# 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 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

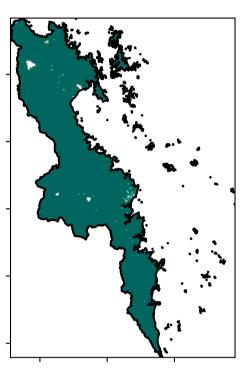


# **Vegetation Cover Aug 2020**

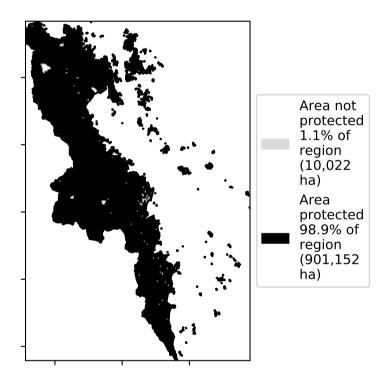
#### Land use and forest cover

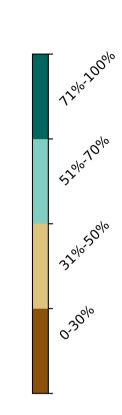
Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments -Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - 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 forests 13 Other uses

#### Total Vegetation Cover [%]

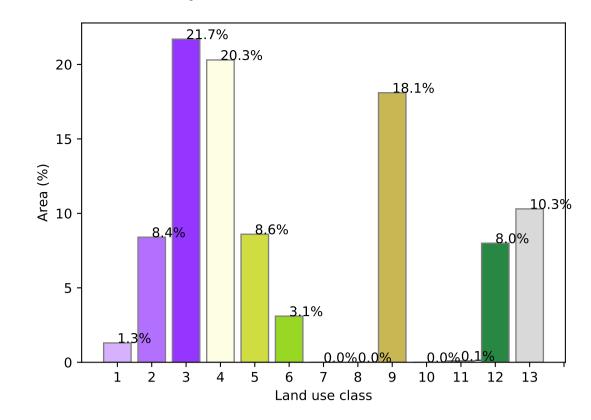


#### % Area protected from water erosion (>70%)

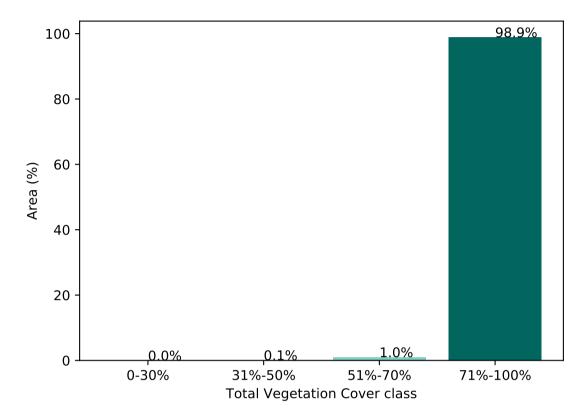




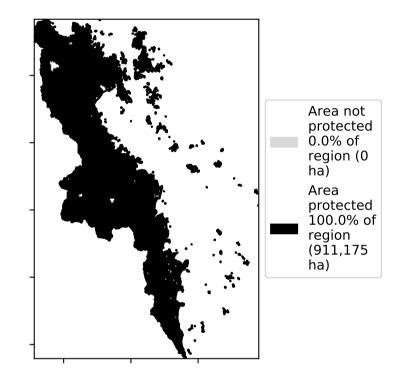
#### Proportion of each land class in area



#### Proportion of vegetation cover class in area



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



**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 using baseline from 2001 to 2019.

Catchment Scale

of Australia (2018)

(2018) and Forests

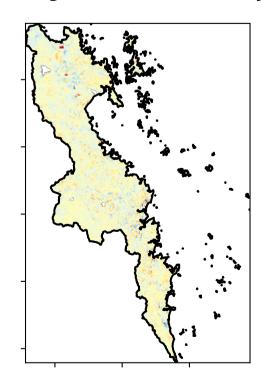
of Australia (2018)

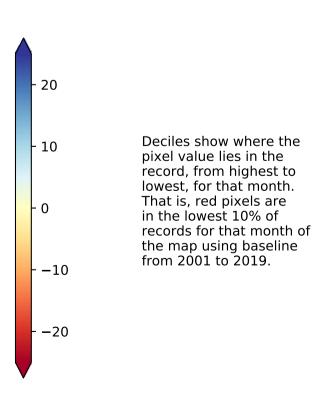
Derived from

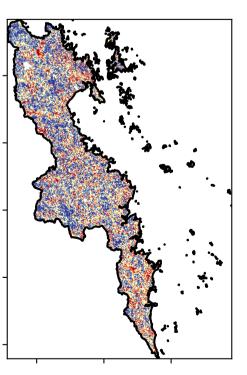
Use of Australia

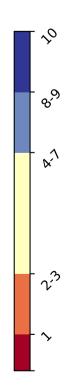
Land Use and Forests

Catchment Scale Land

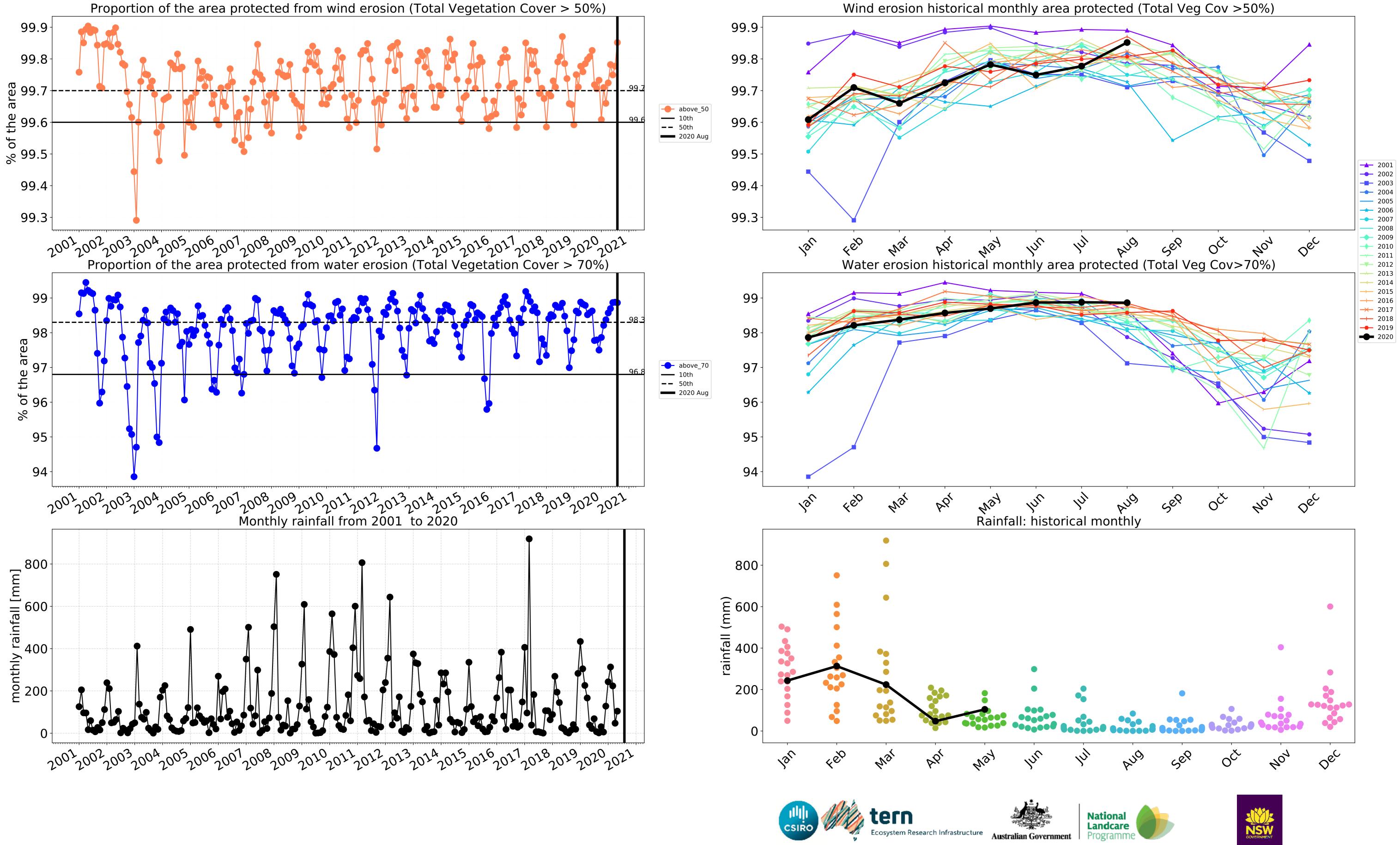


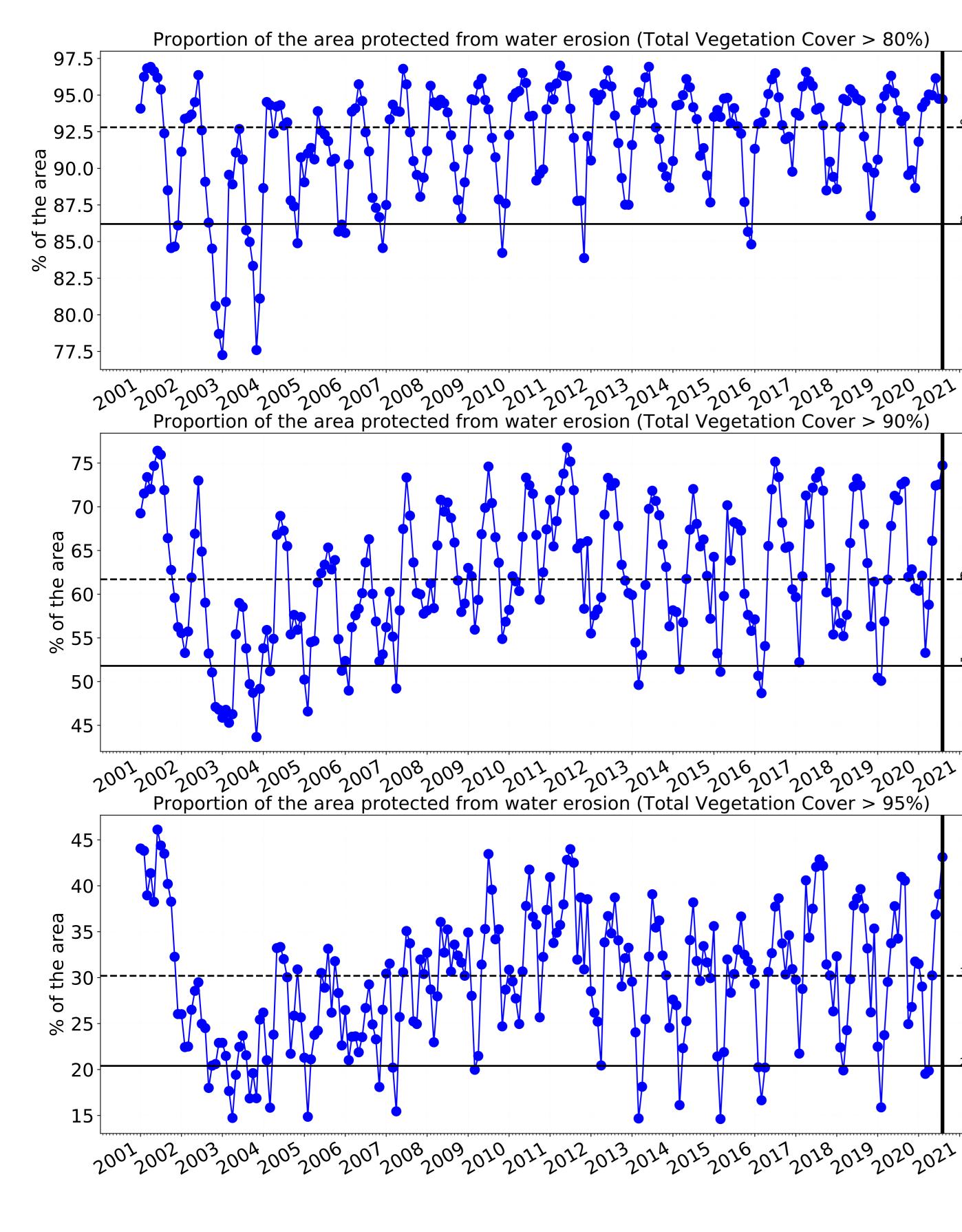


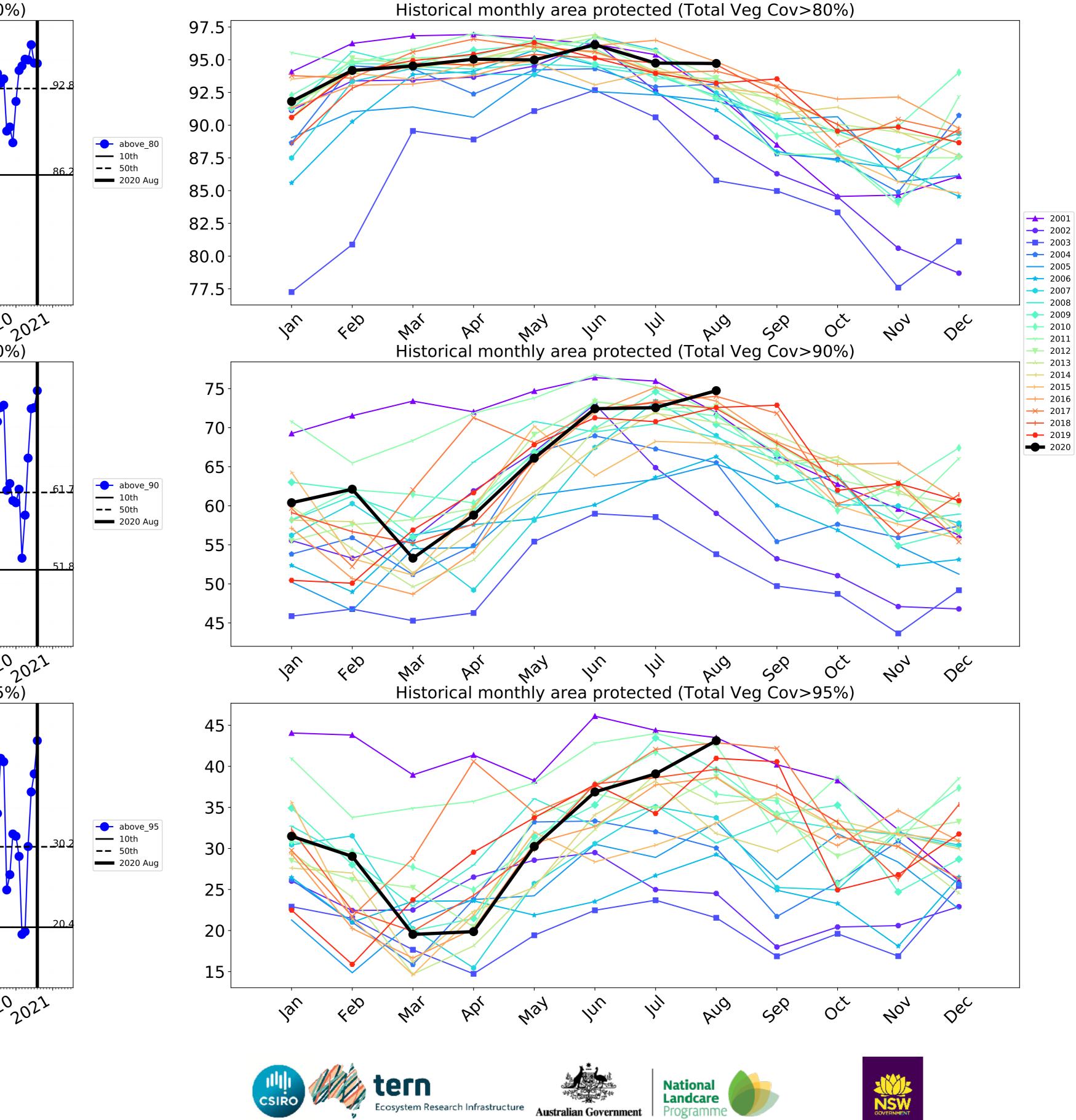












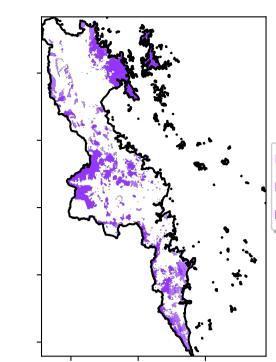


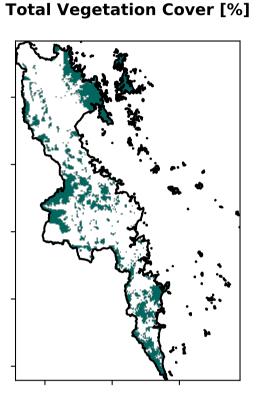
## **Conservation and natural environments**

forest

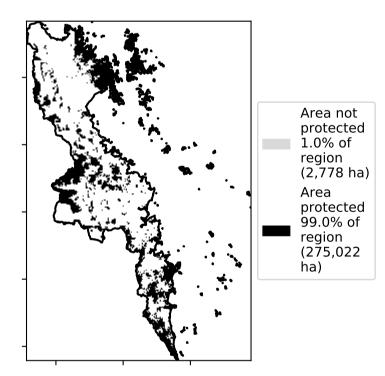
forest

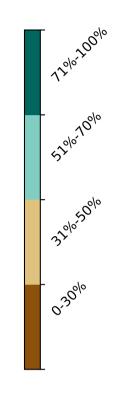
#### Land use and forest cover







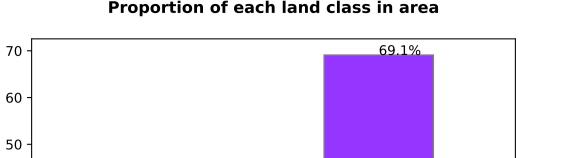




1 Conservation and natural environments - Non-

3 Conservation and natural environments - Non-woodland forest

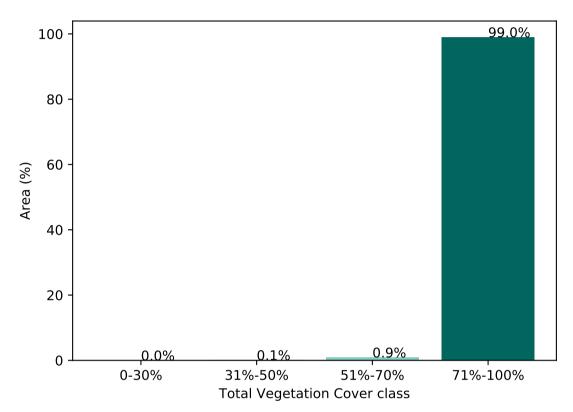
2 Conservation and natural environments – Woodland



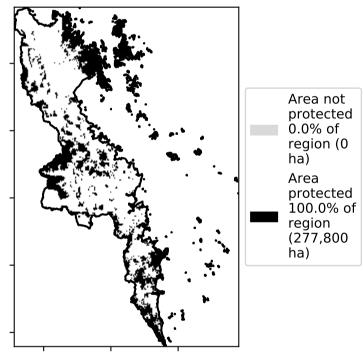
#### Proportion of each land class in area

## 40 Area (%) 30 26.8% 20 10 4.0% 0 2 3 1 Land use class

## Proportion of vegetation cover class in area



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





**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 using baseline from 2001 to 2019.

Catchment Scale Land Use and Forests

of Australia (2018)

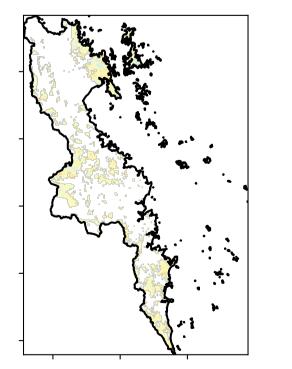
(2018) and Forests

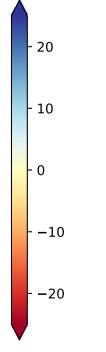
of Australia (2018)

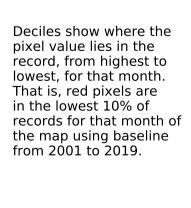
Catchment Scale Land

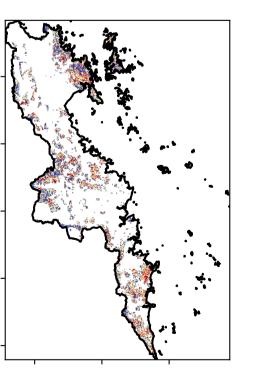
Derived from

Use of Australia



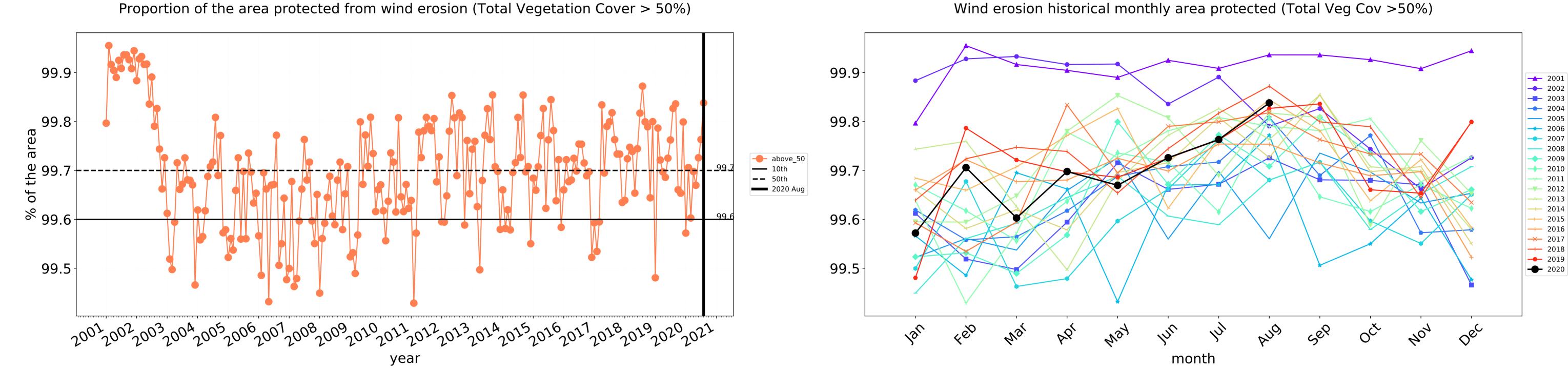






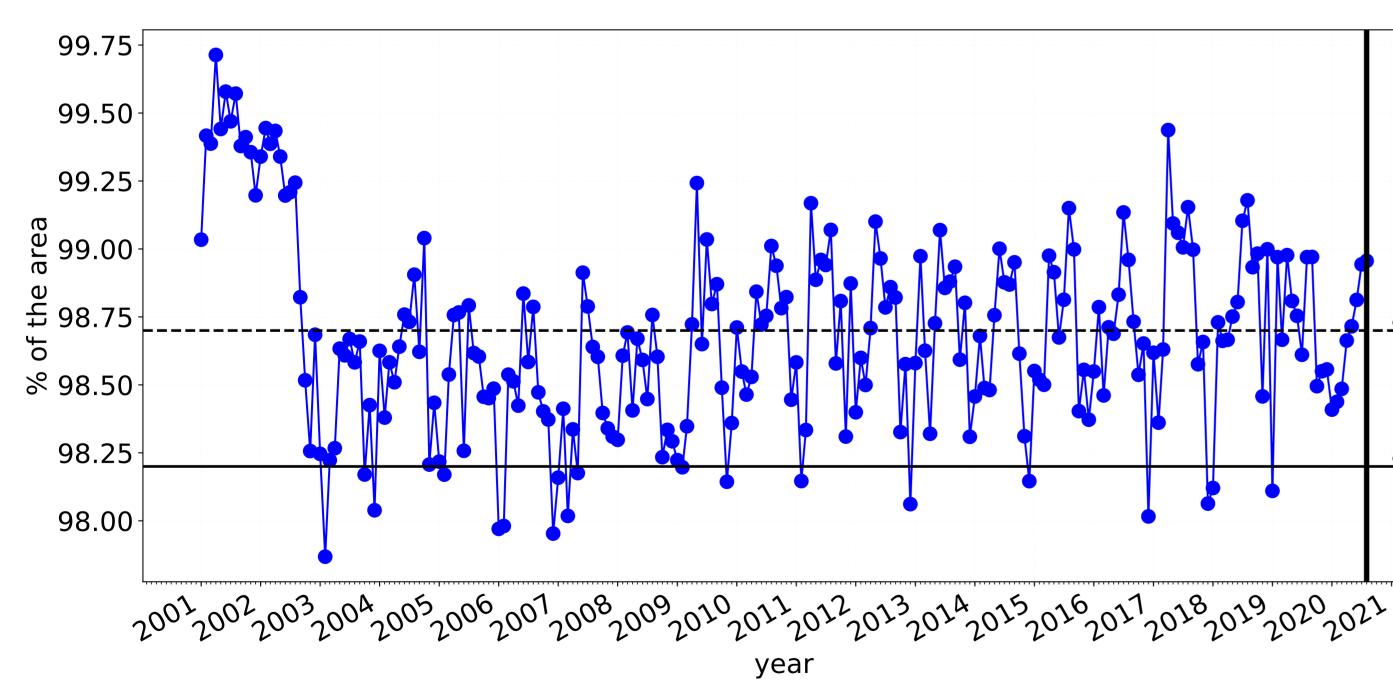






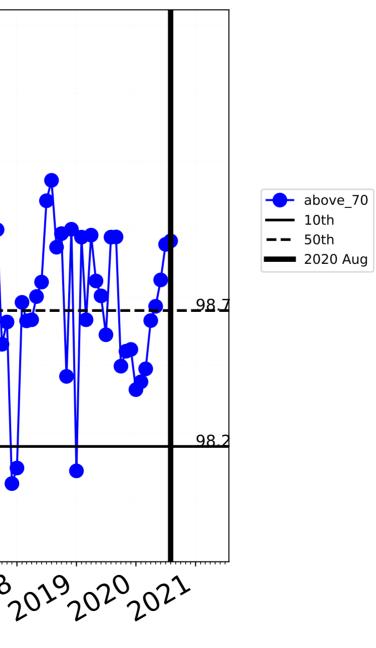
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

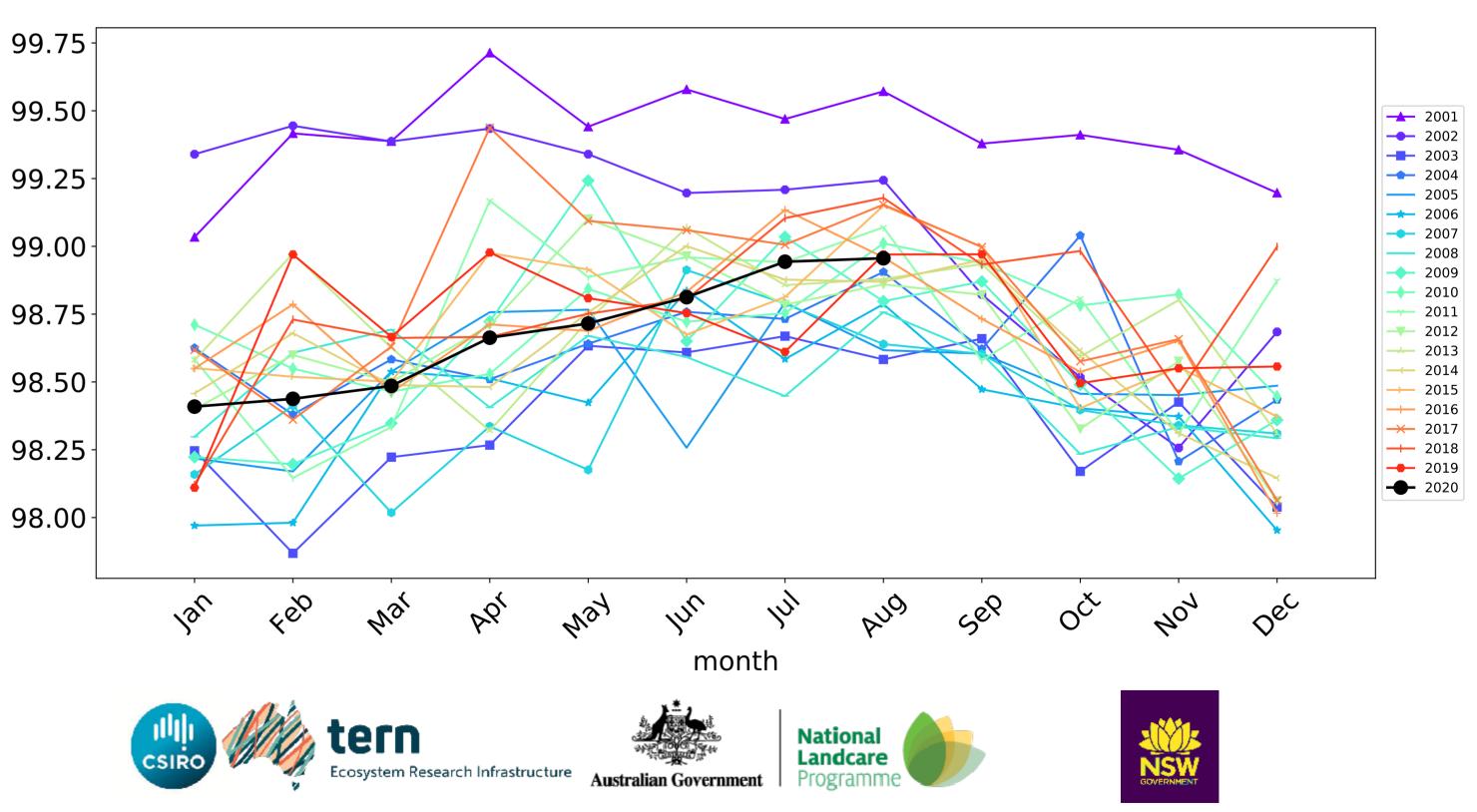


## **Conservation and natural environments timeseries**

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

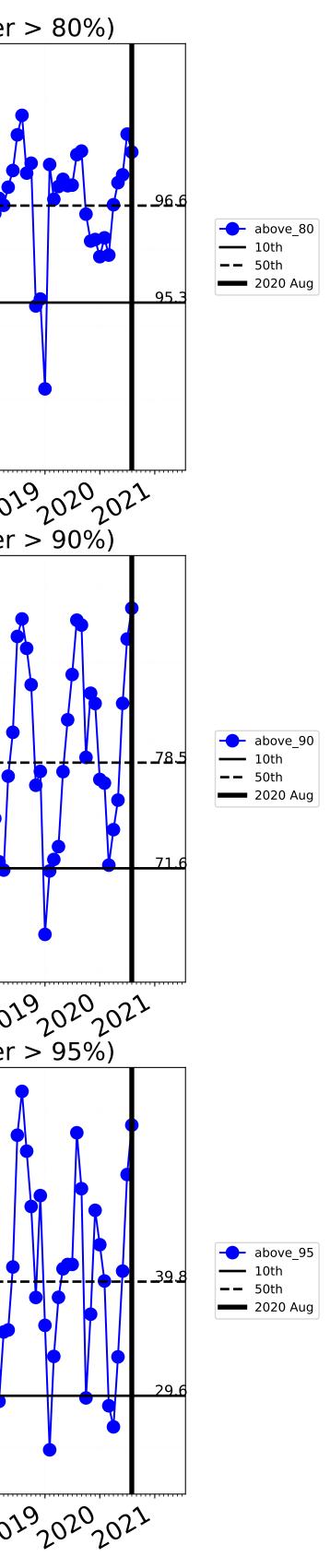


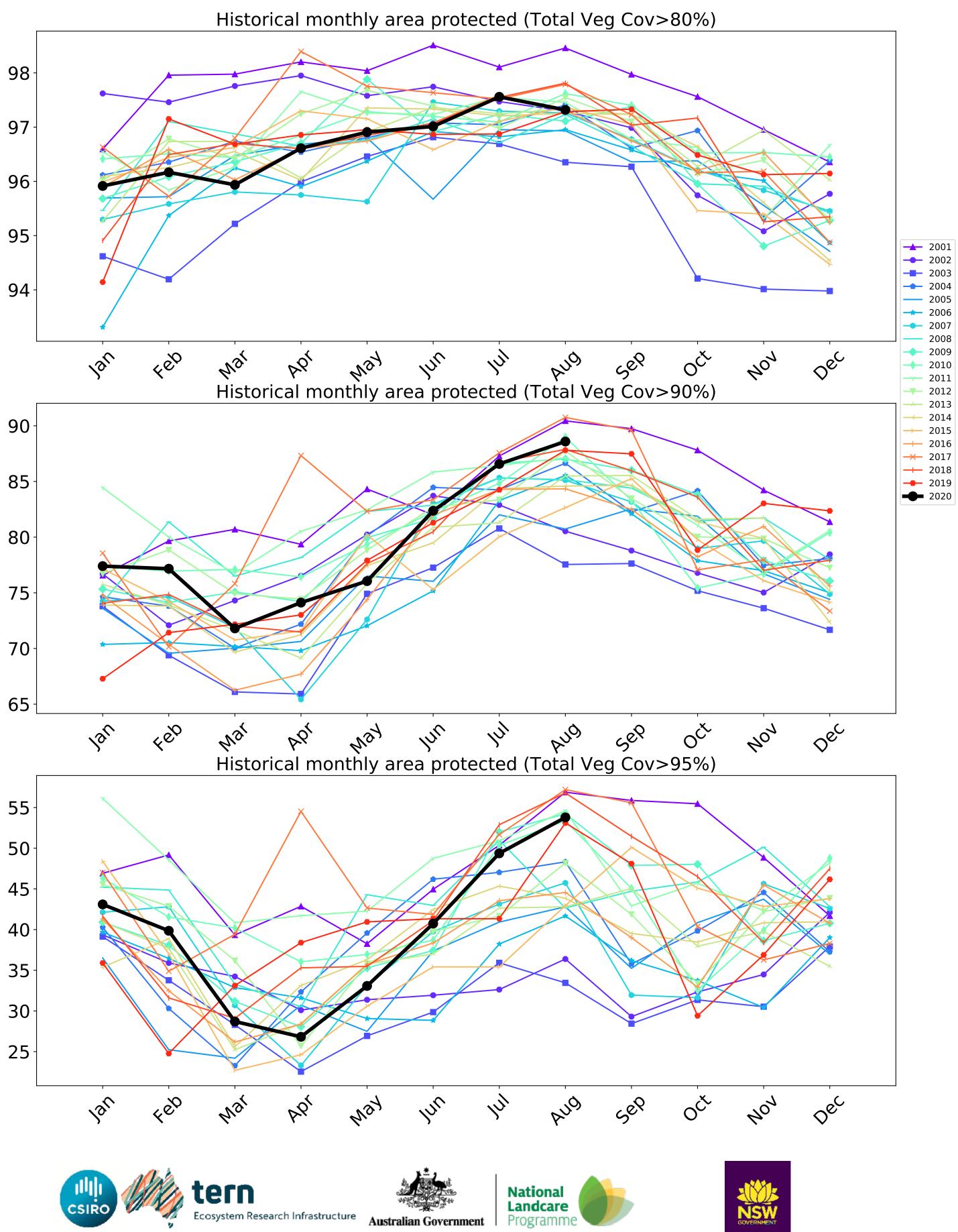
**—** 10th



98 97 area - 96 <del>-</del> of **% 95** 94 20012002200320042005200620072008200920102011201220132014201520162017201820192020201 Proportion of the area protected from water erosion (Total Vegetation Cover > 90%) 90 85 08 area % of the % 70 65 2001200220032004200520062001200820092012012012201320142015201620112018201920202021 Proportion of the area protected from water erosion (Total Vegetation Cover > 95%) 55 50 e 9 8 8 45 et the 35 % 30 25 2002002003200420052006200720082009201201201220132014201520162017201820192020201

Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)

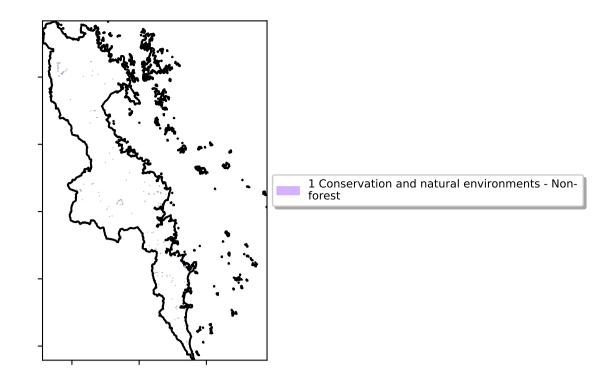




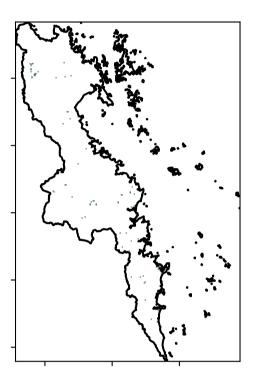


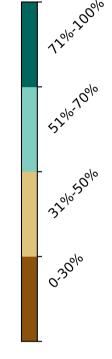
## **Conservation and natural environments non forest**

Land use and forest cover

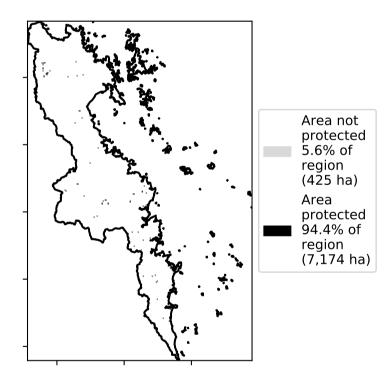


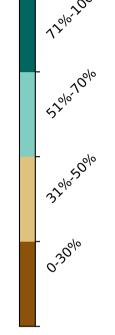
**Total Vegetation Cover [%]** 

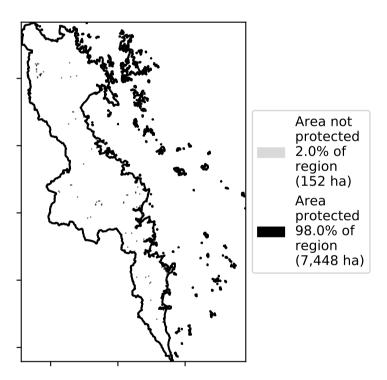




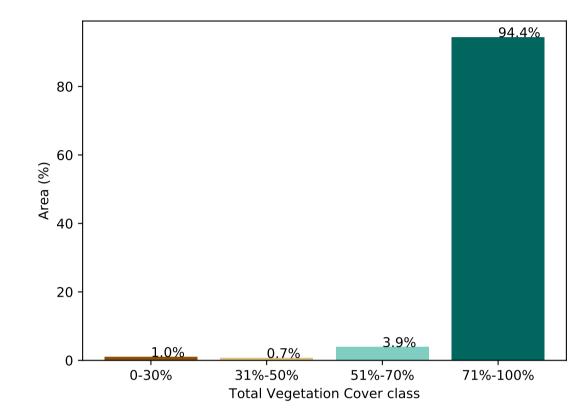
% Area protected from water erosion (>70%)







Proportion of vegetation cover class in area

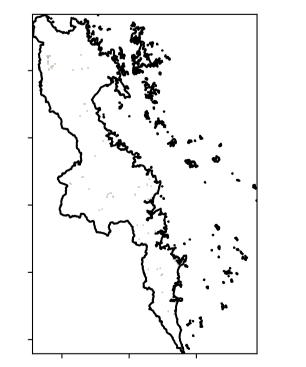


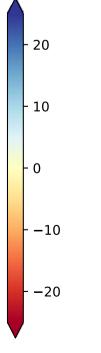
% Area protected from wind erosion (>50%)

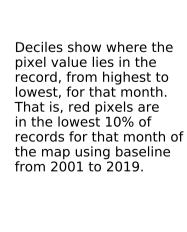


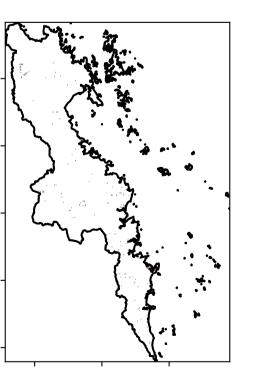
**Total Vegetation Cover Anomaly [%]** 

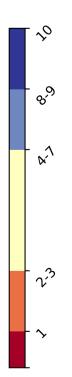
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



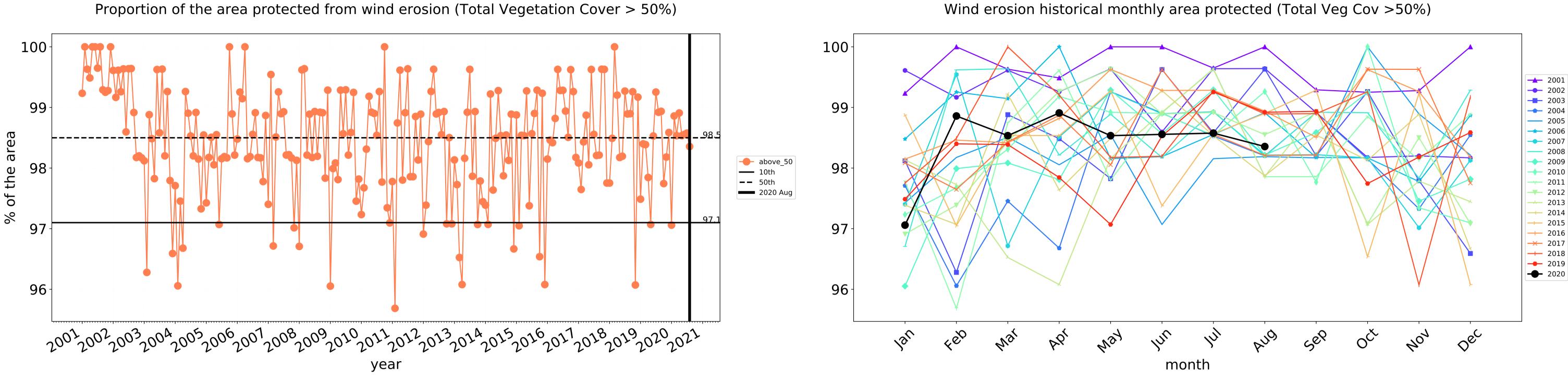


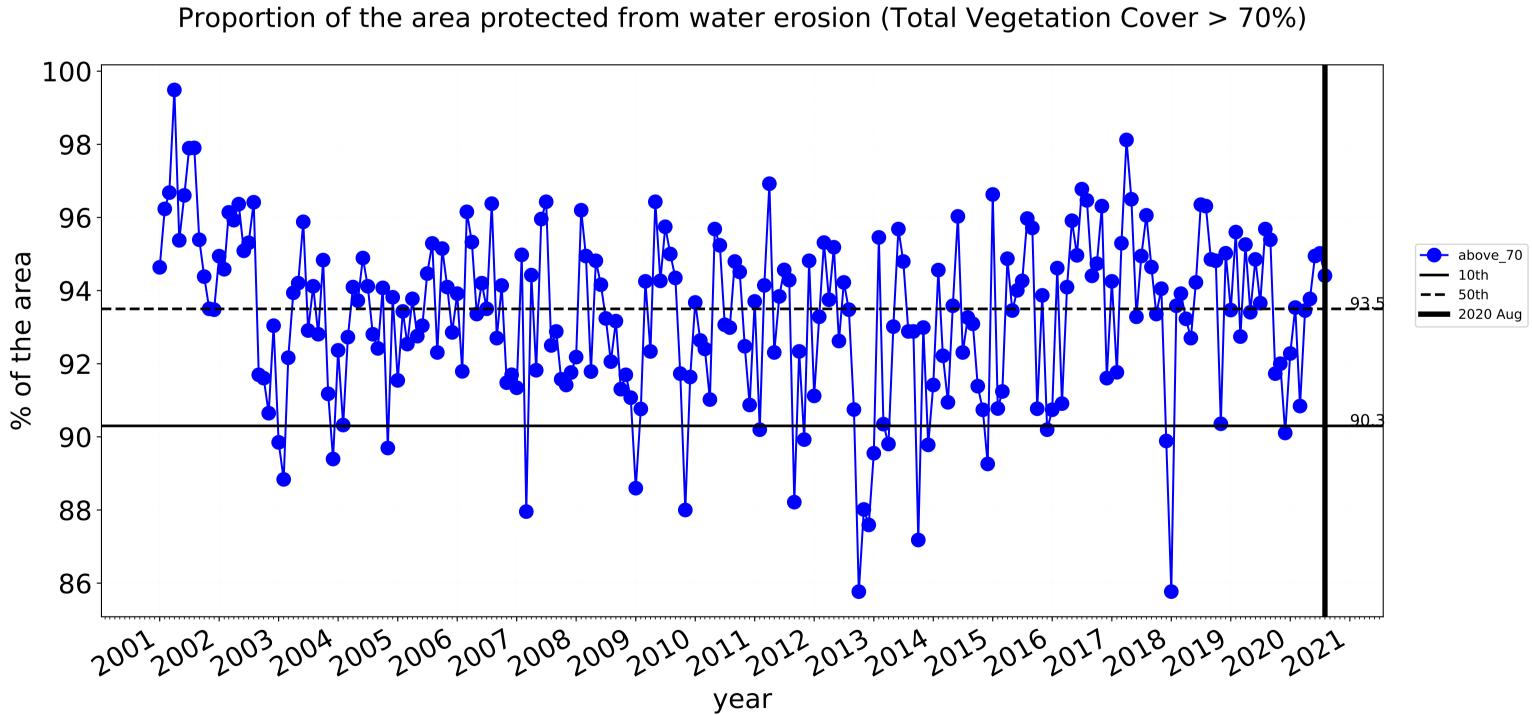




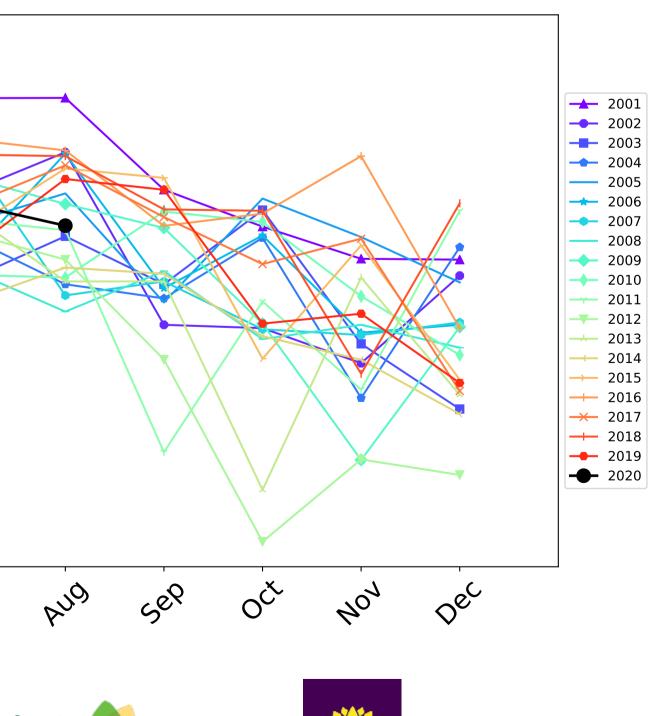






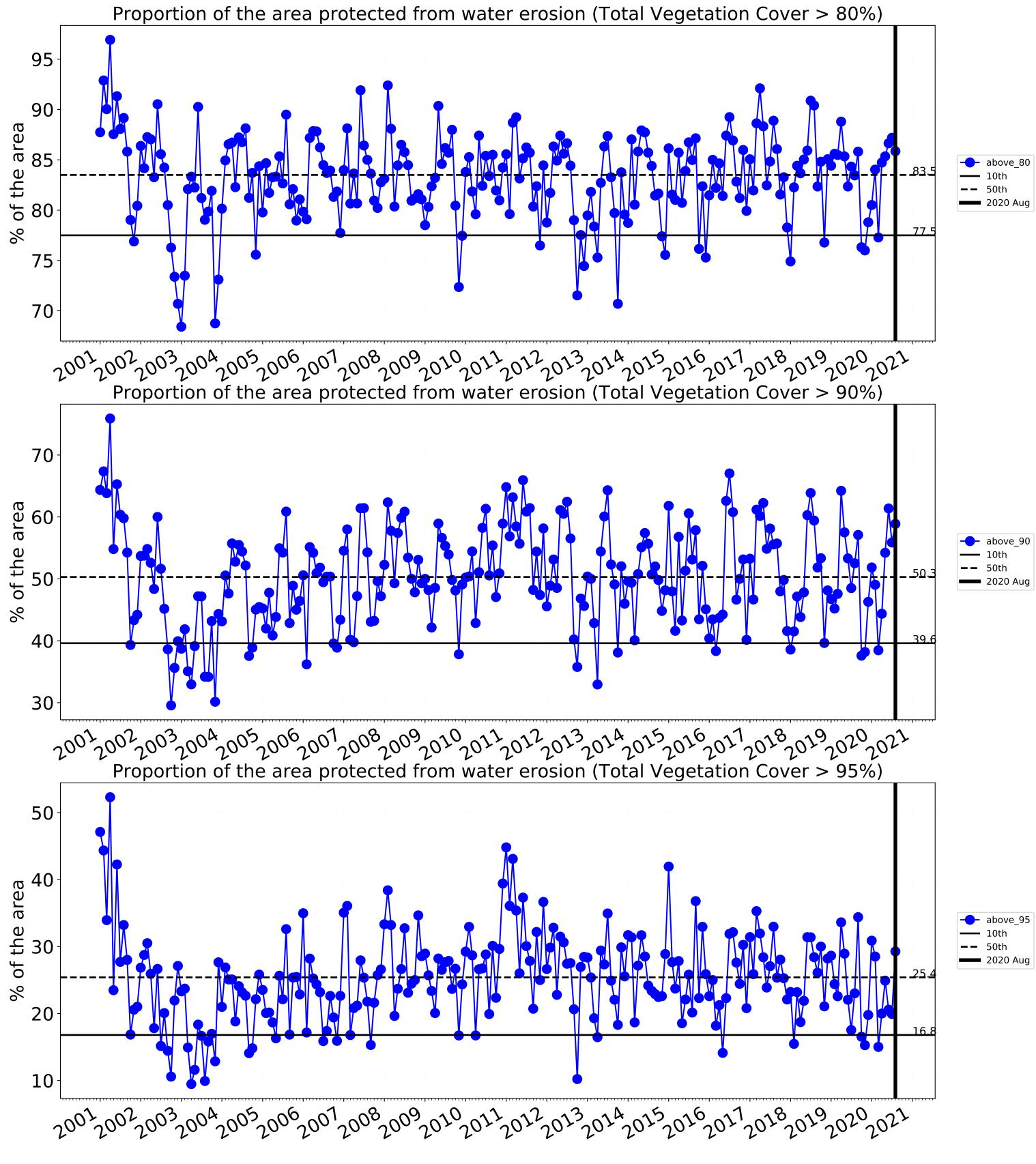


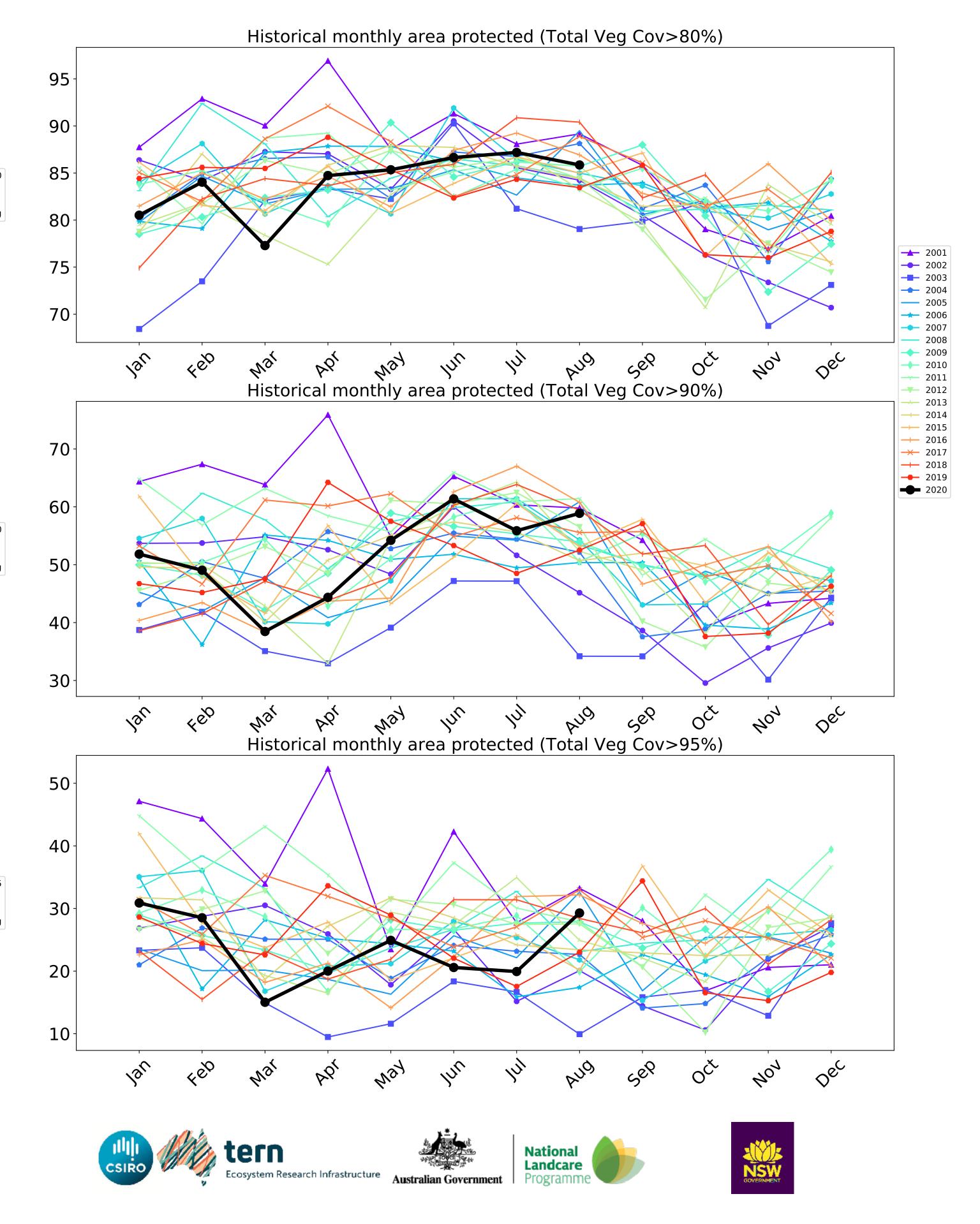
Water erosion historical monthly area protected (Total Veg Cov>70%) 100 -98-96 94 92 90 88-86-Jan feb May AUG ser In OČ (J) Mai 291 month tern National Landcare NSW Ecosystem Research Infrastructure Australian Government Programm





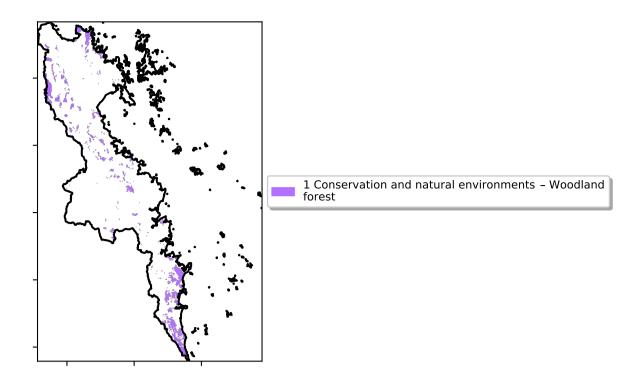




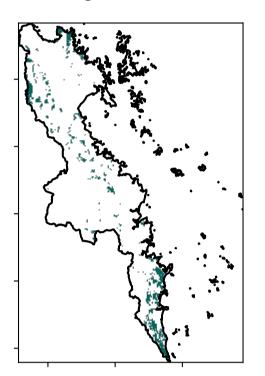


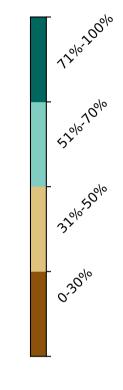
## **Conservation and natural environments Woodland forest**

Land use and forest cover

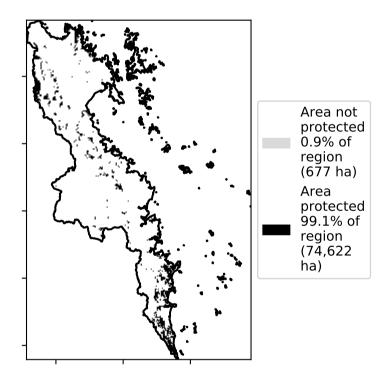


**Total Vegetation Cover [%]** 

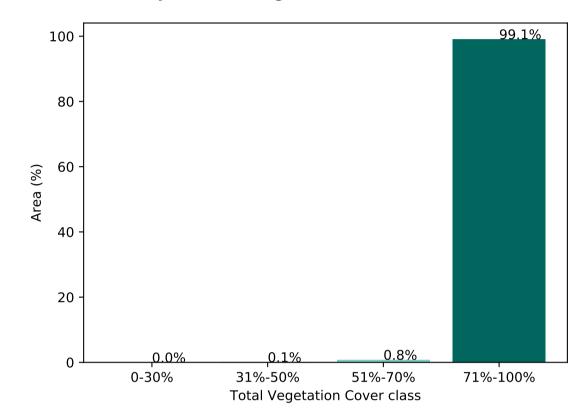




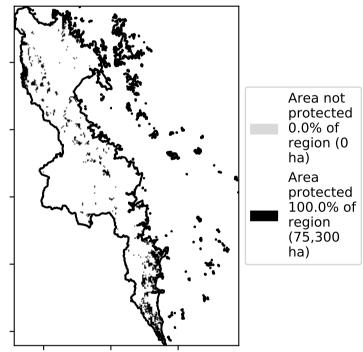
% Area protected from water erosion (>70%)







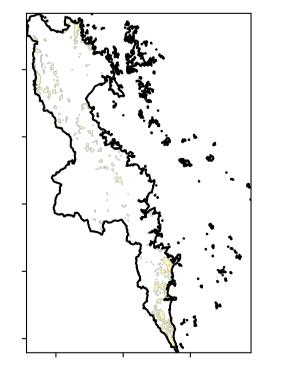
% Area protected from wind erosion (>50%)

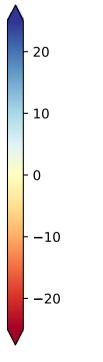


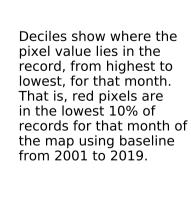
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

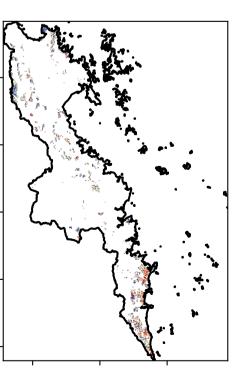
**Total Vegetation Cover Anomaly [%]** 

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 using baseline from 2001 to 2019.



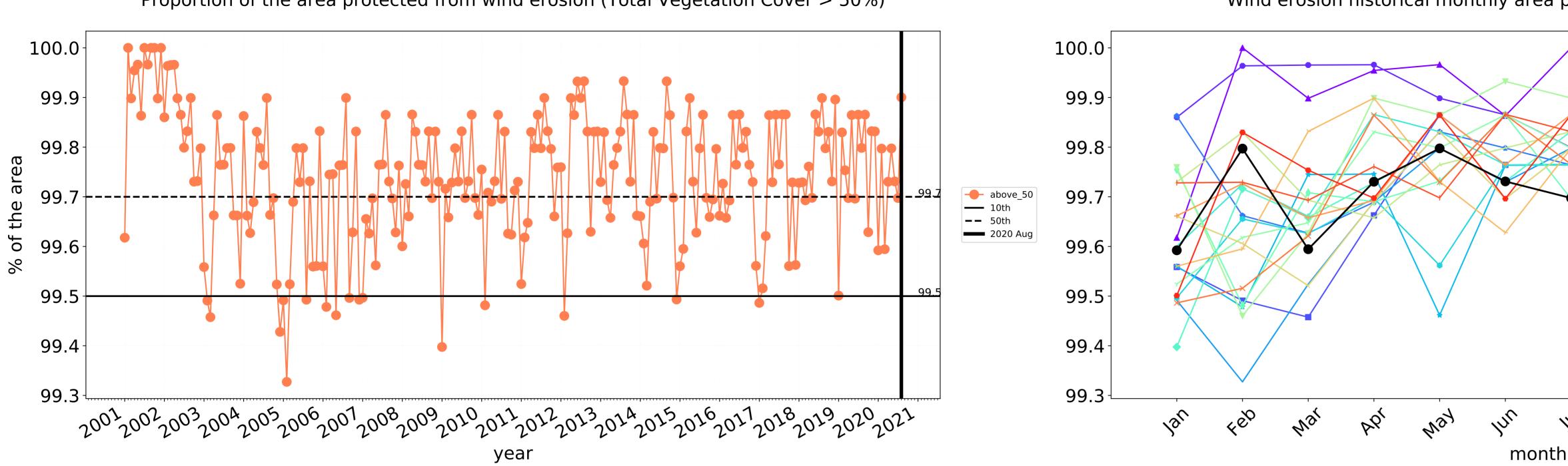






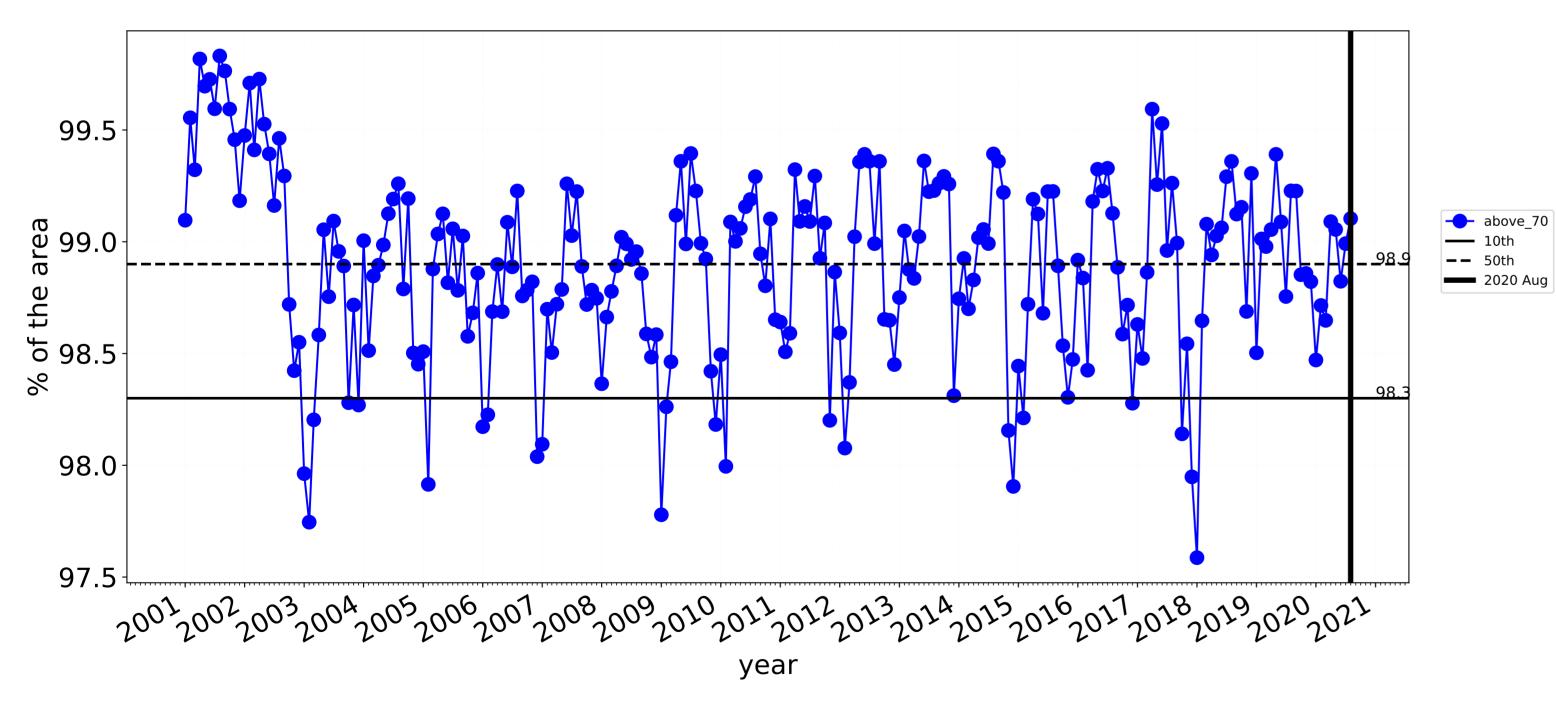


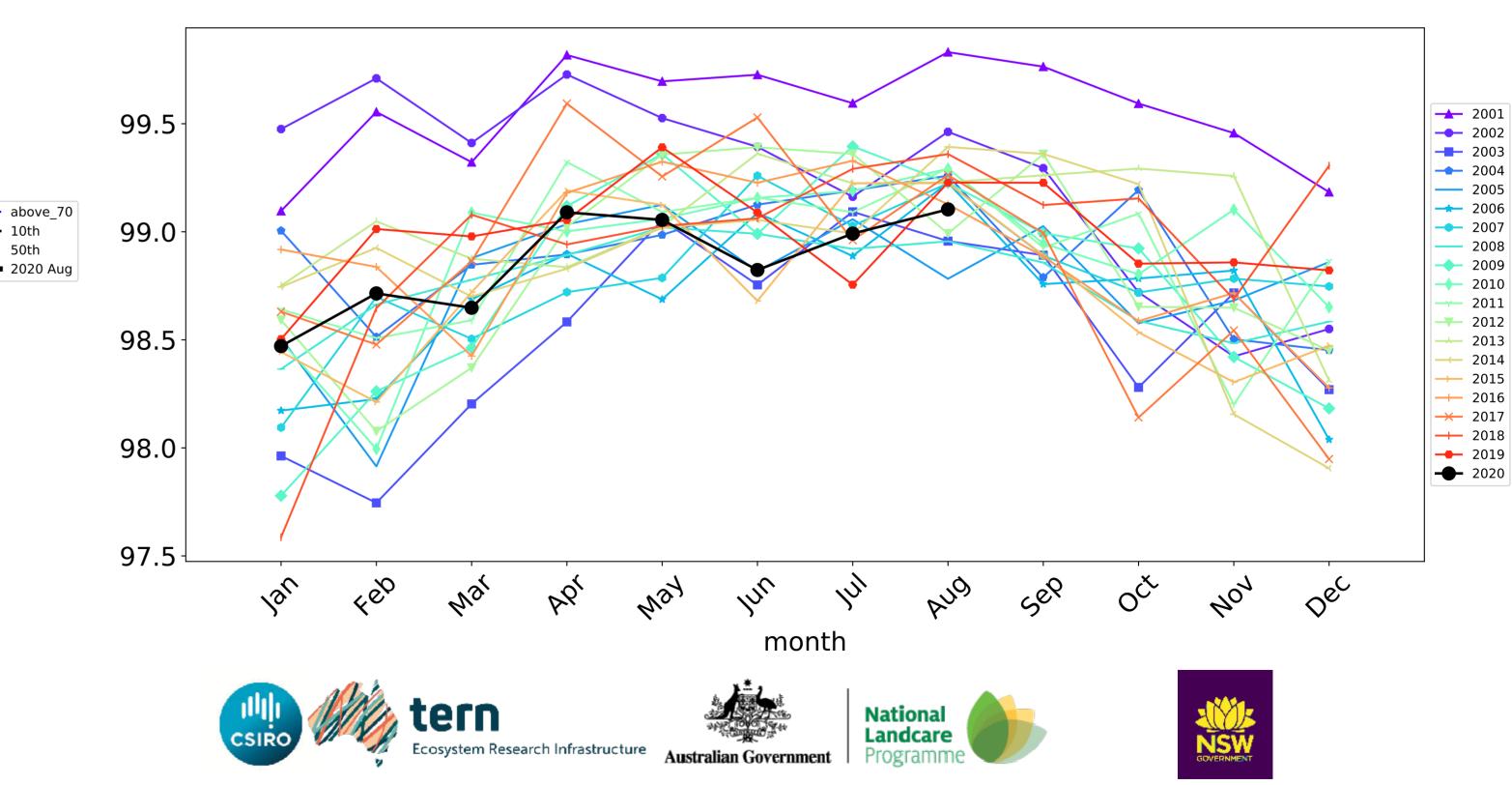




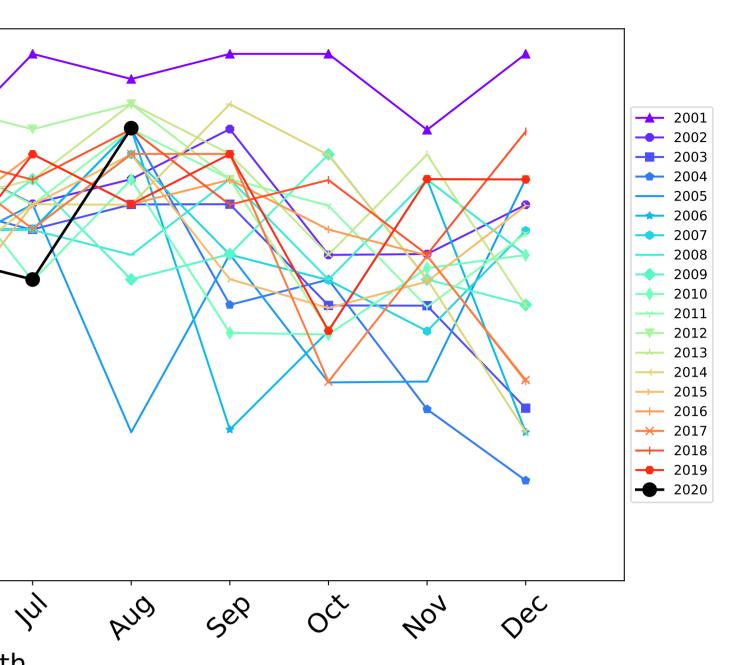
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

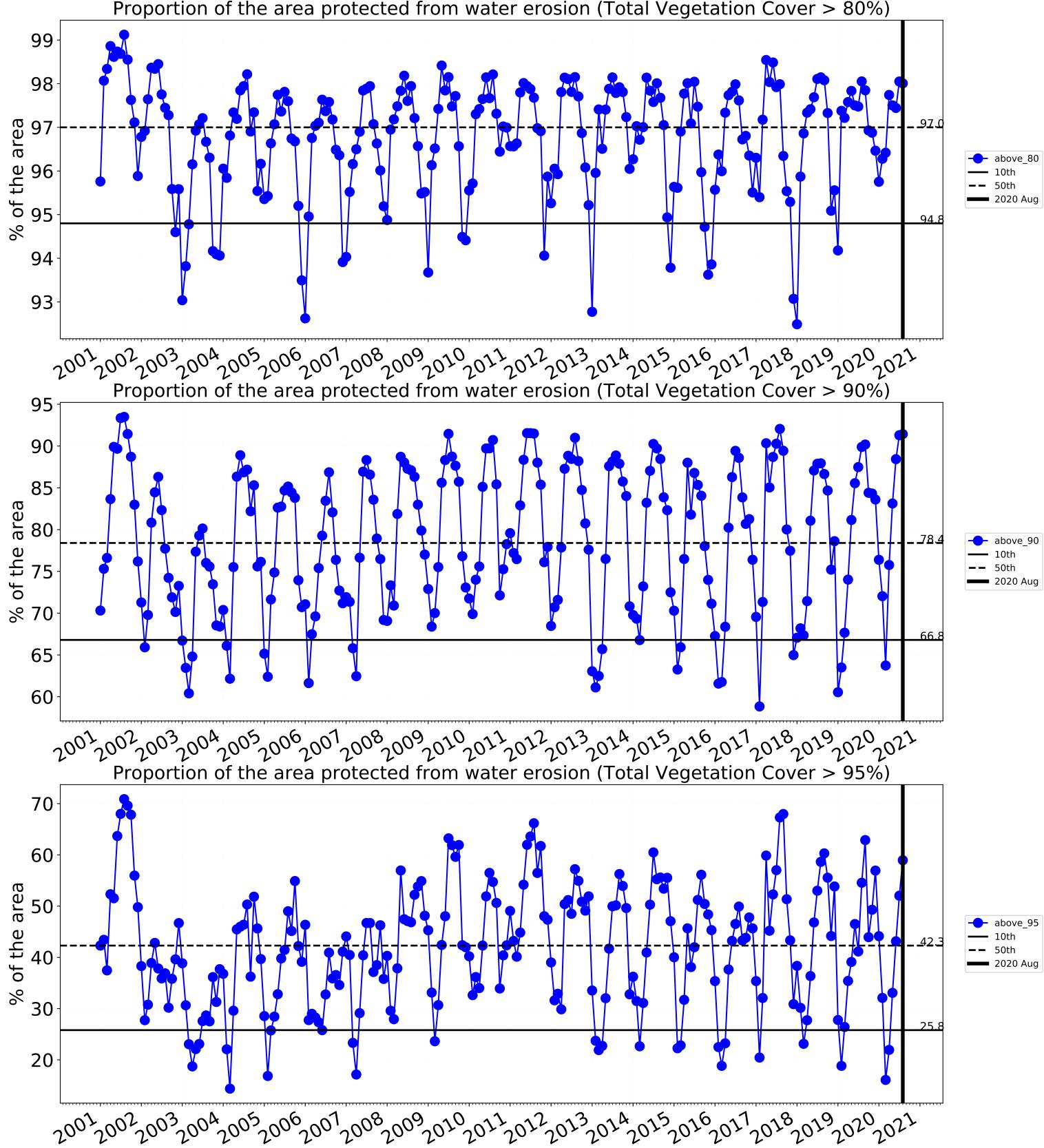




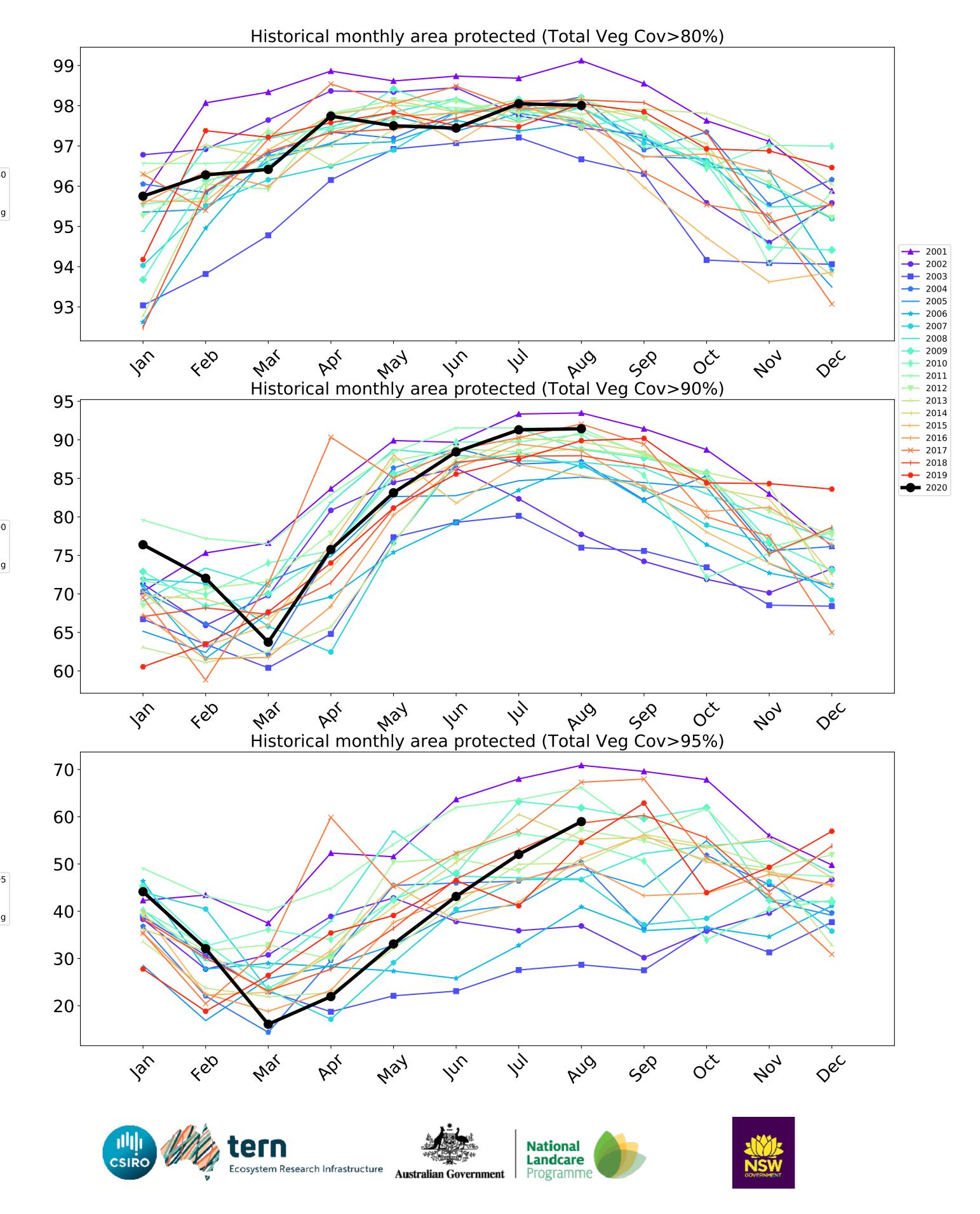
Wind erosion historical monthly area protected (Total Veg Cov >50%)



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

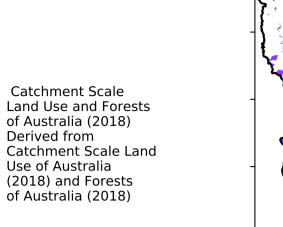


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



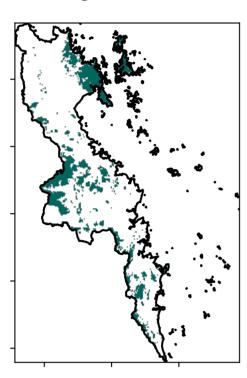
## **Conservation and natural environments Forest (non woodland)**

Land use and forest cover

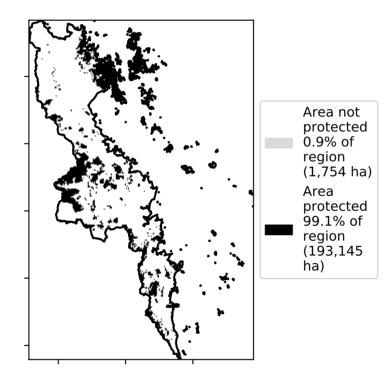


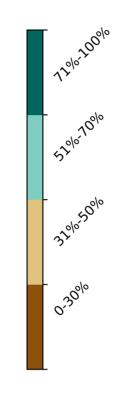
1 Conservation and natural environments – Nonwoodland forest

**Total Vegetation Cover [%]** 

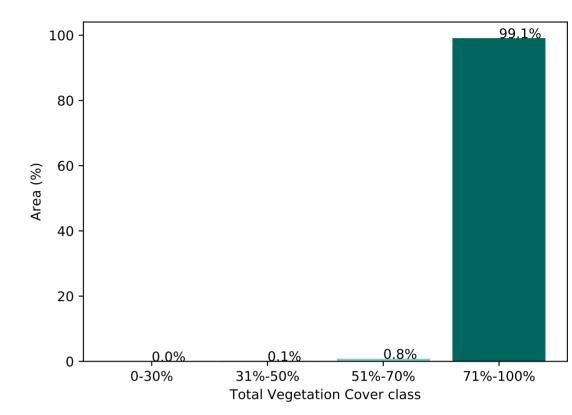




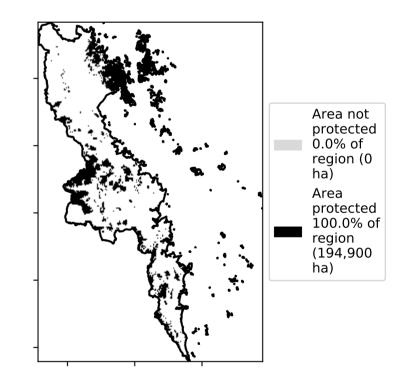




Proportion of vegetation cover class in area

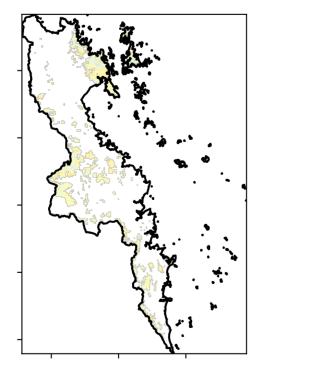


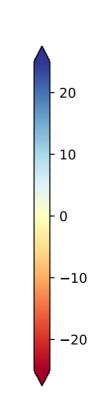
% Area protected from wind erosion (>50%)

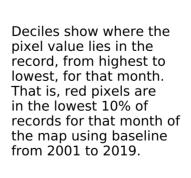


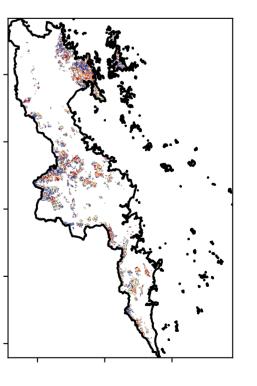
**Total Vegetation Cover Anomaly [%]** 

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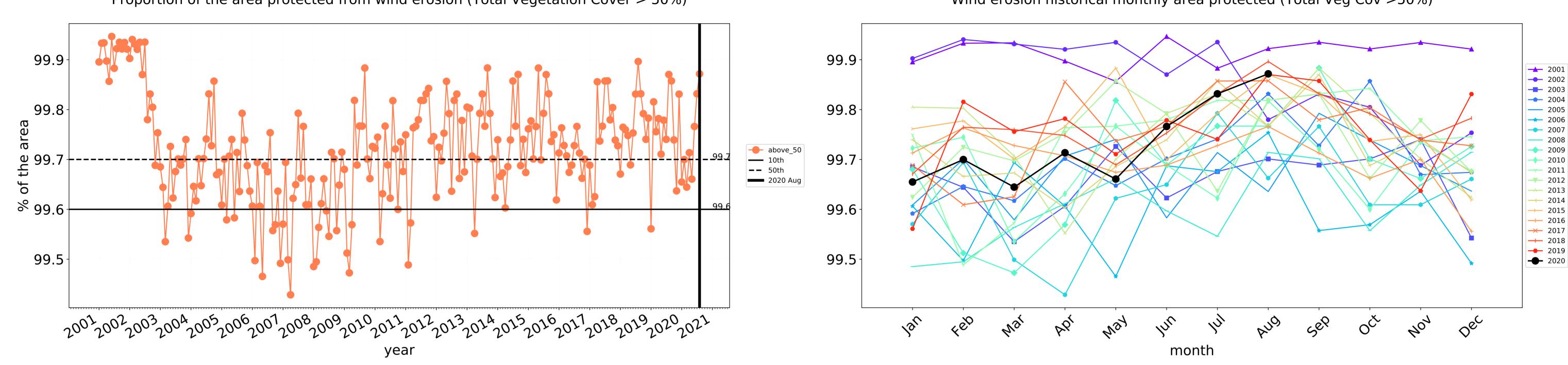






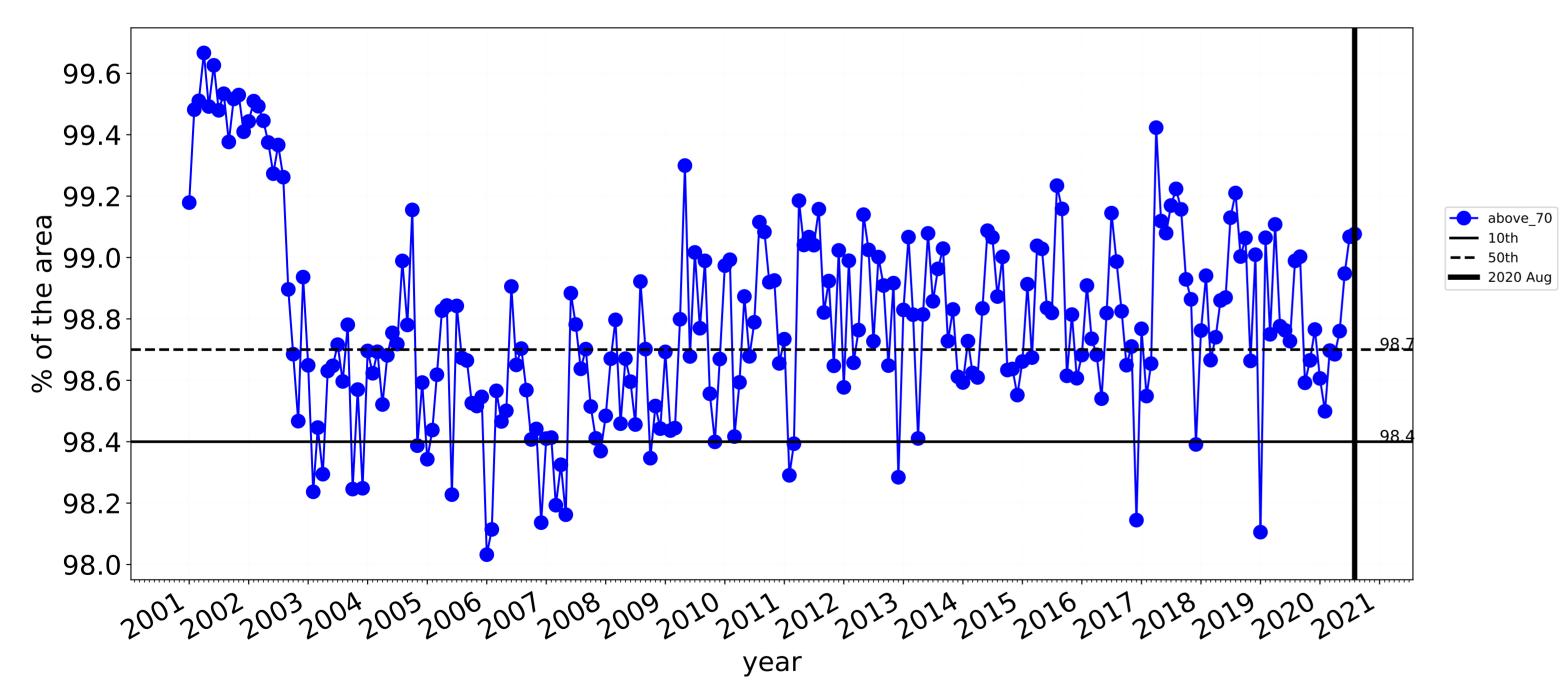


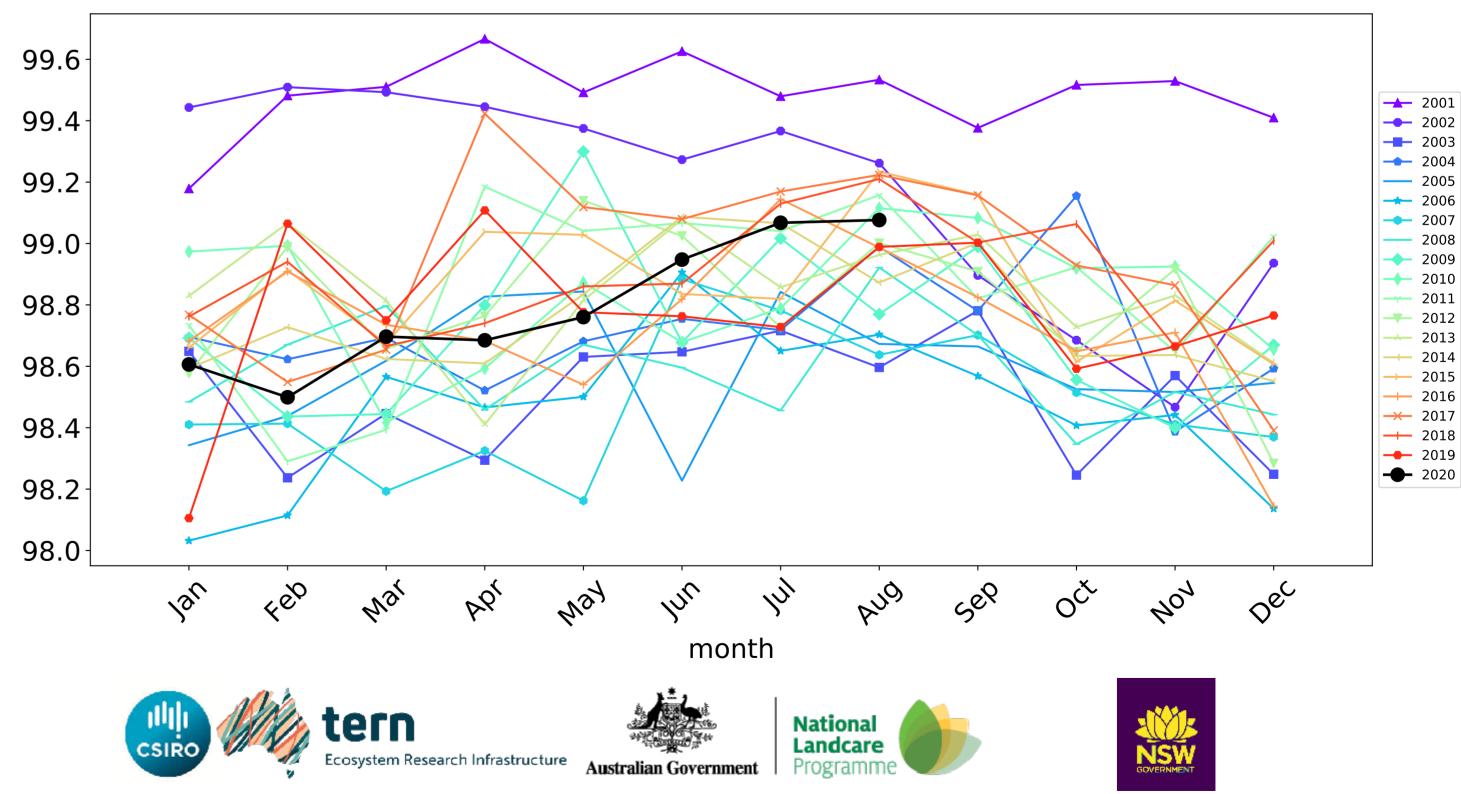




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

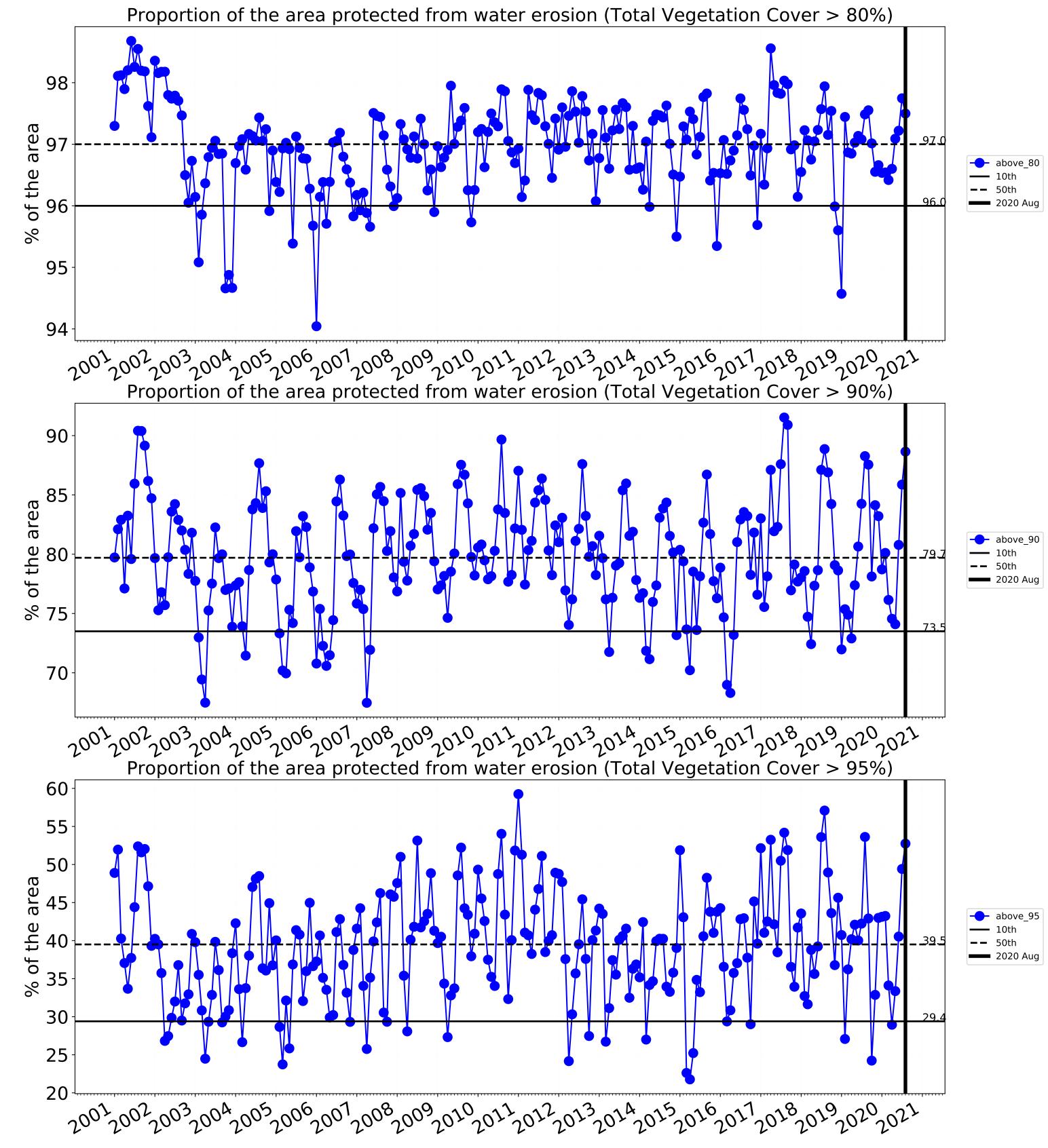
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

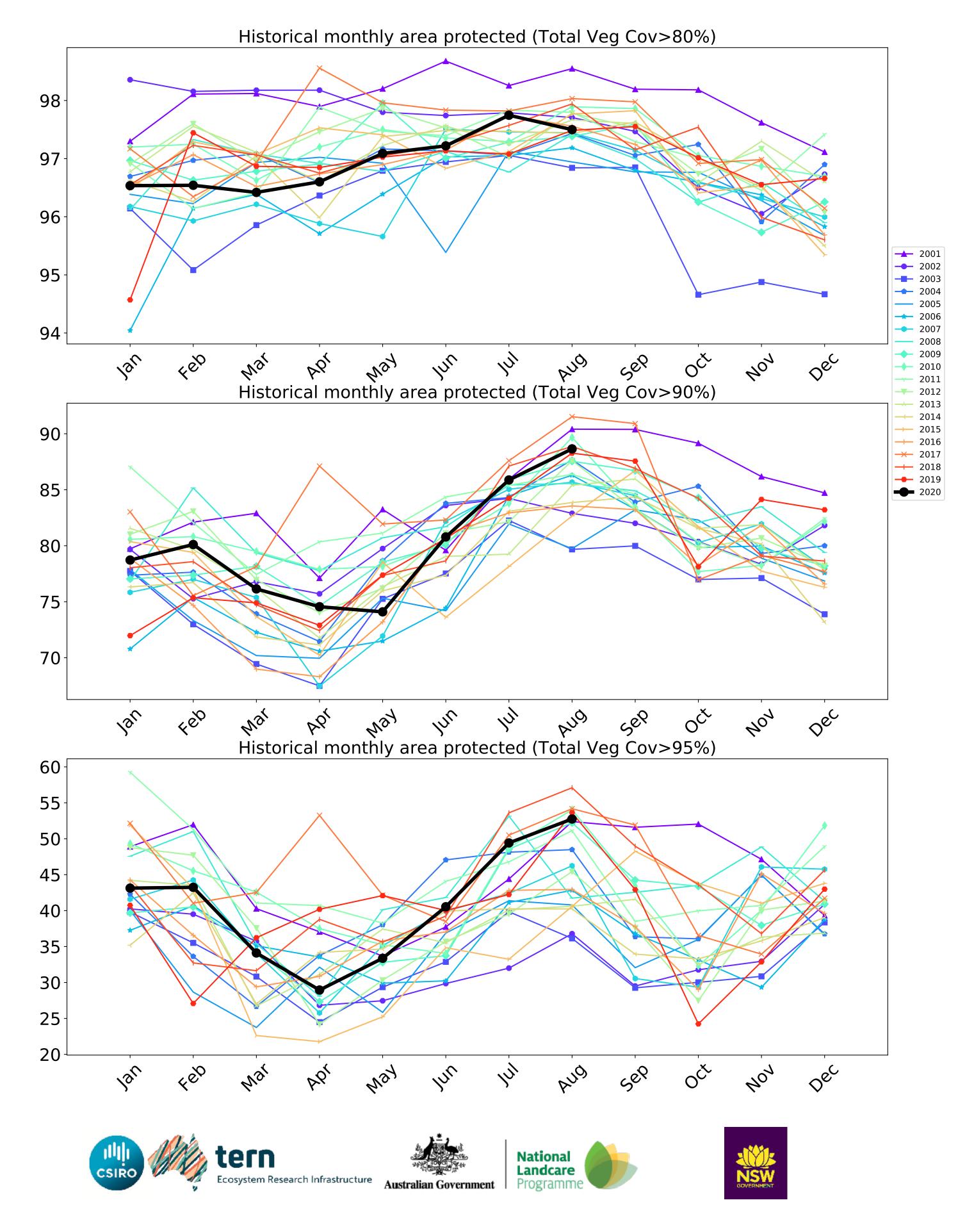




Wind erosion historical monthly area protected (Total Veg Cov >50%)

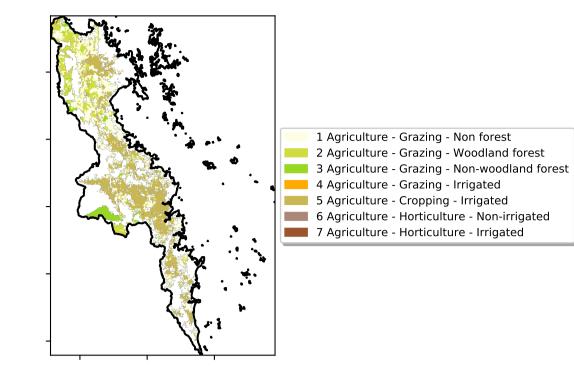
Water erosion historical monthly area protected (Total Veg Cov>70%)



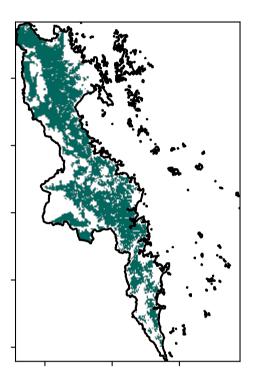


## Agriculture

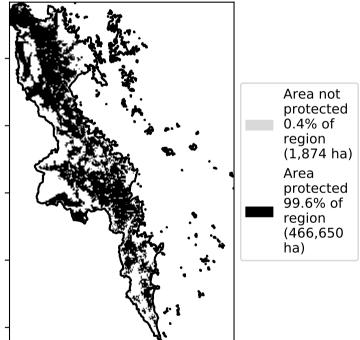
Land use and forest cover

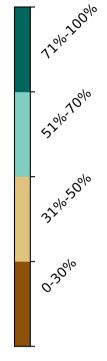


**Total Vegetation Cover [%]** 





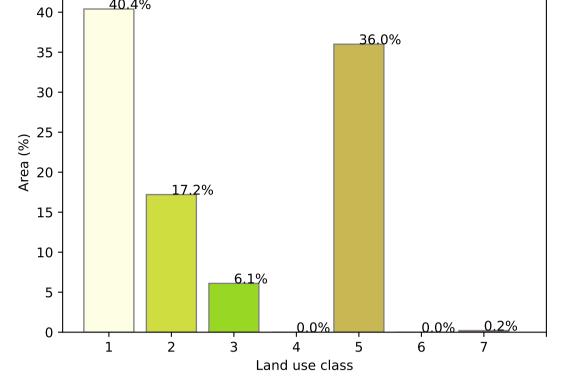




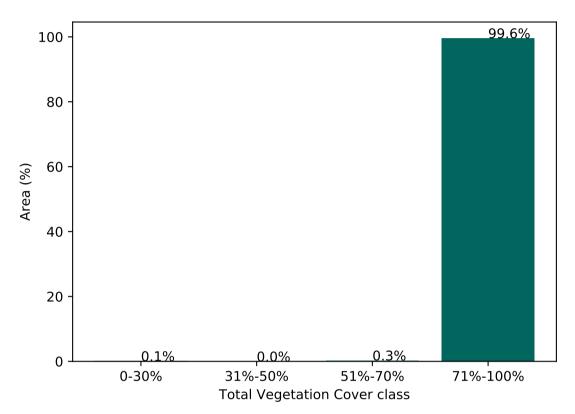


# 40.4%

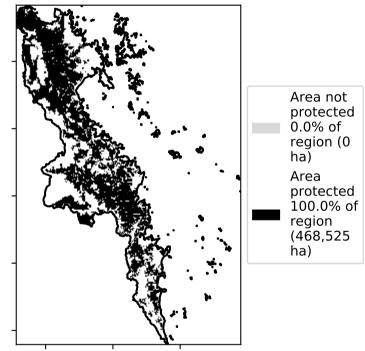
Proportion of each land class in area



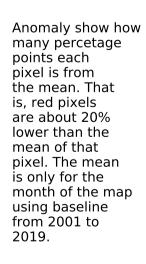
## Proportion of vegetation cover class in area



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



**Total Vegetation Cover Anomaly [%]** 



Catchment Scale

of Australia (2018)

Derived from

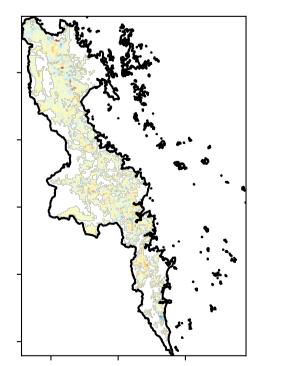
Use of Australia

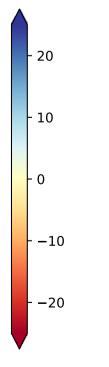
(2018) and Forests

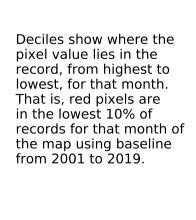
of Australia (2018)

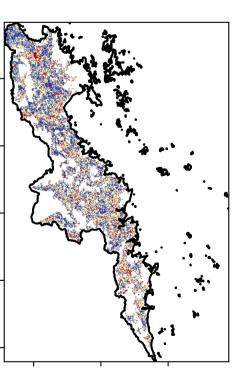
Land Use and Forests

Catchment Scale Land



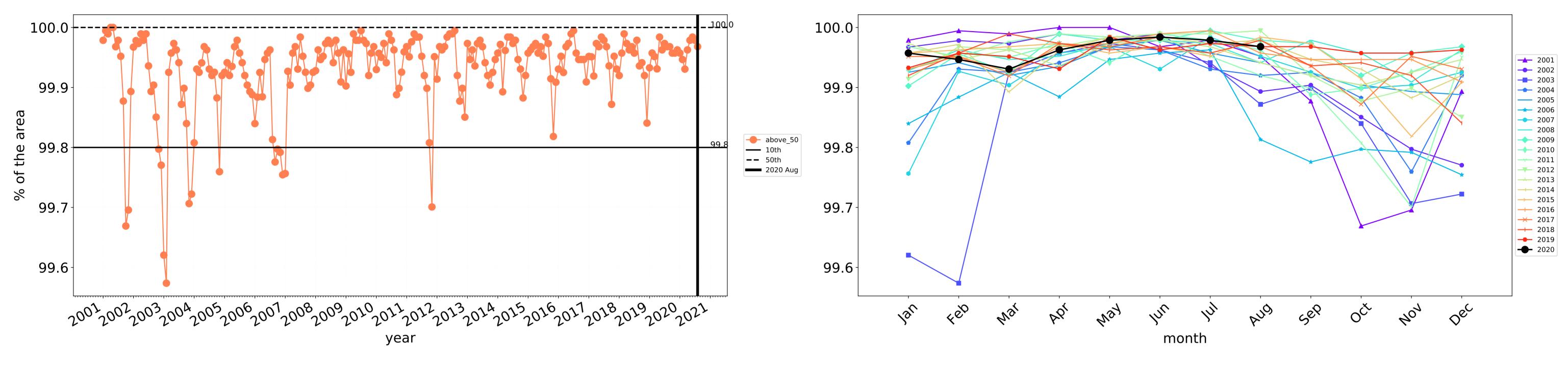












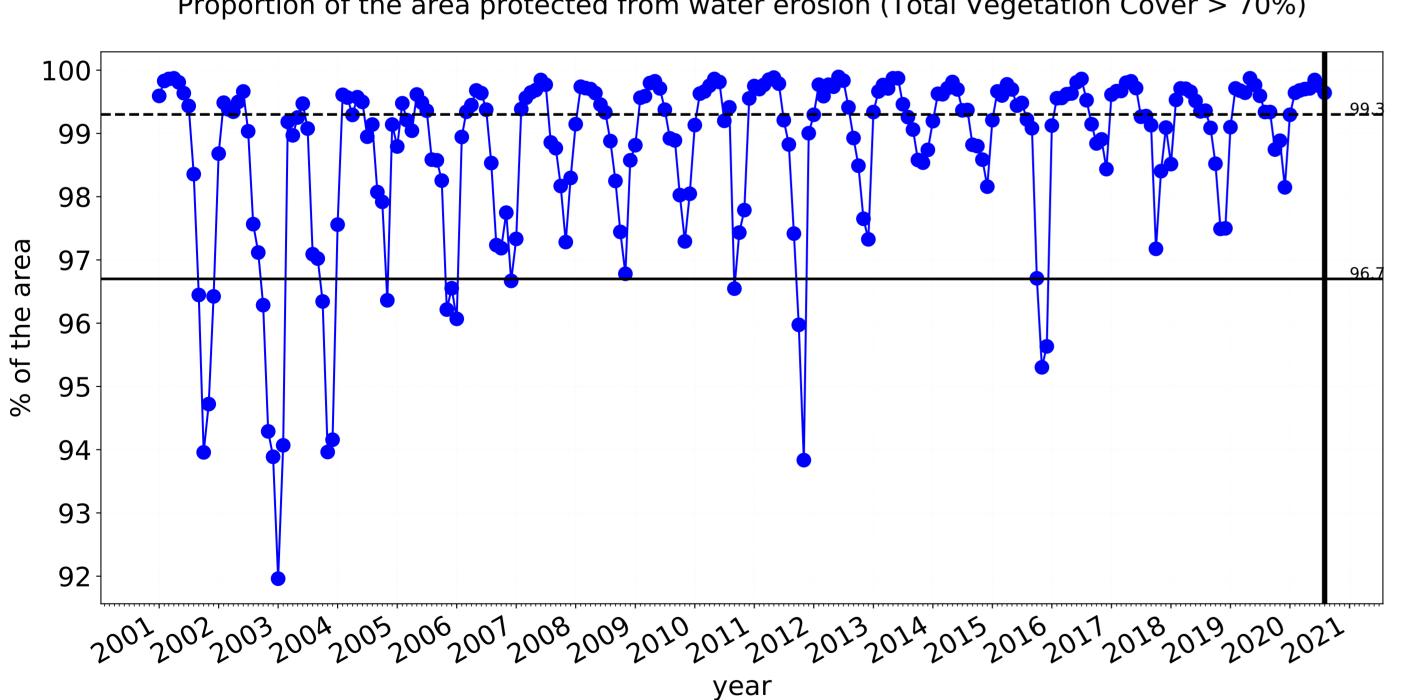
--- above\_70

**—** 2020 Aug

**——** 10th

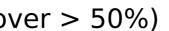
**——** 50th

Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



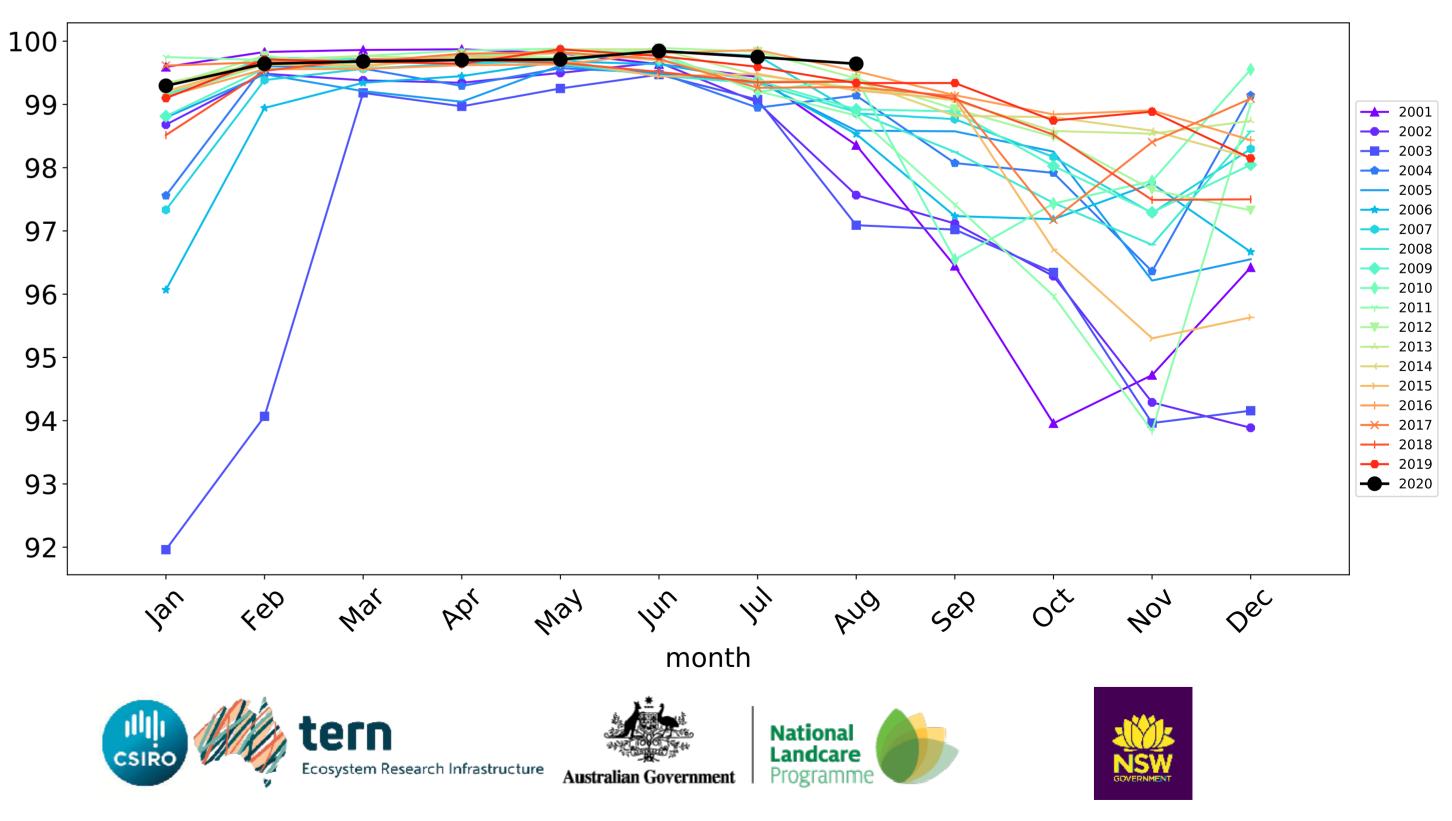
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

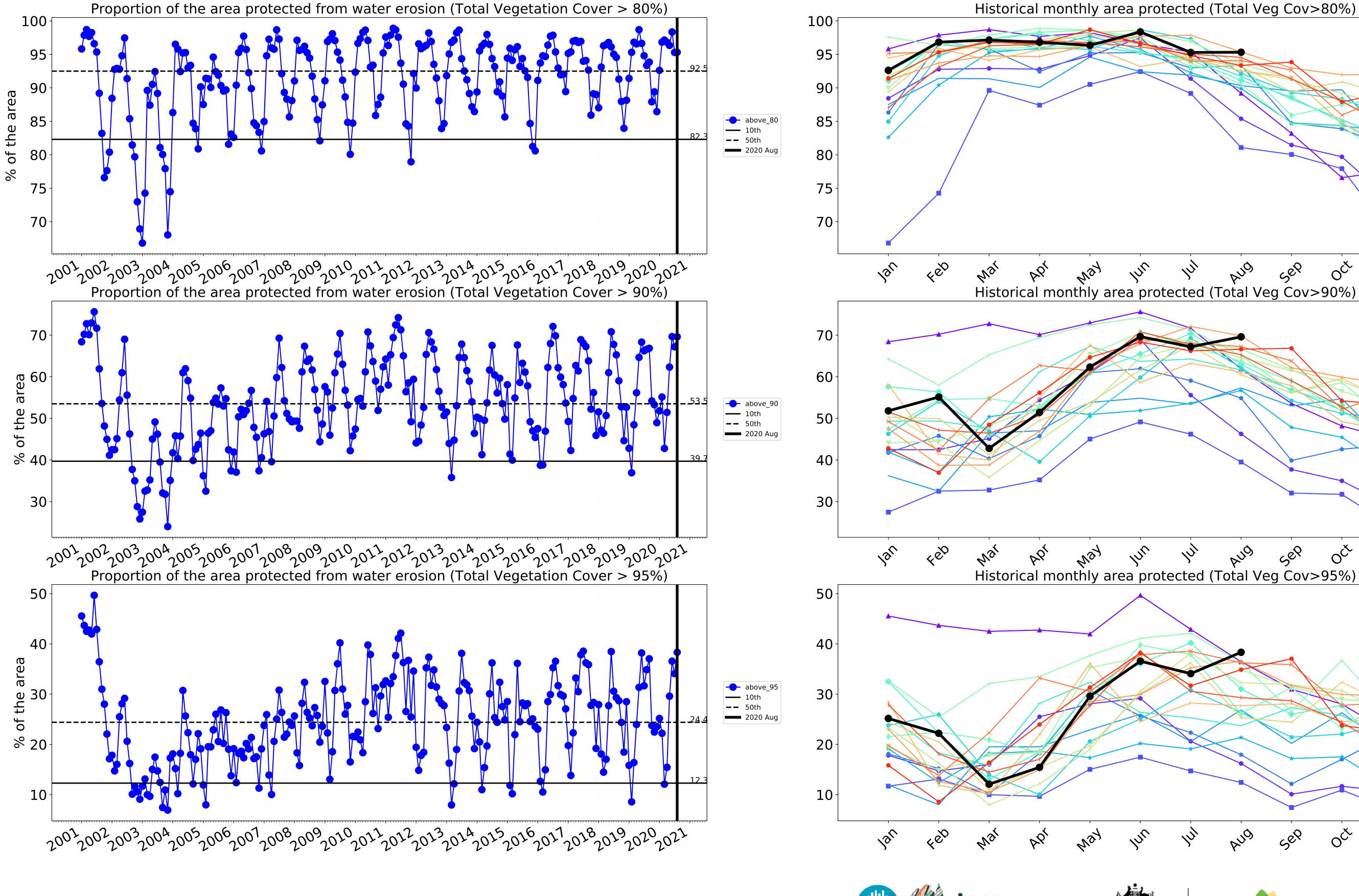
# Agriculture timeseries



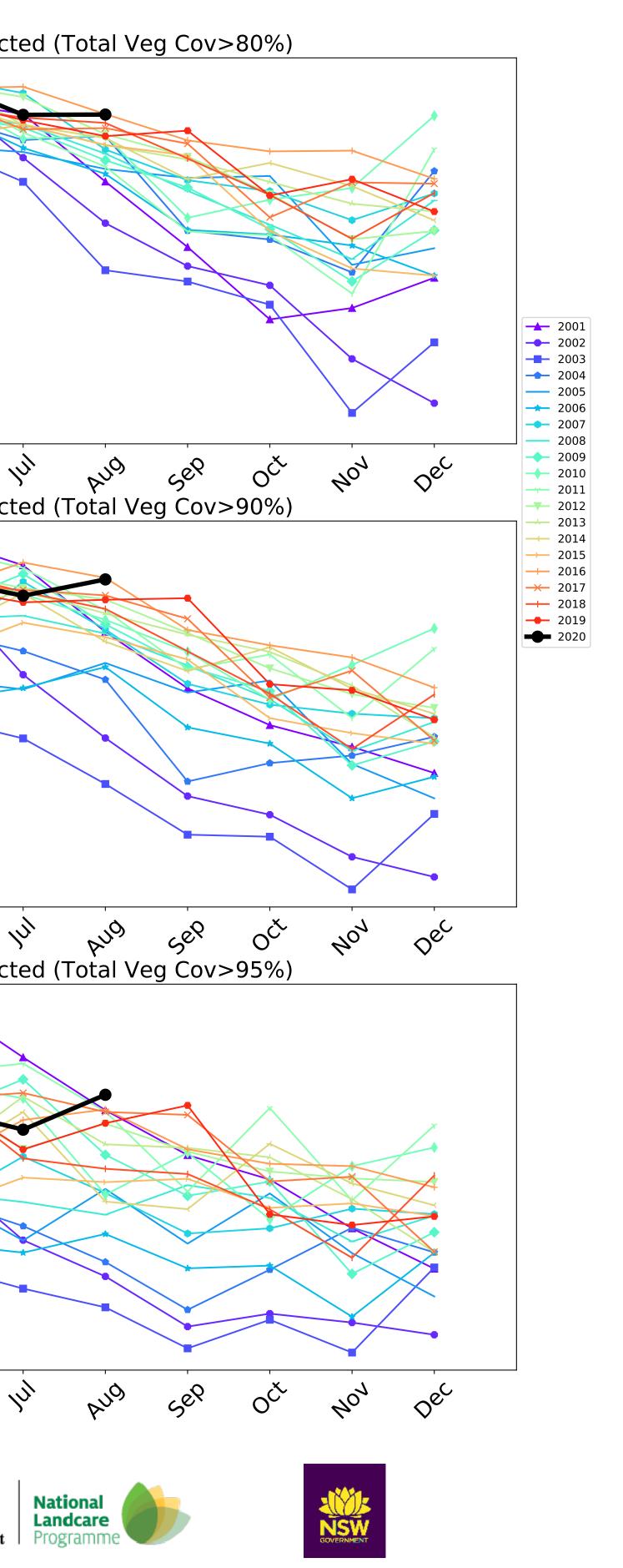
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



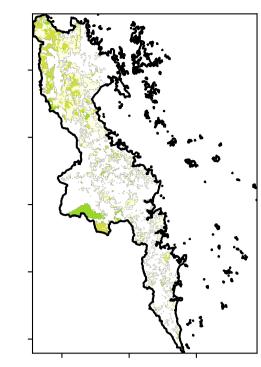




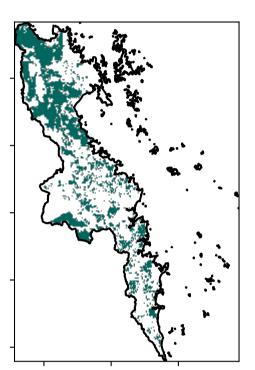


## Grazing

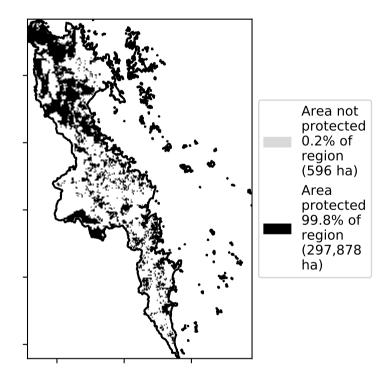
Land use and forest cover

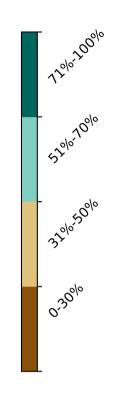


**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)

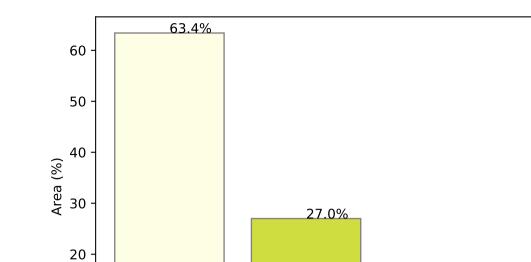




1 Agriculture - Grazing - Non forest

2 Agriculture - Grazing - Woodland forest

3 Agriculture - Grazing - Non-woodland forest



10

0

1

#### Proportion of each land class in area

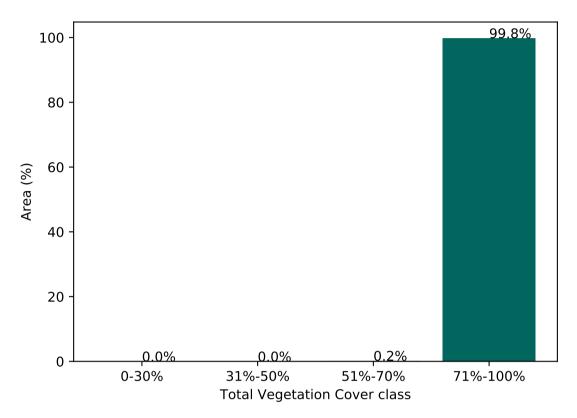
Proportion of vegetation cover class in area

Land use class

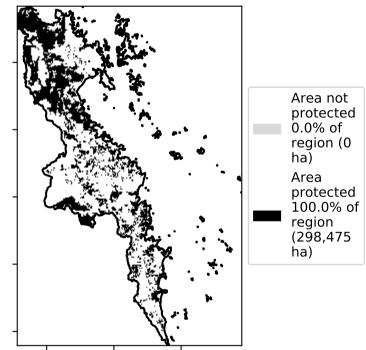
2

9.6%

3



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





**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 using baseline from 2001 to 2019.

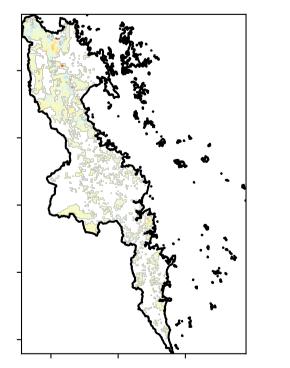
Catchment Scale Land Use and Forests of Australia (2018)

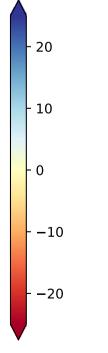
Catchment Scale Land

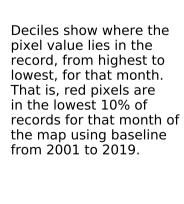
Derived from

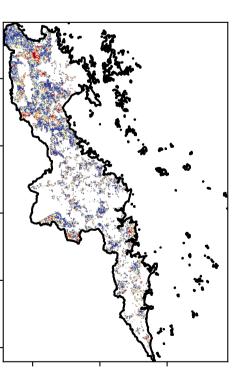
Use of Australia

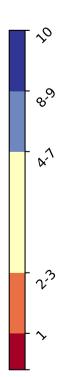
(2018) and Forests of Australia (2018)



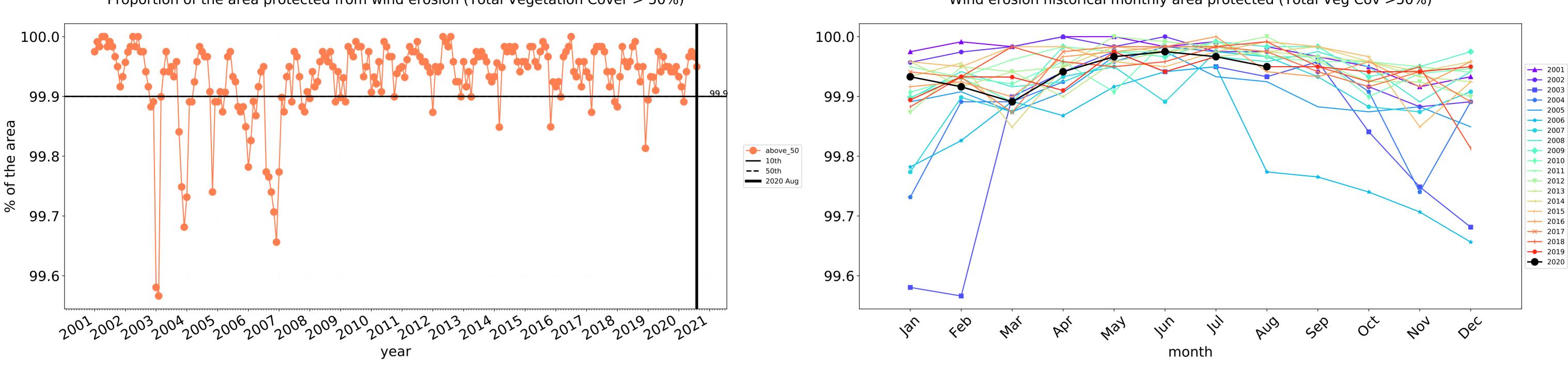






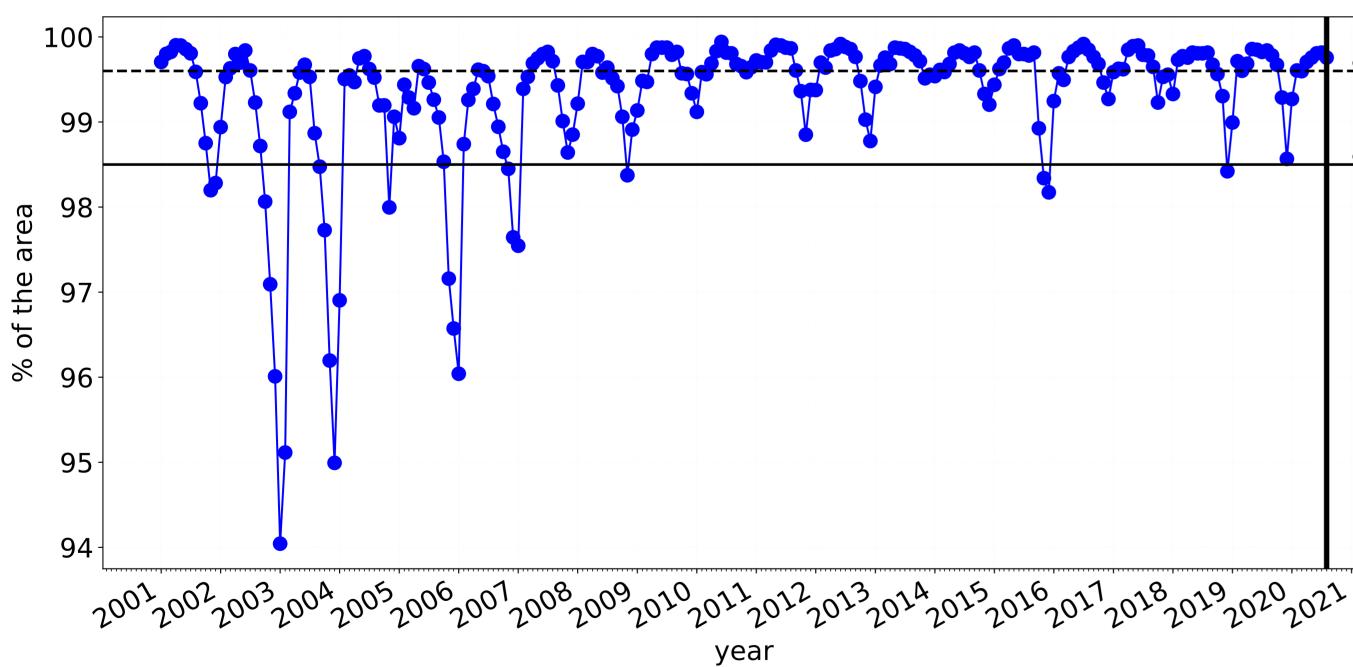






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



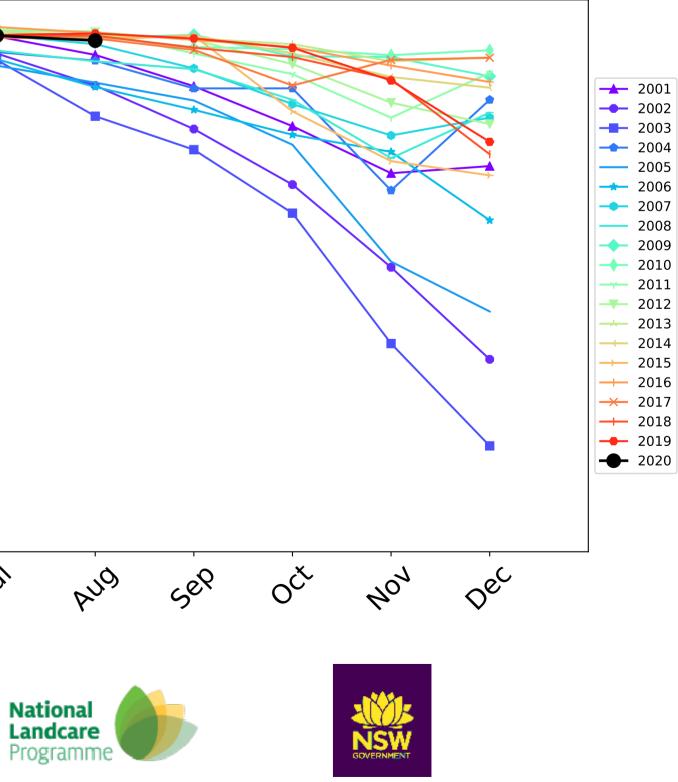


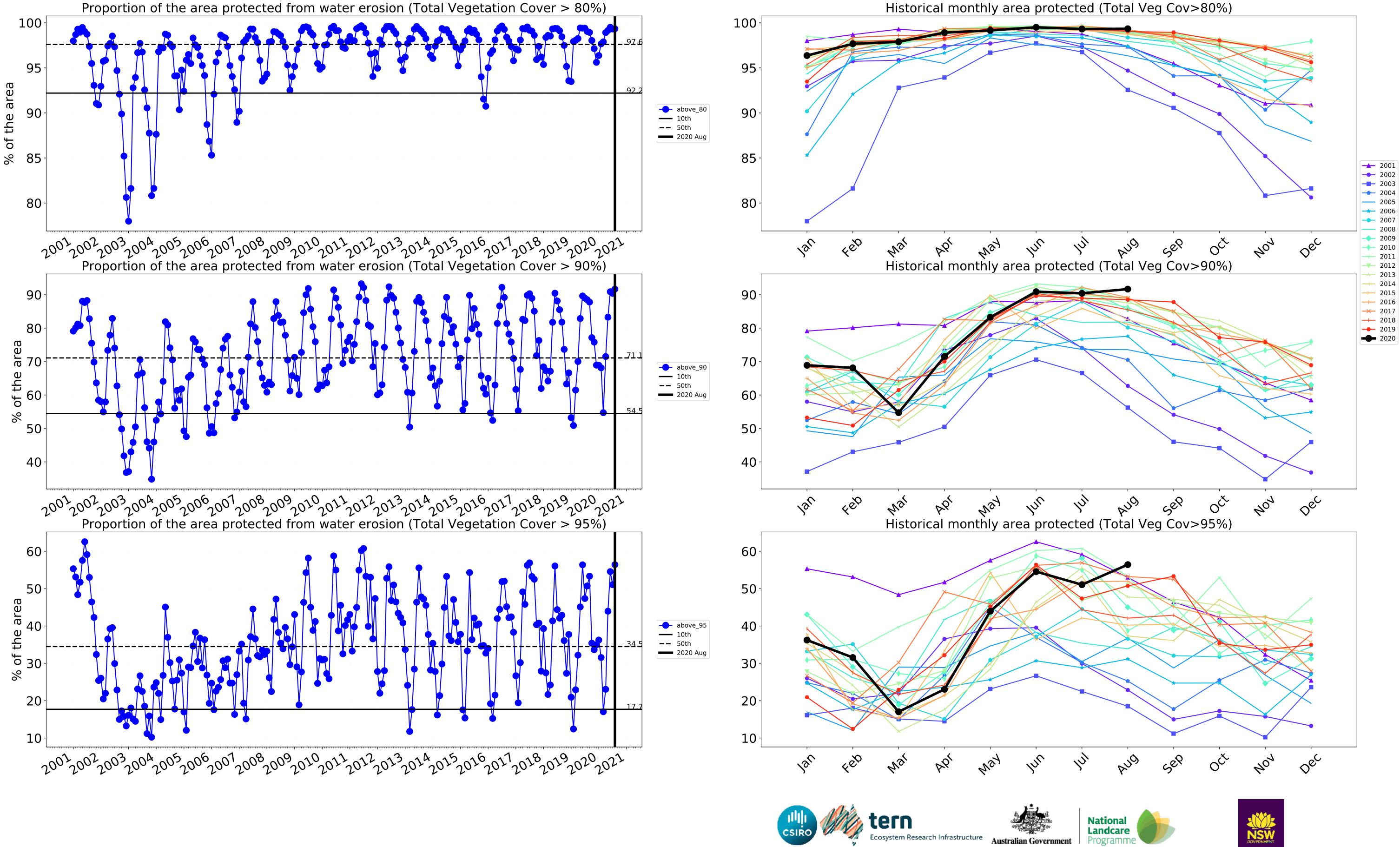
100-\_99.6 99 98 ---- above\_70 **—** 10th **——** 50th **—** 2020 Aug 97 96 95 94 Par 4eb way PQ In In In Mai month tern Ecosystem Research Infrastructure Australian Government

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

23

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

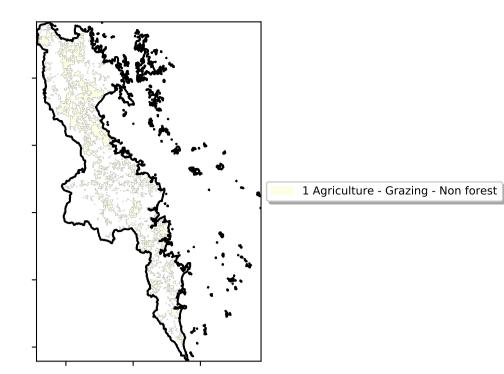




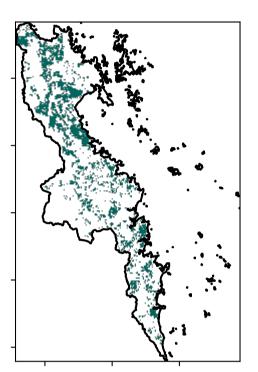
Australian Government

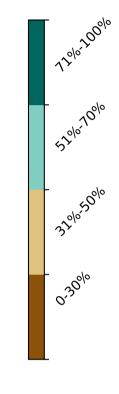
## **Grazing non forest**

Land use and forest cover

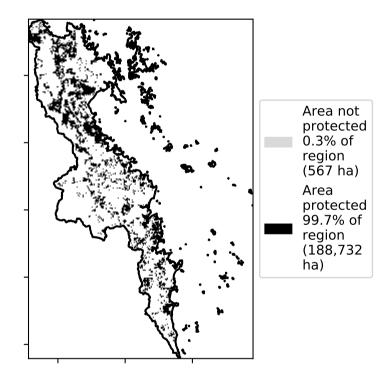


**Total Vegetation Cover [%]** 

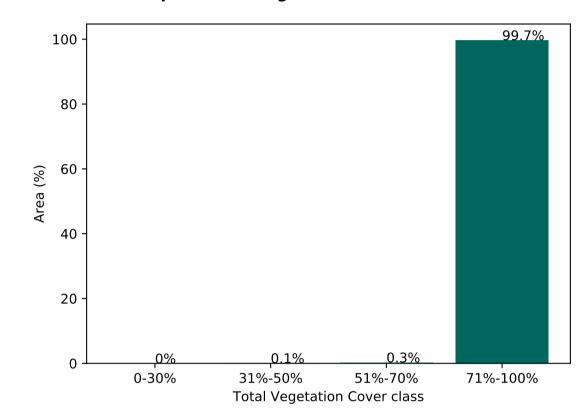




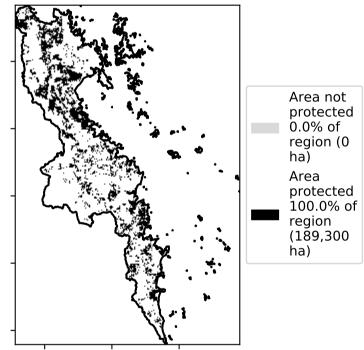
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



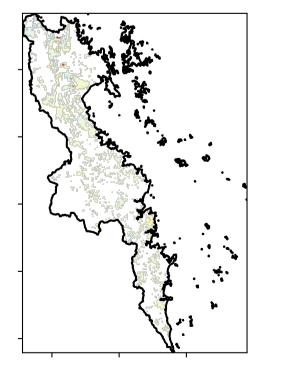
% Area protected from wind erosion (>50%)

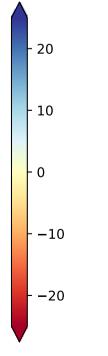


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

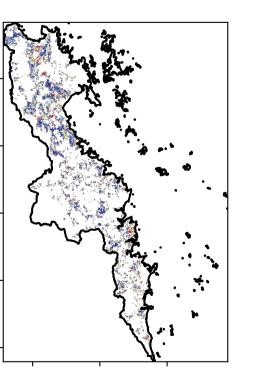
**Total Vegetation Cover Anomaly [%]** 

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 using baseline from 2001 to 2019.



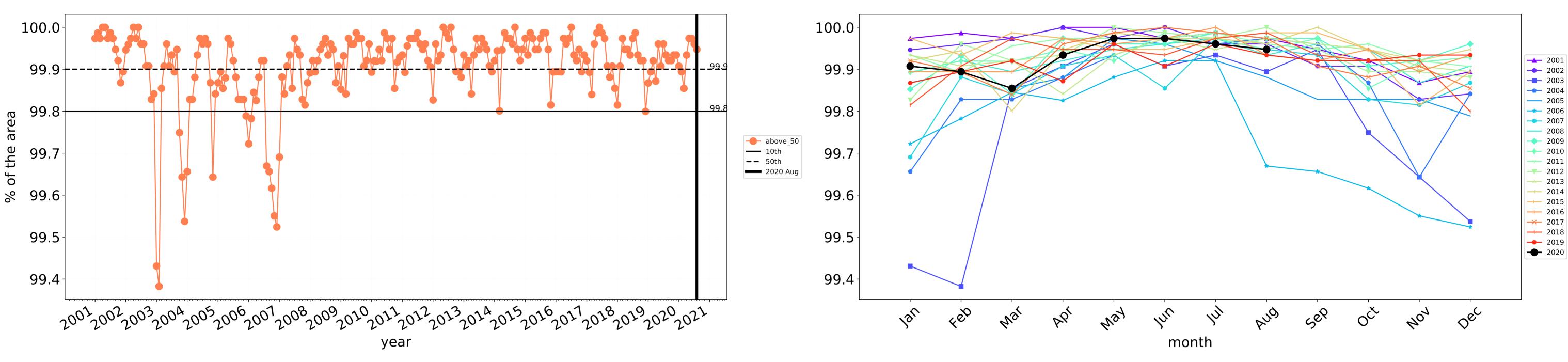






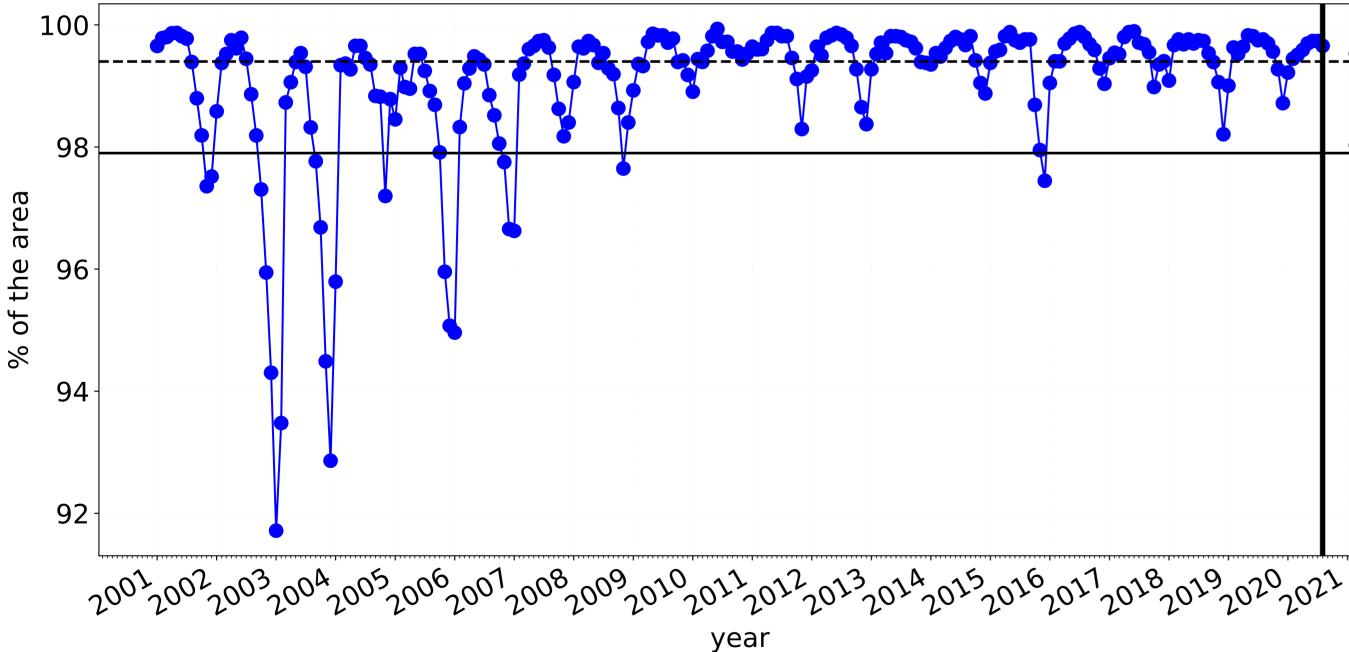






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



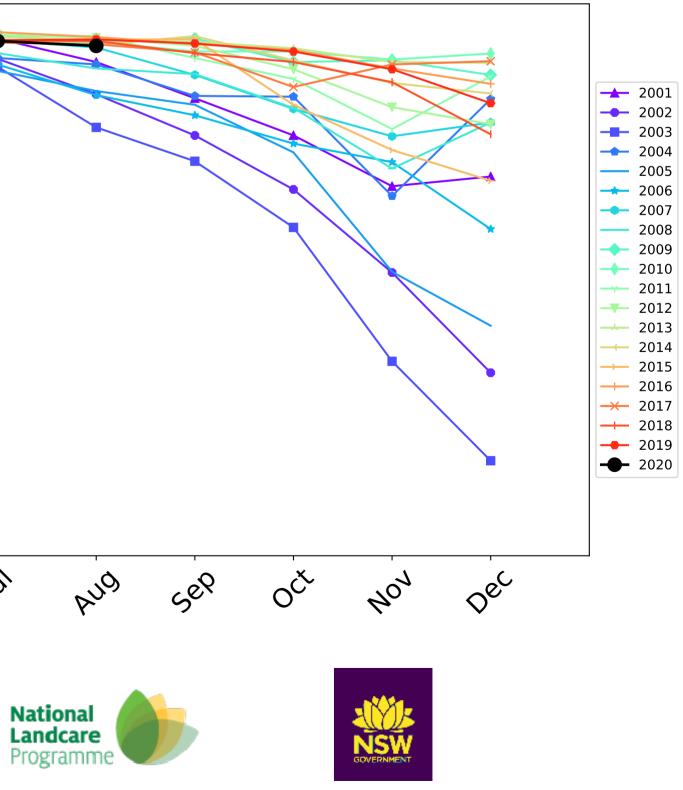


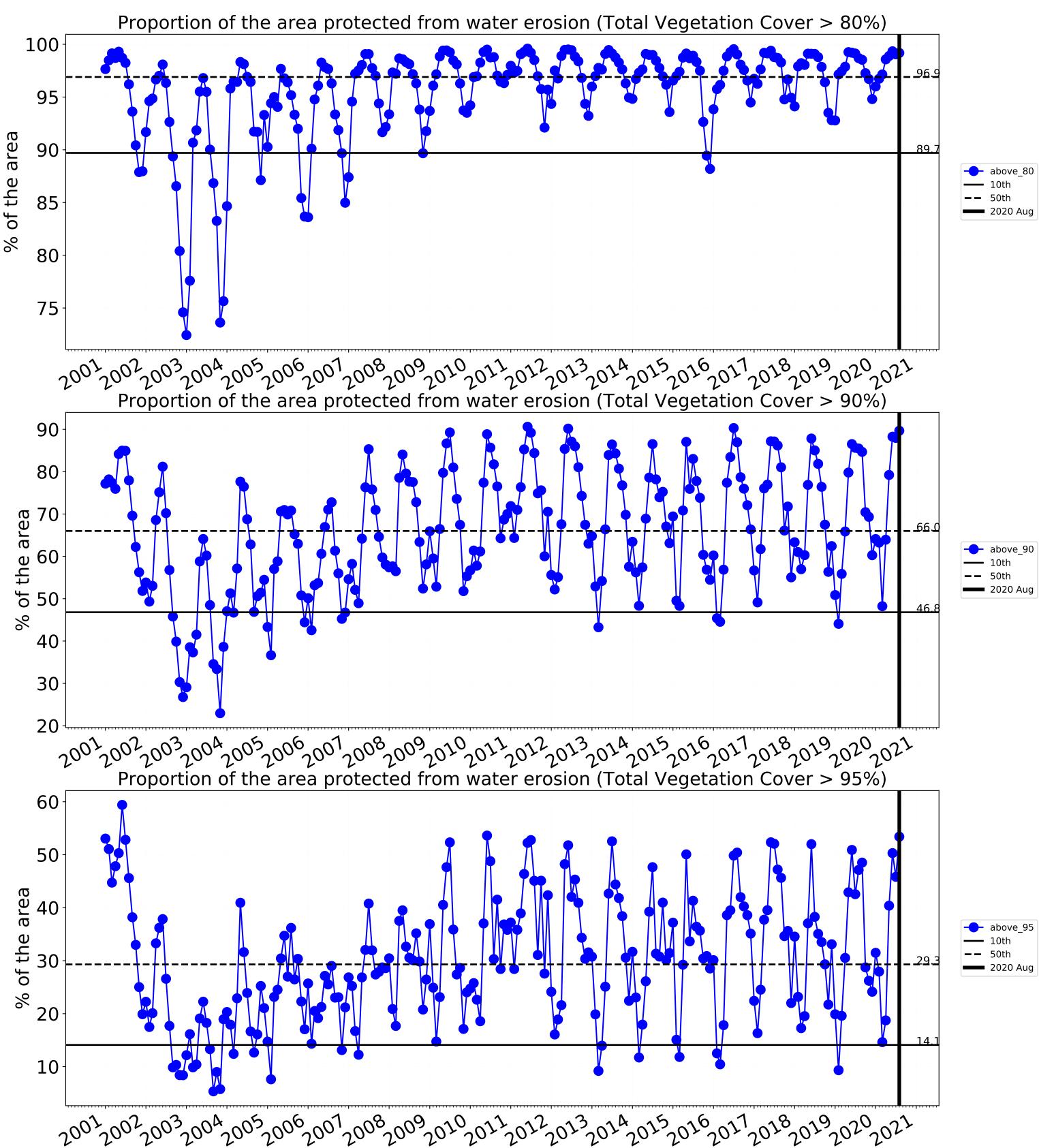
# Grazing non forest timeseries

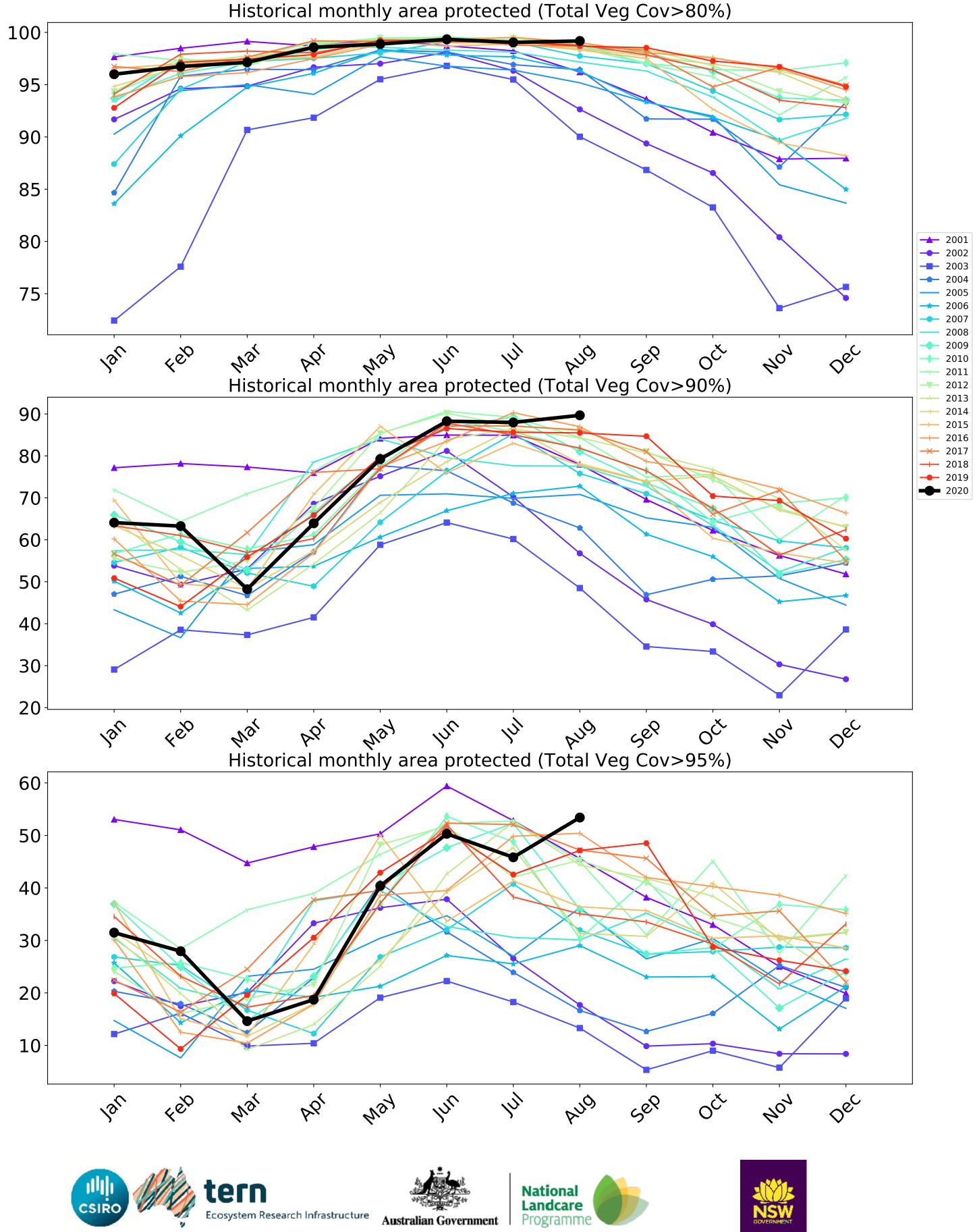
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100-99. 98 97.0 --- above\_70 **—** 10th **——** 50th **—** 2020 Aug 96 94 92 Jan 4eb way PQ In 1<sup>1</sup>1 Mai month tern Ecosystem Research Infrastructure Australian Government

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



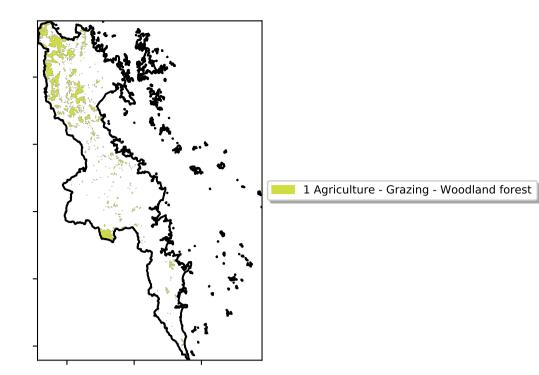




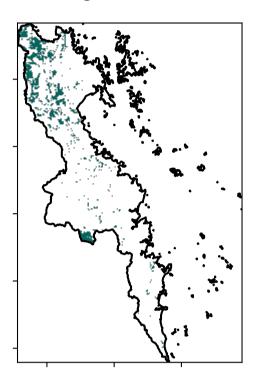


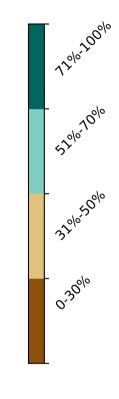
## **Grazing Woodland forest**

Land use and forest cover

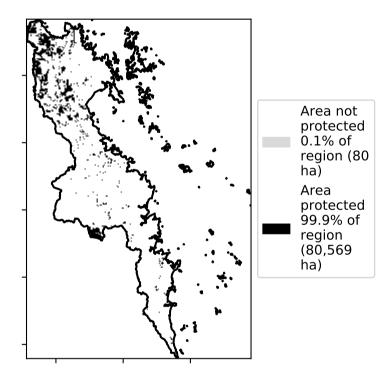


**Total Vegetation Cover [%]** 

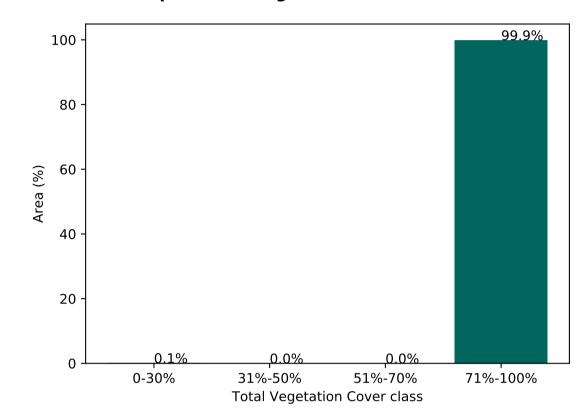




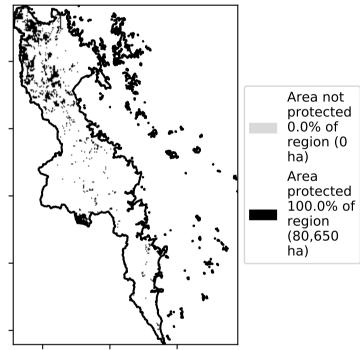
% Area protected from water erosion (>70%)

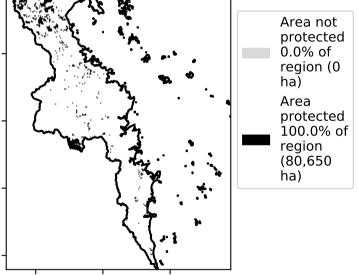


Proportion of vegetation cover class in area



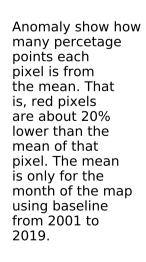
% Area protected from wind erosion (>50%)

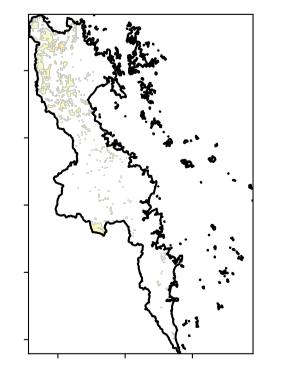


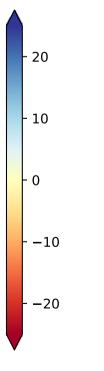


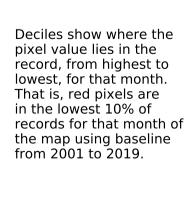
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

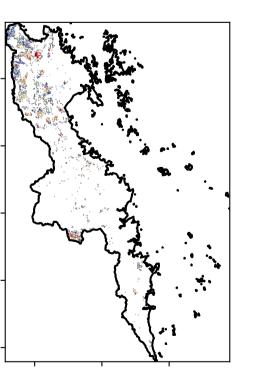
**Total Vegetation Cover Anomaly [%]** 

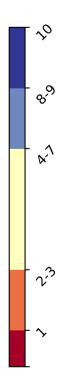




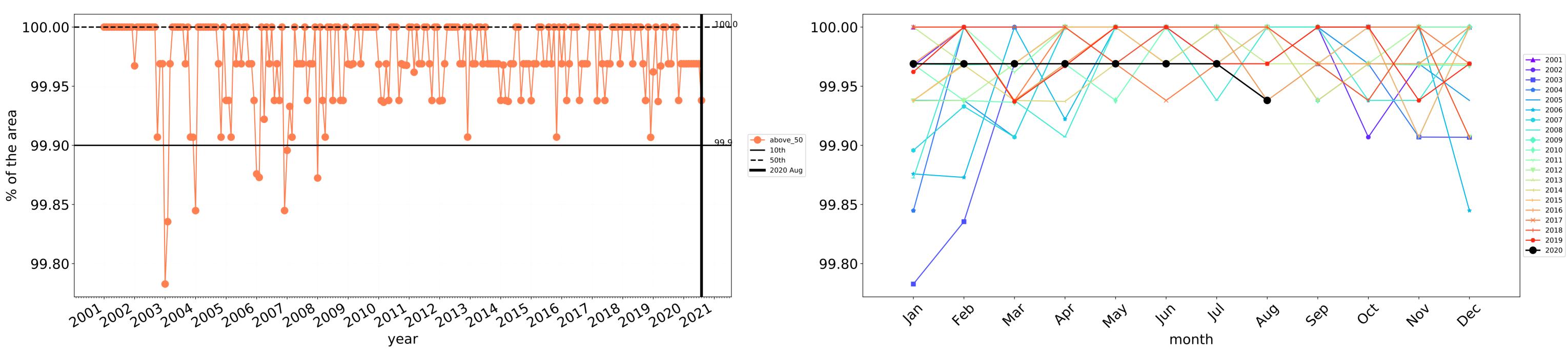






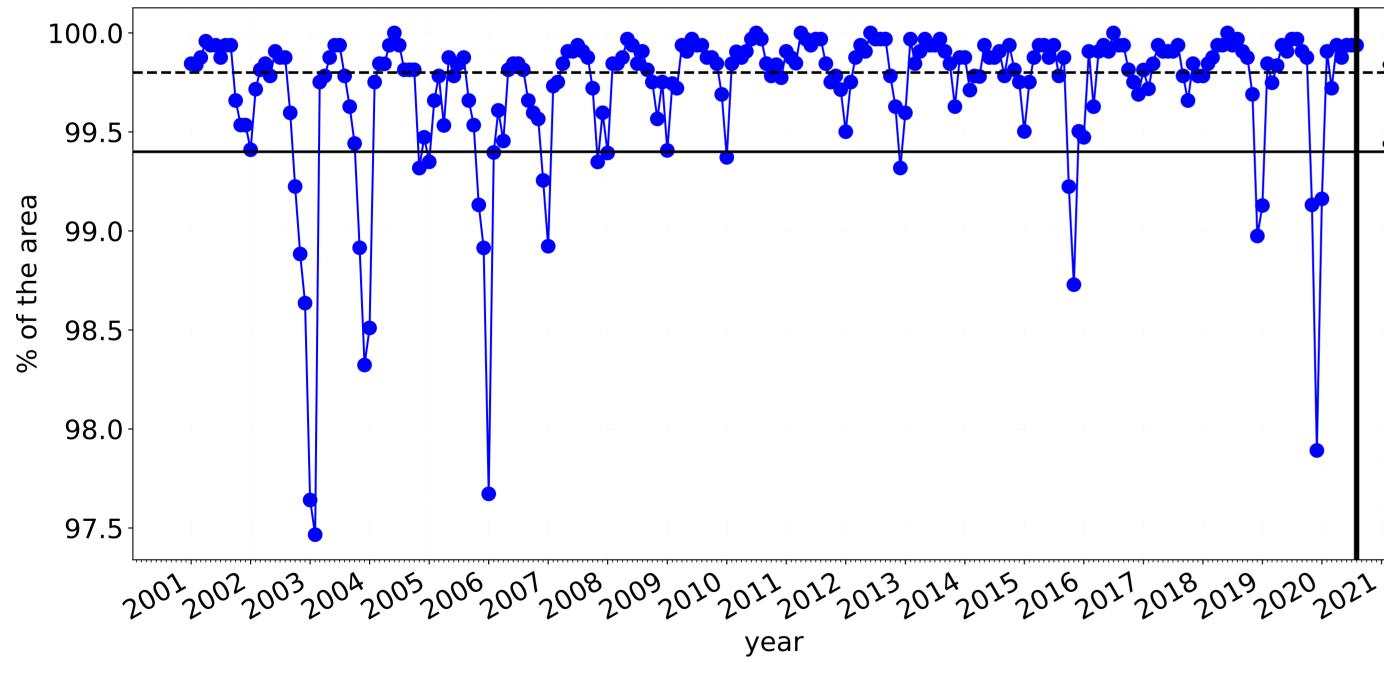


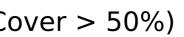




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



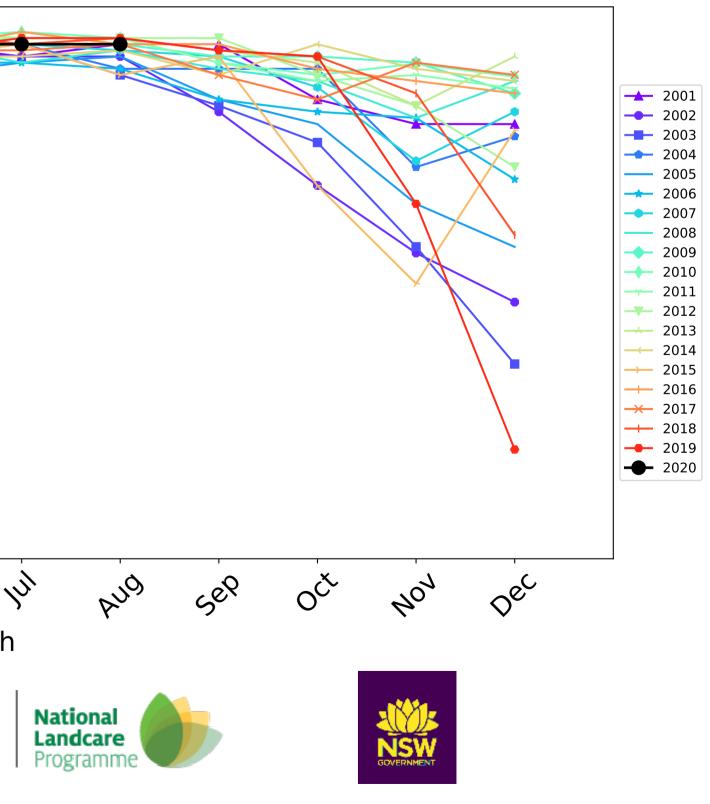


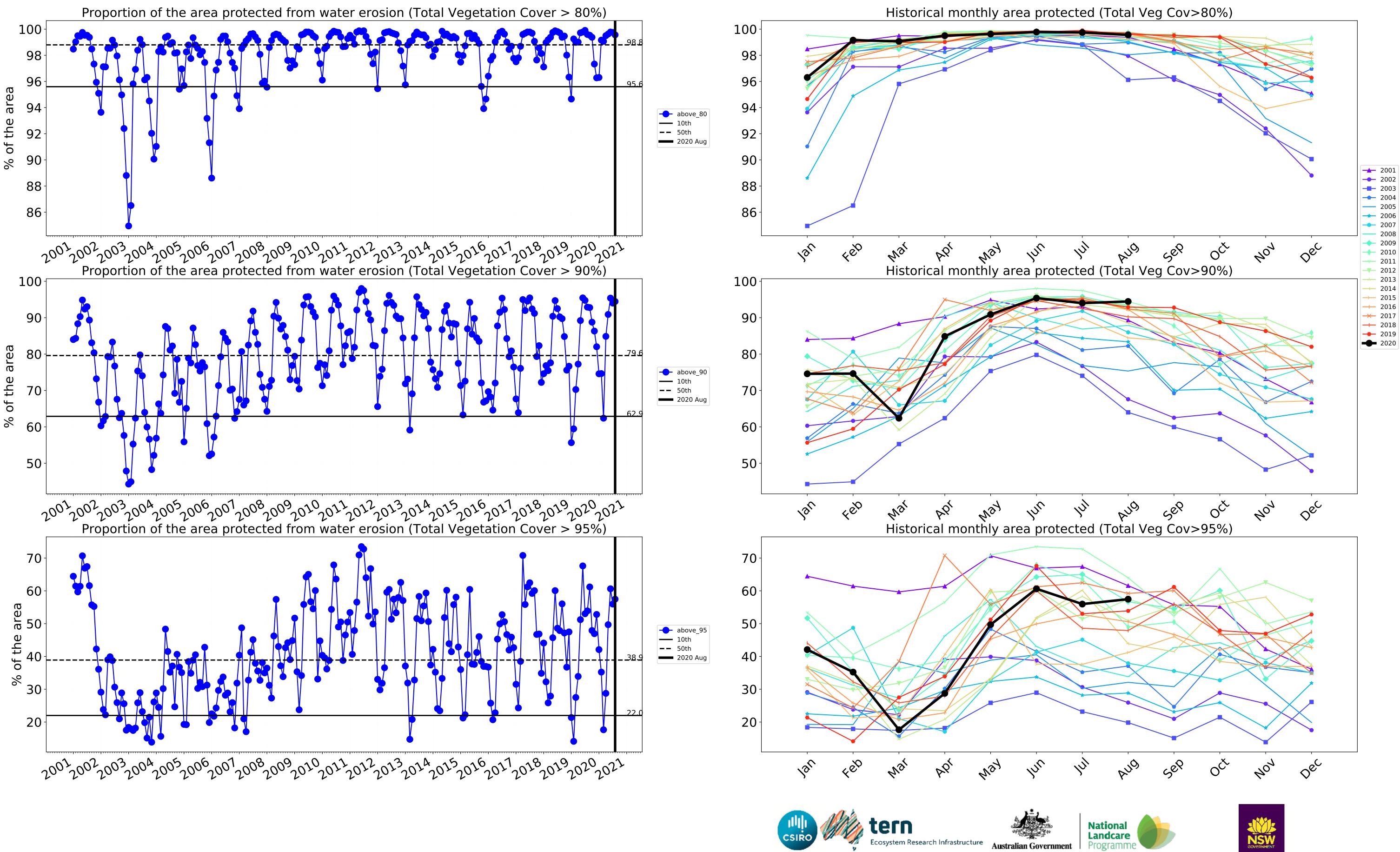
Wind erosion historical monthly area protected (Total Veg Cov >50%)



100.0-99.5 ---- above\_70 **—** 10th 99.0 **--** 50th 98.5 98.0 97.5 feb 1ar In P.Q' May Mai month tern Ecosystem Research Infrastructure Australian Government

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

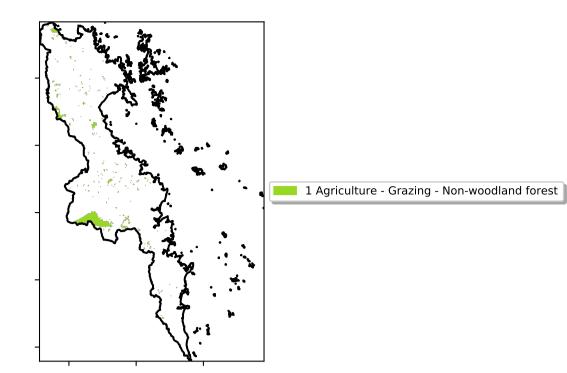




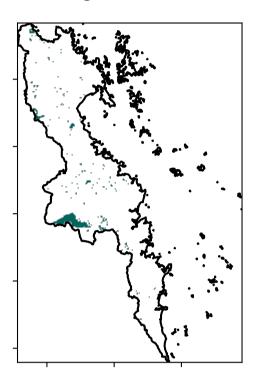
csire tern Ecosystem Research Infrastructure Australian Government

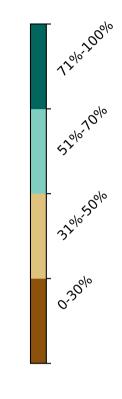
## **Grazing - Forest (non woodland)**

Land use and forest cover

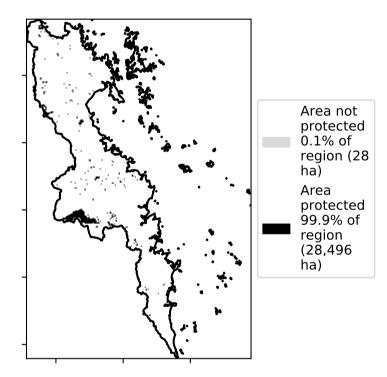


Total Vegetation Cover [%]

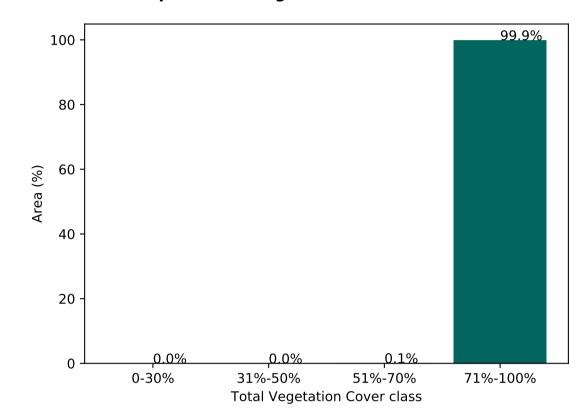




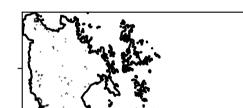
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



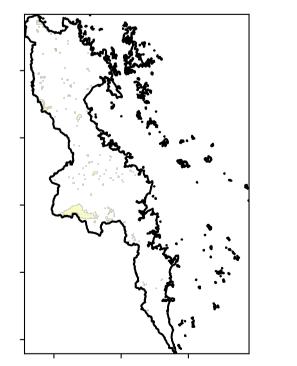
% Area protected from wind erosion (>50%)

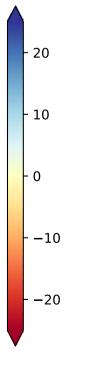


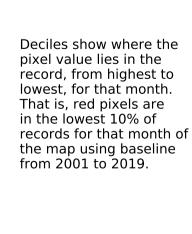
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

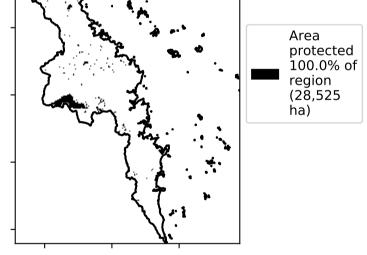
**Total Vegetation Cover Anomaly [%]** 

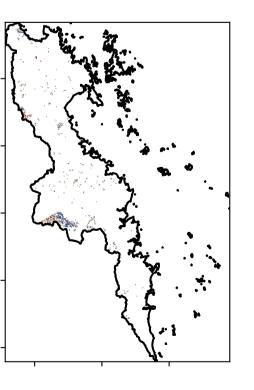
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

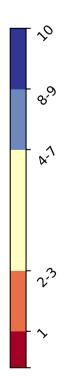




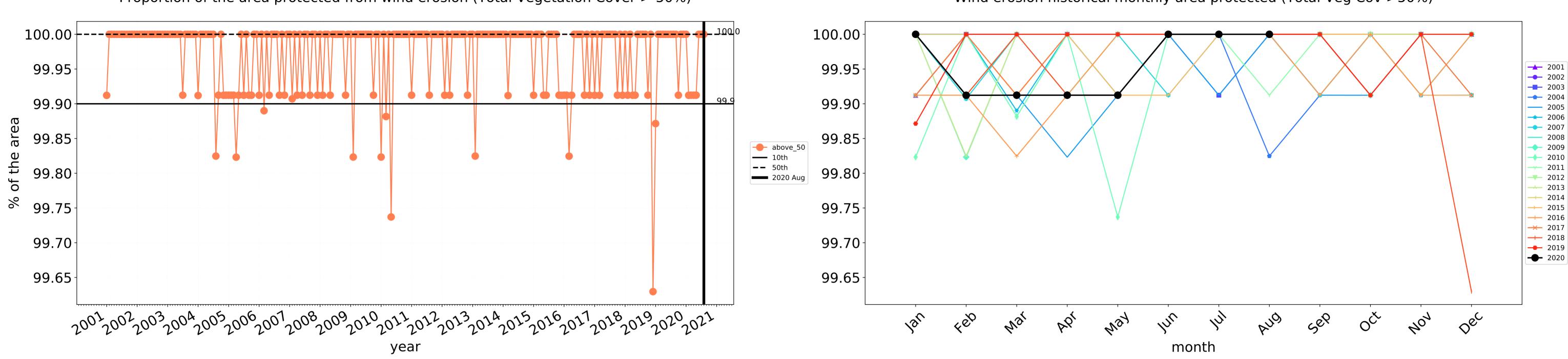






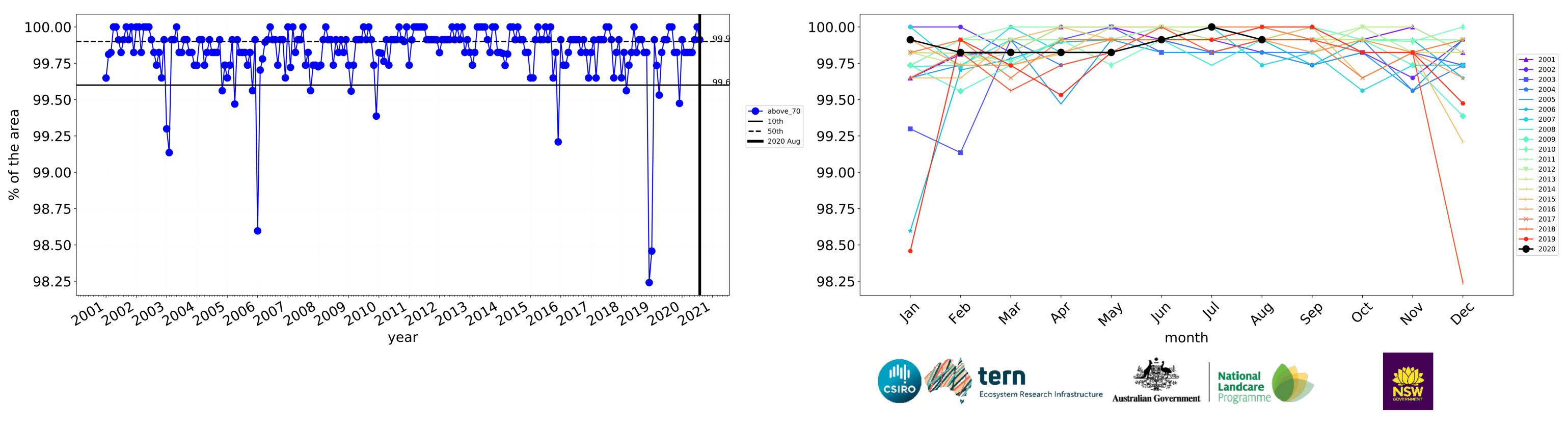






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

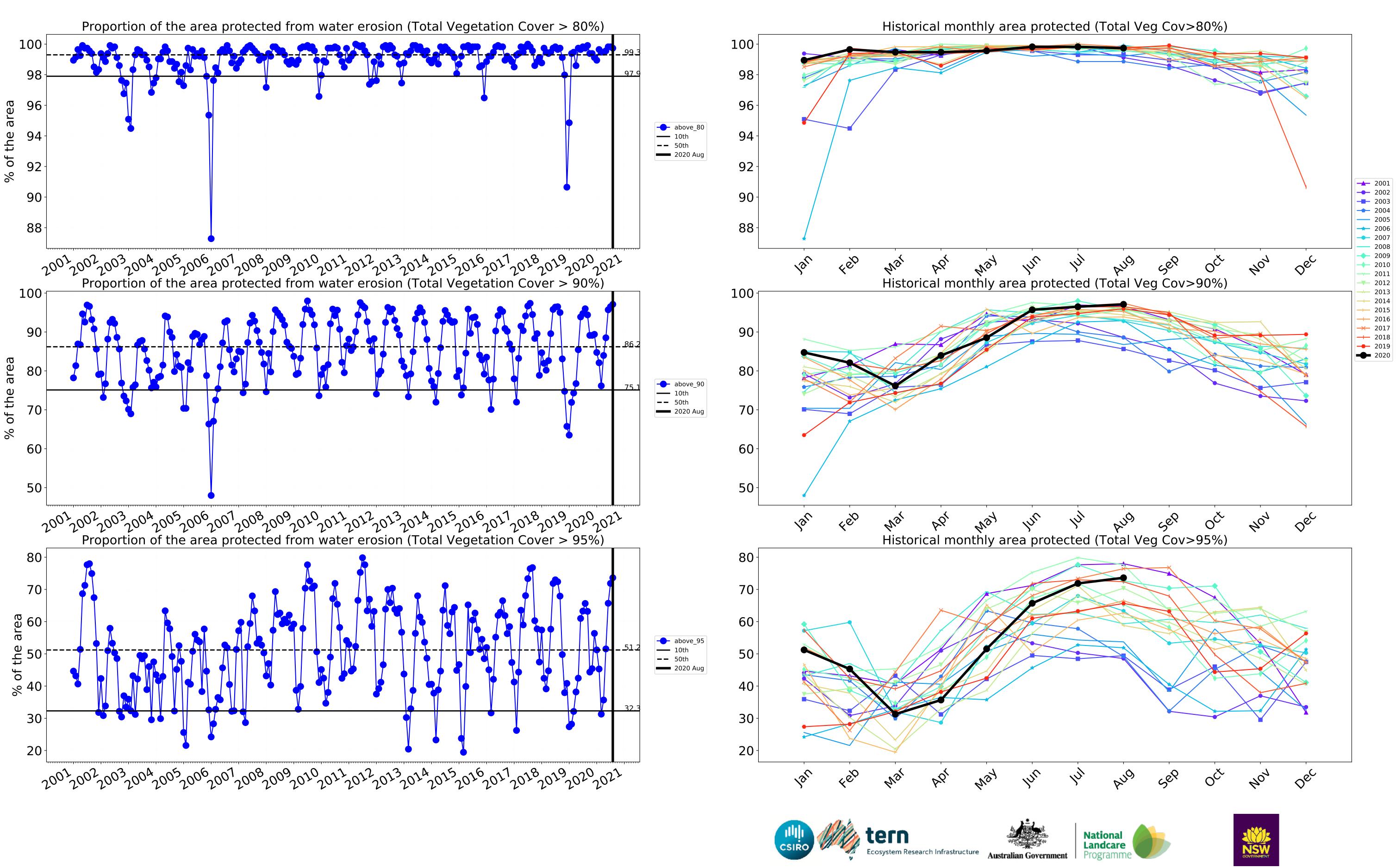
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

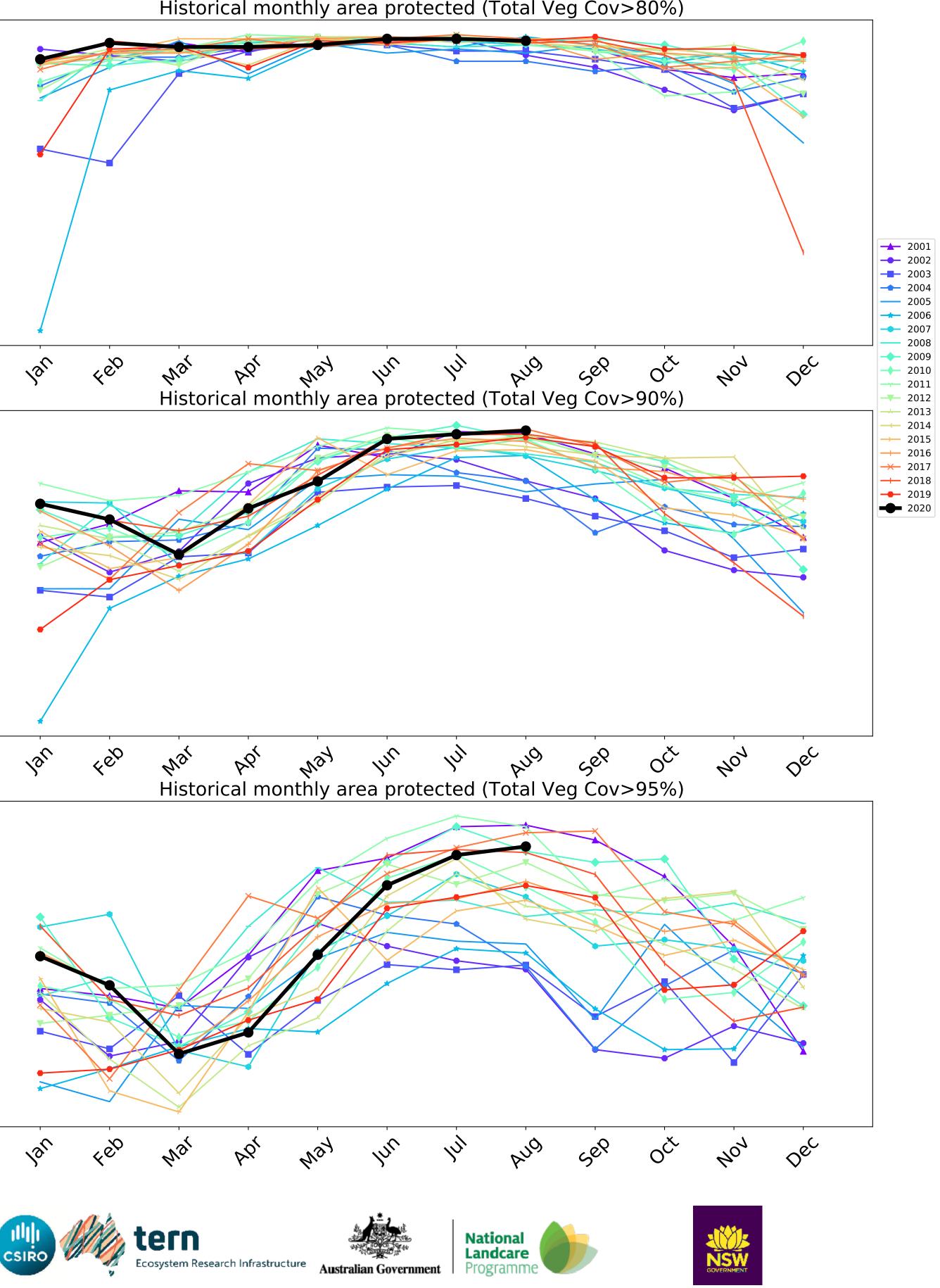


# Grazing - Forest (non woodland) timeseries

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

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

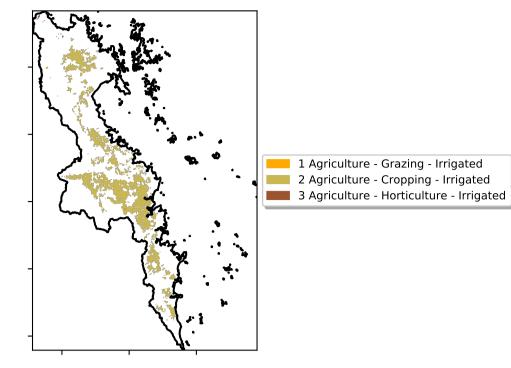




## Irrigation

#### Land use and forest cover

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



1 Agriculture - Grazing - Irrigated

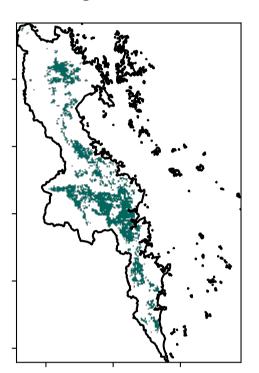
1210-200°

· 52% 70%

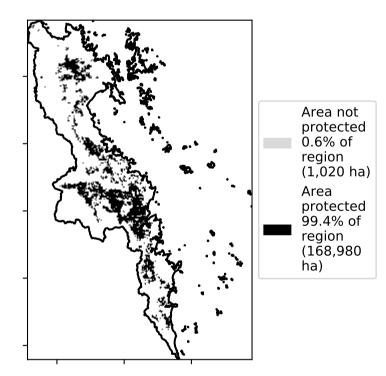
3201050010

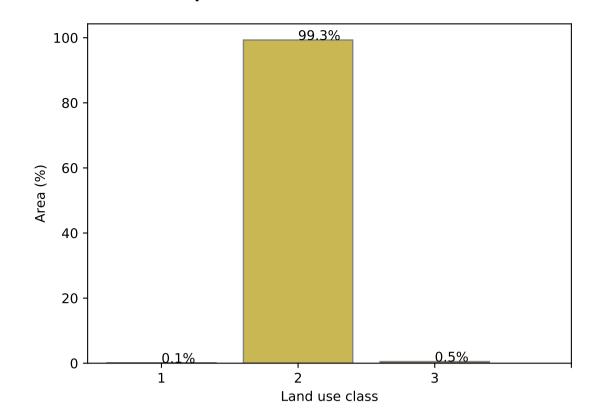
0.30%

**Total Vegetation Cover [%]** 



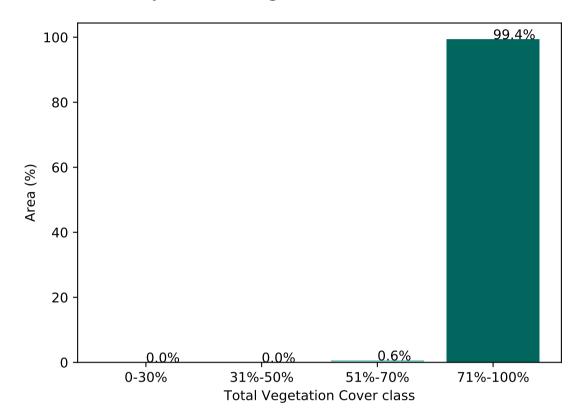
% Area protected from water erosion (>70%)



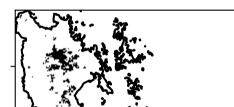


#### Proportion of each land class in area

#### Proportion of vegetation cover class in area

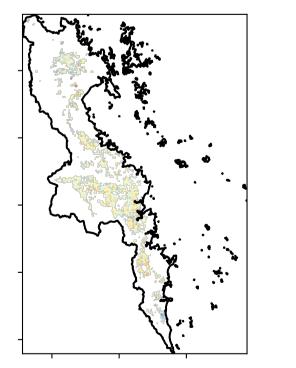


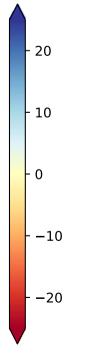
% Area protected from wind erosion (>50%)



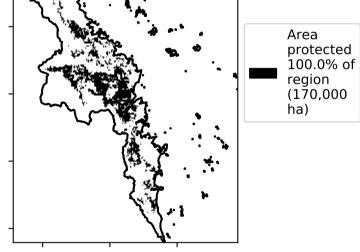
**Total Vegetation Cover Anomaly [%]** 

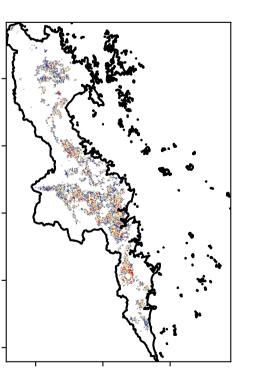
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

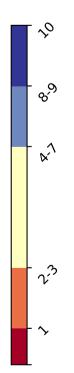




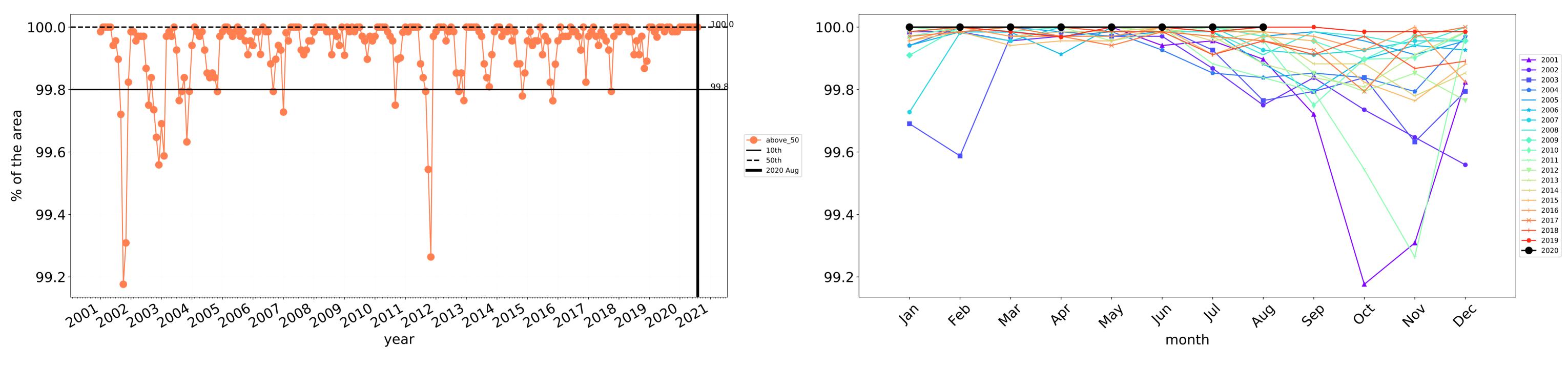






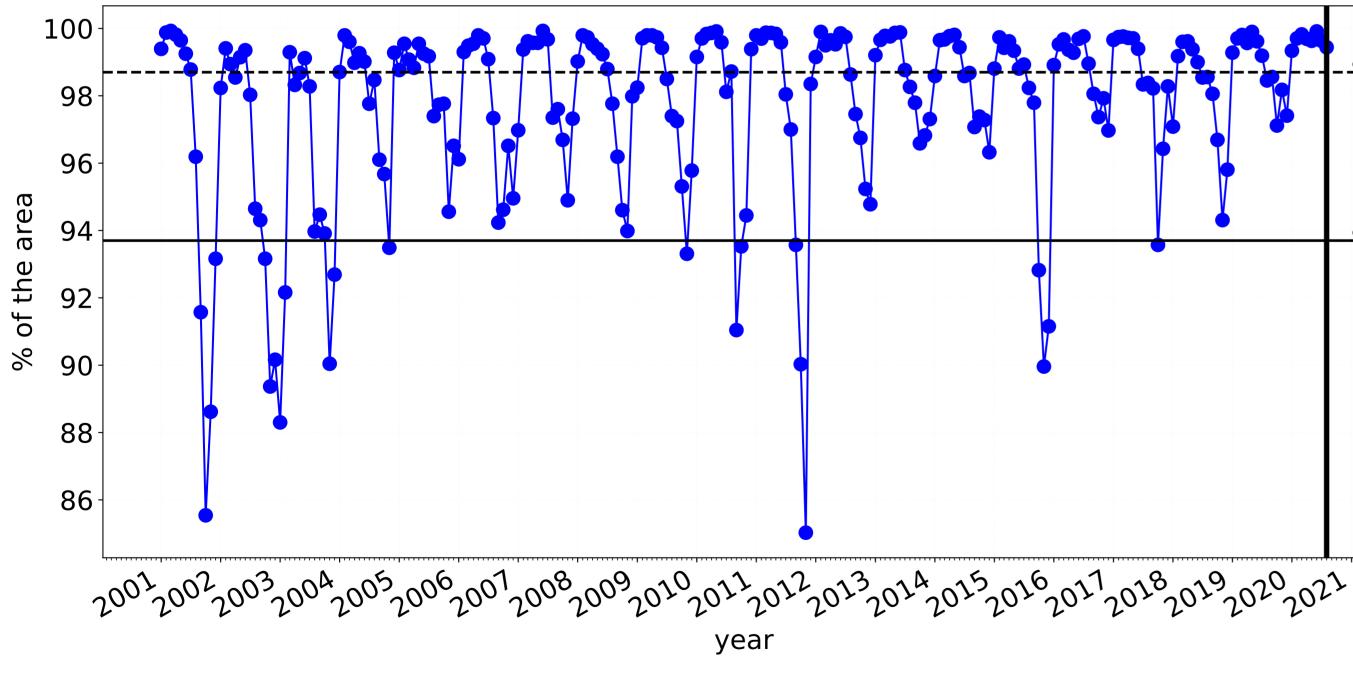






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

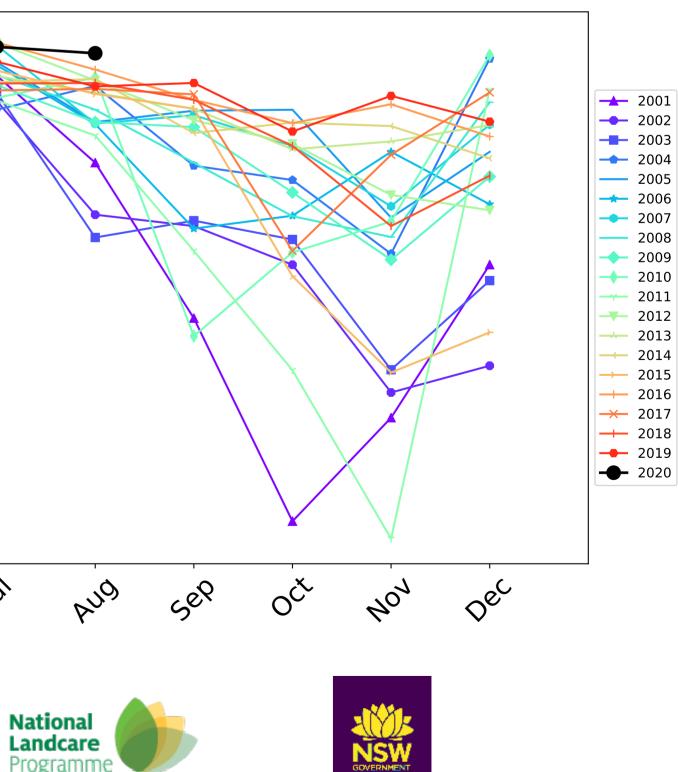


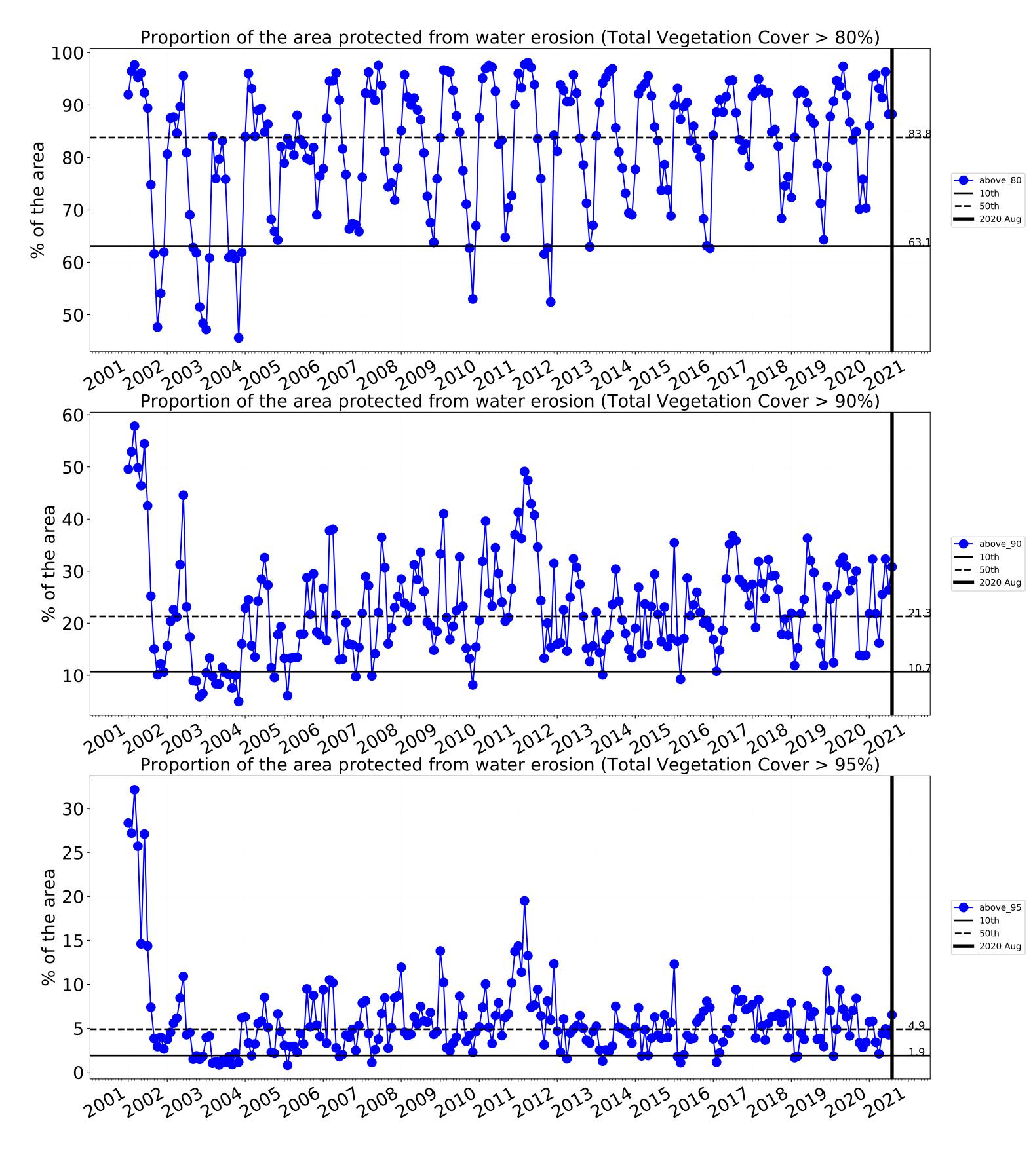


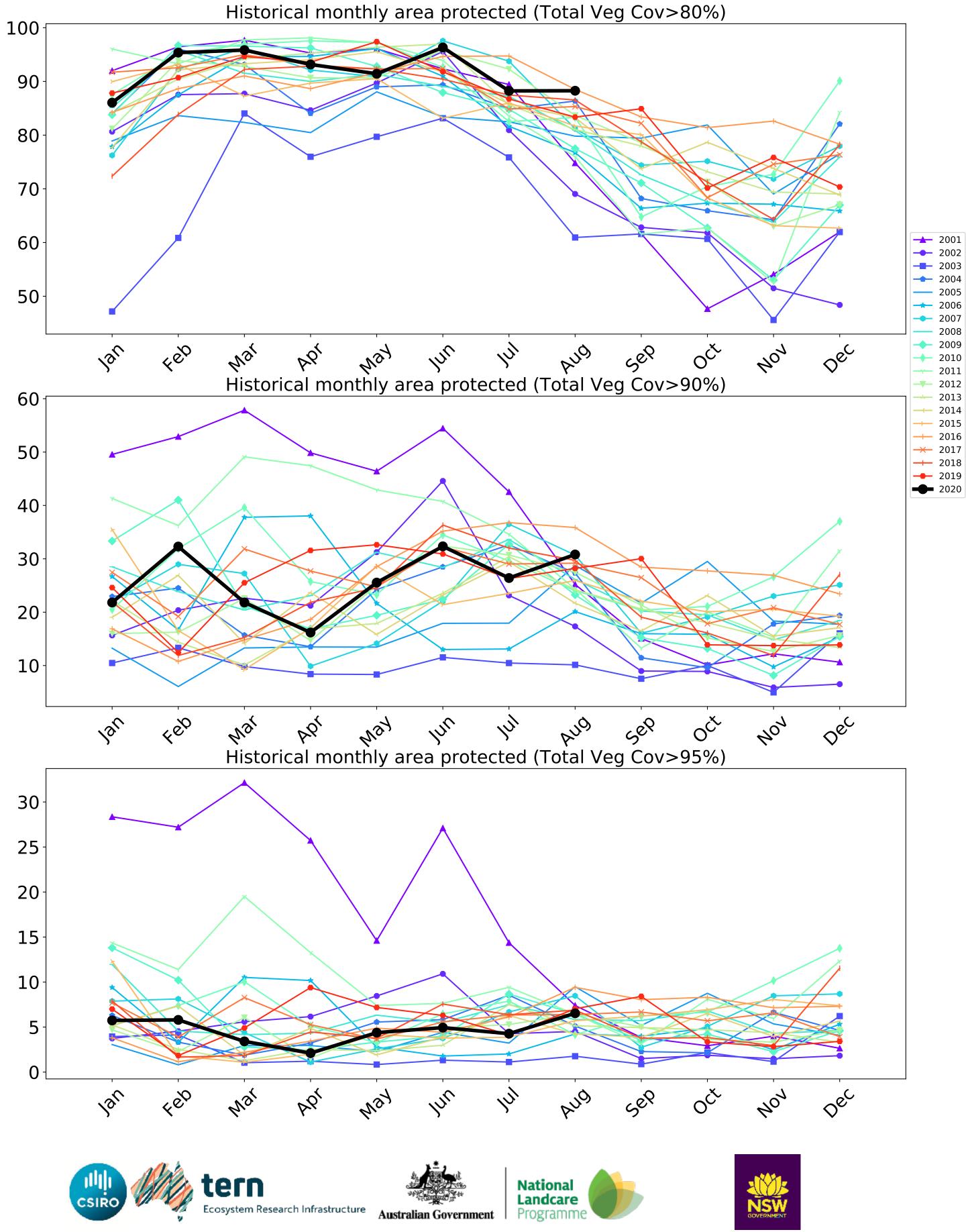
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100-98. 98 96 ---- above\_70 **—** 10th 94 02 **——** 50th 2020 Aug 92 90 88 86 Jan feb way PP In In In Mar month tern Ecosystem Research Infrastructure Programme Australian Government

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

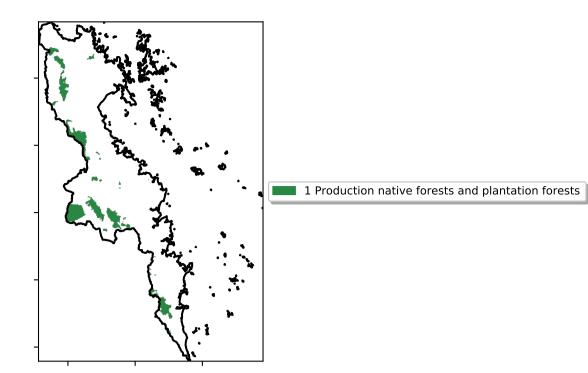




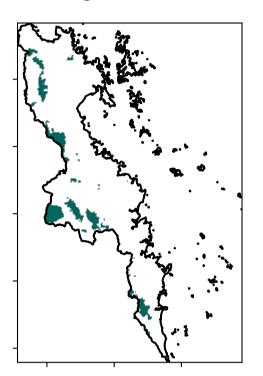


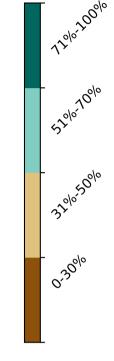
## **Production native forests and plantation forests**

Land use and forest cover

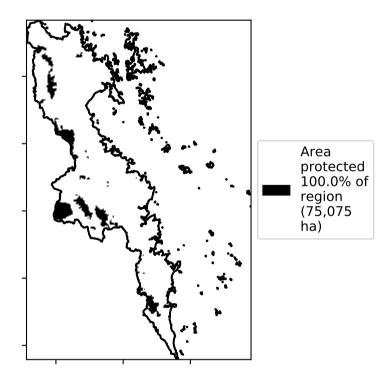


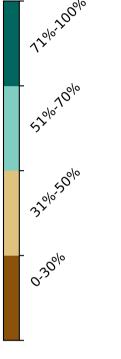
**Total Vegetation Cover [%]** 



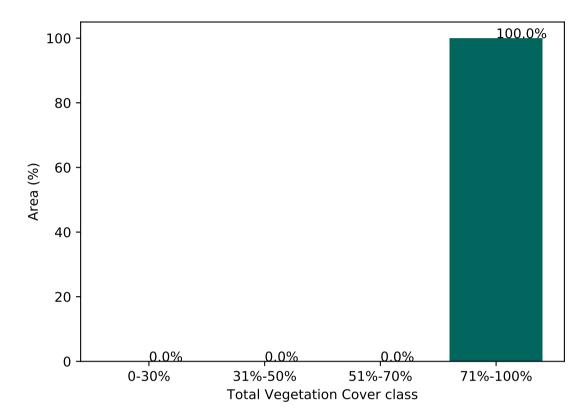


% Area protected from water erosion (>70%)

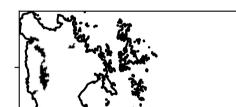




Proportion of vegetation cover class in area

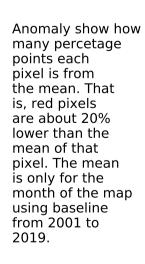


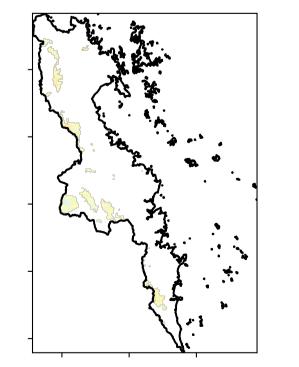
% Area protected from wind erosion (>50%)

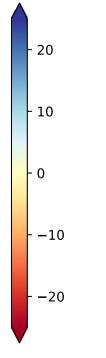


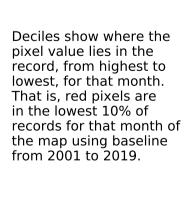
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

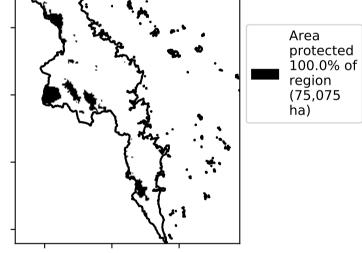
**Total Vegetation Cover Anomaly [%]** 

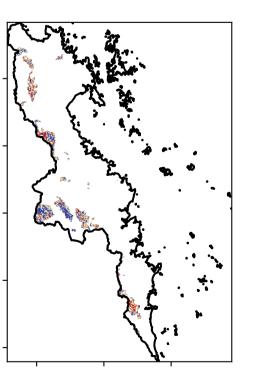


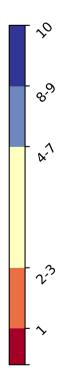




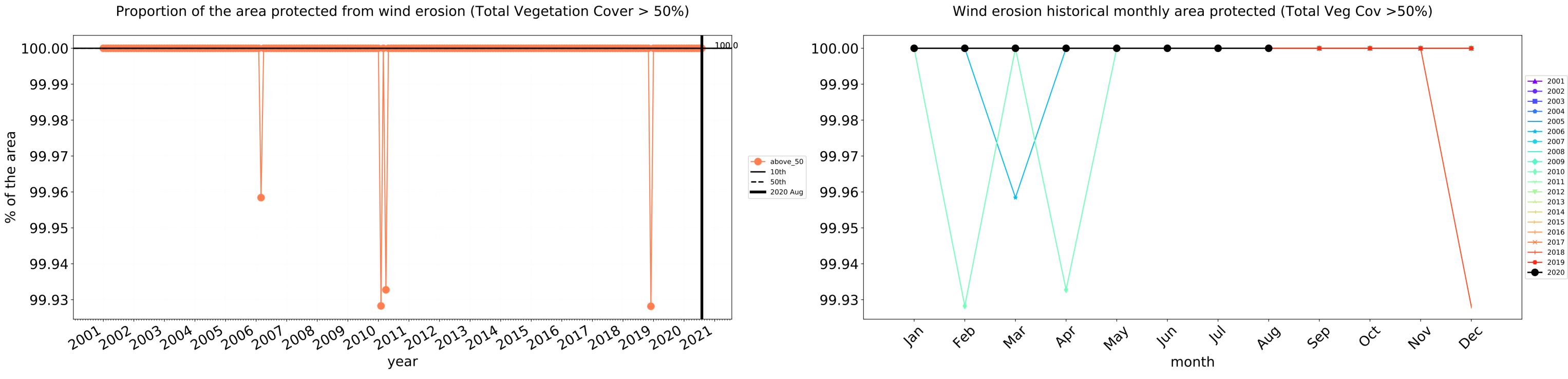




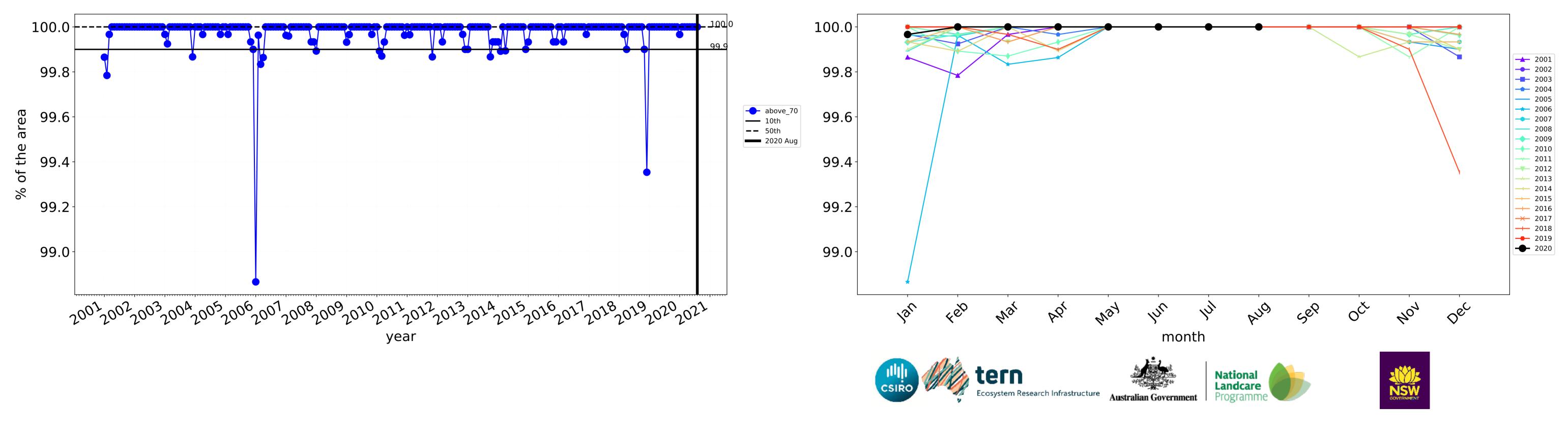




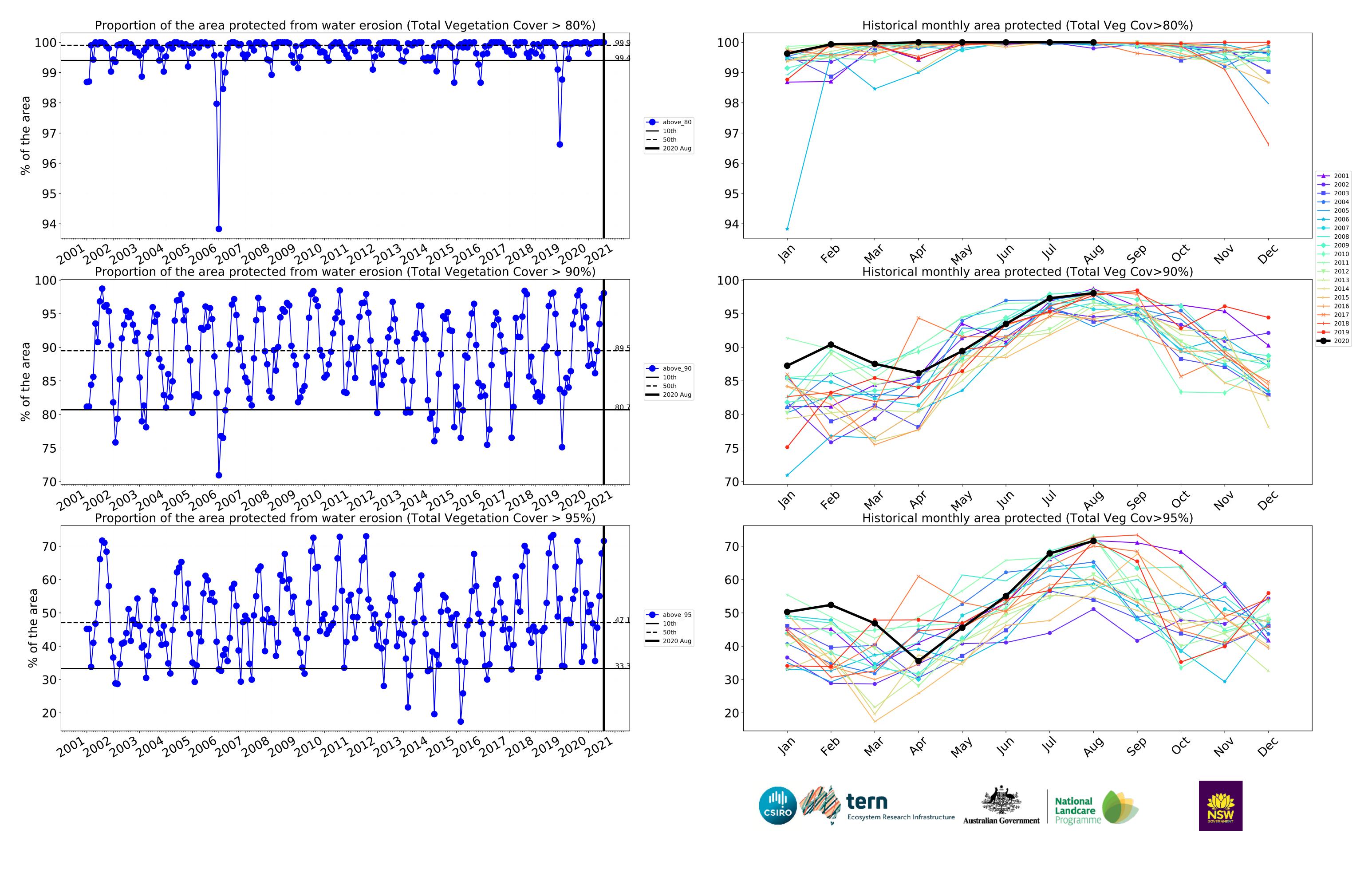




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



# Mackay Whitsunday (911,175 ha and no data 21,885 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	911,175	100.0% 910,775	99.9% 909,825	98.9% 900,825	94.7% 863,025	74.7% 680,975	43.1% 392,950
Conservation and natural environments	277,800	99.9% 277,600	99.8% 277,350	99.0% 274,900	97.3% 270,350	88.6% 246,100	53.8% 149,425
Conservation and natural environments non forest	7,600	99.0% 7,525	98.4% 7,475	94.4% 7,175	85.9% 6,525	58.9% 4,475	29.3% 2,225
Conservation and natural environments Woodland forest	75,300	100.0% 75,300	99.9% 75,225	99.1% 74,625	98.0% 73,800	91.4% 68,850	59.0% 44,400
Conservation and natural environments Forest (non woodland)	194,900	99.9% 194,775	99.9% 194,650	99.1% 193,100	97.5% 190,025	88.6% 172,775	52.7% 102,800
Agriculture	468,525	100.0% 468,500	100.0% 468,375	99.6% 466,850	95.3% 446,600	69.6% 326,050	38.3% 179,575
Grazing	298,475	100.0% 298,450	99.9% 298,325	99.8% 297,750	99.3% 296,500	91.7% 273,625	56.4% 168,450
Grazing non forest	189,300	100.0% 189,300	99.9% 189,200	99.7% 188,650	99.2% 187,750	89.7% 169,750	53.4% 101,100
Grazing Woodland forest	80,650	100.0% 80,625	99.9% 80,600	99.9% 80,600	99.6% 80,300	94.5% 76,175	57.5% 46,350
Grazing - Forest (non woodland)	28,525	100.0% 28,525	100.0% 28,525	99.9% 28,500	99.7% 28,450	97.1% 27,700	73.6% 21,000
Irrigation	170,000	100.0% 170,000	100.0% 170,000	99.4% 169,050	88.3% 150,050	30.8% 52,375	6.5% 11,100
Production native forests and plantation forests	75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	98.1% 73,625	71.6% 53,750

