### Total vegetation cover soil protection Region:NRM Burnett Mary QLD

# **Date: December 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

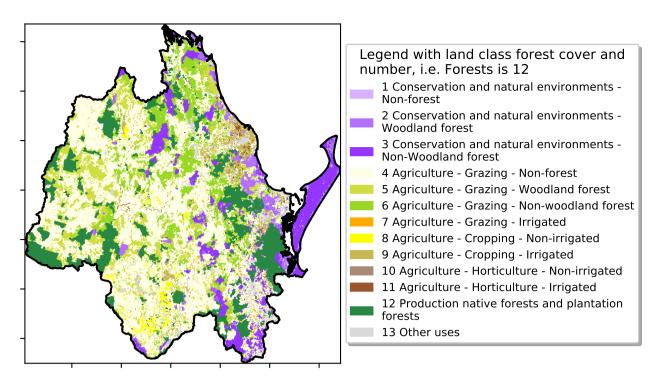


# **Vegetation Cover Dec 2013**

#### Land use and forest cover

#### Proportion of each land class in area

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



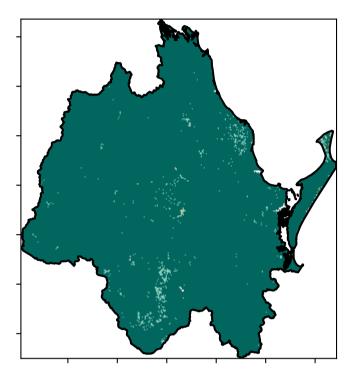
72%

52%70%

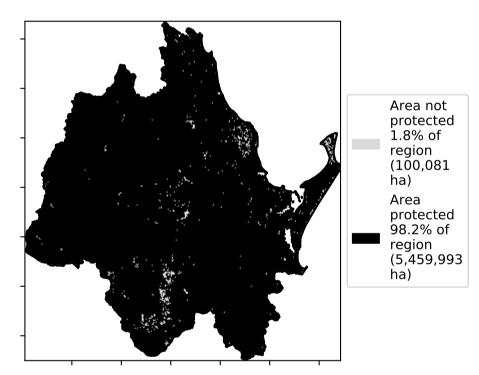
32%50%

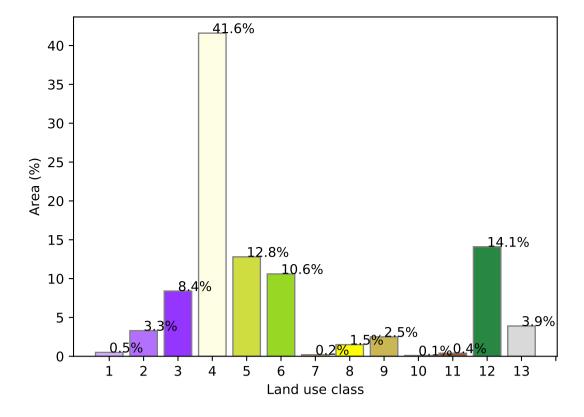
0.30%

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

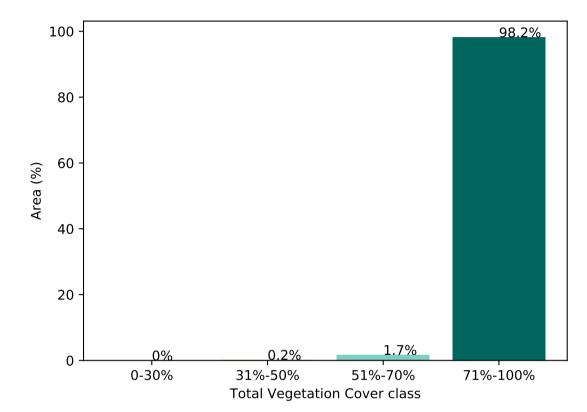


#### % Area protected from water erosion (>70%)

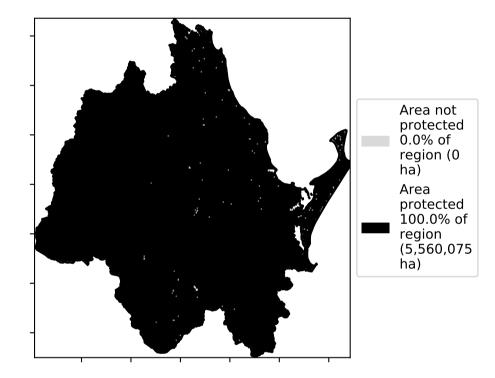




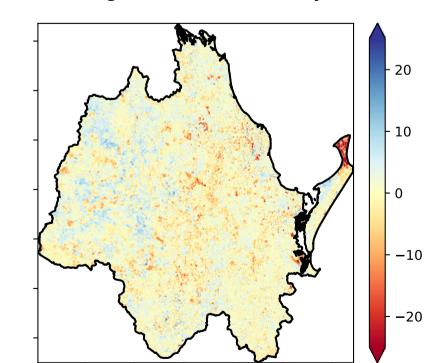
### Proportion of vegetation cover class in area



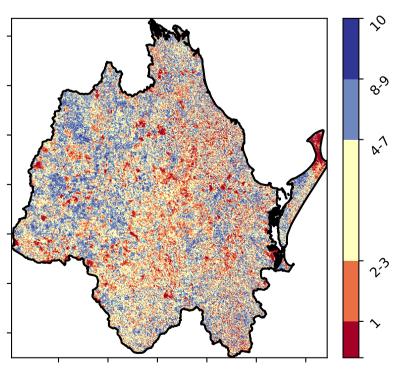
#### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

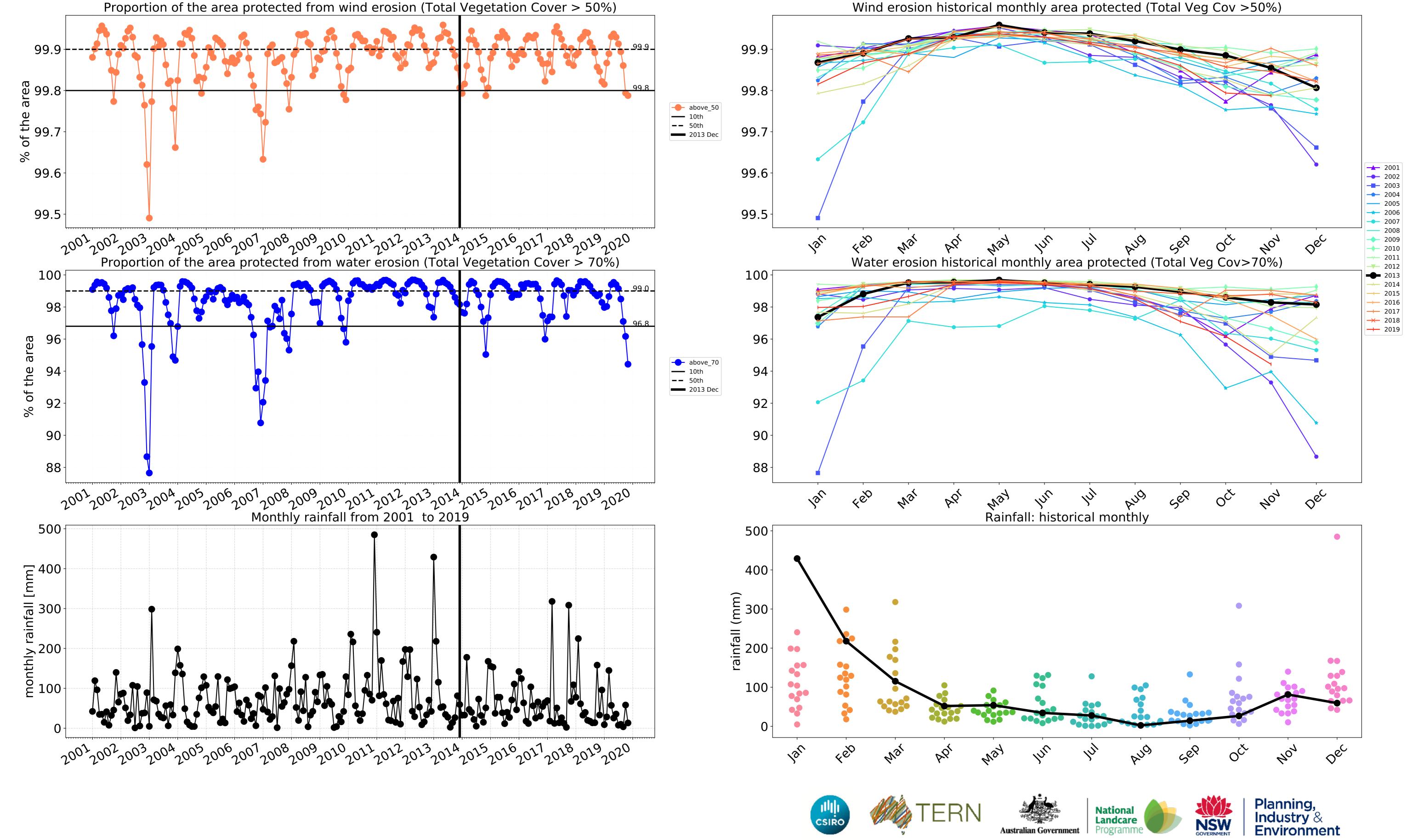


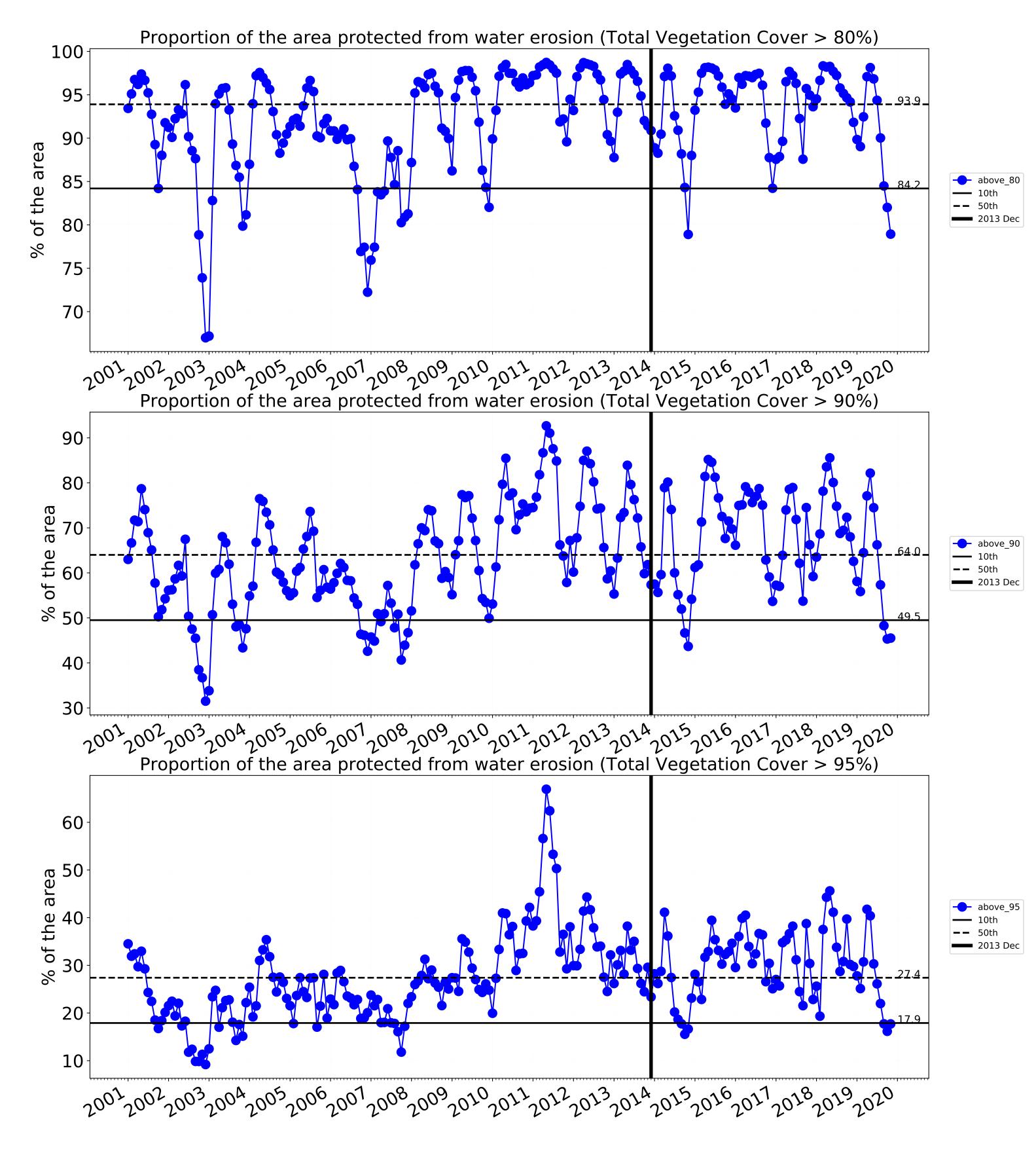
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. **Total Vegetation Cover Decile [%]** 

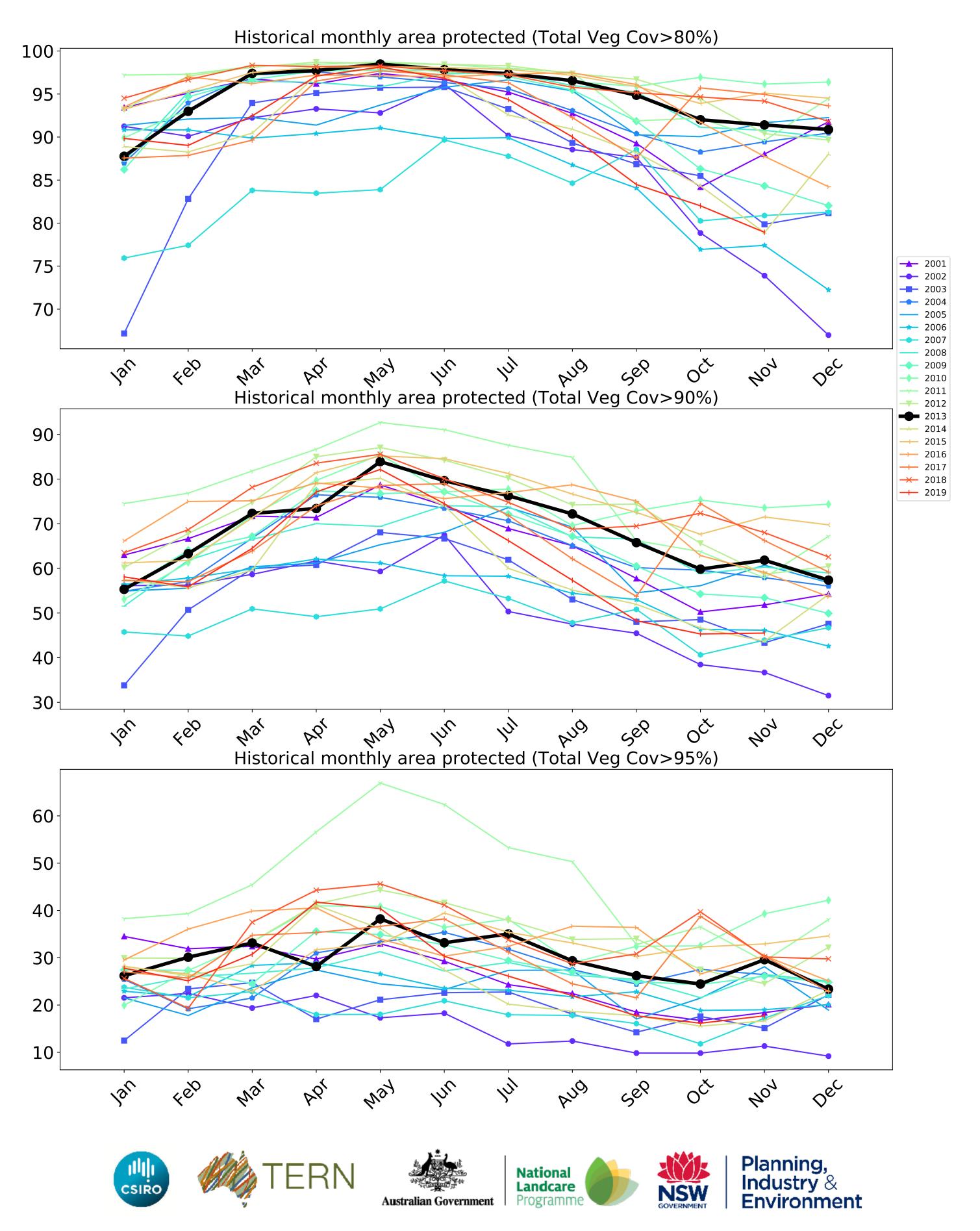




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

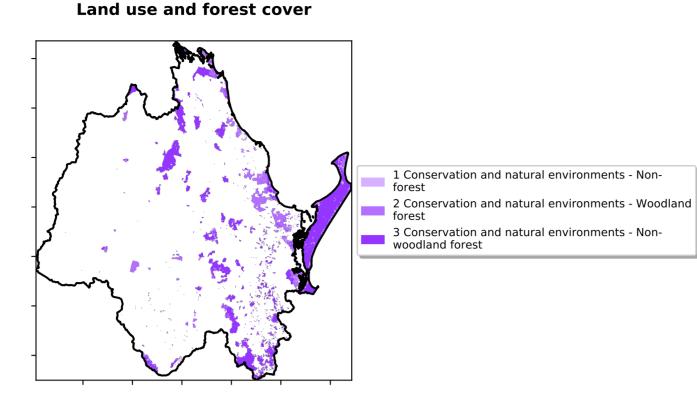




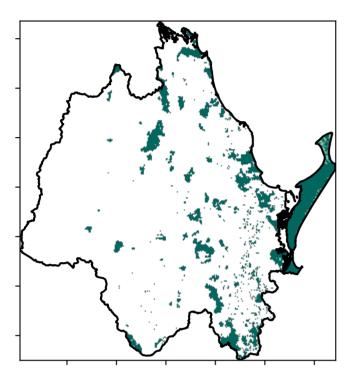


### **Conservation and natural environments**

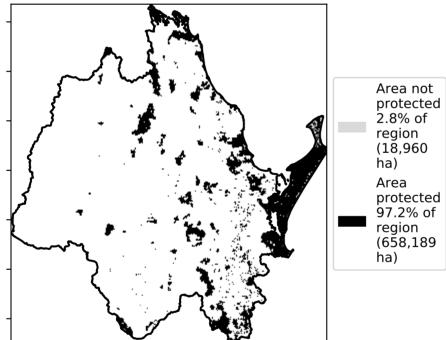
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

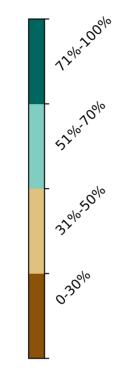


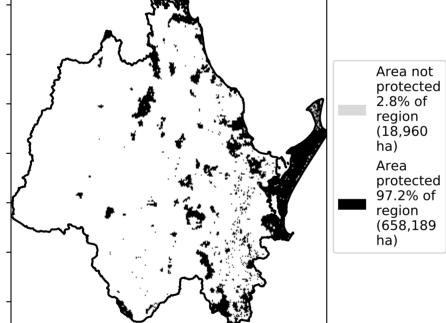
**Total Vegetation Cover [%]** 

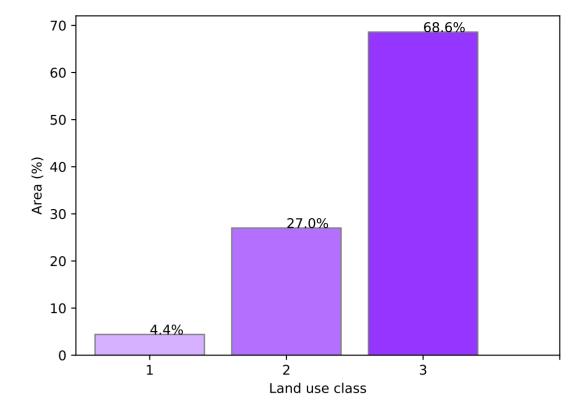


% Area protected from water erosion (>70%)



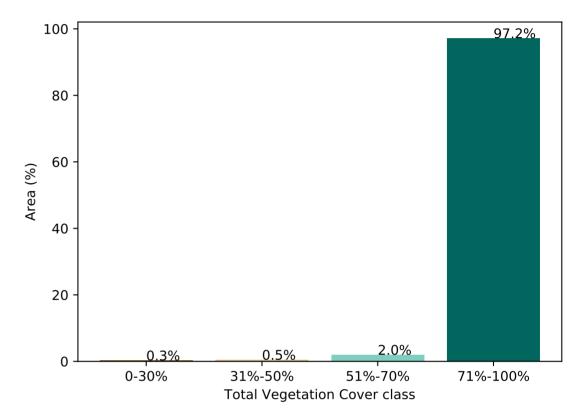






#### Proportion of each land class in area

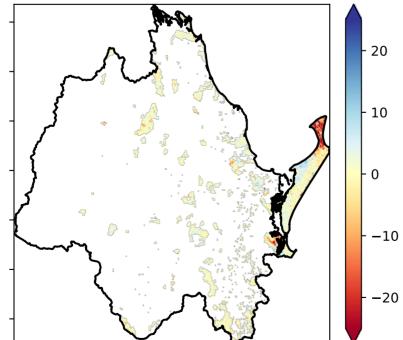
Proportion of vegetation cover class in area



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

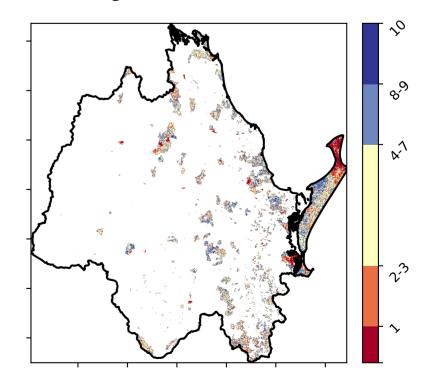


**Total Vegetation Cover Anomaly [%]** 



Area not protected 1.0% of region (6,771 ha) Area protected 99.0% of region (670,378 ha)

**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

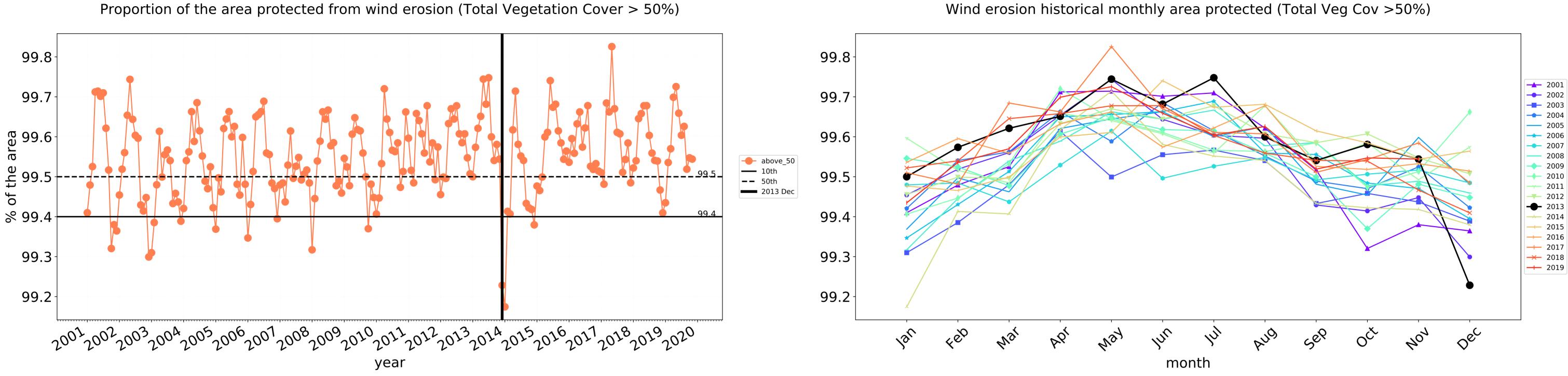
records for that month of

the map using baseline from 2001 to 2019.

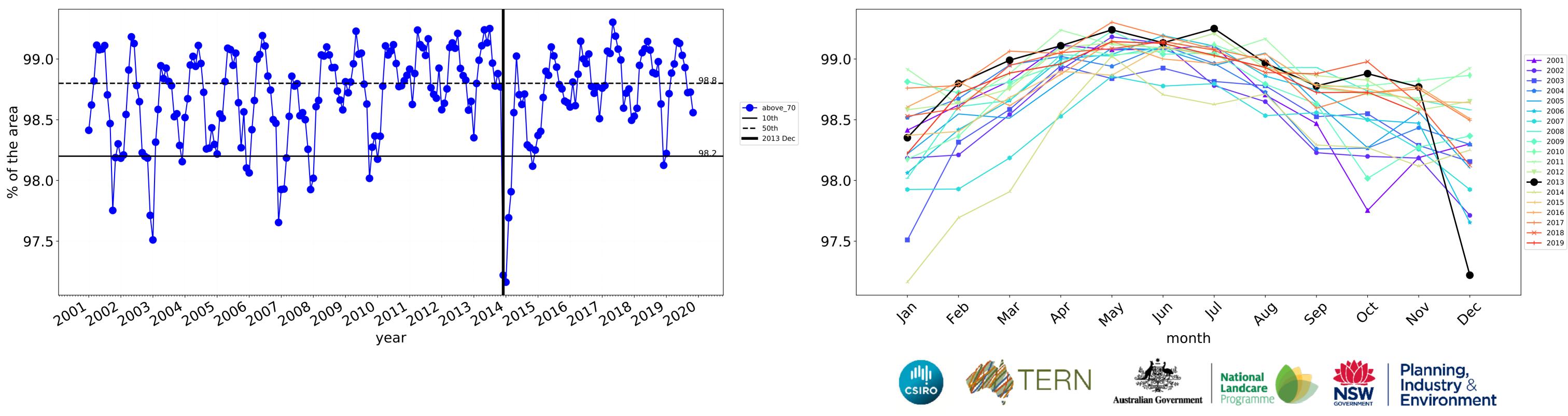
in the lowest 10% of

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 from 2001 to 2019.

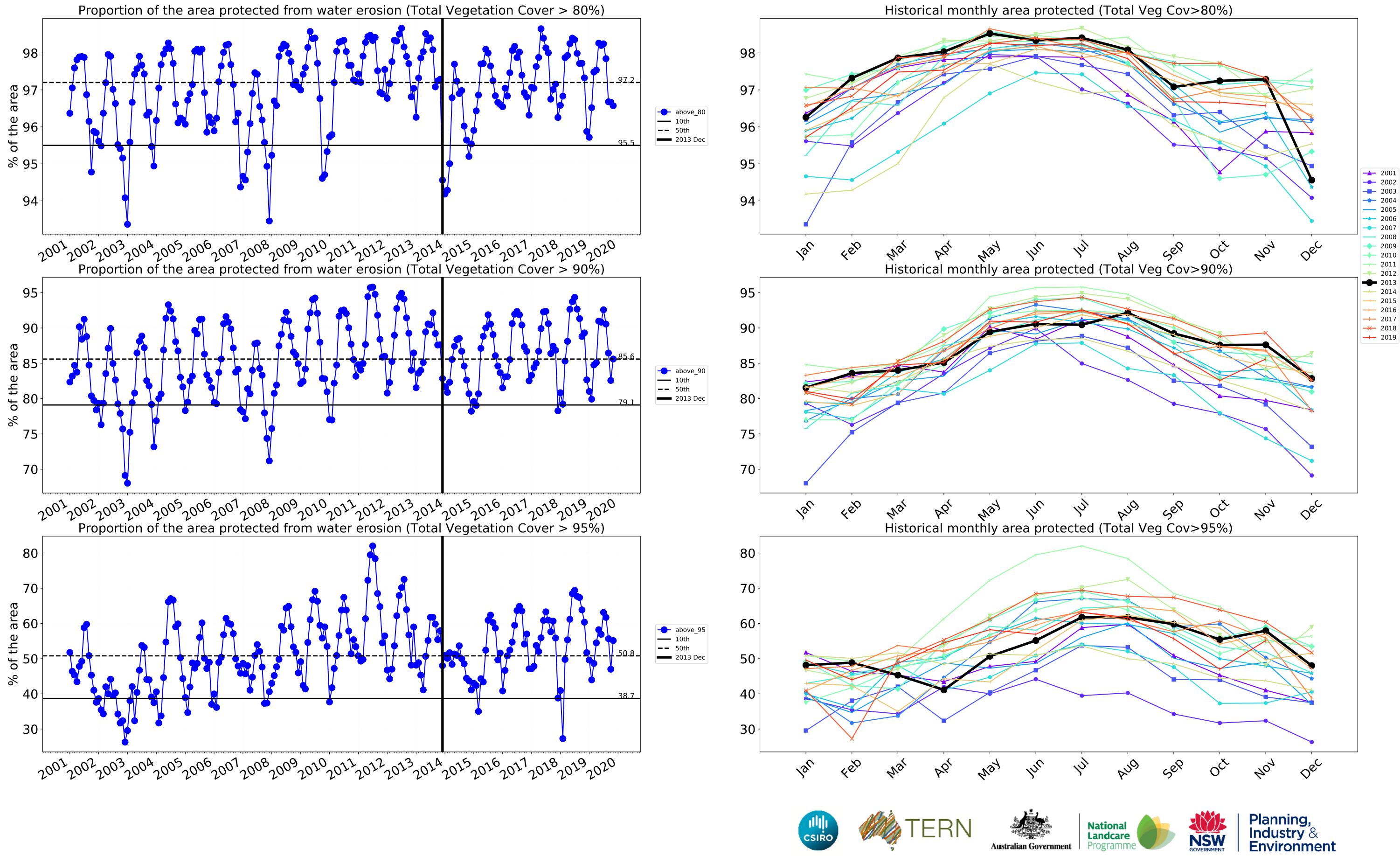


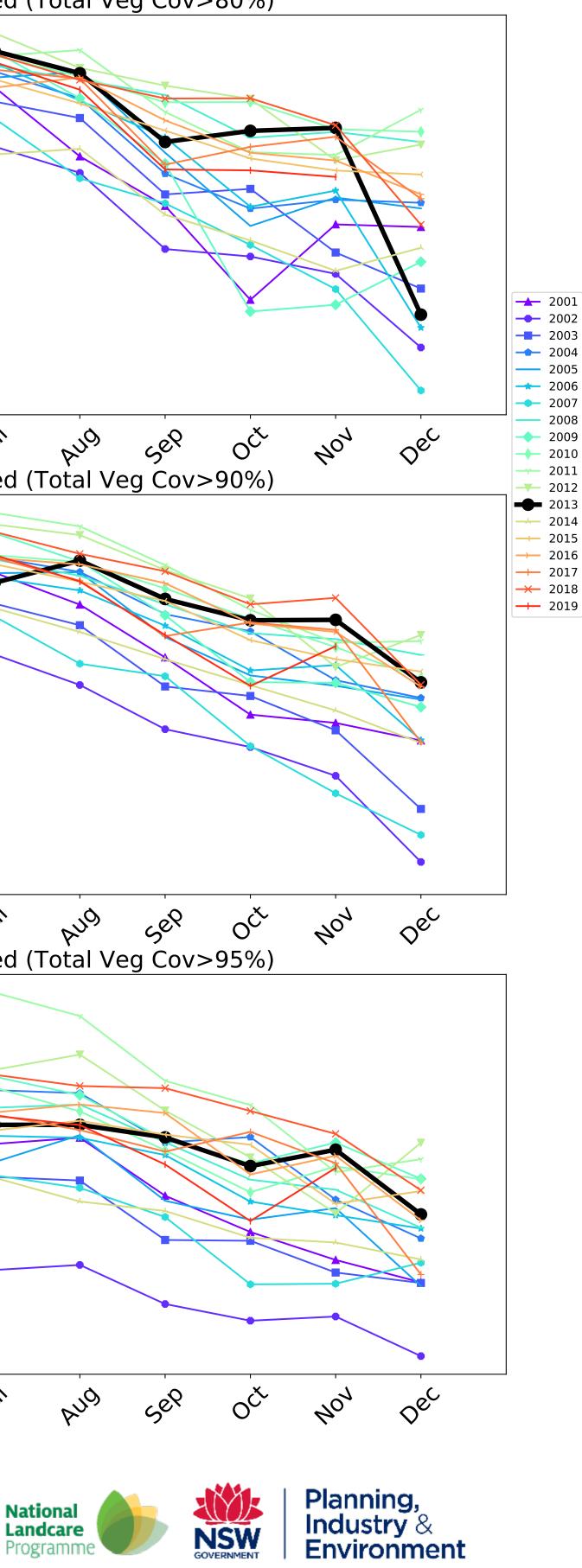






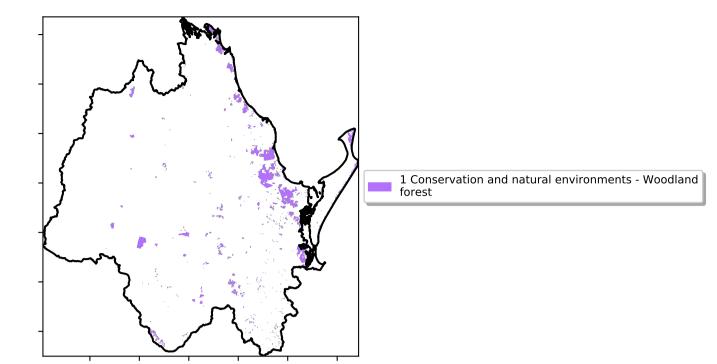
Water erosion historical monthly area protected (Total Veg Cov>70%)



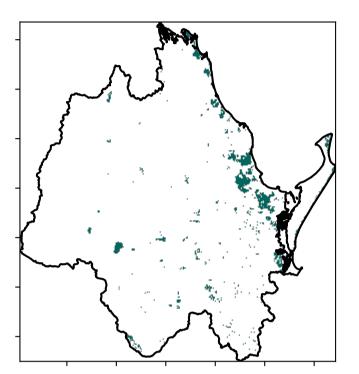


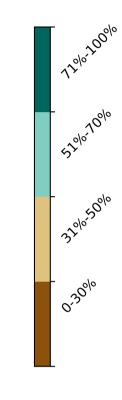
### **Conservation and natural environments Woodland forest**

Land use and forest cover

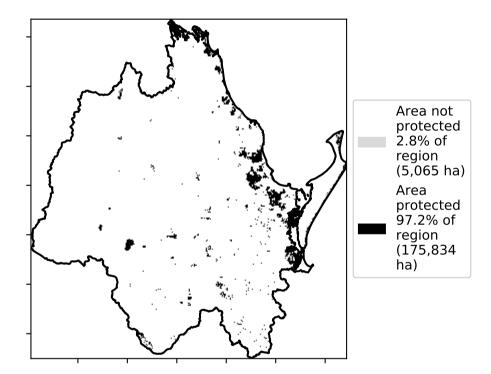


**Total Vegetation Cover [%]** 

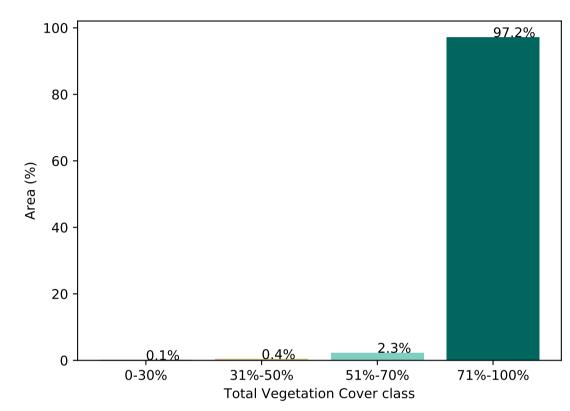




% Area protected from water erosion (>70%)



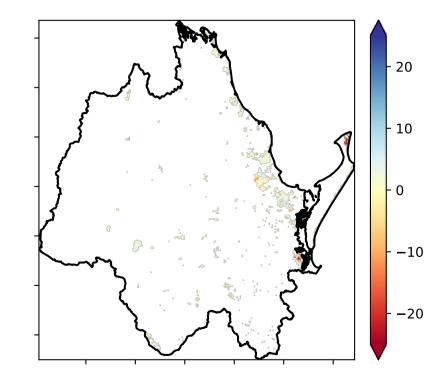




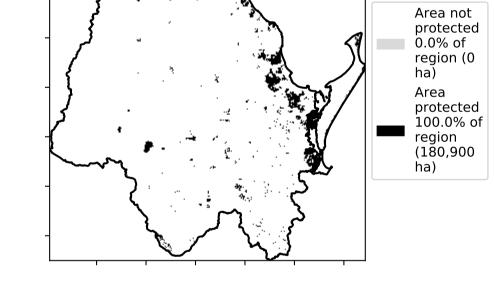
#### % Area protected from wind erosion (>50%)



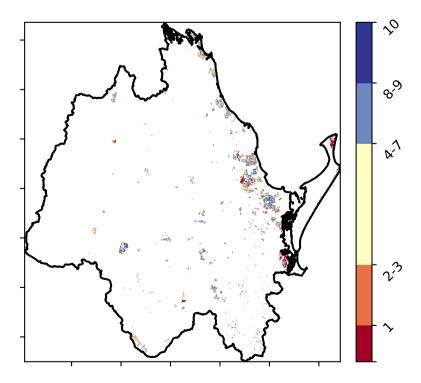
**Total Vegetation Cover Anomaly [%]** 



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



**Total Vegetation Cover Decile [%]** 





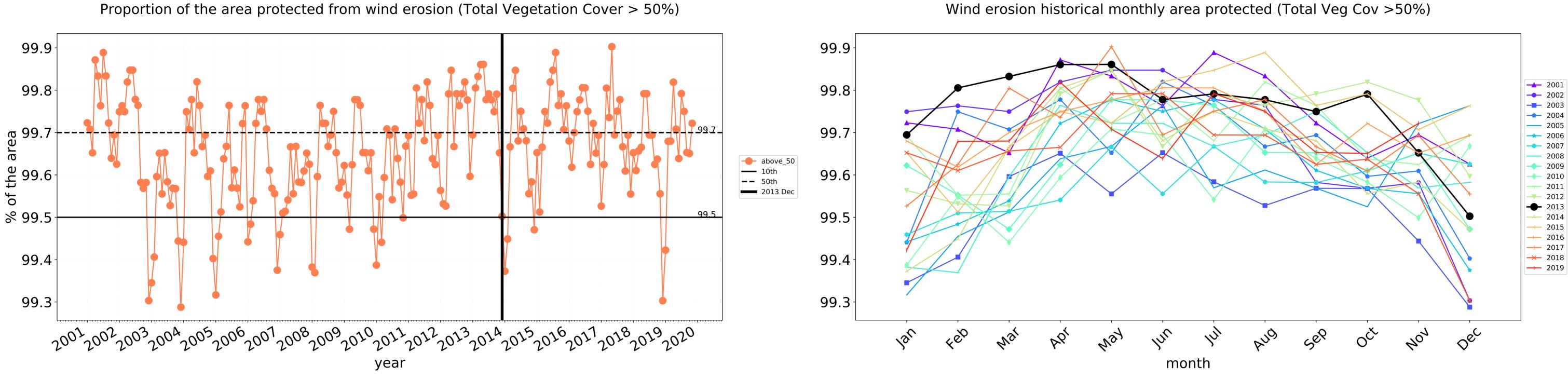
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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

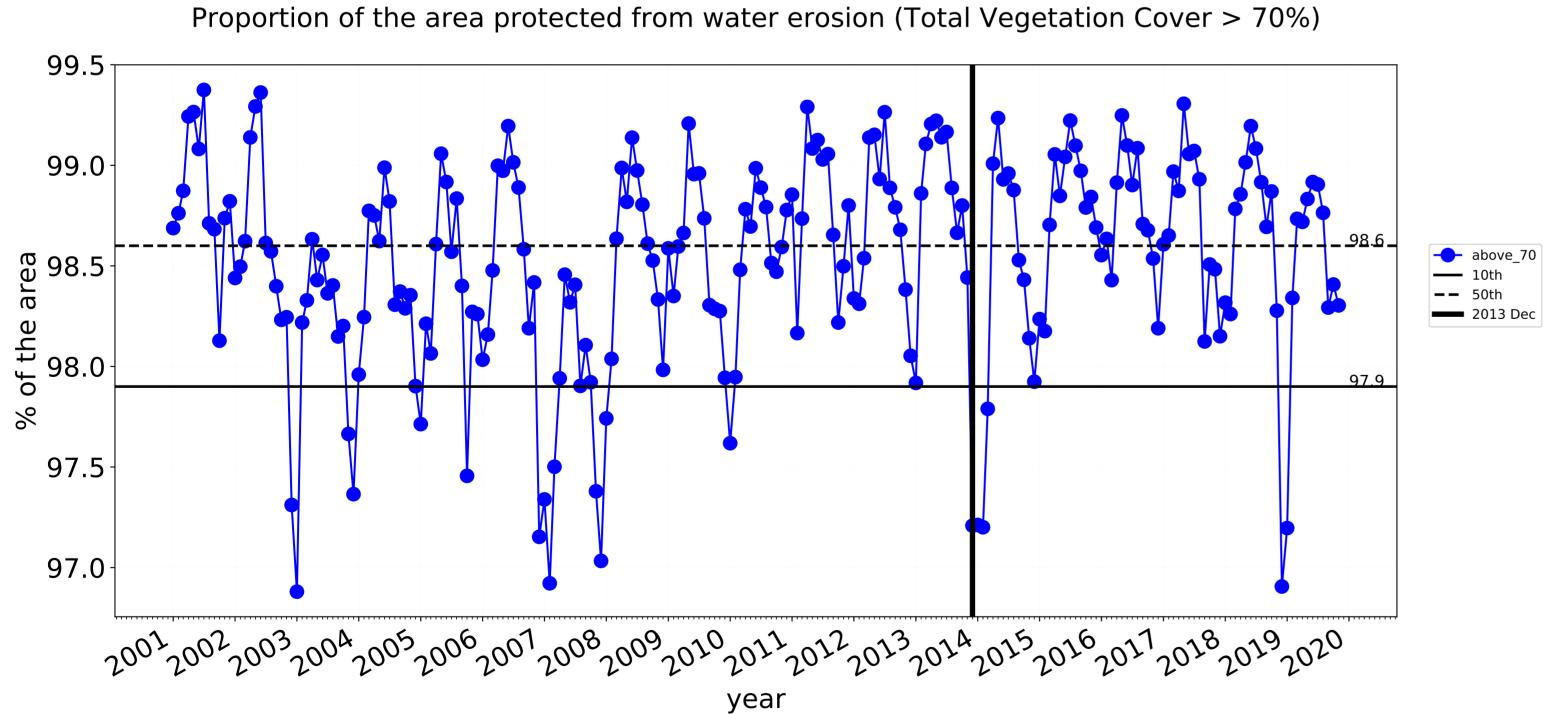
Use of Australia (2018) and Forests of Australia (2018)

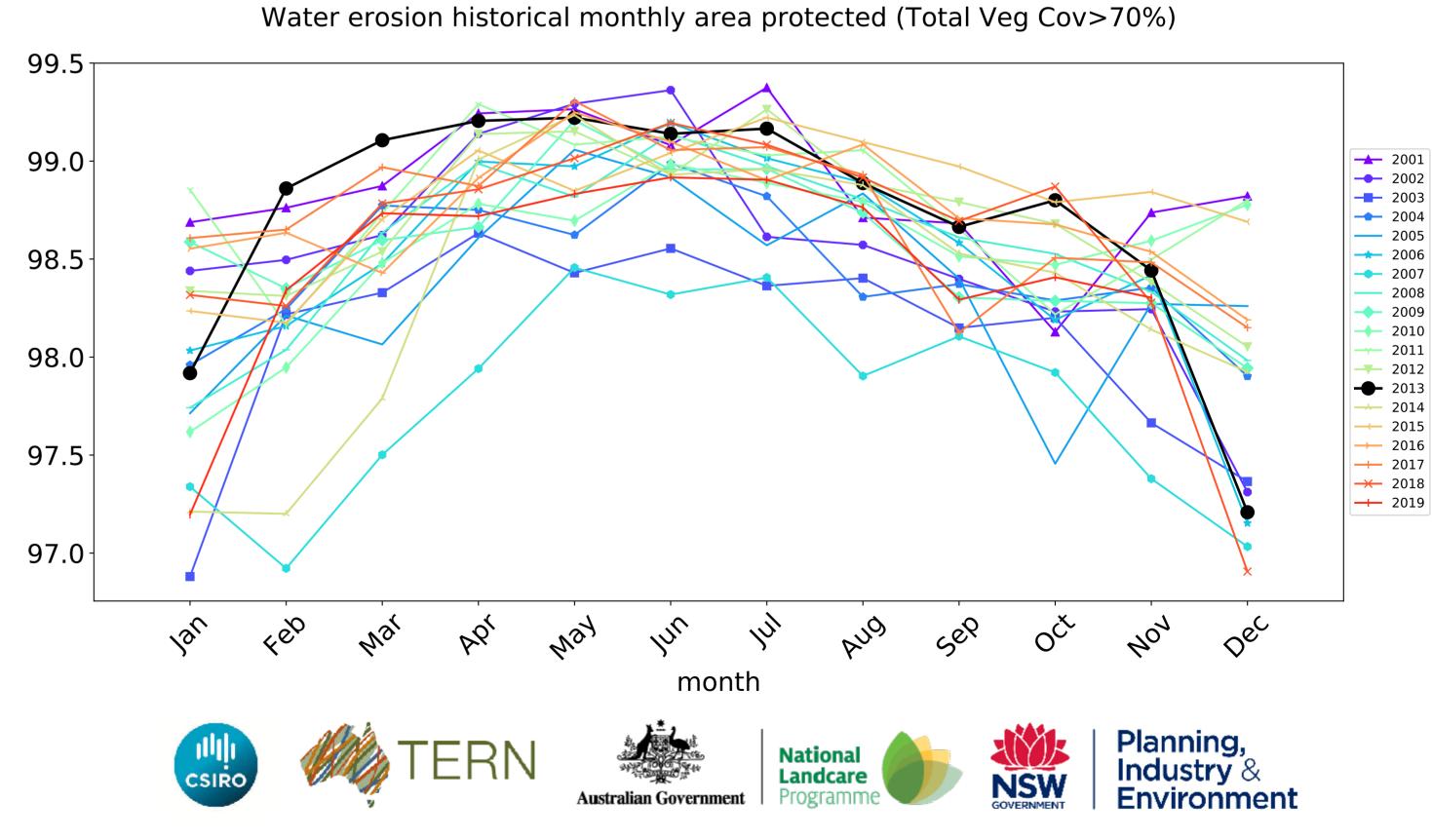
Catchment Scale Land

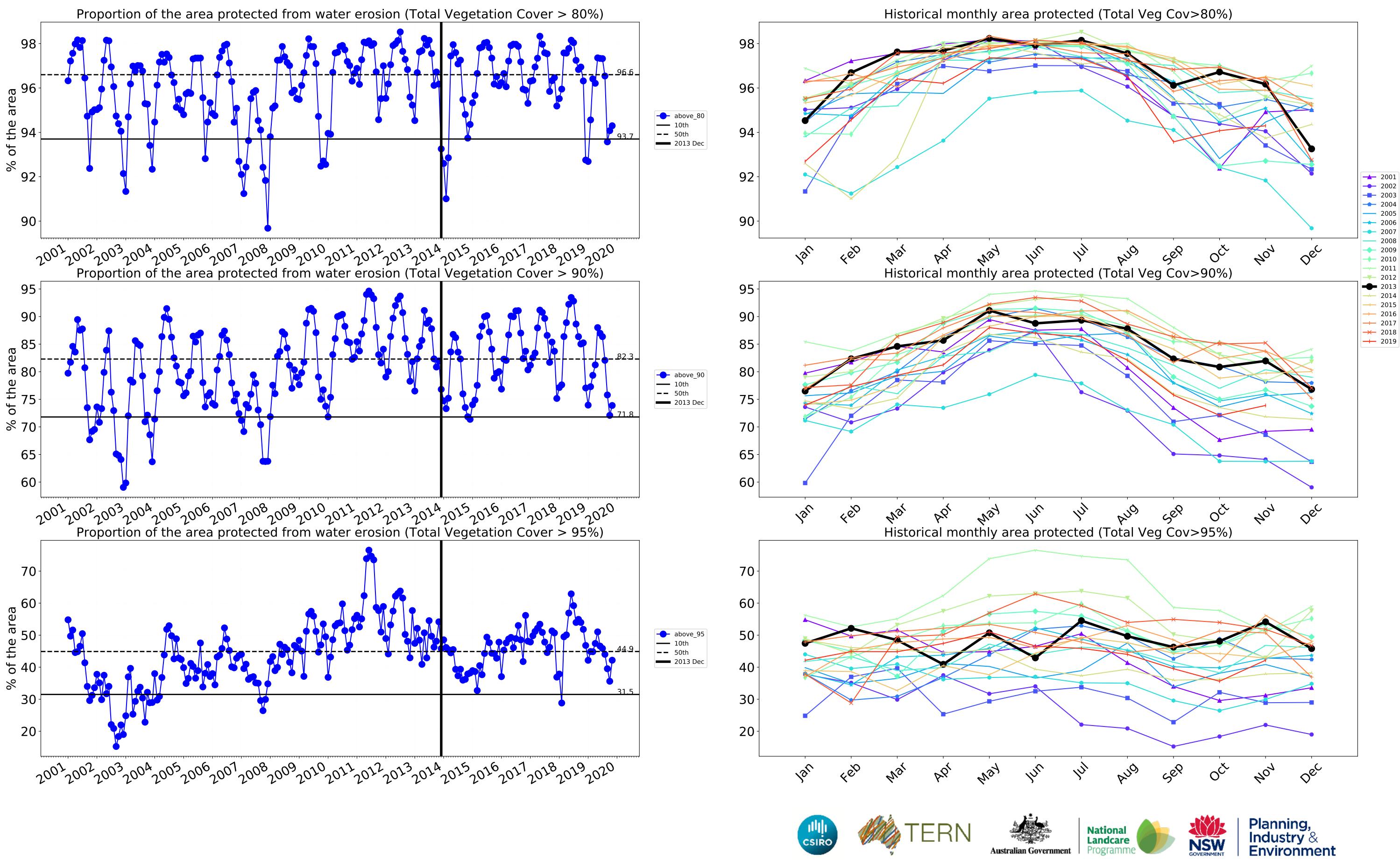




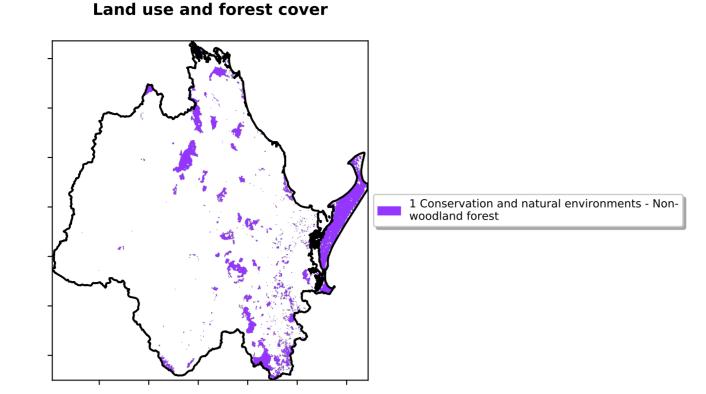
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)







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



120/0

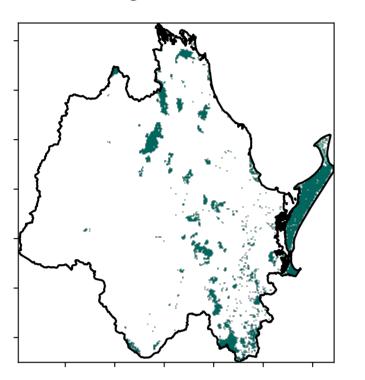
52%70%

32005001

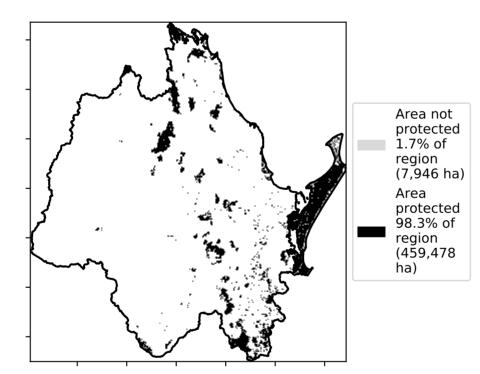
0-30%

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

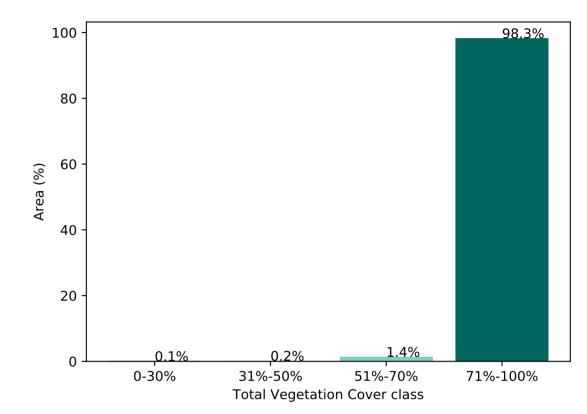
**Total Vegetation Cover [%]** 



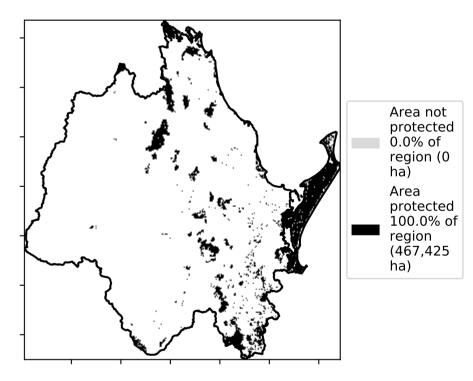
% Area protected from water erosion (>70%)





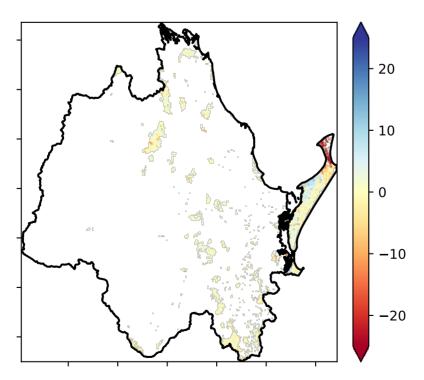


% Area protected from wind erosion (>50%)



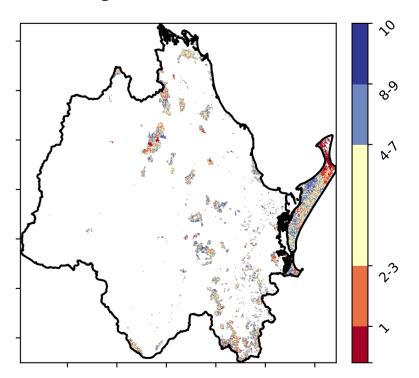
**Total Vegetation Cover Anomaly [%]** 

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.

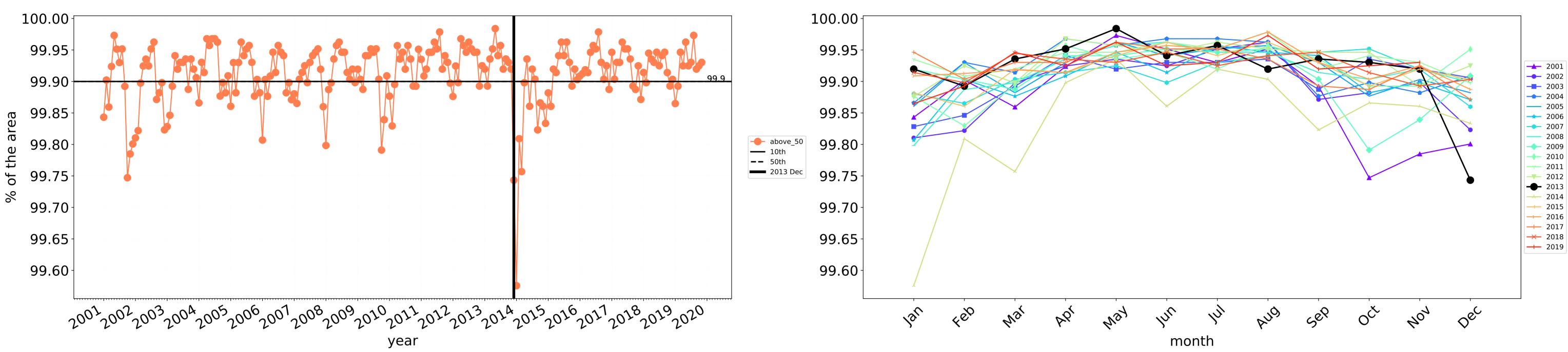


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

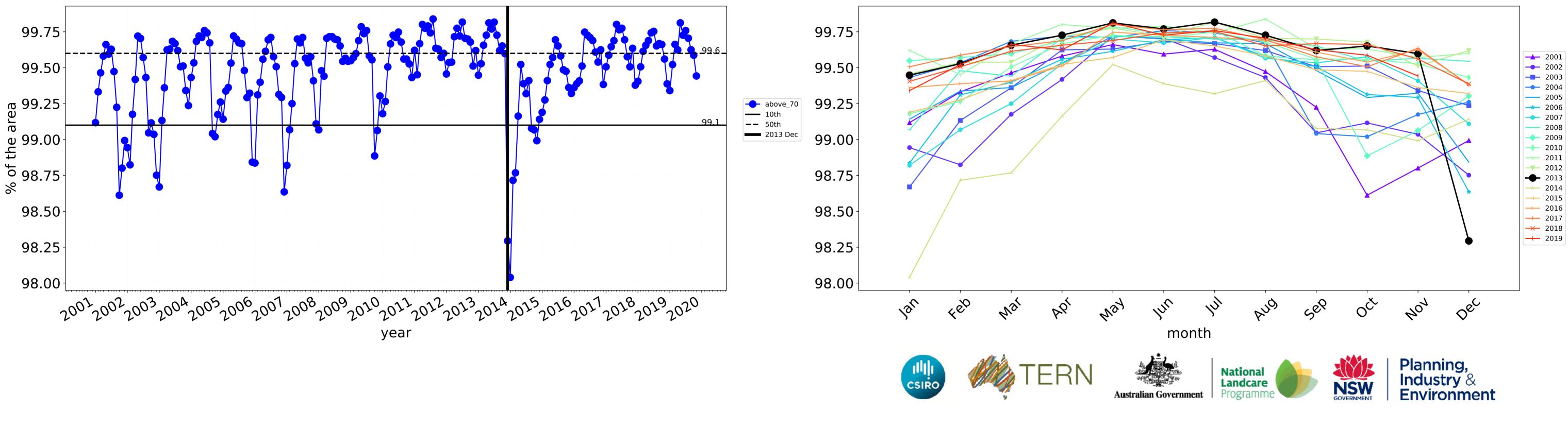


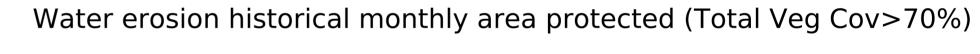




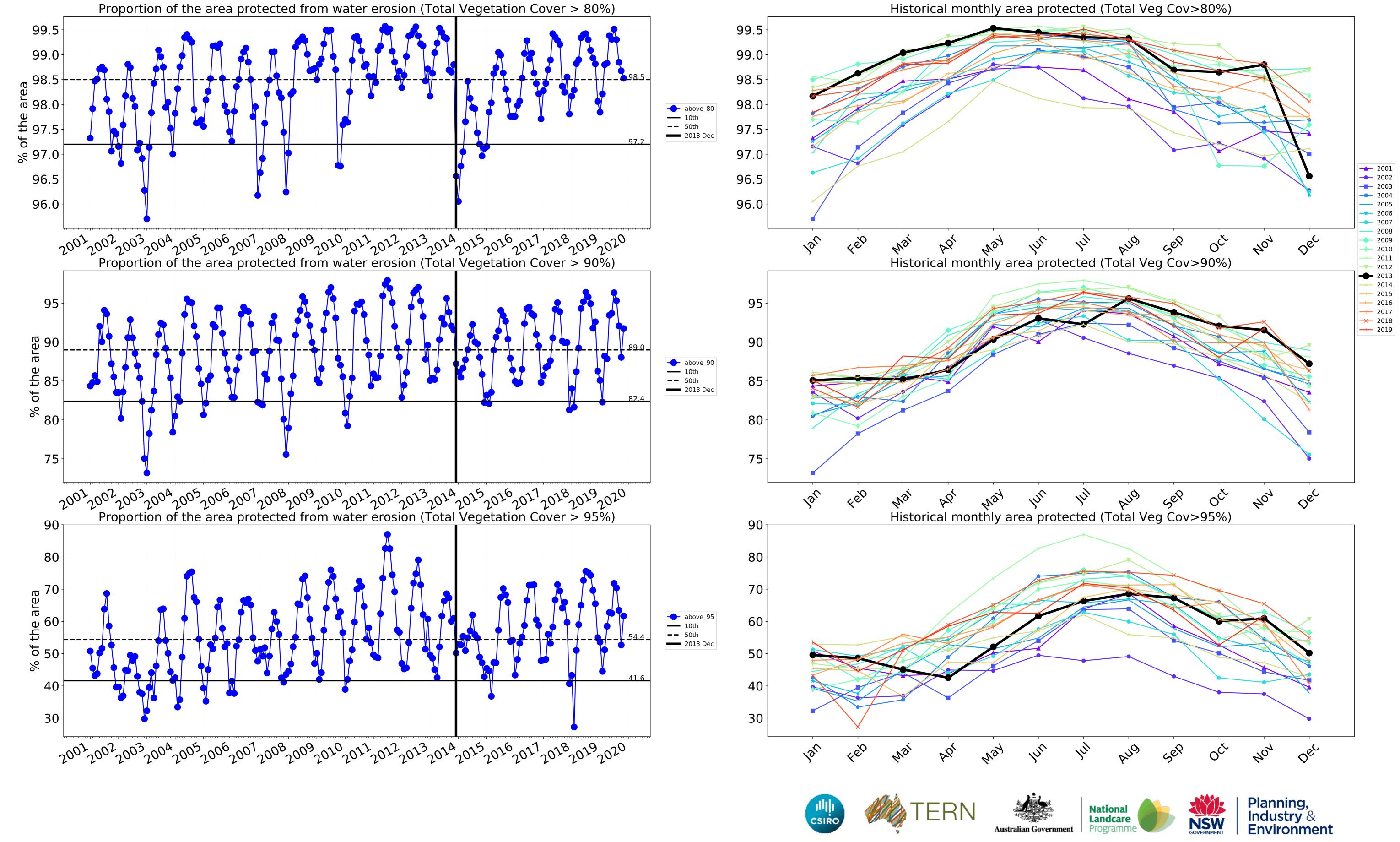
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





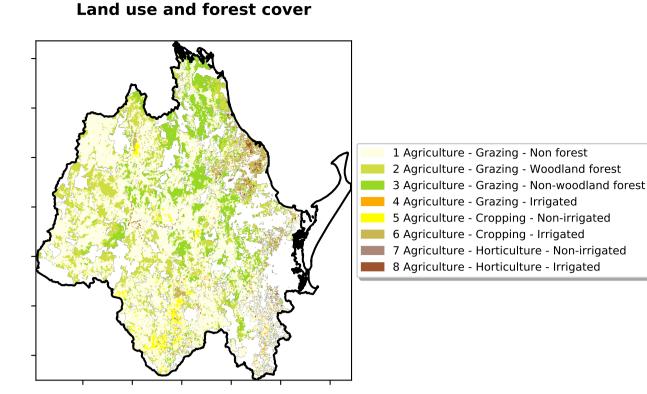


Wind erosion historical monthly area protected (Total Veg Cov >50%)

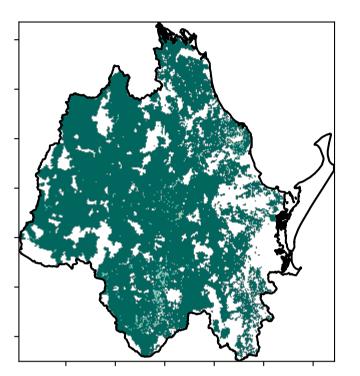


### Agriculture

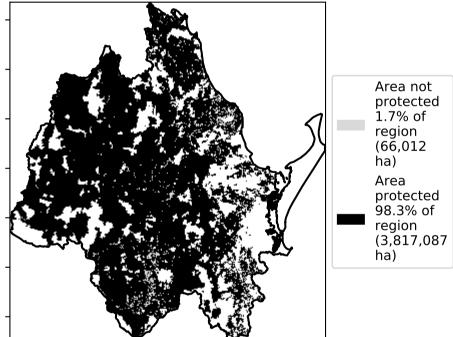
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

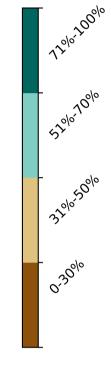


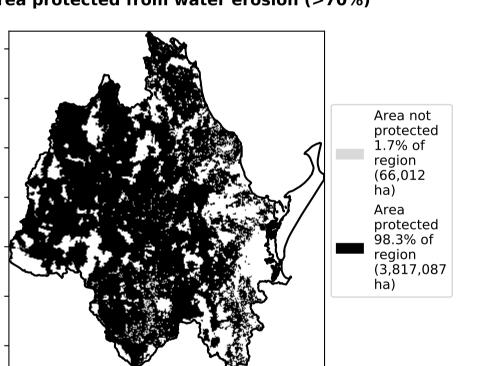
**Total Vegetation Cover [%]** 



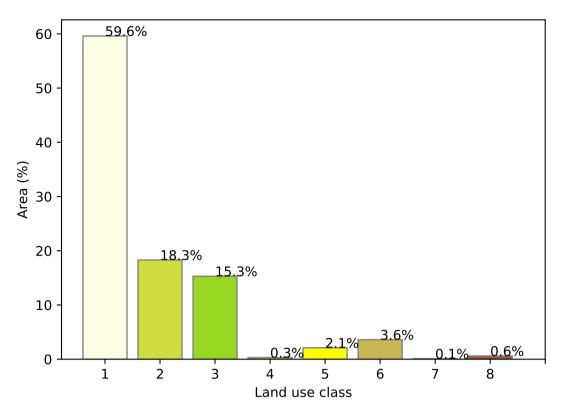
% Area protected from water erosion (>70%)



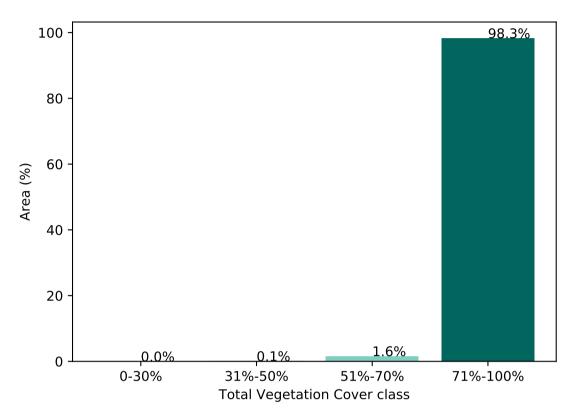




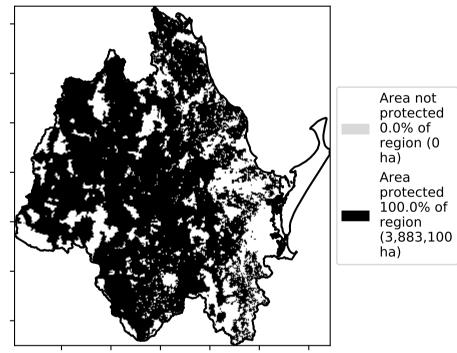




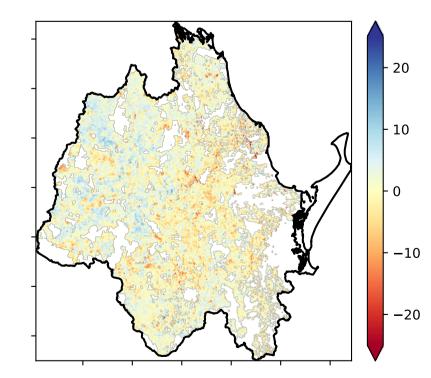
Proportion of vegetation cover class in area



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

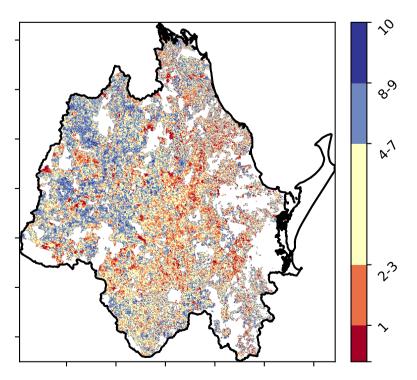


**Total Vegetation Cover Anomaly [%]** 



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

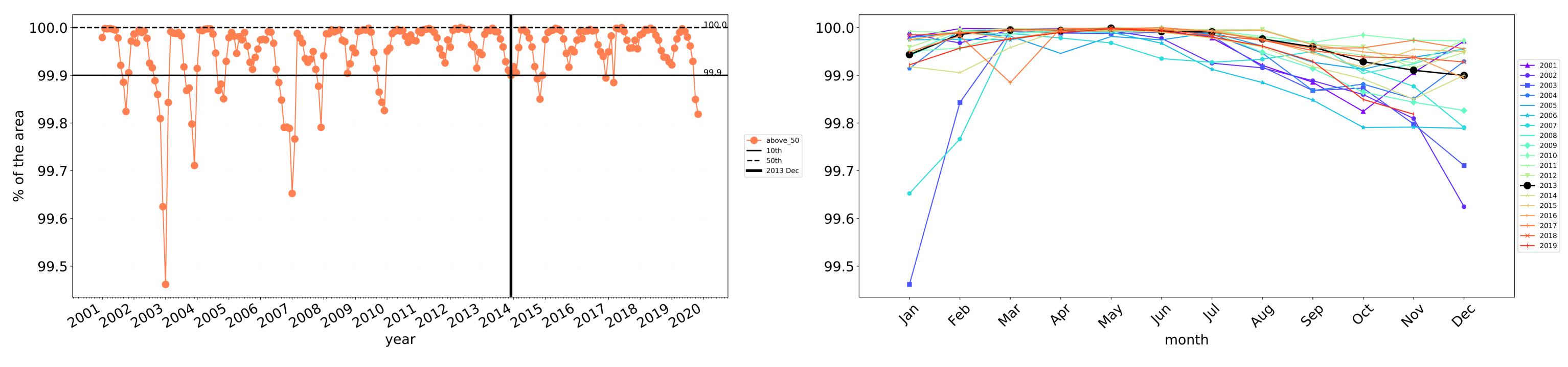
**Total Vegetation Cover Decile [%]** 





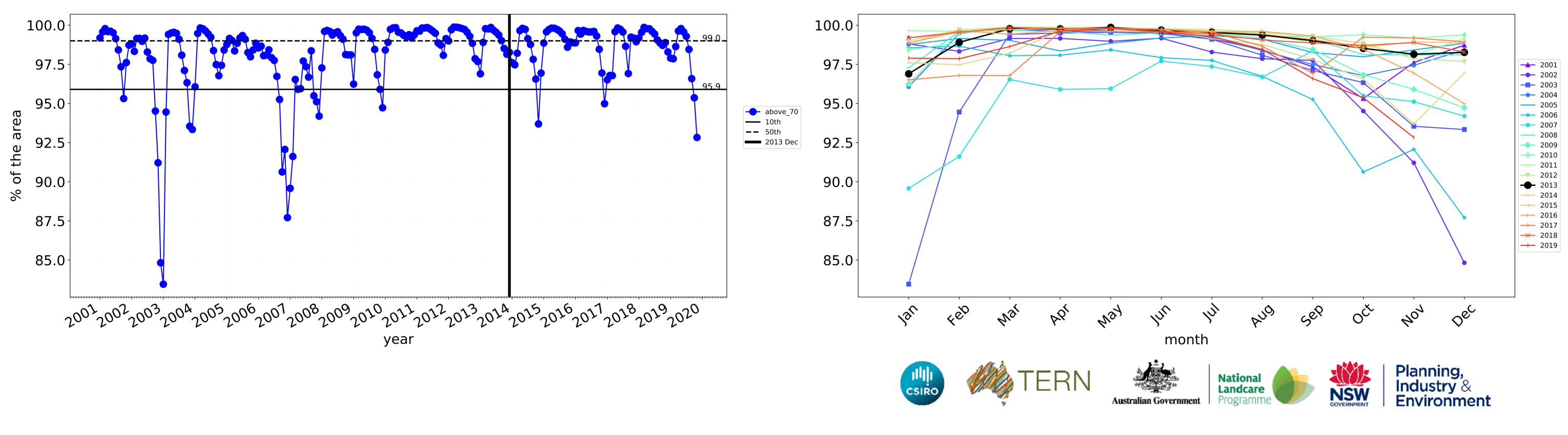
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



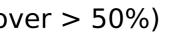


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

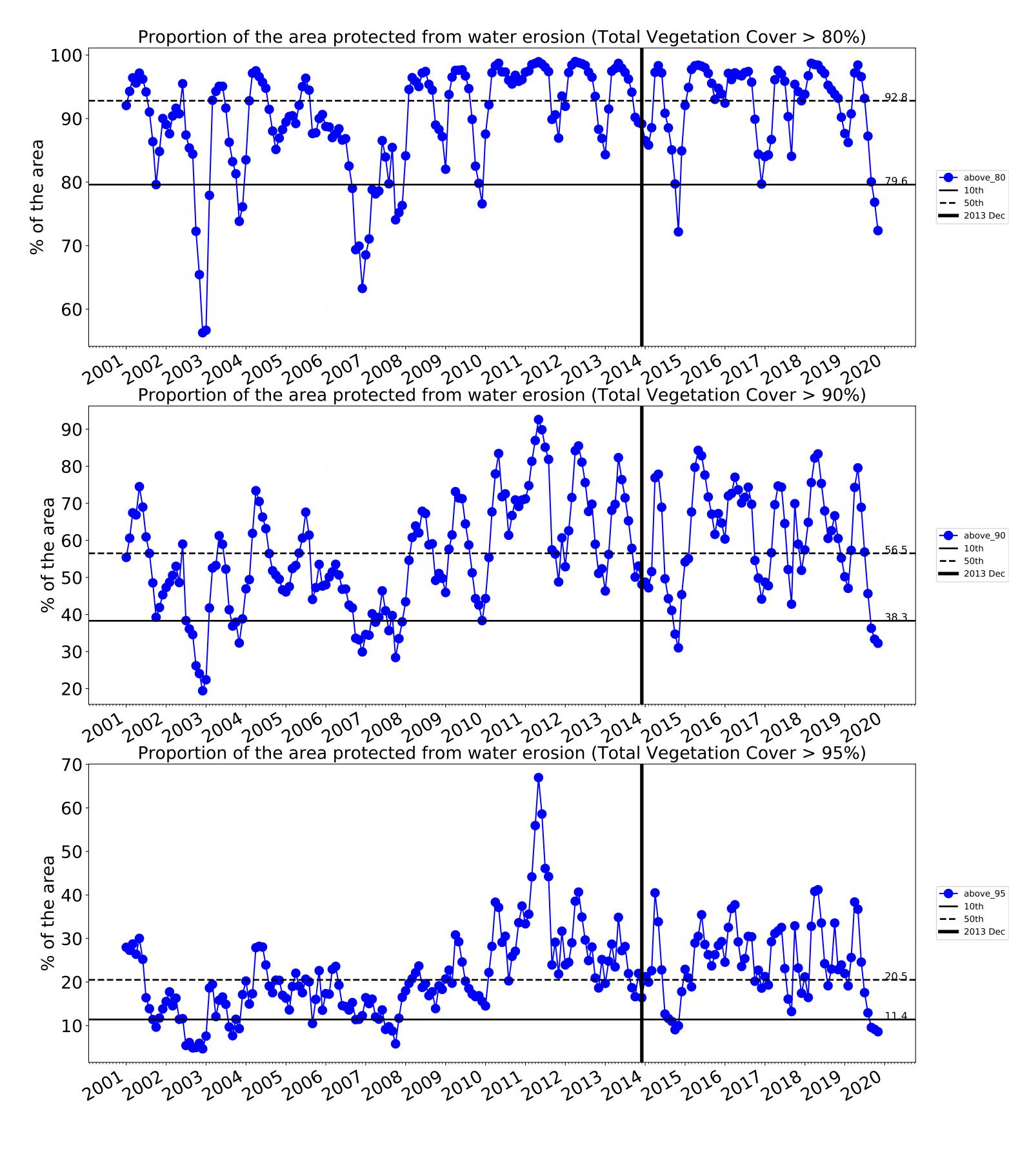


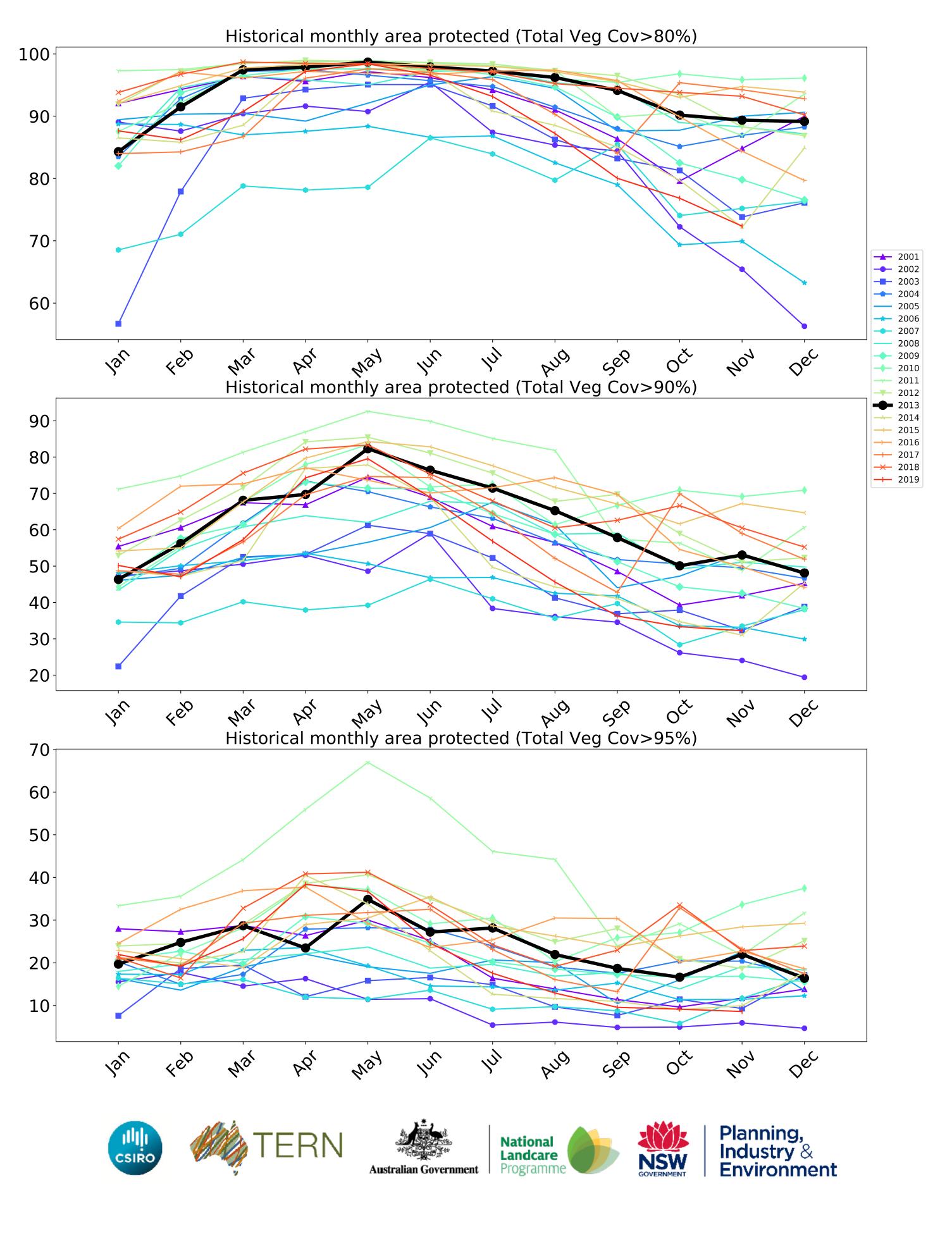
### **Agriculture timeseries**



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

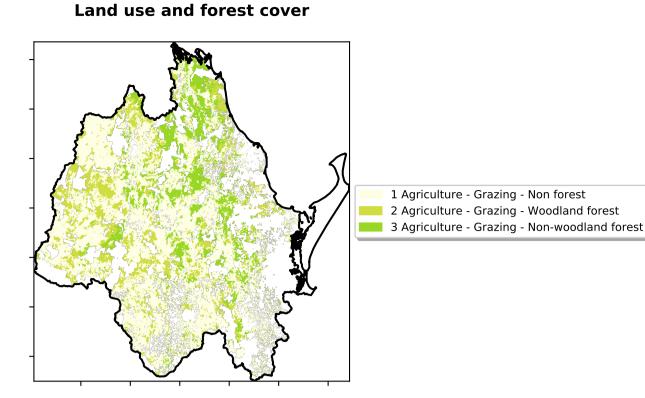
Water erosion historical monthly area protected (Total Veg Cov>70%)



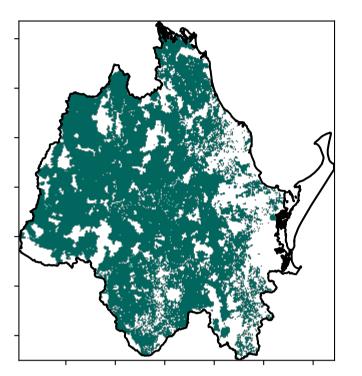


### Grazing

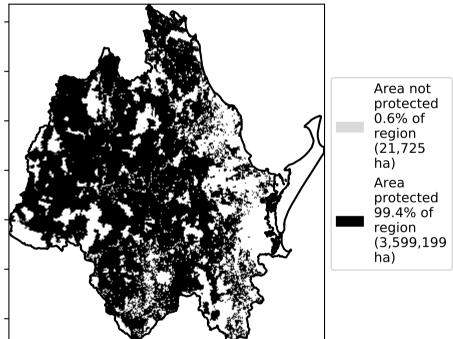
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

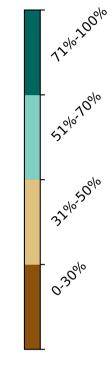


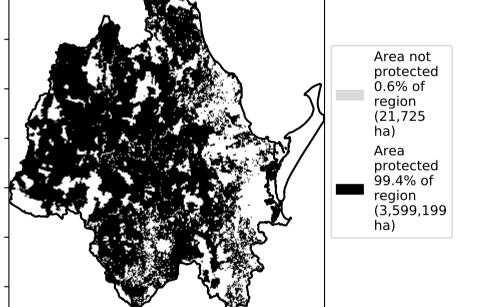
**Total Vegetation Cover [%]** 



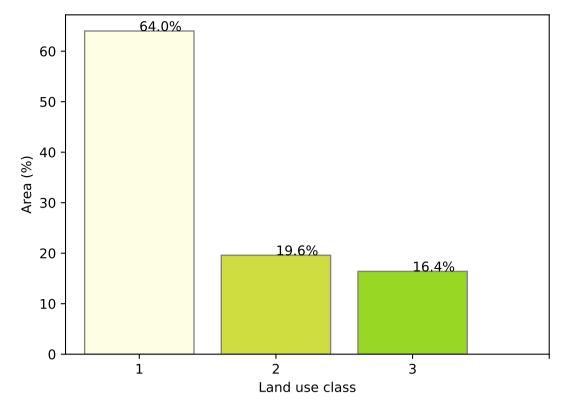
% Area protected from water erosion (>70%)



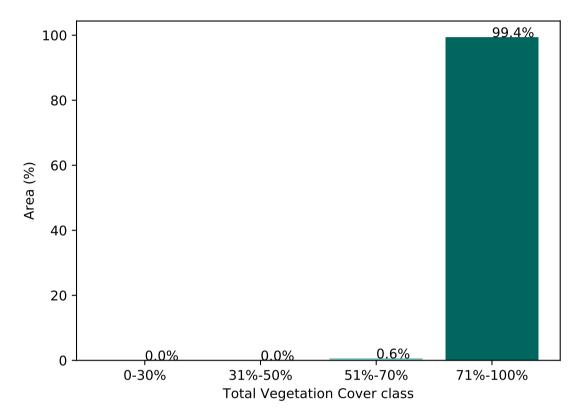




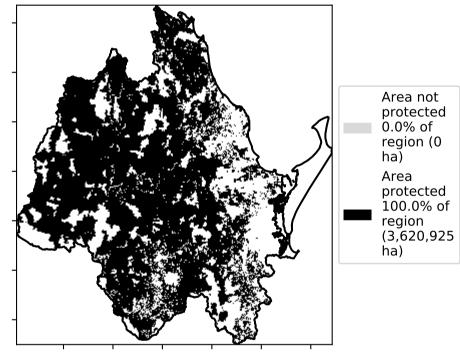
Proportion of each land class in area



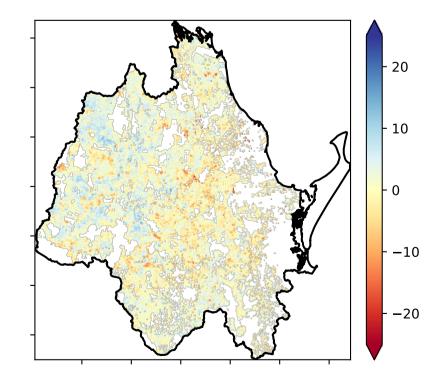
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

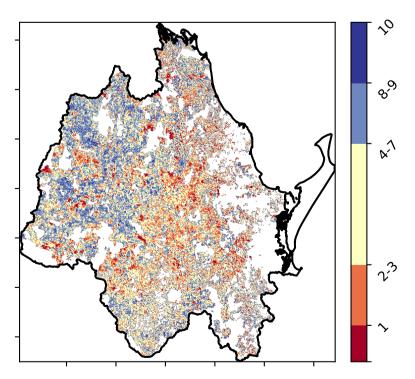


**Total Vegetation Cover Anomaly [%]** 



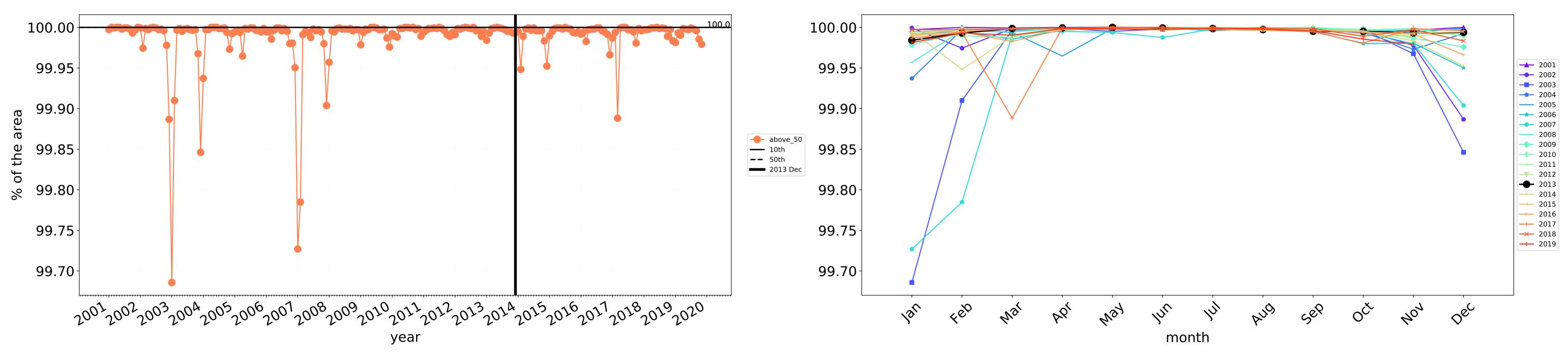
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 



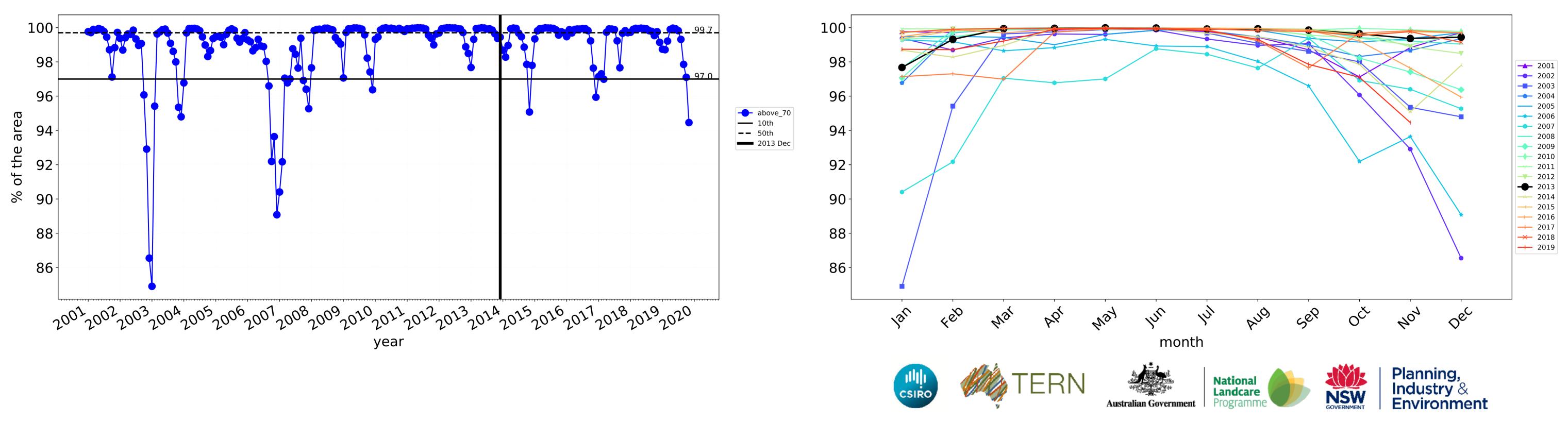


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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

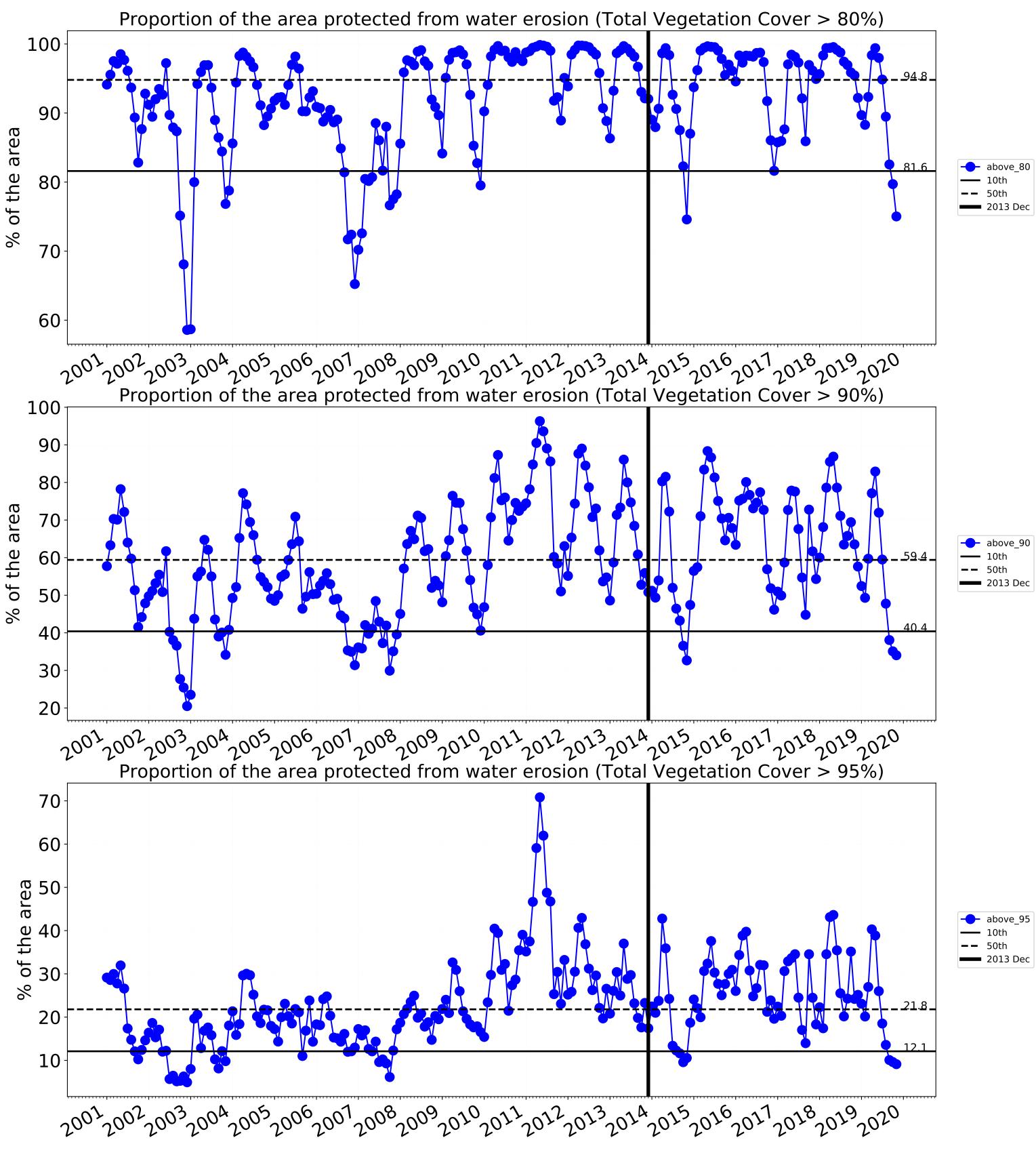
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

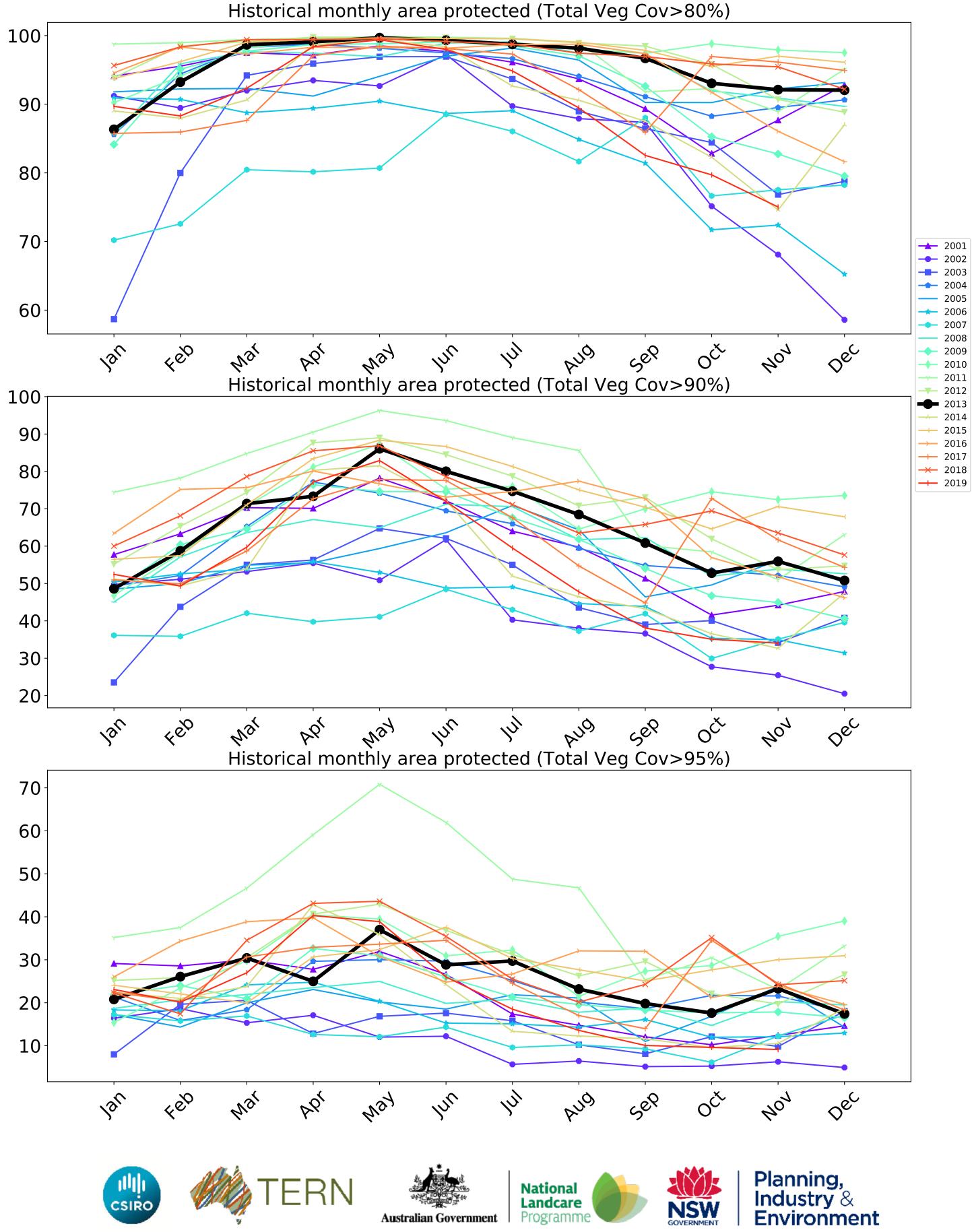




Wind erosion historical monthly area protected (Total Veg Cov >50%)

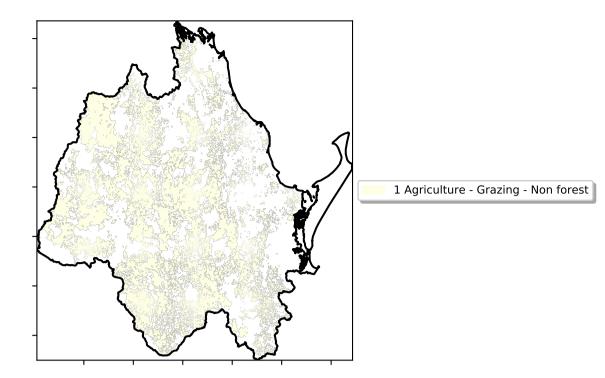
Water erosion historical monthly area protected (Total Veg Cov>70%)



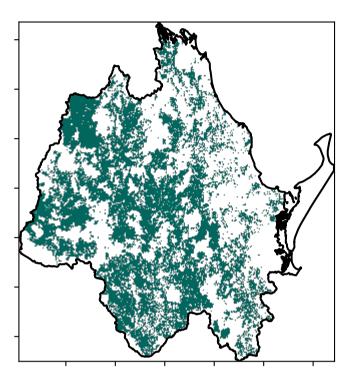


### **Grazing non forest**

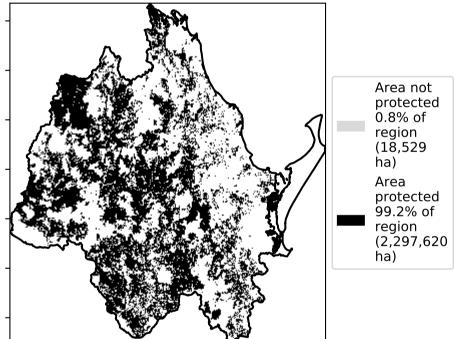
Land use and forest cover

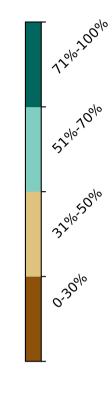


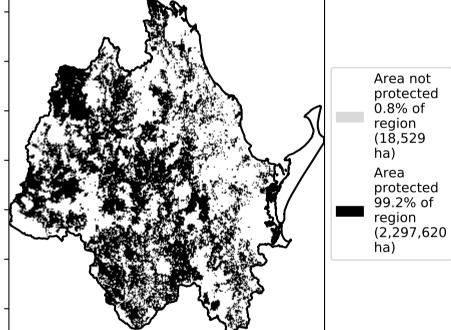
**Total Vegetation Cover [%]** 



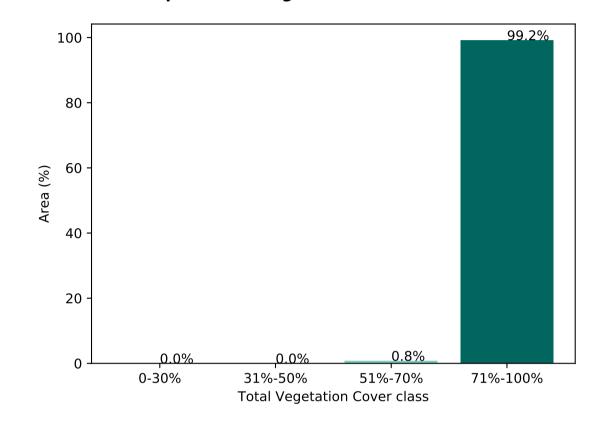




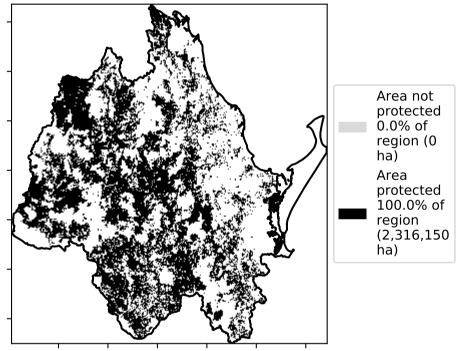




Proportion of vegetation cover class in area

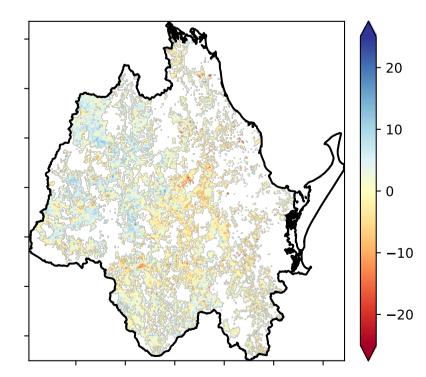


% Area protected from wind erosion (>50%)



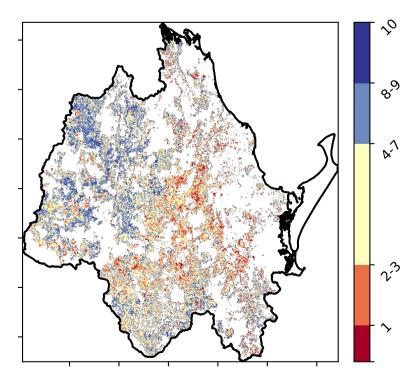
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover Anomaly [%]** 



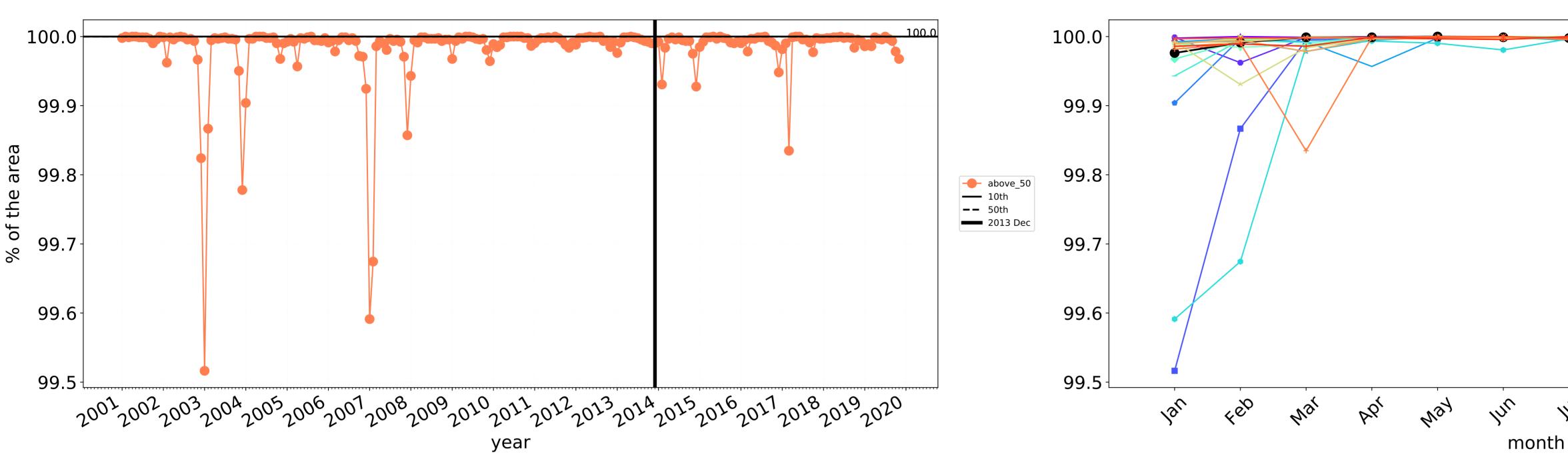
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 



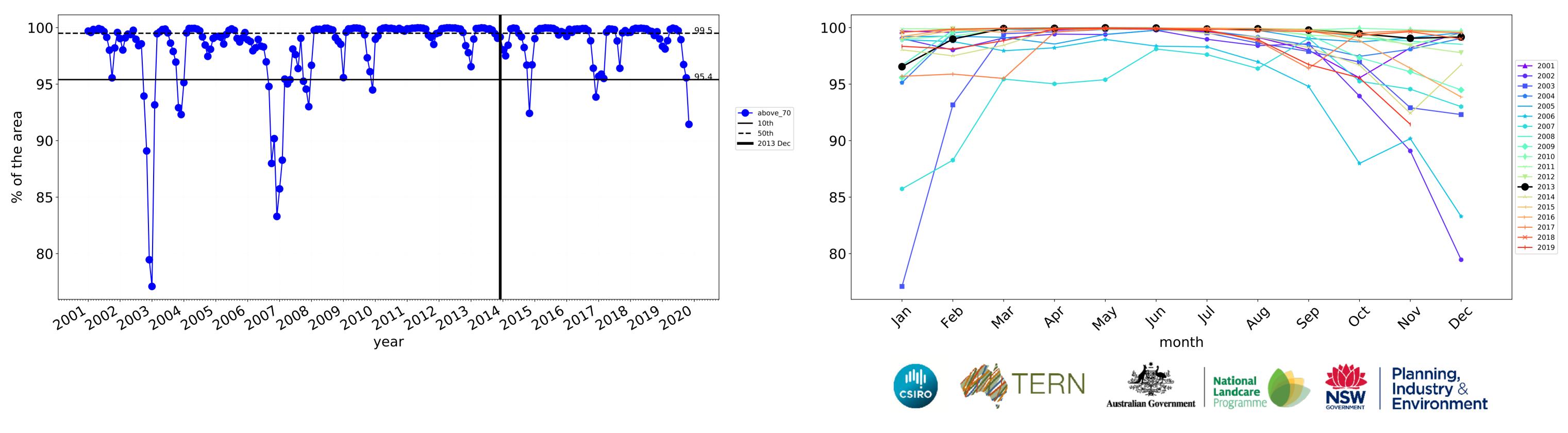


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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

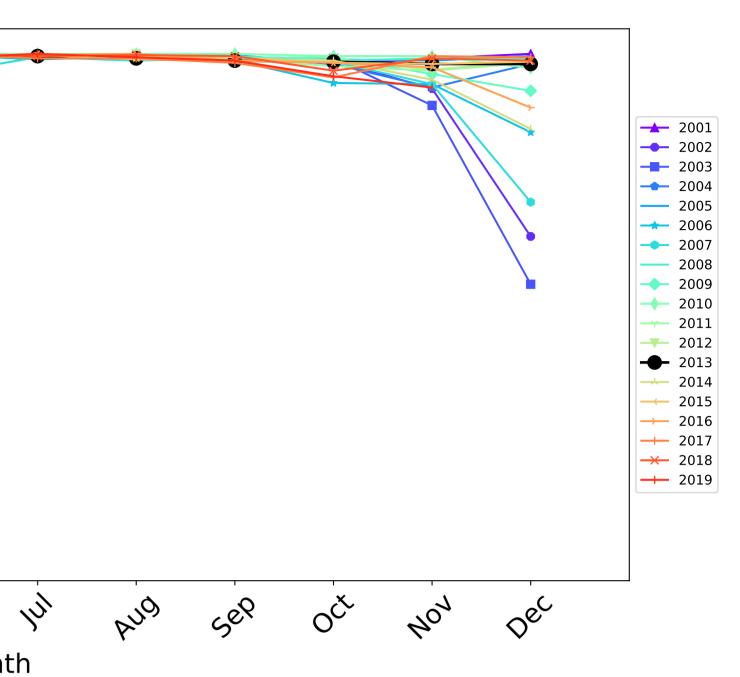
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

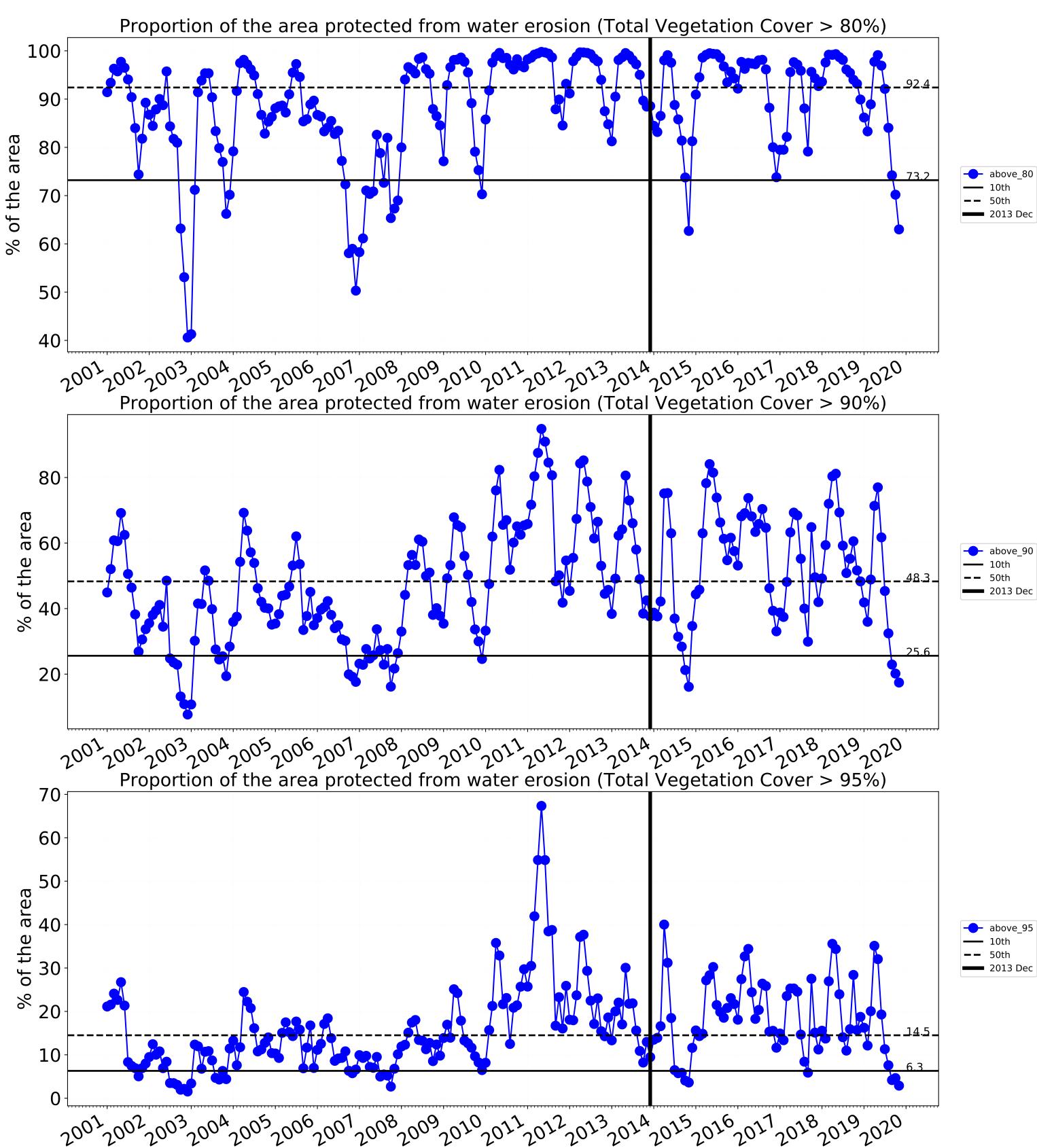


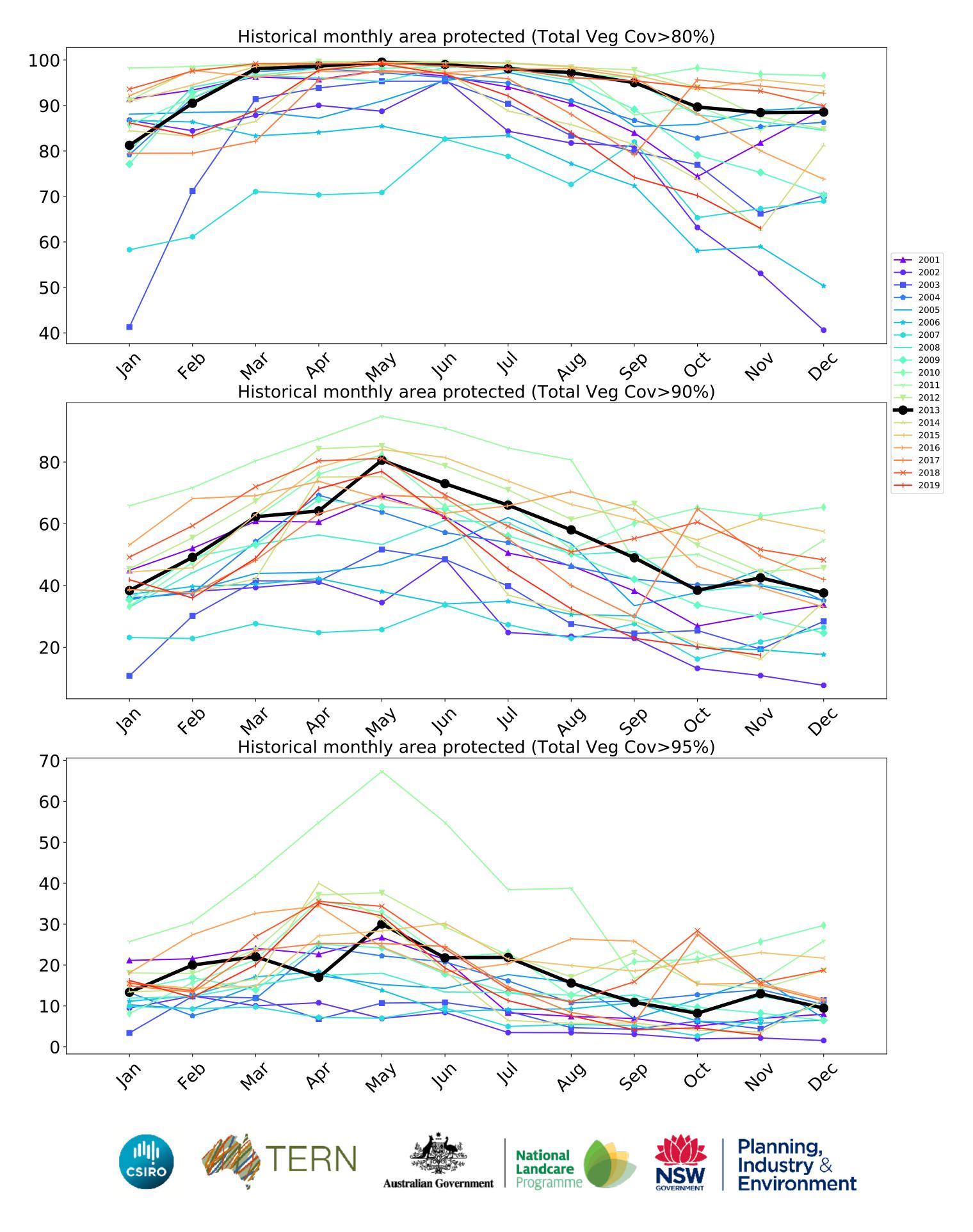
### Grazing non forest timeseries

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

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

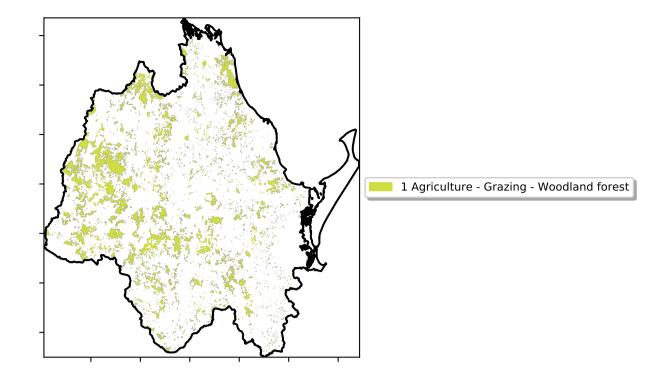




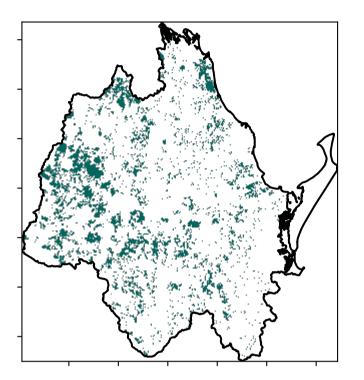


### **Grazing Woodland forest**

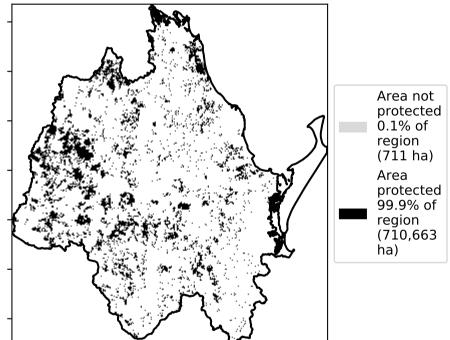
Land use and forest cover

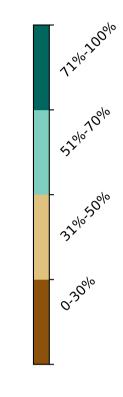


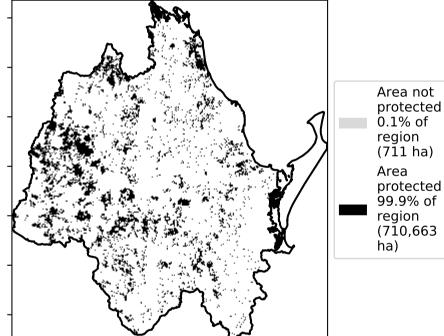
**Total Vegetation Cover [%]** 



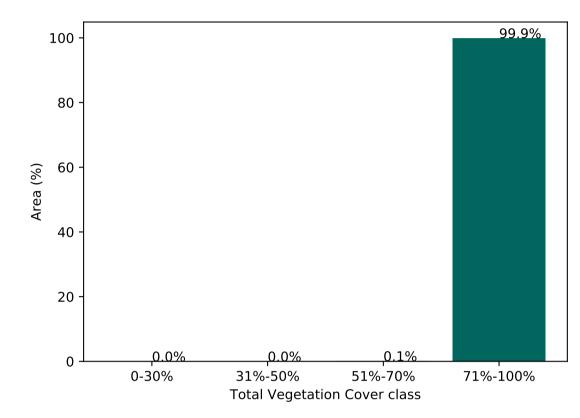








Proportion of vegetation cover class in area

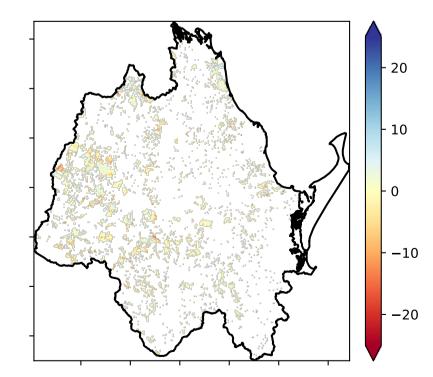


% Area protected from wind erosion (>50%)



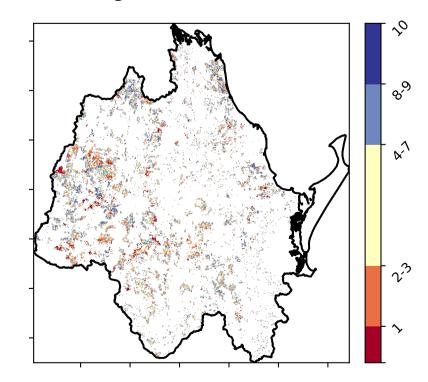
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover Anomaly [%]** 



Area protected 100.0% of region (711,375 ha)

**Total Vegetation Cover Decile [%]** 





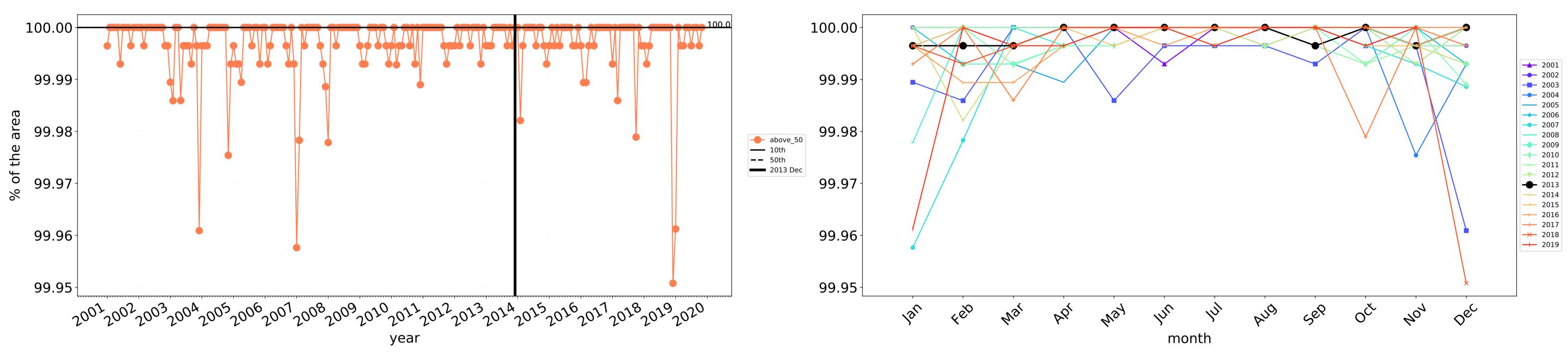
the map using baseline from 2001 to 2019.

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

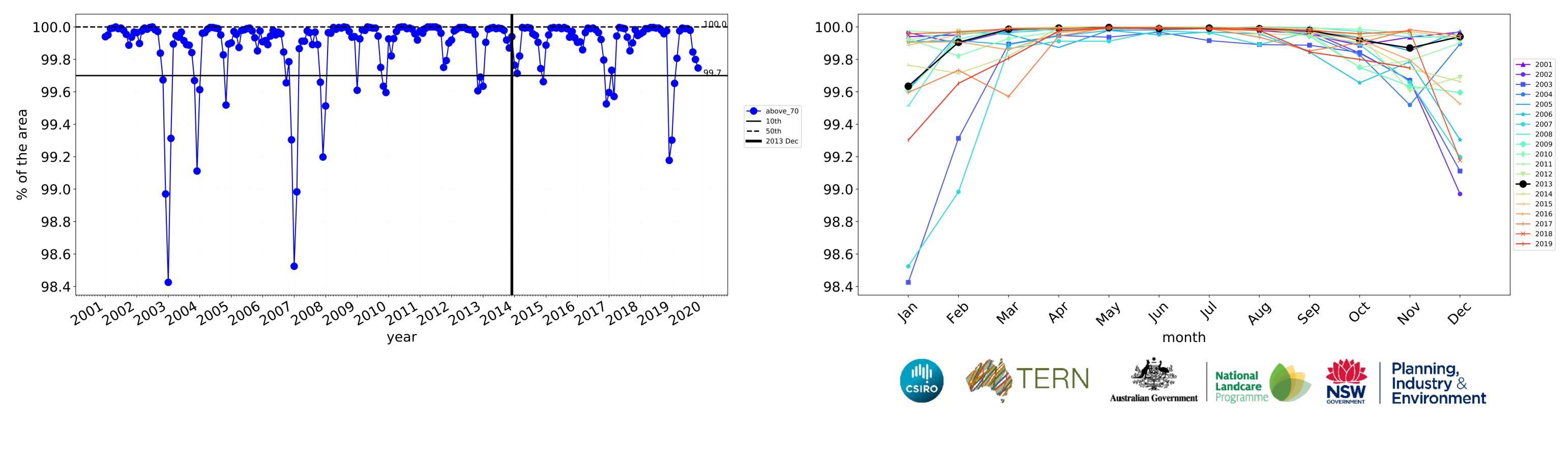
records for that month of

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



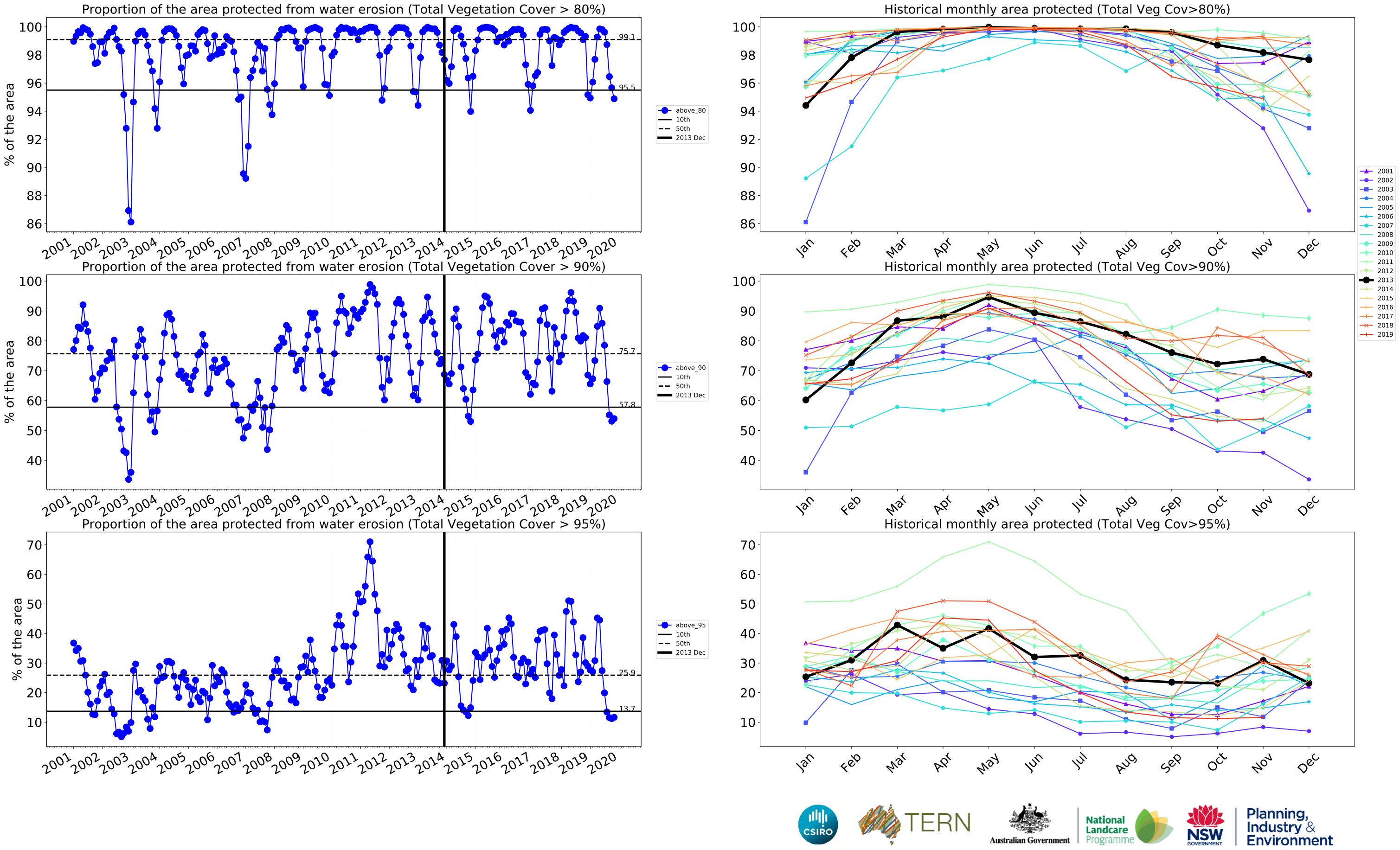
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



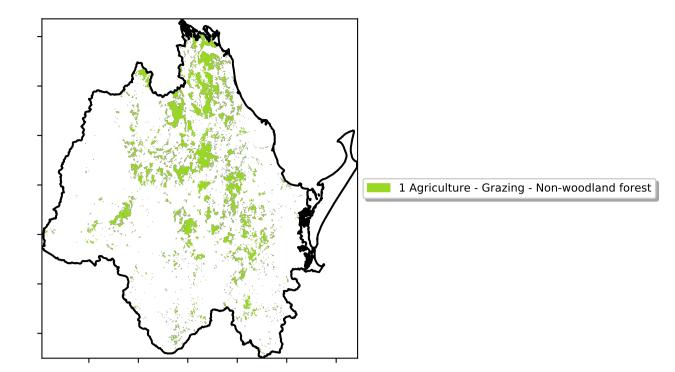
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

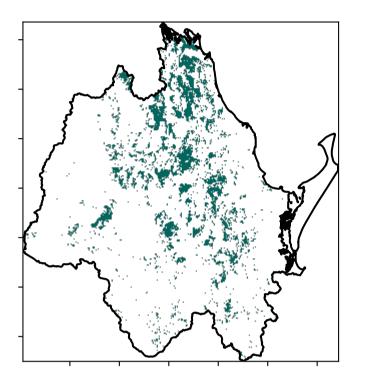


### Grazing - Forest (non woodland)

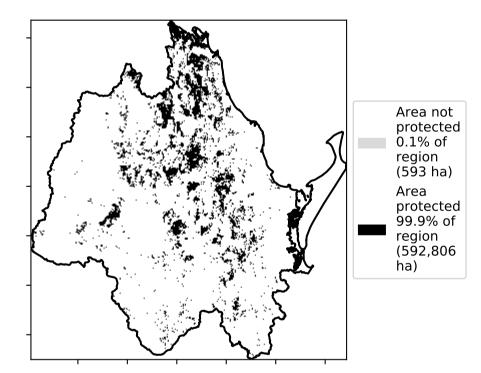
Land use and forest cover

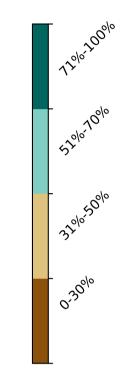


**Total Vegetation Cover [%]** 



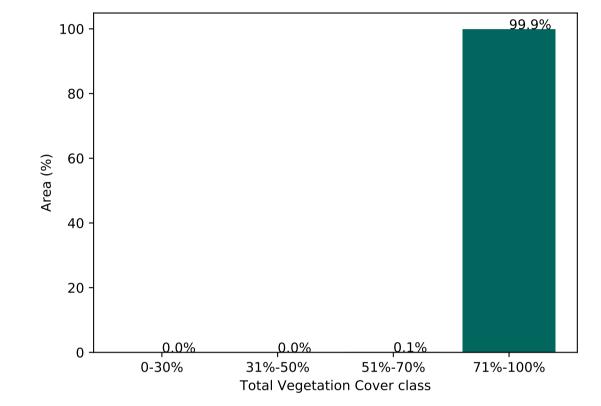








Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Anomaly show how many percetage points each pixel is from the mean That

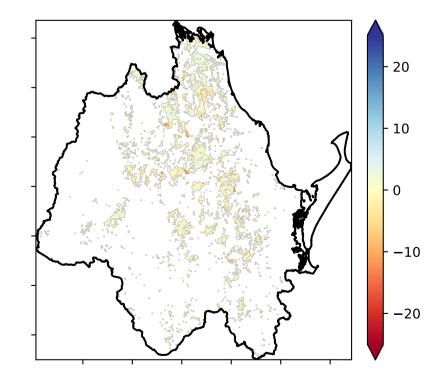
the mean. That

is, red pixels are about 20% lower than the

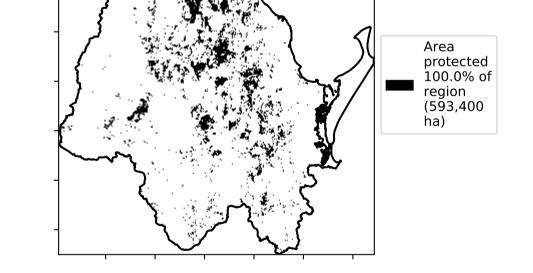
mean of that pixel. The mean

is only for the month of the map

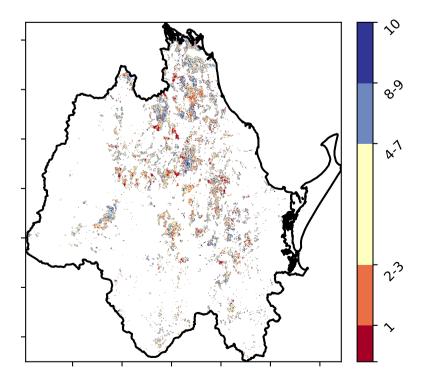
from 2001 to 2019. **Total Vegetation Cover Anomaly [%]** 



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.

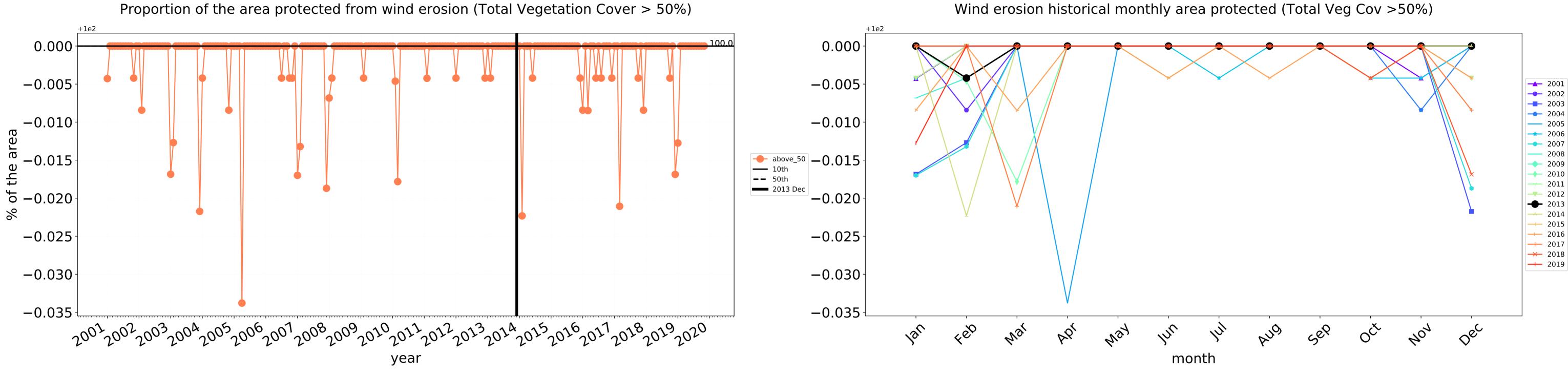


**Total Vegetation Cover Decile [%]** 

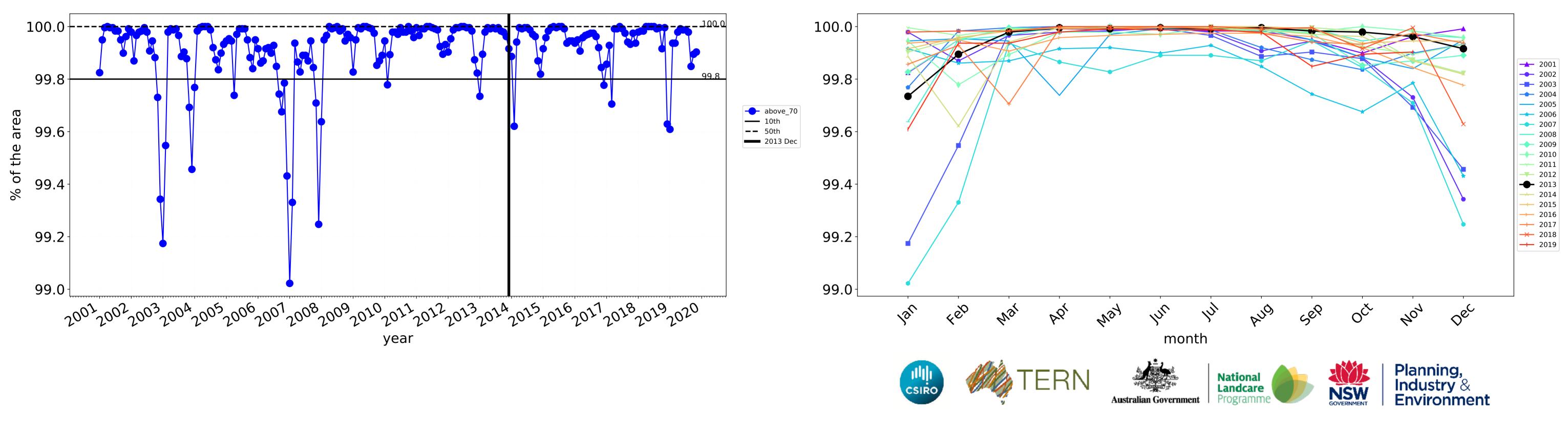




records for that the map using b from 2001 to 20

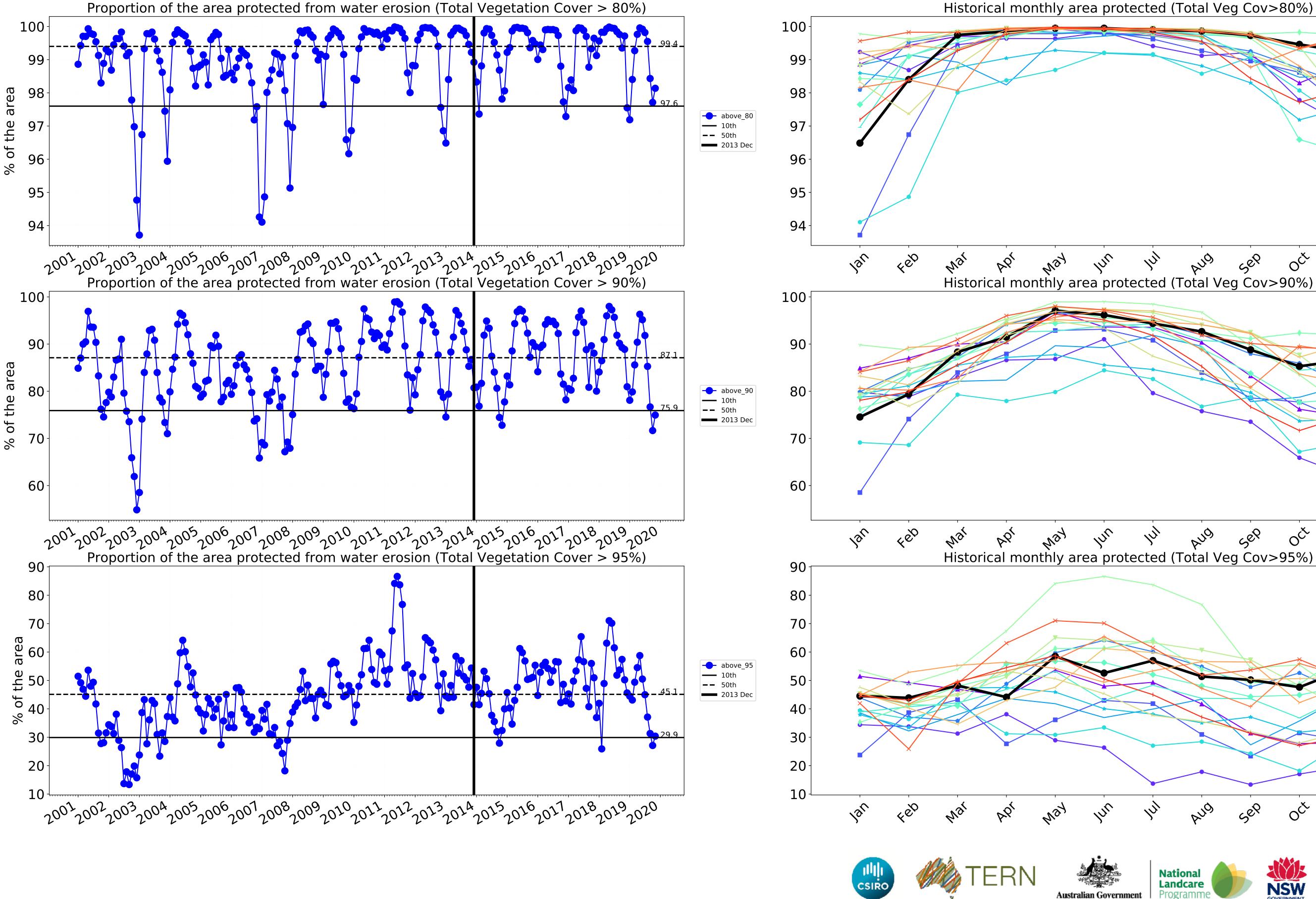


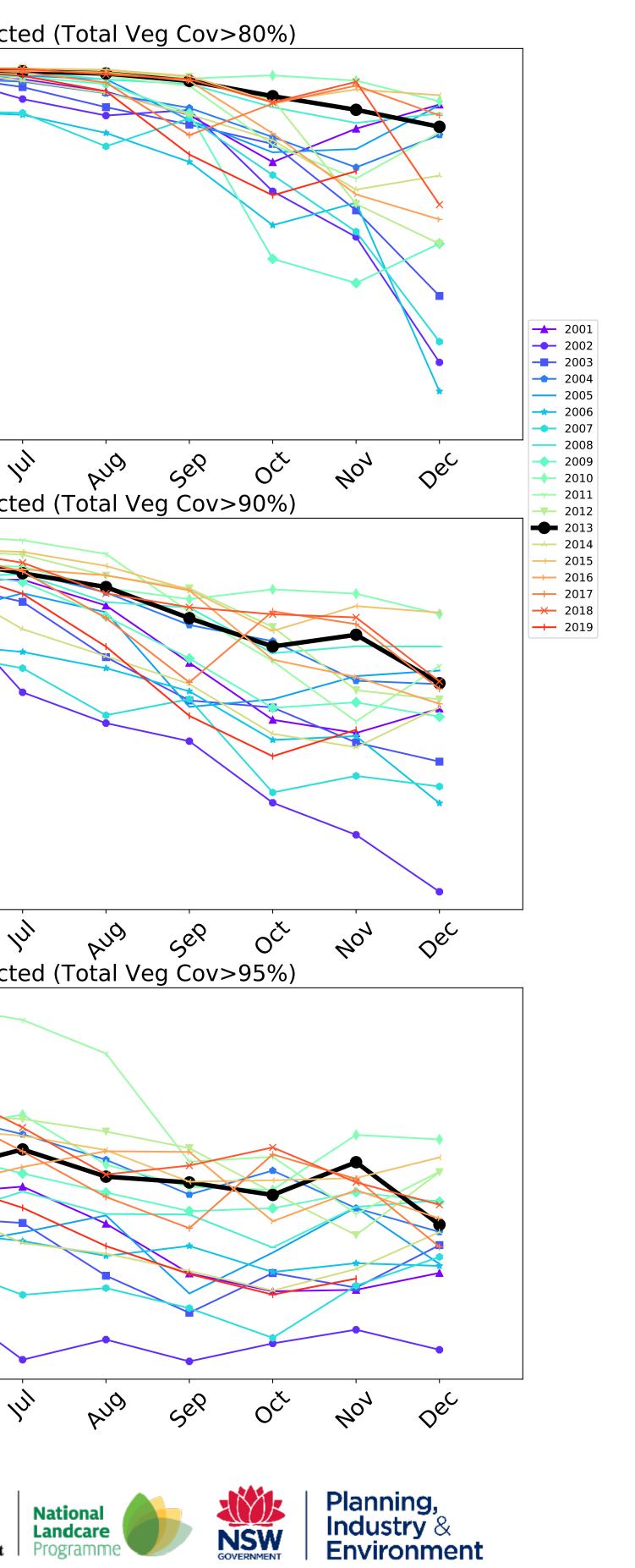
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



### Grazing - Forest (non woodland) timeseries

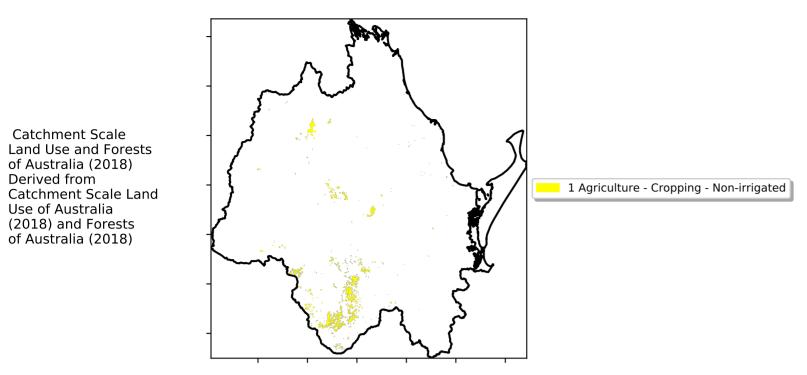
Water erosion historical monthly area protected (Total Veg Cov>70%)



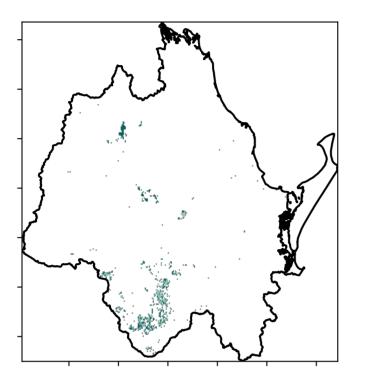


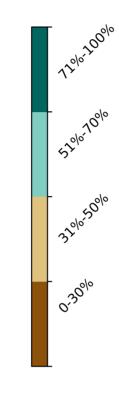
### Cropping

Land use and forest cover

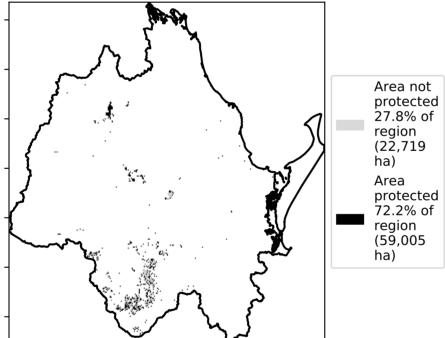


**Total Vegetation Cover [%]** 

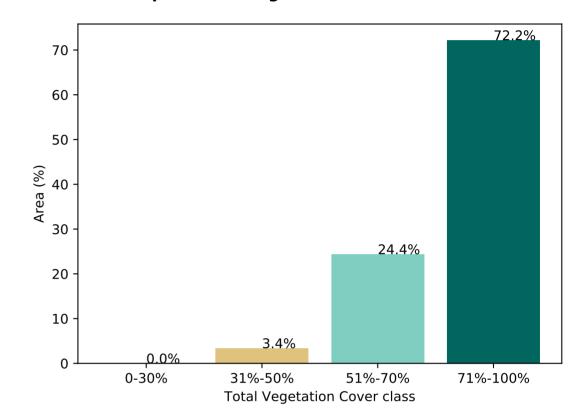




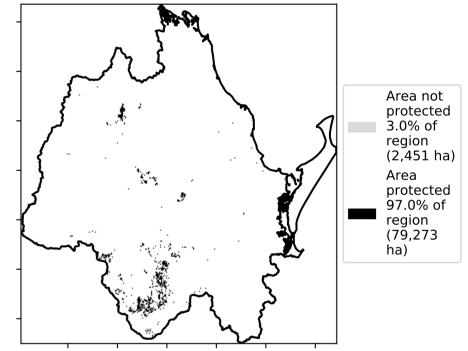
% Area protected from water erosion (>70%)



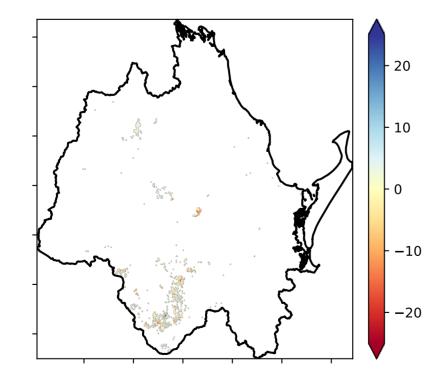
Proportion of vegetation cover class in area



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

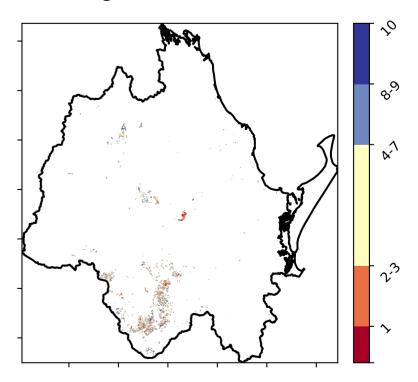


**Total Vegetation Cover Anomaly [%]** 



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

**Total Vegetation Cover Decile [%]** 

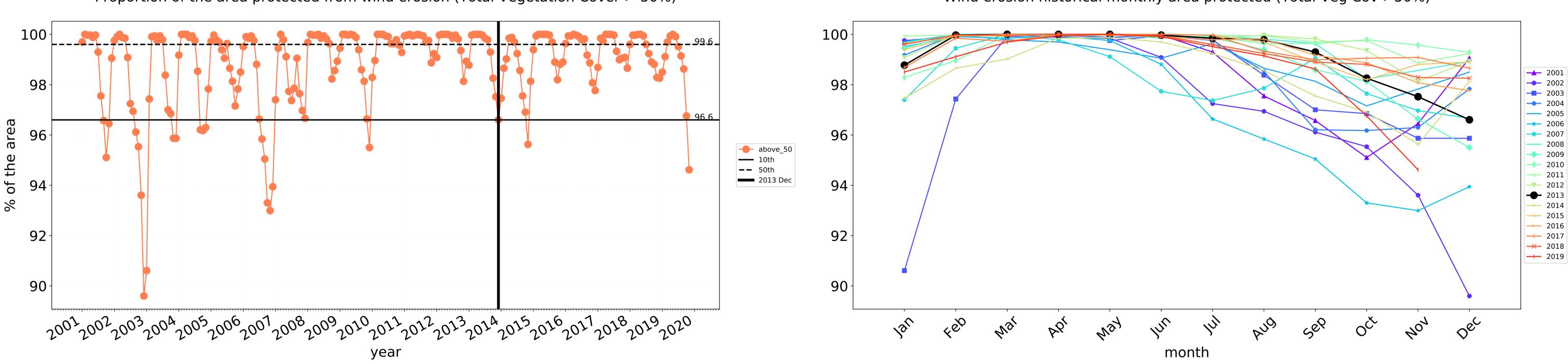




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

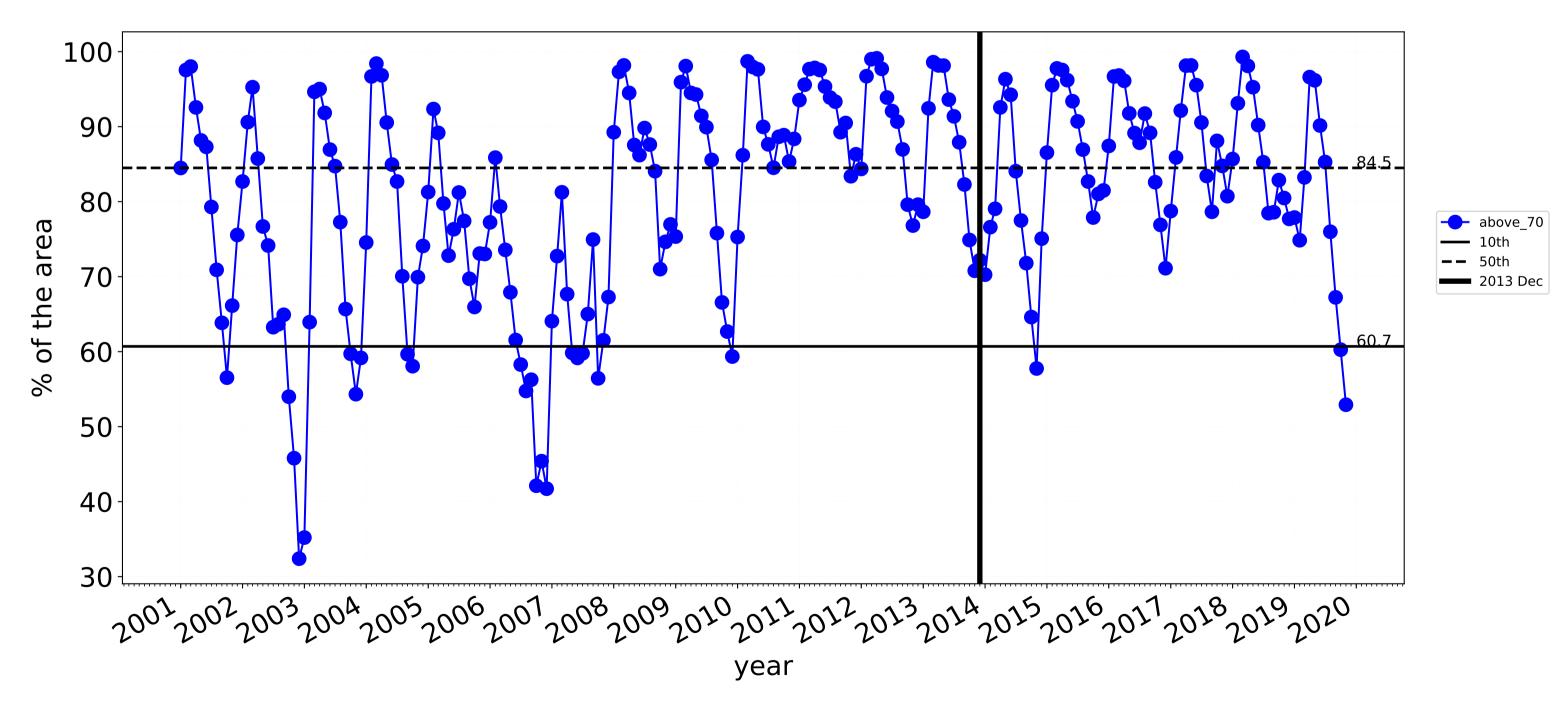
Derived from

Use of Australia (2018) and Forests of Australia (2018)



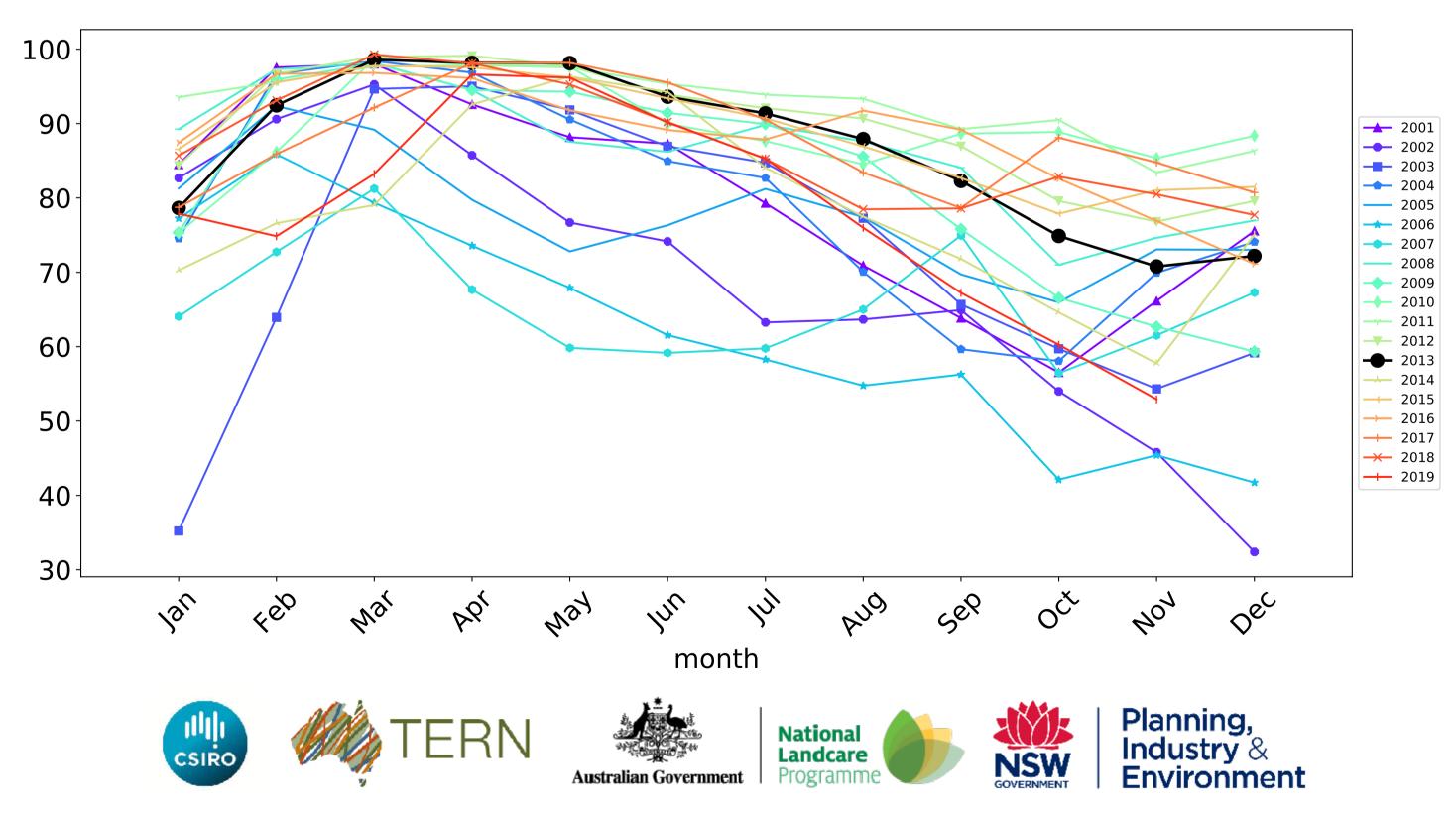
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



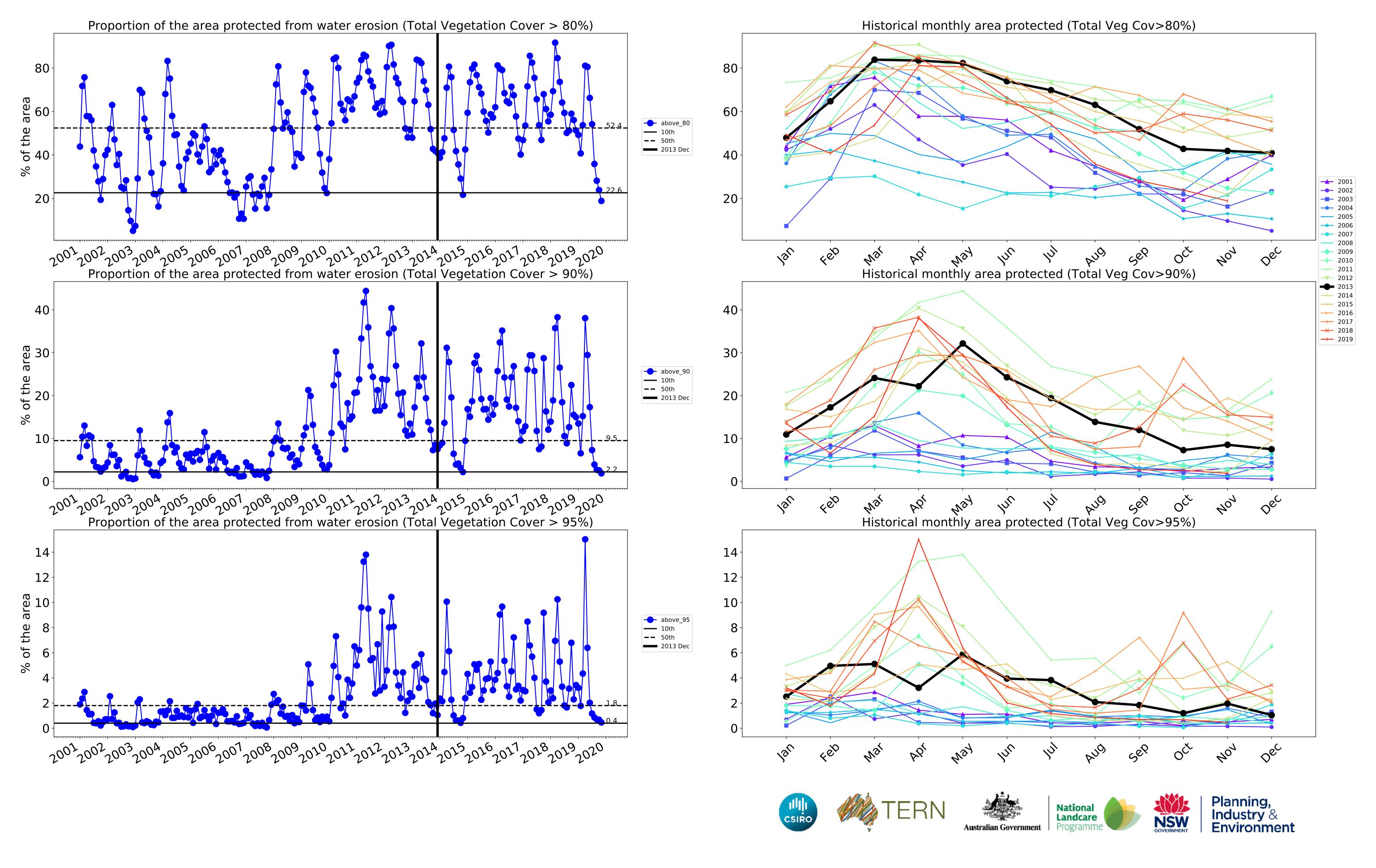


### **Cropping timeseries**

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

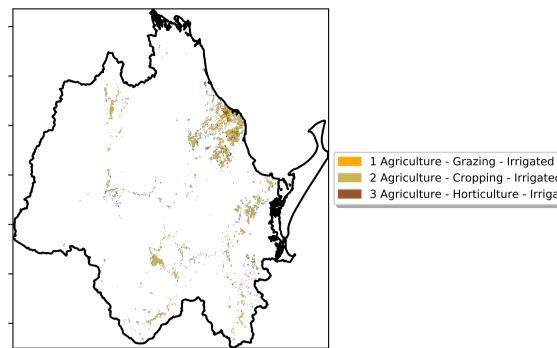


Wind erosion historical monthly area protected (Total Veg Cov >50%)



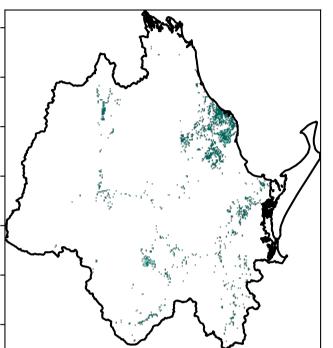
### Irrigation

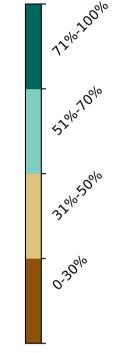
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



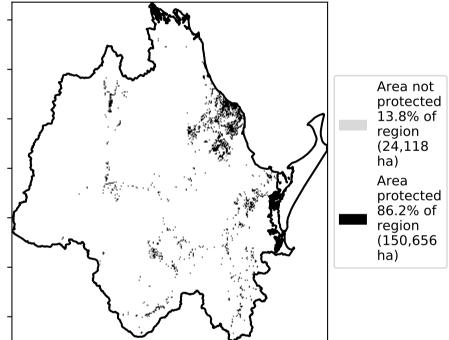
**Total Vegetation Cover [%]** 

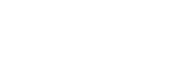
Land use and forest cover





% Area protected from water erosion (>70%)



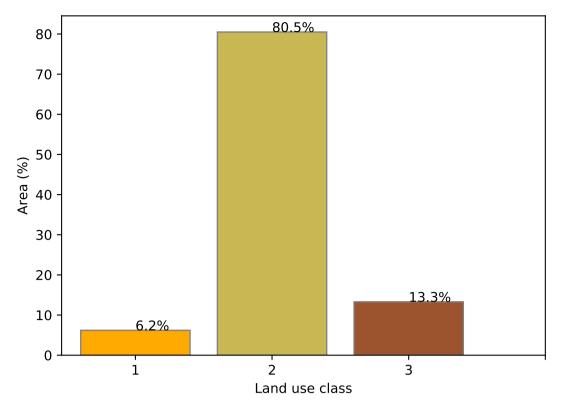




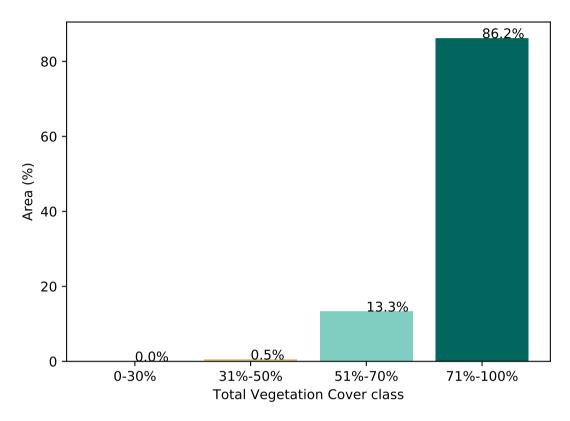


2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

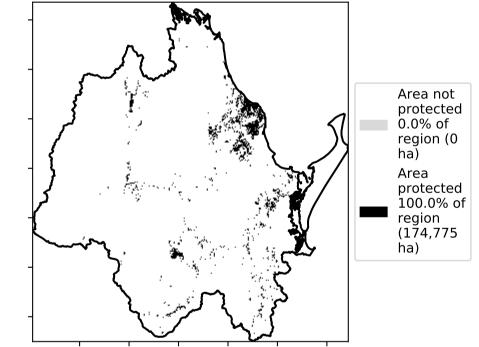
#### Proportion of each land class in area



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



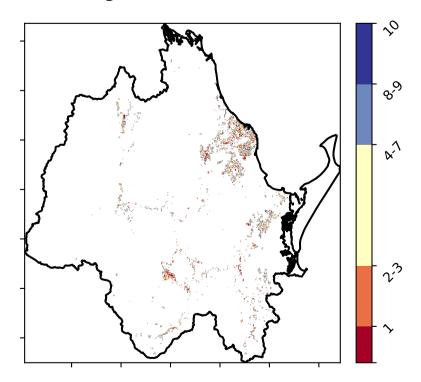


**Total Vegetation Cover Anomaly [%]** 

2 20 10 0 -10 -20

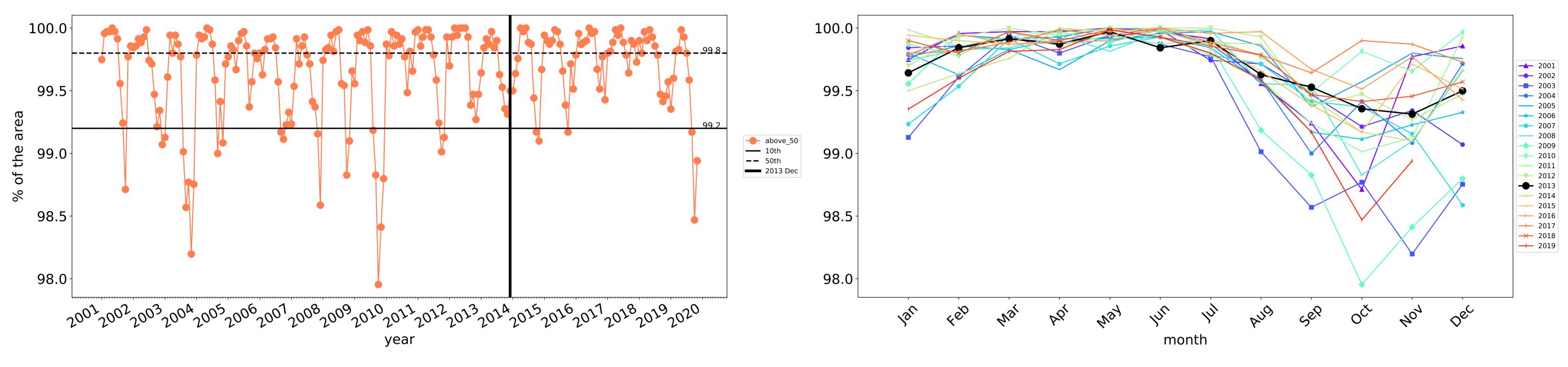
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 



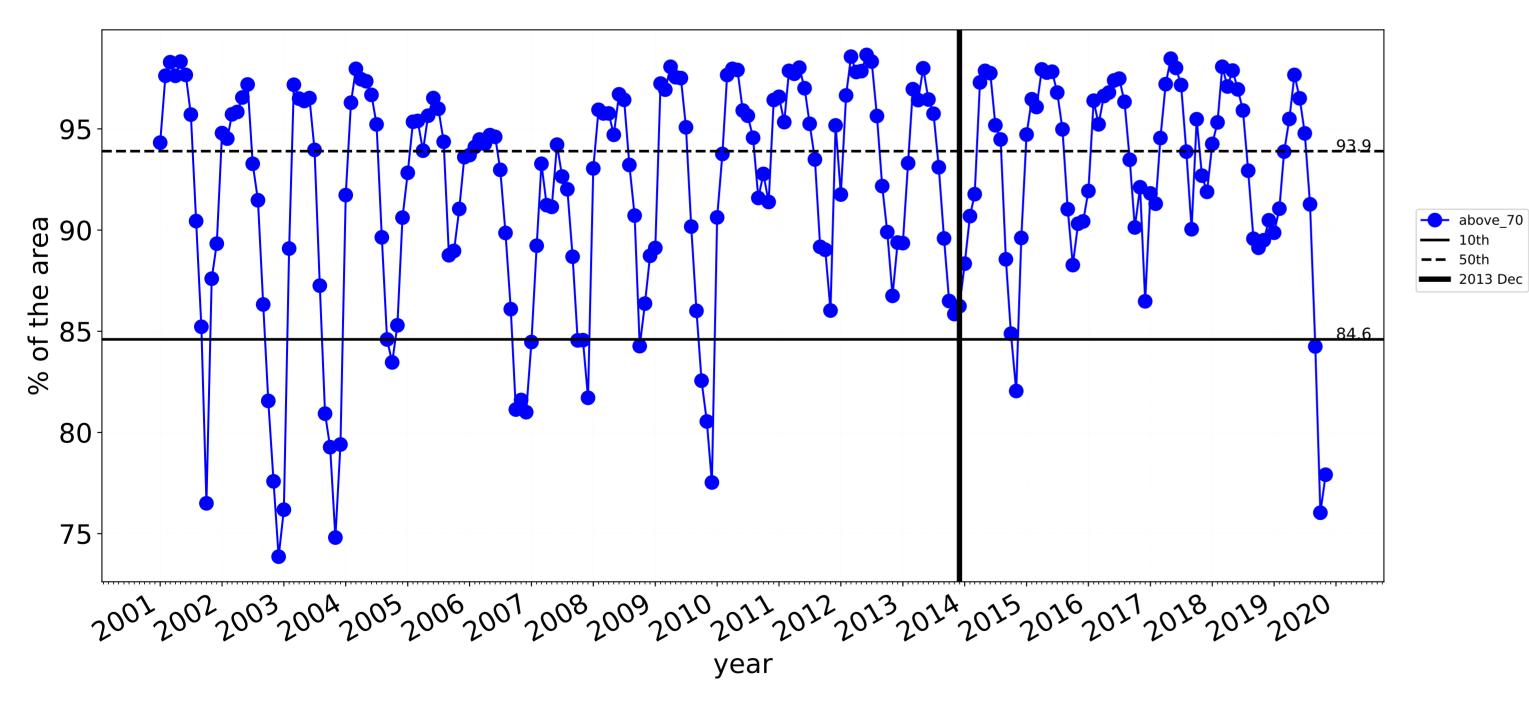


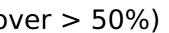
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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

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

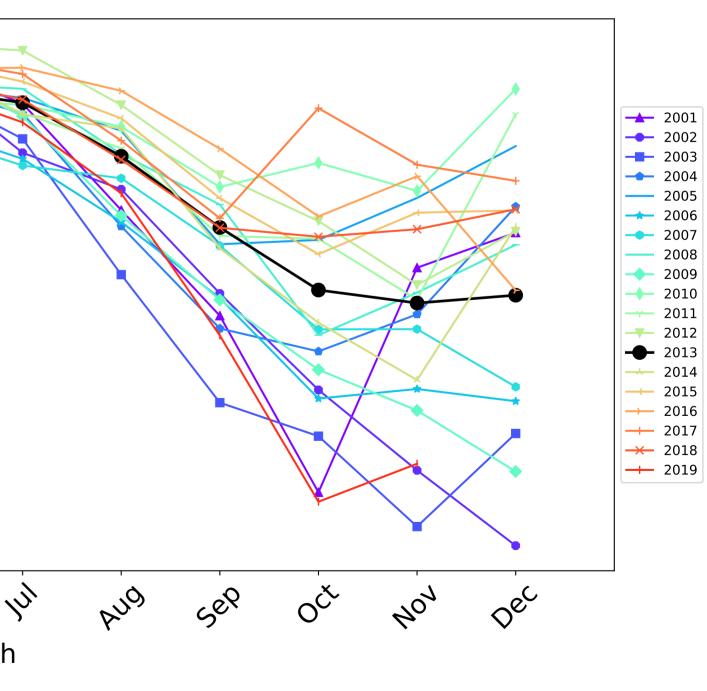




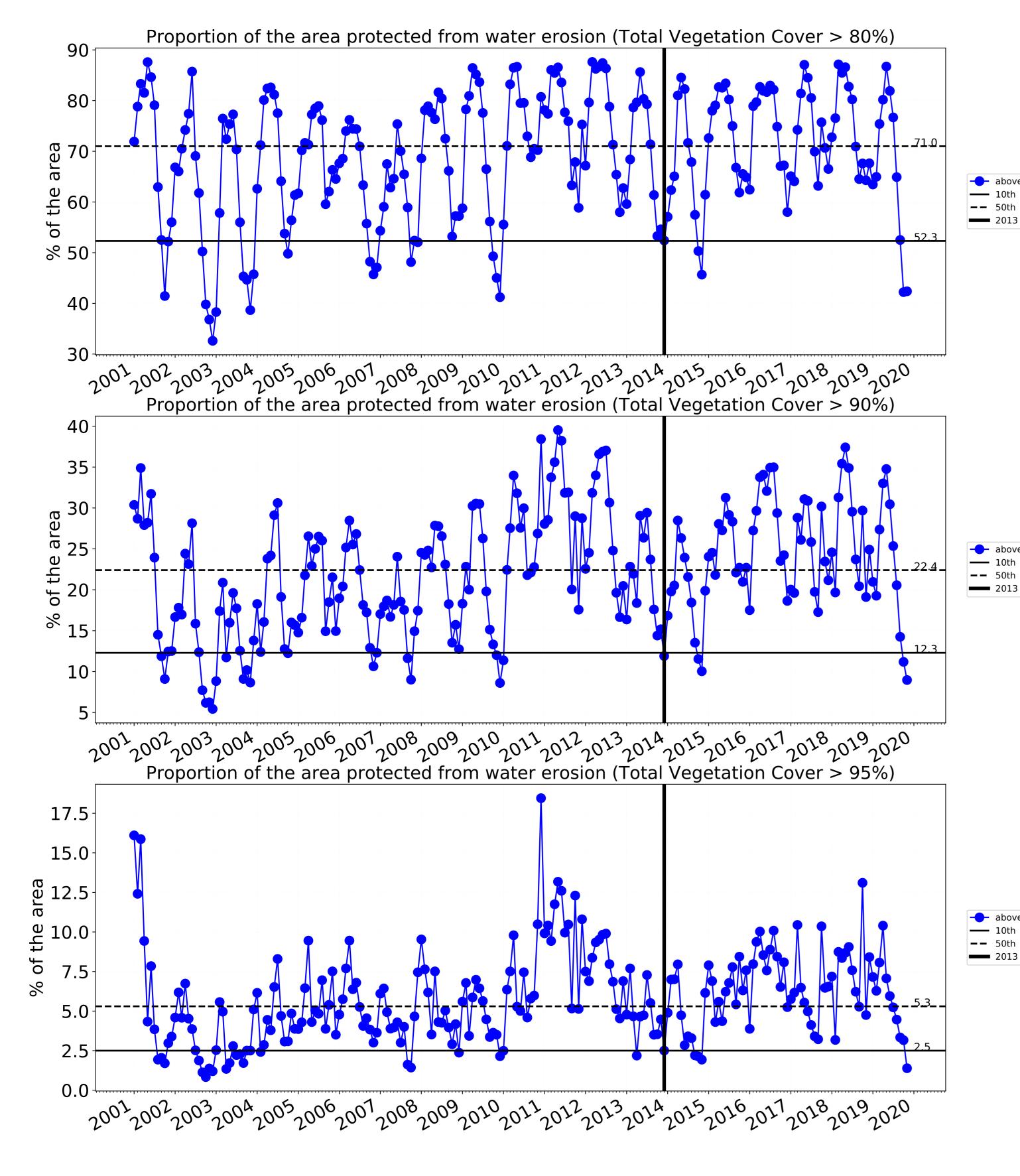
Wind erosion historical monthly area protected (Total Veg Cov >50%)

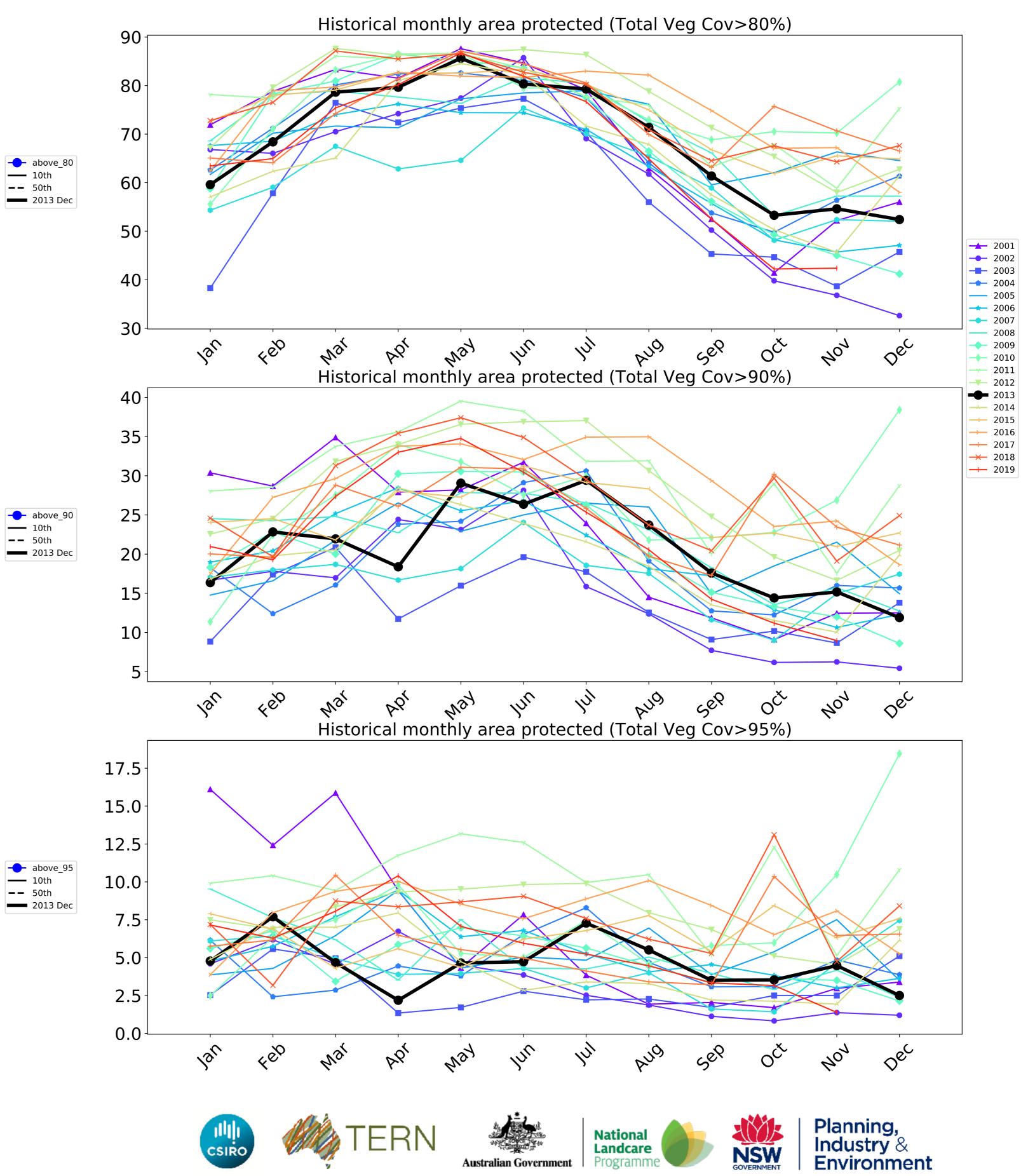
95 90 85 80 75 Jan feb May 1sh Mai PQ1 month ERN (SOR) CSIRC Australian Government

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



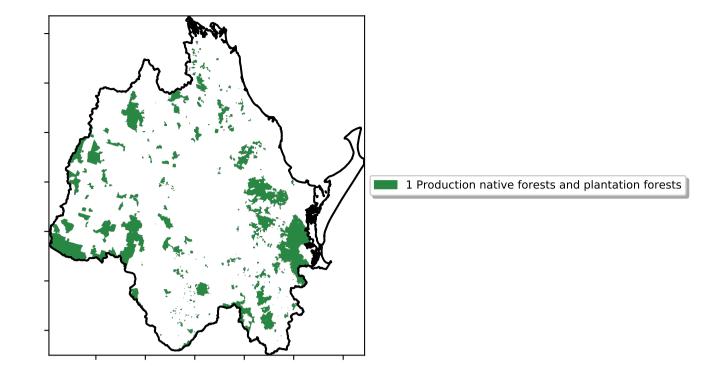




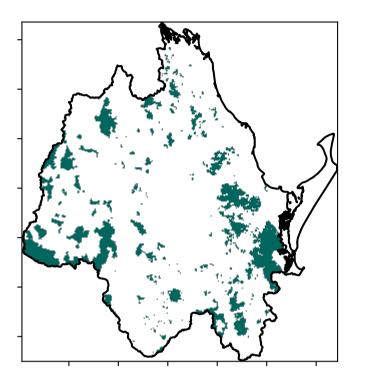


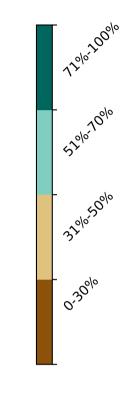
### **Production native forests and plantation forests**

Land use and forest cover

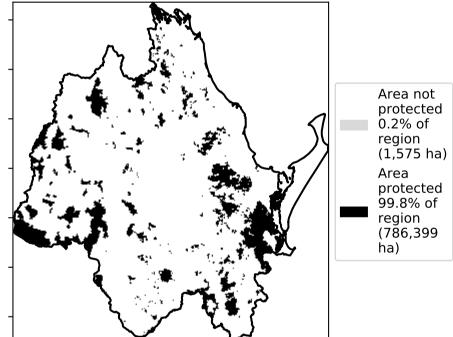


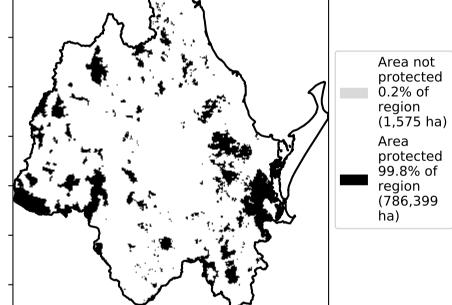
**Total Vegetation Cover [%]** 



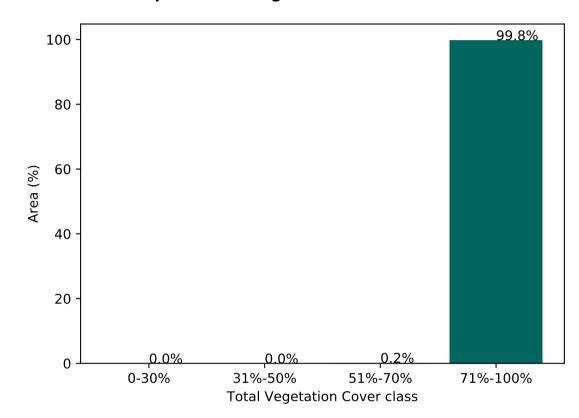


% Area protected from water erosion (>70%)

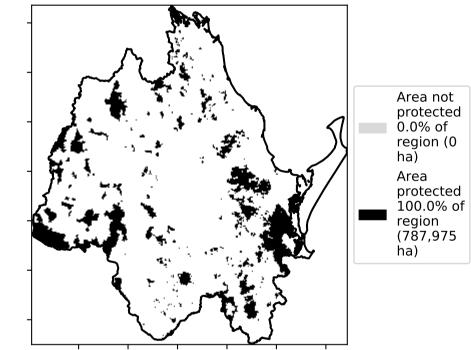




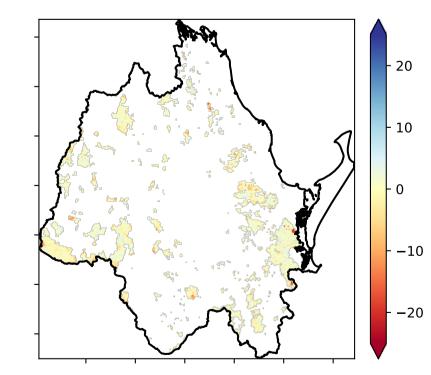
### Proportion of vegetation cover class in area



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

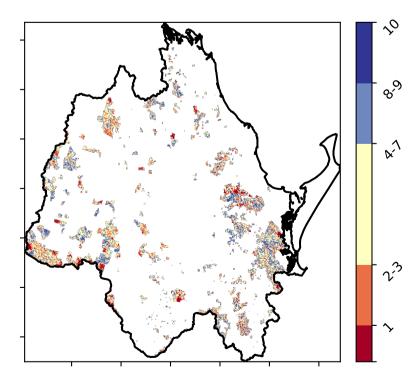


**Total Vegetation Cover Anomaly [%]** 



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

**Total Vegetation Cover Decile [%]** 





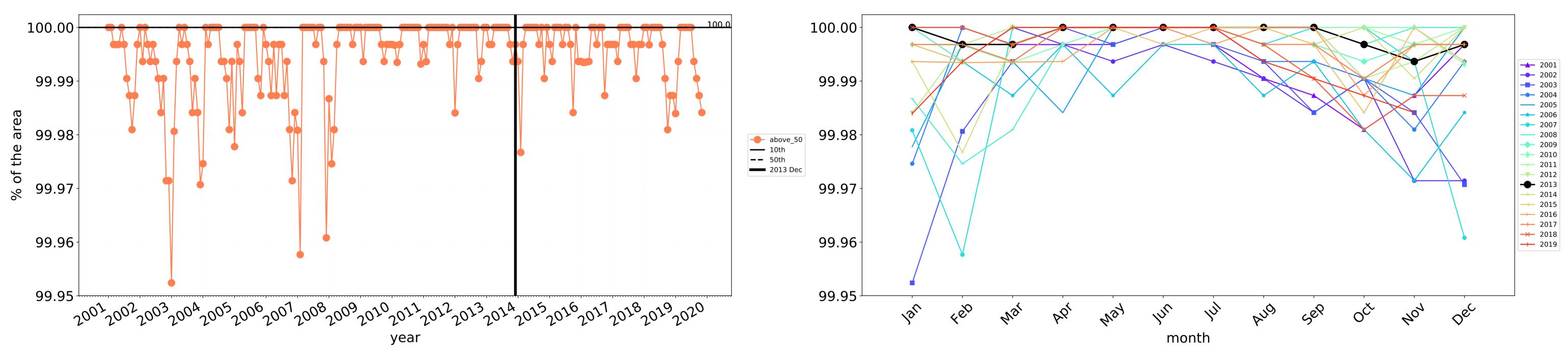
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.

Catchment Scale Land Use and Forests of Australia (2018)

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

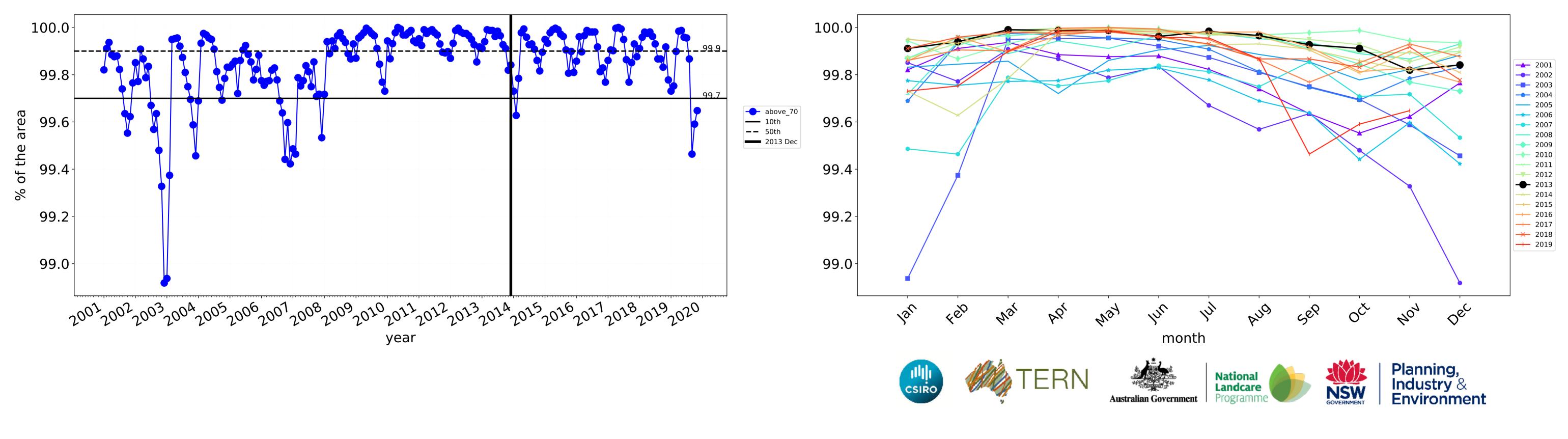
Derived from

### Production native forests and plantation forests timeseries



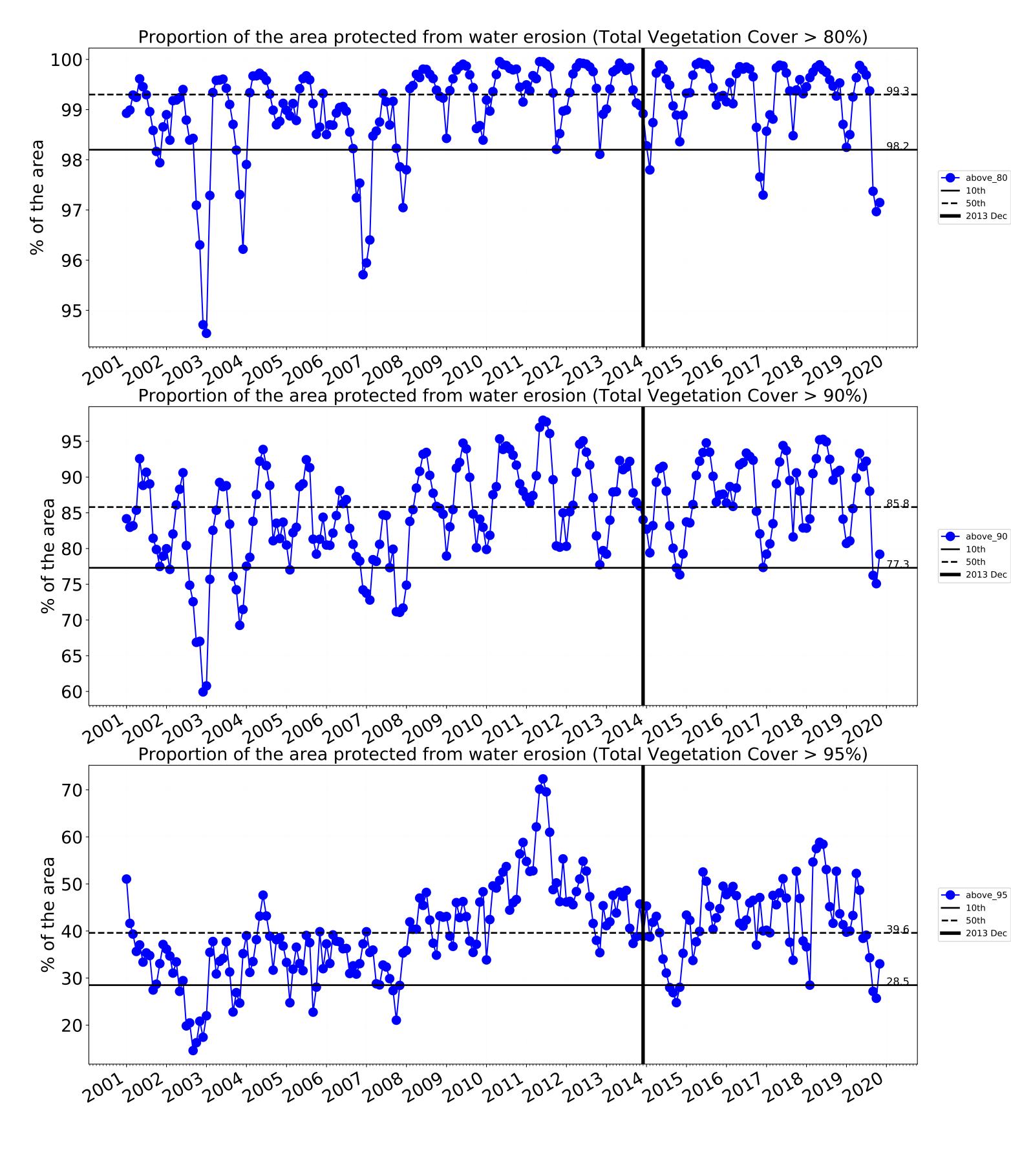
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

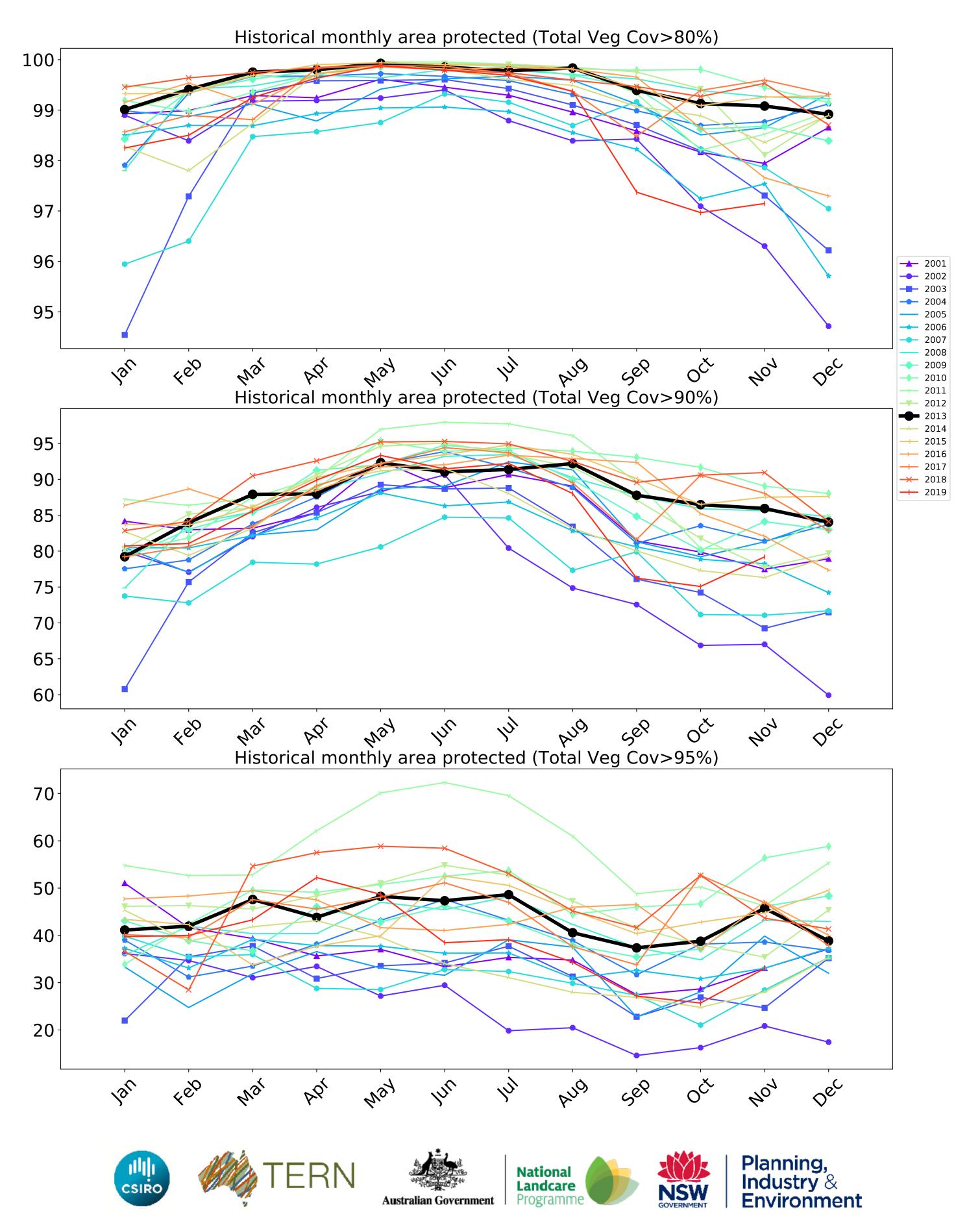
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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









# Burnett Mary (5,560,075 ha and no data 16,780 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	5,560,075	100.0% 5,557,875	99.8% 5,549,325	98.2% 5,457,507	90.9% 5,052,736	57.4% 3,189,570	23.4% 1,299,231
Conservation and natural environments	677,150	99.7% 675,400	99.2% 671,925	97.2% 658,325	94.6% 640,325	82.8% 560,975	48.0% 325,100
Conservation and natural environments Woodland forest	180,900	99.9% 180,675	99.5% 180,000	97.2% 175,850	93.3% 168,700	76.8% 138,950	45.8% 82,875
Conservation and natural environments Forest (non woodland)	467,425	99.9% 467,175	99.7% 466,225	98.3% 459,450	96.6% 451,350	87.2% 407,675	50.2% 234,675
Agriculture	3,883,100	100.0% 3,883,075	99.9% 3,879,200	98.3% 3,815,600	89.2% 3,462,125	48.1% 1,868,325	16.4% 636,600
Grazing	3,620,925	100.0% 3,620,900	100.0% 3,620,700	99.4% 3,600,700	92.0% 3,332,875	50.8% 1,839,200	17.4% 630,625
Grazing non forest	2,316,150	100.0% 2,316,125	100.0% 2,315,925	99.2% 2,296,850	88.6% 2,051,150	37.6% 870,950	9.5% 219,375
Grazing Woodland forest	711,375	100.0% 711,375	100.0% 711,375	99.9% 710,950	97.7% 694,725	68.8% 489,250	23.2% 165,000
Grazing - Forest (non woodland)	593,400	100.0% 593,400	100.0% 593,400	99.9% 592,900	98.9% 587,000	80.7% 479,000	41.5% 246,250
Cropping	81,725	100.0% 81,725	96.6% 78,950	72.2% 59,000	41.0% 33,475	7.5% 6,125	1.0% 850
Irrigation	174,775	100.0% 174,775	99.5% 173,900	86.2% 150,725	52.4% 91,600	11.9% 20,800	2.5% 4,375
Production native forests and plantation forests	787,975	100.0% 787,975	100.0% 787,950	99.8% 786,725	98.9% 779,450	84.0% 662,150	38.8% 306,050

