### **Total vegetation cover soil protection Region:NRM Hunter NSW**

## **Date: November 2010**

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

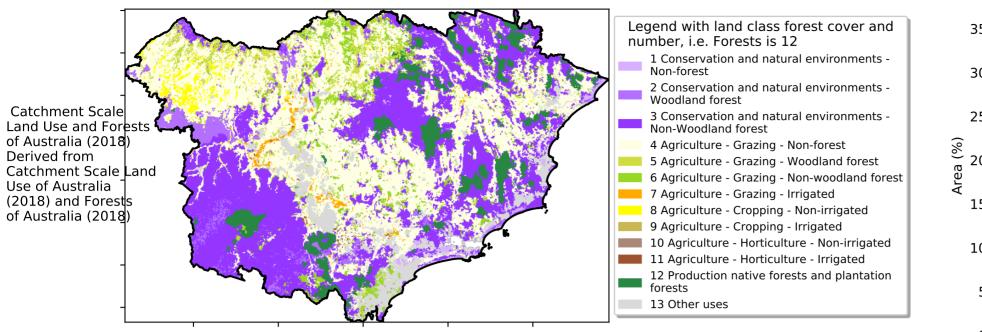


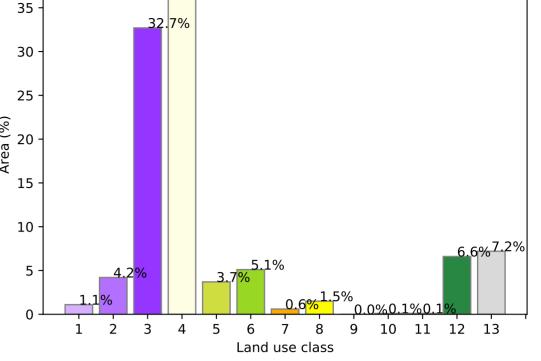
### **Vegetation Cover Nov 2010**

#### Land use and forest cover

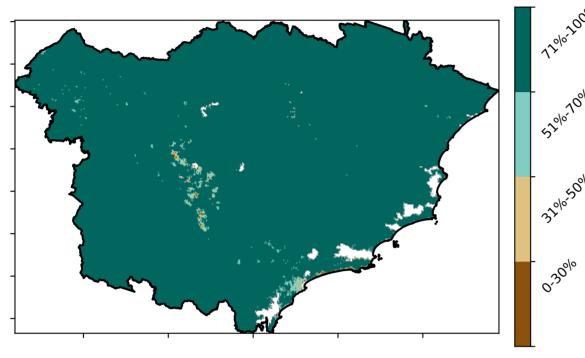
Proportion of each land class in area

36.9%

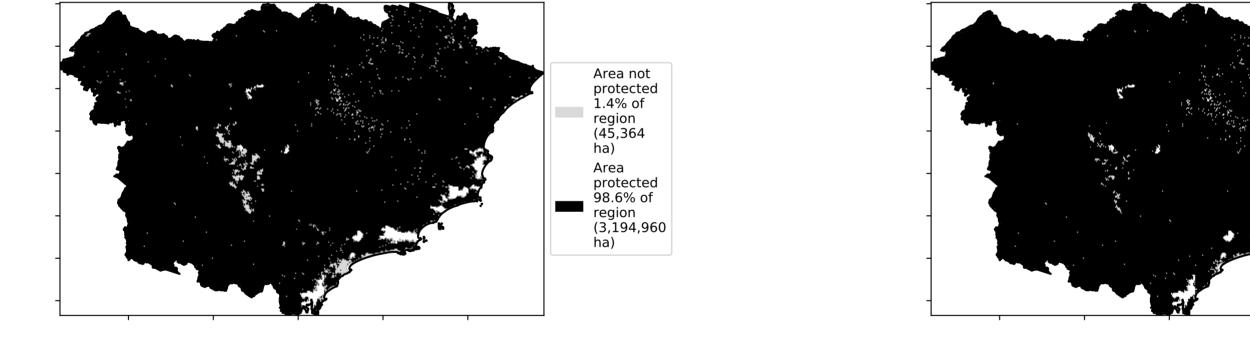




**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)



20

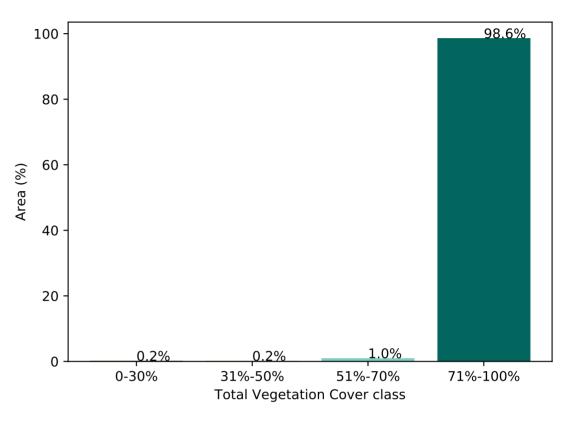
· 10

0

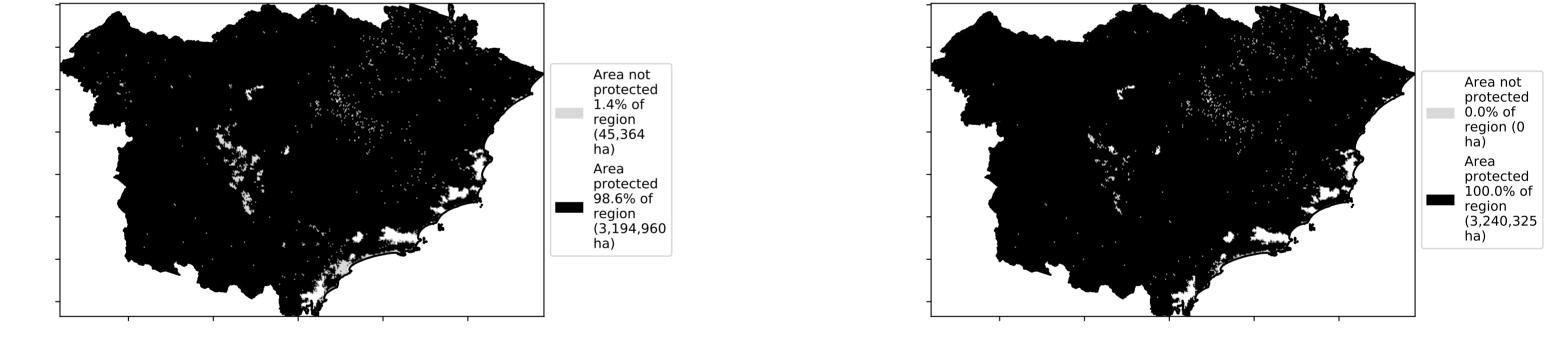
-10

-20

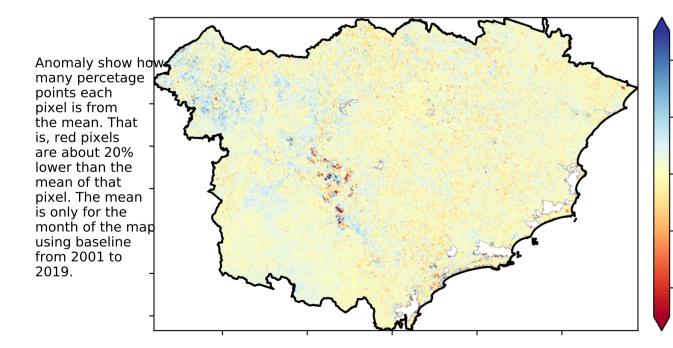
Proportion of vegetation cover class in area



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

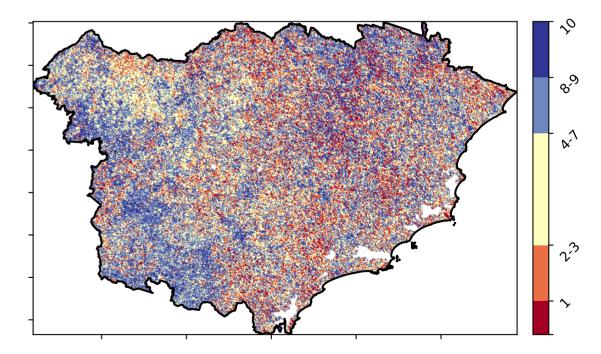


**Total Vegetation Cover Anomaly [%]** 

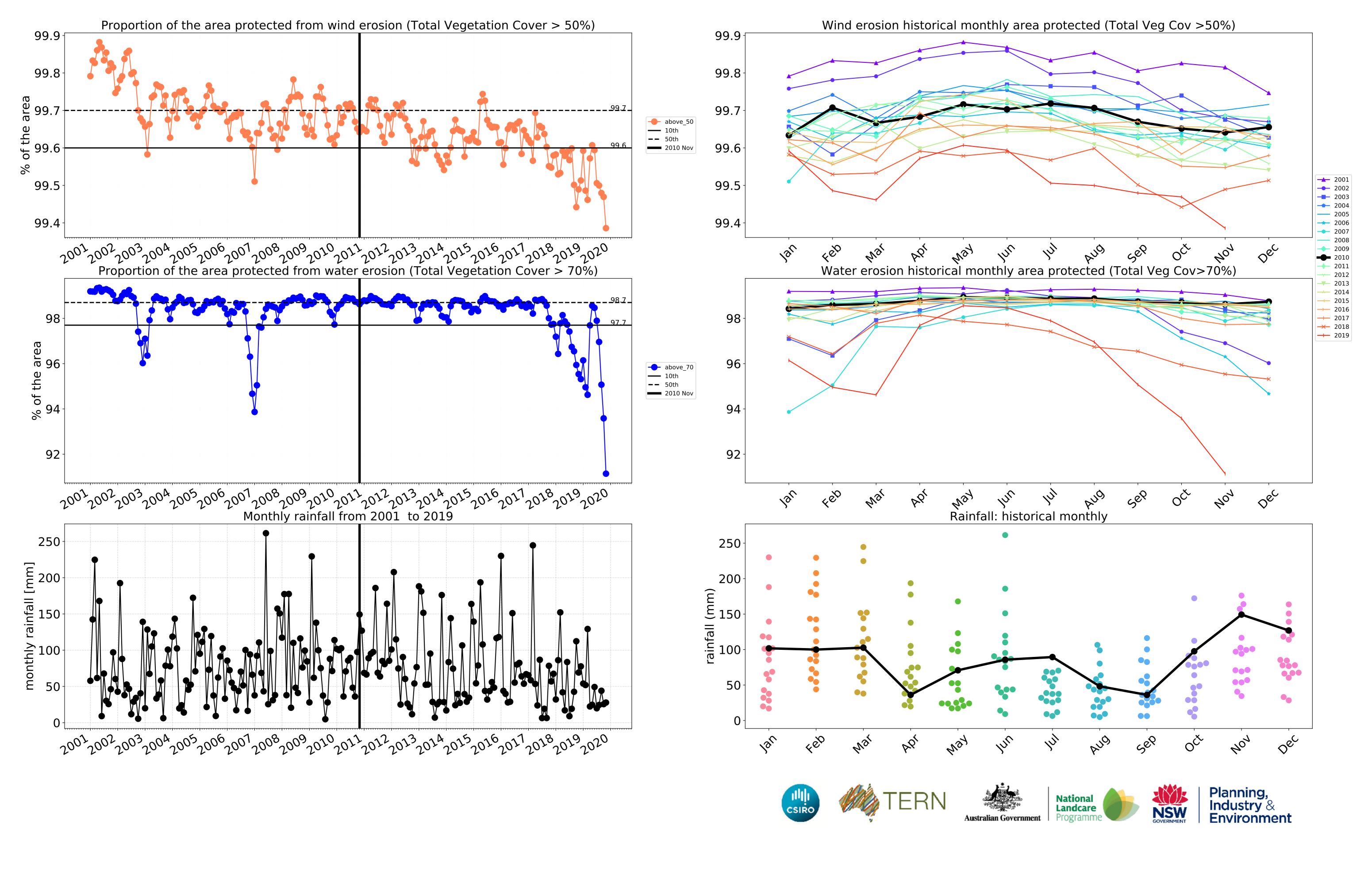


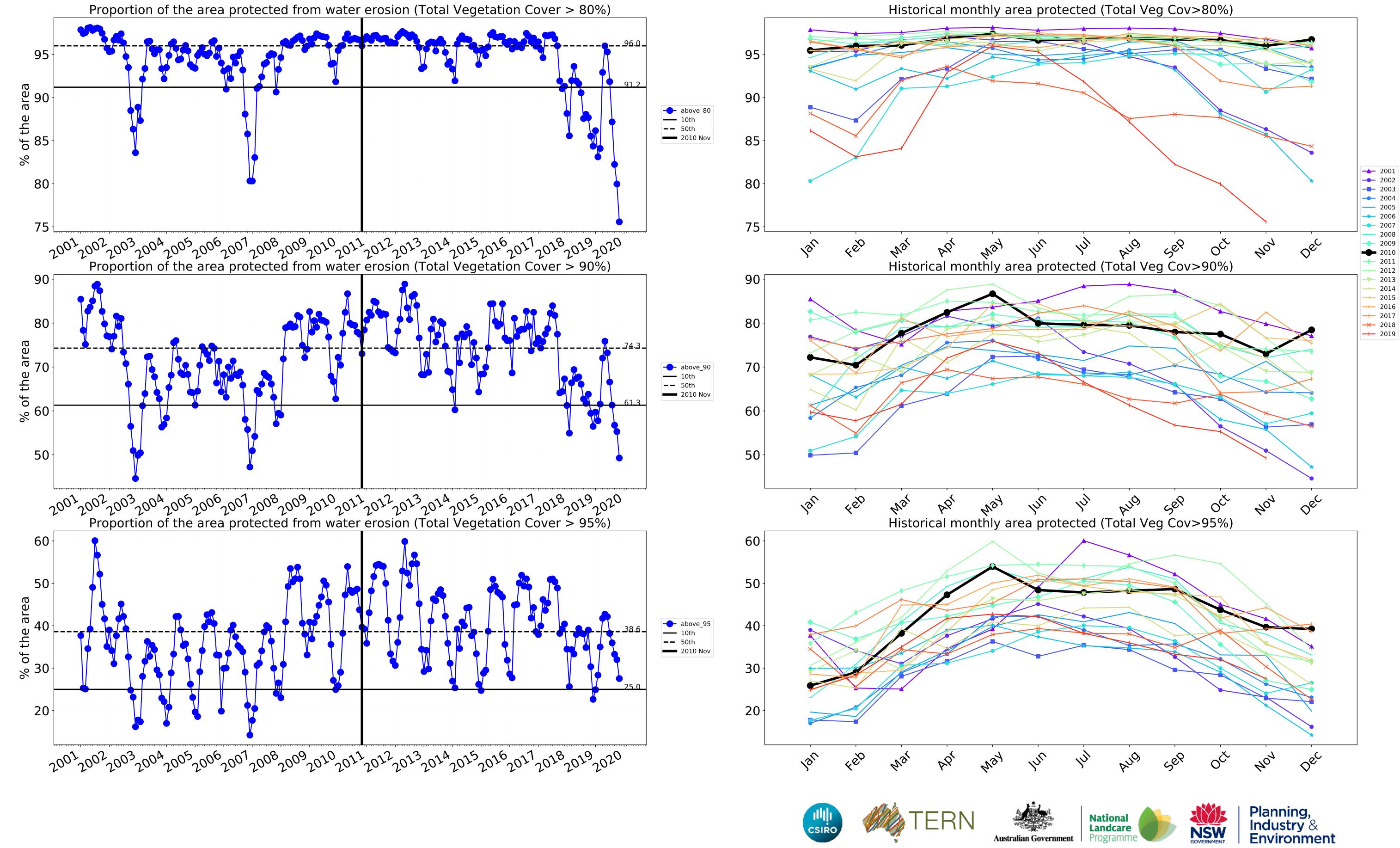
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

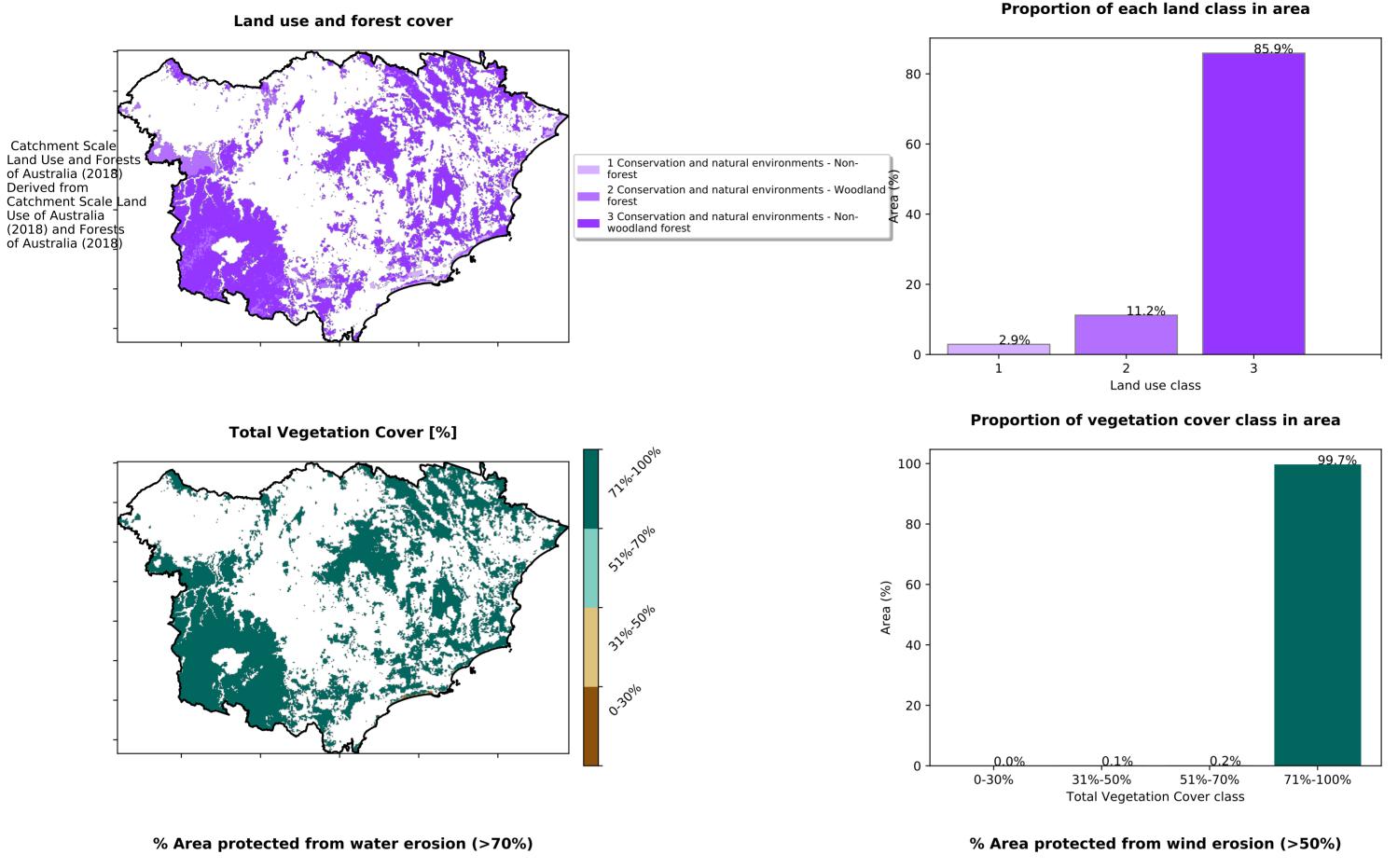


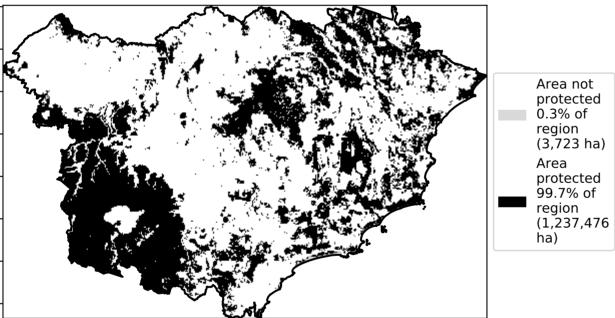






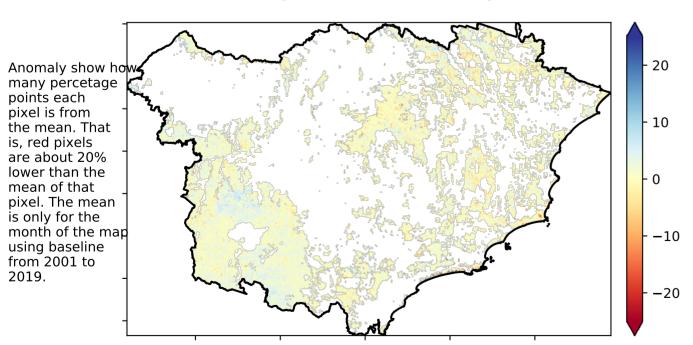
#### **Conservation and natural environments**





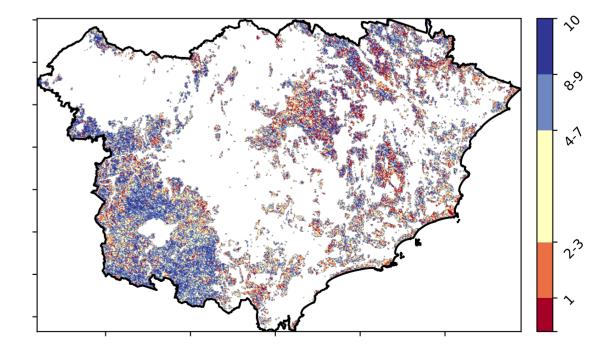


**Total Vegetation Cover Anomaly [%]** 

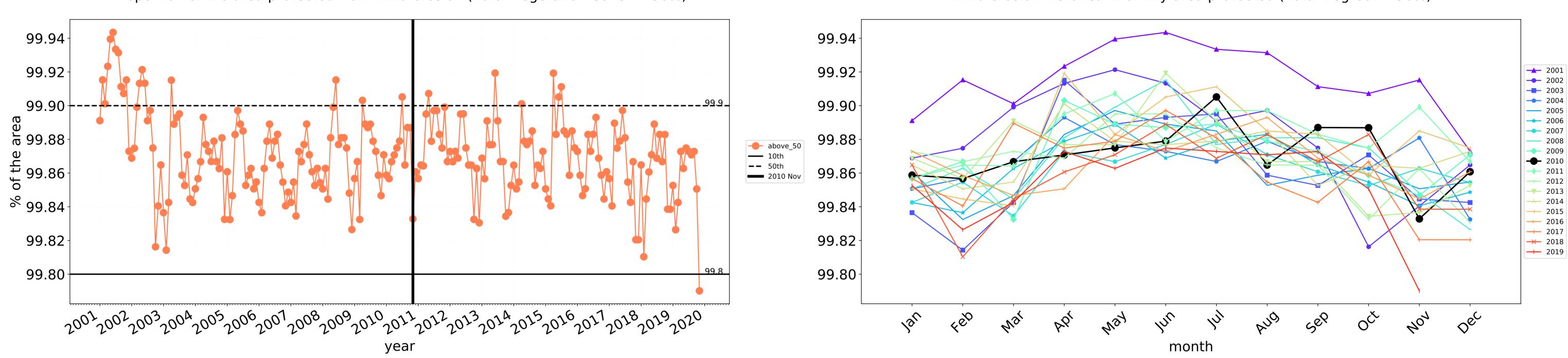


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**Total Vegetation Cover Decile [%]** 

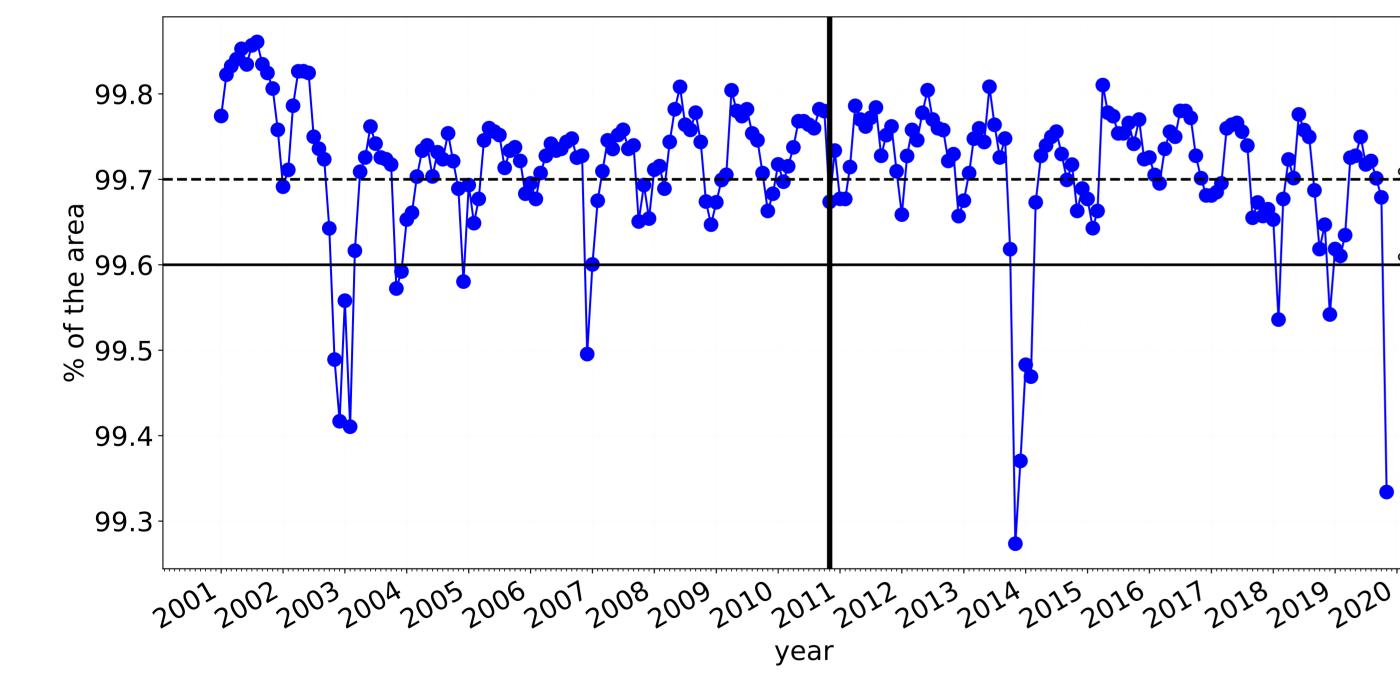






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



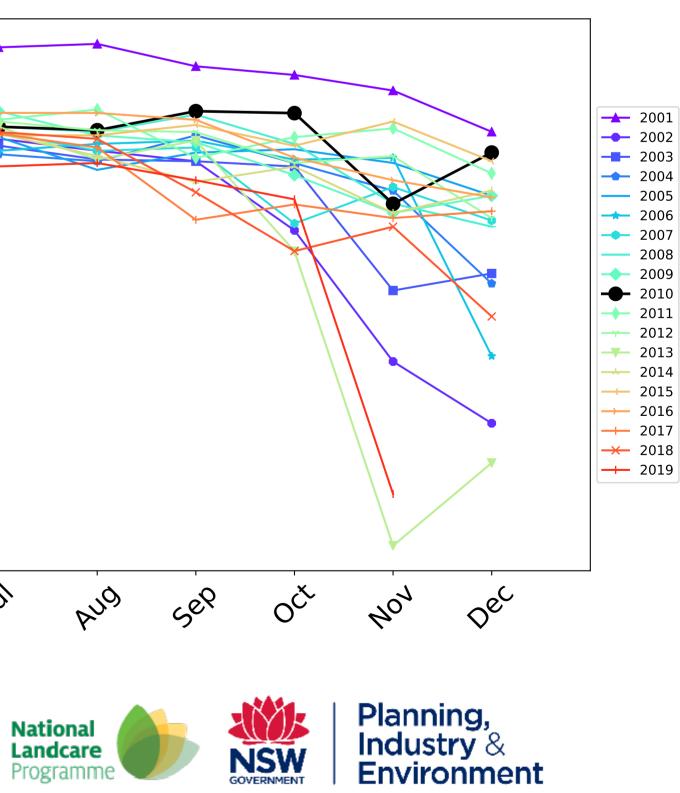
### **Conservation and natural environments timeseries**

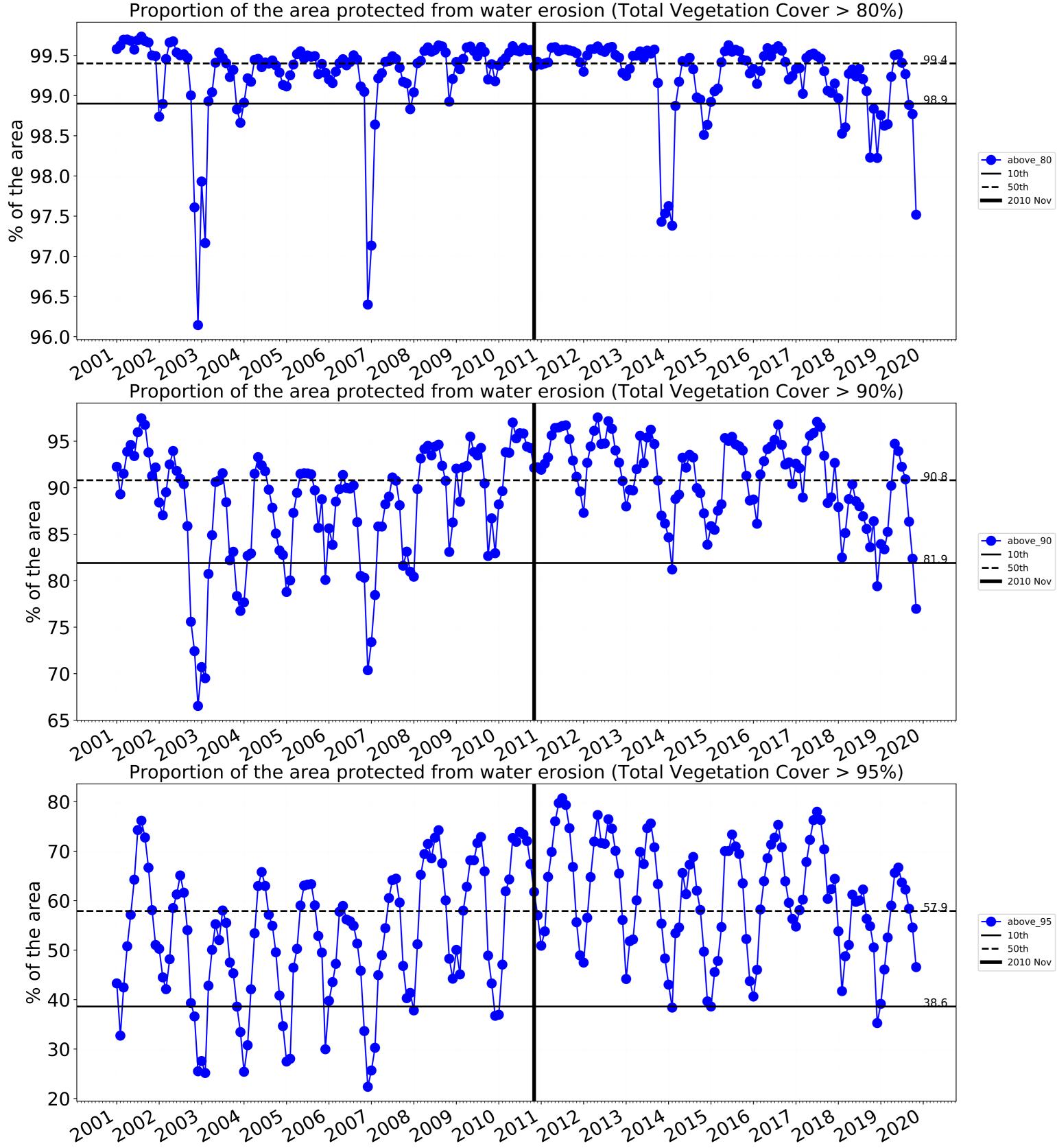
99.8-99.7 --- above\_70 **—** 10th **——** 50th 99.6 99.5<sup>-</sup> 99.4 99.3 Jan fed May In P.Q 1's Mal month FERN Australian Government

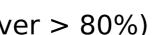
Wind erosion historical monthly area protected (Total Veg Cov >50%)

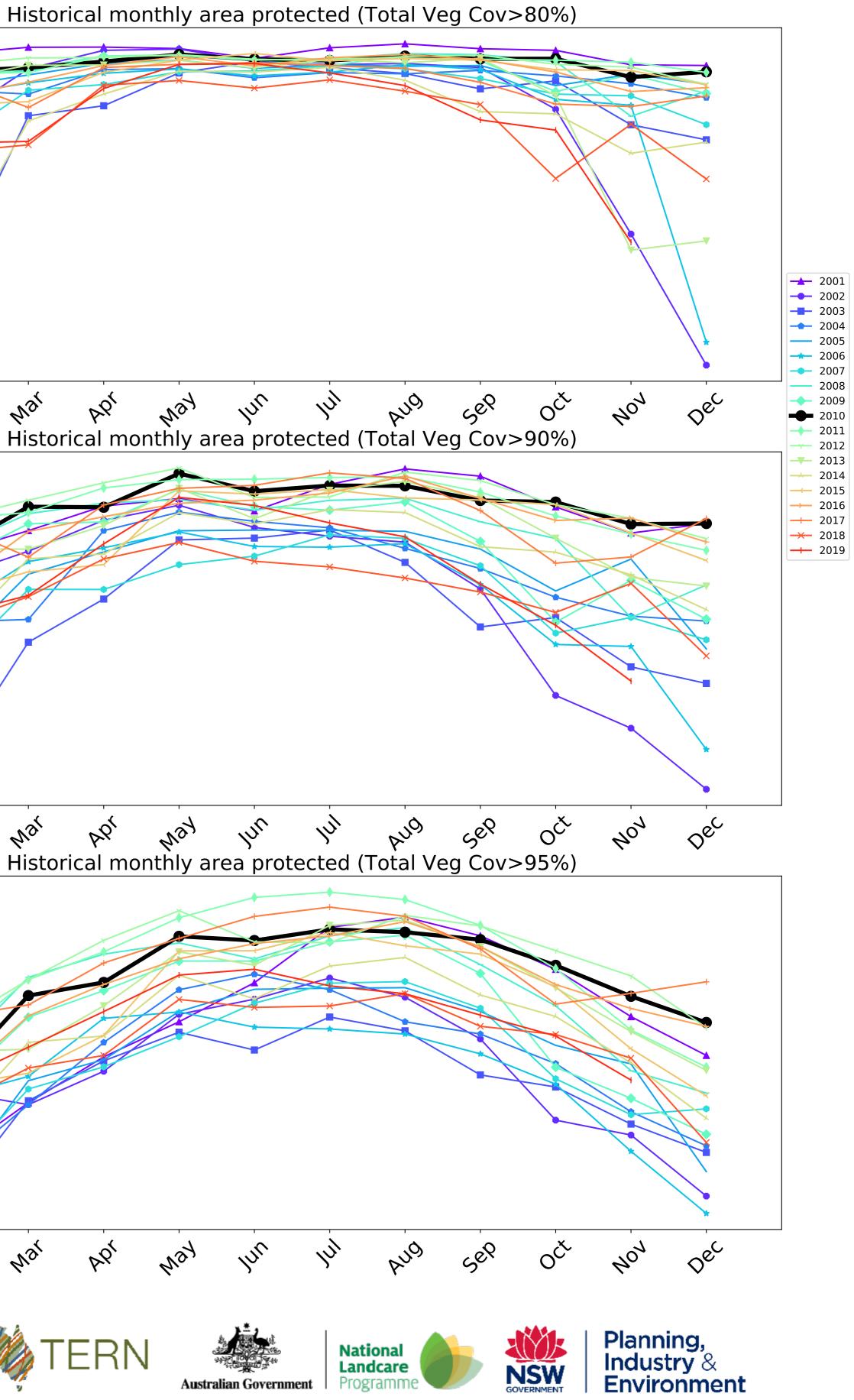
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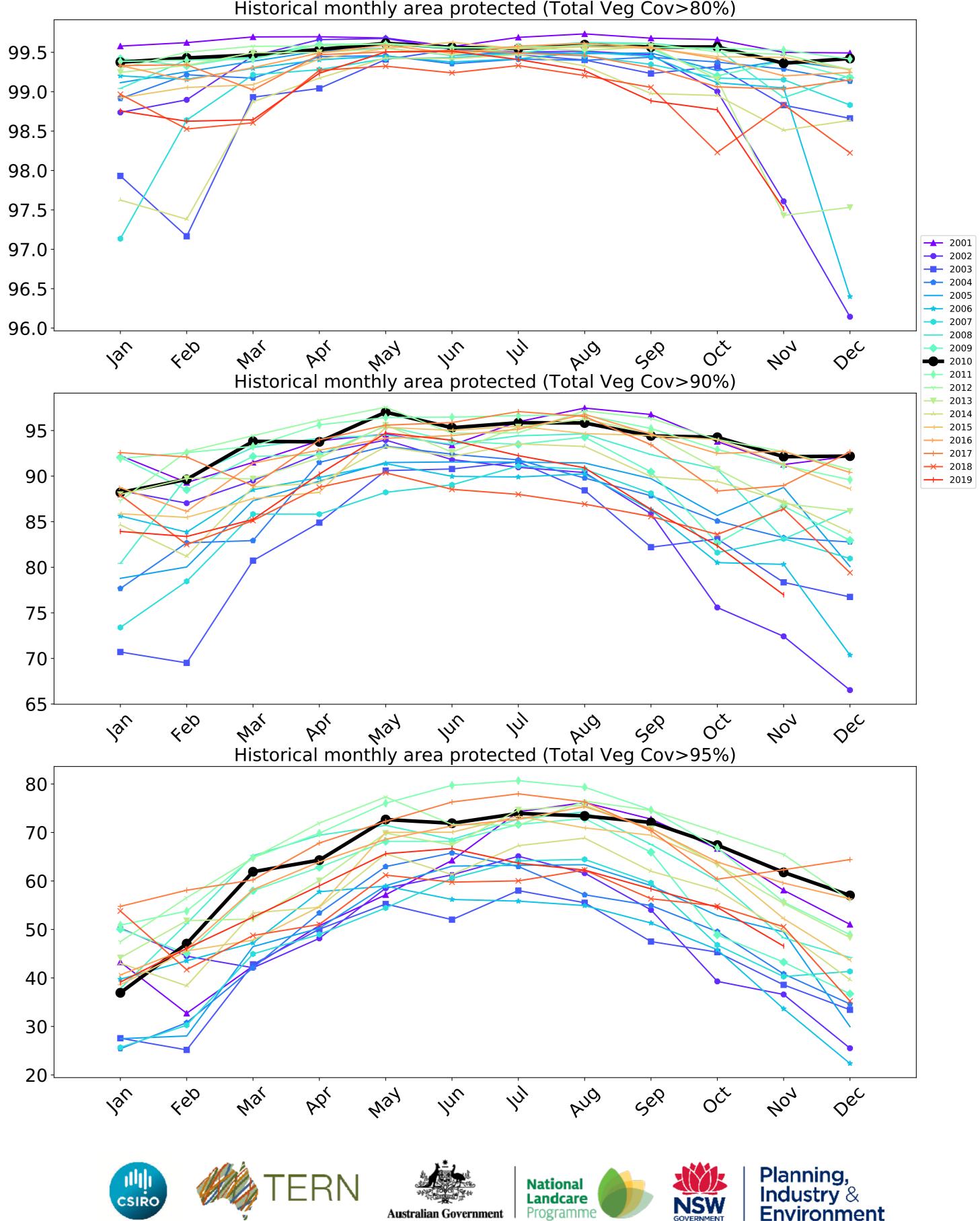
Water erosion historical monthly area protected (Total Veg Cov>70%)



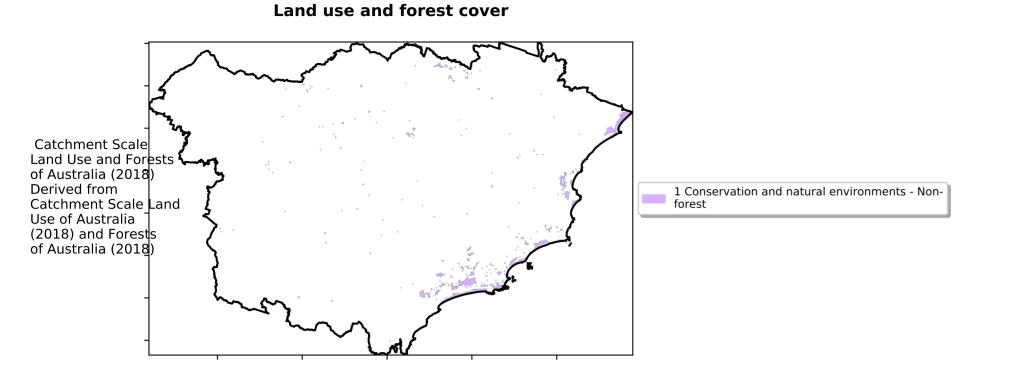




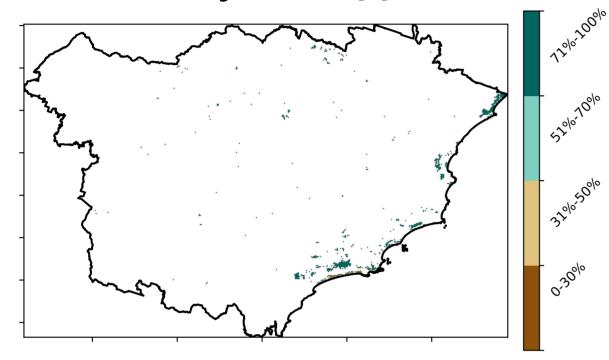




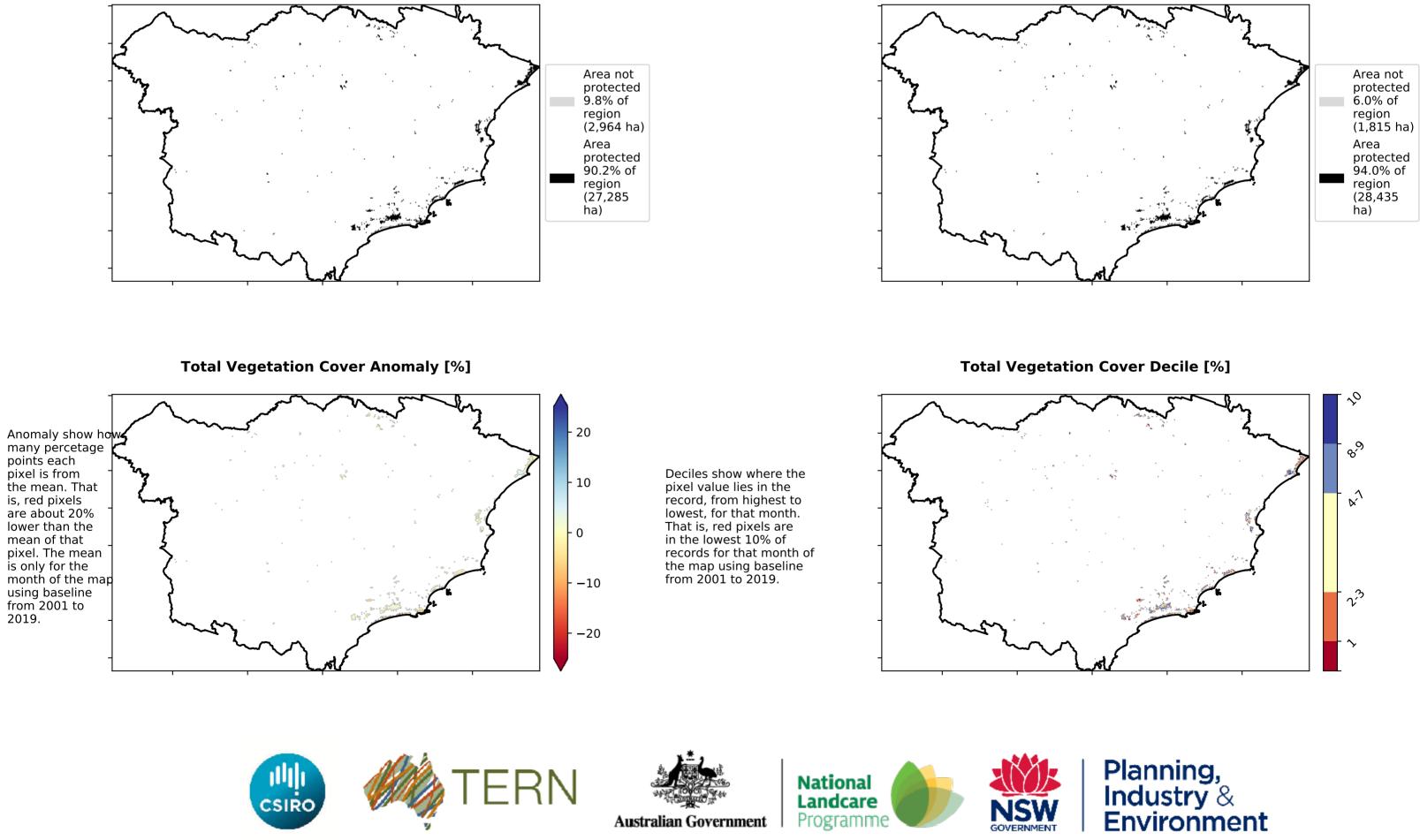
#### **Conservation and natural environments non forest**



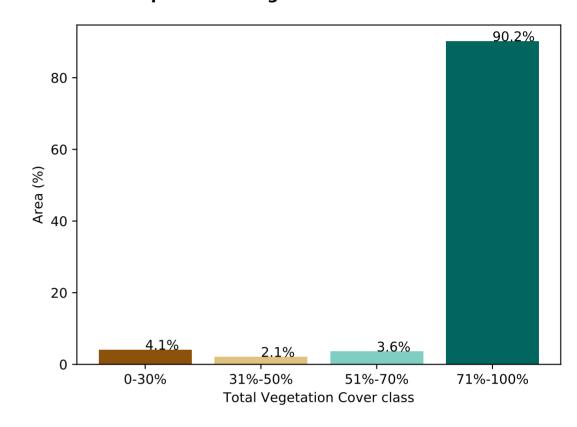
**Total Vegetation Cover [%]** 



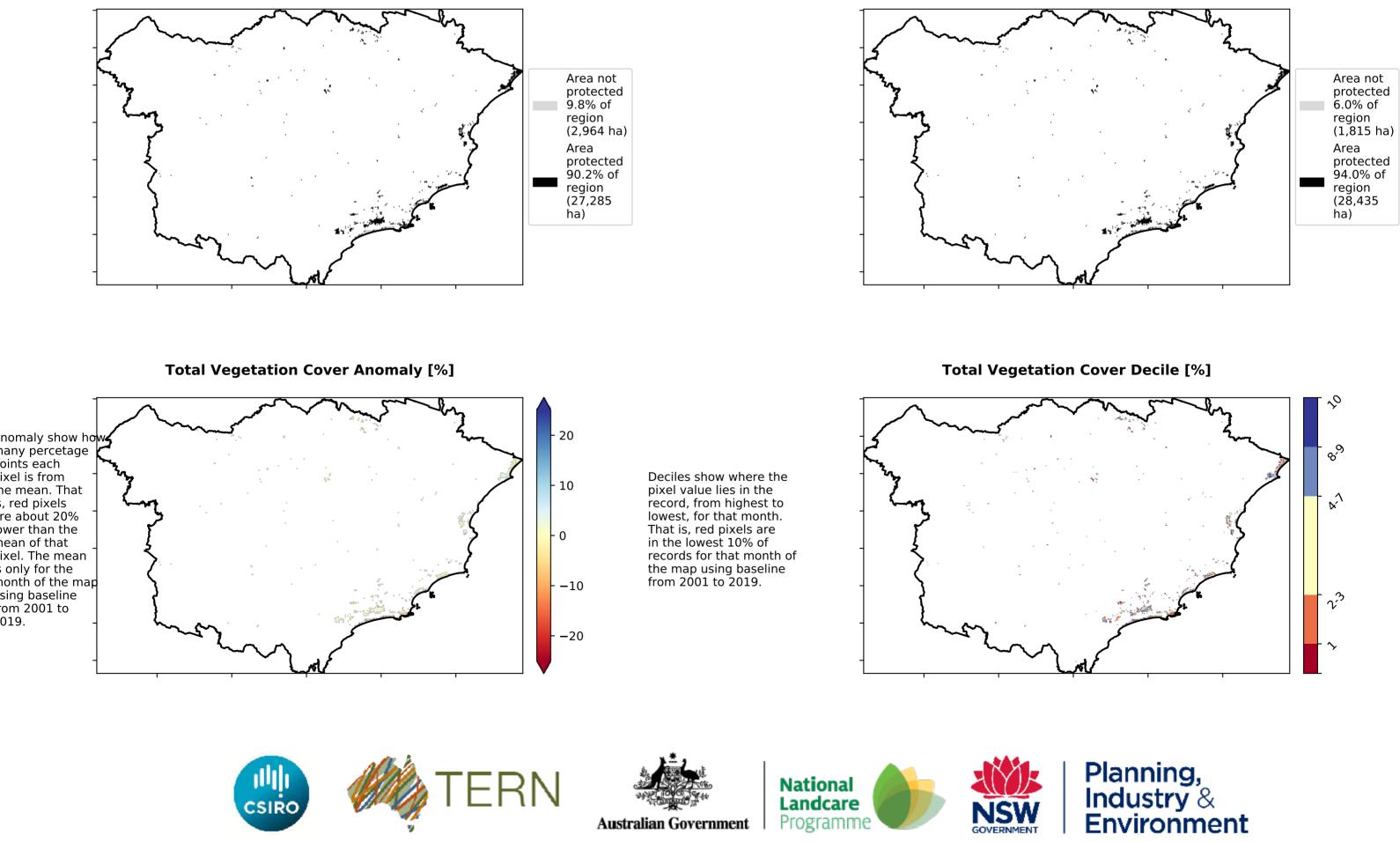
% Area protected from water erosion (>70%)

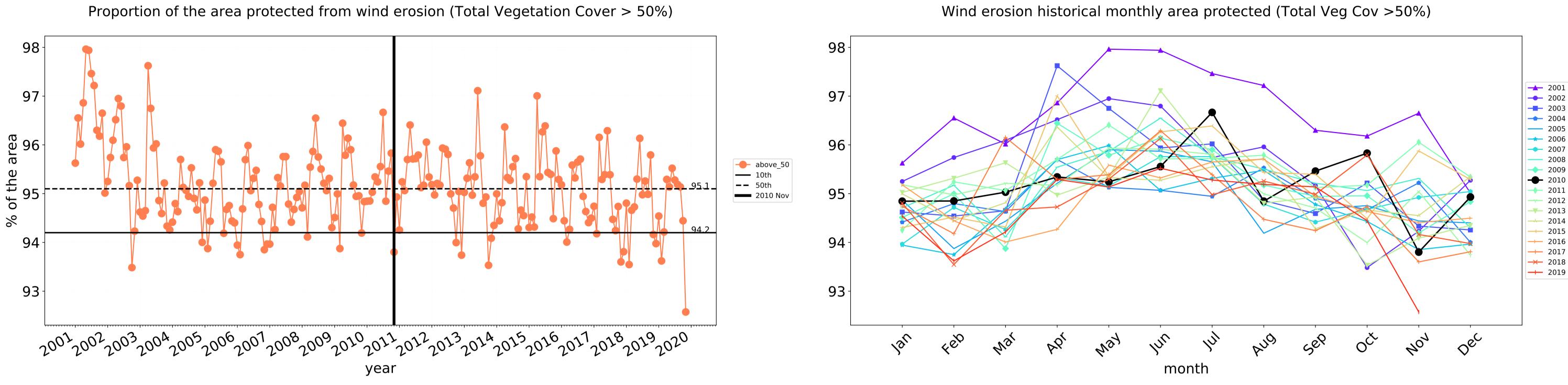


Proportion of vegetation cover class in area

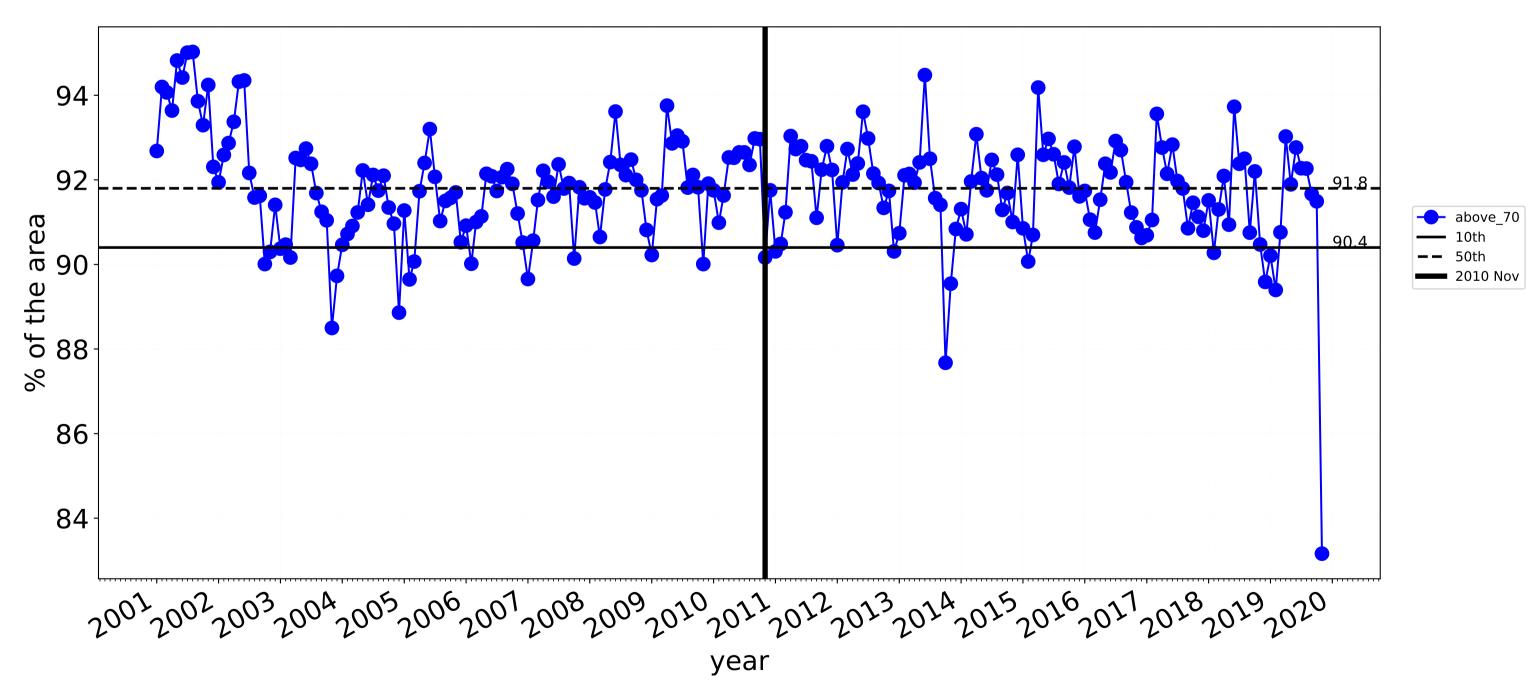


#### % Area protected from wind erosion (>50%)

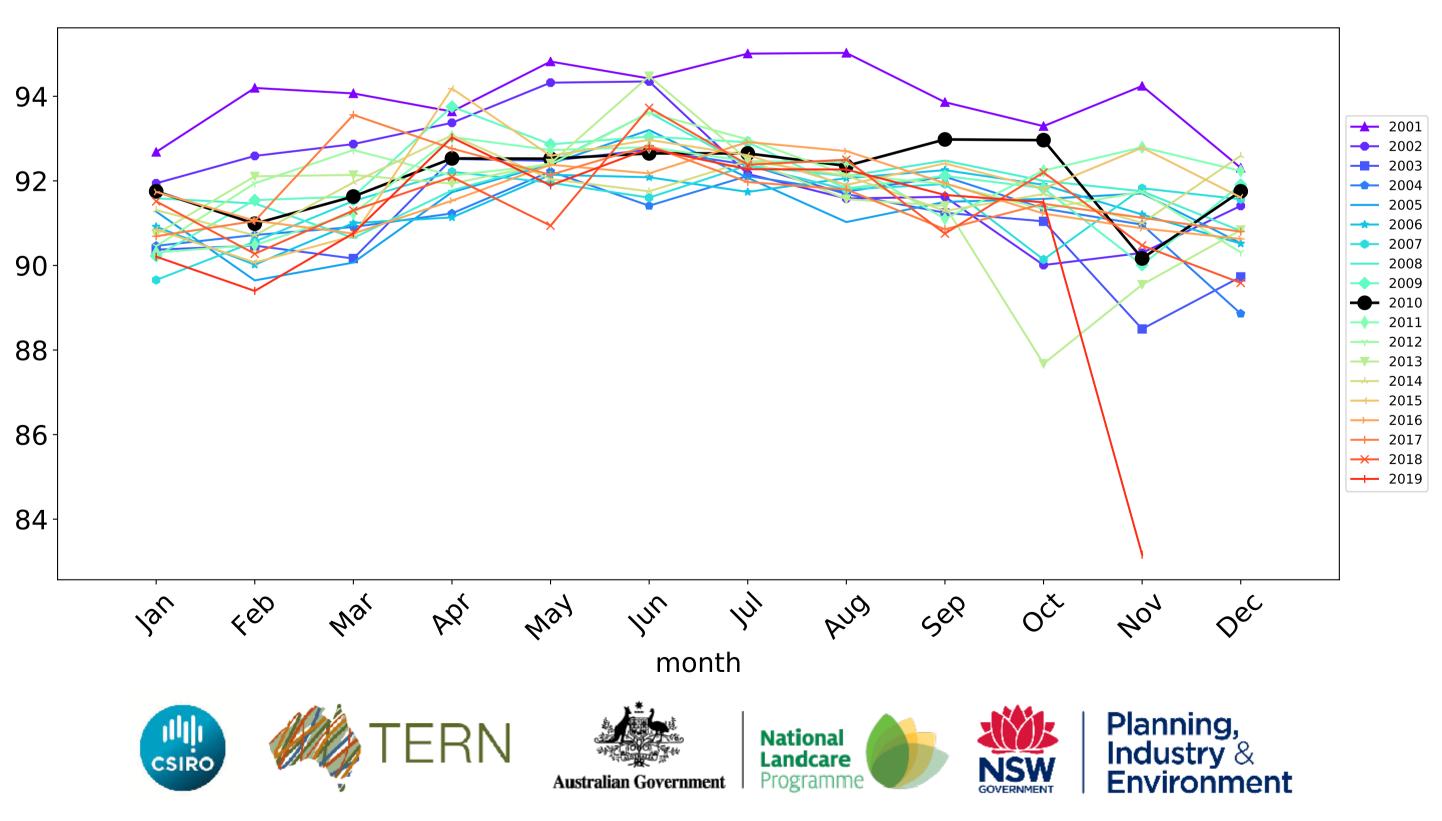


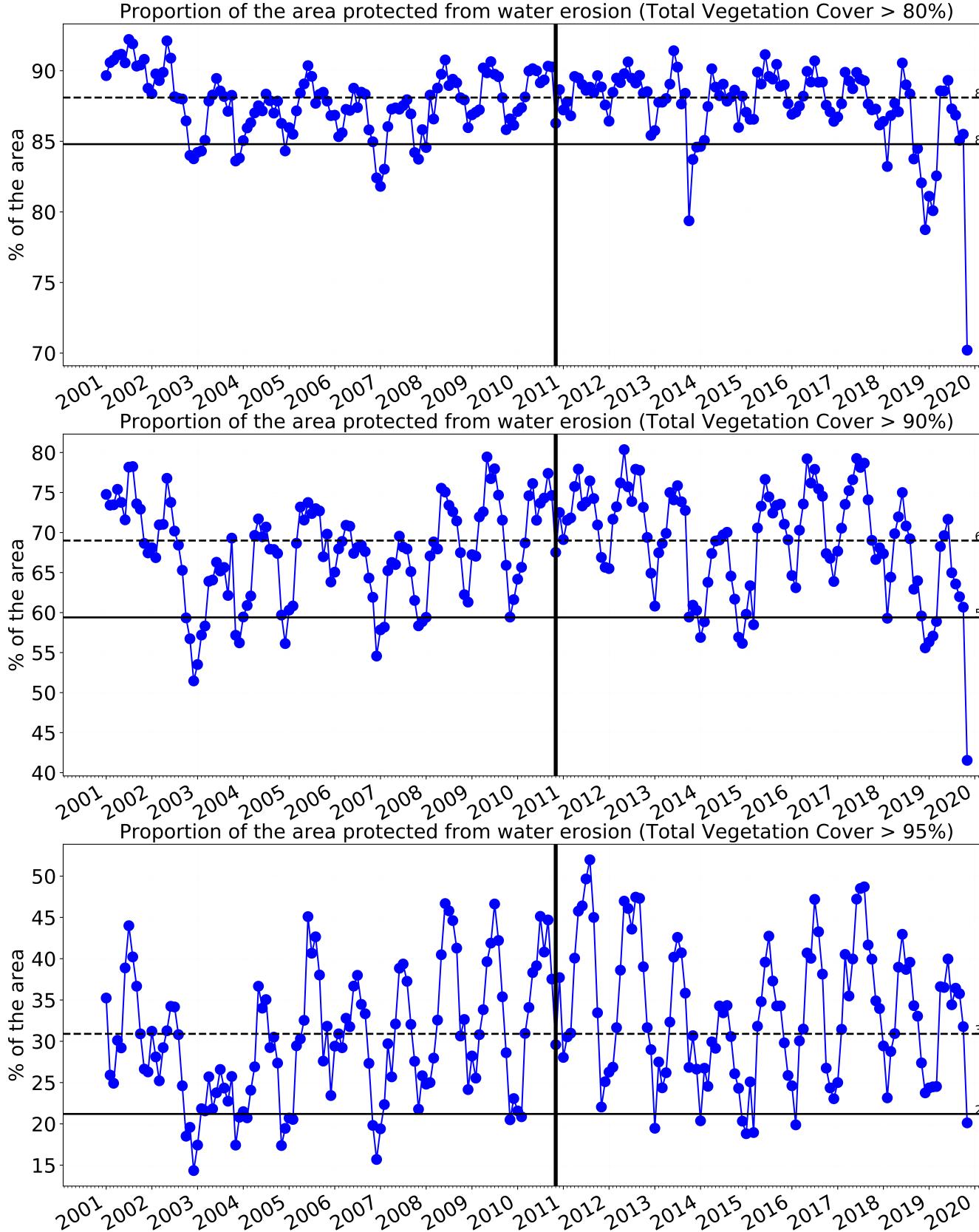


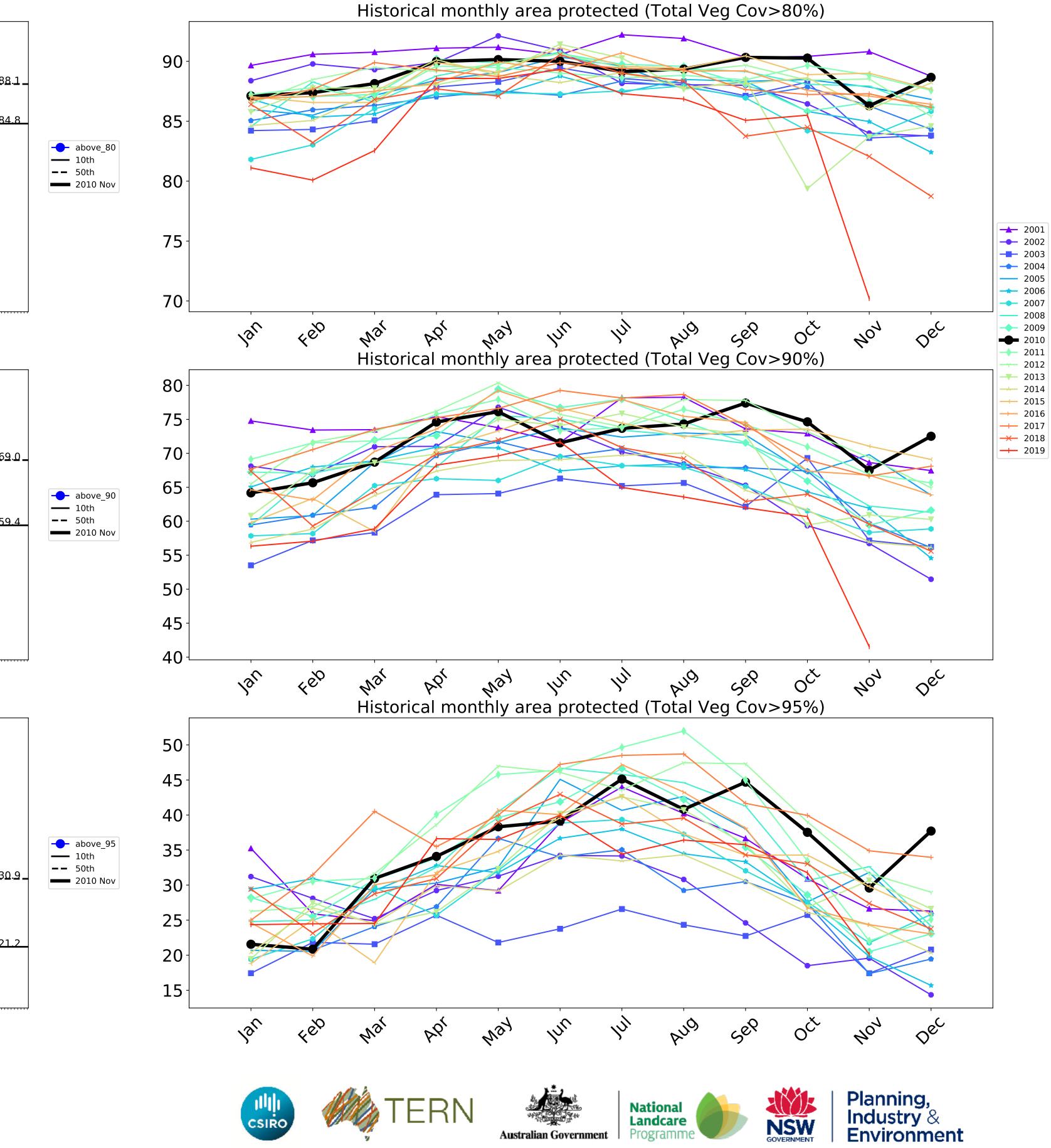
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



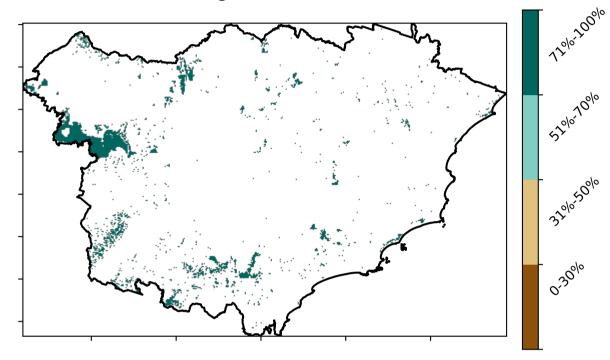




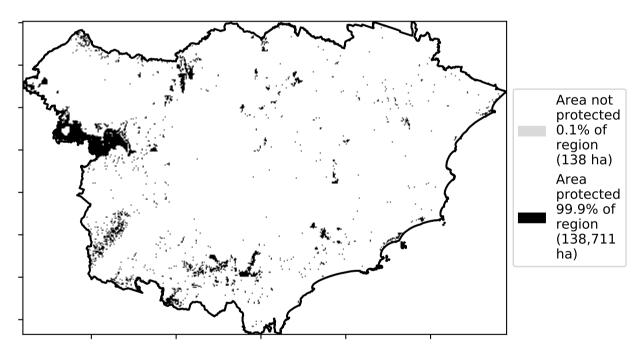
#### **Conservation and natural environments Woodland forest**



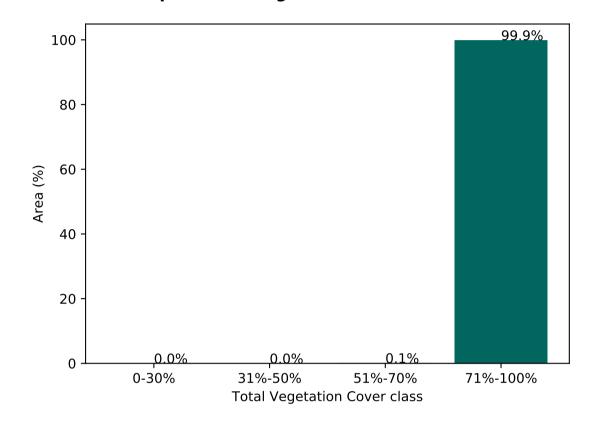
**Total Vegetation Cover [%]** 



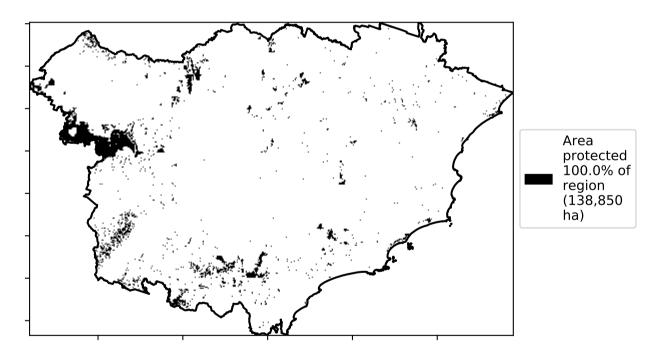
% Area protected from water erosion (>70%)



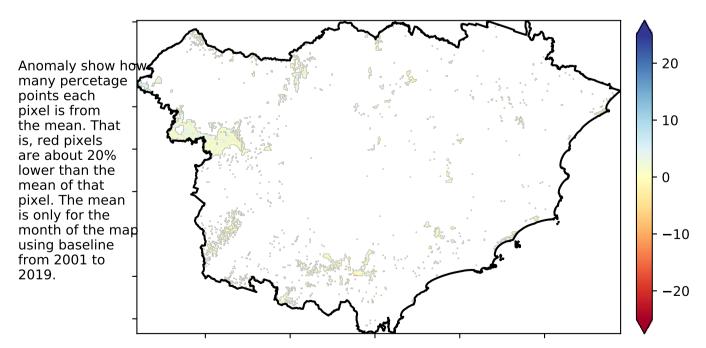
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

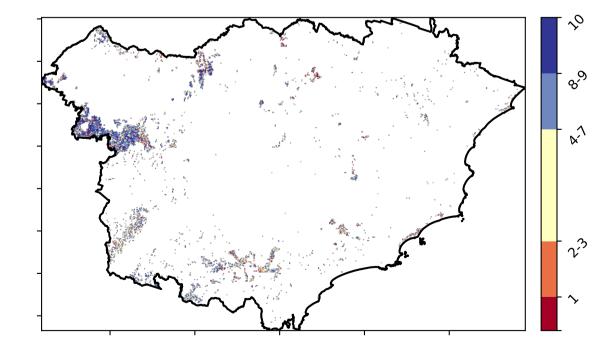


Total Vegetation Cover Anomaly [%]

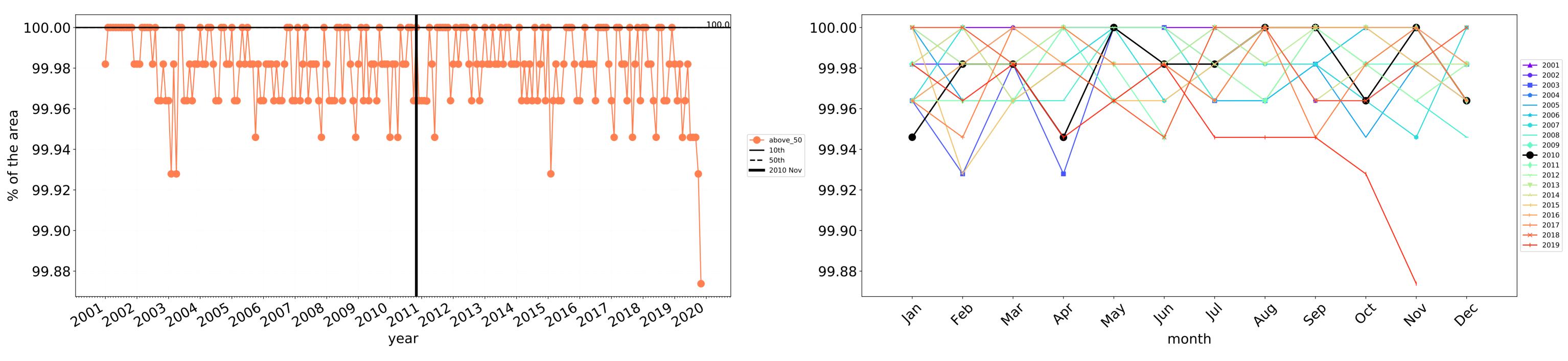


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Total Vegetation Cover Decile [%]

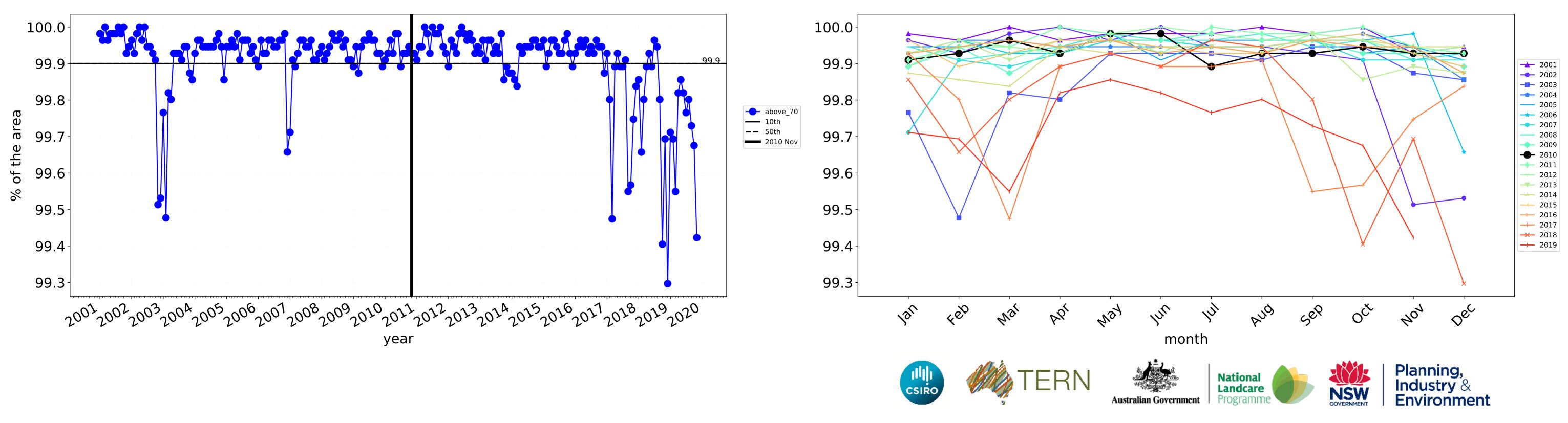


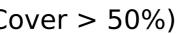




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

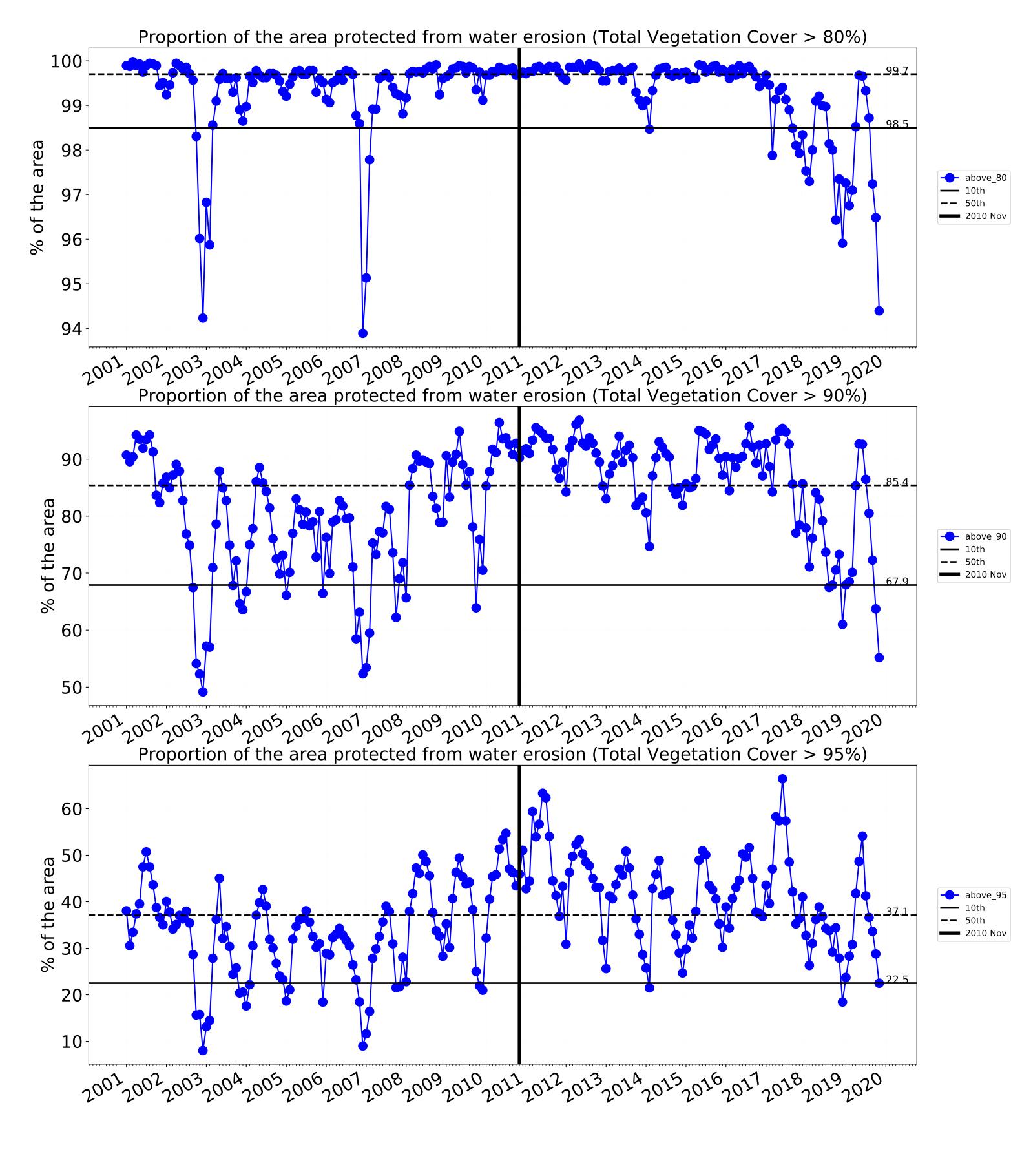
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

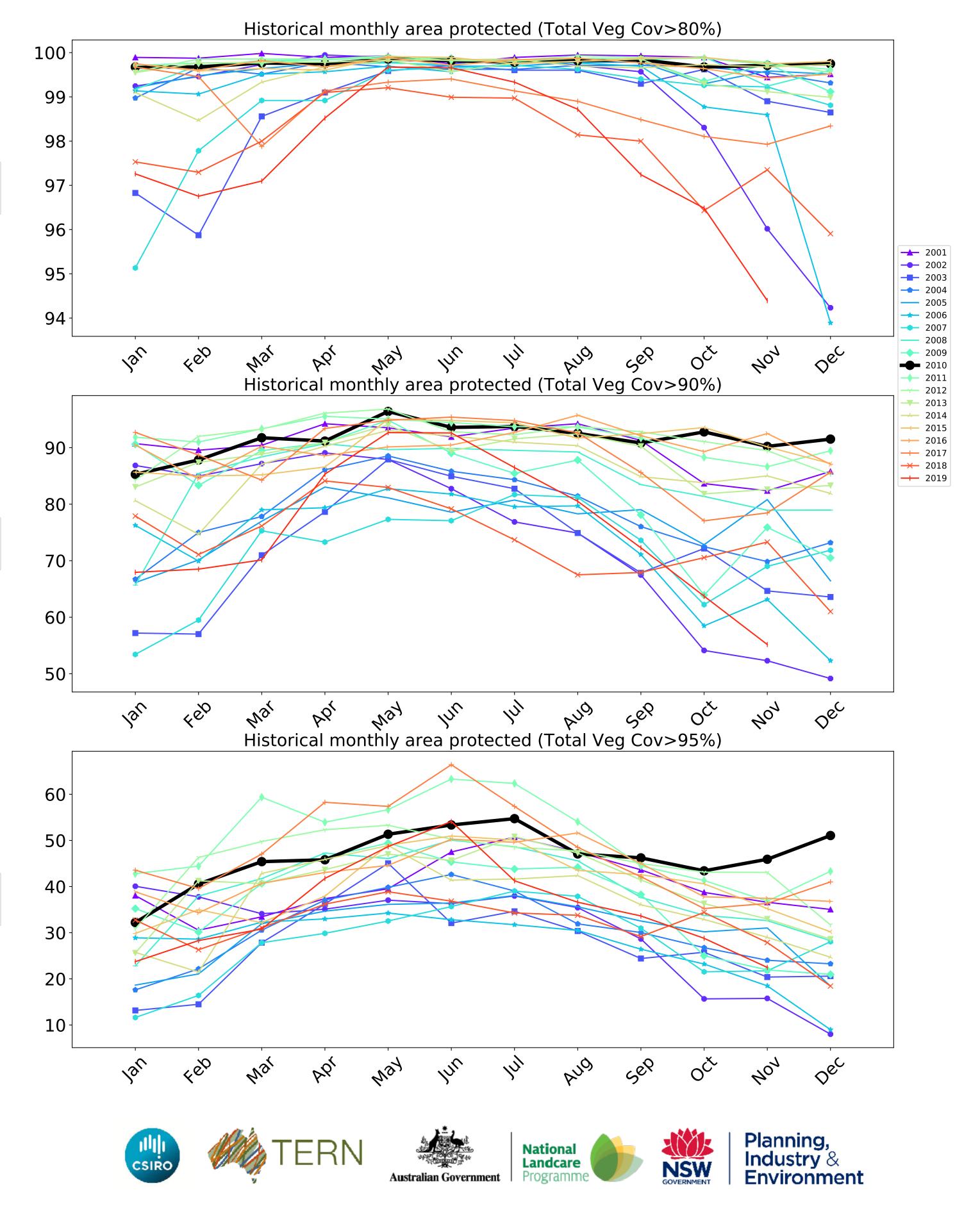




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

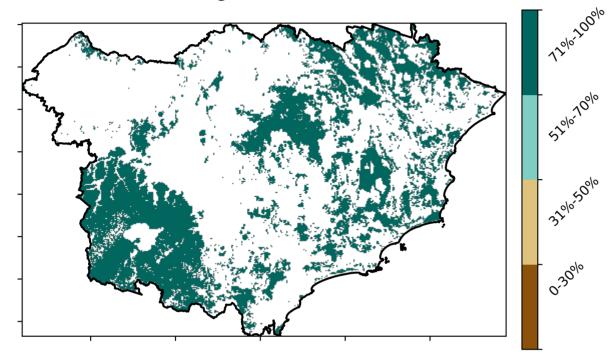




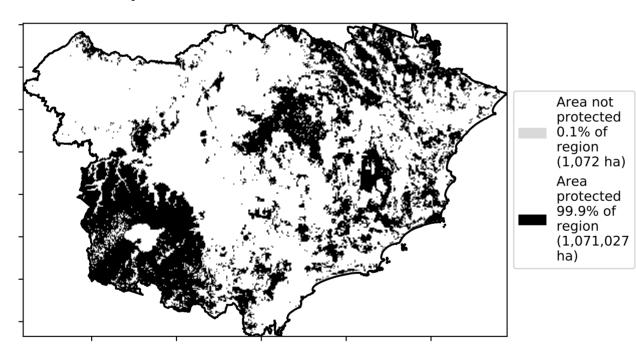
#### **Conservation and natural environments Forest (non woodland)**



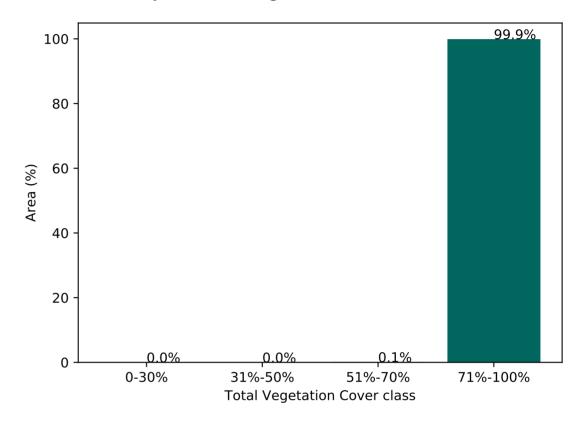
Total Vegetation Cover [%]



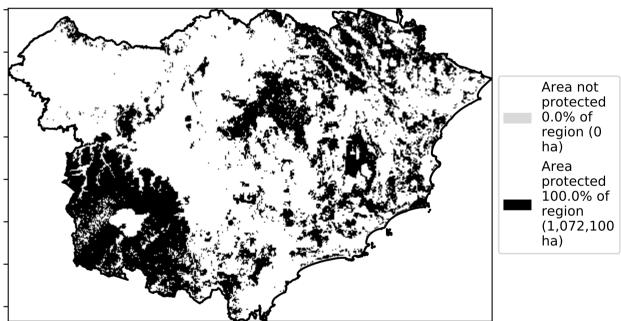
% Area protected from water erosion (>70%)



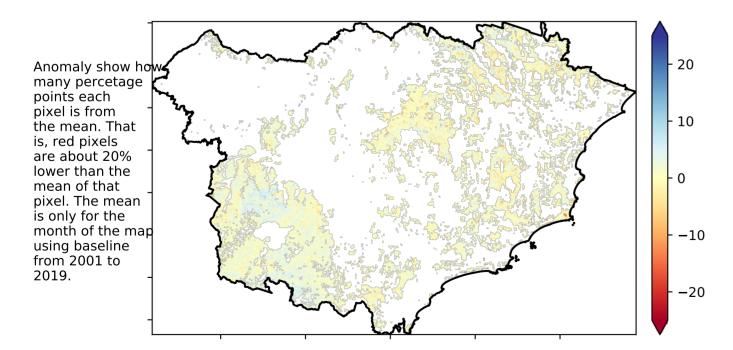
Proportion of vegetation cover class in area



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

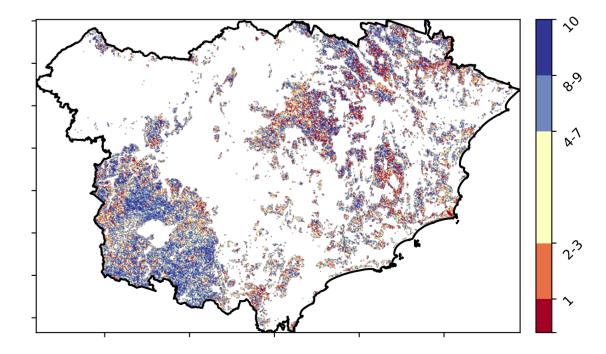


Total Vegetation Cover Anomaly [%]

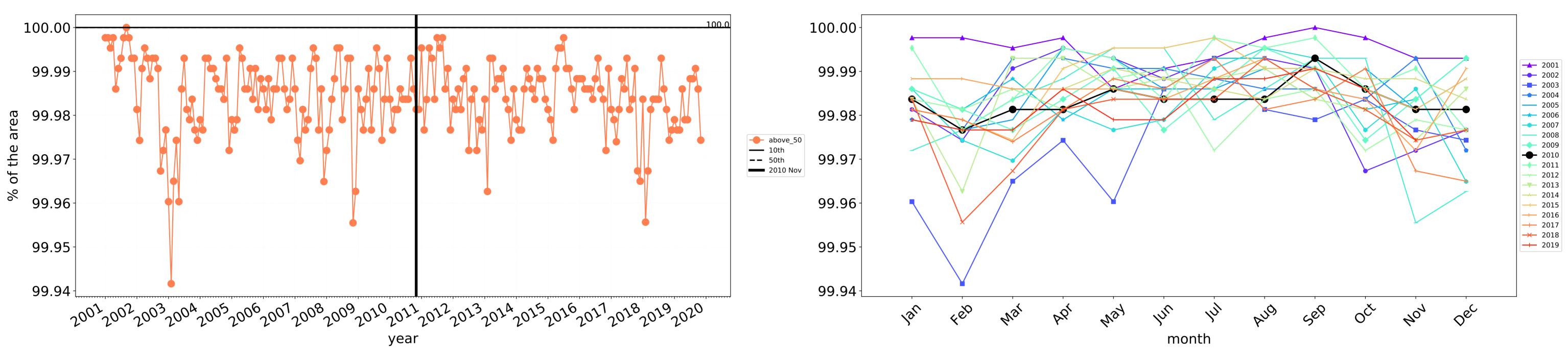


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Total Vegetation Cover Decile [%]

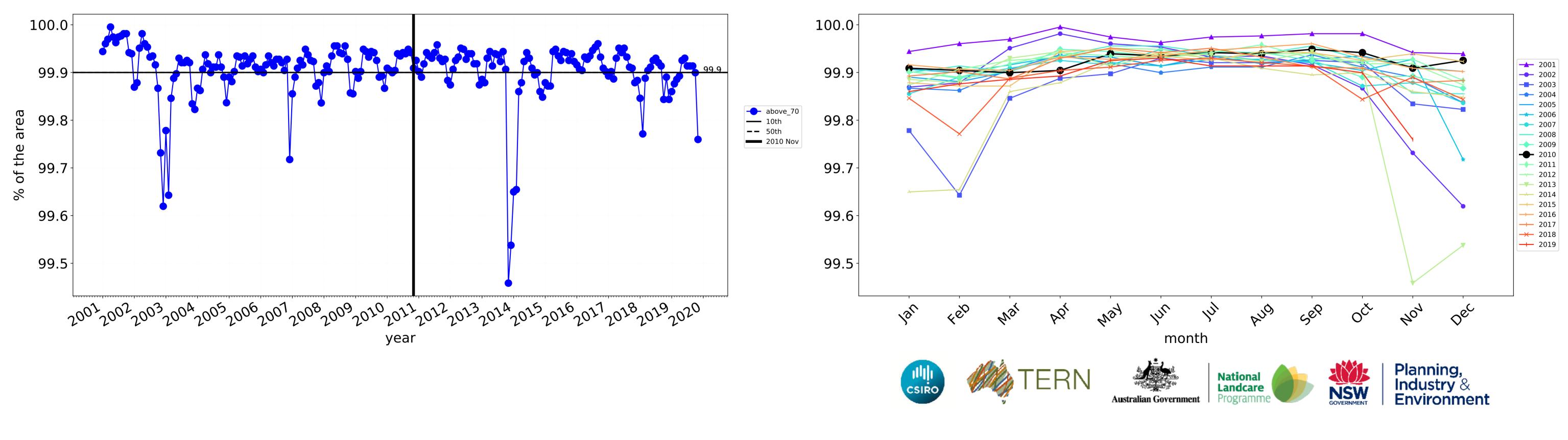






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

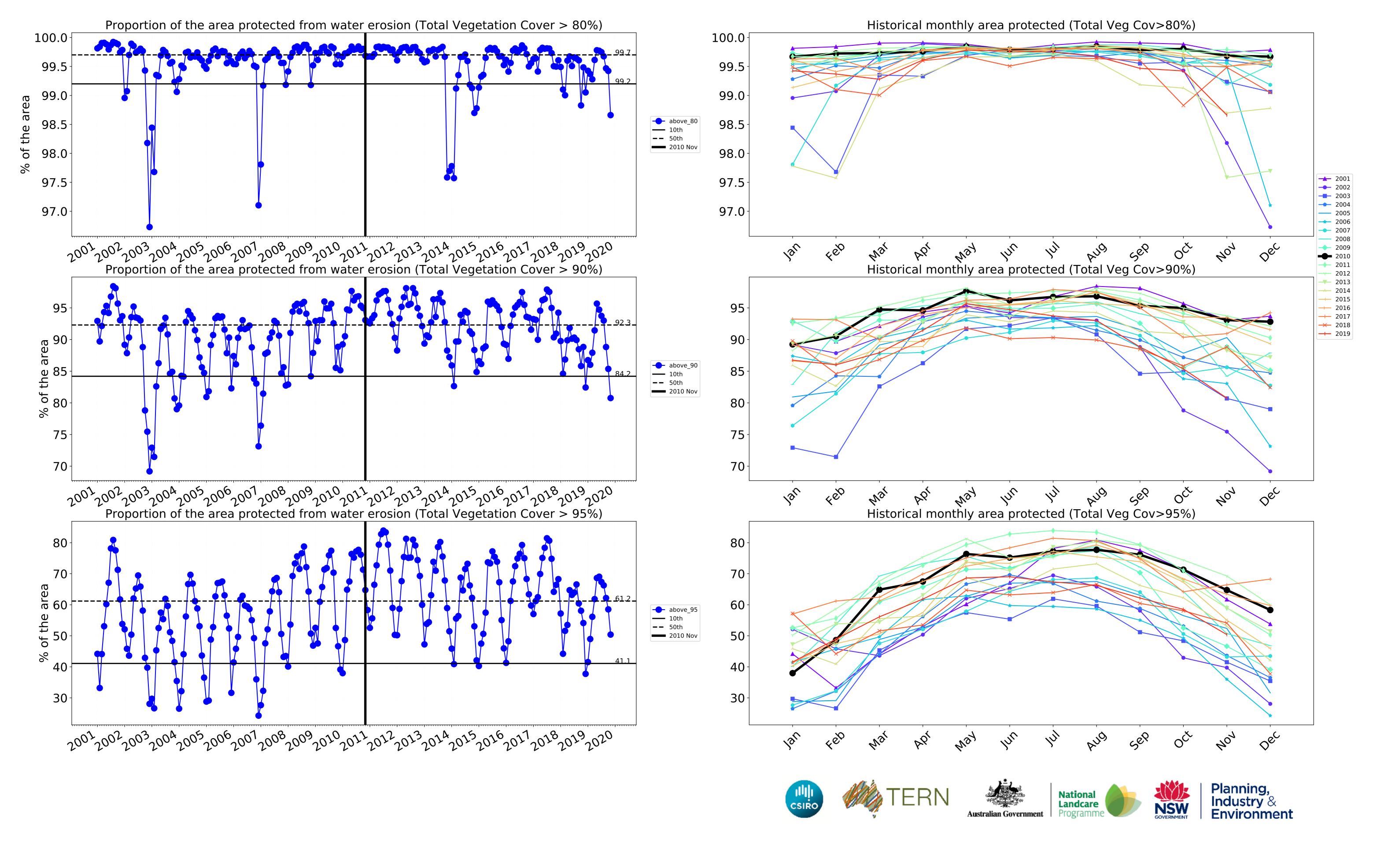
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





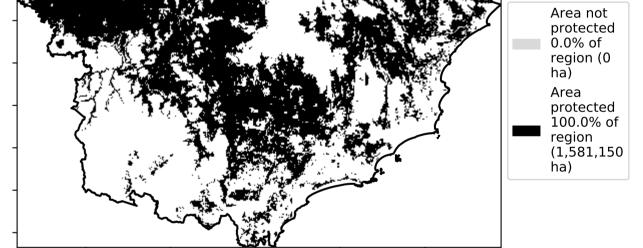
Wind erosion historical monthly area protected (Total Veg Cov >50%)





### Agriculture

Proportion of each land class in area Land use and forest cover 80 <u>76.</u>7% 70 · 60 Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 50 Area (%) - 05 3 Agriculture - Grazing - Non-woodland forest Derived from 4 Agriculture - Grazing - Irrigated Catchment Scale Land 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests of Australia (2018) 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 30 8 Agriculture - Horticulture - Irrigated 20 <u>10.</u>7% 10 <u>7.6</u>% 0 1 2 3 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 12%,100 100 80 52%70% 60 Area (%) 32010 40 0.30% 20 0.0% 0.3% 0.1% 0 0-30% 31%-50% 51%-70% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)

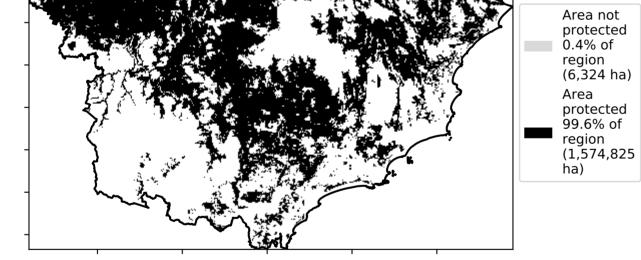


0.2%

8

99.6%

71%-100%

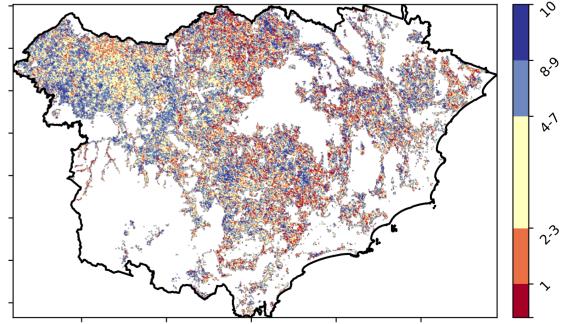


Total Vegetation Cover Anomaly [%]

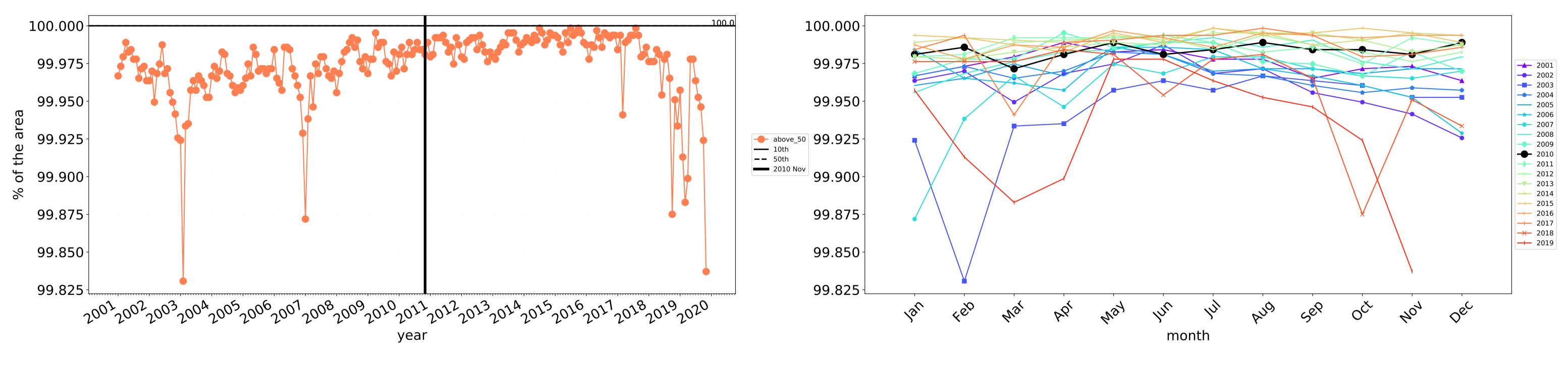
Anomaly show how many percetage points each pixel is from the mean. That · 20 - 10 is, red pixels are about 20% lower than the 0 mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019. -10-20

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 the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

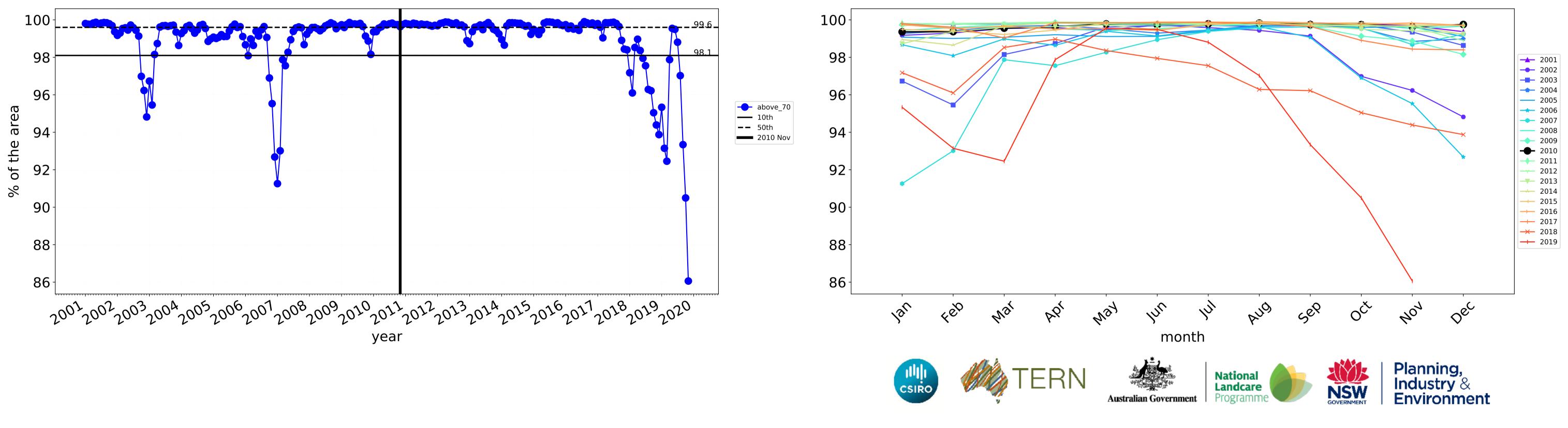






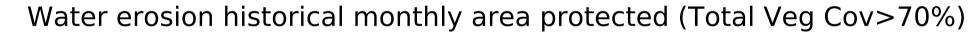
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

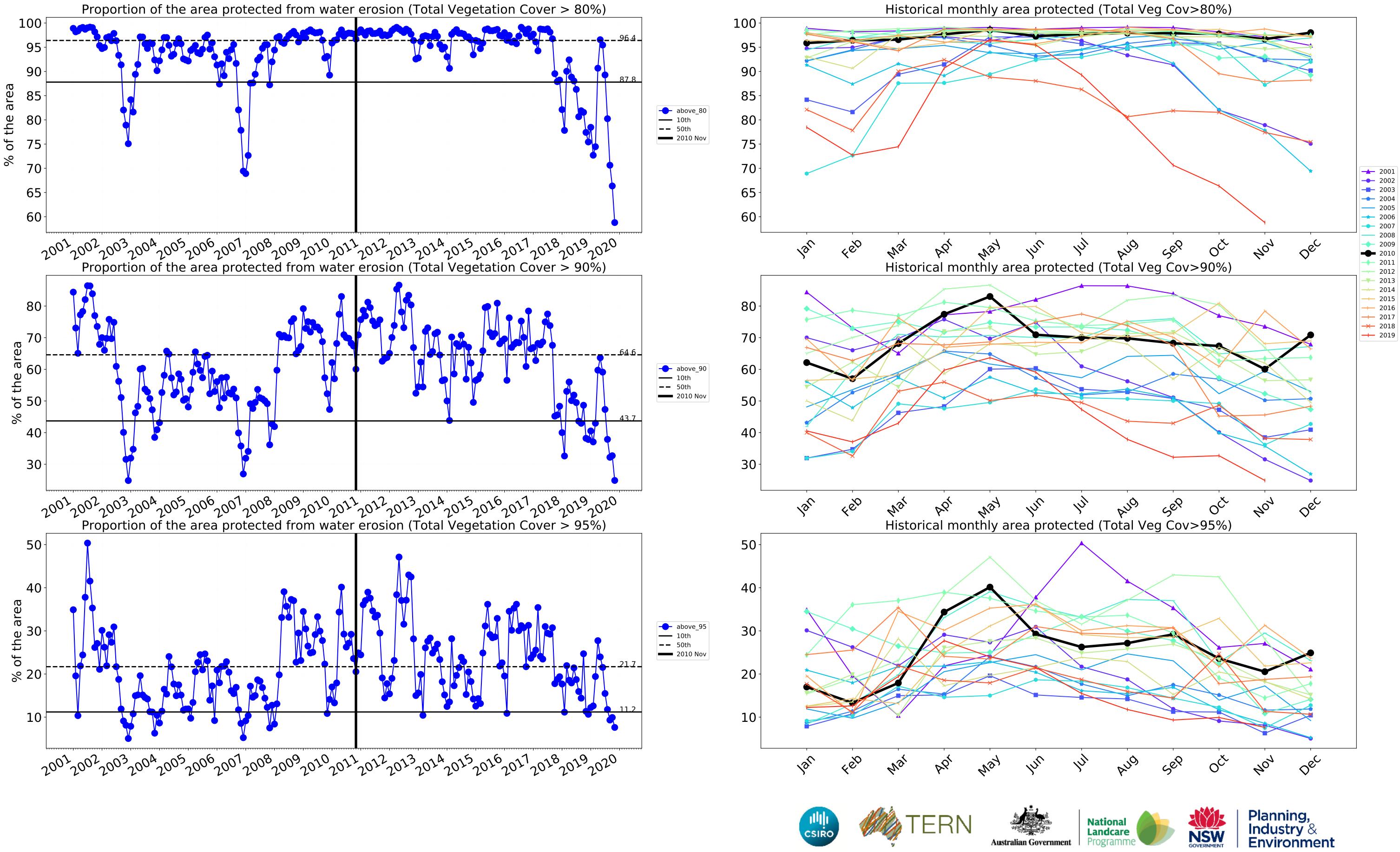
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





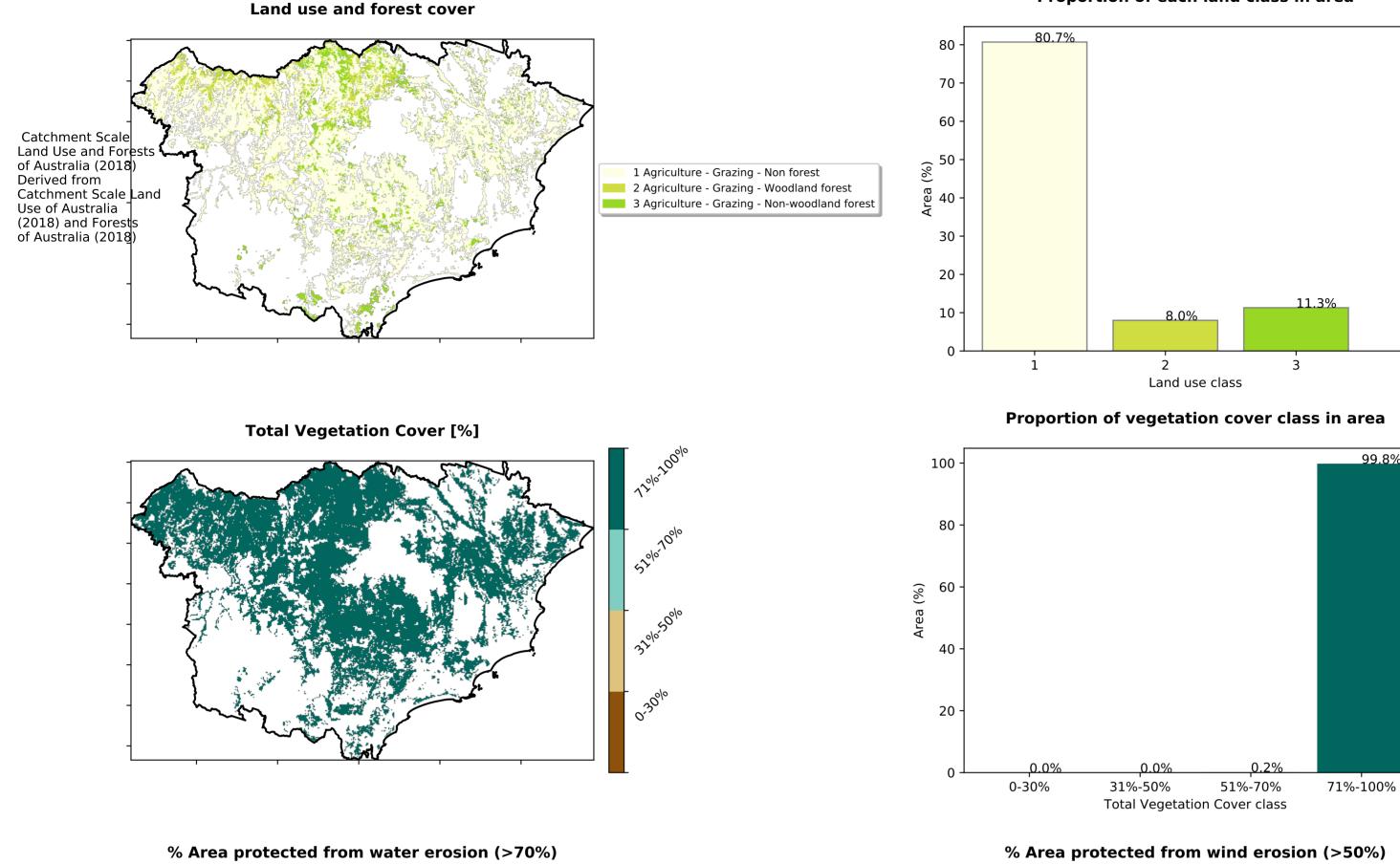
Wind erosion historical monthly area protected (Total Veg Cov >50%)

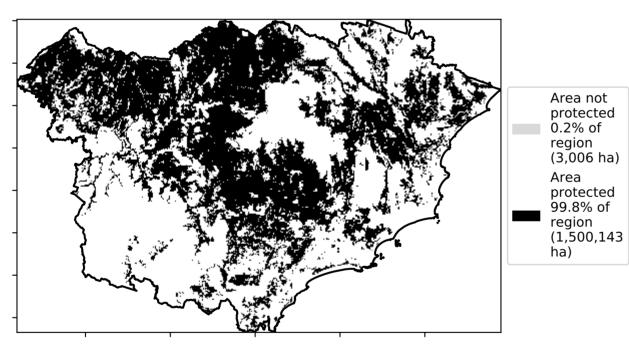




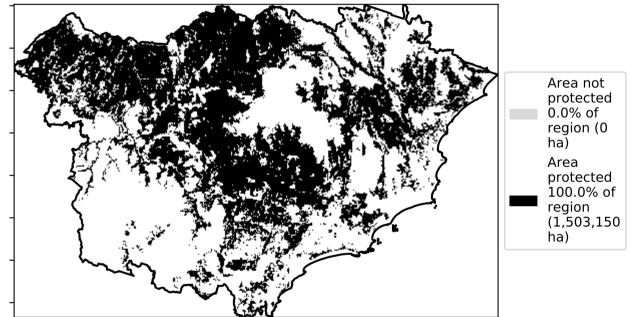


### Grazing



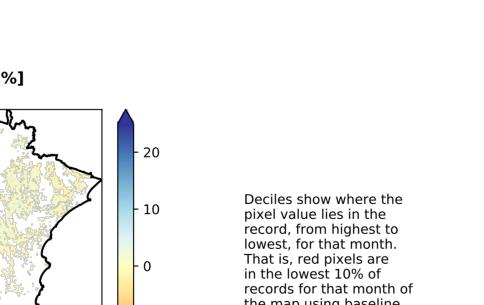


Proportion of each land class in area

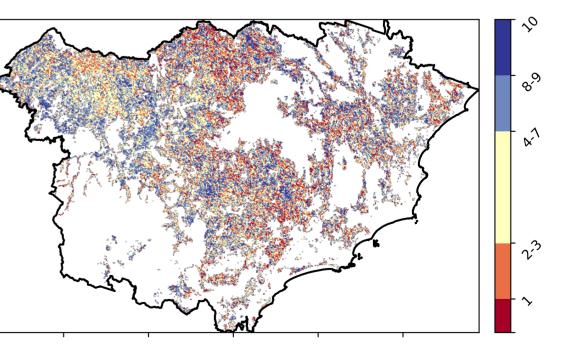


99.8%





Total Vegetation Cover Decile [%]

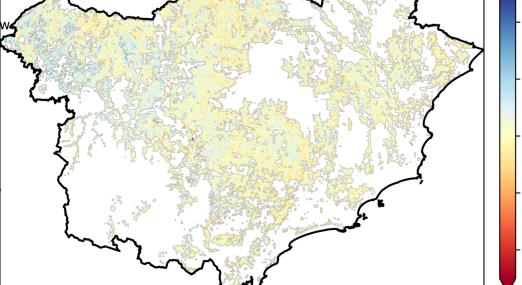




the map using baseline from 2001 to 2019.

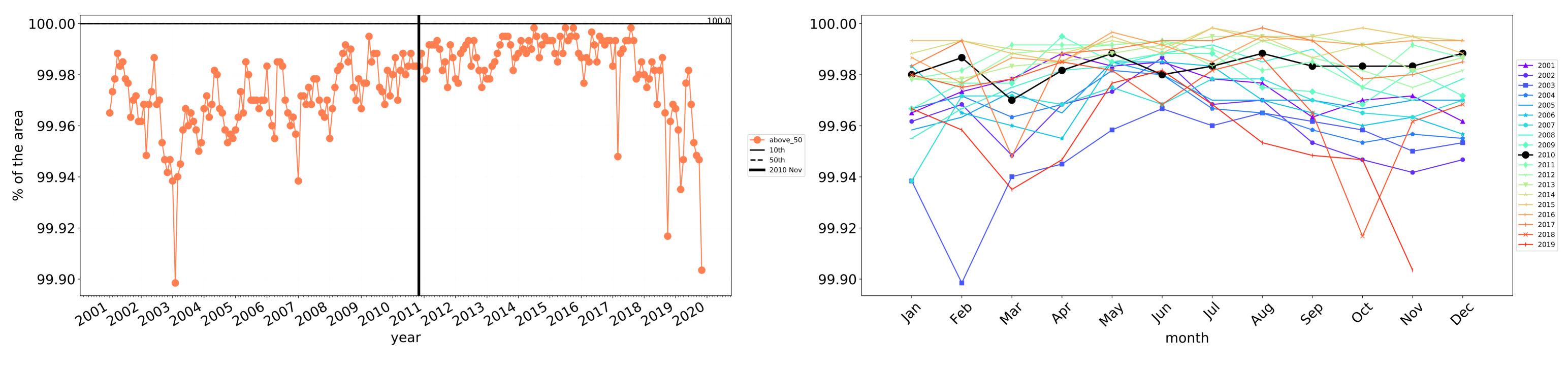
20

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.



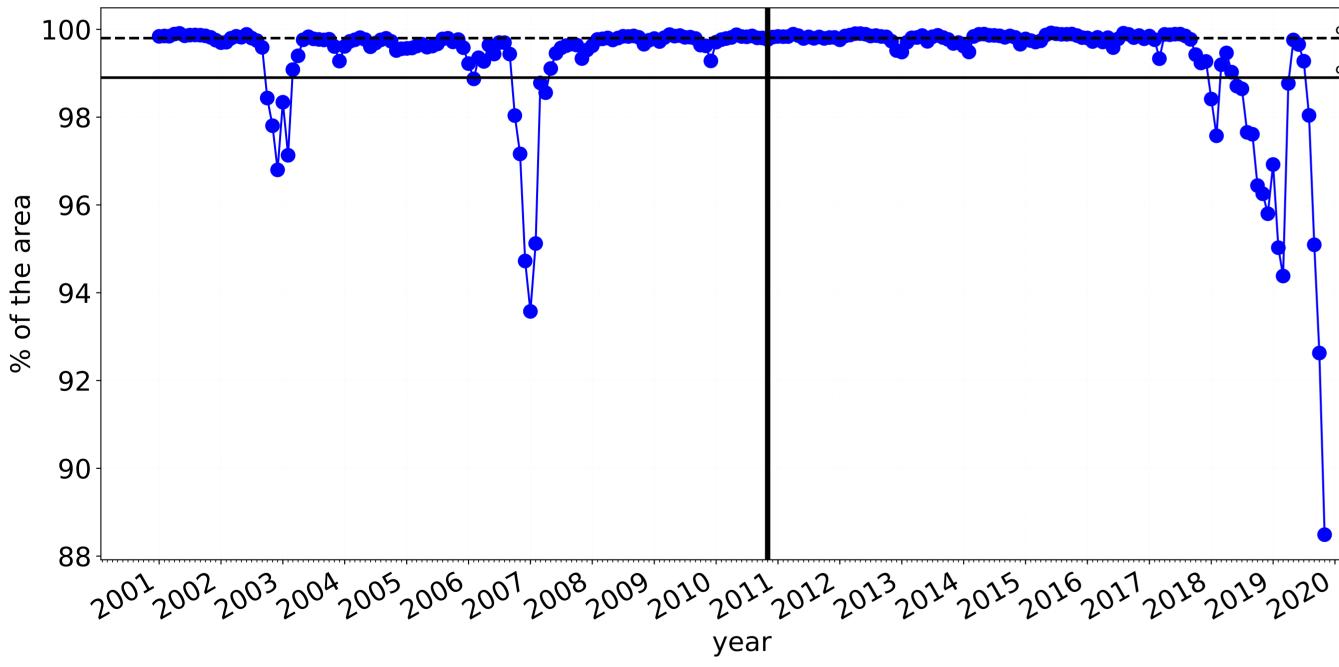
-20

-10



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

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

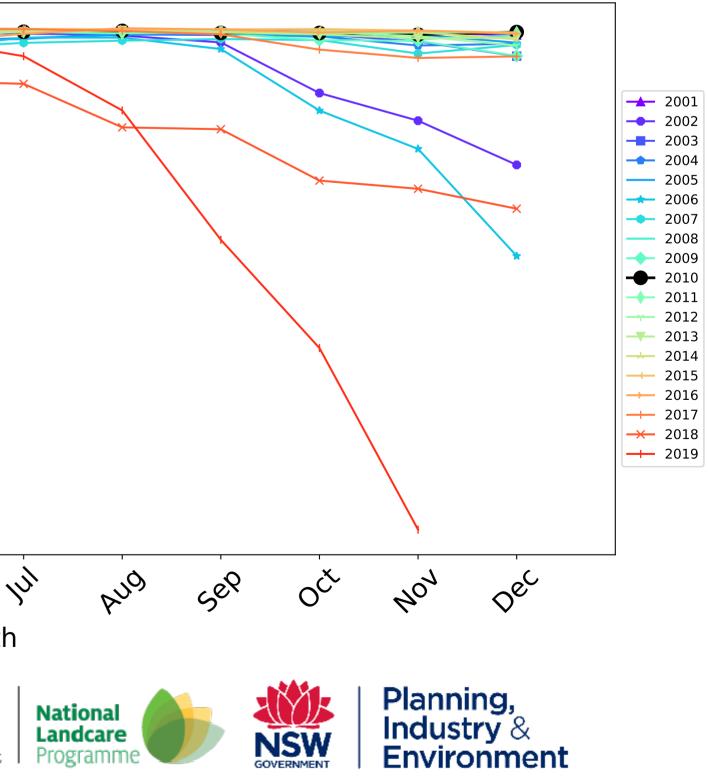


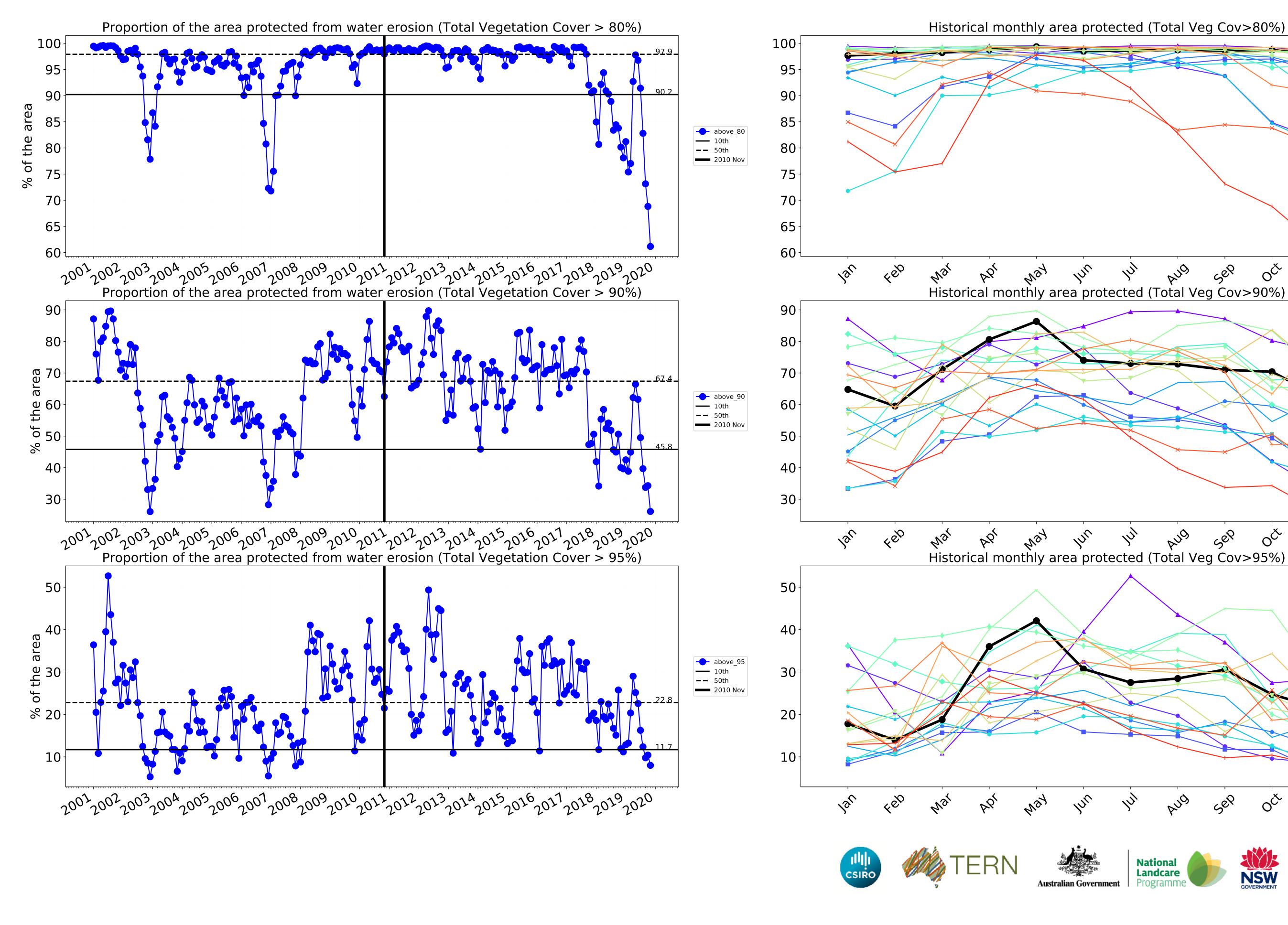


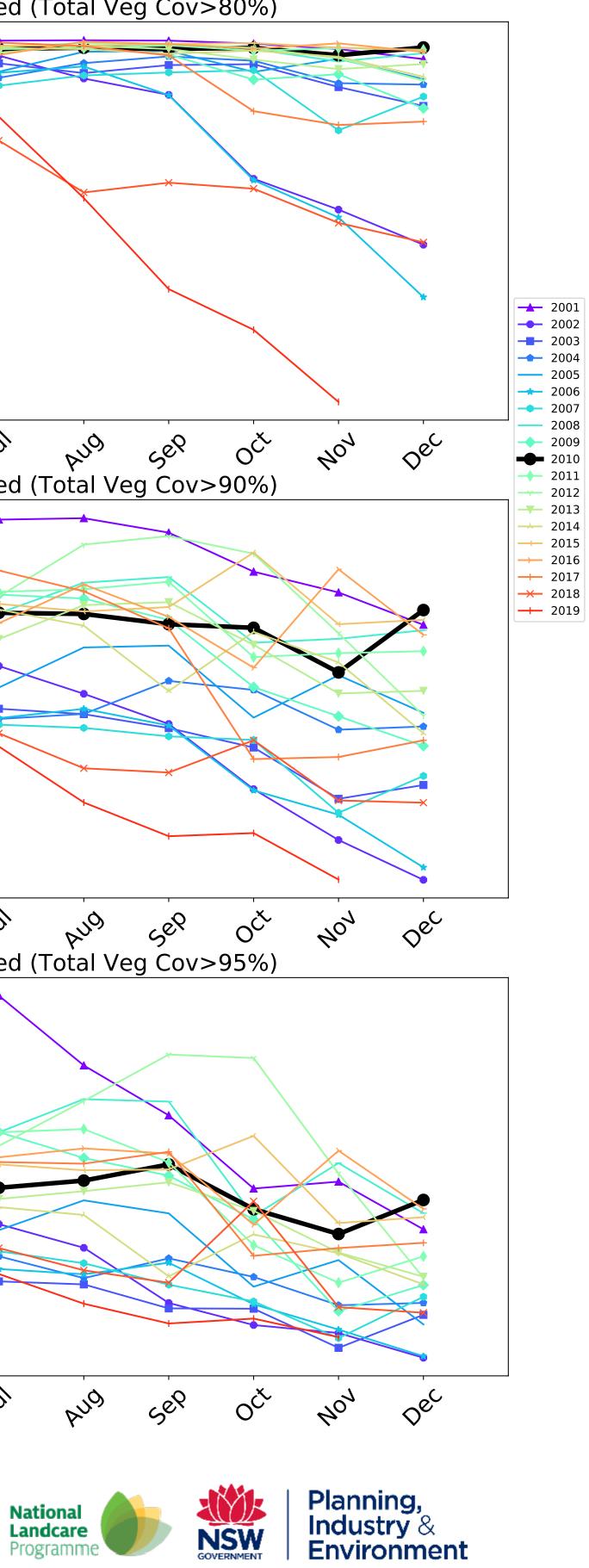
Wind erosion historical monthly area protected (Total Veg Cov >50%)

 $100^{-1}$ \_\_\_\_99.8\_ 98 9 98 ---- above\_70 96 **—** 10th **--** 50th 2010 Nov 94 92 90 88 feb lar In way Wai PQ month **FERN** (SOC) CSIRO Australian Government

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



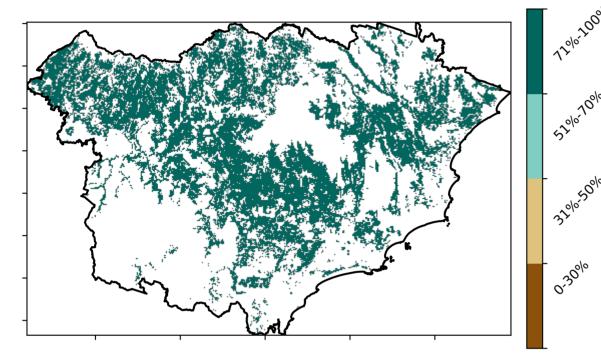




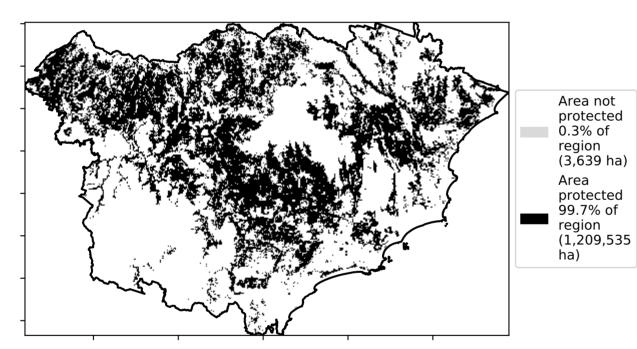
### **Grazing non forest**

Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Agriculture - Grazing - Non forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

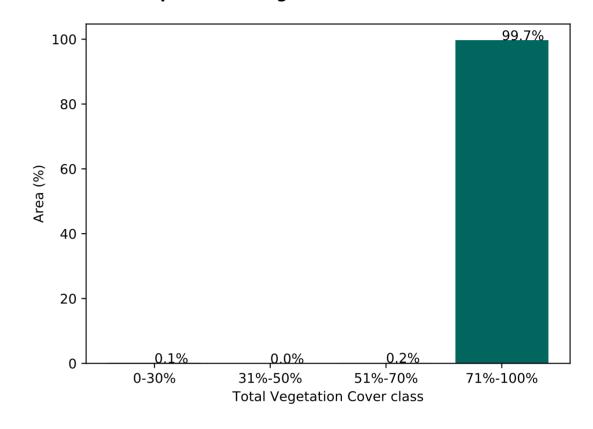
**Total Vegetation Cover [%]** 



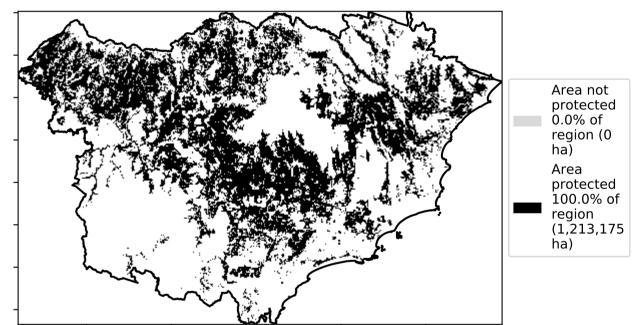
% Area protected from water erosion (>70%)



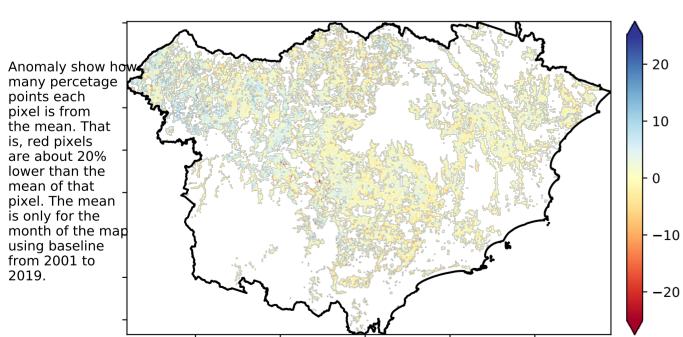
Proportion of vegetation cover class in area



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

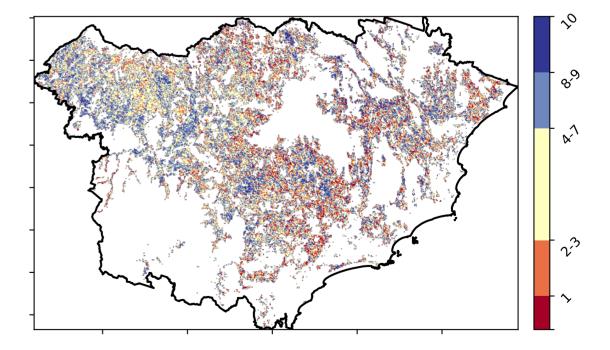


Total Vegetation Cover Anomaly [%]

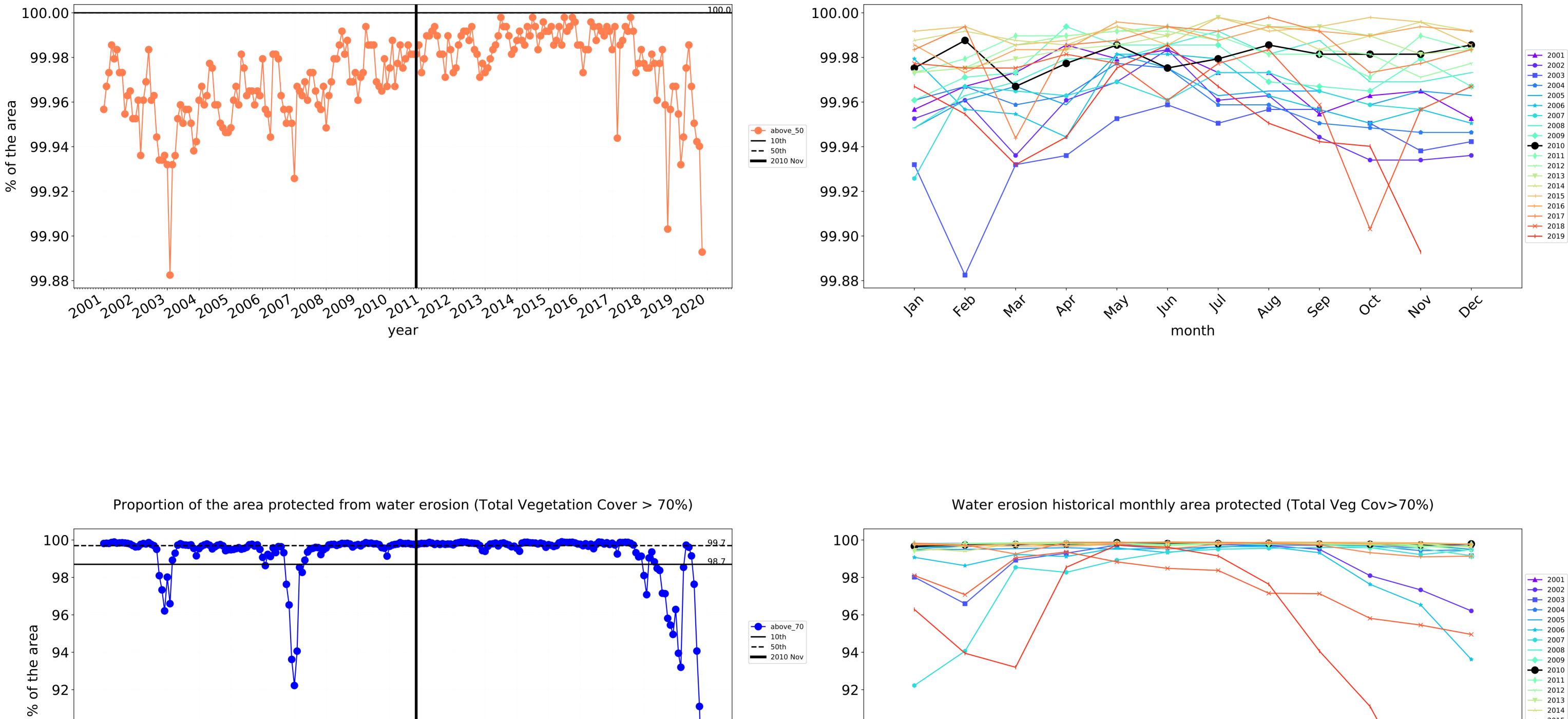


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 







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

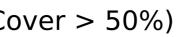
year

92

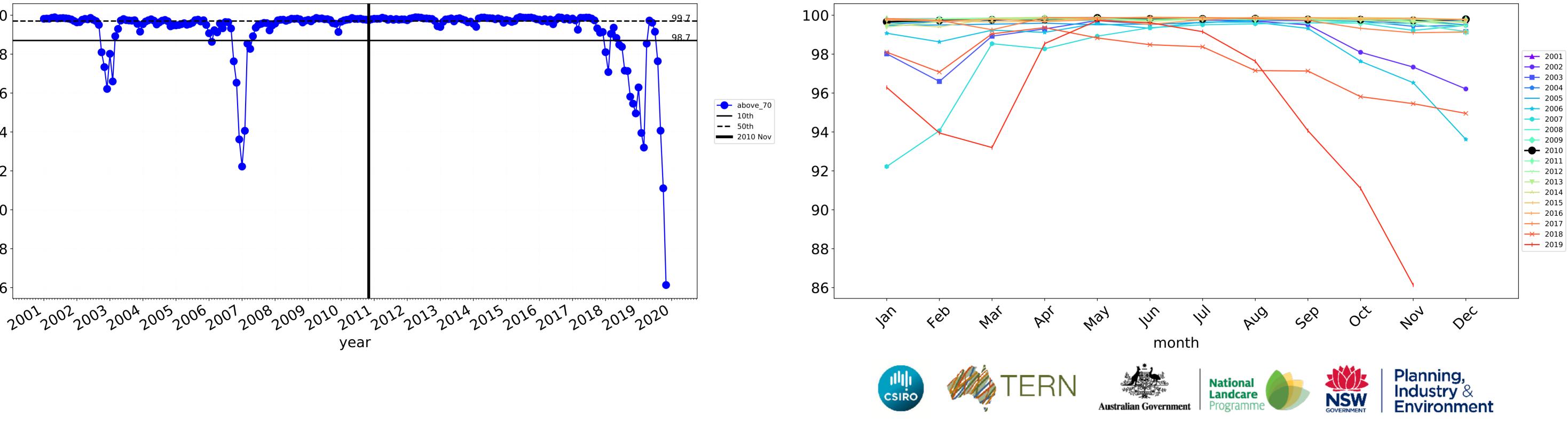
90

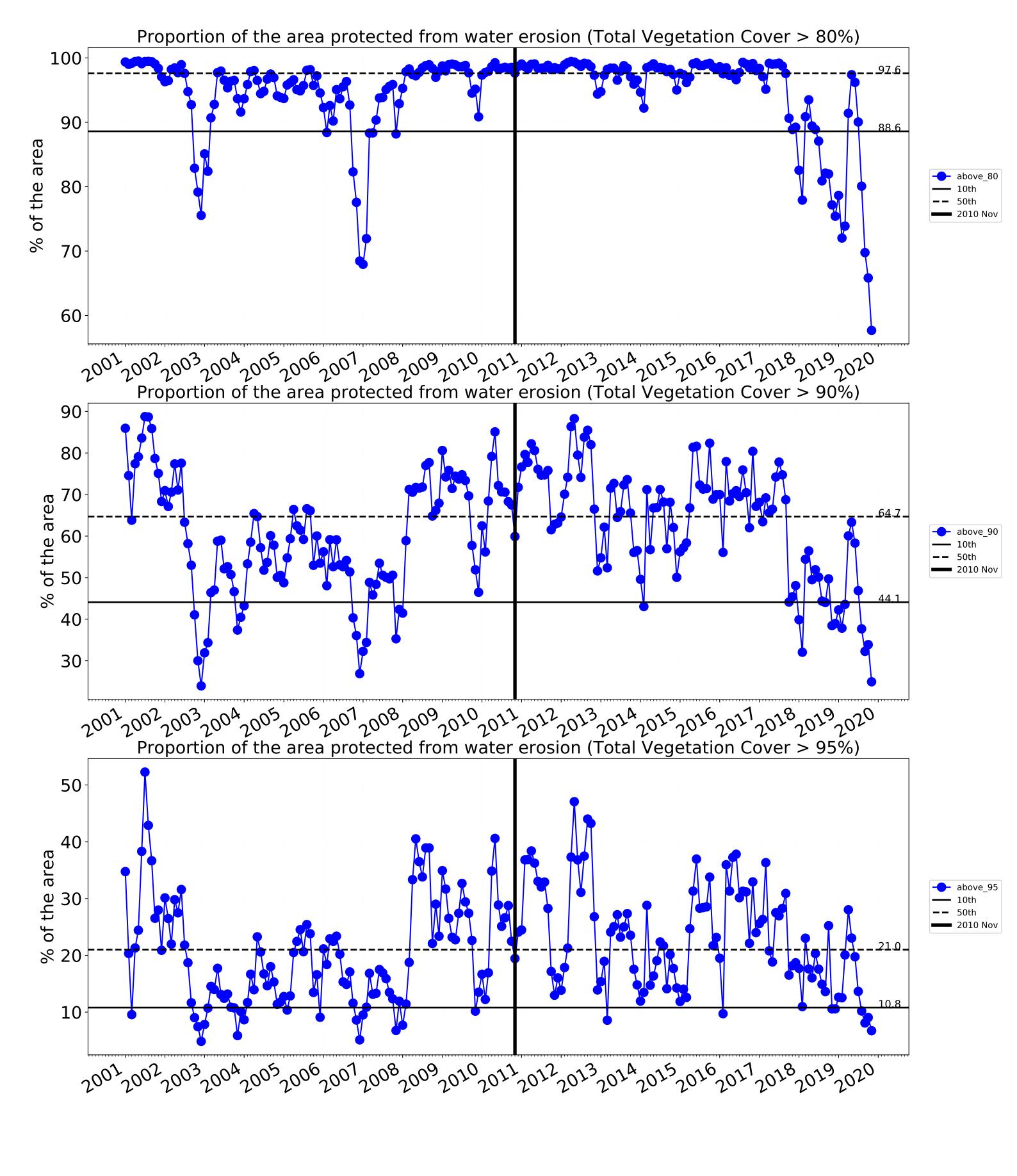
88

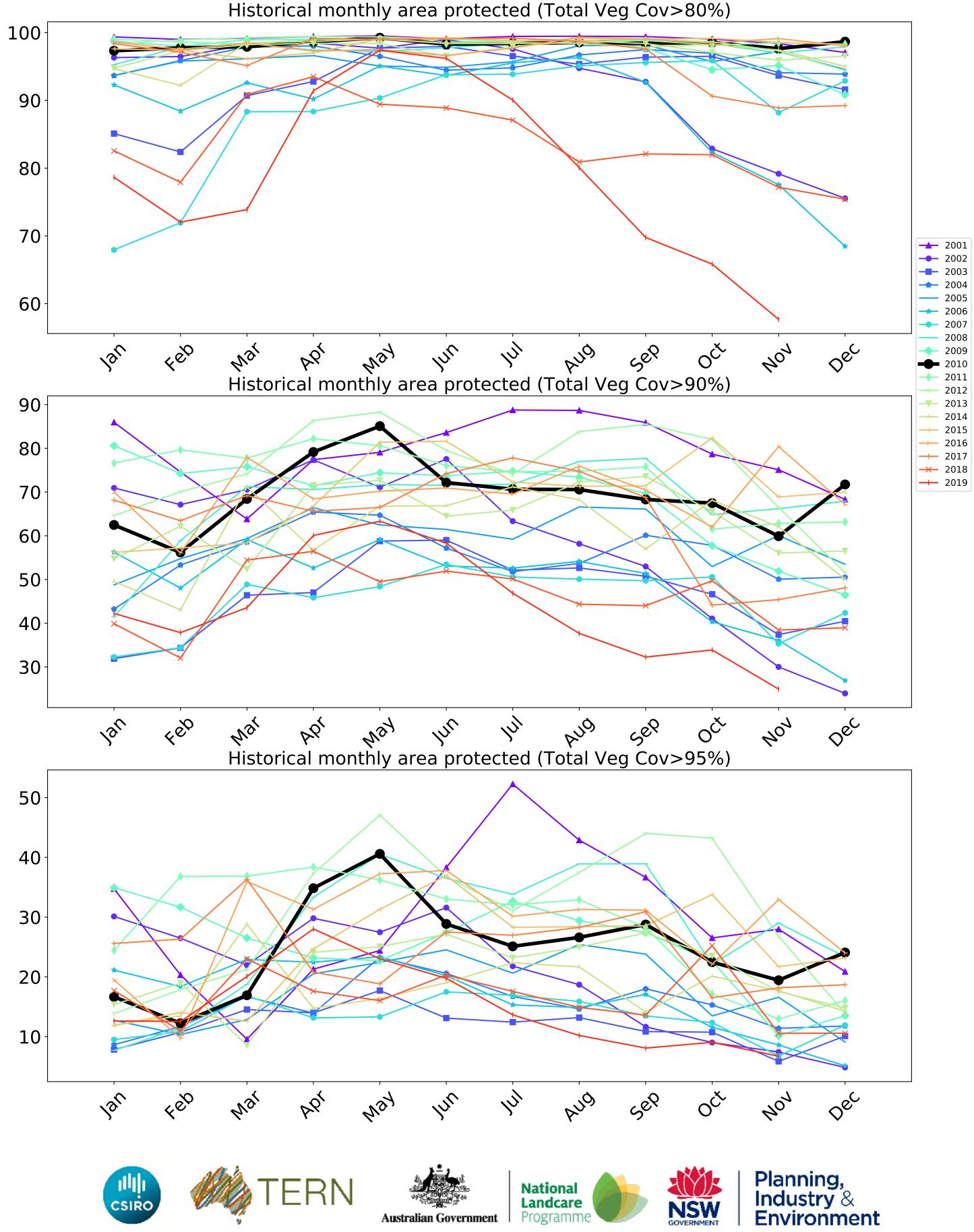
86



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

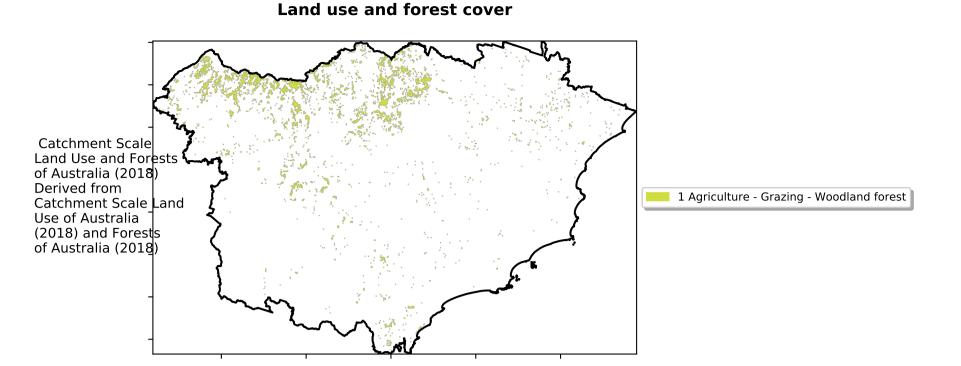




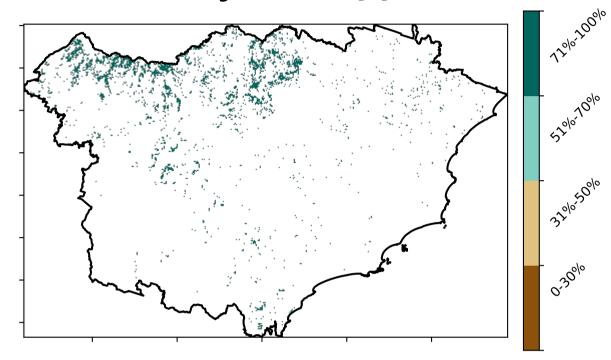




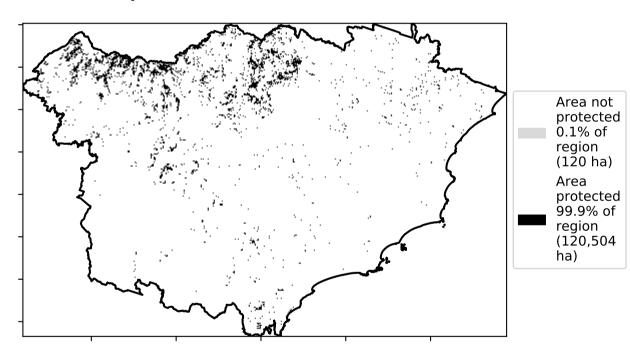
### **Grazing Woodland forest**



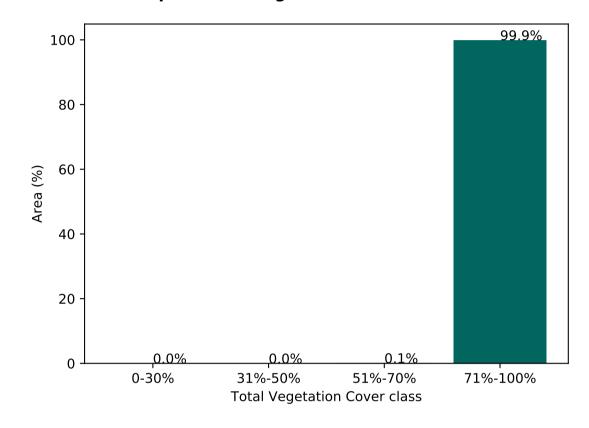
**Total Vegetation Cover [%]** 



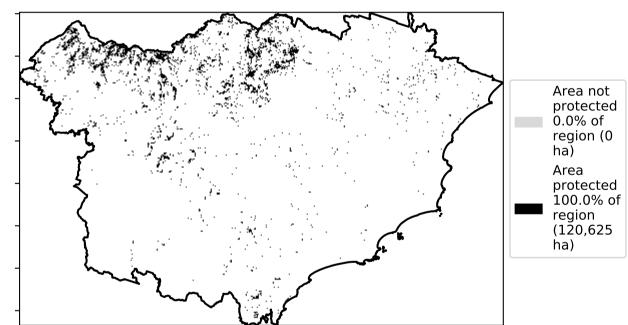
% Area protected from water erosion (>70%)



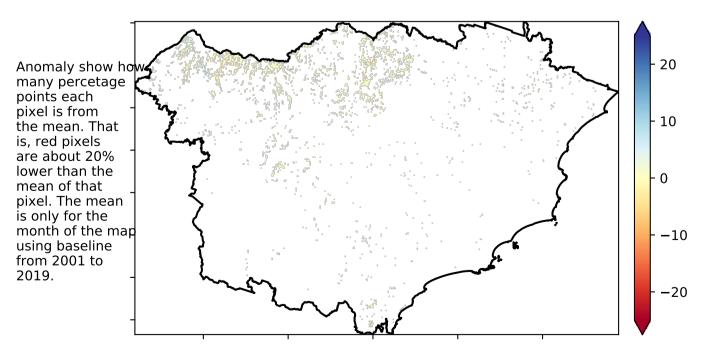
Proportion of vegetation cover class in area



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

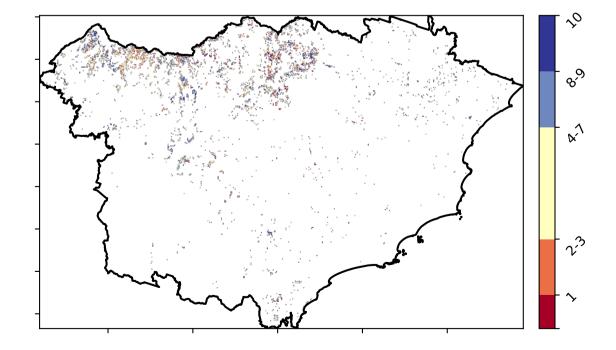


**Total Vegetation Cover Anomaly [%]** 

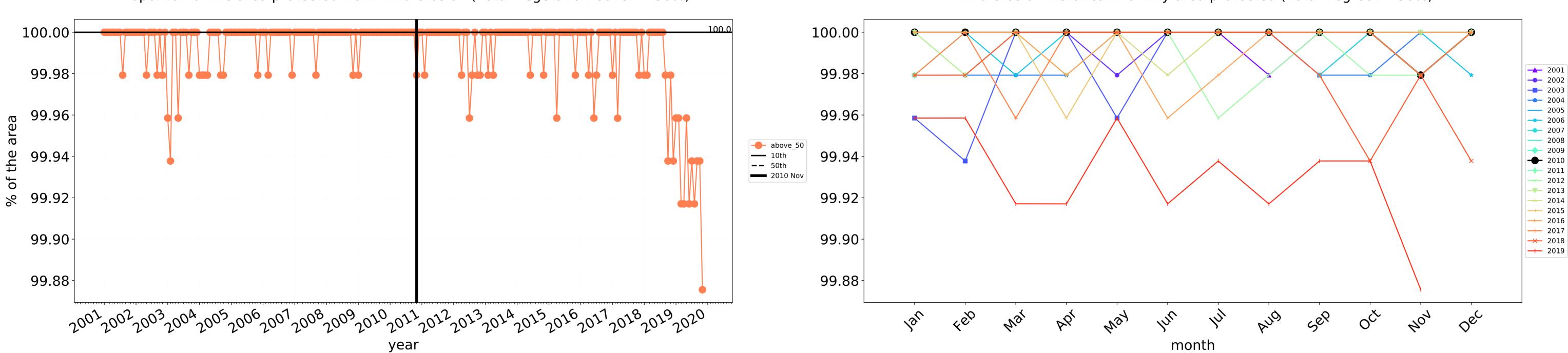


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Total Vegetation Cover Decile [%]

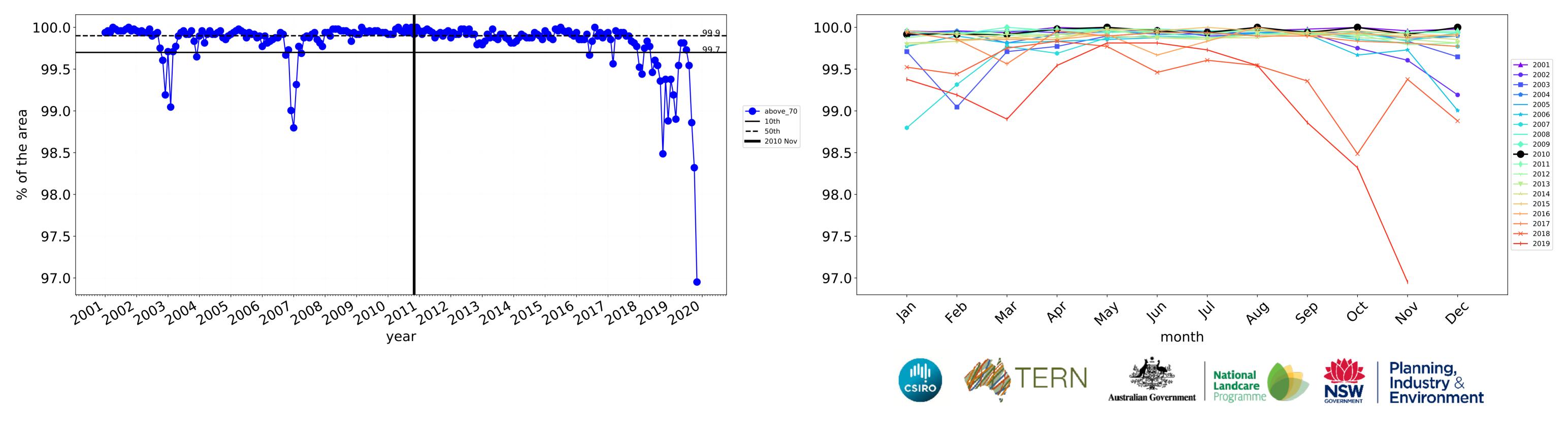






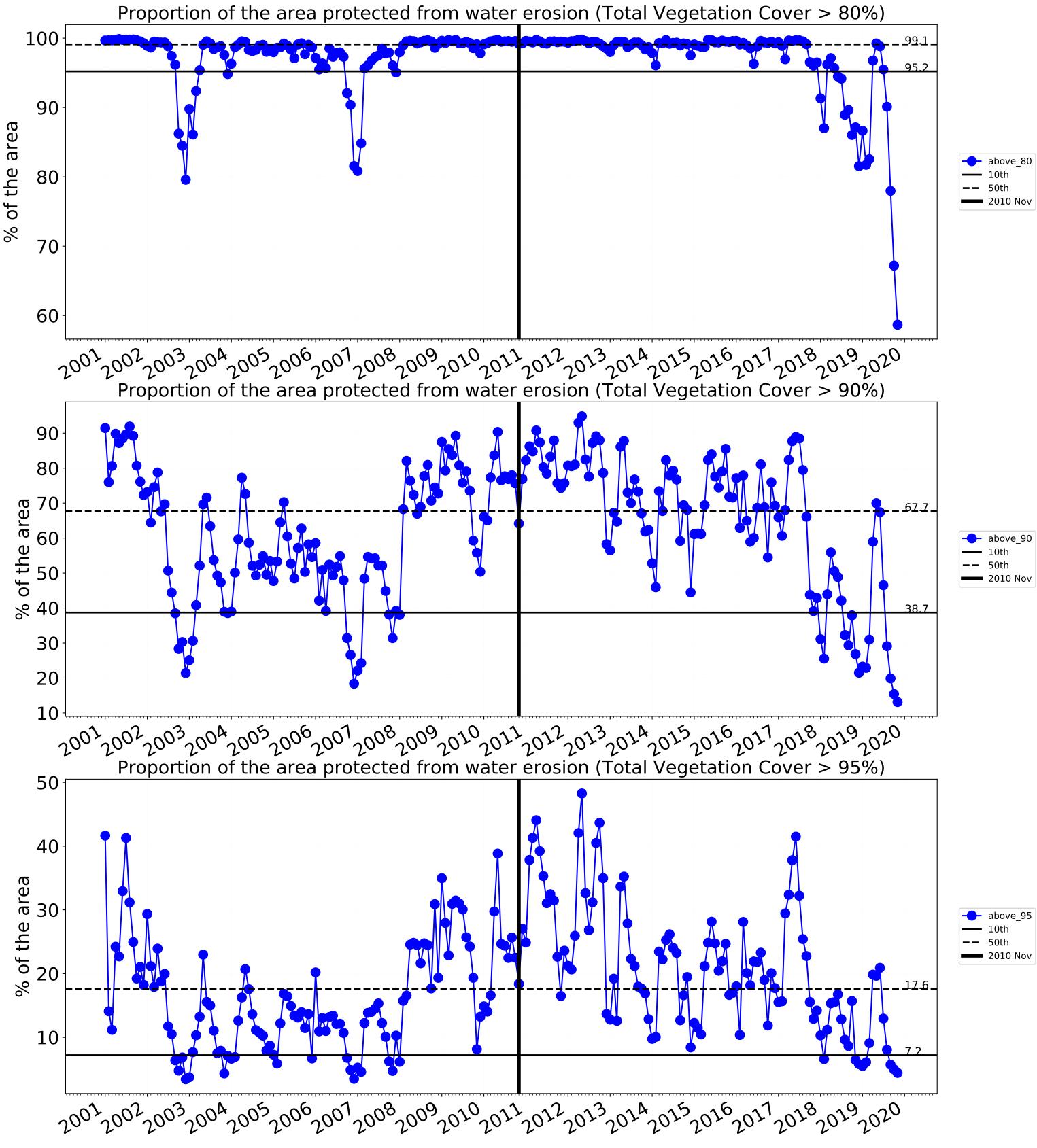
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

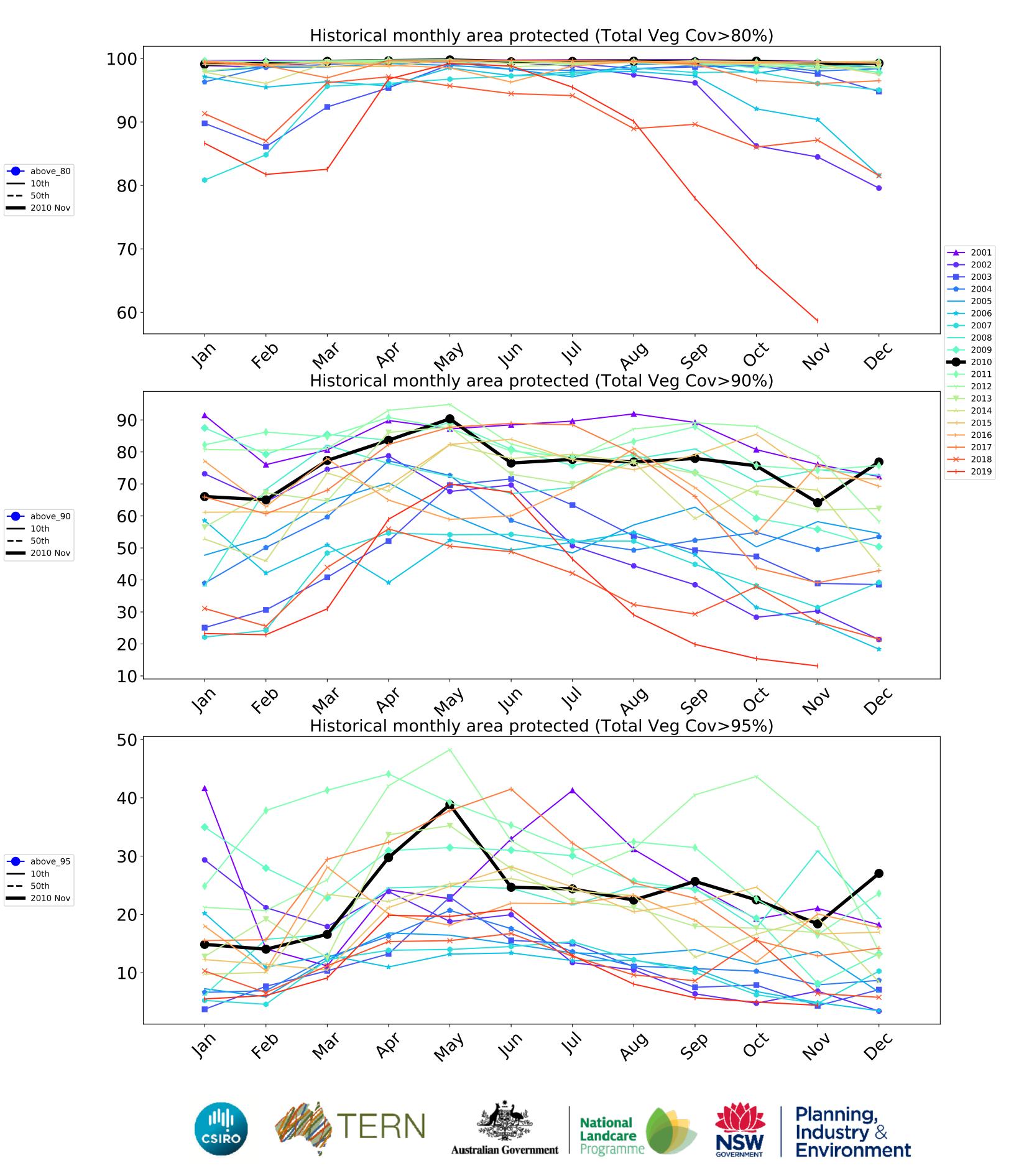
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



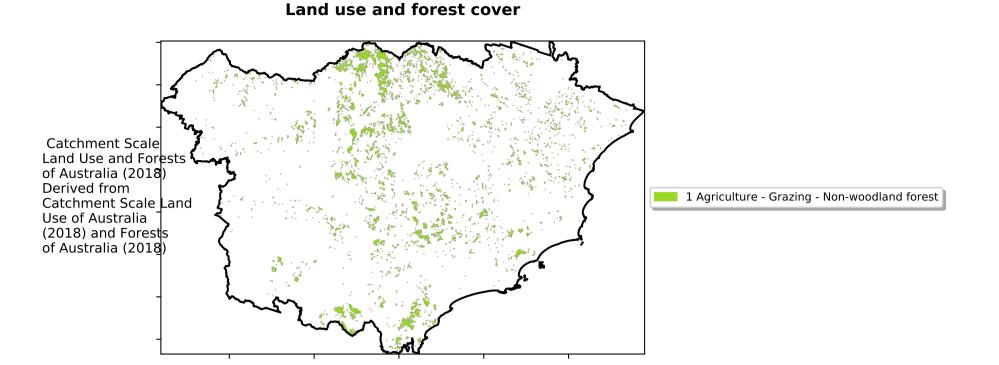
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

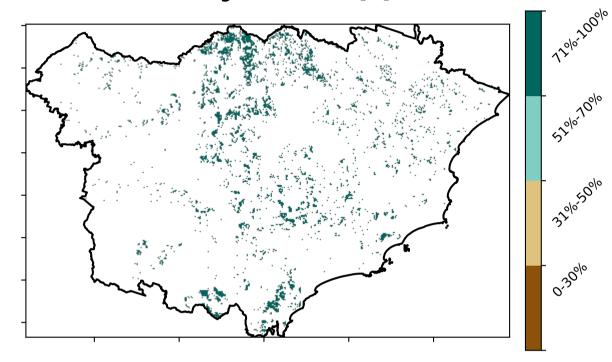




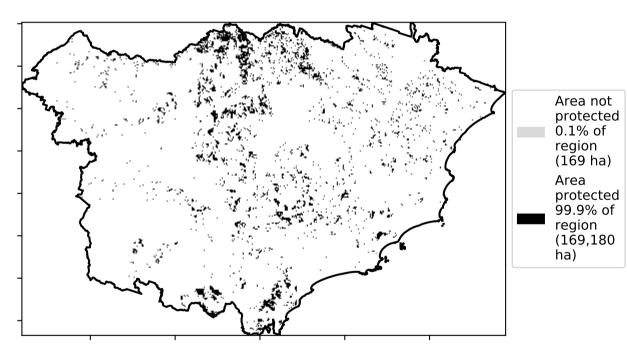
#### Grazing - Forest (non woodland)



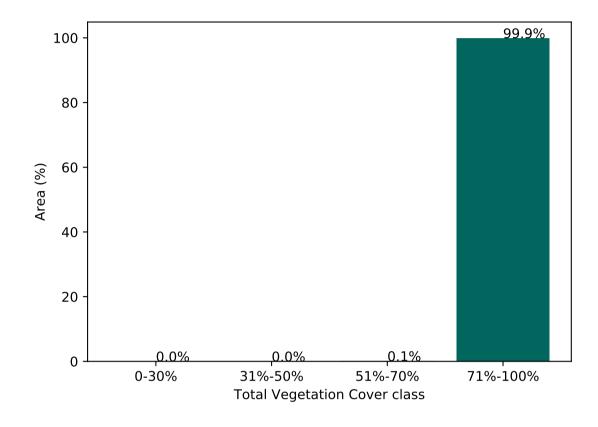
Total Vegetation Cover [%]



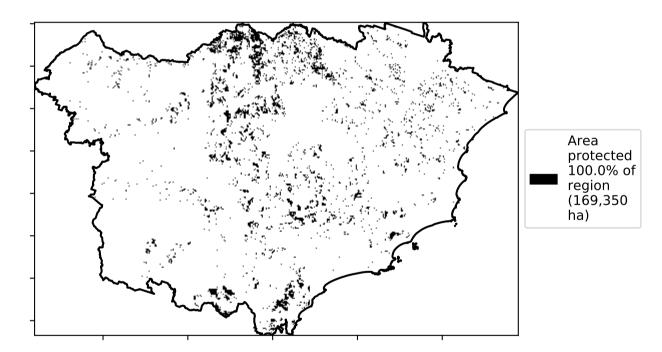
% Area protected from water erosion (>70%)



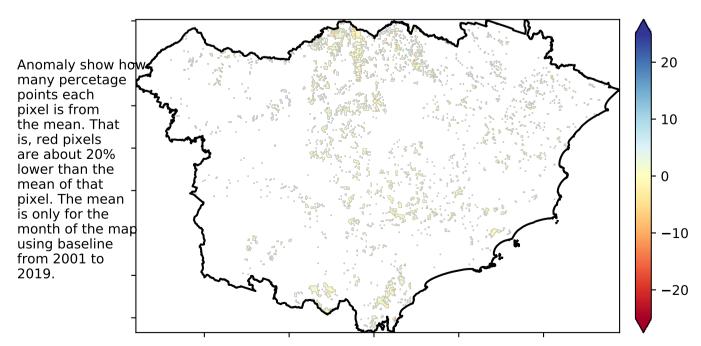
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

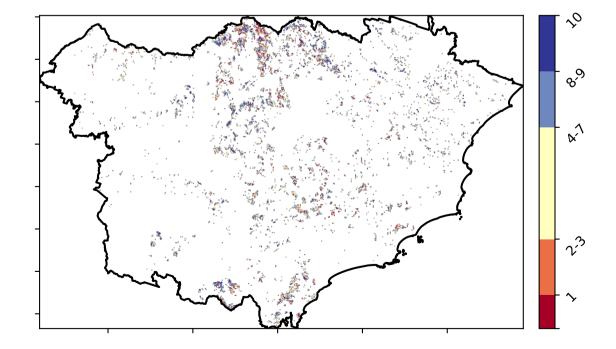


Total Vegetation Cover Anomaly [%]

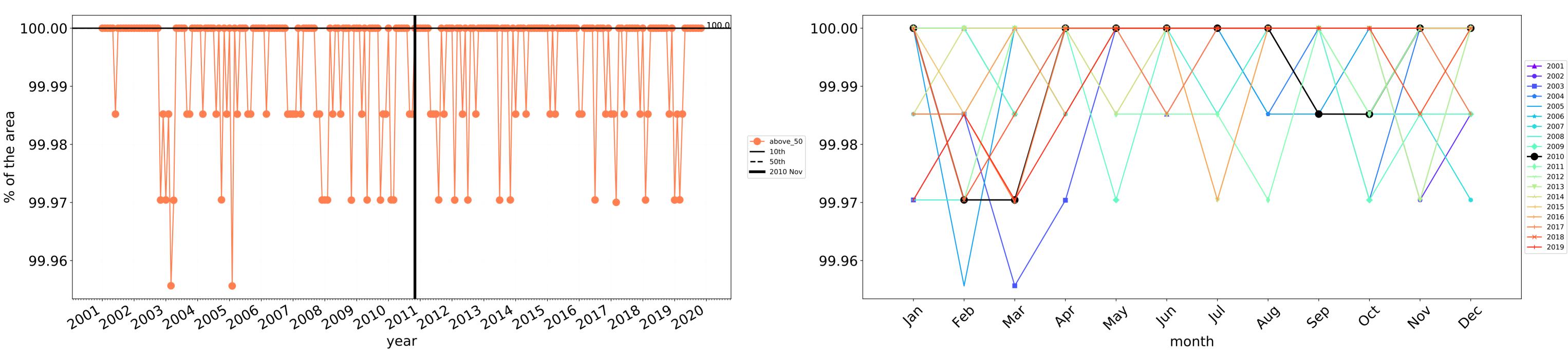


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Total Vegetation Cover Decile [%]

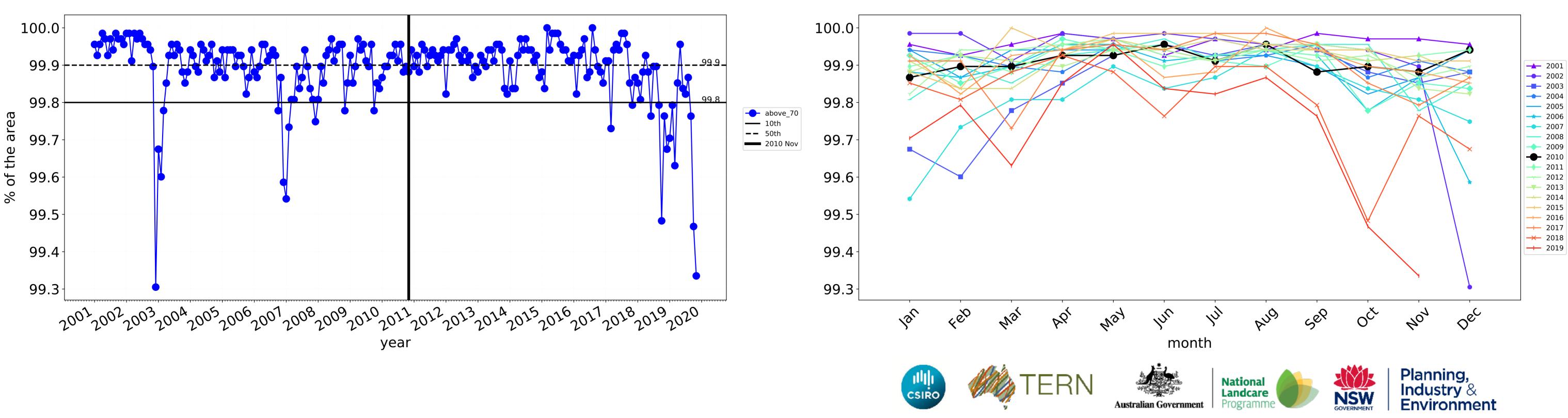


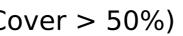




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

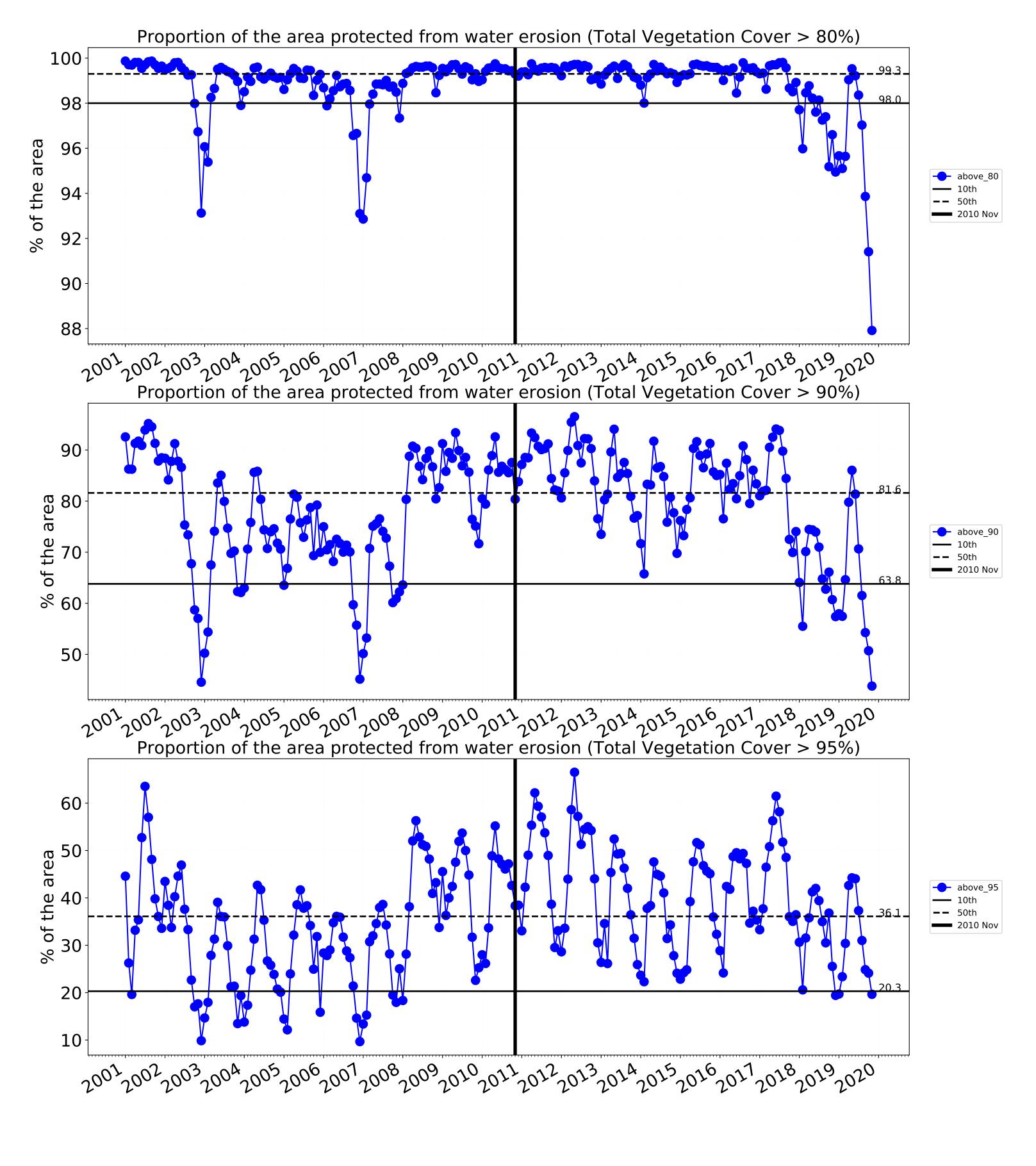


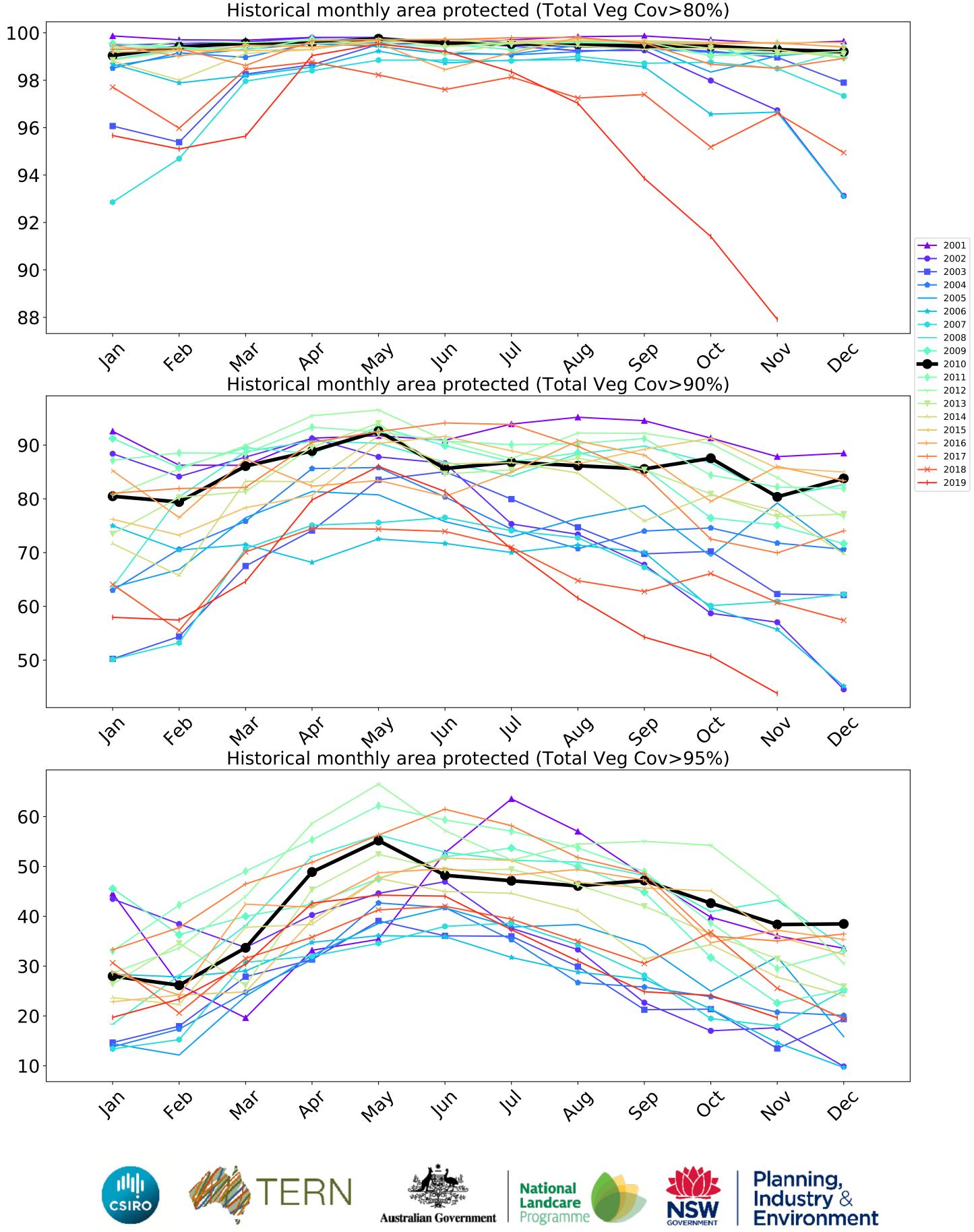


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



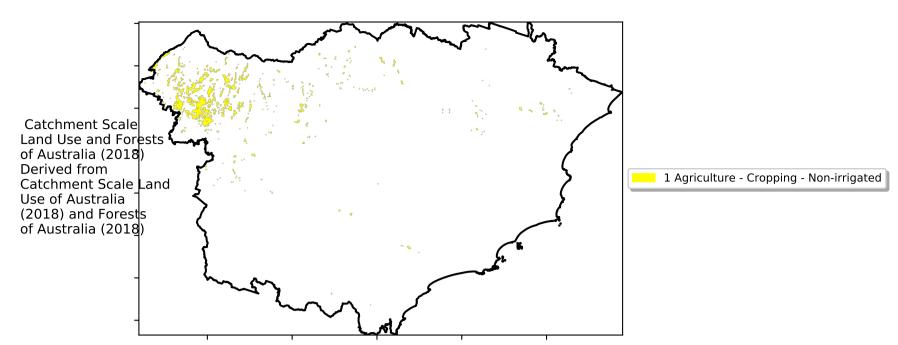




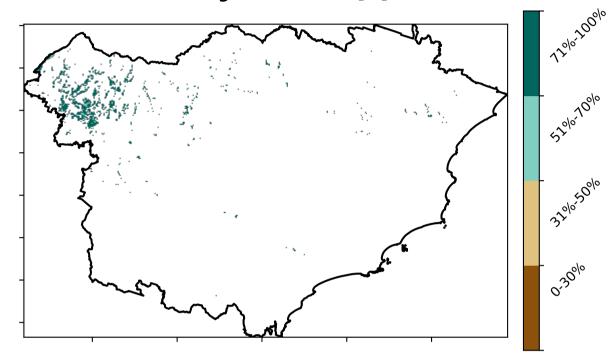
Australian Government

### Cropping

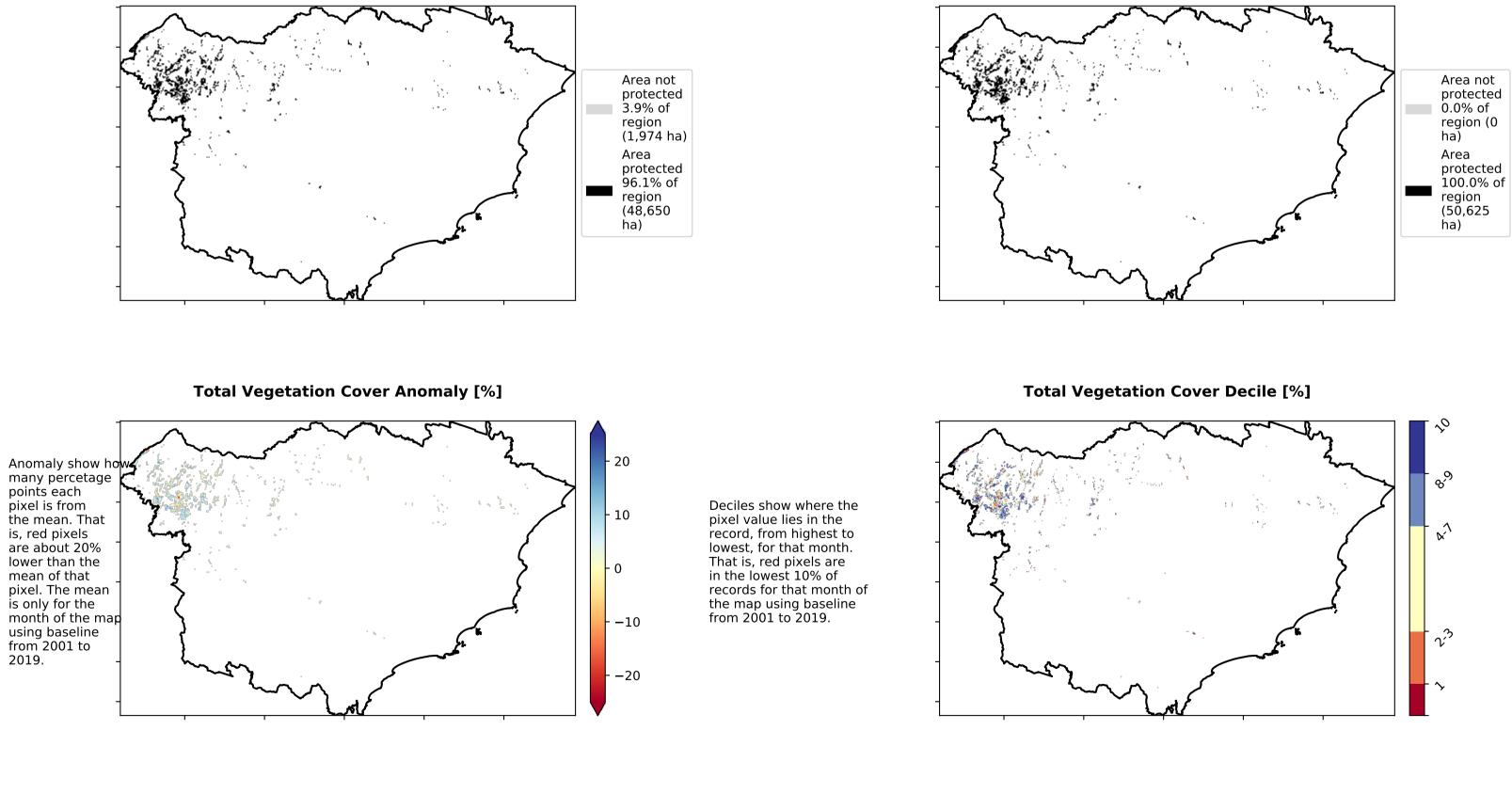
Land use and forest cover



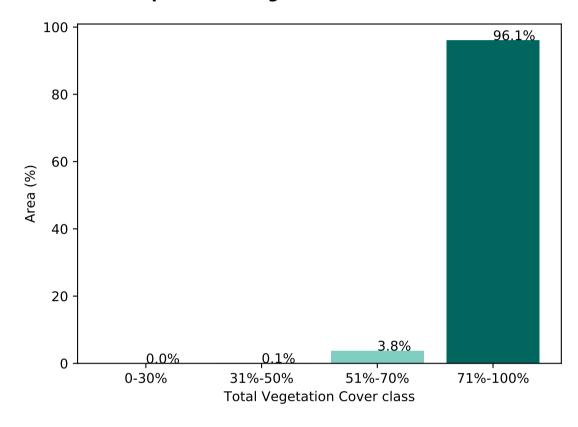
**Total Vegetation Cover [%]** 



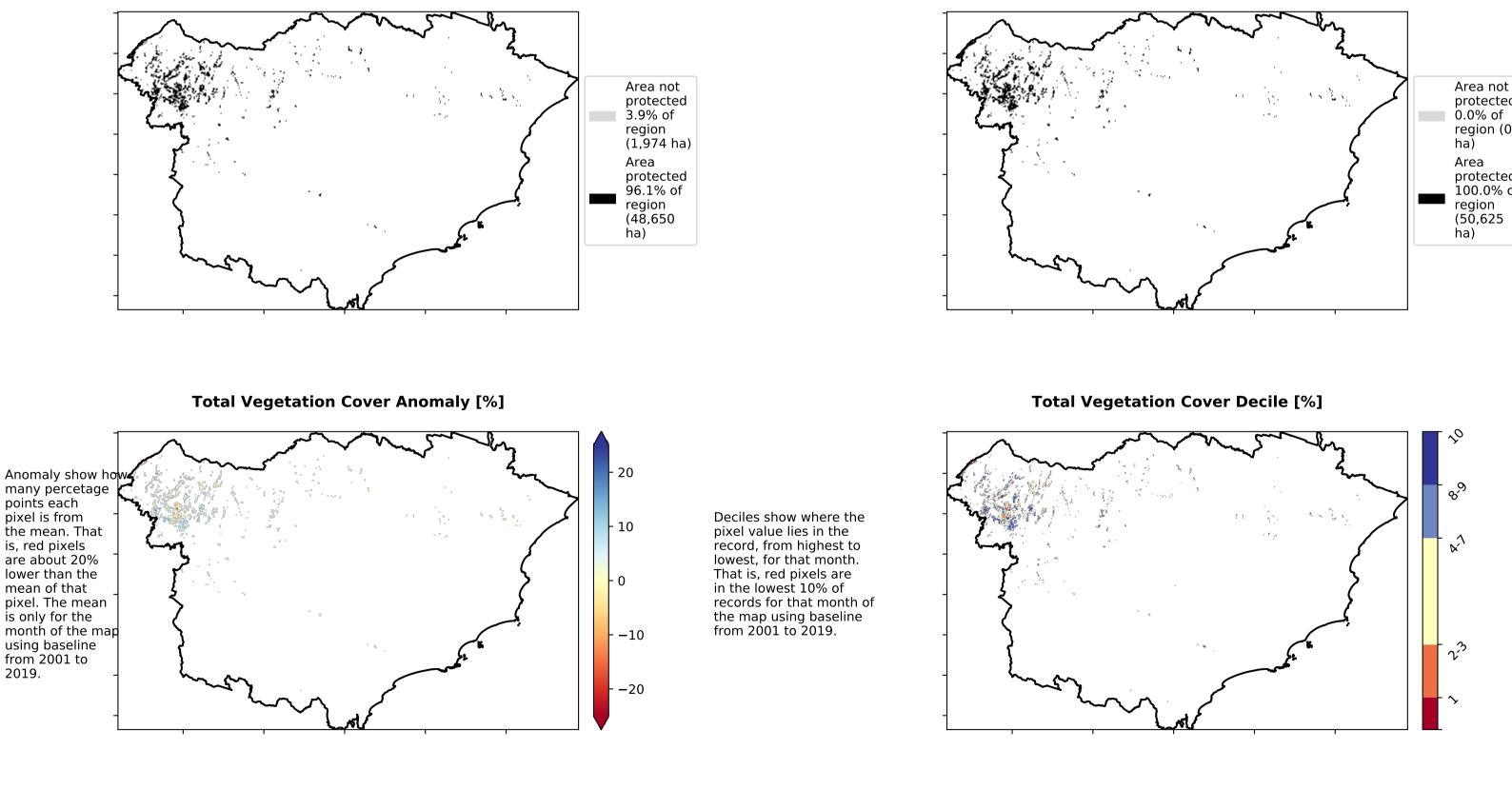
% Area protected from water erosion (>70%)



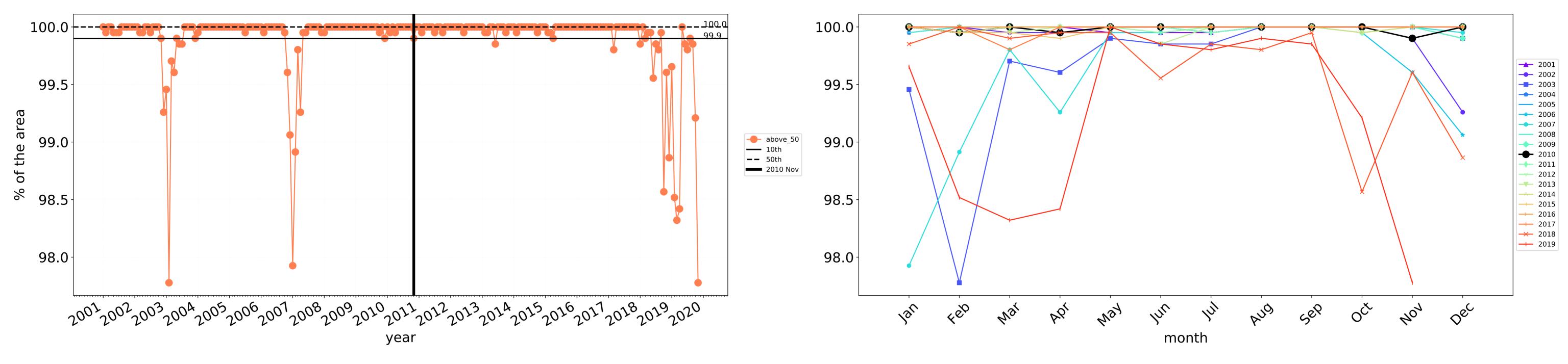
Proportion of vegetation cover class in area



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

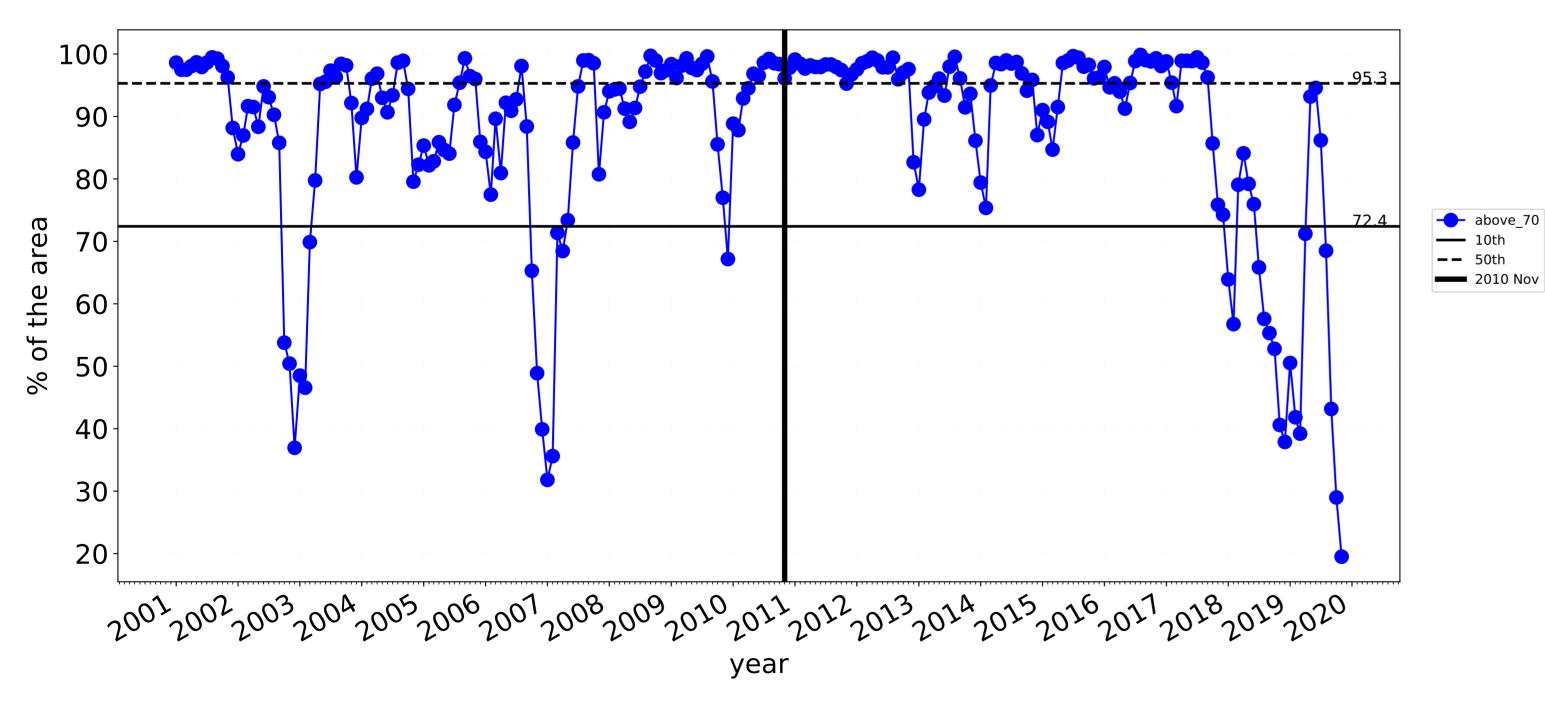




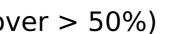


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

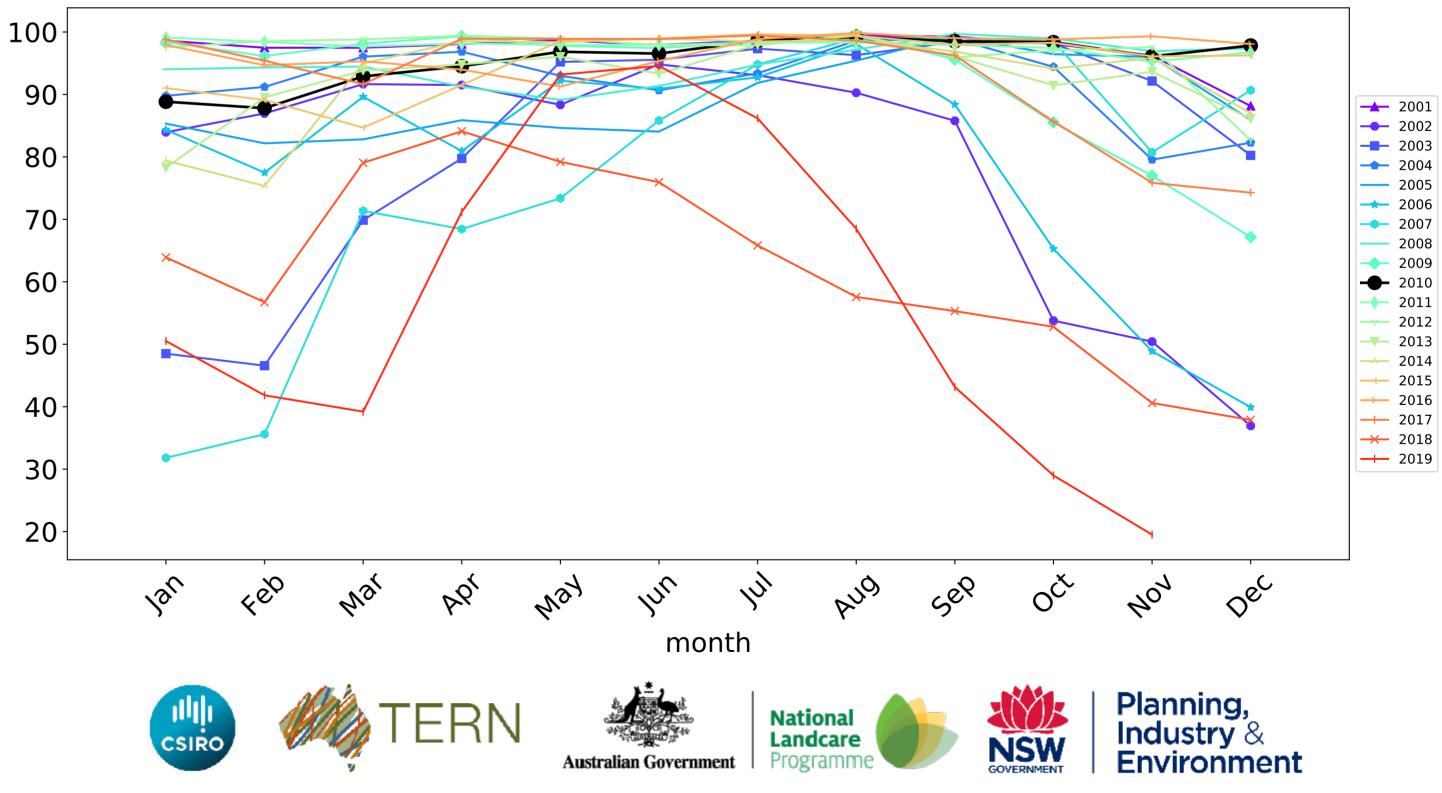
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



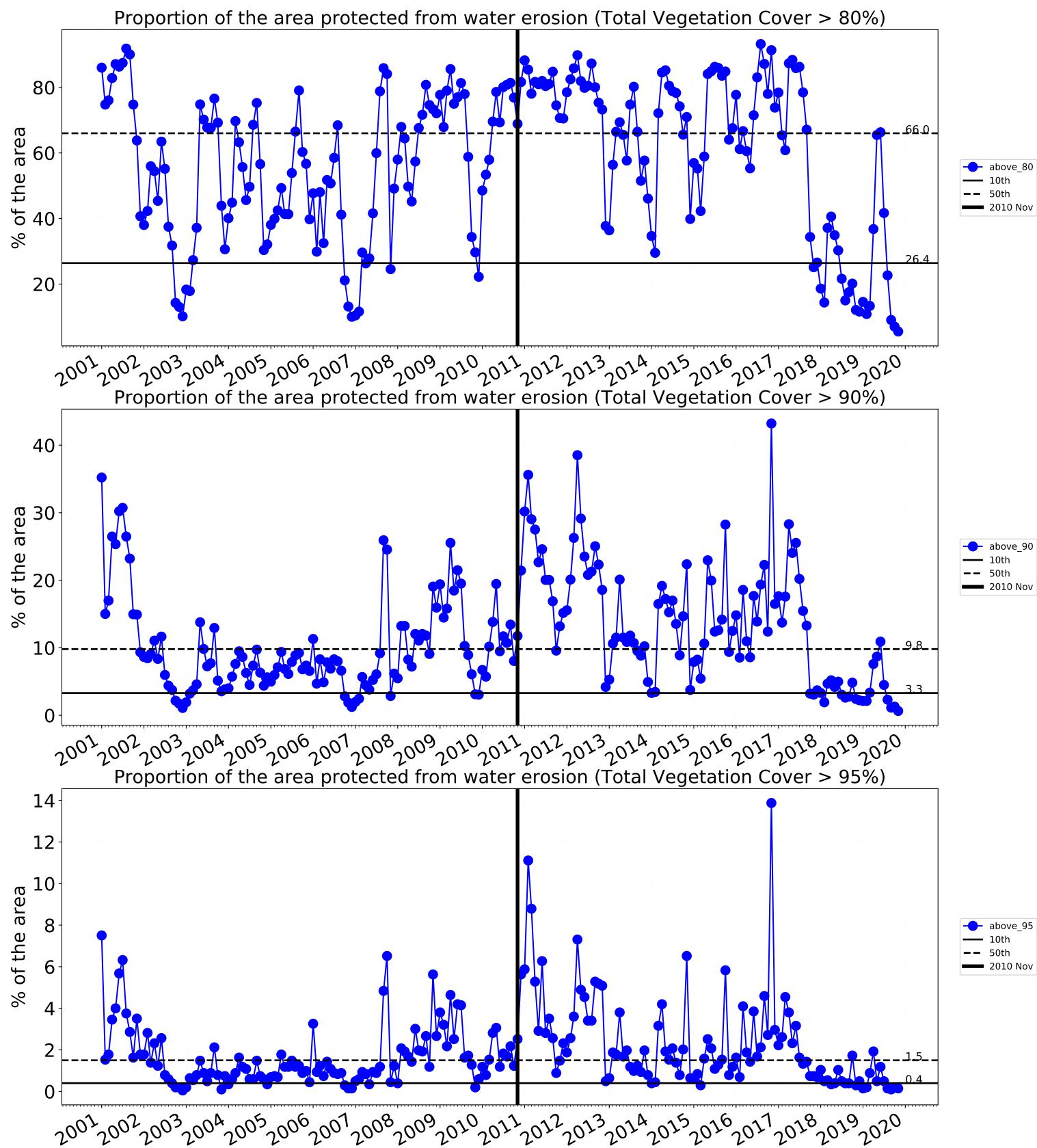
### **Cropping timeseries**

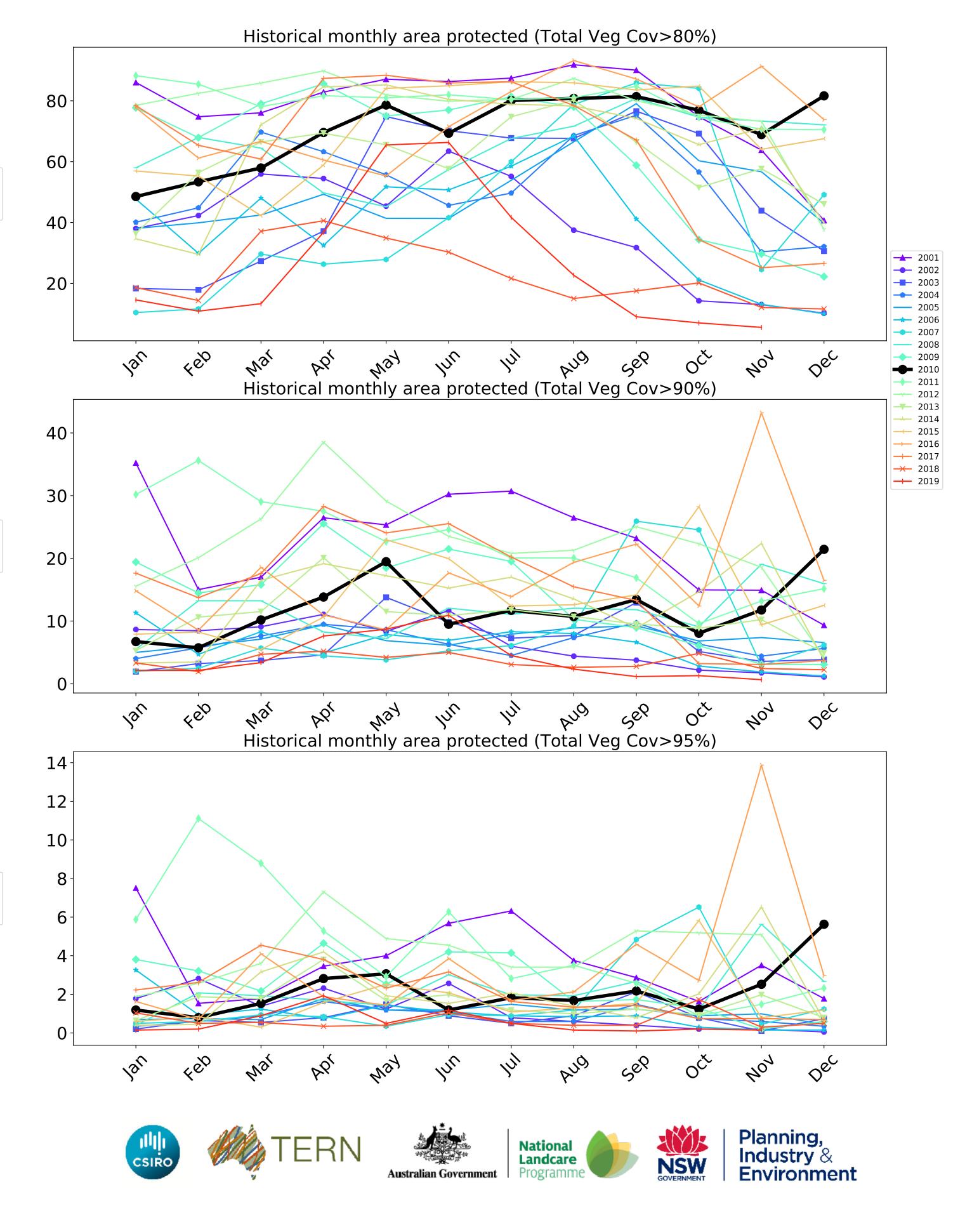


Wind erosion historical monthly area protected (Total Veg Cov >50%)



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

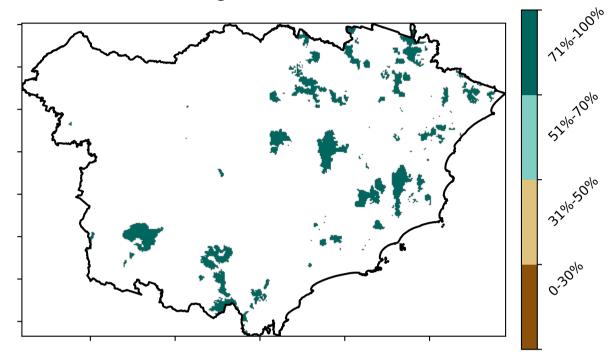




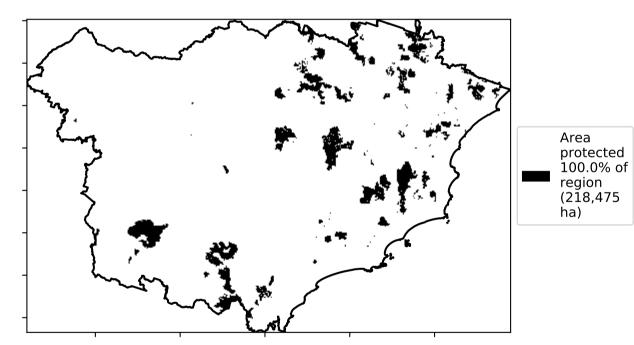
### **Production native forests and plantation forests**



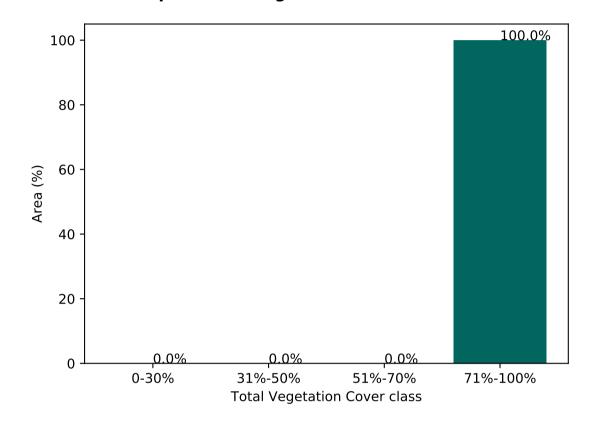
**Total Vegetation Cover [%]** 



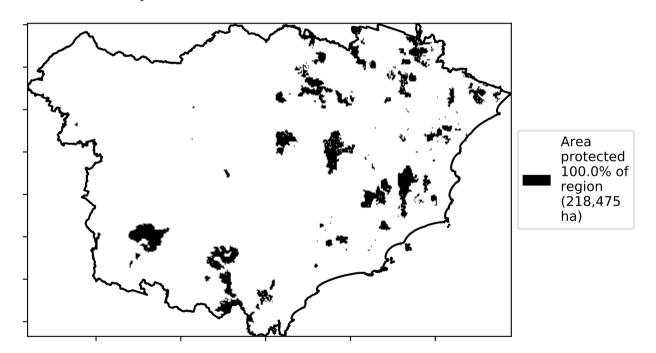
% Area protected from water erosion (>70%)



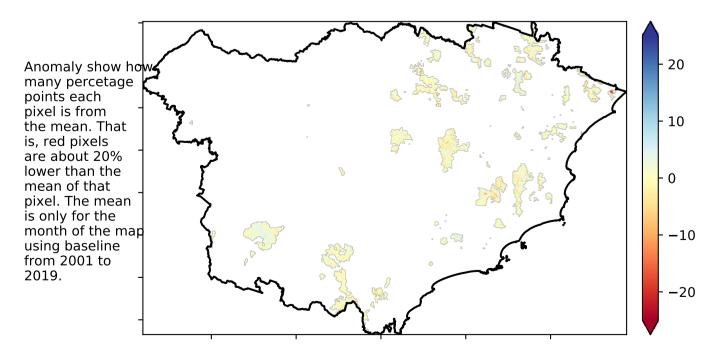
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

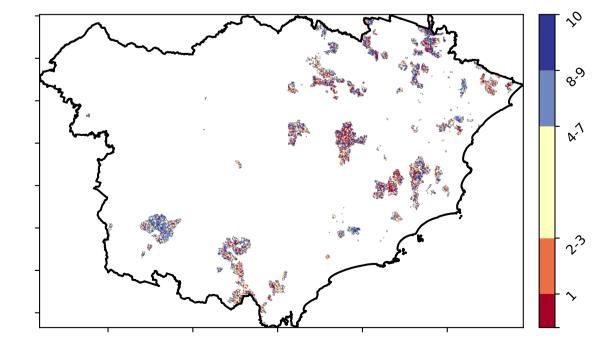


Total Vegetation Cover Anomaly [%]

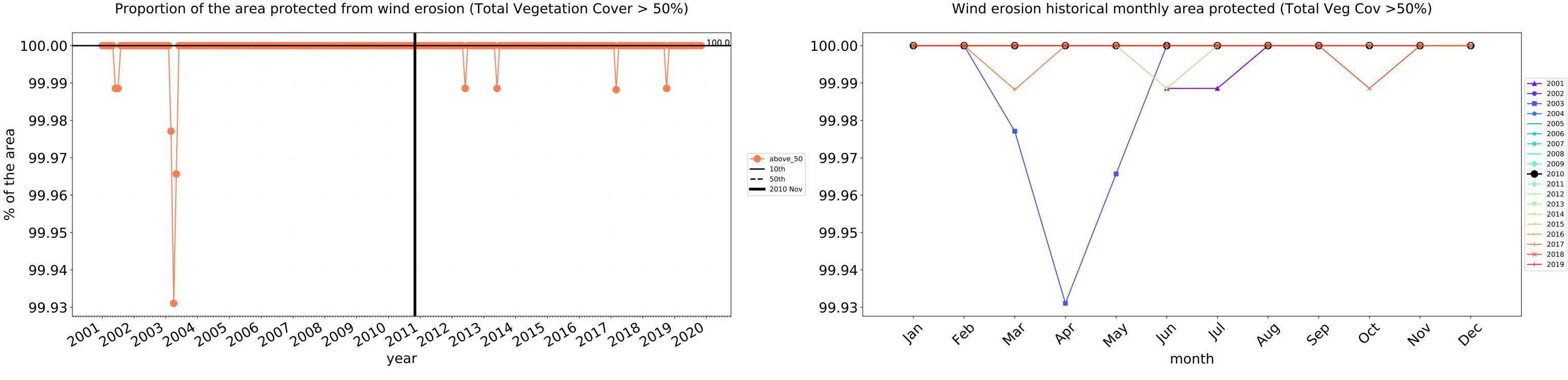


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Total Vegetation Cover Decile [%]

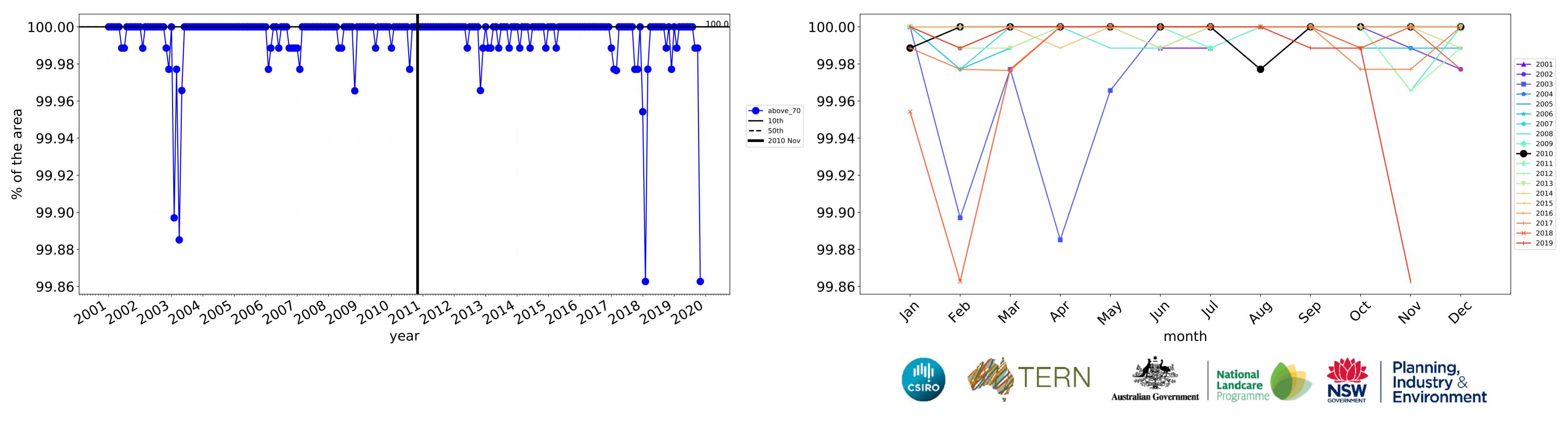


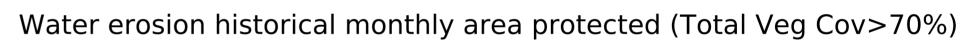


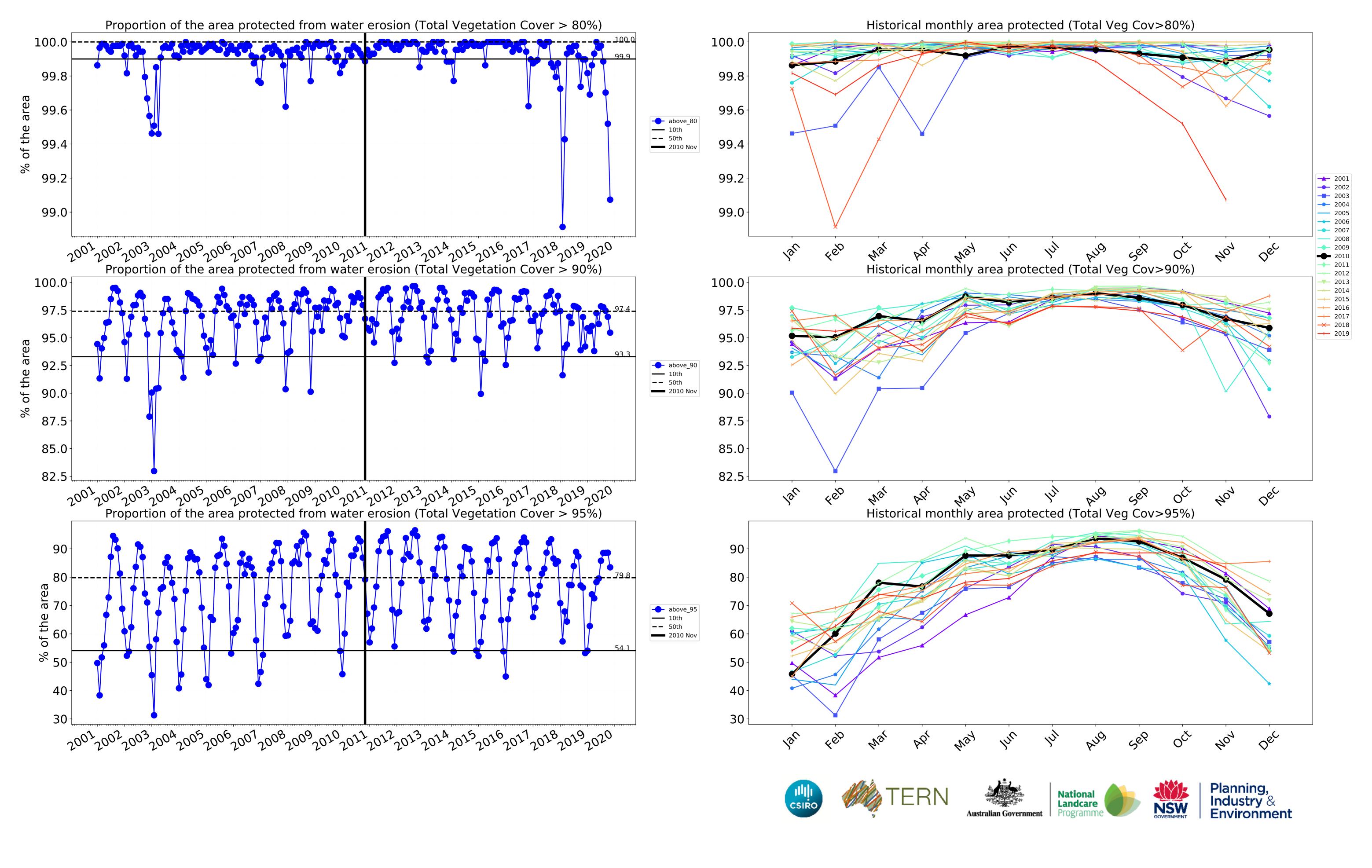


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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







# Hunter (3,240,325 ha and no data 60,100 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	3,240,325	99.9% 3,236,776	99.6% 3,228,704	98.6% 3,195,666	96.0% 3,110,424	73.0% 2,366,330	39.7% 1,285,314
Conservation and natural environments	1,241,200	99.9% 1,239,975	99.8% 1,239,125	99.7% 1,237,150	99.4% 1,233,275	92.1% 1,143,550	61.8% 766,800
Conservation and natural environments non forest	30,250	96.0% 29,025	93.8% 28,375	90.2% 27,275	86.3% 26,100	67.5% 20,425	29.6% 8,950
Conservation and natural environments Woodland forest	138,850	100.0% 138,850	100.0% 138,850	99.9% 138,750	99.7% 138,450	90.2% 125,275	45.9% 63,750
Conservation and natural environments Forest (non woodland)	1,072,100	100.0% 1,072,100	100.0% 1,071,900	99.9% 1,071,125	99.7% 1,068,725	93.1% 997,850	64.7% 694,100
Agriculture	1,581,150	100.0% 1,581,150	100.0% 1,580,850	99.6% 1,575,325	96.7% 1,528,525	60.0% 949,350	20.5% 324,700
Grazing	1,503,150	100.0% 1,503,150	100.0% 1,502,900	99.8% 1,499,650	97.9% 1,472,300	62.6% 940,225	21.5% 322,950
Grazing non forest	1,213,175	100.0% 1,213,175	100.0% 1,212,950	99.7% 1,209,975	97.6% 1,184,525	59.9% 726,750	19.4% 235,850
Grazing Woodland forest	120,625	100.0% 120,625	100.0% 120,600	99.9% 120,525	99.2% 119,625	64.1% 77,375	18.4% 22,175
Grazing - Forest (non woodland)	169,350	100.0% 169,350	100.0% 169,350	99.9% 169,150	99.3% 168,150	80.4% 136,100	38.3% 64,925
Cropping	50,625	100.0% 50,625	99.9% 50,575	96.1% 48,650	68.9% 34,875	11.8% 5,950	2.5% 1,275
Production native forests and plantation forests	218,475	100.0% 218,475	100.0% 218,475	100.0% 218,475	99.9% 218,225	96.7% 211,325	79.2% 172,950

