# **Total vegetation cover soil protection Region:NRM Glenelg Hopkins VIC**

# Date: August 2013

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

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

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

• 71-100% High cover – protected from wind and usually water erosion (high rainfall, steep slopes, and erodible soils may need greater than 80, 90, 95 and up to 100% cover)

- 51-70% Moderate cover protected from wind erosion
- 31-50% Low cover not protected
- 0-30% Very Low cover not protected

Erosion protection: Wind erosion 50% total vegetation cover

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

- Map: water erosion protection (>70% cover) percentage area and hectares.
- Map: wind erosion protection (>50% cover) percentage area and hectares. Comparison with previous years:
  - Map: anomaly comparing this month to the average cover from the same month in previous years.
  - Map: deciles rank of month against the same month in previous years.

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

### **Erosion protection**

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

### Rainfall

• Millimetres rainfall each month (black line).

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

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

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

# Acknowledgment of data:

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

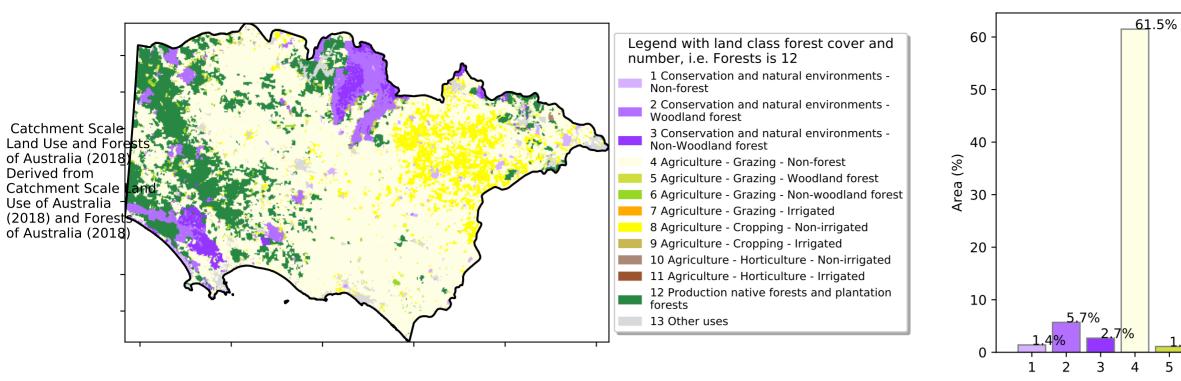
https://doi.org/10.4225/08/5848a3f19a7b3



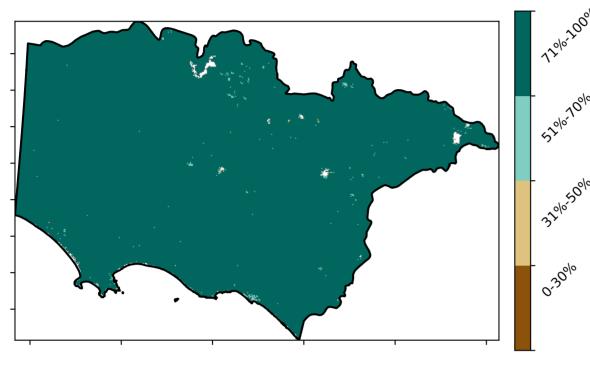
# **Vegetation Cover Aug 2013**

#### Land use and forest cover

#### Proportion of each land class in area

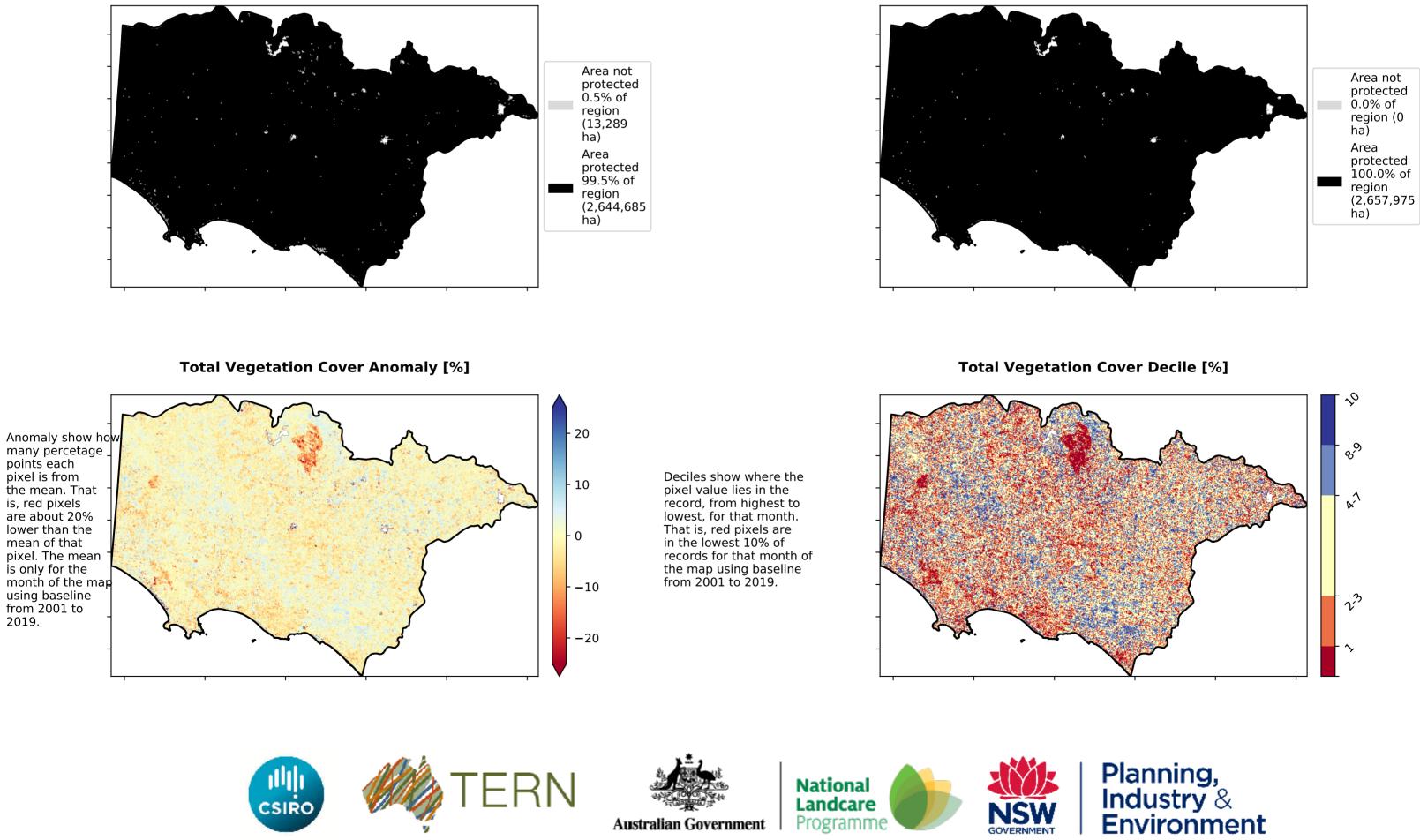


**Total Vegetation Cover [%]** 



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

2019.



Proportion of vegetation cover class in area

Land use class

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6

5

7.9%

8

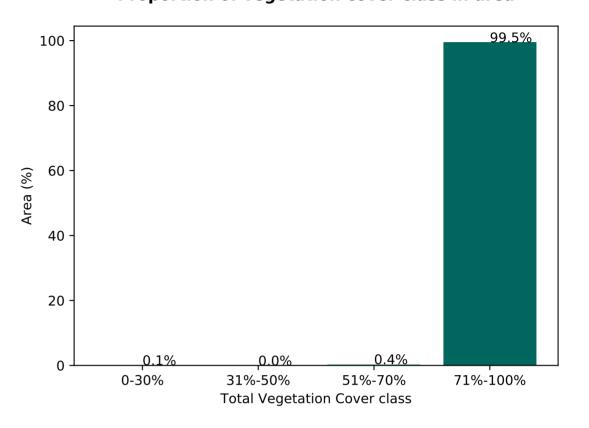
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0.0%0.1%0(

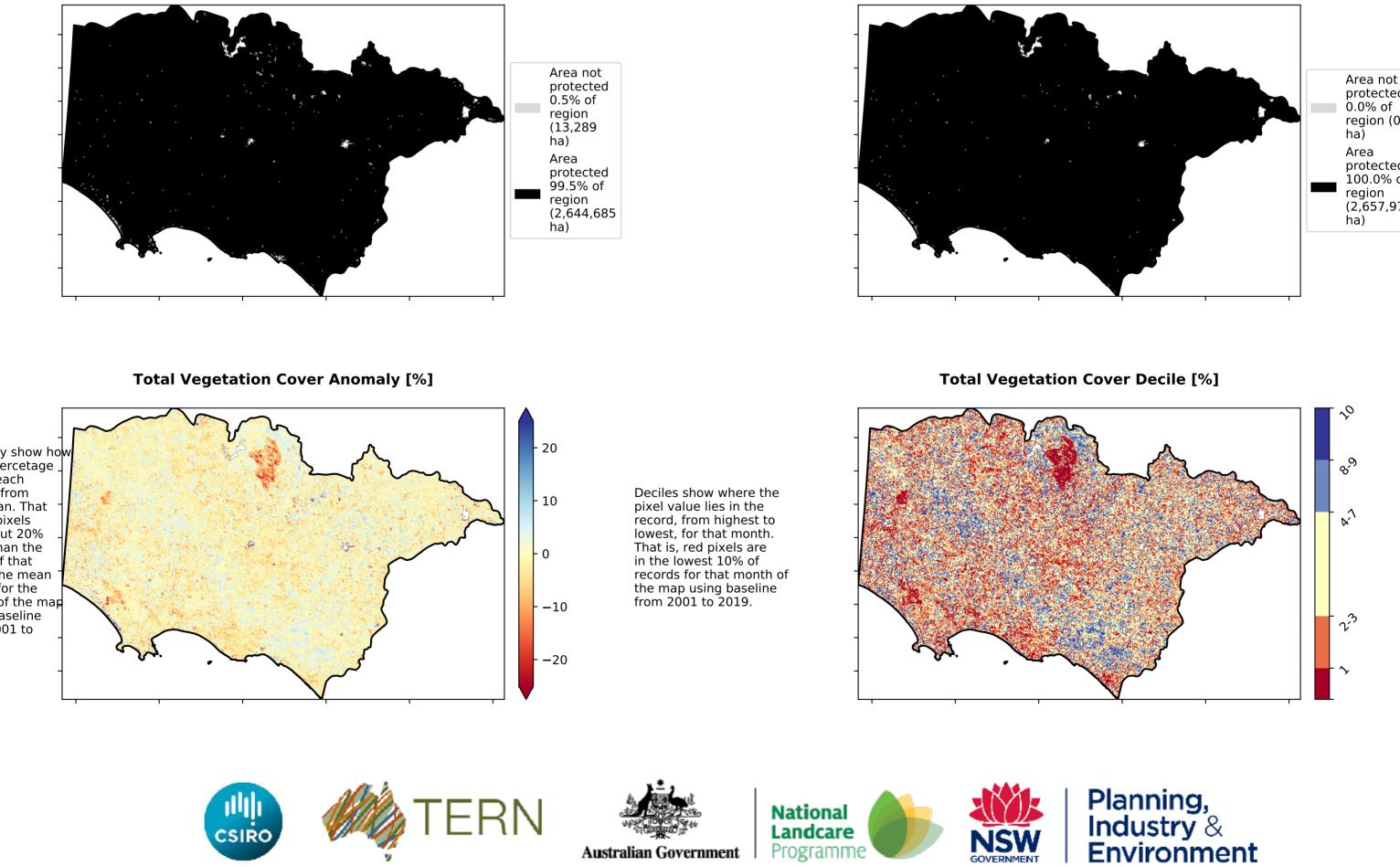
10 11 12 13

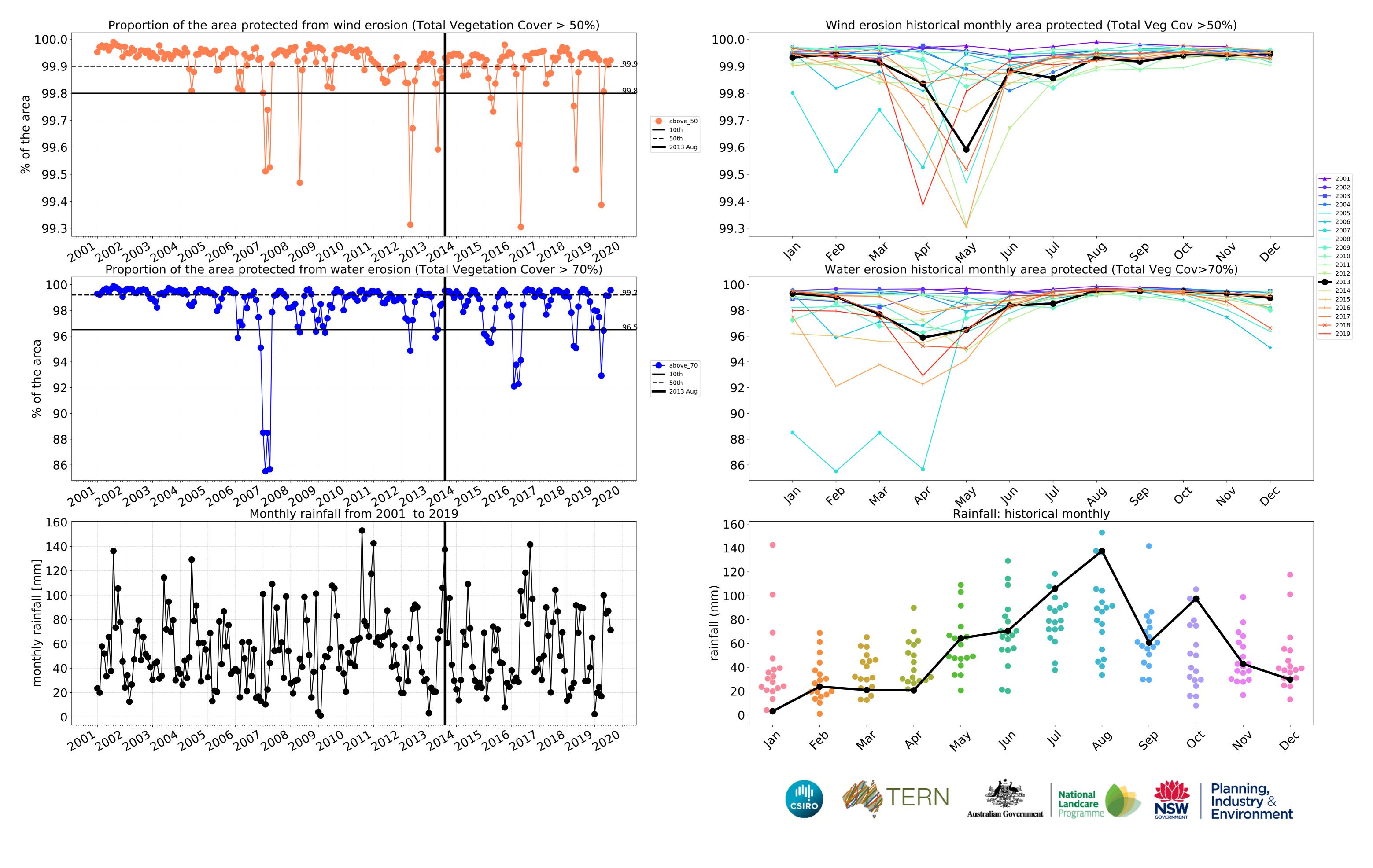
15.9%

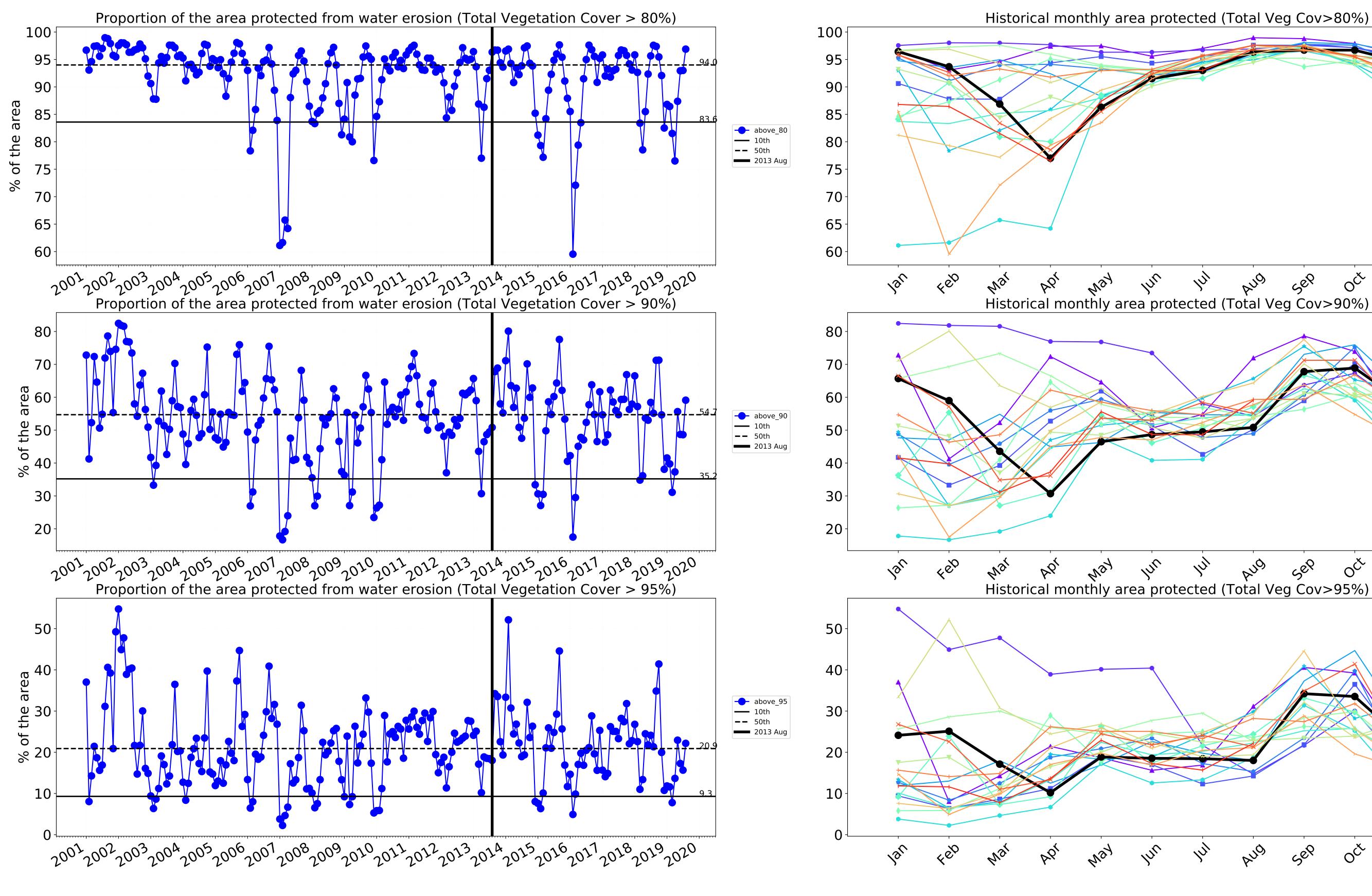
3.0%



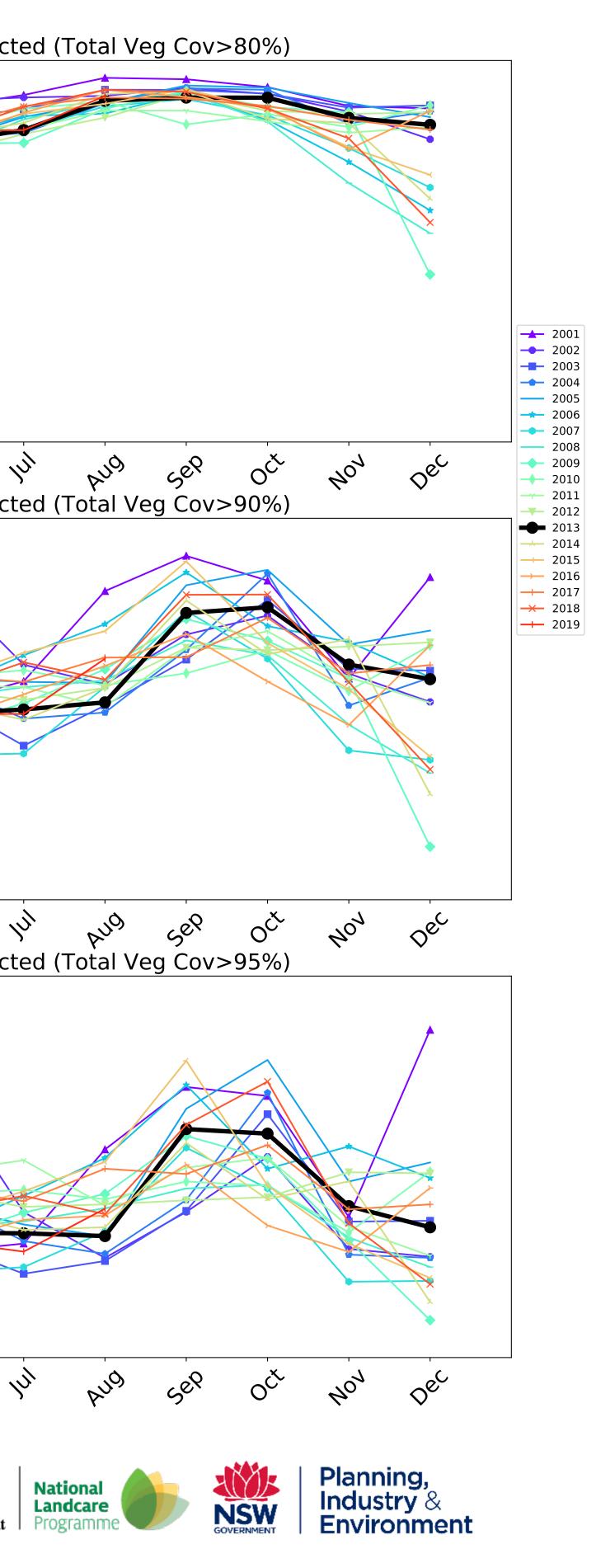
#### % Area protected from wind erosion (>50%)



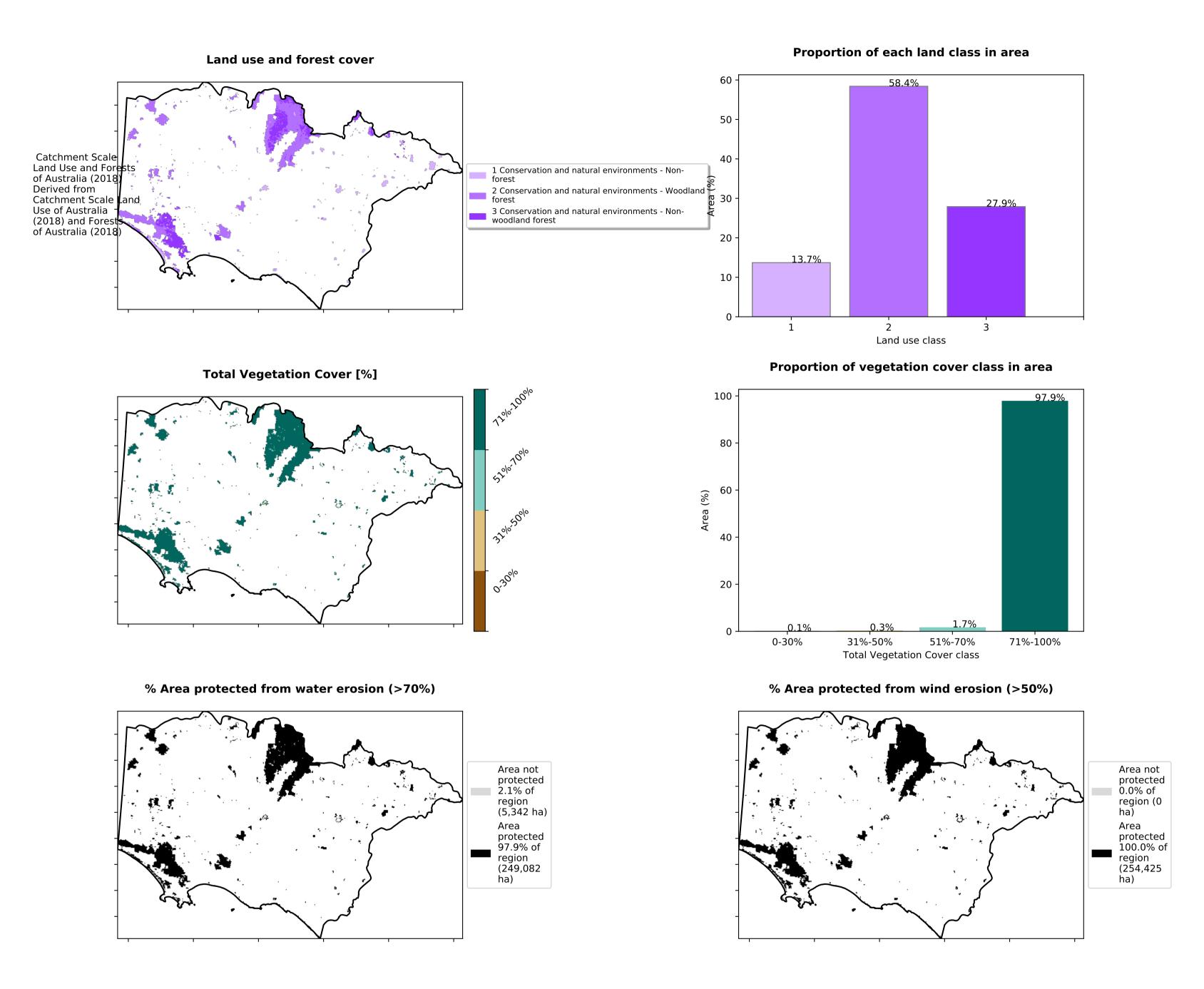




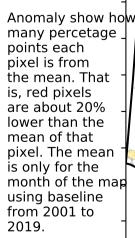


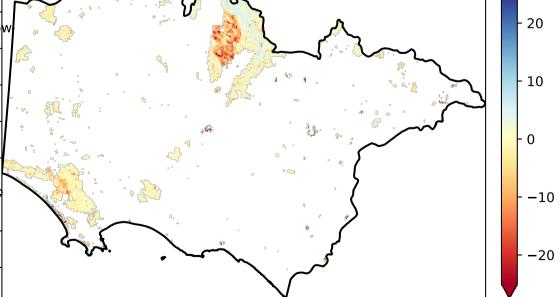


### **Conservation and natural environments**



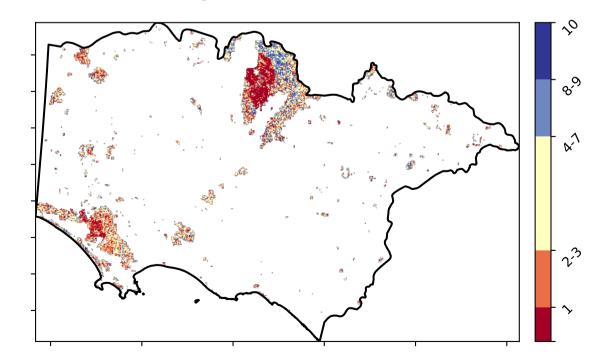
**Total Vegetation Cover Anomaly [%]** 



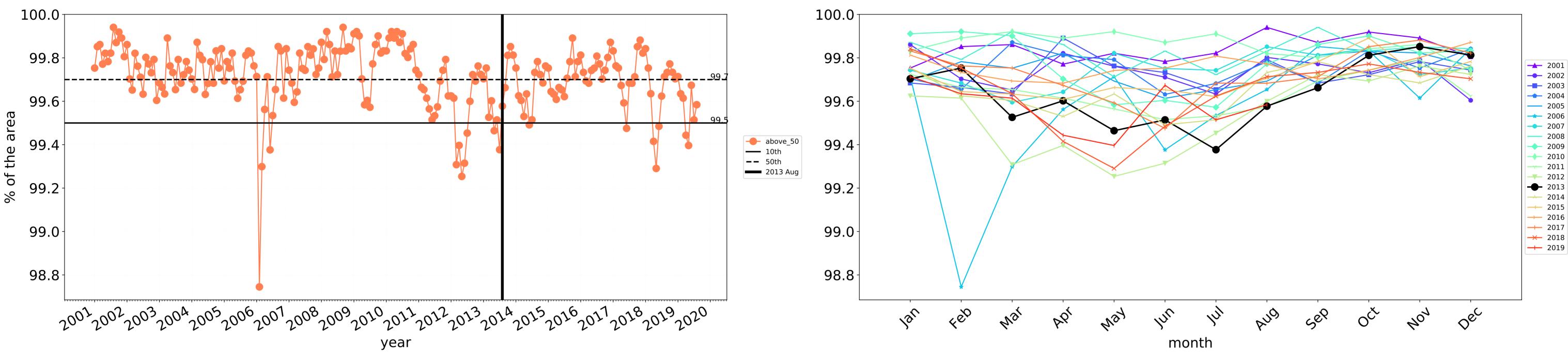


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 



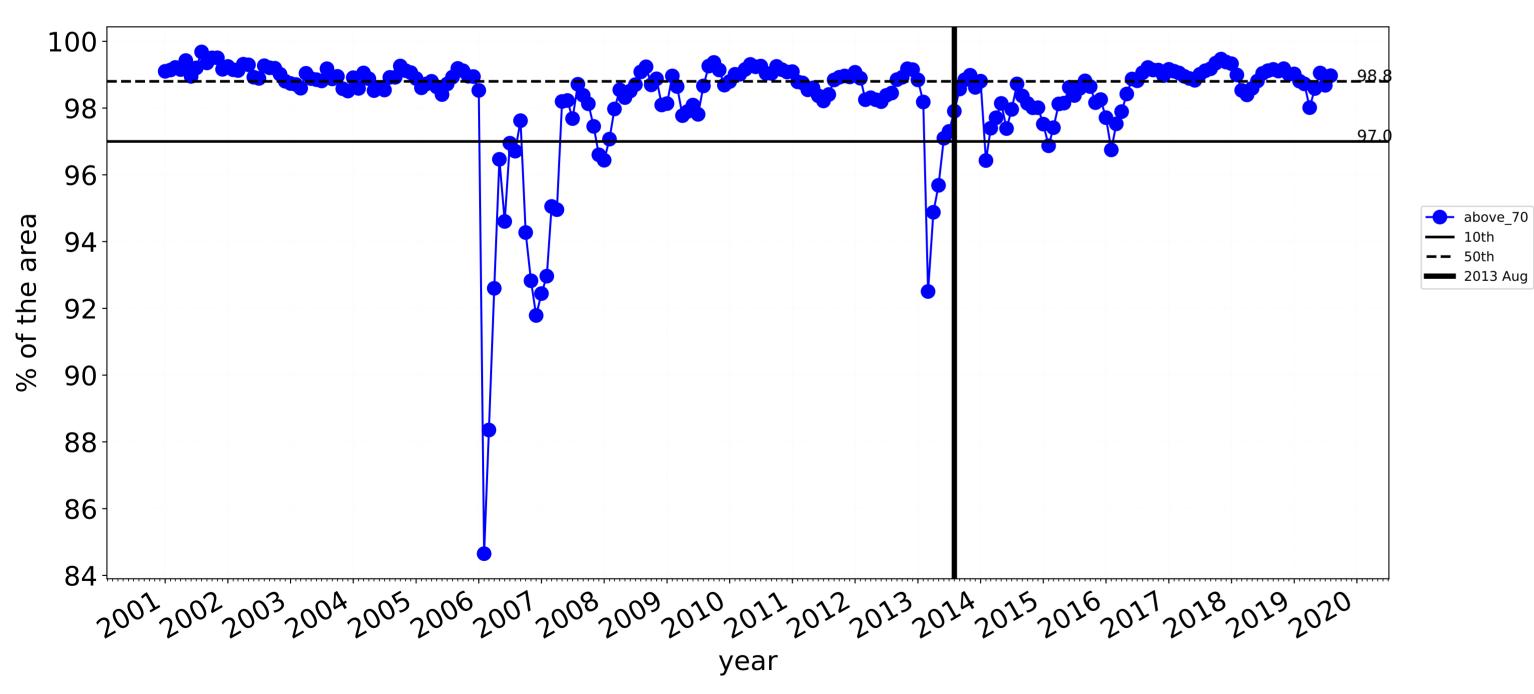




---- above\_70

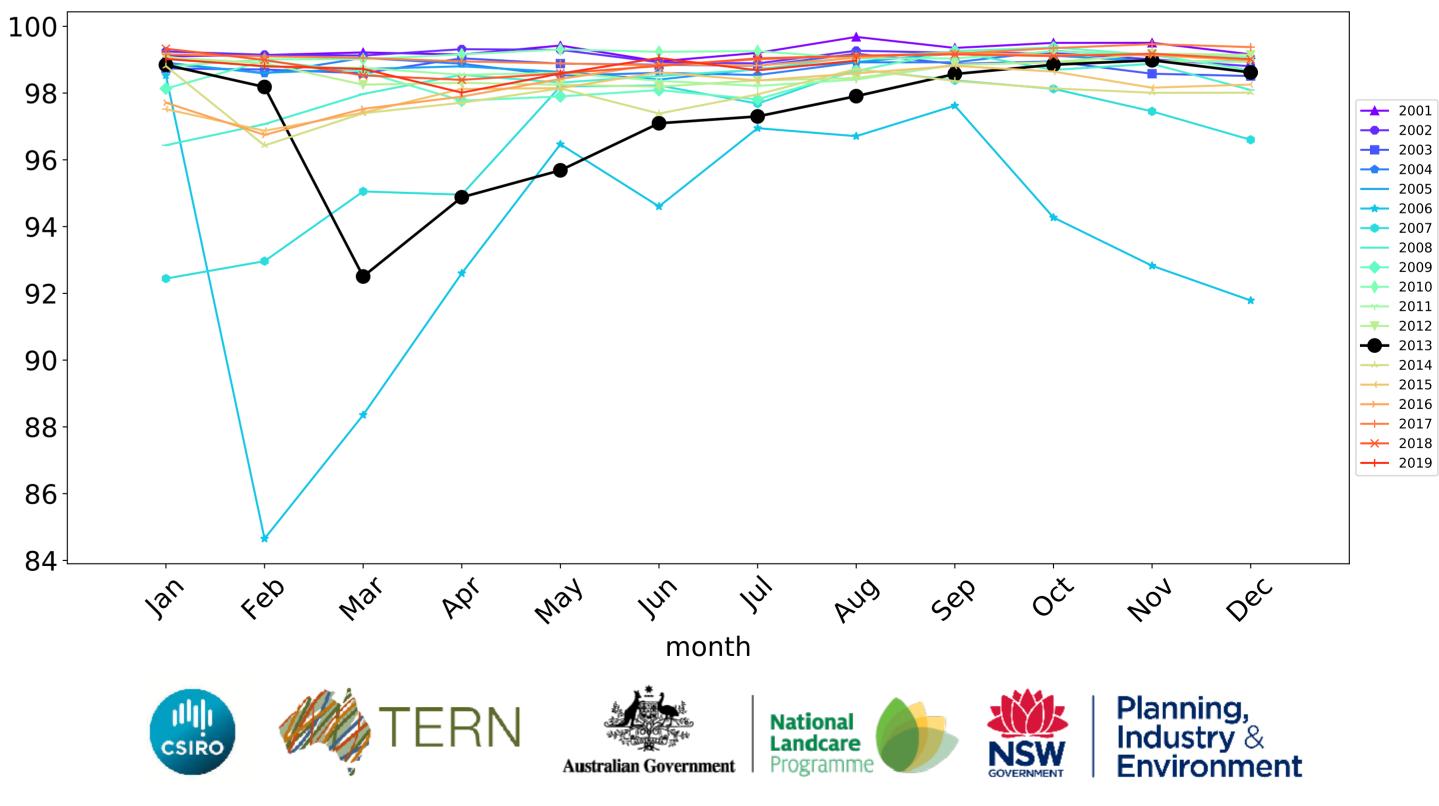
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

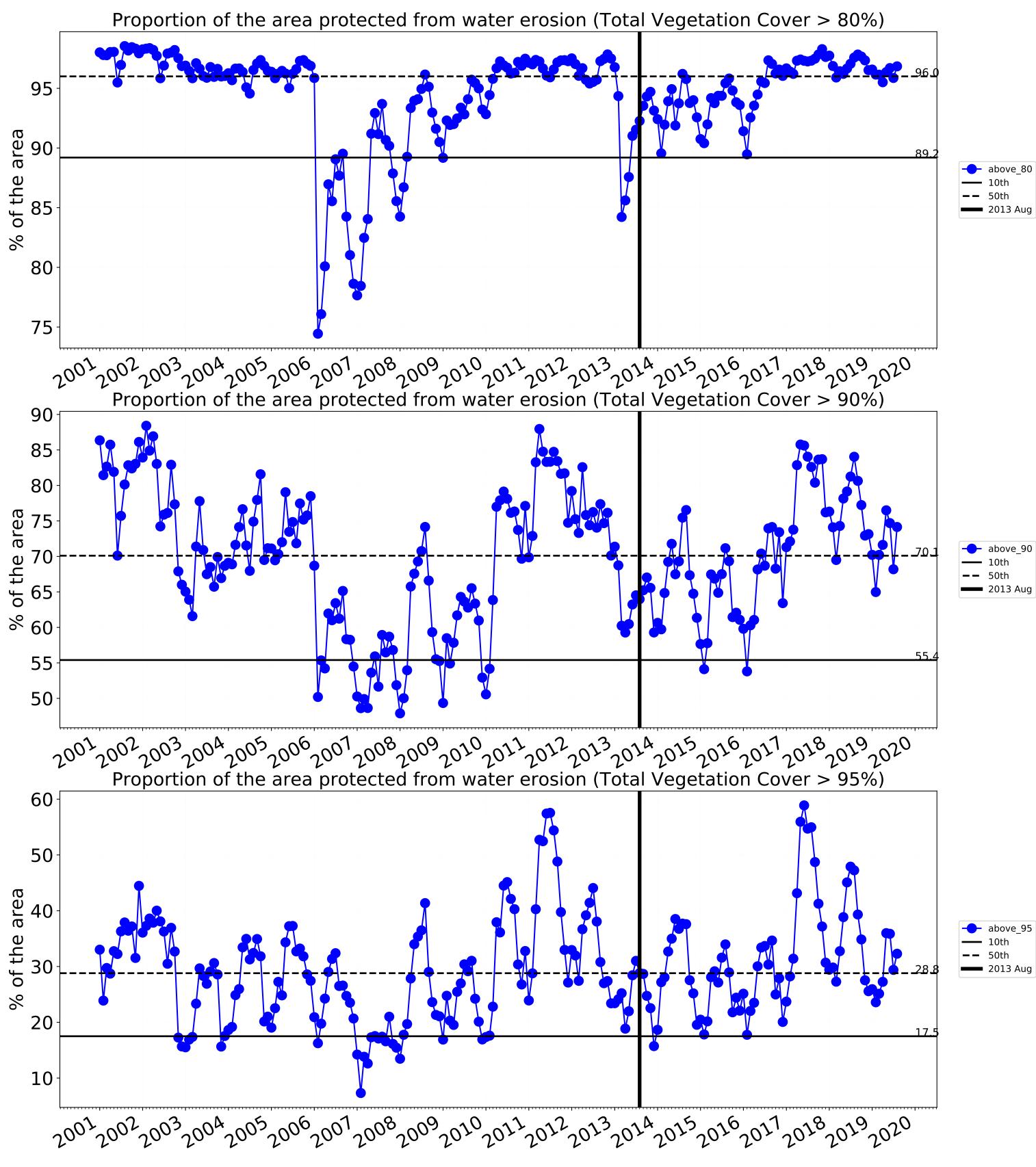


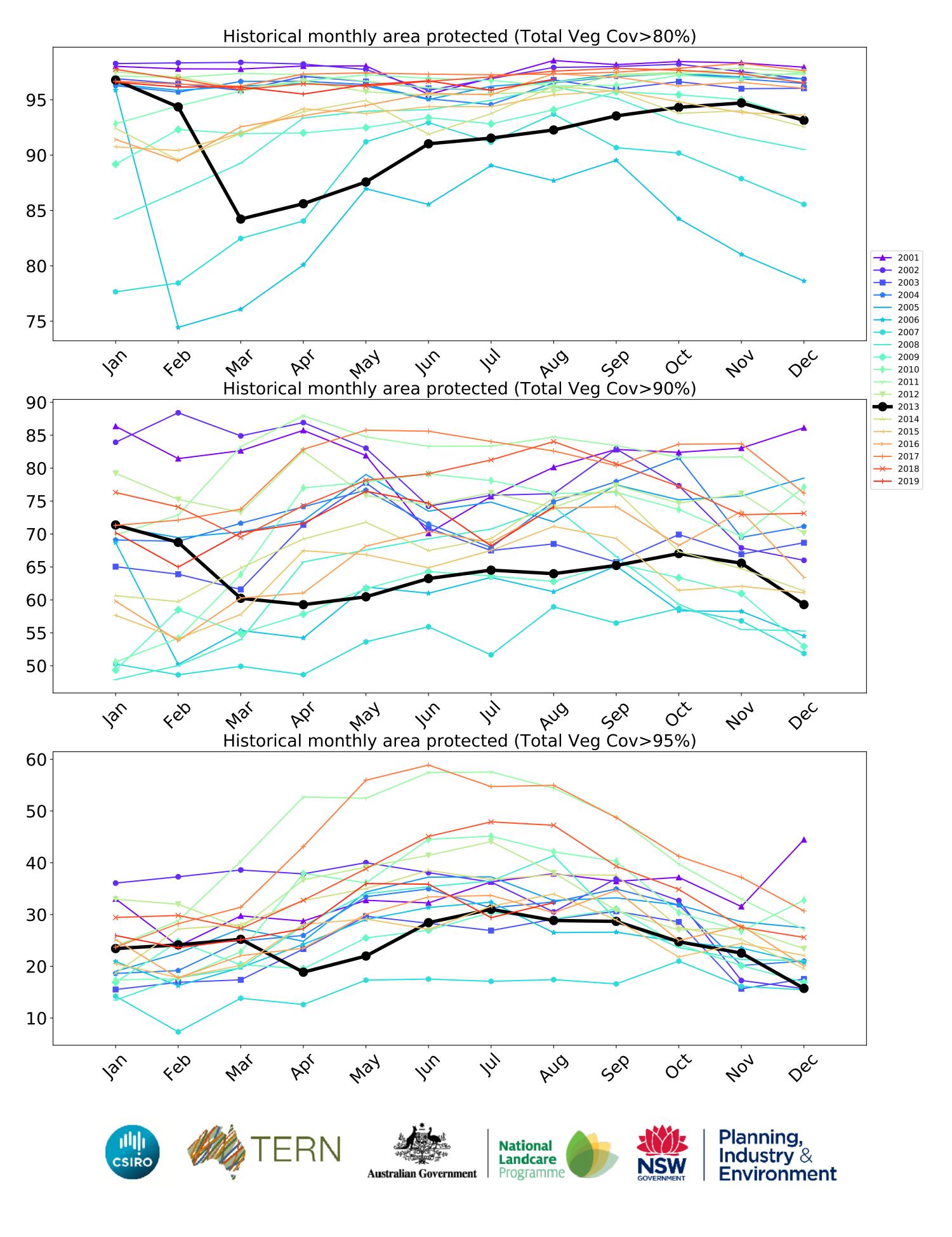
# **Conservation and natural environments timeseries**

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

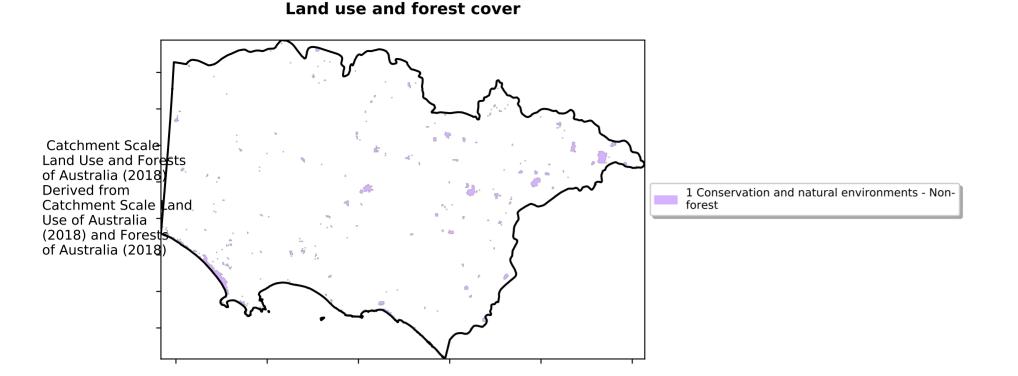


Water erosion historical monthly area protected (Total Veg Cov>70%)

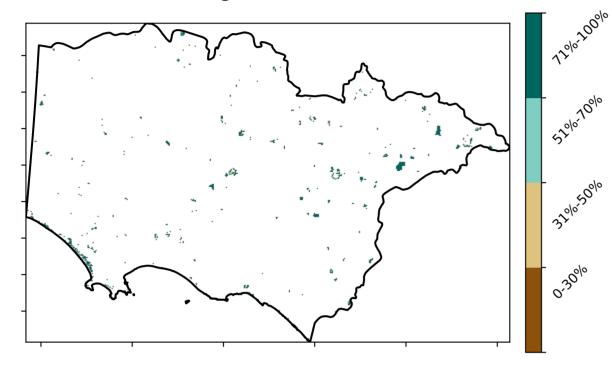




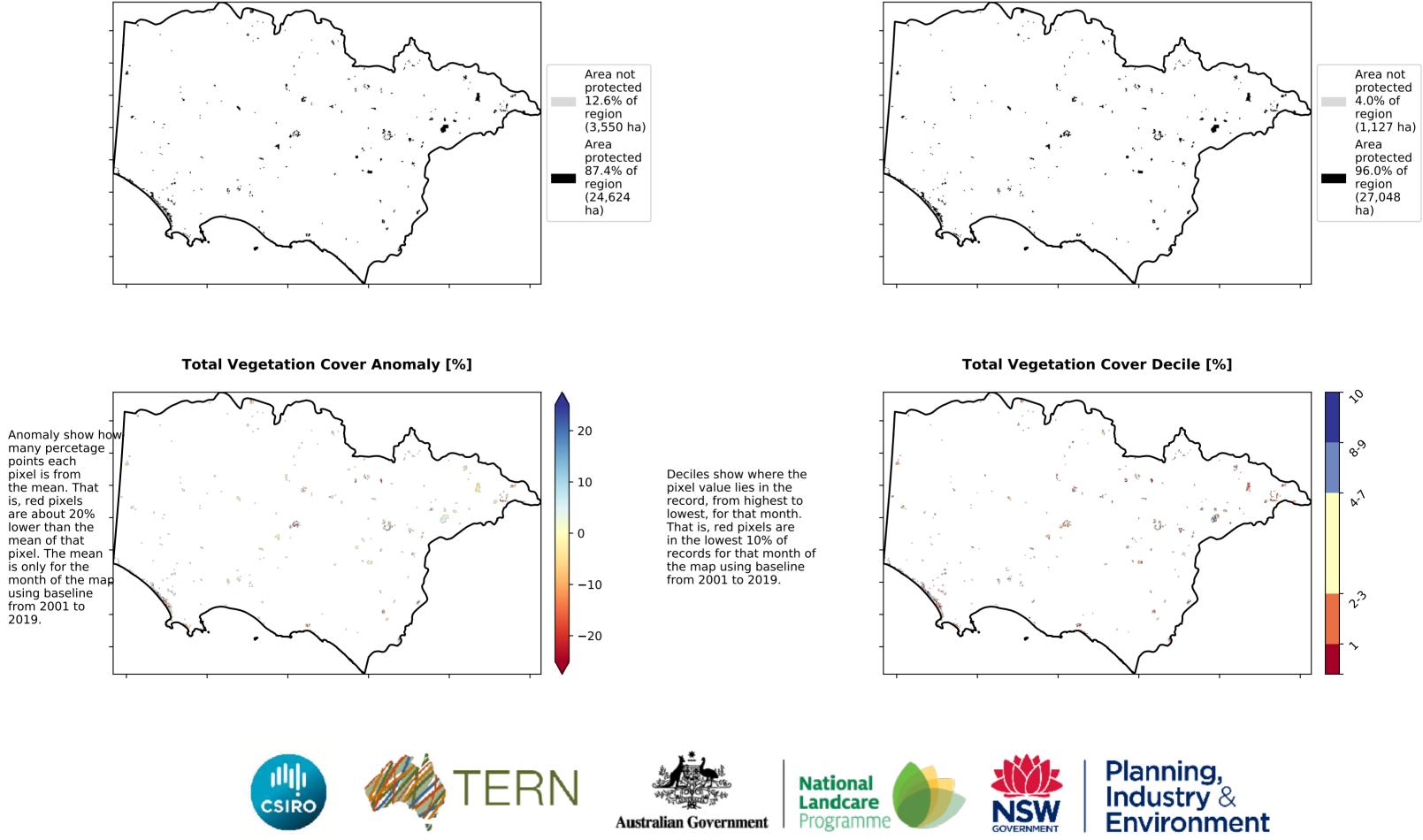
### **Conservation and natural environments non forest**



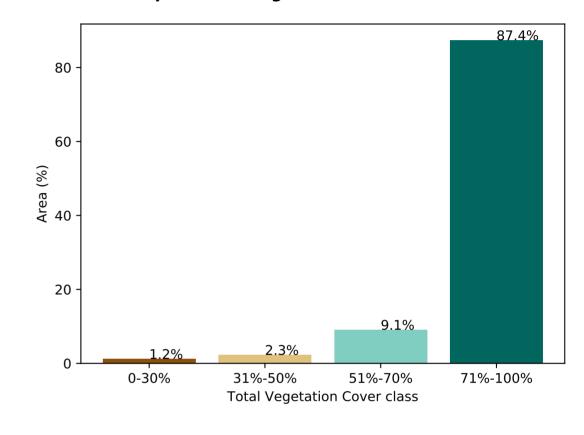
Total Vegetation Cover [%]



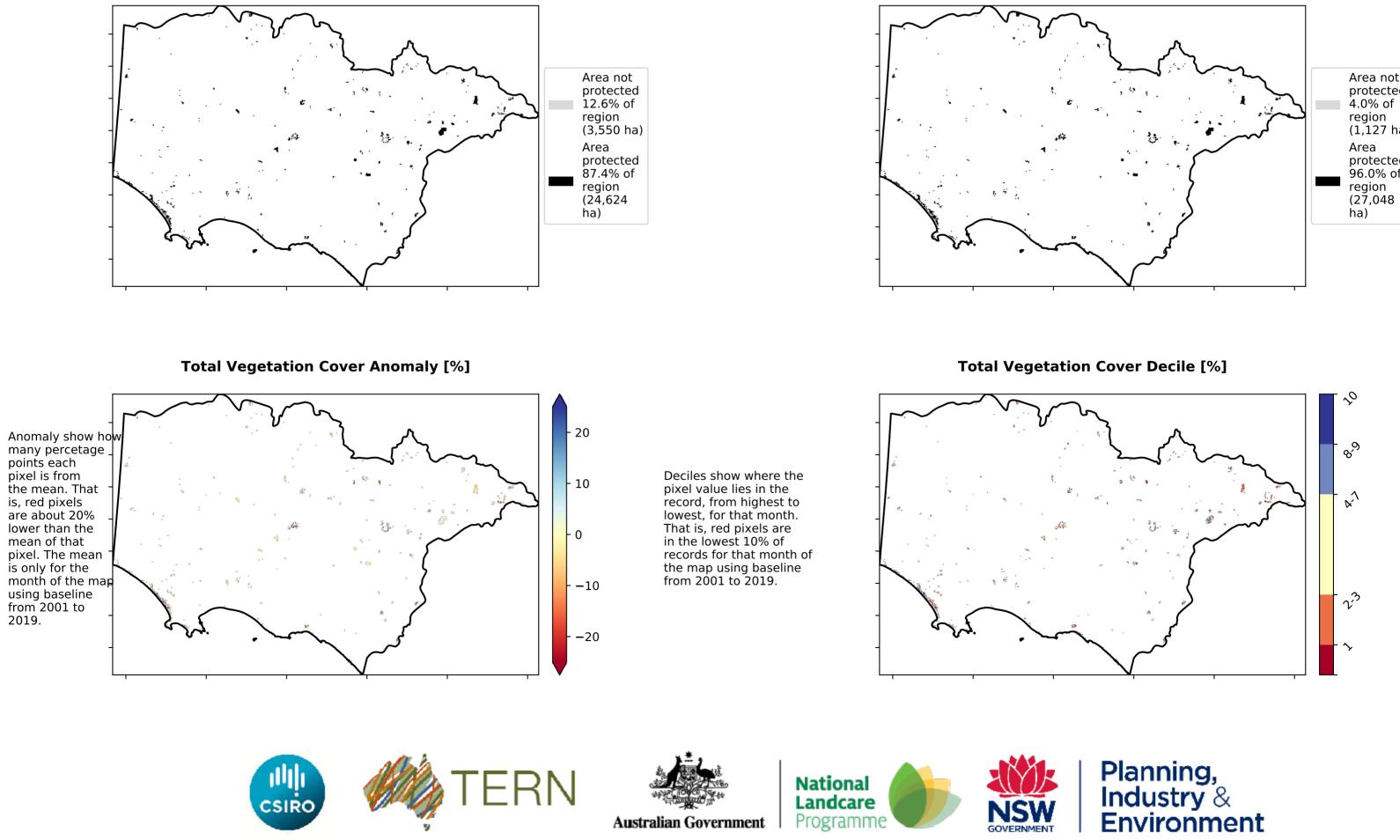
% Area protected from water erosion (>70%)

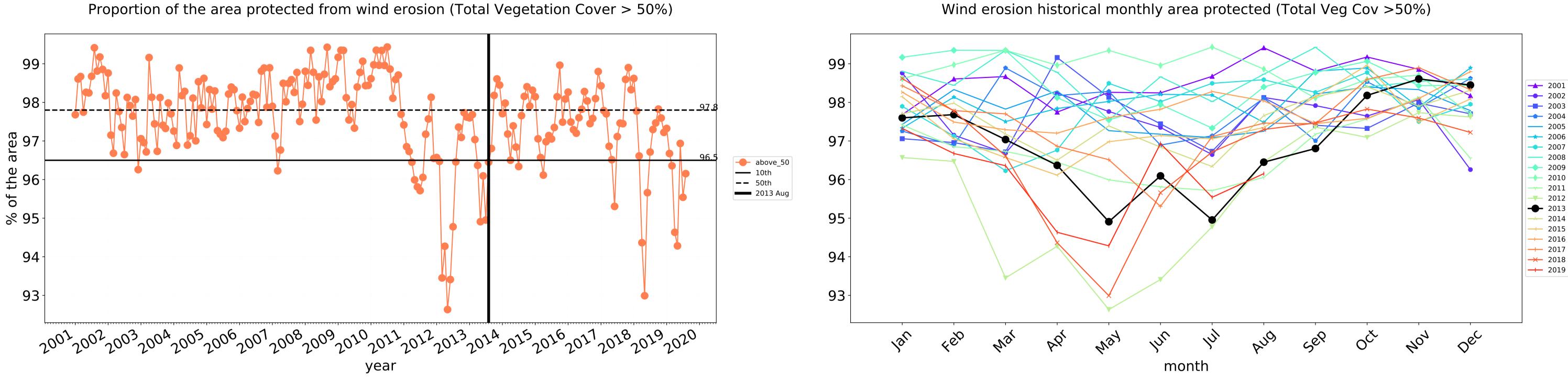


Proportion of vegetation cover class in area

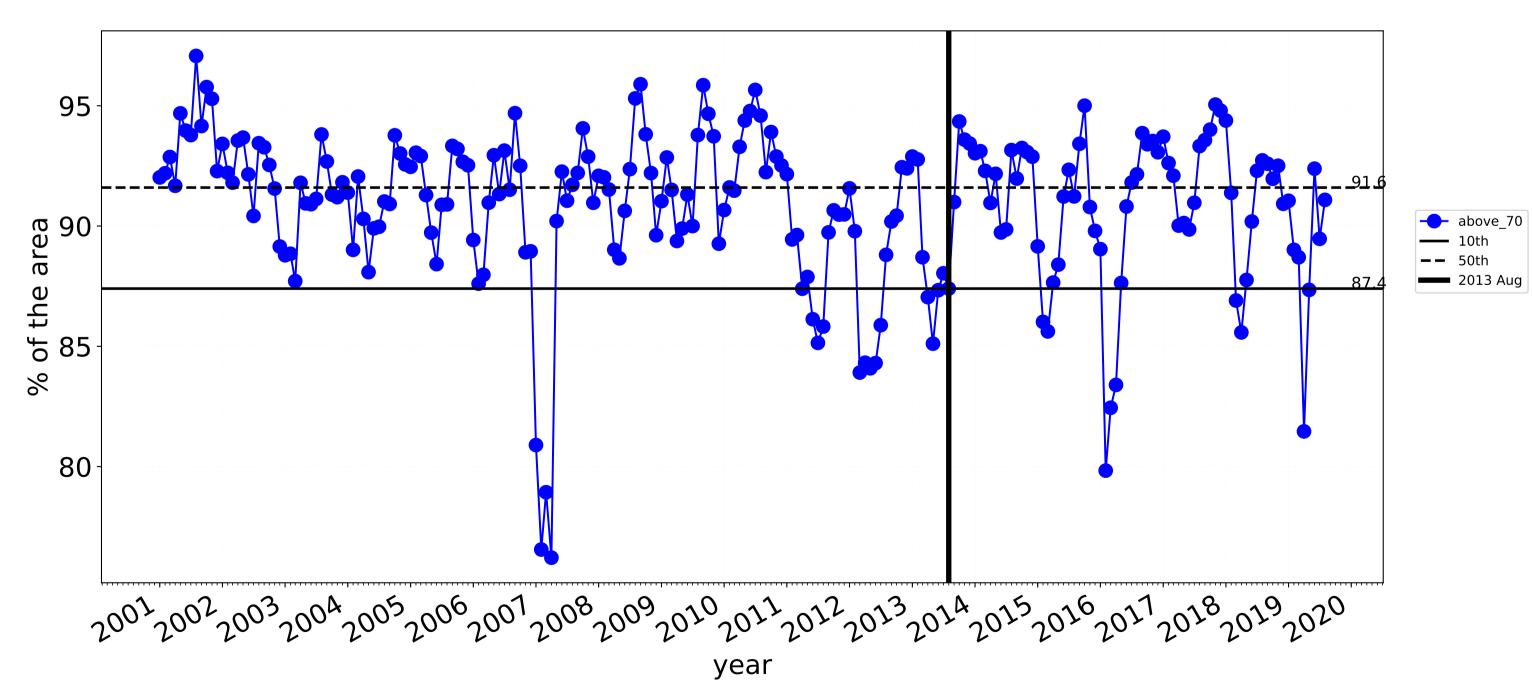


#### % Area protected from wind erosion (>50%)



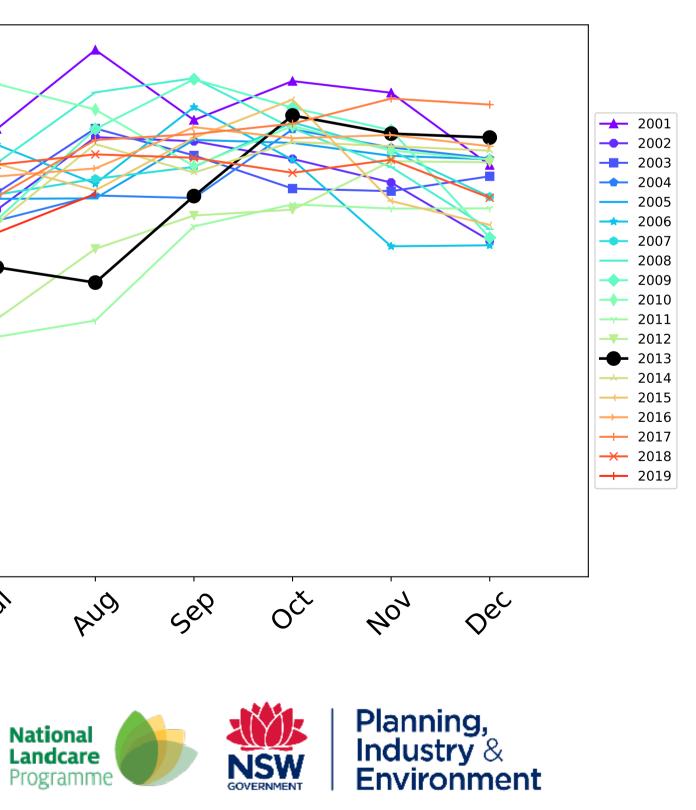


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

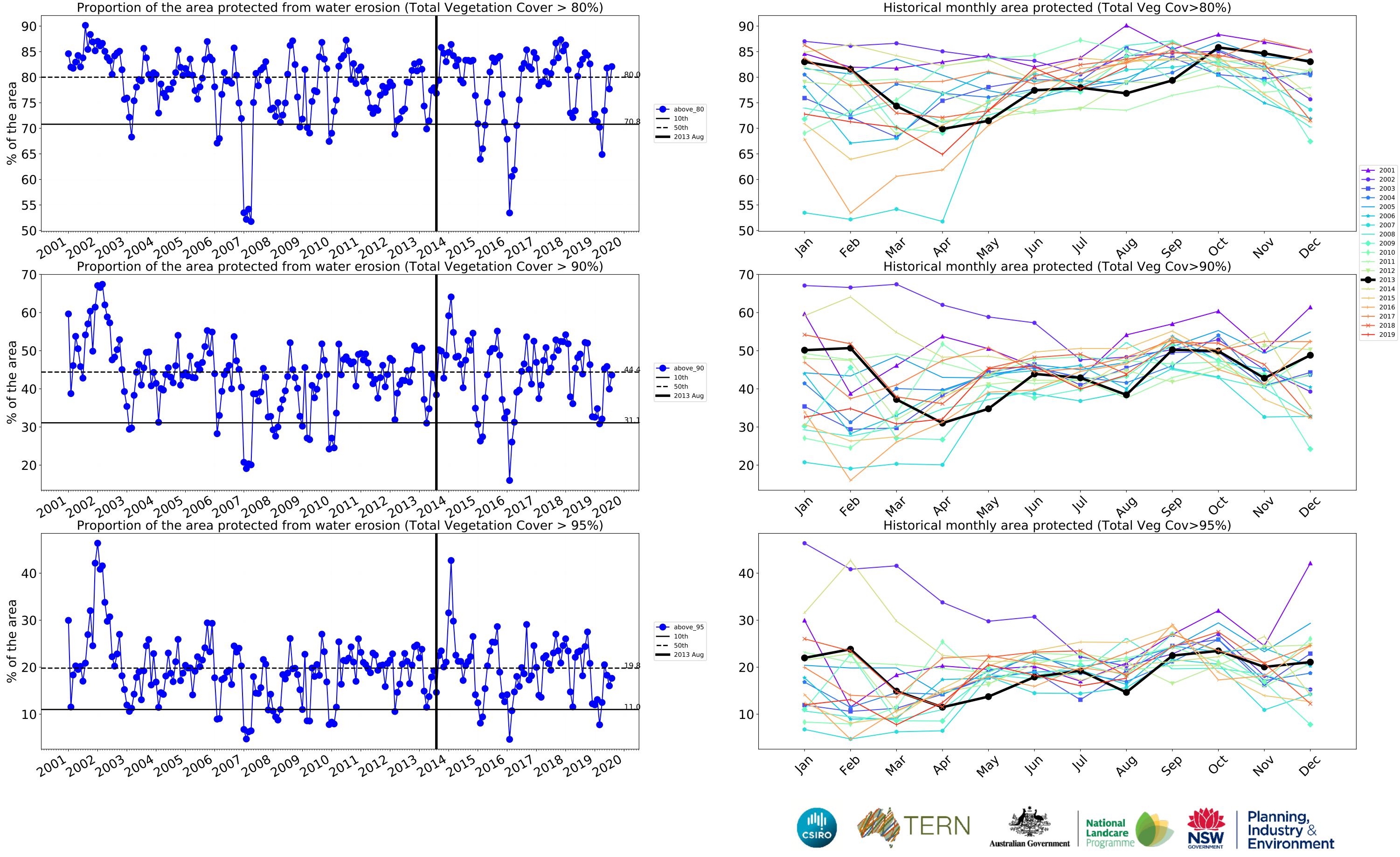


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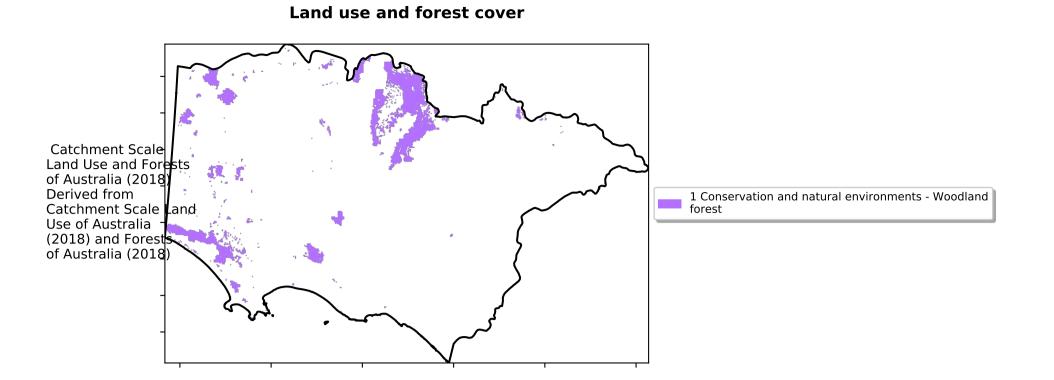
Water erosion historical monthly area protected (Total Veg Cov>70%)



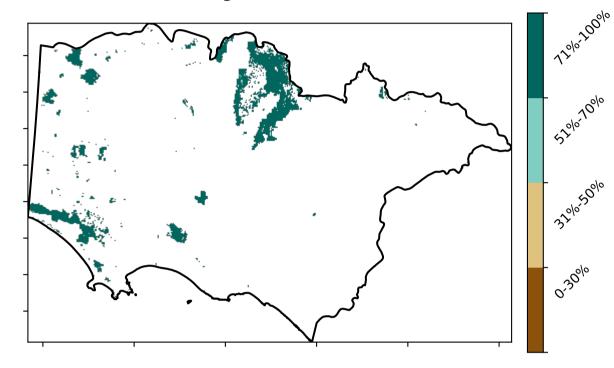
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



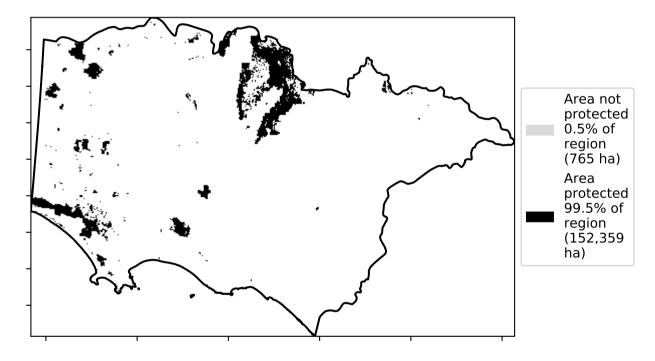
## **Conservation and natural environments Woodland forest**



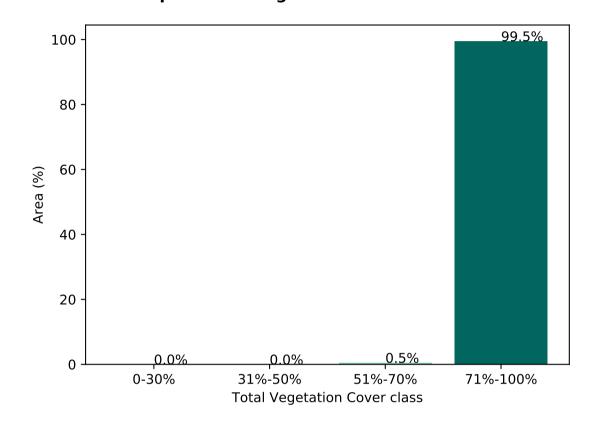
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

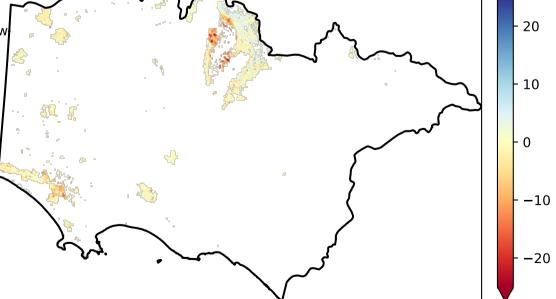


#### % Area protected from wind erosion (>50%)

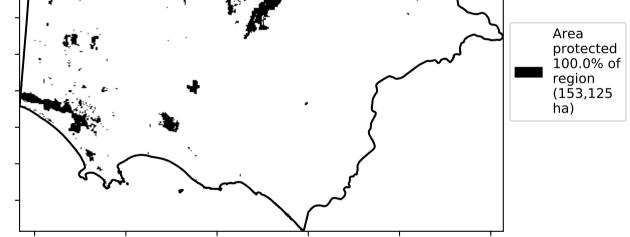


**Total Vegetation Cover Anomaly [%]** 

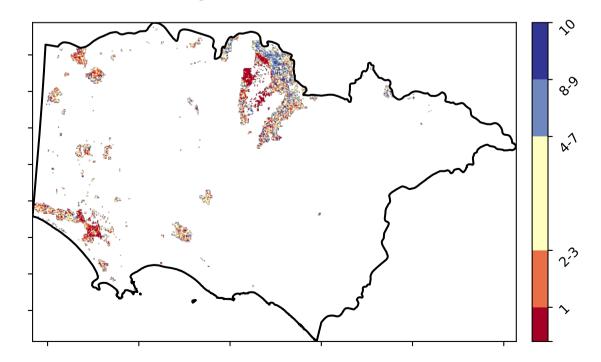
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



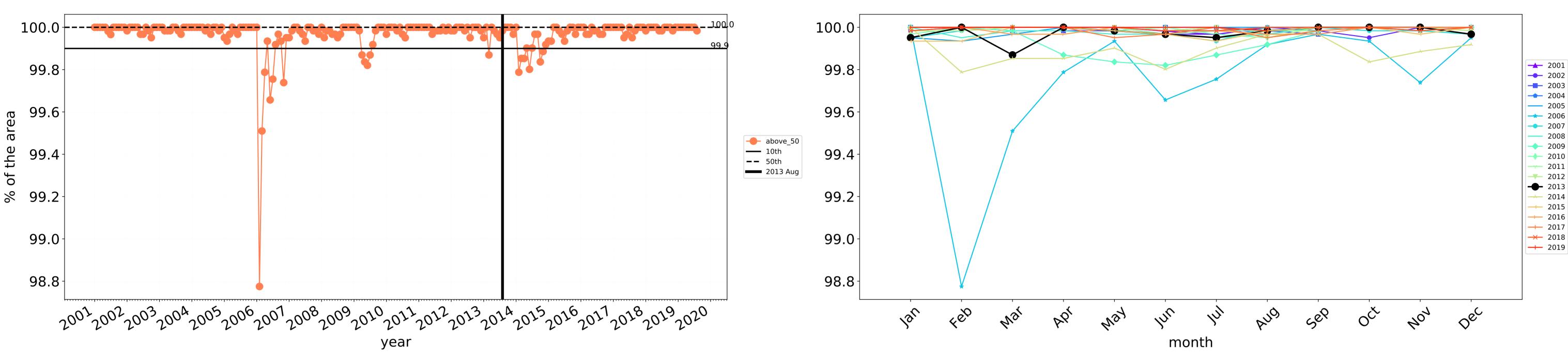
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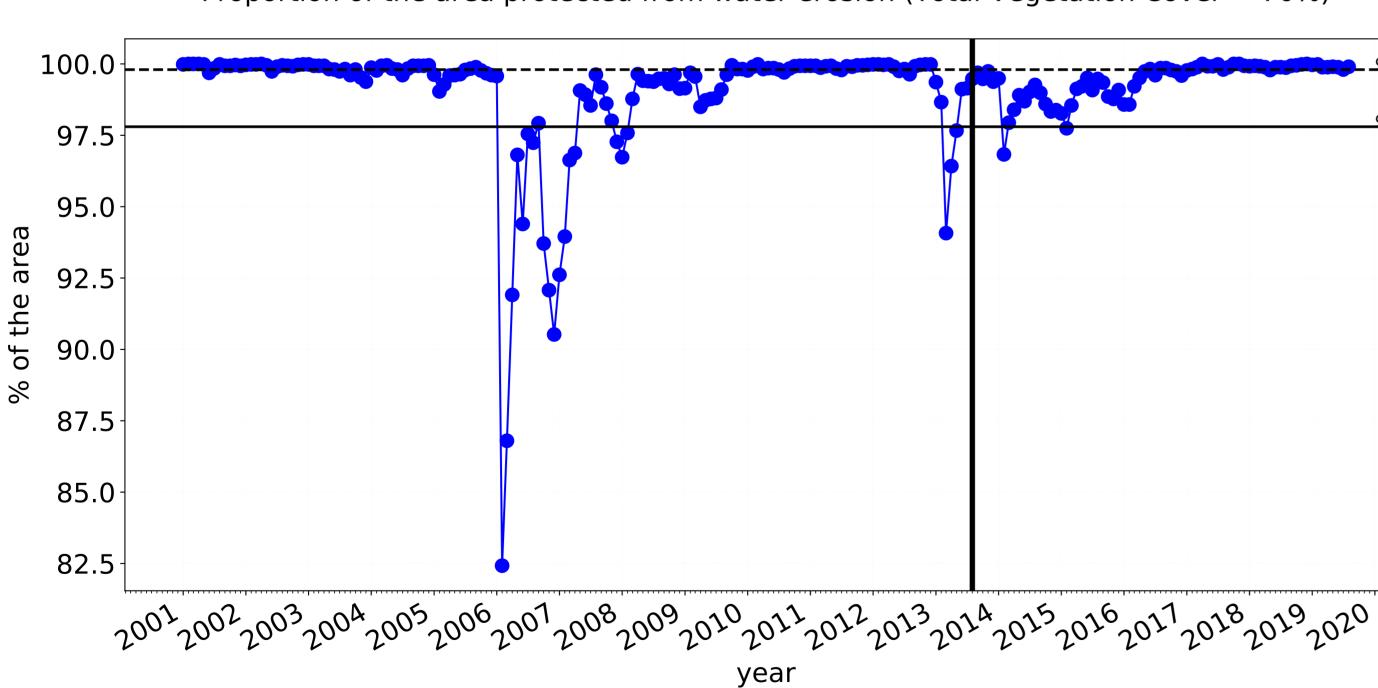
Total Vegetation Cover Decile [%]







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

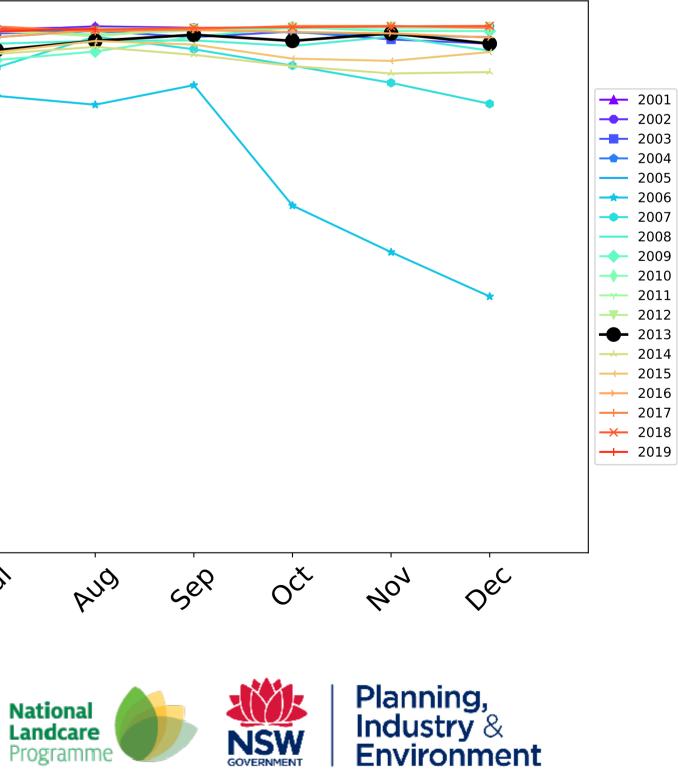


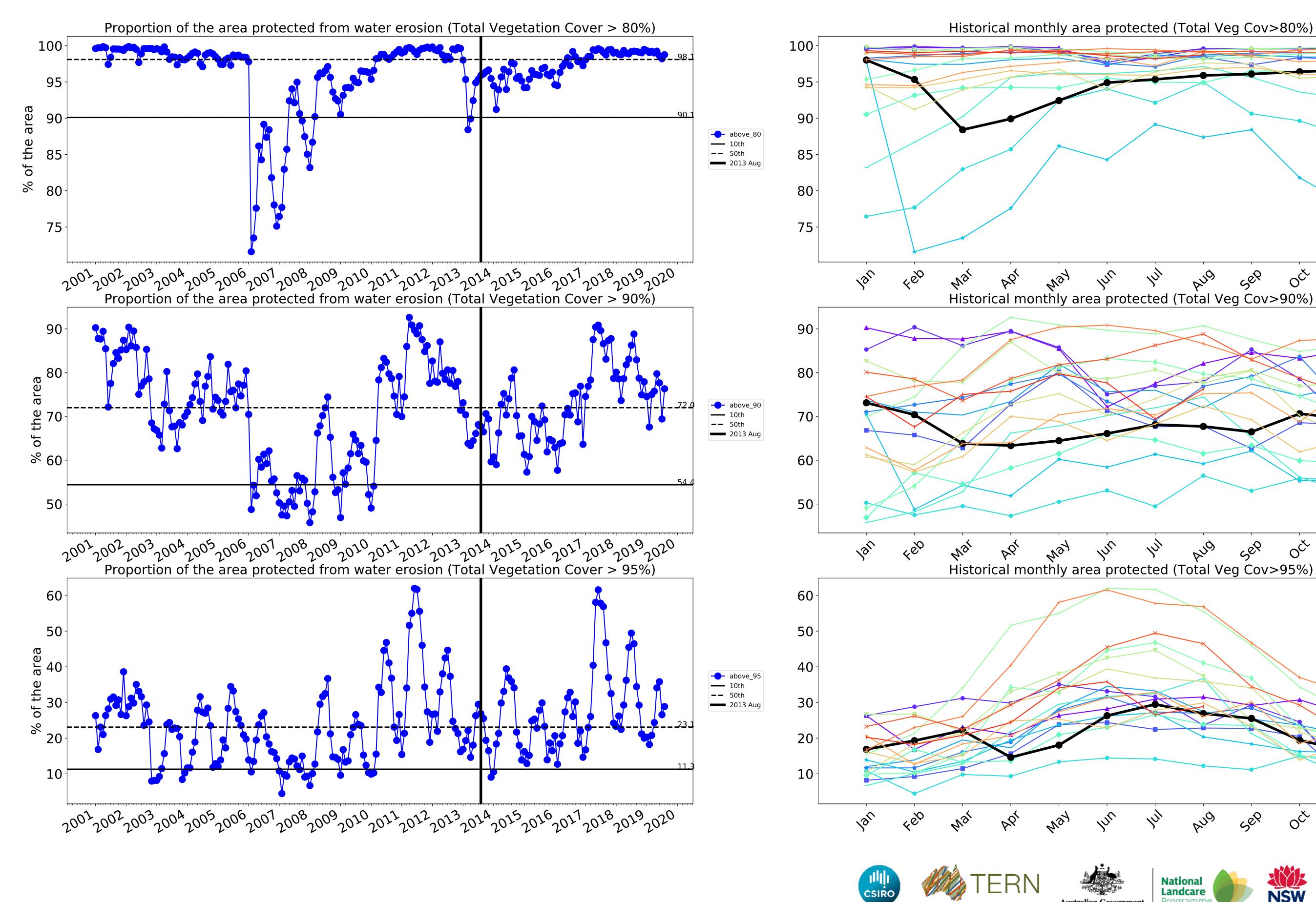
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

100.0-97.5 95.0 --- above\_70 **——** 10th **——** 50th 92.5 90.0 87.5 85.0 82.5 Jan 4er way hill PQ 1st Mar month ERN CSIRO **HAR** Australian Government

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

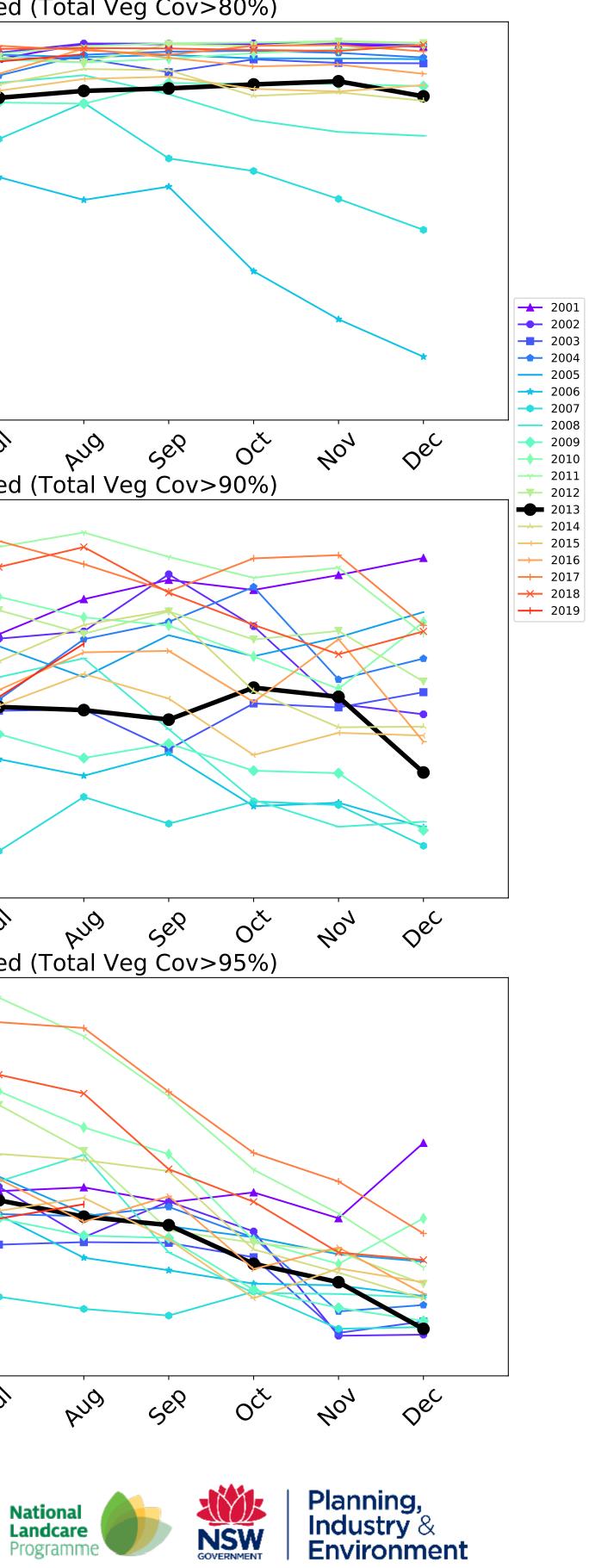
Water erosion historical monthly area protected (Total Veg Cov>70%)



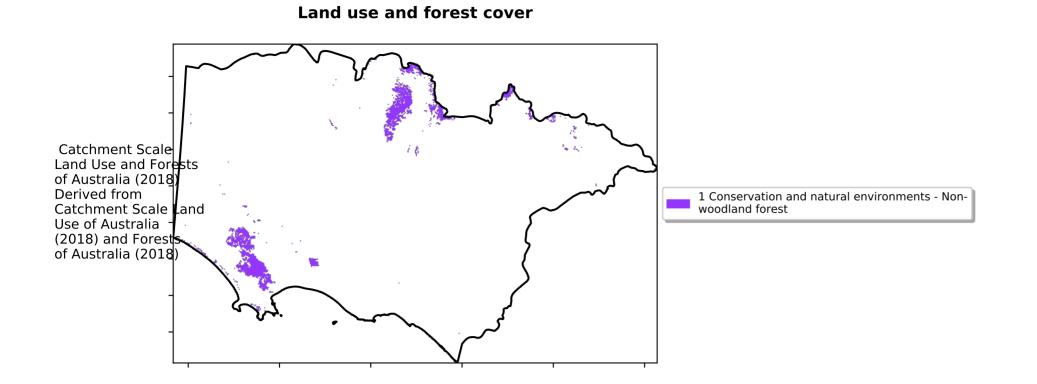


1**3** 

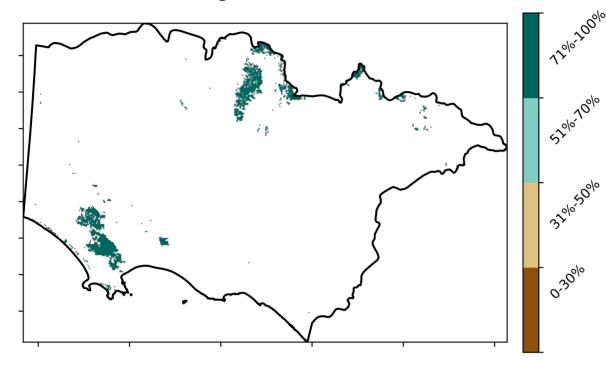
Australian Government



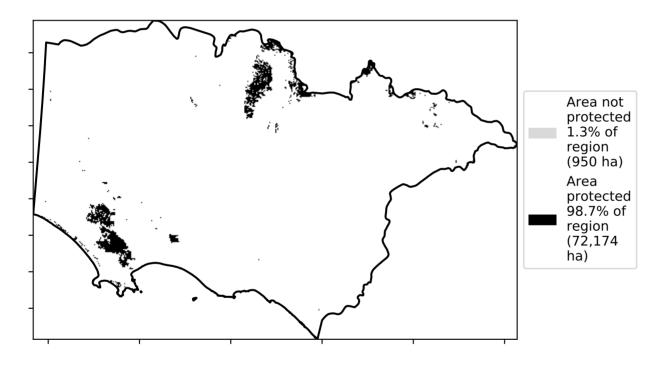
# Conservation and natural environments Forest (non woodland)



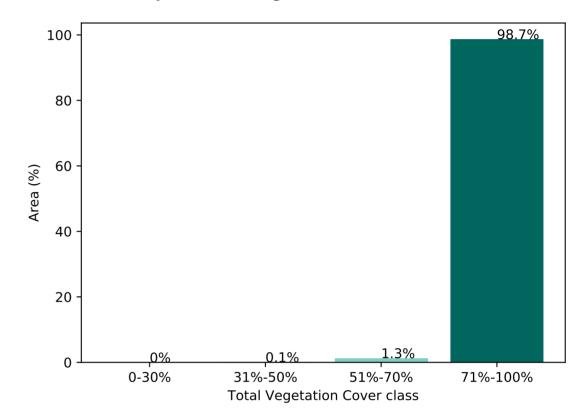
### Total Vegetation Cover [%]



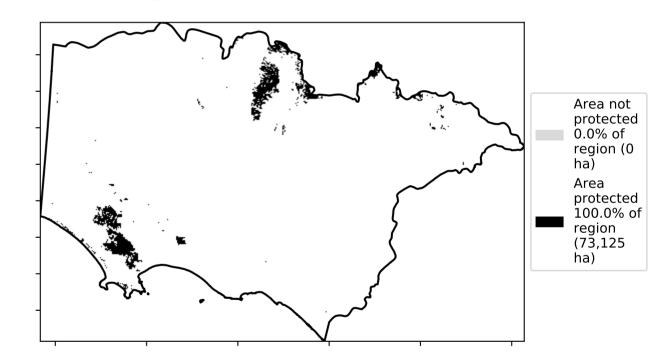
% Area protected from water erosion (>70%)



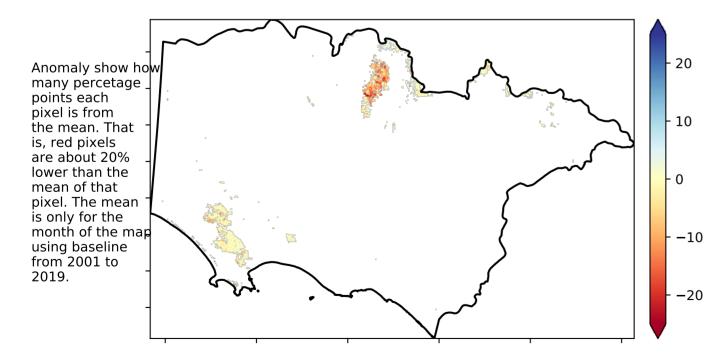




#### % Area protected from wind erosion (>50%)

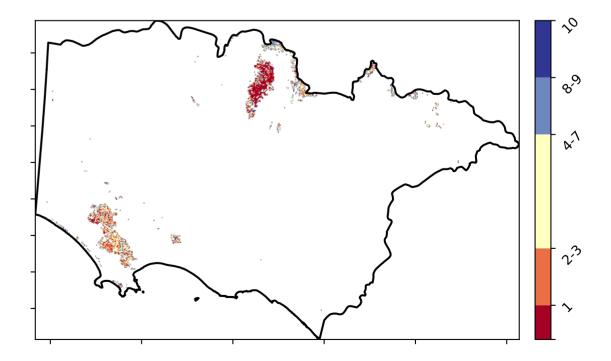


**Total Vegetation Cover Anomaly [%]** 



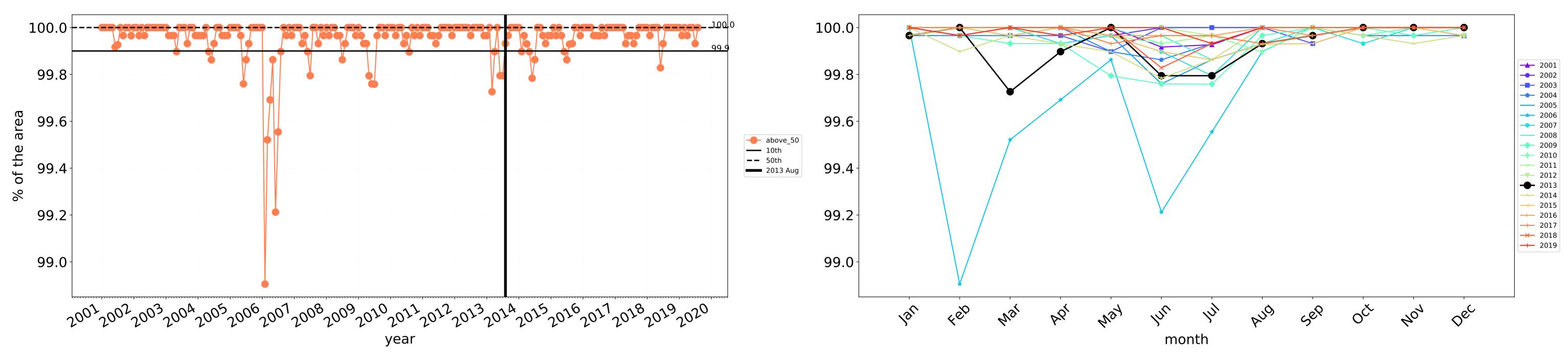
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



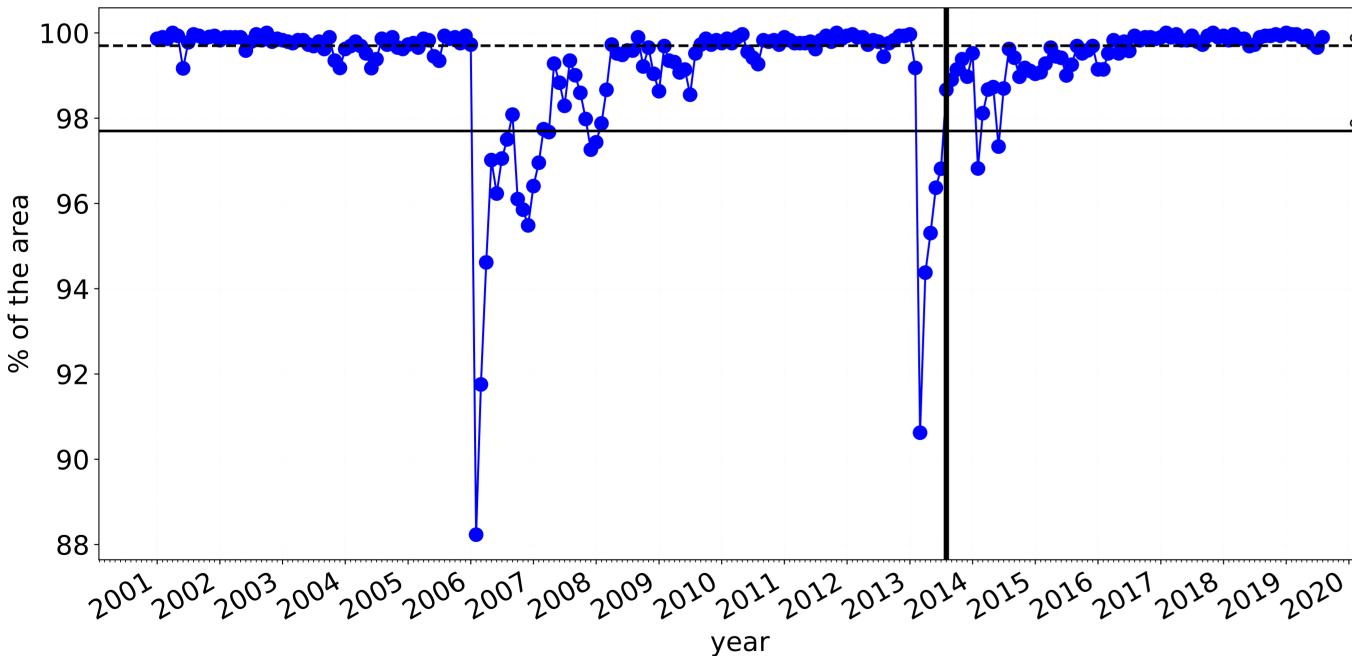


# **Conservation and natural environments Forest (non woodland) timeseries**



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

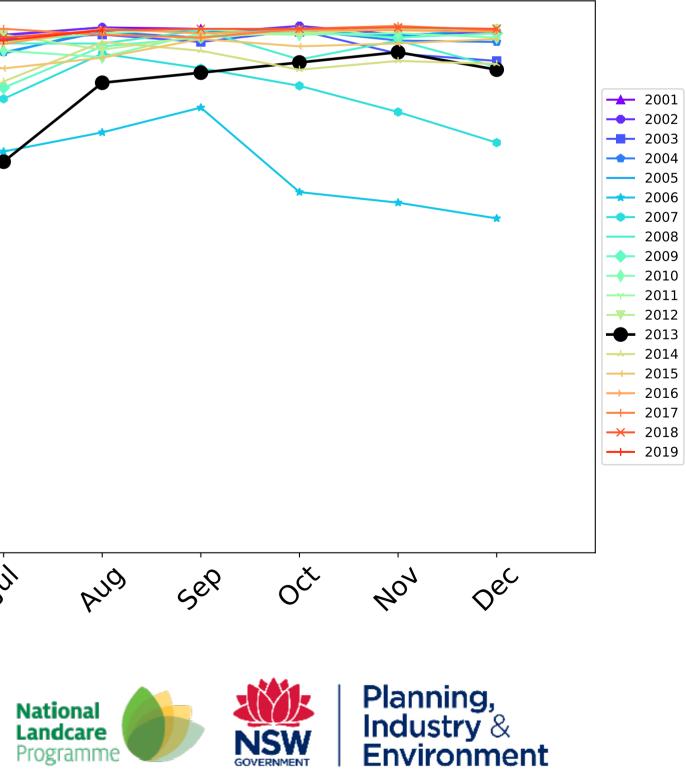
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

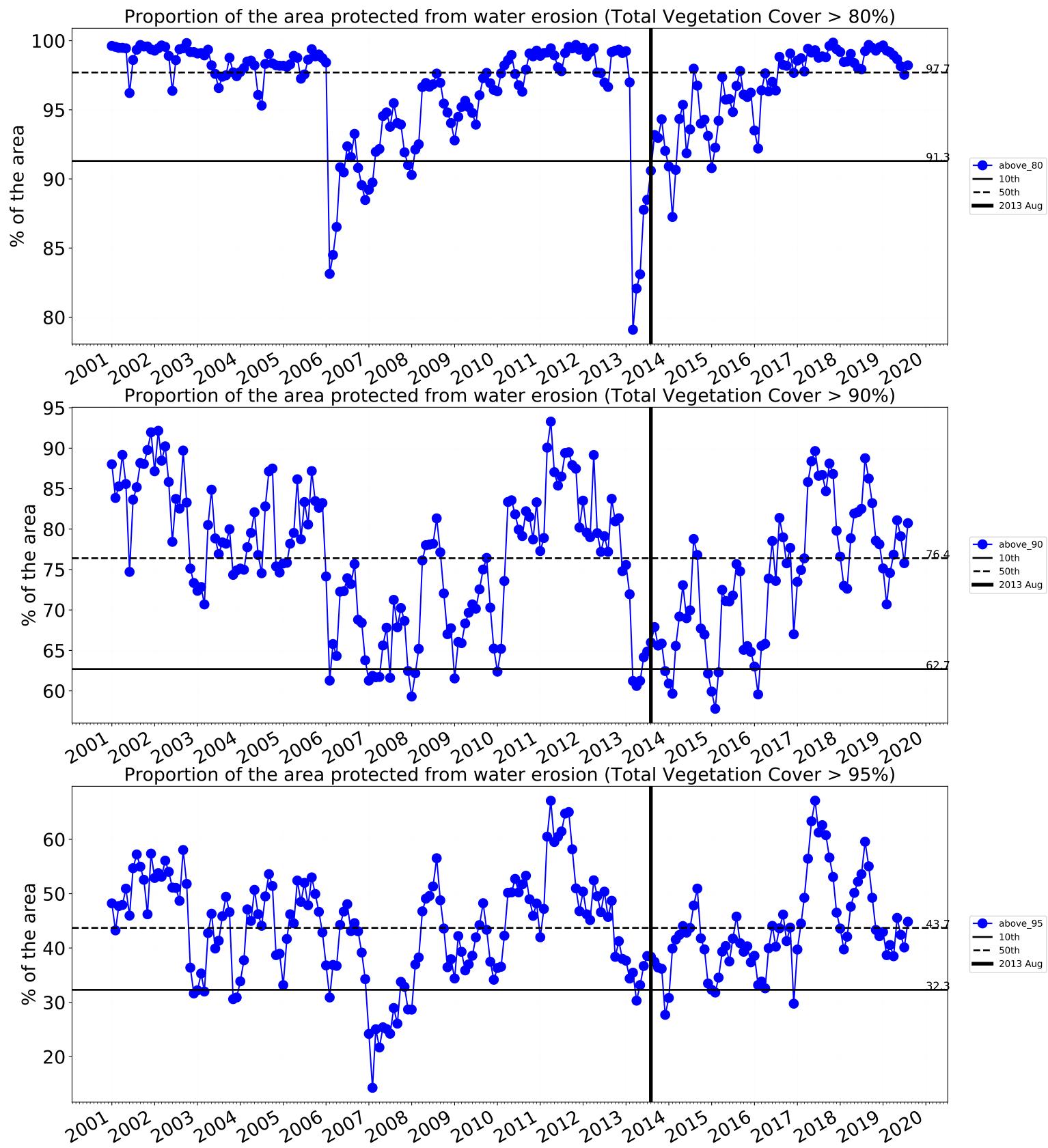


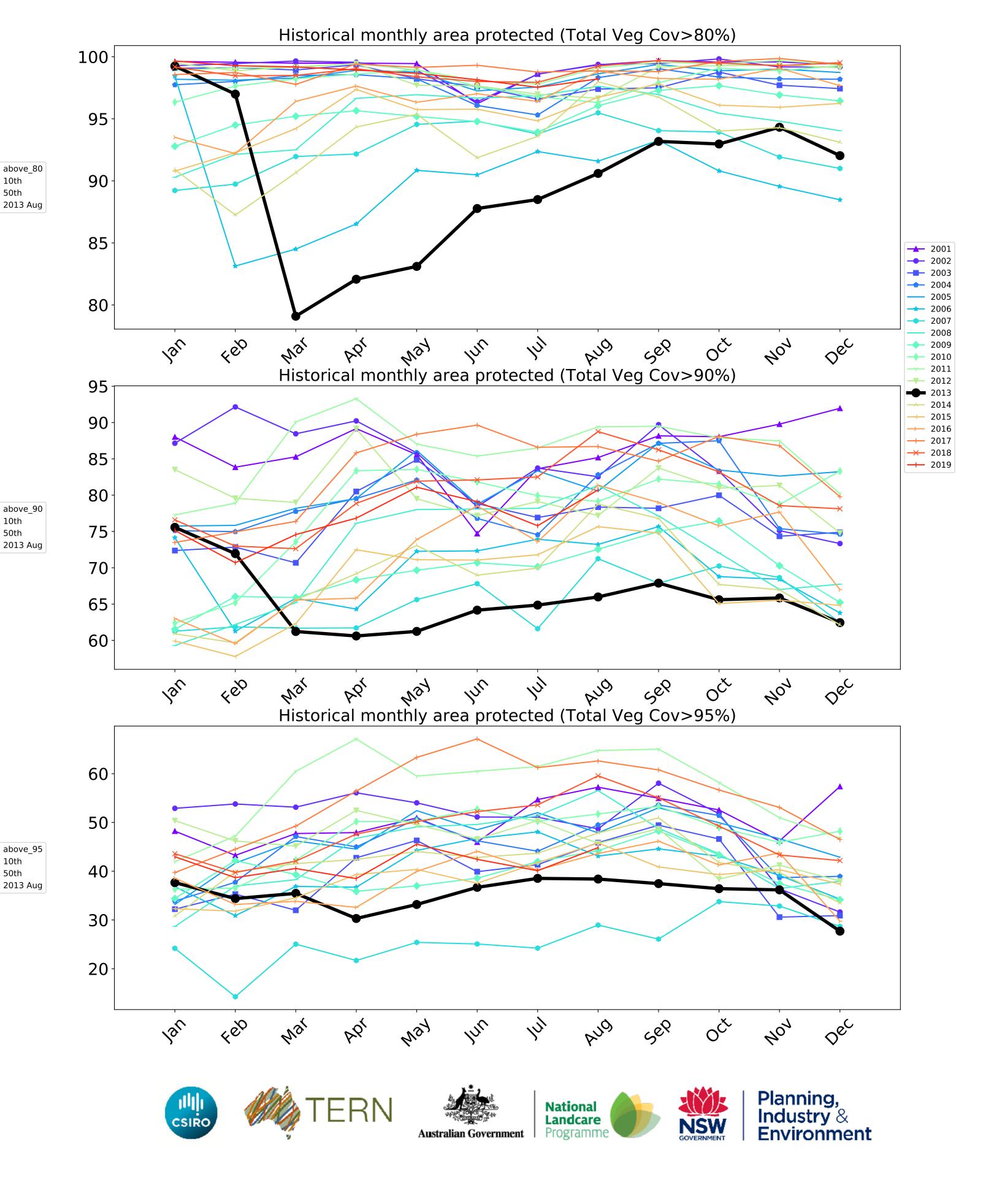
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 98 97 96 ---- above\_70 **——** 10th **——** 50th **—** 2013 Aug 94 92 90 88 Jan 4er way PQ In 1's Mar month ERN **HAR** CSIRC Australian Government

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



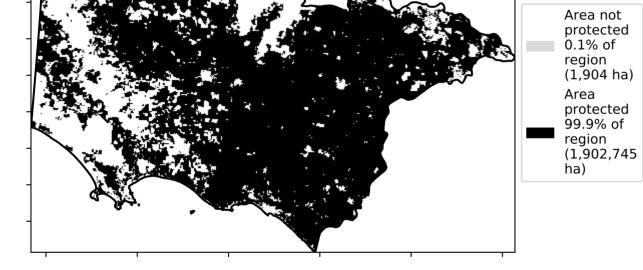




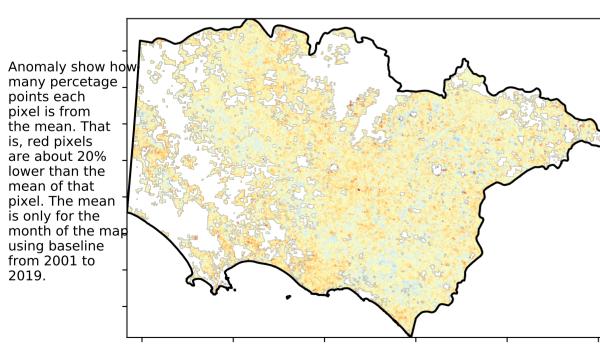
### Agriculture

Land use and forest cover <u>86.3</u>% 80 Catchment Scale Land Use and Forests of Australia (2018) Derived from 60 1 Agriculture - Grazing - Non forest Area (%) 05 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest Catchment Scale Land 4 Agriculture - Cropping - Non-irrigated Use of Australia – (2018) and Forests of Australia (2018) 5 Agriculture - Horticulture - Non-irrigated 6 Agriculture - Horticulture - Irrigated 20 <u>11.1</u>% 0.0% 0 2 3 4 6 1 5 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 99.9% 100 120/0 80 52%70% 60 Area (%) 3200 40 0.30% 20 0.1% 0.0% 0.0% 0 0-30% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)

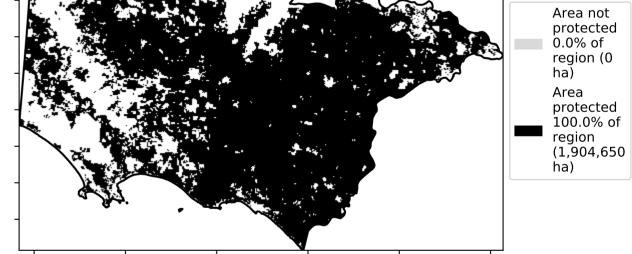
Proportion of each land class in area



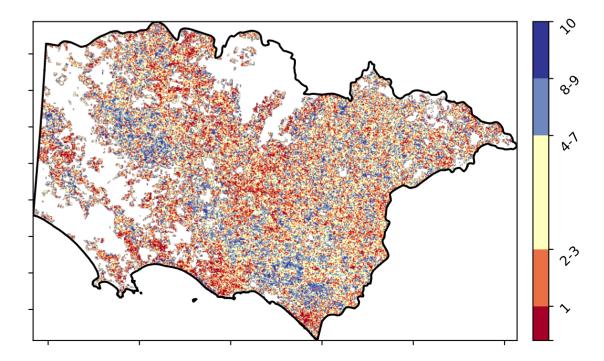
**Total Vegetation Cover Anomaly [%]** 



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 the map using baseline from 2001 to 2019.



**Total Vegetation Cover Decile [%]** 





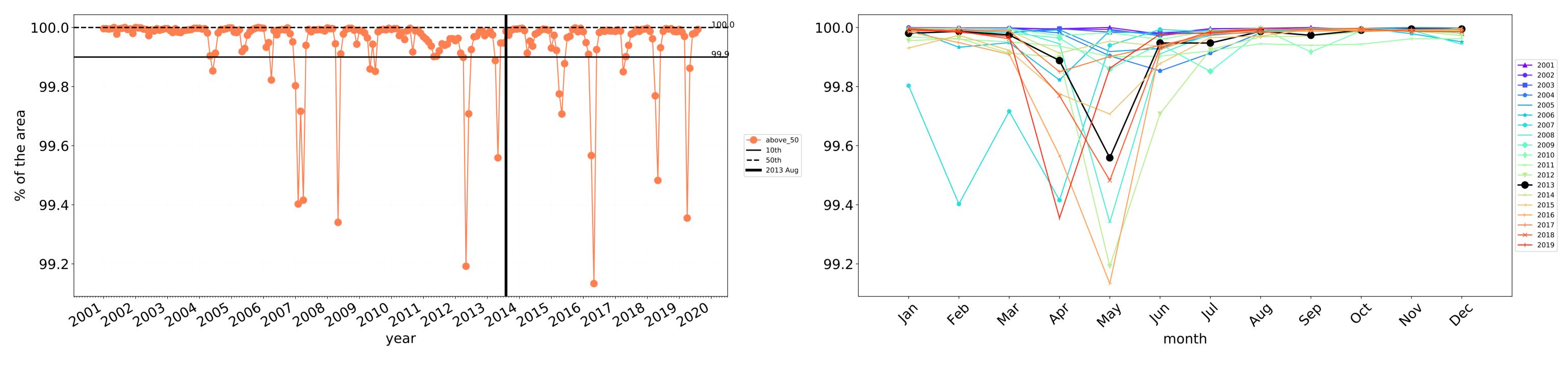
· 20

· 10

0

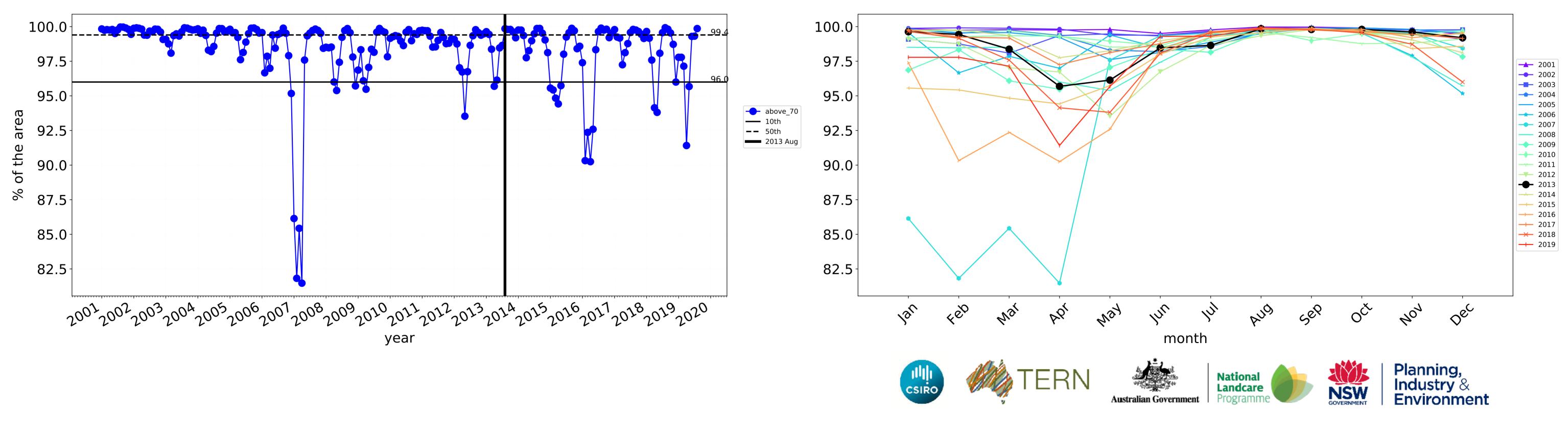
-10

-20

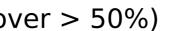


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

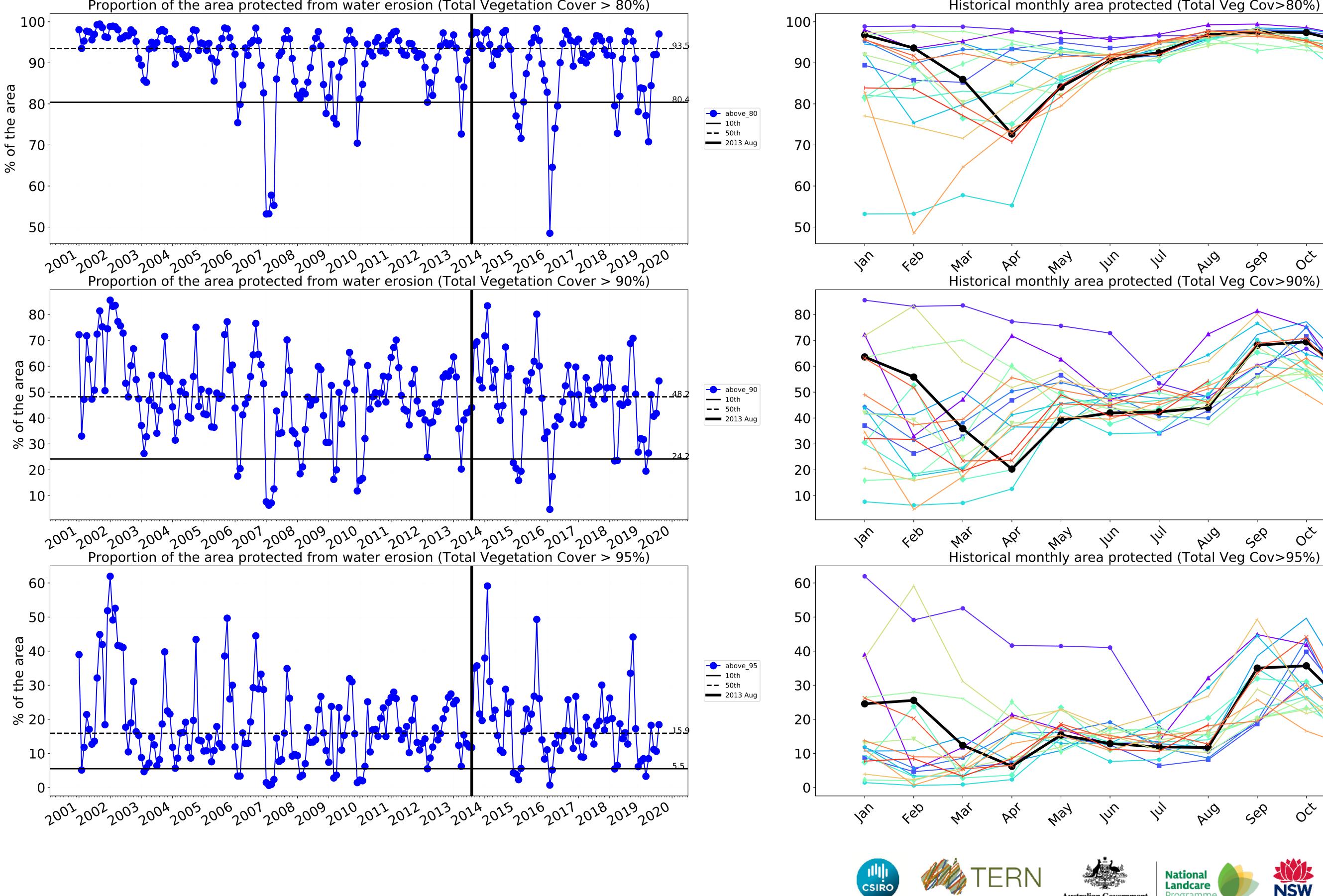


# Agriculture timeseries



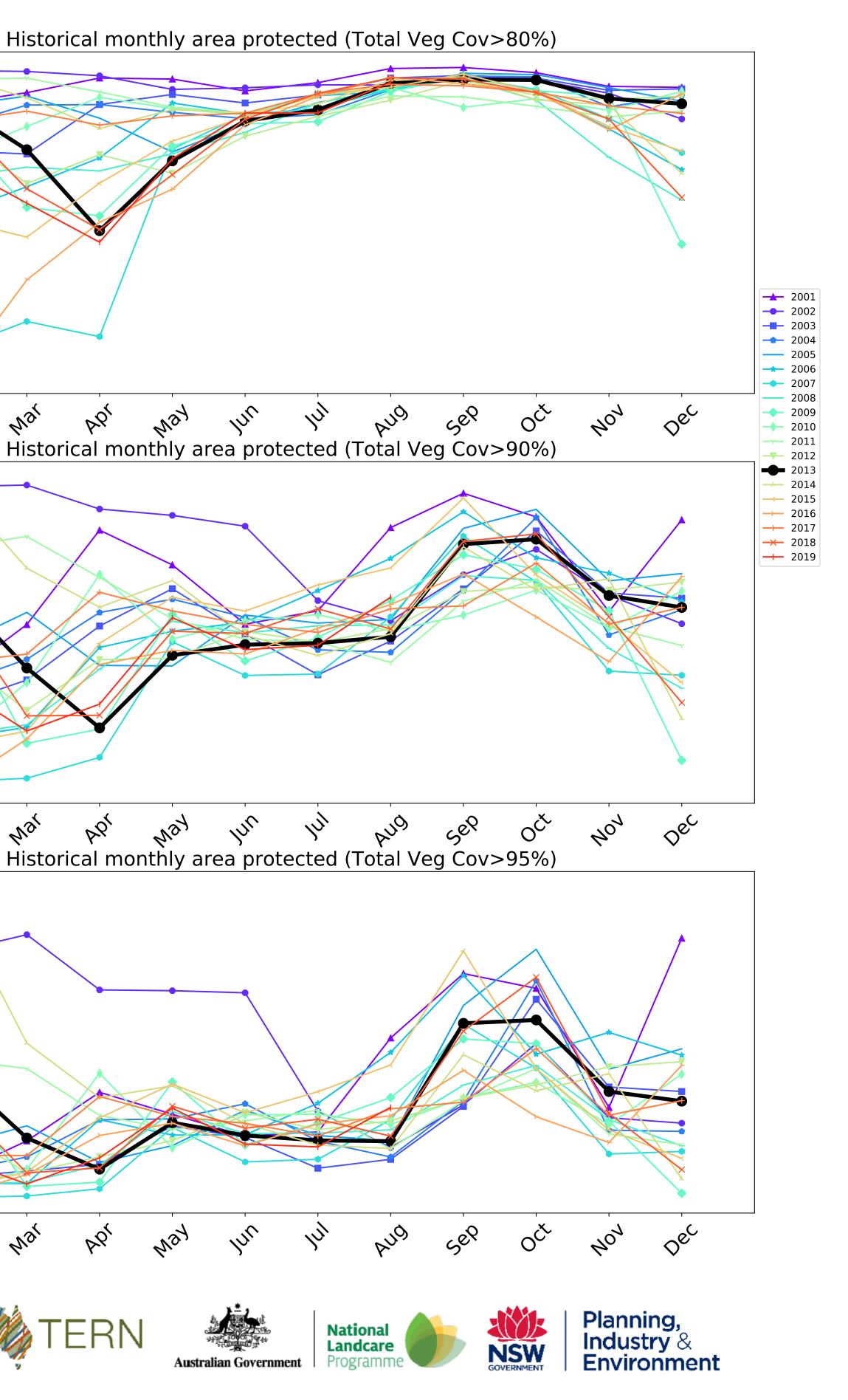
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

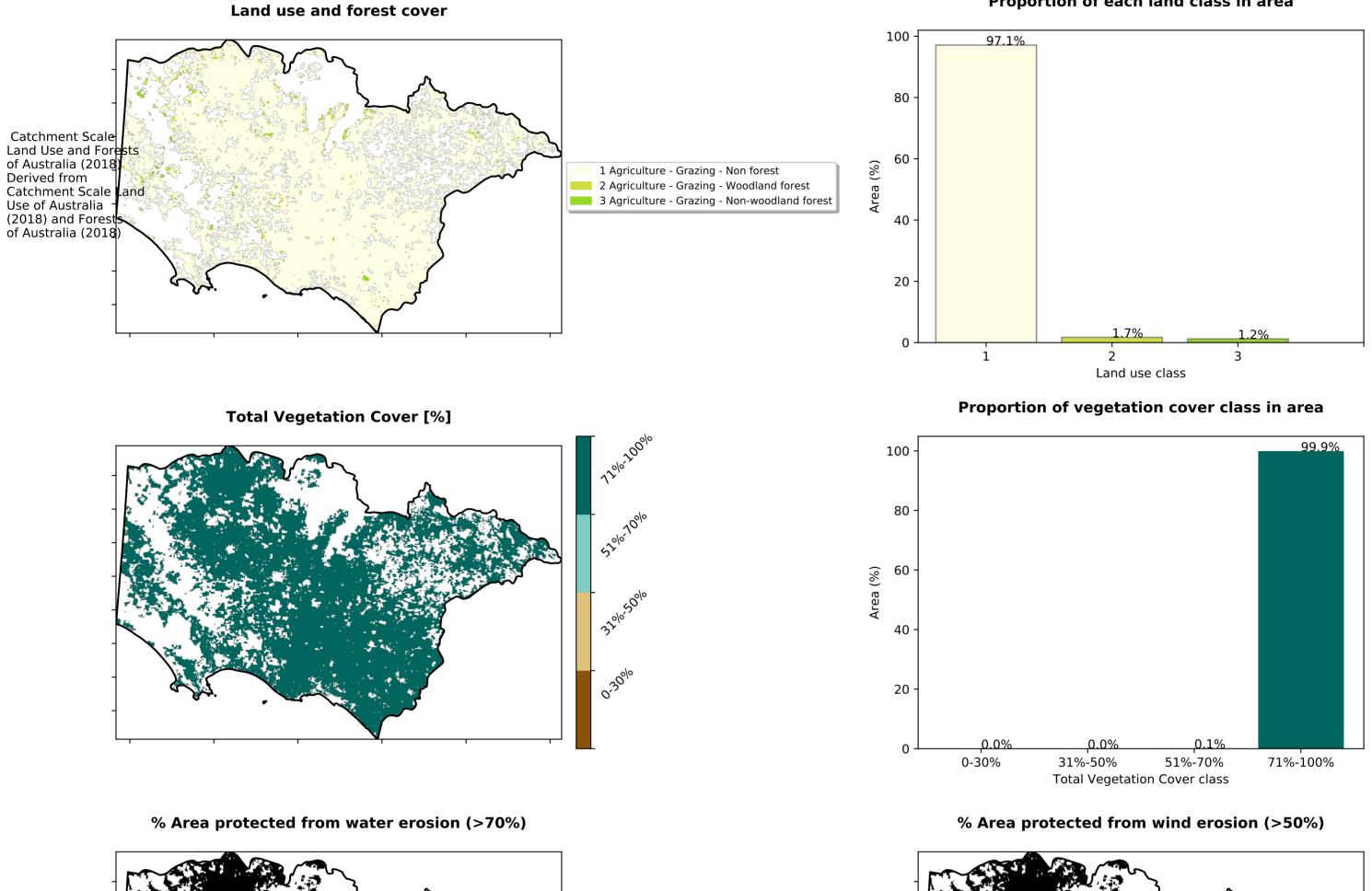


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)

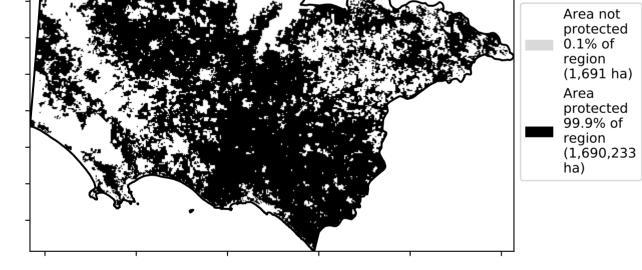
Australian Government



### Grazing

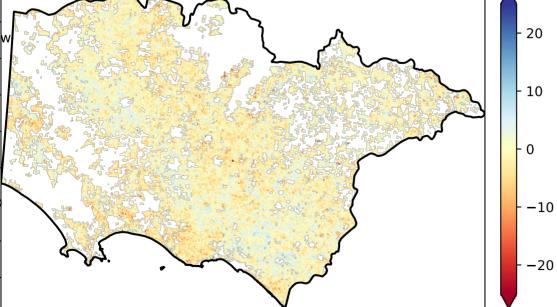


Proportion of each land class in area

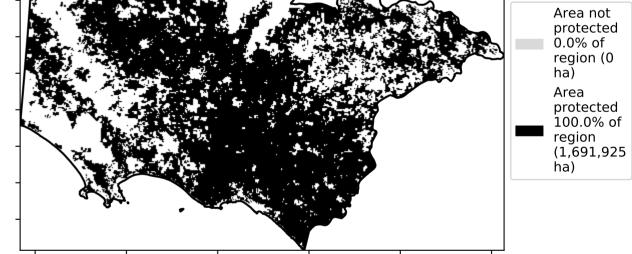


**Total Vegetation Cover Anomaly [%]** 

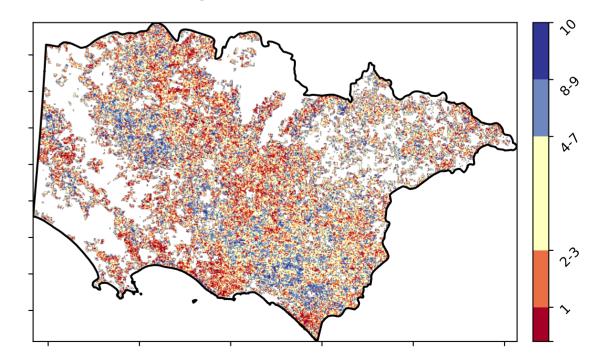
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



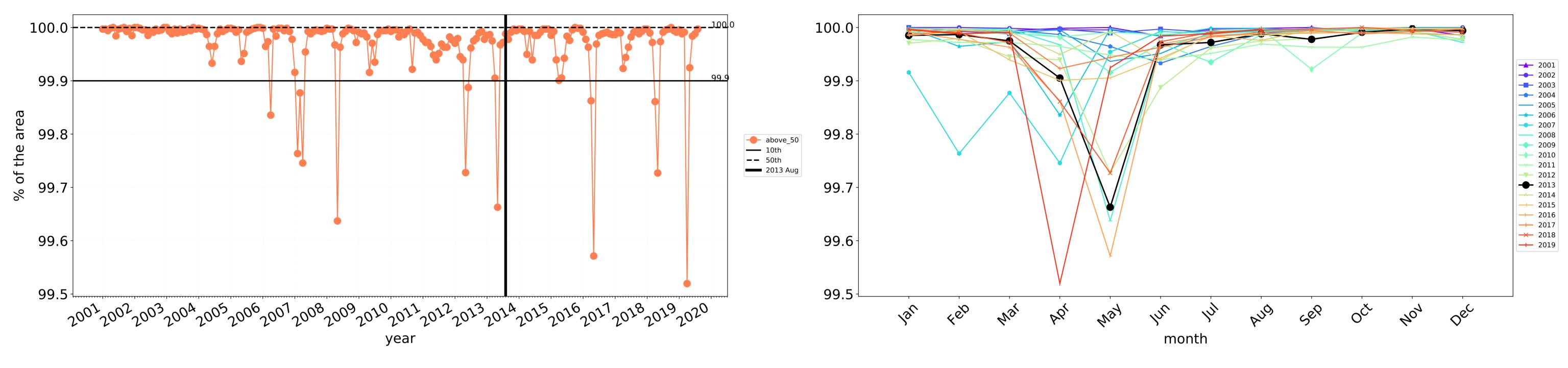
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.



Total Vegetation Cover Decile [%]

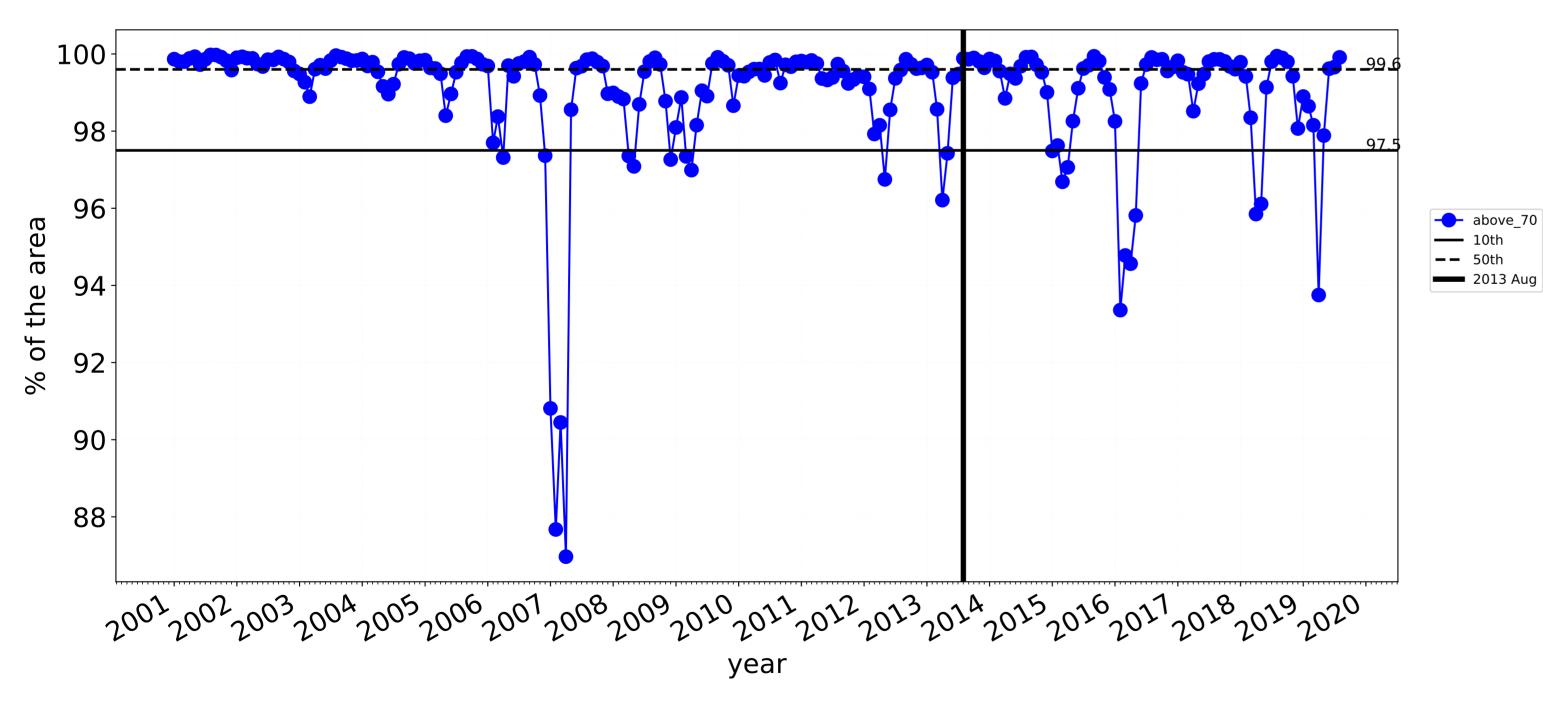






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

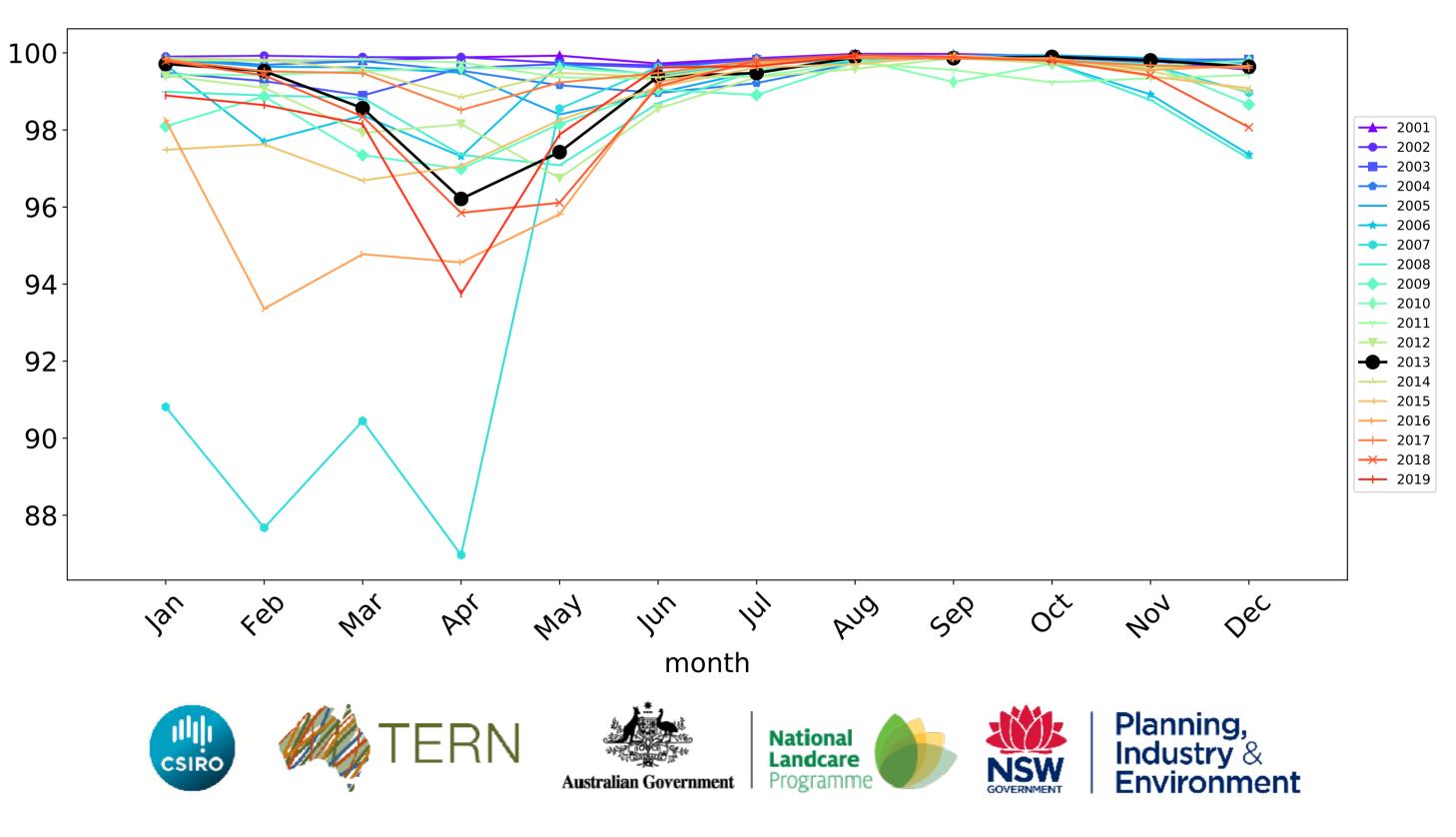
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

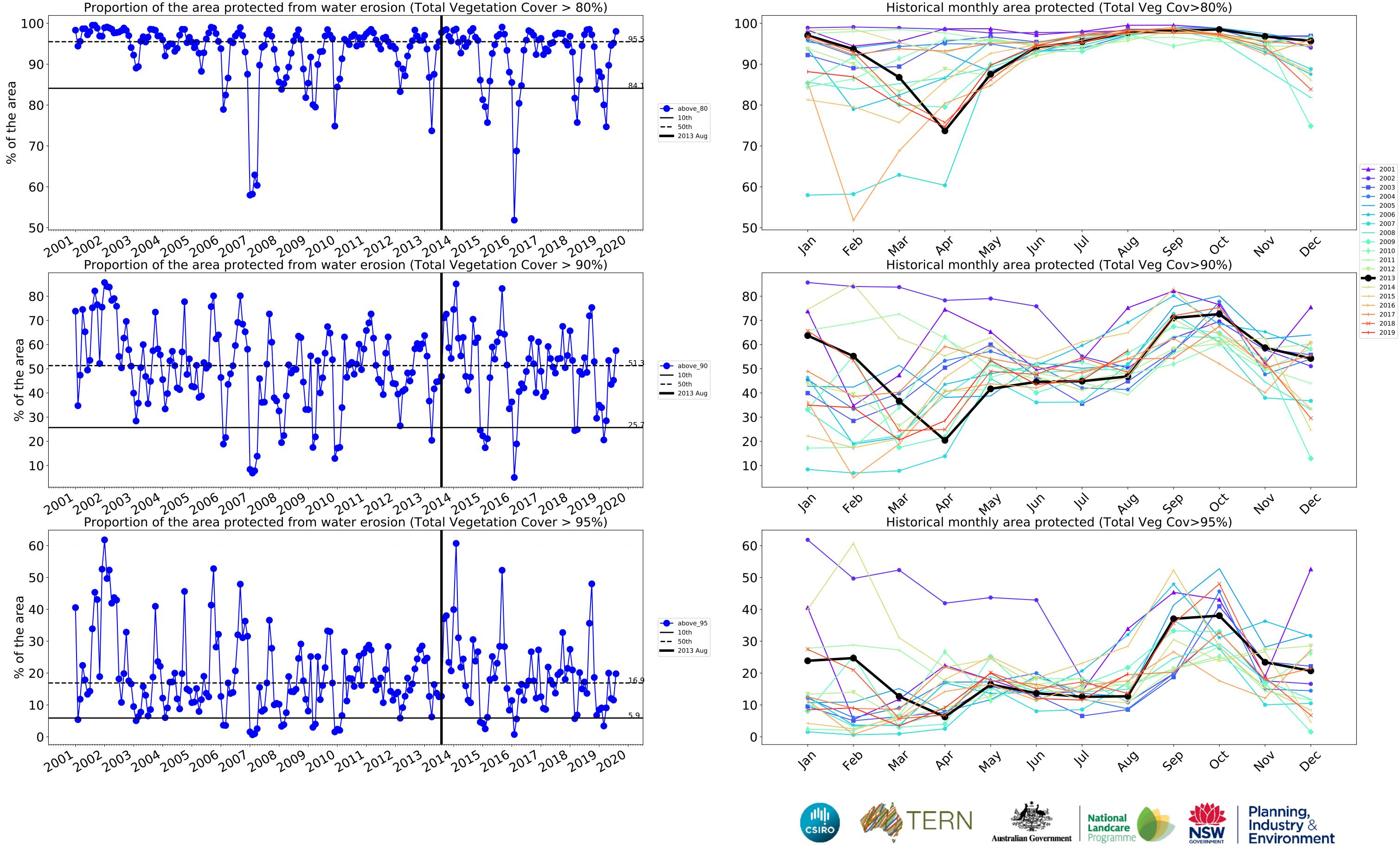




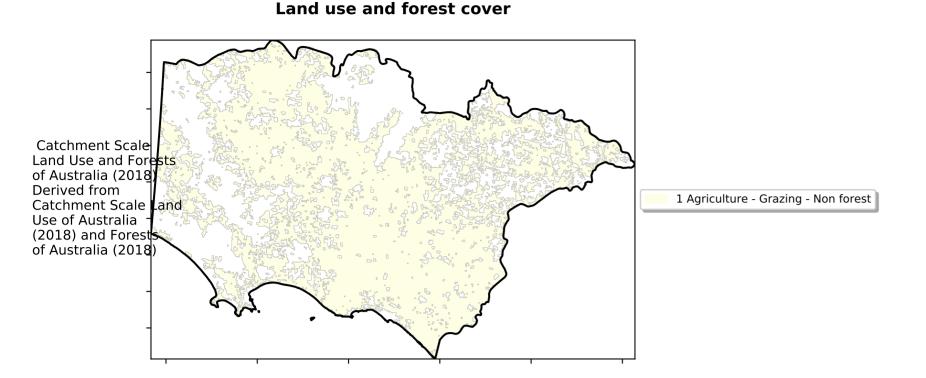
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

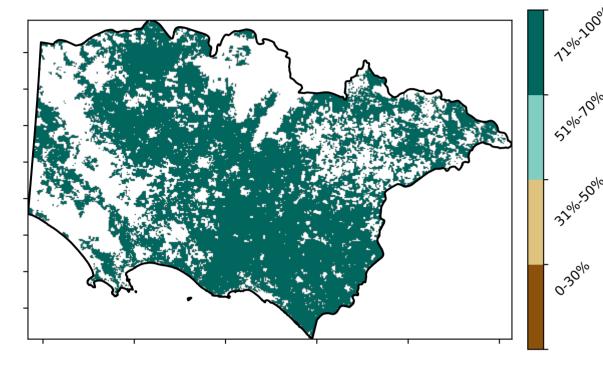




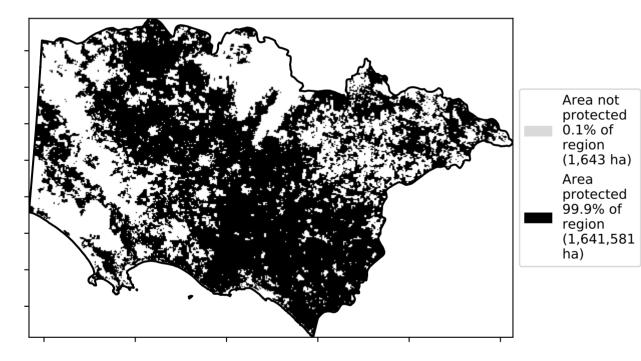
# **Grazing non forest**



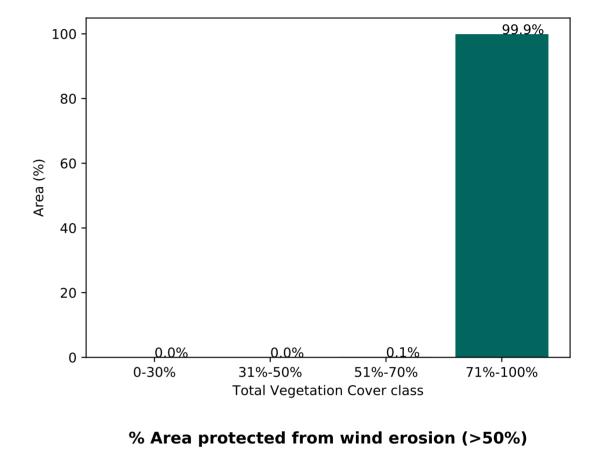
Total Vegetation Cover [%]

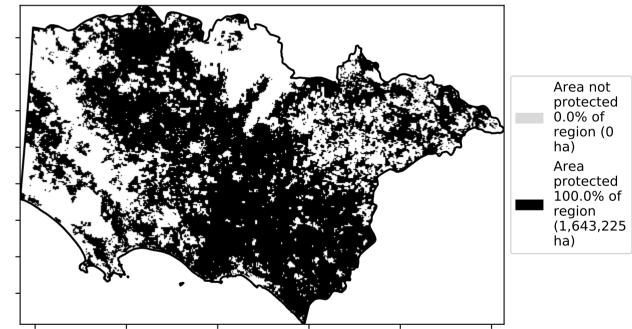


% Area protected from water erosion (>70%)



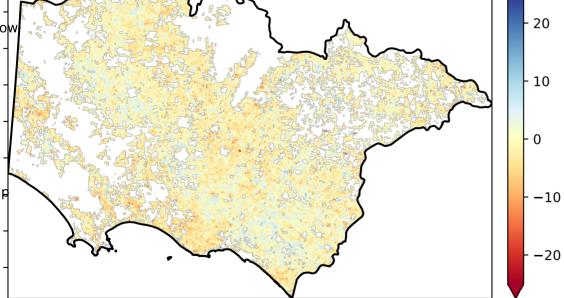
Proportion of vegetation cover class in area





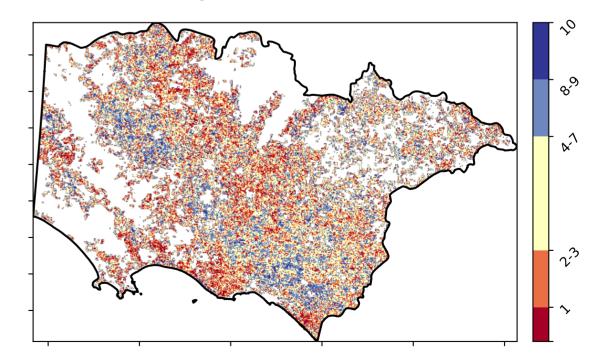
**Total Vegetation Cover Anomaly [%]** 

Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% 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.

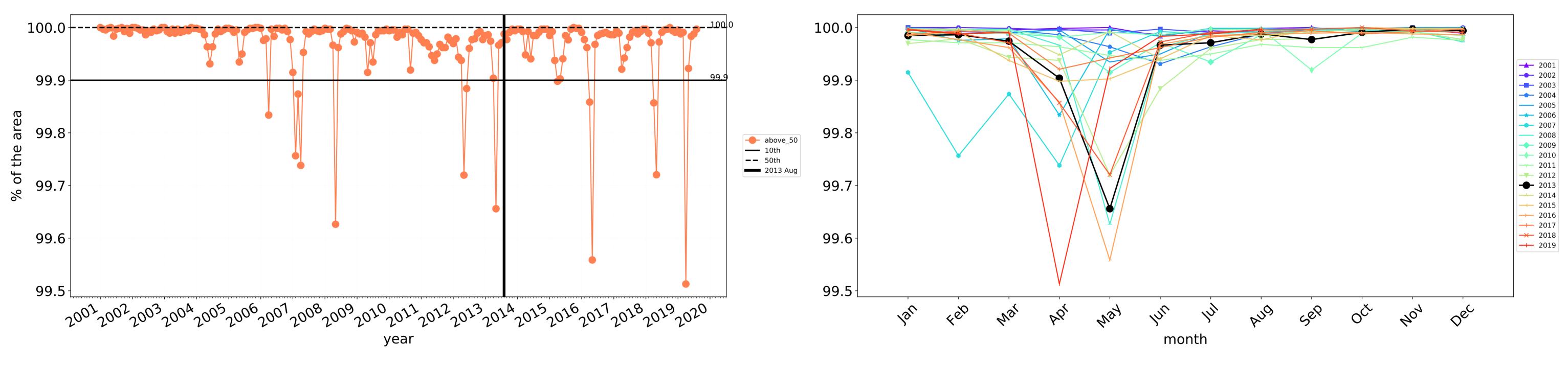


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

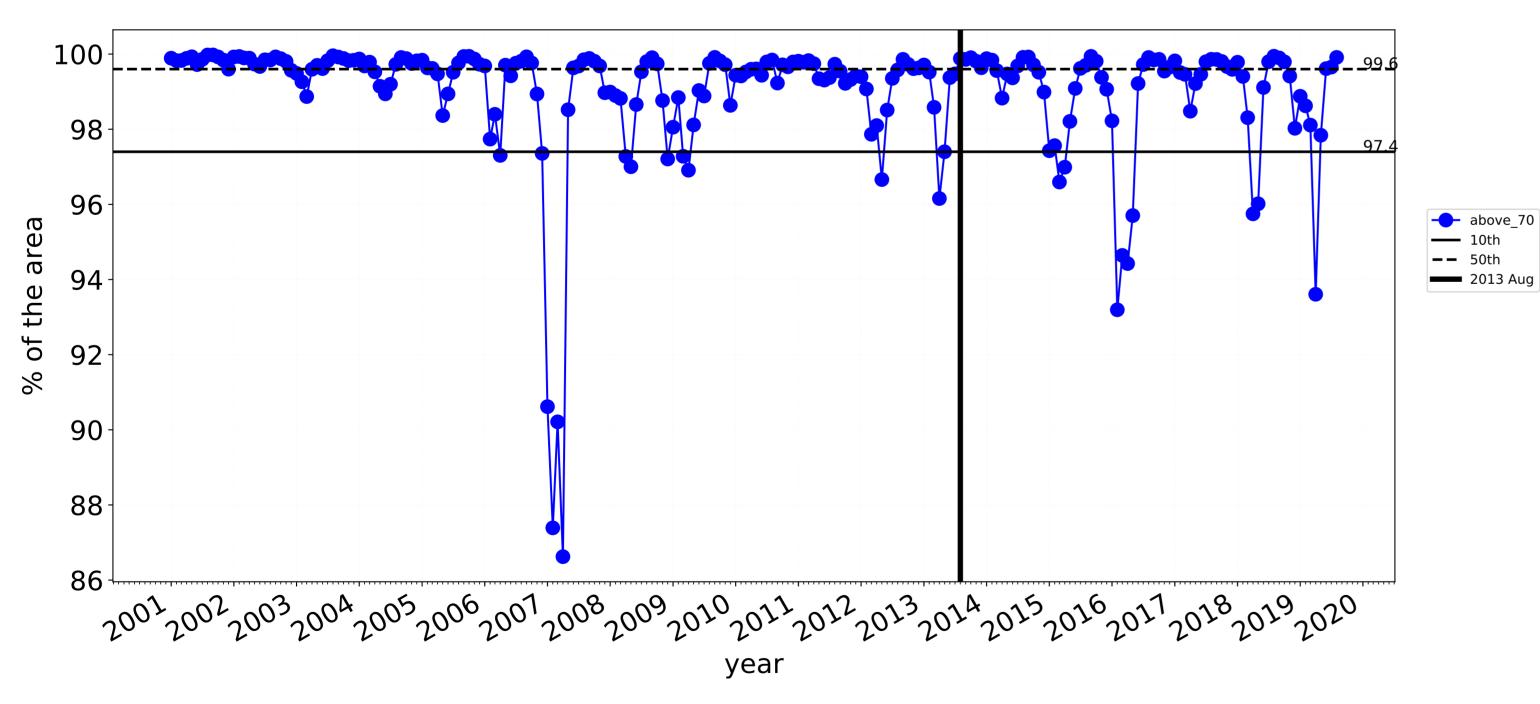




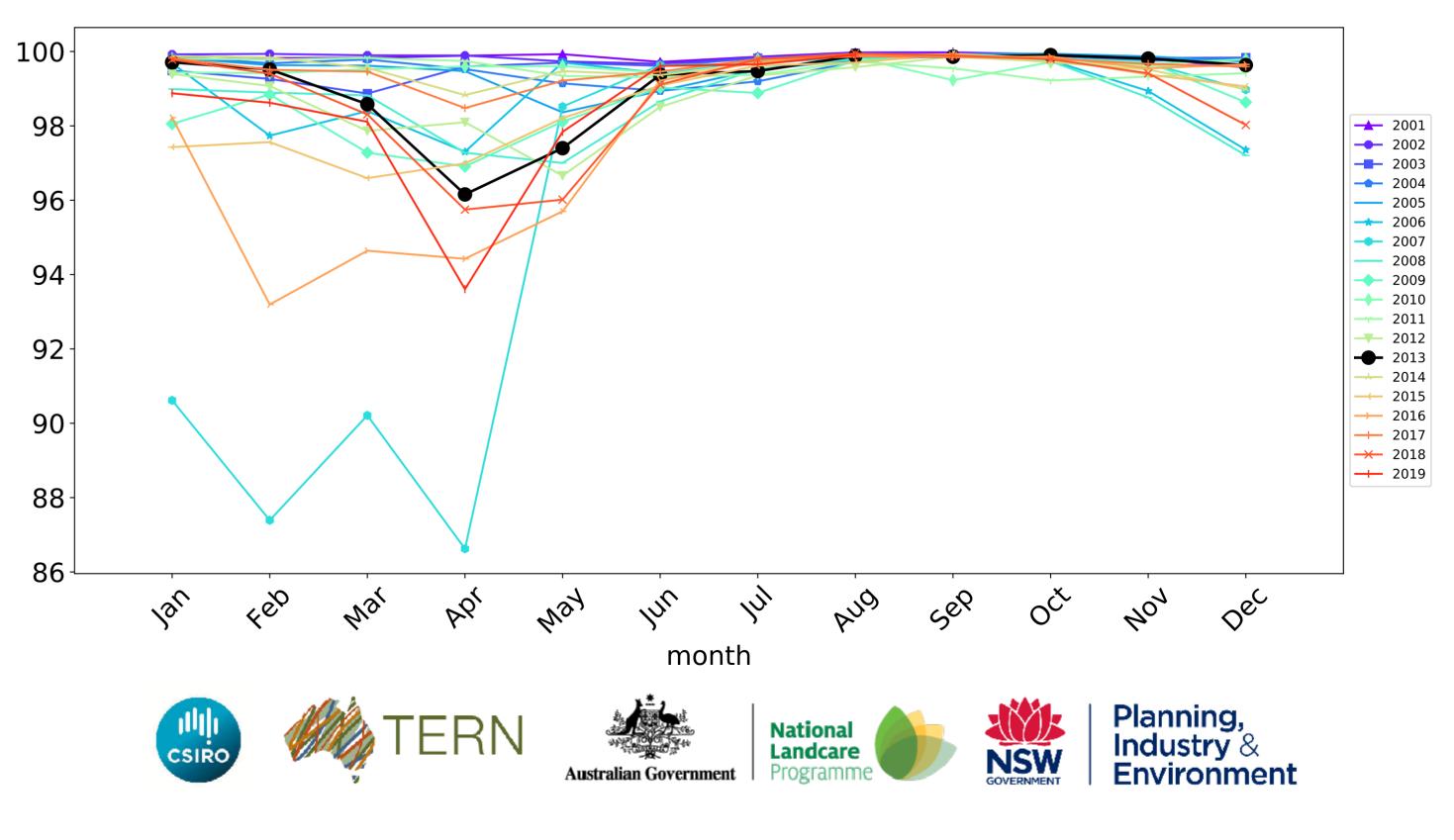


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

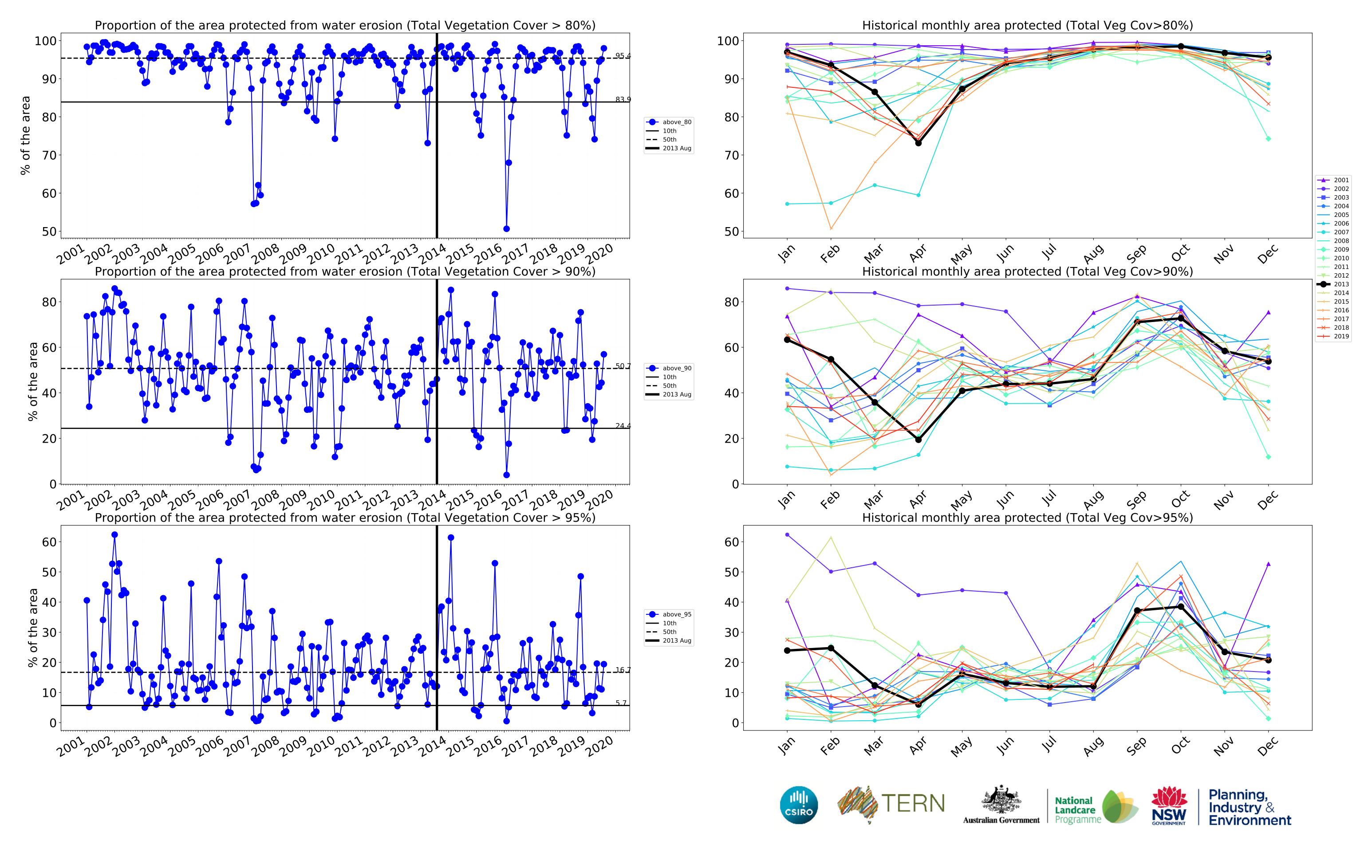
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



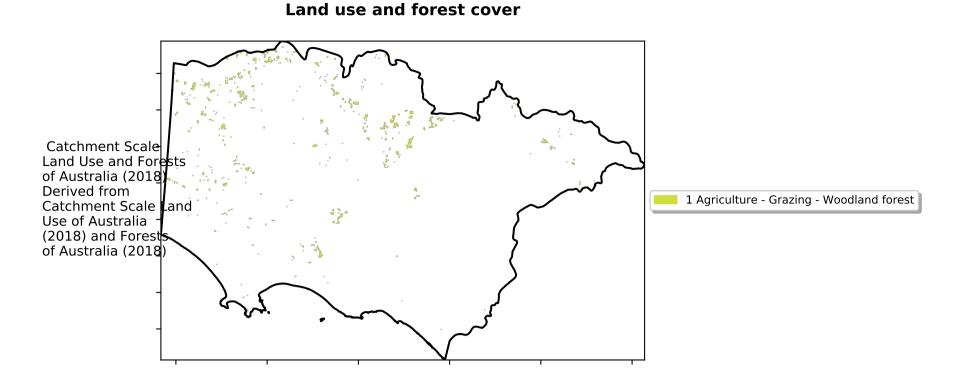
Wind erosion historical monthly area protected (Total Veg Cov >50%)



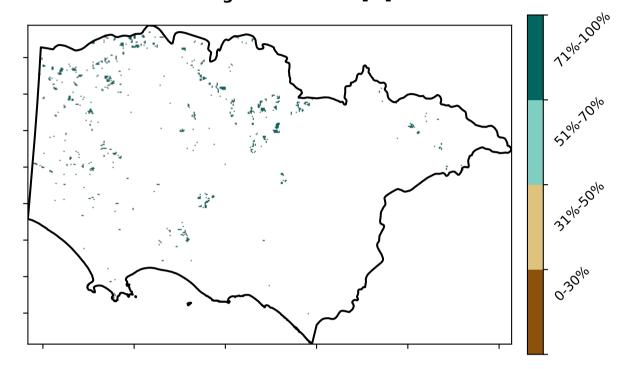
Water erosion historical monthly area protected (Total Veg Cov>70%)



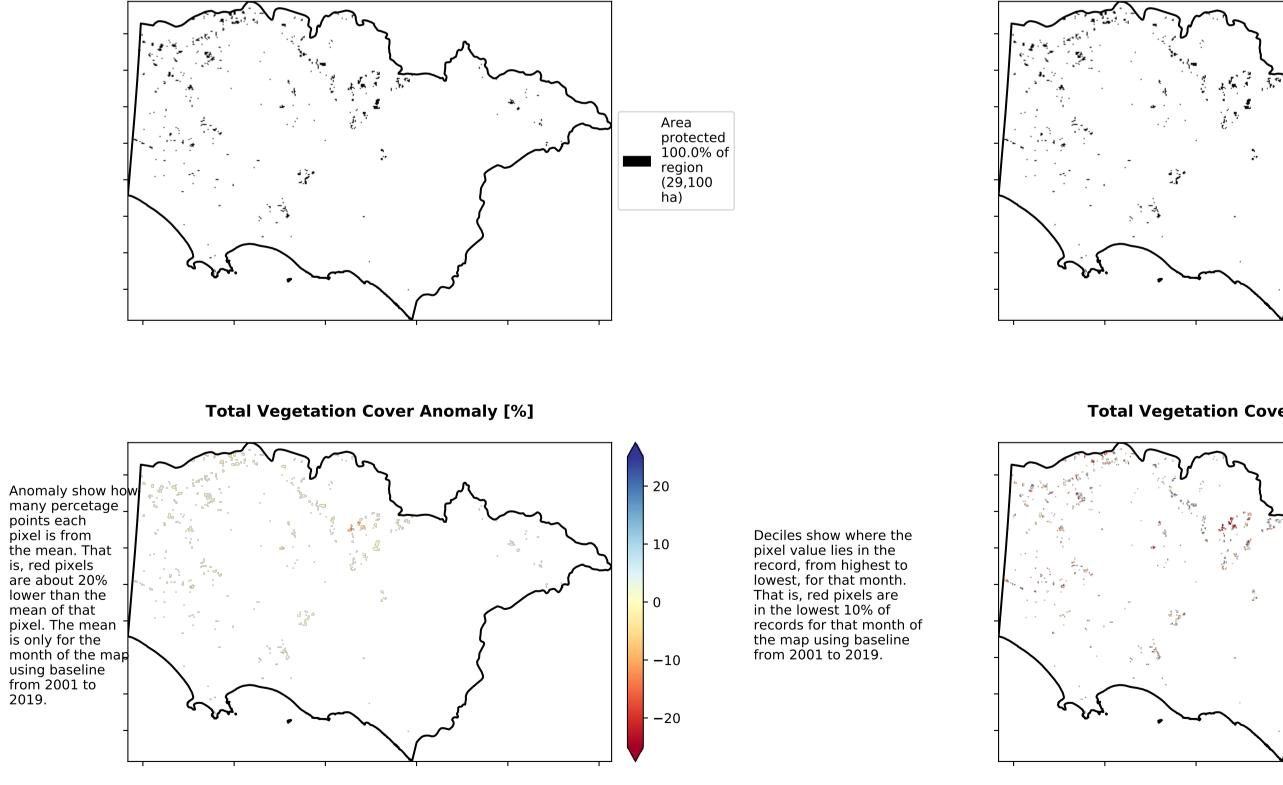
# **Grazing Woodland forest**



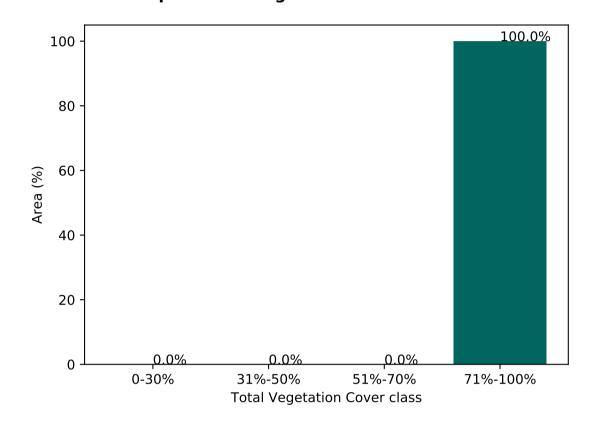
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



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

Area

ha)

\$

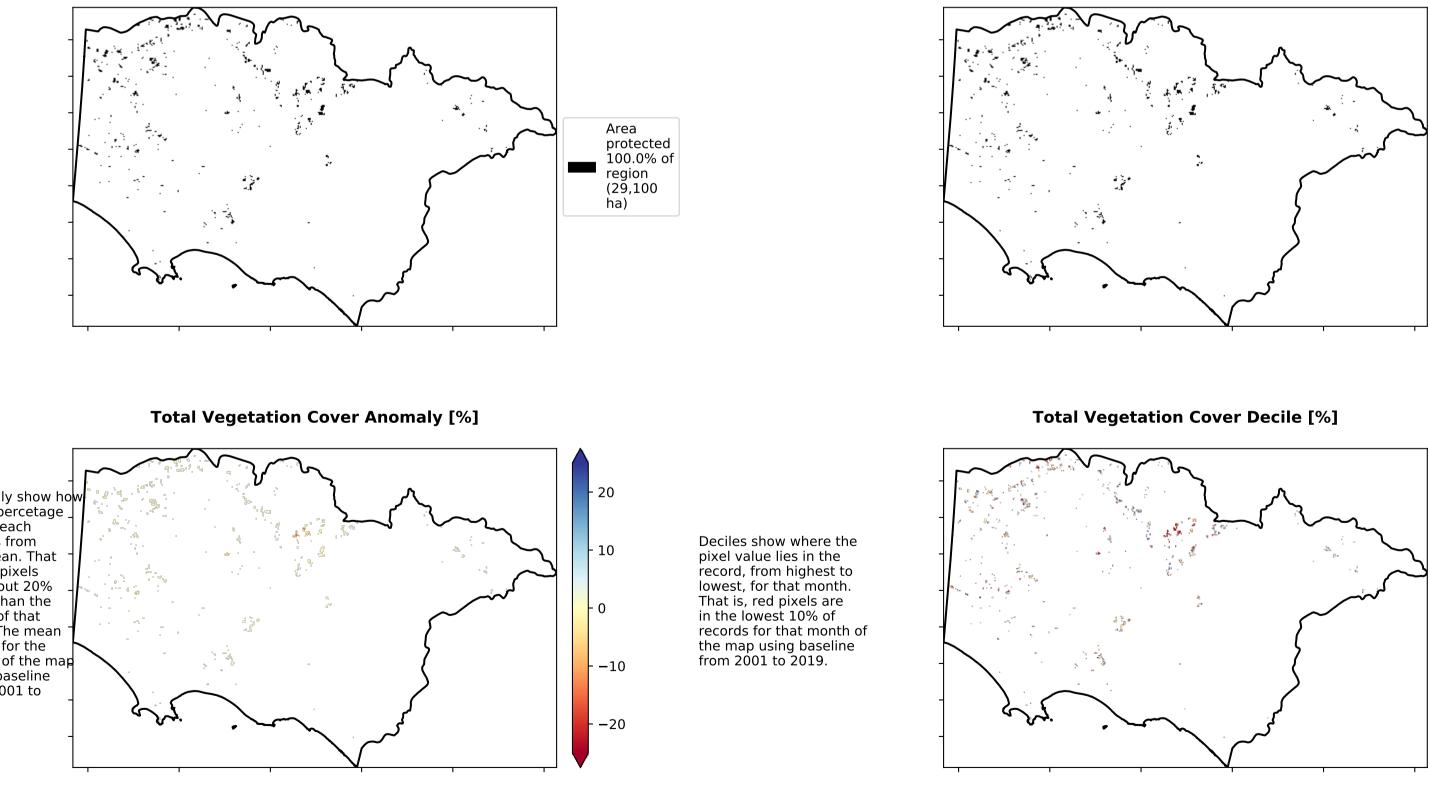
ଚ୍ଚ

x<sup>-1</sup>

~??

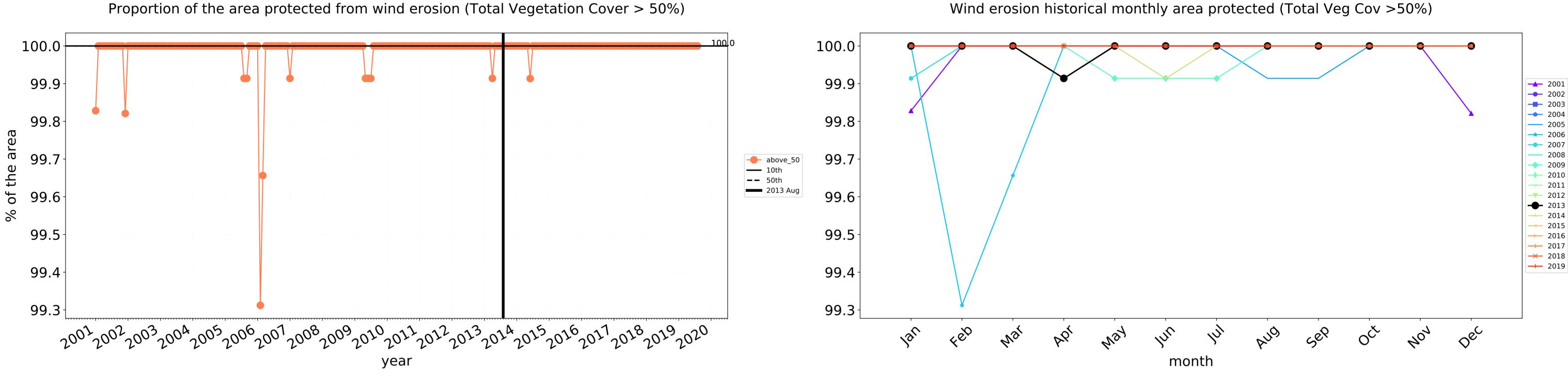
protected 100.0% of

region (29,100



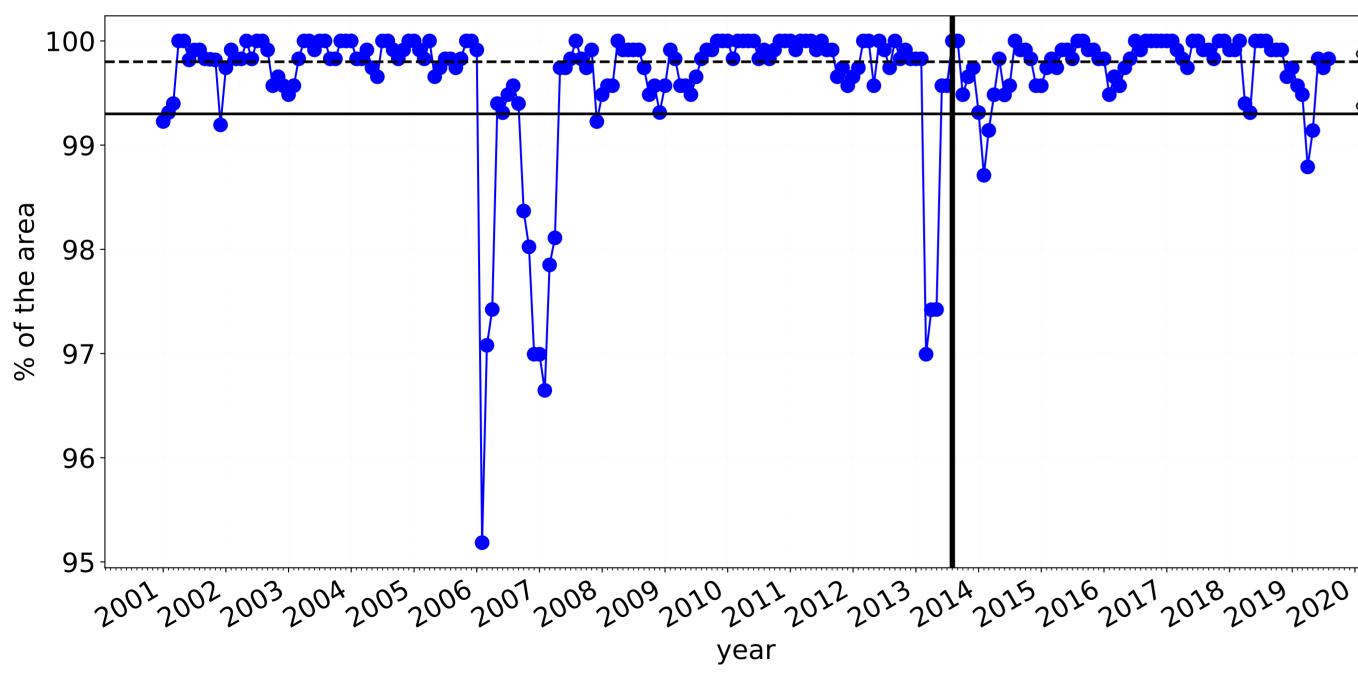


# Grazing Woodland forest timeseries



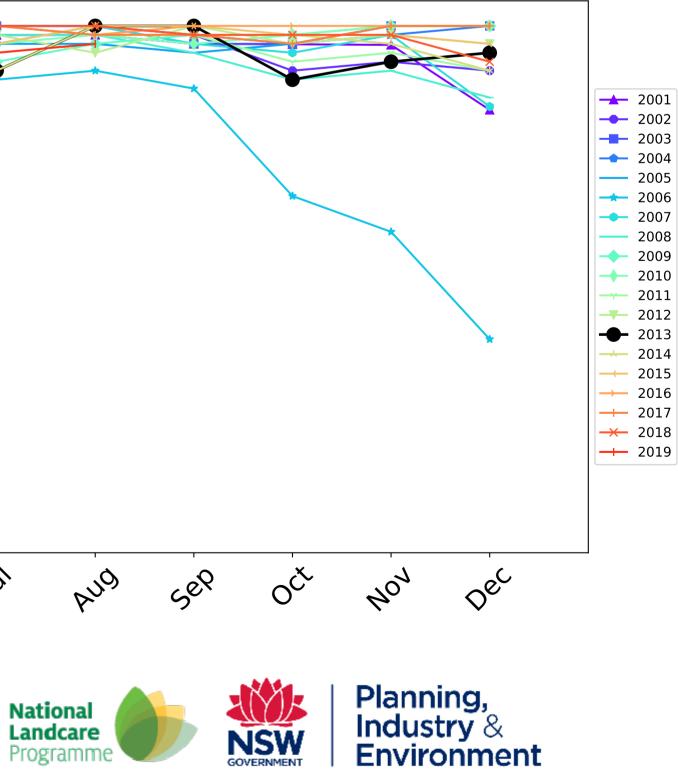
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

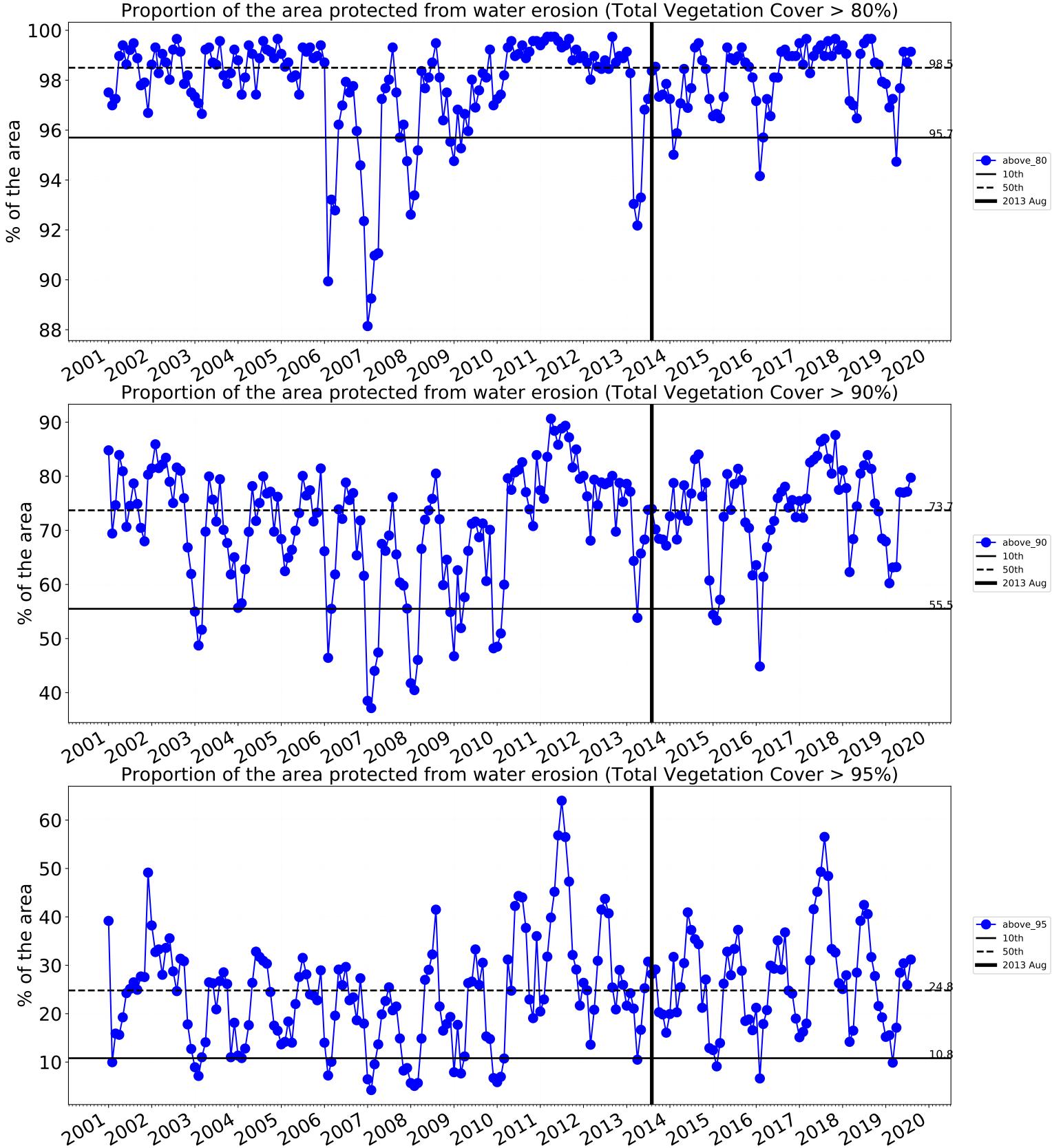
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



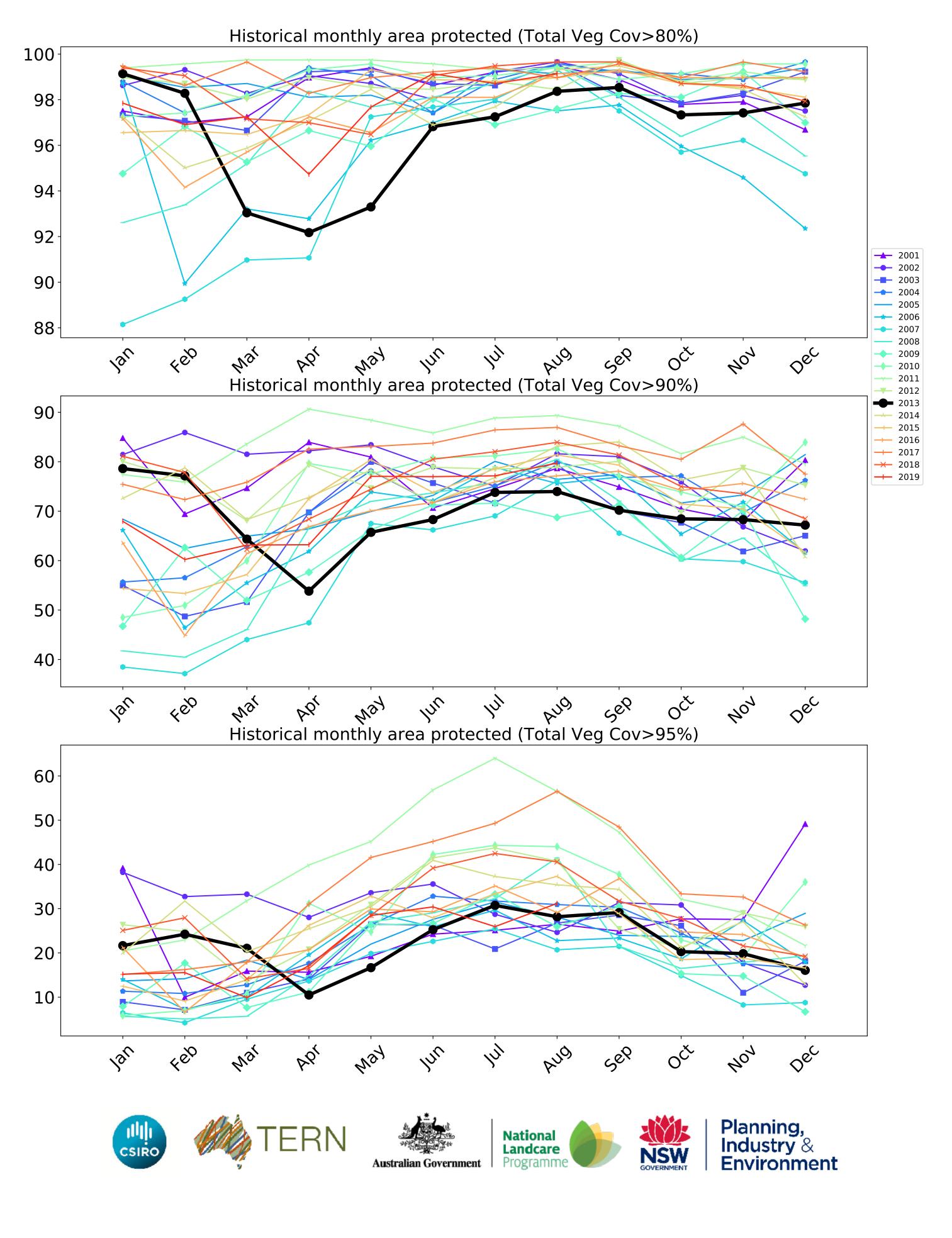
100 99 ---- above\_70 **——** 10th **——** 50th 98 **—** 2013 Aug 97 96 95 Jan 4eb Mai way In 1st Þ6, month FERN **HARD** CSIRC Australian Government

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

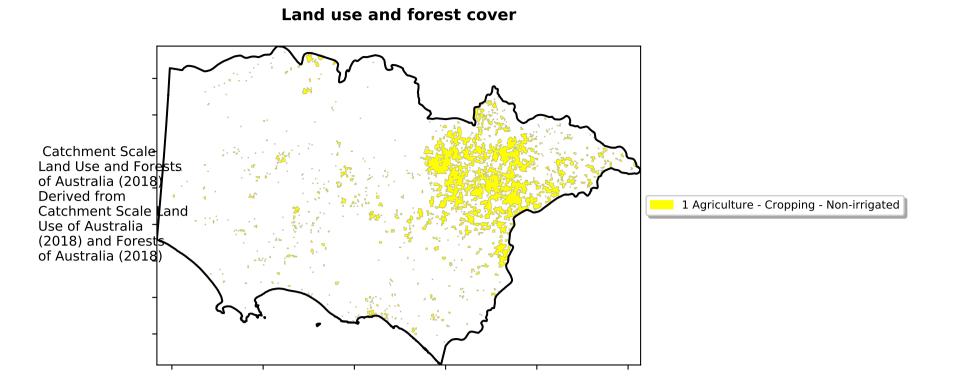




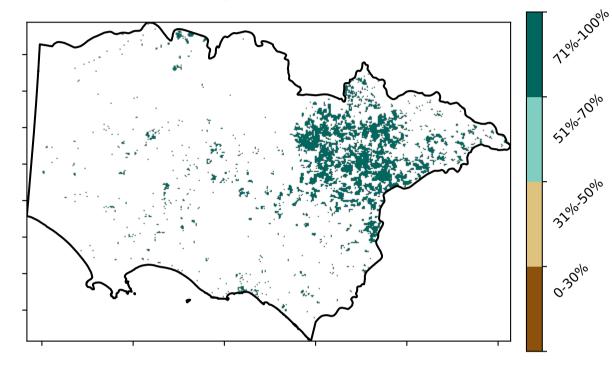
above\_90



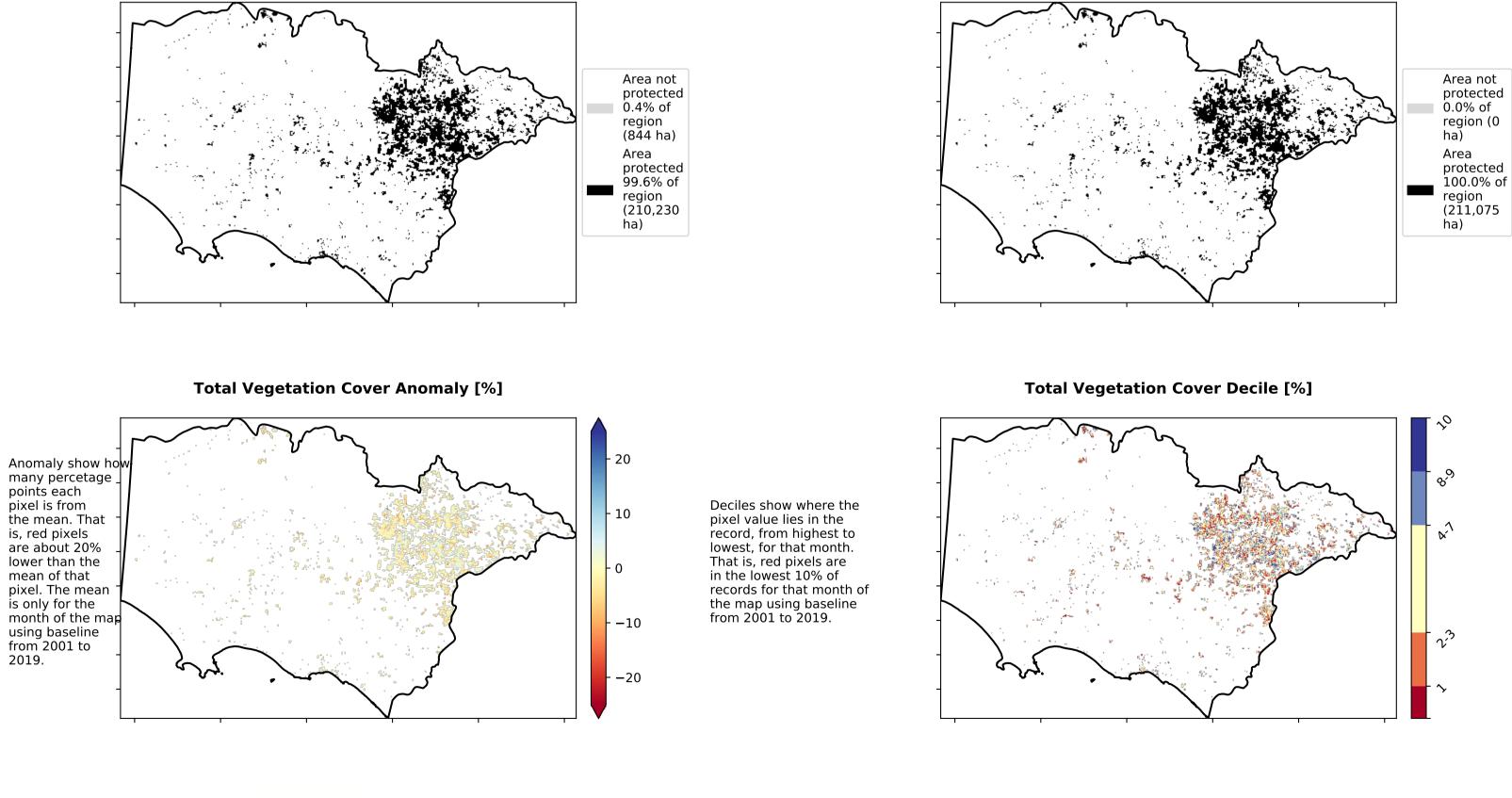
# Cropping



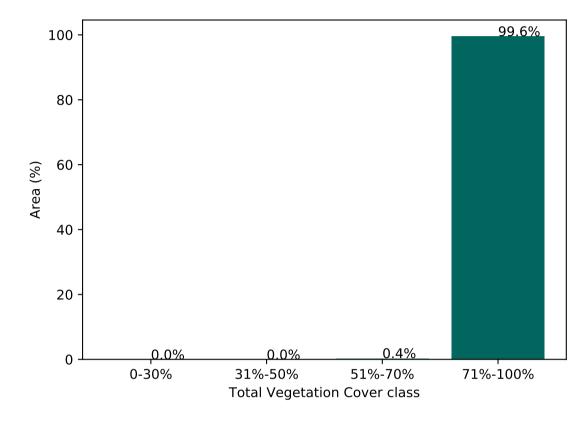
**Total Vegetation Cover [%]** 



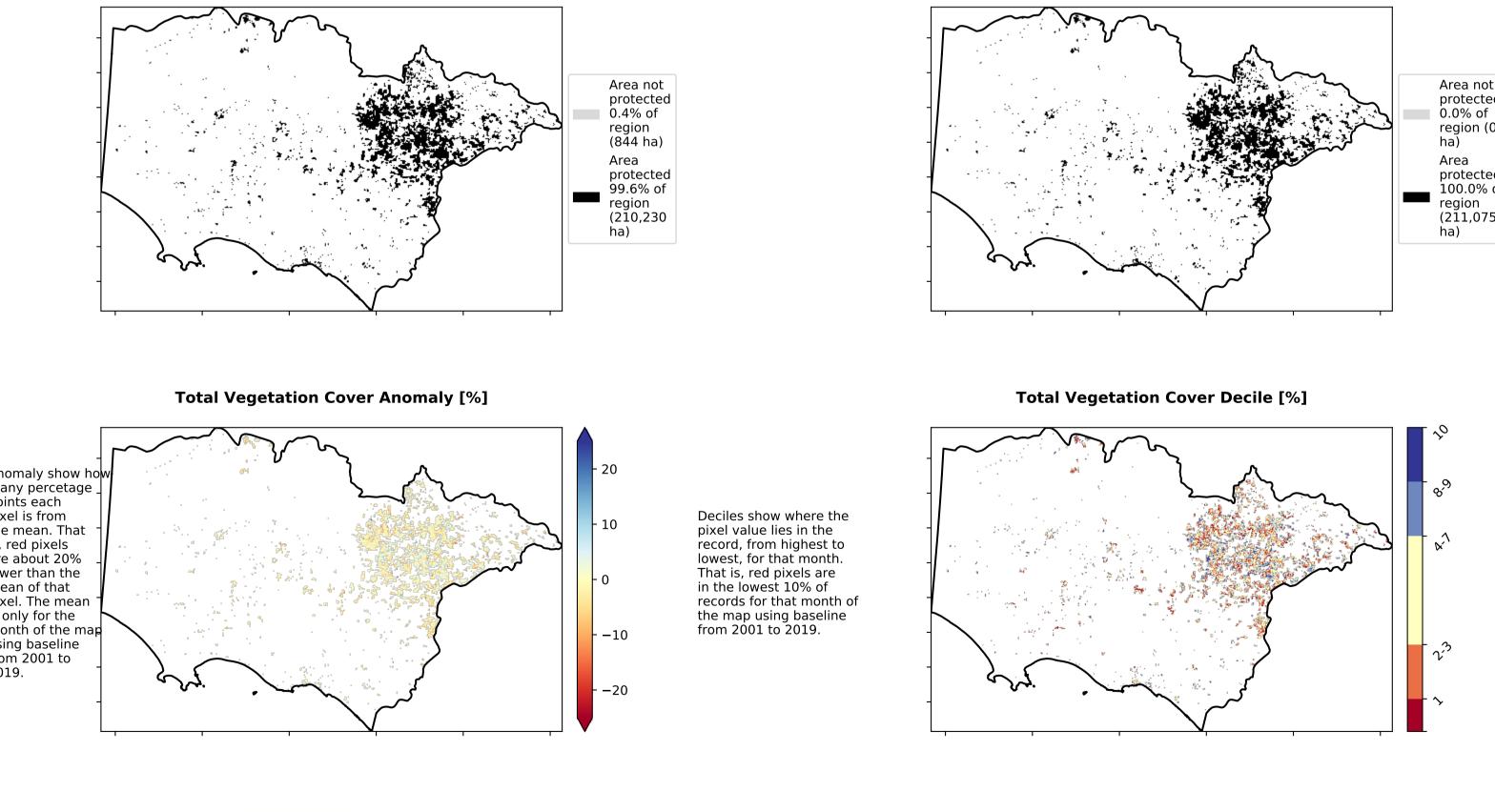
% Area protected from water erosion (>70%)



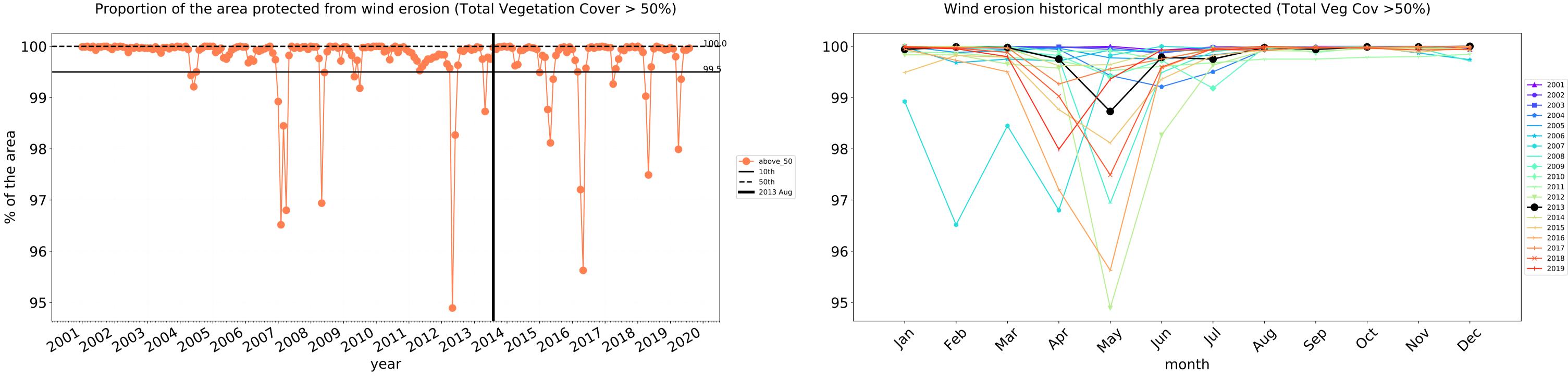
Proportion of vegetation cover class in area



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

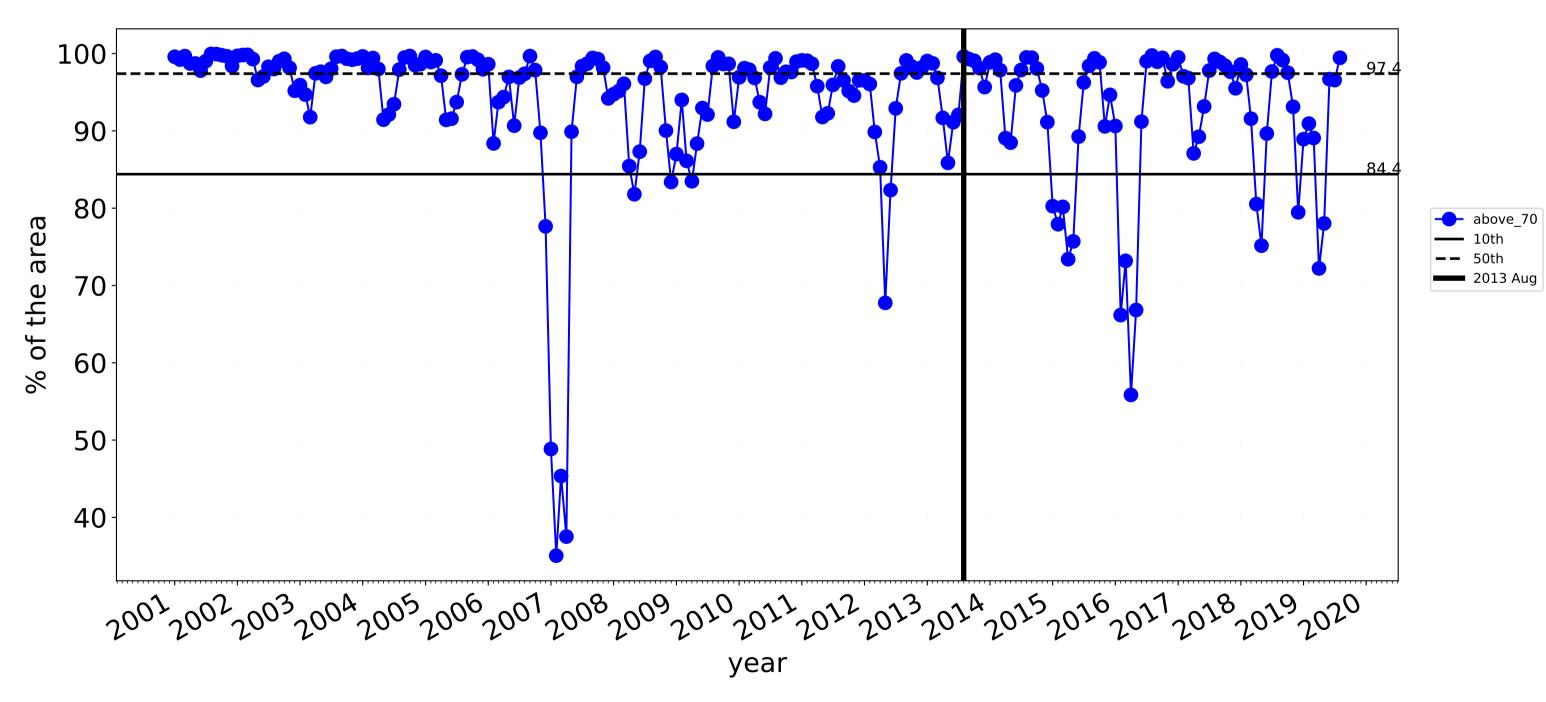






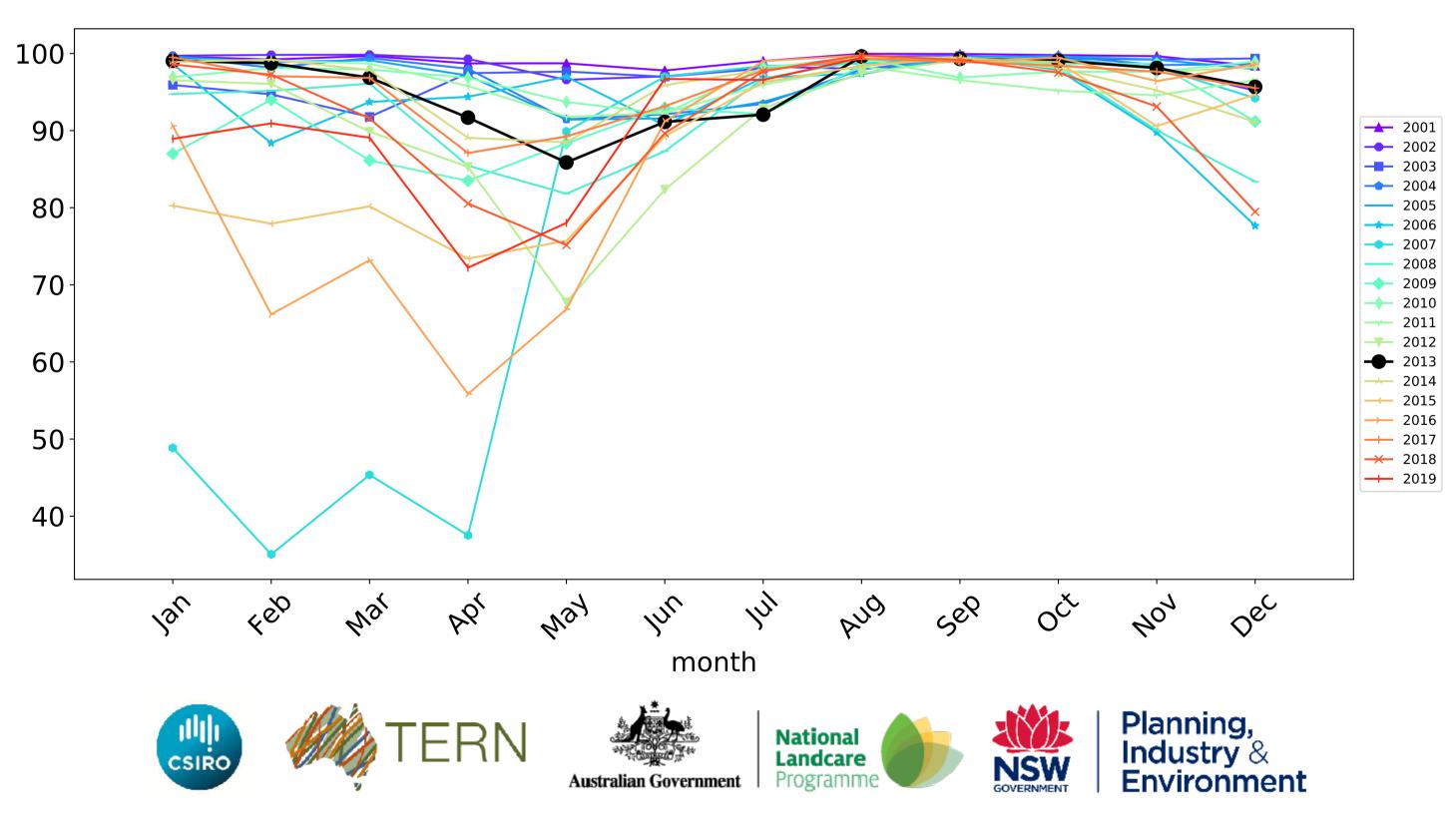
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

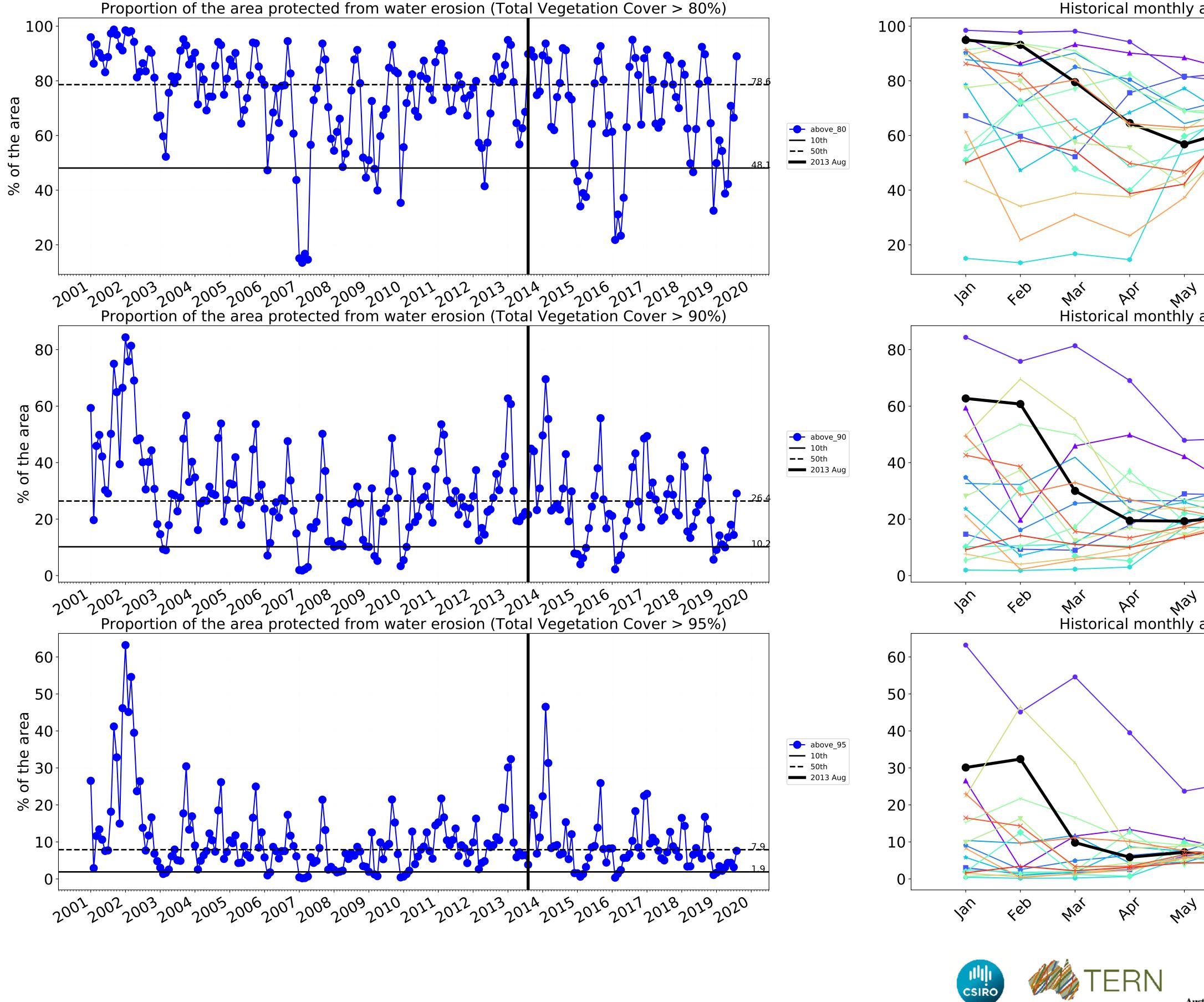


# **Cropping timeseries**

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







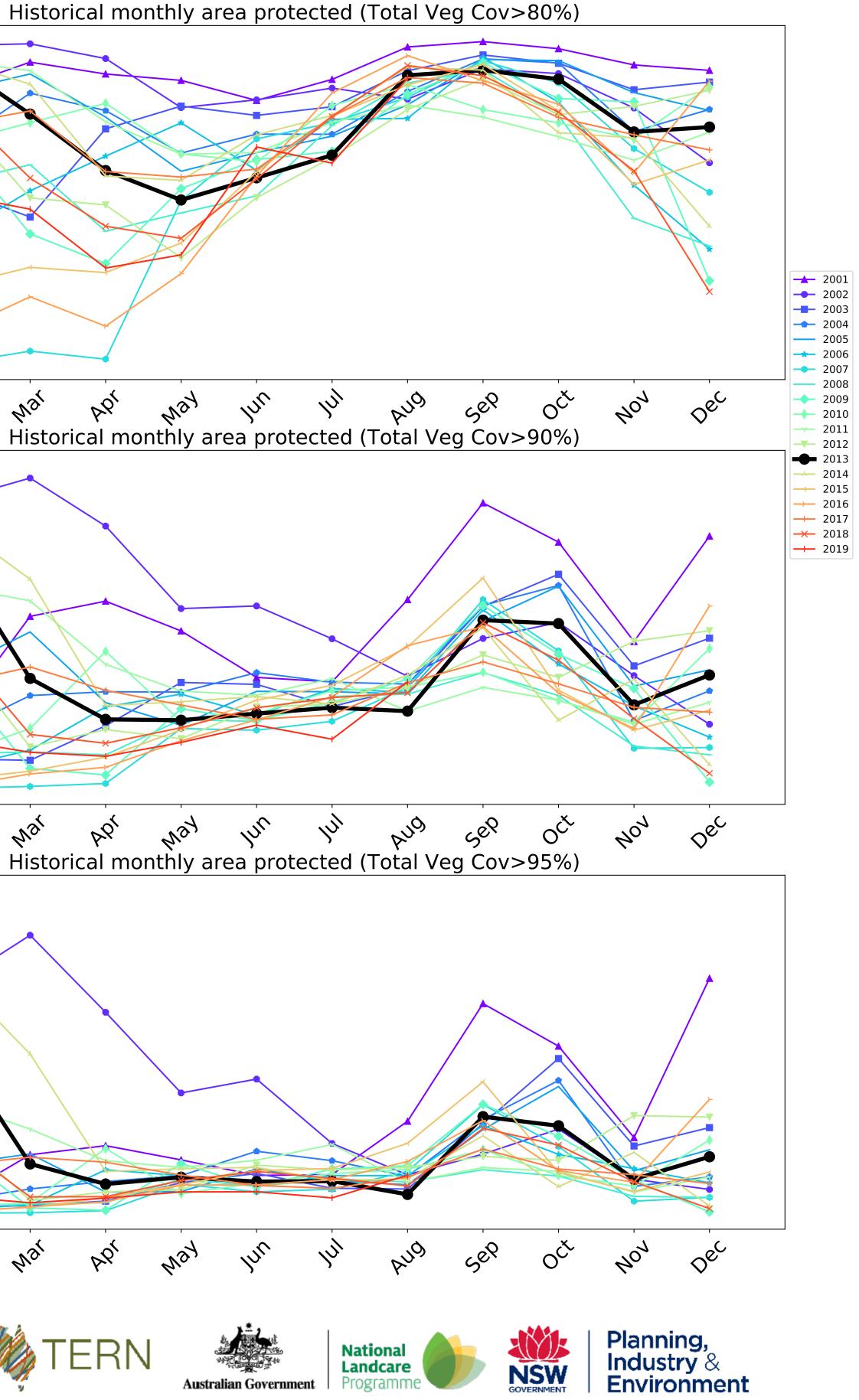
JUJ

2

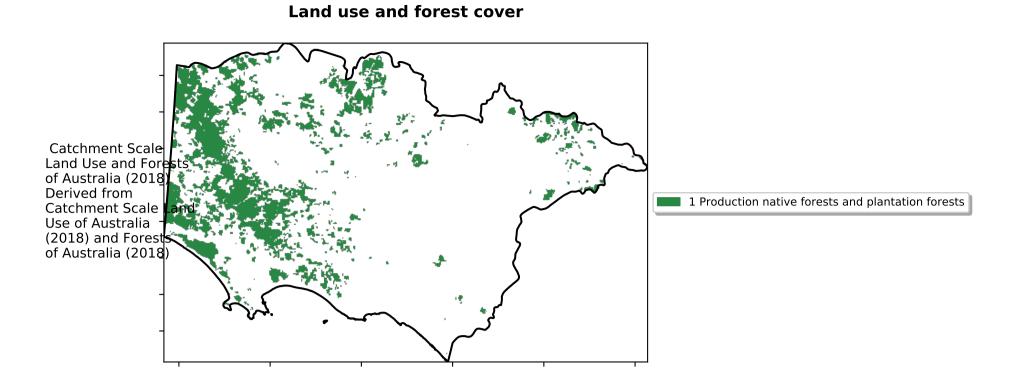
In

Australian Government

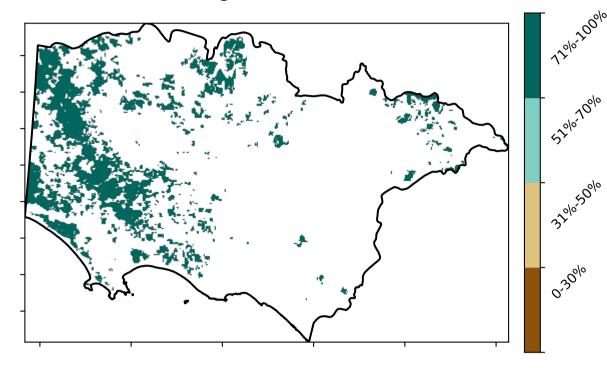
1's



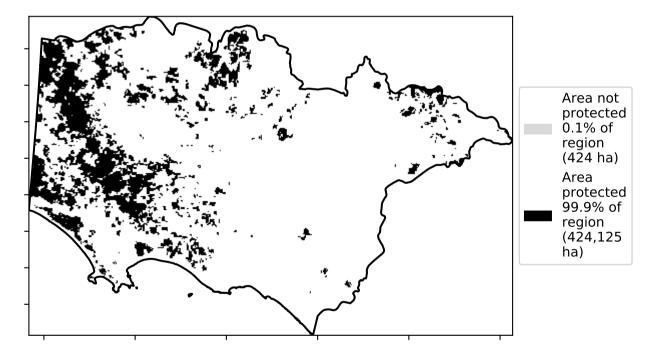
# **Production native forests and plantation forests**



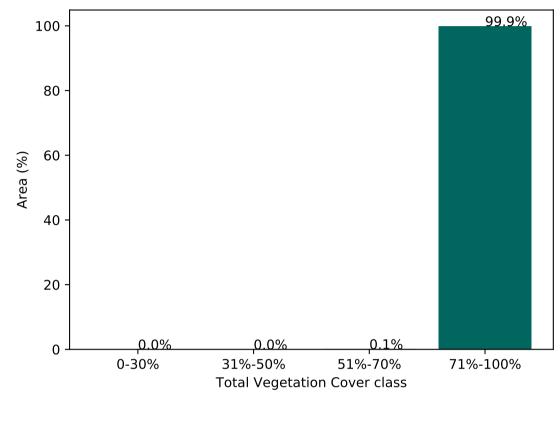
Total Vegetation Cover [%]



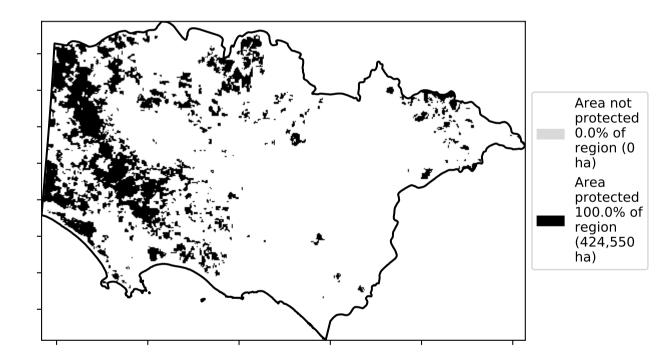
% Area protected from water erosion (>70%)



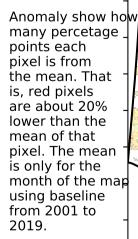


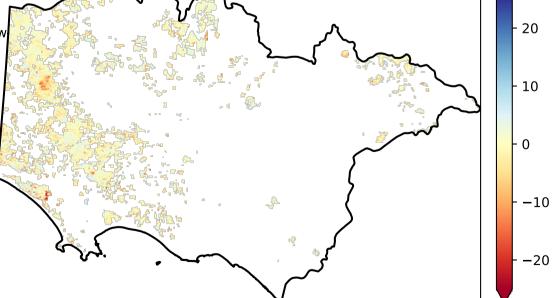


### % Area protected from wind erosion (>50%)



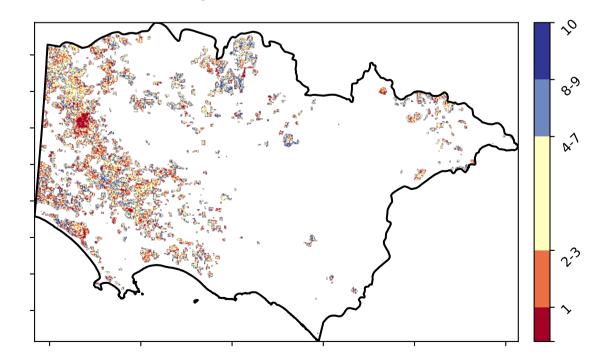
**Total Vegetation Cover Anomaly [%]** 





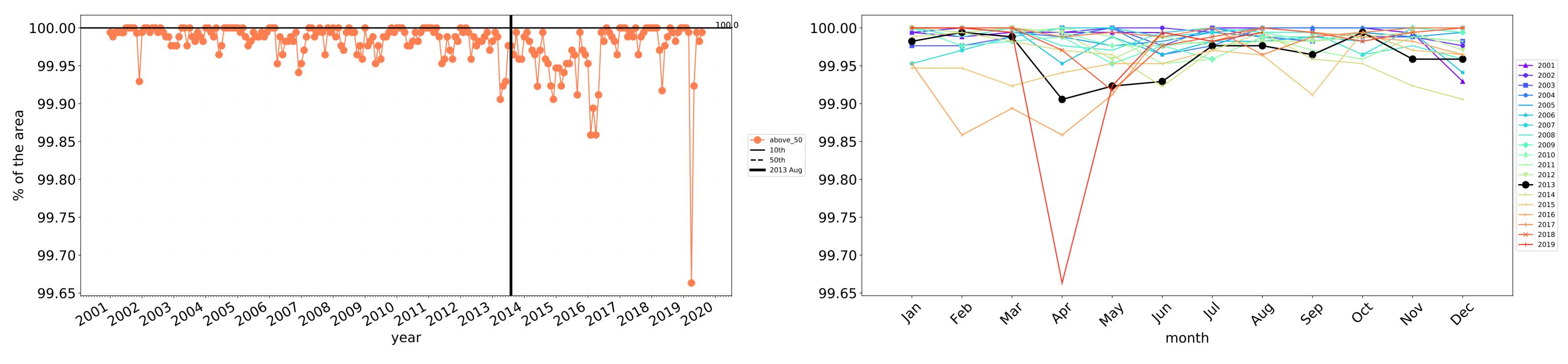
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



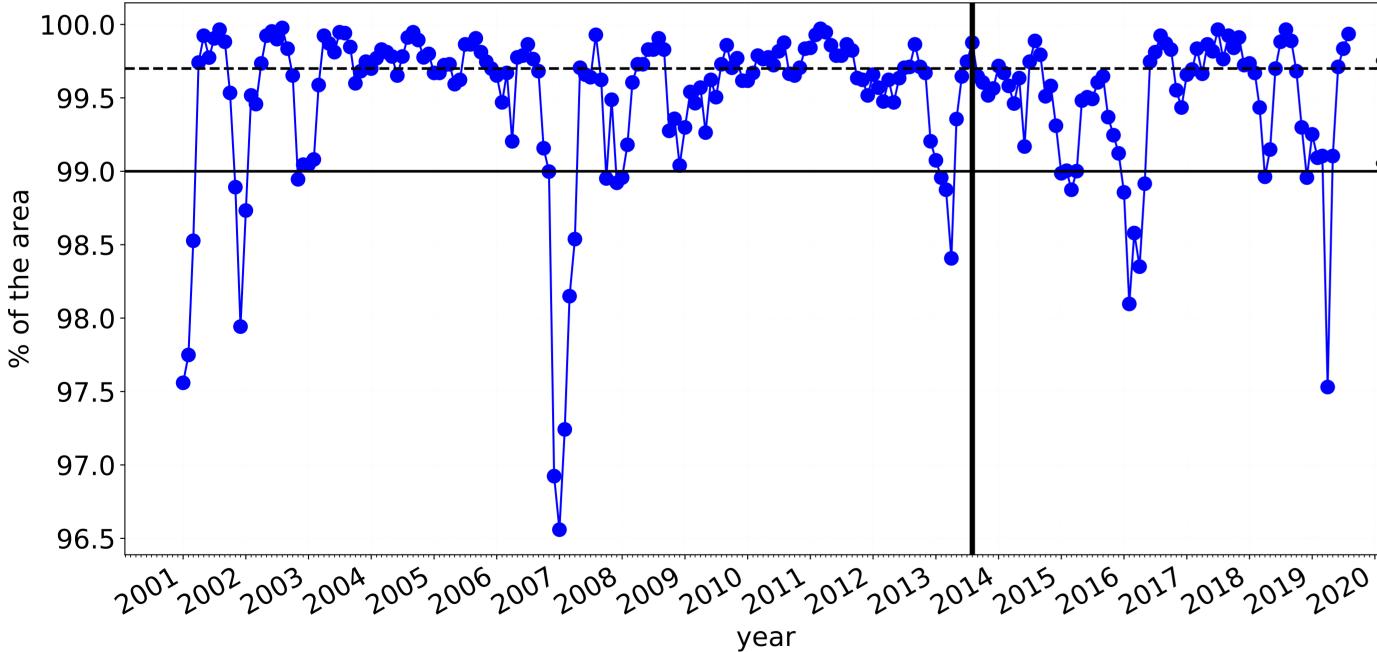


# Production native forests and plantation forests timeseries



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

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



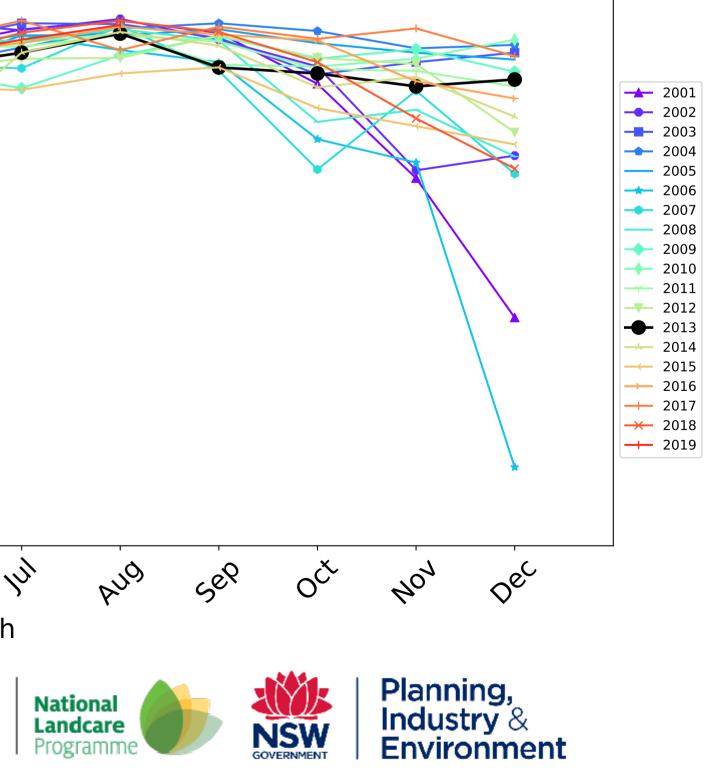


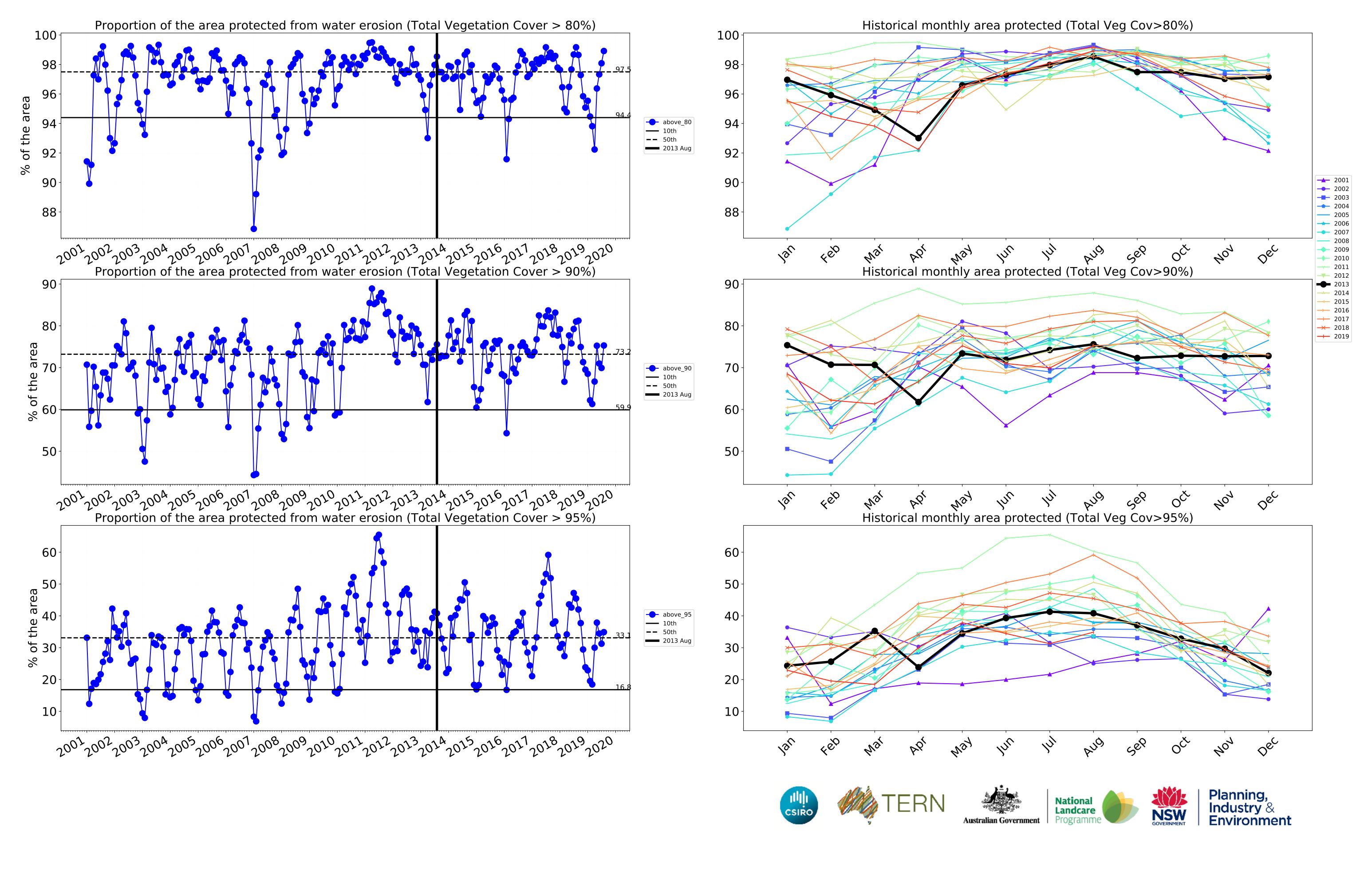
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0-99.5 99.0 --- above\_70 **—** 10th **--** 50th 98.5 98.0 97.5 97.0 96.5 feb lar May In P.Q' Mai month ERN CSIRO Australian Government

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





# Glenelg Hopkins (2,657,975 ha and no data 15,206 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	2,657,975	100.0% 2,657,375	99.9% 2,656,125	99.5% 2,645,600	96.3% 2,560,705	50.8% 1,351,223	18.0% 478,947
Conservation and natural environments	254,425	99.9% 254,075	99.6% 253,350	97.9% 249,100	92.3% 234,750	64.0% 162,775	28.8% 73,375
Conservation and natural environments non forest	28,175	98.8% 27,825	96.5% 27,175	87.4% 24,625	76.8% 21,650	38.4% 10,825	14.6% 4,125
Conservation and natural environments Woodland forest	153,125	100.0% 153,125	100.0% 153,100	99.5% 152,325	95.9% 146,850	67.7% 103,700	26.9% 41,175
Conservation and natural environments Forest (non woodland)	73,125	100.0% 73,125	99.9% 73,075	98.7% 72,150	90.6% 66,250	66.0% 48,250	38.4% 28,075
Agriculture	1,904,650	100.0% 1,904,550	100.0% 1,904,400	99.9% 1,901,850	96.8% 1,844,500	44.0% 838,600	11.7% 223,375
Grazing	1,691,925	100.0% 1,691,825	100.0% 1,691,725	99.9% 1,689,975	97.7% 1,653,525	46.8% 792,625	12.7% 215,200
Grazing non forest	1,643,225	100.0% 1,643,125	100.0% 1,643,025	99.9% 1,641,275	97.7% 1,605,625	46.1% 756,925	12.1% 198,700
Grazing Woodland forest	29,100	100.0% 29,100	100.0% 29,100	100.0% 29,100	98.4% 28,625	74.0% 21,525	28.2% 8,200
Cropping	211,075	100.0% 211,075	100.0% 211,025	99.6% 210,250	89.8% 189,575	21.6% 45,575	3.8% 8,100
Production native forests and plantation forests	424,550	100.0% 424,475	100.0% 424,450	99.9% 424,025	98.5% 418,350	75.6% 320,875	40.8% 173,250

