Cover Anomaly [%]



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





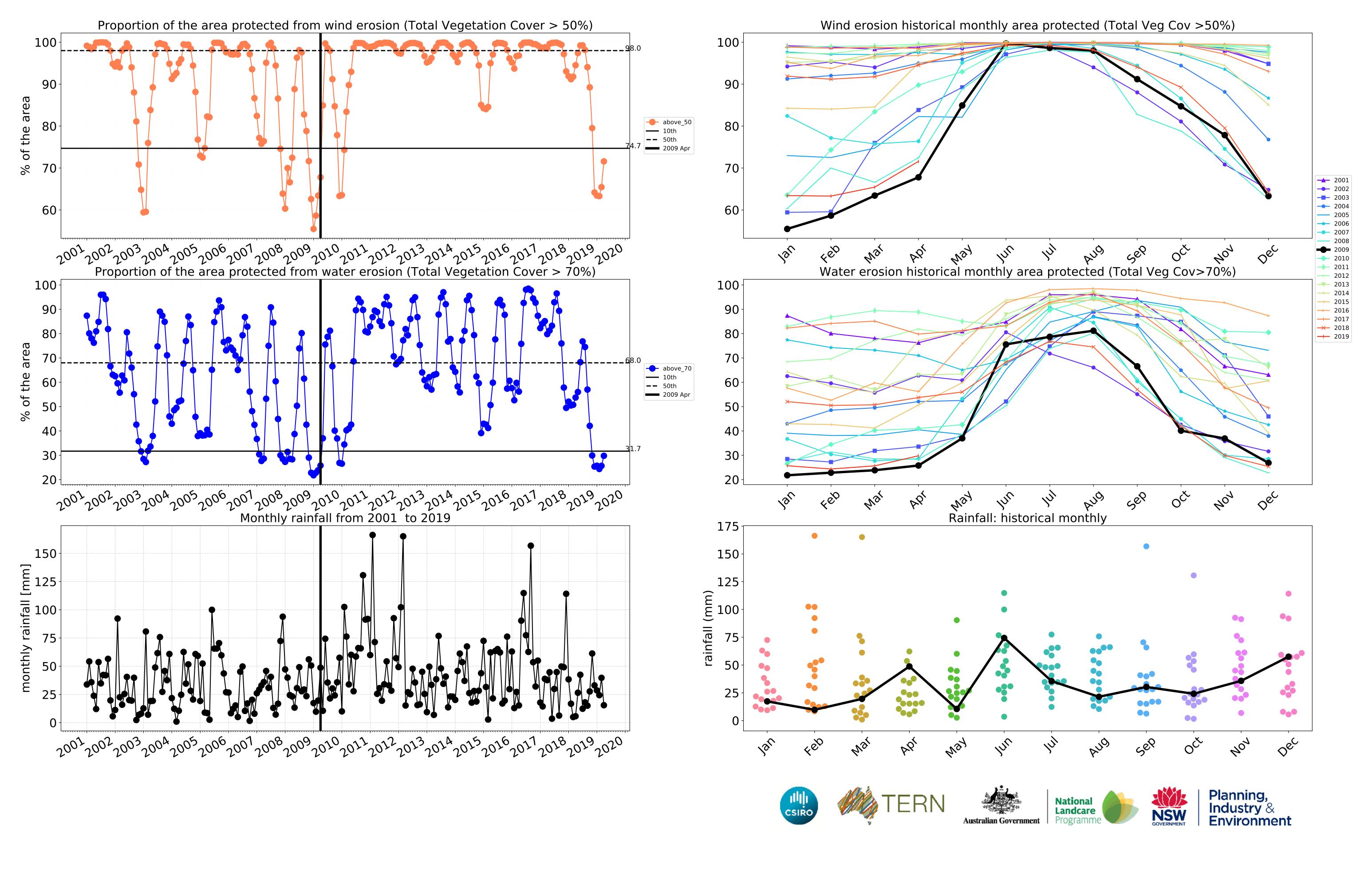




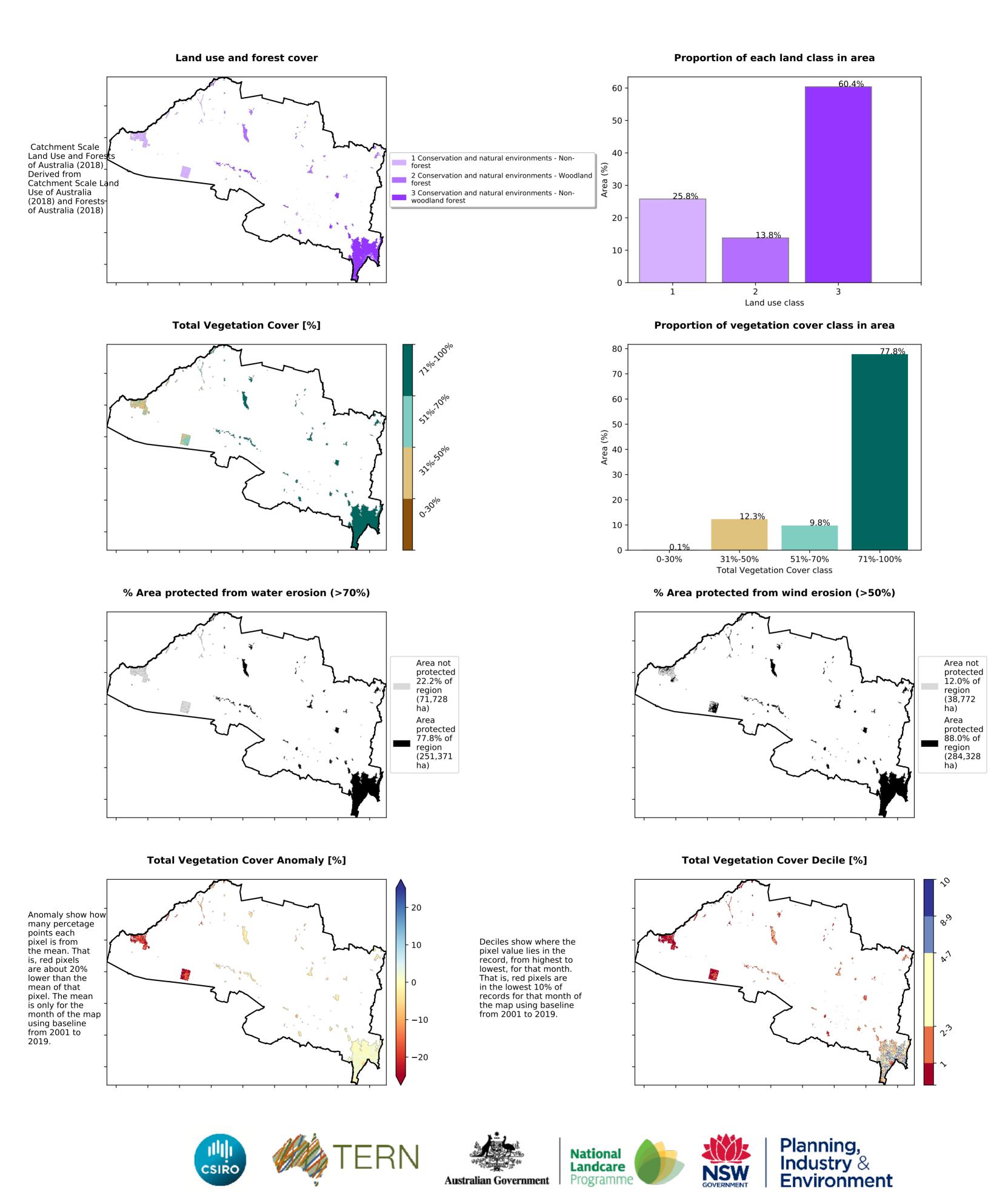




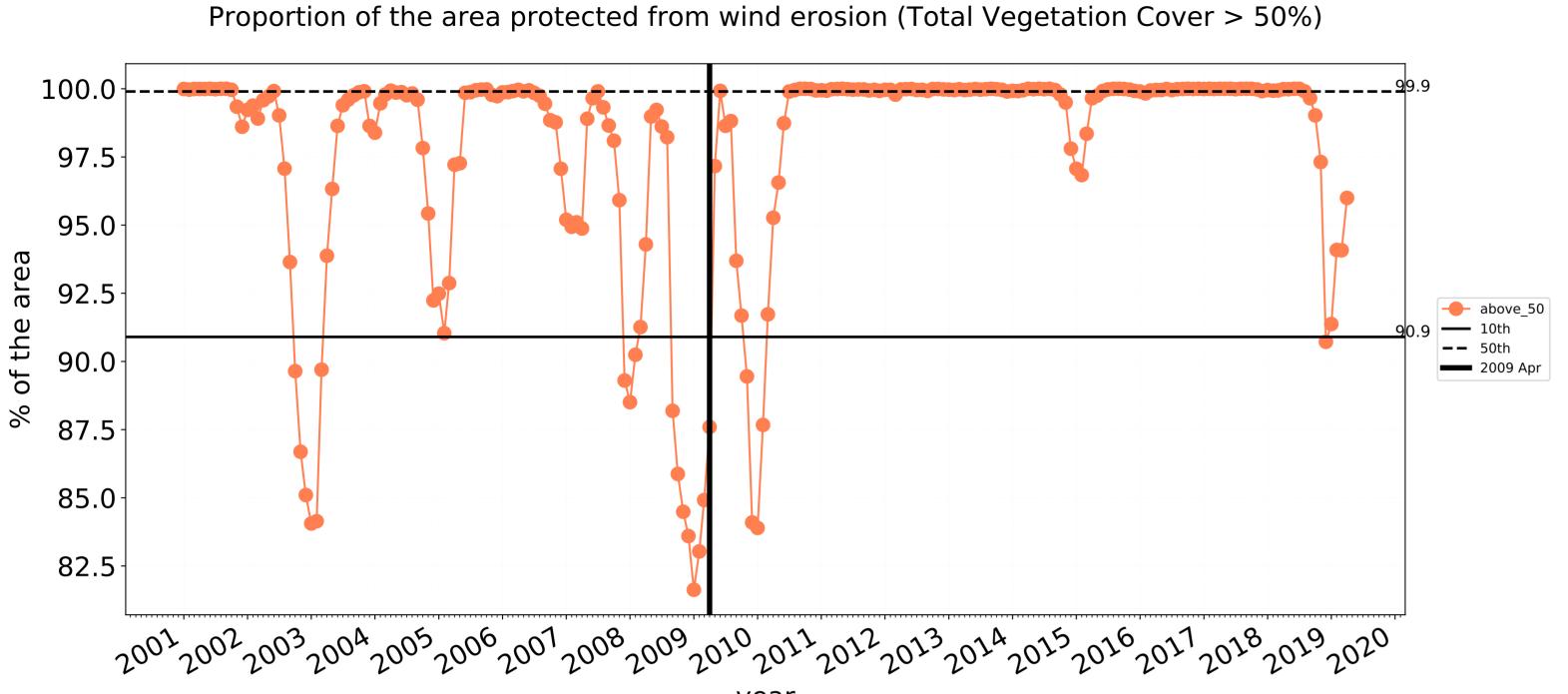


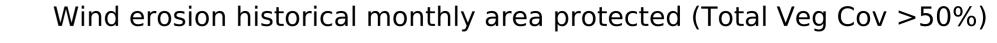


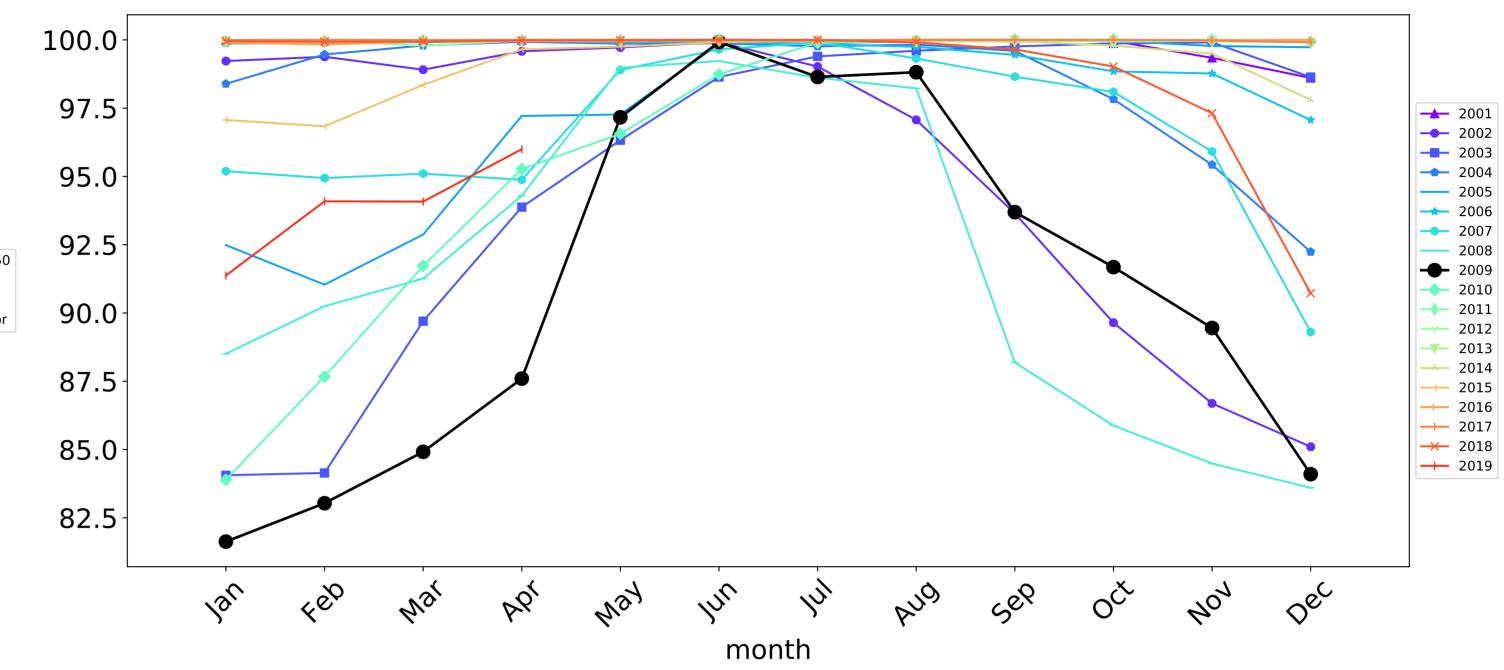
### **Conservation and natural environments**

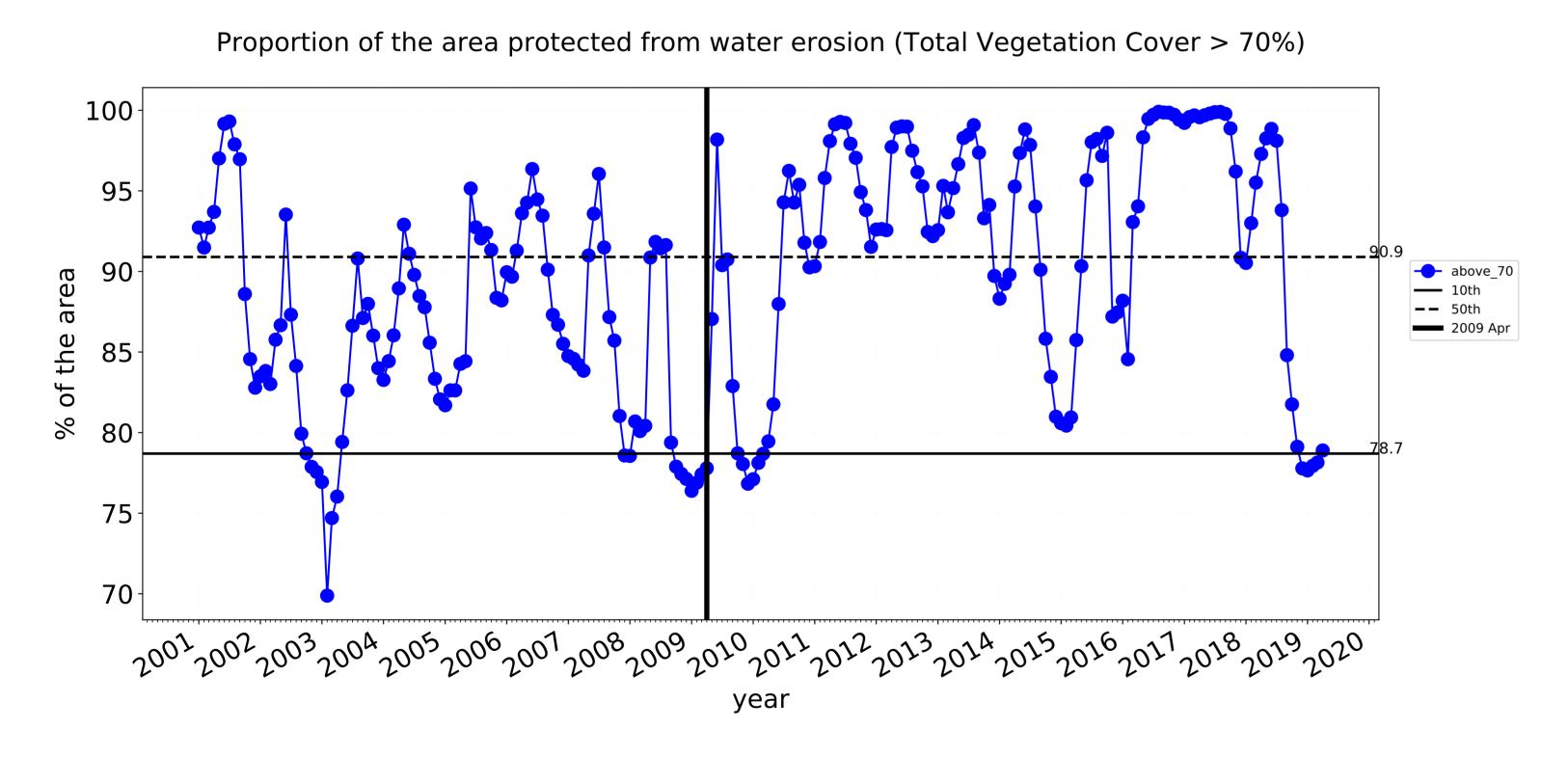


### **Conservation and natural environments timeseries**

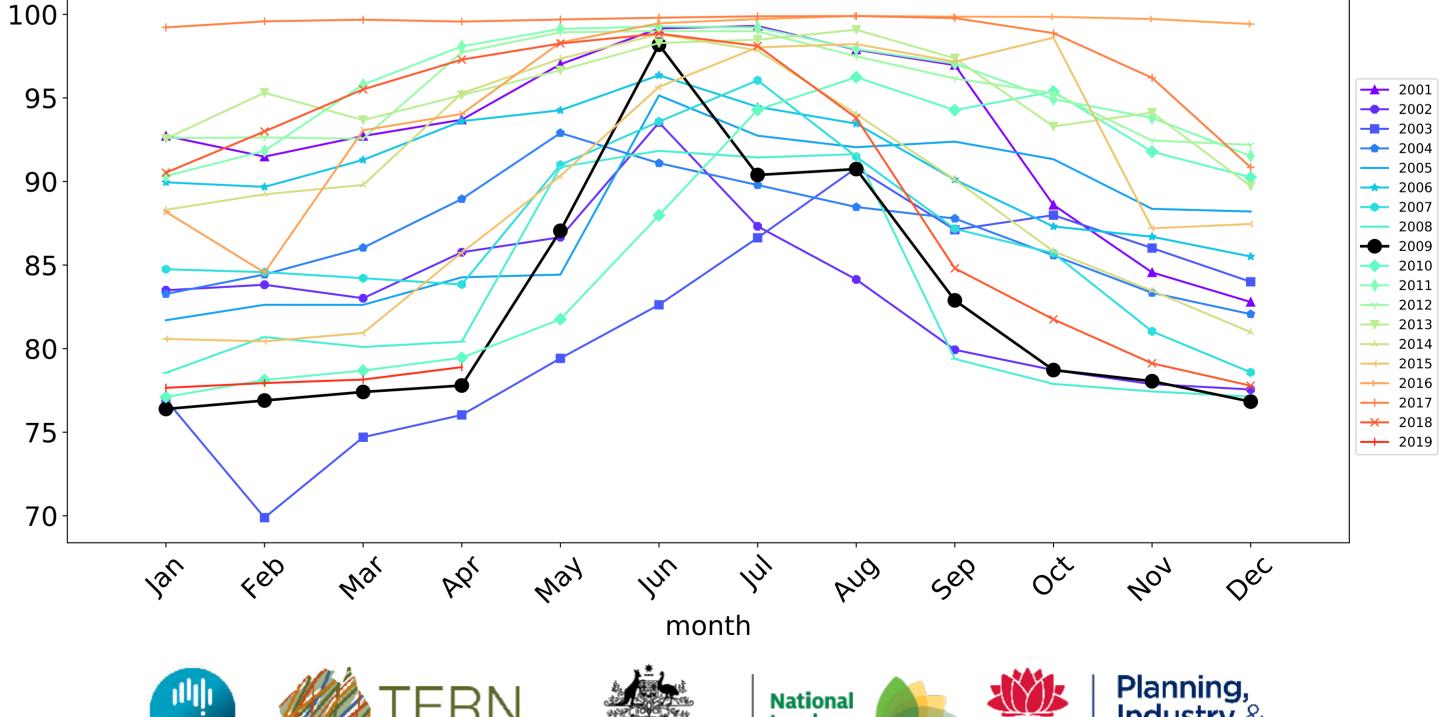








### Water erosion historical monthly area protected (Total Veg Cov>70%)









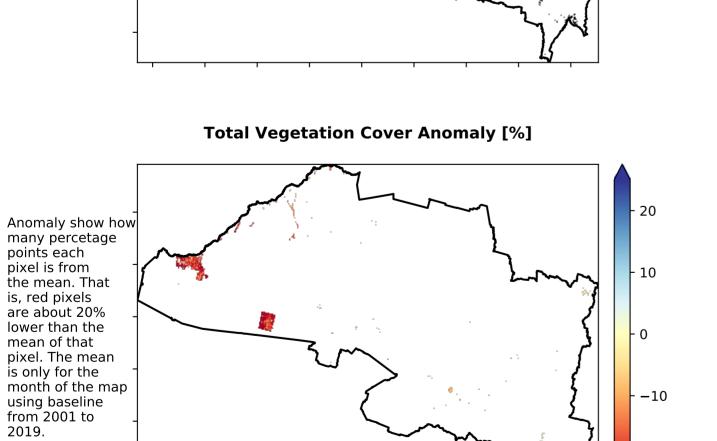


### **Conservation and natural environments non forest**

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

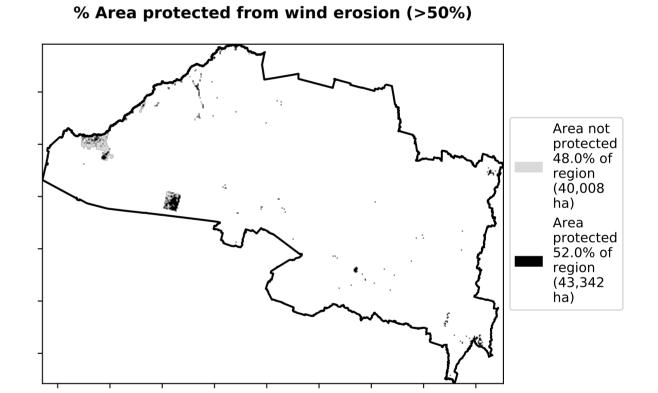
# Total Vegetation Cover [%]

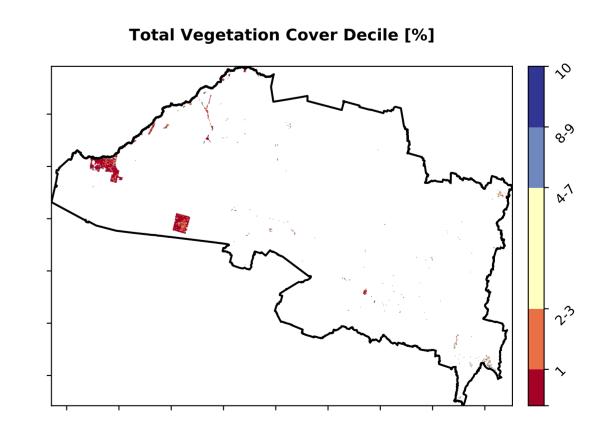
### % Area protected from water erosion (>70%) Area not protected 81.3% of region (67,763 ha) Area protected 18.7% of region (15,586



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 47.7% 40 30 10 0-30% 31%-50% Total Vegetation Cover class 18.7% 71%-100%













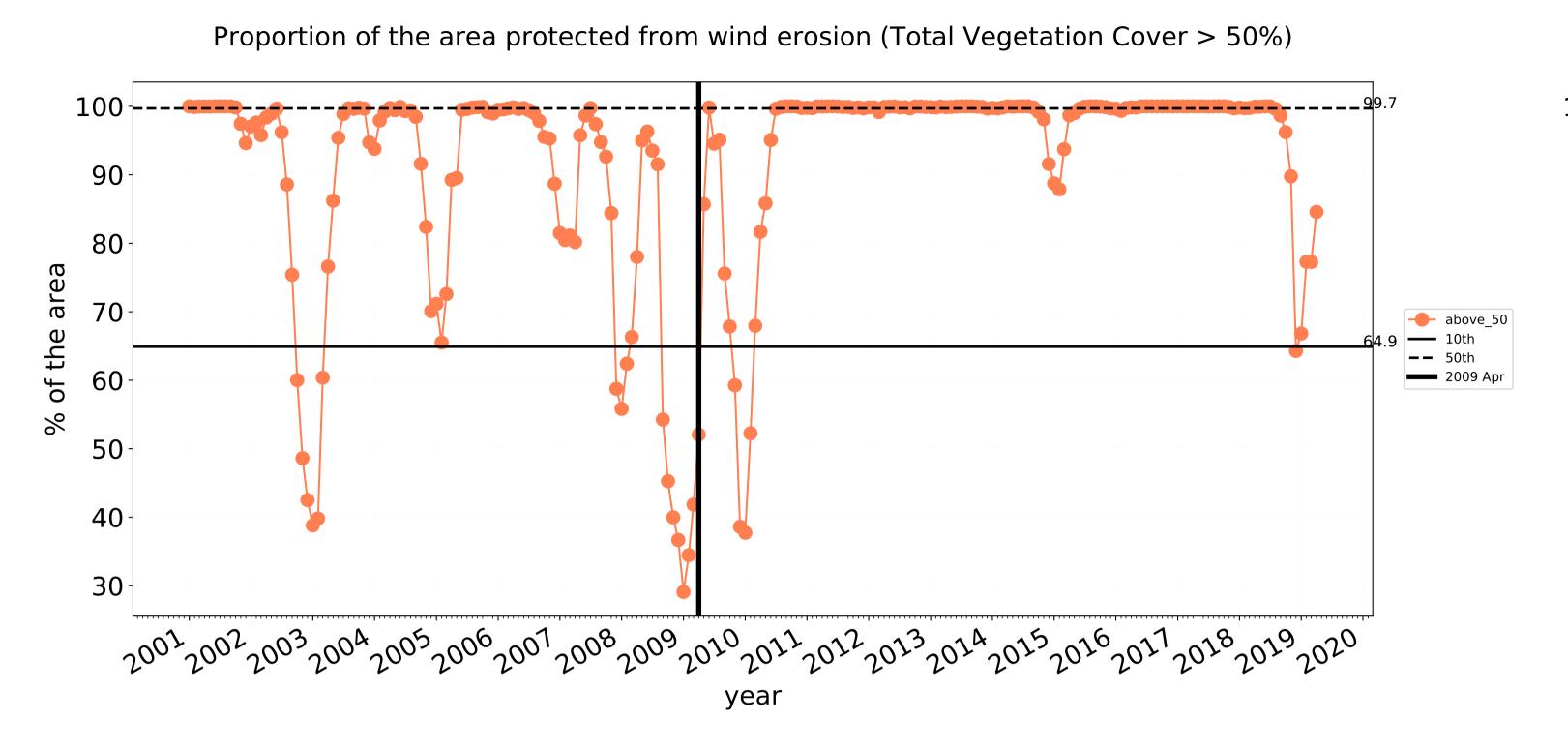


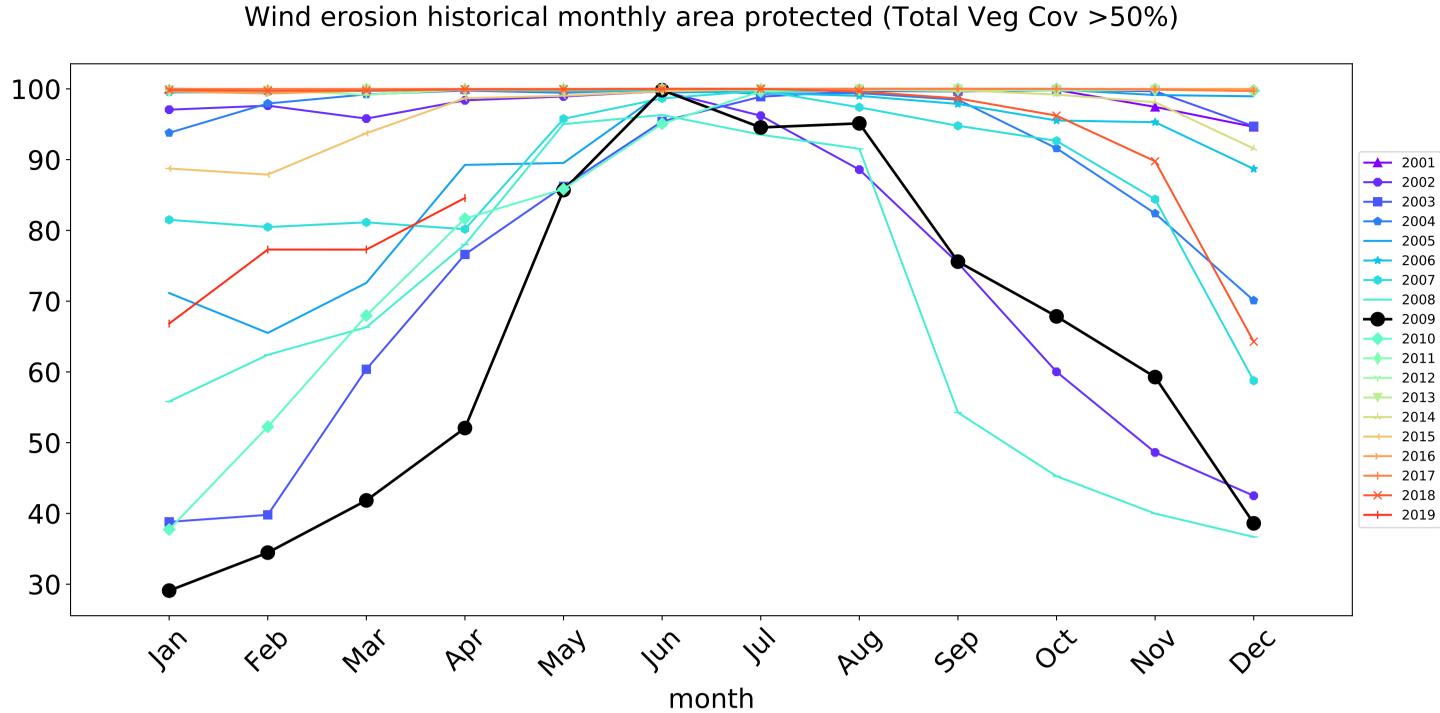


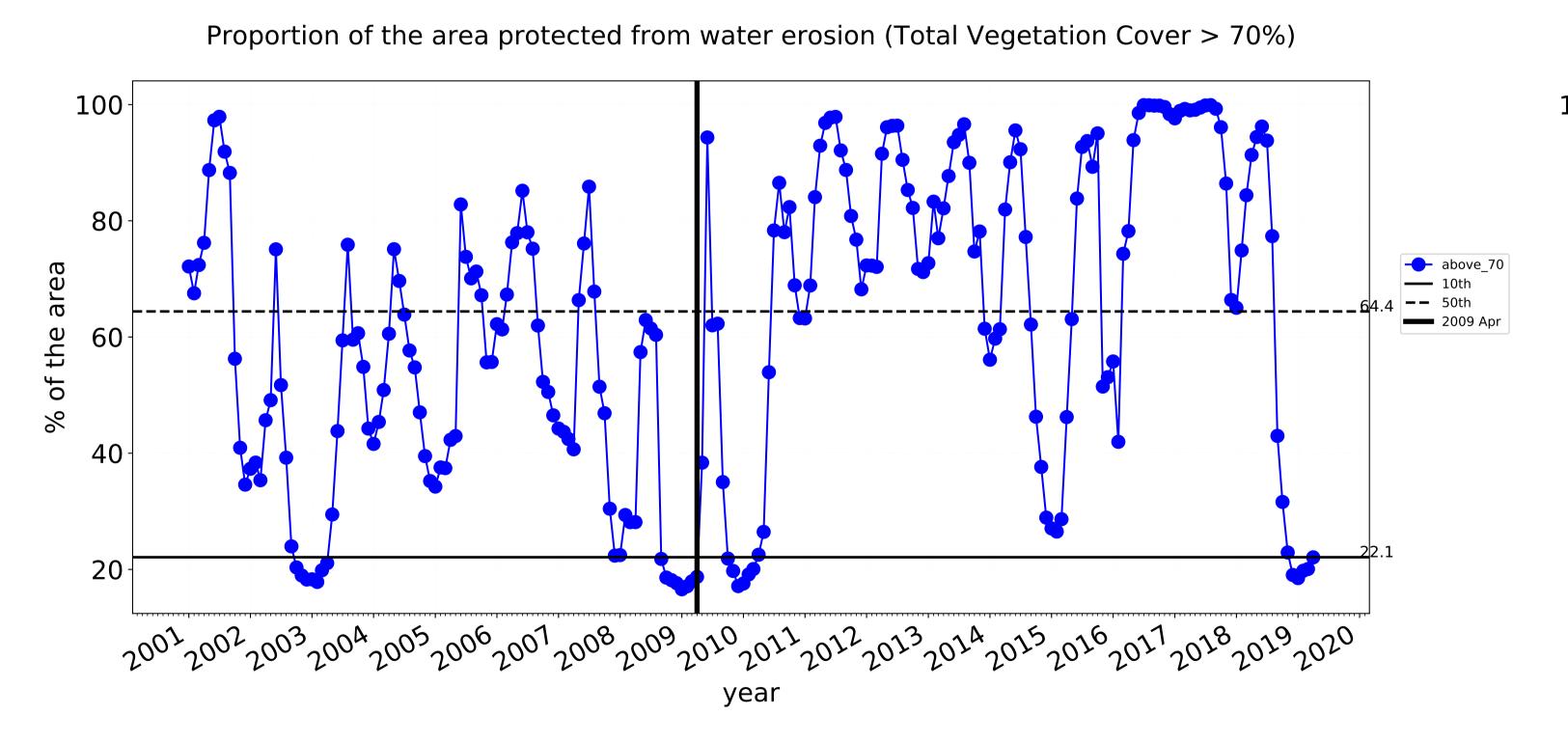
ha)

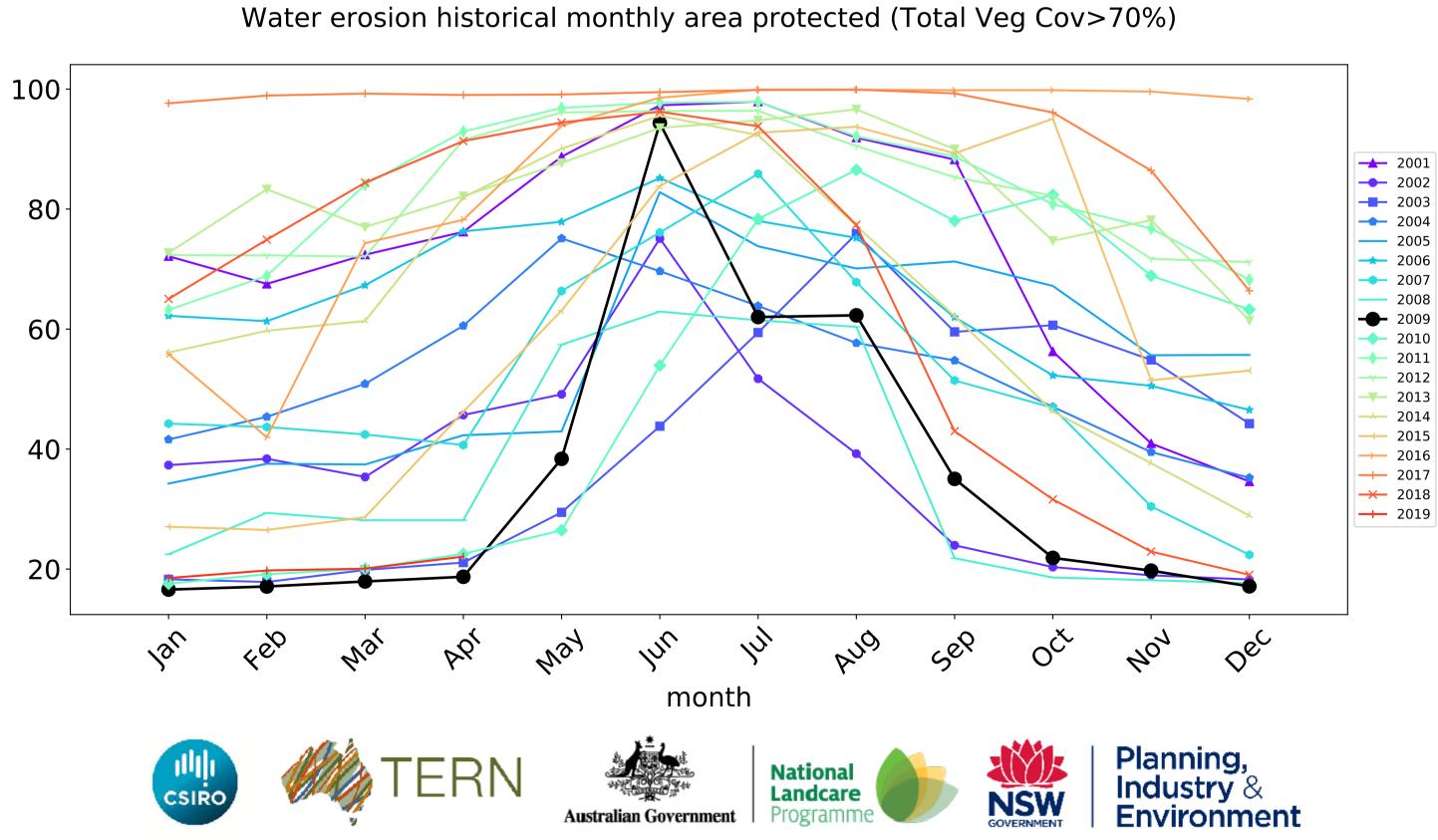
**-**20

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

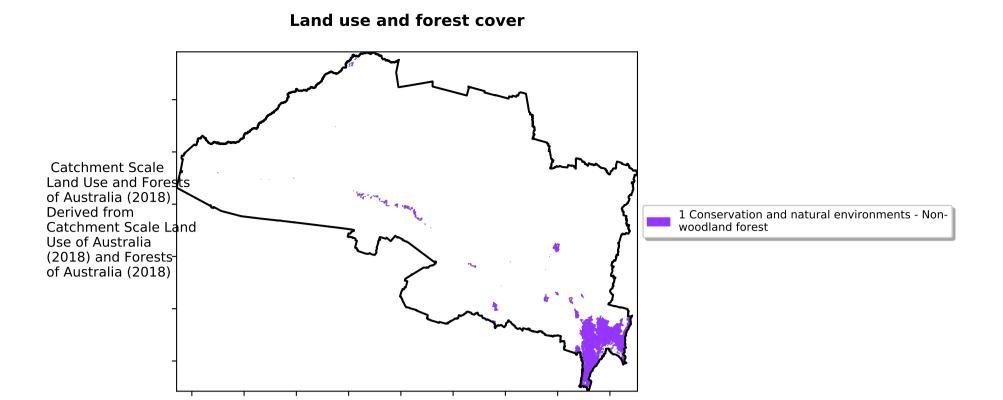




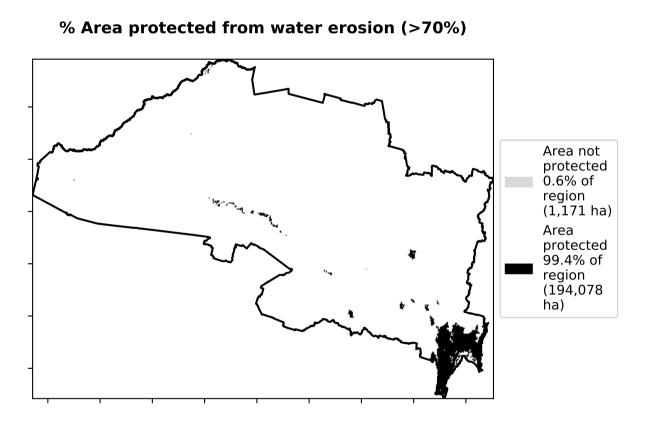


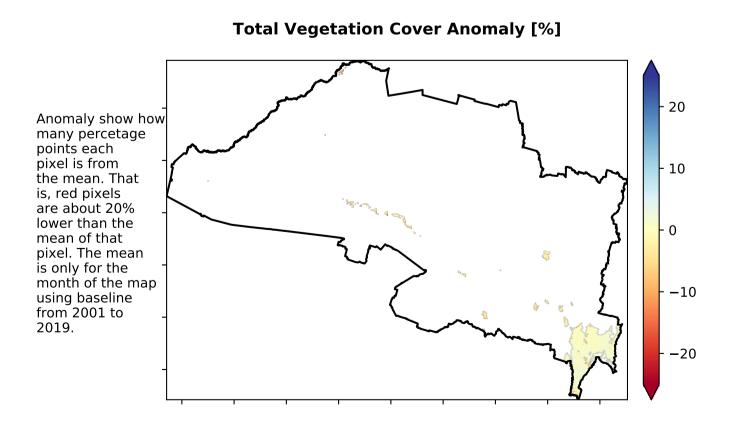


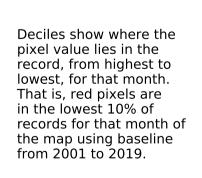
### **Conservation and natural environments Forest (non woodland)**

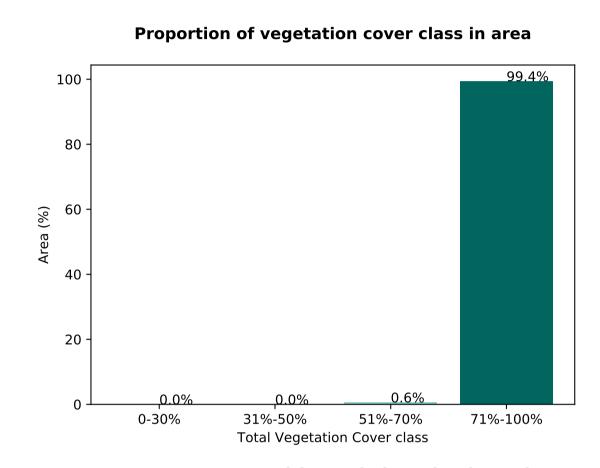


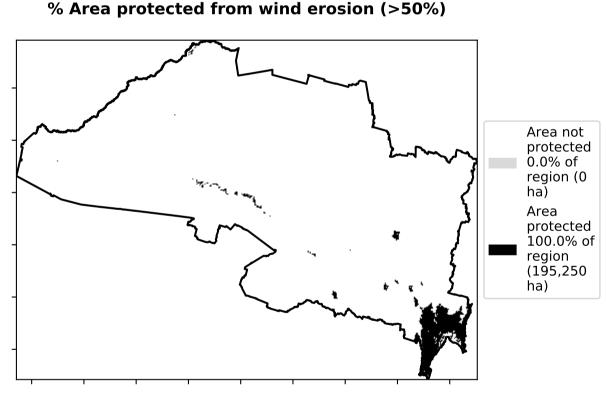
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trol

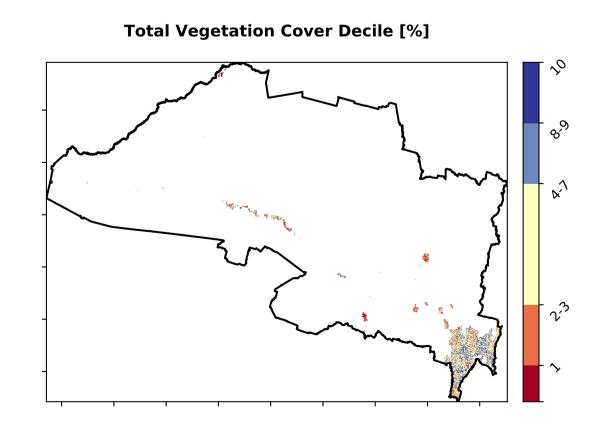














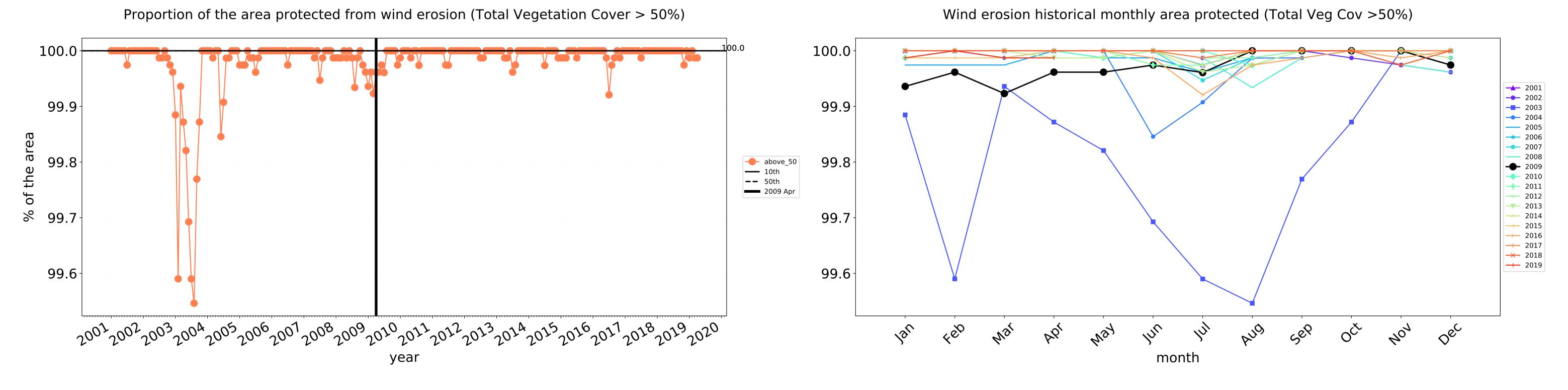


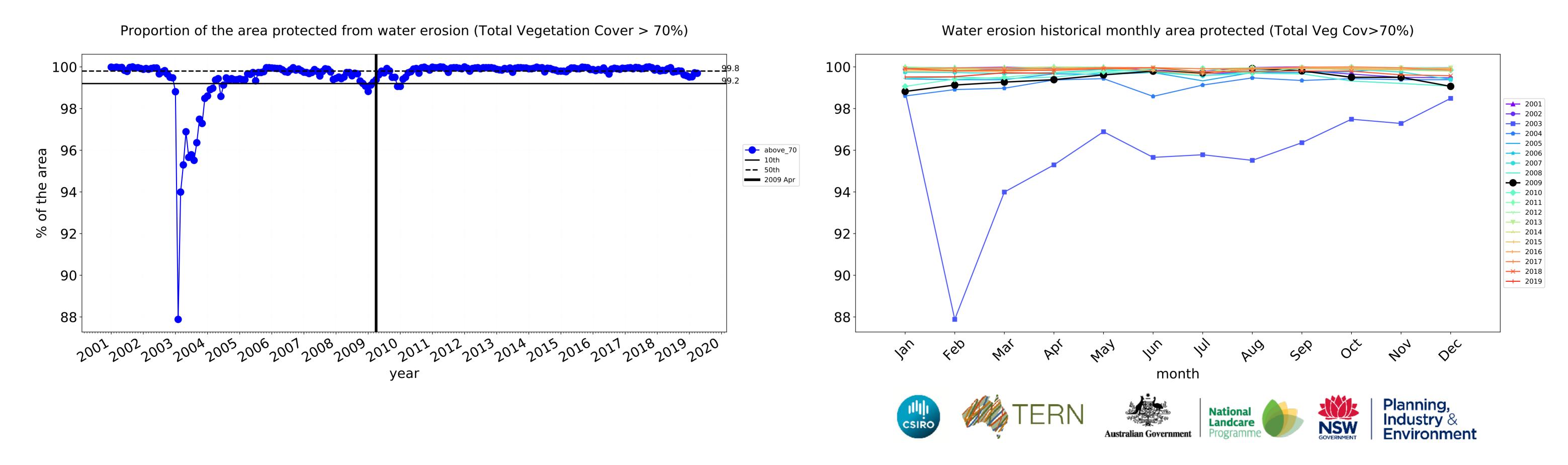








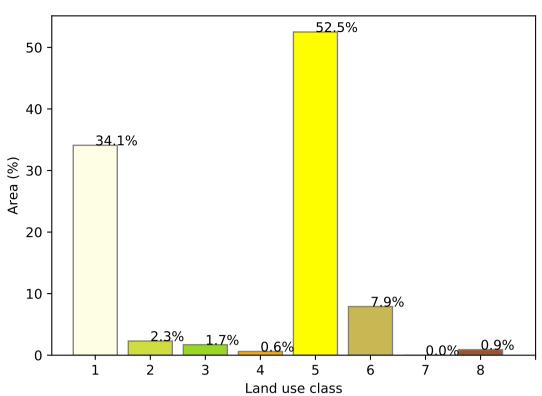




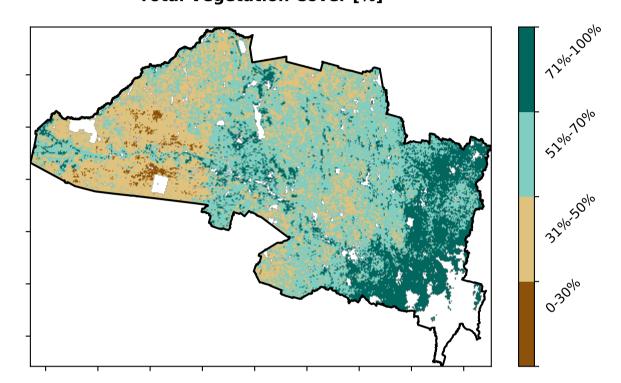
### **Agriculture**

# 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

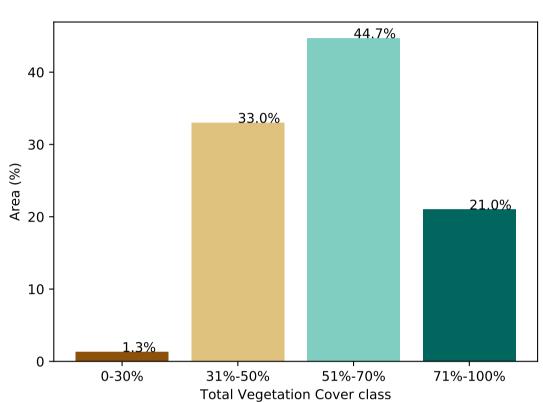
### Proportion of each land class in area



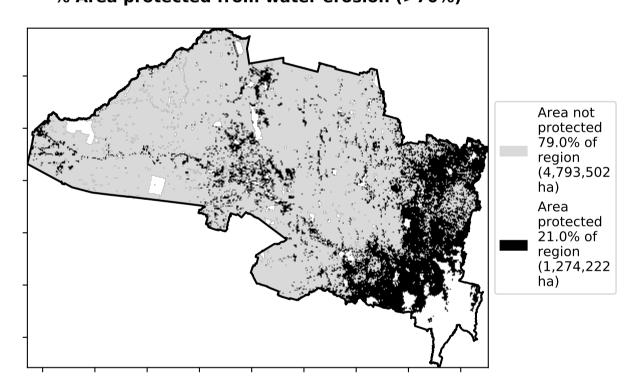
### **Total Vegetation Cover [%]**



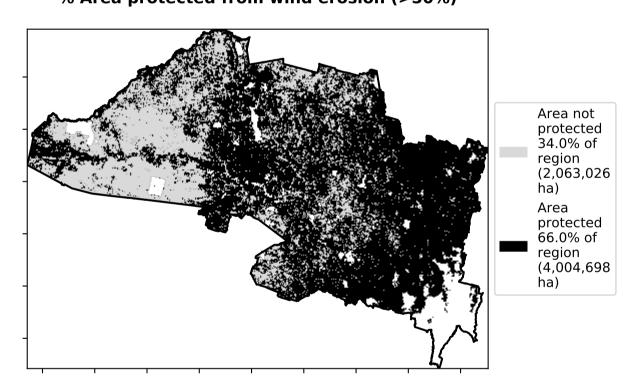
Proportion of vegetation cover class in area



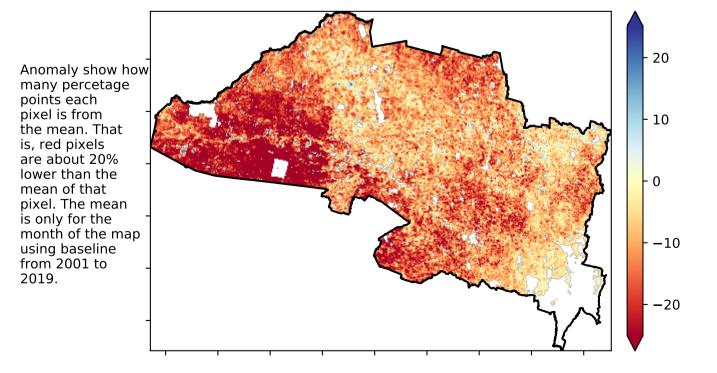
### % Area protected from water erosion (>70%)



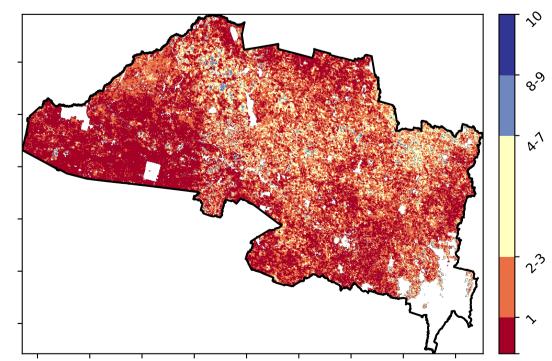
% Area protected from wind erosion (>50%)



### **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.







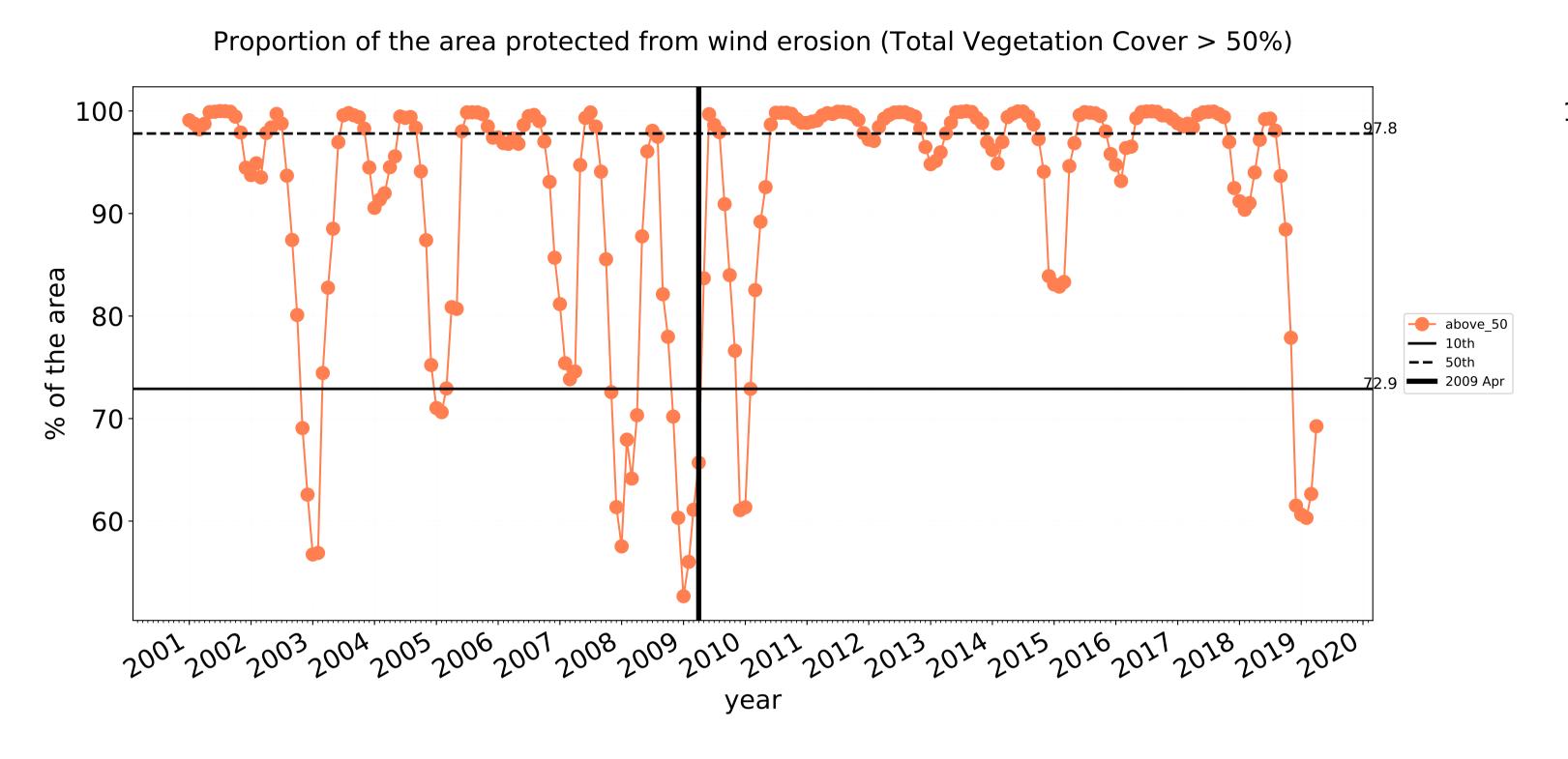


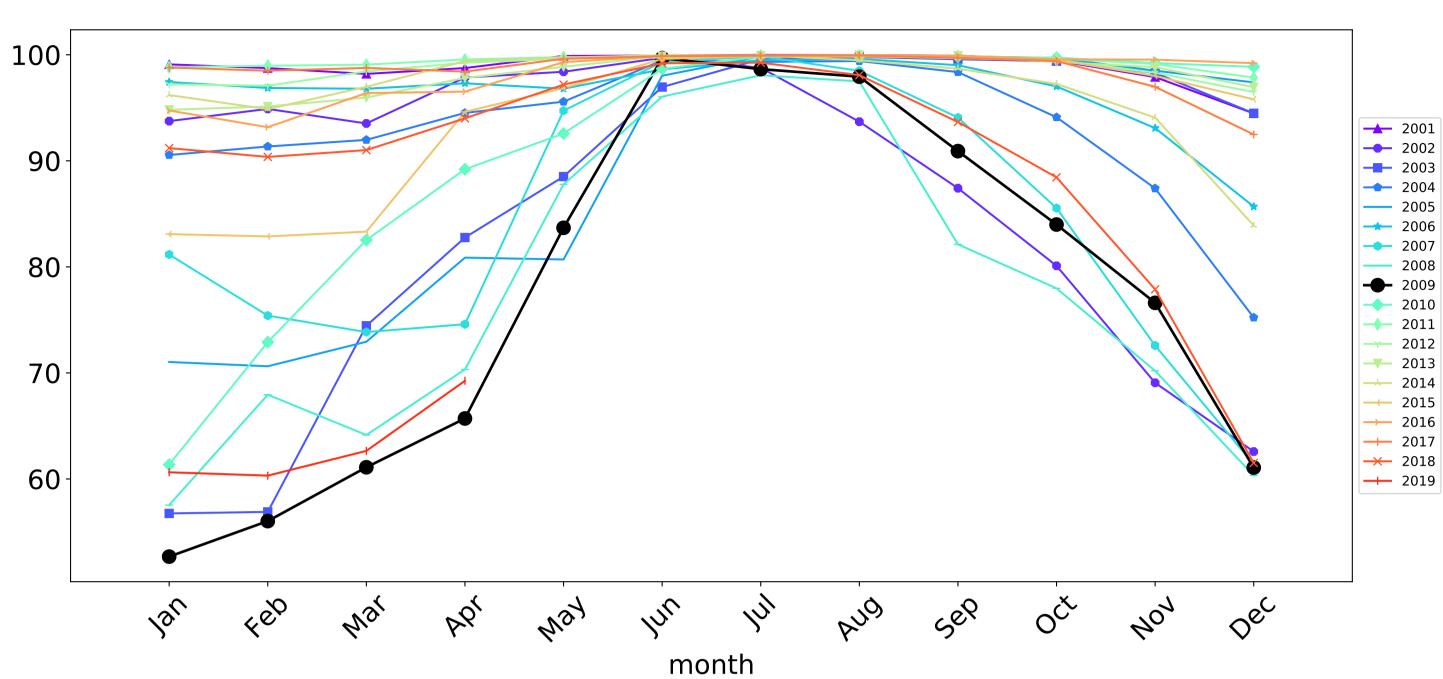




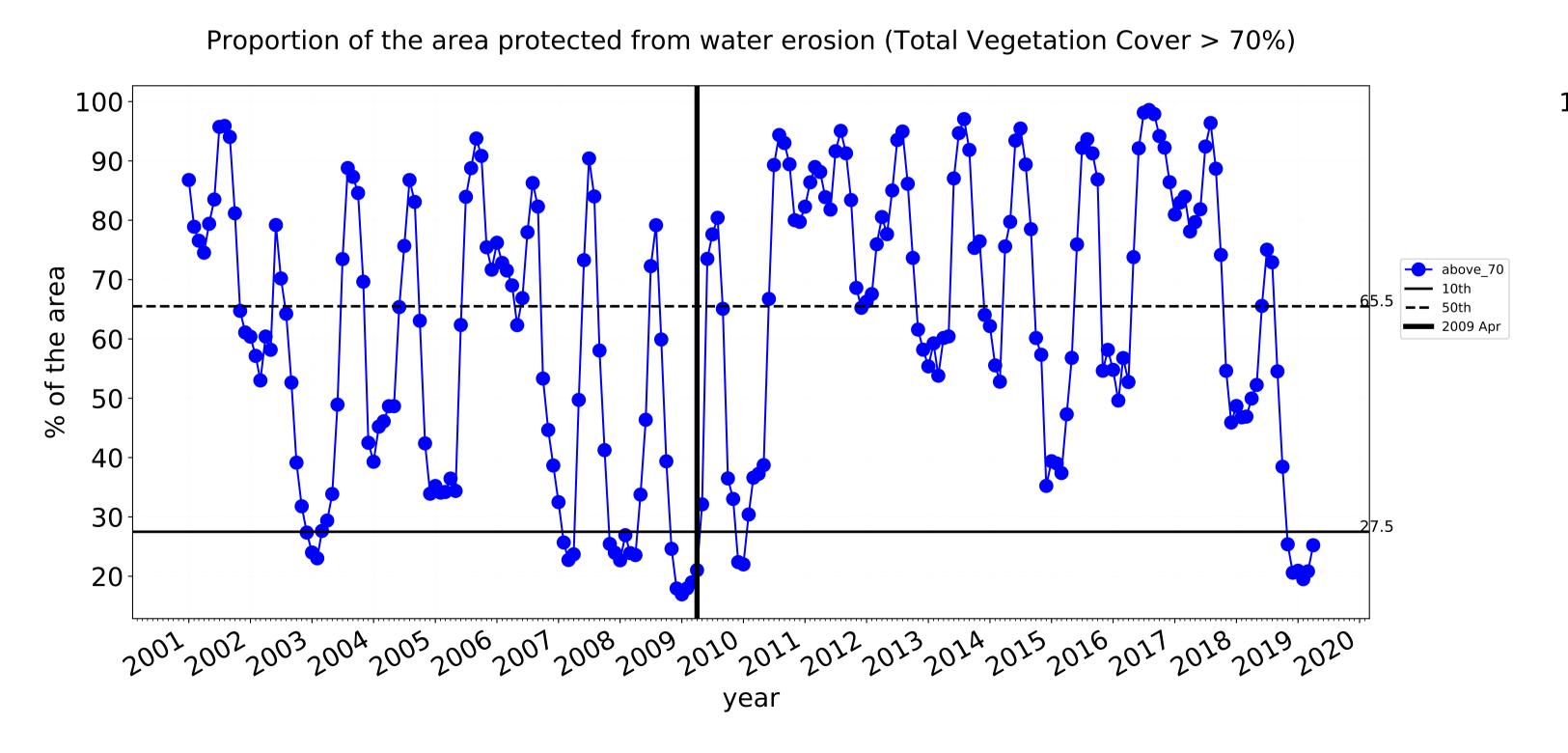


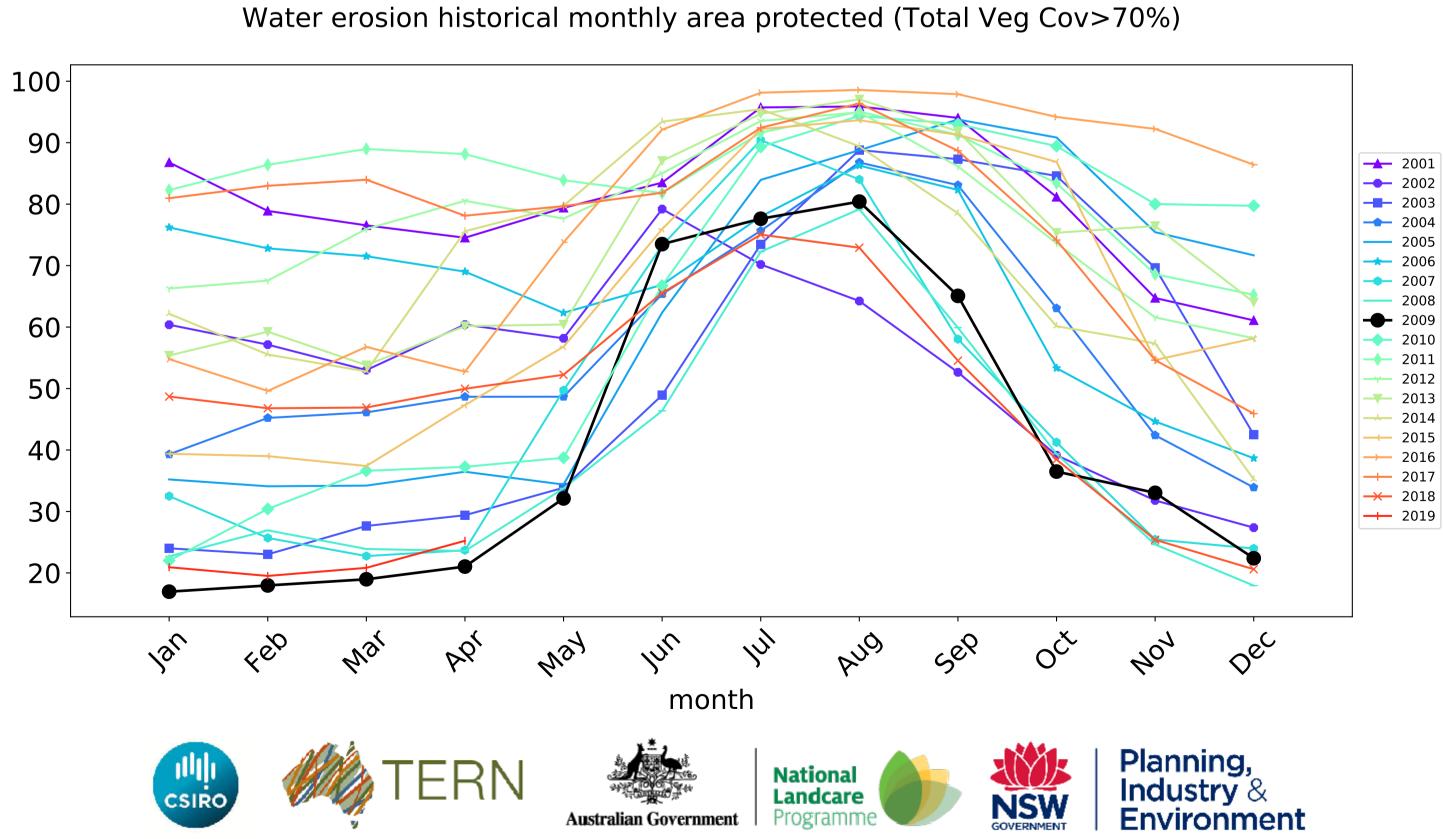
### **Agriculture timeseries**



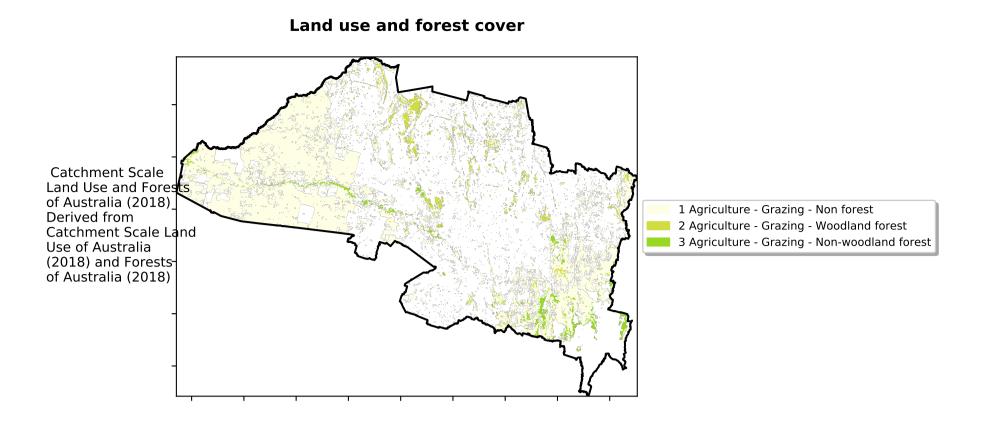


Wind erosion historical monthly area protected (Total Veg Cov >50%)

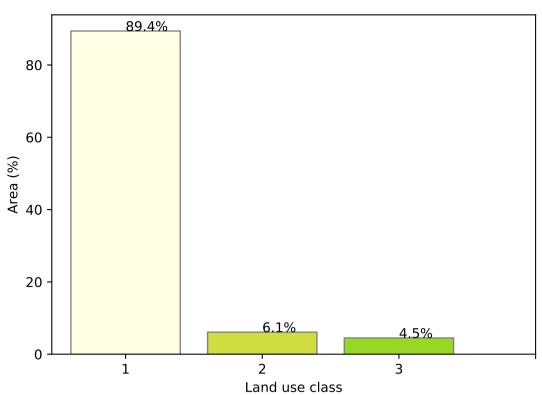




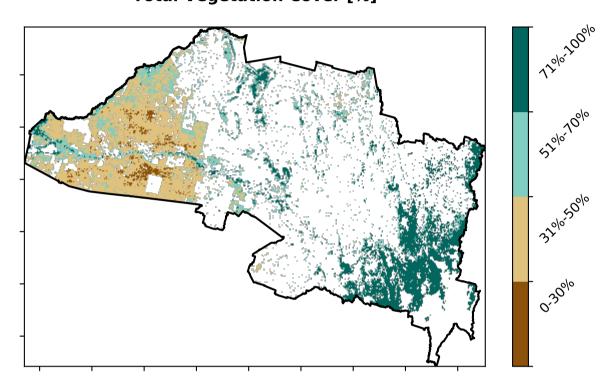
### **Grazing**



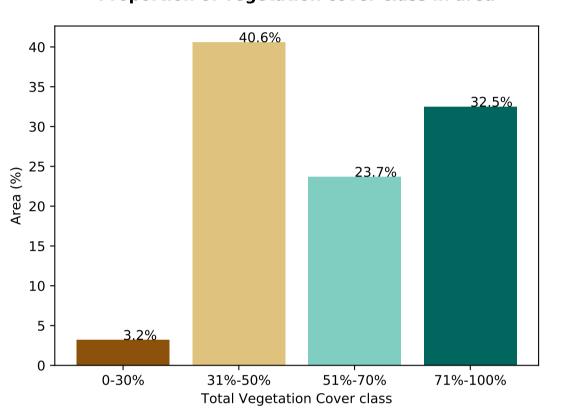
### Proportion of each land class in area



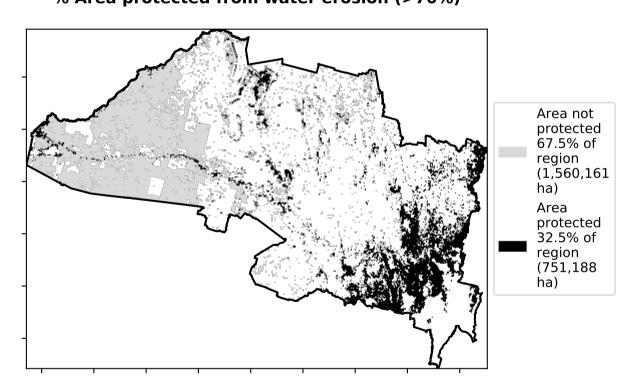
**Total Vegetation Cover [%]** 



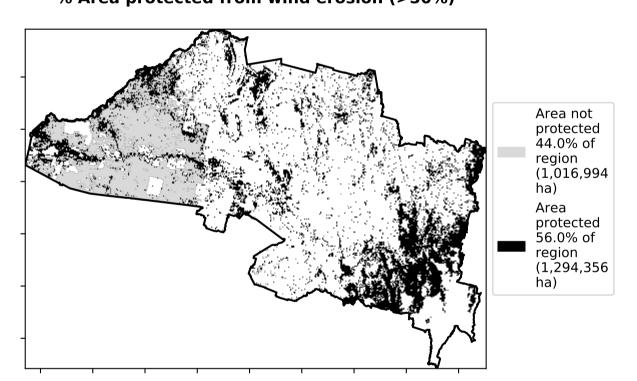
Proportion of vegetation cover class in area



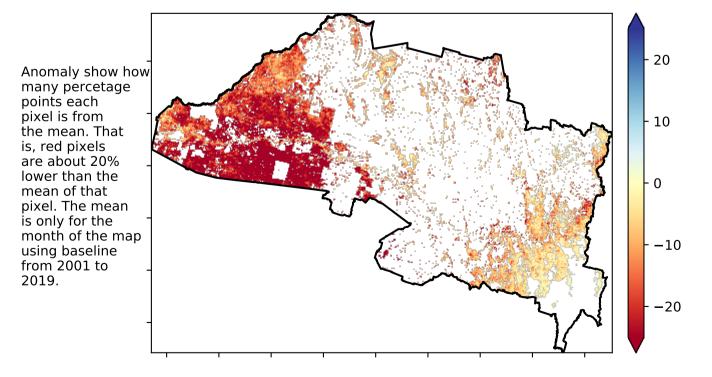
### % Area protected from water erosion (>70%)



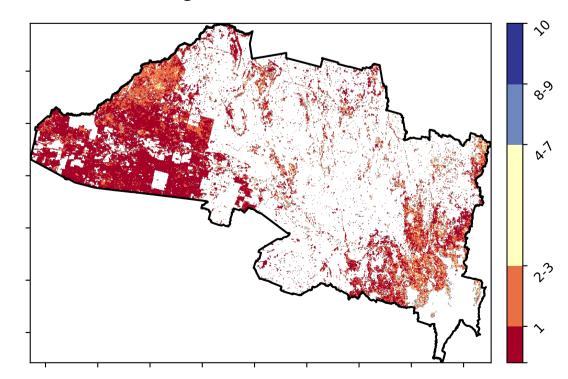
% Area protected from wind erosion (>50%)



### Total Vegetation Cover Anomaly [%]



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







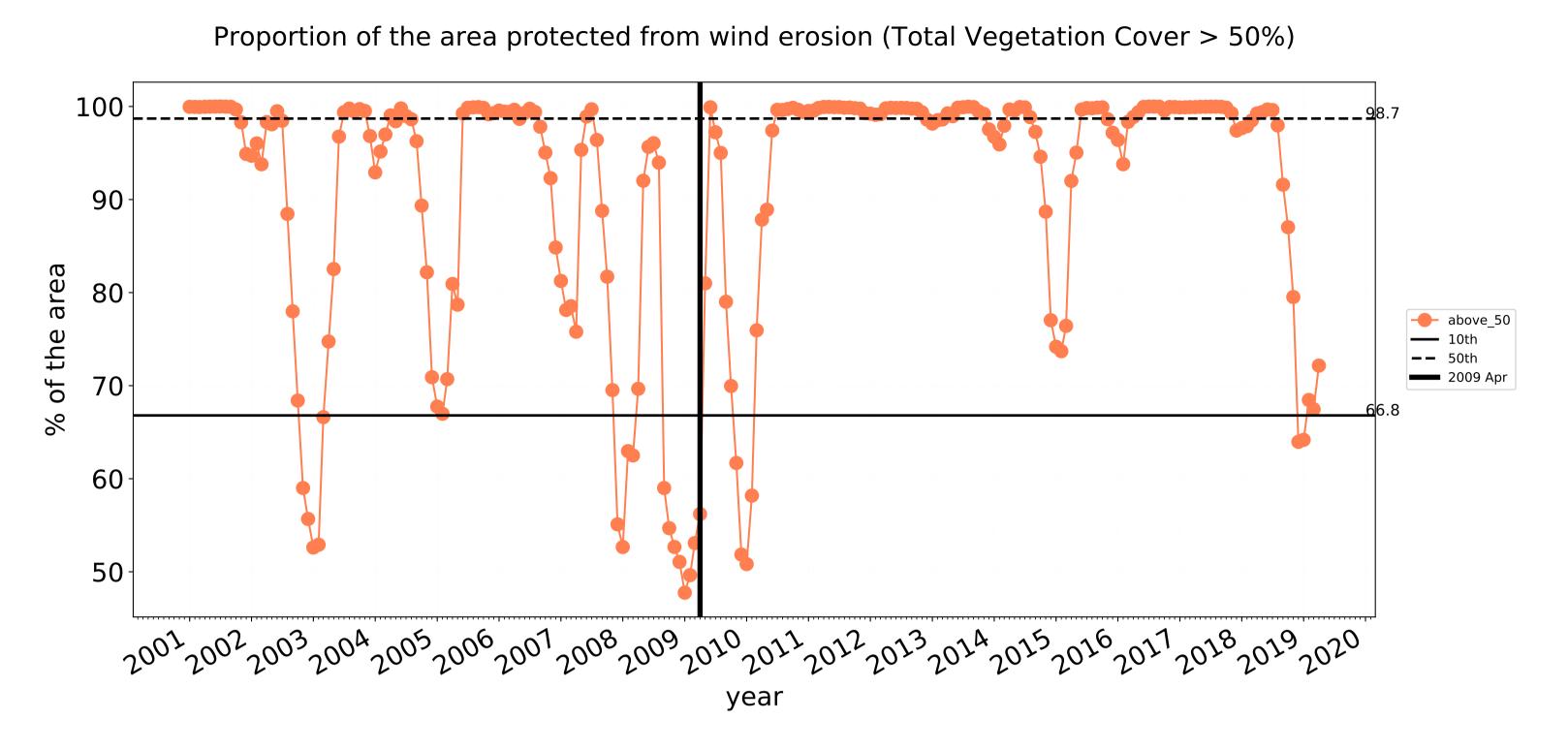


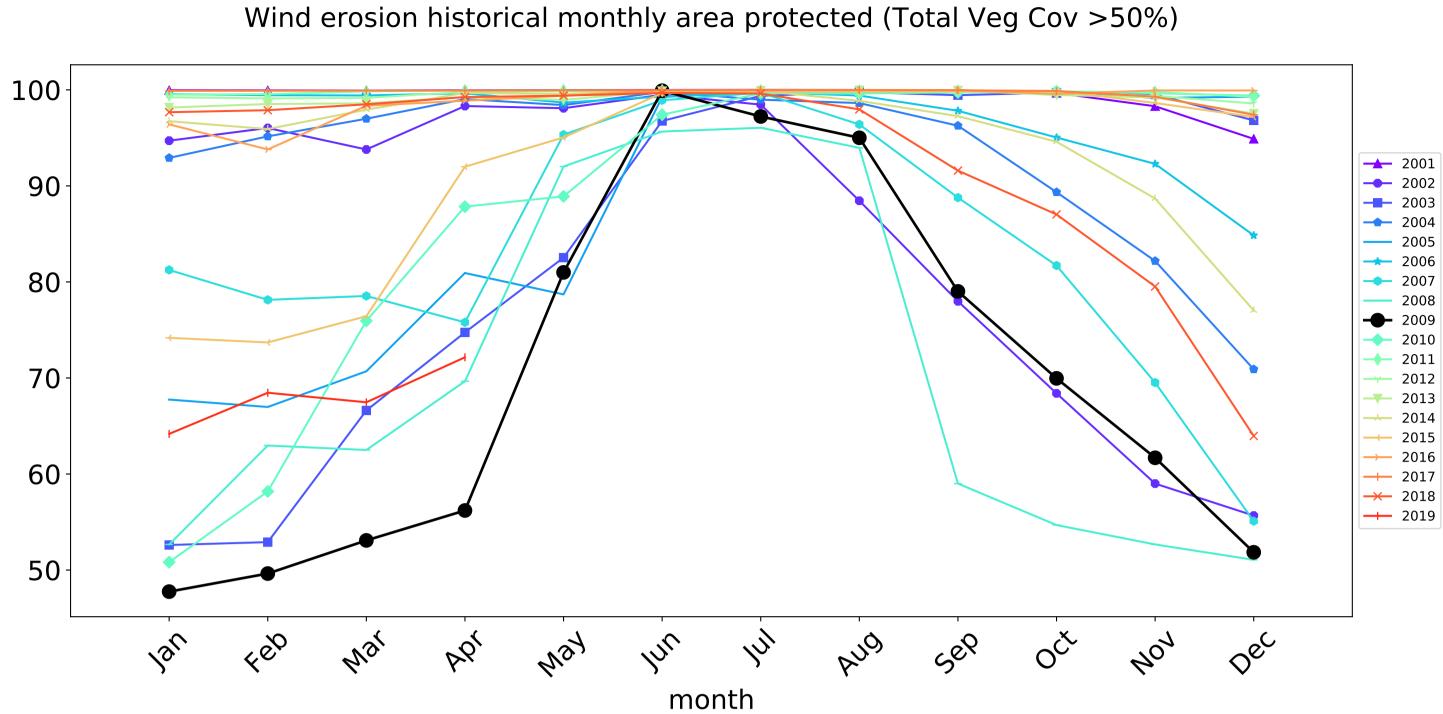


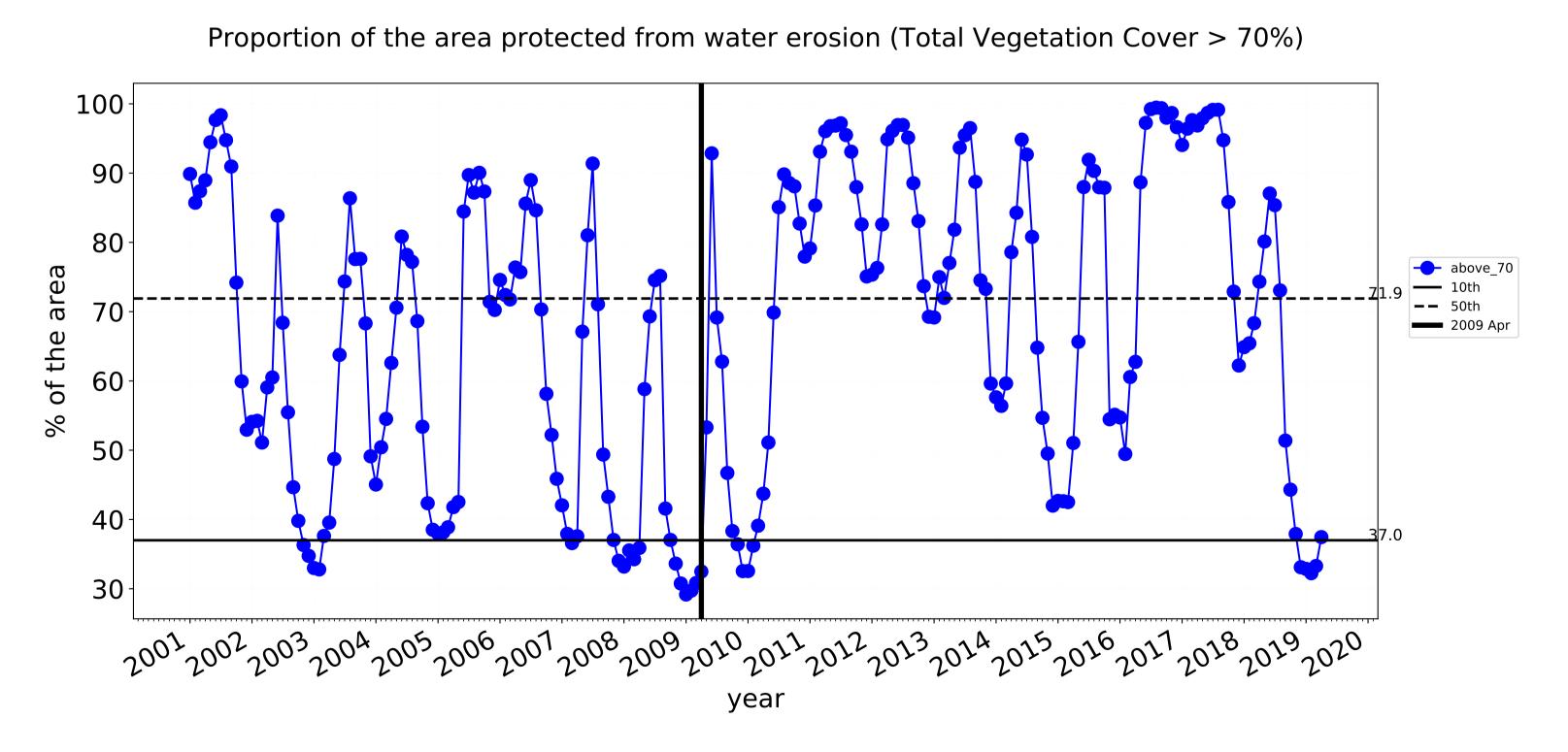


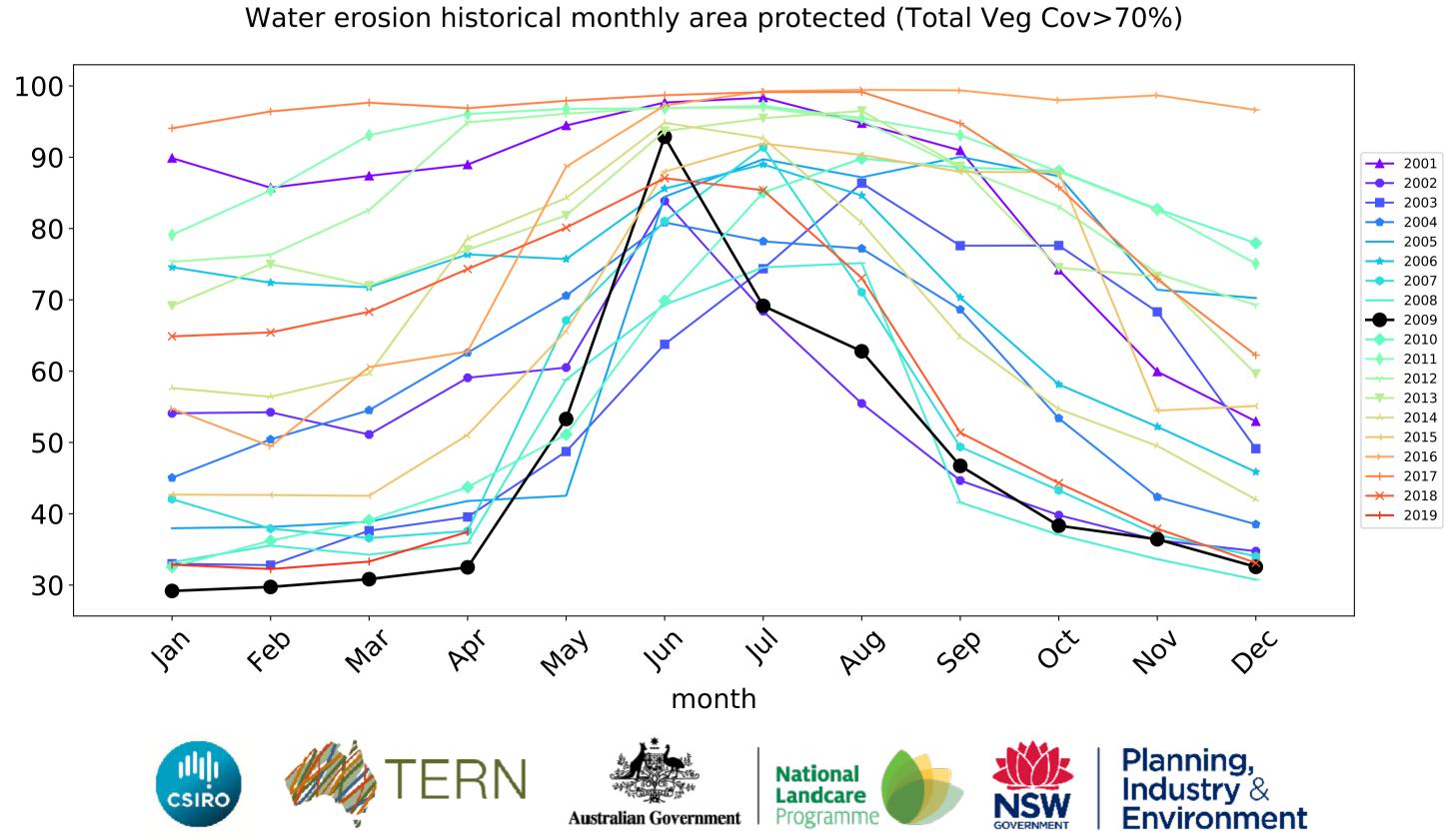


### **Grazing timeseries**



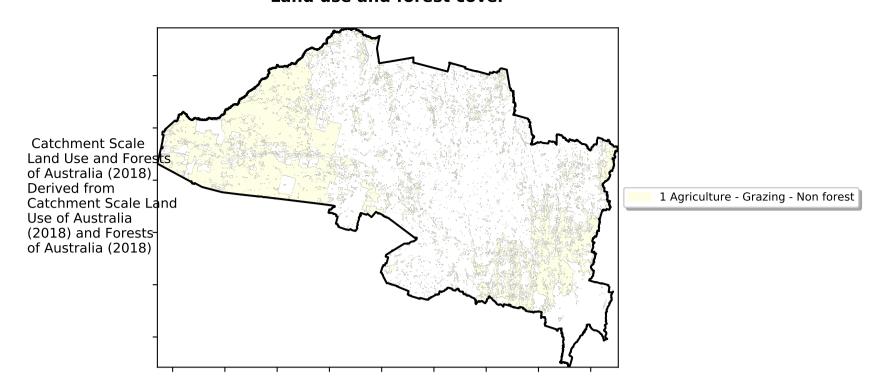




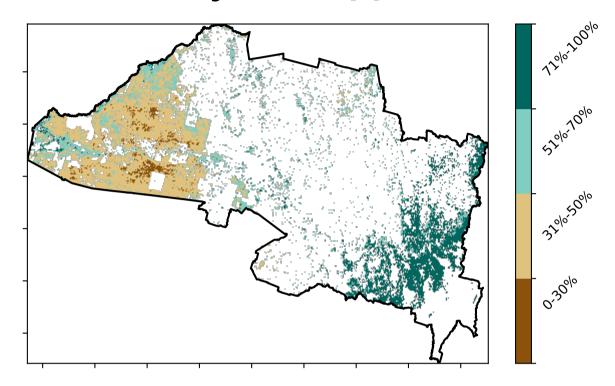


### **Grazing non forest**

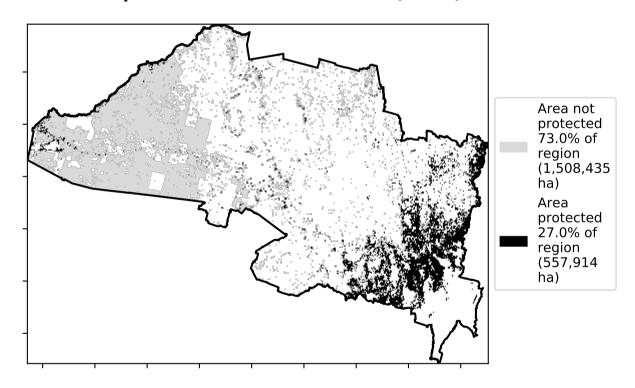
### Land use and forest cover



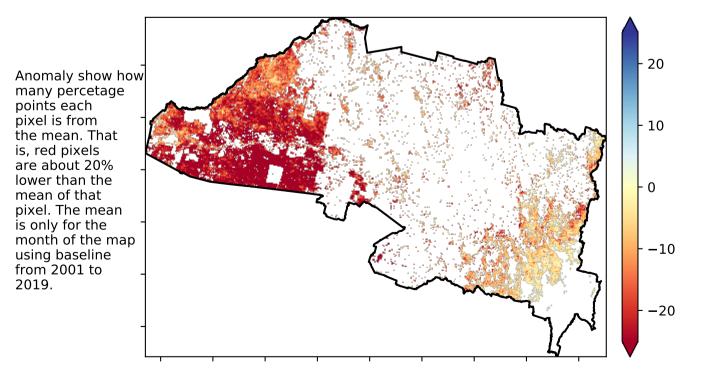
### **Total Vegetation Cover [%]**



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

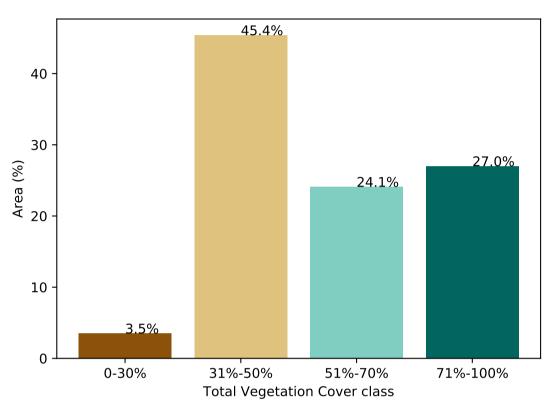


### Total Vegetation Cover Anomaly [%]

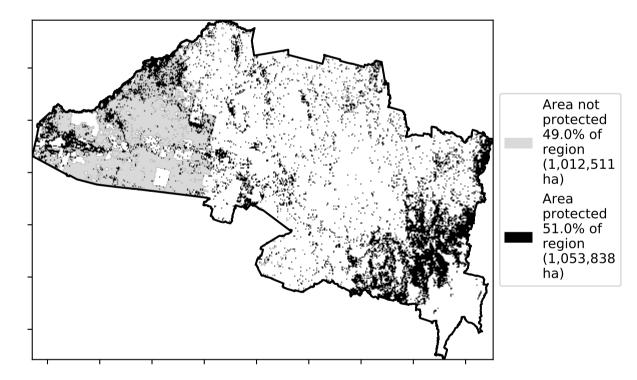


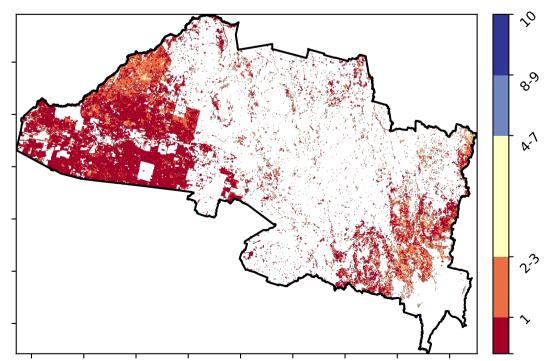
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









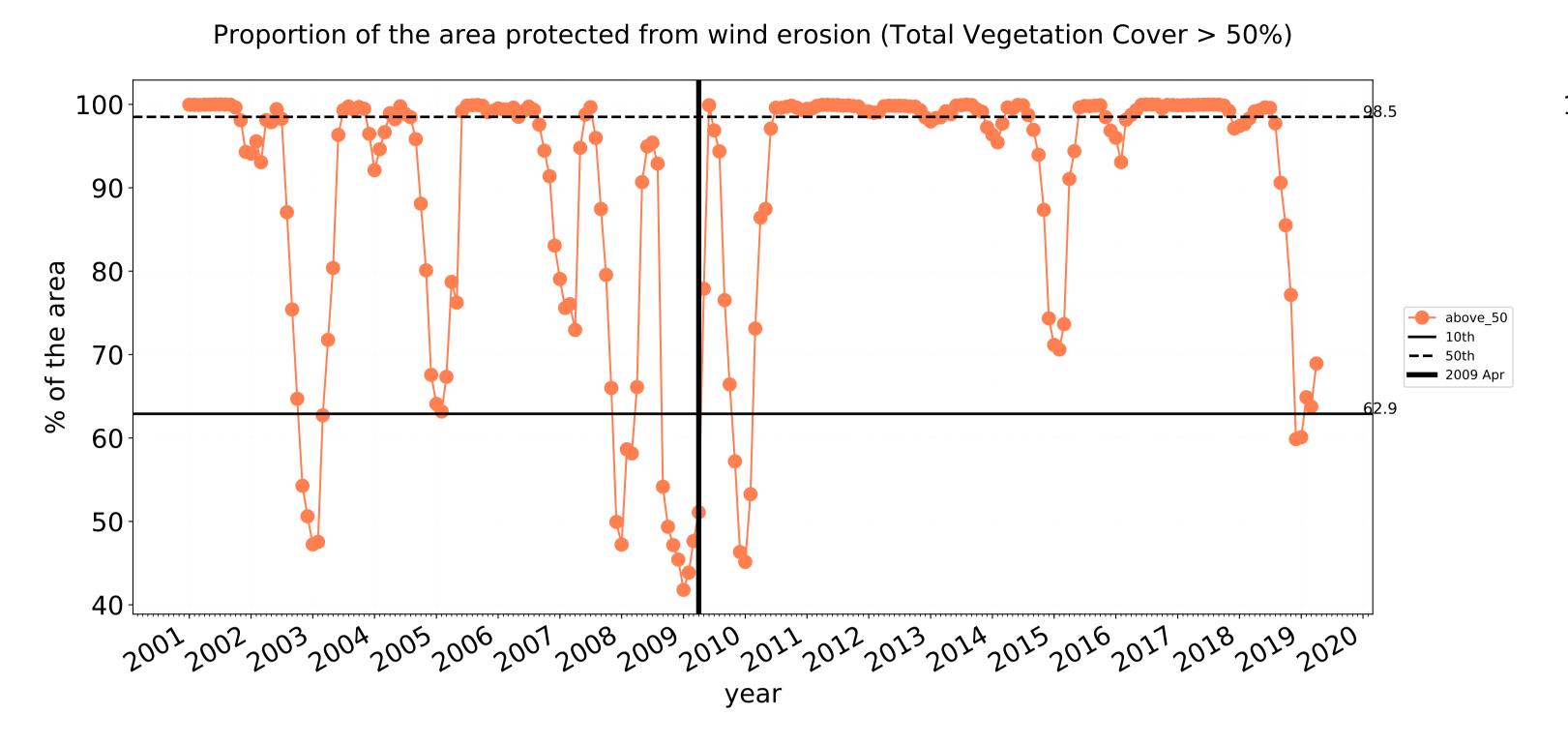


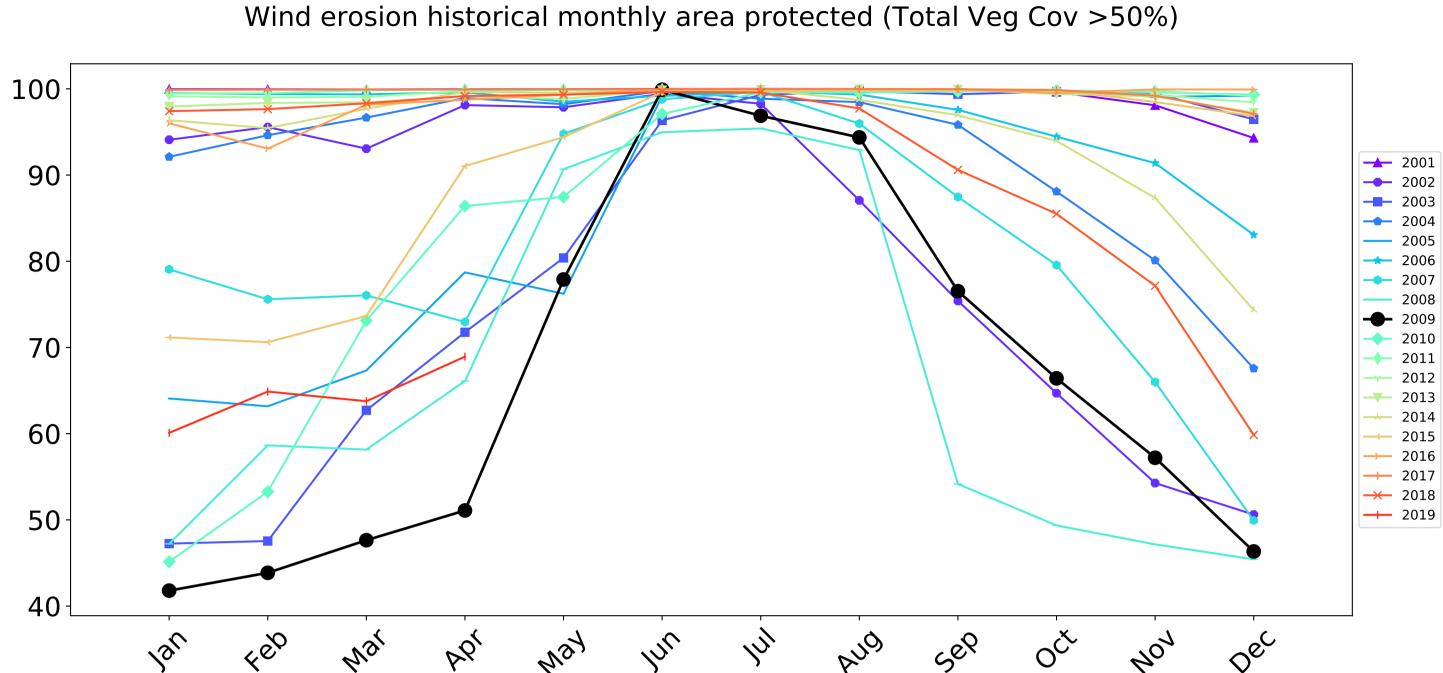




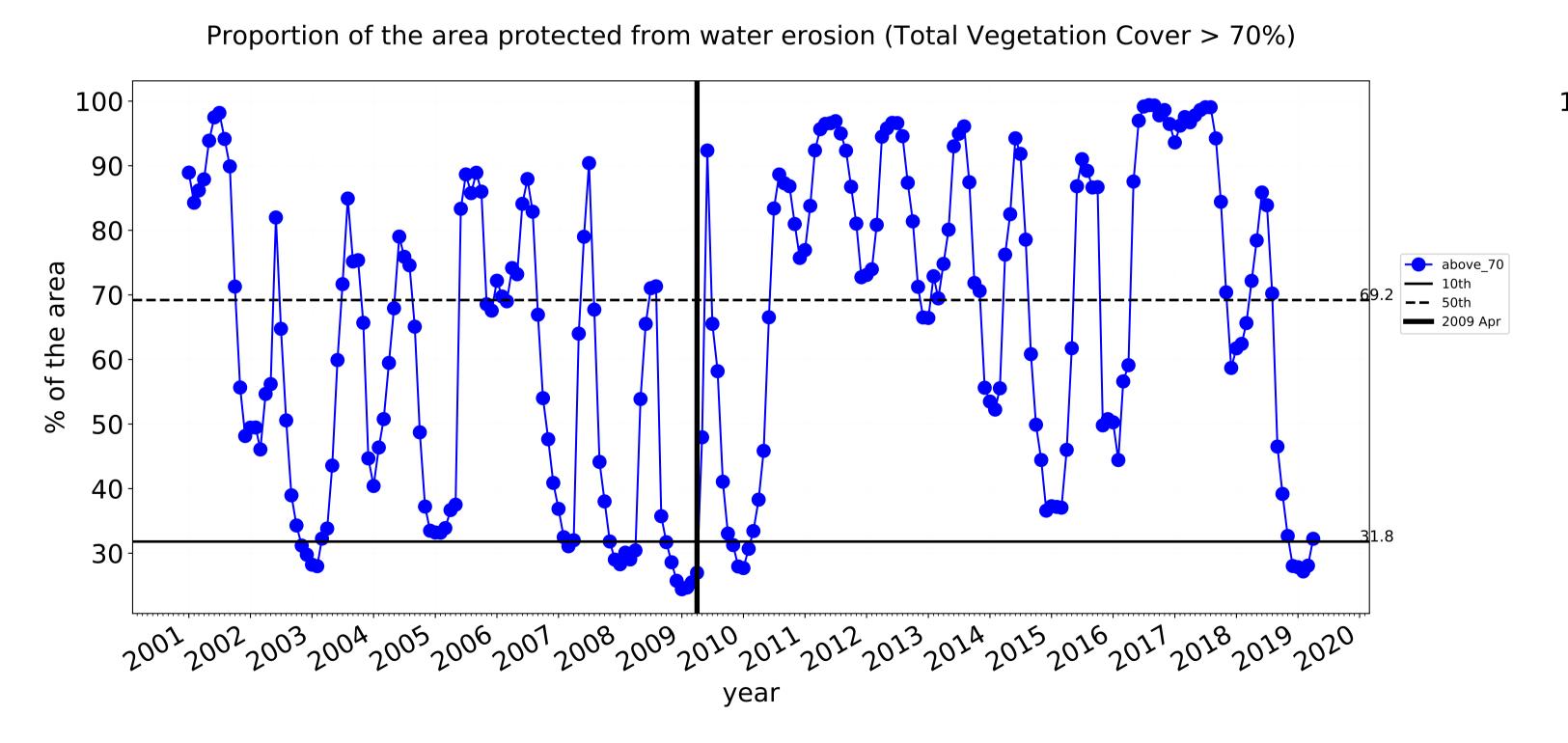


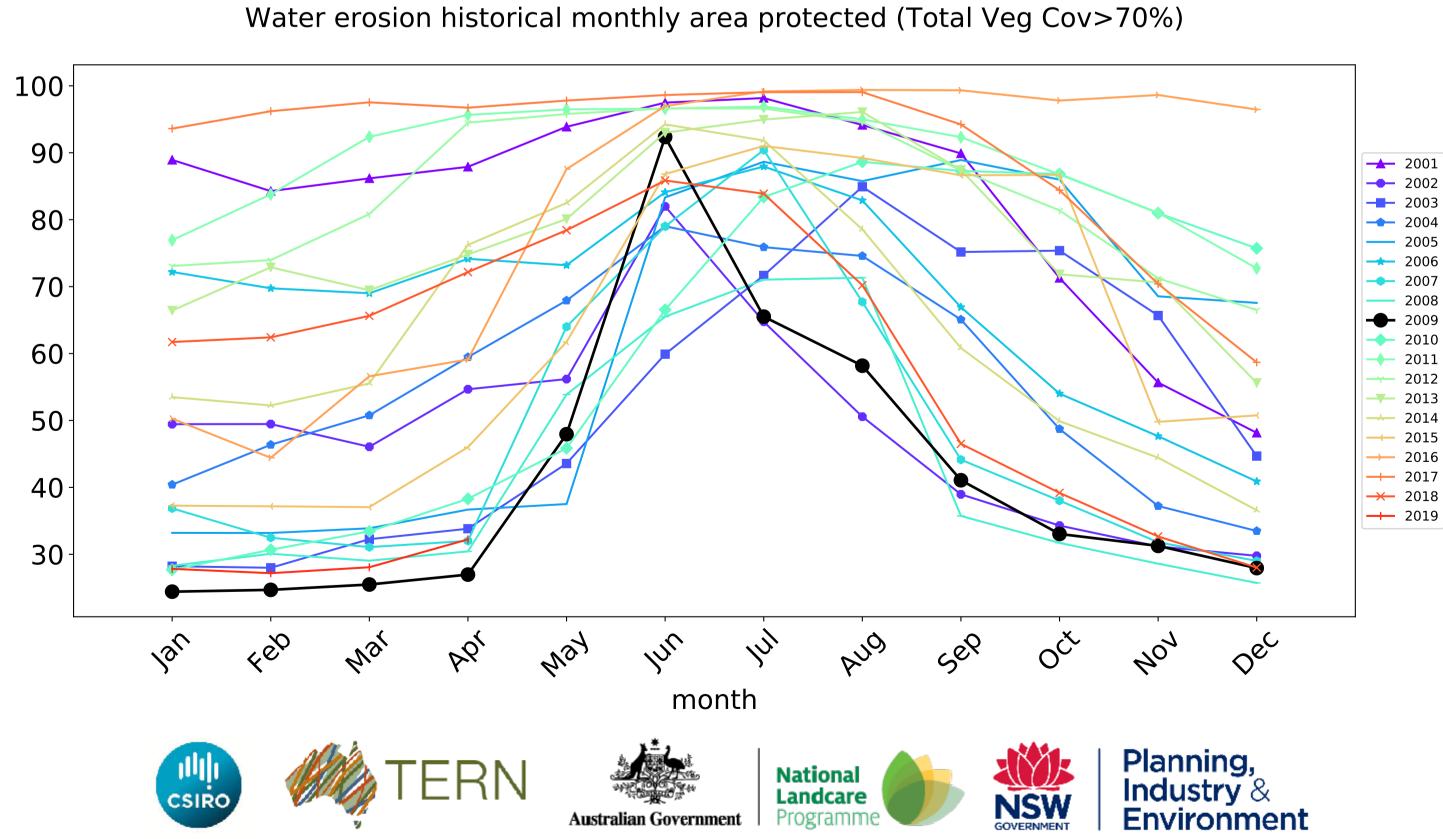
### **Grazing non forest timeseries**





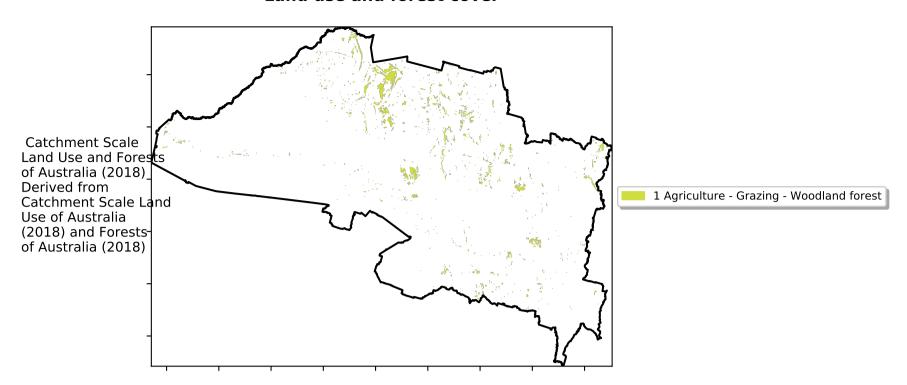
month



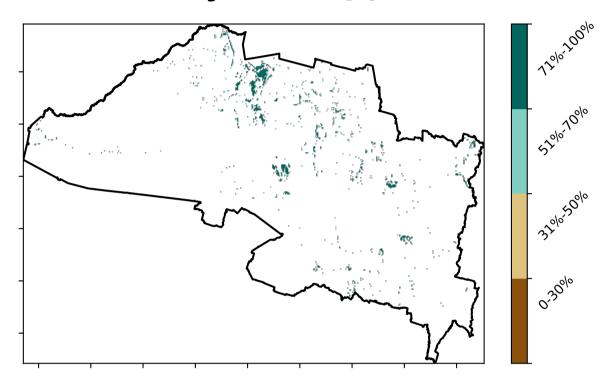


### **Grazing Woodland forest**

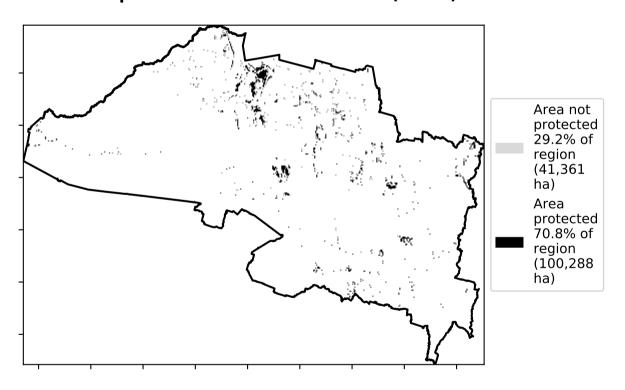
### Land use and forest cover



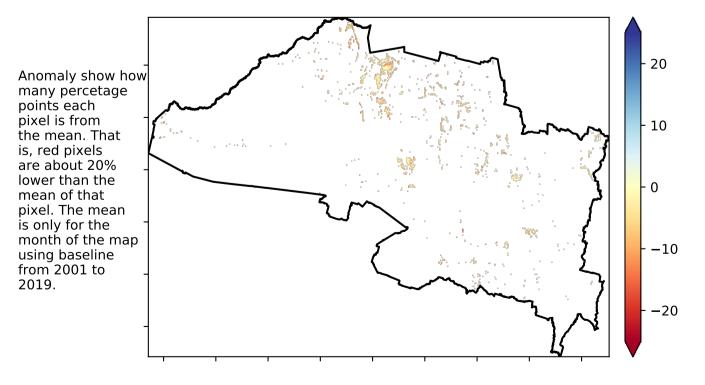
### **Total Vegetation Cover [%]**



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

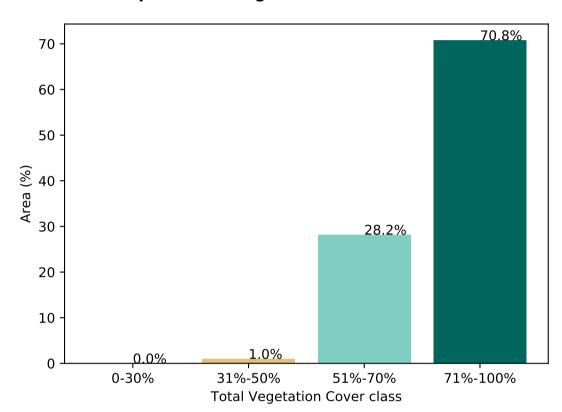


### Total Vegetation Cover Anomaly [%]

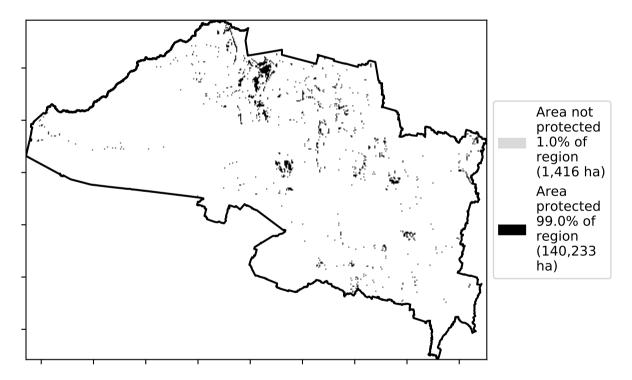


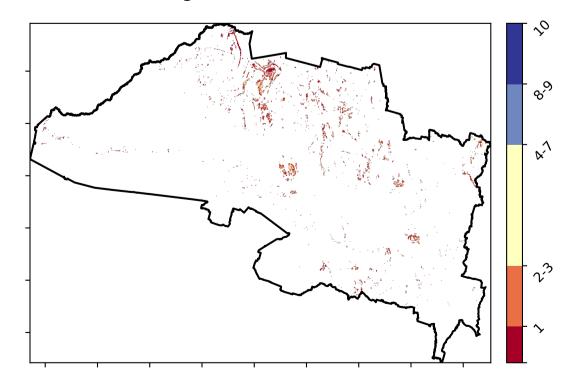
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









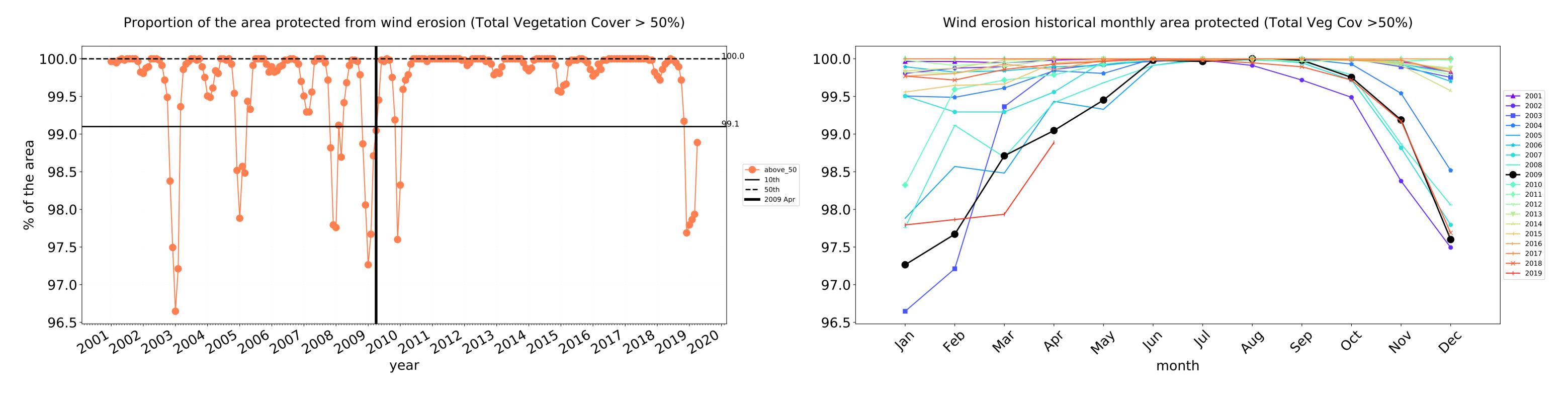


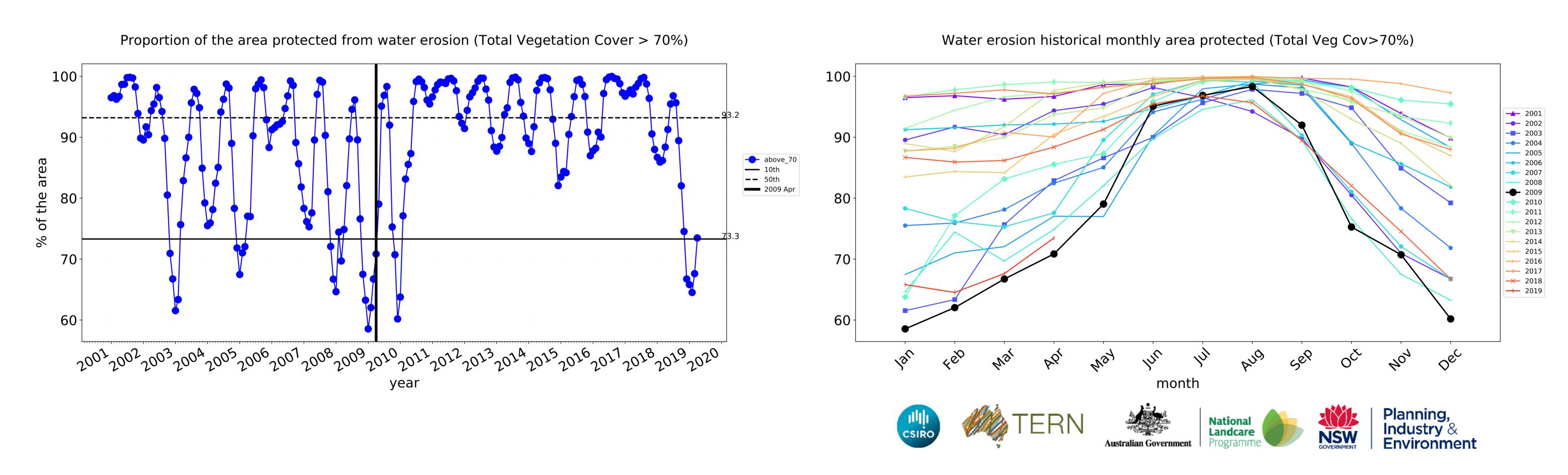






### **Grazing Woodland forest timeseries**



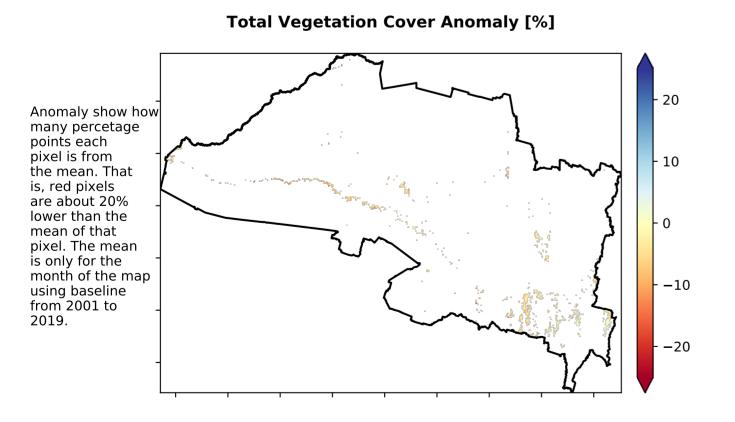


### **Grazing - Forest (non woodland)**

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

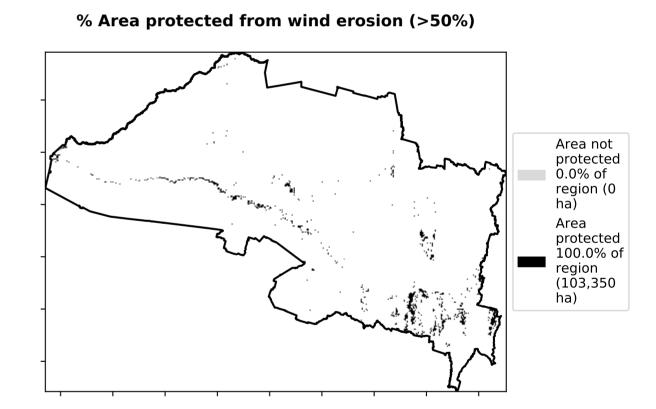
### Total Vegetation Cover [%]

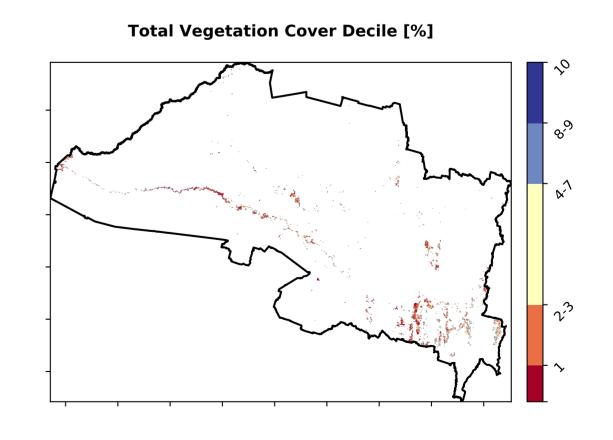
### % Area protected from water erosion (>70%) Area not protected 9.7% of region (10,024 ha) Area protected 90.3% of region (93,325 ha)



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.

### 







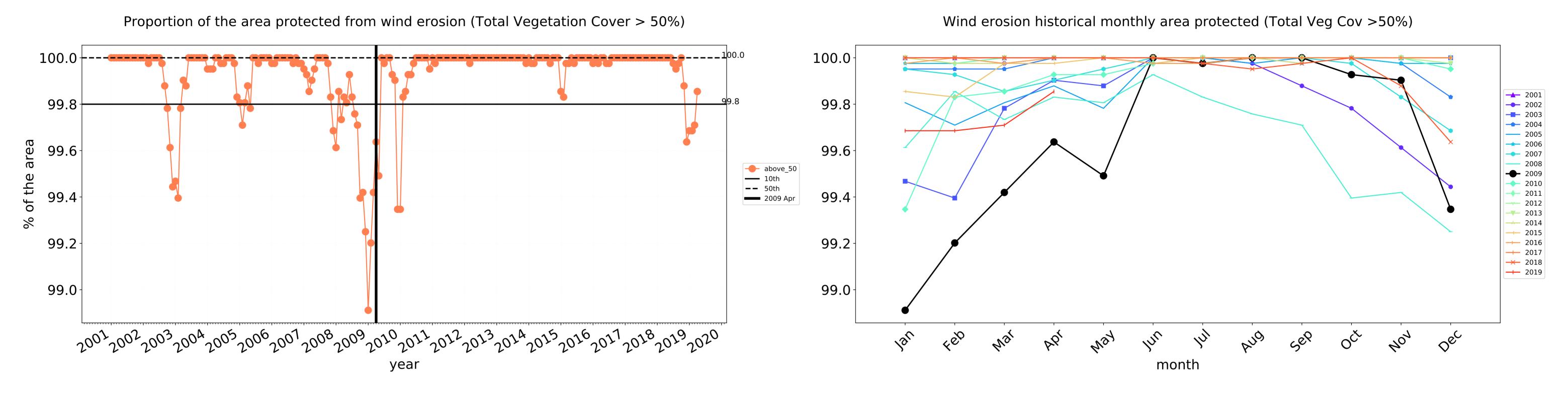


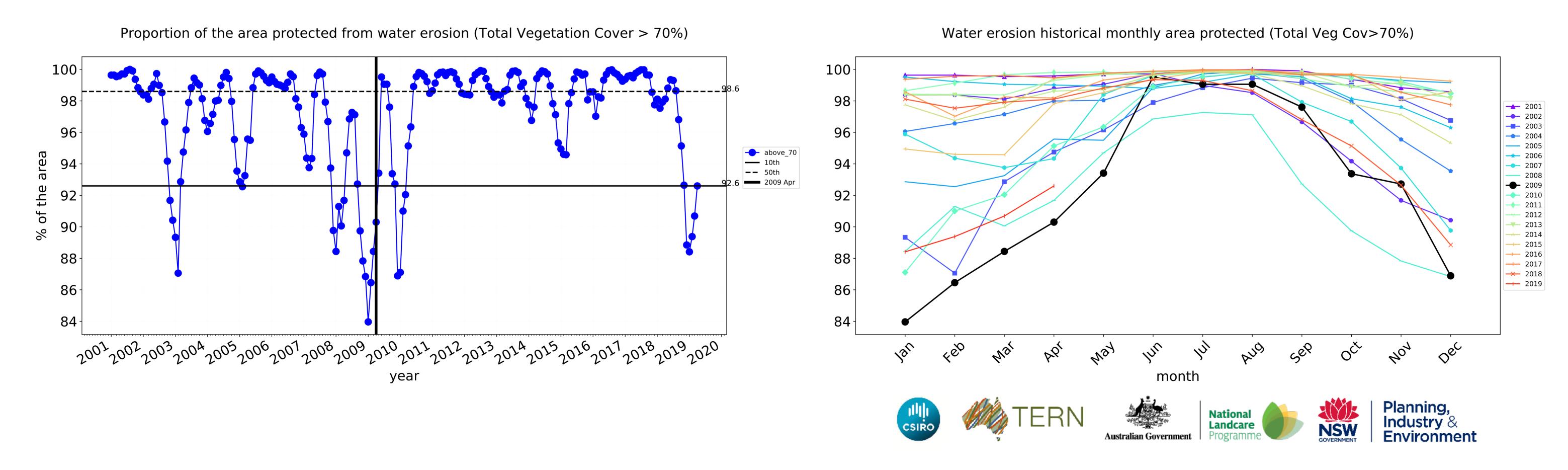






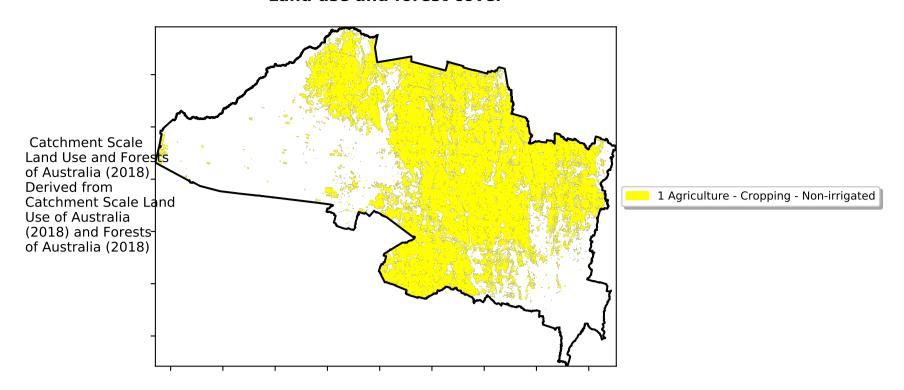




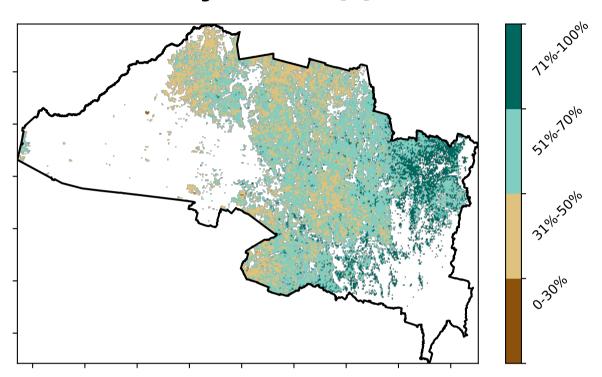


### **Cropping**

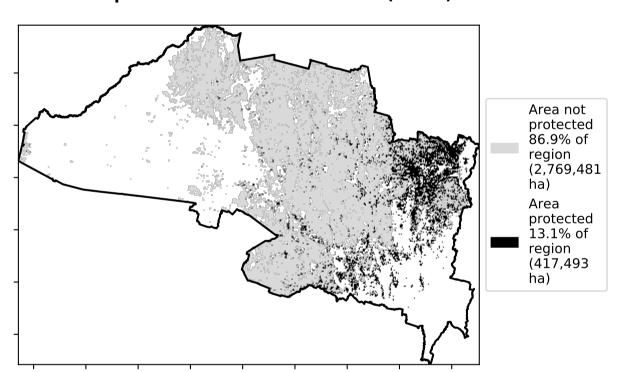
### Land use and forest cover



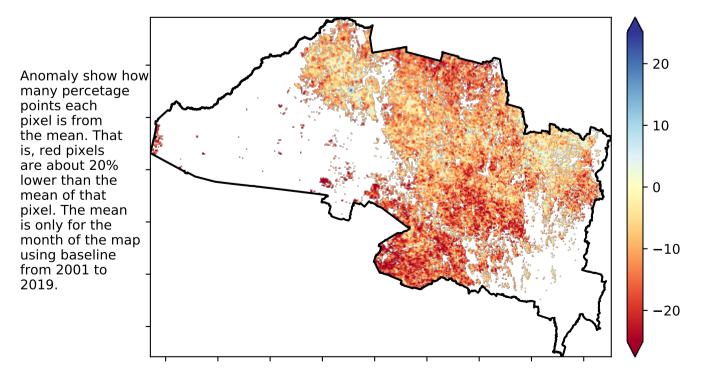
### **Total Vegetation Cover [%]**



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

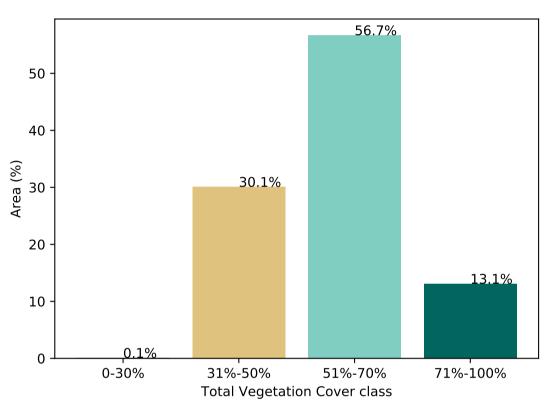


### Total Vegetation Cover Anomaly [%]

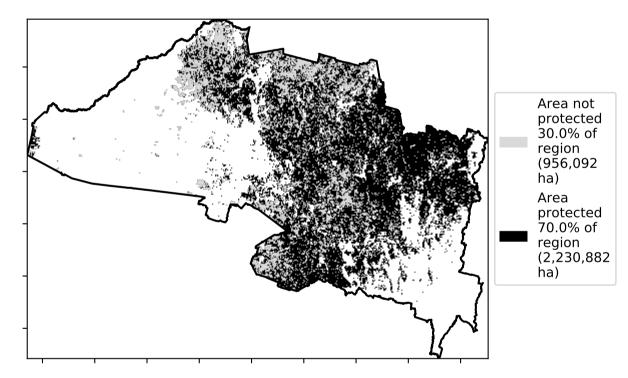


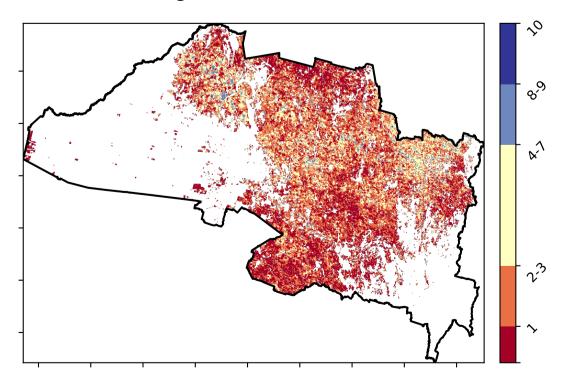
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









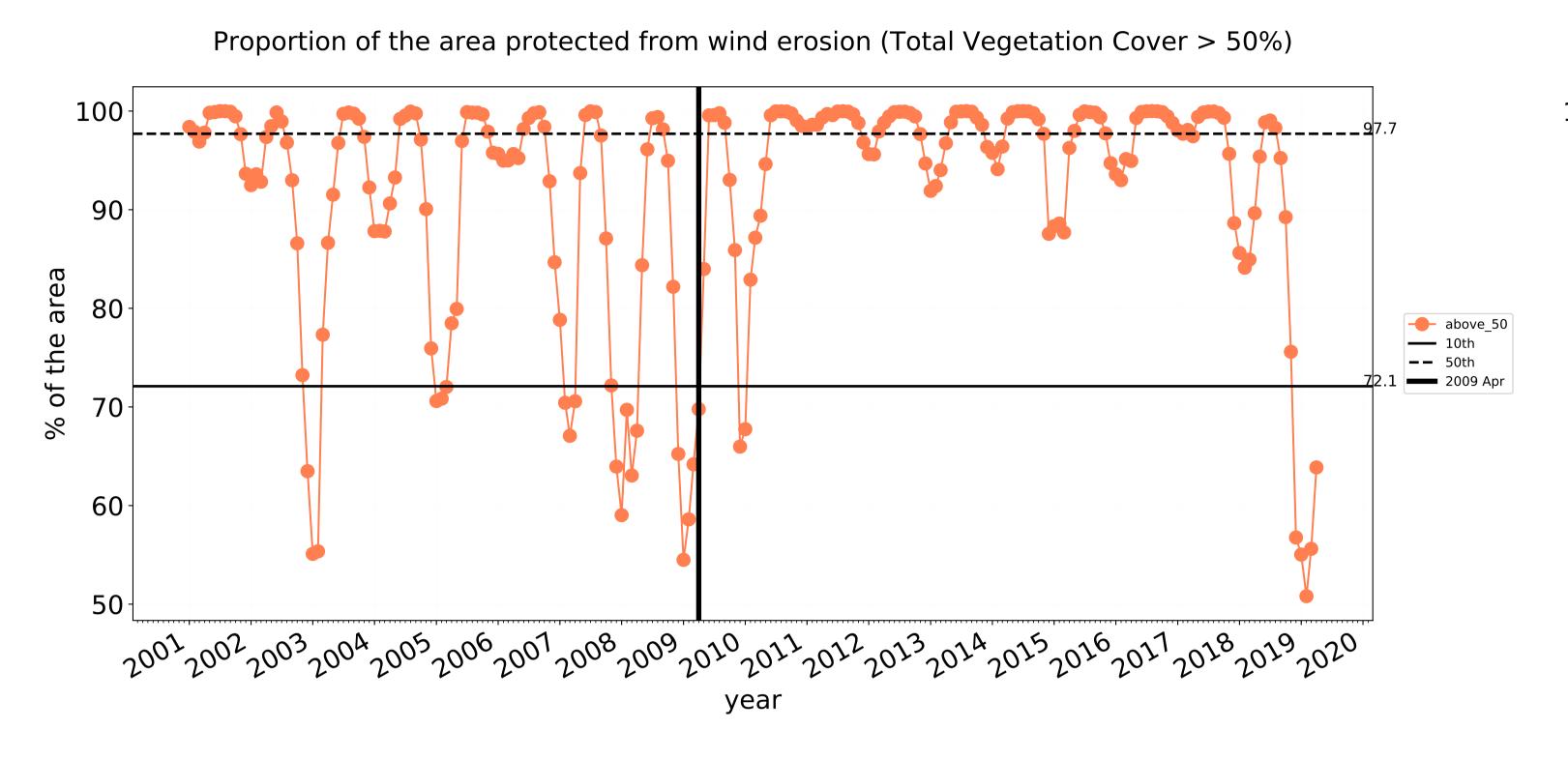


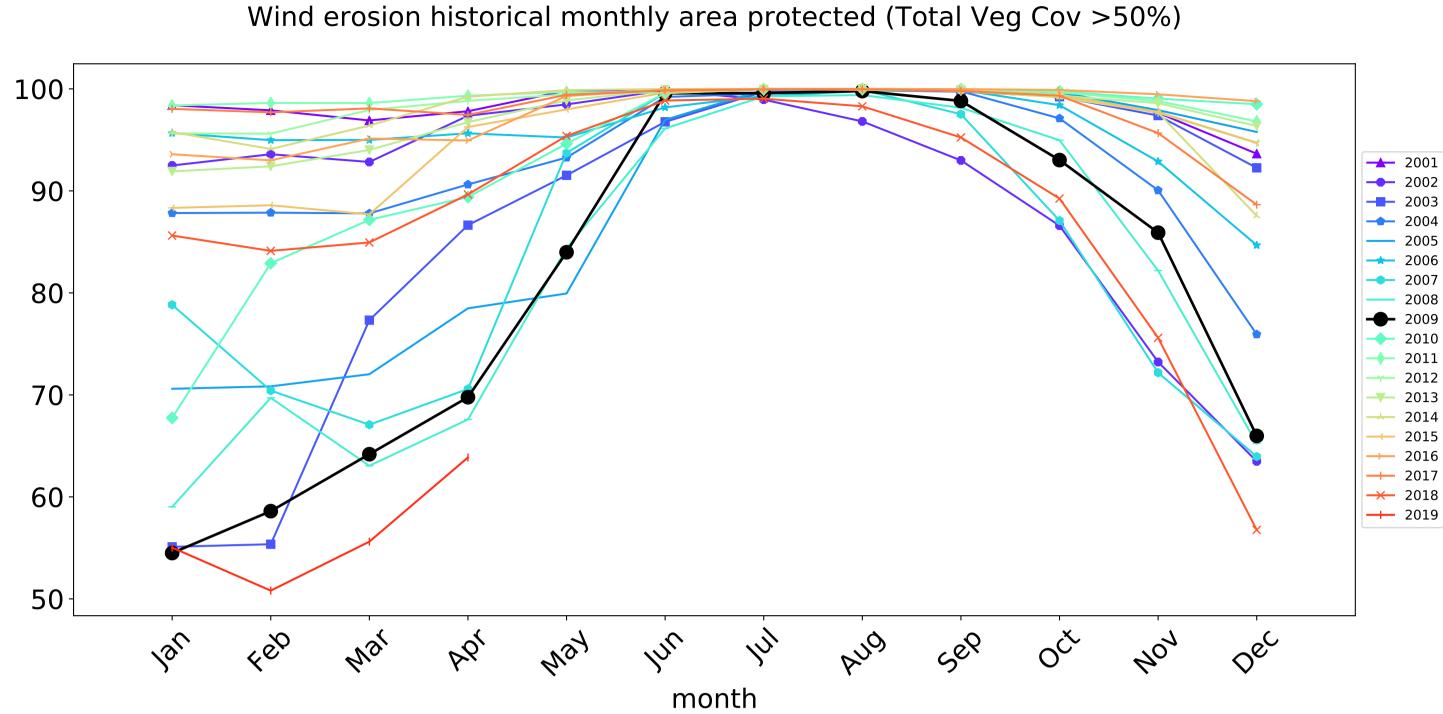


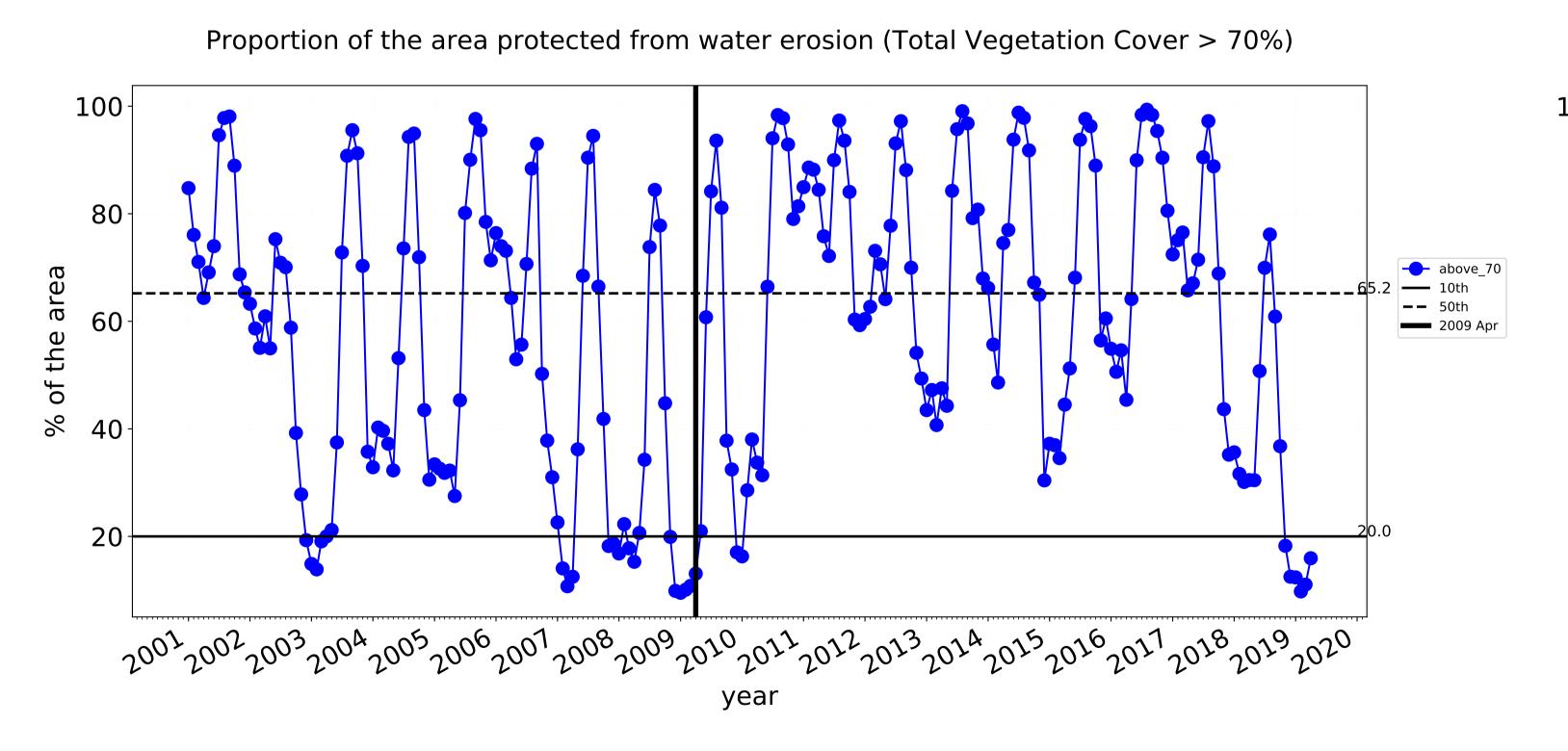


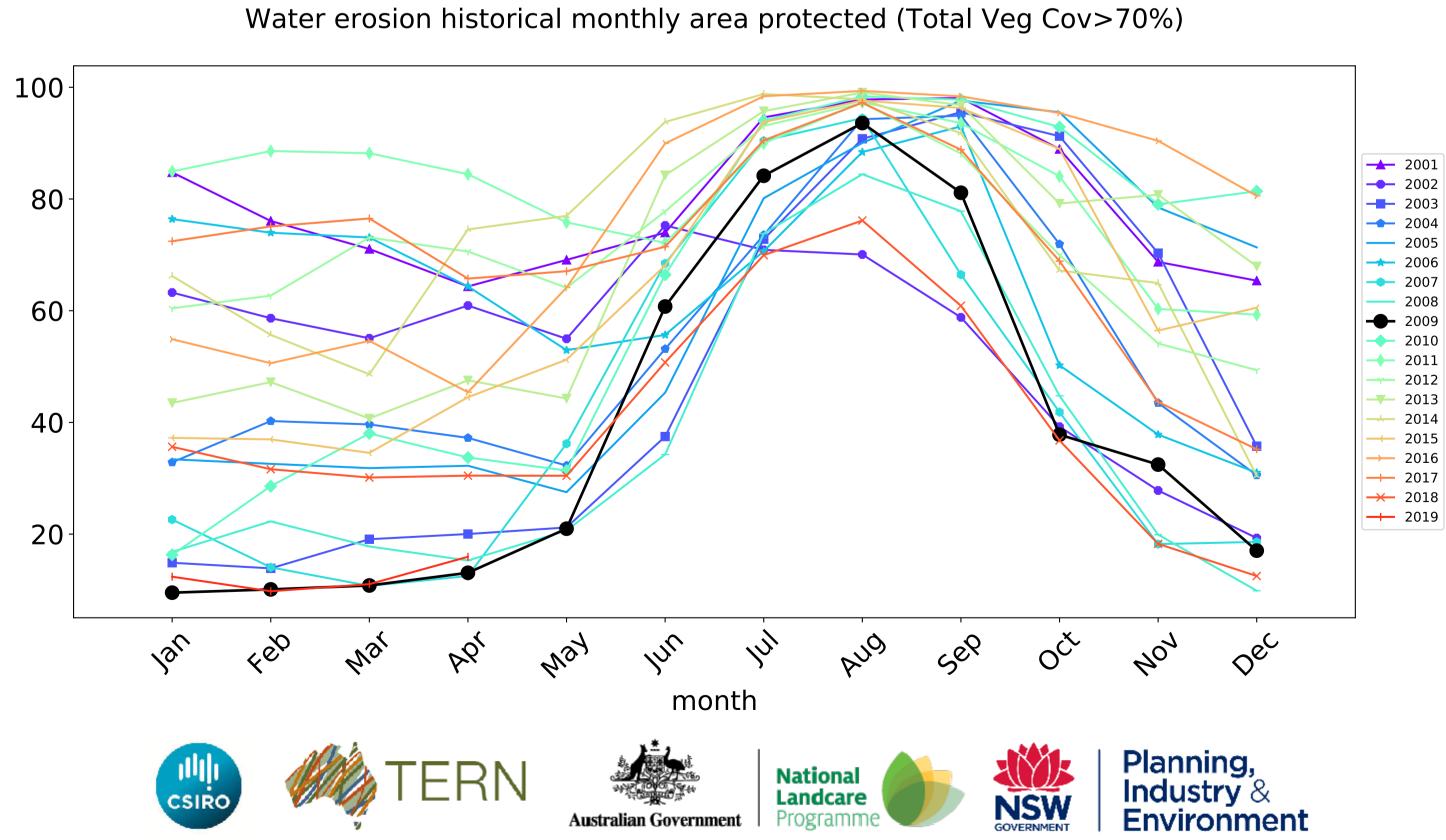


### **Cropping timeseries**

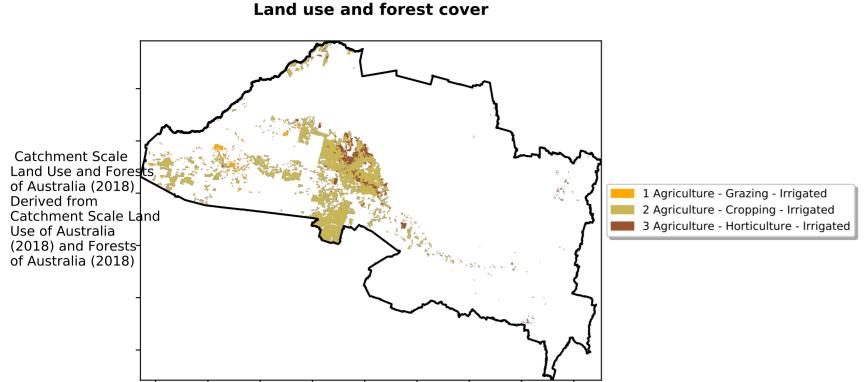


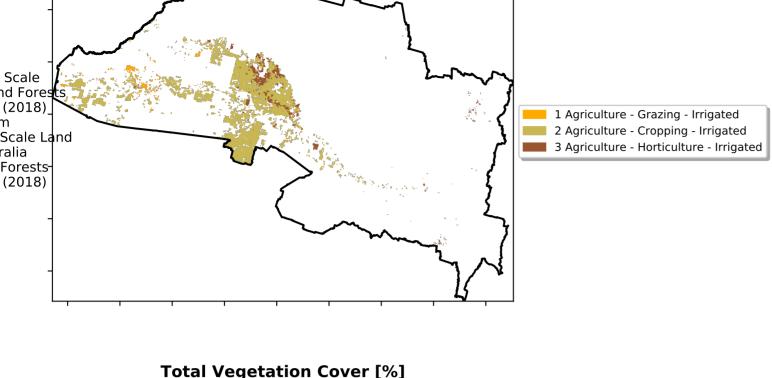


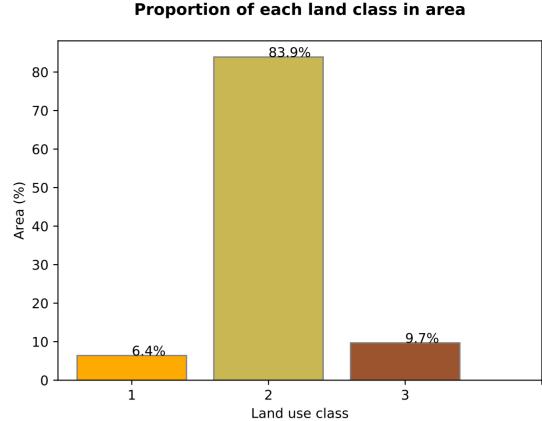


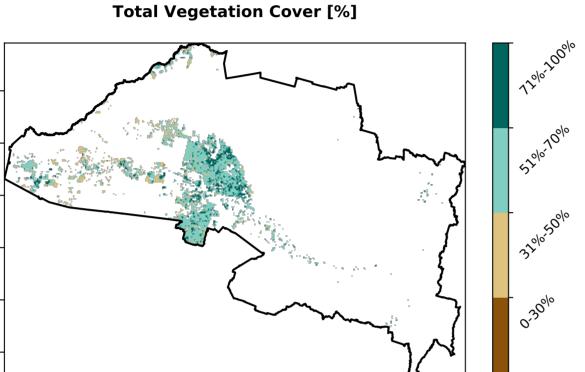


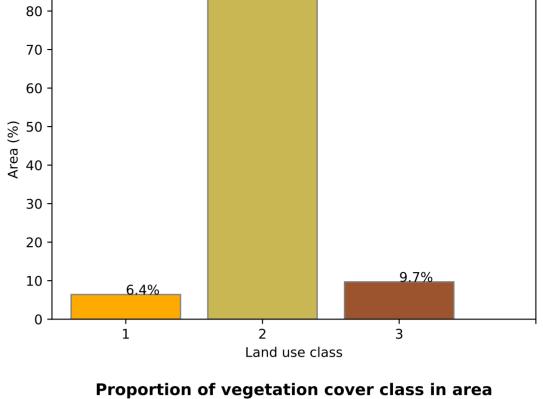
### Irrigation



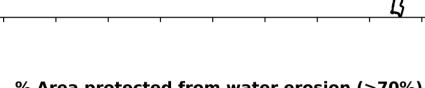


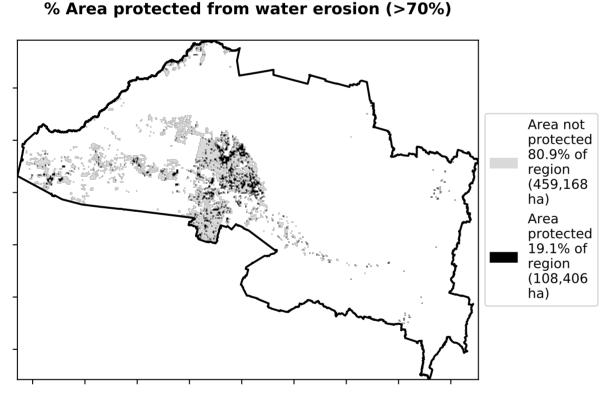




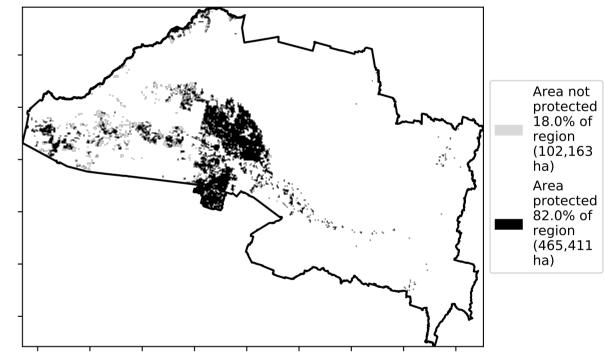


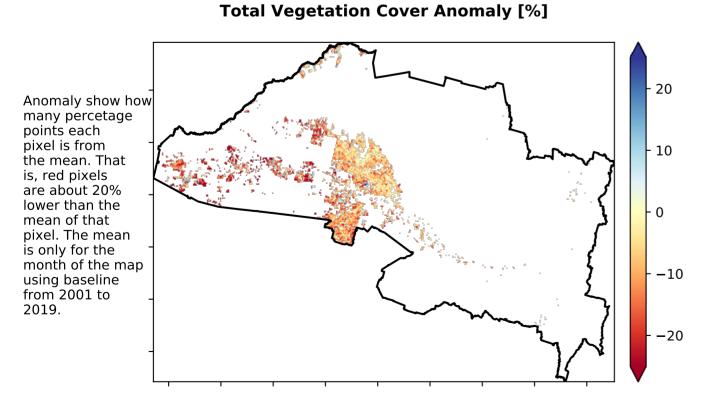
### 62.6% 60 50 Area (%) 19.1% 20 18.1% 10 71%-100% 0-30% 31%-50% 51%-70% **Total Vegetation Cover class**

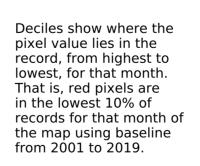


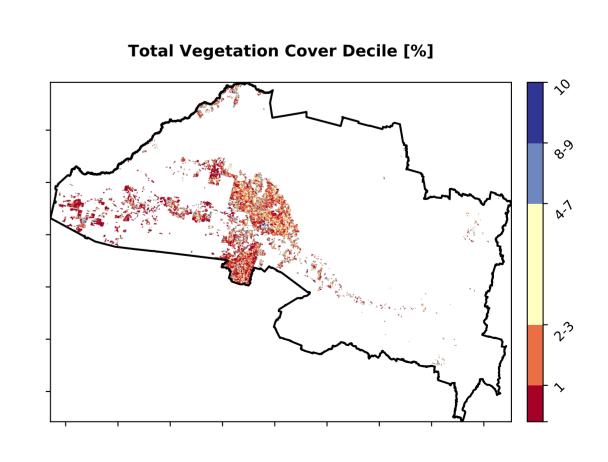


% Area protected from wind erosion (>50%)









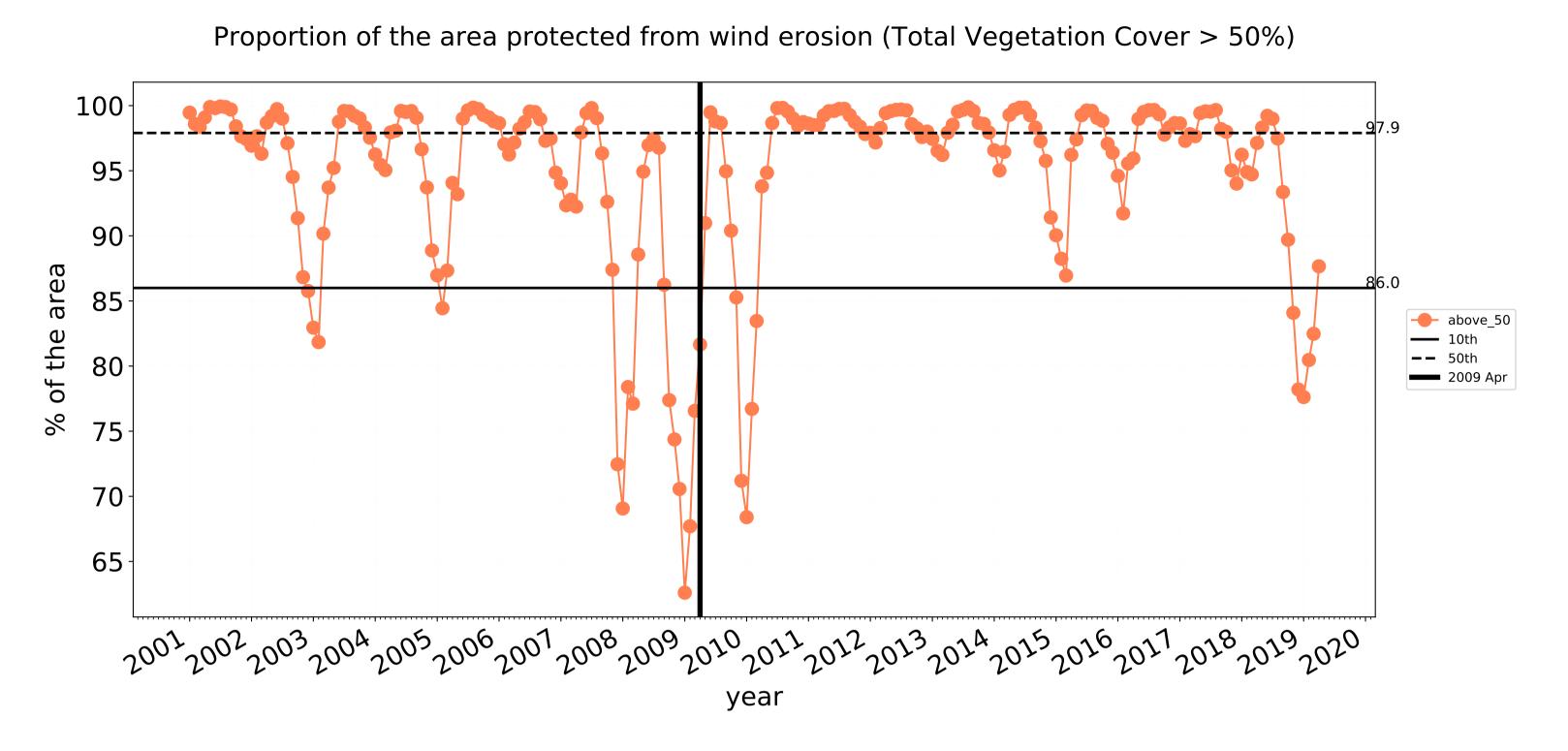


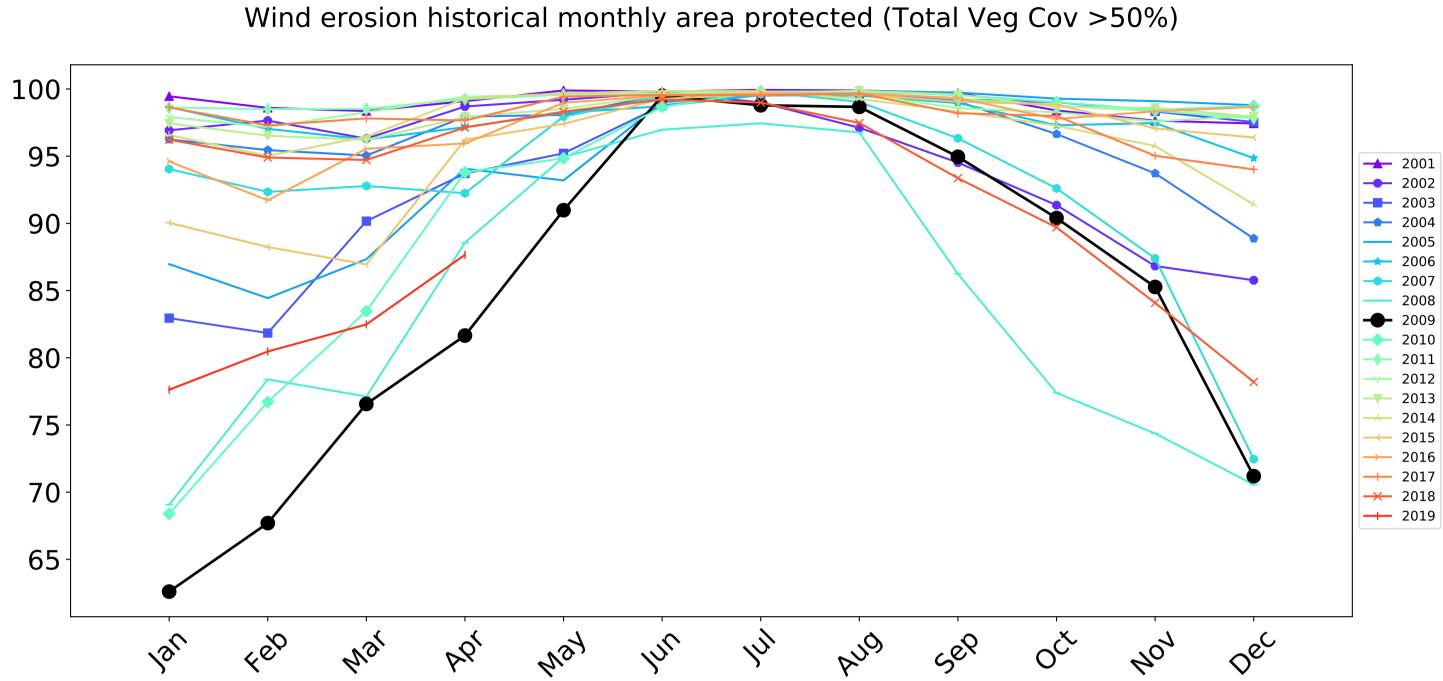




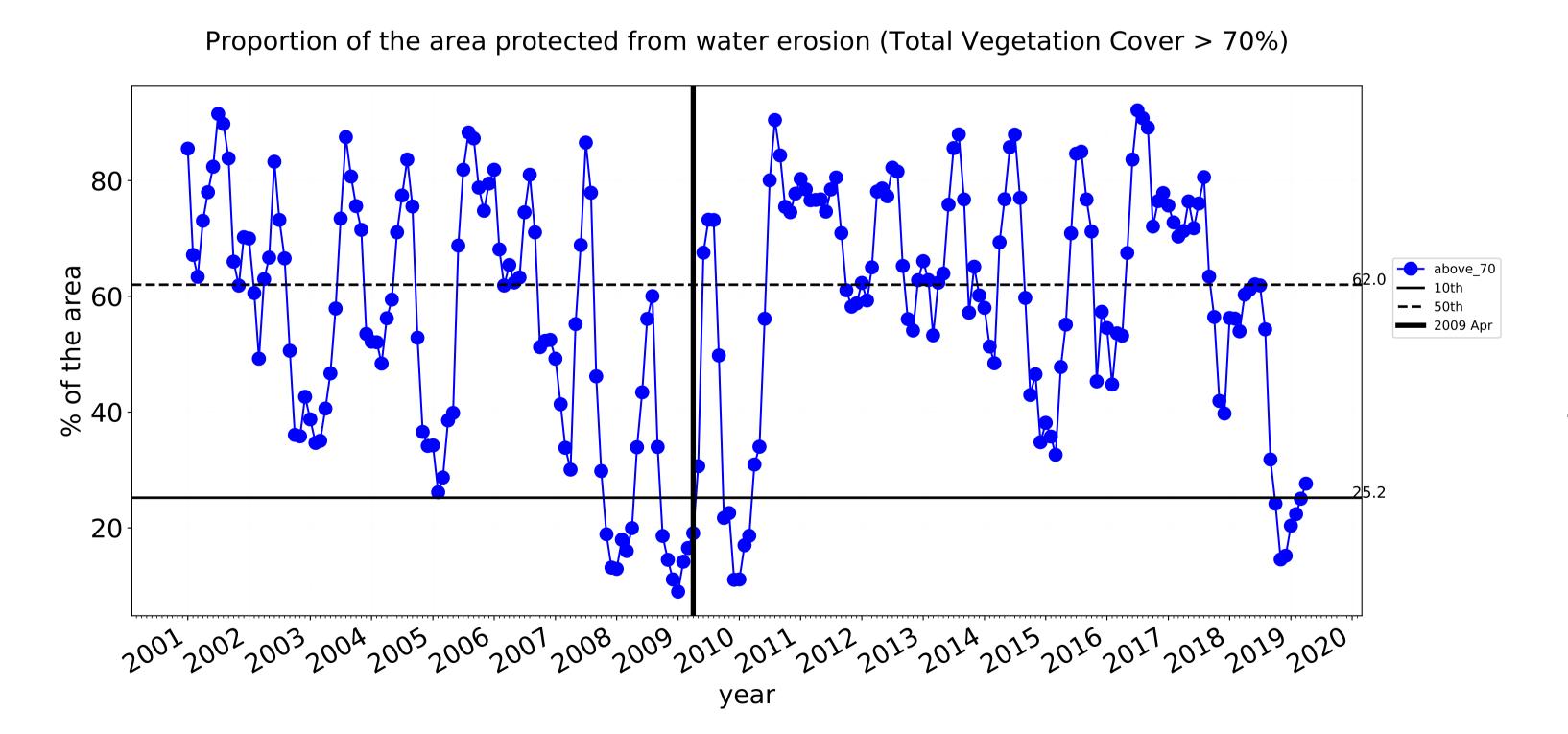


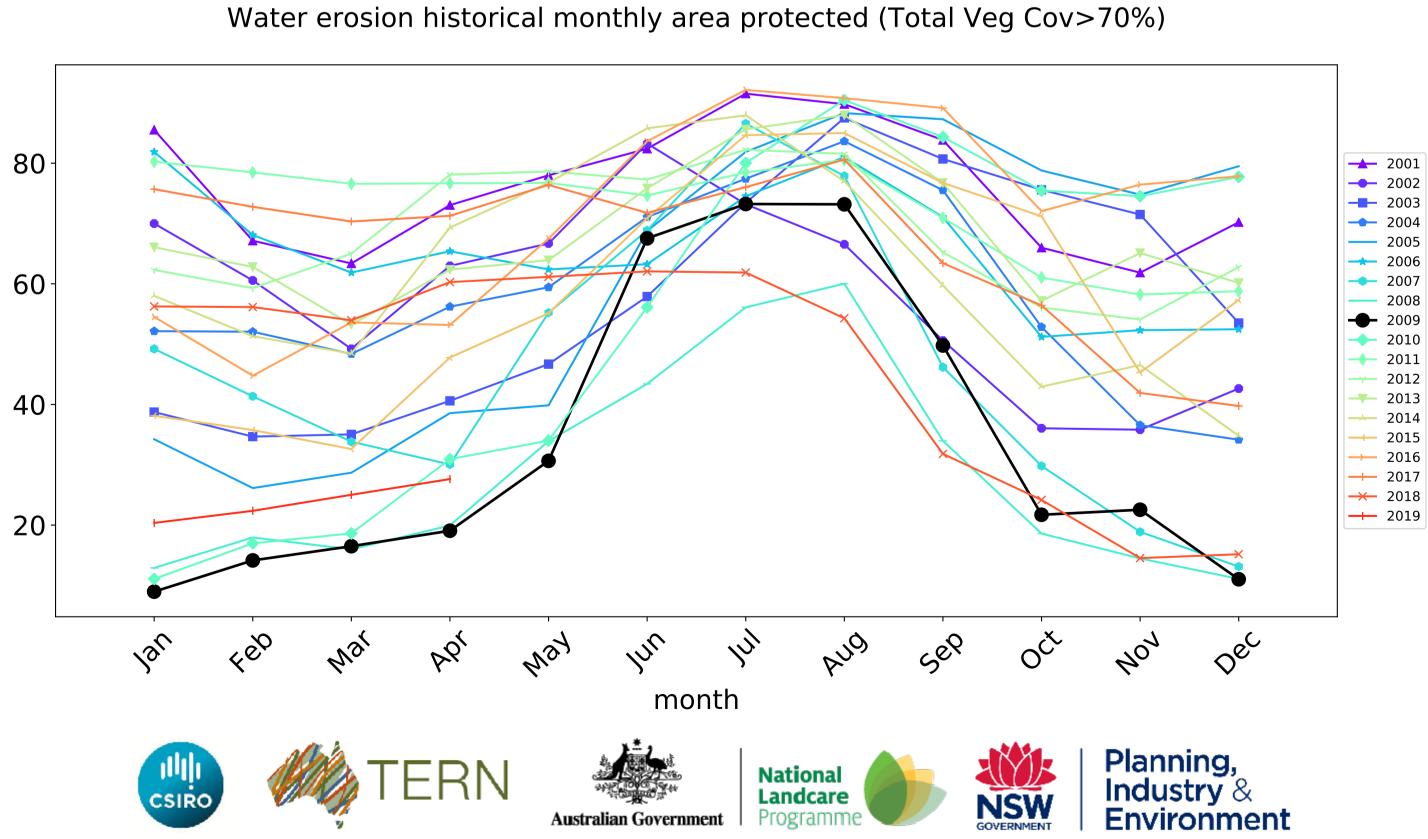






month



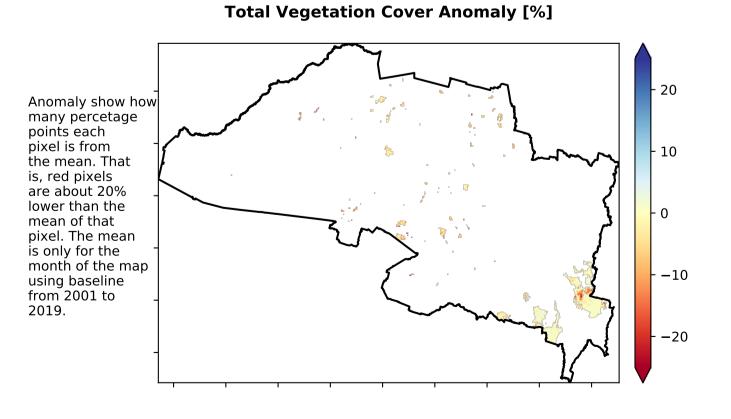


### **Production native forests and plantation forests**

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

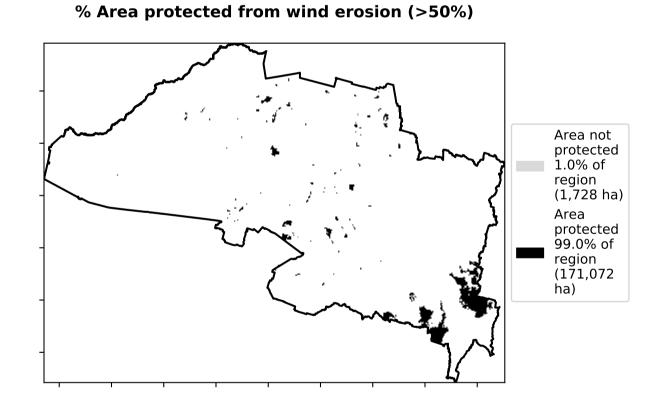
# Total Vegetation Cover [%]

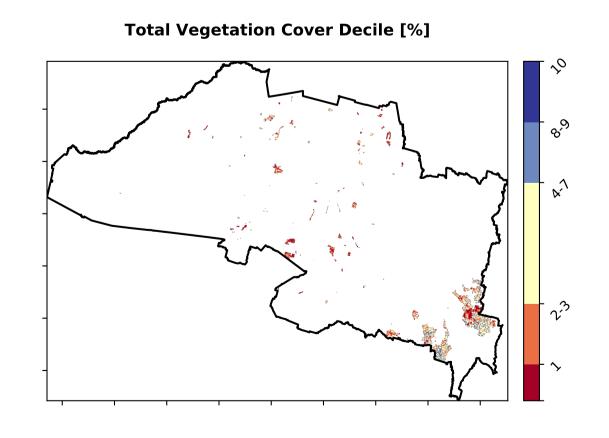
# Area not protected 7.9% of region (13,651 ha) Area protected 92.1% of region (159,148 ha)



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

### 









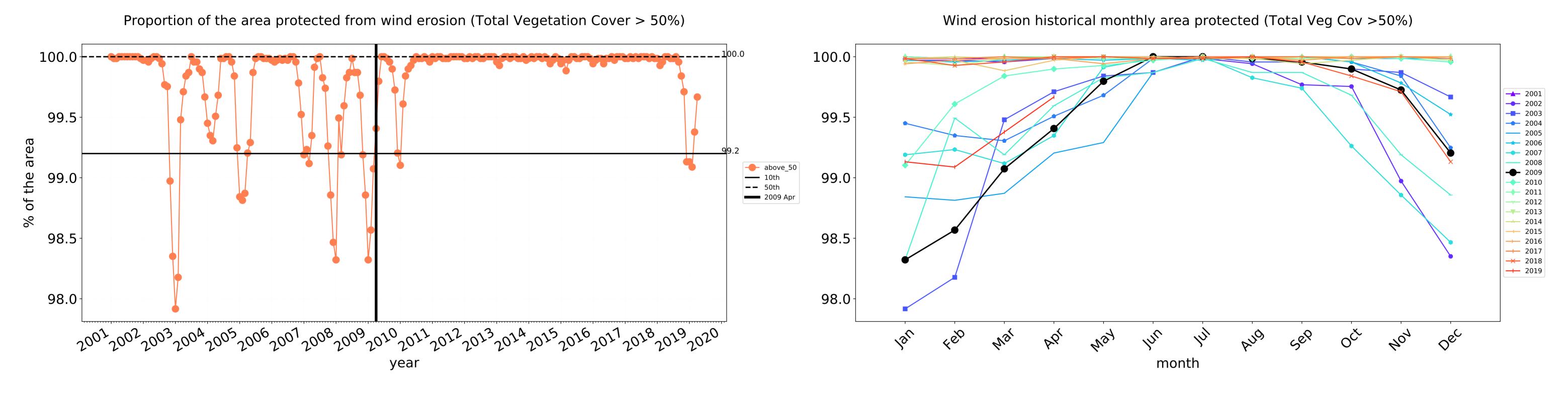


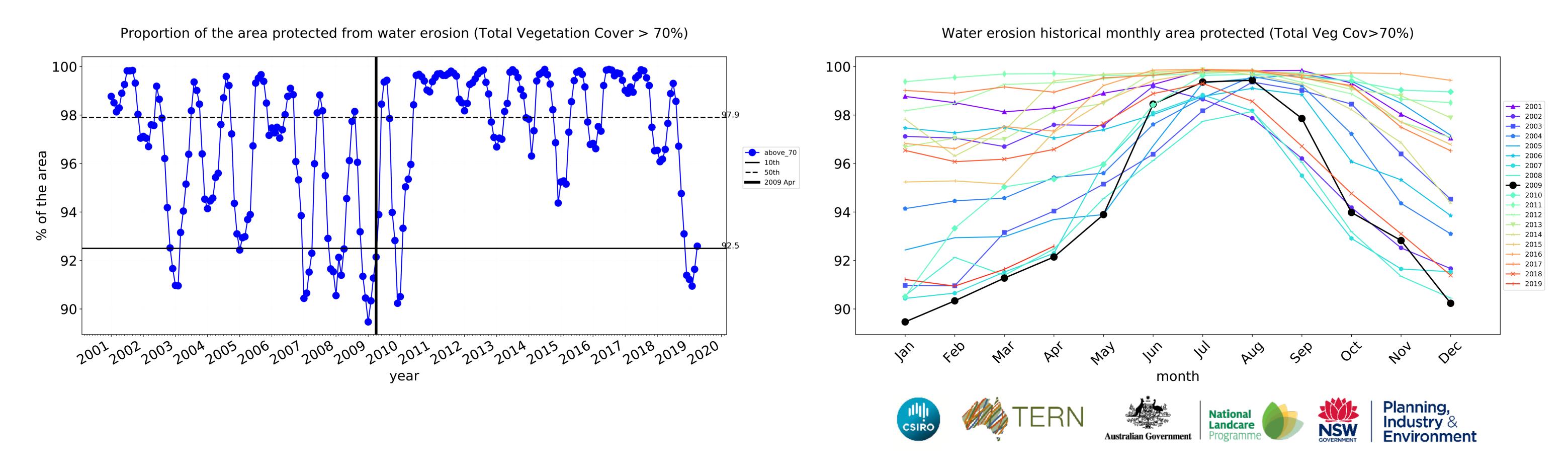






### **Production native forests and plantation forests timeseries**





### Riverina (6,693,600 ha and no data 14,735 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	6,693,600	98.8% 6,614,547	67.8% 4,537,494	25.8% 1,727,114	14.2% 948,460	5.5% 369,863	3.3% 222,483
Conservation and natural environments	323,100	99.9% 322,875	87.6% 283,025	77.8% 251,350	73.2% 236,575	55.3% 178,825	40.7% 131,450
Conservation and natural environments non forest	83,350	99.7% 83,125	52.1% 43,400	18.7% 15,600	13.9% 11,600	9.1% 7,600	4.8% 3,975
Conservation and natural environments Forest (non woodland)	195,250	100.0% 195,250	100.0% 195,175	99.4% 194,050	97.6% 190,575	82.8% 161,725	63.0% 122,975
Agriculture	6,067,725	98.7% 5,990,450	65.7% 3,986,725	21.0% 1,276,300	9.2% 557,000	1.4% 85,950	0.3% 17,800
Grazing	2,311,350	96.8% 2,238,300	56.2% 1,298,975	32.5% 750,975	18.8% 434,100	3.3% 77,075	0.7% 15,275
Grazing non forest	2,066,350	96.5% 1,993,300	51.1% 1,055,700	27.0% 557,300	14.9% 308,500	2.1% 44,000	0.3% 5,750
Grazing Woodland forest	141,650	100.0% 141,650	99.0% 140,300	70.8% 100,350	35.7% 50,575	3.9% 5,525	0.6% 800
Grazing - Forest (non woodland)	103,350	100.0% 103,350	99.6% 102,975	90.3% 93,325	72.6% 75,025	26.7% 27,550	8.4% 8,725
Cropping	3,186,975	99.9% 3,183,875	69.8% 2,223,525	13.1% 416,725	3.0% 95,925	0.1% 3,625	0.0% 300
Irrigation	567,575	99.8% 566,450	81.7% 463,450	19.1% 108,225	4.7% 26,850	0.9% 5,250	0.4% 2,225
Production native forests and plantation forests	172,800	100.0% 172,800	99.4% 171,775	92.1% 159,225	82.1% 141,825	59.7% 103,125	42.2% 72,900











