# 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: December 2015** 

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 Dec 2015**

#### 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

pixel. The mean

month of the map

mean of that

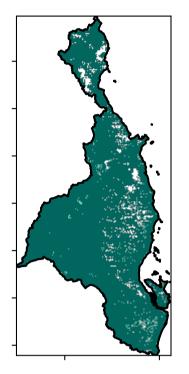
is only for the

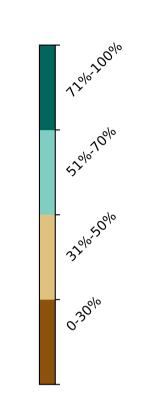
using baseline from 2001 to

2019.

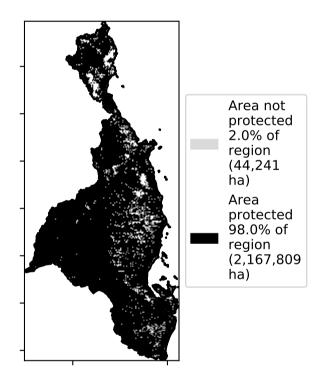
is, red pixels are about 20%

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

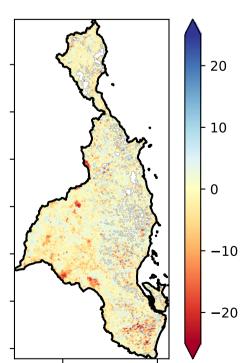




#### % Area protected from water erosion (>70%)

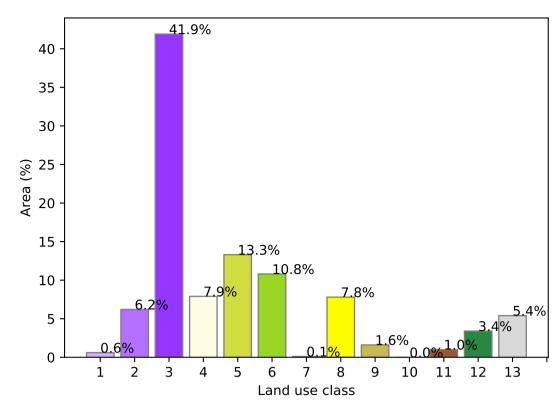


## **Total Vegetation Cover Anomaly [%]**

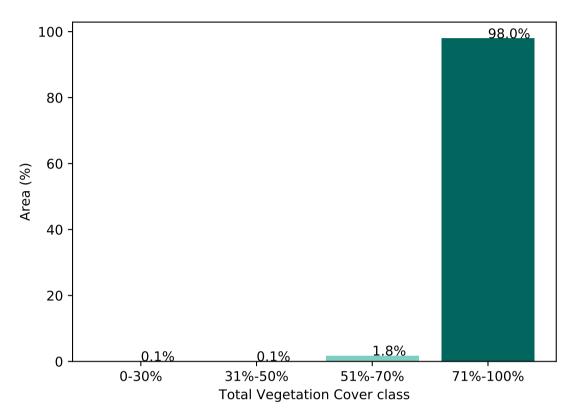


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

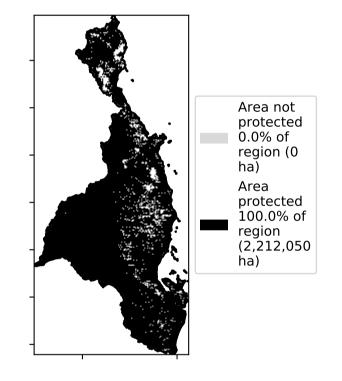
#### Proportion of each land class in area



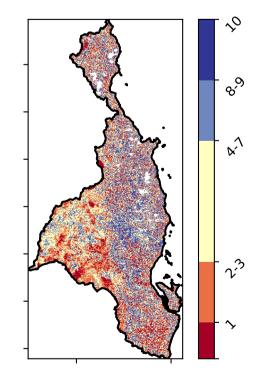
#### **Proportion of vegetation cover class in area**



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



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





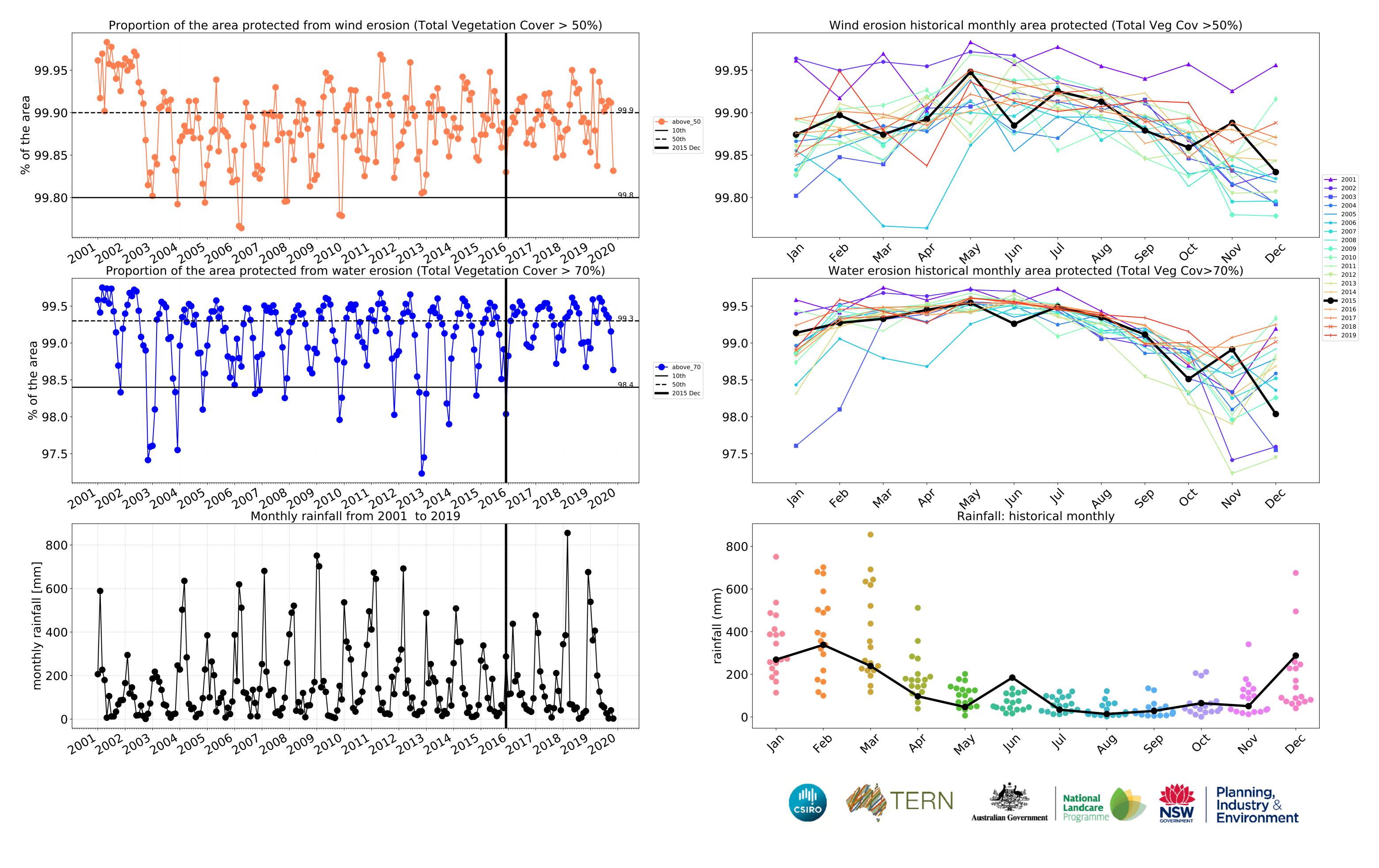


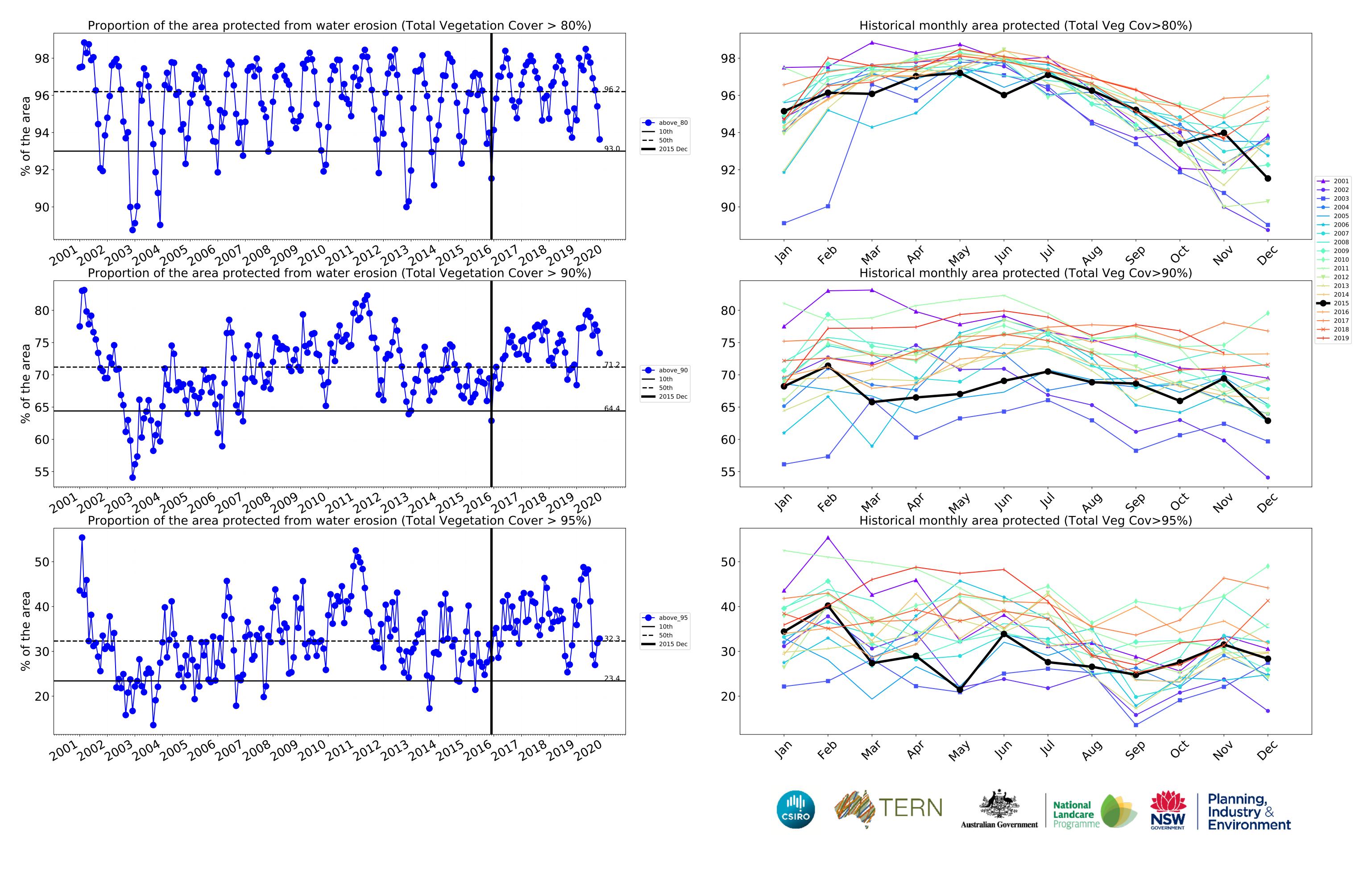








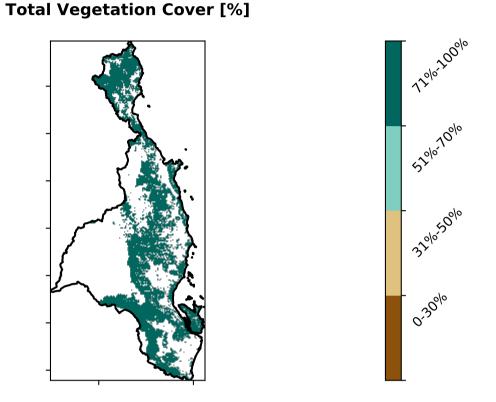




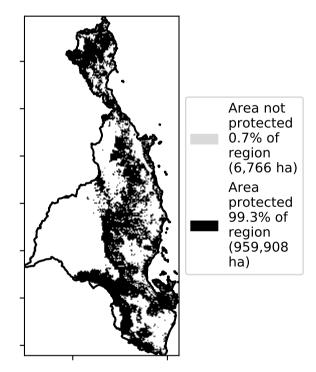
### **Conservation and natural environments**

#### 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)



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



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

Anomaly show how many percetage points each

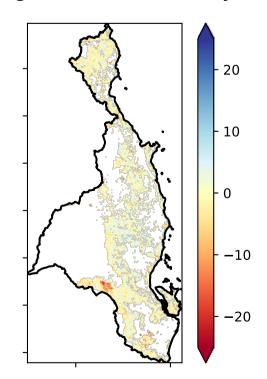
pixel is from the mean. That

pixel. The mean

using baseline from 2001 to 2019.

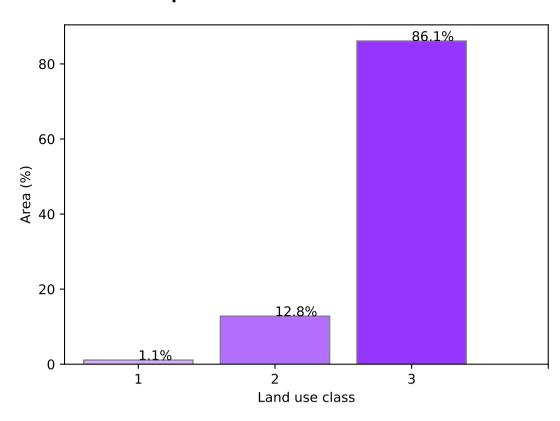
is only for the month of the map

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

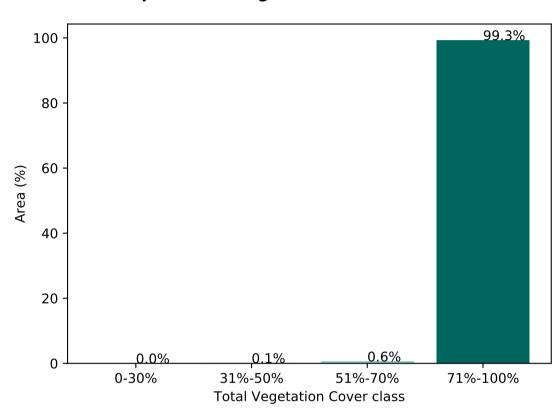


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of

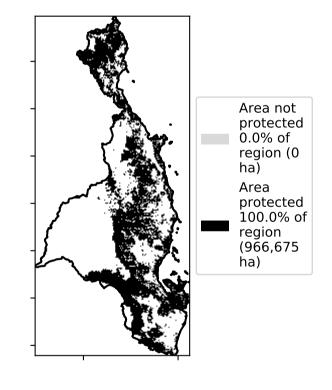
#### **Proportion of each land class in area**



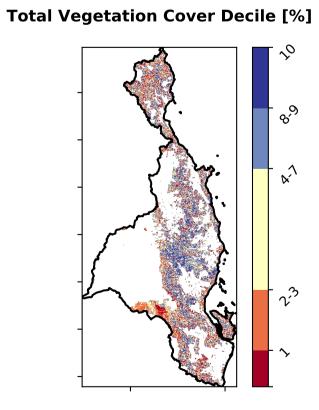
#### Proportion of vegetation cover class in area



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



the map using baseline from 2001 to 2019.







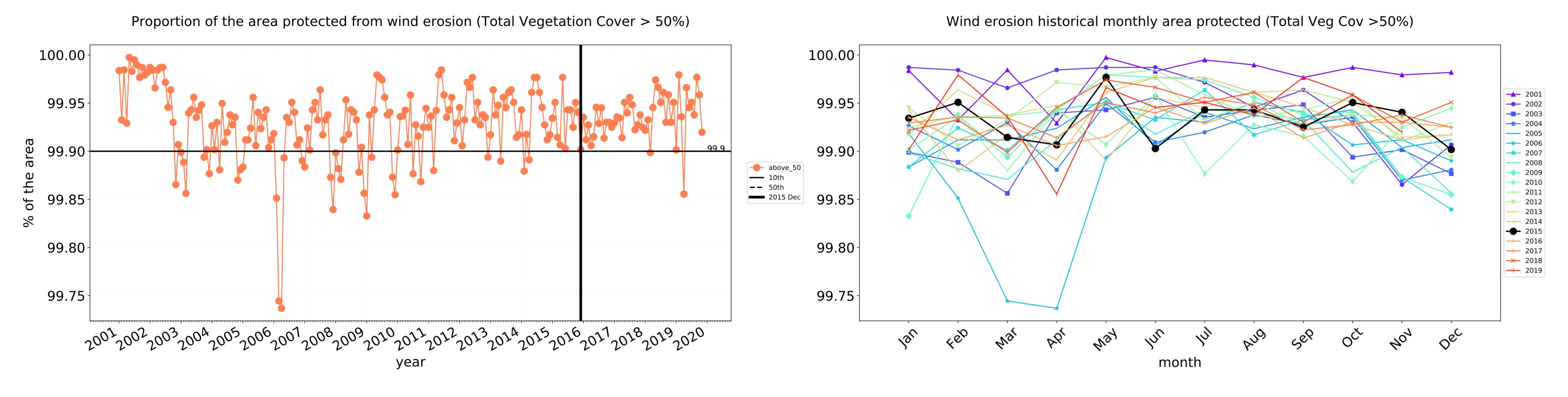


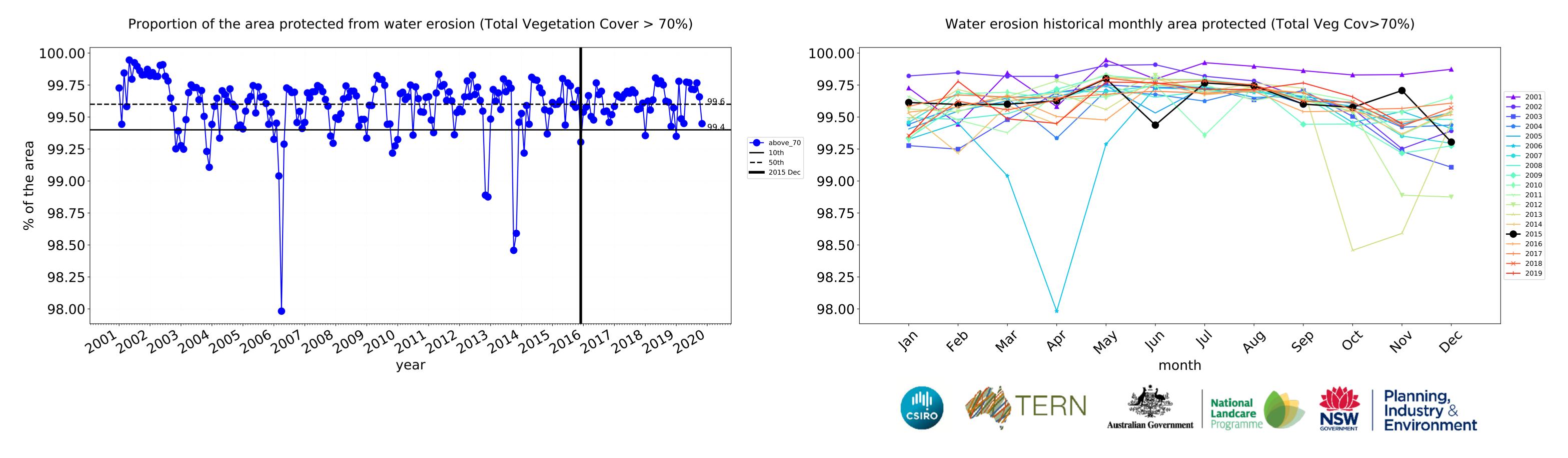


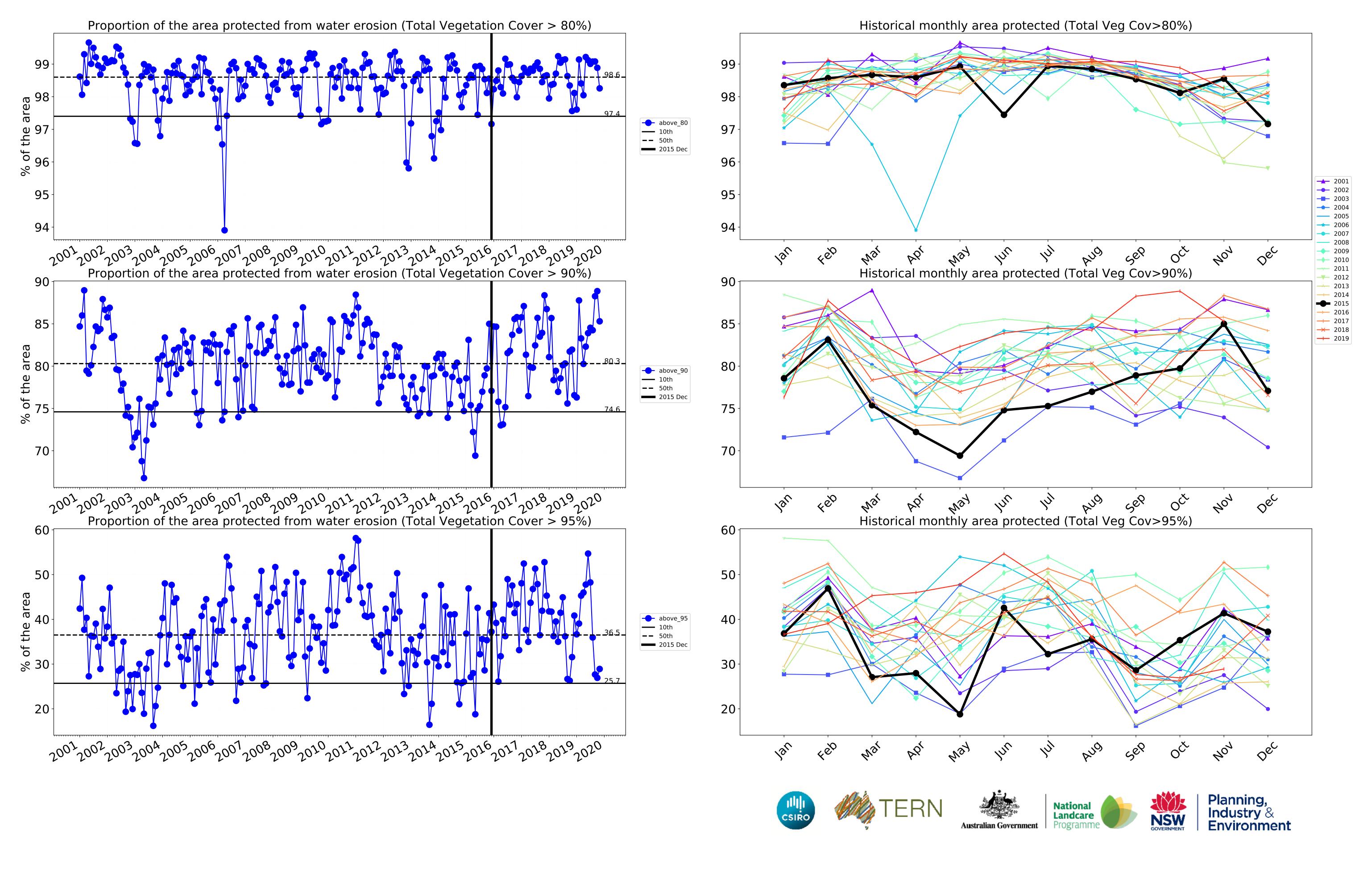




## **Conservation and natural environments timeseries**



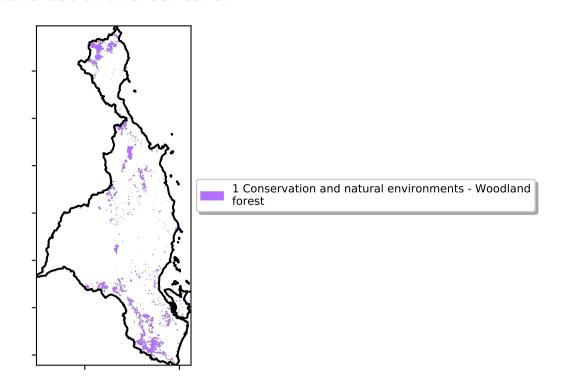




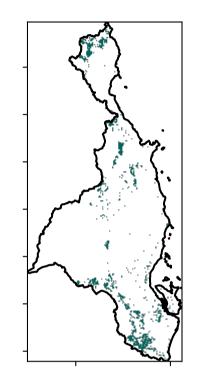
## **Conservation and natural environments Woodland forest**

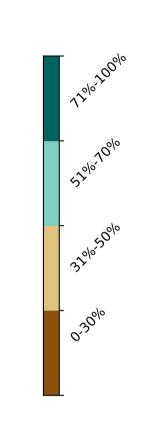
#### Land use and forest cover

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

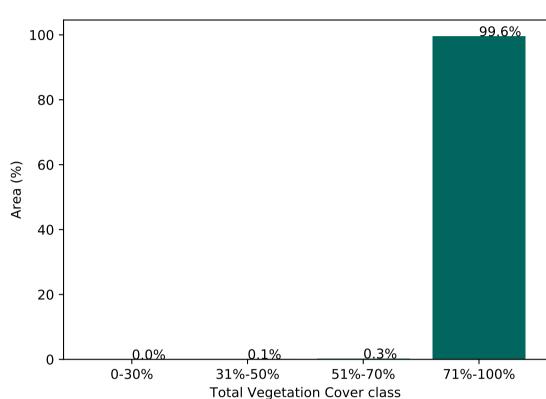


#### **Total Vegetation Cover [%]**

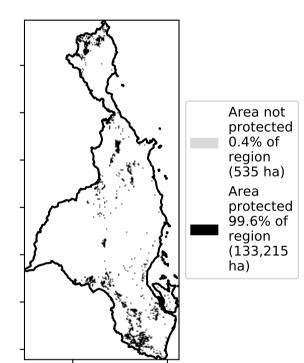




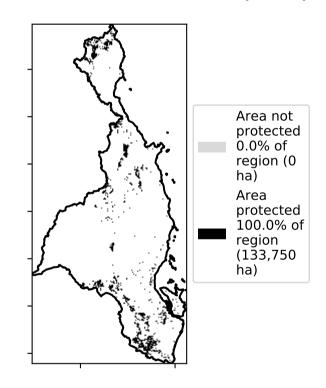
#### Proportion of vegetation cover class in area



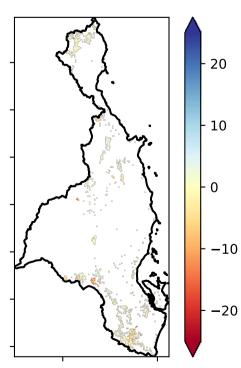
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

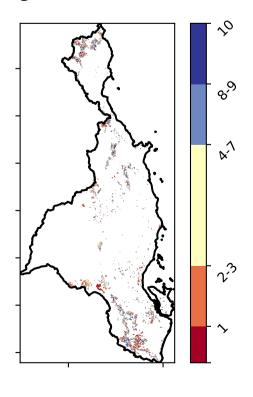


#### **Total Vegetation Cover Anomaly [%]**

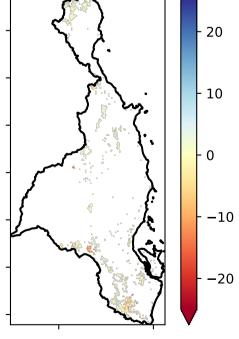


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





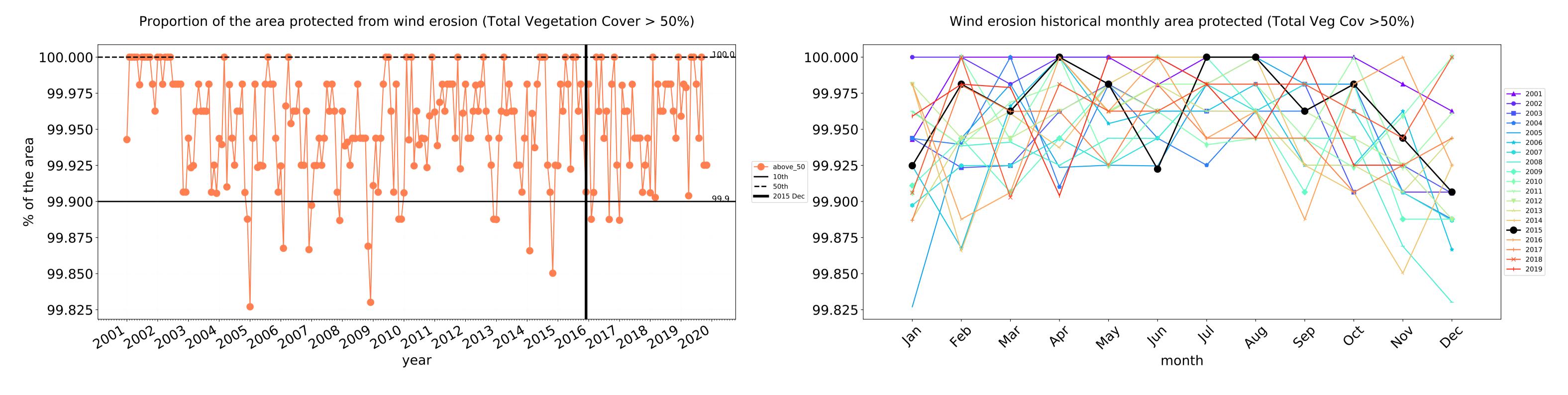


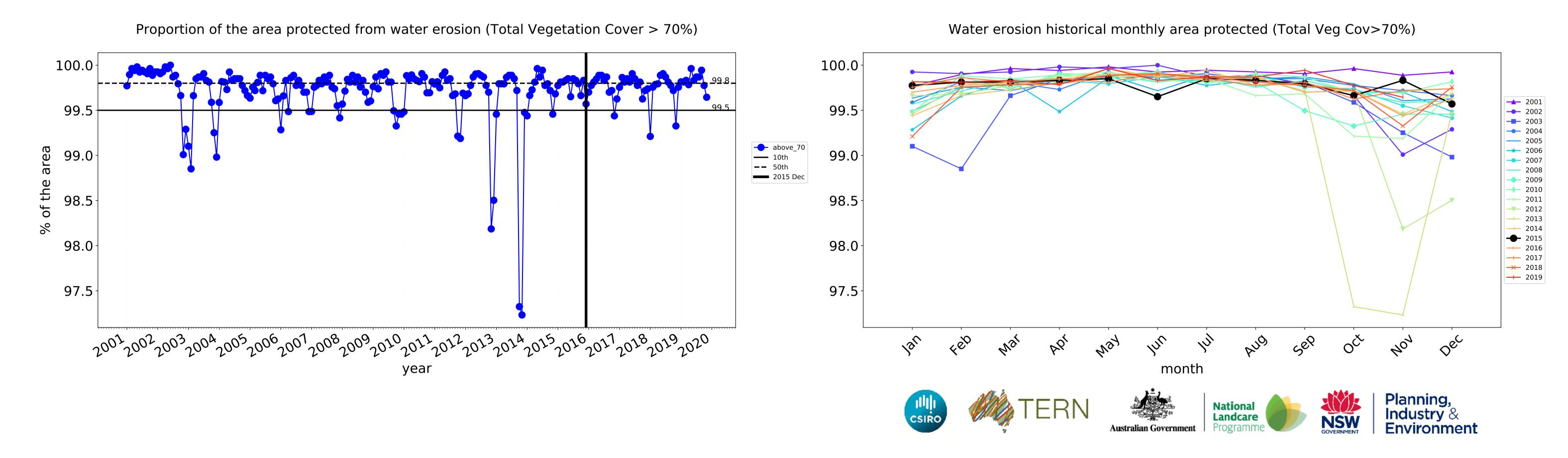


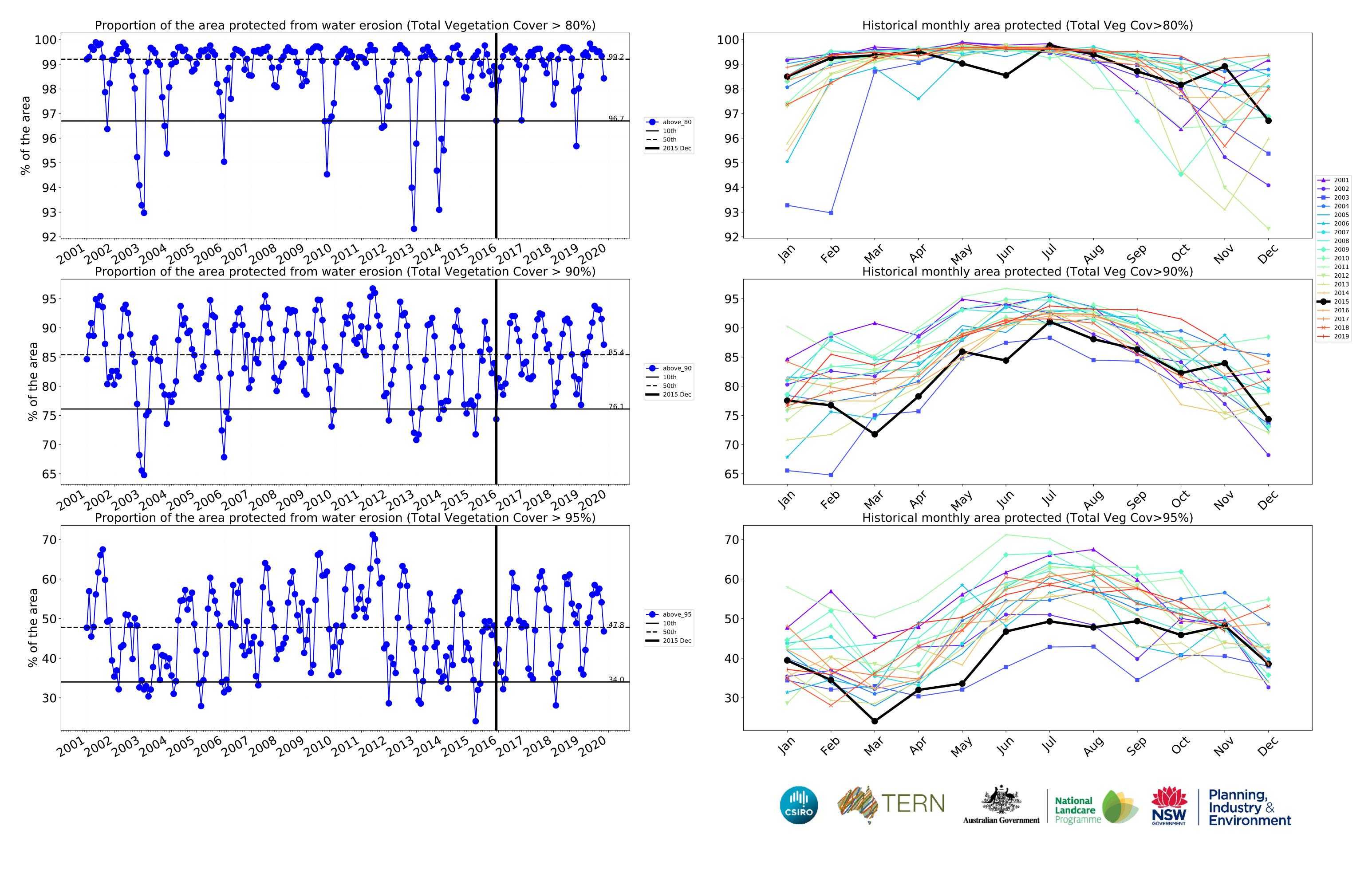








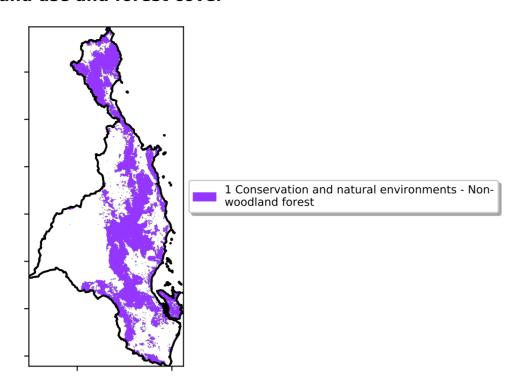




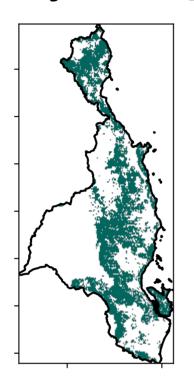
## **Conservation and natural environments Forest (non woodland)**

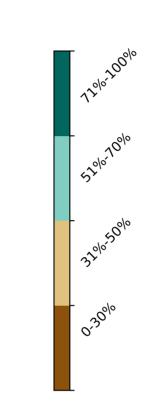
#### Land use and forest cover

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

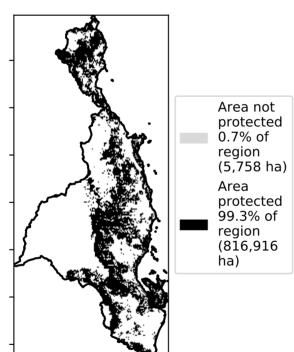


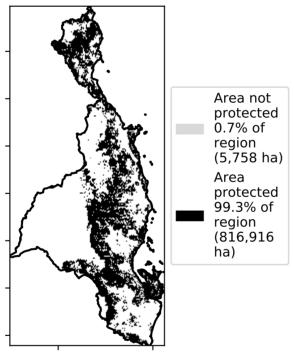
#### **Total Vegetation Cover [%]**



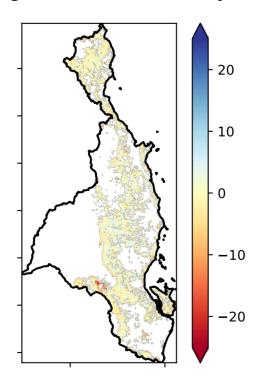


# % Area protected from water erosion (>70%)



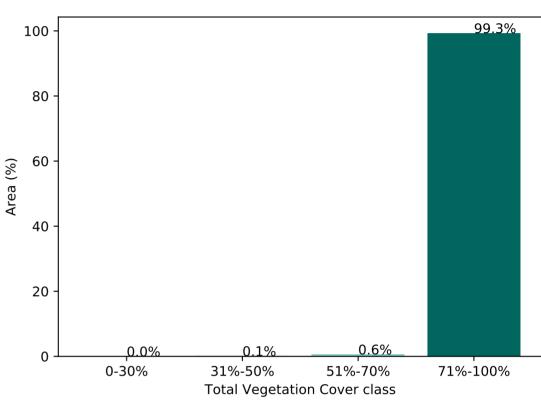


#### **Total Vegetation Cover Anomaly [%]**

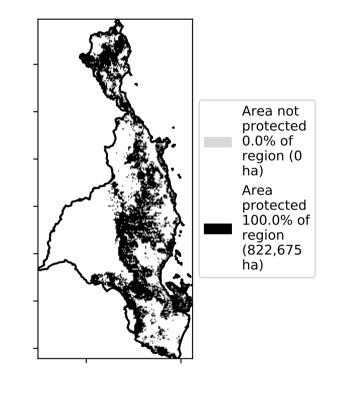


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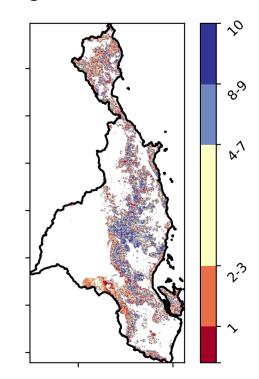
## Proportion of vegetation cover class in area



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



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



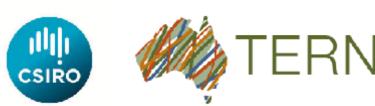


Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the

the mean. That

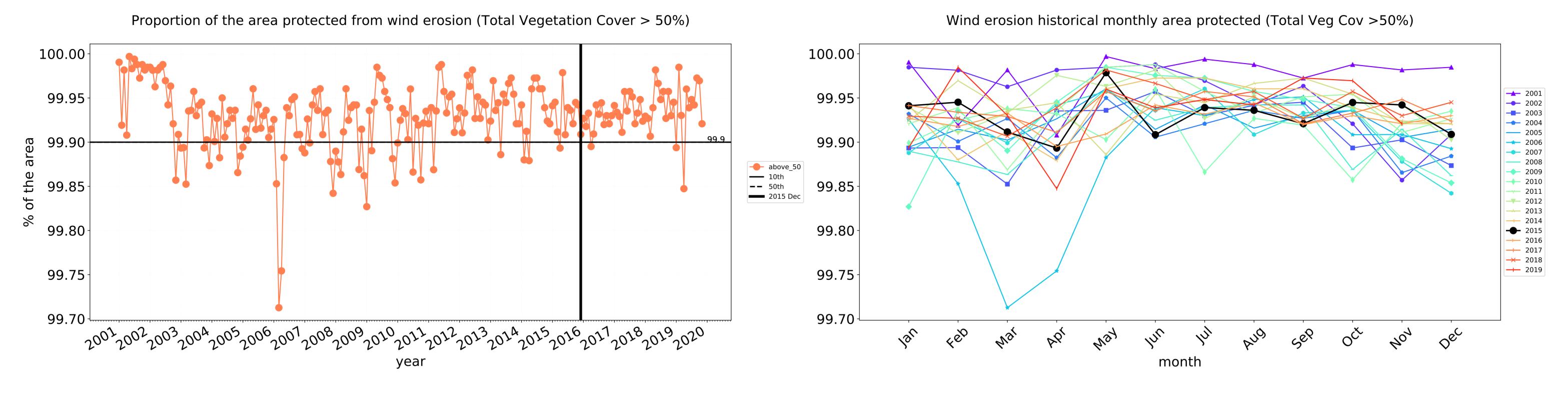


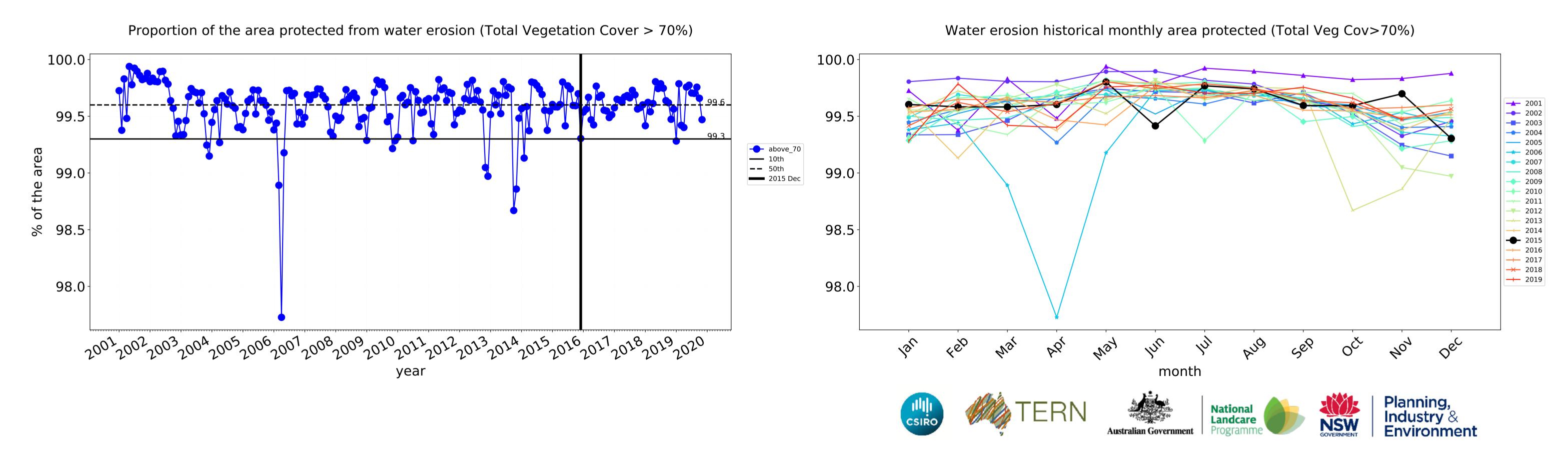


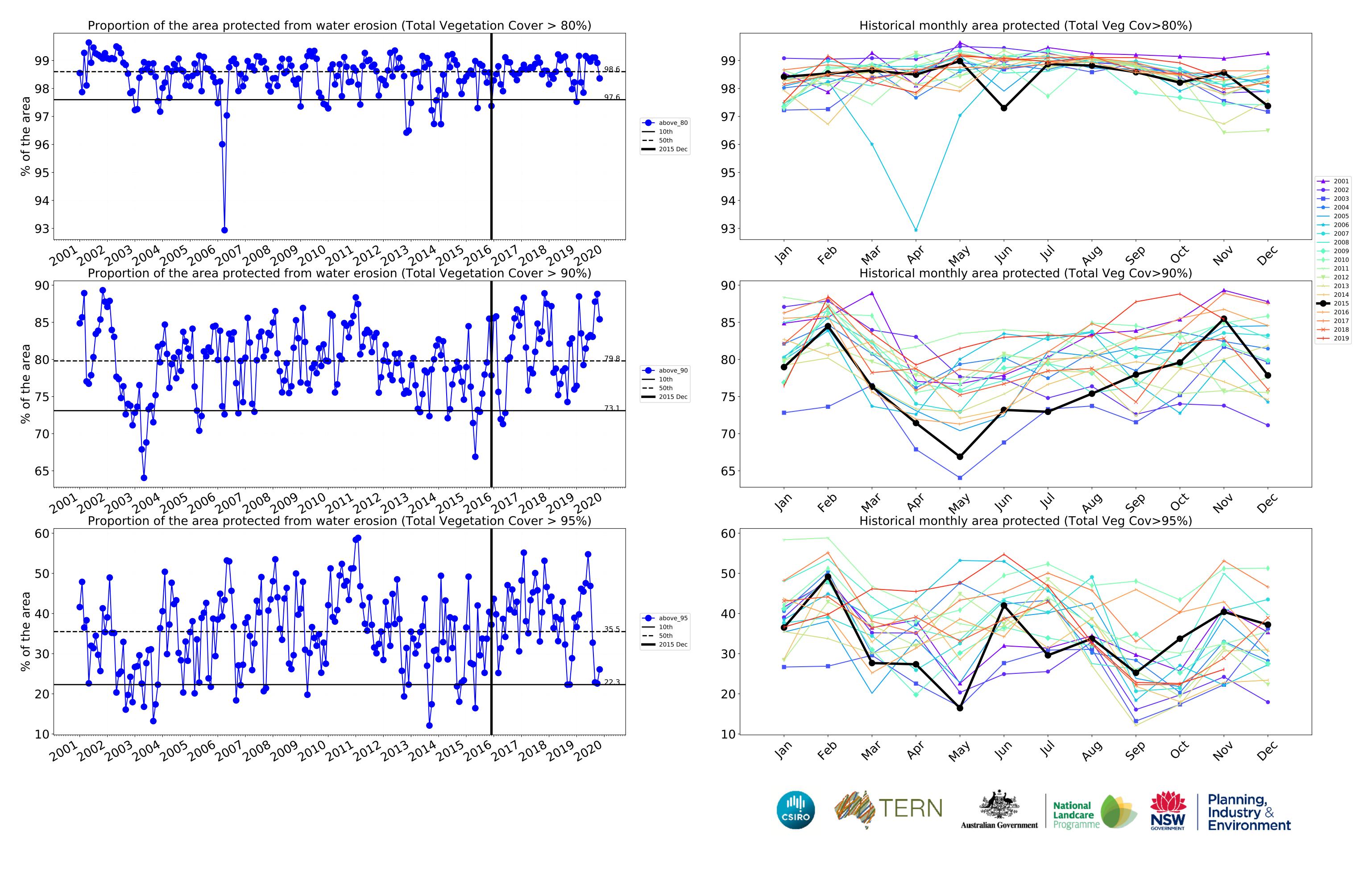












# **Agriculture**

#### 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

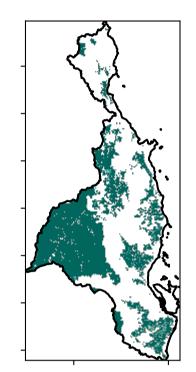
pixel. The mean

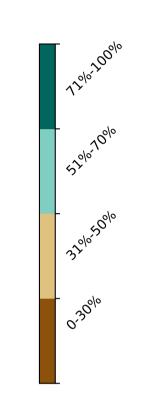
using baseline from 2001 to 2019.

is only for the month of the map

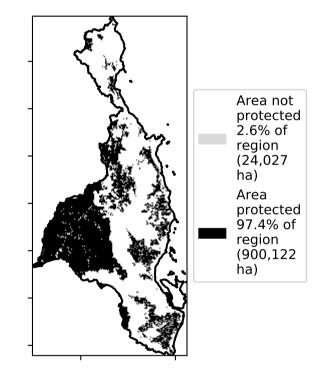
Catchment Scale

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

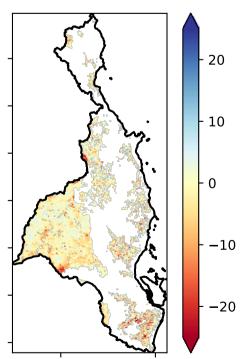




#### % Area protected from water erosion (>70%)

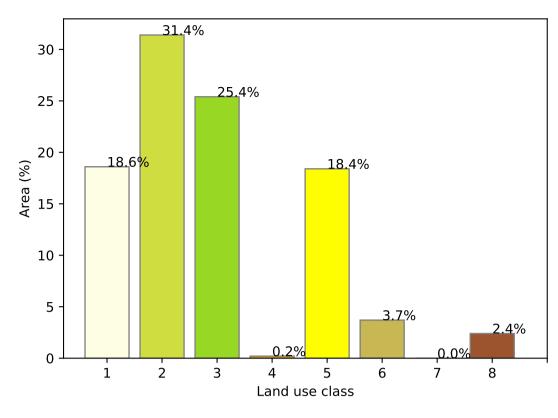


#### **Total Vegetation Cover Anomaly [%]**

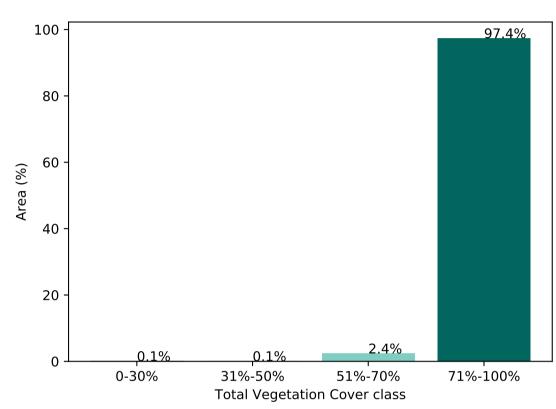


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

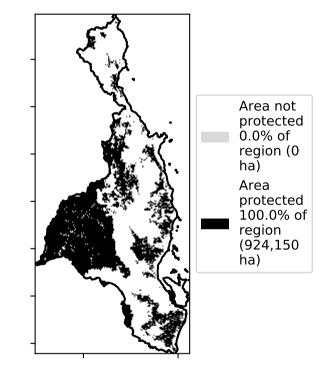
#### **Proportion of each land class in area**

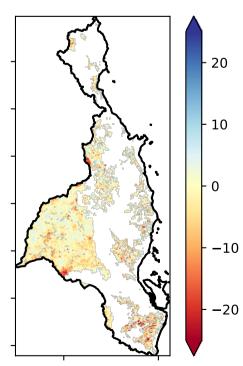


Proportion of vegetation cover class in area

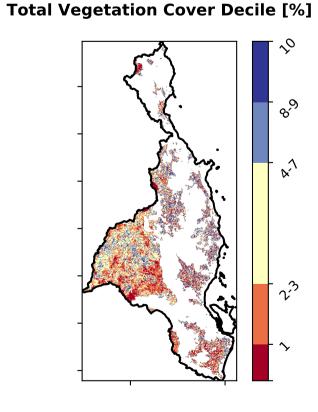


#### % Area protected from wind erosion (>50%)





Deciles show where the records for that month of







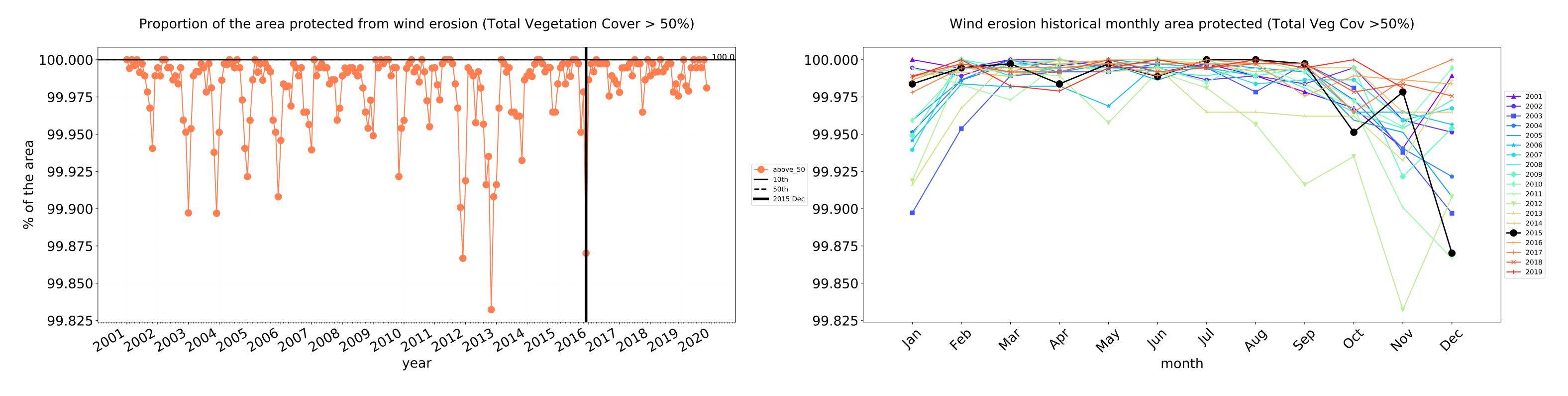


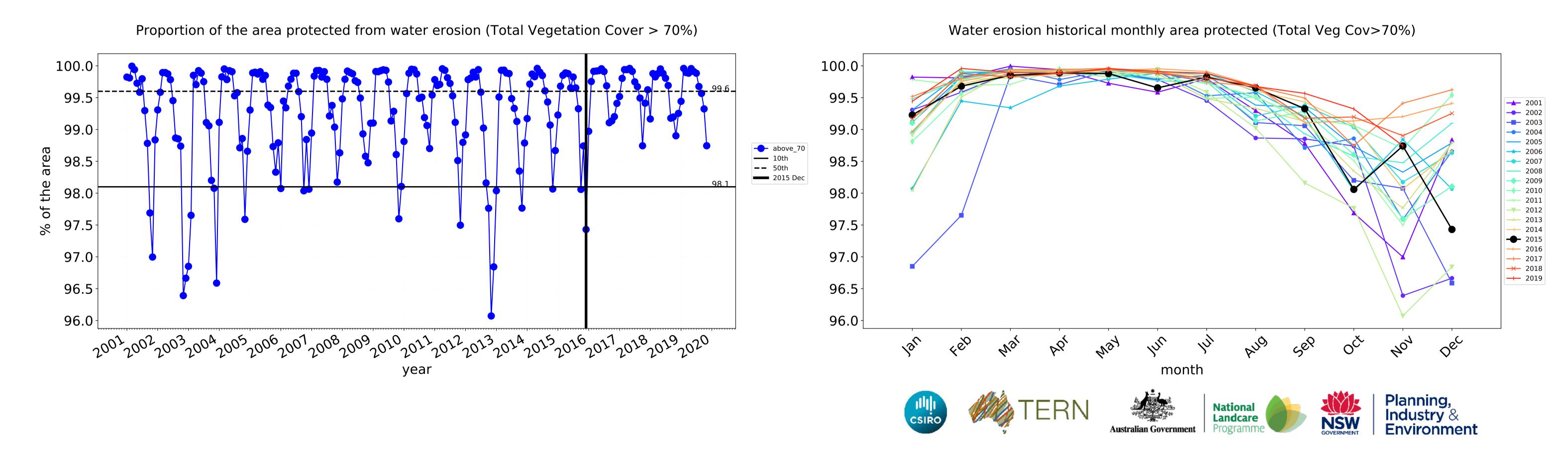


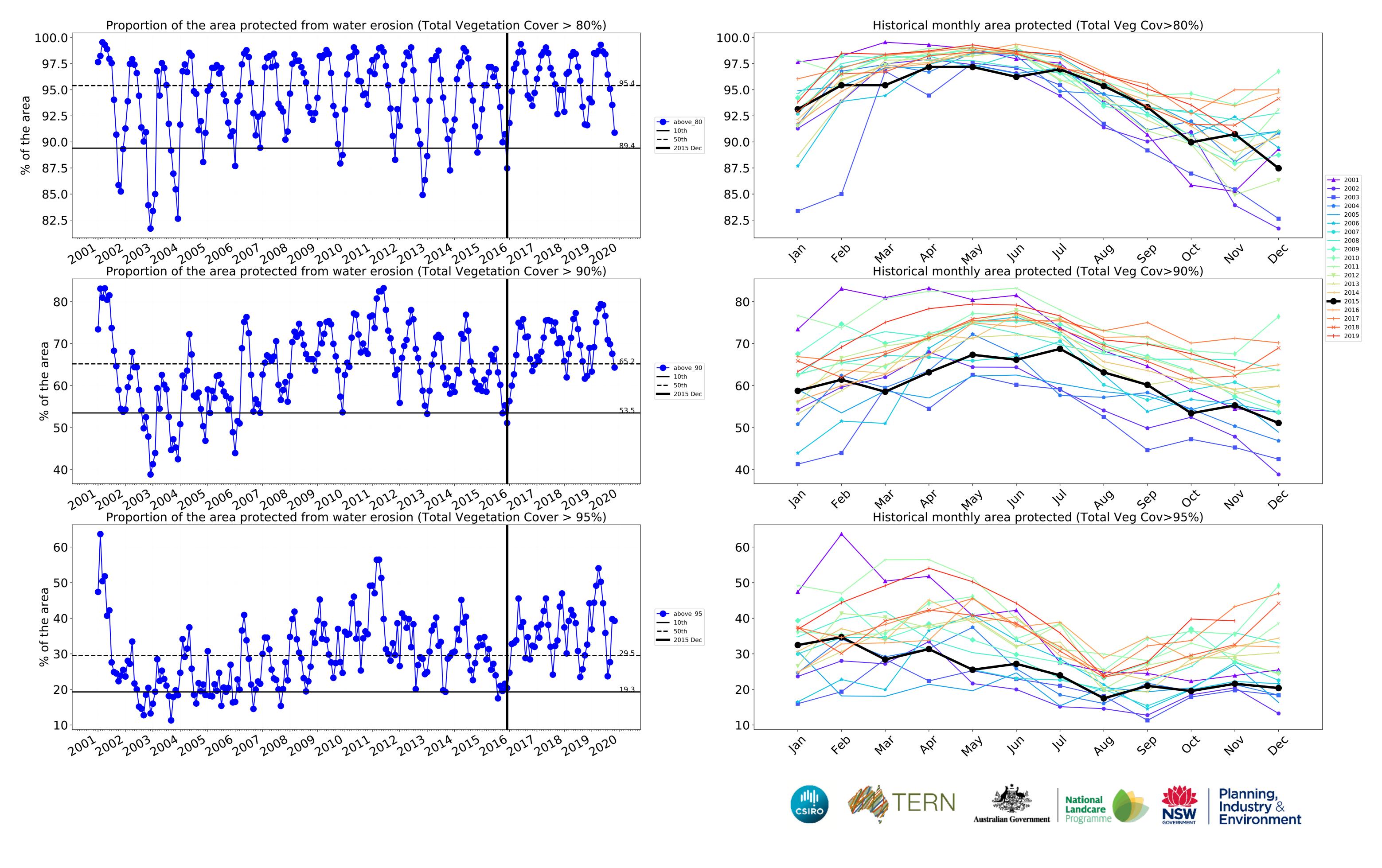




# **Agriculture timeseries**







# **Grazing**

#### Land use and forest cover

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

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

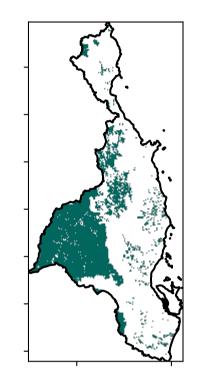
using baseline from 2001 to 2019.

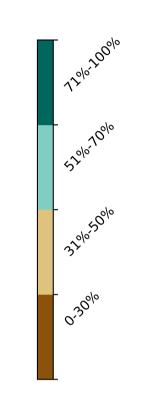
is only for the month of the map

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

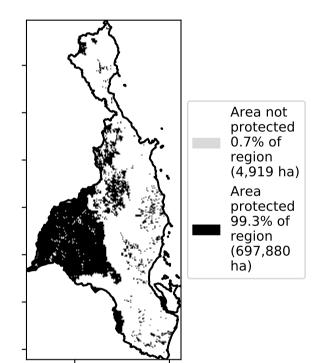
Catchment Scale

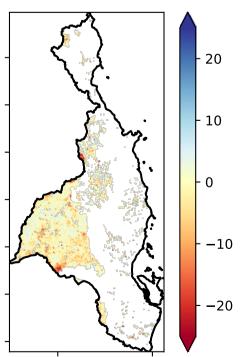
#### **Total Vegetation Cover [%]**





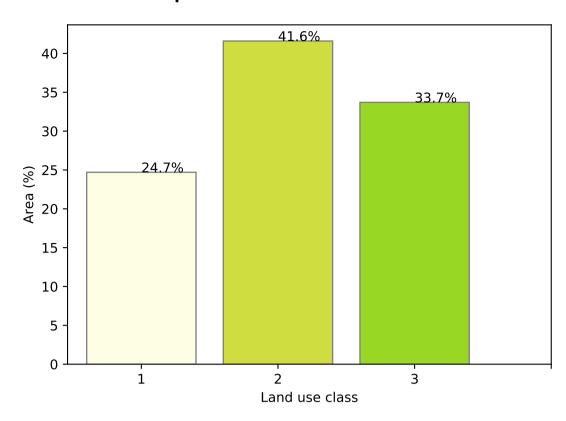
#### % Area protected from water erosion (>70%)



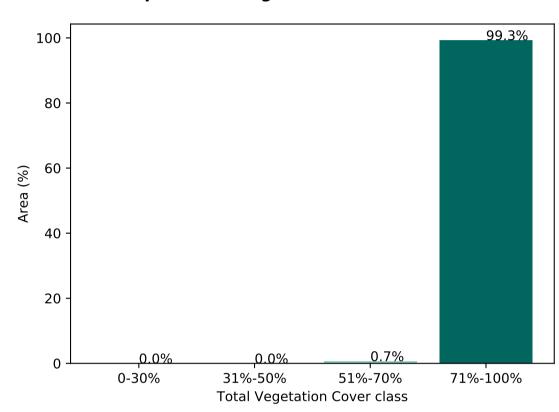


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

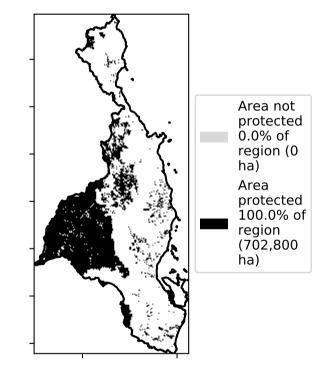
#### **Proportion of each land class in area**



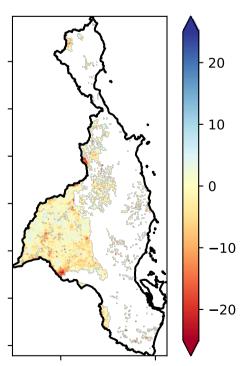
#### Proportion of vegetation cover class in area



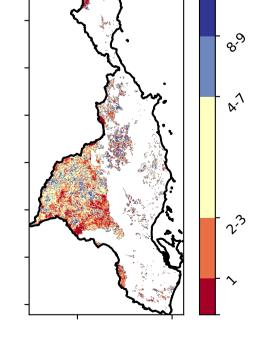
#### % Area protected from wind erosion (>50%)



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



Deciles show where the



**Total Vegetation Cover Decile [%]** 





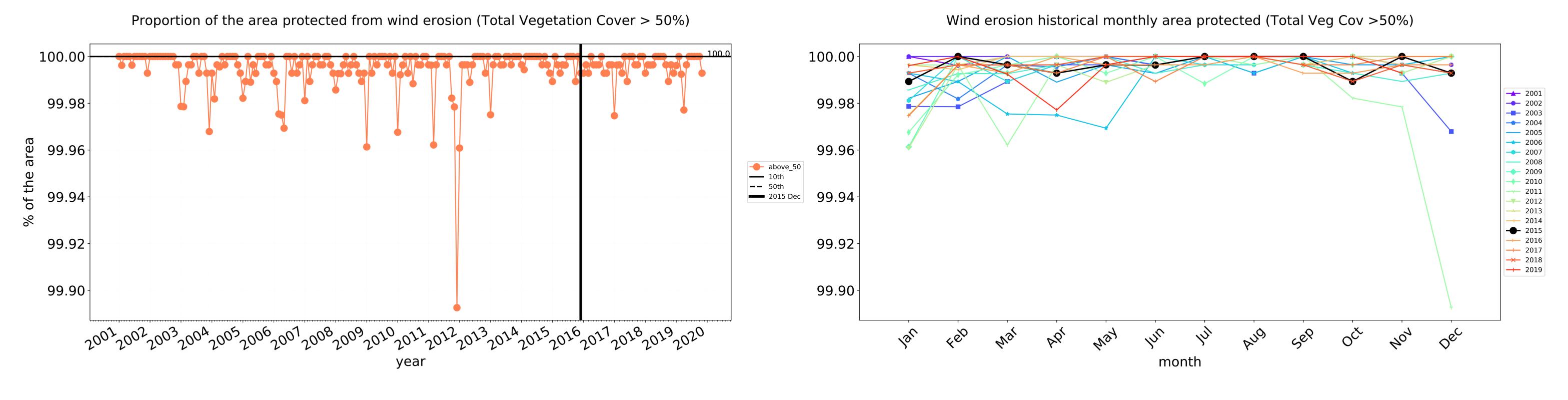


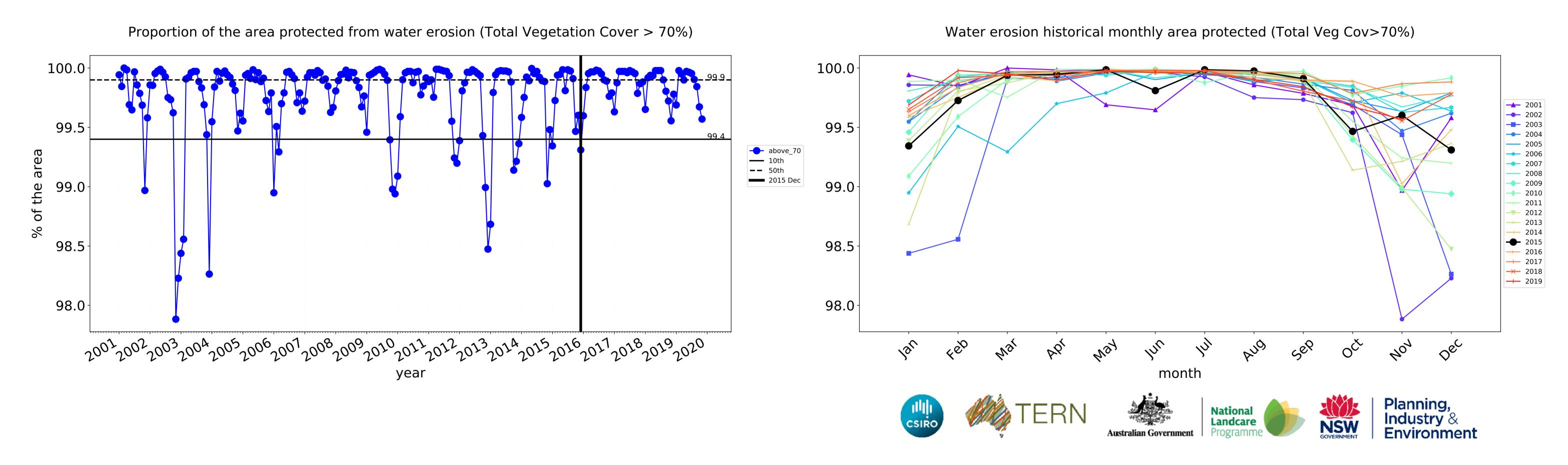


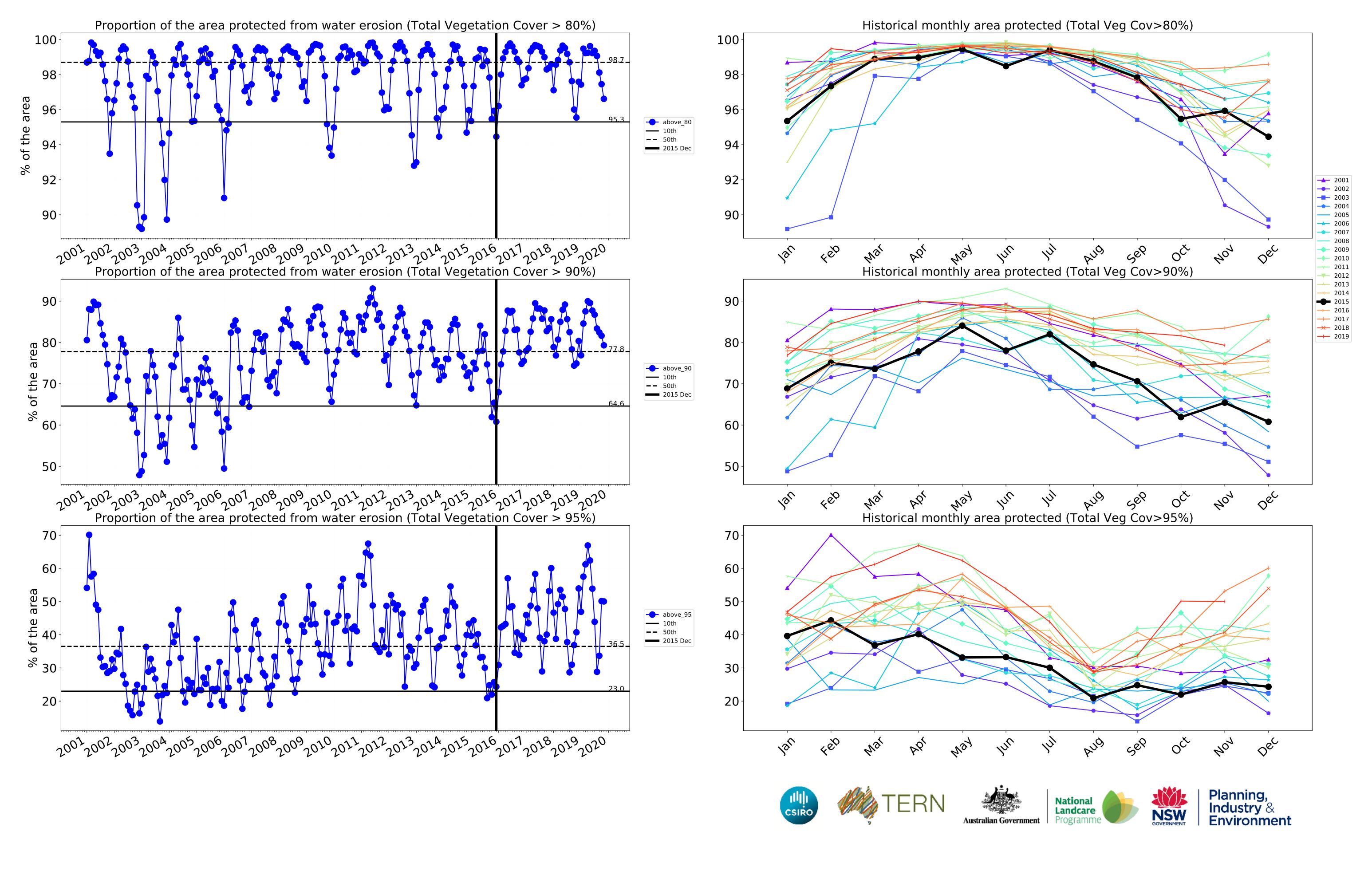




# **Grazing timeseries**







# **Grazing non forest**

#### Land use and forest cover

Catchment Scale 1 Agriculture - Grazing - Non forest

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

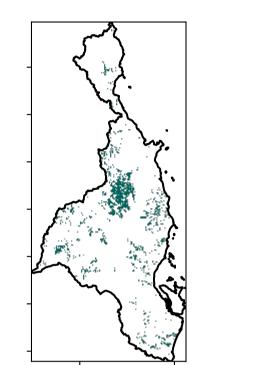
pixel is from the mean. That

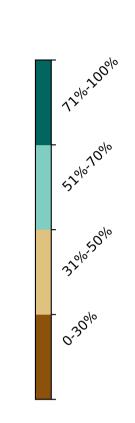
pixel. The mean

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

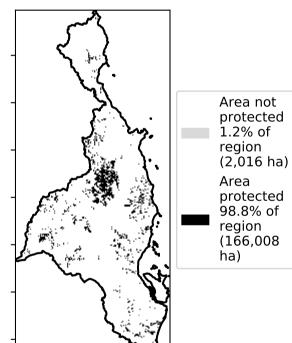
is, red pixels are about 20% lower than the mean of that

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



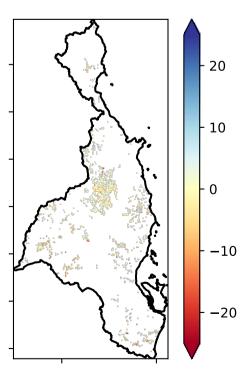


#### % Area protected from water erosion (>70%)



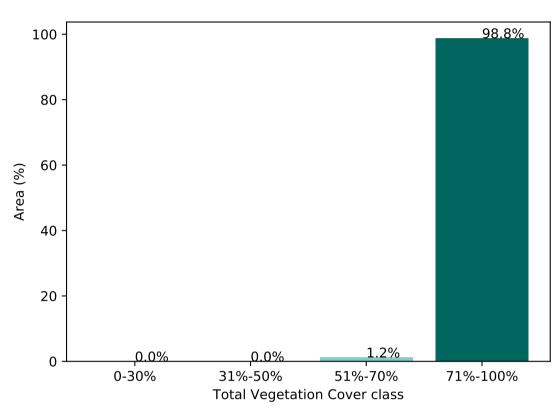
# Area not protected 1.2% of region (2,016 ha)

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

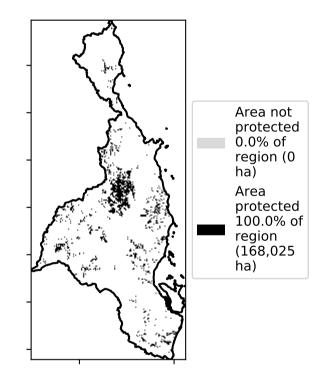


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

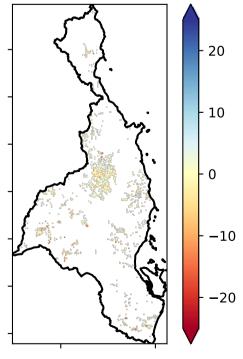
#### Proportion of vegetation cover class in area

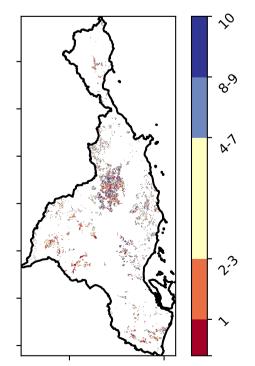


#### % Area protected from wind erosion (>50%)



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









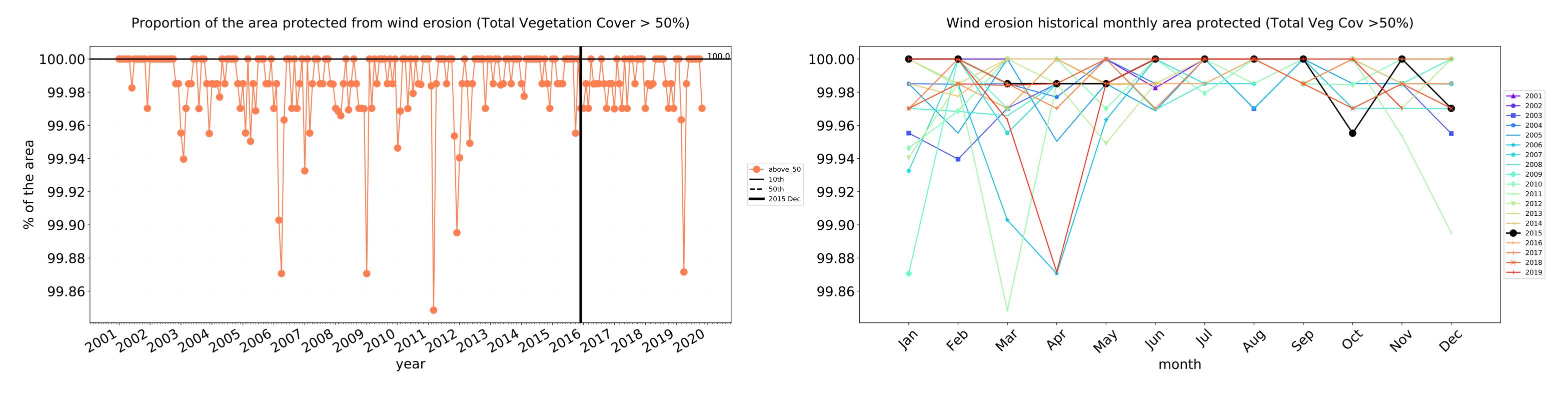


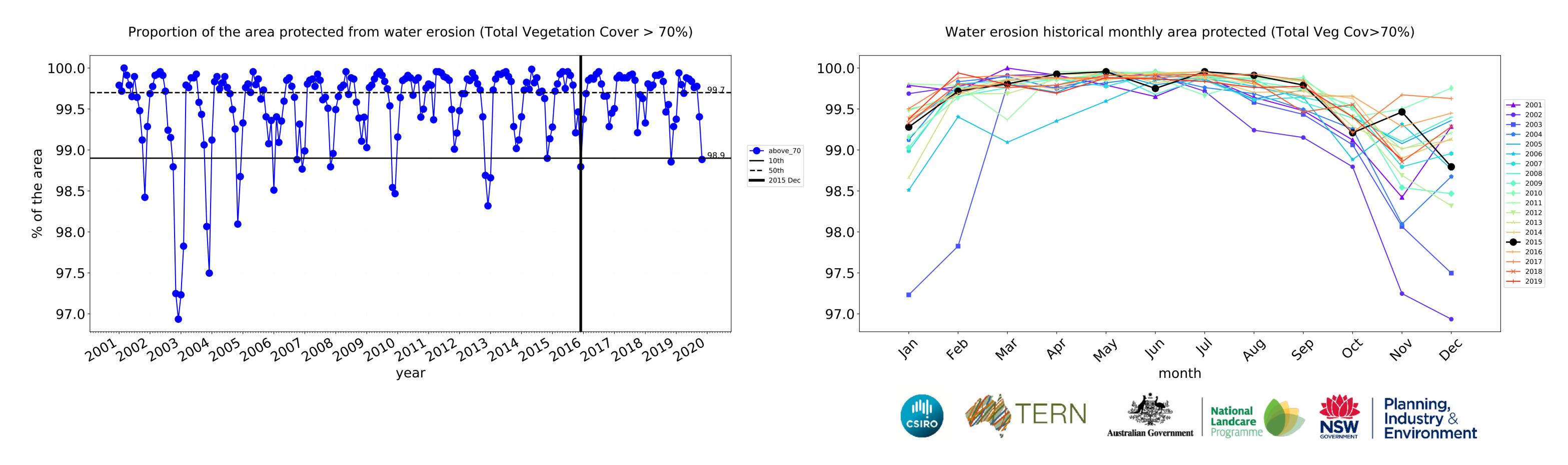


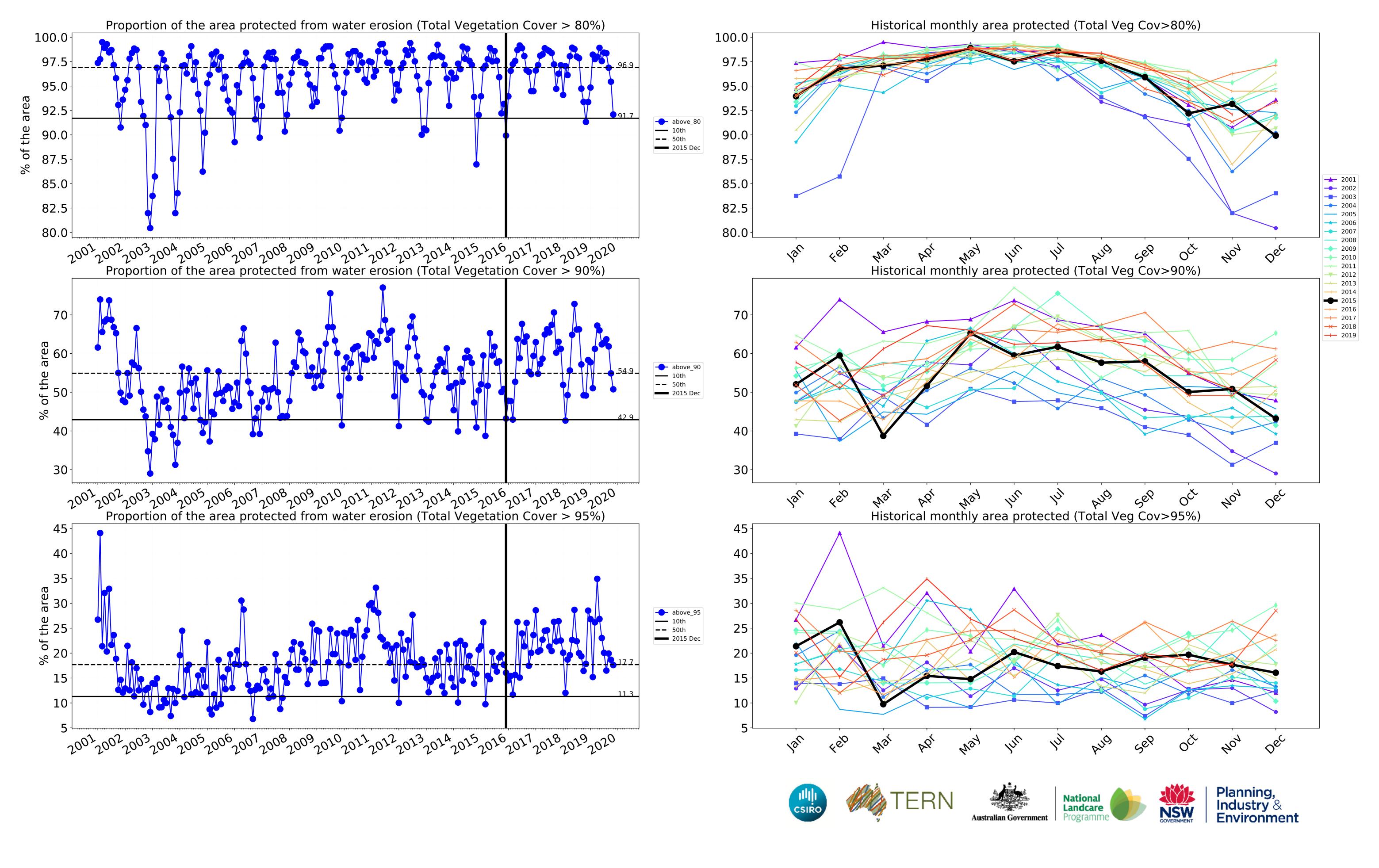




# **Grazing non forest timeseries**







# **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

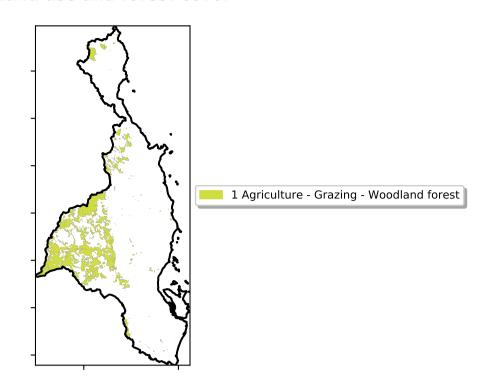
pixel is from the mean. That

pixel. The mean

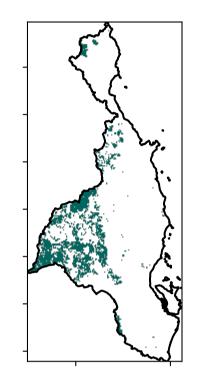
using baseline from 2001 to 2019.

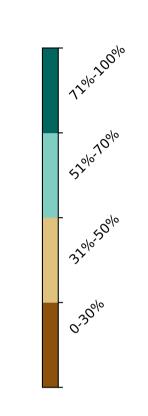
is only for the month of the map

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

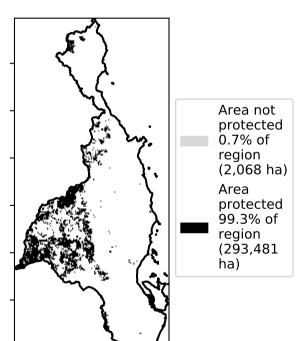


#### **Total Vegetation Cover [%]**

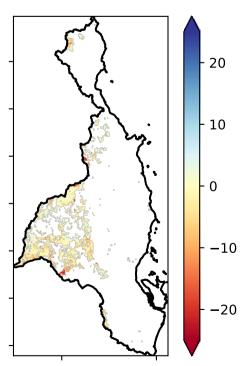




% Area protected from water erosion (>70%)

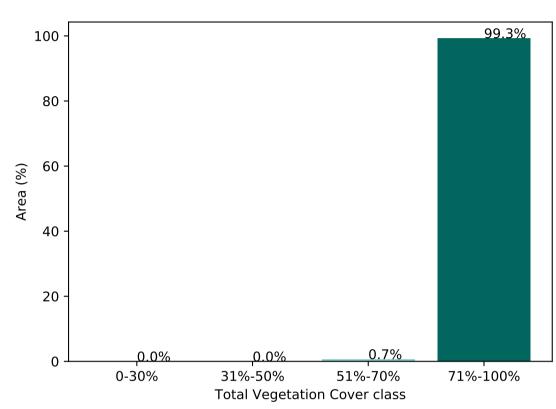


#### **Total Vegetation Cover Anomaly [%]**

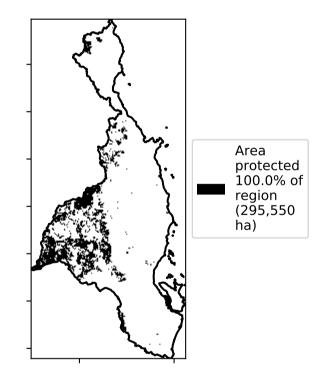


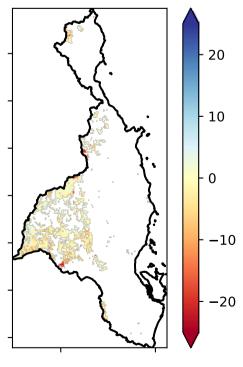
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area

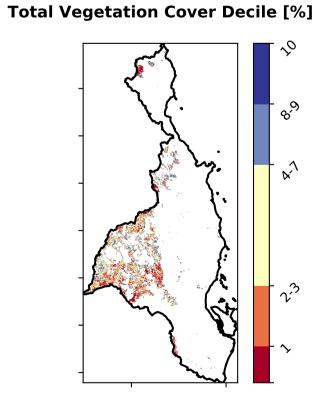


#### % Area protected from wind erosion (>50%)





records for that month of







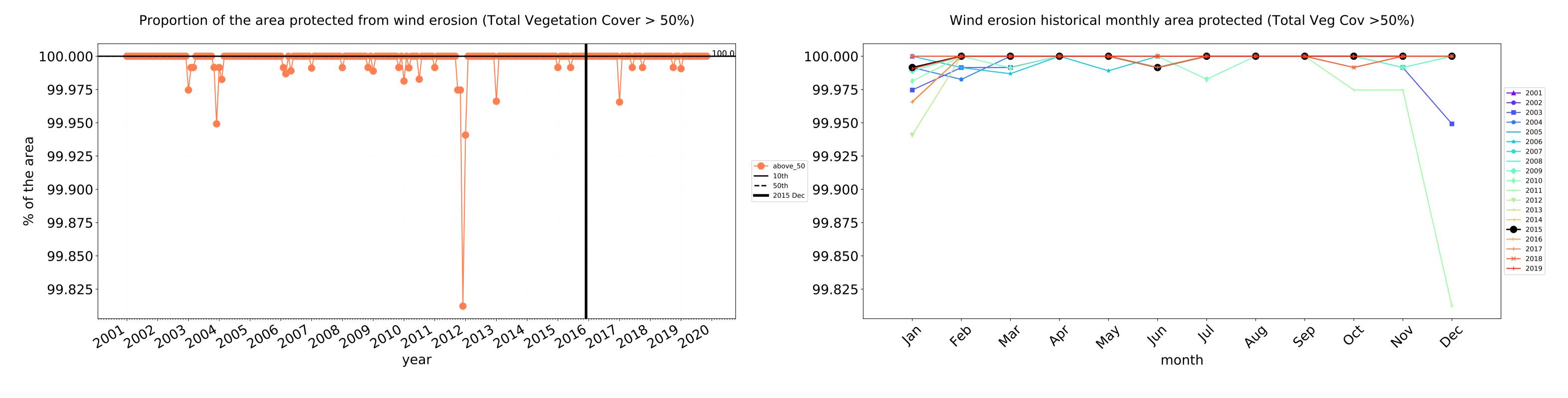


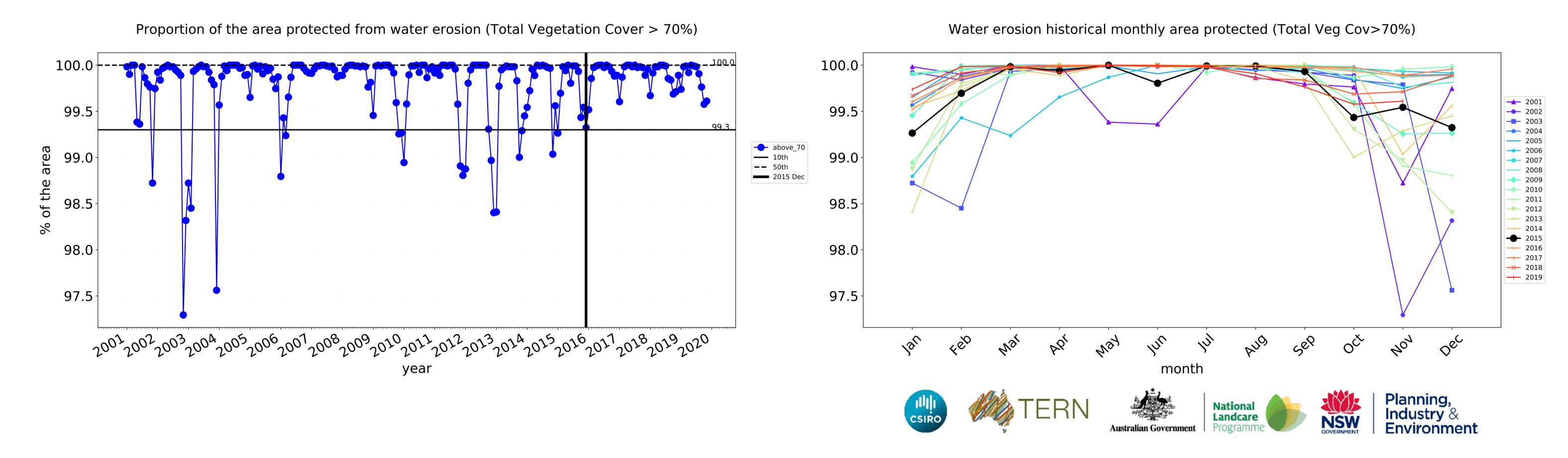


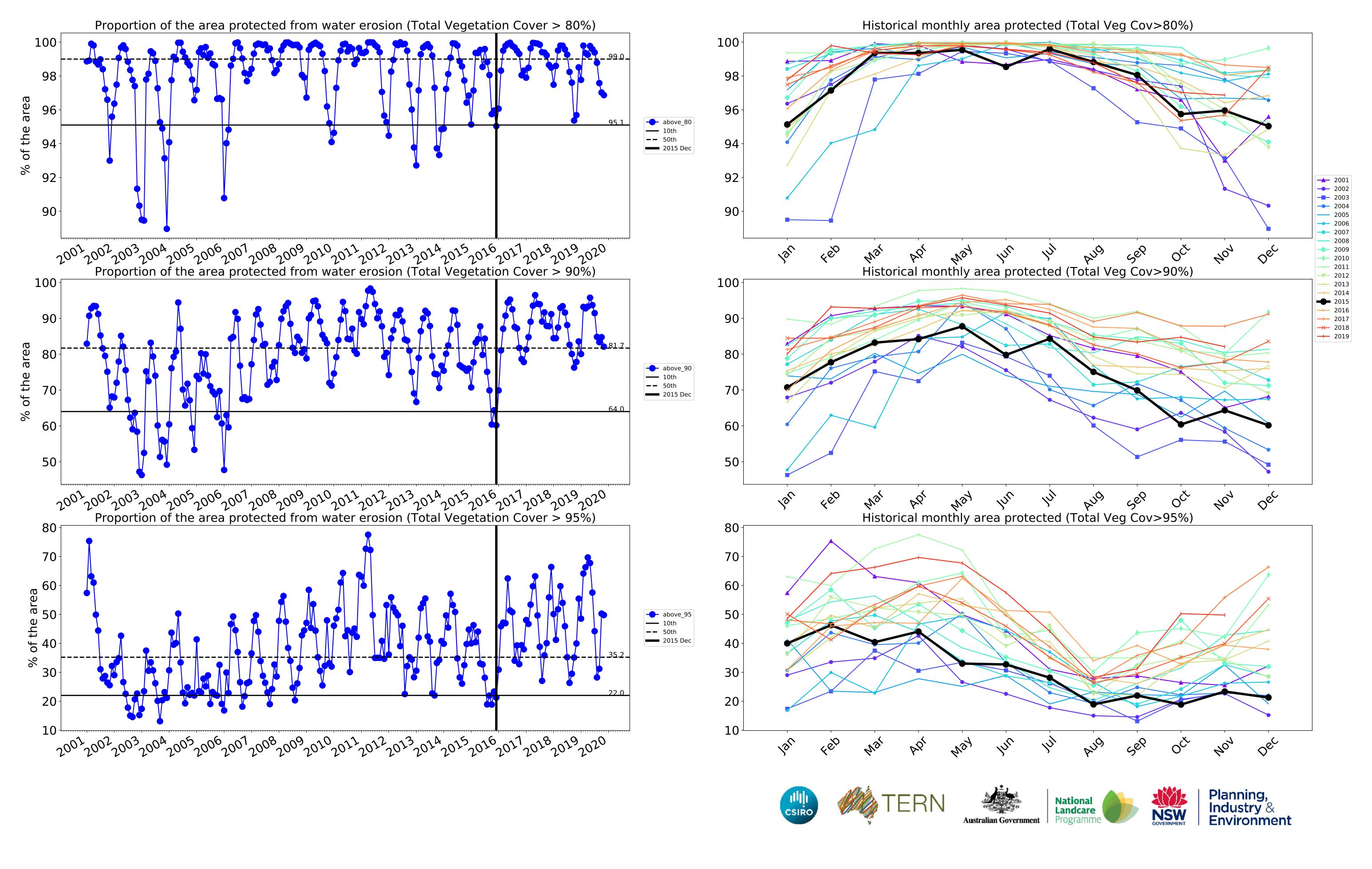




# **Grazing Woodland forest timeseries**







# **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

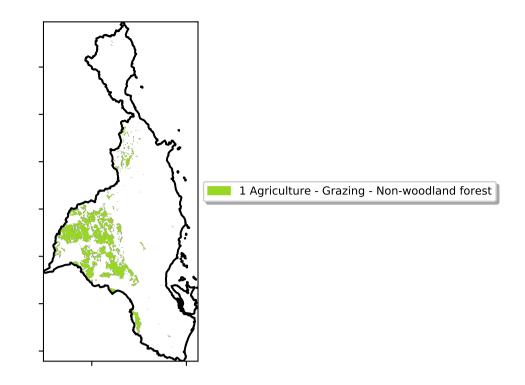
pixel is from the mean. That

pixel. The mean

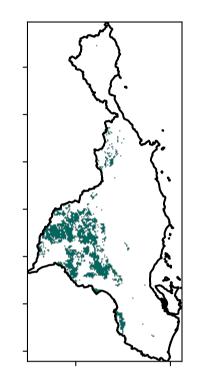
using baseline from 2001 to 2019.

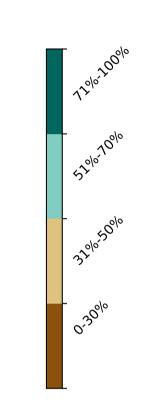
is only for the month of the map

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

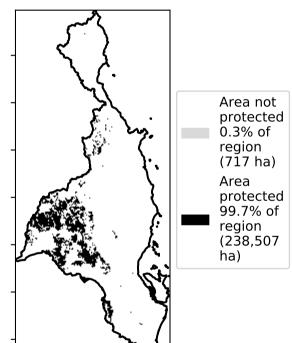


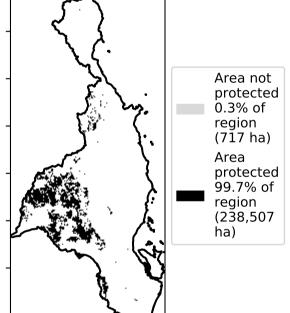
#### **Total Vegetation Cover [%]**



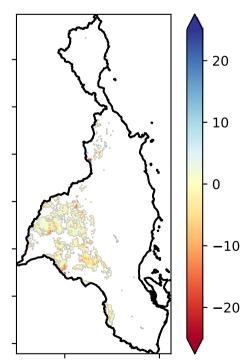


#### % Area protected from water erosion (>70%)



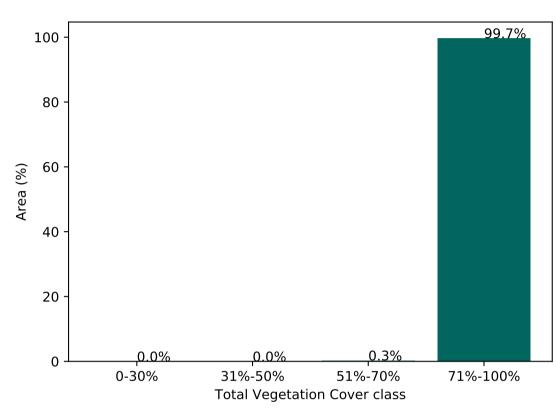


#### **Total Vegetation Cover Anomaly [%]**

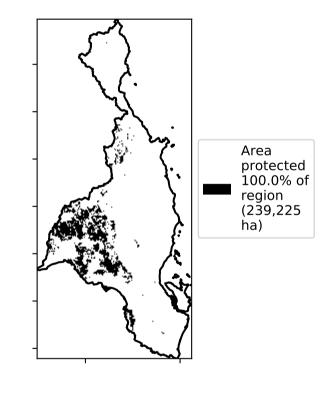


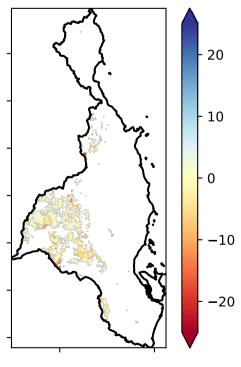
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

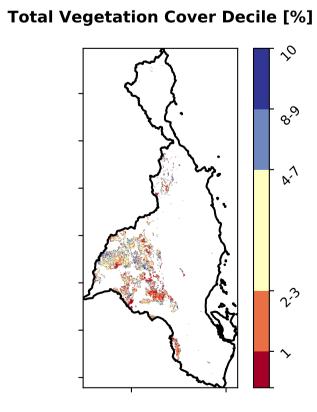
#### Proportion of vegetation cover class in area



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









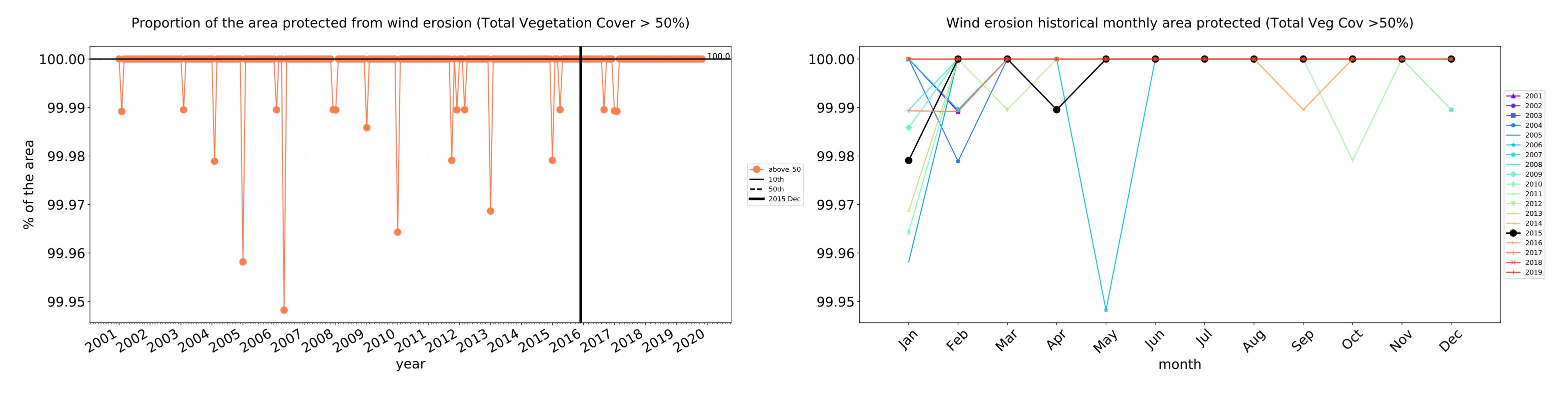


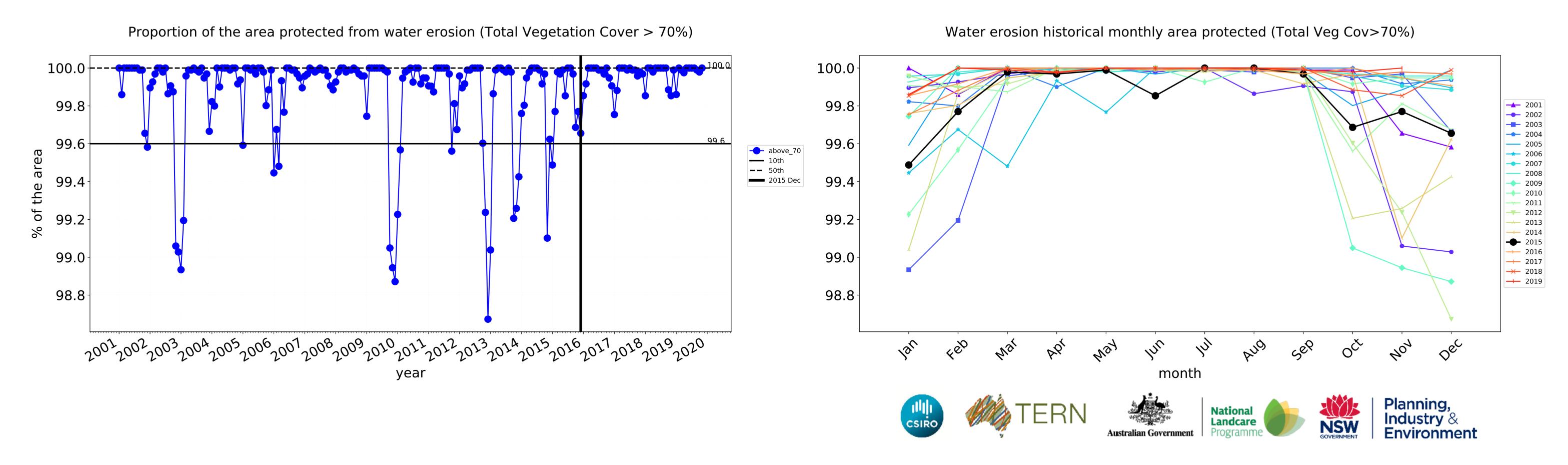


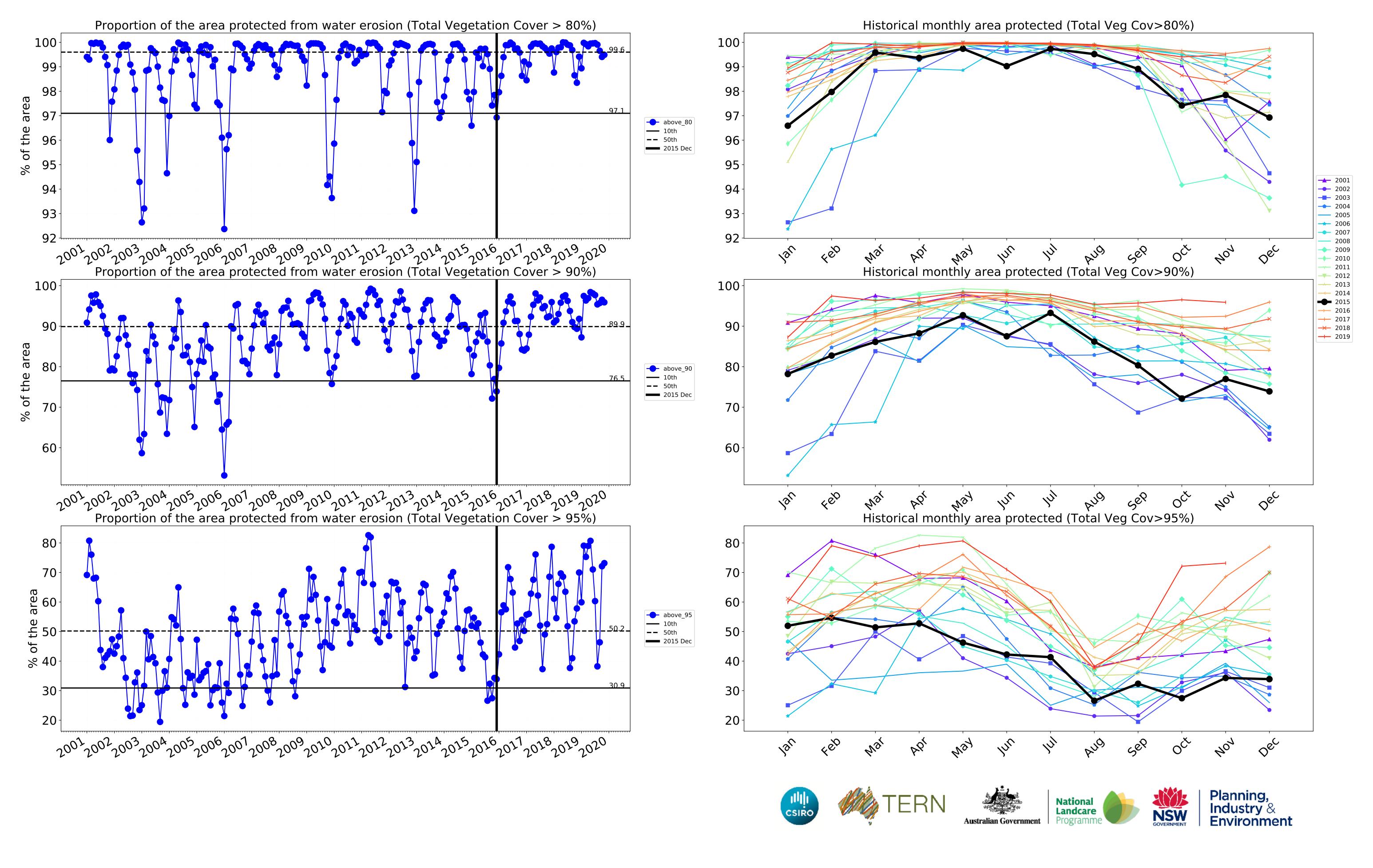












# **Cropping**

#### 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)

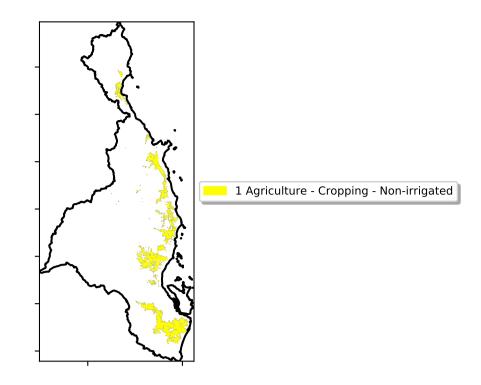
Anomaly show how many percetage points each

pixel is from the mean. That

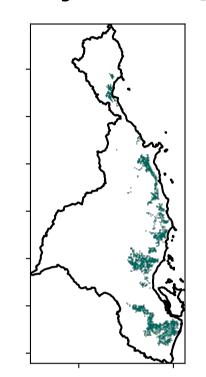
pixel. The mean

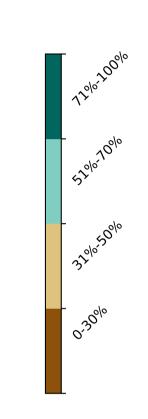
is only for the month of the map using baseline from 2001 to 2019.

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

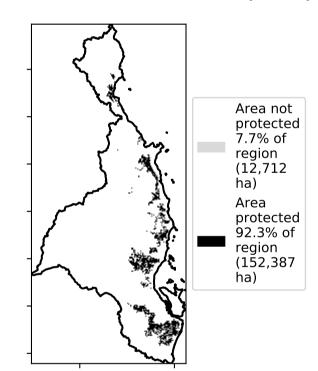


#### **Total Vegetation Cover [%]**

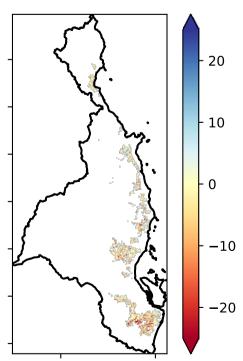




# % Area protected from water erosion (>70%)

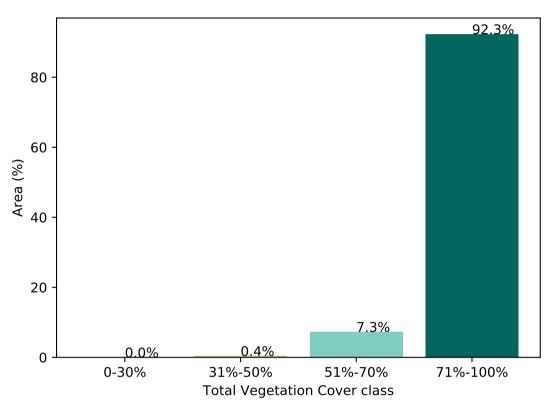


#### **Total Vegetation Cover Anomaly [%]**

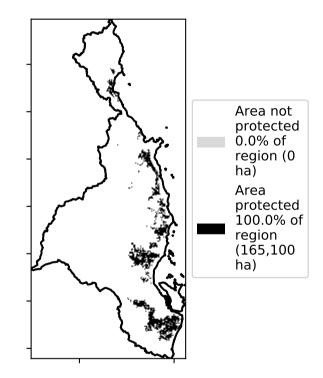


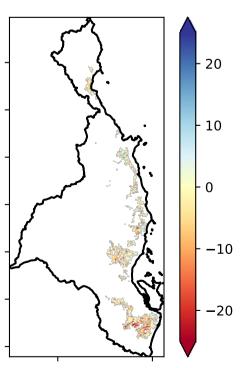
pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area

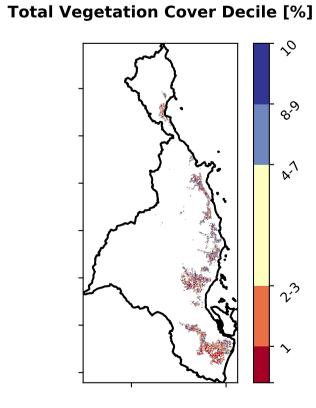


#### % Area protected from wind erosion (>50%)





Deciles show where the







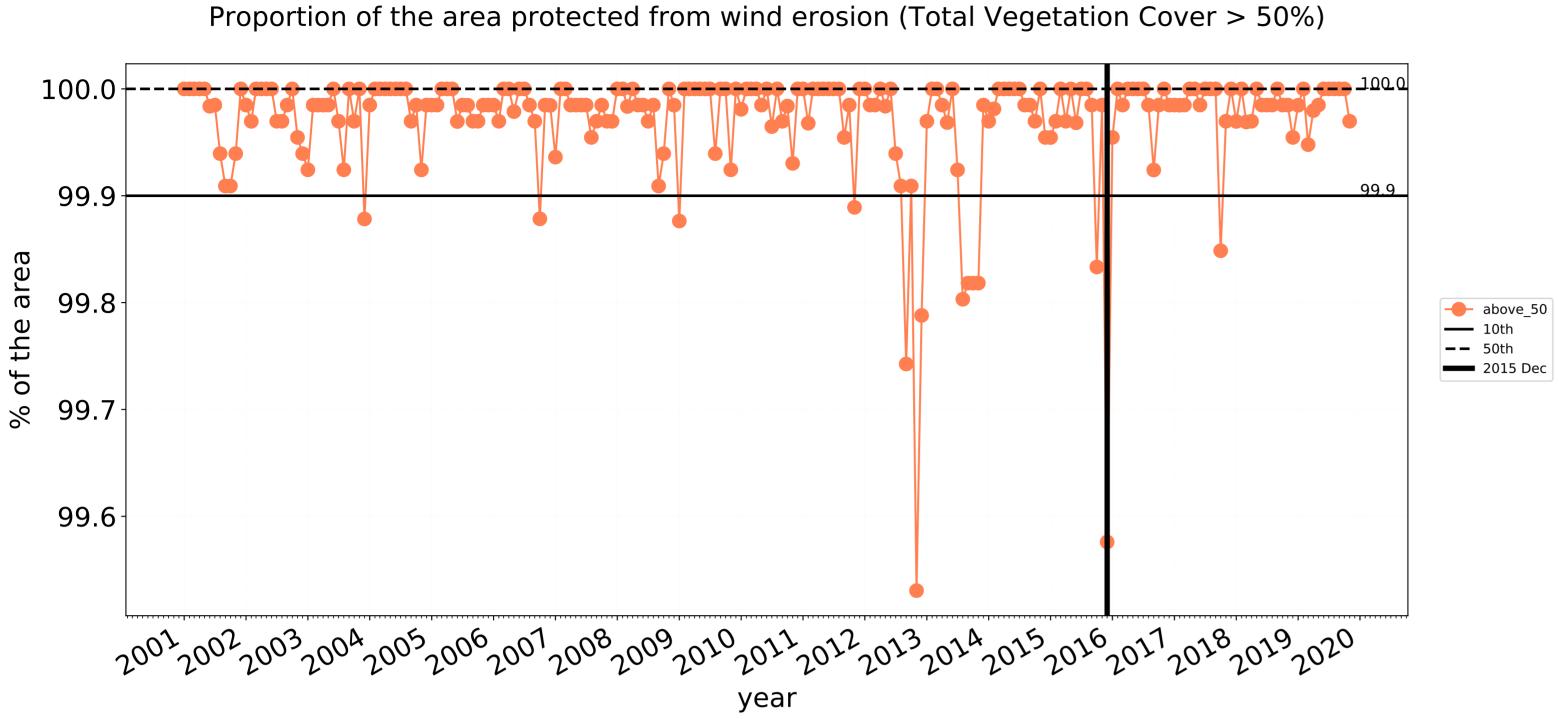


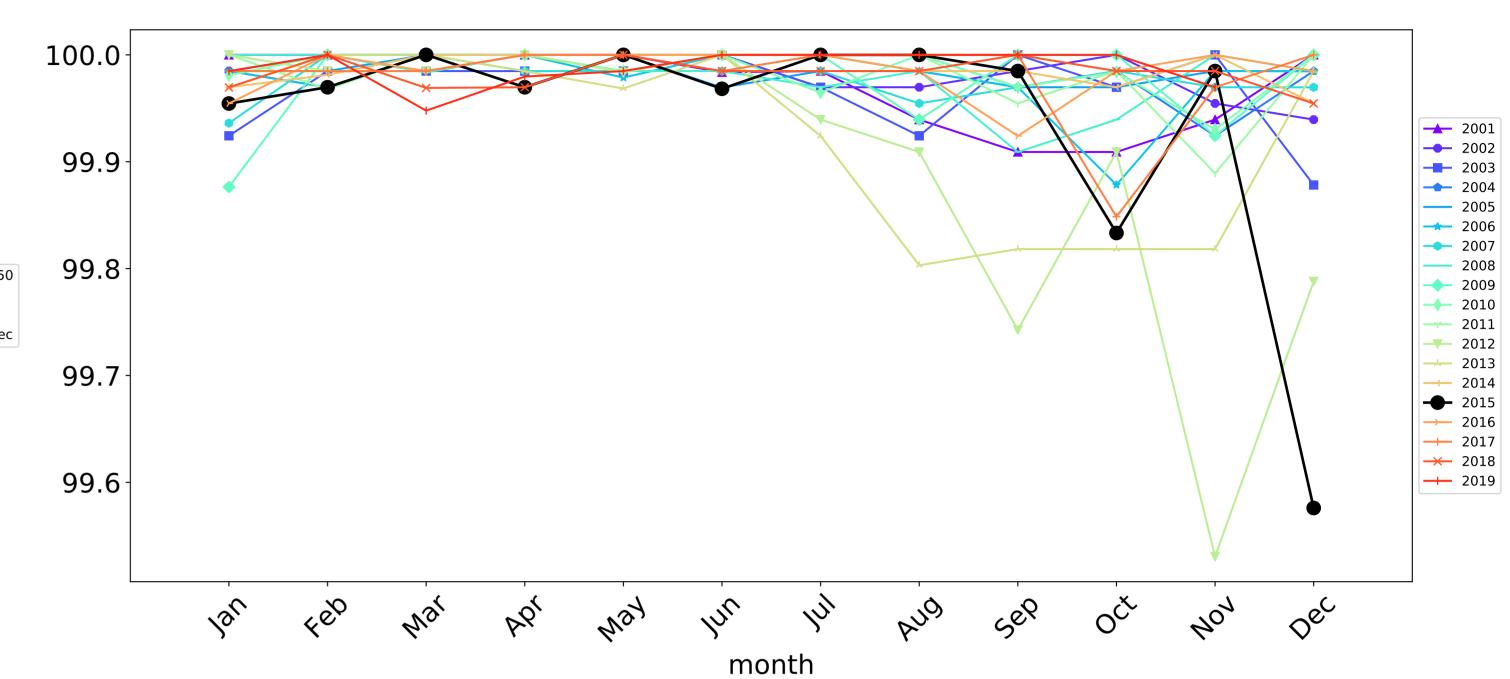




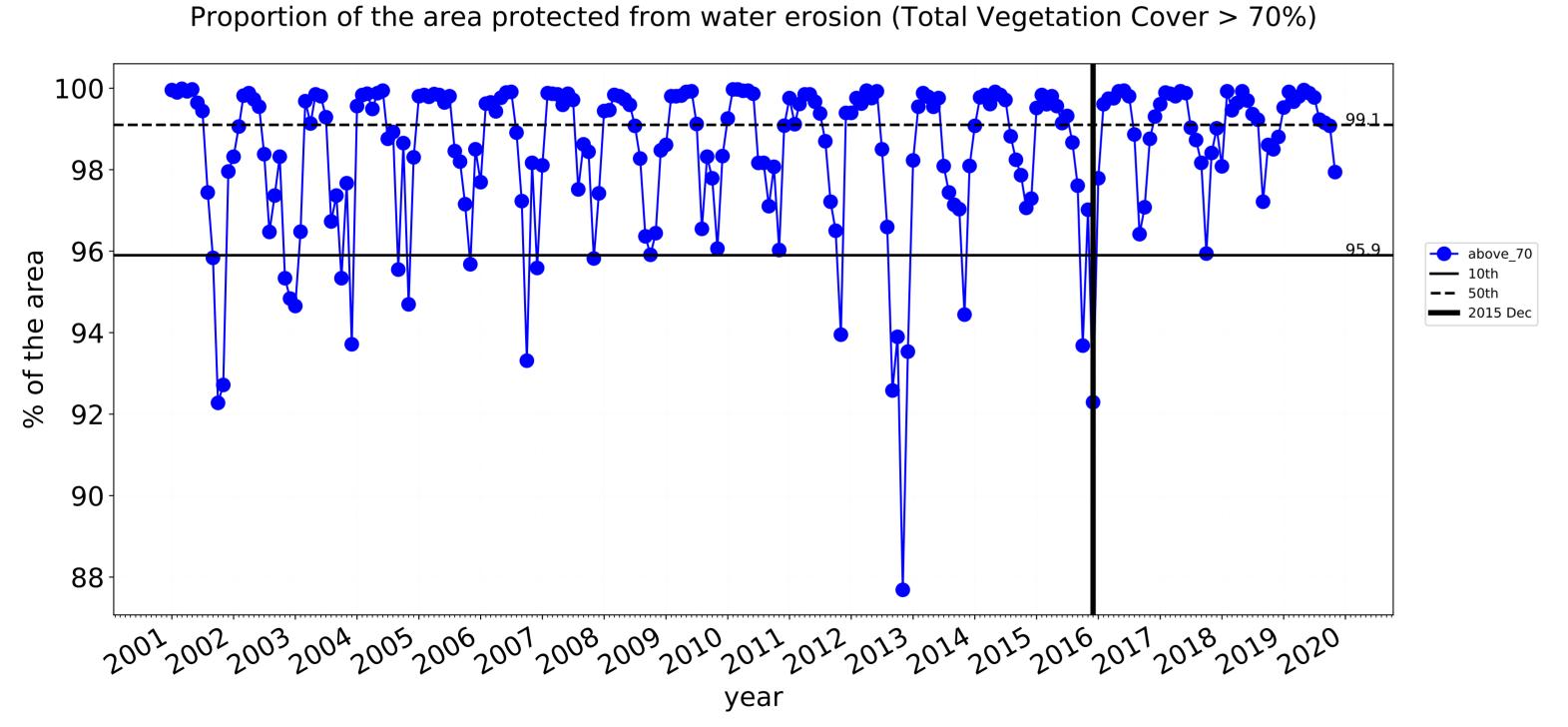


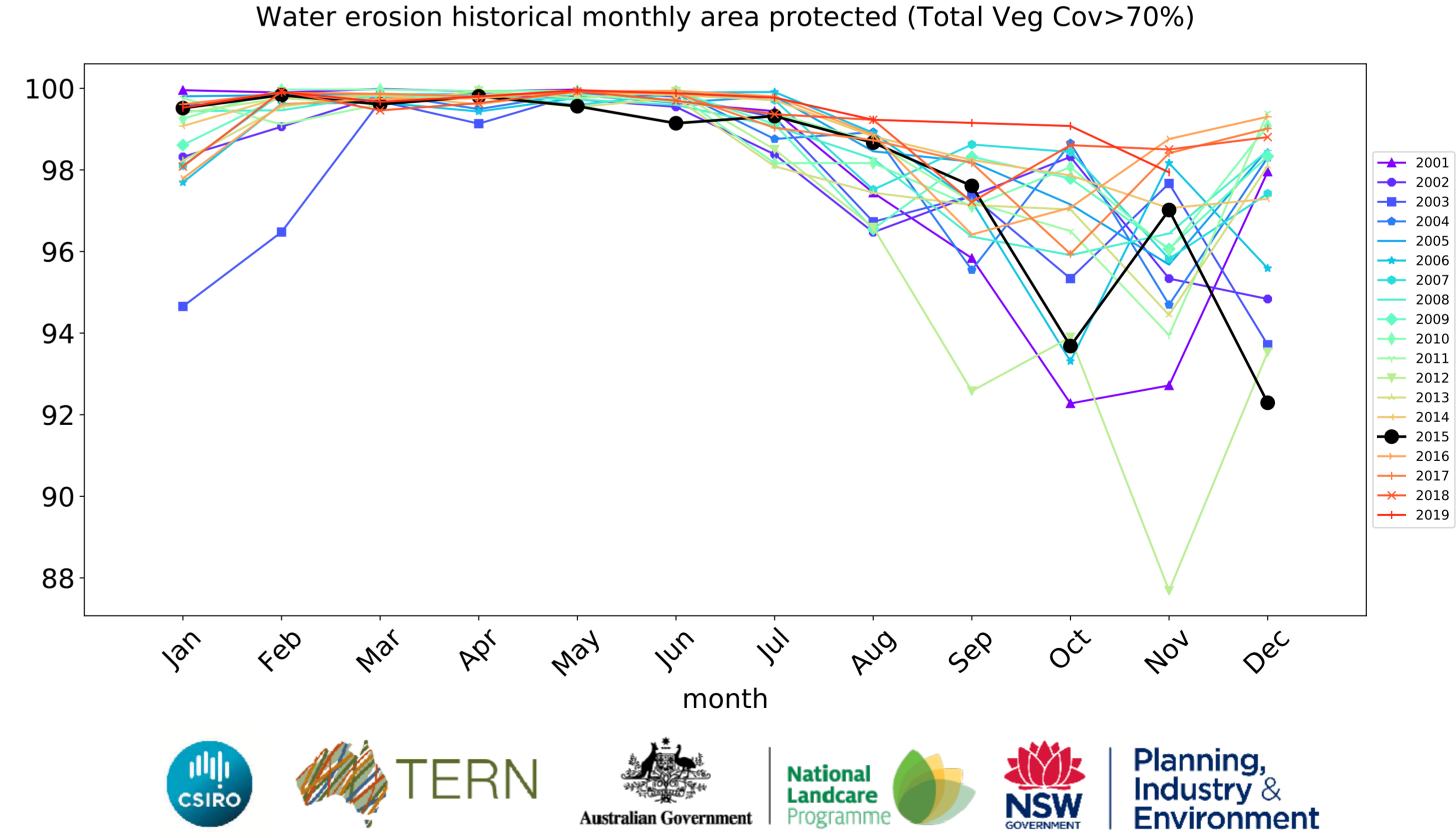
# **Cropping timeseries**

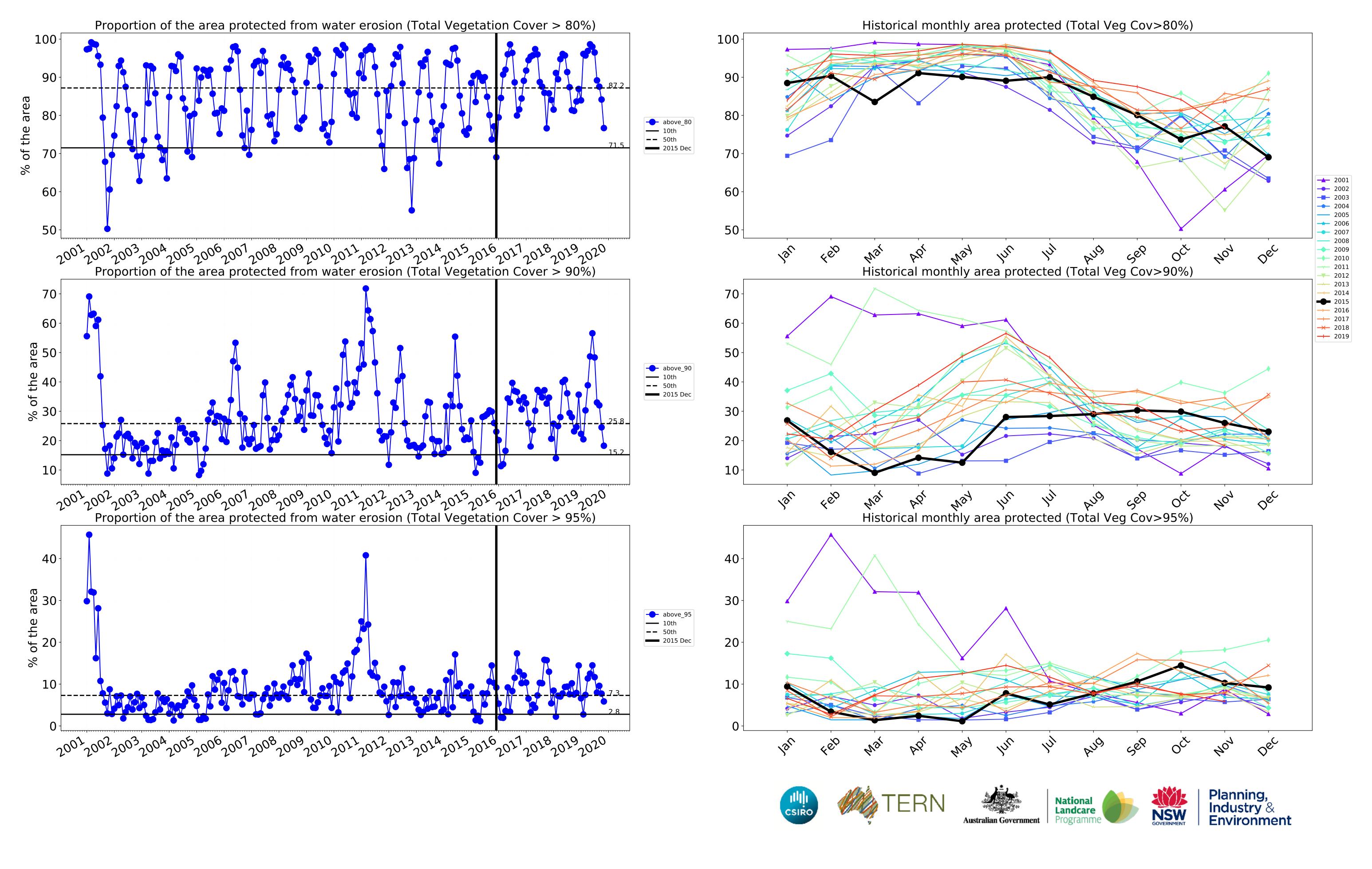




Wind erosion historical monthly area protected (Total Veg Cov >50%)



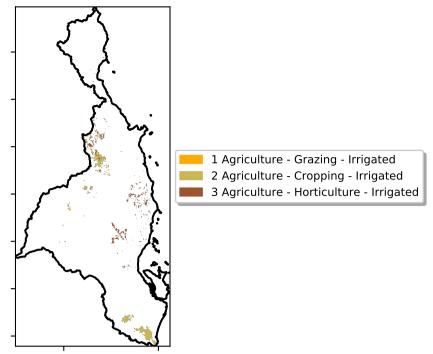


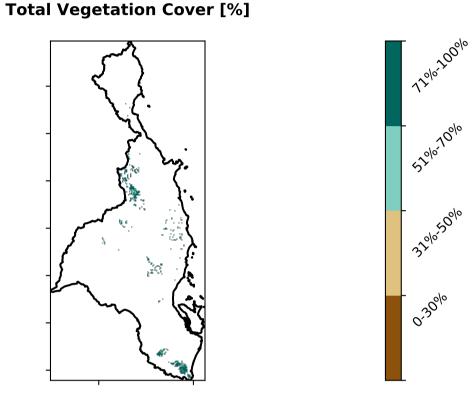


# **Irrigation**

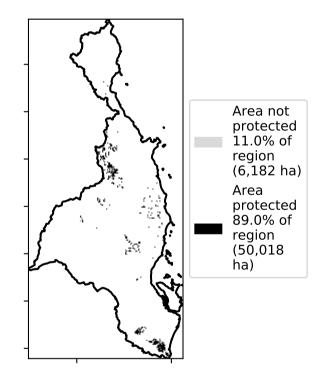
#### Land use and forest cover

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





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





Anomaly show how many percetage points each

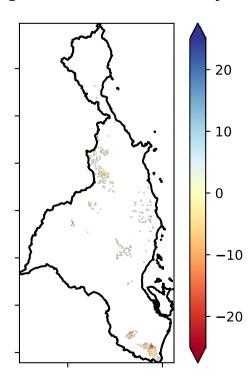
pixel is from the mean. That

pixel. The mean

using baseline from 2001 to 2019.

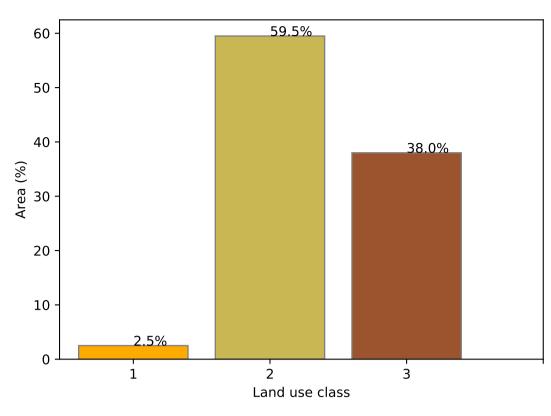
is only for the month of the map

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

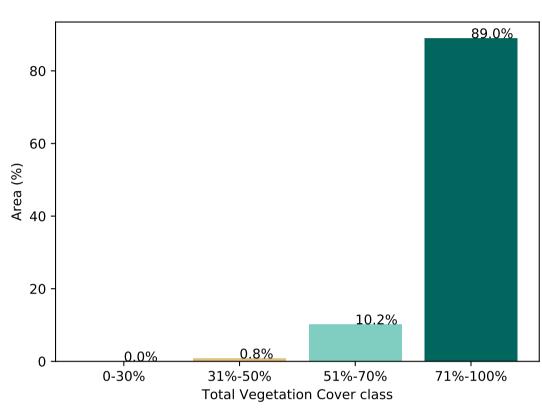


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

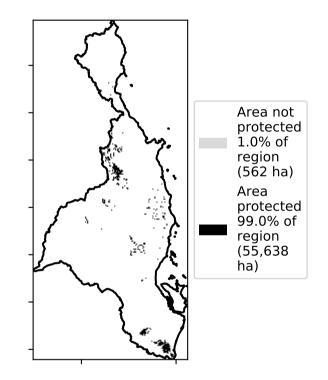
#### **Proportion of each land class in area**



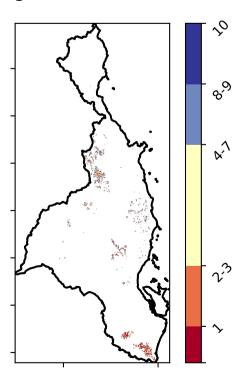
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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







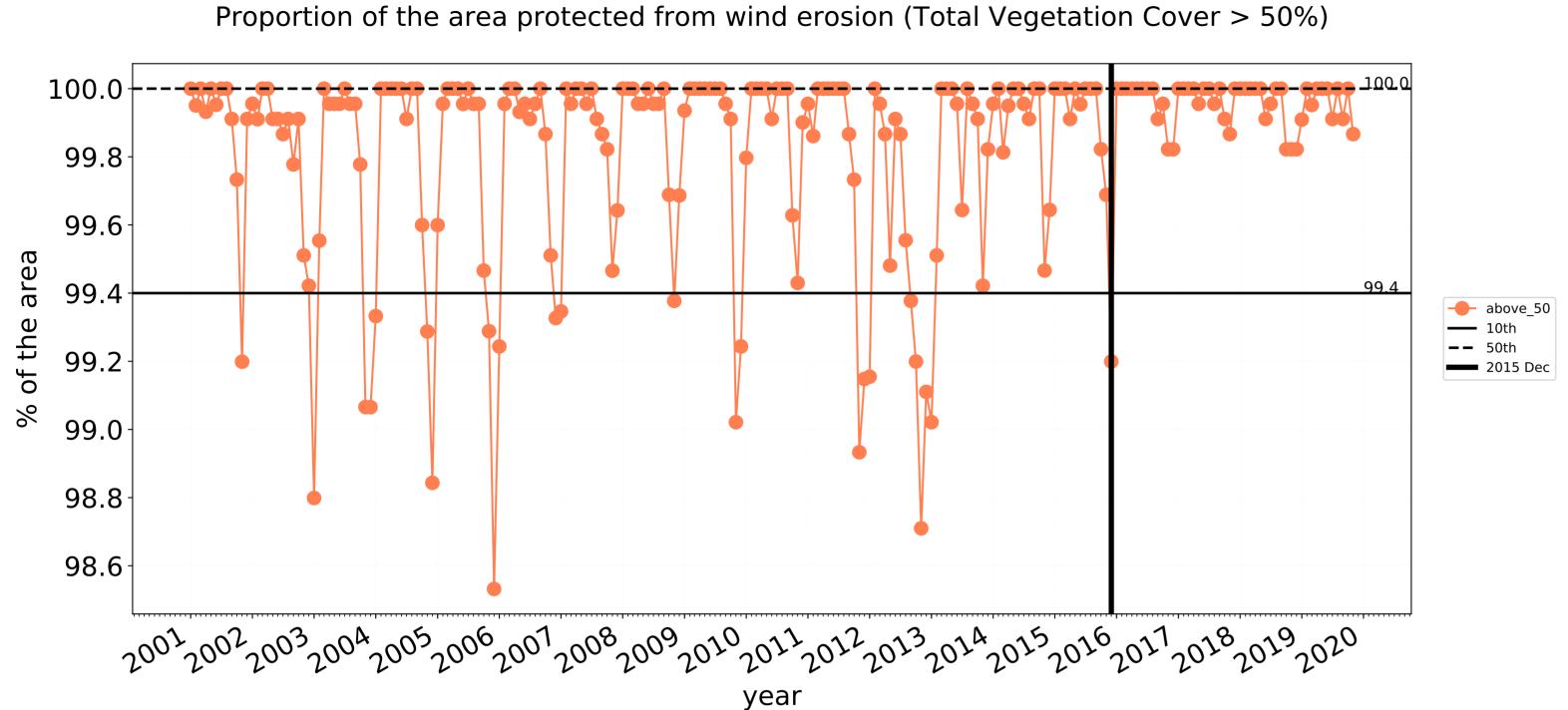


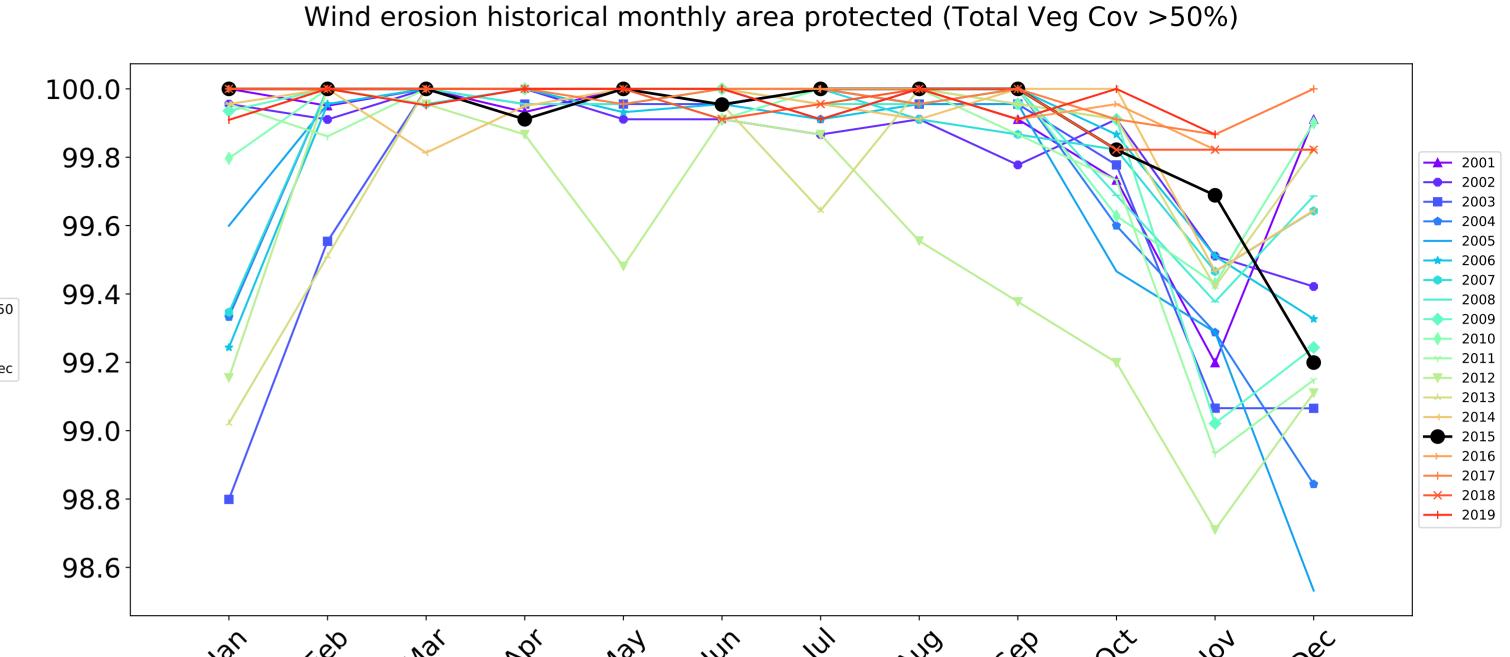




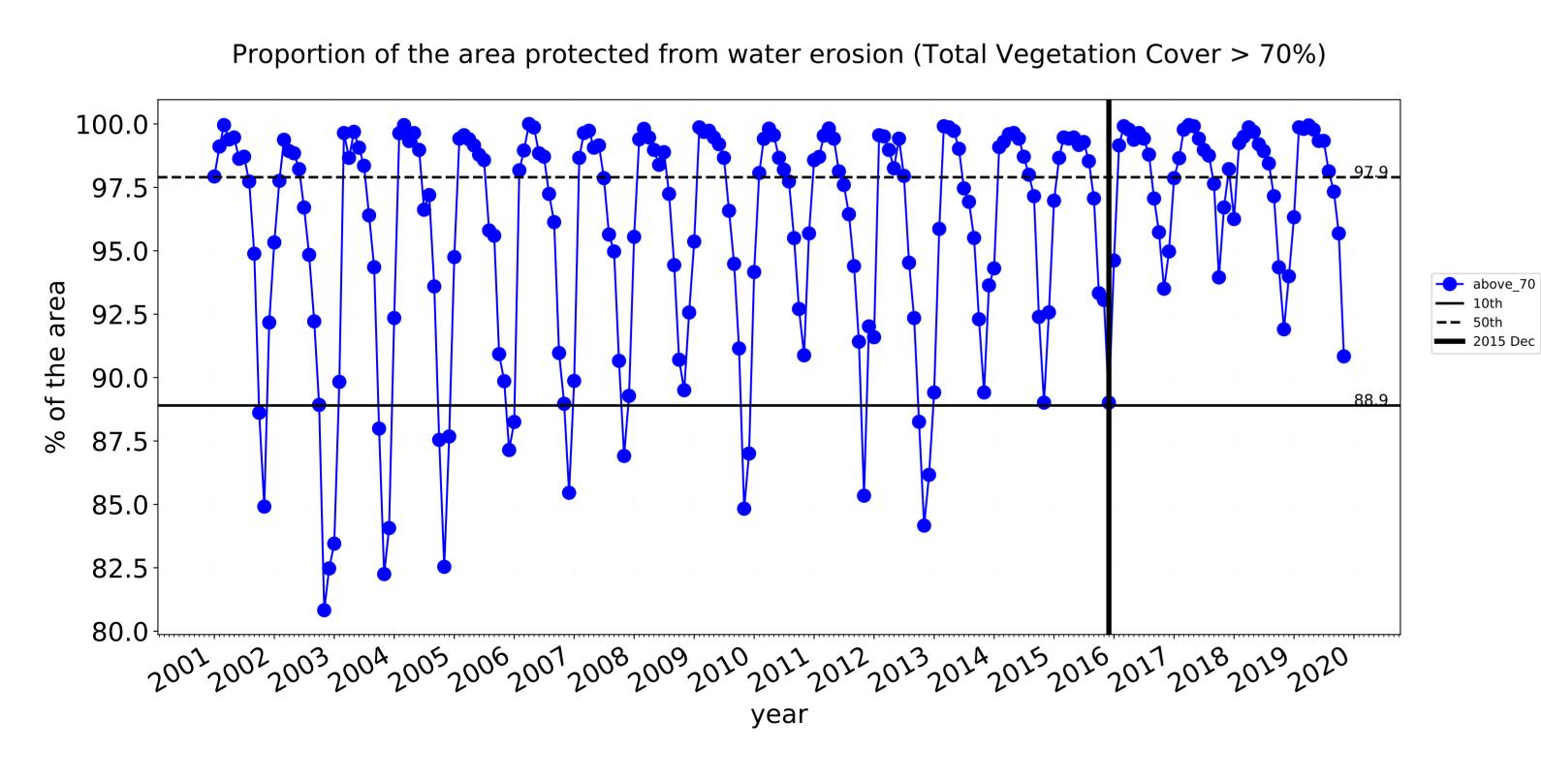


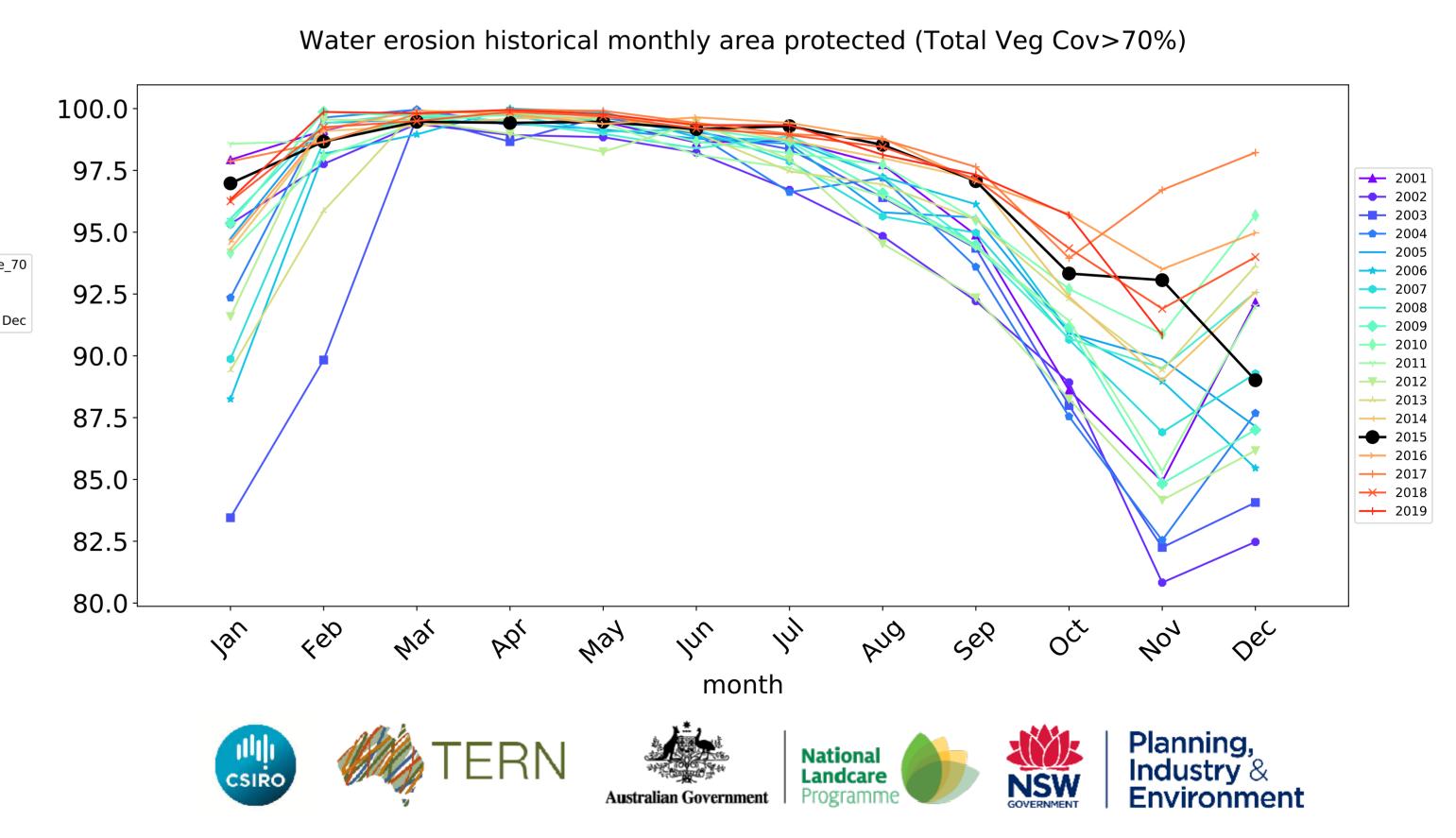
# **Irrigation timeseries**

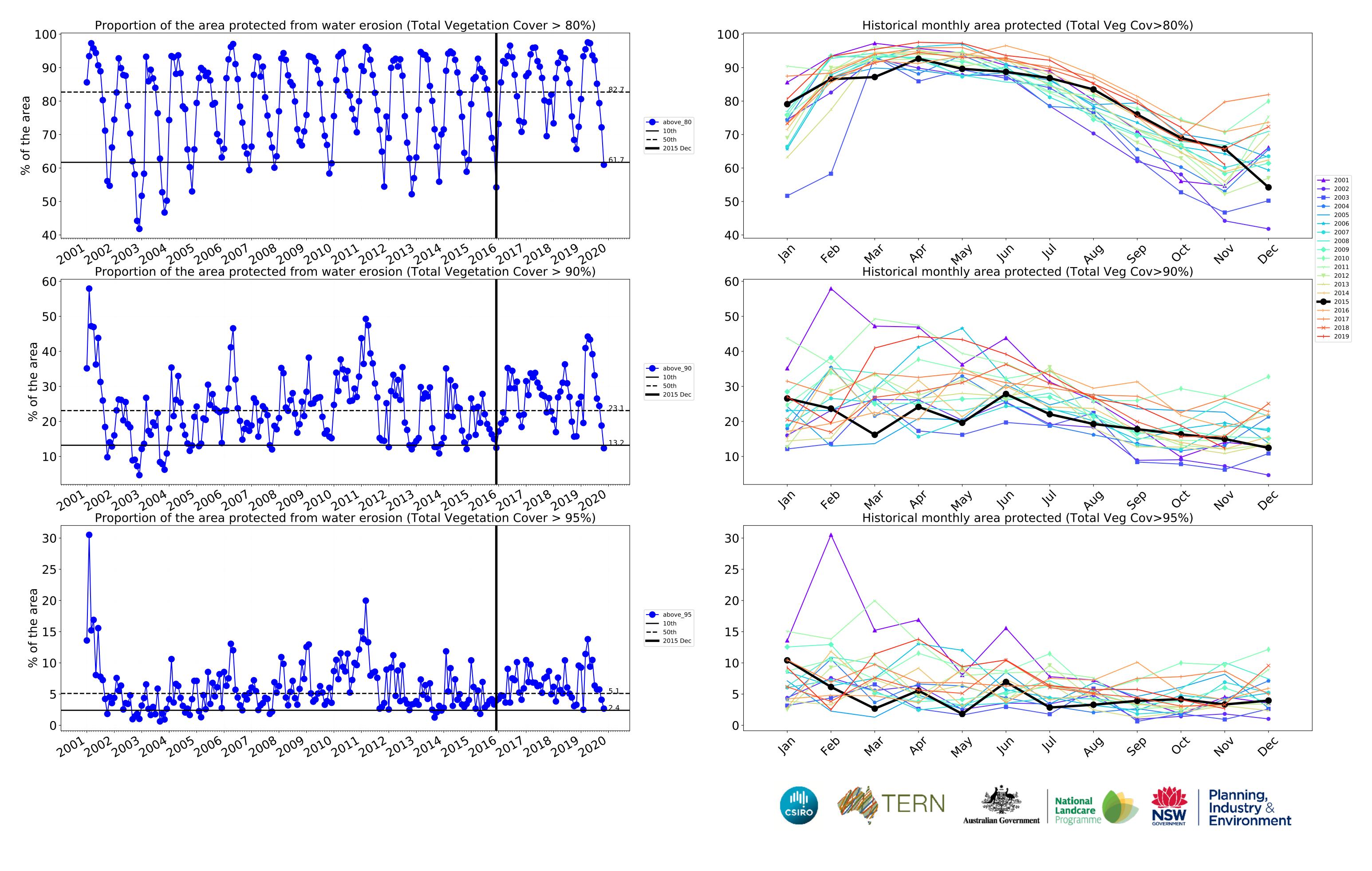




month



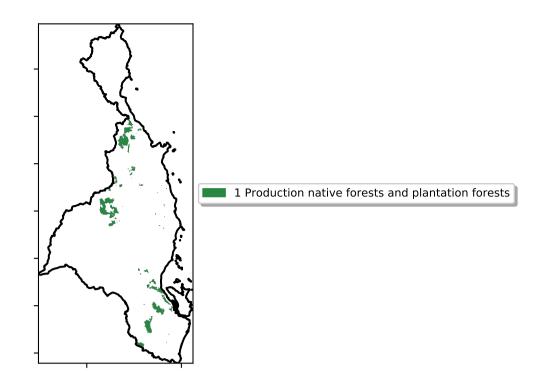




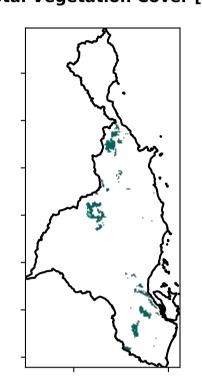
# **Production native forests and plantation forests**

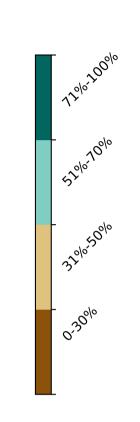
#### Land use and forest cover

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

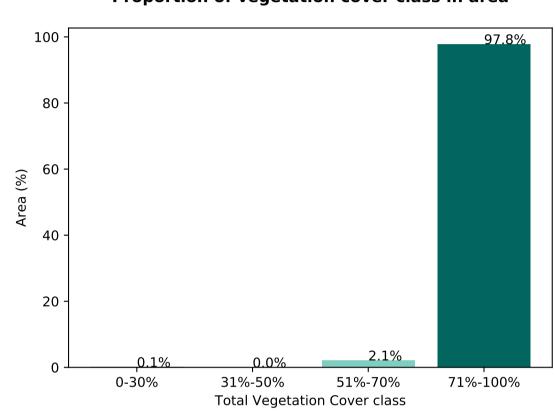


#### **Total Vegetation Cover [%]**

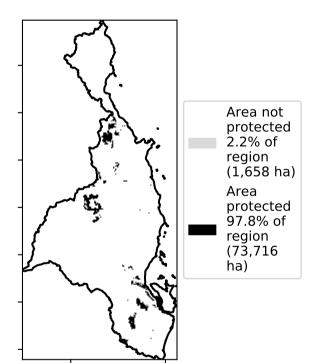




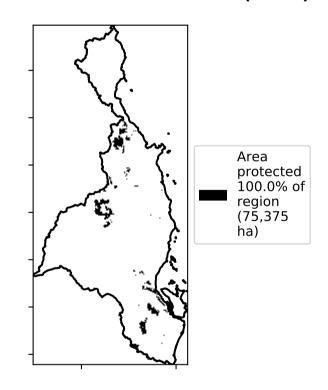
#### Proportion of vegetation cover class in area



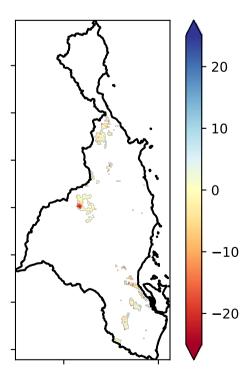
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

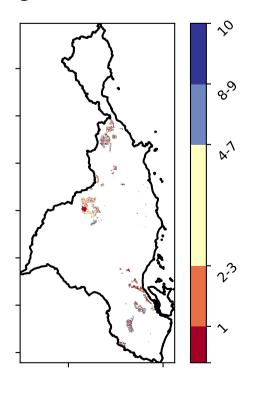


#### **Total Vegetation Cover Anomaly [%]**

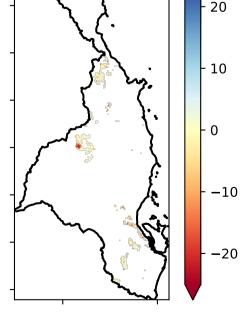


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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







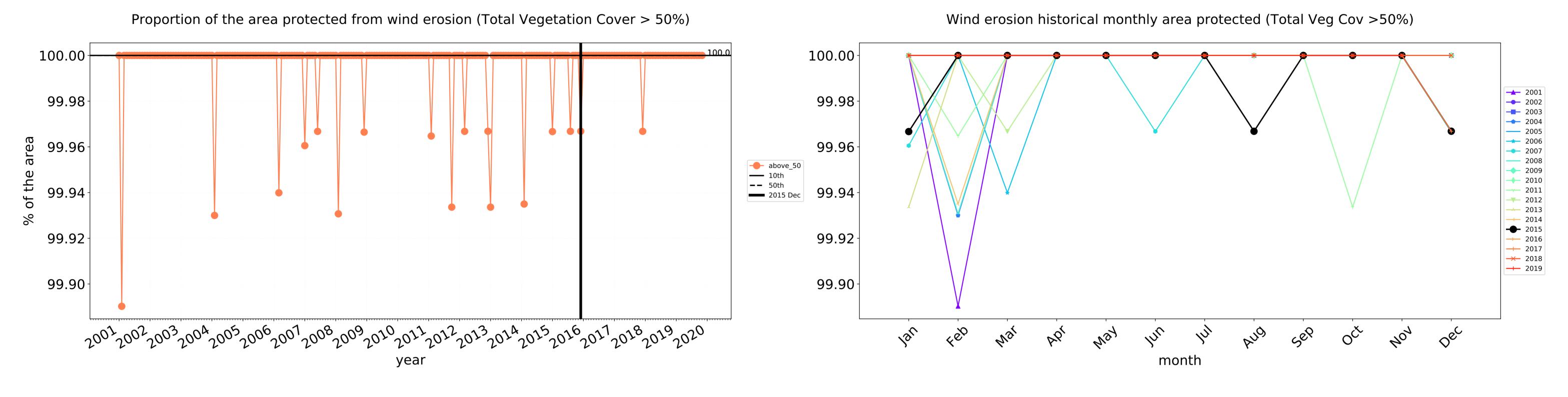


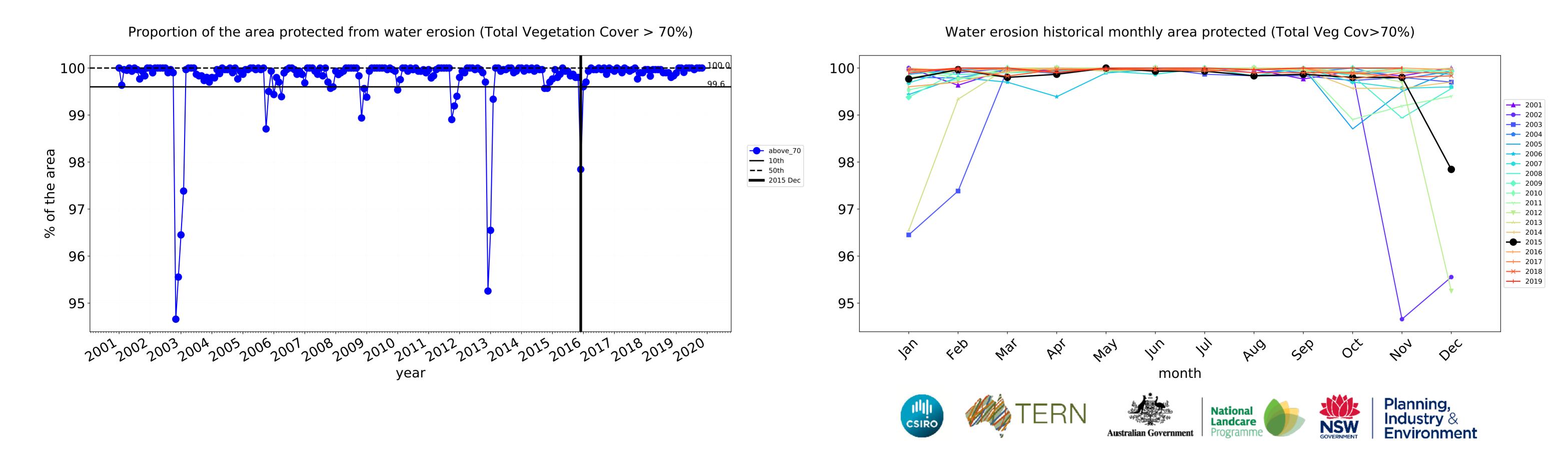


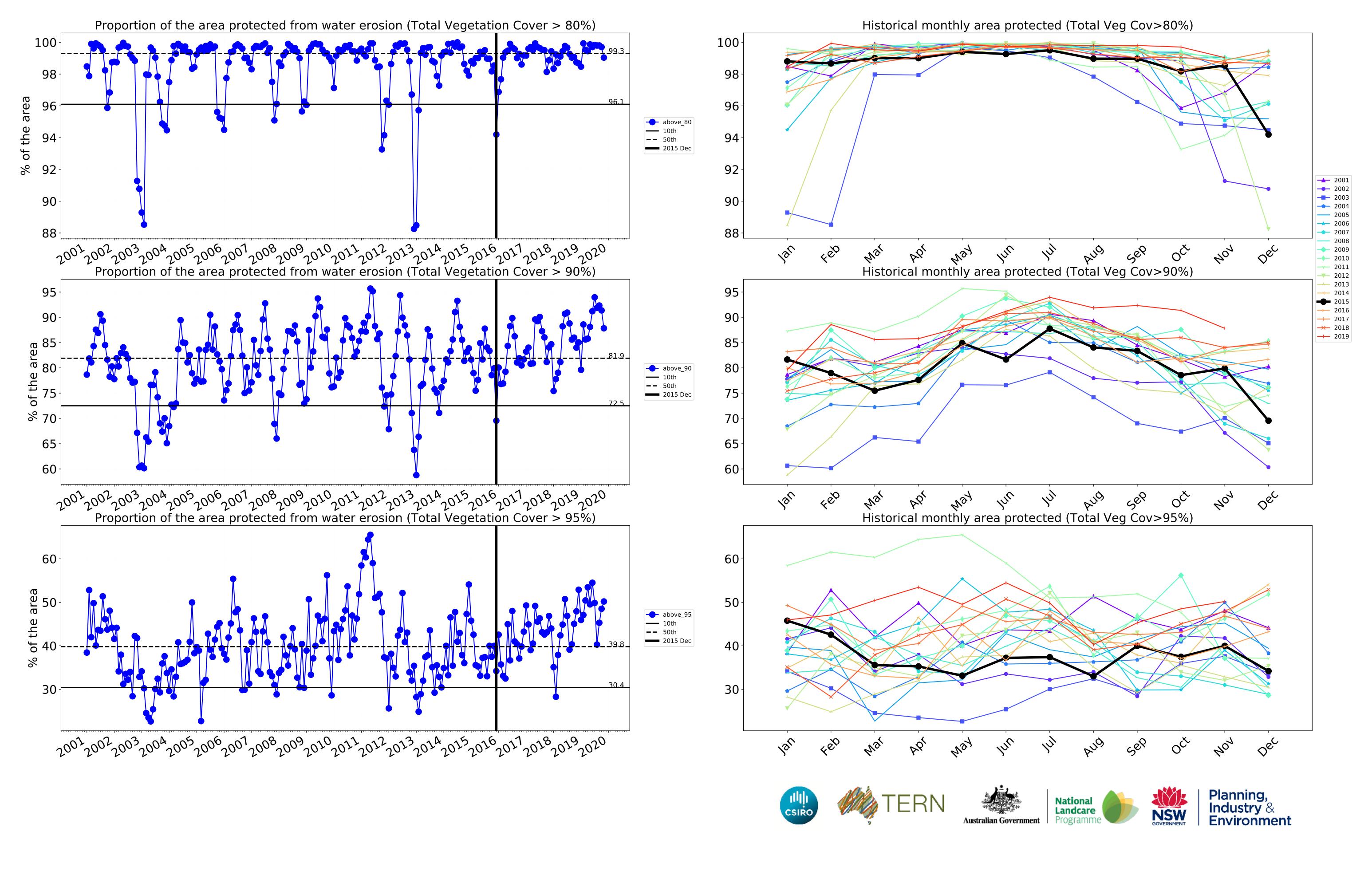




# **Production native forests and plantation forests timeseries**







# Wet Tropics (2,212,050 ha and no data 12,194 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	2,212,050	100.0% 2,211,356	99.8% 2,208,289	98.0% 2,168,633	91.5% 2,024,701	62.9% 1,391,048	28.3% 626,771
Conservation and natural environments	966,675	100.0% 966,400	99.9% 965,725	99.3% 959,950	97.2% 939,250	77.1% 745,075	37.2% 359,975
Conservation and natural environments Woodland forest	133,750	100.0% 133,725	99.9% 133,625	99.6% 133,175	96.7% 129,350	74.4% 99,450	38.6% 51,575
Conservation and natural environments Forest (non woodland)	822,675	100.0% 822,425	99.9% 821,925	99.3% 816,950	97.4% 801,075	77.9% 640,475	37.2% 306,250
Agriculture	924,150	100.0% 924,100	99.9% 922,950	97.4% 900,400	87.5% 808,350	51.1% 472,250	20.4% 188,400
Grazing	702,800	100.0% 702,775	100.0% 702,750	99.3% 697,950	94.5% 663,850	60.8% 427,200	24.3% 171,000
Grazing non forest	168,025	100.0% 168,000	100.0% 167,975	98.8% 166,000	89.9% 151,100	43.2% 72,575	16.1% 27,000
Grazing Woodland forest	295,550	100.0% 295,550	100.0% 295,550	99.3% 293,550	95.0% 280,875	60.2% 177,825	21.3% 62,900
Grazing - Forest (non woodland)	239,225	100.0% 239,225	100.0% 239,225	99.7% 238,400	96.9% 231,875	73.9% 176,800	33.9% 81,100
Cropping	165,100	100.0% 165,100	99.6% 164,400	92.3% 152,375	69.0% 113,975	23.0% 38,050	9.2% 15,175
Irrigation	56,200	100.0% 56,175	99.2% 55,750	89.0% 50,025	54.2% 30,475	12.5% 7,000	4.0% 2,225
Production native forests and plantation forests	75,375	100.0% 75,375	100.0% 75,350	97.8% 73,750	94.2% 71,000	69.6% 52,425	34.2% 25,775











