# Total vegetation cover soil protection Region:NRM Wet Tropics 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: March 2017

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 2017**

#### Land use and forest cover

#### Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments -2 Conservation and natural environments -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 13 Other uses

#### 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

lower than the mean of that

is only for the

using baseline from 2001 to

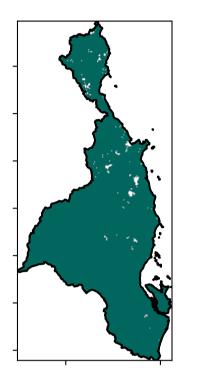
2019.

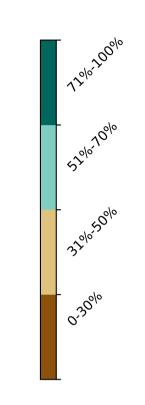
pixel. The mean

month of the map

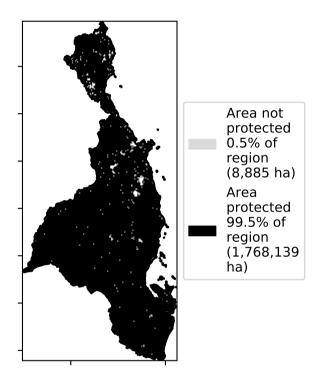
is, red pixels are about 20%

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

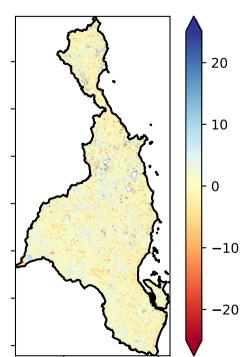




#### % Area protected from water erosion (>70%)

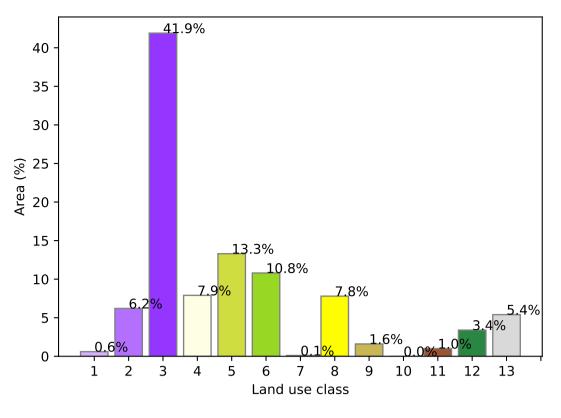


## **Total Vegetation Cover Anomaly [%]**

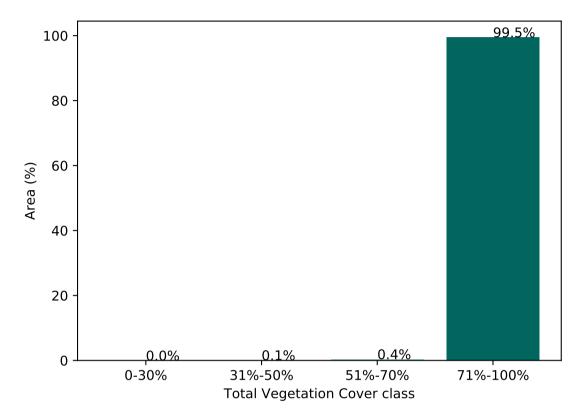


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

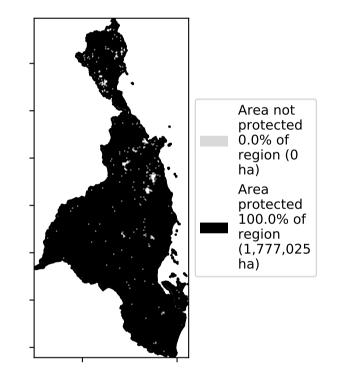
#### **Proportion of each land class in area**

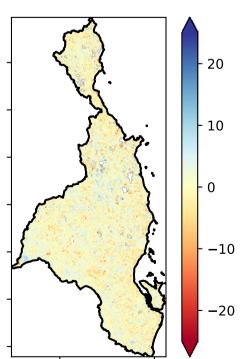


#### Proportion of vegetation cover class in area

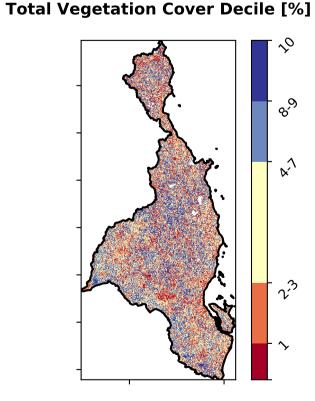


#### % Area protected from wind erosion (>50%)





records for that month of





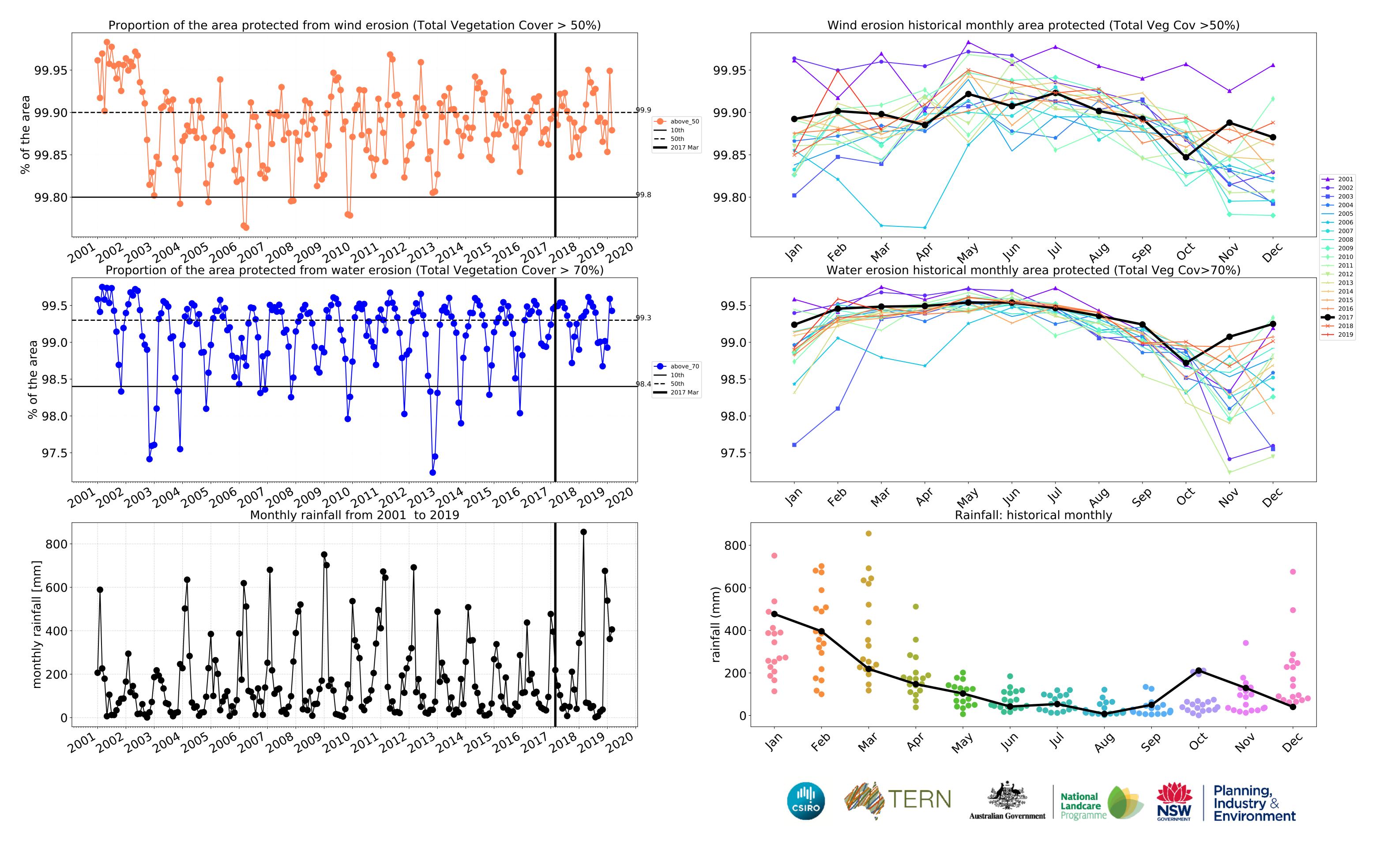


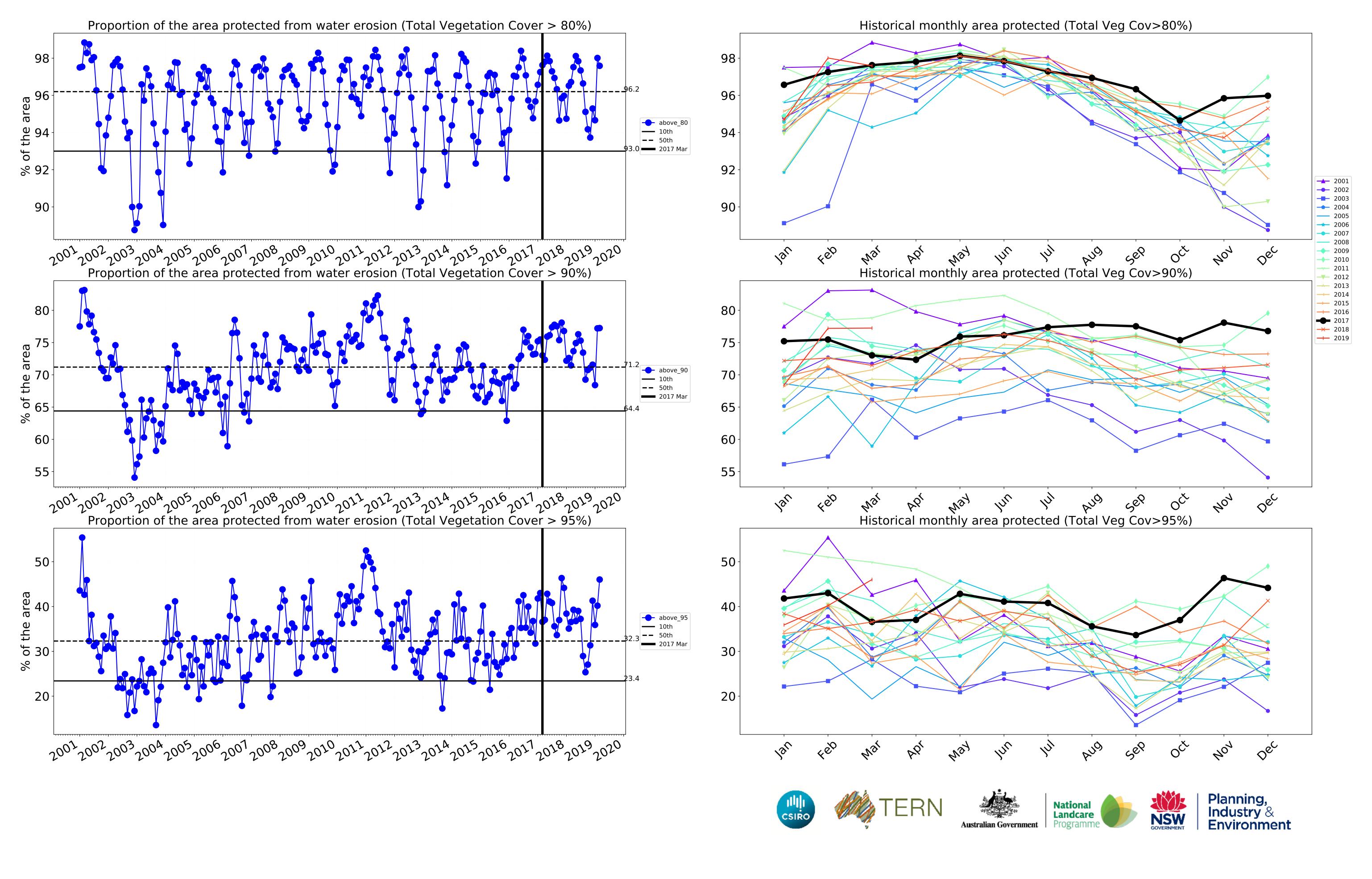










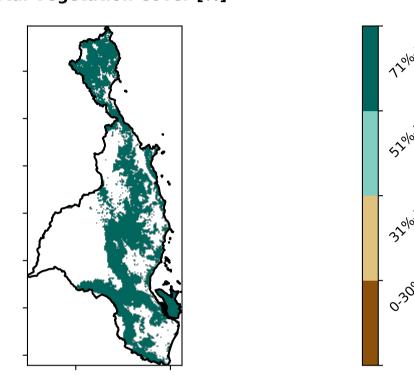


## **Conservation and natural environments**

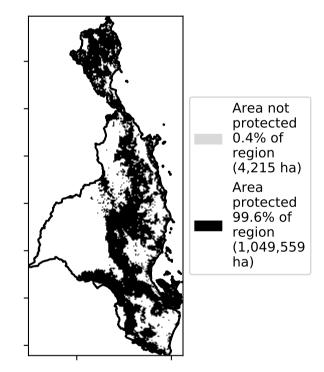
#### Land use and forest cover

## Catchment Scale Land Use and Forests 1 Conservation and natural environments - Nonof Australia (2018) Derived from 2 Conservation and natural environments - Woodland Catchment Scale Land Use of Australia 3 Conservation and natural environments - Non-woodland forest (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

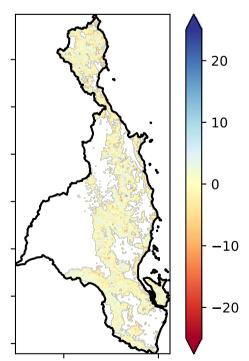
pixel is from the mean. That

pixel. The mean

using baseline from 2001 to 2019.

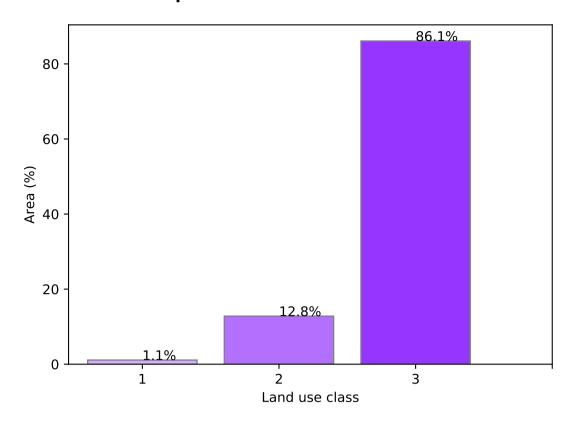
is only for the month of the map

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

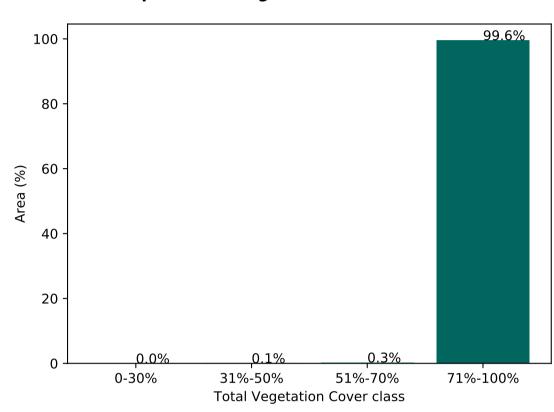


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

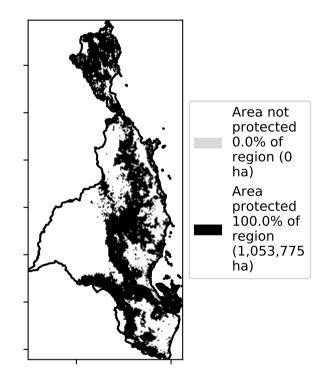
#### **Proportion of each land class in area**

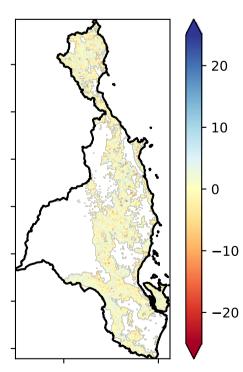


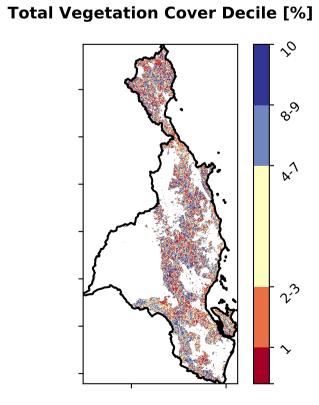
#### Proportion of vegetation cover class in area



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











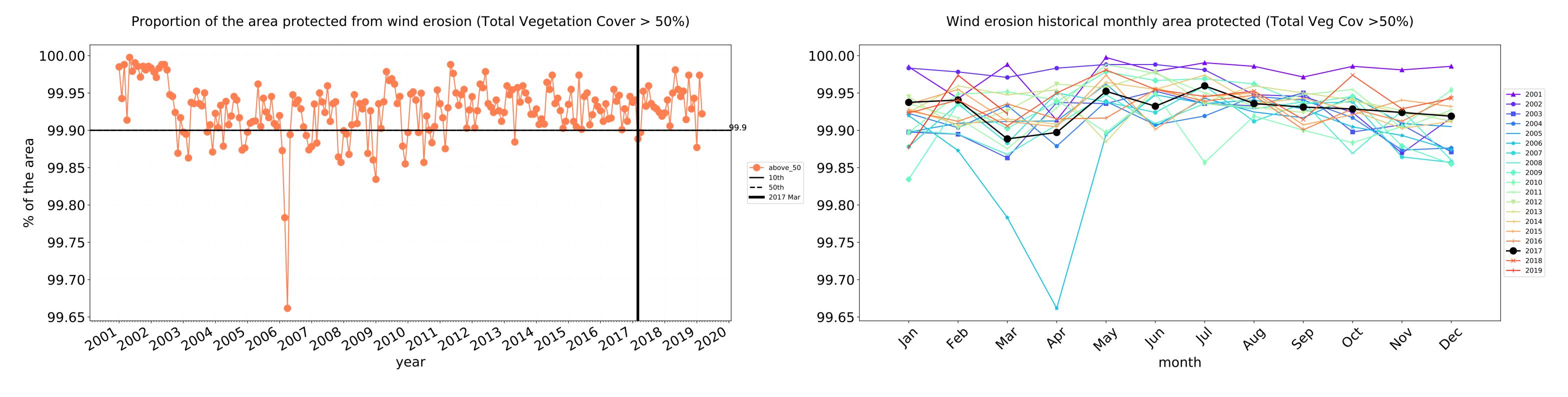


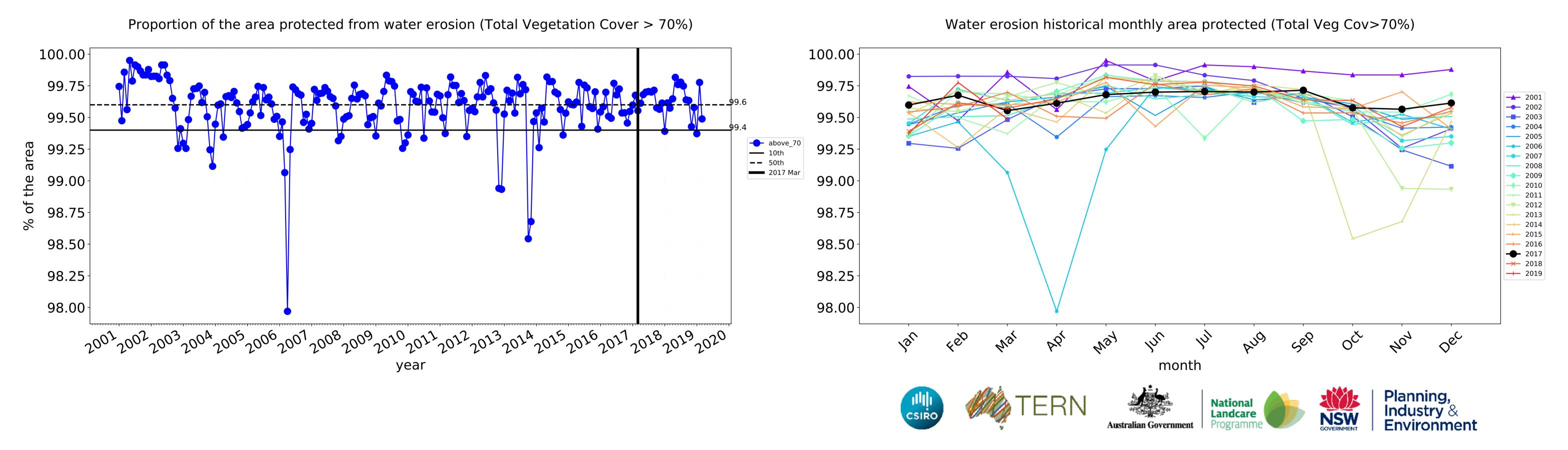


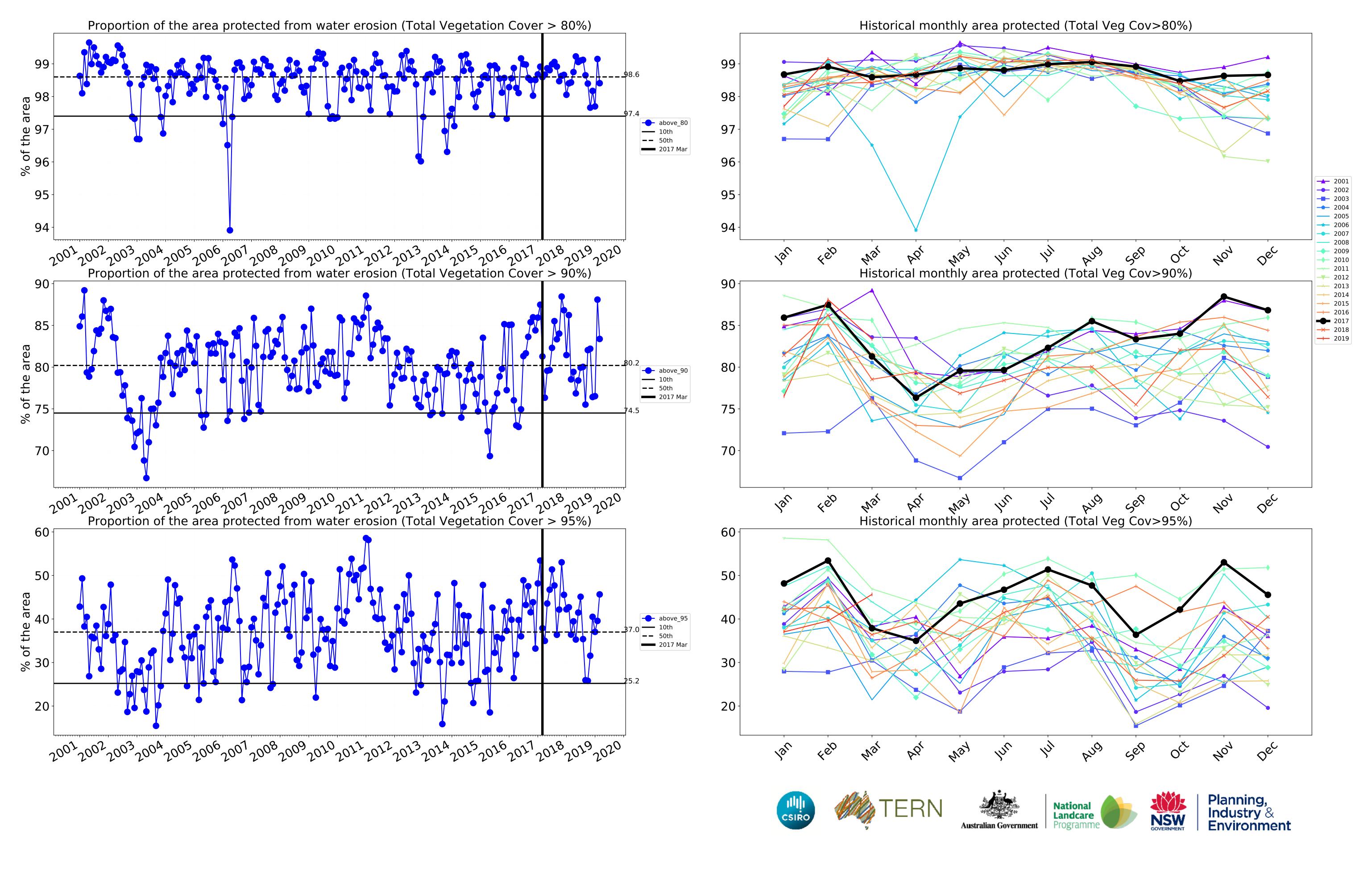




## **Conservation and natural environments timeseries**







## **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

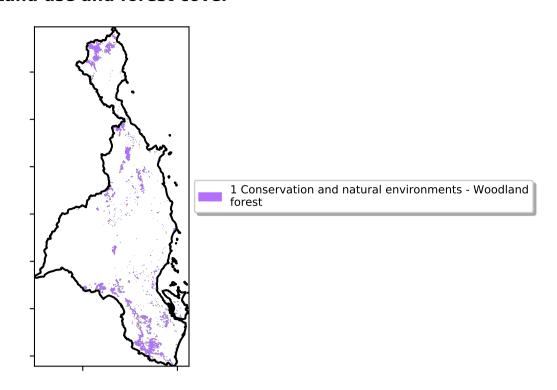
pixel is from the mean. That

pixel. The mean

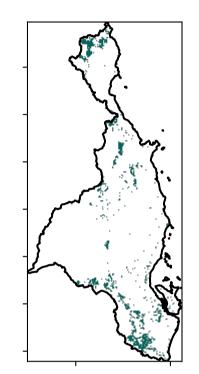
using baseline from 2001 to 2019.

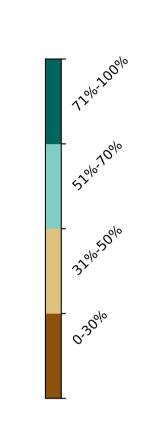
is only for the month of the map

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

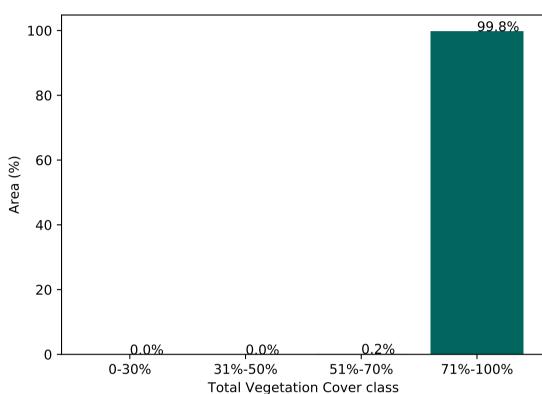


#### **Total Vegetation Cover [%]**

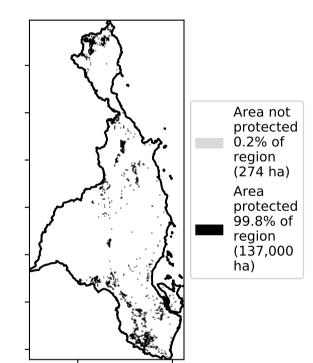




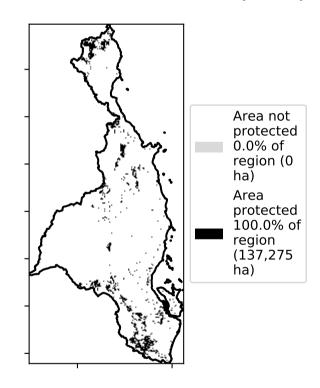
## Proportion of vegetation cover class in area



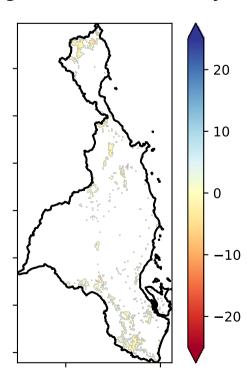
#### % Area protected from water erosion (>70%)



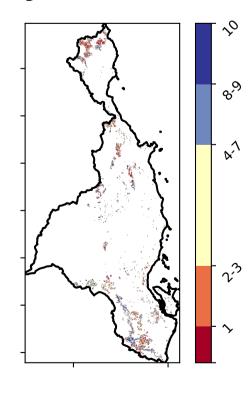
% Area protected from wind erosion (>50%)



#### **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.







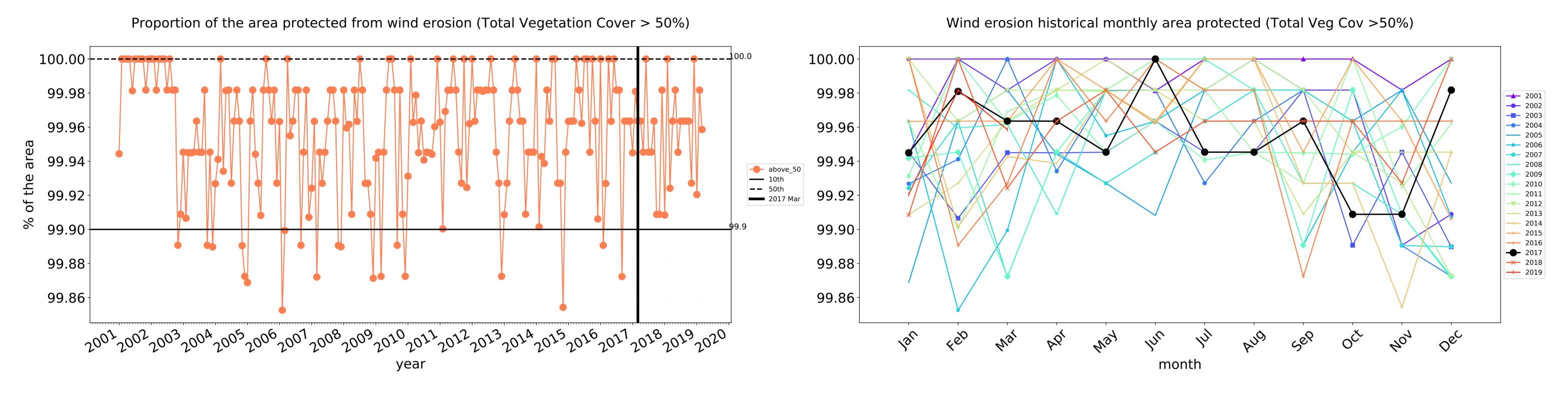


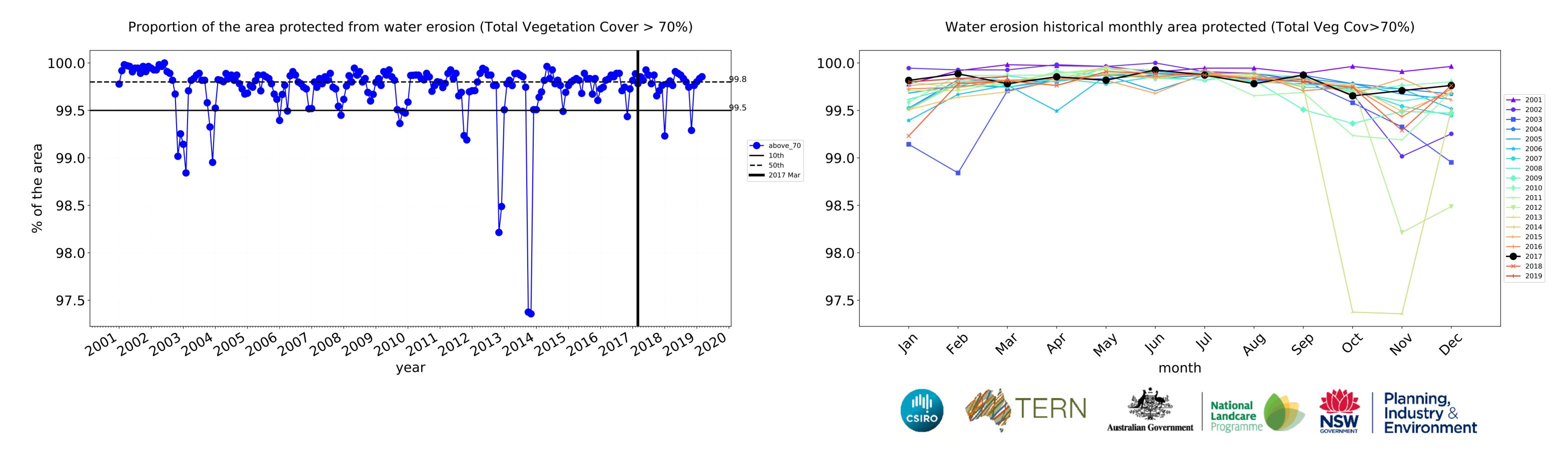


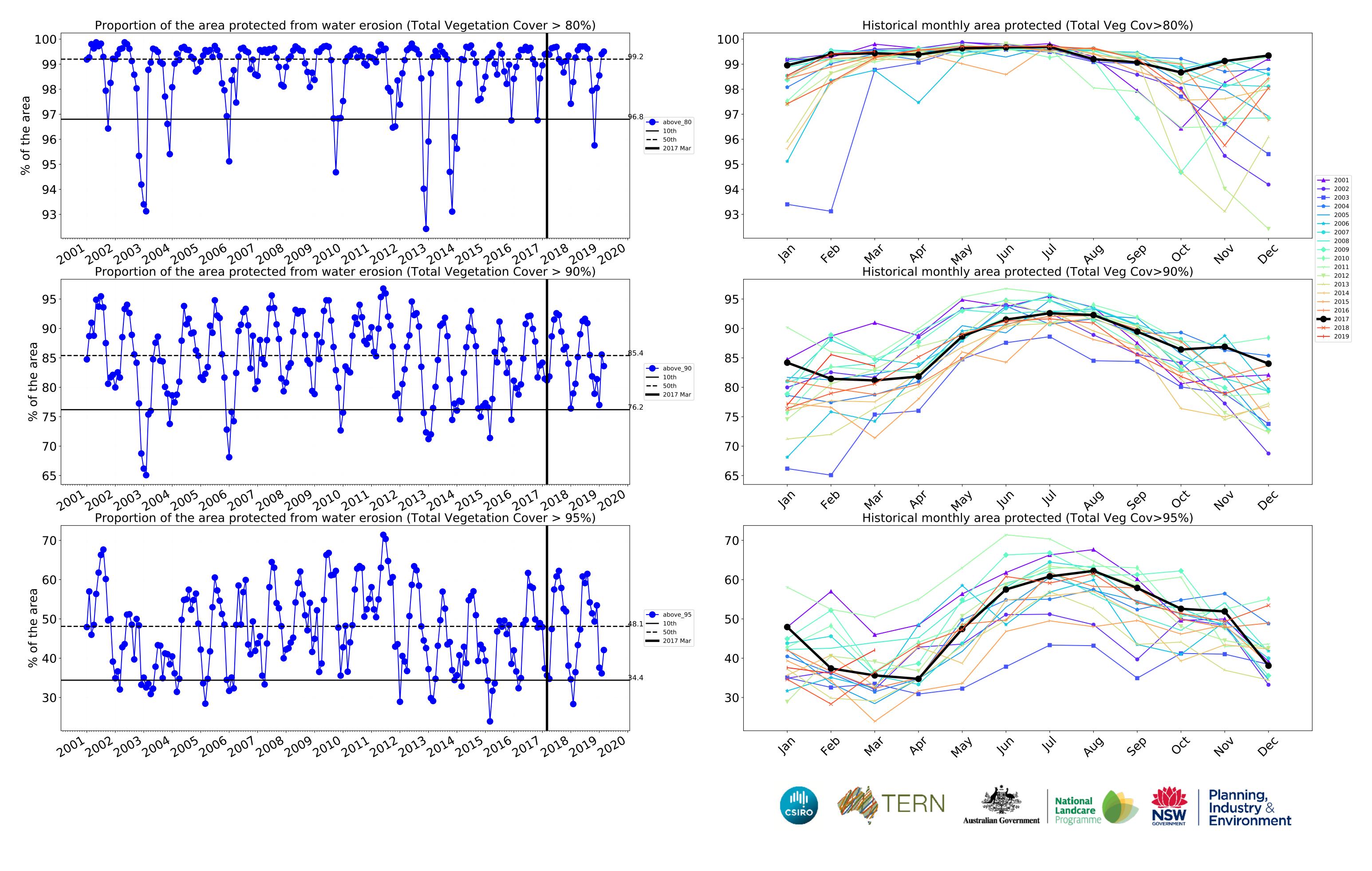




## Conservation and natural environments Woodland forest timeseries







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

#### 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

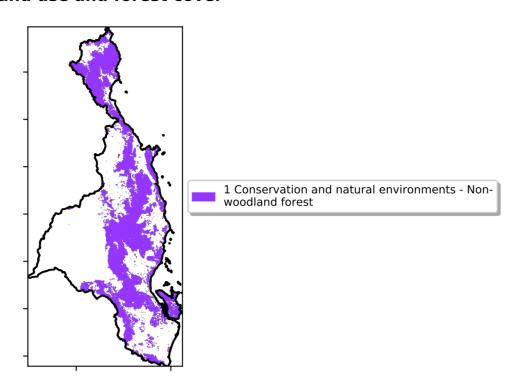
is, red pixels are about 20% lower than the mean of that

the mean. That

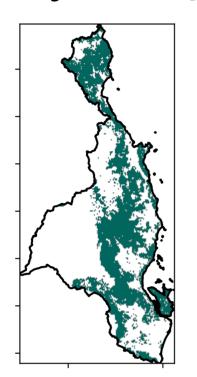
pixel. The mean

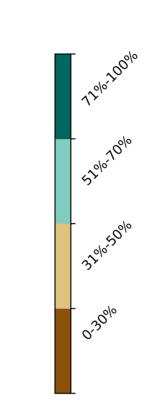
using baseline from 2001 to 2019.

is only for the month of the map

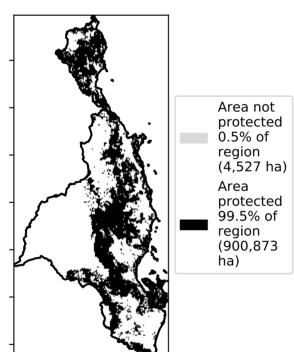


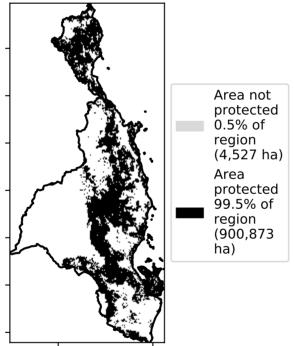
#### **Total Vegetation Cover [%]**



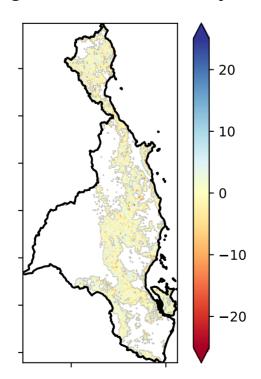


## % Area protected from water erosion (>70%)



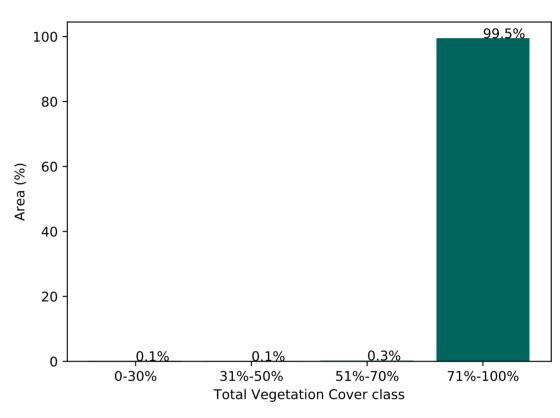


#### **Total Vegetation Cover Anomaly [%]**

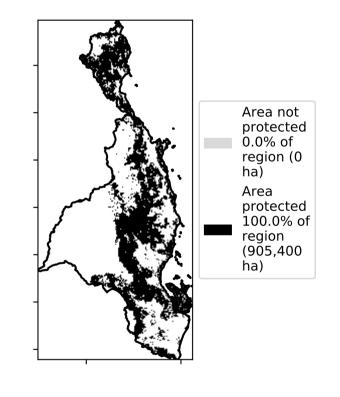


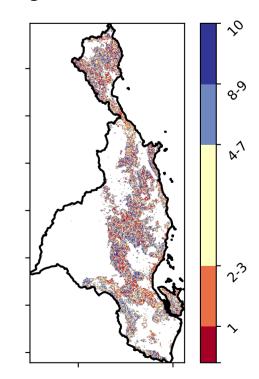
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area



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







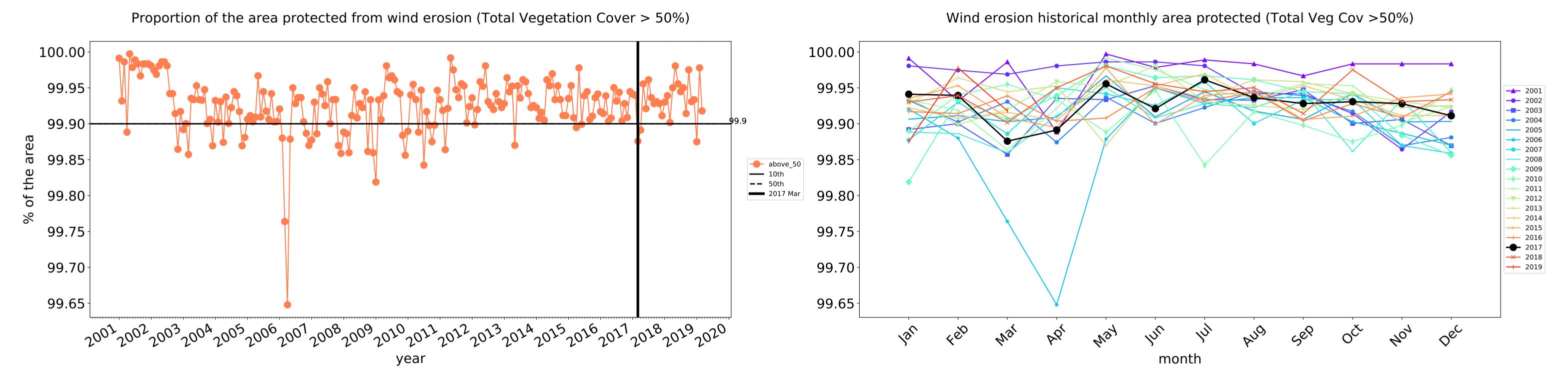


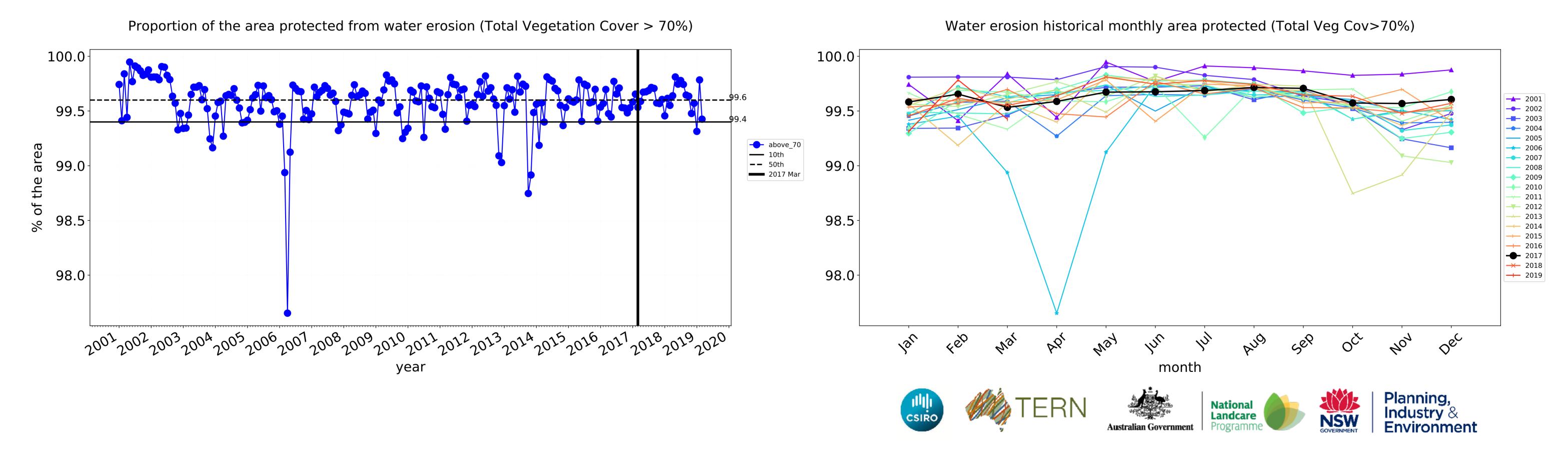


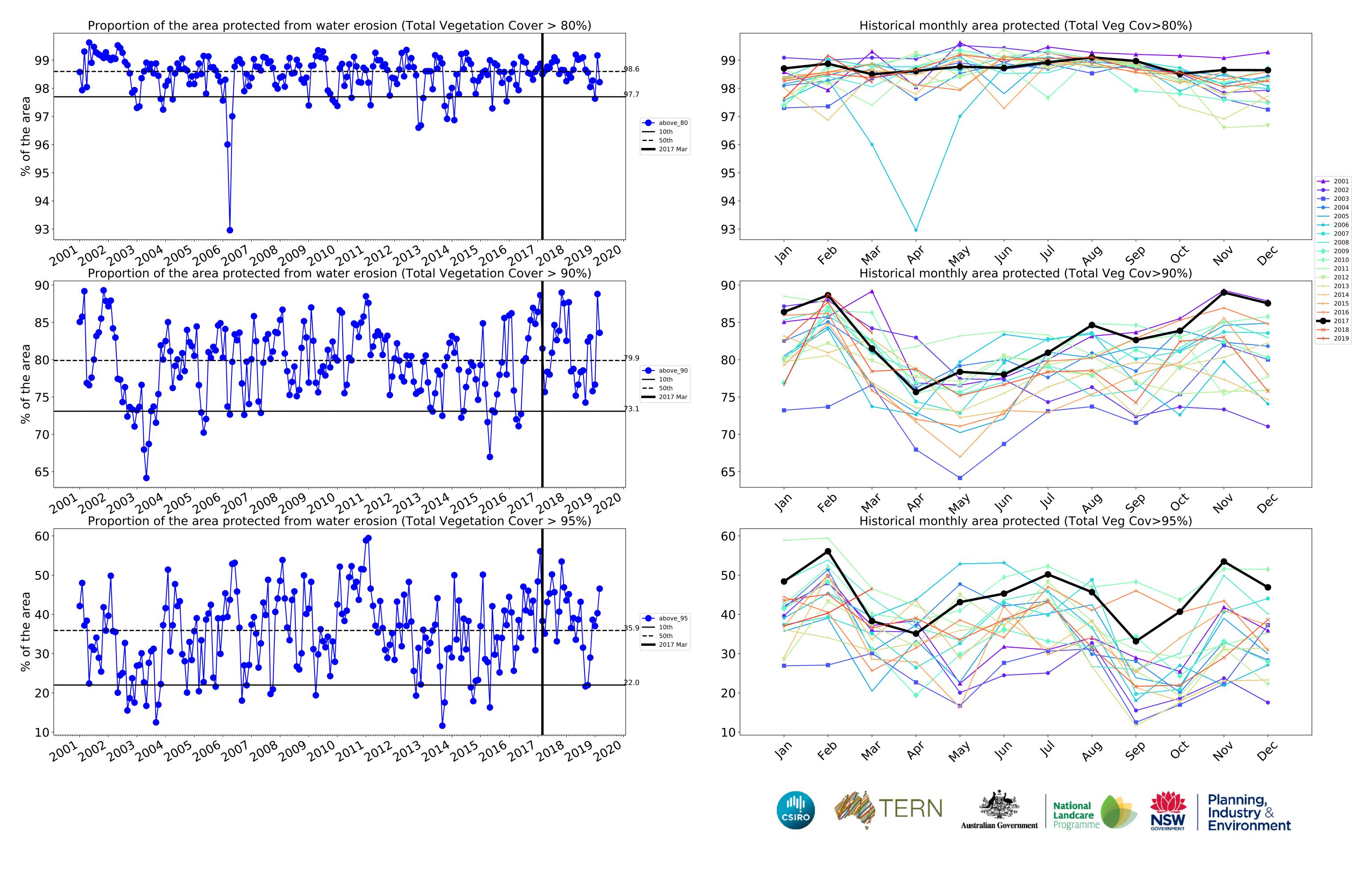












## **Agriculture**

#### Land use and forest cover

## 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 8 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

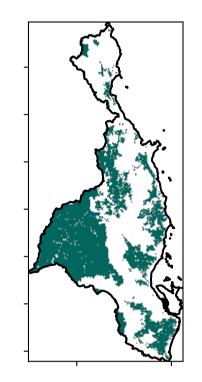
pixel. The mean

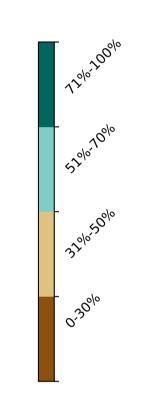
using baseline from 2001 to 2019.

is only for the month of the map

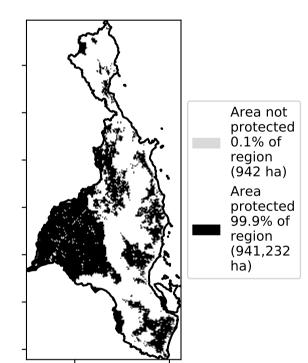
Catchment Scale

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



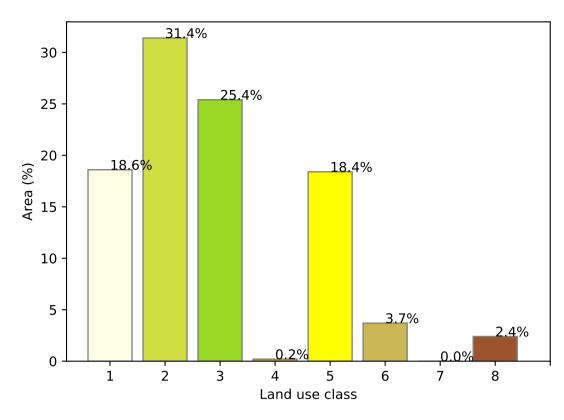


#### % Area protected from water erosion (>70%)

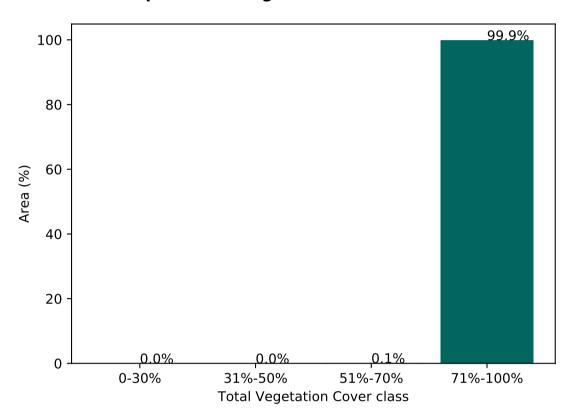


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

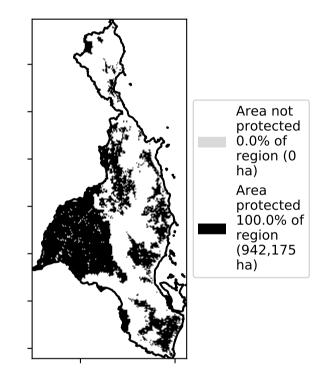
#### **Proportion of each land class in area**



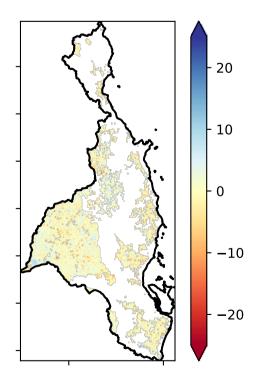
Proportion of vegetation cover class in area



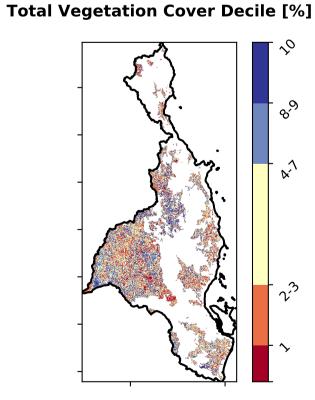
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 



Deciles show where the records for that month of







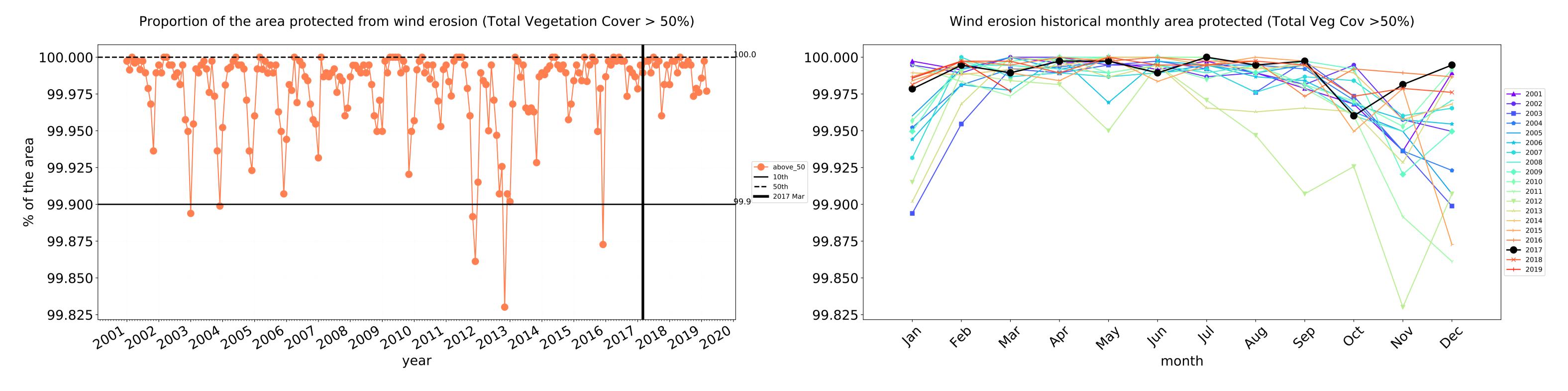


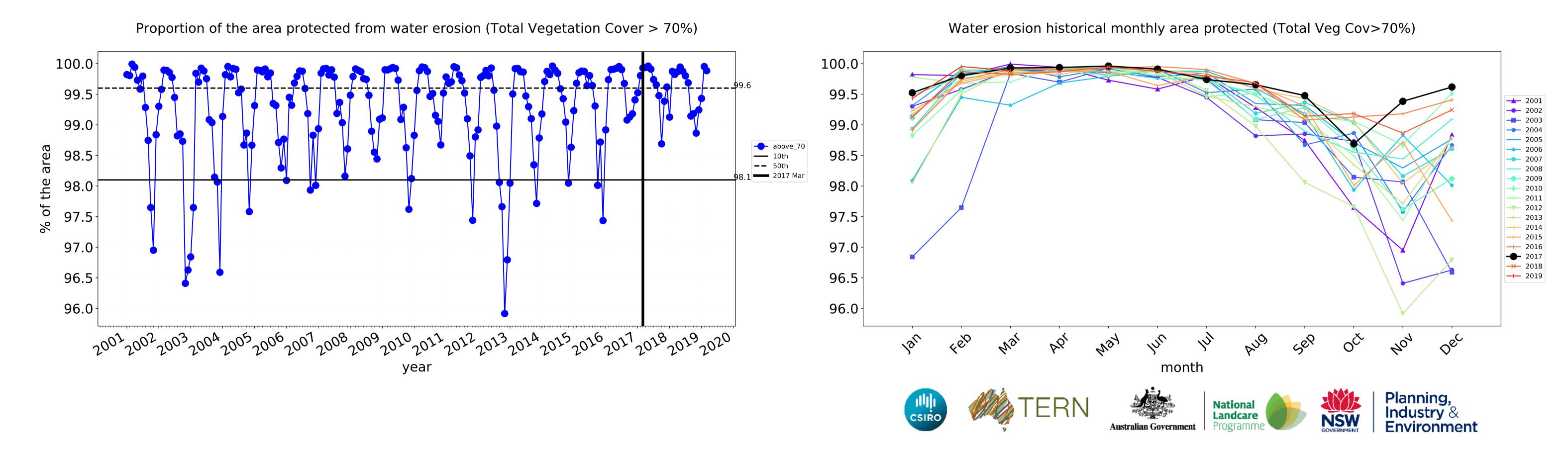


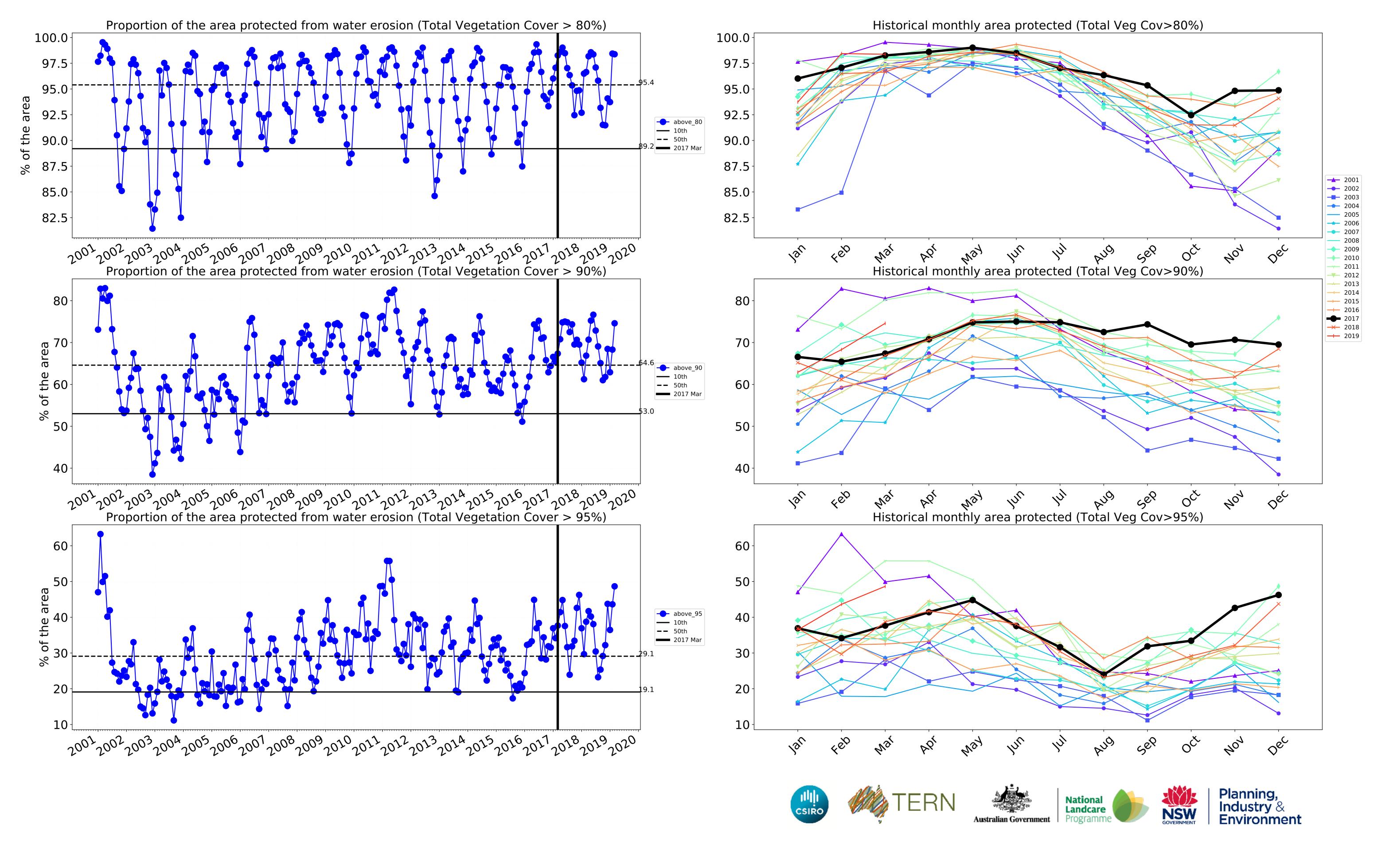




## **Agriculture timeseries**







## **Grazing**

#### Land use and forest cover

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

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

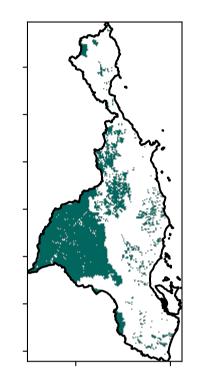
pixel. The mean

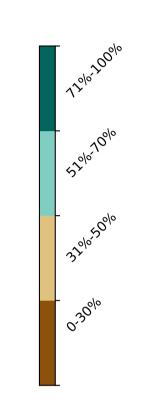
using baseline from 2001 to 2019.

is only for the month of the map

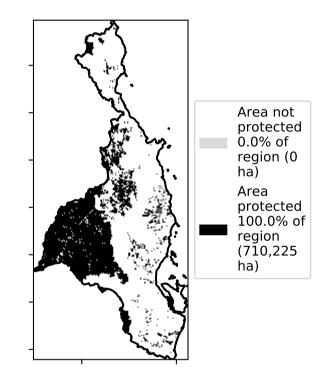
is, red pixels are about 20% lower than the mean of that

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

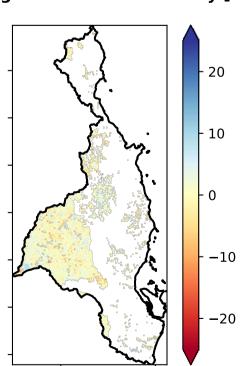




#### % Area protected from water erosion (>70%)

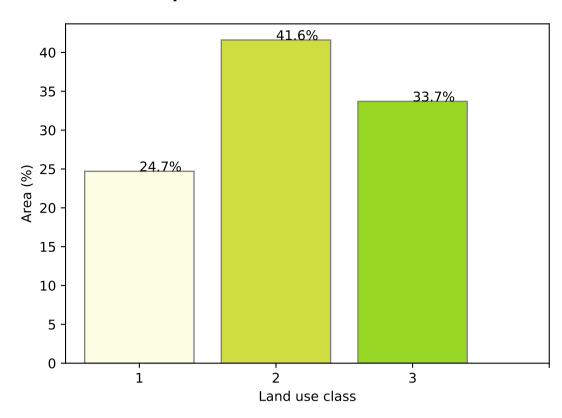


#### **Total Vegetation Cover Anomaly [%]**

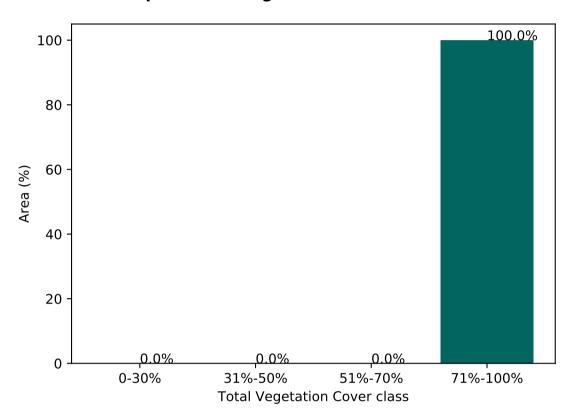


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

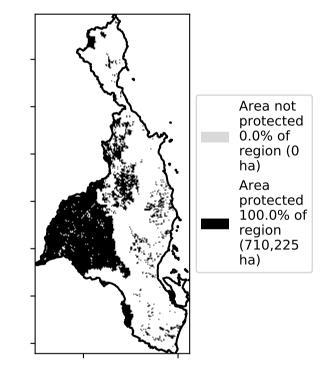
#### **Proportion of each land class in area**

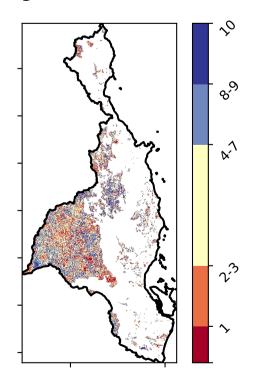


#### Proportion of vegetation cover class in area



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









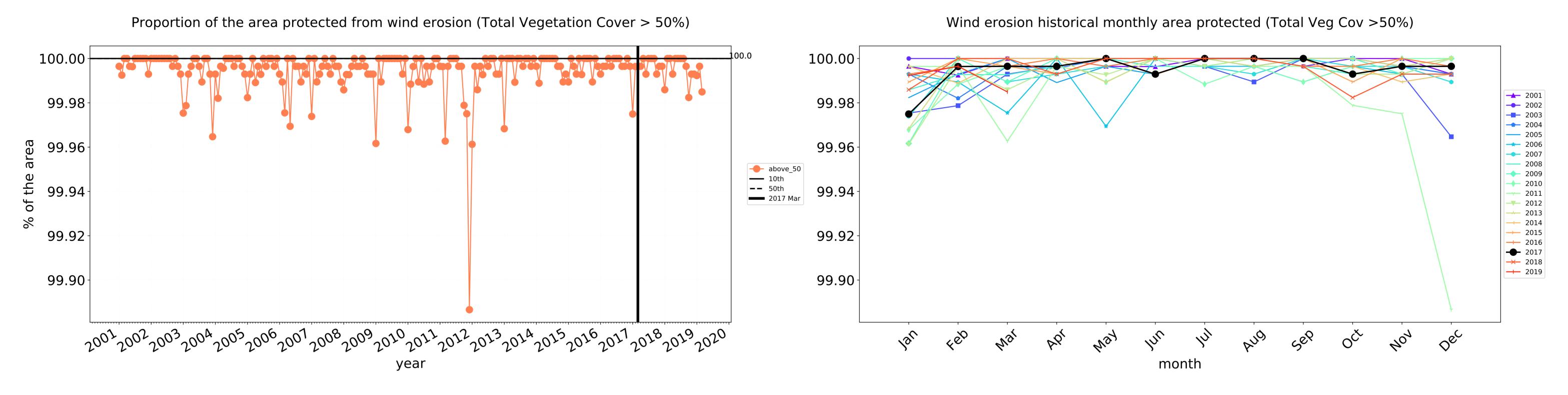


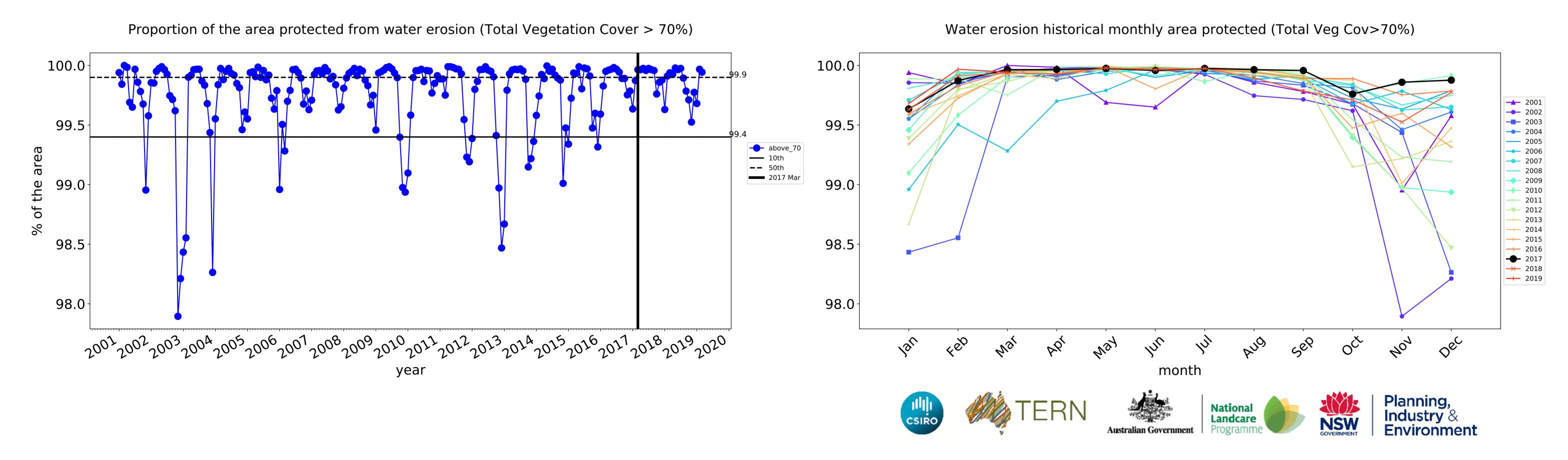


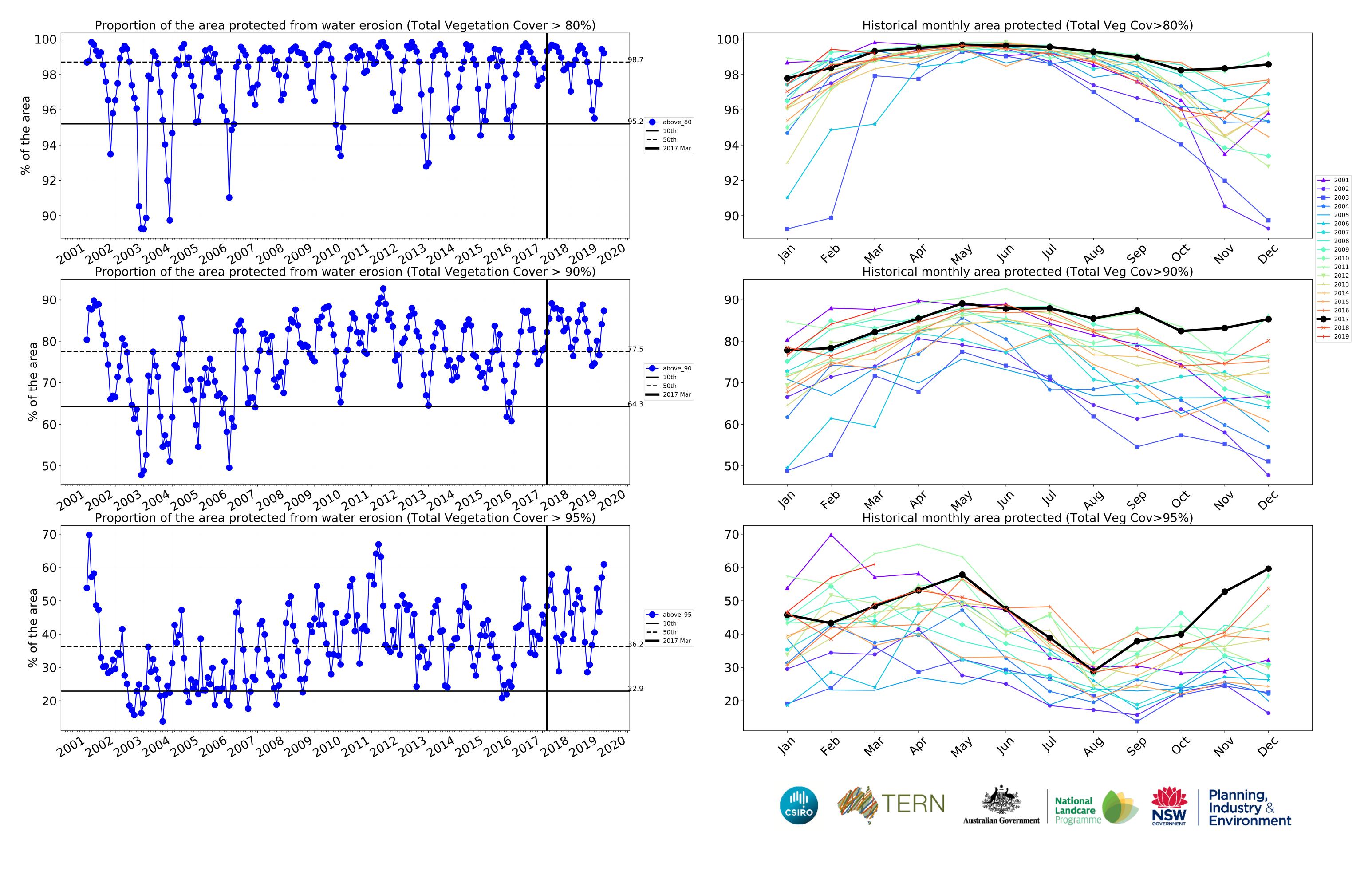




## **Grazing timeseries**







## **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)

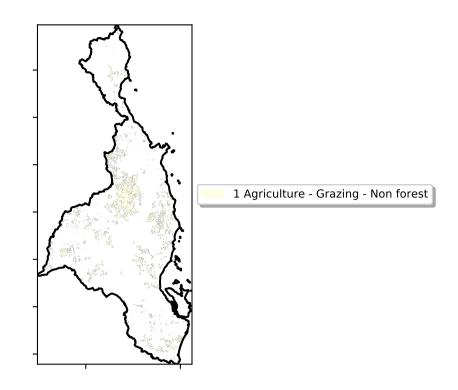
Anomaly show how many percetage points each

pixel is from the mean. That

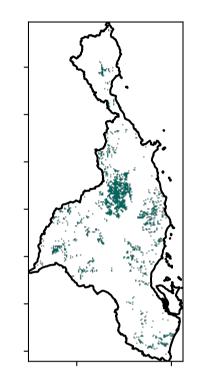
pixel. The mean

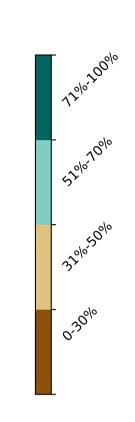
is only for the month of the map using baseline from 2001 to 2019.

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

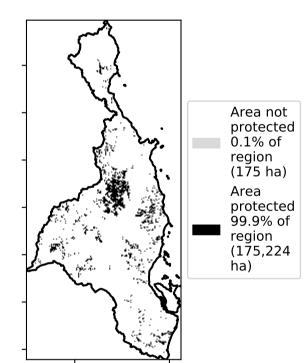


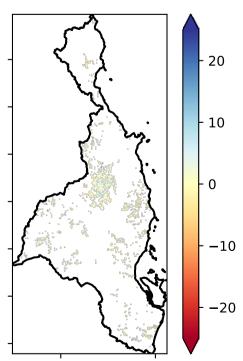
#### **Total Vegetation Cover [%]**





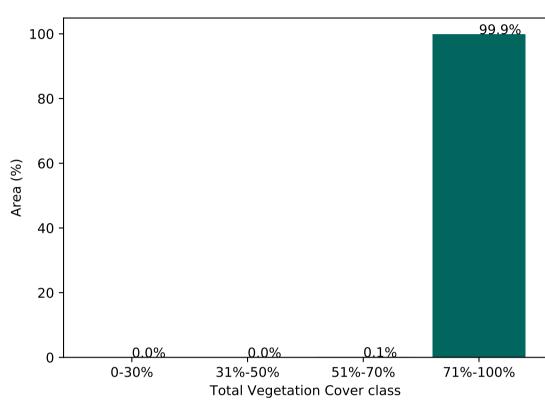
#### % Area protected from water erosion (>70%)



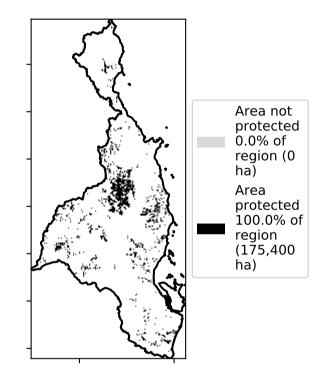


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

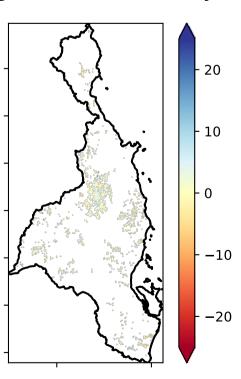
#### Proportion of vegetation cover class in area



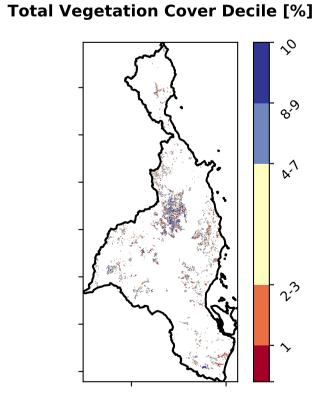
#### % Area protected from wind erosion (>50%)



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



records for that month of







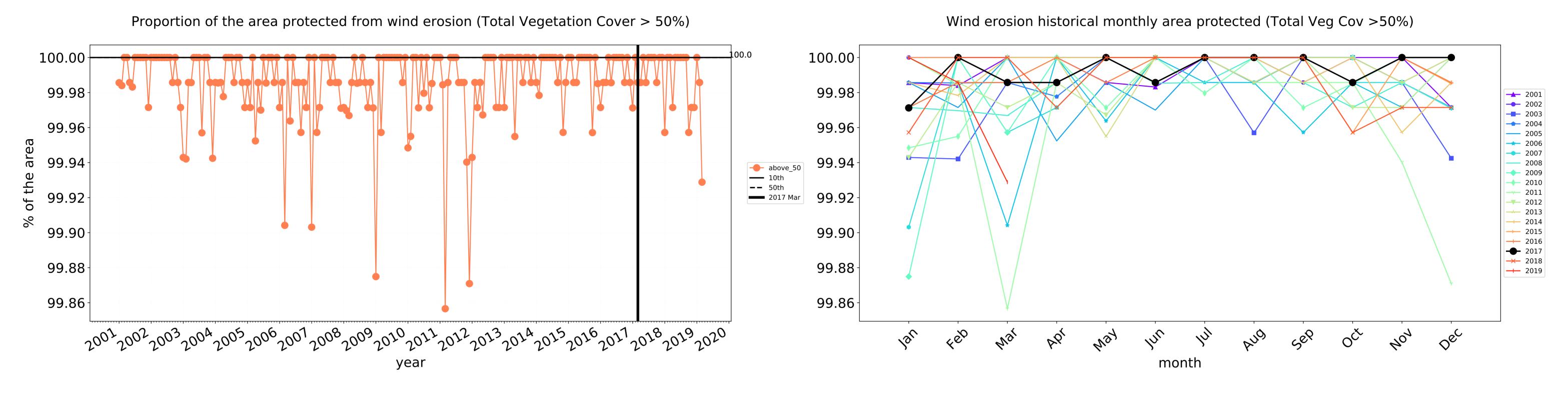


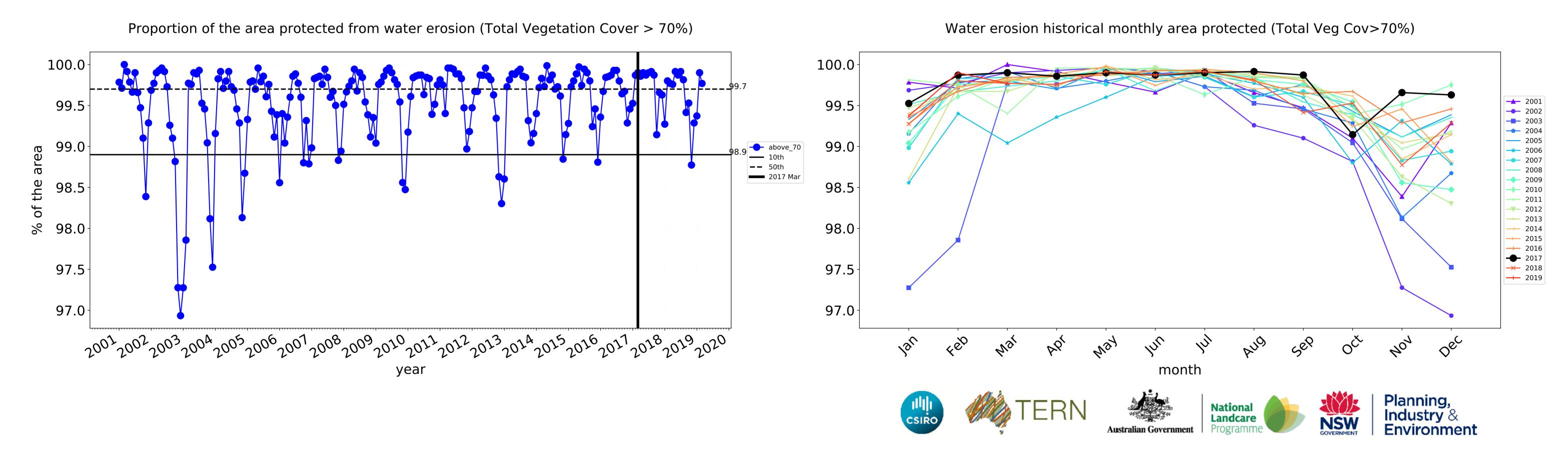


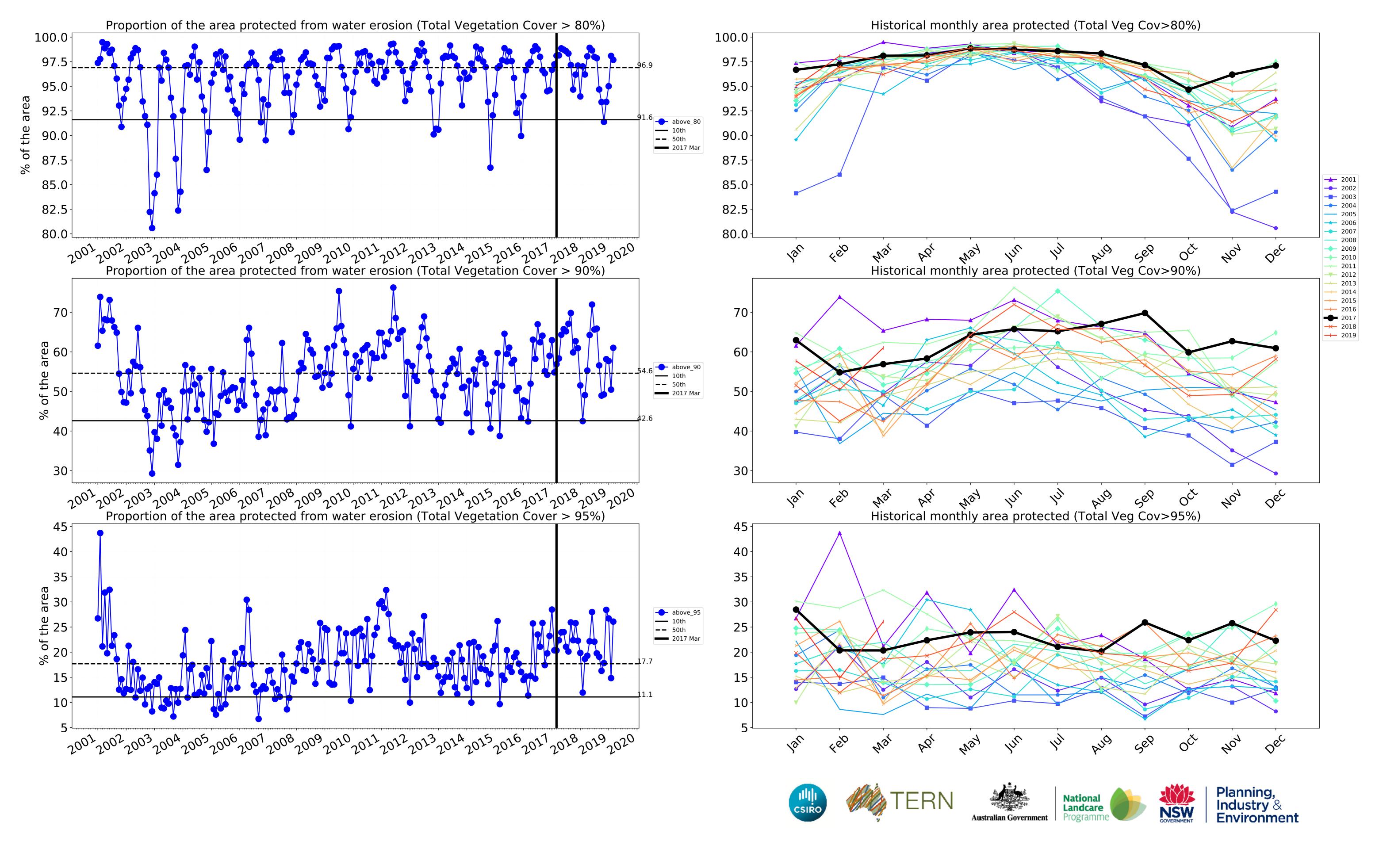




## **Grazing non forest timeseries**







## **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

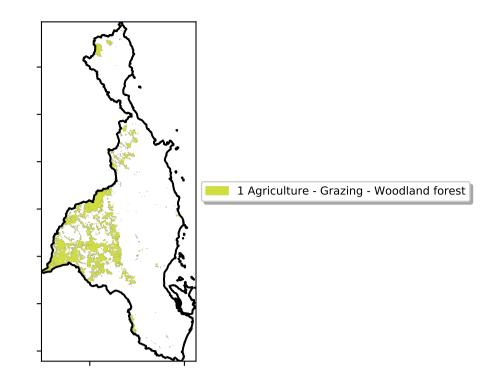
pixel is from the mean. That

pixel. The mean

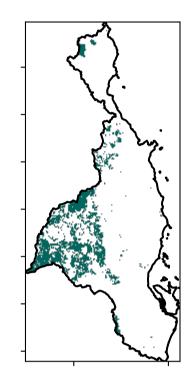
is only for the month of the map using baseline

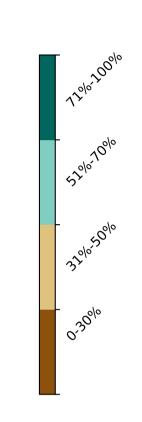
from 2001 to 2019.

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

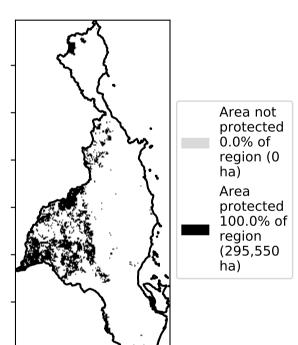


#### **Total Vegetation Cover [%]**

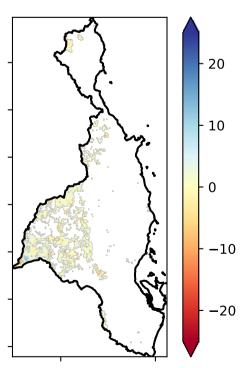




#### % Area protected from water erosion (>70%)

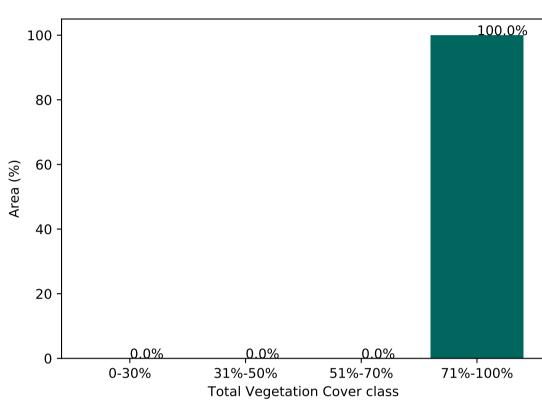


#### **Total Vegetation Cover Anomaly [%]**

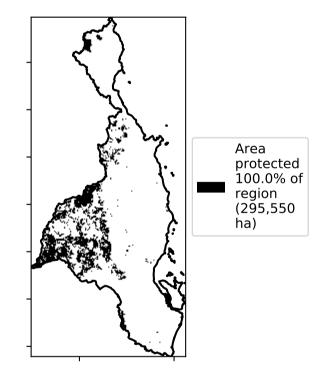


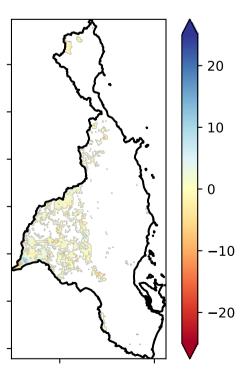
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

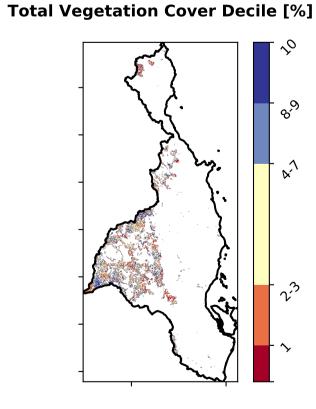
#### Proportion of vegetation cover class in area



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











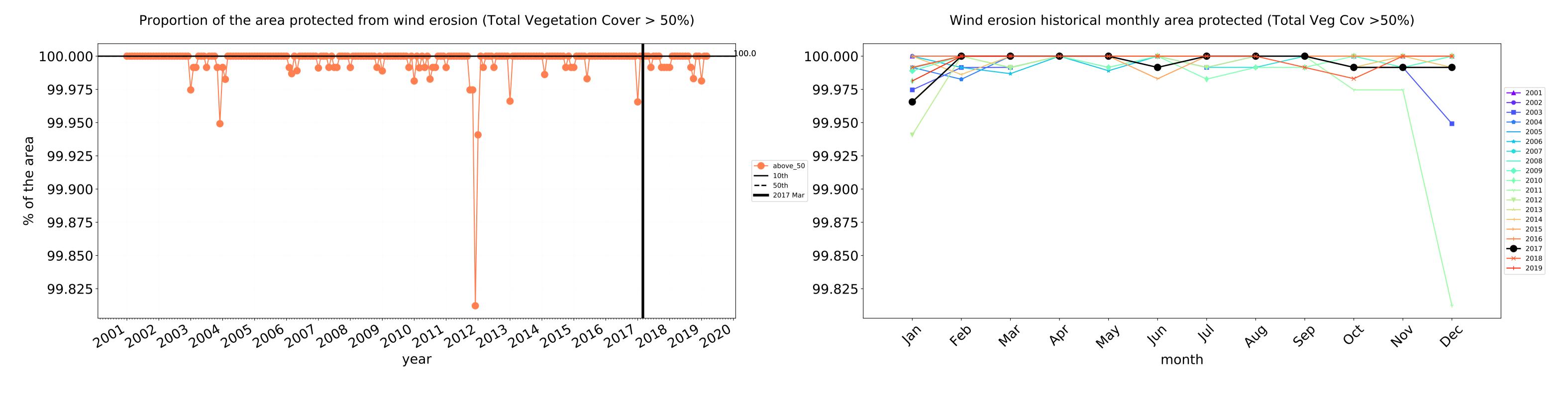


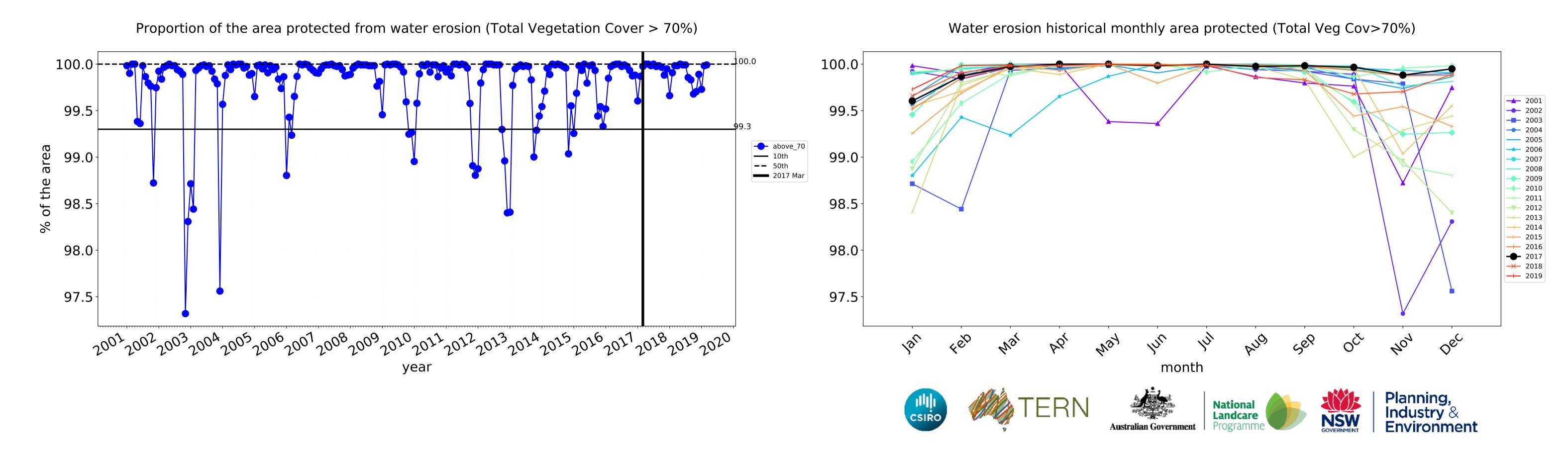


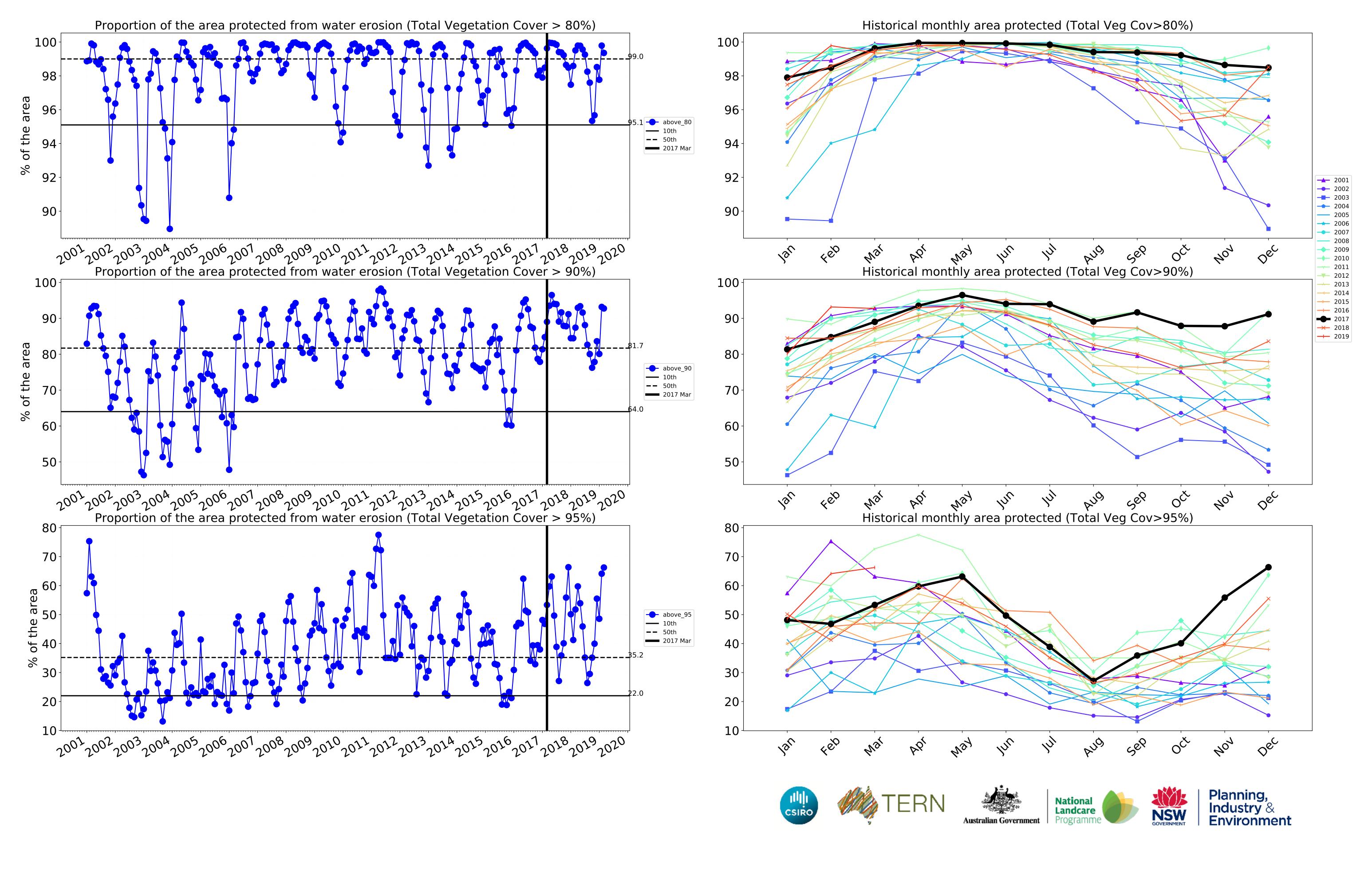




## **Grazing Woodland forest timeseries**







## **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

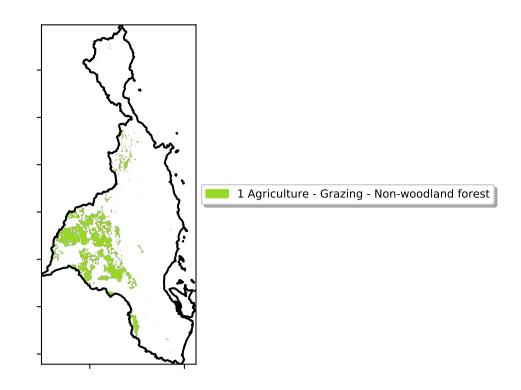
pixel is from the mean. That

pixel. The mean

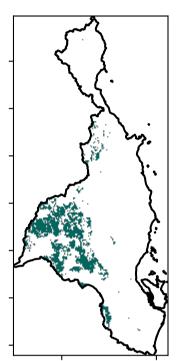
using baseline from 2001 to 2019.

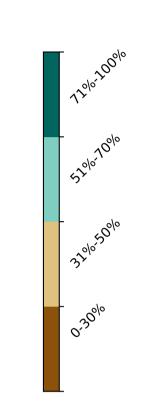
is only for the month of the map

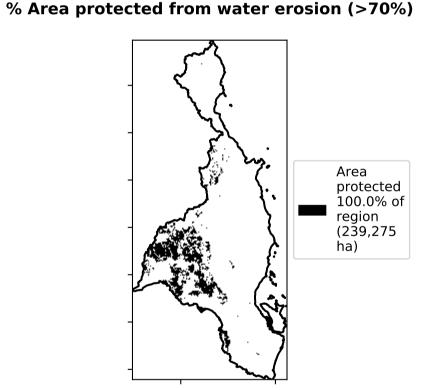
is, red pixels are about 20% lower than the mean of that



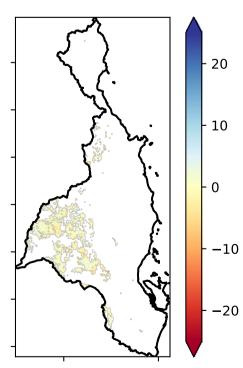
#### **Total Vegetation Cover [%]**





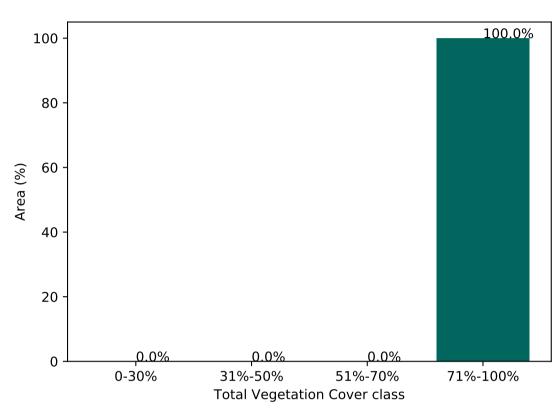


## **Total Vegetation Cover Anomaly [%]**

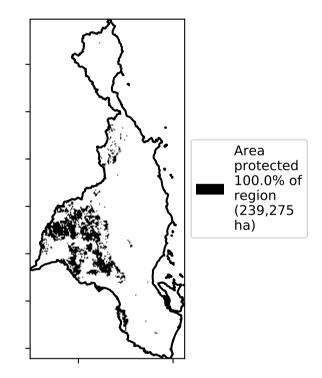


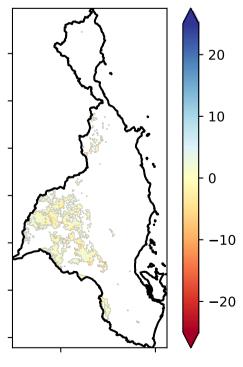
pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area

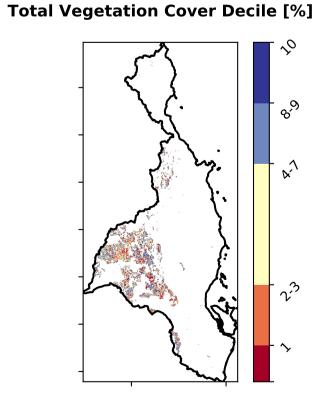


#### % Area protected from wind erosion (>50%)





Deciles show where the records for that month of





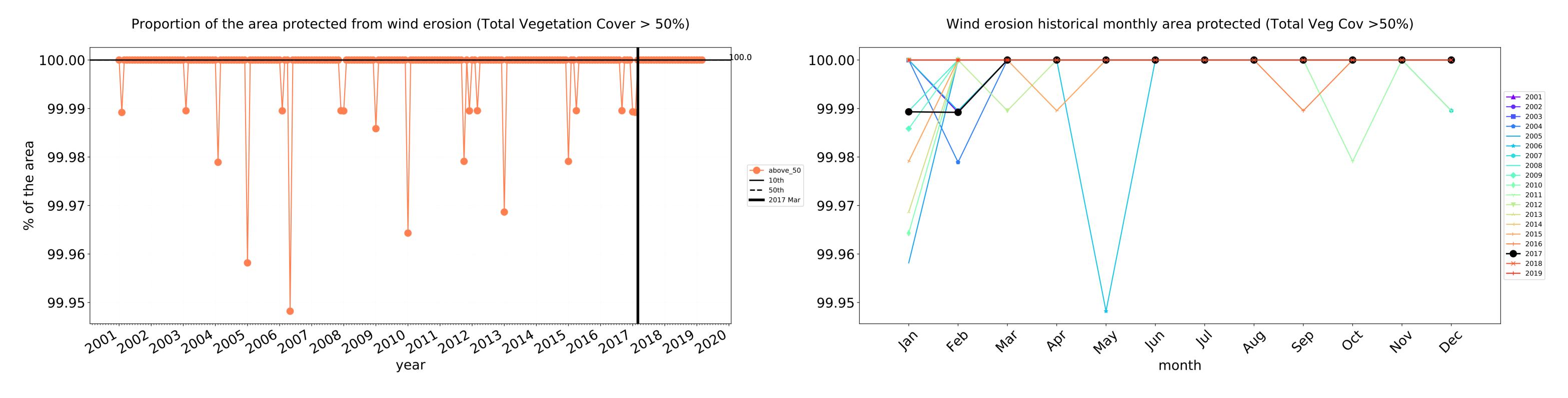


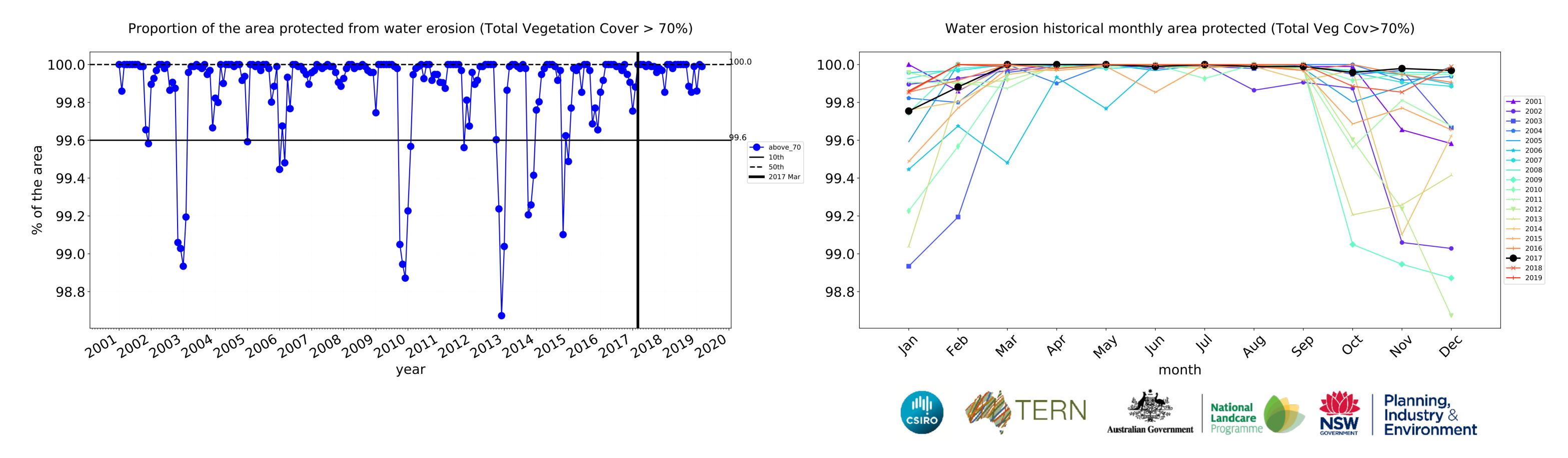


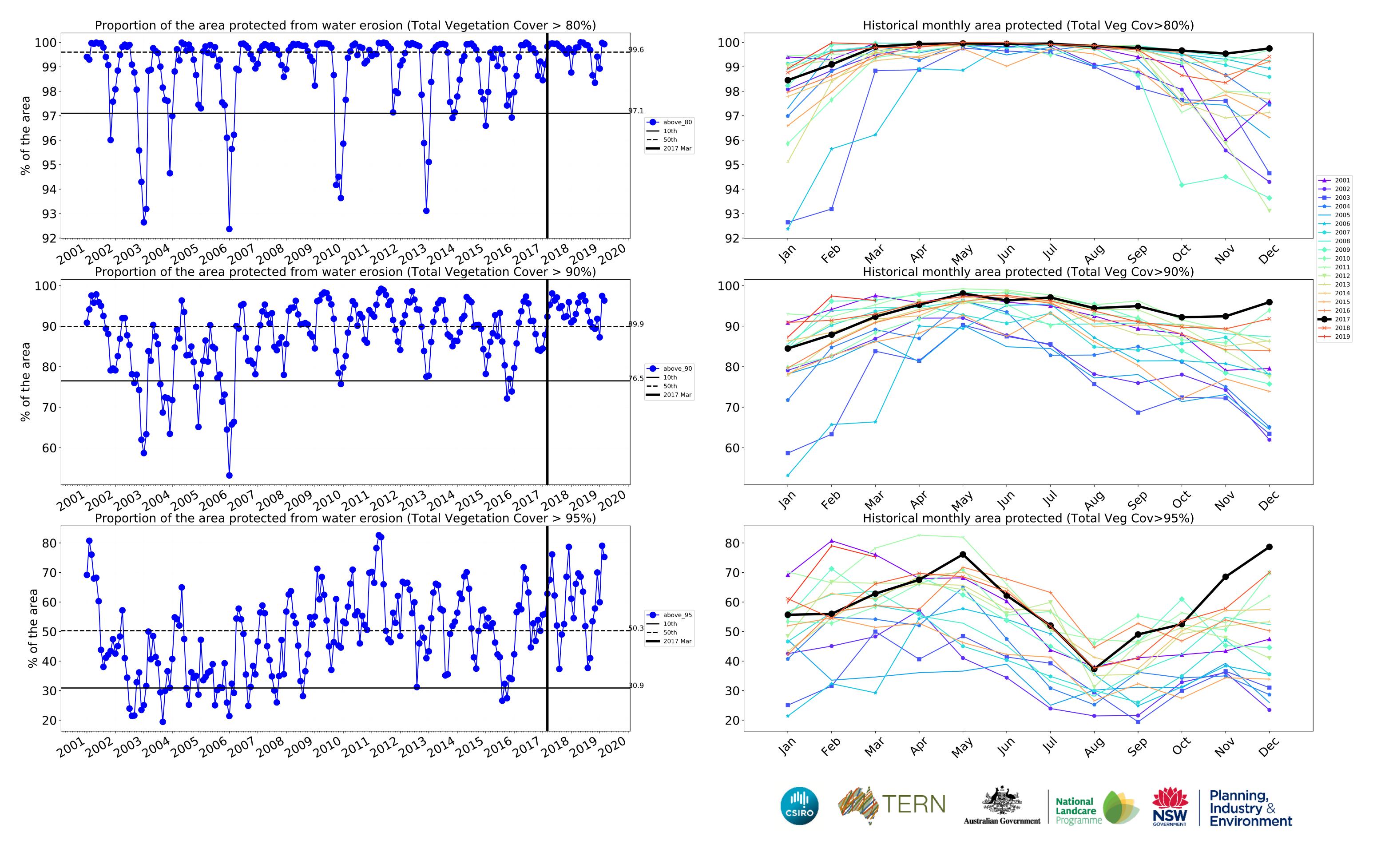












## **Cropping**

#### 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)

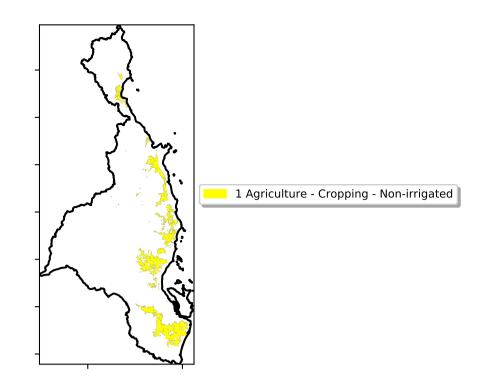
Anomaly show how many percetage points each

pixel is from the mean. That

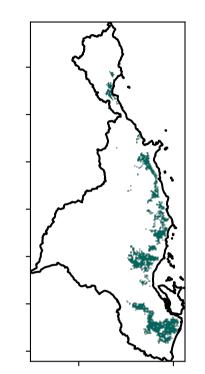
pixel. The mean

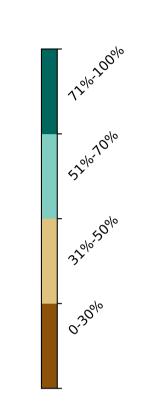
is only for the month of the map using baseline from 2001 to 2019.

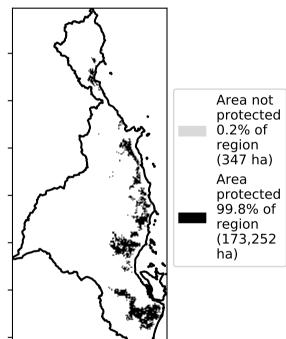
is, red pixels are about 20% lower than the mean of that



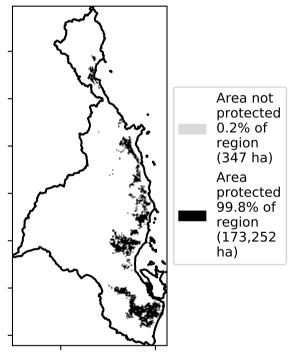
#### **Total Vegetation Cover [%]**

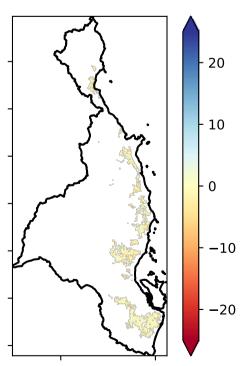






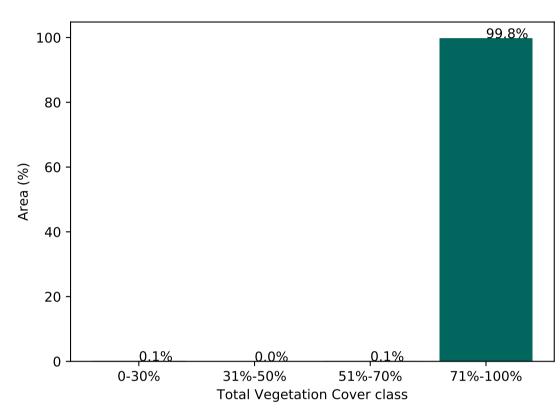
## % Area protected from water erosion (>70%)



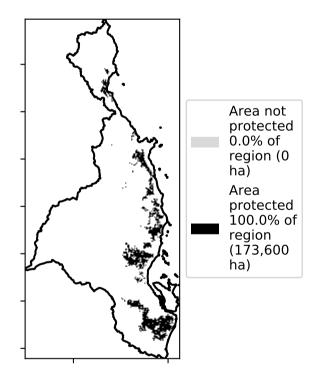


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

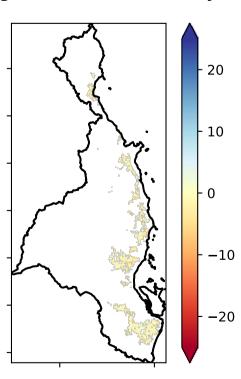
#### Proportion of vegetation cover class in area

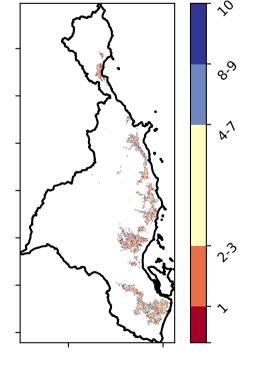


#### % Area protected from wind erosion (>50%)



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









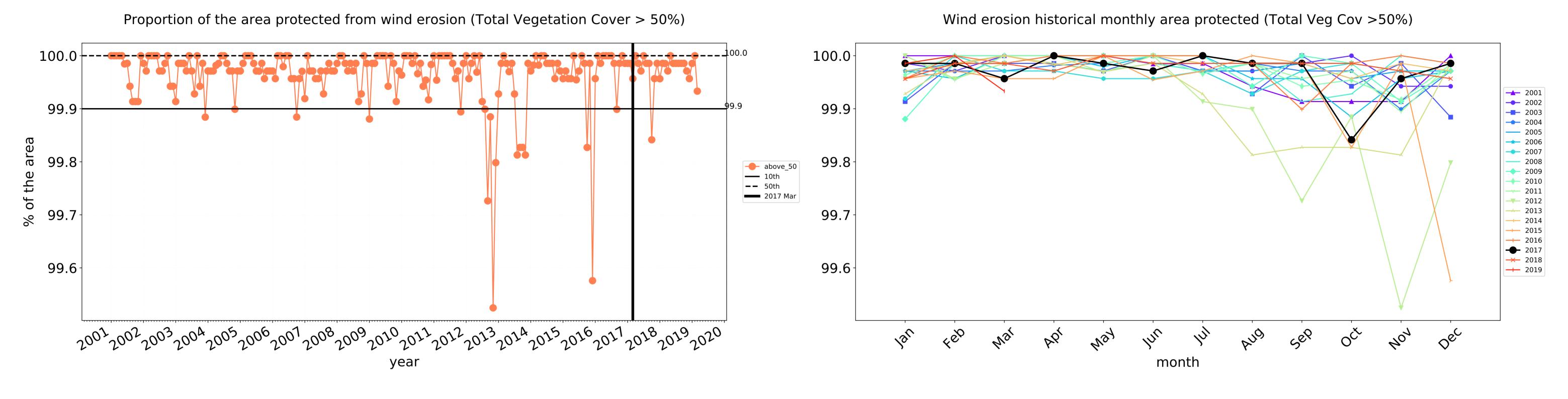


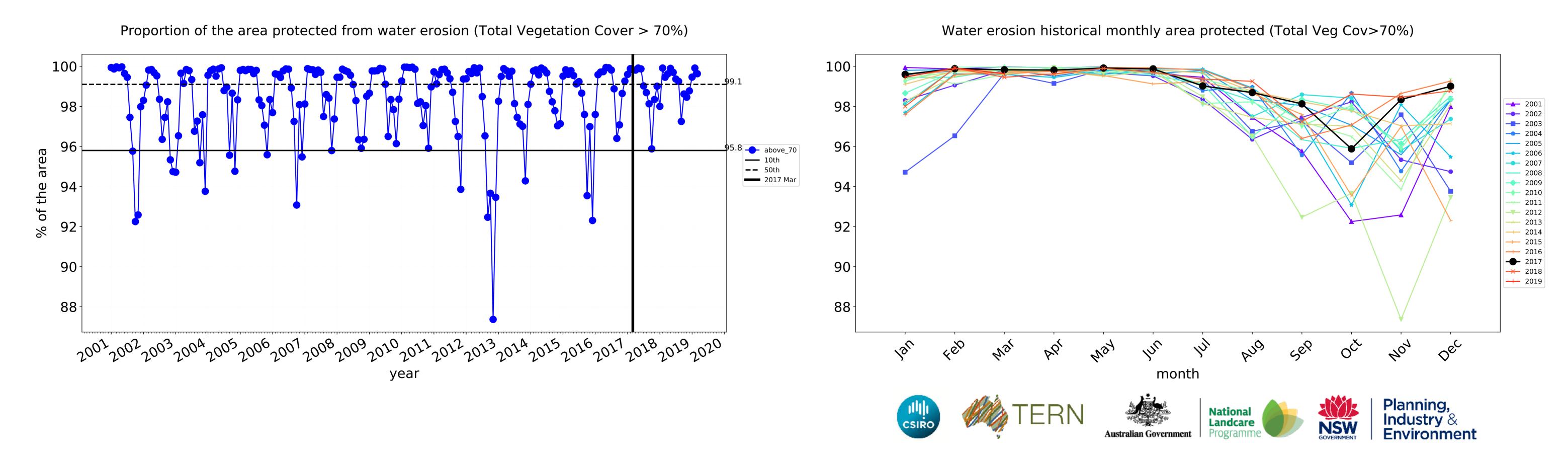


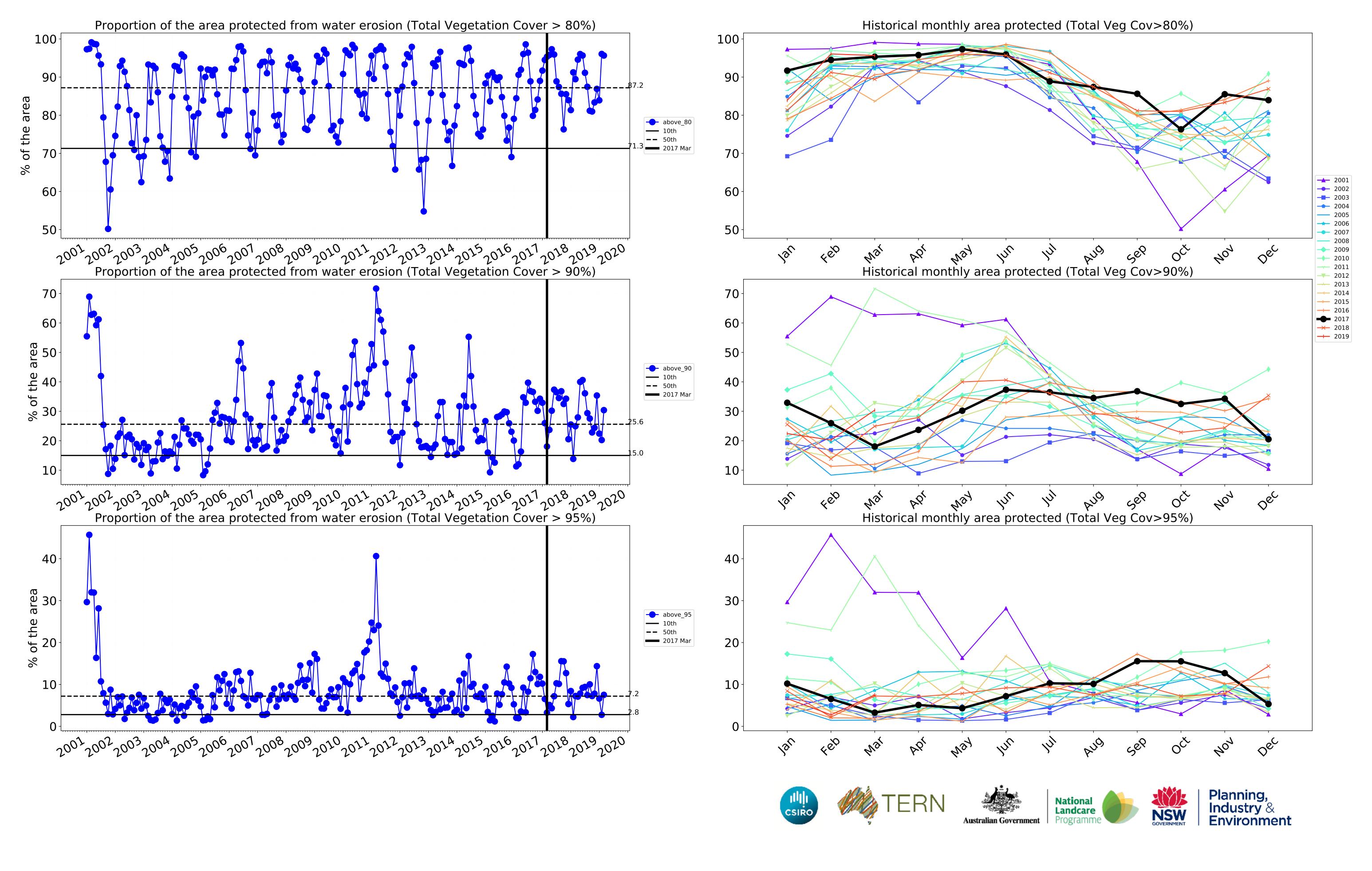




## **Cropping timeseries**







## **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)

Anomaly show how many percetage points each

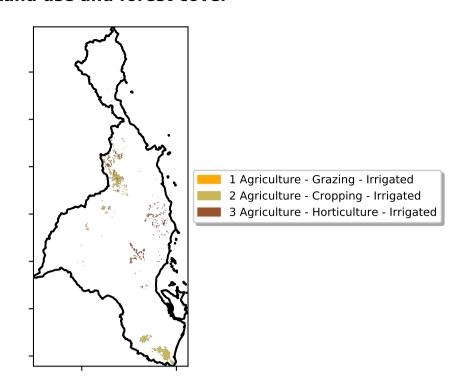
pixel is from the mean. That

pixel. The mean

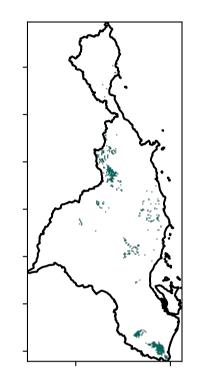
using baseline from 2001 to 2019.

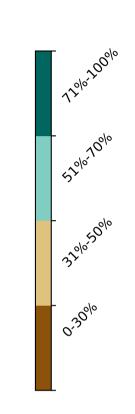
is only for the month of the map

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

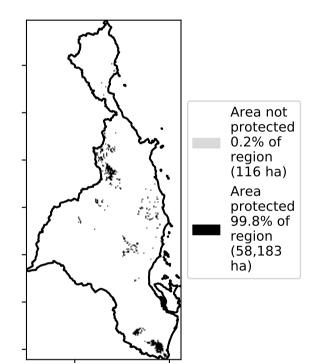


#### **Total Vegetation Cover [%]**

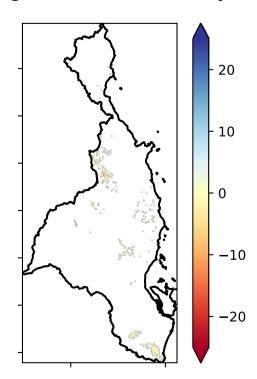




#### % Area protected from water erosion (>70%)

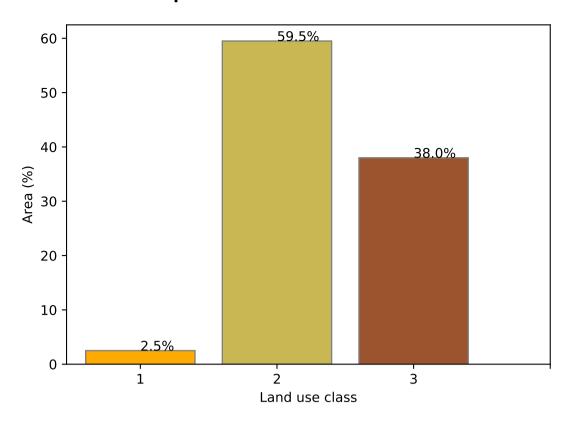


#### **Total Vegetation Cover Anomaly [%]**

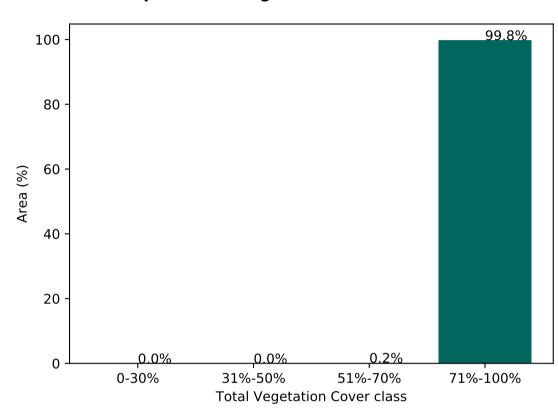


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

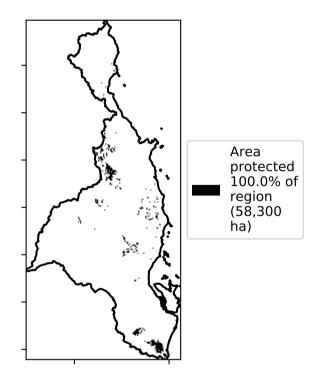
#### Proportion of each land class in area

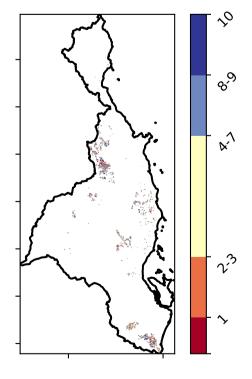


#### Proportion of vegetation cover class in area



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









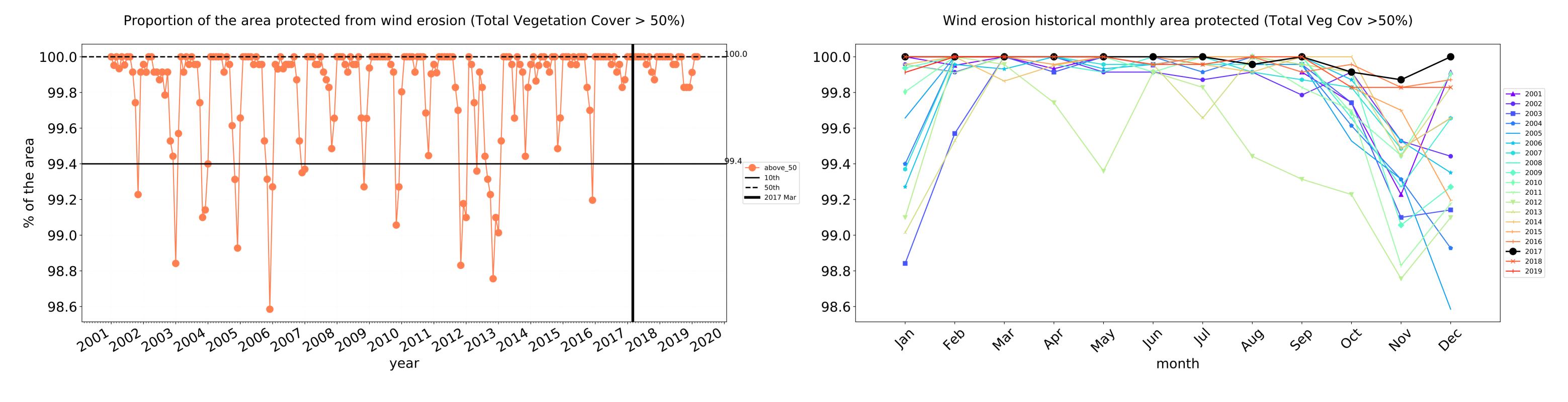


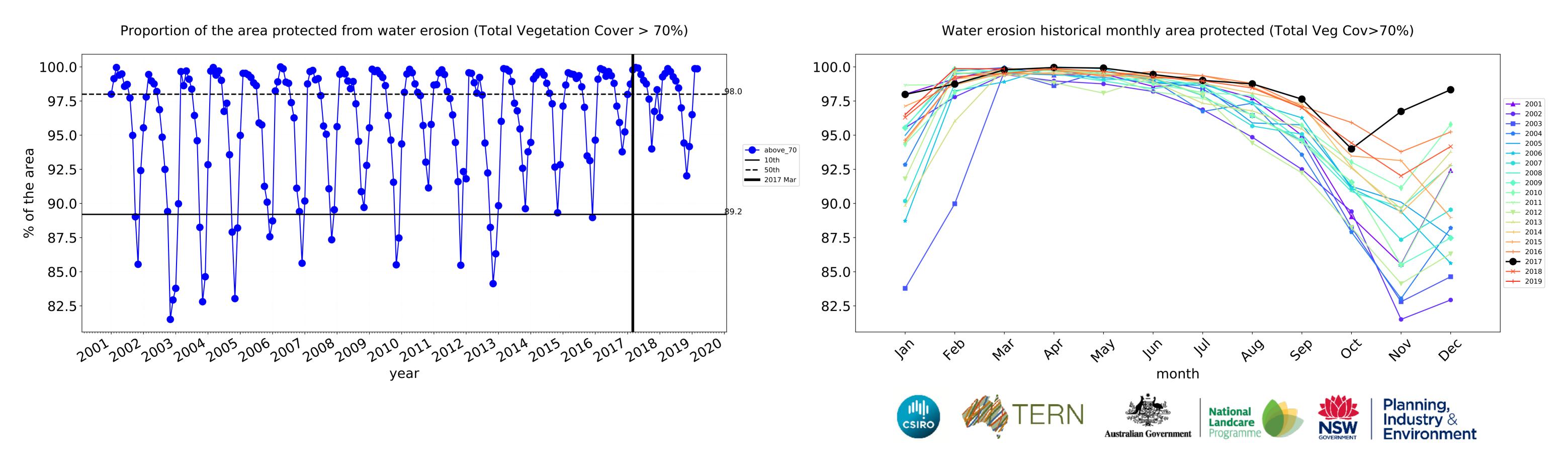


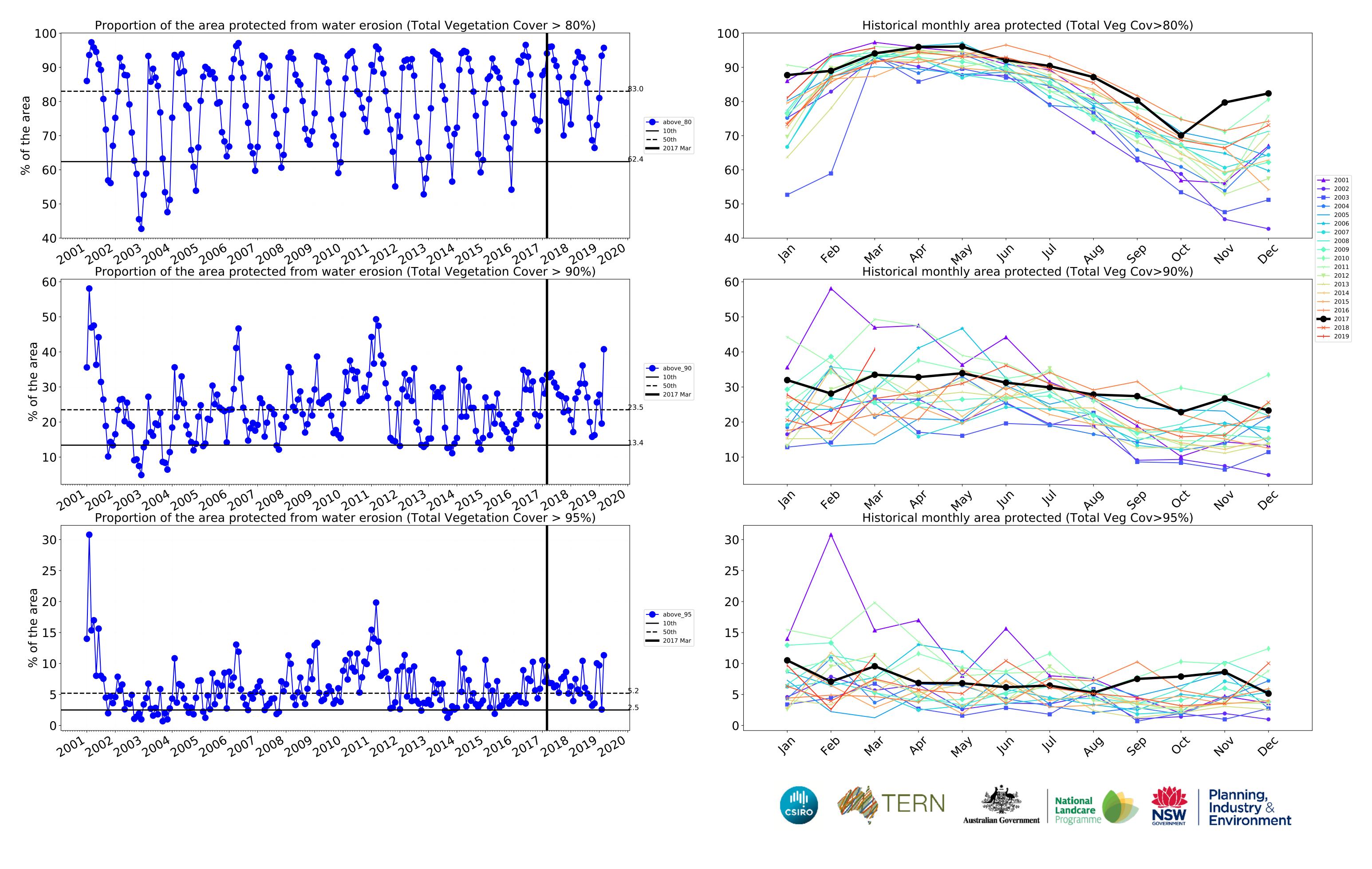




## **Irrigation timeseries**







## **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

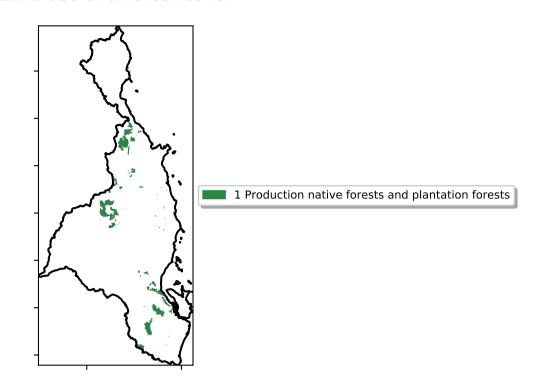
pixel is from the mean. That

pixel. The mean

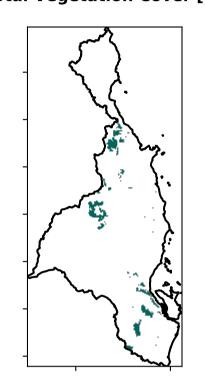
using baseline from 2001 to 2019.

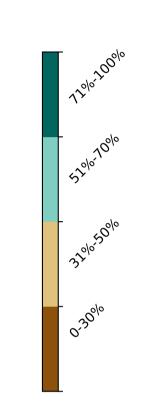
is only for the month of the map

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

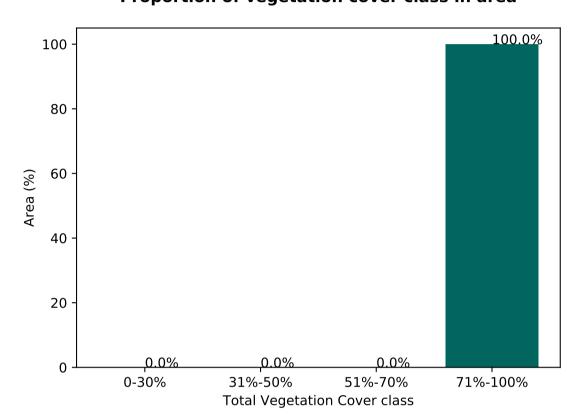


#### **Total Vegetation Cover [%]**

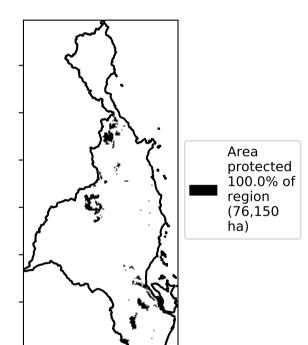




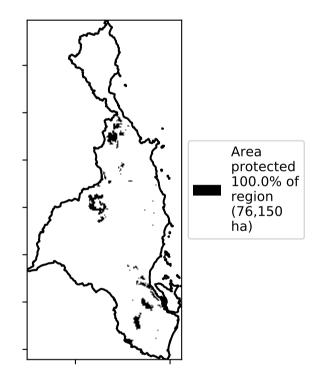
#### Proportion of vegetation cover class in area



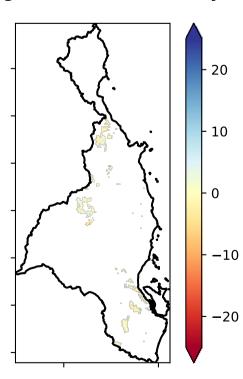
#### % Area protected from water erosion (>70%)



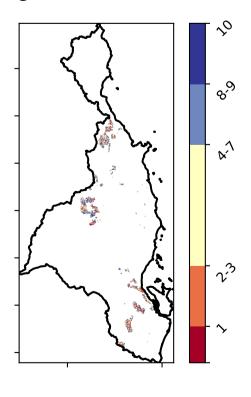
% Area protected from wind erosion (>50%)



#### **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.







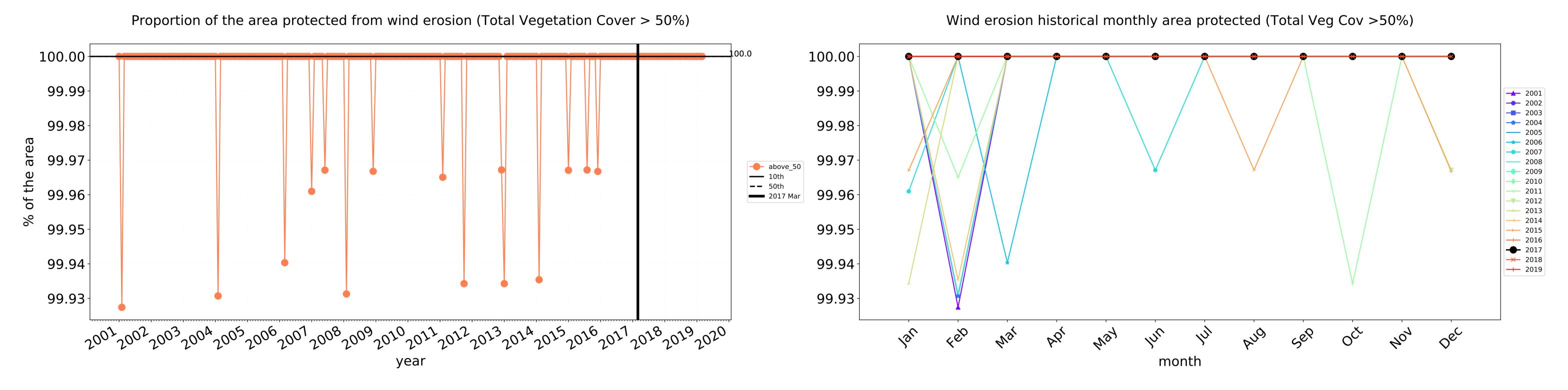


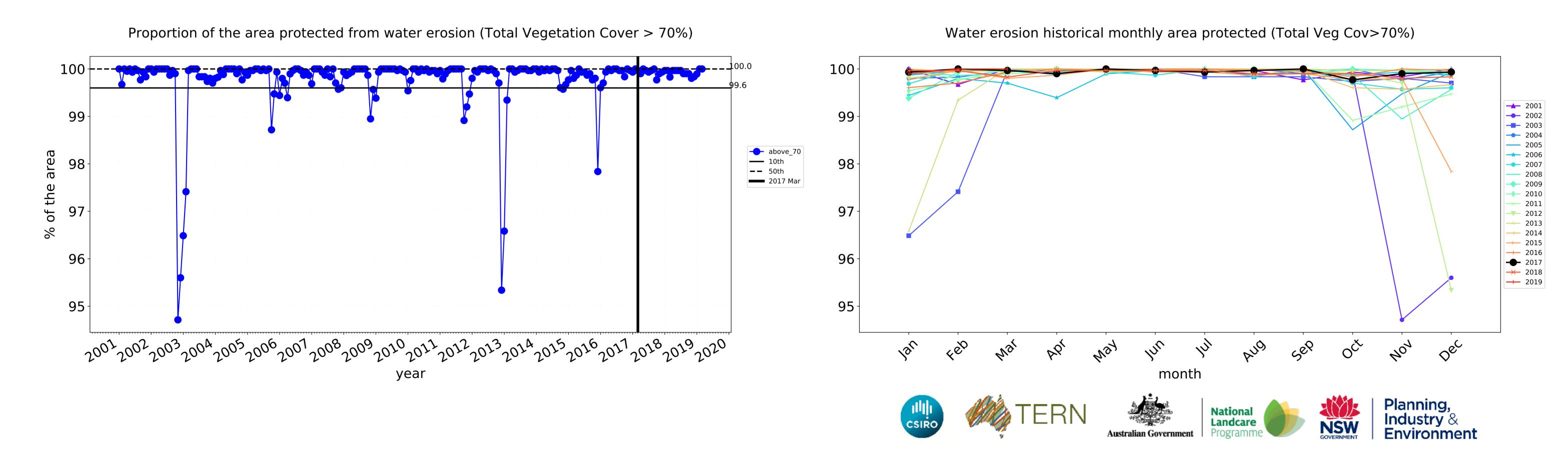


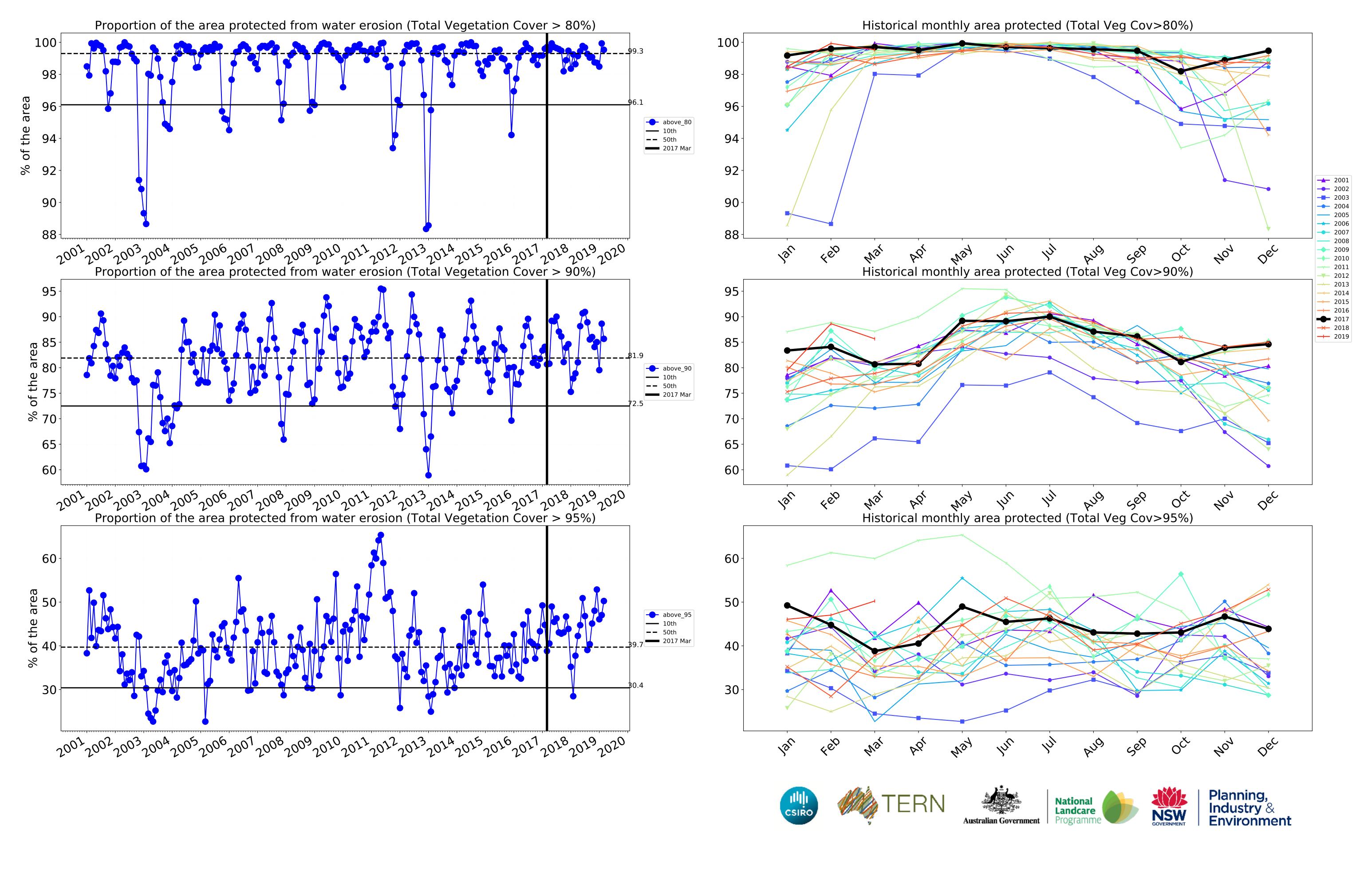




## **Production native forests and plantation forests timeseries**







# Wet Tropics (1,777,025 ha and no data 447,219 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	1,777,025	100.0% 1,776,618	99.9% 1,775,214	99.5% 1,767,871	97.6% 1,734,839	73.0% 1,297,570	36.6% 649,964
Conservation and natural environments	1,053,775	100.0% 1,053,475	99.9% 1,052,600	99.6% 1,049,075	98.6% 1,038,925	81.3% 856,500	37.9% 399,150
Conservation and natural environments Woodland forest	137,275	100.0% 137,275	100.0% 137,225	99.8% 136,975	99.4% 136,500	81.2% 111,425	35.6% 48,900
Conservation and natural environments Forest (non woodland)	905,400	100.0% 905,100	99.9% 904,275	99.5% 901,175	98.5% 891,825	81.5% 737,975	38.3% 346,800
Agriculture	942,175	100.0% 942,175	100.0% 942,075	99.9% 941,500	98.3% 925,775	67.4% 634,700	37.7% 354,925
Grazing	710,225	100.0% 710,225	100.0% 710,200	100.0% 709,975	99.3% 705,375	82.2% 583,825	48.4% 343,675
Grazing non forest	175,400	100.0% 175,400	100.0% 175,375	99.9% 175,225	98.1% 172,075	56.9% 99,800	20.4% 35,700
Grazing Woodland forest	295,550	100.0% 295,550	100.0% 295,550	100.0% 295,475	99.6% 294,450	89.0% 263,100	53.3% 157,650
Grazing - Forest (non woodland)	239,275	100.0% 239,275	100.0% 239,275	100.0% 239,275	99.8% 238,850	92.3% 220,925	62.8% 150,325
Cropping	173,600	100.0% 173,600	100.0% 173,525	99.8% 173,300	95.3% 165,500	18.0% 31,325	3.3% 5,675
Irrigation	58,300	100.0% 58,300	100.0% 58,300	99.8% 58,175	94.1% 54,850	33.5% 19,525	9.6% 5,575
Production native forests and plantation forests	76,150	100.0% 76,150	100.0% 76,150	100.0% 76,125	99.7% 75,925	80.7% 61,425	38.8% 29,550











