# Total vegetation cover soil protection Region:LGA Townsville\_(C) QLD

This report describes vegetation protecting the soil surface from erosion during a chosen month compared to previous years. This report has been generated using MODIS fractional vegetation cover information available in Rangelands and Pasture Productivity (RAPP) map tool https://map.geo-rapp.org/#australia. The report is based on 500 metre pixel data on monthly time steps.

Land use forest cover:

Date: August 2021

Results can be shown for the whole region (polygon), and separated by land use and forest cover classes which are likely to show different cover patterns and targets. Land use is divided into four broad classes: Conservation and natural environments, Agriculture, production native forests and plantation forests (no report), and other (no report). Agriculture is divided into grazing, crops and horticulture which are sub-divided into non-irrigated and irrigated. If forest is present land use is further divided into: non-forest, woodland forest and non-woodland forest. The area of each land use and forest class are shown as a map and chart. The report content is repeated for each land use and forest cover class that covers at least 1% of the area of the chosen region. Total vegetation Cover:

The total vegetation cover indicates where soil is likely to be protected from wind and or water hillslope erosion. Total vegetation cover for this month is shown on a map and chart classified into 4 classes.

- 71-100% High cover protected from wind and usually water erosion (high rainfall, steep slopes, and erodible soils may need greater than 80, 90, 95 and up to 100% cover)
  - 51-70% Moderate cover protected from wind erosion
  - 31-50% Low cover not protected
  - 0-30% Very Low cover not protected

Erosion protection: Wind erosion 50% total vegetation cover

The vegetation cover threshold required to prevent soil erosion is usually 50% to reduce wind erosion, 70% or 80% to reduce water (hillslope) erosion depending on the steepness and rainfall. Areas protected from erosion for the month:

- Map: water erosion protection (>70% cover) percentage area and hectares.
- Map: wind erosion protection (>50% cover) percentage area and hectares.

Comparison with previous years:

- Map: anomaly comparing this month to the average cover from the same month in previous years.
- Map: deciles rank of month against the same month in previous years.

Anomalies and deciles until September 2019 are calculated comparing to the same months 2001 to 2019. Extra monthly data will be used to calculate anomalies and deciles post September 2019 as they become available. Time series monthly from January 2001 to current:

# **Erosion protection**

- Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for each month (orange lines). Horizontal lines are 10th (cover target) and 50th percentiles.
- Water erosion protection time series: percentage of the area of the region with greater than 70% cover for each month (blue line). Horizontal lines are 10th (cover target) and 50th percentiles.

# Rainfall

• Millimetres rainfall each month (black line).

Each time series is also stacked by year. The black line shows the current year of data. Water erosion protection for higher rainfall and steeper slopes:

Water erosion protection on higher slopes. As slope increases, more cover is required to control water erosion. The thresholds reported are:

- the percentage area with pixels greater than 80% total cover.
- the percentage area with pixels greater than 90% total cover.
- the percentage area with pixels greater than 95% total cover.

# **Acknowledgment of data:**

- 1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
- 2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
- 3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
- 4. MODIS Fractional cover algorithm:

https://doi.org/10.4225/08/5848a3f19a7b3







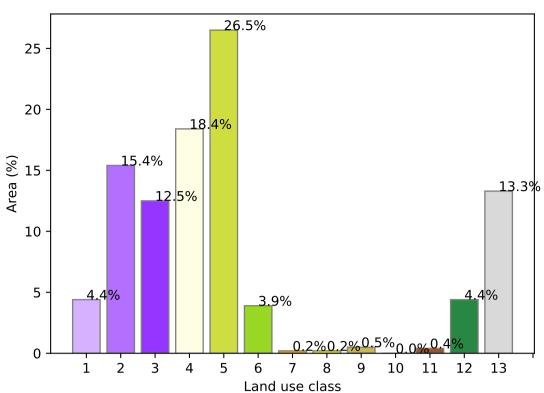


# **Vegetation Cover Aug 2021**

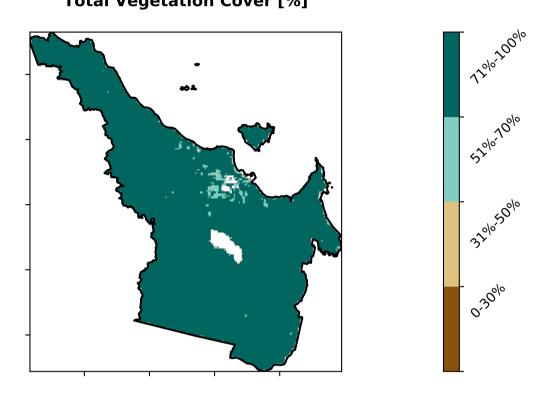
### Land use and forest cover

# 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 - Irrigated 8 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Horticulture - Non-irrigated 10 Agriculture - Horticulture - Irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

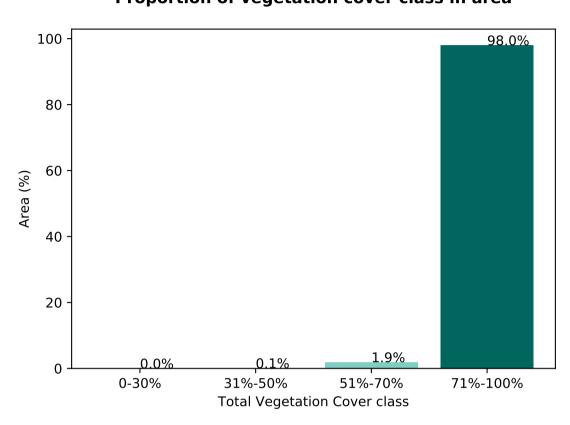
# Proportion of each land class in area



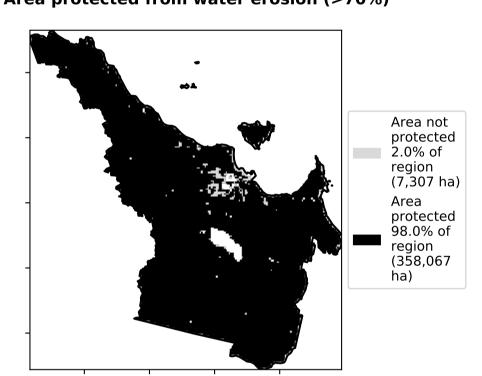
**Total Vegetation Cover [%]** 



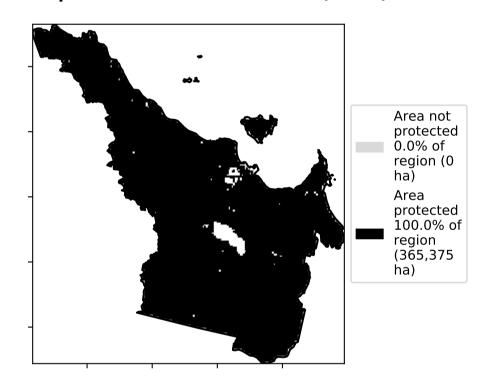
Proportion of vegetation cover class in area



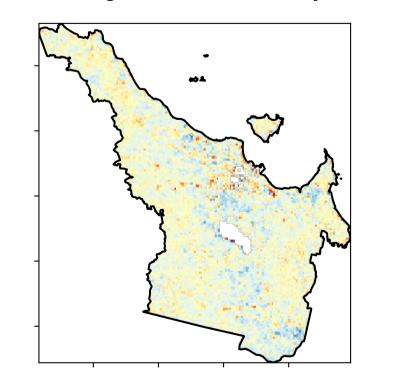
# % Area protected from water erosion (>70%)

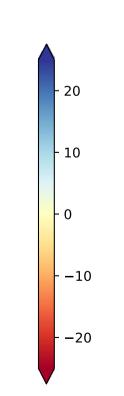


% Area protected from wind erosion (>50%)



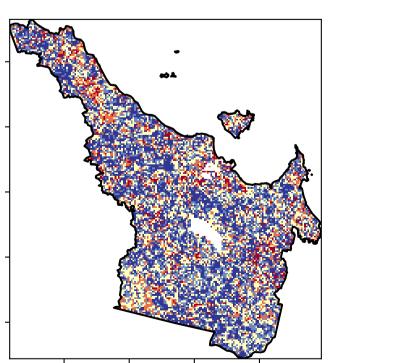
# Total Vegetation Cover Anomaly [%]





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

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



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.

Anomaly show how many percetage points each

Catchment Scale

Derived from

Use of Australia

(2018) and Forests

of Australia (2018)

Land Use and Forests of Australia (2018)

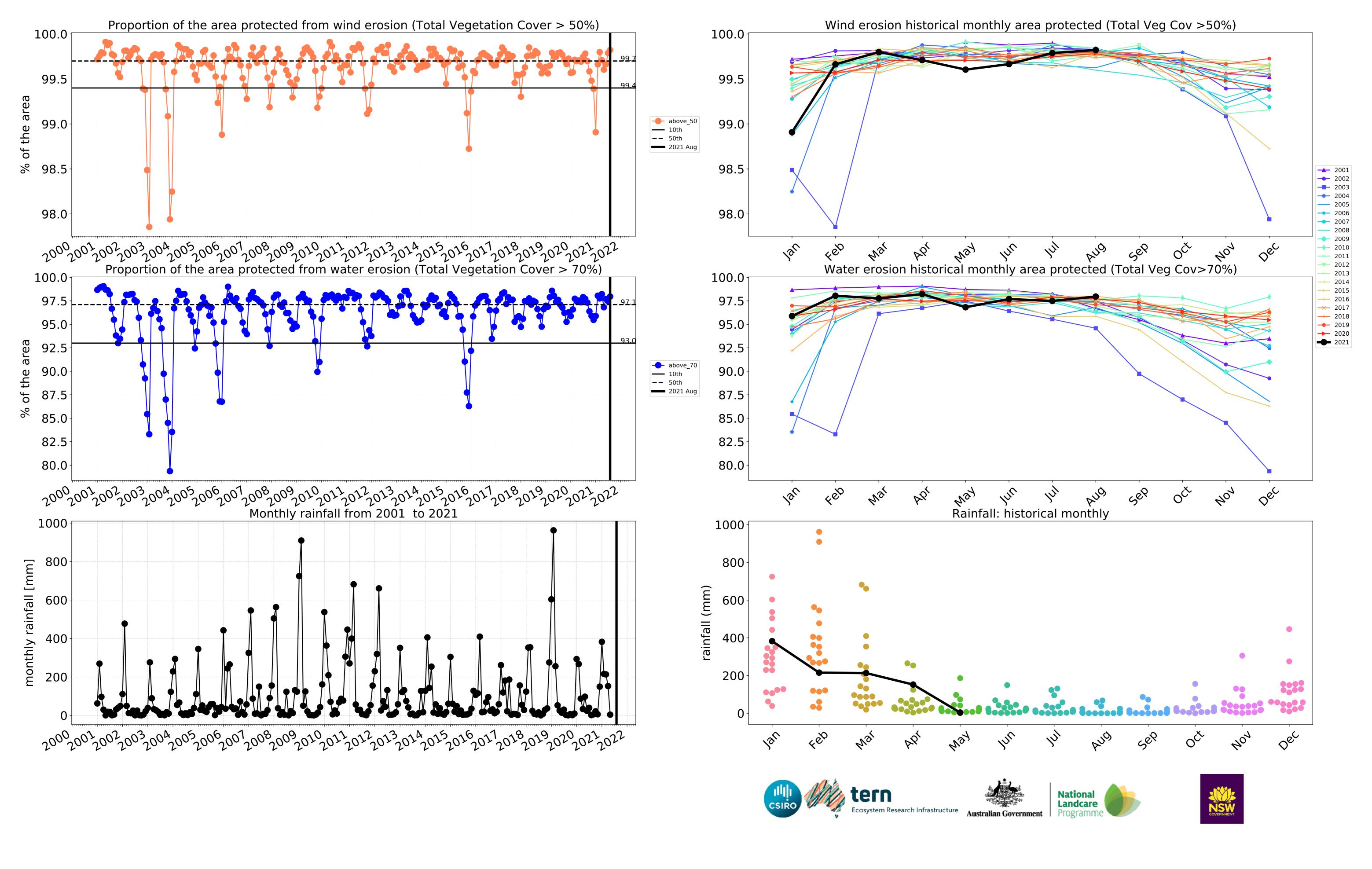
Catchment Scale Land

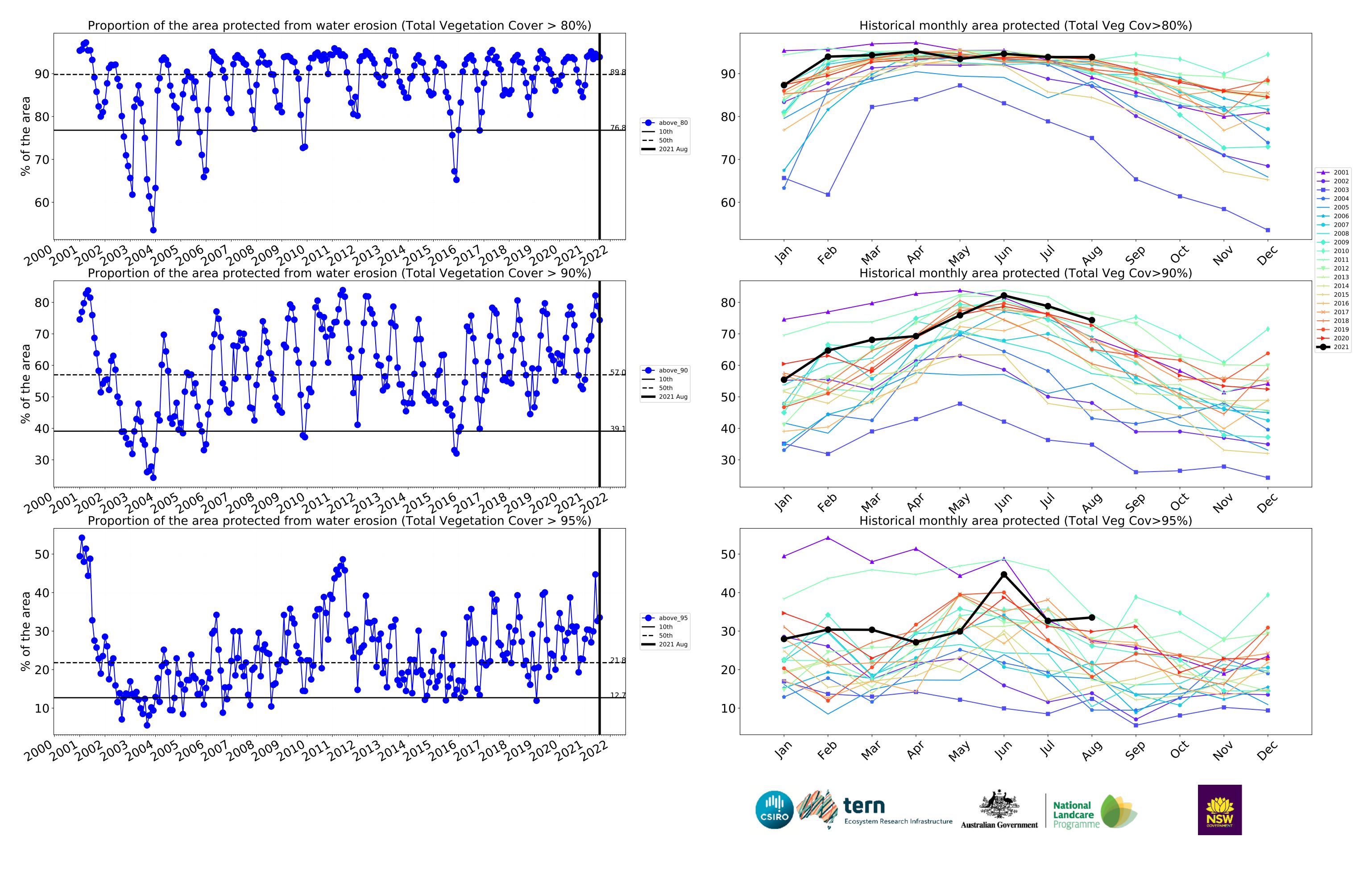






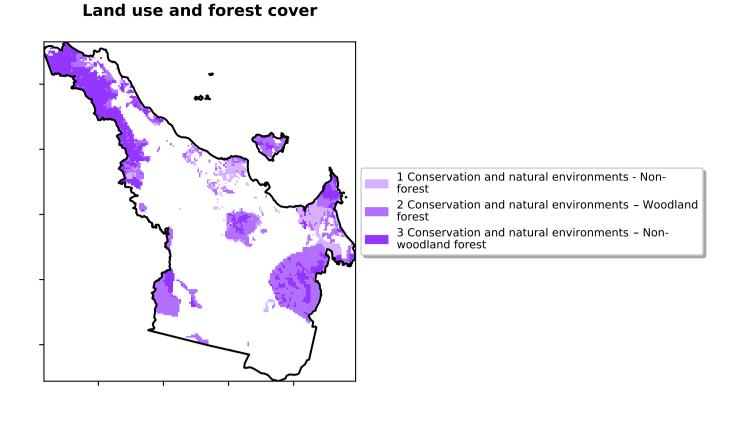






# **Conservation and natural environments**

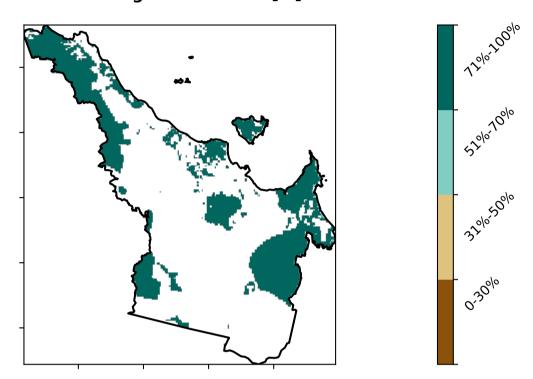
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



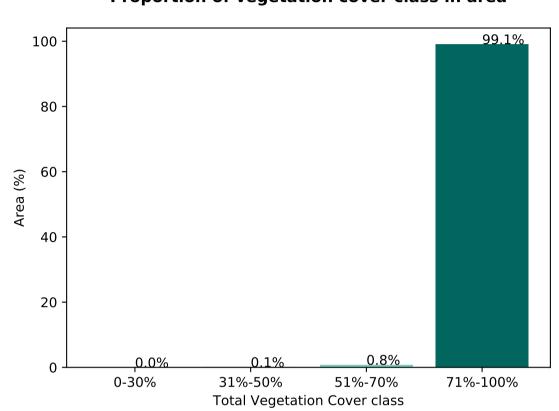
# 

Proportion of each land class in area

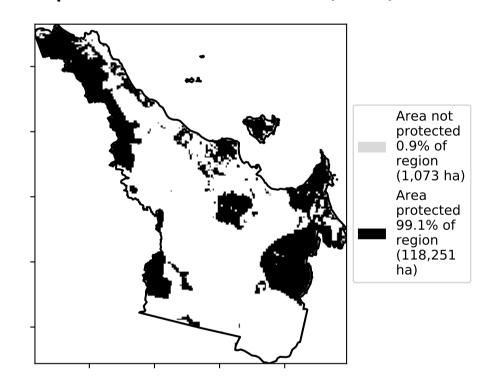




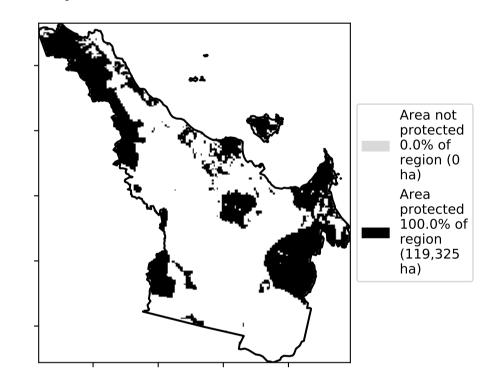
Proportion of vegetation cover class in area



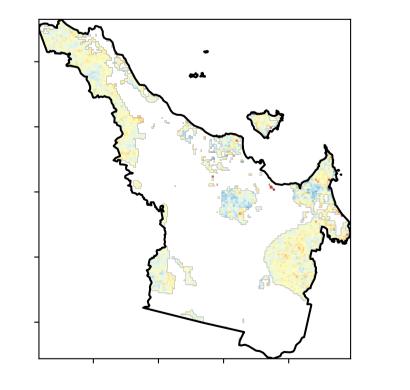
# % Area protected from water erosion (>70%)

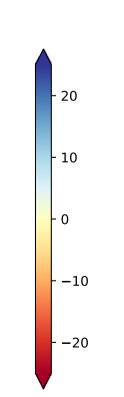


% Area protected from wind erosion (>50%)



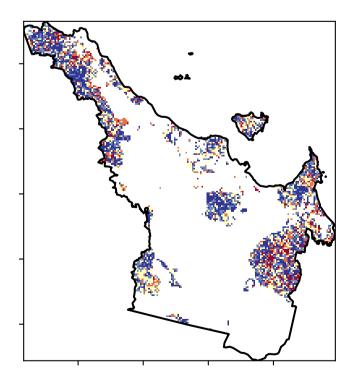
# **Total Vegetation Cover Anomaly [%]**

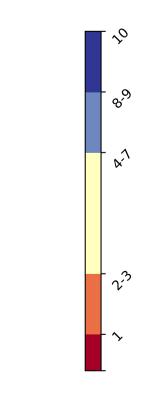




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

# Total Vegetation Cover Decile [%]





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

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

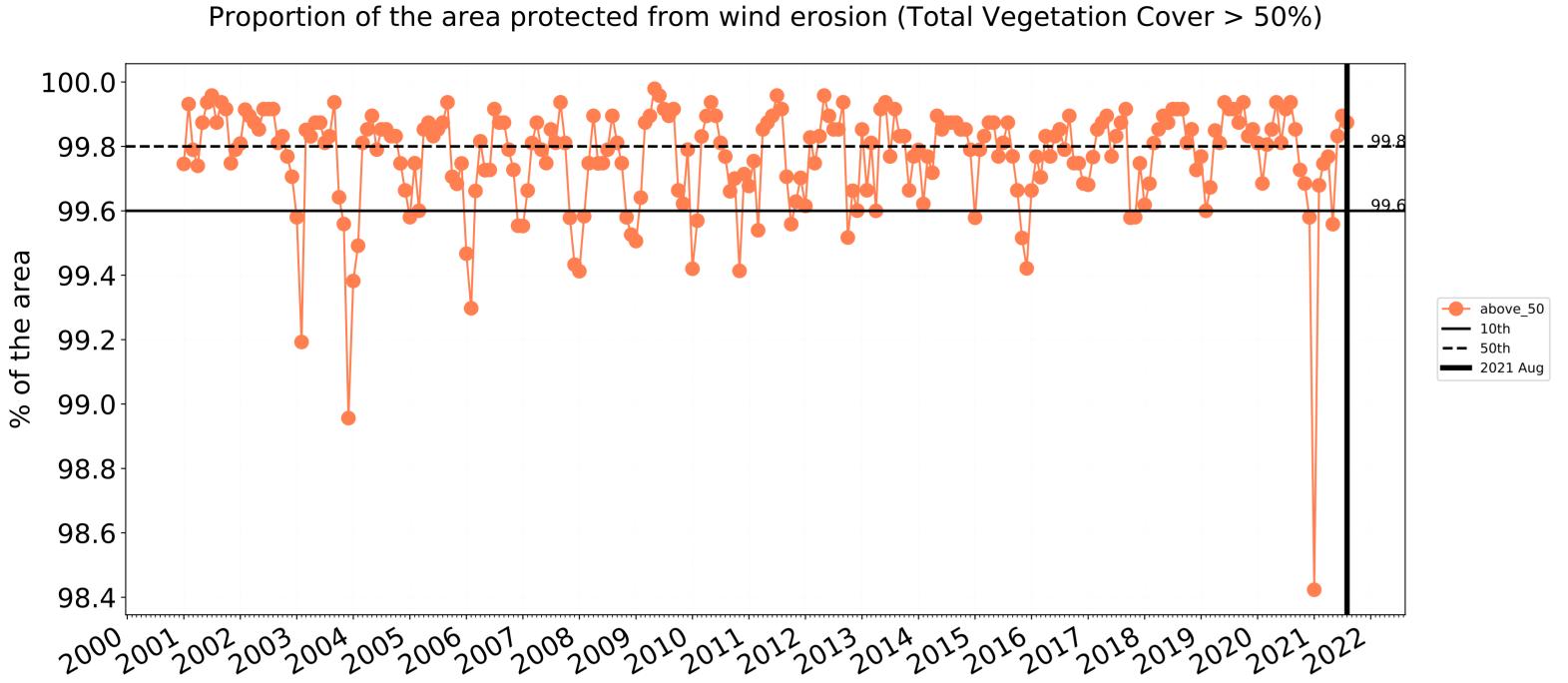


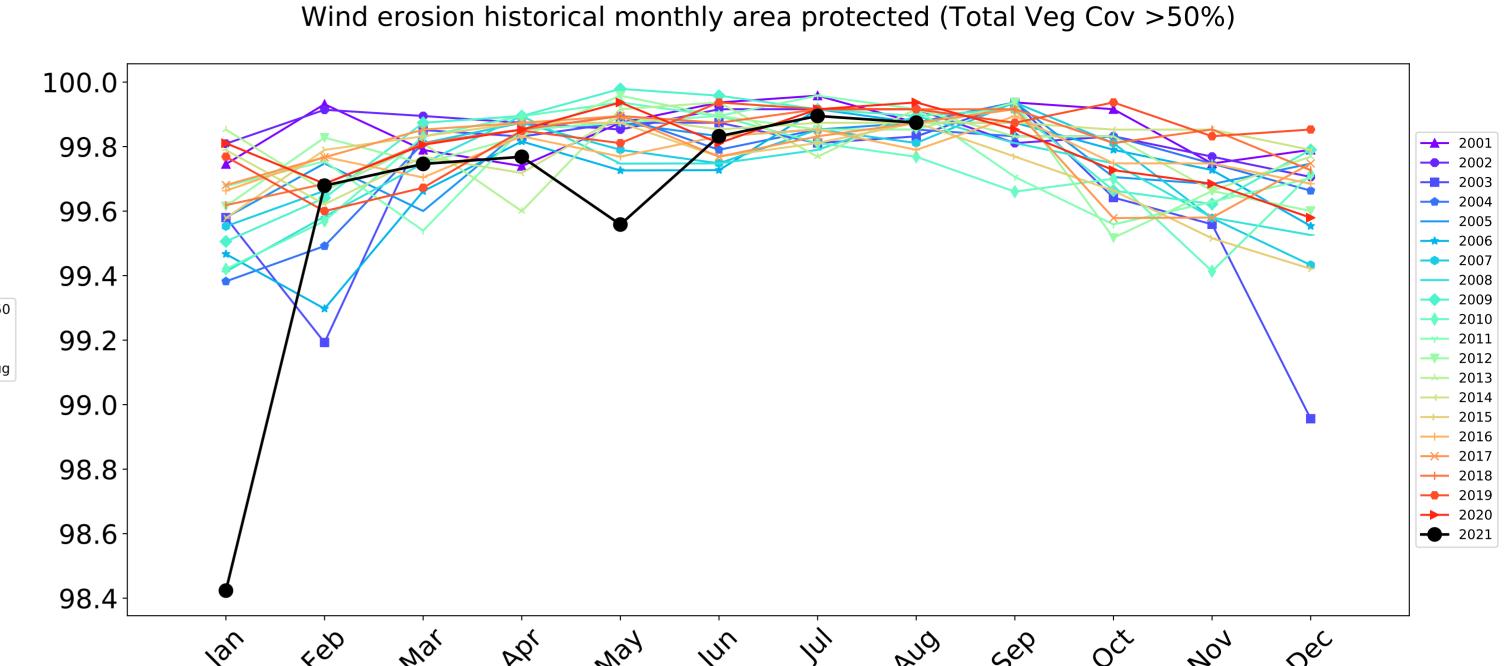






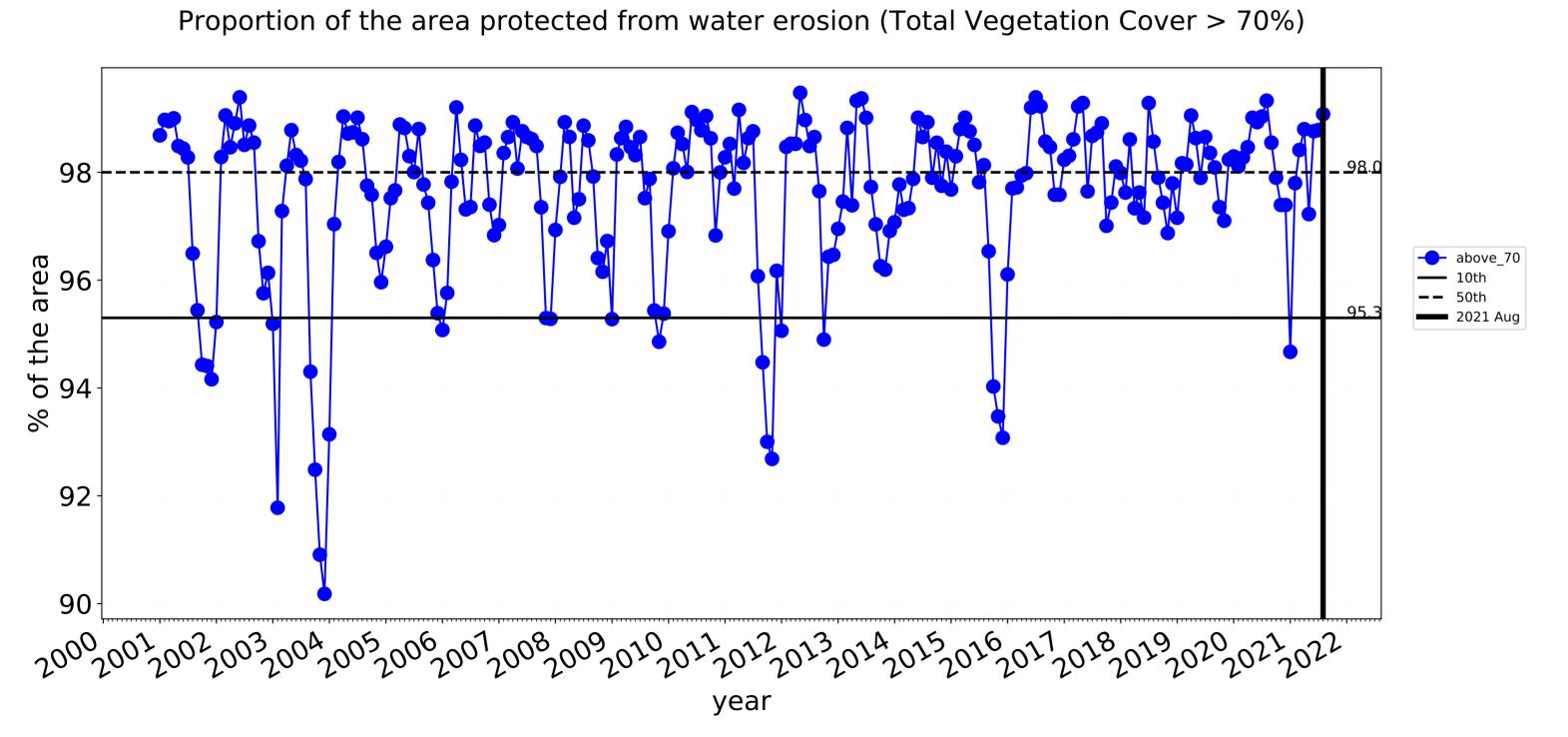
# **Conservation and natural environments timeseries**

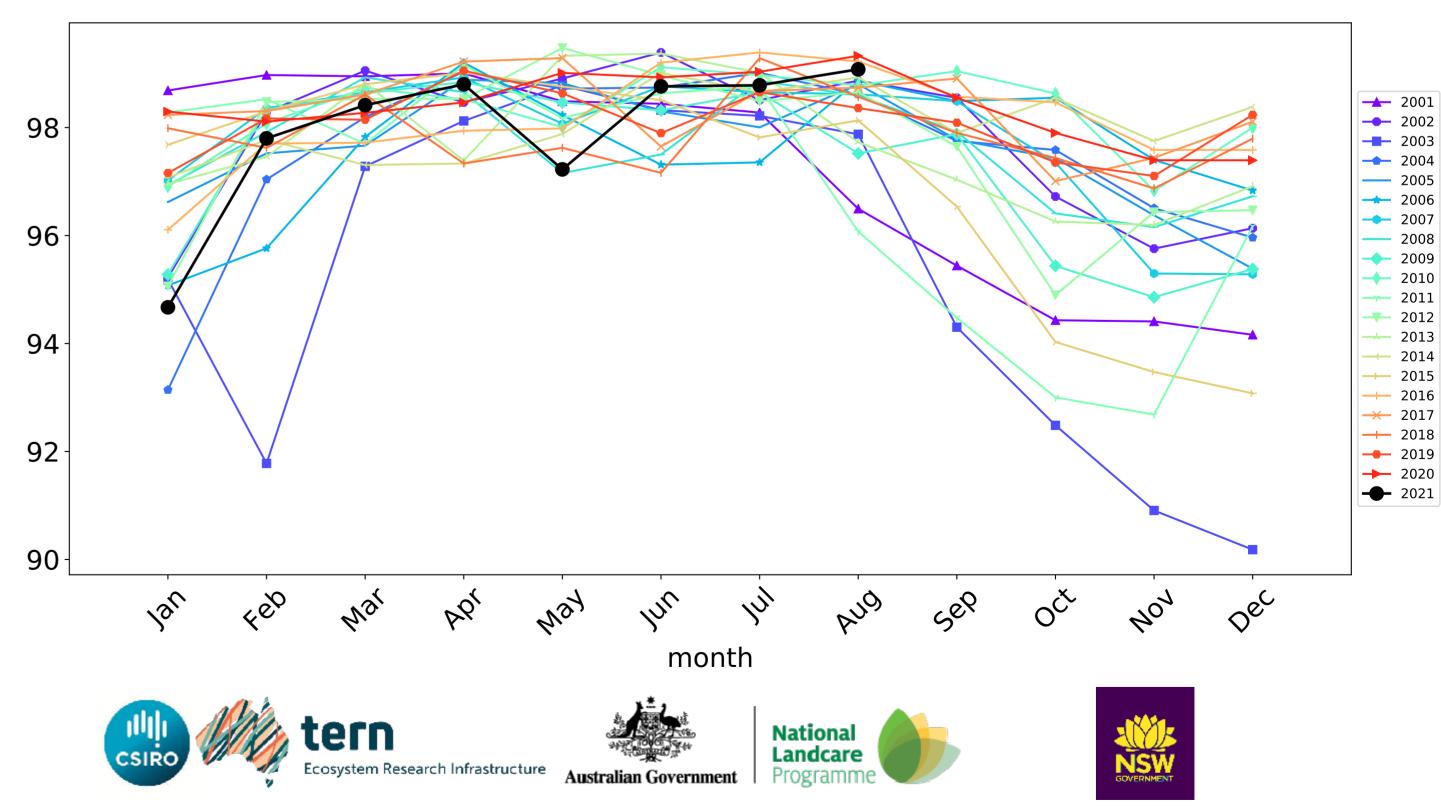


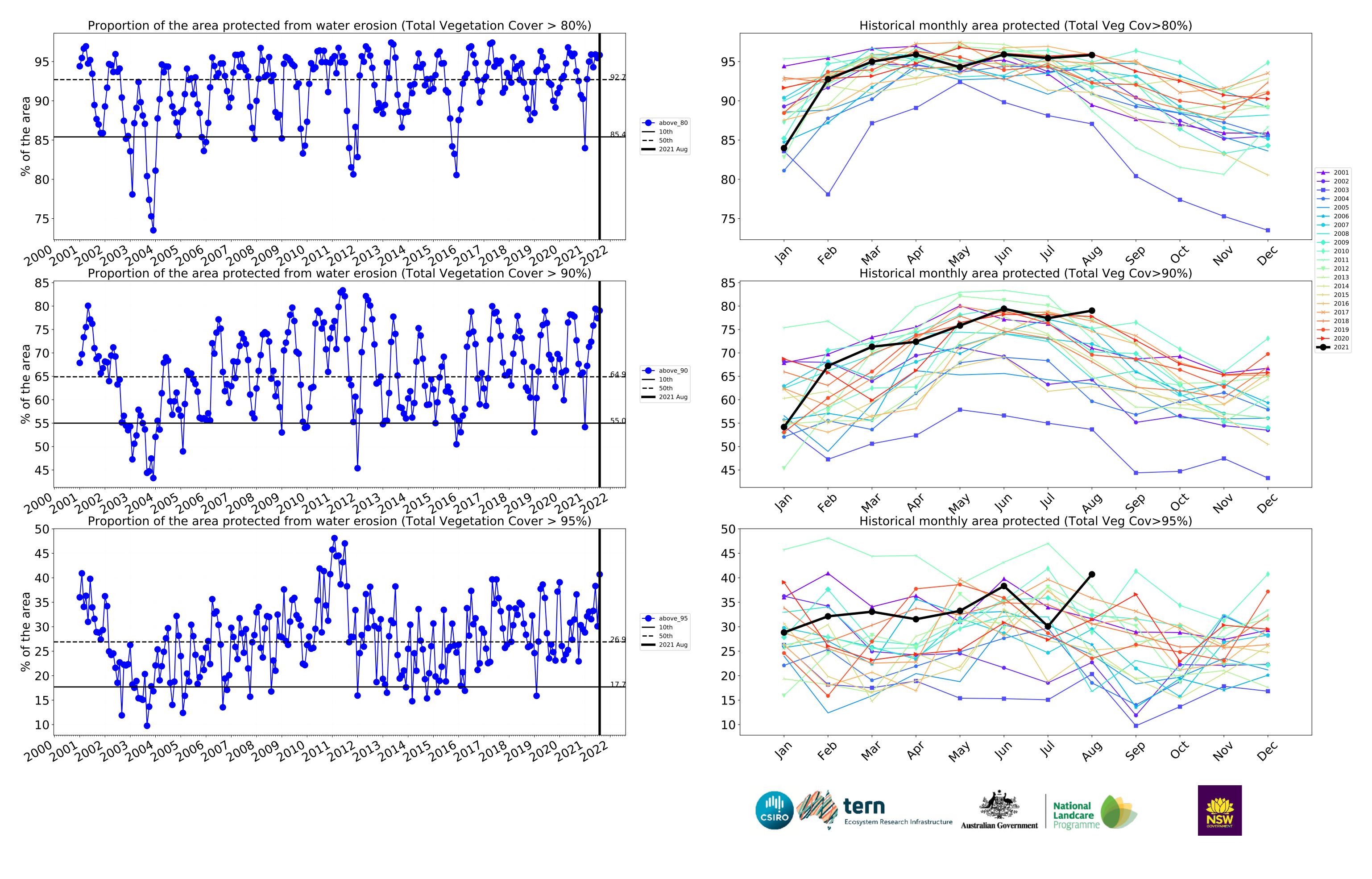


month

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







# **Conservation and natural environments non forest**

### Land use and forest cover

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

Anomaly show how many percetage points each

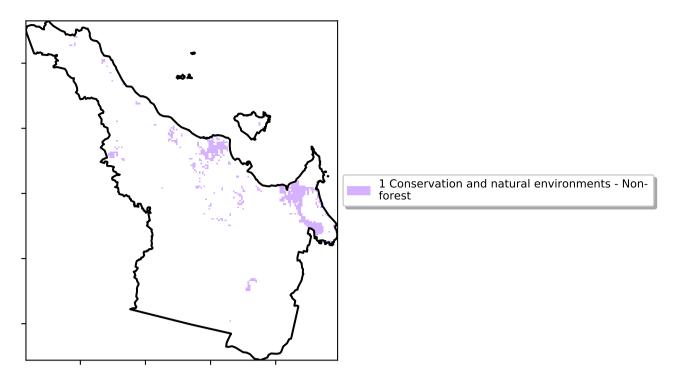
pixel is from

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

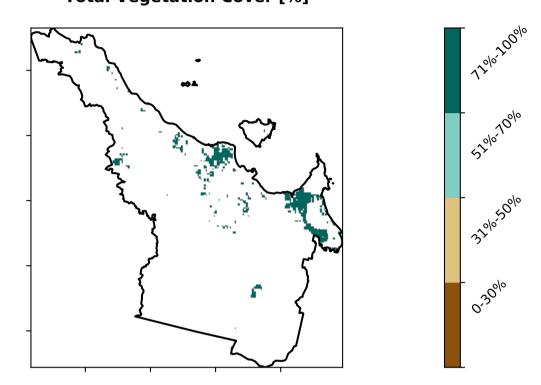
the mean. That

is only for the month of the map

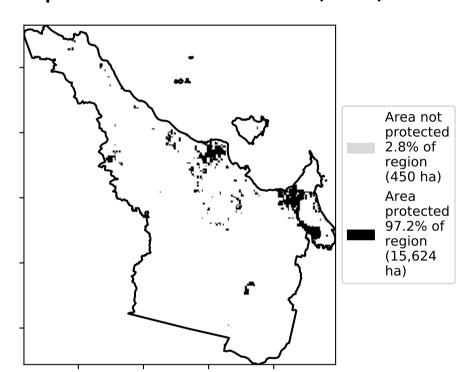
using baseline from 2001 to 2019.



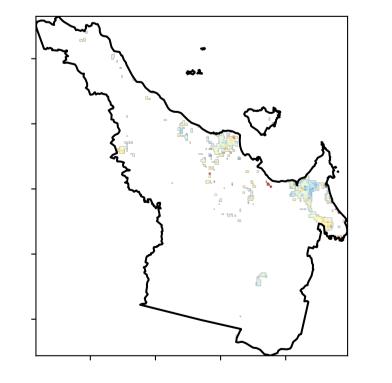
### **Total Vegetation Cover [%]**



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

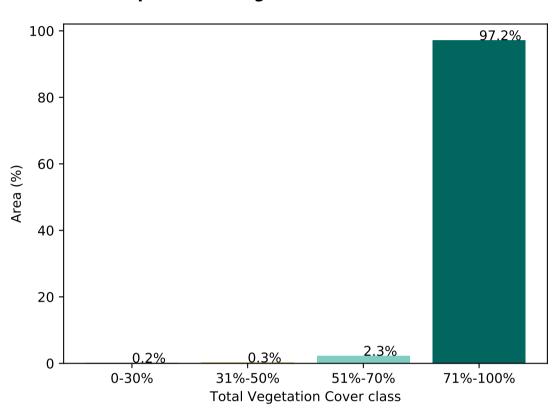


# **Total Vegetation Cover Anomaly [%]**

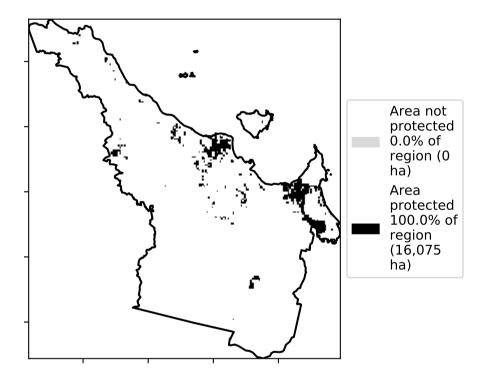


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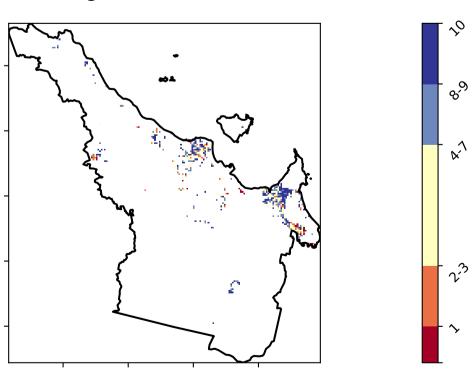
### Proportion of vegetation cover class in area



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



# Total Vegetation Cover Decile [%]











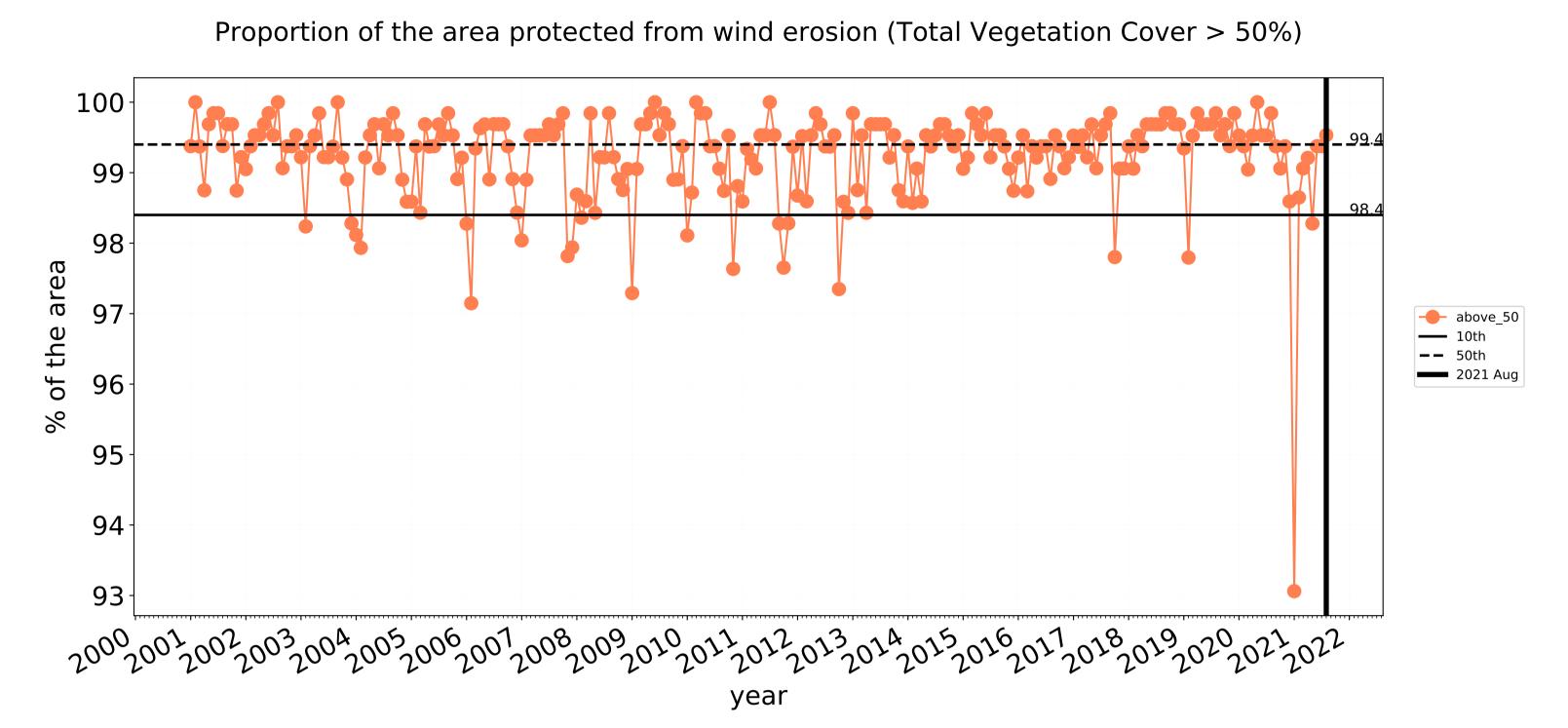
- 20

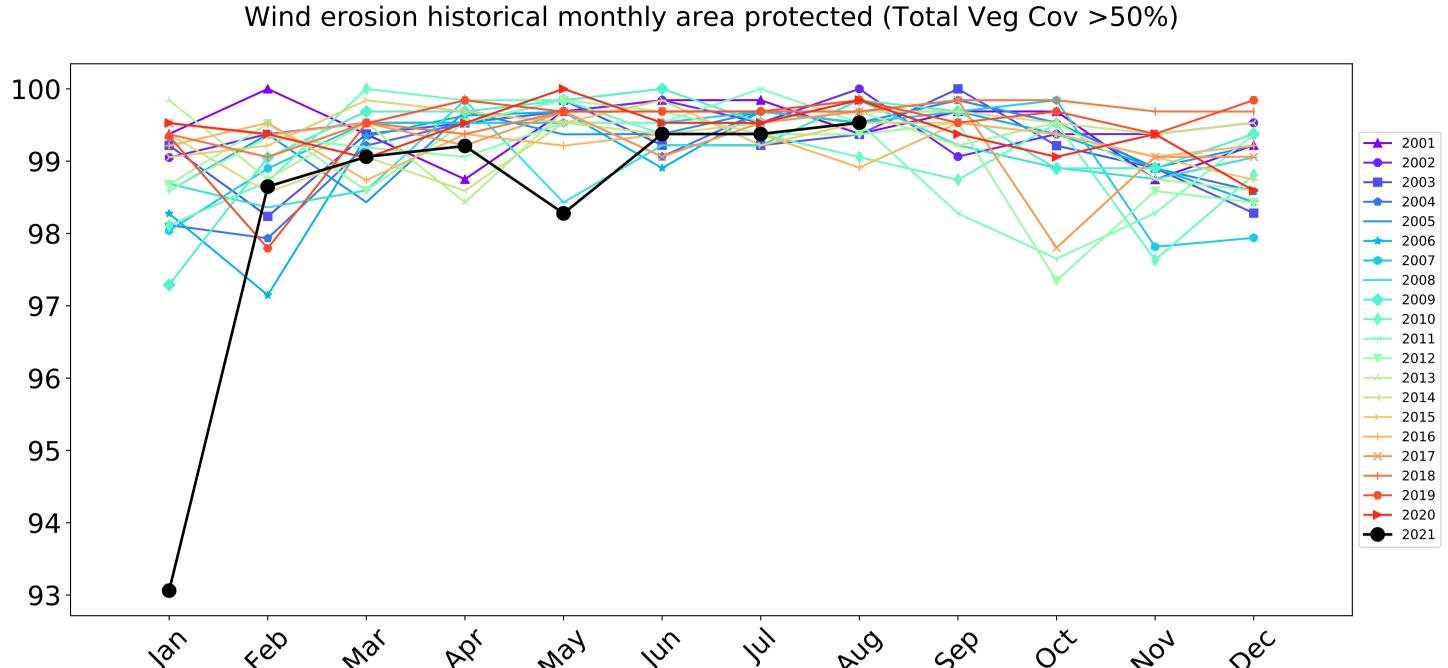
- 10

-10

**-**20

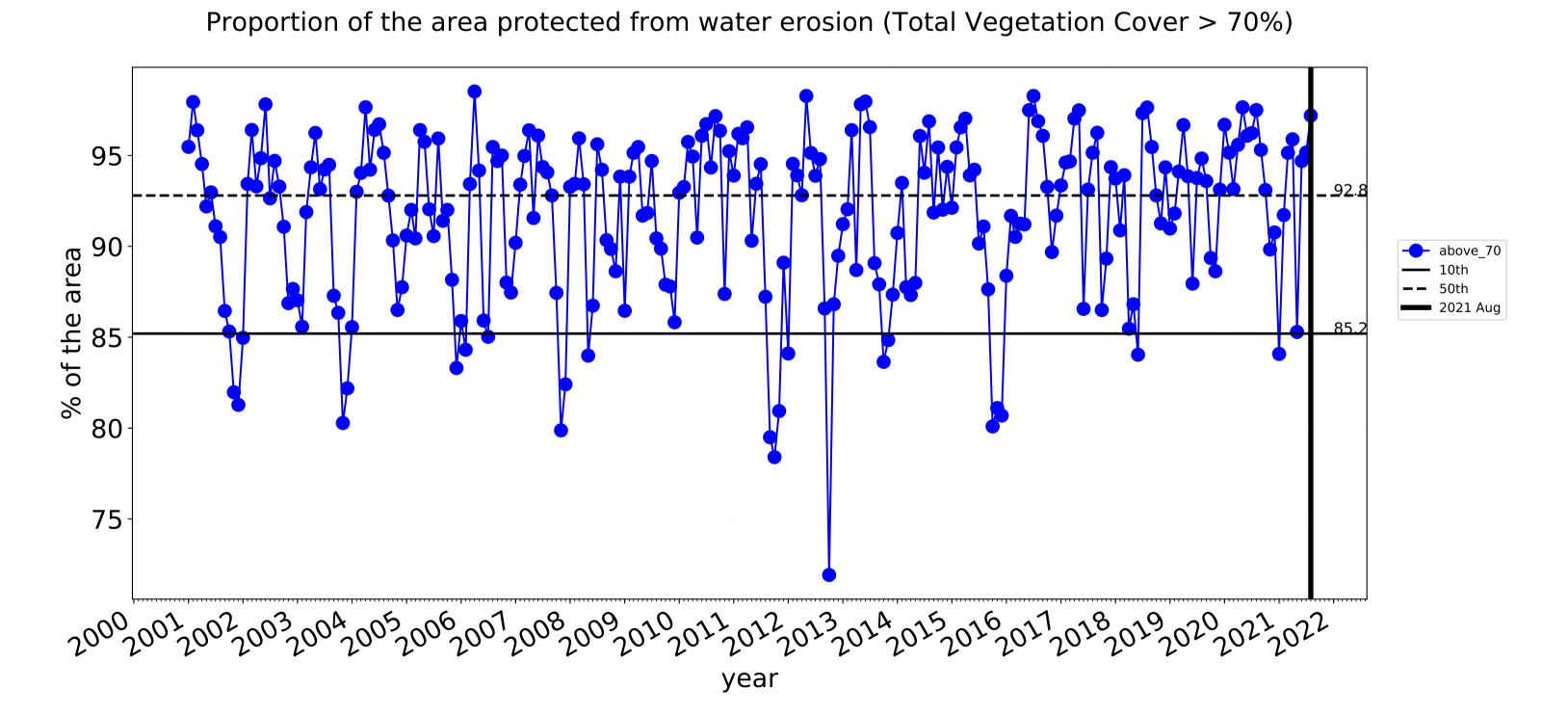
# **Conservation and natural environments non forest timeseries**

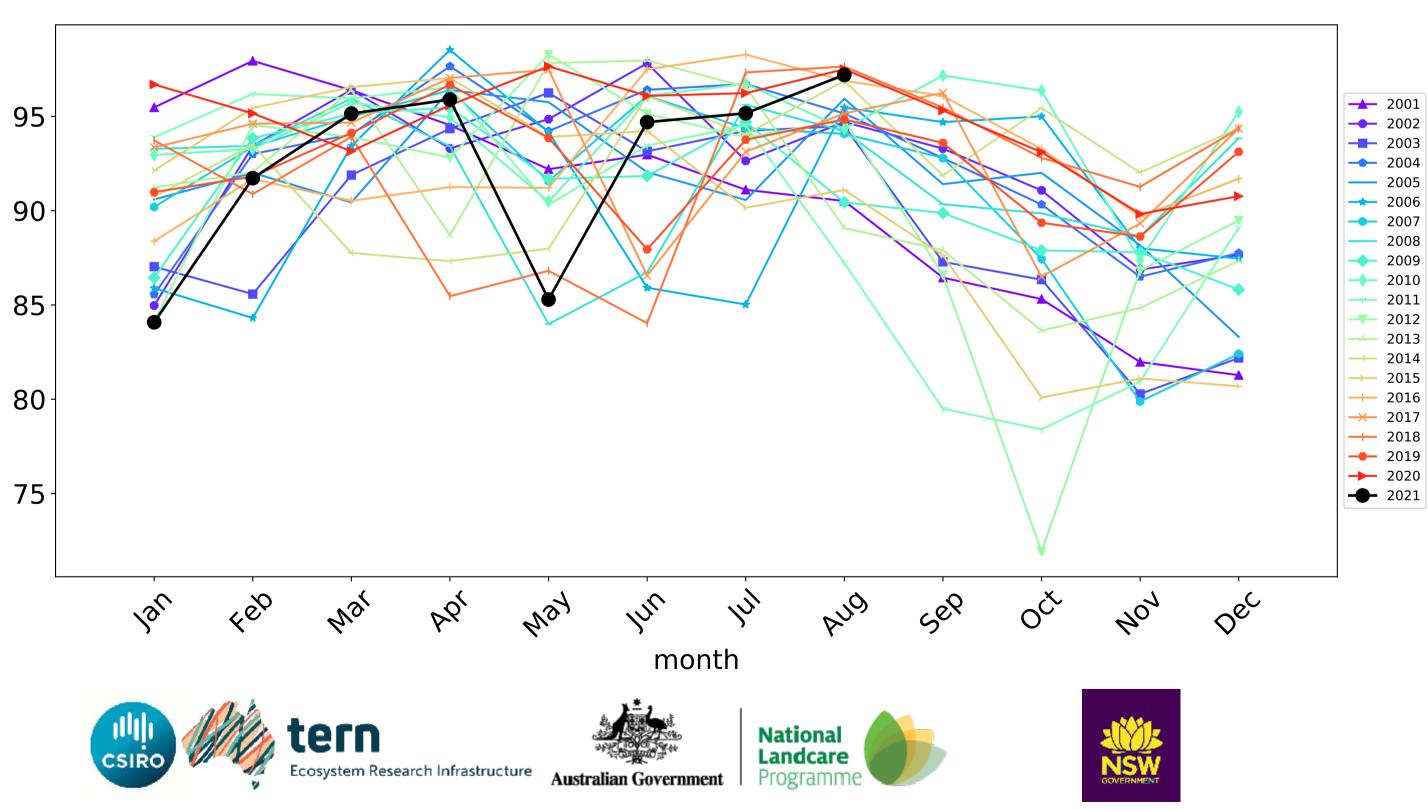


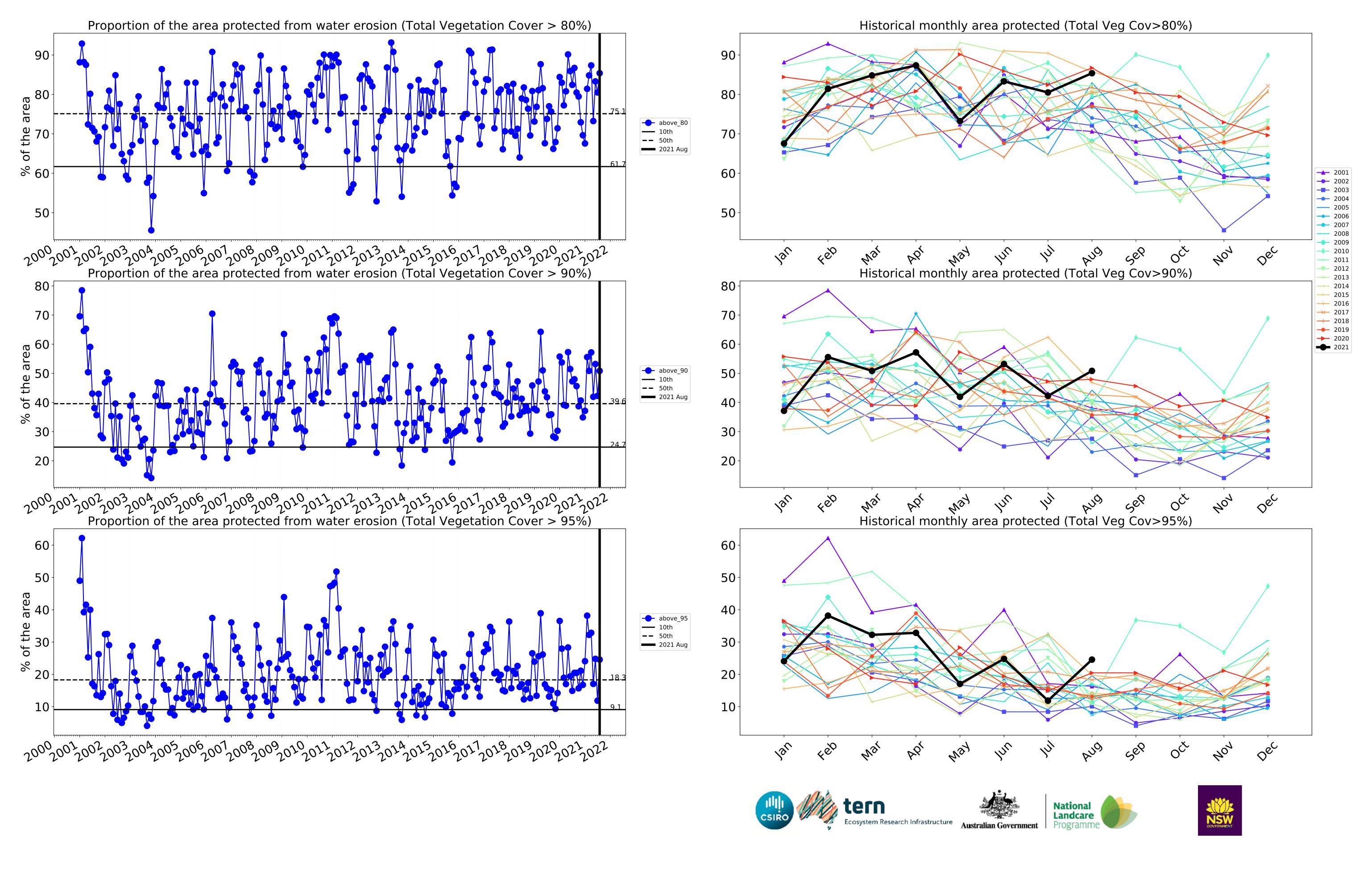


month

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







# **Conservation and natural environments Woodland forest**

### Land use and forest cover

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

Anomaly show how many percetage points each

pixel is from

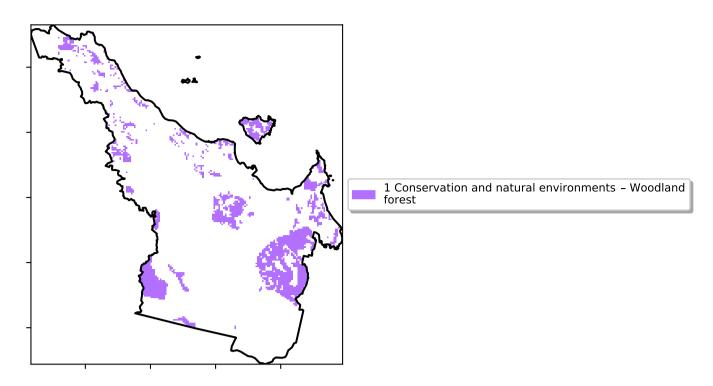
is, red pixels are about 20% lower than the mean of that

the mean. That

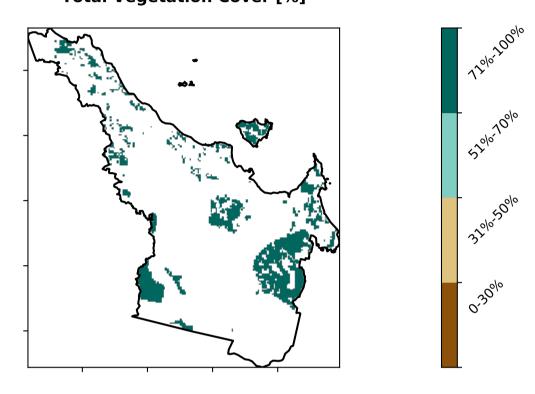
pixel. The mean

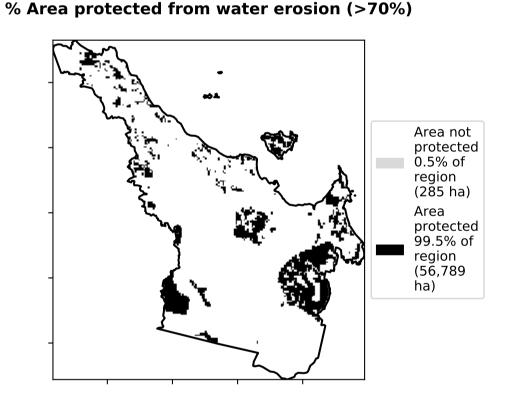
using baseline from 2001 to 2019.

is only for the month of the map

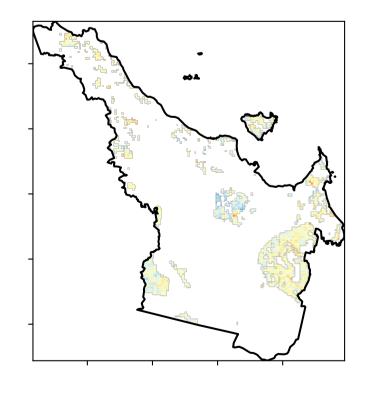


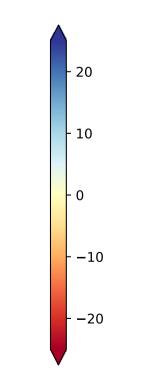
### **Total Vegetation Cover [%]**





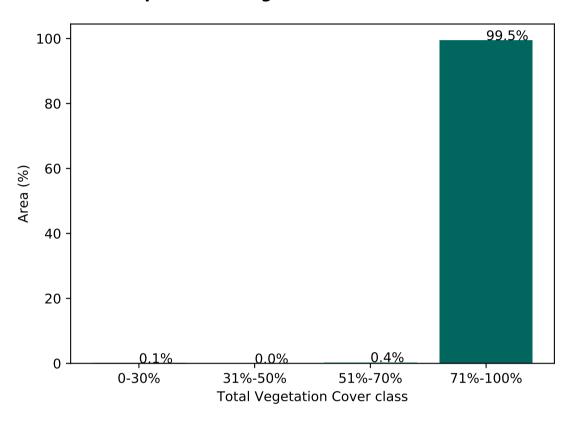
**Total Vegetation Cover Anomaly [%]** 



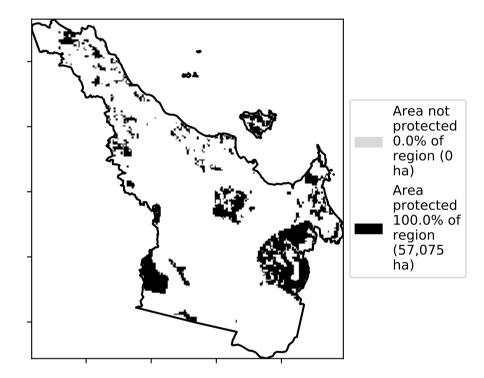


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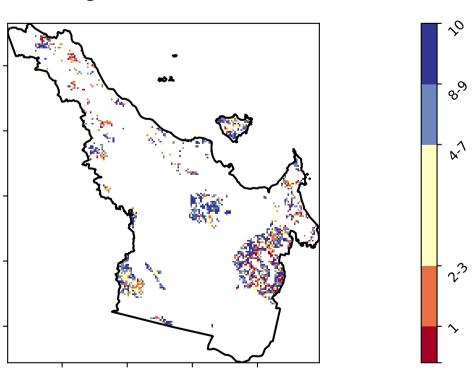
# Proportion of vegetation cover class in area



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



# Total Vegetation Cover Decile [%]





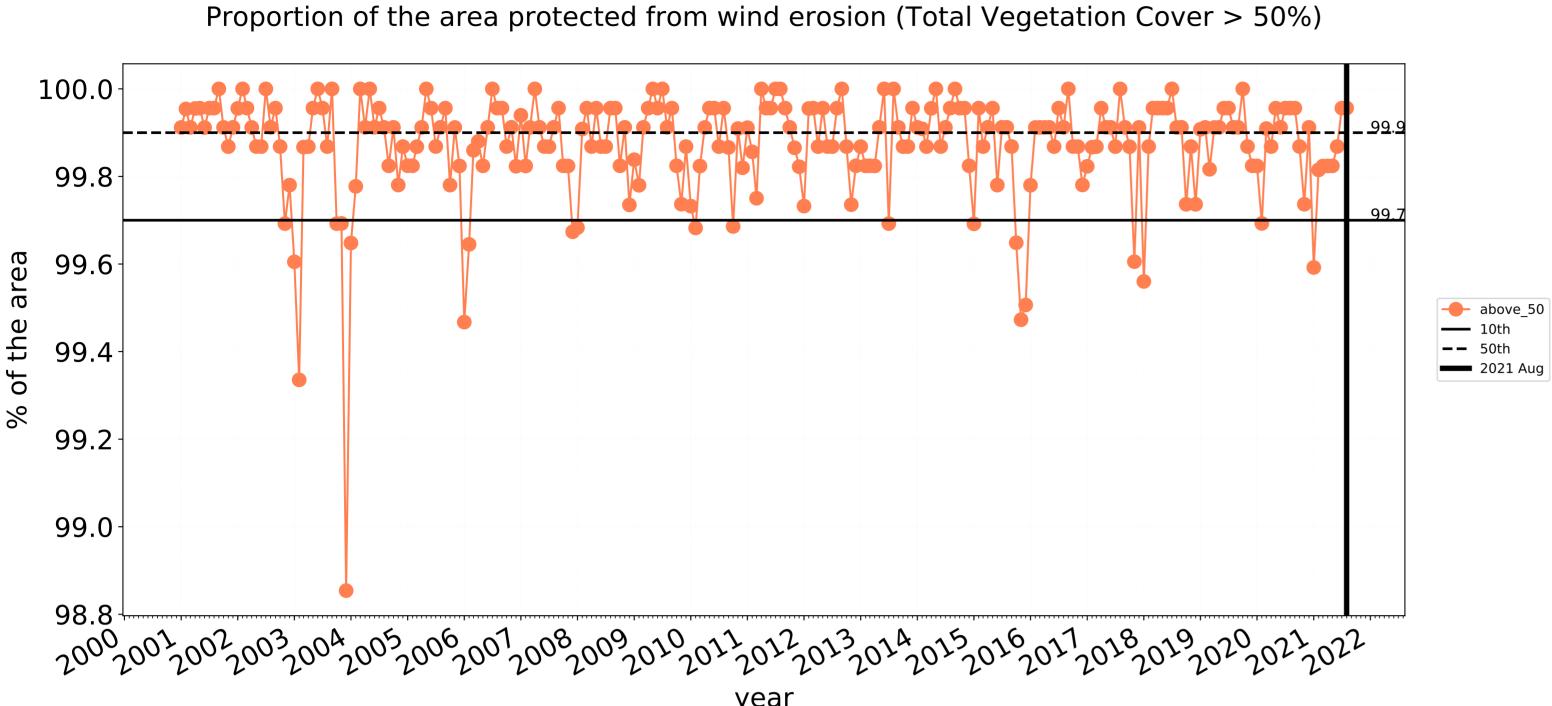


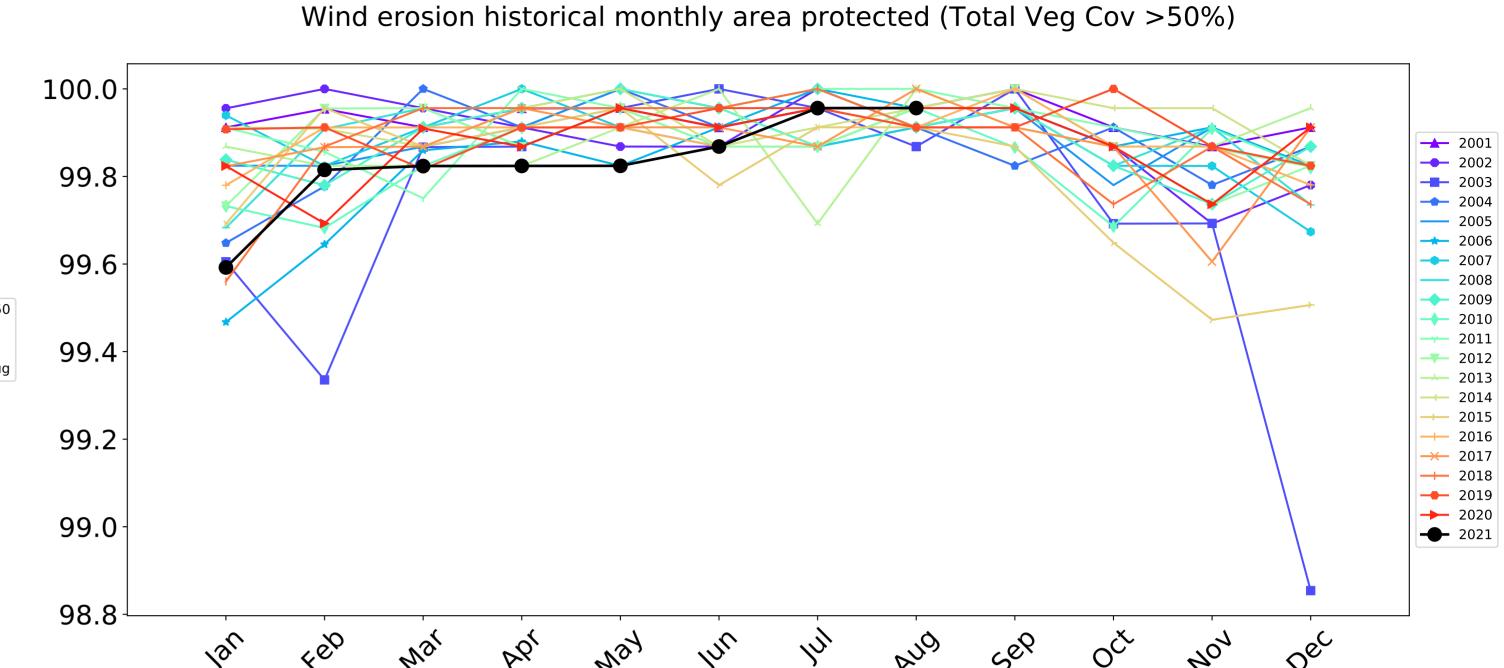




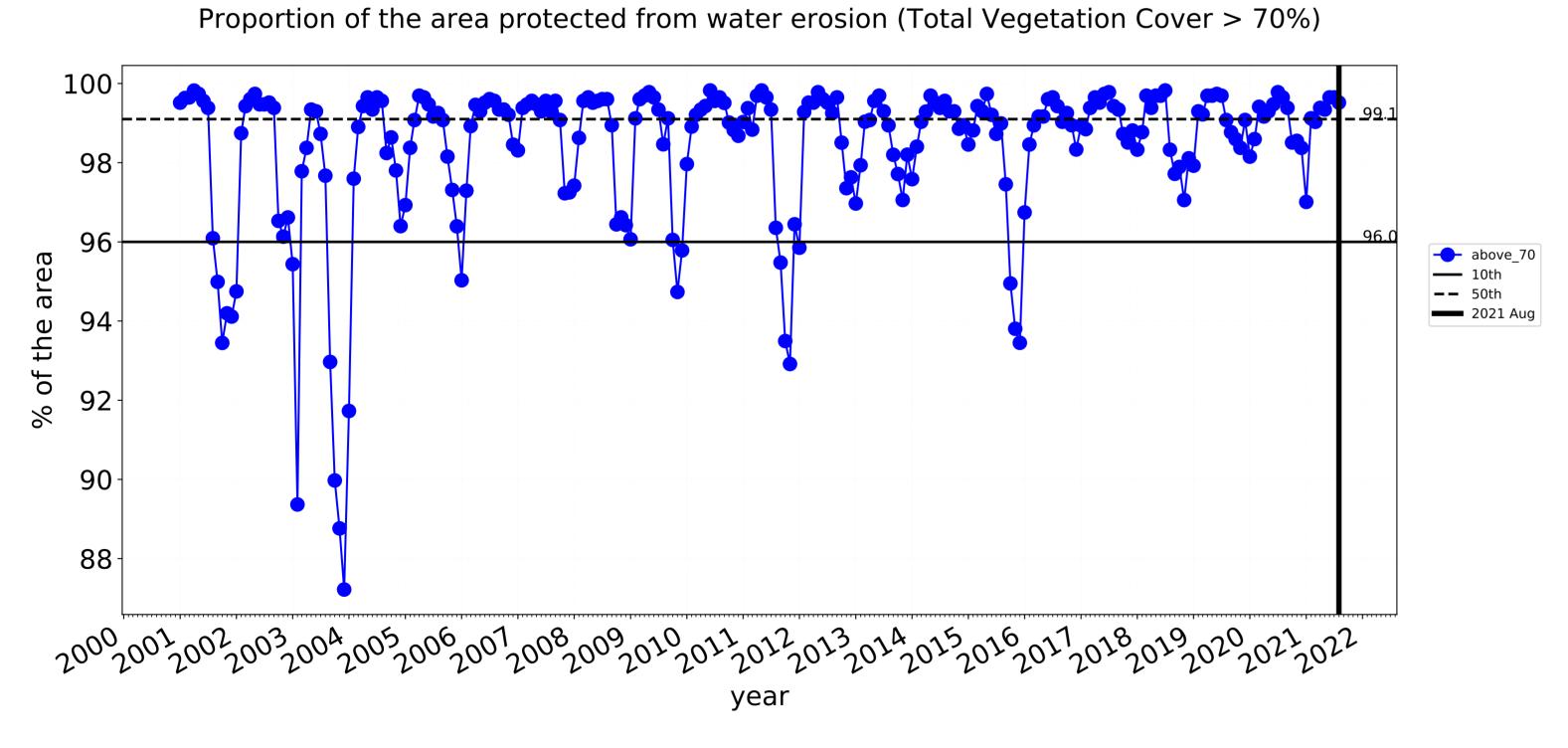


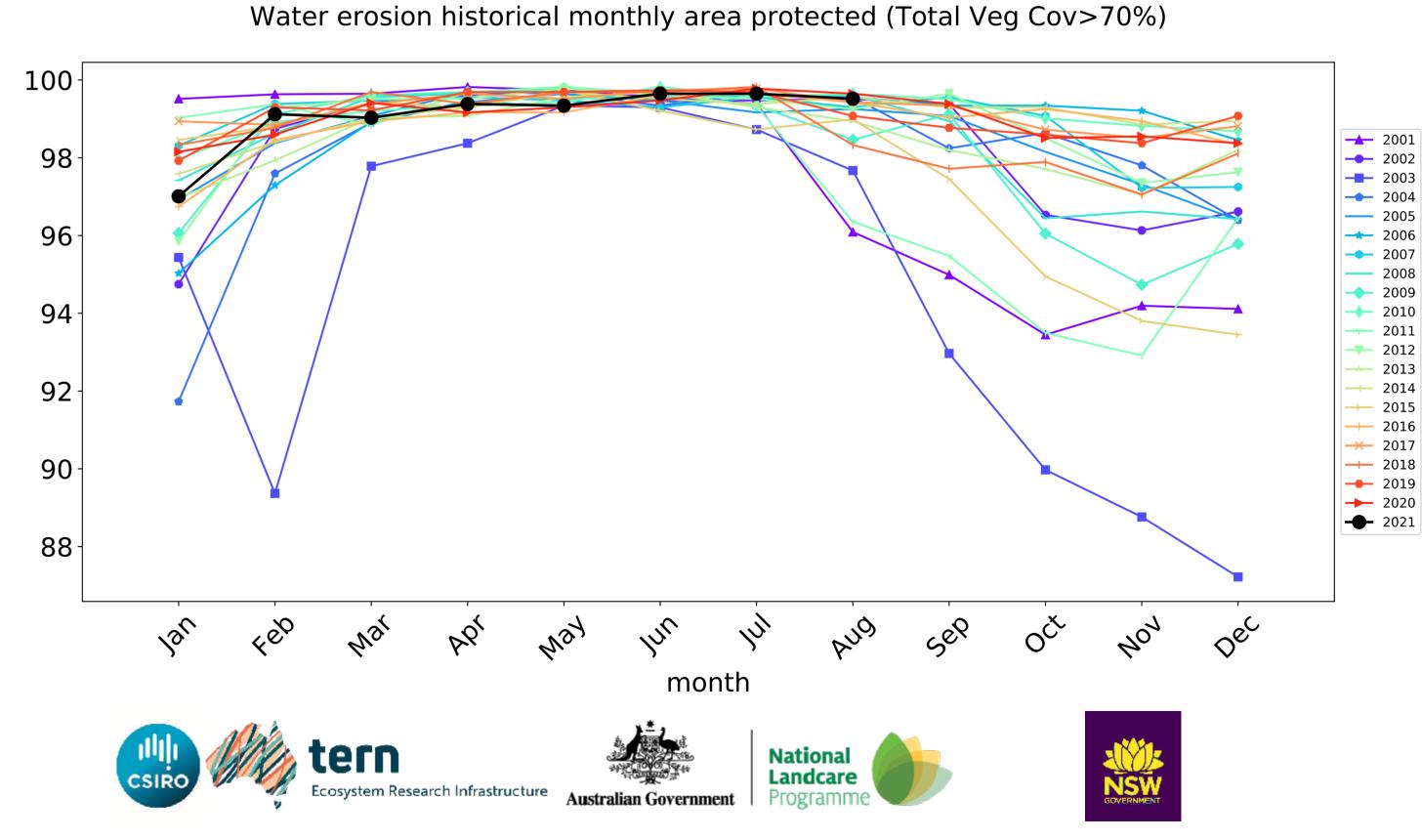


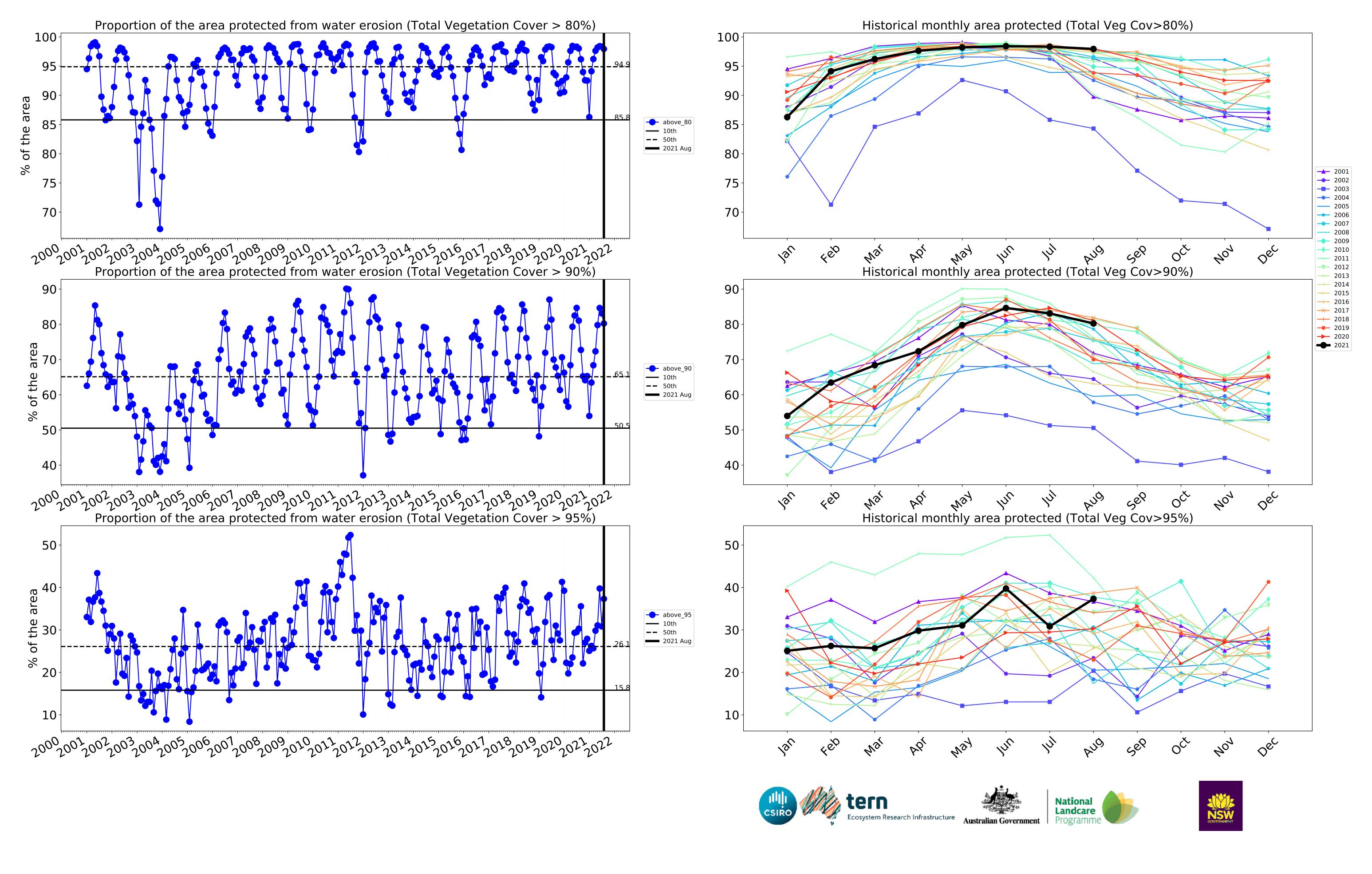




month







# **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)

Anomaly show how many percetage points each

pixel is from

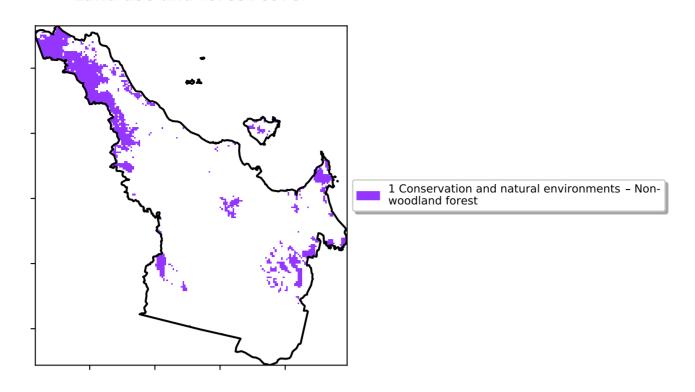
is, red pixels are about 20% lower than the mean of that

the mean. That

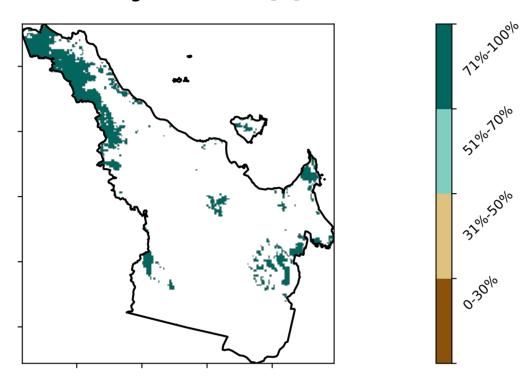
pixel. The mean

using baseline from 2001 to 2019.

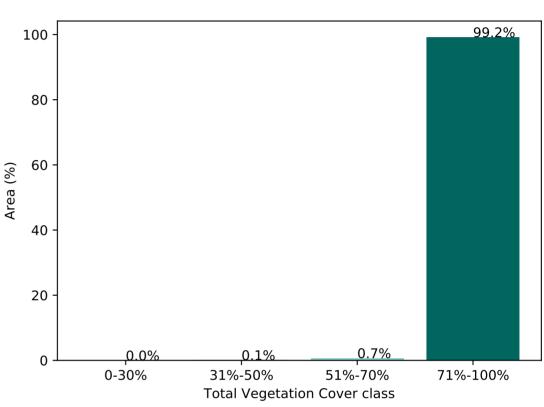
is only for the month of the map



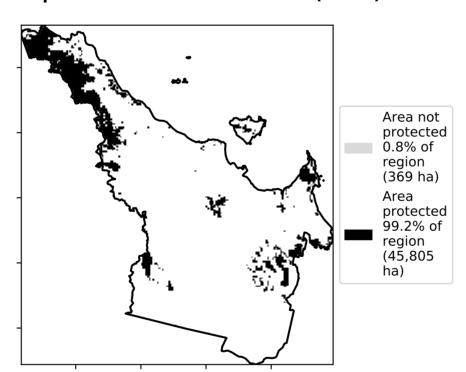
### **Total Vegetation Cover [%]**



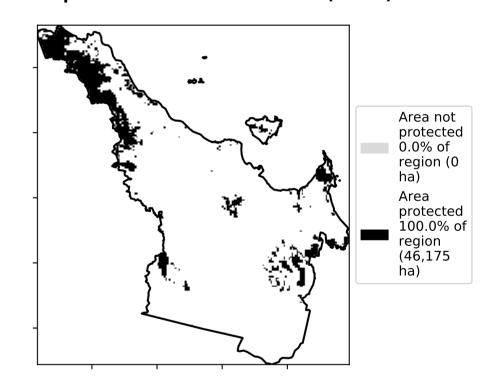
Proportion of vegetation cover class in area



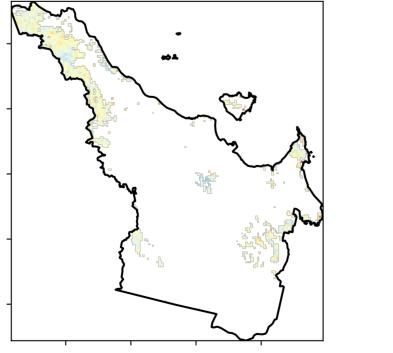
### % Area protected from water erosion (>70%)

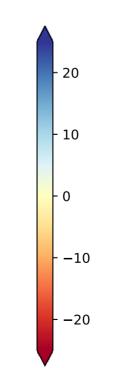


% Area protected from wind erosion (>50%)



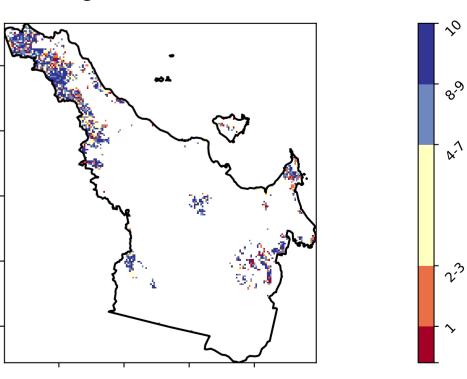
# **Total Vegetation Cover Anomaly [%]**





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 [%]





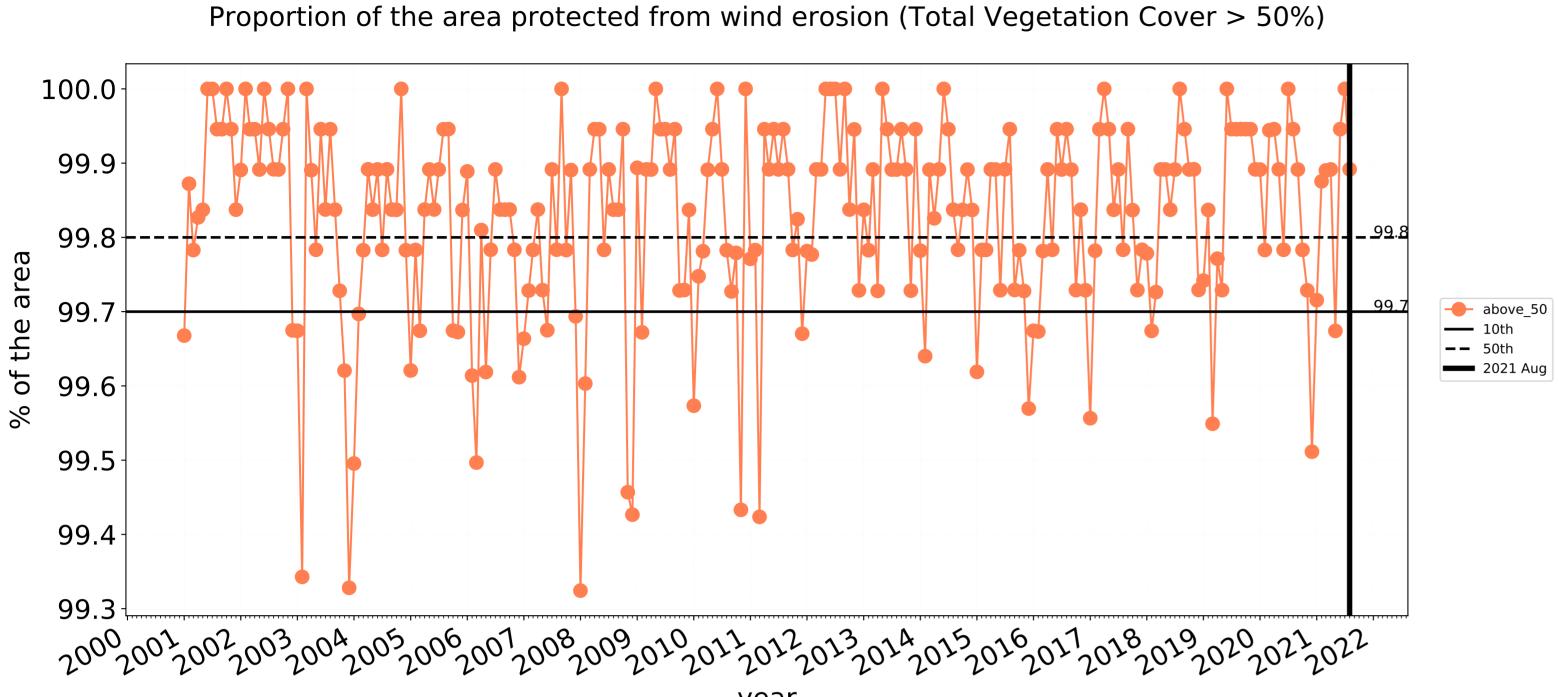


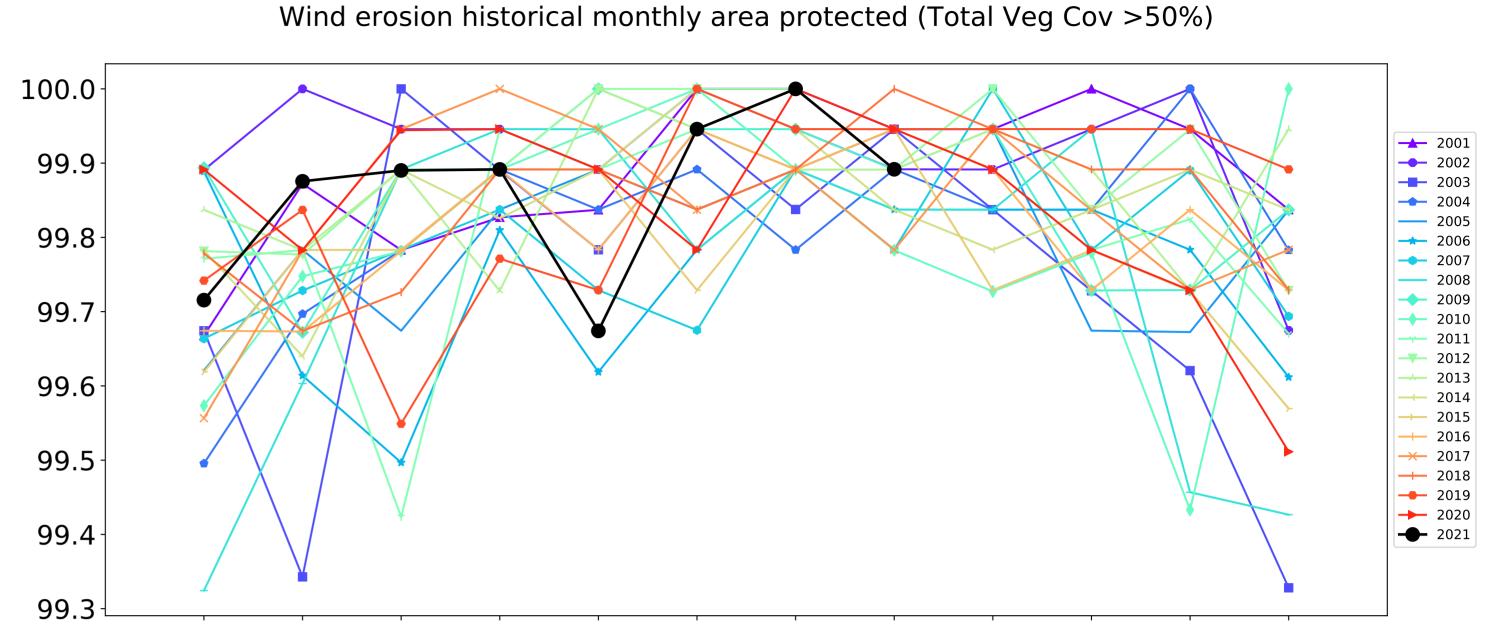




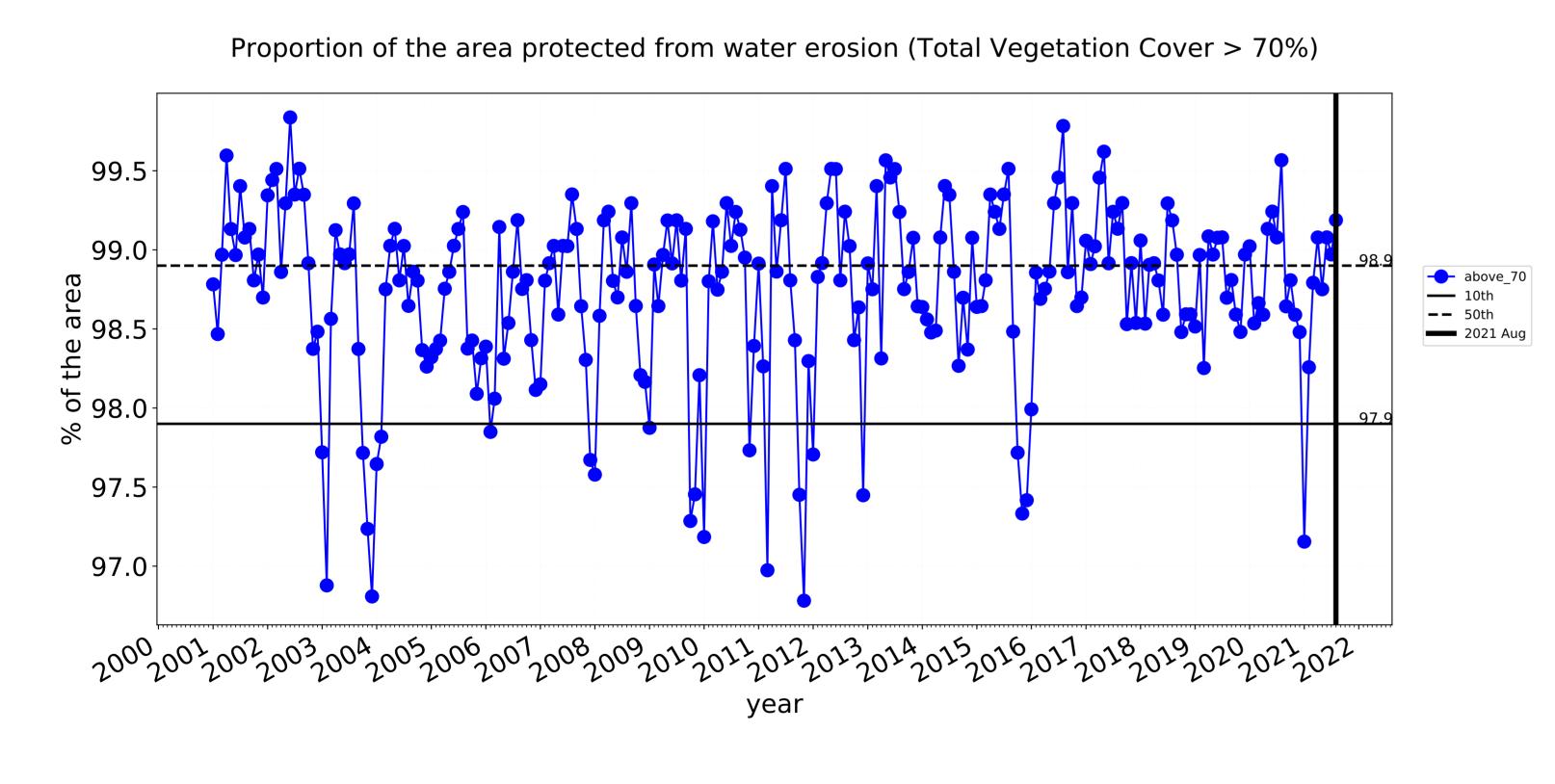


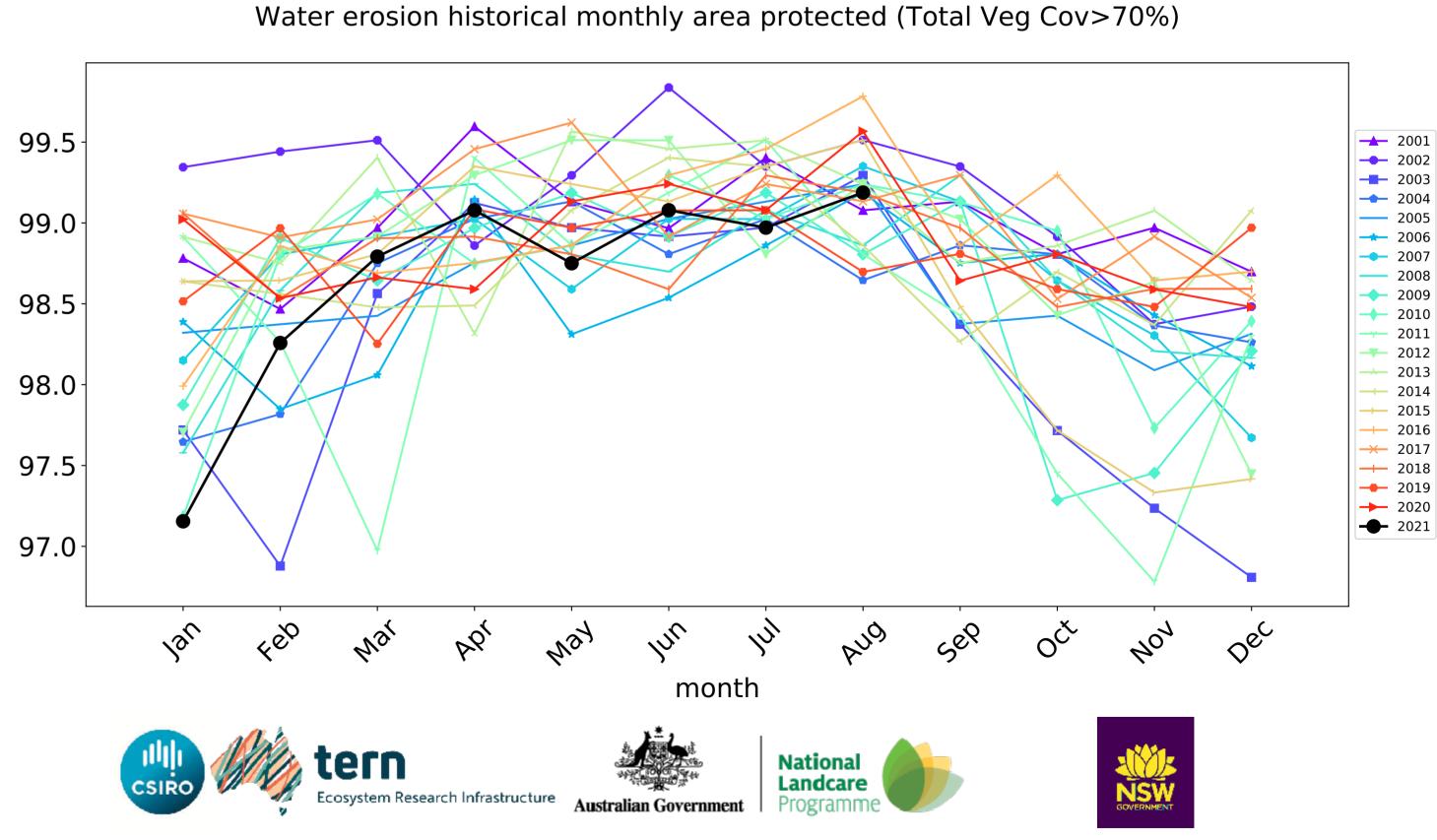


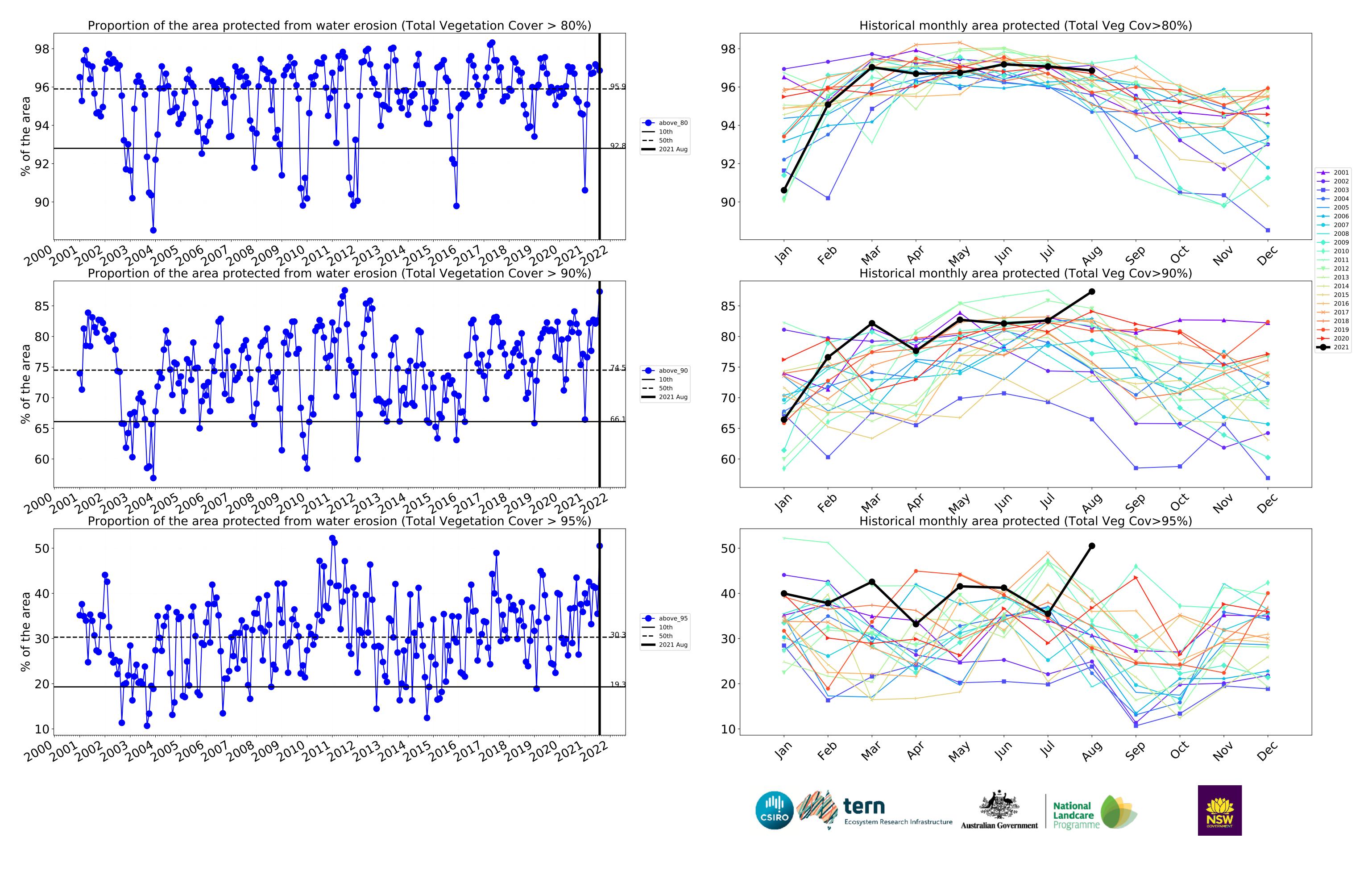




month

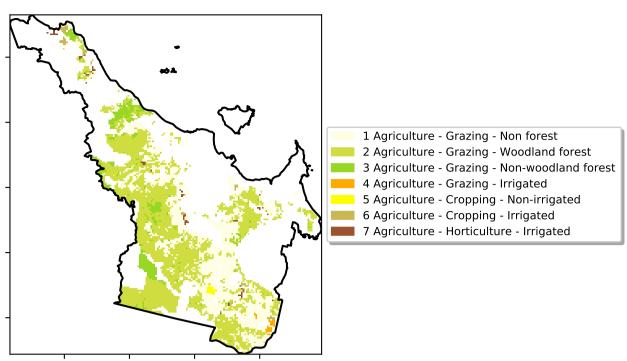






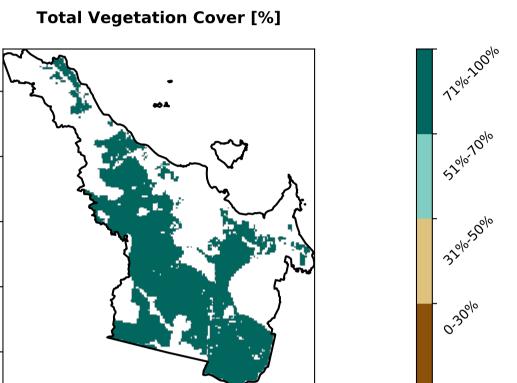
# **Agriculture**

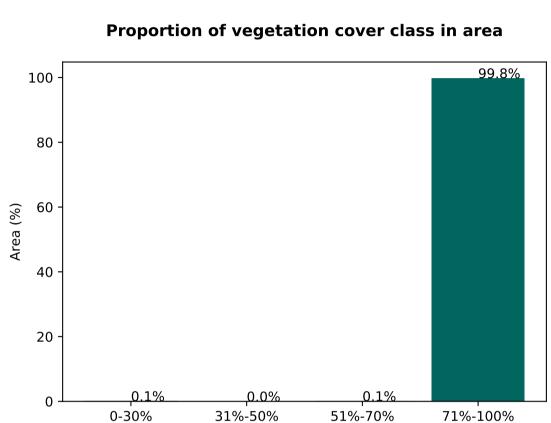
### Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



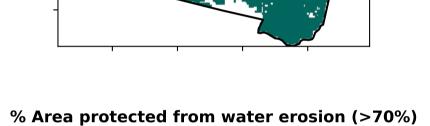
# 52.8% 50 40 \_36.6% Area (%) ω 20 10 Land use class

**Proportion of each land class in area** 

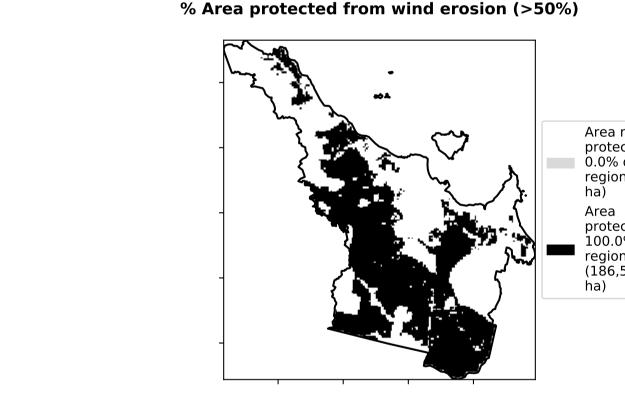


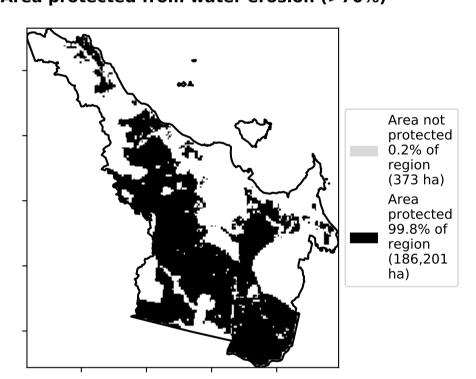


**Total Vegetation Cover class** 



**Land use and forest cover** 

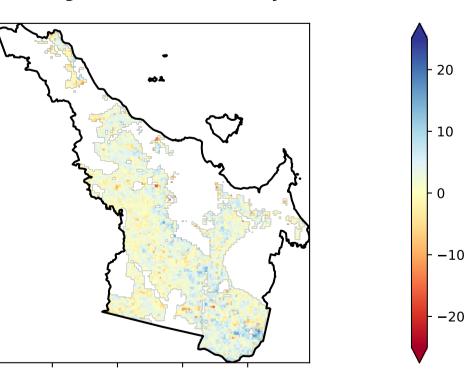




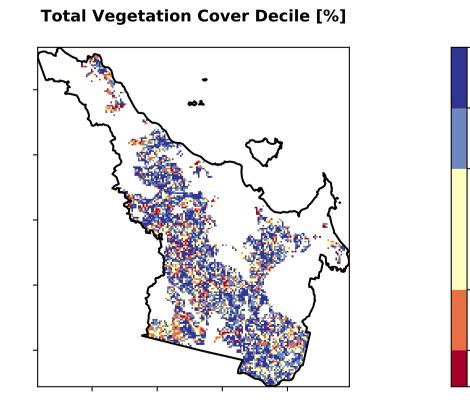
Area not protected 0.0% of region (0 protected 100.0% of region (186,575

**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.



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



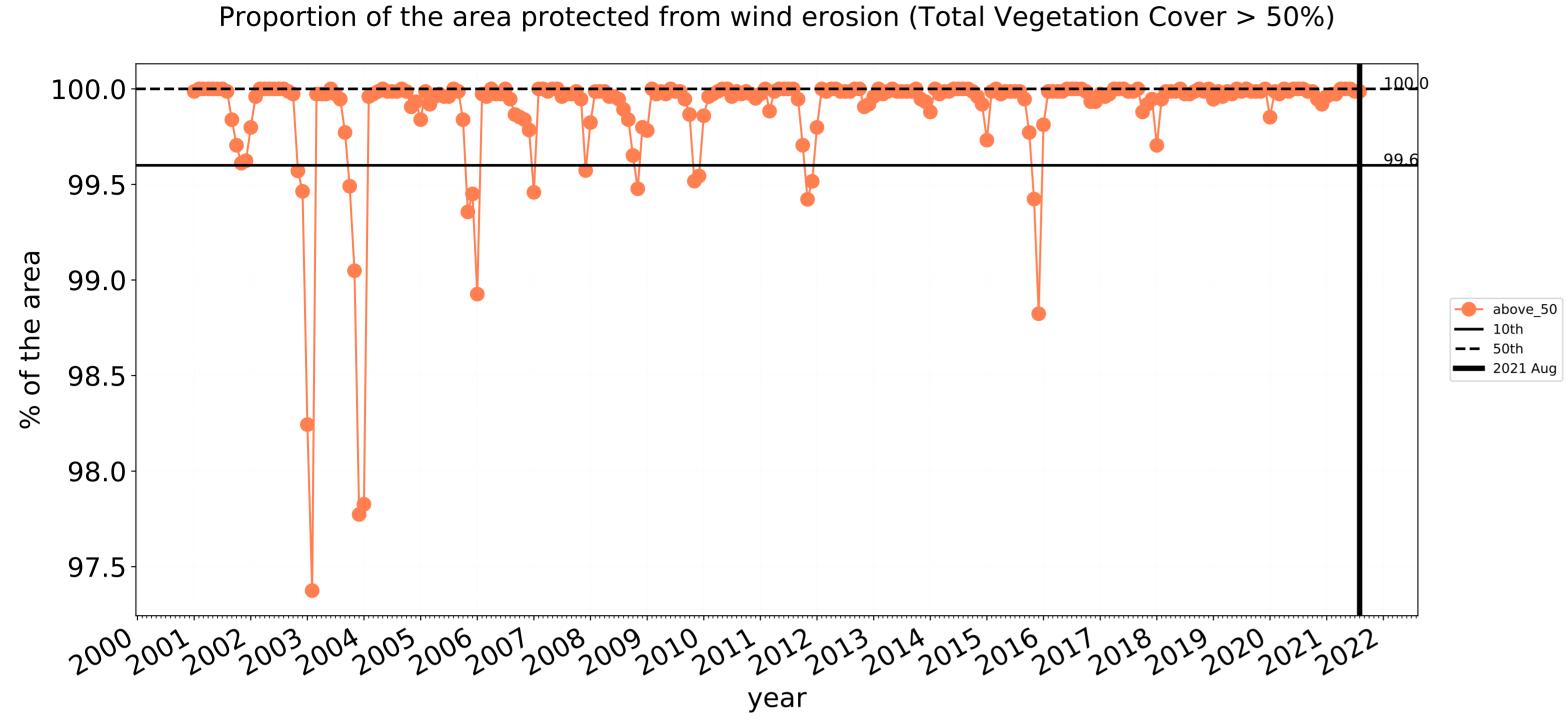


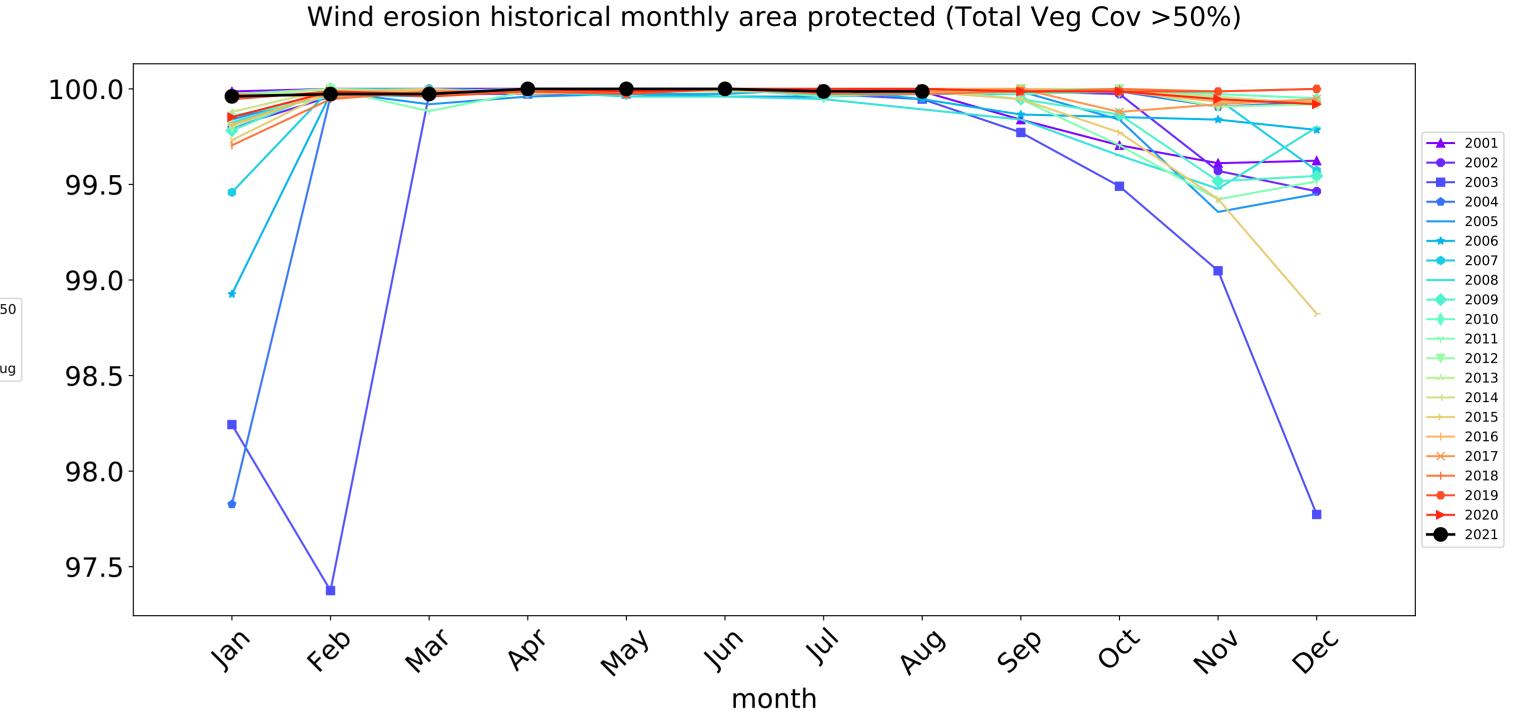


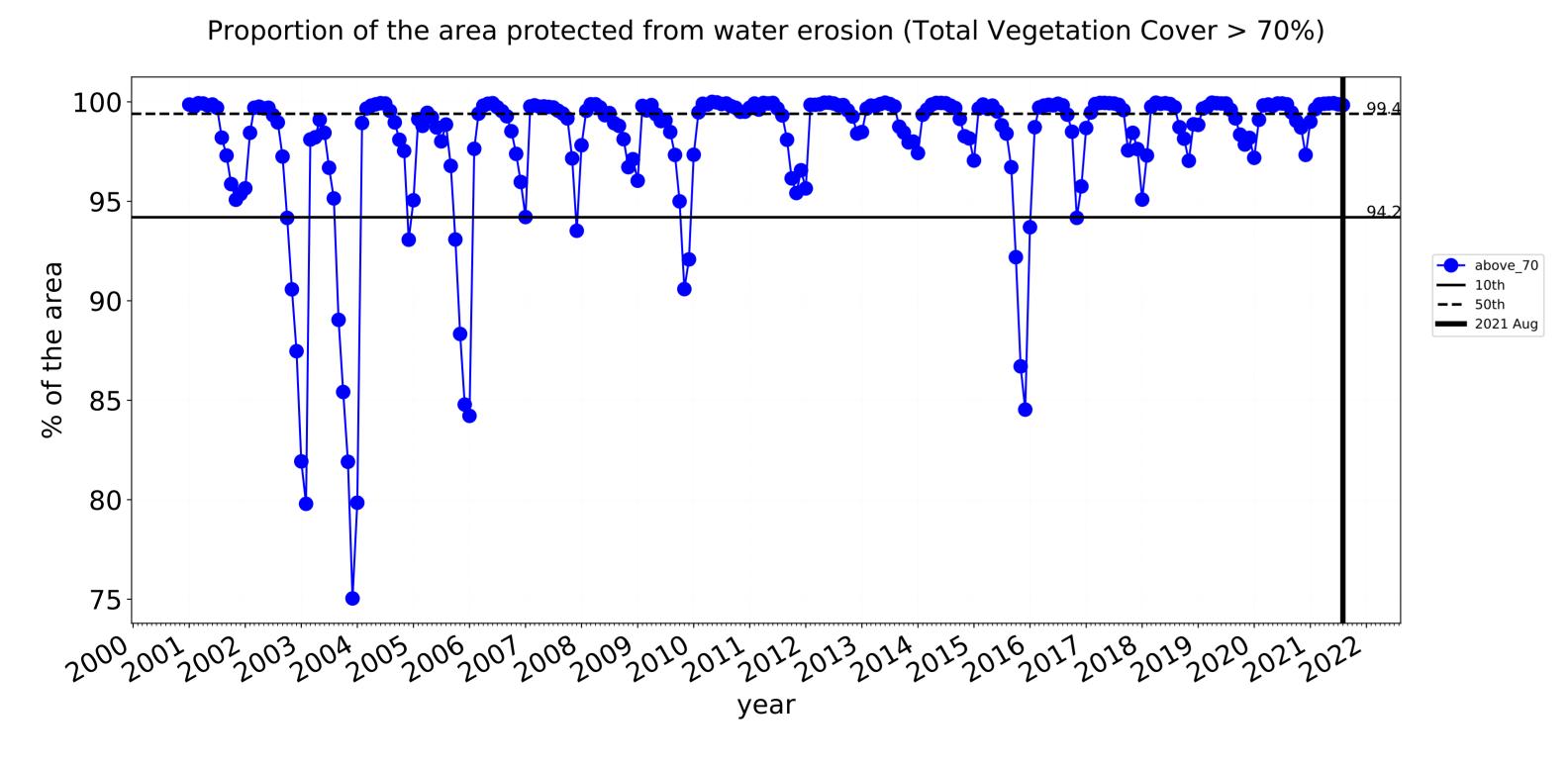


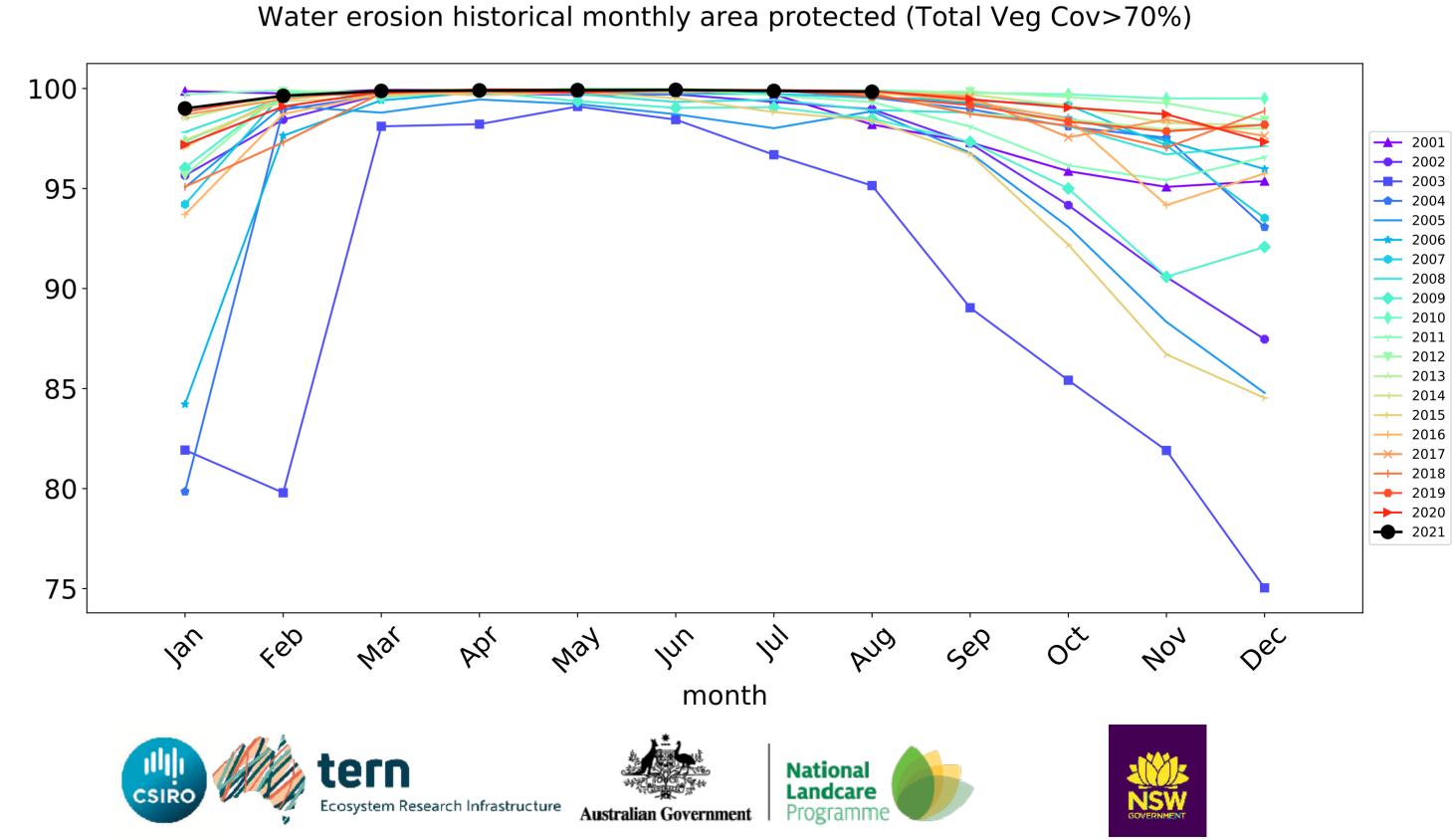


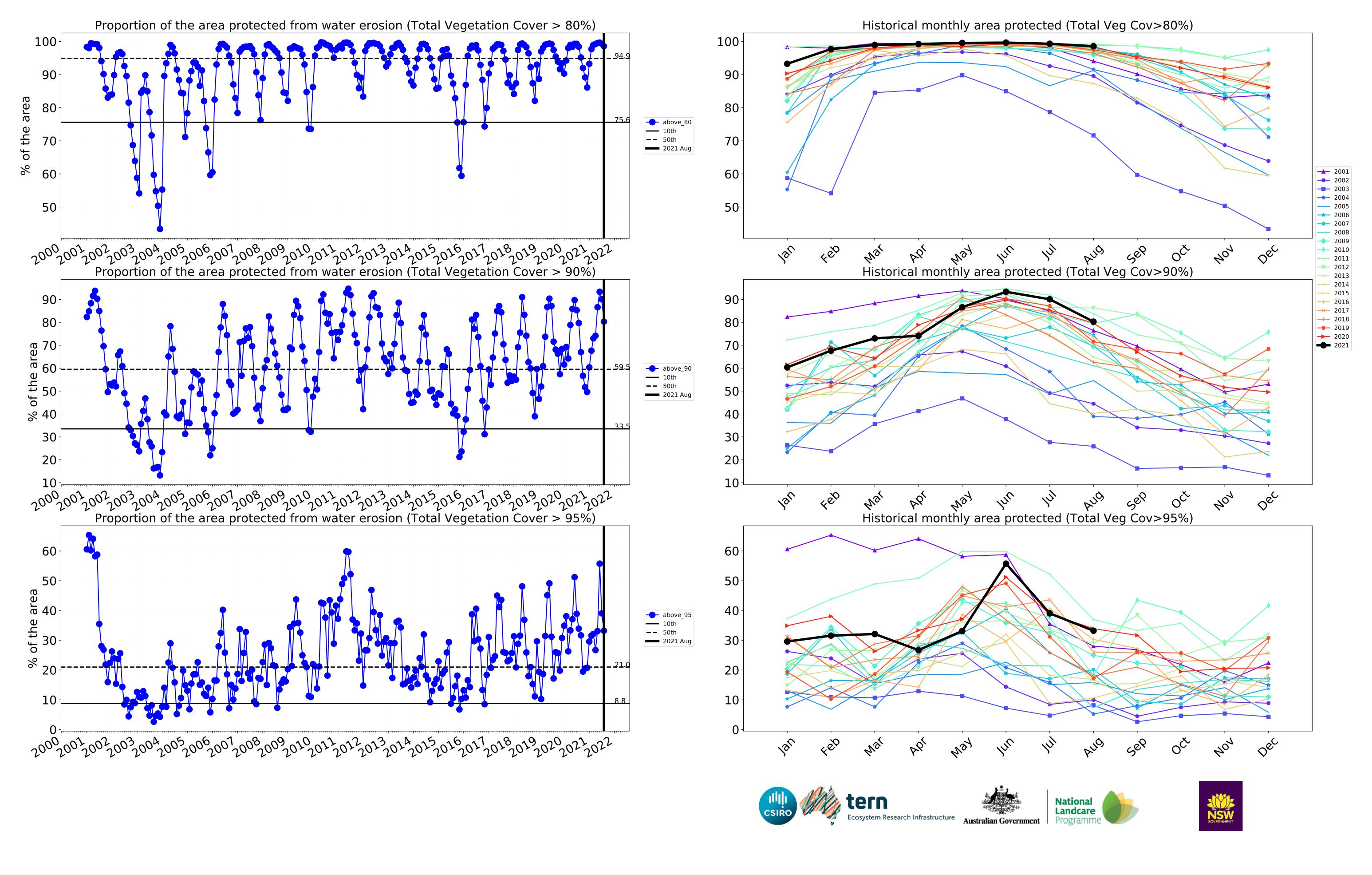
# **Agriculture timeseries**











# **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

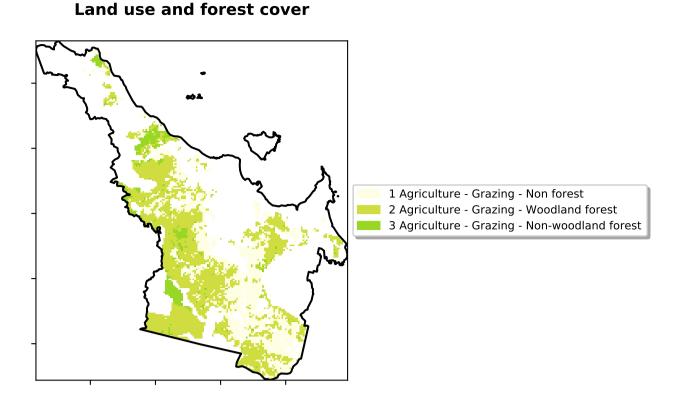
pixel is from

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

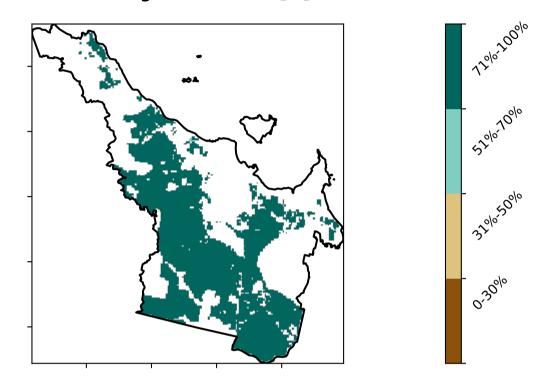
the mean. That

is only for the month of the map

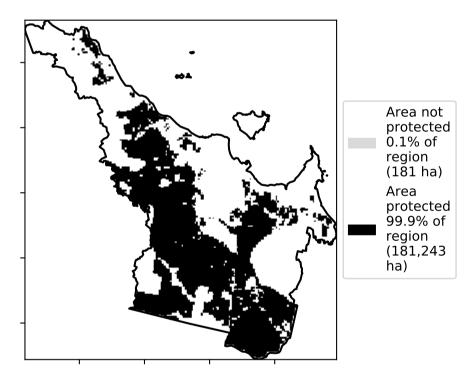
using baseline from 2001 to 2019.



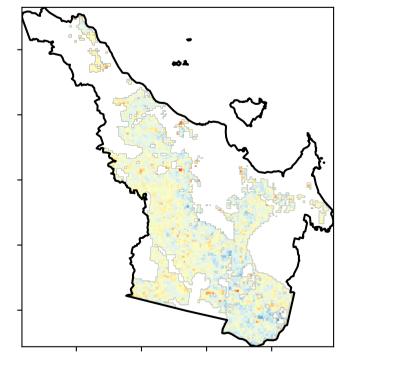
# Total Vegetation Cover [%]

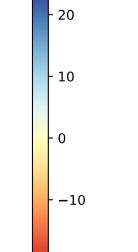


### % Area protected from water erosion (>70%)



# Total Vegetation Cover Anomaly [%]

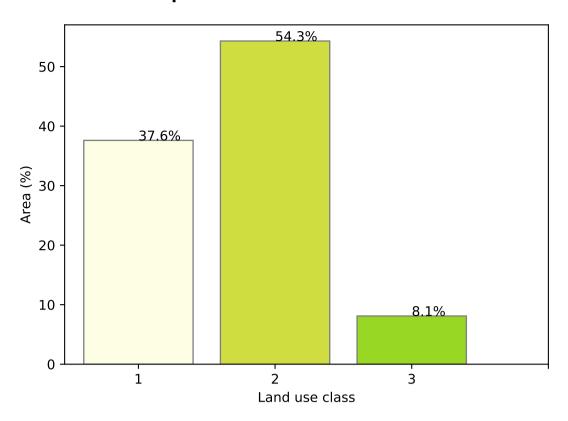




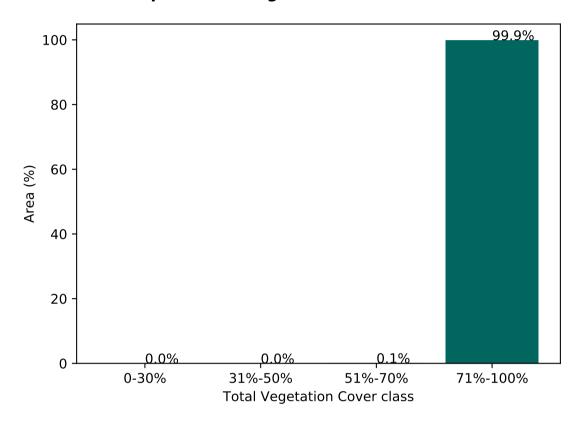
**-**20

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.

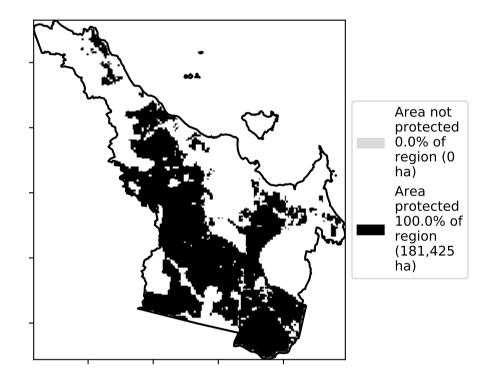
### Proportion of each land class in area



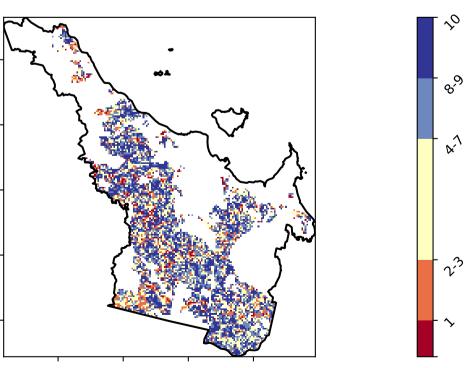
### Proportion of vegetation cover class in area



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



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







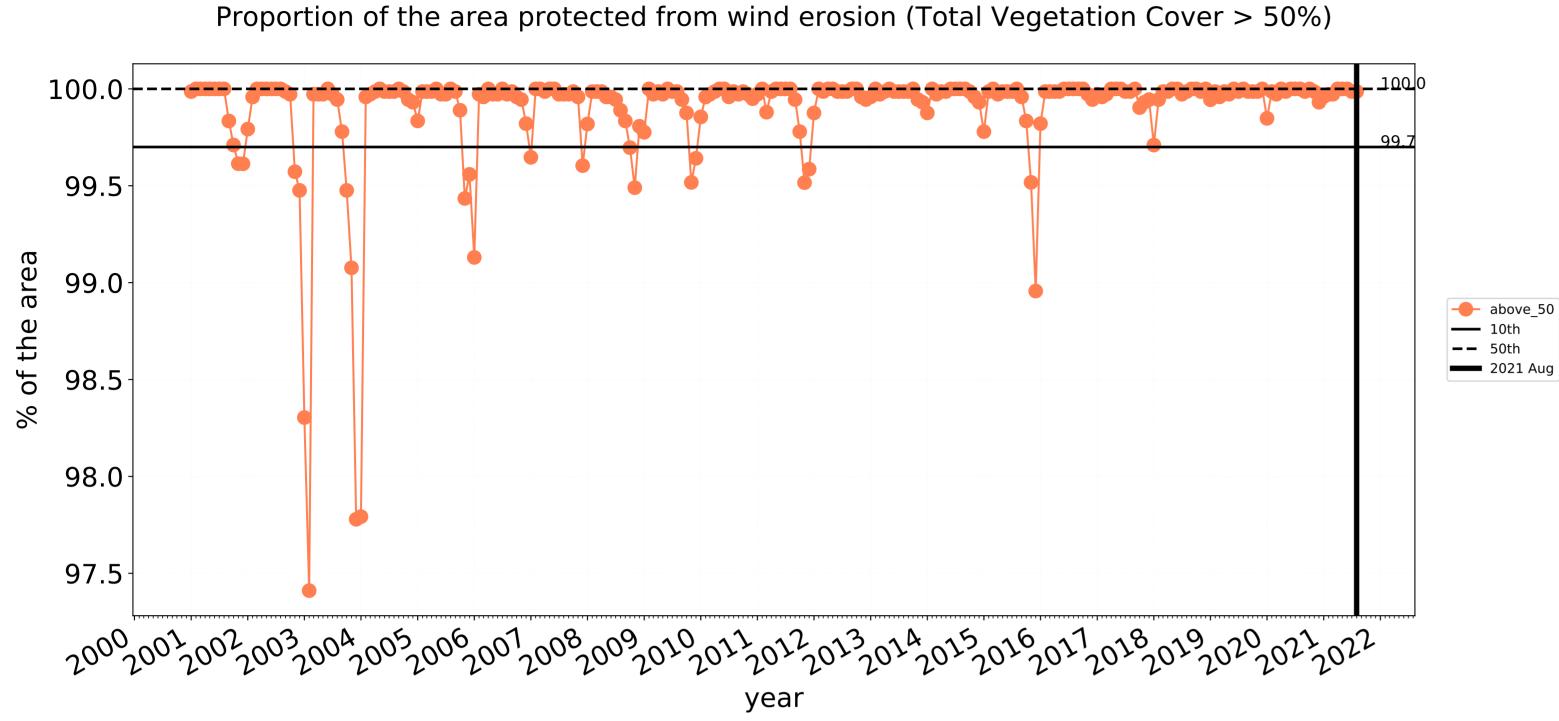


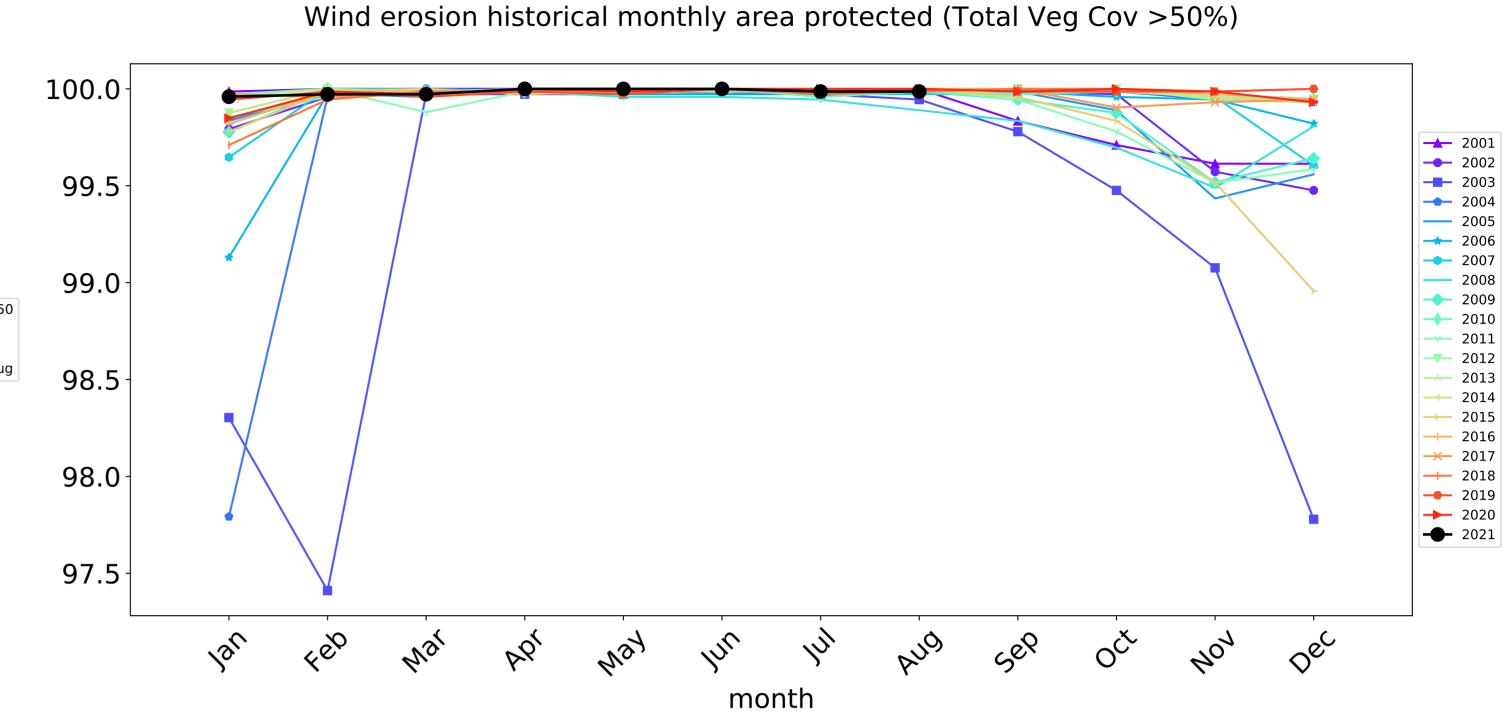


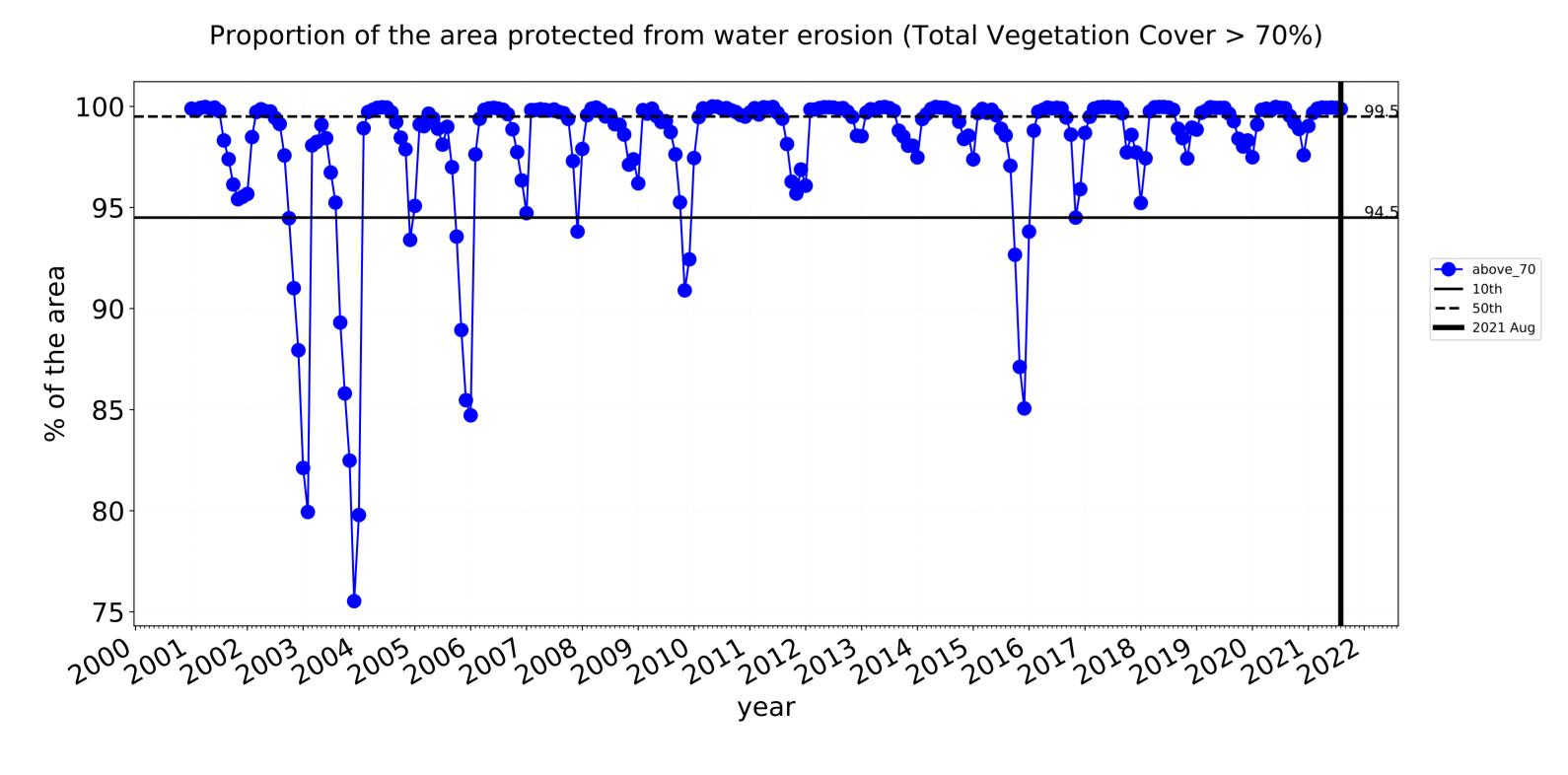


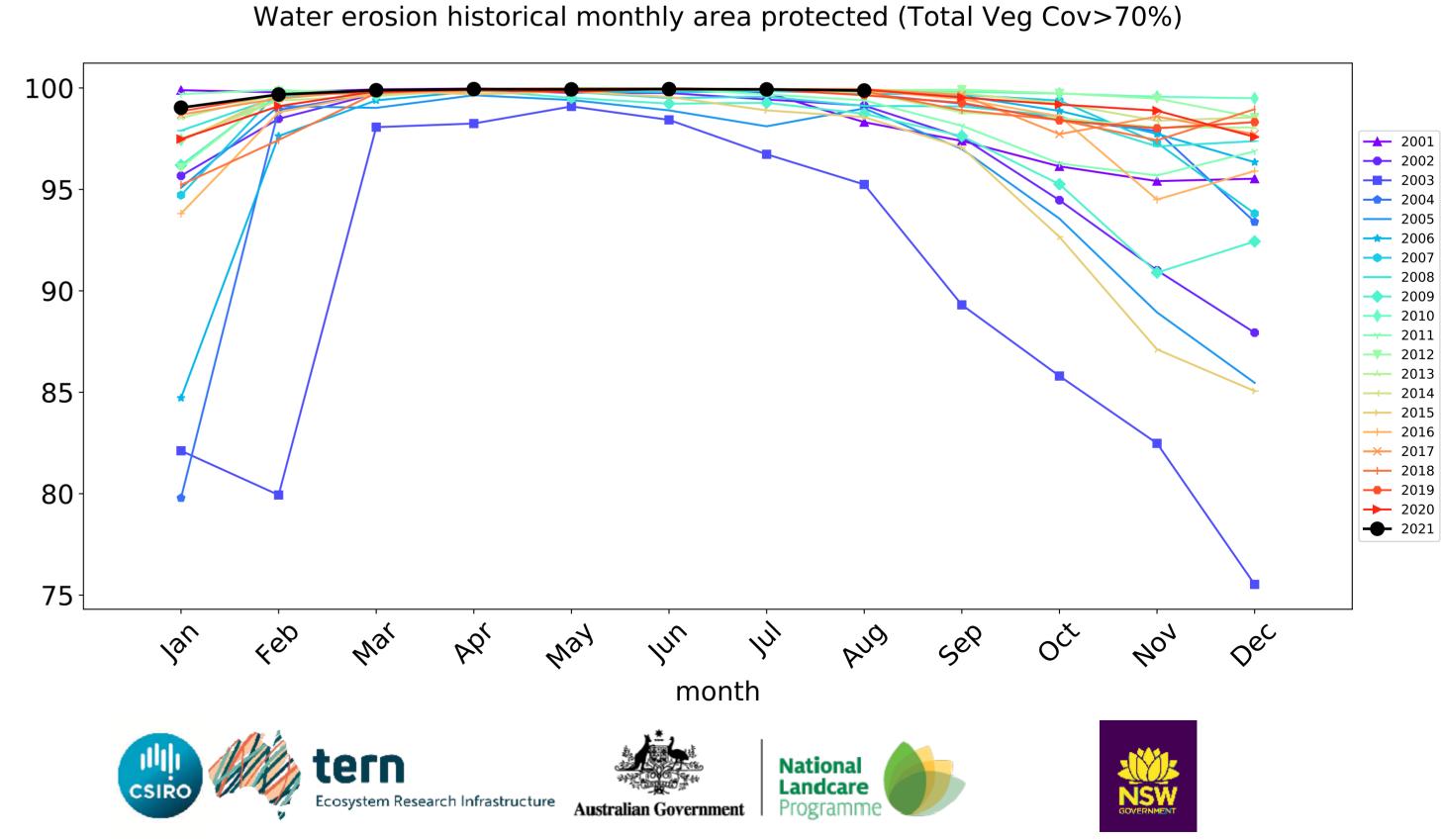


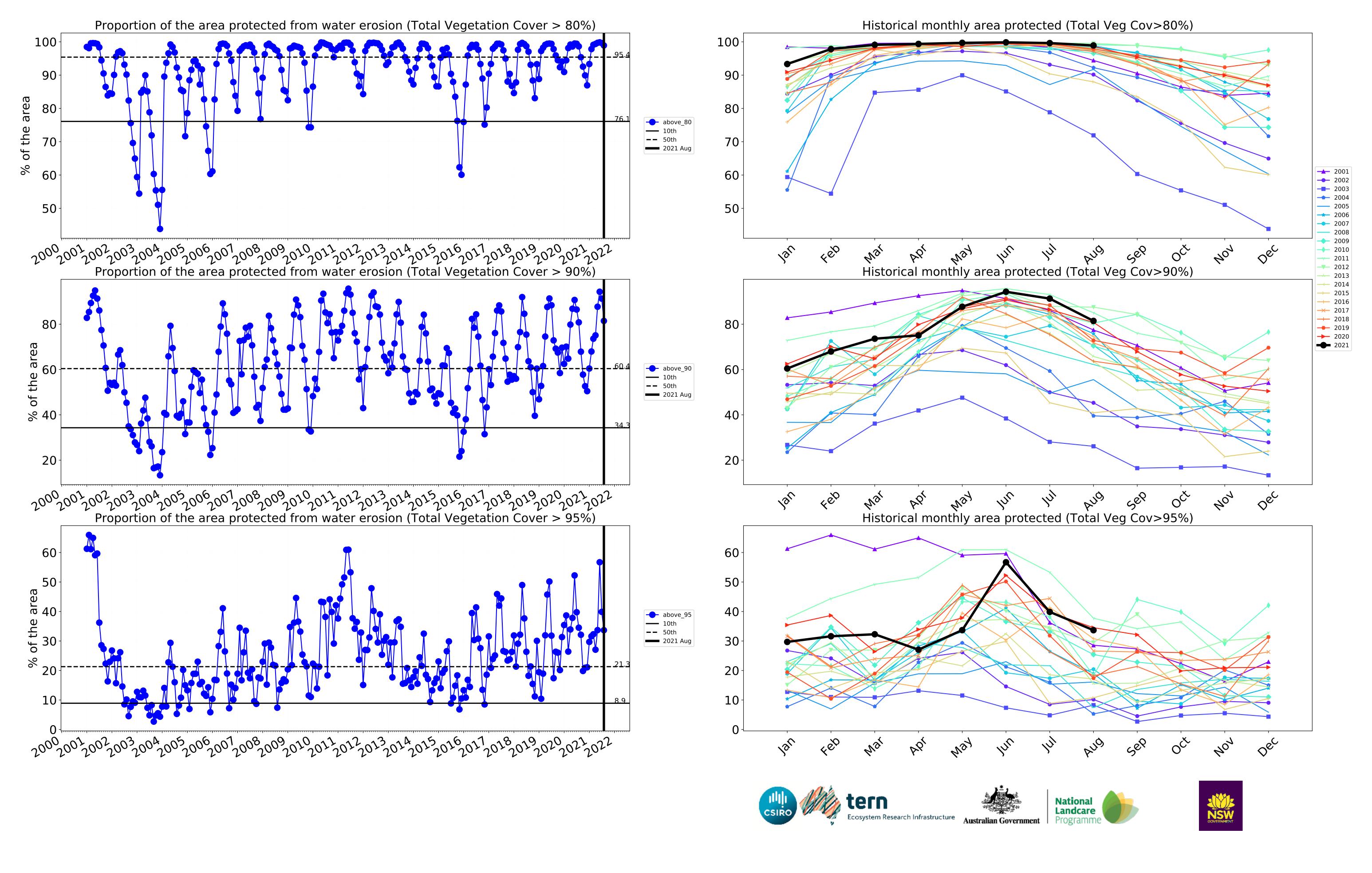
# **Grazing timeseries**











# **Grazing non forest**

### Land use and forest cover

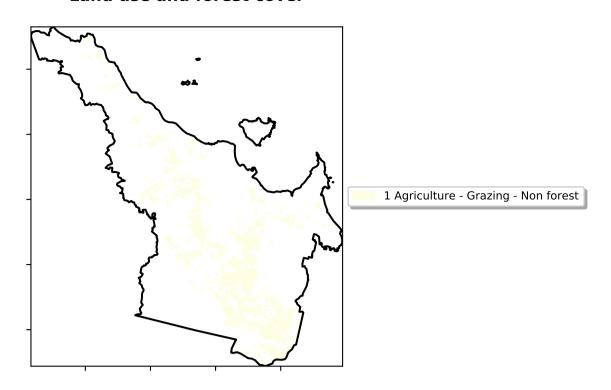
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Anomaly show how many percetage points each

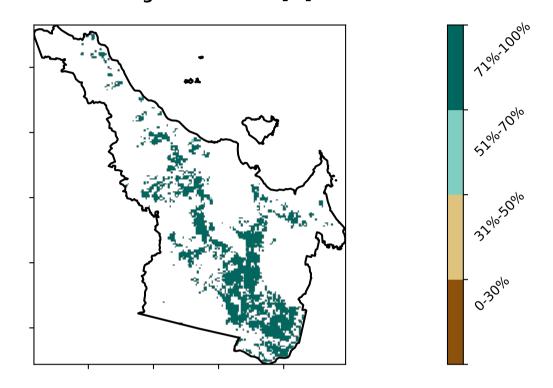
pixel is from the mean. That

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

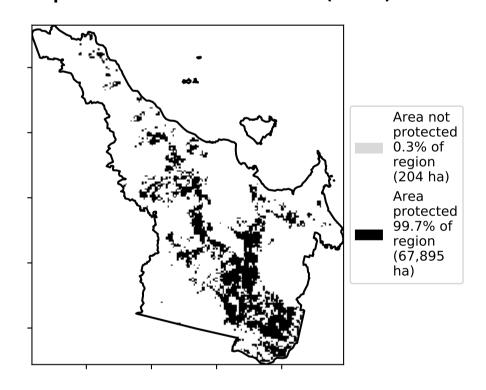
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



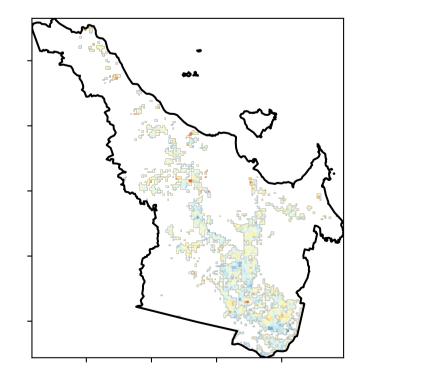
### **Total Vegetation Cover [%]**



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

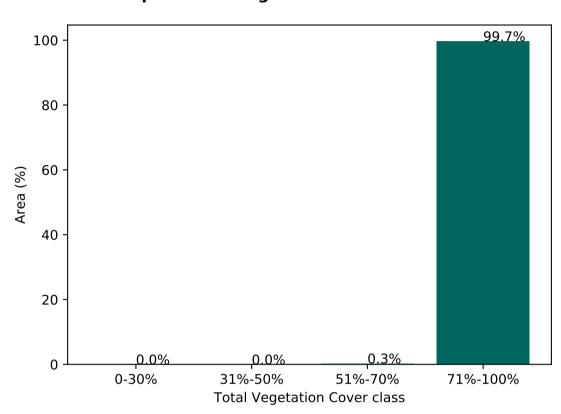


# **Total Vegetation Cover Anomaly [%]**

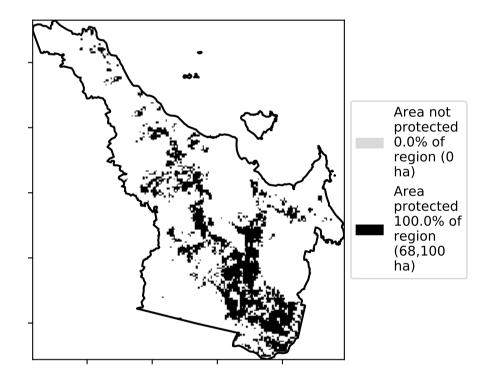


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

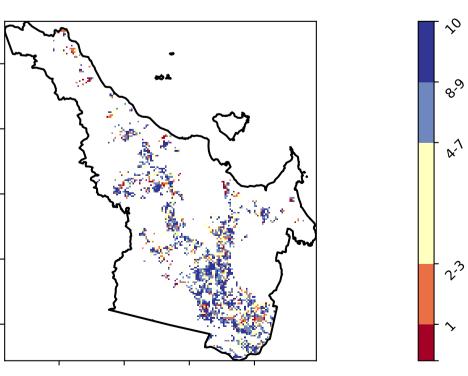
### **Proportion of vegetation cover class in area**



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



# Total Vegetation Cover Decile [%]











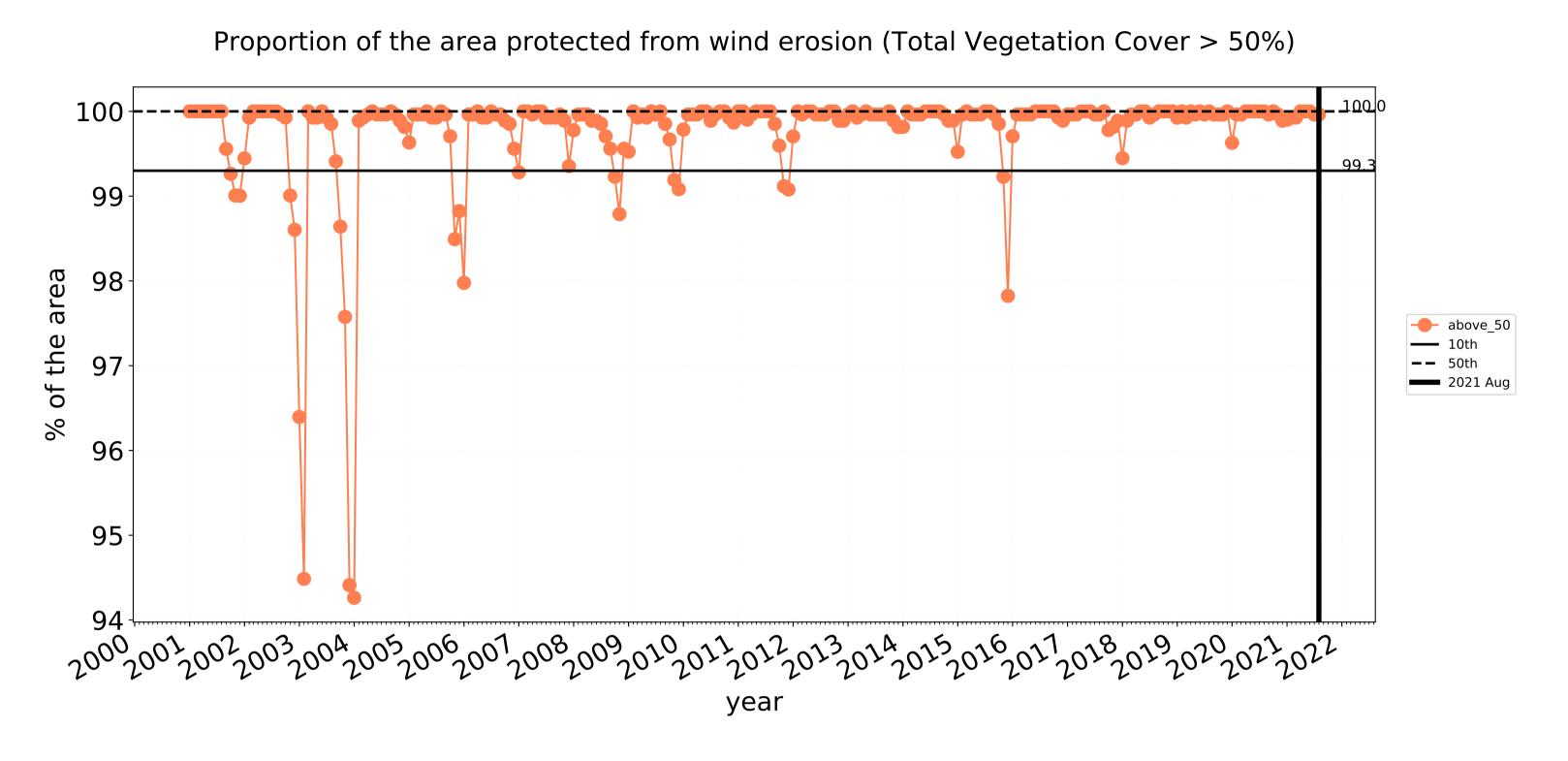
- 20

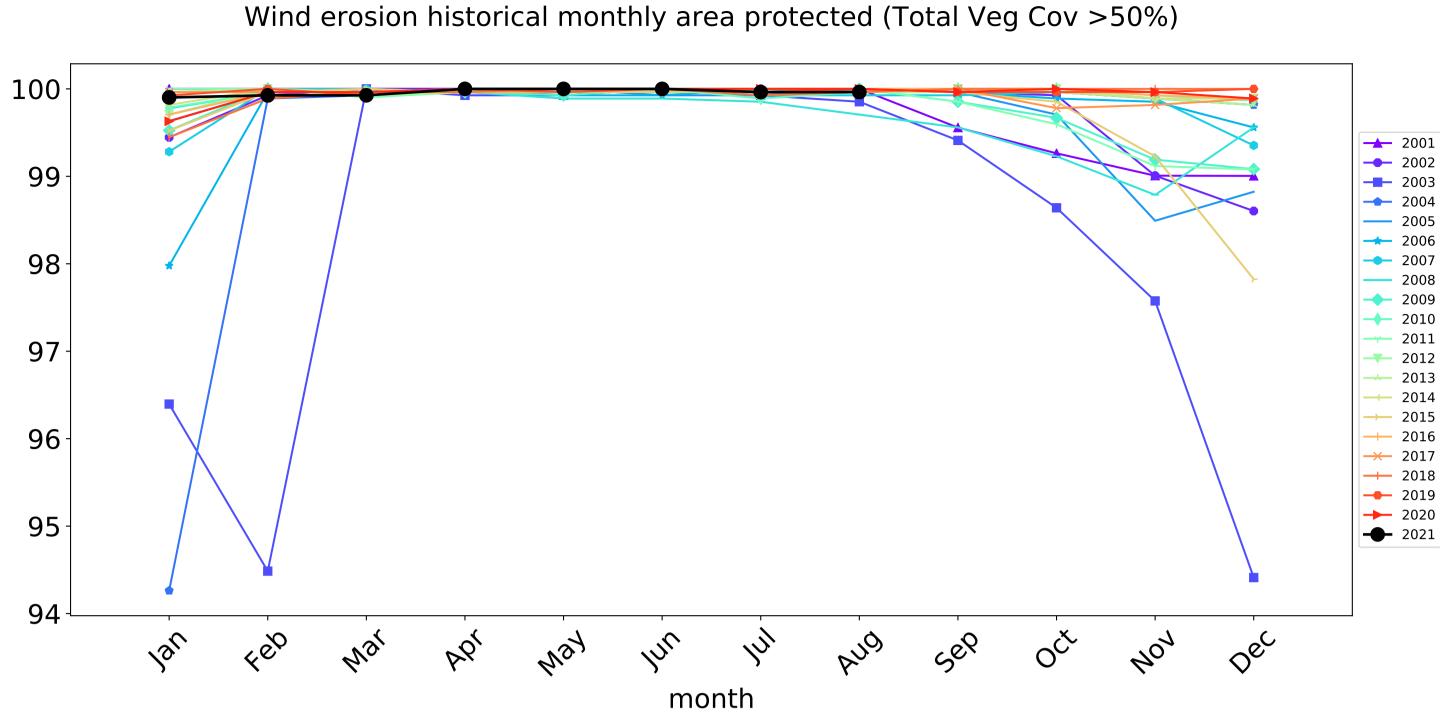
- 10

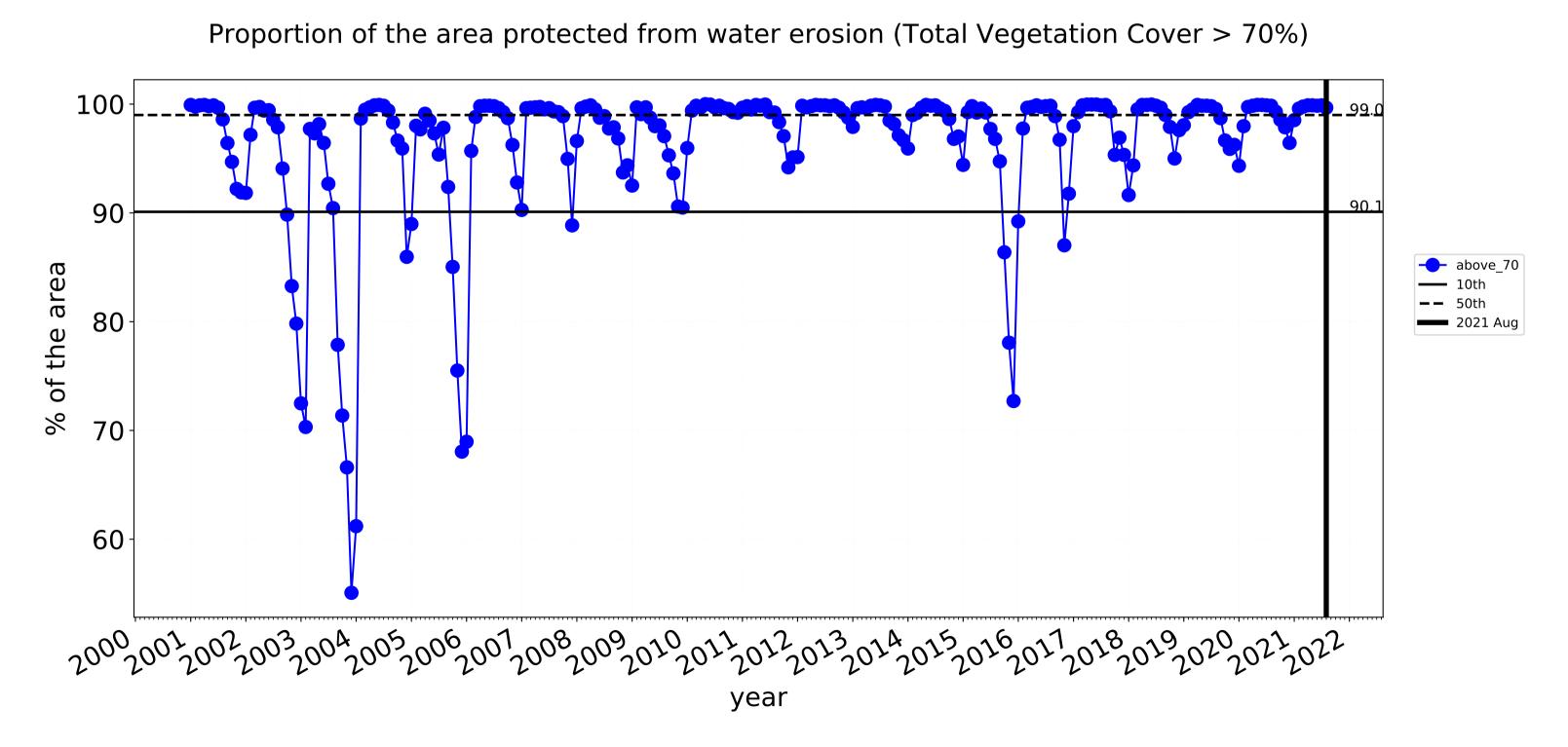
-10

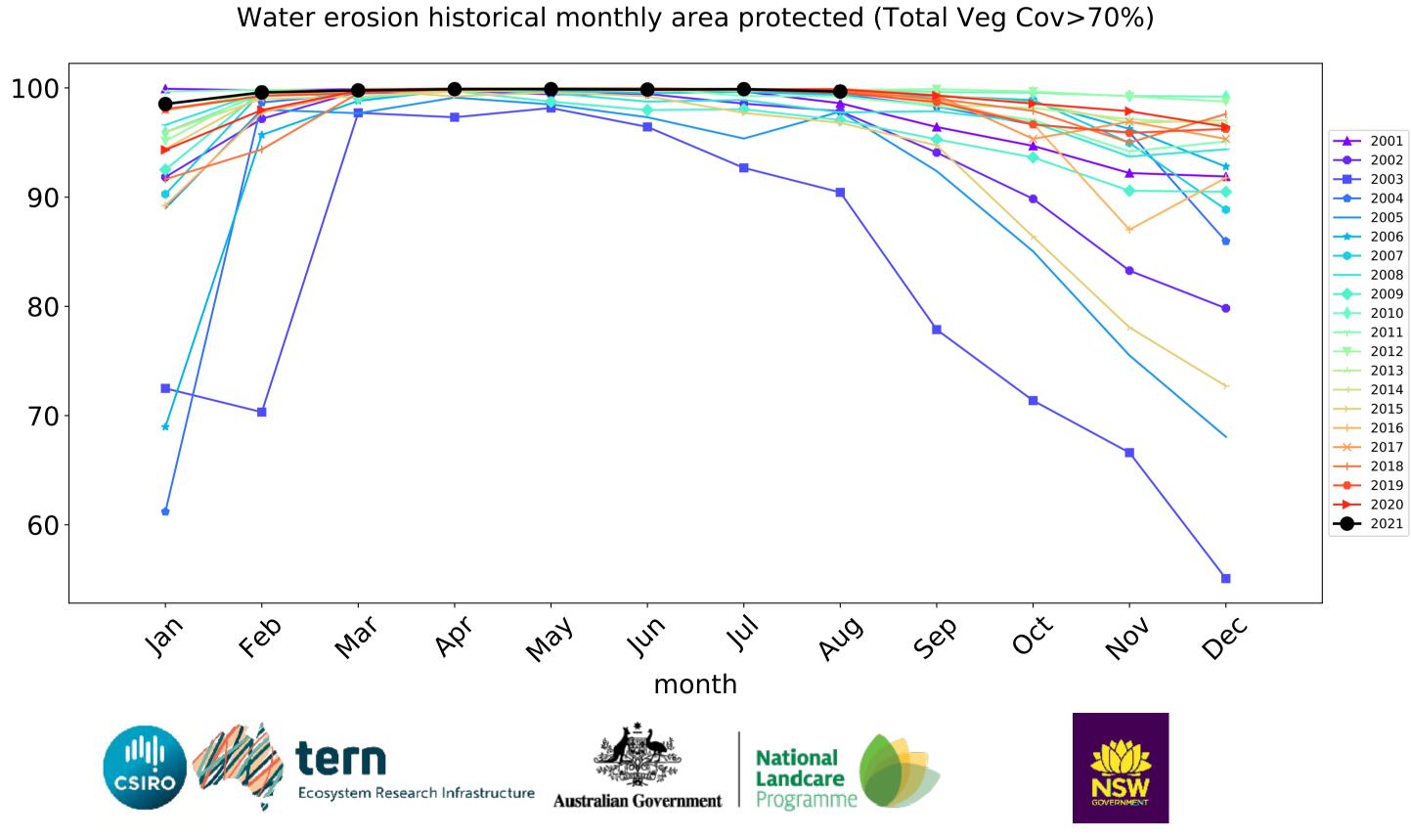
**-**20

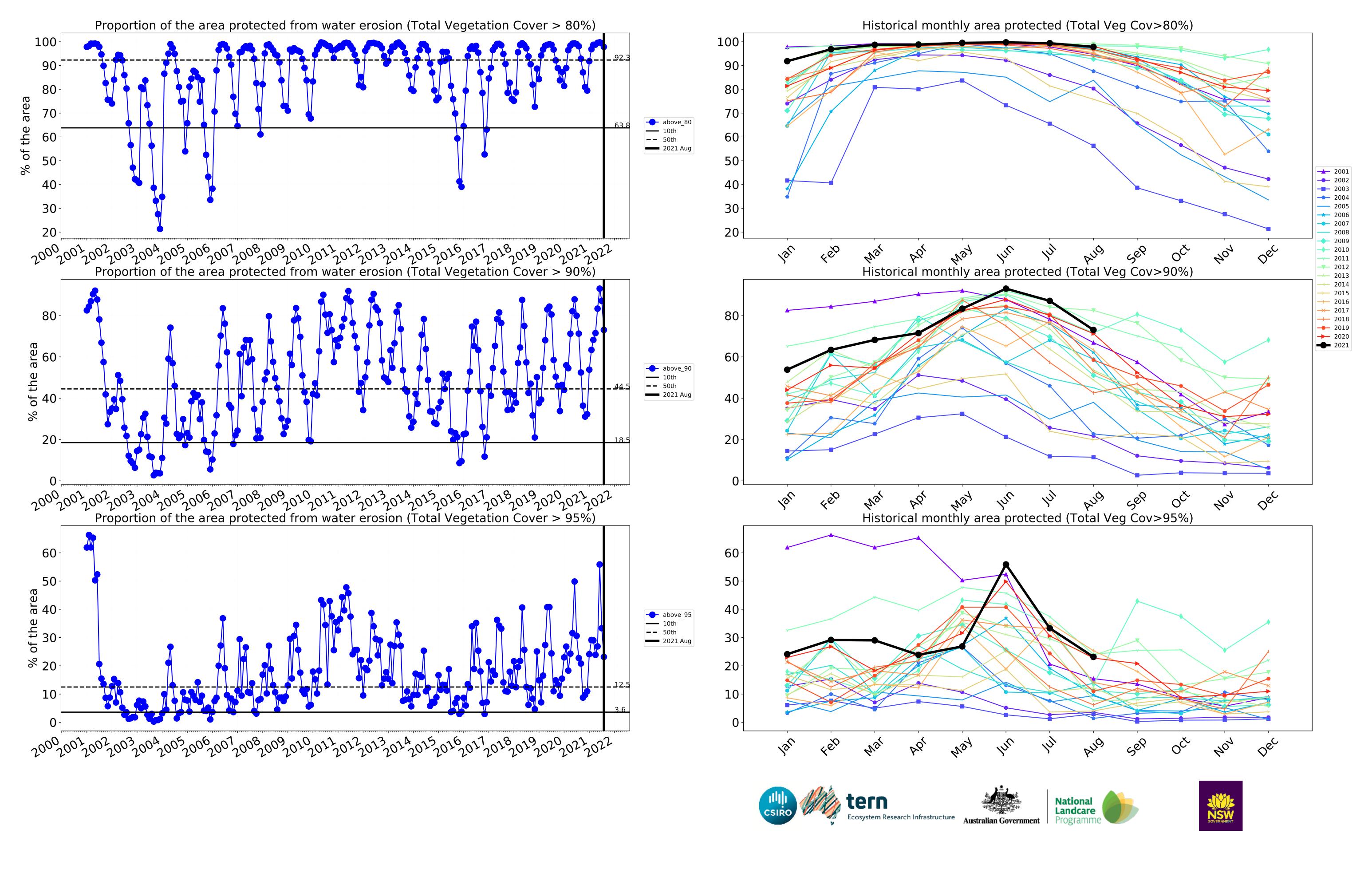
# **Grazing non forest timeseries**











# **Grazing Woodland forest**

### Land use and forest cover

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

Anomaly show how many percetage points each

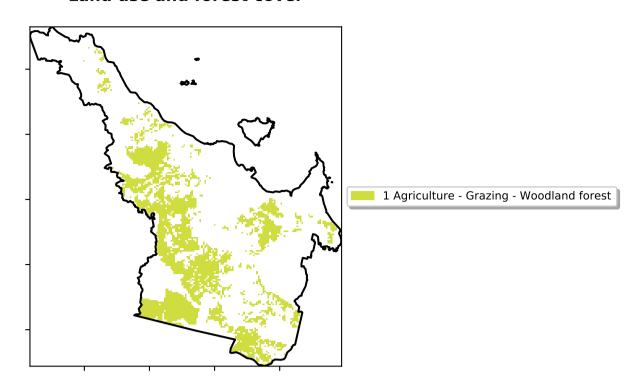
pixel is from

is, red pixels

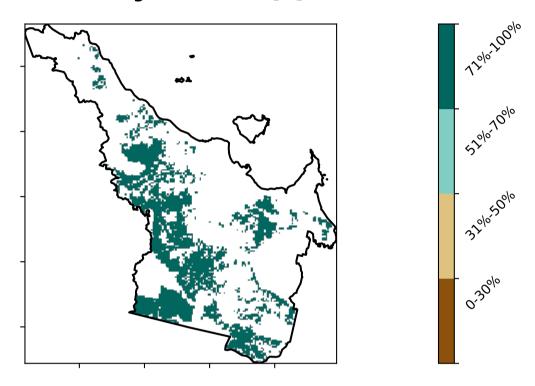
are about 20% lower than the mean of that

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

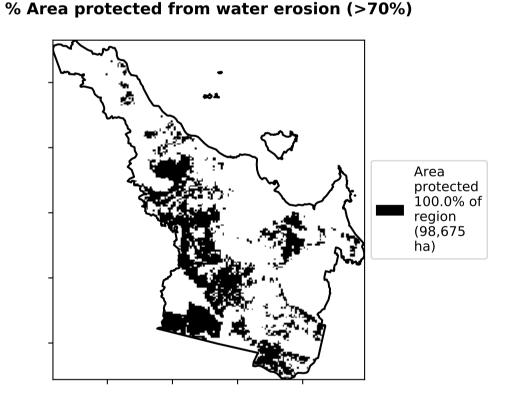
the mean. That



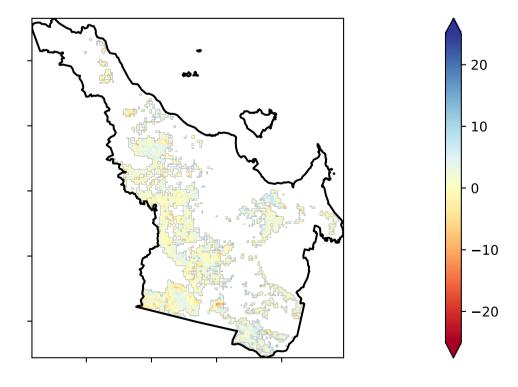
### **Total Vegetation Cover [%]**



### O/ Awar must start from water angles (> 700/)



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

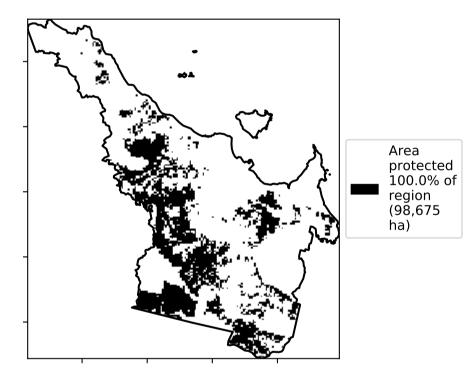


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

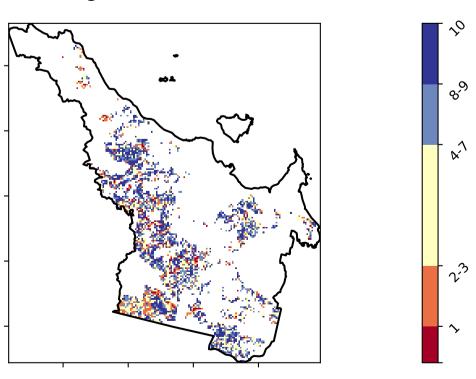
### **Proportion of vegetation cover class in area**



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



# Total Vegetation Cover Decile [%]







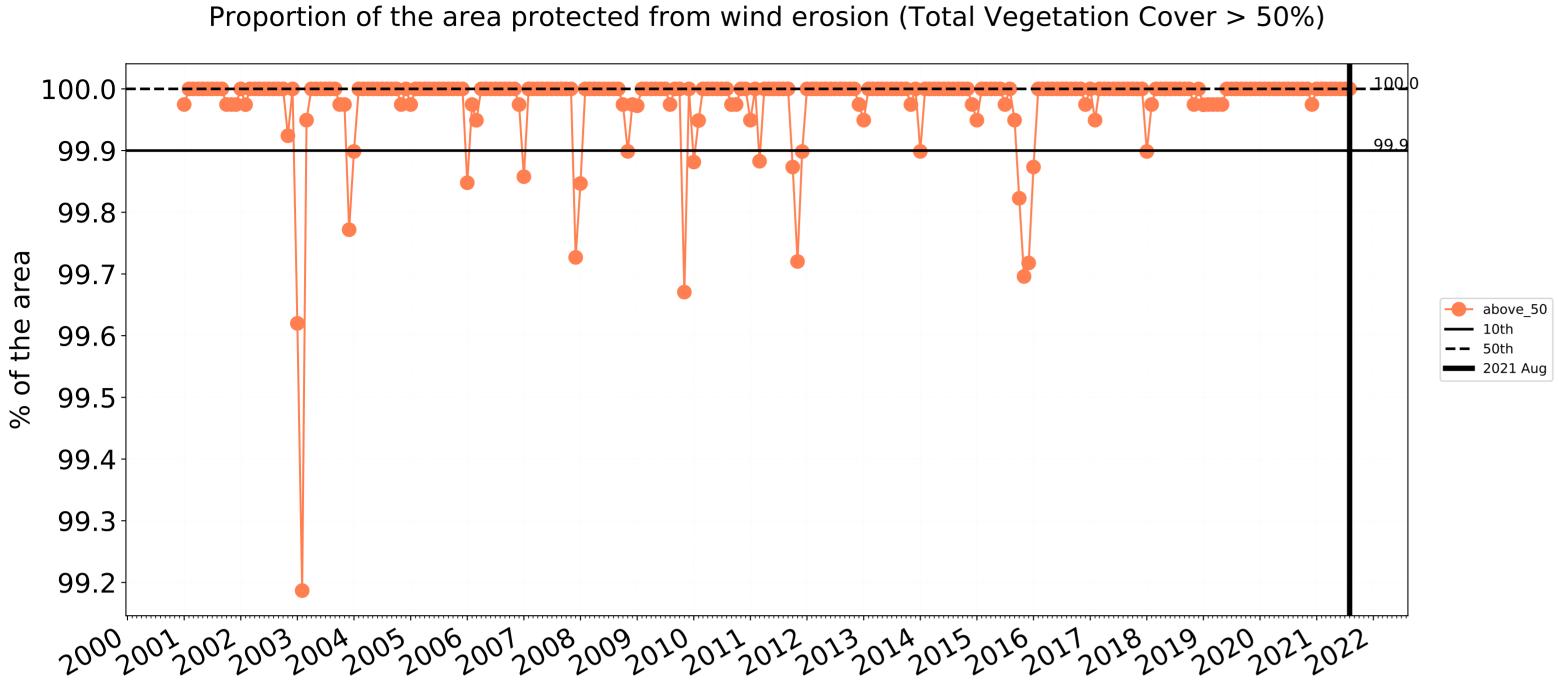


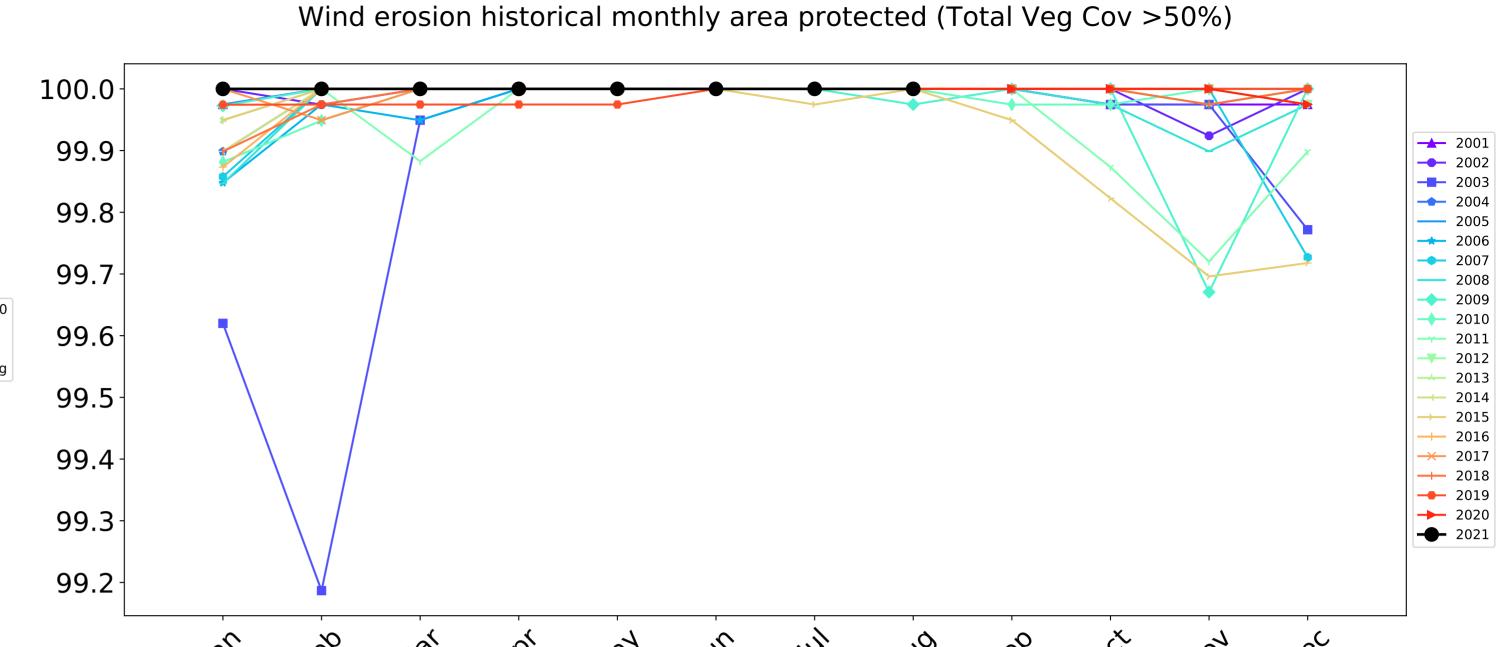




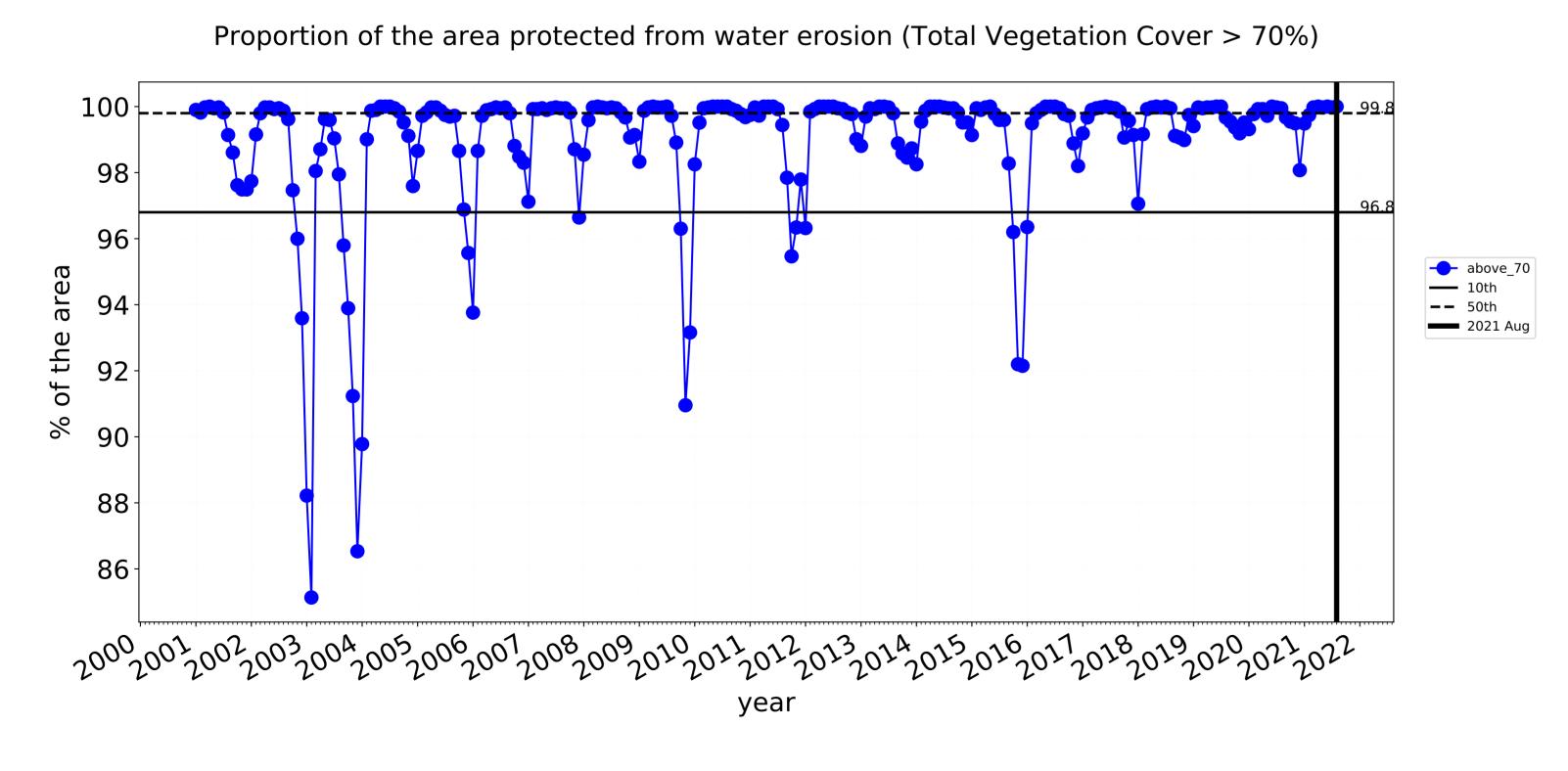


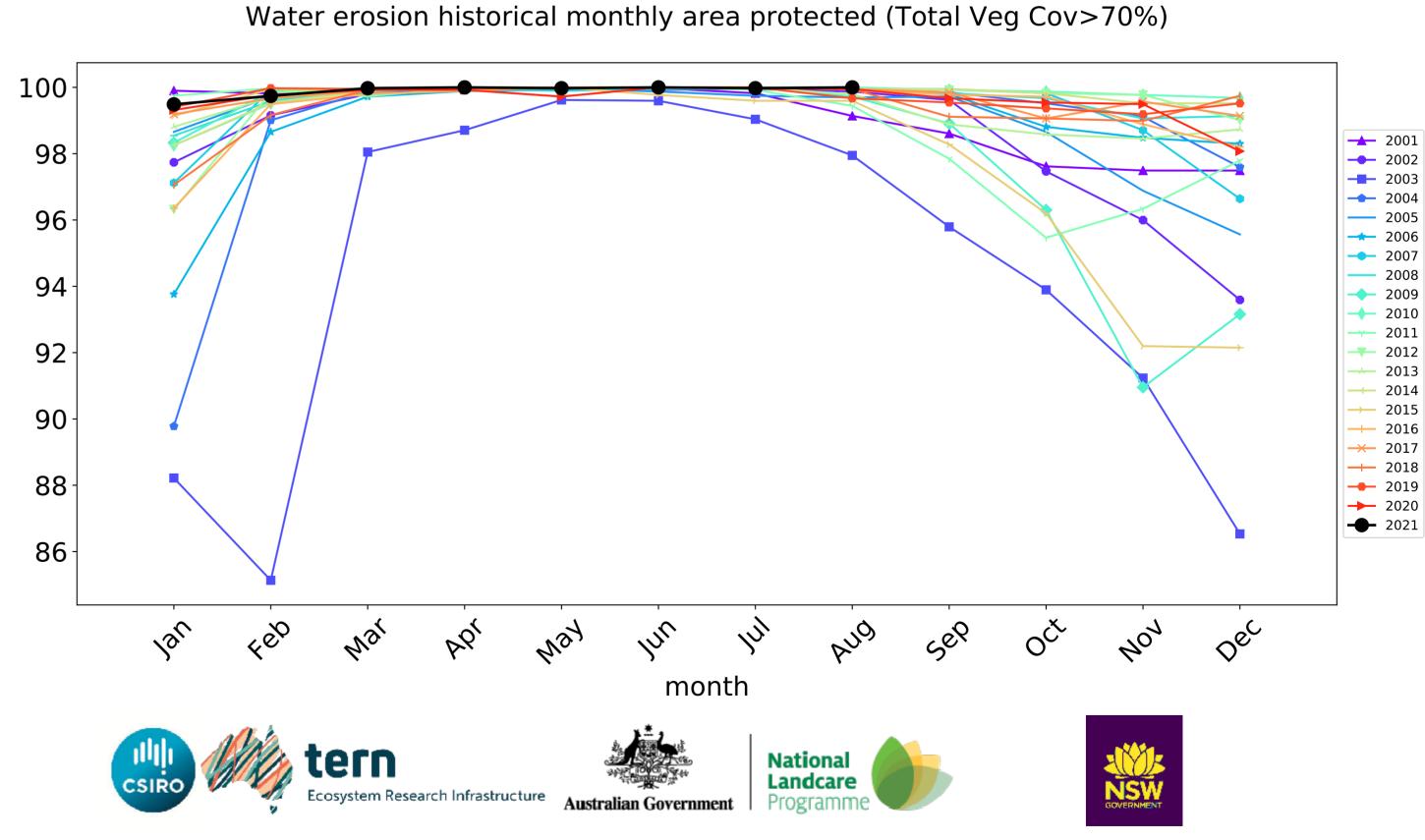
# **Grazing Woodland forest timeseries**

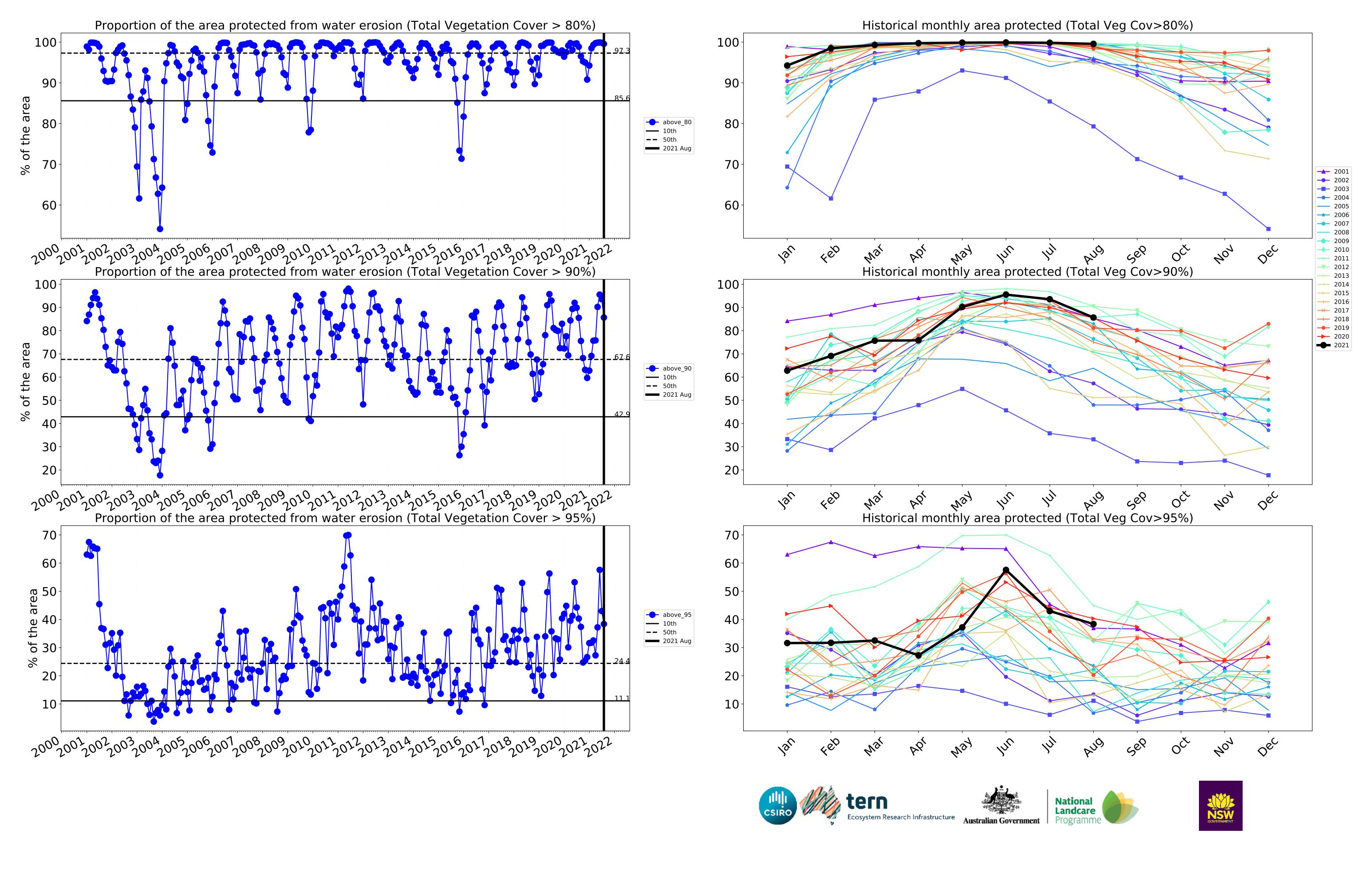




month







# **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

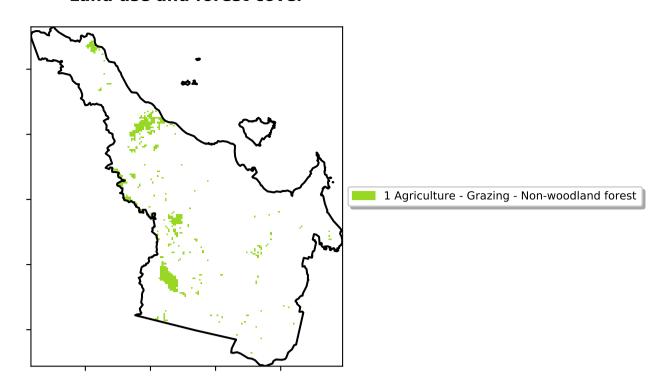
pixel is from

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

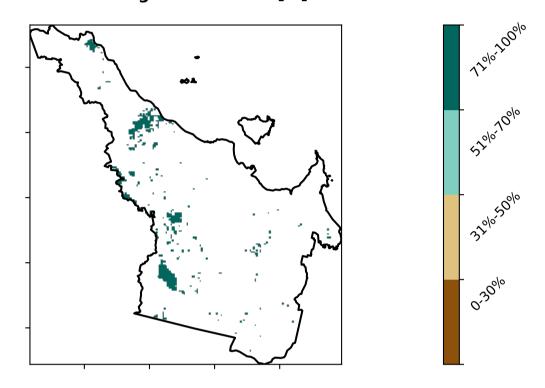
the mean. That

is only for the month of the map

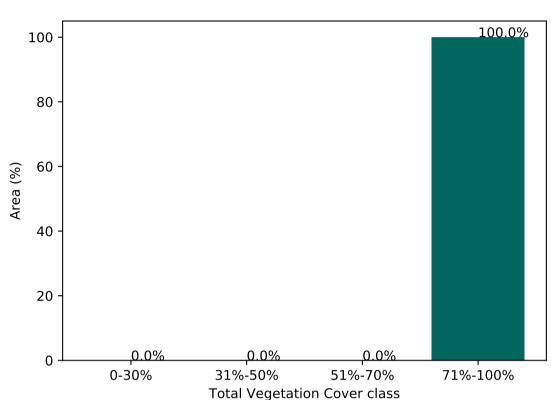
using baseline from 2001 to 2019.



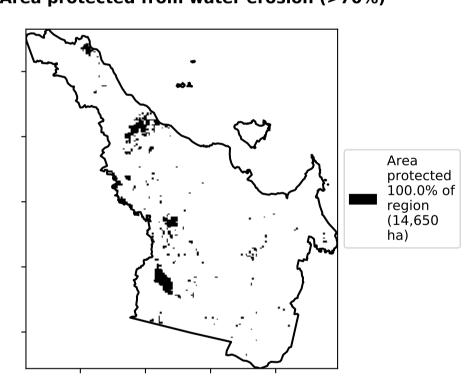
### **Total Vegetation Cover [%]**



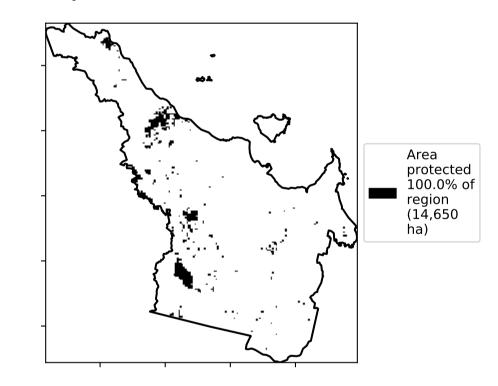
# Proportion of vegetation cover class in area



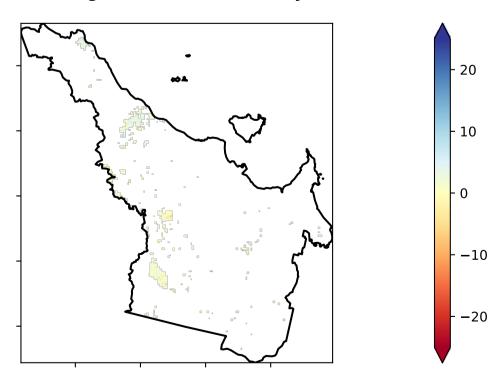
# % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

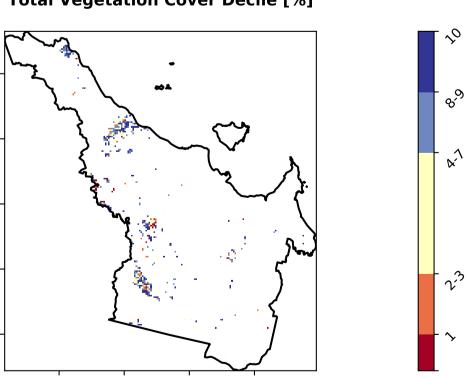


# **Total Vegetation Cover Anomaly [%]**



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 [%]



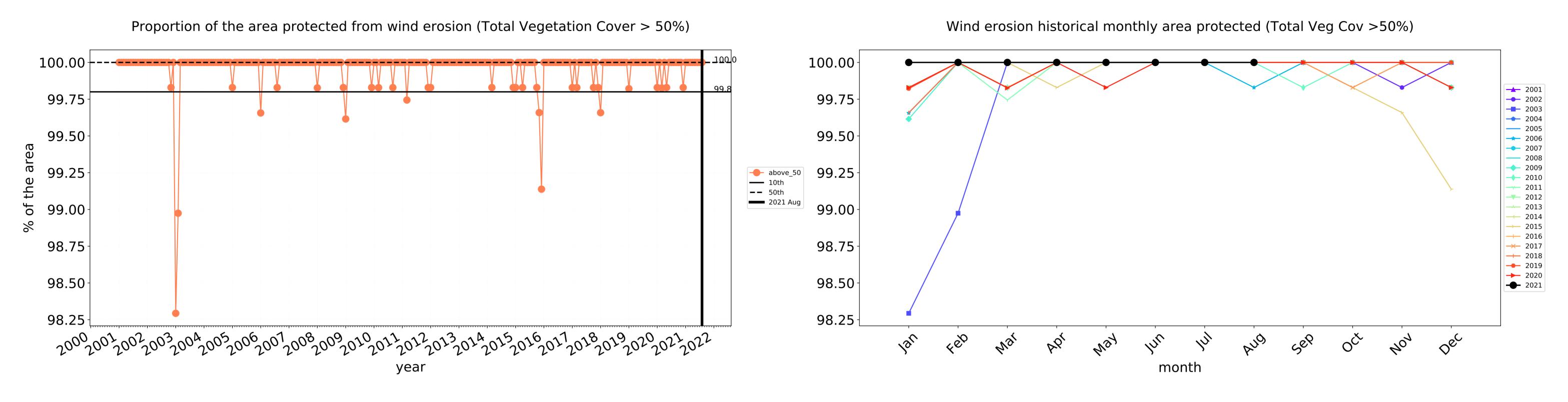


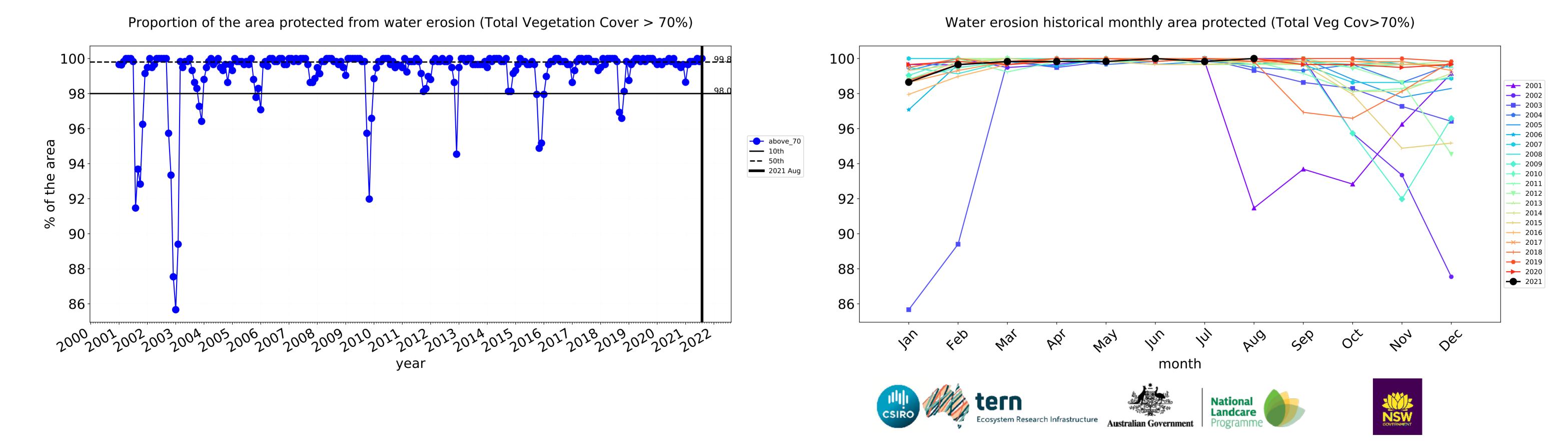


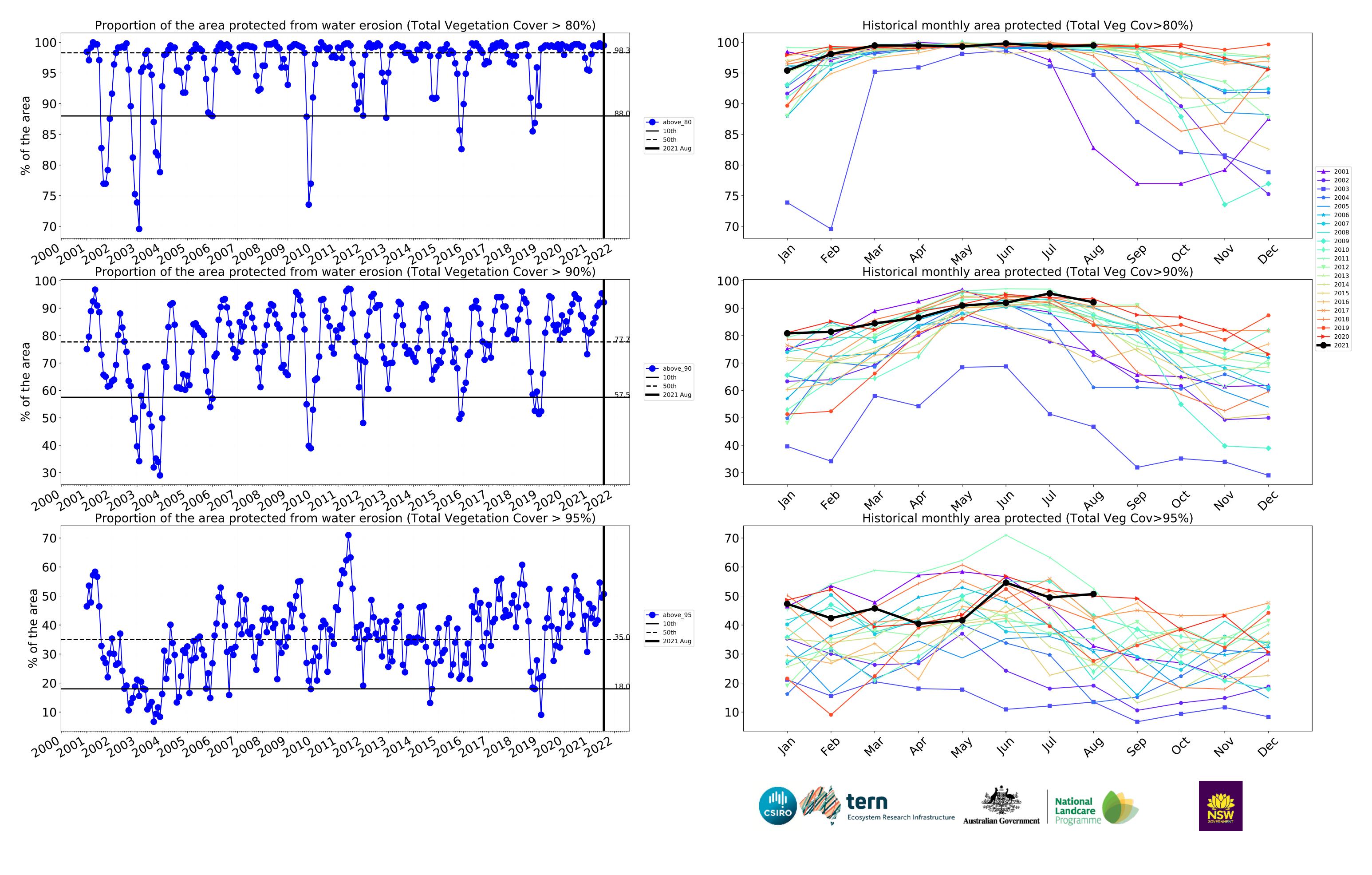












# **Irrigation**

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

Anomaly show how many percetage points each

pixel is from

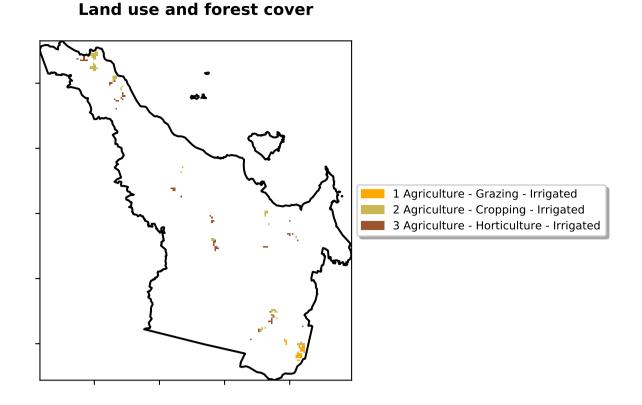
is, red pixels are about 20% lower than the mean of that

the mean. That

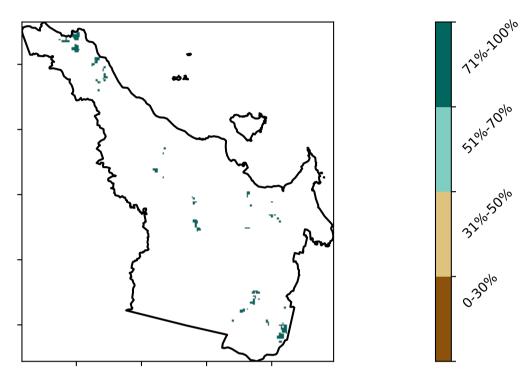
pixel. The mean

using baseline from 2001 to 2019.

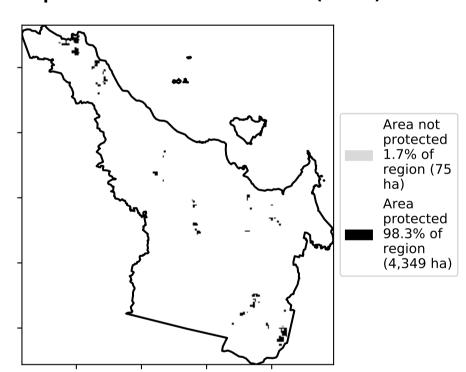
is only for the month of the map



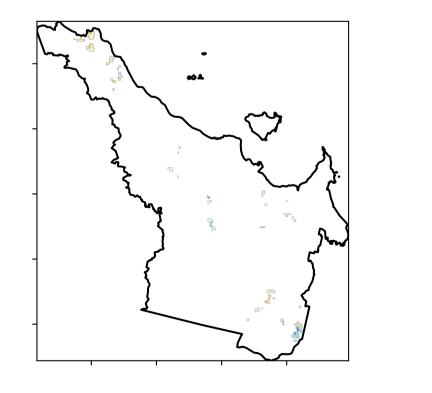
### **Total Vegetation Cover [%]**



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

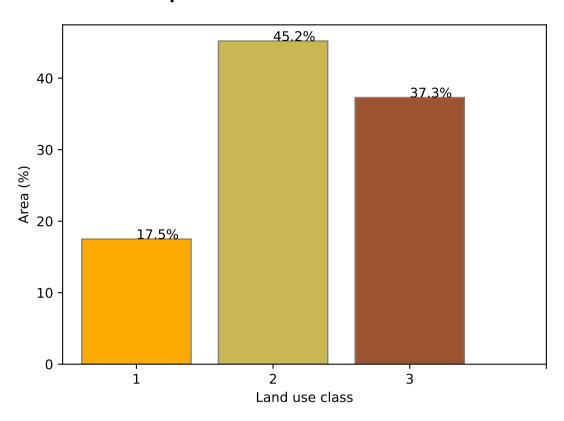


# **Total Vegetation Cover Anomaly [%]**

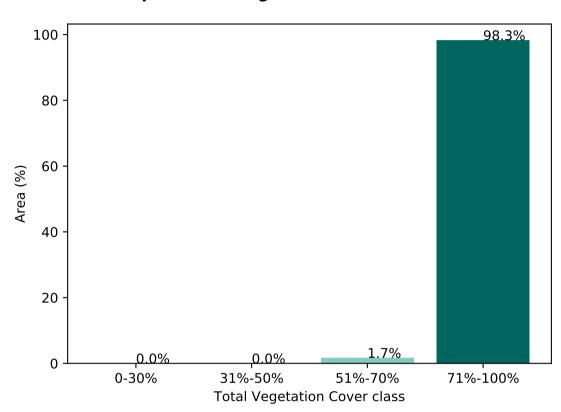


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

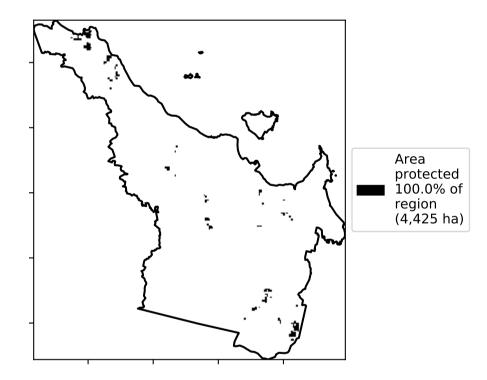
### Proportion of each land class in area



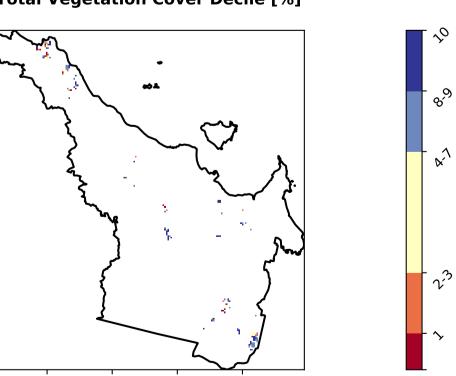
### **Proportion of vegetation cover class in area**



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



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









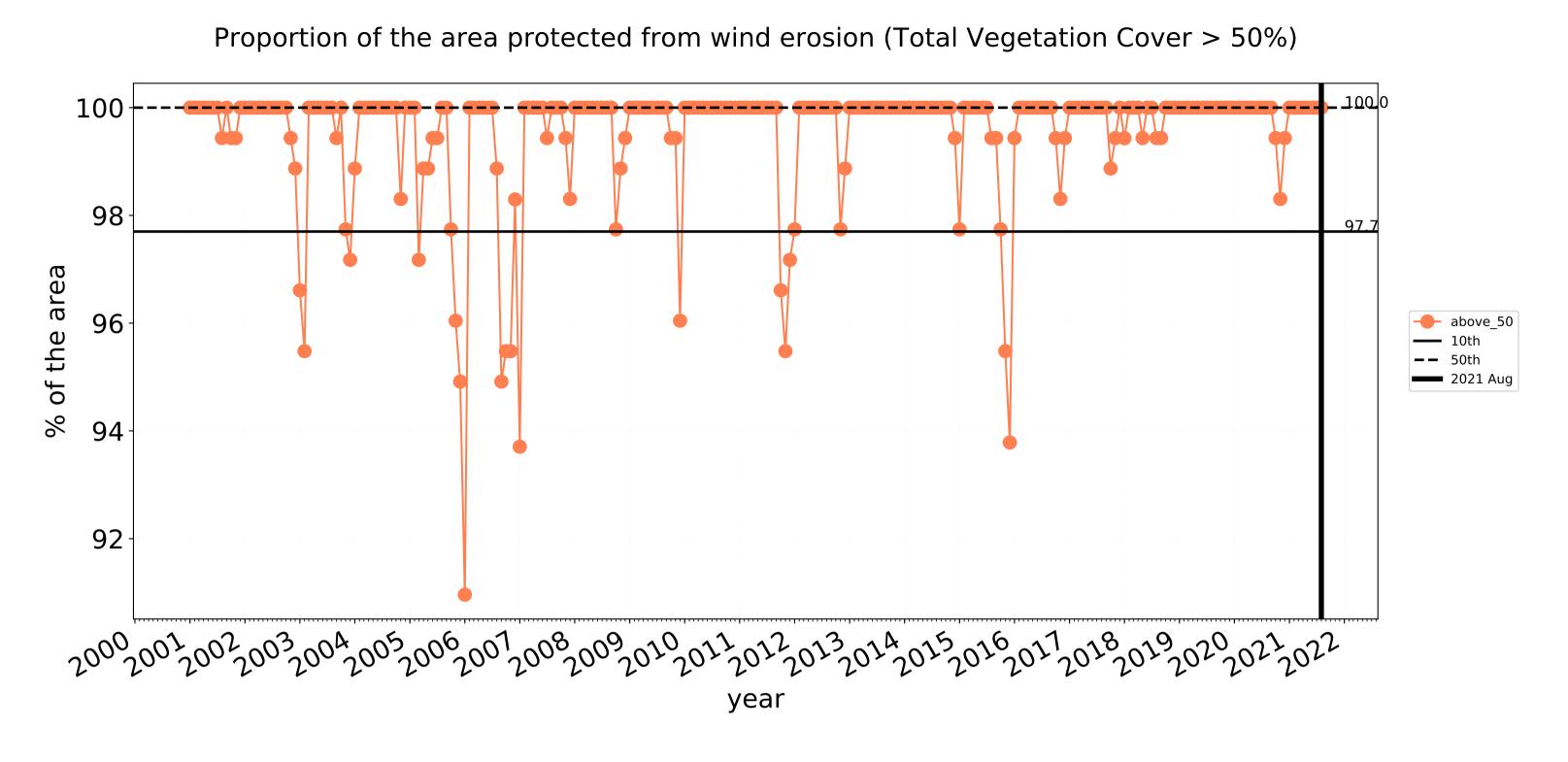


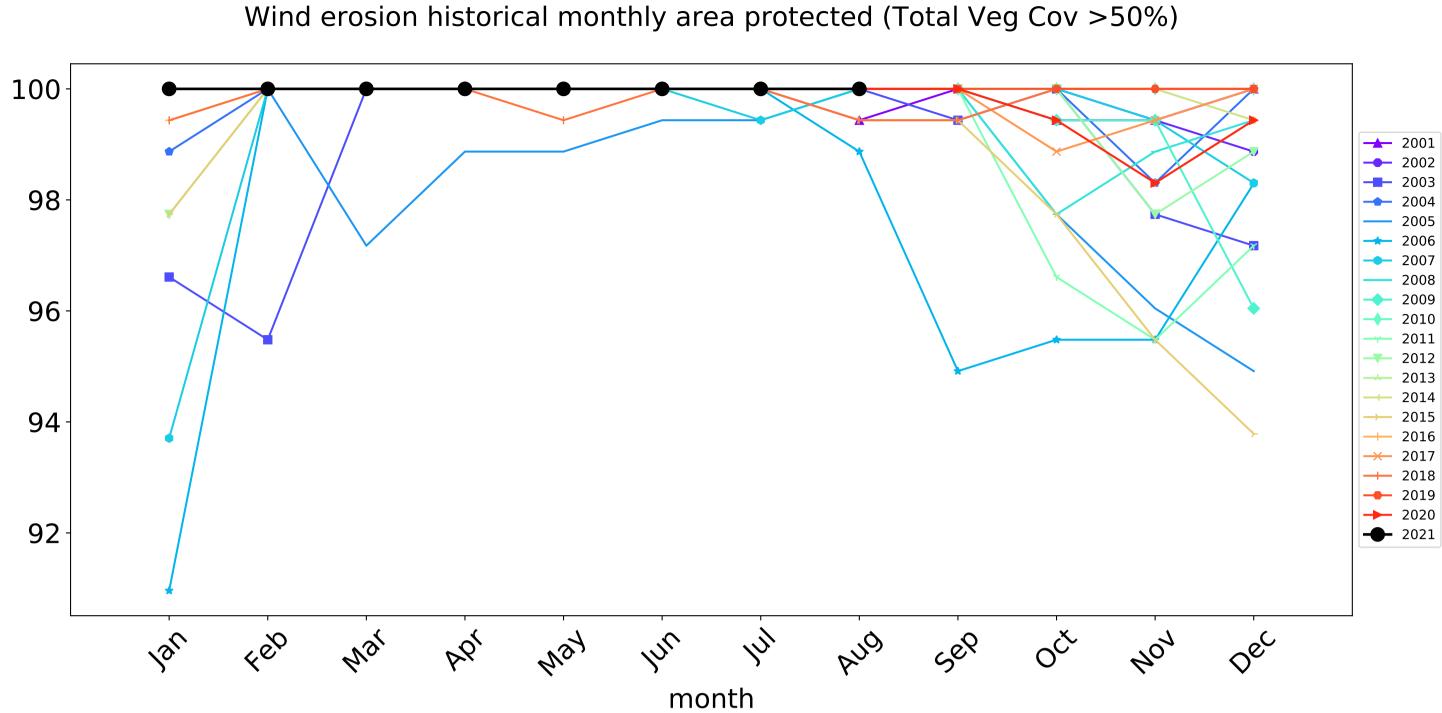
- 20

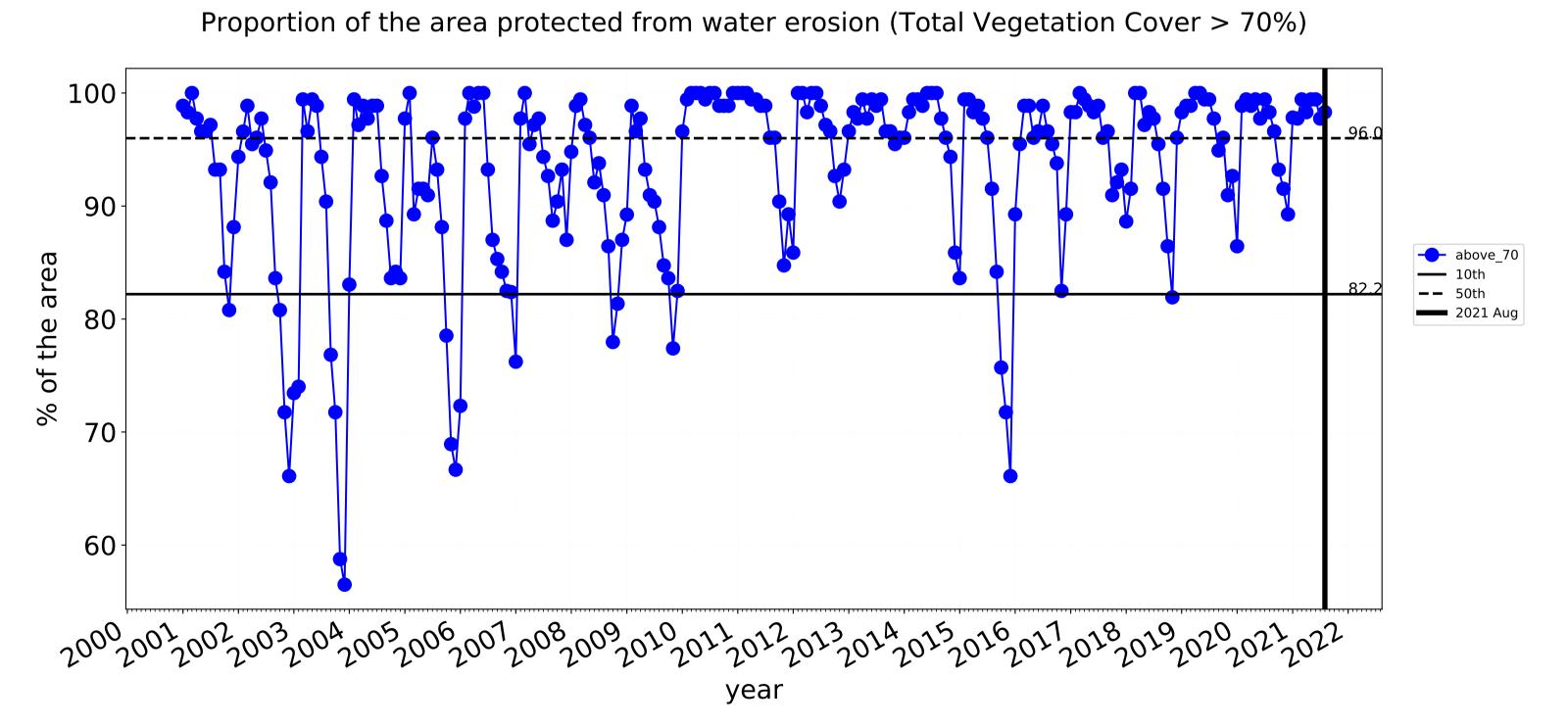
- 10

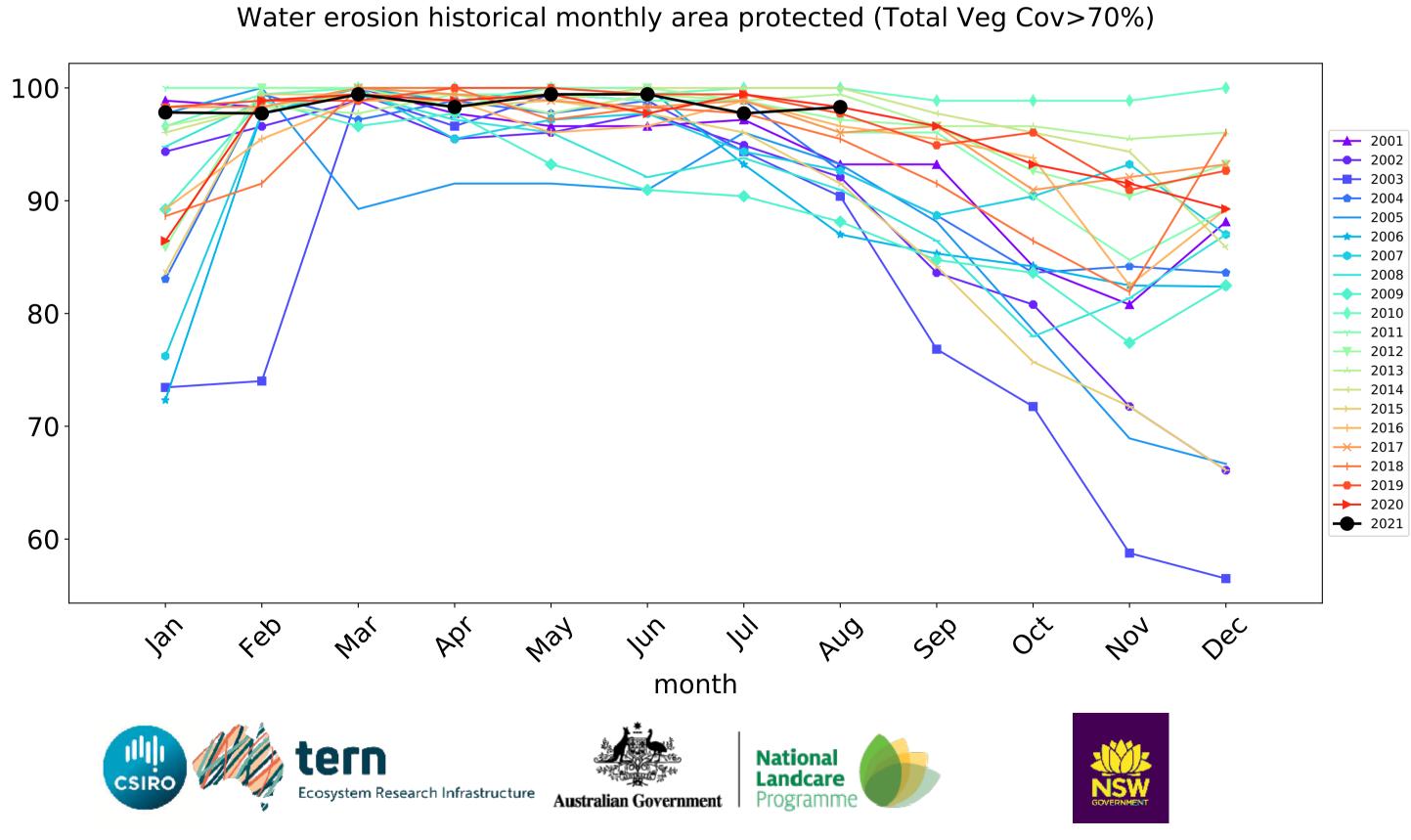
-10

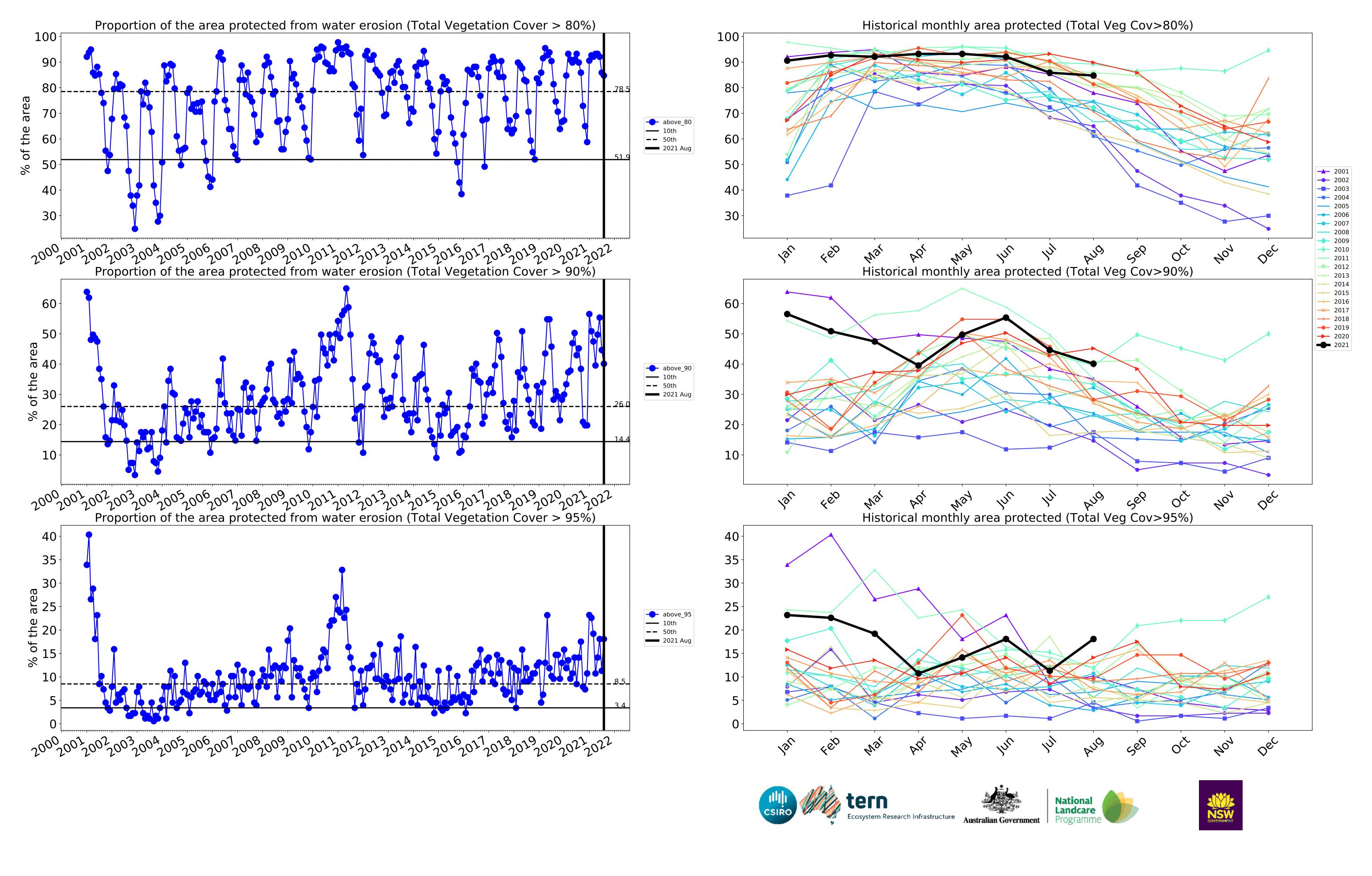
**-**20











# **Production native forests and plantation forests**

### Land use and forest cover

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

Anomaly show how many percetage points each

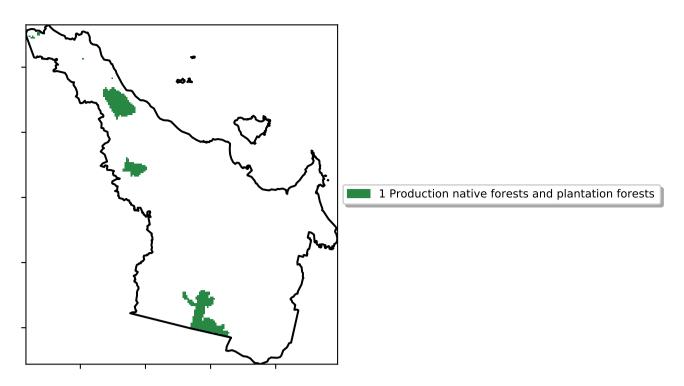
pixel is from

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

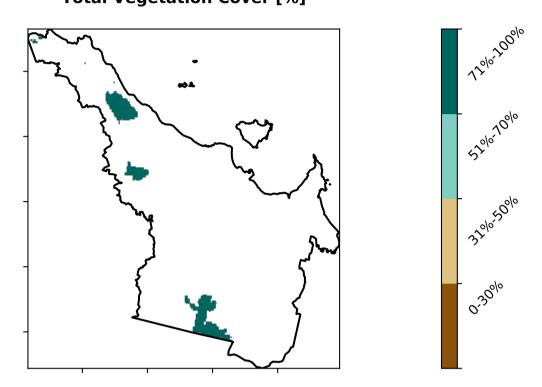
the mean. That

is only for the month of the map

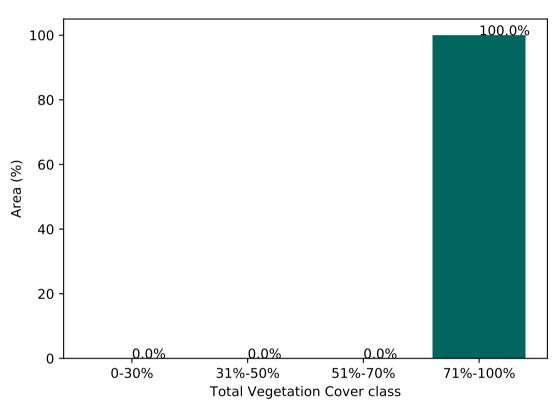
using baseline from 2001 to 2019.



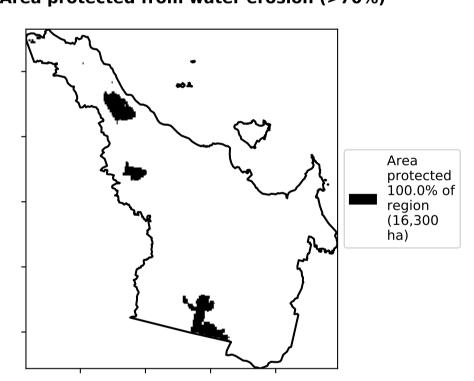
### **Total Vegetation Cover [%]**



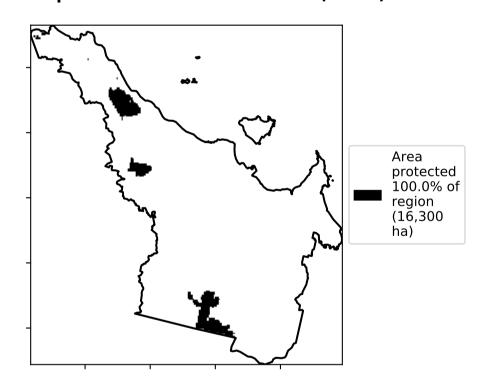
### **Proportion of vegetation cover class in area**



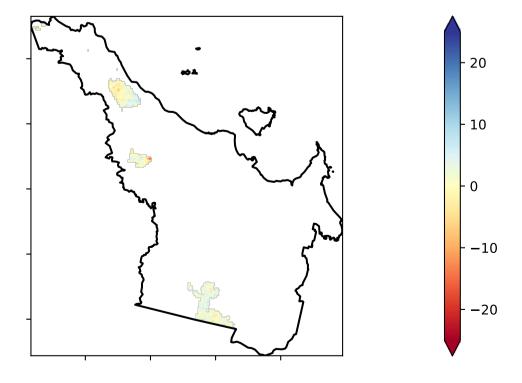
# % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

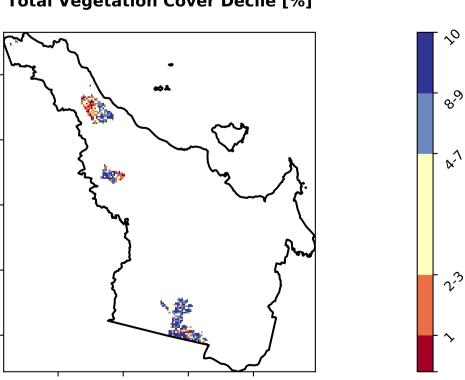


# **Total Vegetation Cover Anomaly [%]**



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 [%]



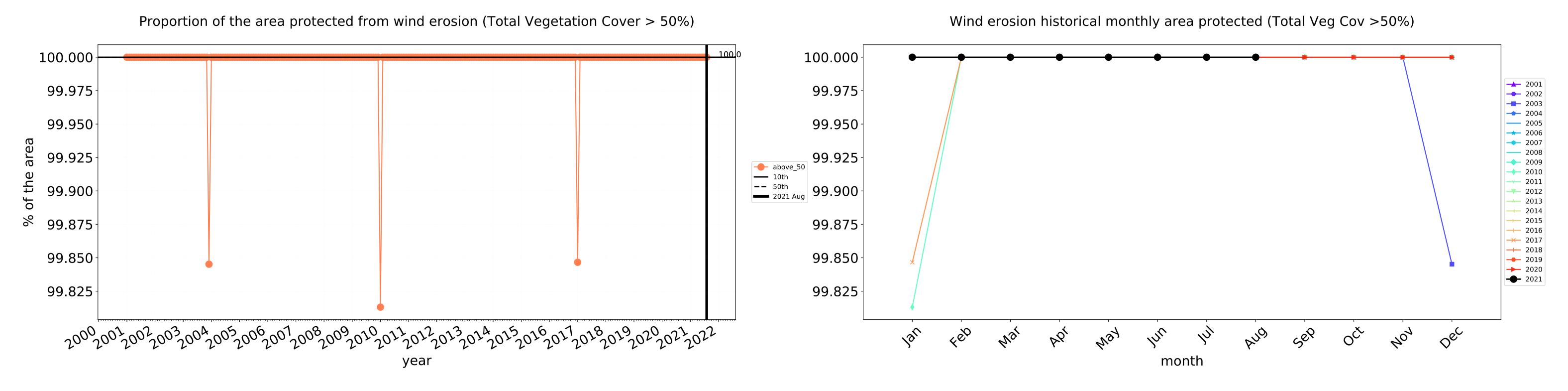


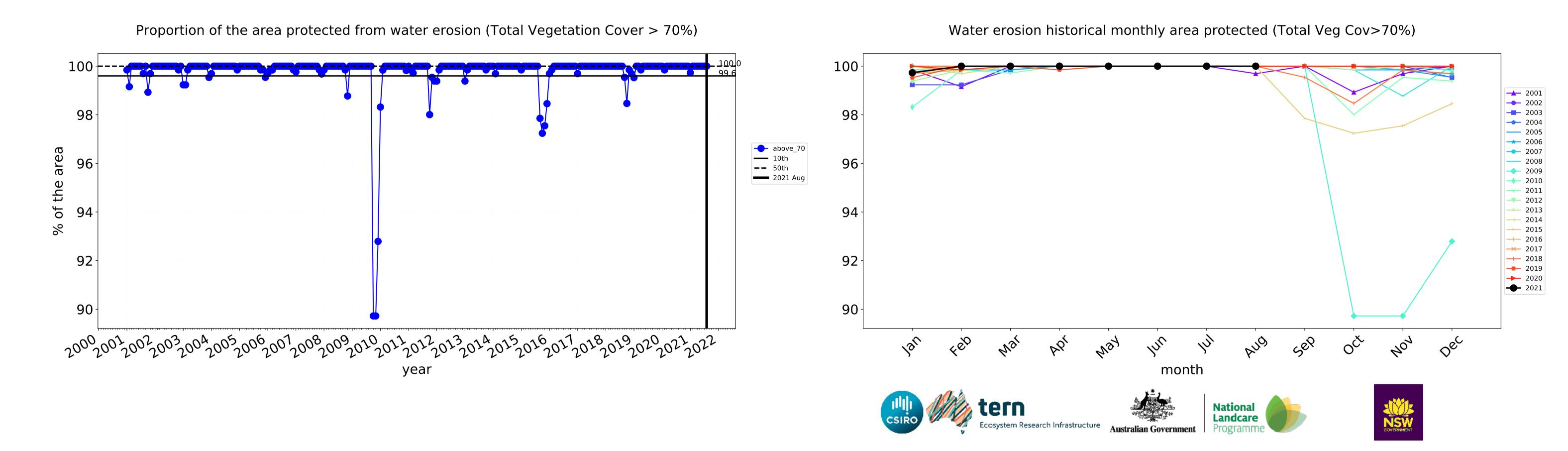


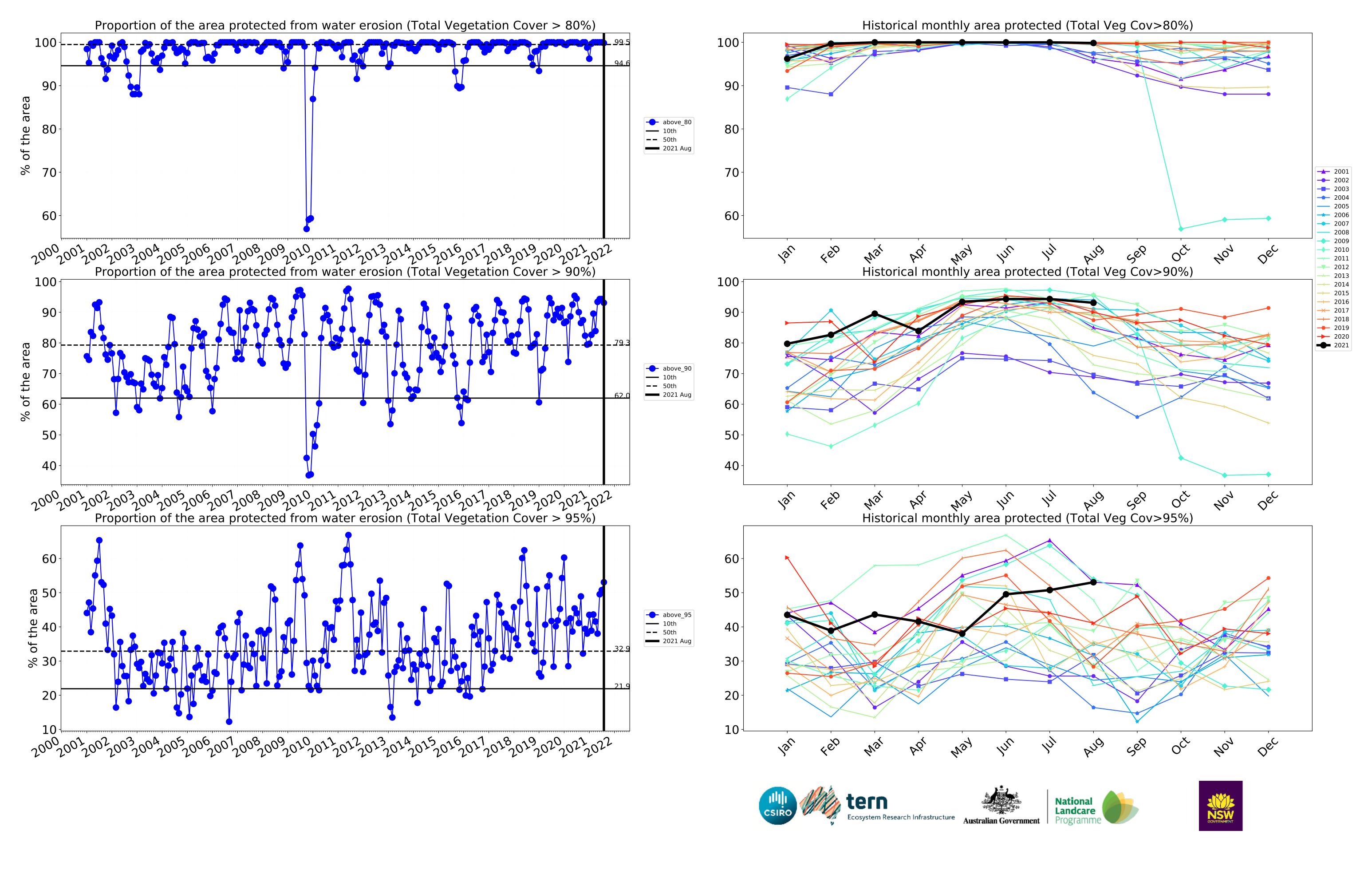




# **Production native forests and plantation forests timeseries**







# Townsville\_(C) (365,375 ha and no data 7,810 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	365,375	99.9% 365,100	99.8% 364,725	98.0% 357,925	93.9% 342,975	74.4% 271,725	33.5% 122,525
Conservation and natural environments	119,325	100.0% 119,300	99.9% 119,175	99.1% 118,225	95.8% 114,350	79.0% 94,300	40.7% 48,575
Conservation and natural environments non forest	16,075	99.8% 16,050	99.5% 16,000	97.2% 15,625	85.4% 13,725	50.9% 8,175	24.6% 3,950
Conservation and natural environments Woodland forest	57,075	100.0% 57,075	100.0% 57,050	99.5% 56,800	97.9% 55,900	80.2% 45,800	37.3% 21,300
natural environments Forest (non woodland)	46,175	100.0% 46,175	99.9% 46,125	99.2% 45,800	96.9% 44,725	87.3% 40,325	50.5% 23,325
Agriculture	186,575	100.0% 186,550	100.0% 186,550	99.8% 186,275	98.6% 183,900	80.3% 149,850	33.2% 61,950
Grazing	181,425	100.0% 181,400	100.0% 181,400	99.9% 181,200	98.9% 179,450	81.5% 147,775	33.7% 61,075
Grazing non forest	68,100	100.0% 68,075	100.0% 68,075	99.7% 67,875	97.8% 66,625	73.1% 49,750	23.2% 15,775
Grazing Woodland forest	98,675	100.0% 98,675	100.0% 98,675	100.0% 98,675	99.6% 98,250	85.7% 84,525	38.4% 37,875
Grazing - Forest (non woodland)	14,650	100.0% 14,650	100.0% 14,650	100.0% 14,650	99.5% 14,575	92.2% 13,500	50.7% 7,425
Irrigation	4,425	100.0% 4,425	100.0% 4,425	98.3% 4,350	84.7% 3,750	40.1% 1,775	18.1% 800
Production native forests and plantation forests	16,300	100.0% 16,300	100.0% 16,300	100.0% 16,300	99.8% 16,275	93.1% 15,175	53.1% 8,650







