# **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: September 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







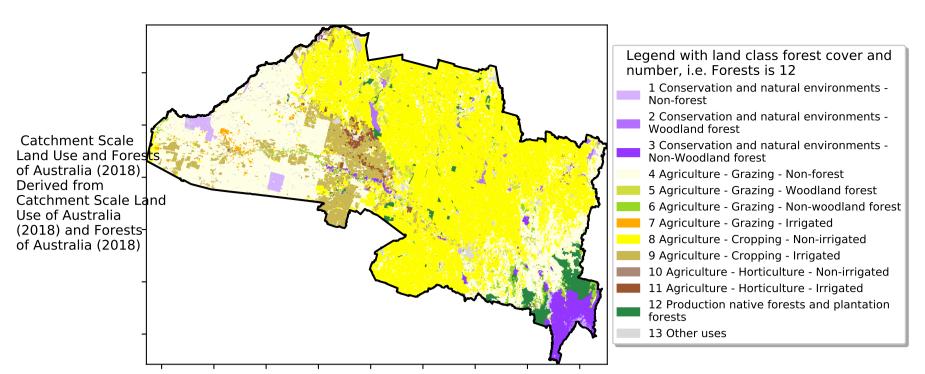


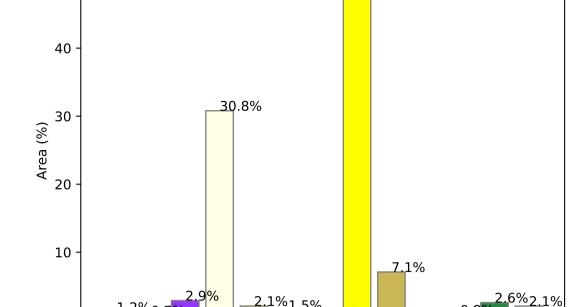




# **Vegetation Cover Sep 2009**

### Land use and forest cover

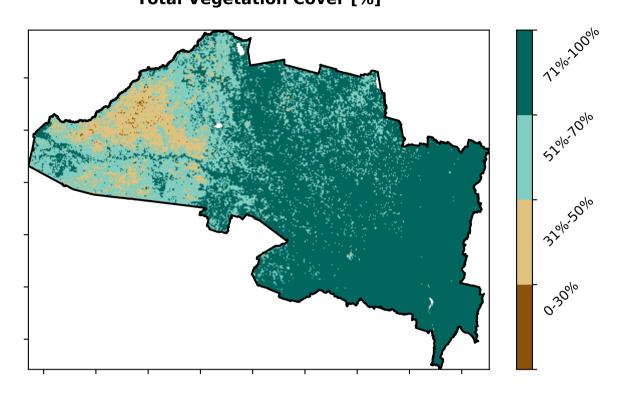




**Proportion of each land class in area** 

47.5%

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

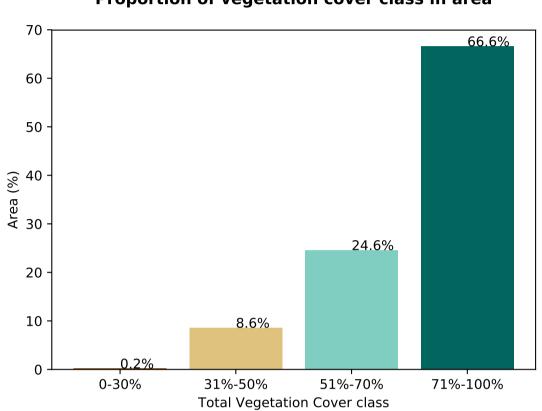


Proportion of vegetation cover class in area

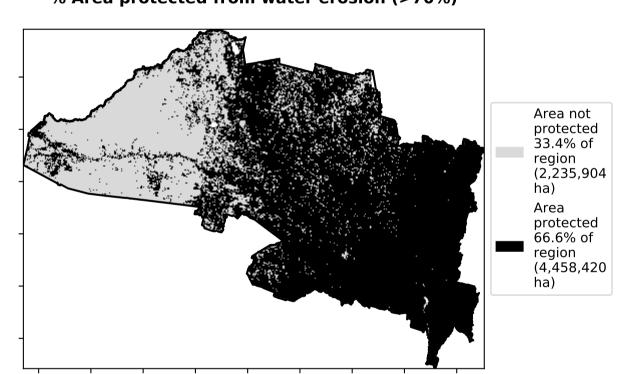
Land use class

8

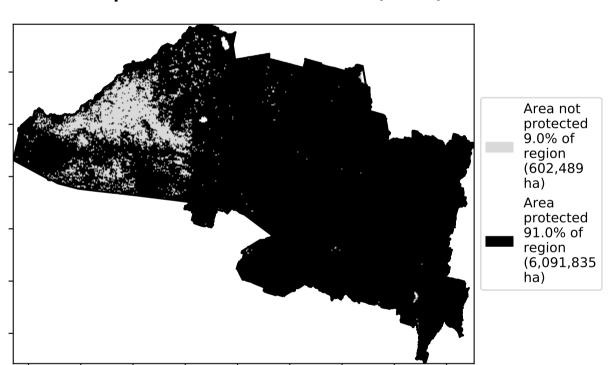
9 10 11 12 13



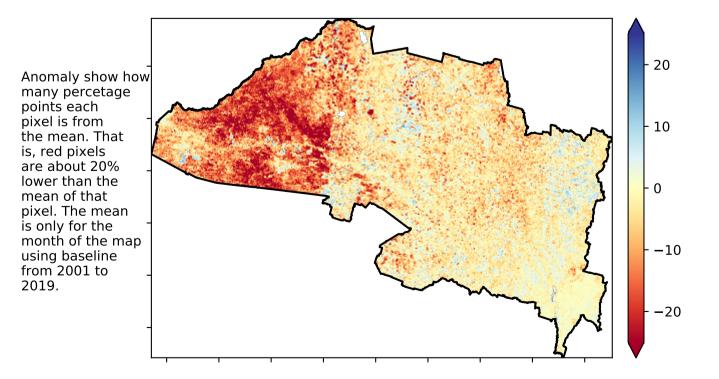
## % Area protected from water erosion (>70%)



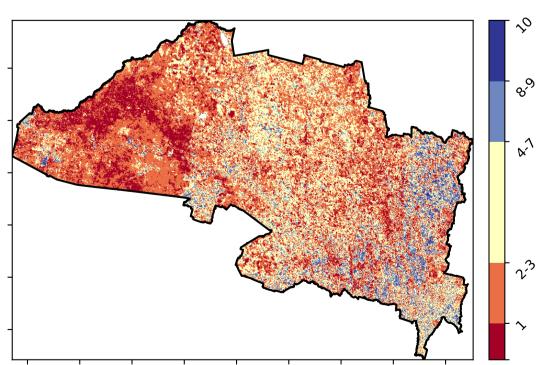
% Area protected from wind erosion (>50%)



# 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.





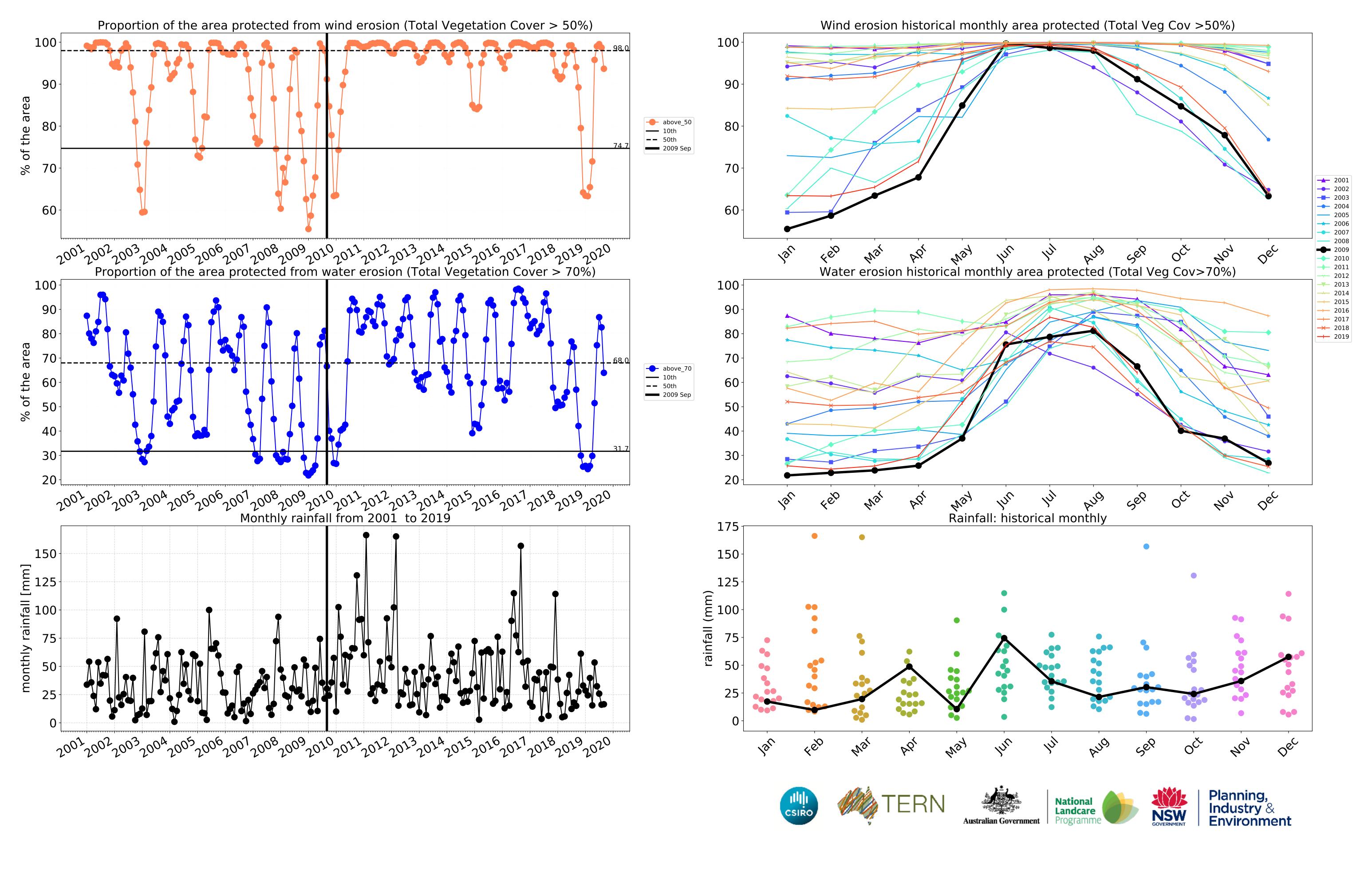




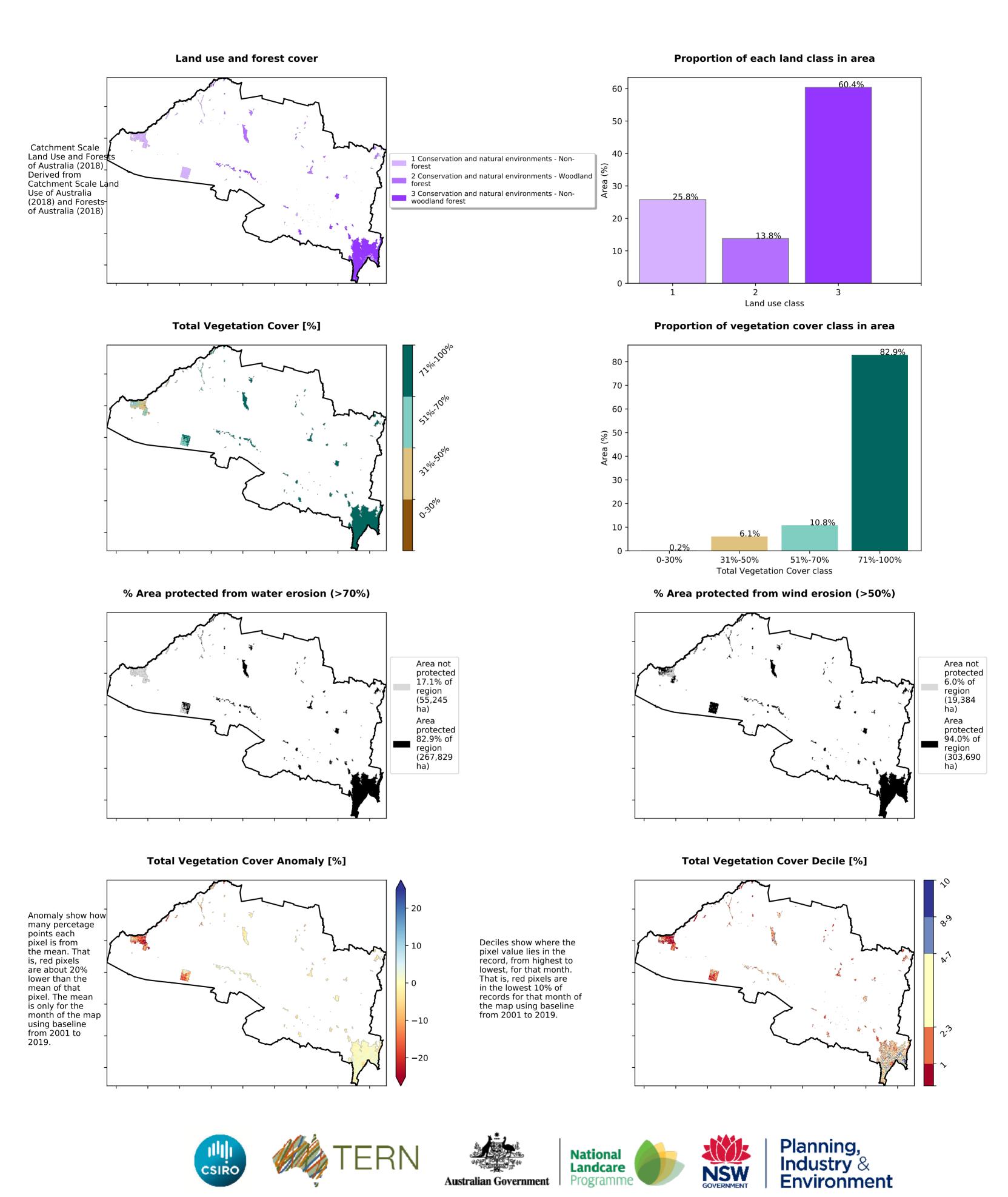




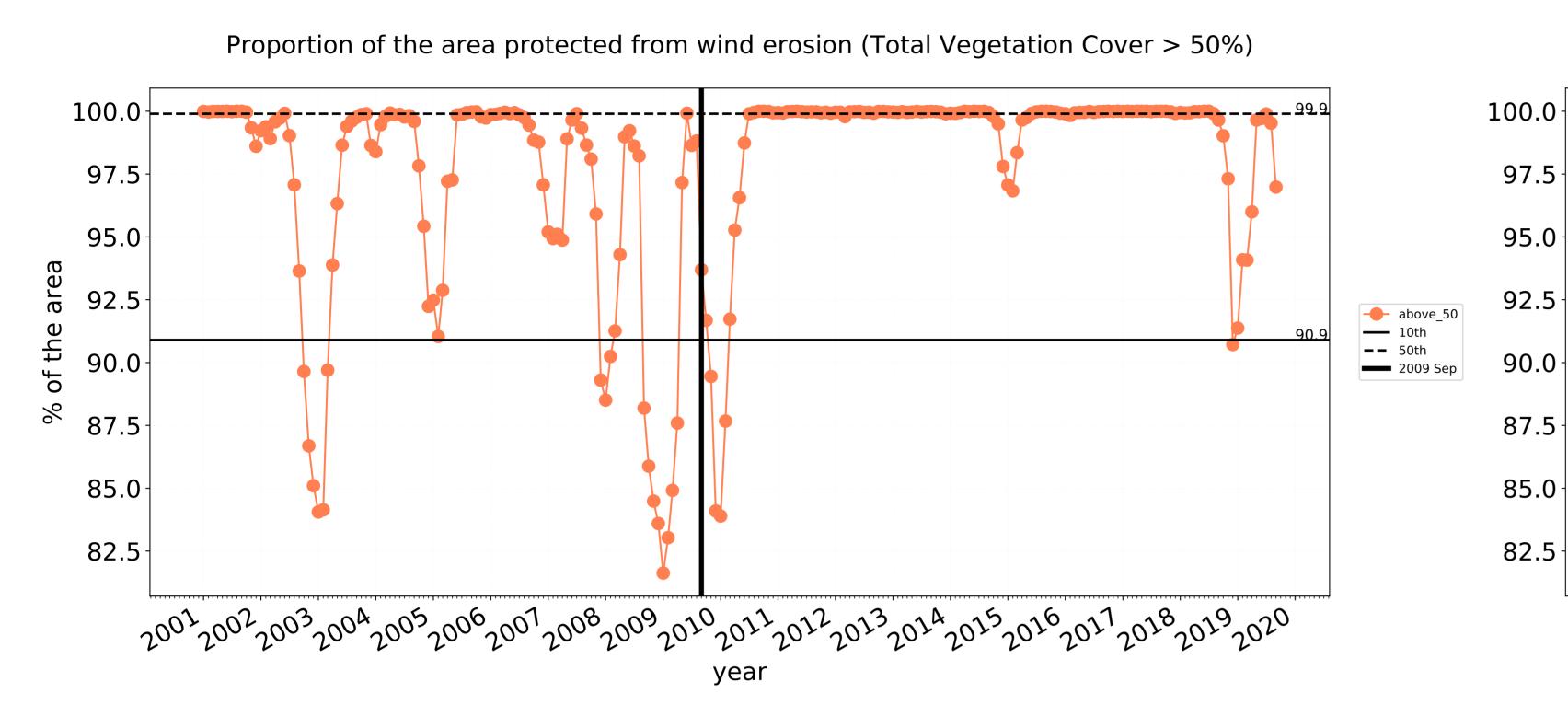


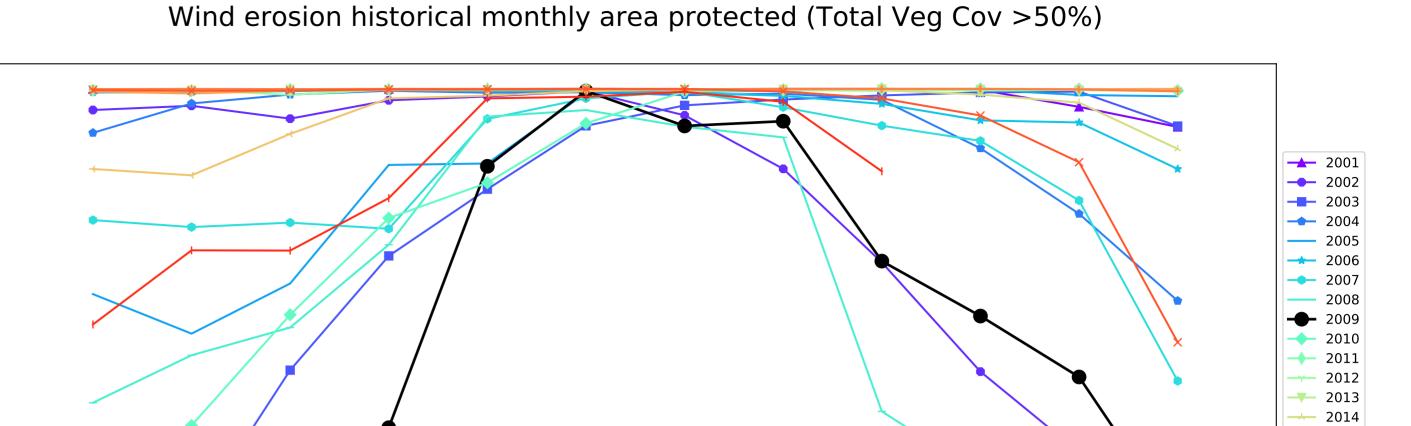


## **Conservation and natural environments**



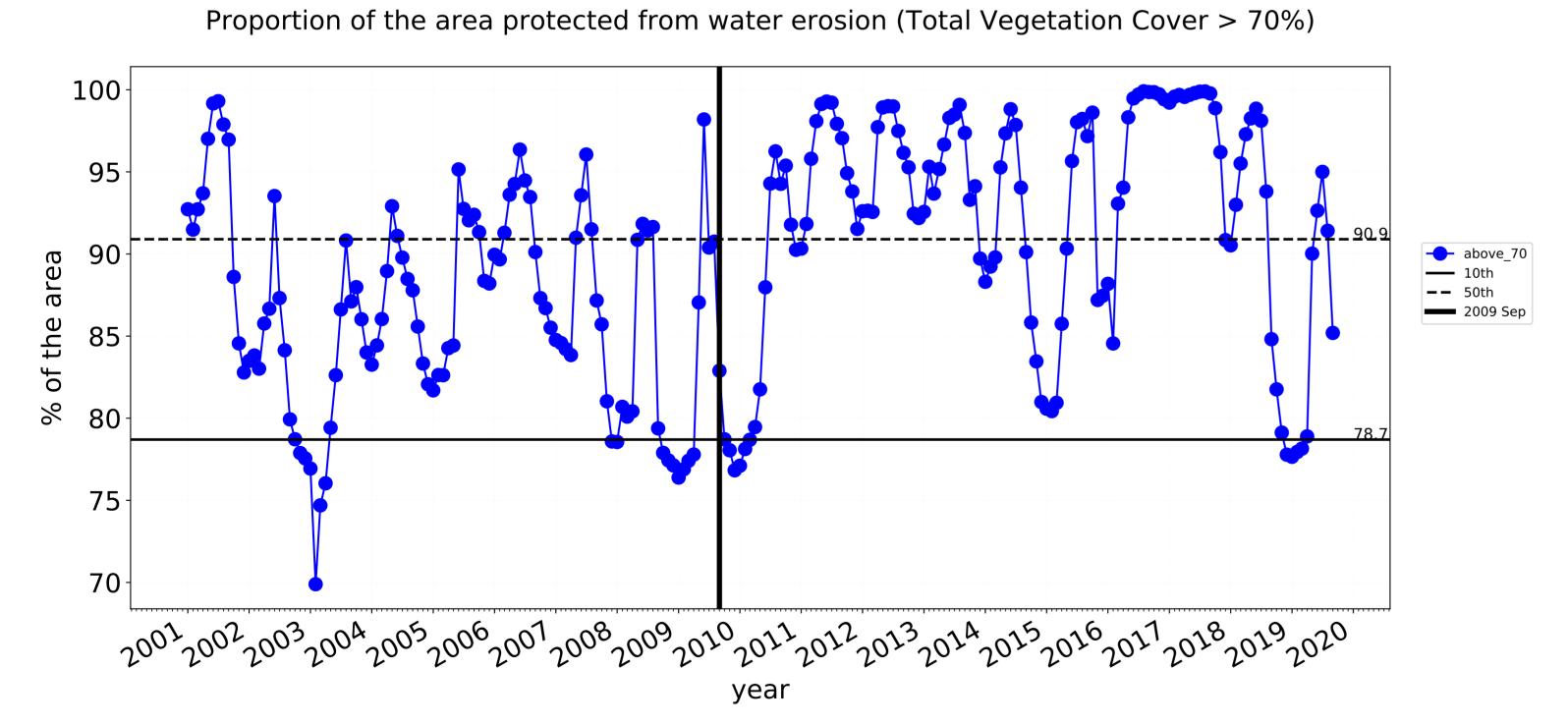
## **Conservation and natural environments timeseries**

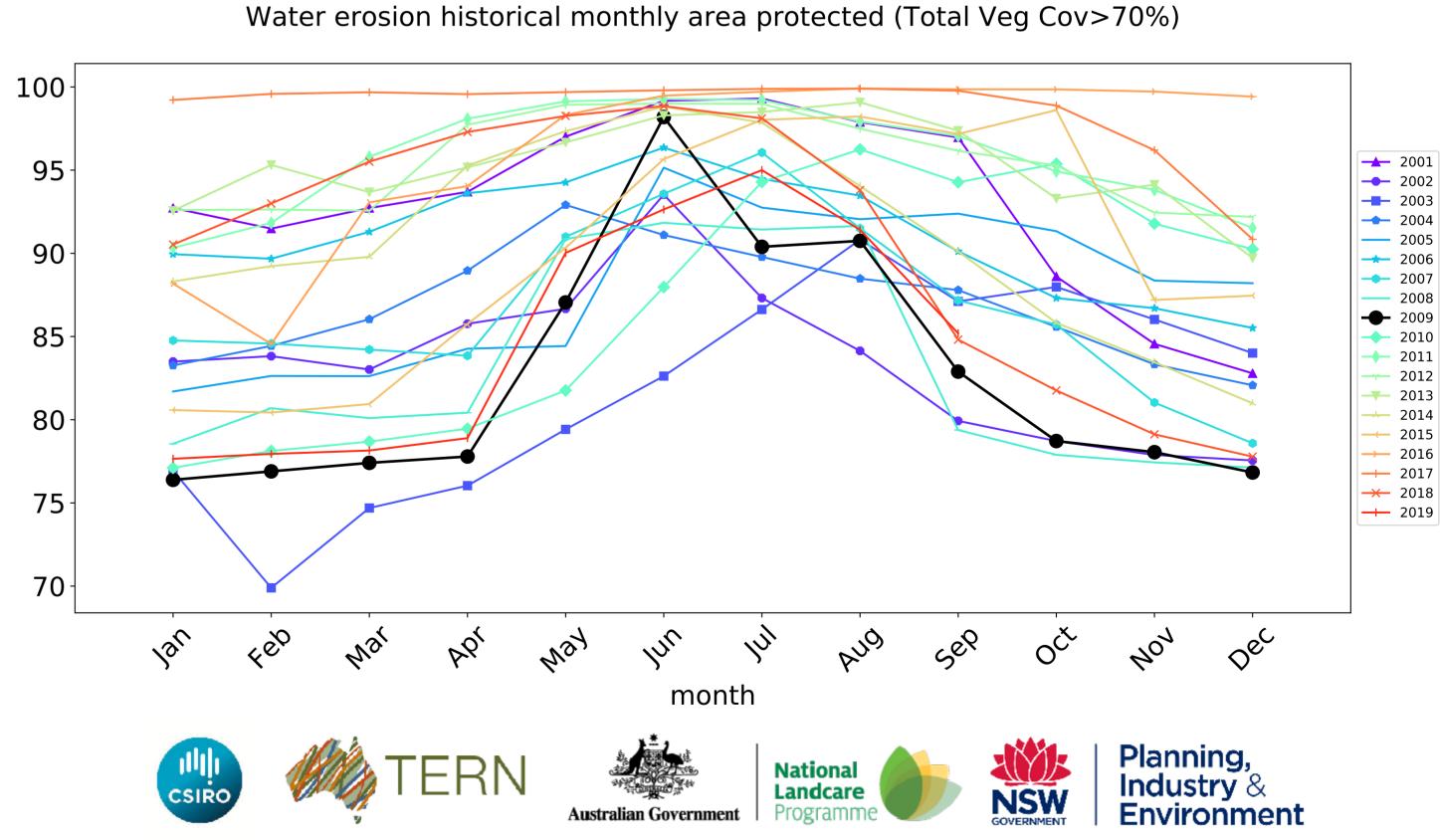




201520162017

→ 2018
→ 2019





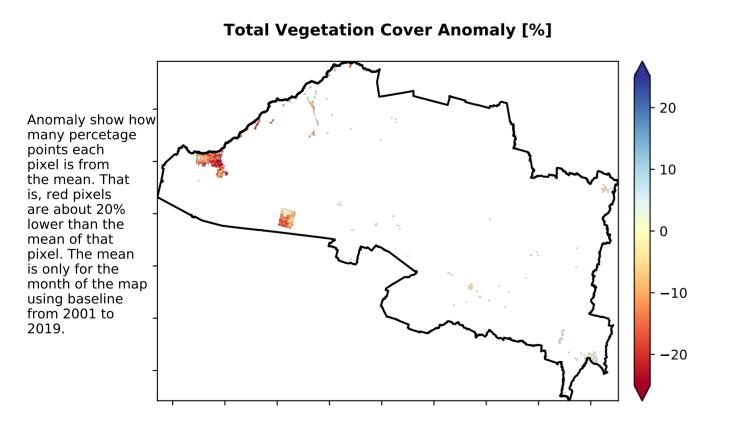
month

# **Conservation and natural environments non forest**

# Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-Catchment Scale Land Use of Australia (2018) and Forestsof Australia (2018)

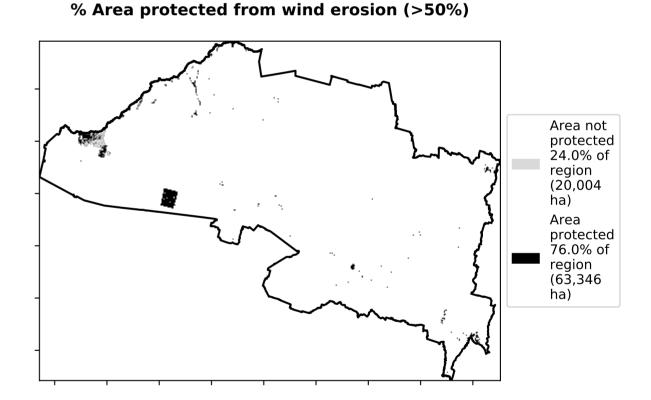
**Total Vegetation Cover [%]** 

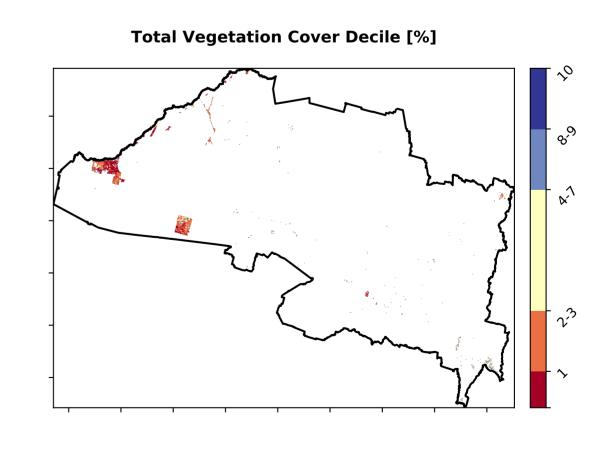
# % Area protected from water erosion (>70%) Area not protected 65.0% of region (54,177 ha) Area protected 35.0% of region (29,172 ha)



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# Proportion of vegetation cover class in area 40.6% 40 35.0% 35 30 Area (%) 23.7% 15 10 0-30% 31%-50% 51%-70% 71%-100% **Total Vegetation Cover class**









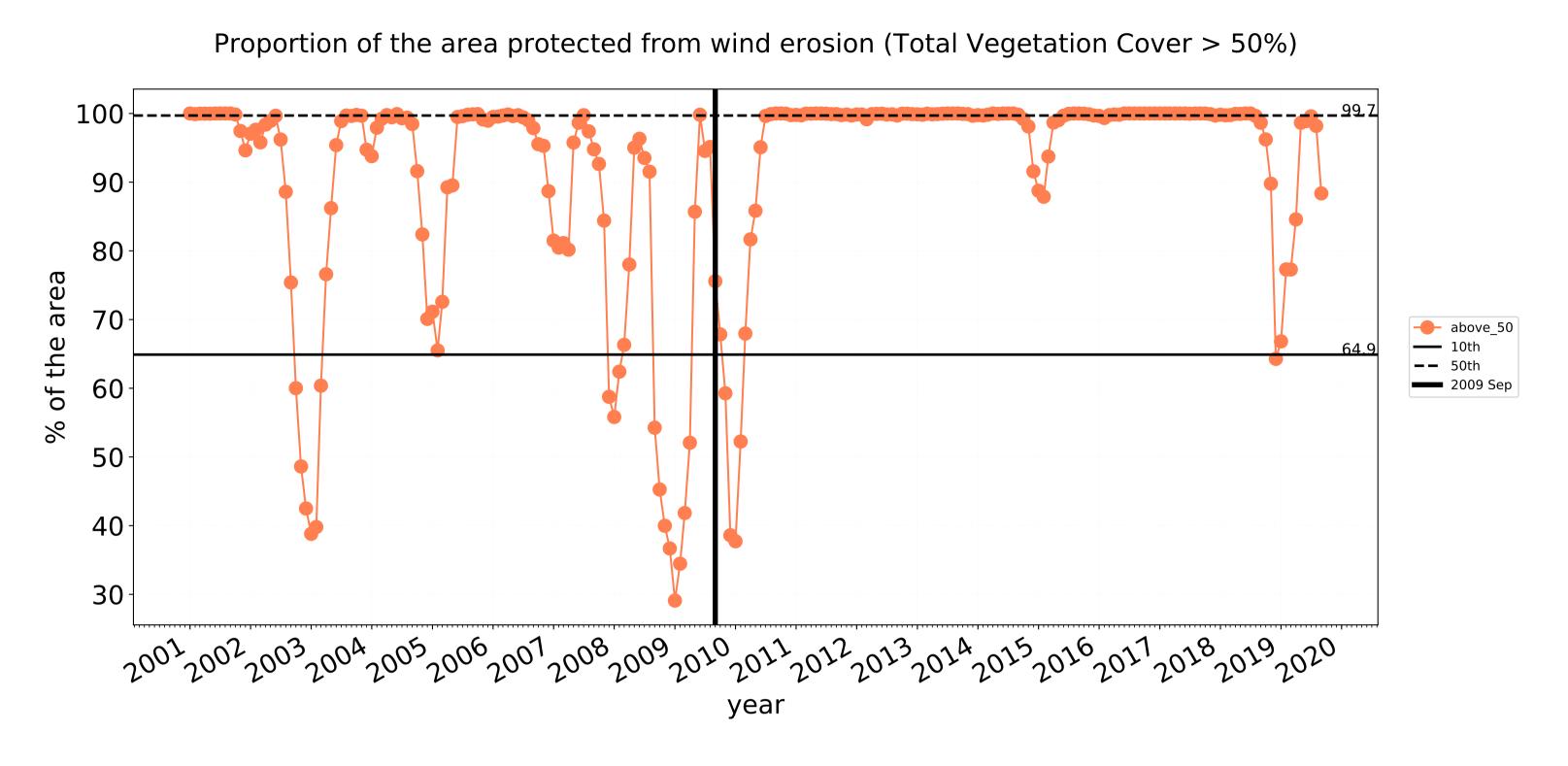


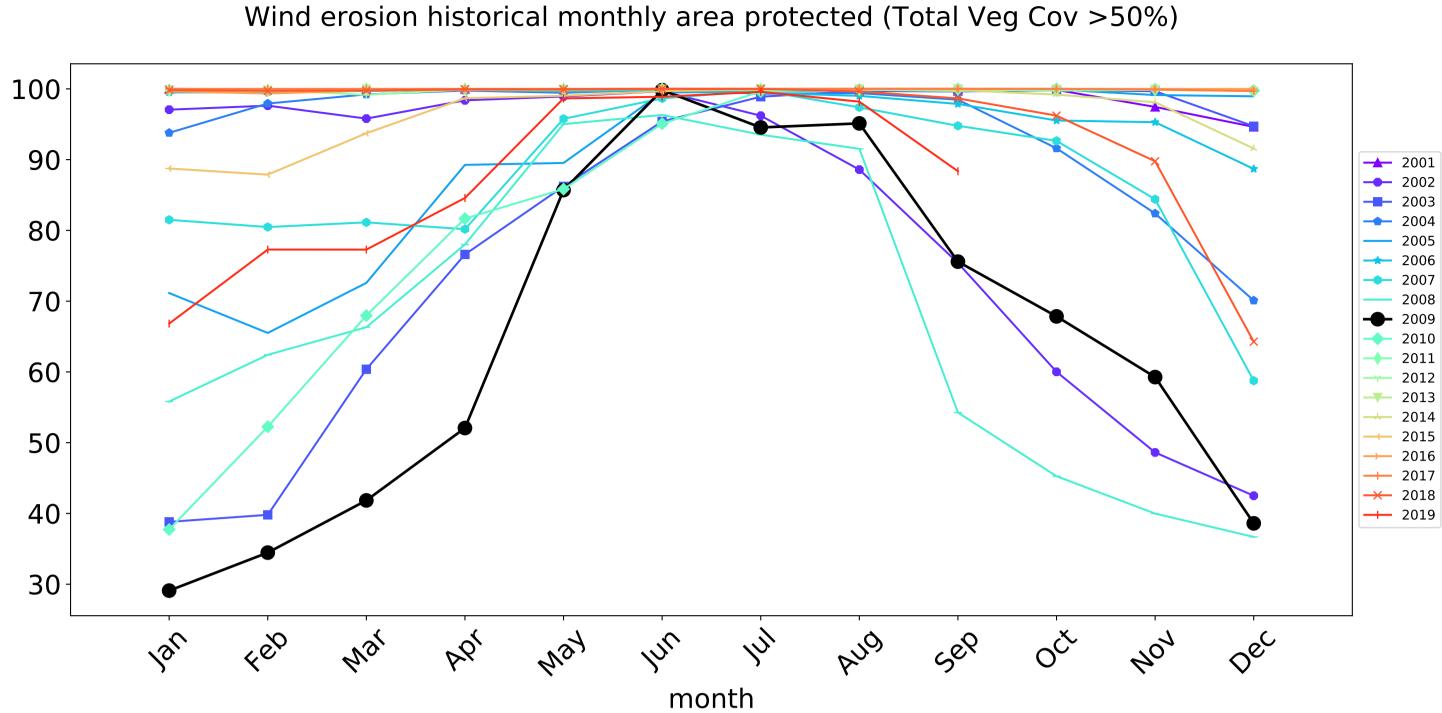


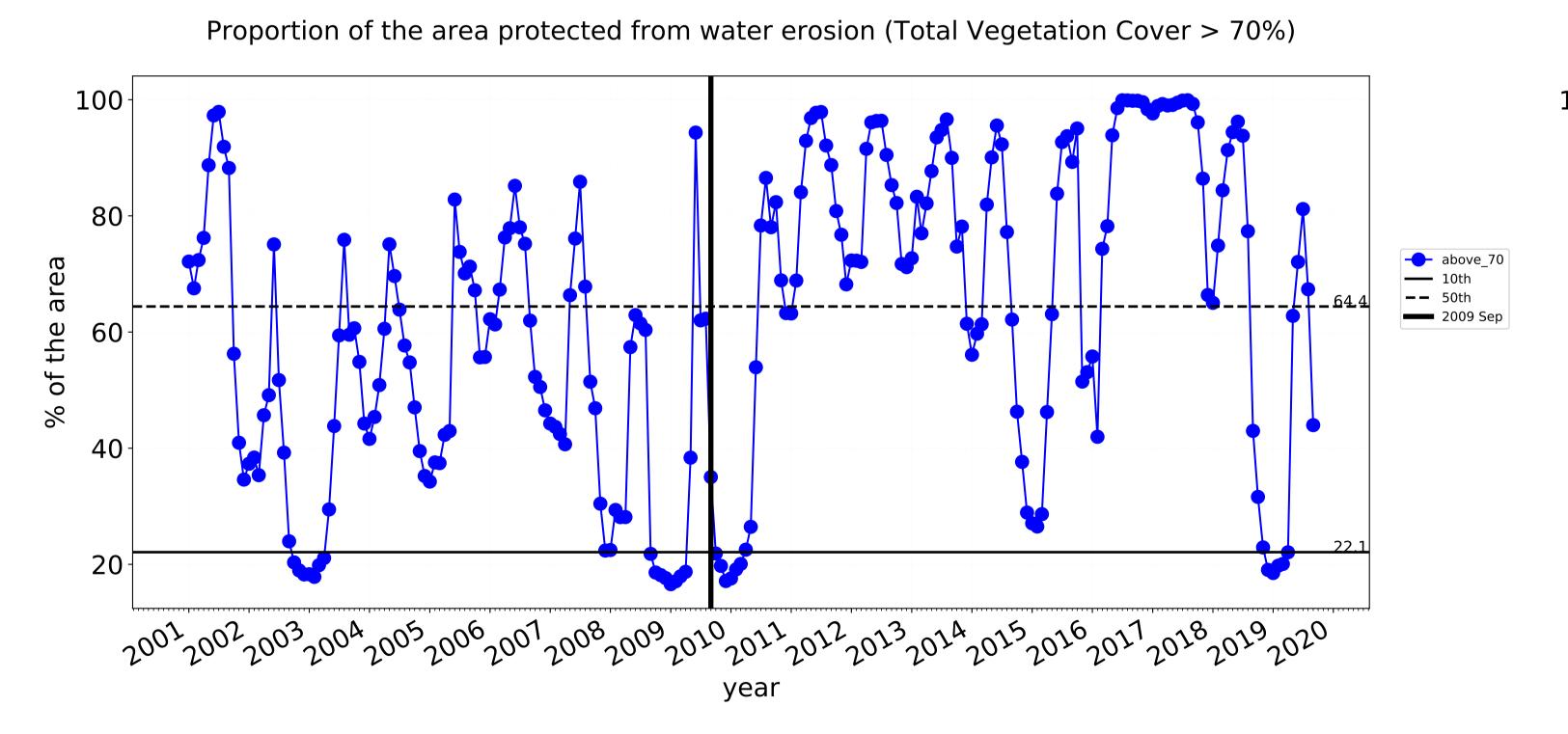


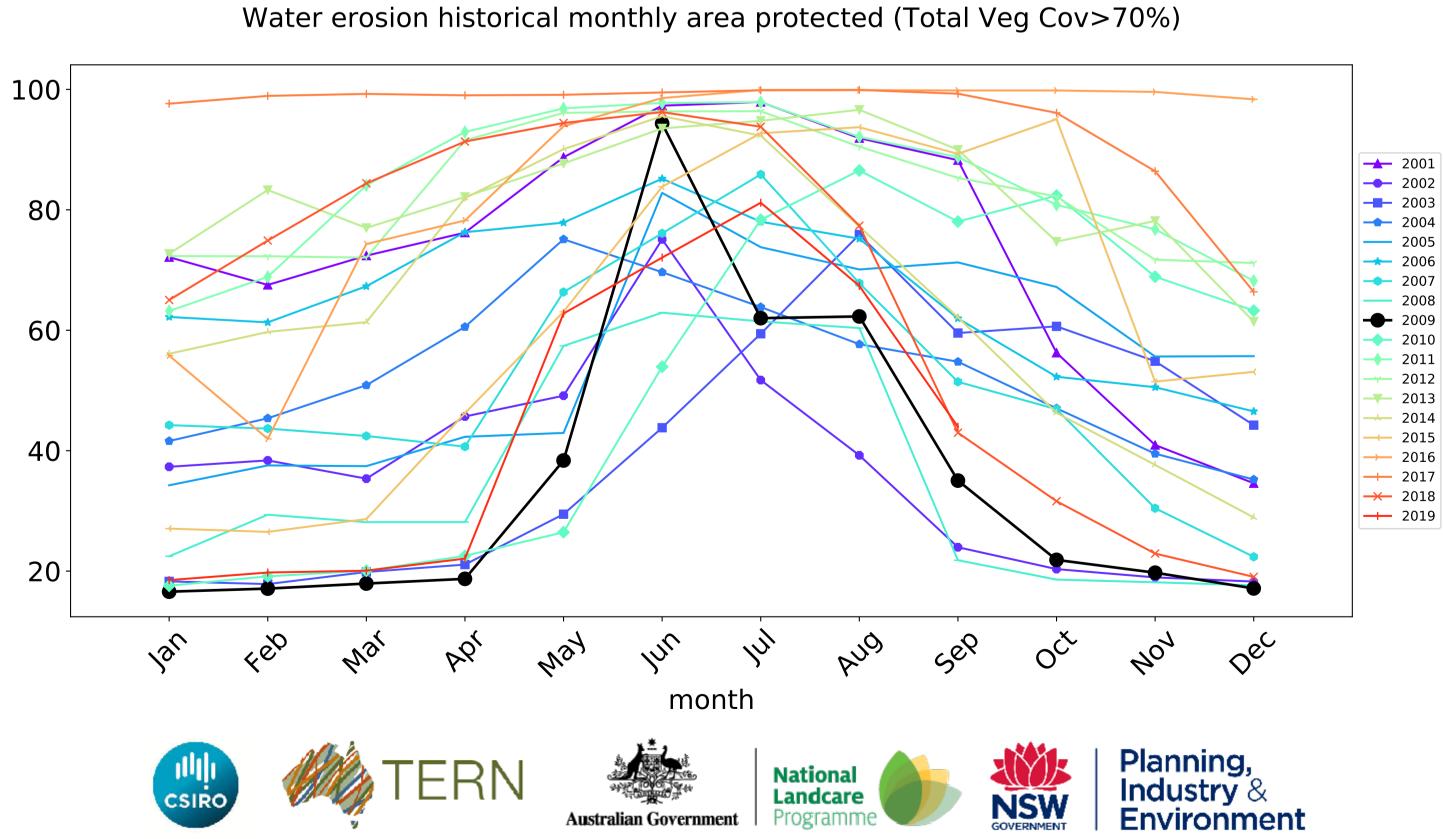


# **Conservation and natural environments non forest timeseries**

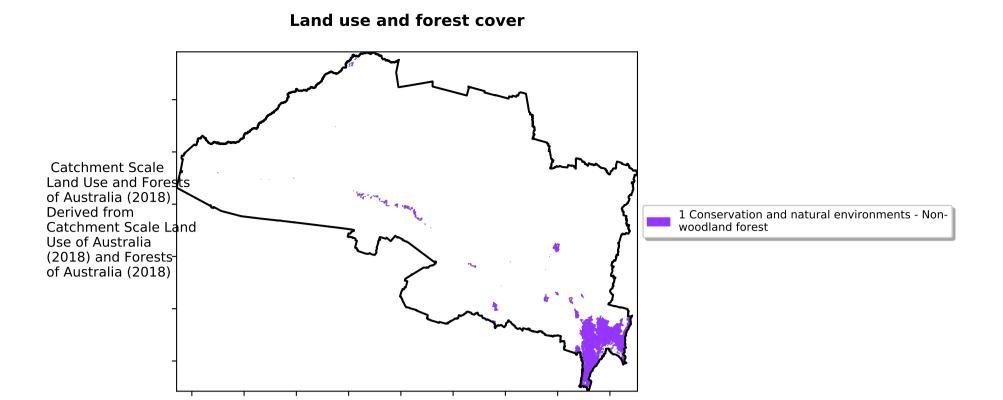




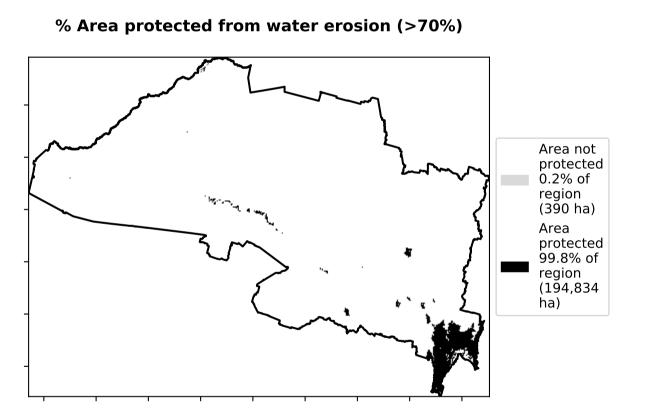


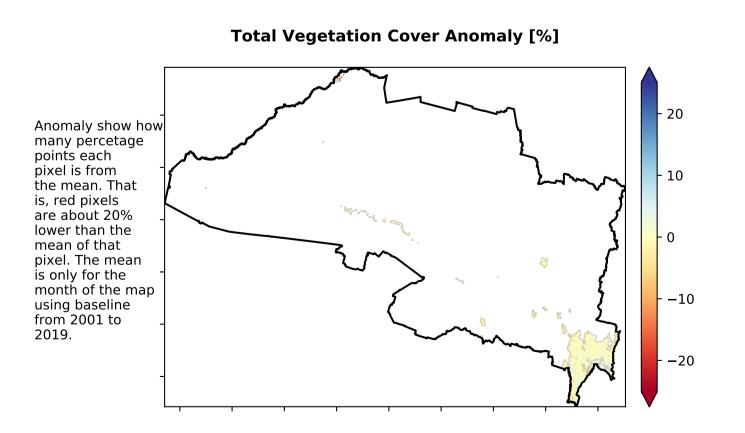


# **Conservation and natural environments Forest (non woodland)**

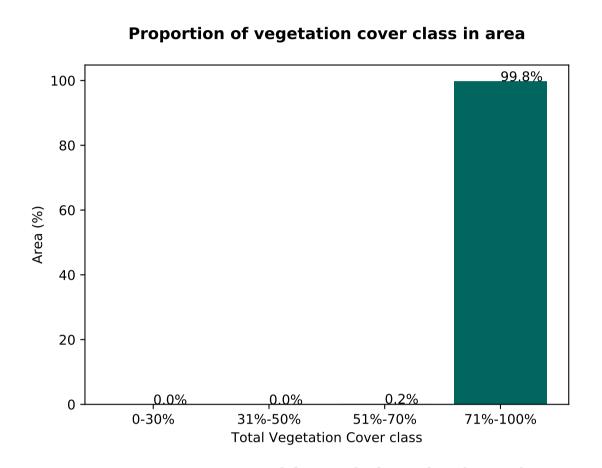


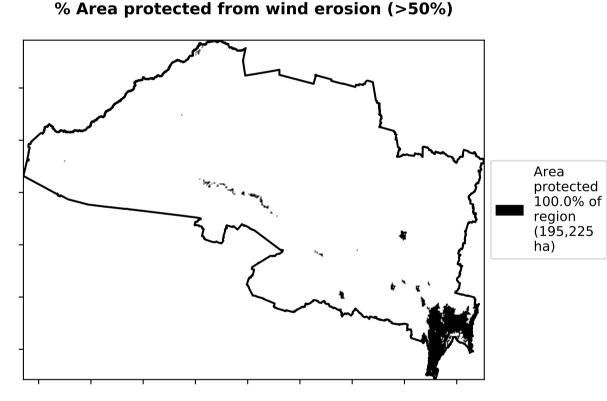
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trolo Indolo Trol

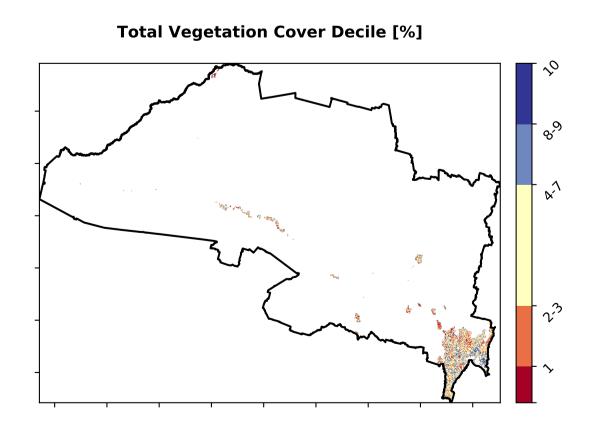




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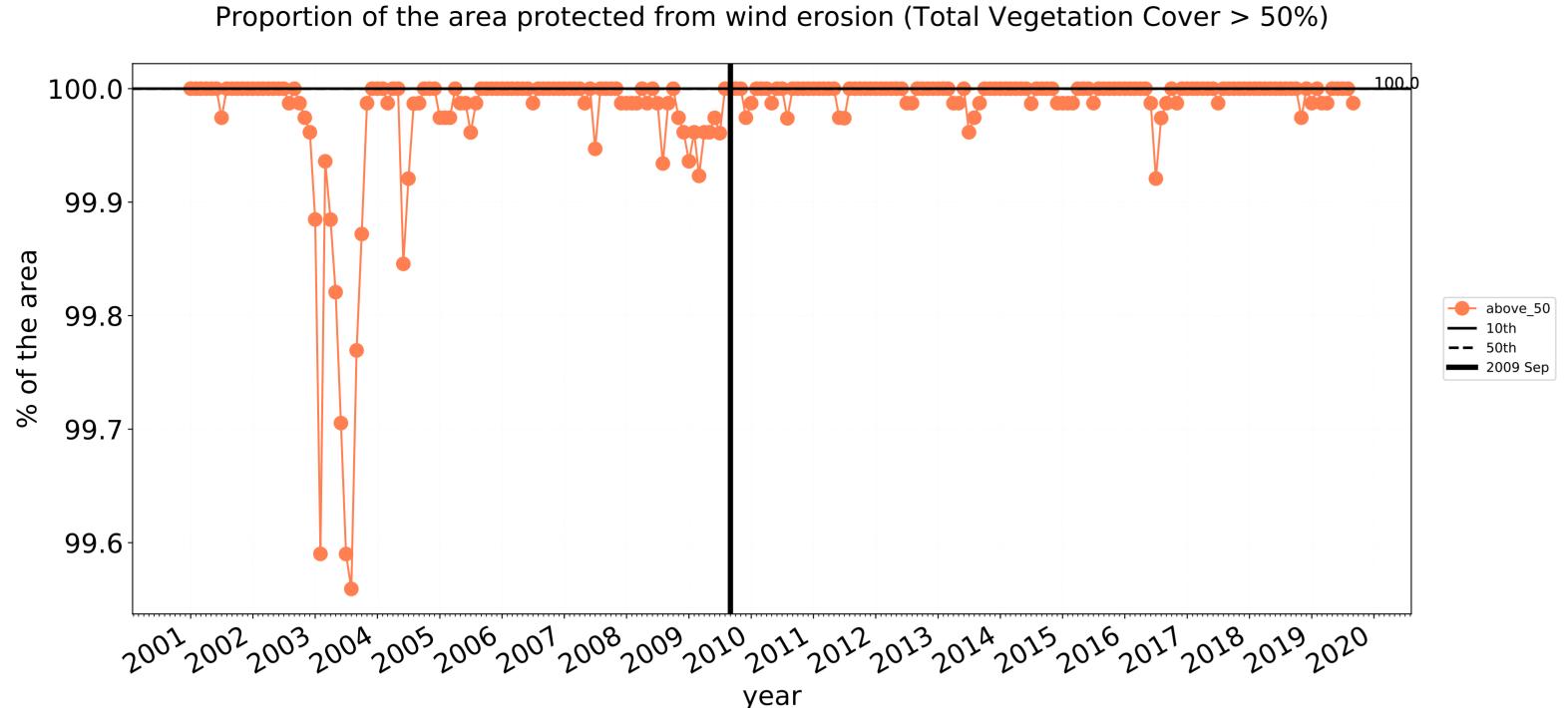


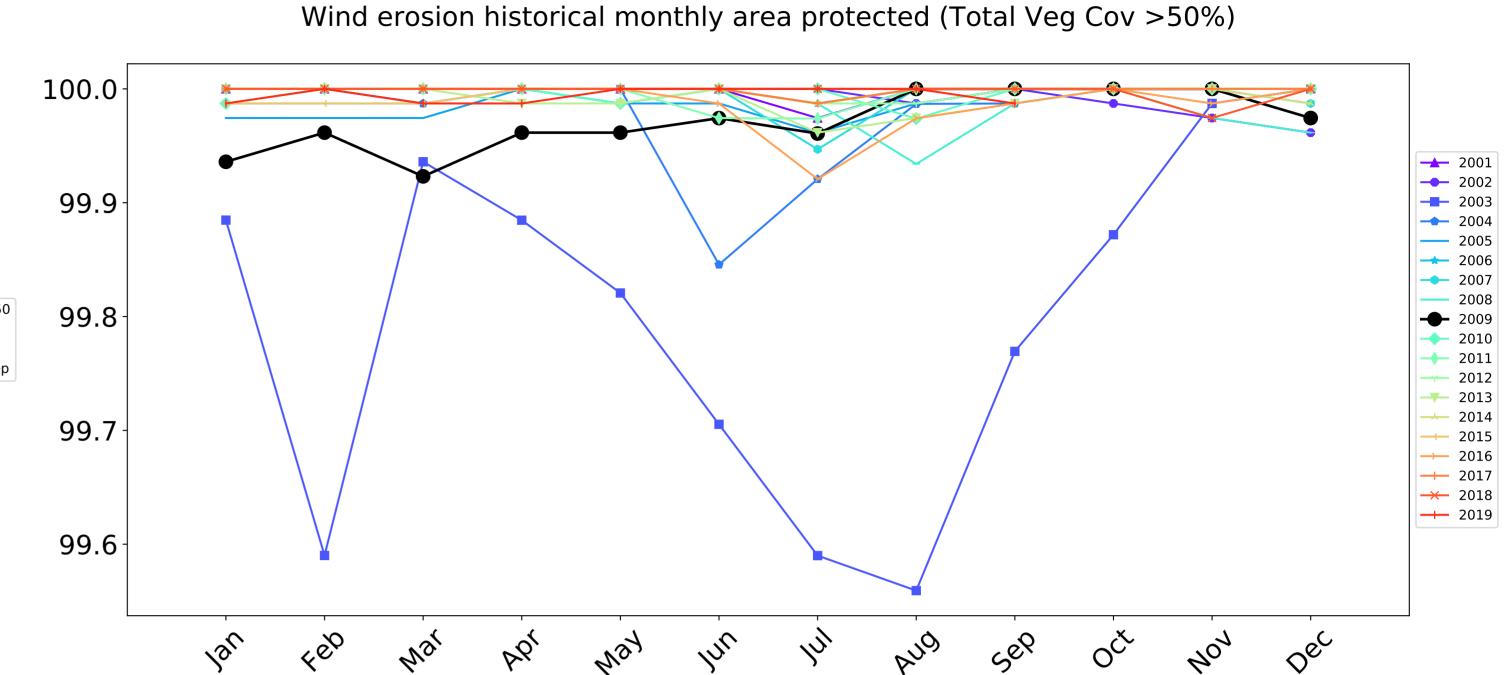




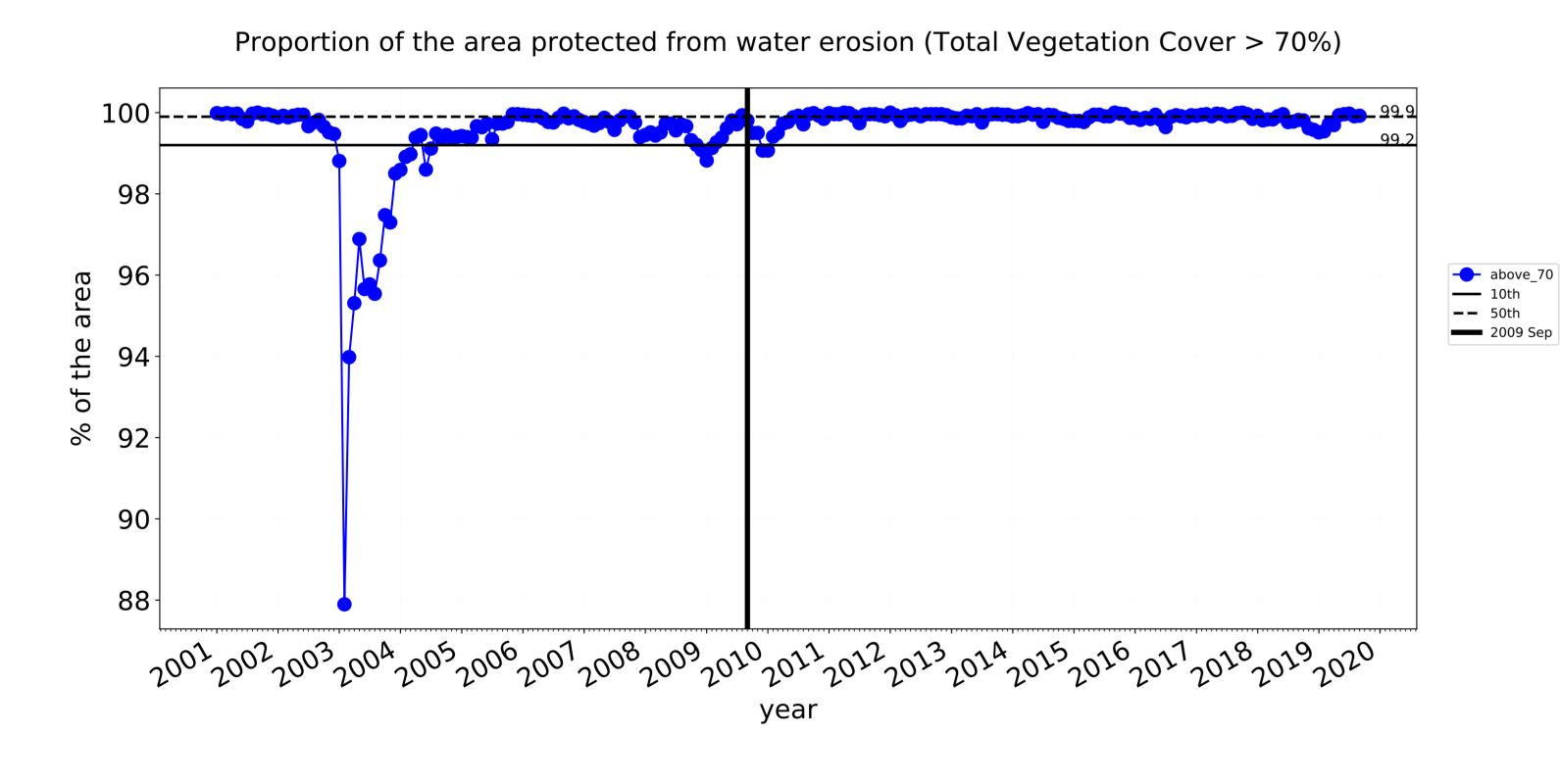


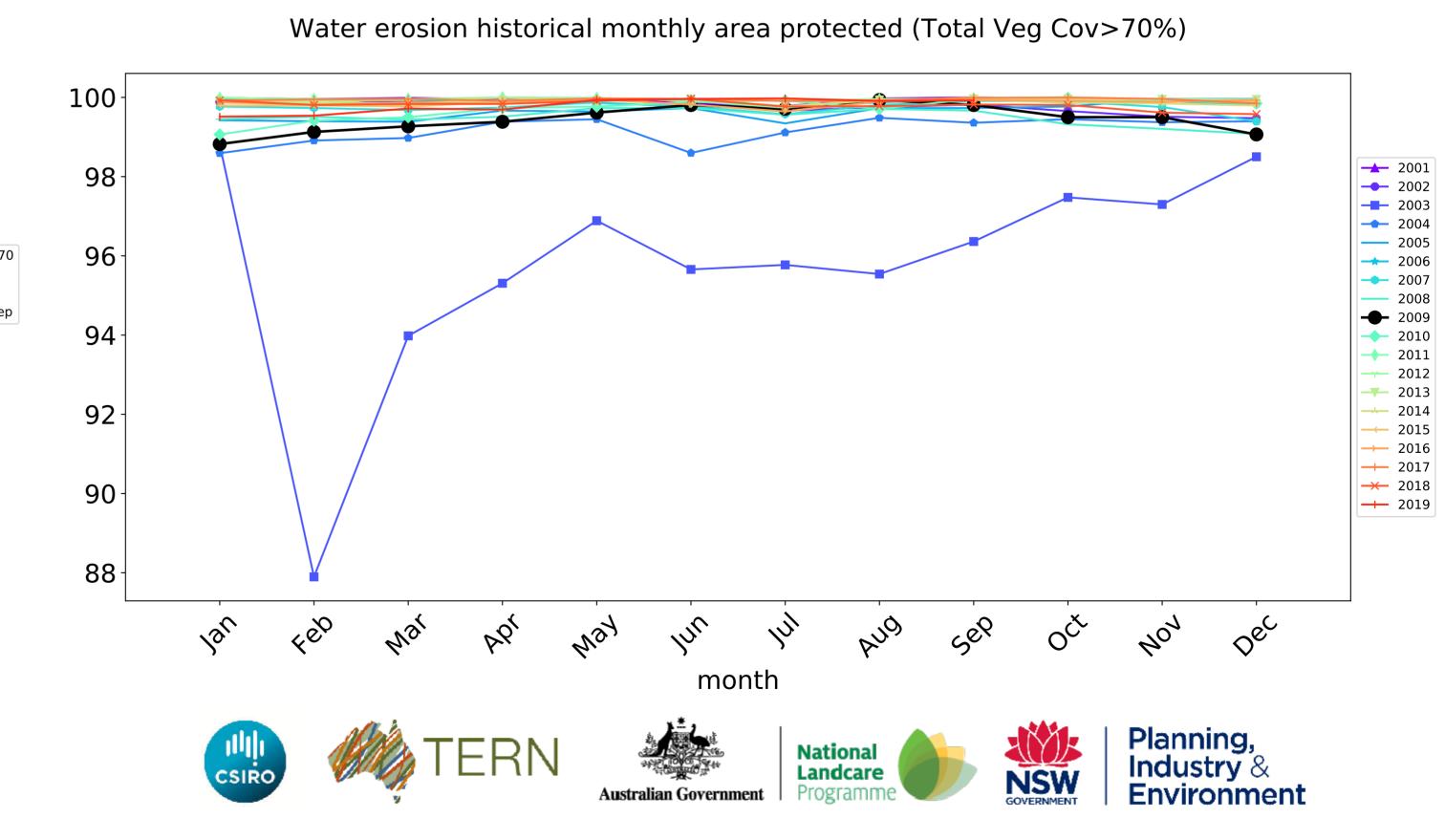






month





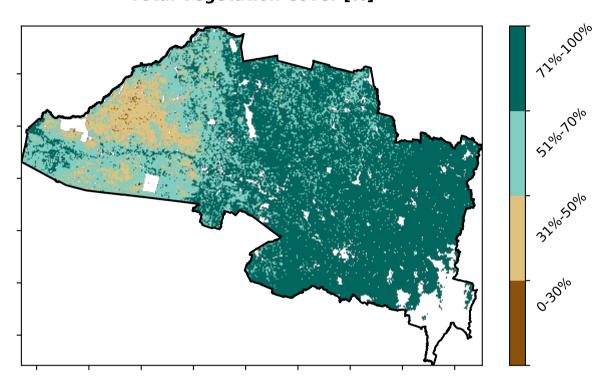
# **Agriculture**

# 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

# 50 - 52.5% 40 - 34.1% 20 - 10 - 7.9% 1 2 3 4 5 6 7 8

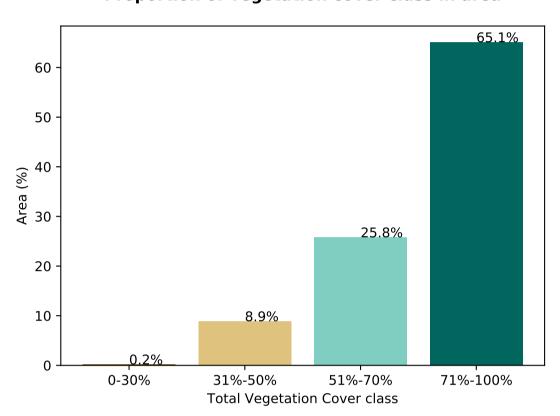
**Proportion of each land class in area** 



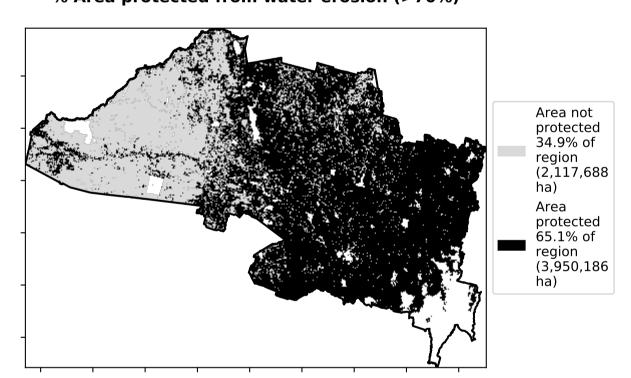


Proportion of vegetation cover class in area

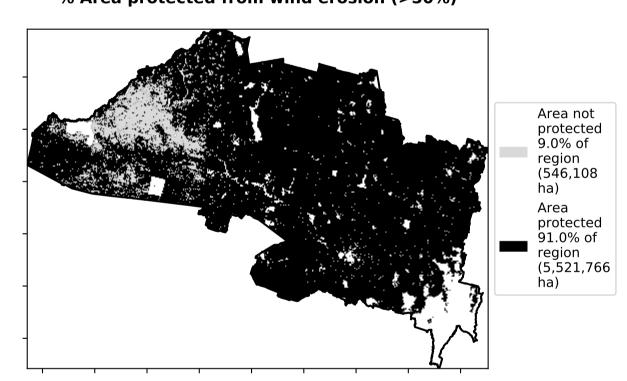
Land use class



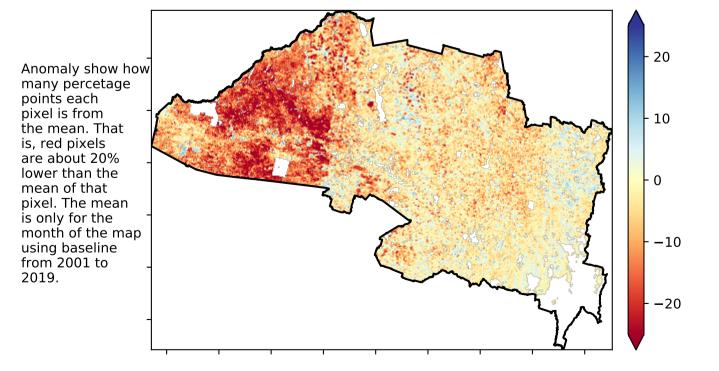
## % Area protected from water erosion (>70%)



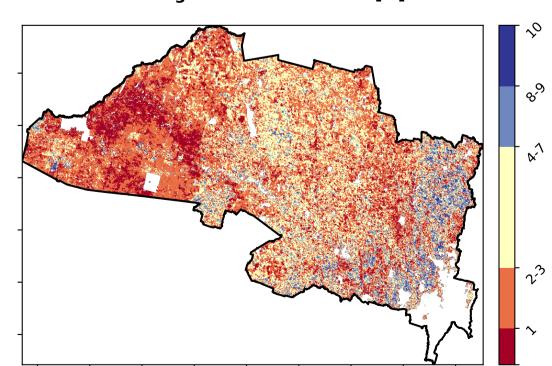
% Area protected from wind erosion (>50%)



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



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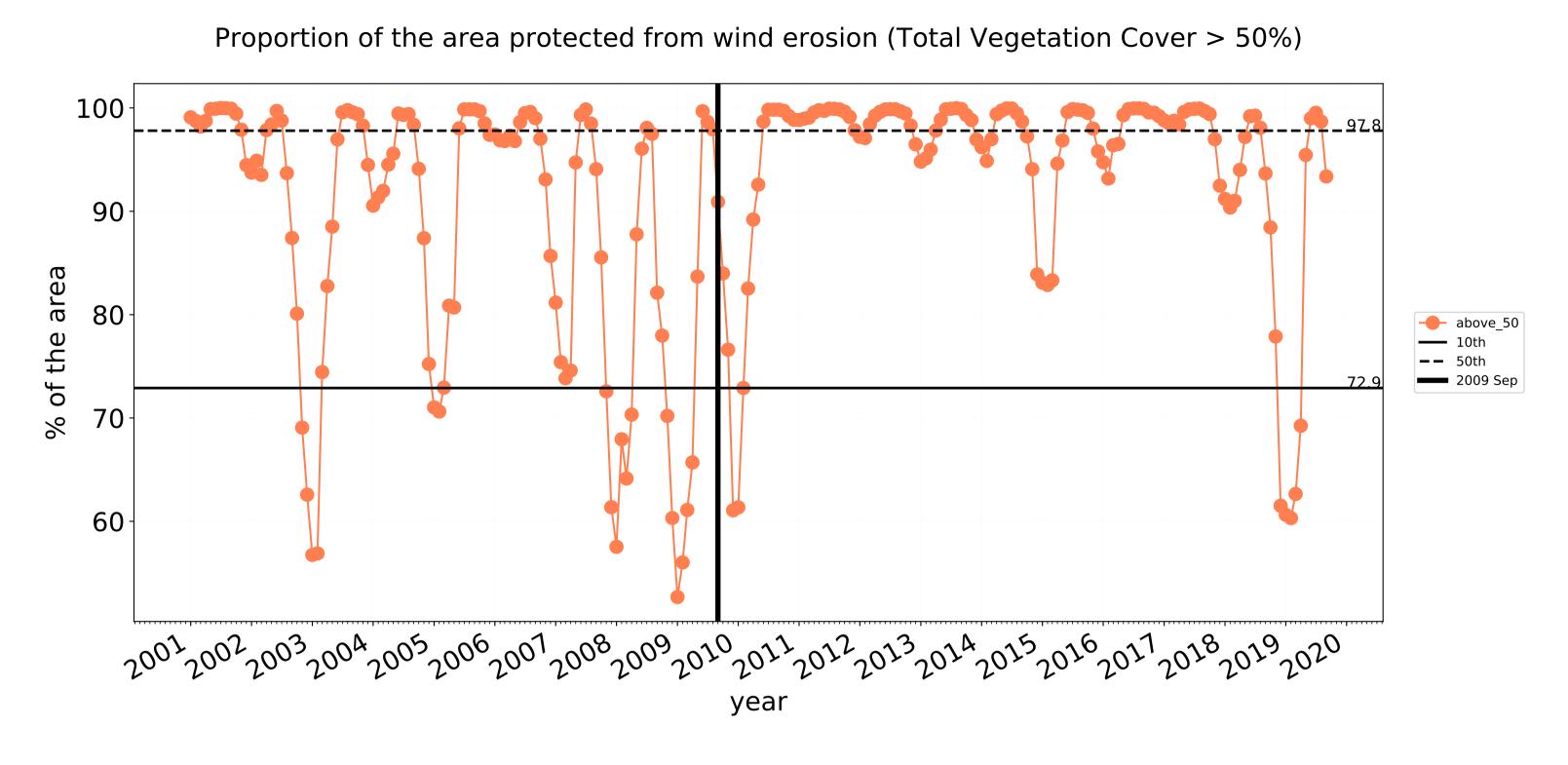


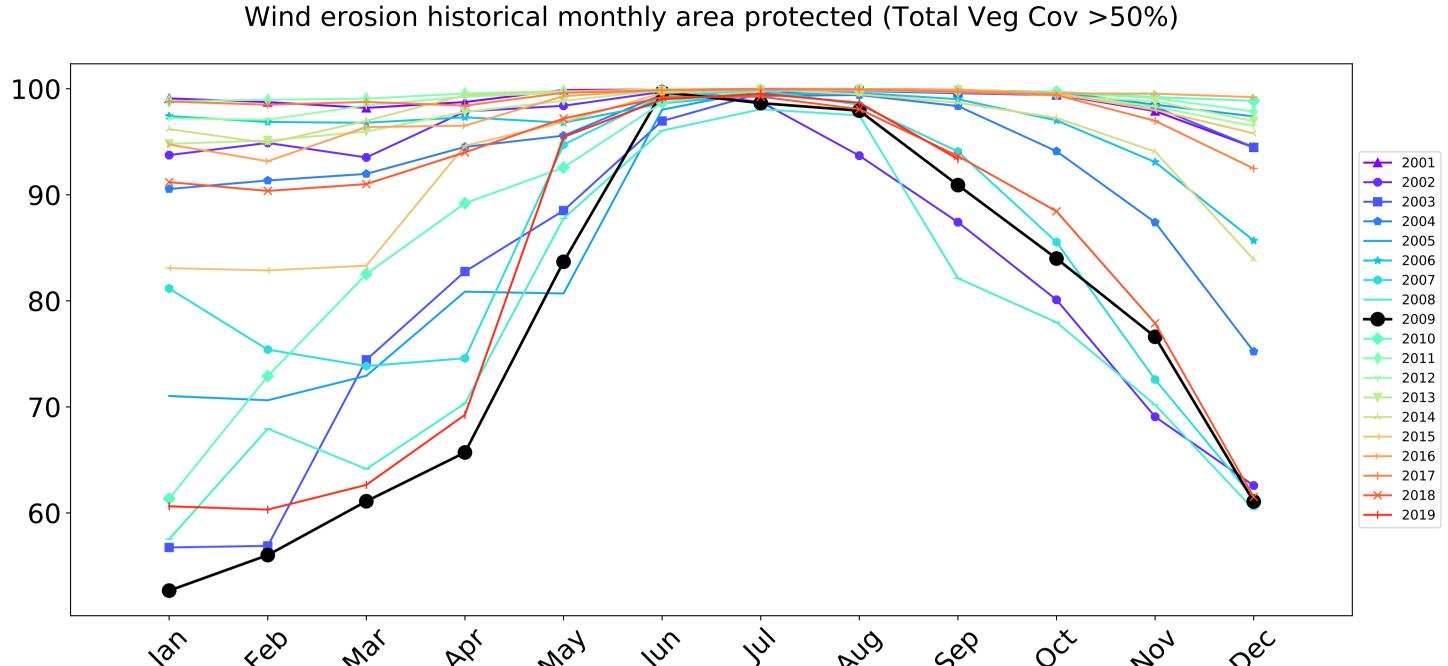




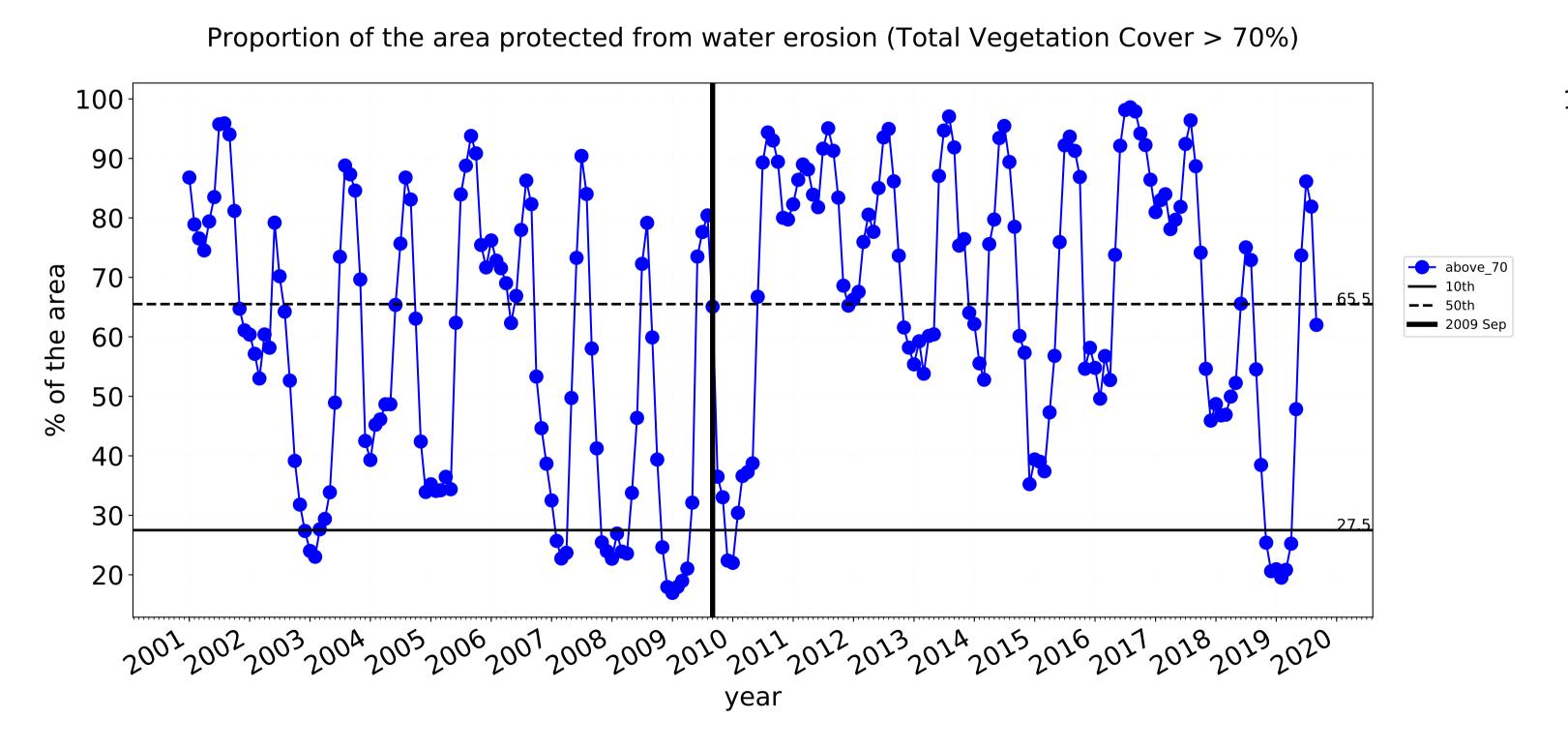


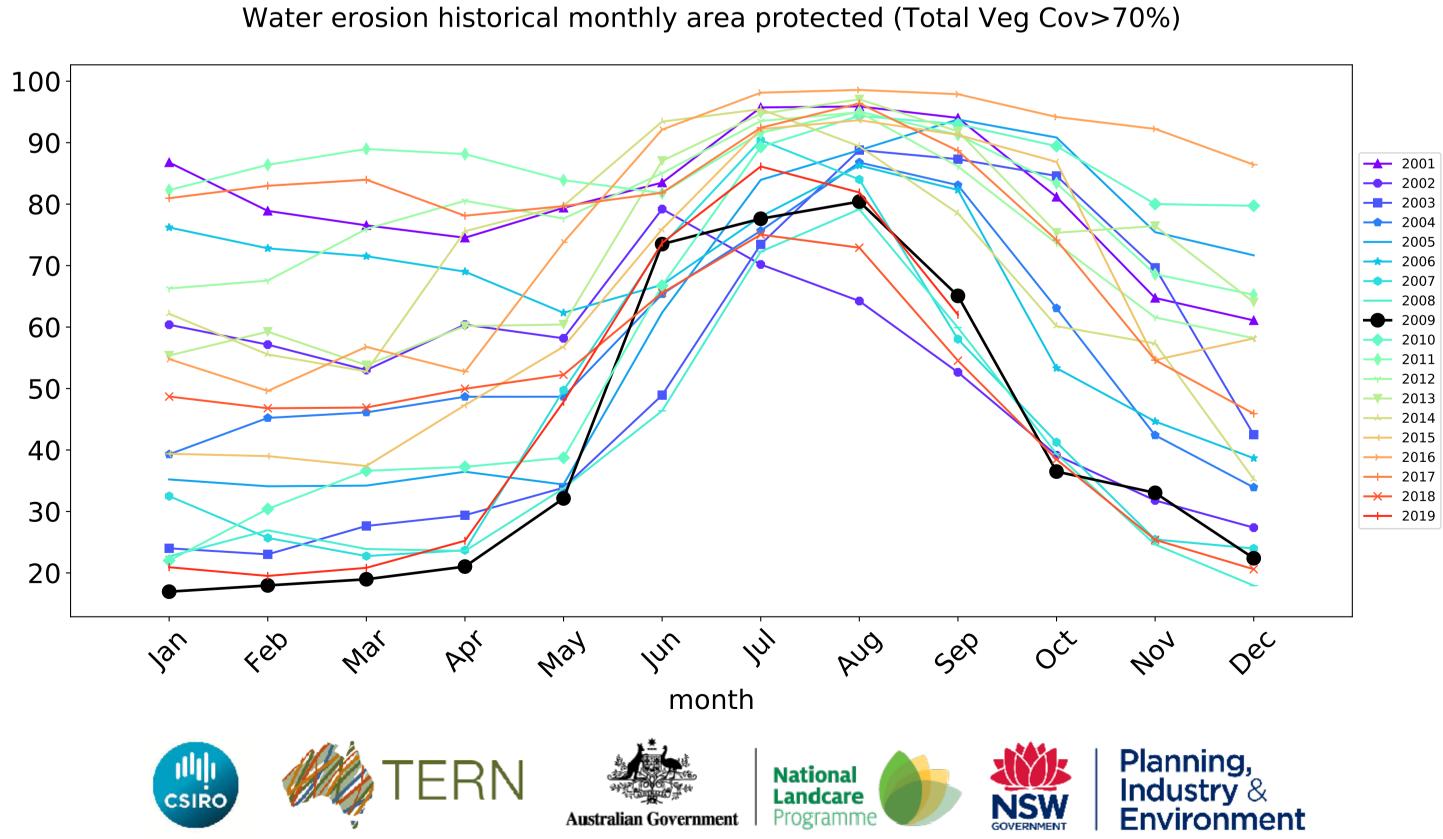
# **Agriculture timeseries**



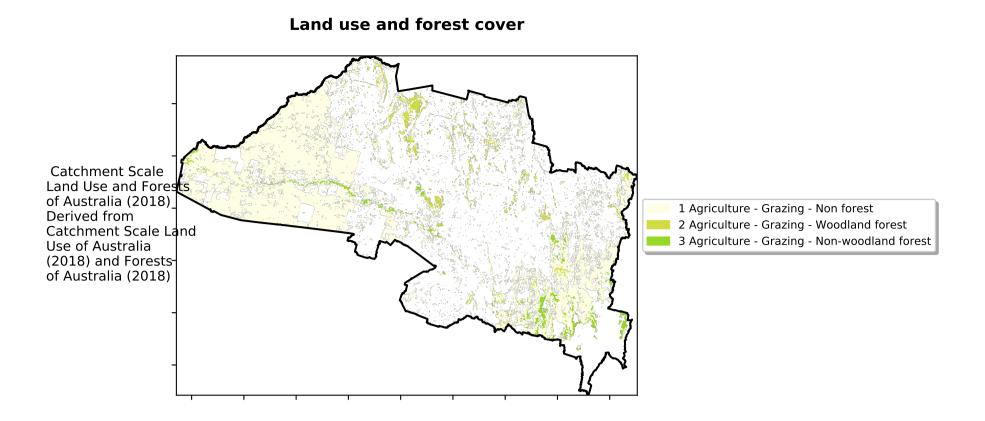


month

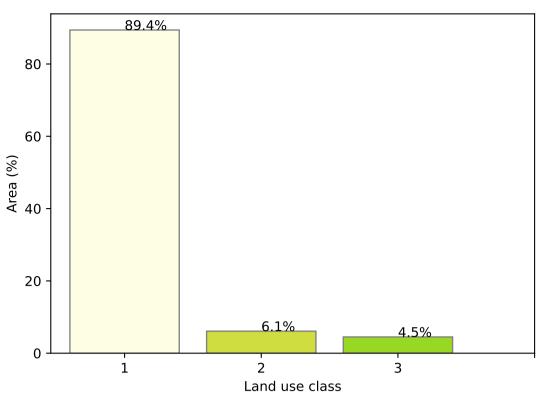




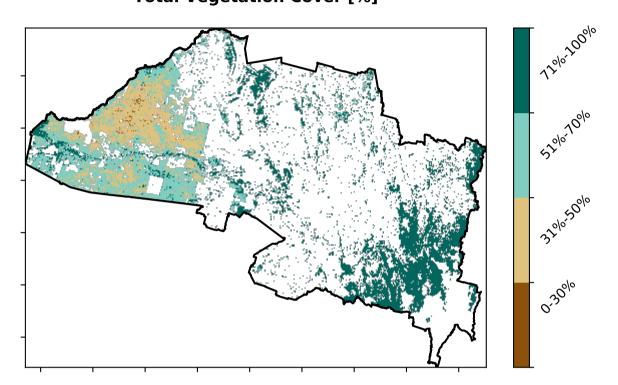
# **Grazing**



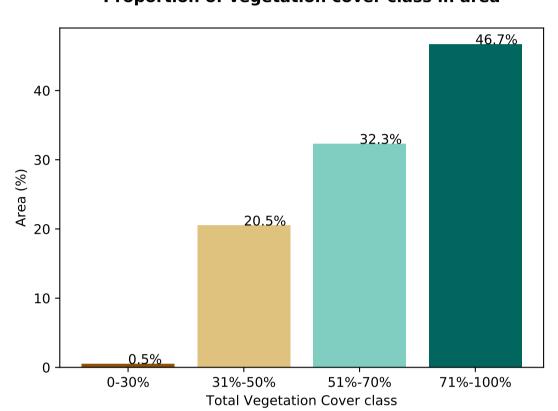
### Proportion of each land class in area



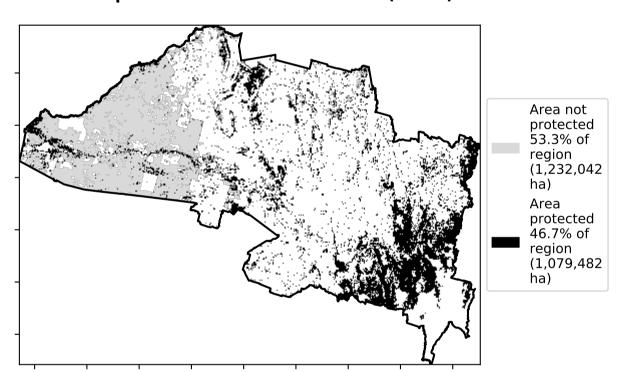
**Total Vegetation Cover [%]** 



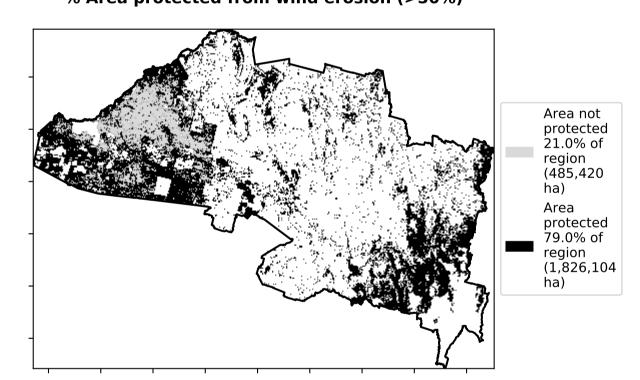
Proportion of vegetation cover class in area



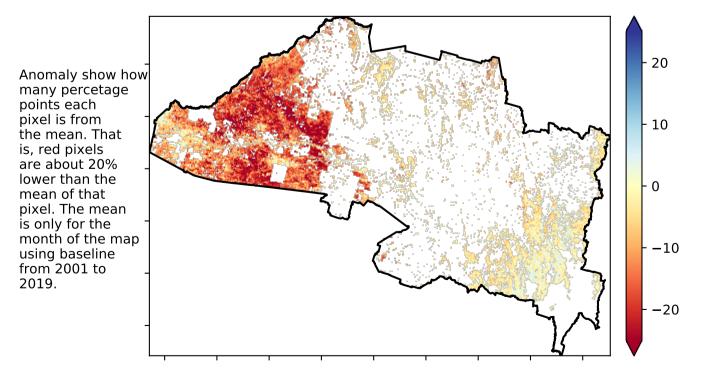
% Area protected from water erosion (>70%)



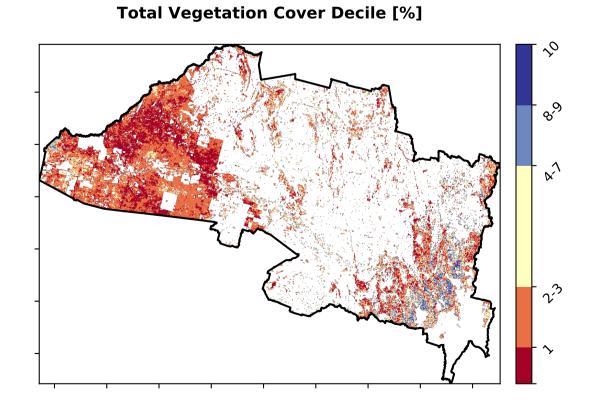
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



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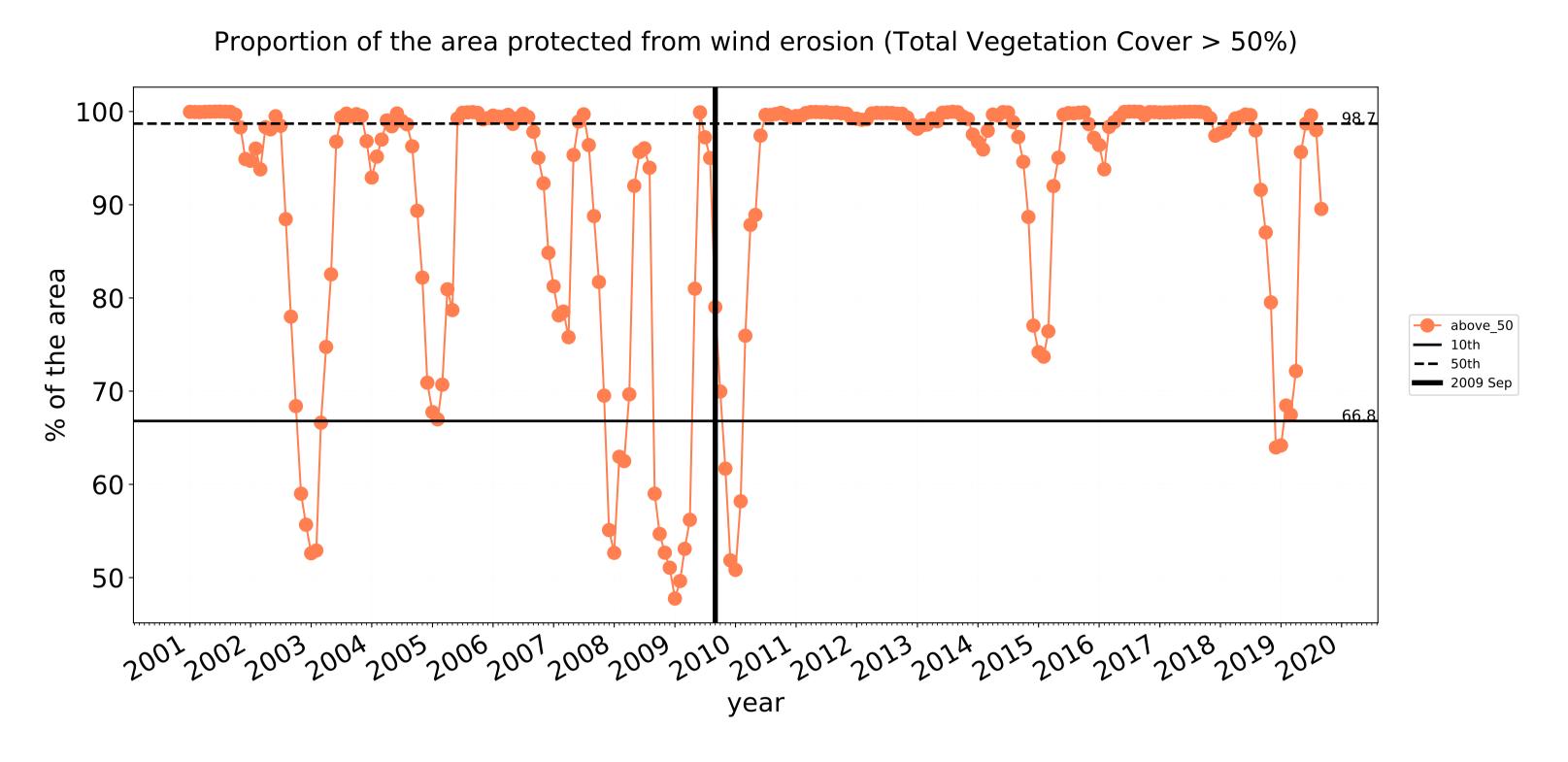


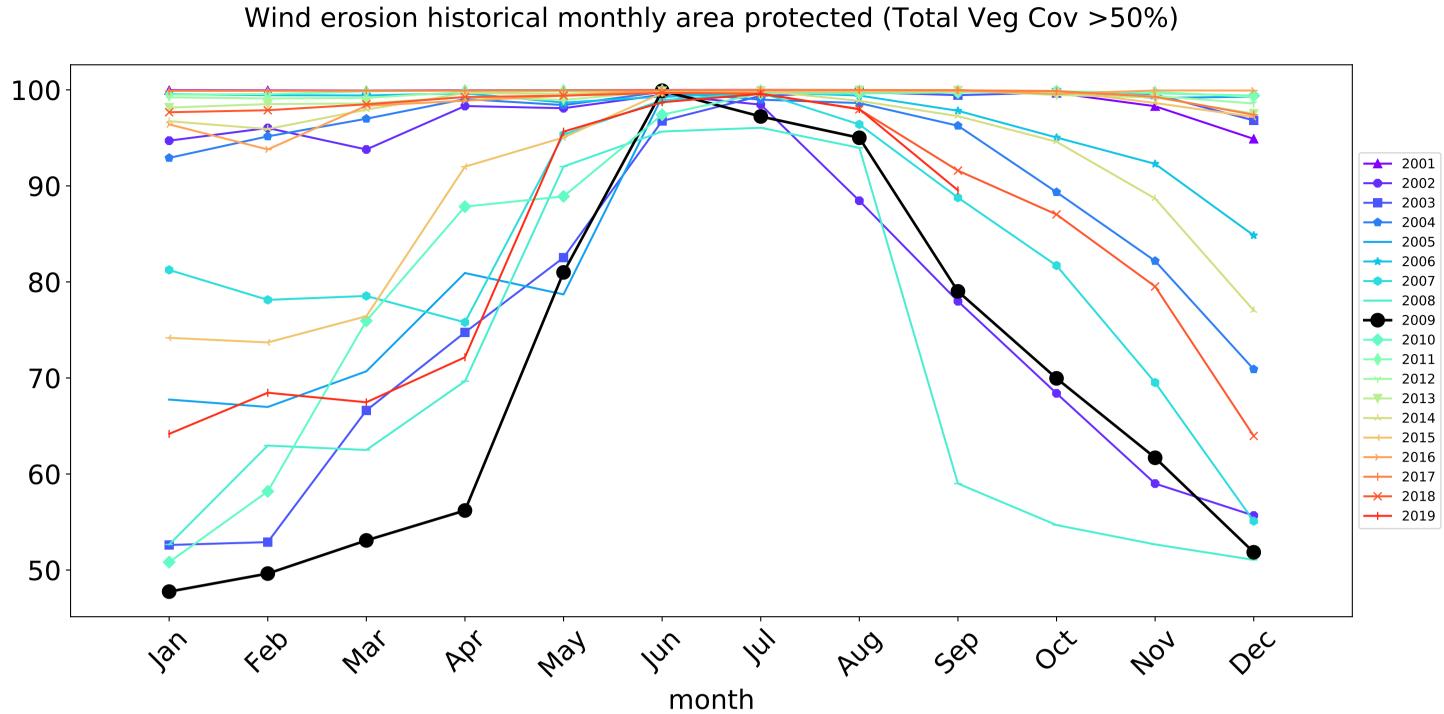


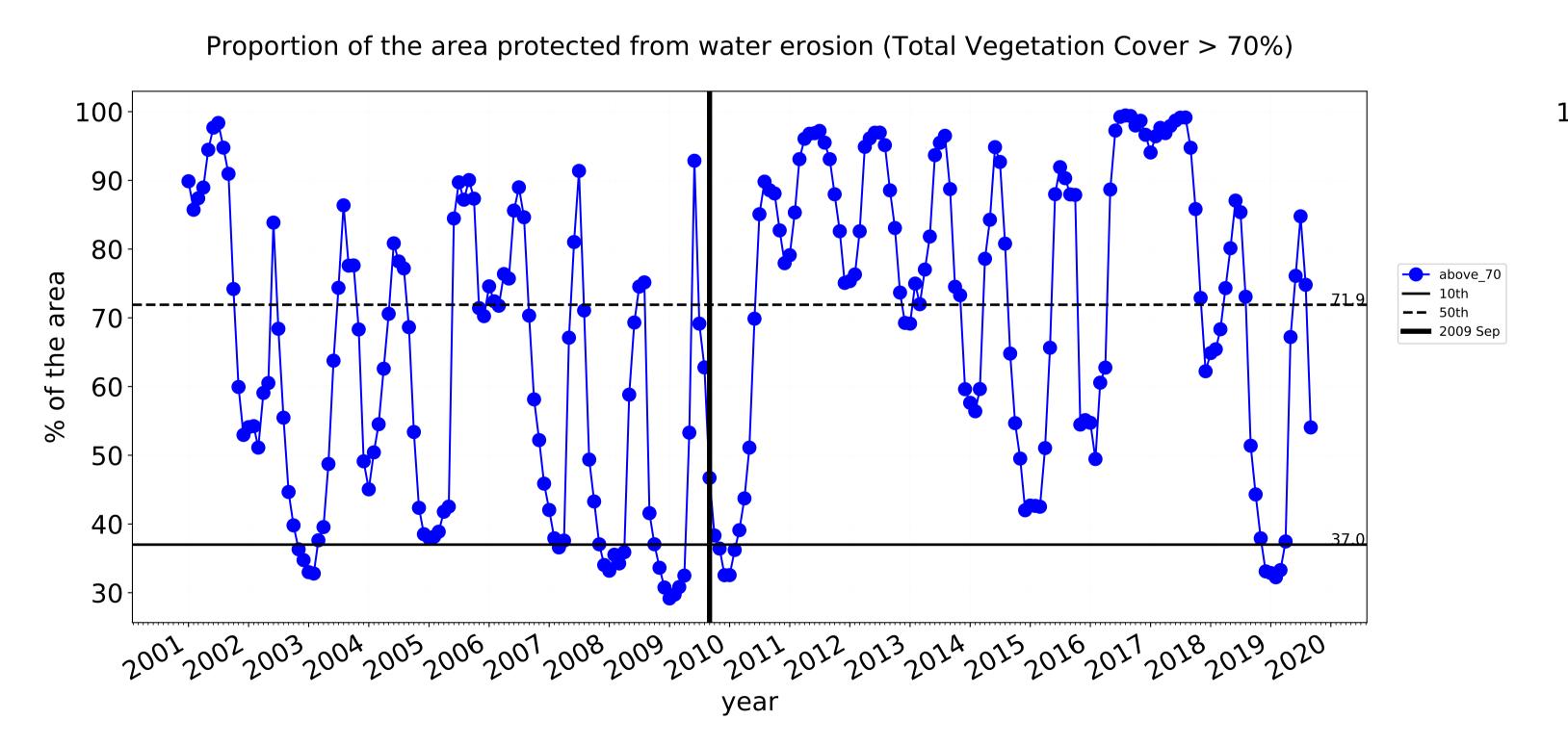


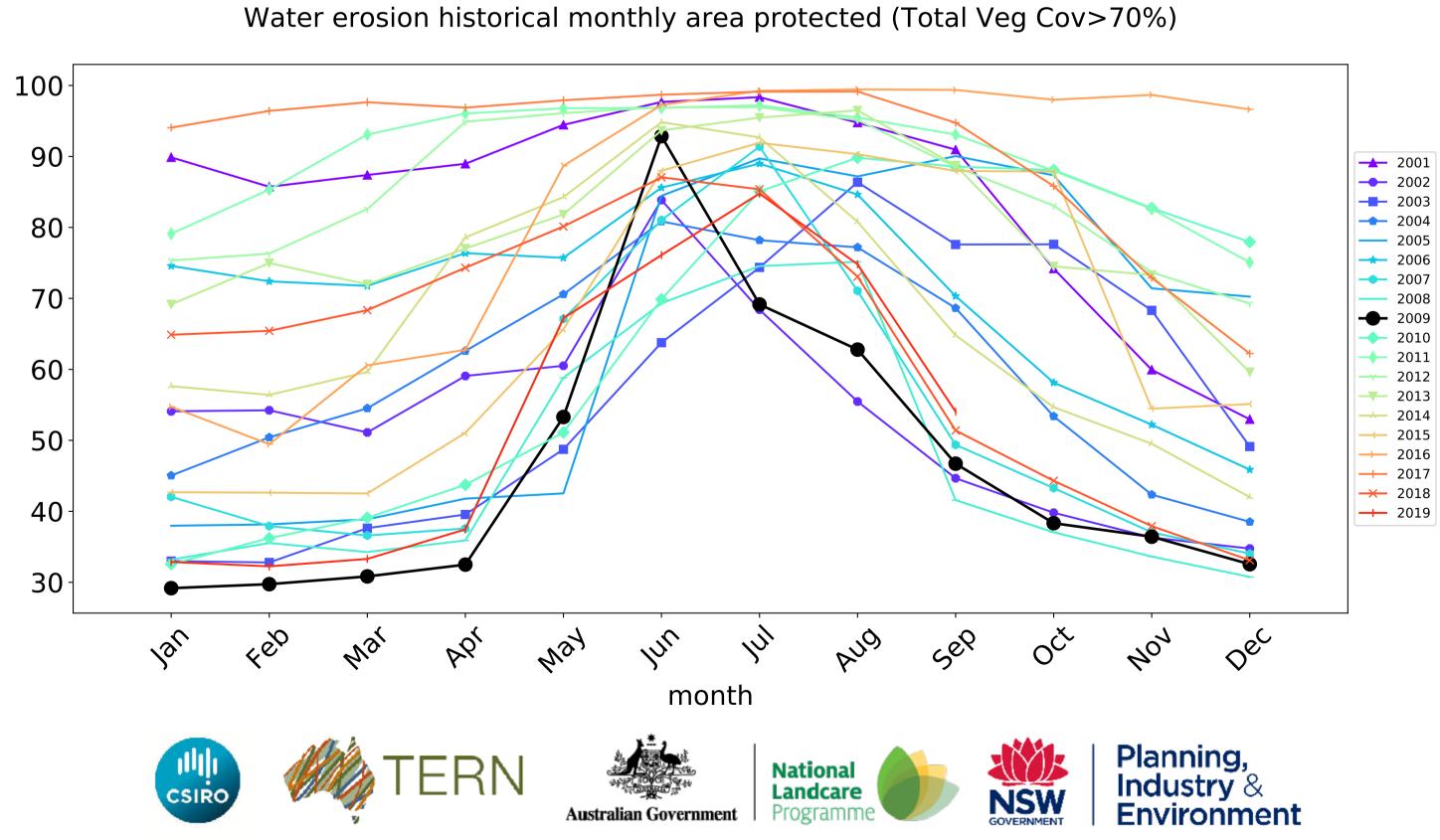


# **Grazing timeseries**



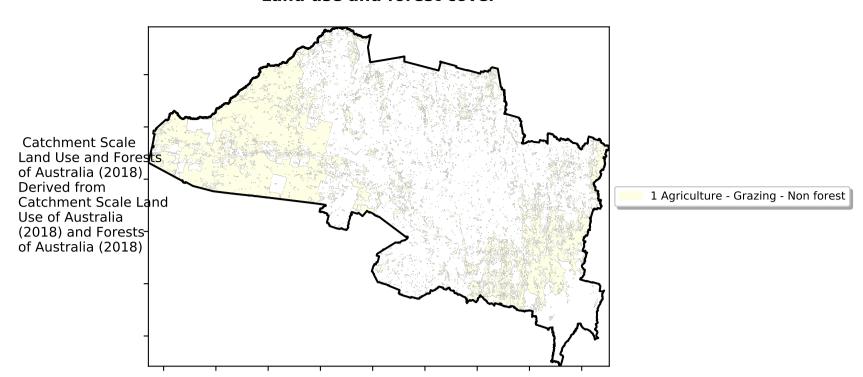




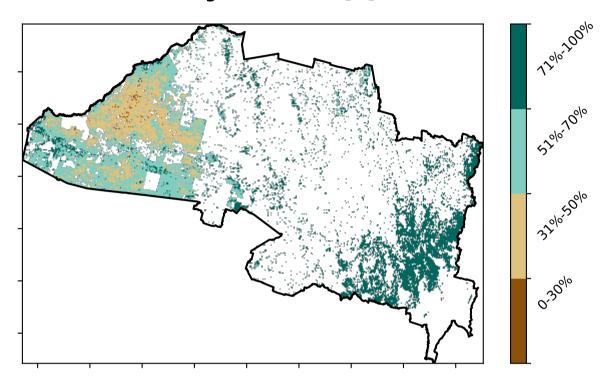


# **Grazing non forest**

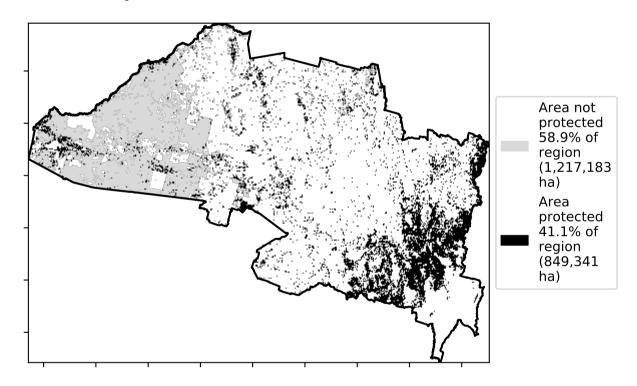
### Land use and forest cover



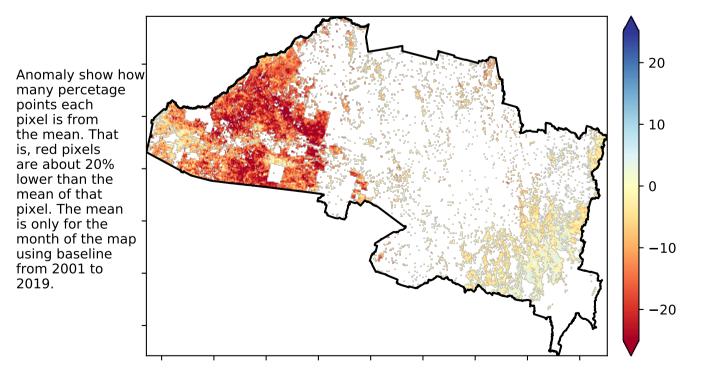
### **Total Vegetation Cover [%]**



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

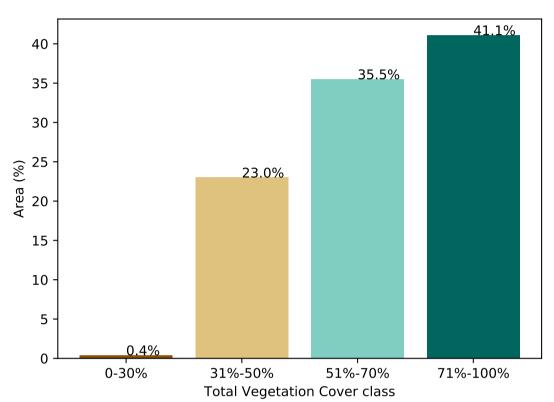


### Total Vegetation Cover Anomaly [%]

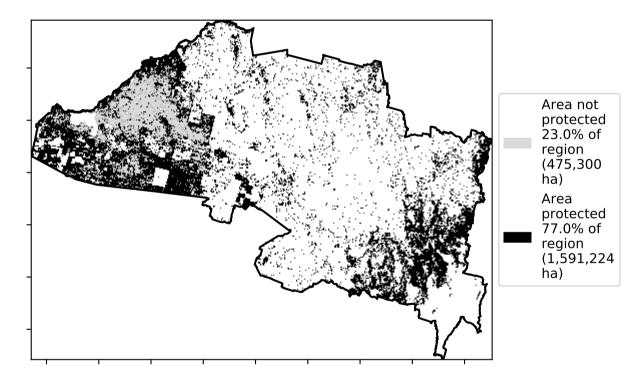


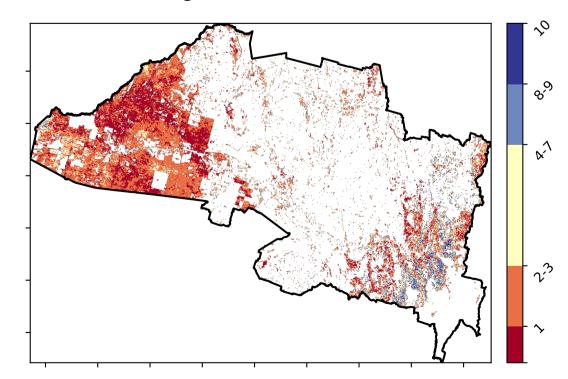
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### **Proportion of vegetation cover class in area**



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









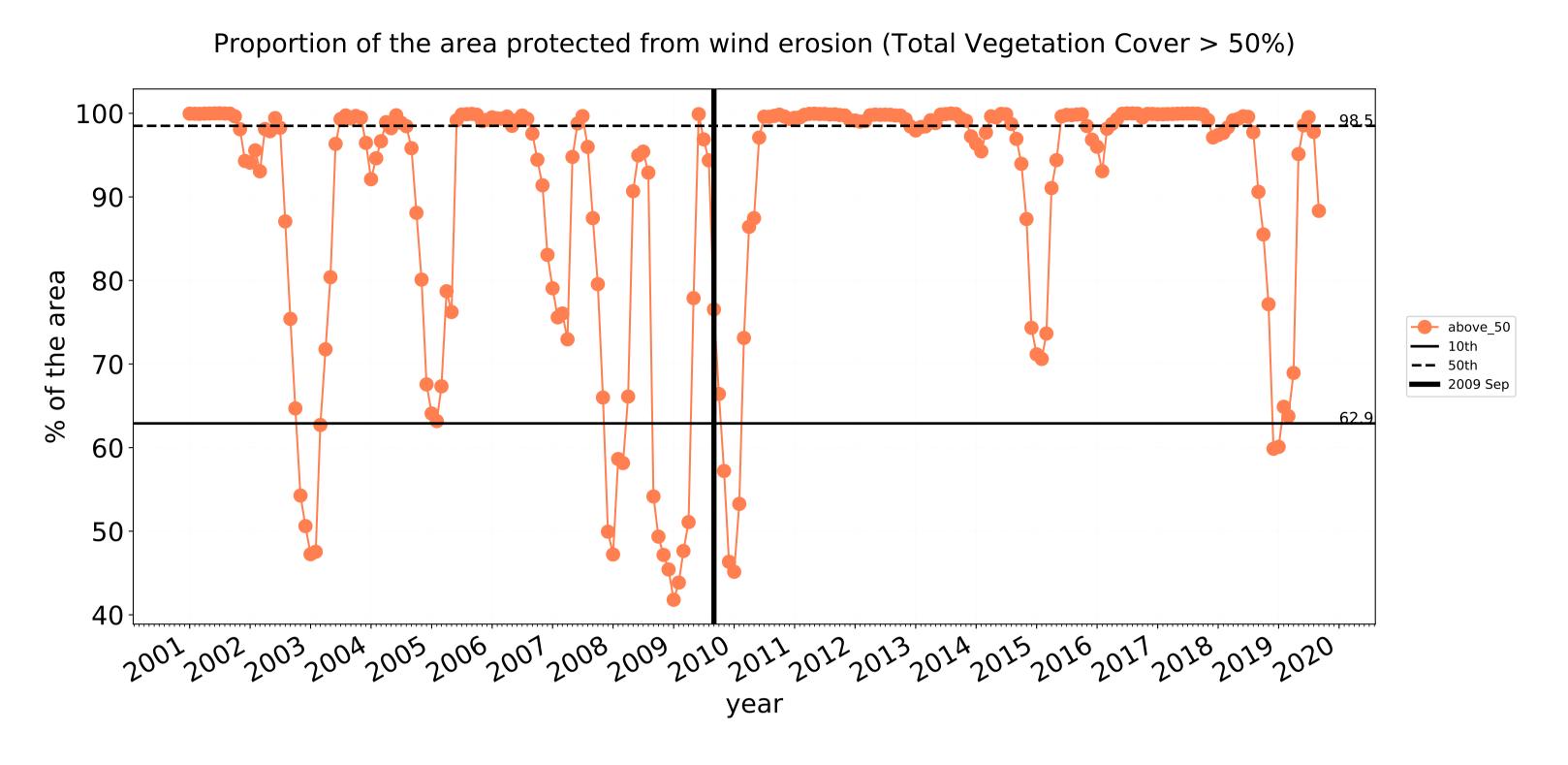


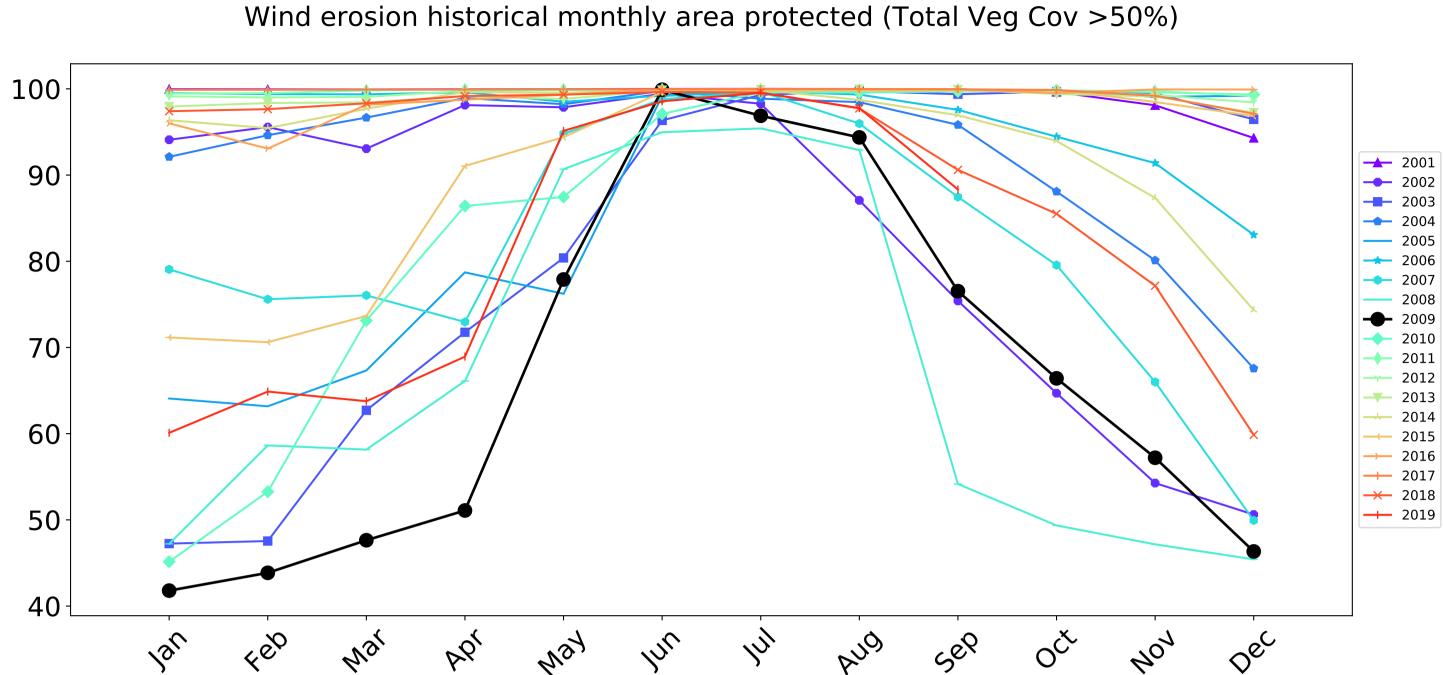






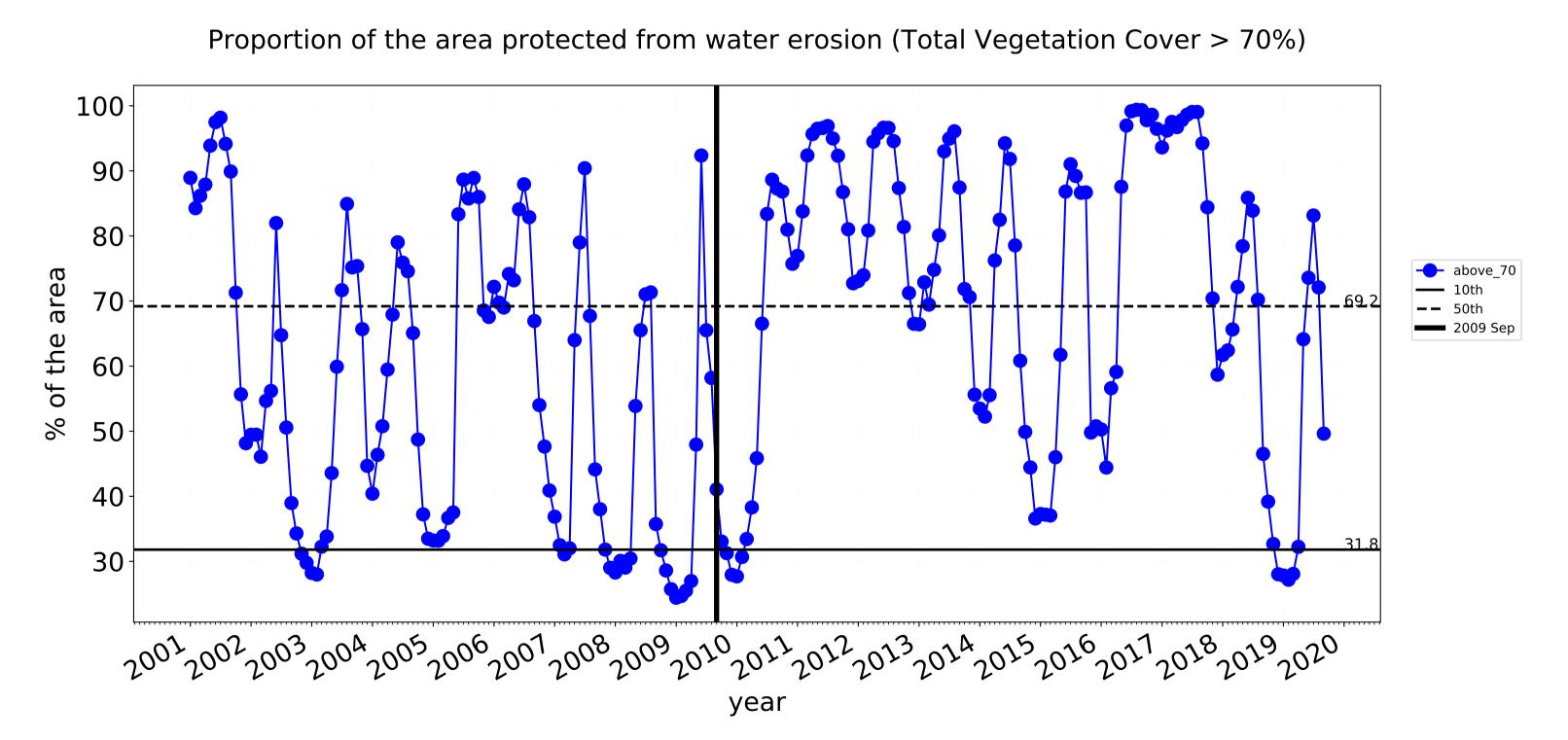
# **Grazing non forest timeseries**

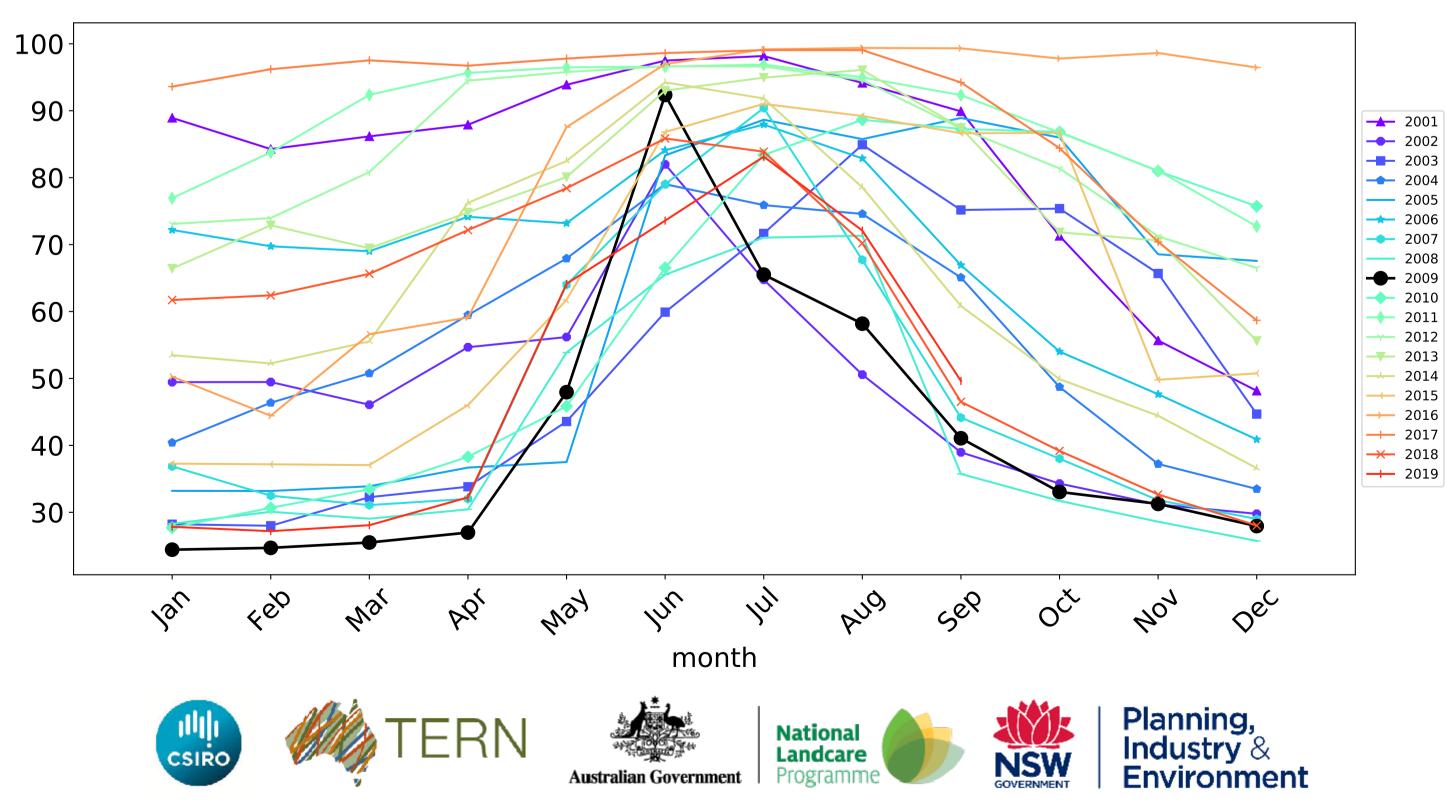




month

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



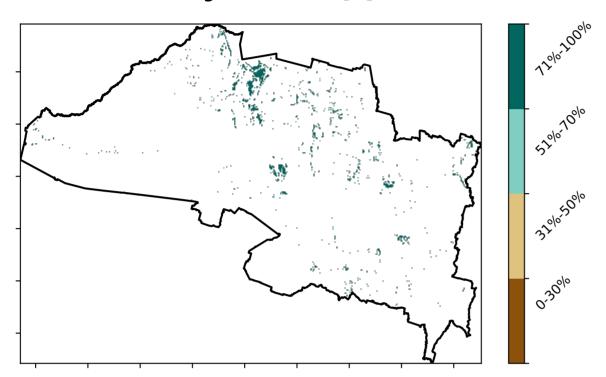


# **Grazing Woodland forest**

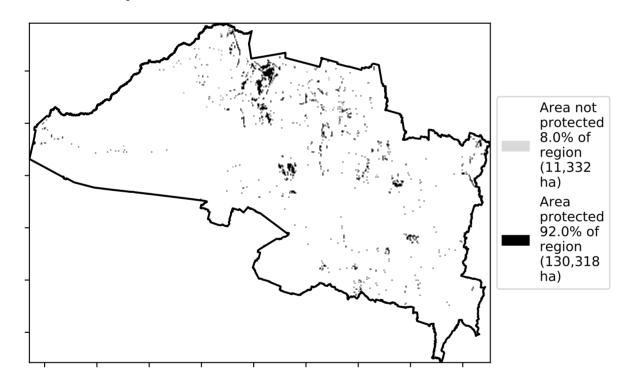
Catchment Scale
Land Use and Forests
of Australia (2018)
Derived from 1 Agriculture - Grazing - Woodland forest Catchment Scale Land Use of Australia (2018) and Forests-of Australia (2018)

Land use and forest cover

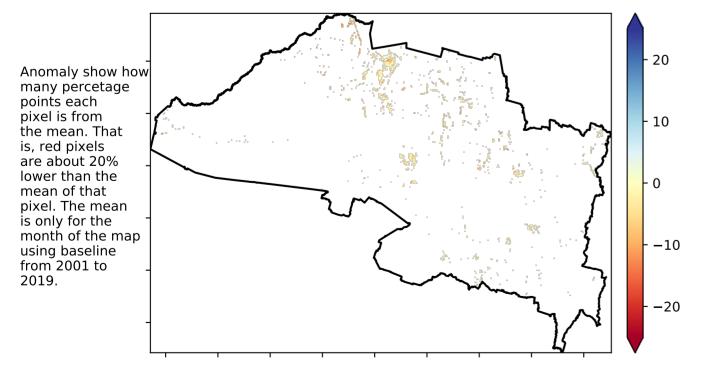
### **Total Vegetation Cover [%]**



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

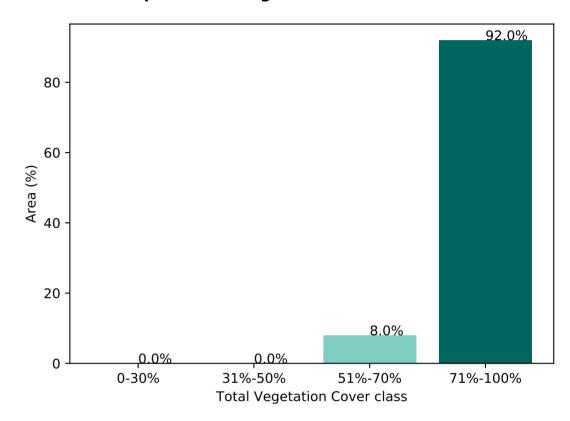


### **Total Vegetation Cover Anomaly [%]**

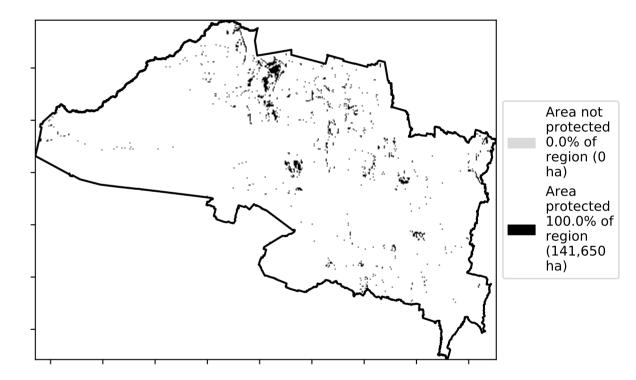


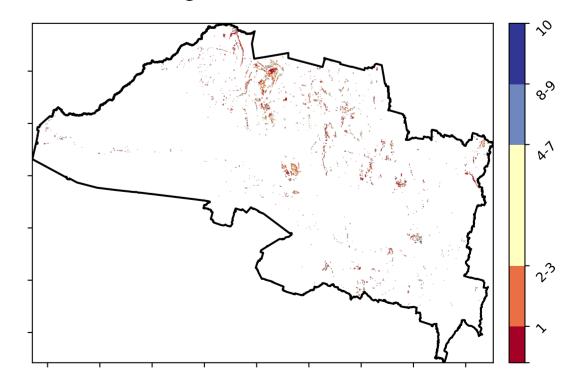
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### Proportion of vegetation cover class in area



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









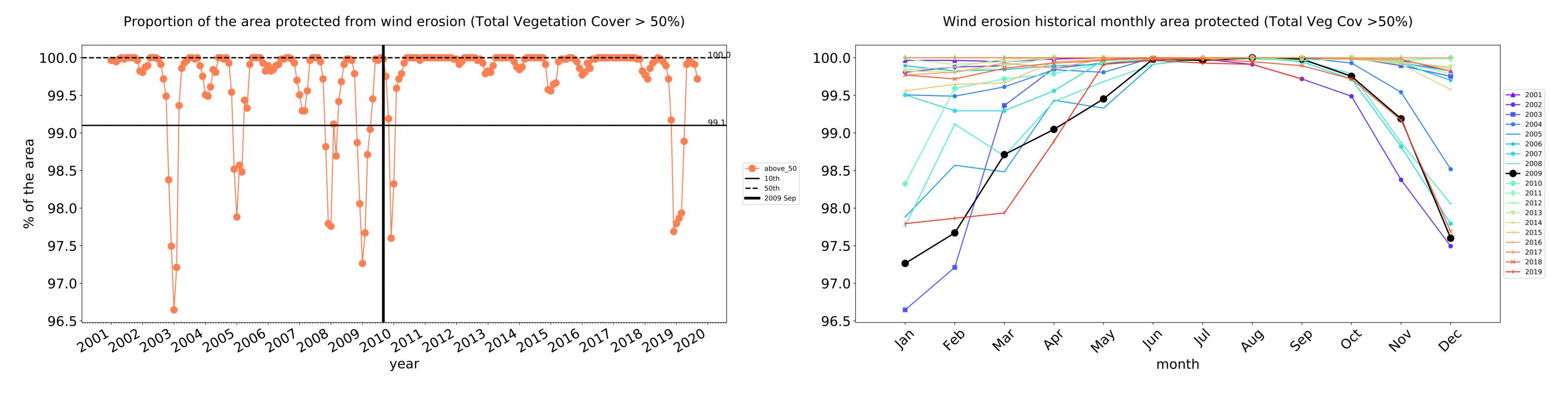


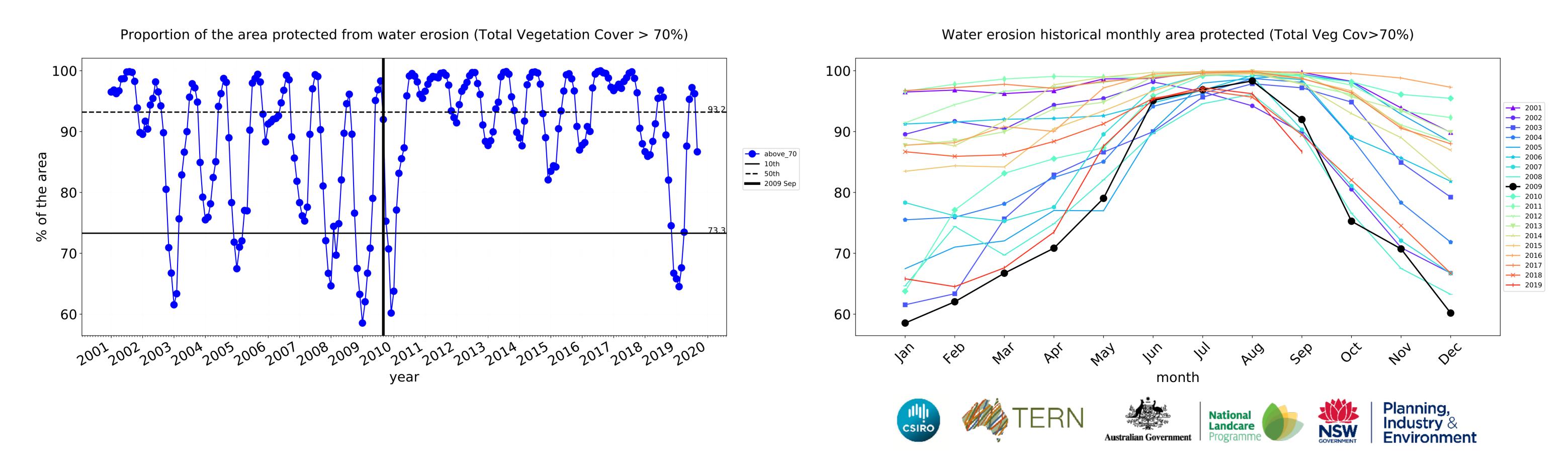






# **Grazing Woodland forest timeseries**

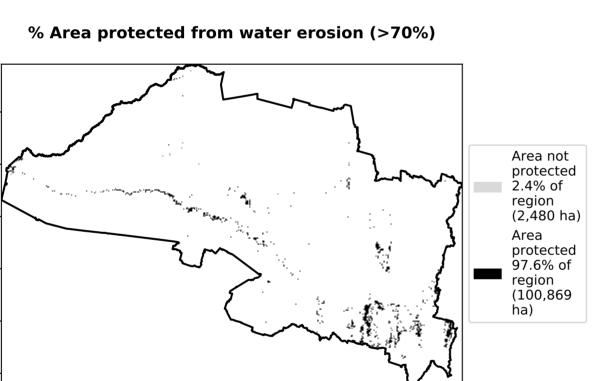


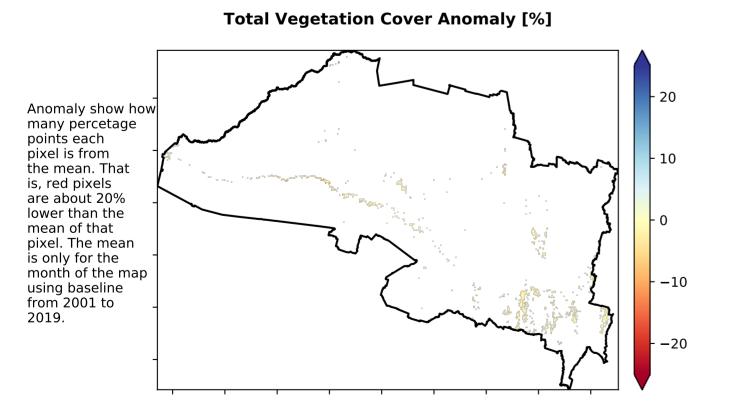


# **Grazing - Forest (non woodland)**

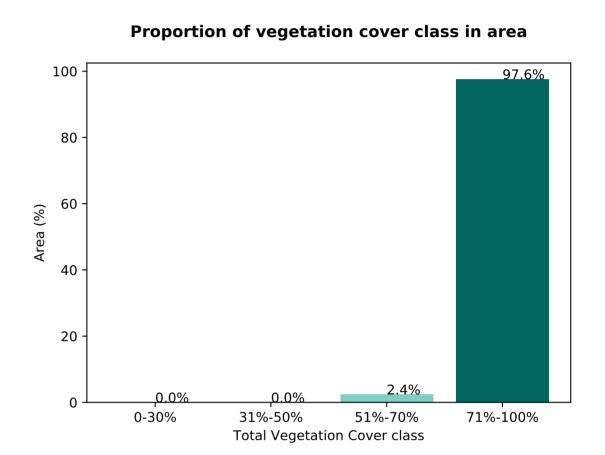
# Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Agriculture - Grazing - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests-of Australia (2018)

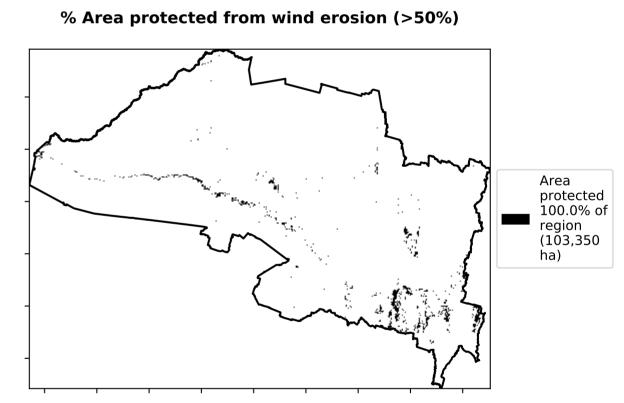
# **Total Vegetation Cover [%]**

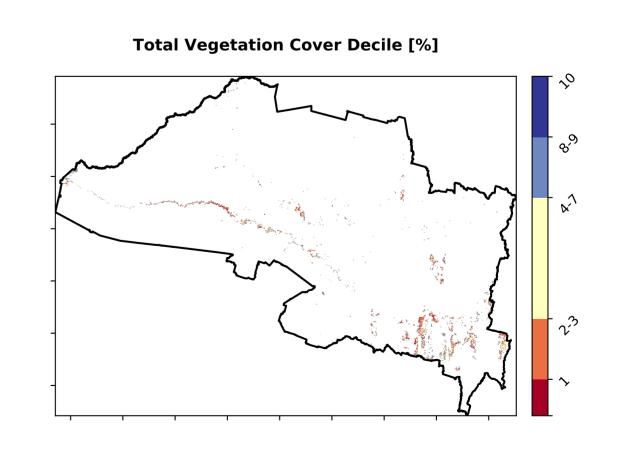




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline. the map using baseline from 2001 to 2019.









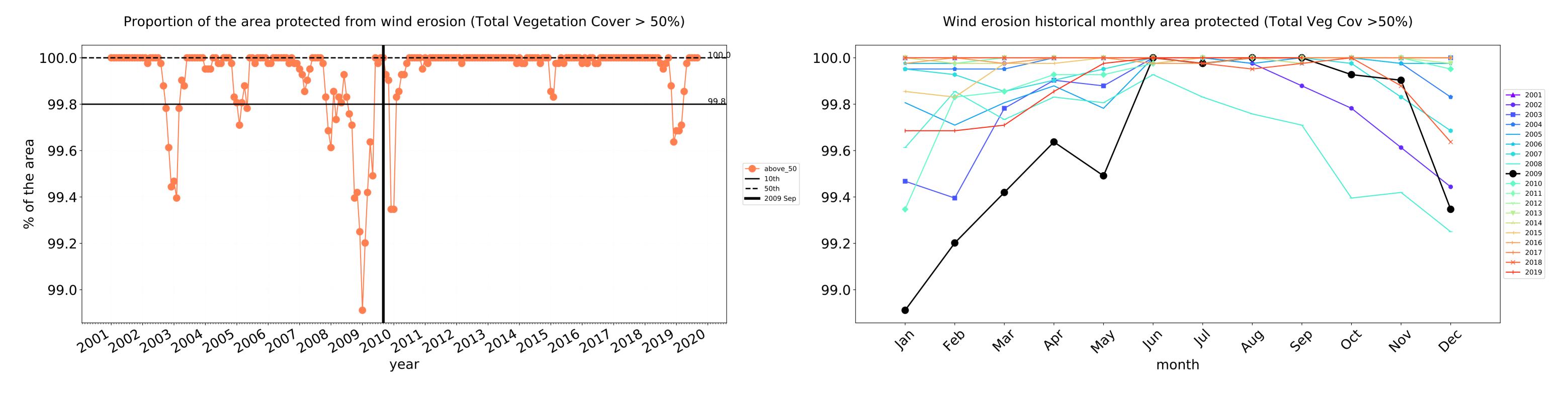


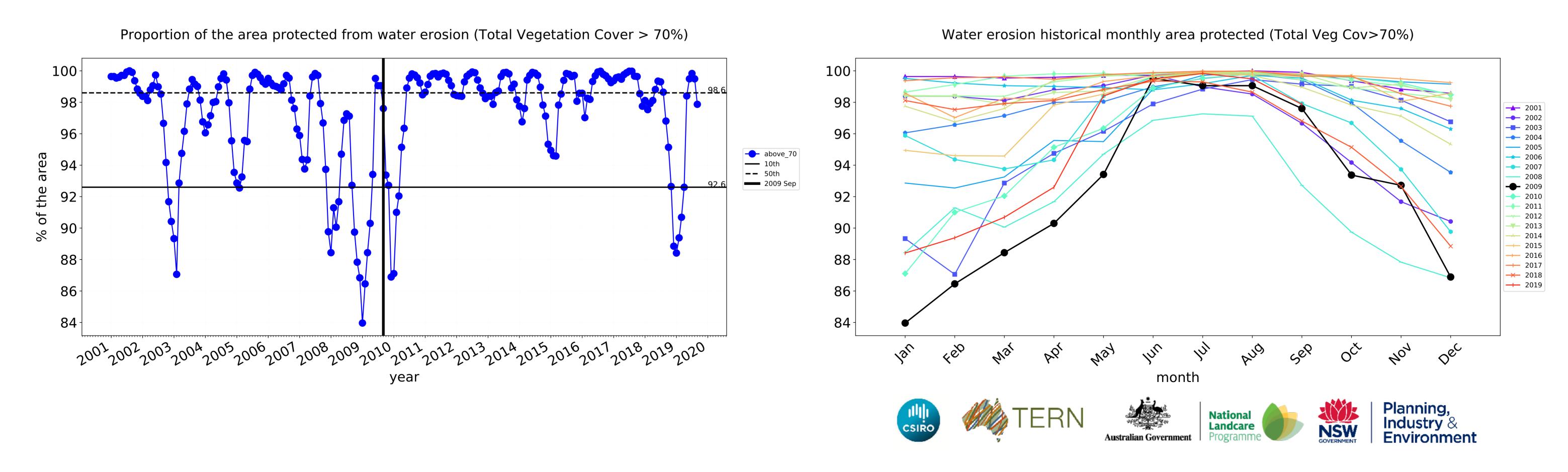






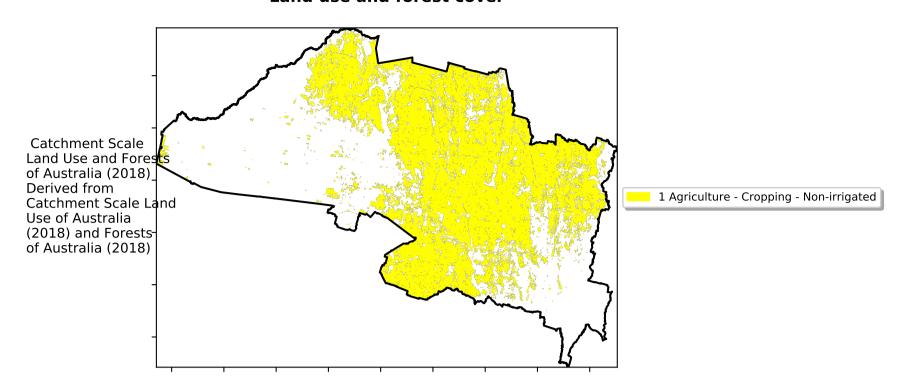




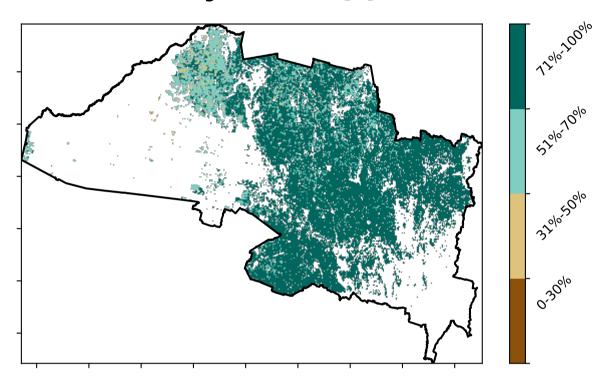


# **Cropping**

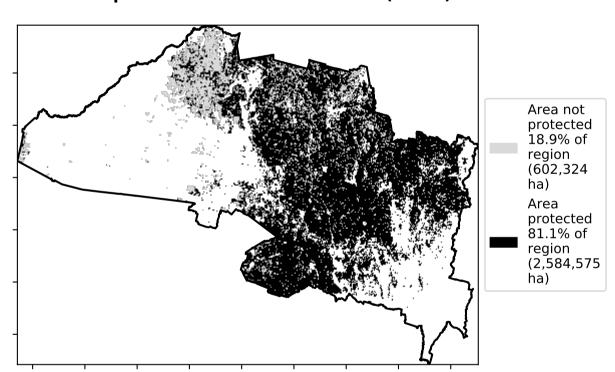
### Land use and forest cover



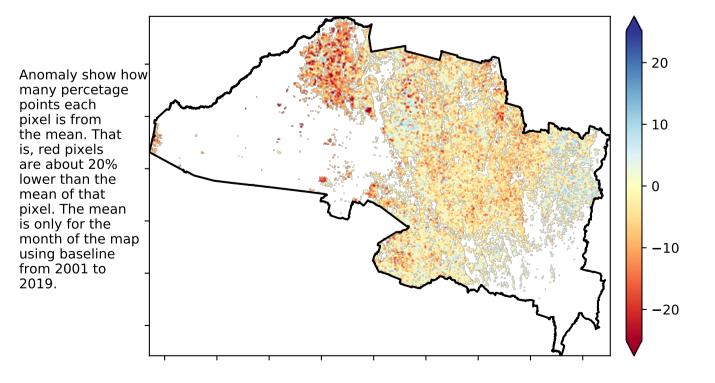
### **Total Vegetation Cover [%]**



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

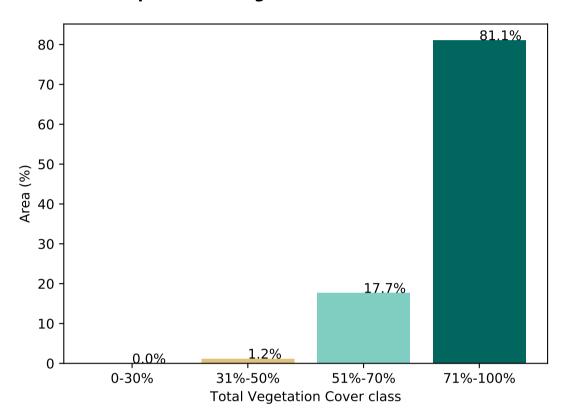


### Total Vegetation Cover Anomaly [%]

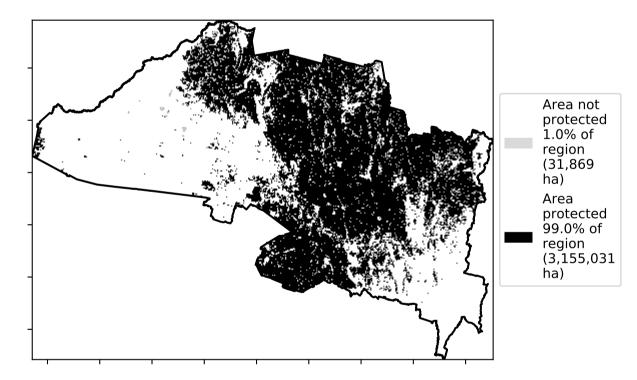


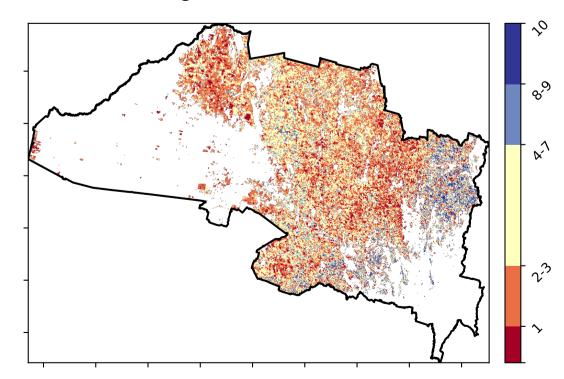
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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









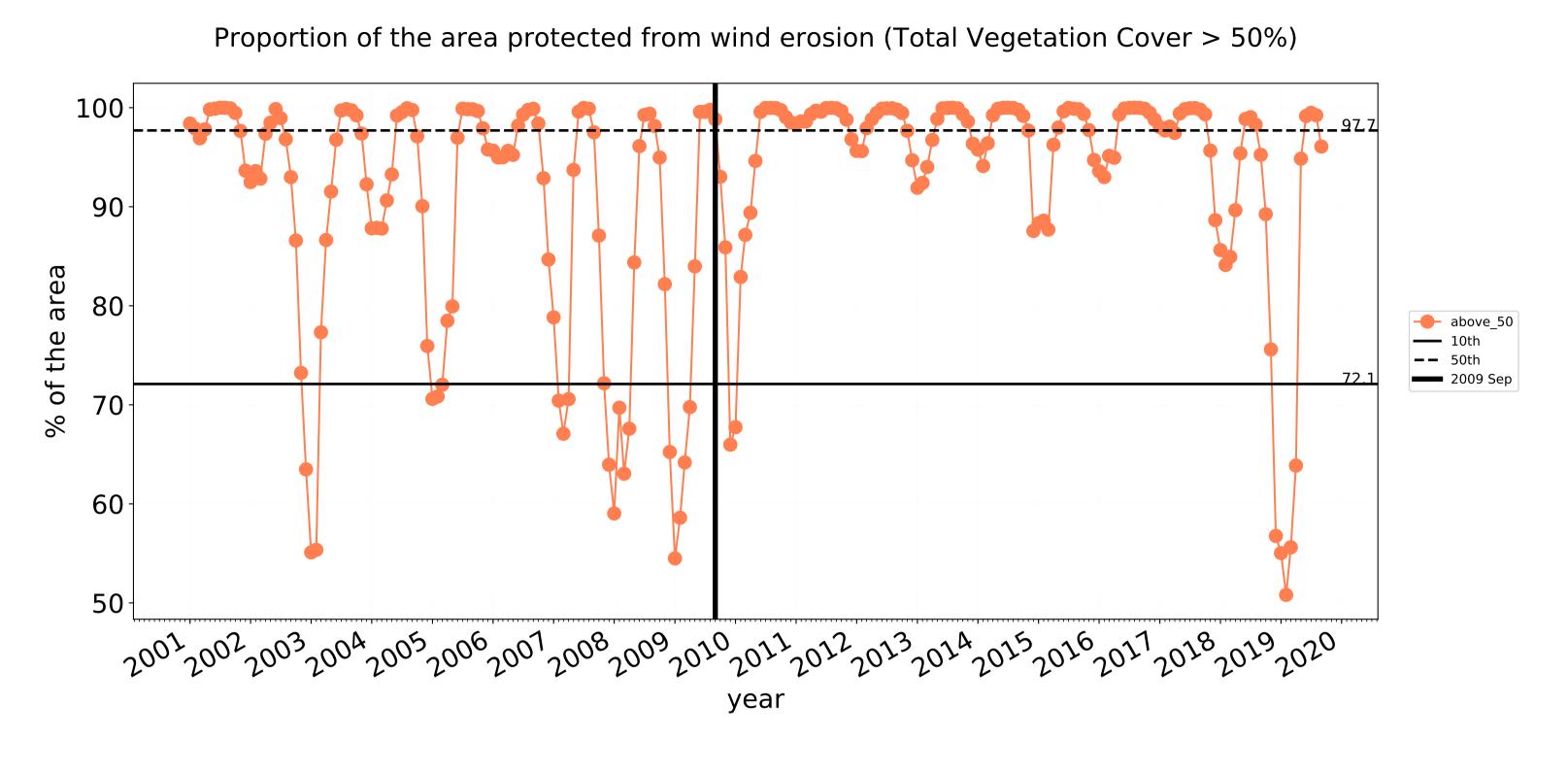


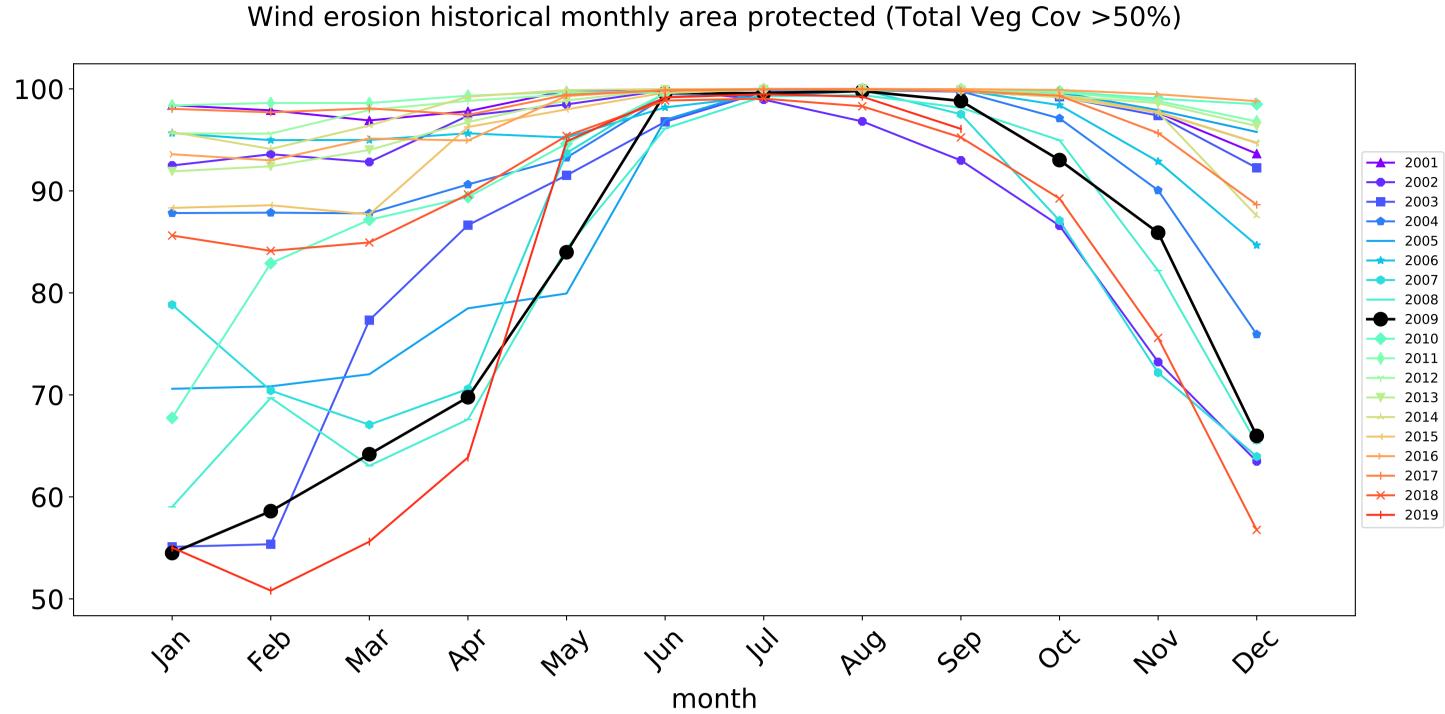


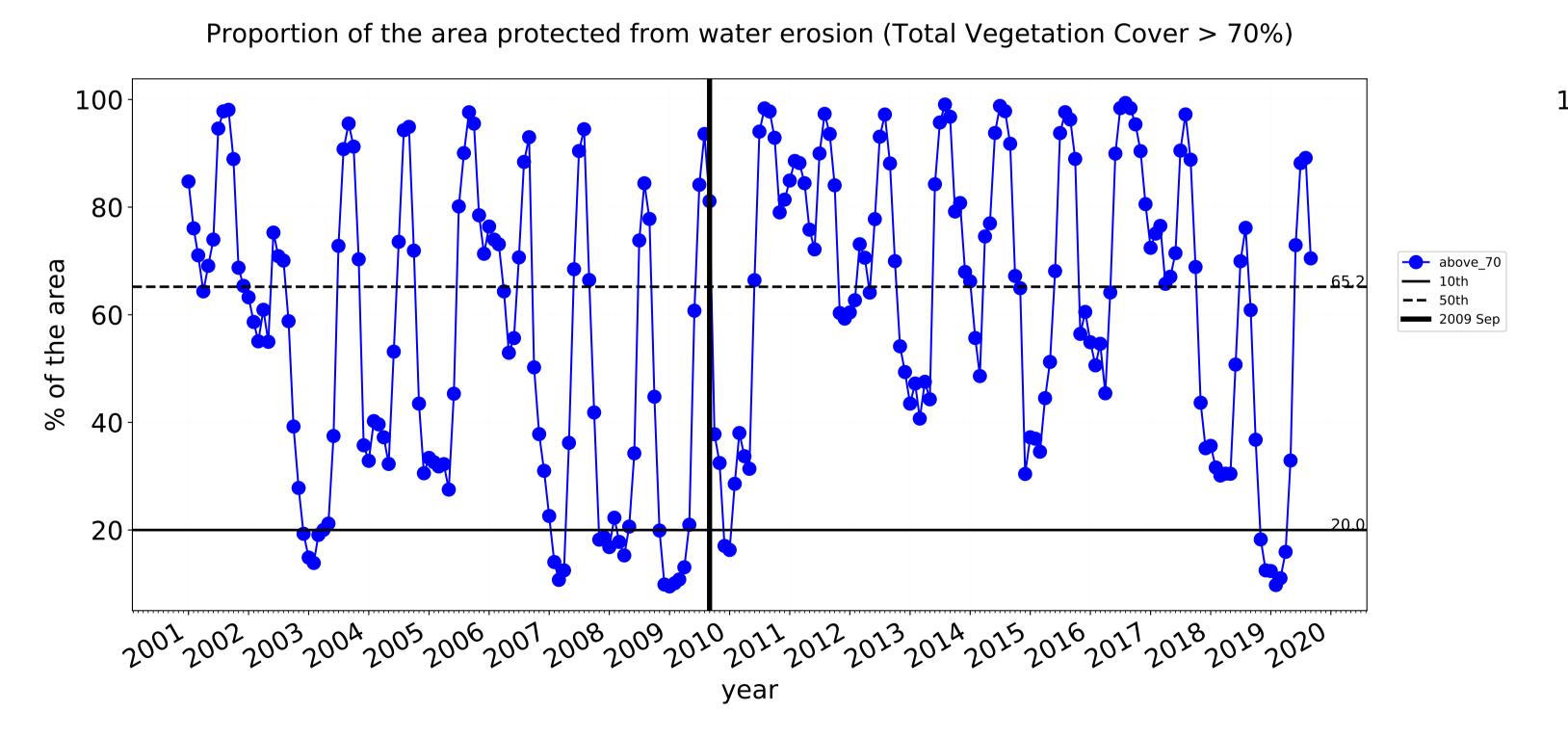


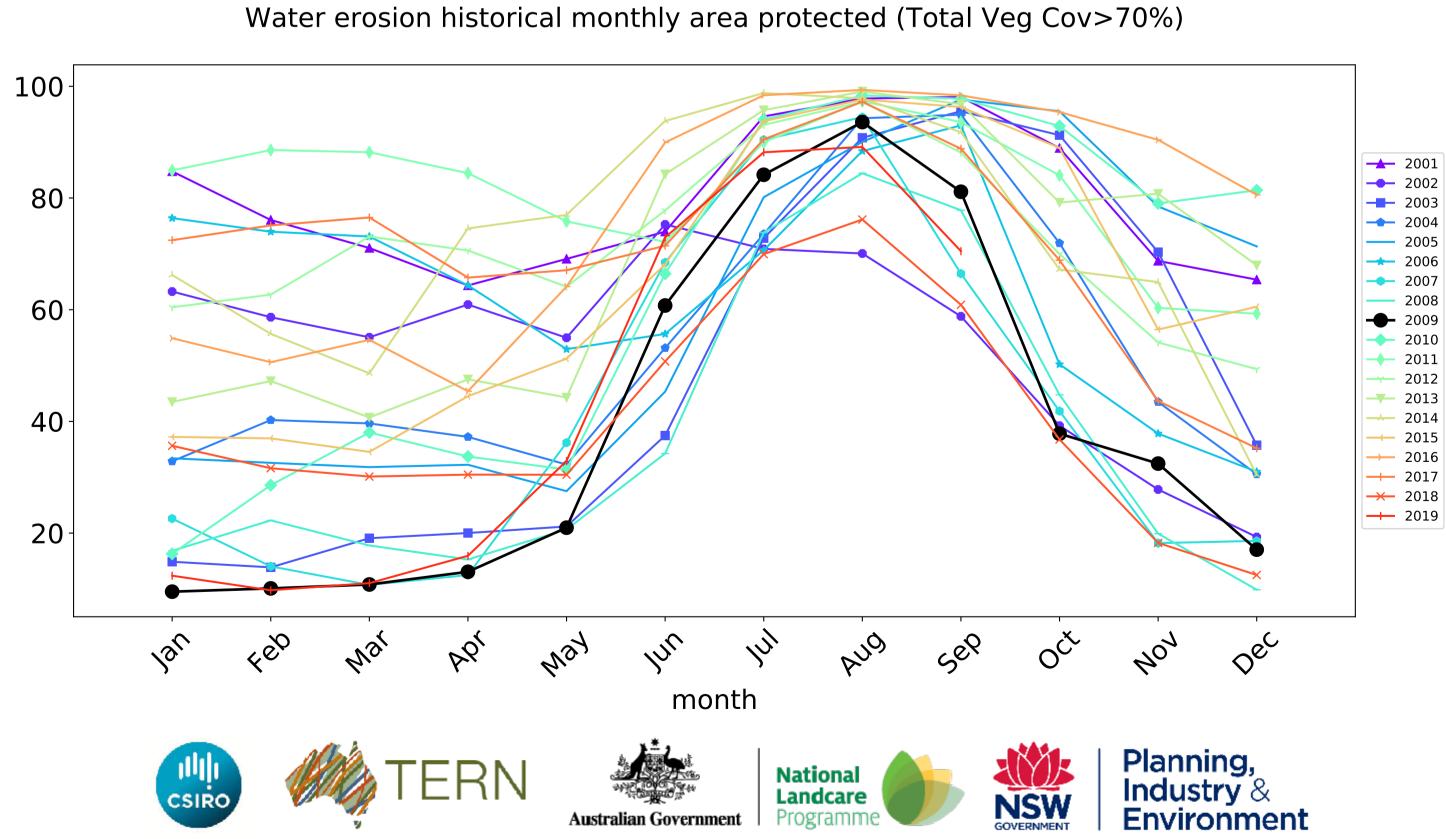


# **Cropping timeseries**

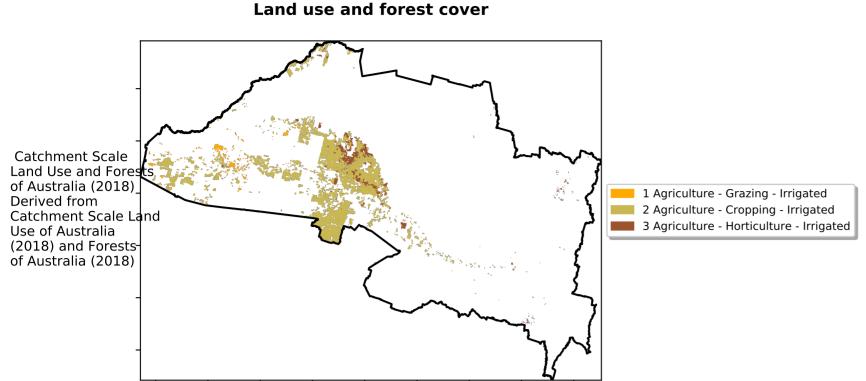


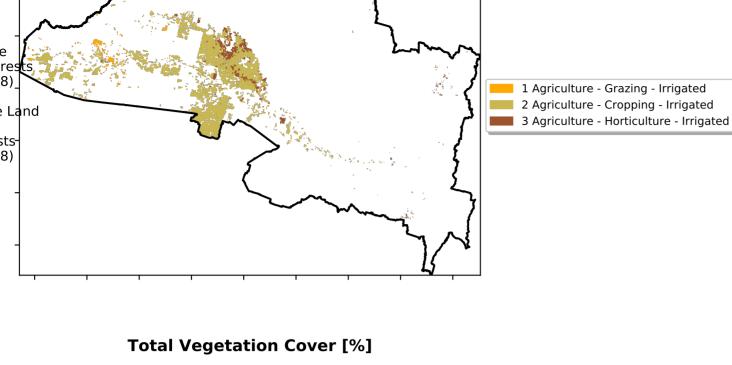


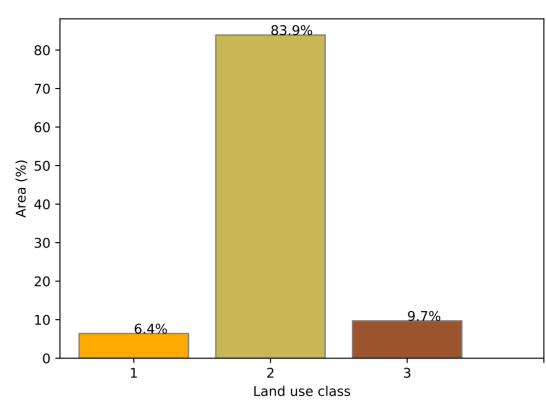




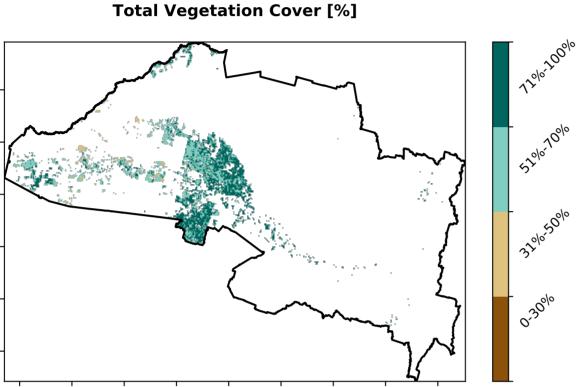
# Irrigation

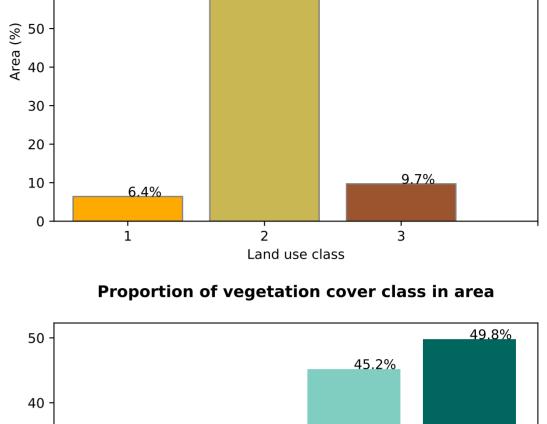


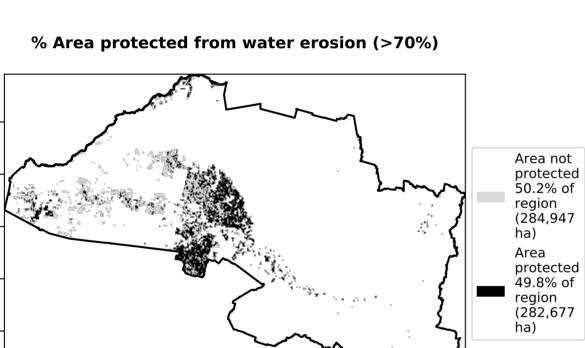


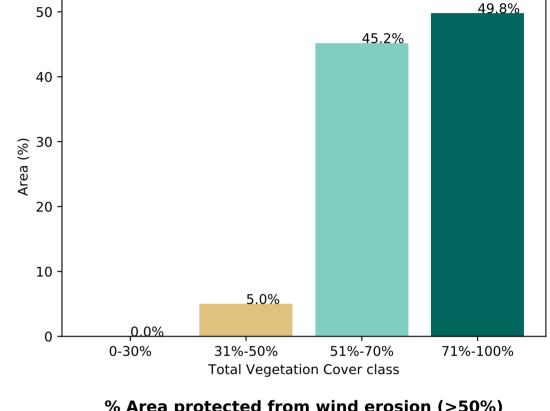


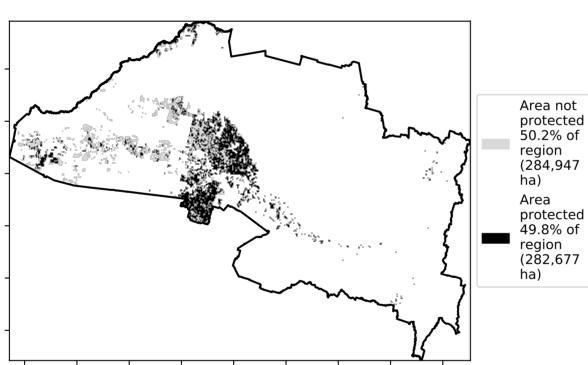
**Proportion of each land class in area** 

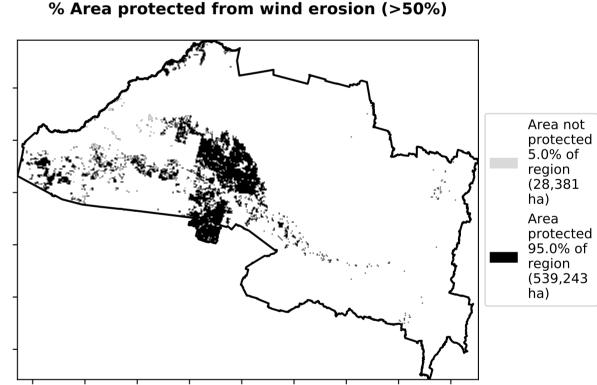


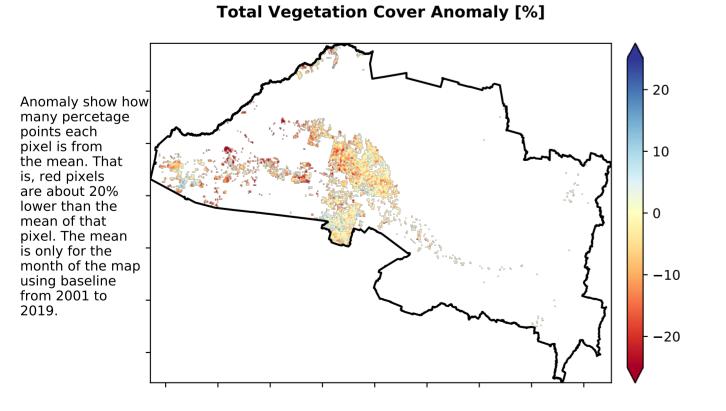


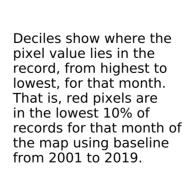


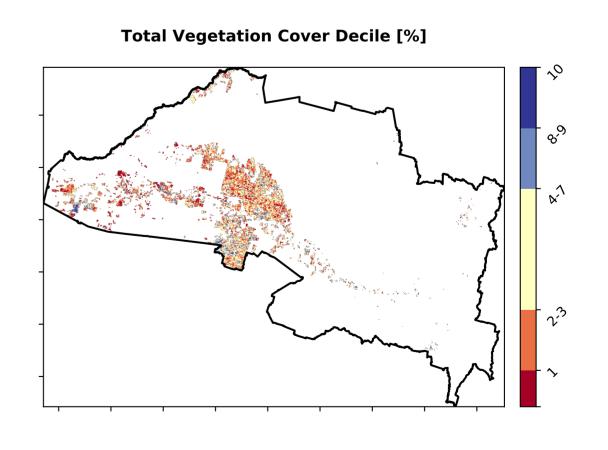












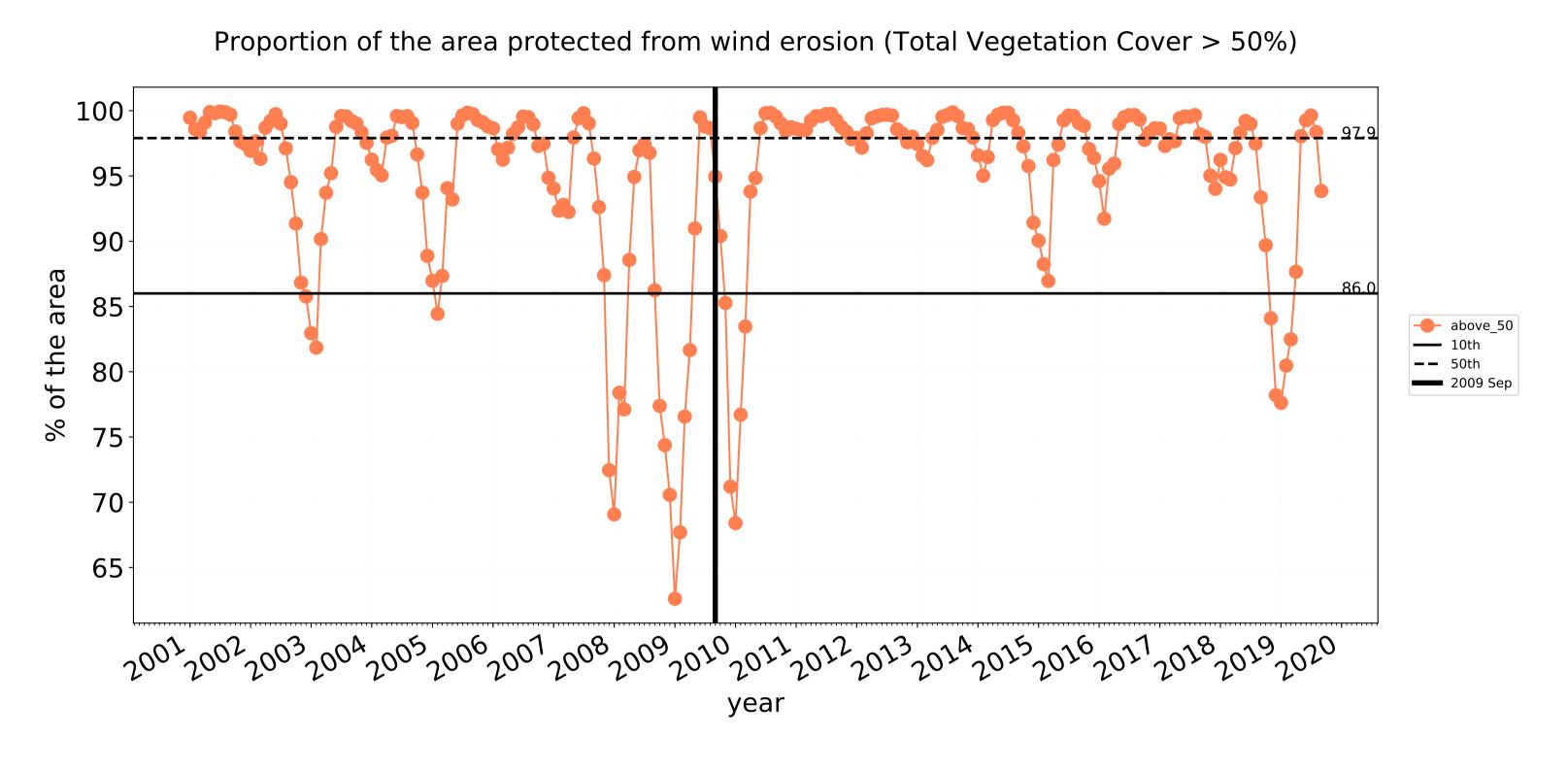


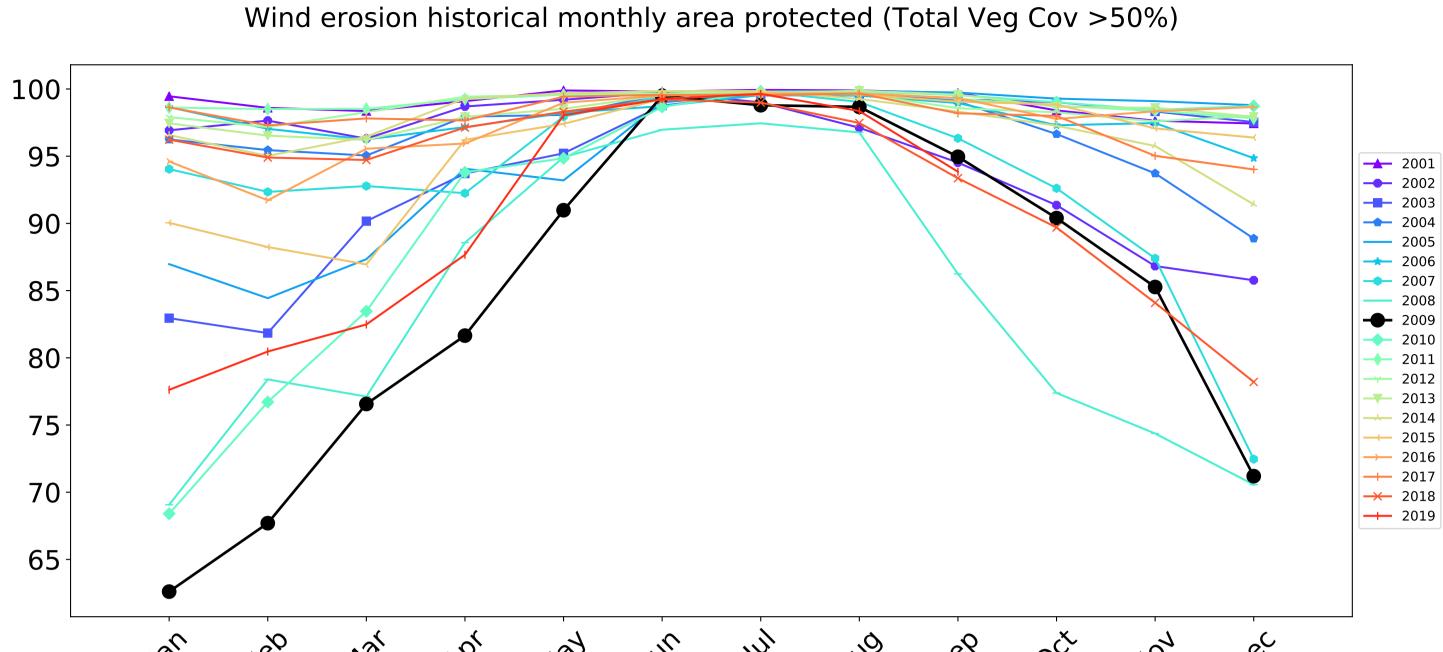




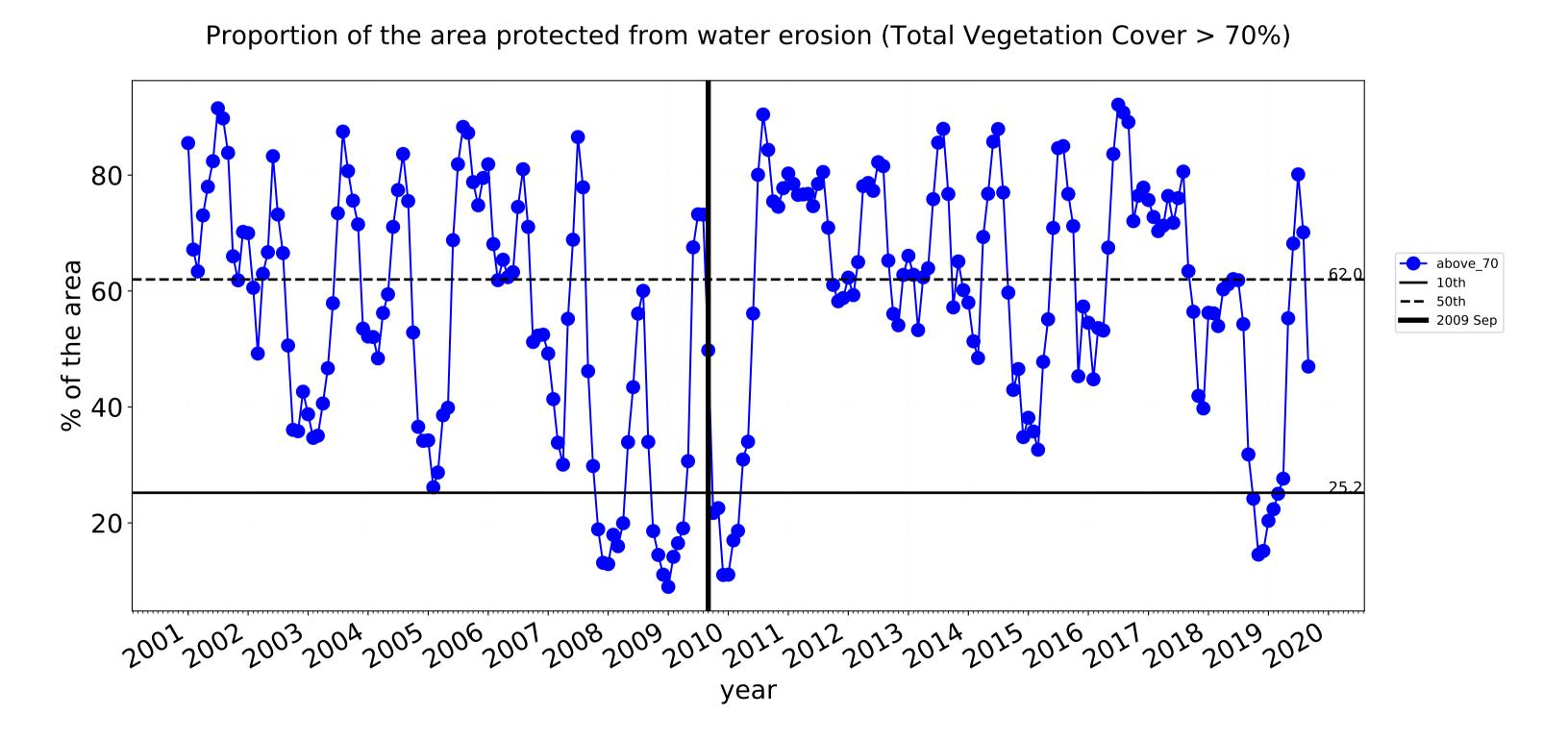


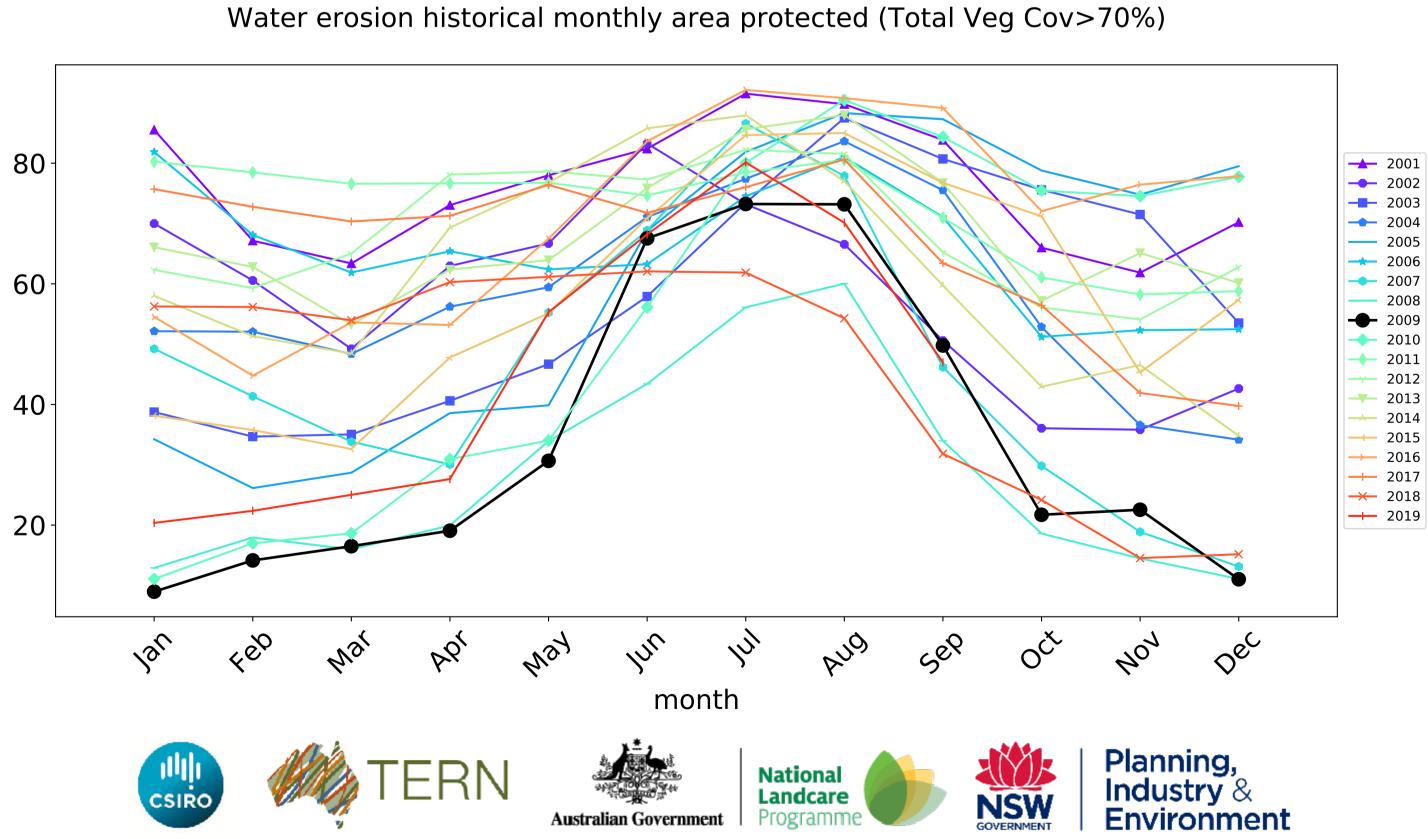






month



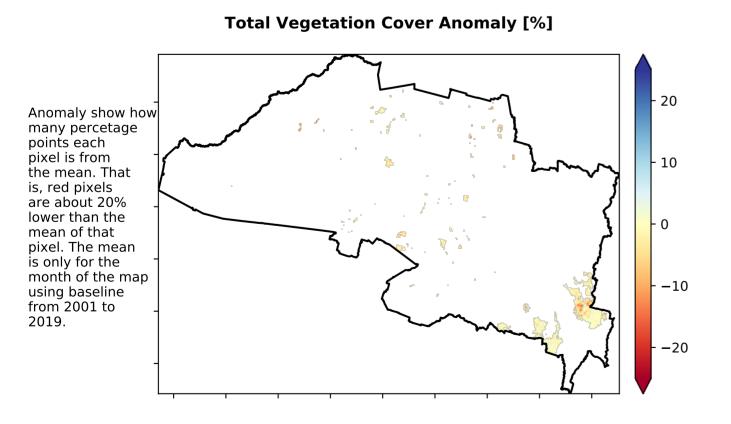


# **Production native forests and plantation forests**

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

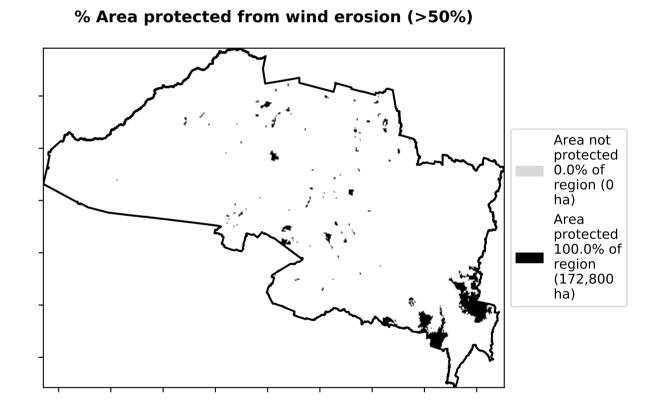
# Total Vegetation Cover [%]

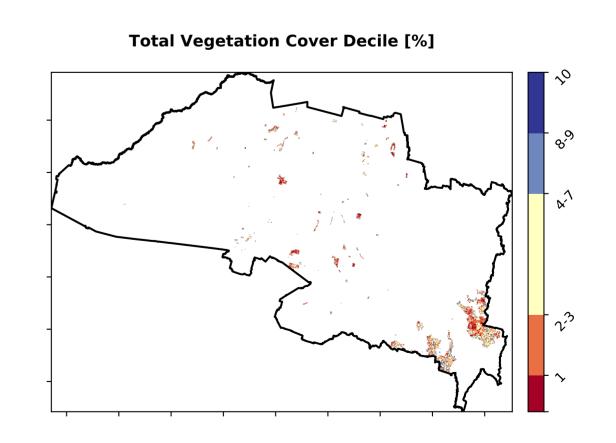
# Area not protected 2.1% of region (3,628 ha) Area protected 97.9% of region (169,171 ha)



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

# Proportion of vegetation cover class in area 100 - 97.9% 80 - 60 - 40 - 40 - 20 - 0.0% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class









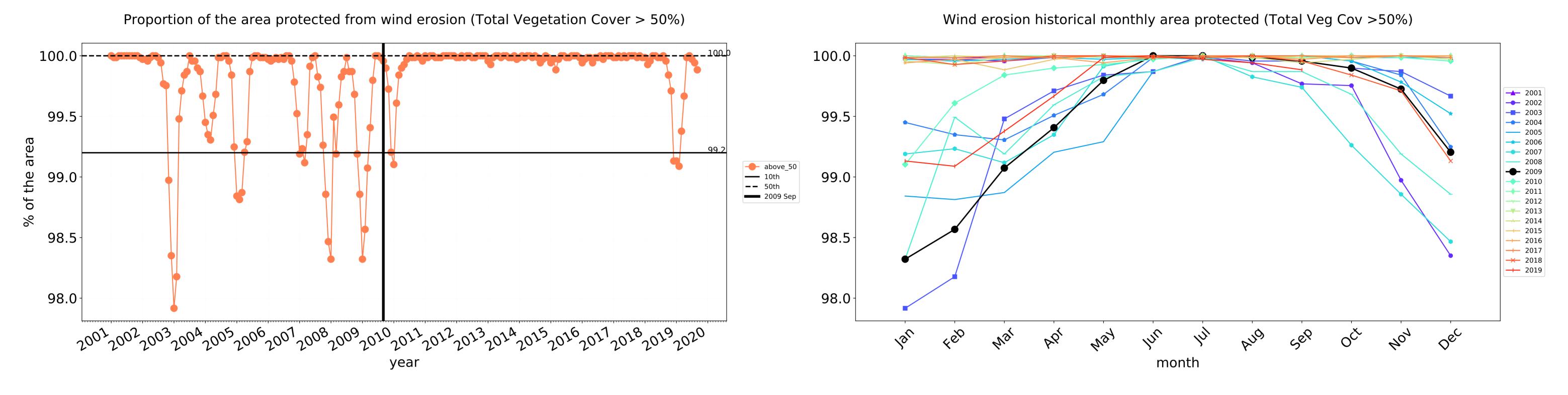


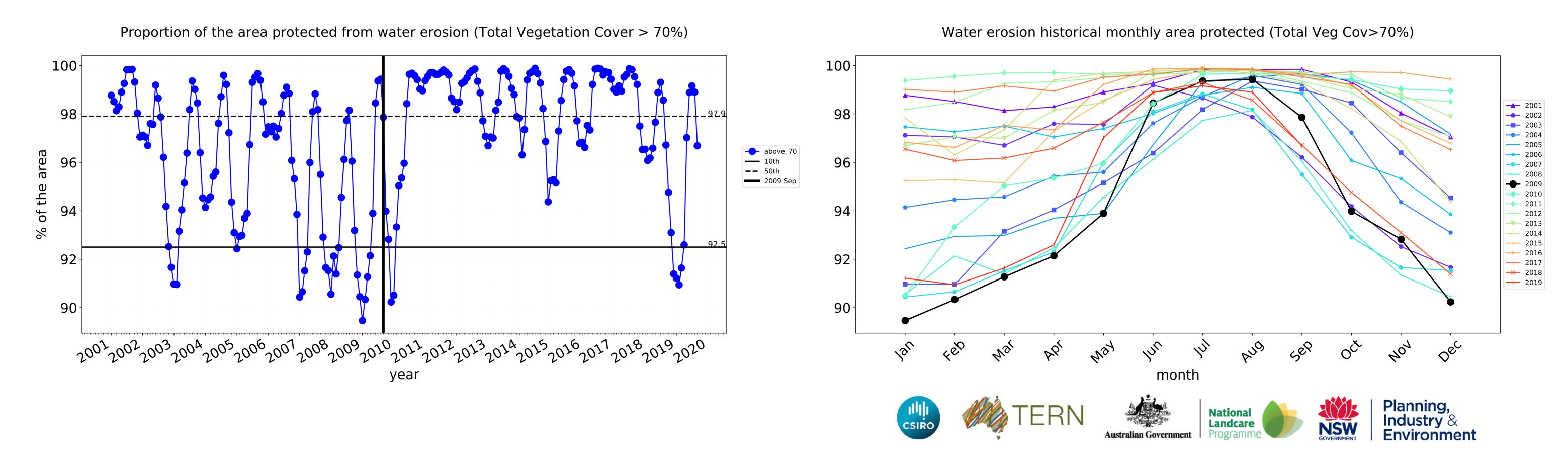






# **Production native forests and plantation forests timeseries**





# Riverina (6,694,325 ha and no data 14,010 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	6,694,325	99.8% 6,682,199	91.2% 6,104,384	66.6% 4,456,416	39.5% 2,647,444	12.6% 842,747	4.8% 323,383
Conservation and natural environments	323,075	99.8% 322,475	93.7% 302,700	82.9% 267,800	76.8% 248,250	53.6% 173,250	28.7% 92,650
Conservation and natural environments non forest	83,350	99.3% 82,750	75.6% 63,000	35.0% 29,200	19.8% 16,500	9.8% 8,200	4.4% 3,650
Conservation and natural environments Forest (non woodland)	195,225	100.0% 195,225	100.0% 195,225	99.8% 194,850	98.9% 193,000	78.2% 152,650	44.2% 86,350
Agriculture	6,067,875	99.8% 6,057,300	90.9% 5,516,600	65.1% 3,948,600	36.4% 2,208,325	9.3% 566,750	3.0% 184,500
Grazing	2,311,525	99.6% 2,301,400	79.0% 1,826,525	46.7% 1,079,750	33.5% 774,525	12.1% 279,625	4.0% 91,875
Grazing non forest	2,066,525	99.5% 2,056,400	76.5% 1,581,550	41.1% 848,575	29.2% 602,900	11.1% 228,825	4.1% 84,600
Grazing Woodland forest	141,650	100.0% 141,650	100.0% 141,625	92.0% 130,300	58.7% 83,150	9.8% 13,875	0.8% 1,100
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,350	97.6% 100,875	85.6% 88,475	35.7% 36,925	6.0% 6,175
Cropping	3,186,900	100.0% 3,186,575	98.8% 3,149,250	81.1% 2,585,150	42.7% 1,361,700	8.9% 283,350	2.9% 92,150
Irrigation	567,625	100.0% 567,500	95.0% 539,000	49.8% 282,575	12.7% 71,975	0.7% 3,750	0.1% 475
Production native forests and plantation forests	172,800	100.0% 172,800	100.0% 172,725	97.9% 169,100	90.4% 156,250	56.9% 98,275	26.4% 45,550











