Total vegetation cover soil protection Region:NRM Hunter NSW

Date: November 2014

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

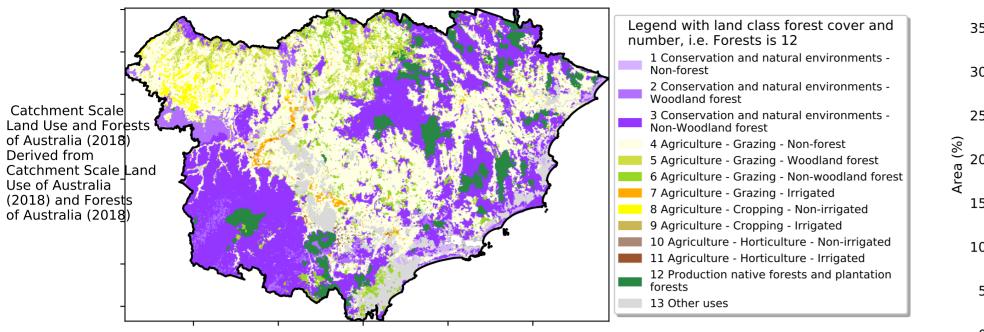


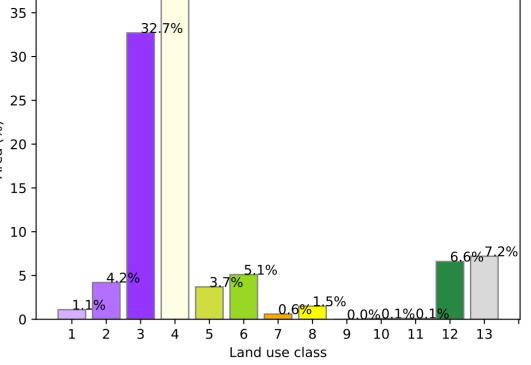
Vegetation Cover Nov 2014

Land use and forest cover

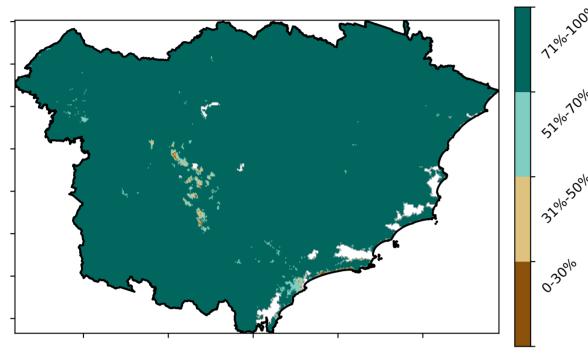
Proportion of each land class in area

36.9%

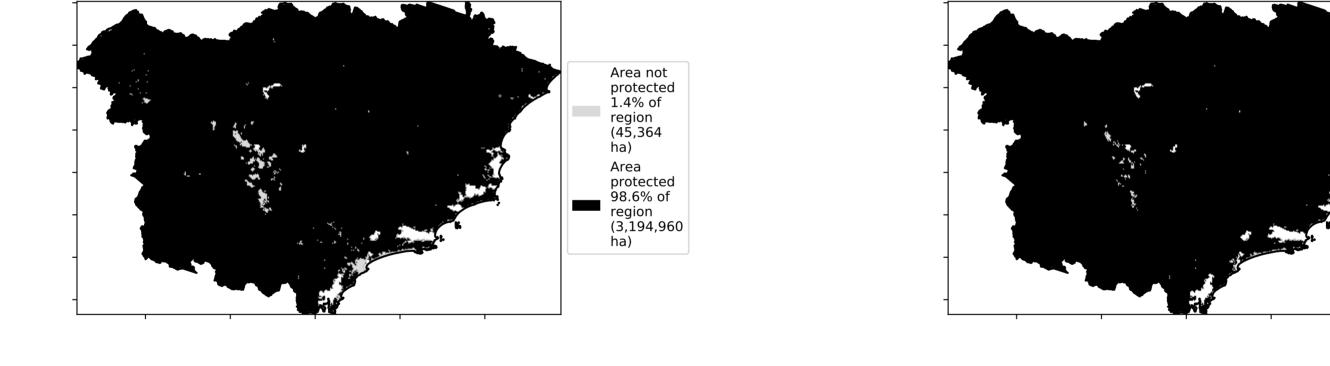




Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



20

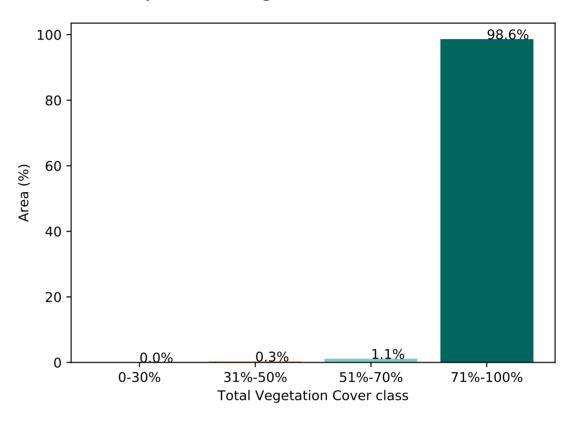
· 10

0

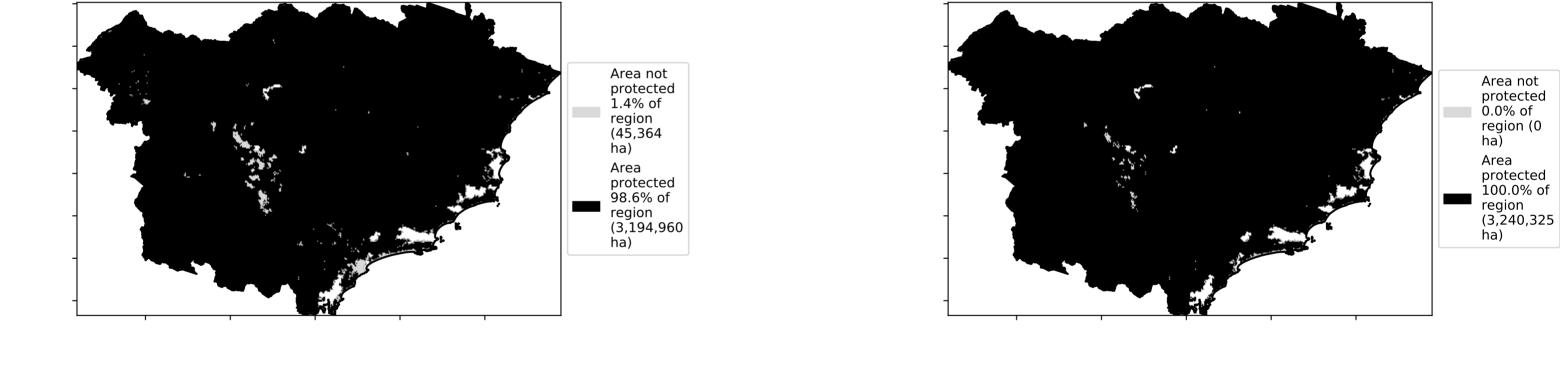
-10

-20

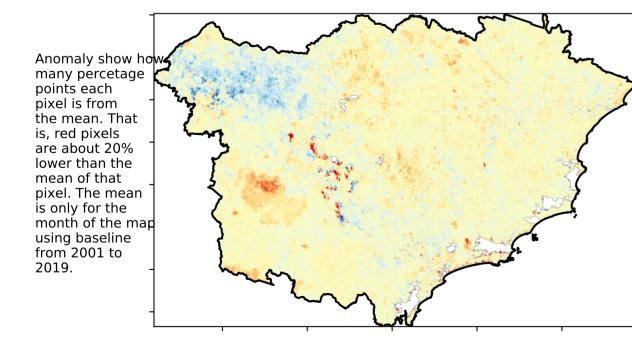
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

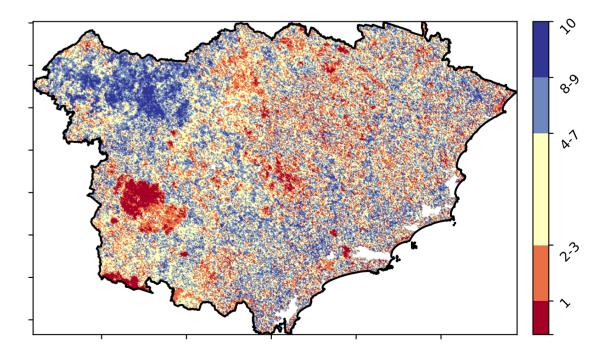


Total Vegetation Cover Anomaly [%]

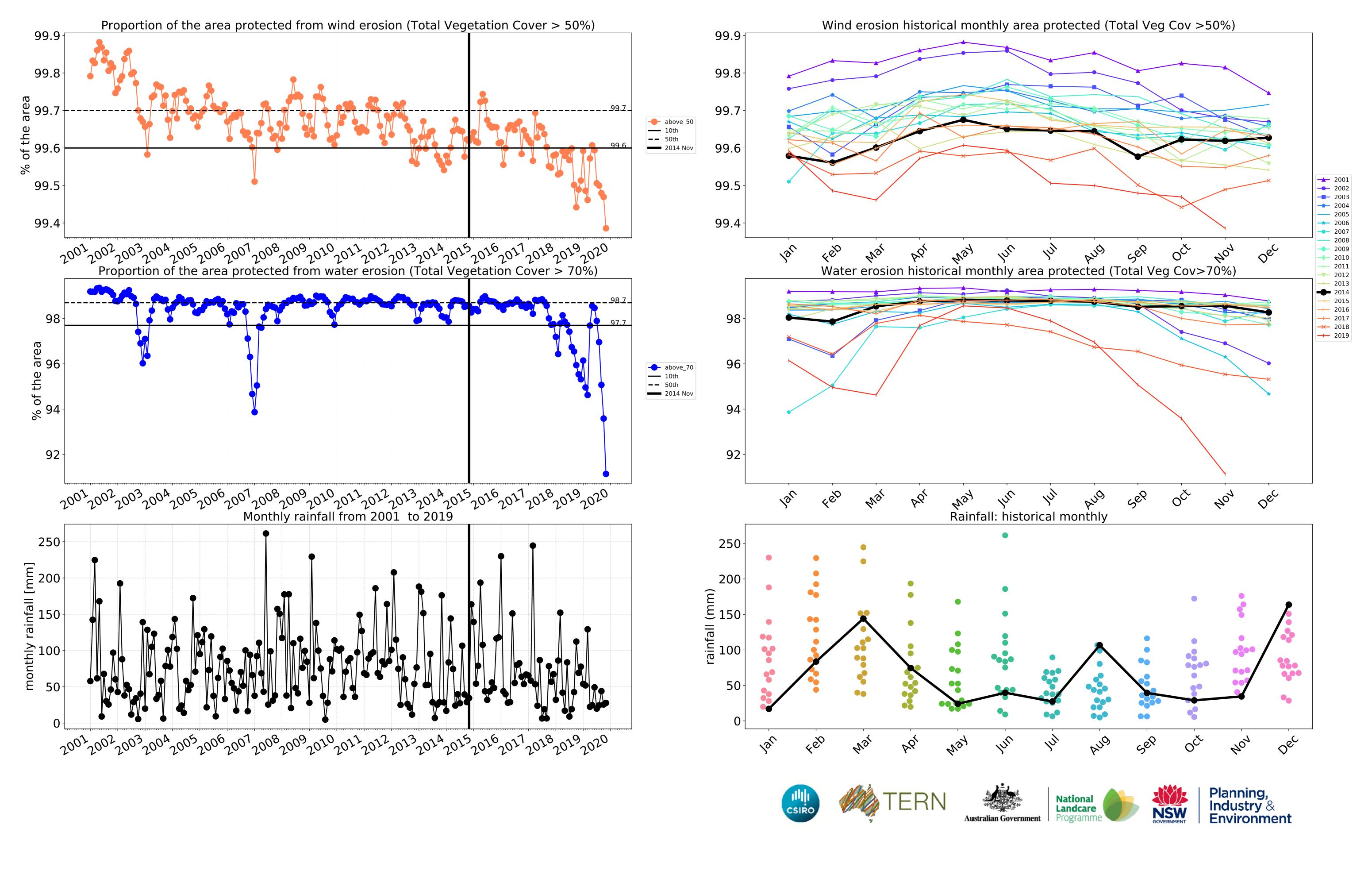


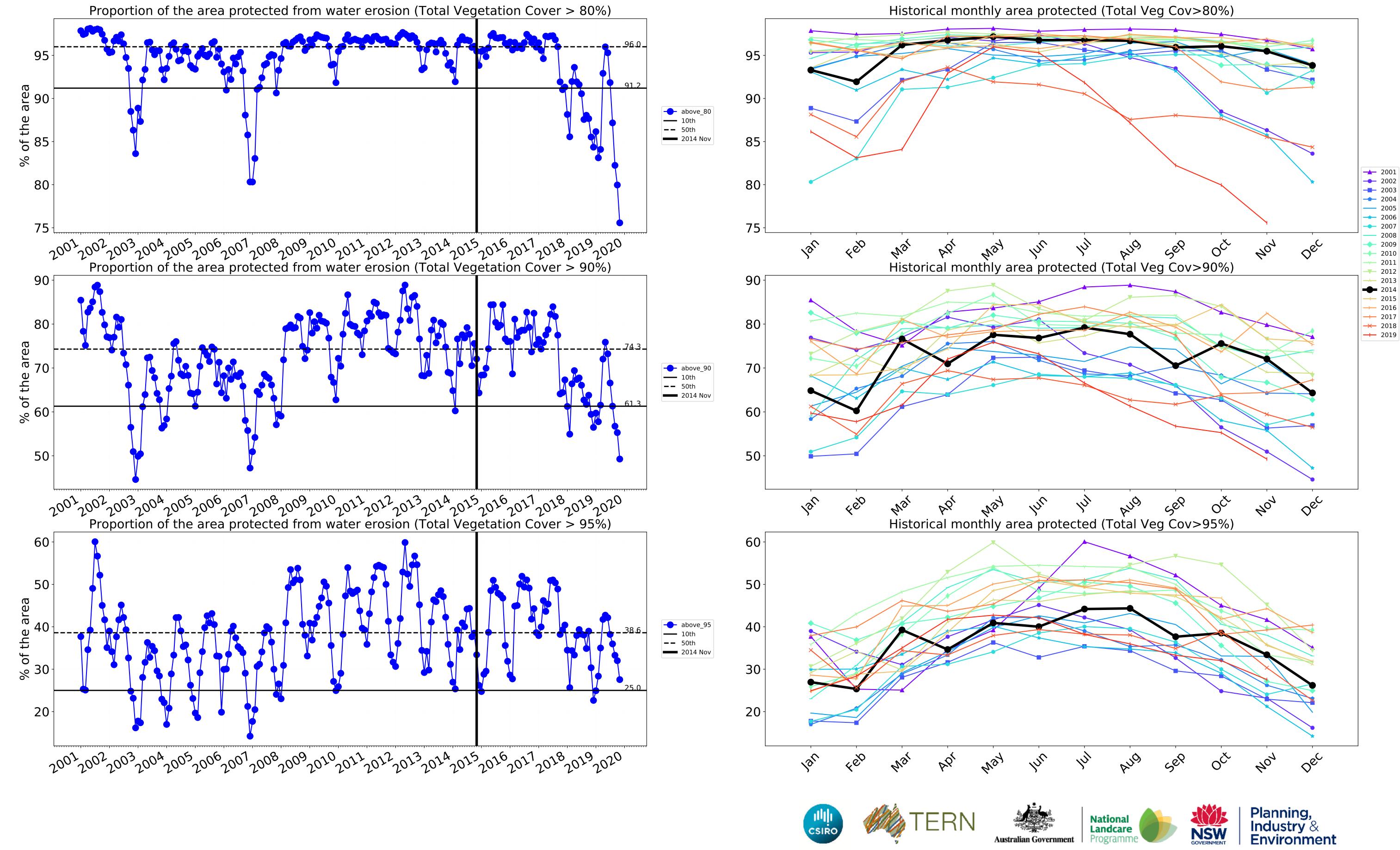
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

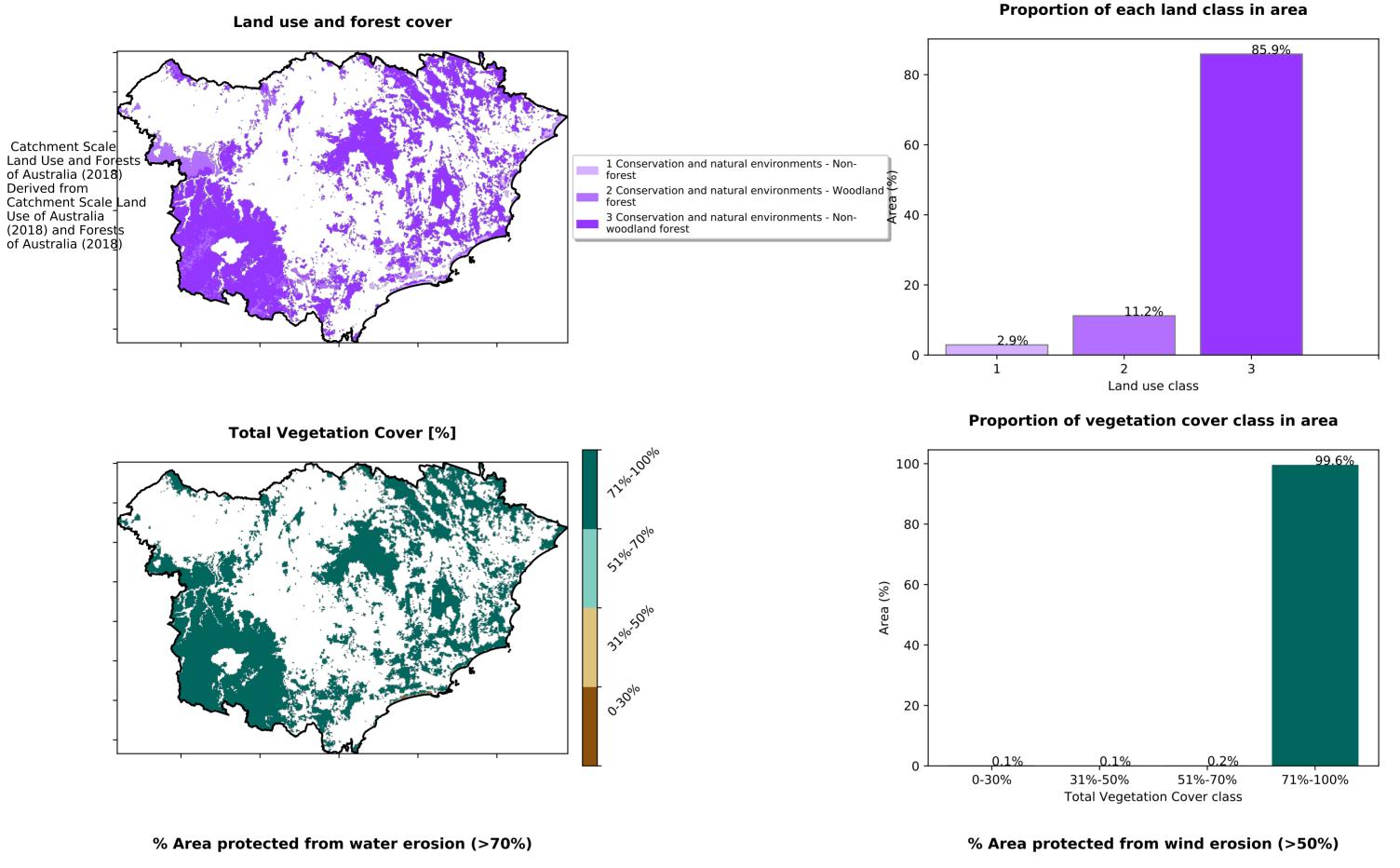


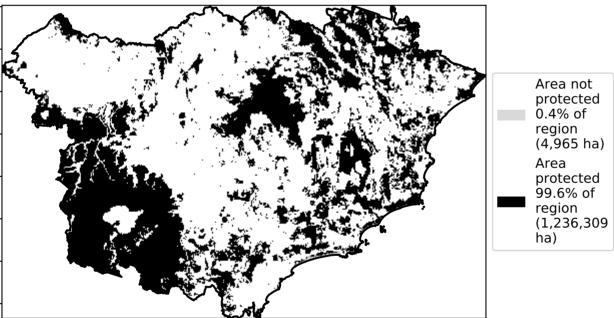






Conservation and natural environments





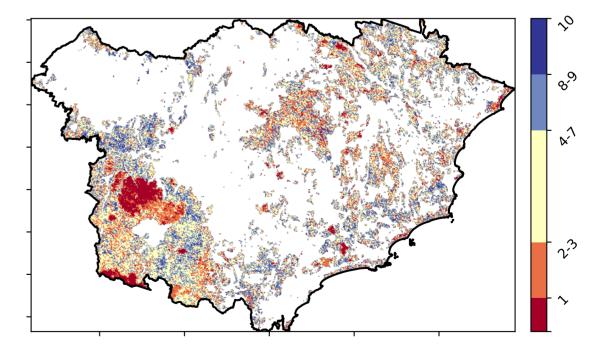
Area not protected 0.0% of region (0 ha) Area protected 100.0% of region (1,241,275 ha)

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 mean of that 0 pixel. The mean is only for the month of the map using baseline from 2001 to 2019. -10 -20

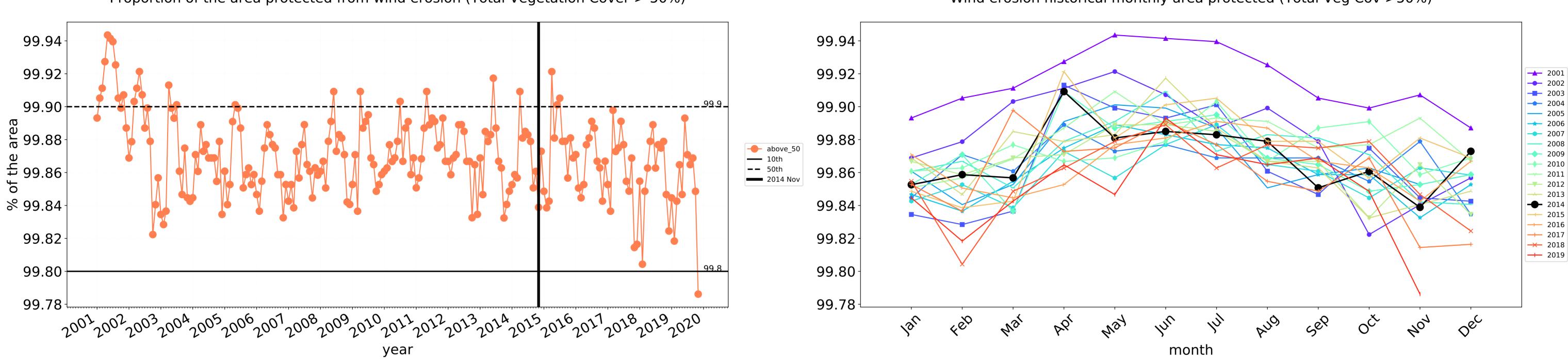
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



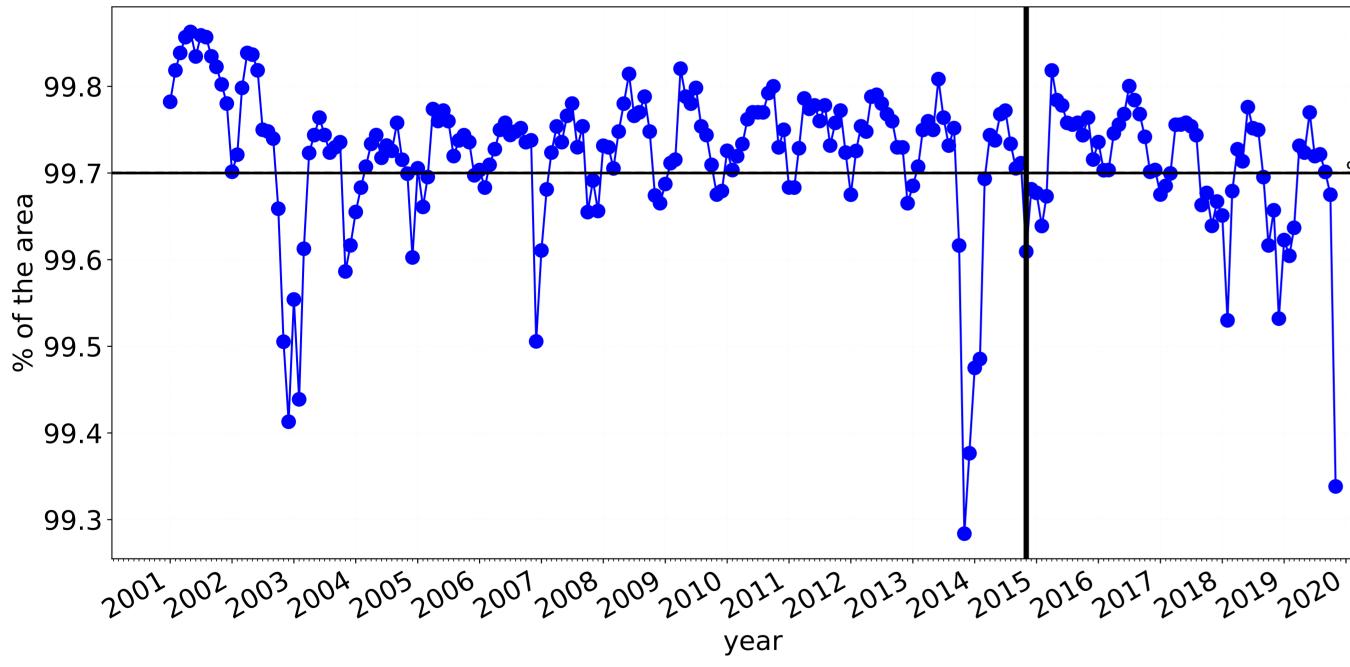


8



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

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



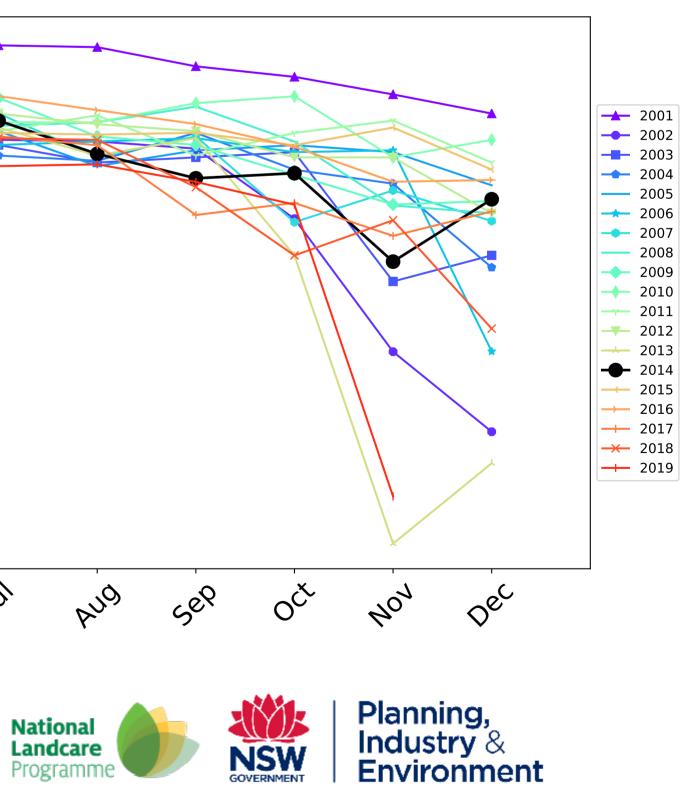
Conservation and natural environments timeseries

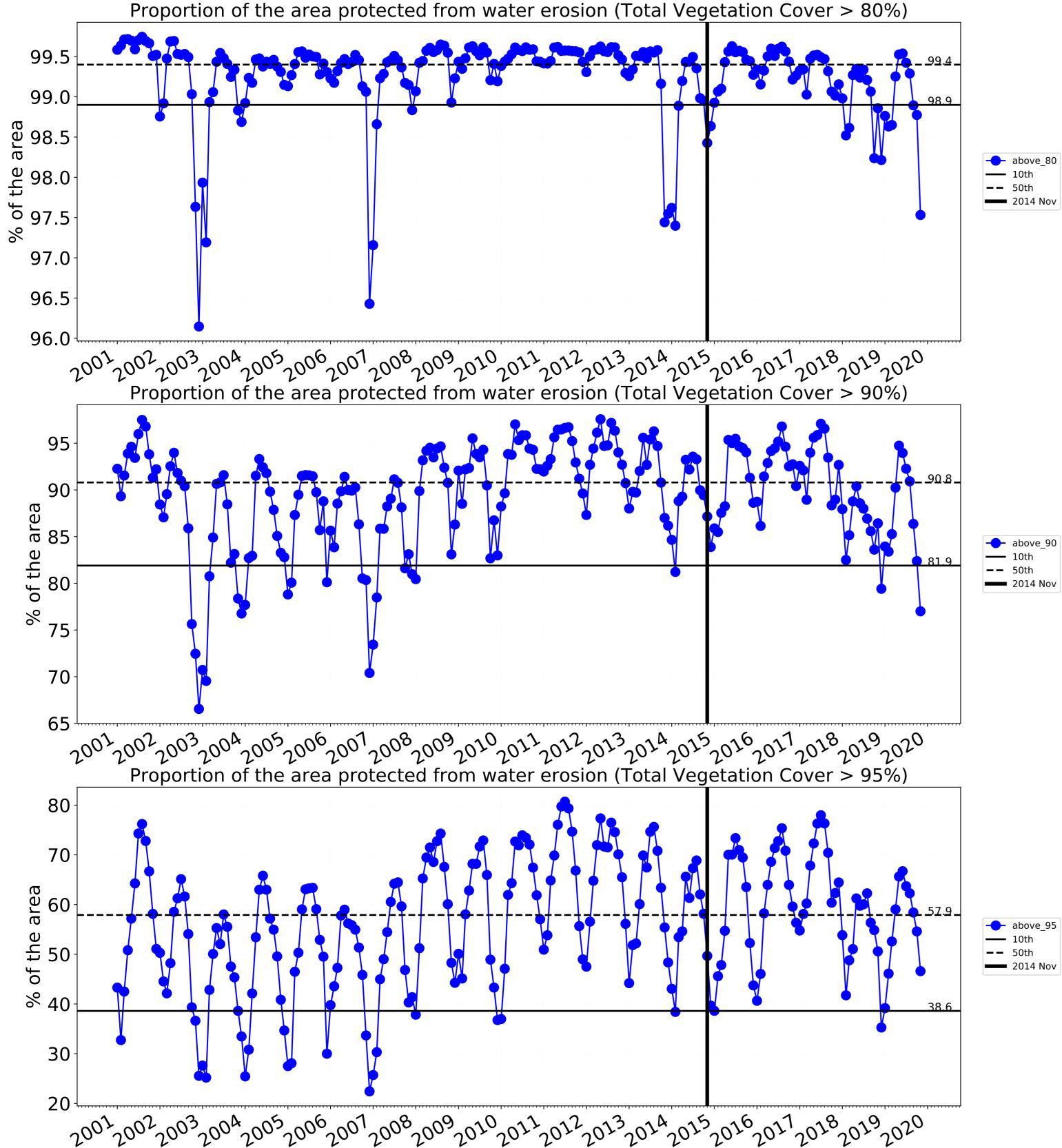
99.8 99.7 --- above_70 **—** 10th **——** 50th 99.6 **—** 2014 Nov 99.5 99.4⁻ 99.3-Jan fer In May 1's Mal P.Q month FERN (SOR) CSIRC Australian Government

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

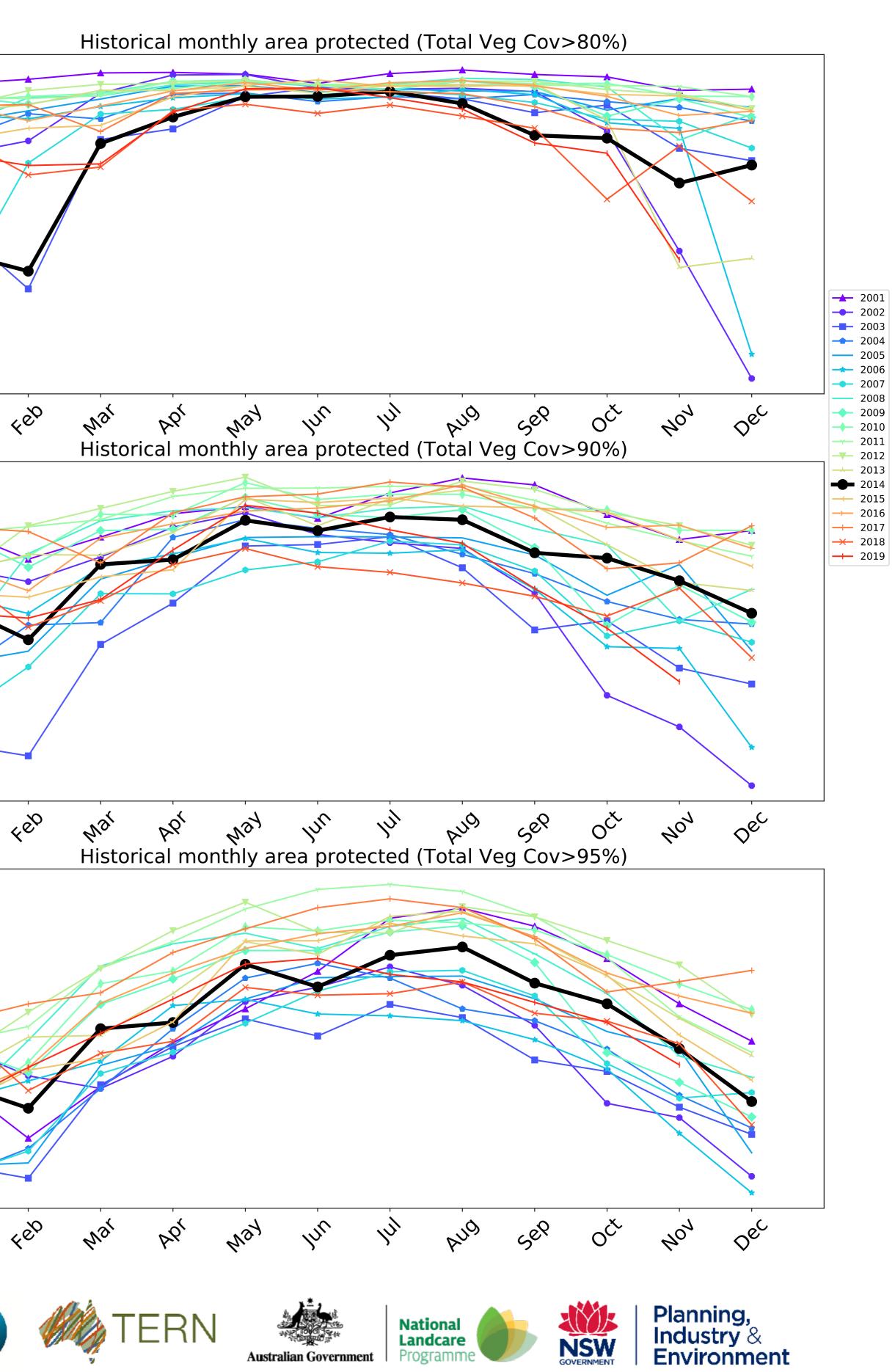
6

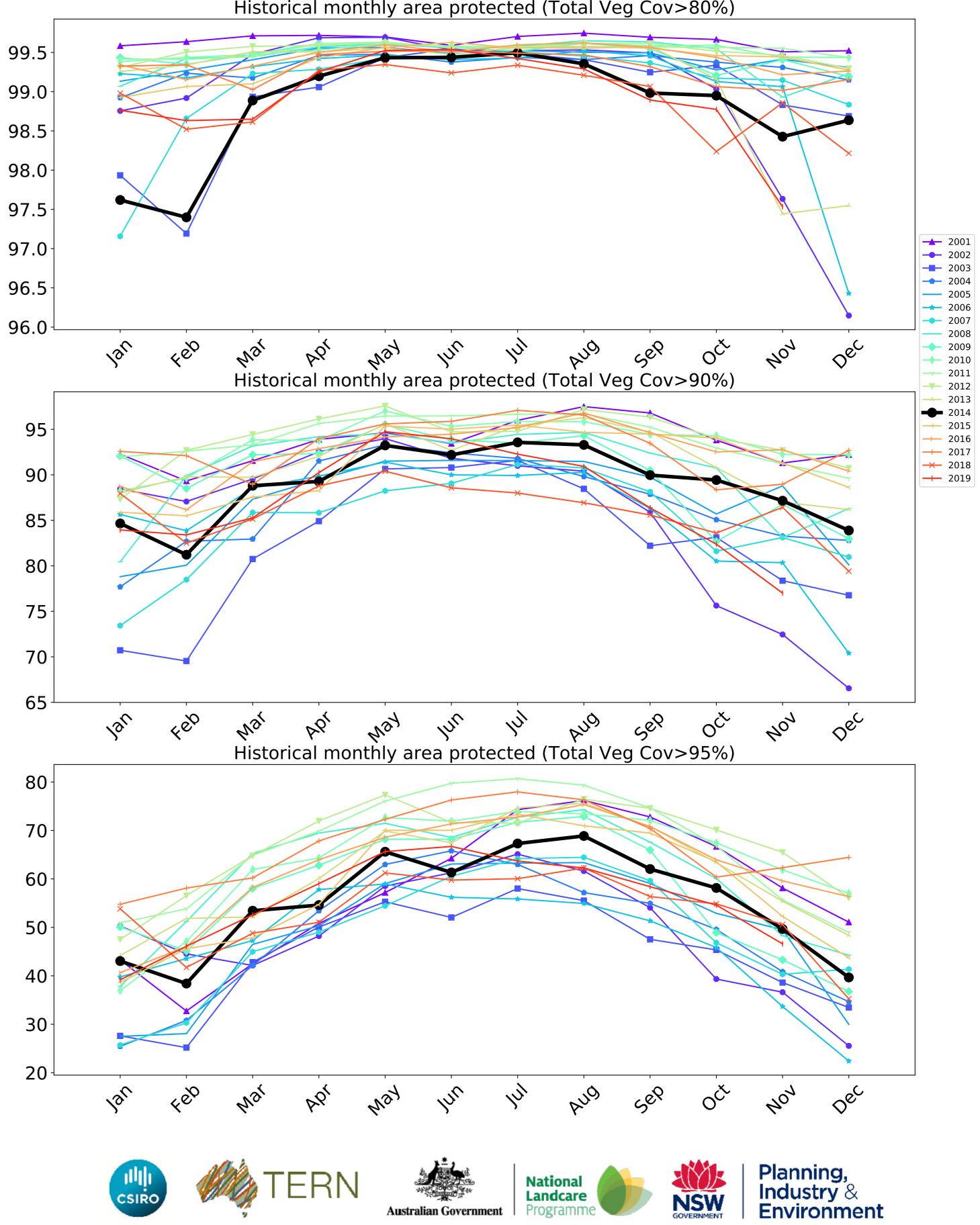
Water erosion historical monthly area protected (Total Veg Cov>70%)

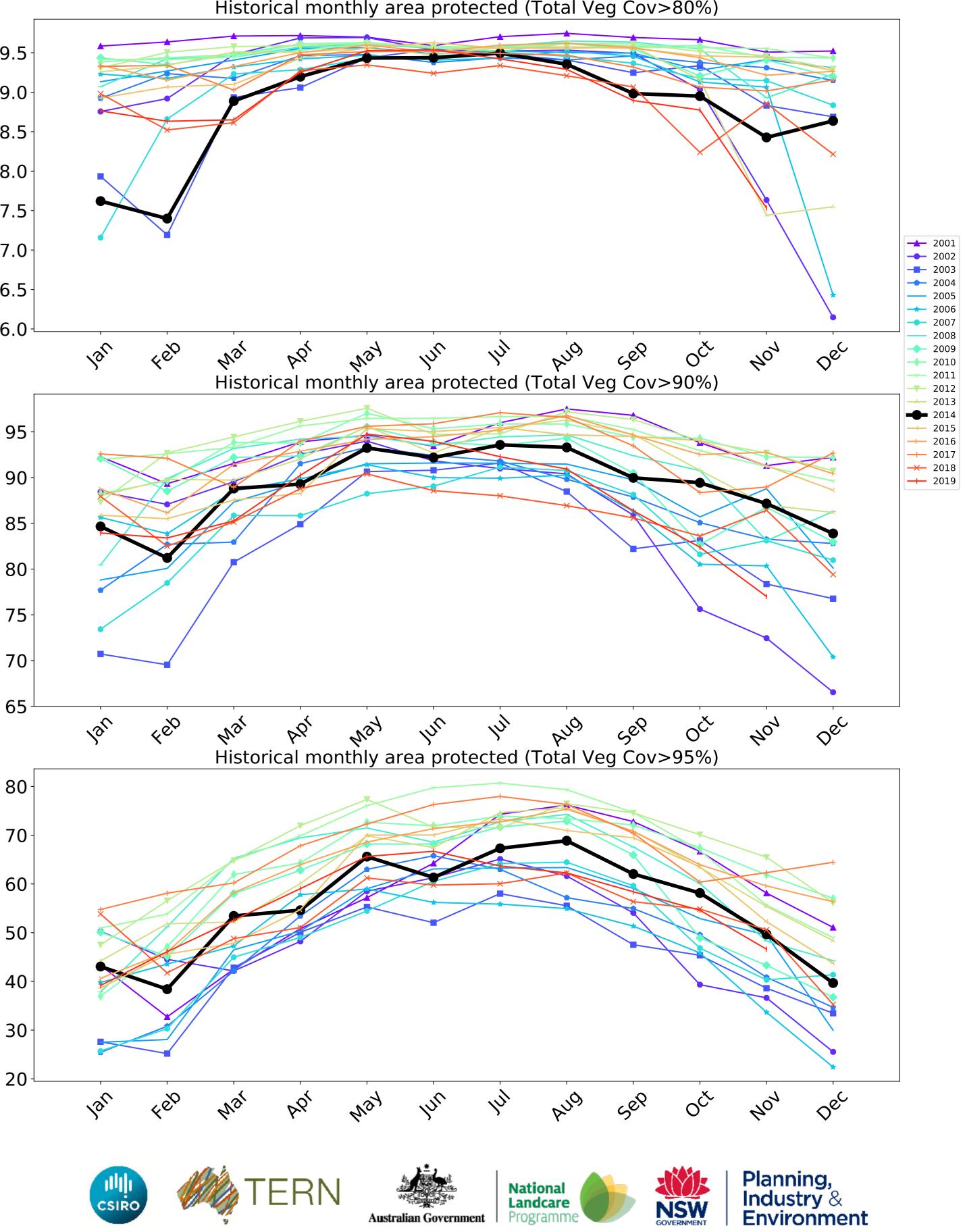






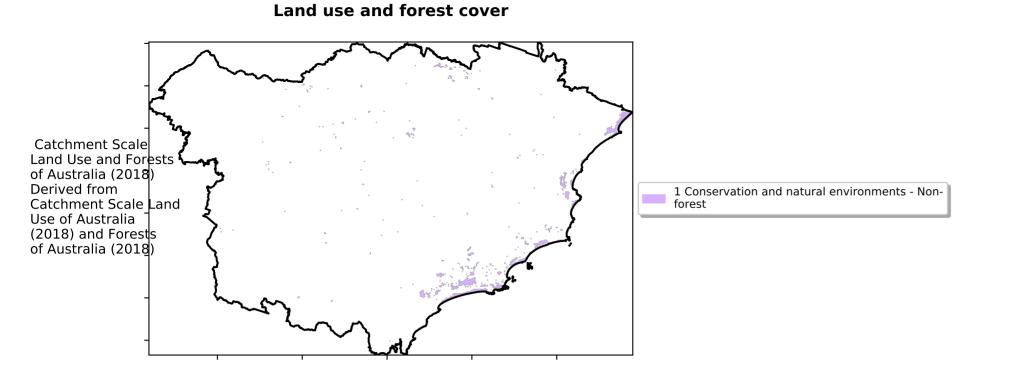




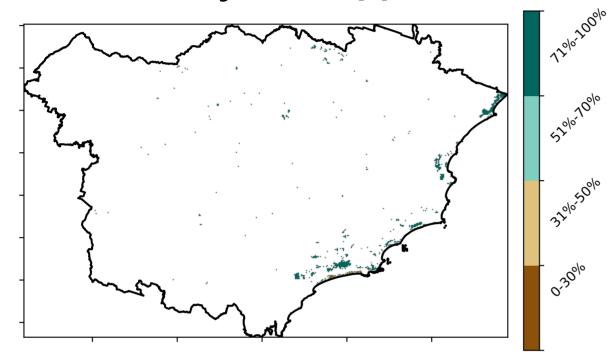




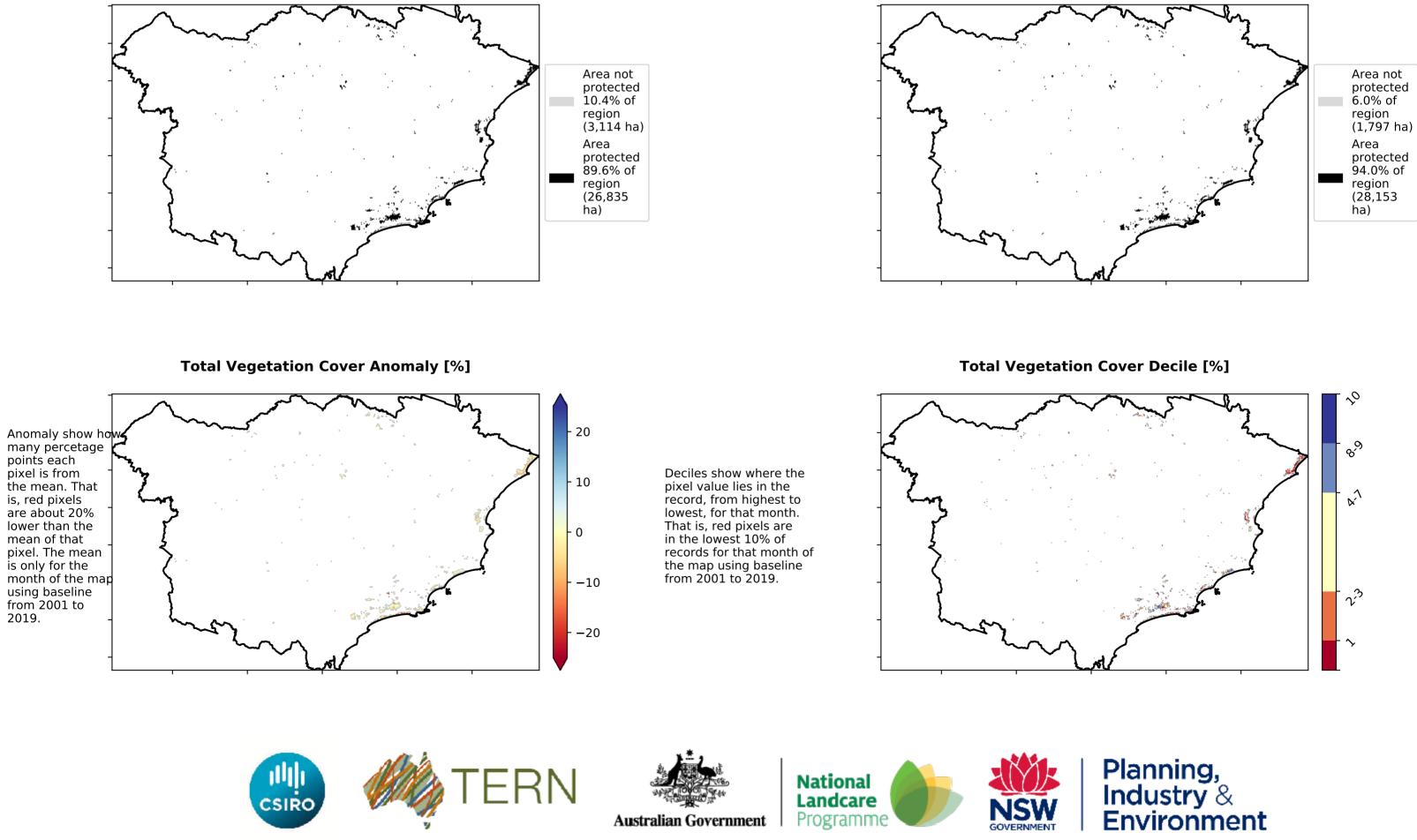
Conservation and natural environments non forest



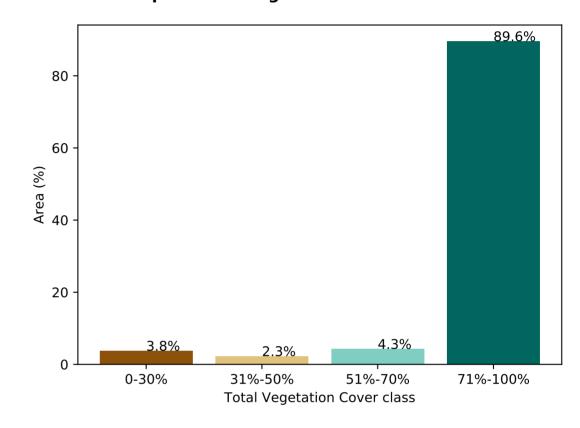
Total Vegetation Cover [%]



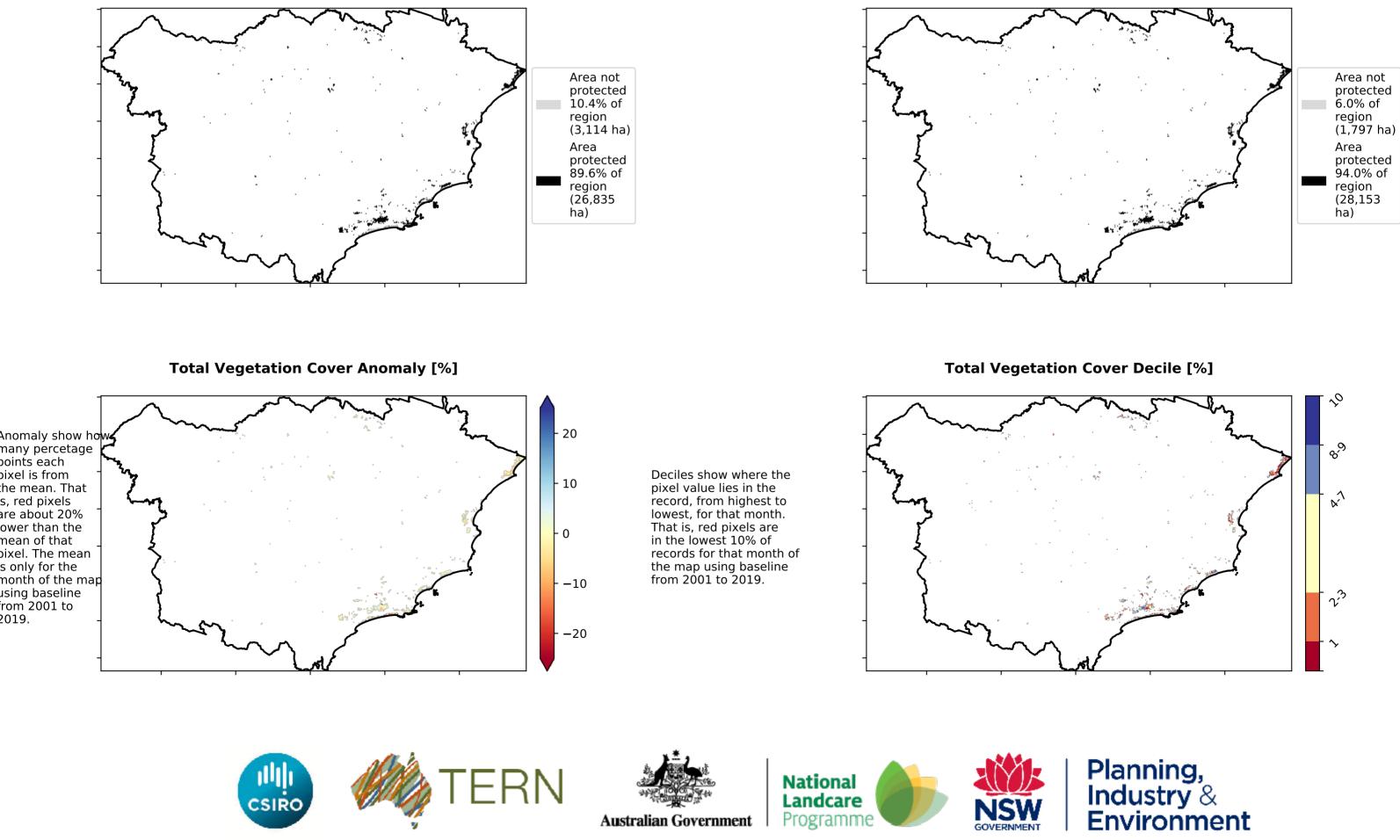
% Area protected from water erosion (>70%)

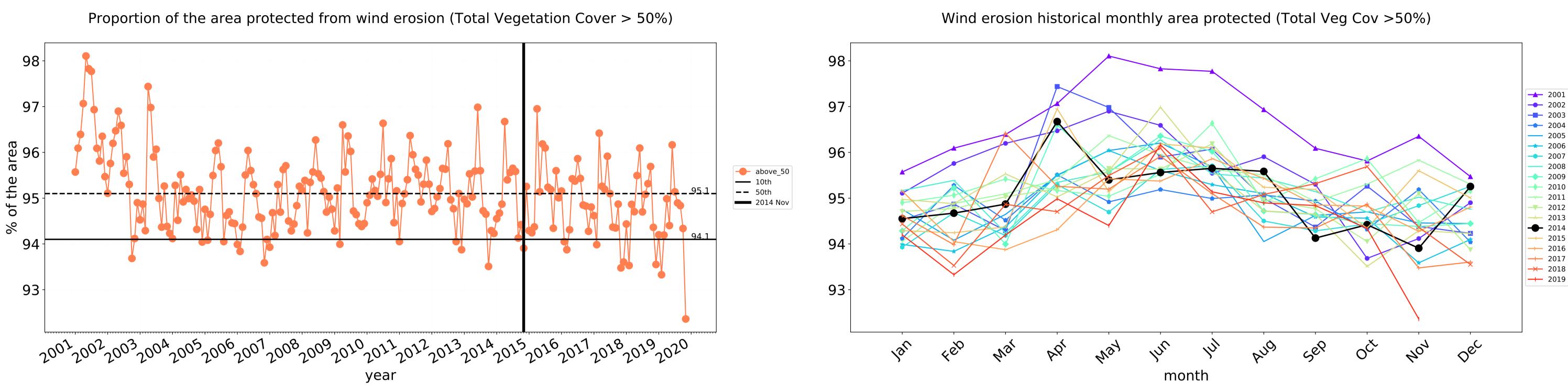


Proportion of vegetation cover class in area

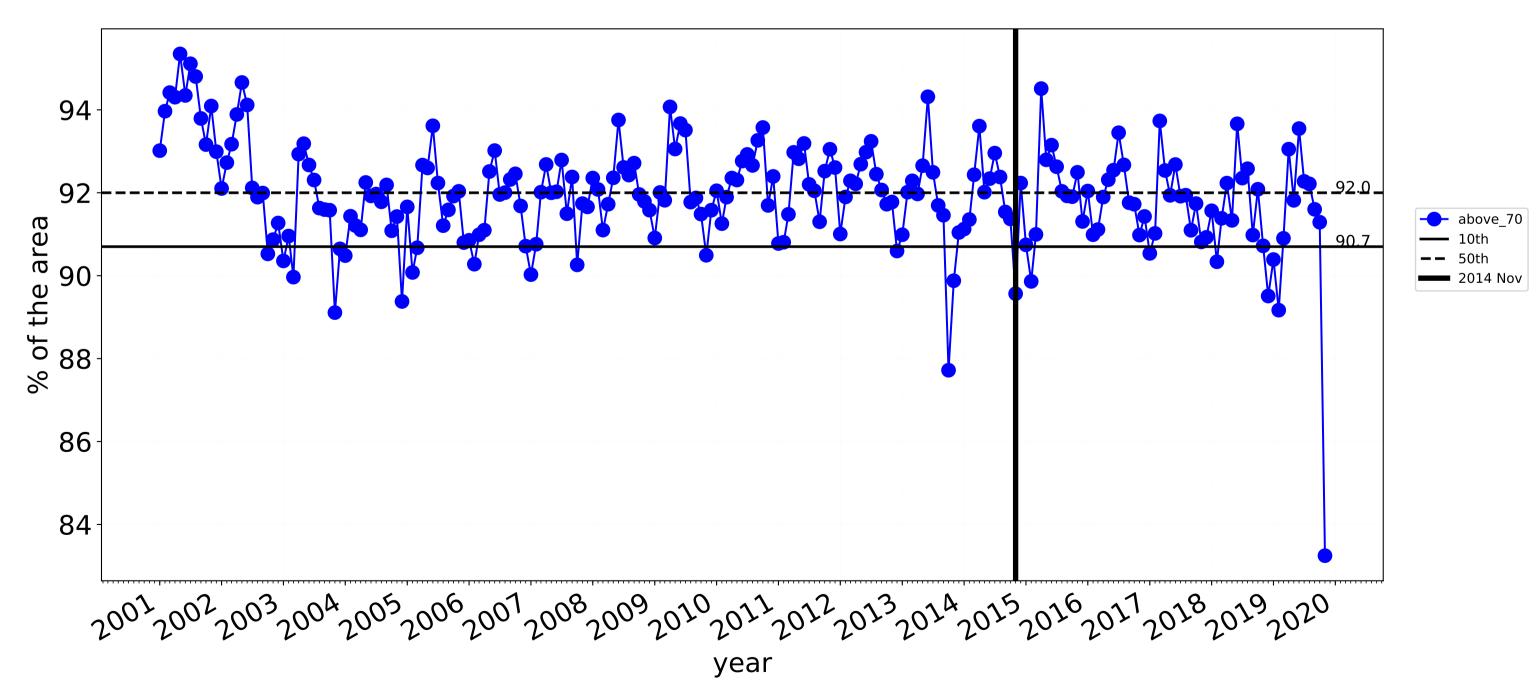


% Area protected from wind erosion (>50%)

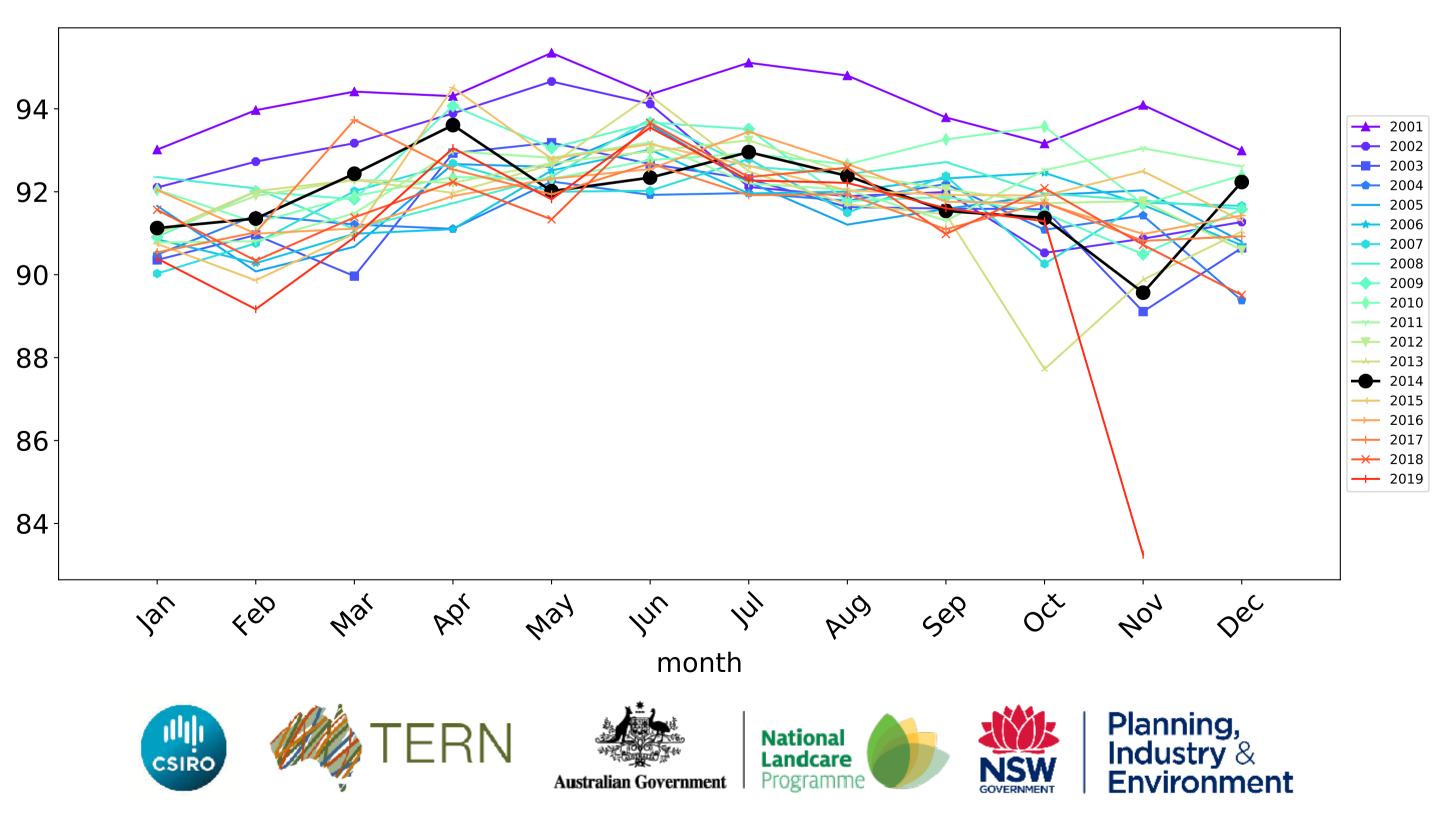


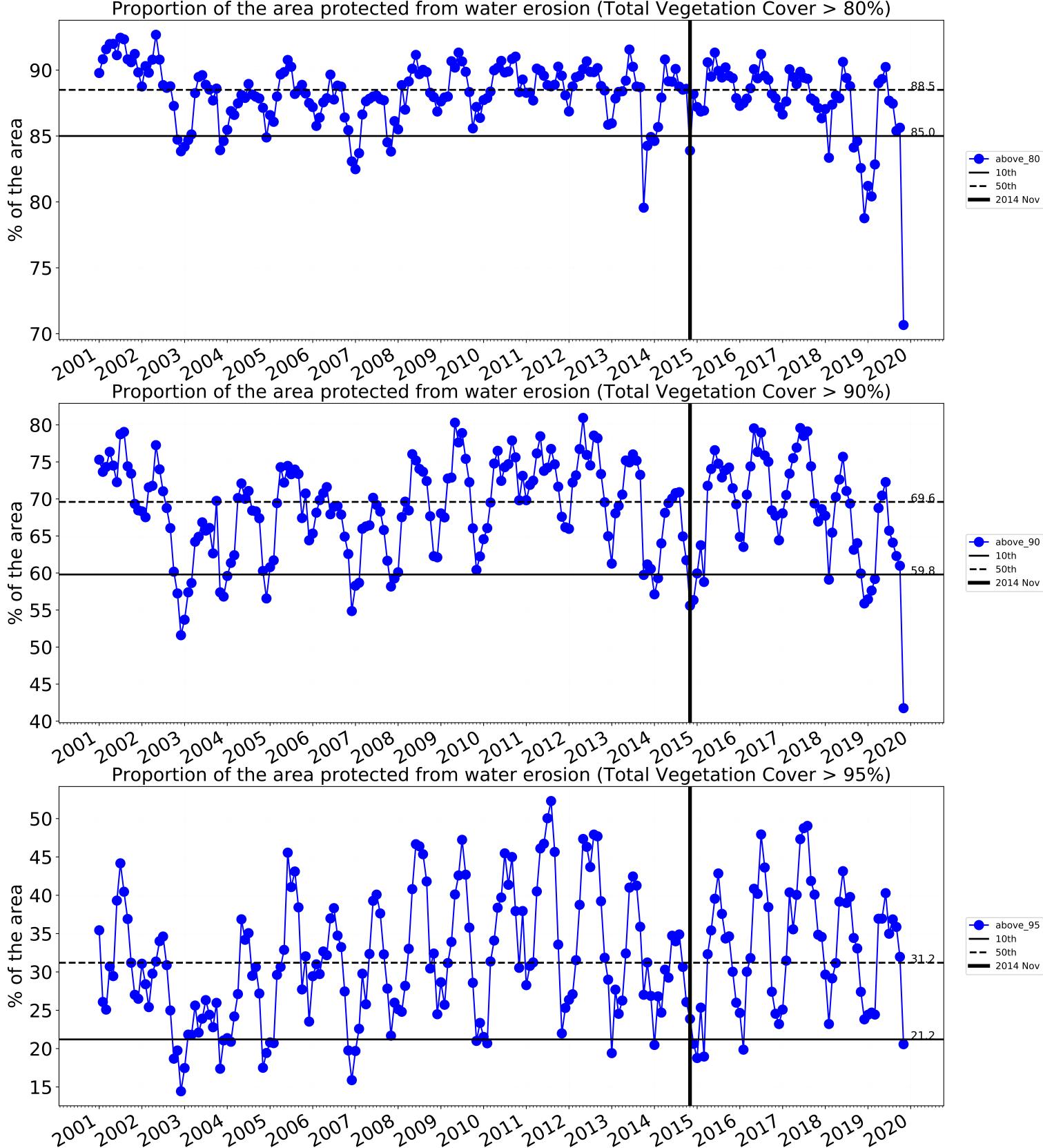


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

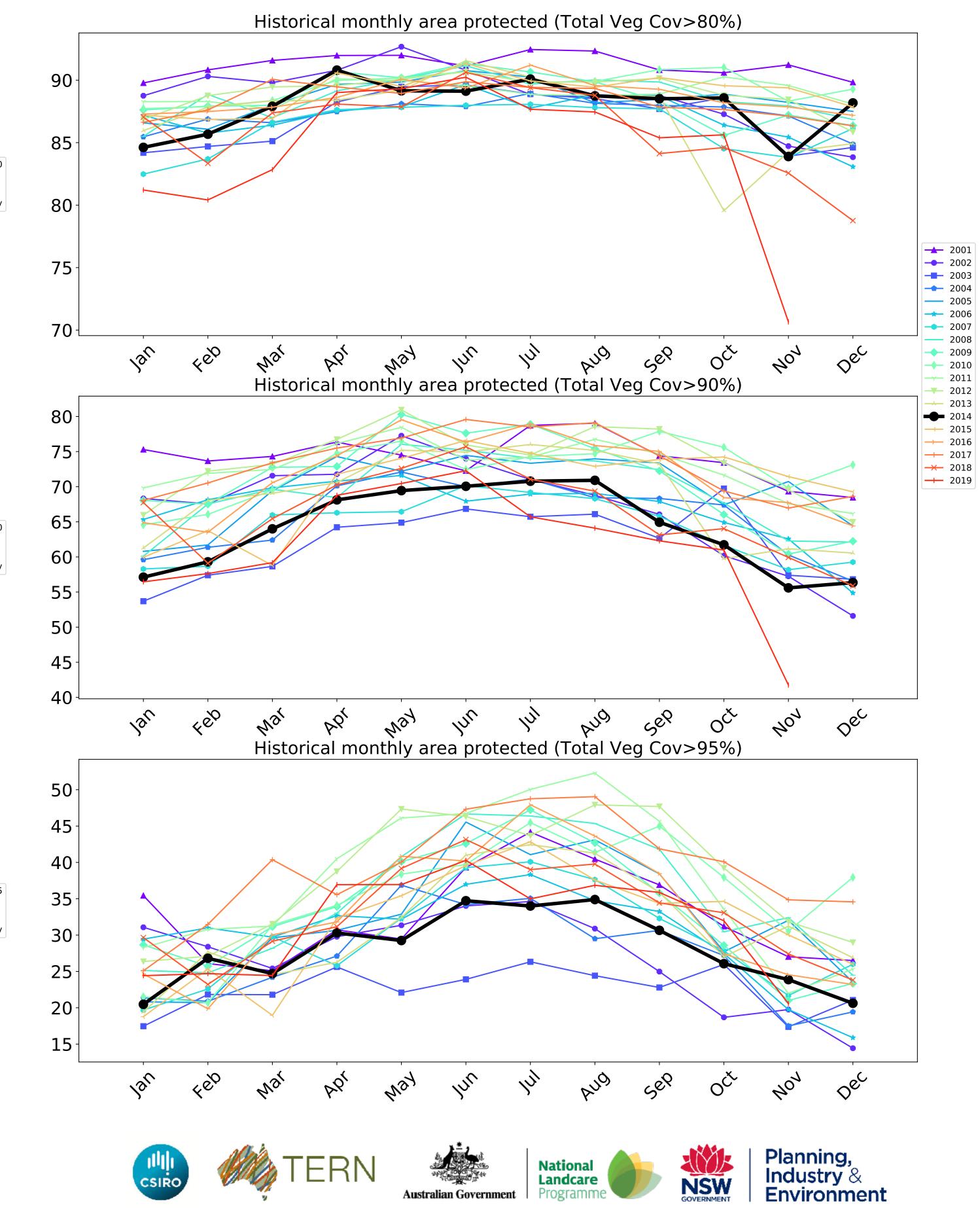


Water erosion historical monthly area protected (Total Veg Cov>70%)

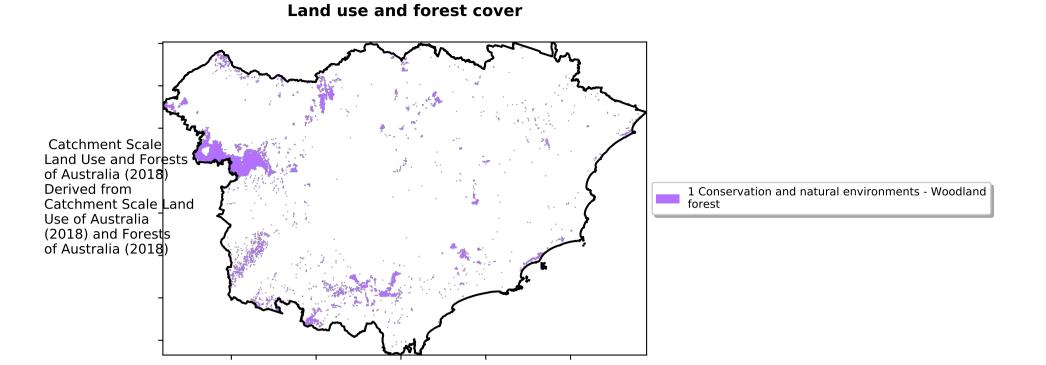




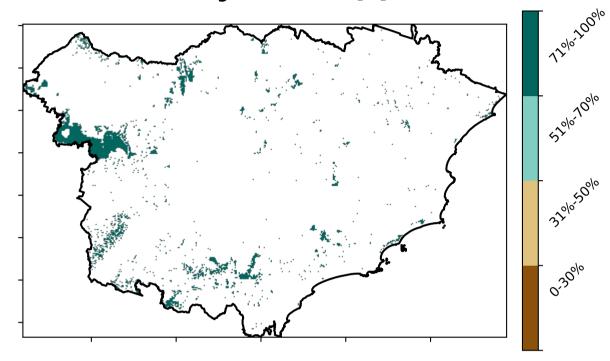
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



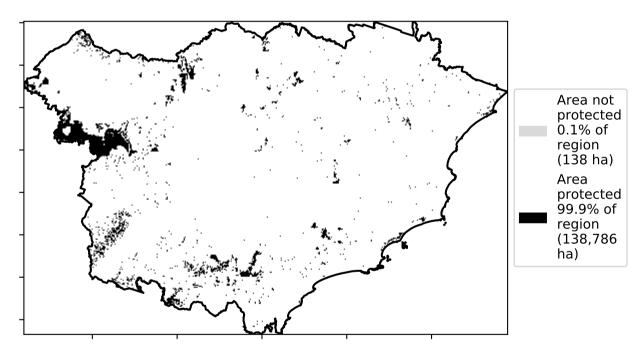
Conservation and natural environments Woodland forest



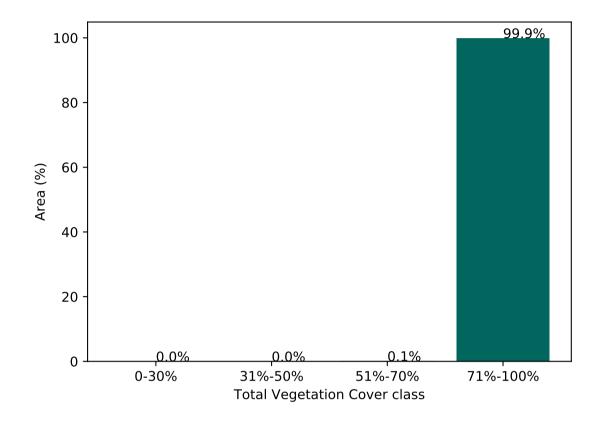
Total Vegetation Cover [%]



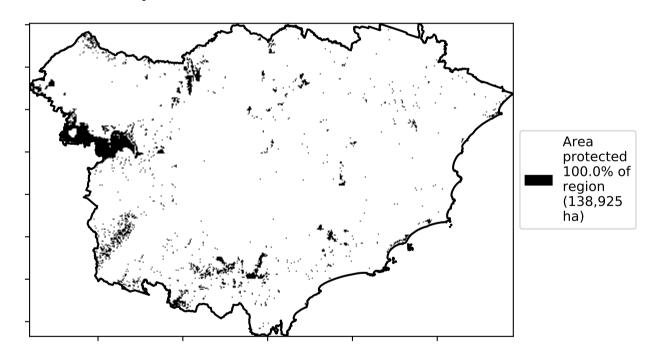
% Area protected from water erosion (>70%)



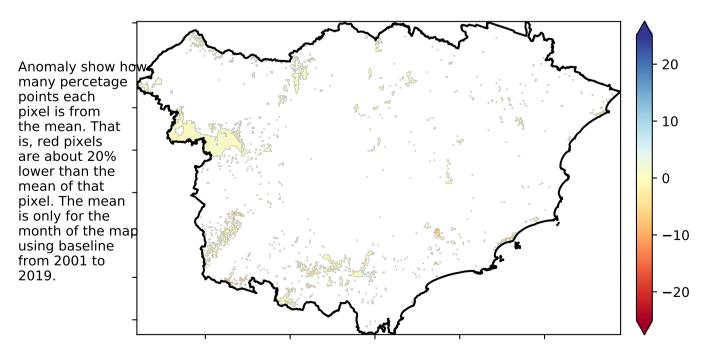
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

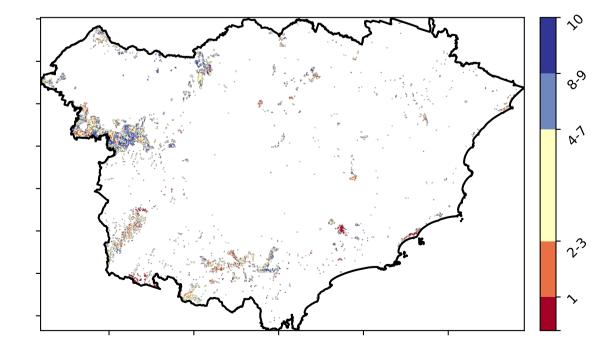


Total Vegetation Cover Anomaly [%]



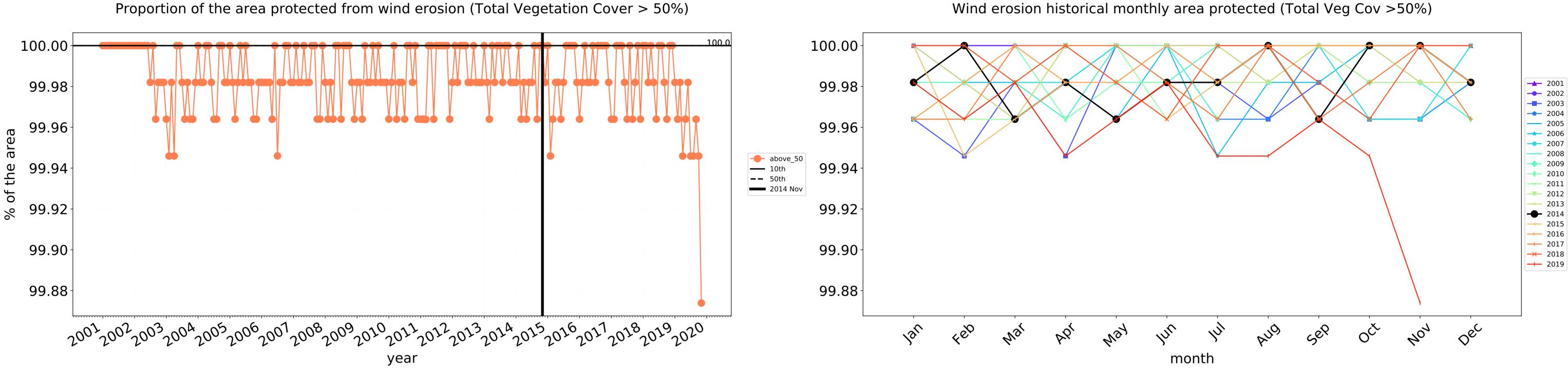
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

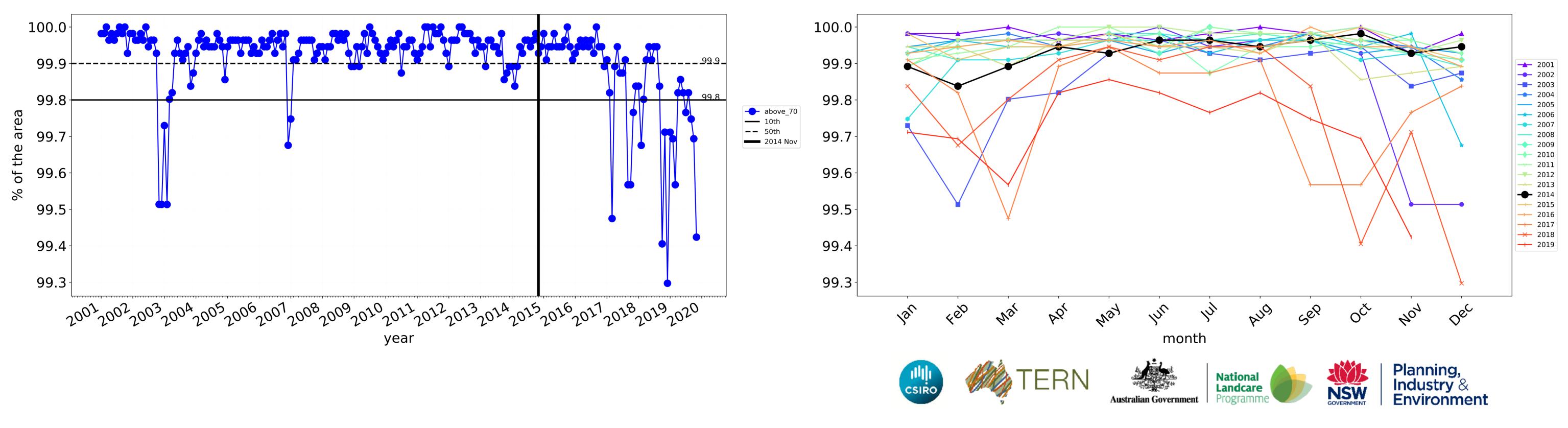




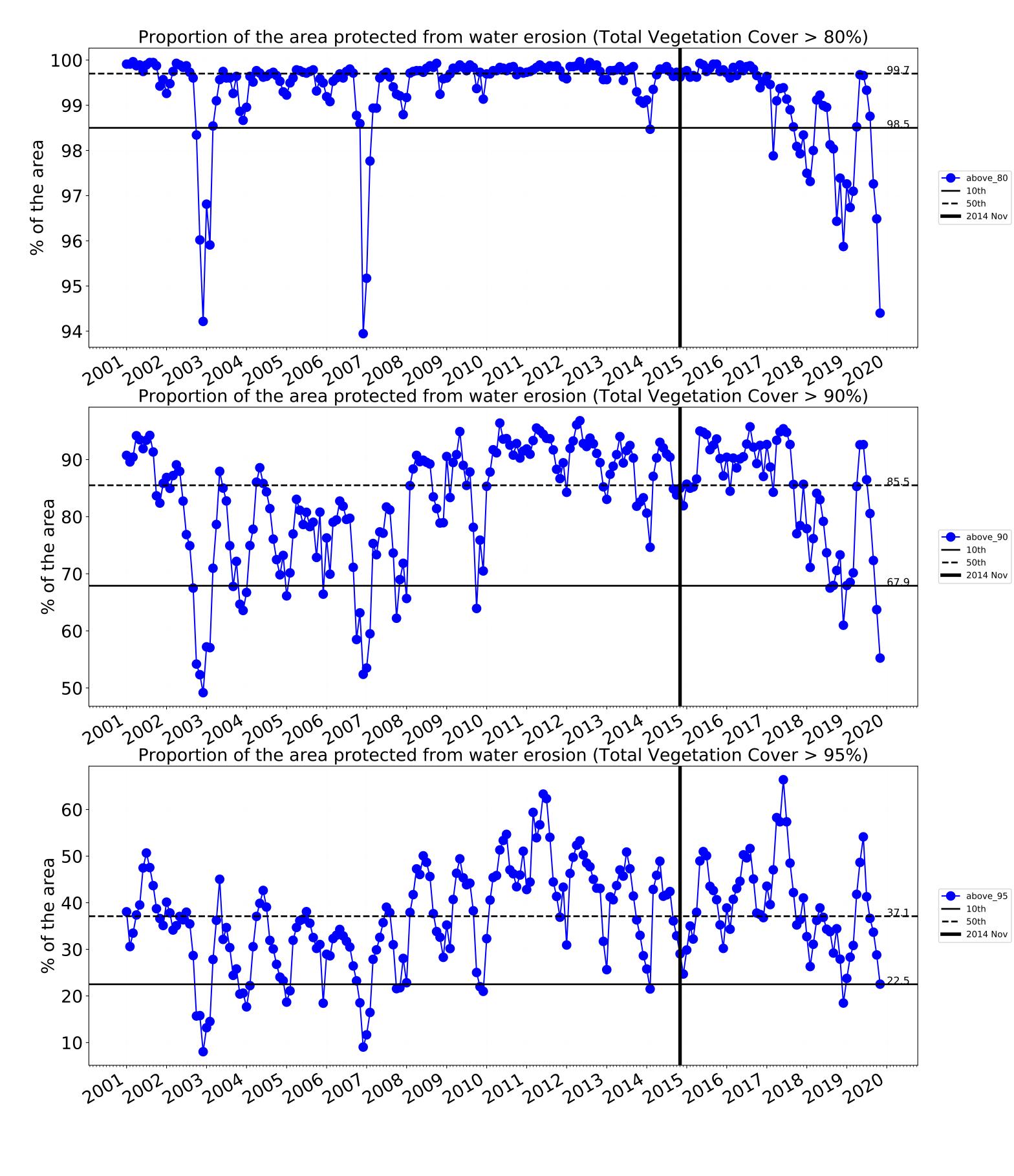
Conservation and natural environments Woodland forest timeseries

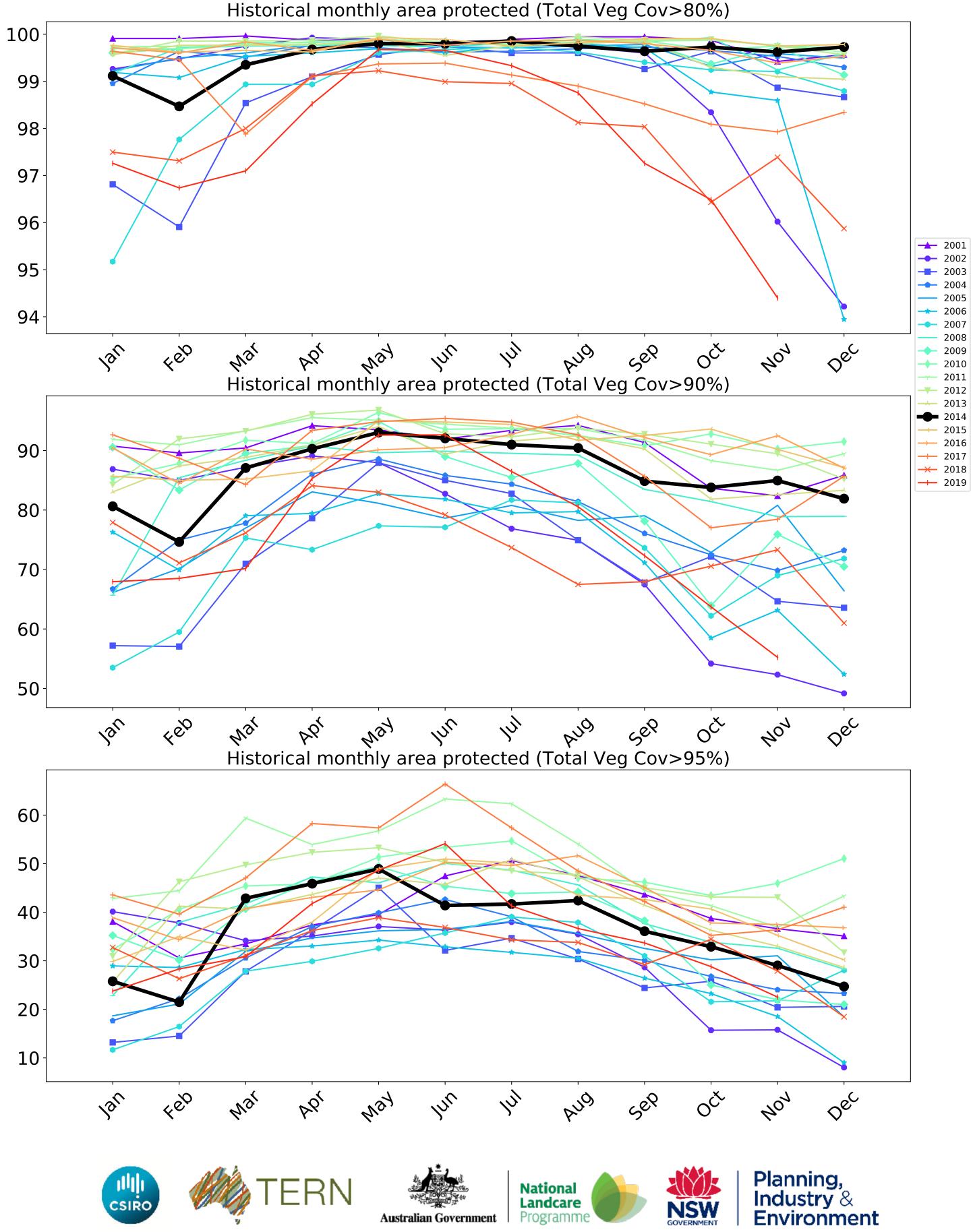


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



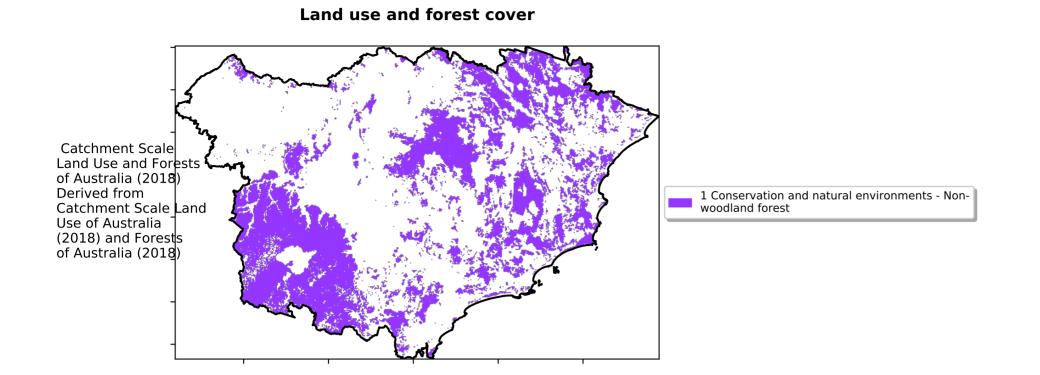
Water erosion historical monthly area protected (Total Veg Cov>70%)



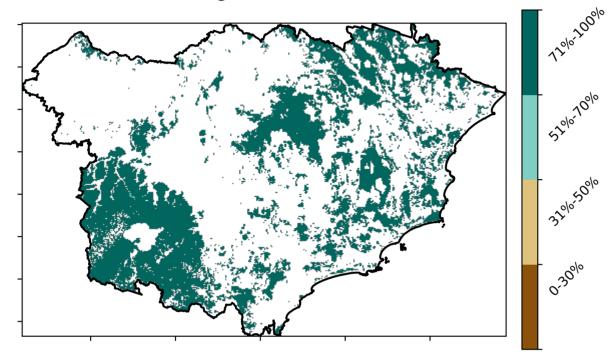




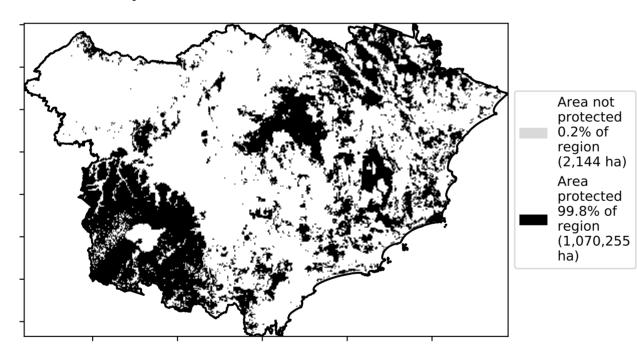
Conservation and natural environments Forest (non woodland)



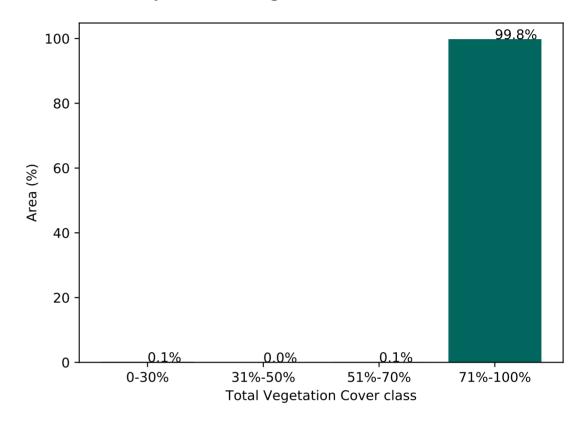
Total Vegetation Cover [%]



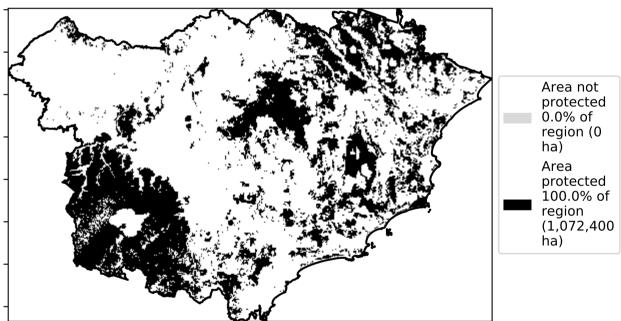
% Area protected from water erosion (>70%)



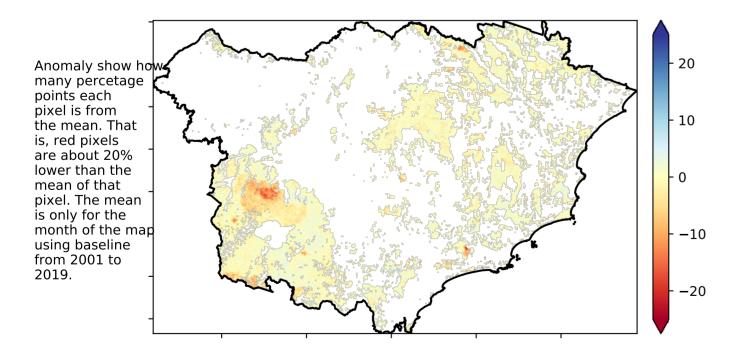
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

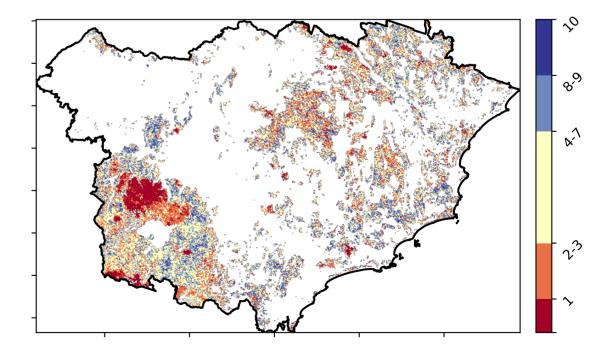


Total Vegetation Cover Anomaly [%]

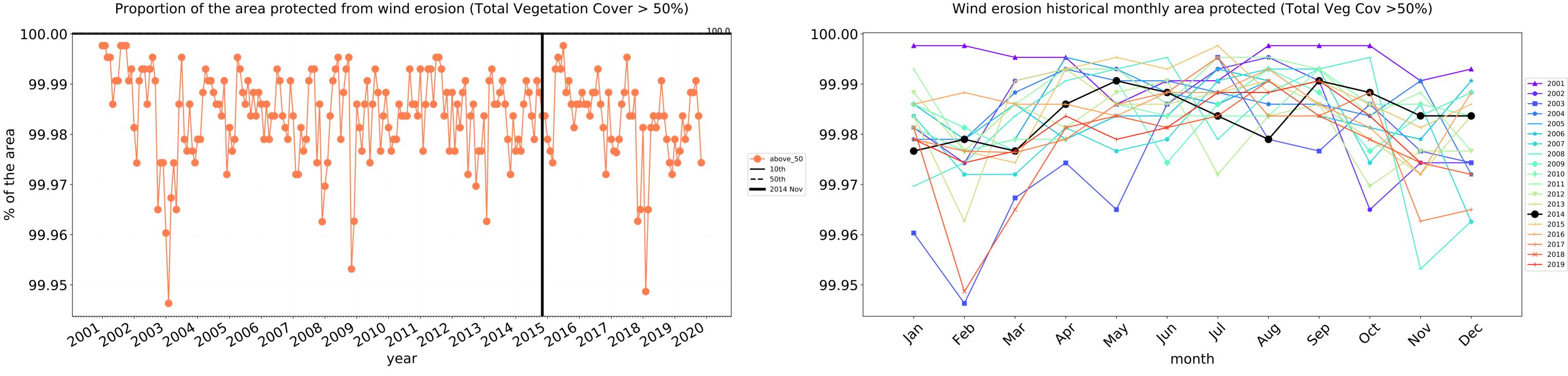


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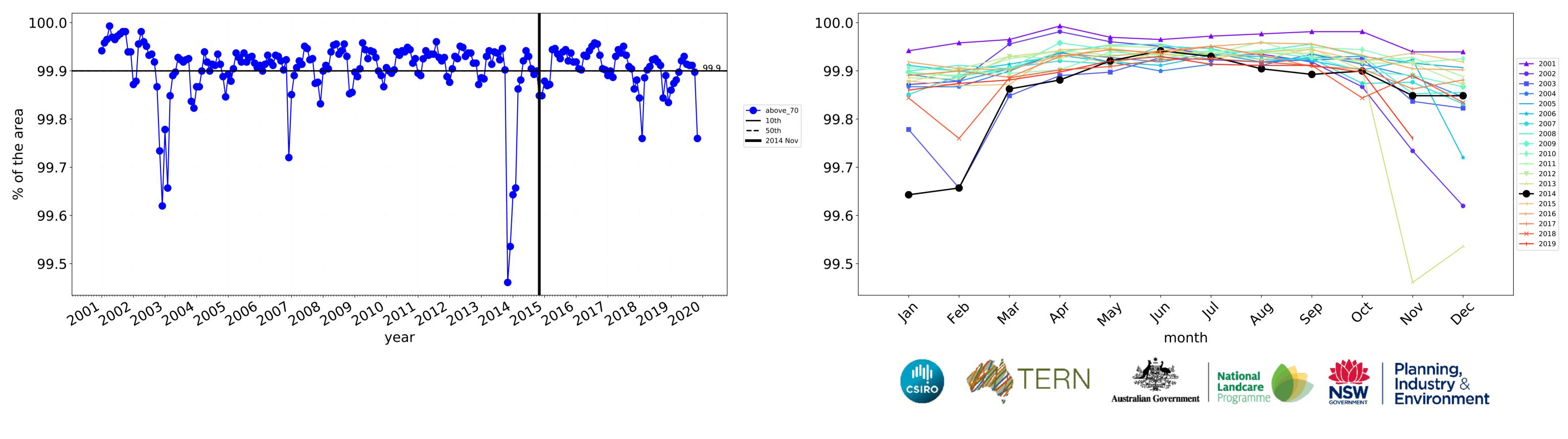
Total Vegetation Cover Decile [%]



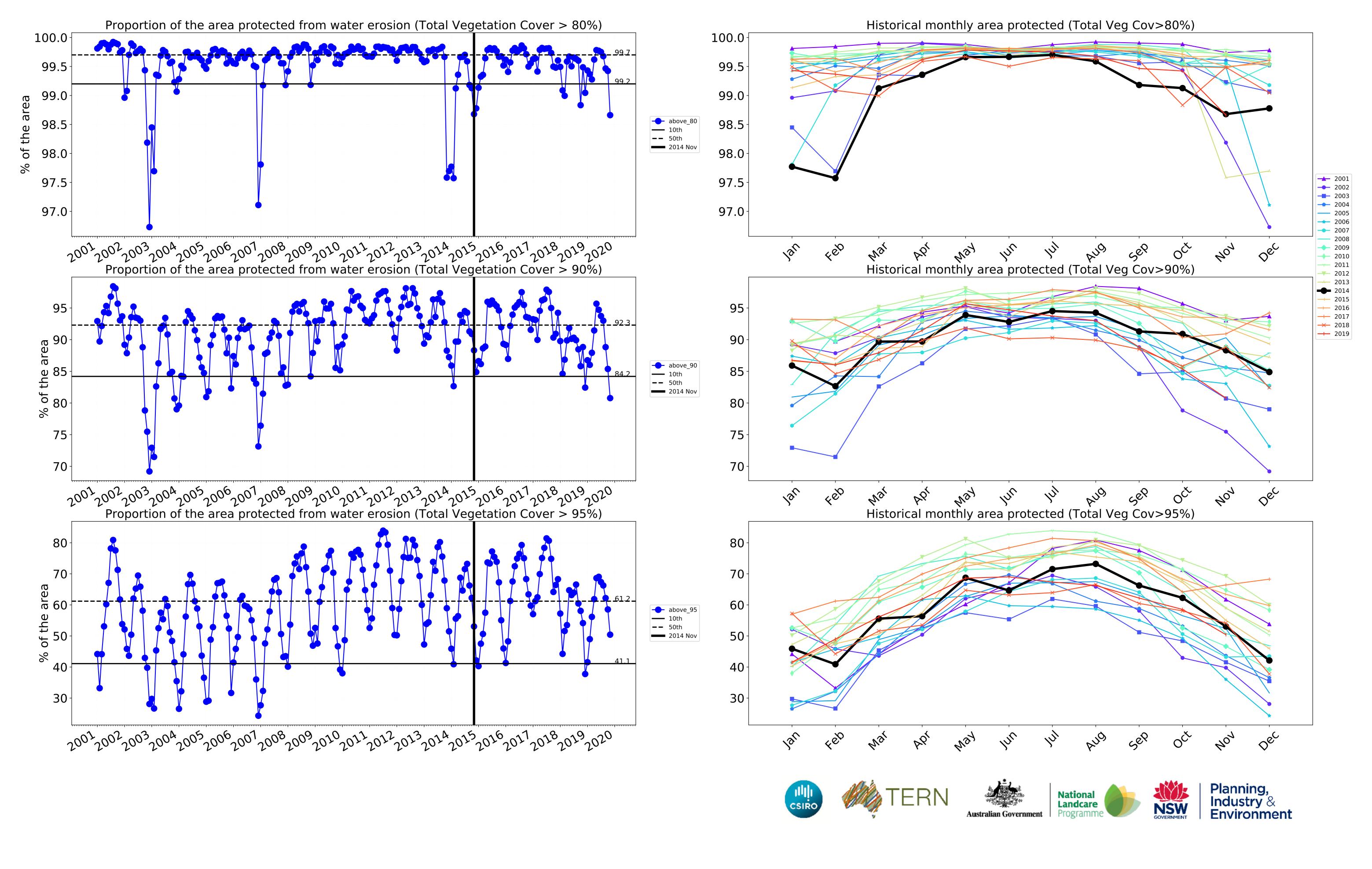




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Agriculture

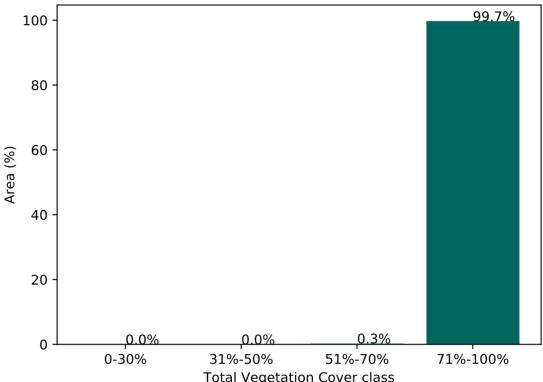
Land use and forest cover 80 -<u>76.</u>7% 70 · 60 Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 50 Area (%) - 05 3 Agriculture - Grazing - Non-woodland forest Derived from 4 Agriculture - Grazing - Irrigated Catchment 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 **Total Vegetation Cover [%]** 12%,100 100 80 52%70% 60 Area (%) 32010 40 0.30% 20 0.0% 0.0% 0 0-30% 31%-50% Total Vegetation Cover class % Area protected from water erosion (>70%)

Proportion of each land class in area

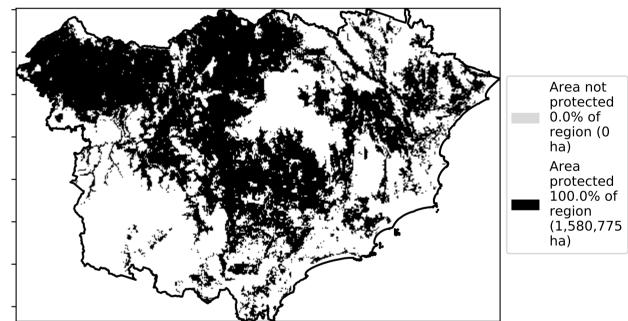
Proportion of vegetation cover class in area

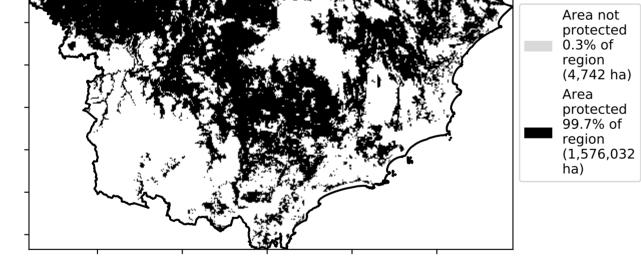
0.2%

8



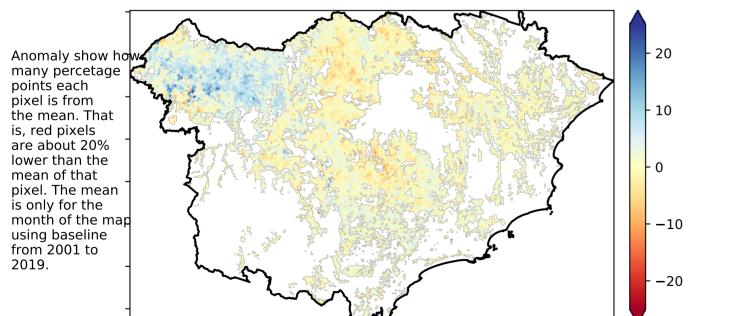
% Area protected from wind erosion (>50%)



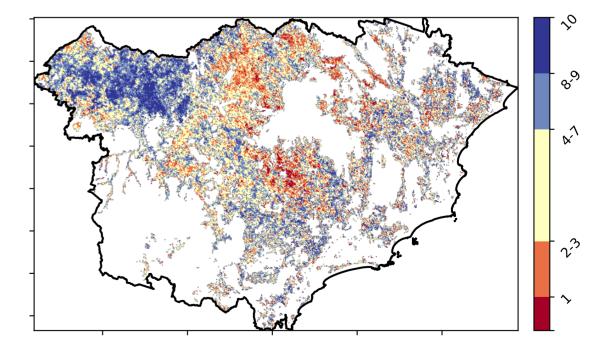


Total Vegetation Cover Anomaly [%]

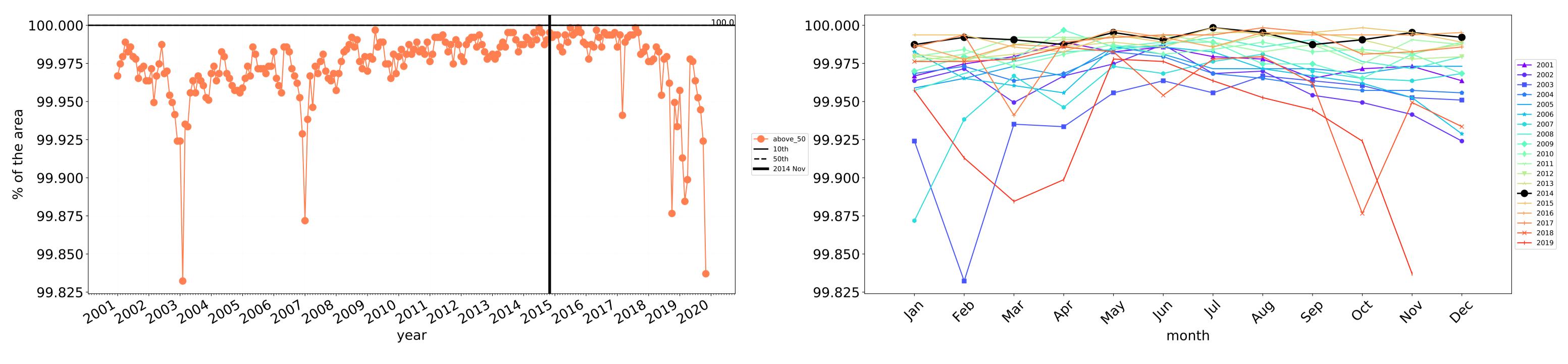
Total Vegetation Cover Decile [%]



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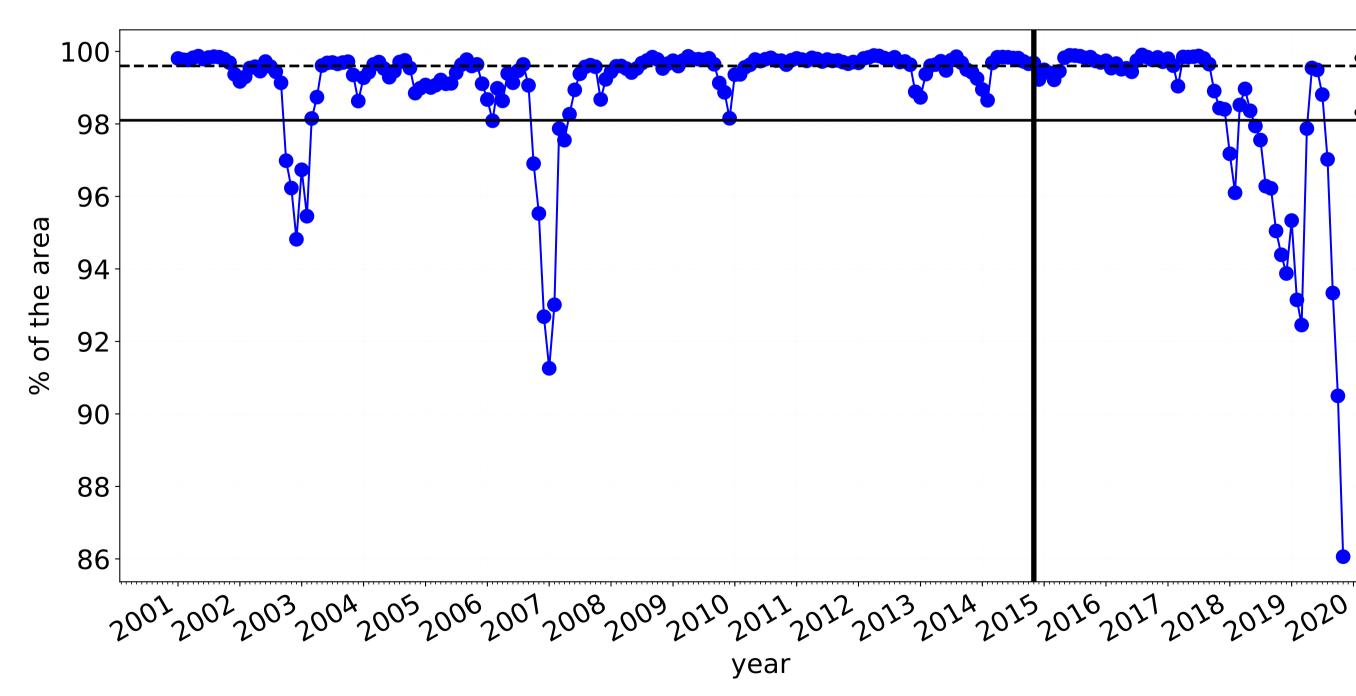






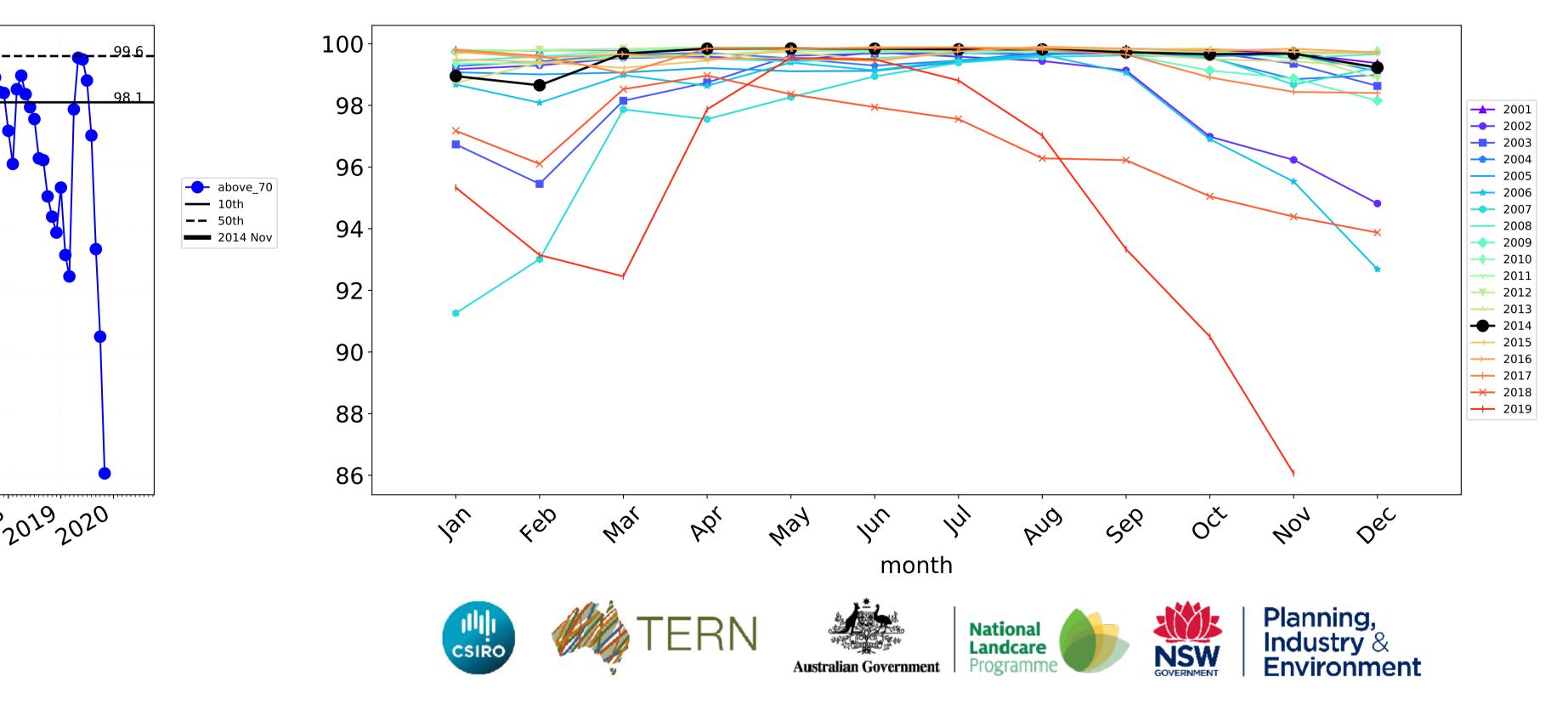
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

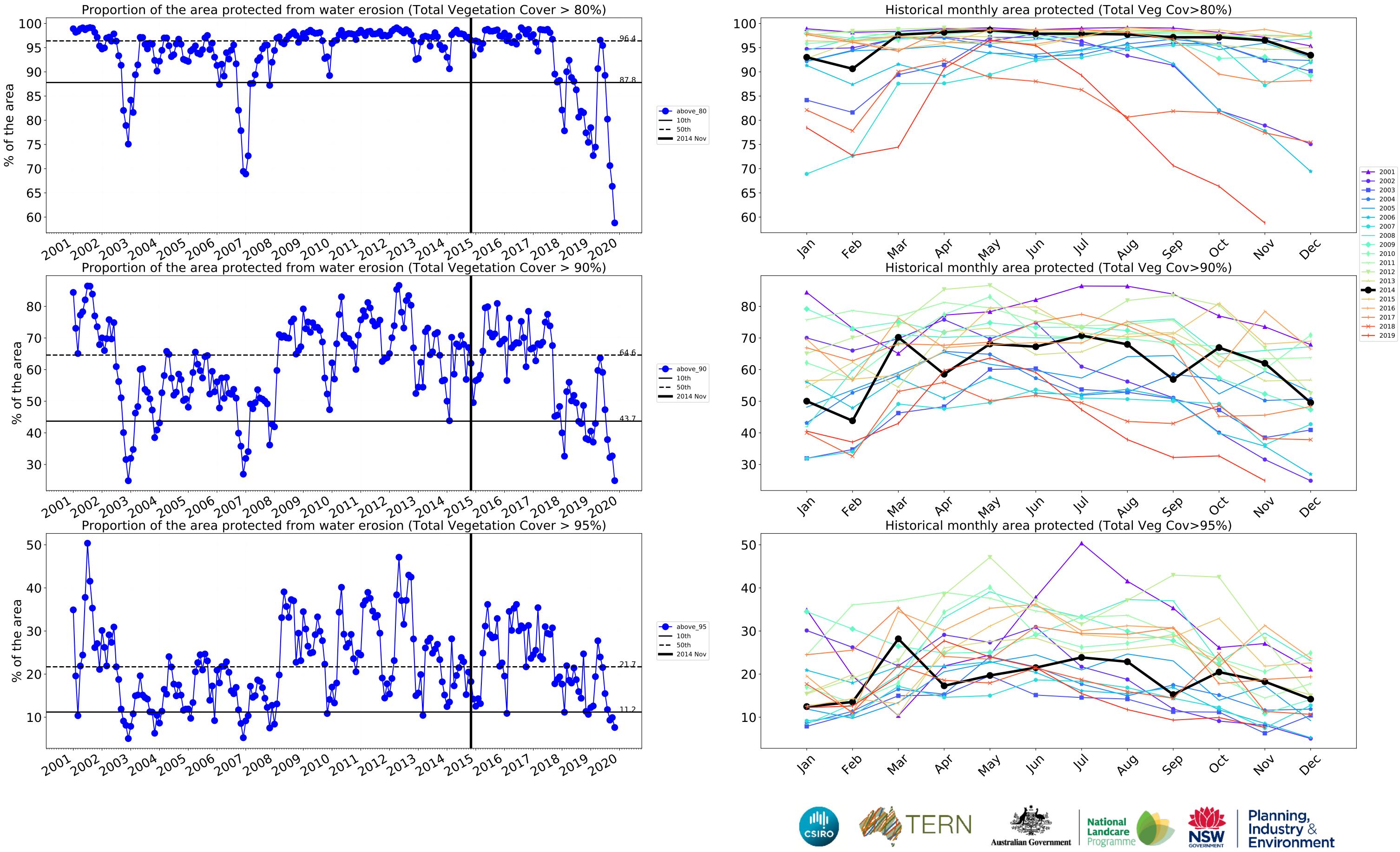




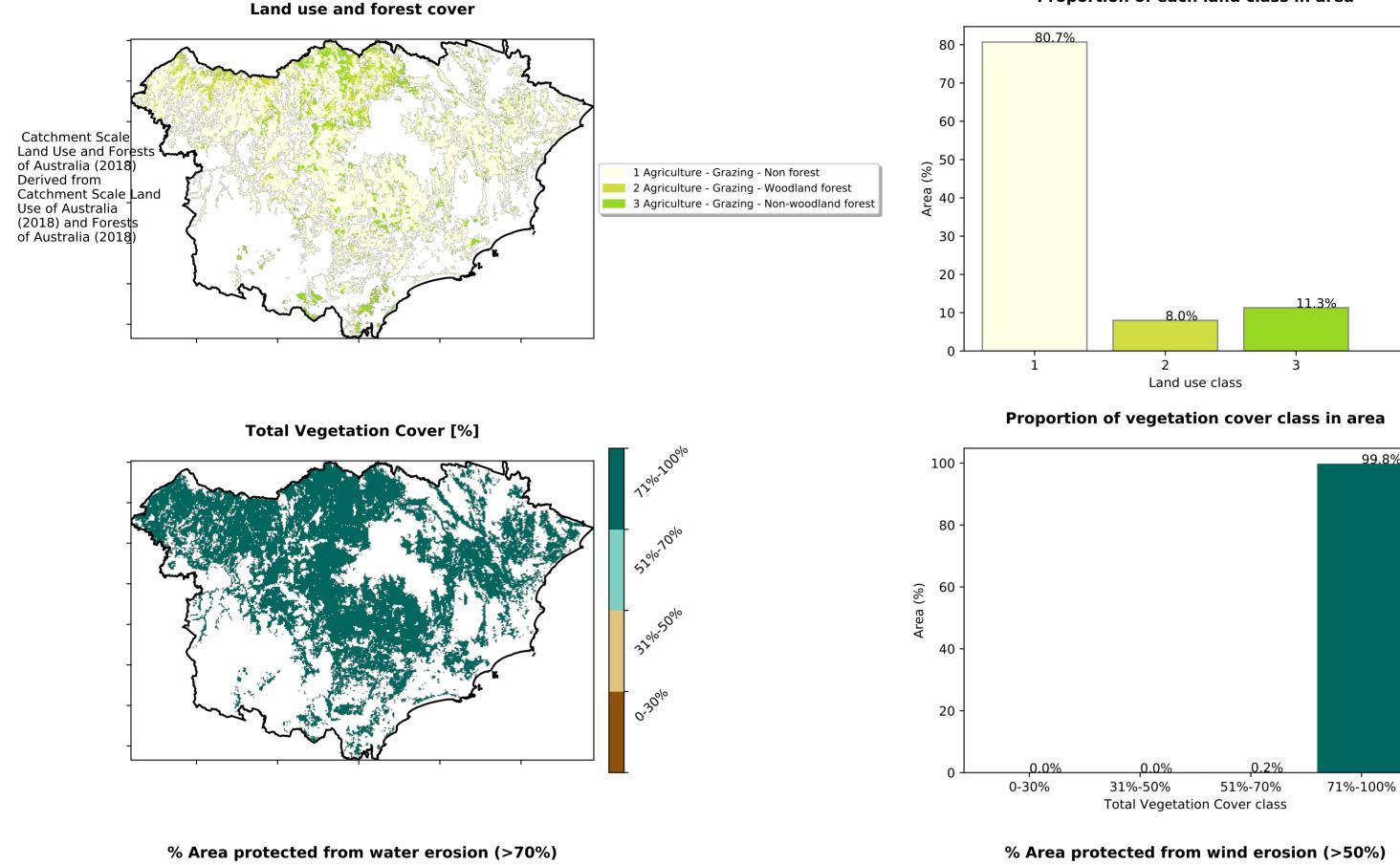
Wind erosion historical monthly area protected (Total Veg Cov >50%)

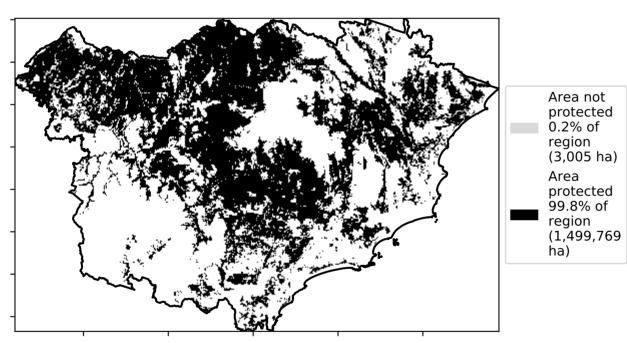


Water erosion historical monthly area protected (Total Veg Cov>70%)

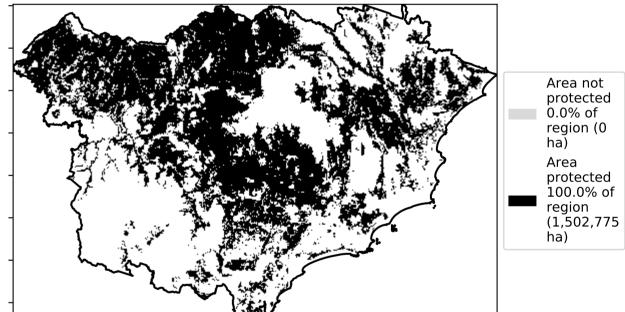


Grazing





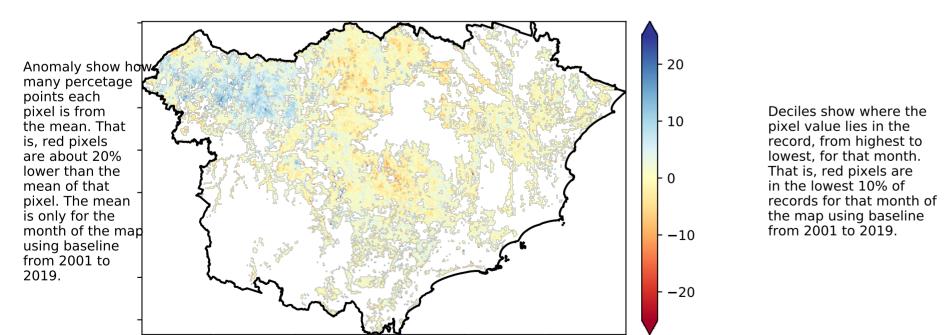
Proportion of each land class in area

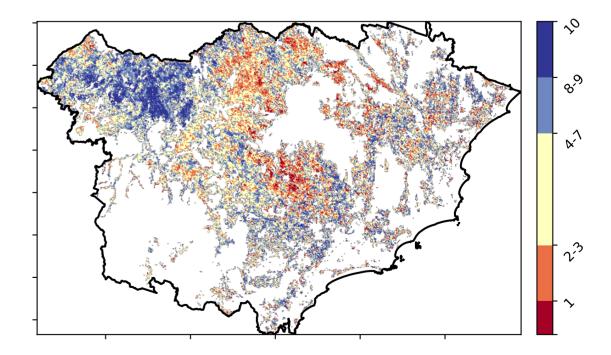


99.8%

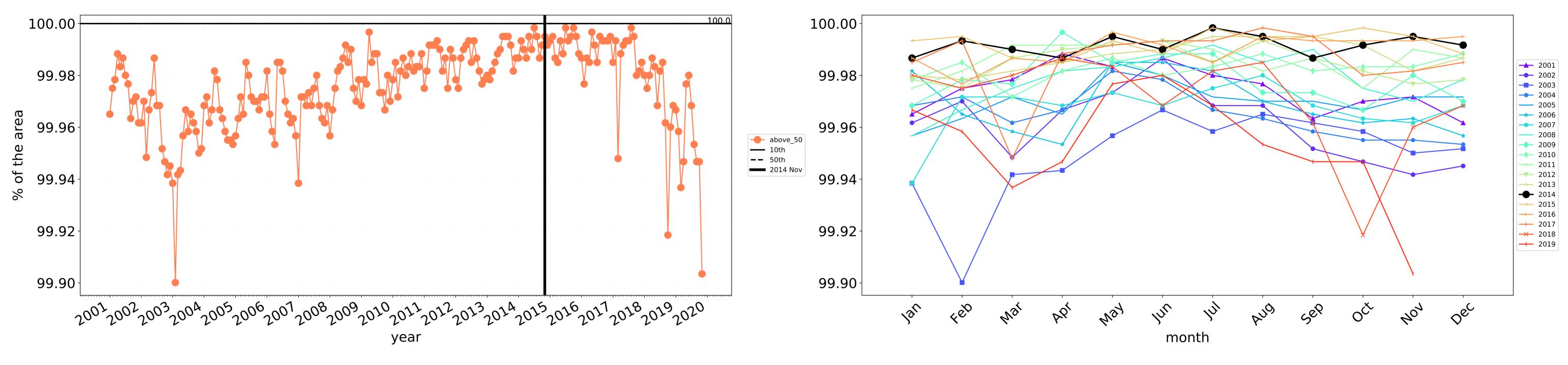
Total Vegetation Cover Anomaly [%]

Total Vegetation Cover Decile [%]



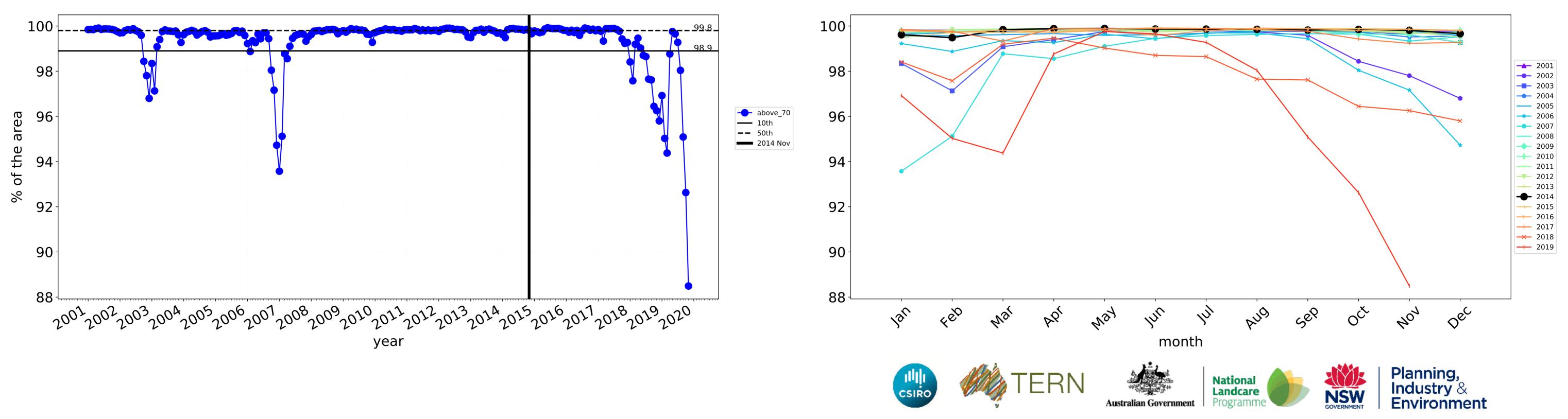


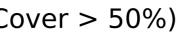




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

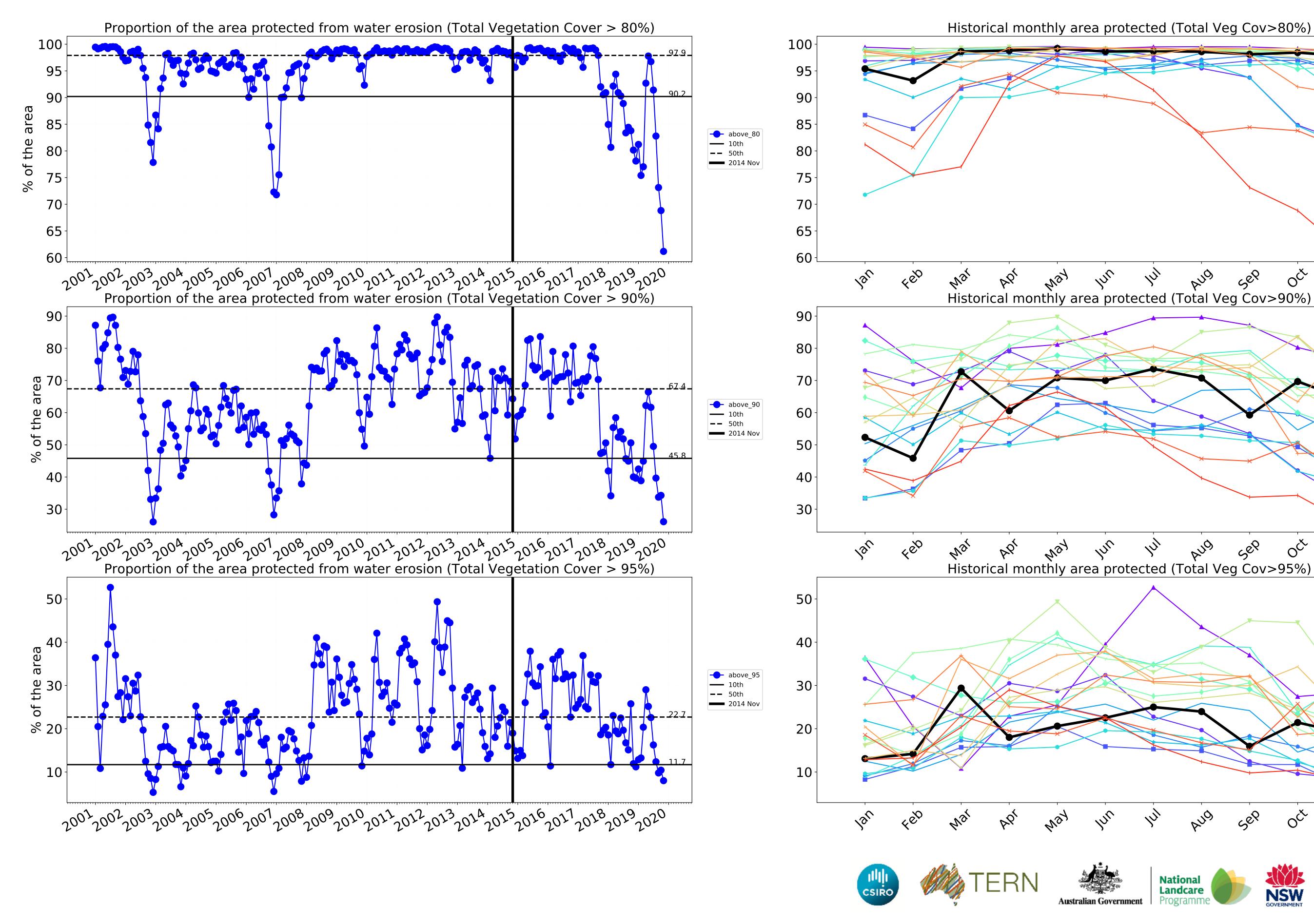
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

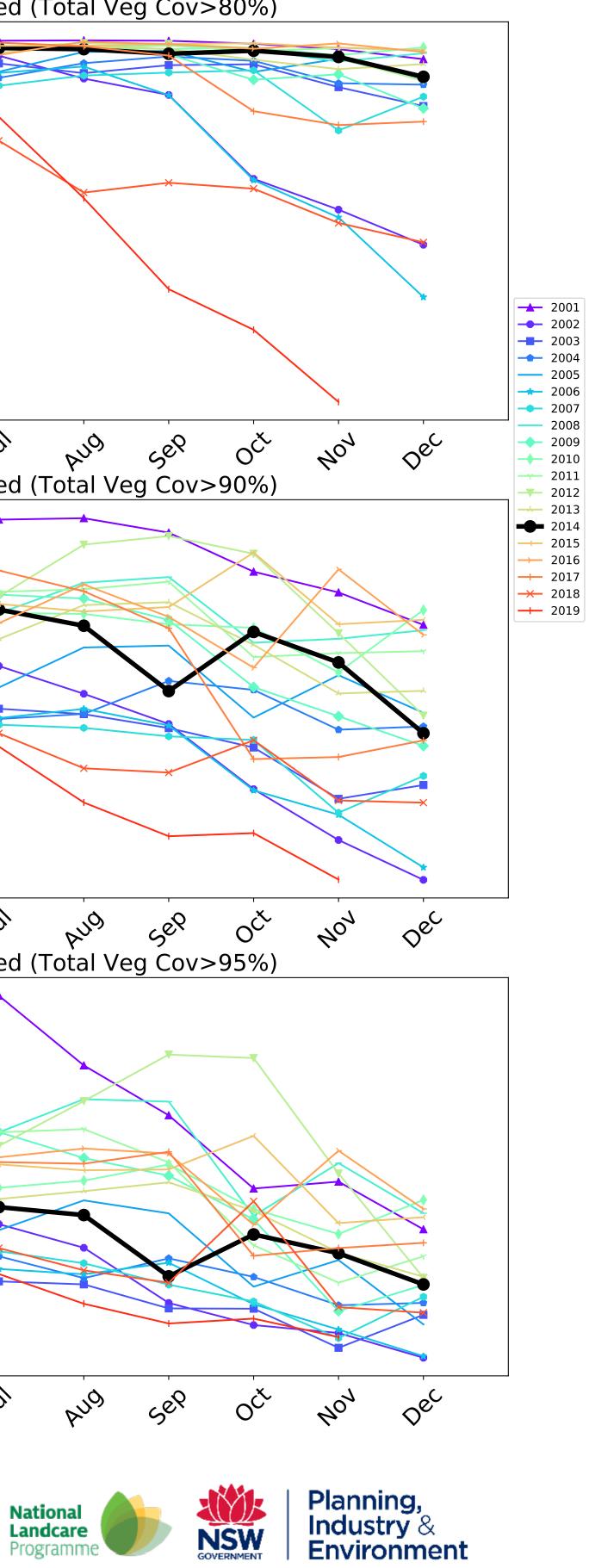




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

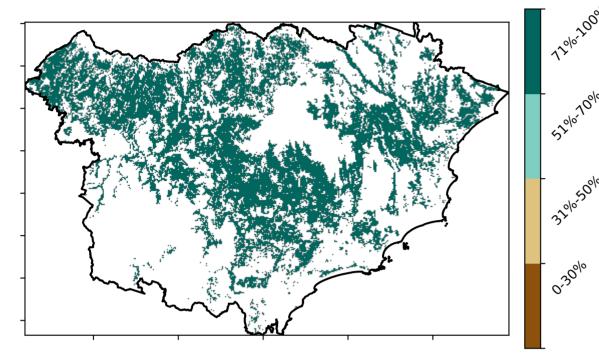




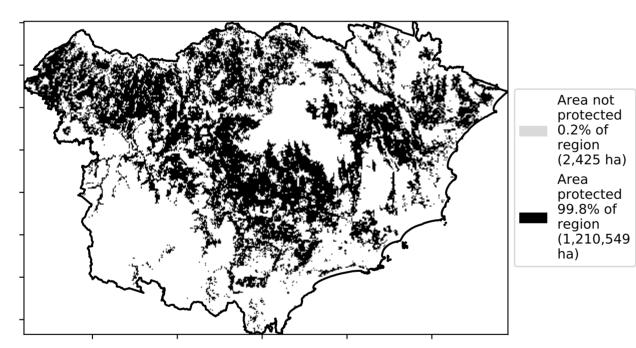
Grazing non forest

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)

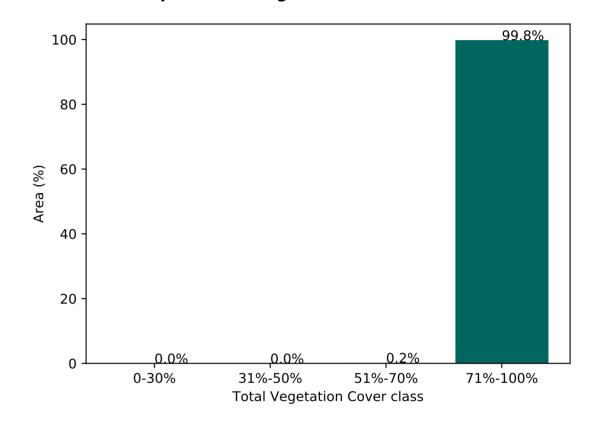
Total Vegetation Cover [%]



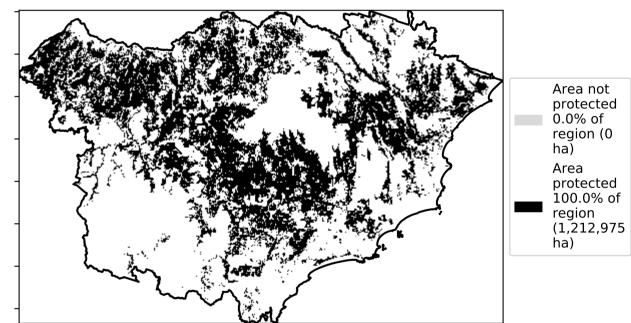
% Area protected from water erosion (>70%)



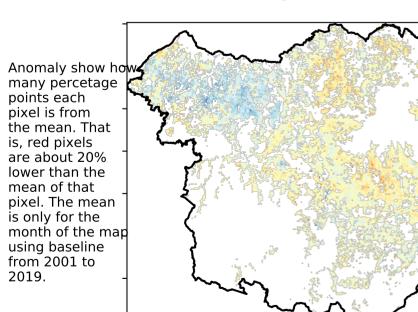
Proportion of vegetation cover class in area

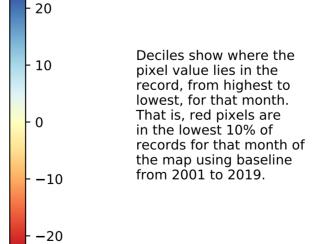


% Area protected from wind erosion (>50%)

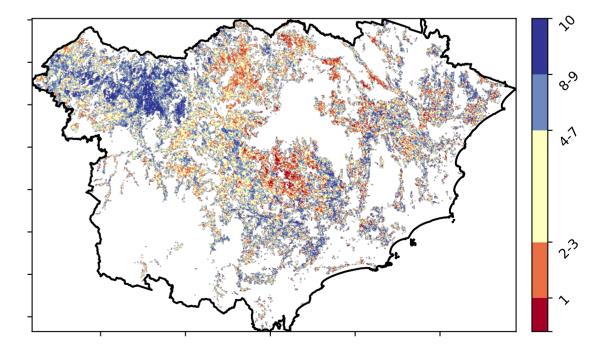


Total Vegetation Cover Anomaly [%]

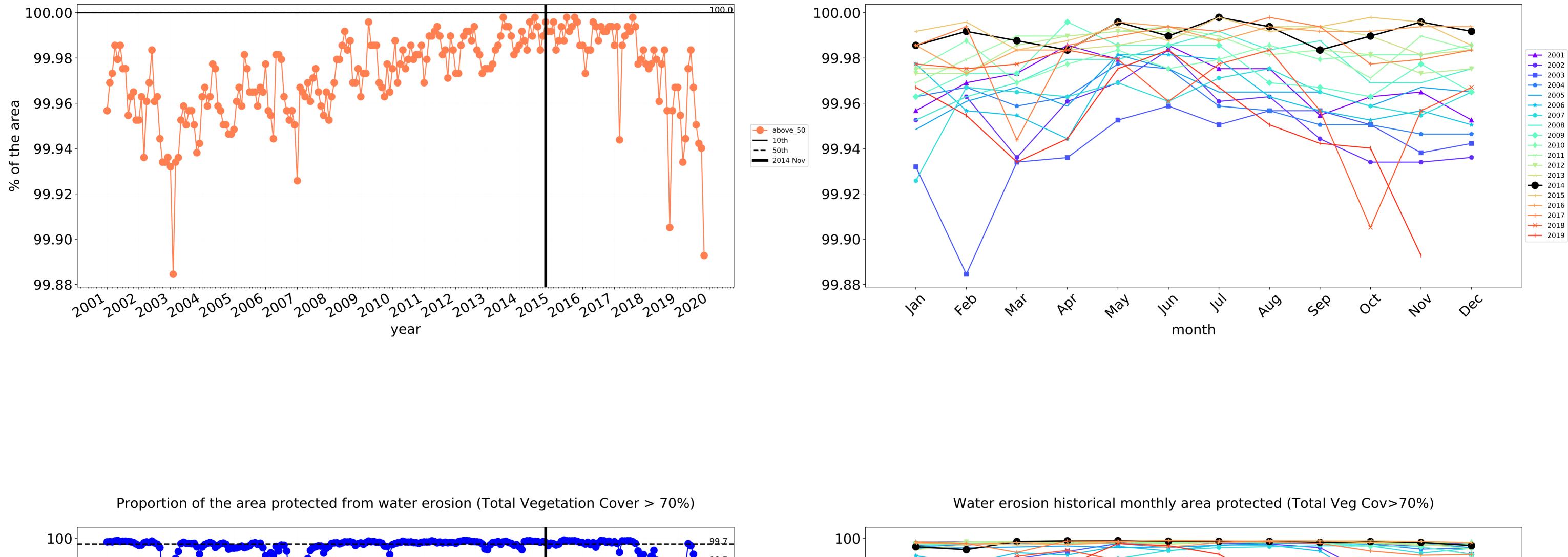




Total Vegetation Cover Decile [%]









year

98

96

94

92

90

88

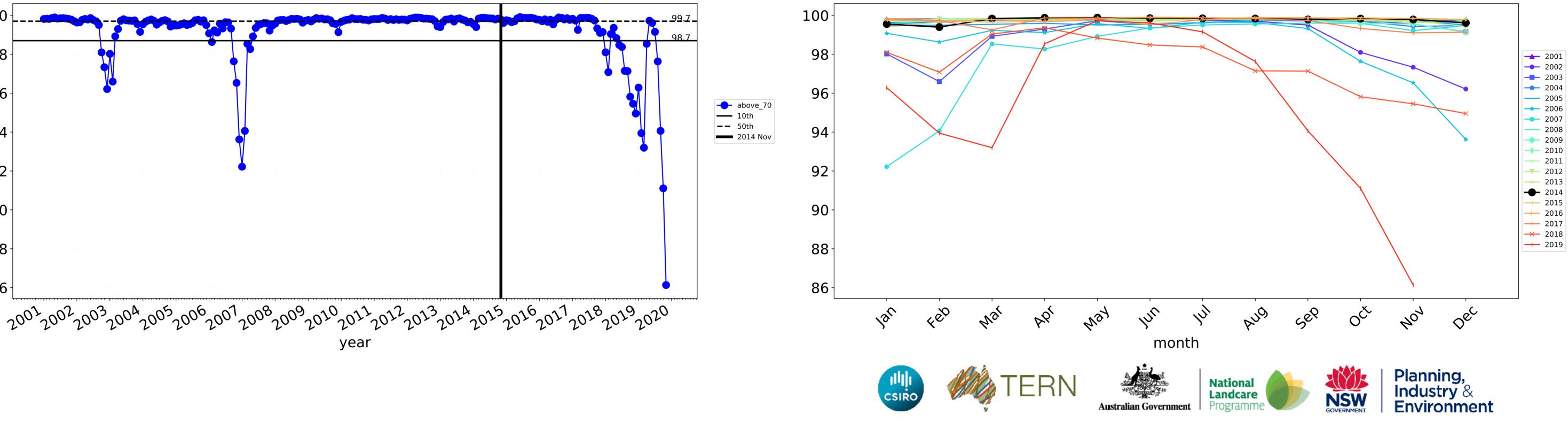
86

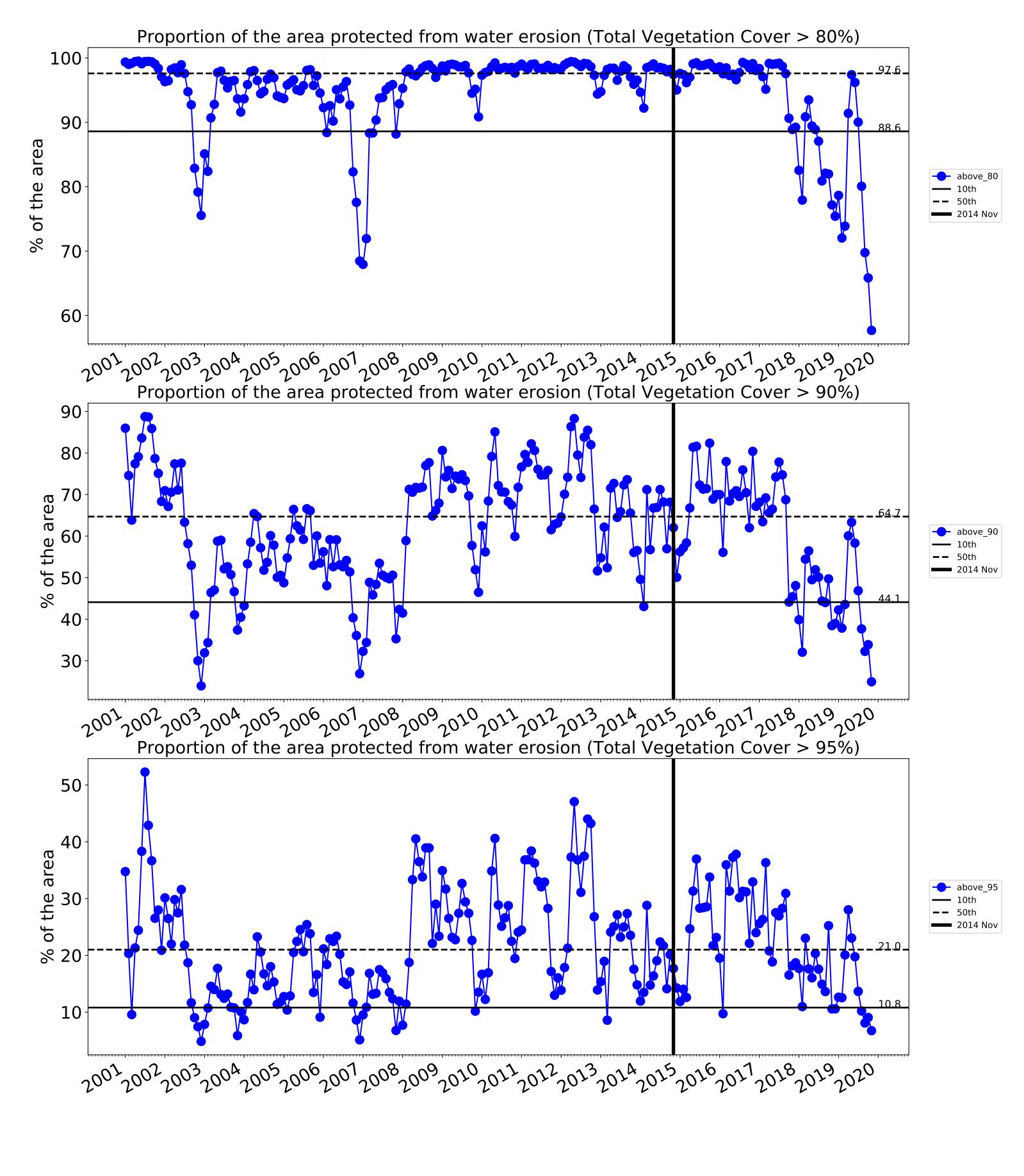
area

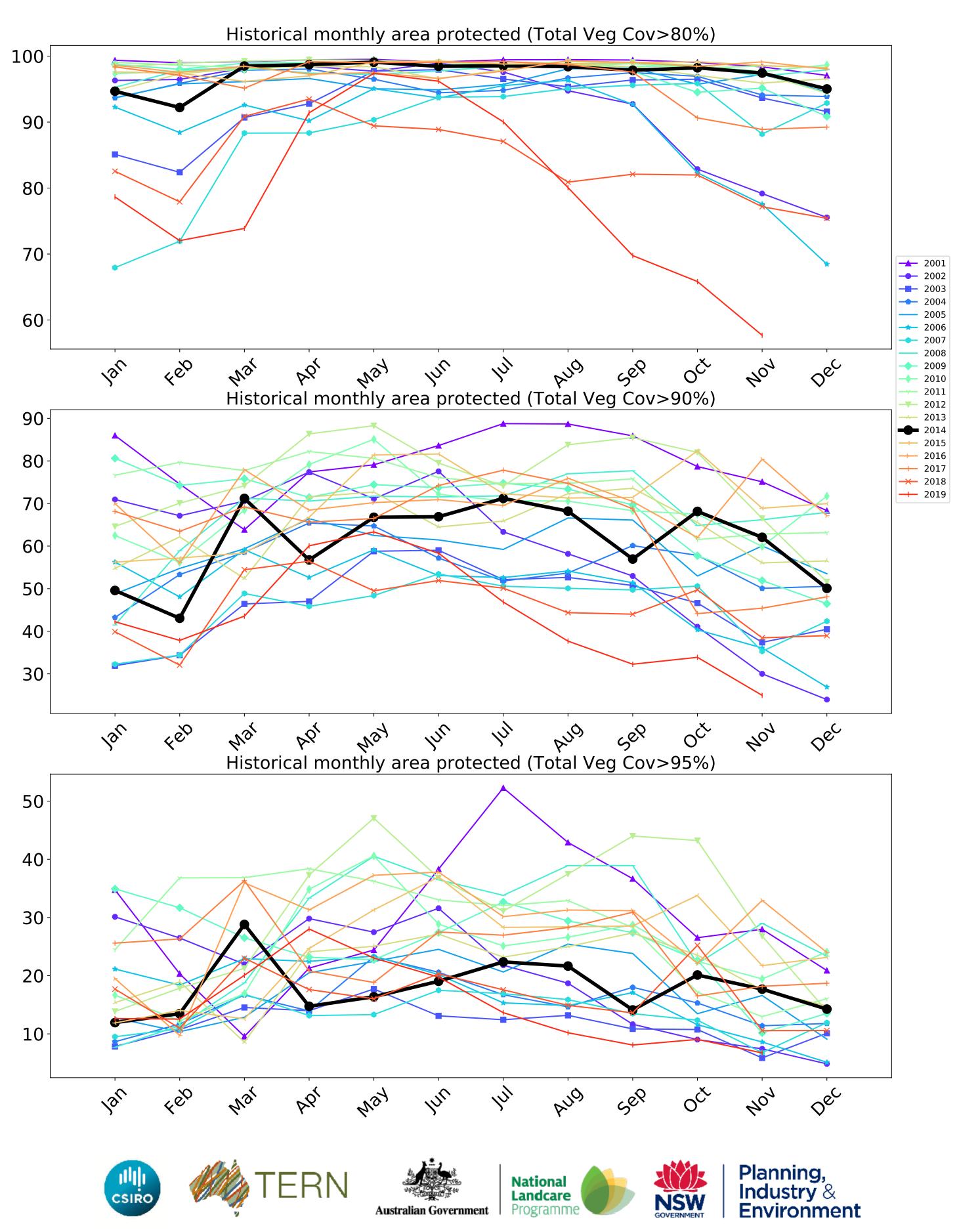
of the

%

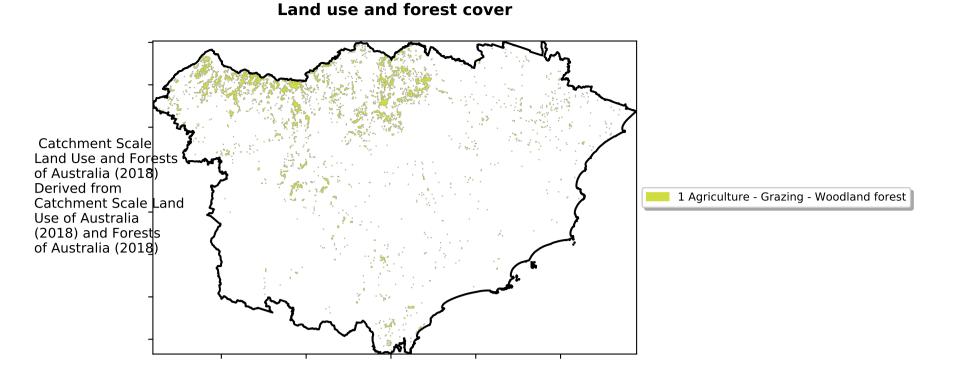
Wind erosion historical monthly area protected (Total Veg Cov >50%)



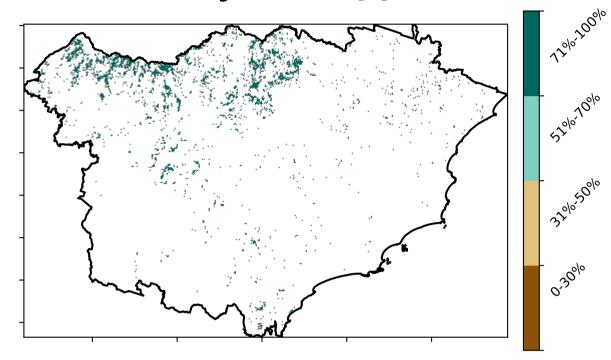




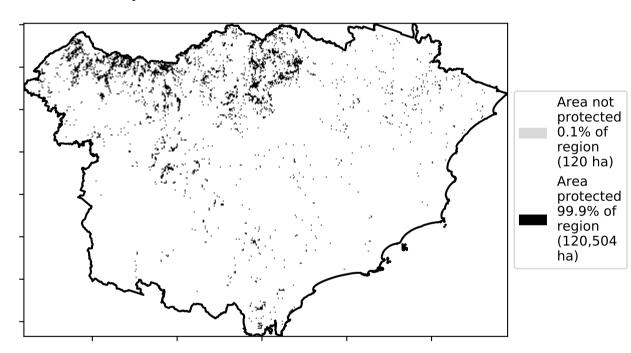
Grazing Woodland forest



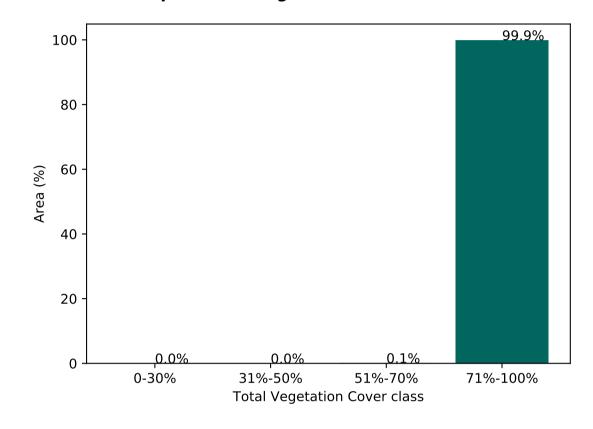
Total Vegetation Cover [%]



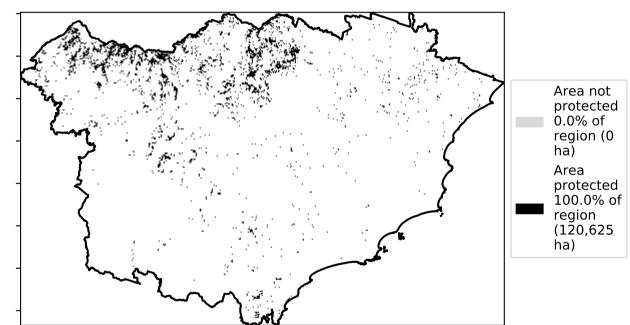
% Area protected from water erosion (>70%)



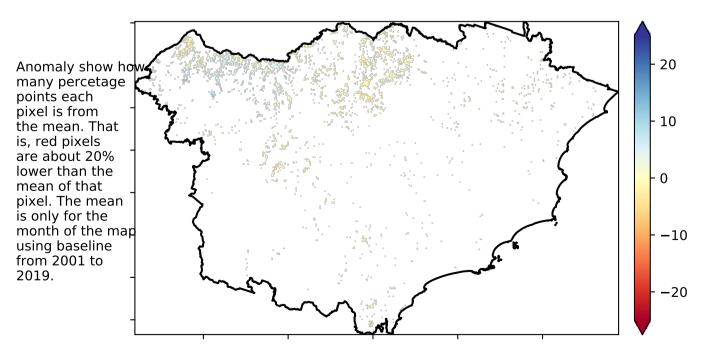
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

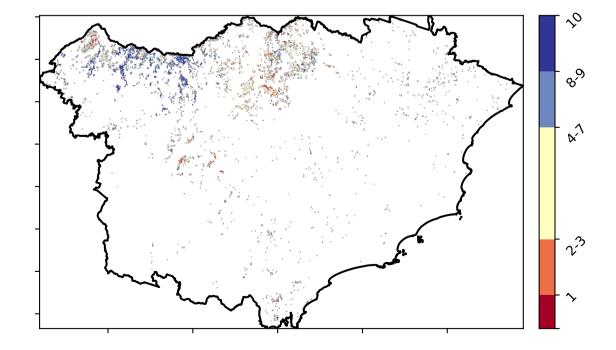


Total Vegetation Cover Anomaly [%]

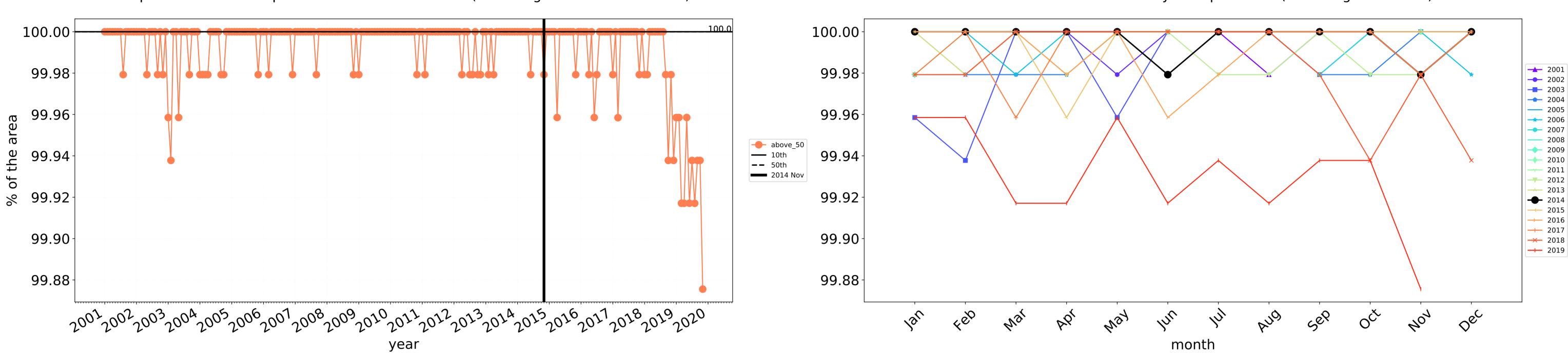


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

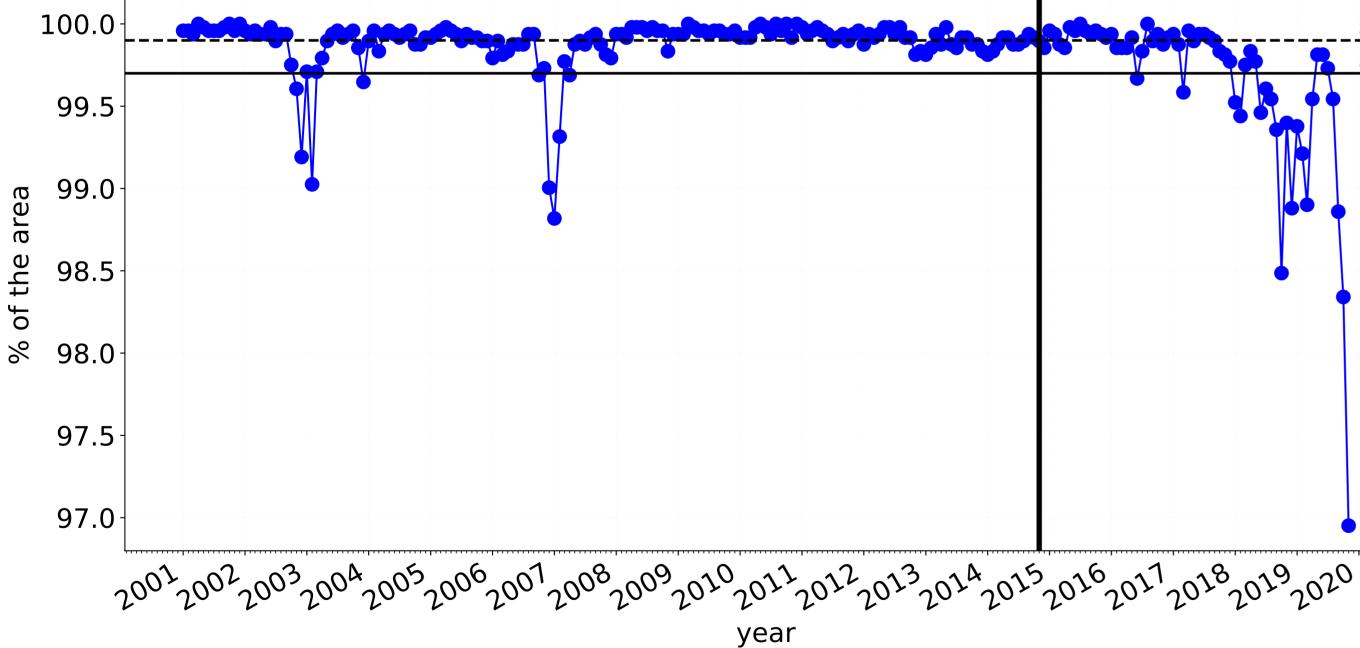






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

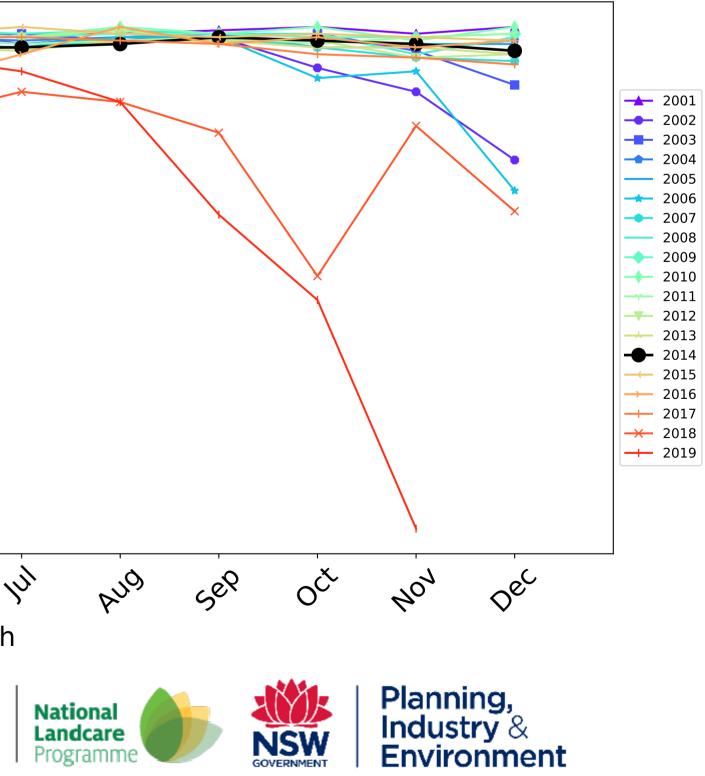
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

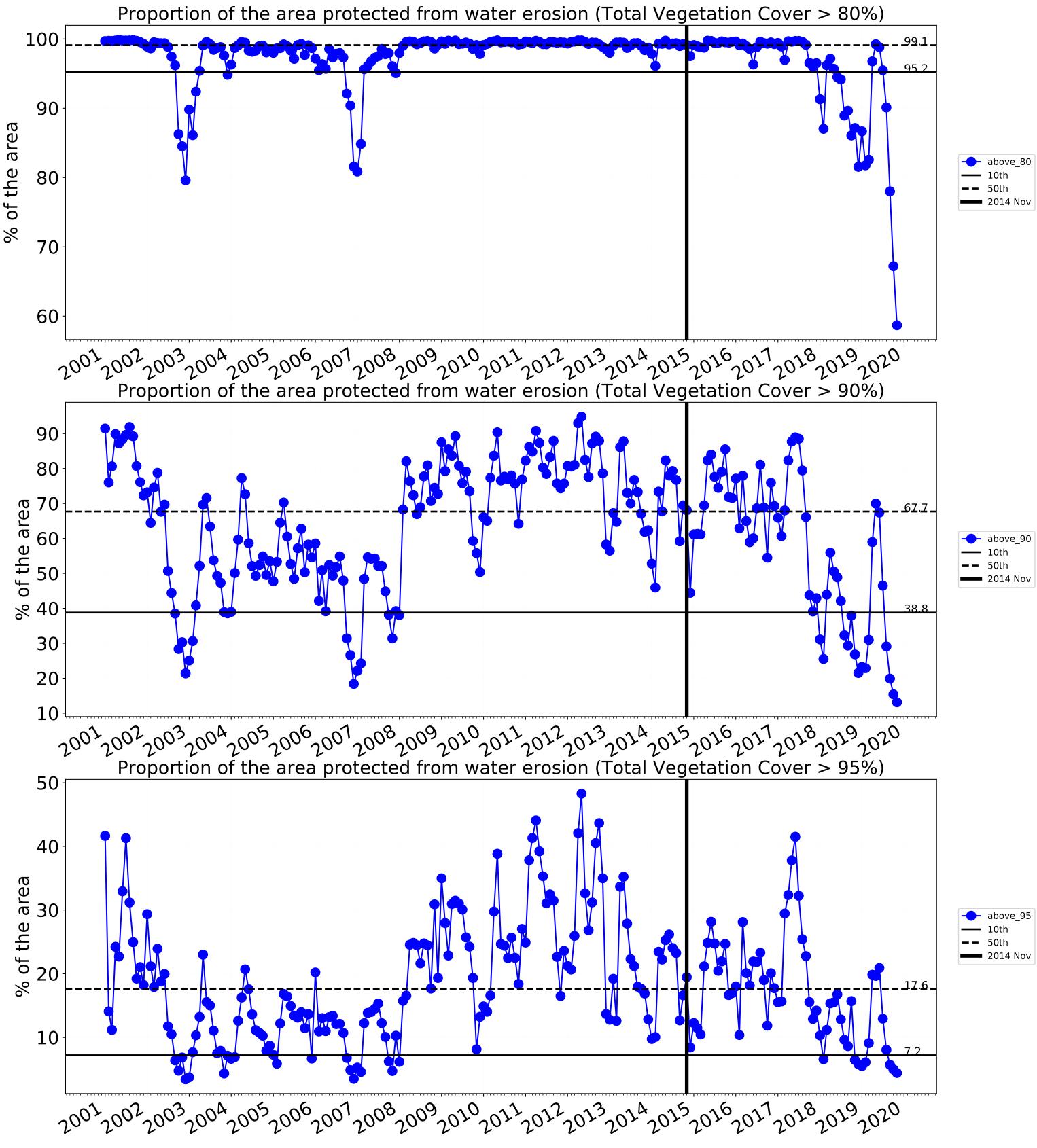


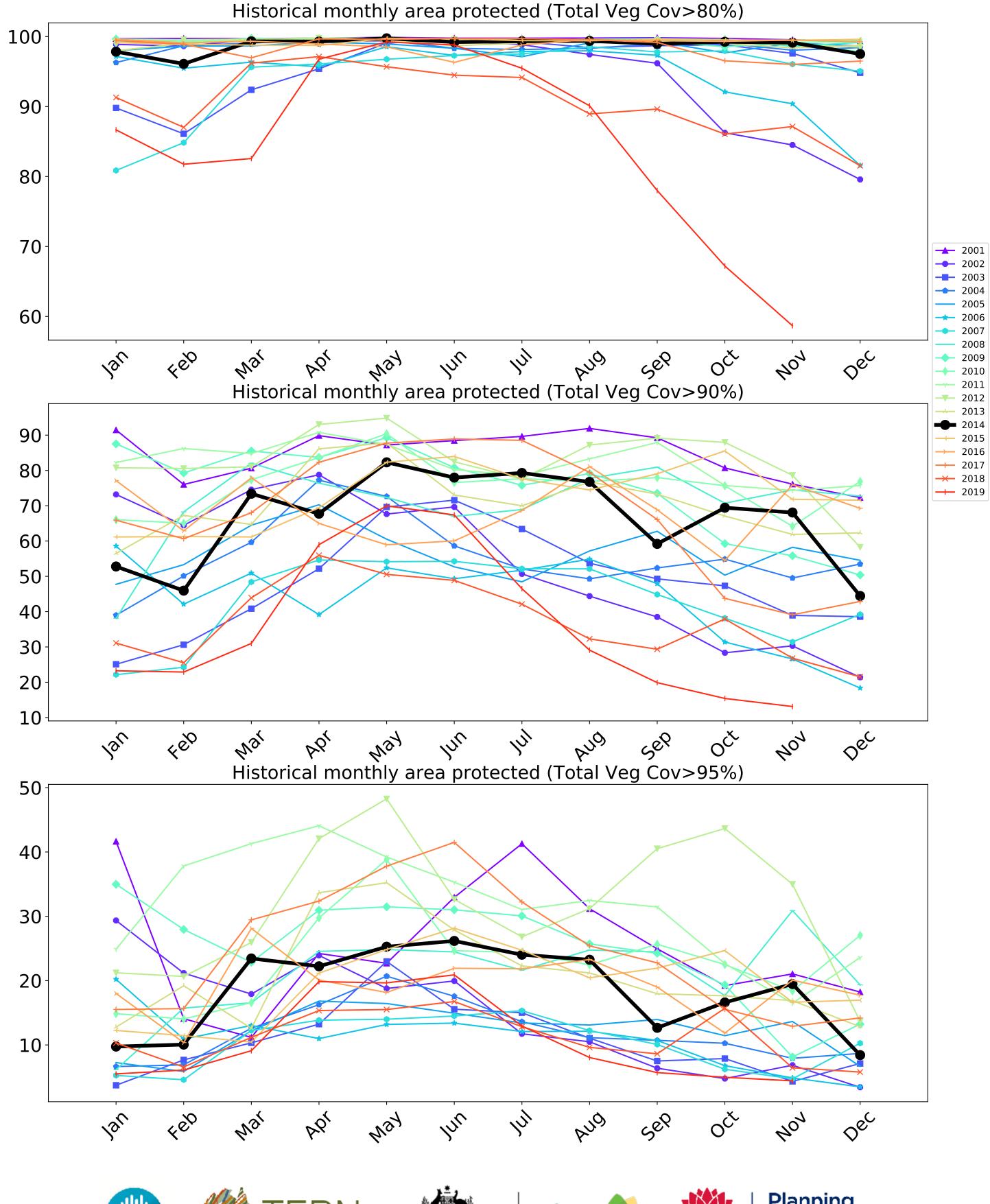
100.0-____99.9_ 00 7 99.5 ---- above_70 99.0 **—** 10th **--** 50th 98.5 98.0 97.5 97.0 feb lar May Inu PQ Mai month **FERN** CSIRO Australian Government

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

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





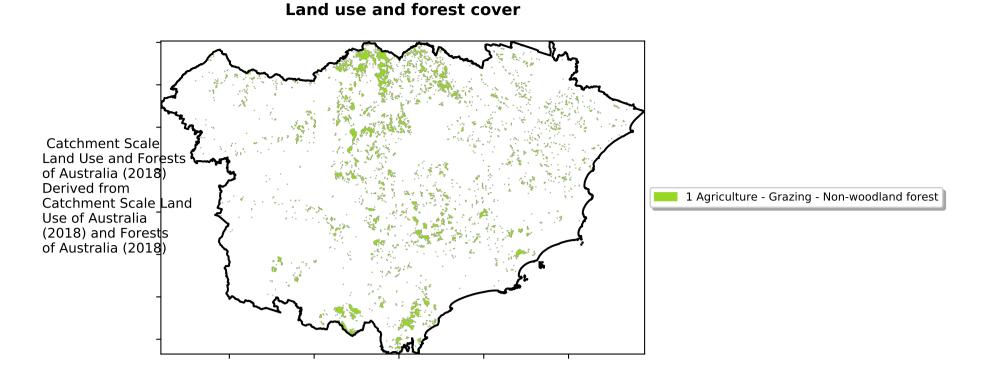




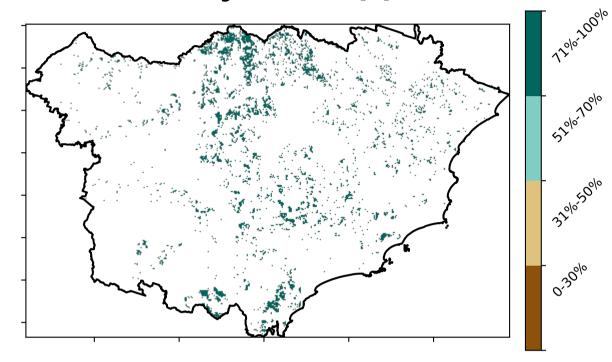
above_90



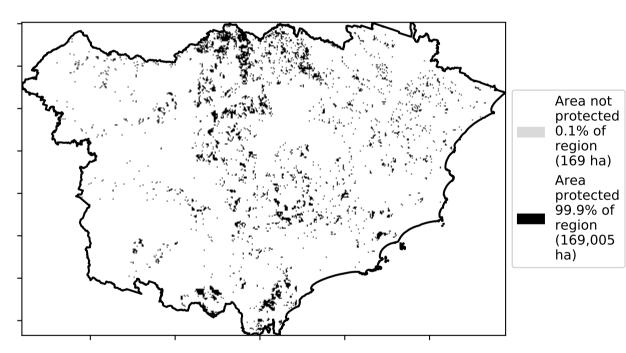
Grazing - Forest (non woodland)



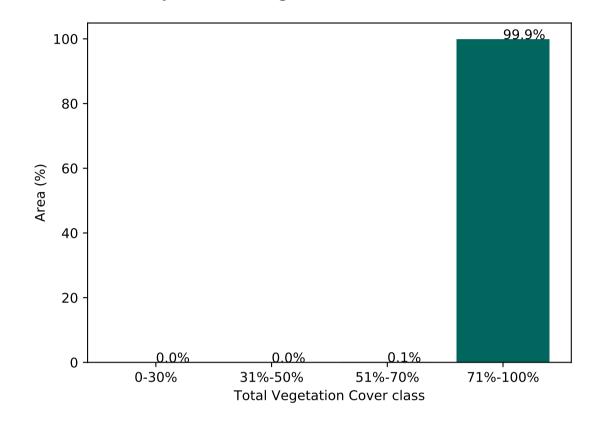
Total Vegetation Cover [%]



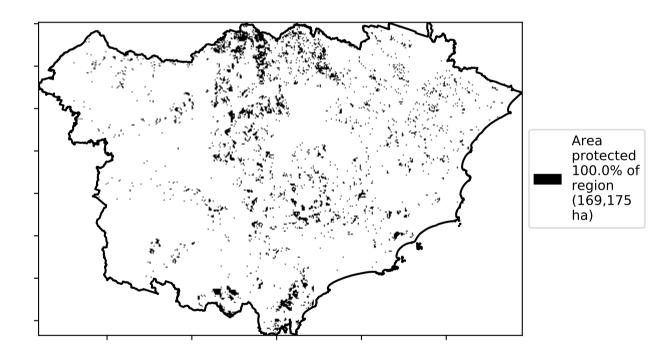
% Area protected from water erosion (>70%)



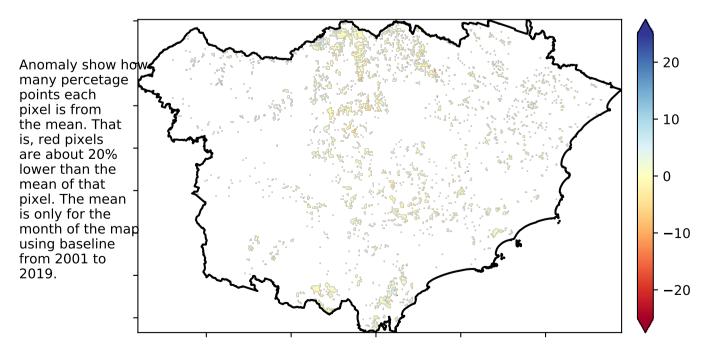
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

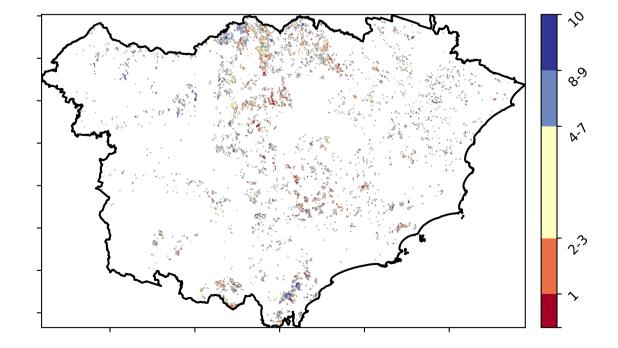


Total Vegetation Cover Anomaly [%]

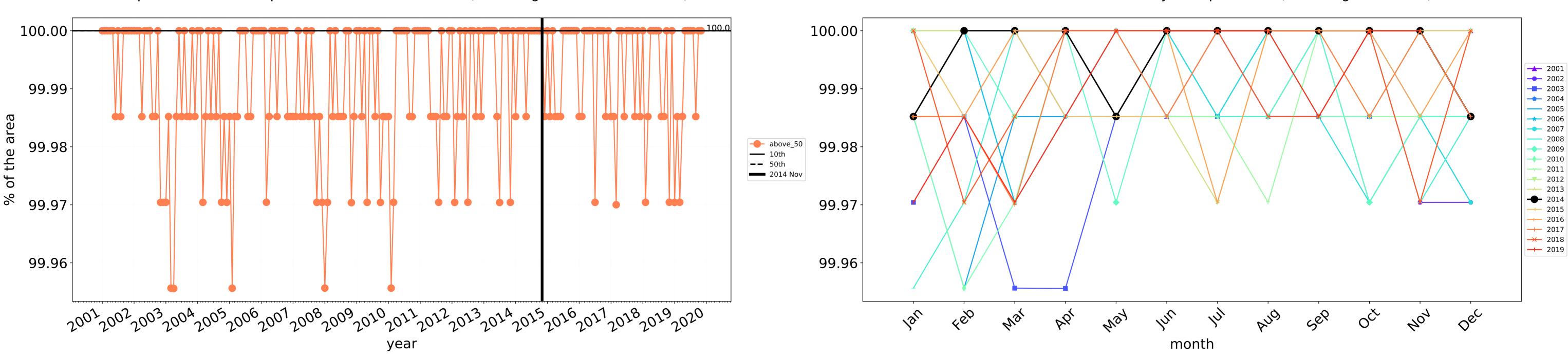


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

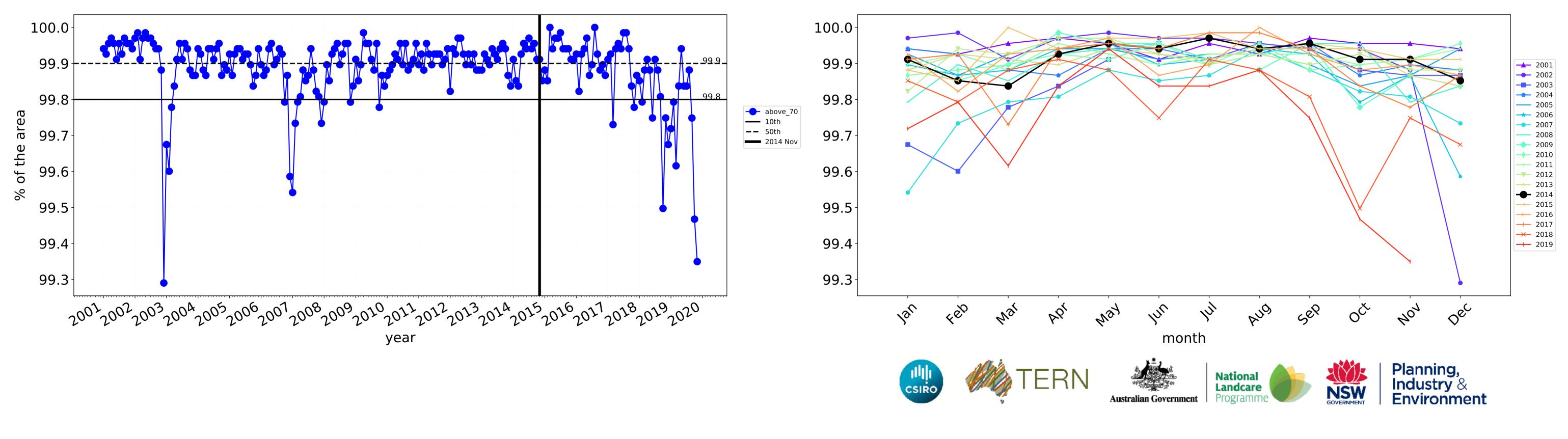


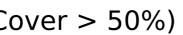




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

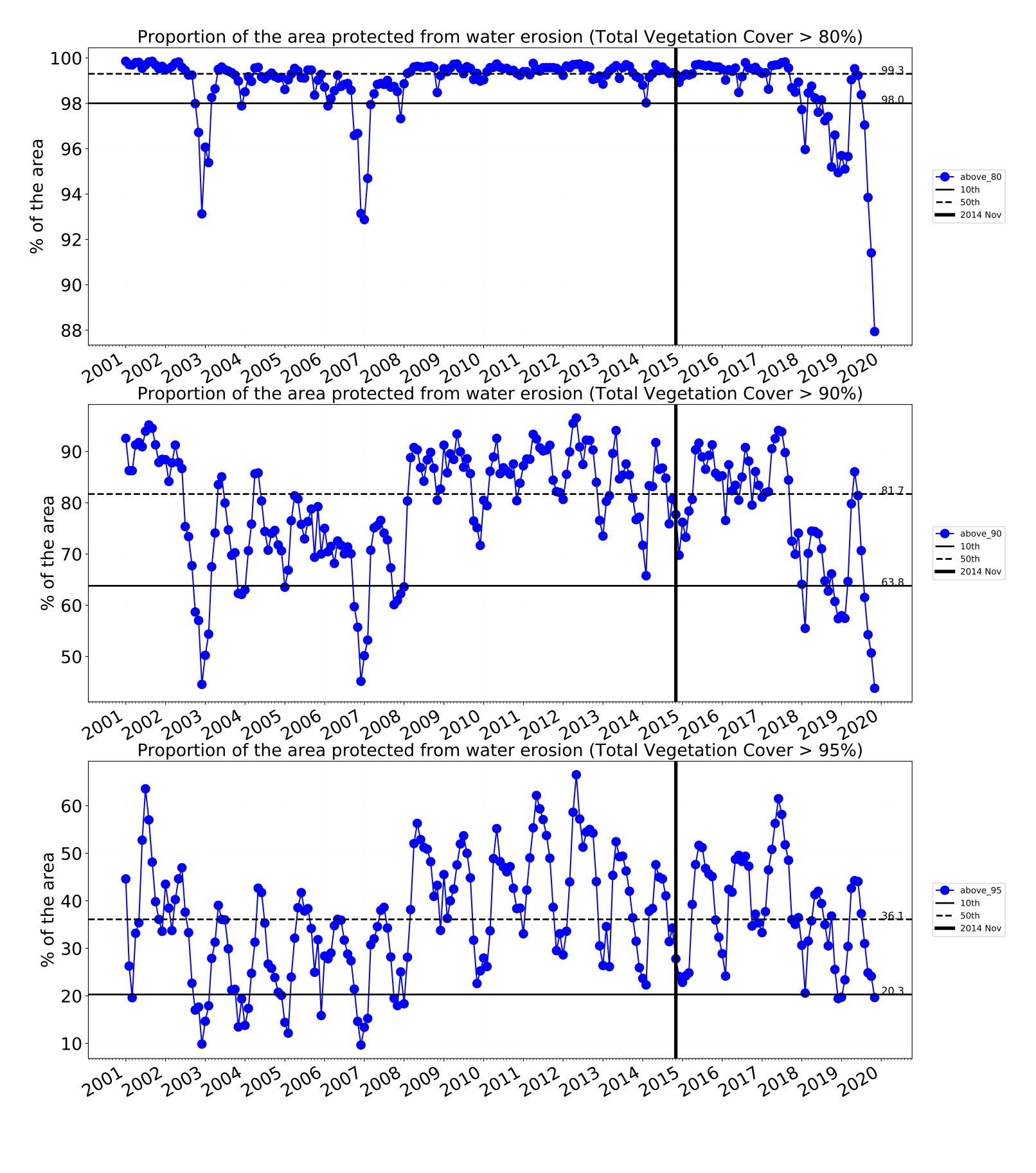


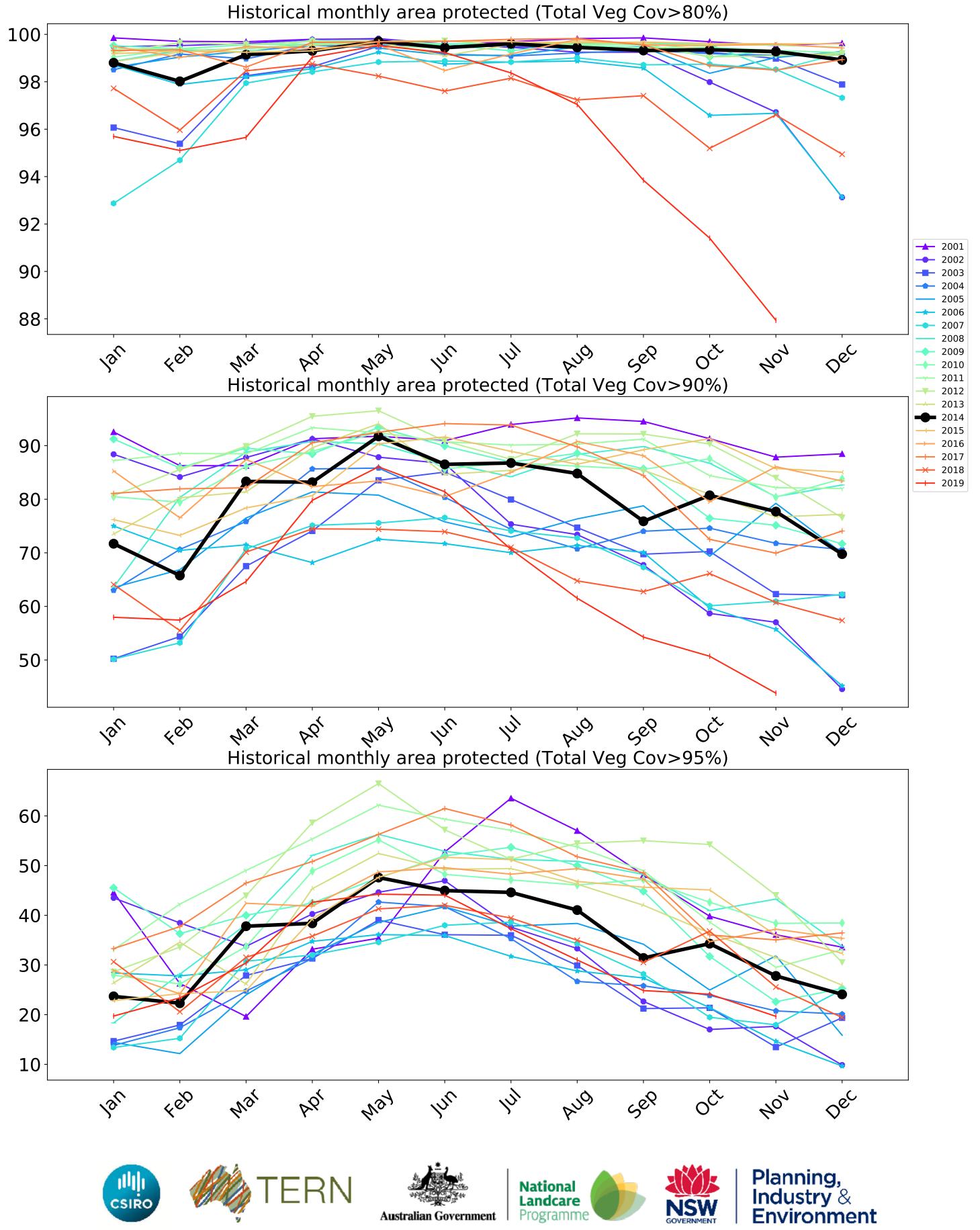


Wind erosion historical monthly area protected (Total Veg Cov >50%)



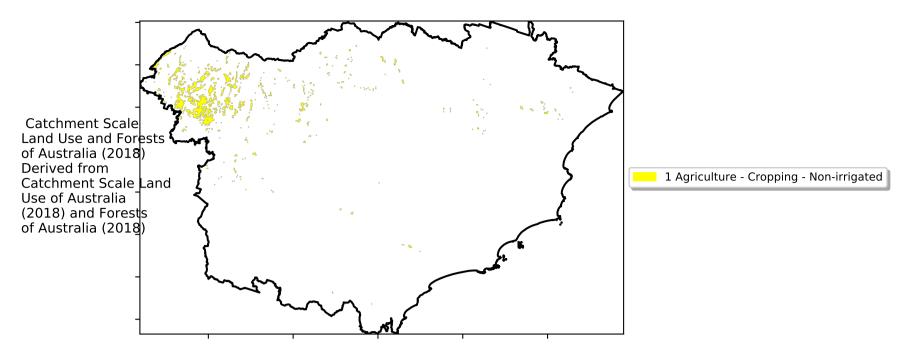
Water erosion historical monthly area protected (Total Veg Cov>70%)



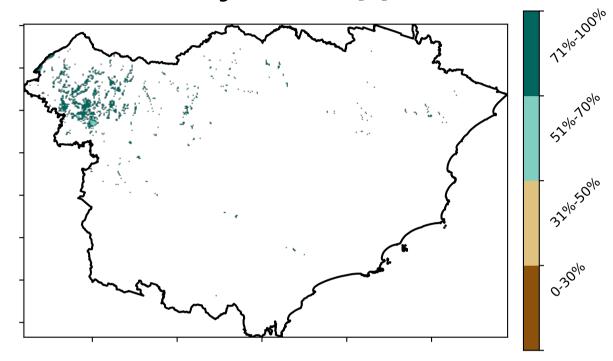


Cropping

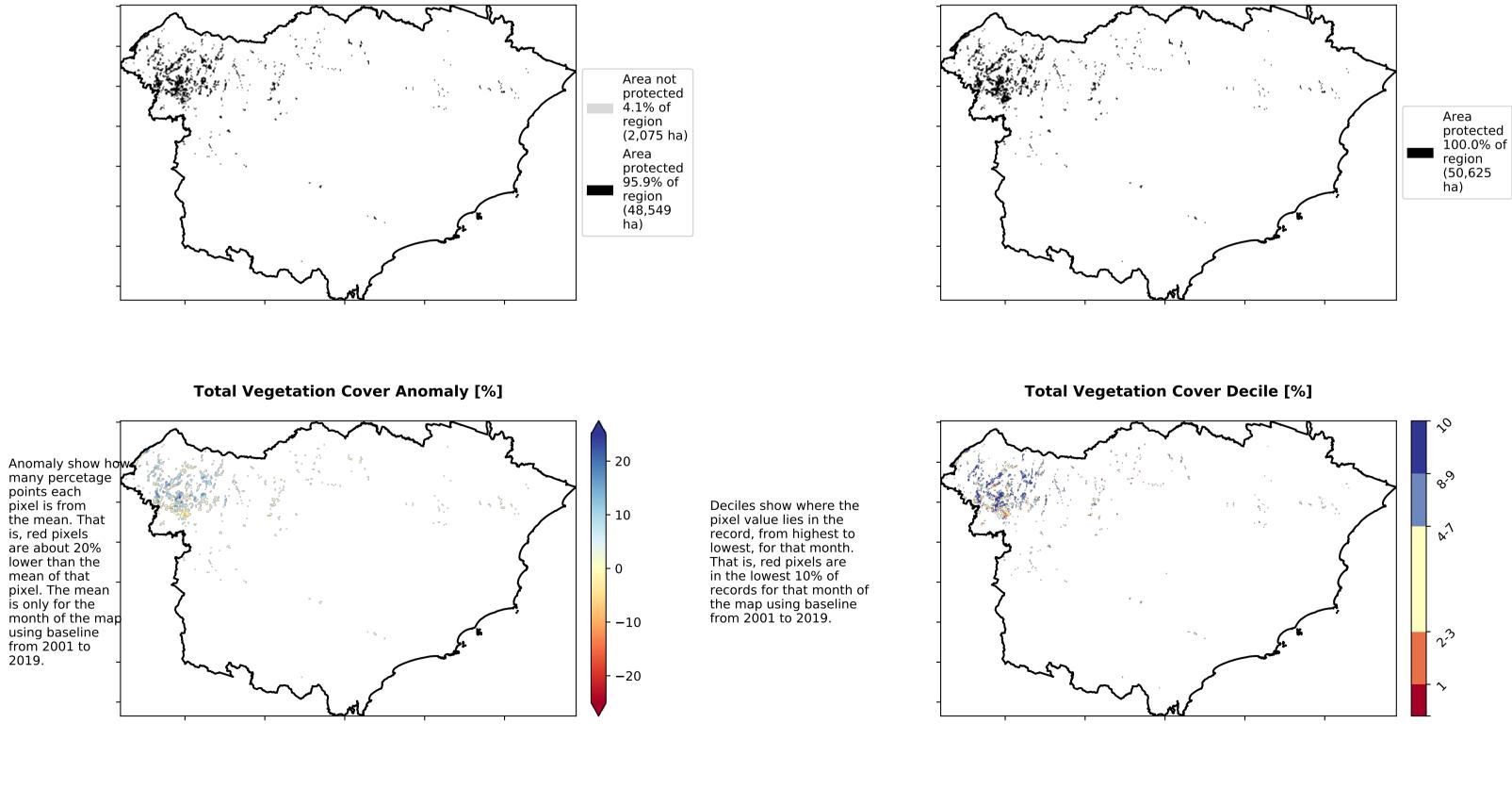
Land use and forest cover



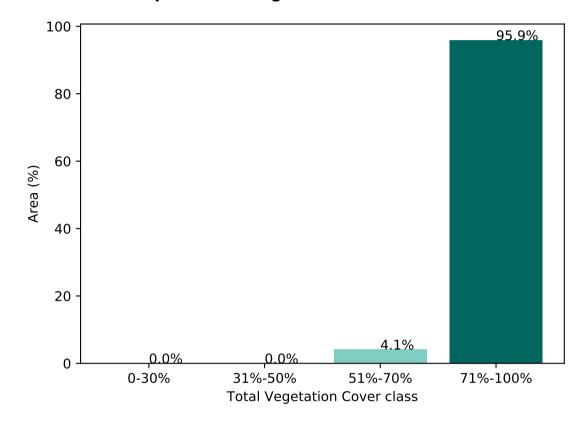
Total Vegetation Cover [%]



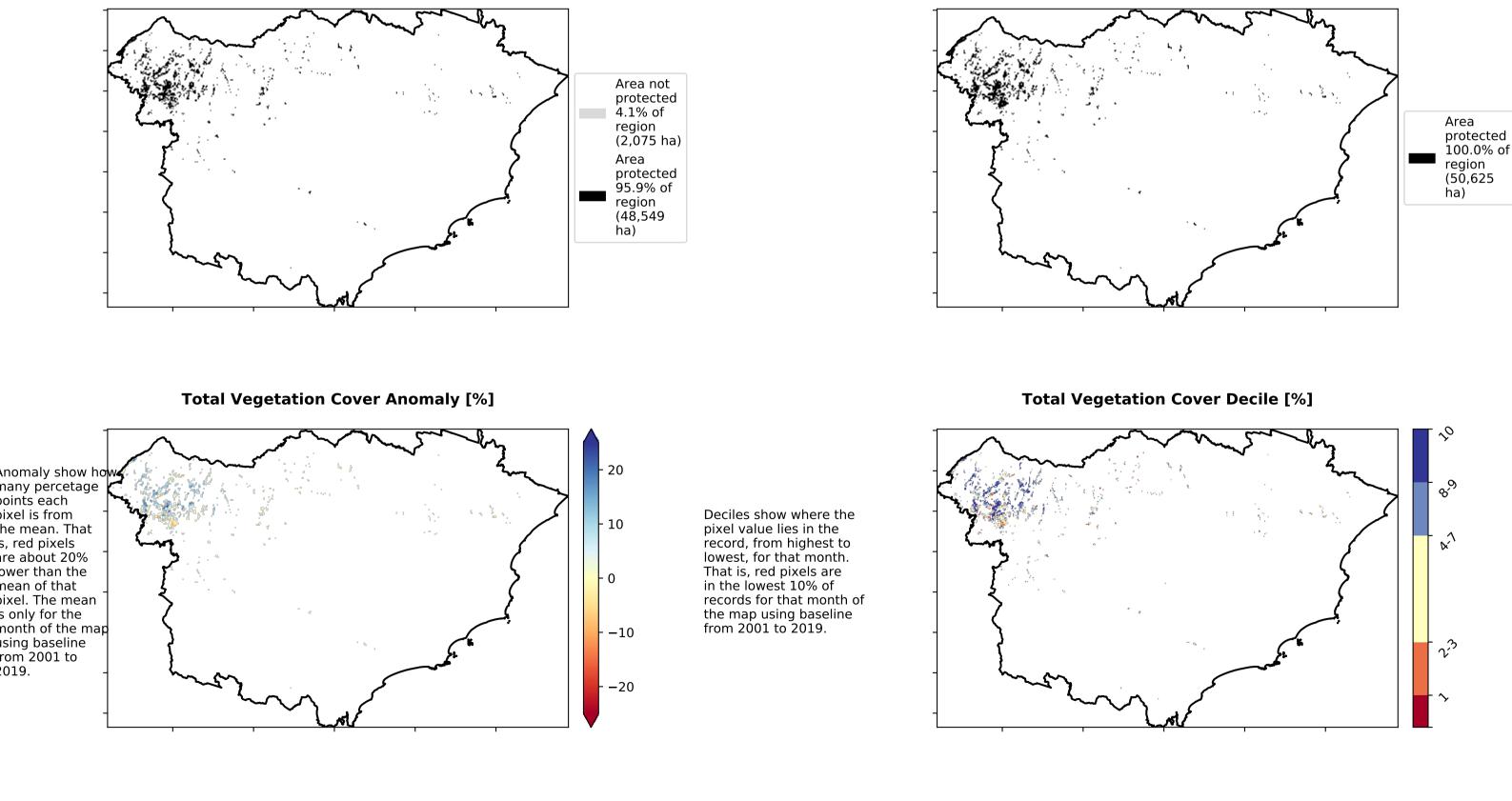
% Area protected from water erosion (>70%)



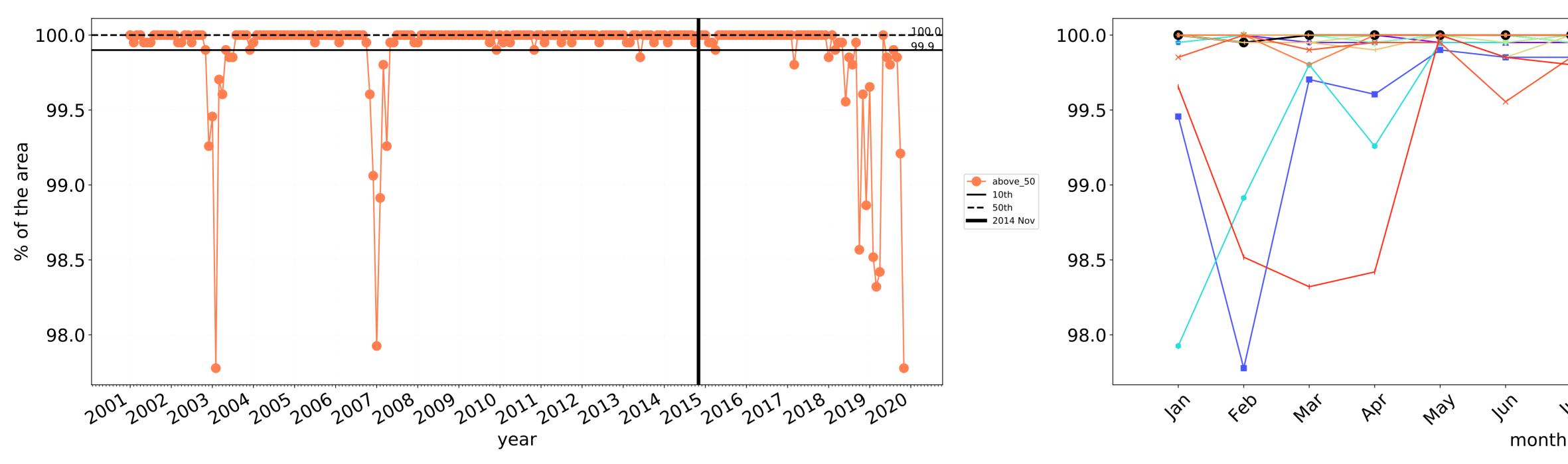
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

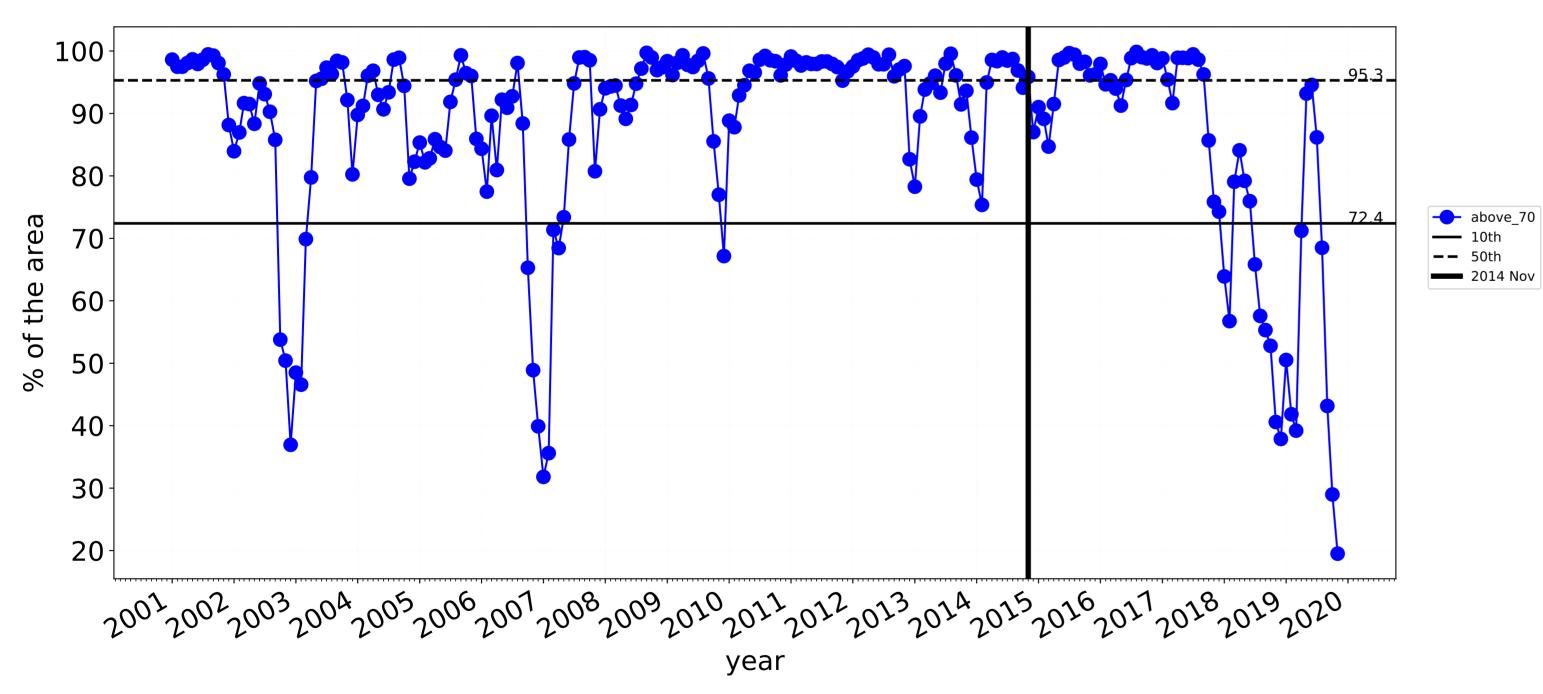






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

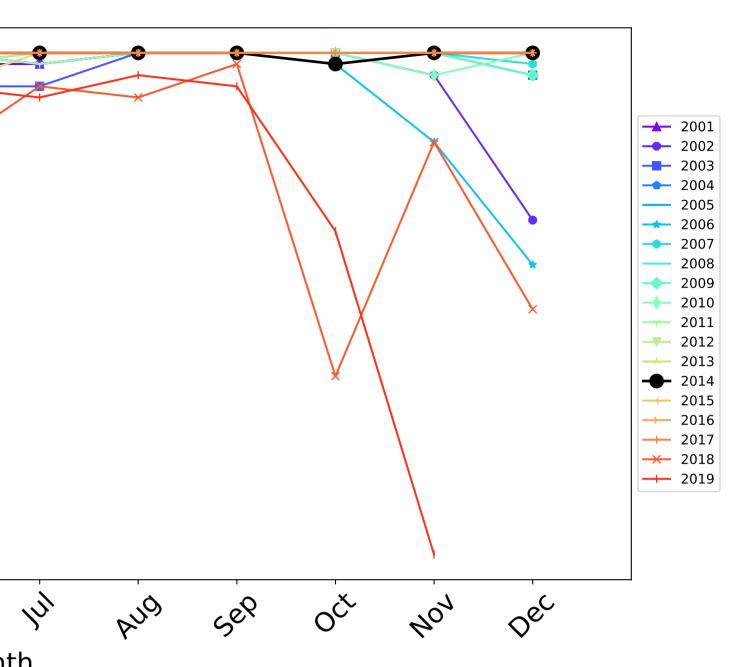


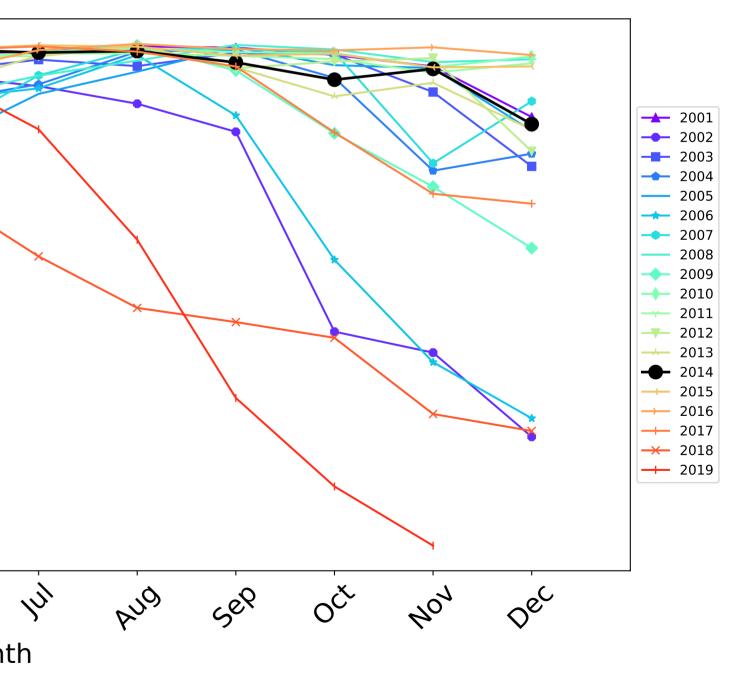
Cropping timeseries

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

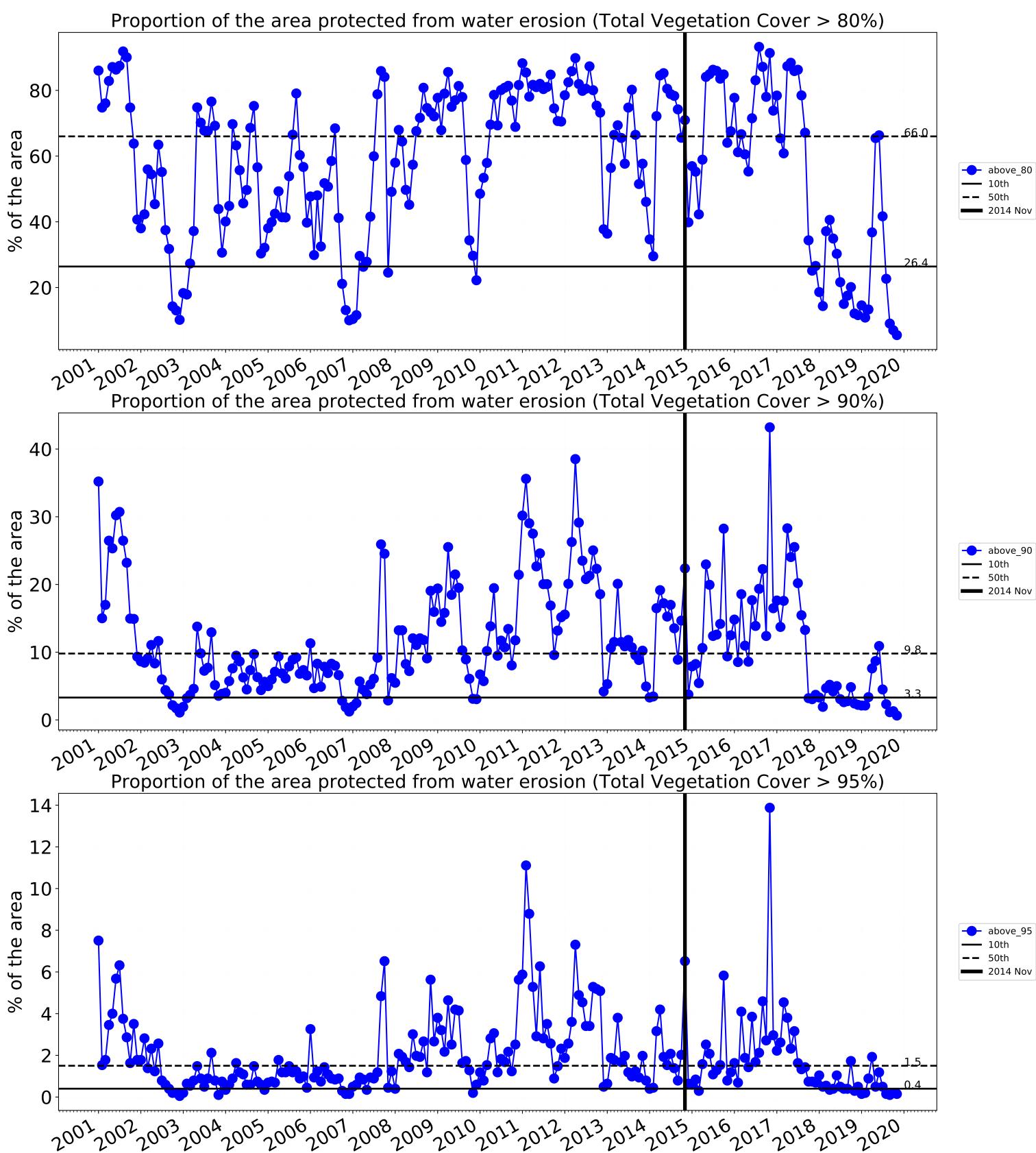
100 90 80 70-60 50 40 30 20 lar 4eb way PQ In Mai month ERN **HORA** CSIRO Australian Government

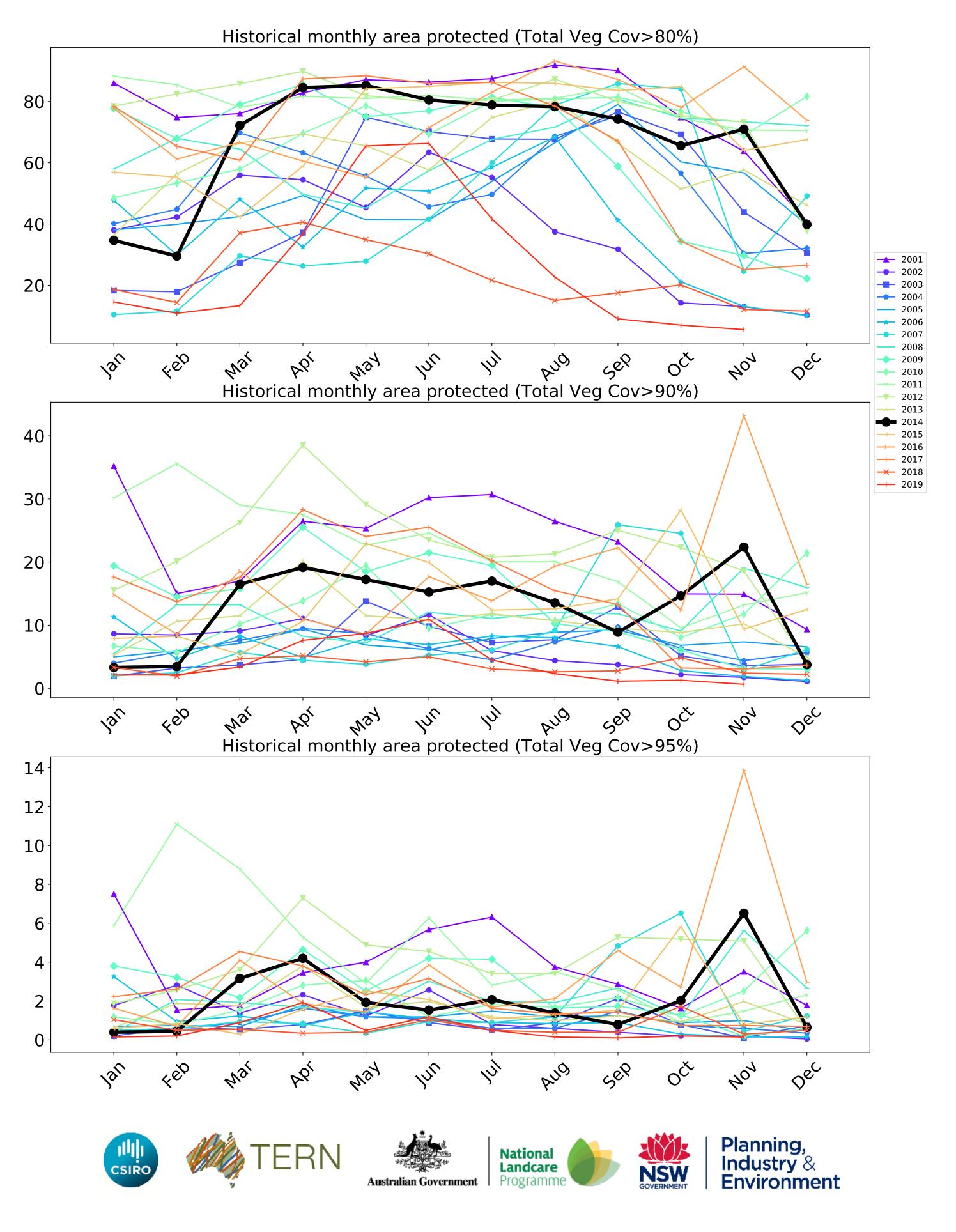
Water erosion historical monthly area protected (Total Veg Cov>70%)







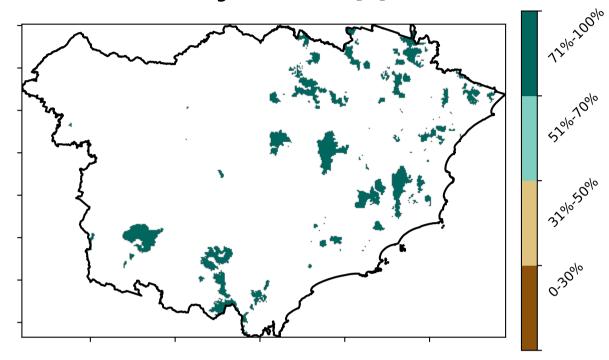




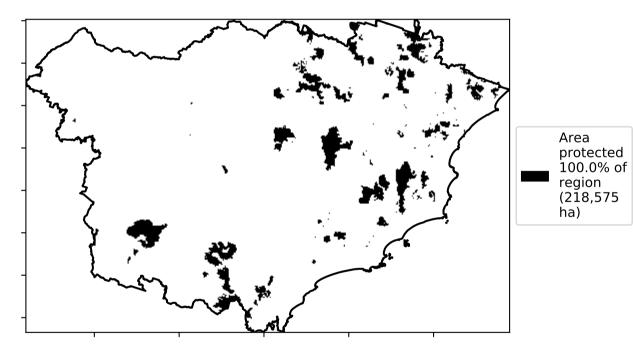
Production native forests and plantation forests



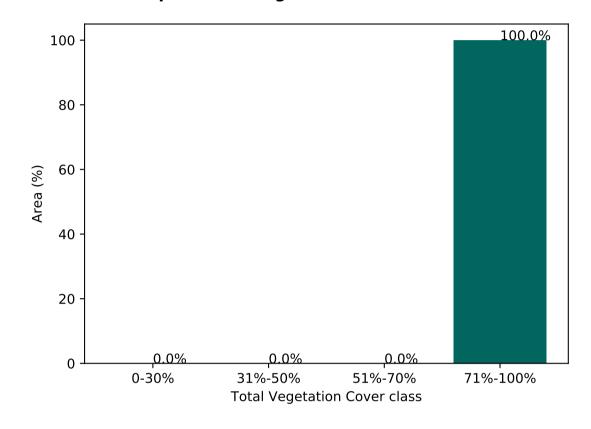
Total Vegetation Cover [%]



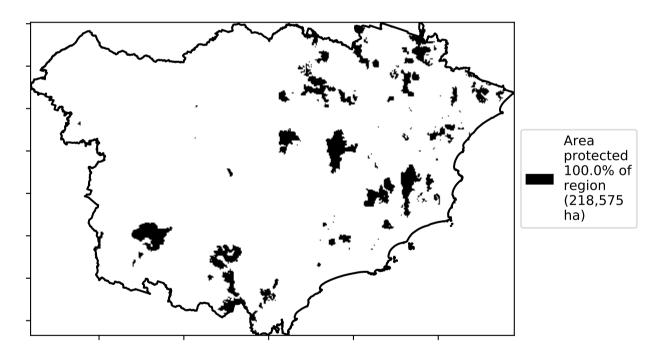
% Area protected from water erosion (>70%)



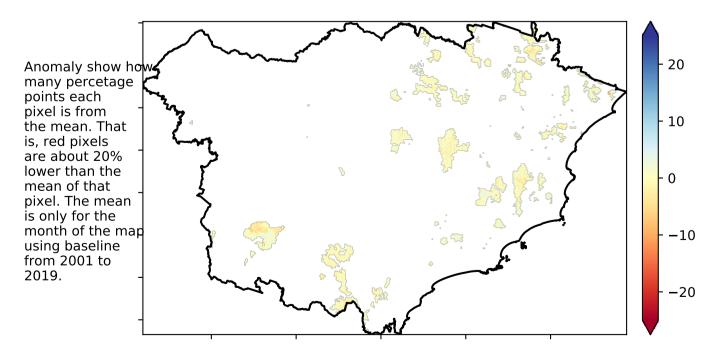
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

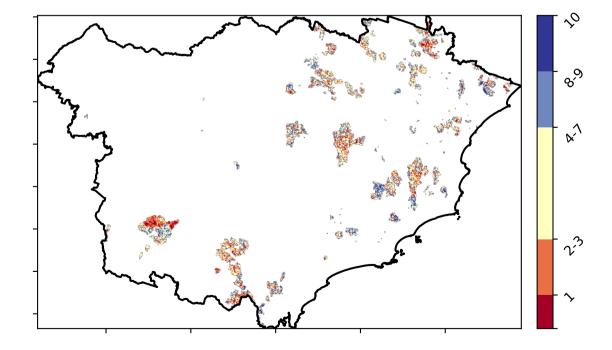


Total Vegetation Cover Anomaly [%]

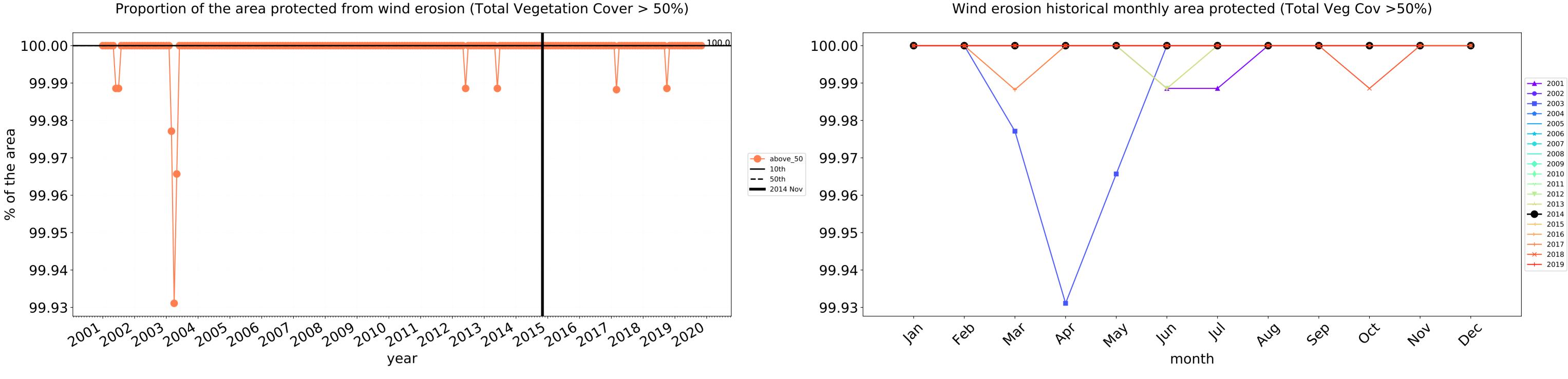


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Total Vegetation Cover Decile [%]

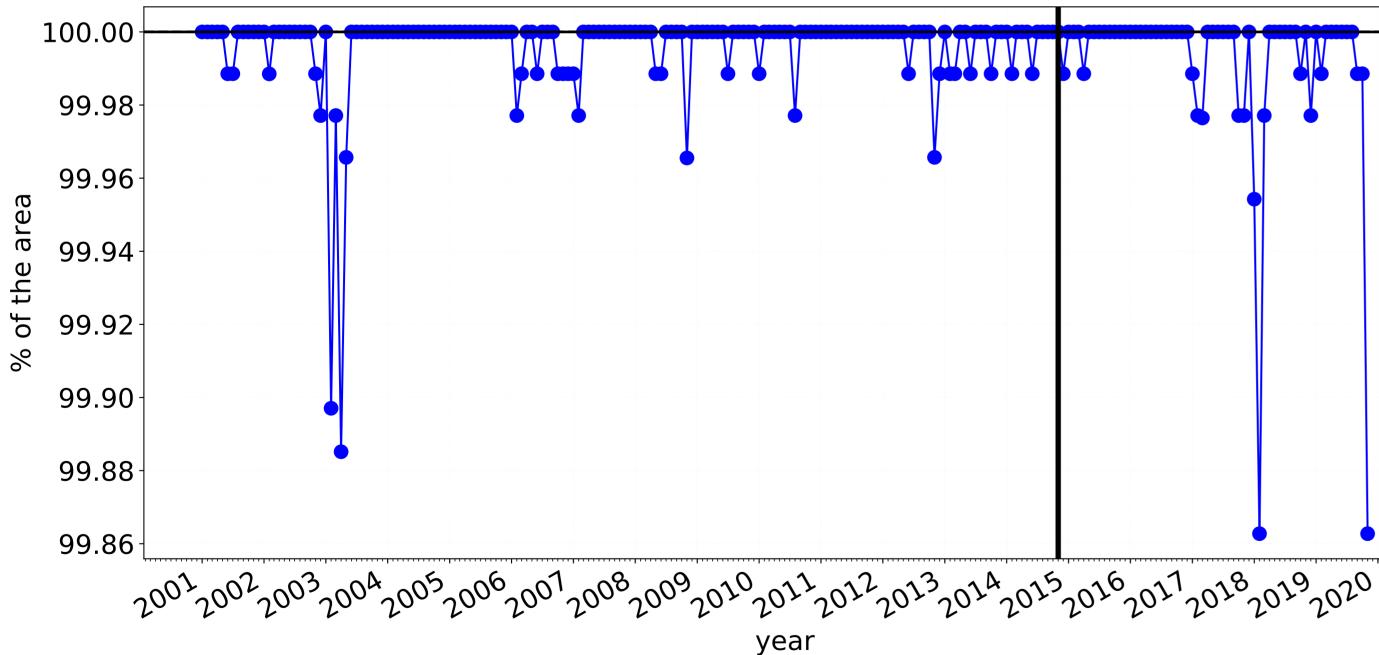






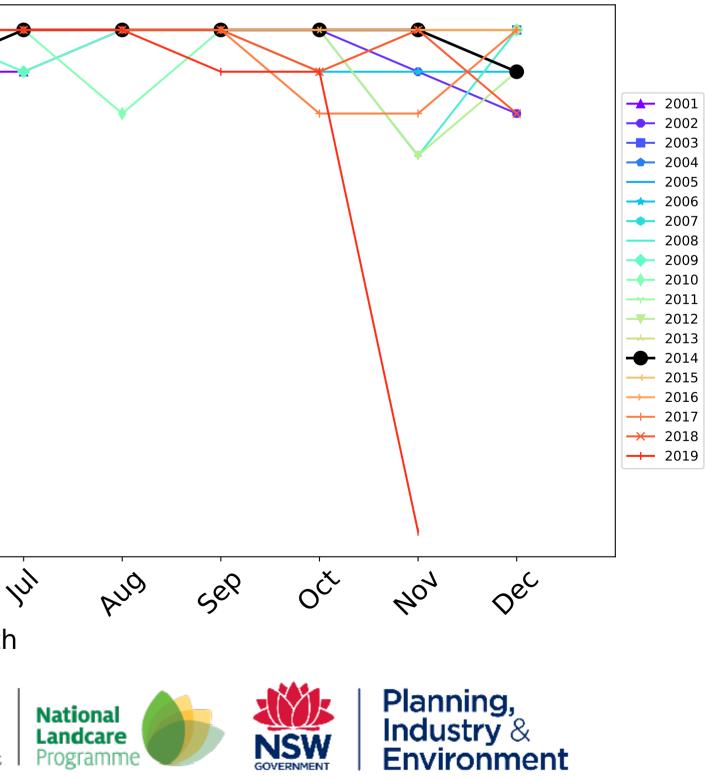
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

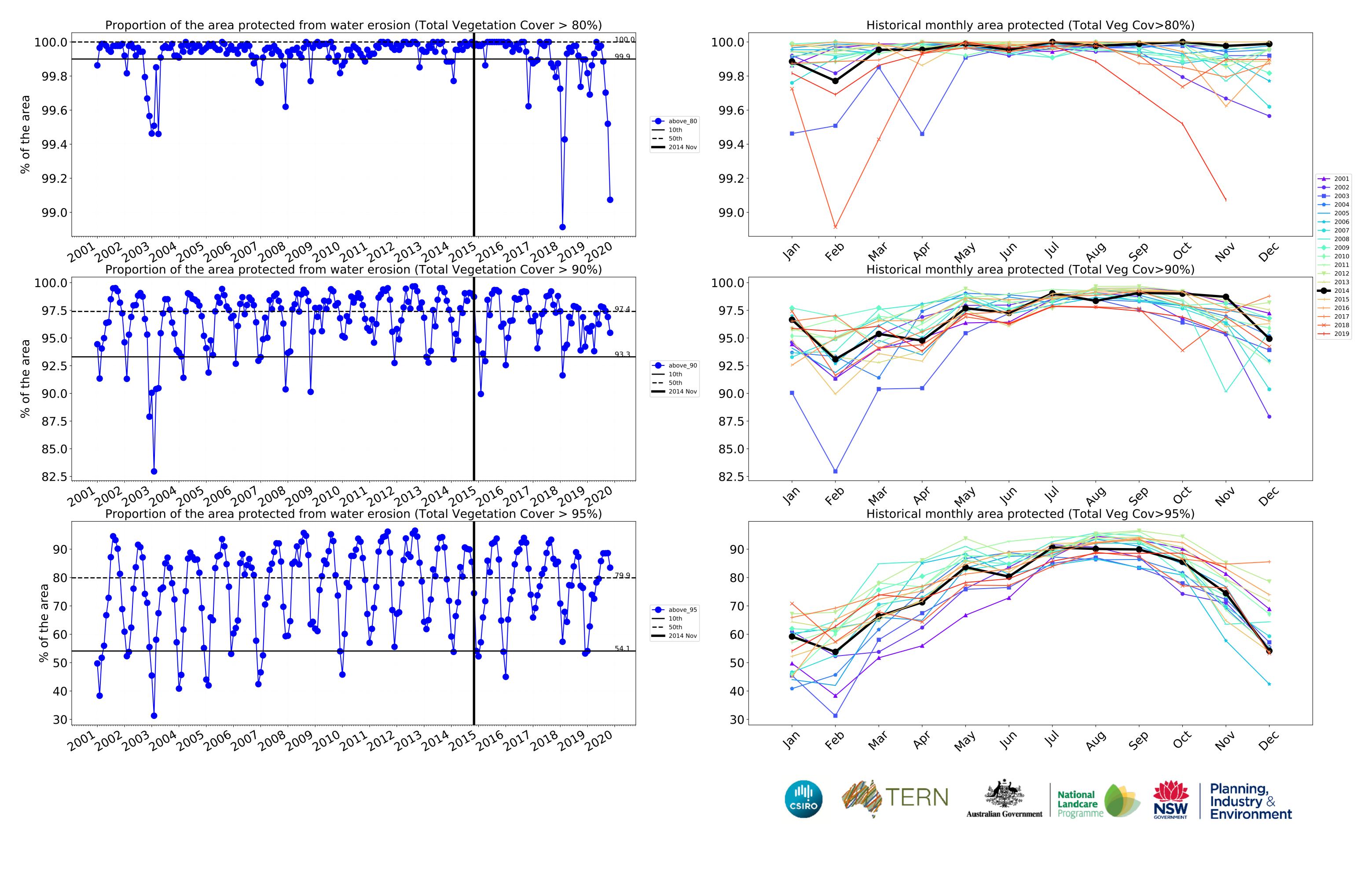
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



100.0 100.00 99.98-99.96 --- above_70 **—** 10th **--** 50th 99.94 **—** 2014 Nov 99.92 99.90 99.88 99.86 feb May Inu Jar War PQ month **FERN** (SOR) CSIRO Australian Government

Water erosion historical monthly area protected (Total Veg Cov>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% 3,237,350	99.6% 3,227,978	98.6% 3,193,711	95.5% 3,093,886	72.1% 2,335,023	33.4% 1,082,307
Conservation and natural environments	1,241,275	99.9% 1,240,075	99.8% 1,239,275	99.6% 1,236,425	98.4% 1,221,750	87.2% 1,081,825	49.7% 616,450
Conservation and natural environments non forest	29,950	96.2% 28,800	93.9% 28,125	89.6% 26,825	83.9% 25,125	55.6% 16,650	23.9% 7,150
Conservation and natural environments Woodland forest	138,925	100.0% 138,925	100.0% 138,925	99.9% 138,825	99.6% 138,400	85.0% 118,025	29.0% 40,325
Conservation and natural environments Forest (non woodland)	1,072,400	100.0% 1,072,350	100.0% 1,072,225	99.8% 1,070,775	98.7% 1,058,225	88.3% 947,150	53.1% 568,975
Agriculture	1,580,775	100.0% 1,580,750	100.0% 1,580,700	99.7% 1,575,725	96.5% 1,525,800	62.0% 980,050	18.3% 288,625
Grazing	1,502,775	100.0% 1,502,750	100.0% 1,502,700	99.8% 1,499,925	97.8% 1,469,300	64.3% 966,300	19.0% 285,075
Grazing non forest	1,212,975	100.0% 1,212,975	100.0% 1,212,925	99.8% 1,210,400	97.4% 1,181,775	62.1% 752,725	17.7% 214,575
Grazing Woodland forest	120,625	100.0% 120,600	100.0% 120,600	99.9% 120,500	99.1% 119,575	68.1% 82,125	19.5% 23,475
Grazing - Forest (non woodland)	169,175	100.0% 169,175	100.0% 169,175	99.9% 169,025	99.3% 167,950	77.7% 131,450	27.8% 47,025
Cropping	50,625	100.0% 50,625	100.0% 50,625	95.9% 48,525	71.0% 35,925	22.4% 11,325	6.5% 3,300
Production native forests and plantation forests	218,575	100.0% 218,575	100.0% 218,575	100.0% 218,575	100.0% 218,525	98.7% 215,775	74.5% 162,775

