# 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 2001

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 2001**

#### 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

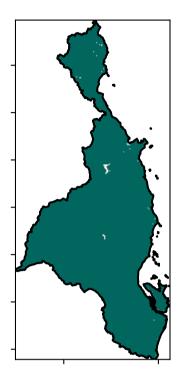
2019.

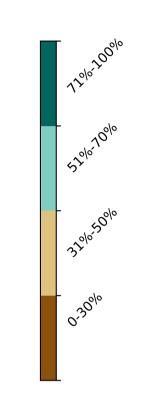
pixel. The mean

month of the map

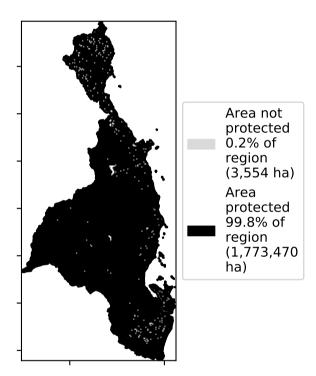
is, red pixels are about 20%

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

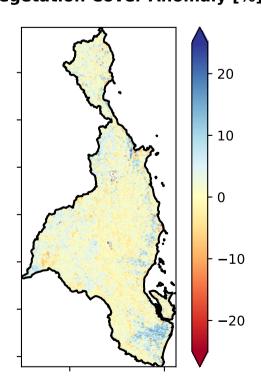




#### % Area protected from water erosion (>70%)

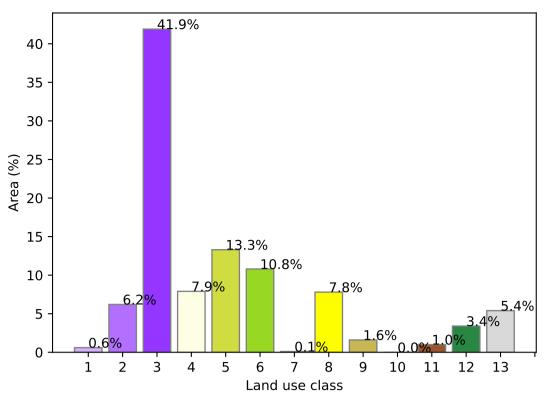


**Total Vegetation Cover Anomaly [%]** 

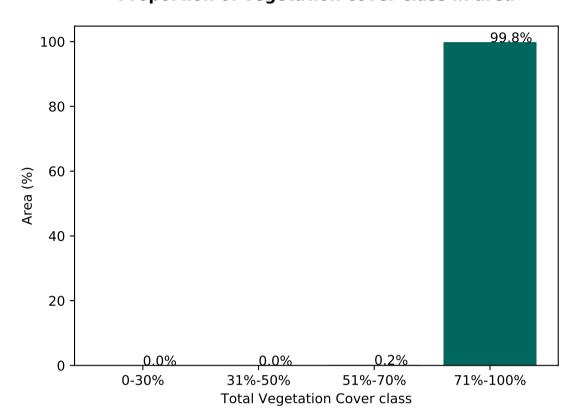


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

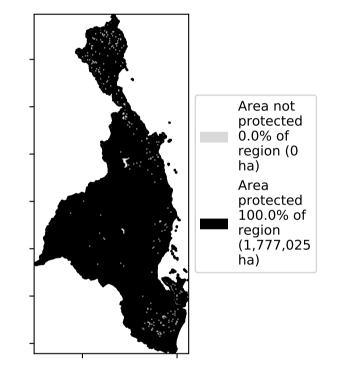
#### Proportion of each land class in area



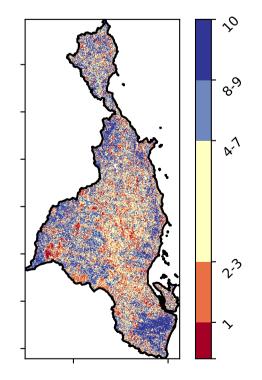
#### Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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





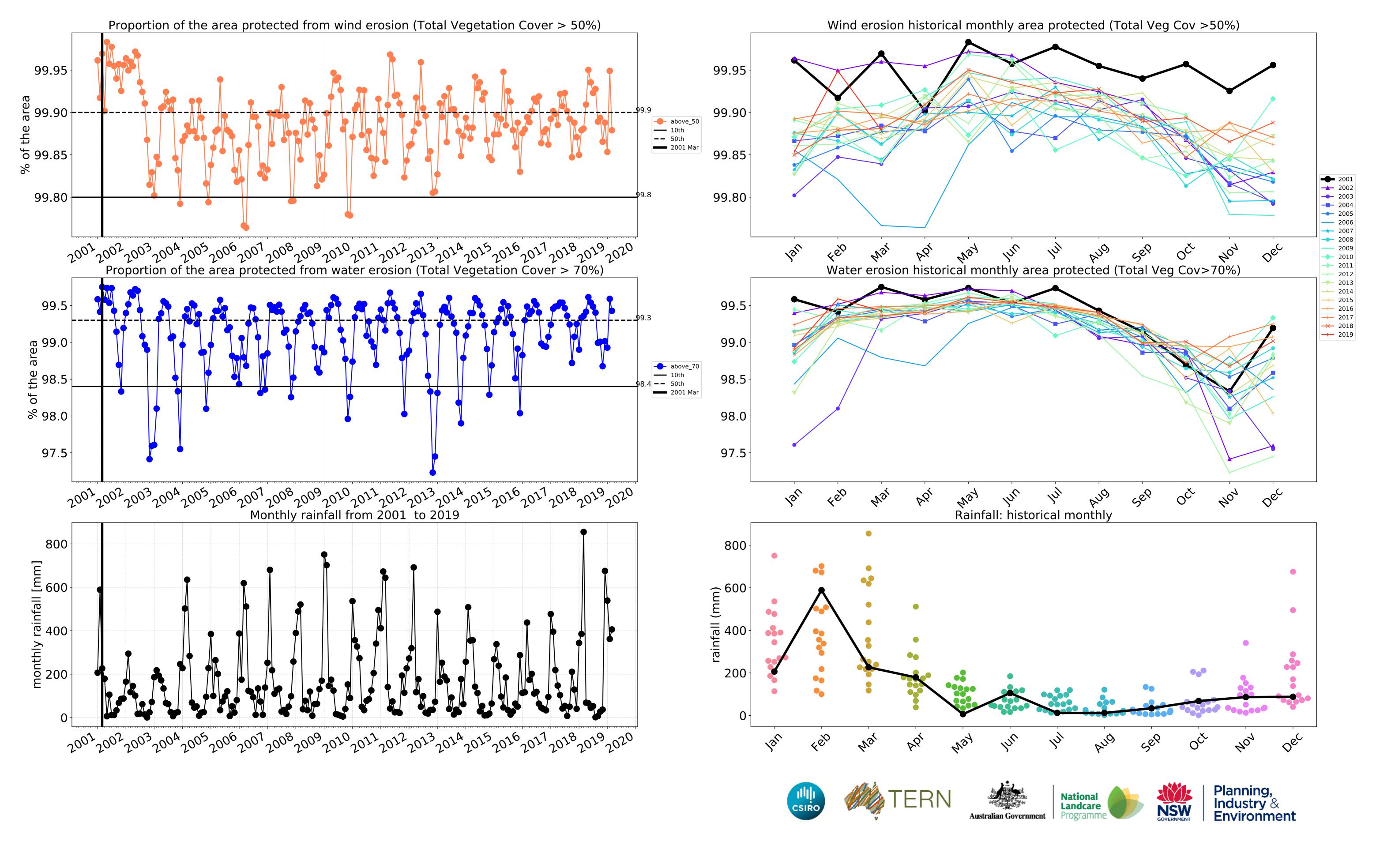


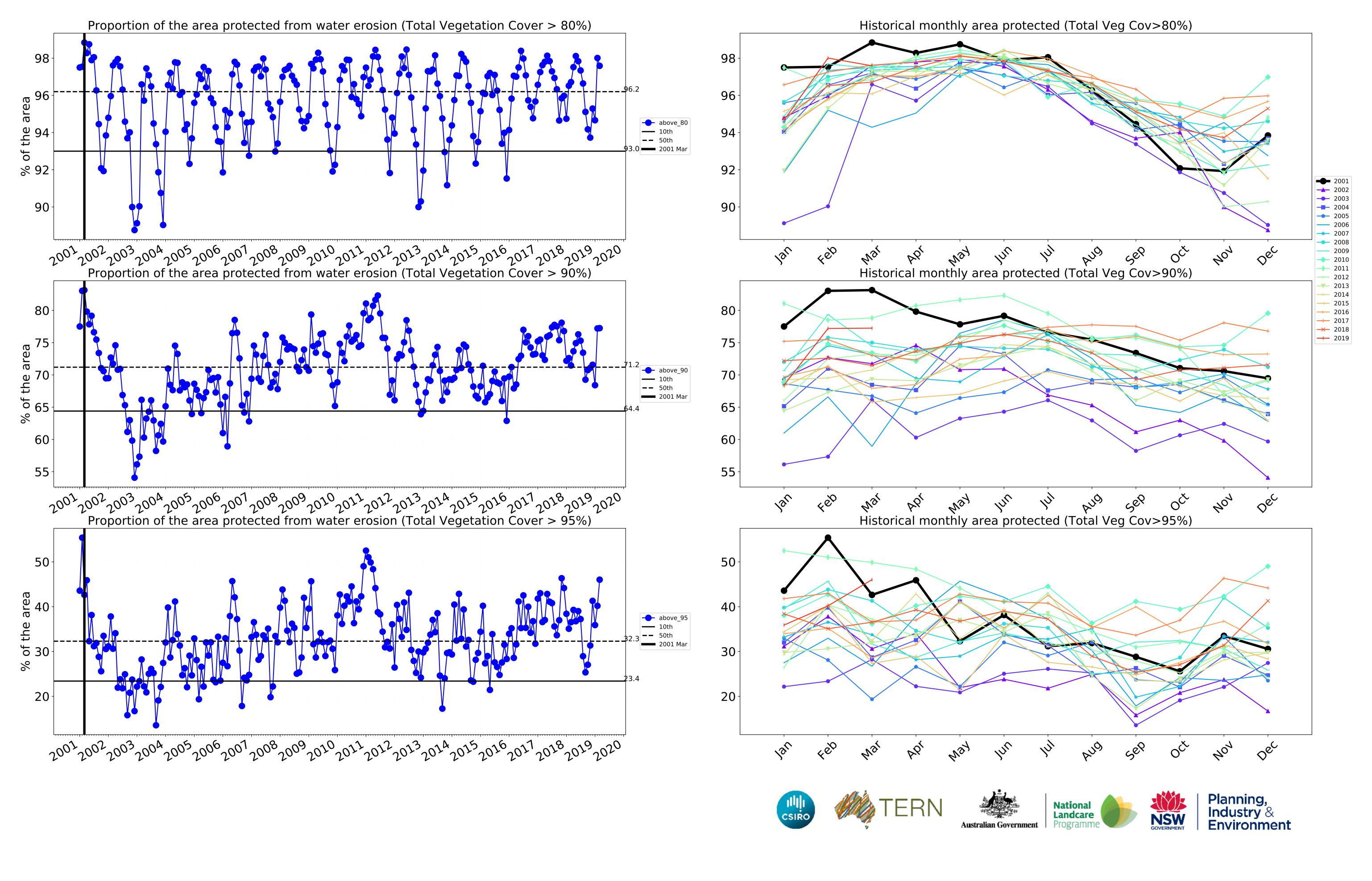








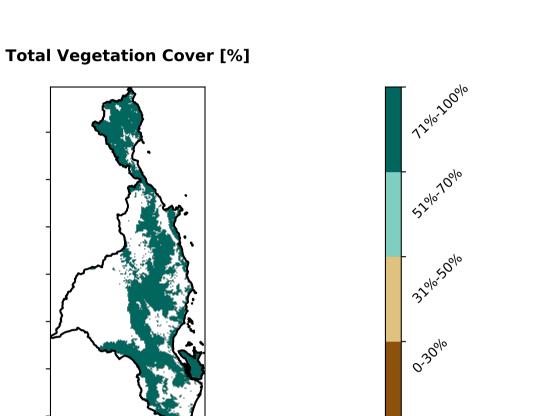




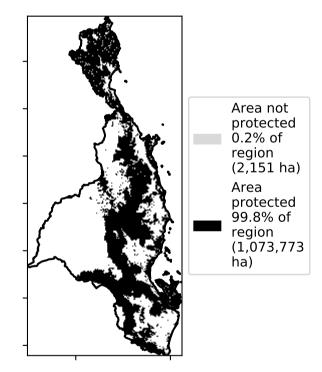
## **Conservation and natural environments**

#### Land use and forest cover

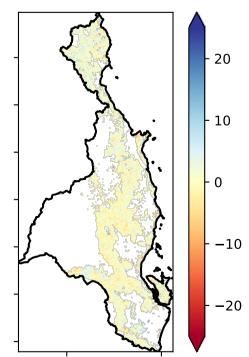
## Catchment Scale Land Use and Forests 1 Conservation and natural environments - Nonof Australia (2018) Derived from 2 Conservation and natural environments - Woodland Catchment Scale Land Use of Australia 3 Conservation and natural environments - Non-woodland forest (2018) and Forests of Australia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



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

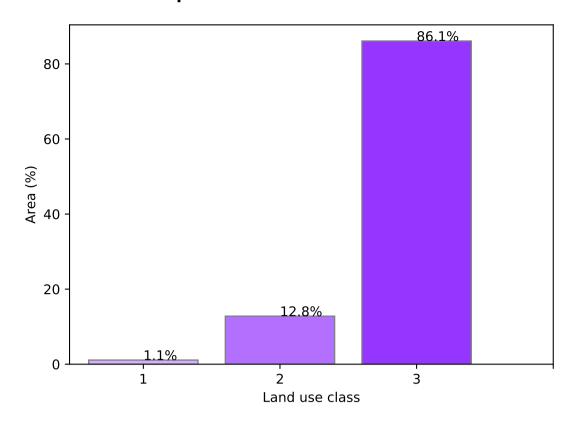


## **Total Vegetation Cover Anomaly [%]**

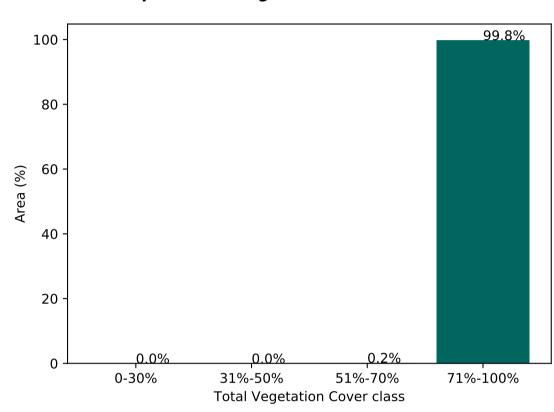


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

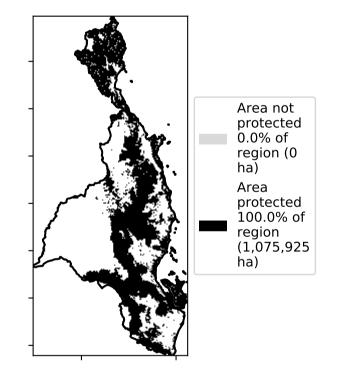
#### Proportion of each land class in area



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Anomaly show how many percetage points each

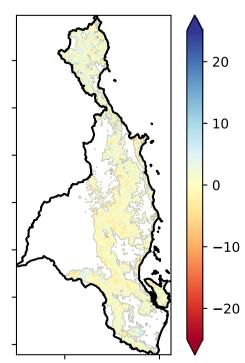
pixel is from the mean. That

pixel. The mean

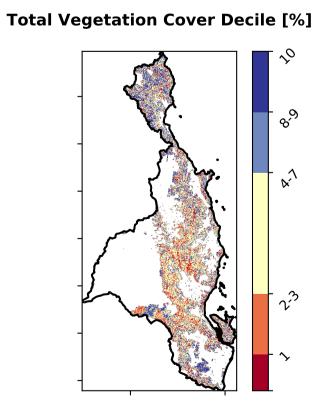
using baseline from 2001 to 2019.

is only for the month of the map

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



Deciles show where the records for that month of







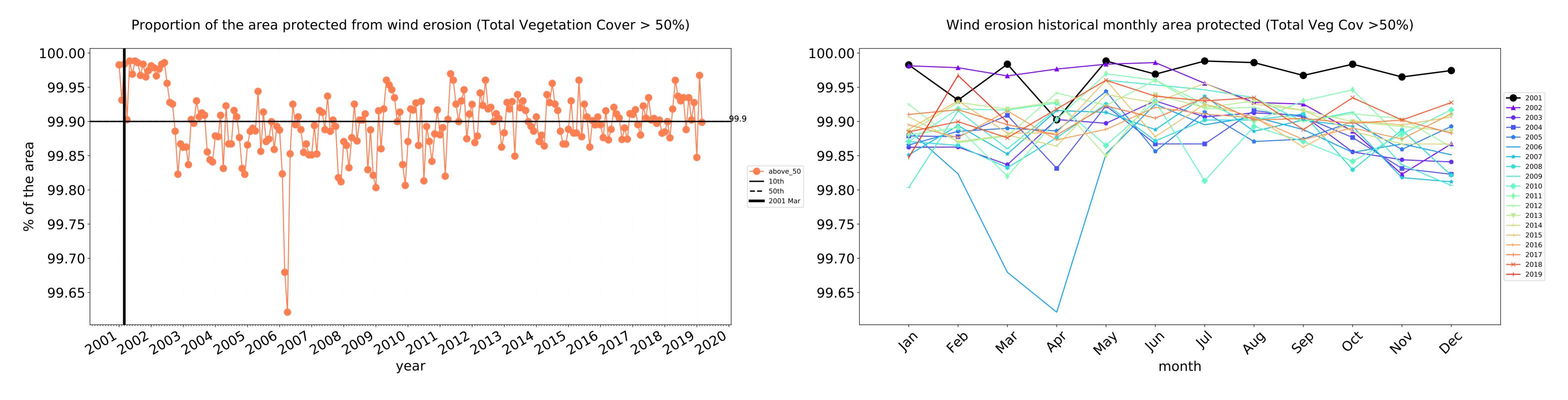


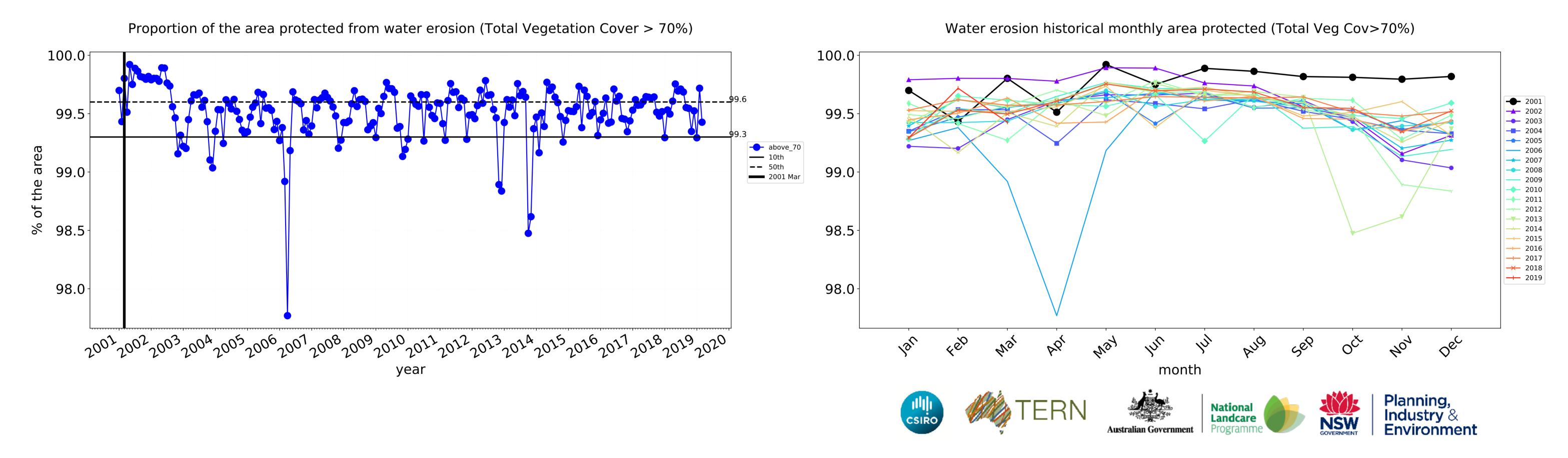


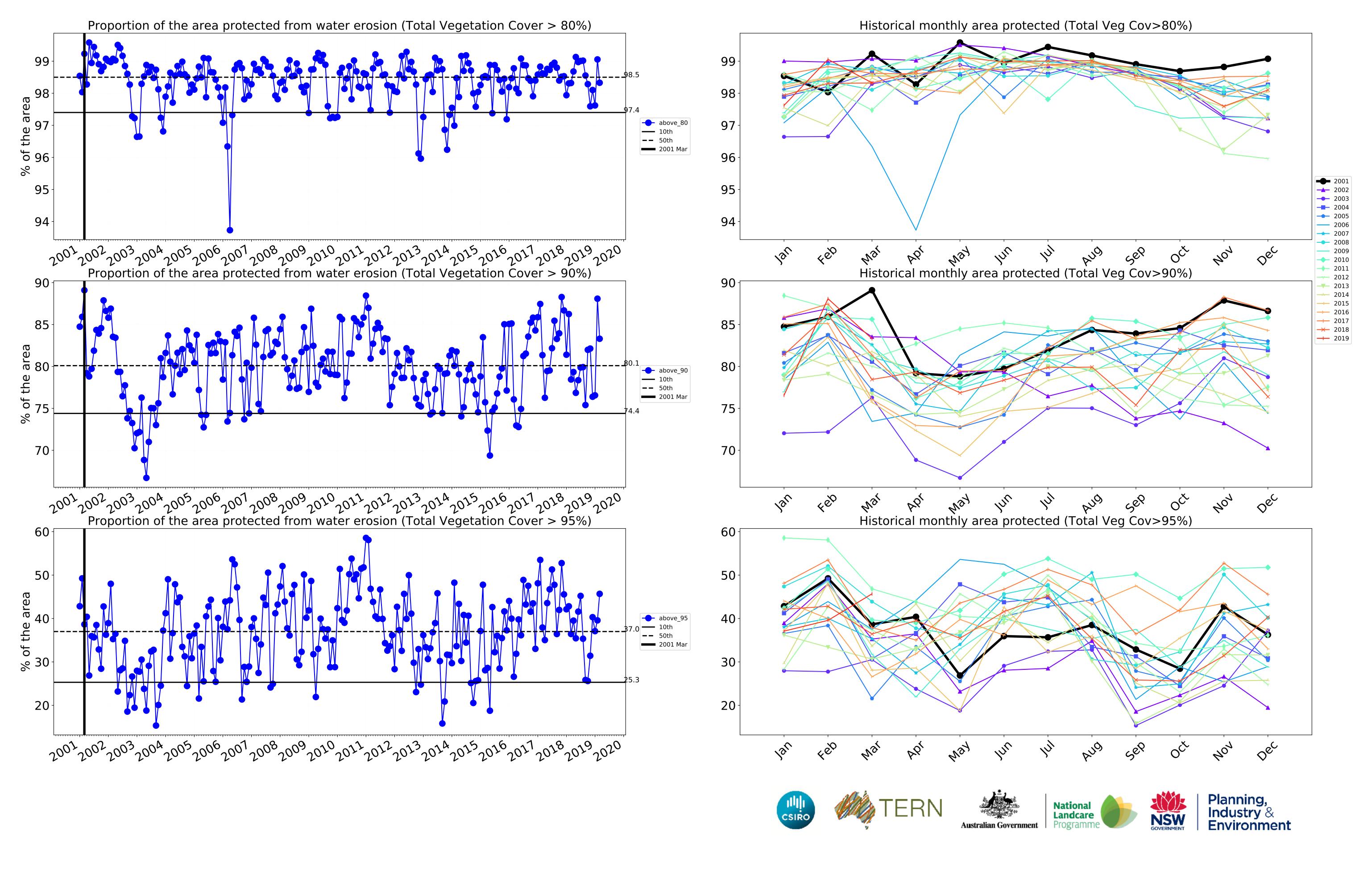




## **Conservation and natural environments timeseries**



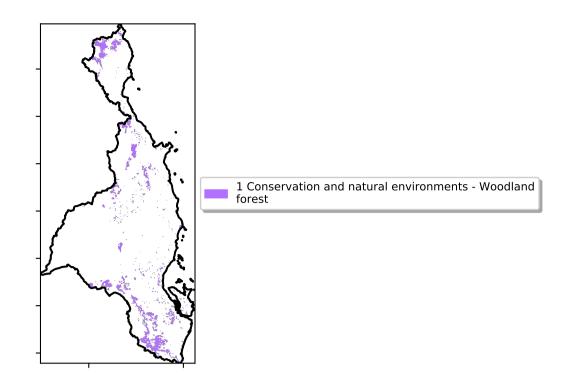




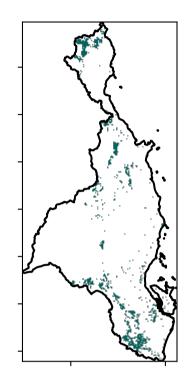
## **Conservation and natural environments Woodland forest**

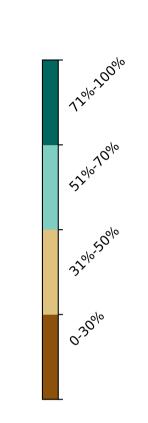
#### Land use and forest cover

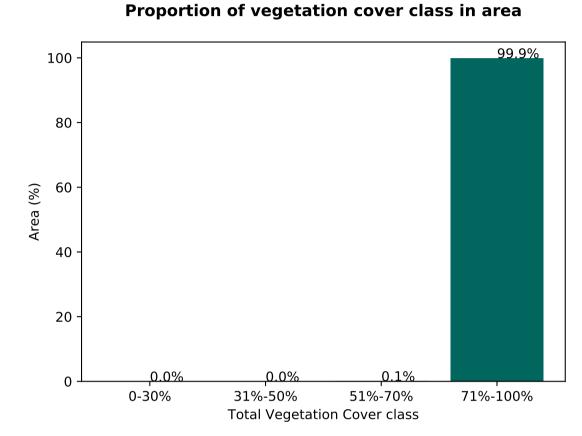
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



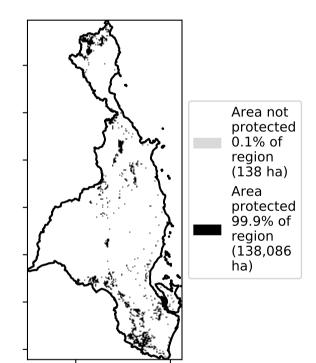
#### **Total Vegetation Cover [%]**



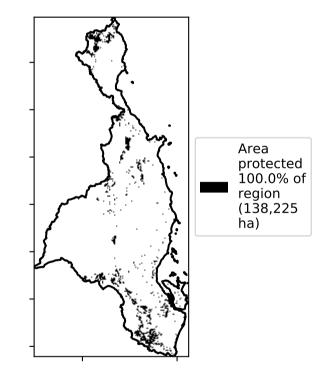




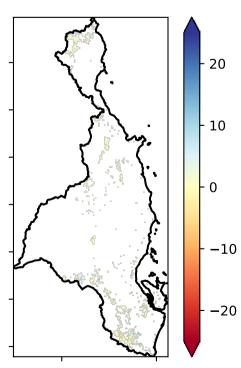
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

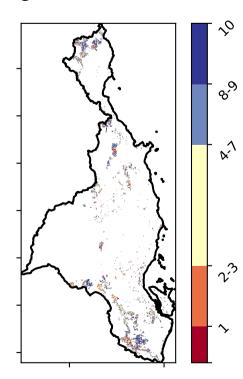


## **Total Vegetation Cover Anomaly [%]**

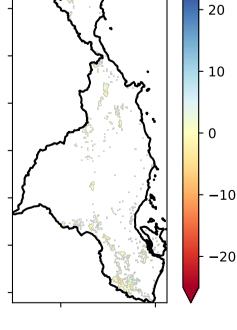


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**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.





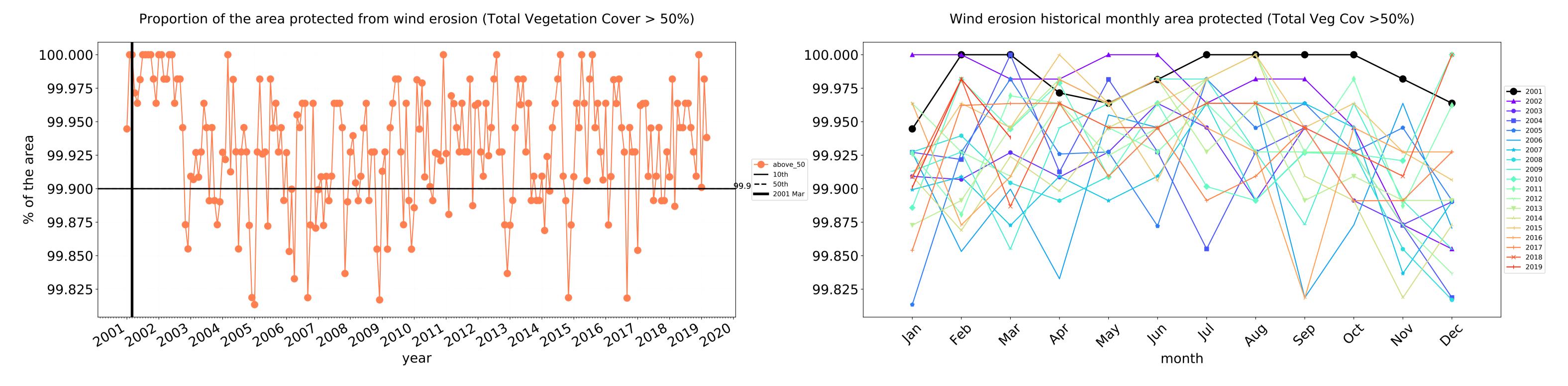


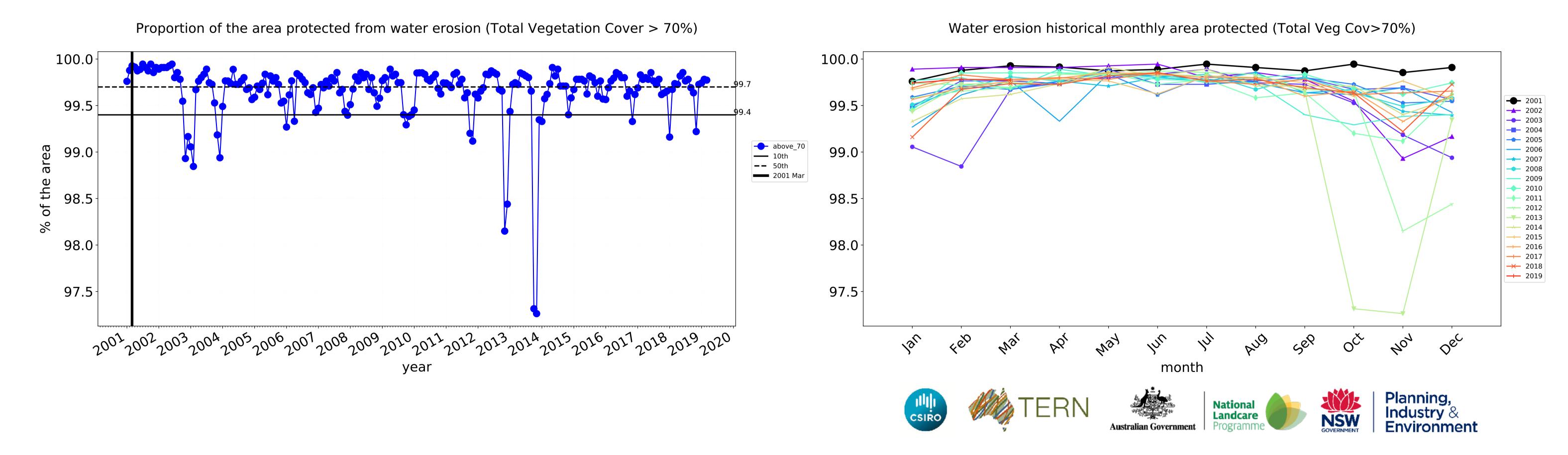


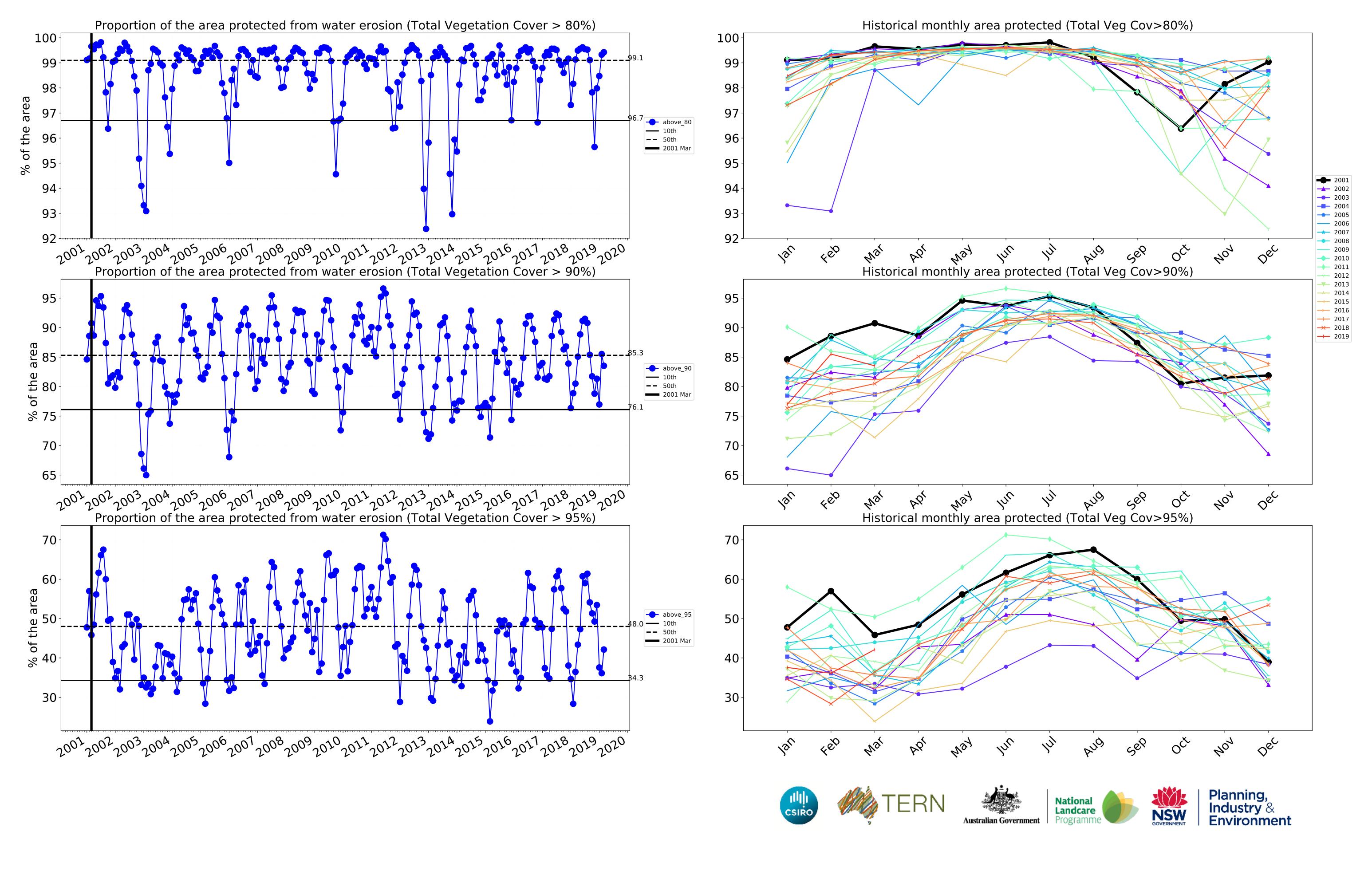








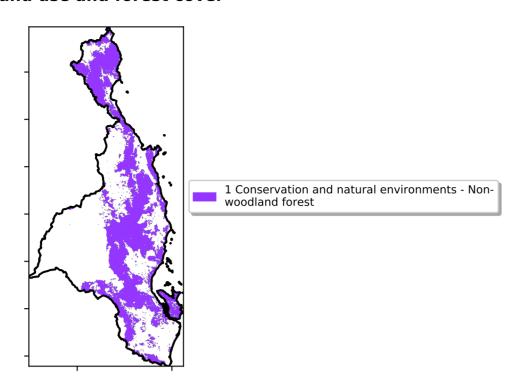




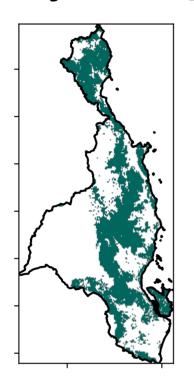
## **Conservation and natural environments Forest (non woodland)**

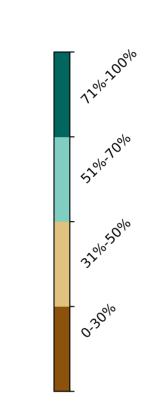
#### Land use and forest cover

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

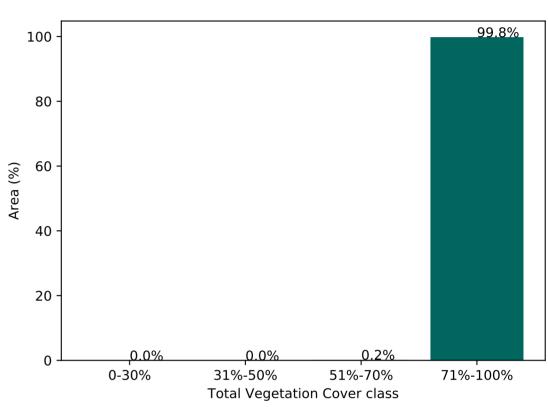


#### **Total Vegetation Cover [%]**

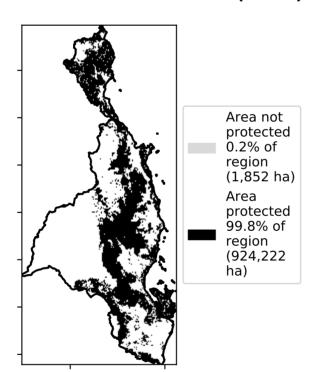




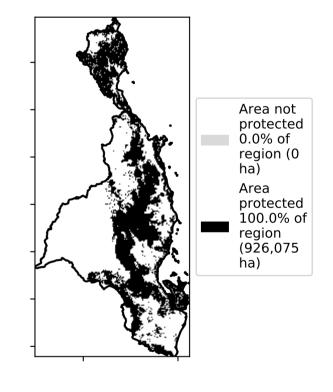
#### Proportion of vegetation cover class in area



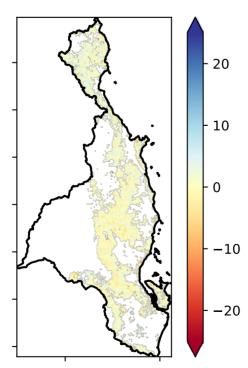
## % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

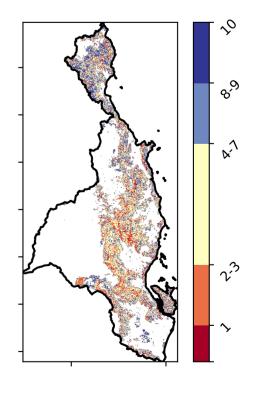


## **Total Vegetation Cover Anomaly [%]**

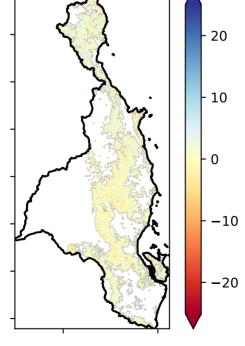


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## **Total Vegetation Cover Decile [%]**



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.







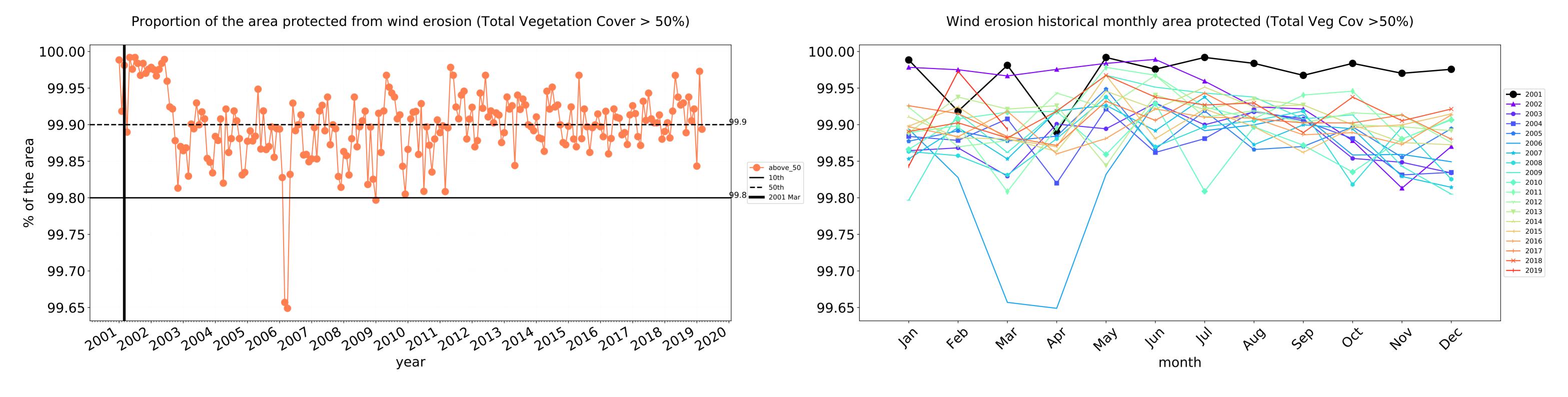


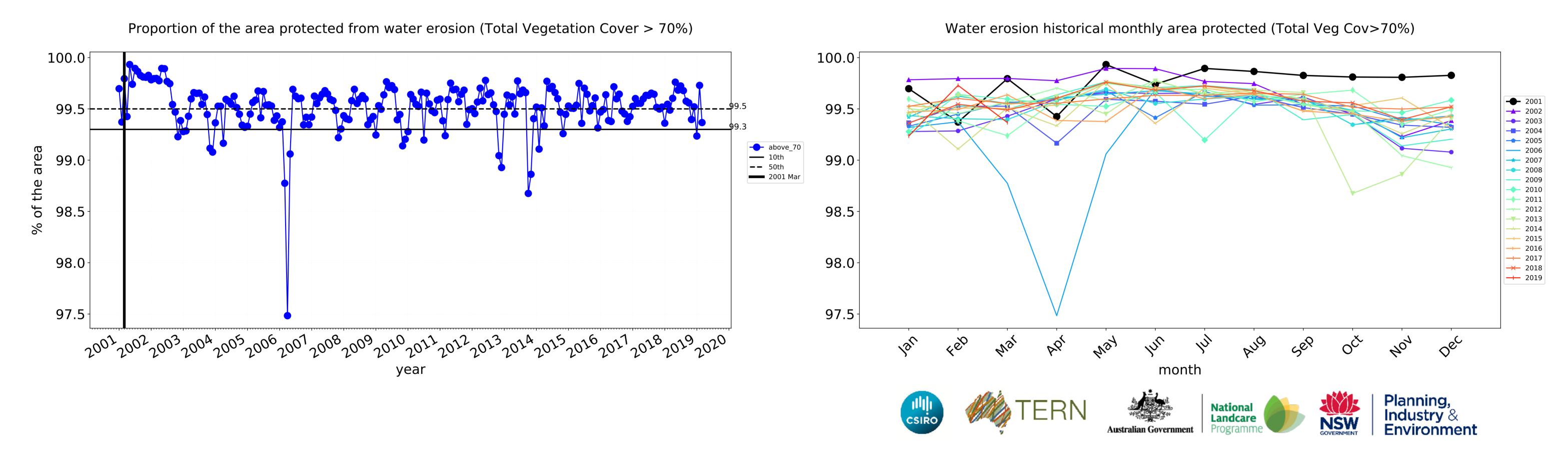


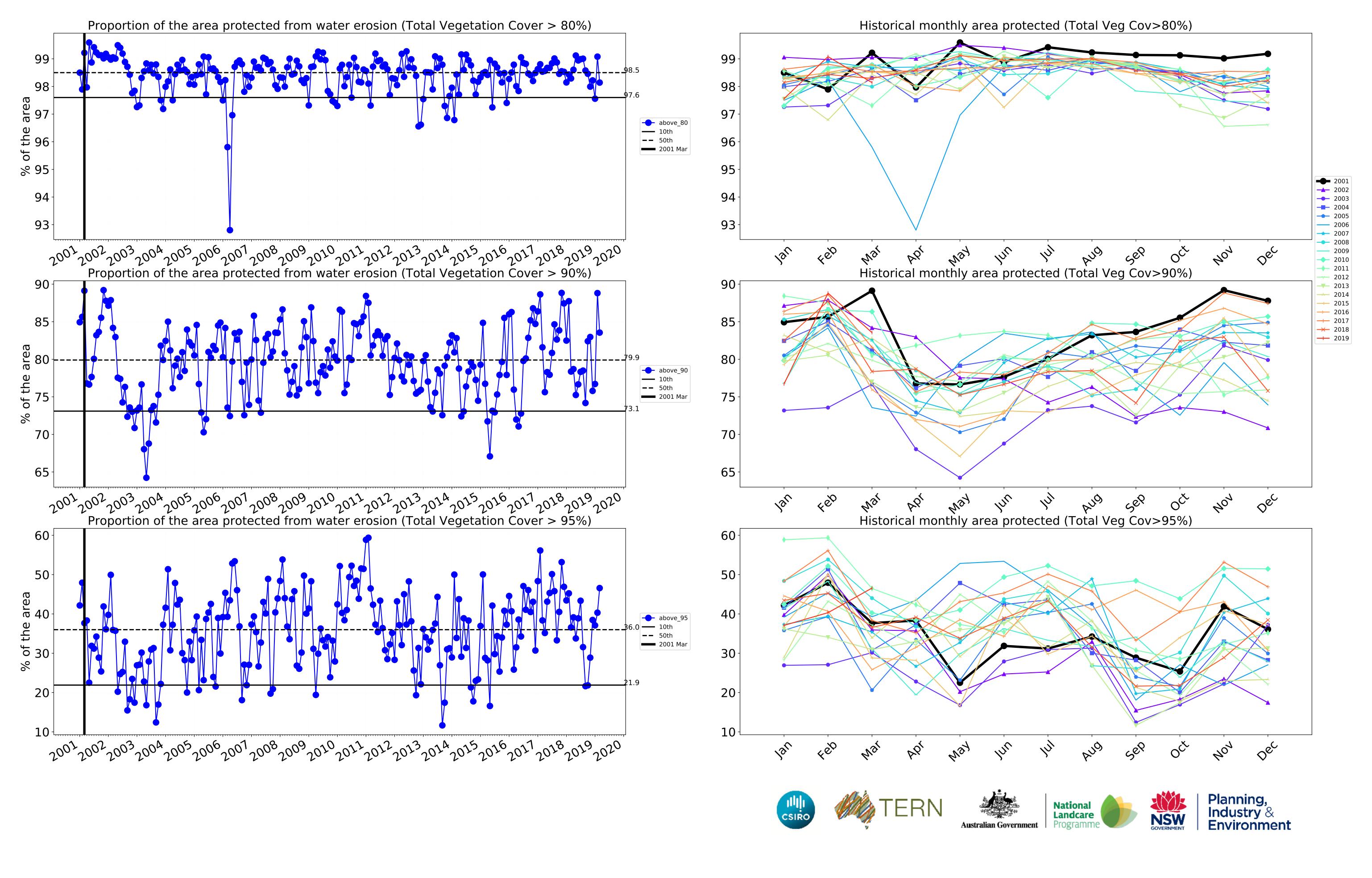




## Conservation and natural environments Forest (non woodland) timeseries







## **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

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

Anomaly show how many percetage points each

pixel is from

the mean. That is, red pixels

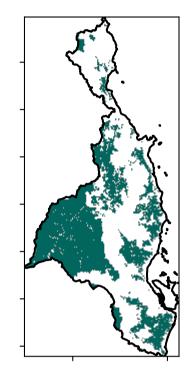
are about 20% lower than the mean of that

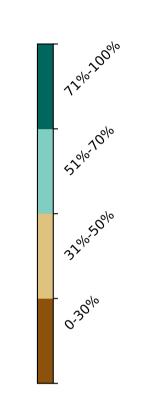
pixel. The mean

using baseline from 2001 to 2019.

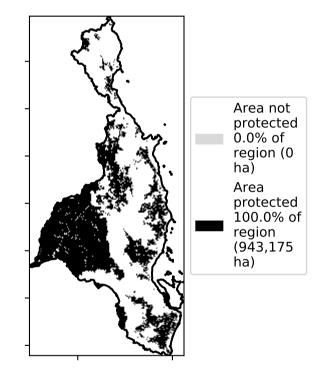
is only for the month of the map

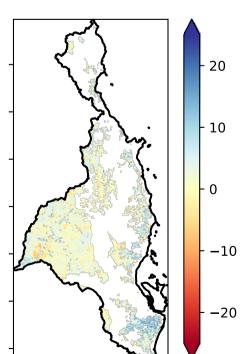
## **Total Vegetation Cover [%]**





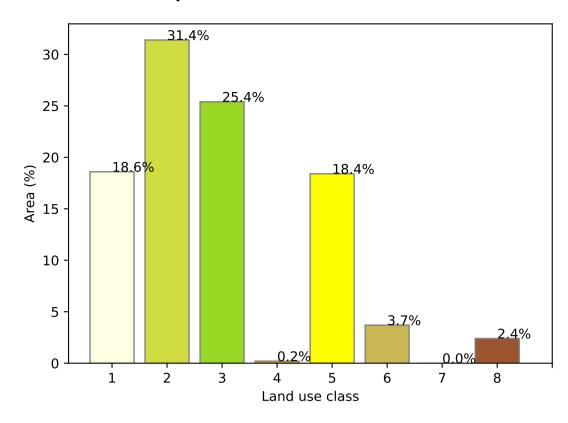
## % Area protected from water erosion (>70%)



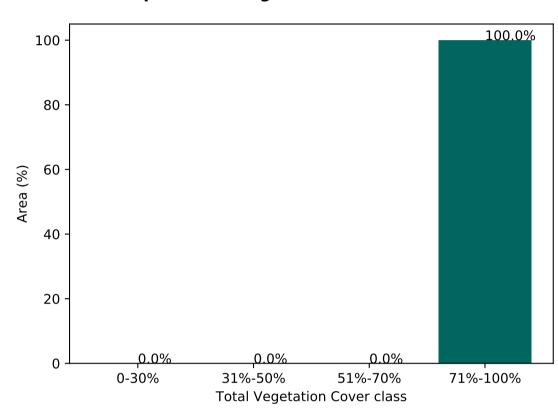


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

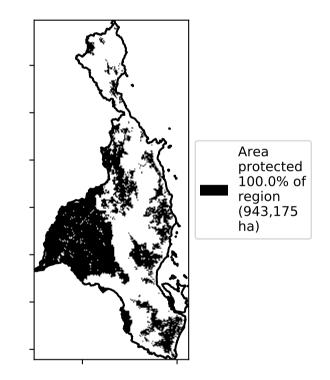
#### Proportion of each land class in area



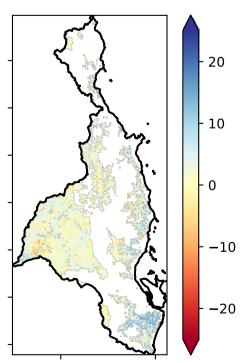
Proportion of vegetation cover class in area



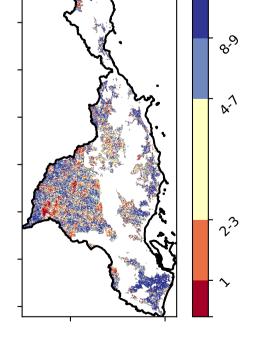
#### % Area protected from wind erosion (>50%)



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



Deciles show where the



**Total Vegetation Cover Decile [%]** 





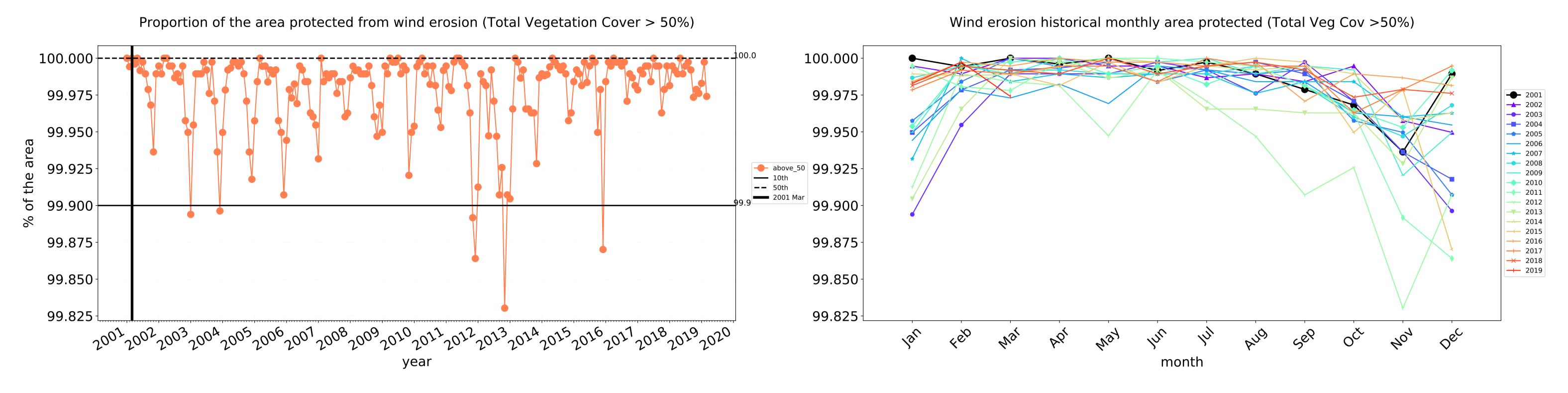


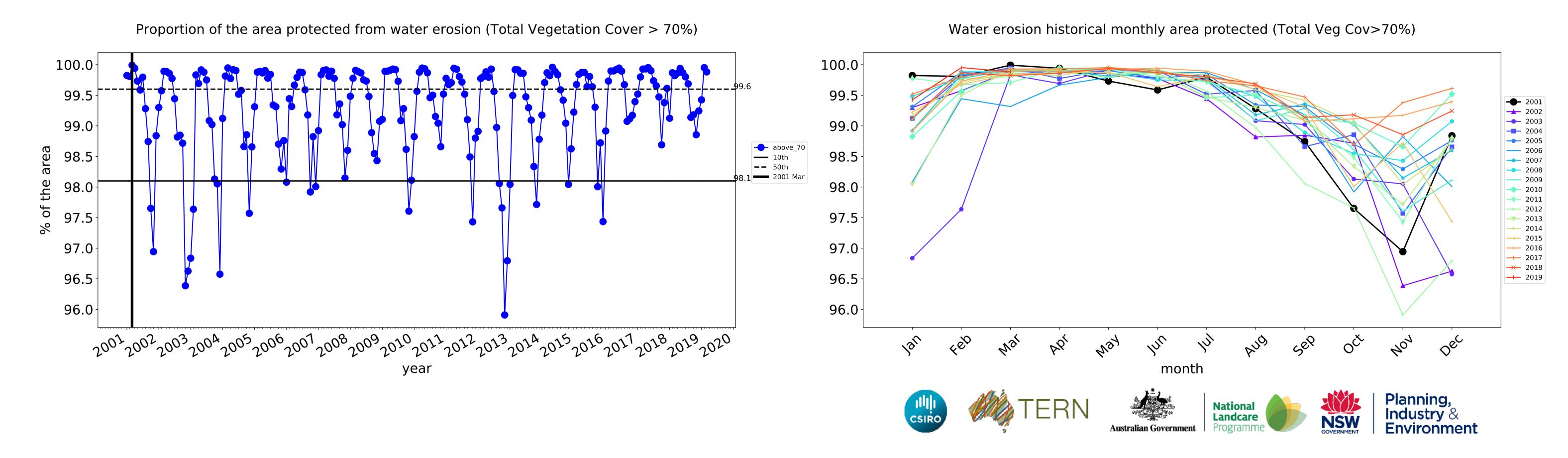


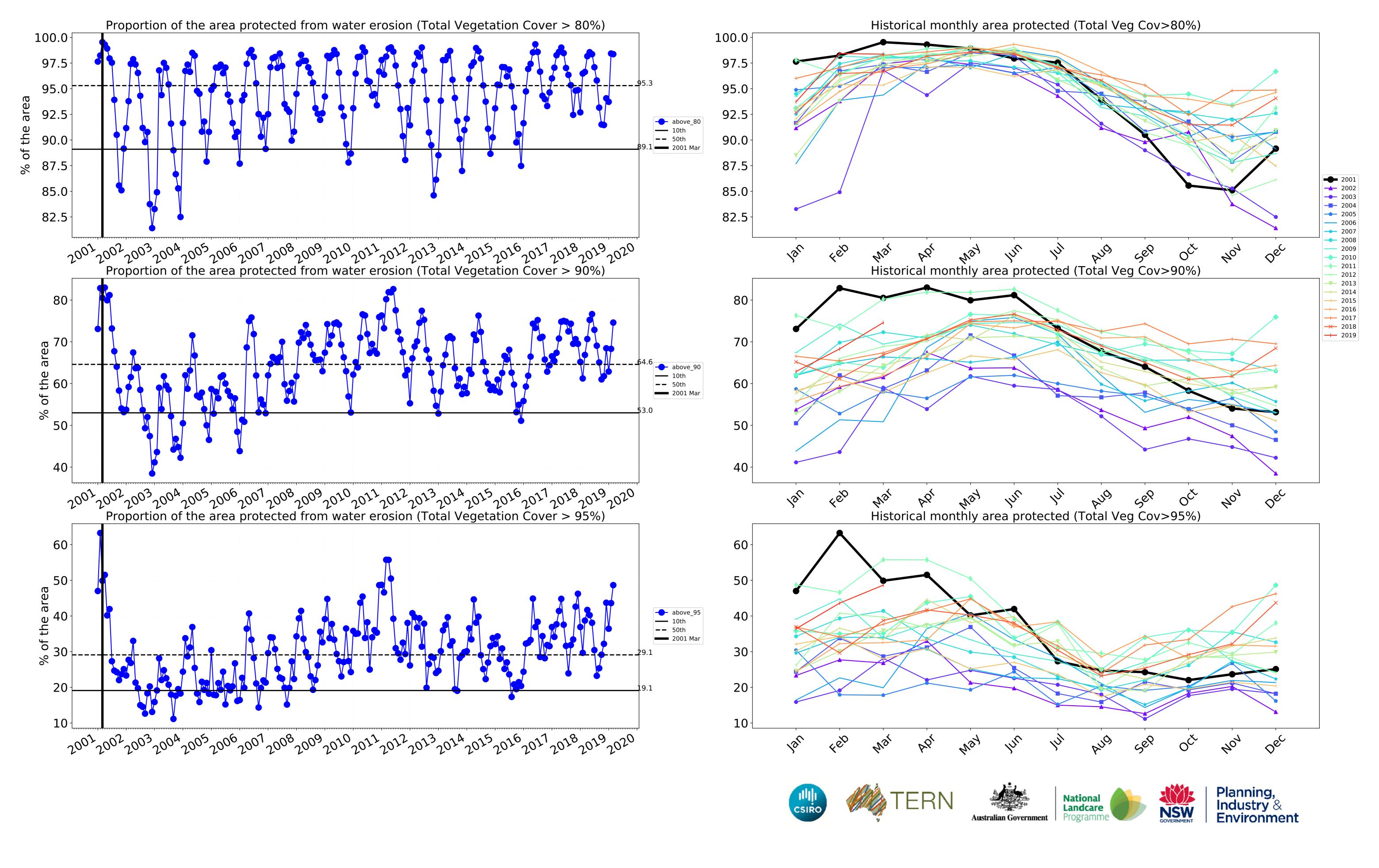




## **Agriculture timeseries**







## 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

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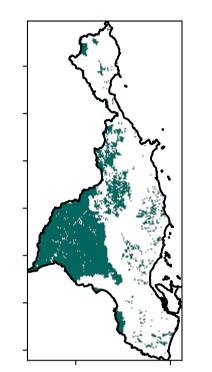
using baseline from 2001 to 2019.

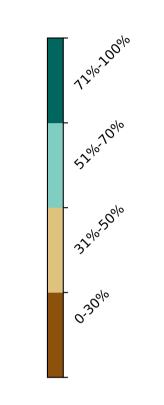
is only for the month of the map

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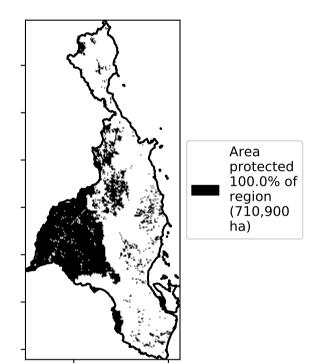
Catchment Scale

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





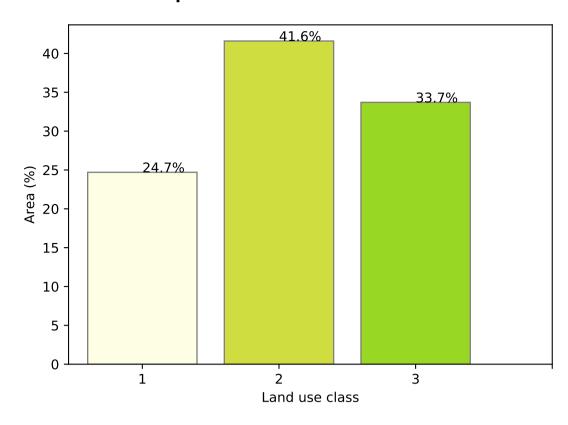
% Area protected from water erosion (>70%)



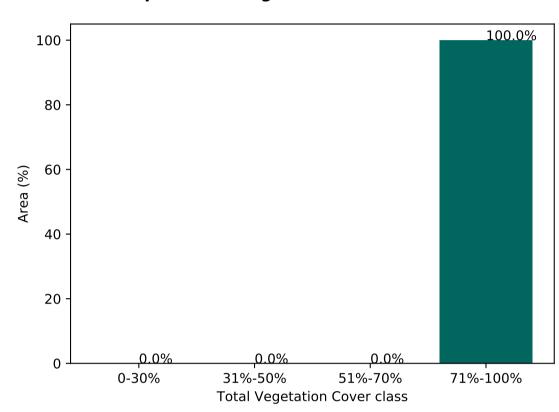
**Total Vegetation Cover Anomaly [%]** 

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.

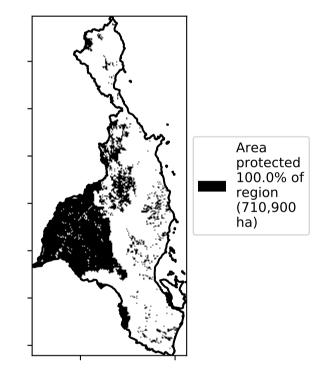
#### Proportion of each land class in area

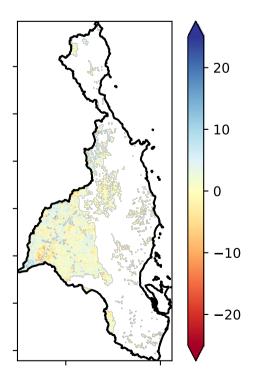


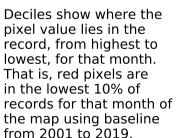
Proportion of vegetation cover class in area

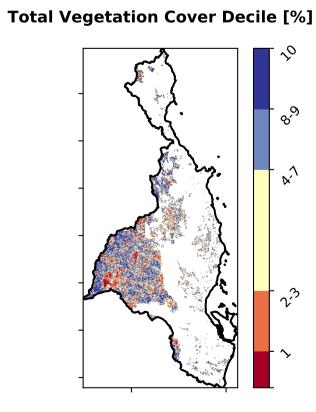


% Area protected from wind erosion (>50%)













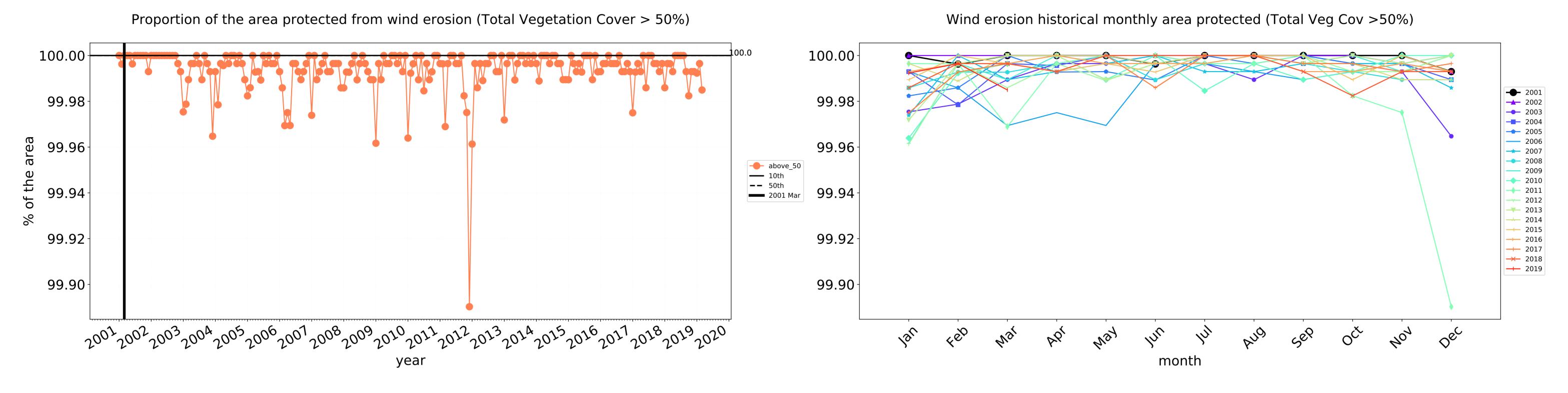


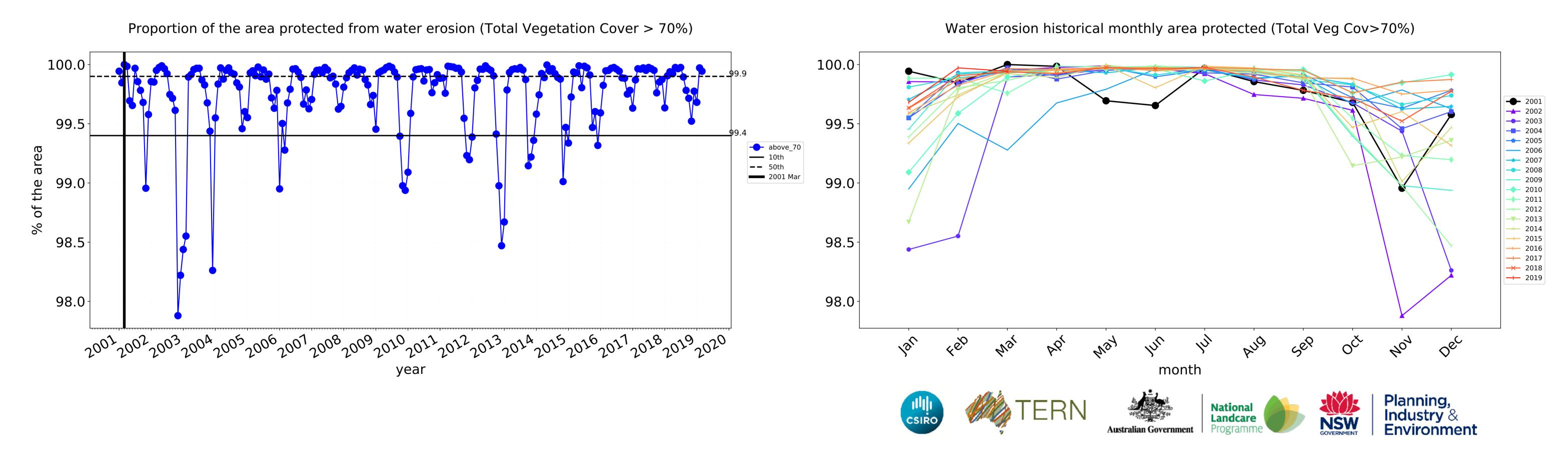


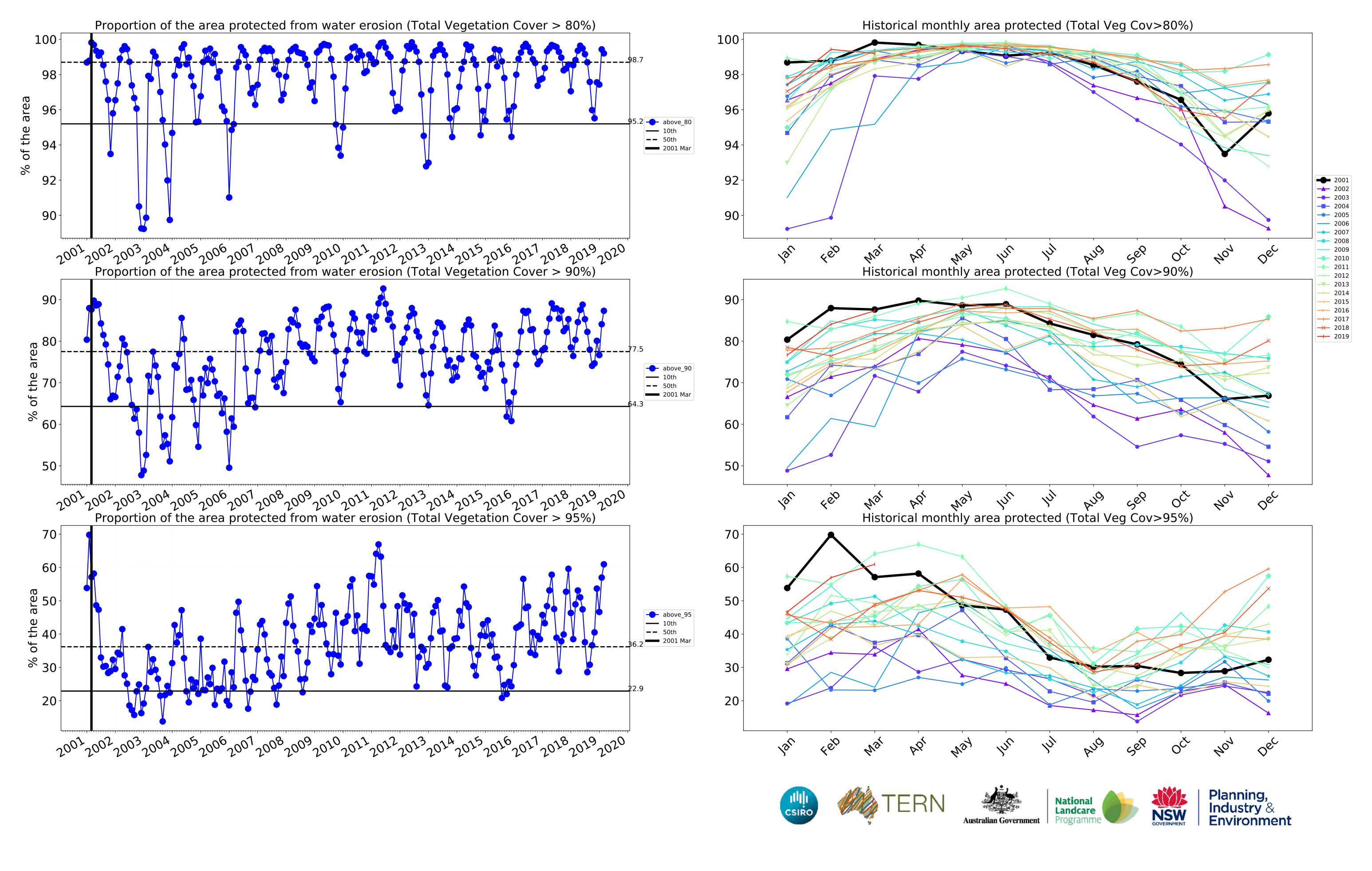




## **Grazing timeseries**







## **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)

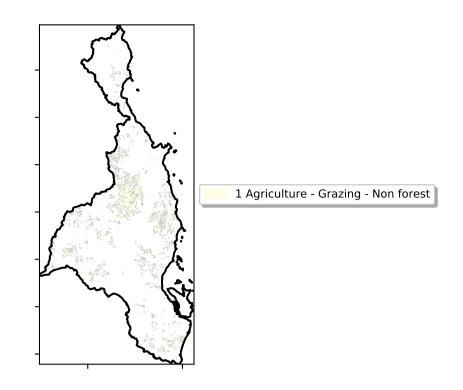
Anomaly show how many percetage points each

pixel is from the mean. That

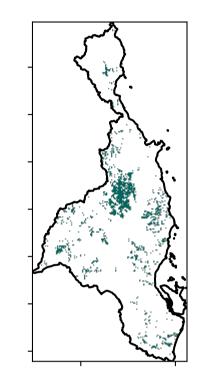
pixel. The mean

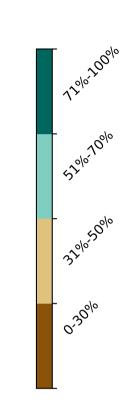
is only for the month of the map using baseline from 2001 to 2019.

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

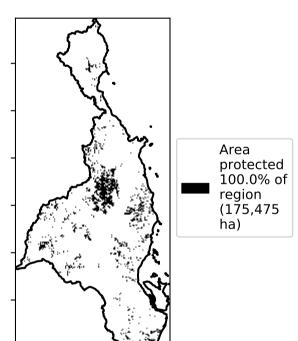


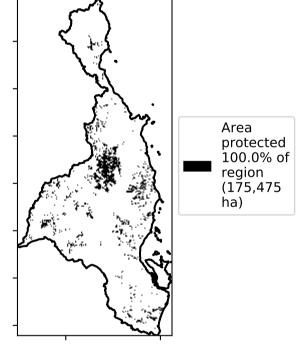
#### **Total Vegetation Cover [%]**



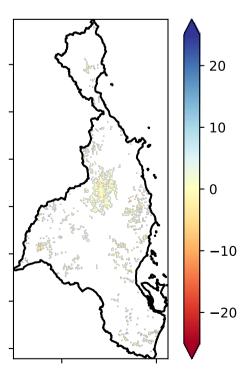


## % Area protected from water erosion (>70%)



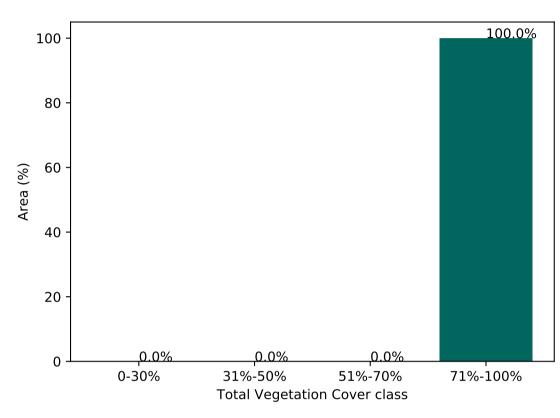


## **Total Vegetation Cover Anomaly [%]**

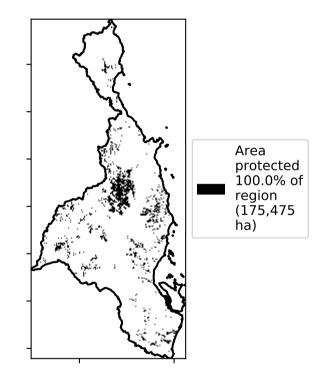


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

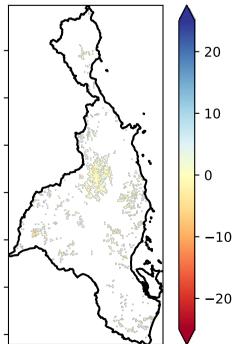
#### Proportion of vegetation cover class in area

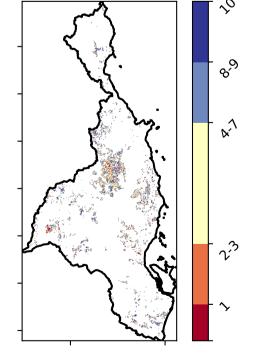


## % Area protected from wind erosion (>50%)



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









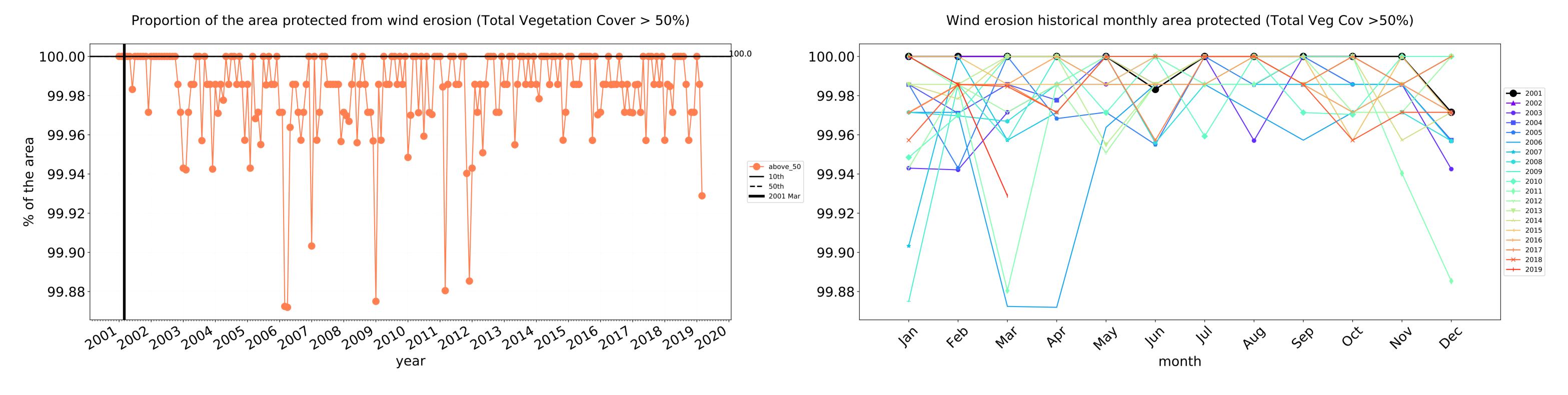


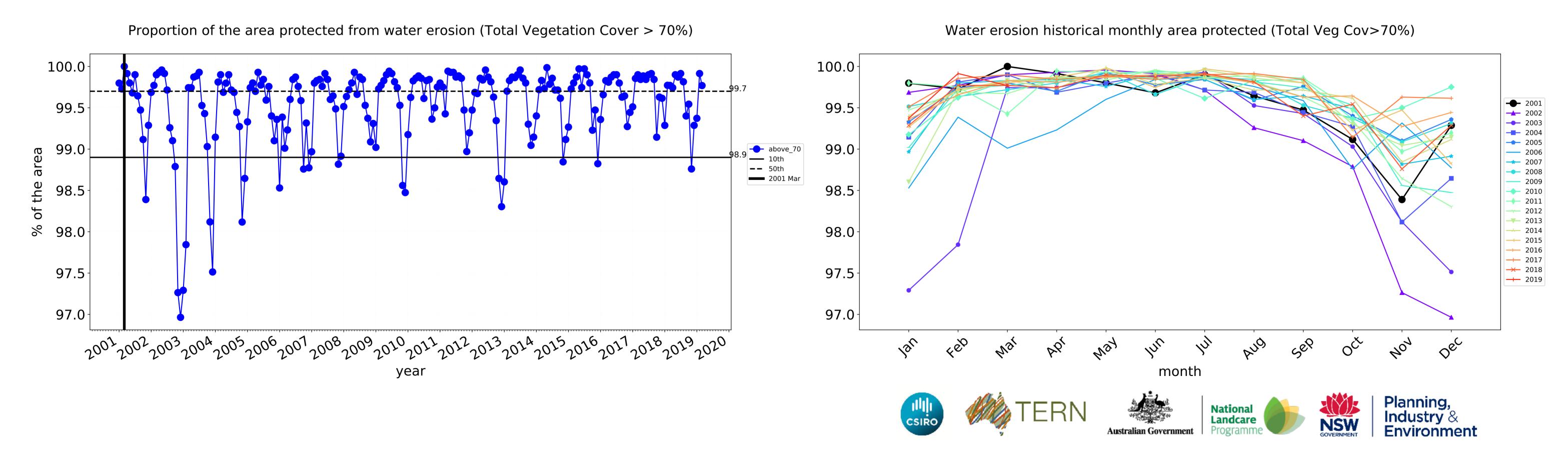


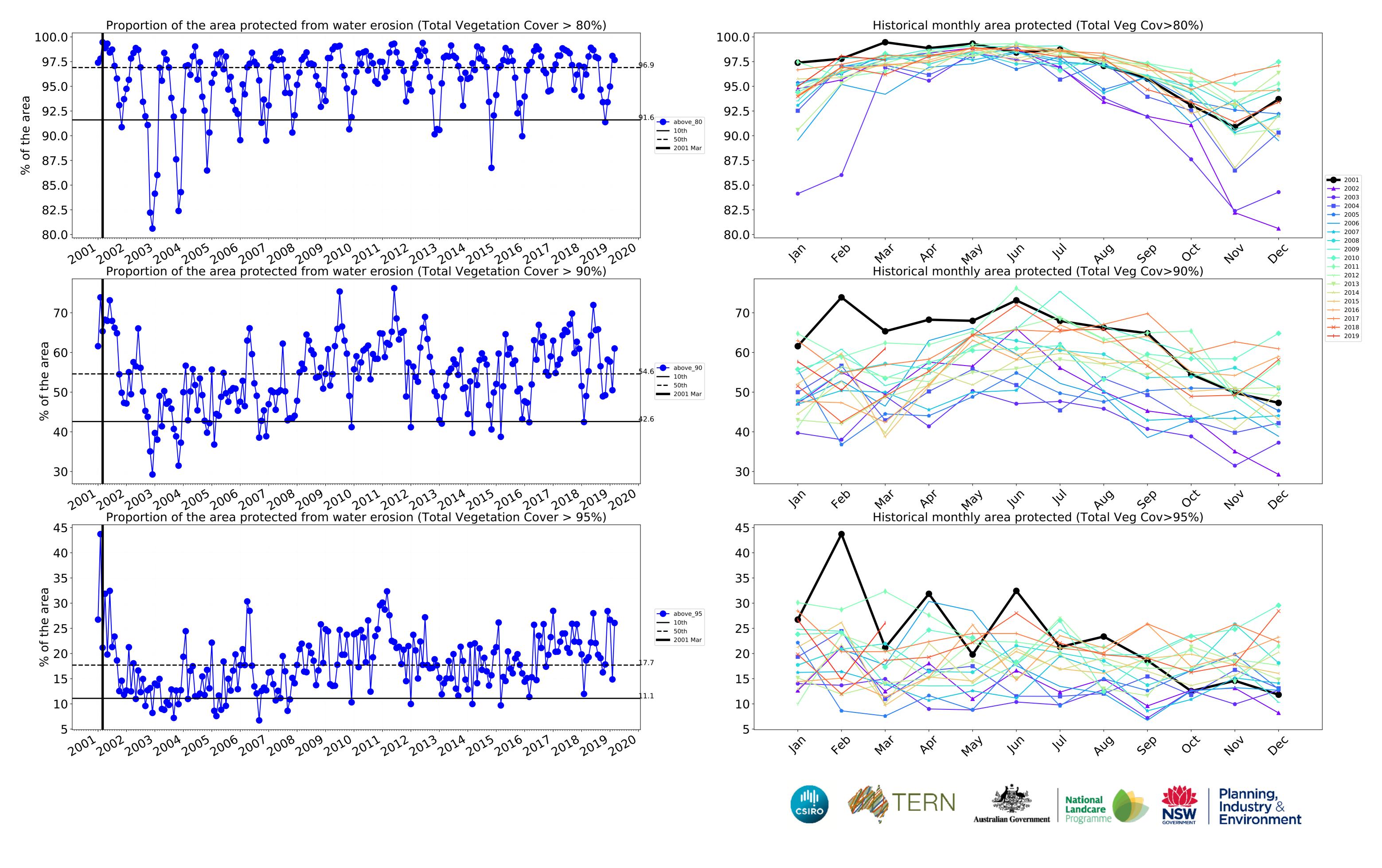




## **Grazing non forest timeseries**







## **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)

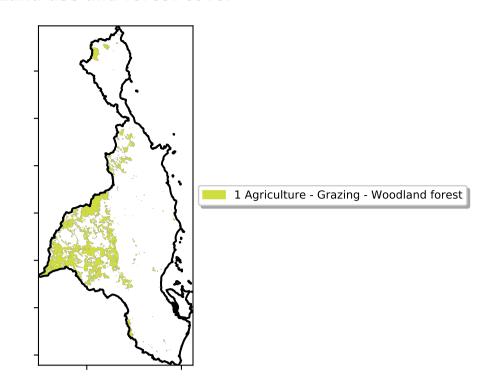
Anomaly show how many percetage points each

pixel is from the mean. That

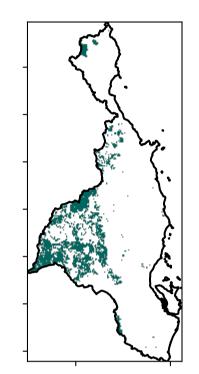
pixel. The mean

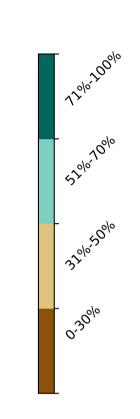
is only for the month of the map using baseline from 2001 to 2019.

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

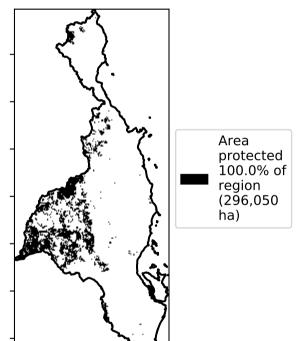


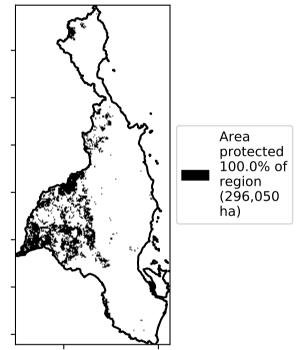
#### **Total Vegetation Cover [%]**



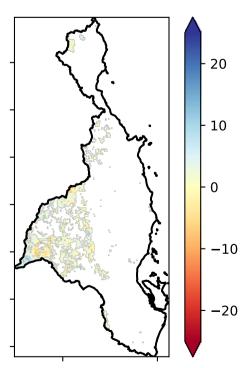


## % Area protected from water erosion (>70%)



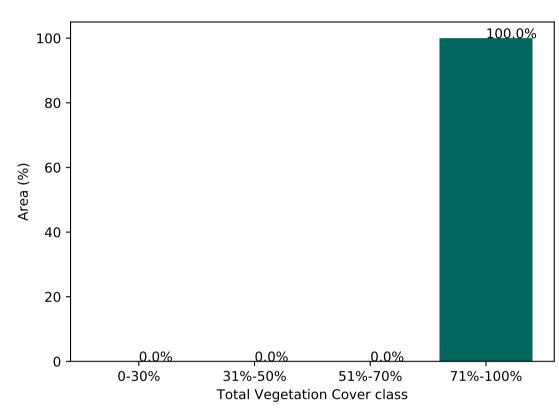


## **Total Vegetation Cover Anomaly [%]**

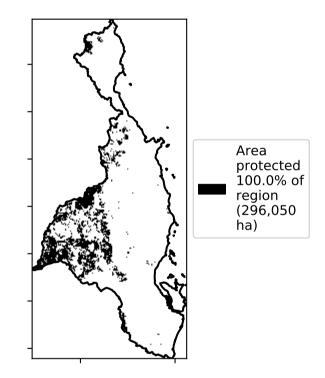


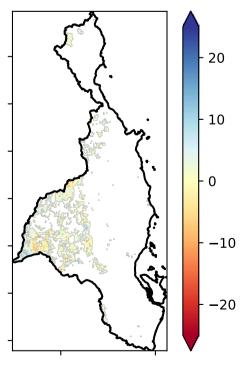
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area

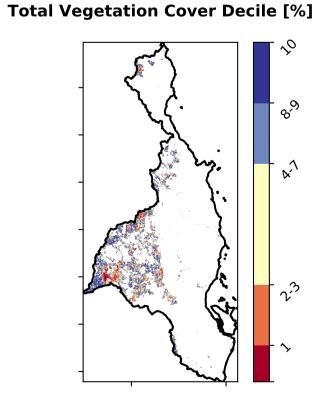


## % Area protected from wind erosion (>50%)





records for that month of







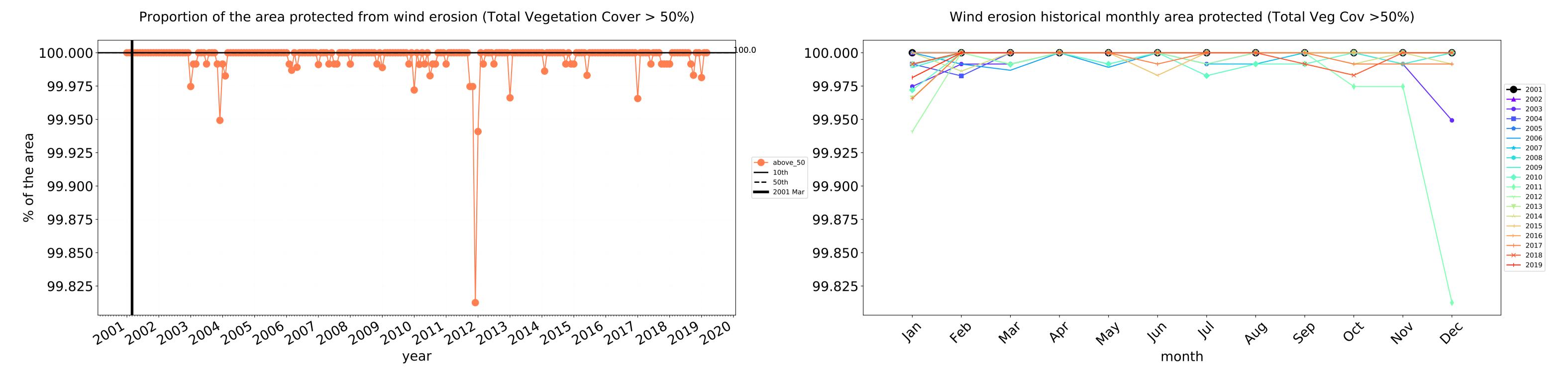


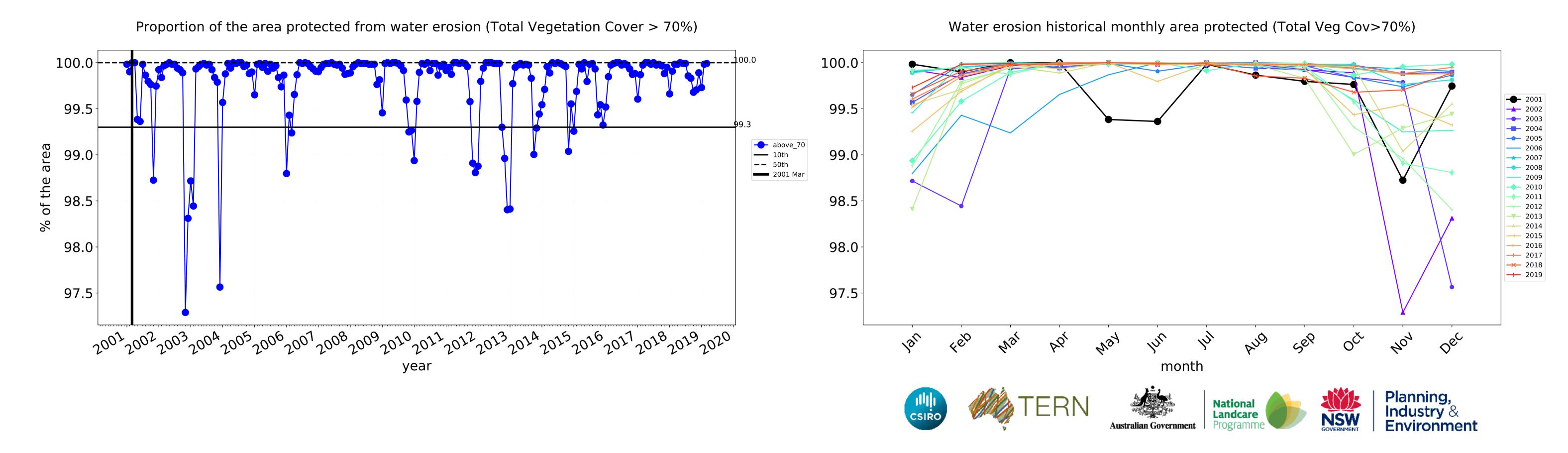


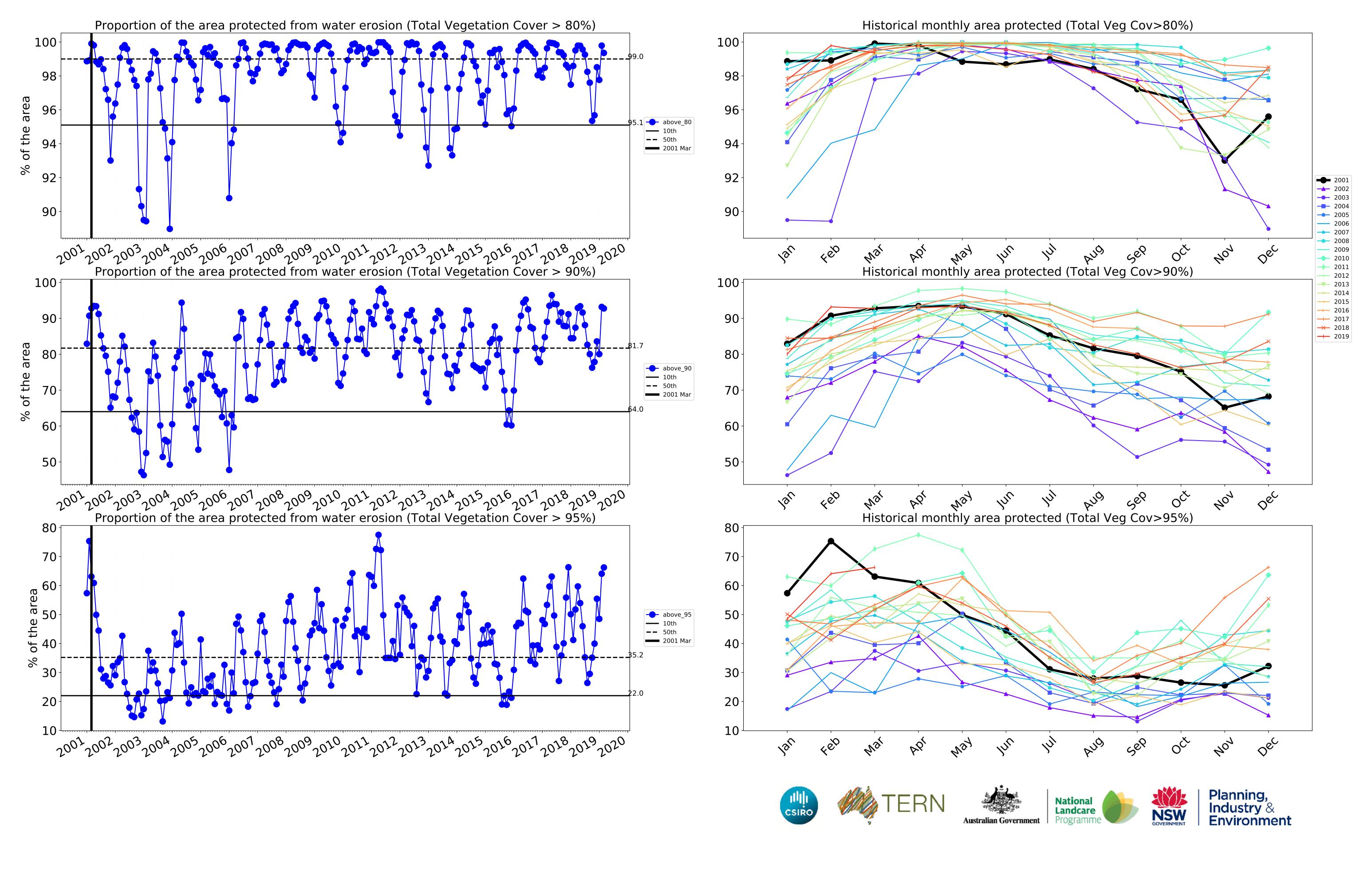




## **Grazing Woodland forest timeseries**







## **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

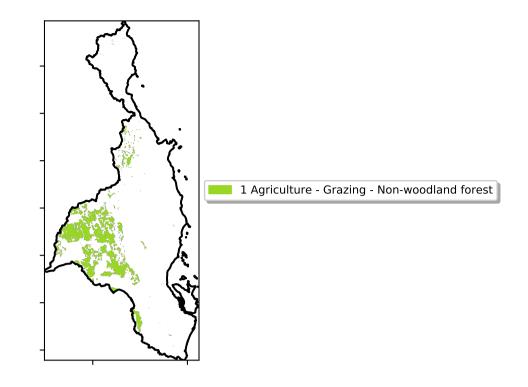
pixel is from the mean. That

pixel. The mean

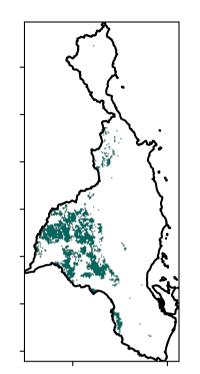
is only for the month of the map using baseline

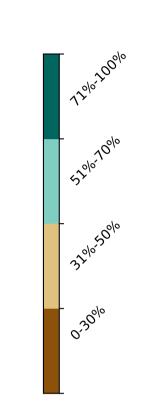
from 2001 to 2019.

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

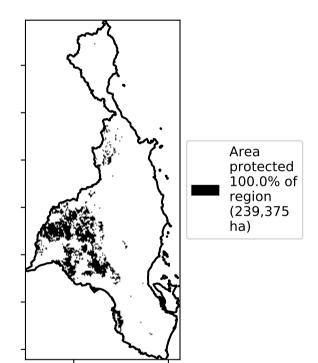


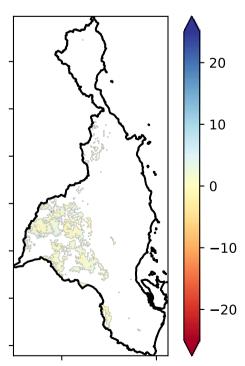
#### **Total Vegetation Cover [%]**





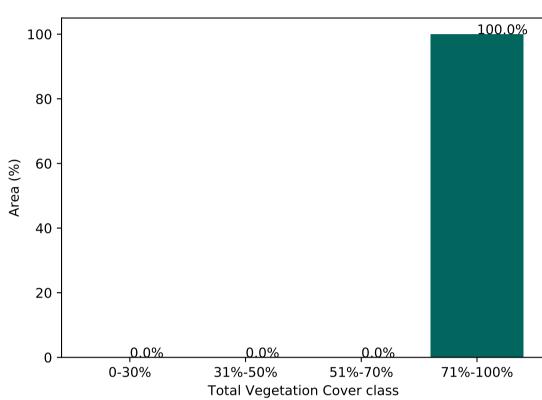
#### % Area protected from water erosion (>70%)



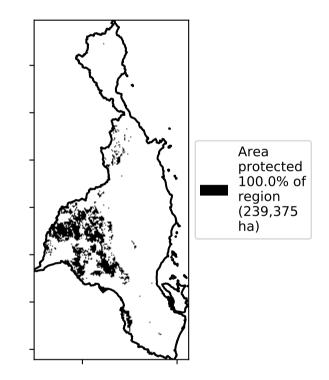


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

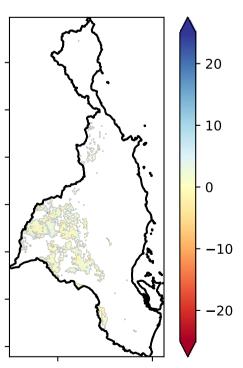
## Proportion of vegetation cover class in area



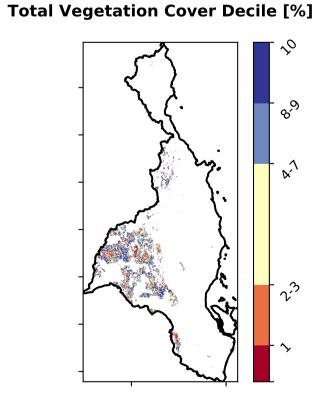
#### % Area protected from wind erosion (>50%)



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



records for that month of





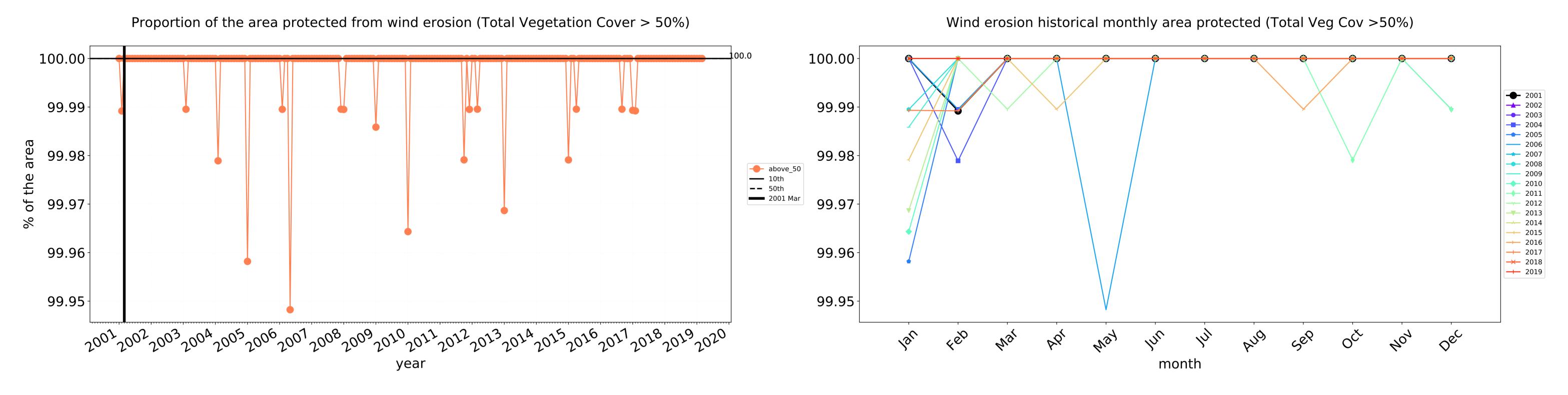


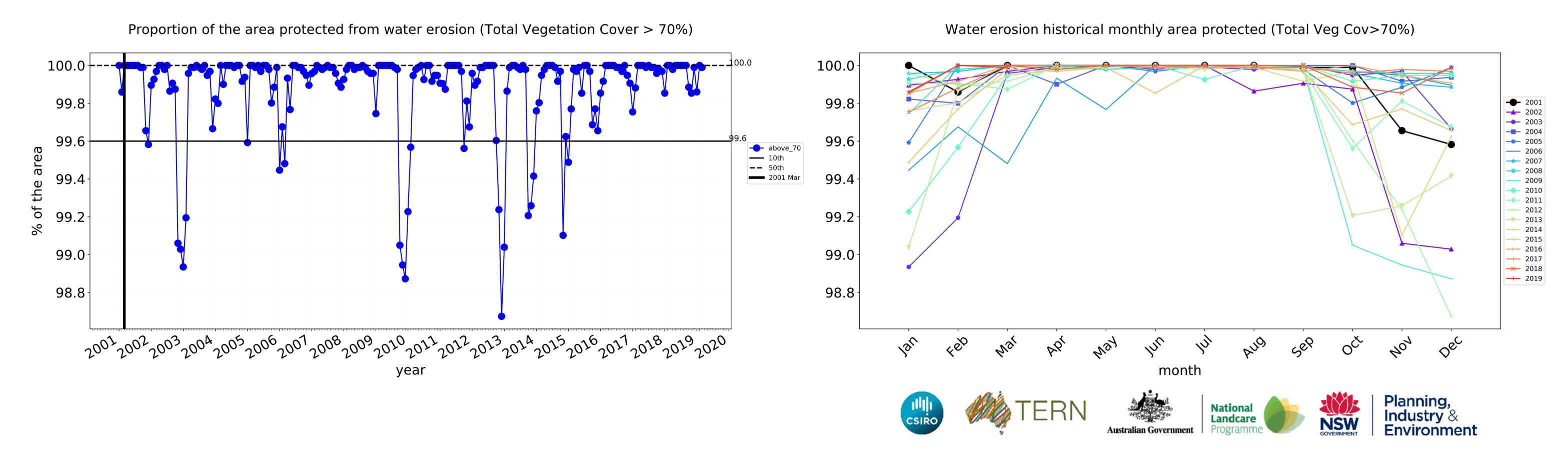


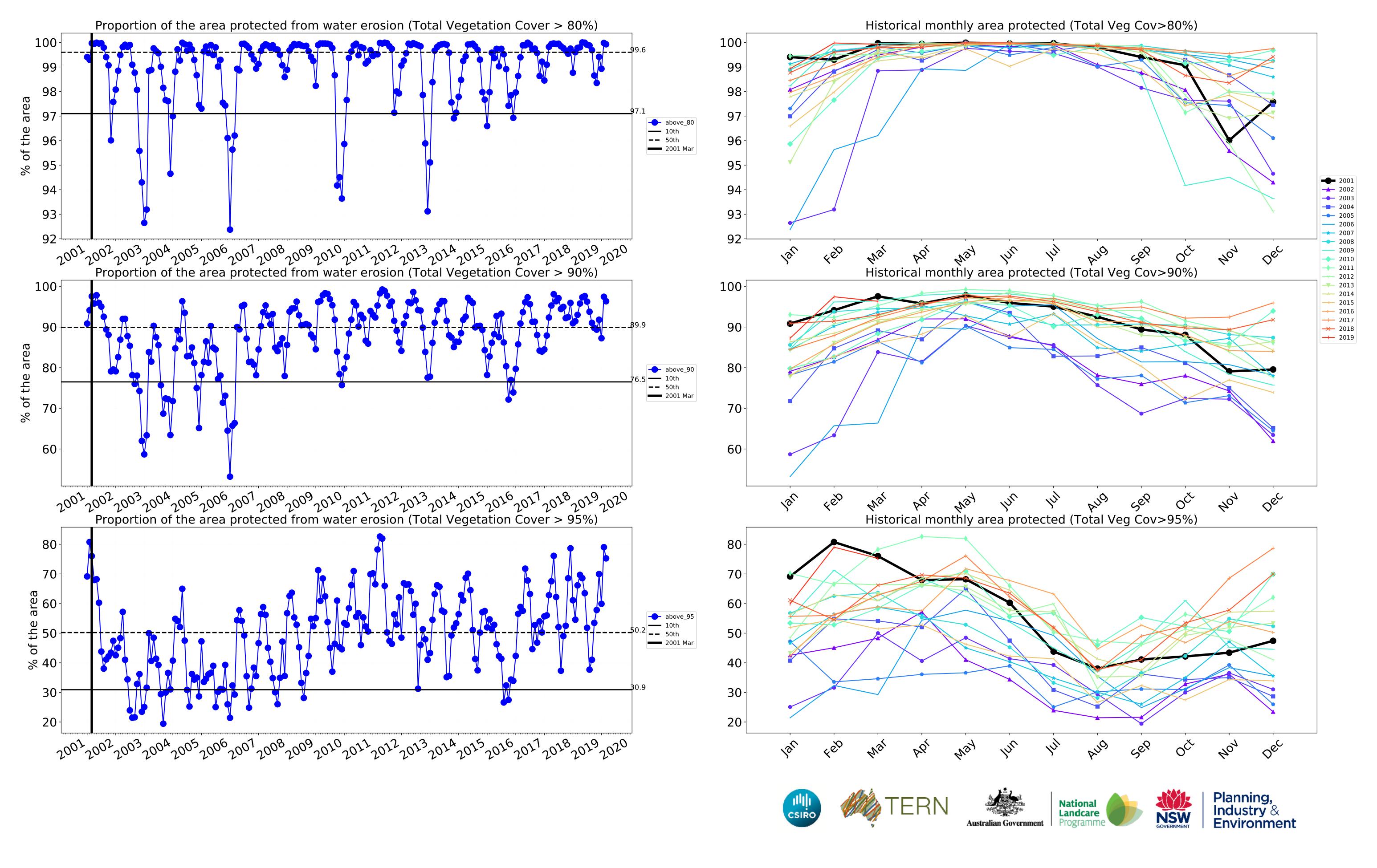












## **Cropping**

#### **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)

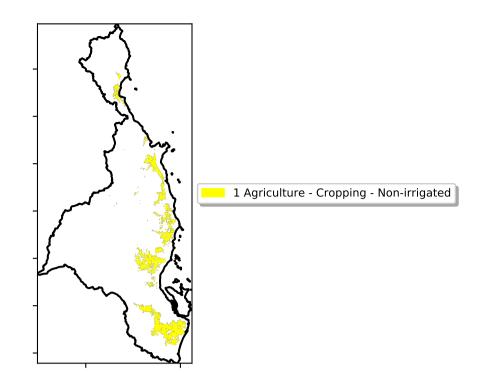
Anomaly show how many percetage points each

pixel is from the mean. That

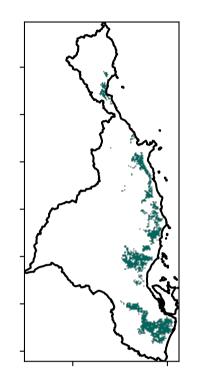
pixel. The mean

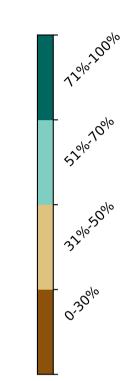
is only for the month of the map using baseline from 2001 to 2019.

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

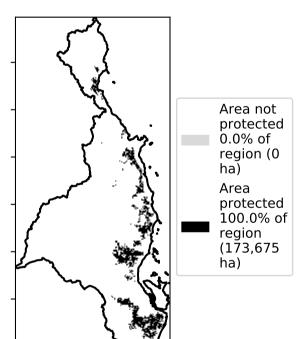


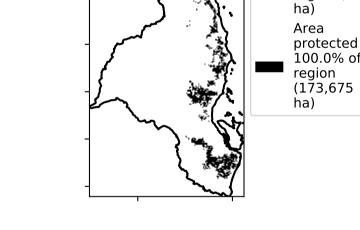
#### **Total Vegetation Cover [%]**



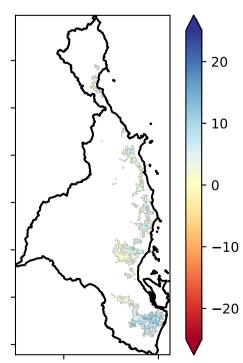


% Area protected from water erosion (>70%)



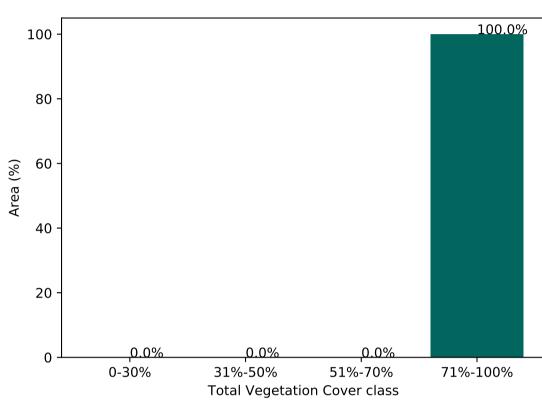


## **Total Vegetation Cover Anomaly [%]**

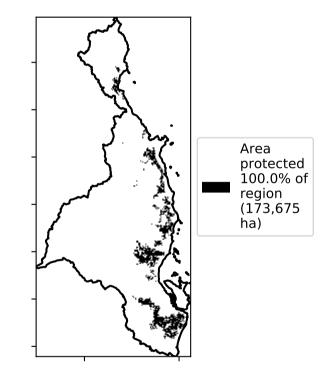


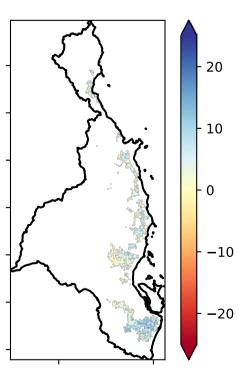
pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

## Proportion of vegetation cover class in area

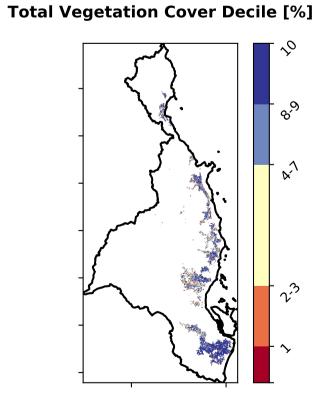


#### % Area protected from wind erosion (>50%)





Deciles show where the records for that month of







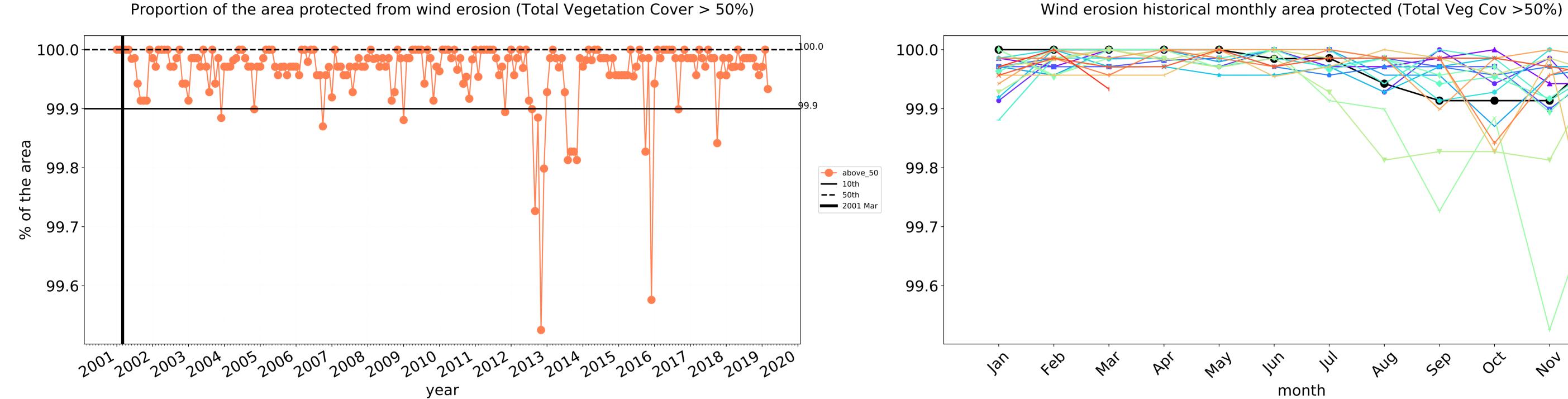


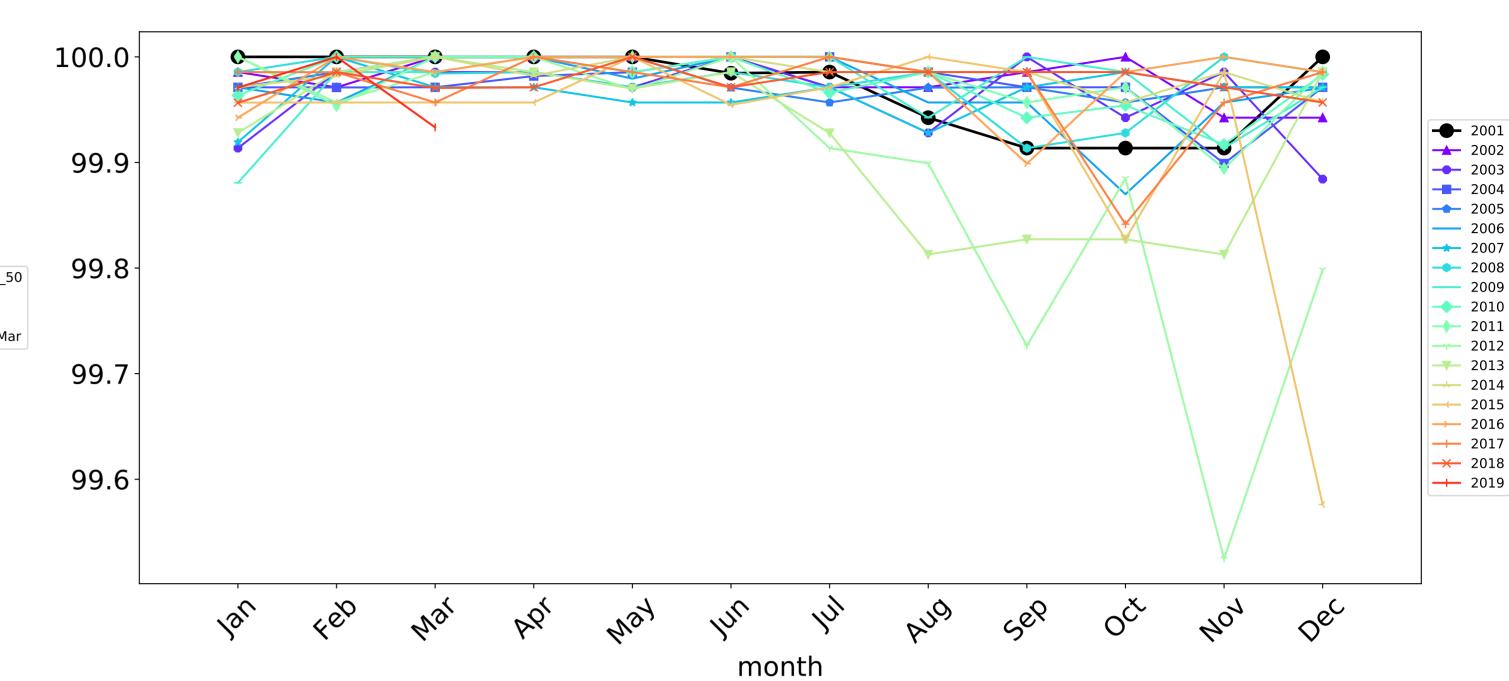


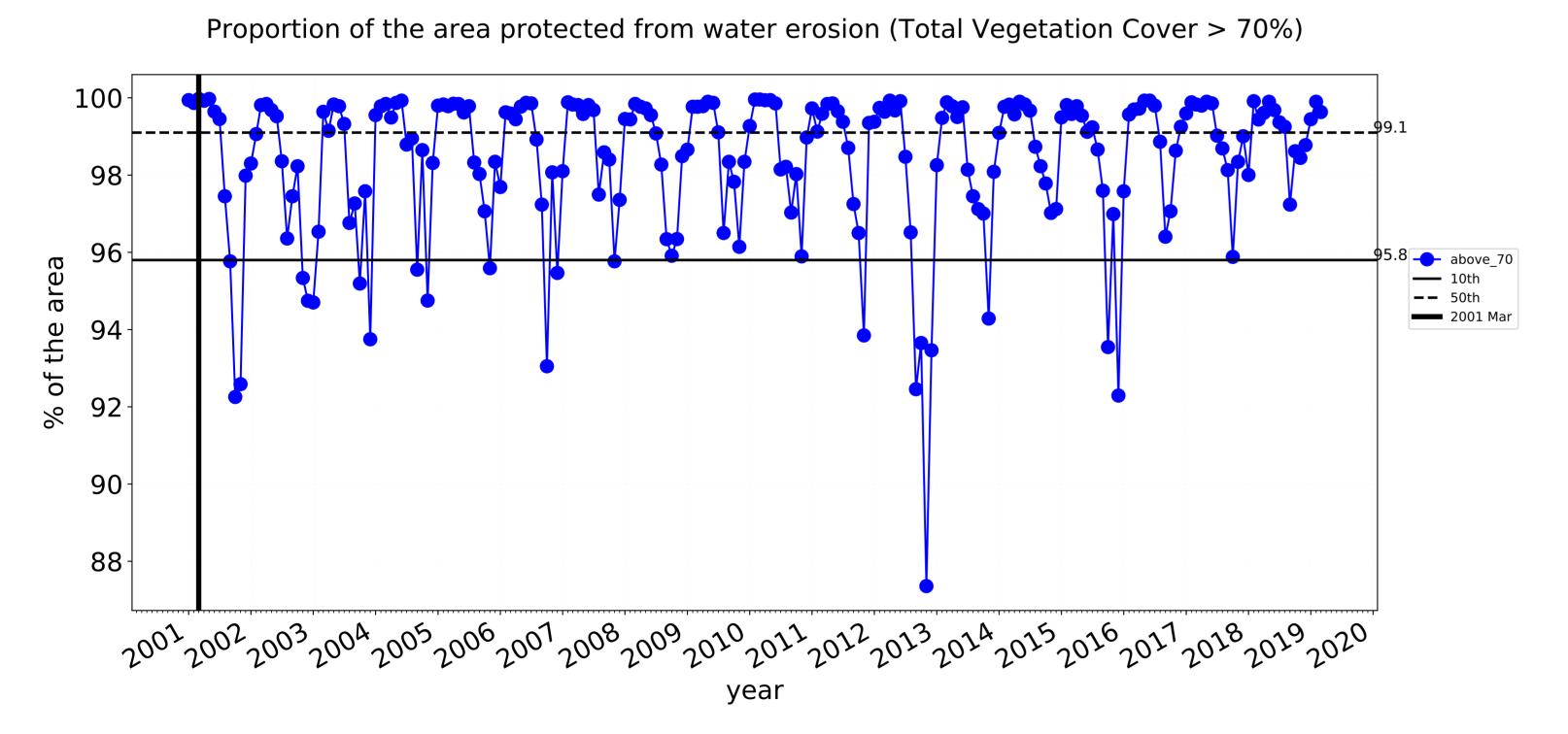


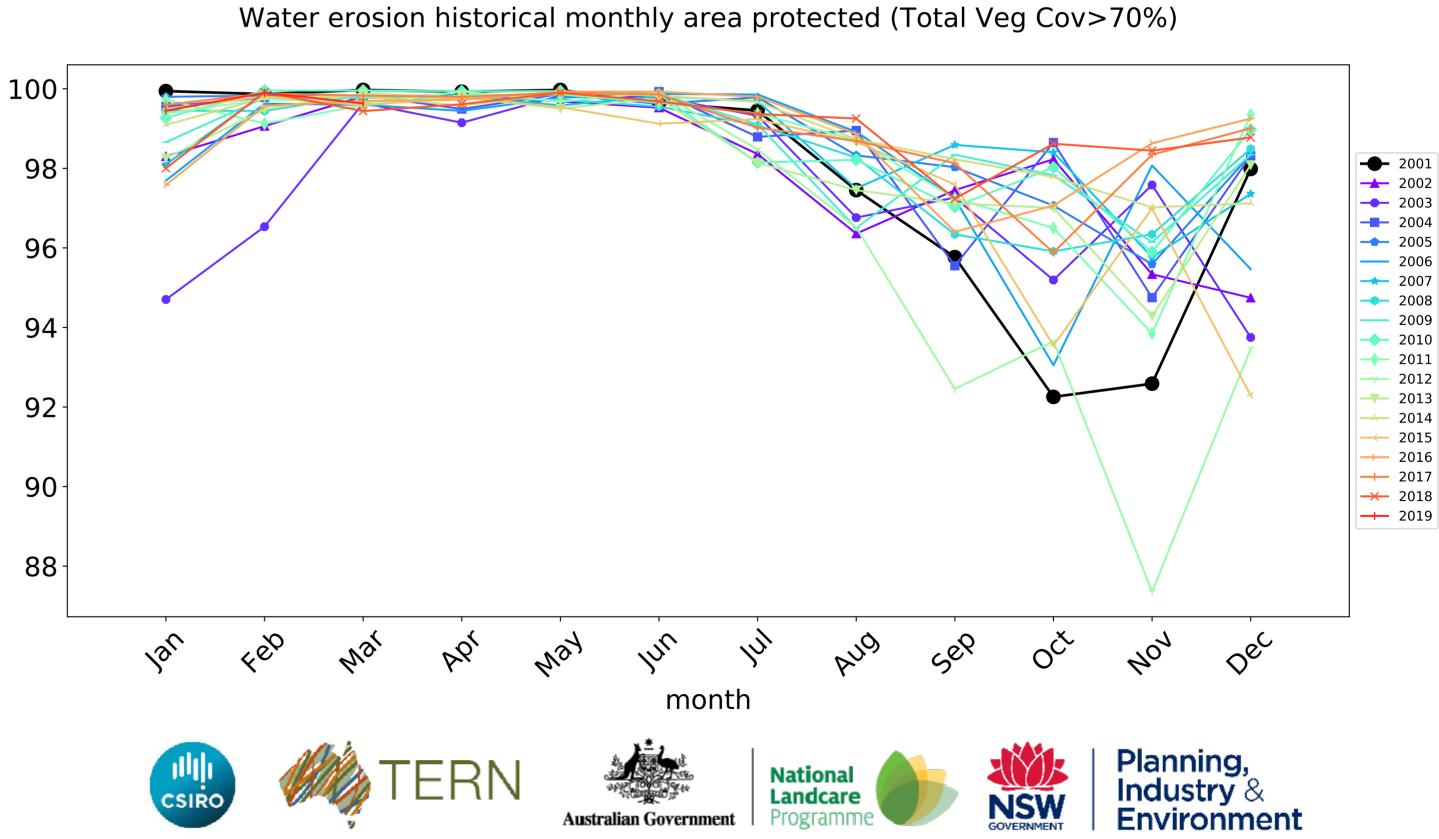


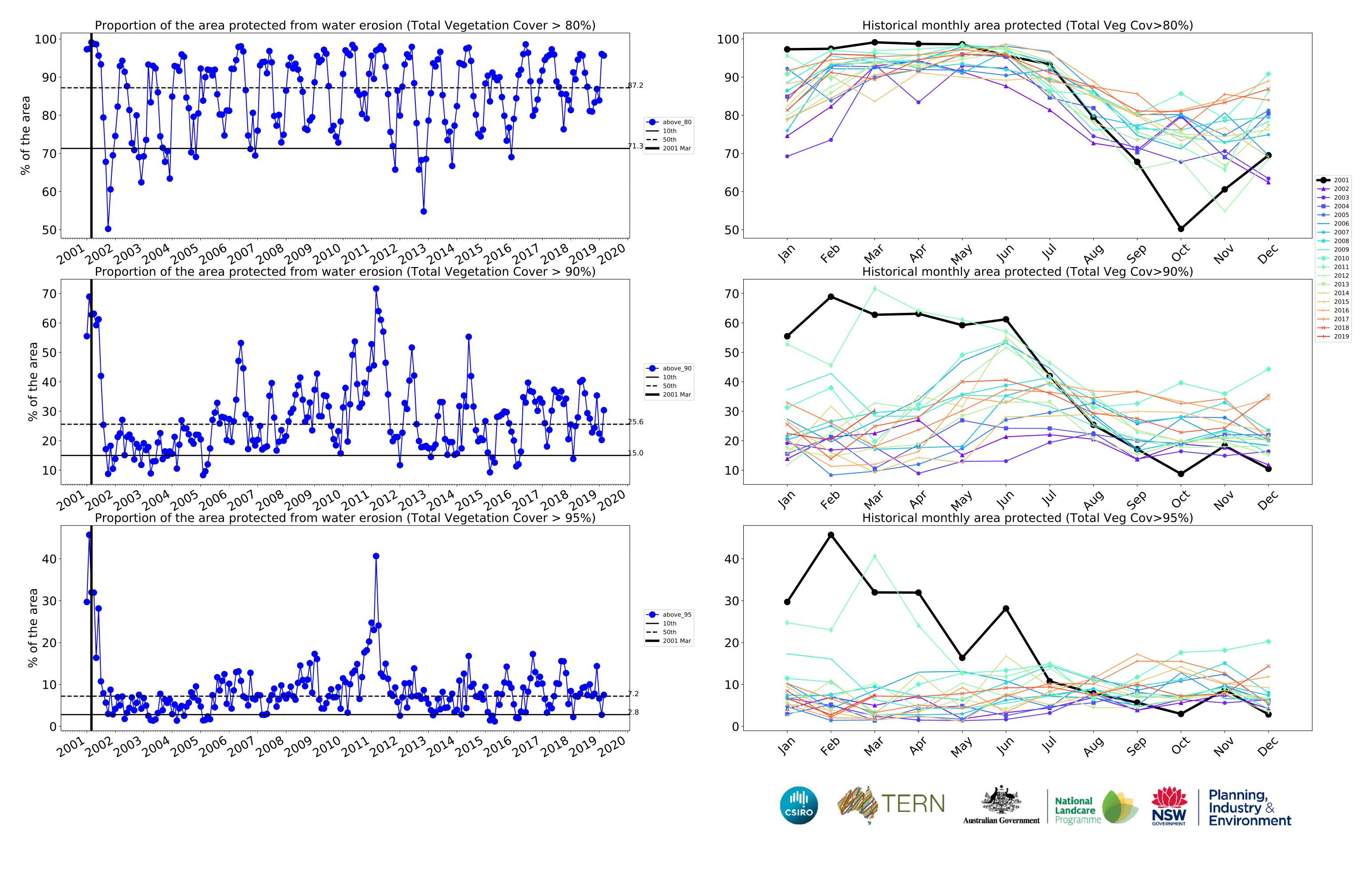
## **Cropping timeseries**











## **Irrigation**

#### Land use and forest cover

# Land Use and Forests 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

## 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

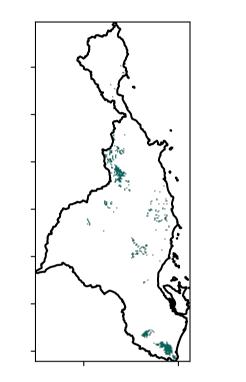
is, red pixels are about 20% lower than the mean of that

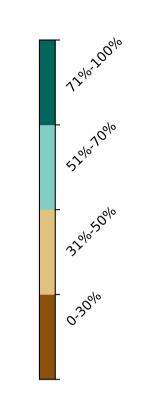
Catchment Scale

of Australia (2018)

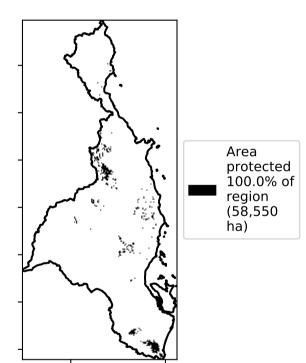
Derived from

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

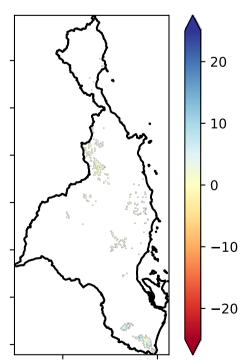




% Area protected from water erosion (>70%)

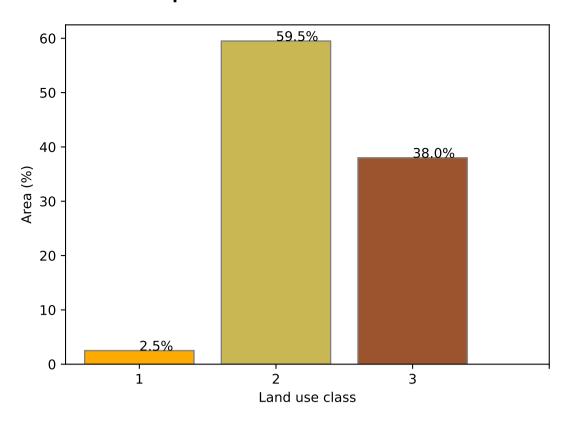


**Total Vegetation Cover Anomaly [%]** 

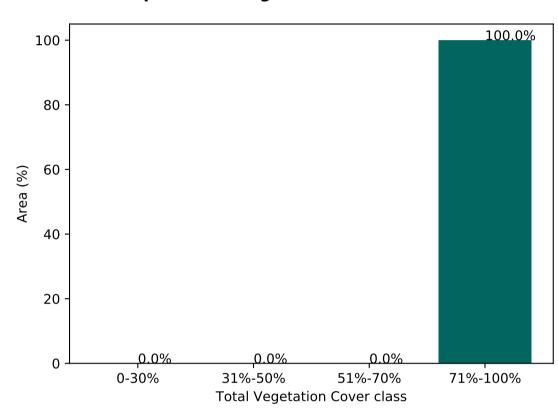


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

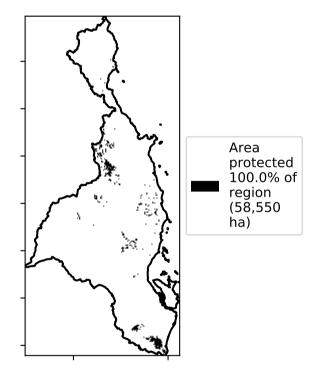
#### Proportion of each land class in area

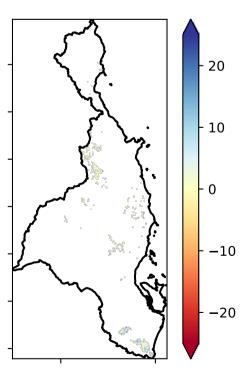


Proportion of vegetation cover class in area

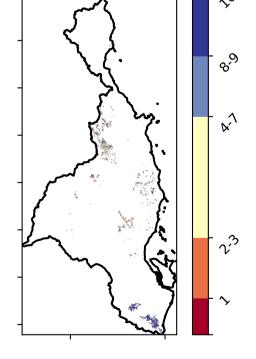


% Area protected from wind erosion (>50%)





Deciles show where the



**Total Vegetation Cover Decile [%]** 





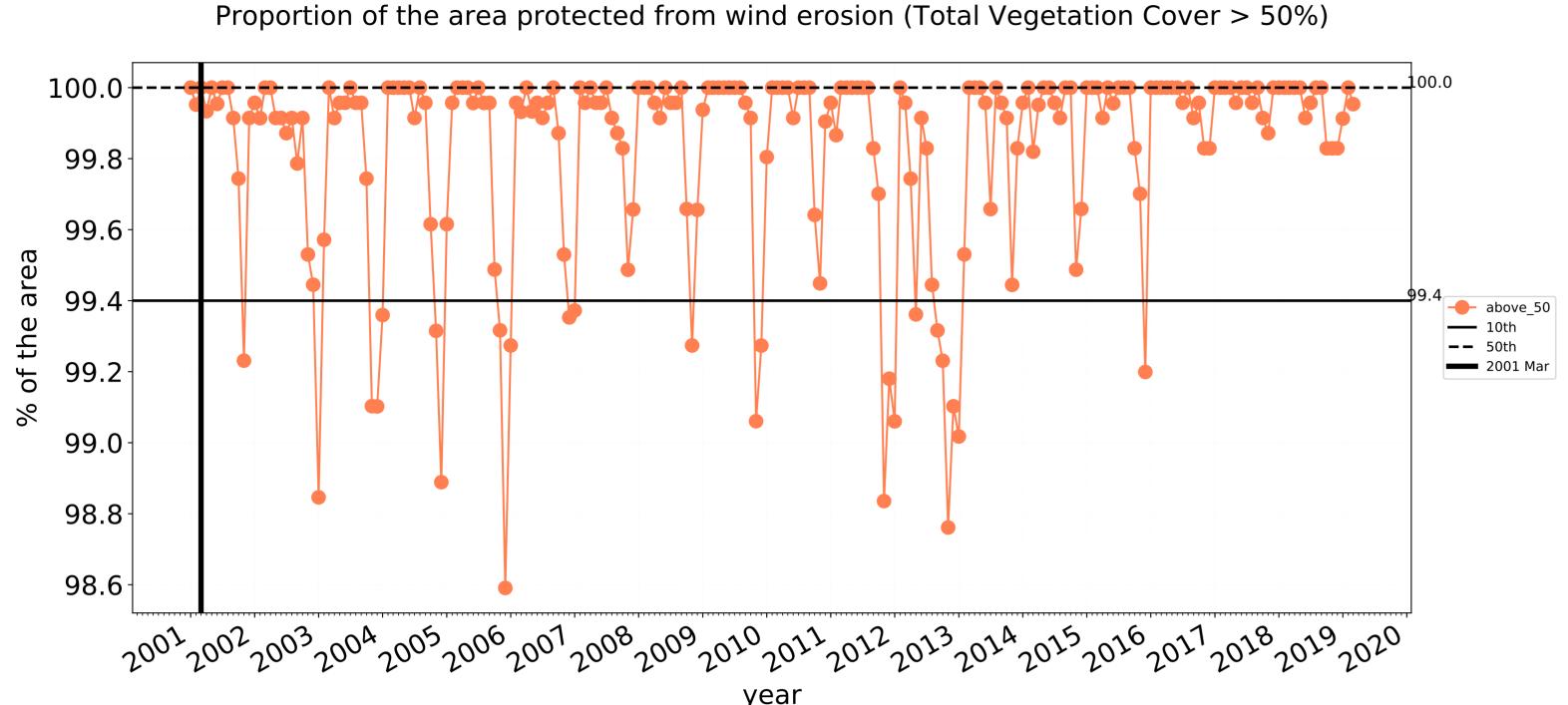


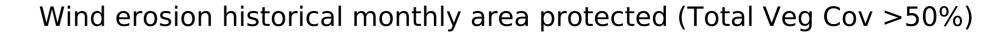


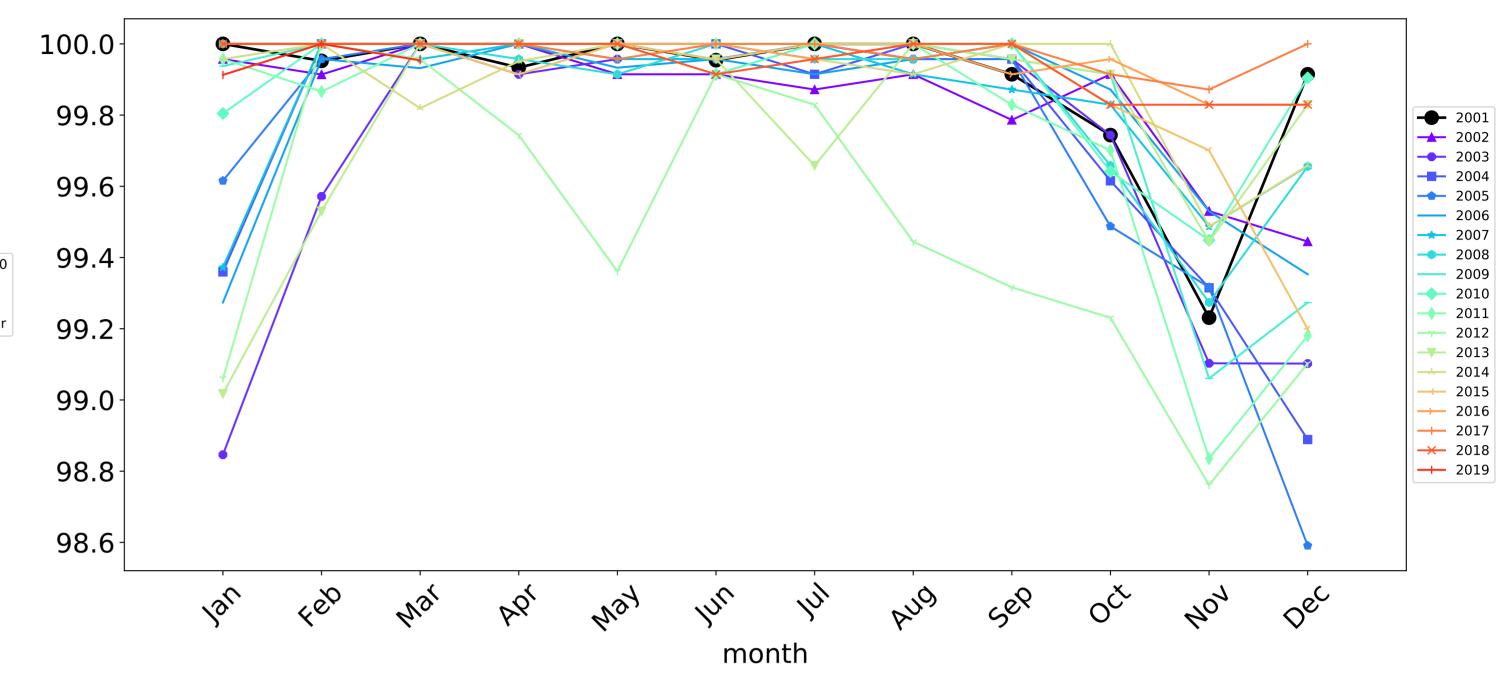


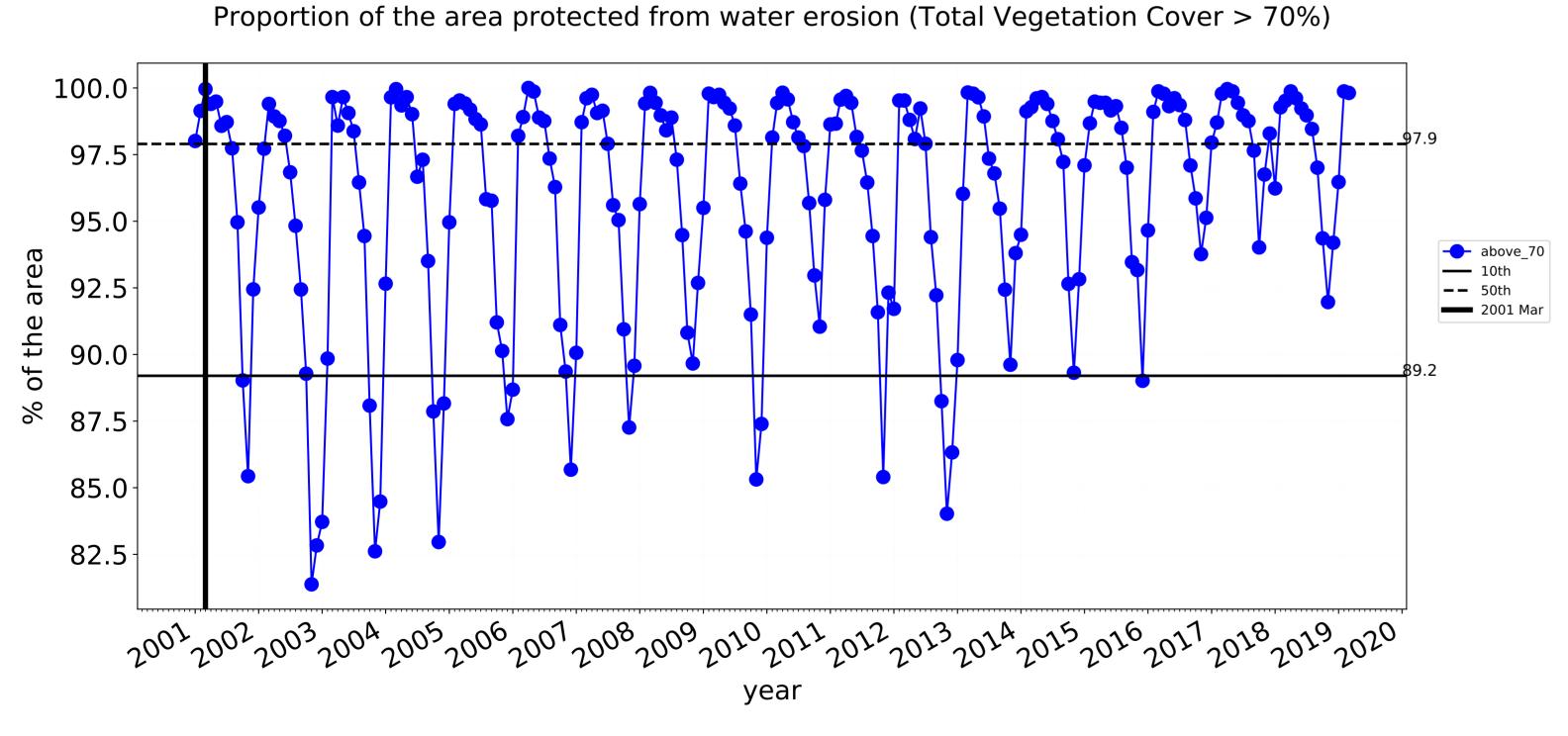


## **Irrigation timeseries**







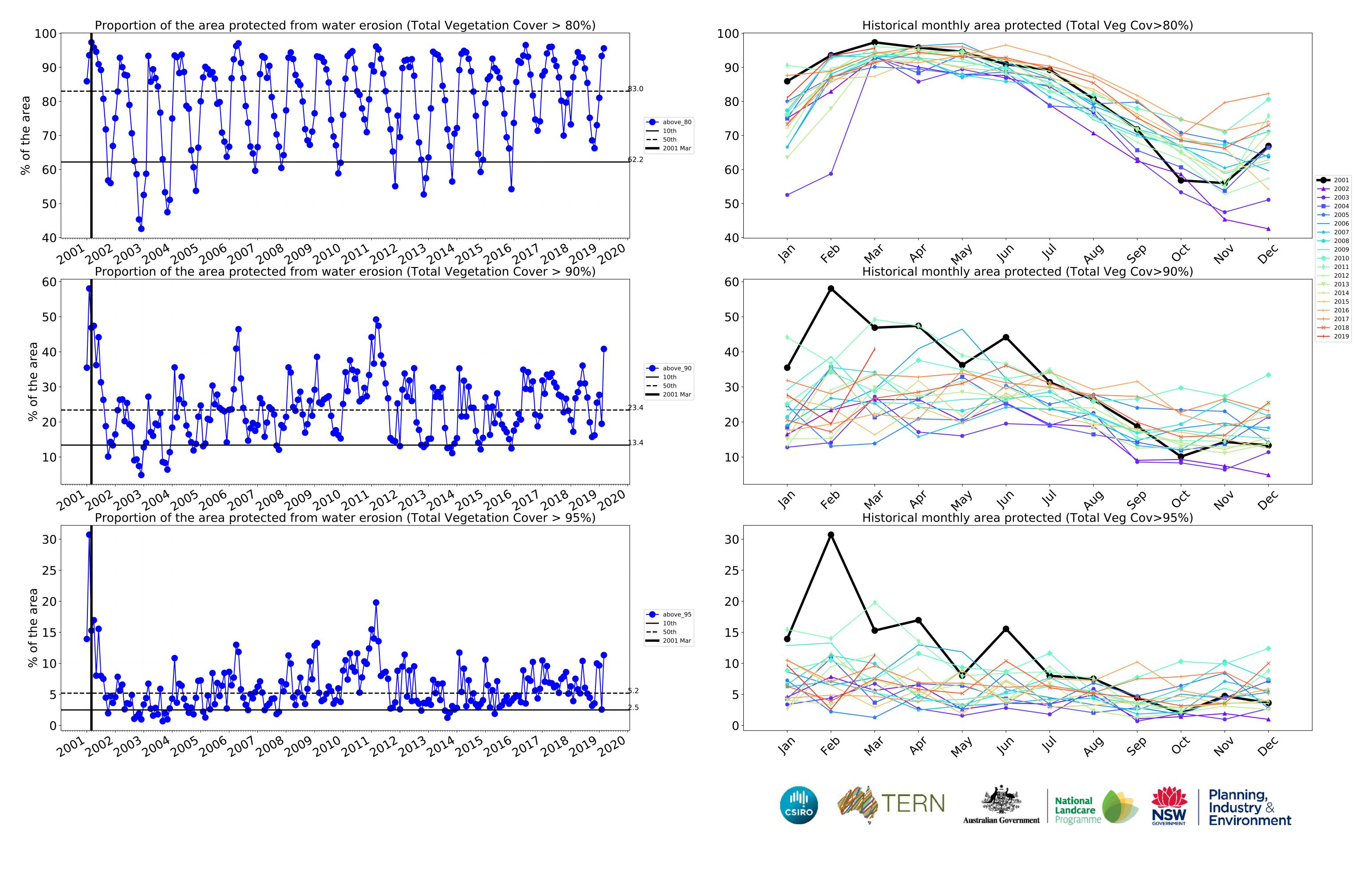


## 100.0 97.5 2001 2002 2003 2004 95.0 92.5 2011 2012 2013 90.0 2014 87.5 <del>←</del> 2015 **→** 2016 <del>----</del> 2017 85.0 → 2018 → 2019 82.5 month Planning, Industry & Environment National

Landcare

NSW GOVERNMENT

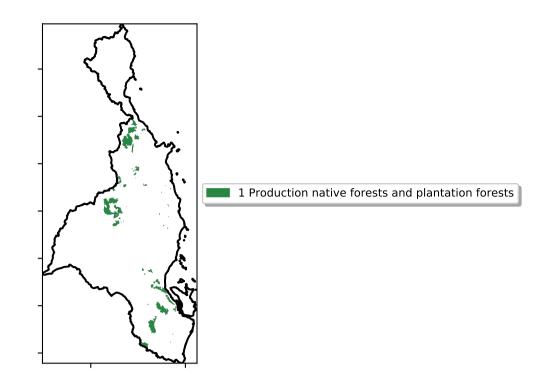
Water erosion historical monthly area protected (Total Veg Cov>70%)



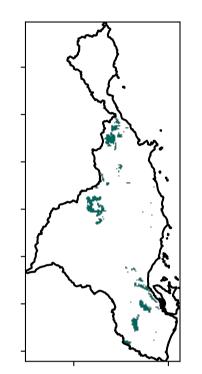
## **Production native forests and plantation forests**

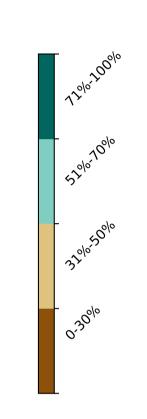
#### Land use and forest cover

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

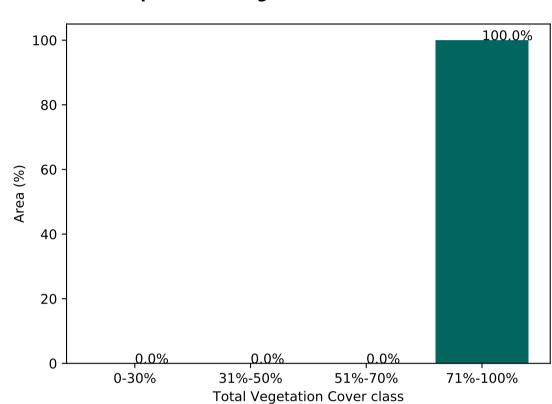


#### **Total Vegetation Cover [%]**

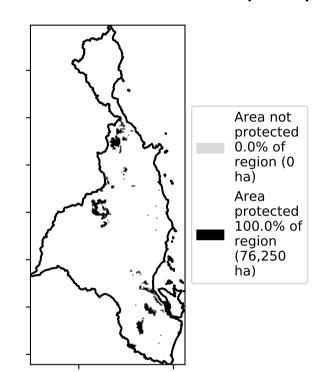




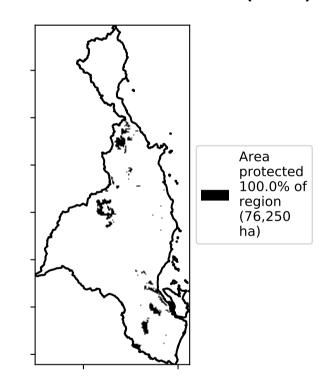
#### Proportion of vegetation cover class in area



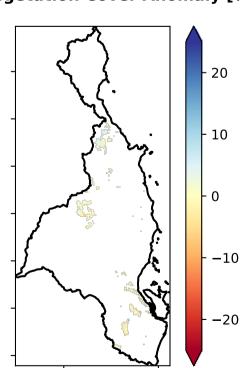
## % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

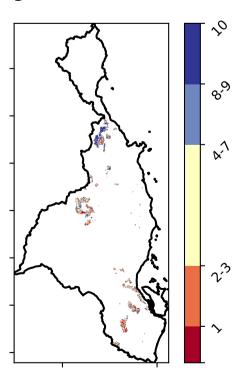


## **Total Vegetation Cover Anomaly [%]**

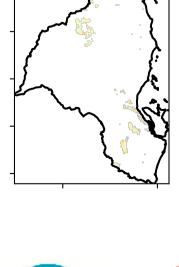


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**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.





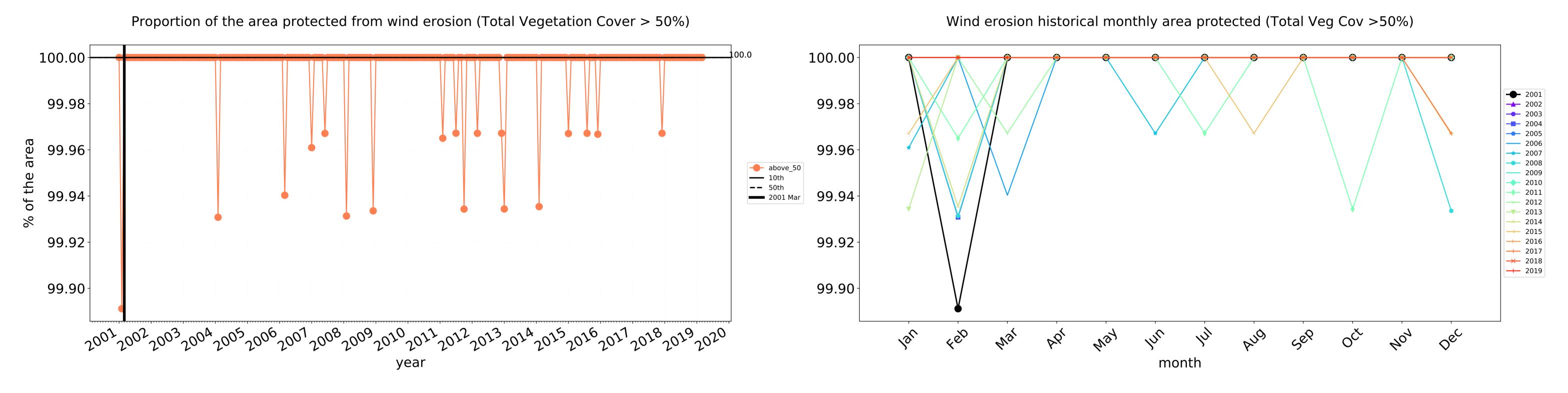


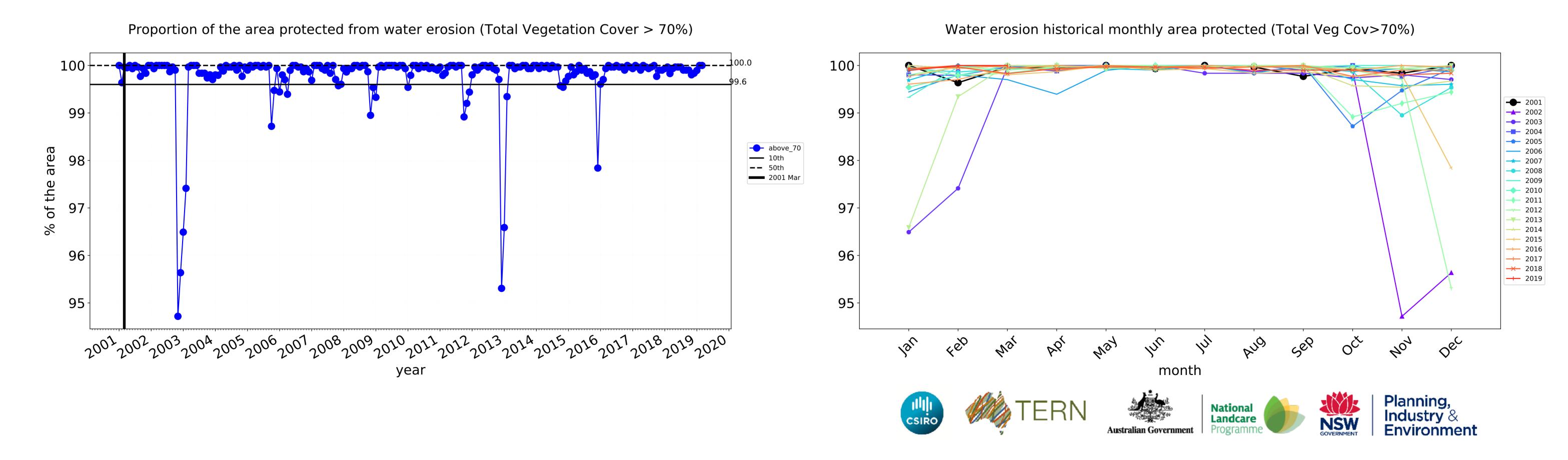


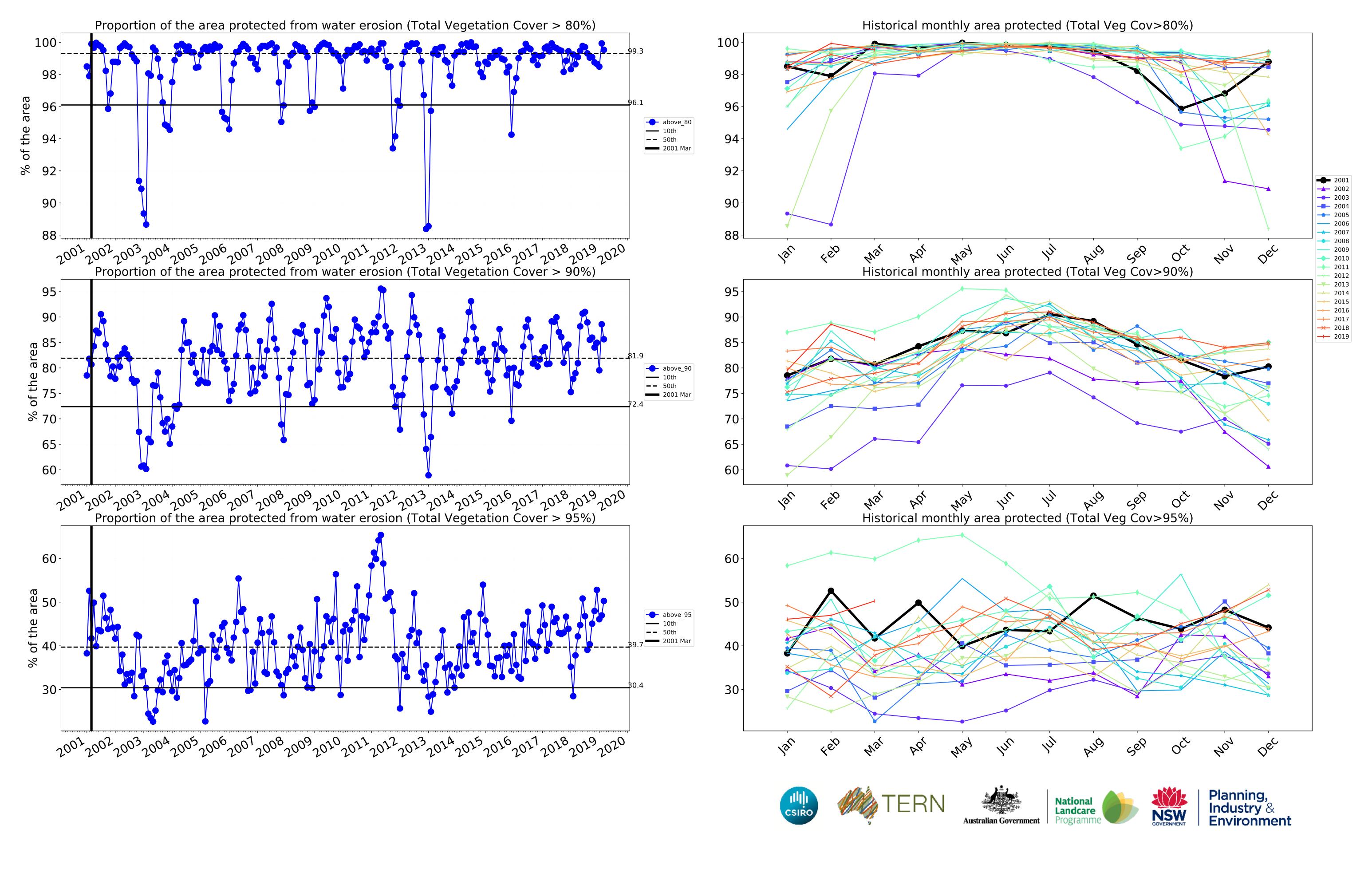




## **Production native forests and plantation forests timeseries**







# Wet Tropics (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% 1,776,904	100.0% 1,776,482	99.8% 1,772,604	98.8% 1,756,428	83.1% 1,477,454	42.6% 757,566
Conservation and natural environments	1,075,925	100.0% 1,075,875	100.0% 1,075,750	99.8% 1,073,800	99.2% 1,067,650	89.1% 958,625	38.6% 415,825
Conservation and natural environments Woodland forest	138,225	100.0% 138,225	100.0% 138,225	99.9% 138,125	99.7% 137,750	90.7% 125,425	45.8% 63,350
Conservation and natural environments Forest (non woodland)	926,075	100.0% 926,025	100.0% 925,900	99.8% 924,175	99.2% 918,825	89.1% 825,375	37.7% 348,800
Agriculture	943,175	100.0% 943,175	100.0% 943,175	100.0% 943,100	99.5% 938,800	80.5% 759,350	49.9% 470,425
Grazing	710,900	100.0% 710,900	100.0% 710,900	100.0% 710,900	99.8% 709,600	87.6% 622,850	57.1% 405,950
Grazing non forest	175,475	100.0% 175,475	100.0% 175,475	100.0% 175,475	99.5% 174,525	65.3% 114,650	21.2% 37,125
Grazing Woodland forest	296,050	100.0% 296,050	100.0% 296,050	100.0% 296,050	99.9% 295,775	92.8% 274,700	63.1% 186,825
Grazing - Forest (non woodland)	239,375	100.0% 239,375	100.0% 239,375	100.0% 239,375	100.0% 239,300	97.5% 233,500	76.0% 182,000
Cropping	173,675	100.0% 173,675	100.0% 173,675	100.0% 173,625	99.1% 172,150	62.8% 109,025	32.0% 55,525
Irrigation	58,550	100.0% 58,550	100.0% 58,550	100.0% 58,525	97.4% 57,000	46.9% 27,450	15.3% 8,950
Production native forests and plantation forests	76,250	100.0% 76,250	100.0% 76,250	100.0% 76,225	99.9% 76,175	80.7% 61,525	41.7% 31,800











