### 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: April 2024

Results can be shown for the whole region (polygon), and separated by land use and forest cover classes which are likely to show different cover patterns and targets. Land use is divided into four broad classes: Conservation and natural environments, Agriculture, production native forests and plantation forests (no report), and other (no report). Agriculture is divided into grazing, crops and horticulture which are sub-divided into non-irrigated and irrigated. If forest is present land use is further divided into: non-forest, woodland forest and non-woodland forest. The area of each land use and forest class are shown as a map and chart. The report content is repeated for each land use and forest cover class that covers at least 1% of the area of the chosen region. Total vegetation Cover:

The total vegetation cover indicates where soil is likely to be protected from wind and or water hillslope erosion. Total vegetation cover for this month is shown on a map and chart classified into 4 classes.

- 71-100% High cover protected from wind and usually water erosion (high rainfall, steep slopes, and erodible soils may need greater than 80, 90, 95 and up to 100% cover)
  - 51-70% Moderate cover protected from wind erosion
  - 31-50% Low cover not protected
  - 0-30% Very Low cover not protected

Erosion protection: Wind erosion 50% total vegetation cover

The vegetation cover threshold required to prevent soil erosion is usually 50% to reduce wind erosion, 70% or 80% to reduce water (hillslope) erosion depending on the steepness and rainfall. Areas protected from erosion for the month:

- Map: water erosion protection (>70% cover) percentage area and hectares.
- Map: wind erosion protection (>50% cover) percentage area and hectares.

Comparison with previous years:

- Map: anomaly comparing this month to the average cover from the same month in previous years.
- Map: deciles rank of month against the same month in previous years.

Anomalies and deciles until September 2019 are calculated comparing to the same months 2001 to 2019. Extra monthly data will be used to calculate anomalies and deciles post September 2019 as they become available. Time series monthly from January 2001 to current:

#### **Erosion protection**

- Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for each month (orange lines). Horizontal lines are 10th (cover target) and 50th percentiles.
- Water erosion protection time series: percentage of the area of the region with greater than 70% cover for each month (blue line). Horizontal lines are 10th (cover target) and 50th percentiles.

#### Rainfall

• Millimetres rainfall each month (black line).

Each time series is also stacked by year. The black line shows the current year of data.

Water erosion protection for higher rainfall and steeper slopes:

Water erosion protection on higher slopes. As slope increases, more cover is required to control water erosion. The thresholds reported are:

- the percentage area with pixels greater than 80% total cover.
- the percentage area with pixels greater than 90% total cover.
- the percentage area with pixels greater than 95% total cover.

#### **Acknowledgment of data:**

- 1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
- 2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
- 3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
- 4. MODIS Fractional cover algorithm:

https://doi.org/10.4225/08/5848a3f19a7b3









#### **Vegetation Cover Apr 2024**

#### 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

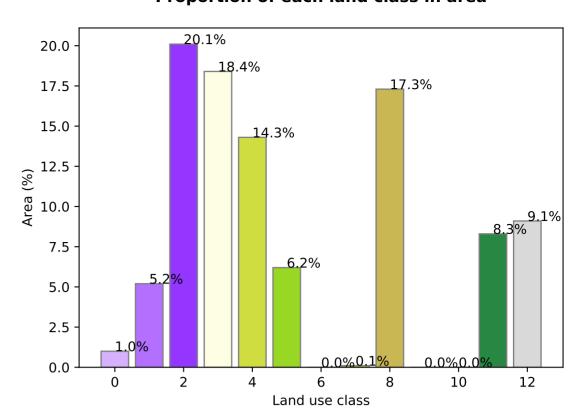
using baseline from 2001 to

2019.

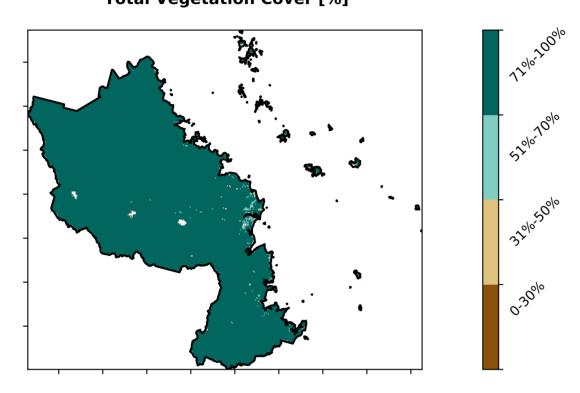
Land Use and Forests

#### 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

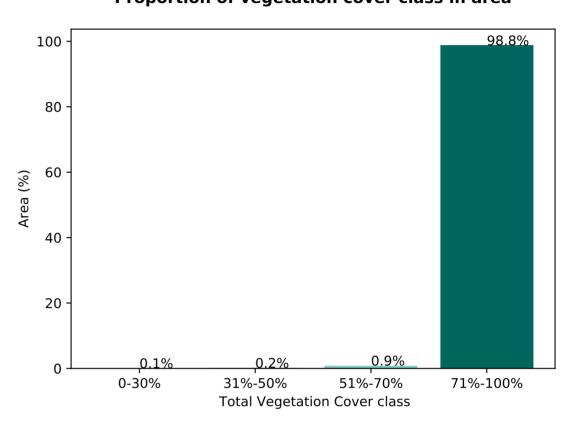
#### **Proportion of each land class in area**

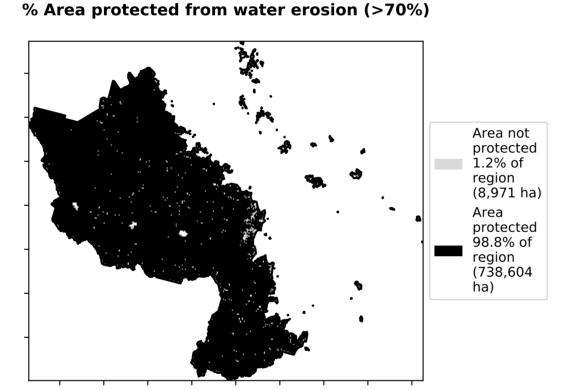


#### **Total Vegetation Cover [%]**

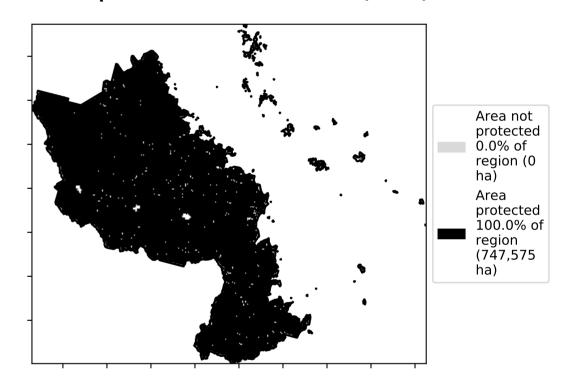


Proportion of vegetation cover class in area

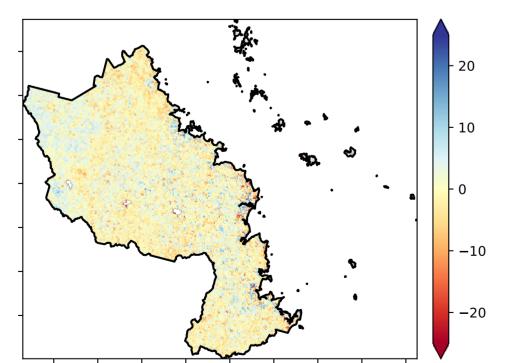




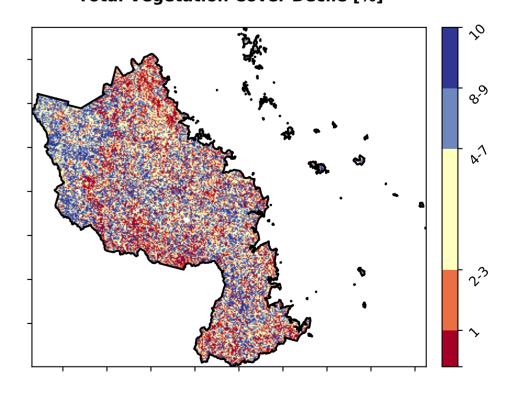
% Area protected from wind erosion (>50%)



#### **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.

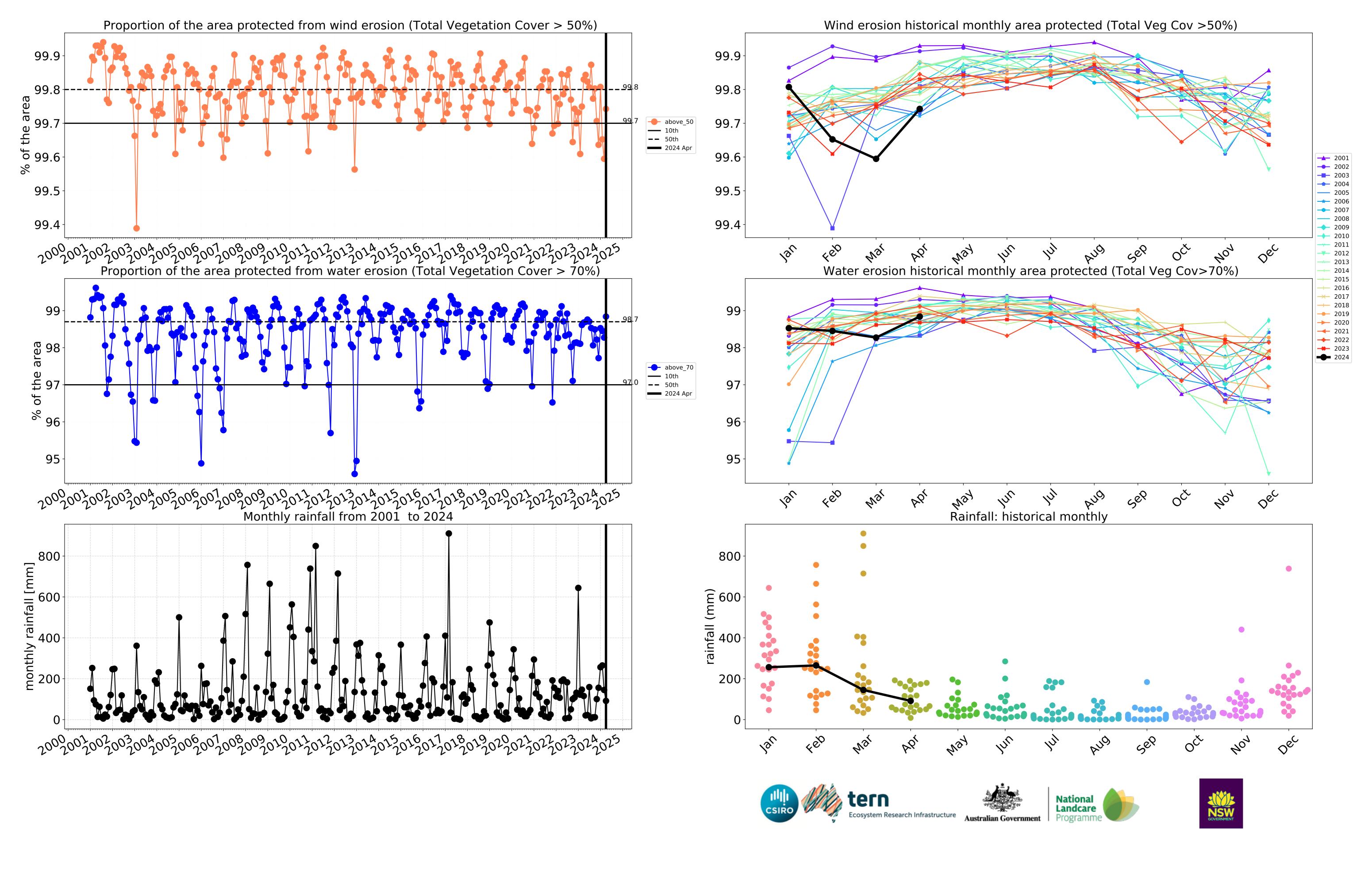


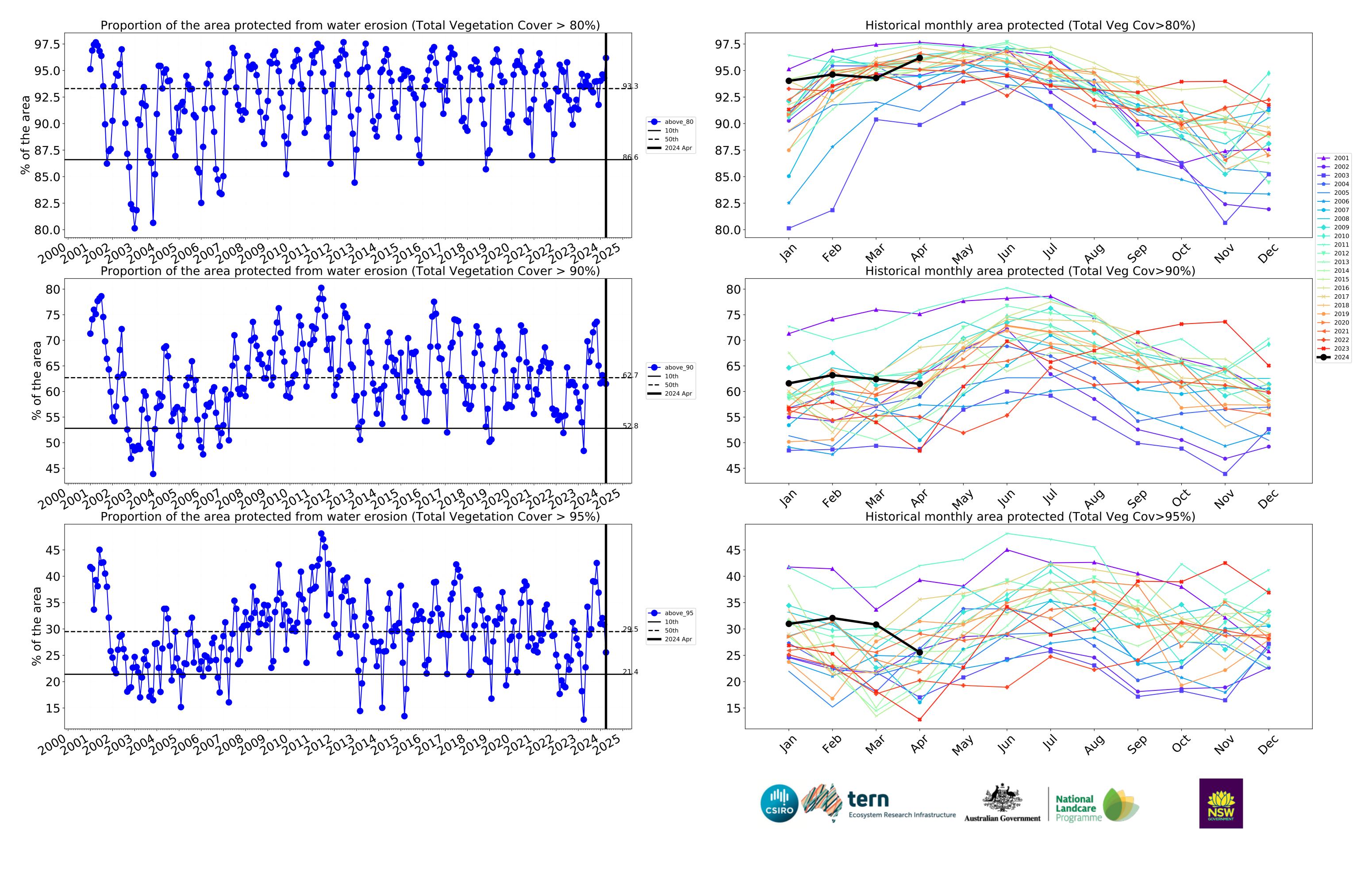












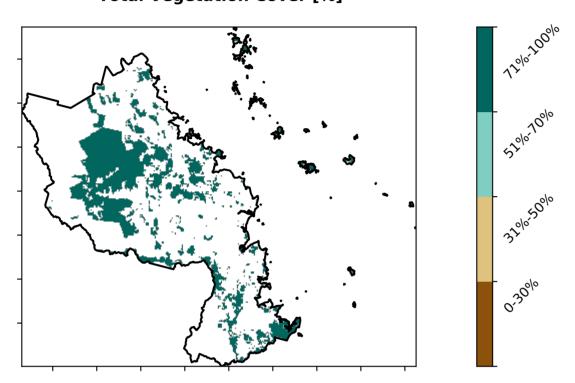
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#### **Conservation and natural environments**

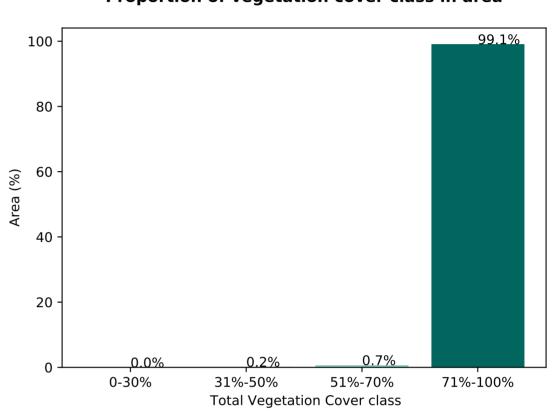
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) Australia (2018) On Scale Land On Scale

#### **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

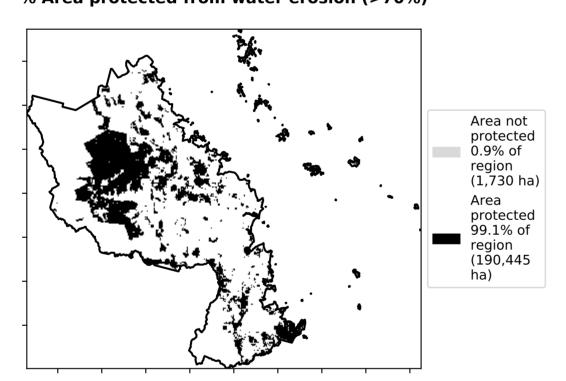
#### **Total Vegetation Cover [%]**



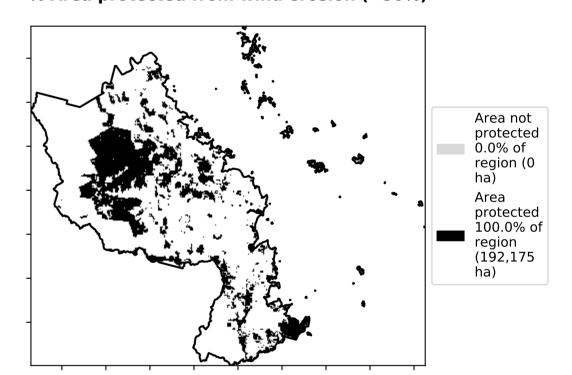
Proportion of vegetation cover class in area



#### % 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

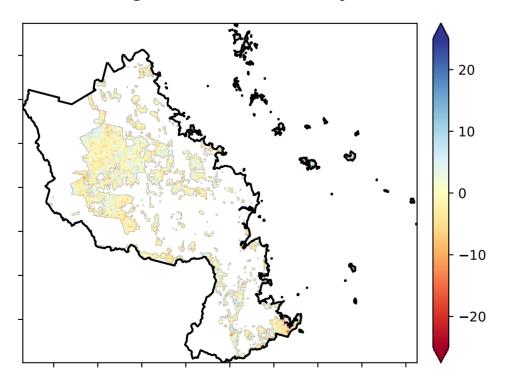
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pixel. The mean

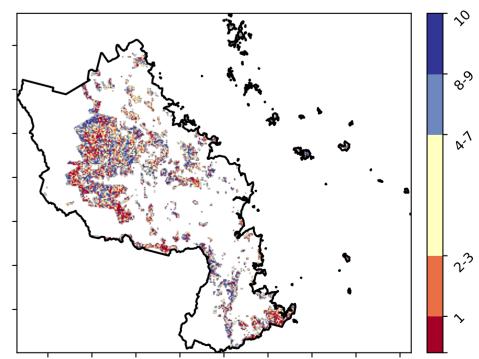
using baseline from 2001 to 2019.

is only for the month of the map

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



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.



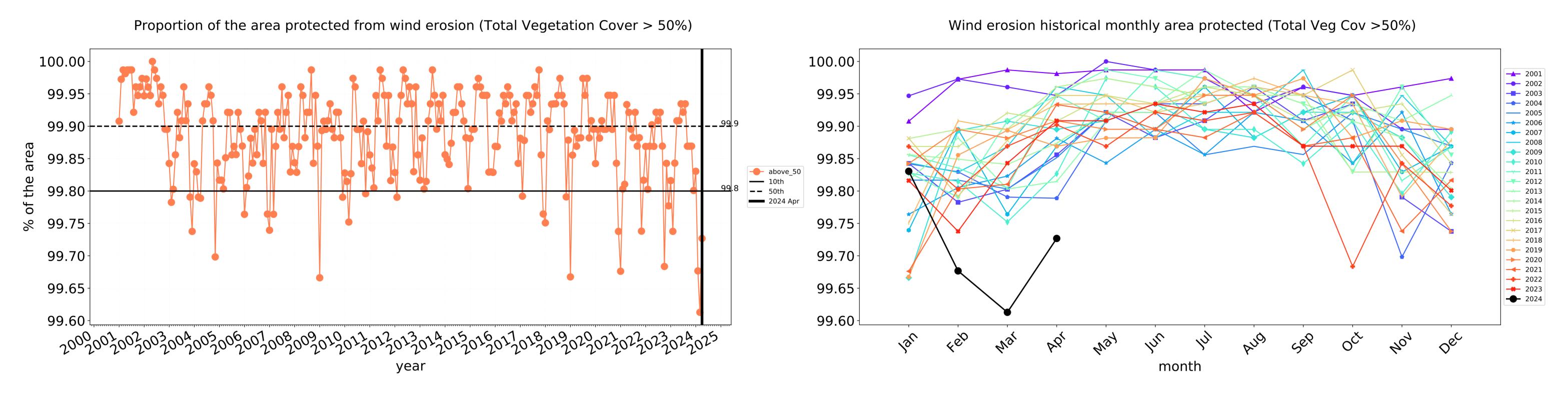


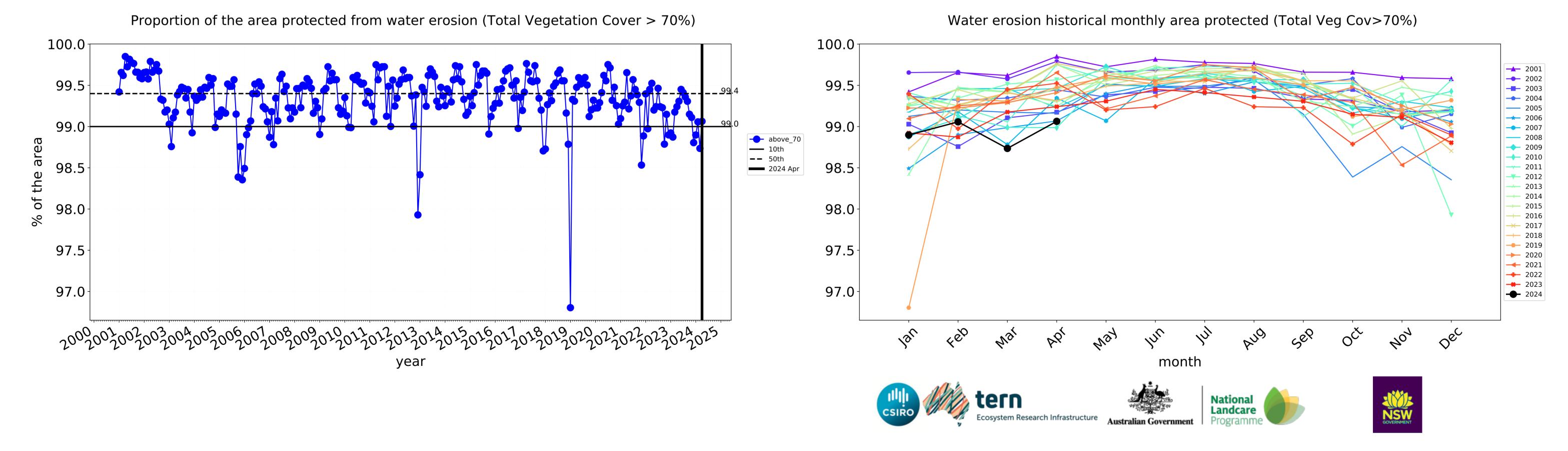


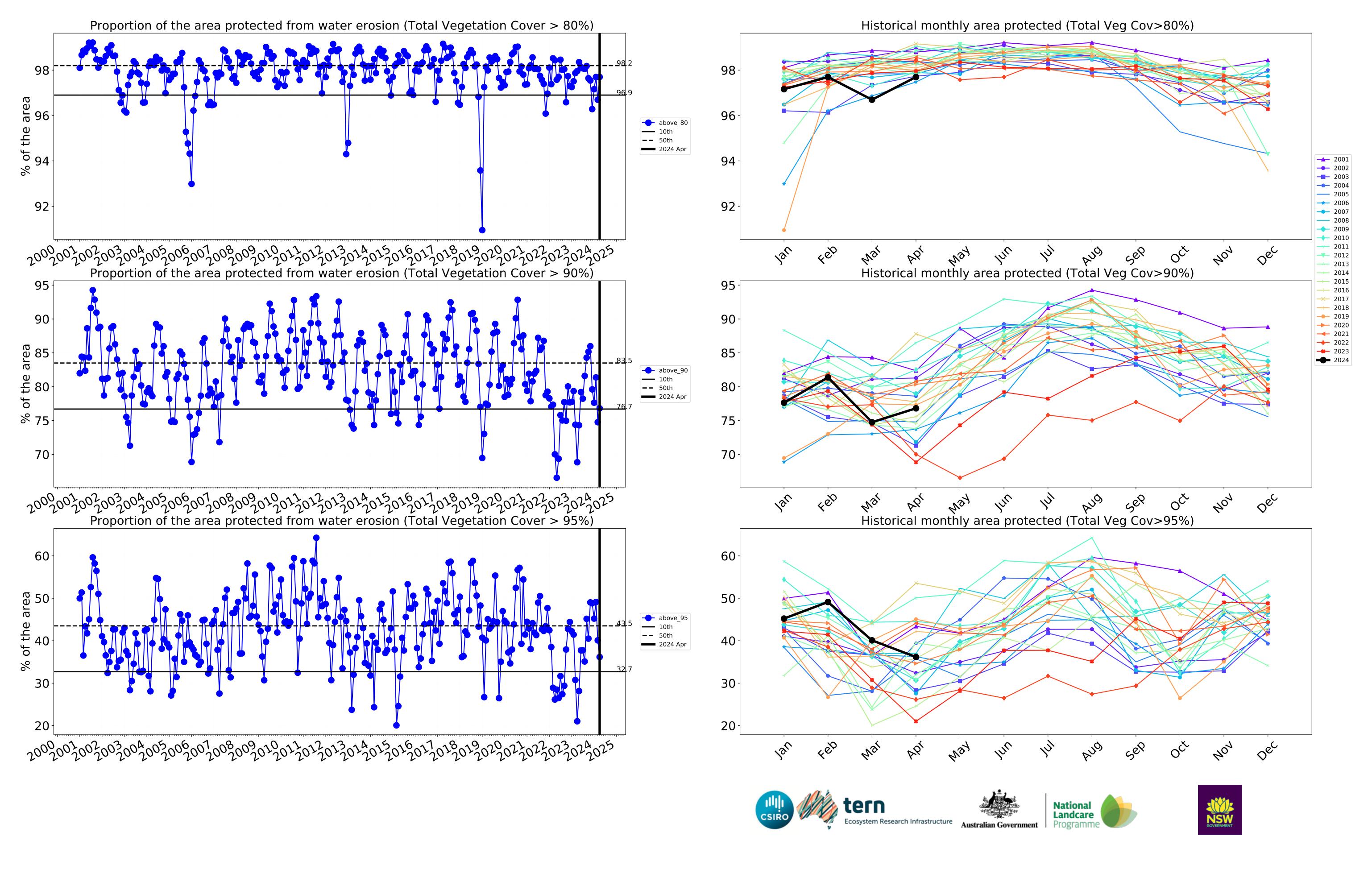




#### **Conservation and natural environments timeseries**







#### **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)

Anomaly show how many percetage points each pixel is from

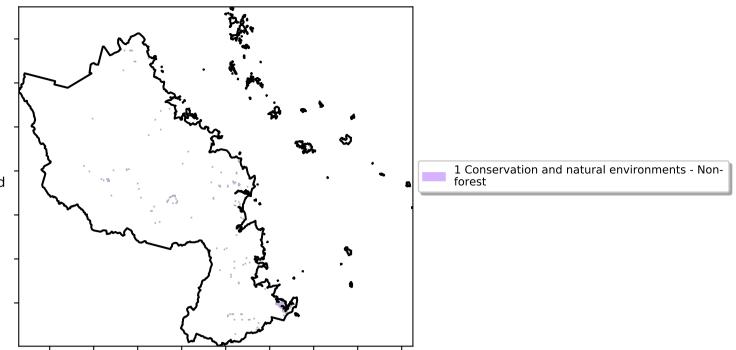
the mean. That

pixel. The mean

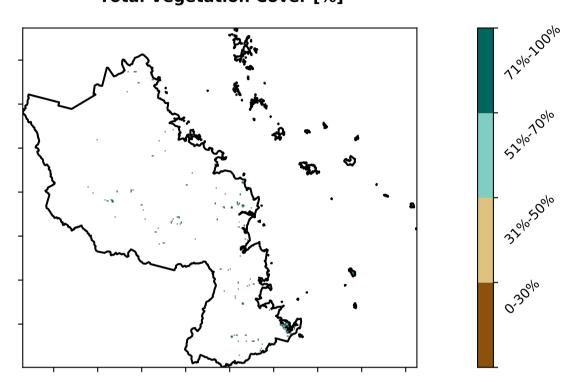
using baseline from 2001 to 2019.

is only for the month of the map

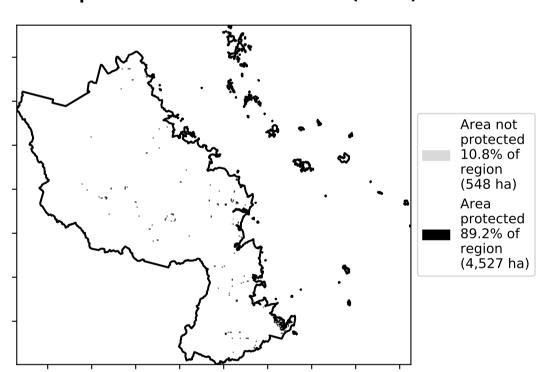
is, red pixels are about 20% lower than the mean of that



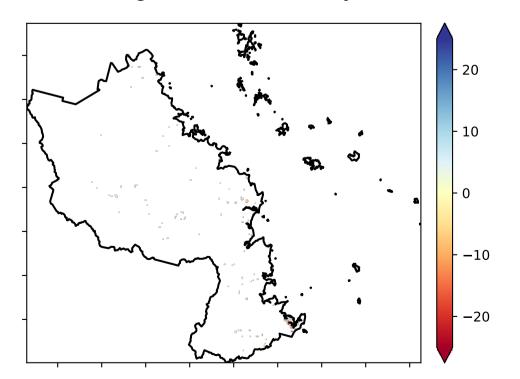
#### **Total Vegetation Cover [%]**



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

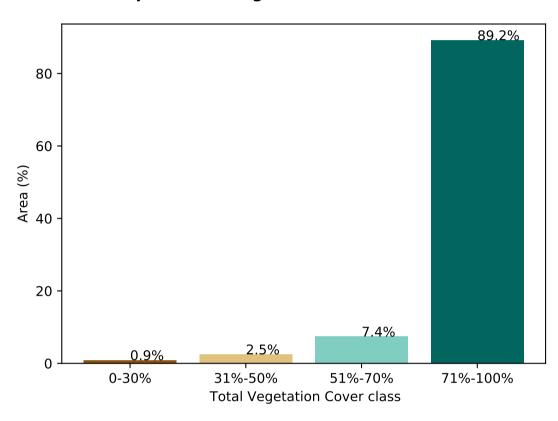


#### Total Vegetation Cover Anomaly [%]

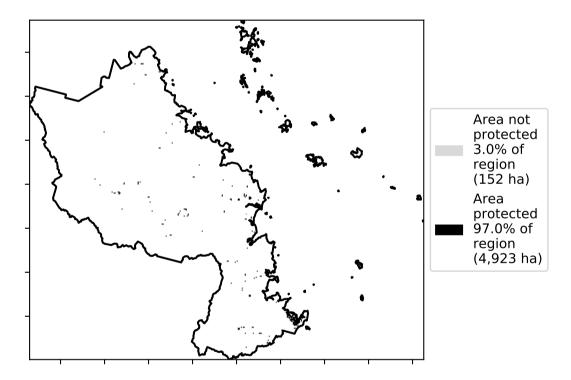


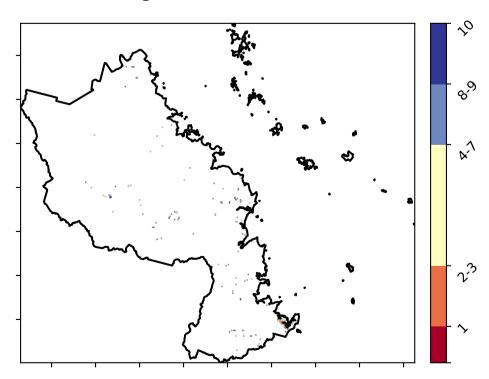
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#### Proportion of vegetation cover class in area



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









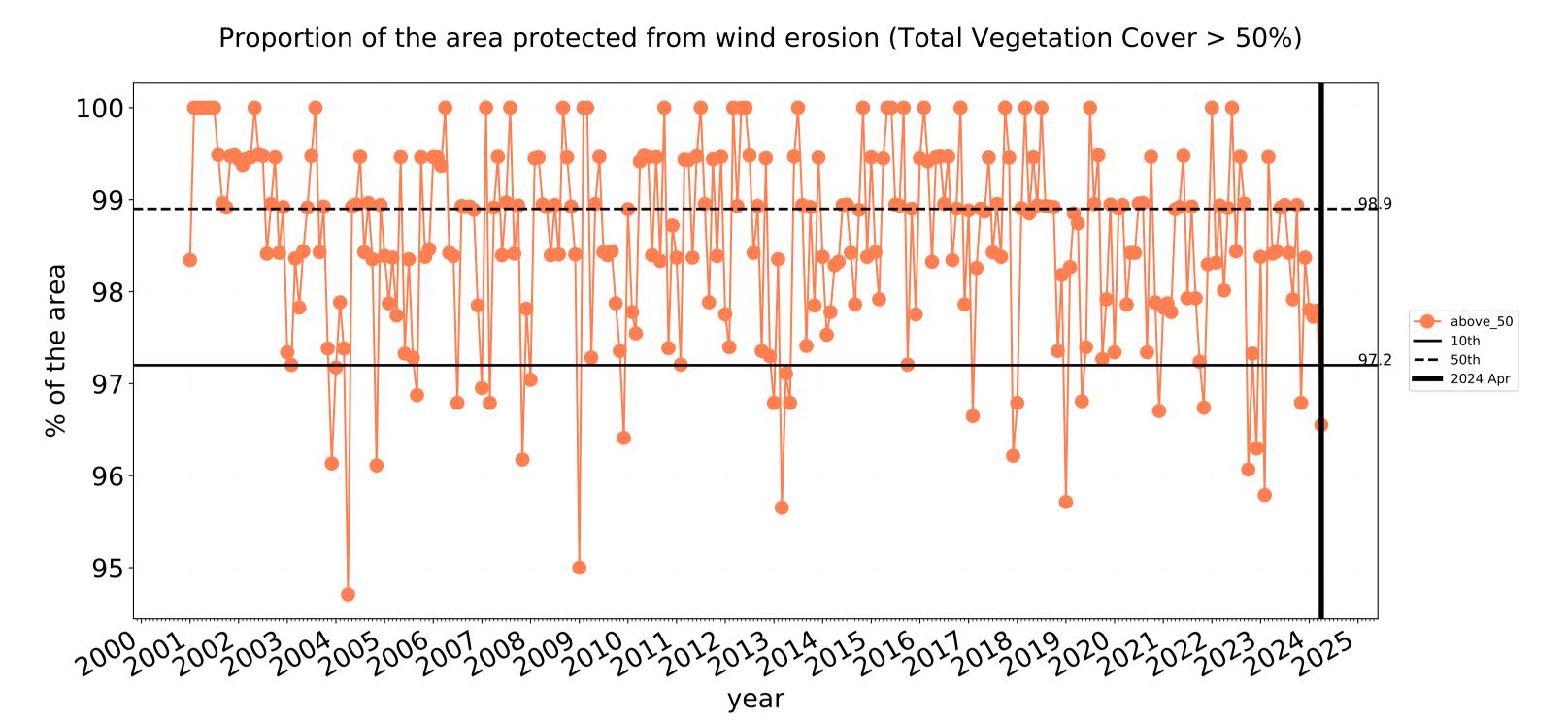


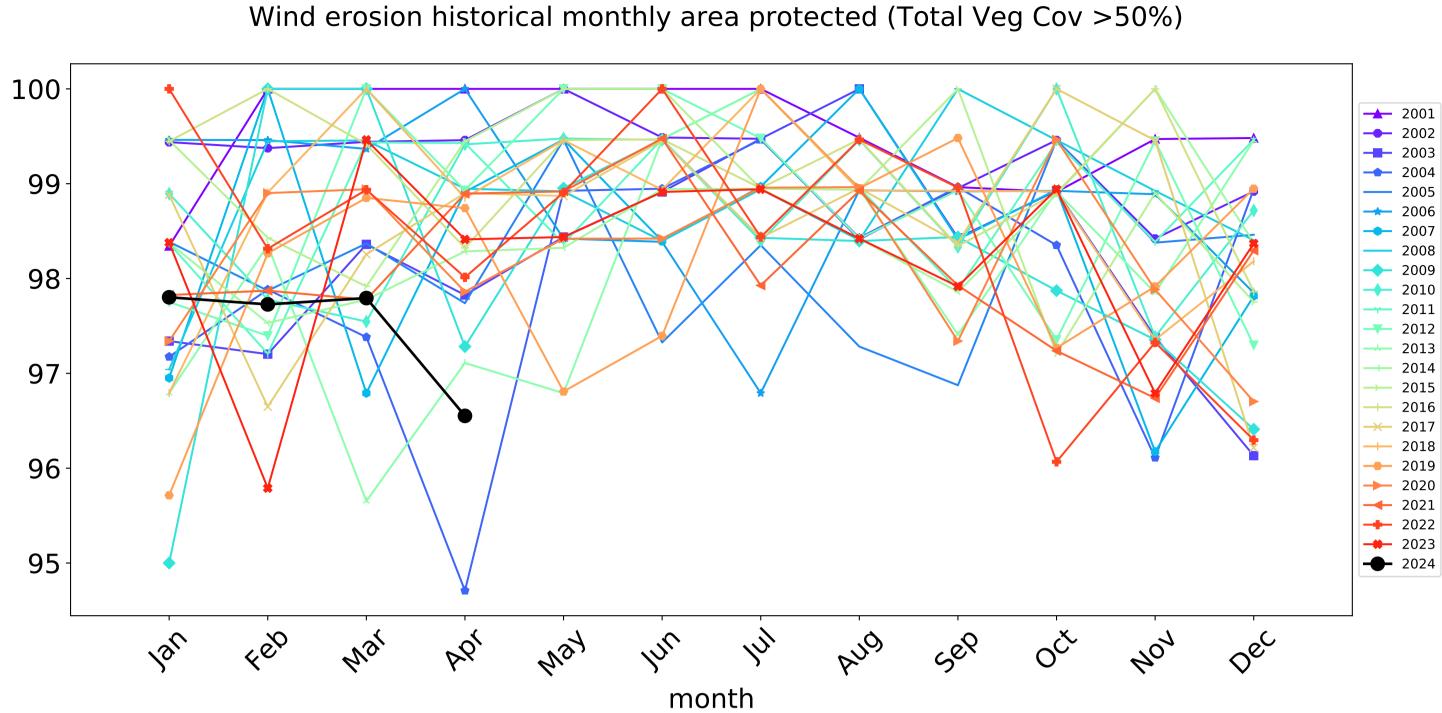


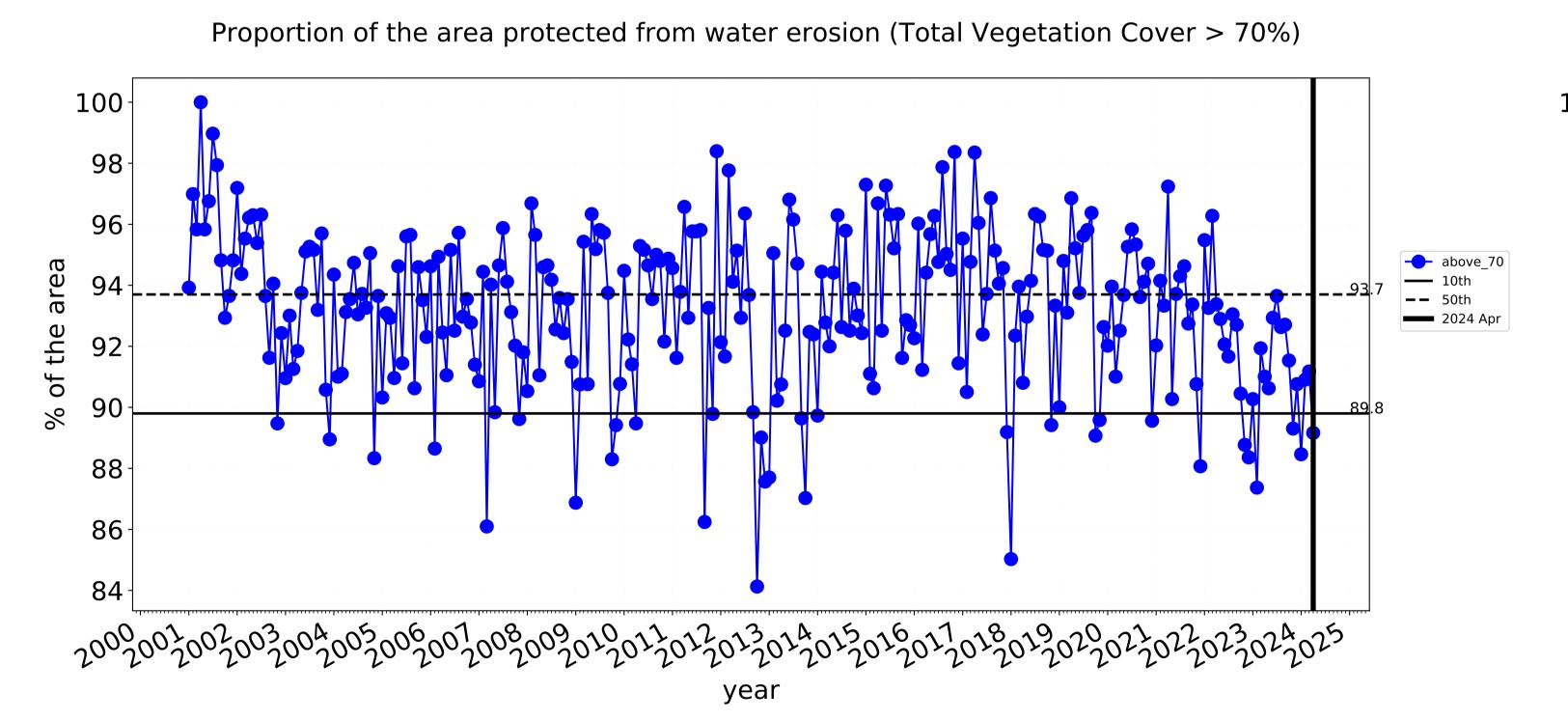


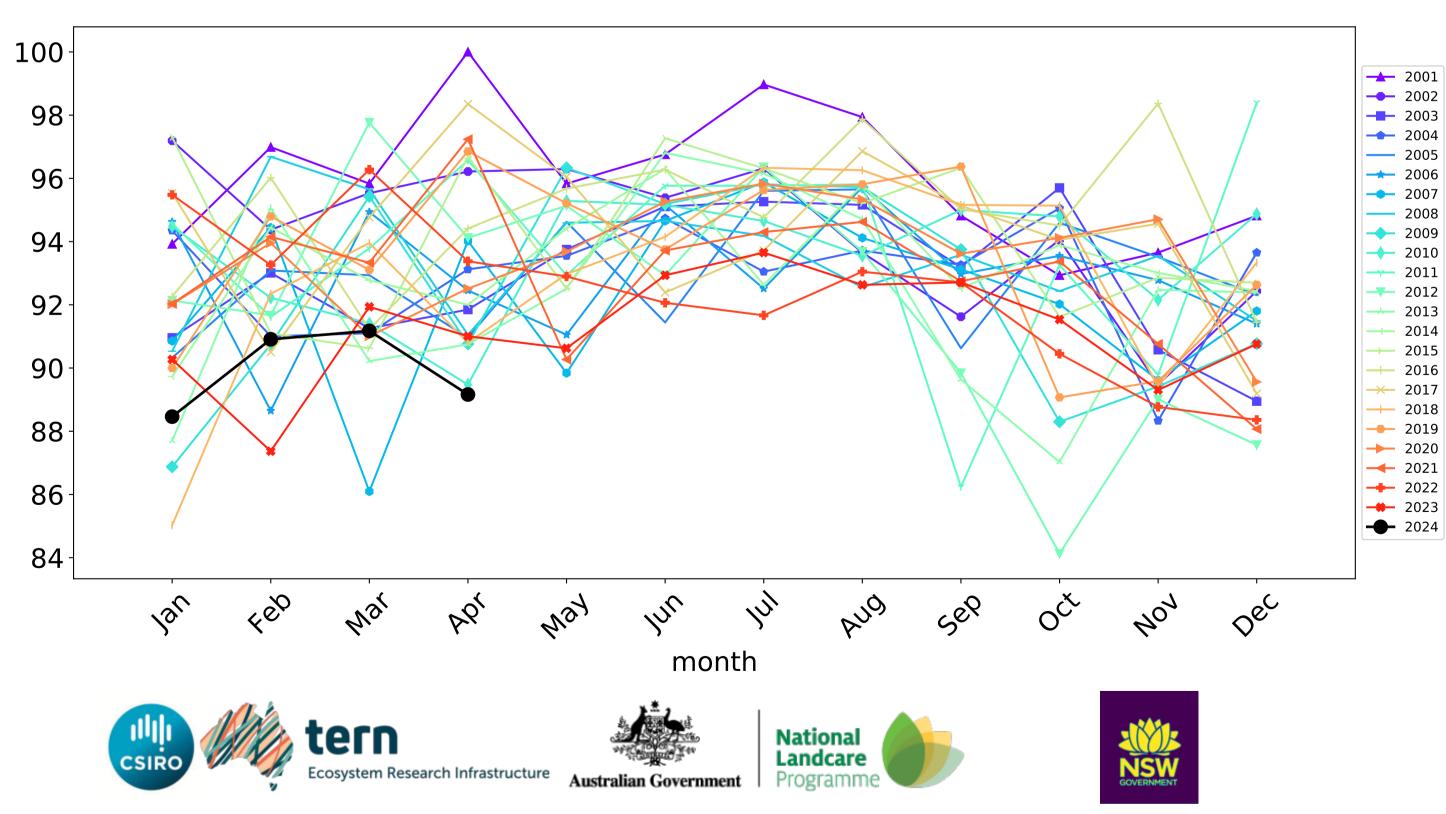


#### **Conservation and natural environments non forest timeseries**

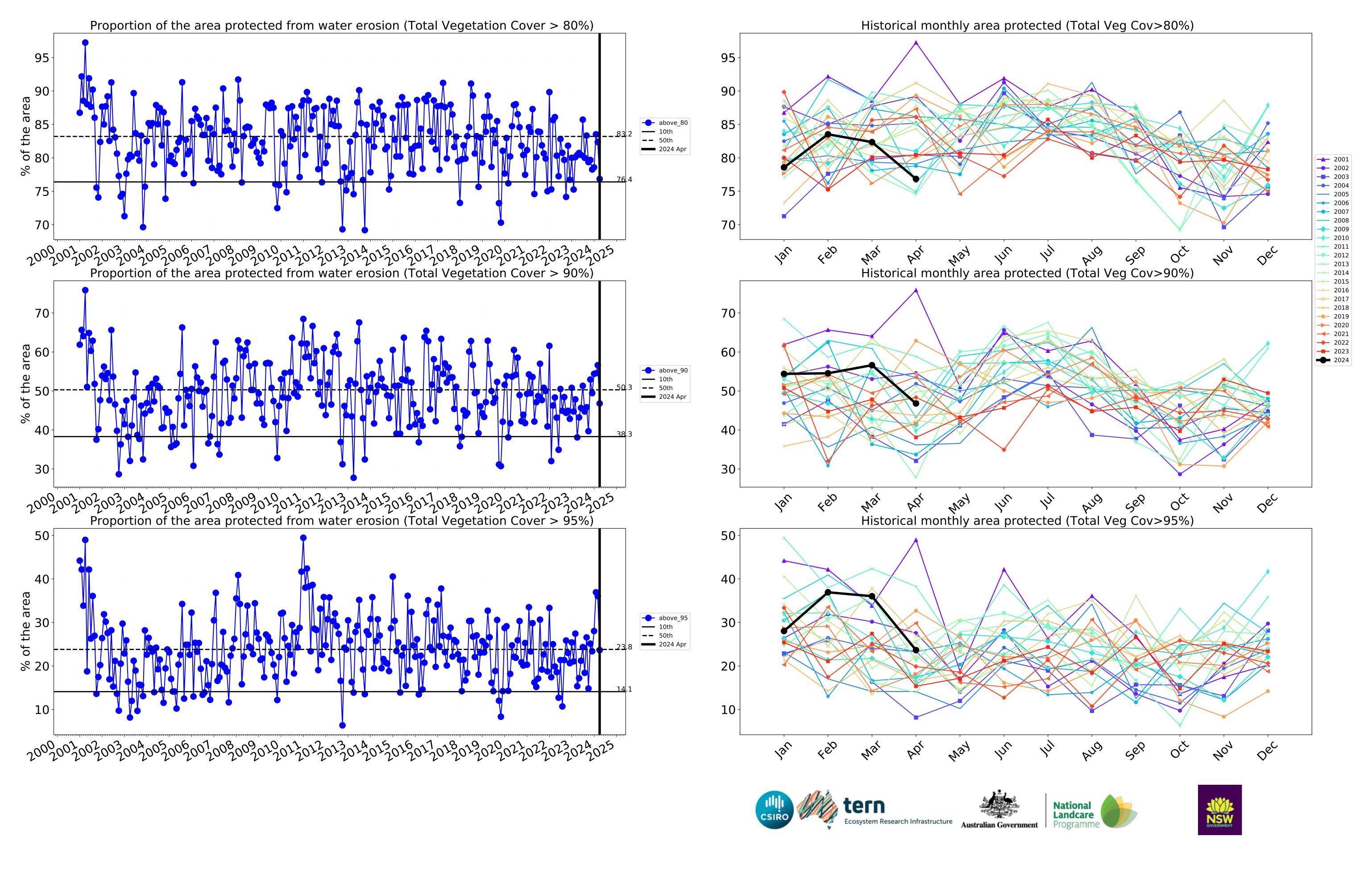








Water erosion historical monthly area protected (Total Veg Cov>70%)



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

Catchment Scale Land Use and Forests of Australia (2018)

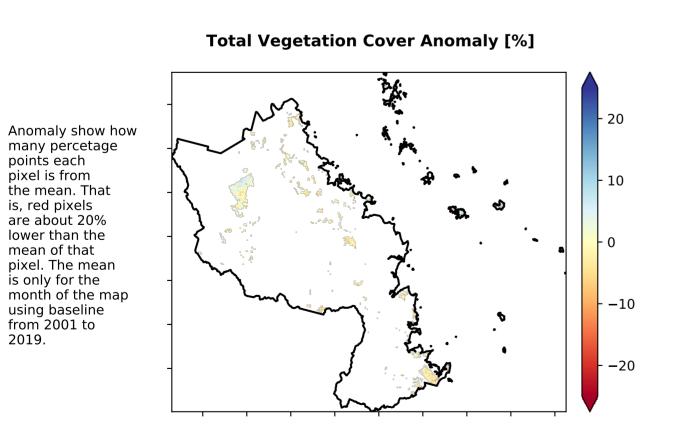
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

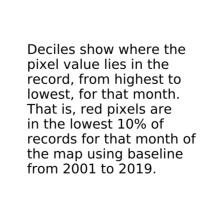
Derived from

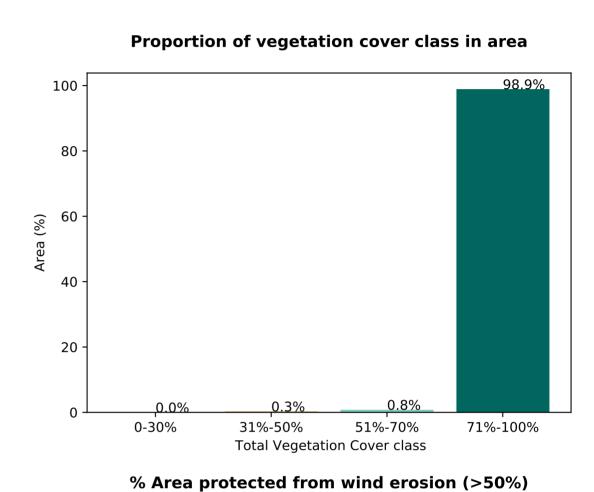
## Land use and forest cover 1 Conservation and natural environments - Woodland forest

## Total Vegetation Cover [%]

## Area not protected 1.1% of region (405 ha) Area protected 98.9% of region (36,395 ha)

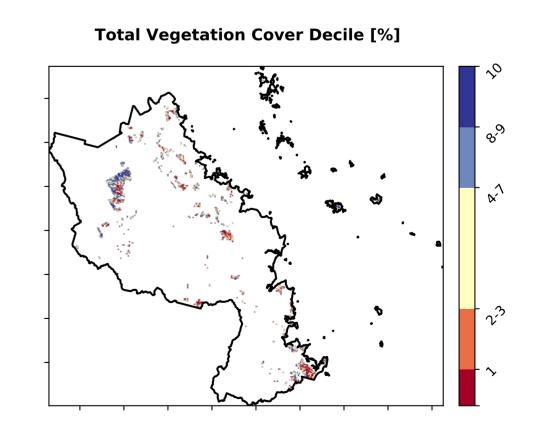






Area not protected 0.0% of region (0 ha)

Area protected 100.0% of region (36,800 ha)



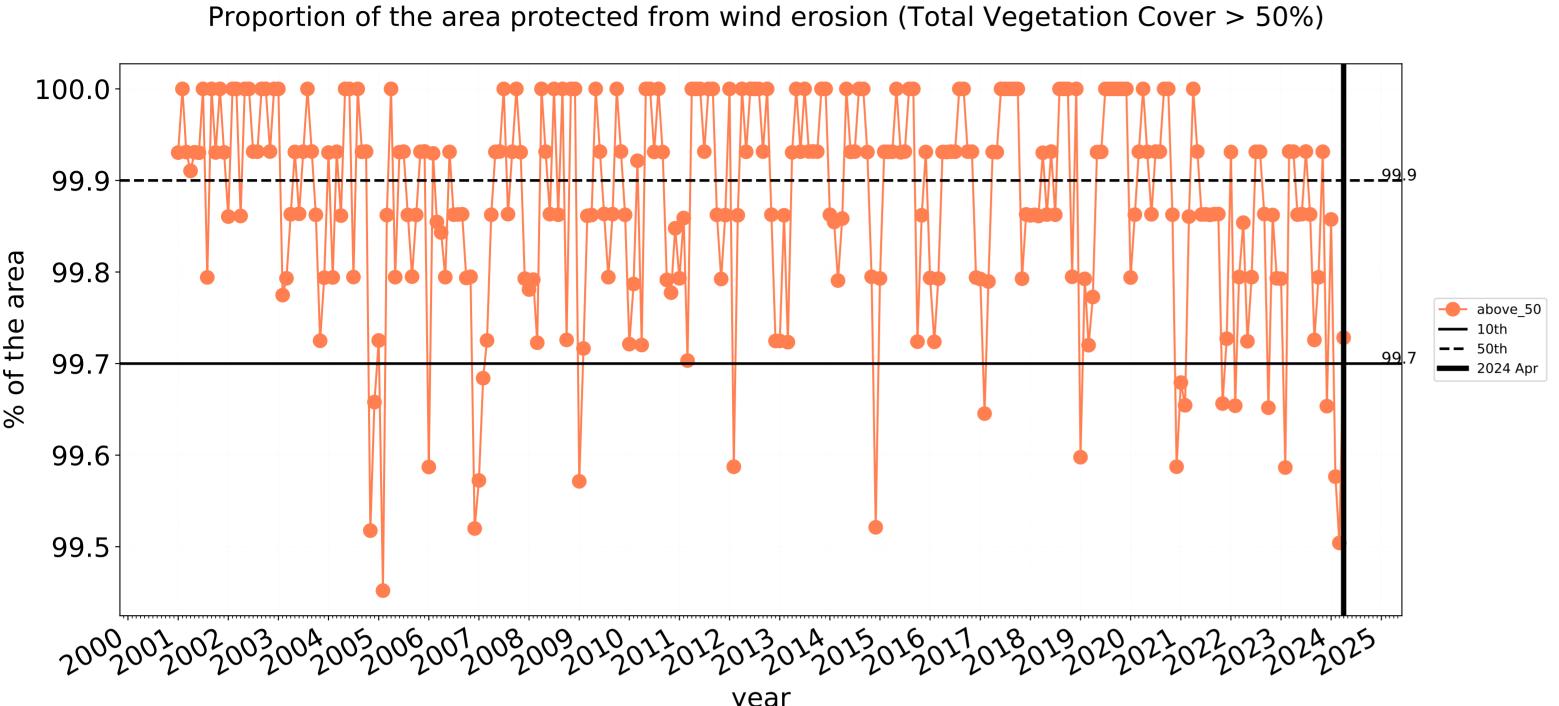


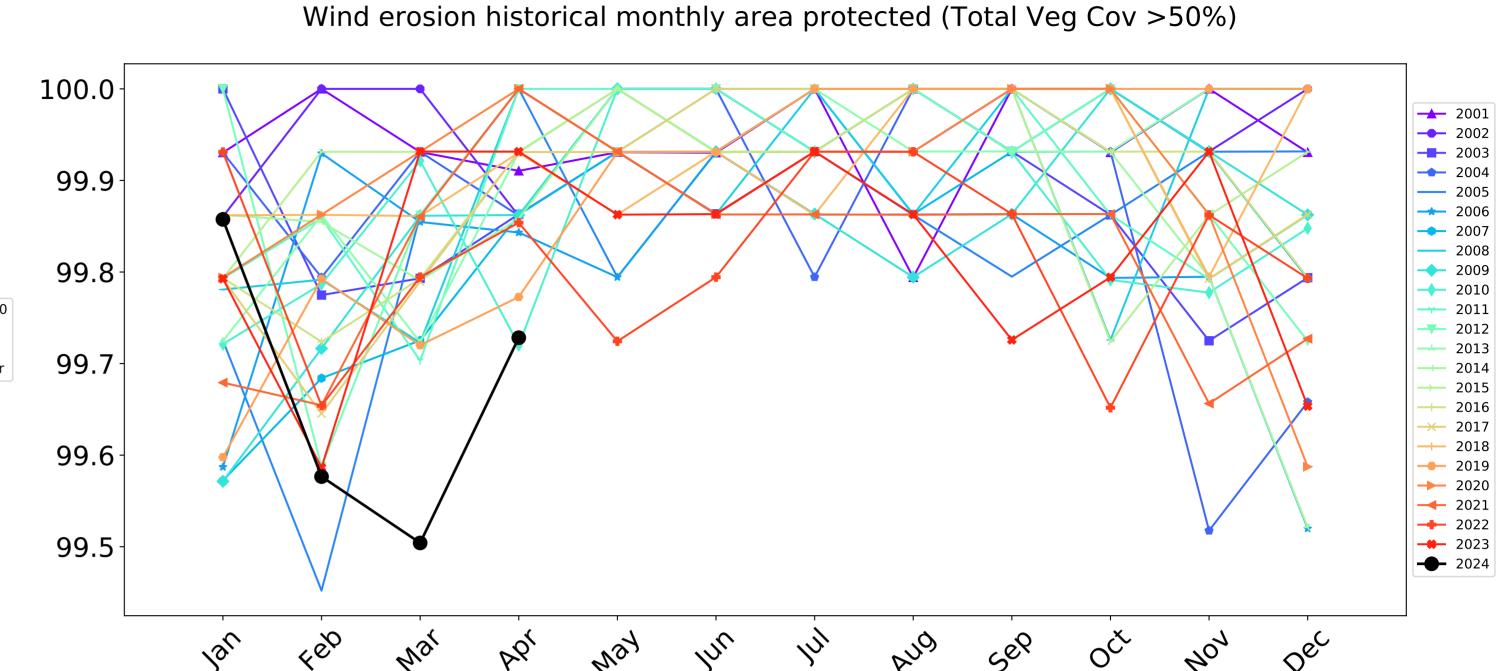




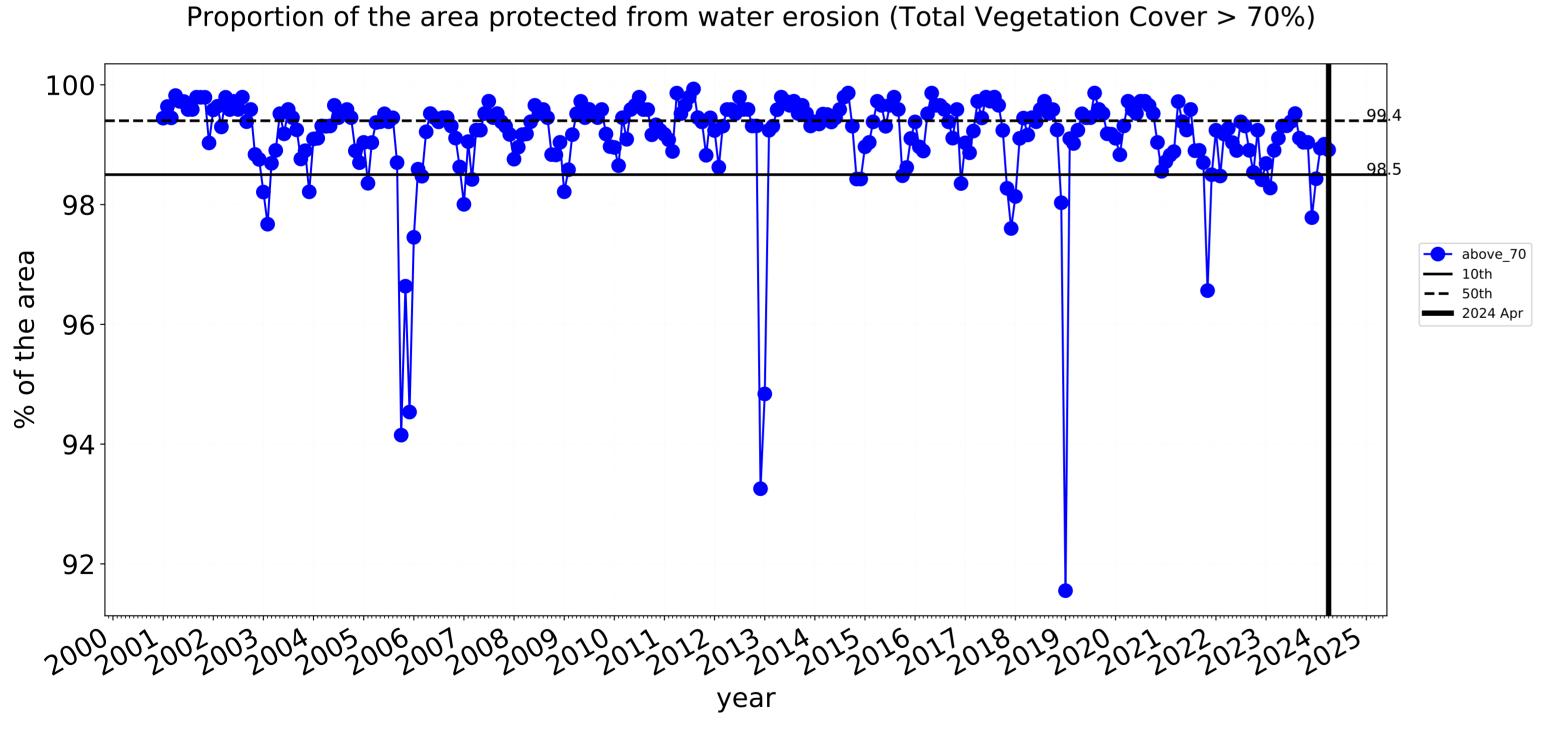


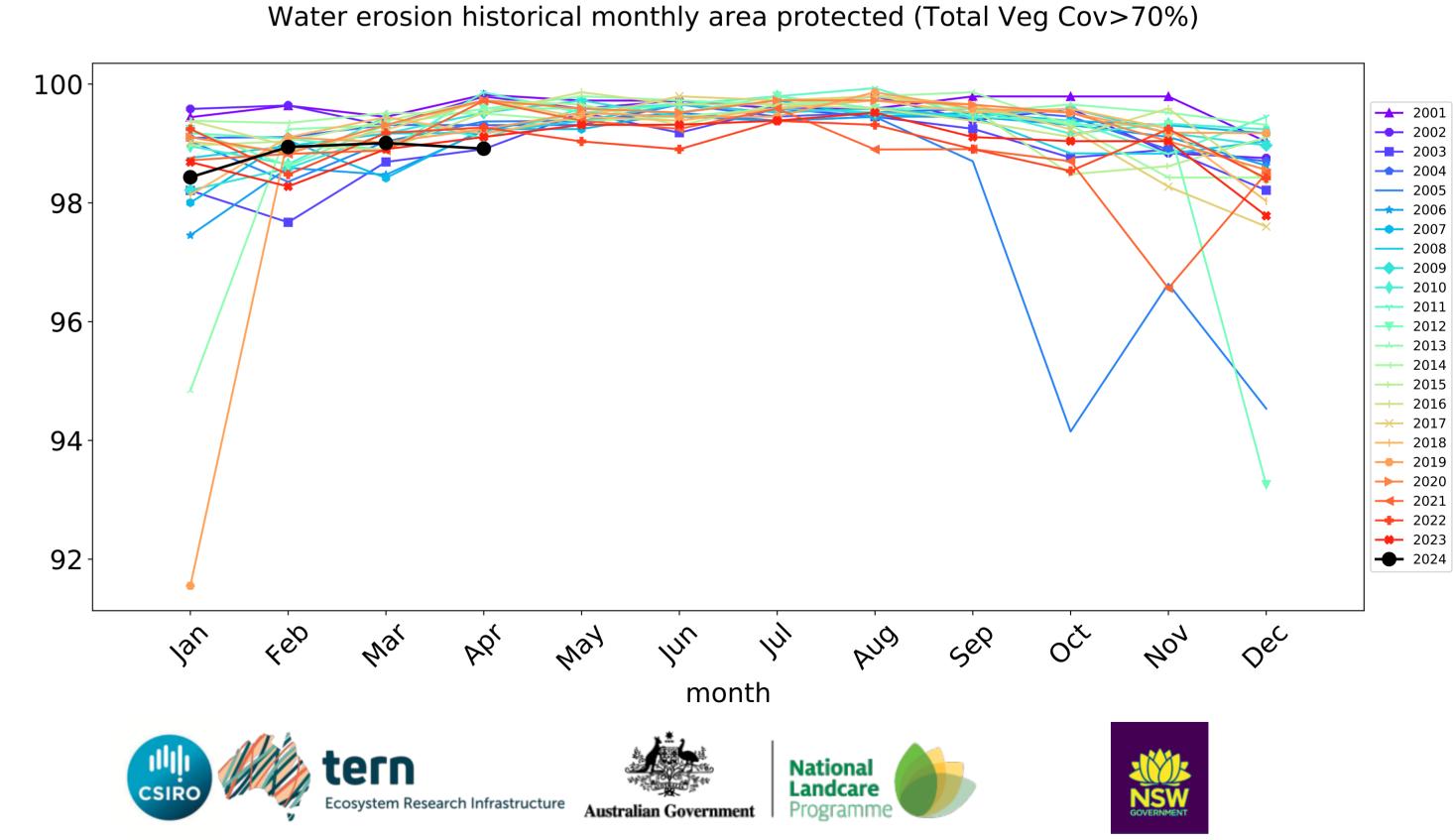
#### **Conservation and natural environments Woodland forest timeseries**

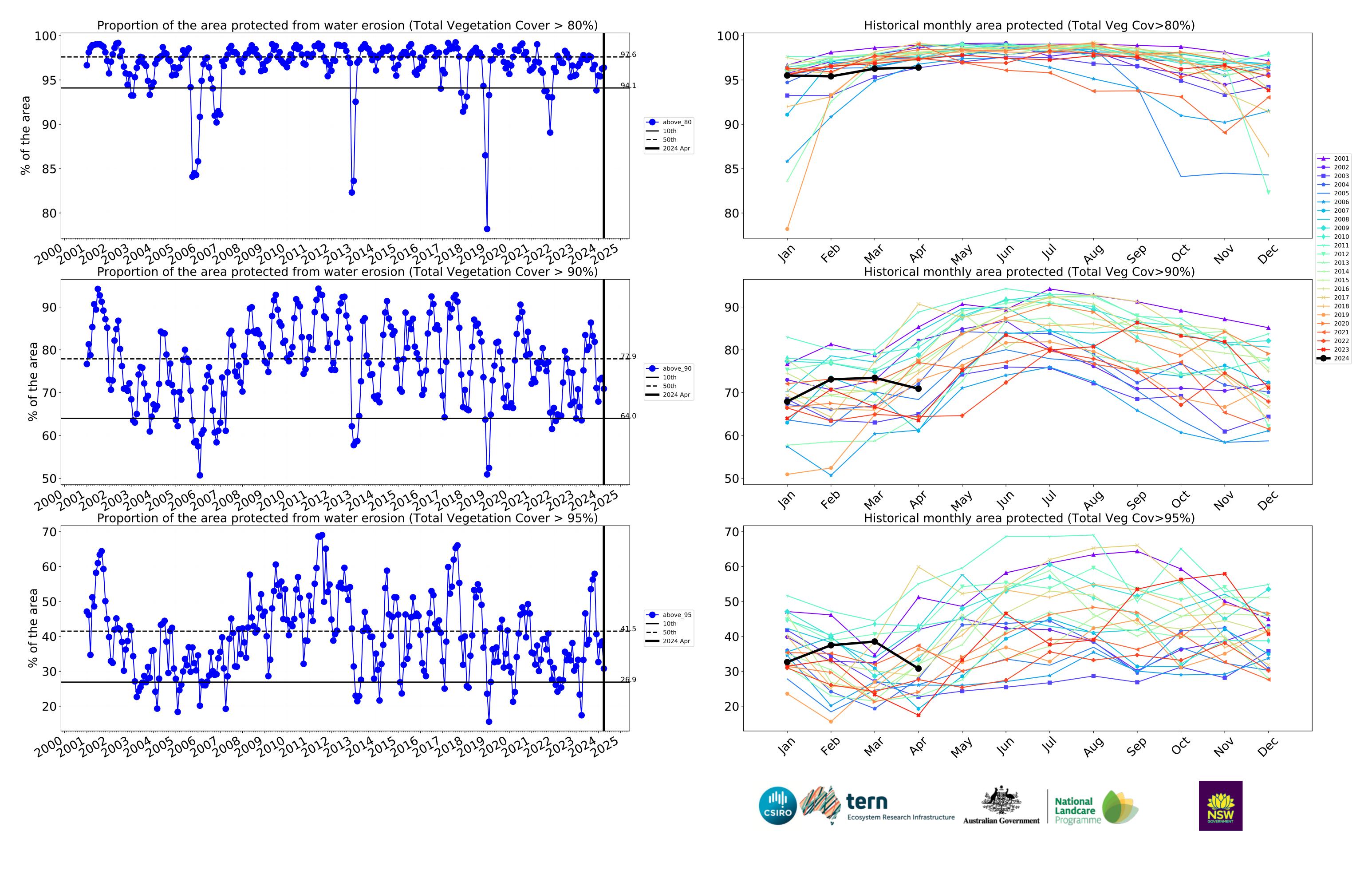




month

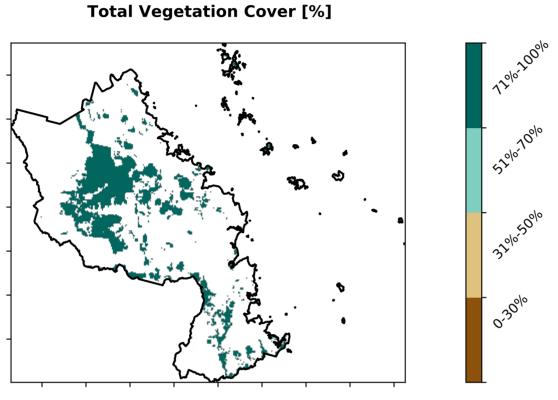




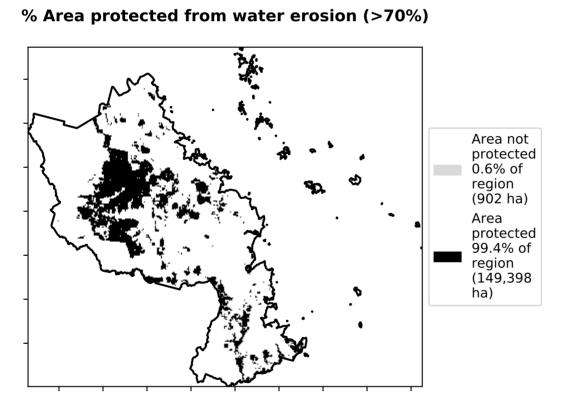


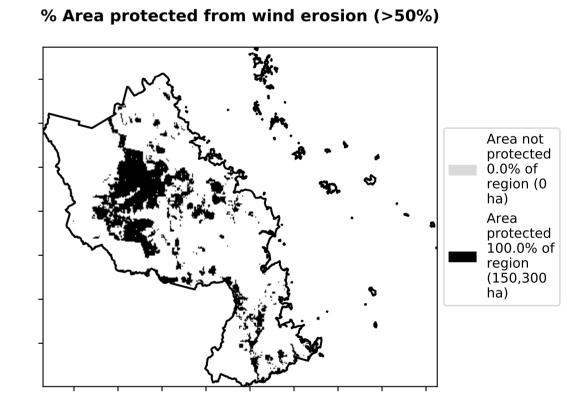
#### **Conservation and natural environments Forest (non woodland)**

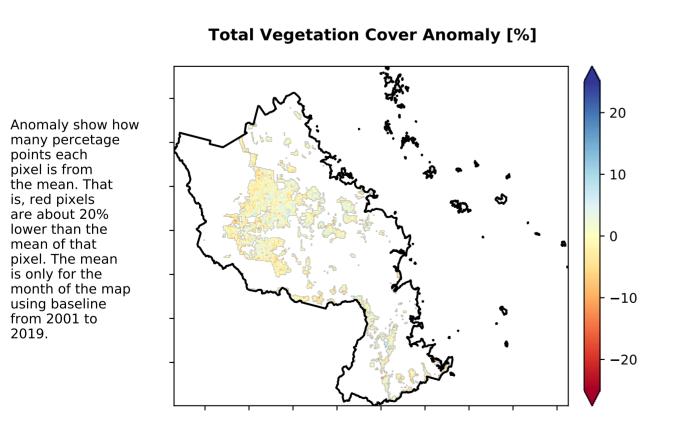
### Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

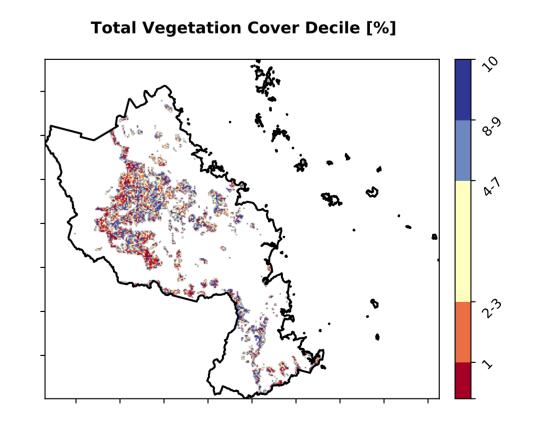


#### Proportion of vegetation cover class in area 99.4% 100 80 20 -0-30% 31%-50% 51%-70% 71%-100% **Total Vegetation Cover class**







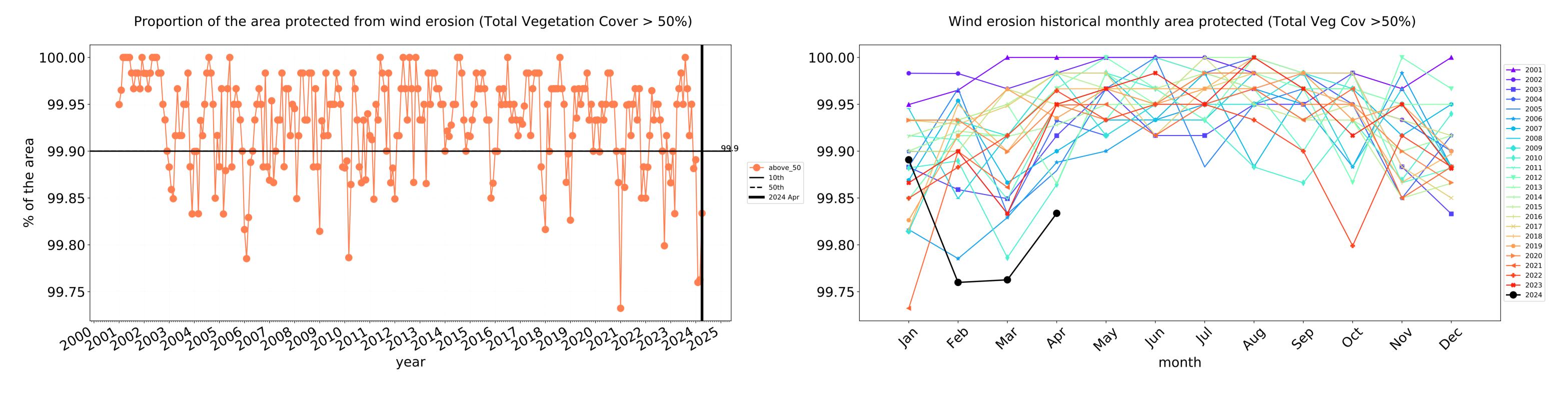


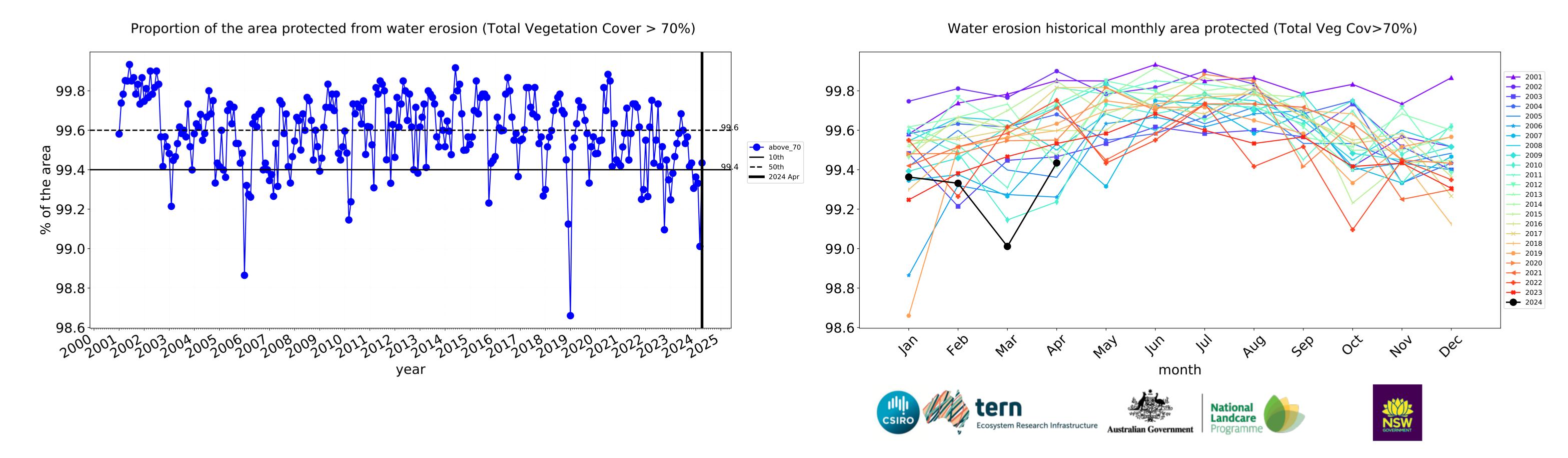
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline. the map using baseline from 2001 to 2019.

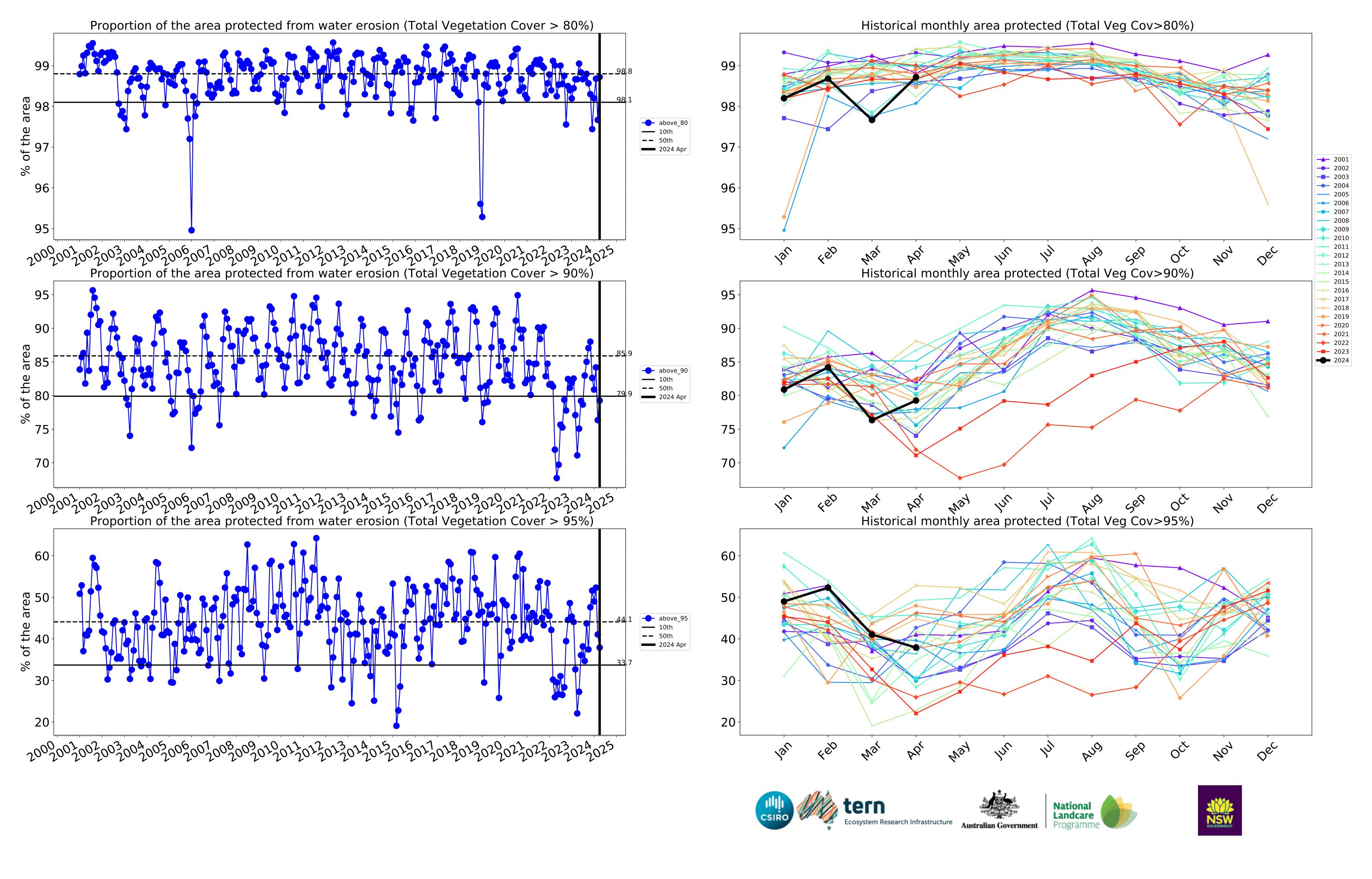






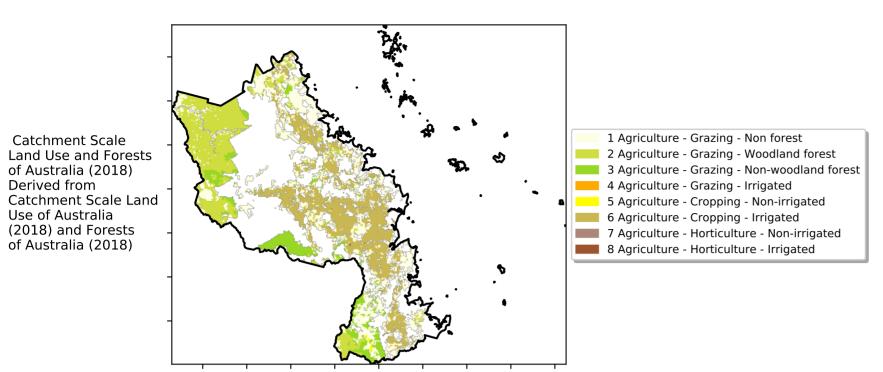




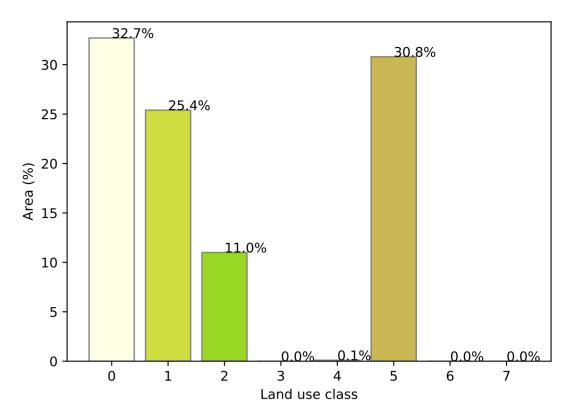


#### **Agriculture**

#### Land use and forest cover



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



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

of Australia (2018)

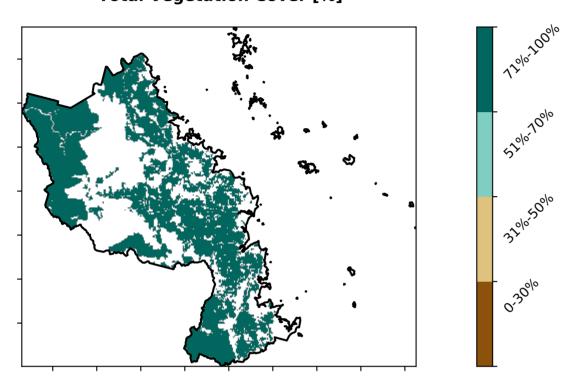
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pixel. The mean

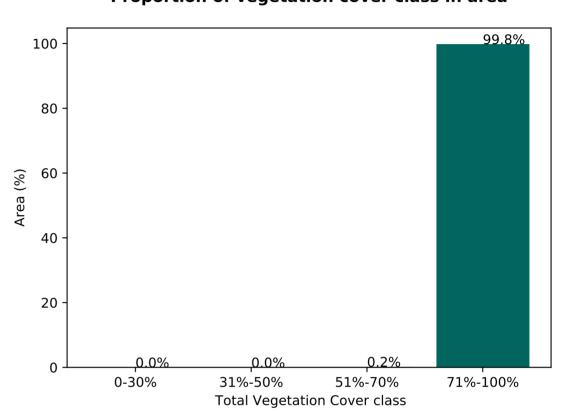
using baseline from 2001 to 2019.

is only for the month of the map

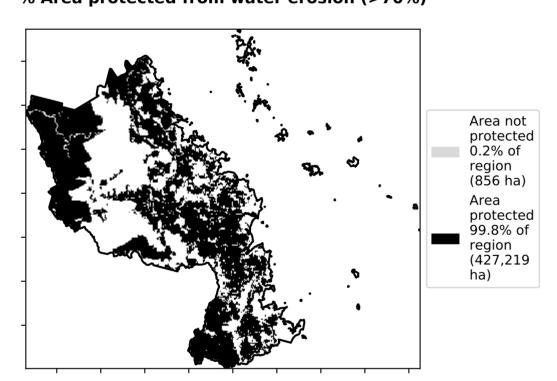
is, red pixels are about 20% lower than the mean of that



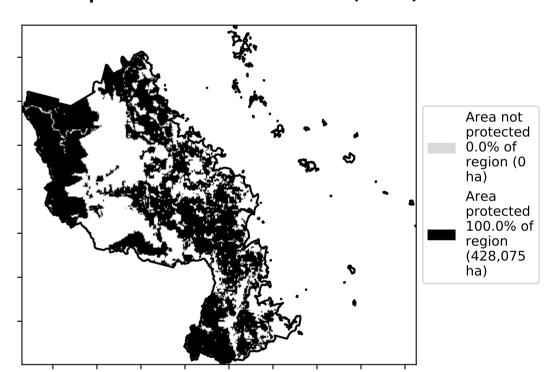
Proportion of vegetation cover class in area



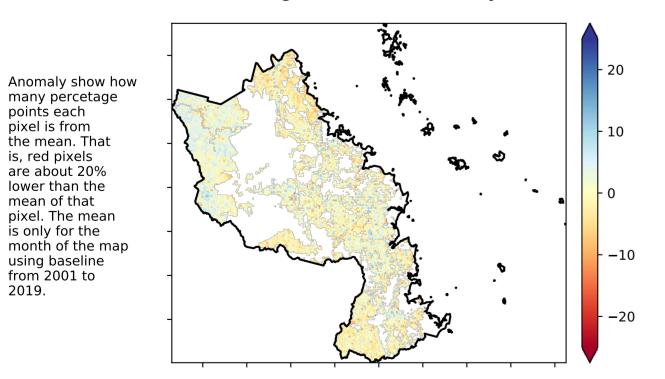
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

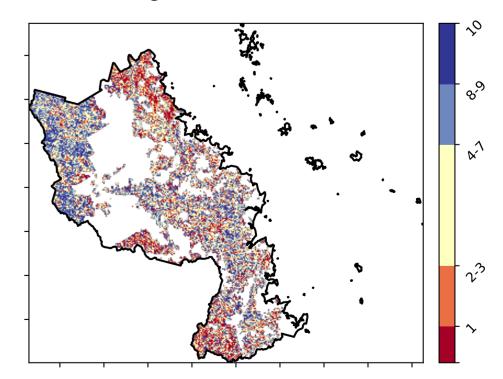


#### **Total Vegetation Cover Anomaly [%]**



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 [%]** 







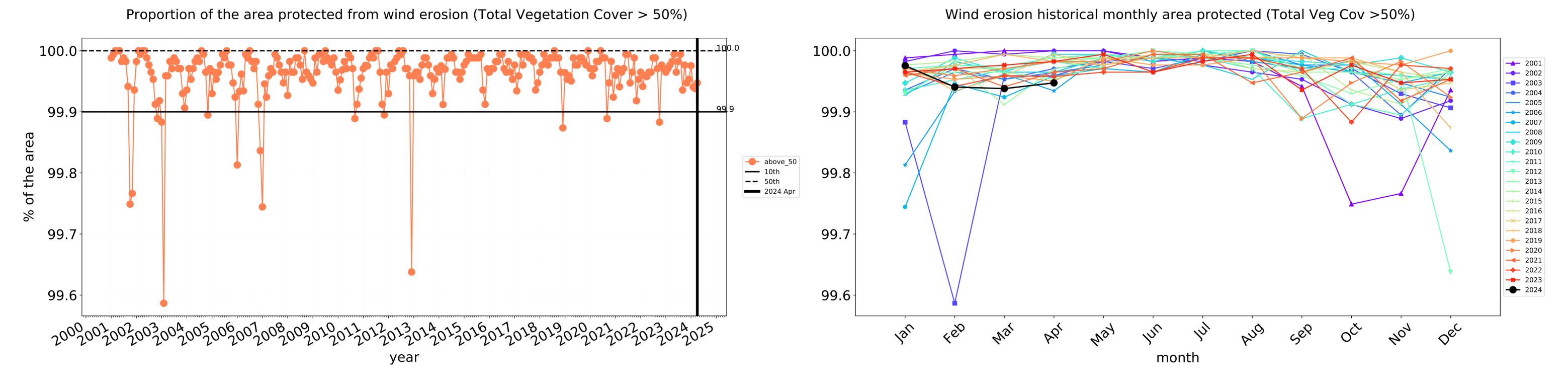


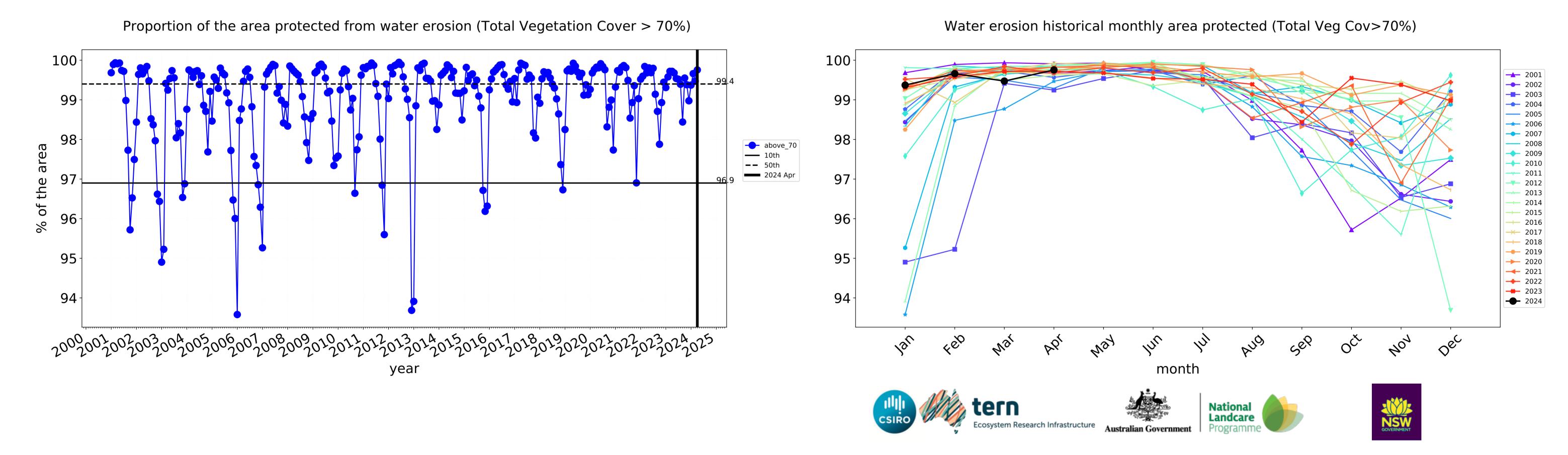


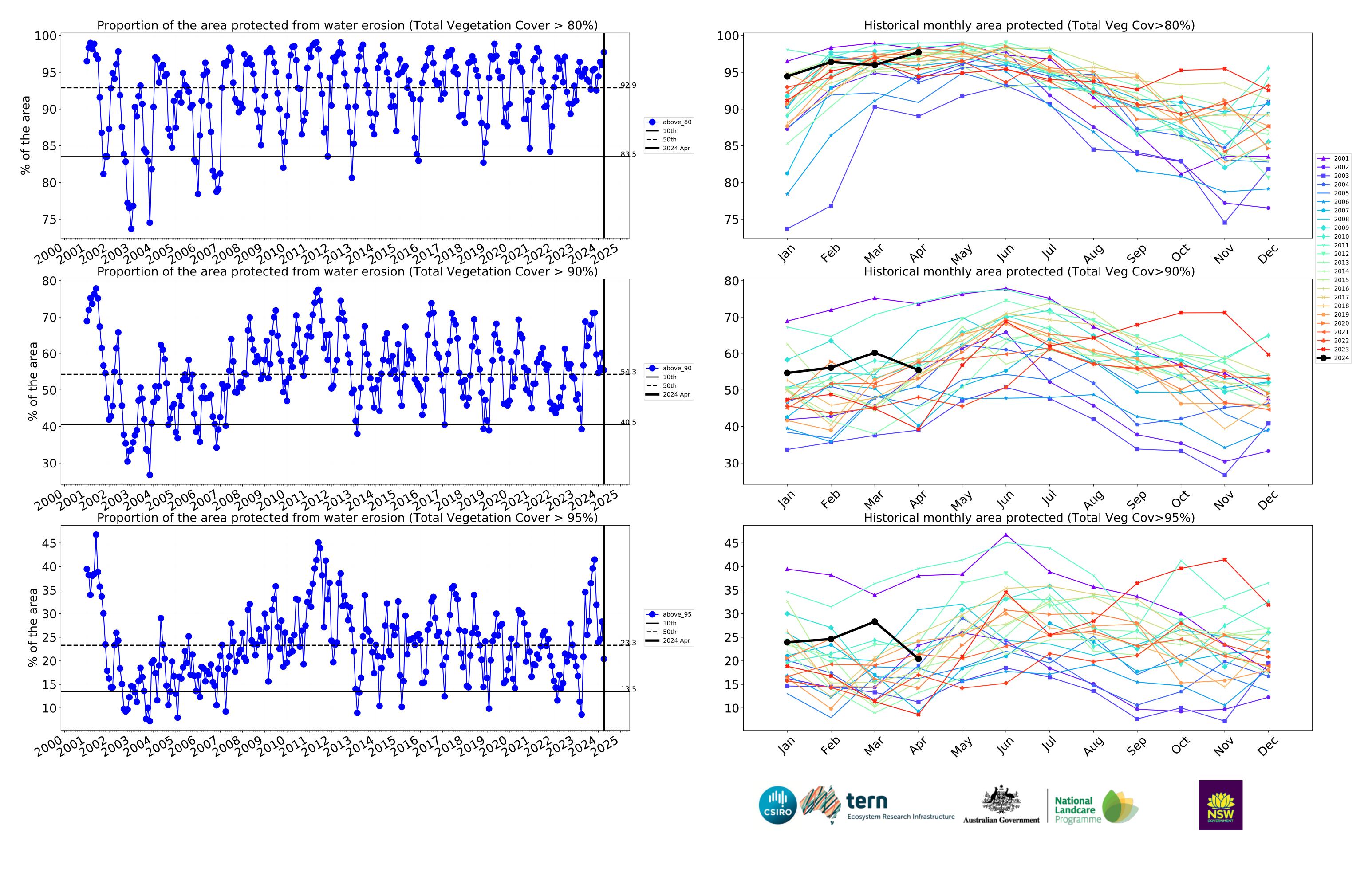




#### **Agriculture timeseries**





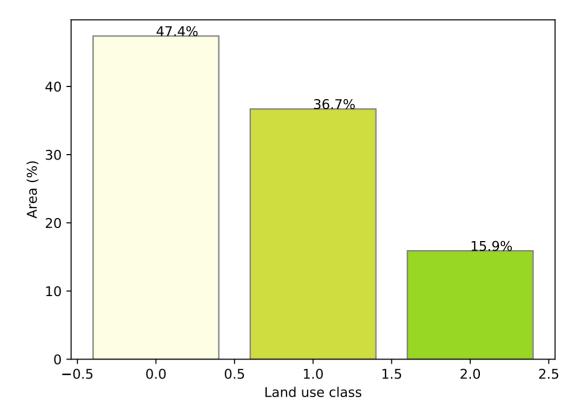


#### **Grazing**

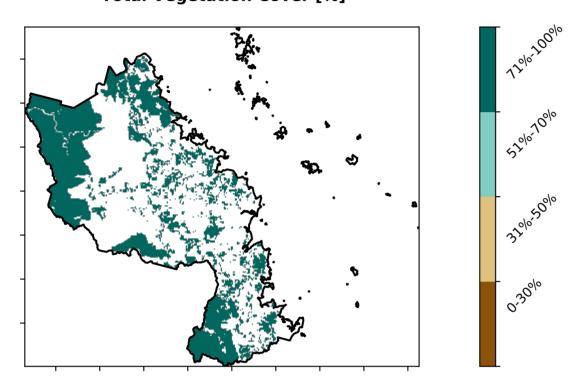
#### Land use and forest cover

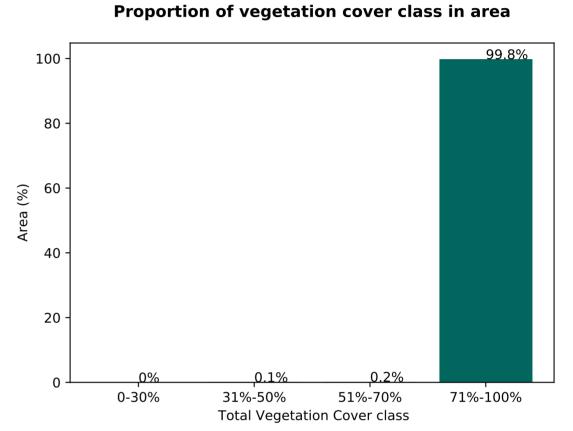
## Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest

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

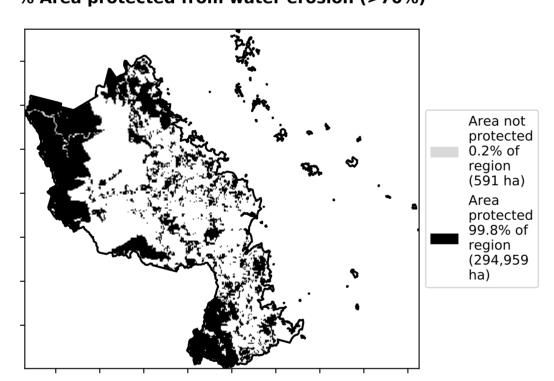


#### **Total Vegetation Cover [%]**

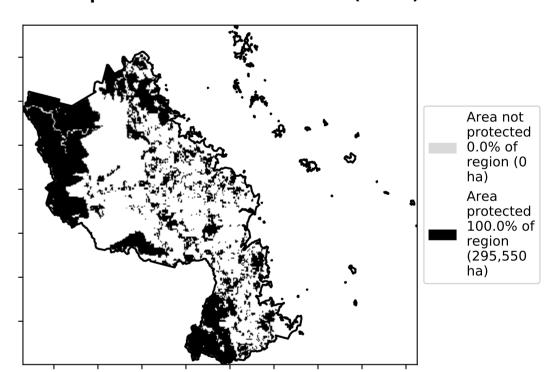




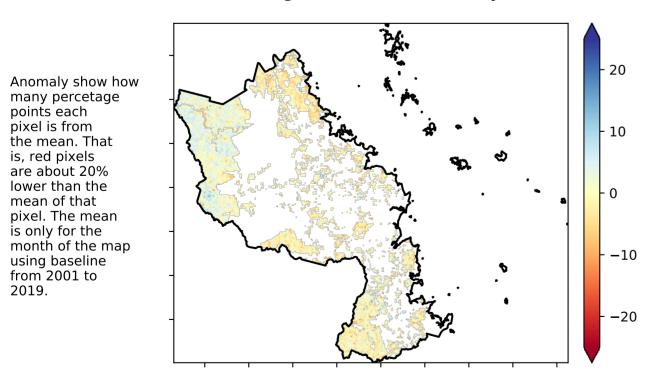
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



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

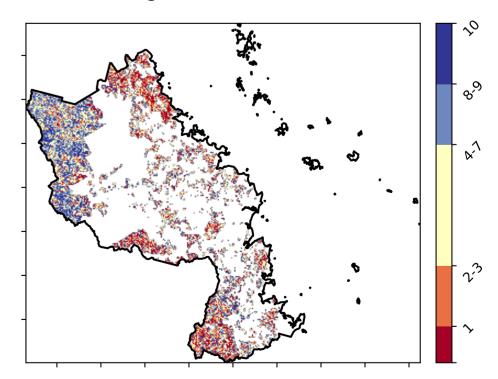


lower than the

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.



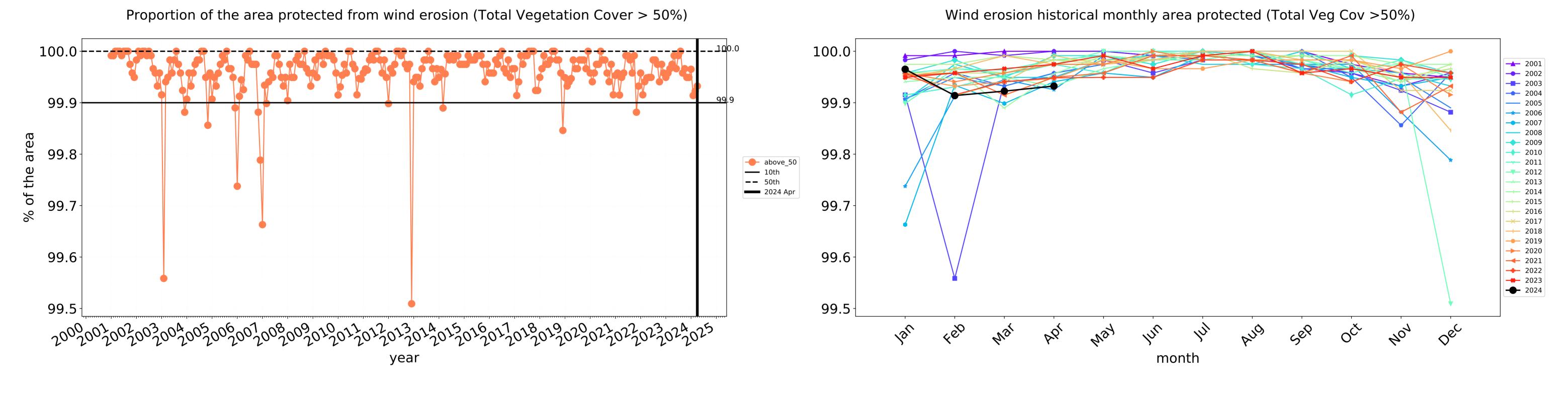


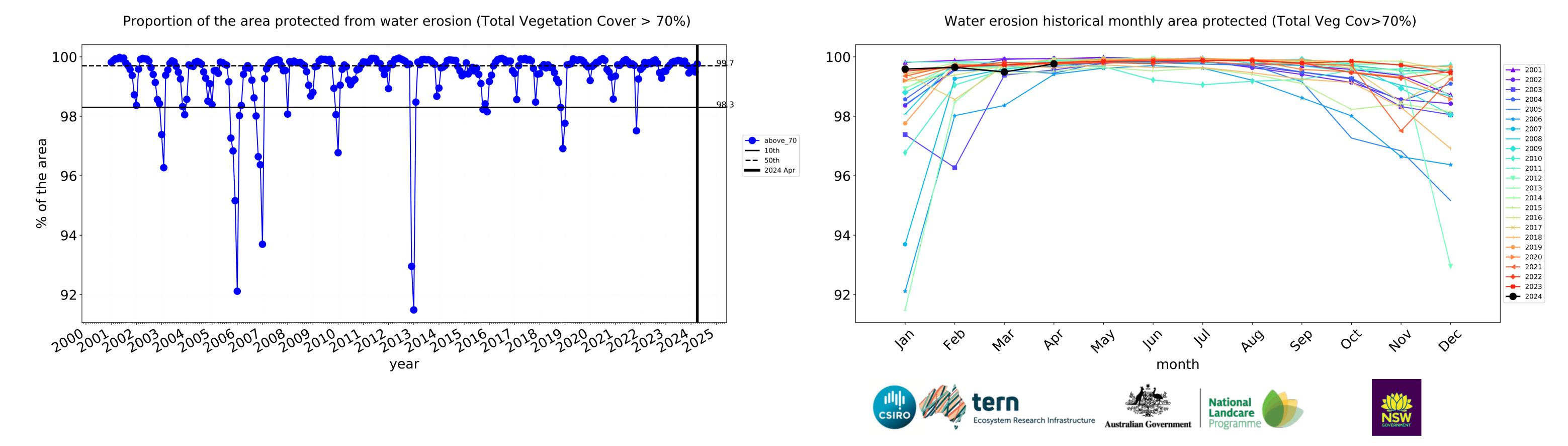


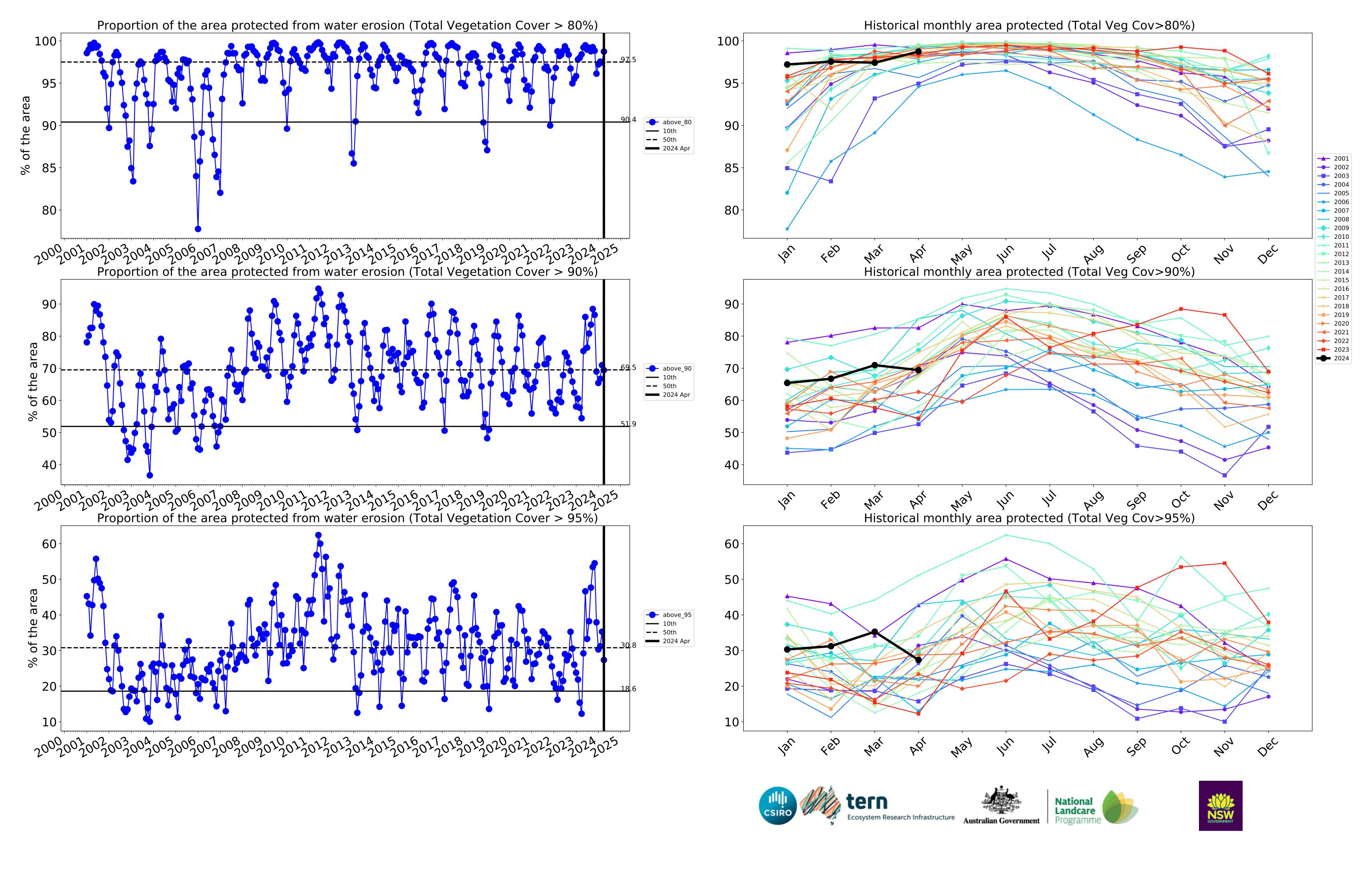




#### **Grazing timeseries**







#### **Grazing non forest**

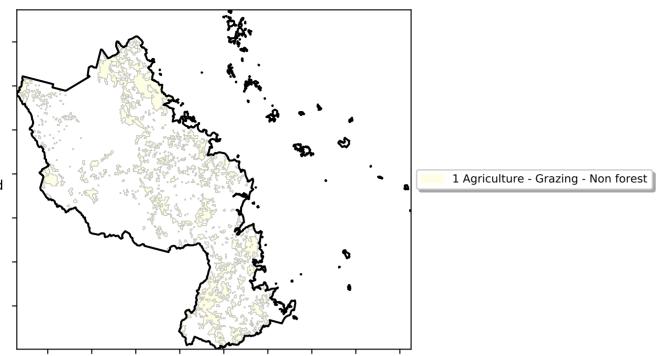
#### Land use and forest cover

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

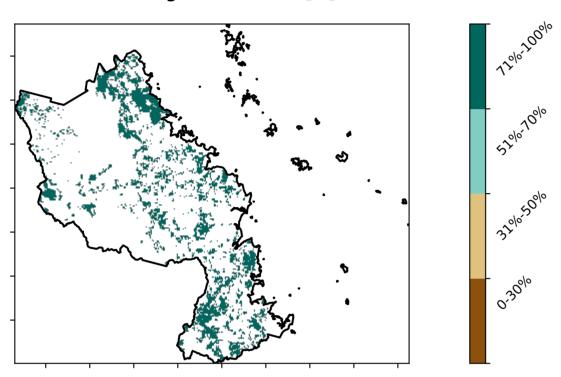
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20%

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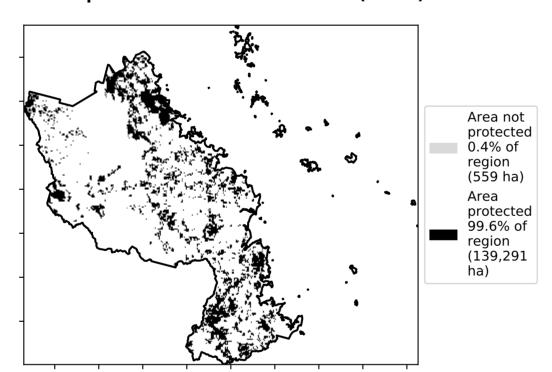
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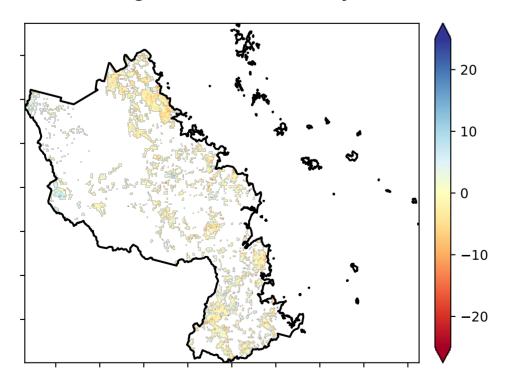
#### **Total Vegetation Cover [%]**



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

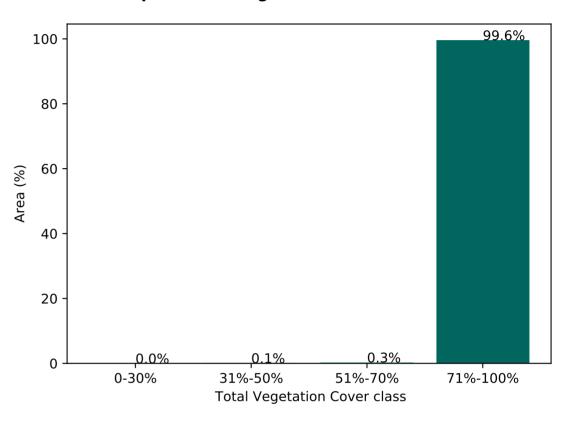


#### Total Vegetation Cover Anomaly [%]

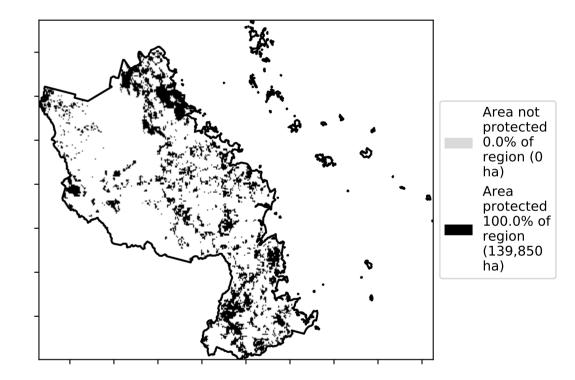


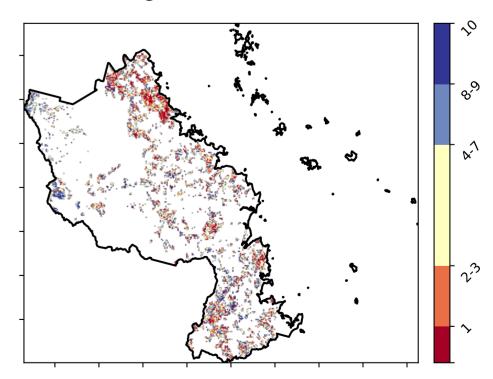
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





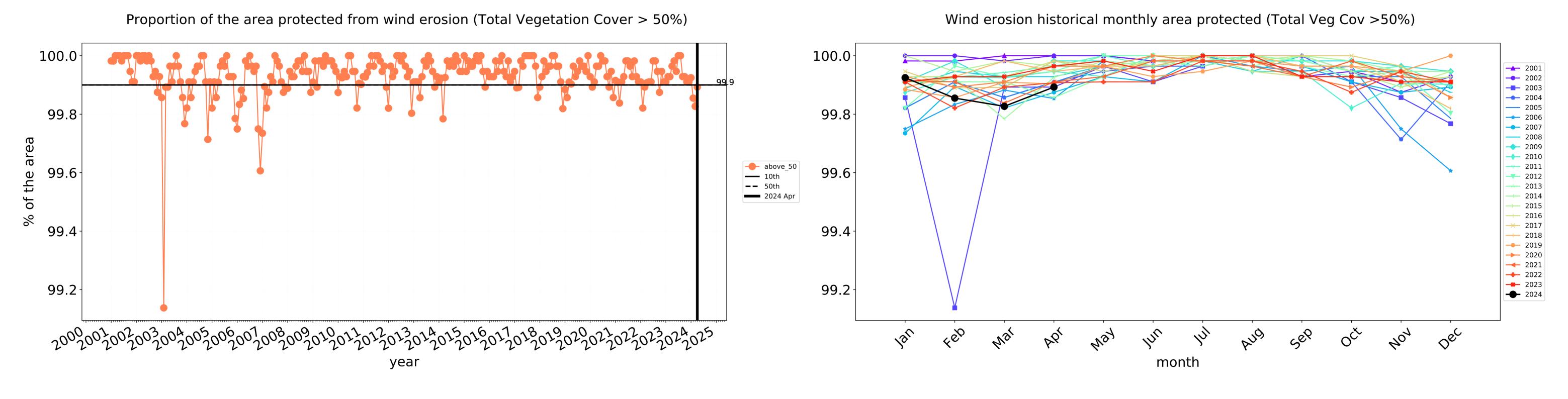


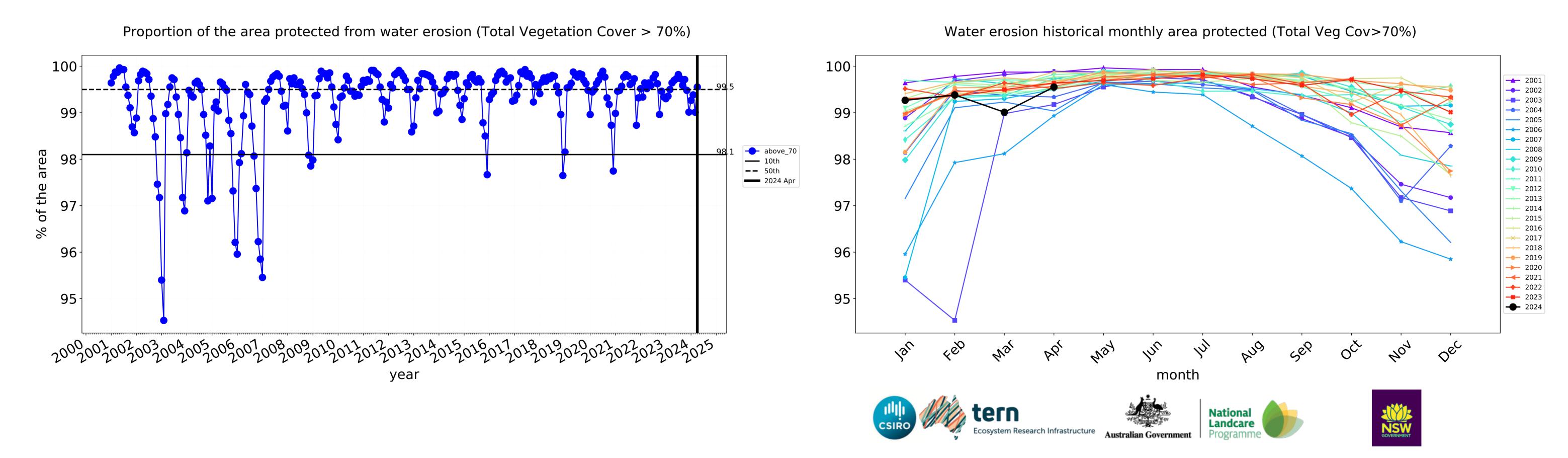


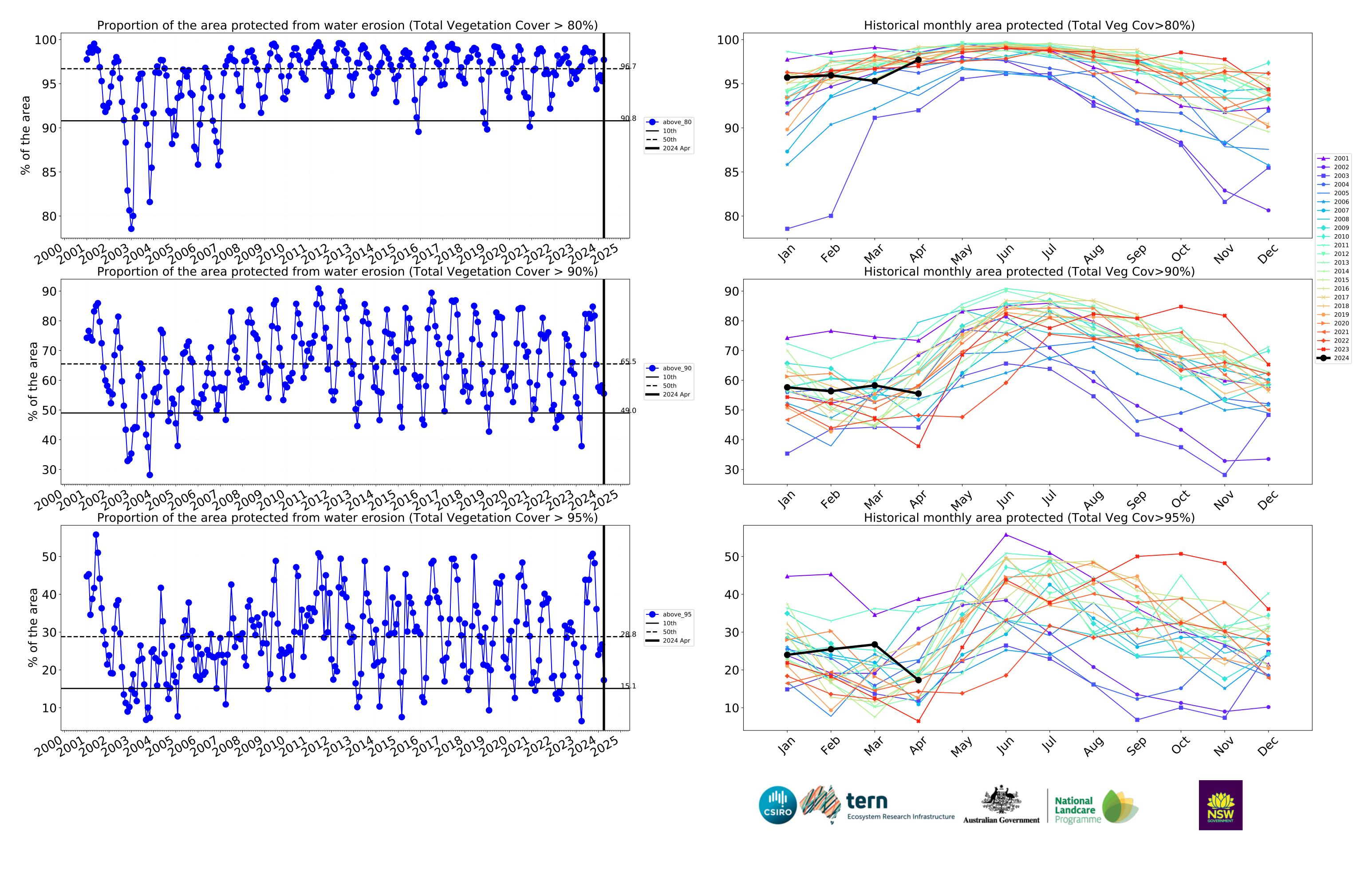




#### **Grazing non forest timeseries**







#### **Grazing Woodland forest**

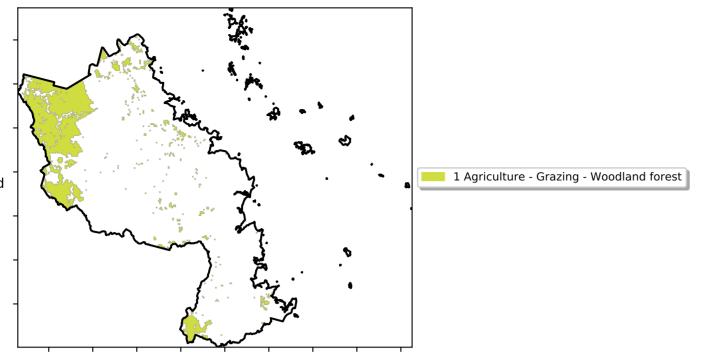
#### Land use and forest cover

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

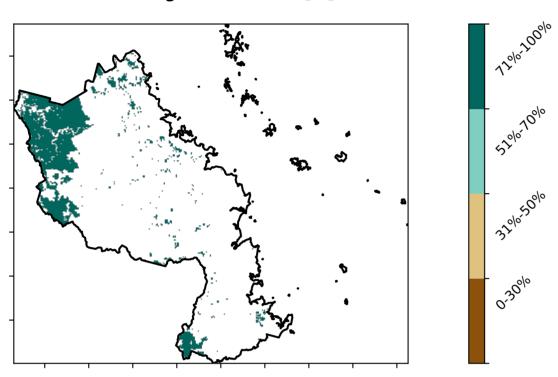
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20%

lower than the mean of that pixel. The mean

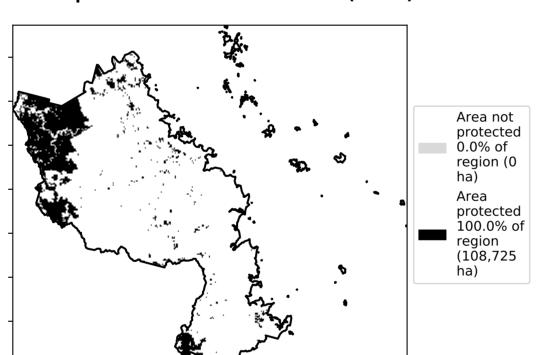
is only for the month of the map using baseline from 2001 to 2019.



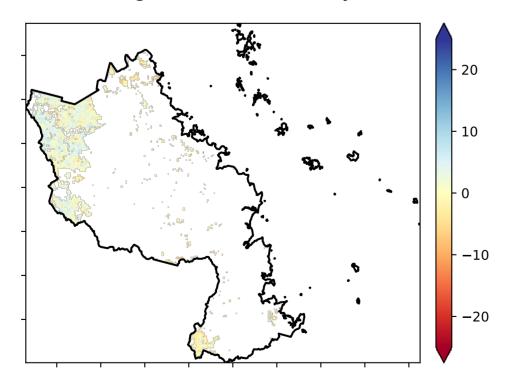
#### **Total Vegetation Cover [%]**



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

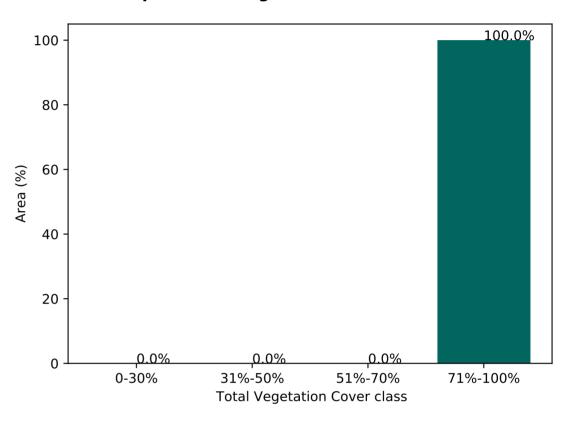


#### **Total Vegetation Cover Anomaly [%]**

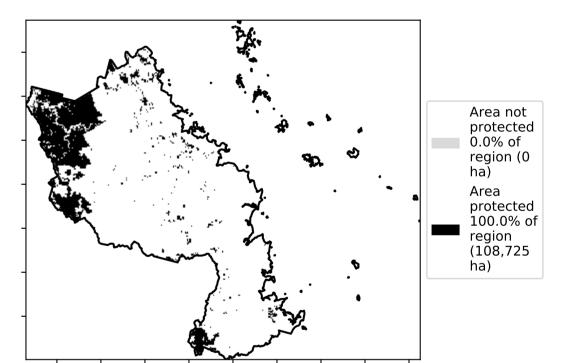


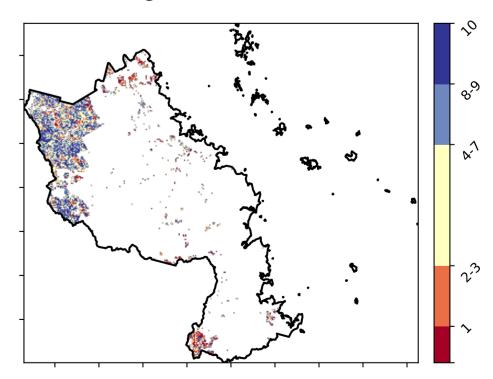
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





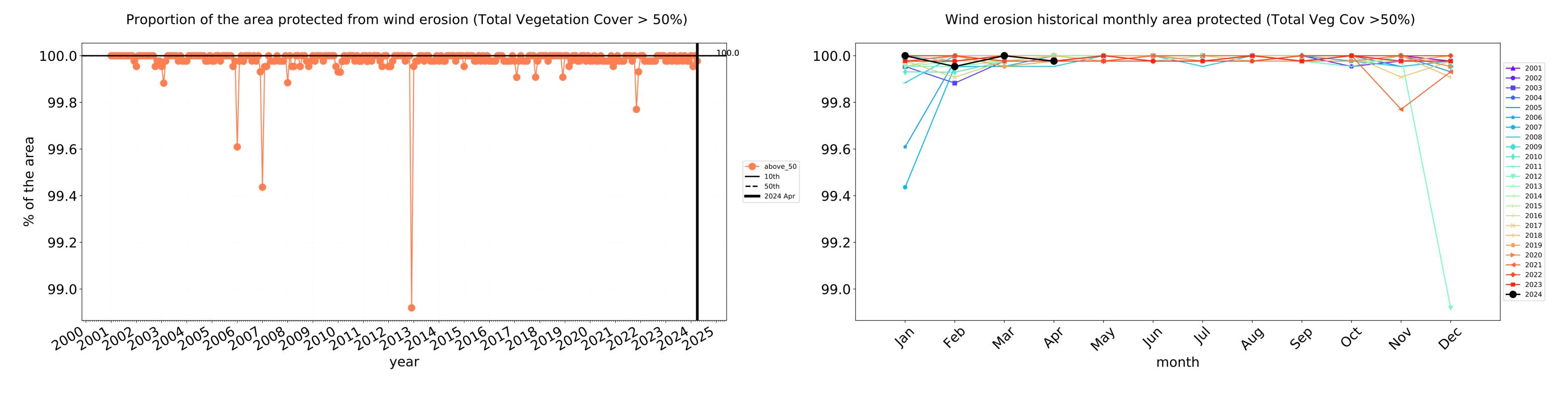


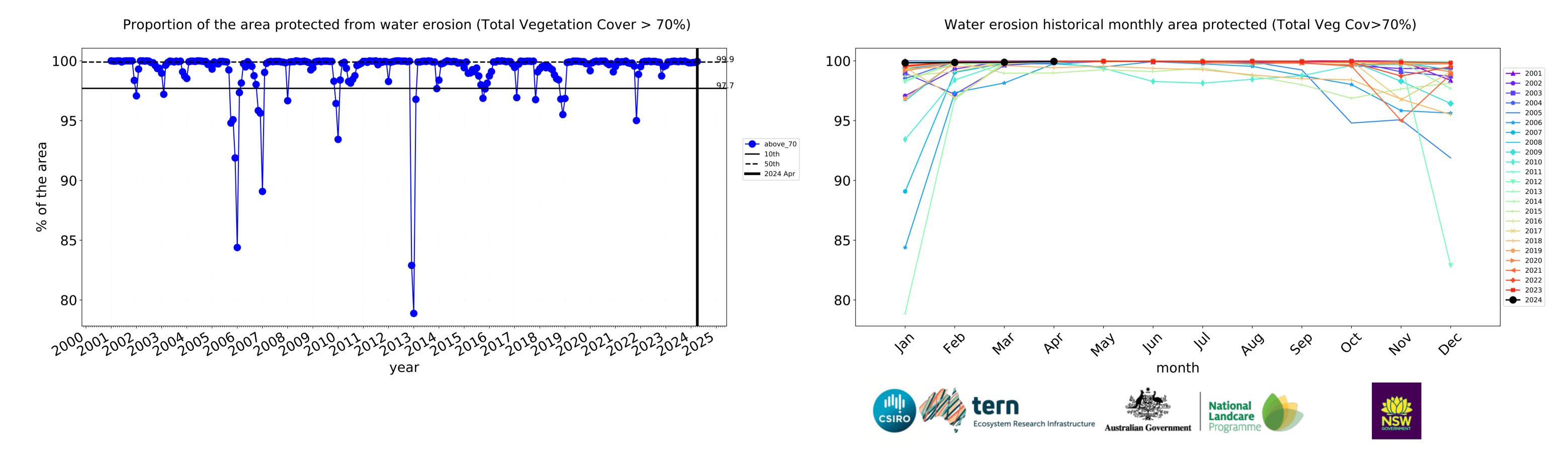


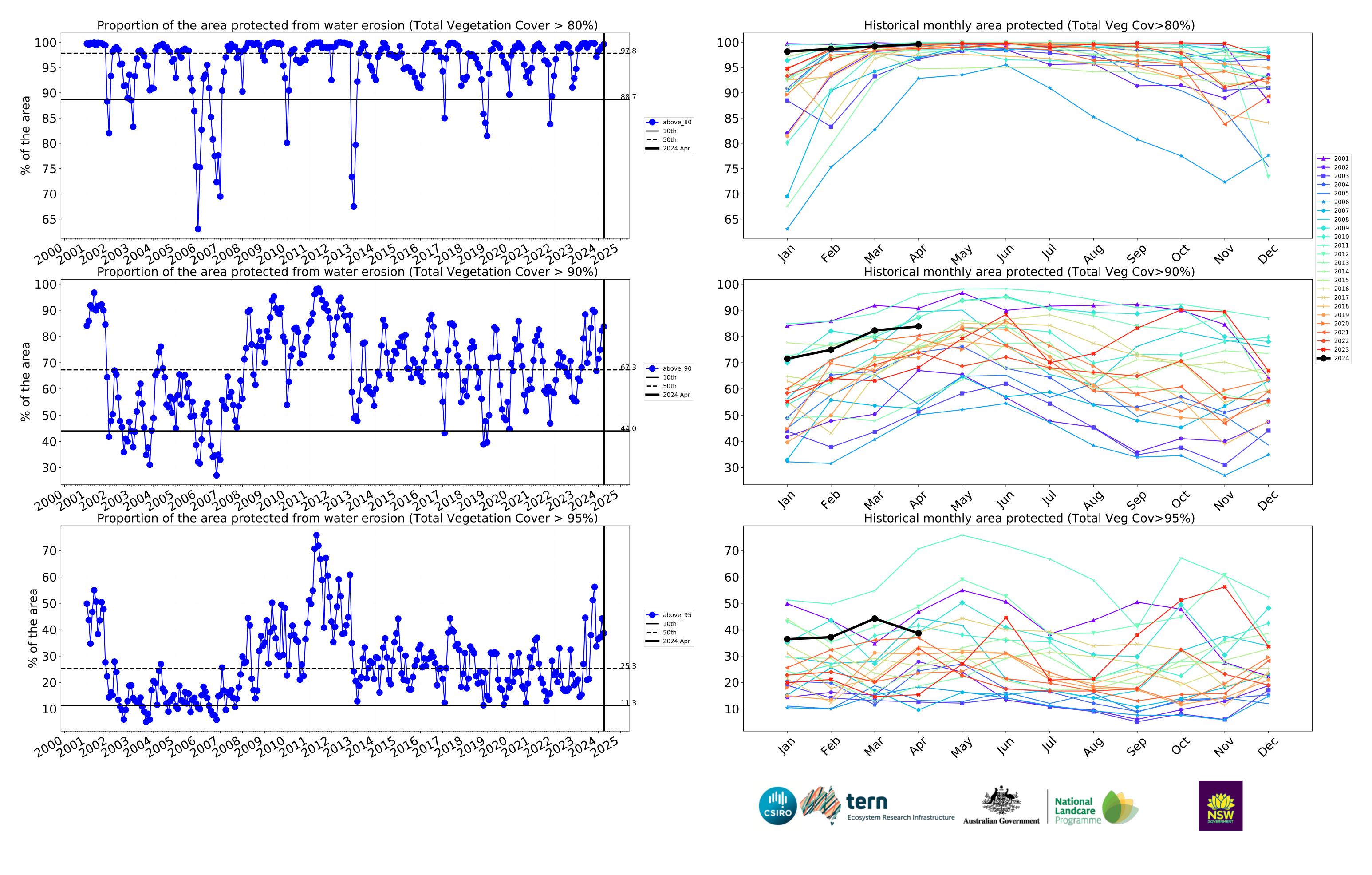




#### **Grazing Woodland forest timeseries**







#### **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) 1 Agriculture - Grazing - Non-woodland forest

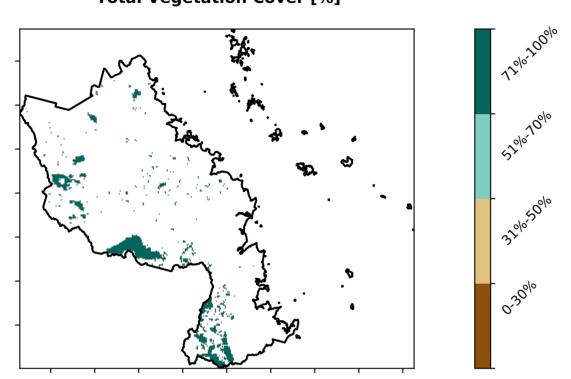
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20%

lower than the mean of that

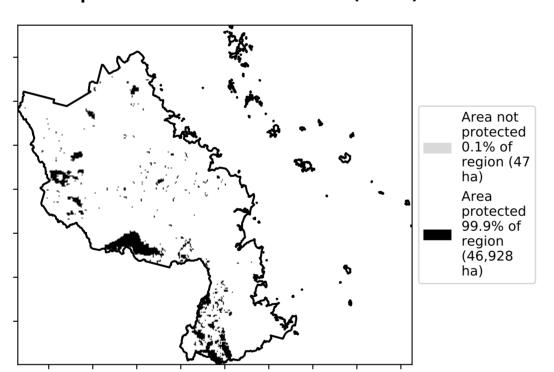
using baseline from 2001 to 2019.

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

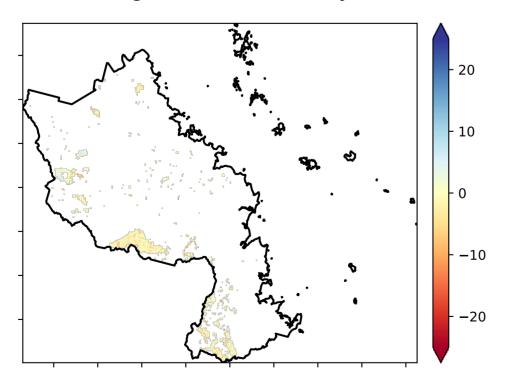
#### **Total Vegetation Cover [%]**



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

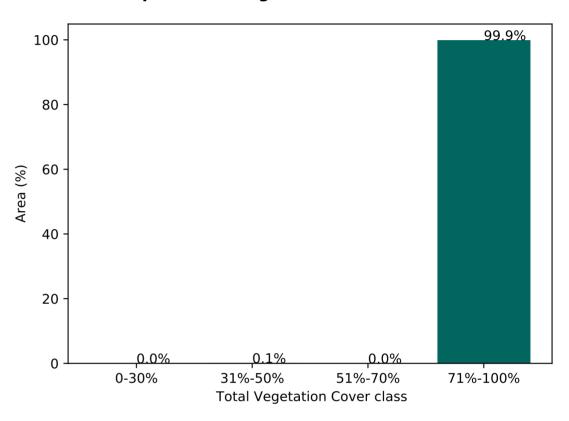


#### **Total Vegetation Cover Anomaly [%]**

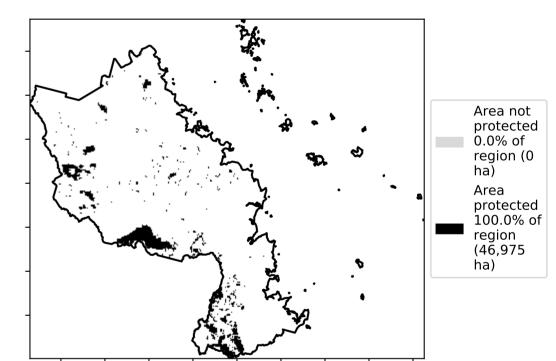


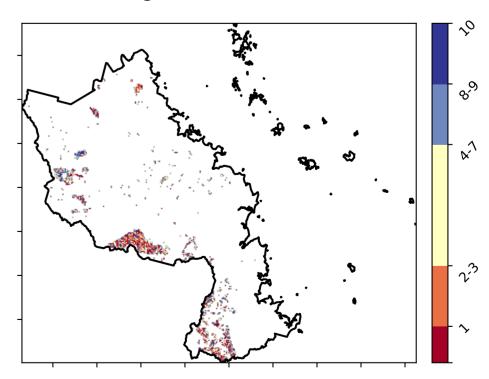
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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



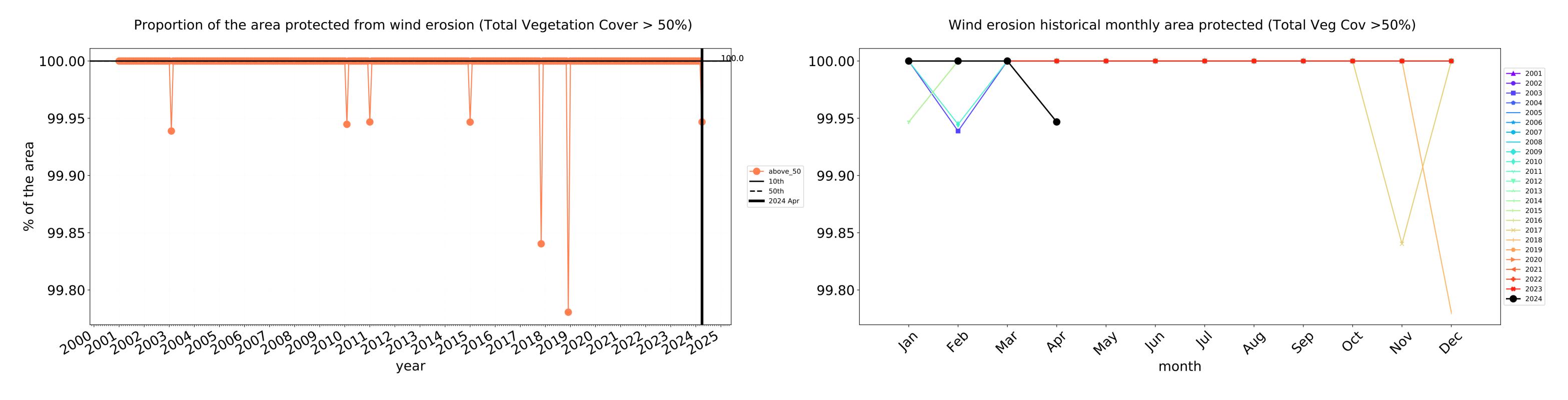


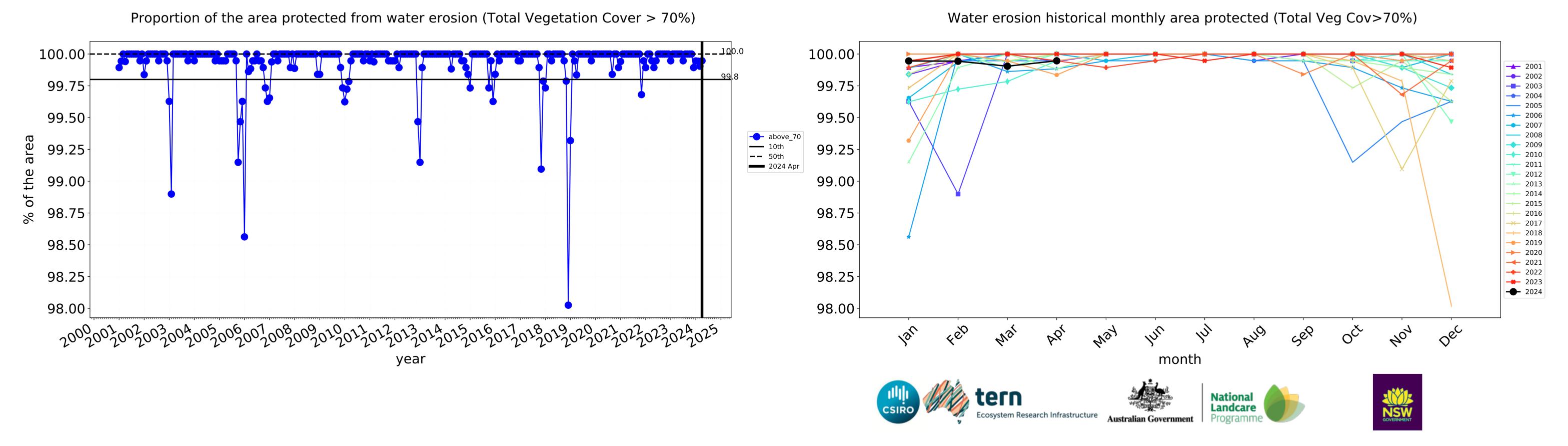


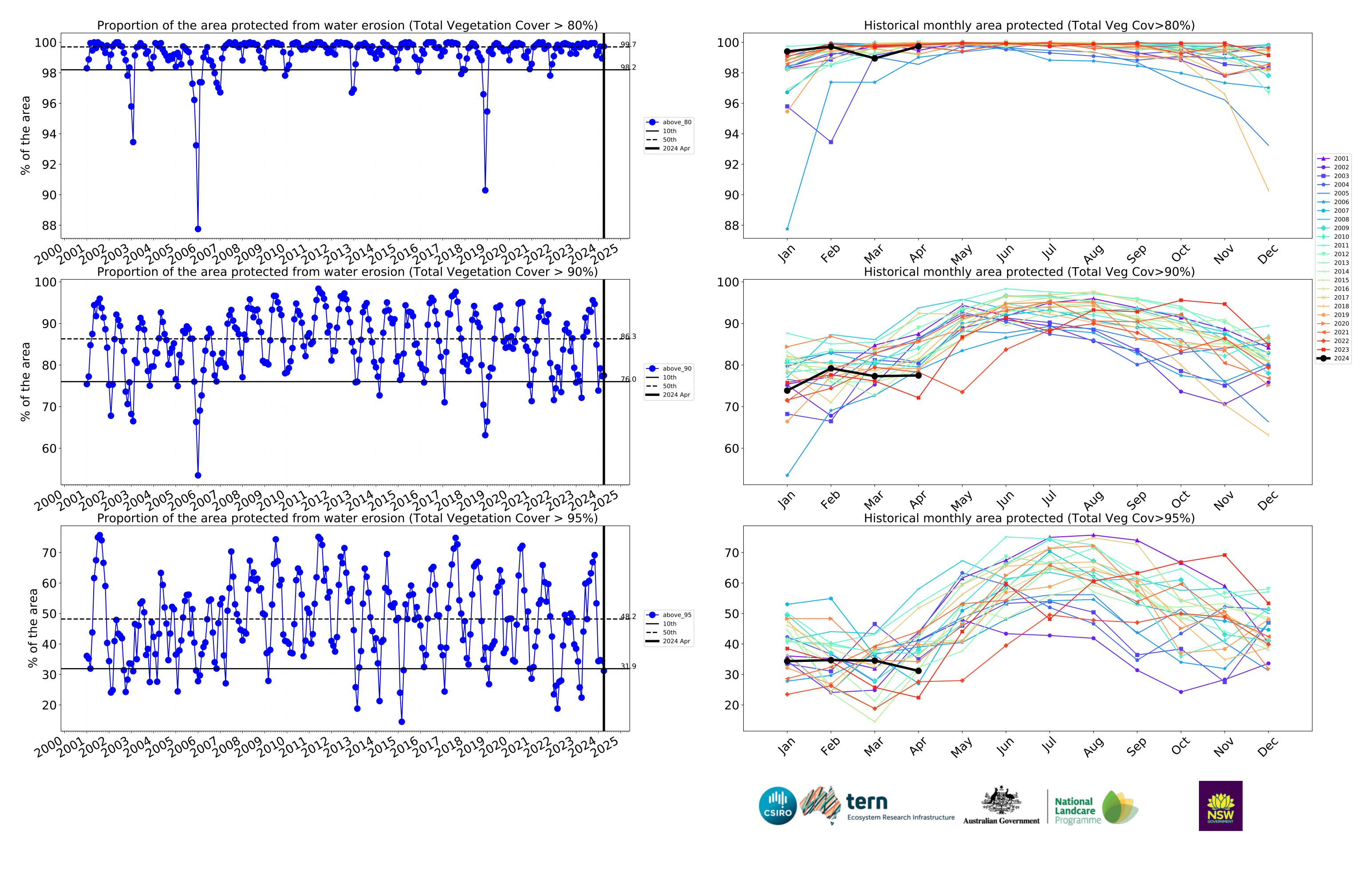






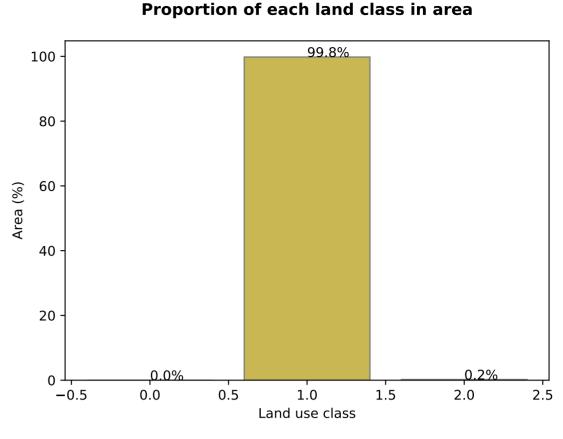


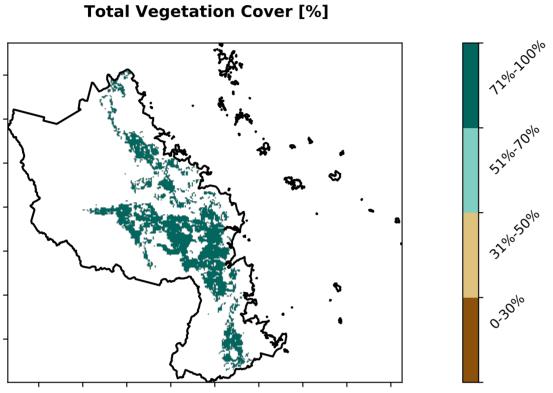


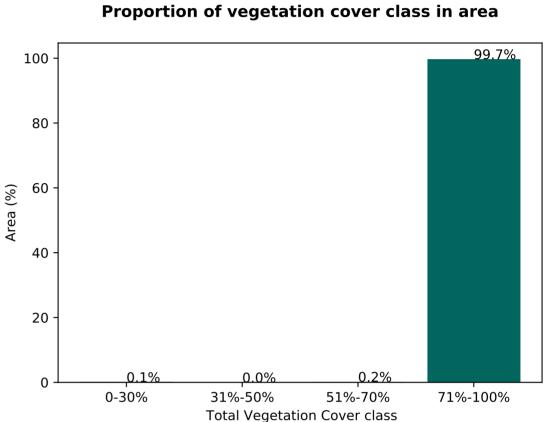


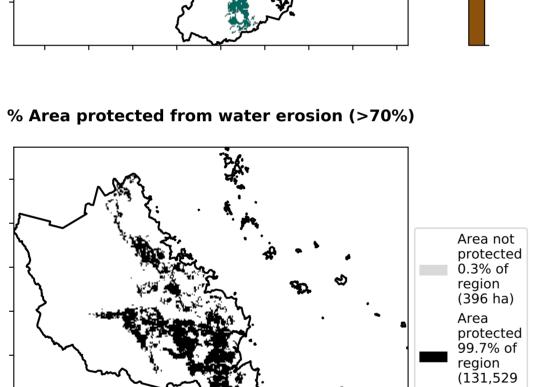
#### Irrigation

### 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



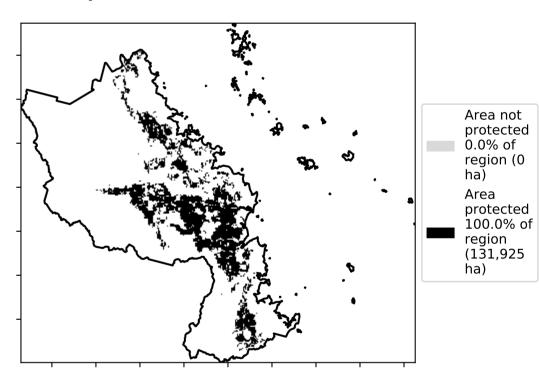


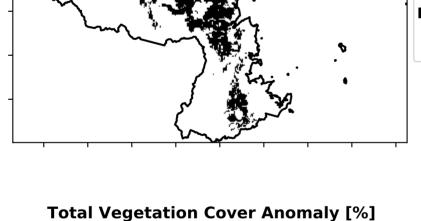




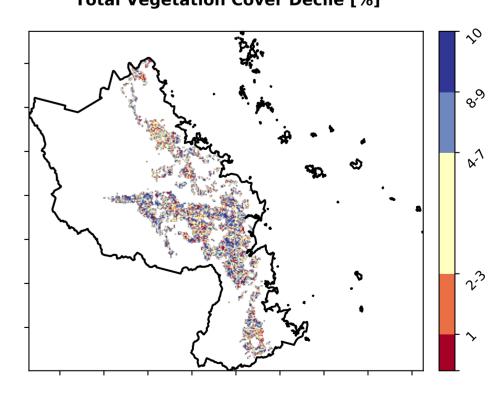
ha)

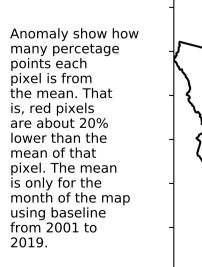


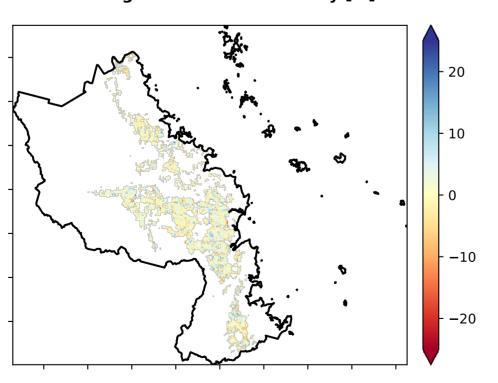




**Total Vegetation Cover Decile [%]** 







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.

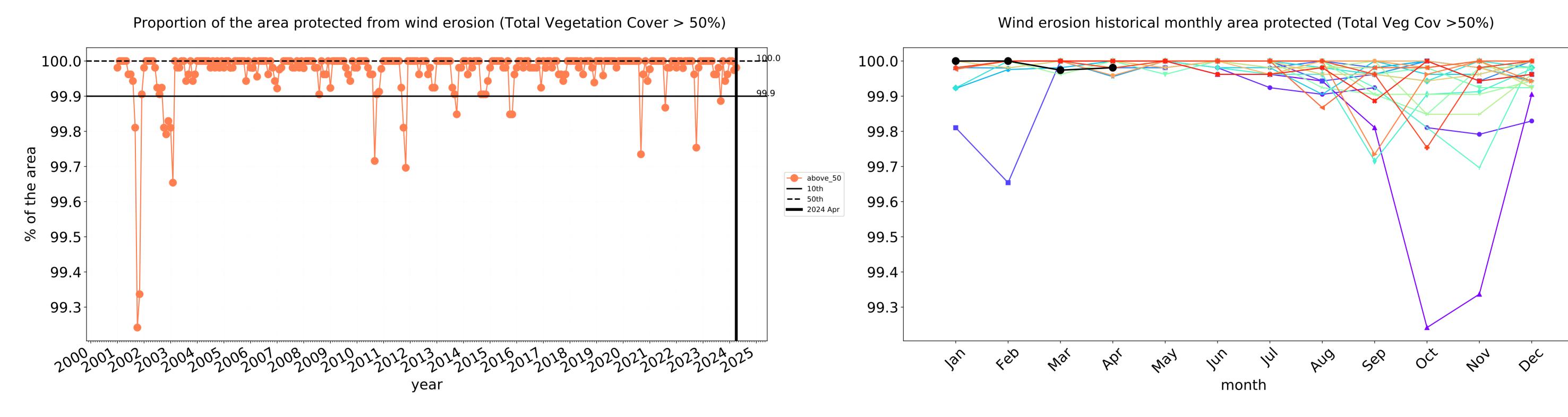


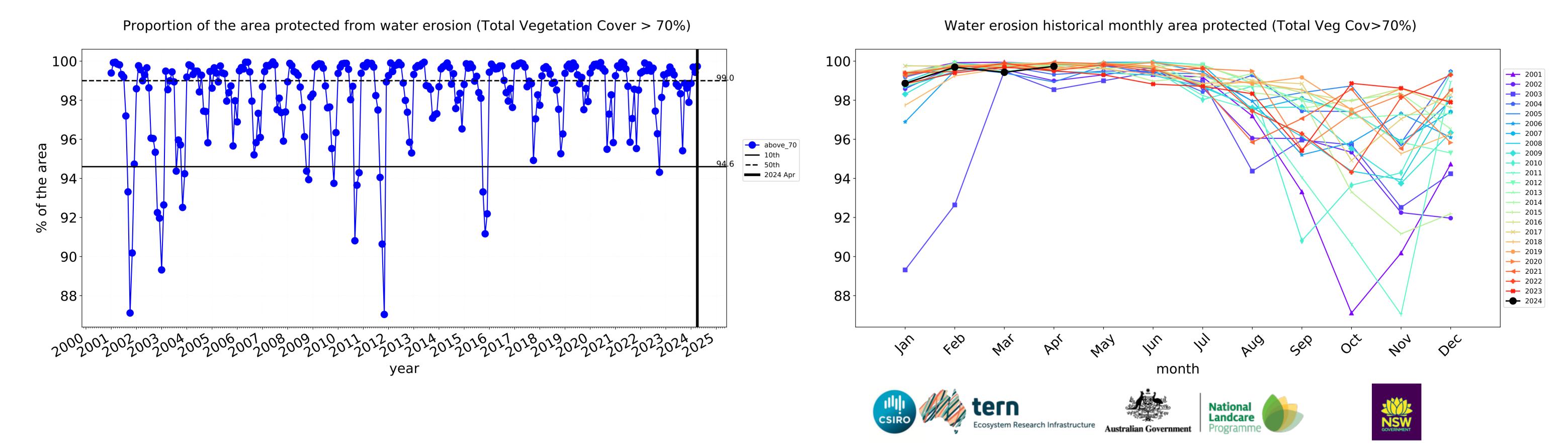






#### Irrigation timeseries



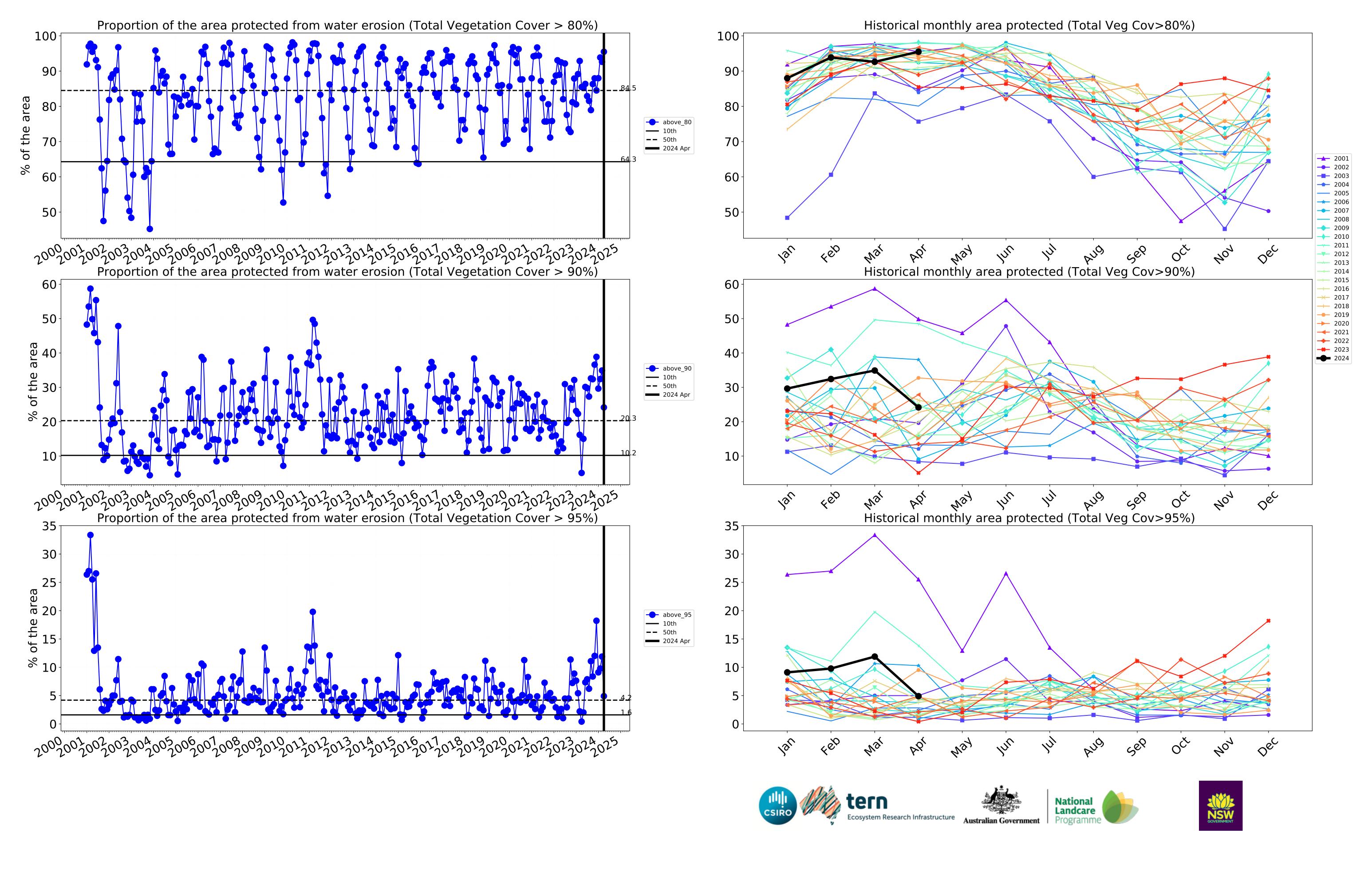


<del>----</del> 2007

**~** 2009

→ 2015 → 2016

022 **2**023



#### **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)

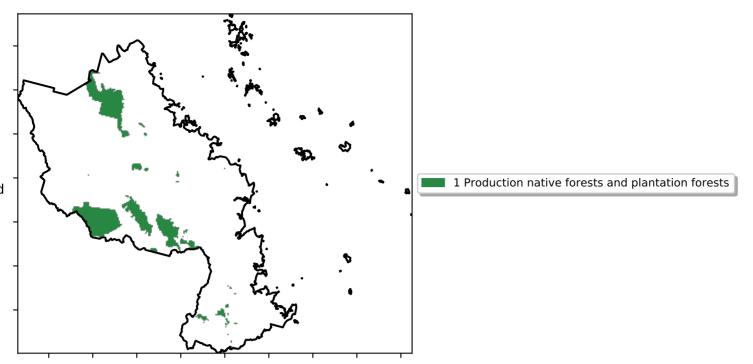
Anomaly show how many percetage points each pixel is from

the mean. That

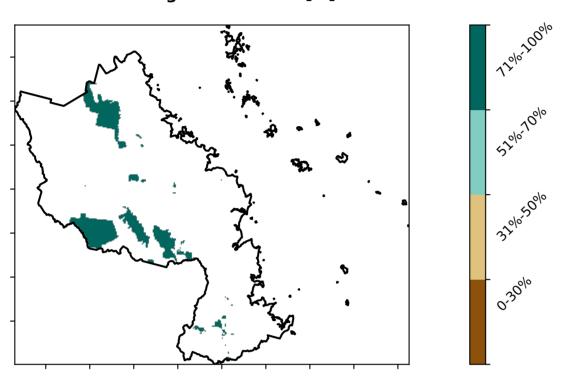
is, red pixels are about 20% lower than the

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

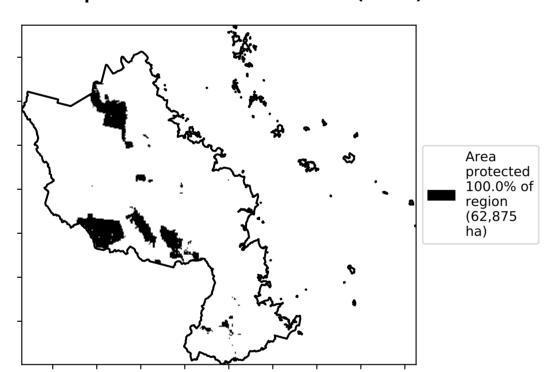
using baseline from 2001 to 2019.



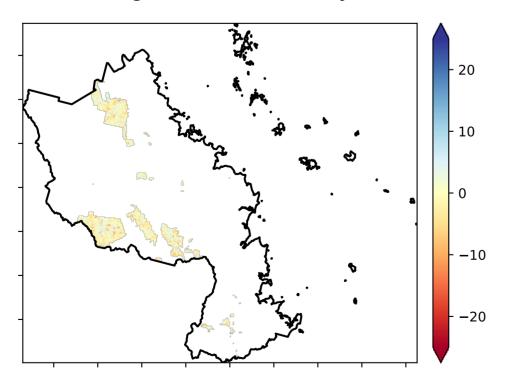
#### **Total Vegetation Cover [%]**



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

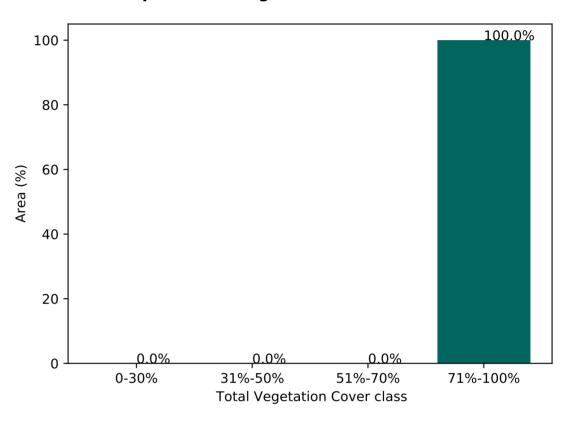


#### **Total Vegetation Cover Anomaly [%]**

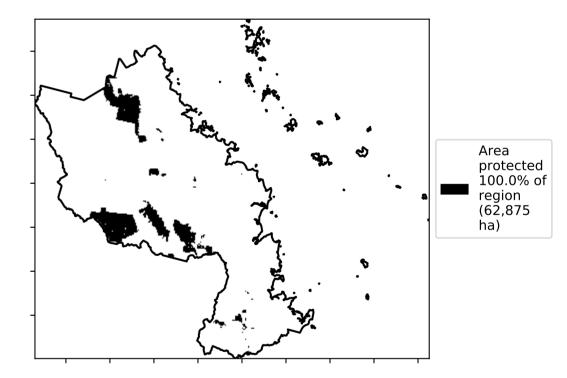


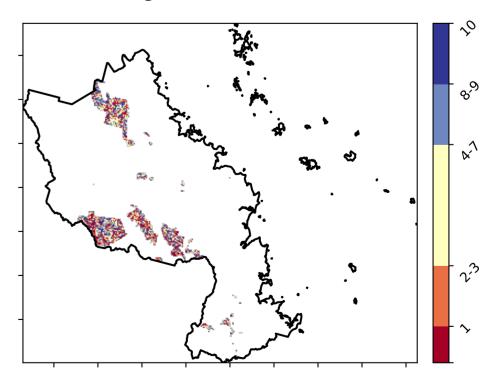
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









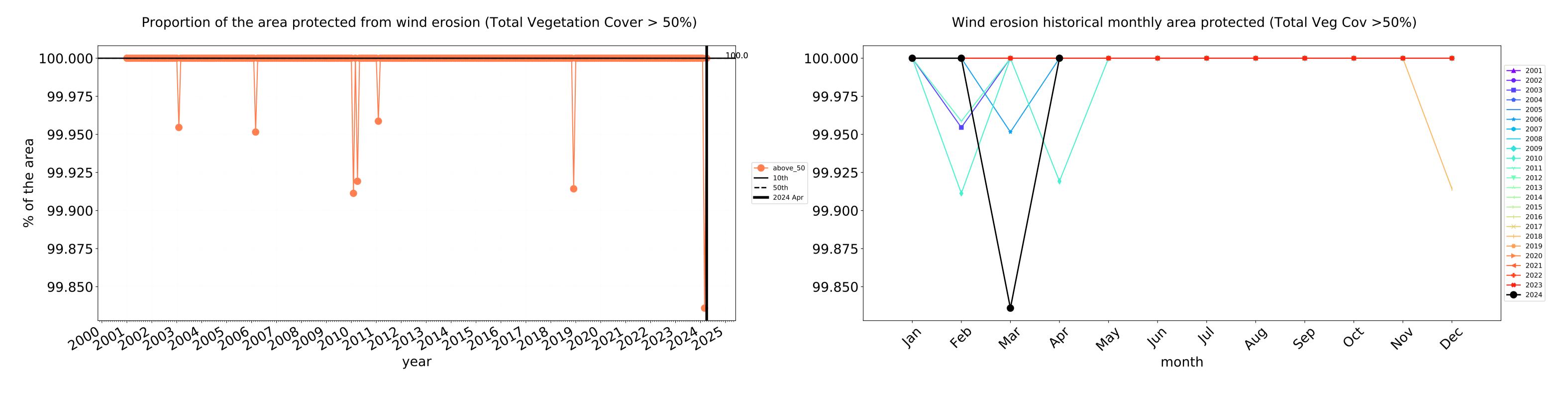


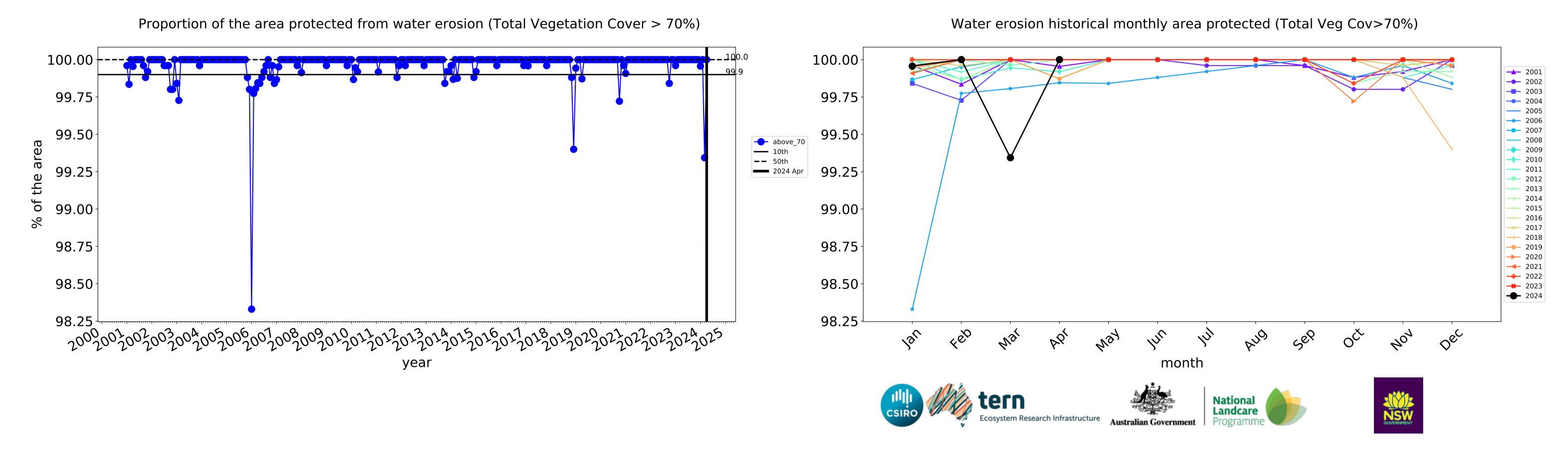


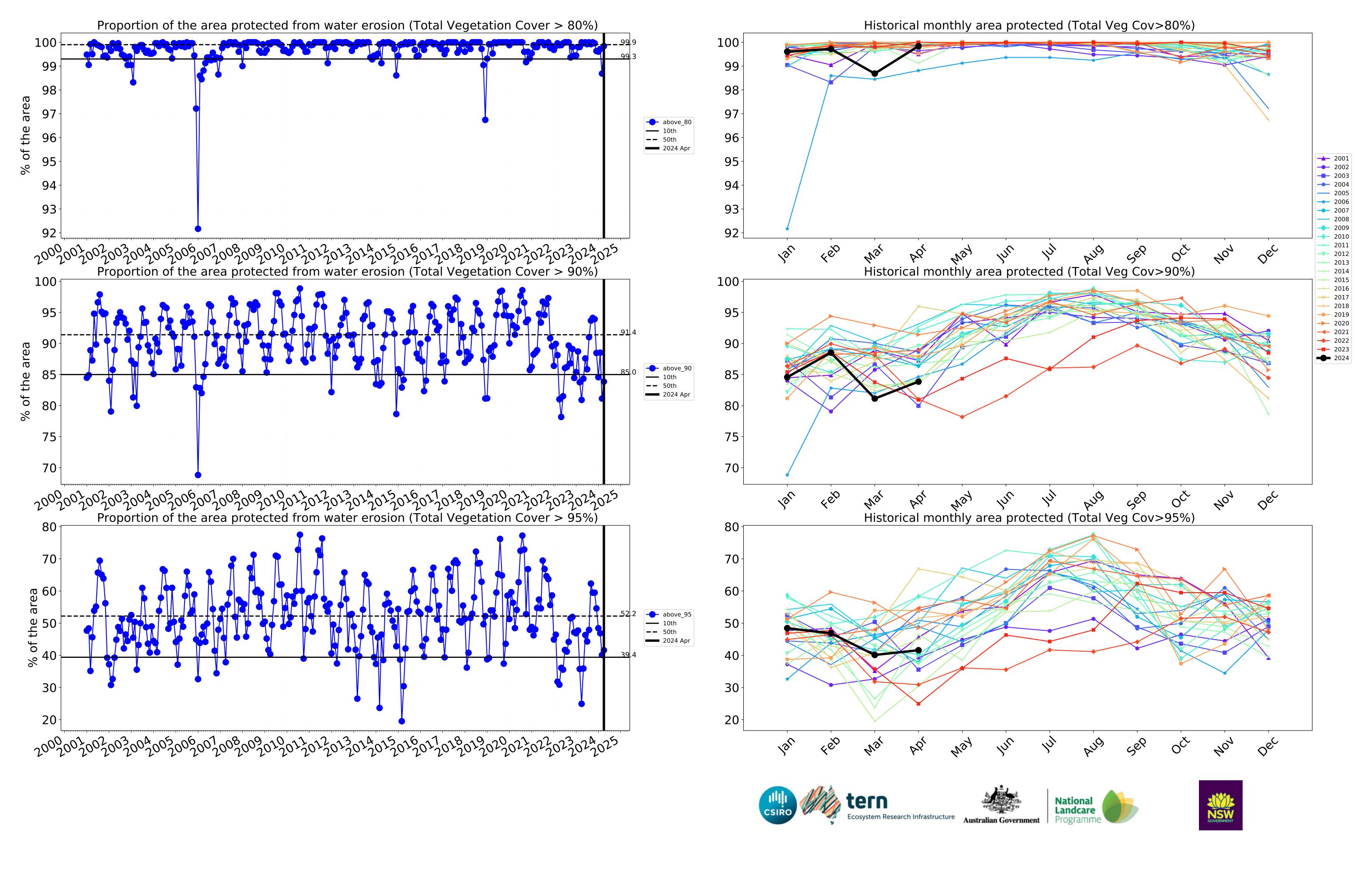




#### **Production native forests and plantation forests timeseries**







## Mackay\_(R) (747,575 ha and no data 13,736 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	747,575	99.9% 747,050	99.7% 745,650	98.8% 738,900	96.2% 719,075	61.5% 459,700	25.5% 191,000
Conservation and natural environments	192,175	100.0% 192,100	99.7% 191,650	99.1% 190,375	97.7% 187,750	76.8% 147,600	36.2% 69,500
Conservation and natural environments non forest	5,075	99.0% 5,025	96.6% 4,900	89.2% 4,525	76.8% 3,900	46.8% 2,375	23.6% 1,200
Conservation and natural environments Woodland forest	36,800	100.0% 36,800	99.7% 36,700	98.9% 36,400	96.4% 35,475	70.9% 26,100	30.8% 11,325
Conservation and natural environments Forest (non woodland)	150,300	100.0% 150,275	99.8% 150,050	99.4% 149,450	98.7% 148,375	79.3% 119,125	37.9% 56,975
Agriculture	428,075	100.0% 428,025	99.9% 427,850	99.8% 427,025	97.7% 418,400	55.5% 237,500	20.4% 87,375
Grazing	295,550	100.0% 295,500	99.9% 295,350	99.8% 294,850	98.7% 291,825	69.4% 205,200	27.4% 80,875
Grazing non forest	139,850	100.0% 139,800	99.9% 139,700	99.6% 139,225	97.7% 136,650	55.5% 77,650	17.3% 24,200
Grazing Woodland forest	108,725	100.0% 108,725	100.0% 108,700	100.0% 108,675	99.6% 108,325	83.8% 91,150	38.7% 42,025
Grazing - Forest (non woodland)	46,975	100.0% 46,975	99.9% 46,950	99.9% 46,950	99.7% 46,850	77.5% 36,400	31.2% 14,650
Irrigation	131,925	100.0% 131,925	100.0% 131,900	99.7% 131,575	95.5% 125,975	24.2% 31,875	4.9% 6,475
Production native forests and plantation forests	62,875	100.0% 62,875	100.0% 62,875	100.0% 62,875	99.8% 62,775	83.9% 52,725	41.6% 26,150







