### Total vegetation cover soil protection Region:LGA Cardinia (S) VIC

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: March 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 Mar 2024**

#### Land use and forest cover

#### 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 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

Catchment Scale

of Australia (2018)

(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

month of the map

using baseline from 2001 to 2019.

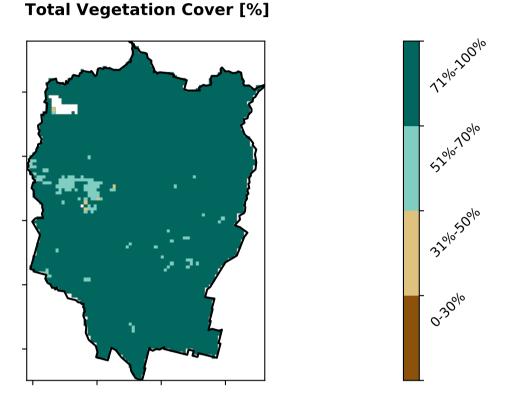
mean of that pixel. The mean is only for the

Derived from

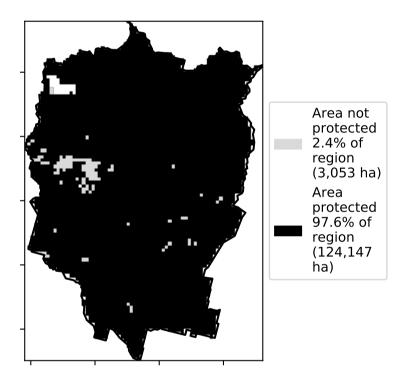
Use of Australia

Land Use and Forests

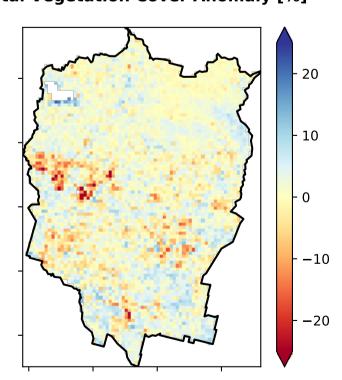
Catchment Scale Land



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

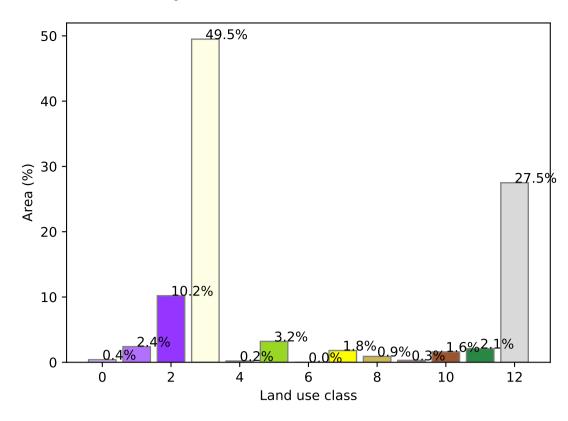


#### **Total Vegetation Cover Anomaly [%]**

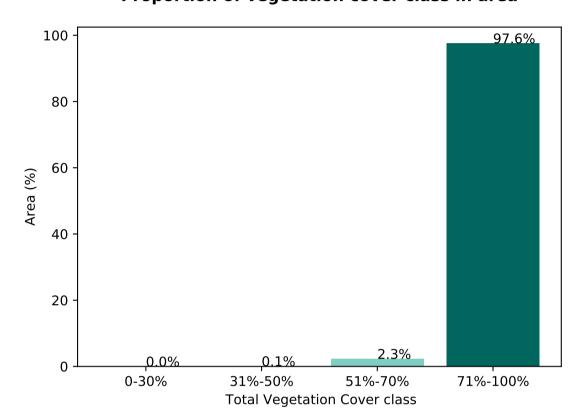


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

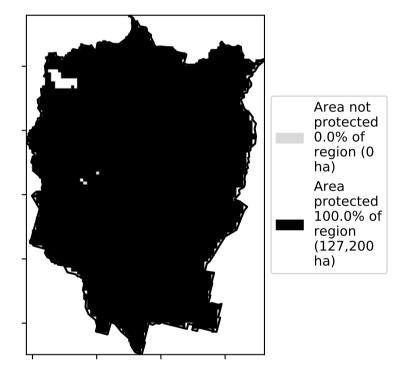
#### Proportion of each land class in area

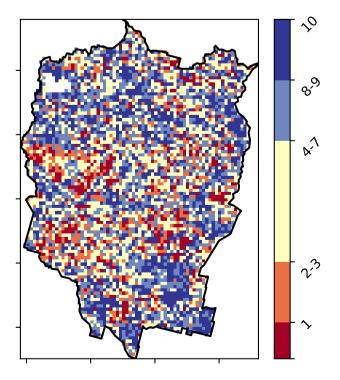


#### Proportion of vegetation cover class in area



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





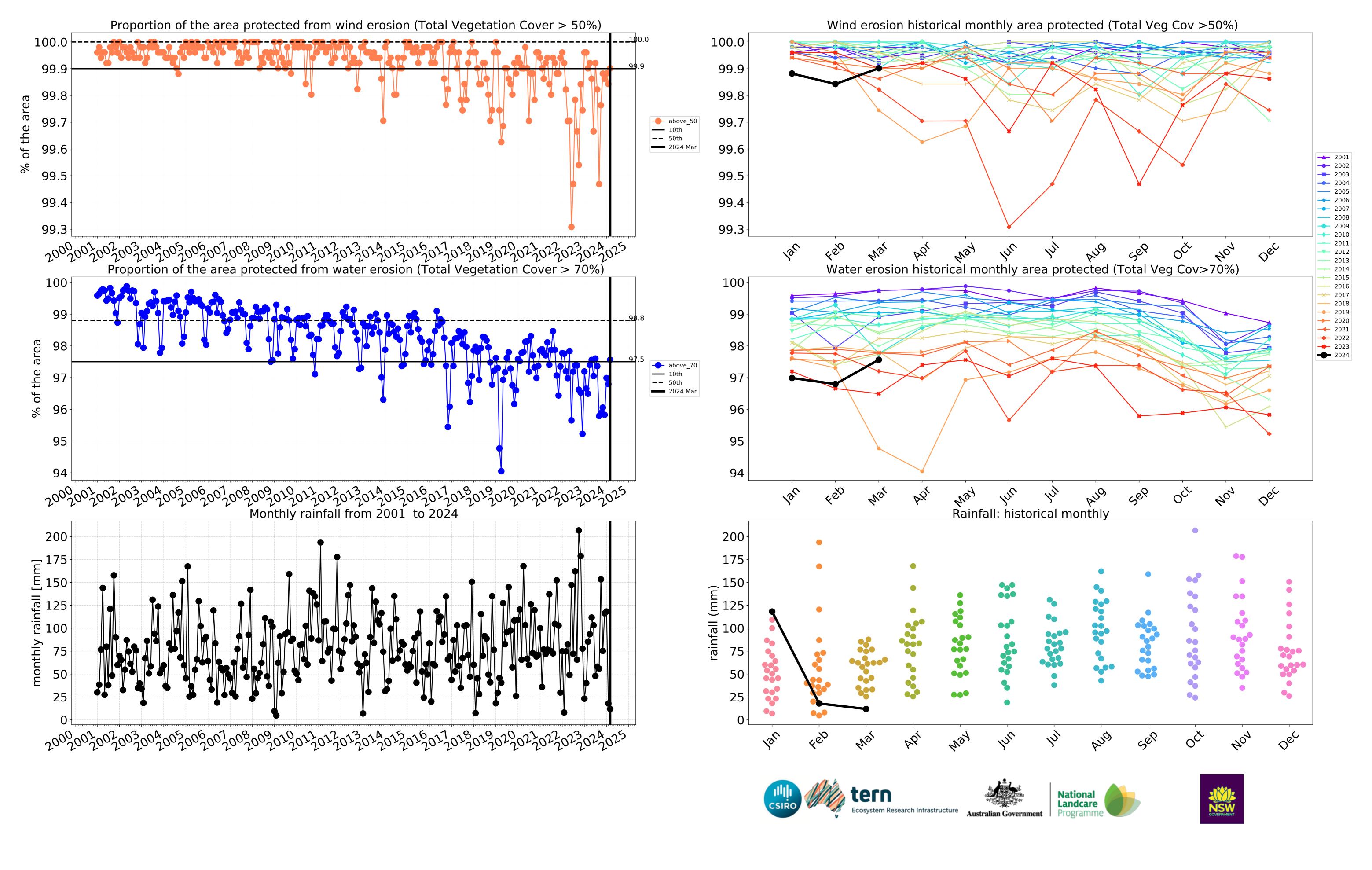


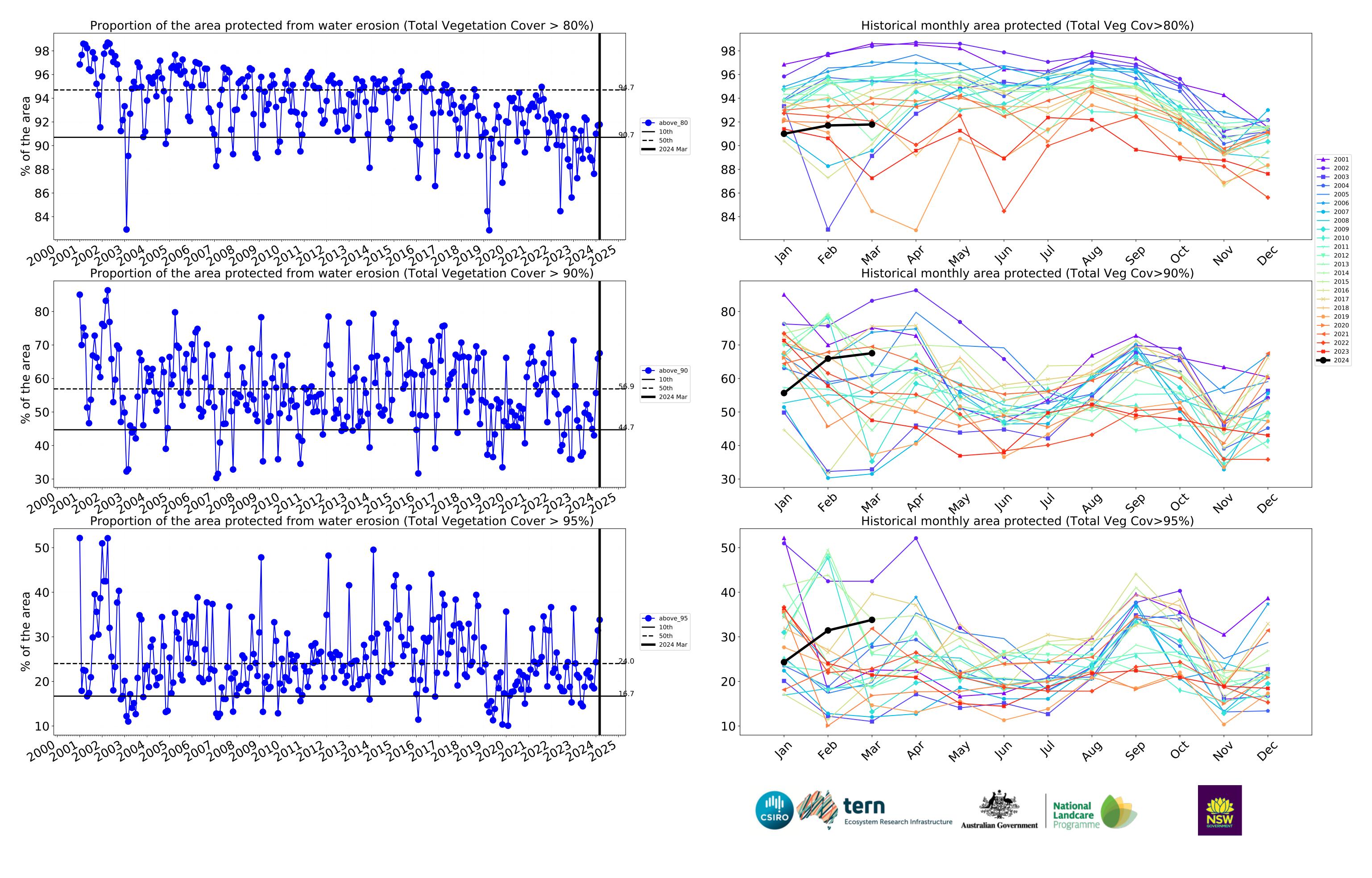












#### **Conservation and natural environments**

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

Use of Australia

(2018) and Forests

of Australia (2018)

Anomaly show how many percetage points each

pixel is from the mean. That

is, red pixels

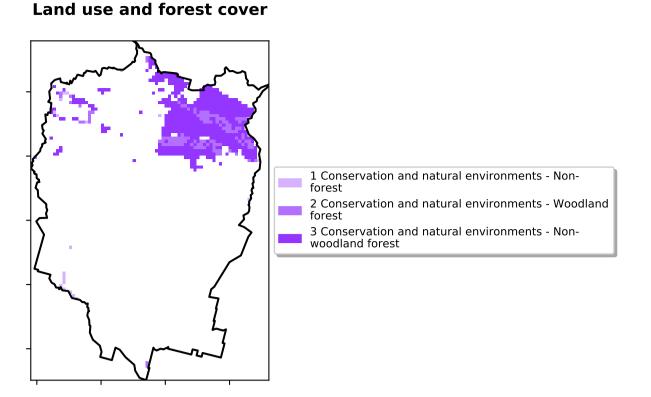
mean of that

pixel. The mean

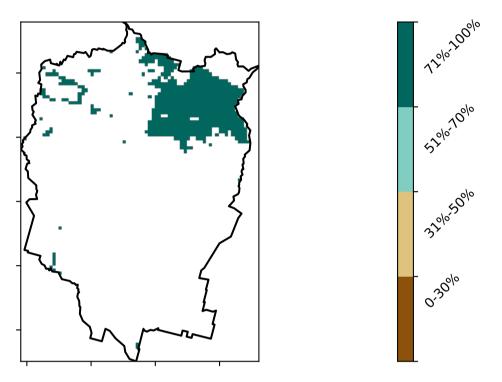
using baseline from 2001 to 2019.

is only for the month of the map

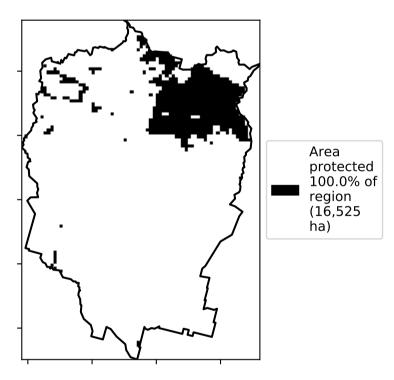
are about 20% lower than the



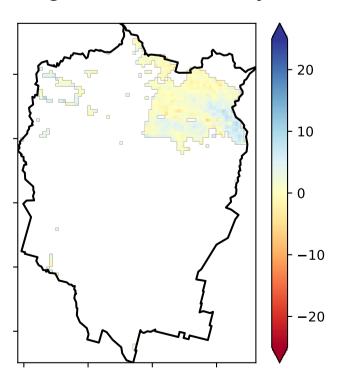
#### **Total Vegetation Cover [%]**



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

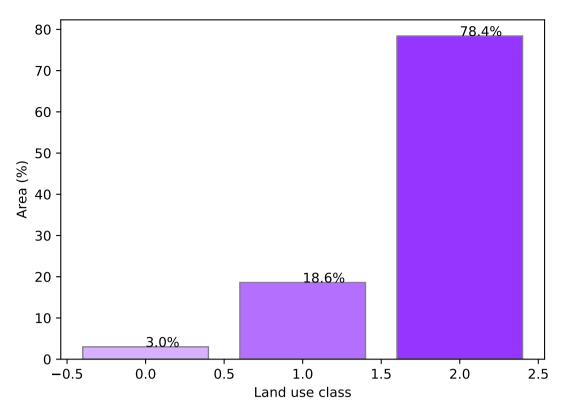


#### **Total Vegetation Cover Anomaly [%]**

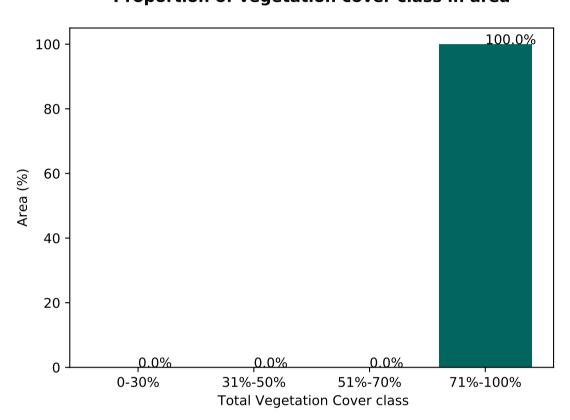


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

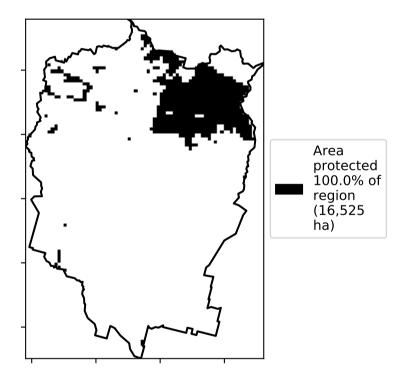
#### Proportion of each land class in area

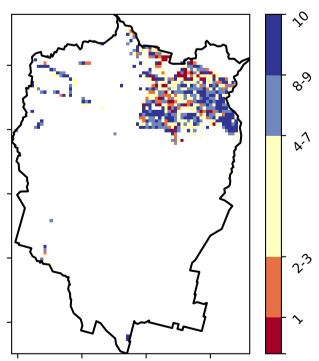


#### Proportion of vegetation cover class in area



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







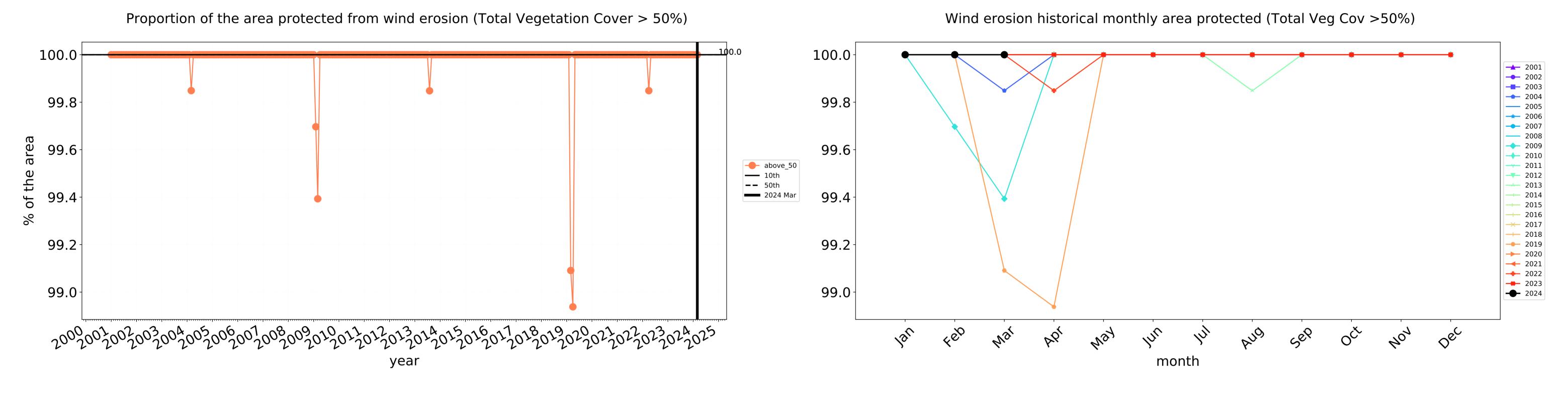


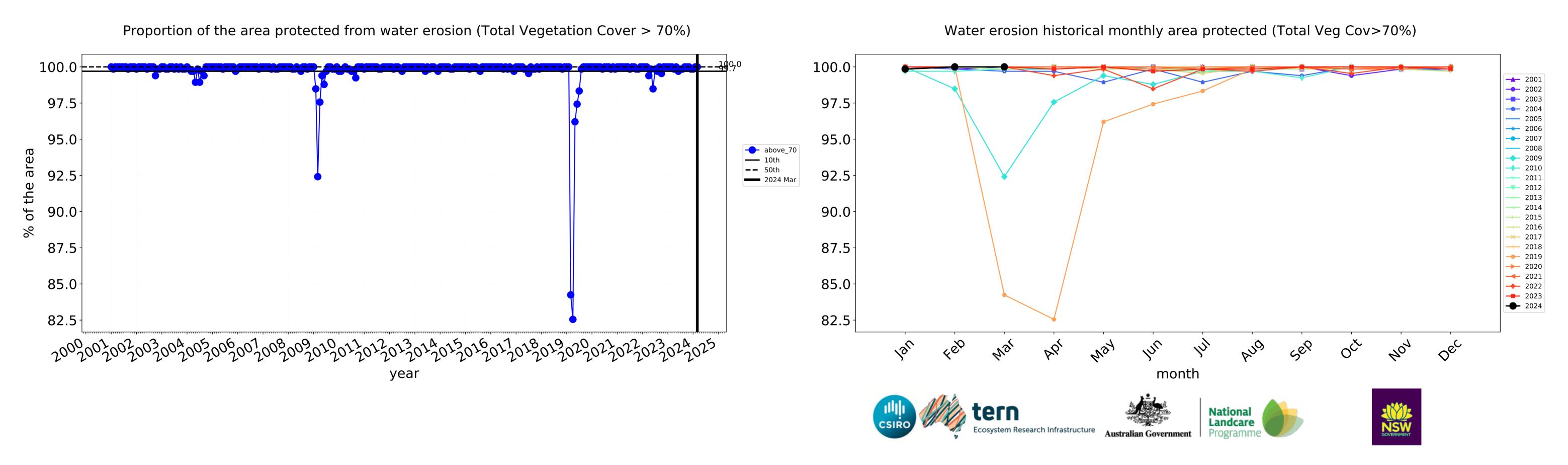


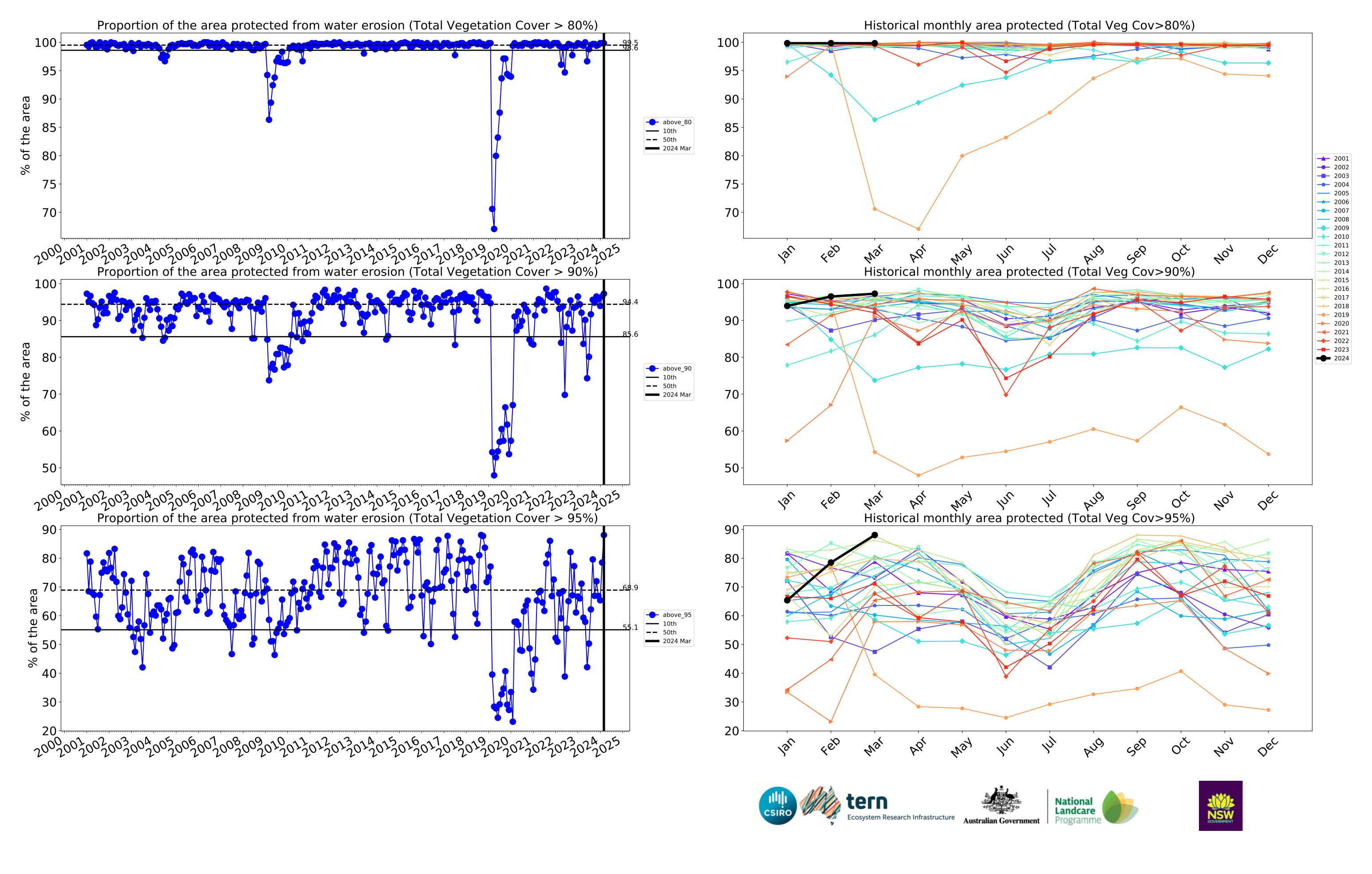




#### **Conservation and natural environments timeseries**







#### **Conservation and natural environments 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

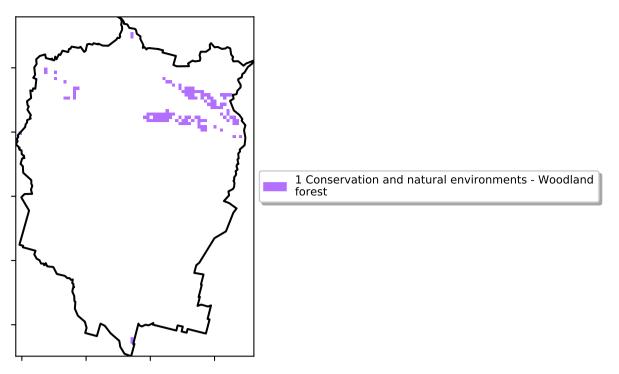
are about 20% lower than the

mean of that

pixel. The mean

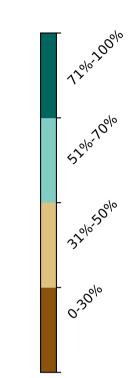
using baseline from 2001 to 2019.

is only for the month of the map

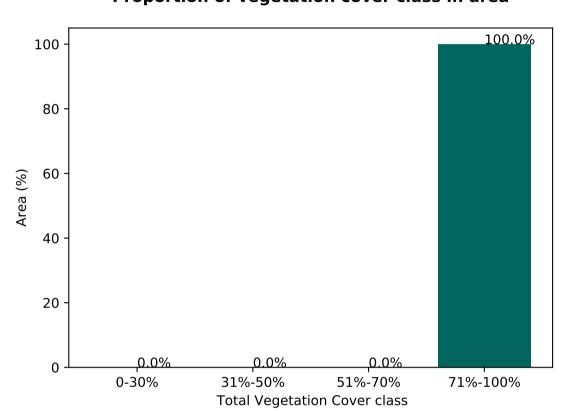


#### **Total Vegetation Cover [%]**

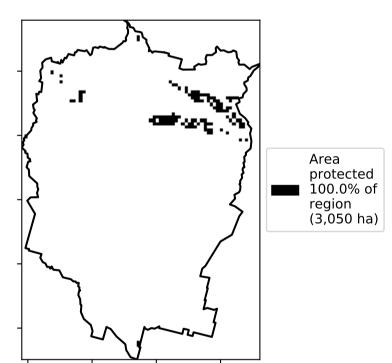




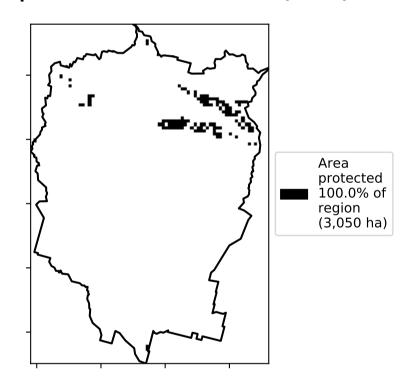
#### Proportion of vegetation cover class in area



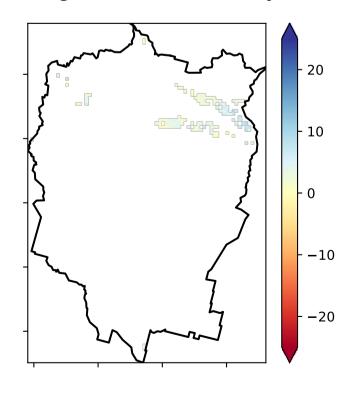
#### % Area protected from water erosion (>70%)



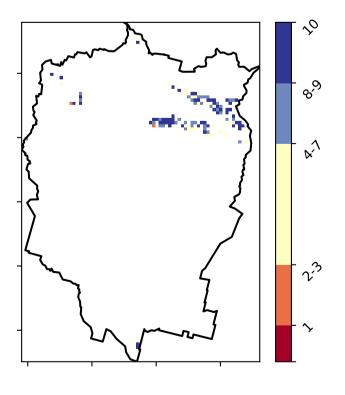
% Area protected from wind erosion (>50%)



#### **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.







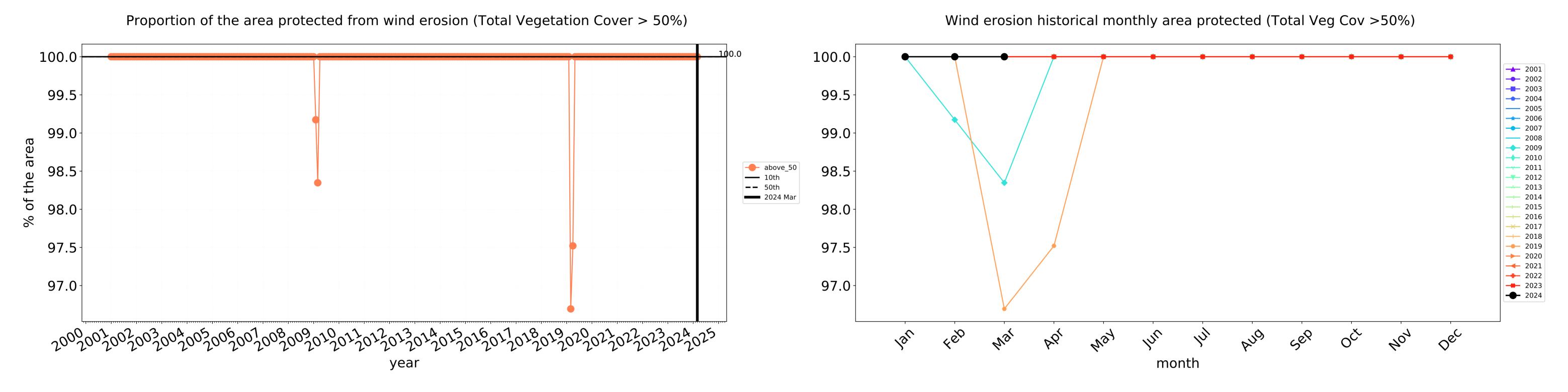


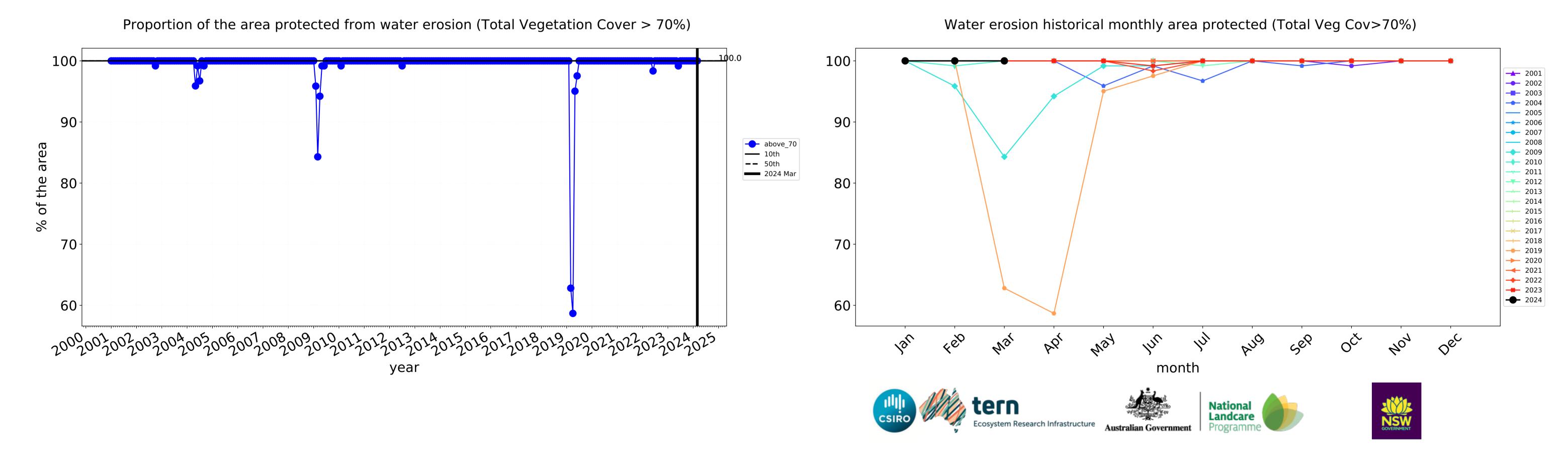


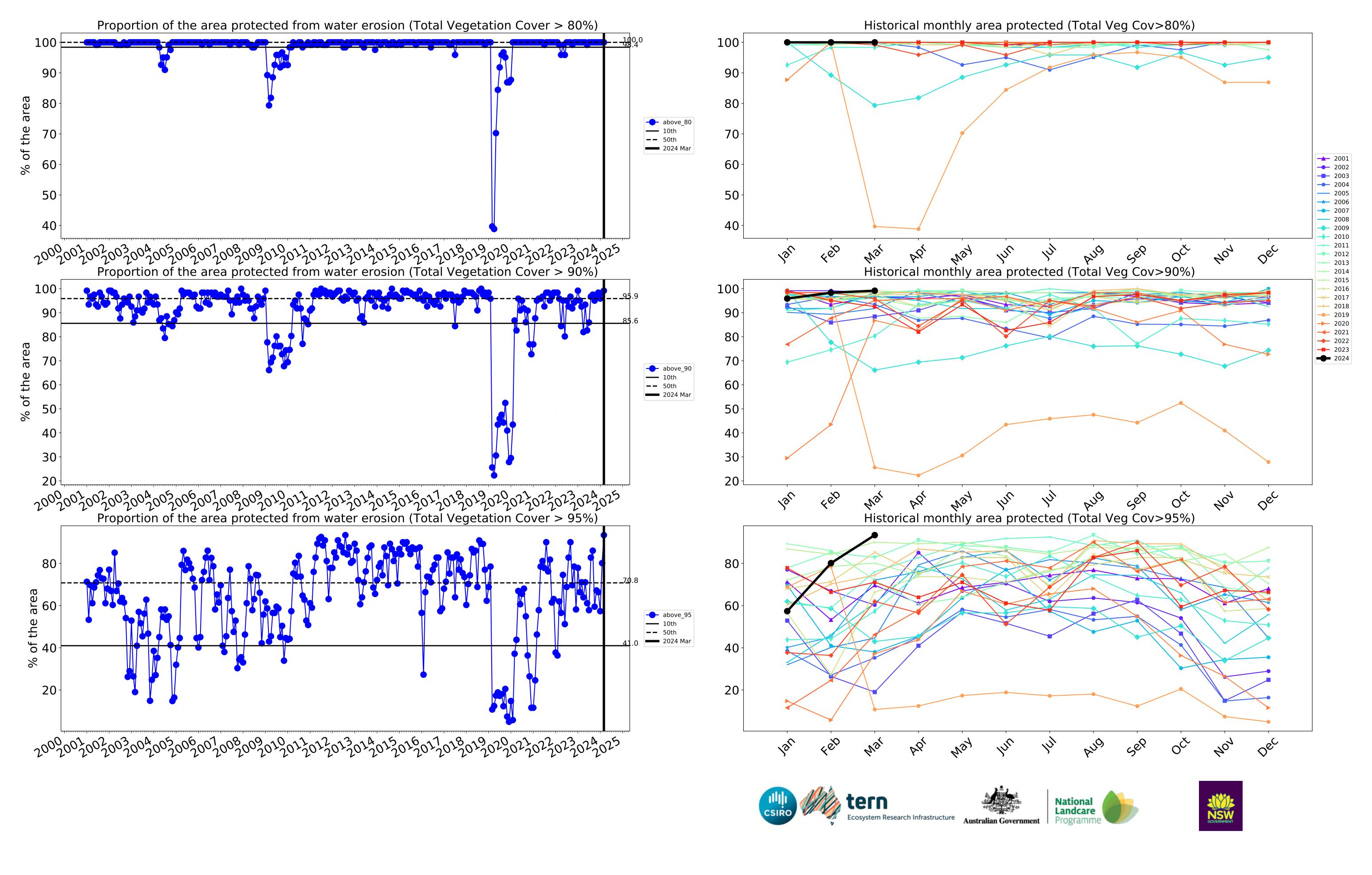




#### **Conservation and natural environments Woodland forest timeseries**







#### **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) and Forests of Australia (2018)

Anomaly show how many percetage points each

pixel is from

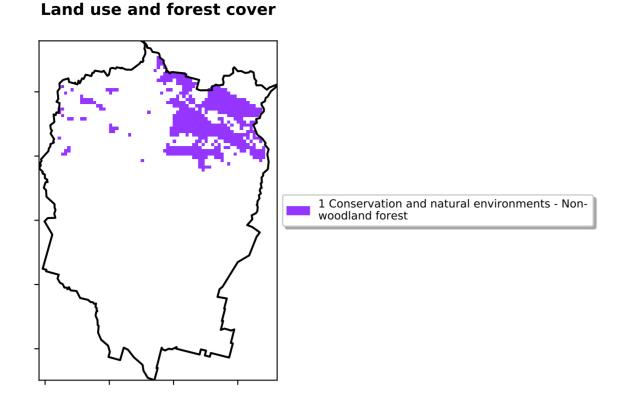
the mean. That is, red pixels

are about 20% lower than the mean of that

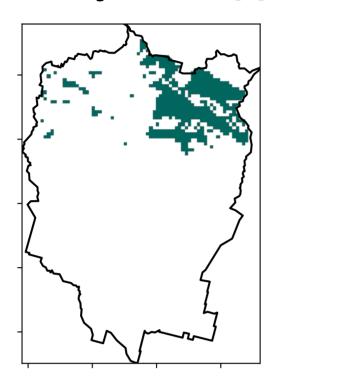
pixel. The mean

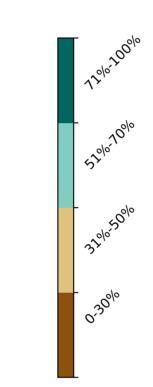
using baseline from 2001 to 2019.

is only for the month of the map

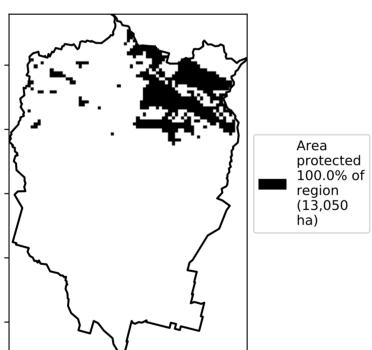


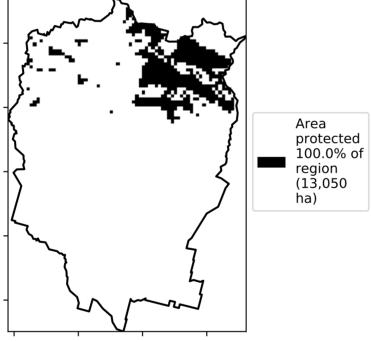
#### **Total Vegetation Cover [%]**



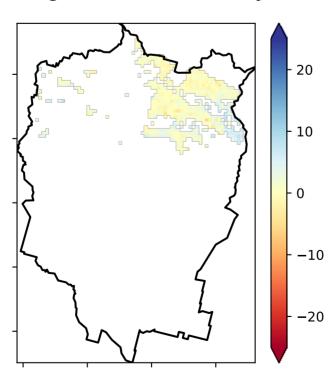


#### % Area protected from water erosion (>70%)



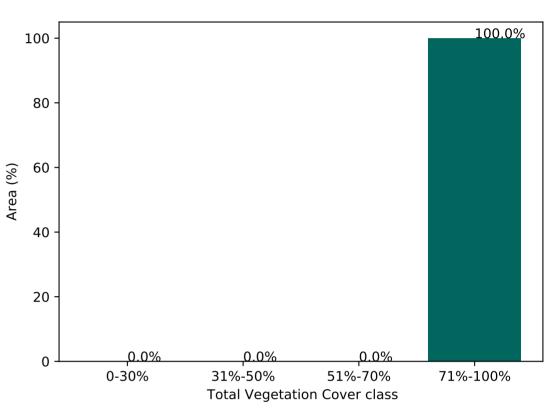


#### **Total Vegetation Cover Anomaly [%]**

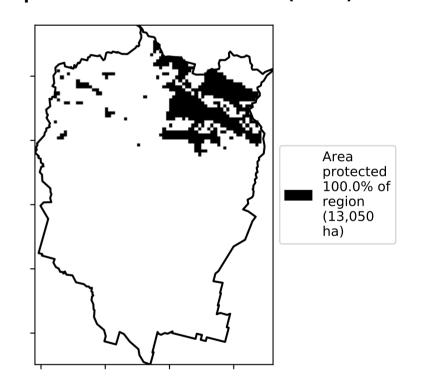


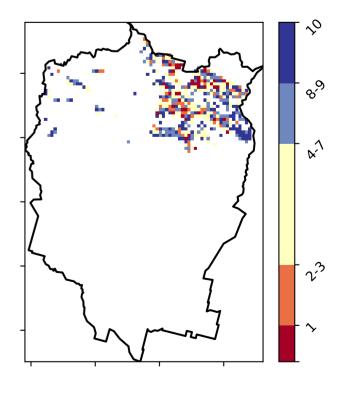
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#### Proportion of vegetation cover class in area



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



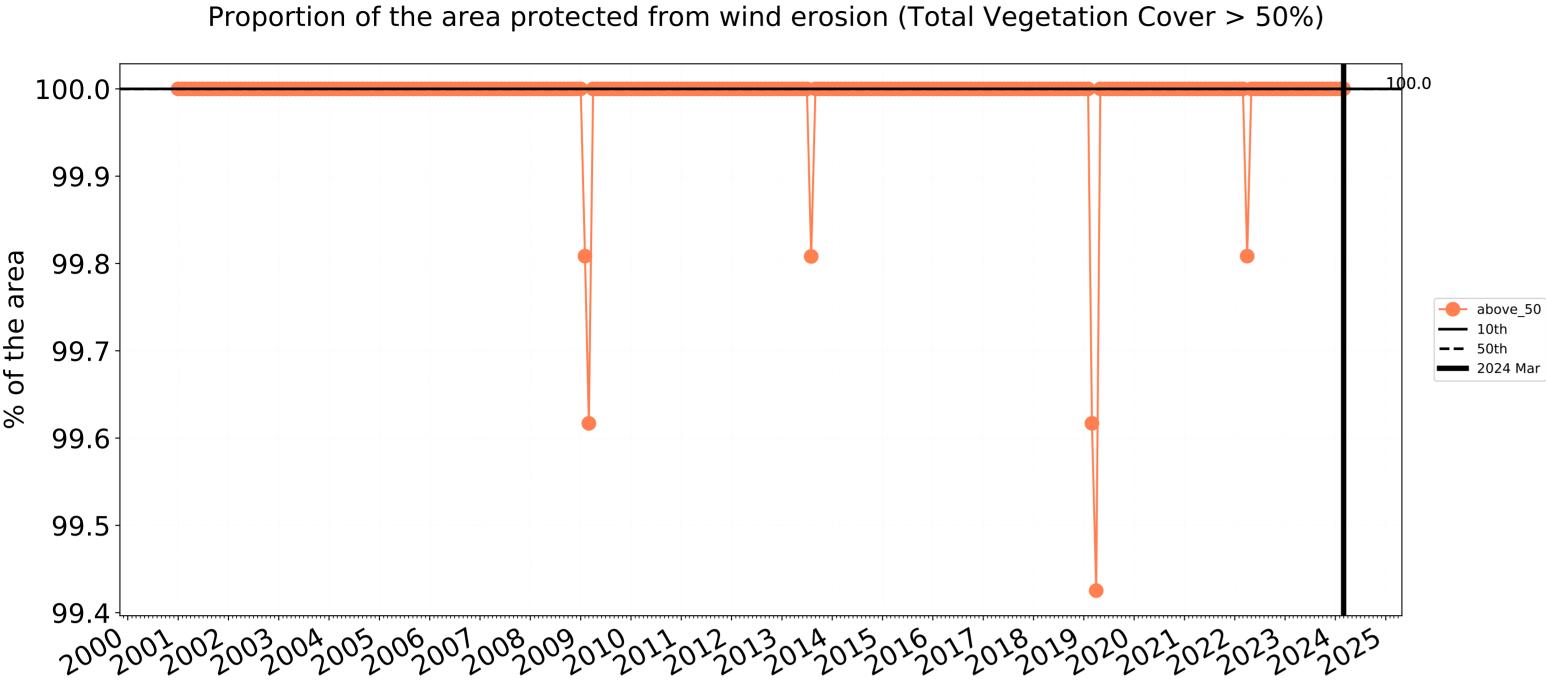






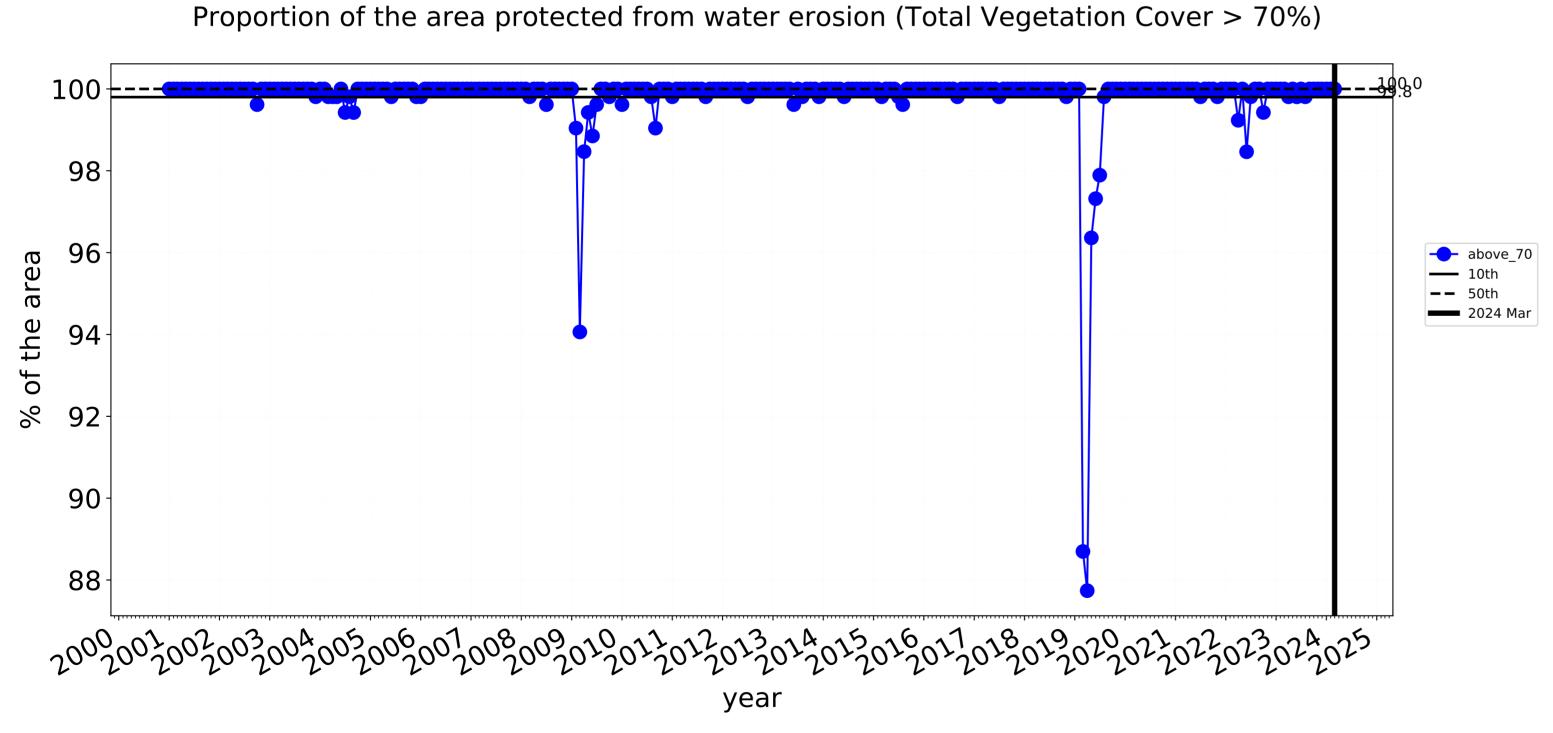


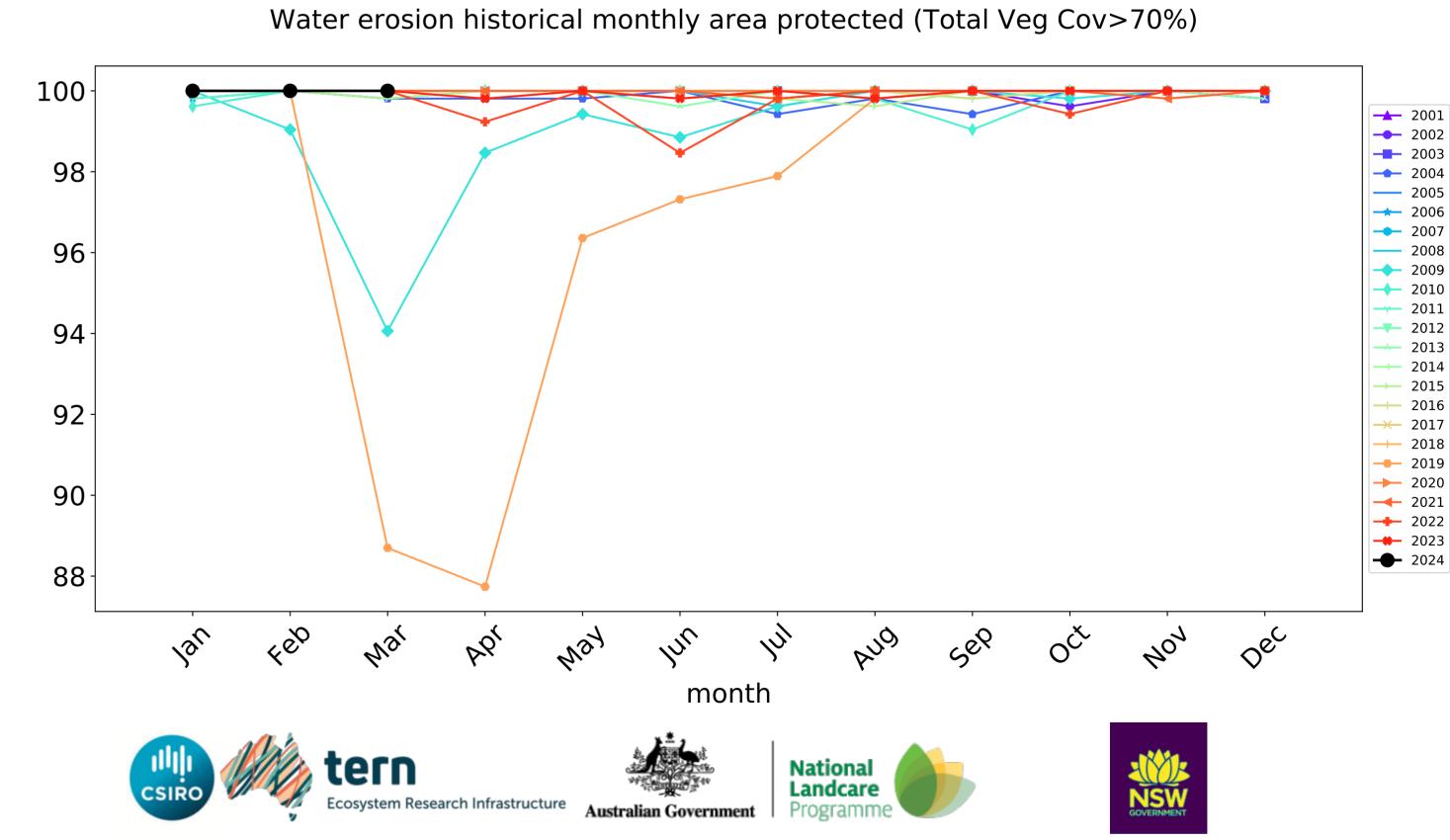


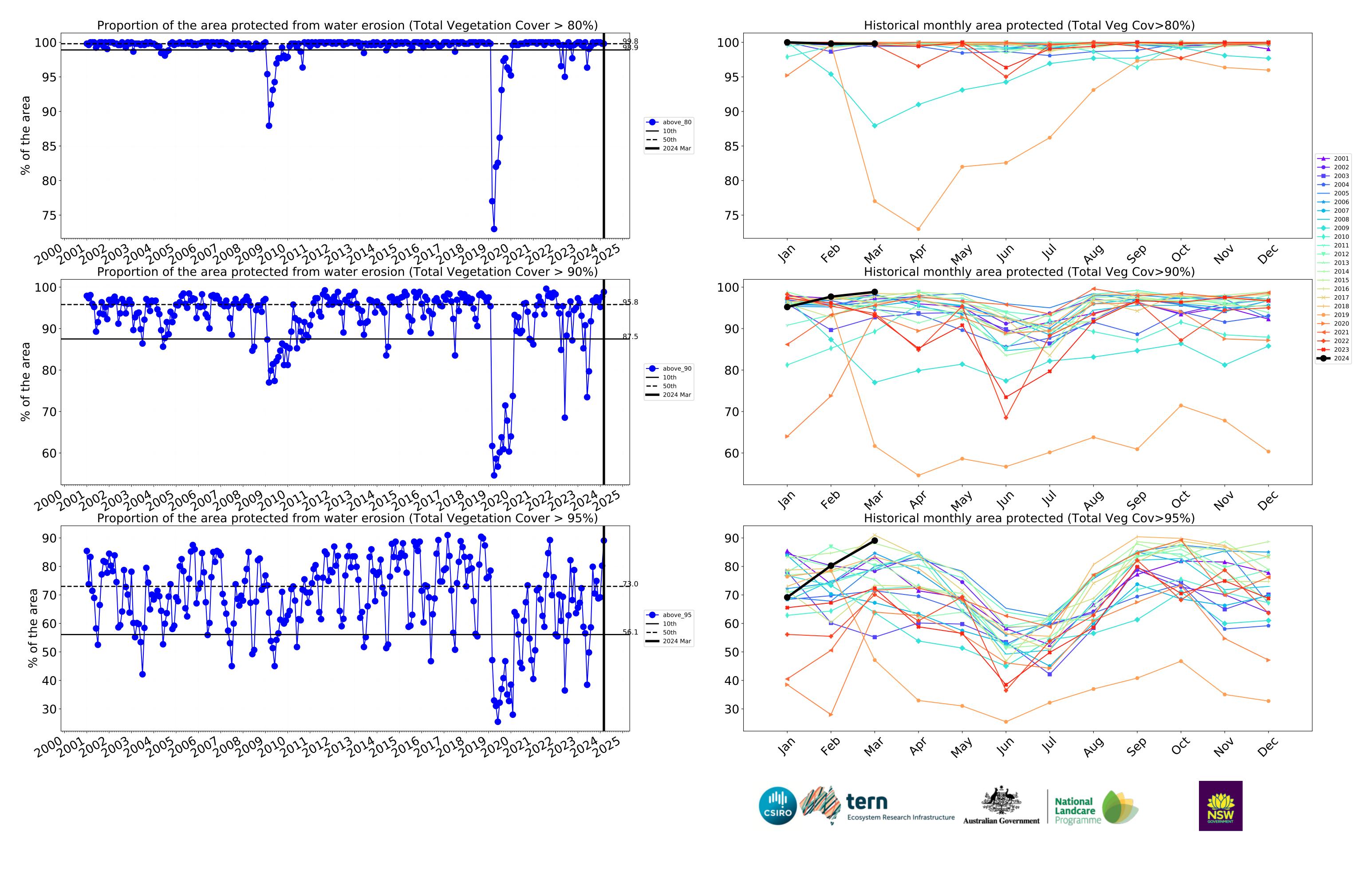




month







#### **Agriculture**

#### Land use and forest cover

# 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Cropping - Non-irrigated 5 Agriculture - Cropping - Irrigated 6 Agriculture - Horticulture - Non-irrigated 7 Agriculture - Horticulture - Irrigated

#### 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

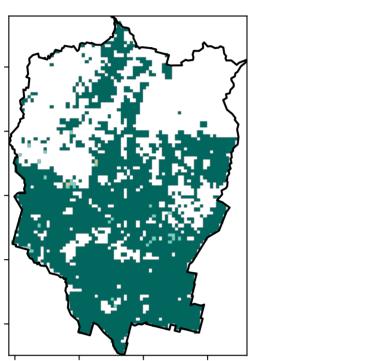
using baseline from 2001 to 2019.

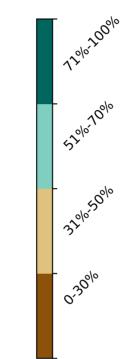
pixel. The mean

is only for the month of the map

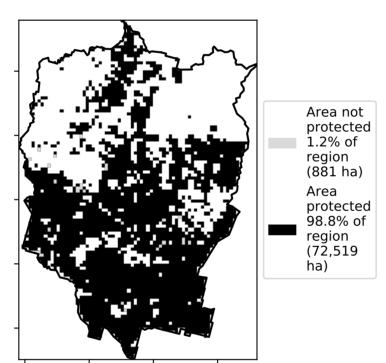
Catchment Scale

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

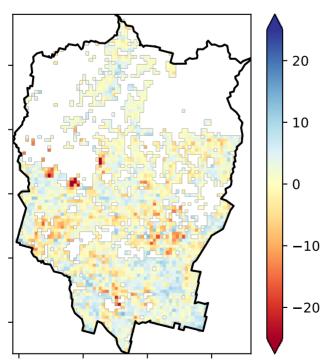




#### % Area protected from water erosion (>70%)

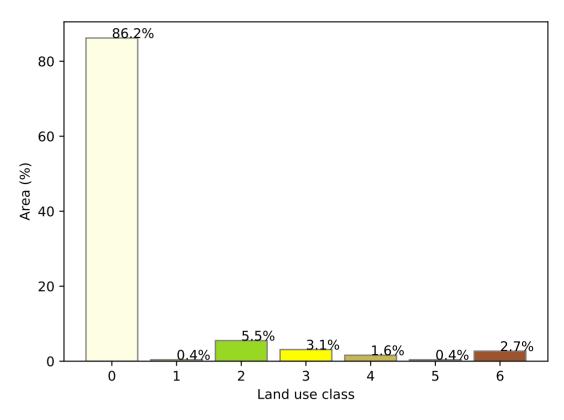


#### Total Vegetation Cover Anomaly [%]

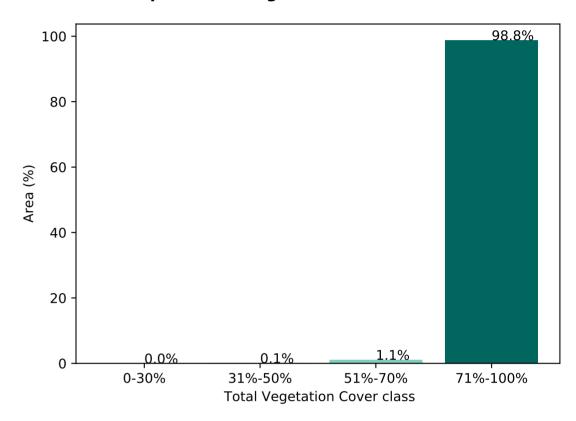


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

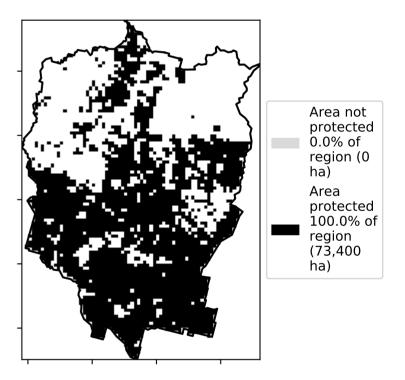
#### Proportion of each land class in area

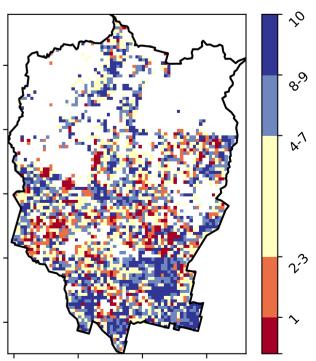


Proportion of vegetation cover class in area



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









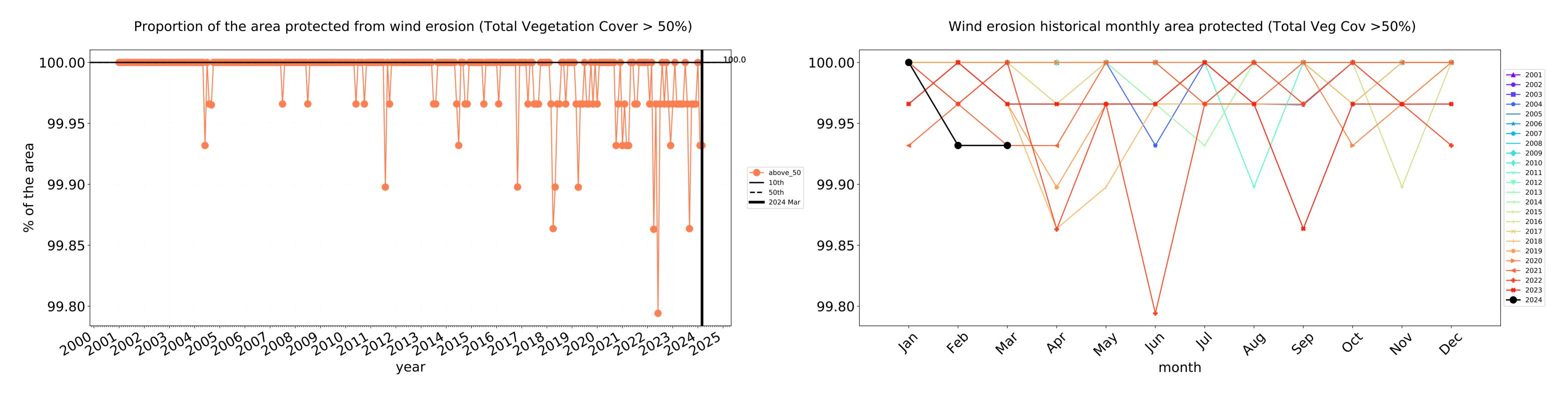


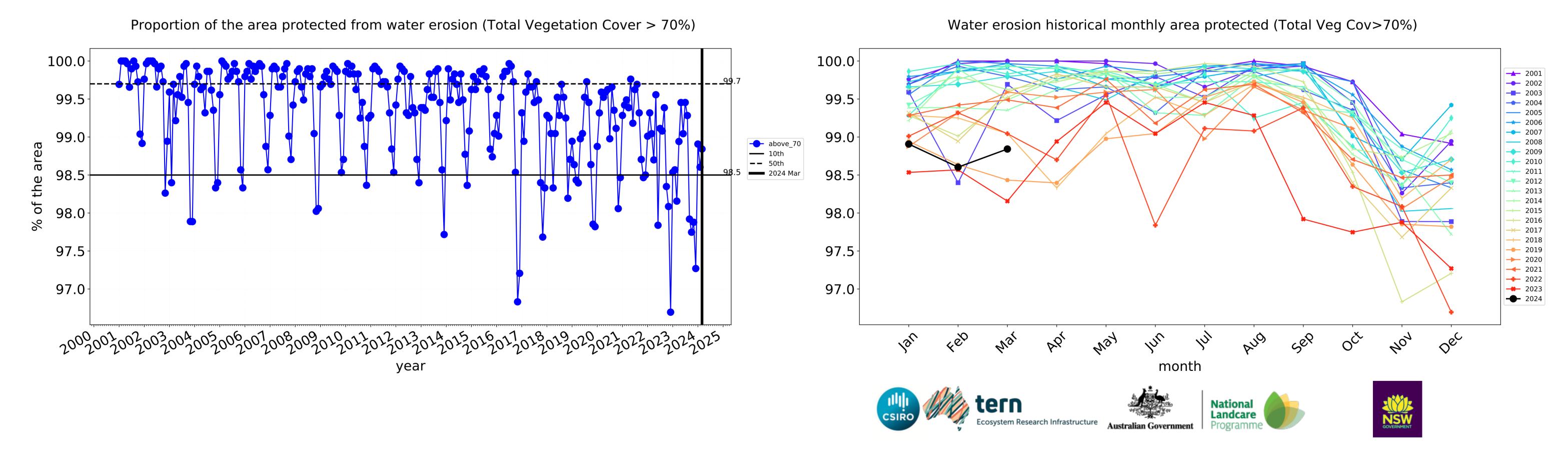


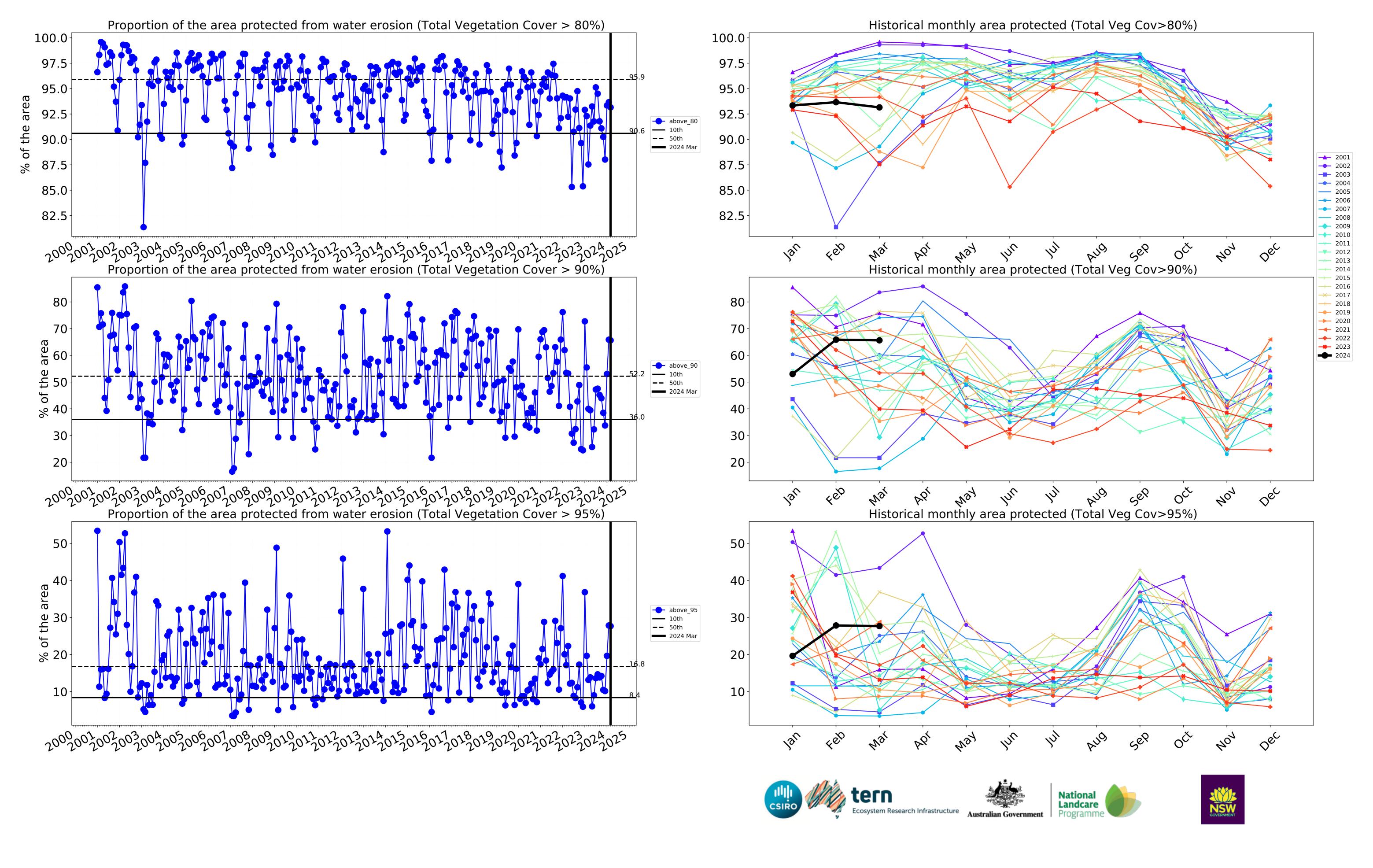




#### **Agriculture timeseries**







#### Grazing

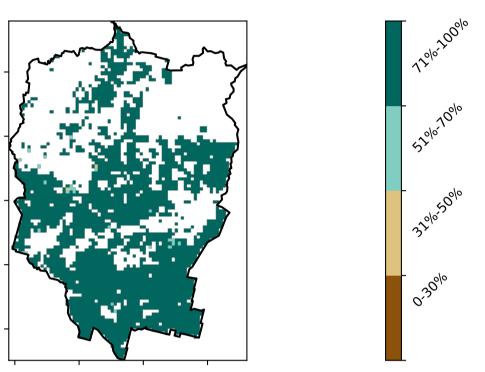
#### **Land use and forest cover**

## 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest

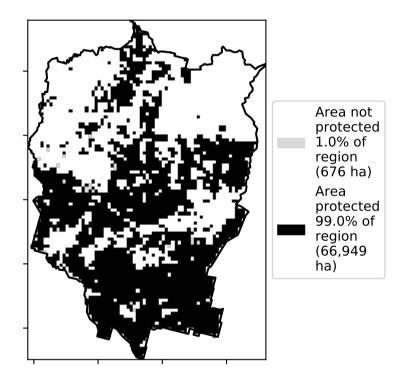
#### Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Catchment Scale

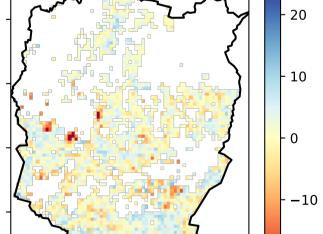
#### **Total Vegetation Cover [%]**



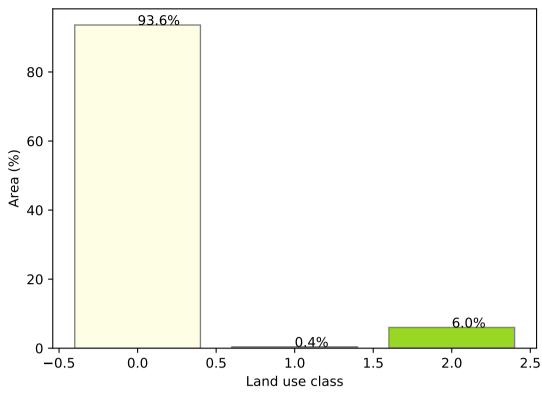
% Area protected from water erosion (>70%)



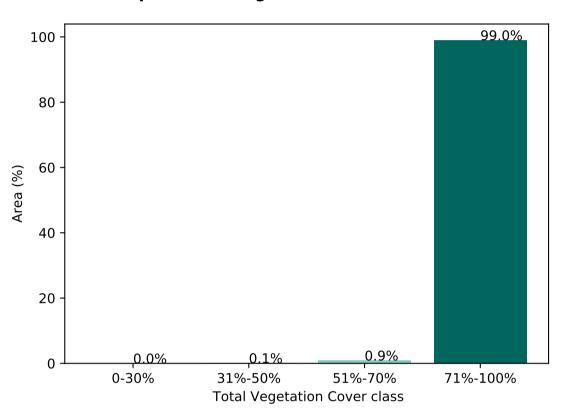
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



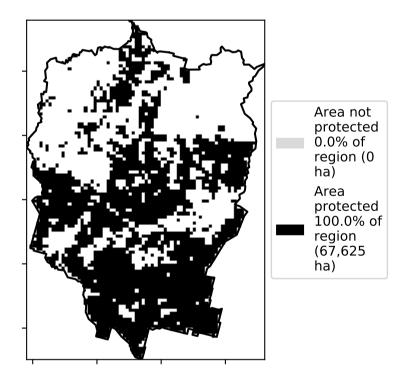
#### **Proportion of each land class in area**



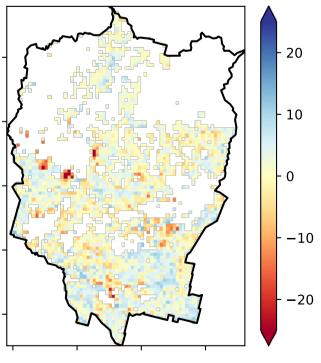
Proportion of vegetation cover class in area



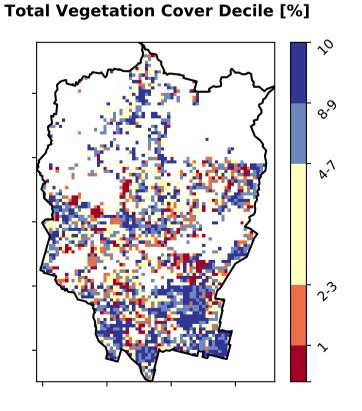
% Area protected from wind erosion (>50%)



**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.







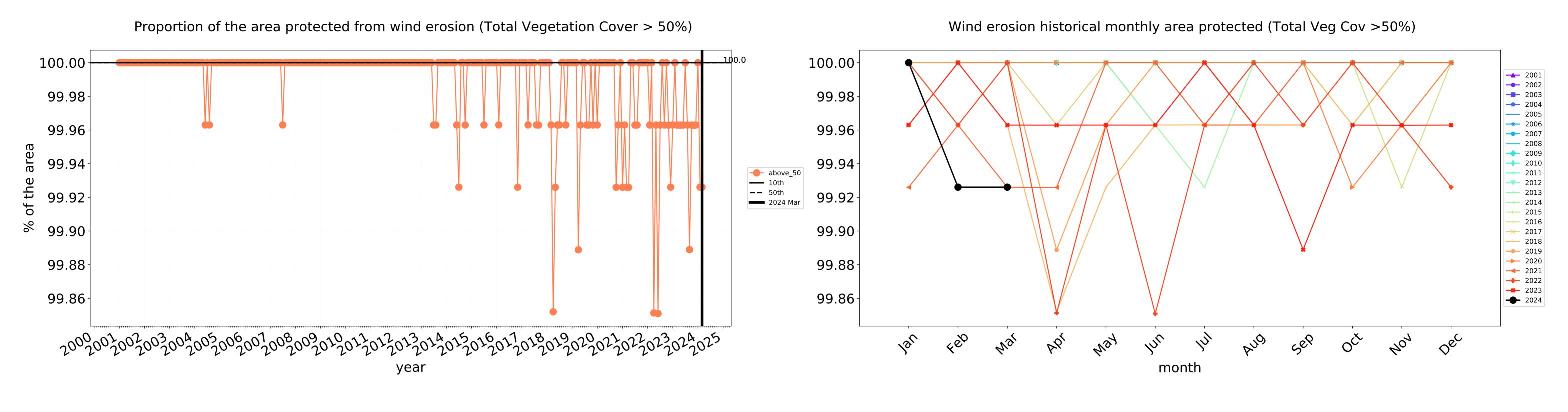


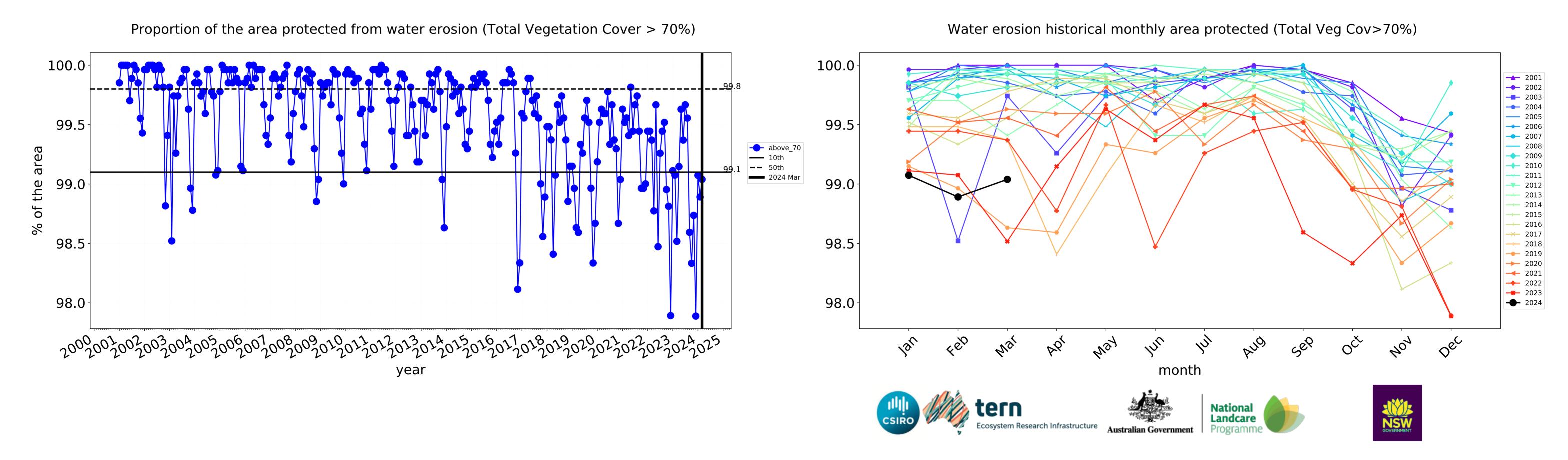


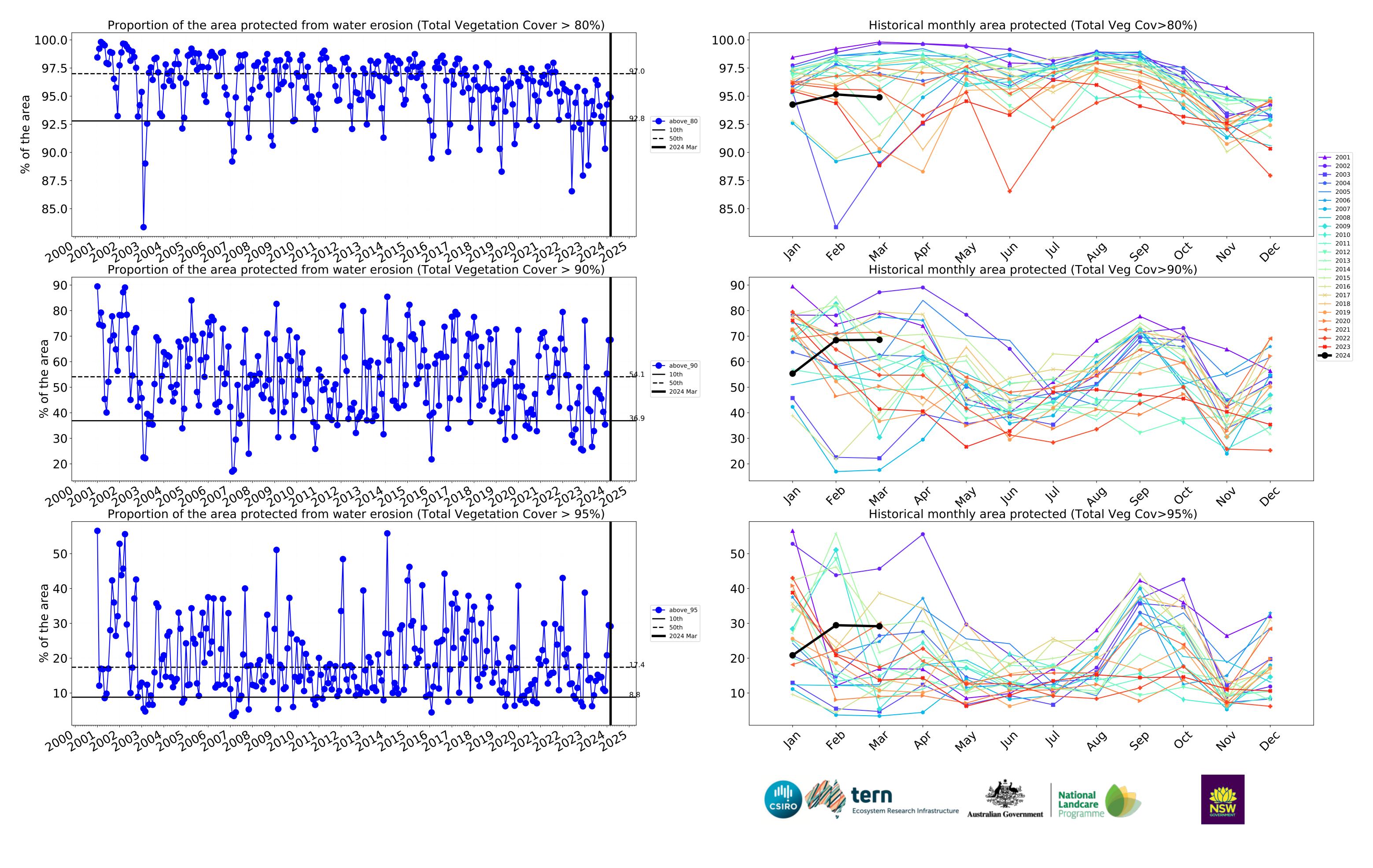




#### **Grazing timeseries**







#### **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)

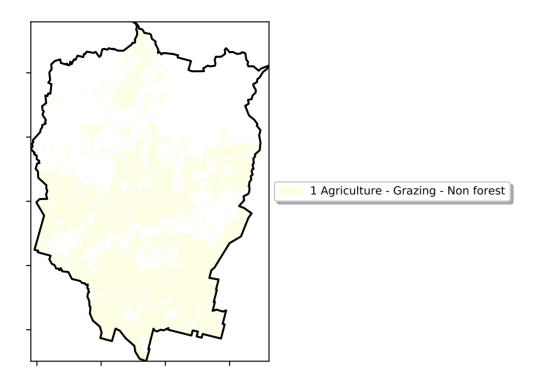
Anomaly show how many percetage points each pixel is from the mean. That

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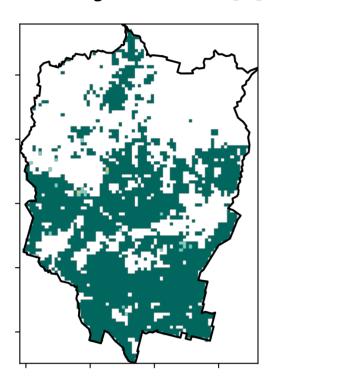
mean of that

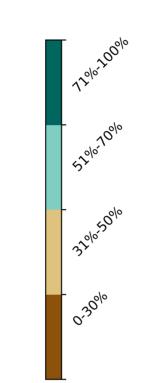
pixel. The mean

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

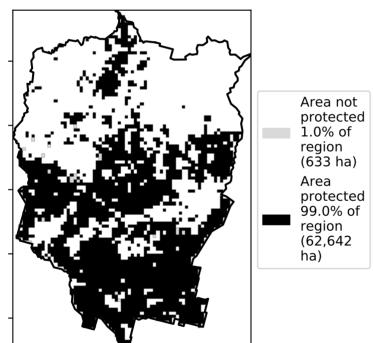


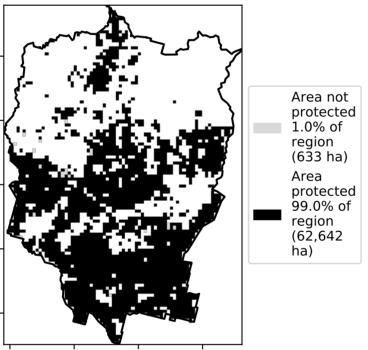
#### **Total Vegetation Cover [%]**



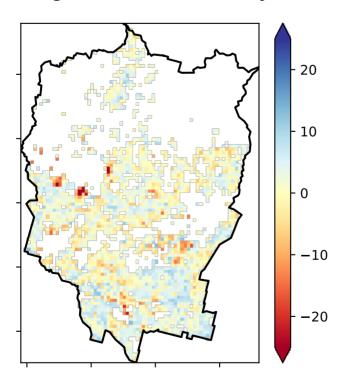


#### % Area protected from water erosion (>70%)



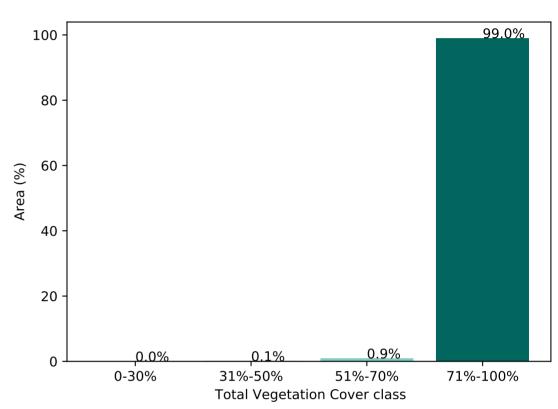


#### **Total Vegetation Cover Anomaly [%]**

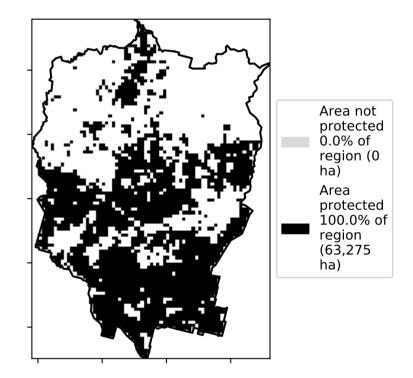


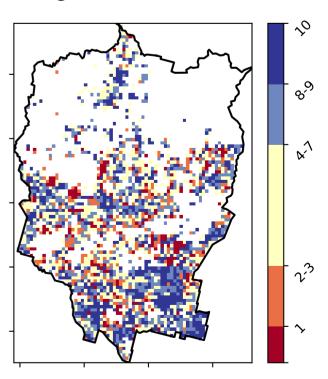
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area



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









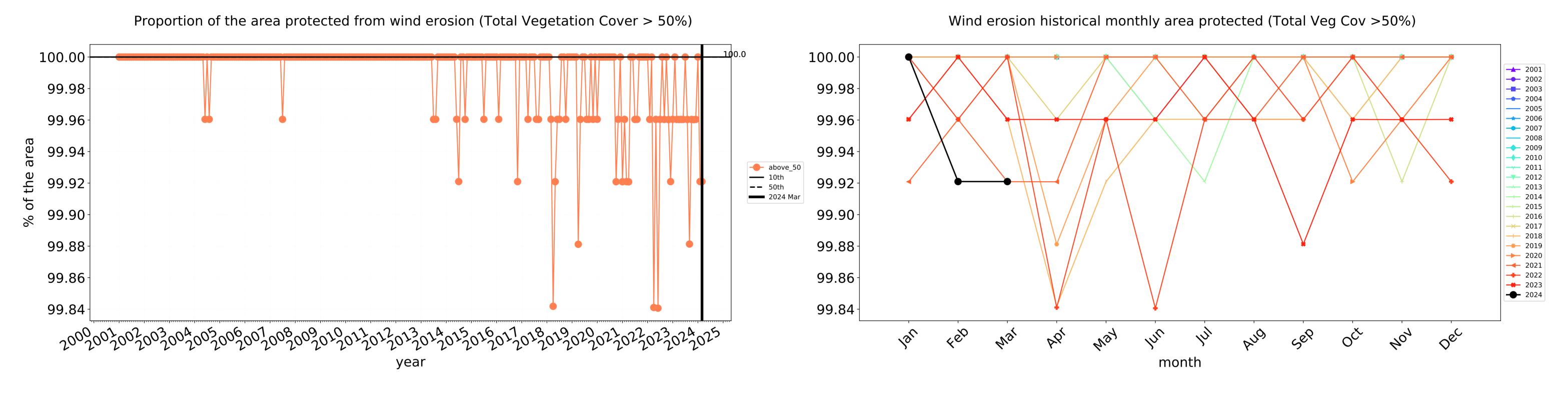


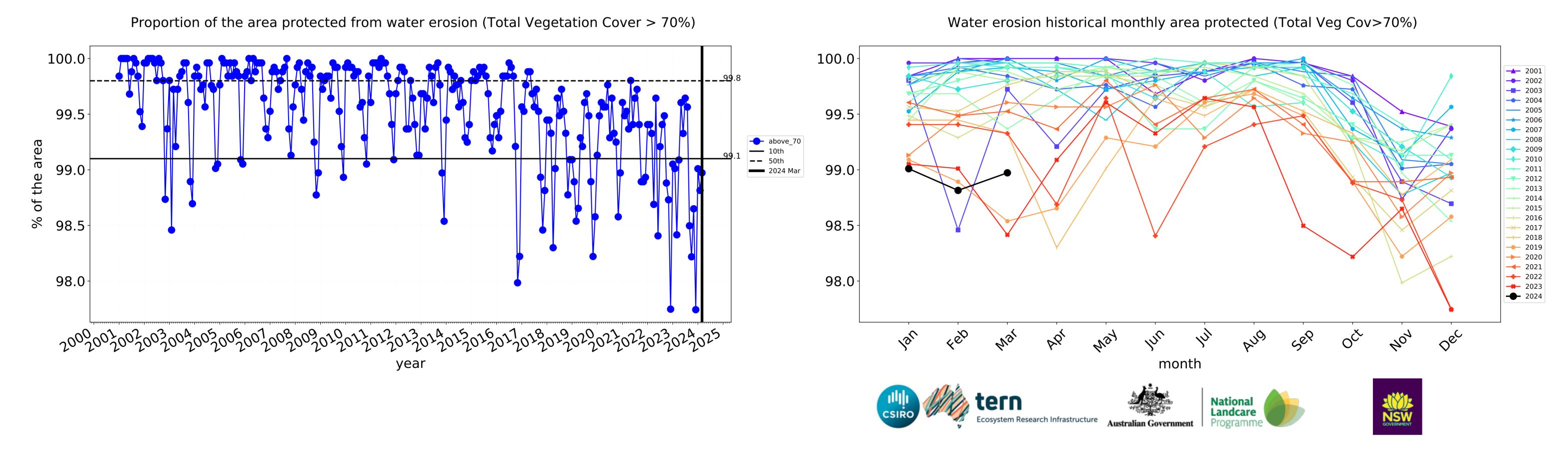


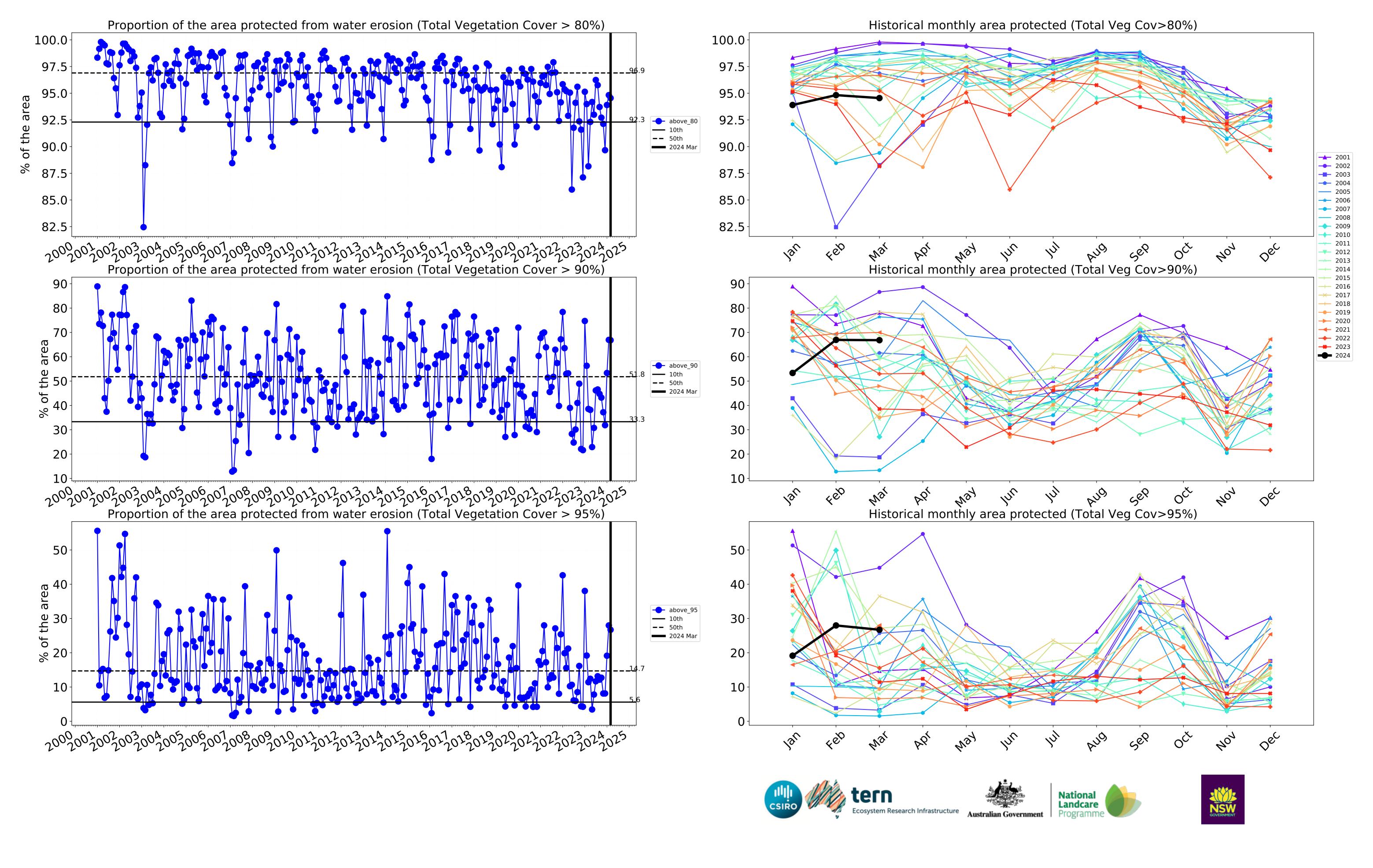




#### **Grazing non forest timeseries**



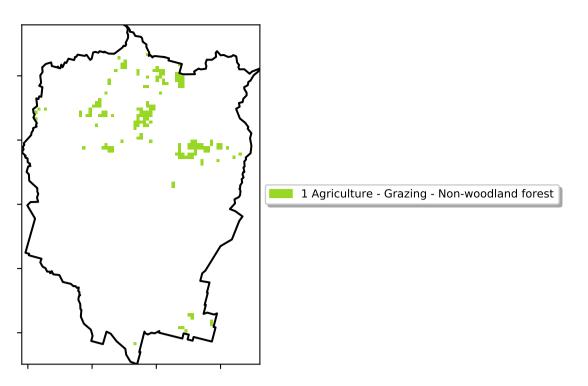




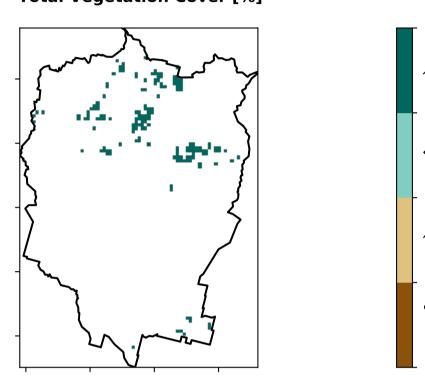
#### **Grazing - Forest (non woodland)**

#### Land use and forest cover

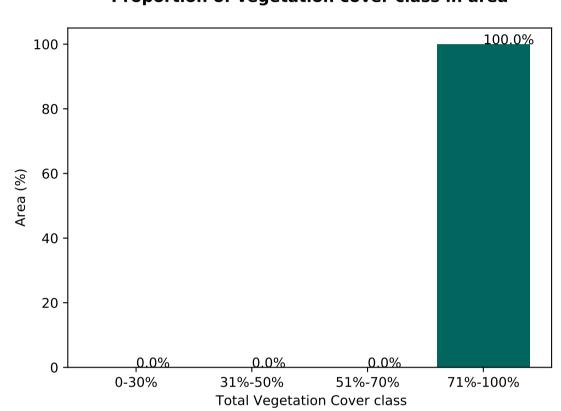
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



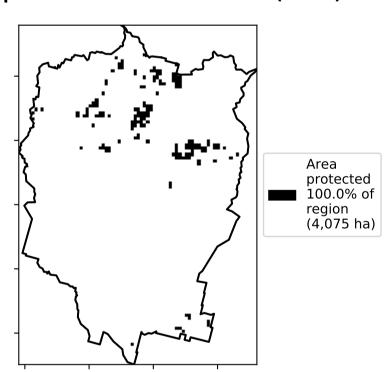
#### **Total Vegetation Cover [%]**



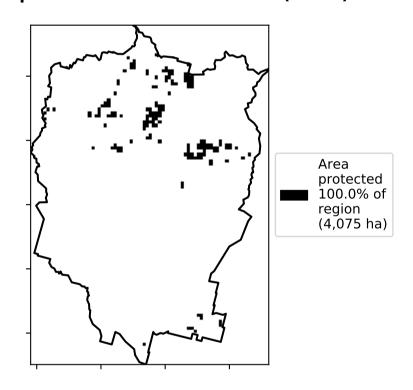
#### Proportion of vegetation cover class in area



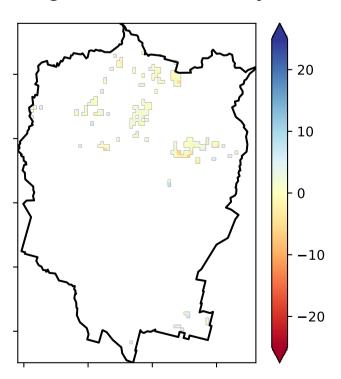
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

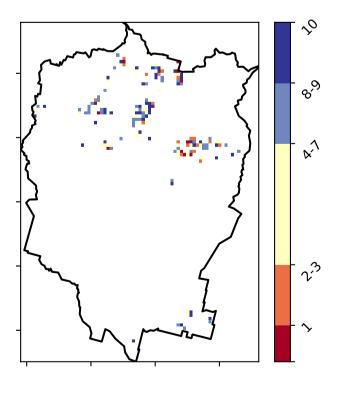


#### **Total Vegetation Cover Anomaly [%]**



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 [%]





Anomaly show how many percetage points each

pixel is from the mean. That

is, red pixels

mean of that pixel. The mean

is only for the month of the map

using baseline from 2001 to 2019.

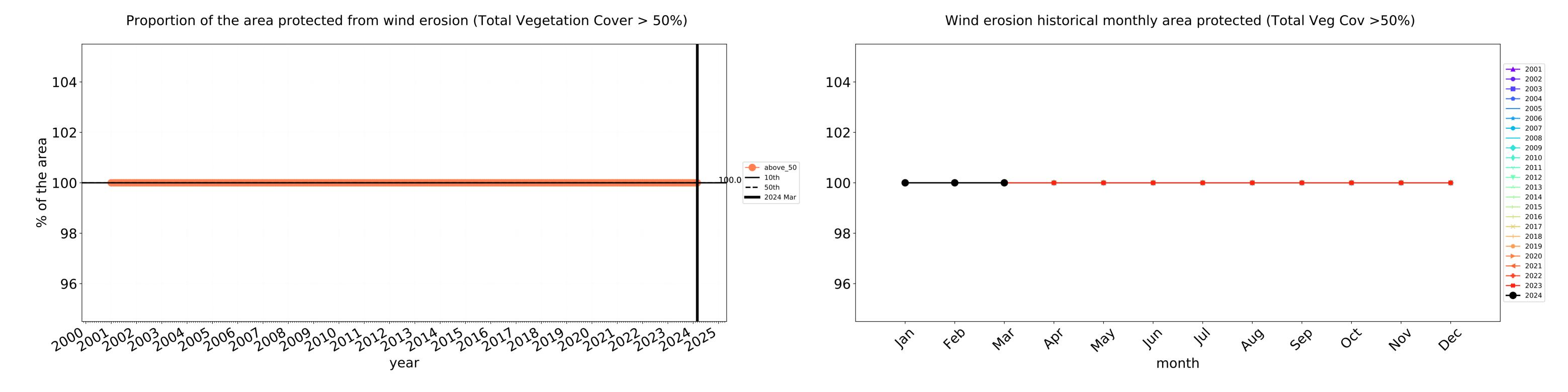
are about 20% lower than the

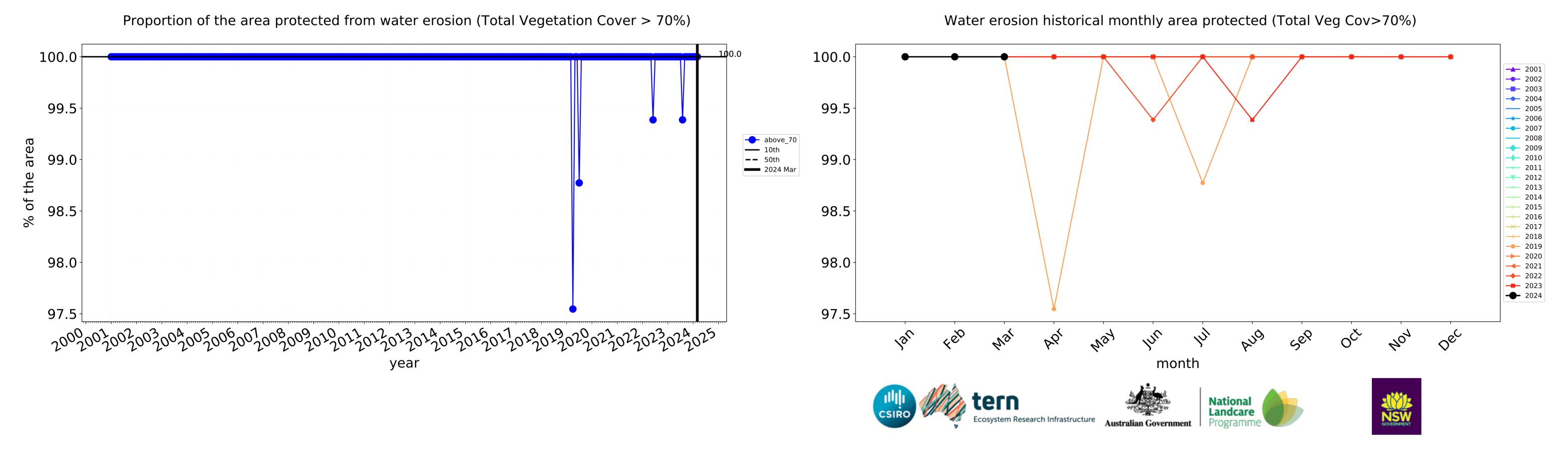


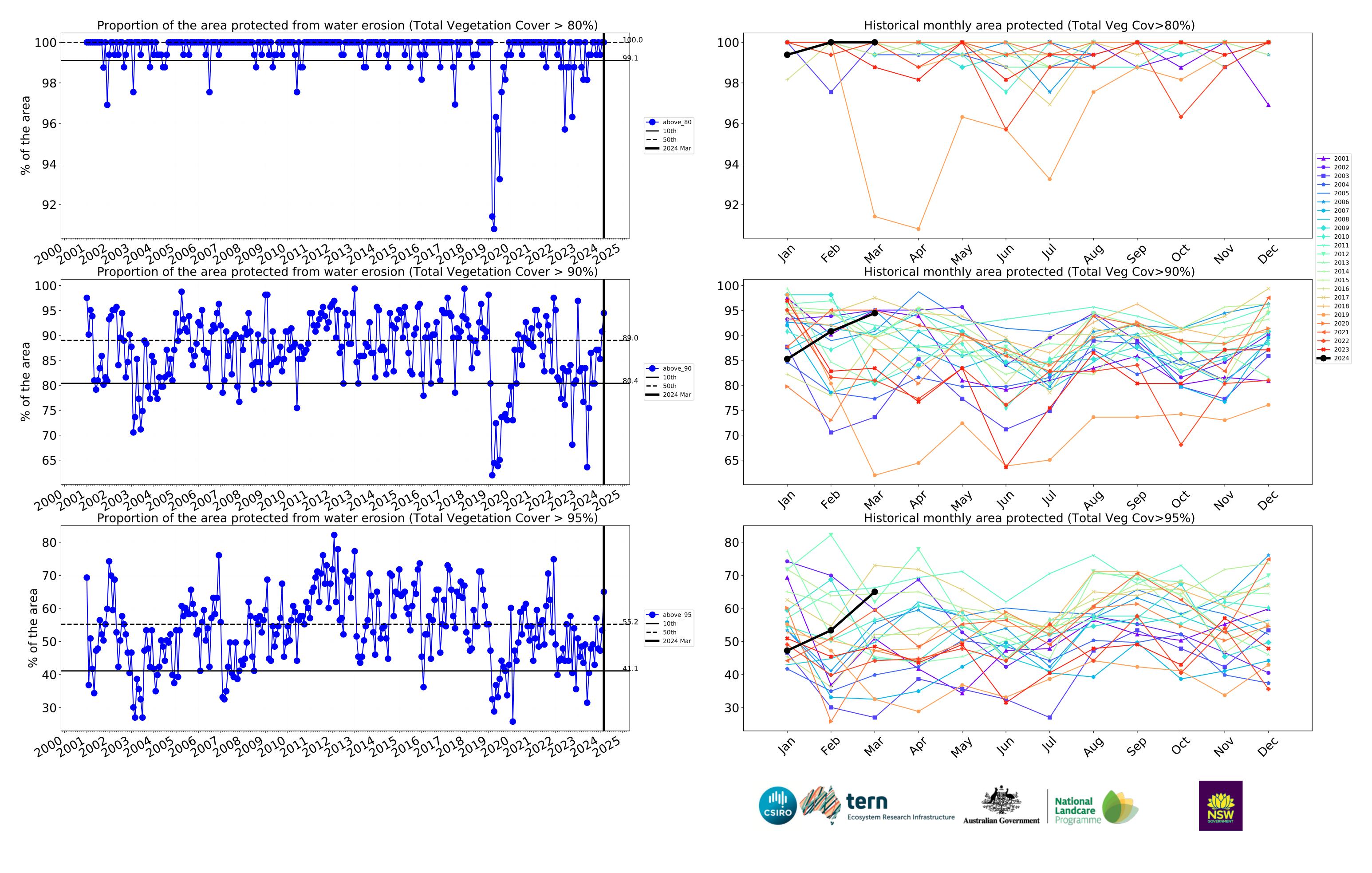












#### Cropping

#### 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

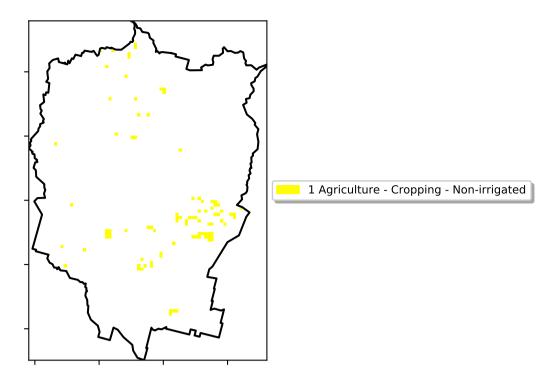
is, red pixels

mean of that pixel. The mean

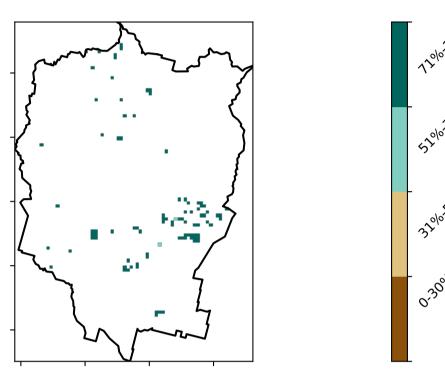
is only for the month of the map

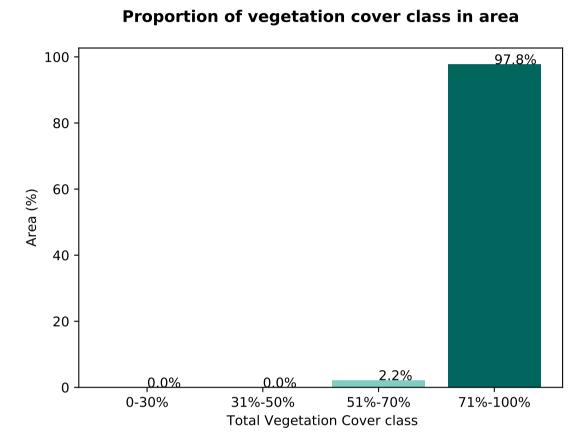
using baseline from 2001 to 2019.

are about 20% lower than the

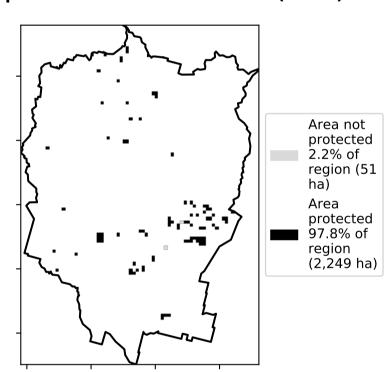


#### **Total Vegetation Cover [%]**

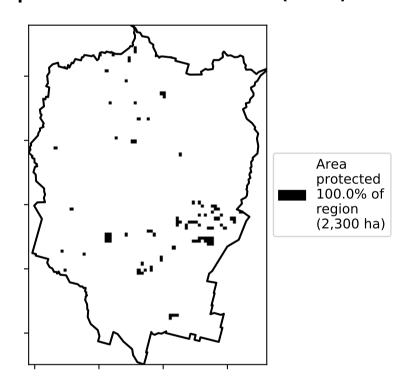




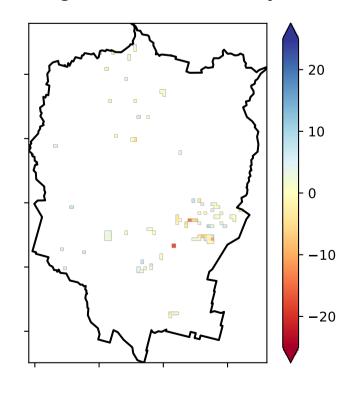
#### % Area protected from water erosion (>70%)



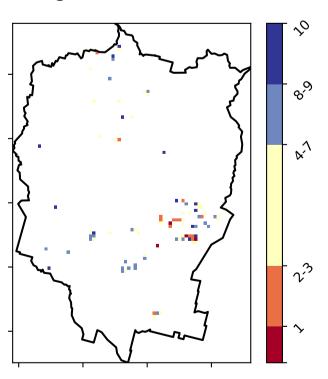
% Area protected from wind erosion (>50%)



#### **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.





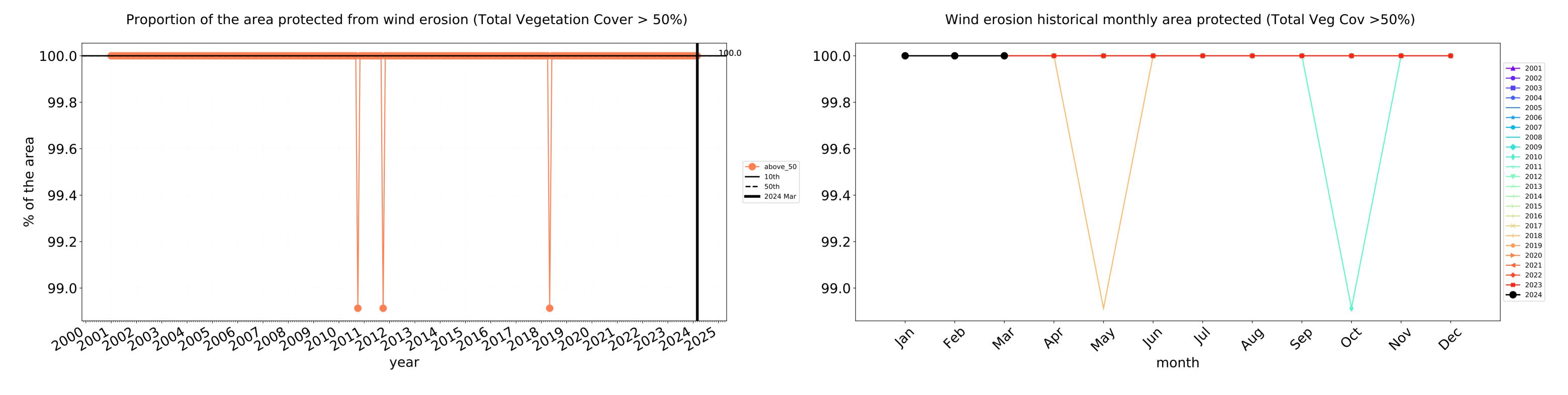


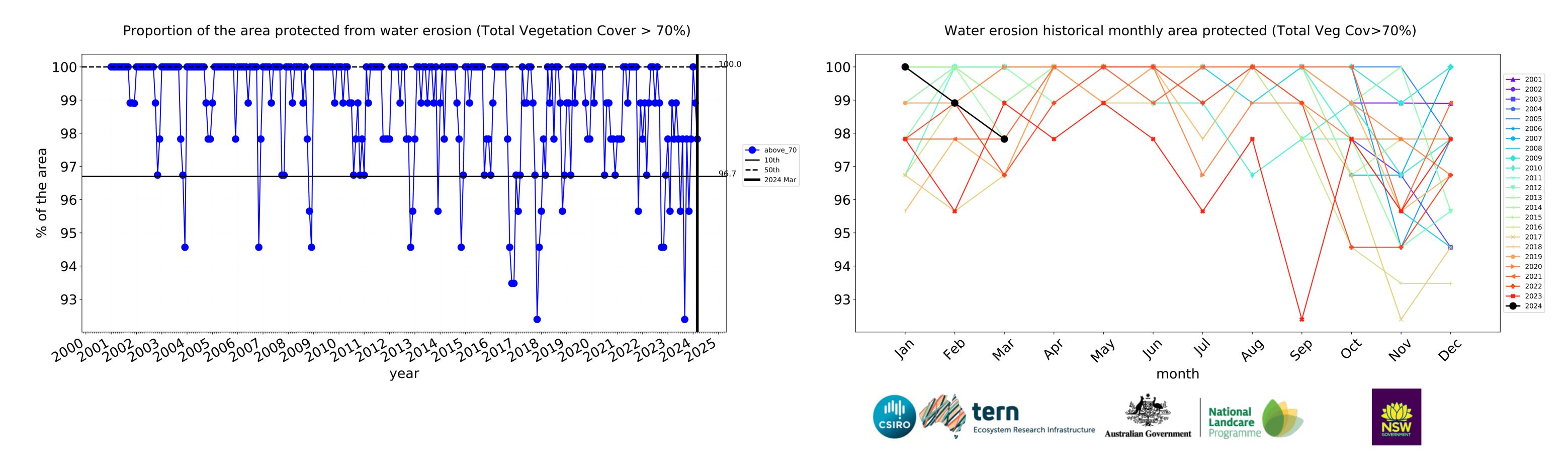


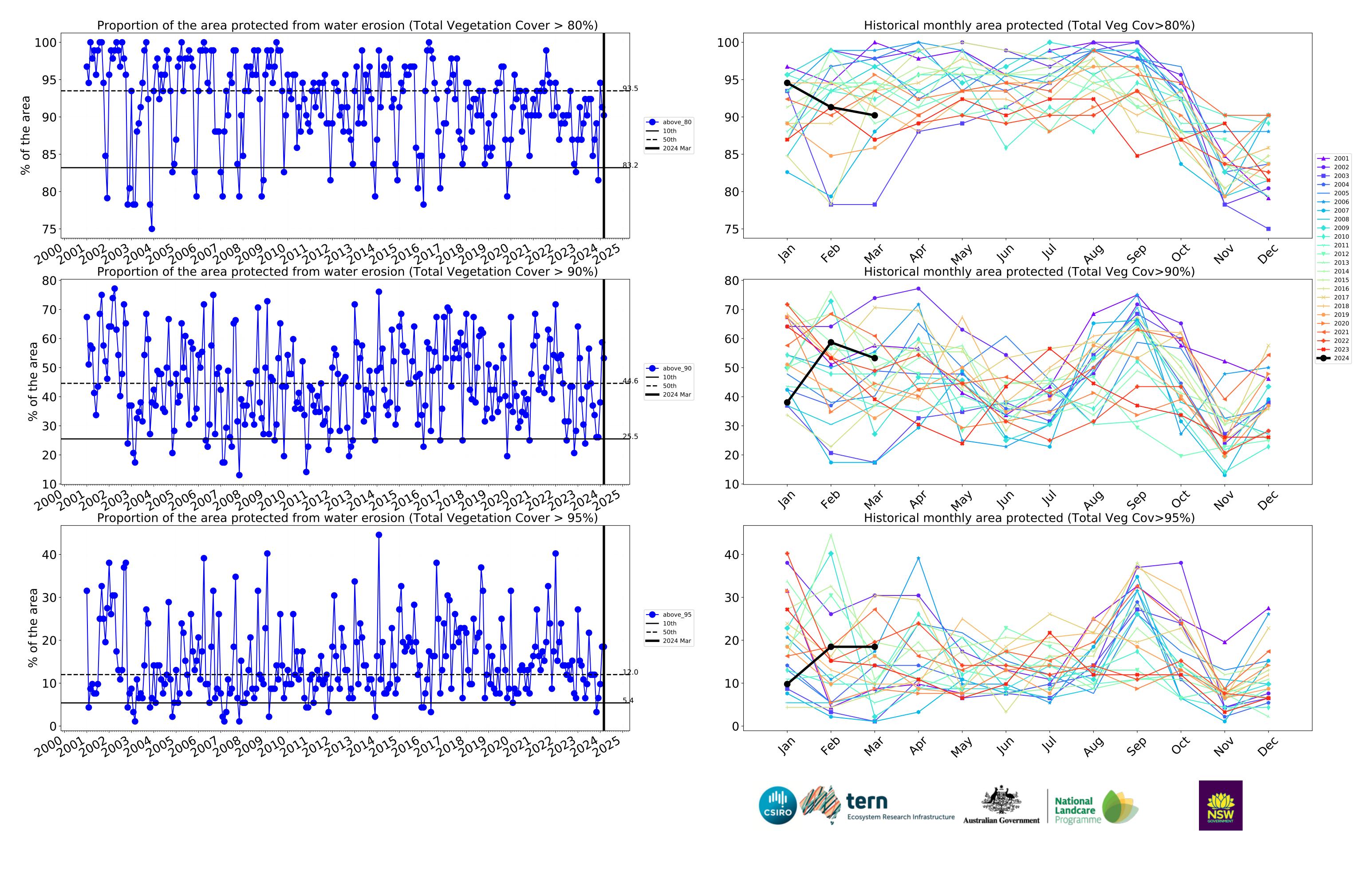




#### **Cropping timeseries**







#### Irrigation

#### Land use and forest cover

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

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

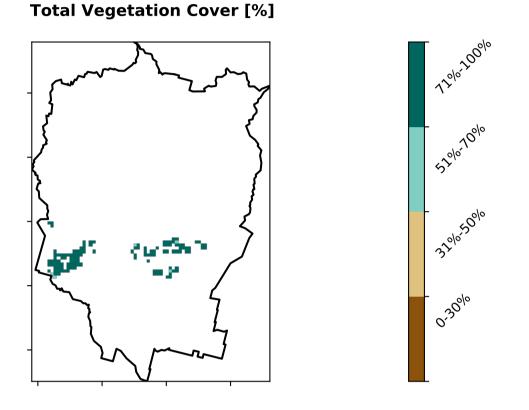
mean of that pixel. The mean

is only for the month of the map

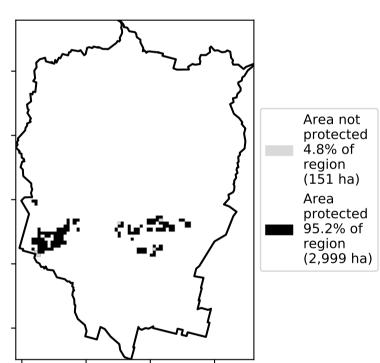
using baseline from 2001 to 2019.

are about 20% lower than the

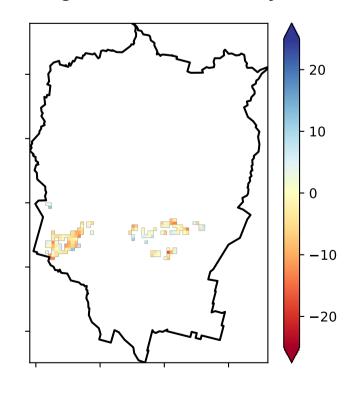
# 1 Agriculture - Cropping - Irrigated 2 Agriculture - Horticulture - Irrigated



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

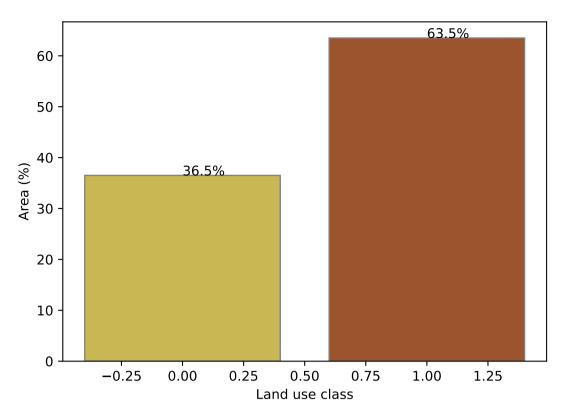


#### **Total Vegetation Cover Anomaly [%]**

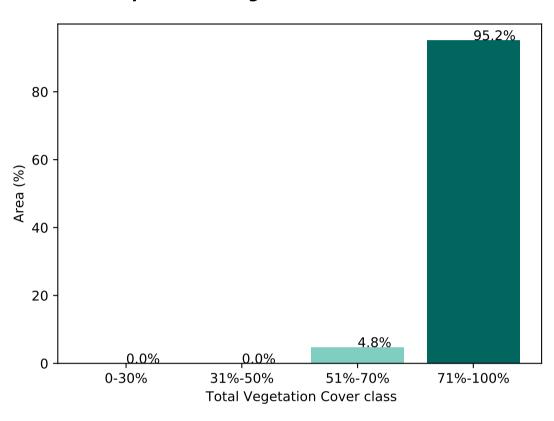


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

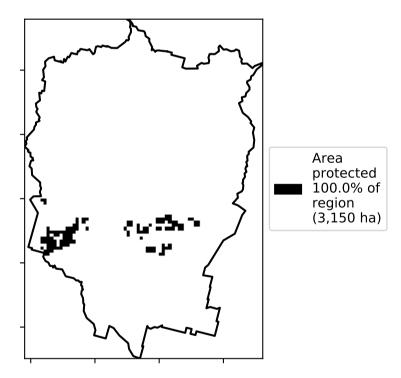
#### **Proportion of each land class in area**

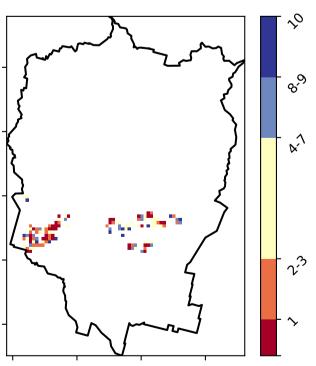


#### **Proportion of vegetation cover class in area**



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









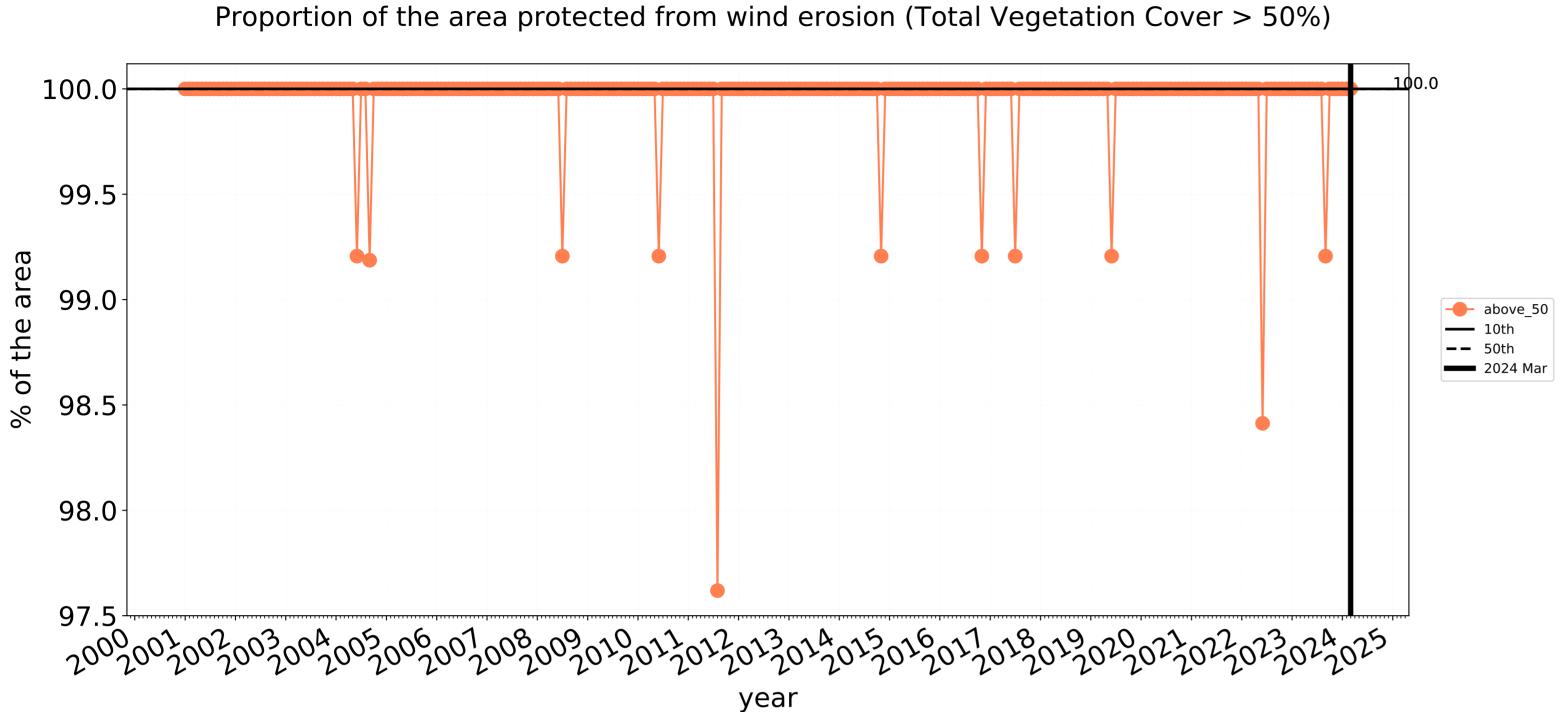


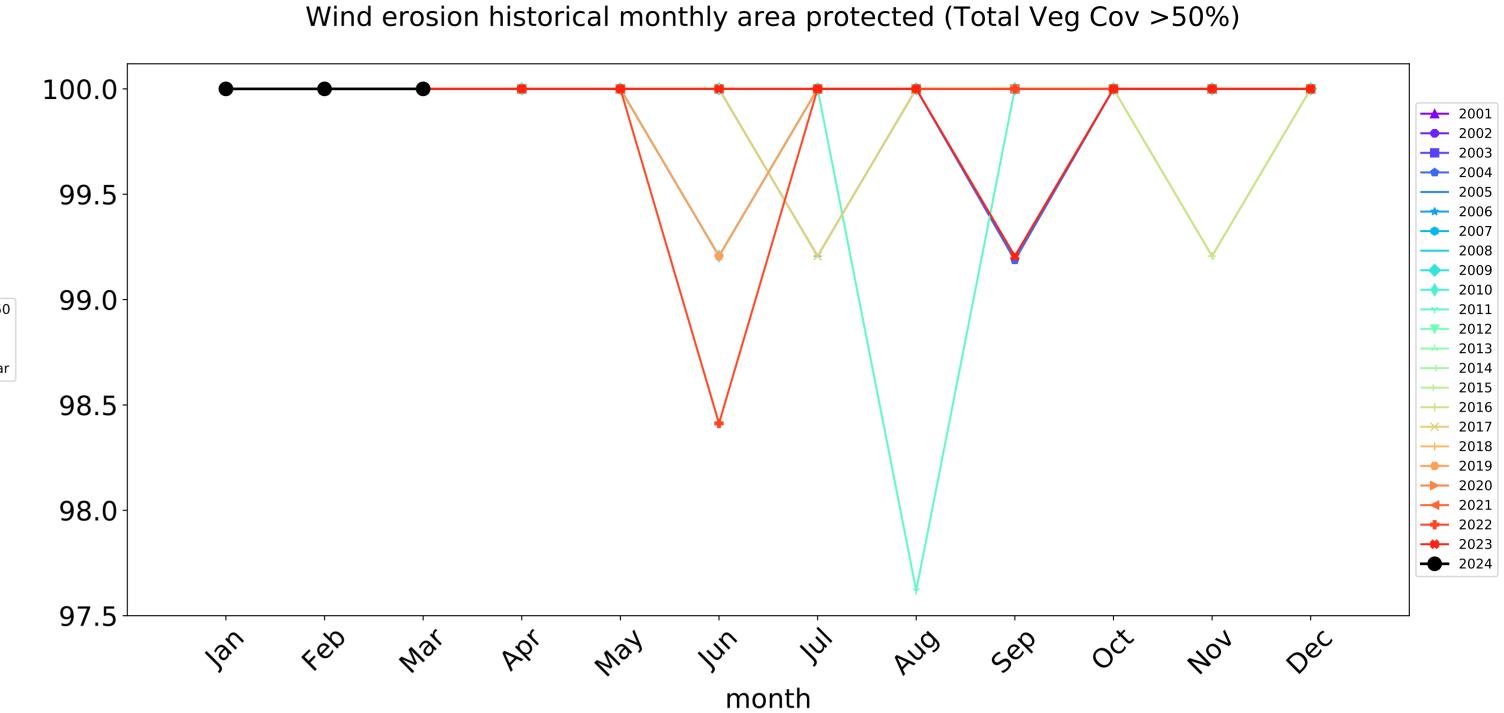


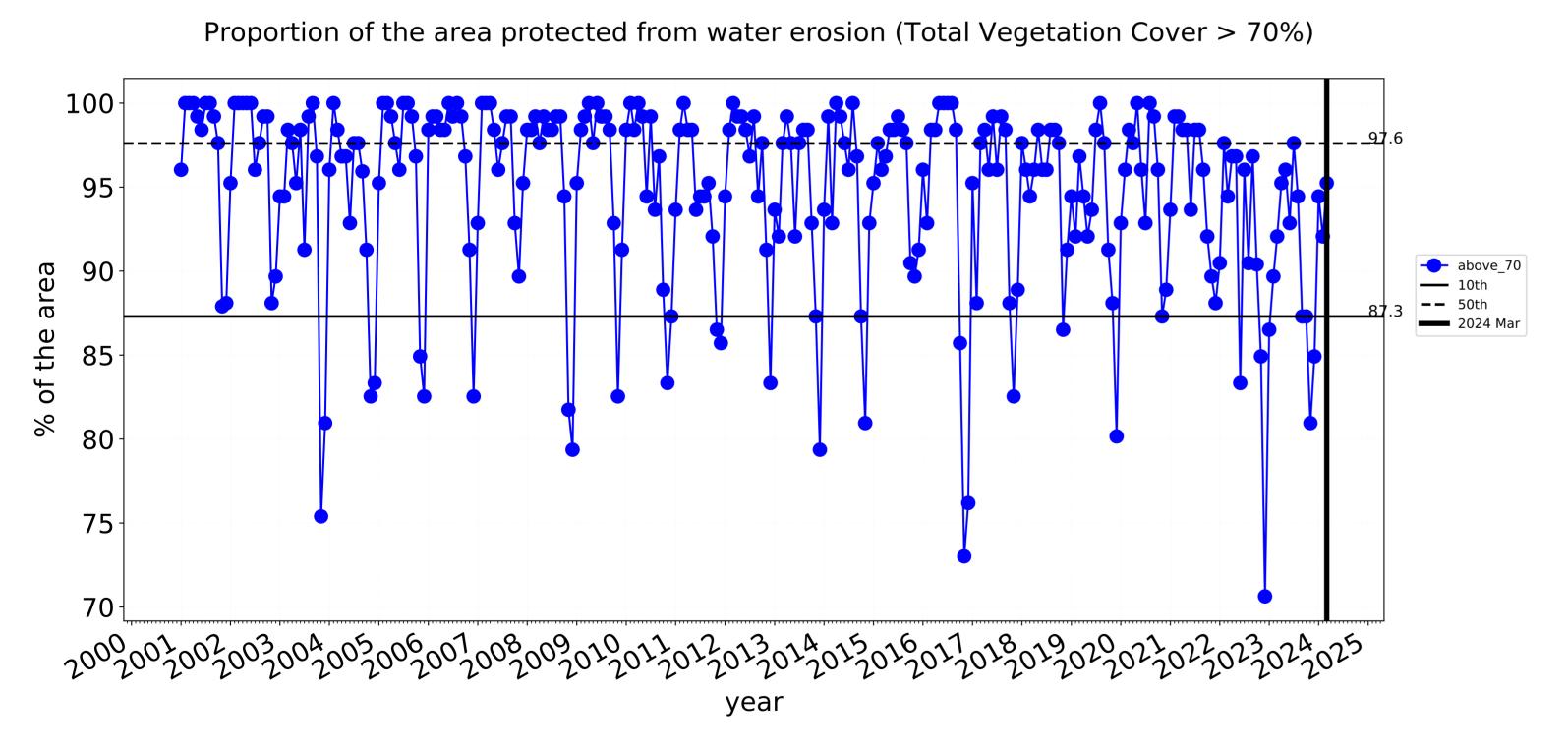


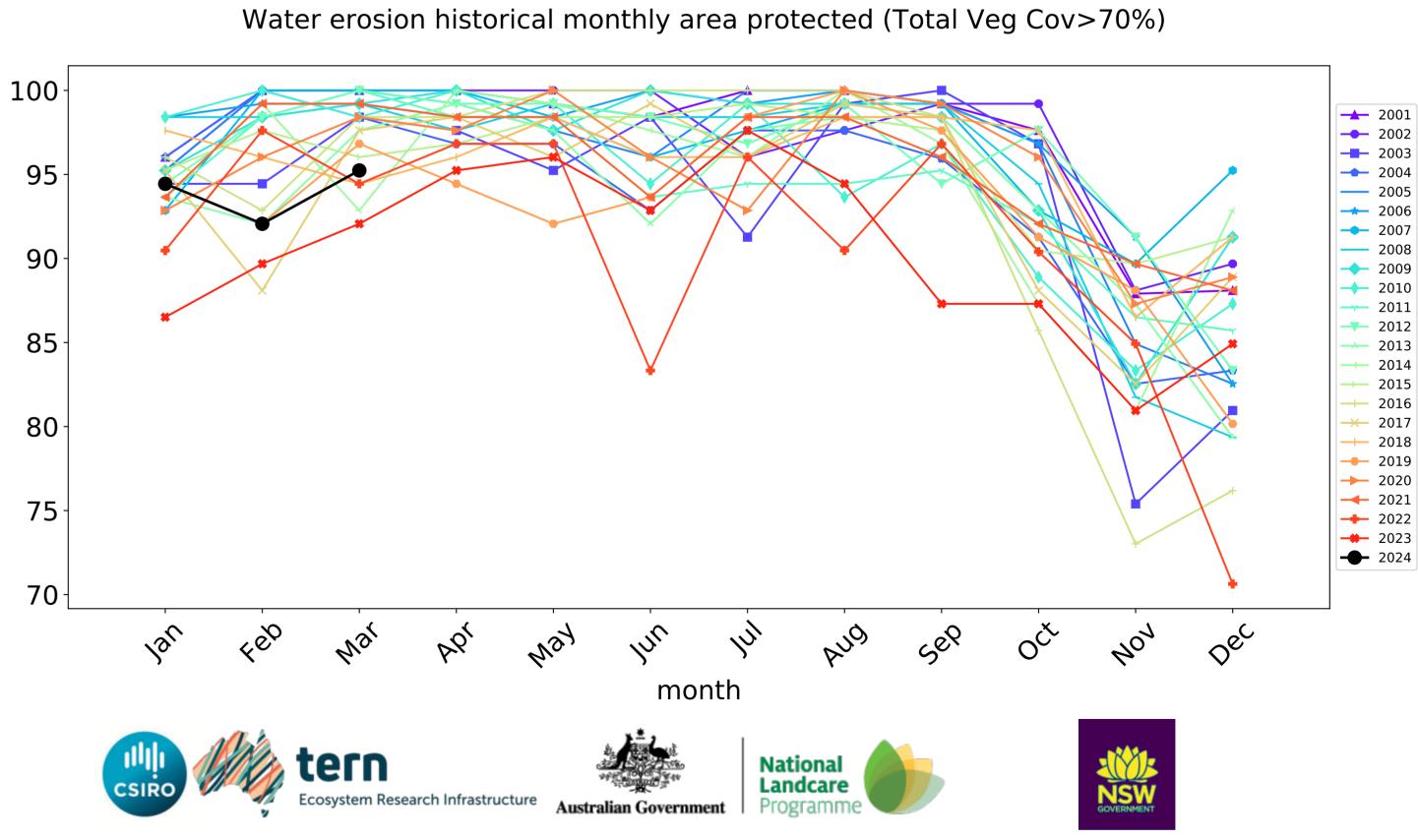


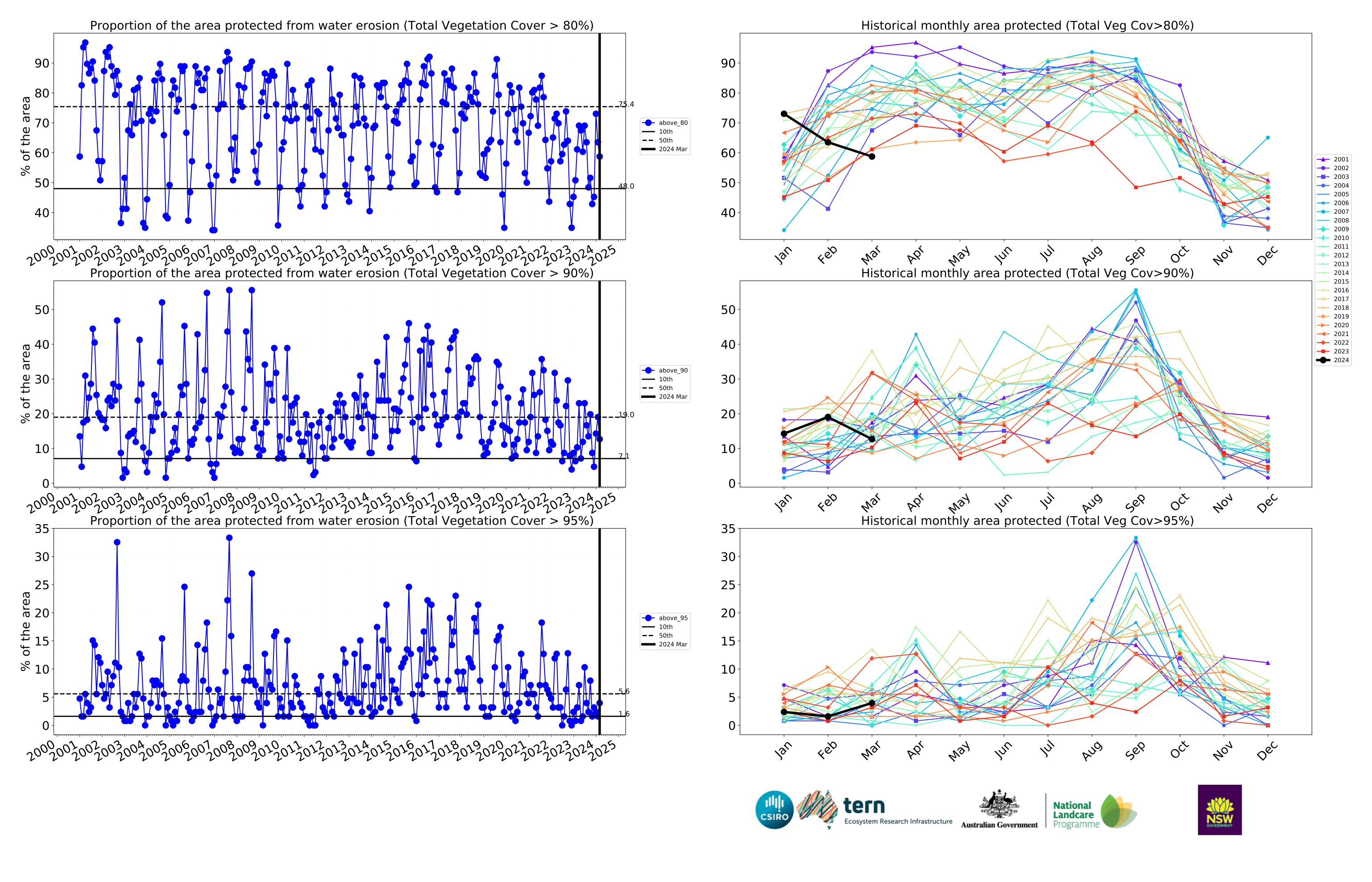
#### **Irrigation timeseries**











#### **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

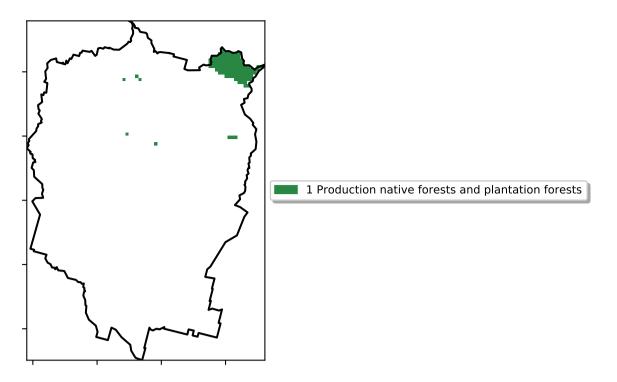
is, red pixels

mean of that pixel. The mean

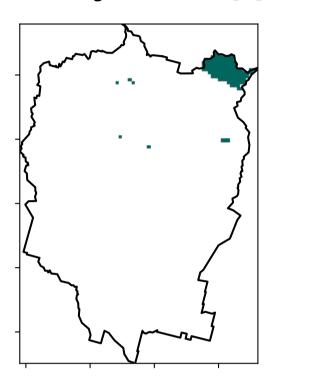
is only for the month of the map

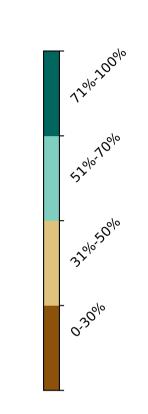
using baseline from 2001 to 2019.

are about 20% lower than the

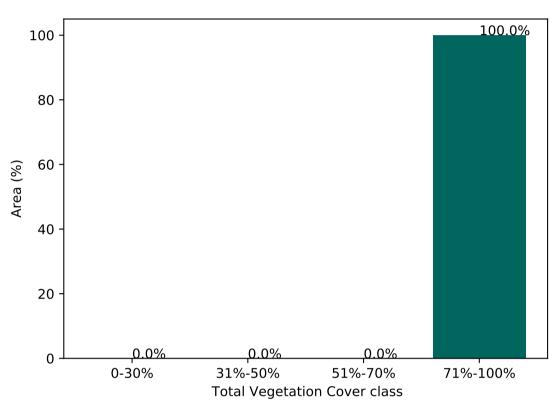


#### **Total Vegetation Cover [%]**

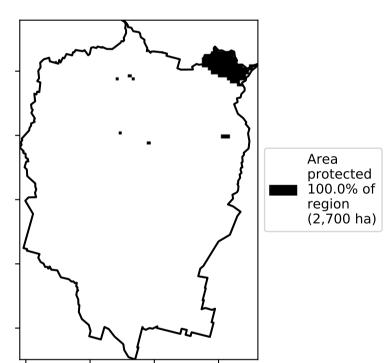




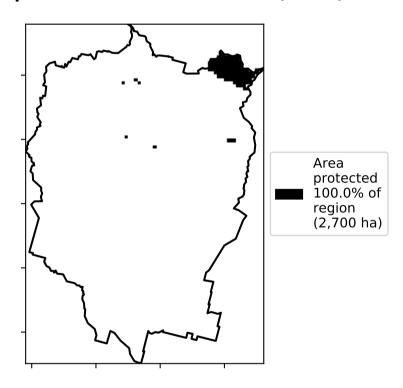
#### Proportion of vegetation cover class in area



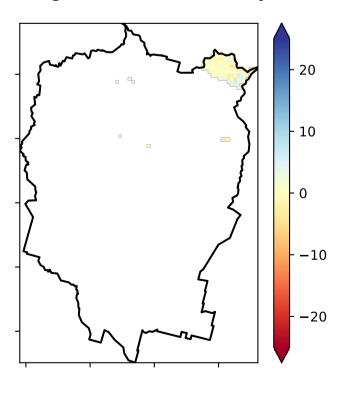
#### % Area protected from water erosion (>70%)



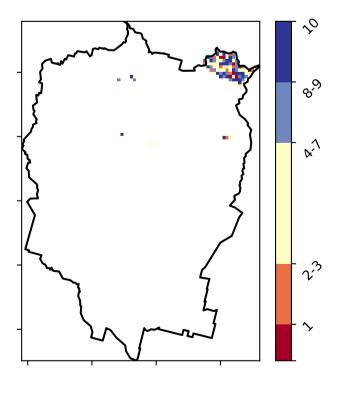
% Area protected from wind erosion (>50%)



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



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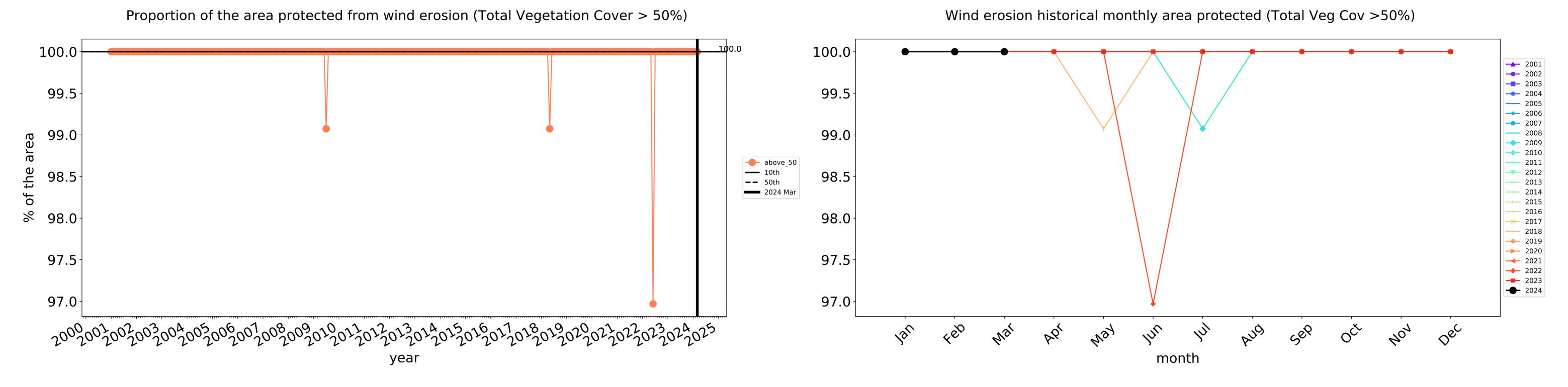


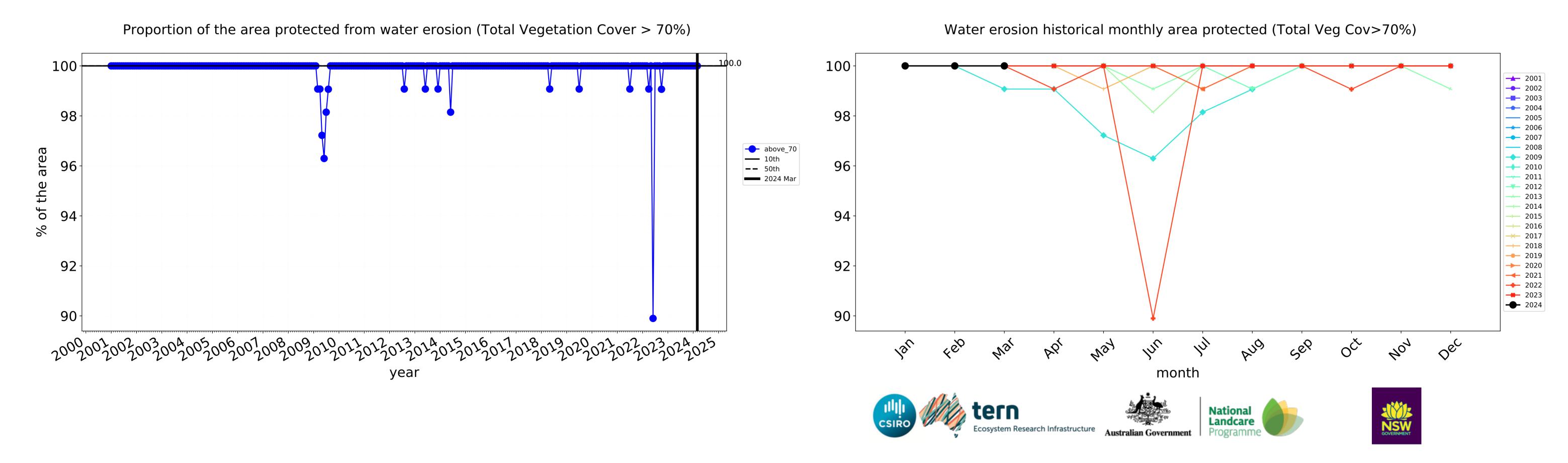


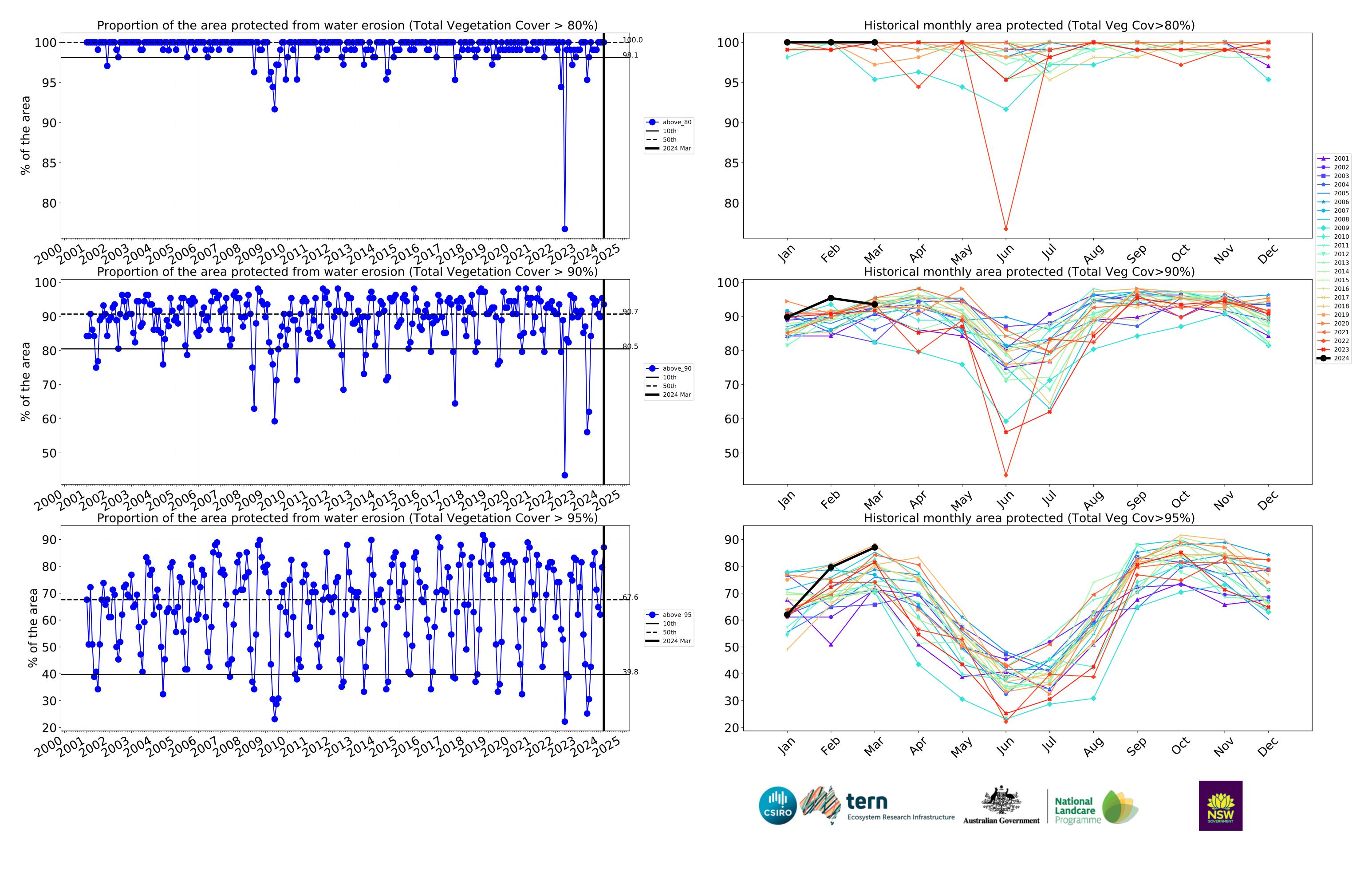




#### **Production native forests and plantation forests timeseries**







### Cardinia\_(S) (127,200 ha and no data 1,053 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	127,200	100.0% 127,200	99.9% 127,075	97.6% 124,100	91.8% 116,750	67.6% 85,925	33.8% 43,000
Conservation and natural environments	16,525	100.0% 16,525	100.0% 16,525	100.0% 16,525	99.8% 16,500	97.3% 16,075	88.0% 14,550
Conservation and natural environments Woodland forest	3,050	100.0% 3,050	100.0% 3,050	100.0% 3,050	100.0% 3,050	99.2% 3,025	93.4% 2,850
Conservation and natural environments Forest (non woodland)	13,050	100.0% 13,050	100.0% 13,050	100.0% 13,050	99.8% 13,025	98.9% 12,900	89.1% 11,625
Agriculture	73,400	100.0% 73,400	99.9% 73,350	98.8% 72,550	93.2% 68,375	65.6% 48,175	27.7% 20,325
Grazing	67,625	100.0% 67,625	99.9% 67,575	99.0% 66,975	94.9% 64,175	68.6% 46,375	29.2% 19,725
Grazing non forest	63,275	100.0% 63,275	99.9% 63,225	99.0% 62,625	94.5% 59,825	66.8% 42,275	26.7% 16,900
Grazing - Forest (non woodland)	4,075	100.0% 4,075	100.0% 4,075	100.0% 4,075	100.0% 4,075	94.5% 3,850	65.0% 2,650
Cropping	2,300	100.0% 2,300	100.0% 2,300	97.8% 2,250	90.2% 2,075	53.3% 1,225	18.5% 425
Irrigation	3,150	100.0% 3,150	100.0% 3,150	95.2% 3,000	58.7% 1,850	12.7% 400	4.0% 125
Production native forests and plantation forests	2,700	100.0% 2,700	100.0% 2,700	100.0% 2,700	100.0% 2,700	93.5% 2,525	87.0% 2,350







