## Total vegetation cover soil protection Region:LGA Mackay\_(R) QLD

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: June 2022

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 Jun 2022**

### Land use and forest cover

Catchment Scale

of Australia (2018)

Derived from

Use of Australia

(2018) and Forests

of Australia (2018)

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

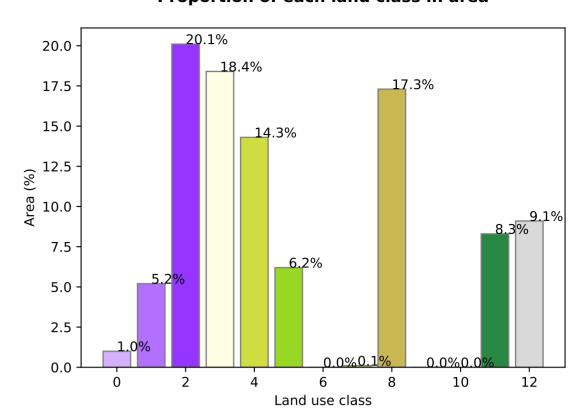
using baseline from 2001 to

2019.

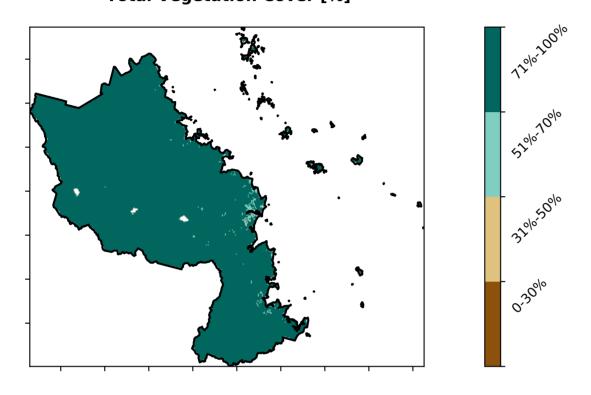
Land Use and Forests

### 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 - 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 forests 13 Other uses

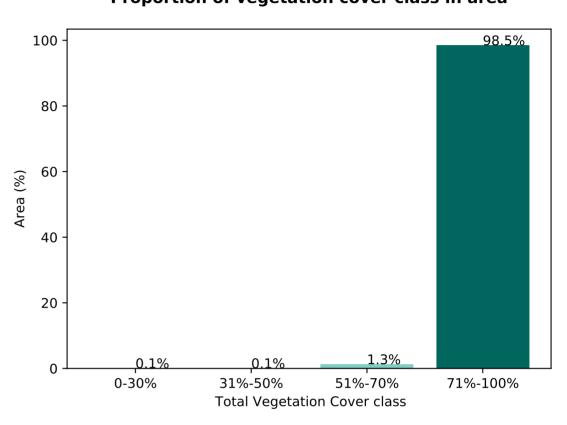
### **Proportion of each land class in area**



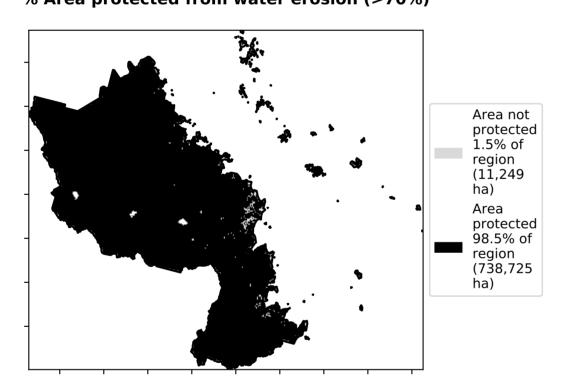
### **Total Vegetation Cover [%]**



Proportion of vegetation cover class in area



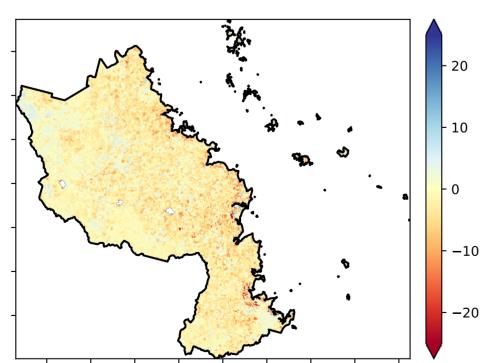
### % Area protected from water erosion (>70%)



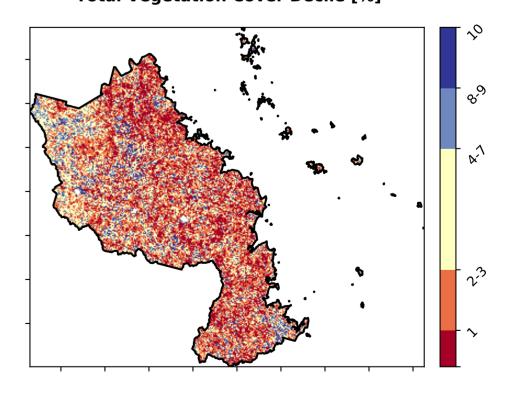
% Area protected from wind erosion (>50%)



### **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.

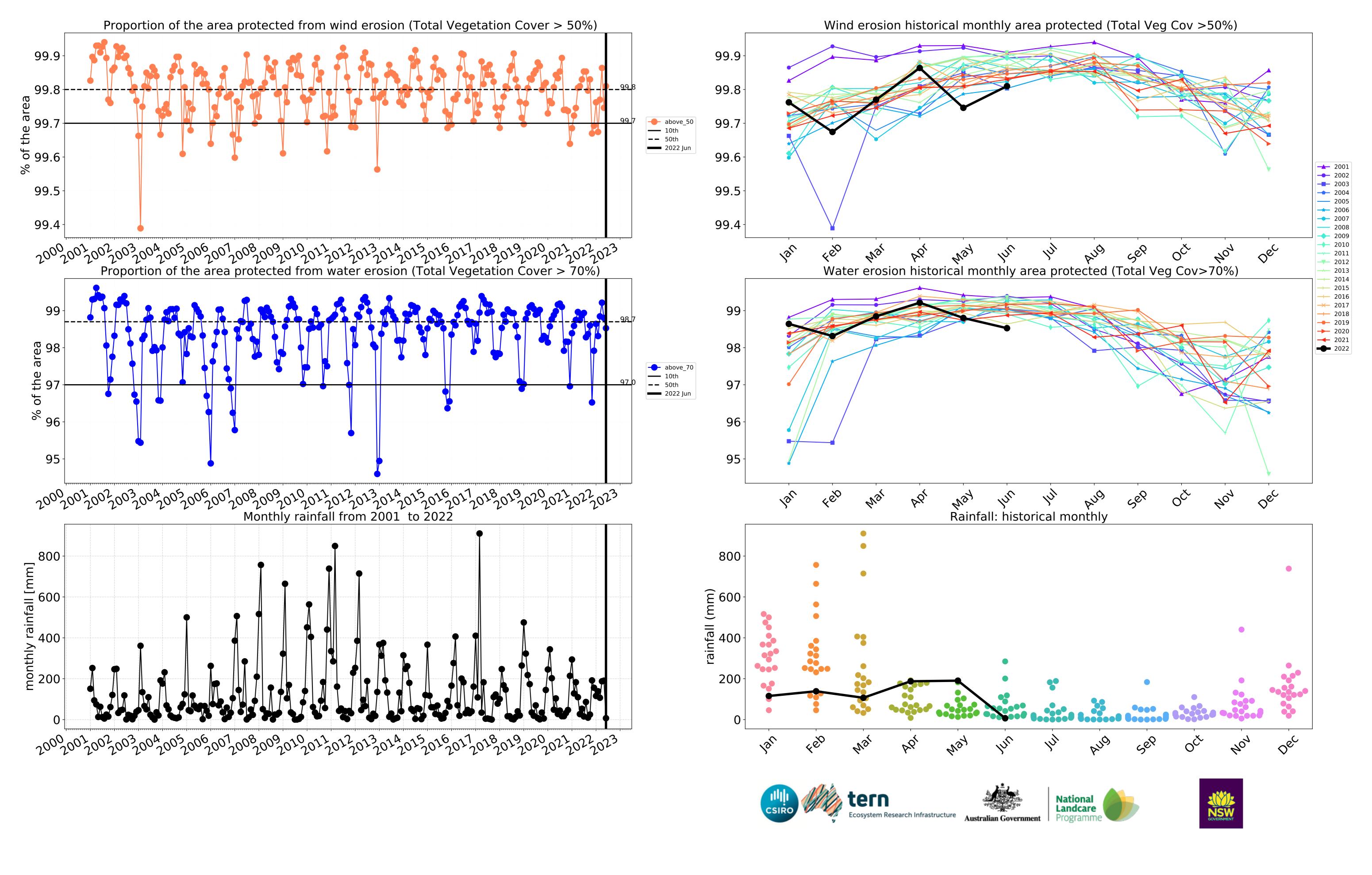


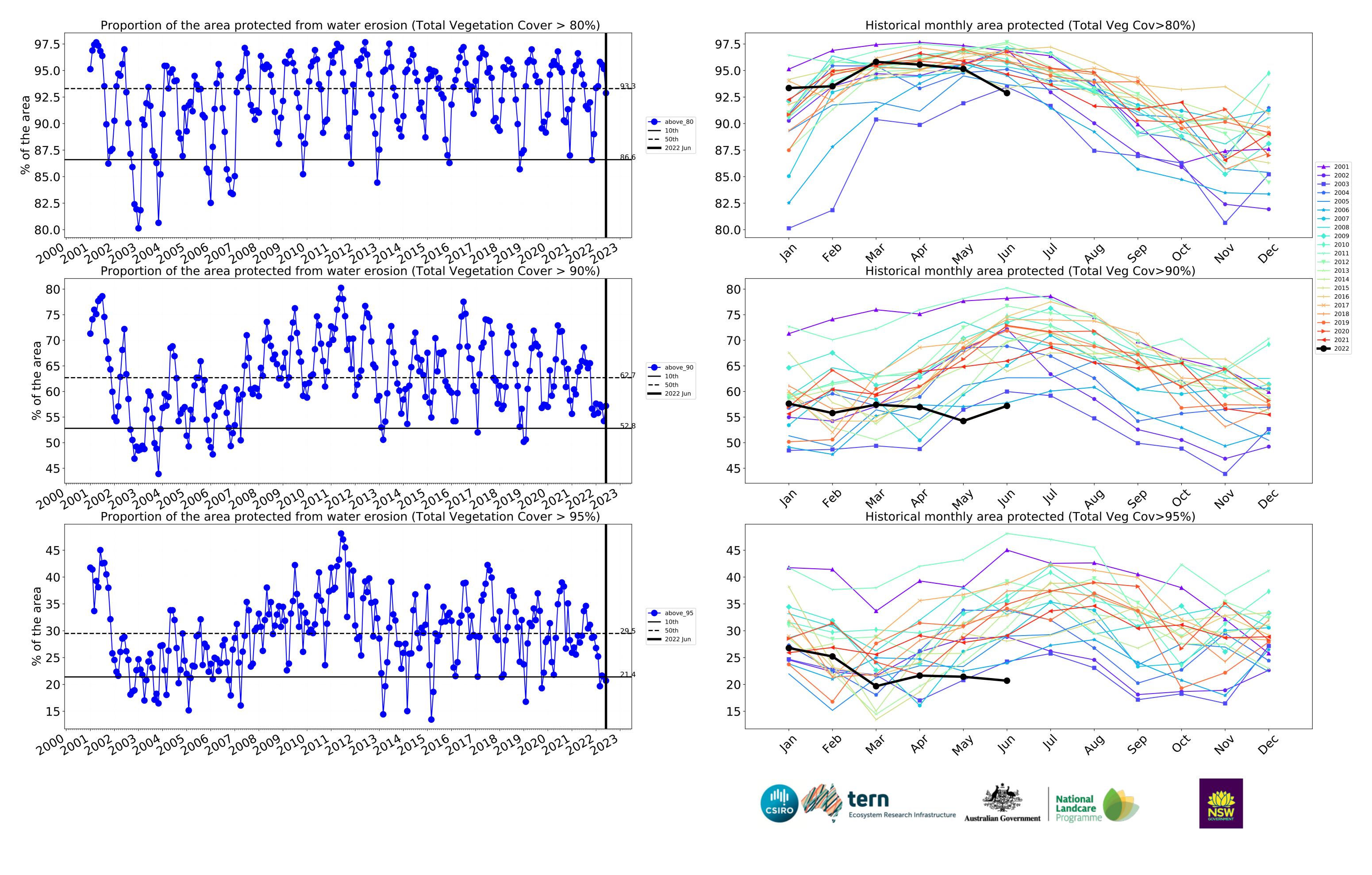










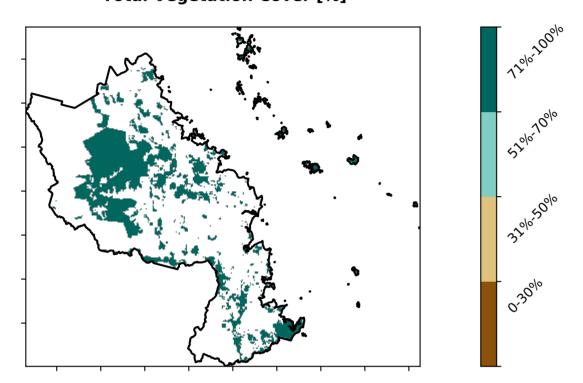


### **Conservation and natural environments**

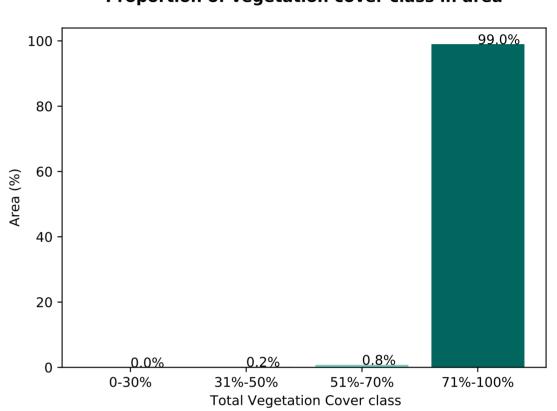
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) Australia (2018) Catchment Scale Land Catchment S

### **Proportion of each land class in area** 80 76.5% 70 60 50 Area (%) 30 19.8% 20 10 3.7% 1.0 2.0 2.5 1.5 -0.50.0 0.5 Land use class

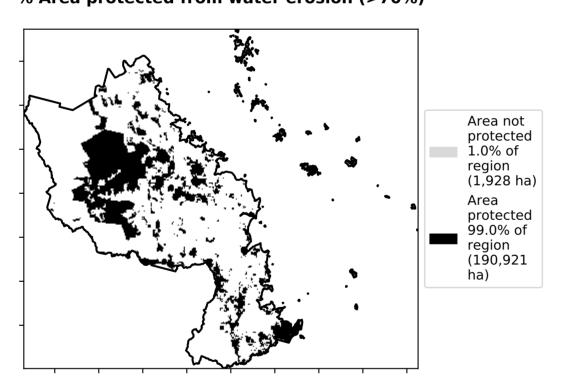
### **Total Vegetation Cover [%]**



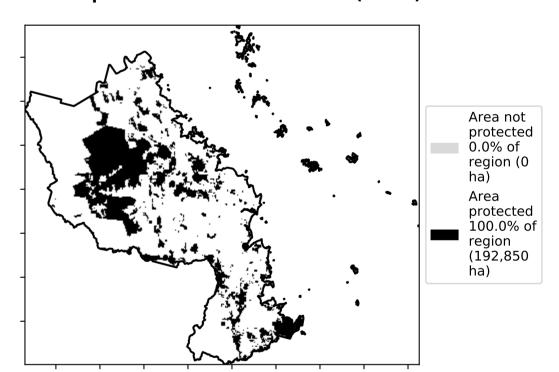
Proportion of vegetation cover class in area



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



% Area protected from wind erosion (>50%)



### Total Vegetation Cover Anomaly [%]

Anomaly show how many percetage points each pixel is from

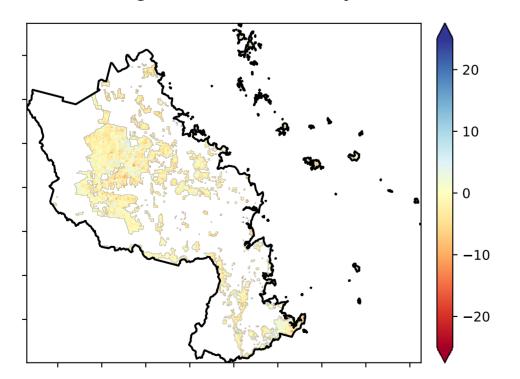
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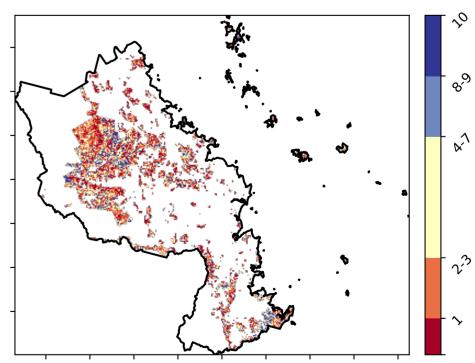
using baseline from 2001 to 2019.

is only for the month of the map

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



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



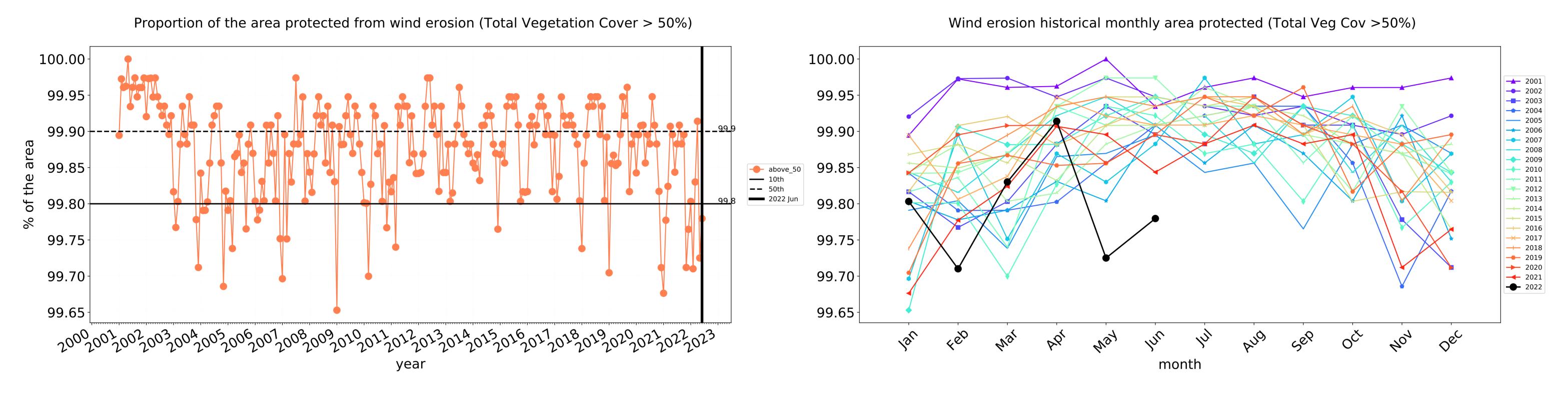


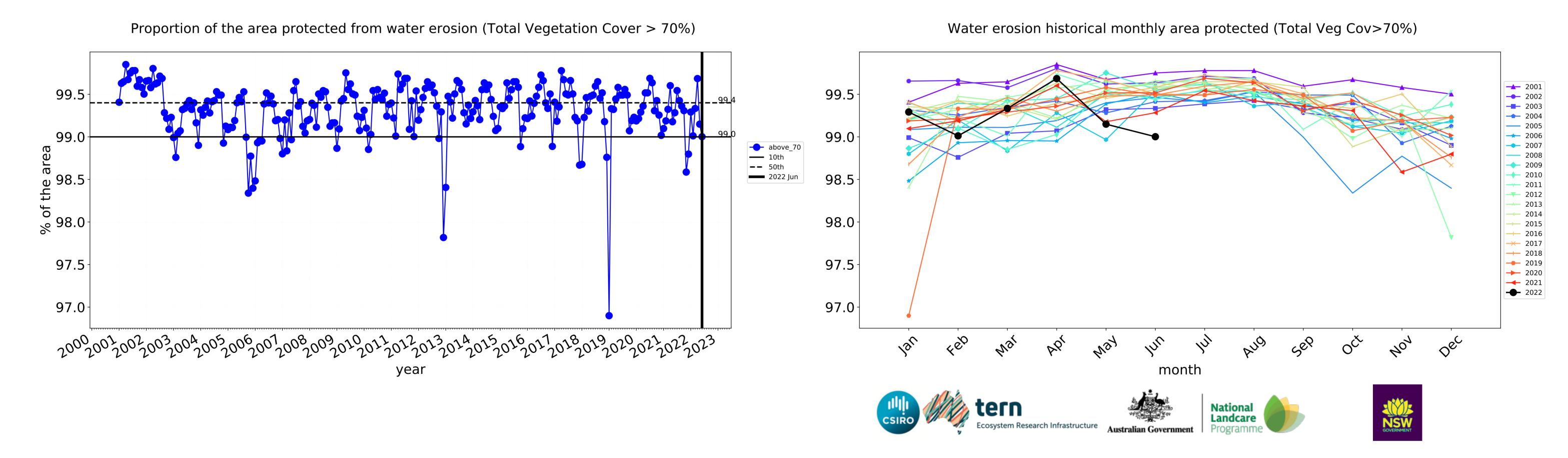


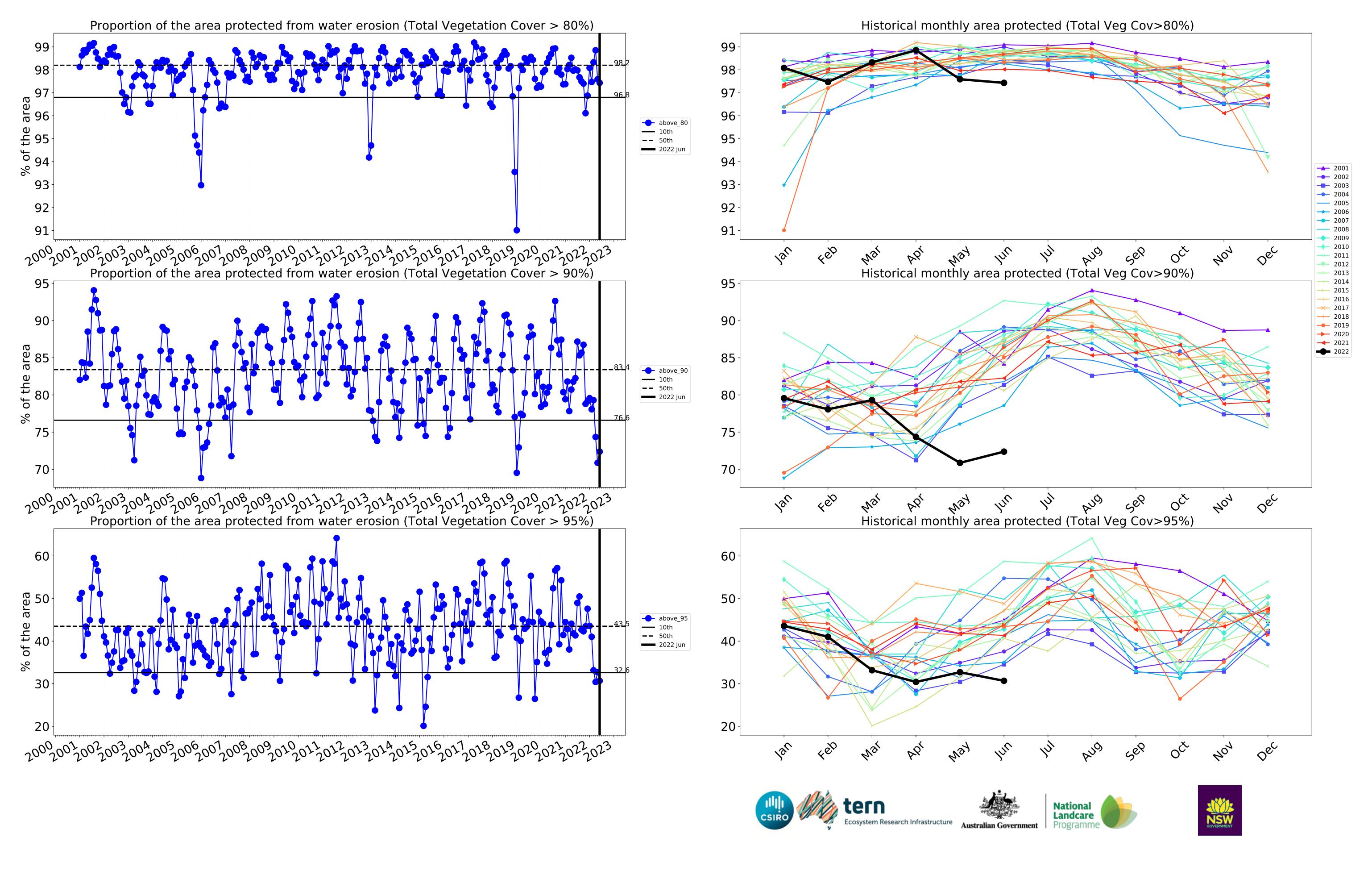




### **Conservation and natural environments timeseries**



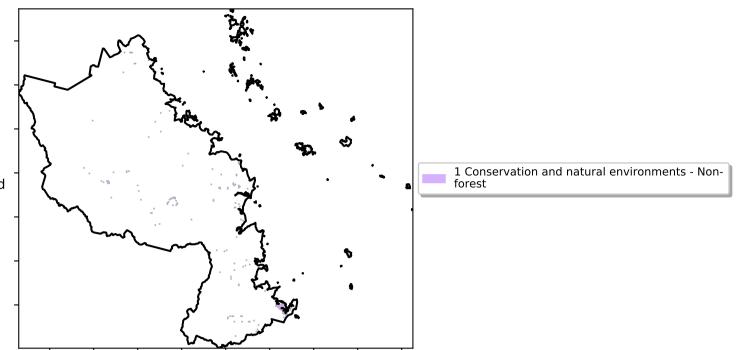




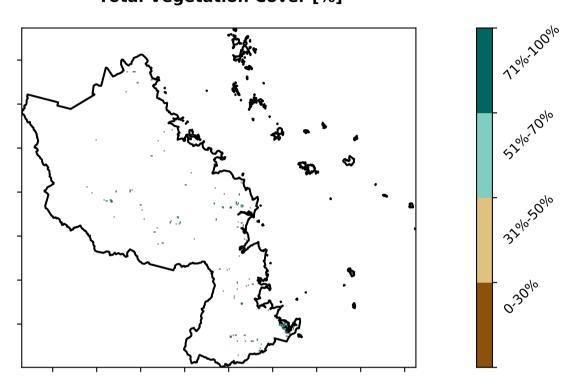
### **Conservation and natural environments non forest**

### Land use and forest cover

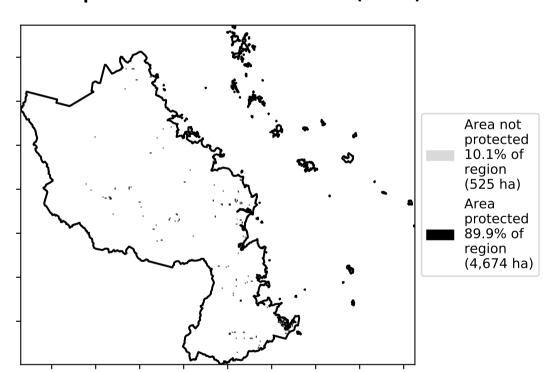
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



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



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



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

Anomaly show how many percetage points each pixel is from

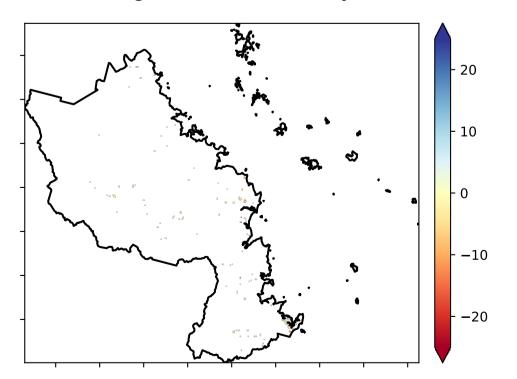
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using baseline from 2001 to 2019.

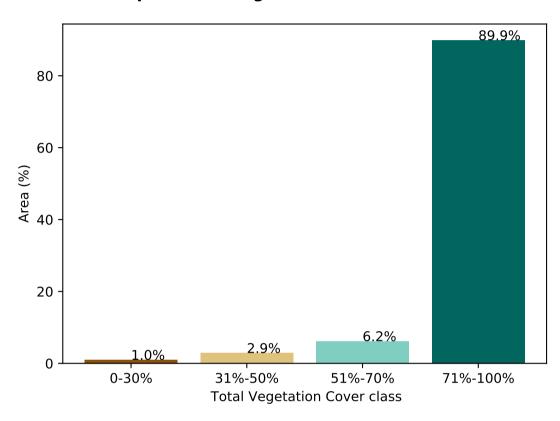
is only for the month of the map

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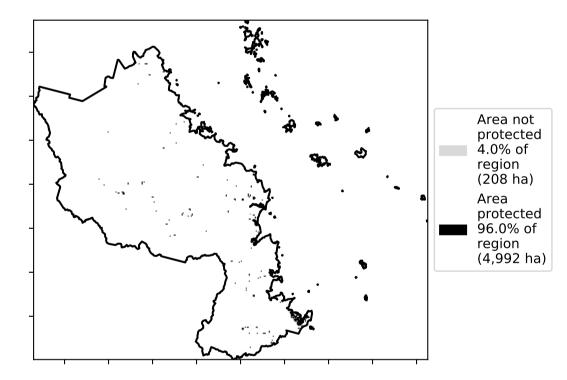


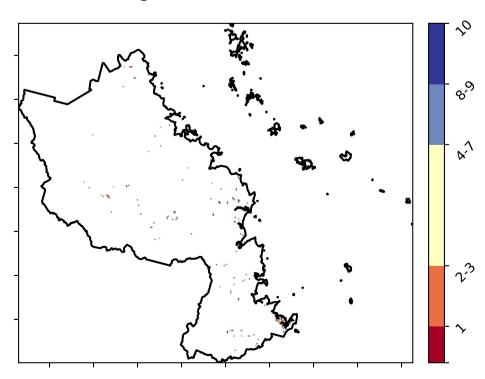
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### Proportion of vegetation cover class in area



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







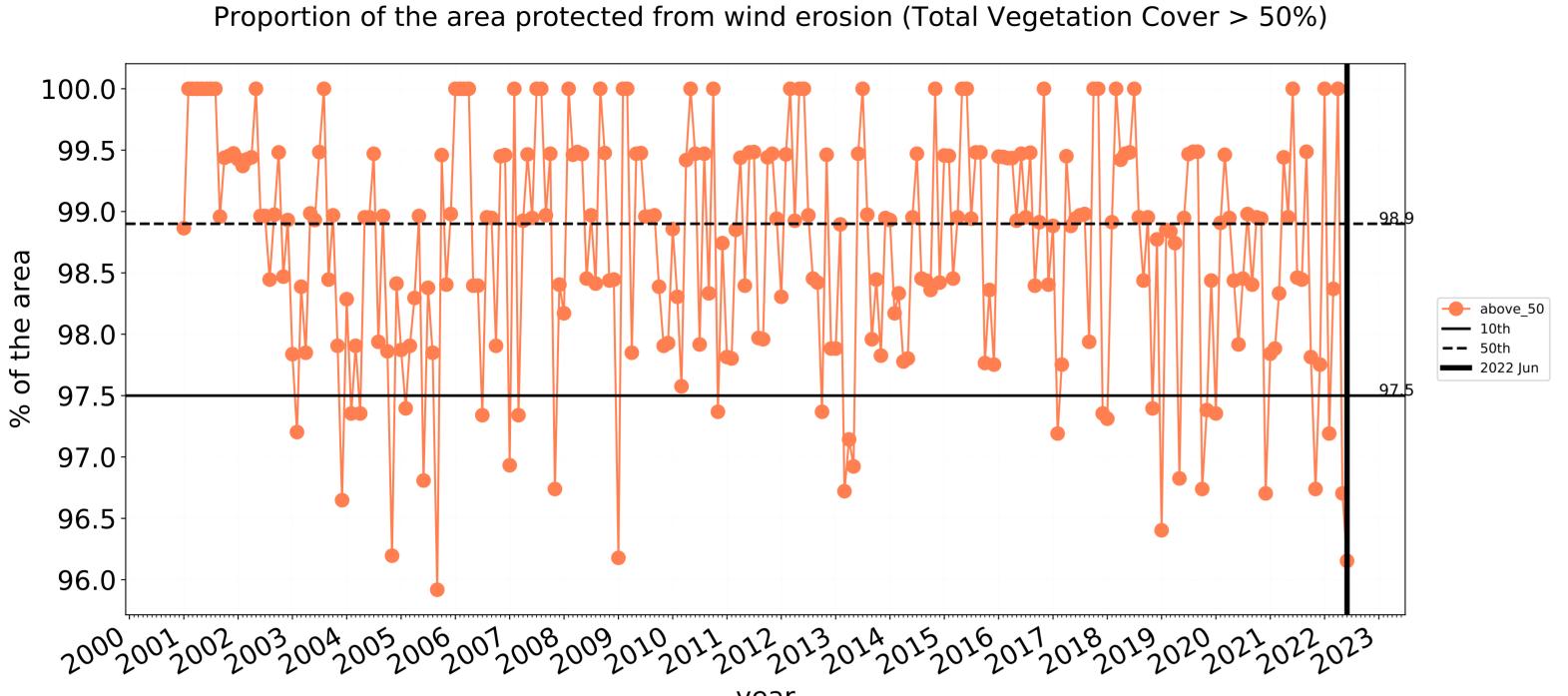


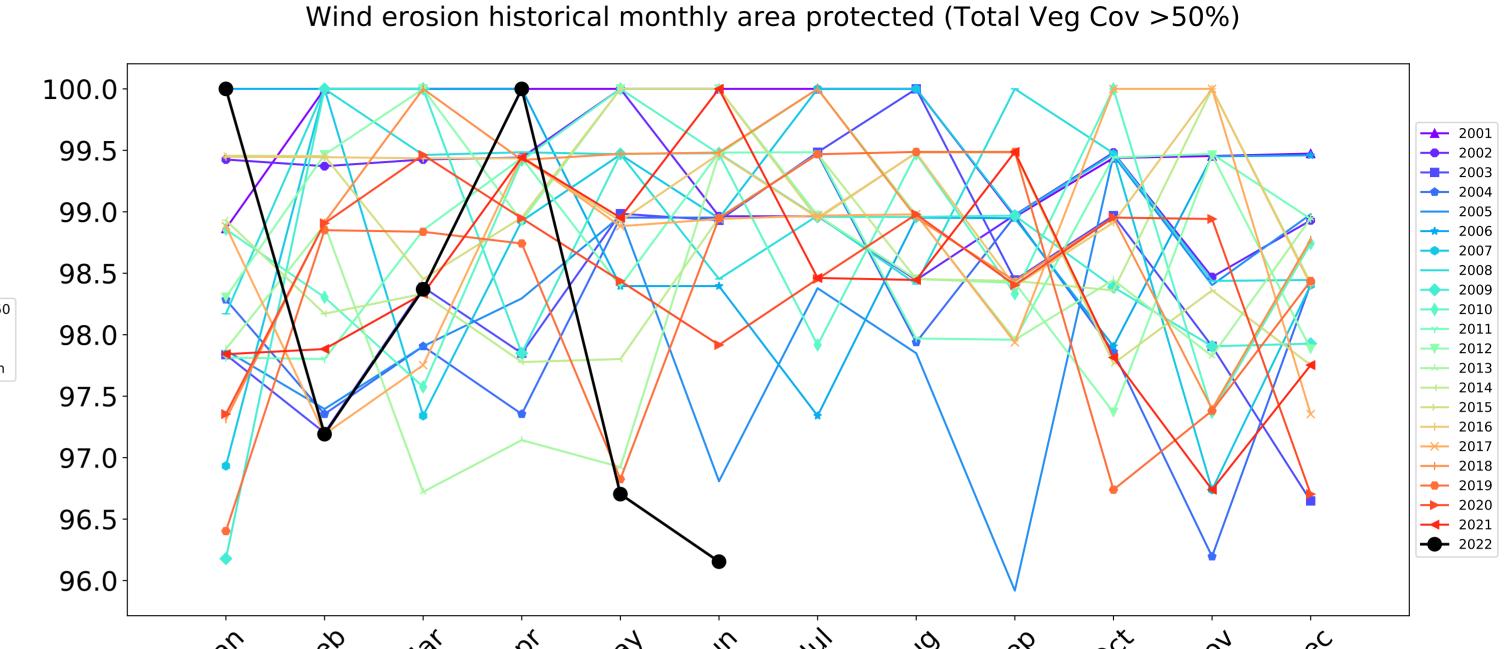




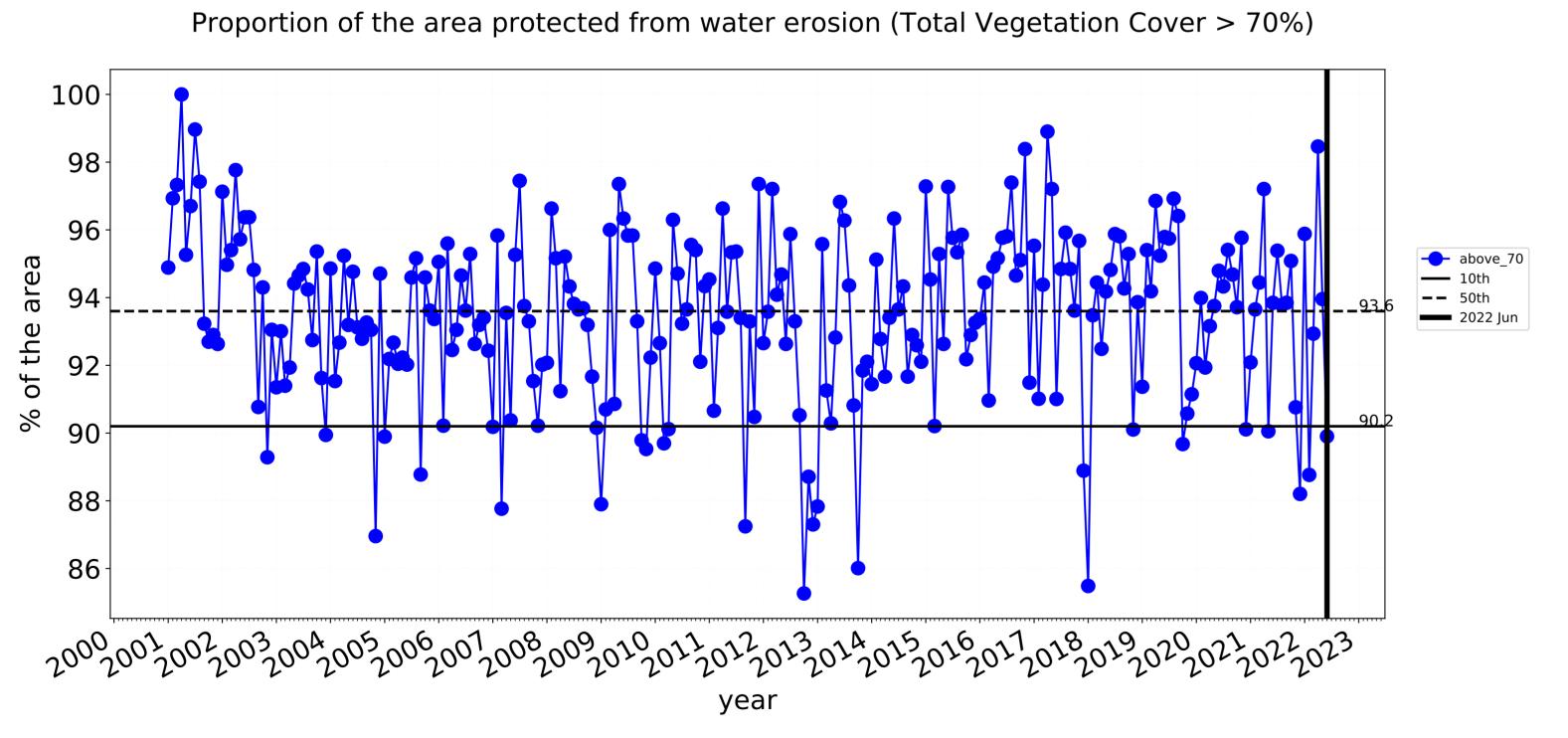


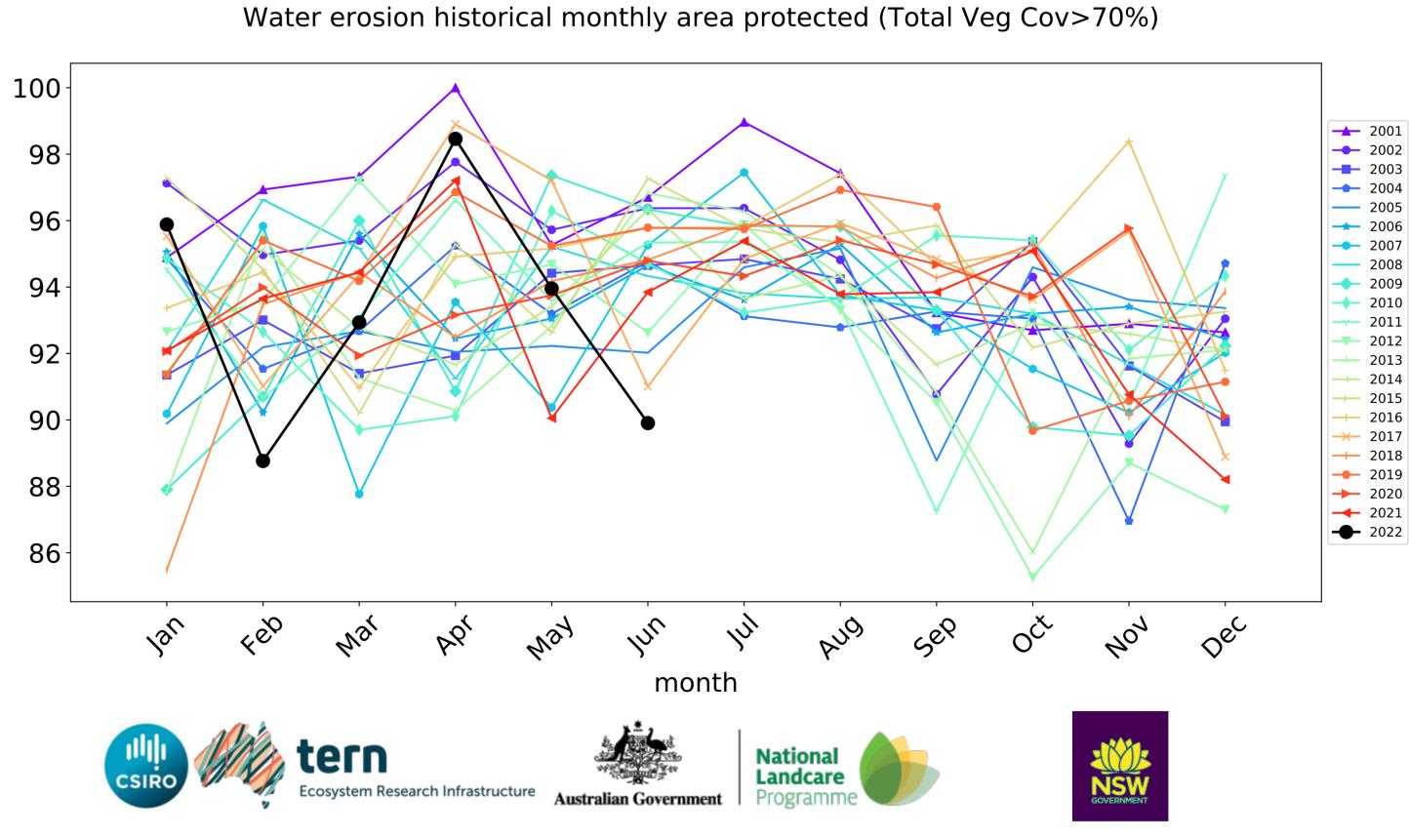
### **Conservation and natural environments non forest timeseries**

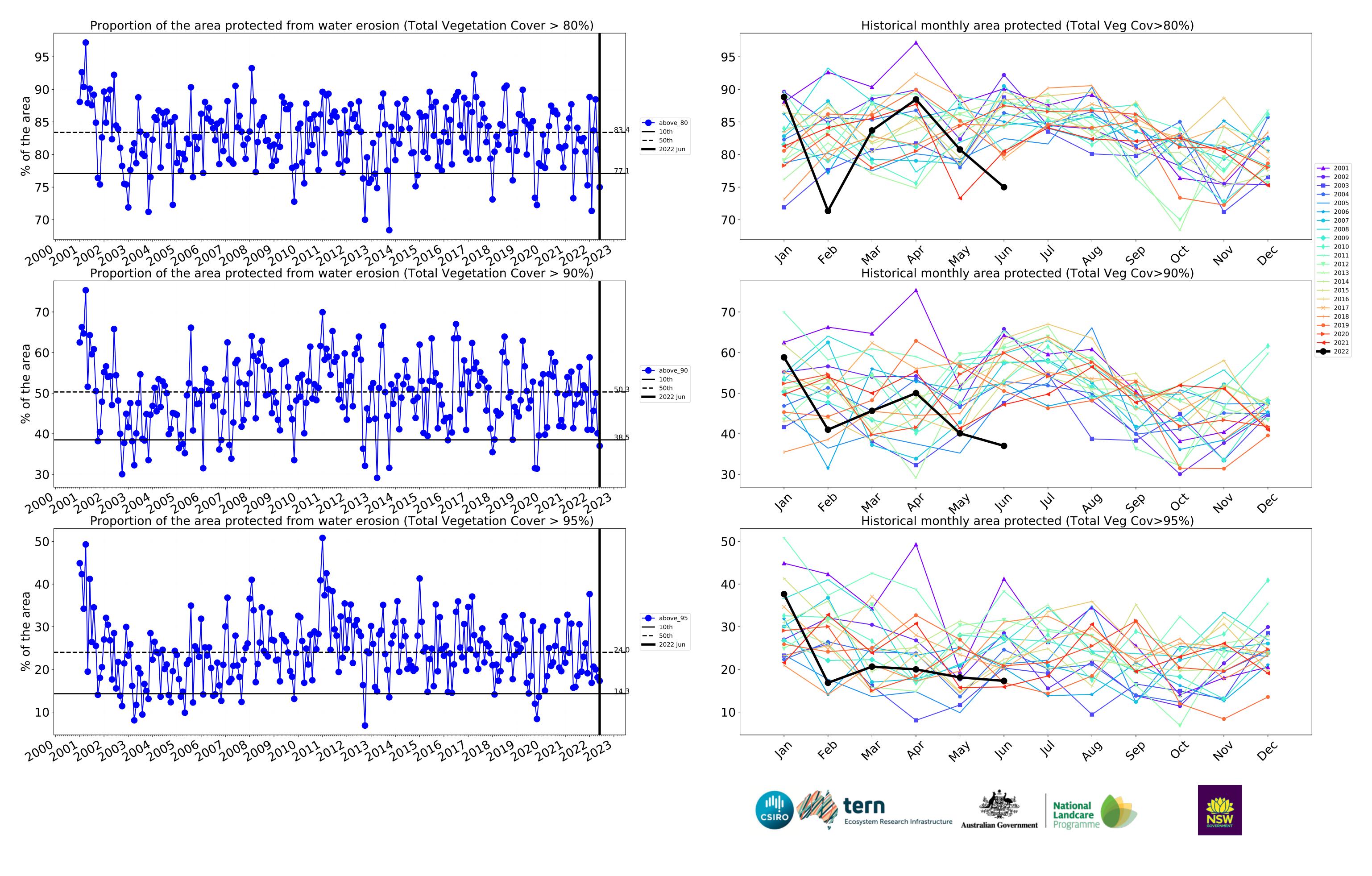




month







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

Catchment Scale Land Use and Forests of Australia (2018)

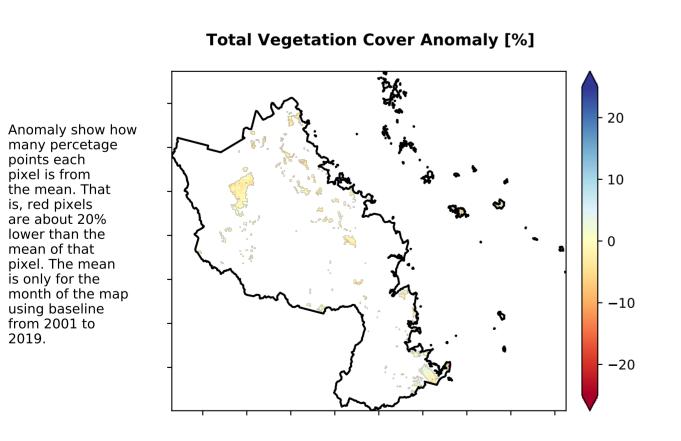
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Derived from

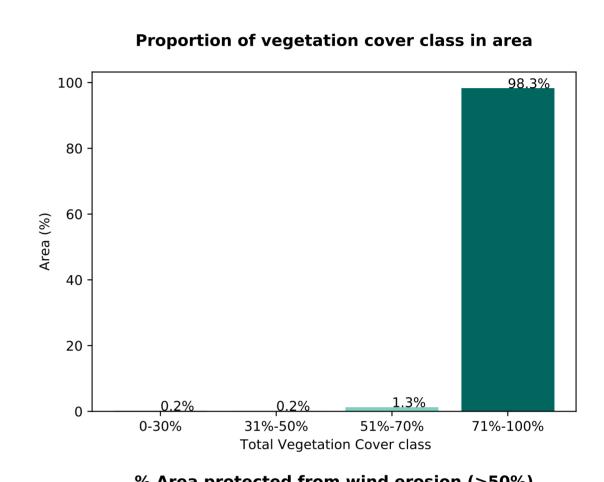
# Land use and forest cover 1 Conservation and natural environments - Woodland

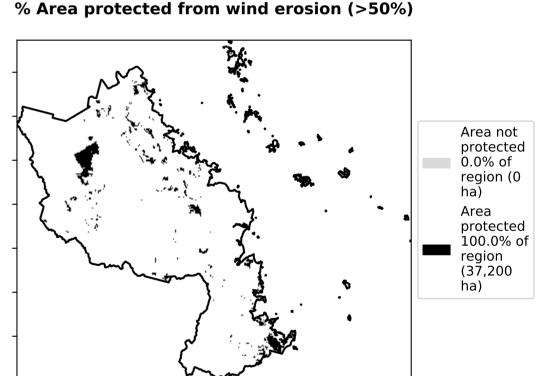
# **Total Vegetation Cover [%]**

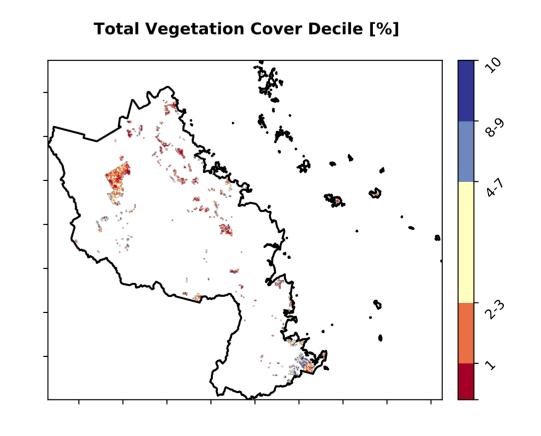
## % Area protected from water erosion (>70%) Area not protected 1.7% of region (632 ha) Area protected 98.3% of region (36,567 ha)



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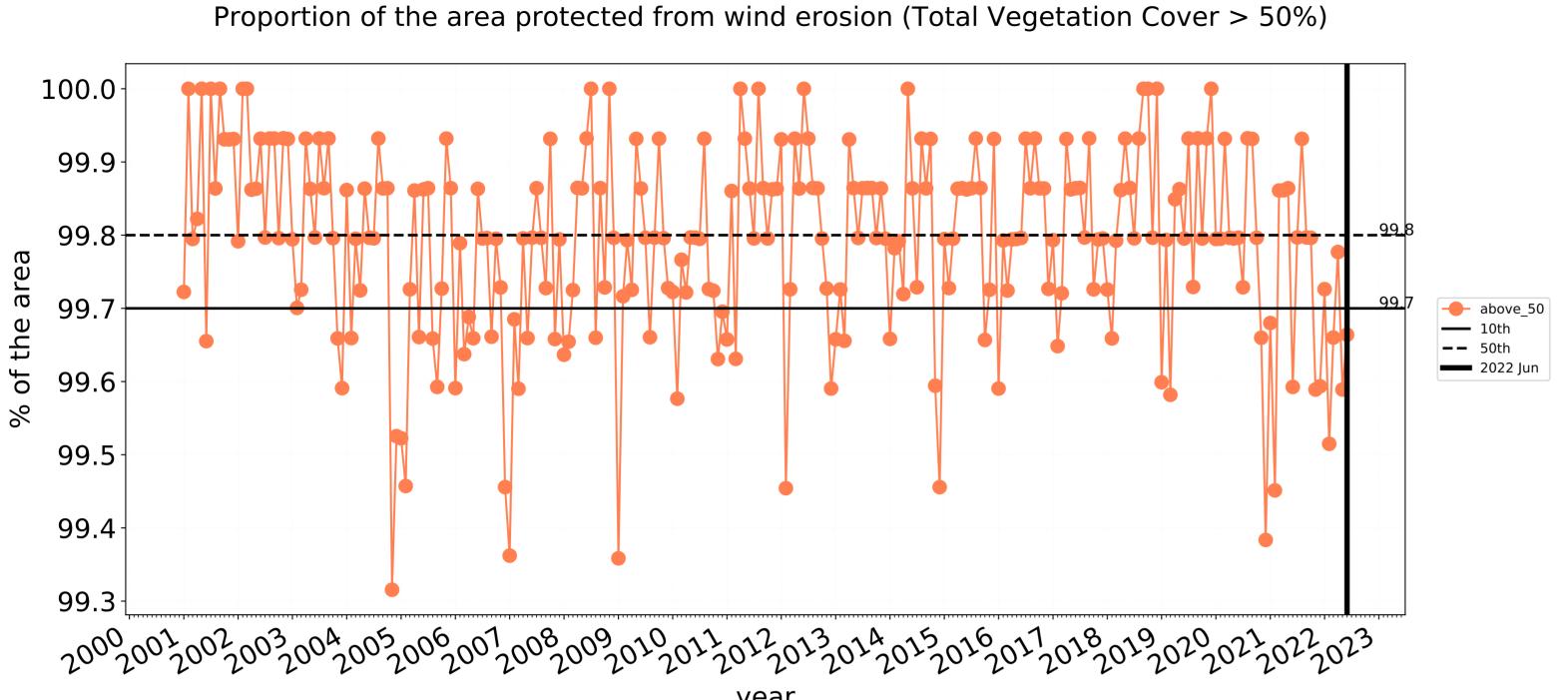


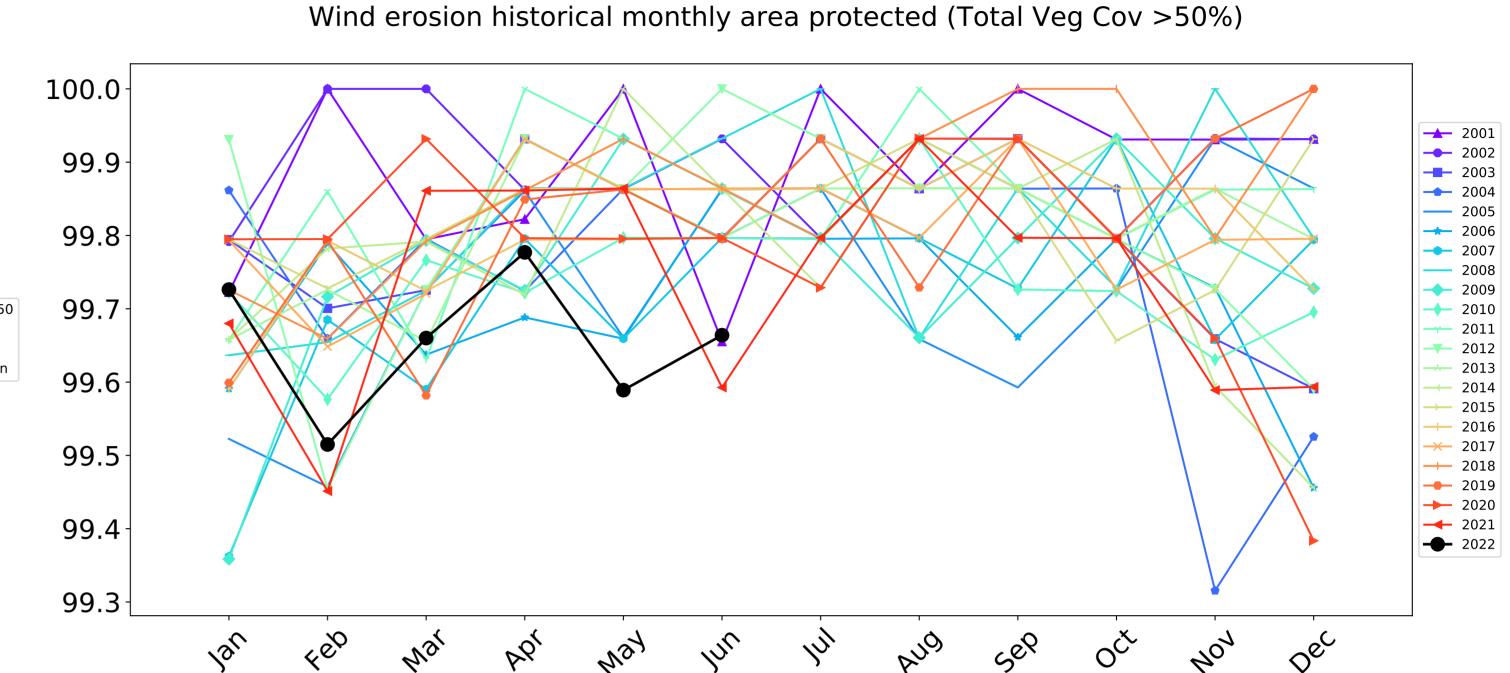




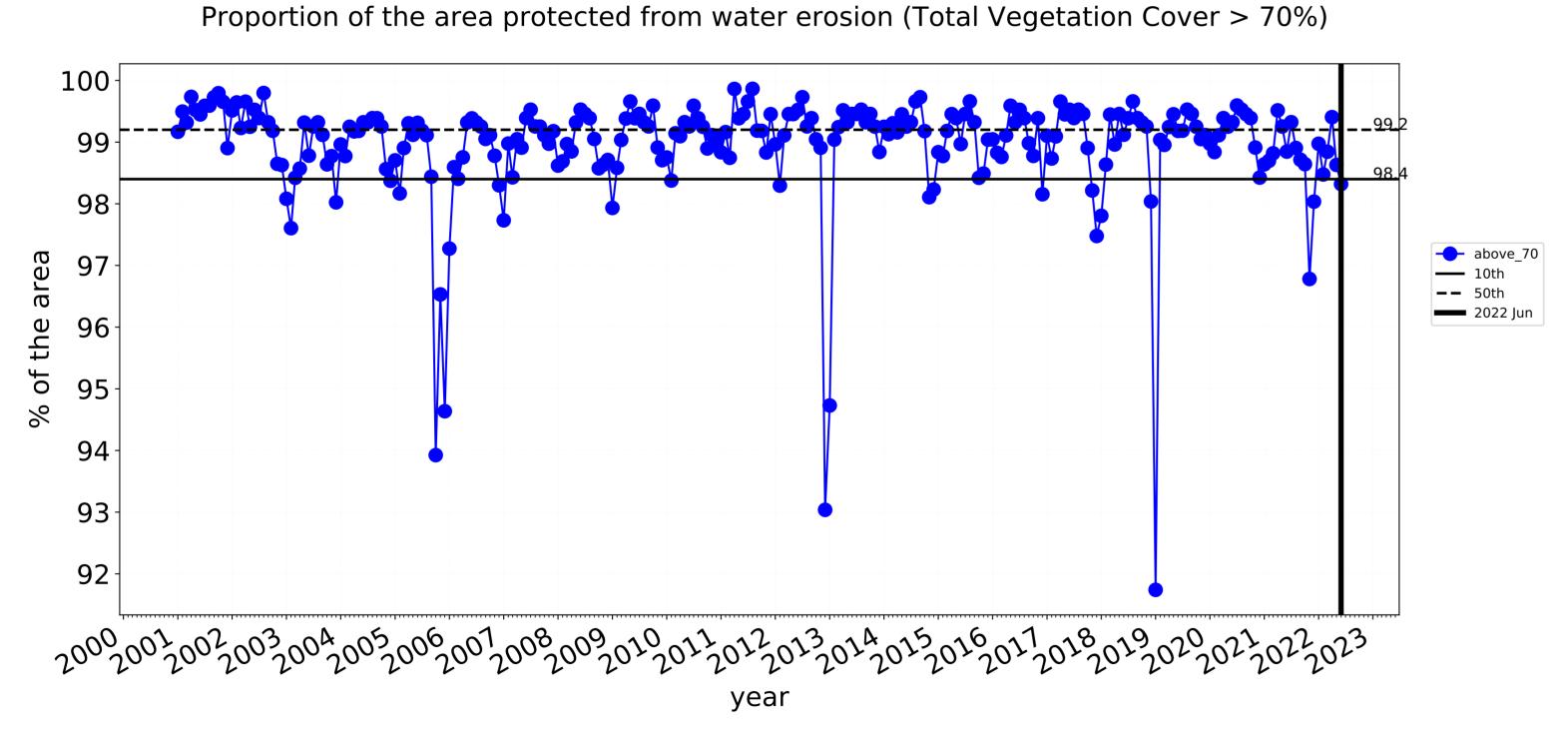


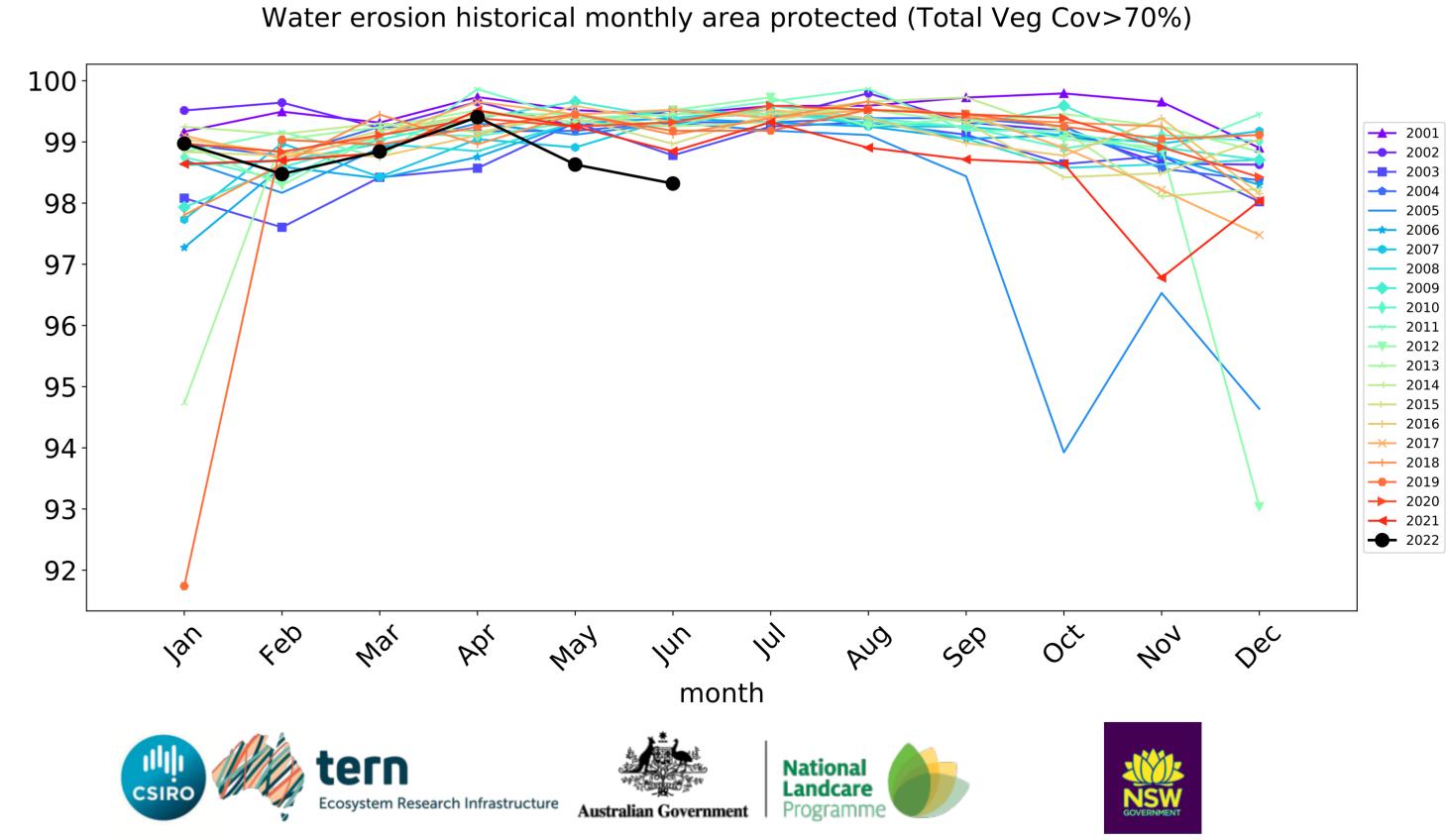
### **Conservation and natural environments Woodland forest timeseries**

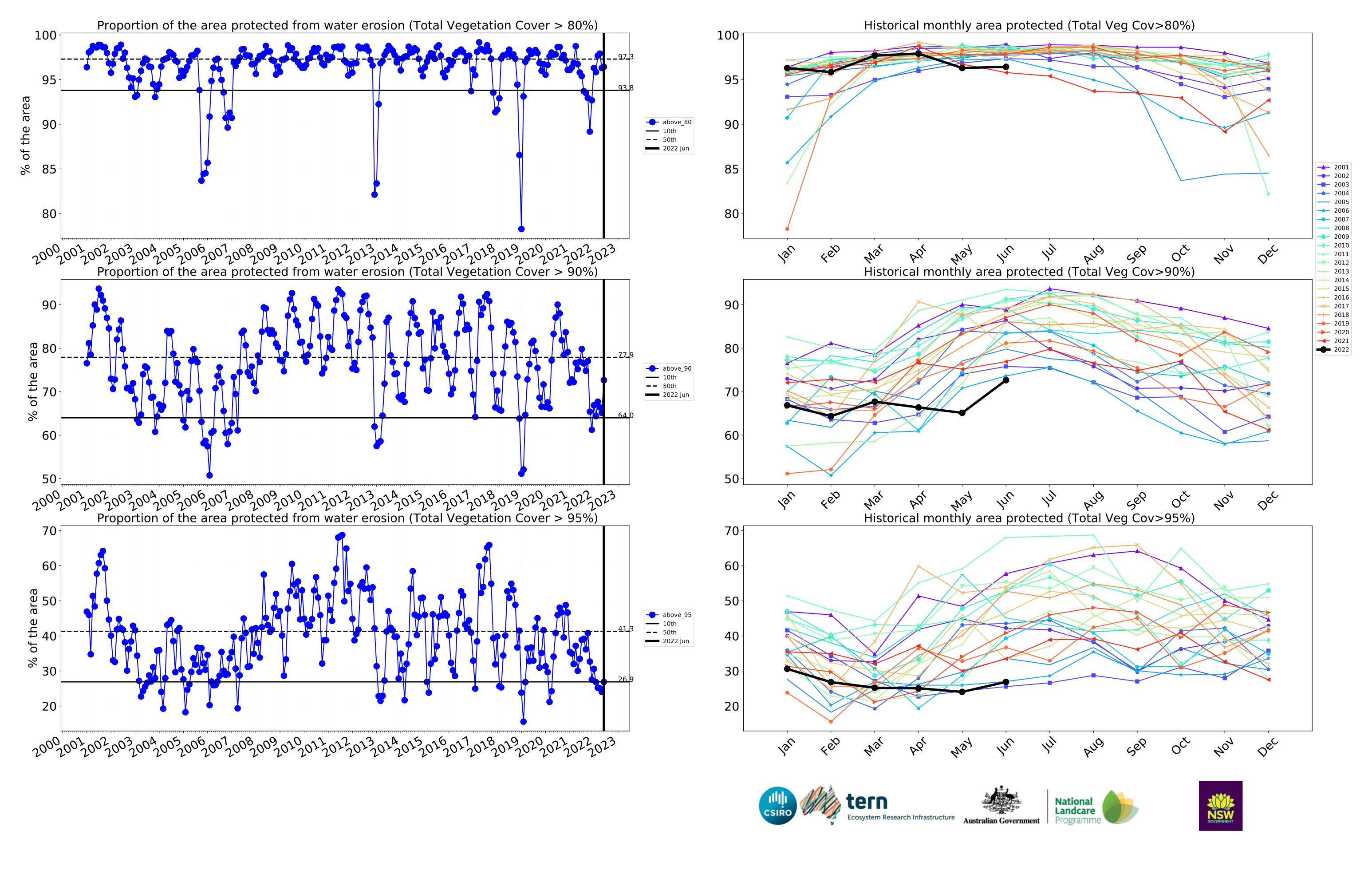




month







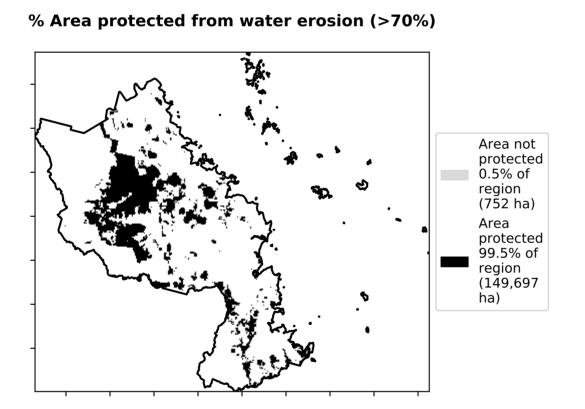
### **Conservation and natural environments Forest (non woodland)**

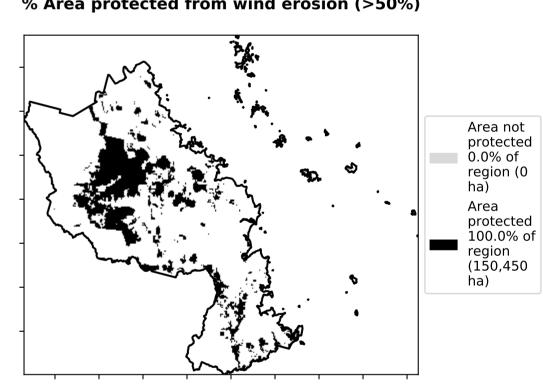
## Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

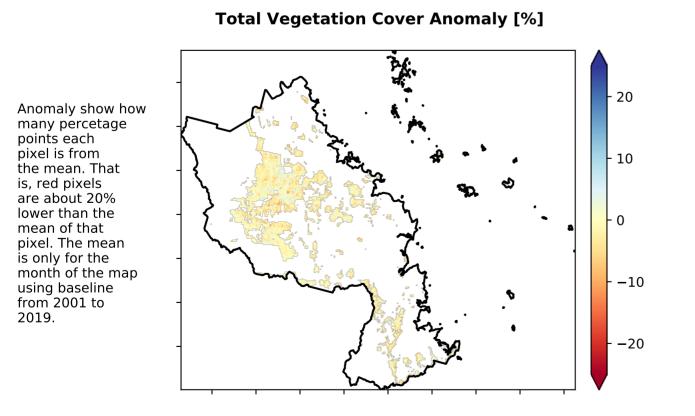
# **Total Vegetation Cover [%]**

### 99.5% 100 80 20 -0-30% 31%-50% 51%-70% 71%-100% **Total Vegetation Cover class** % Area protected from wind erosion (>50%)

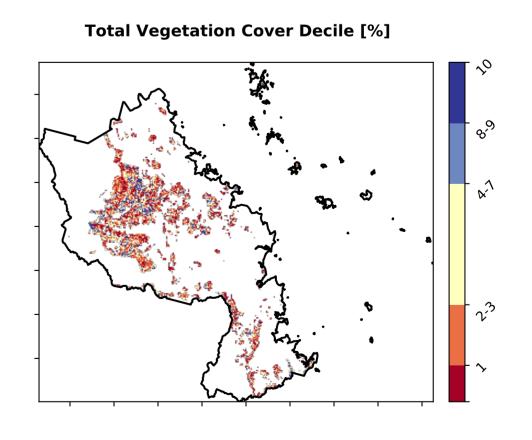
Proportion of vegetation cover class in area







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.

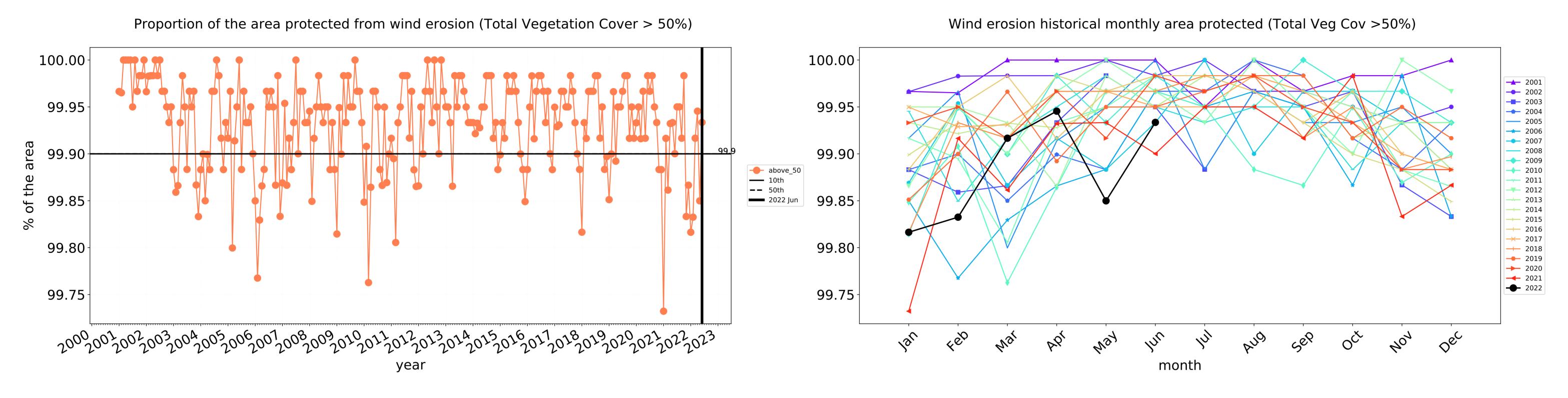


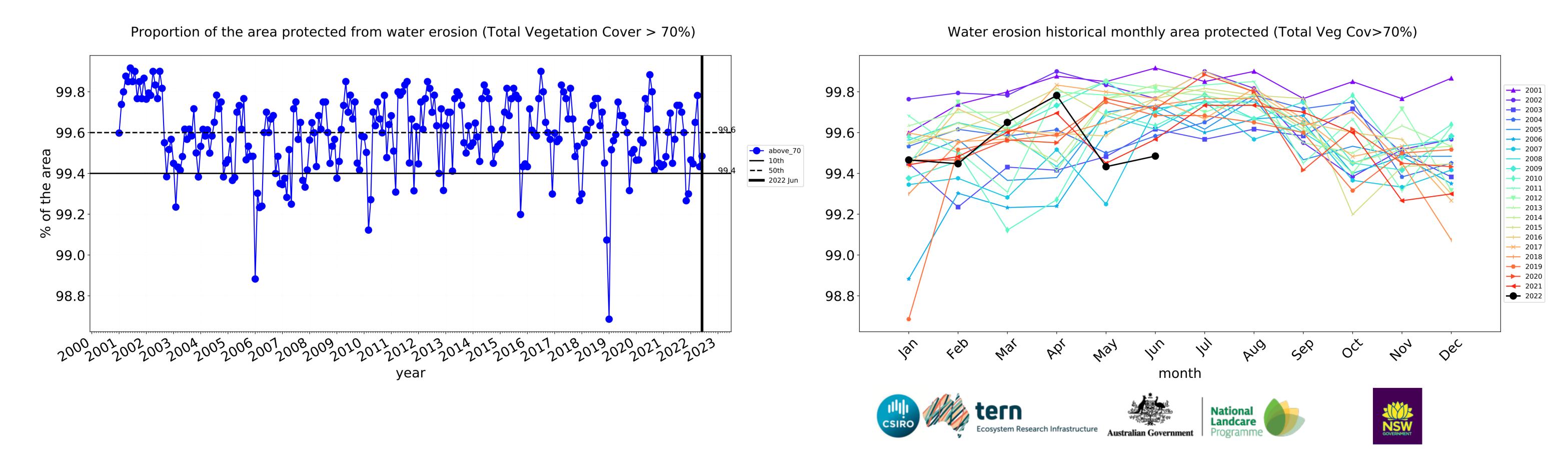


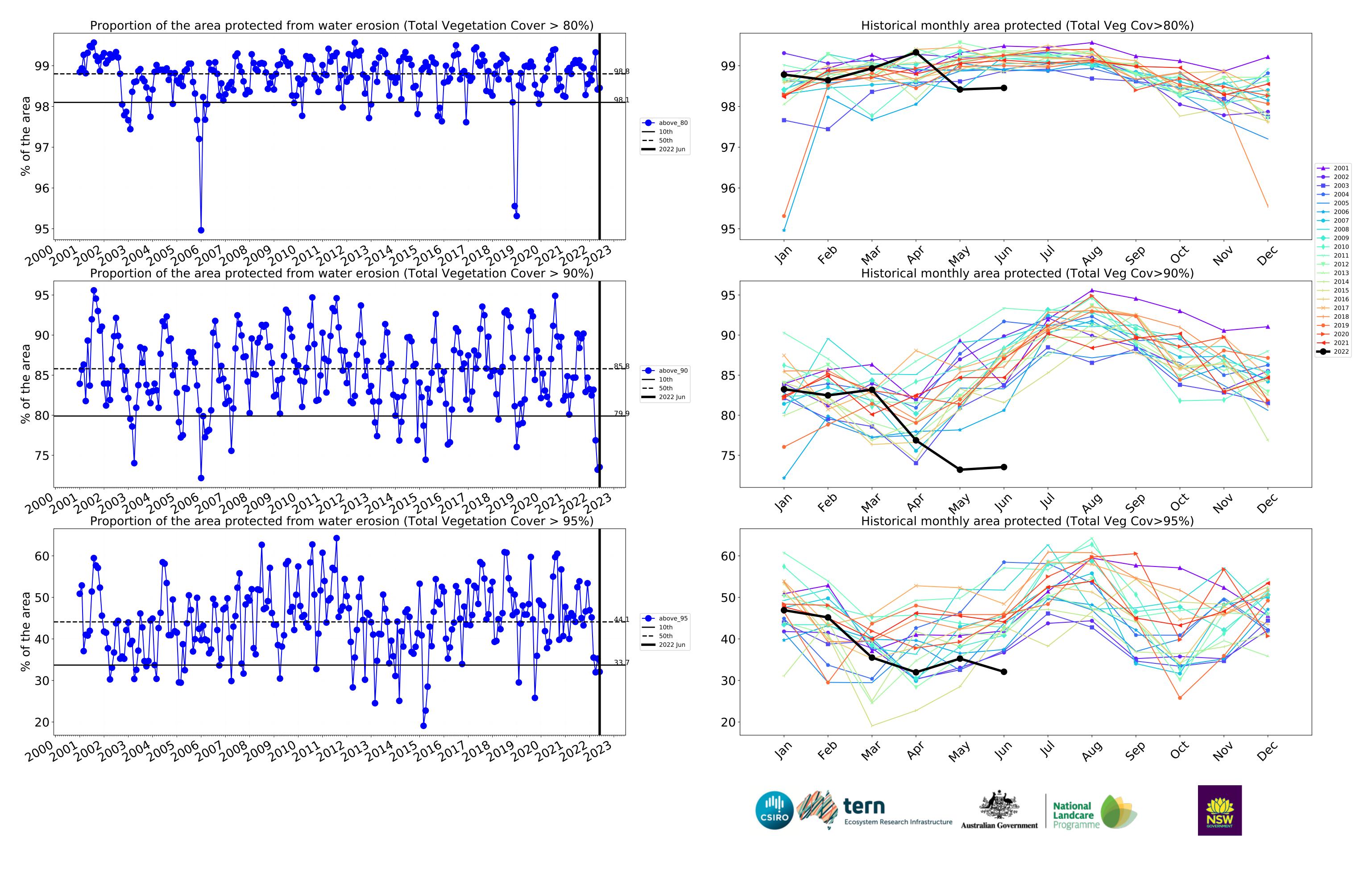






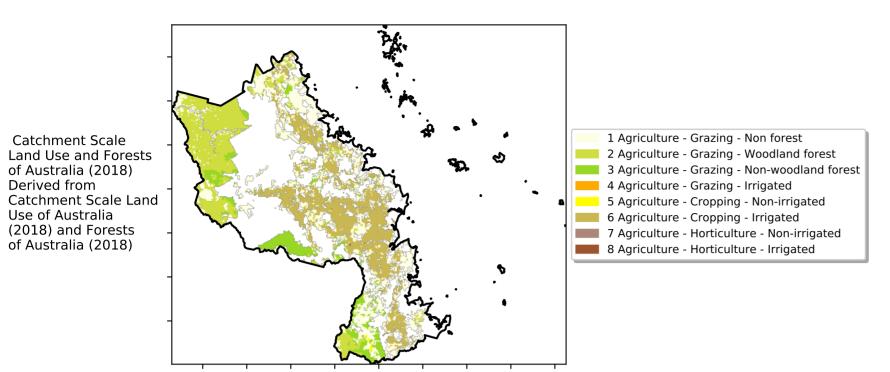




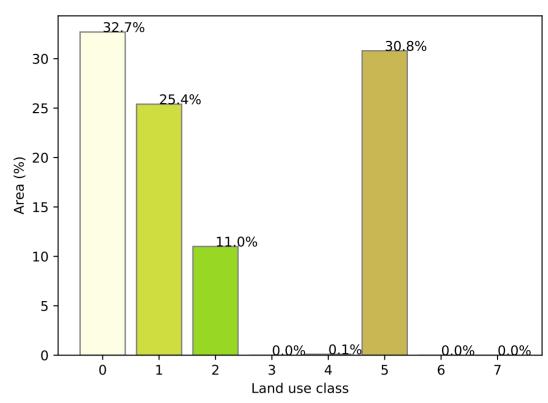


### **Agriculture**

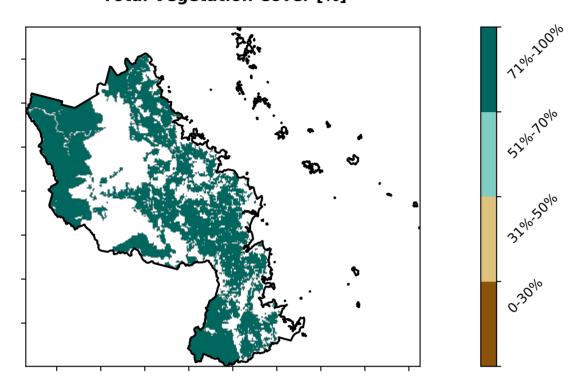
### Land use and forest cover



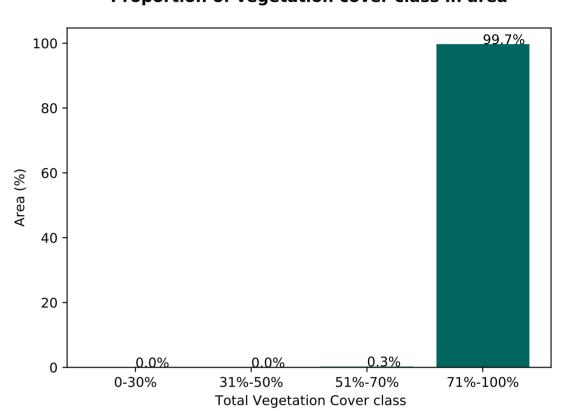
### **Proportion of each land class in area**



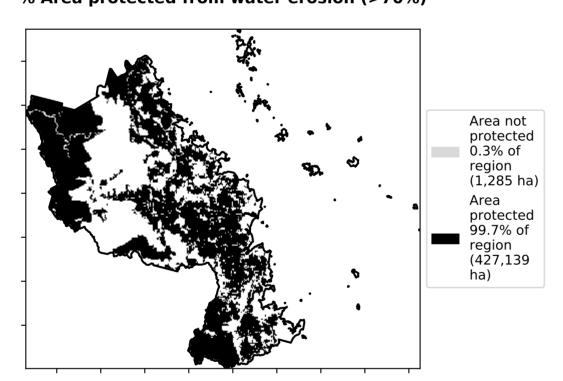
### **Total Vegetation Cover [%]**



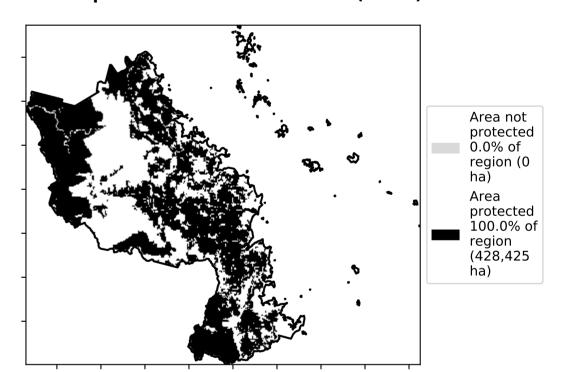
Proportion of vegetation cover class in area



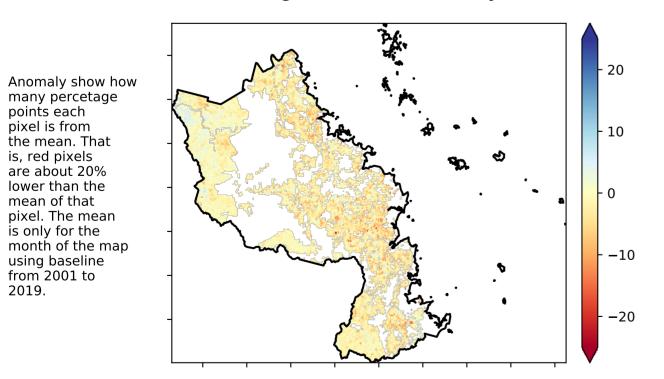
### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

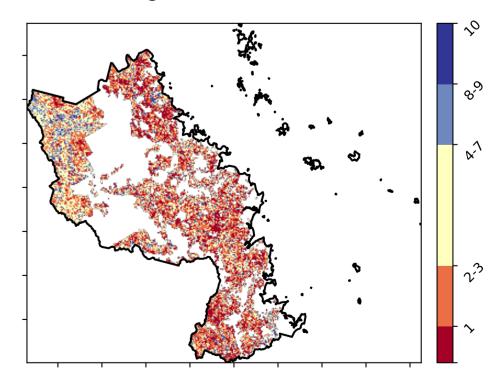


### **Total Vegetation Cover Anomaly [%]**



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

pixel. The mean

using baseline from 2001 to 2019.

is only for the month of the map

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



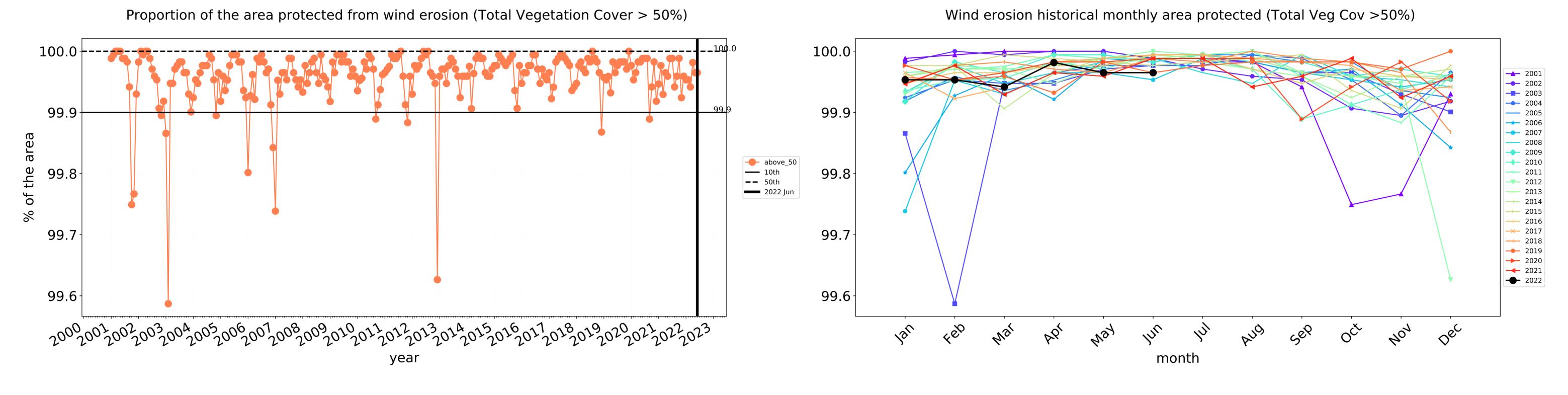


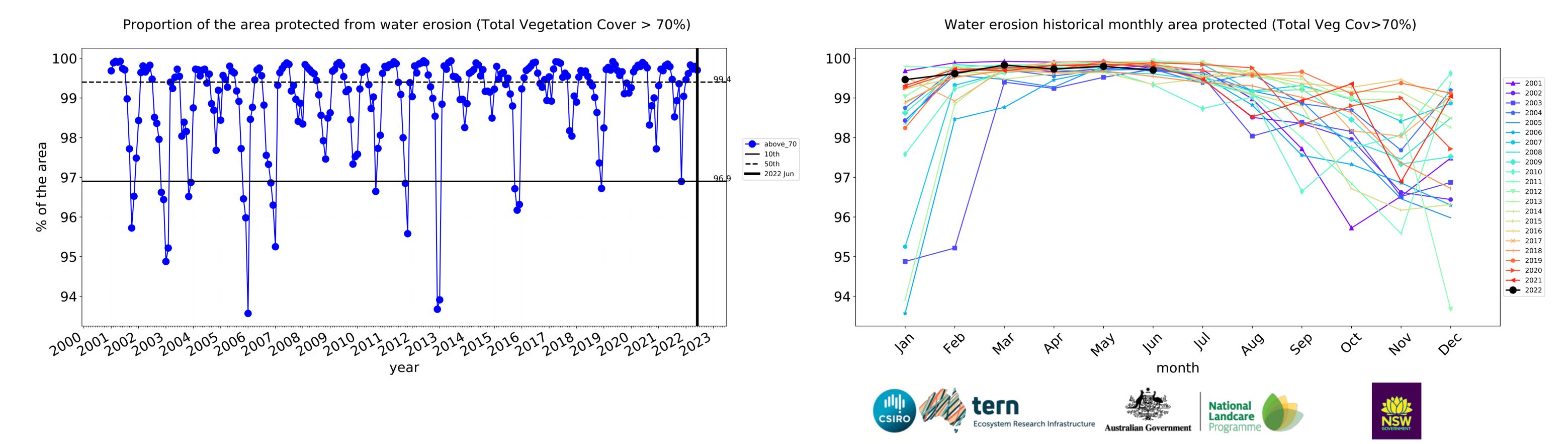


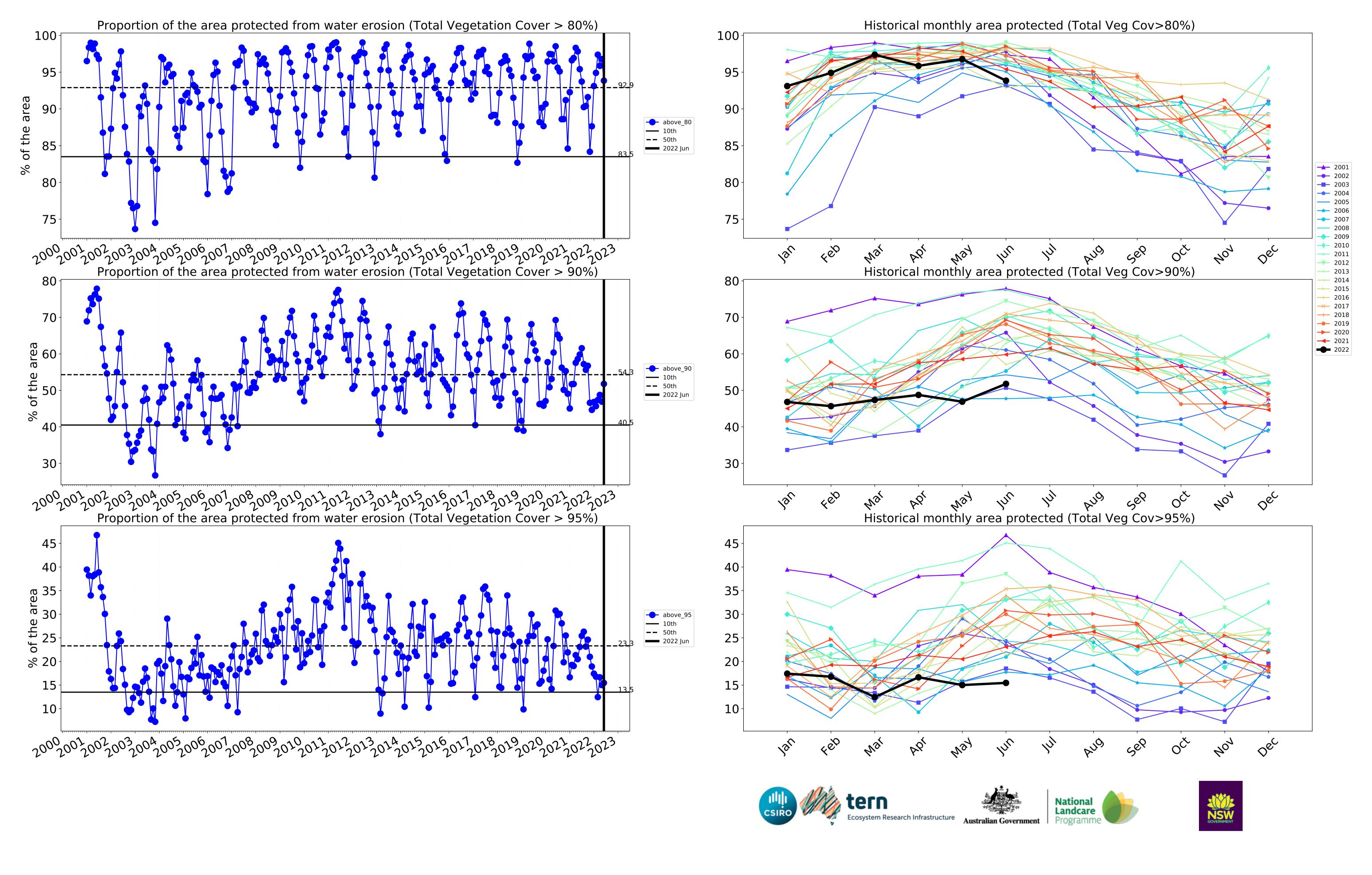




### **Agriculture timeseries**





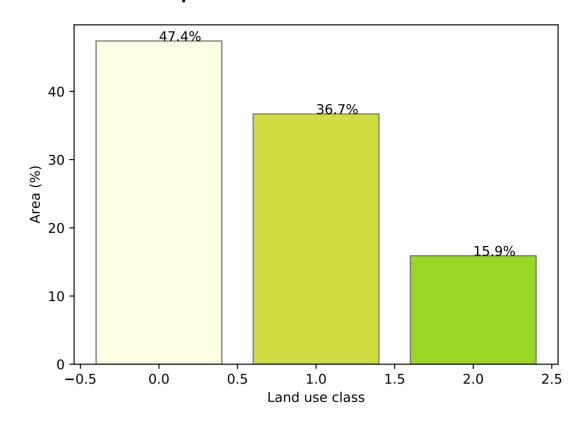


### **Grazing**

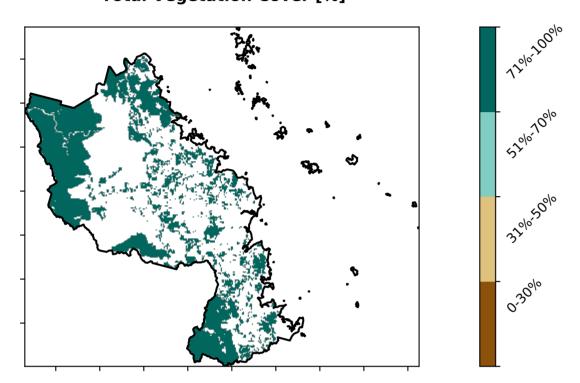
### Land use and forest cover

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

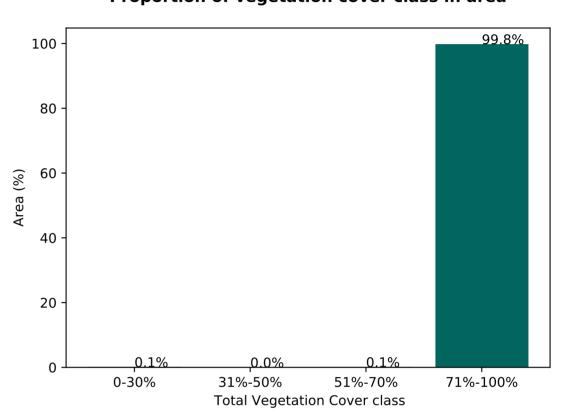
### Proportion of each land class in area



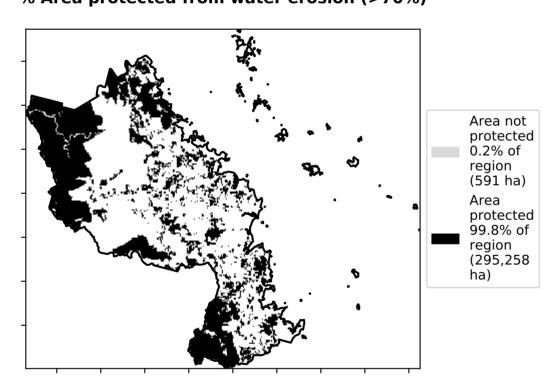
### **Total Vegetation Cover [%]**



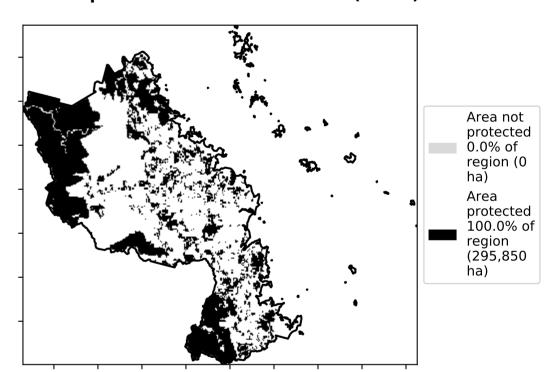
Proportion of vegetation cover class in area



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



% Area protected from wind erosion (>50%)



### Total Vegetation Cover Anomaly [%]

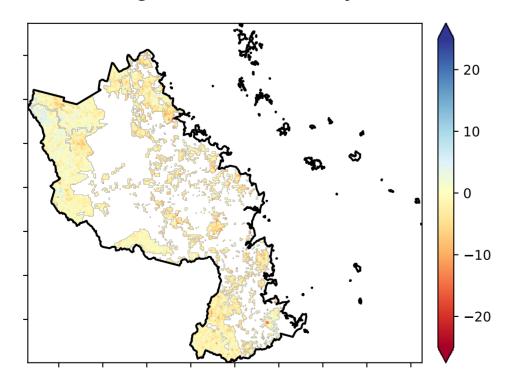
Anomaly show how many percetage points each pixel is from

the mean. That is, red pixels are about 20%

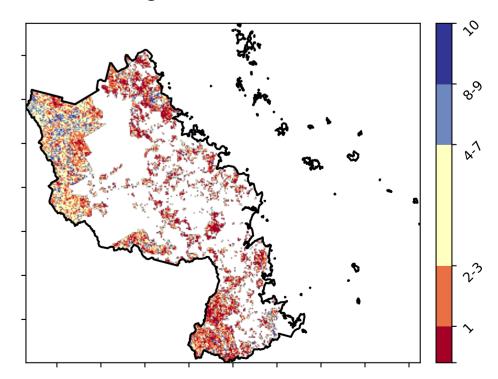
lower than the

using baseline from 2001 to 2019.

mean of that pixel. The mean is only for the month of the map



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.



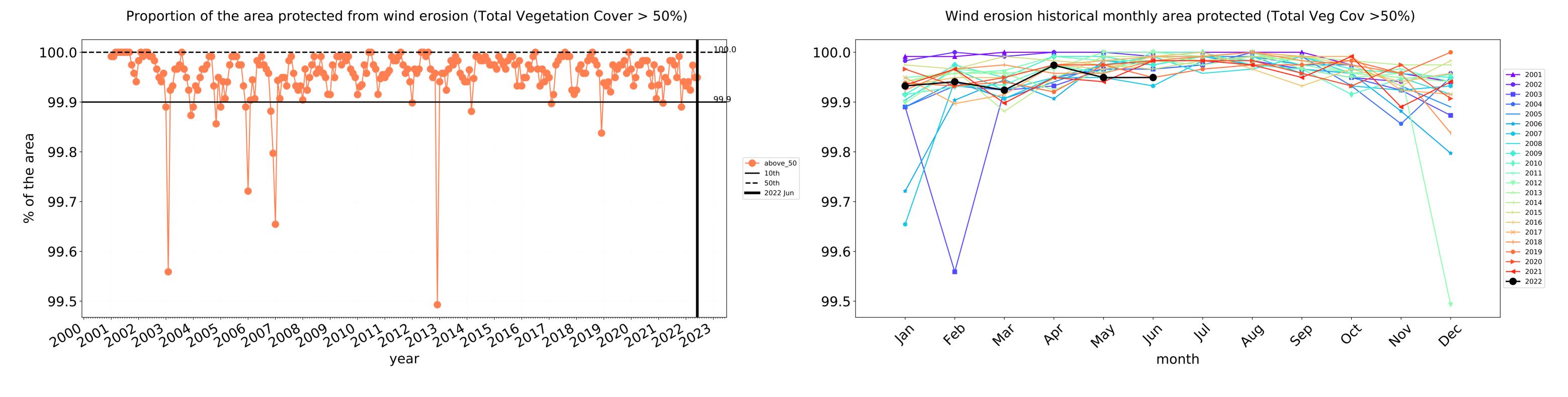


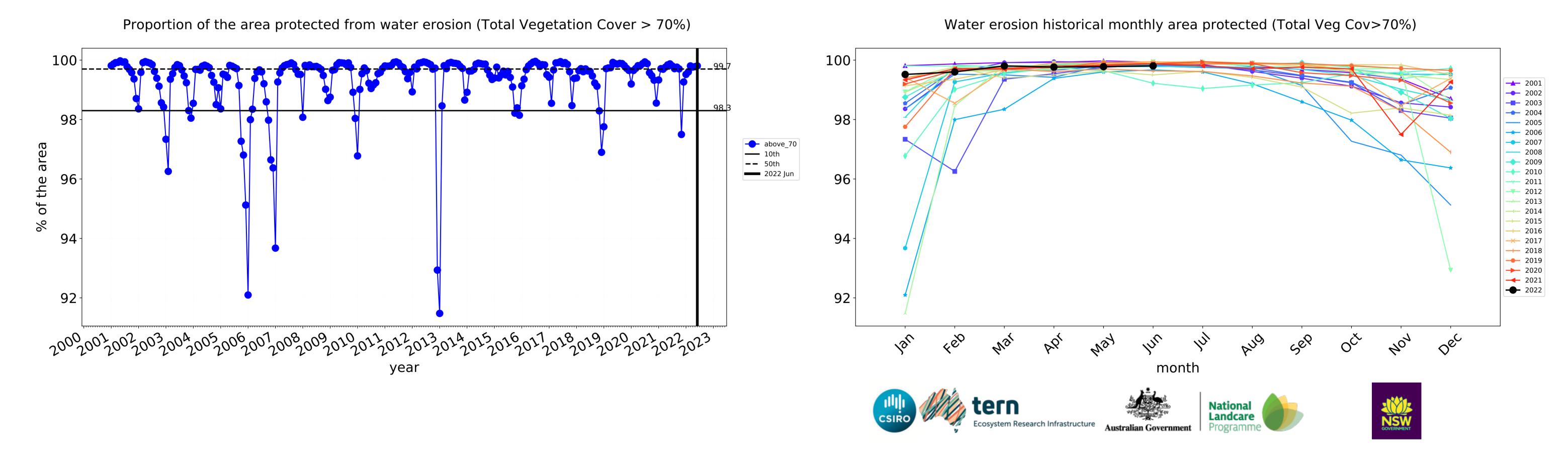


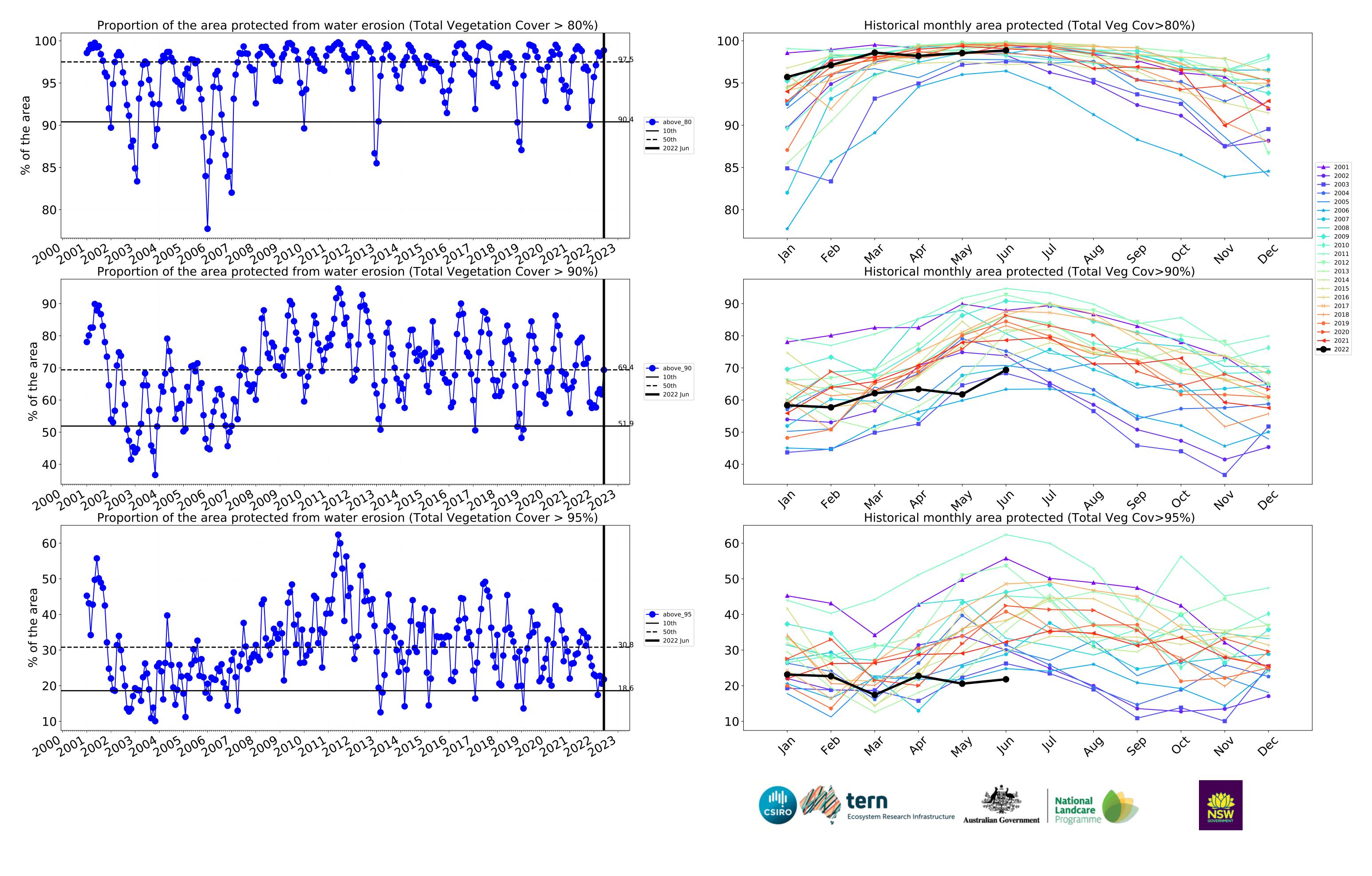




### **Grazing timeseries**







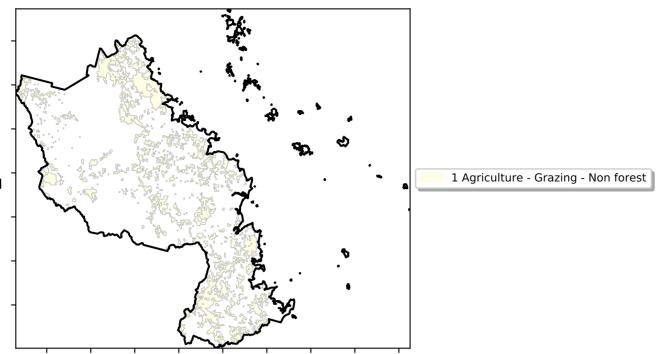
### **Grazing non forest**

### Land use and forest cover

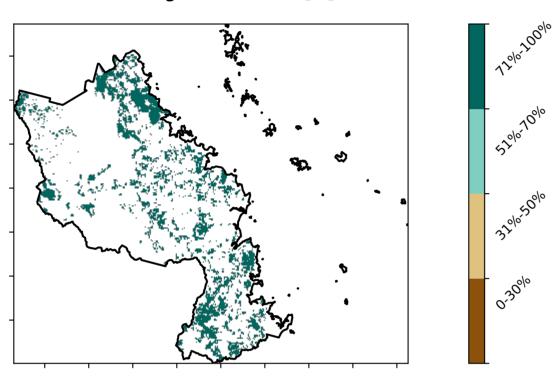
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

lower than the mean of that

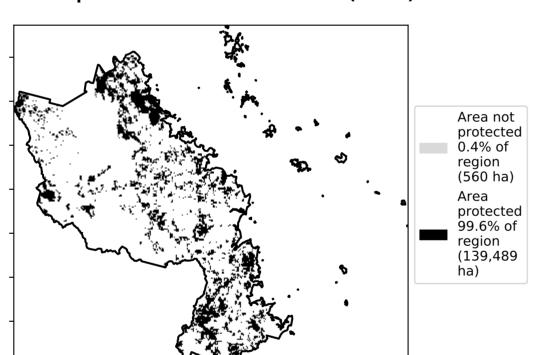
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



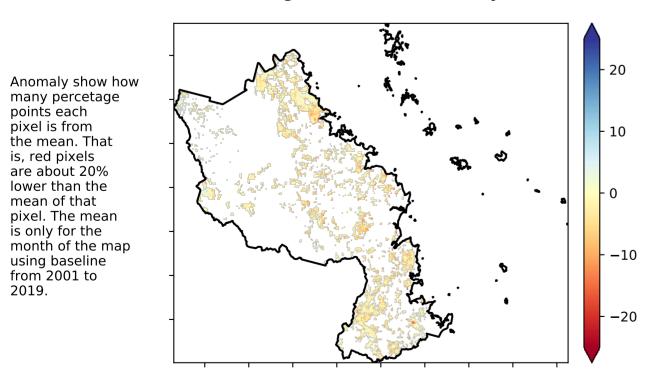
### **Total Vegetation Cover [%]**



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

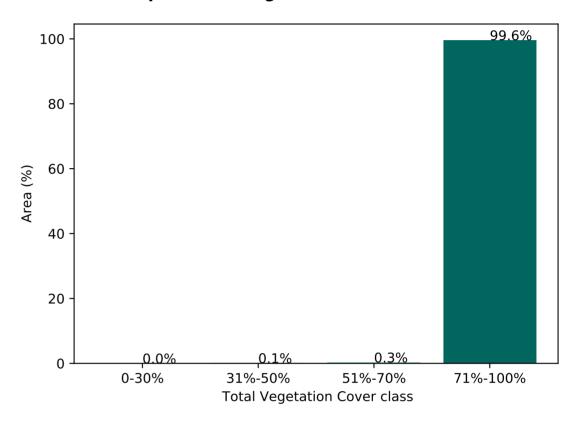


### **Total Vegetation Cover Anomaly [%]**

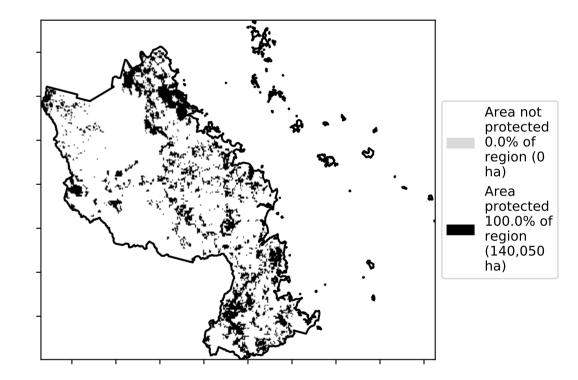


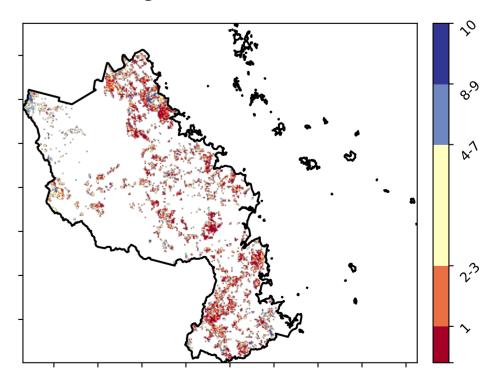
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





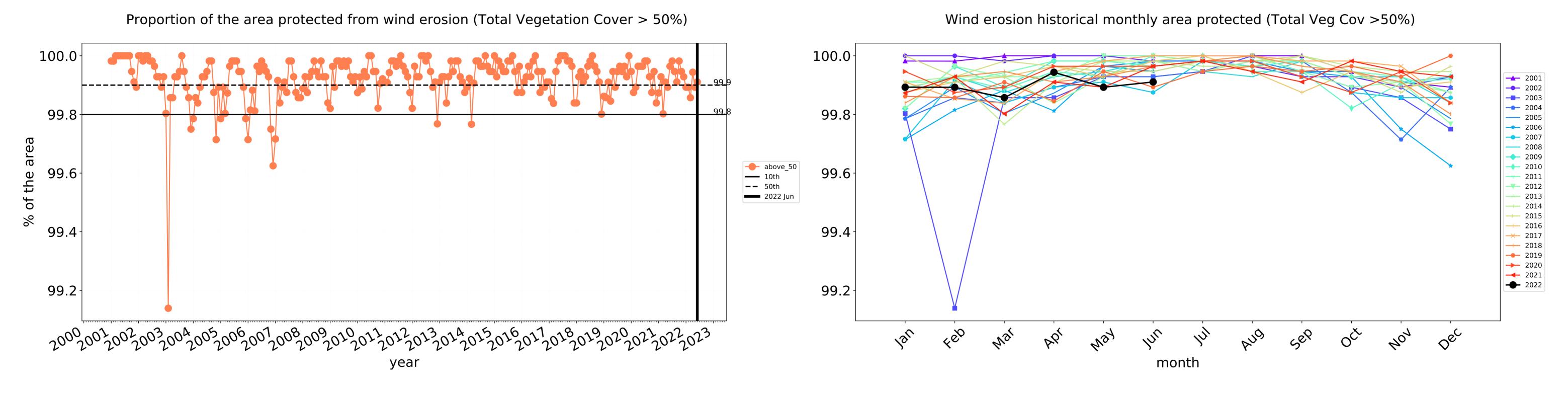


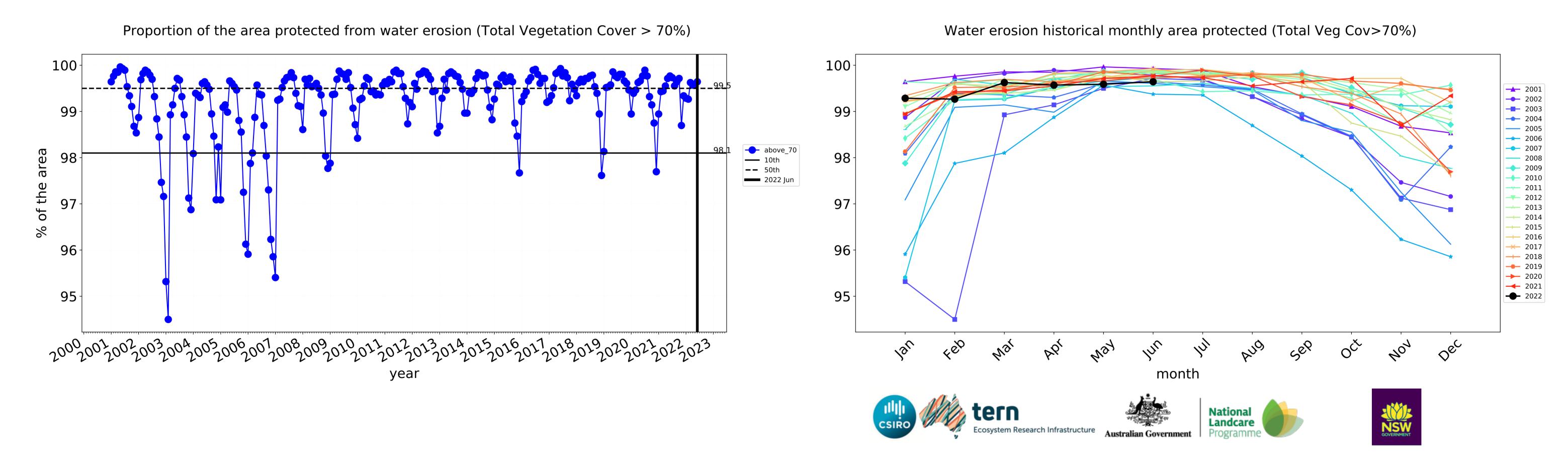


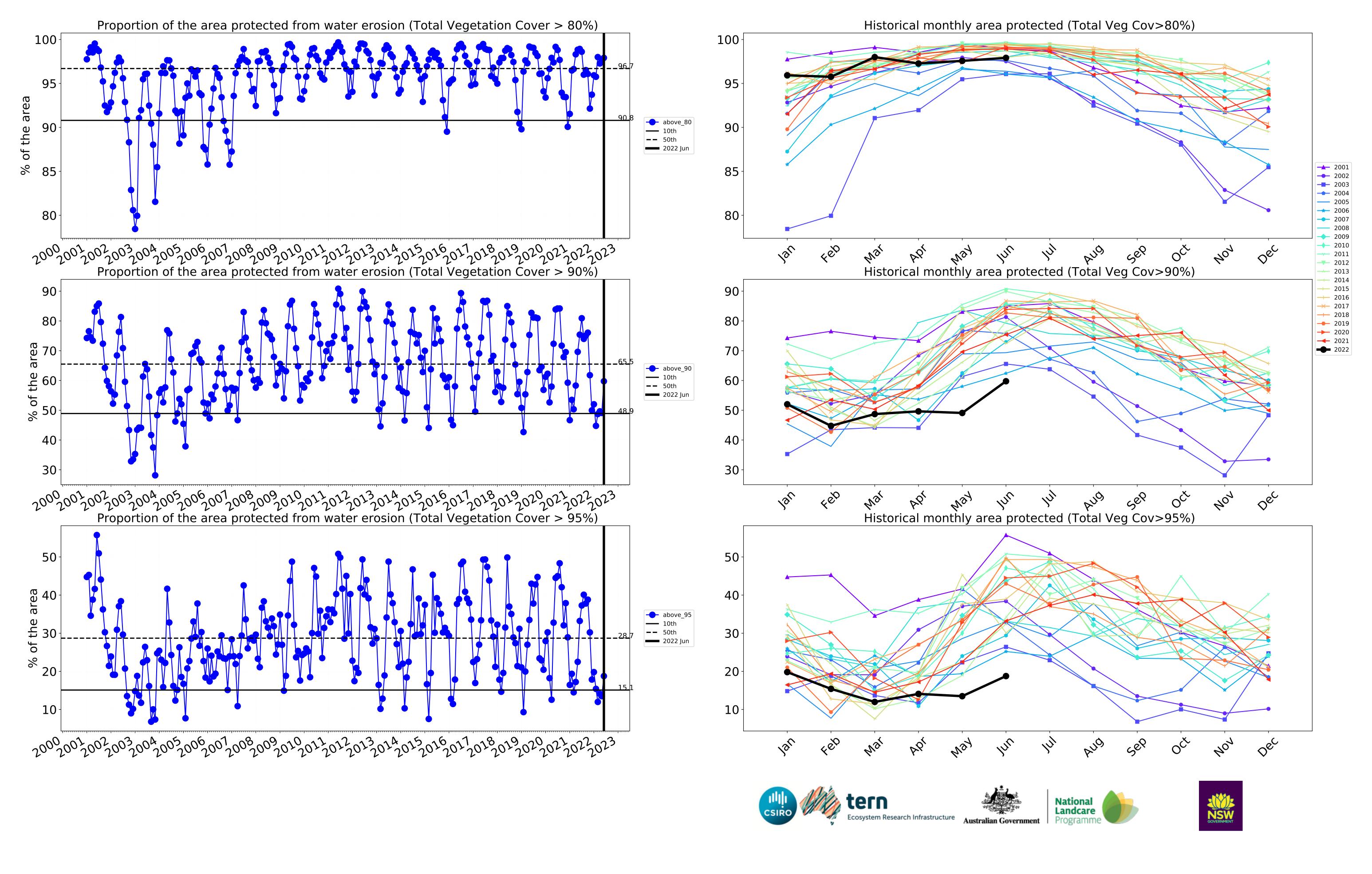




### **Grazing non forest timeseries**







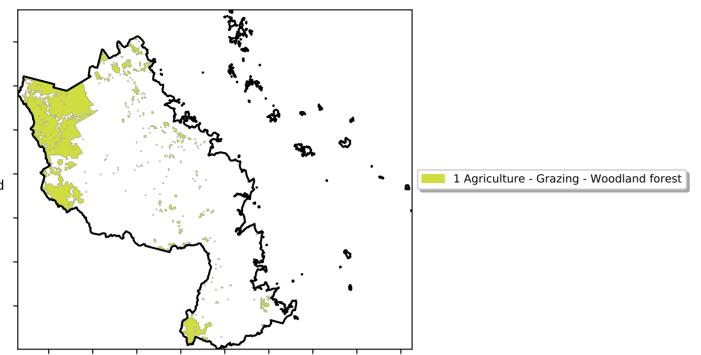
### **Grazing Woodland forest**

### Land use and forest cover

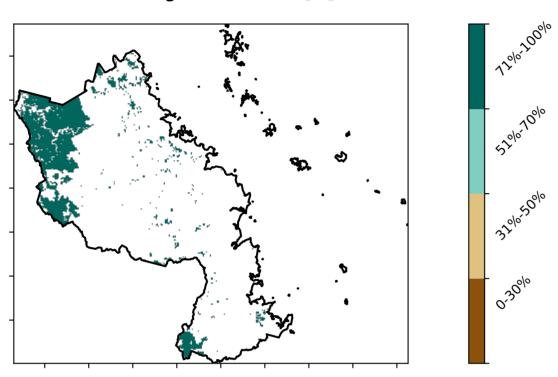
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

lower than the mean of that pixel. The mean is only for the month of the map

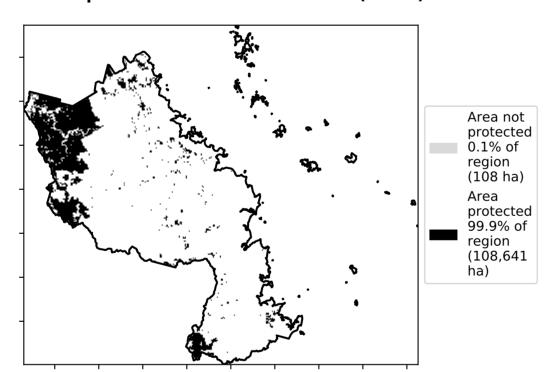
using baseline from 2001 to 2019.



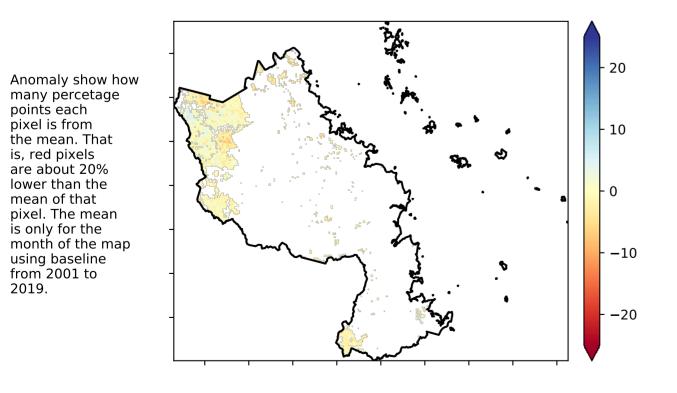
### **Total Vegetation Cover [%]**



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

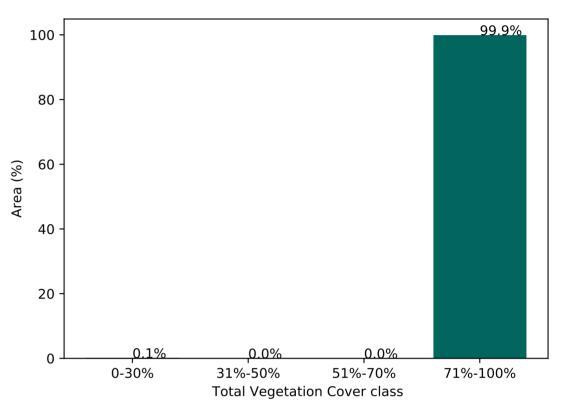


### **Total Vegetation Cover Anomaly [%]**

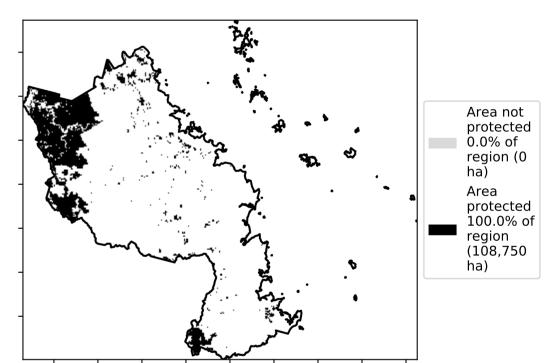


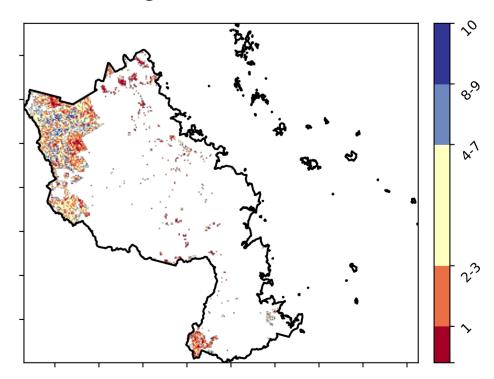
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









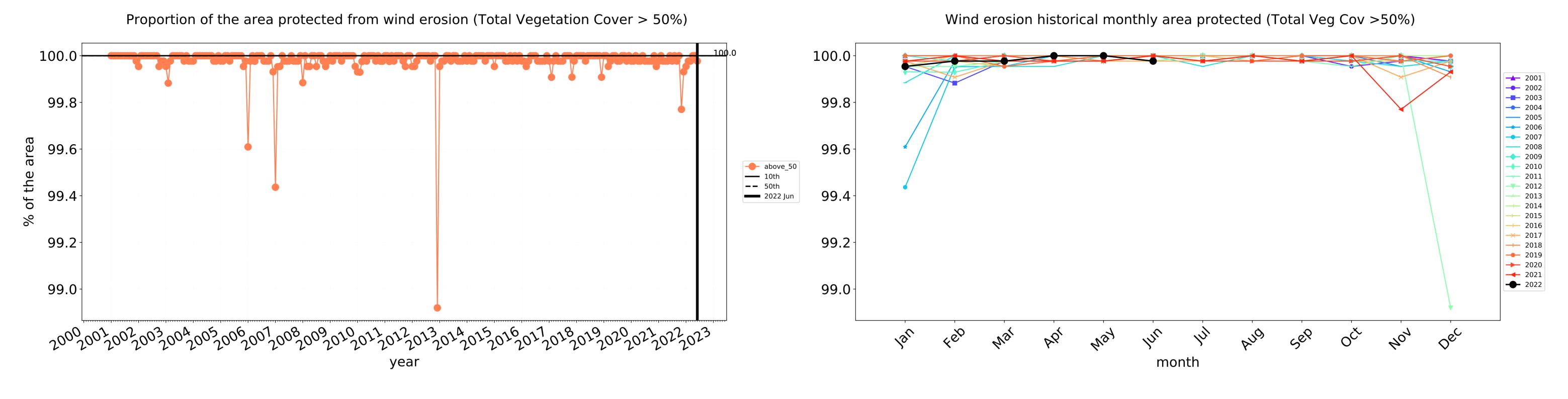


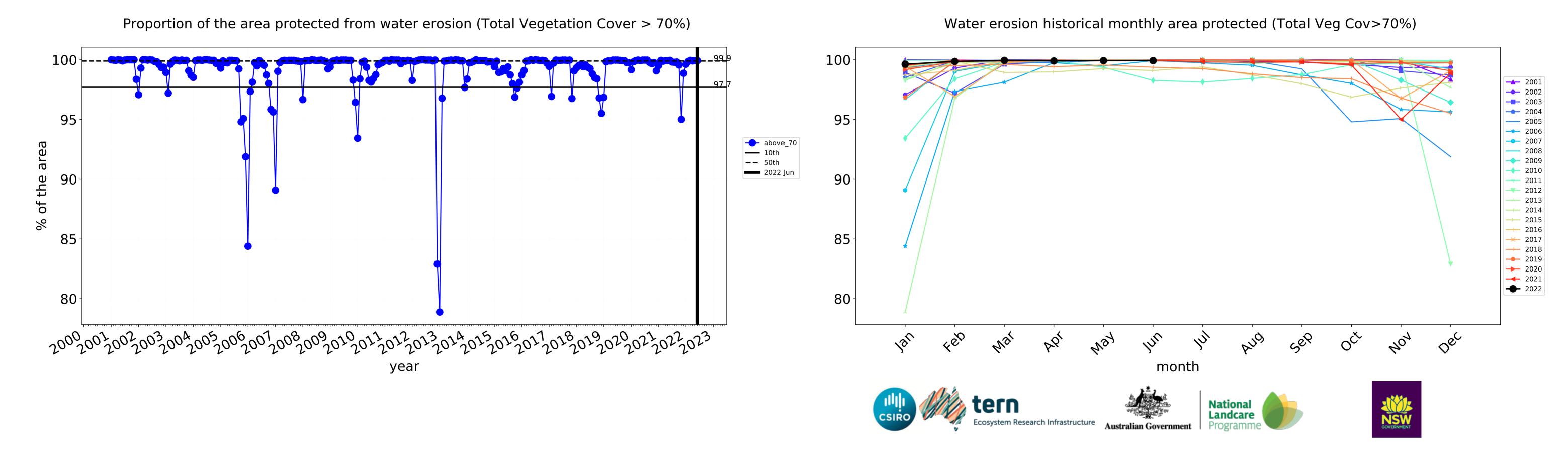


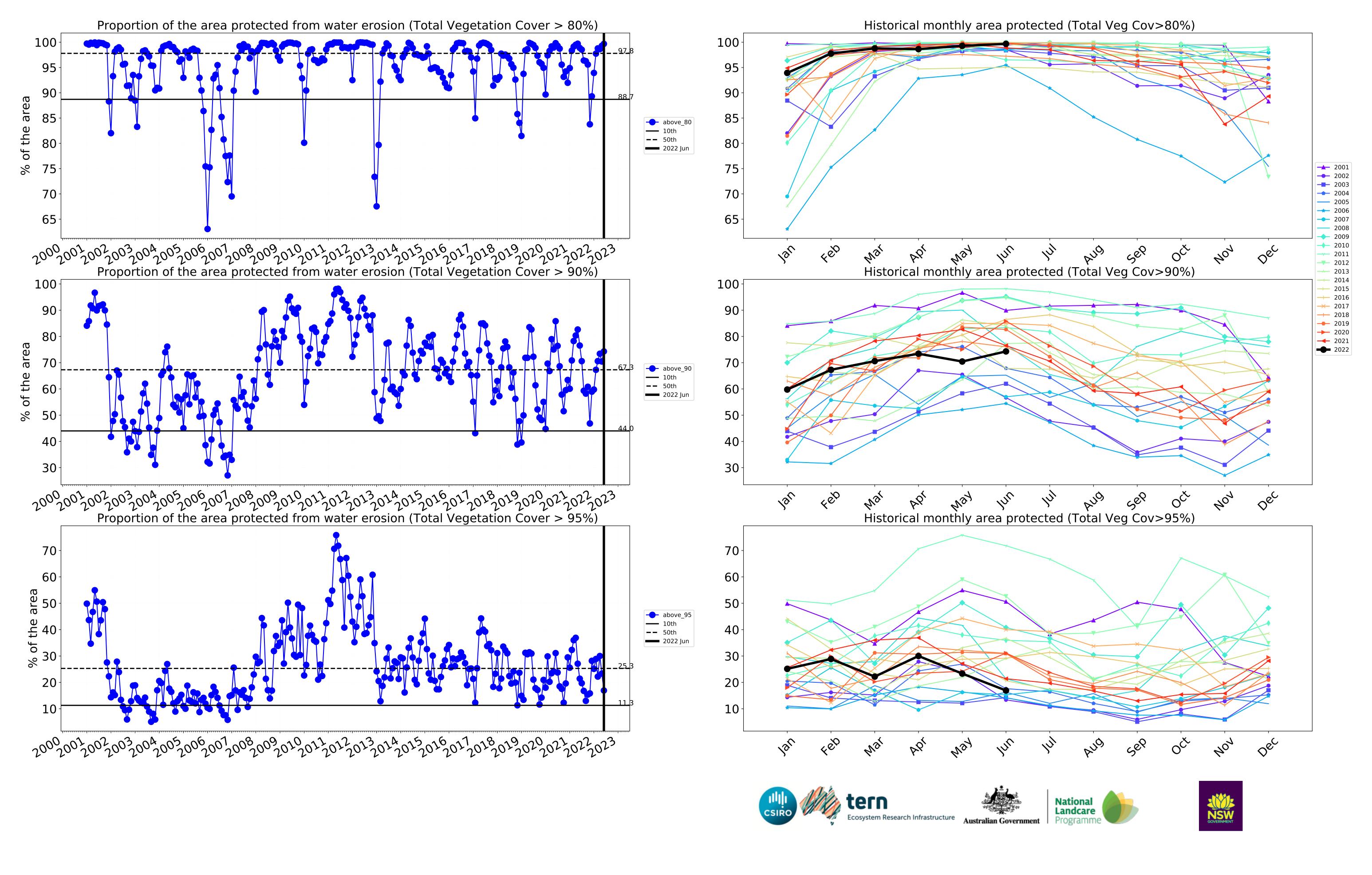




### **Grazing Woodland forest timeseries**







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

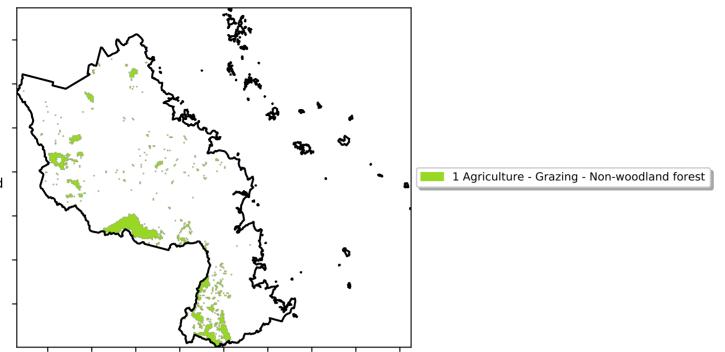
### Land use and forest cover

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

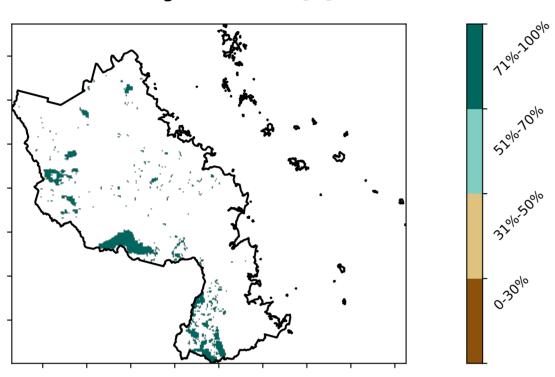
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20%

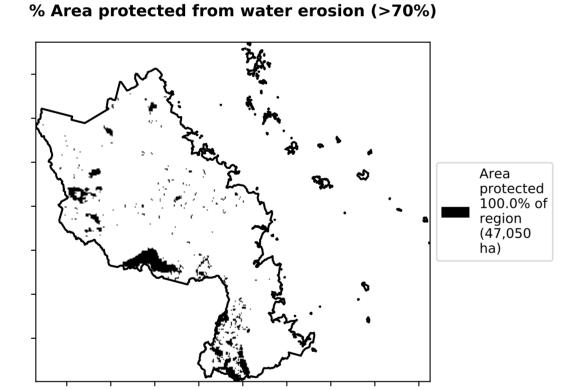
lower than the mean of that pixel. The mean

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

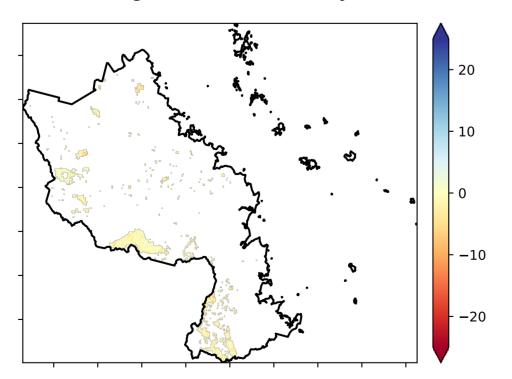


### **Total Vegetation Cover [%]**



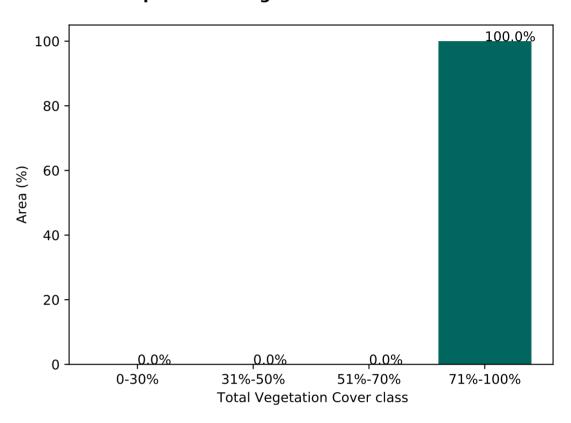


### **Total Vegetation Cover Anomaly [%]**

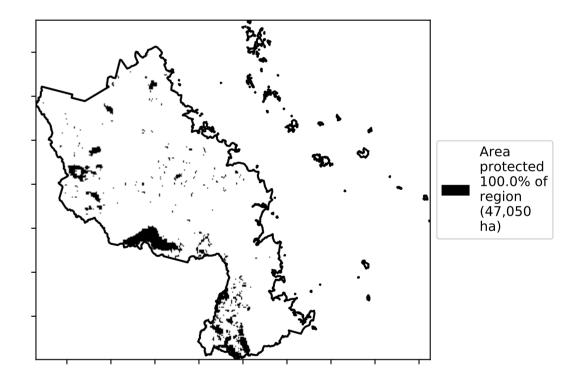


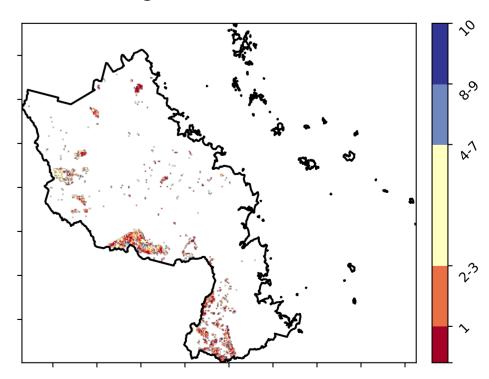
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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



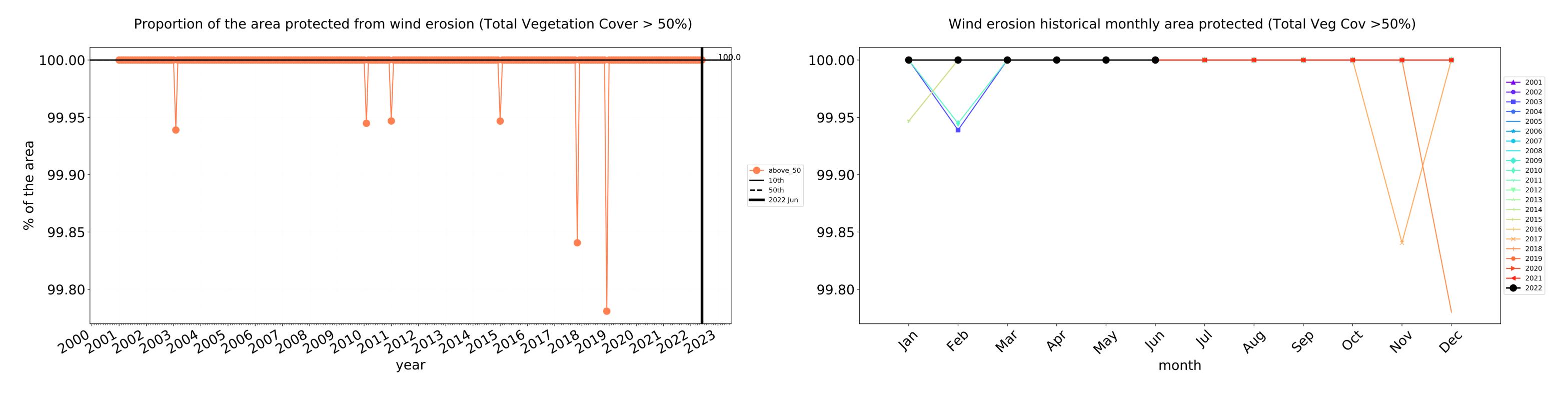


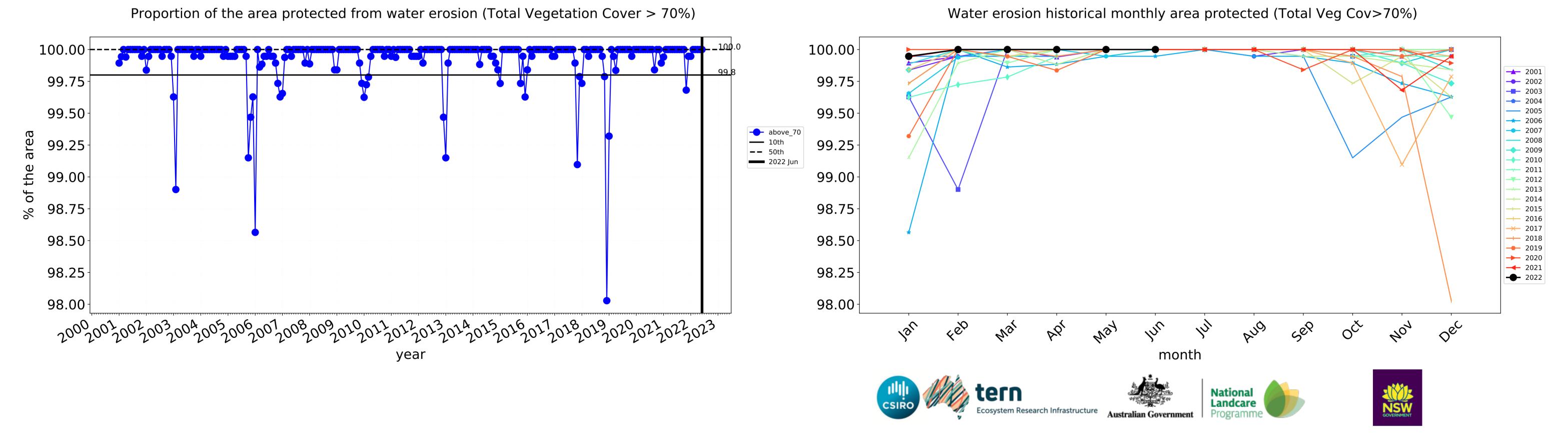


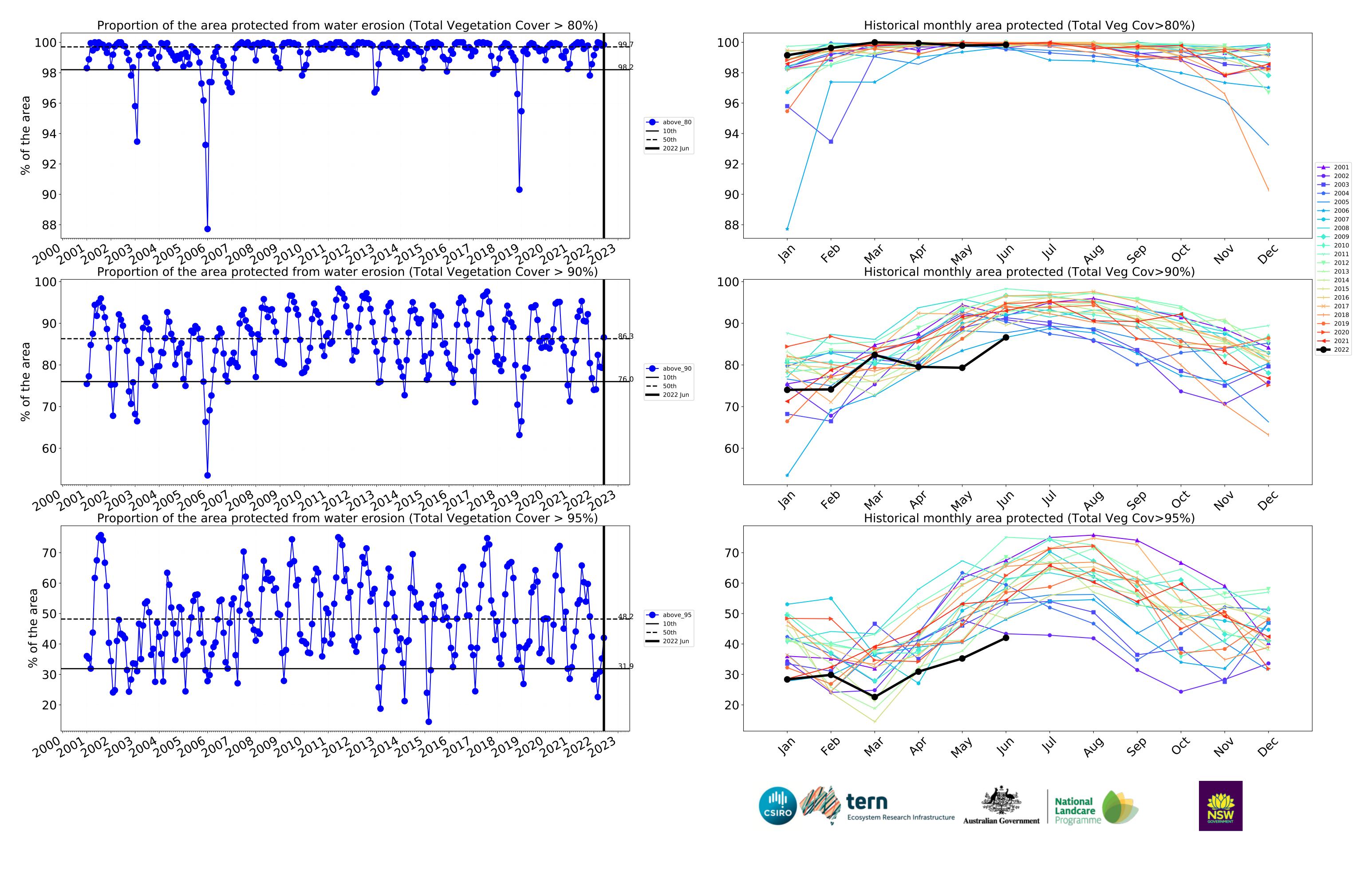






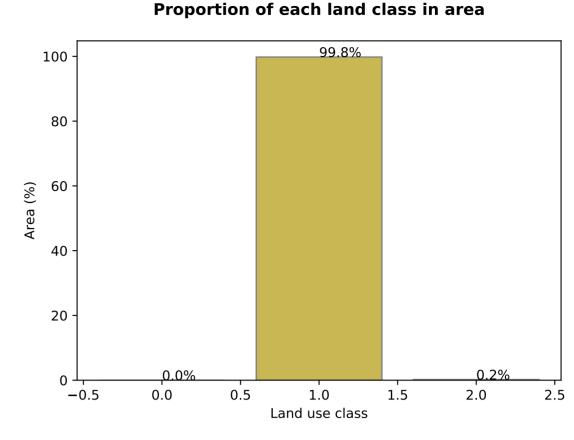


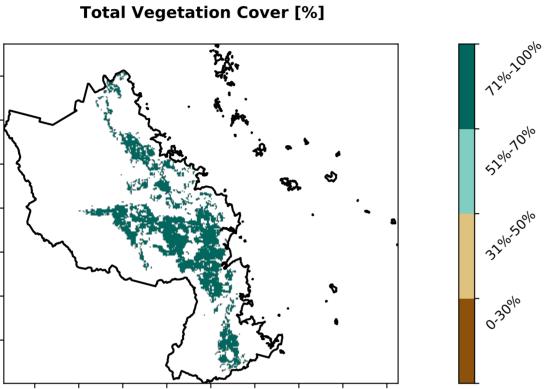


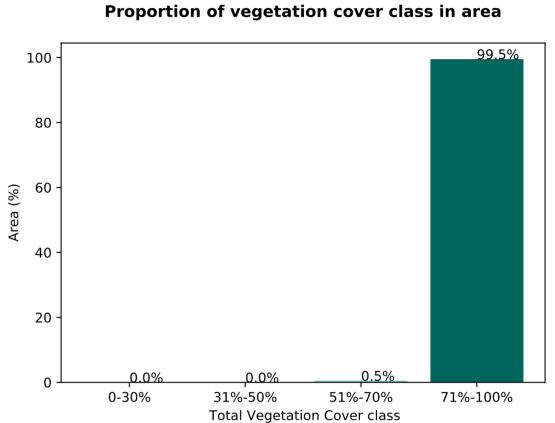


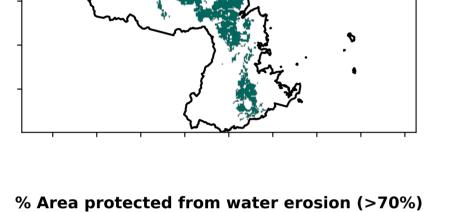
### Irrigation

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

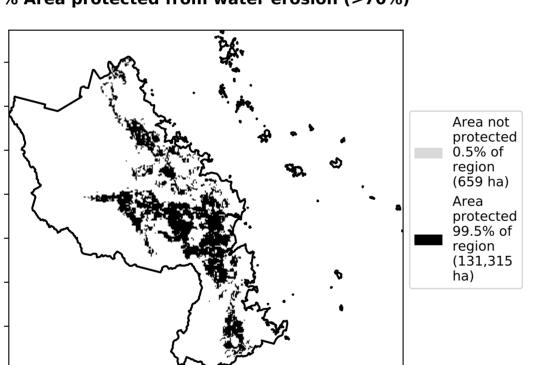


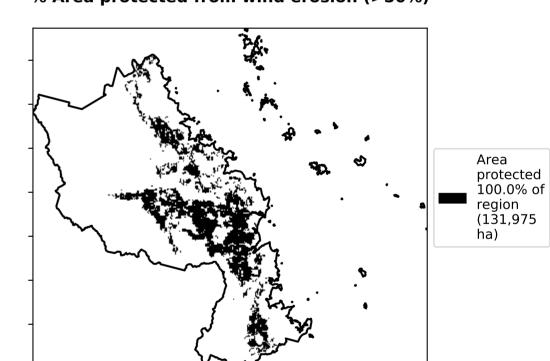






% Area protected from wind erosion (>50%)







Anomaly show how many percetage points each pixel is from

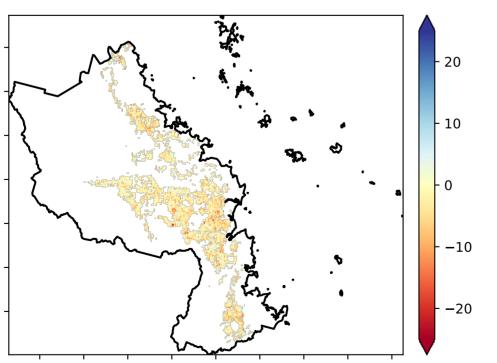
the mean. That is, red pixels

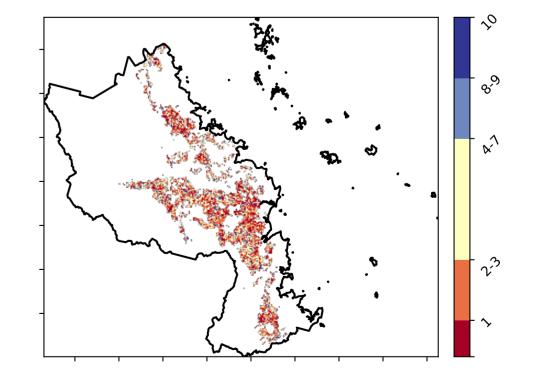
are about 20% lower than the

mean of that pixel. The mean is only for the month of the map

using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 





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.

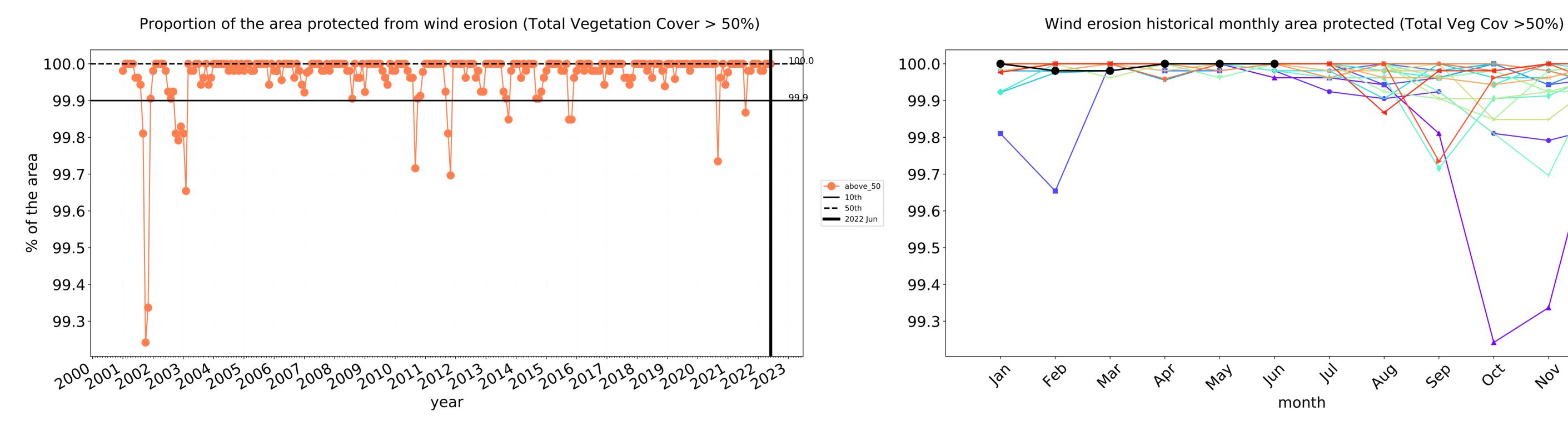


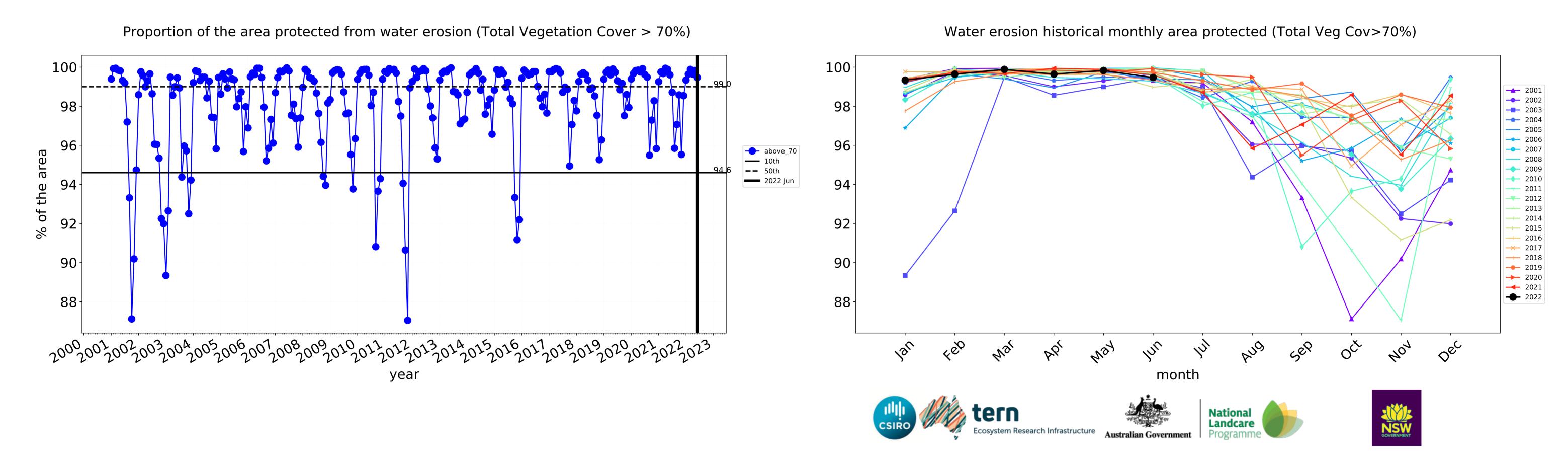


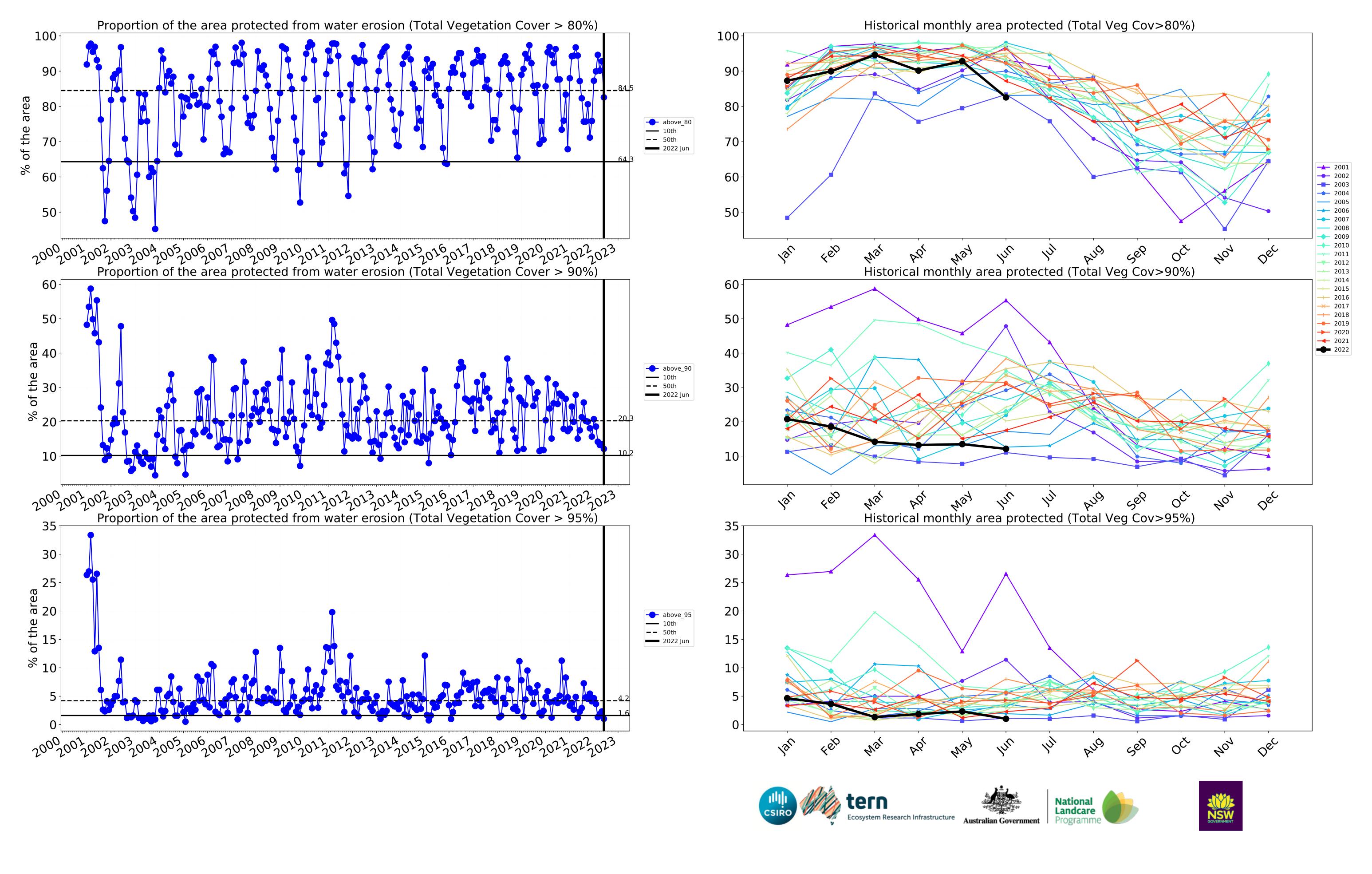




### Irrigation timeseries







### **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)

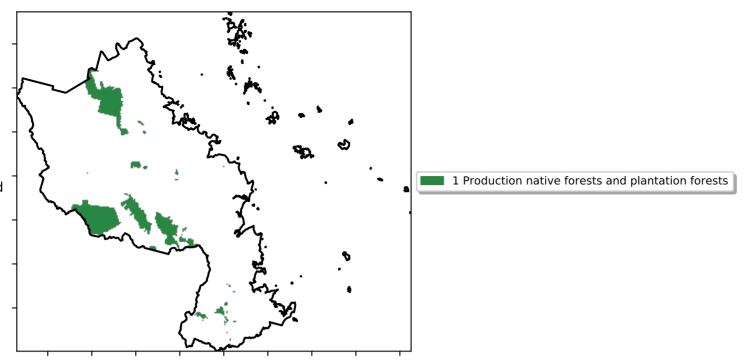
Anomaly show how many percetage points each pixel is from

the mean. That

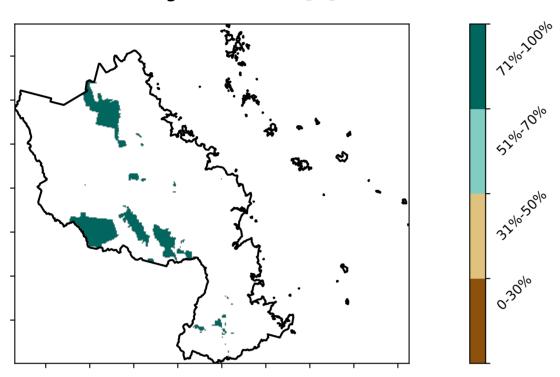
is, red pixels are about 20% lower than the

mean of that pixel. The mean is only for the month of the map

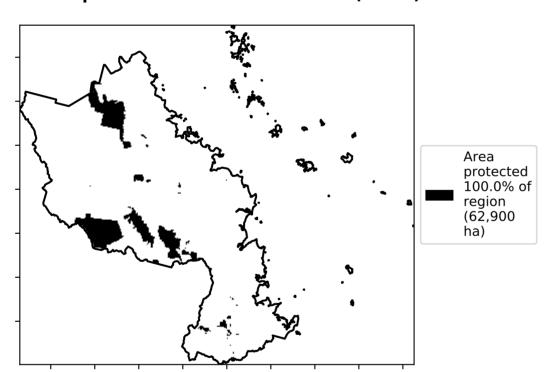
using baseline from 2001 to 2019.



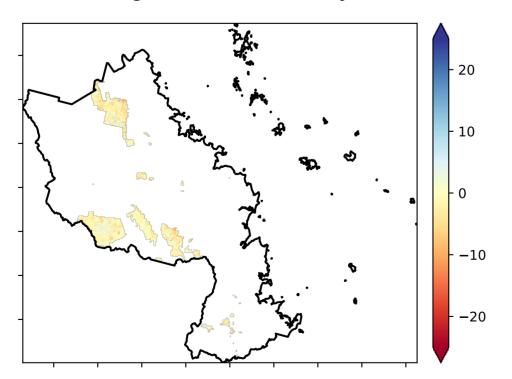
### **Total Vegetation Cover [%]**



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

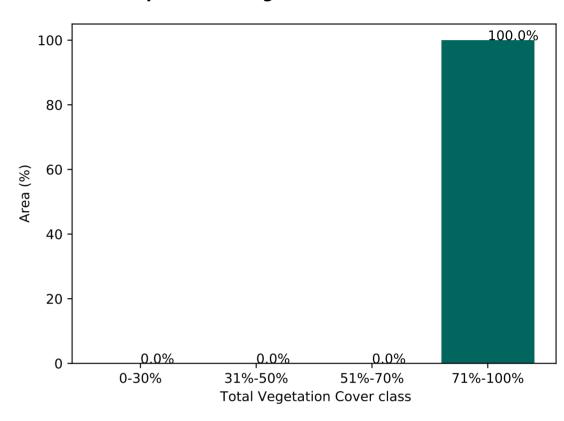


### **Total Vegetation Cover Anomaly [%]**

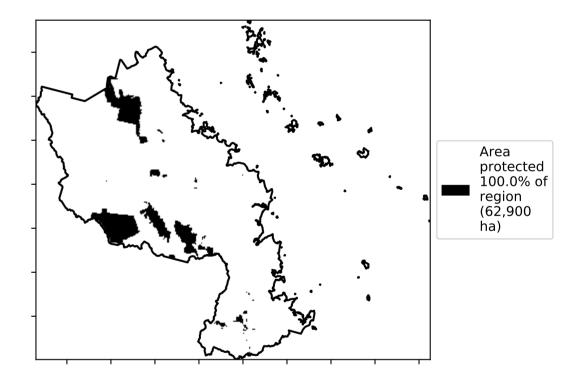


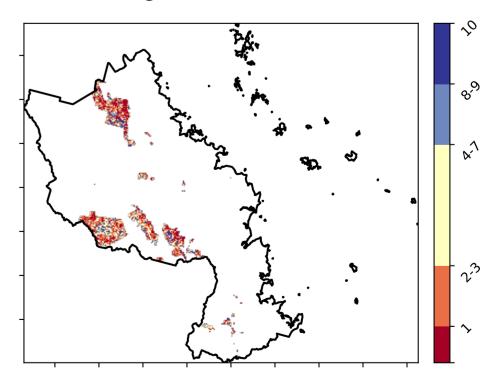
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





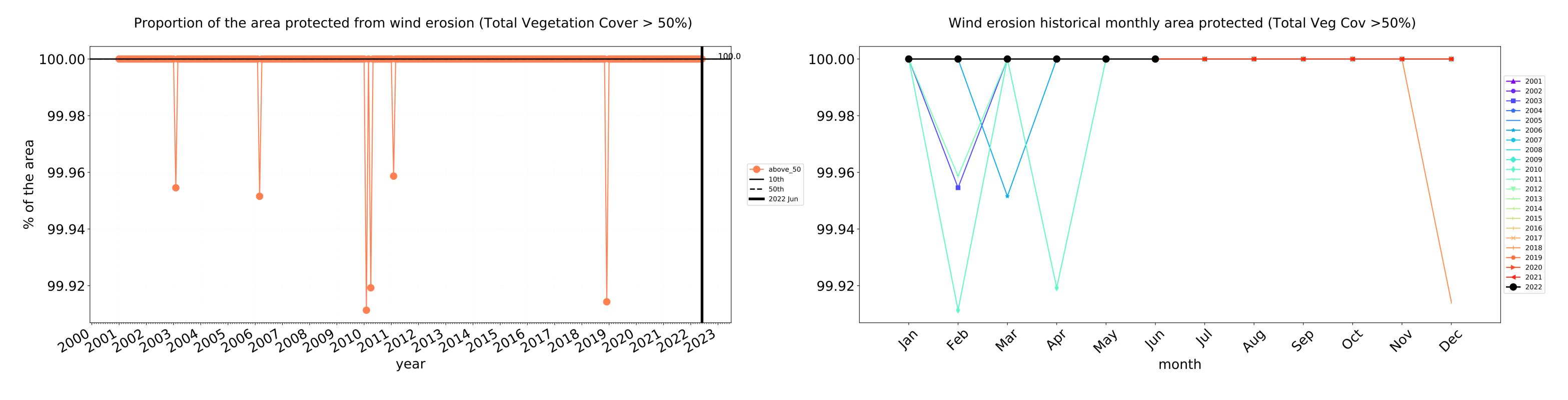


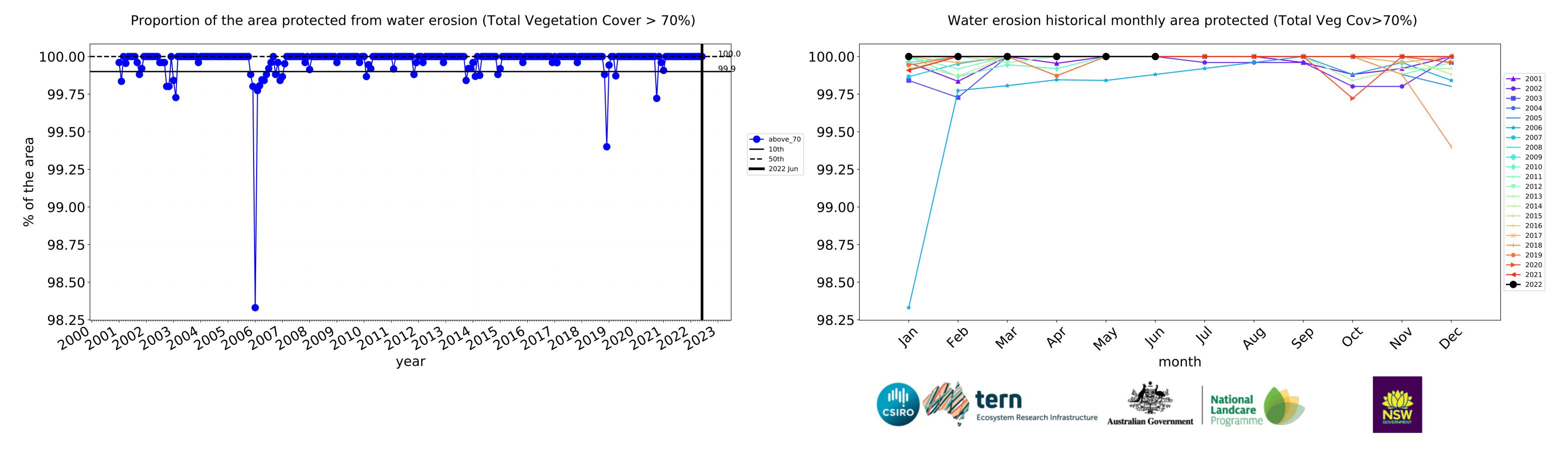


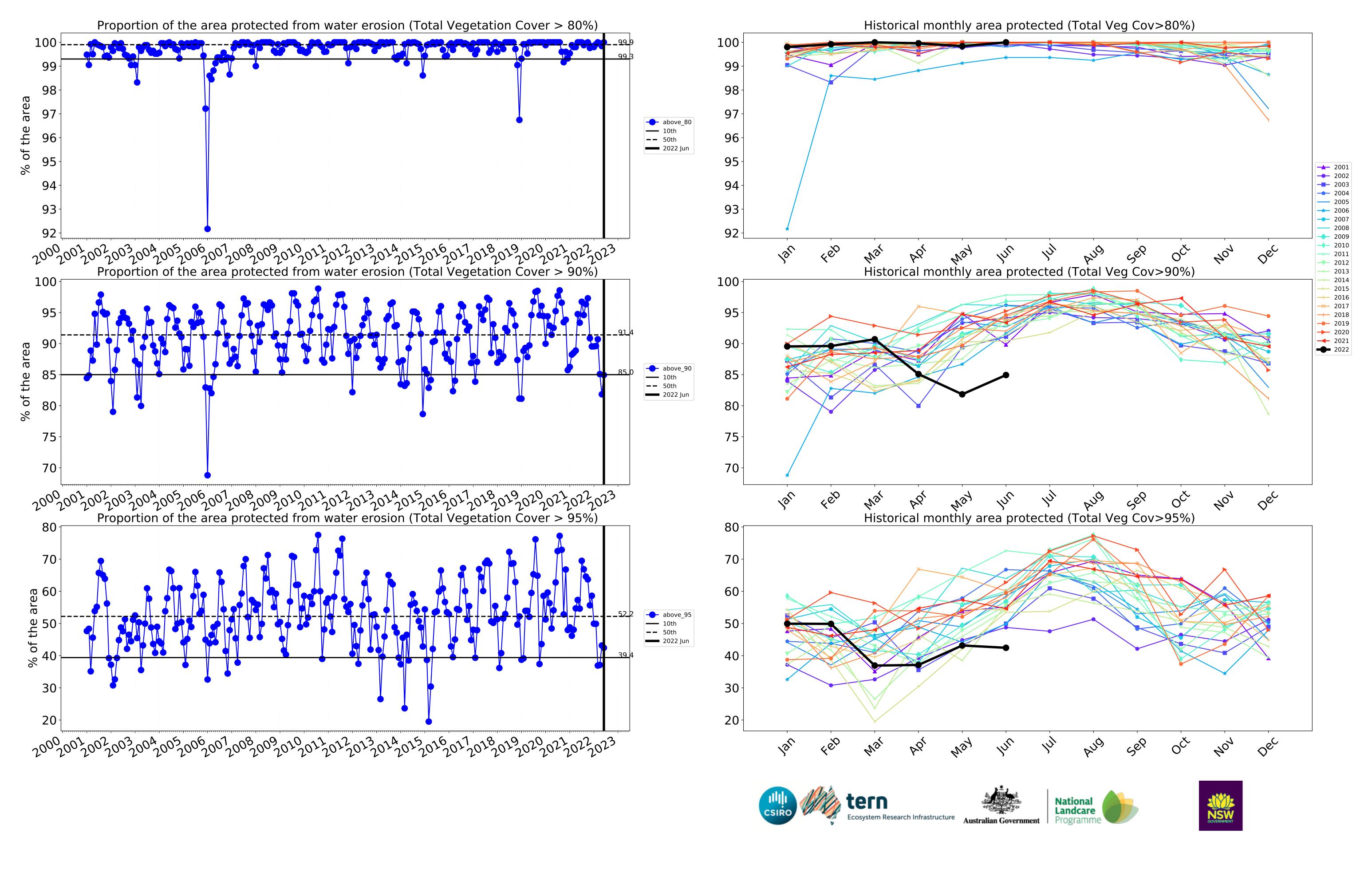




### **Production native forests and plantation forests timeseries**







# Mackay\_(R) (749,975 ha and no data 11,336 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	749,975	99.9% 749,575	99.8% 748,550	98.5% 738,925	92.9% 696,550	57.2% 428,900	20.7% 155,225
Conservation and natural environments	192,850	99.9% 192,725	99.8% 192,425	99.0% 190,925	97.4% 187,900	72.4% 139,575	30.7% 59,175
Conservation and natural environments non forest	5,200	99.0% 5,150	96.2% 5,000	89.9% 4,675	75.0% 3,900	37.0% 1,925	17.3% 900
Conservation and natural environments Woodland forest	37,200	99.9% 37,150	99.7% 37,075	98.3% 36,575	96.4% 35,875	72.6% 27,025	26.9% 10,000
Conservation and natural environments Forest (non woodland)	150,450	100.0% 150,425	99.9% 150,350	99.5% 149,675	98.5% 148,125	73.5% 110,625	32.1% 48,275
Agriculture	428,425	100.0% 428,400	100.0% 428,275	99.7% 427,150	93.8% 402,050	51.8% 221,825	15.5% 66,250
Grazing	295,850	100.0% 295,825	99.9% 295,700	99.8% 295,275	98.9% 292,500	69.4% 205,225	21.8% 64,475
Grazing non forest	140,050	100.0% 140,025	99.9% 139,925	99.6% 139,550	97.9% 137,125	59.7% 83,675	18.8% 26,275
Grazing Woodland forest	108,750	100.0% 108,750	100.0% 108,725	99.9% 108,675	99.7% 108,400	74.3% 80,800	16.9% 18,425
Grazing - Forest (non woodland)	47,050	100.0% 47,050	100.0% 47,050	100.0% 47,050	99.8% 46,975	86.6% 40,750	42.0% 19,775
Irrigation	131,975	100.0% 131,975	100.0% 131,975	99.5% 131,275	82.6% 108,950	12.1% 16,000	1.0% 1,350
Production native forests and plantation forests	62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	84.9% 53,425	42.4% 26,700







