### Total vegetation cover soil protection Region:LGA Serpentine-Jarrahdale\_(S) WA

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:

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













**Date: December 2019** 

### **Vegetation Cover Dec 2019**

### **Land use and forest cover**

Catchment Scale

of Australia (2018)

(2018) and Forests

of Australia (2018)

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20%

lower than the

month of the map

using baseline from 2001 to

2019.

mean of that pixel. The mean is only for the

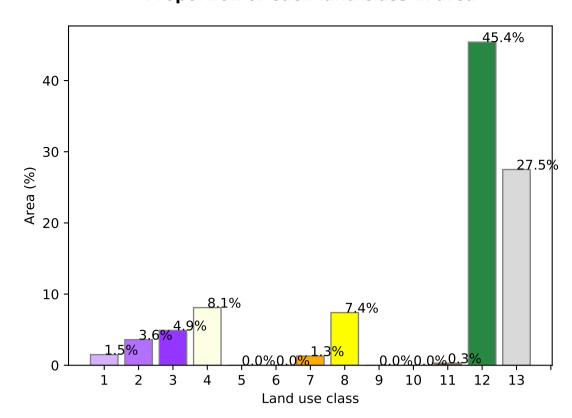
the mean. That

Derived from

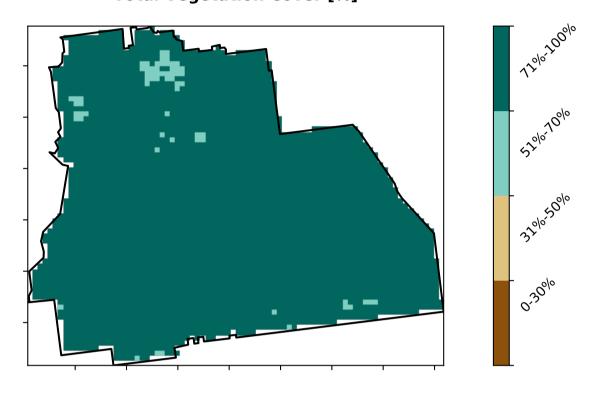
Use of Australia

### Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments -Land Use and Forests Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - Woodland forest Catchment Scale Land 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation 13 Other uses

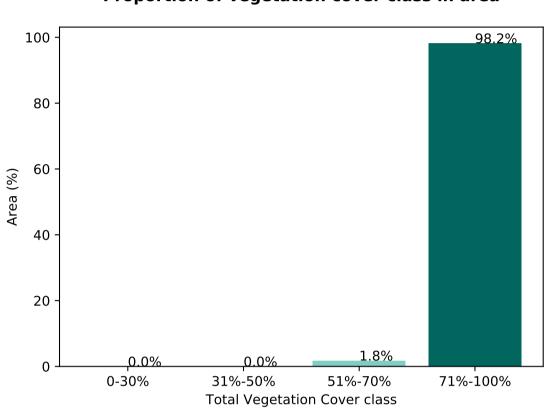
### **Proportion of each land class in area**



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



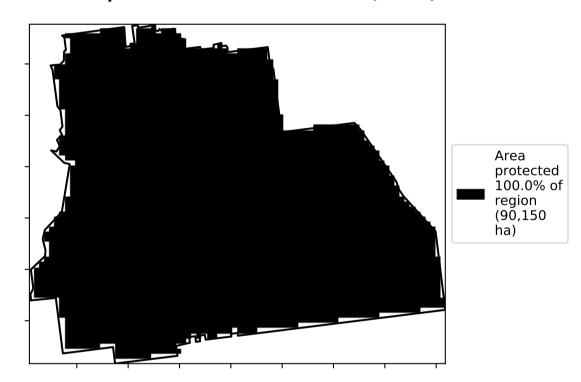
**Proportion of vegetation cover class in area** 



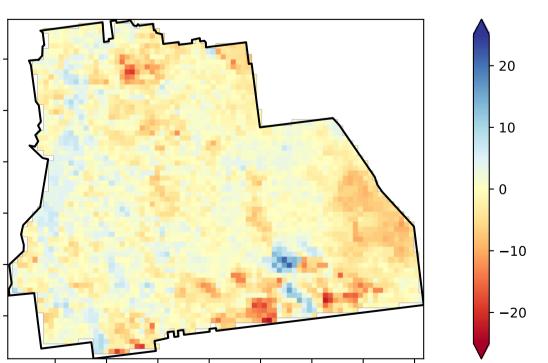
### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

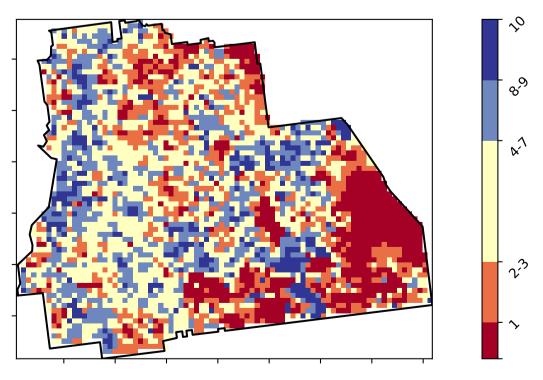


### **Total Vegetation Cover Anomaly [%]**



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

**Total Vegetation Cover Decile [%]** 





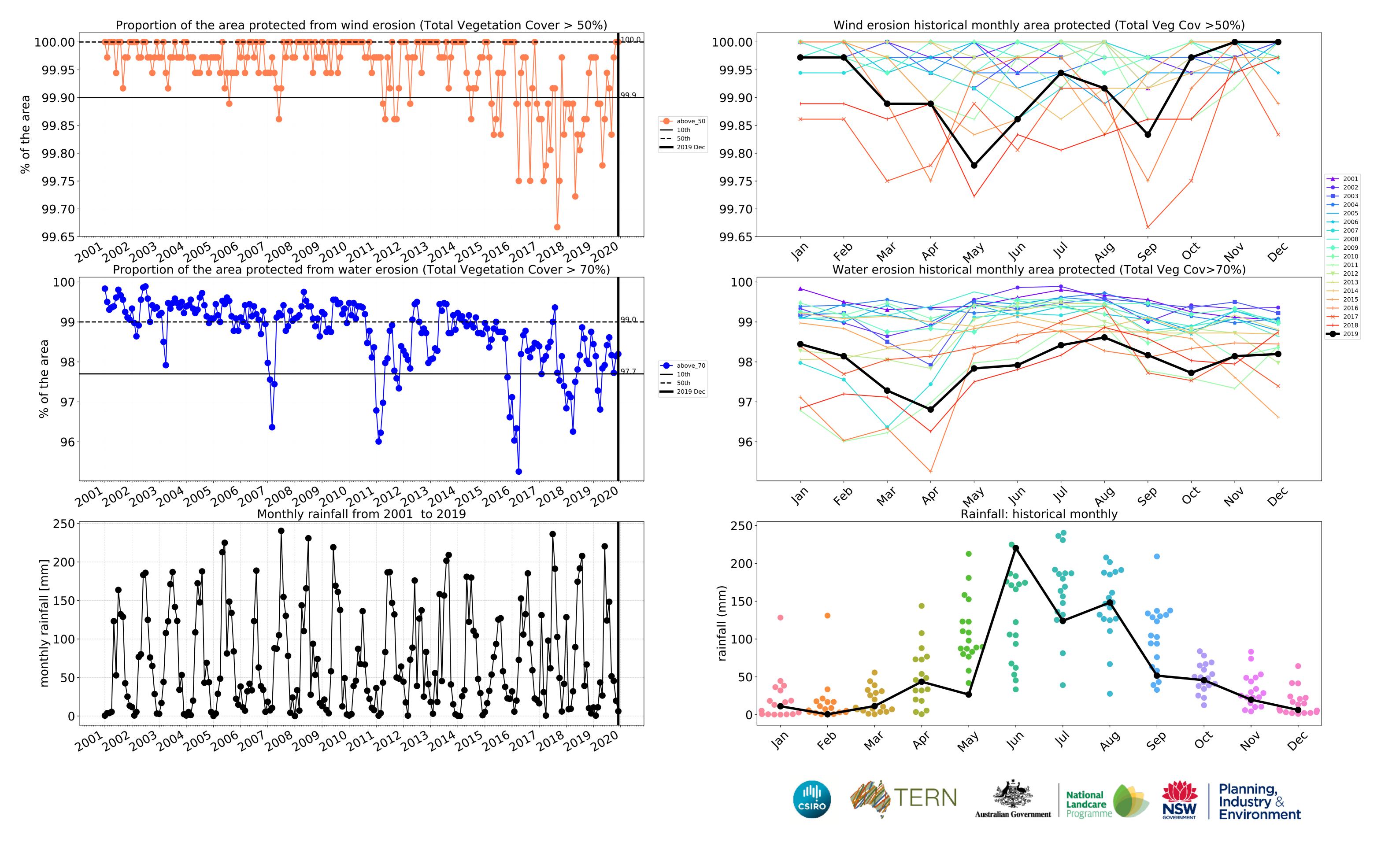


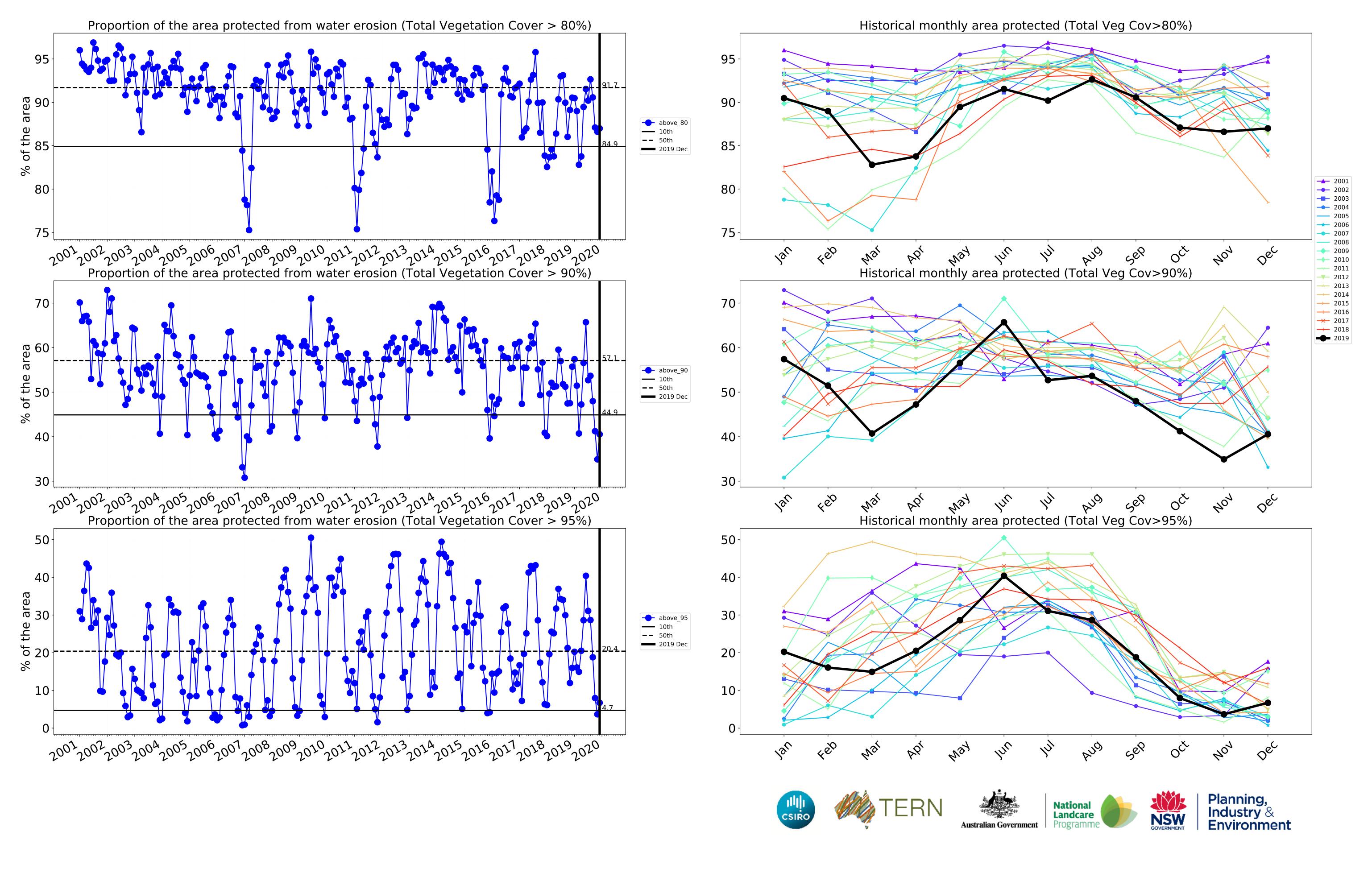












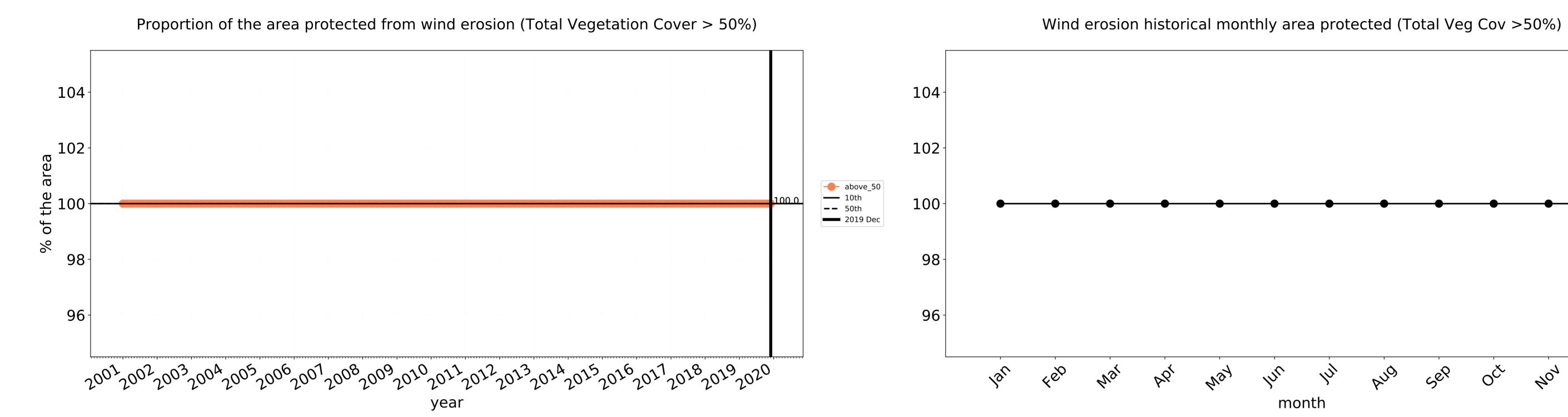
### **Conservation and natural environments**

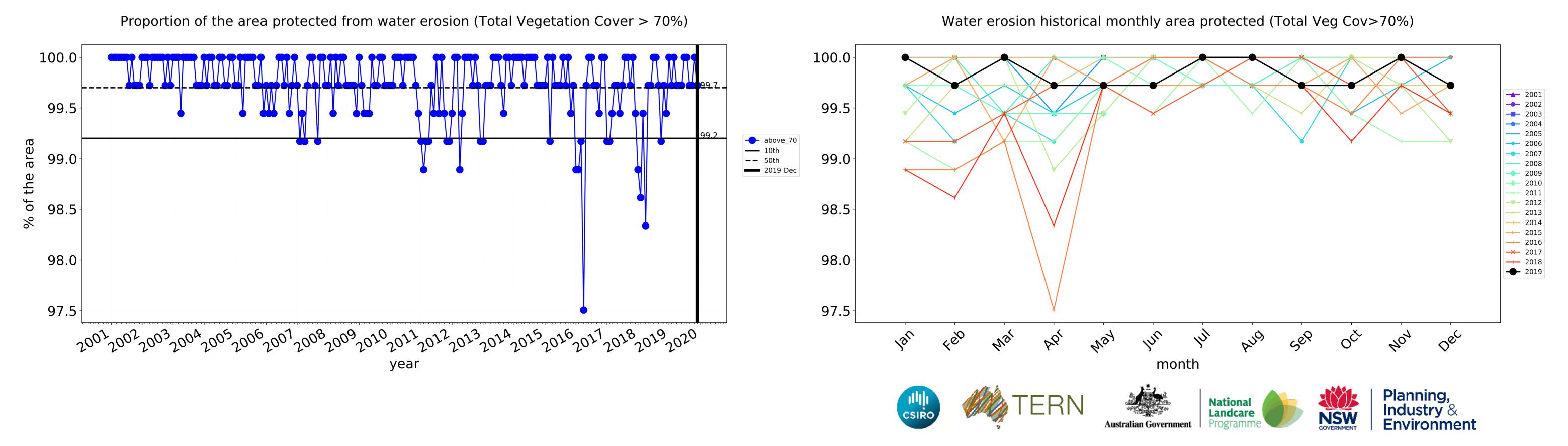
### Land use and forest cover **Proportion of each land class in area** 50 49.0% 40 -36.3% Catchment Scale Land Use and Forests of Australia (2018) ${\bf 1}$ Conservation and natural environments - Nonforest Area (%) Derived from 2 Conservation and natural environments – Woodland Catchment Scale Land Use of Australia 3 Conservation and natural environments - Non-(2018) and Forests 20 of Australia (2018) 14.7% 10 3 2 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 99.7% 100 80 60 · 40 -20 -0.0% 0.0% 51%-70% 0-30% 31%-50% 71%-100% **Total Vegetation Cover class** % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%) Area Area protected 99.7% of protected 100.0% of region (8,997 ha) region (9,025 ha) **Total Vegetation Cover Decile [%] Total Vegetation Cover Anomaly [%]** - 20 Anomaly show how many percetage points each pixel is from the mean. That Deciles show where the pixel value lies in the - 10 record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of is, red pixels are about 20% lower than the mean of that pixel. The mean records for that month of is only for the month of the map the map using baseline from 2001 to 2019. using baseline from 2001 to 2019. -10**-**20 Planning, Industry & Environment **National** Landcare

Australian Government

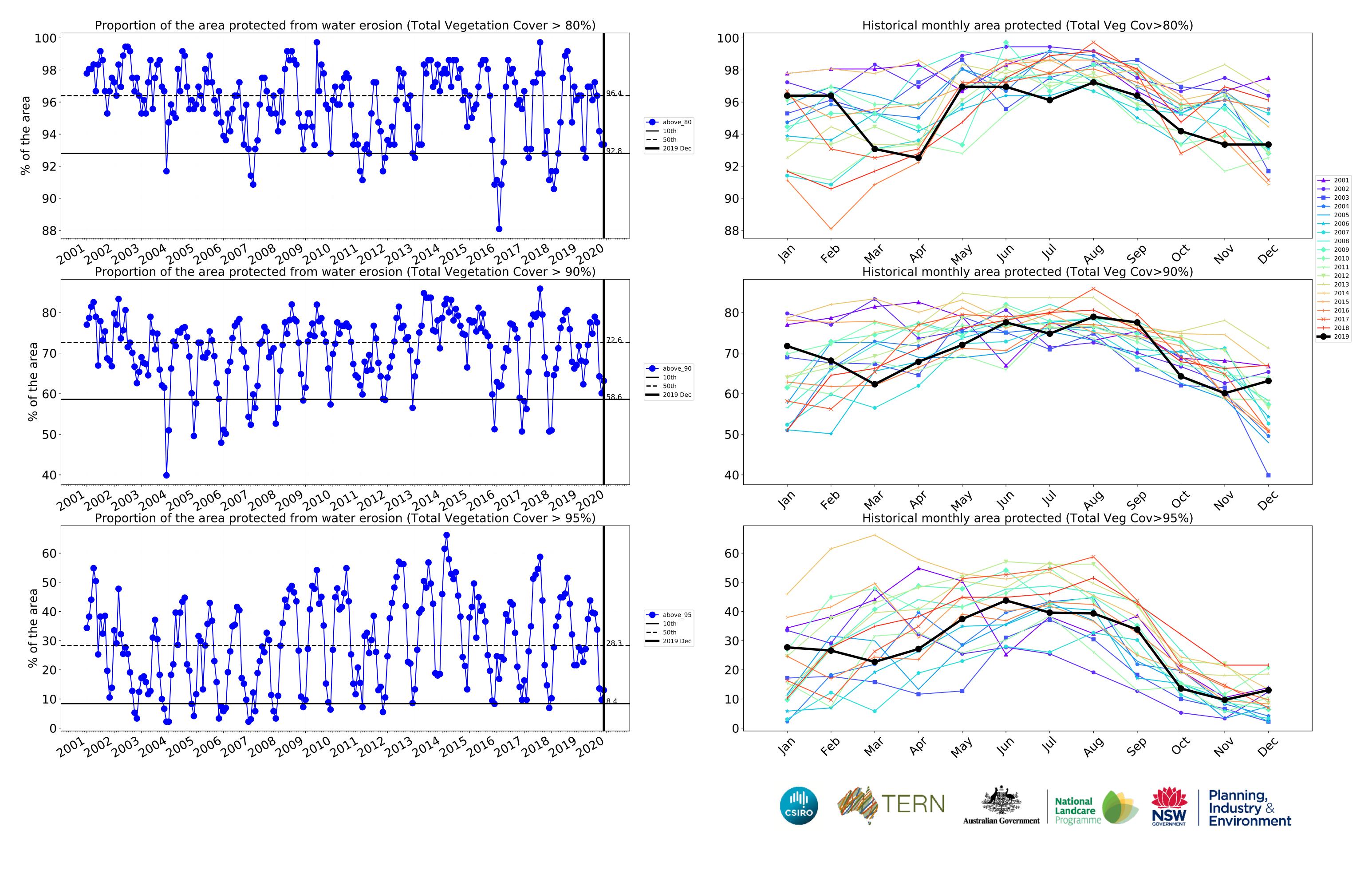
Programme

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

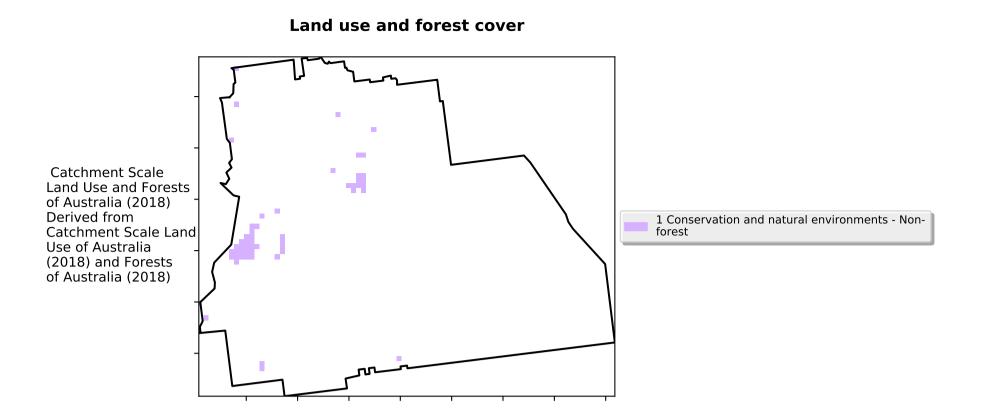




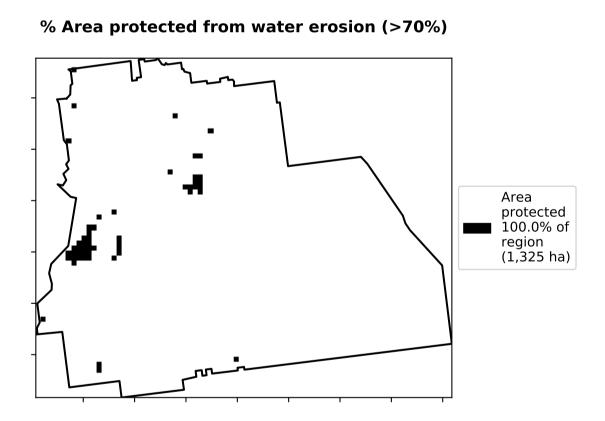
→ 2015 → 2016 → 2017 → 2018 **-••** 2019

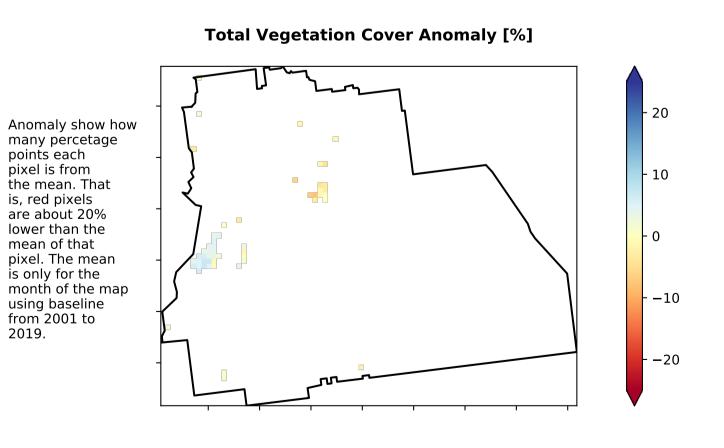


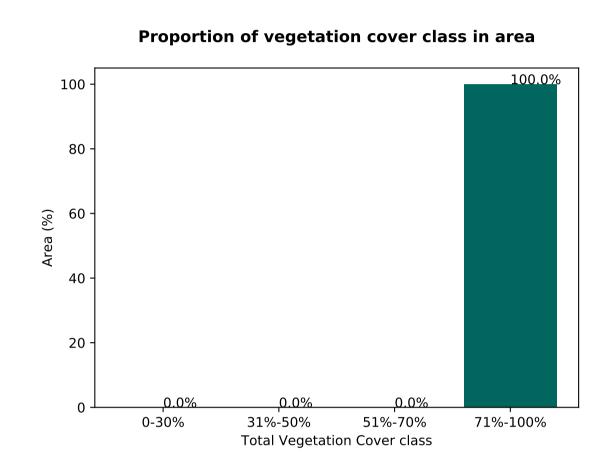
### **Conservation and natural environments non forest**

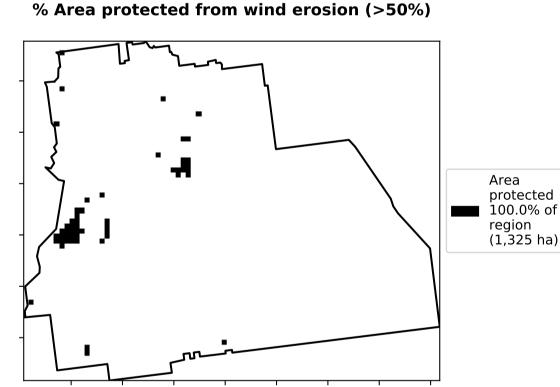


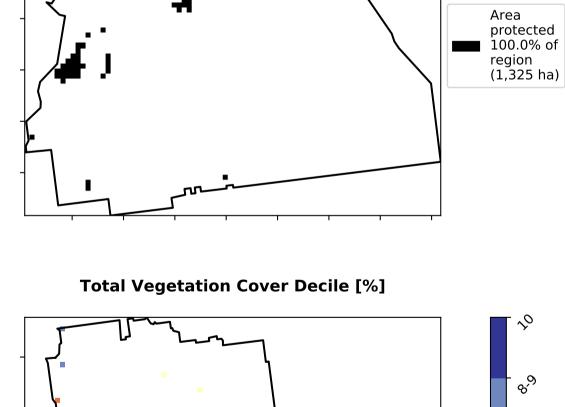
### **Total Vegetation Cover [%]**

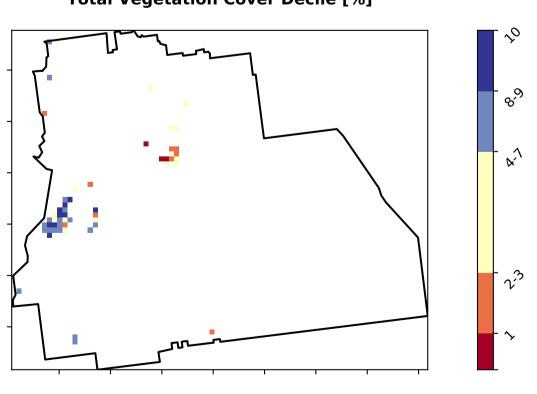


















Deciles show where the pixel value lies in the

record, from highest to

lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

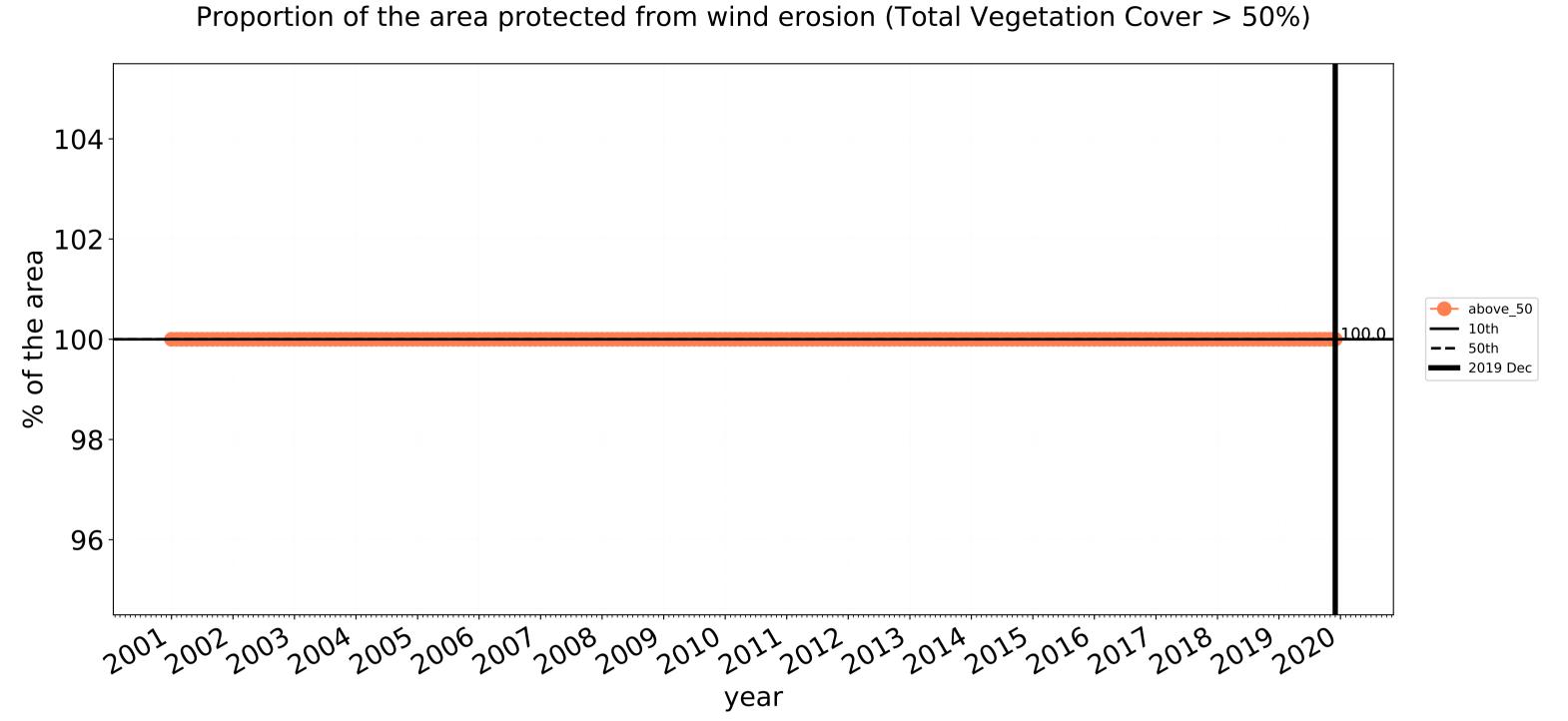
the map using baseline from 2001 to 2019.



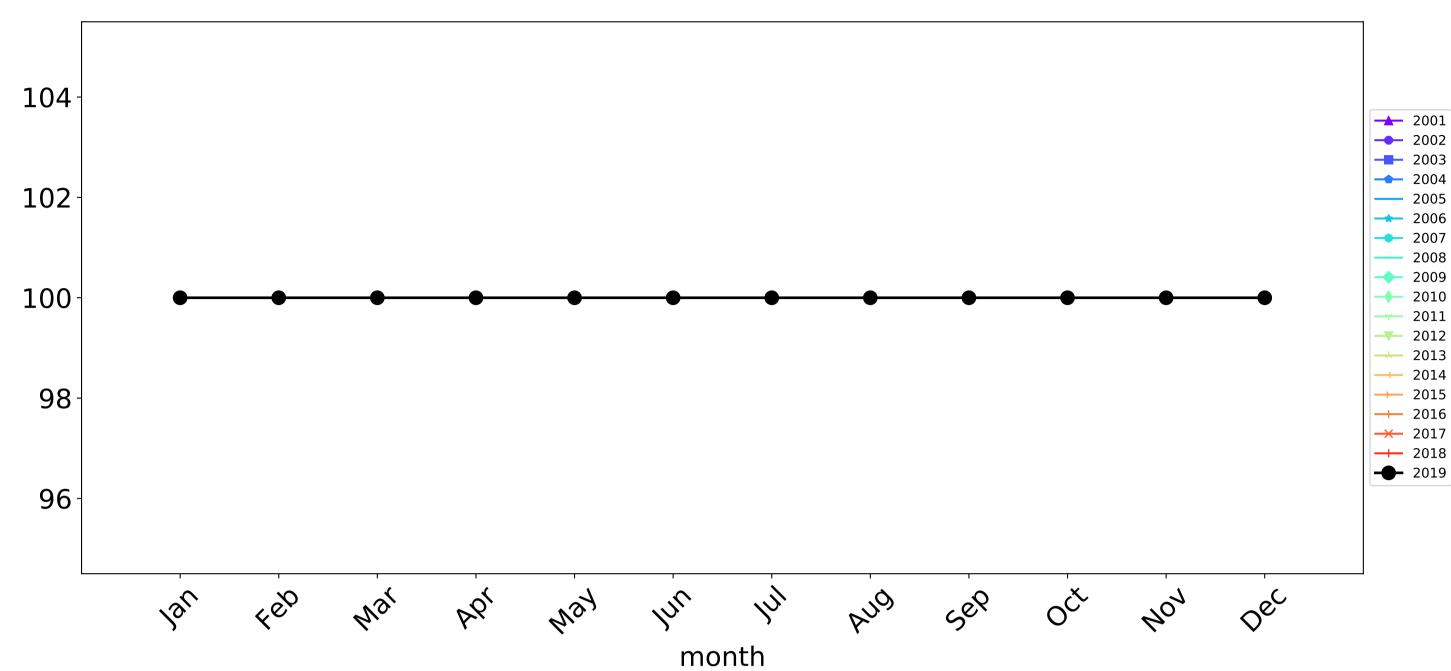


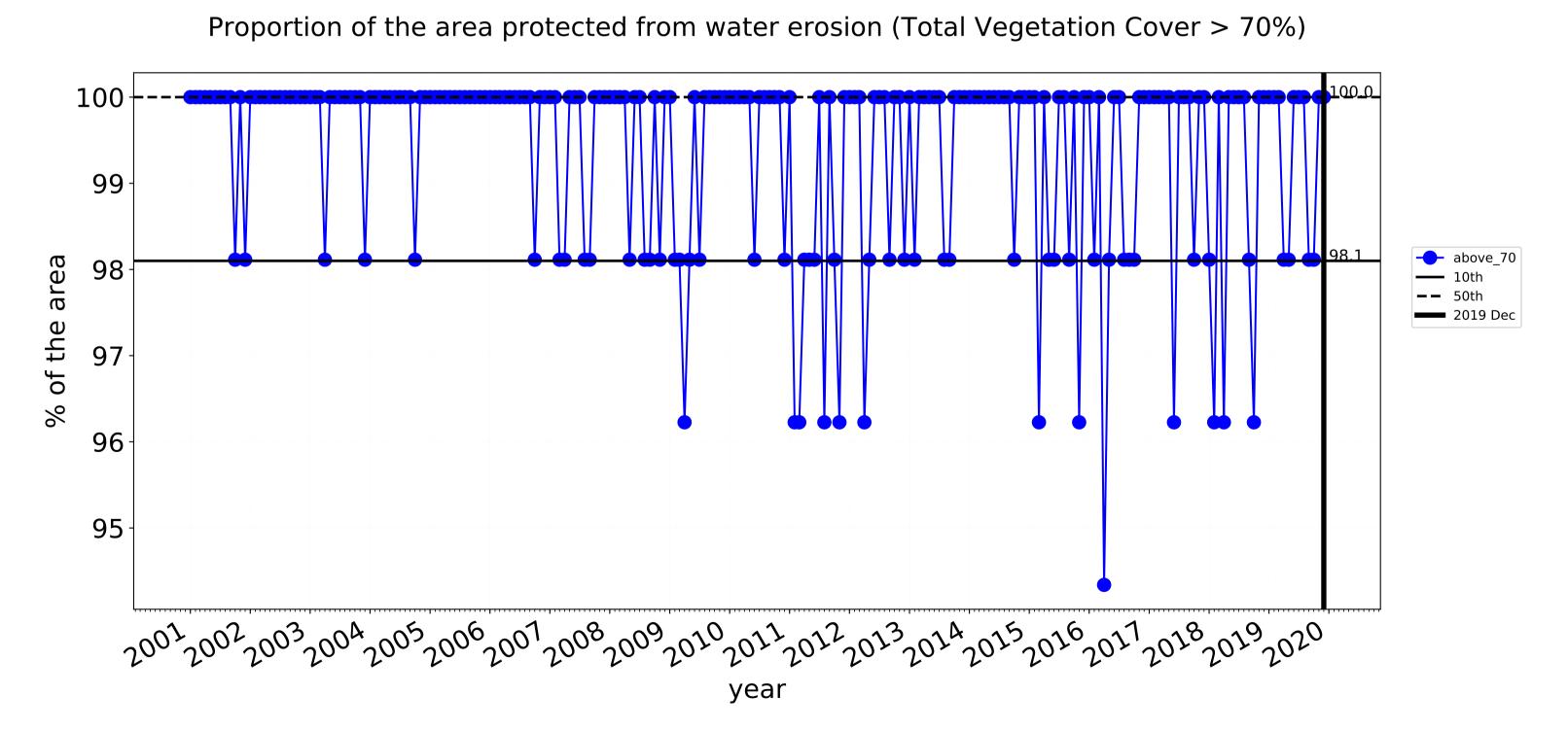


### **Conservation and natural environments non forest timeseries**

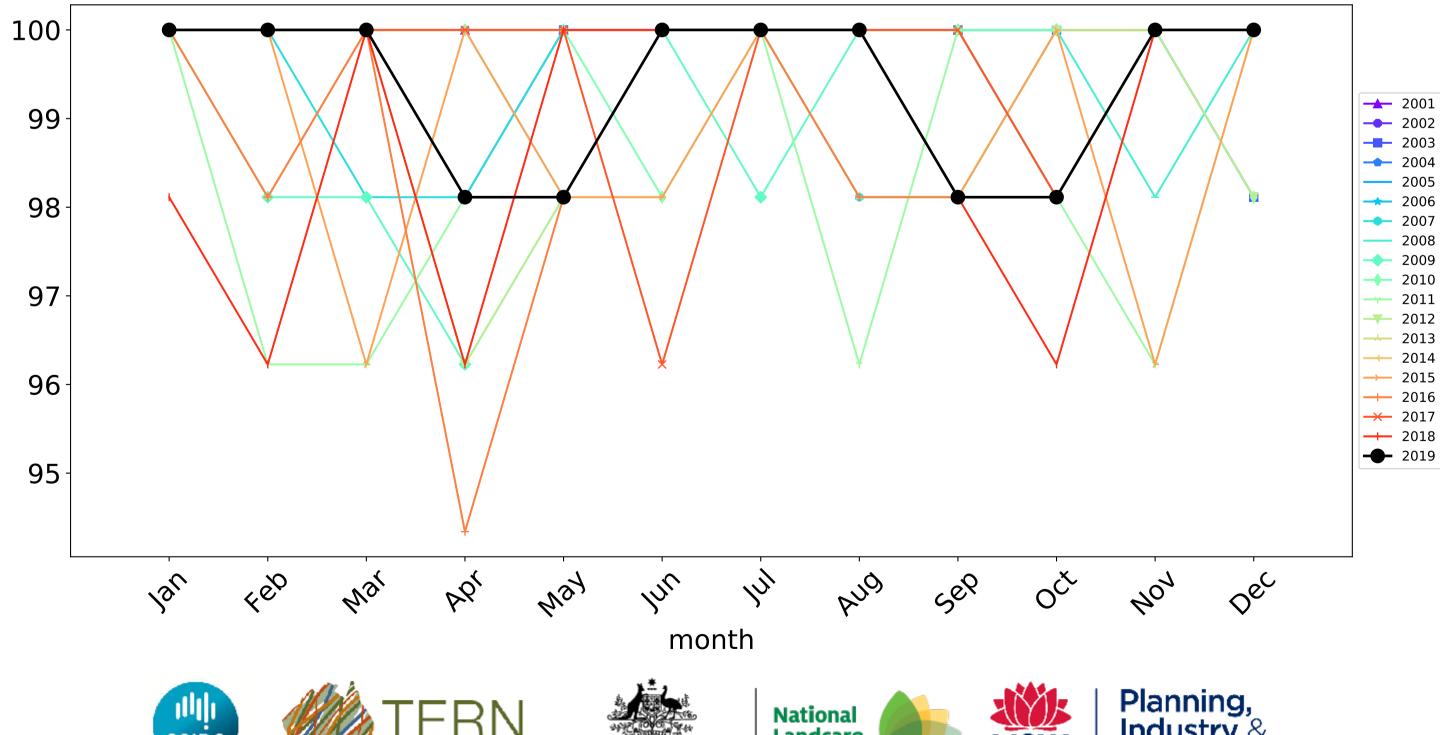








### Water erosion historical monthly area protected (Total Veg Cov>70%)

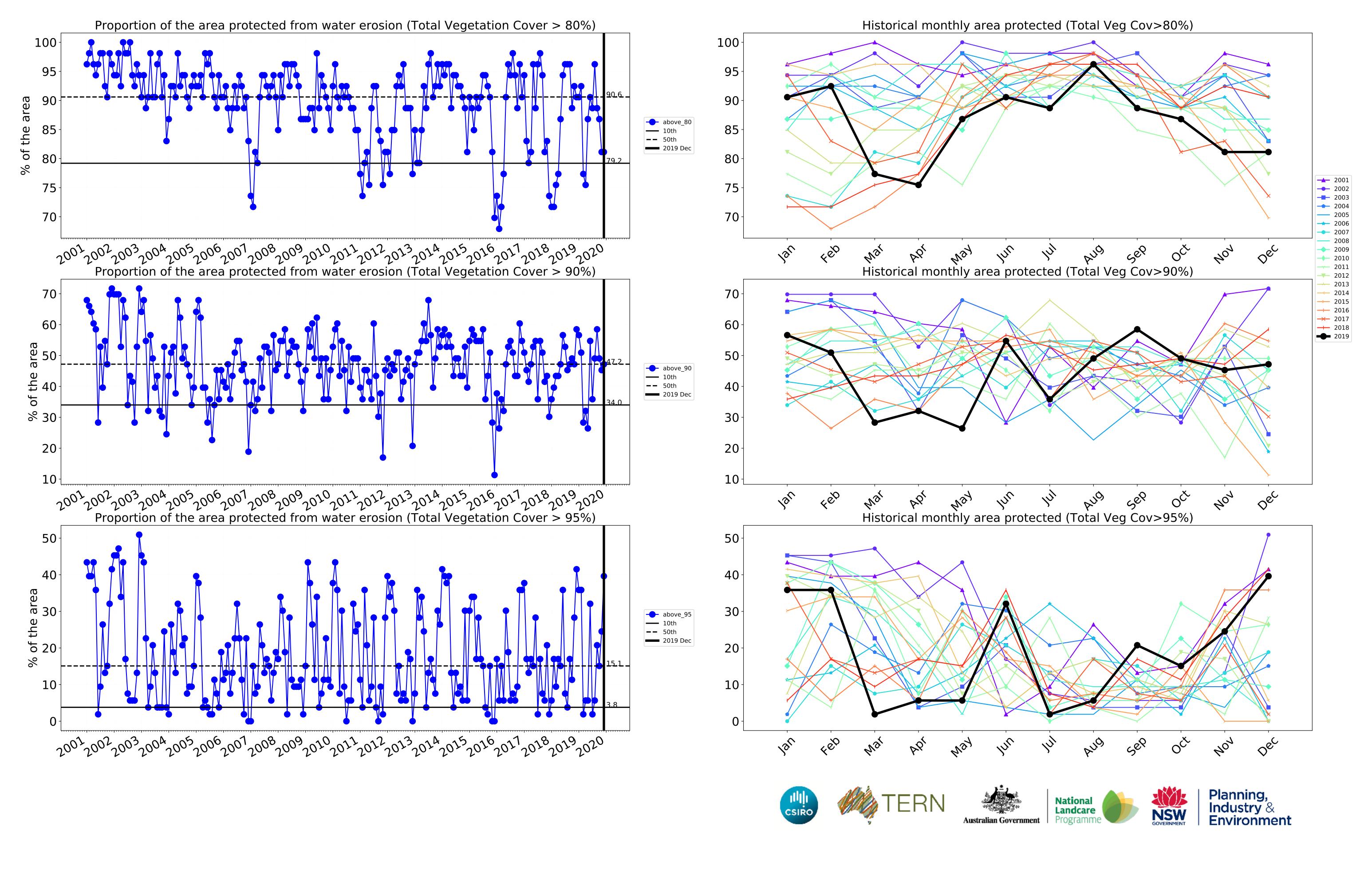










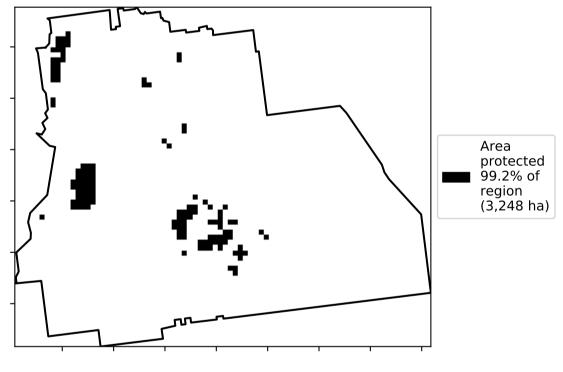


### **Conservation and natural environments Woodland forest**

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

### Total Vegetation Cover [%]

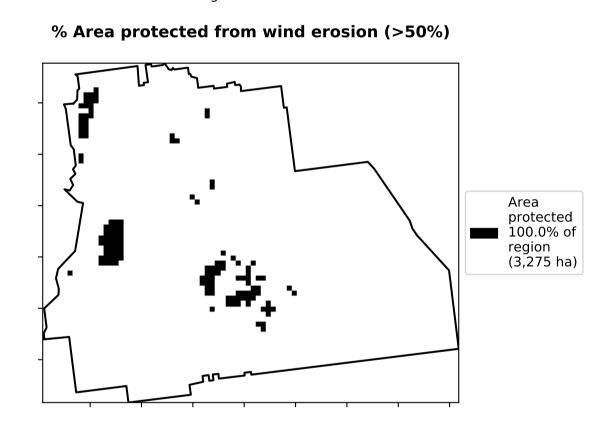
% Area protected from water erosion (>70%)

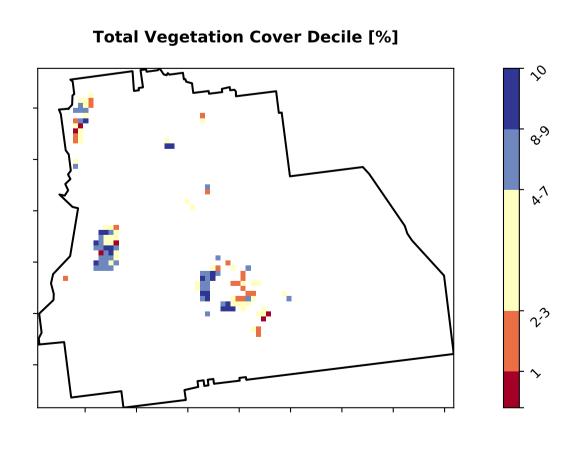


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean is only for the month of the map using baseline from 2001 to 2019.

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

# Proportion of vegetation cover class in area 100 - 99.2% 80 - 99.2% 40 - 20 - 0.0% 0.0% 0.8% Total Vegetation Cover class







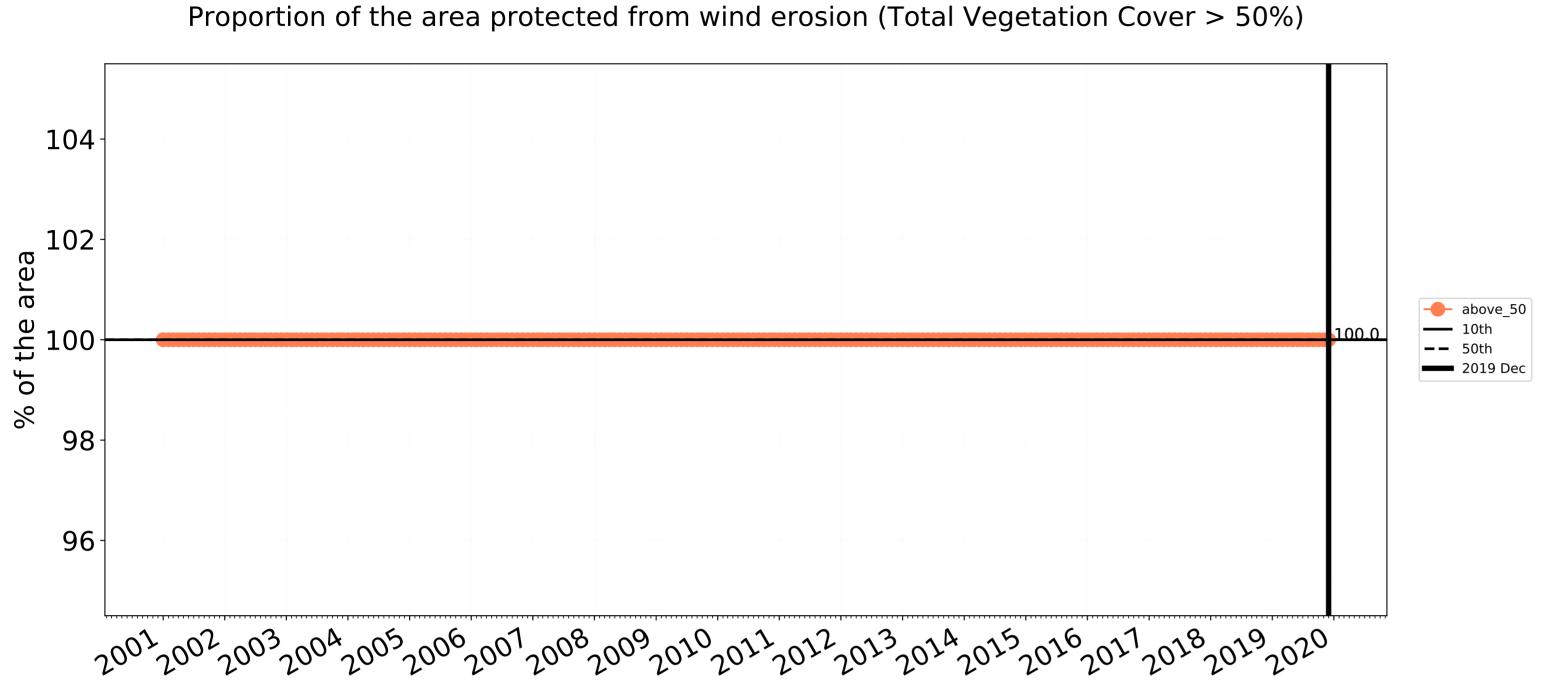




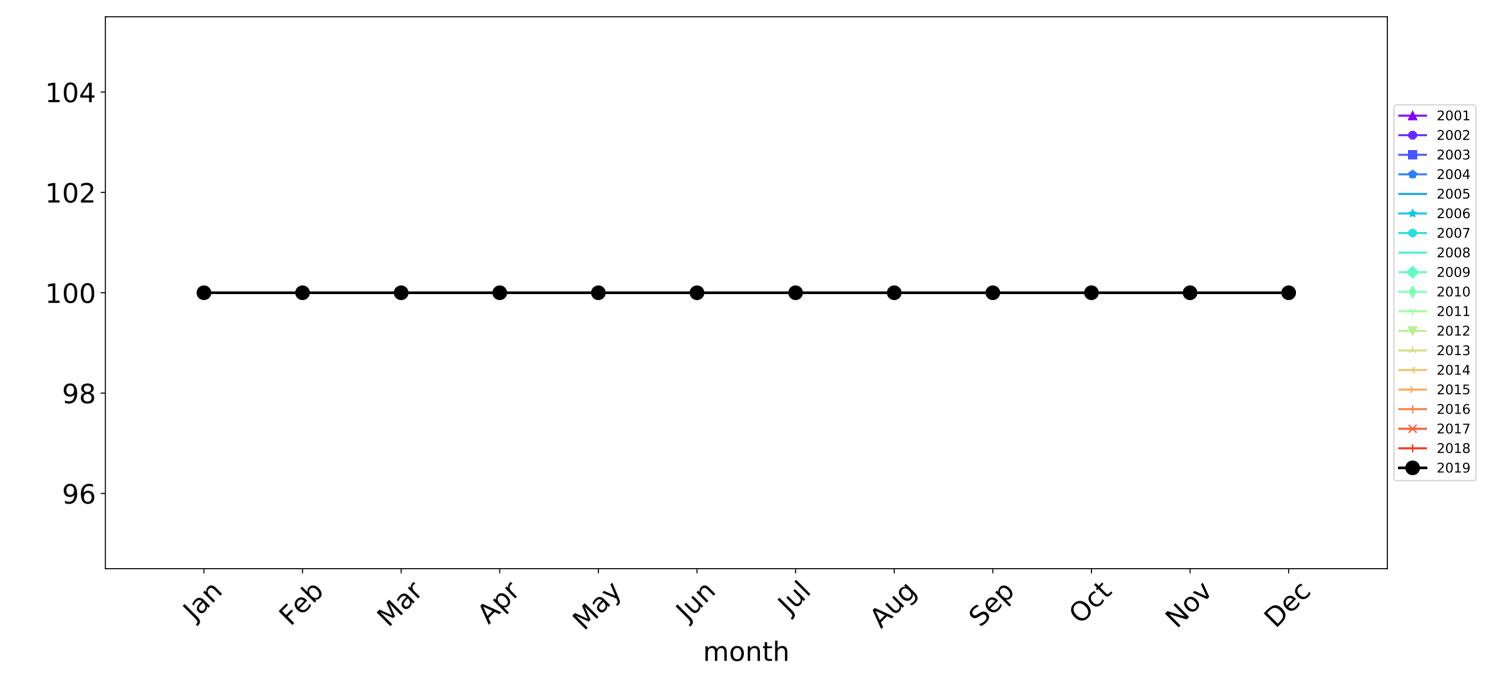


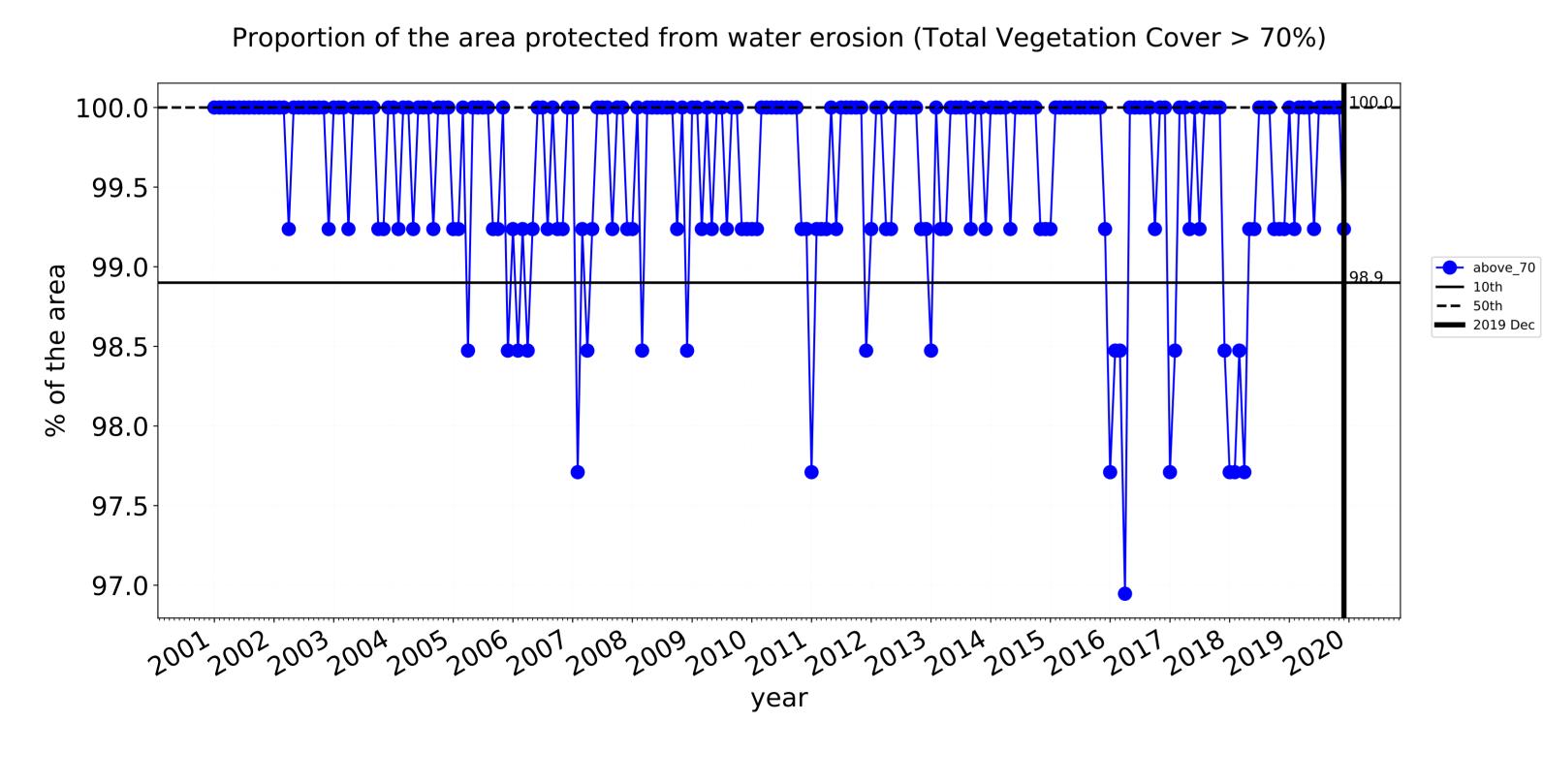


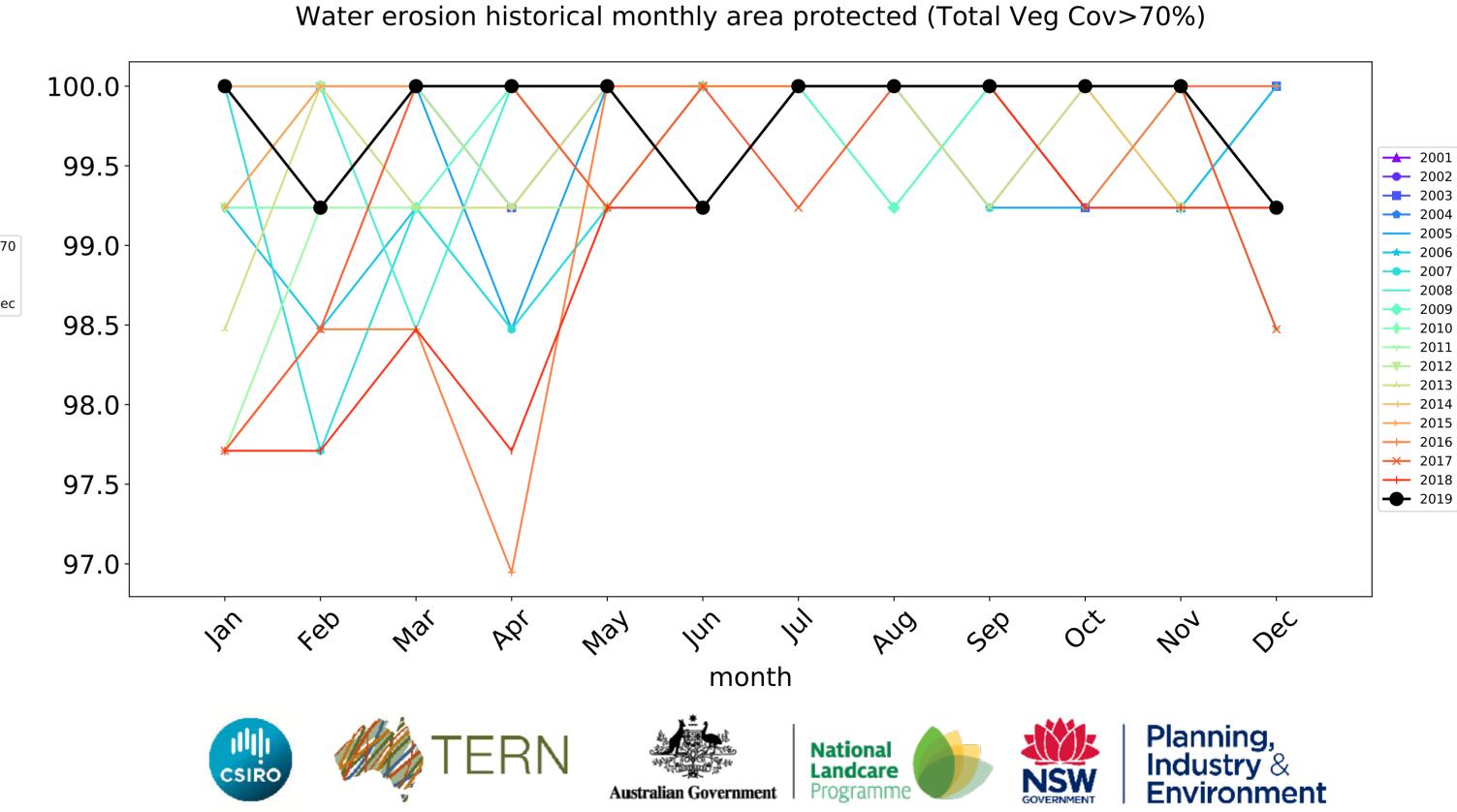


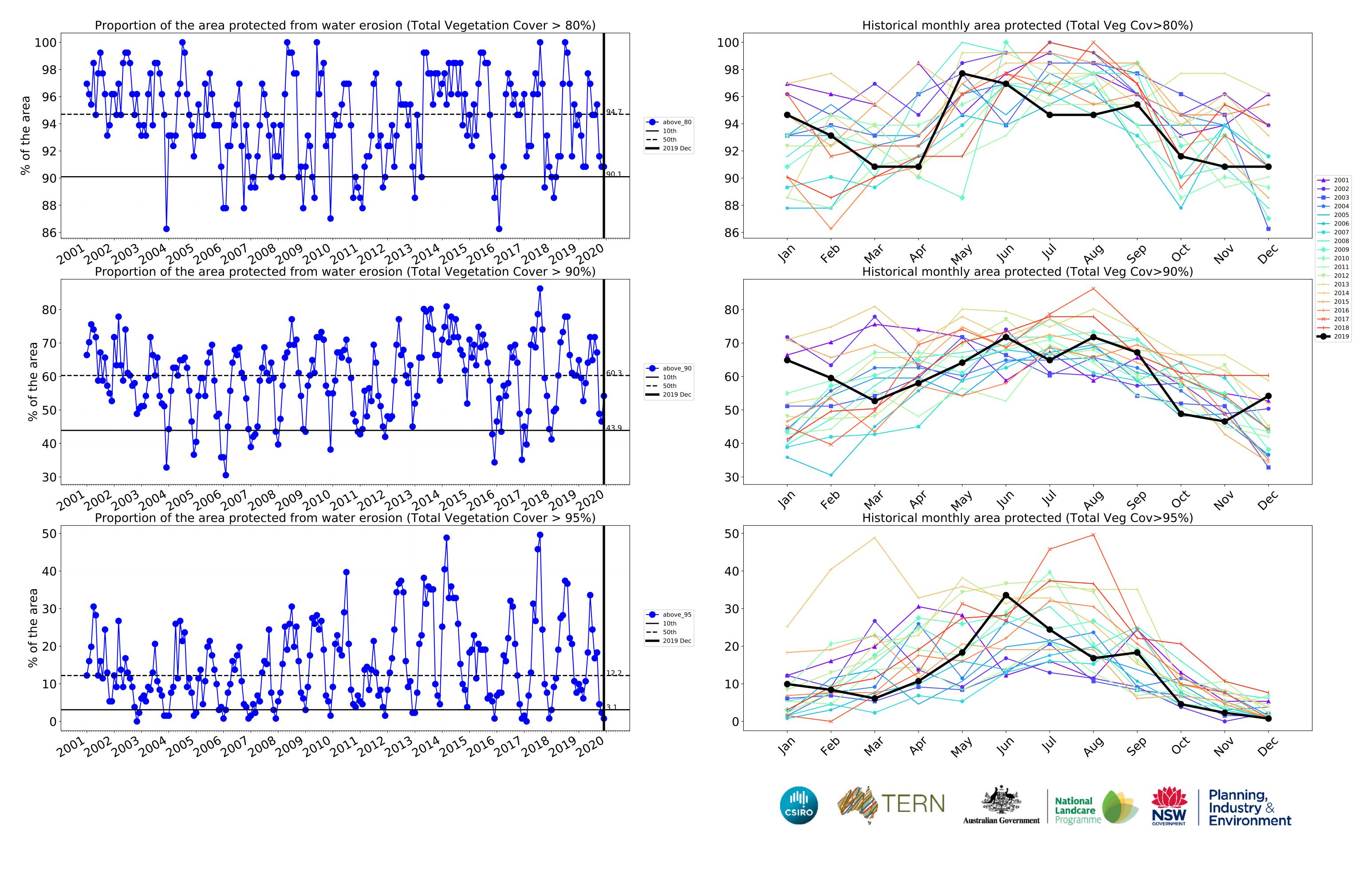


### Wind erosion historical monthly area protected (Total Veg Cov >50%)



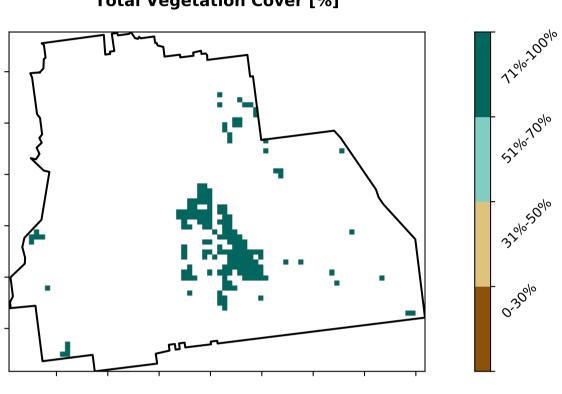


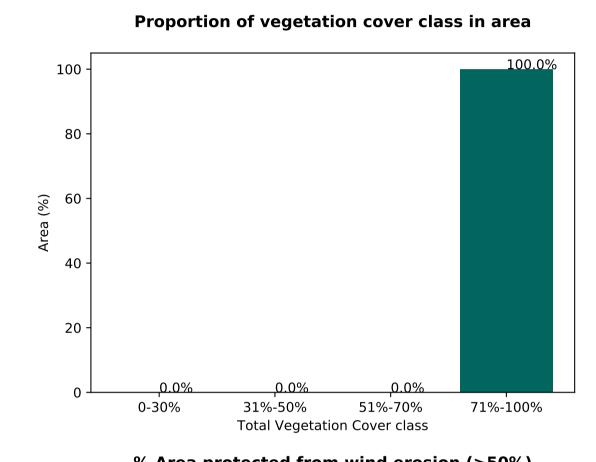


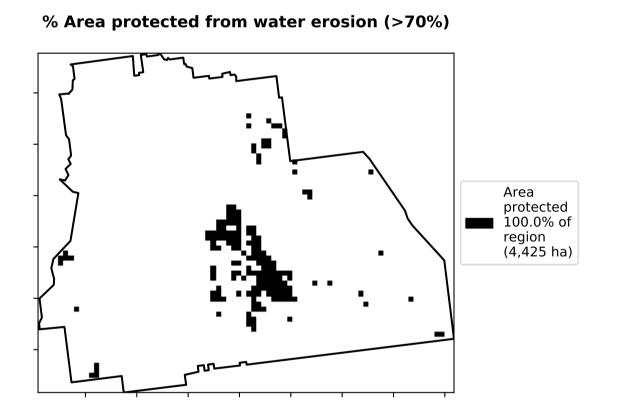


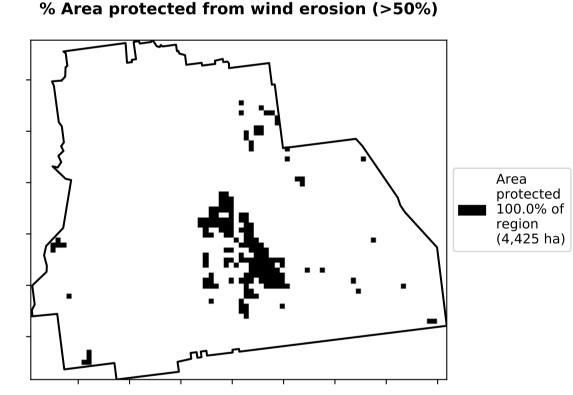
### **Conservation and natural environments Forest (non woodland)**

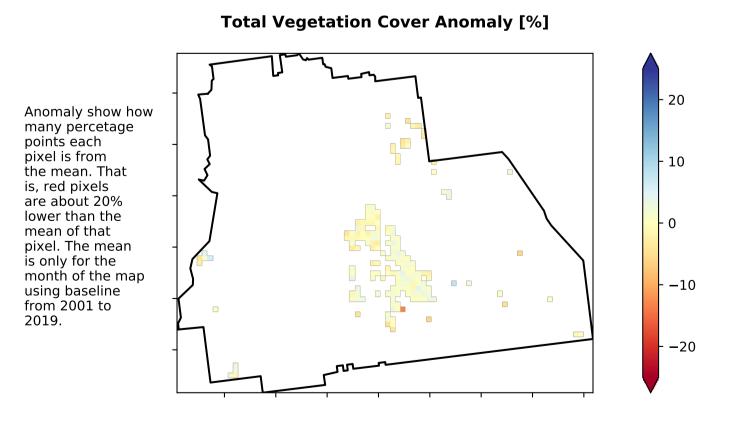
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) Australia (2018) Total Vegetation Cover [%]



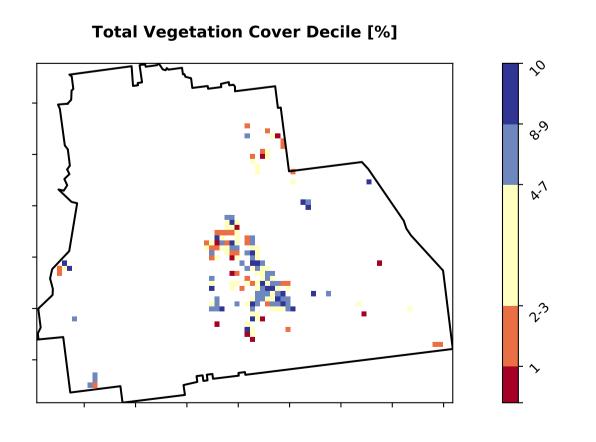








Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





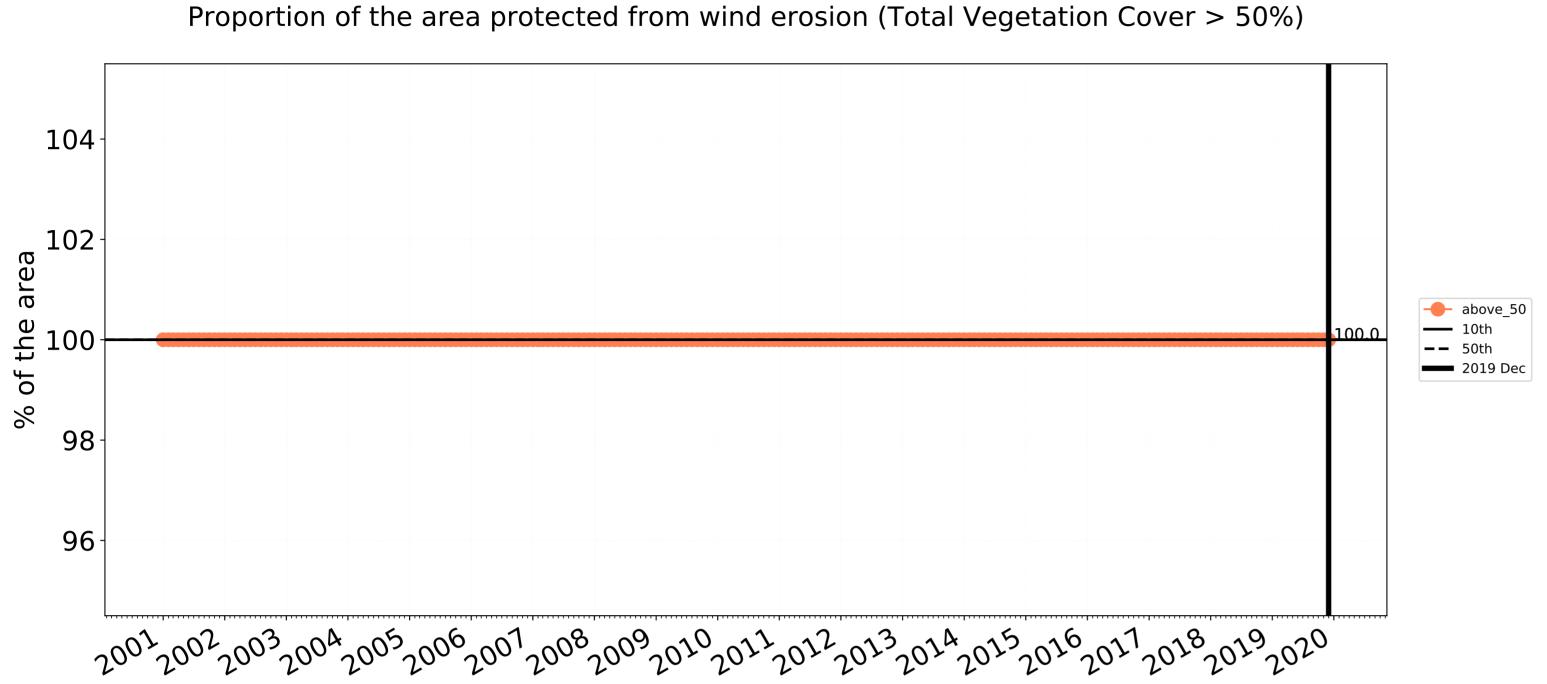




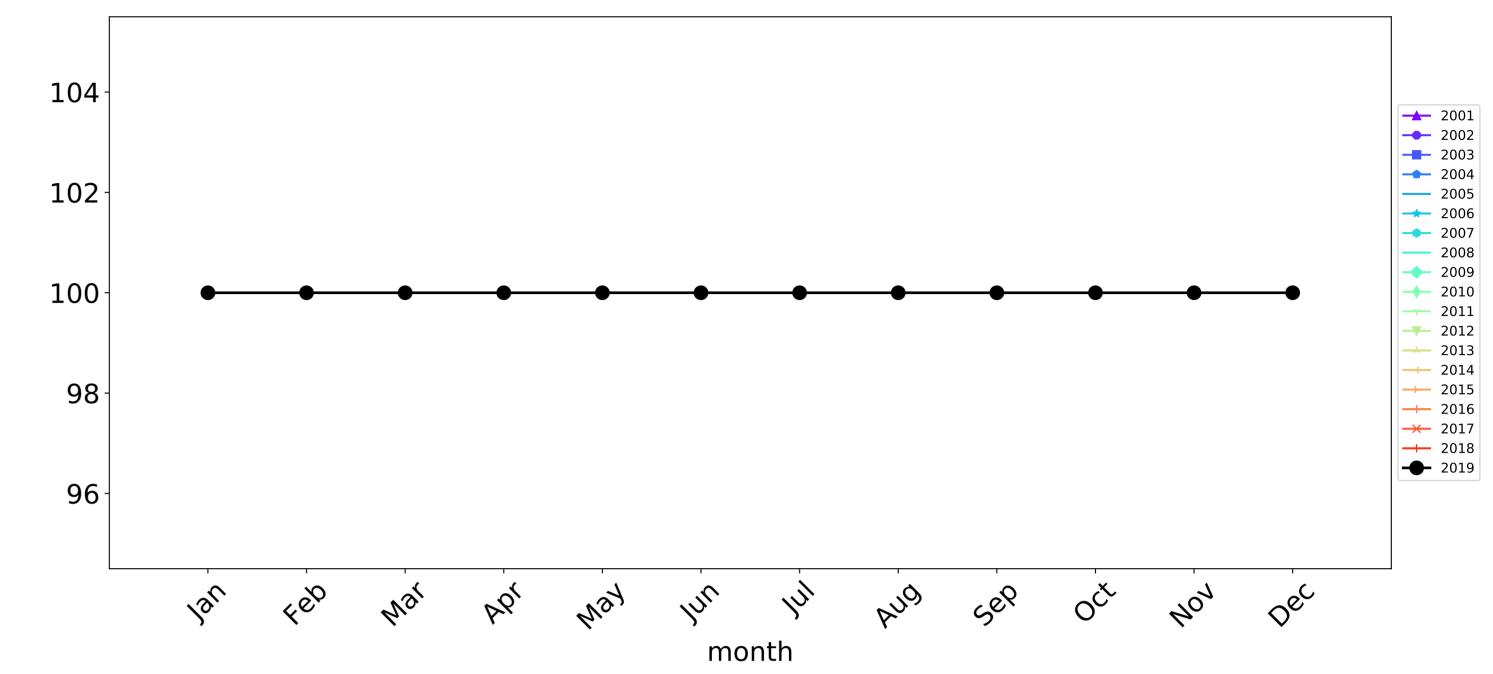


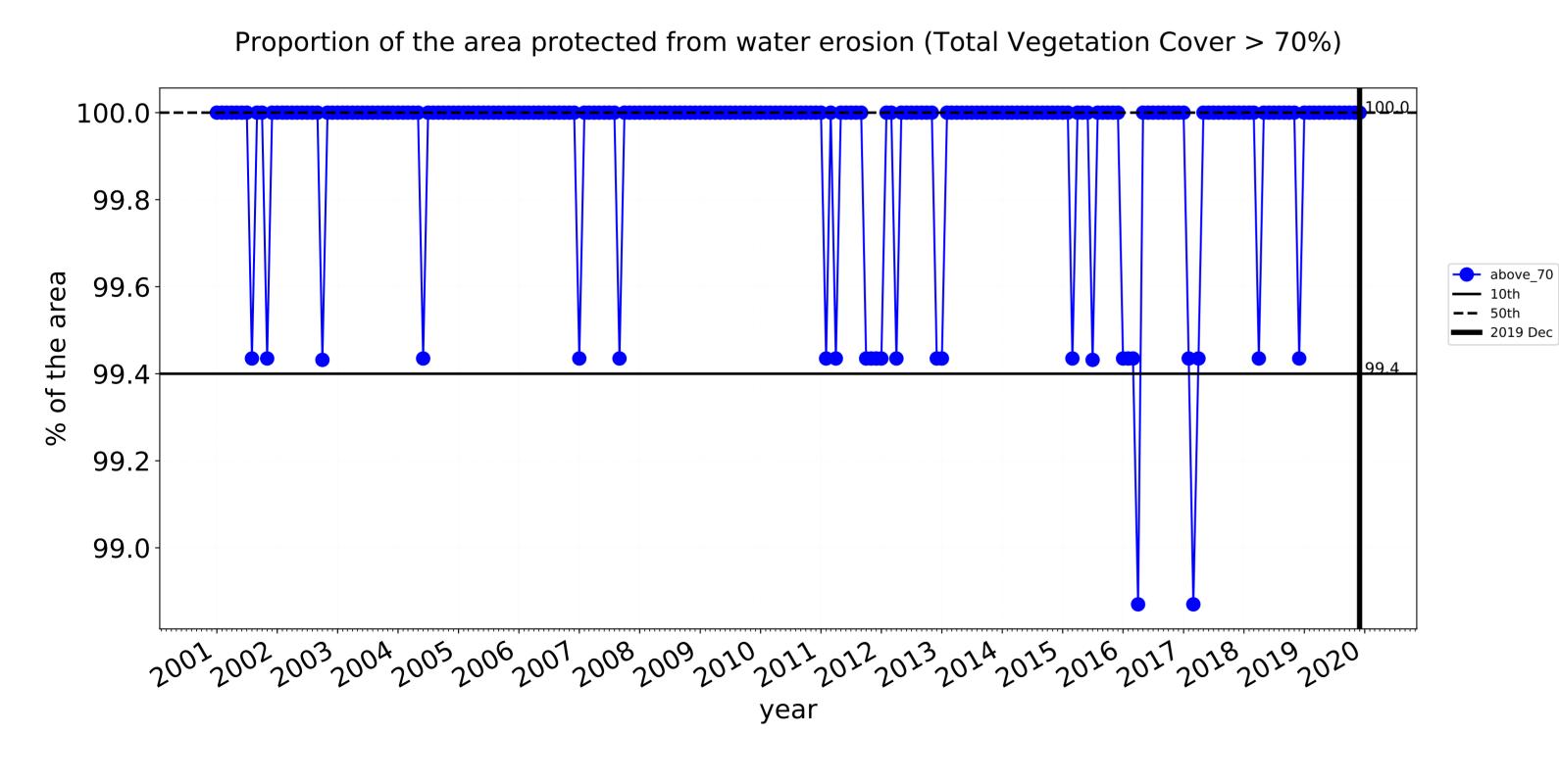


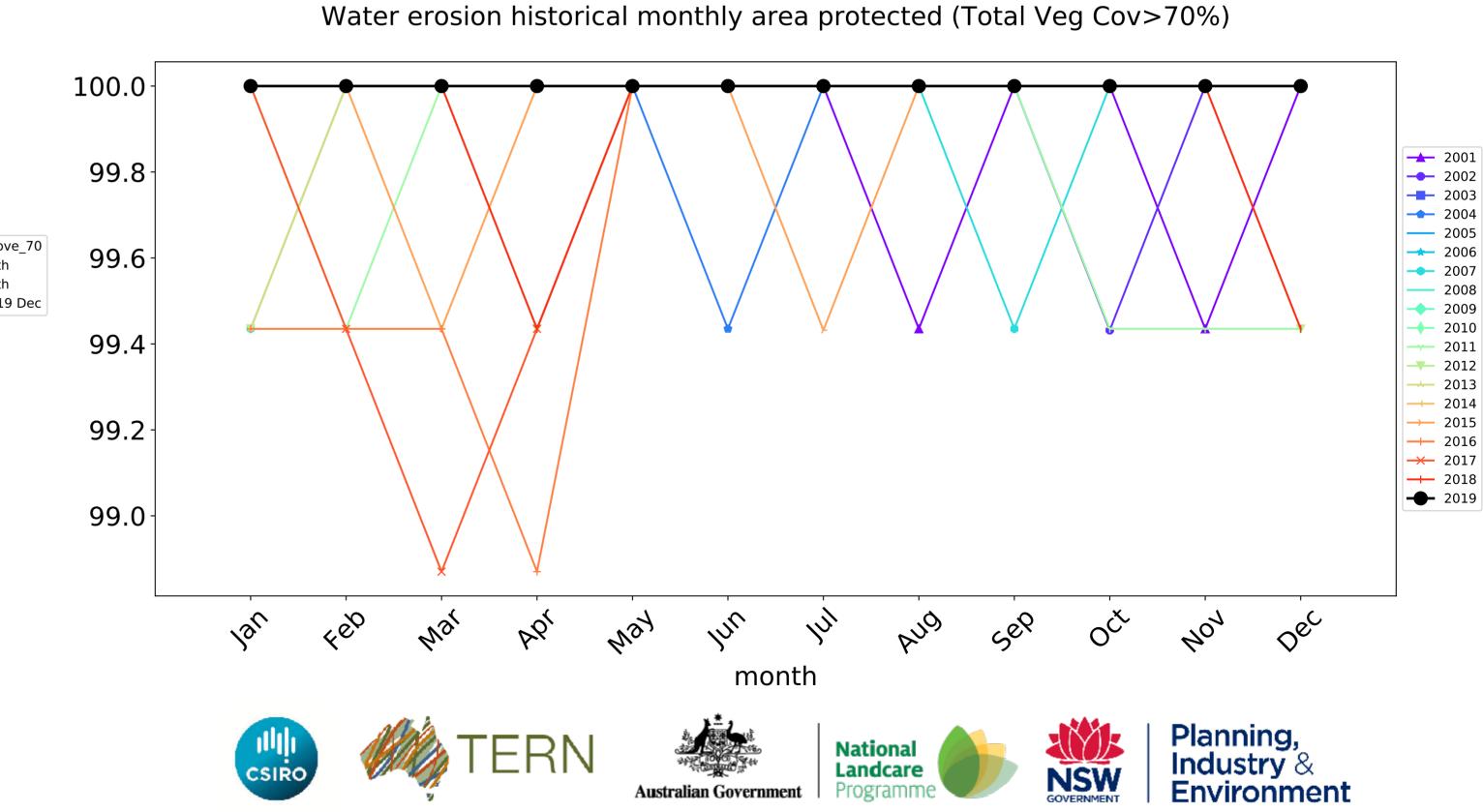


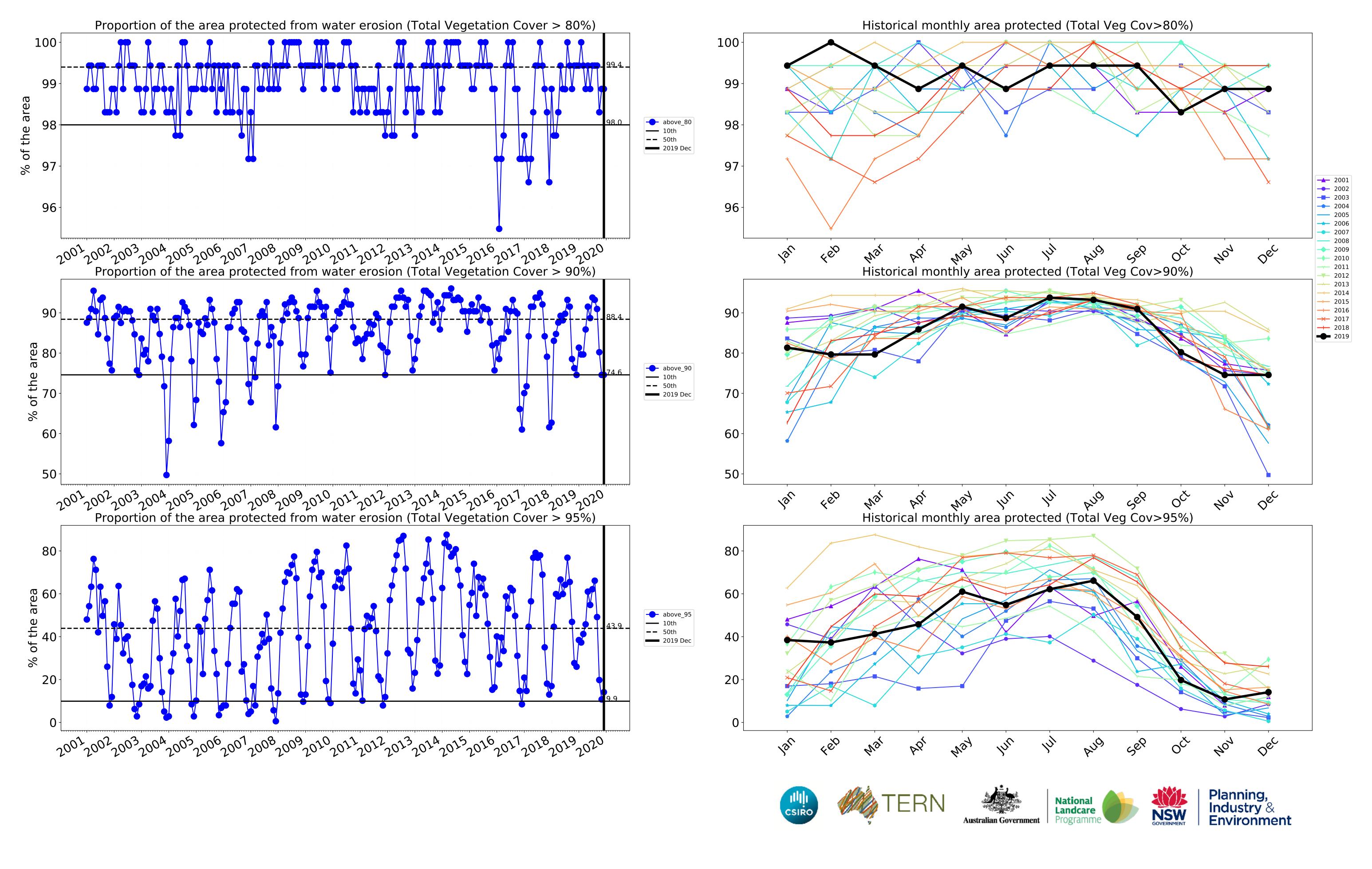


Wind erosion historical monthly area protected (Total Veg Cov >50%)







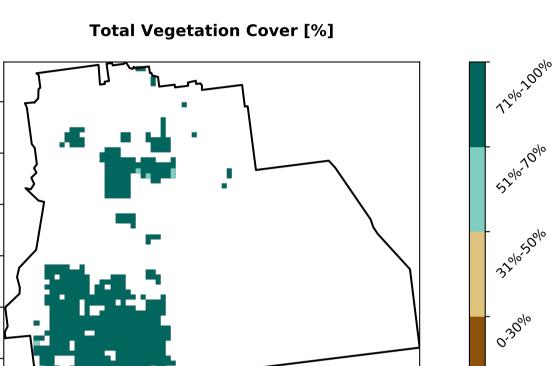


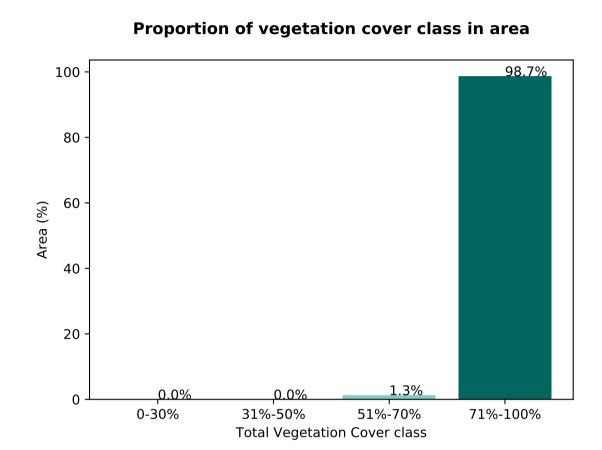
### **Agriculture**

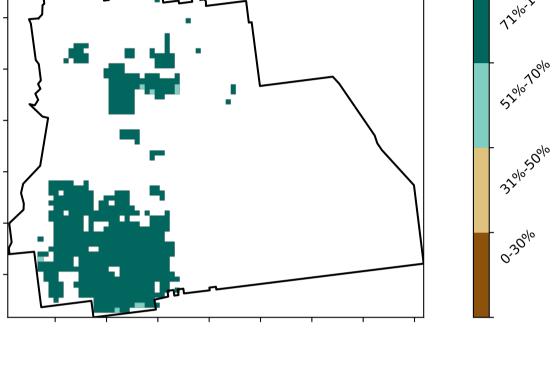
### Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest Derived from 2 Agriculture - Grazing - Irrigated Catchment Scale Land 3 Agriculture - Cropping - Non-irrigated Use of Australia 4 Agriculture - Horticulture - Irrigated (2018) and Forests of Australia (2018)

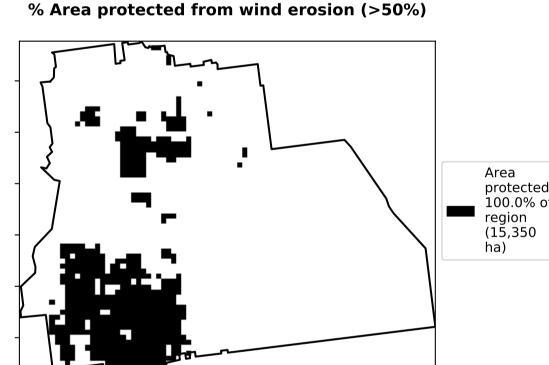
### 47.4% 43.5% 40 10 7.5% 1.6% 2 3 Land use class

**Proportion of each land class in area** 

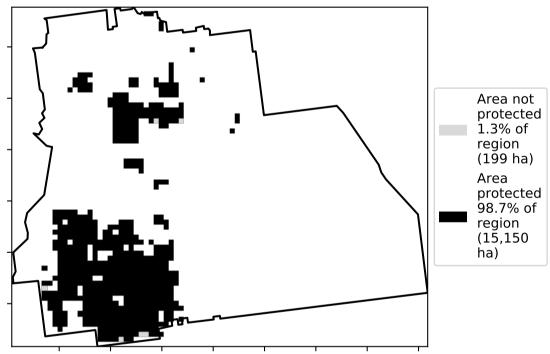


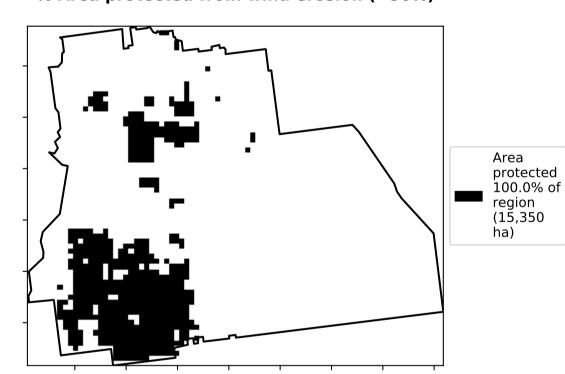




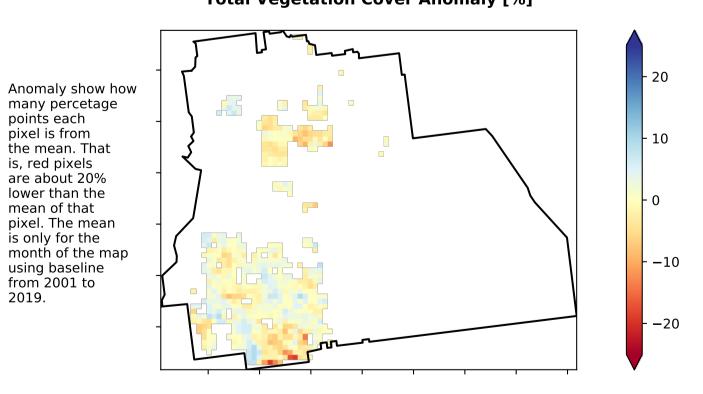






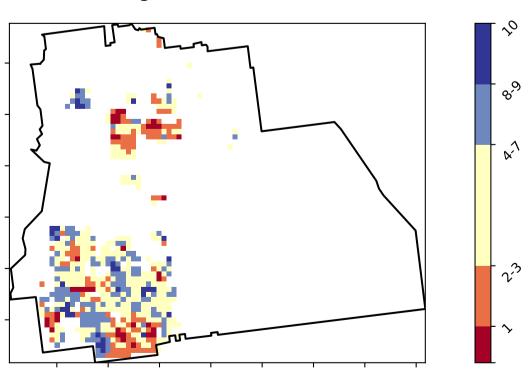


### **Total Vegetation Cover Anomaly [%]**



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

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





pixel is from

the mean. That is, red pixels

are about 20% lower than the mean of that

pixel. The mean

using baseline from 2001 to 2019.

is only for the month of the map



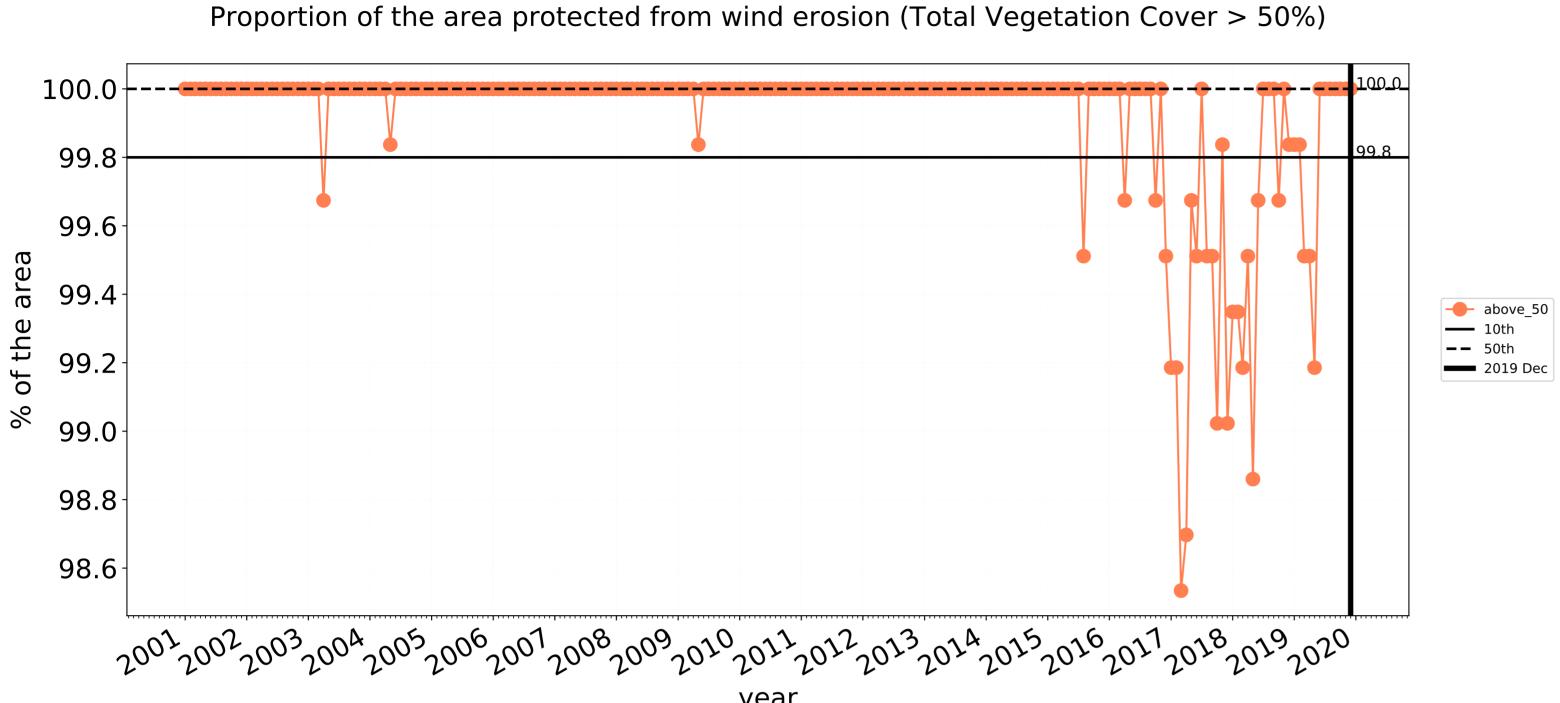


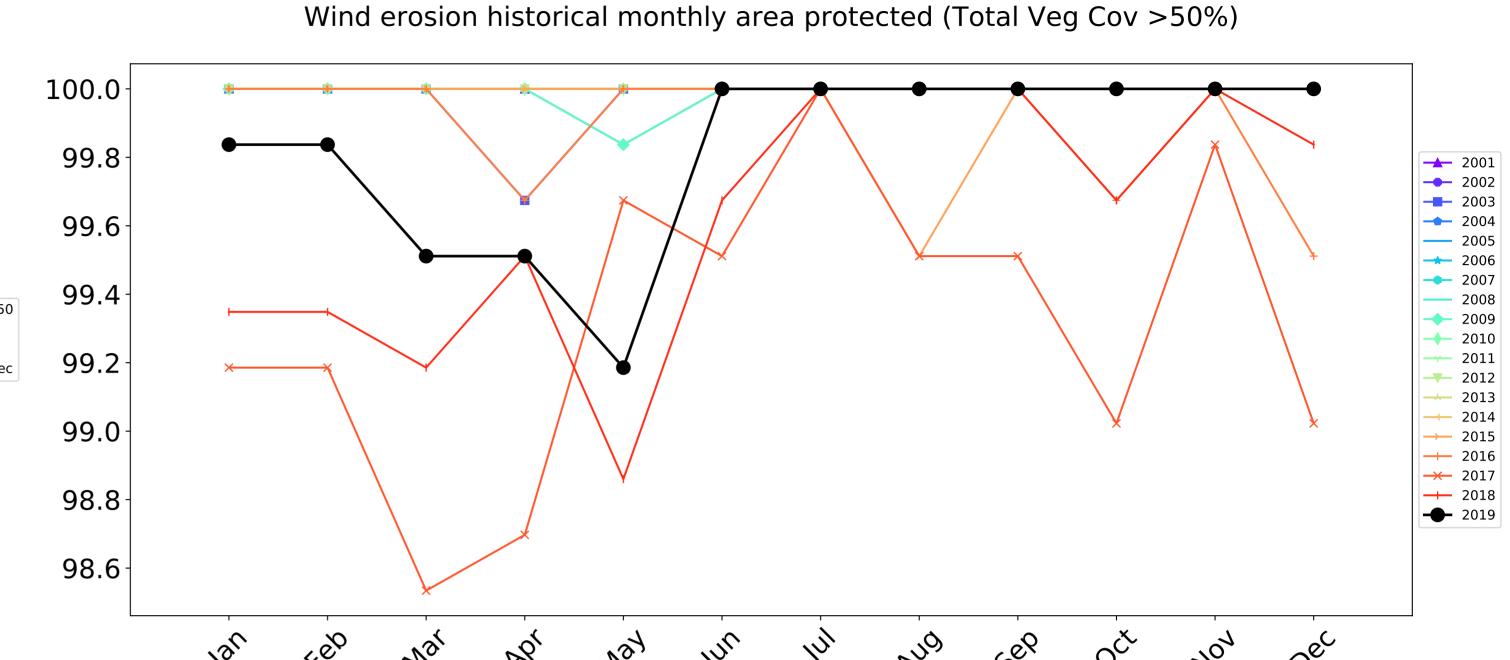




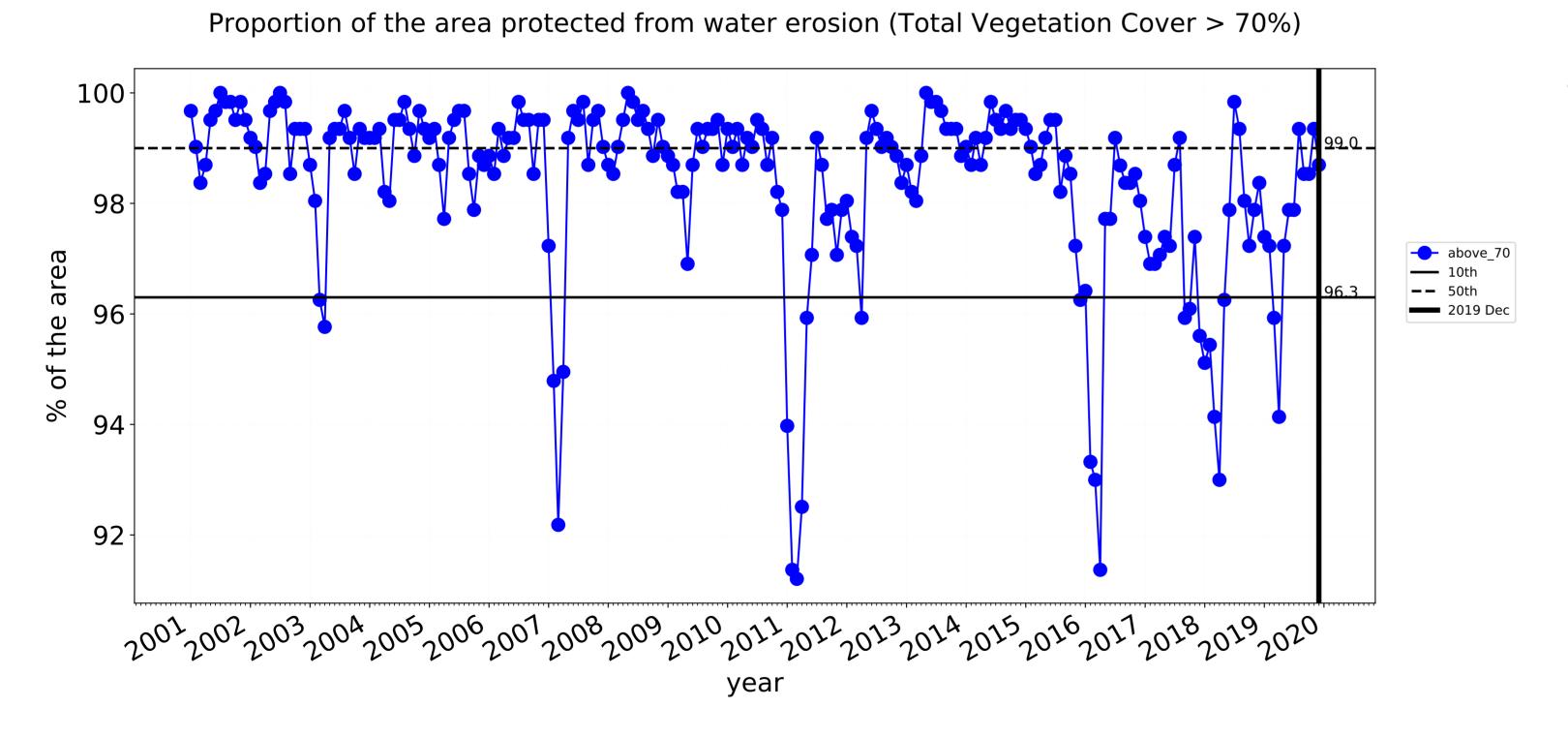


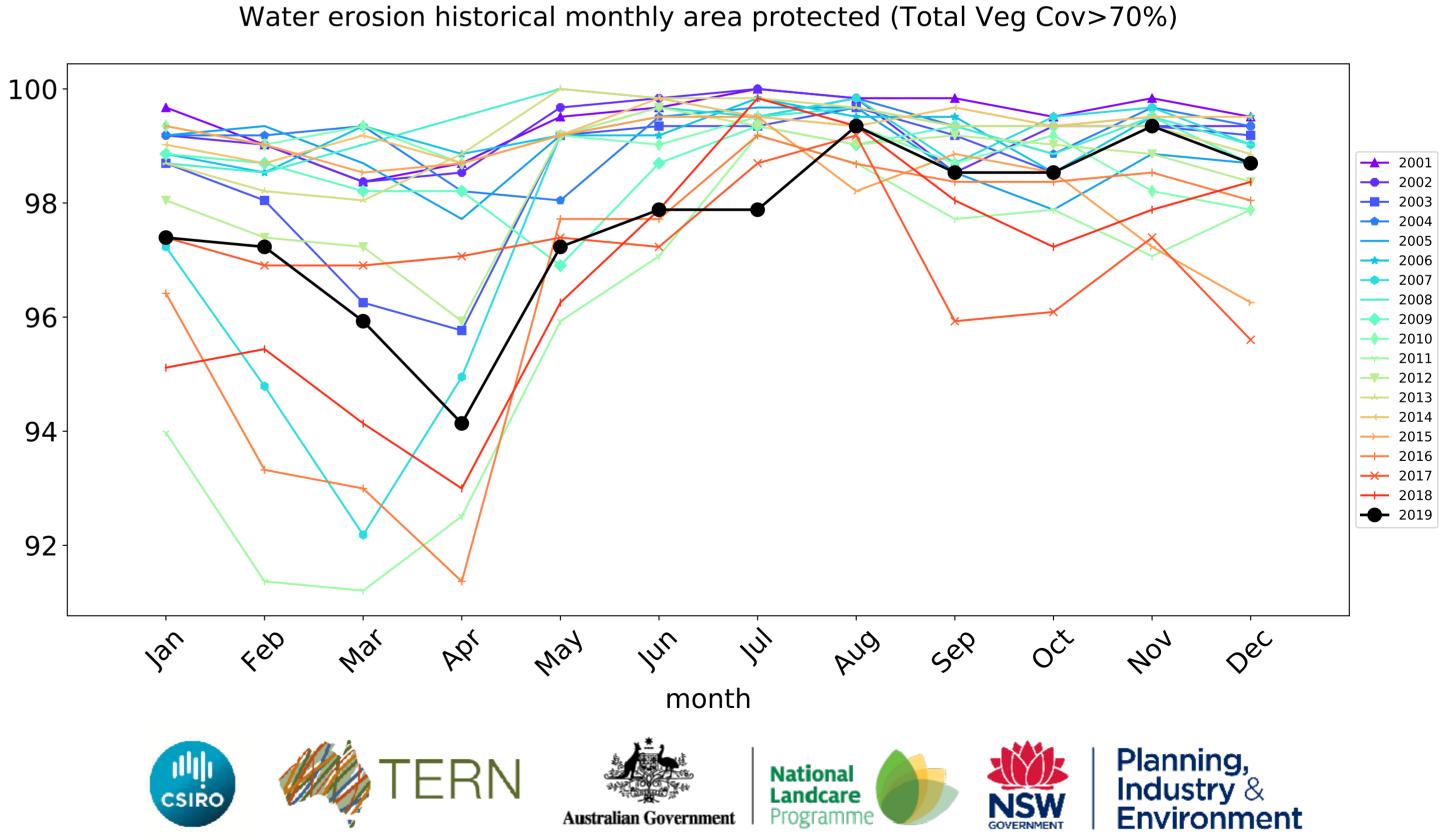
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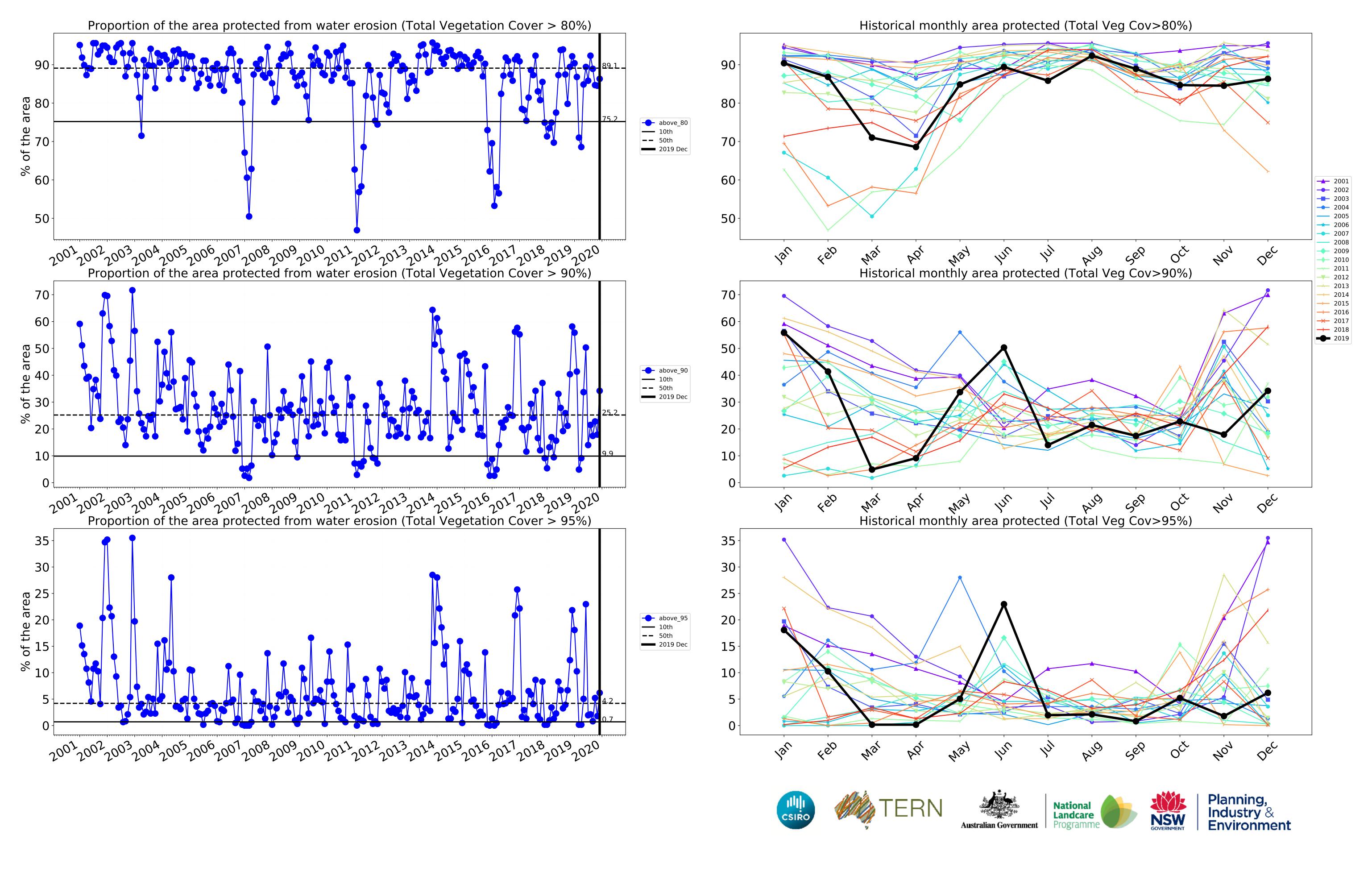




month

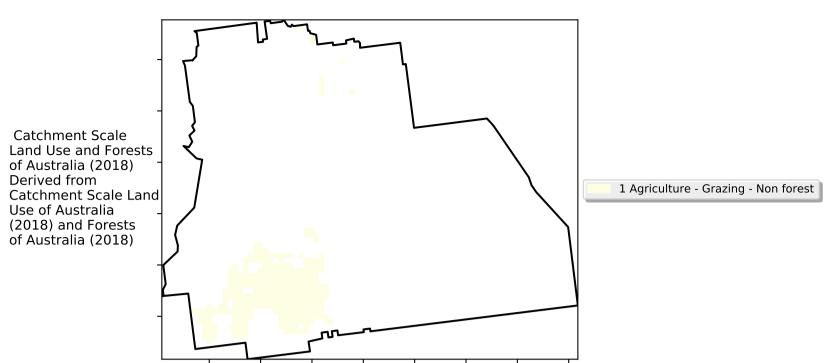




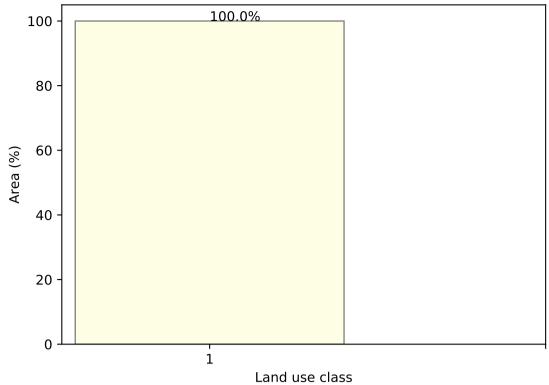


### **Grazing**

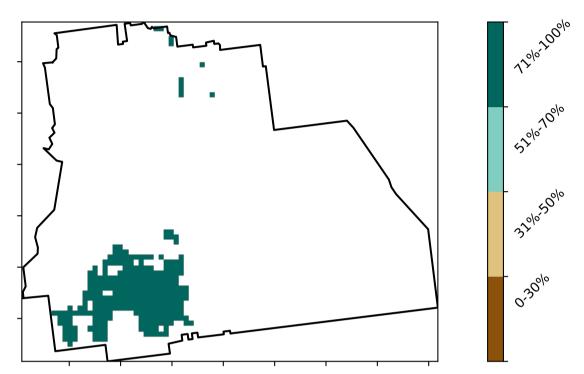
### Land use and forest cover



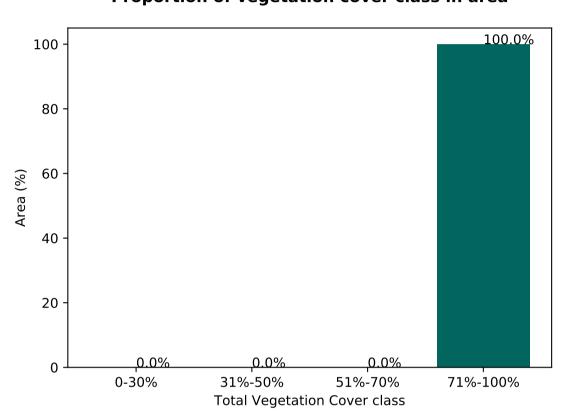
### **Proportion of each land class in area**



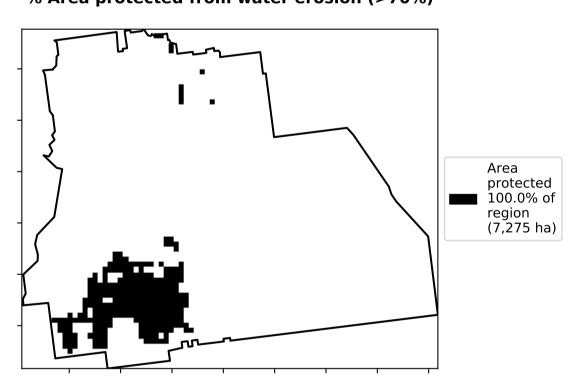
**Total Vegetation Cover [%]** 



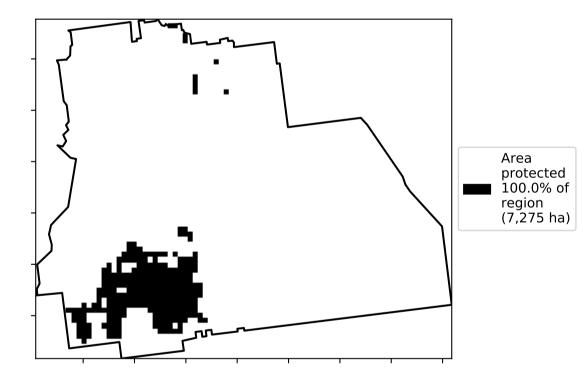
Proportion of vegetation cover class in area



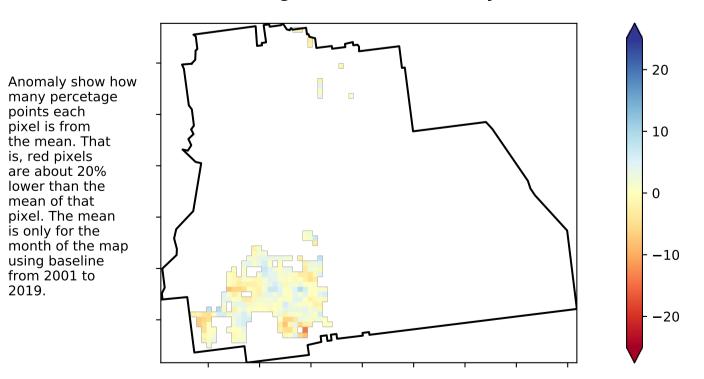
% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

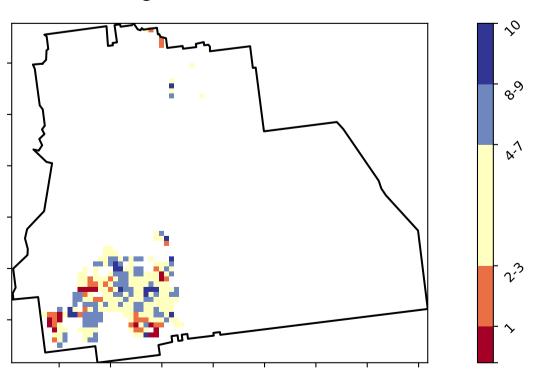


### **Total Vegetation Cover Anomaly [%]**



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.

**Total Vegetation Cover Decile [%]** 





the mean. That

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 pixel. The mean



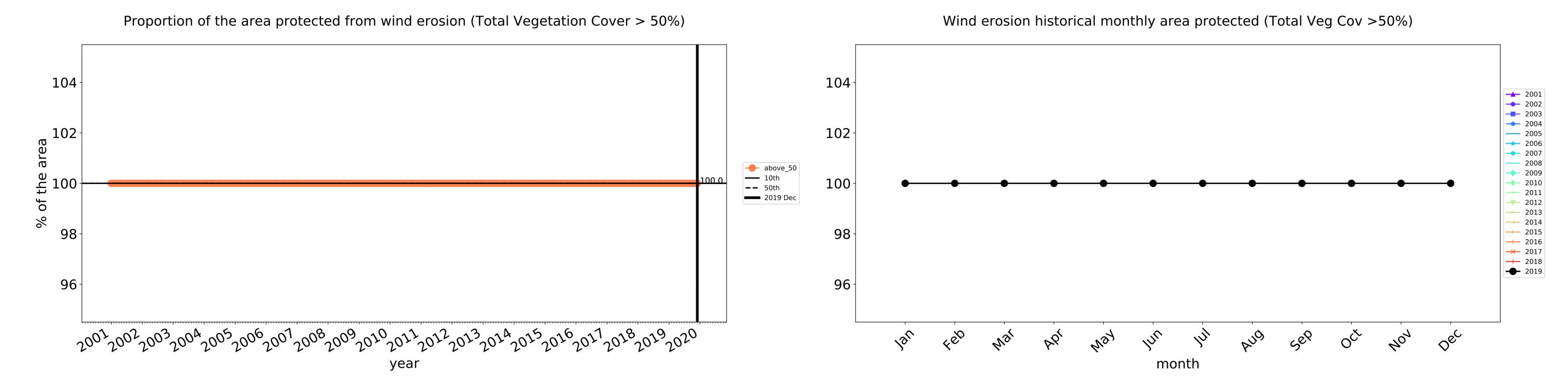


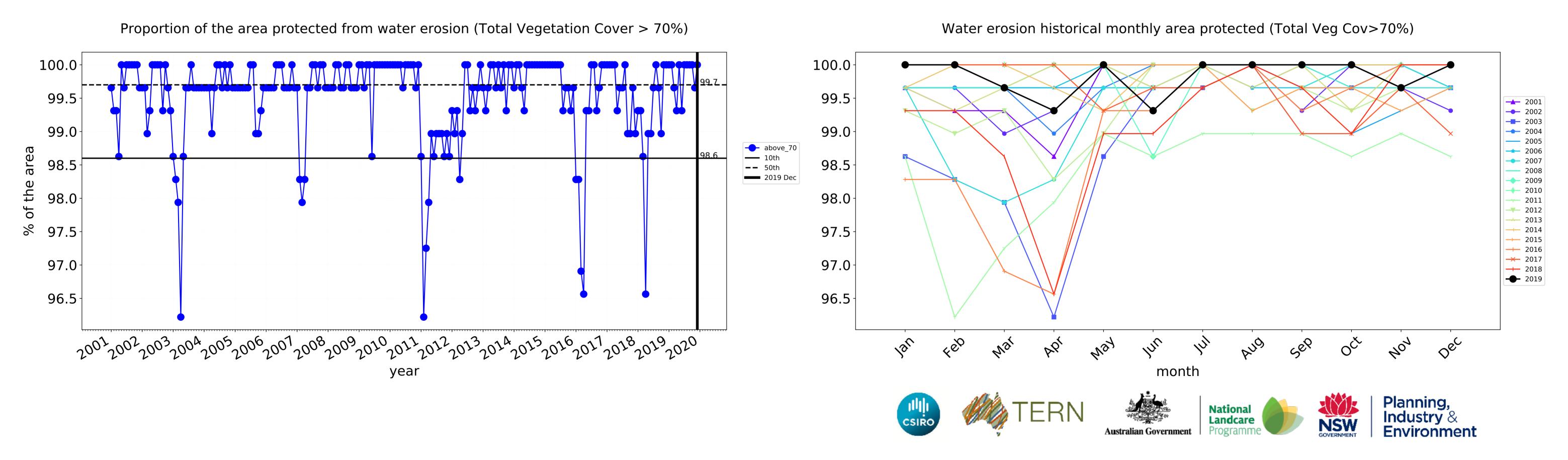


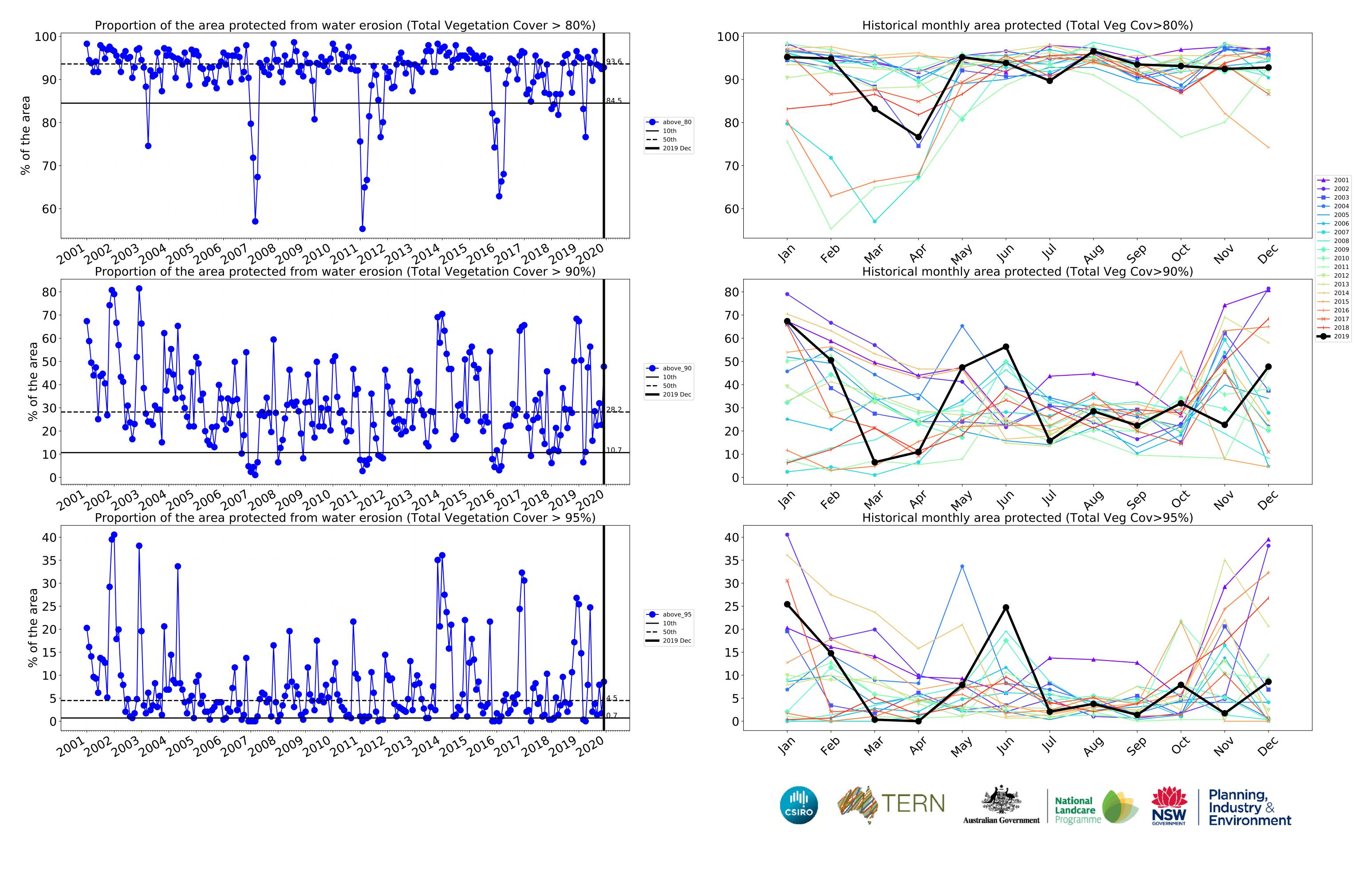




### **Grazing timeseries**

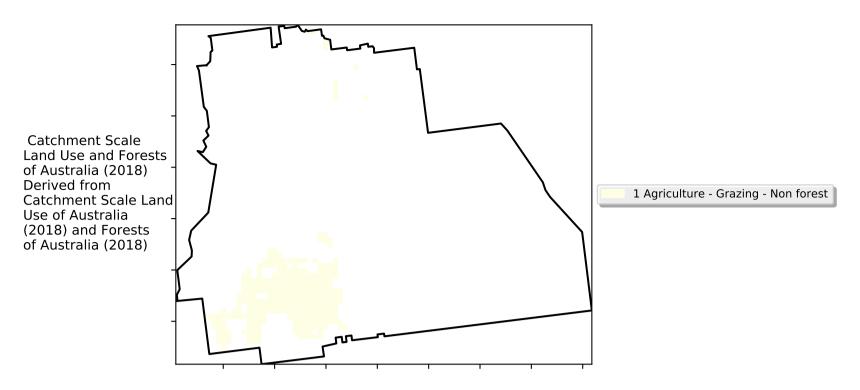




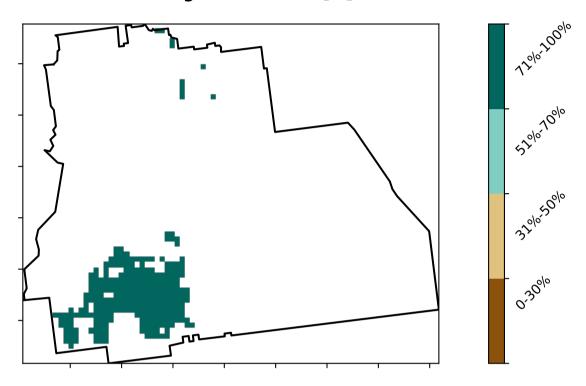


### **Grazing non forest**

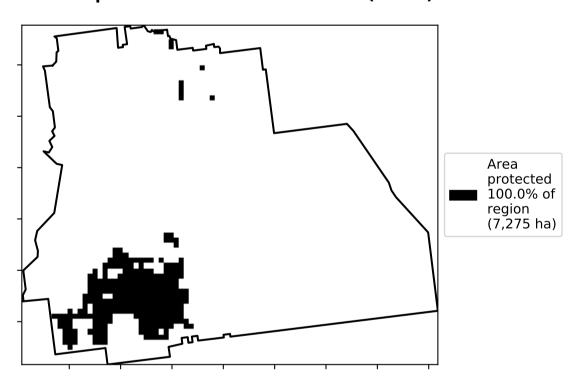
### Land use and forest cover



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



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



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

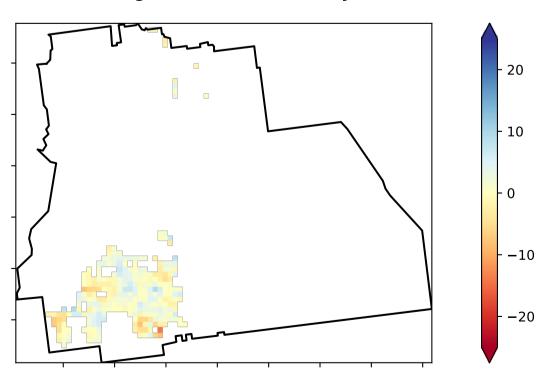
Anomaly show how many percetage points each pixel is from

the mean. That

is only for the month of the map

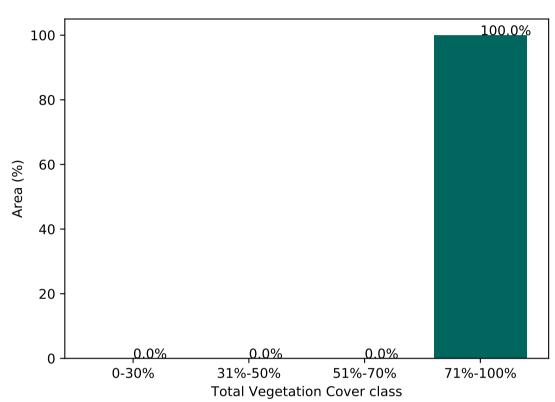
using baseline from 2001 to 2019.

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

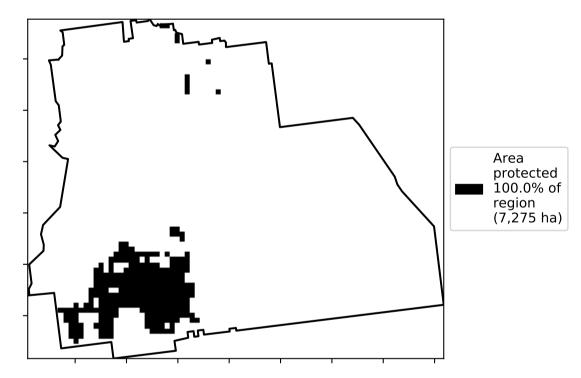


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

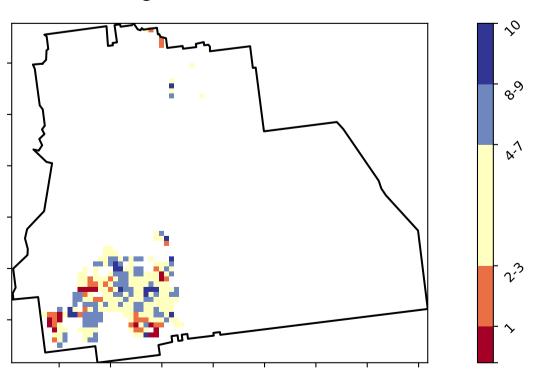
### **Proportion of vegetation cover class in area**



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



### Total Vegetation Cover Decile [%]







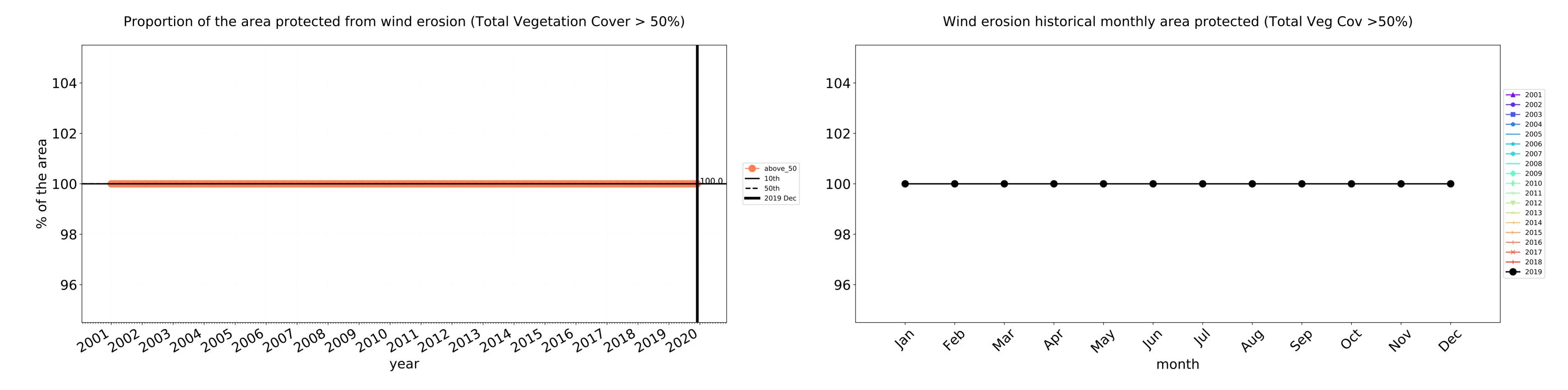


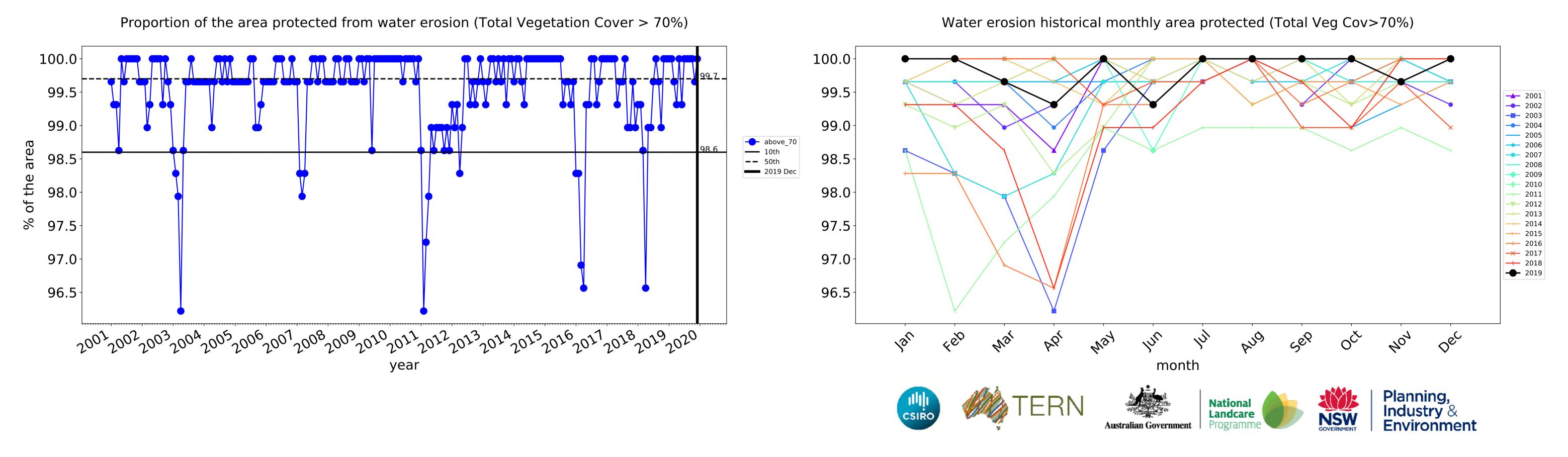


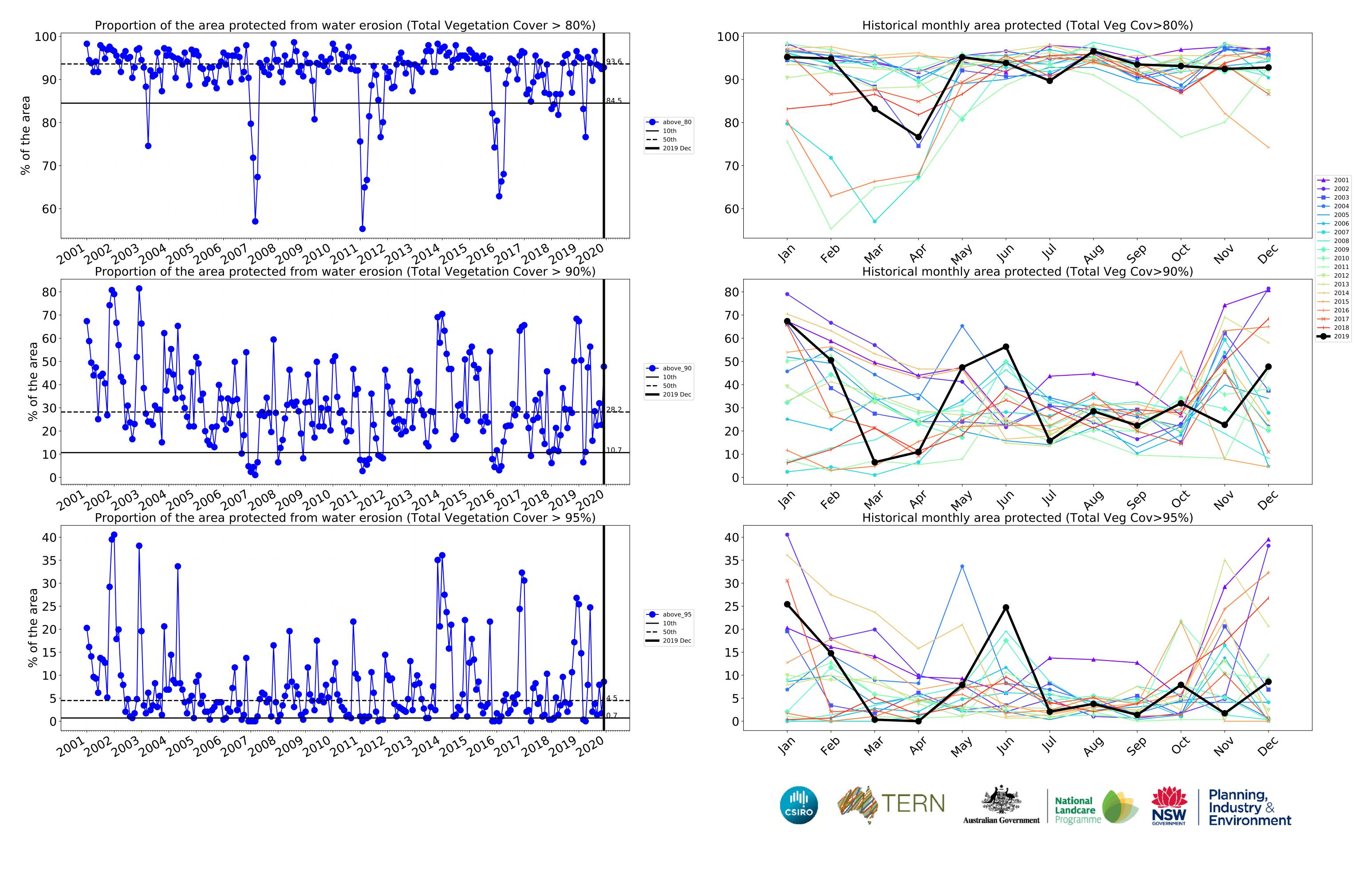




### **Grazing non forest timeseries**

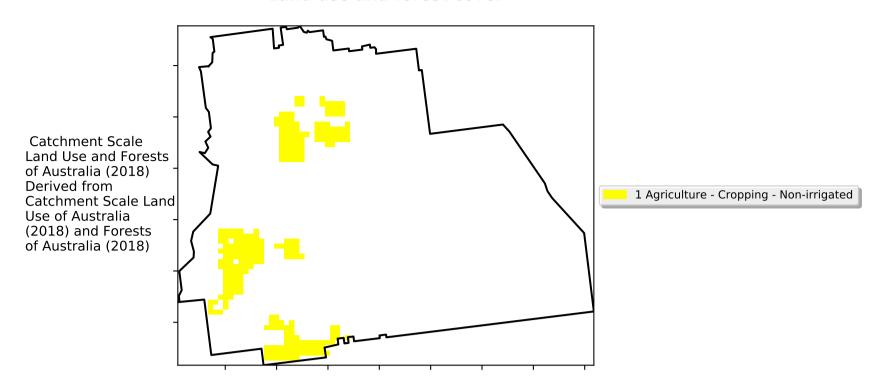




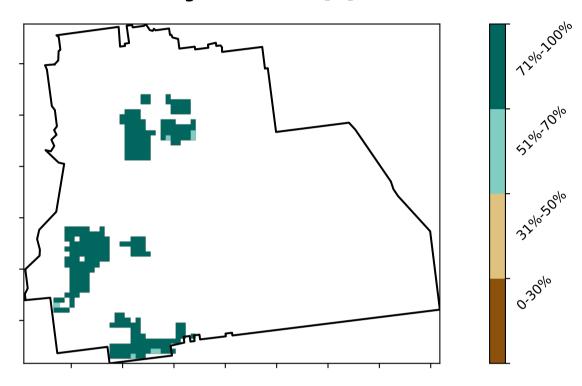


### **Cropping**

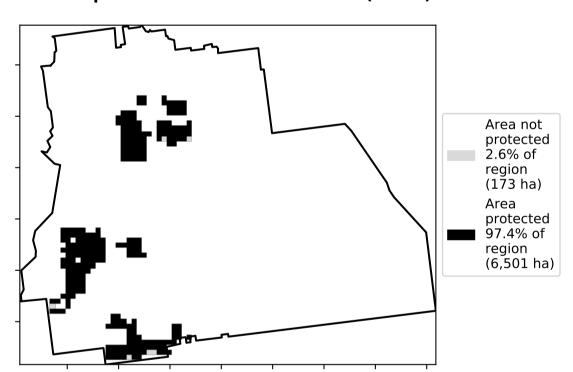
### Land use and forest cover



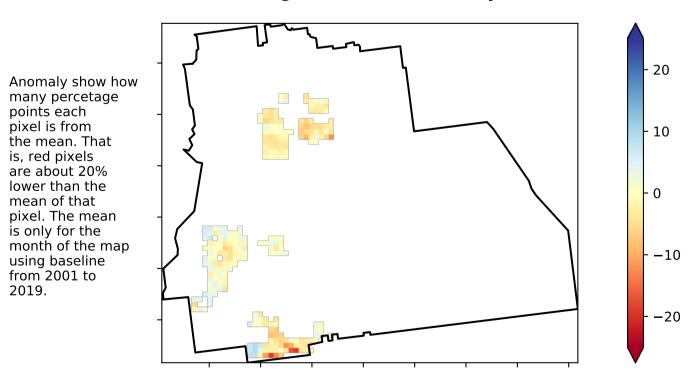
### **Total Vegetation Cover [%]**



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

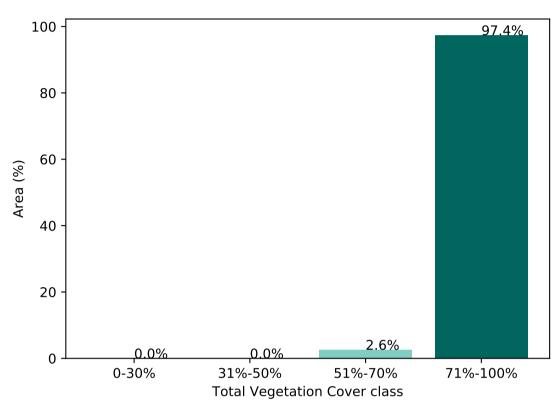


### **Total Vegetation Cover Anomaly [%]**



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.

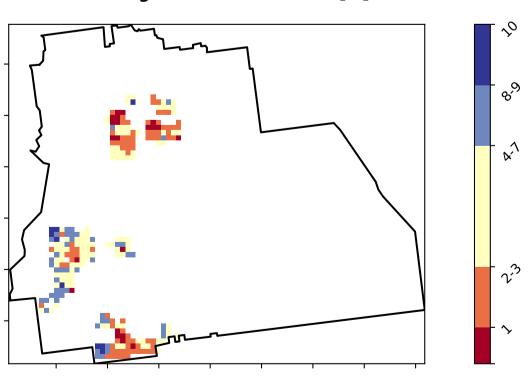
### Proportion of vegetation cover class in area



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



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





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

is only for the month of the map

using baseline from 2001 to 2019.



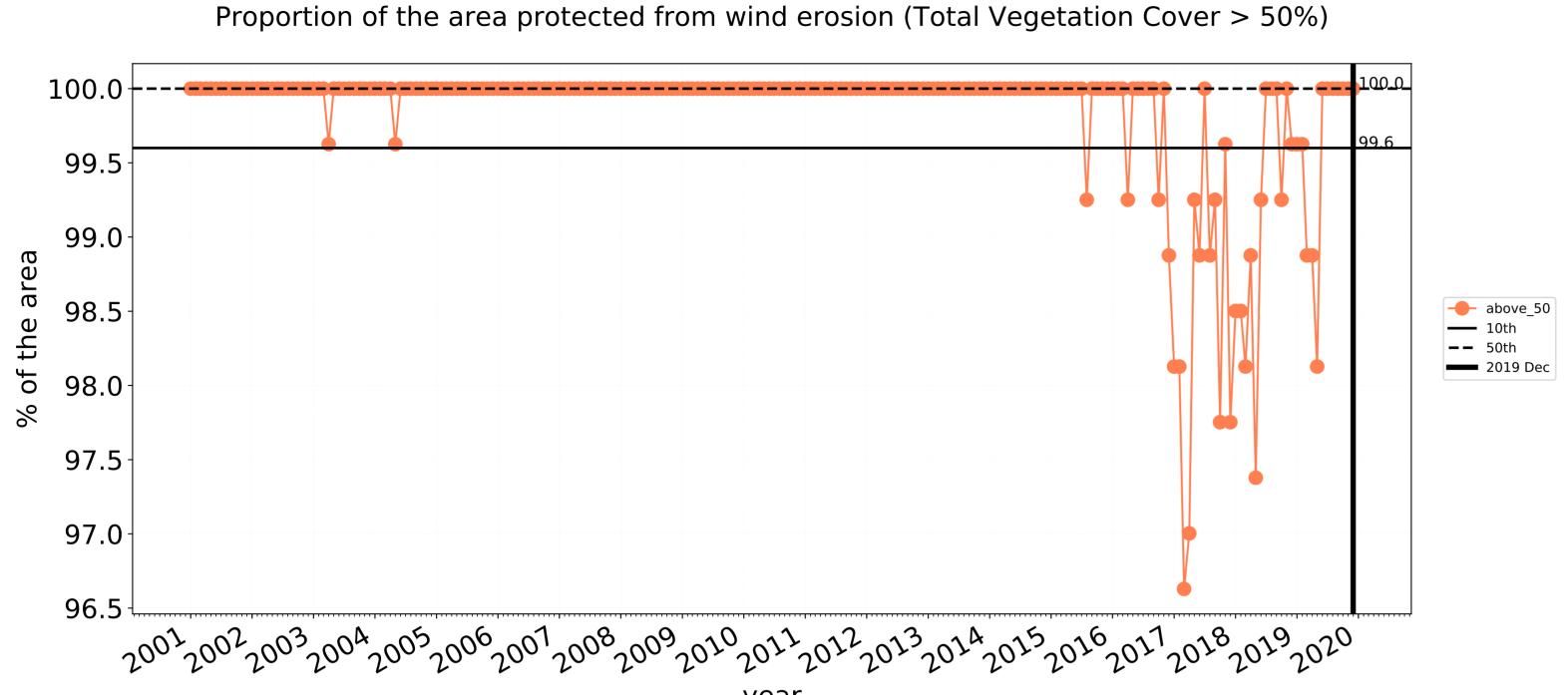


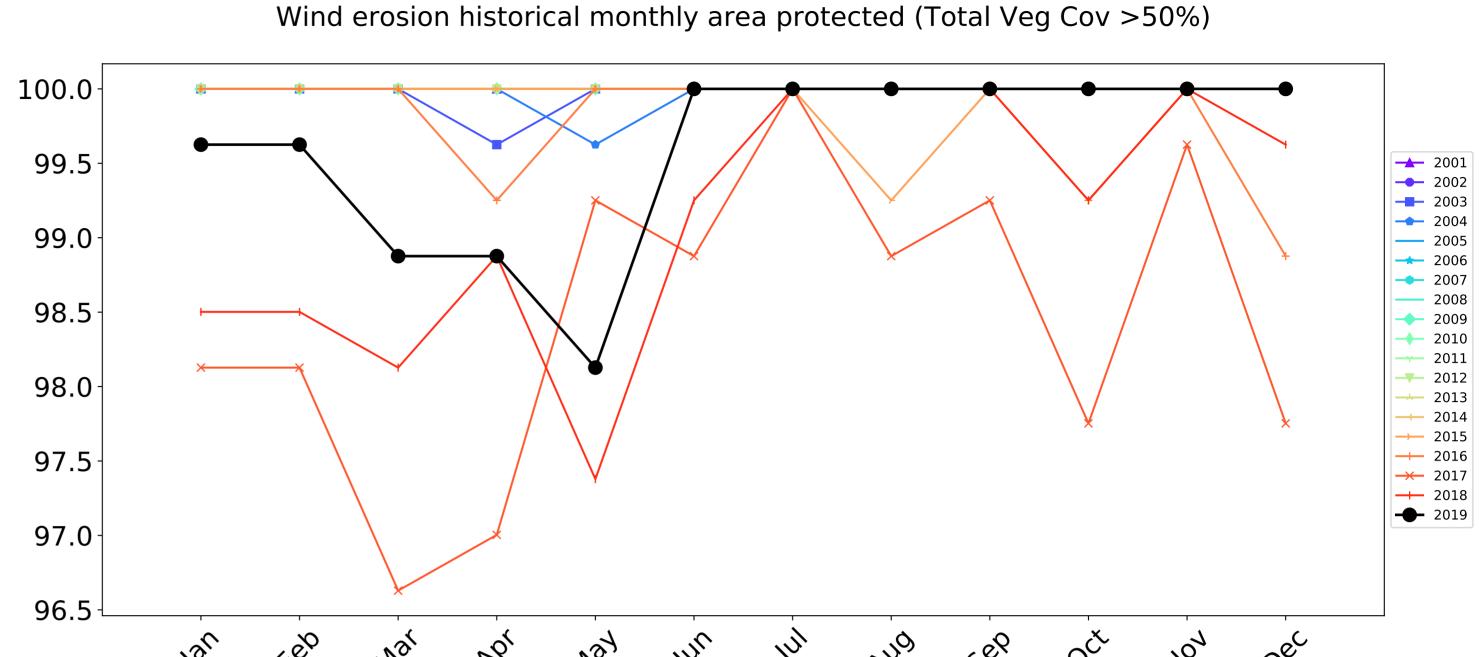




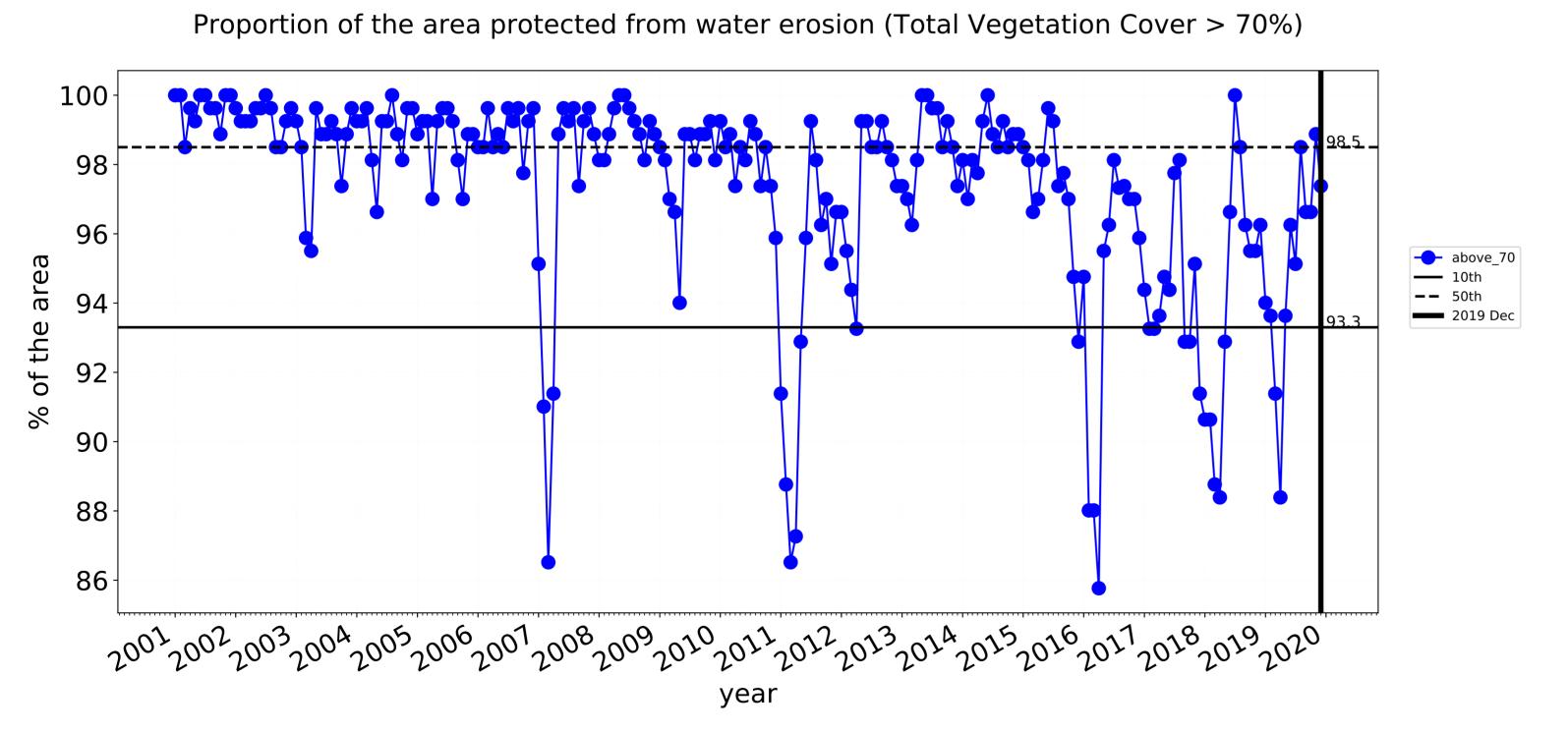


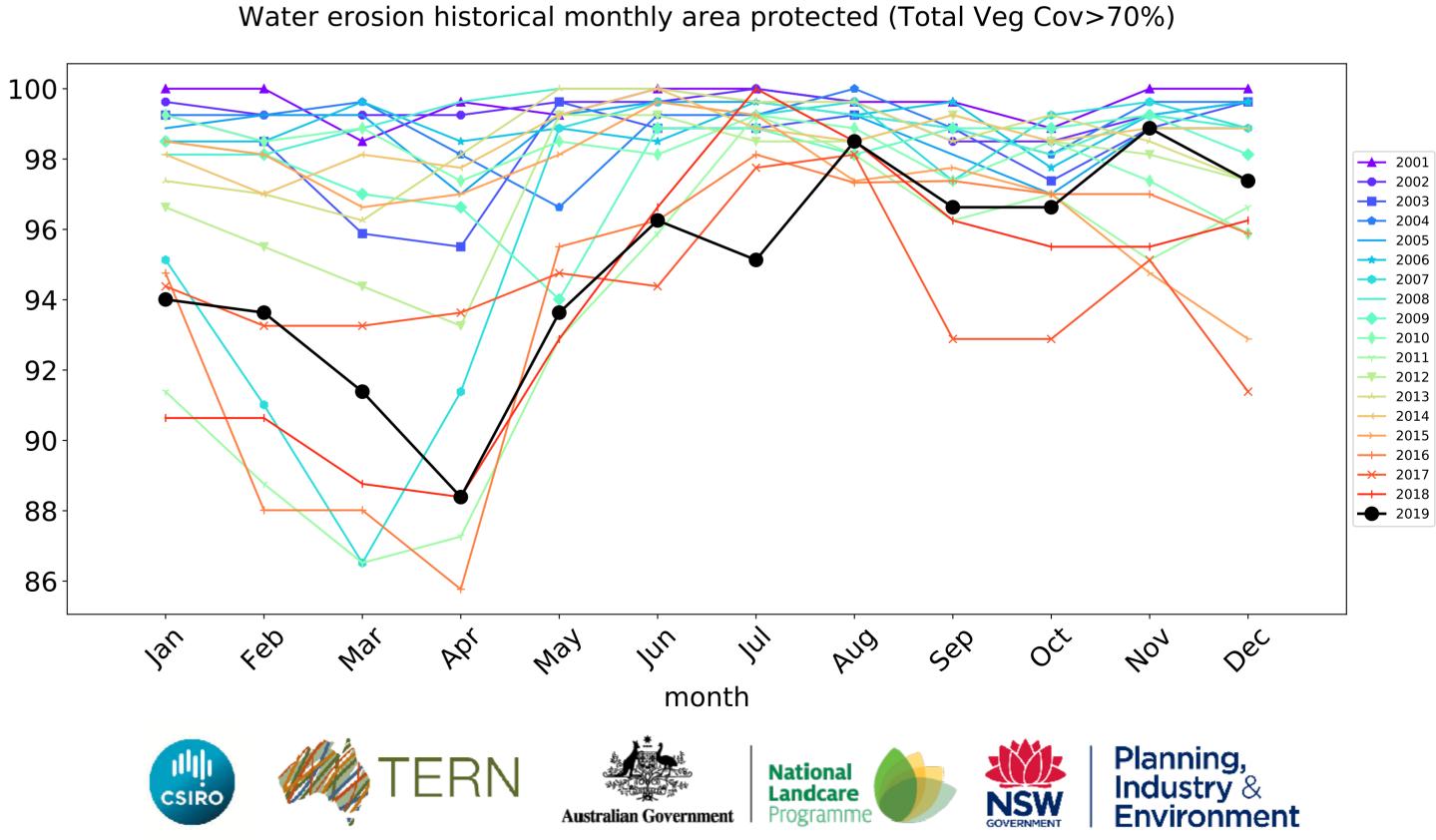
### **Cropping timeseries**

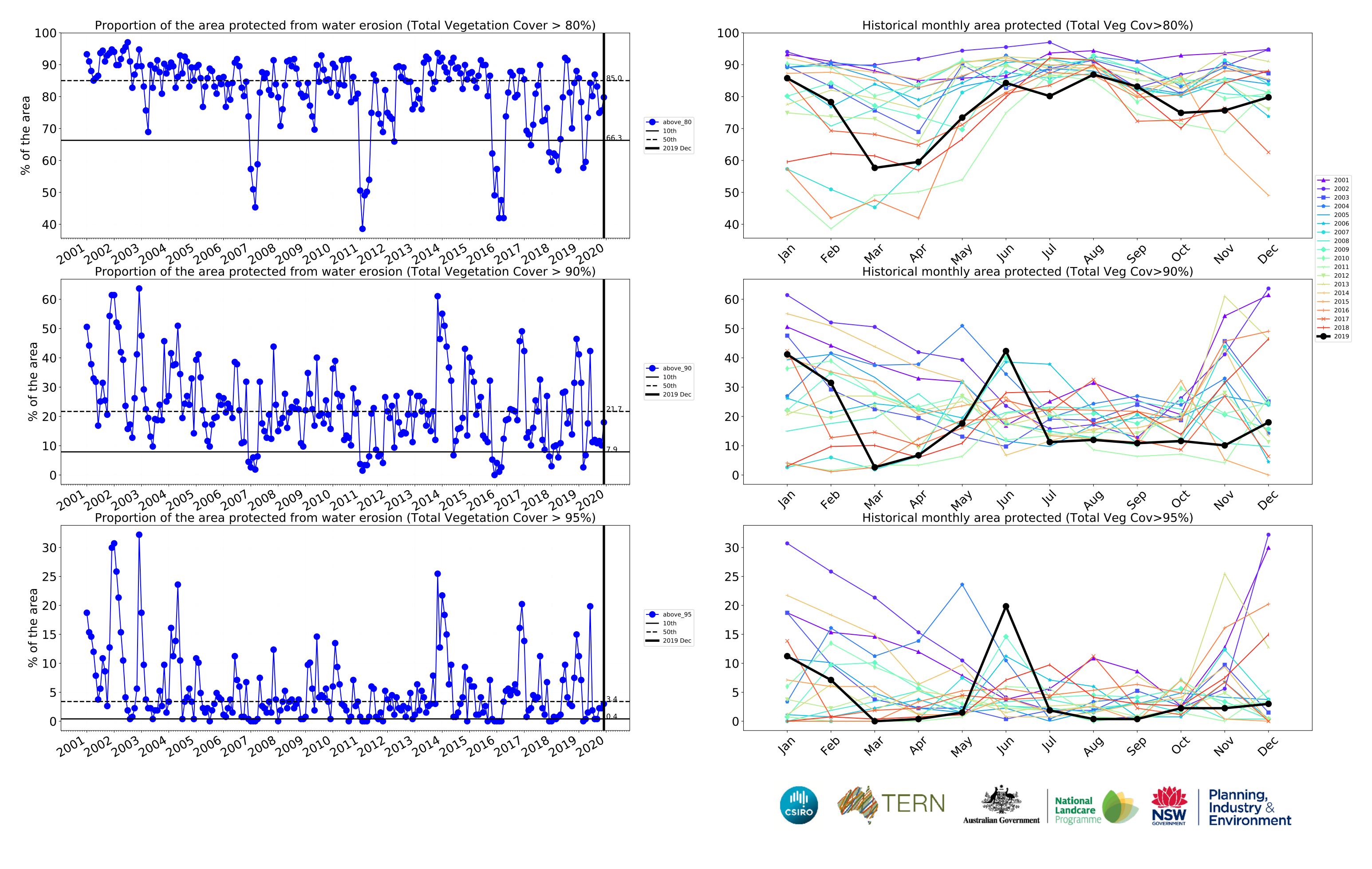




month

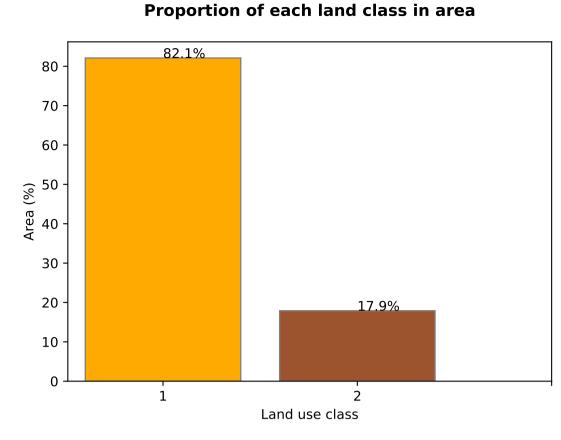


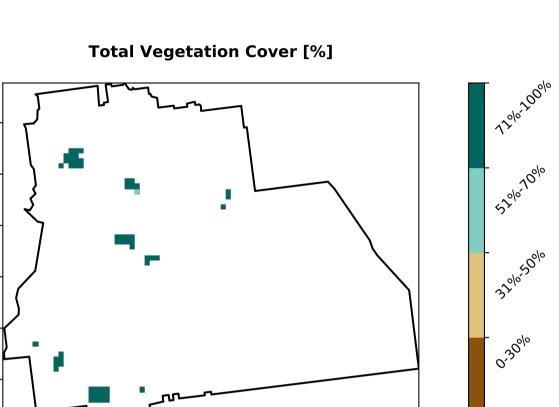


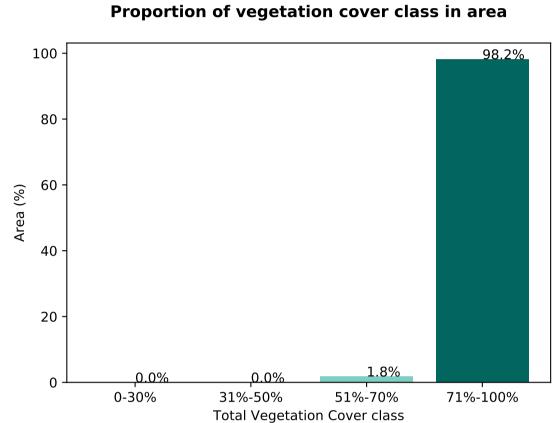


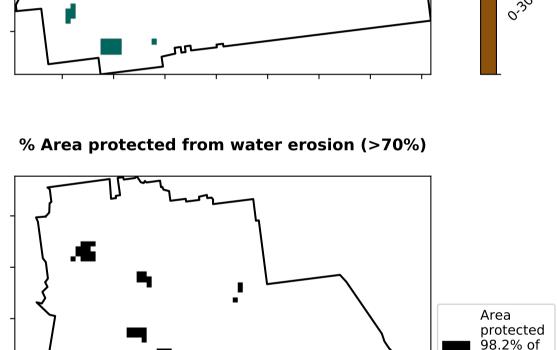
### **Irrigation**

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

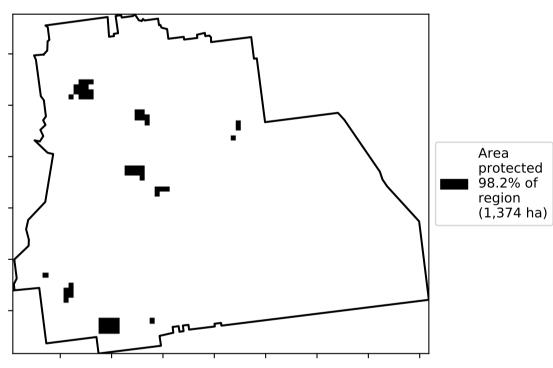


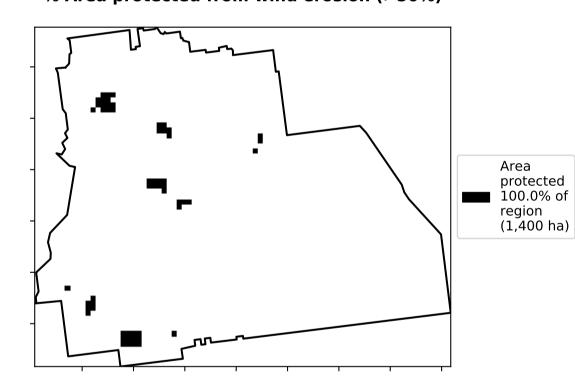








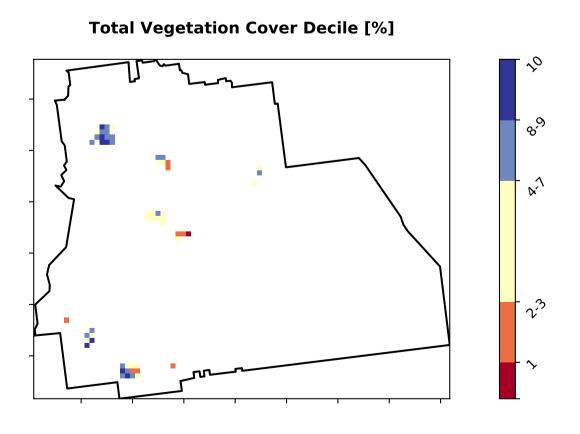






### - 20 - 10 -10**-**20

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.



Anomaly show how many percetage points each pixel is from

the mean. That is, red pixels

are about 20% lower than the mean of that pixel. The mean

is only for the month of the map

using baseline from 2001 to 2019.



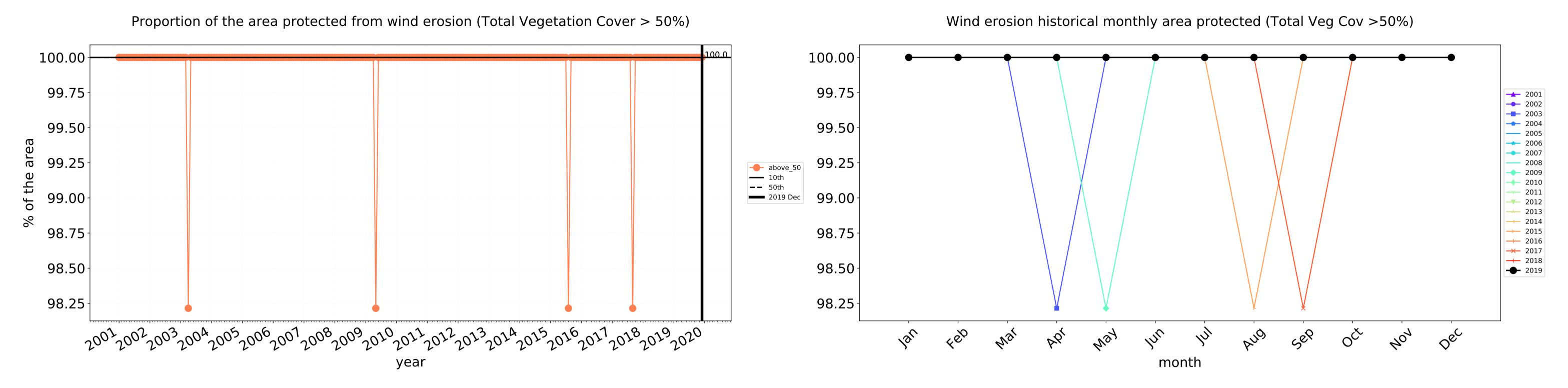


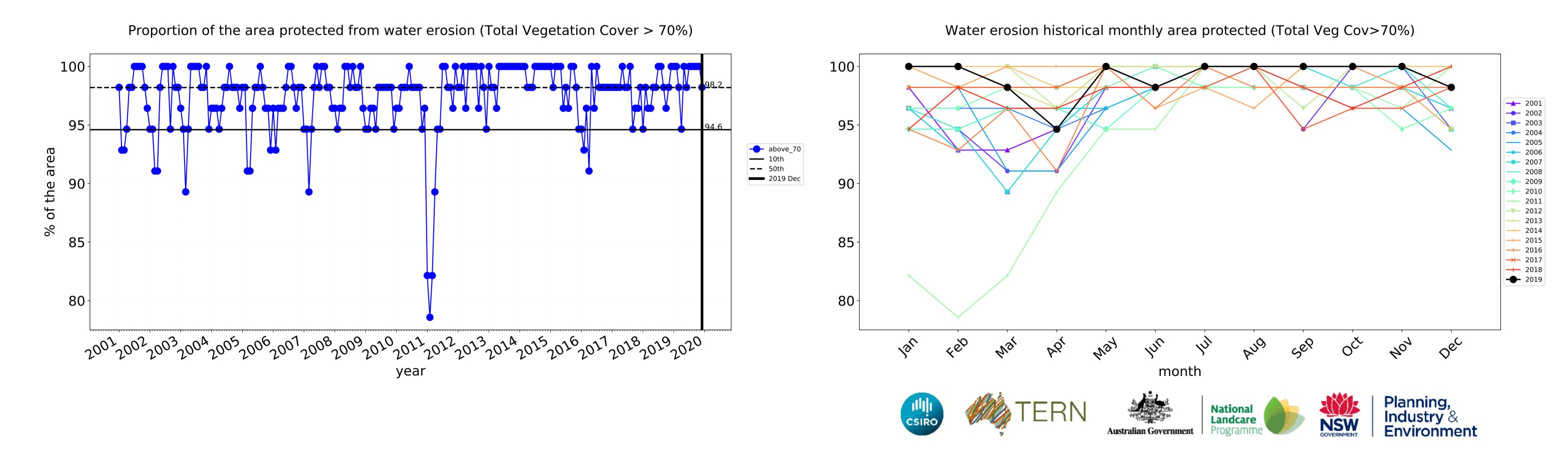


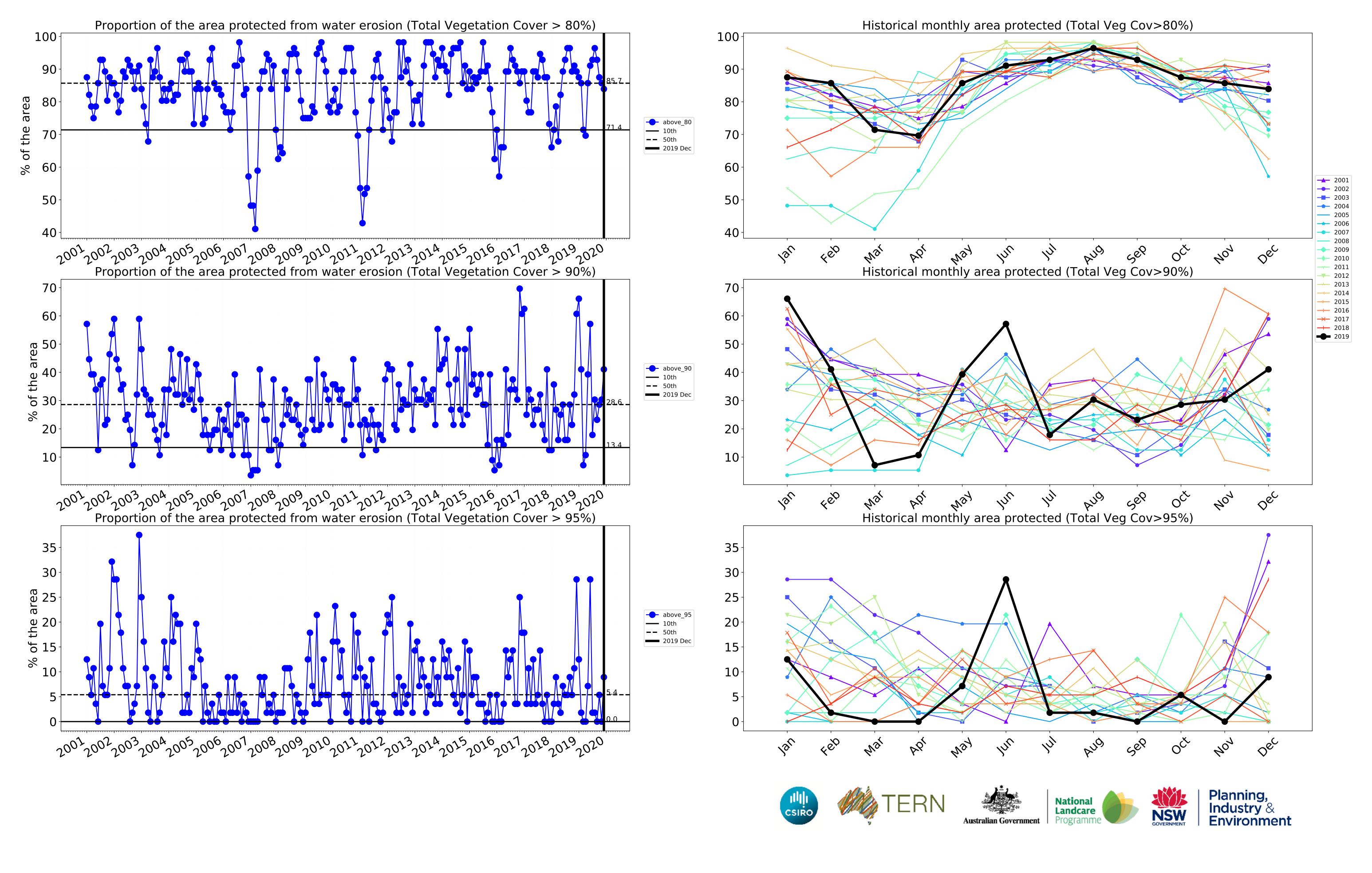




### **Irrigation timeseries**







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

### Land use and forest cover

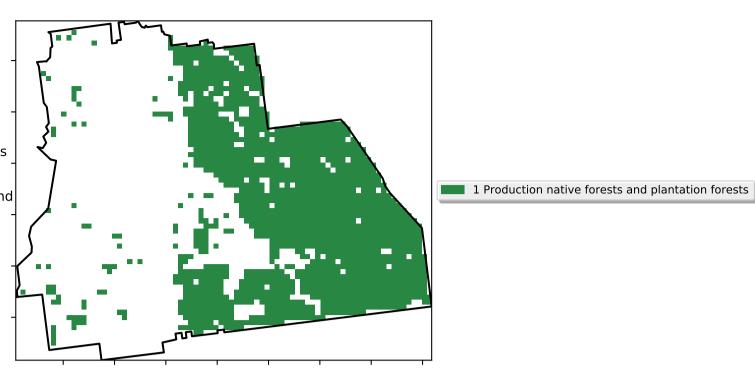
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

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

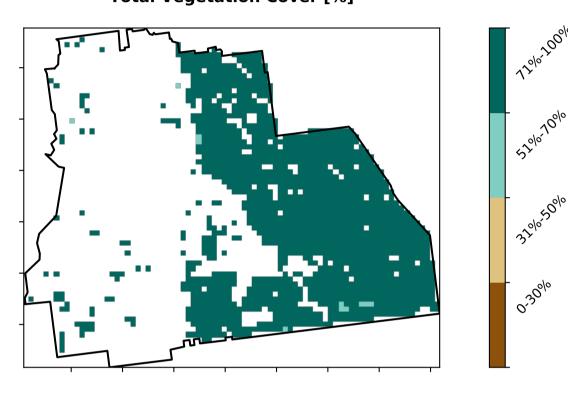
pixel. The mean

using baseline from 2001 to 2019.

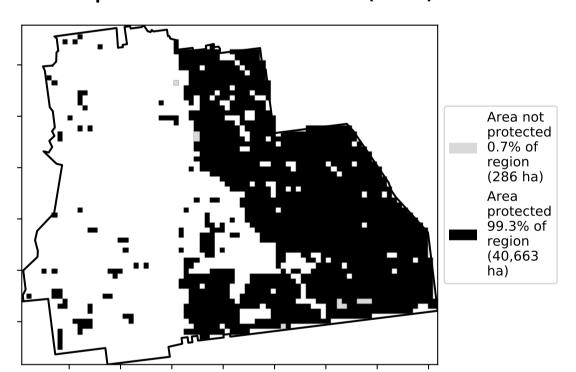
is only for the month of the map



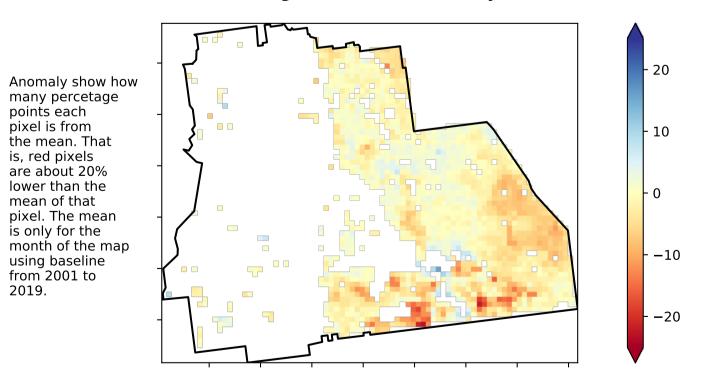
### **Total Vegetation Cover [%]**



% Area protected from water erosion (>70%)

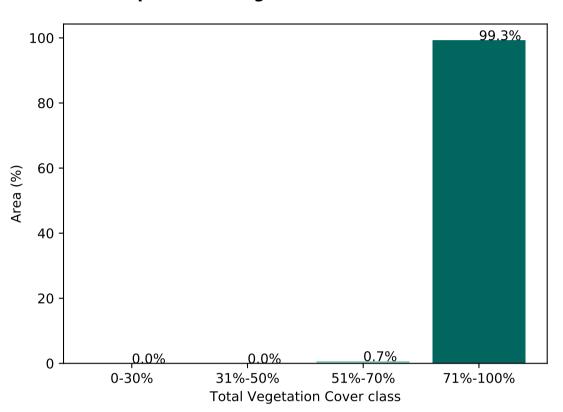


**Total Vegetation Cover Anomaly [%]** 



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.

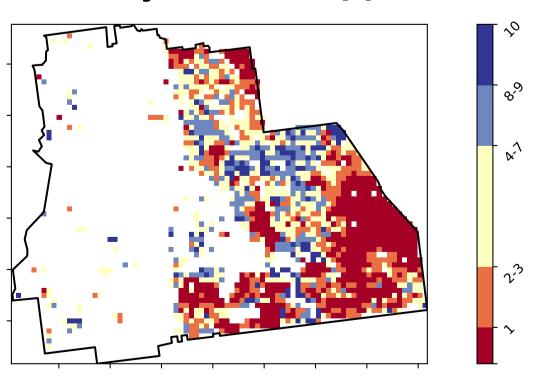
### Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 







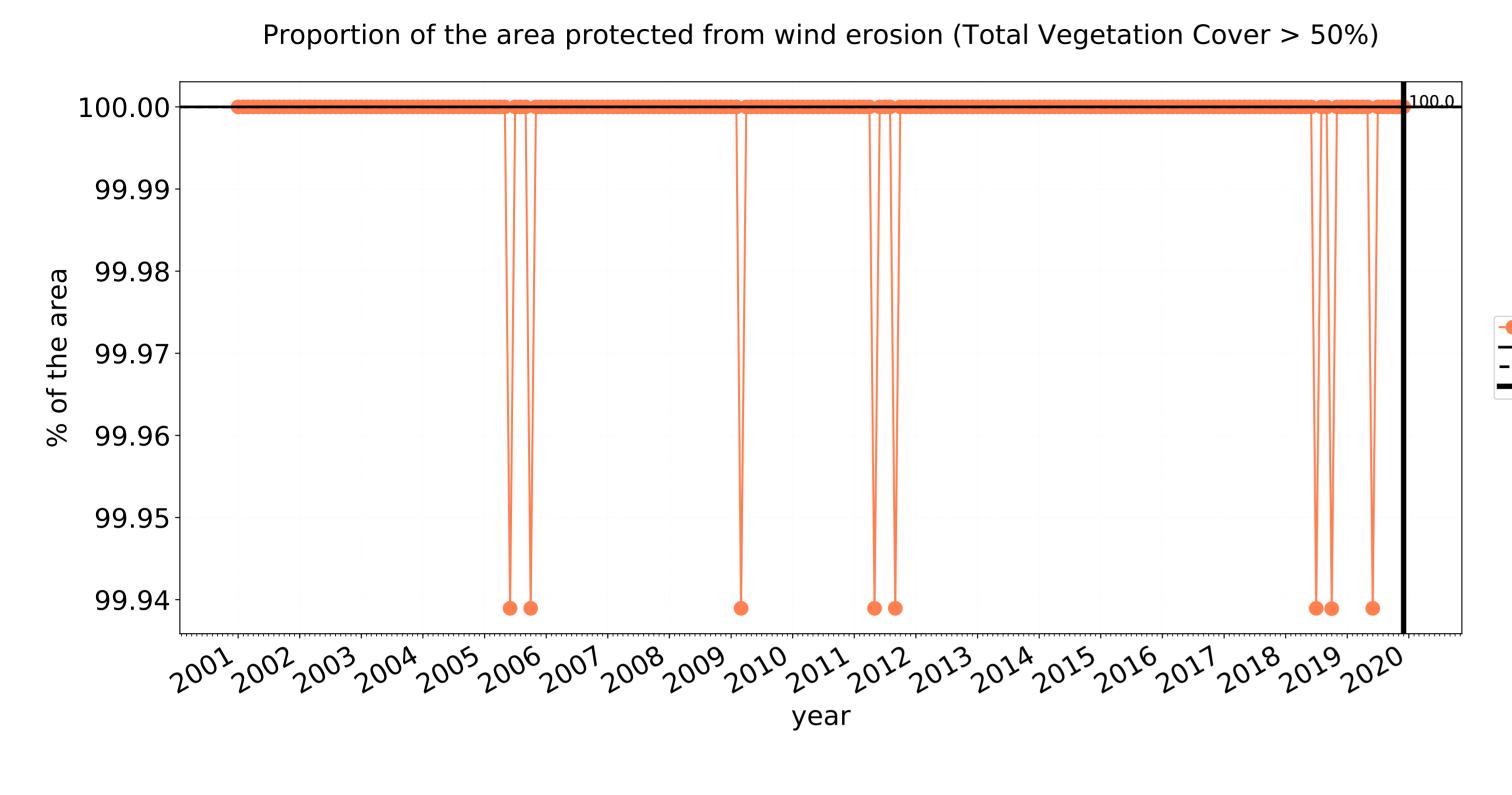


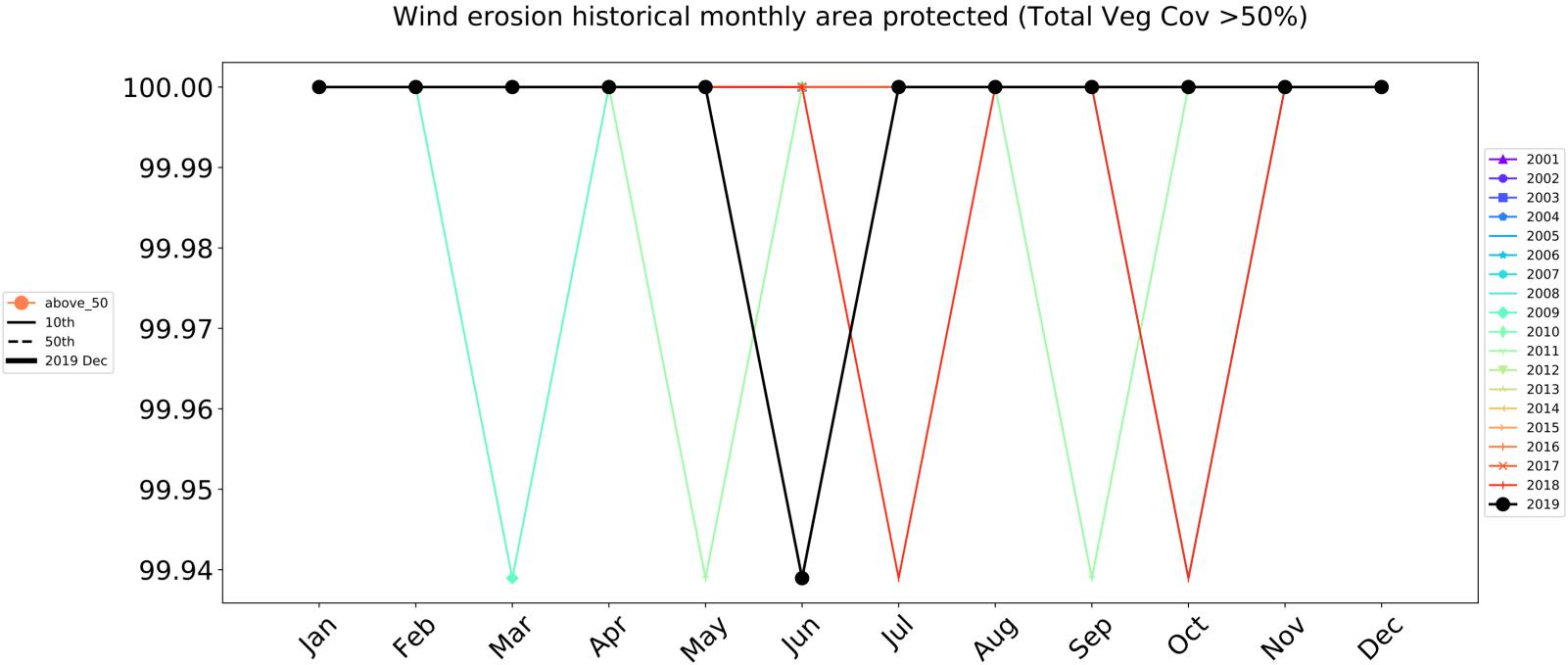




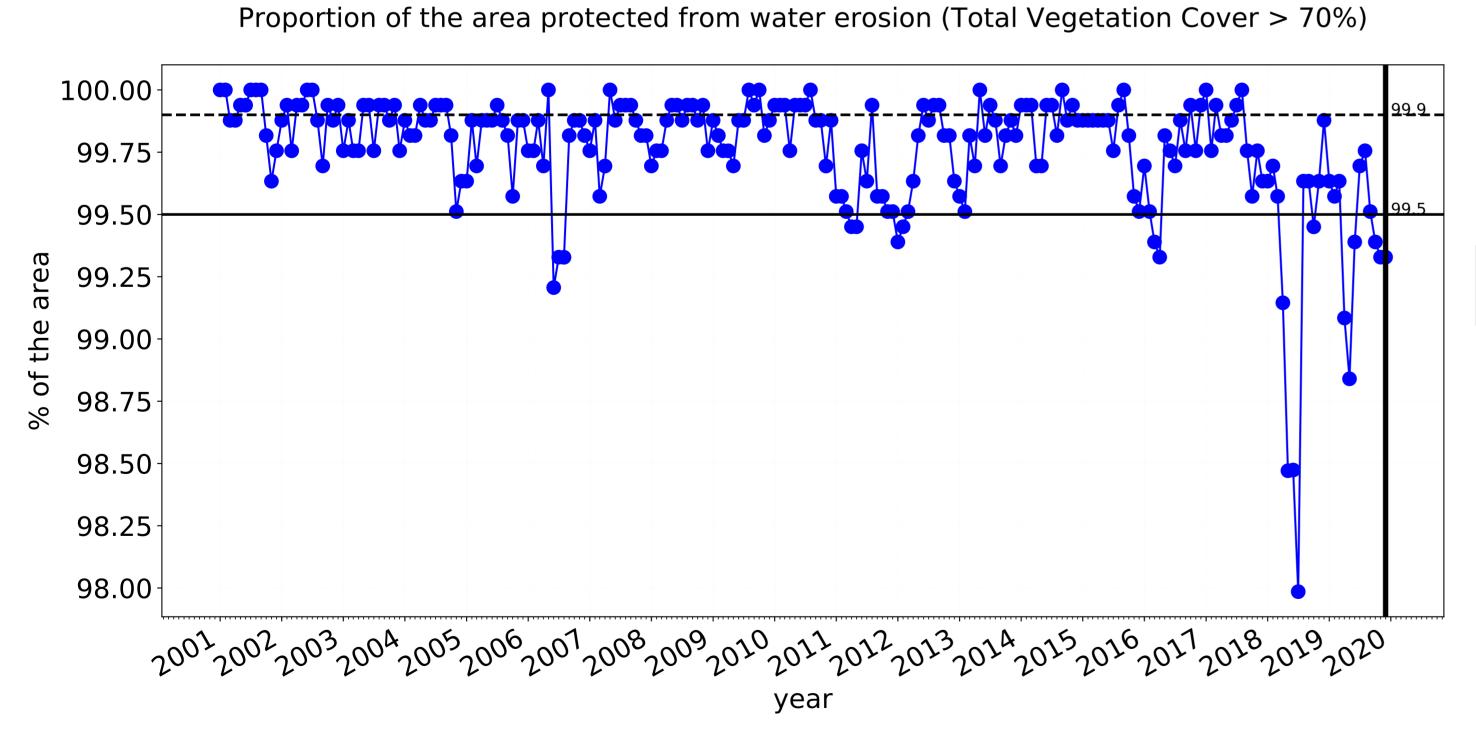


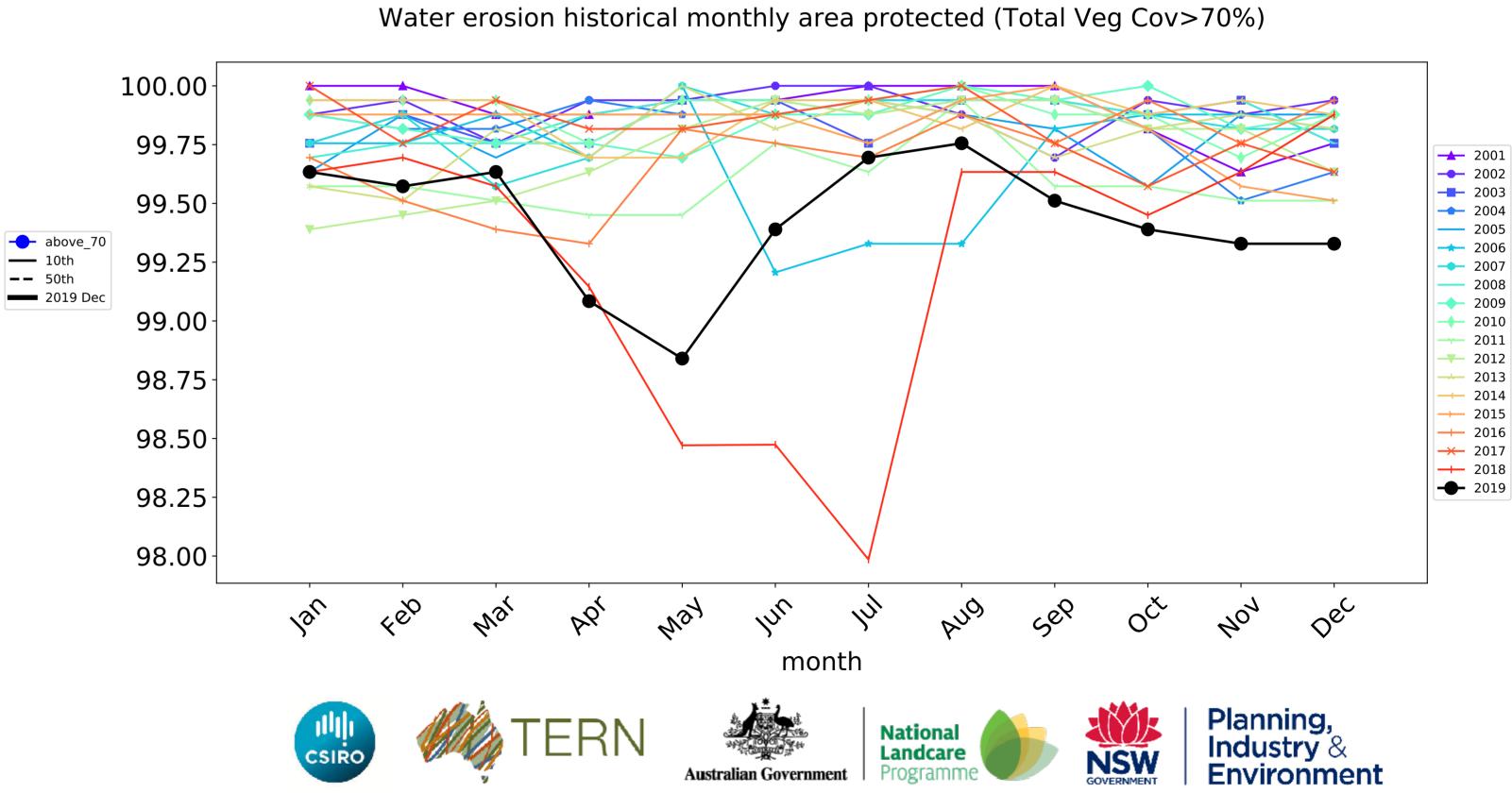
### **Production native forests and plantation forests timeseries**

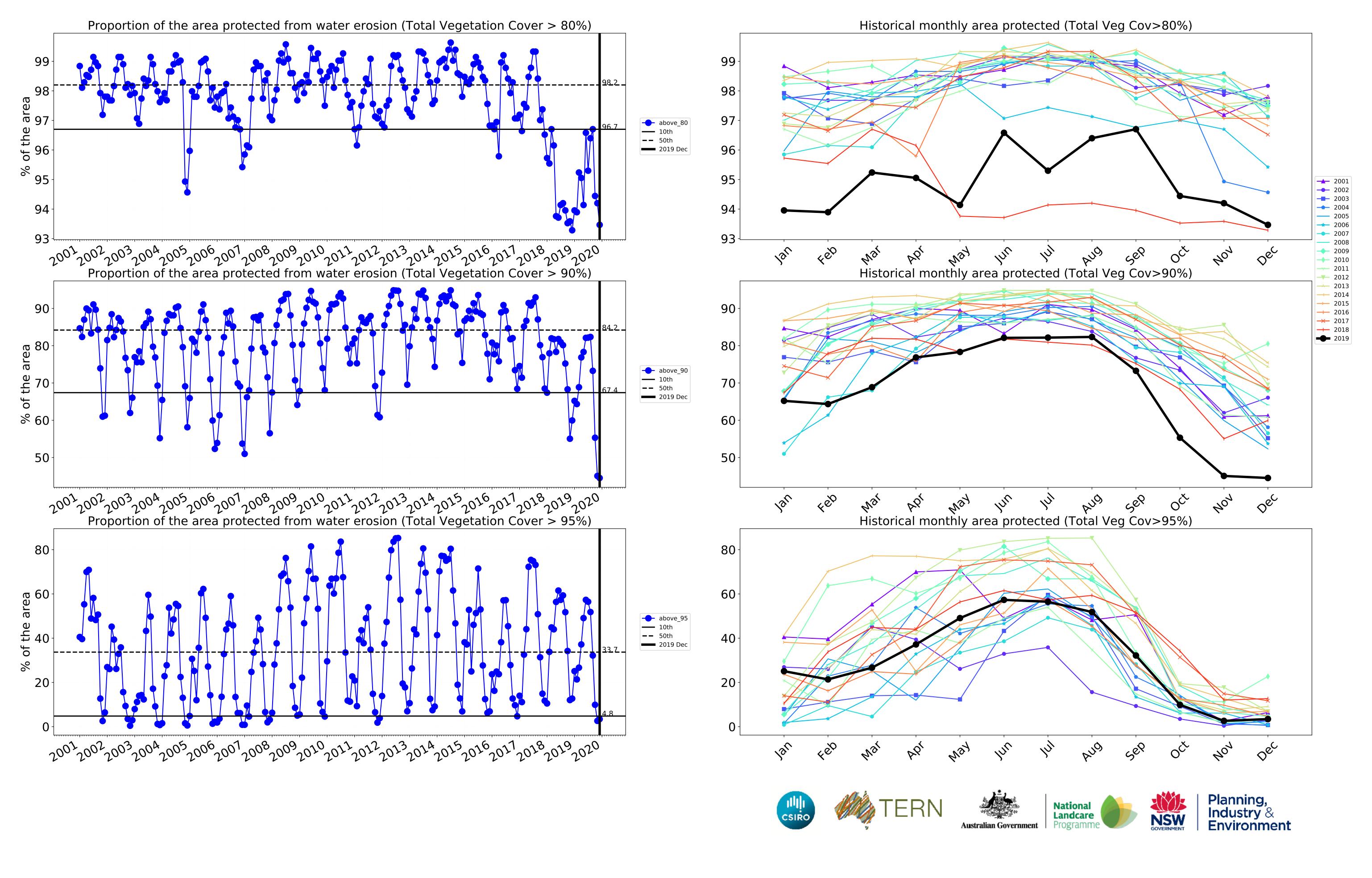




month







### Serpentine-Jarrahdale\_(S) (total 90,150 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	90,150	100.0% 90,150	100.0% 90,150	98.2% 88,525	87.0% 78,425	40.5% 36,550	6.7% 6,050
Conservation and natural environments	9,025	100.0% 9,025	100.0% 9,025	99.7% 9,000	93.4% 8,425	63.2% 5,700	13.0% 1,175
Conservation and natural environments non forest	1,325	100.0% 1,325	100.0% 1,325	100.0% 1,325	81.1% 1,075	47.2% 625	39.6% 525
Conservation and natural environments Woodland forest	3,275	100.0% 3,275	100.0% 3,275	99.2% 3,250	90.8% 2,975	54.2% 1,775	0.8% 25
Conservation and natural environments Forest (non woodland)	4,425	100.0% 4,425	100.0% 4,425	100.0% 4,425	98.9% 4,375	74.6% 3,300	14.1% 625
Agriculture	15,350	100.0% 15,350	100.0% 15,350	98.7% 15,150	86.3% 13,250	34.2% 5,250	6.2% 950
Grazing	7,275	100.0% 7,275	100.0% 7,275	100.0% 7,275	92.8% 6,750	47.8% 3,475	8.6% 625
Grazing non forest	7,275	100.0% 7,275	100.0% 7,275	100.0% 7,275	92.8% 6,750	47.8% 3,475	8.6% 625
Cropping	6,675	100.0% 6,675	100.0% 6,675	97.4% 6,500	79.8% 5,325	18.0% 1,200	3.0% 200
Irrigation	1,400	100.0% 1,400	100.0% 1,400	98.2% 1,375	83.9% 1,175	41.1% 575	8.9% 125
Production native forests and plantation forests	40,950	100.0% 40,950	100.0% 40,950	99.3% 40,675	93.5% 38,275	44.5% 18,225	3.4% 1,400











