### **Total vegetation cover soil protection Region:NRM Riverina NSW**

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: November 2012** 

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





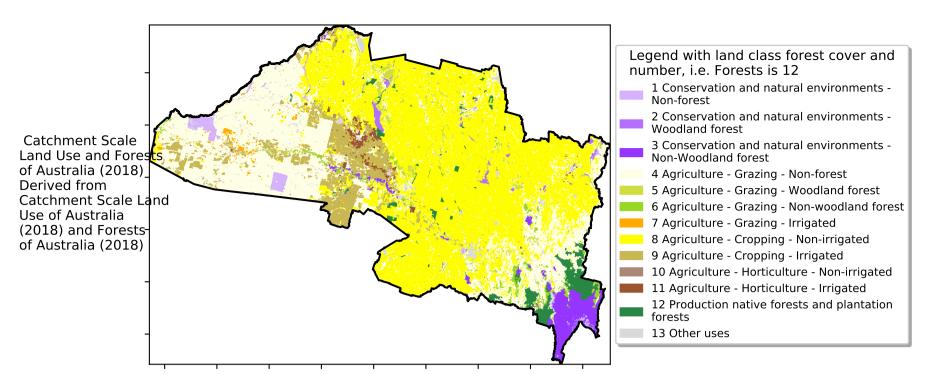




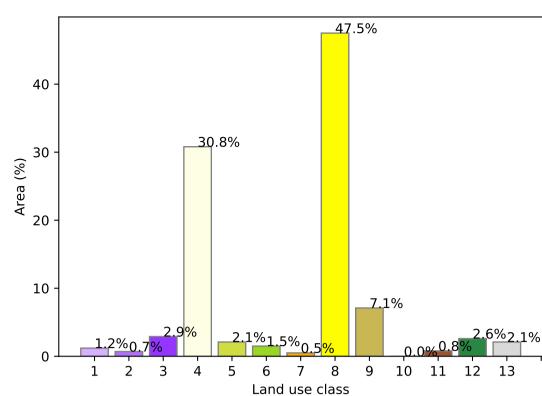


#### **Vegetation Cover Nov 2012**

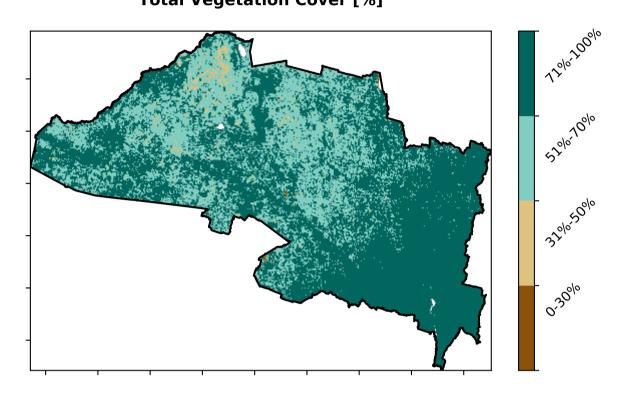
#### Land use and forest cover



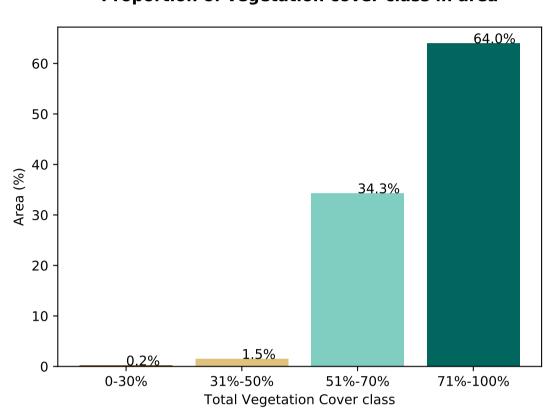
#### Proportion of each land class in area



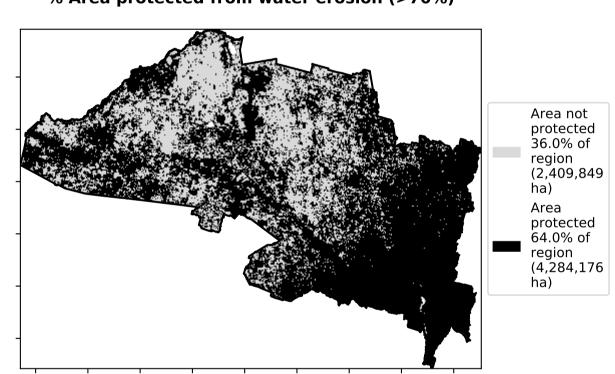
#### **Total Vegetation Cover [%]**



Proportion of vegetation cover class in area



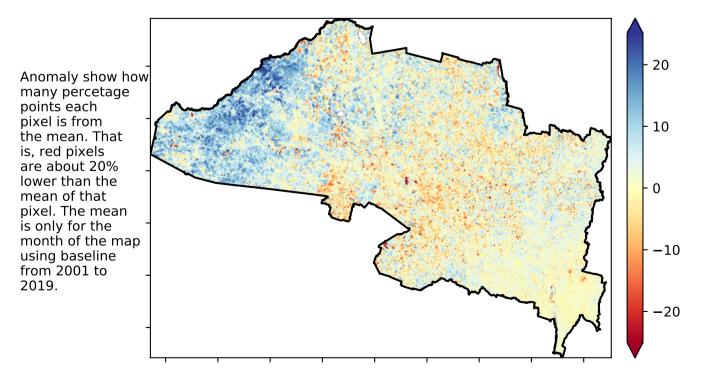
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

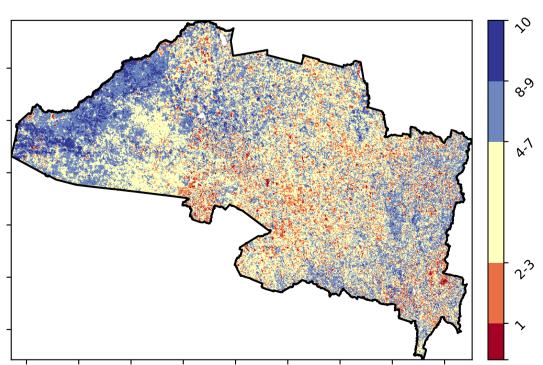


#### Total Vegetation Cover Anomaly [%]



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 [%]**





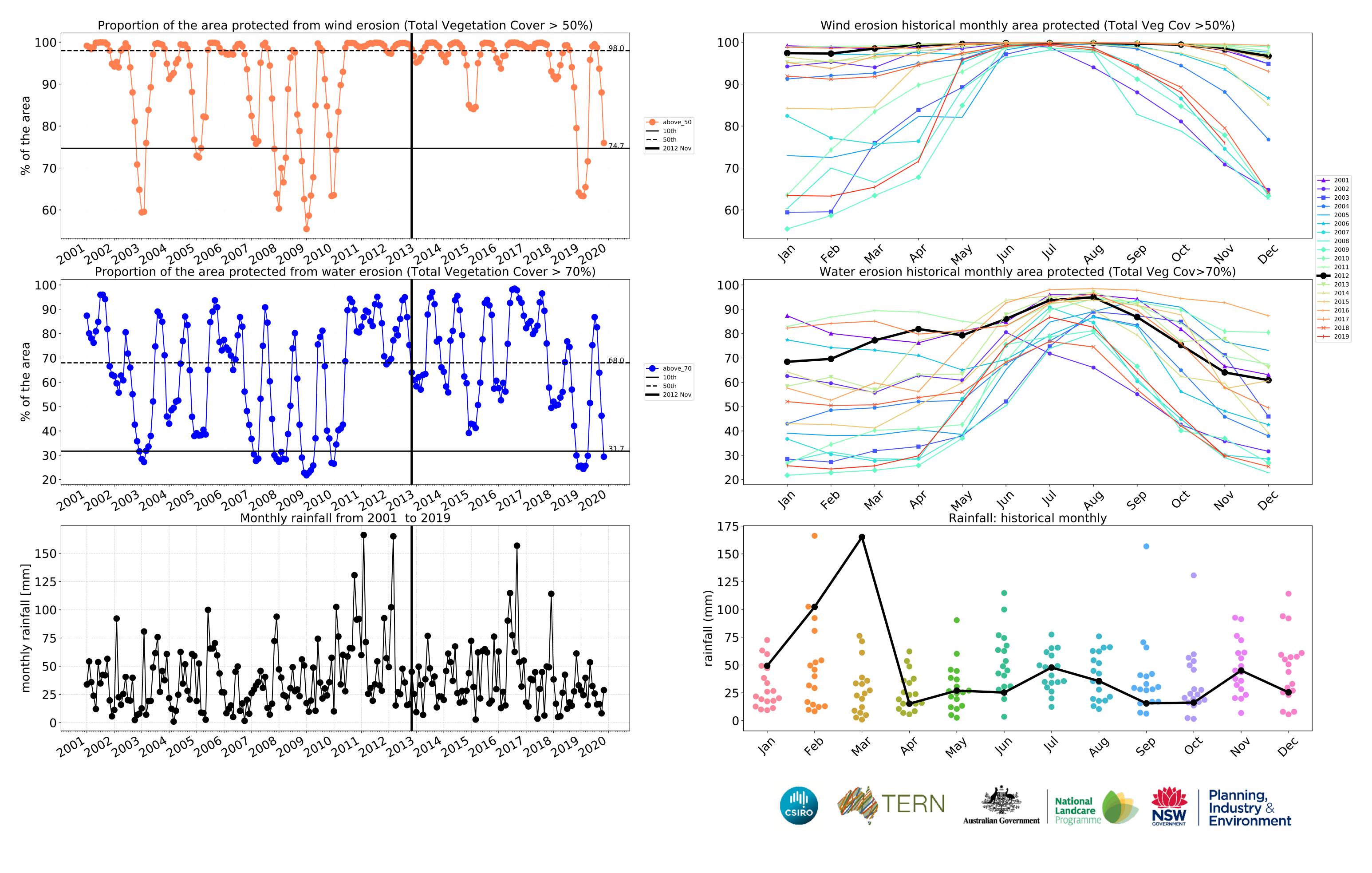




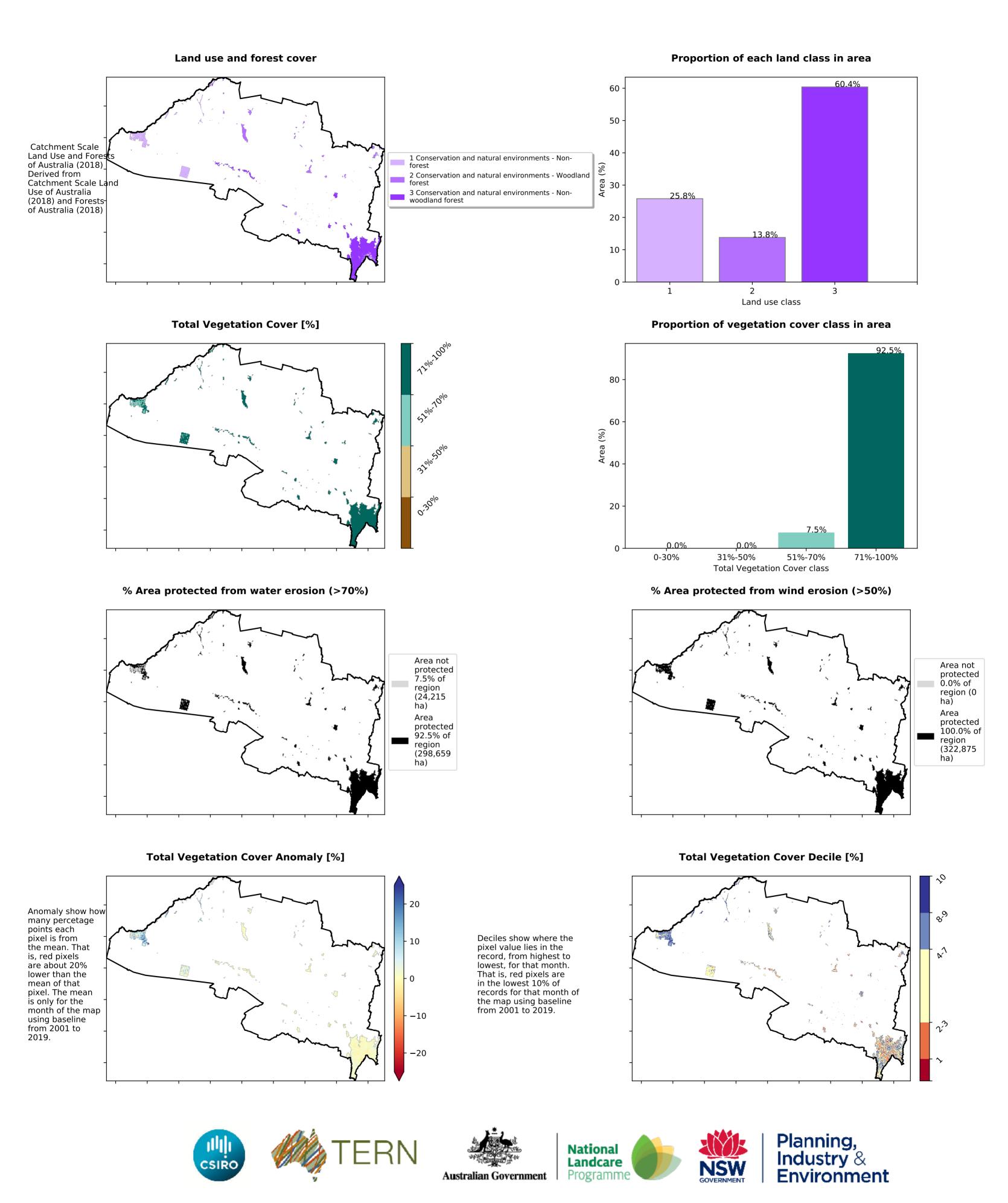




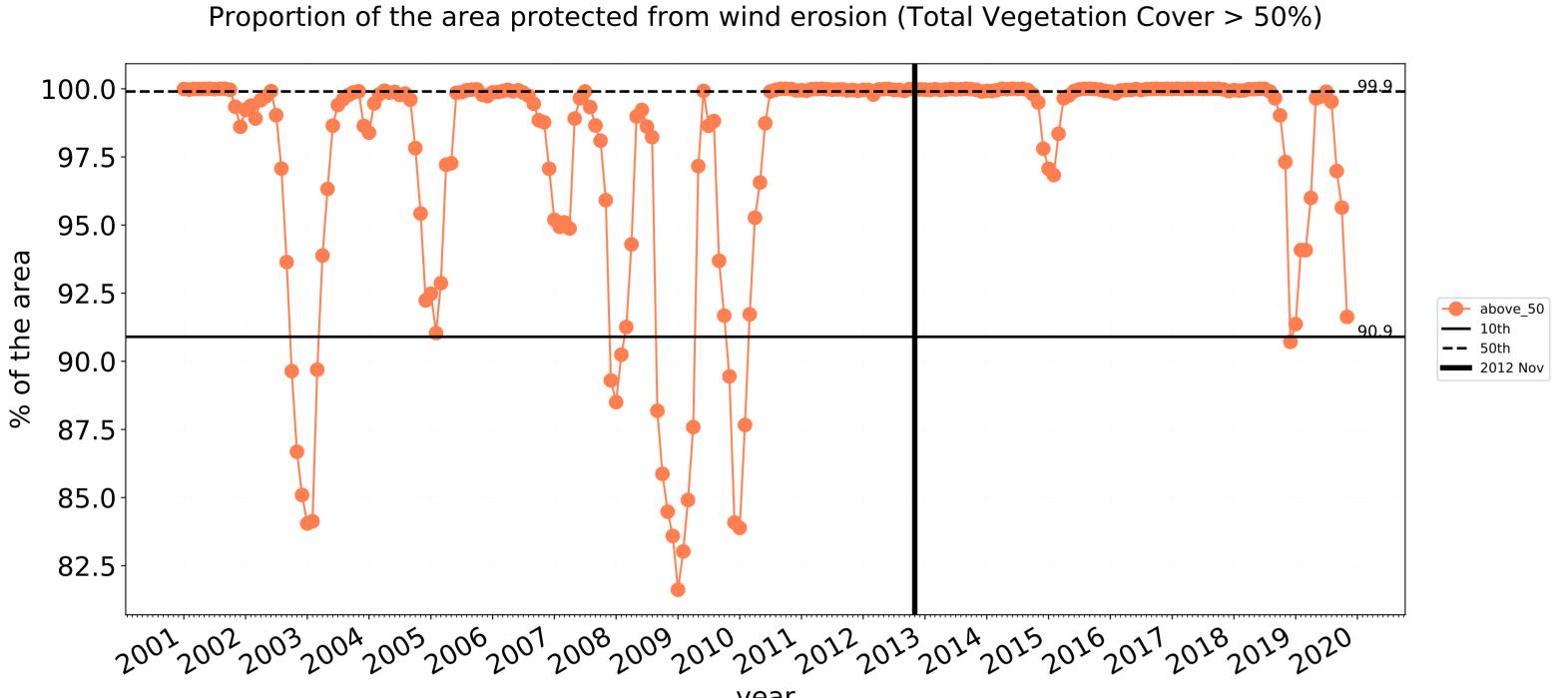


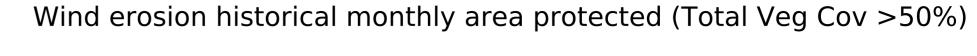


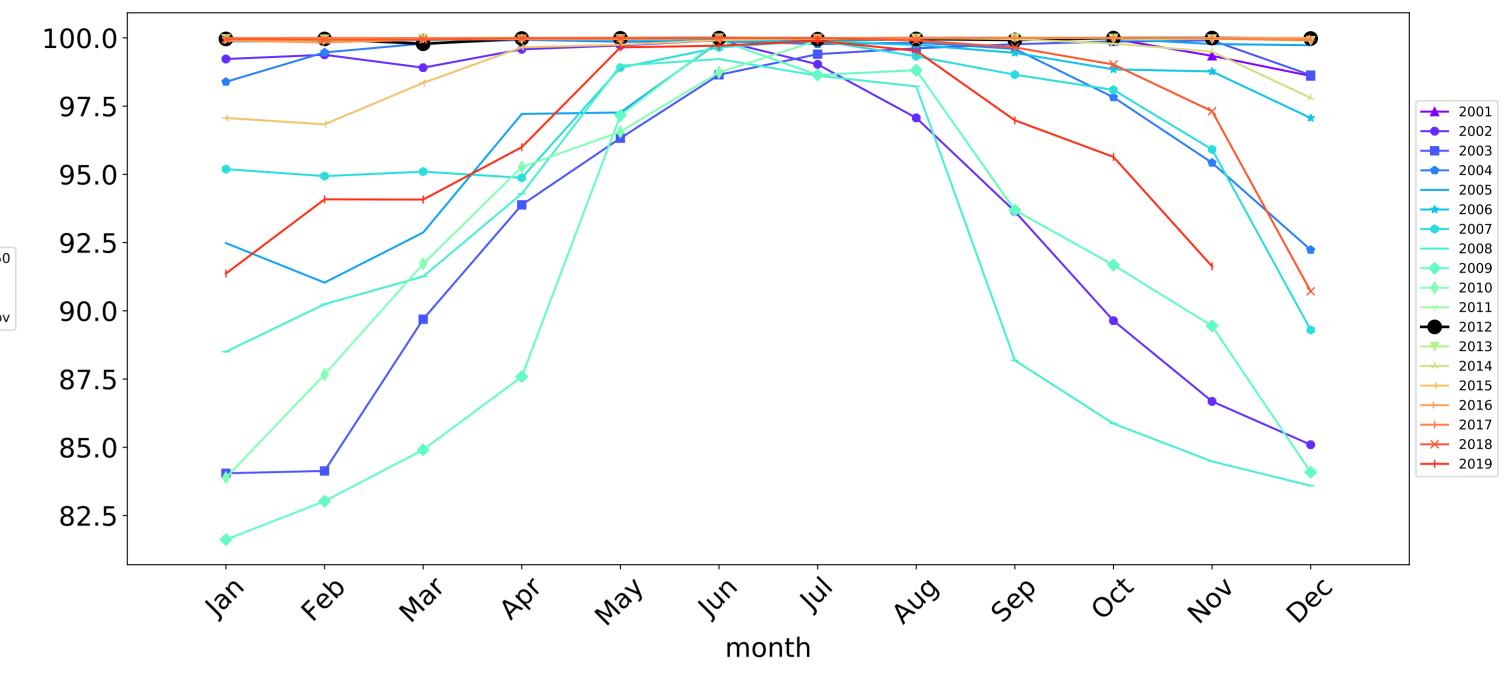
#### **Conservation and natural environments**

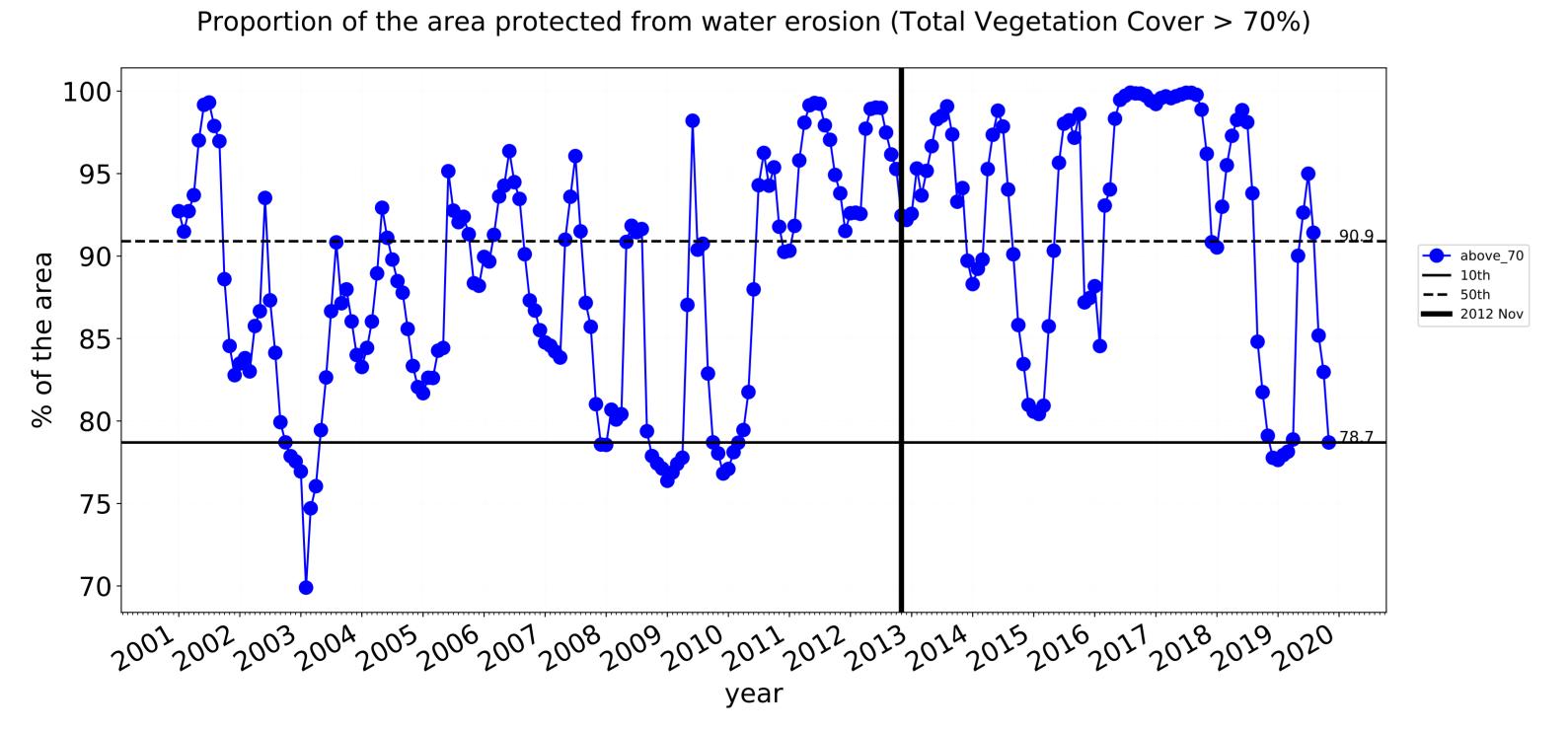


#### **Conservation and natural environments timeseries**









#### 100 2001 2002 2003 95 <del>----</del> 2005 90 <del>----</del> 2007 85 → 2010 2011 2012 2013 2014 80 <del>←</del> 2015 **→** 2016 <del>----</del> 2017 <del>×</del> 2018 75 <del>----</del> 2019 70month Planning, Industry & Environment NSW GOVERNMENT National Landcare

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

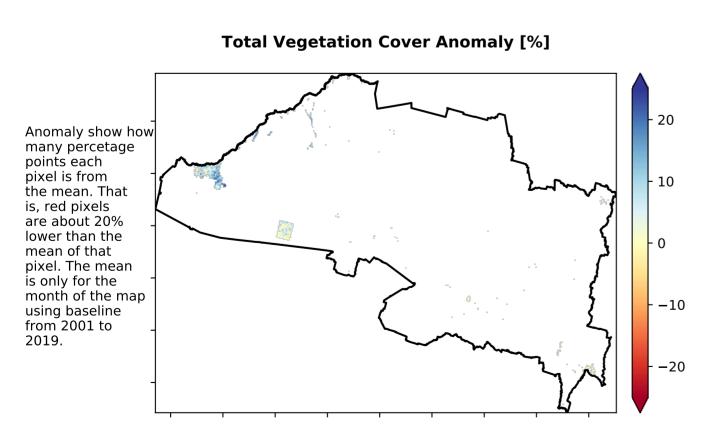
#### **Conservation and natural environments non forest**

## Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 1 Conservation and natural environments - Nonforest 1 Conservation and natural environments - Nonforest

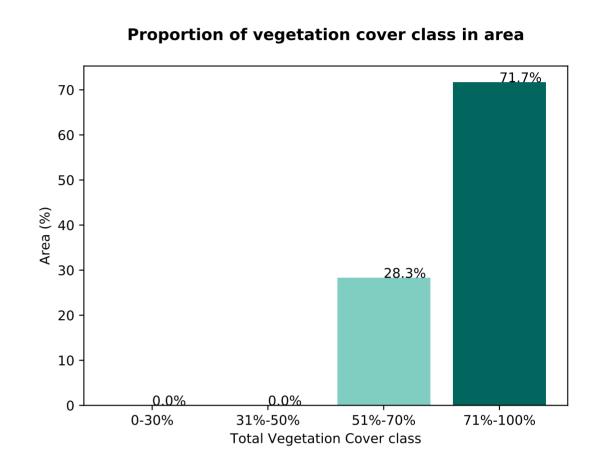
# Total Vegetation Cover [%]

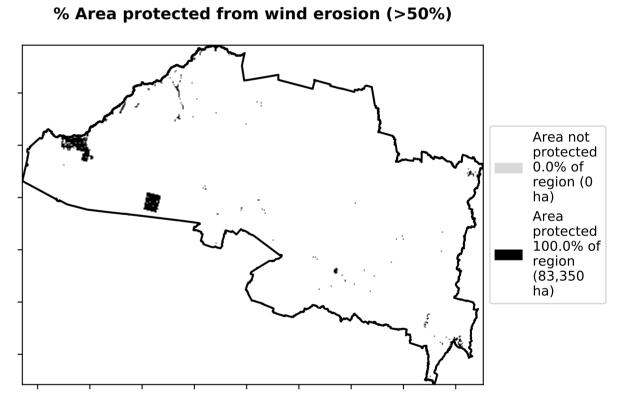
## Area not protected 28.3% of region (23,588 ha) Area protected 71.7% of region (59,761 ha)

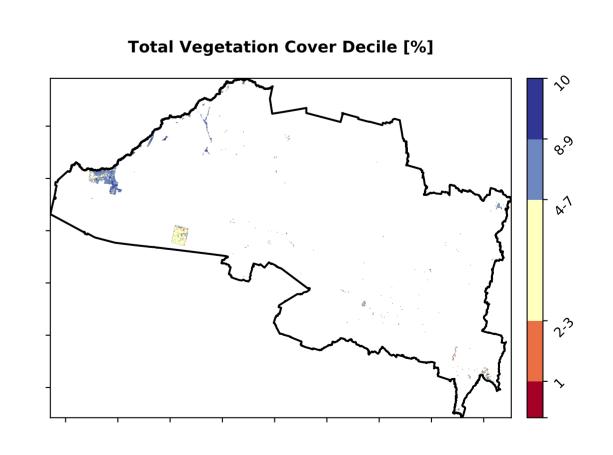
% Area protected from water erosion (>70%)



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









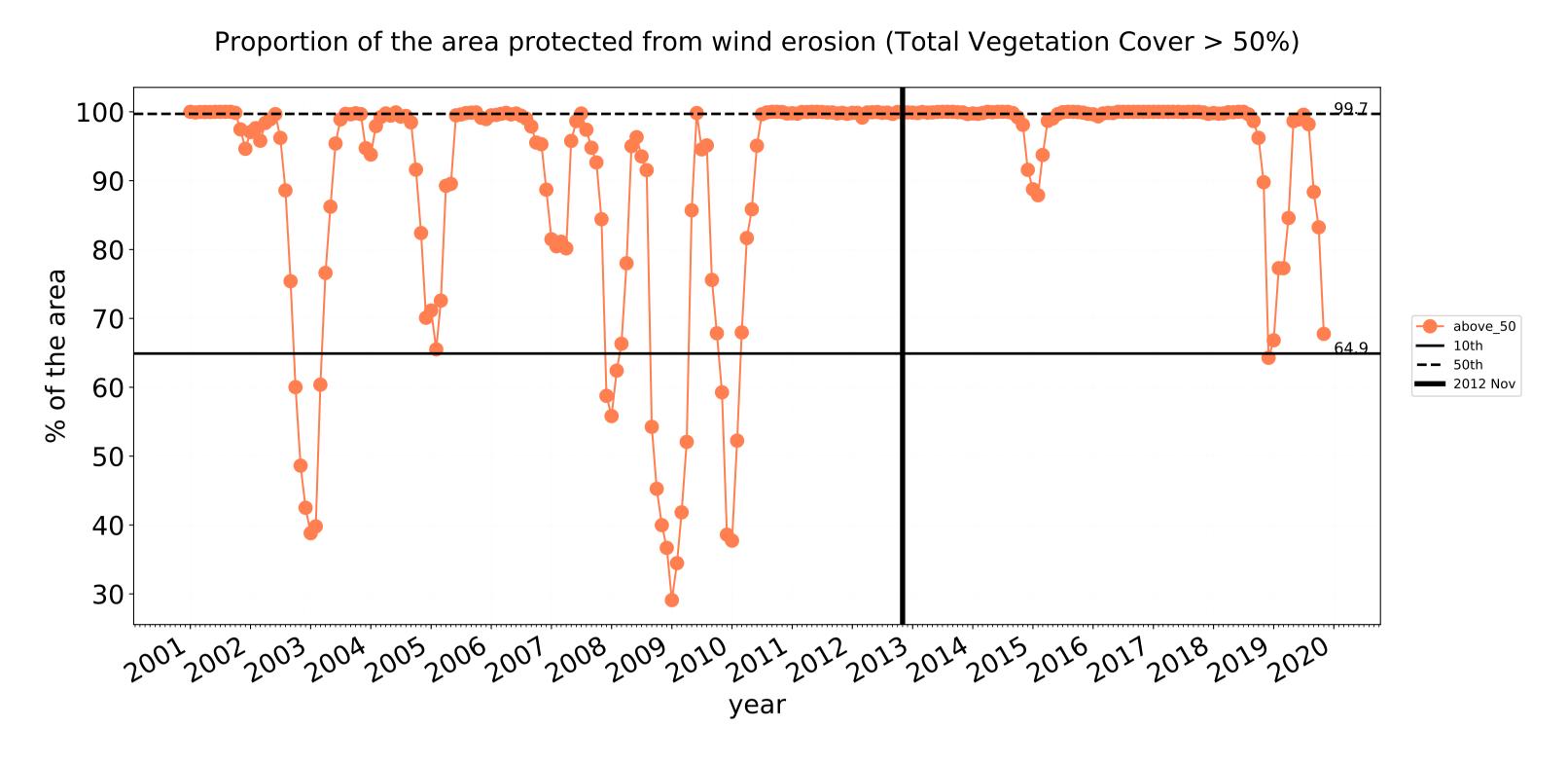


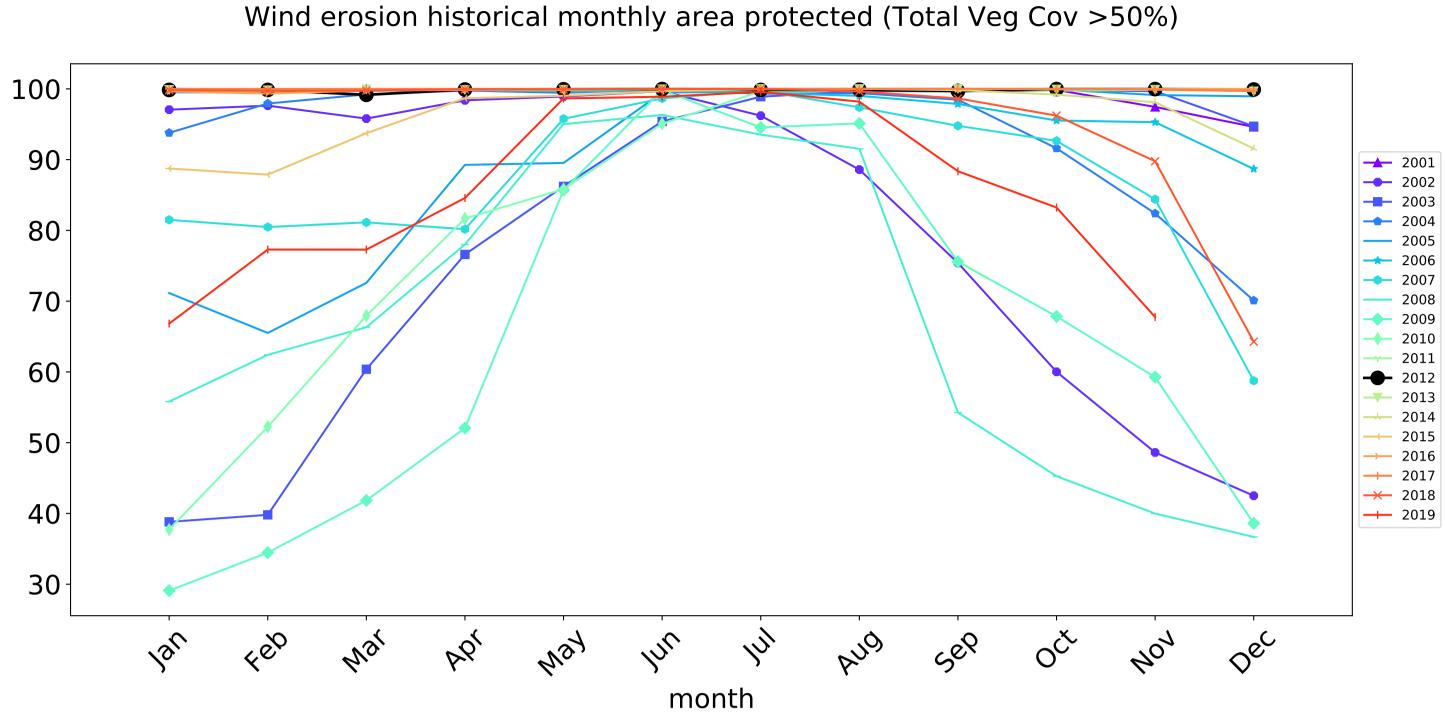


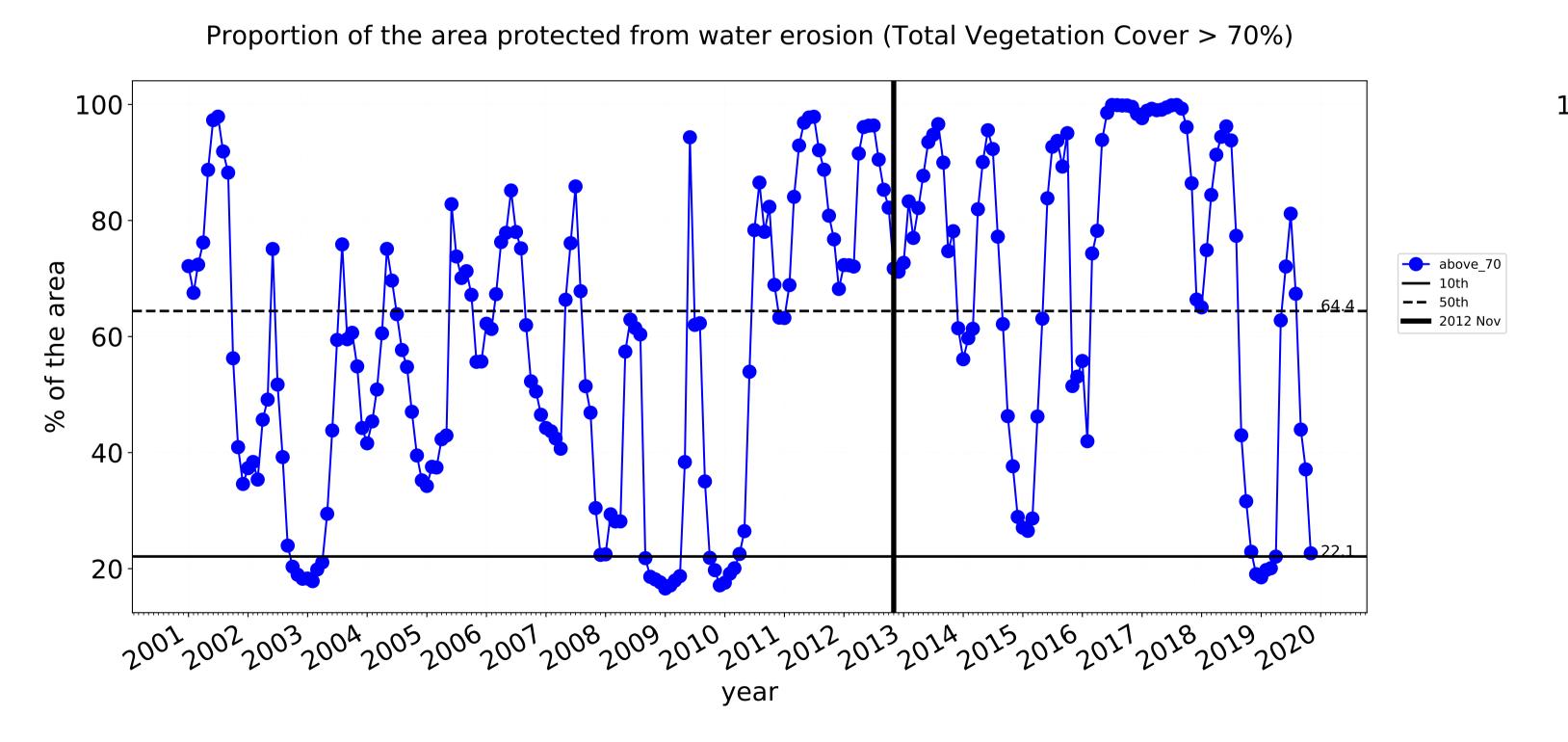


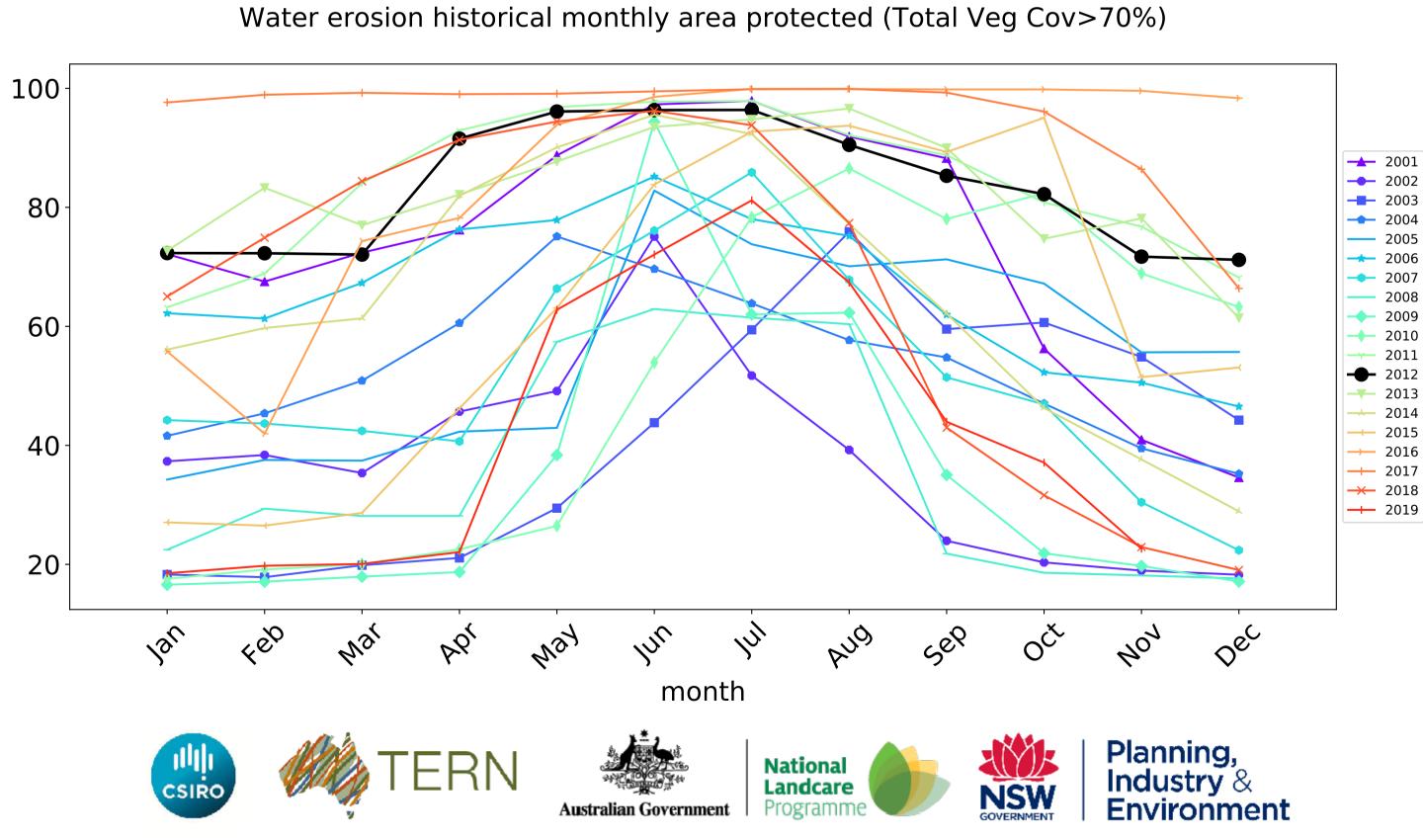


#### **Conservation and natural environments non forest timeseries**

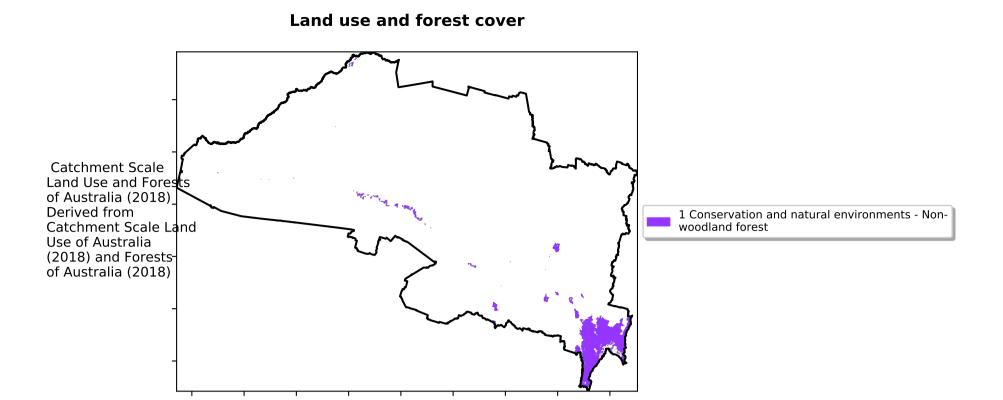




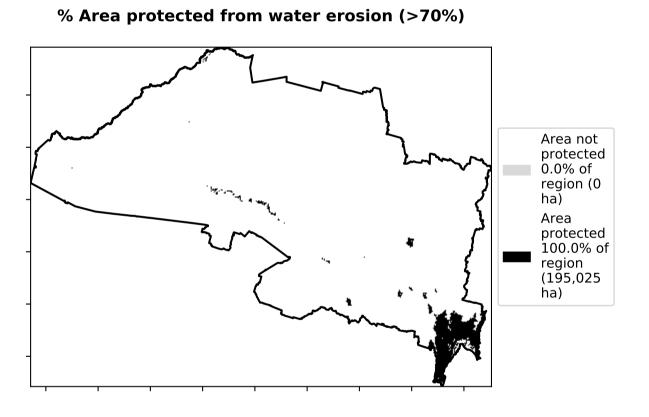


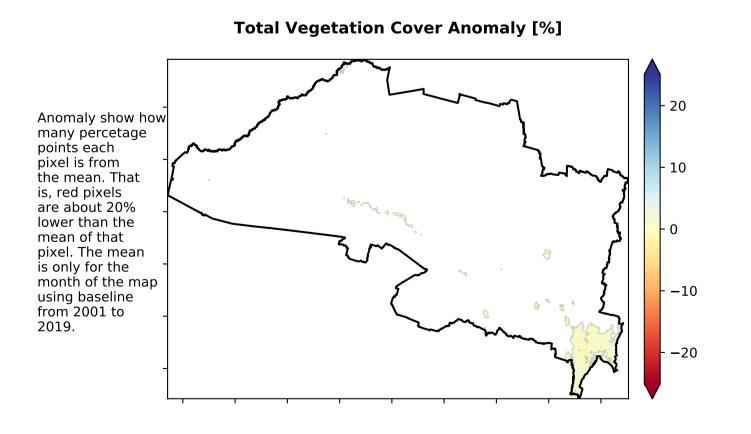


#### **Conservation and natural environments Forest (non woodland)**

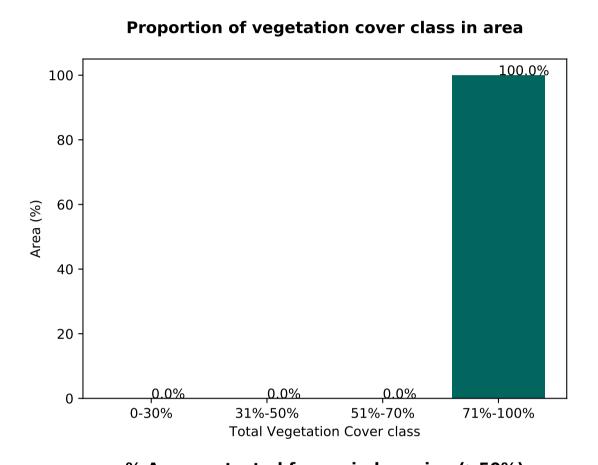


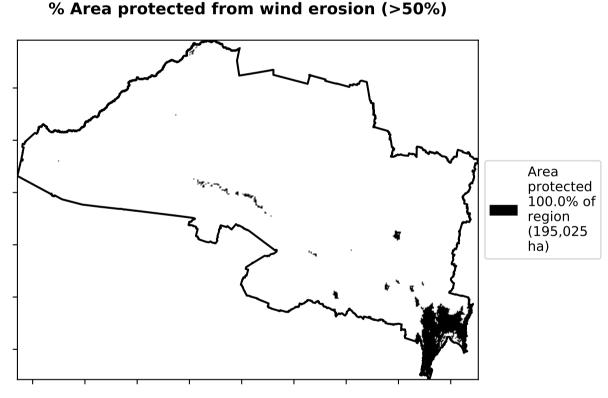
# Total Vegetation Cover [%] Trolo Indolo Trol Indolo Trolo Indolo Trol Indolo Trolo Indolo Trolo Indolo Trolo Indolo Trol

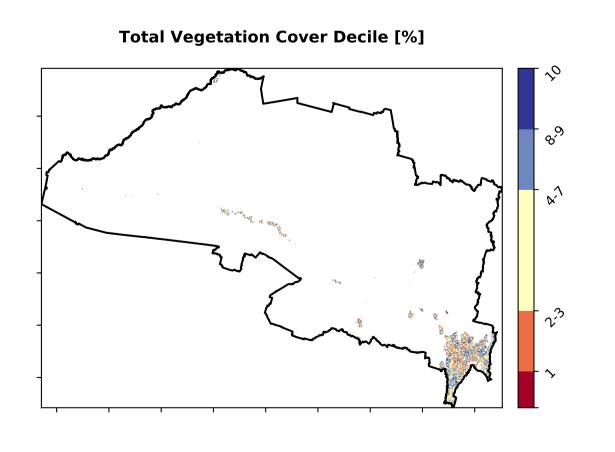




## Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.









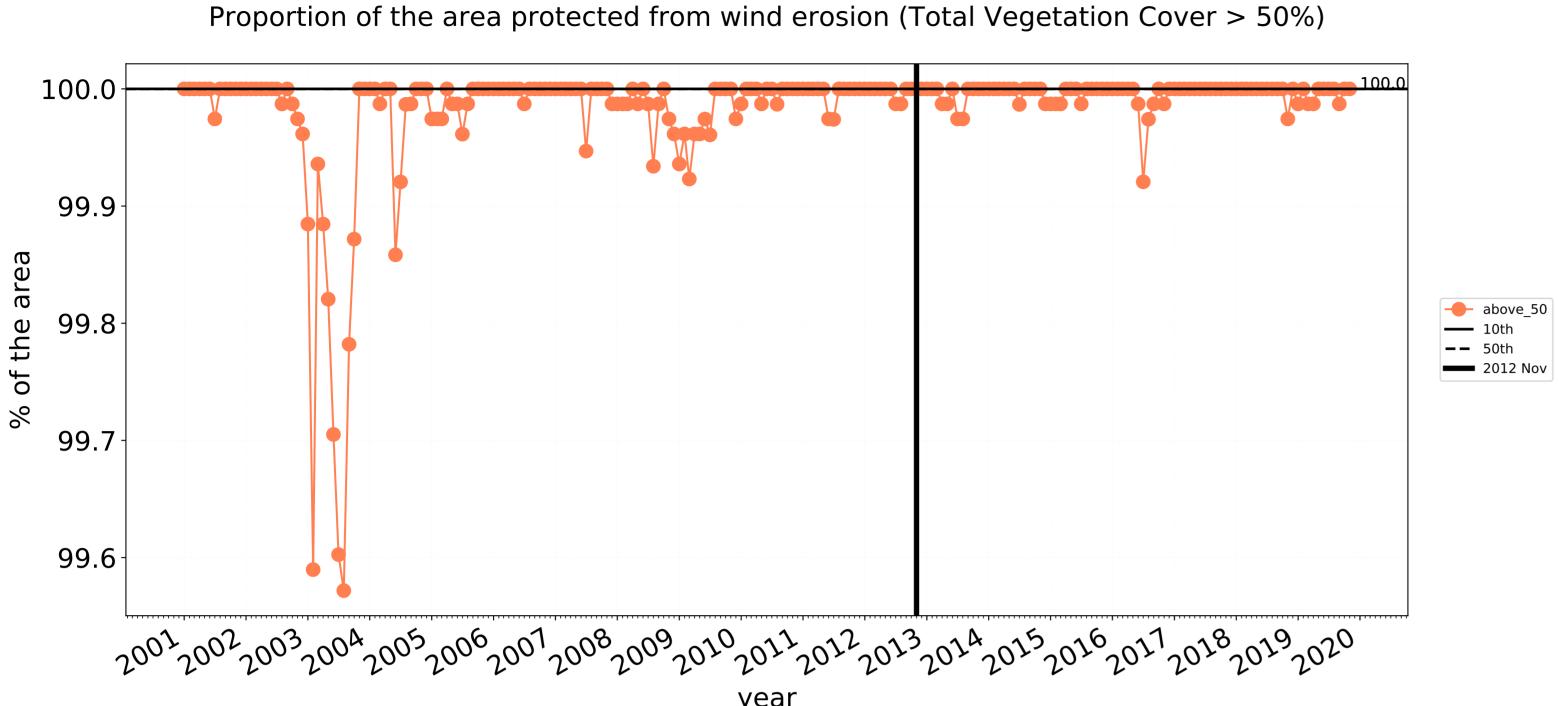


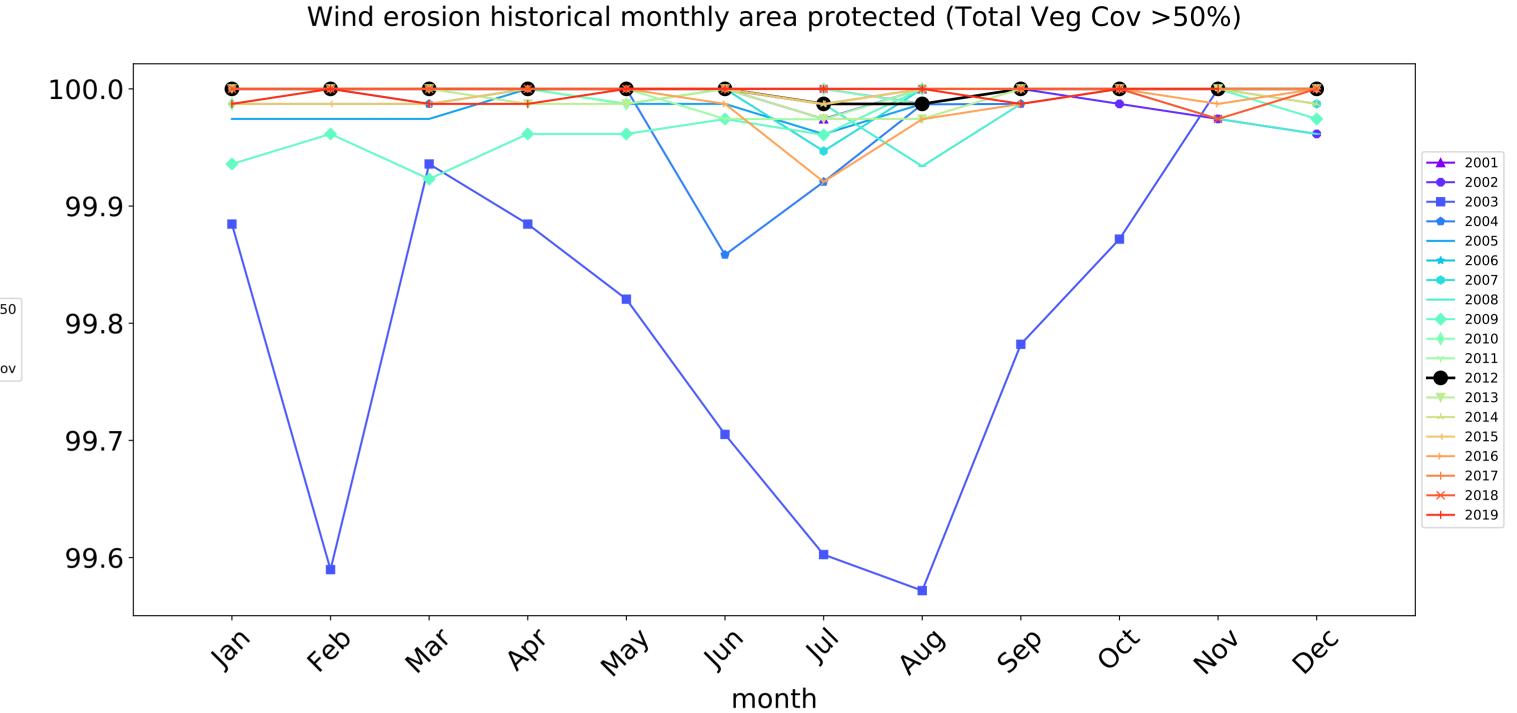


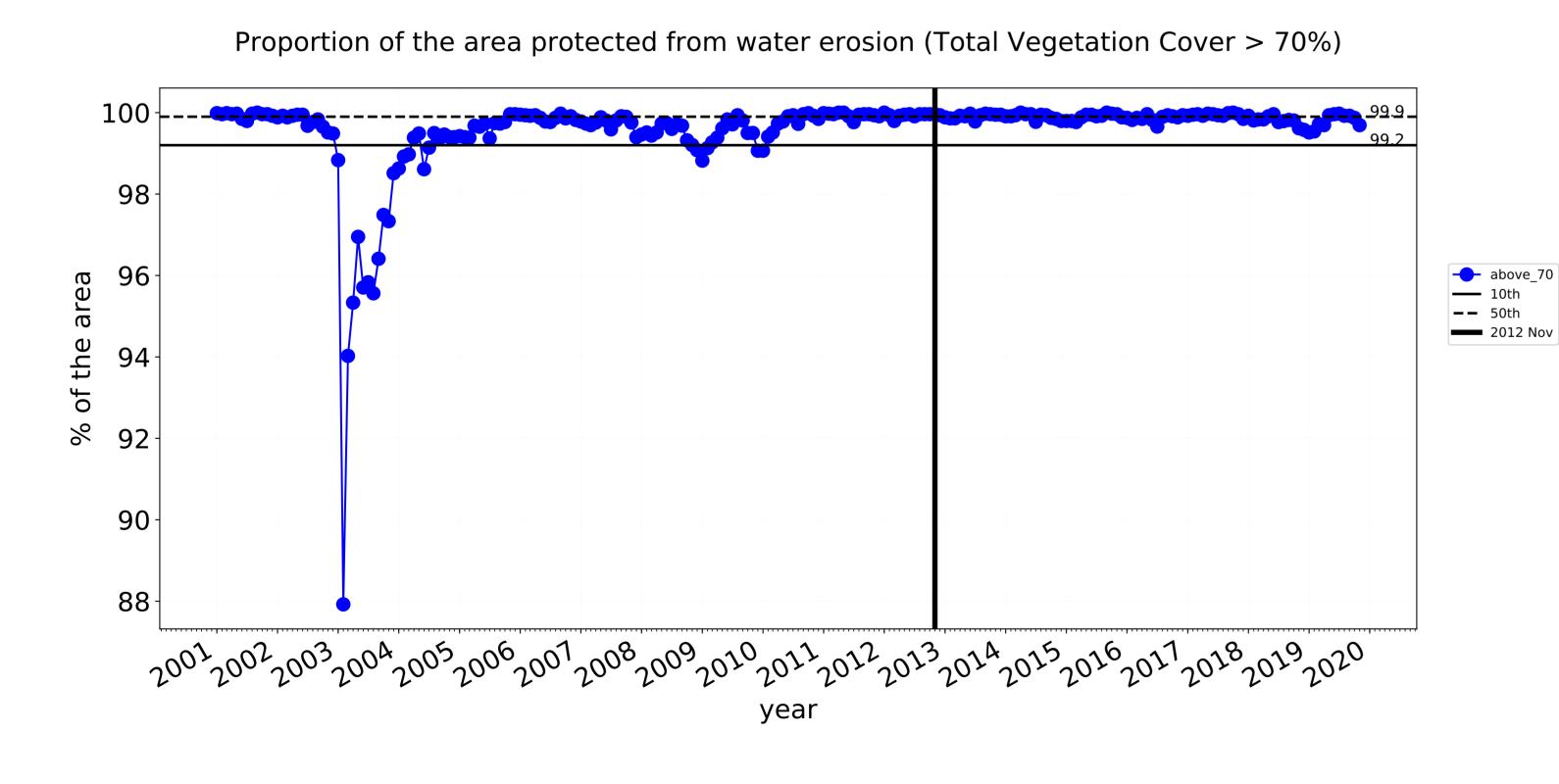


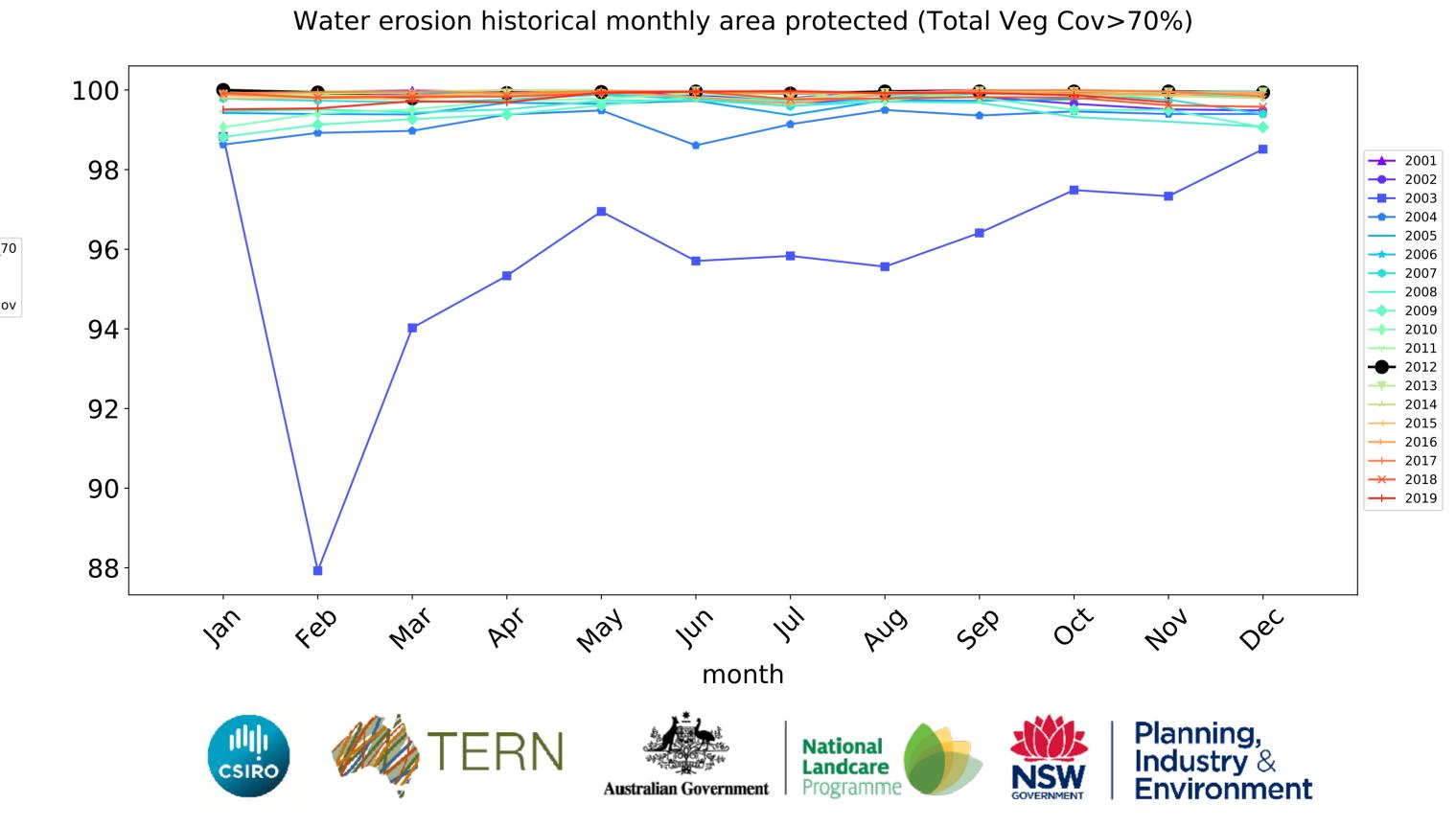












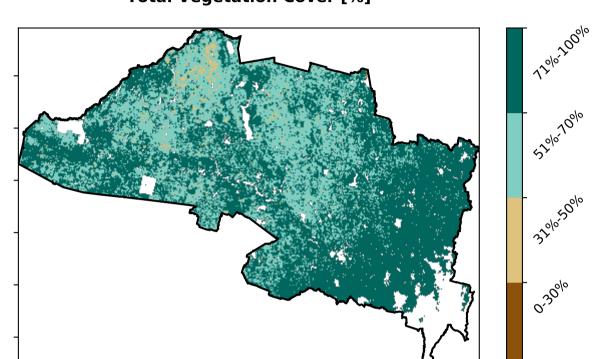
#### **Agriculture**

# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) Australia (2018) Bariculture - Grazing - Non forest A Agriculture - Grazing - Woodland forest A Agriculture - Grazing - Non-woodland forest A Agriculture - Grazing - Non-woodland forest A Agriculture - Grazing - Non-woodland forest A Agriculture - Grazing - Non-irrigated A Agriculture - Grazing - Non-irrigated A Agriculture - Grazing - Non-irrigated A Agriculture - Grazing - Non-woodland forest A Agriculture - Horticulture - Non-irrigated B Agriculture - Horticulture - Horticulture - Irrigated

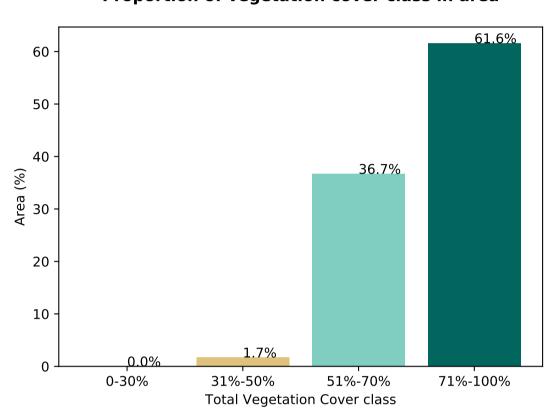
### 52.5% 40 - 34.1% 8 30 - 34.1% 20 - 10 - 2.3% 1.7% 0.6% 7.9% Land use class

**Proportion of each land class in area** 

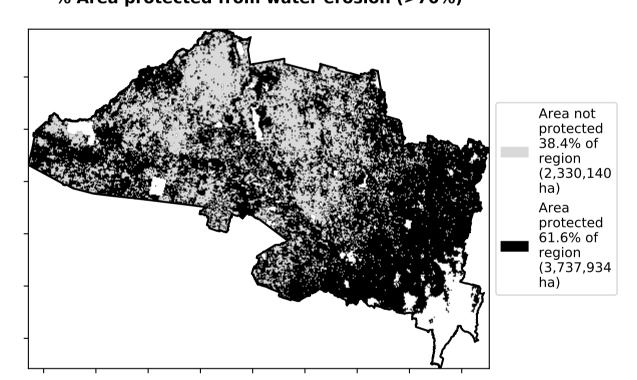
**Total Vegetation Cover [%]** 



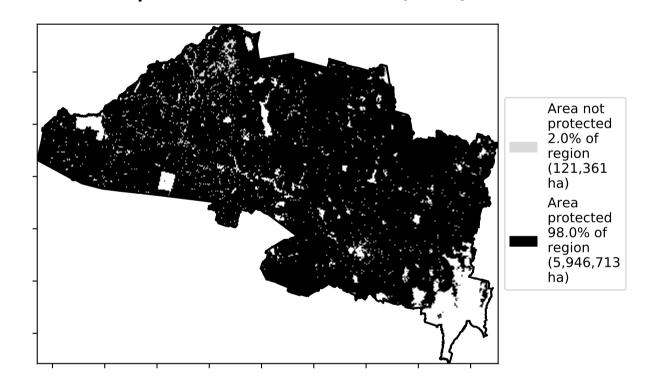
Proportion of vegetation cover class in area



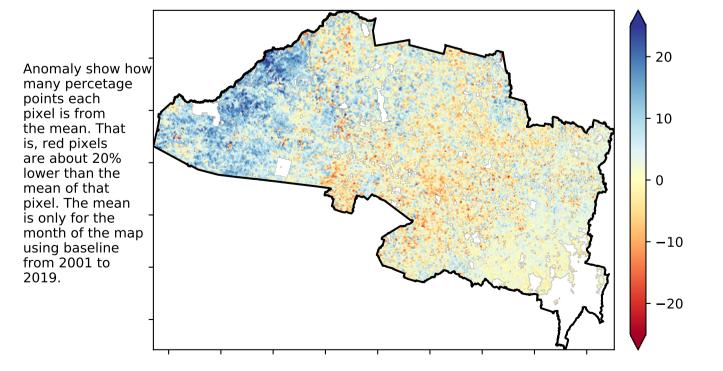
% Area protected from water erosion (>70%)



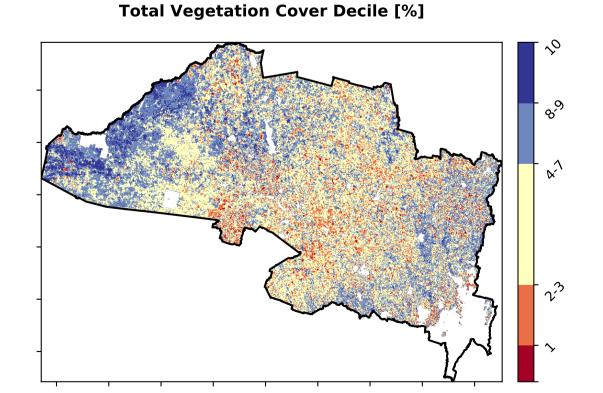
% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



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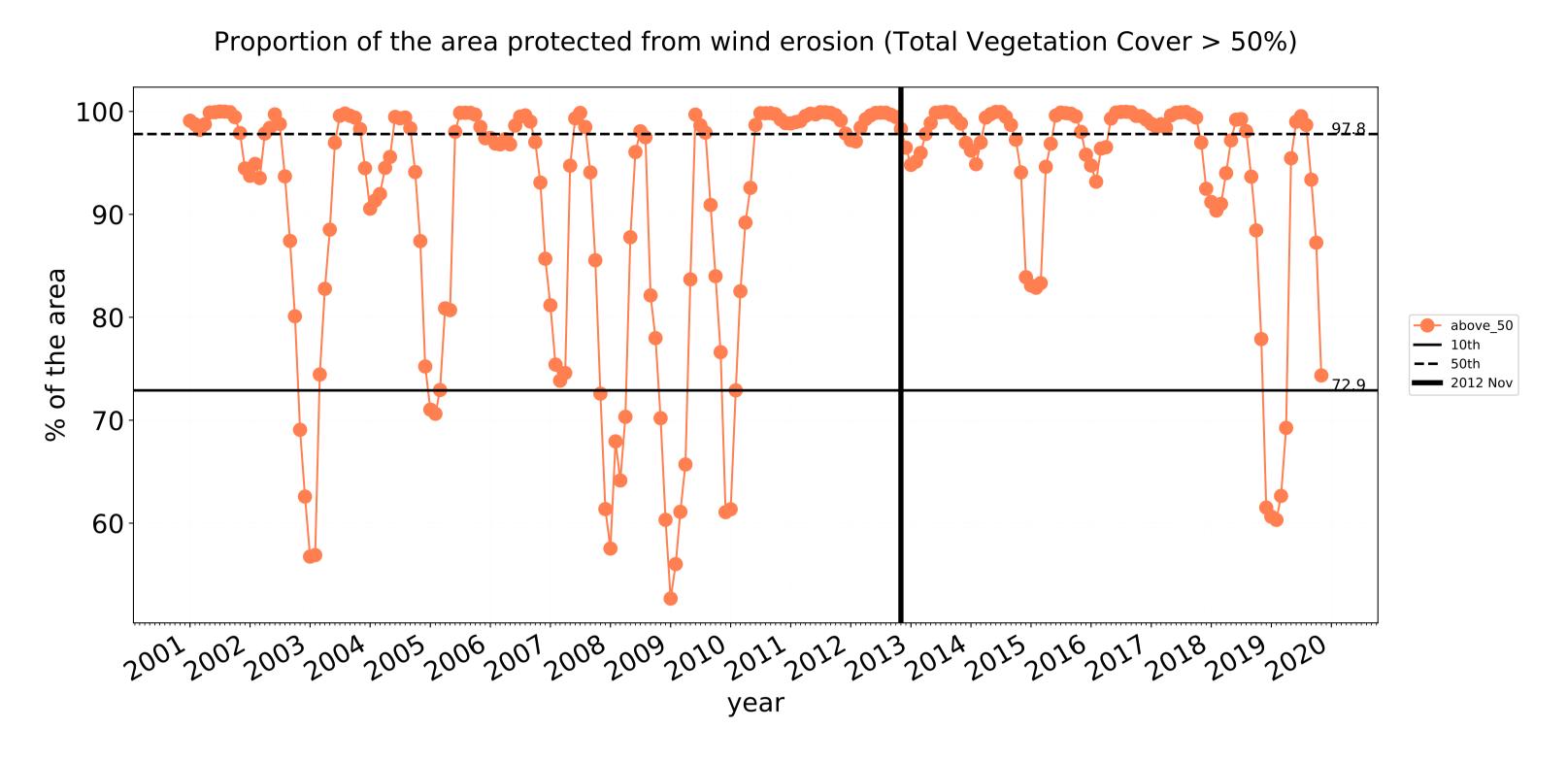


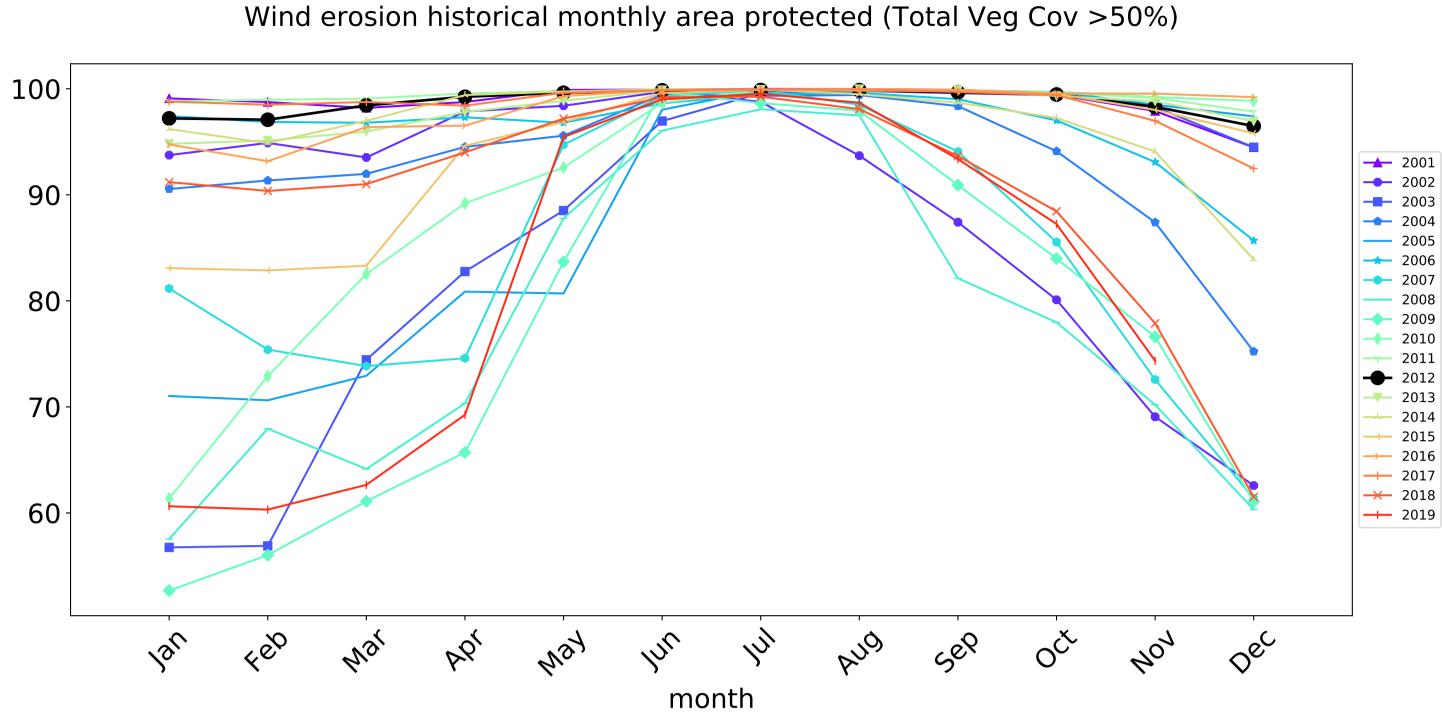


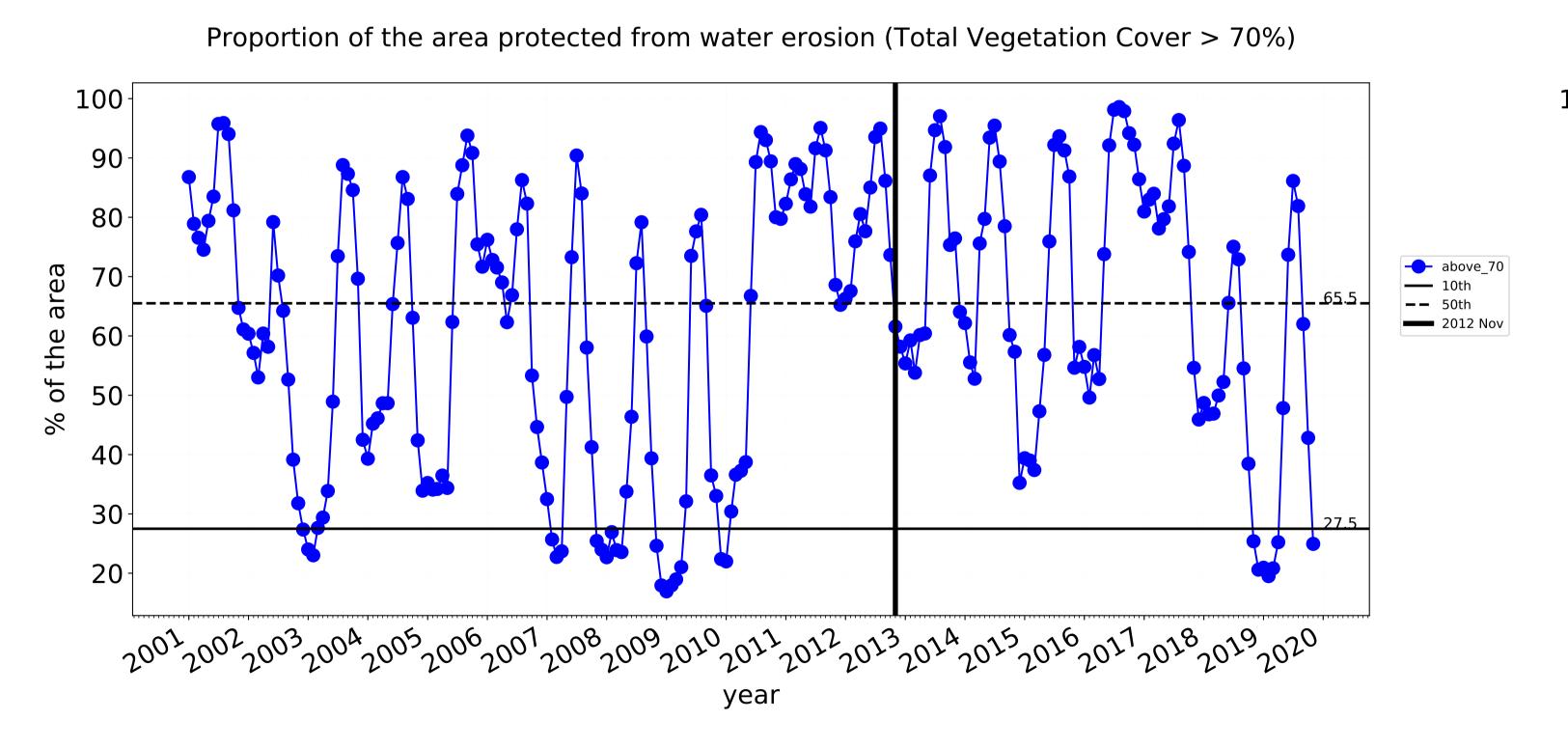


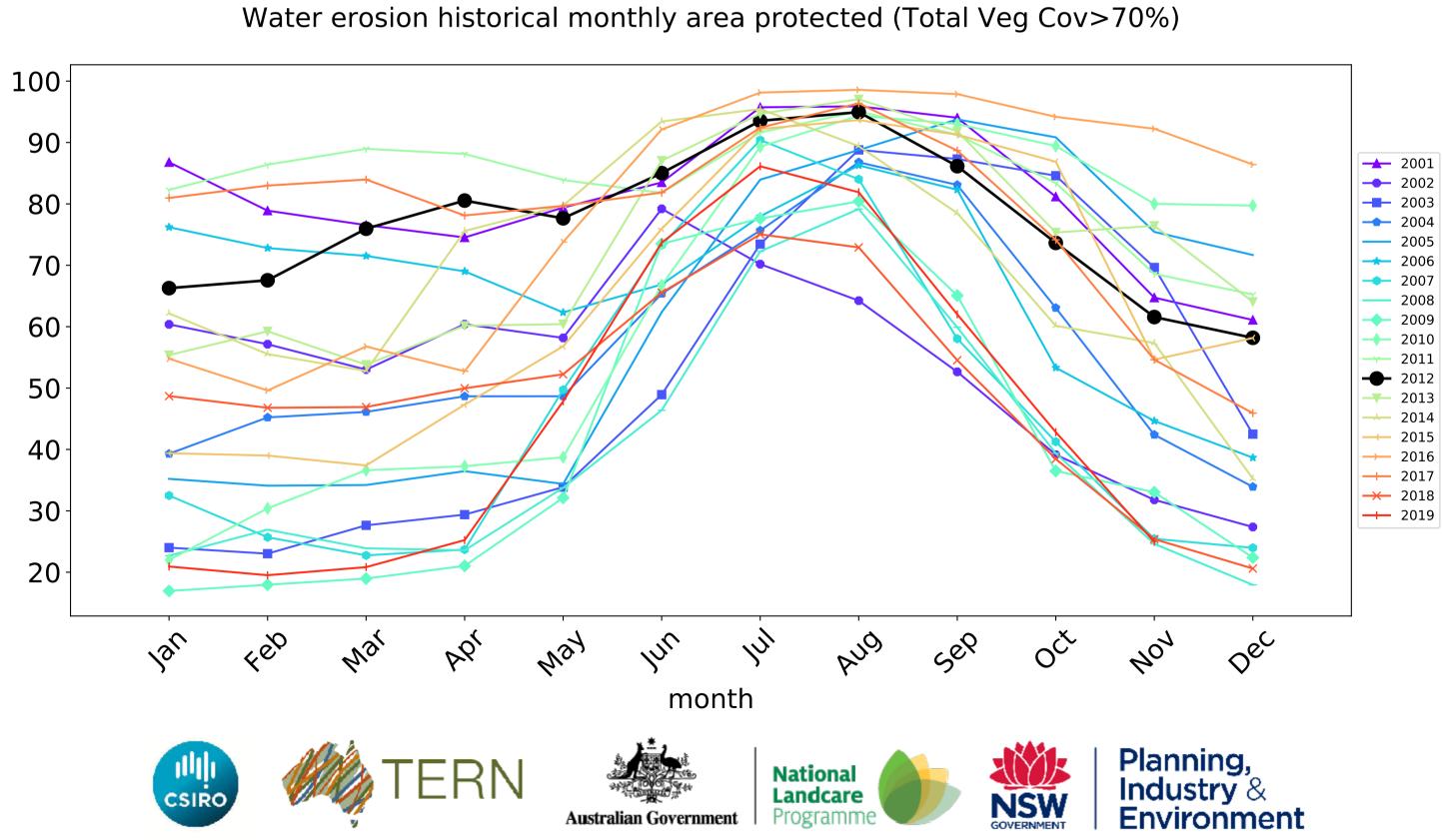


#### **Agriculture timeseries**





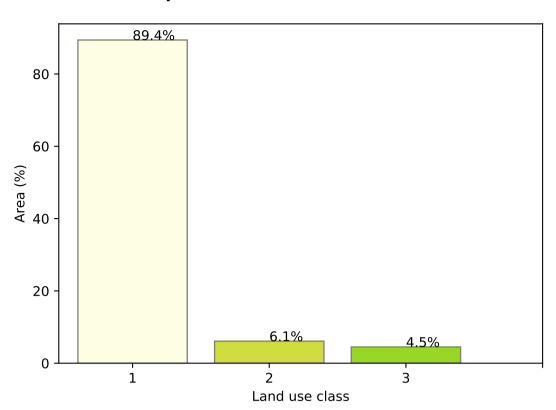




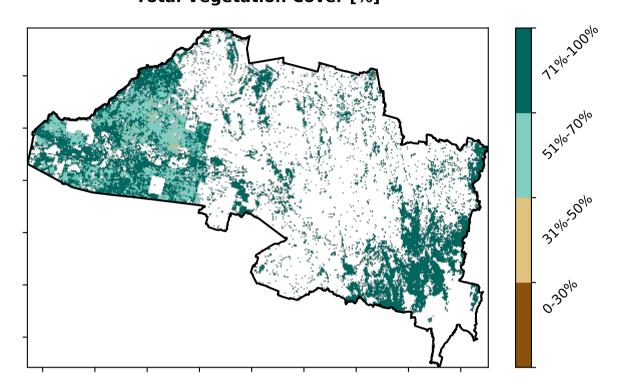
#### Grazing

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

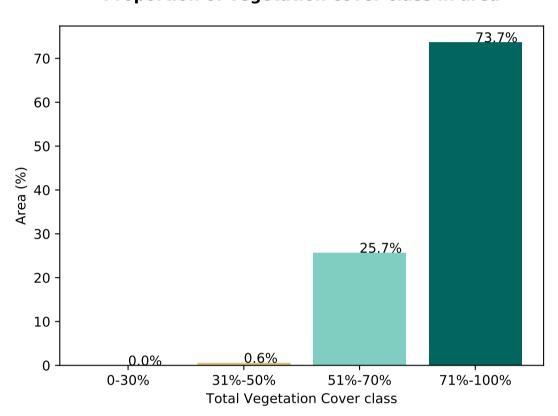
#### Proportion of each land class in area



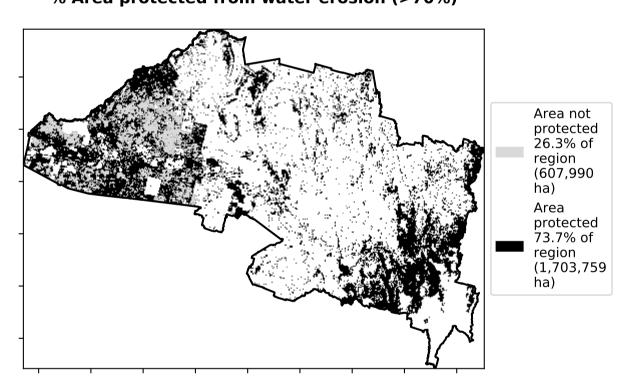
**Total Vegetation Cover [%]** 



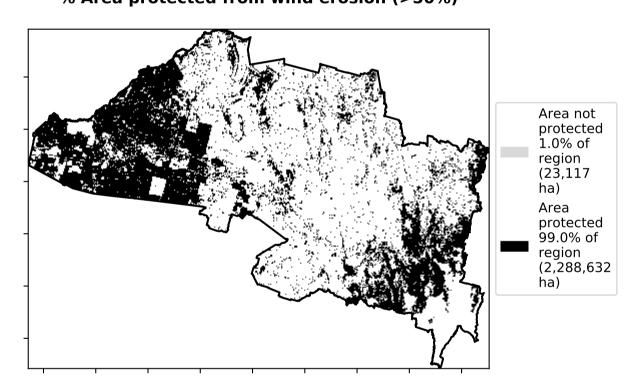
Proportion of vegetation cover class in area



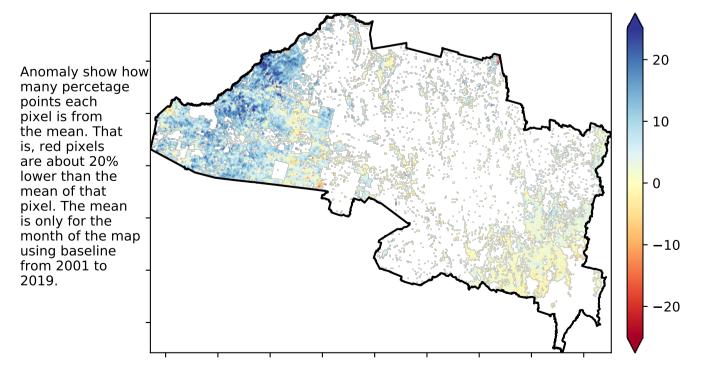
#### % Area protected from water erosion (>70%)



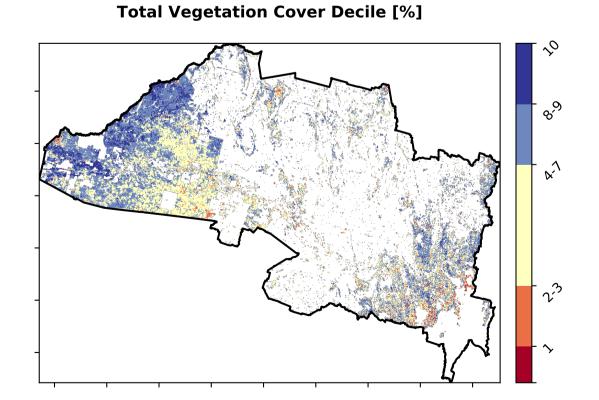
% Area protected from wind erosion (>50%)



#### 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.







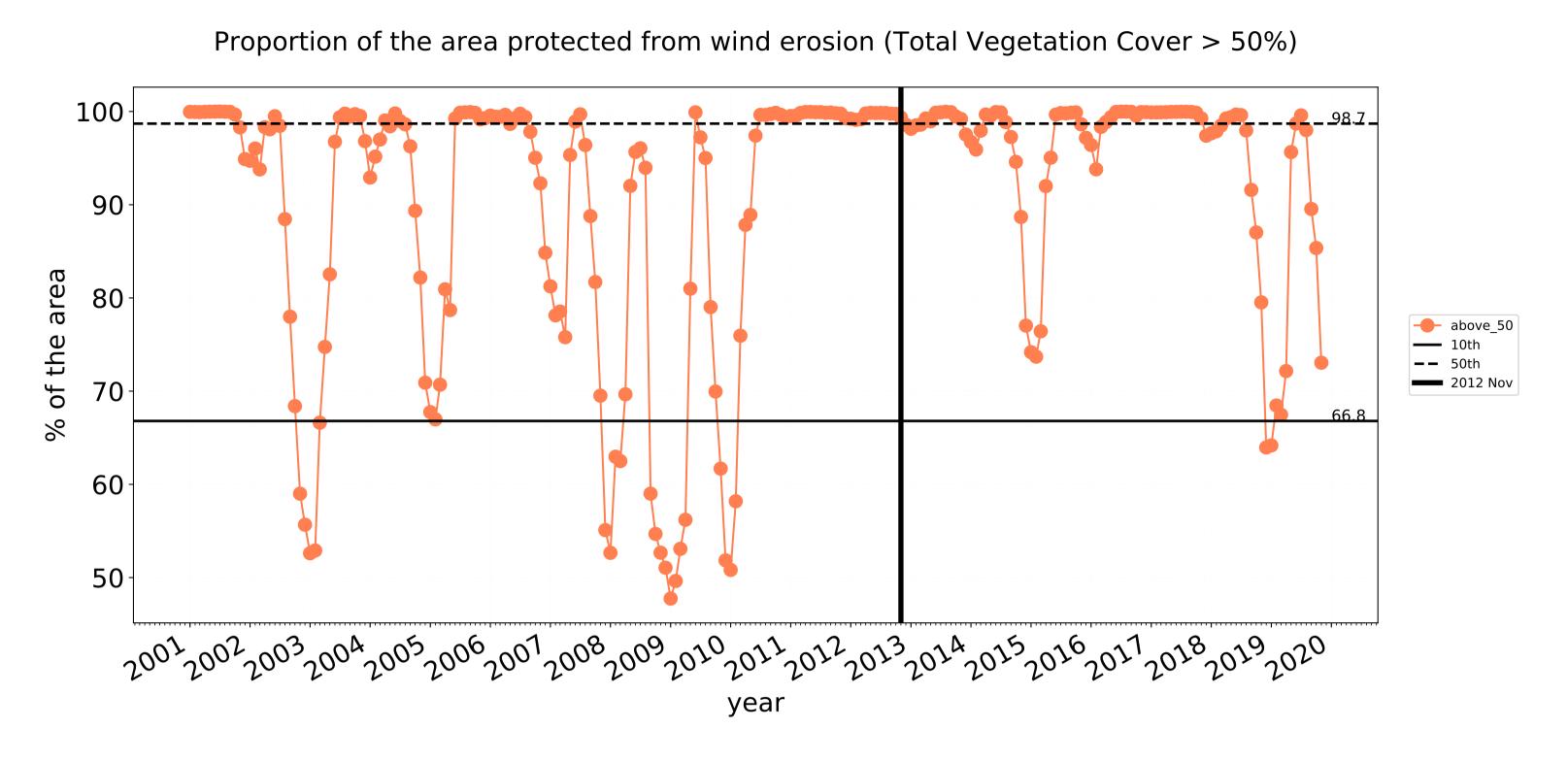


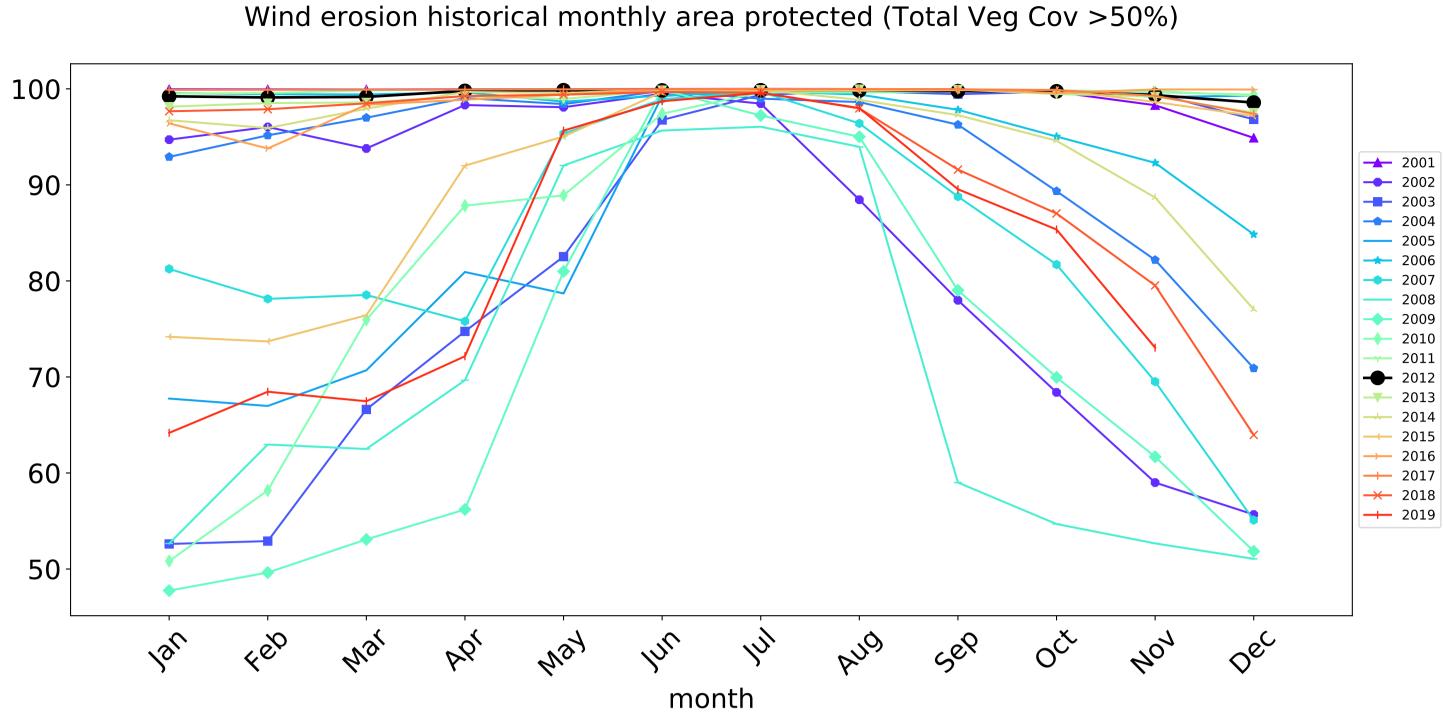


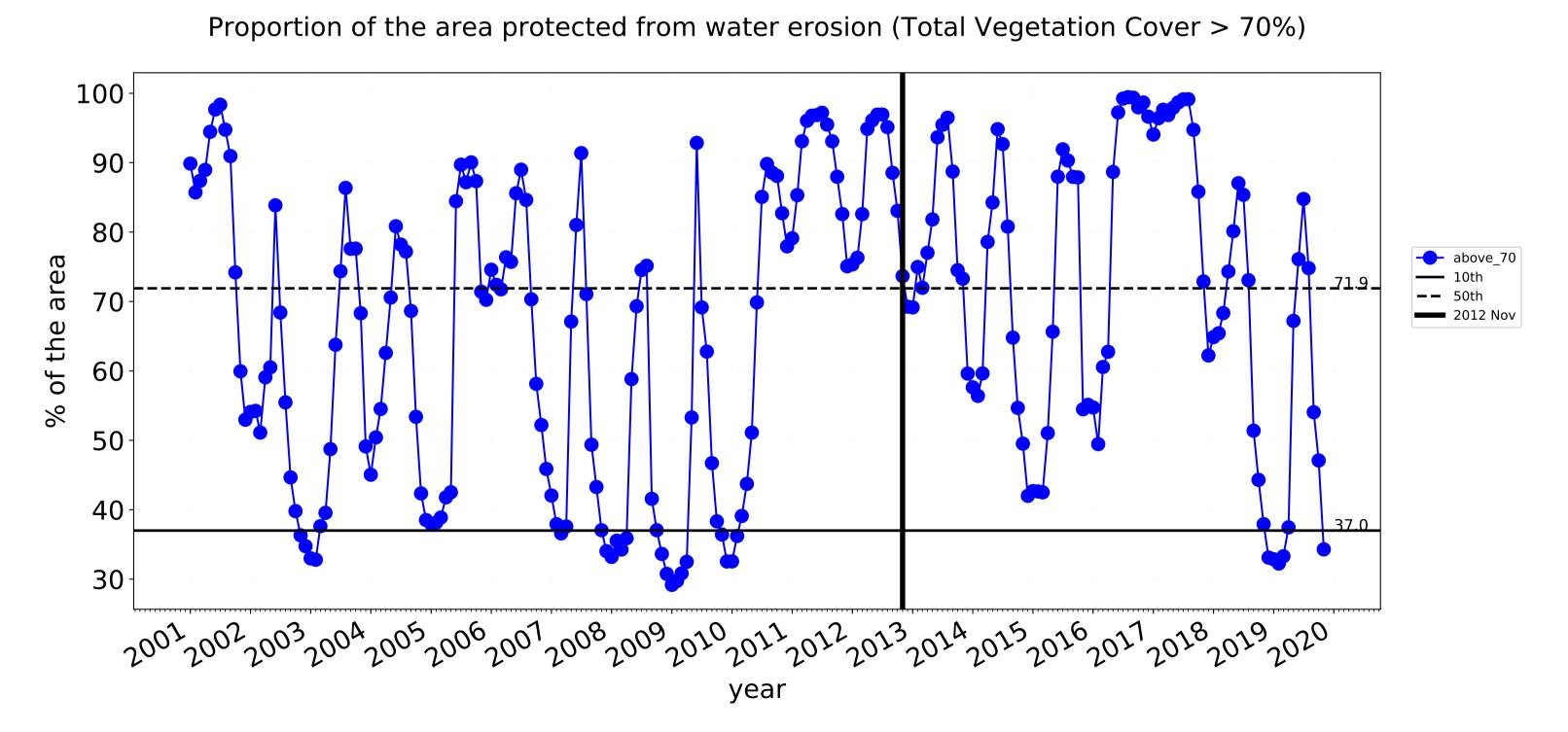


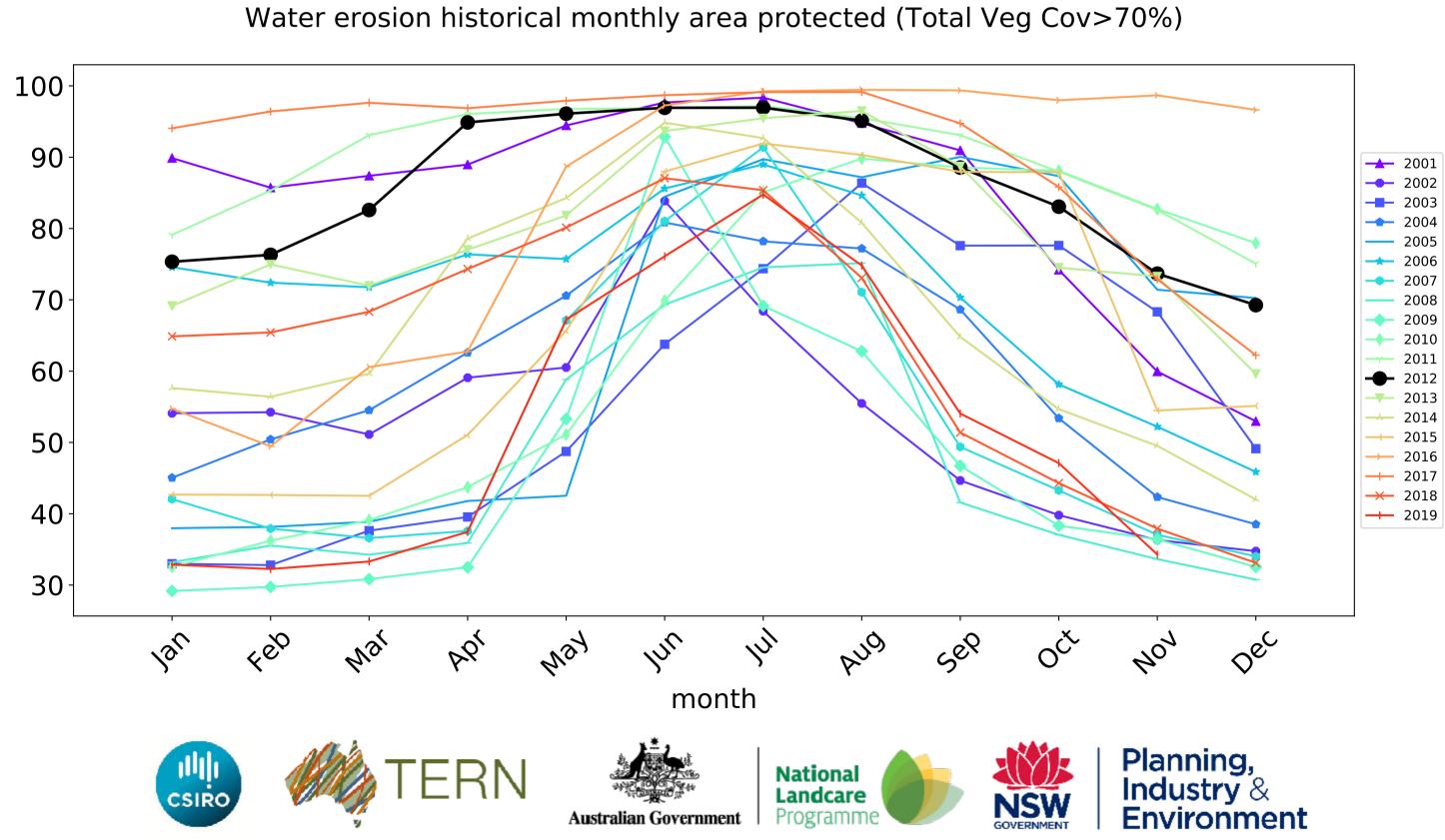


#### **Grazing timeseries**



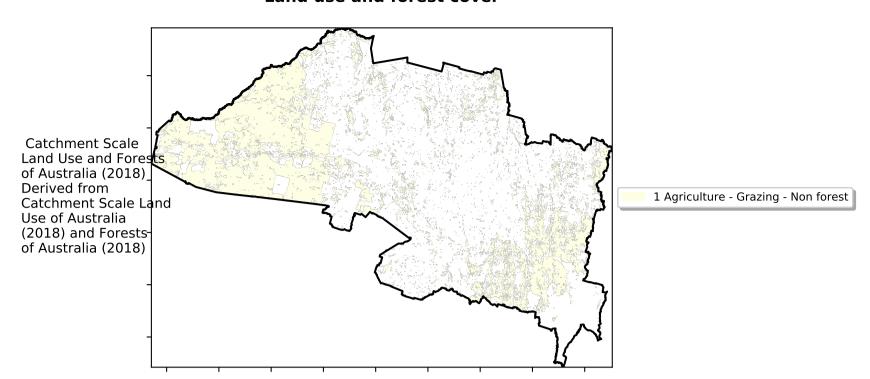




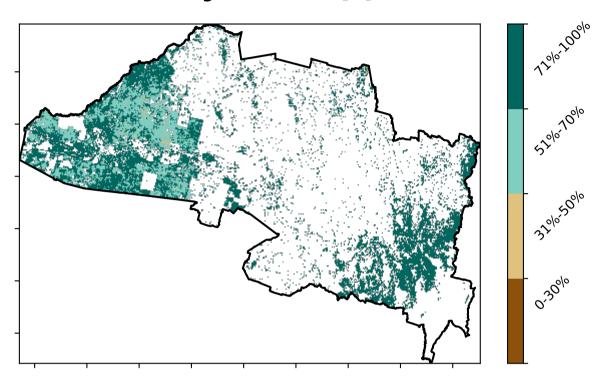


#### **Grazing non forest**

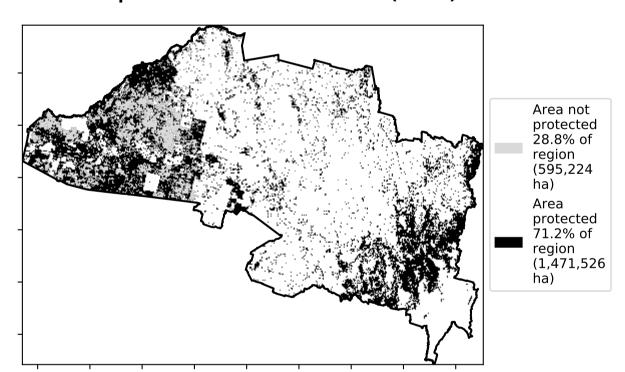
#### Land use and forest cover



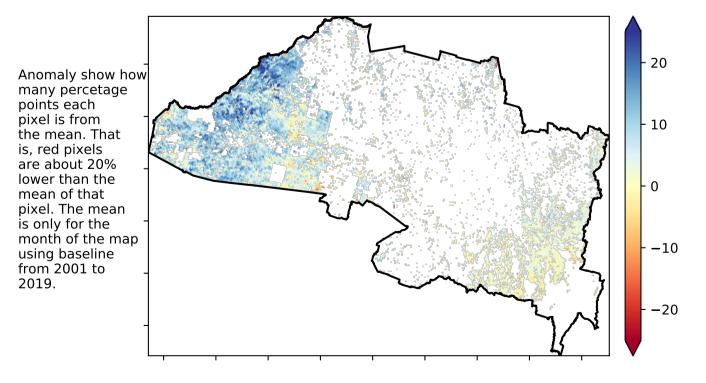
#### **Total Vegetation Cover [%]**



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

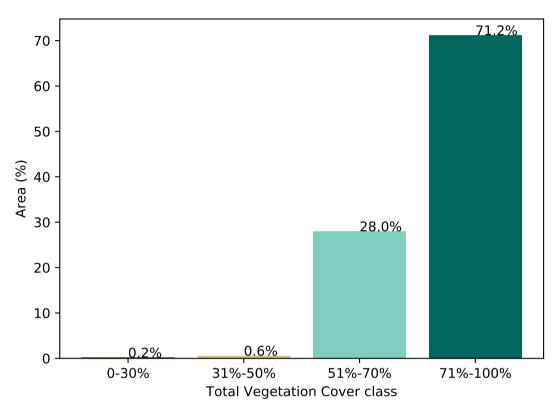


#### Total Vegetation Cover Anomaly [%]

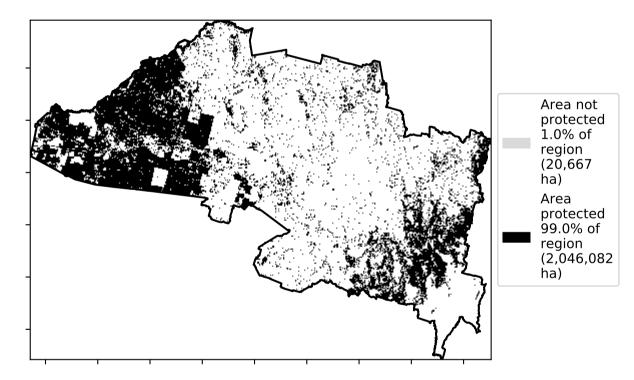


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

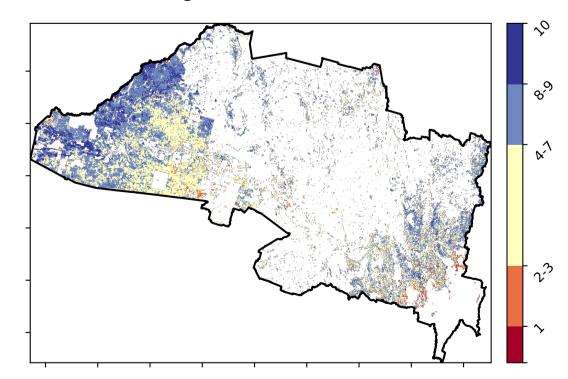
#### **Proportion of vegetation cover class in area**



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



#### Total Vegetation Cover Decile [%]







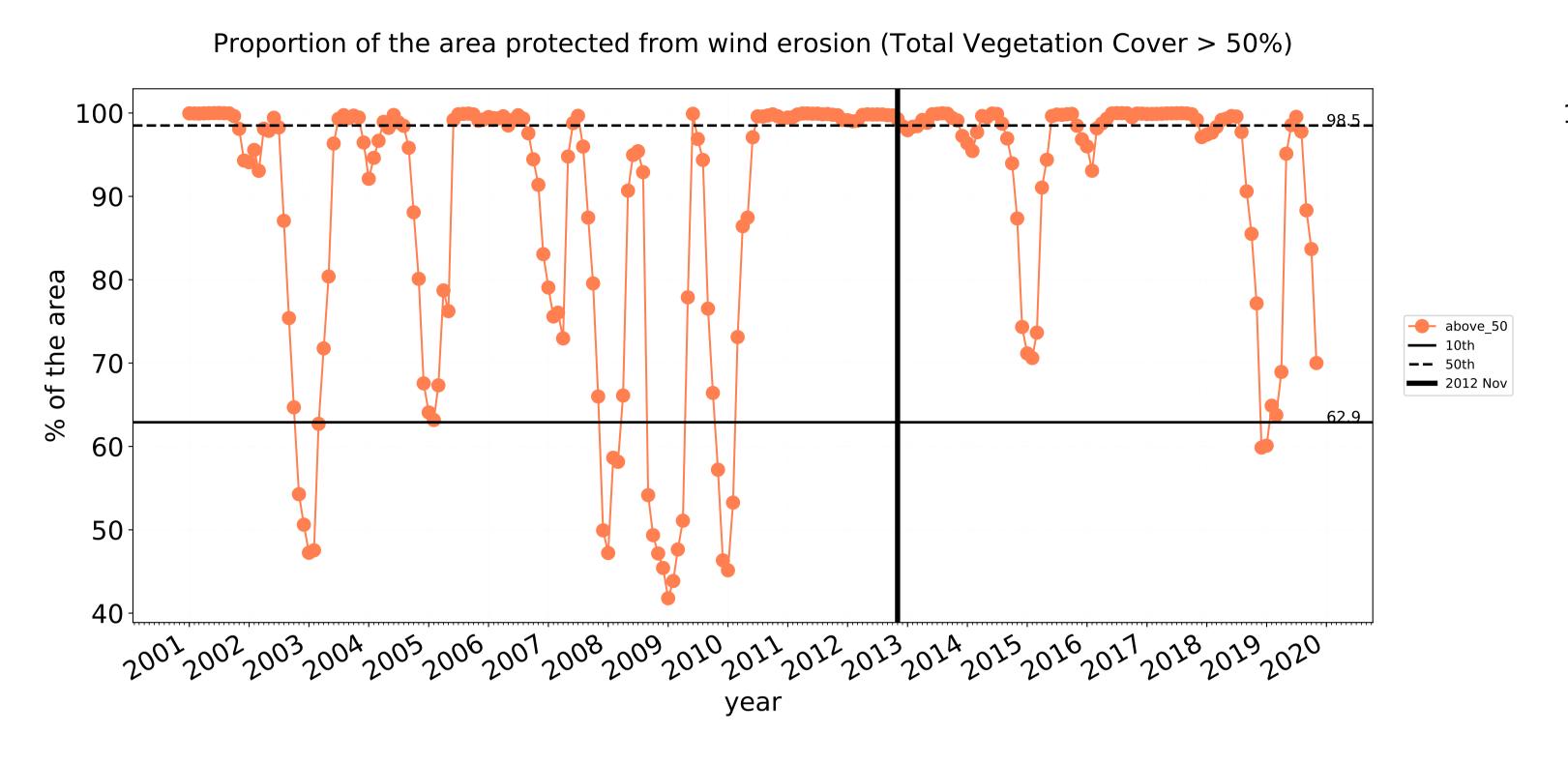


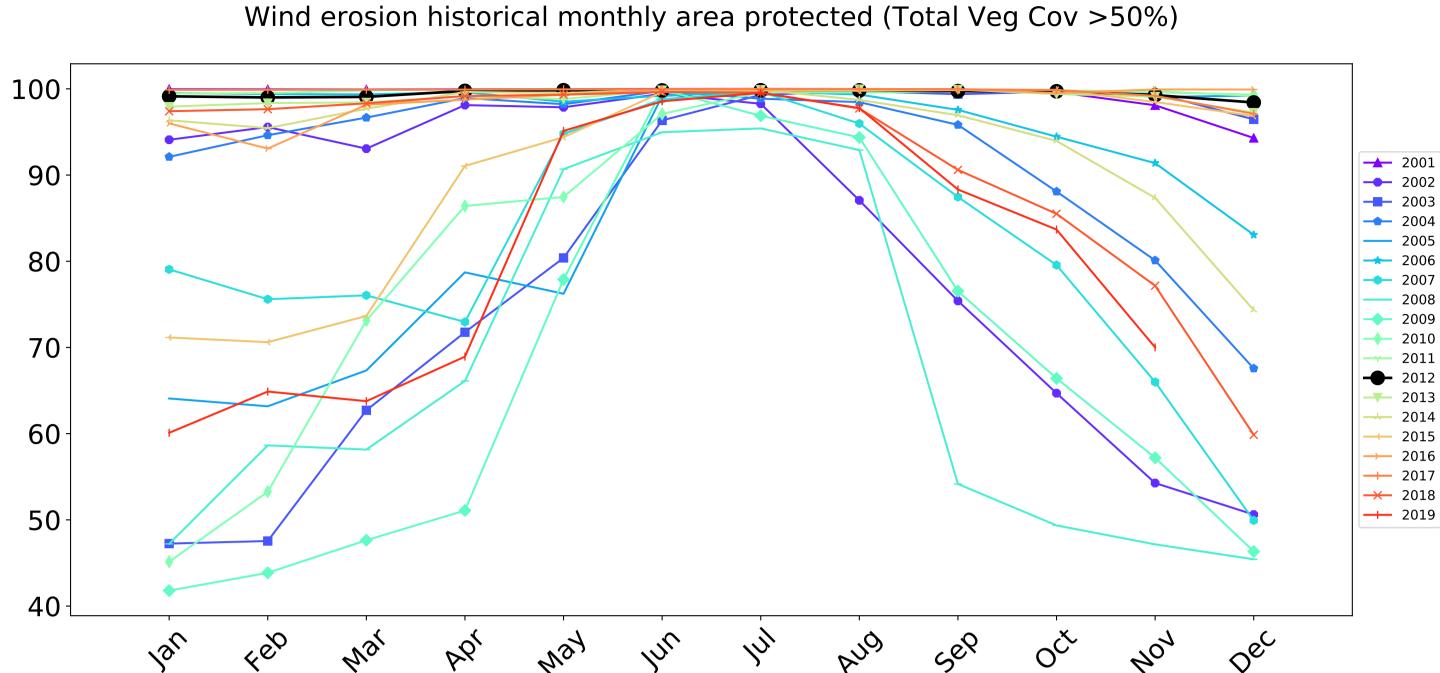




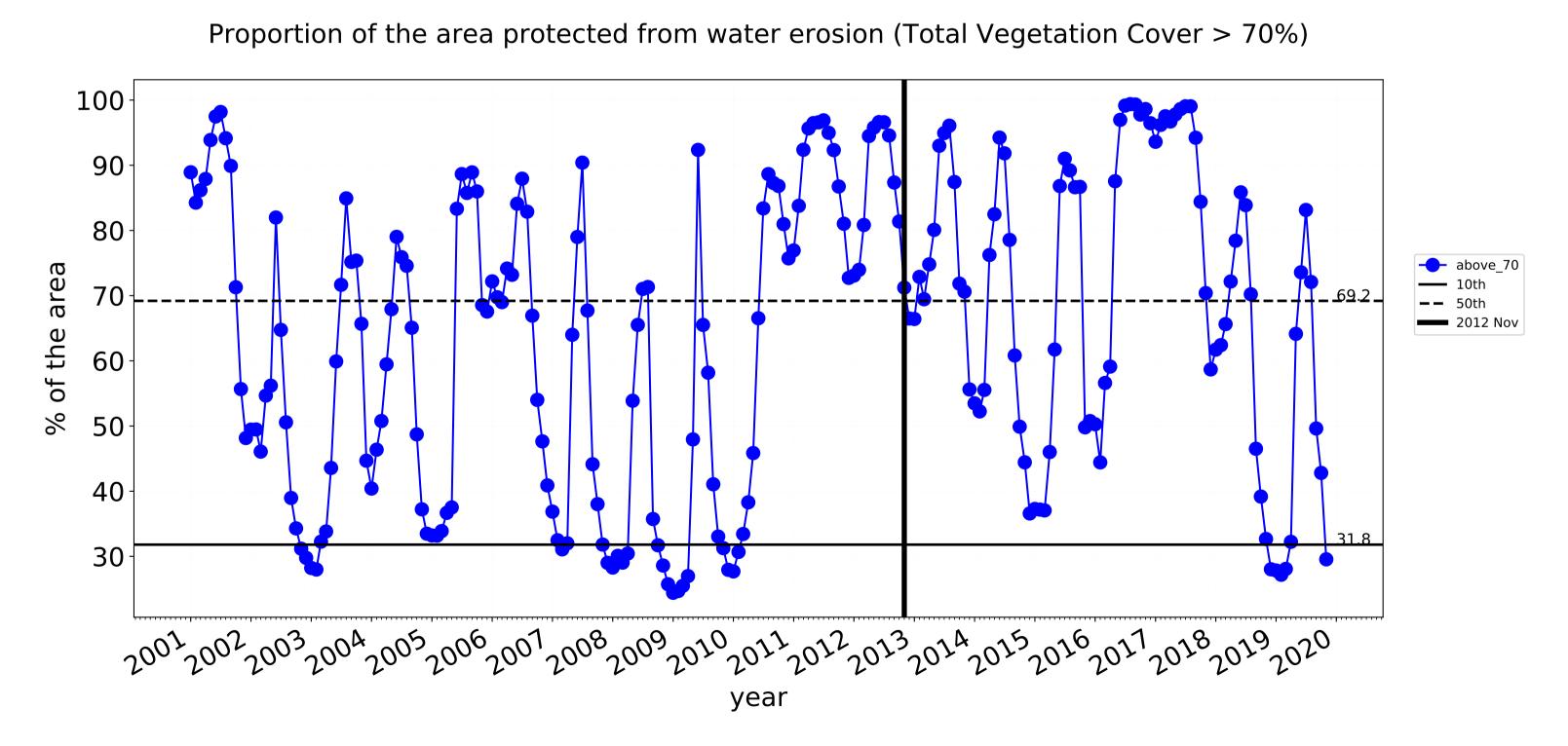


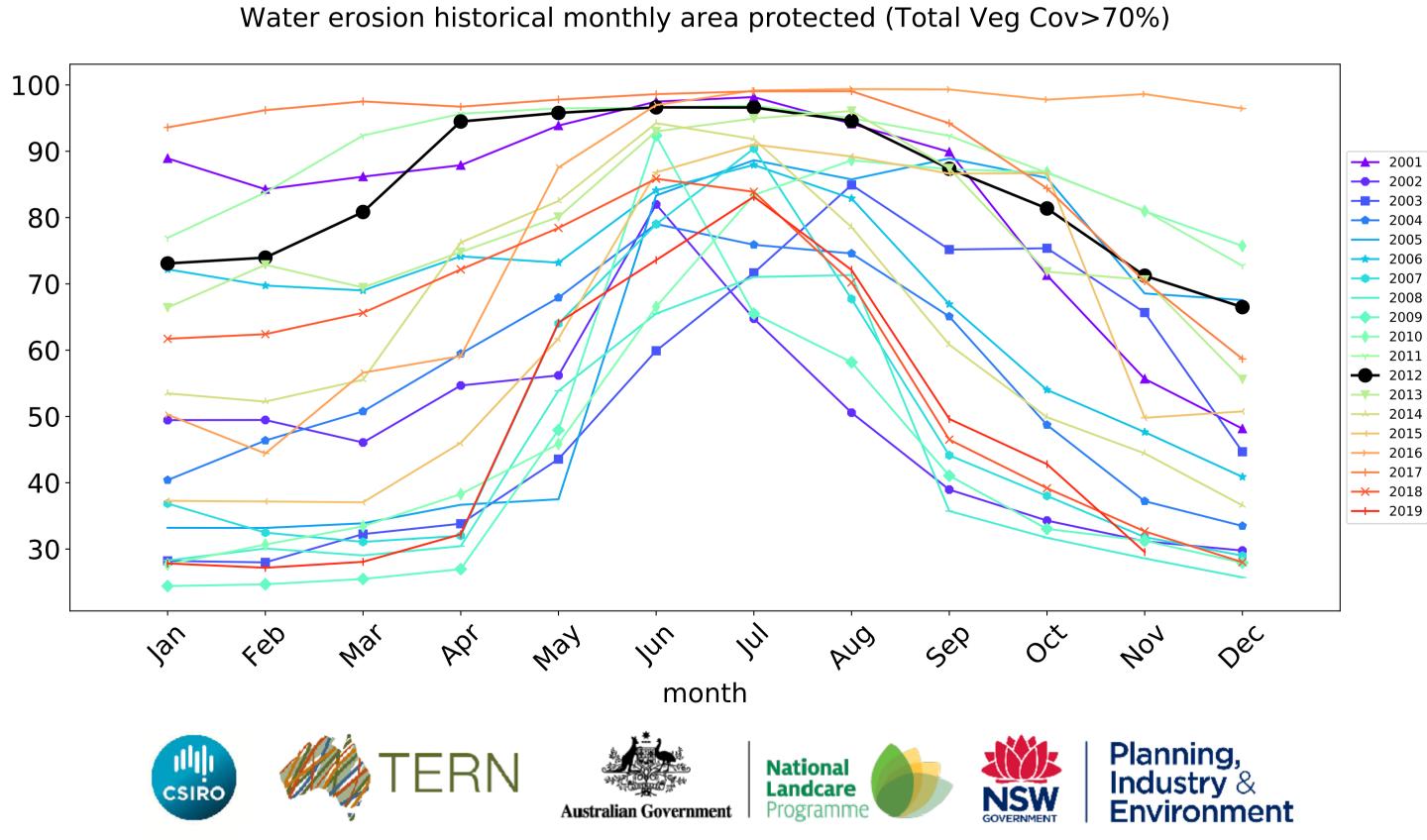
#### **Grazing non forest timeseries**





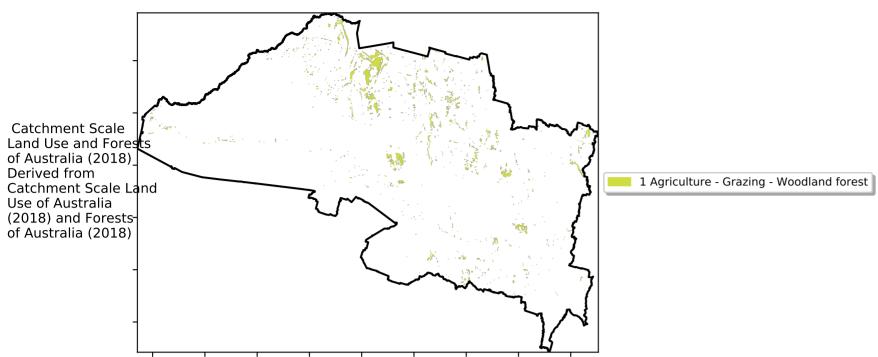
month



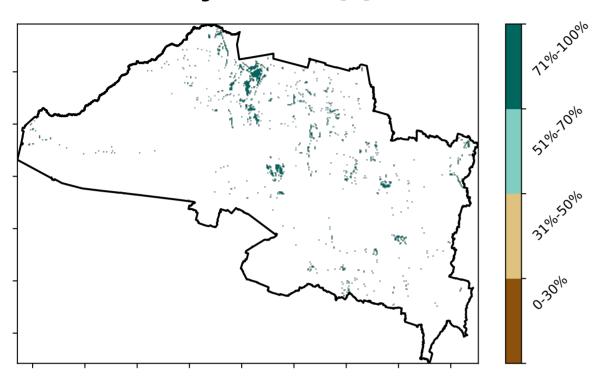


#### **Grazing Woodland forest**

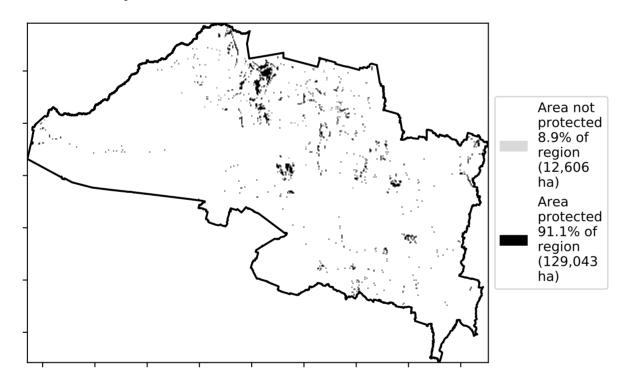
#### Land use and forest cover



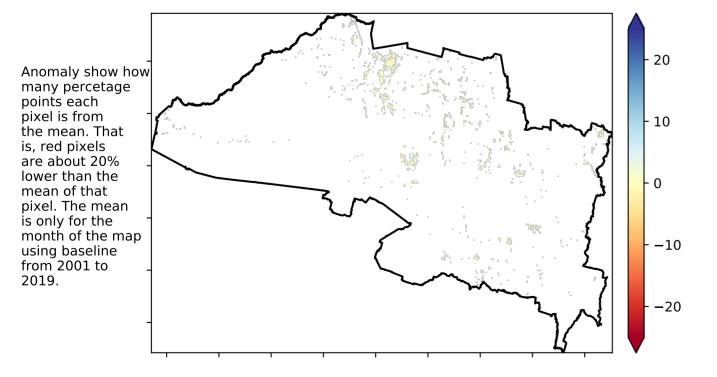
#### Total Vegetation Cover [%]



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

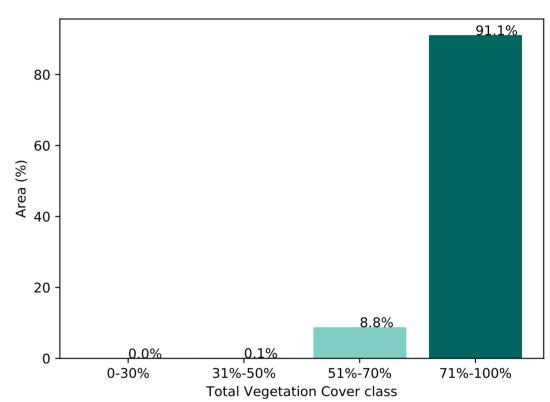


#### Total Vegetation Cover Anomaly [%]

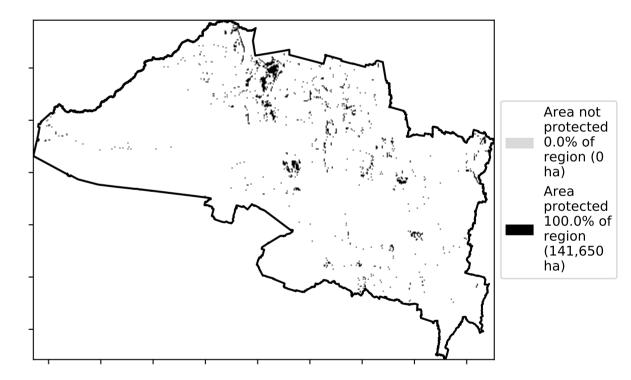


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

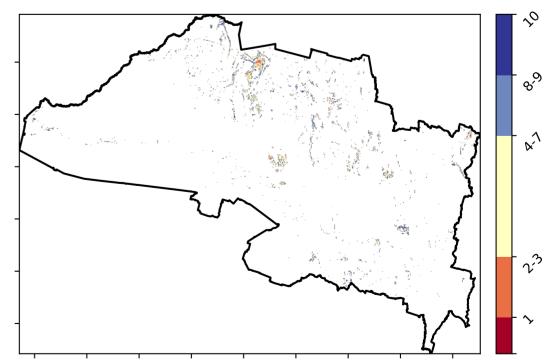
#### Proportion of vegetation cover class in area



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



#### Total Vegetation Cover Decile [%]







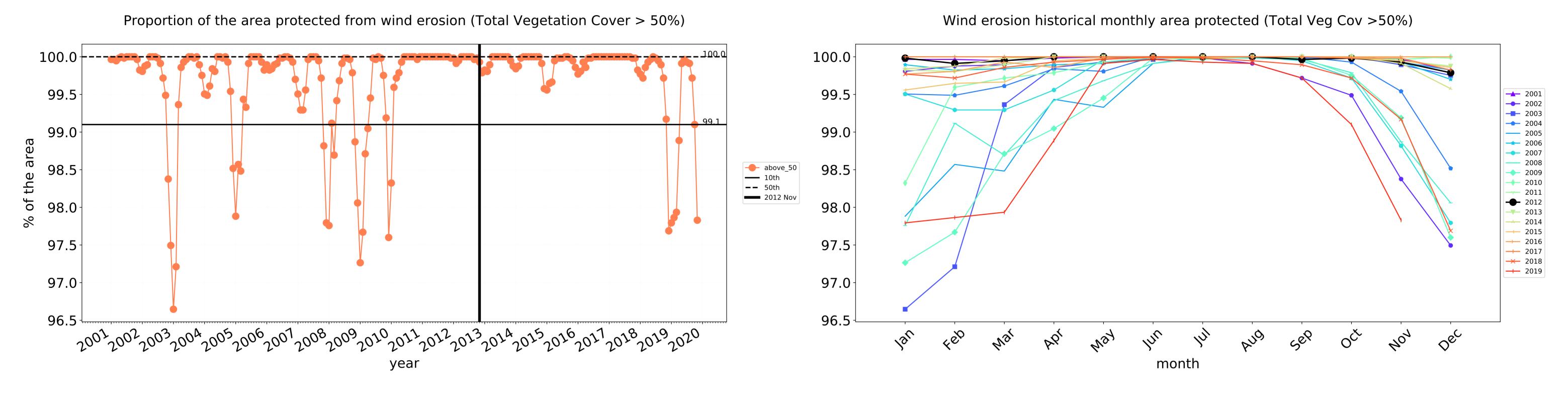


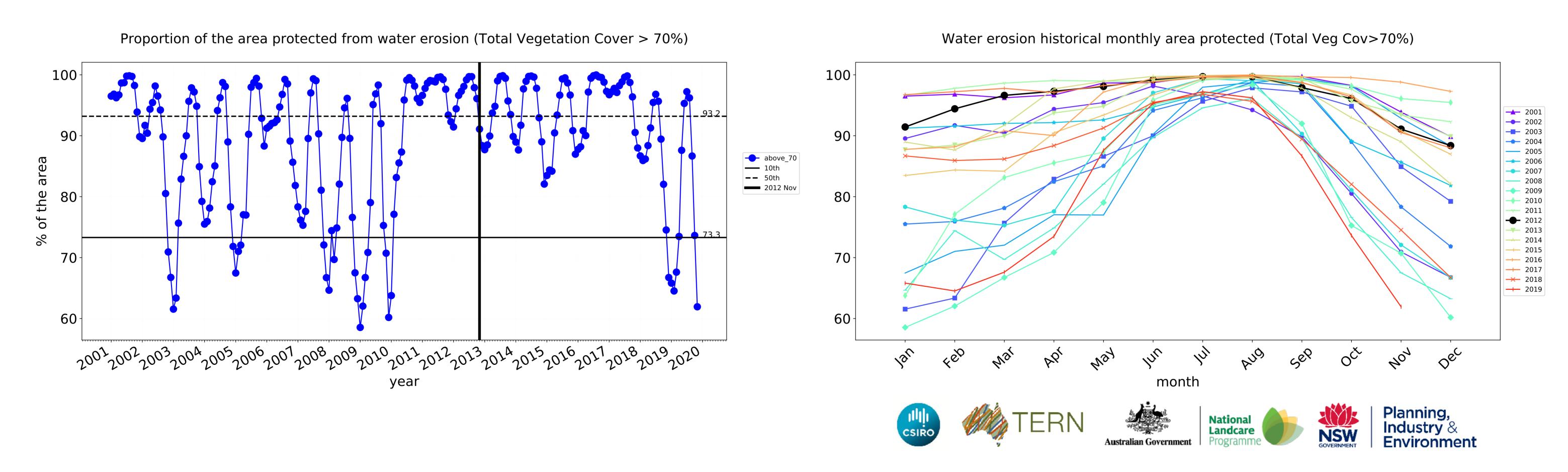






#### **Grazing Woodland forest timeseries**



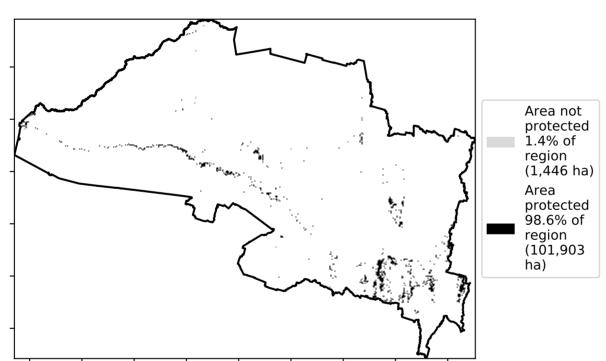


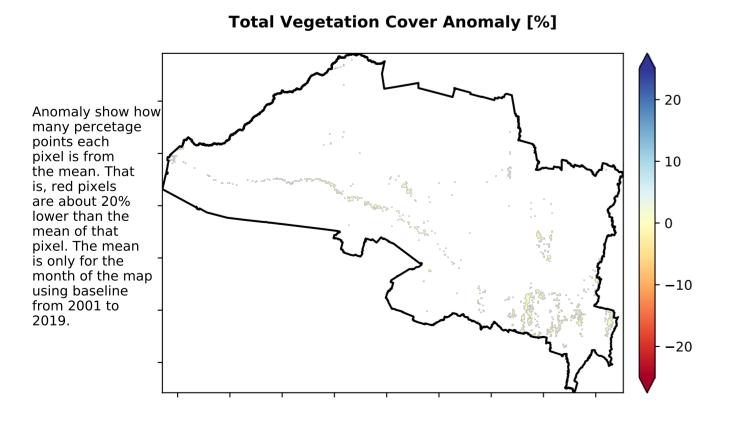
#### **Grazing - Forest (non woodland)**

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

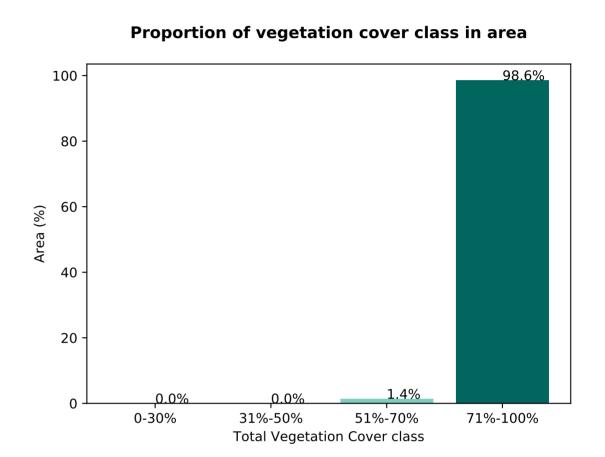
# **Total Vegetation Cover [%]**

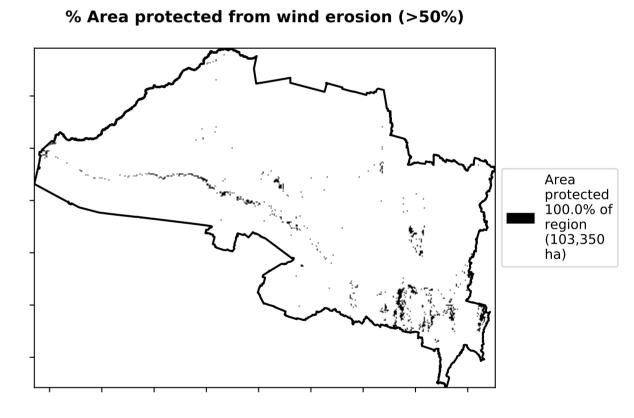
## % Area protected from water erosion (>70%)

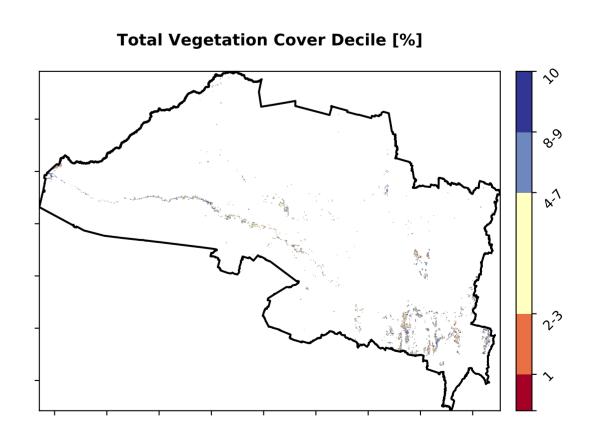




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline. the map using baseline from 2001 to 2019.









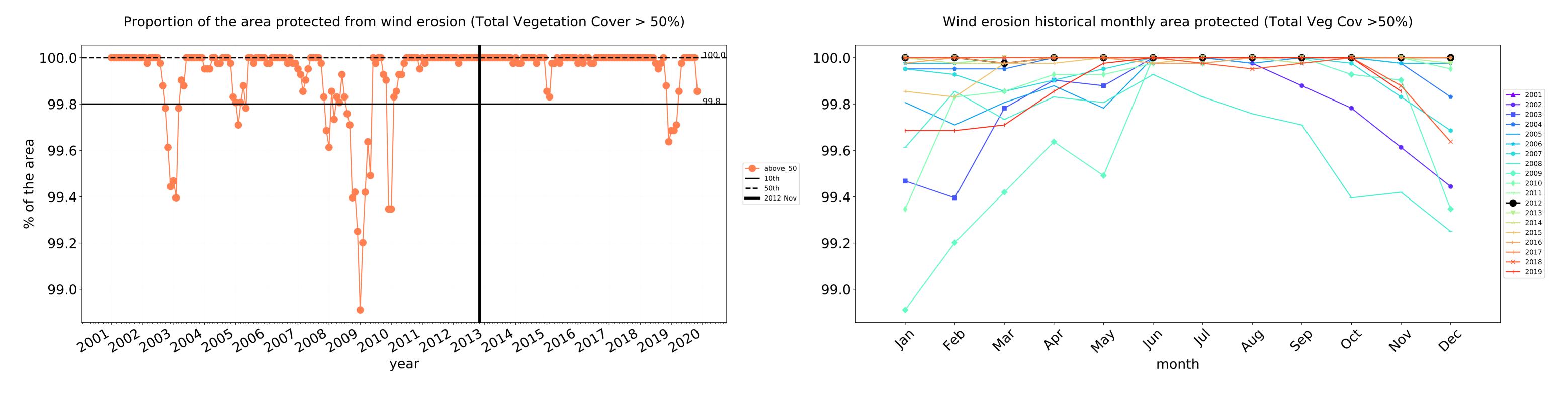


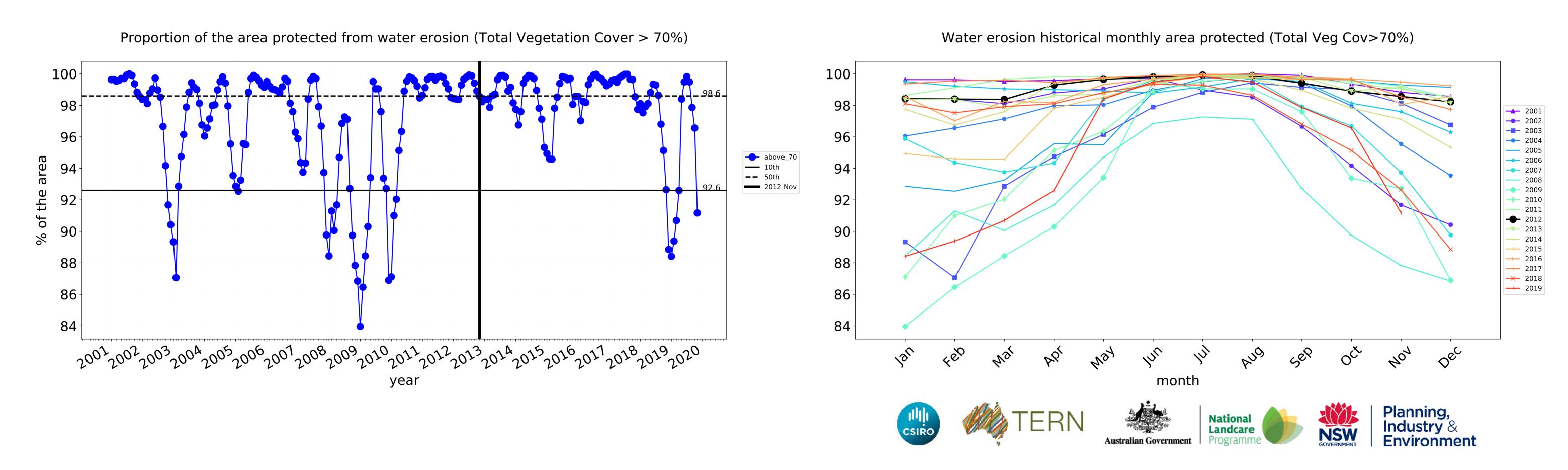






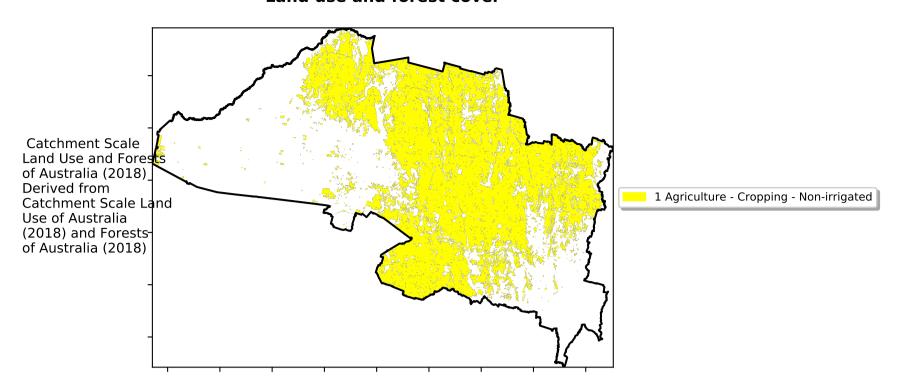




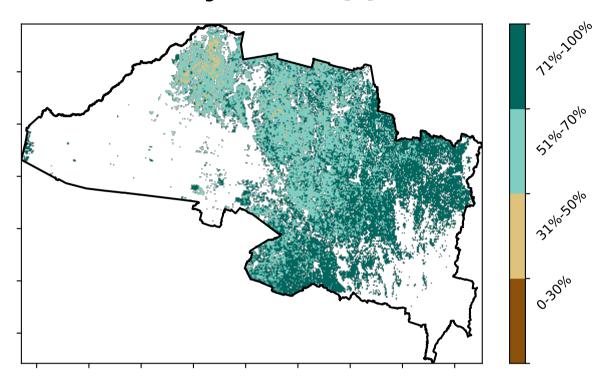


#### **Cropping**

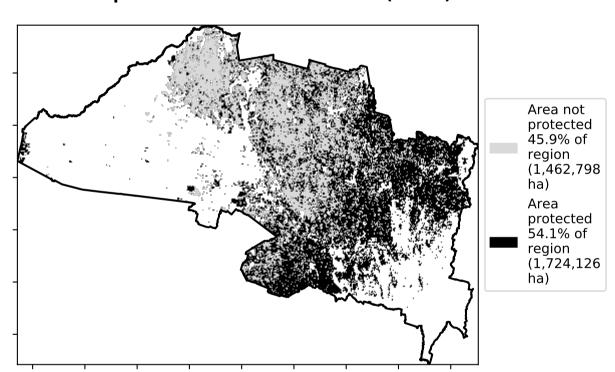
#### Land use and forest cover



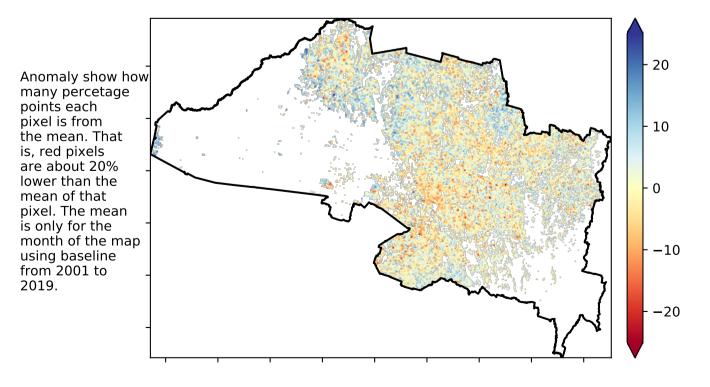
#### **Total Vegetation Cover [%]**



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

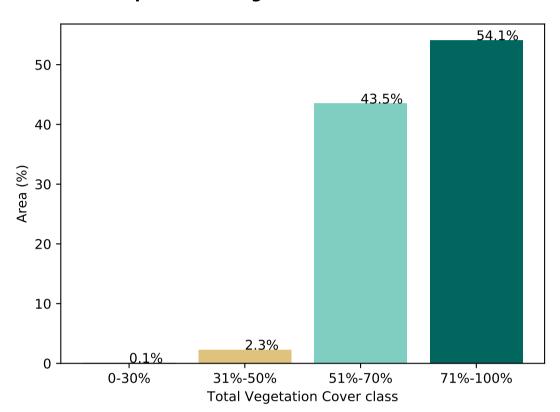


#### Total Vegetation Cover Anomaly [%]

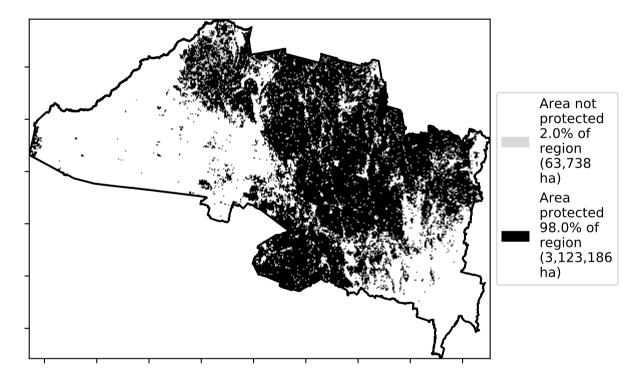


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

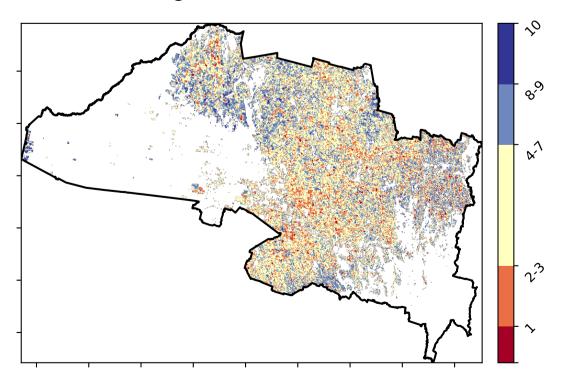
#### **Proportion of vegetation cover class in area**



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



#### Total Vegetation Cover Decile [%]







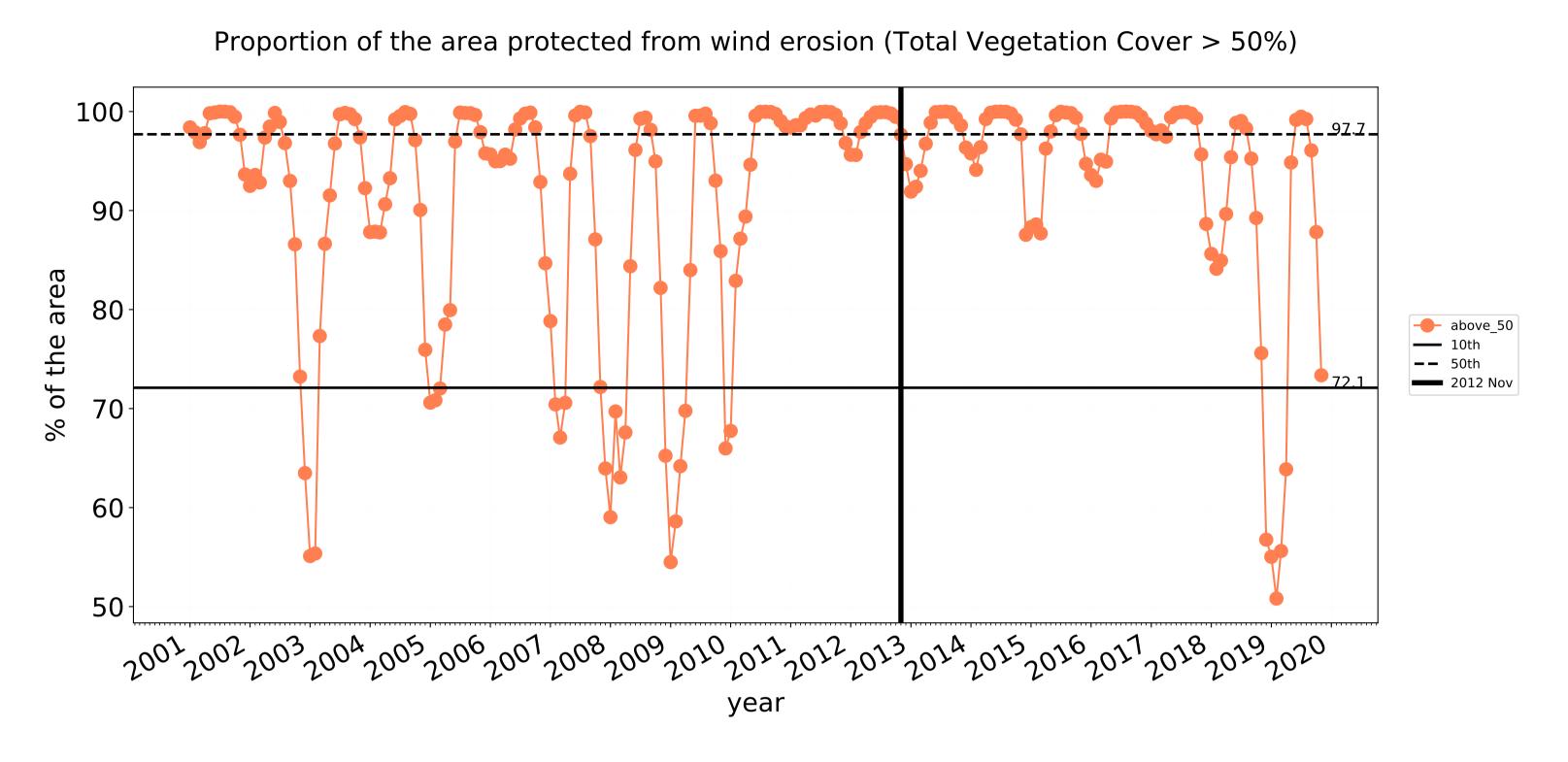


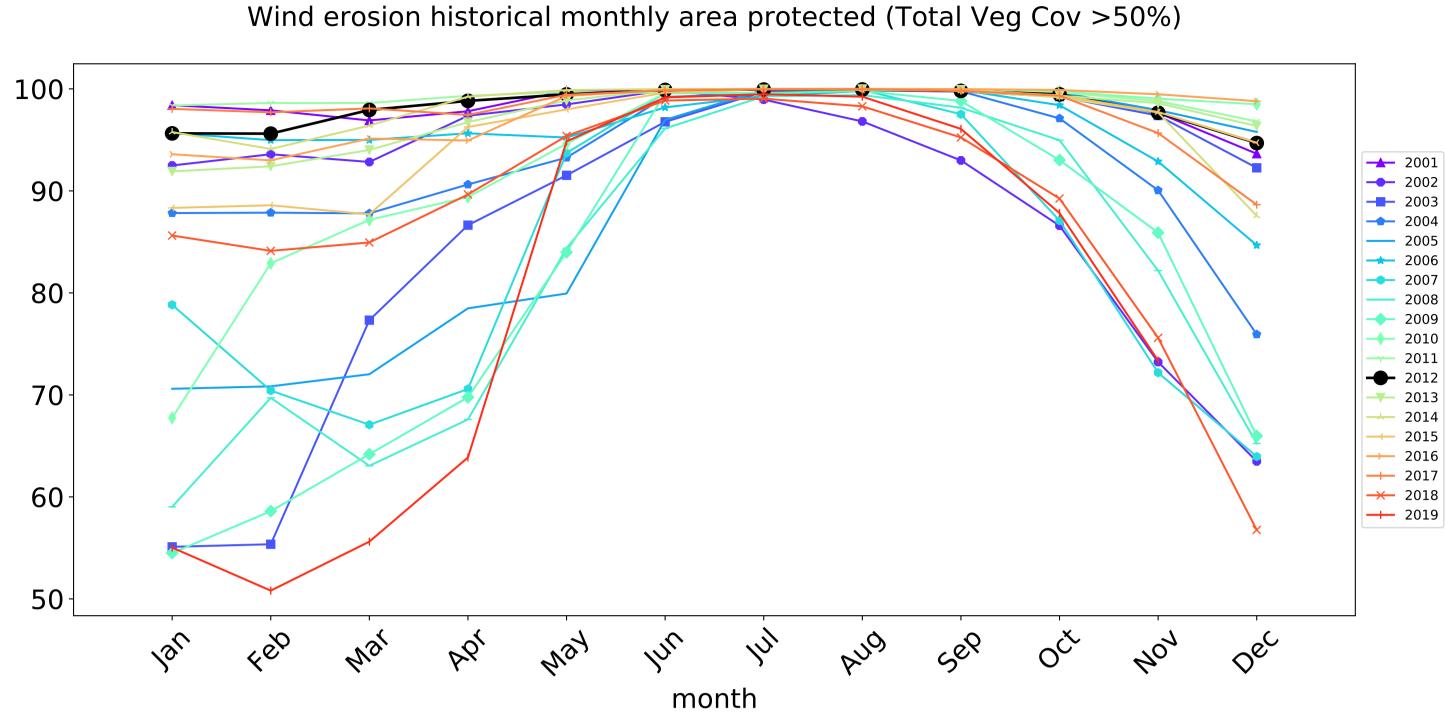


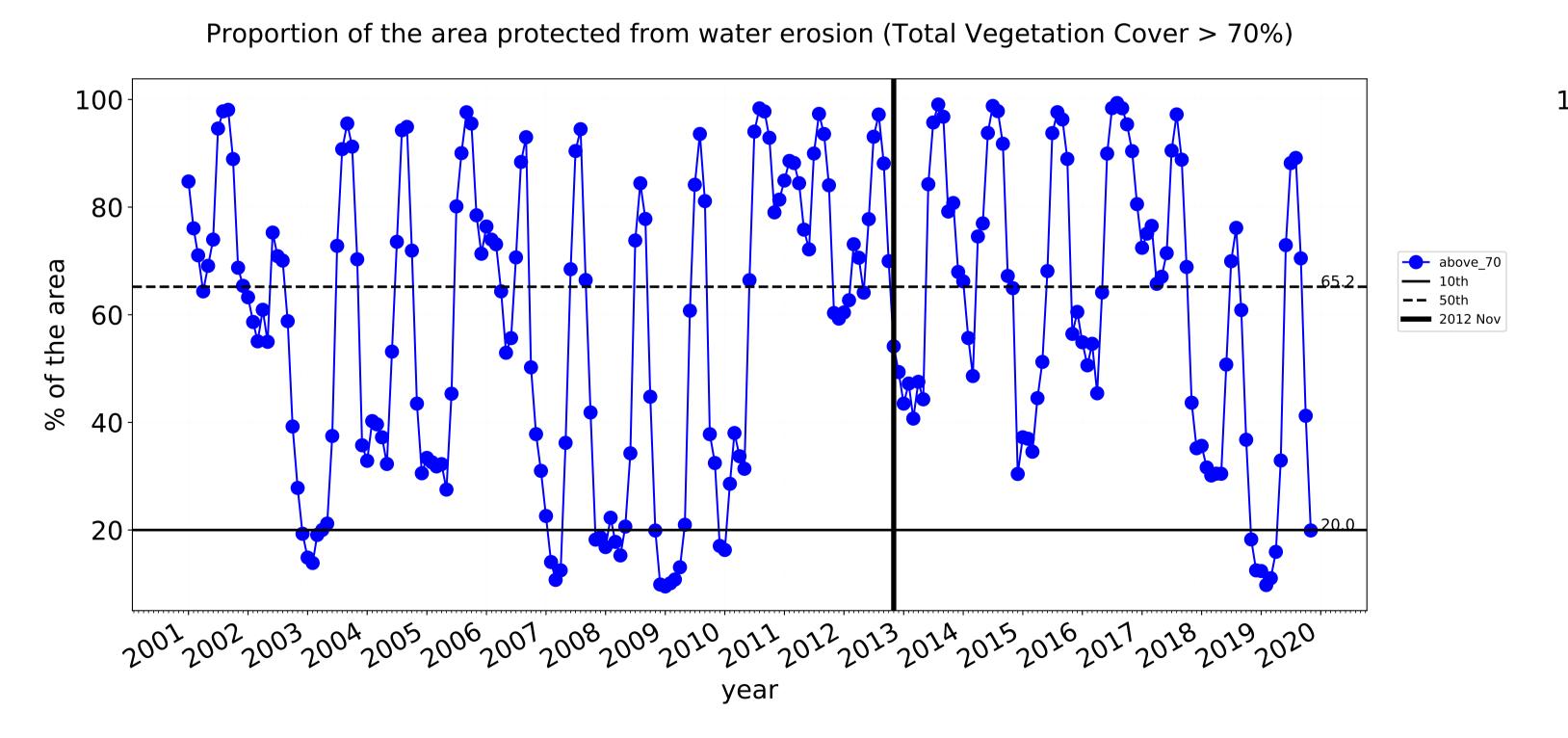


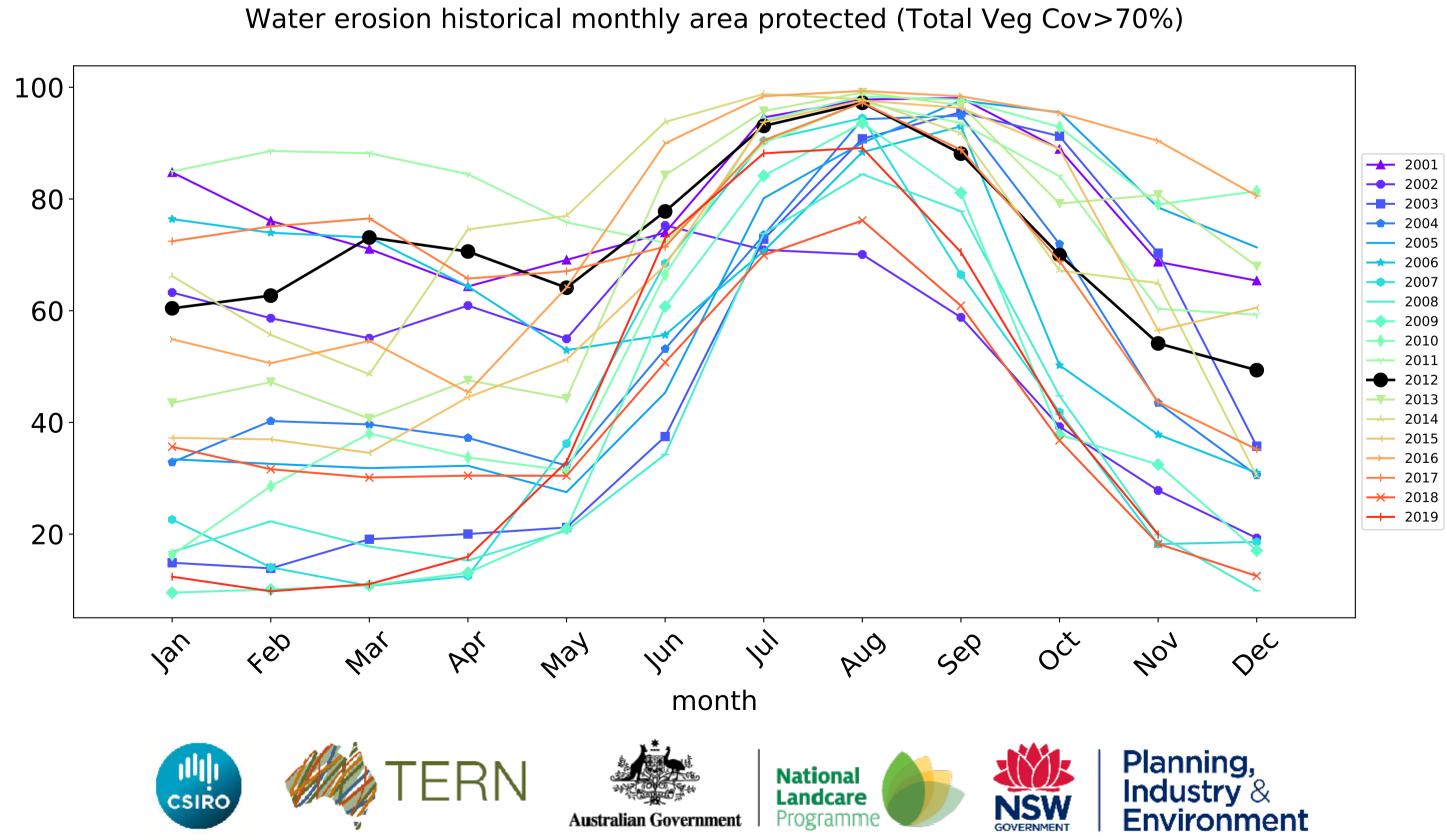


#### **Cropping timeseries**



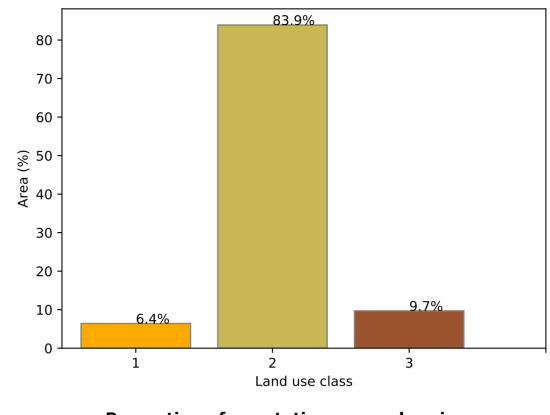


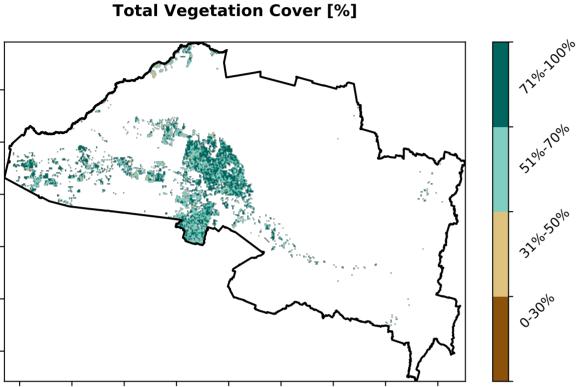


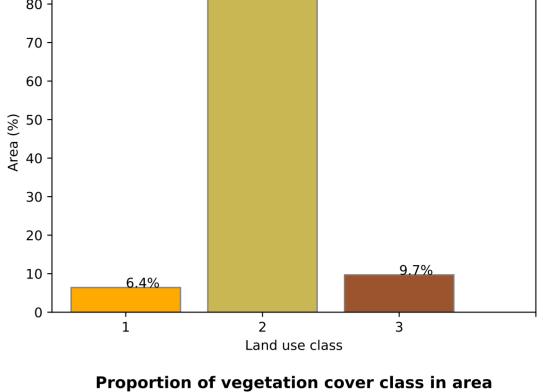


#### Irrigation

### Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

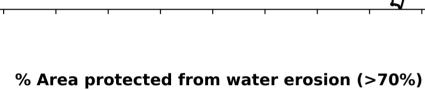


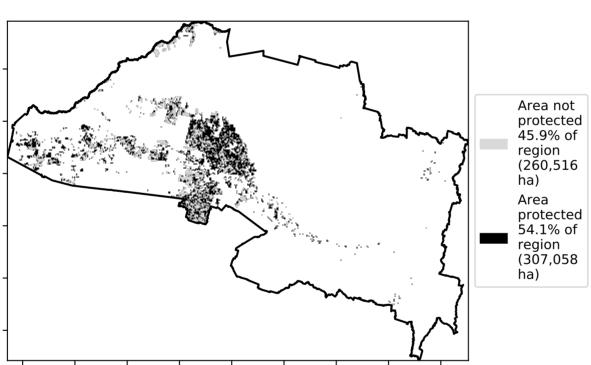




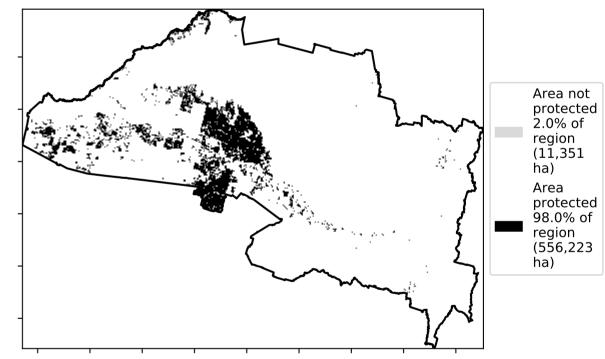
**Proportion of each land class in area** 

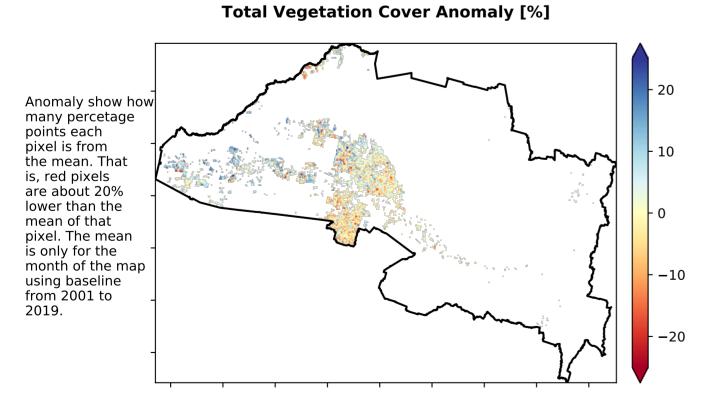
#### 54.1% 50 43.5% 40 Area (%) 0 20 10 2.3% 31%-50% 51%-70% 71%-100% 0-30% **Total Vegetation Cover class**



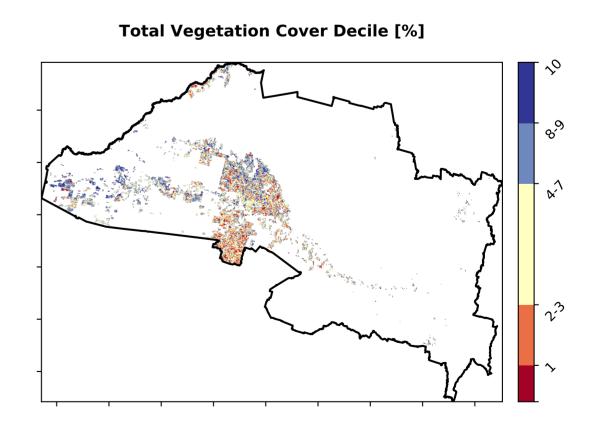


% Area protected from wind erosion (>50%)





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





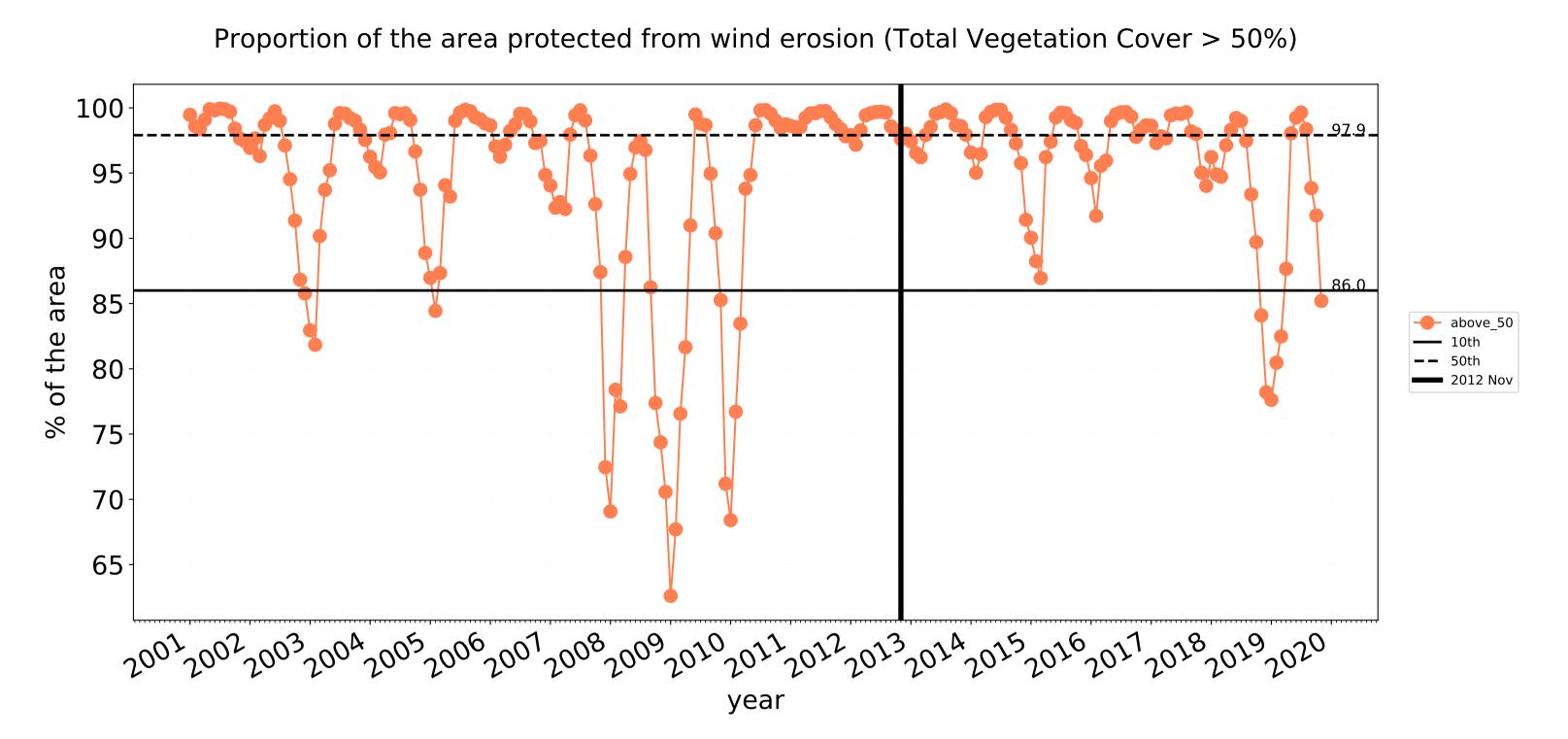


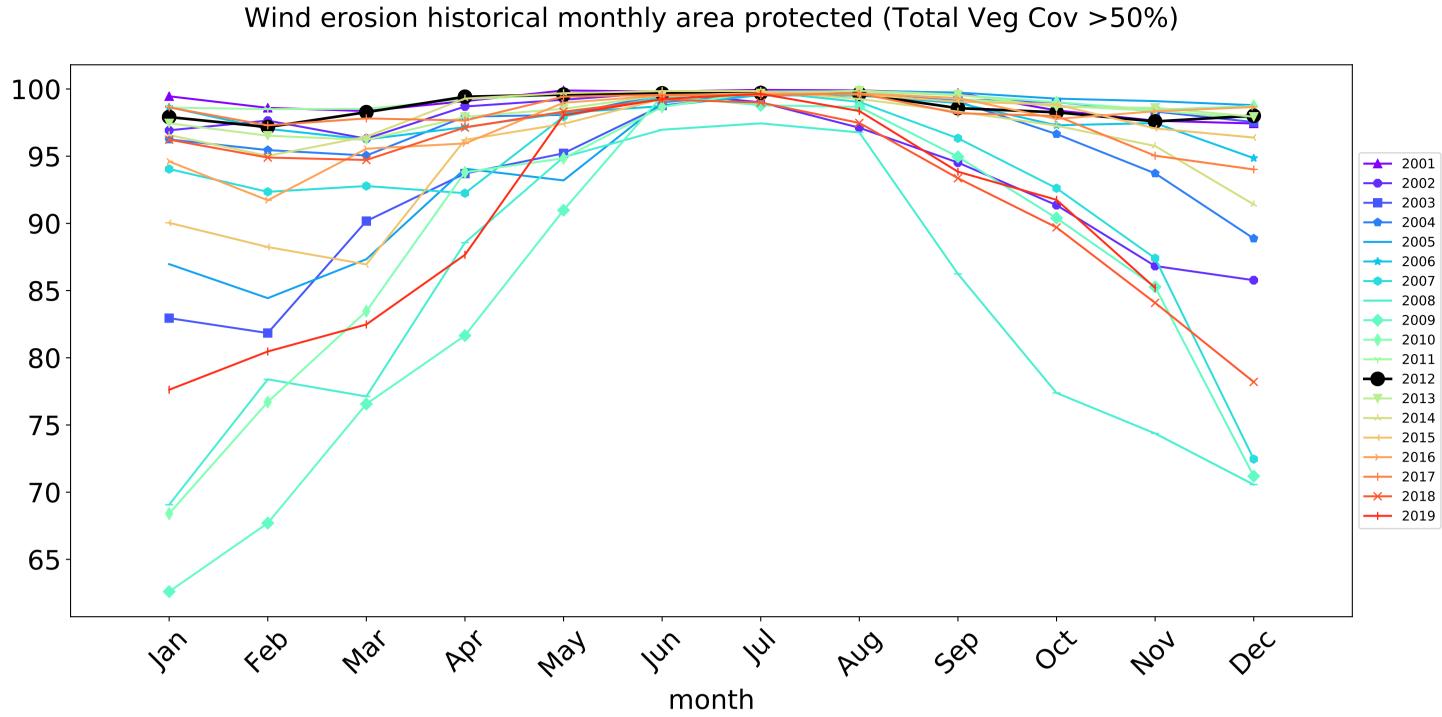


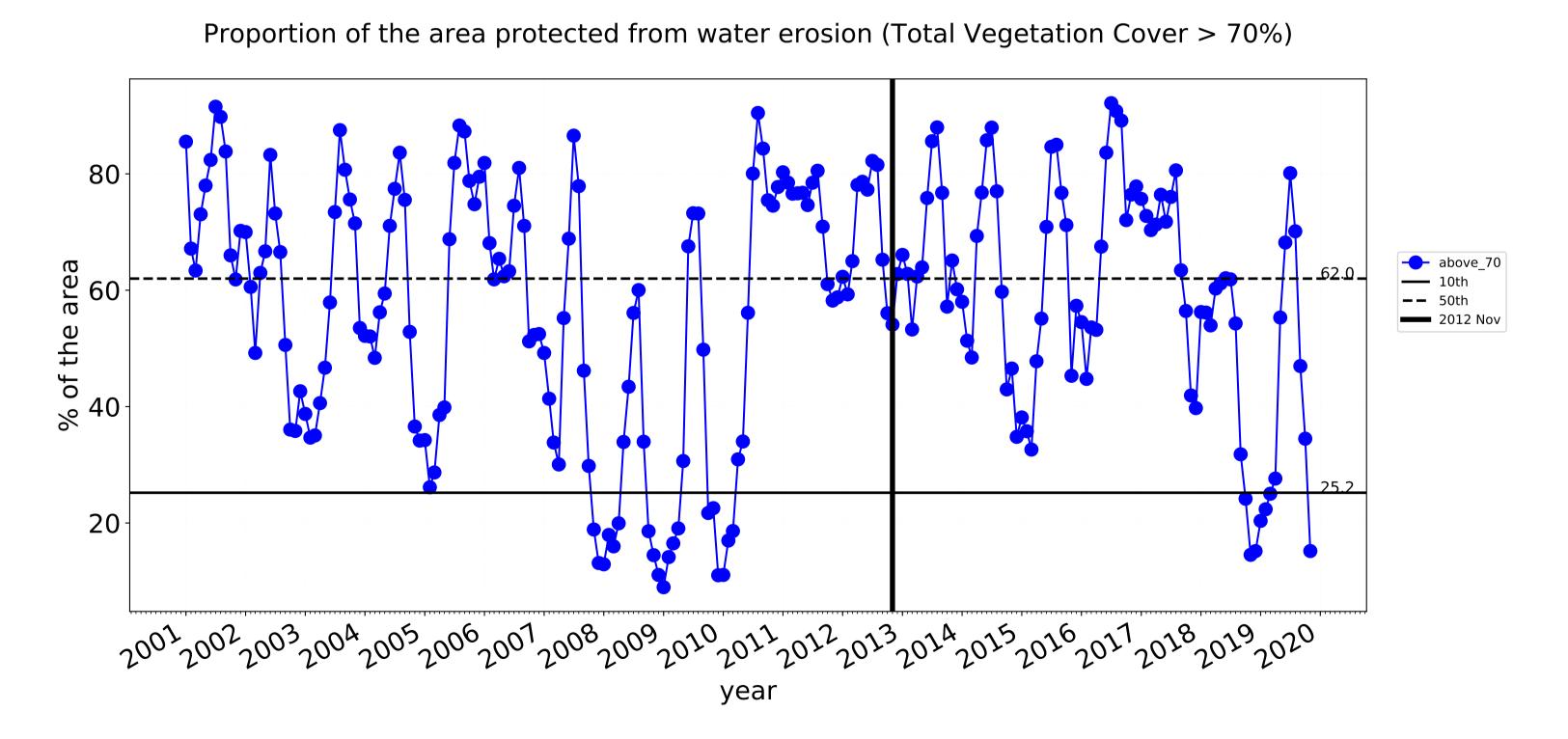


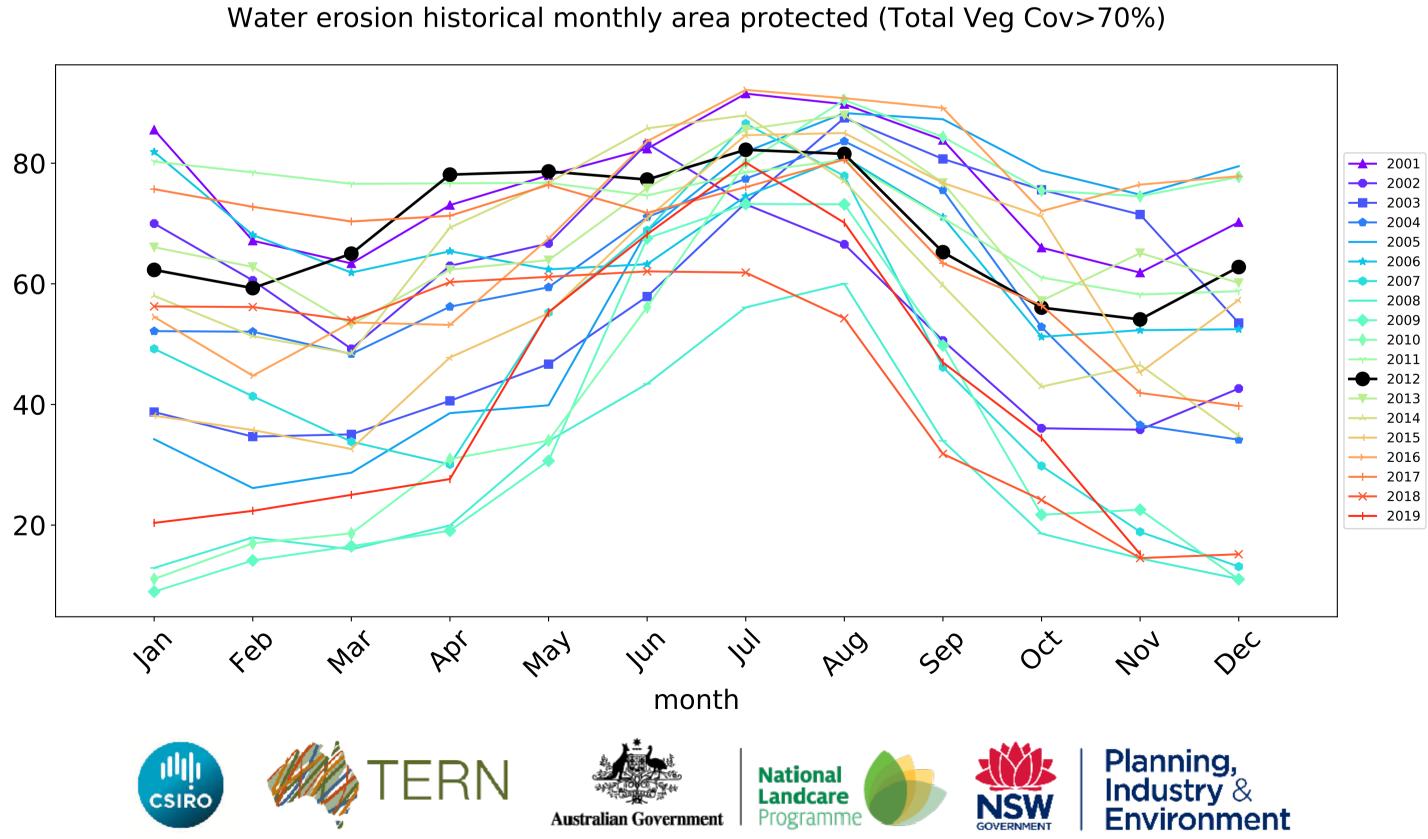








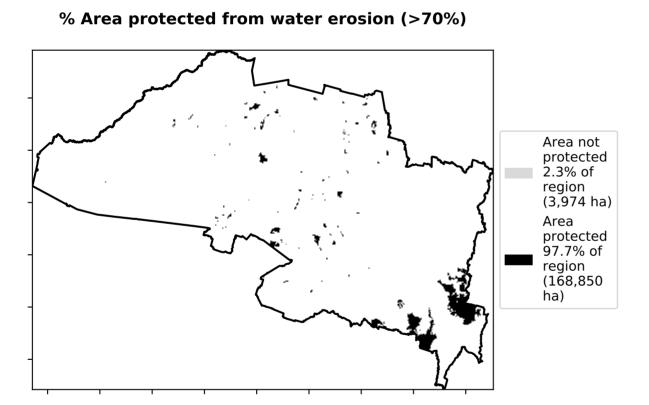


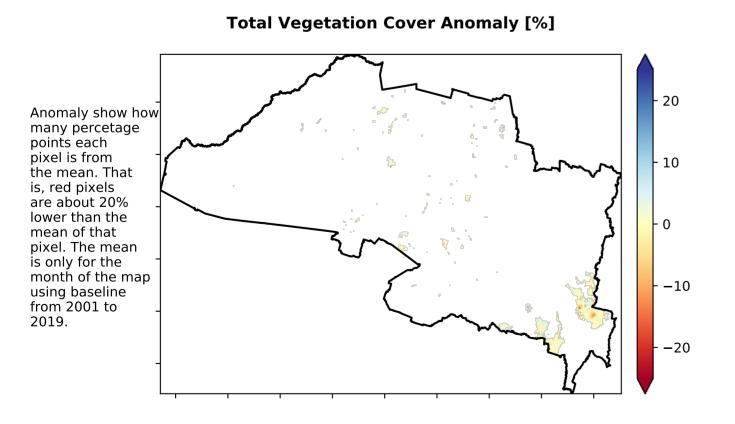


#### **Production native forests and plantation forests**

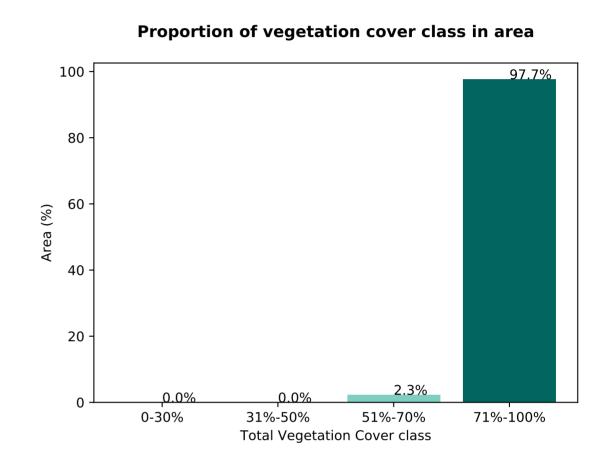
## Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 1 Production native forests and plantation forests of Australia (2018)

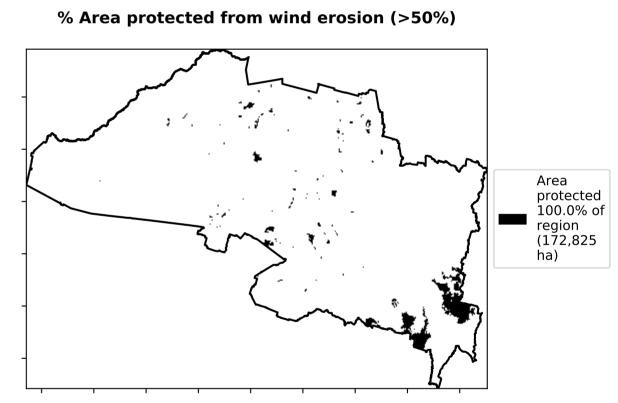
# Total Vegetation Cover [%] Total Vegetation Cover [%] Tiple Total Vegetation Cover [%]

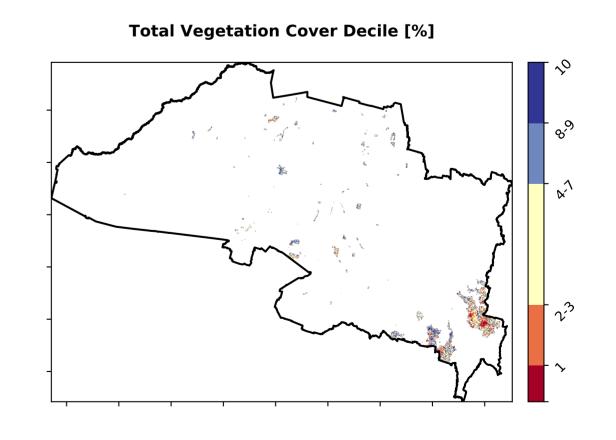




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.











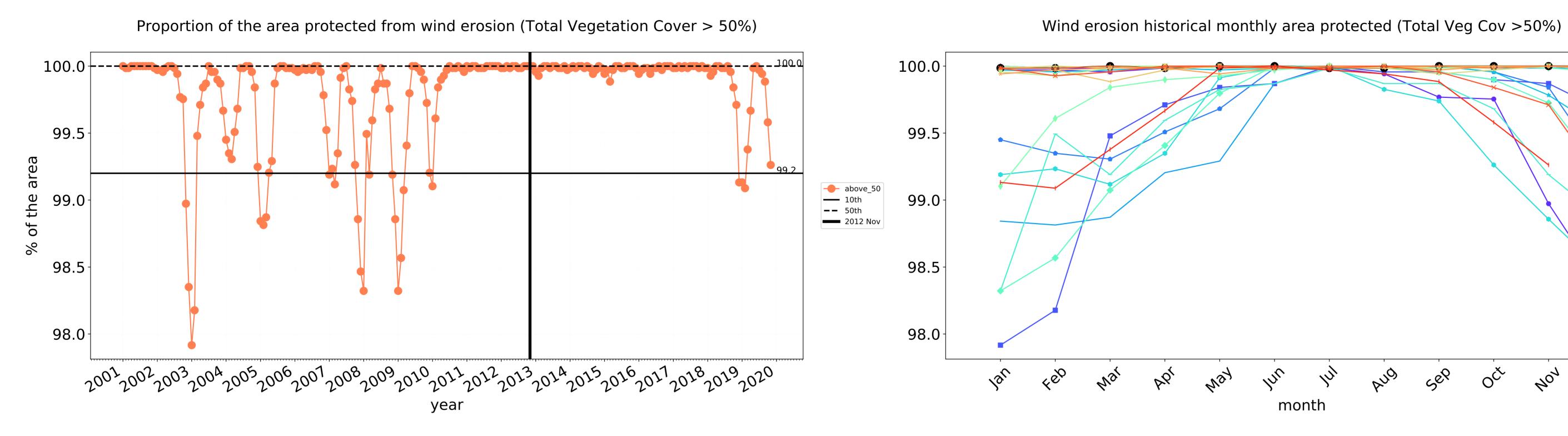


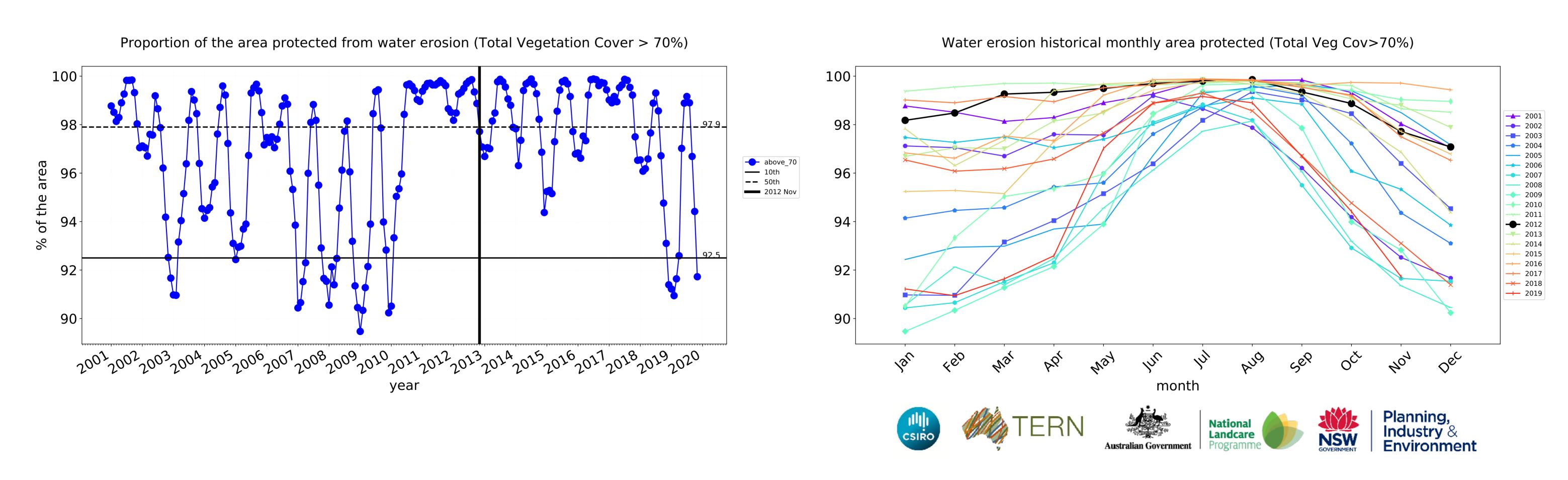






#### **Production native forests and plantation forests timeseries**





2002 2003

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

2009

→ 2010

2011

2012 2013

<del>←</del> 2015

→ 2016 → 2017 → 2018 → 2019

### Riverina (6,694,025 ha and no data 14,310 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	6,694,025	99.9% 6,687,425	98.4% 6,584,200	64.0% 4,287,075	33.7% 2,257,850	14.3% 955,275	4.1% 273,775
Conservation and natural environments	322,875	100.0% 322,875	100.0% 322,850	92.5% 298,500	80.1% 258,725	59.0% 190,500	23.8% 76,975
Conservation and natural environments non forest	83,350	100.0% 83,350	100.0% 83,325	71.7% 59,775	30.6% 25,500	12.6% 10,525	6.4% 5,350
Conservation and natural environments Forest (non woodland)	195,025	100.0% 195,025	100.0% 195,025	100.0% 194,950	99.1% 193,350	85.8% 167,425	35.7% 69,550
Agriculture	6,068,075	100.0% 6,065,150	98.3% 5,964,925	61.6% 3,736,025	29.7% 1,802,350	10.7% 647,125	2.4% 146,075
Grazing	2,311,750	99.9% 2,310,125	99.3% 2,296,700	73.7% 1,703,000	42.5% 982,525	19.9% 460,175	4.8% 109,850
Grazing non forest	2,066,750	99.9% 2,065,125	99.3% 2,051,800	71.2% 1,472,100	38.8% 802,325	19.1% 394,675	4.7% 97,825
Grazing Woodland forest	141,650	100.0% 141,650	99.9% 141,550	91.1% 129,025	62.8% 88,900	11.9% 16,850	1.4% 1,925
Grazing - Forest (non woodland)	103,350	100.0% 103,350	100.0% 103,350	98.6% 101,875	88.3% 91,300	47.1% 48,650	9.8% 10,100
Cropping	3,186,925	100.0% 3,186,175	97.7% 3,112,525	54.1% 1,725,350	23.2% 739,150	5.6% 179,000	1.1% 34,375
Irrigation	567,575	99.9% 567,025	97.6% 553,875	54.1% 307,075	14.2% 80,450	1.4% 7,925	0.3% 1,850
Production native forests and plantation forests	172,825	100.0% 172,825	100.0% 172,825	97.7% 168,875	90.3% 156,000	63.0% 108,875	28.6% 49,350











