### Total vegetation cover soil protection Region:NRM Mackay Whitsunday 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:

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









Date: July 2020

#### **Vegetation Cover Jul 2020**

#### Land use and forest cover

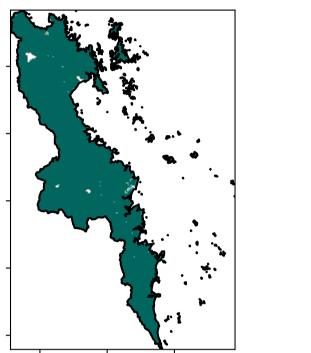
#### Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - Woodland forest 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation 13 Other uses

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

Land Use and Forests

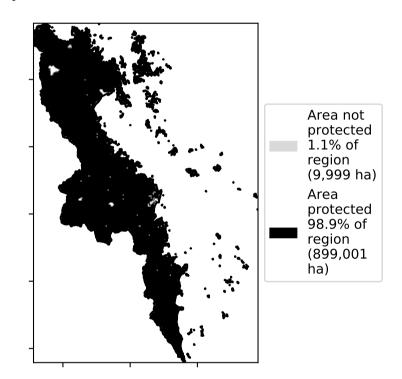
Catchment Scale

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

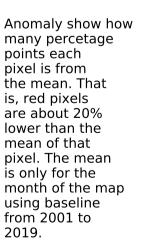


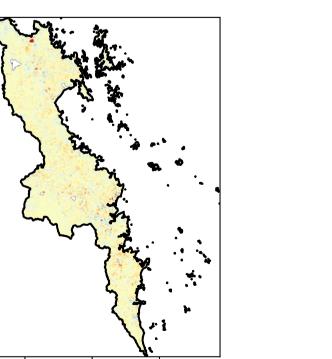
#### % Area protected from water erosion (>70%)

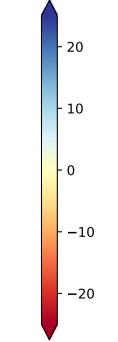
**Total Vegetation Cover Anomaly [%]** 



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

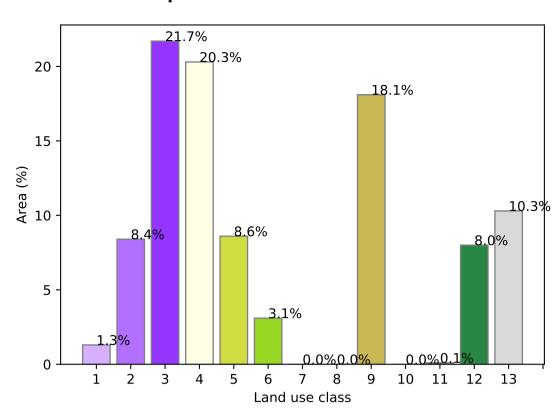




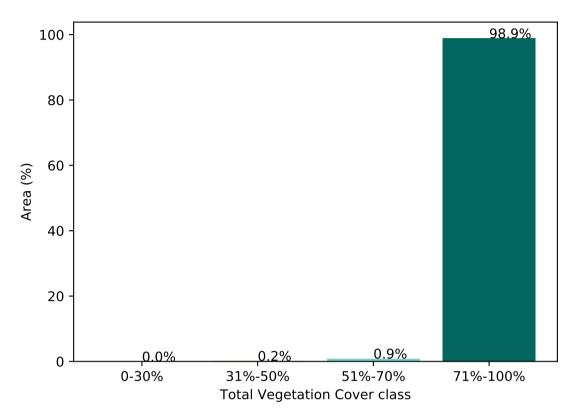


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

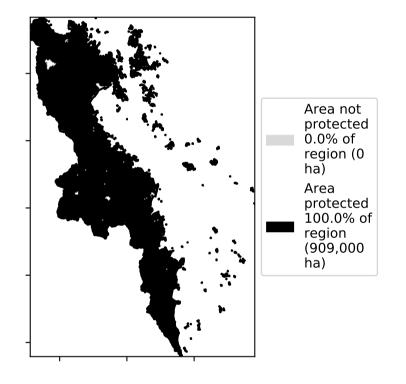
#### **Proportion of each land class in area**



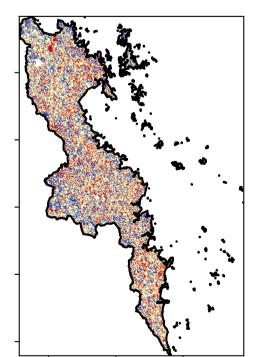
#### Proportion of vegetation cover class in area

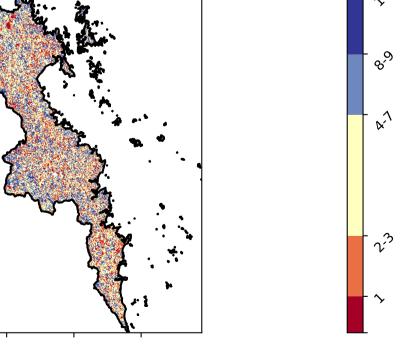


#### % Area protected from wind erosion (>50%)



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



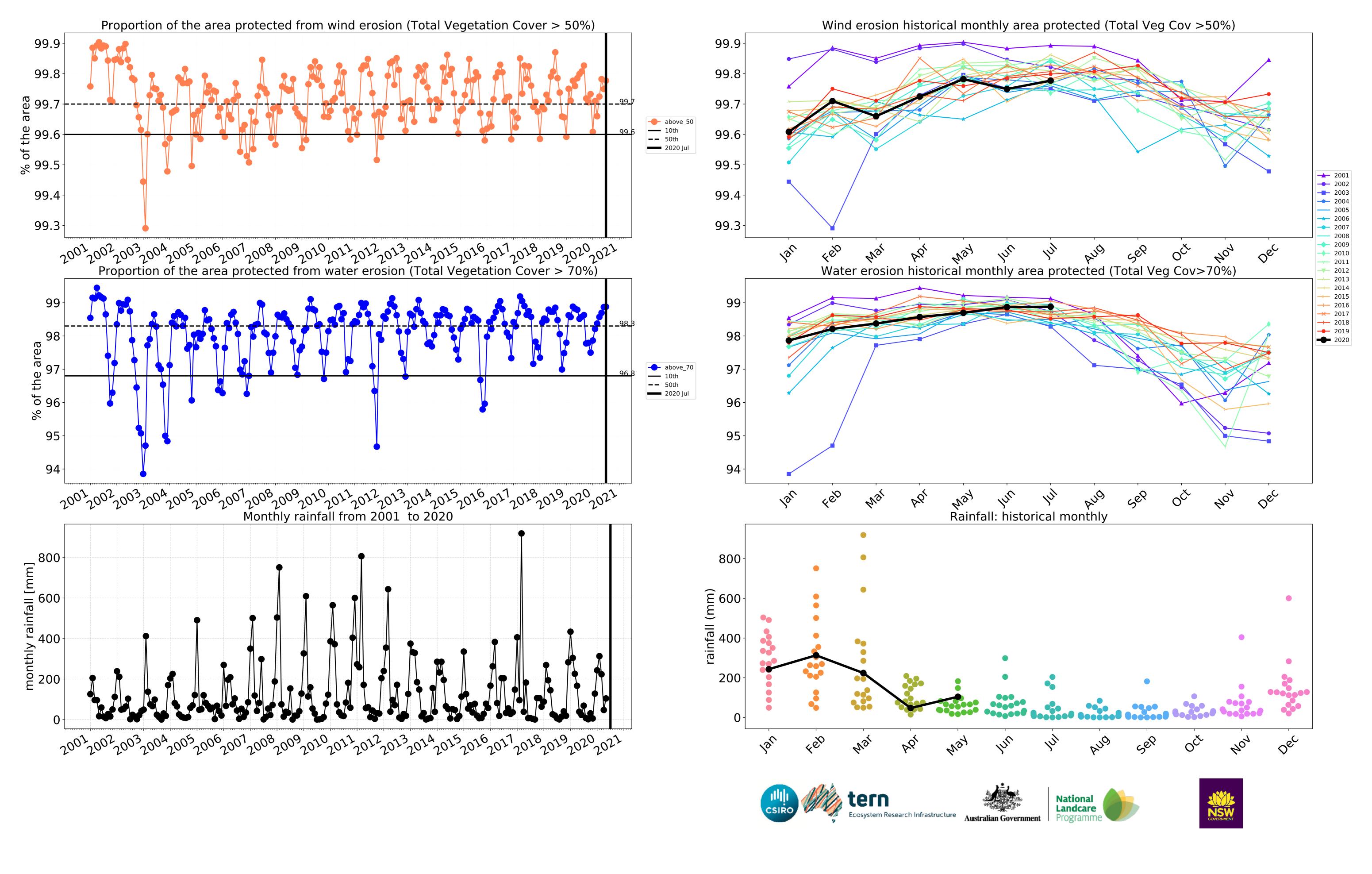


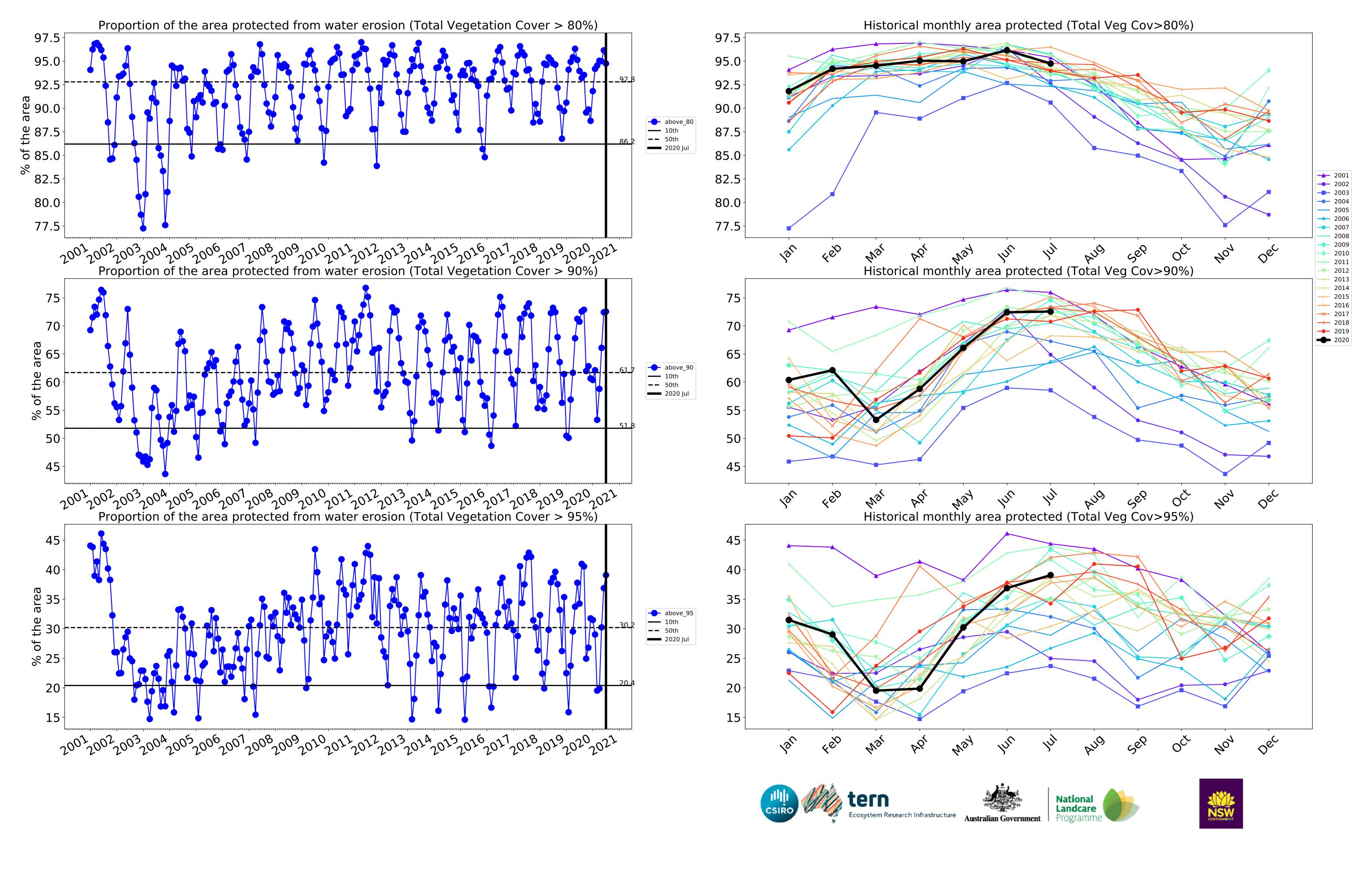






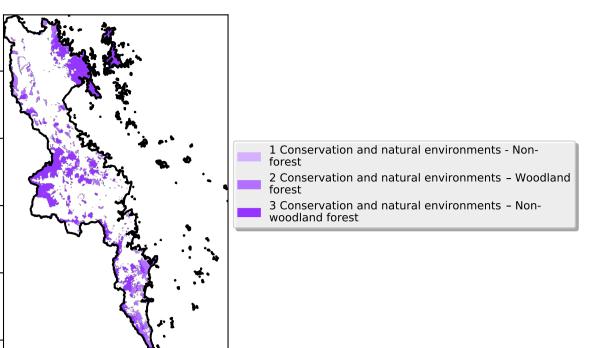




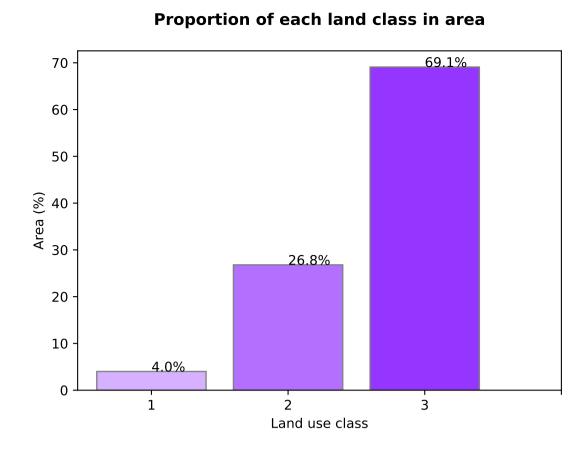


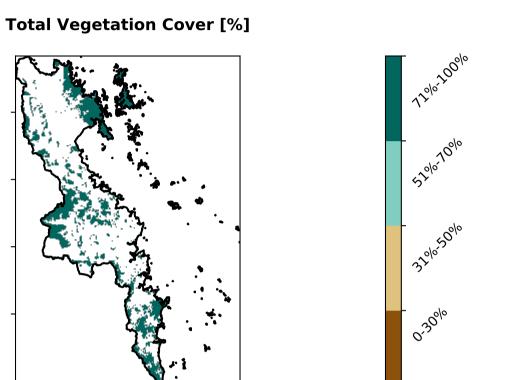
#### **Conservation and natural environments**

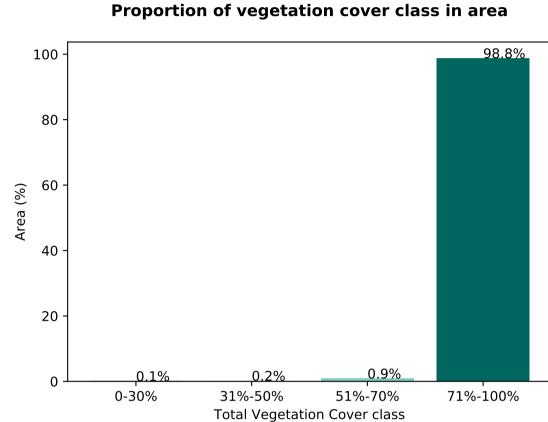
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

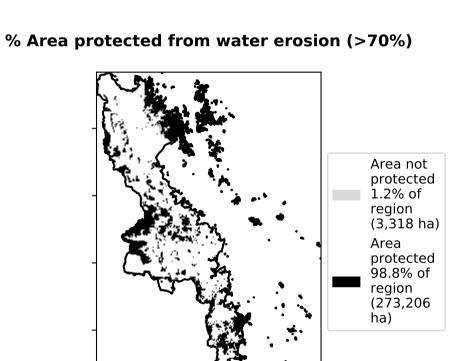


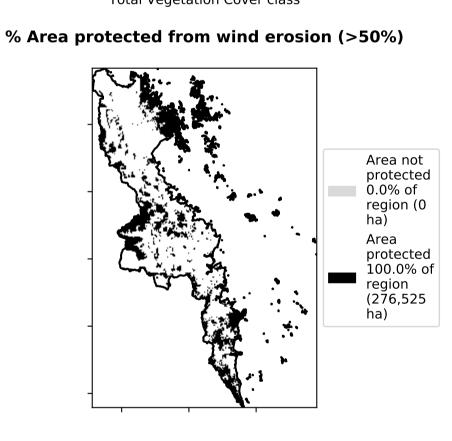
Land use and forest cover

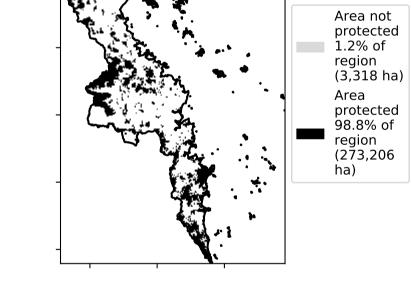


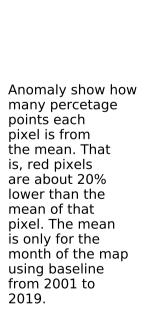


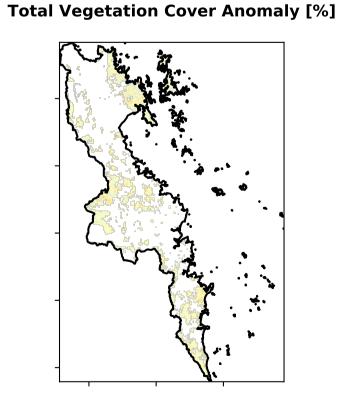


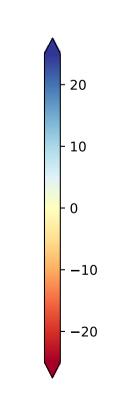




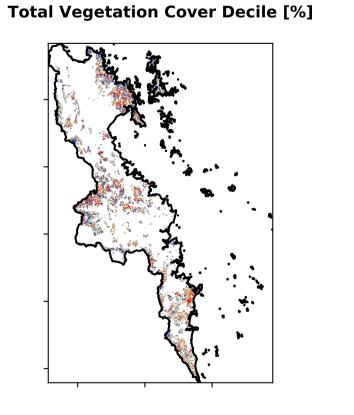








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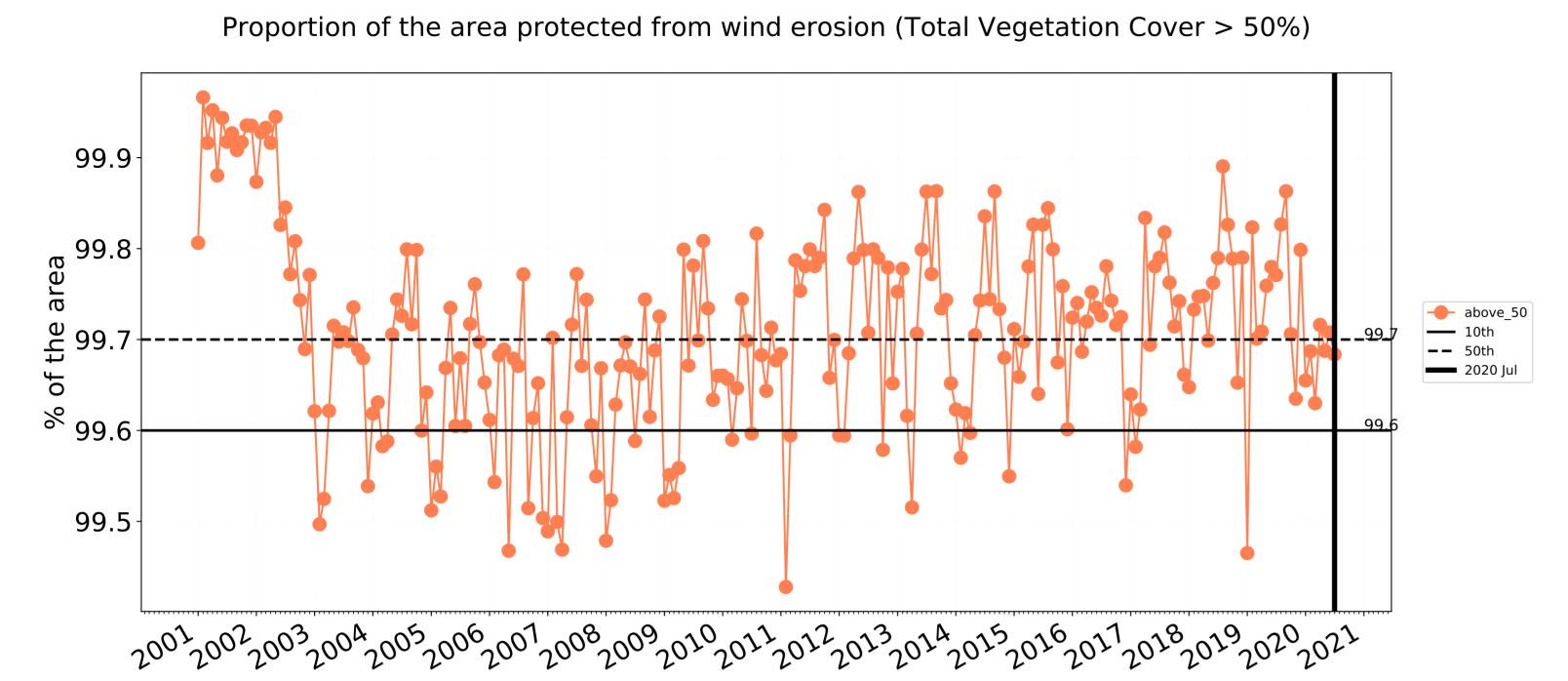




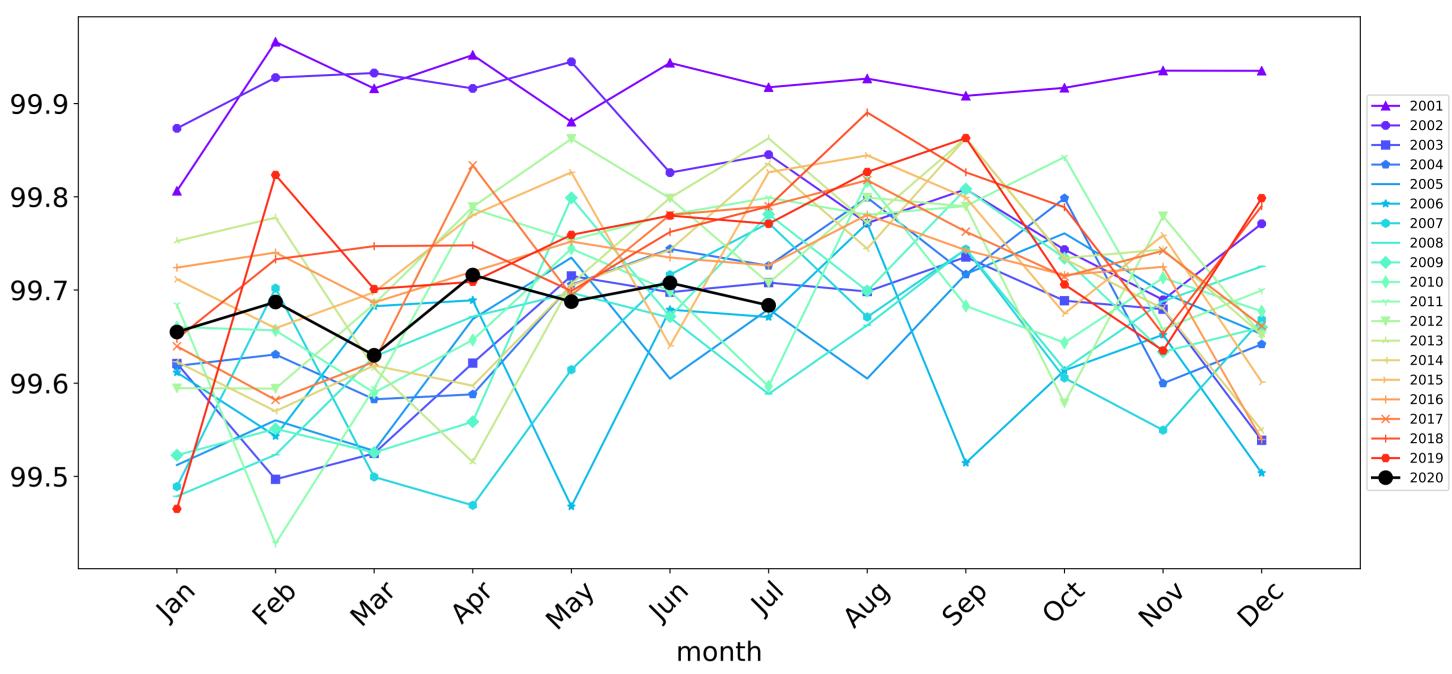


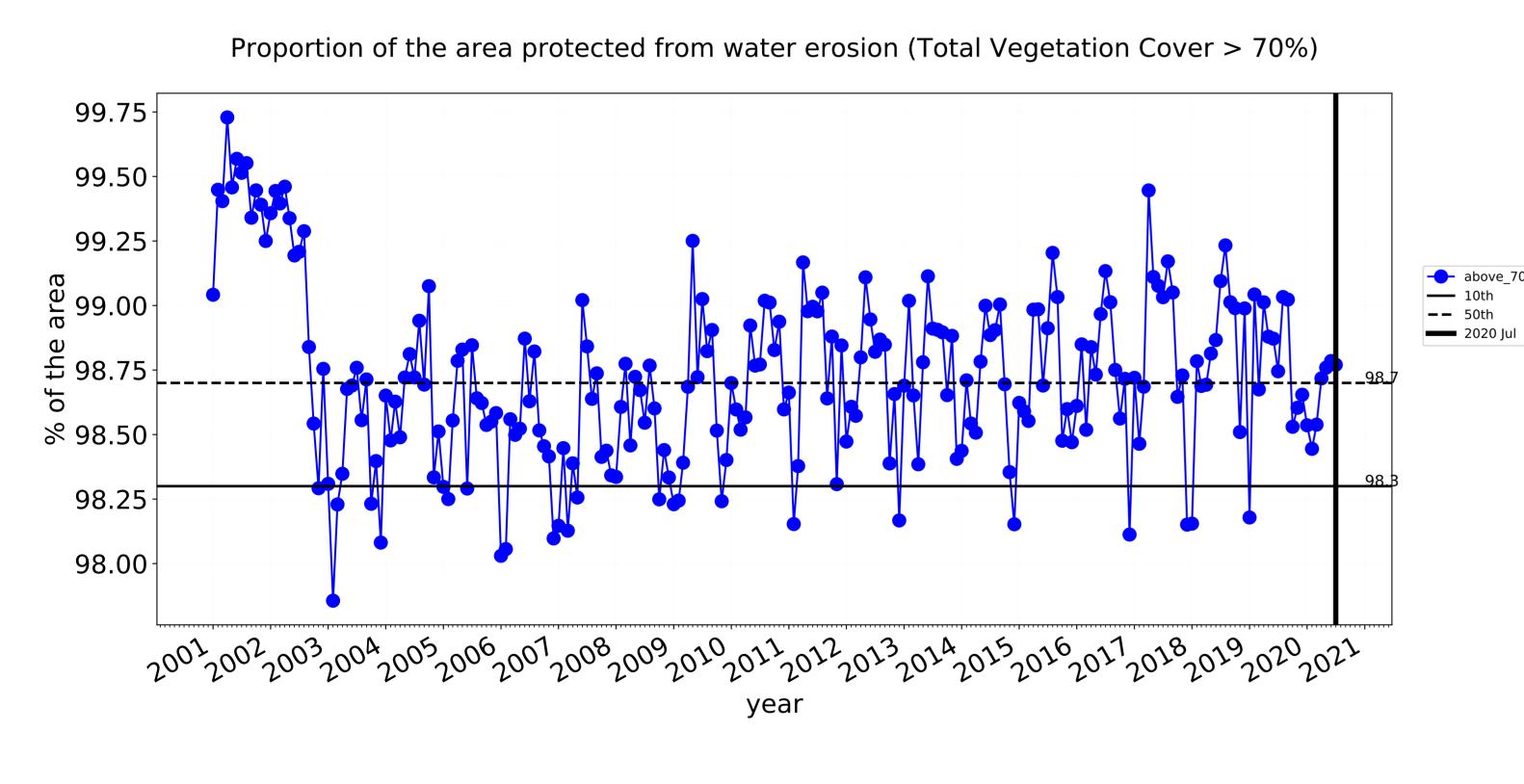


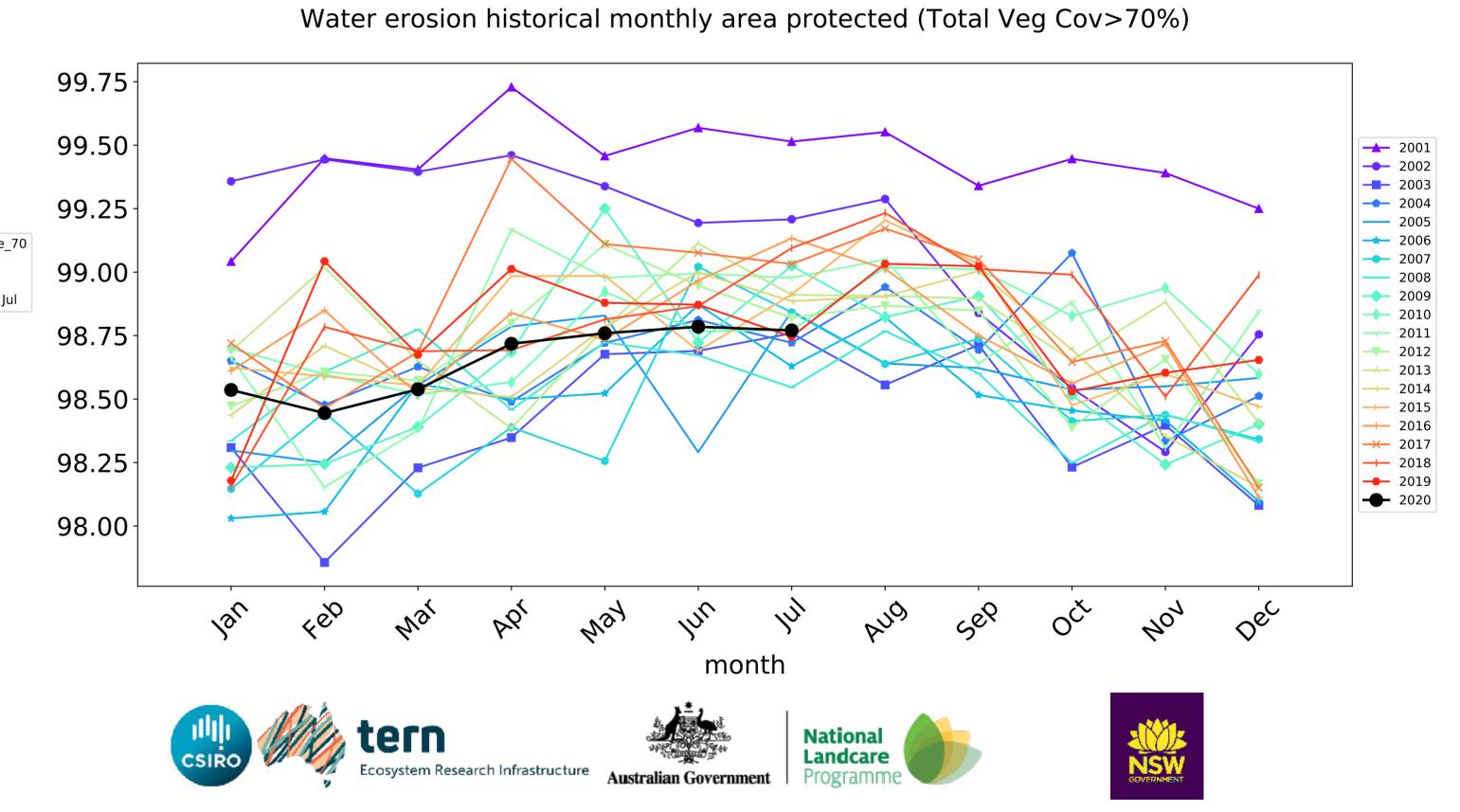
#### **Conservation and natural environments timeseries**

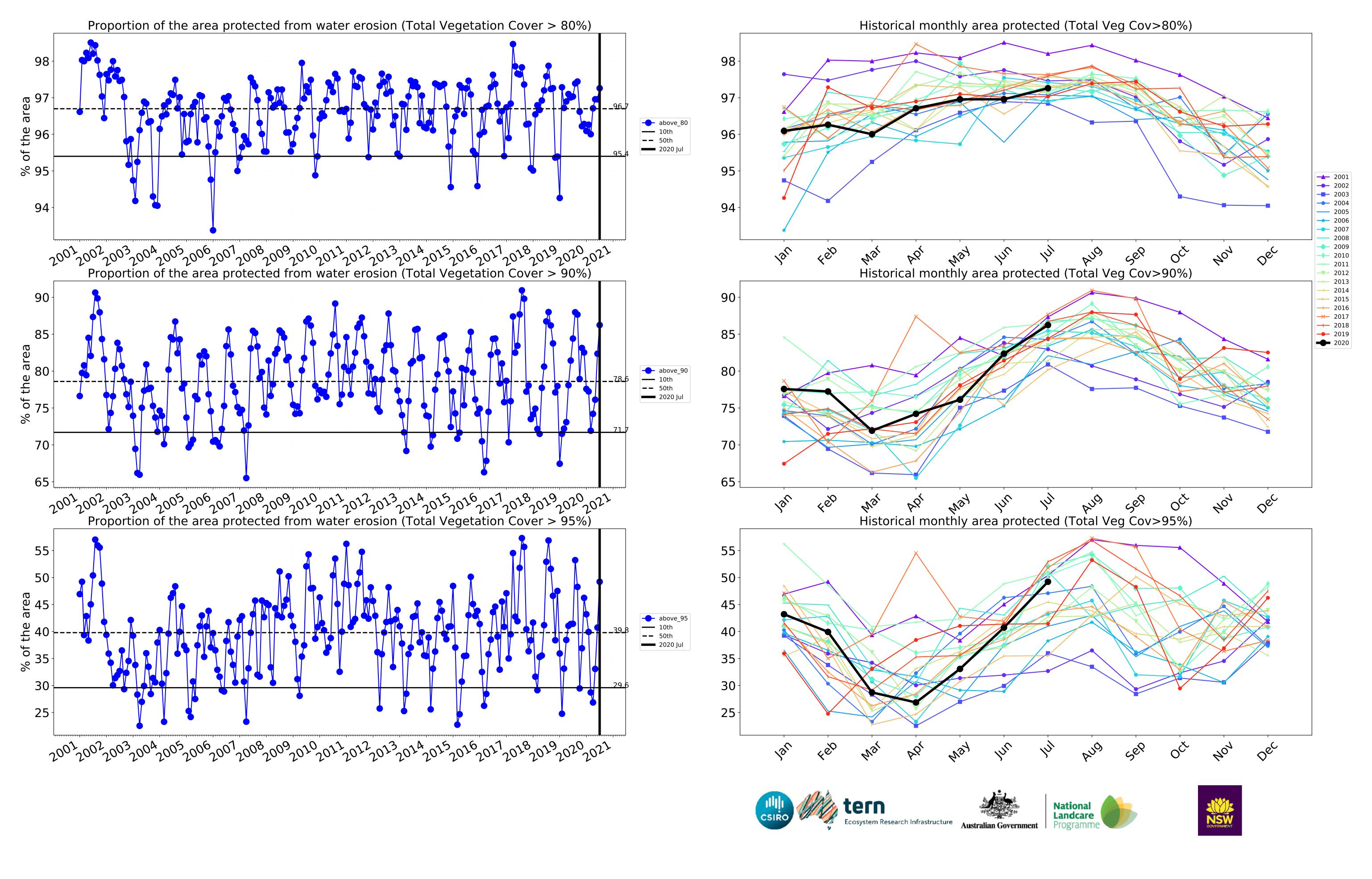


#### Wind erosion historical monthly area protected (Total Veg Cov >50%)









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

#### Catchment Scale Land Use and Forests

of Australia (2018) Derived from

Anomaly show how many percetage points each

pixel is from

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

the mean. That

pixel. The mean

using baseline from 2001 to 2019.

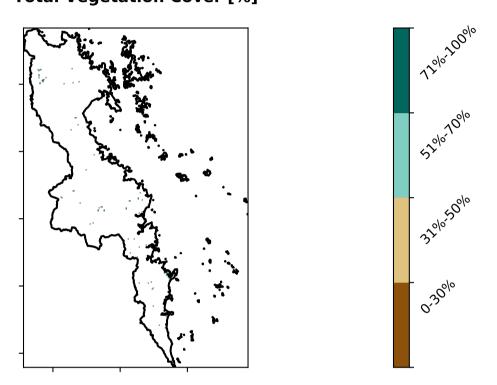
is only for the month of the map

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

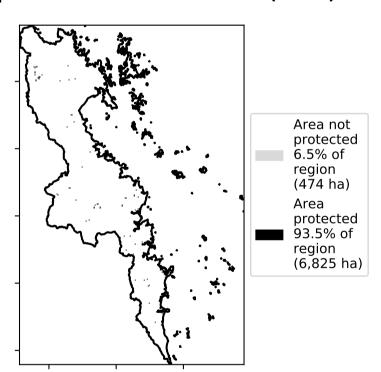
# 1 Conservation and natural environments - Nonforest

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

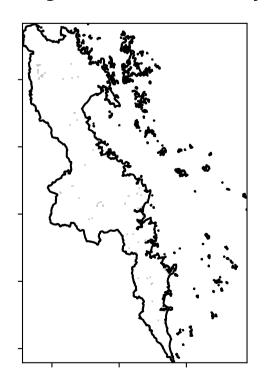
Land use and forest cover

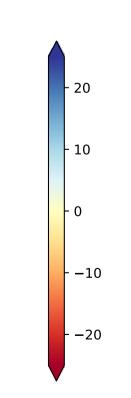


#### % Area protected from water erosion (>70%)



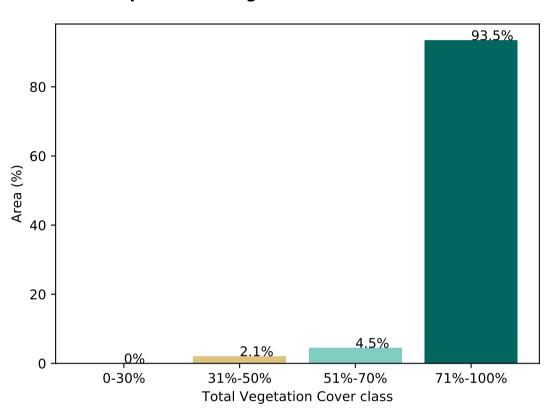
#### **Total Vegetation Cover Anomaly [%]**



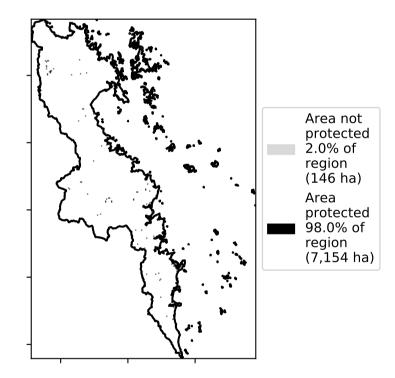


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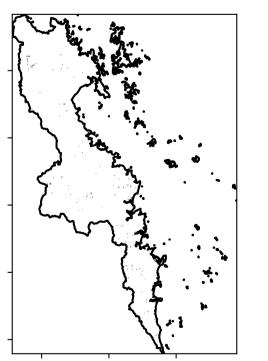
#### **Proportion of vegetation cover class in area**

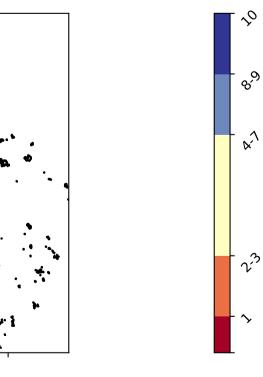


#### % Area protected from wind erosion (>50%)



#### Total Vegetation Cover Decile [%]









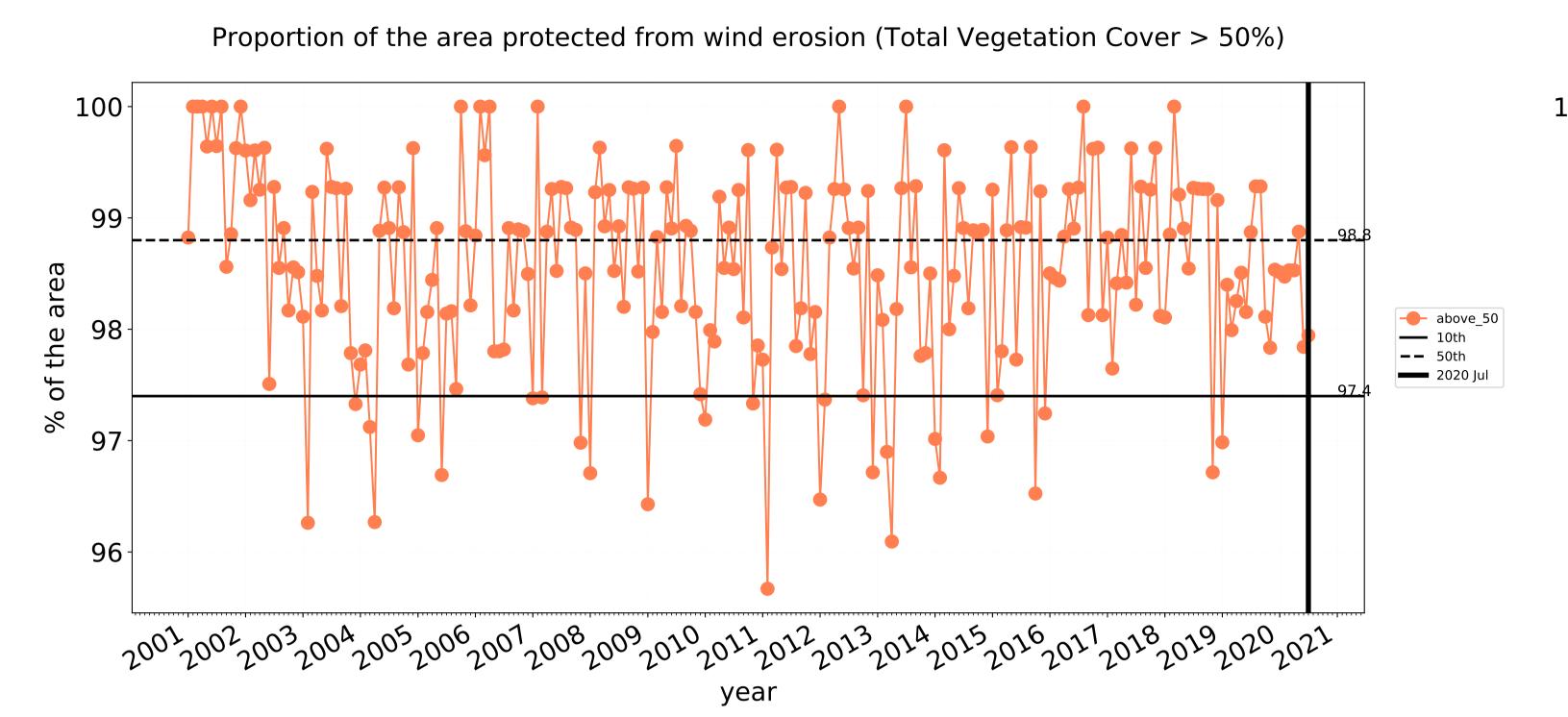


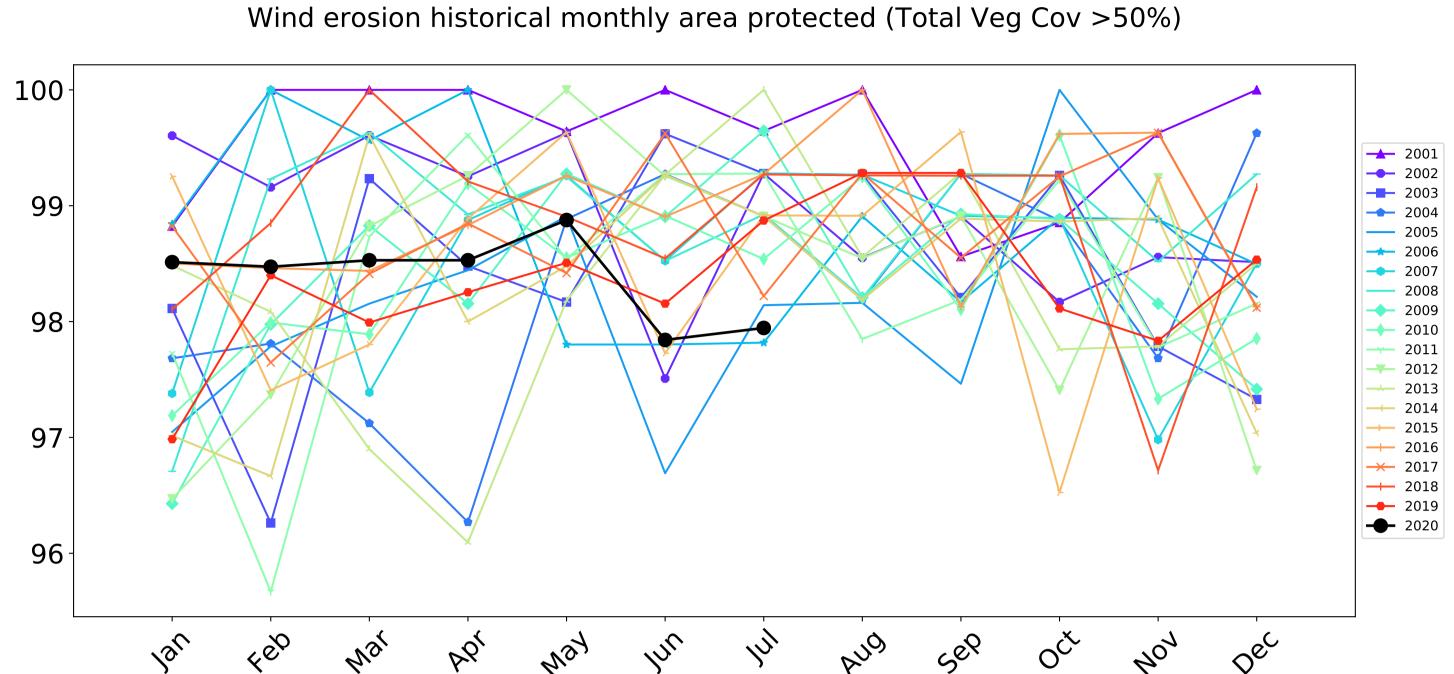




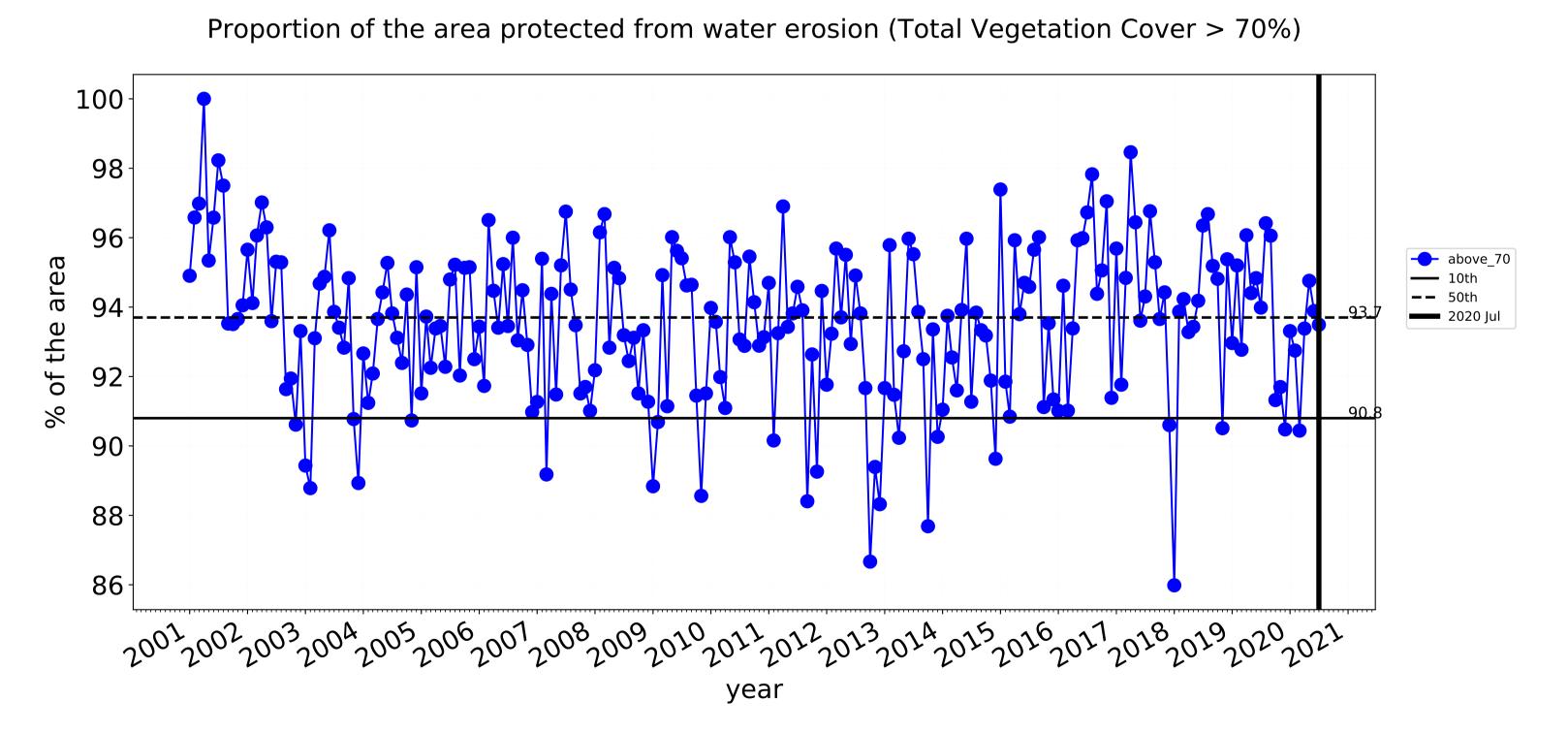


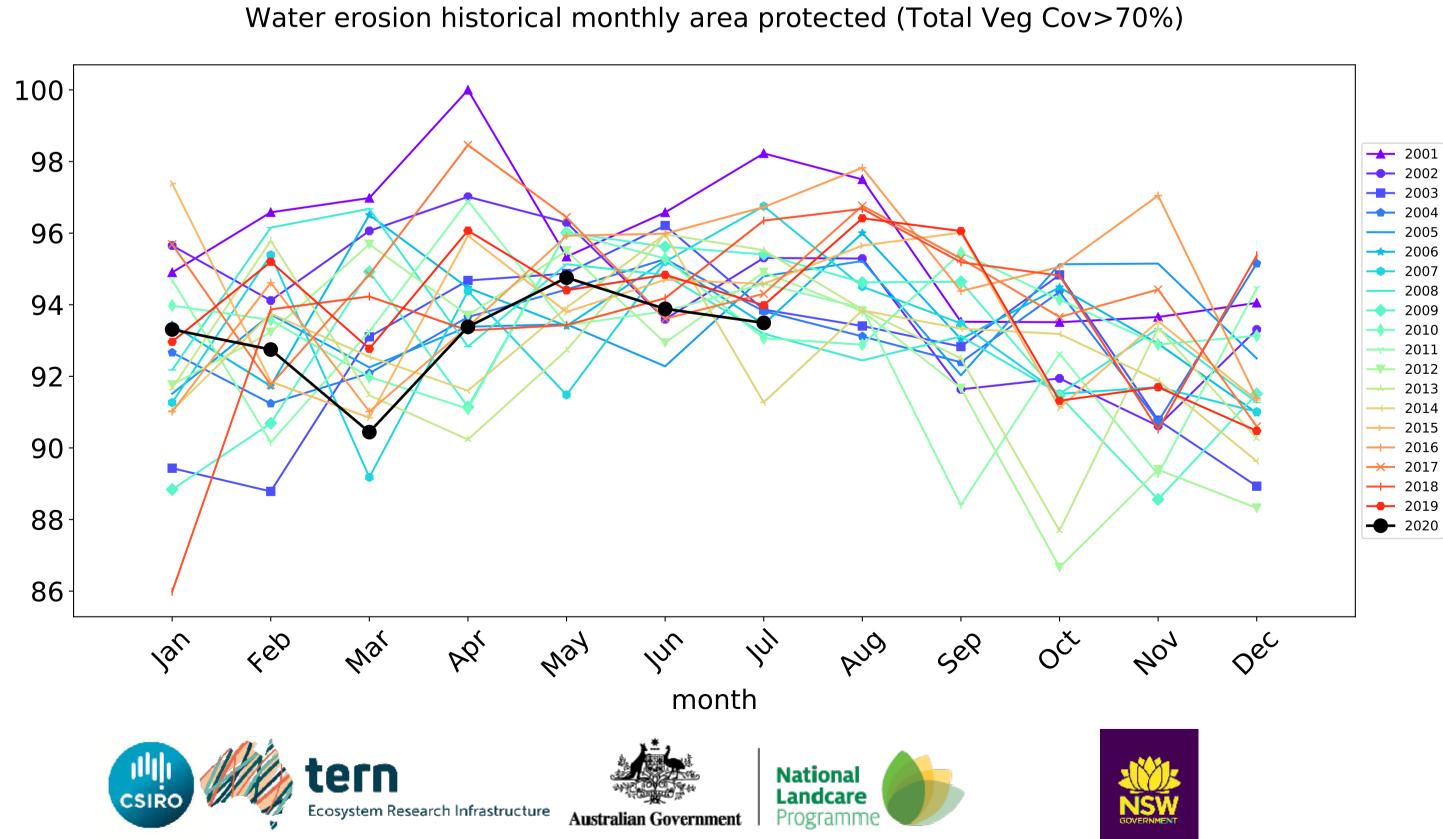
#### **Conservation and natural environments non forest timeseries**

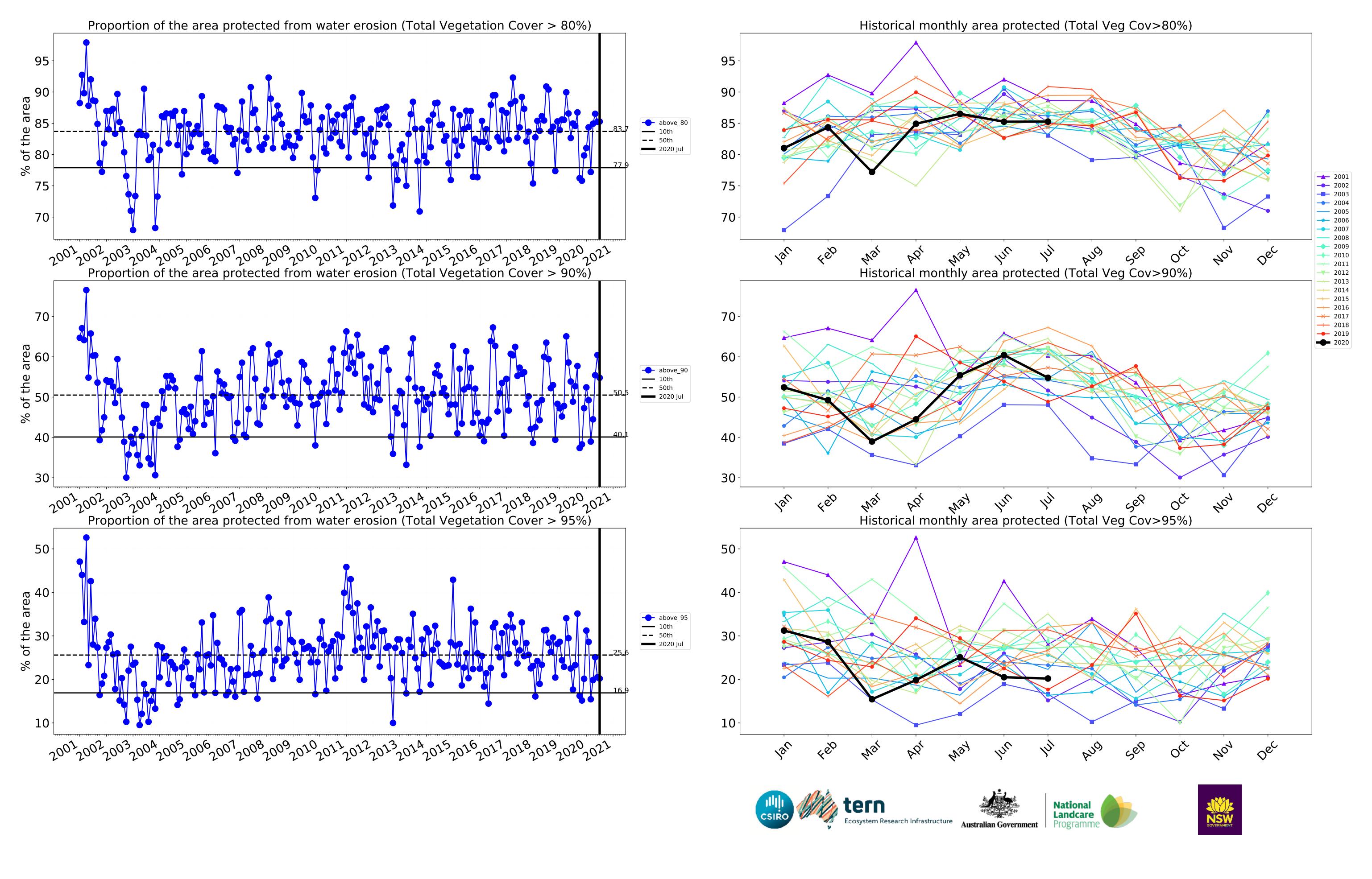




month





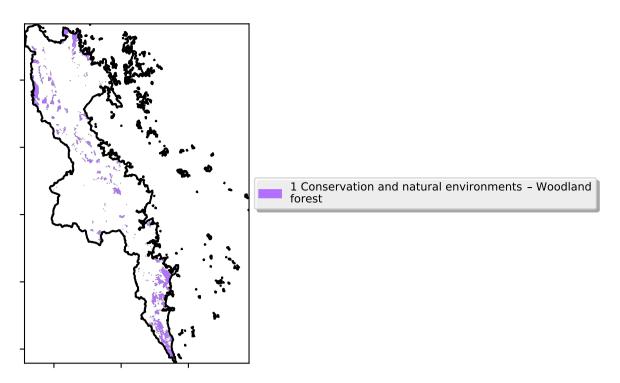


#### **Conservation and natural environments Woodland forest**

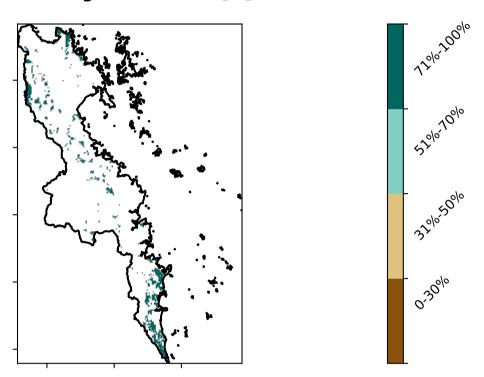
#### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests

of Australia (2018)

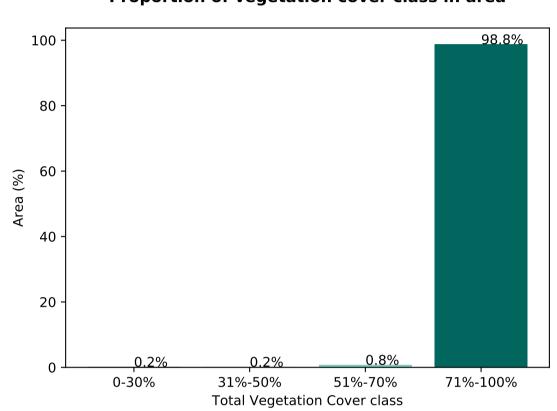
#### Land use and forest cover



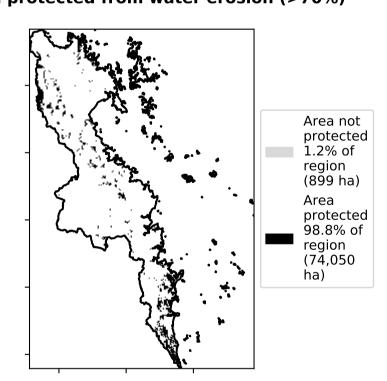
#### **Total Vegetation Cover [%]**



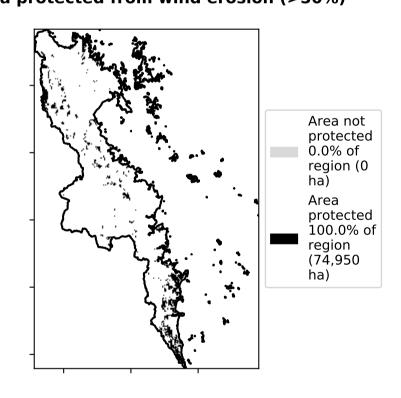
#### Proportion of vegetation cover class in area



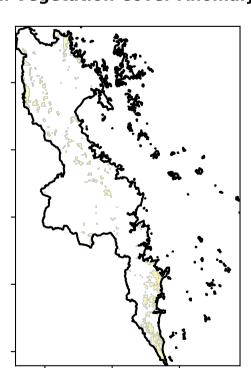
#### % Area protected from water erosion (>70%)

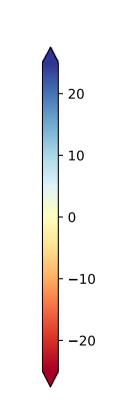


% Area protected from wind erosion (>50%)



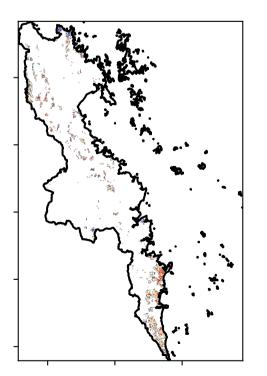
#### **Total Vegetation Cover Anomaly [%]**

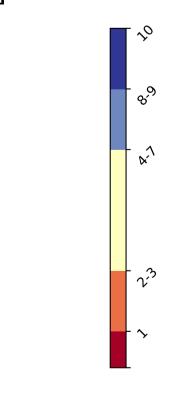




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Total Vegetation Cover Decile [%]





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.

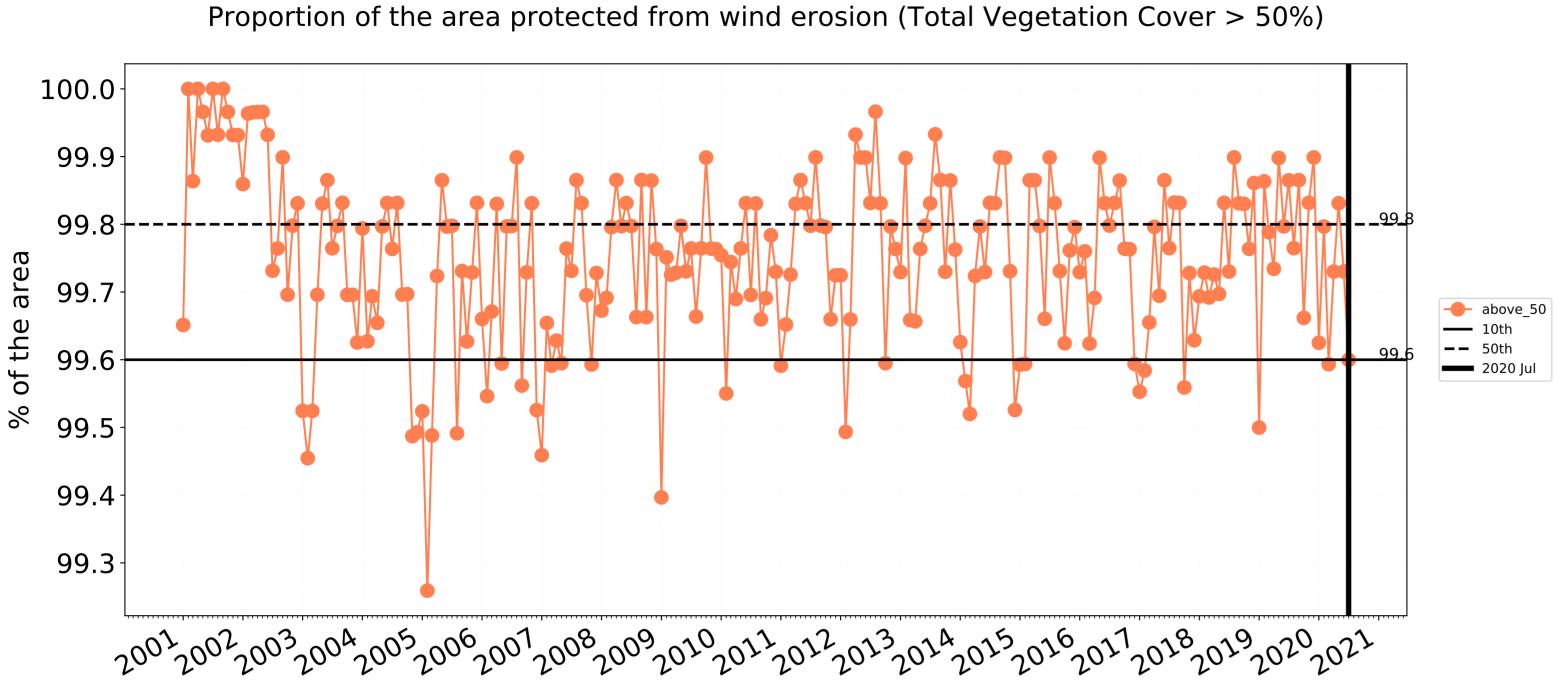


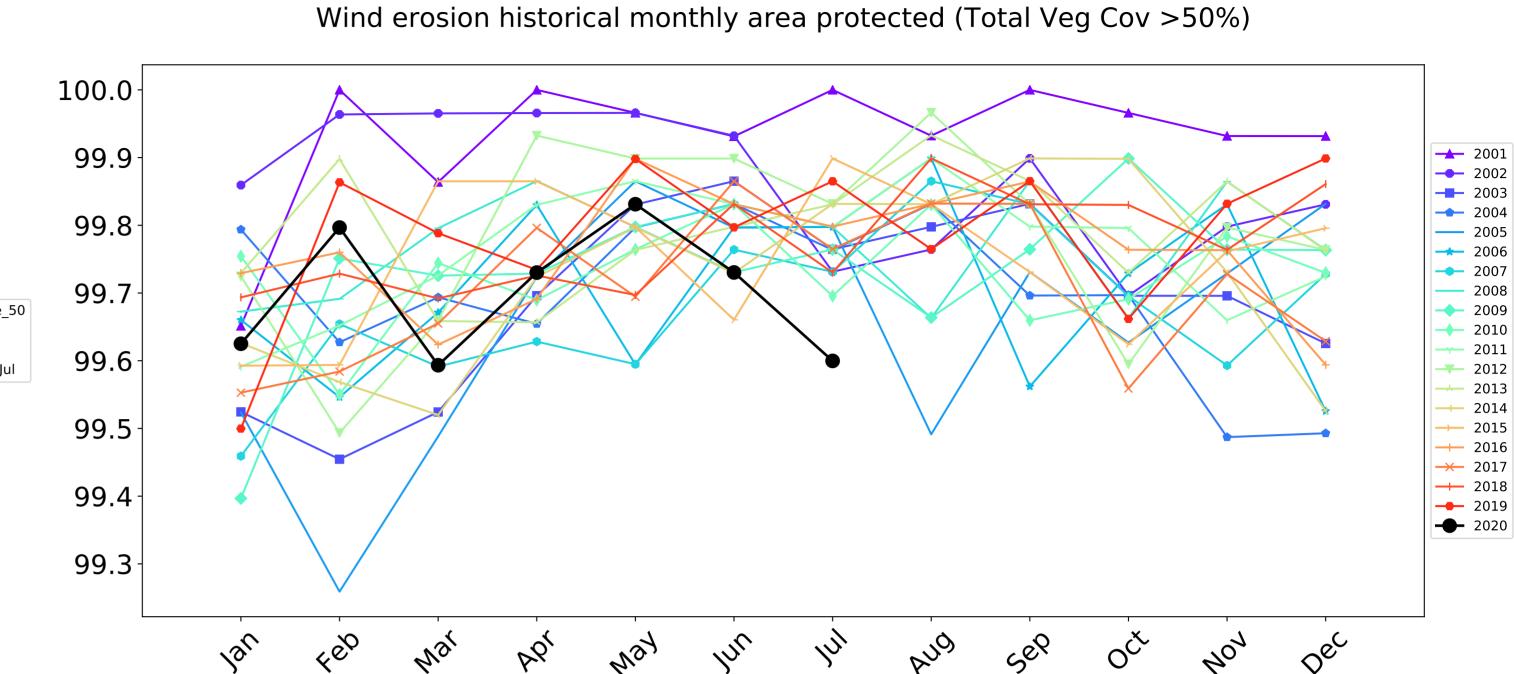




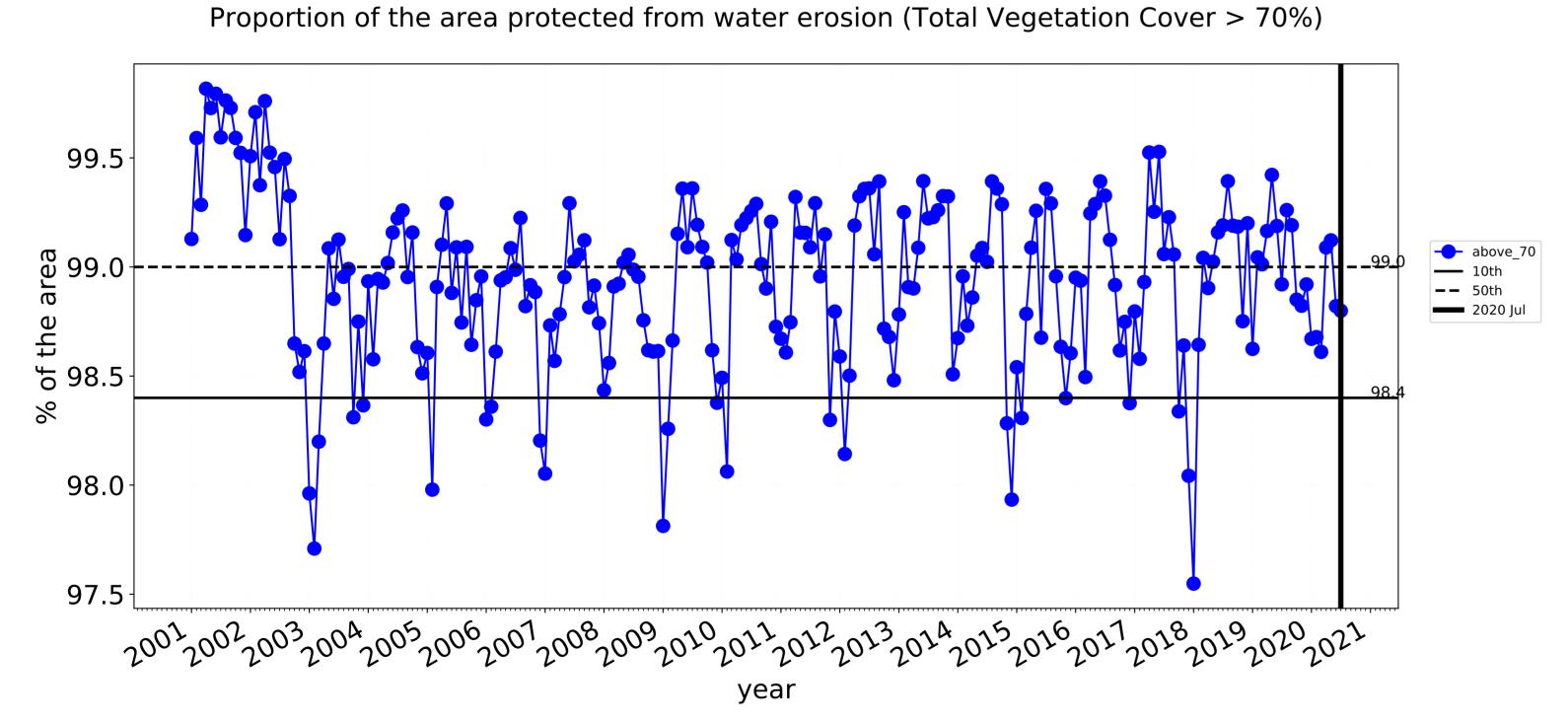


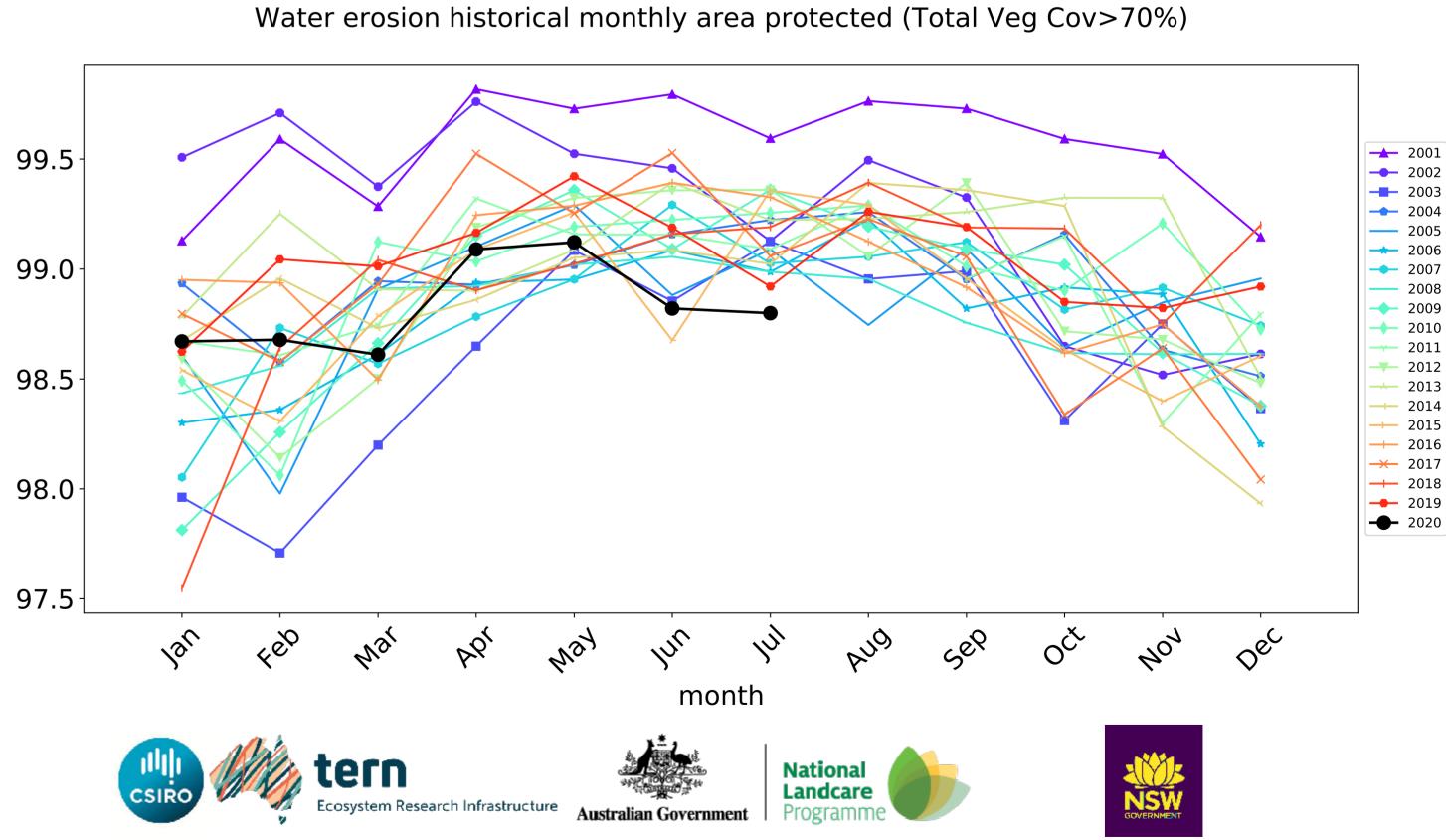
#### **Conservation and natural environments Woodland forest timeseries**

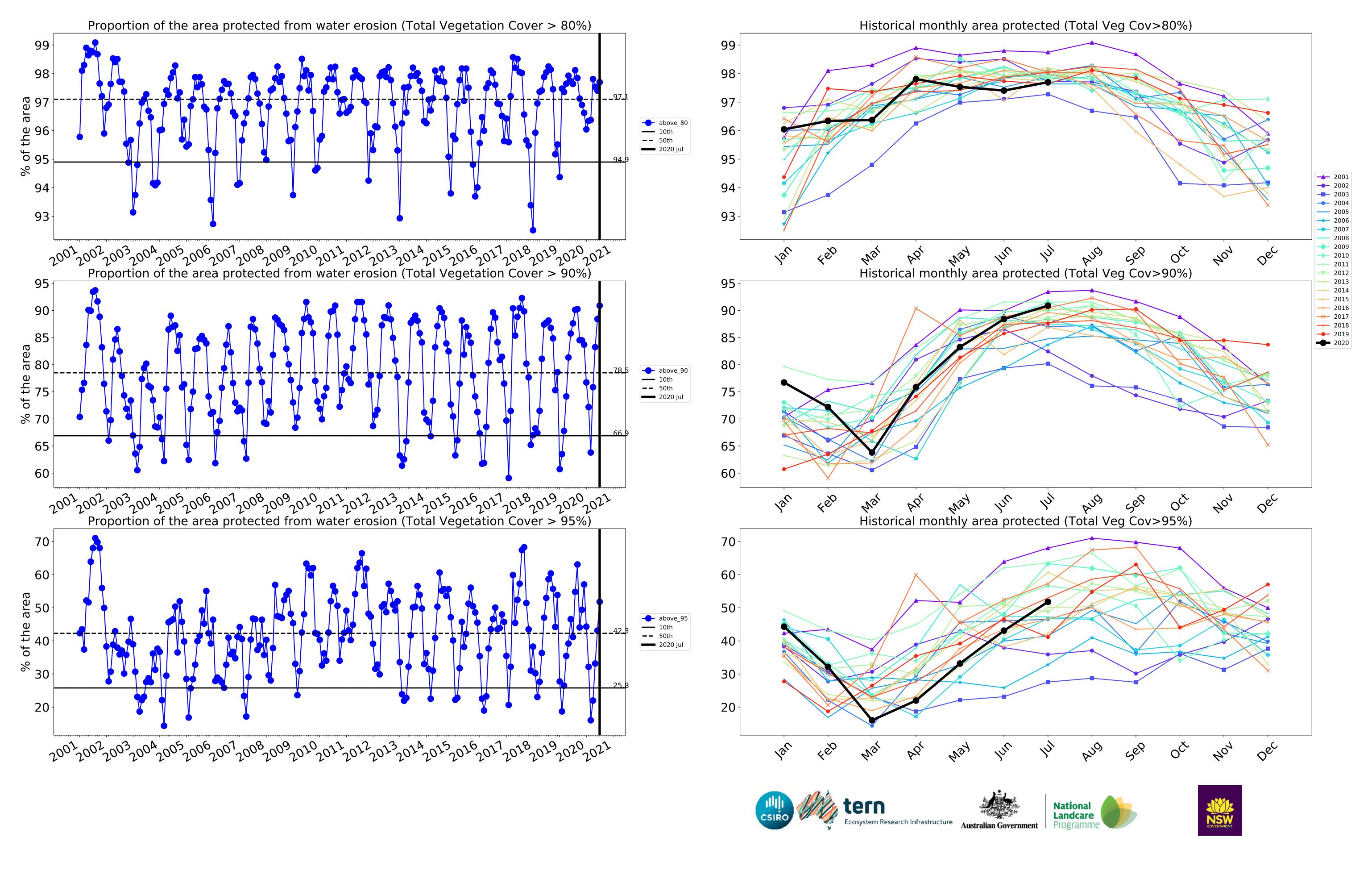




month







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

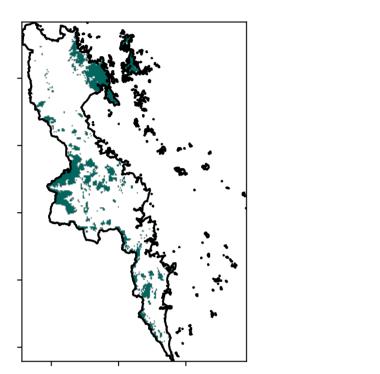
Land use and forest cover

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

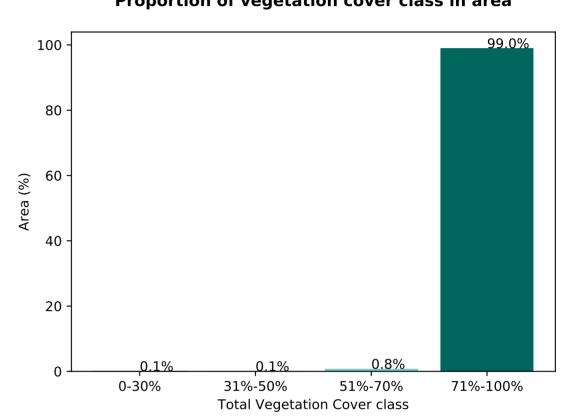
of Australia (2018)

# 1 Conservation and natural environments - Non-woodland forest

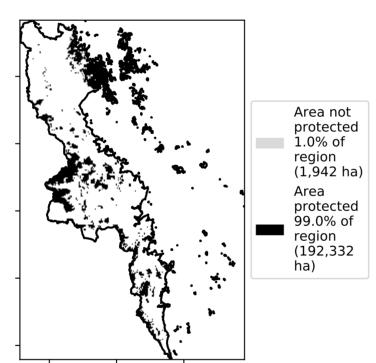
#### **Total Vegetation Cover [%]**



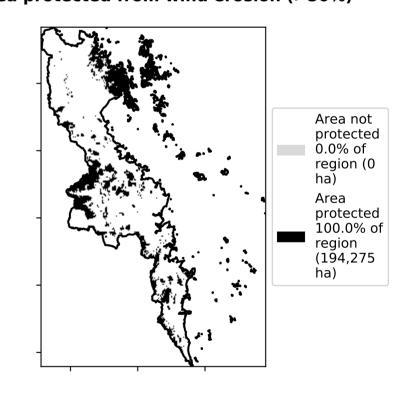
#### Proportion of vegetation cover class in area



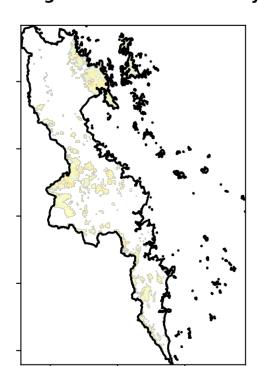
#### % Area protected from water erosion (>70%)

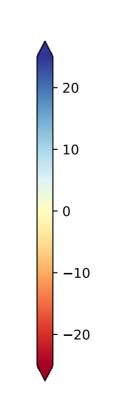


% Area protected from wind erosion (>50%)



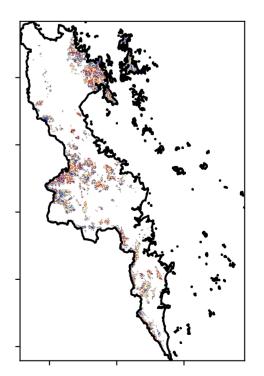
#### **Total Vegetation Cover Anomaly [%]**

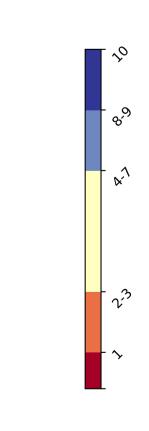




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Total Vegetation Cover Decile [%]





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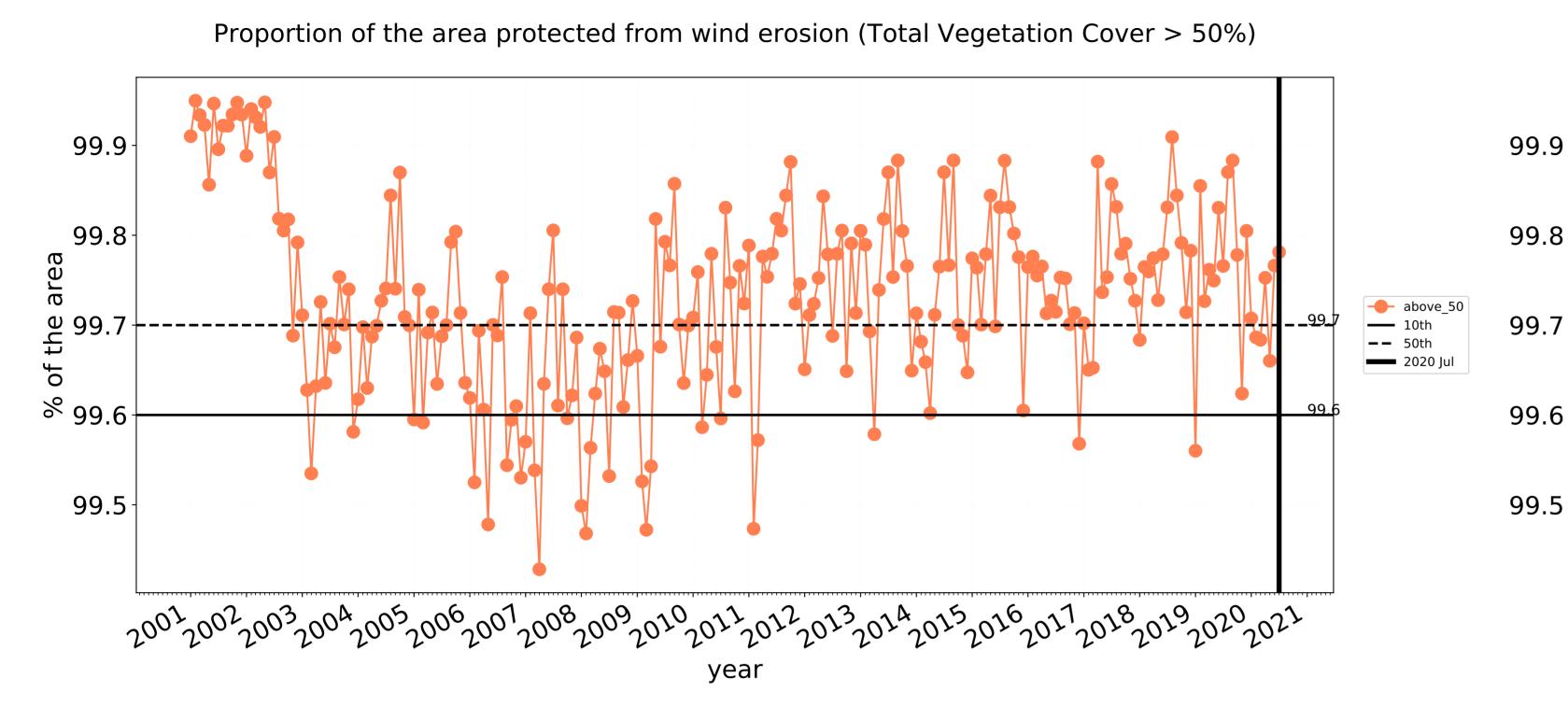


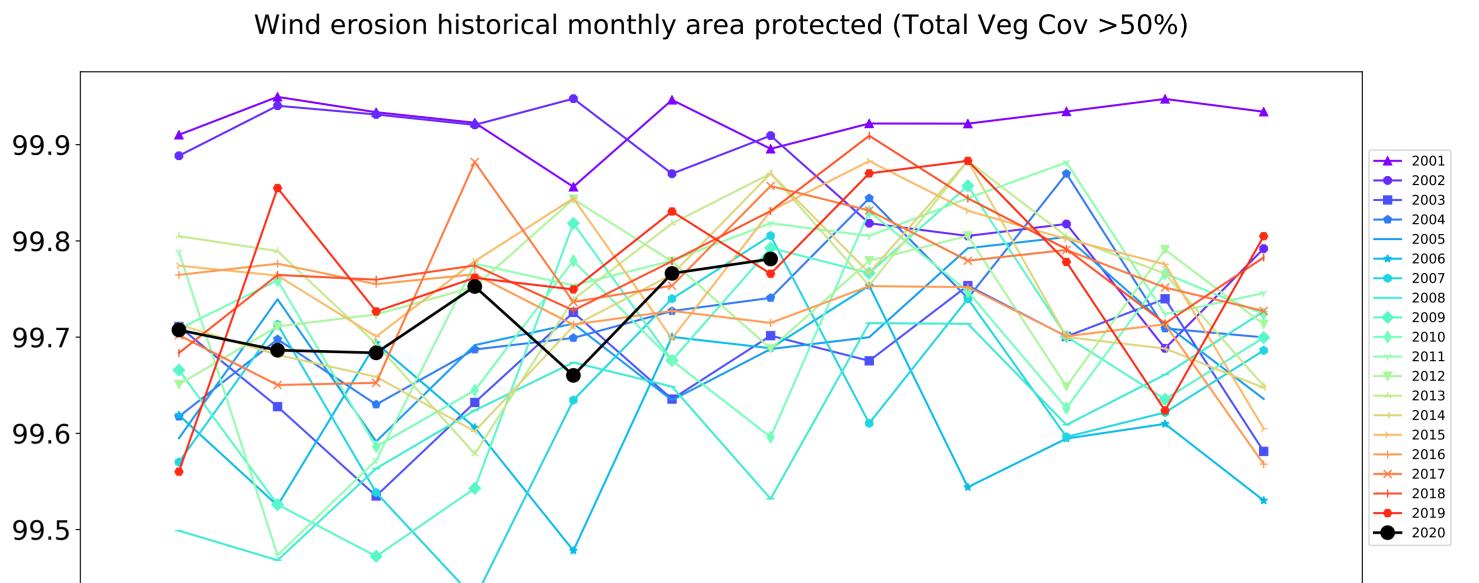




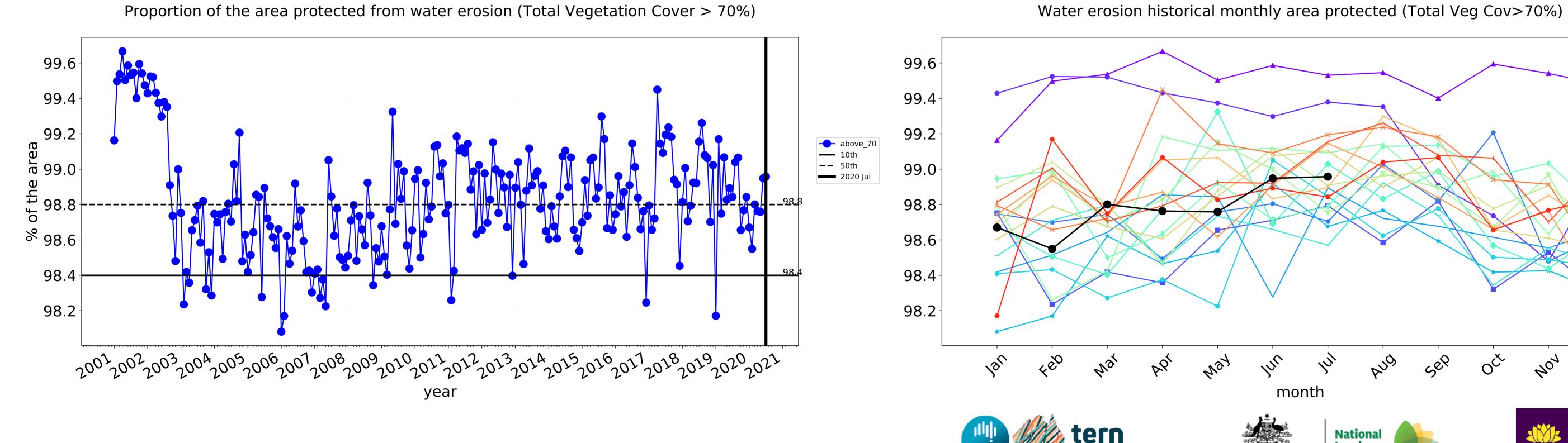


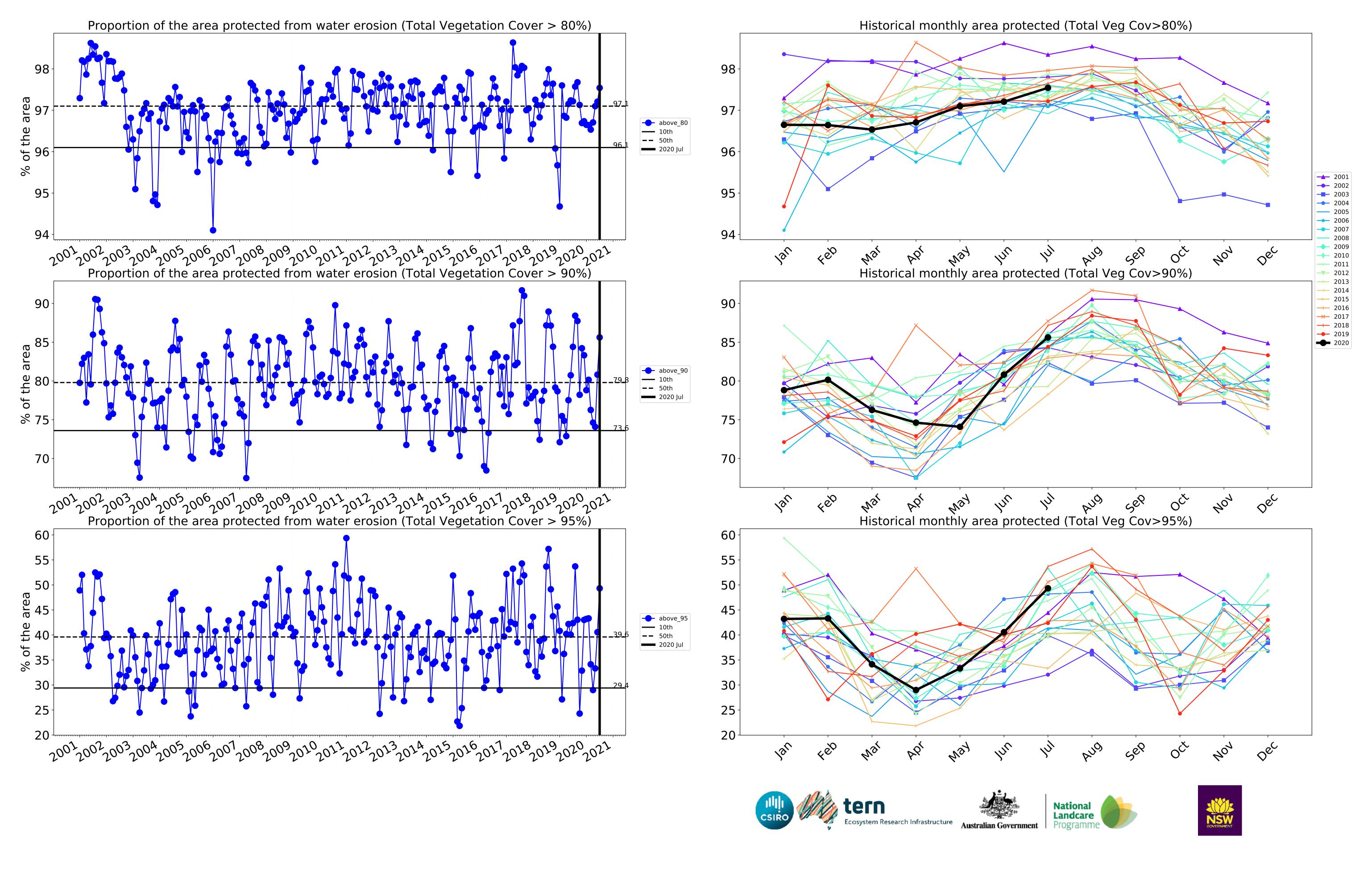
#### Conservation and natural environments Forest (non woodland) timeseries





month





#### **Agriculture**

#### 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

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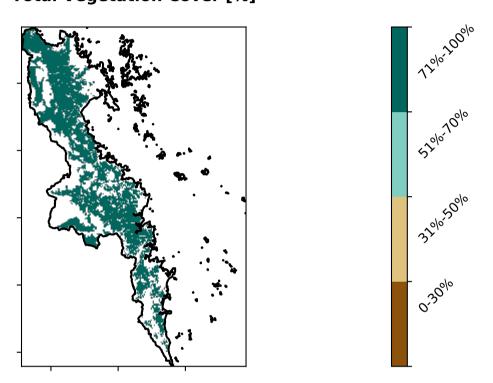
is only for the month of the map

using baseline from 2001 to 2019.

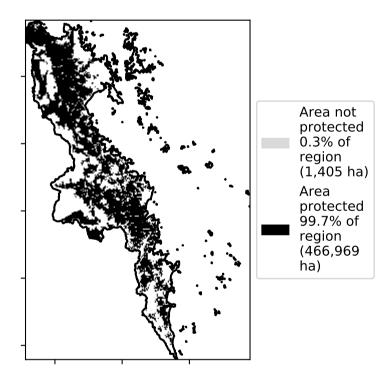
### 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Irrigated 6 Agriculture - Horticulture - Non-irrigated 7 Agriculture - Horticulture - Irrigated

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

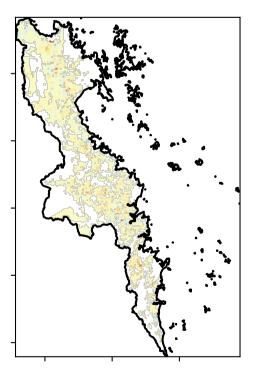
Land use and forest cover

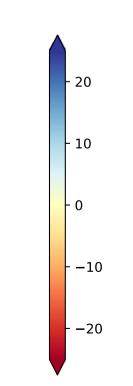


% Area protected from water erosion (>70%)



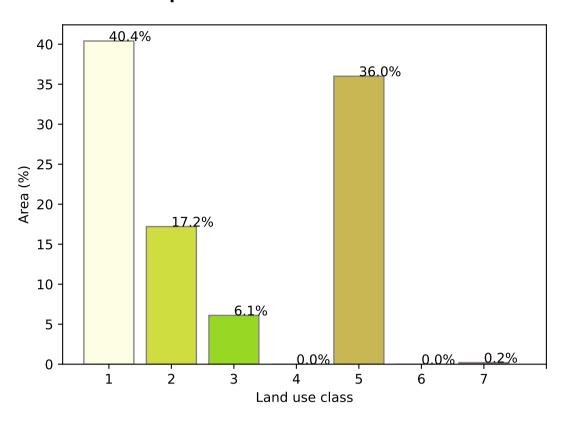
**Total Vegetation Cover Anomaly [%]** 



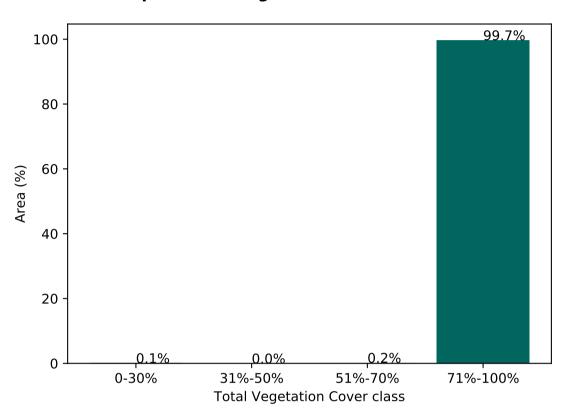


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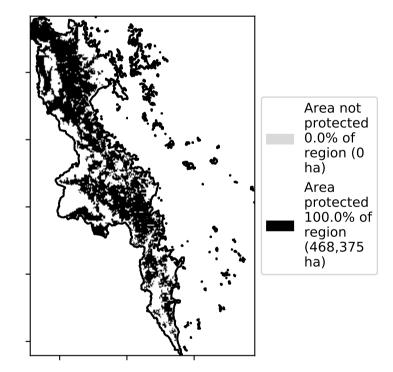
#### **Proportion of each land class in area**

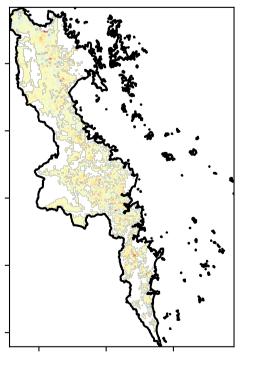


**Proportion of vegetation cover class in area** 

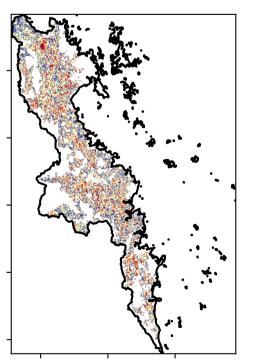


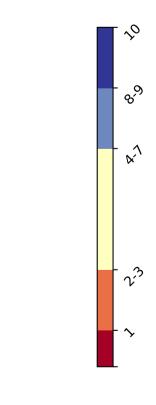
% Area protected from wind erosion (>50%)





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









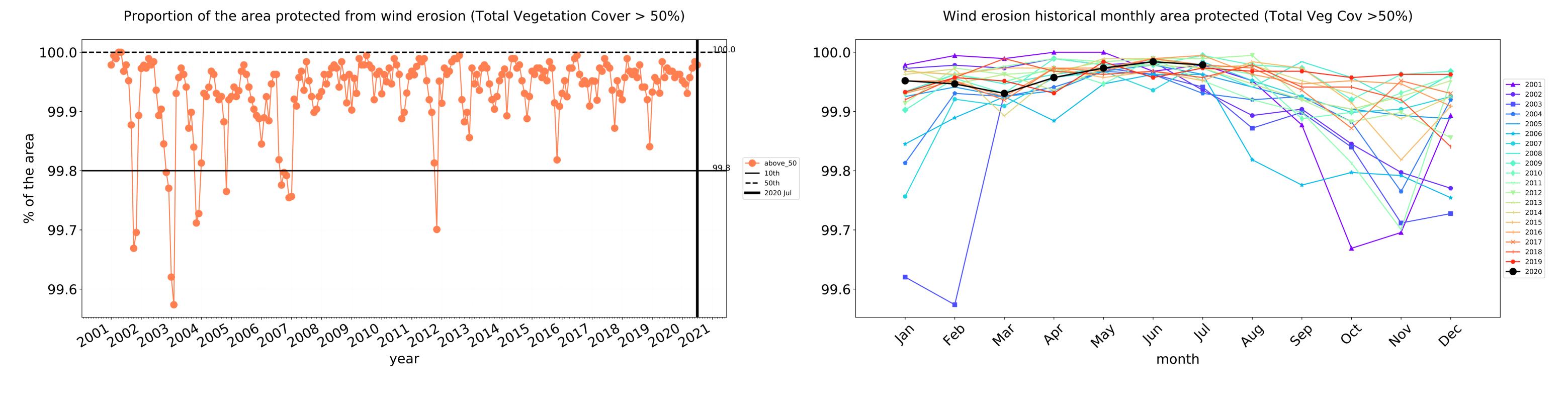


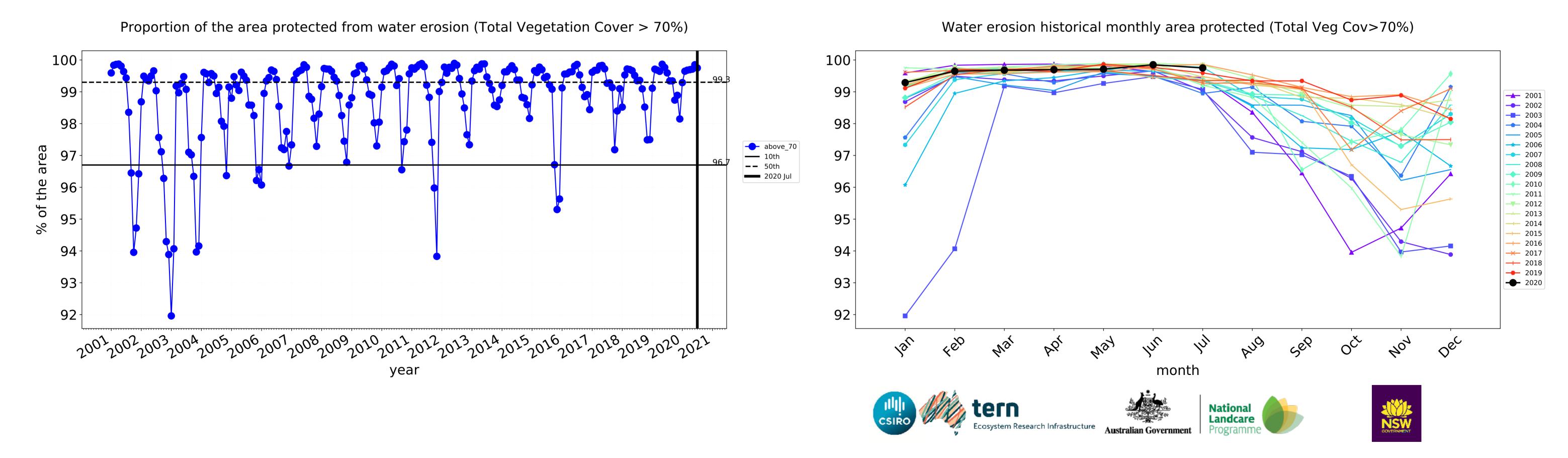


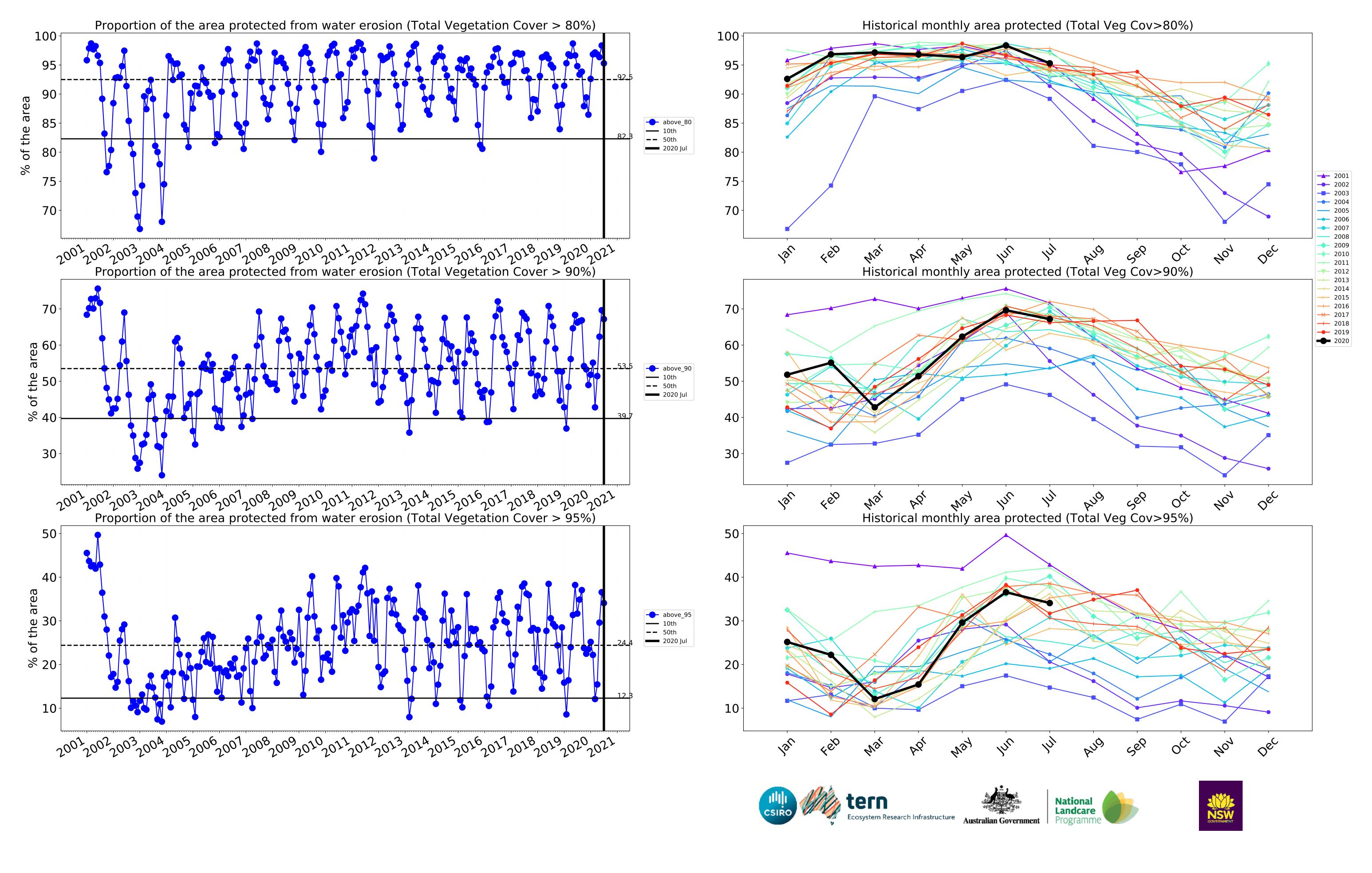




#### **Agriculture timeseries**







#### **Grazing**

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

Anomaly show how many percetage points each

pixel is from

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

the mean. That

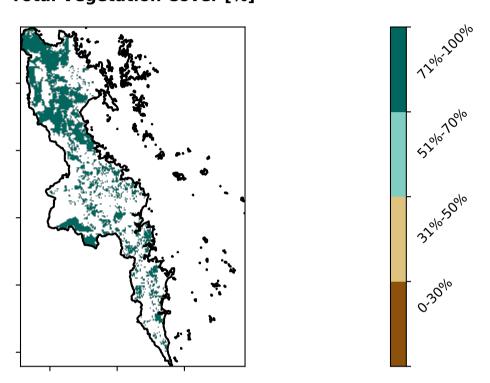
is only for the month of the map

using baseline from 2001 to 2019.

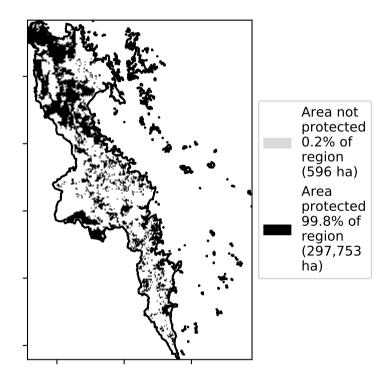
# 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest

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

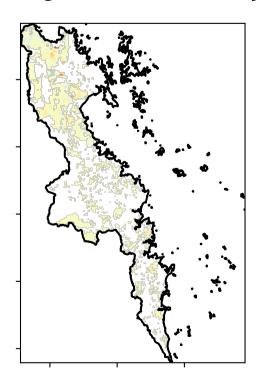
Land use and forest cover

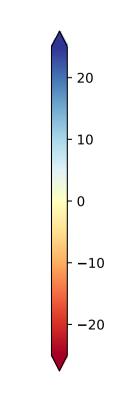


% Area protected from water erosion (>70%)



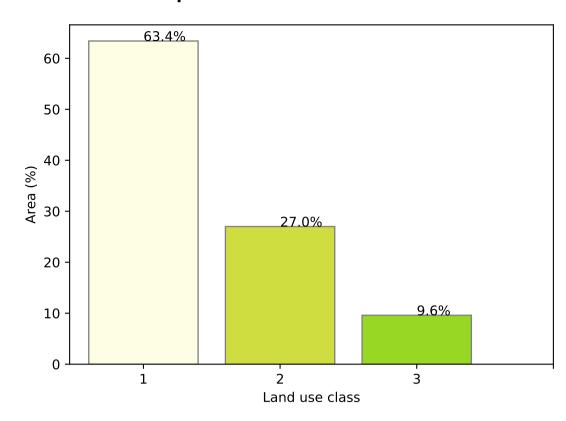
**Total Vegetation Cover Anomaly [%]** 



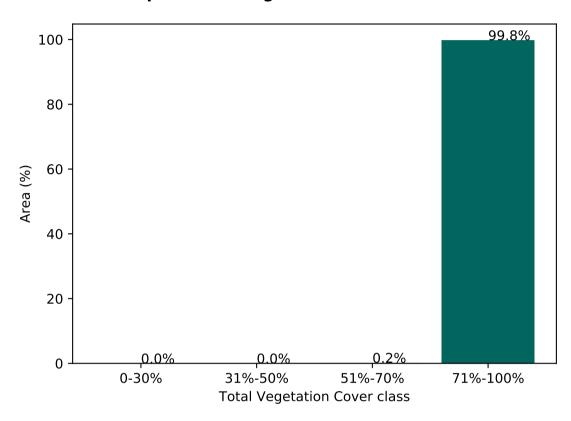


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

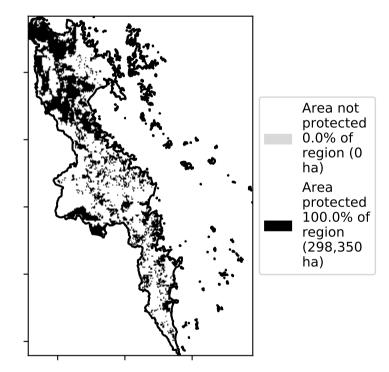
#### Proportion of each land class in area



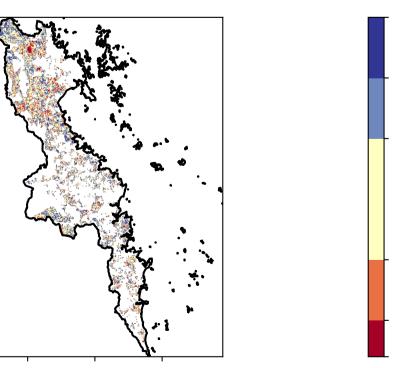
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



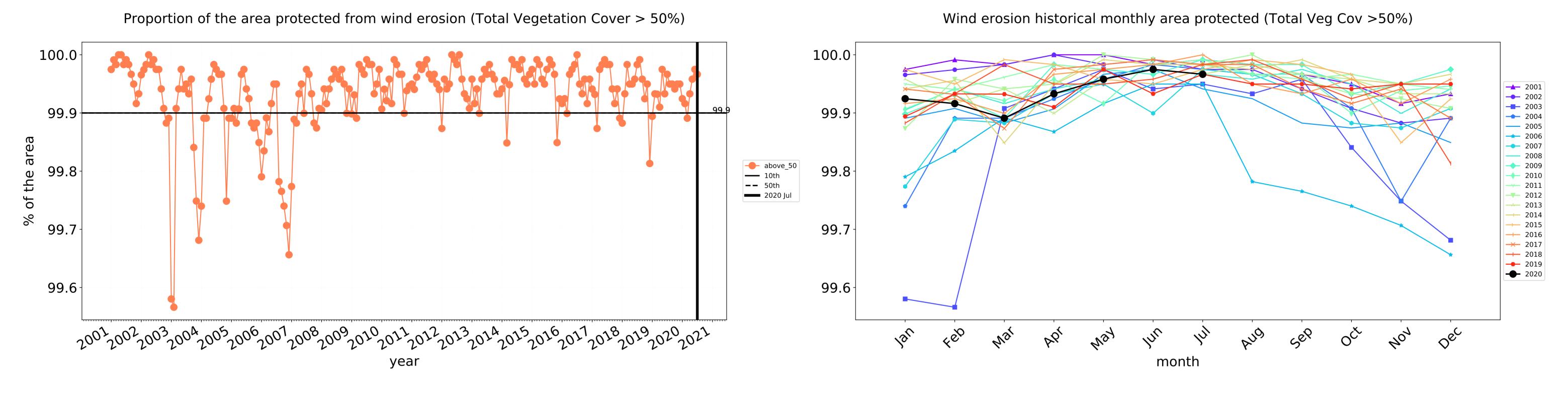


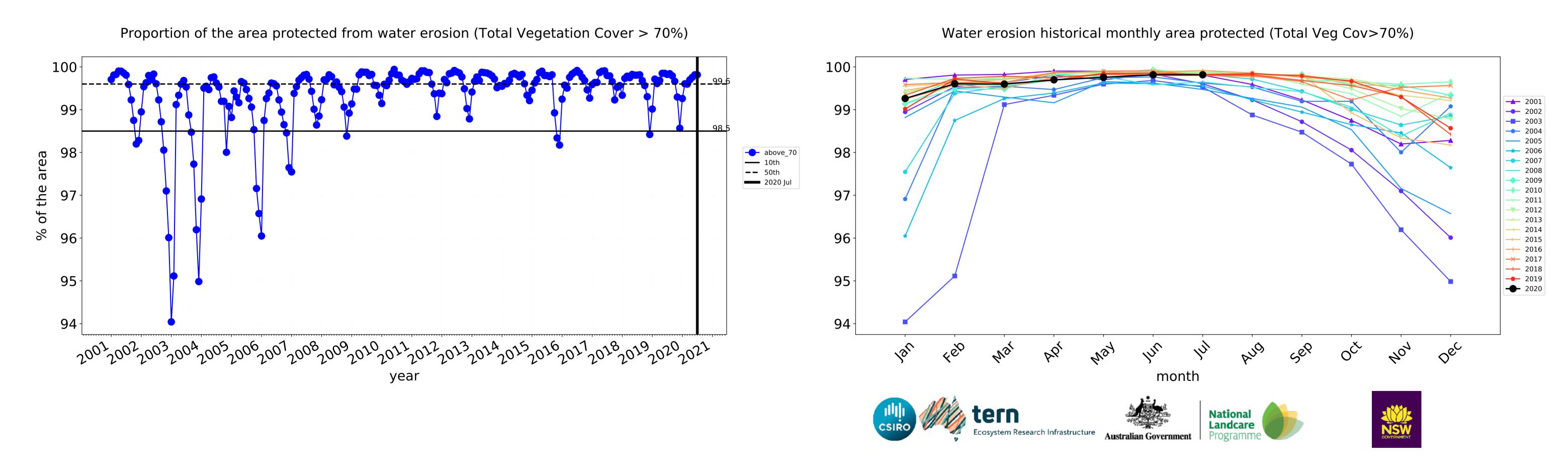


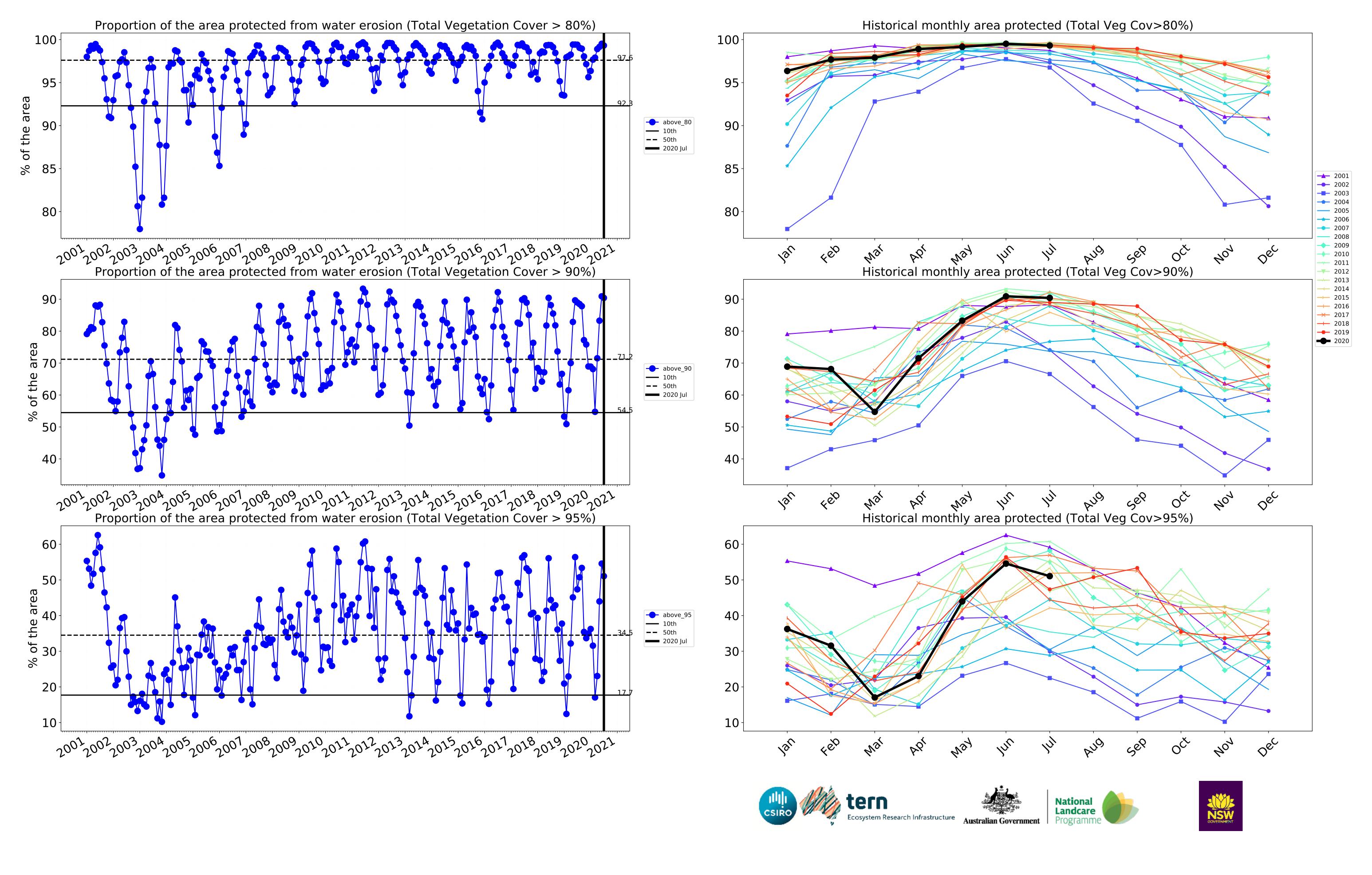




#### **Grazing timeseries**







#### **Grazing non forest**

#### Land use and forest cover

1 Agriculture - Grazing - Non forest

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

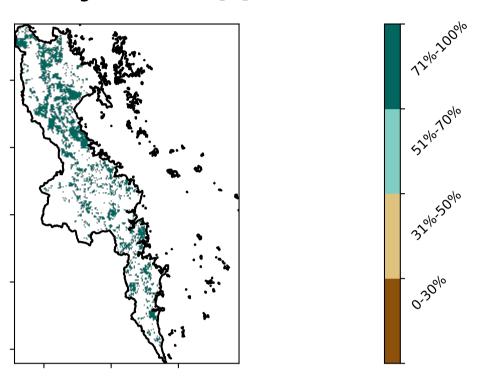
Anomaly show how many percetage points each

pixel is from

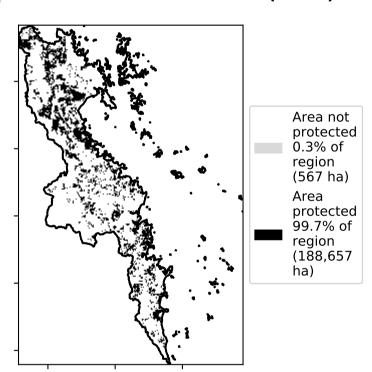
the mean. That is, red pixels are about 20% lower than the mean of that

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

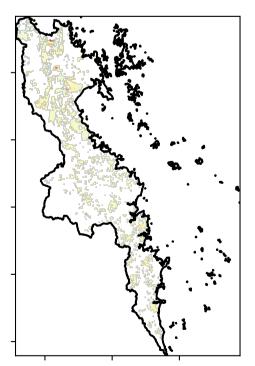
#### **Total Vegetation Cover [%]**



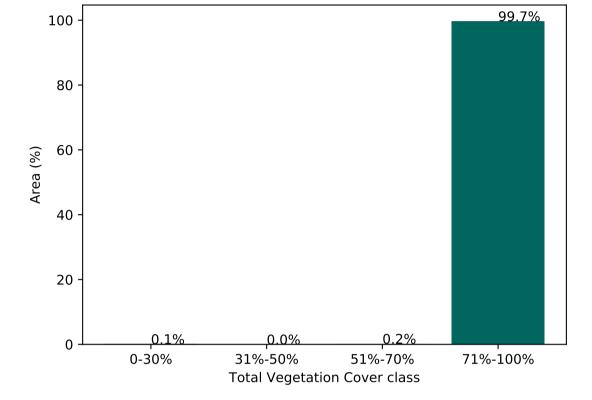
#### % Area protected from water erosion (>70%)



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

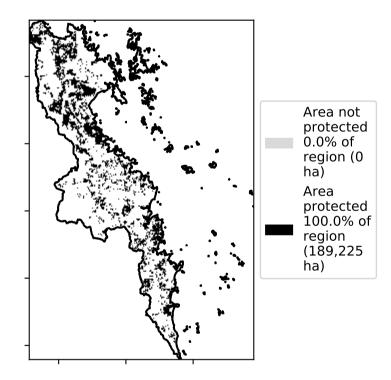


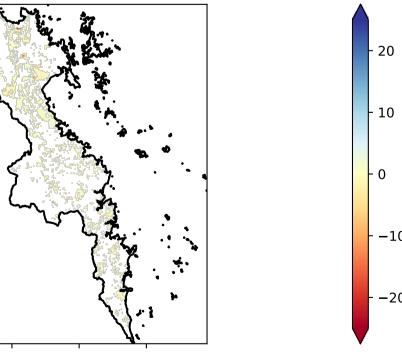
- 20 - 10 -10**-**20



**Proportion of vegetation cover class in area** 

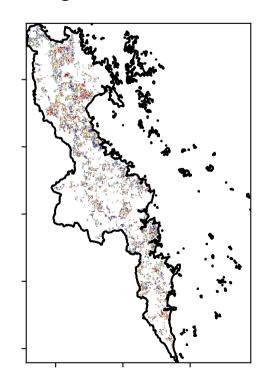
#### % Area protected from wind erosion (>50%)

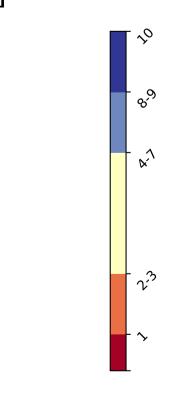




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline. the map using baseline from 2001 to 2019.

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









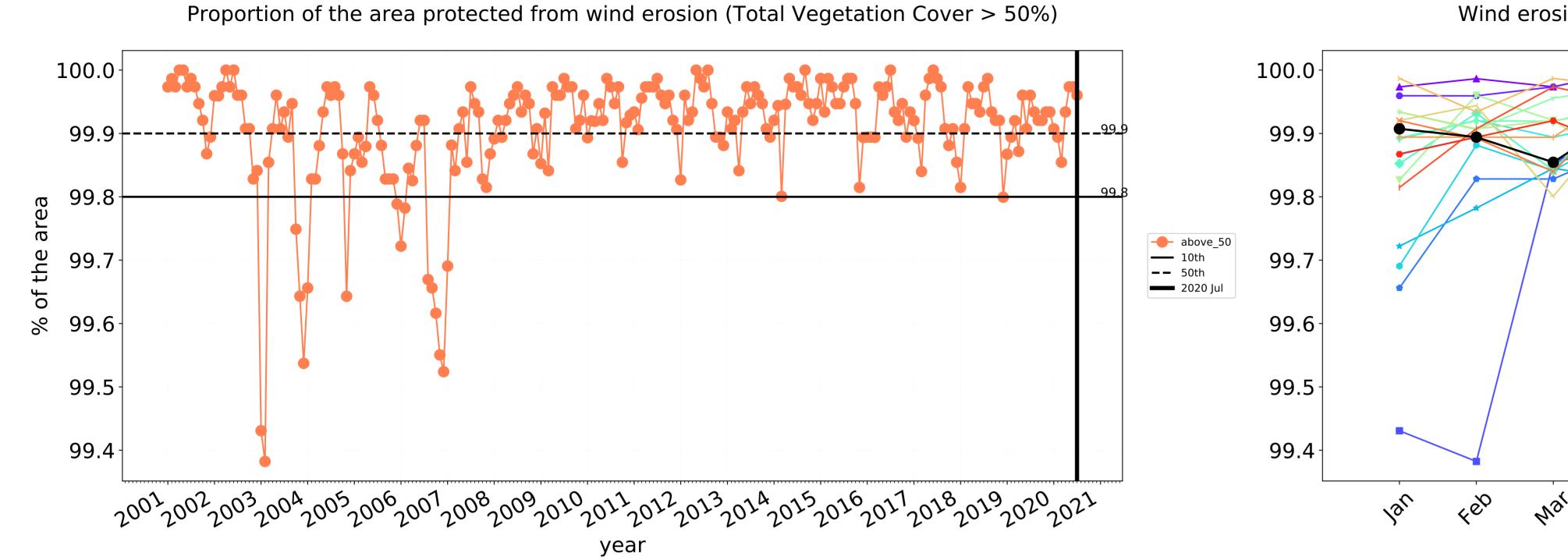


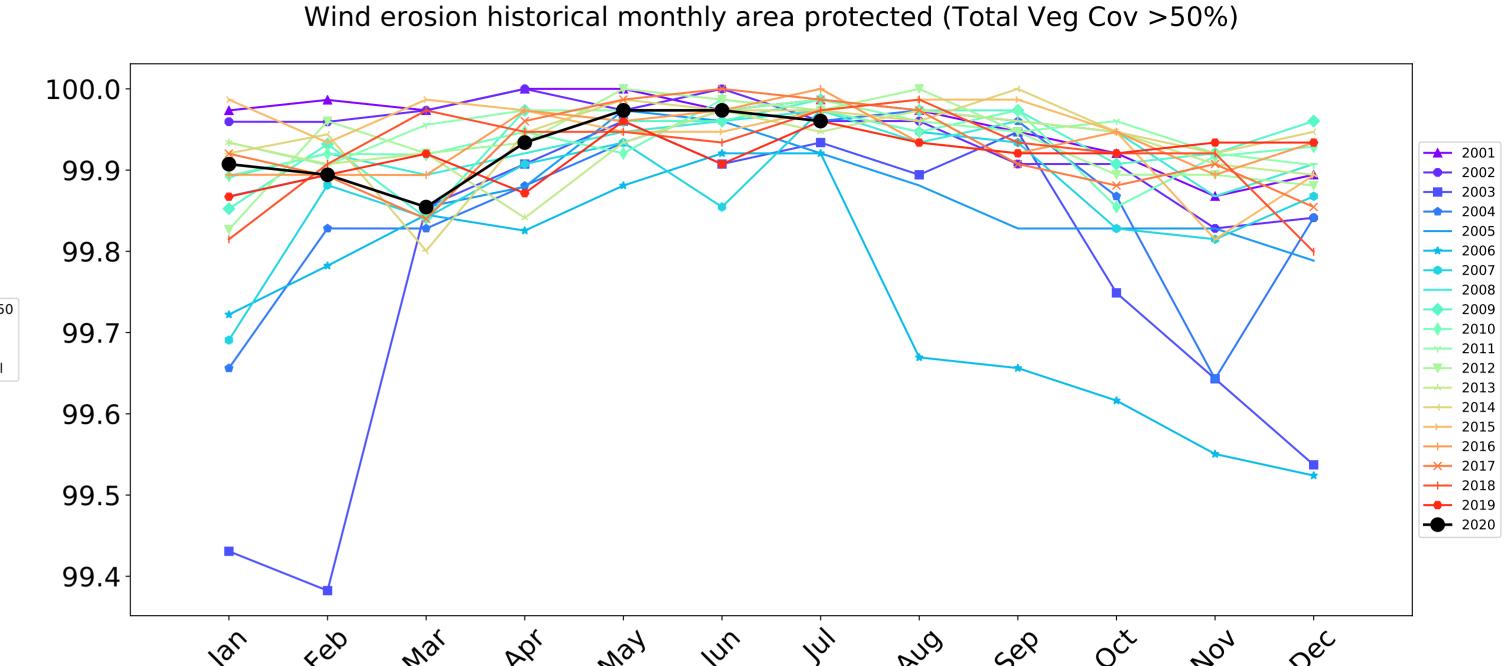




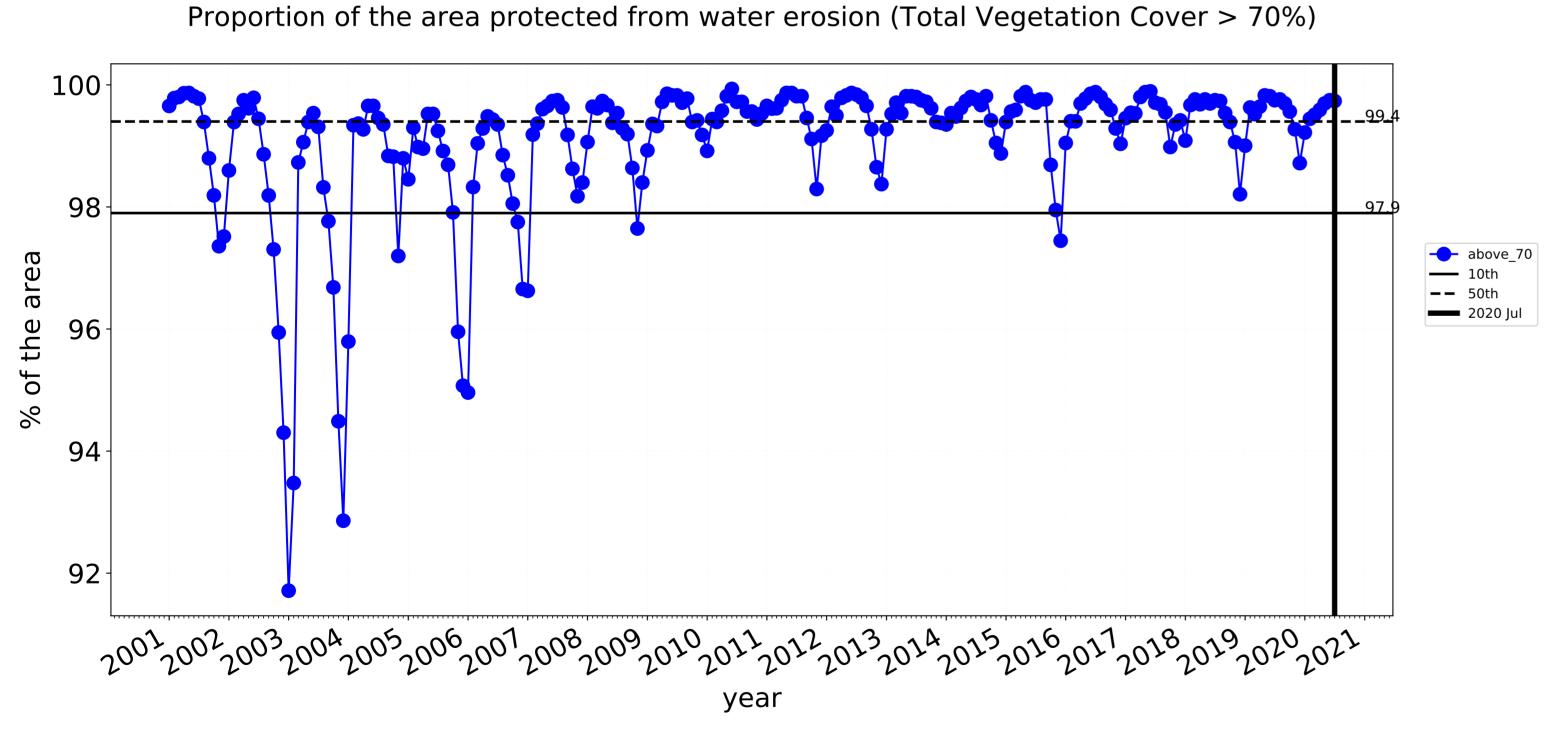


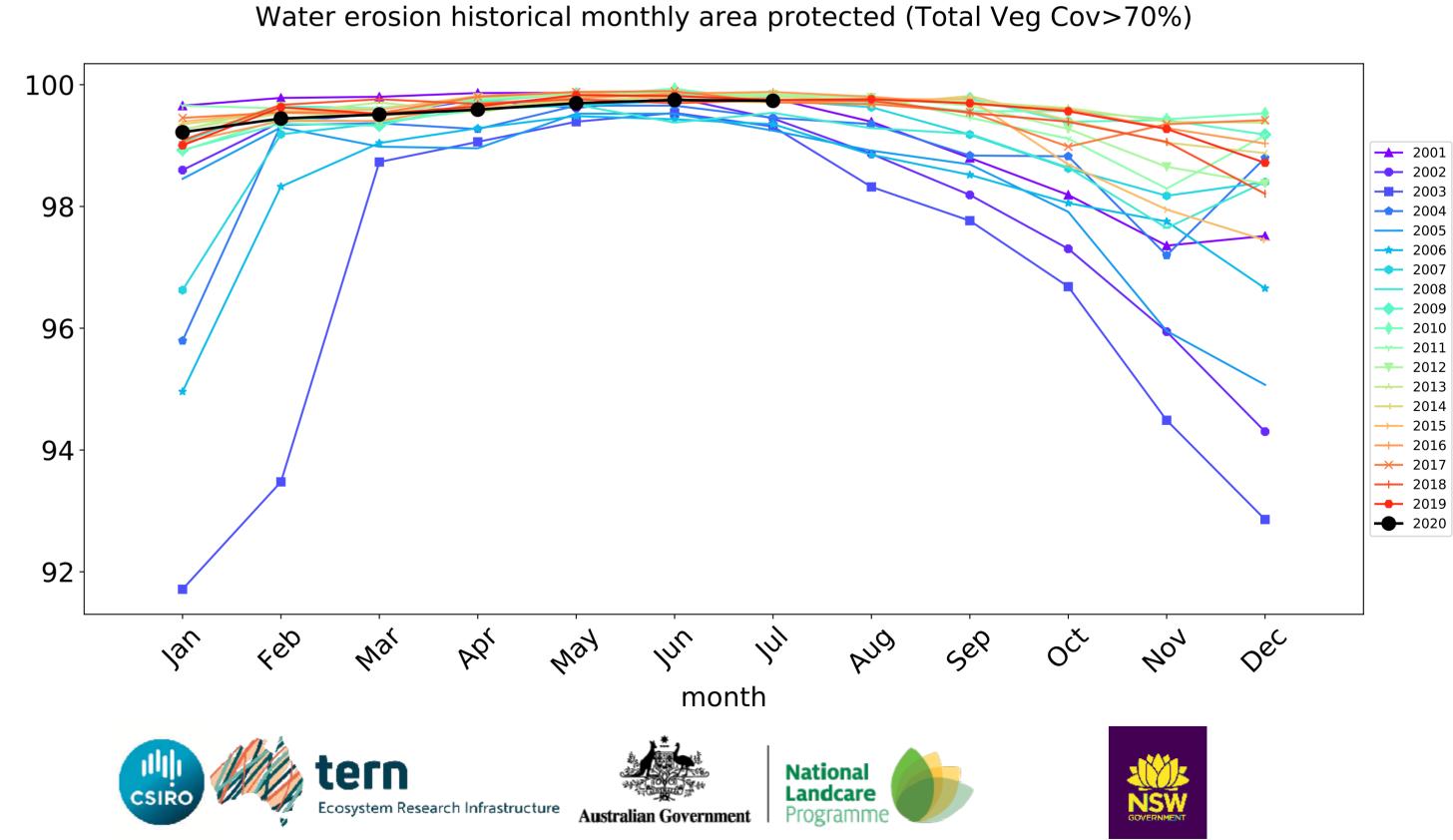
#### **Grazing non forest timeseries**

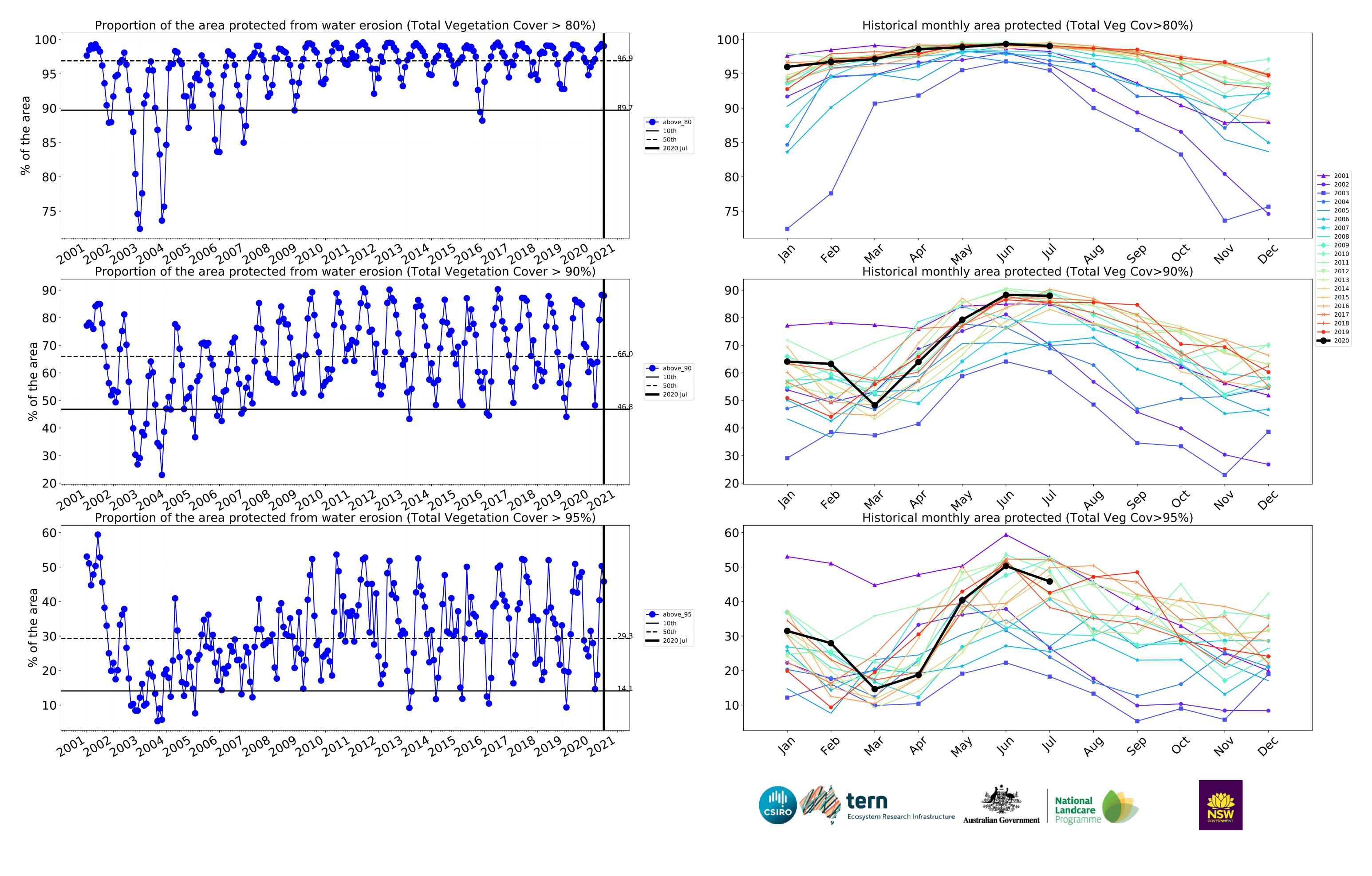




month



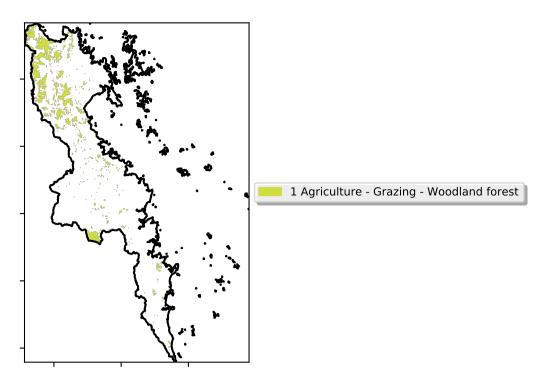




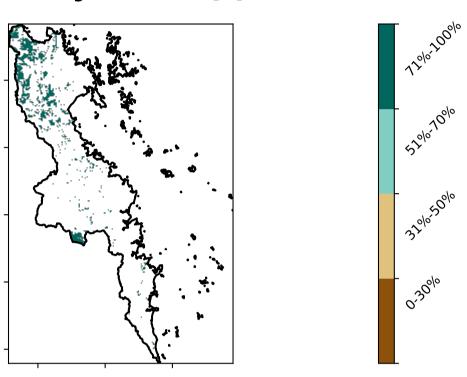
#### **Grazing Woodland forest**

#### Land use and forest cover

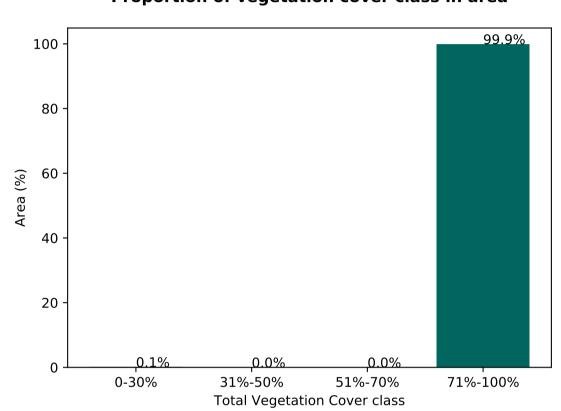
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



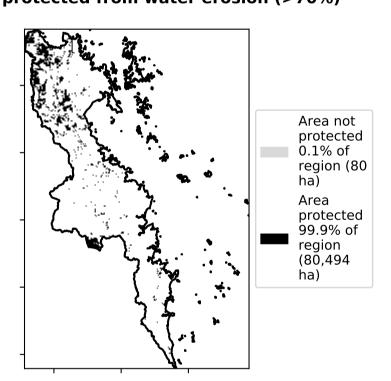
#### **Total Vegetation Cover [%]**



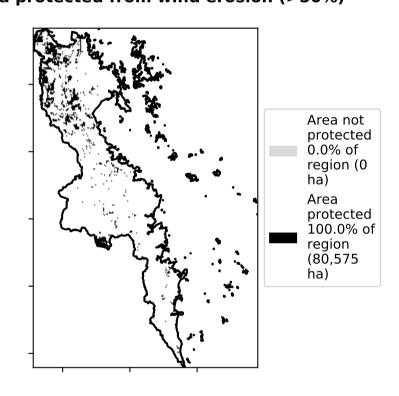
#### Proportion of vegetation cover class in area



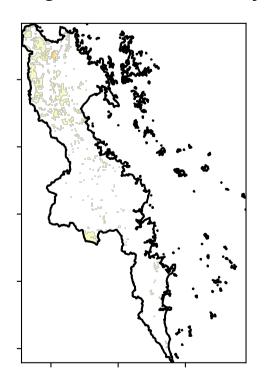
#### % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



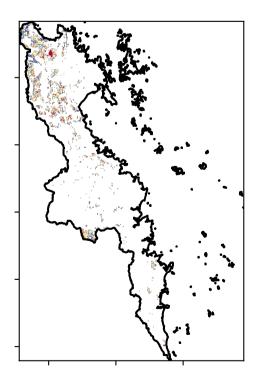
#### **Total Vegetation Cover Anomaly [%]**

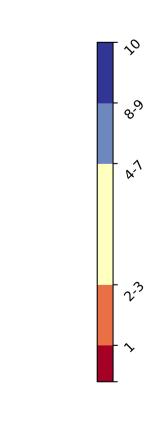


- 20 - 10 - 0 - -10 - -20

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.

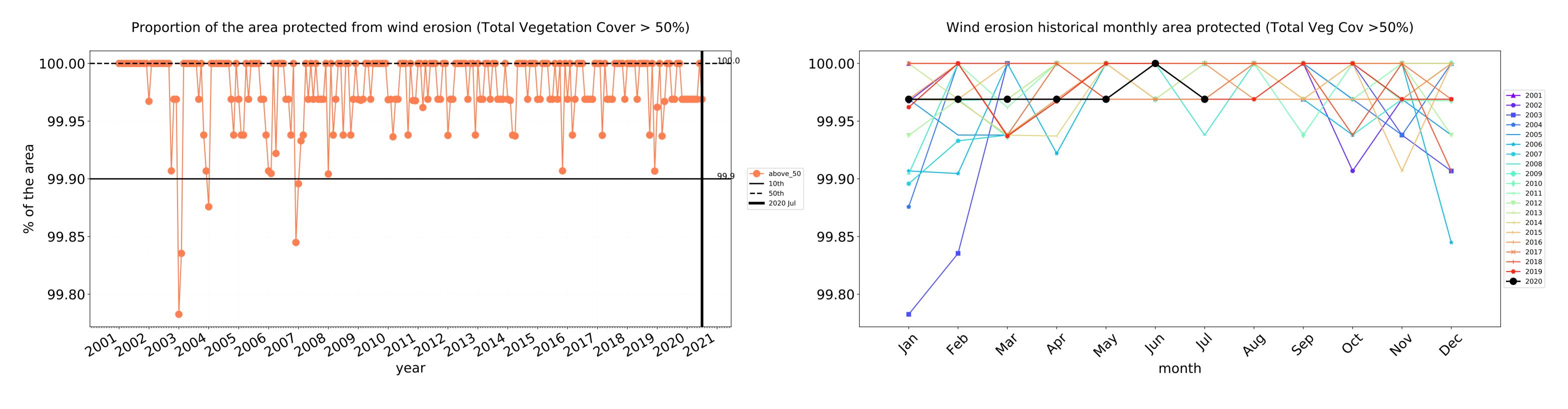


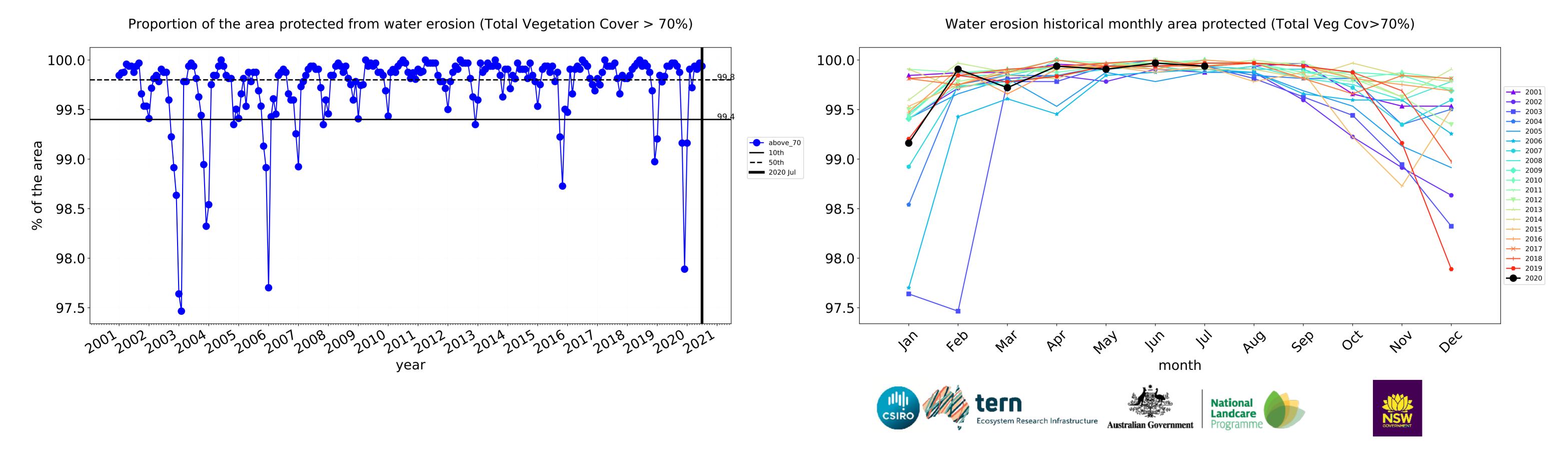


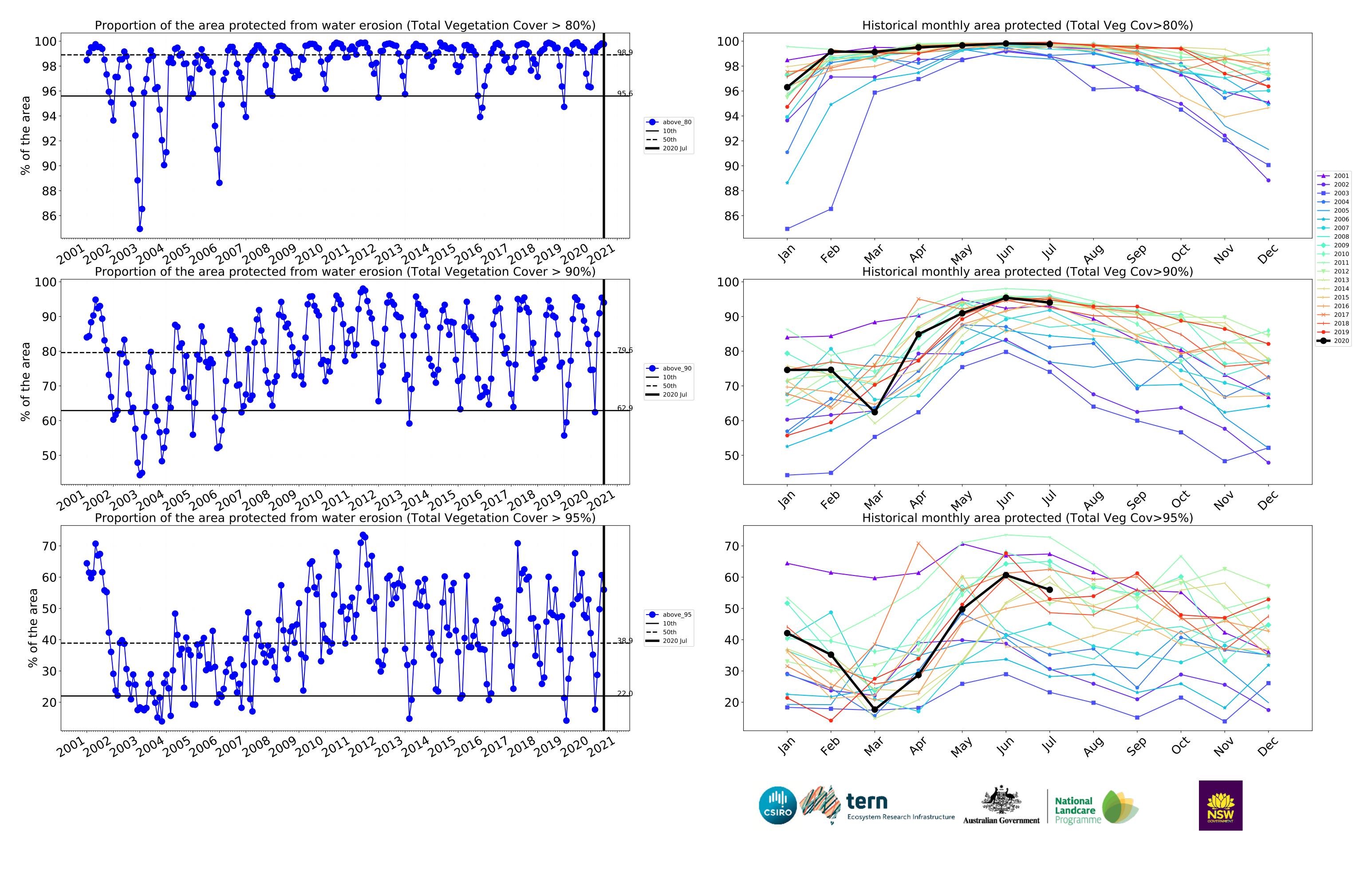




#### **Grazing Woodland forest timeseries**







#### **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

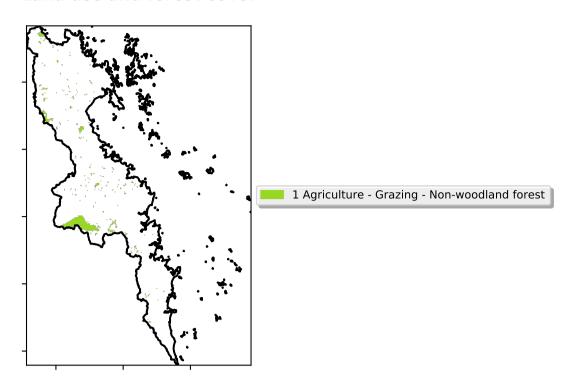
pixel is from

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

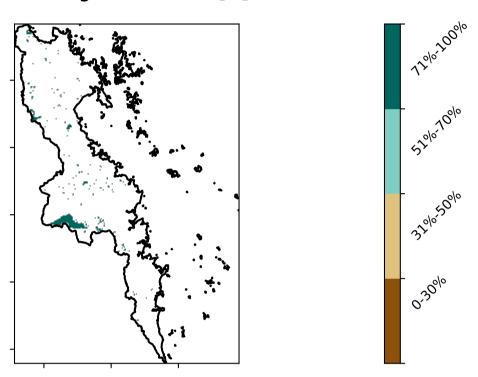
the mean. That

is only for the month of the map

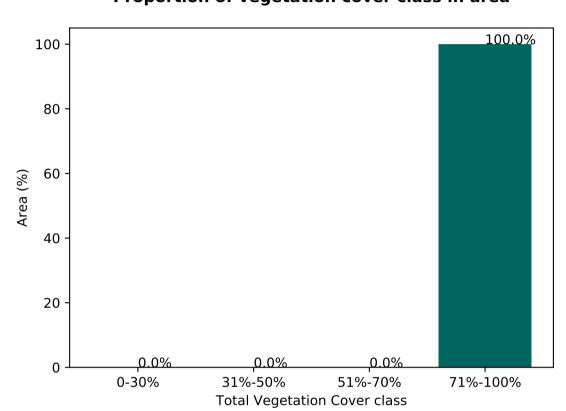
using baseline from 2001 to 2019.



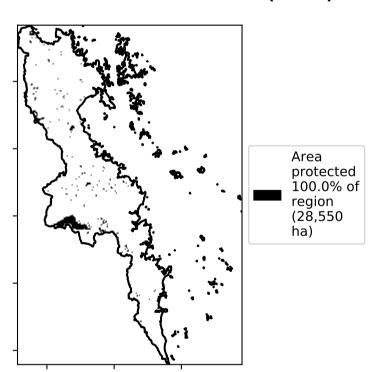
#### **Total Vegetation Cover [%]**



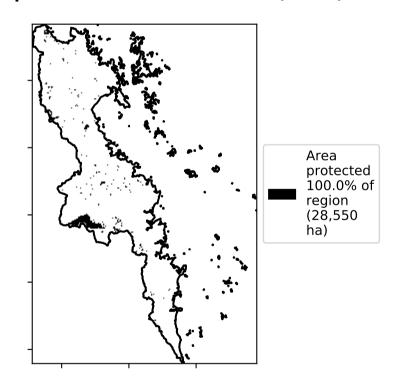
#### Proportion of vegetation cover class in area



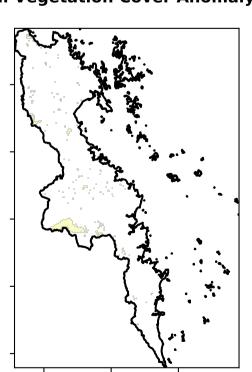
#### % Area protected from water erosion (>70%)

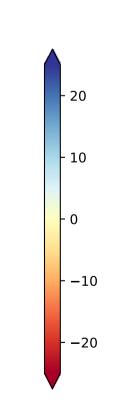


% Area protected from wind erosion (>50%)



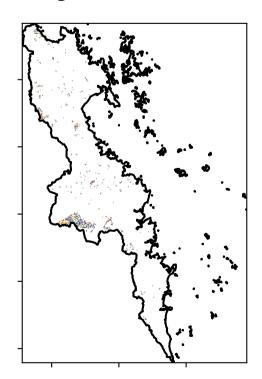
#### **Total Vegetation Cover Anomaly [%]**

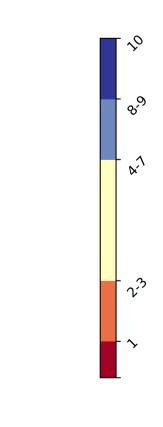




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]







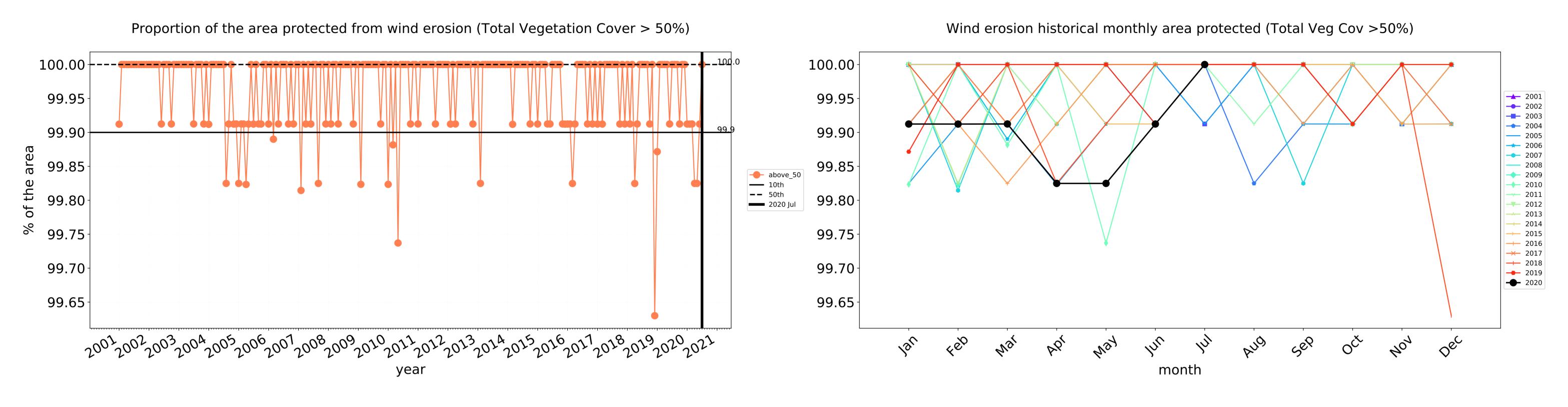


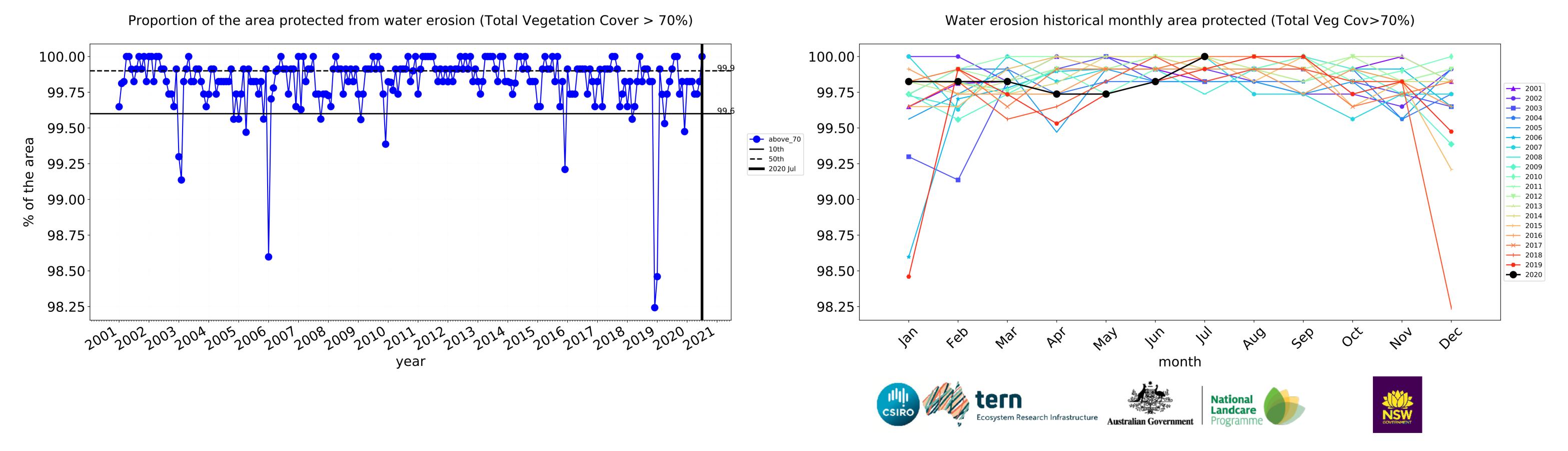


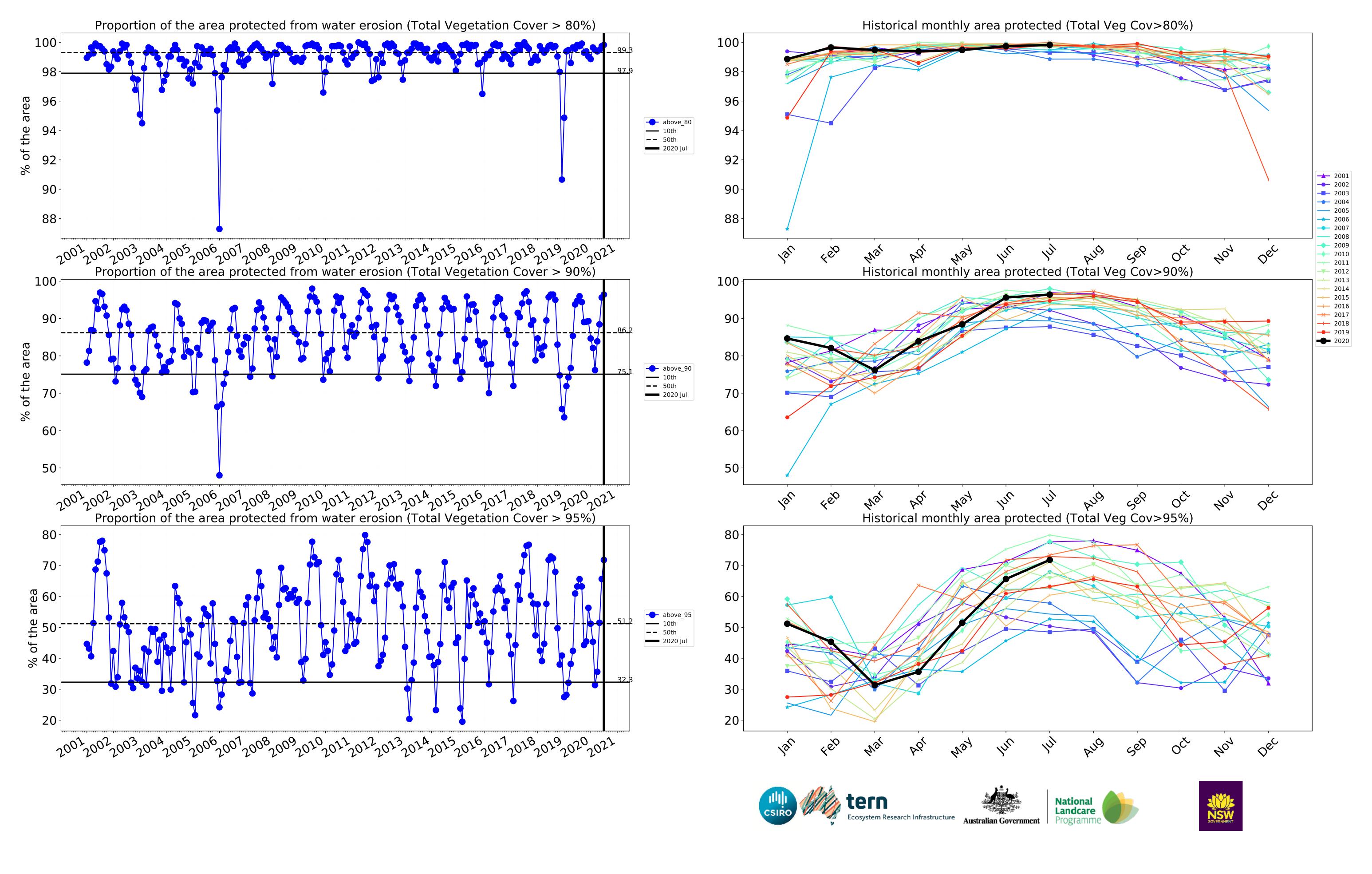






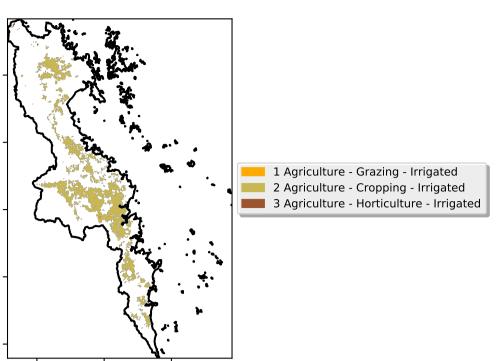




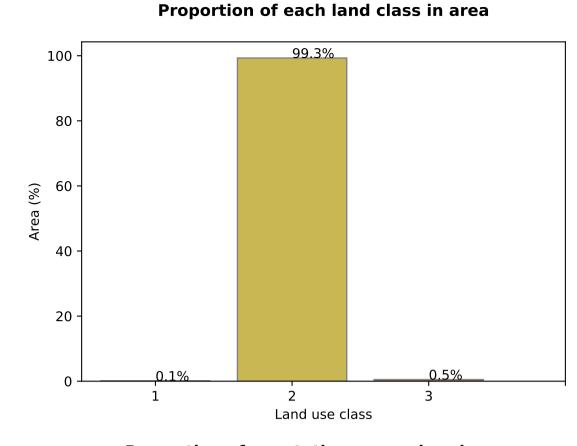


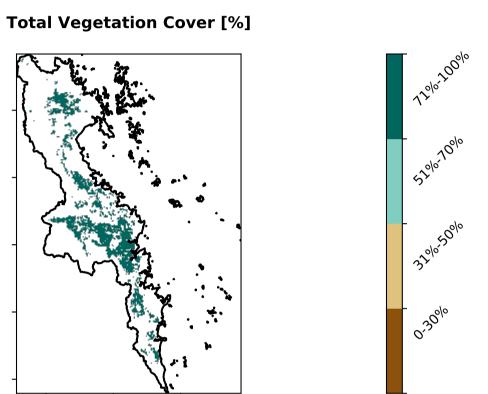
#### Irrigation

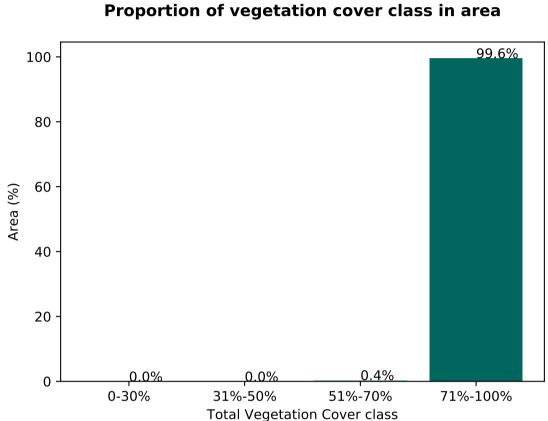
#### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

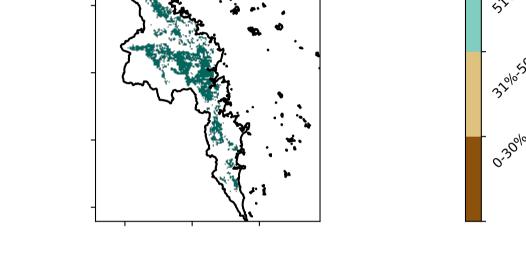


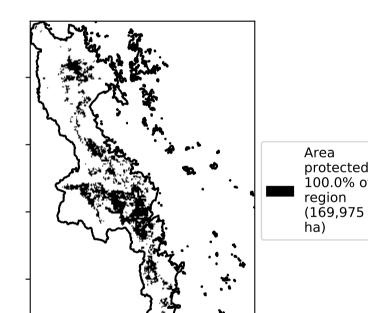
Land use and forest cover



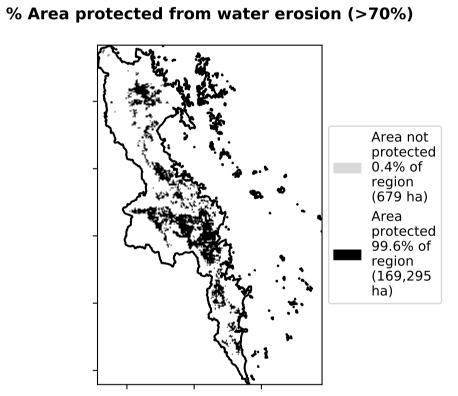


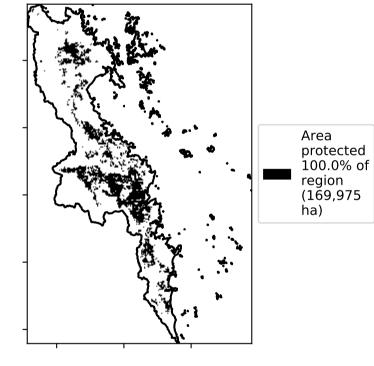




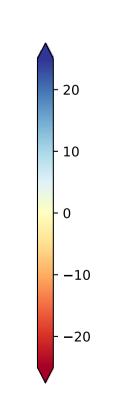


% Area protected from wind erosion (>50%)



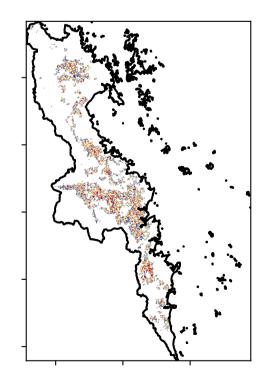


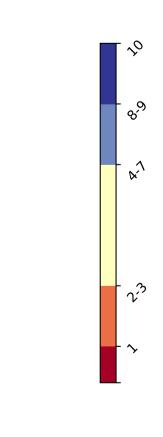
**Total Vegetation Cover Anomaly [%]** 



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

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

the mean. That

is only for the month of the map

using baseline from 2001 to 2019.

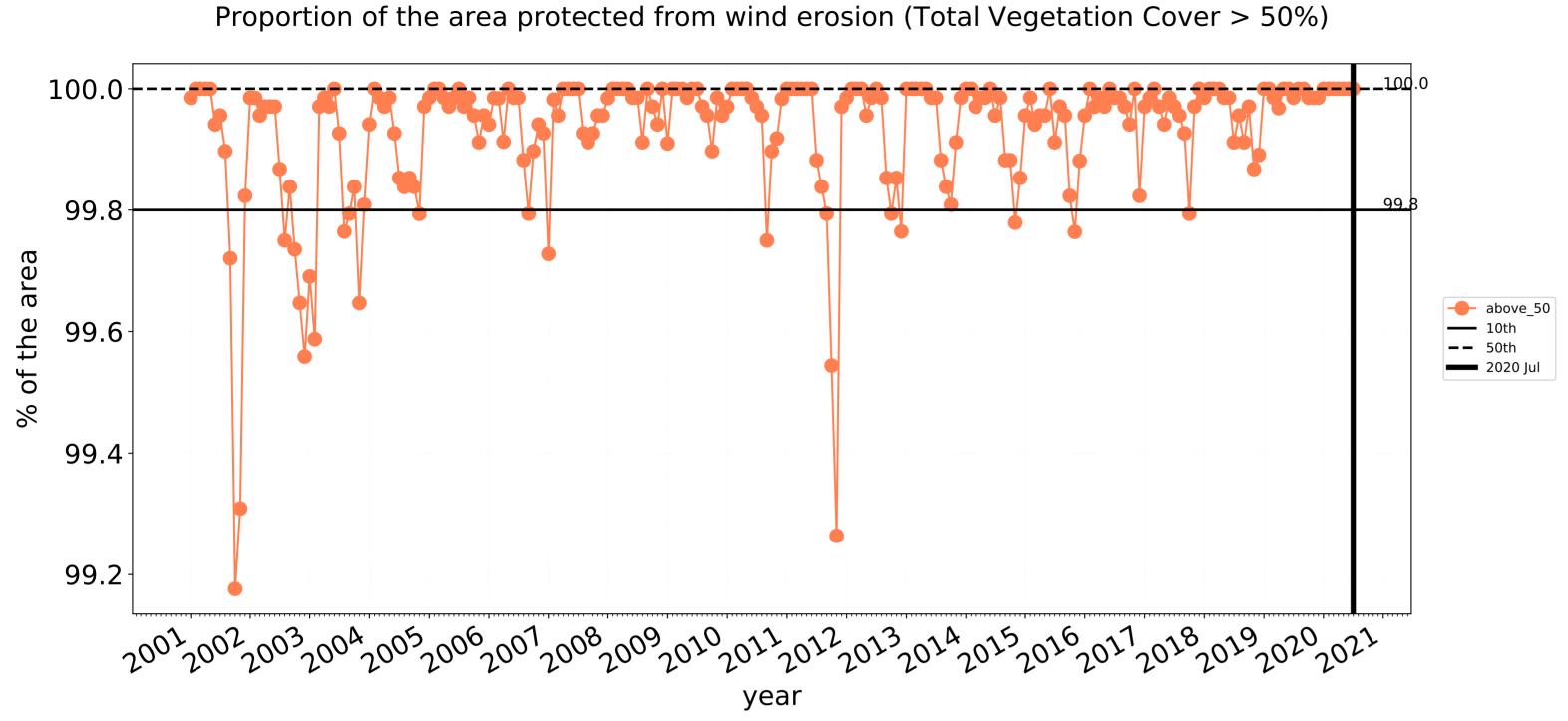


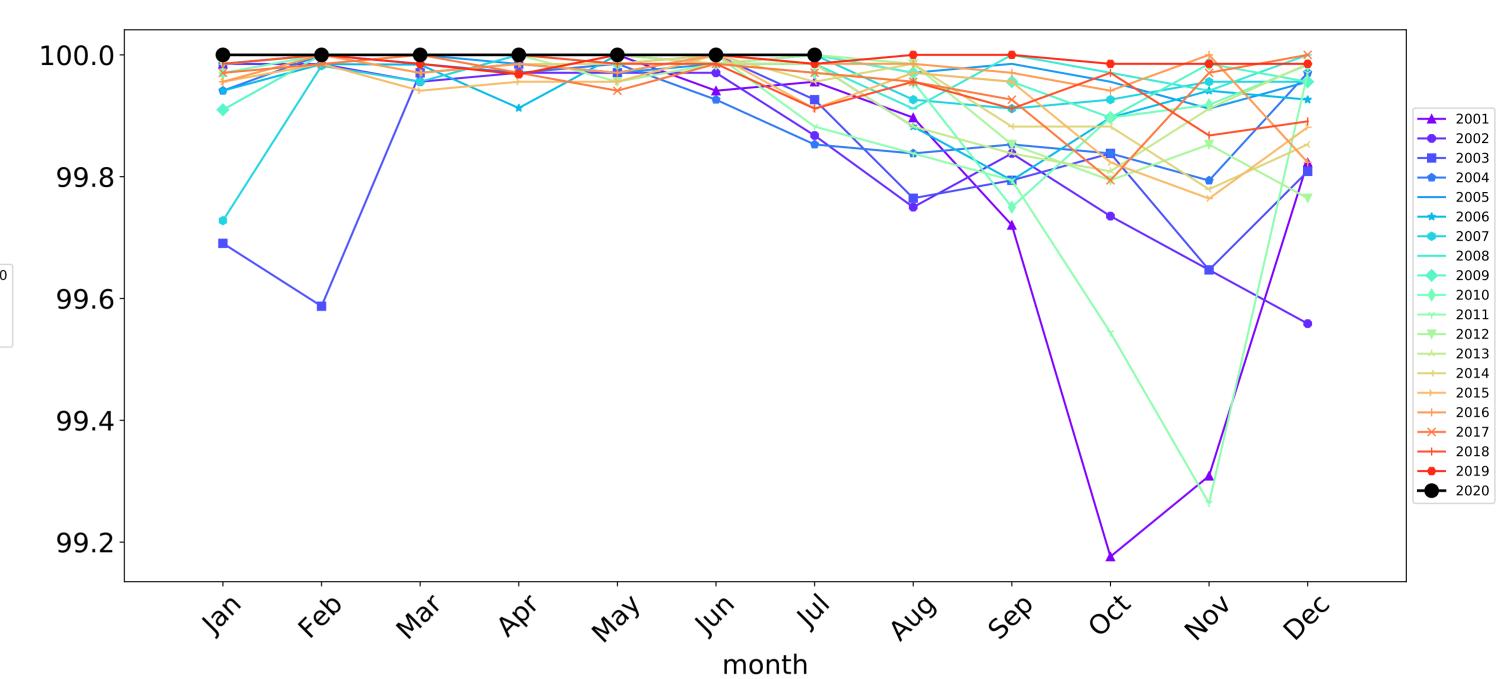




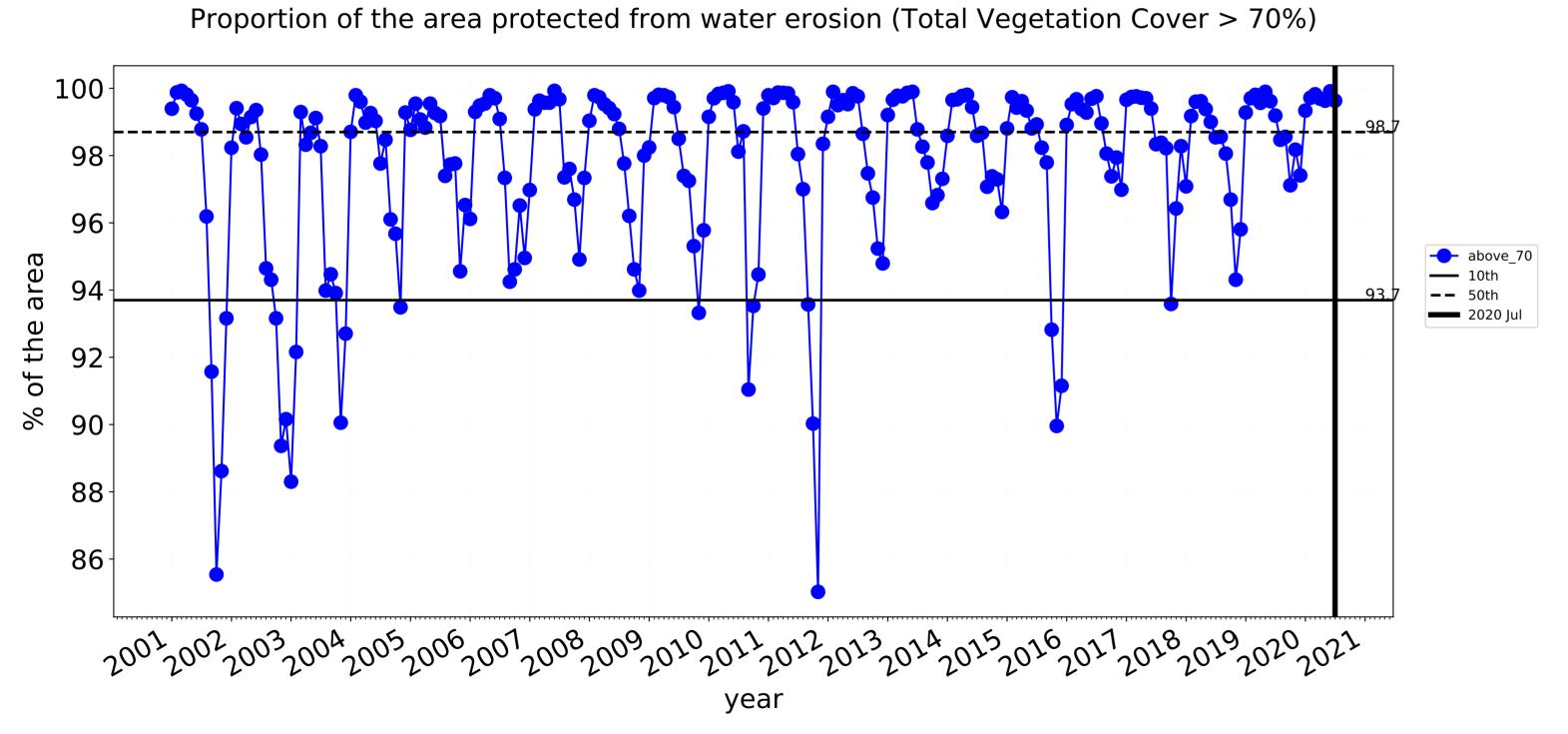


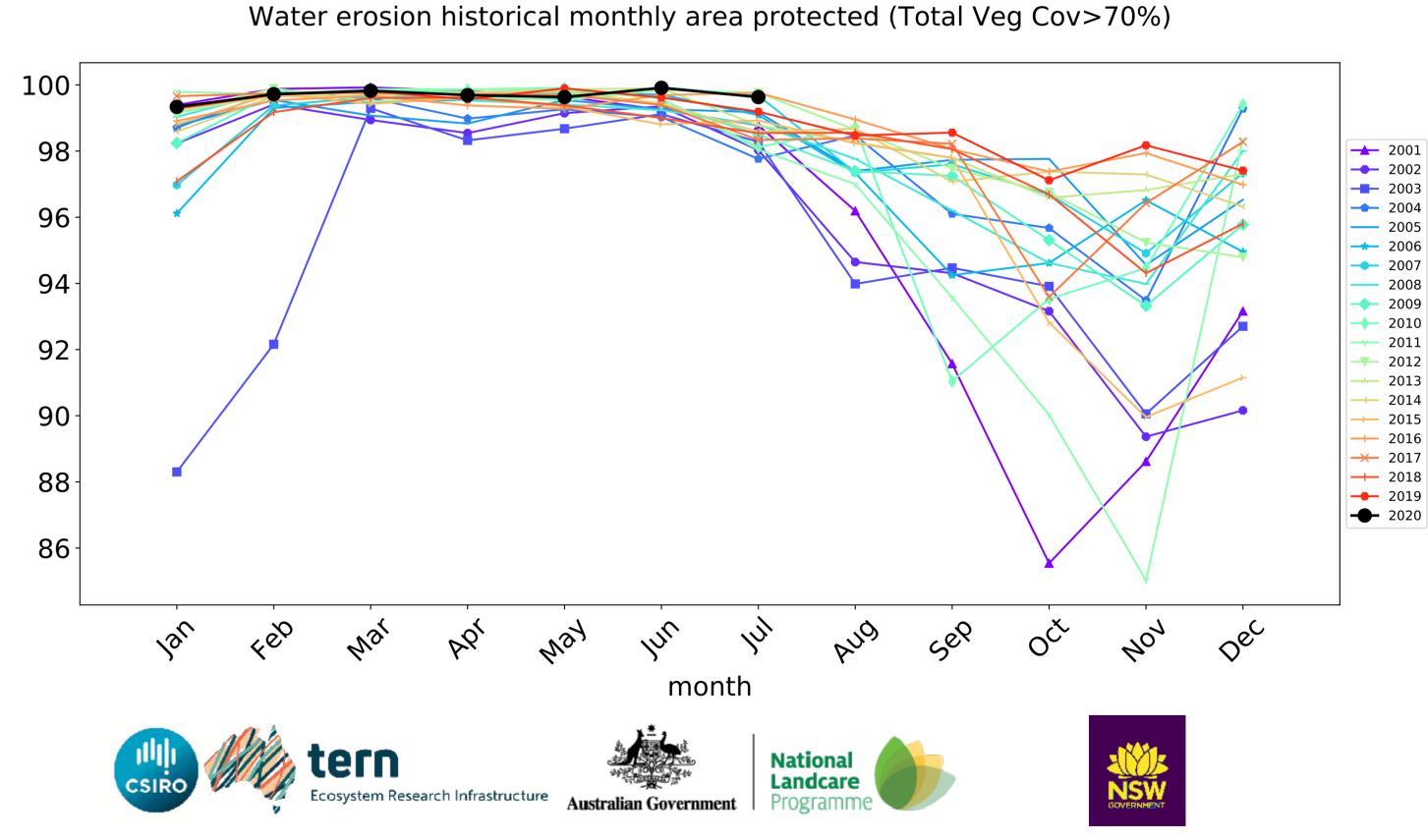
#### Irrigation timeseries

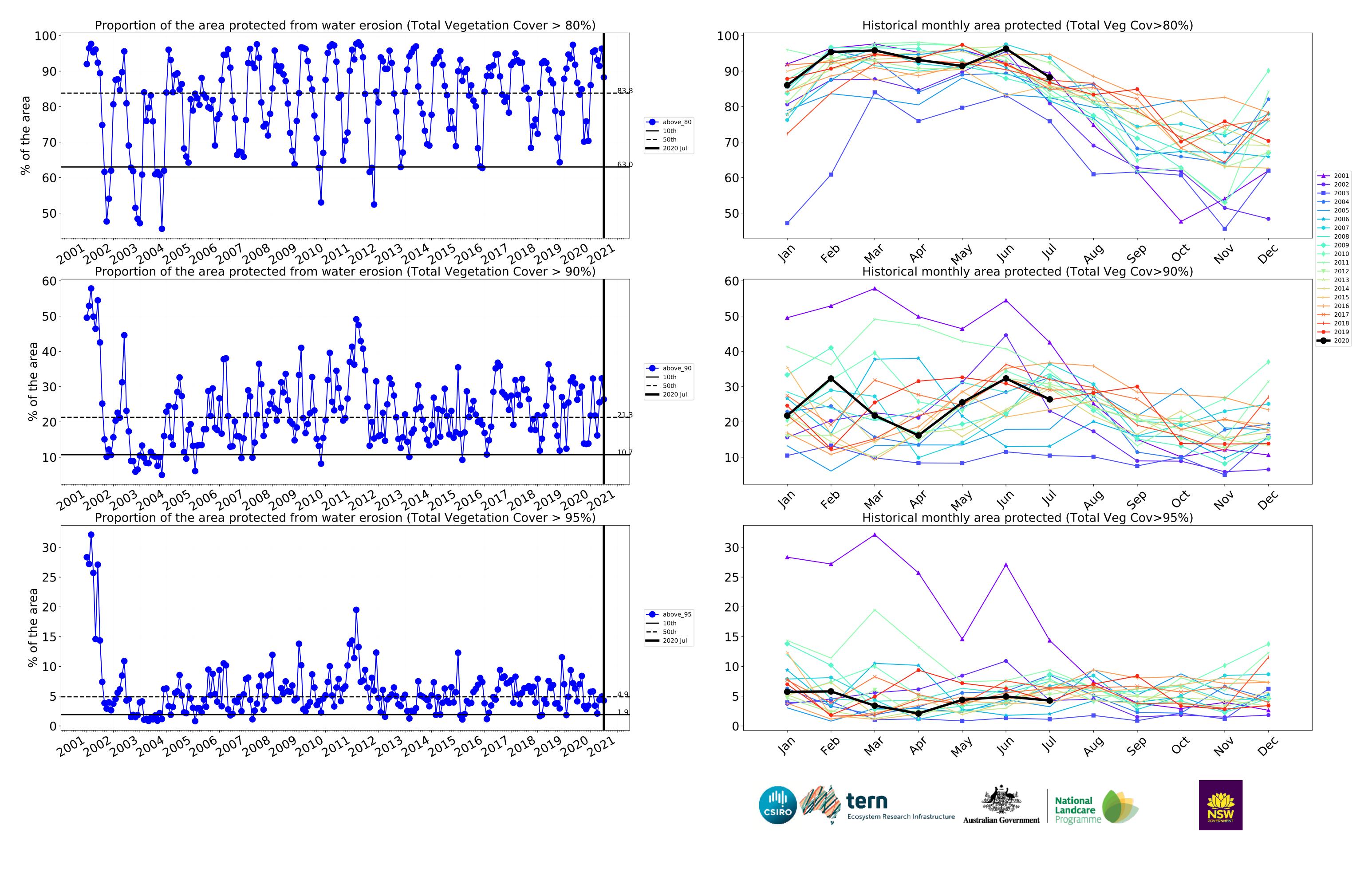




Wind erosion historical monthly area protected (Total Veg Cov >50%)



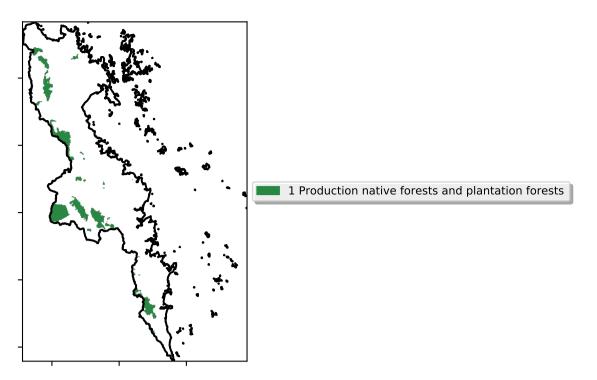




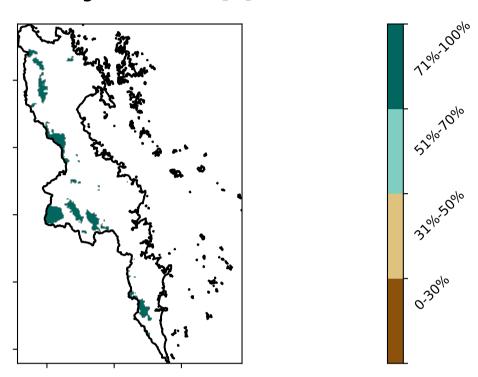
#### **Production native forests and plantation forests**

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

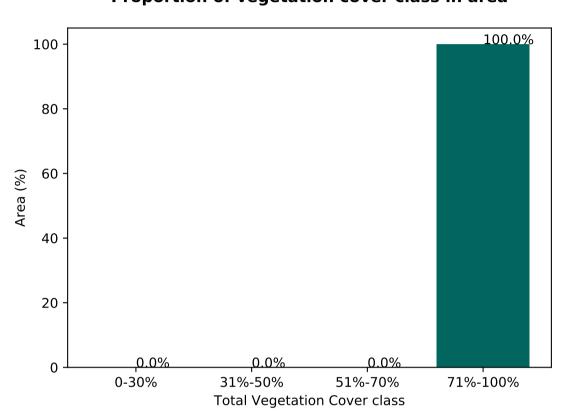
#### Land use and forest cover



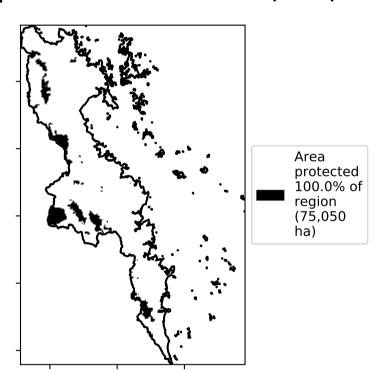
#### **Total Vegetation Cover [%]**



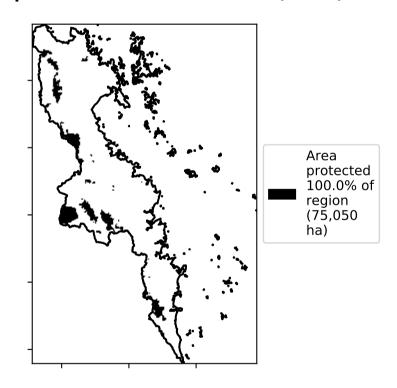
#### Proportion of vegetation cover class in area



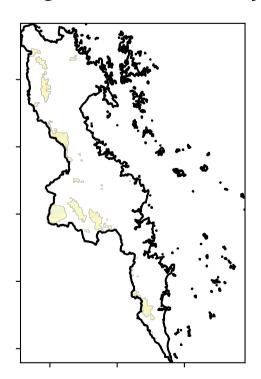
#### % Area protected from water erosion (>70%)

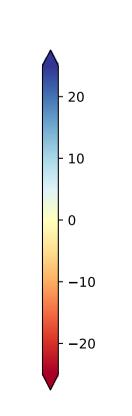


% Area protected from wind erosion (>50%)



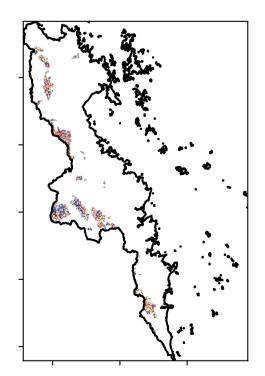
#### **Total Vegetation Cover Anomaly [%]**

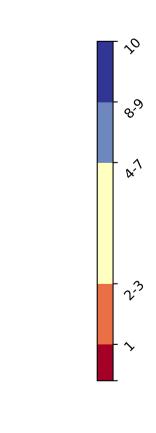




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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.

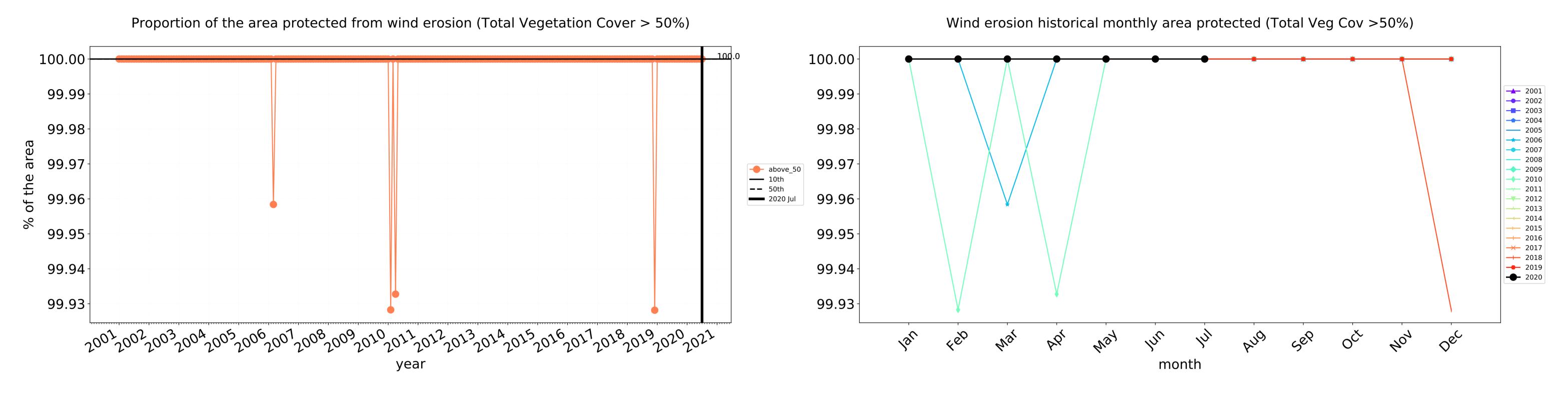


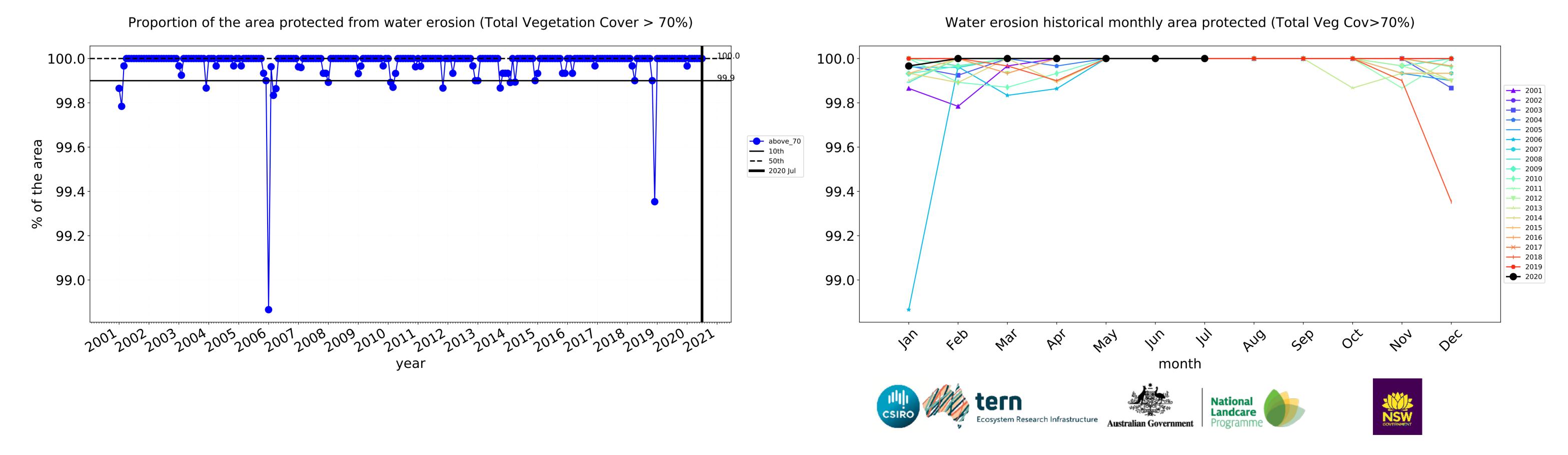


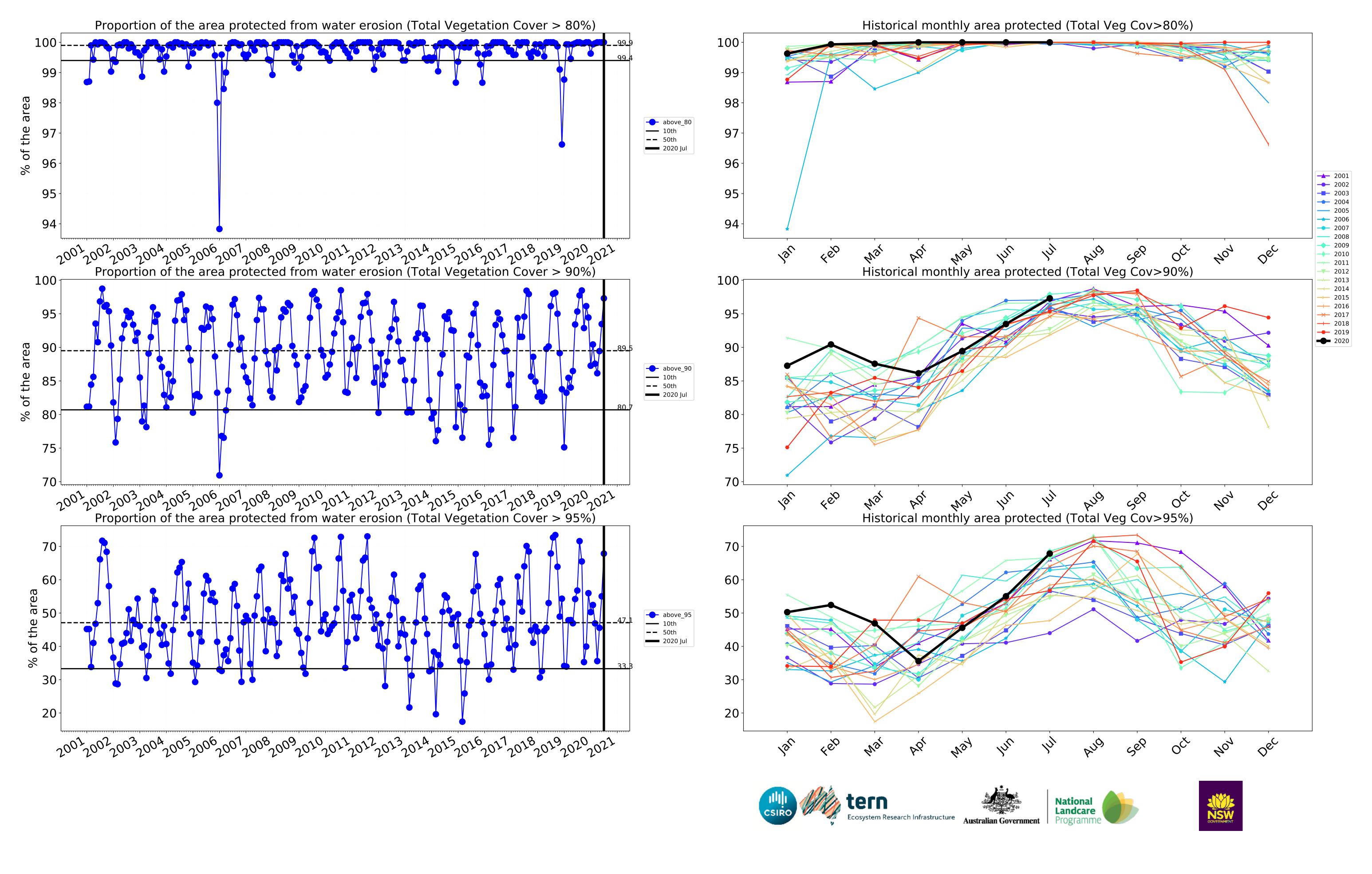




#### **Production native forests and plantation forests timeseries**







### Mackay Whitsunday (909,000 ha and no data 24,060 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	909,000	99.9% 908,500	99.8% 906,975	98.9% 898,800	94.7% 861,225	72.6% 659,575	39.1% 355,250
Conservation and natural environments	276,525	99.9% 276,200	99.7% 275,650	98.8% 273,125	97.3% 268,950	86.2% 238,475	49.2% 136,125
Conservation and natural environments non forest	7,300	100.0% 7,300	97.9% 7,150	93.5% 6,825	85.3% 6,225	54.8% 4,000	20.2% 1,475
Conservation and natural environments Woodland forest	74,950	99.8% 74,800	99.6% 74,650	98.8% 74,050	97.7% 73,225	90.9% 68,125	51.8% 38,825
natural environments Forest (non woodland)	194,275	99.9% 194,100	99.8% 193,850	99.0% 192,250	97.5% 189,500	85.6% 166,350	49.3% 95,825
Agriculture	468,375	100.0% 468,375	100.0% 468,275	99.7% 467,200	95.3% 446,325	67.2% 314,675	34.1% 159,600
Grazing	298,350	100.0% 298,350	100.0% 298,250	99.8% 297,800	99.3% 296,300	90.4% 269,750	51.1% 152,325
Grazing non forest	189,225	100.0% 189,225	100.0% 189,150	99.7% 188,725	99.0% 187,425	88.0% 166,475	45.8% 86,725
Grazing Woodland forest	80,575	100.0% 80,575	100.0% 80,550	99.9% 80,525	99.8% 80,375	94.0% 75,750	56.0% 45,100
Grazing - Forest (non woodland)	28,550	100.0% 28,550	100.0% 28,550	100.0% 28,550	99.8% 28,500	96.4% 27,525	71.8% 20,500
Irrigation	169,975	100.0% 169,975	100.0% 169,975	99.6% 169,350	88.2% 149,975	26.4% 44,875	4.3% 7,250
Production native forests and plantation forests	75,050	100.0% 75,050	100.0% 75,050	100.0% 75,050	100.0% 75,050	97.3% 73,025	67.9% 50,925







