# Total vegetation cover soil protection Region:LGA Hinchinbrook\_(S) 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:

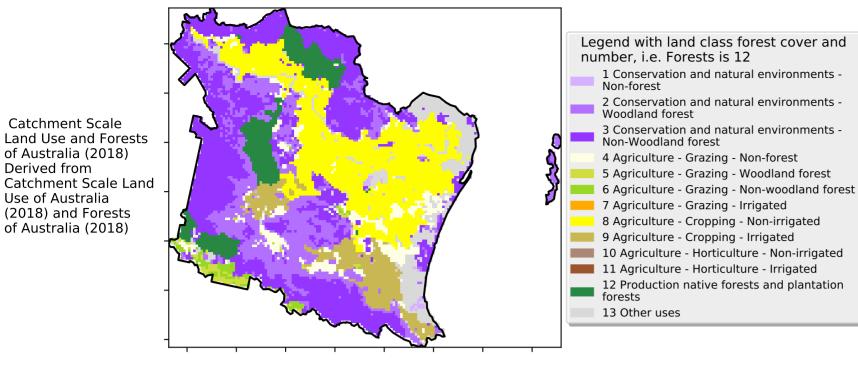
https://doi.org/10.4225/08/5848a3f19a7b3



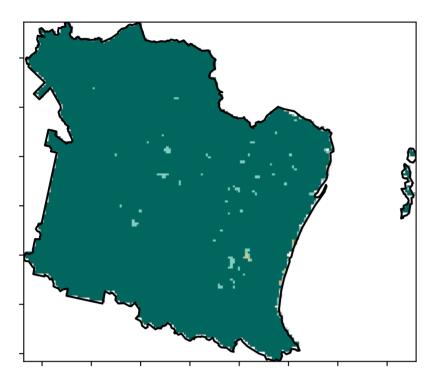
# **Vegetation Cover Dec 2019**

#### Land use and forest cover

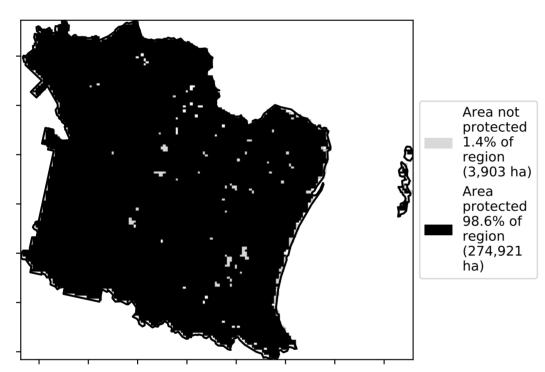
Proportion of each land class in area

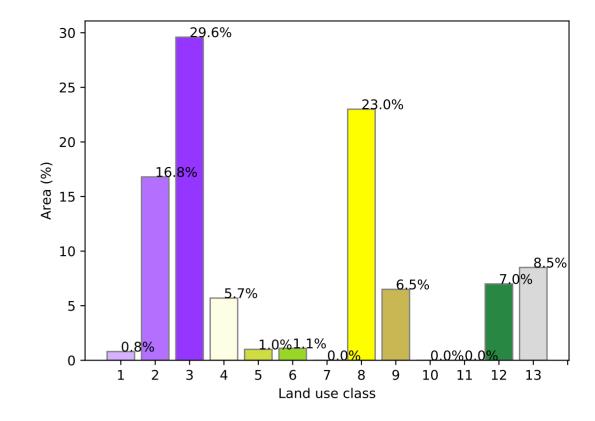


#### **Total Vegetation Cover [%]**

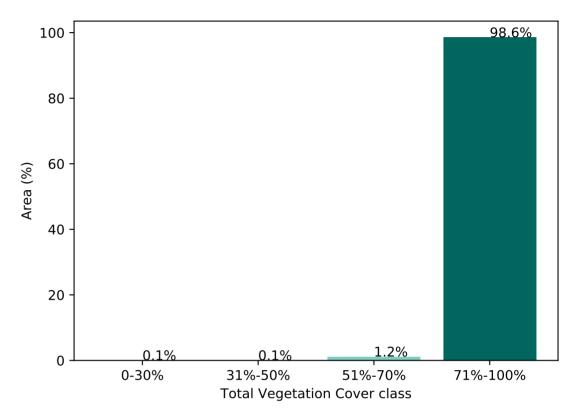


#### % Area protected from water erosion (>70%)

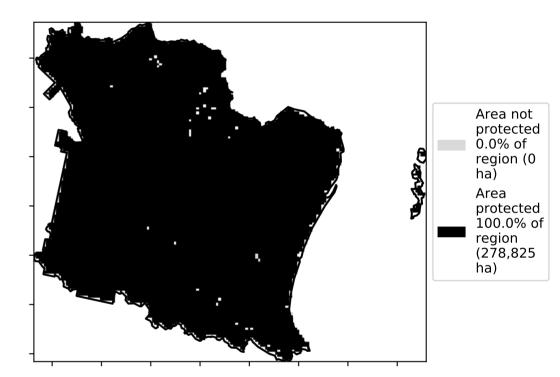




#### Proportion of vegetation cover class in area

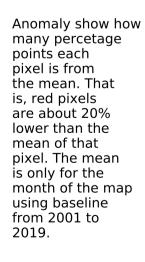


#### % Area protected from wind erosion (>50%)

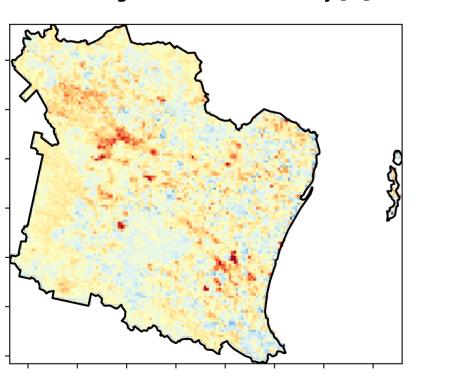


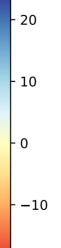
**Total Vegetation Cover Anomaly [%]** 

**Total Vegetation Cover Decile [%]** 



Derived from





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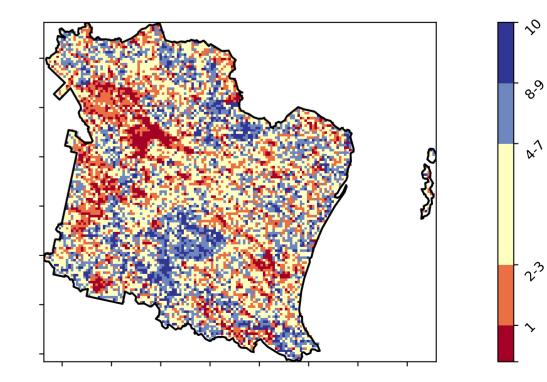
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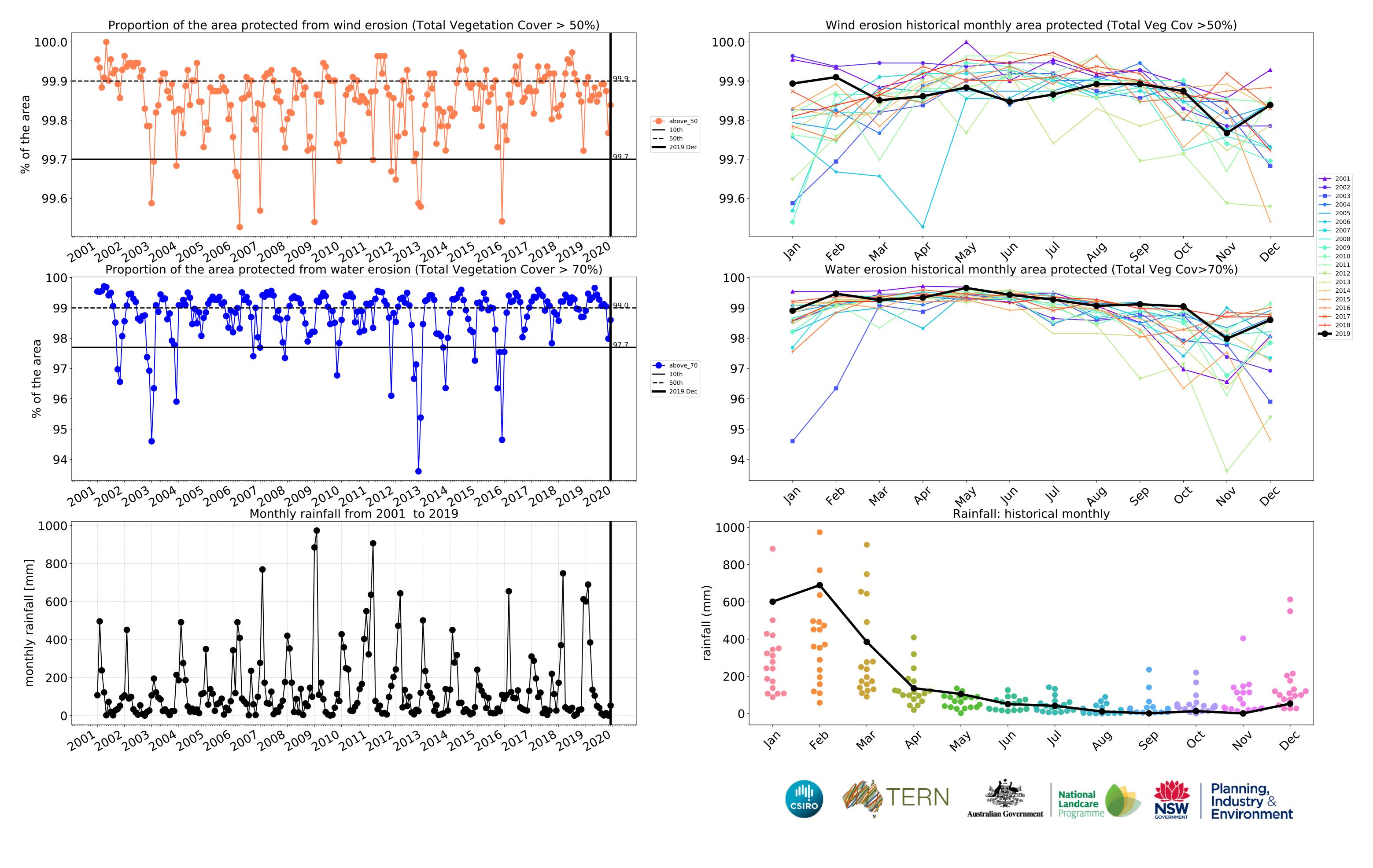
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0.30%

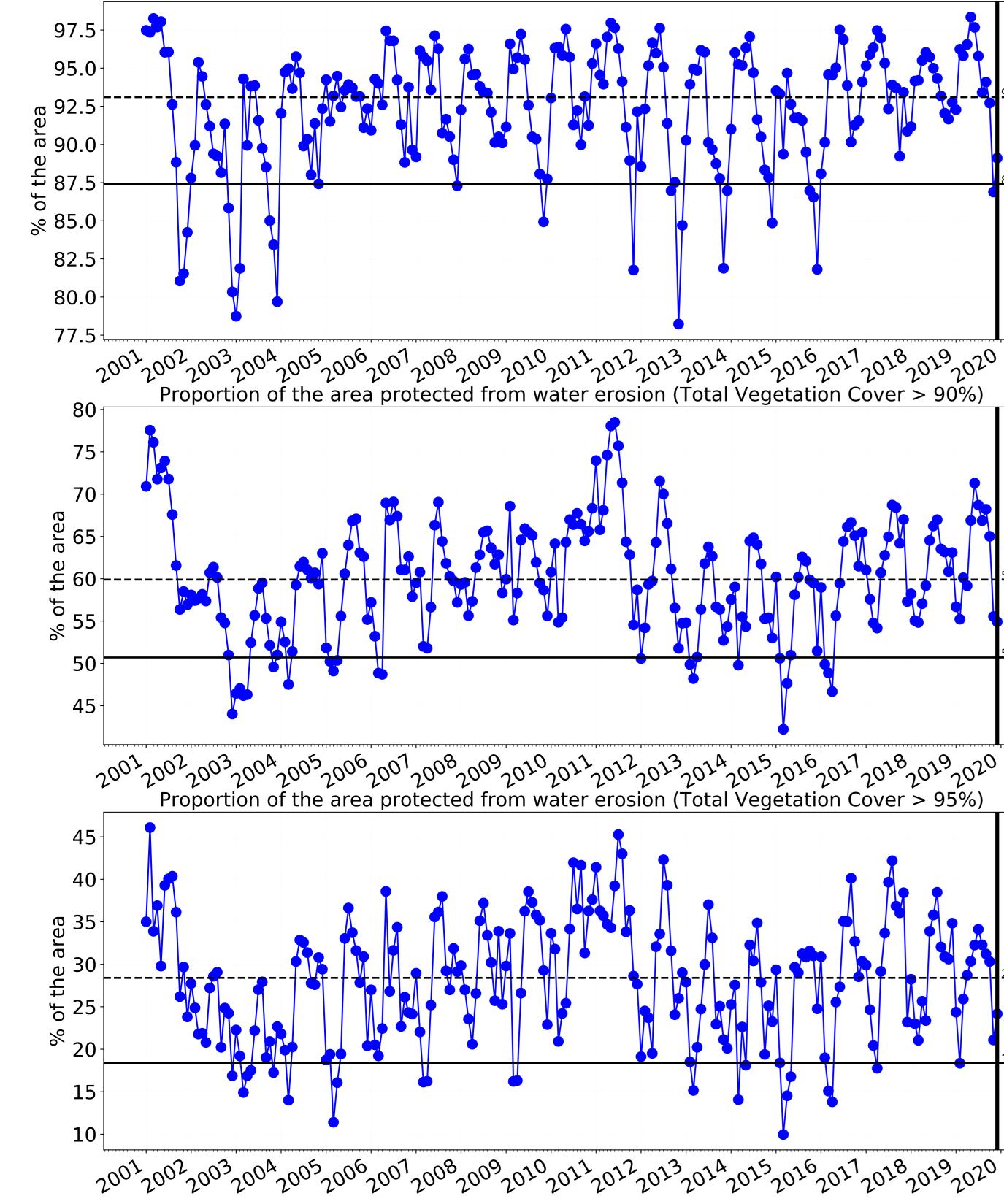
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

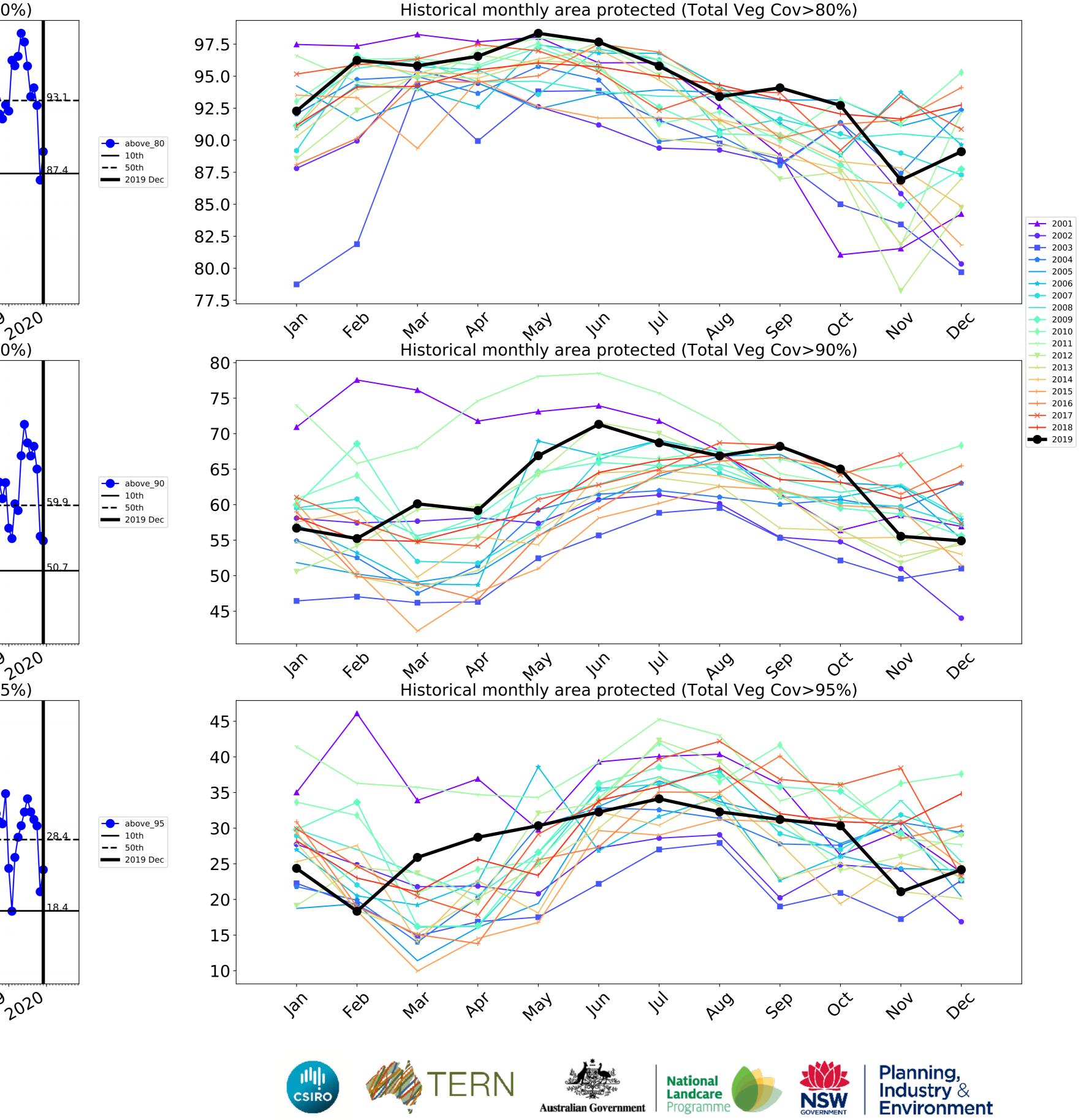






Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)





### **Conservation and natural environments**

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Land use and forest cover

1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Nonwoodland forest

60

50

40

(%)

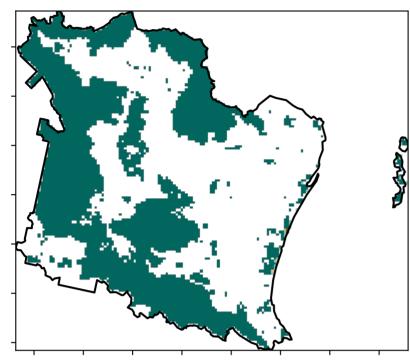
Area 06

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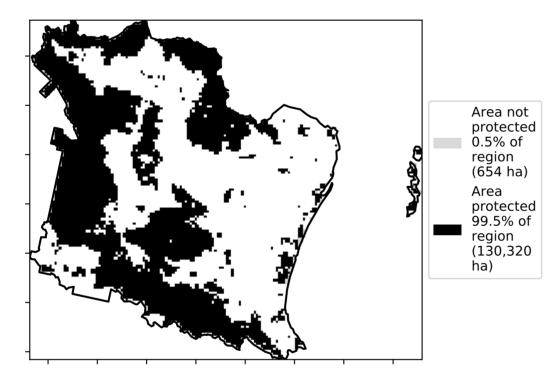
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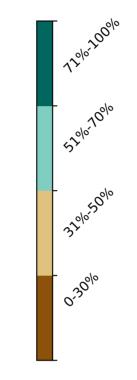
0

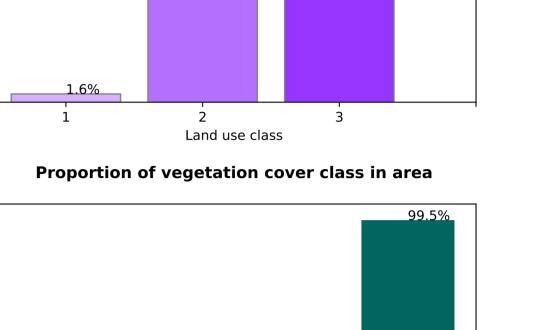
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



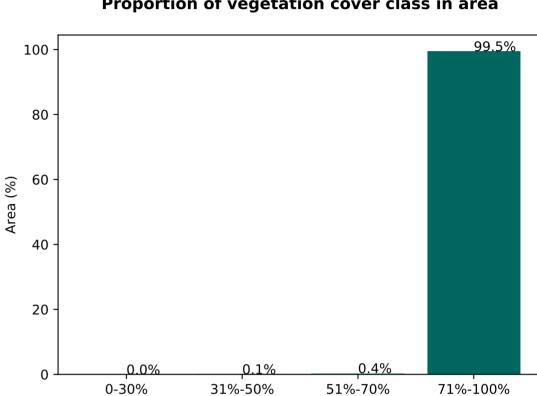




# Proportion of each land class in area

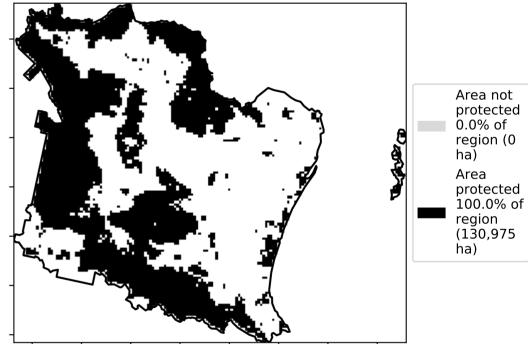
35.6%

62.8%



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

Total Vegetation Cover class



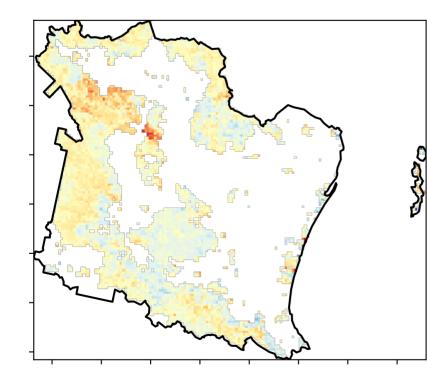
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**Total Vegetation Cover Anomaly [%]** 

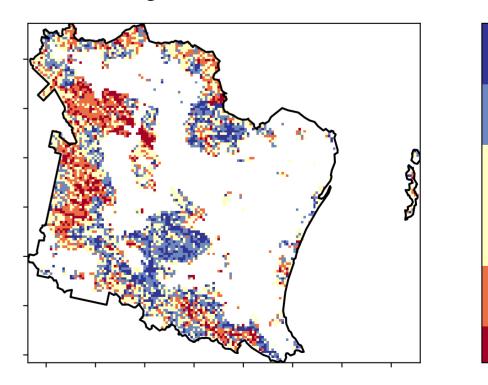


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**Total Vegetation Cover Decile [%]** 





Deciles show where the

pixel value lies in the

record, from highest to

lowest, for that month. That is, red pixels are

records for that month of

the map using baseline from 2001 to 2019.

in the lowest 10% of

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

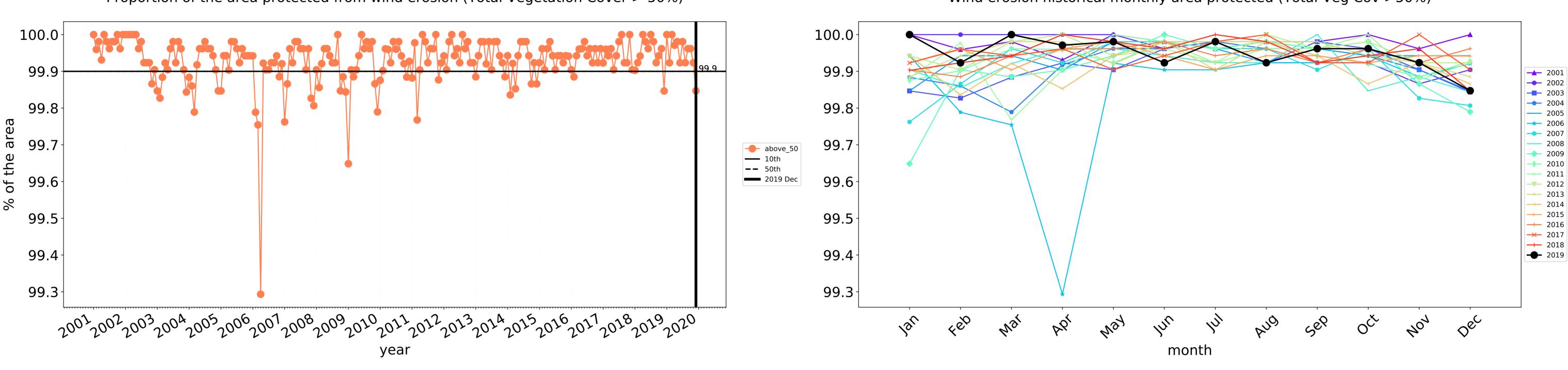
Derived from

Use of Australia

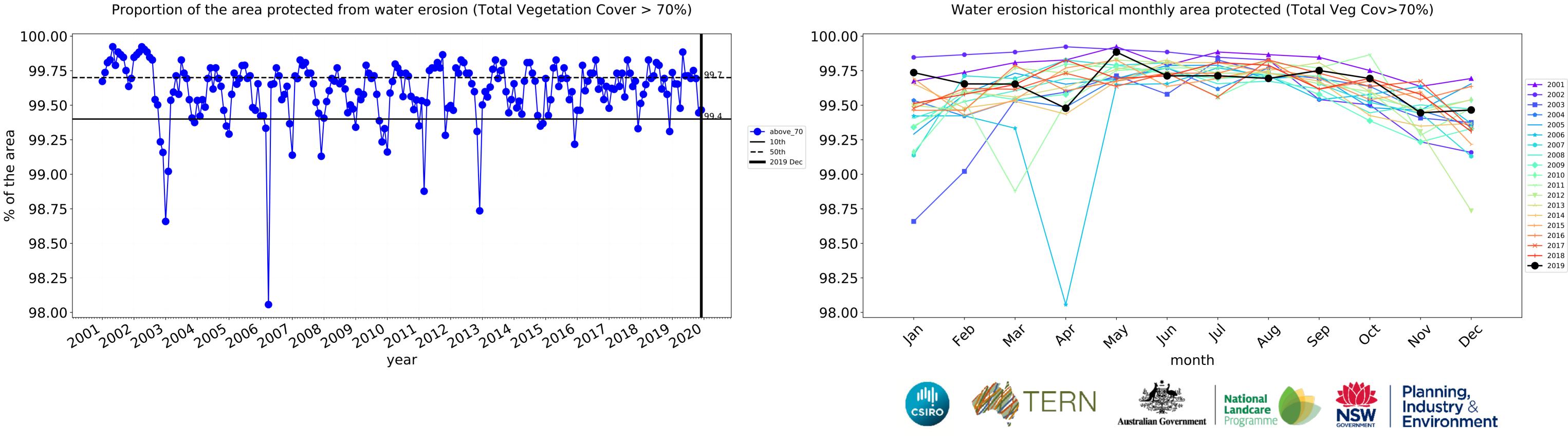
(2018) and Forests

of Australia (2018)



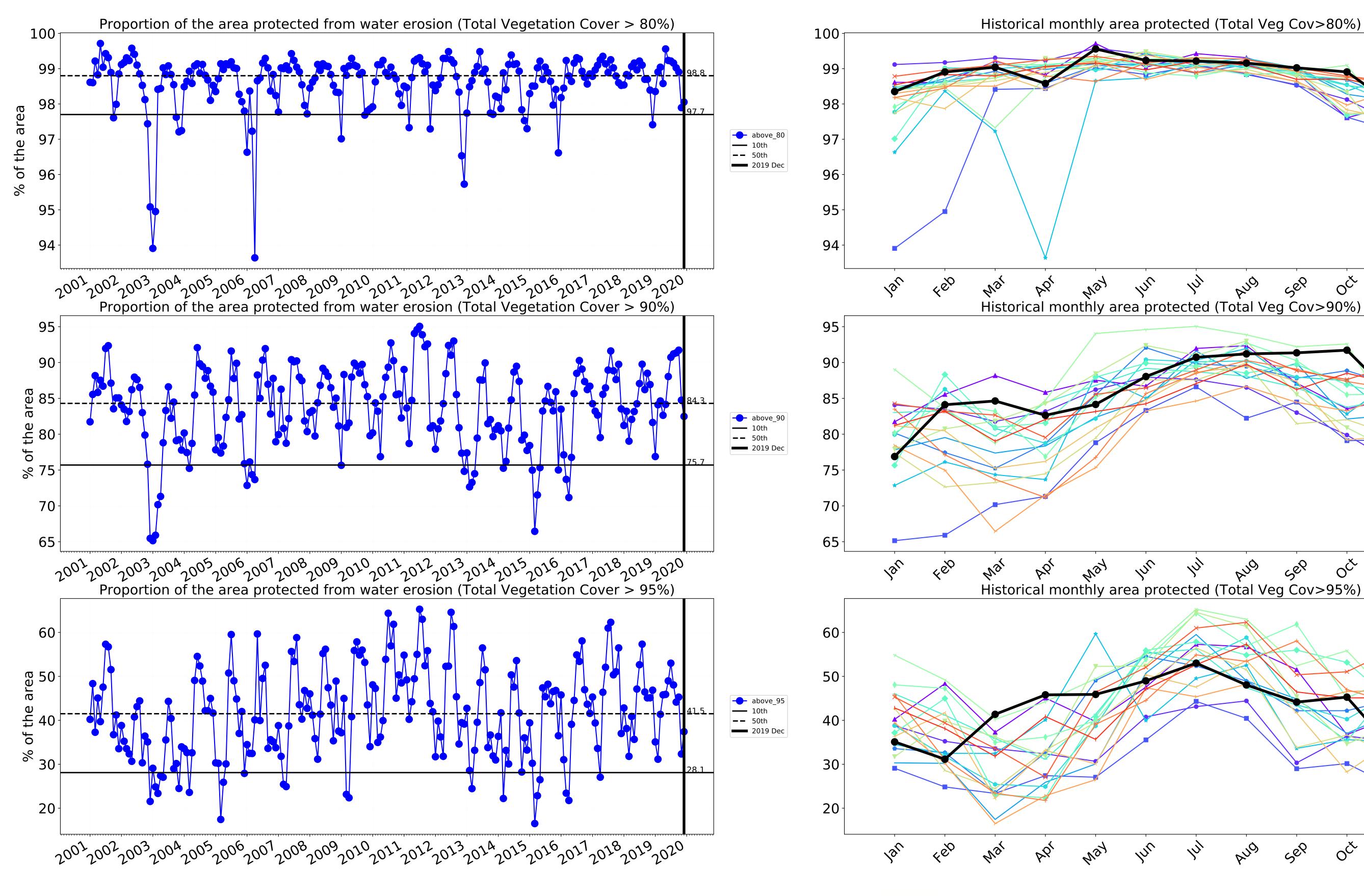


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

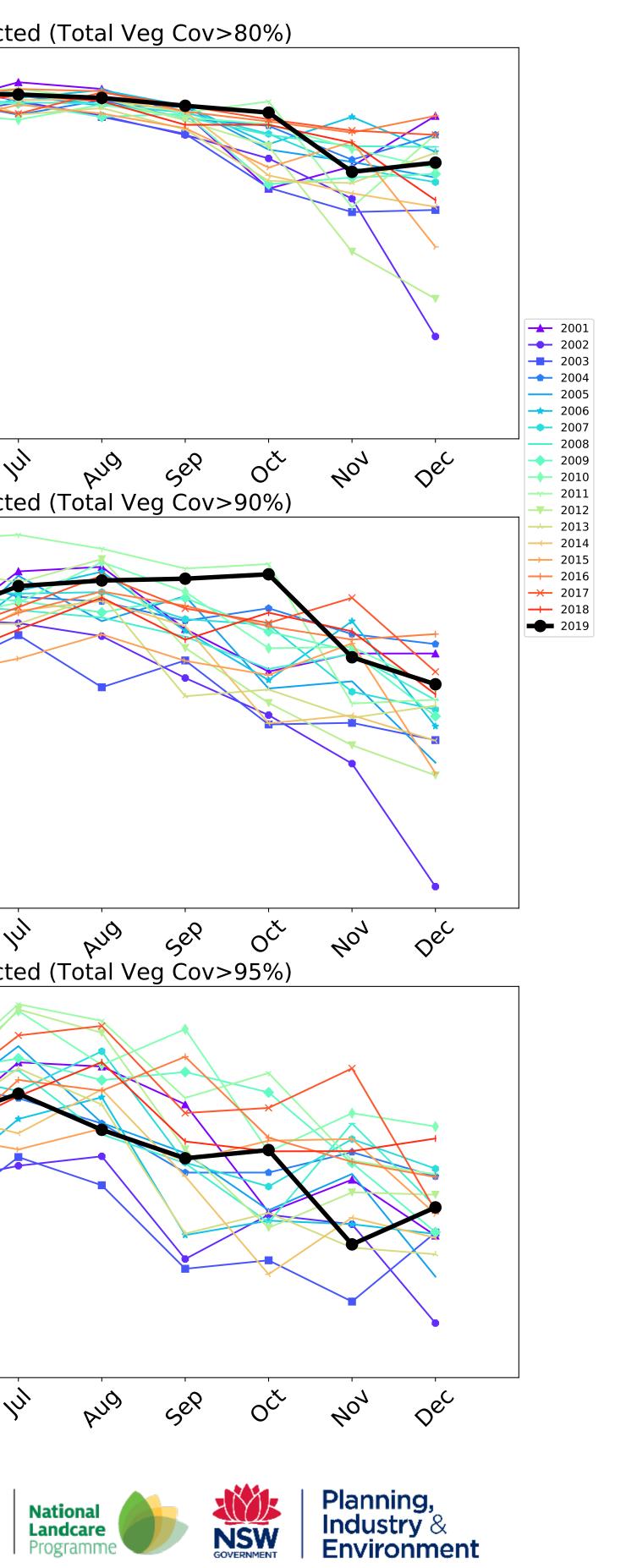


# **Conservation and natural environments timeseries**

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



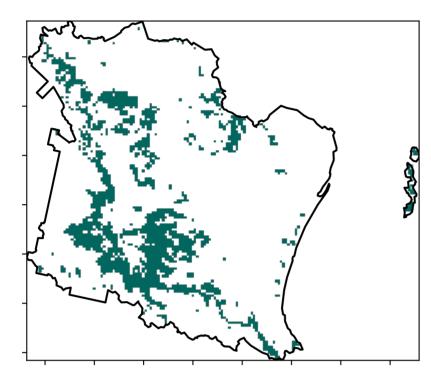




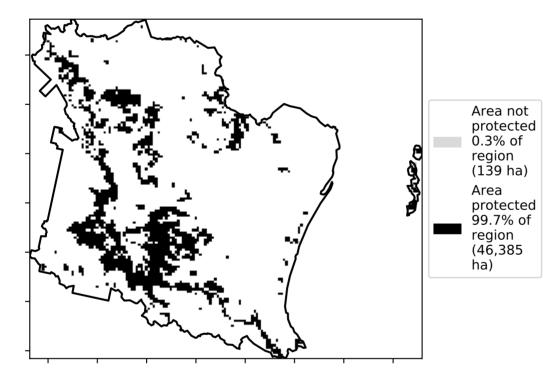
### **Conservation and natural environments Woodland forest**

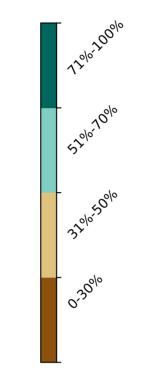
Ś 1 Conservation and natural environments - Woodland forest

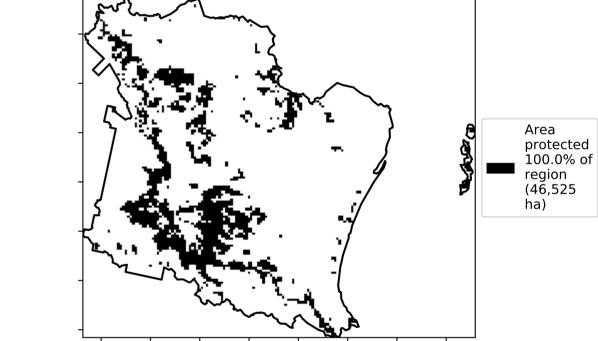
**Total Vegetation Cover [%]** 



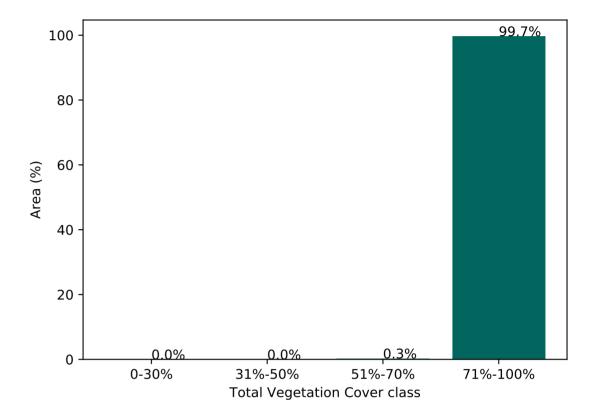
% Area protected from water erosion (>70%)







#### Proportion of vegetation cover class in area



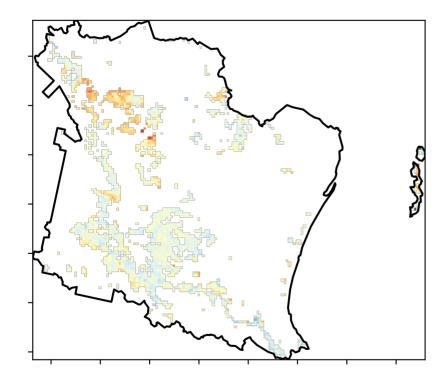
#### % Area protected from wind erosion (>50%)

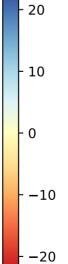


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Land use and forest cover

**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.

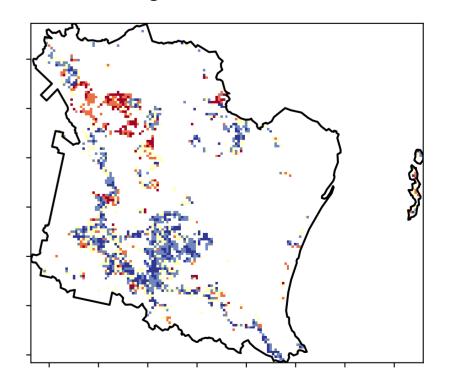
**Total Vegetation Cover Decile [%]** 

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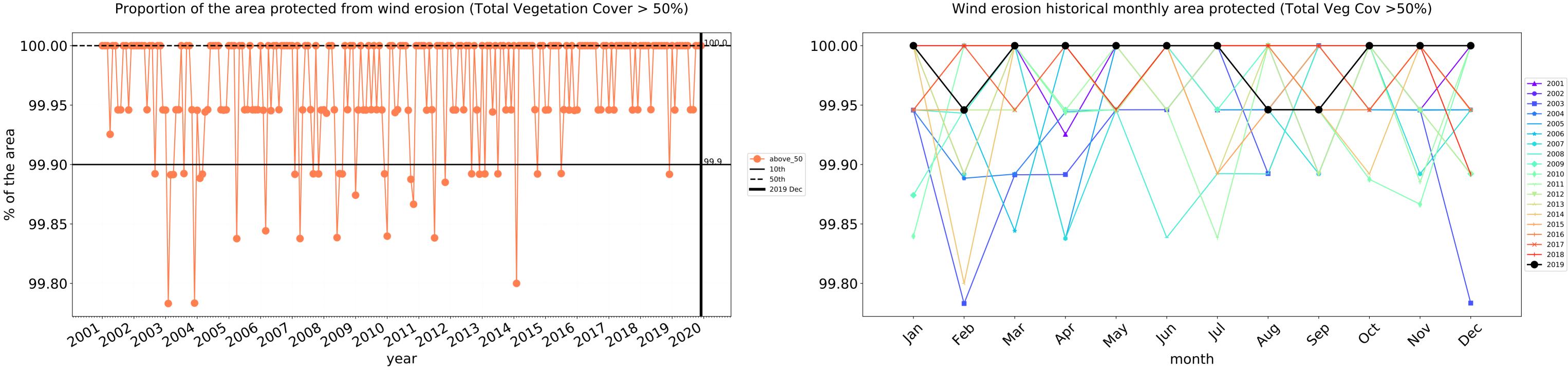
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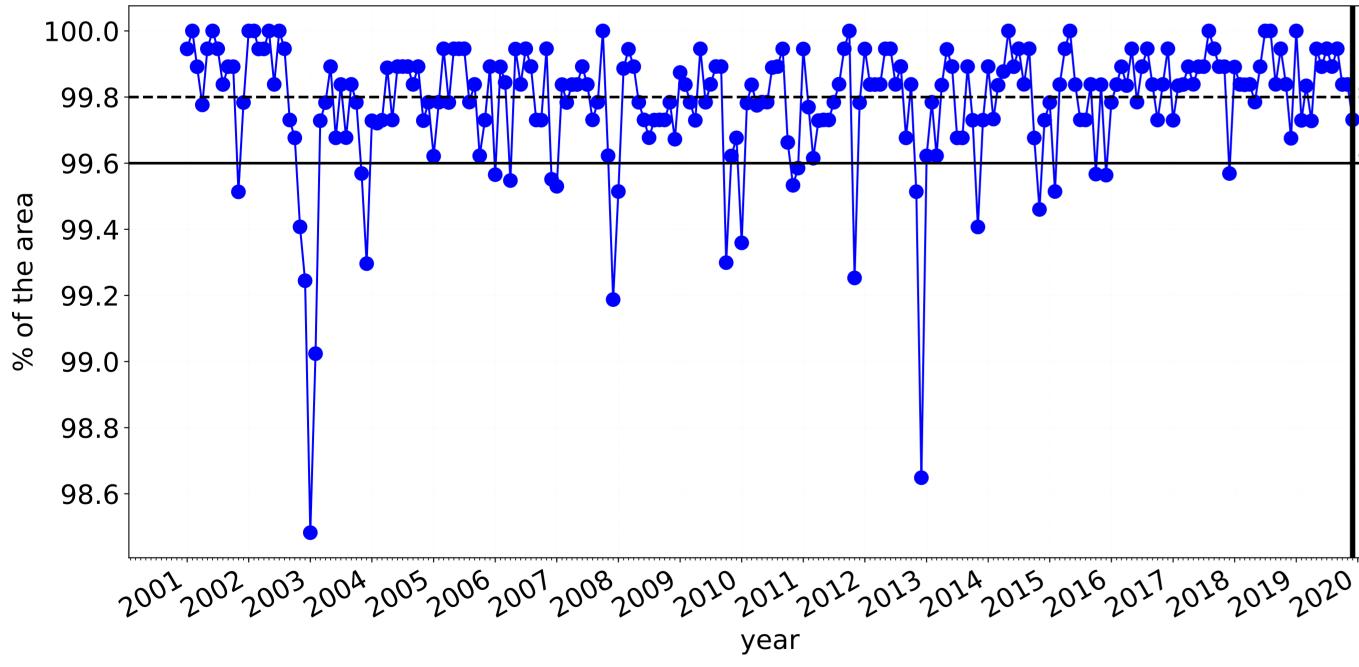
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.





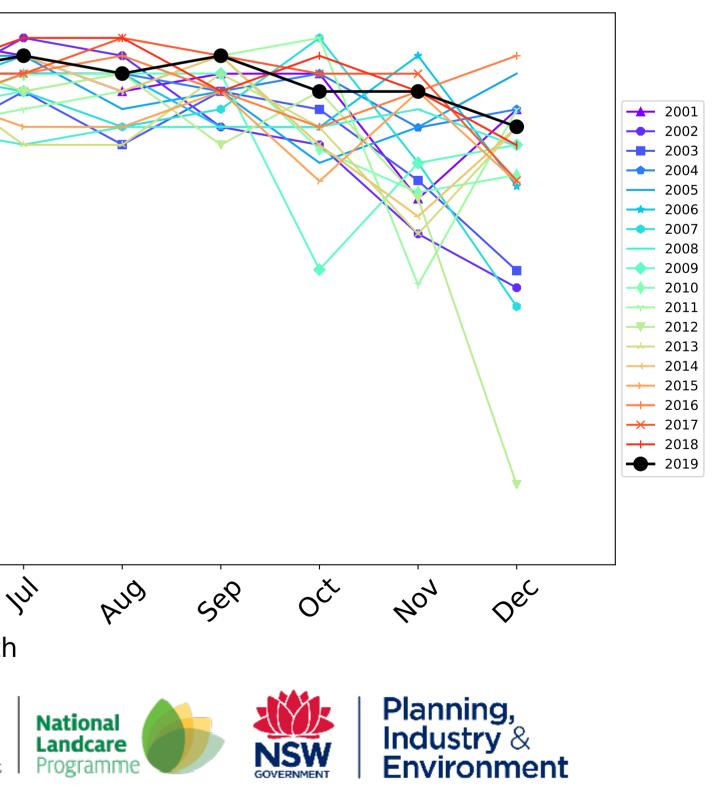
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

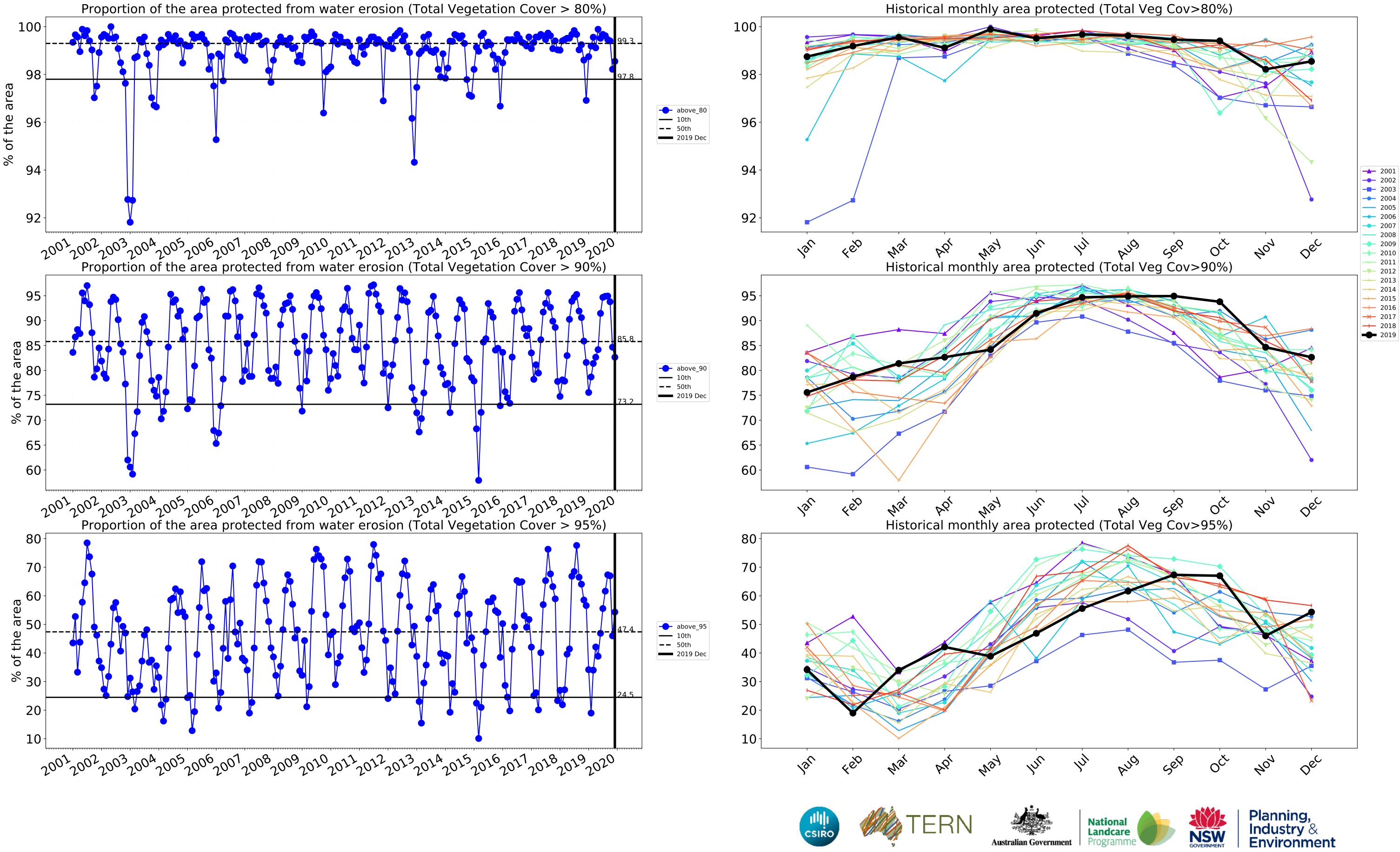
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



100.0 99.8 99.6 ---- above\_70 **—** 10th 99.4 **——** 50th **—** 2019 Dec 99.2 99.0 98.8 98.6 feb lar May In PQ Mai month ΓERN CSIRO Australian Government

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





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

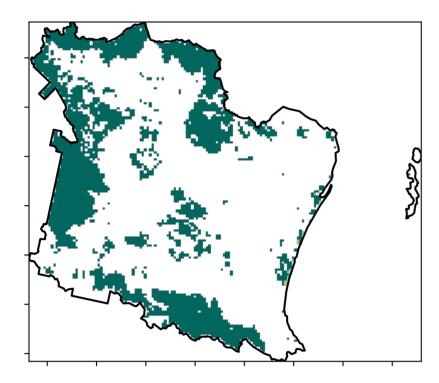
Land use and forest cover

Catchment Scale Land Use and Forests of Australia (2018) 1 Conservation and natural environments - Non-Catchment Scale Land woodland forest Ľ Use of Australia (2018) and Forests

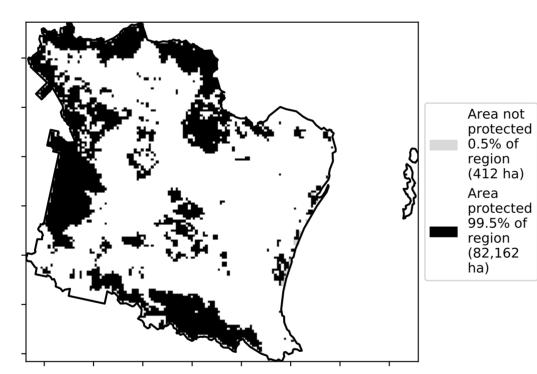
of Australia (2018)

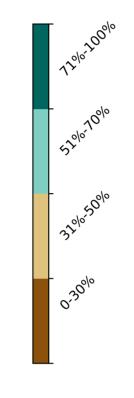
Derived from

**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





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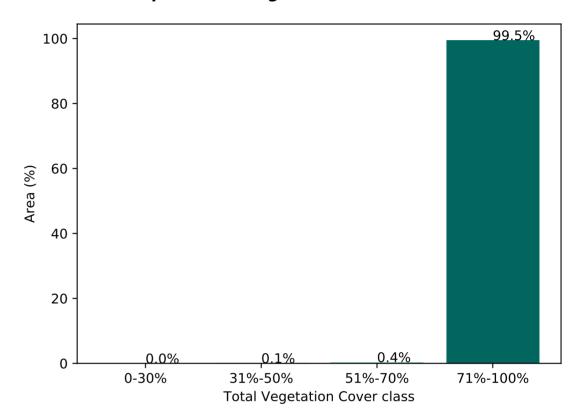
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Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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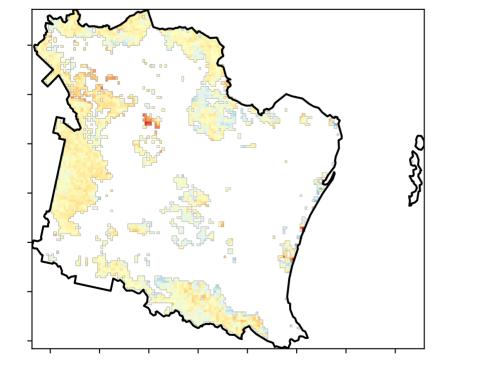
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Total Vegetation Cover Anomaly [%]

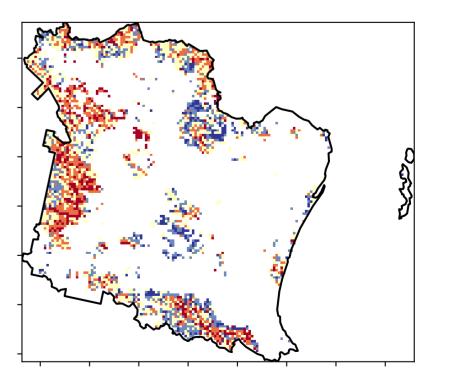
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.



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.

Area not protected 0.0% of region (0 ha) Area protected 100.0% of region (82,575 ha)

**Total Vegetation Cover Decile [%]** 





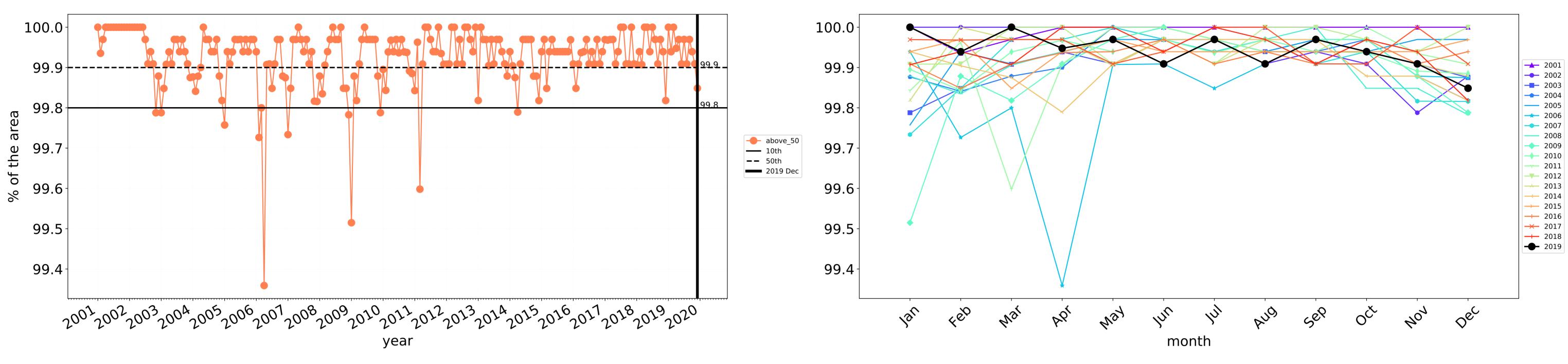






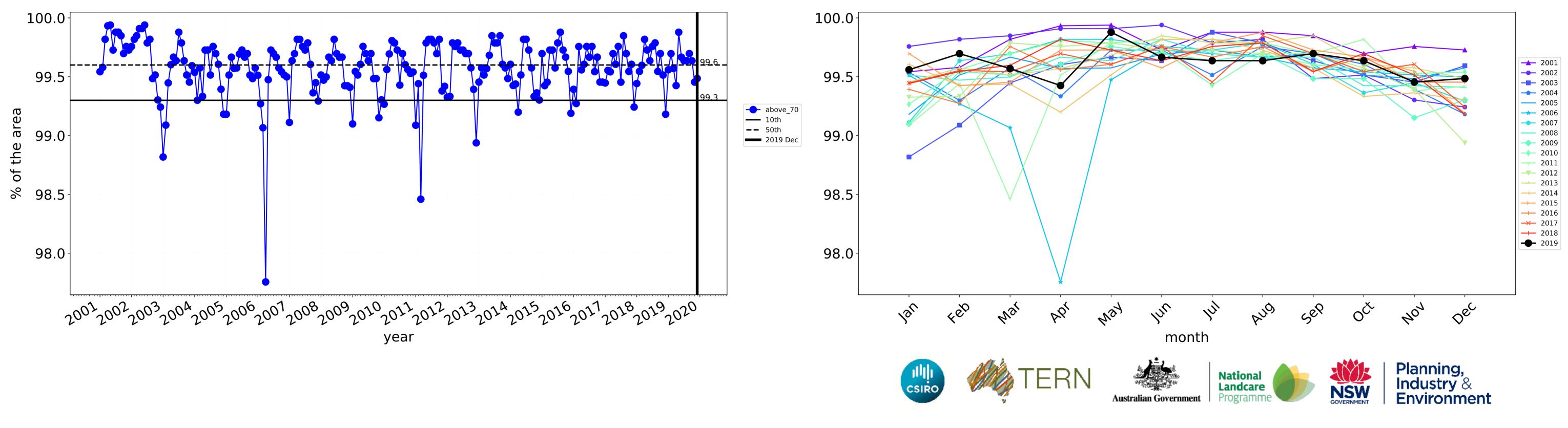


## **Conservation and natural environments Forest (non woodland) timeseries**



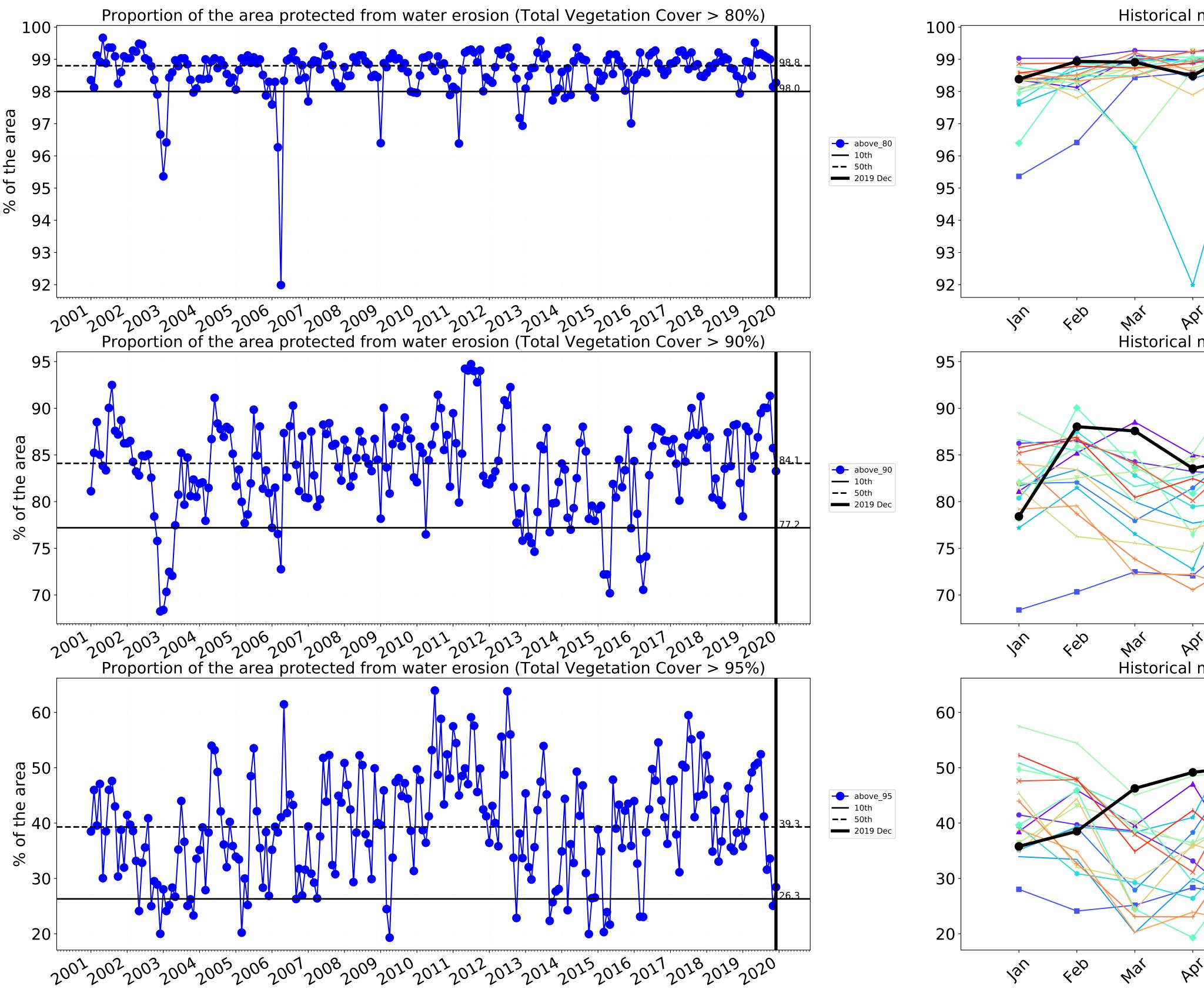
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

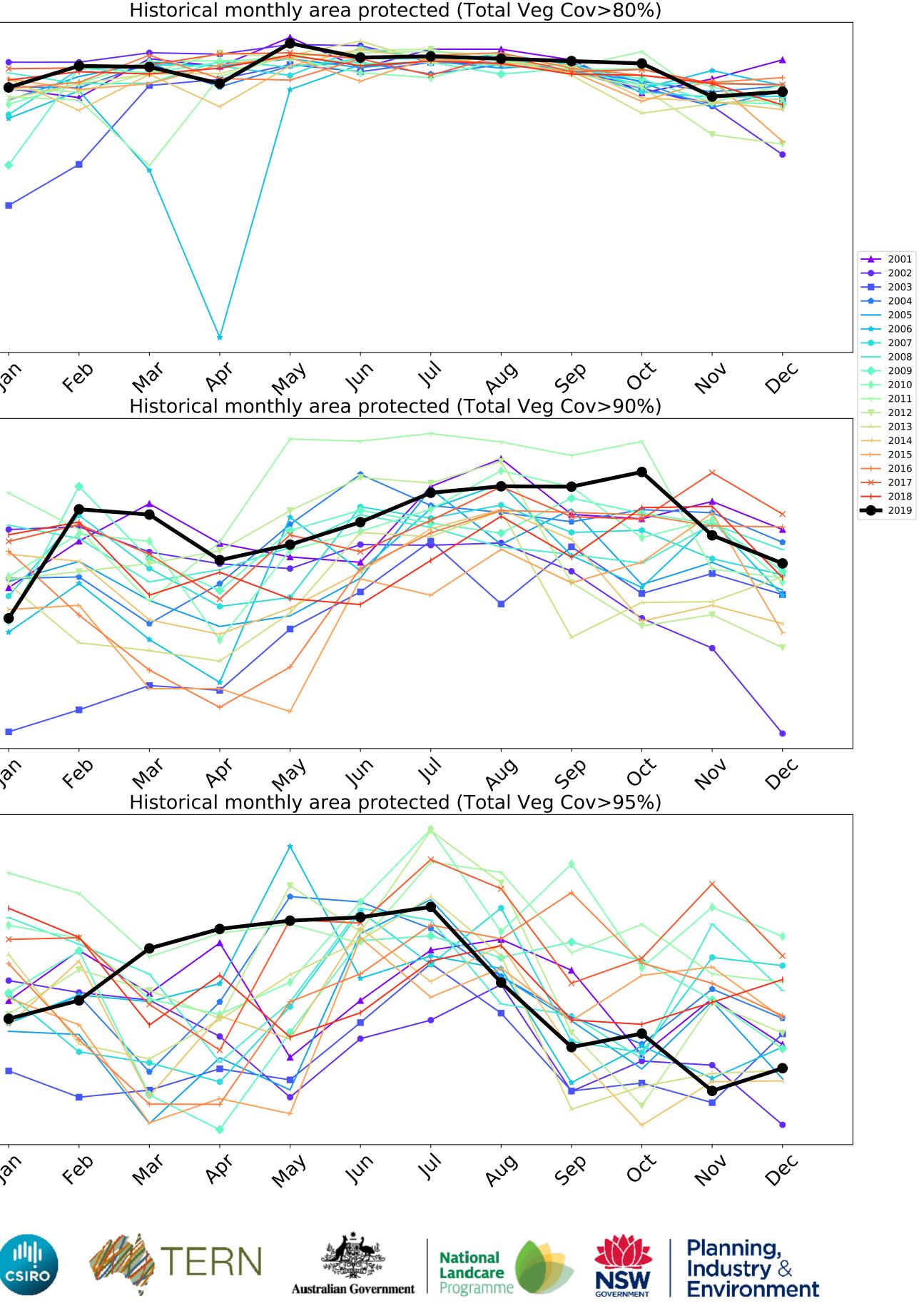




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

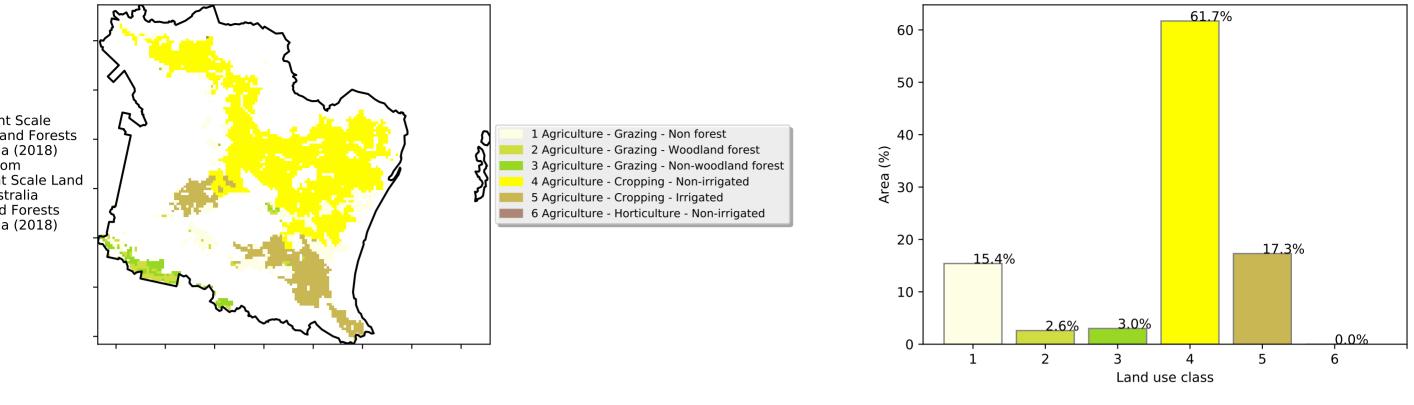


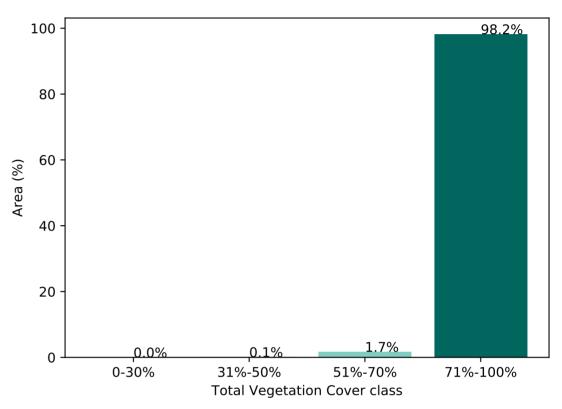


### Agriculture

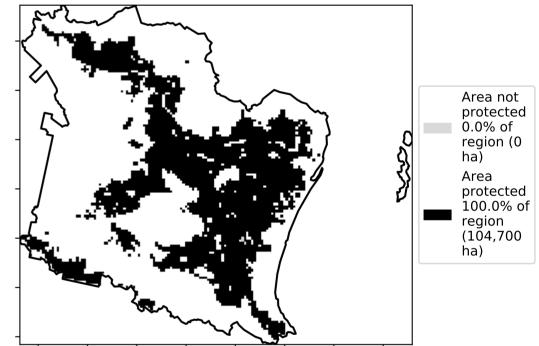
Land use and forest cover

Proportion of each land class in area

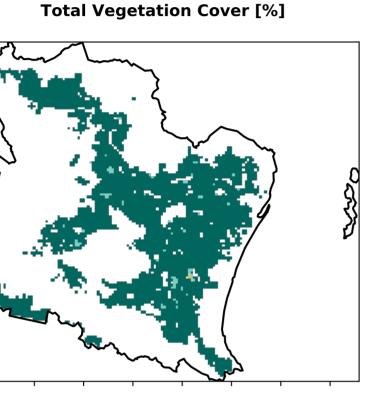




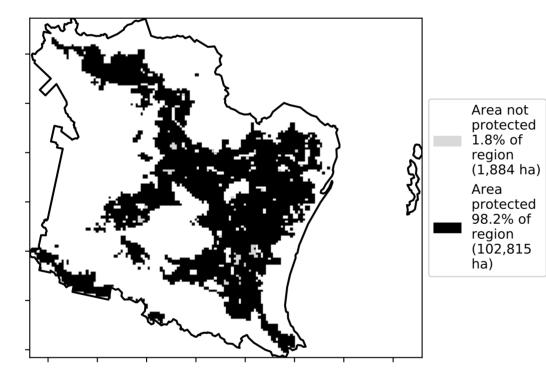
#### % Area protected from wind erosion (>50%)



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



% Area protected from water erosion (>70%)

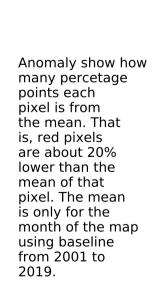


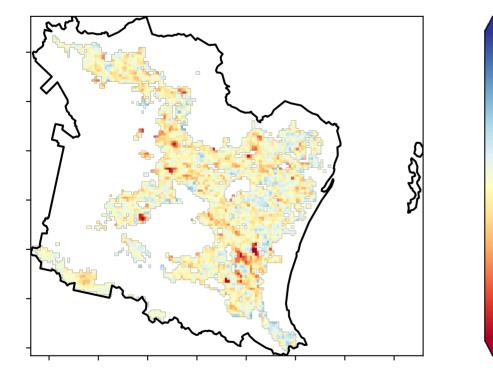
52% TON 32905001 0.30%

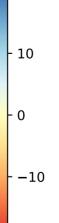
12º10-200°

#### Proportion of vegetation cover class in area

Total Vegetation Cover Anomaly [%]

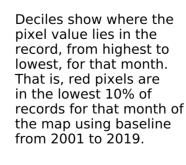




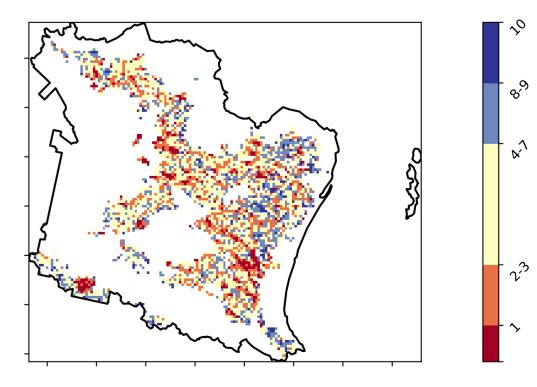


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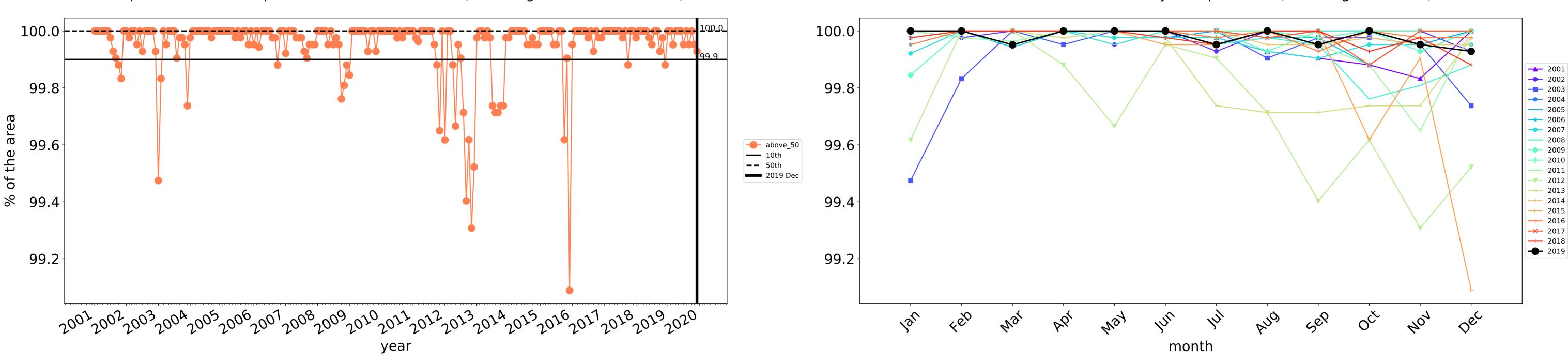
- 20



**Total Vegetation Cover Decile [%]** 

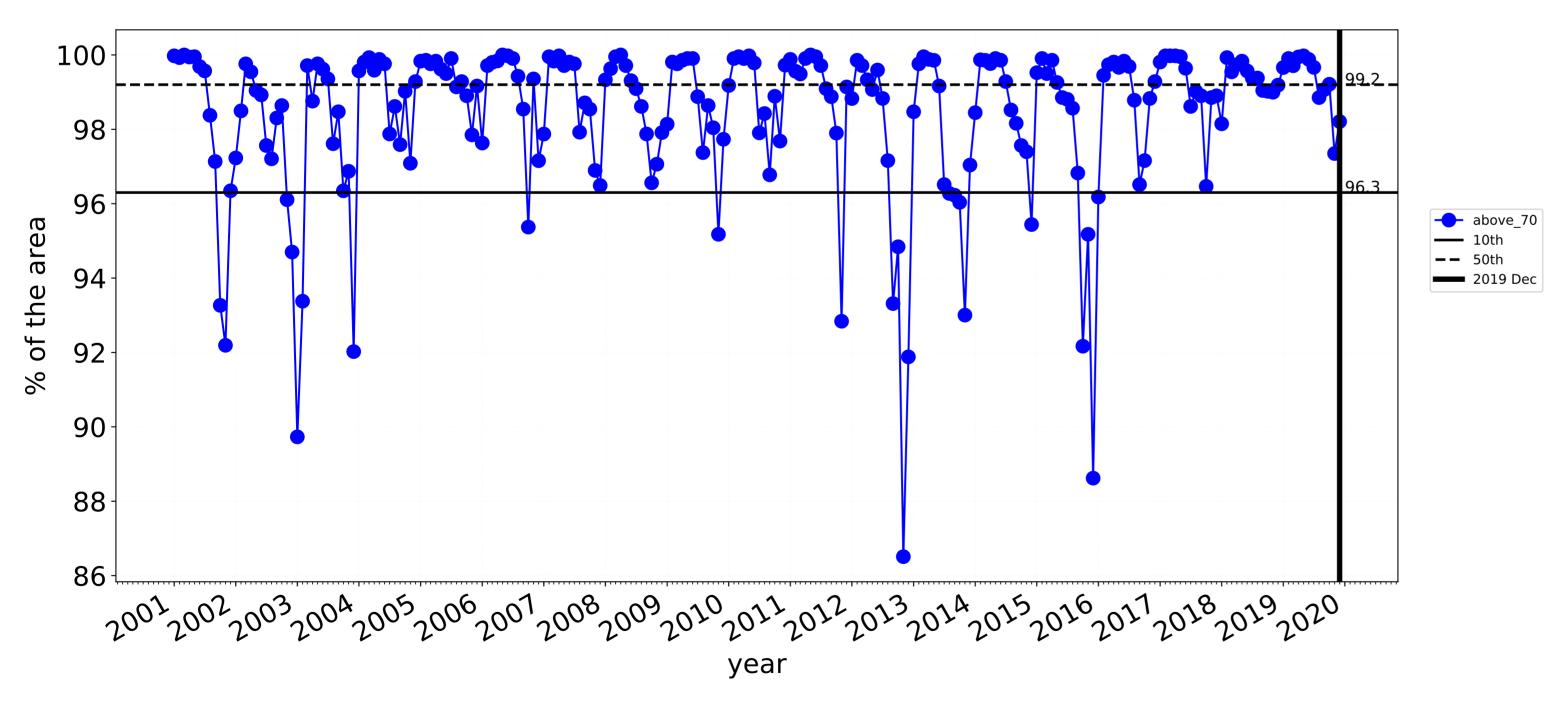




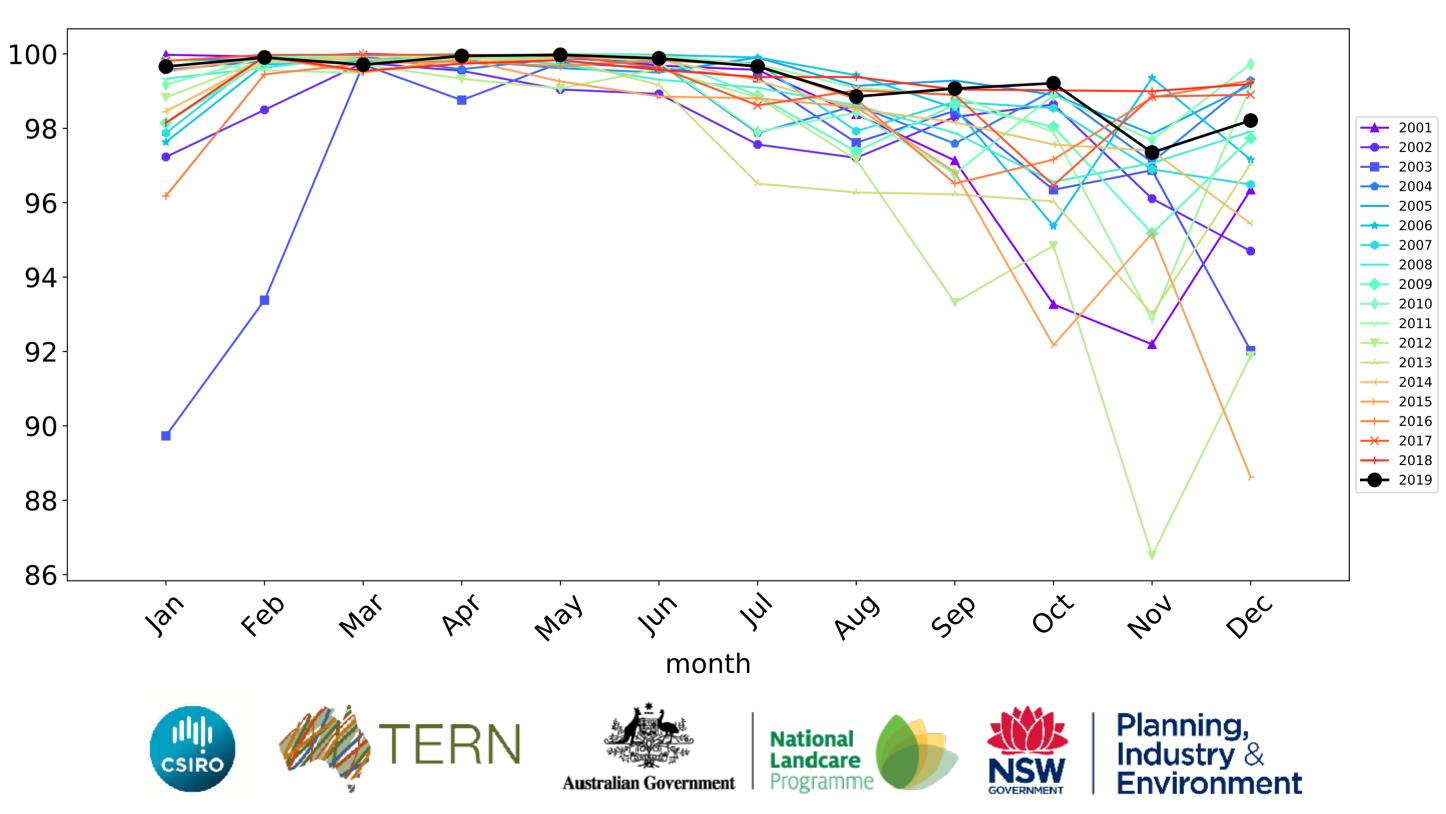


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

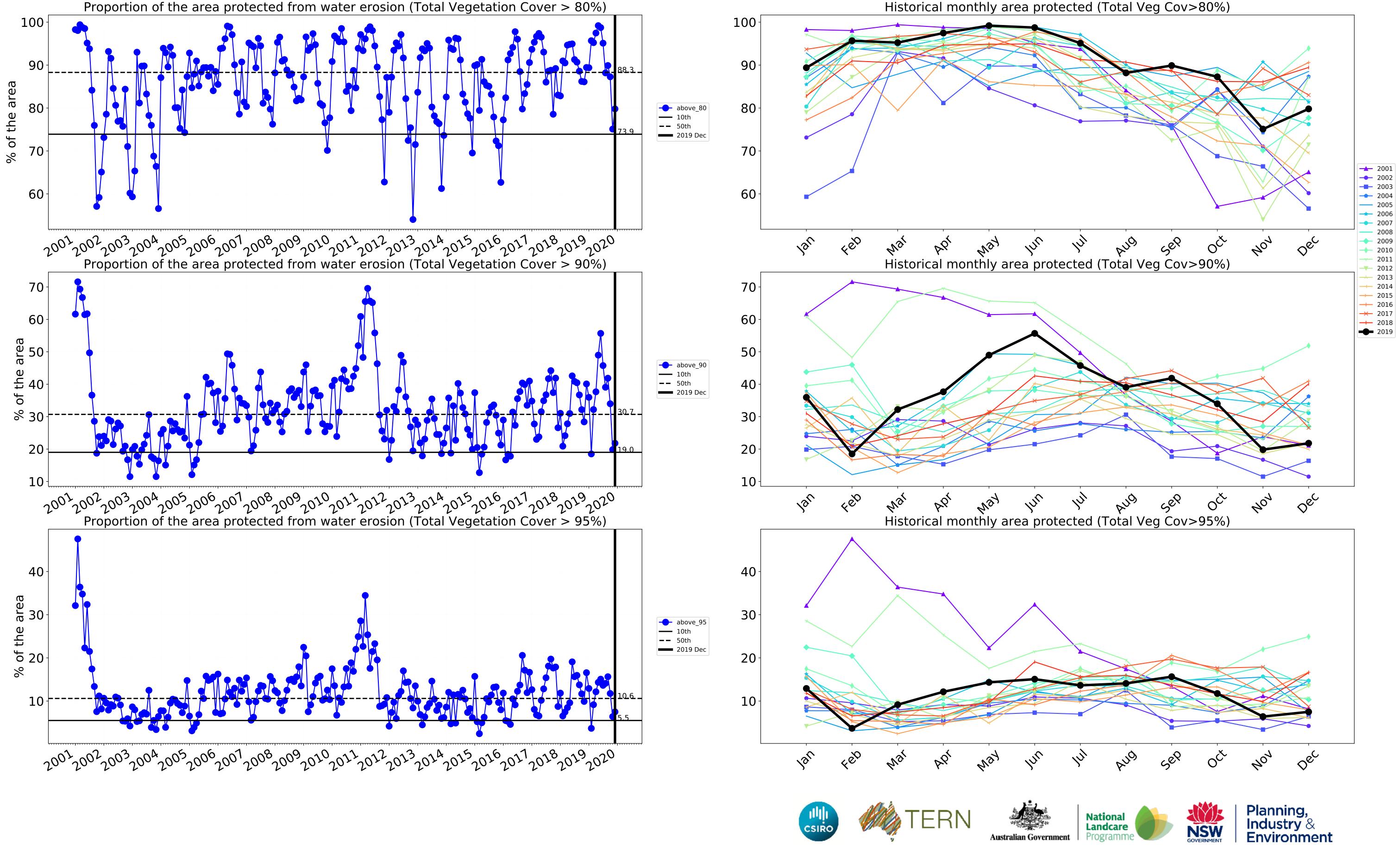


# Agriculture timeseries



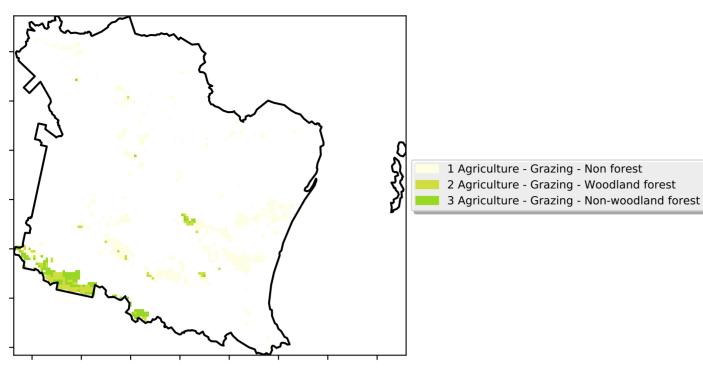
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



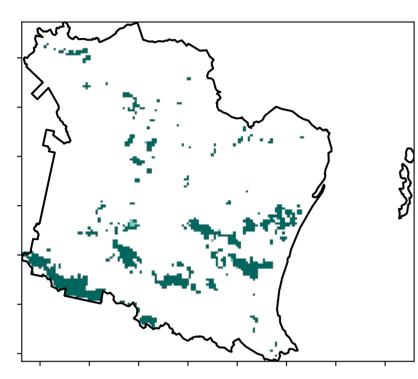
### Grazing

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

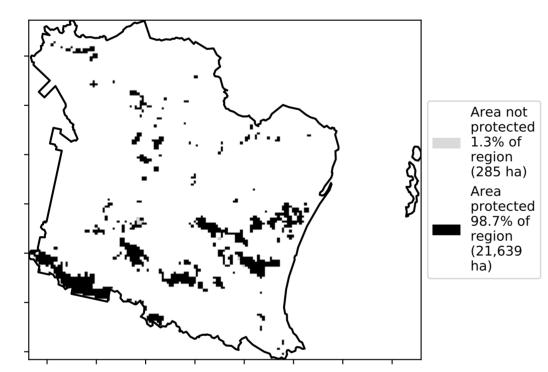


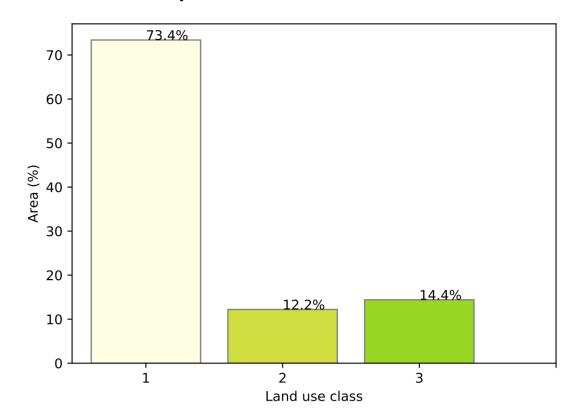
Land use and forest cover

**Total Vegetation Cover [%]** 



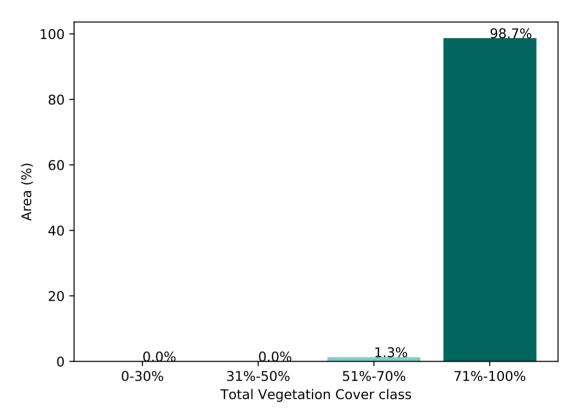
% Area protected from water erosion (>70%)



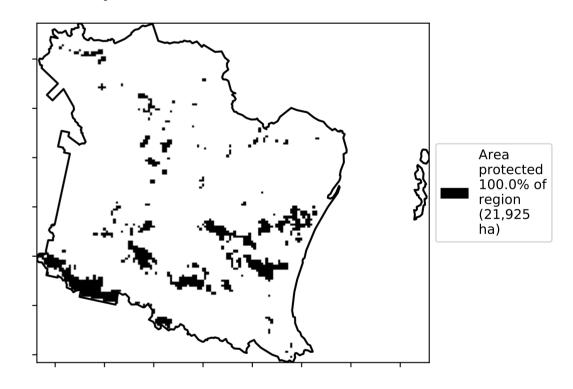


#### Proportion of each land class in area

Proportion of vegetation cover class in area



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



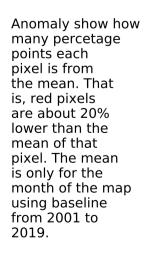
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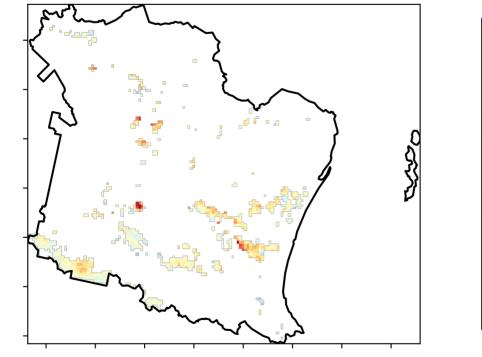
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**Total Vegetation Cover Anomaly [%]** 





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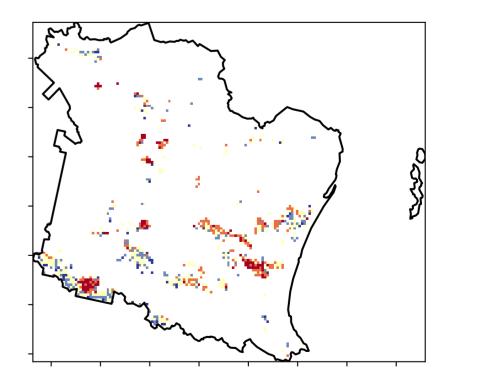
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52% TON

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0.30%

Total Vegetation Cover Decile [%]





Deciles show where the

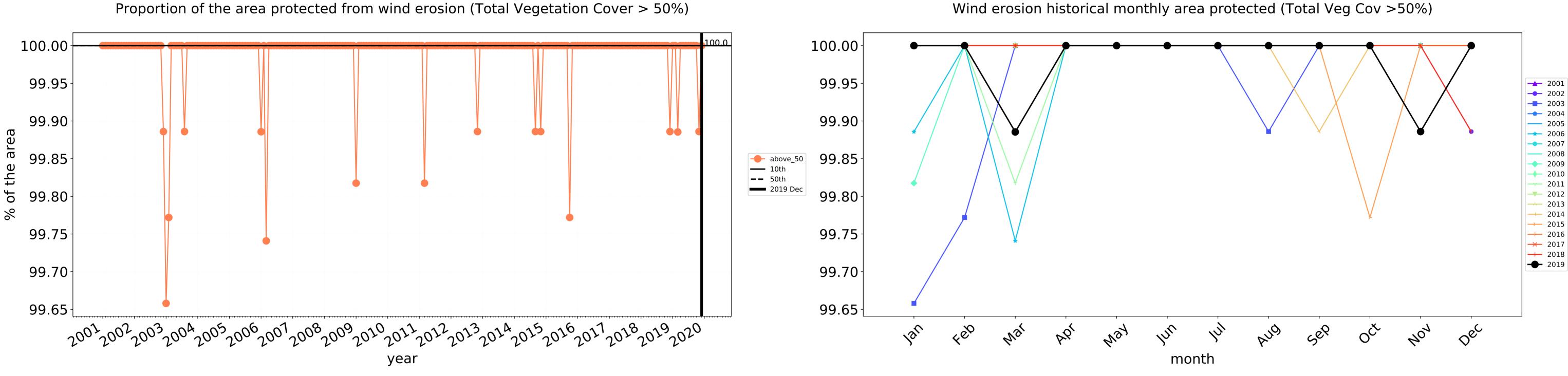
pixel value lies in the

record, from highest to

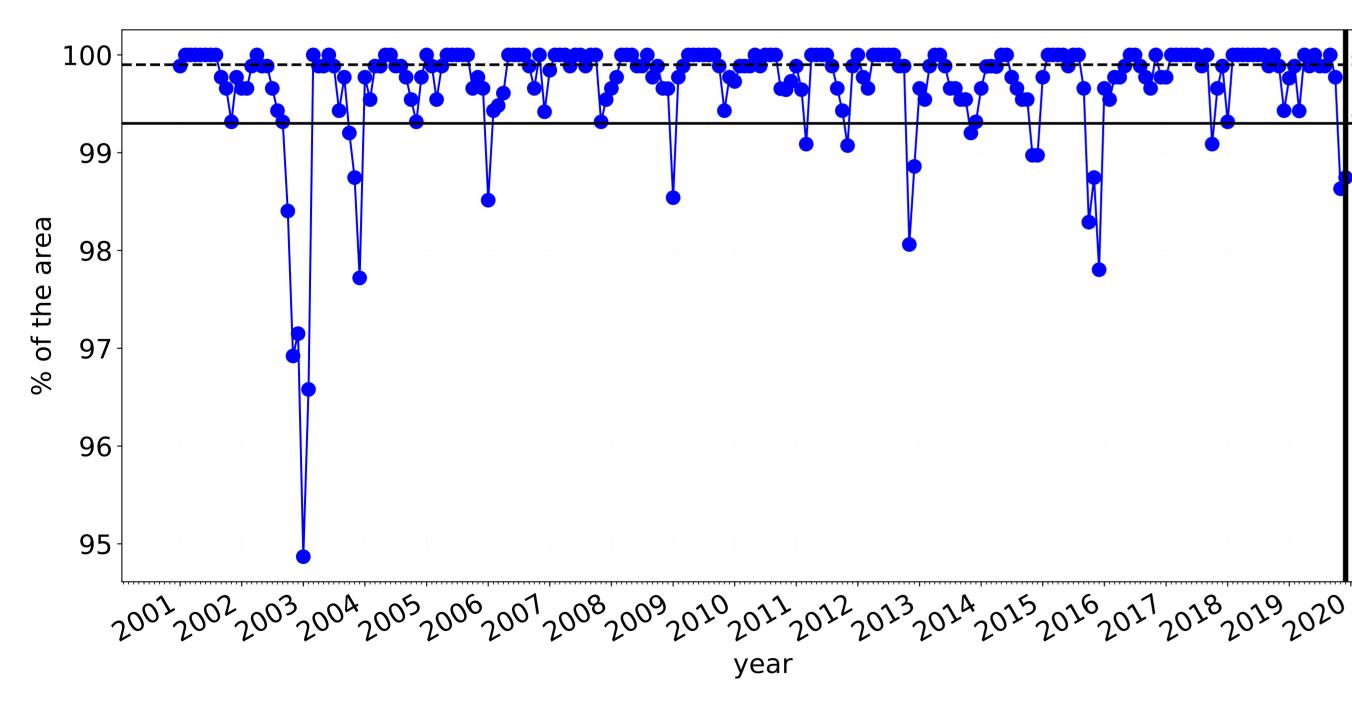
lowest, for that month. That is, red pixels are

records for that month of the map using baseline from 2001 to 2019.

in the lowest 10% of



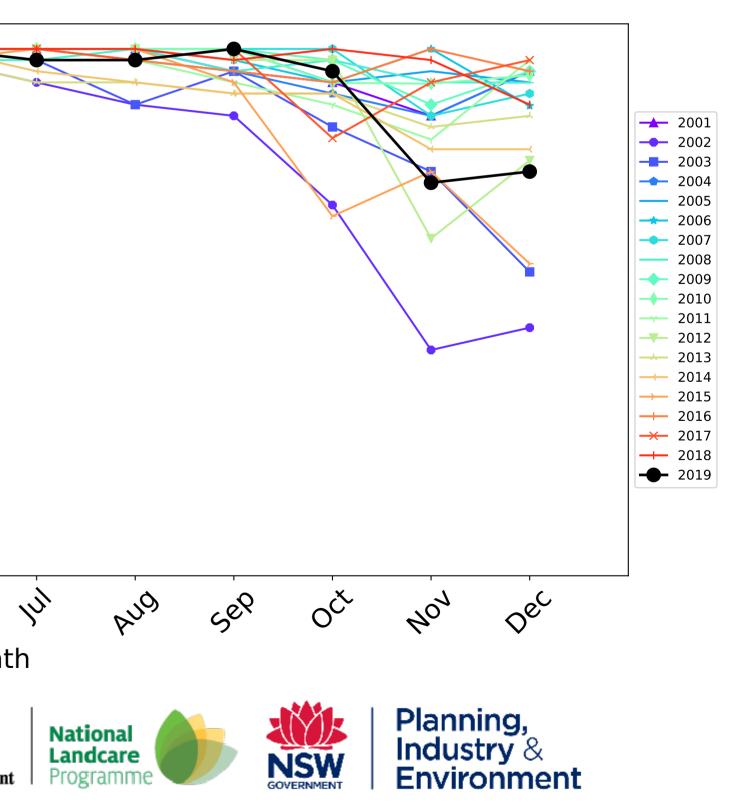
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

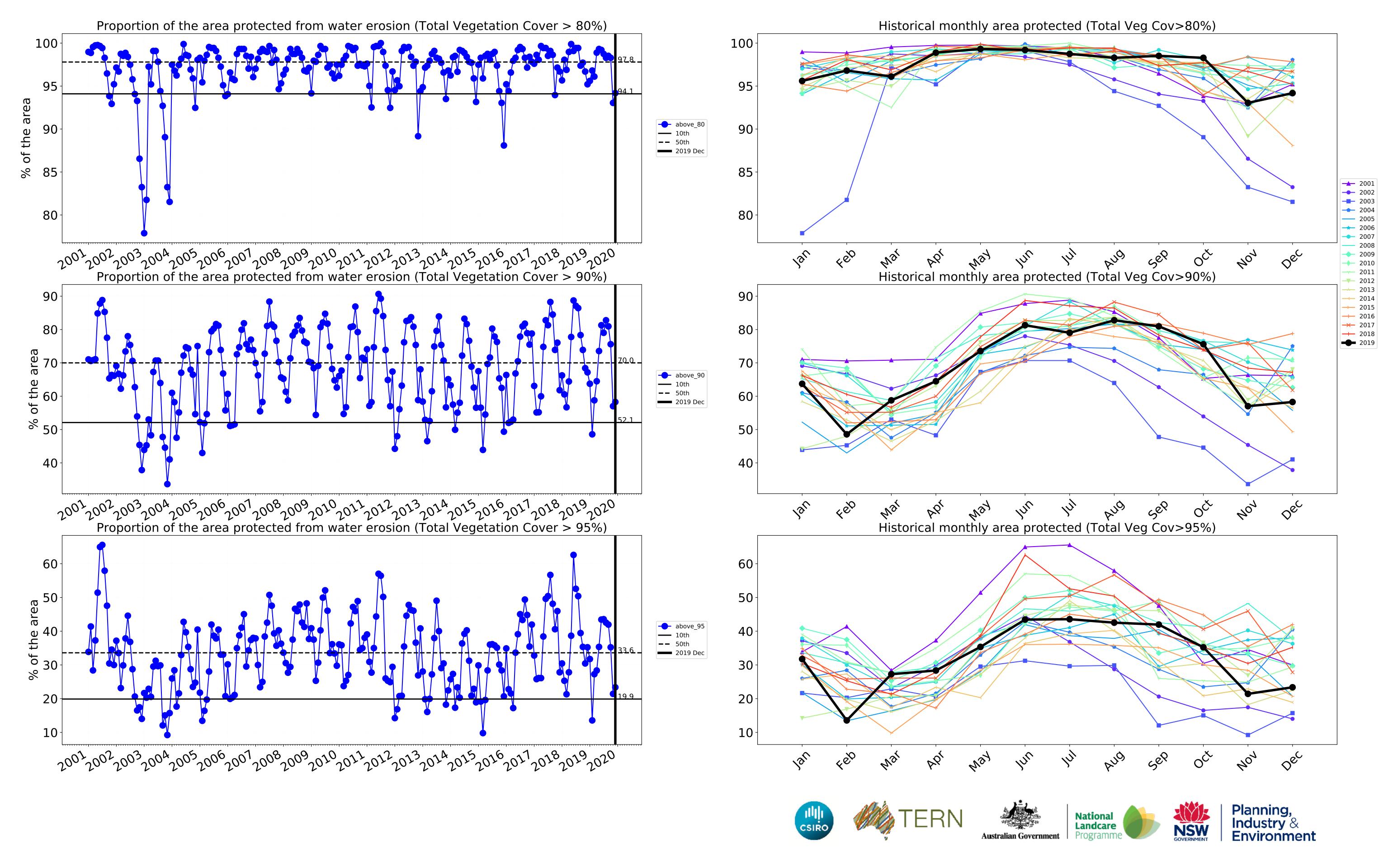


# Grazing timeseries

100 <u>99.9</u> 99 ---- above\_70 **—** 10th 98 **--** 50th **——** 2019 Dec 97 96 95 feb lar Inu May War PQ month ΓERN CSIRO Australian Government

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





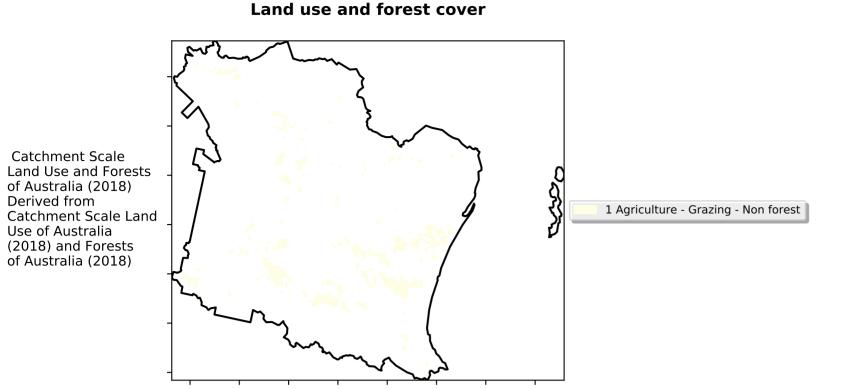
### **Grazing non forest**

12%200%

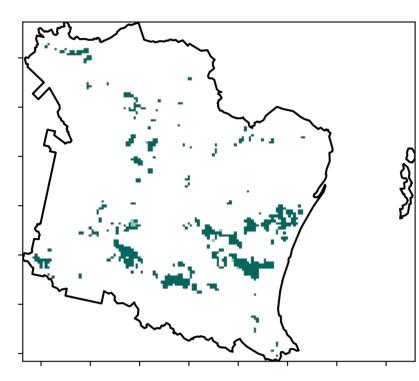
, 52°1070°10

32005001

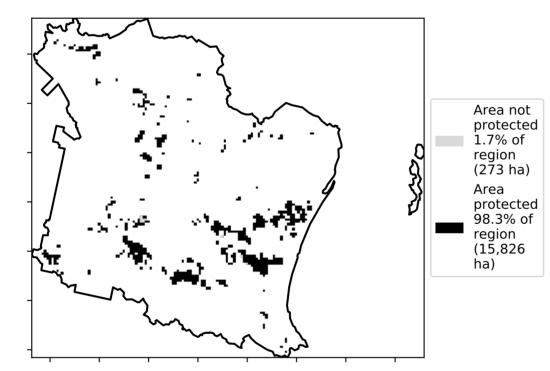
0.30%



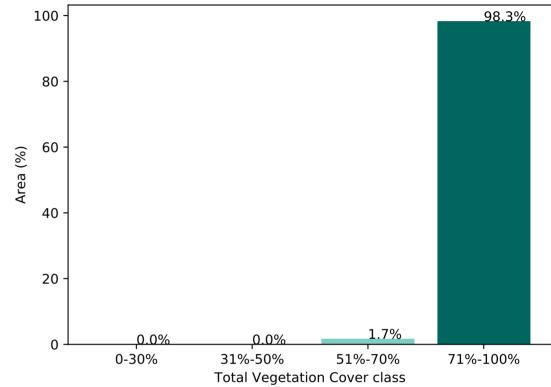
**Total Vegetation Cover [%]** 



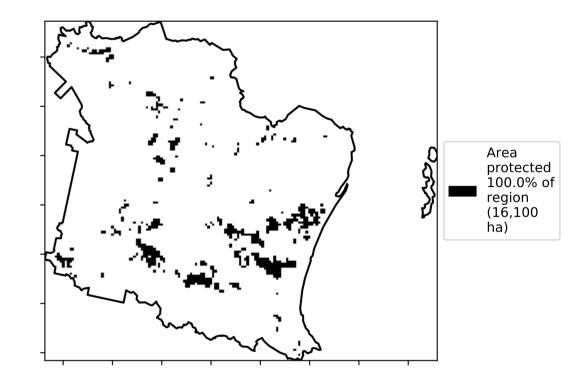
% Area protected from water erosion (>70%)







% Area protected from wind erosion (>50%)



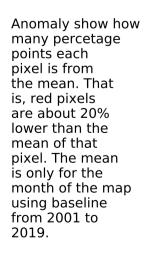
\$

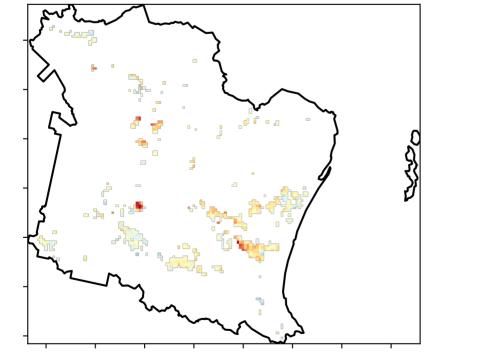
୍ଚ୍ଚ

A.1

2.3

Total Vegetation Cover Anomaly [%]



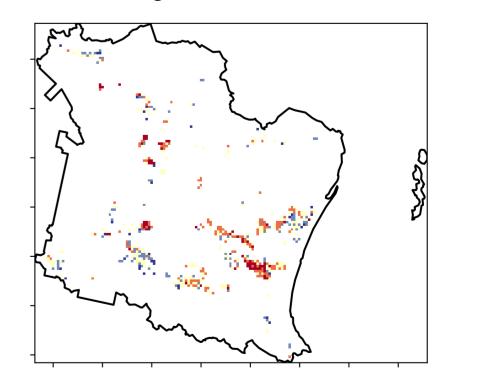


- 10 - 0 - —10

-20

- 20

**Total Vegetation Cover Decile [%]** 





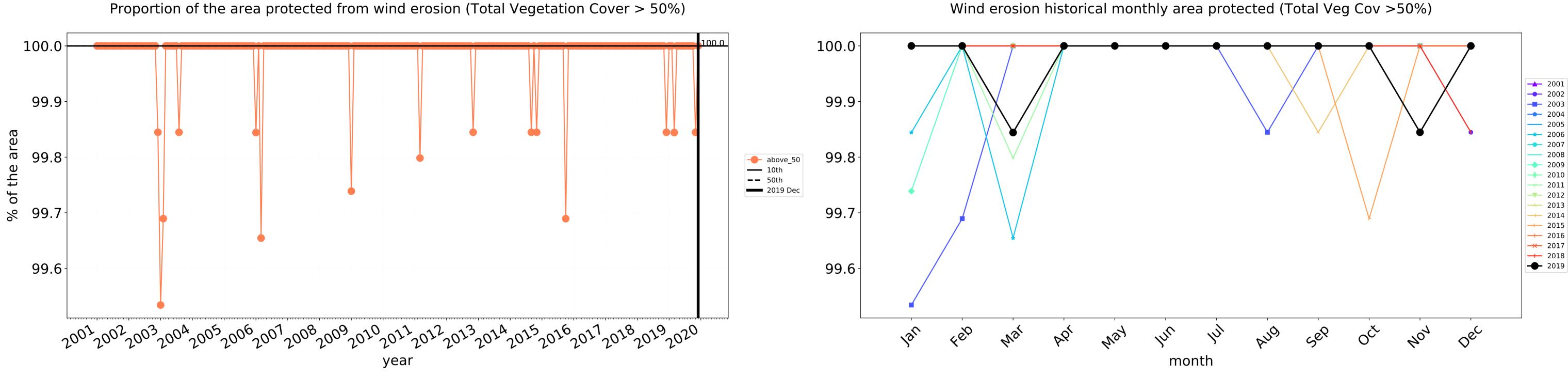
Deciles show where the pixel value lies in the

record, from highest to

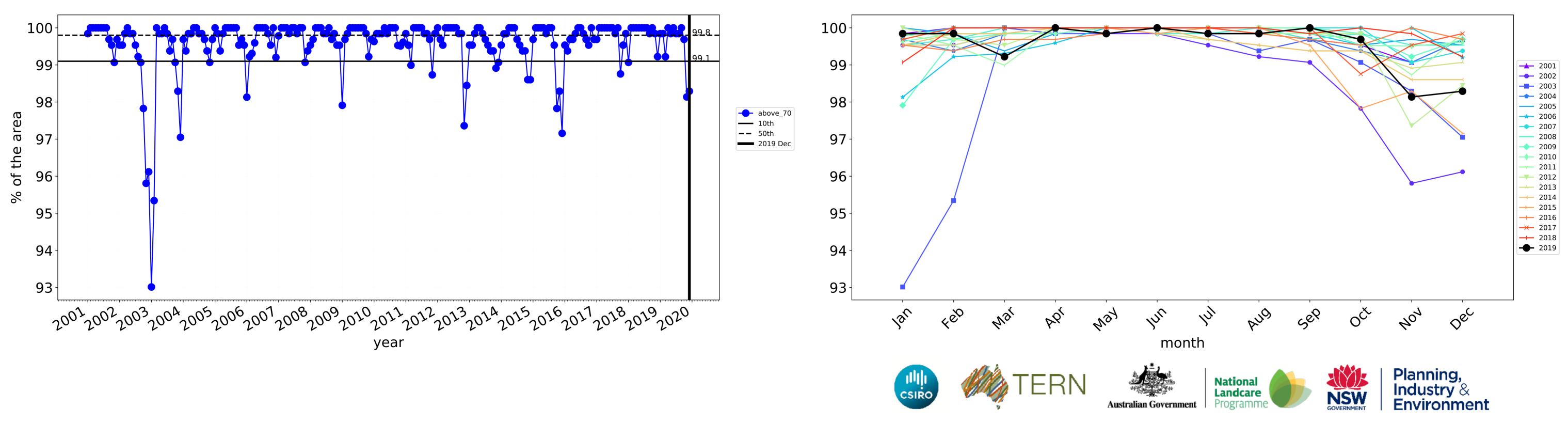
lowest, for that month. That is, red pixels are

records for that month of the map using baseline from 2001 to 2019.

in the lowest 10% of

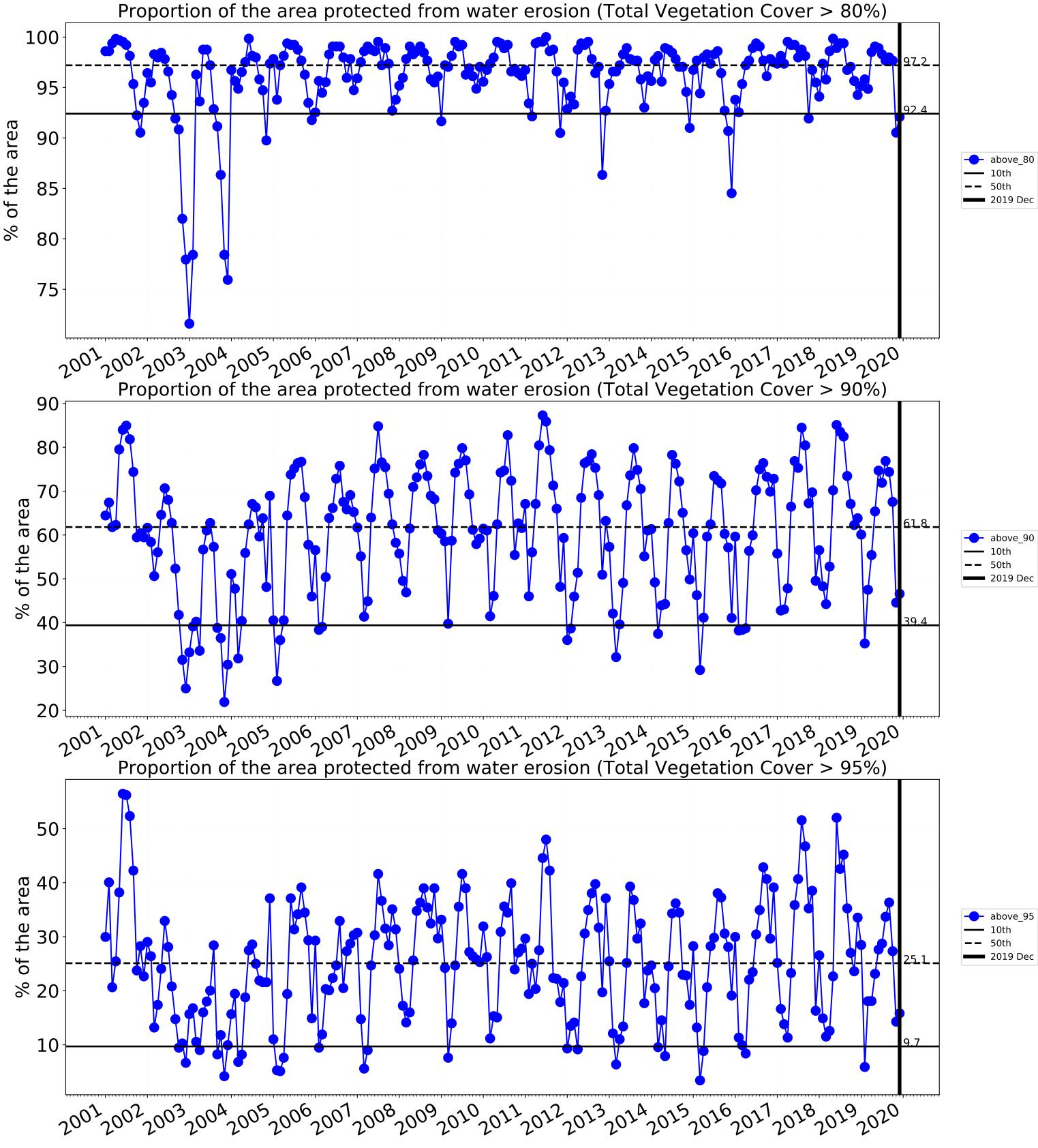


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

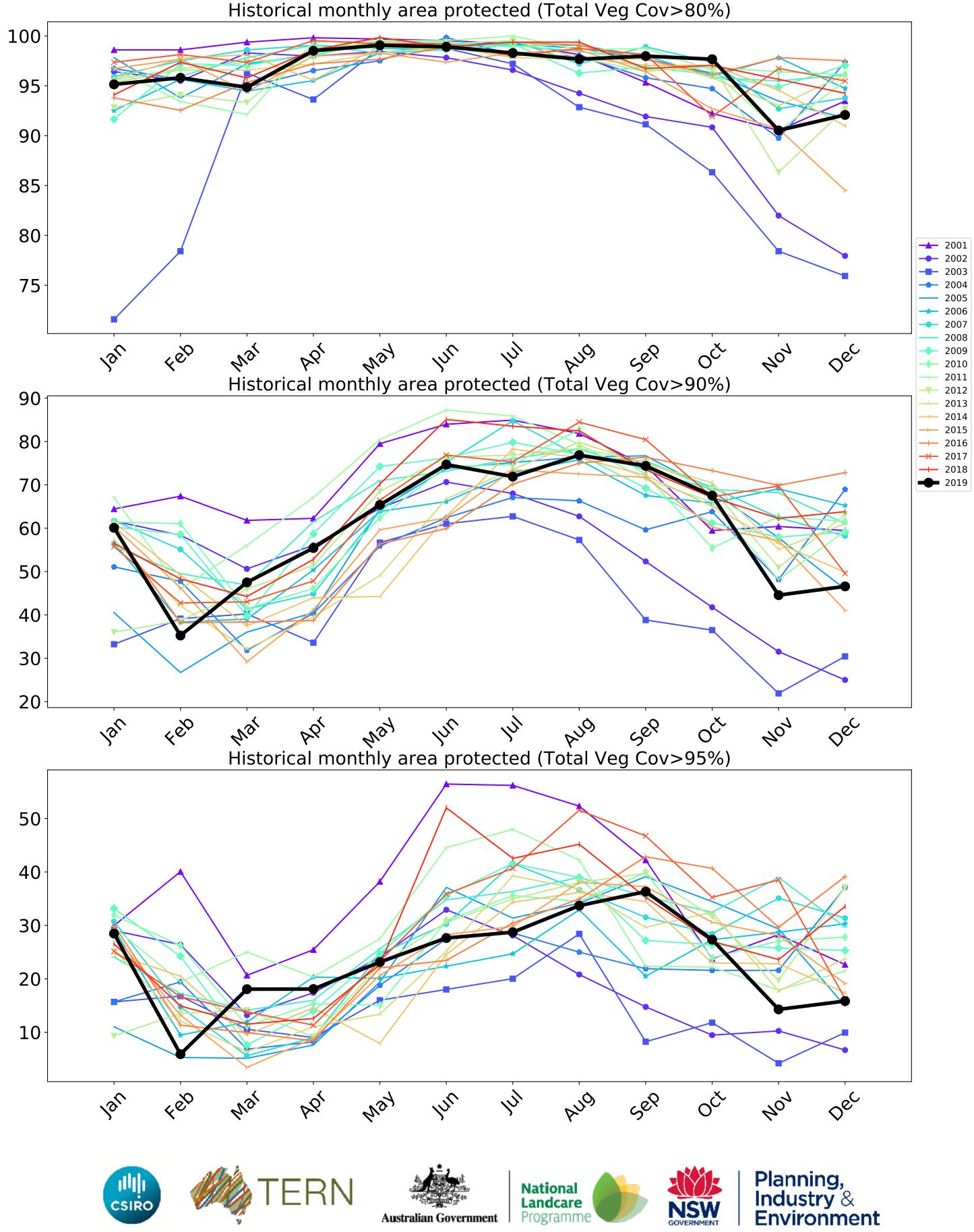


# Grazing non forest timeseries

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







Australian Government

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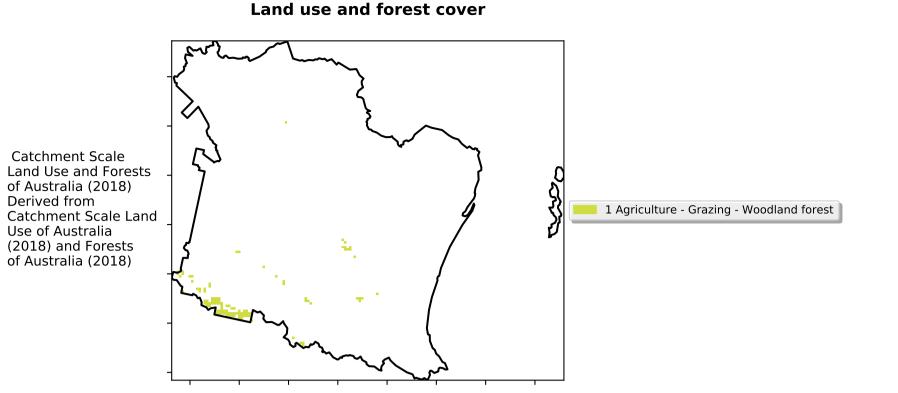
### **Grazing Woodland forest**

120010000

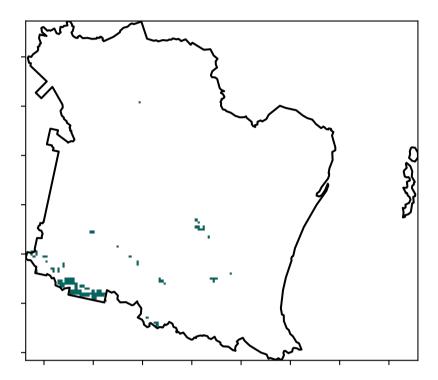
52°10010010

32%50%

0.30%



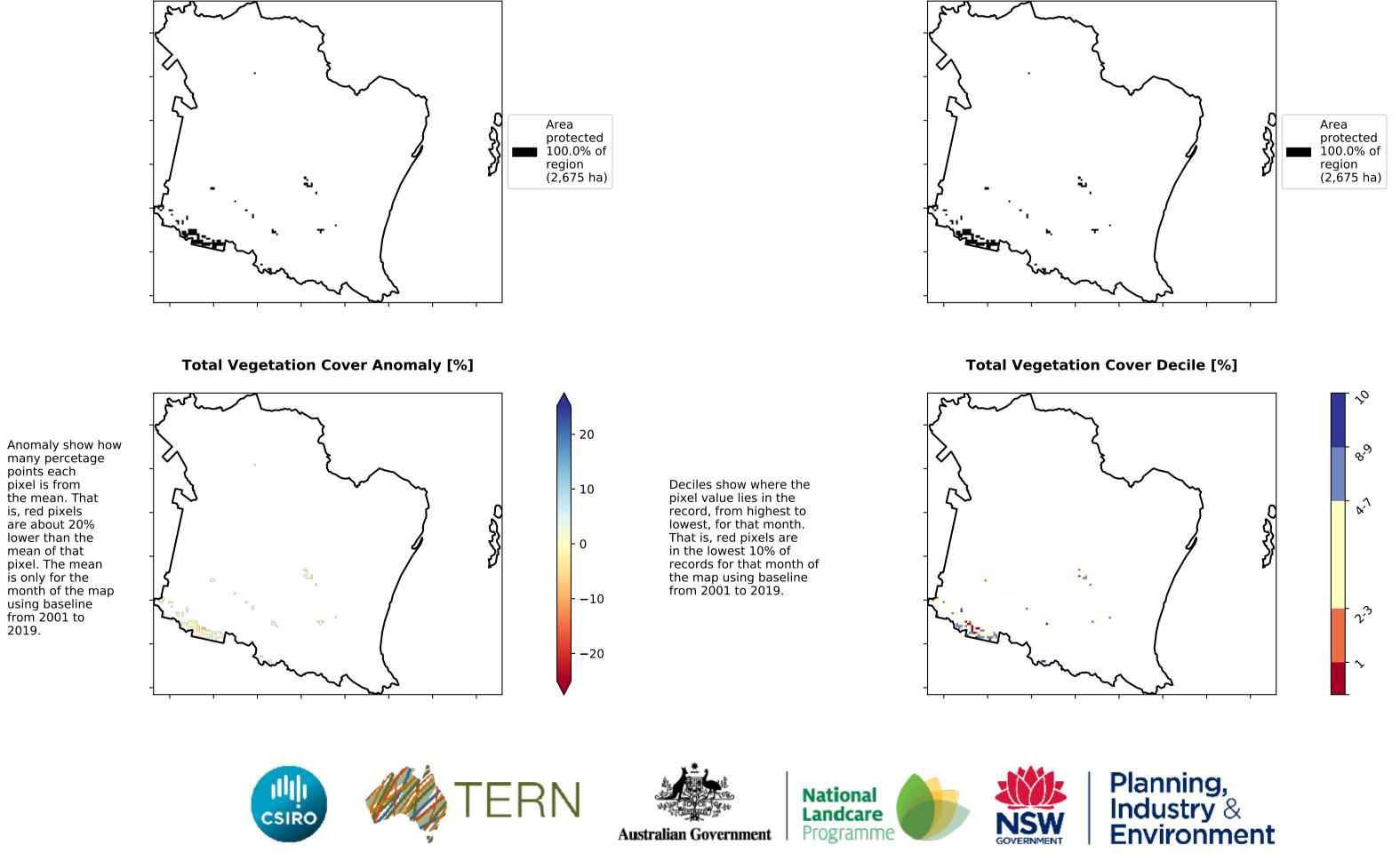
**Total Vegetation Cover [%]** 



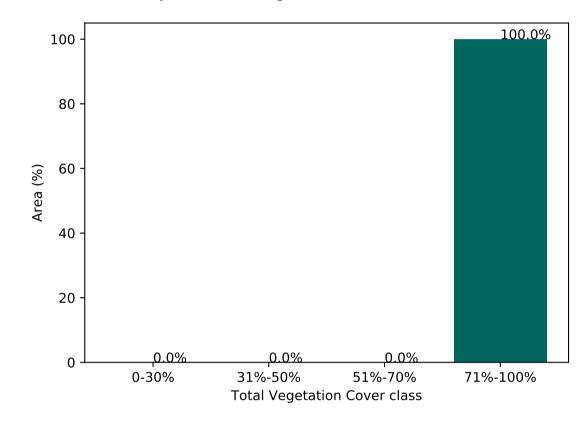
% Area protected from water erosion (>70%)

pixel is from

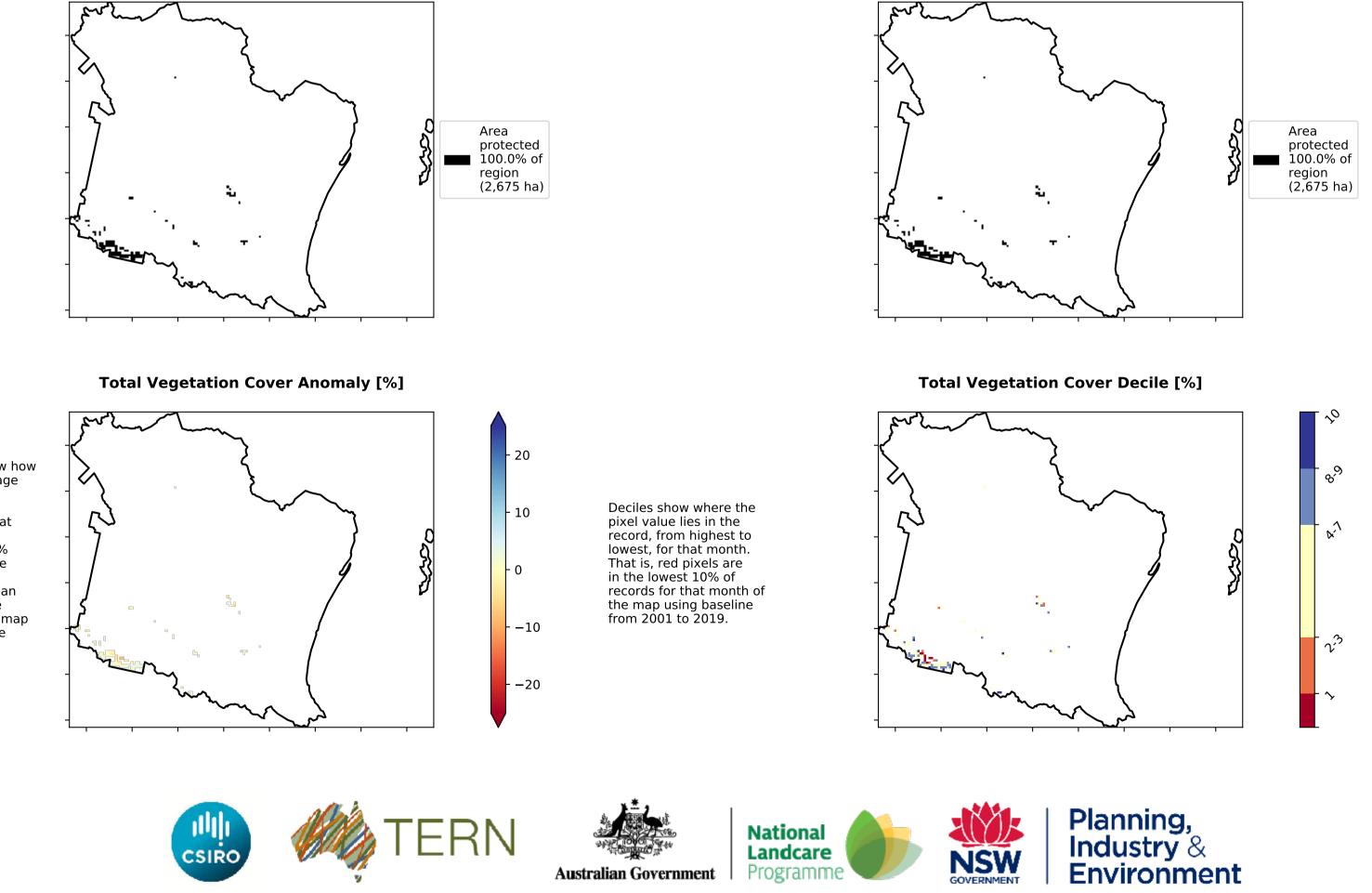
is, red pixels



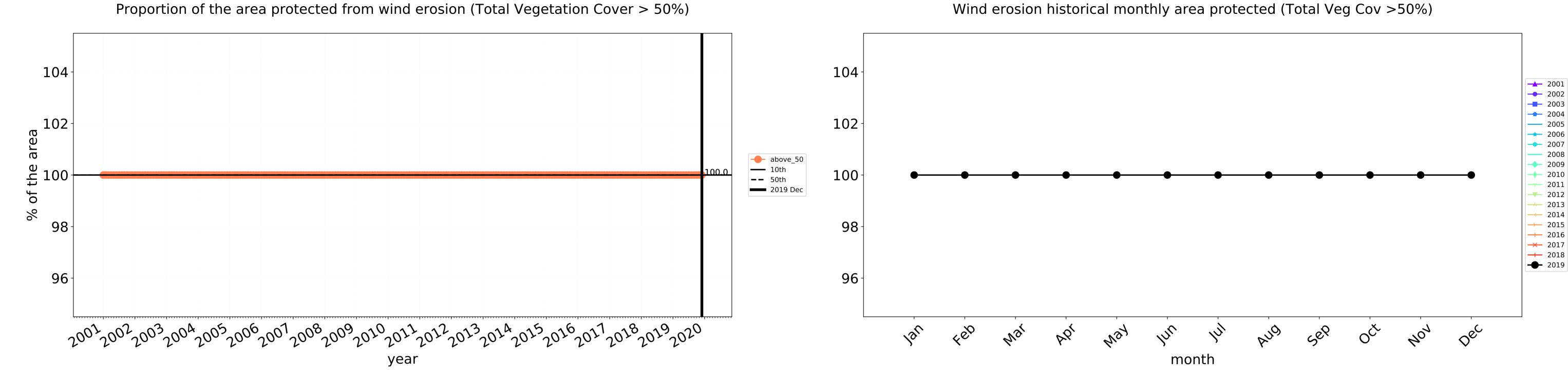
Proportion of vegetation cover class in area



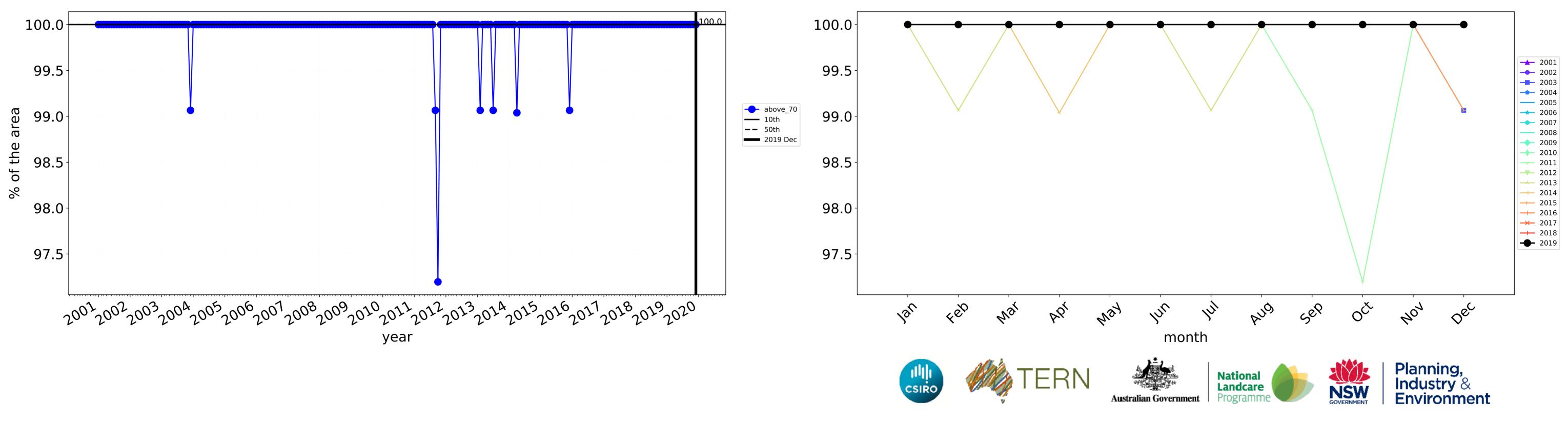
% Area protected from wind erosion (>50%)



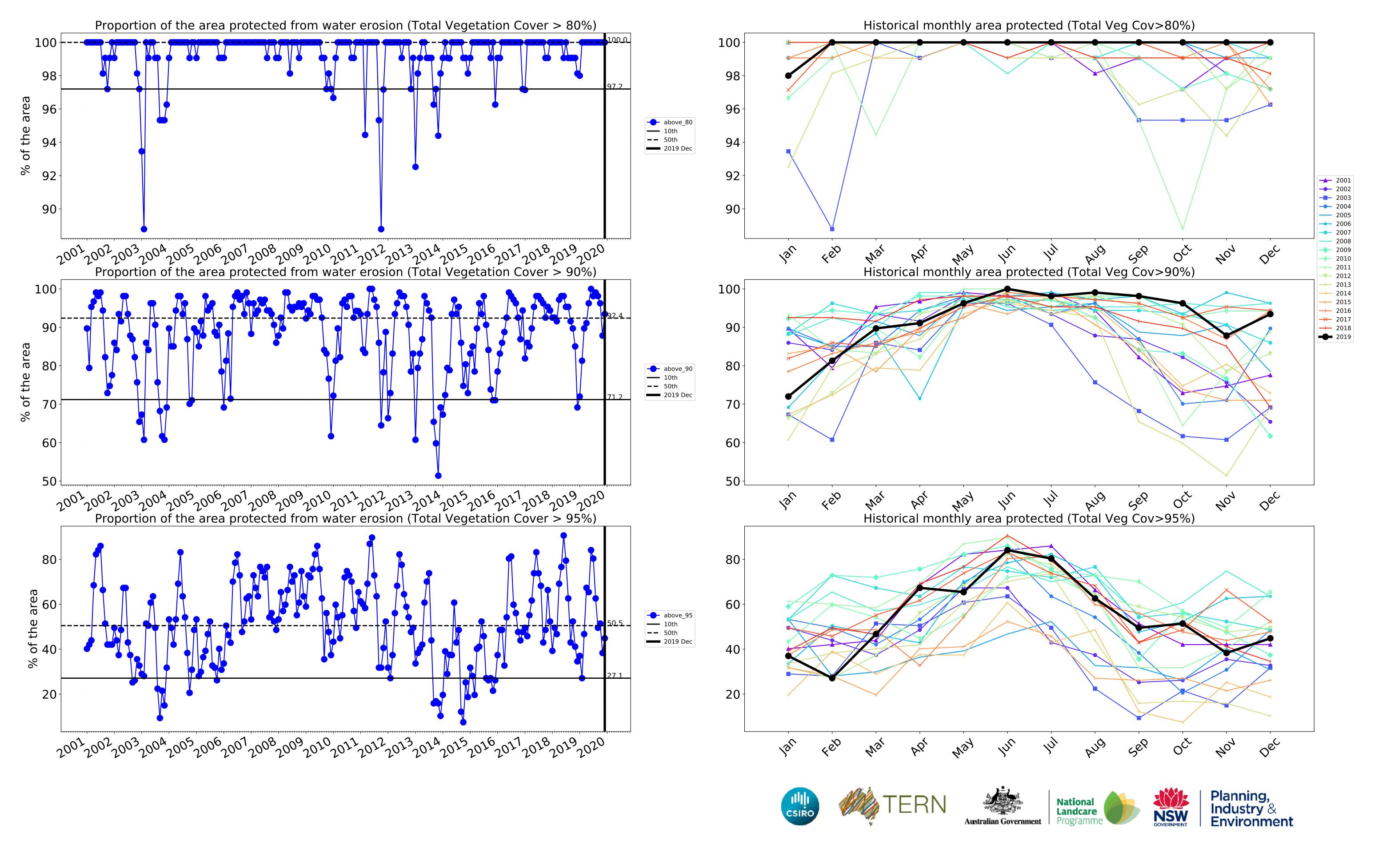
# Grazing Woodland forest timeseries



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



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



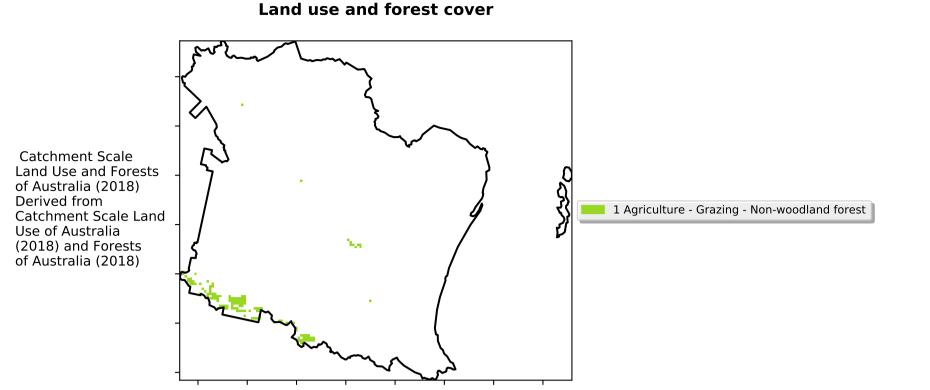
### **Grazing - Forest (non woodland)**

120010000

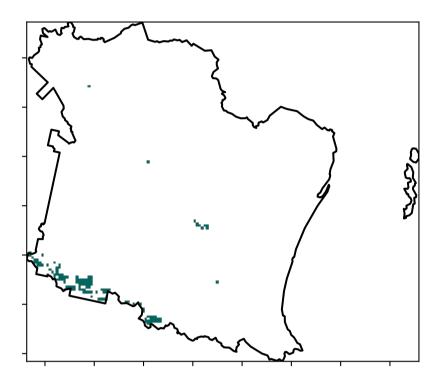
52°10010

3201050010

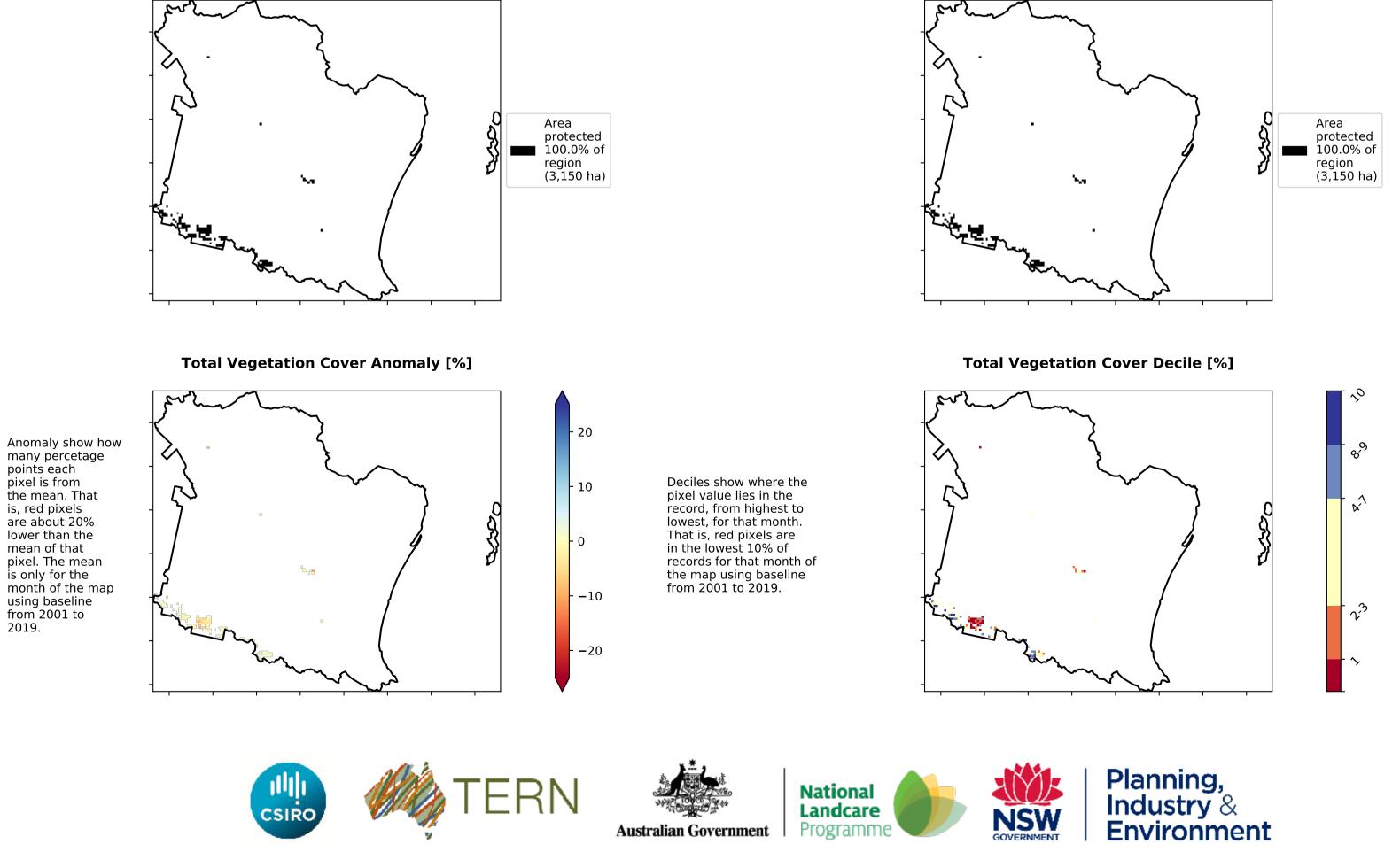
0.30%



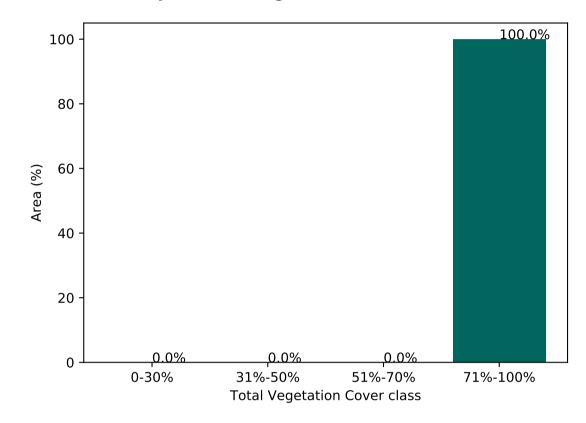
**Total Vegetation Cover [%]** 



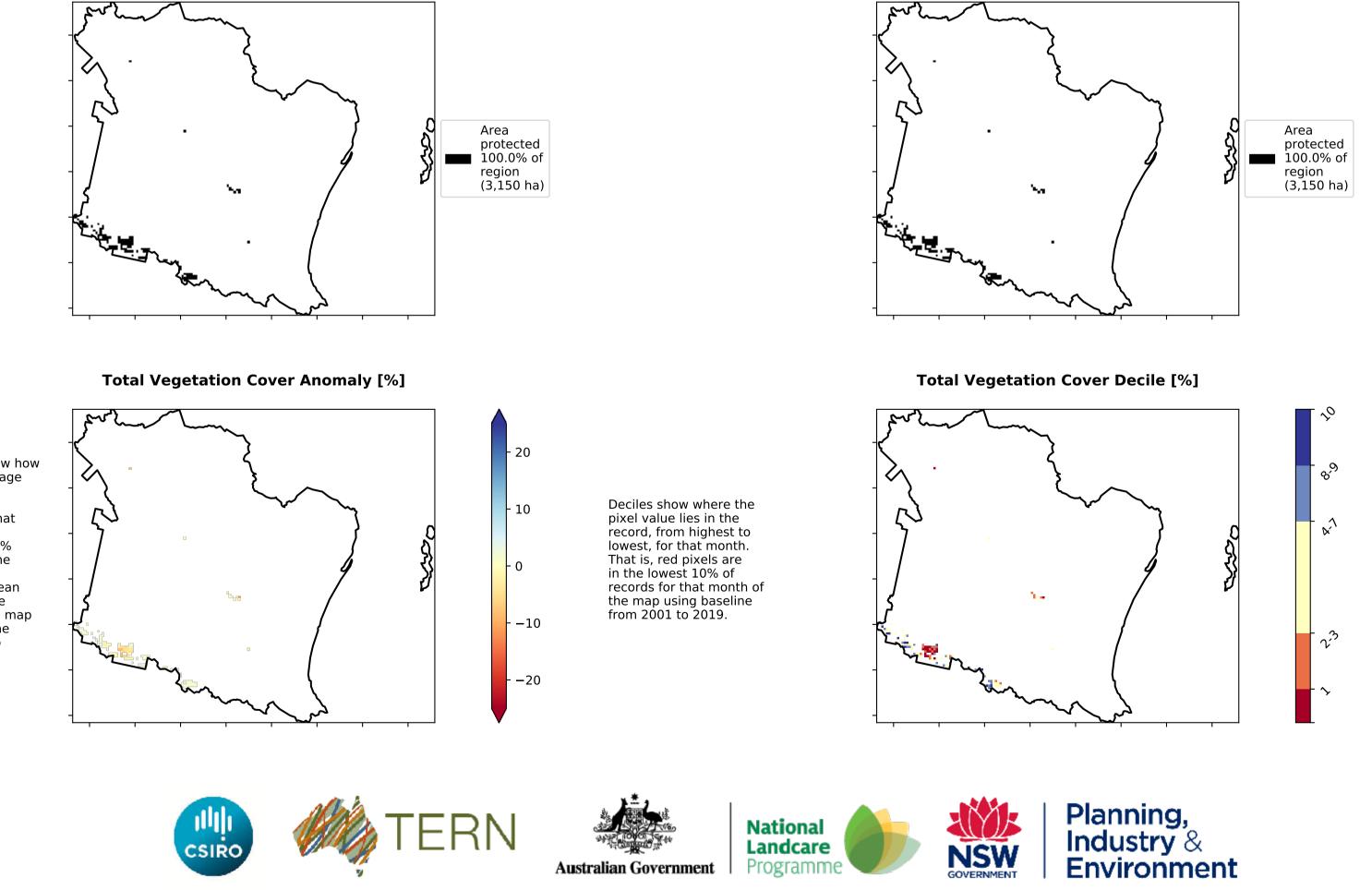
% Area protected from water erosion (>70%)

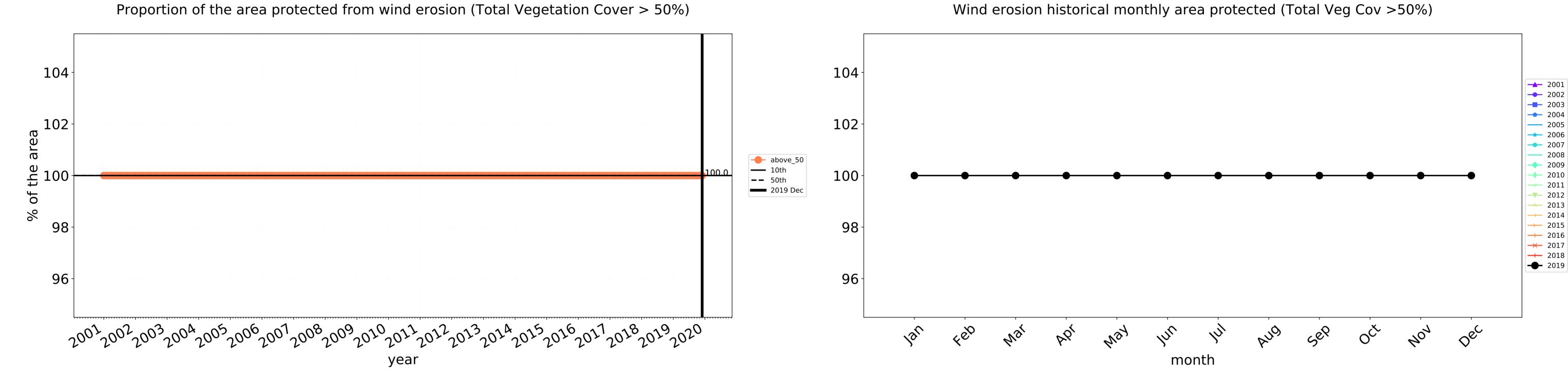


Proportion of vegetation cover class in area

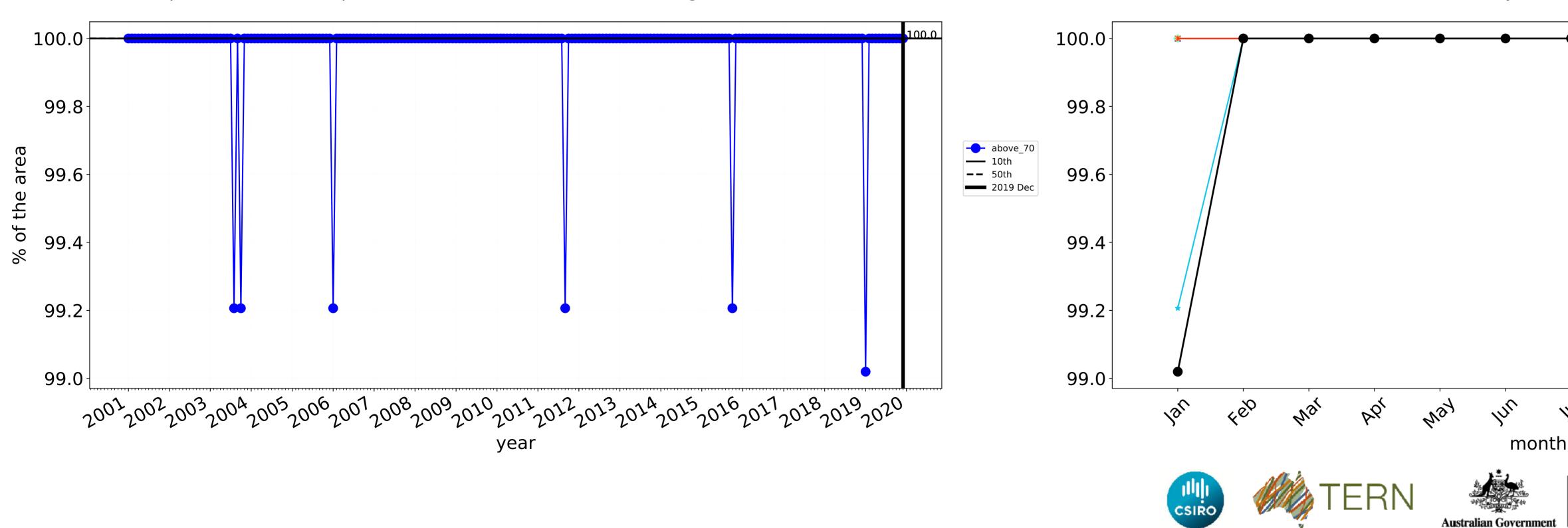


% Area protected from wind erosion (>50%)



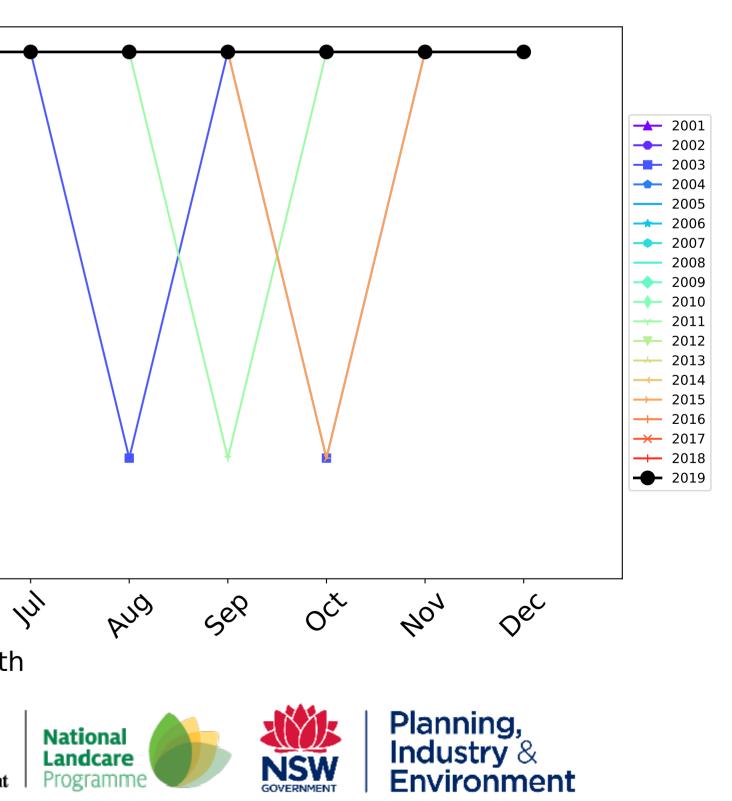


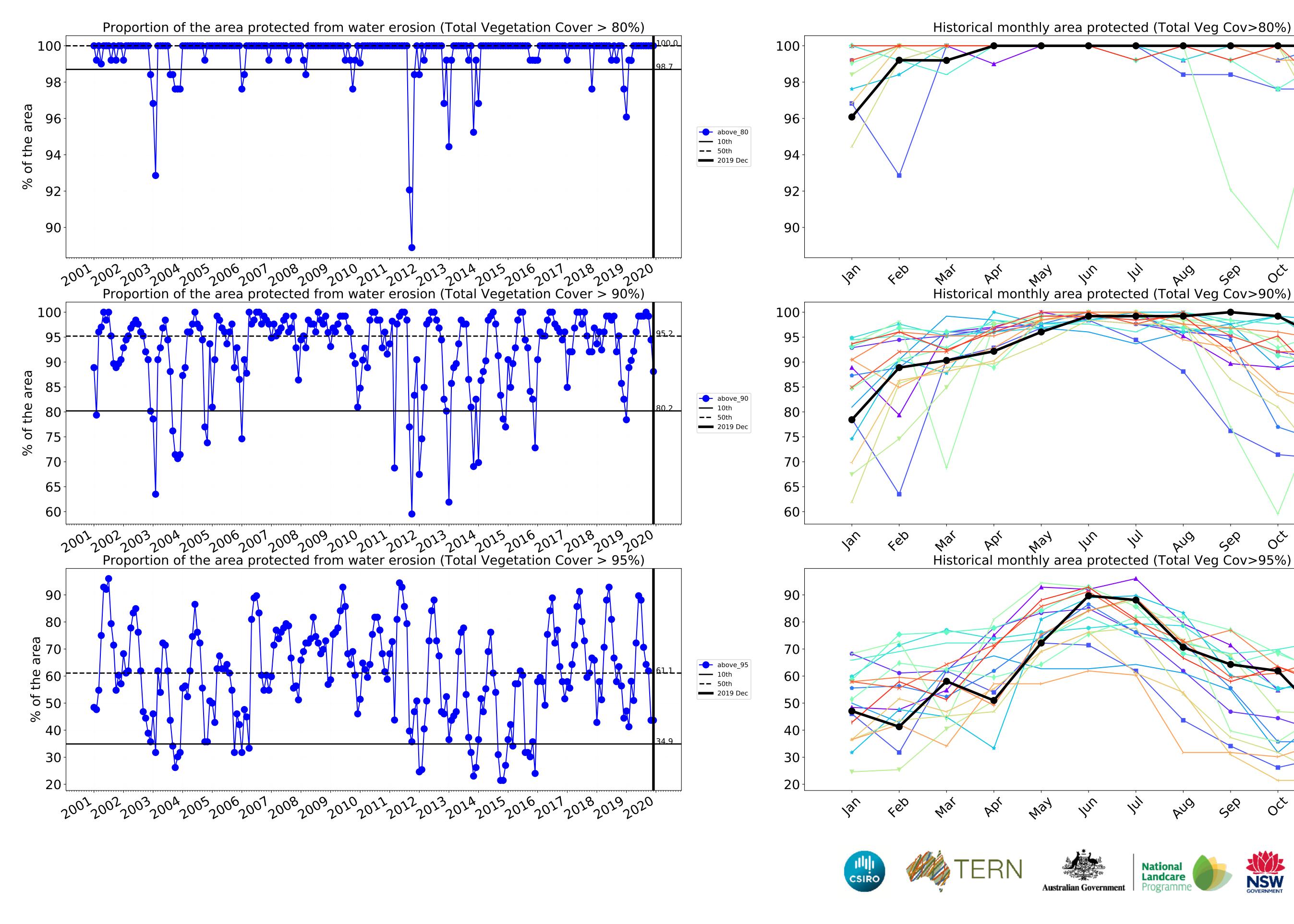
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

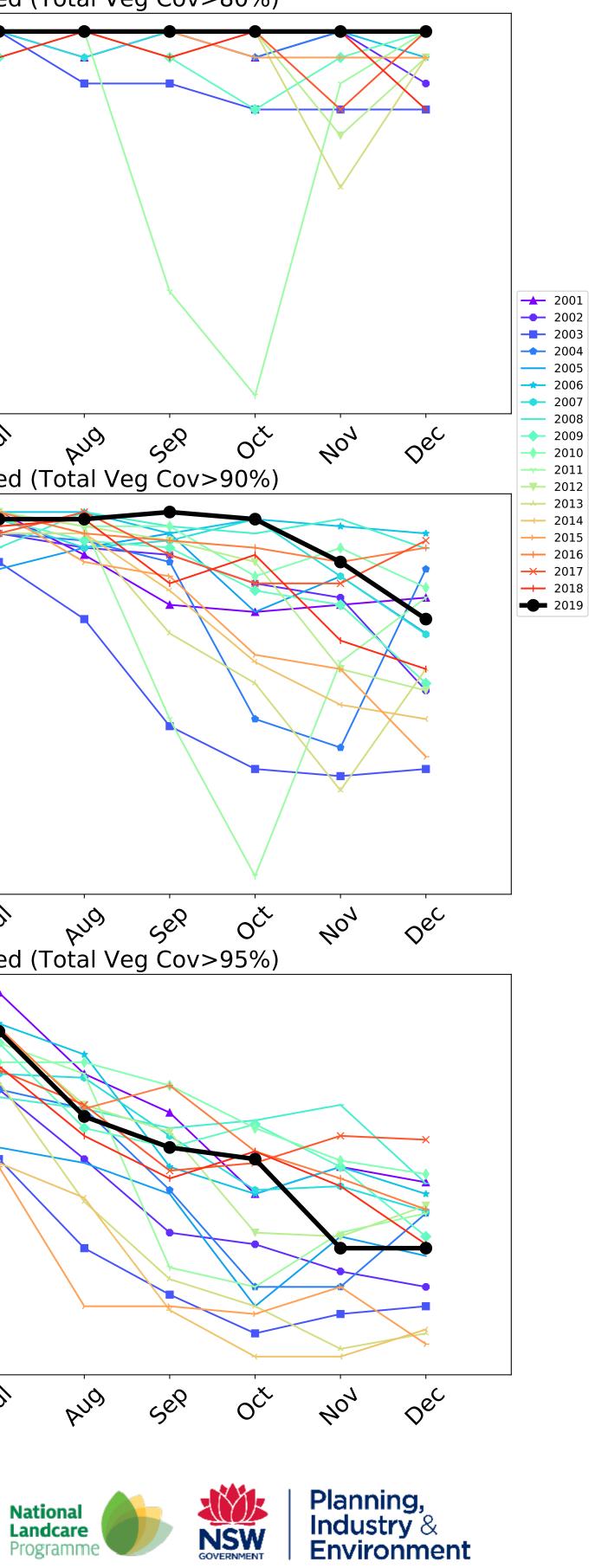


# Grazing - Forest (non woodland) timeseries

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







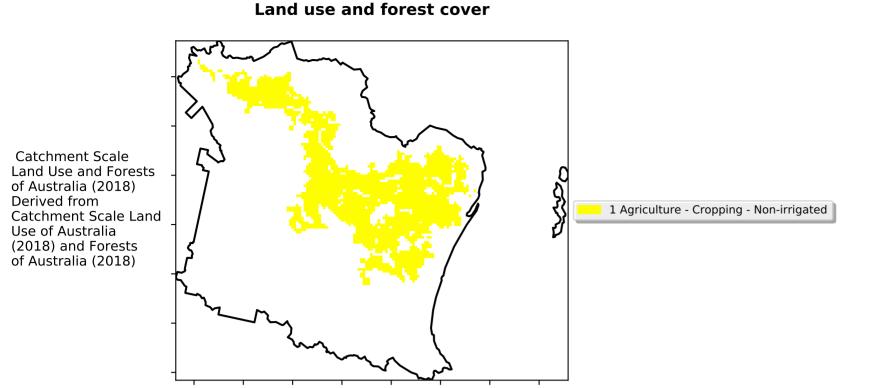
### Cropping

12%200%

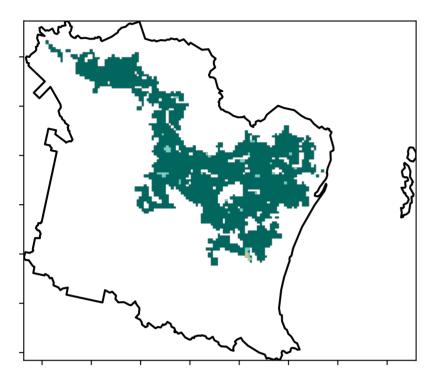
52% TON

32%50%

0.30%



**Total Vegetation Cover [%]** 

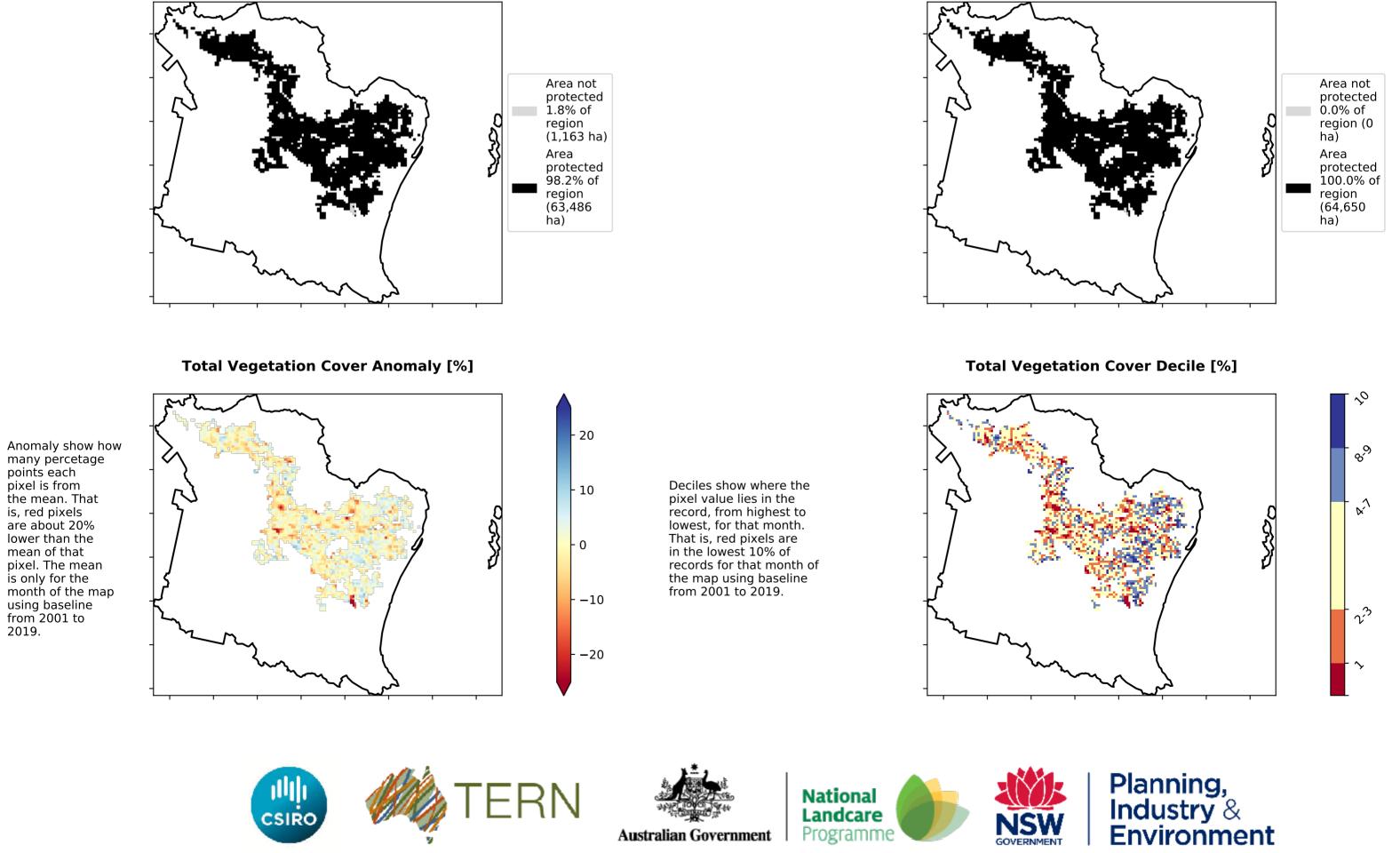


% Area protected from water erosion (>70%)

CSIRO

is, red pixels

mean of that

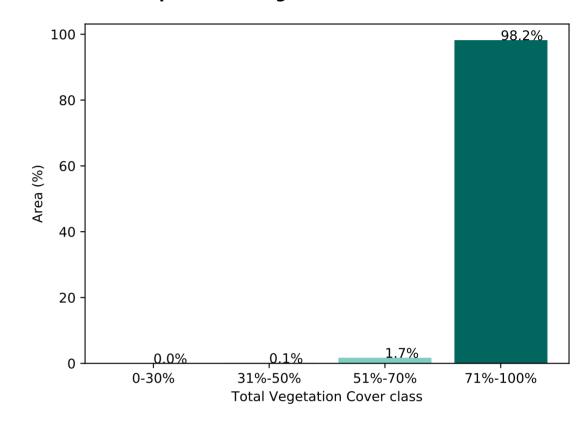


Landcare

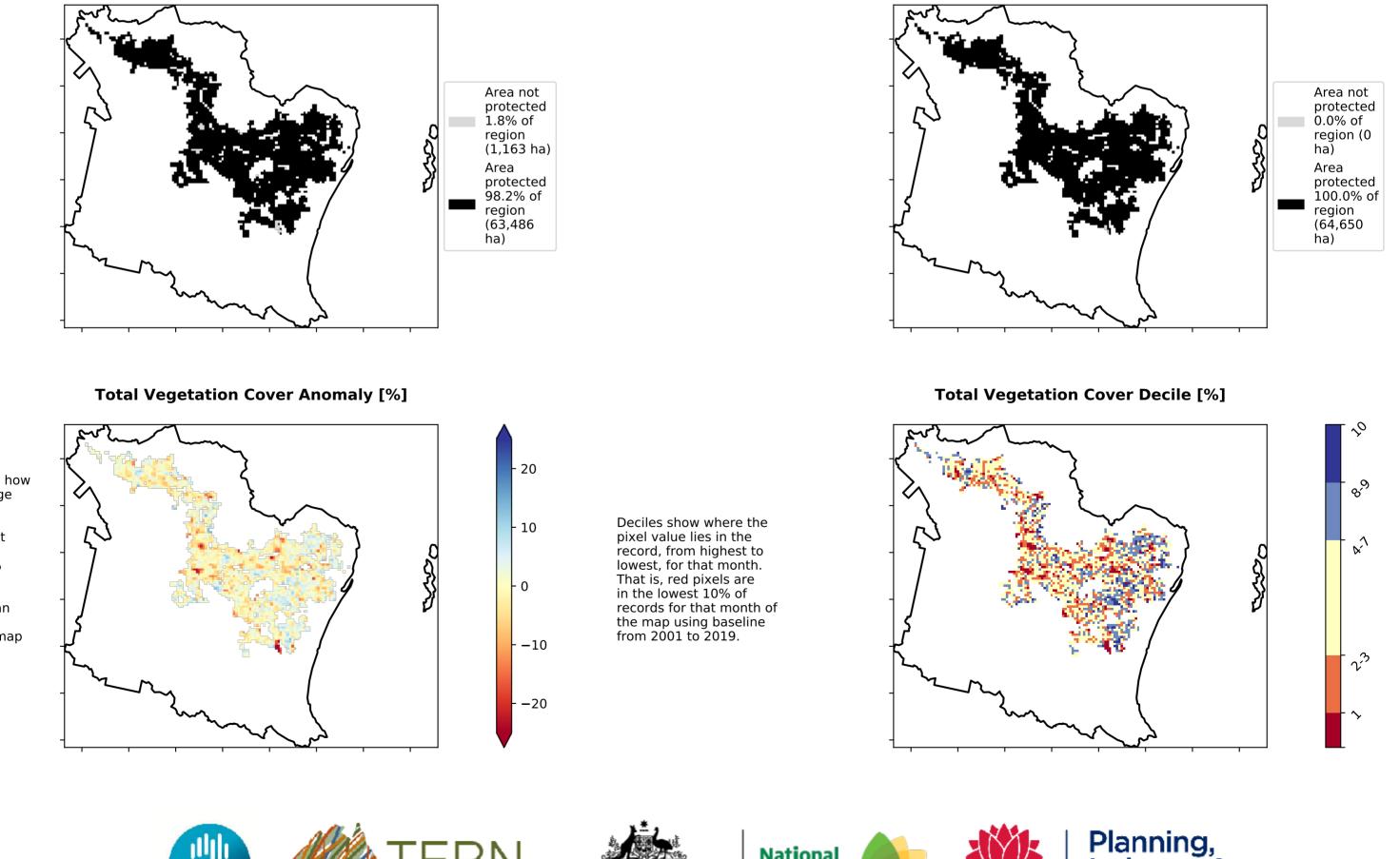
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**NSW** GOVERNMENT

Proportion of vegetation cover class in area

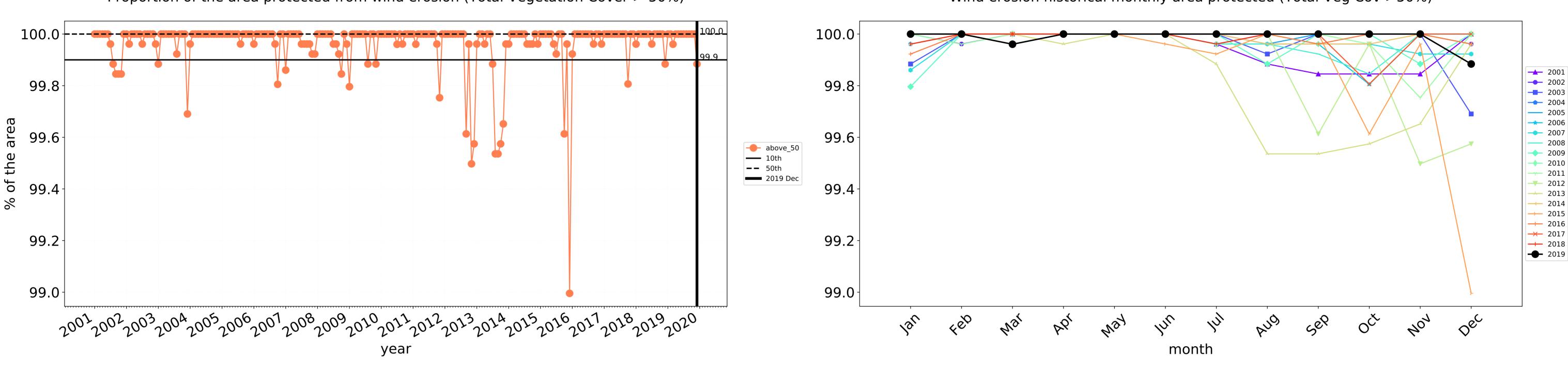


#### % Area protected from wind erosion (>50%)



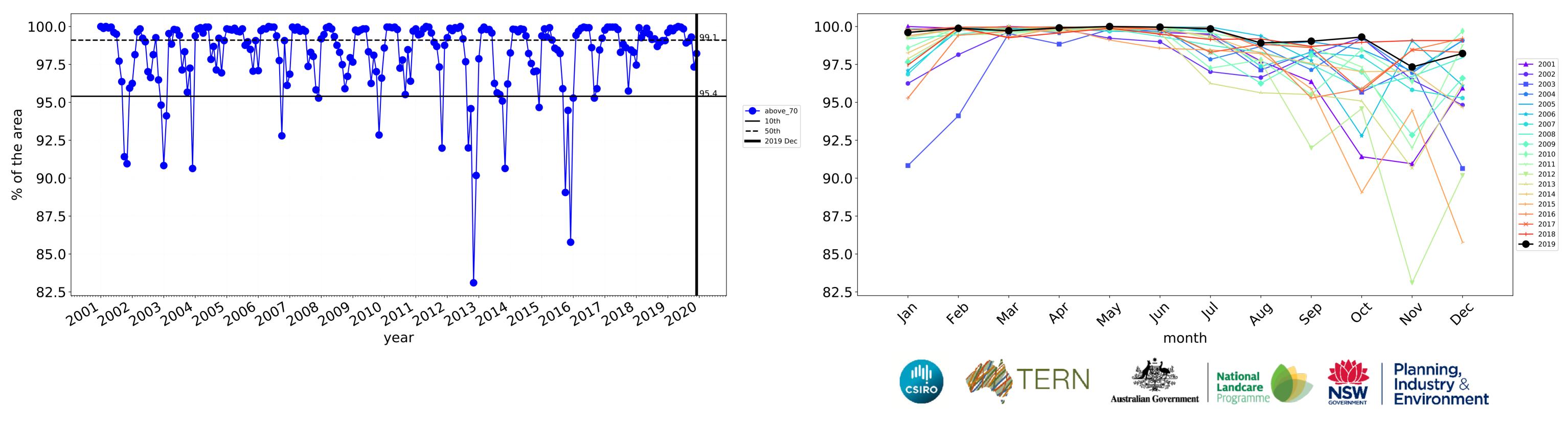
29

Australian Government



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

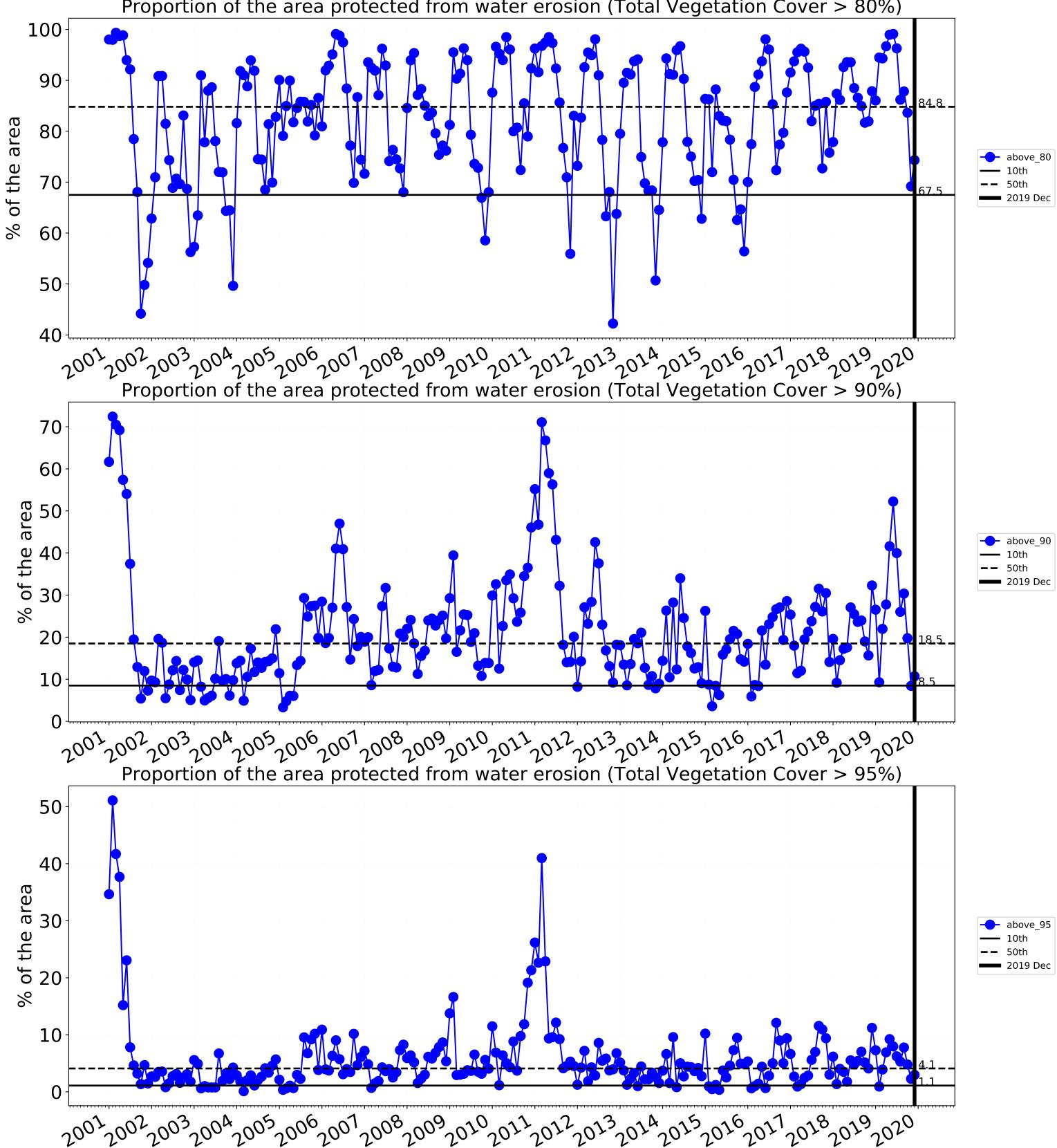
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



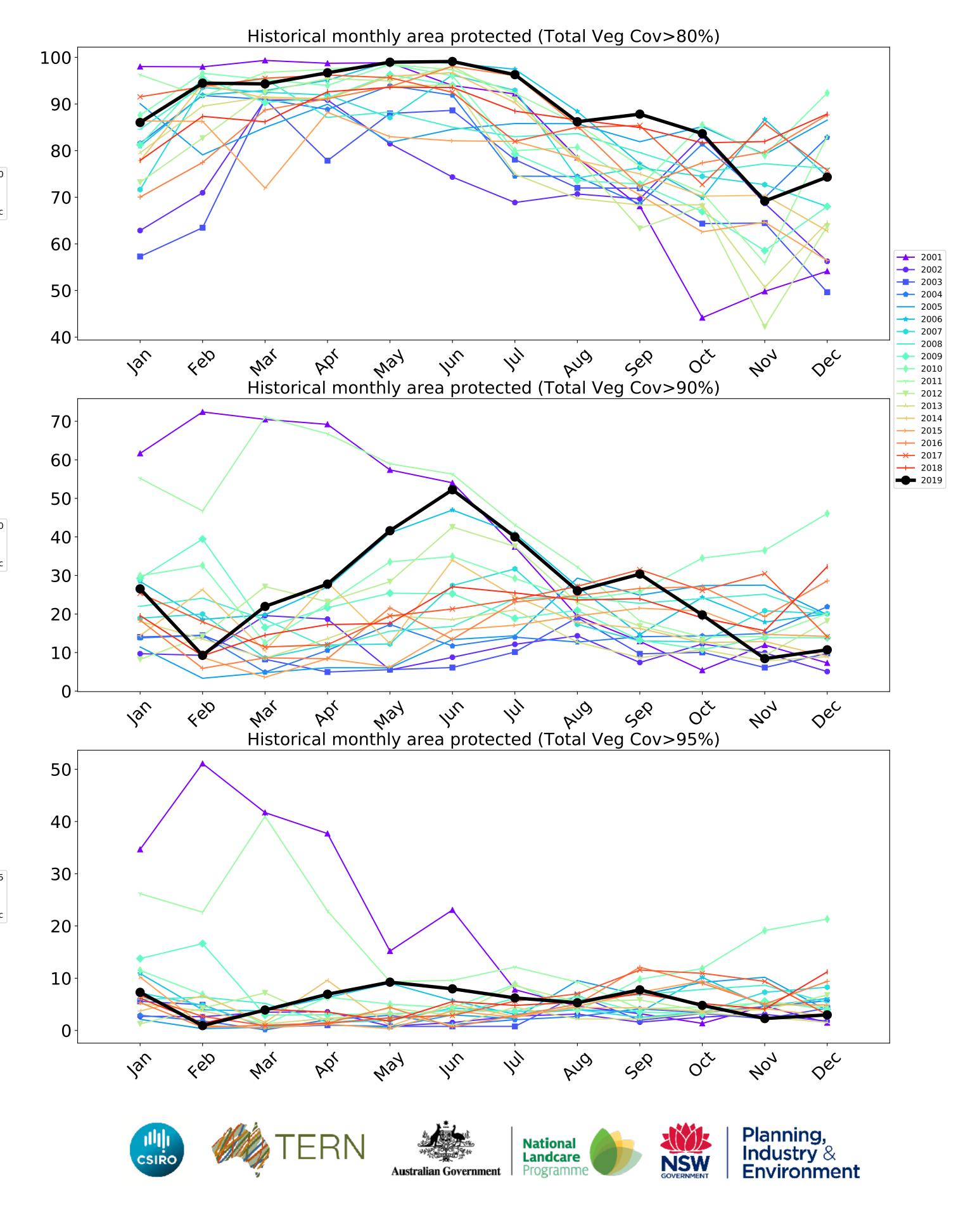
# **Cropping timeseries**

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%)



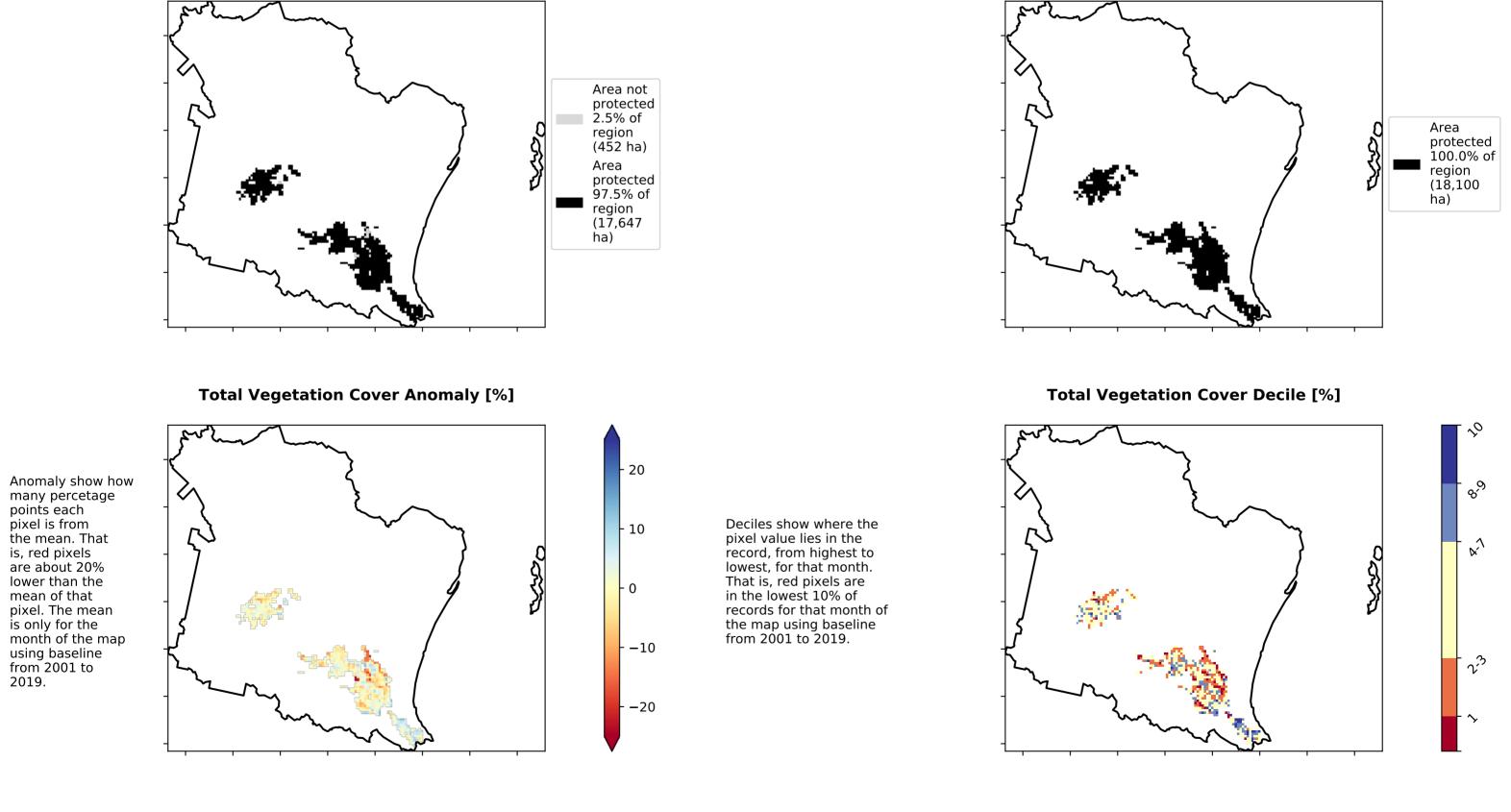
### Irrigation

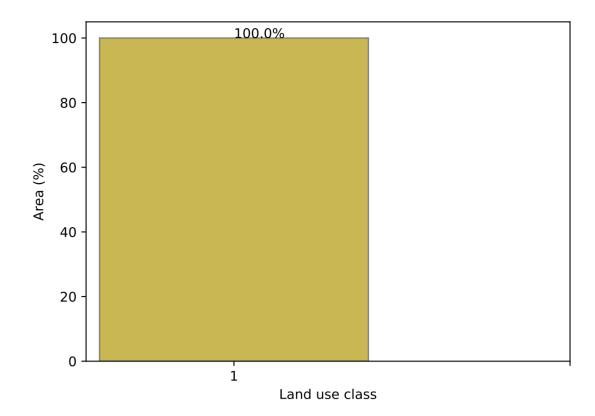
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 2002 1 Agriculture - Cropping - Irrigated **Total Vegetation Cover [%]** 12%200% 2 52% TON 0 32005001 0.30%

% Area protected from water erosion (>70%)

is, red pixels

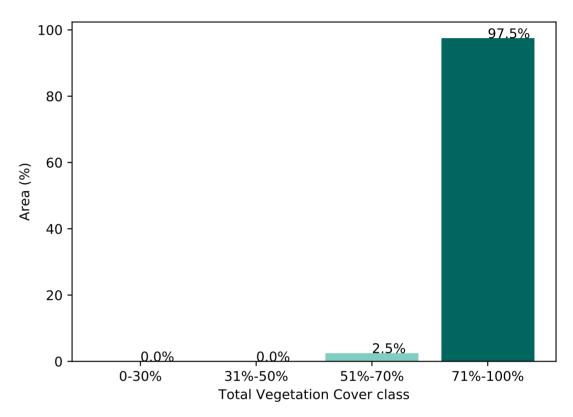
mean of that



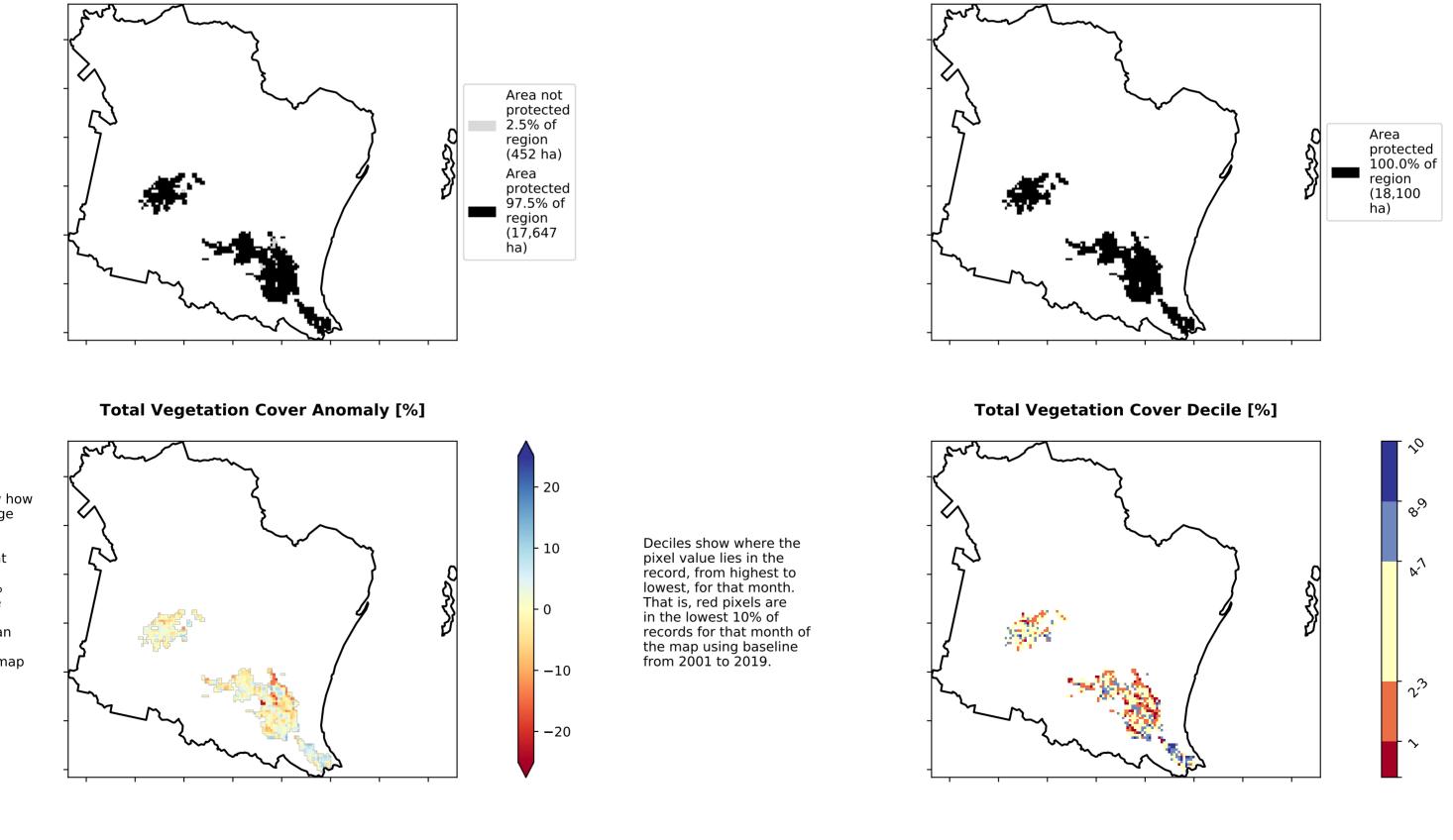


#### Proportion of each land class in area

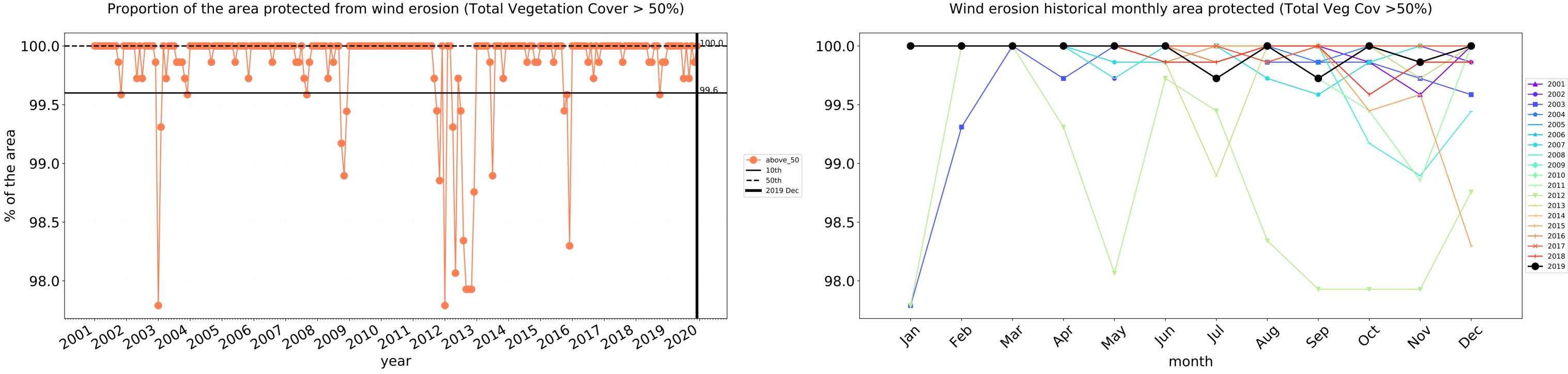
#### Proportion of vegetation cover class in area



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

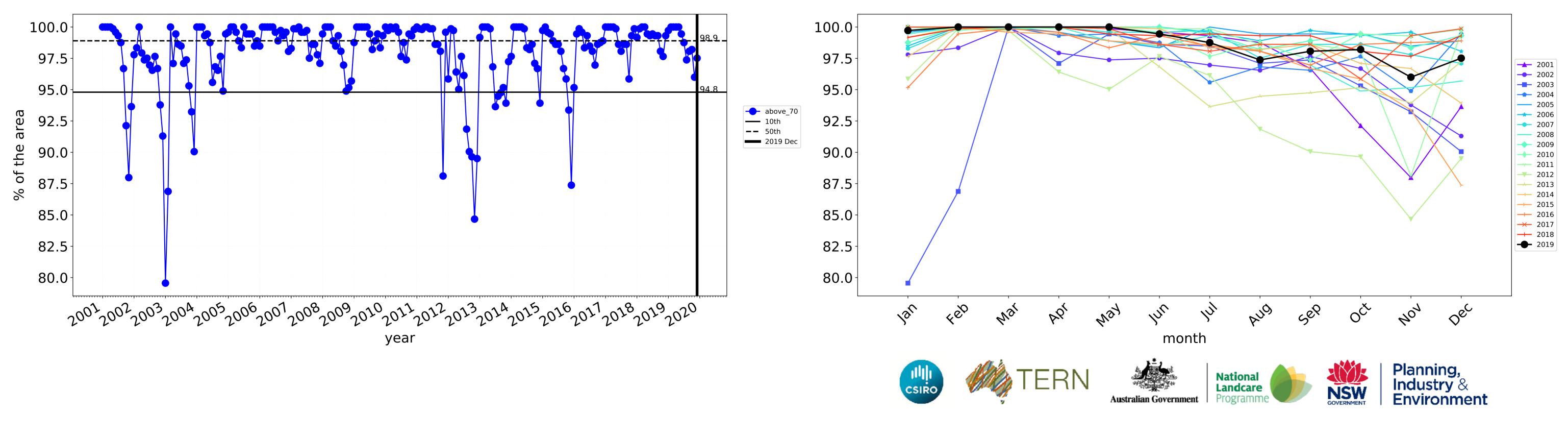






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

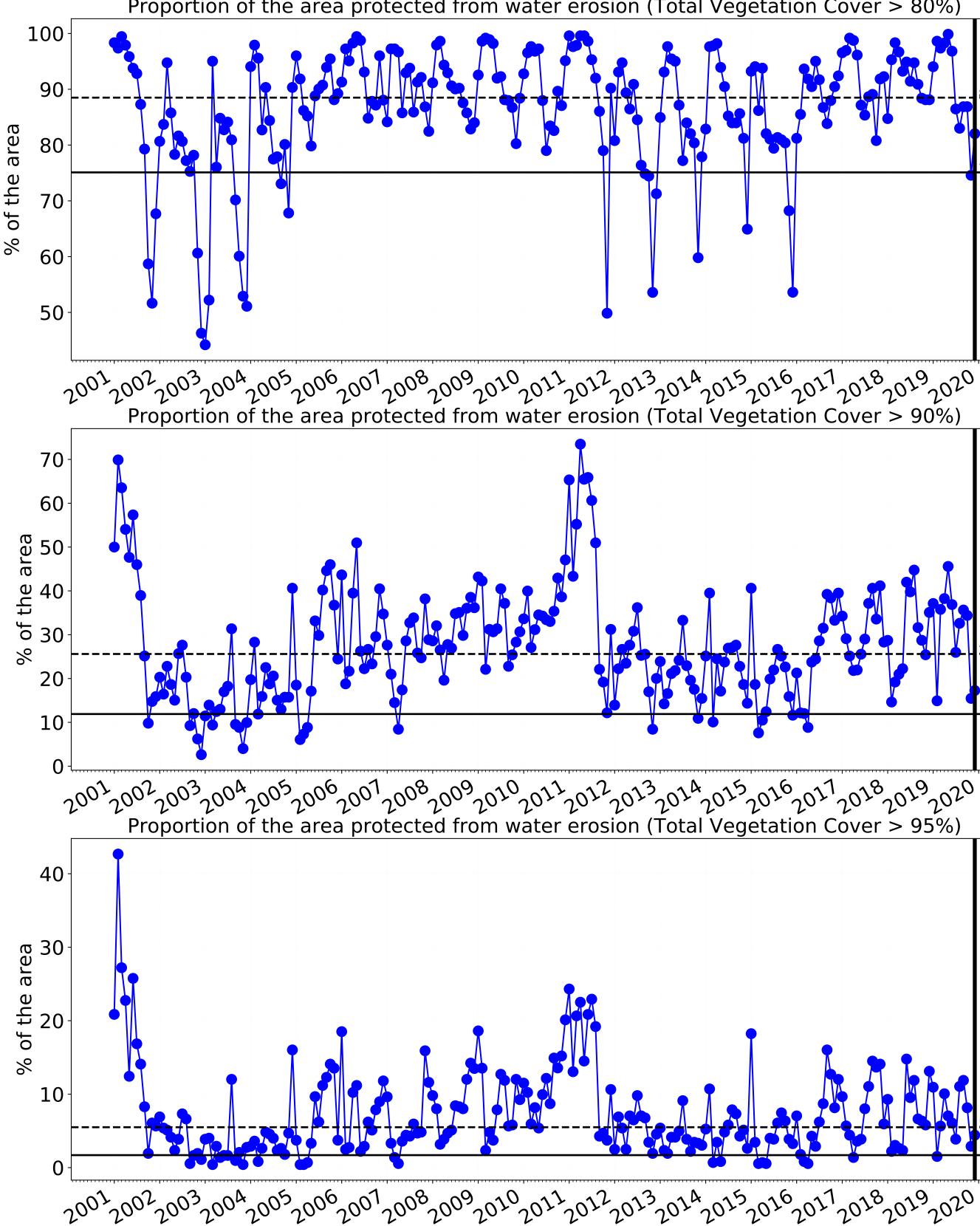
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



# Irrigation timeseries

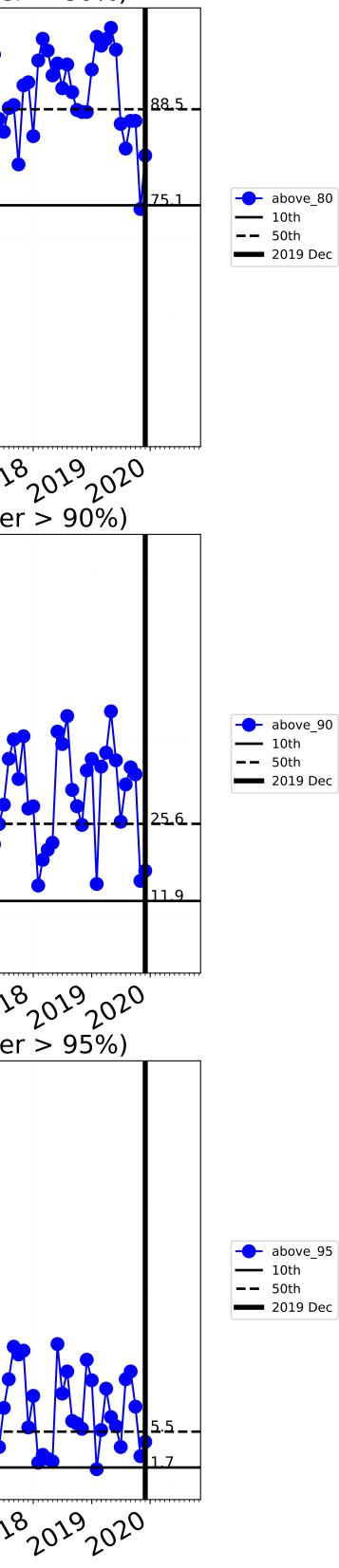


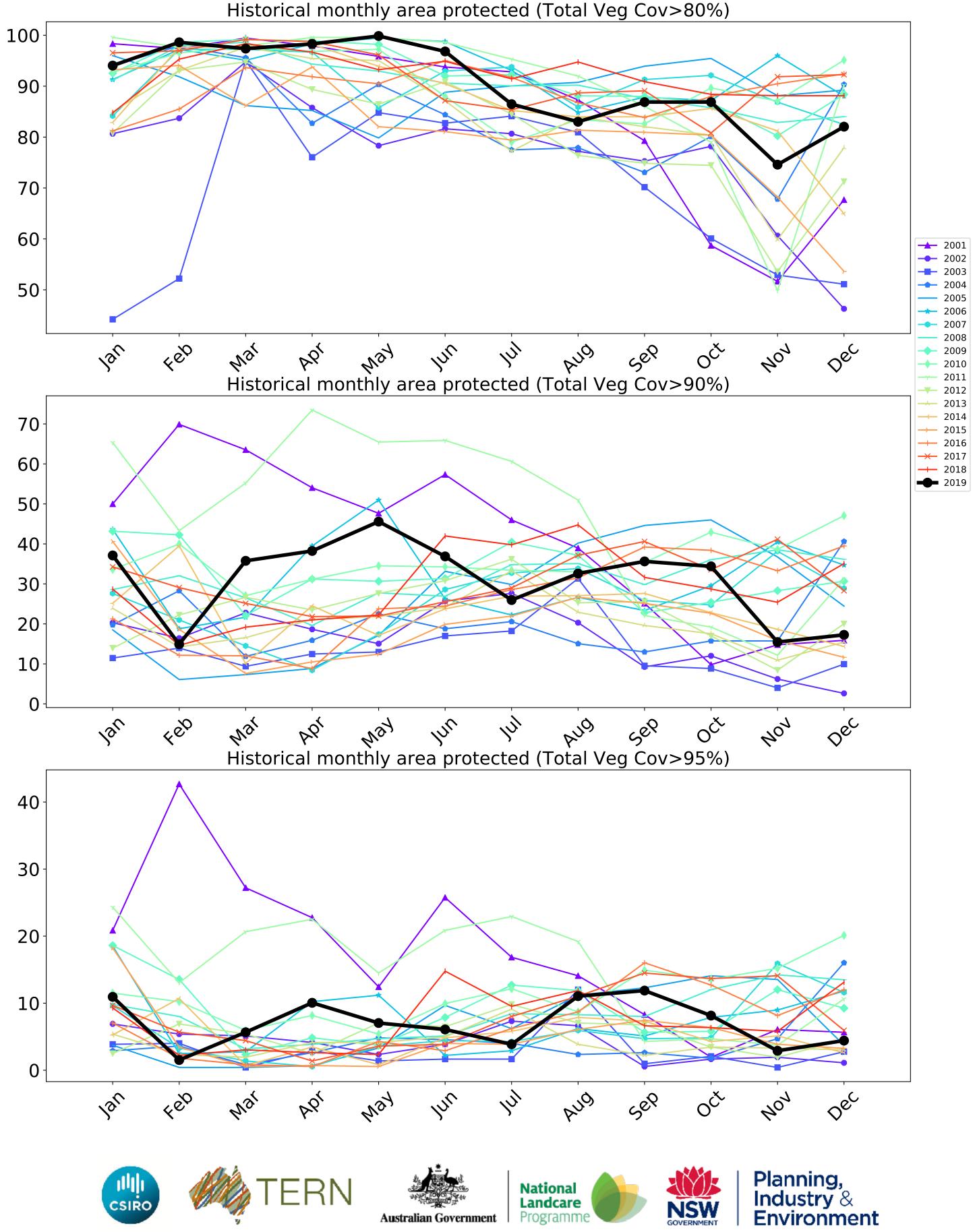
33



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







Australian Government

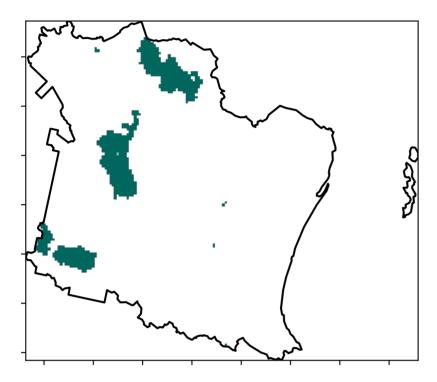
Programm

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

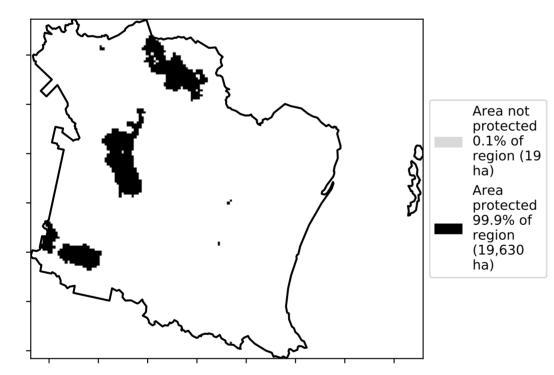
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 

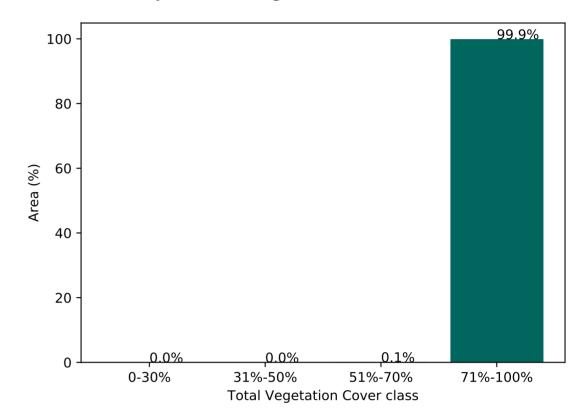
Land use and forest cover



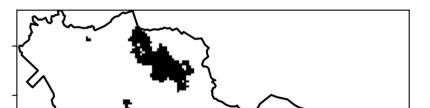
% Area protected from water erosion (>70%)







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



Area

ha)

protected 100.0% of

\$

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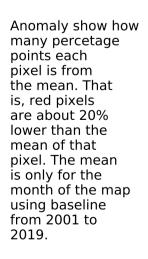
A.1

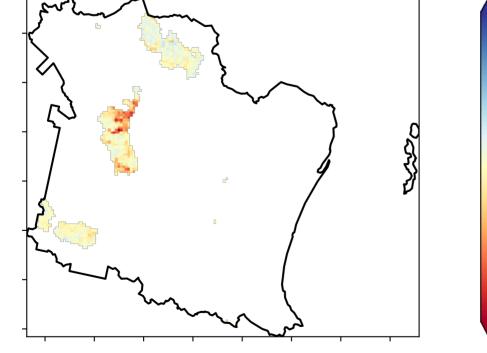
2.3

region (19,650

D

**Total Vegetation Cover Anomaly [%]** 





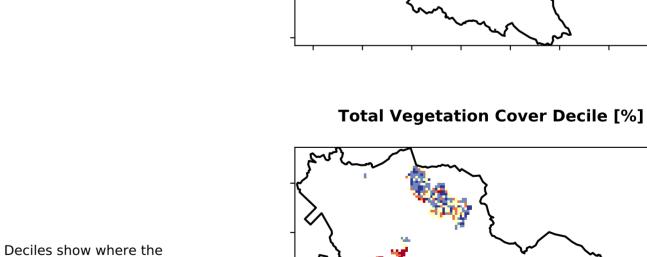


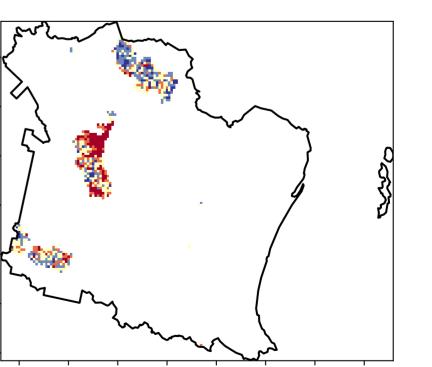
12%-100

52°1070°1

329050

0.30%







pixel value lies in the

record, from highest to

lowest, for that month. That is, red pixels are

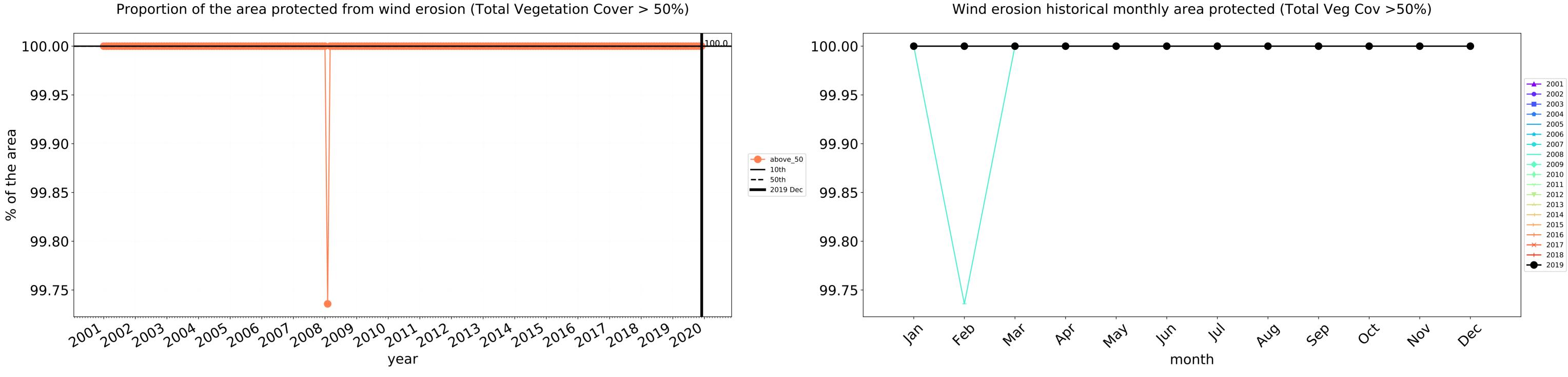
records for that month of

the map using baseline from 2001 to 2019.

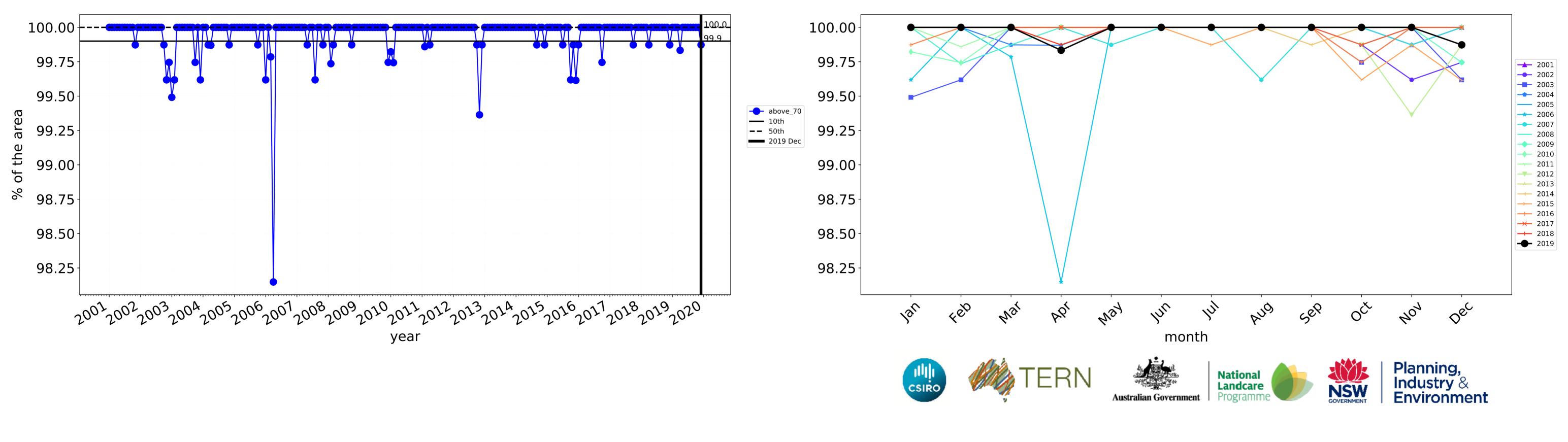
in the lowest 10% of

32

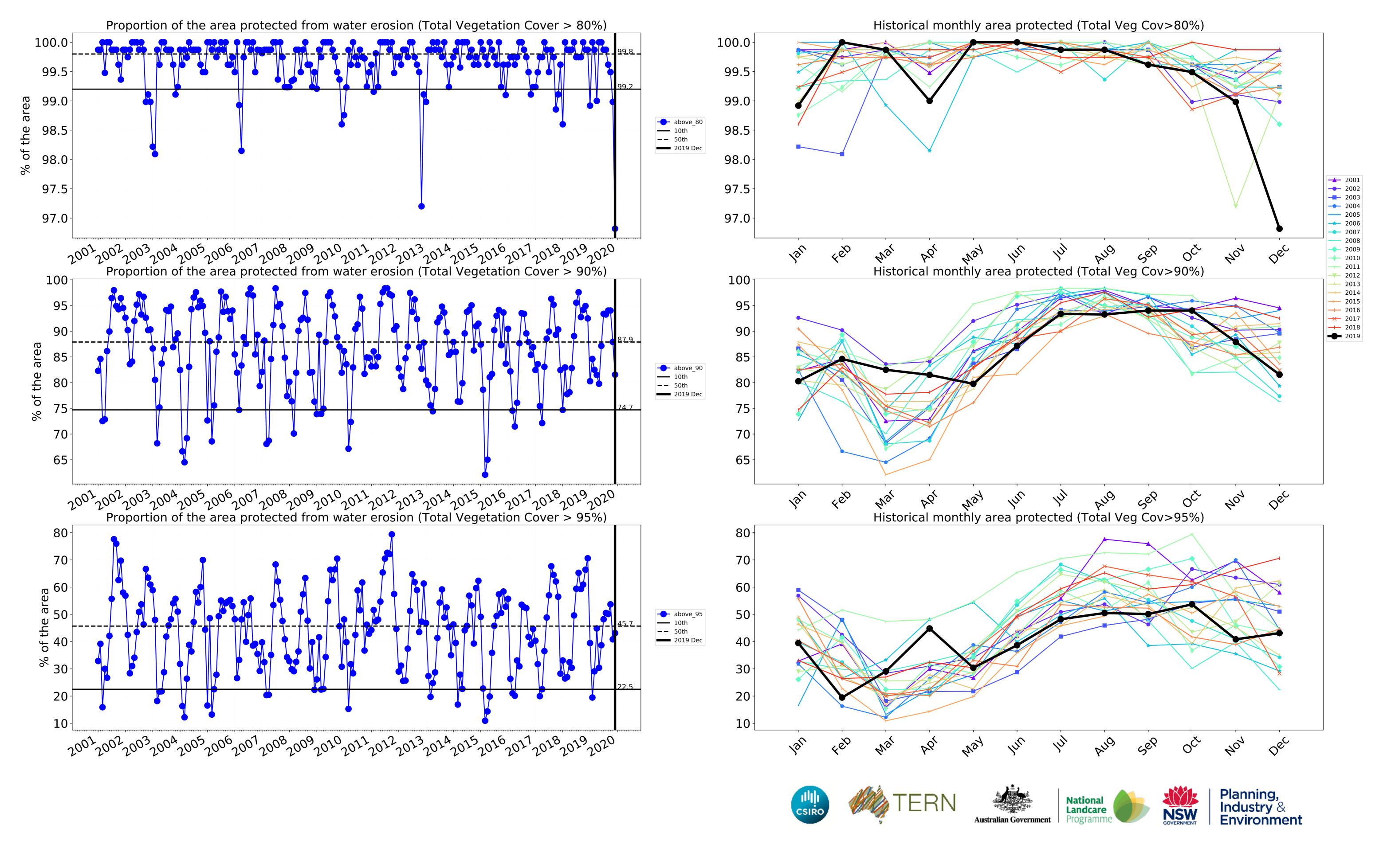
# **Production native forests and plantation forests timeseries**



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







# Hinchinbrook\_(S) (278,825 ha and no data 1,837 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	278,825	100.0% 278,750	99.8% 278,375	98.6% 274,925	89.1% 248,450	54.9% 153,125	24.2% 67,400
Conservation and natural environments	130,975	99.9% 130,900	99.8% 130,775	99.5% 130,275	98.1% 128,425	82.5% 108,025	37.4% 49,000
Conservation and natural environments Woodland forest	46,525	100.0% 46,525	100.0% 46,525	99.7% 46,400	98.5% 45,850	82.6% 38,450	54.3% 25,275
Conservation and natural environments Forest (non woodland)	82,575	99.9% 82,525	99.8% 82,450	99.5% 82,150	98.3% 81,150	83.3% 68,750	28.4% 23,475
Agriculture	104,700	100.0% 104,700	99.9% 104,625	98.2% 102,825	79.8% 83,550	21.8% 22,825	7.5% 7,850
Grazing	21,925	100.0% 21,925	100.0% 21,925	98.7% 21,650	94.2% 20,650	58.3% 12,775	23.4% 5,125
Grazing non forest	16,100	100.0% 16,100	100.0% 16,100	98.3% 15,825	92.1% 14,825	46.6% 7,500	15.8% 2,550
Grazing Woodland forest	2,675	100.0% 2,675	100.0% 2,675	100.0% 2,675	100.0% 2,675	93.5% 2,500	44.9% 1,200
Grazing - Forest (non woodland)	3,150	100.0% 3,150	100.0% 3,150	100.0% 3,150	100.0% 3,150	88.1% 2,775	43.7% 1,375
Cropping	64,650	100.0% 64,650	99.9% 64,575	98.2% 63,500	74.3% 48,050	10.7% 6,925	3.0% 1,925
Irrigation	18,100	100.0% 18,100	100.0% 18,100	97.5% 17,650	82.0% 14,850	17.3% 3,125	4.4% 800
Production native forests and plantation forests	19,650	100.0% 19,650	100.0% 19,650	99.9% 19,625	96.8% 19,025	81.6% 16,025	43.1% 8,475

