Total vegetation cover soil protection Region:NRM Hunter NSW

Date: May 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:

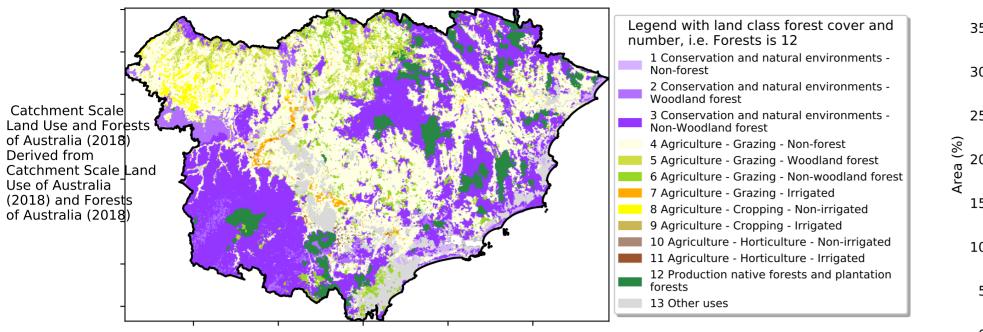
https://doi.org/10.4225/08/5848a3f19a7b3

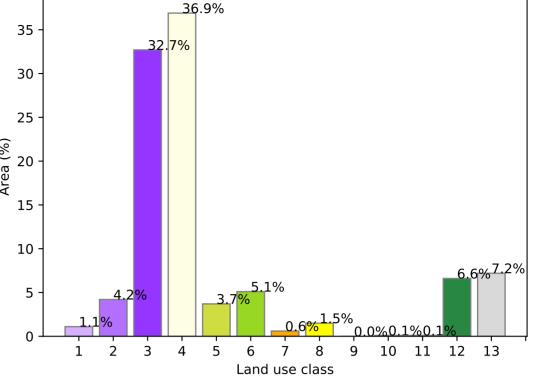


Vegetation Cover May 2010

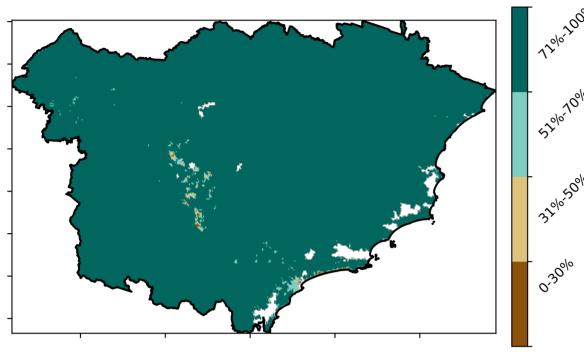
Land use and forest cover

Proportion of each land class in area

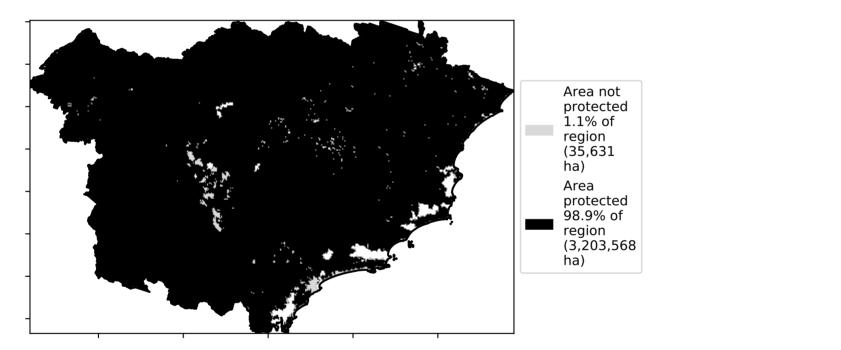




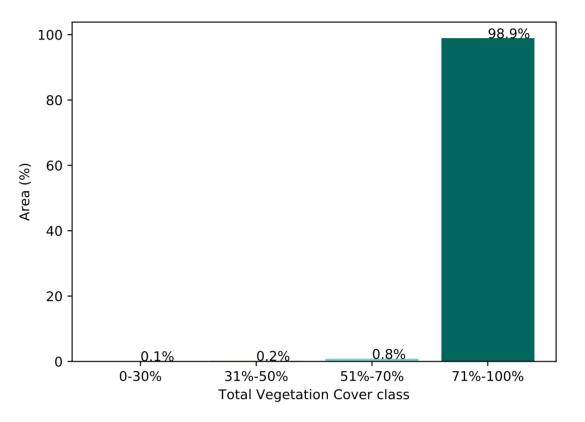
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

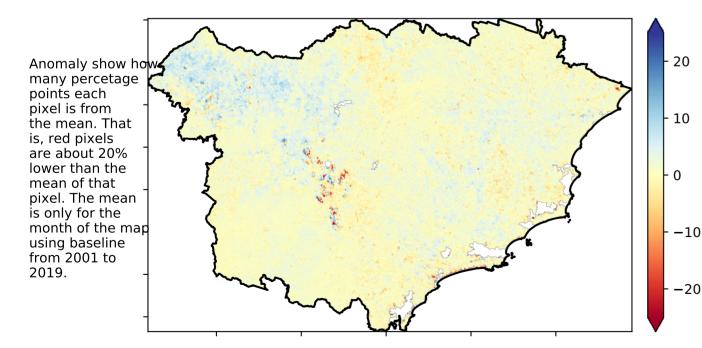


% Area protected from wind erosion (>50%)



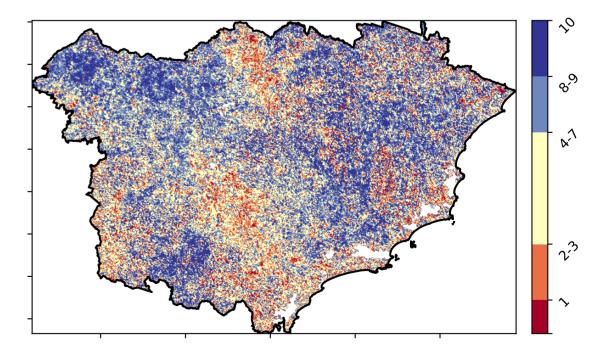
Area not protected 0.0% of region (0

Total Vegetation Cover Anomaly [%]

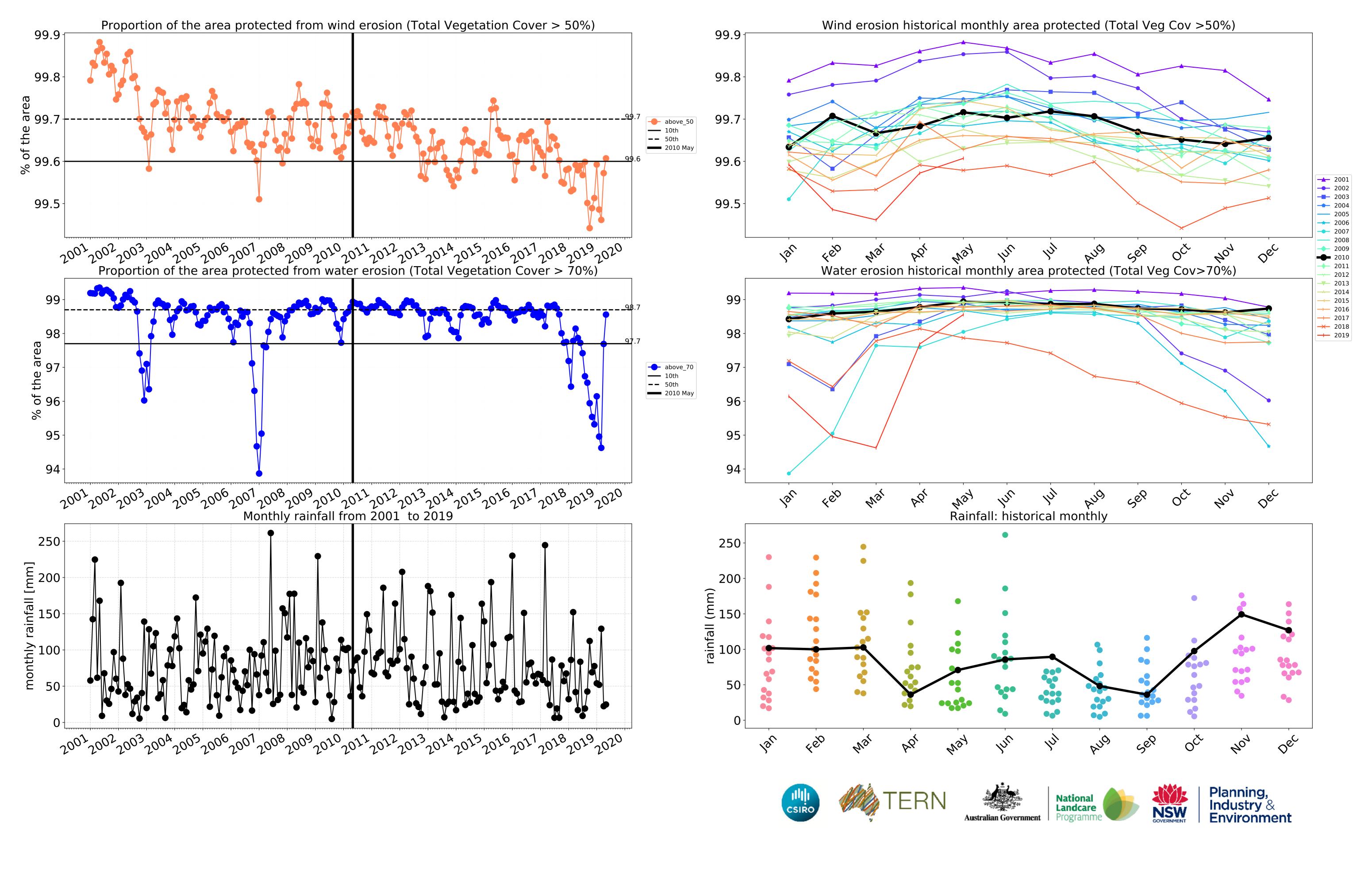


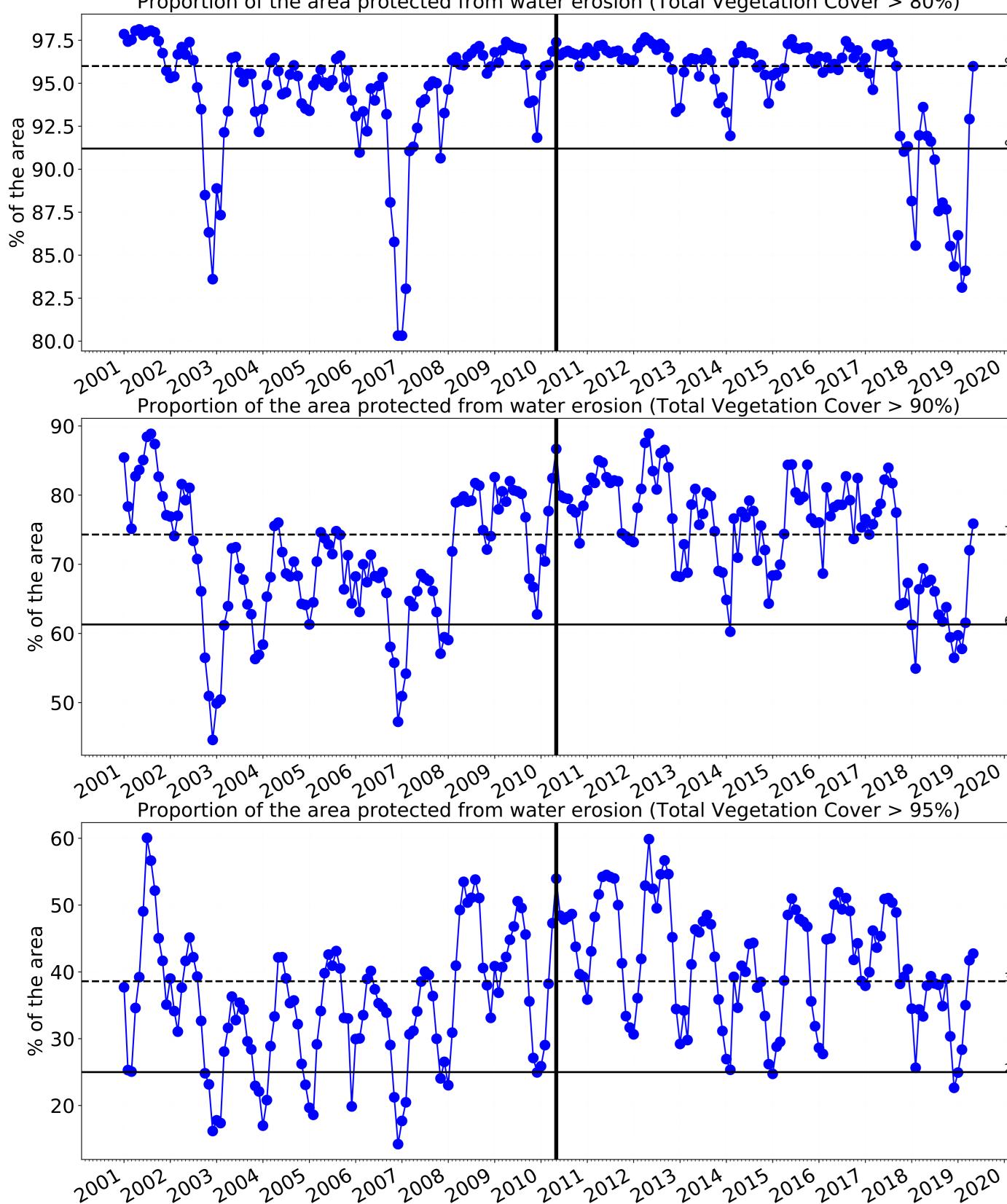
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

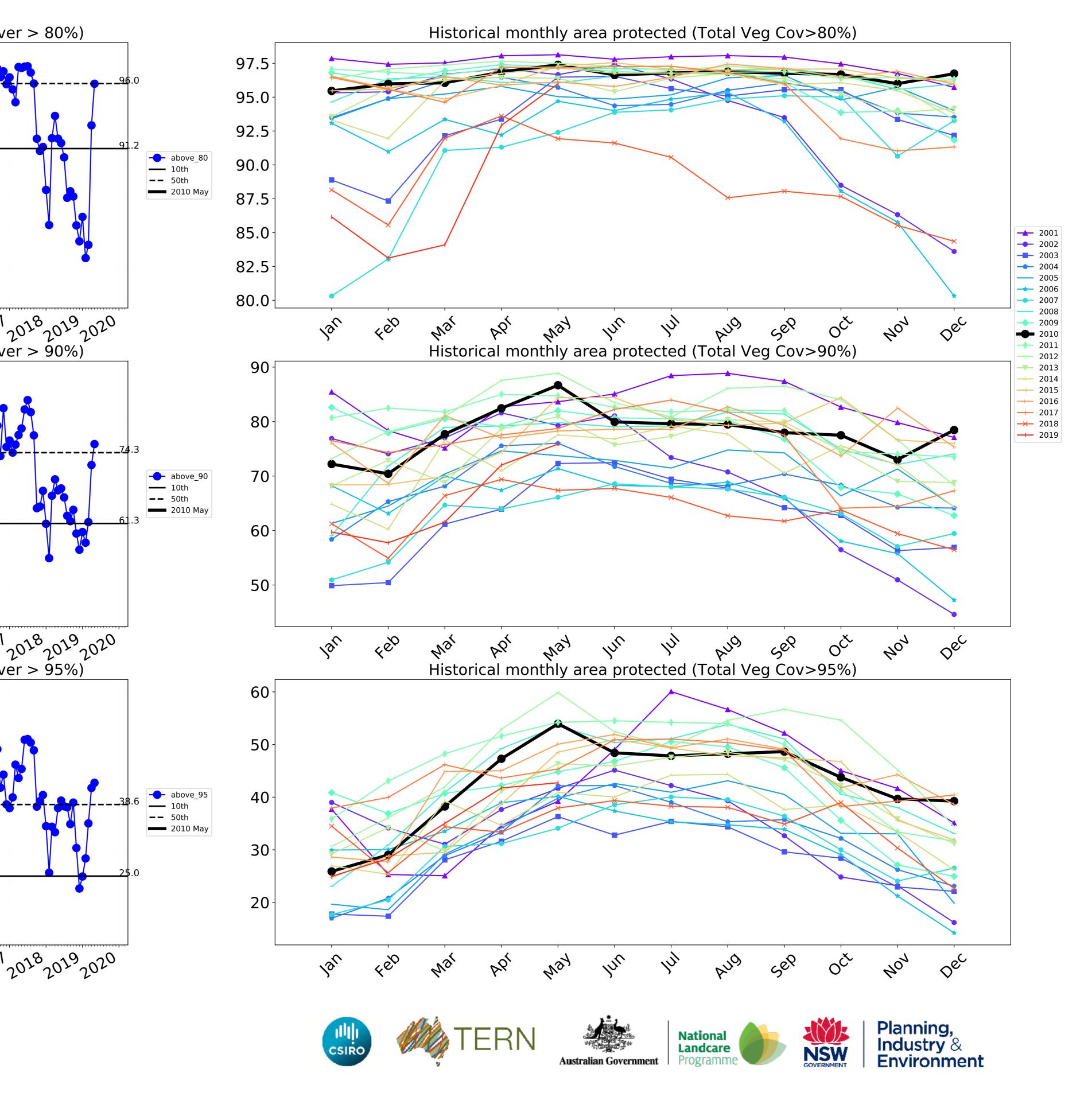




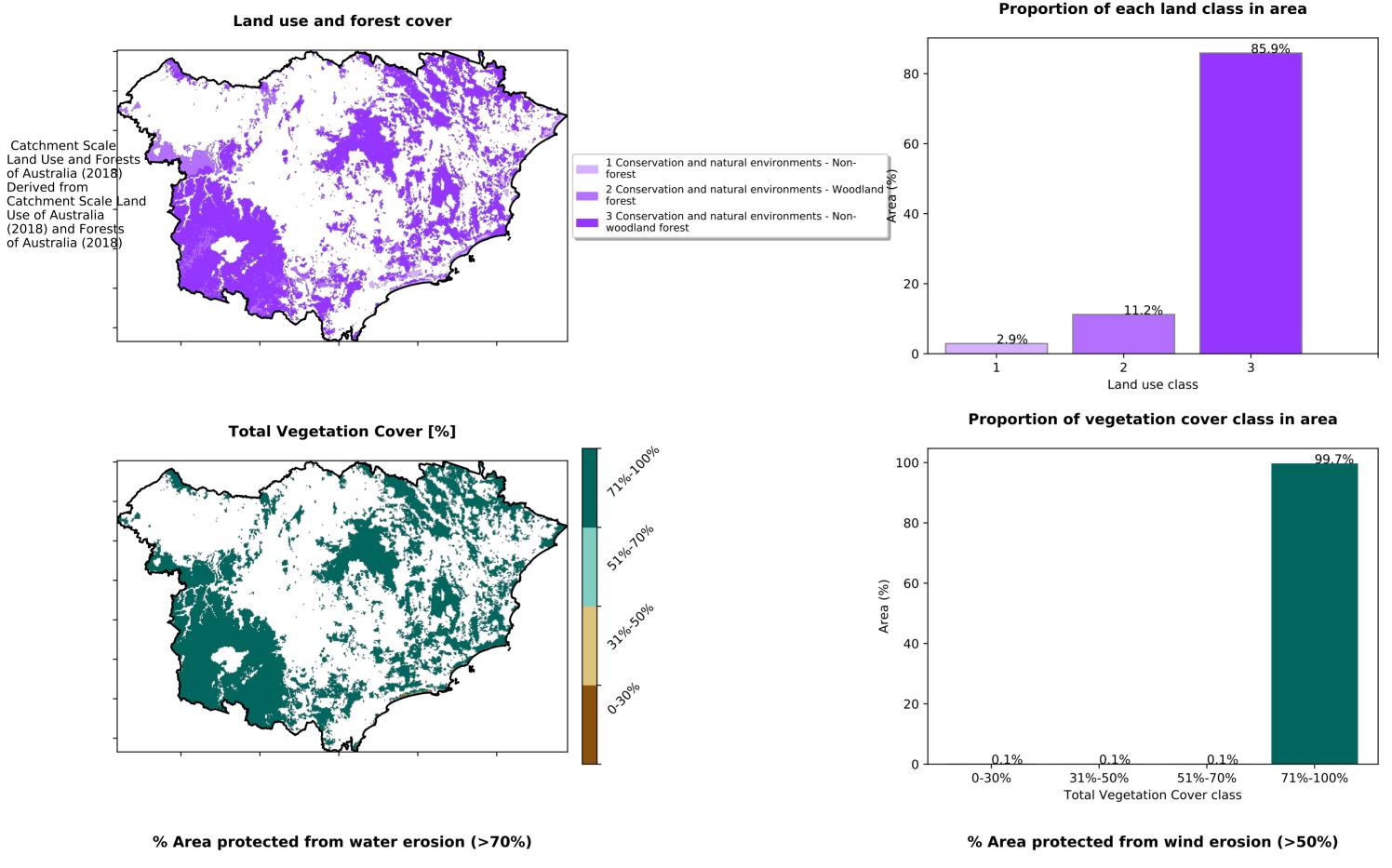


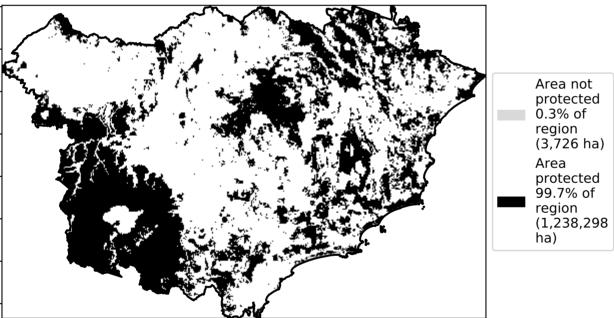


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



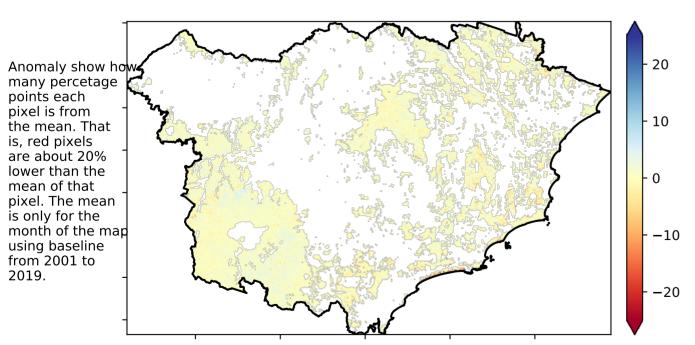
Conservation and natural environments





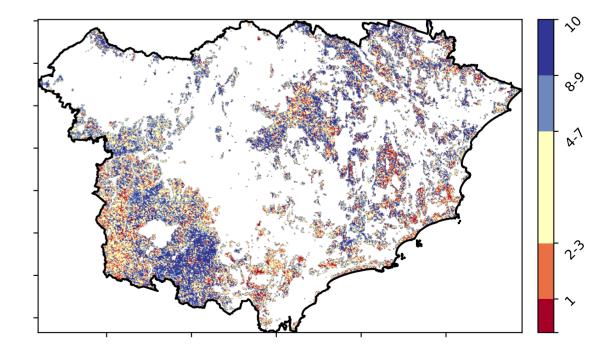
Area not protected 0.0% of region (0 ha) Area protected 100.0% of region (1,242,025 ha)

Total Vegetation Cover Anomaly [%]



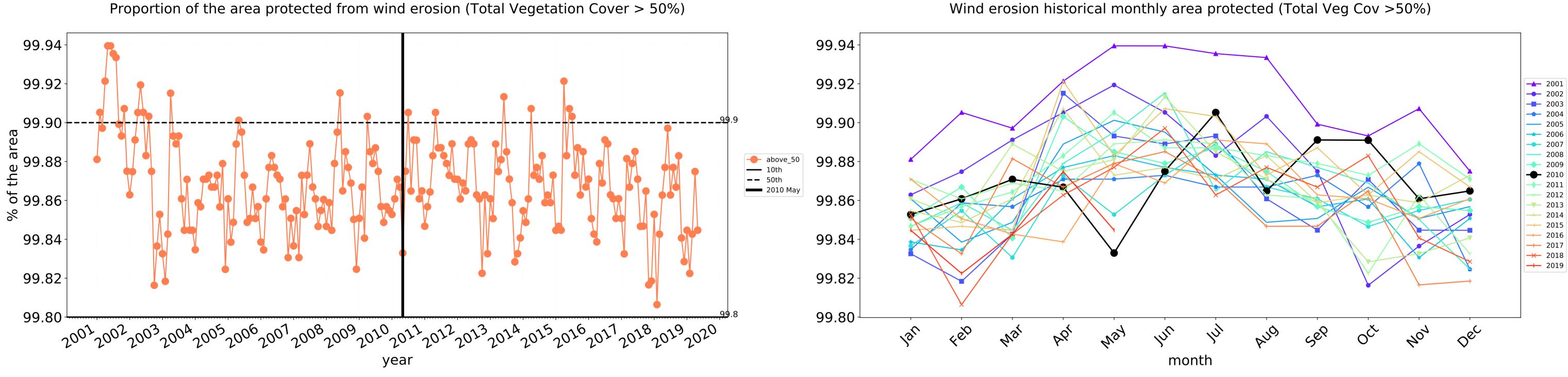
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

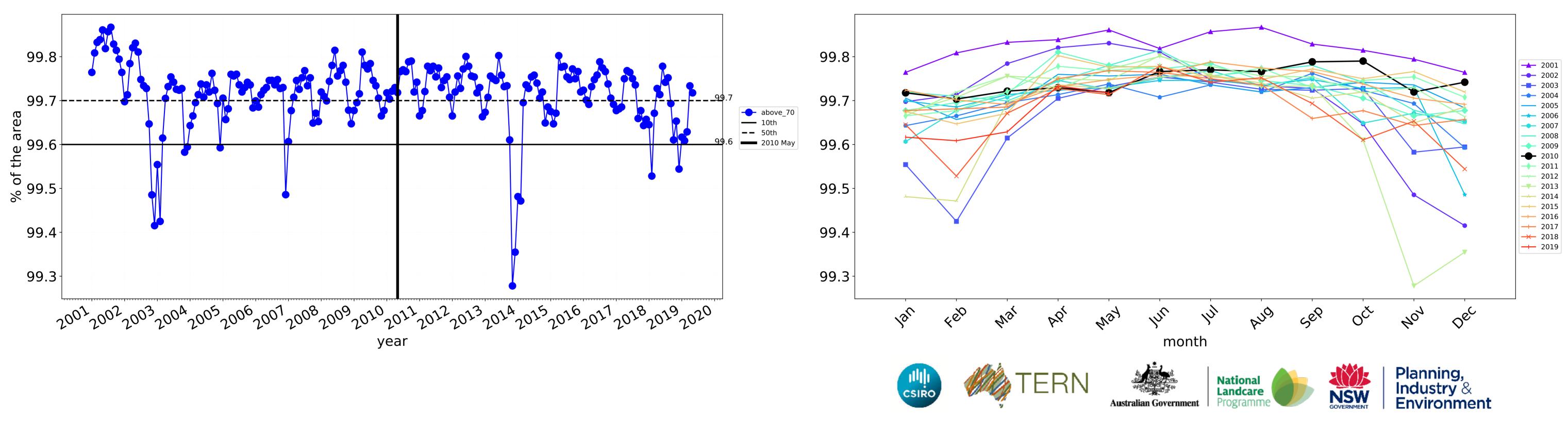




8

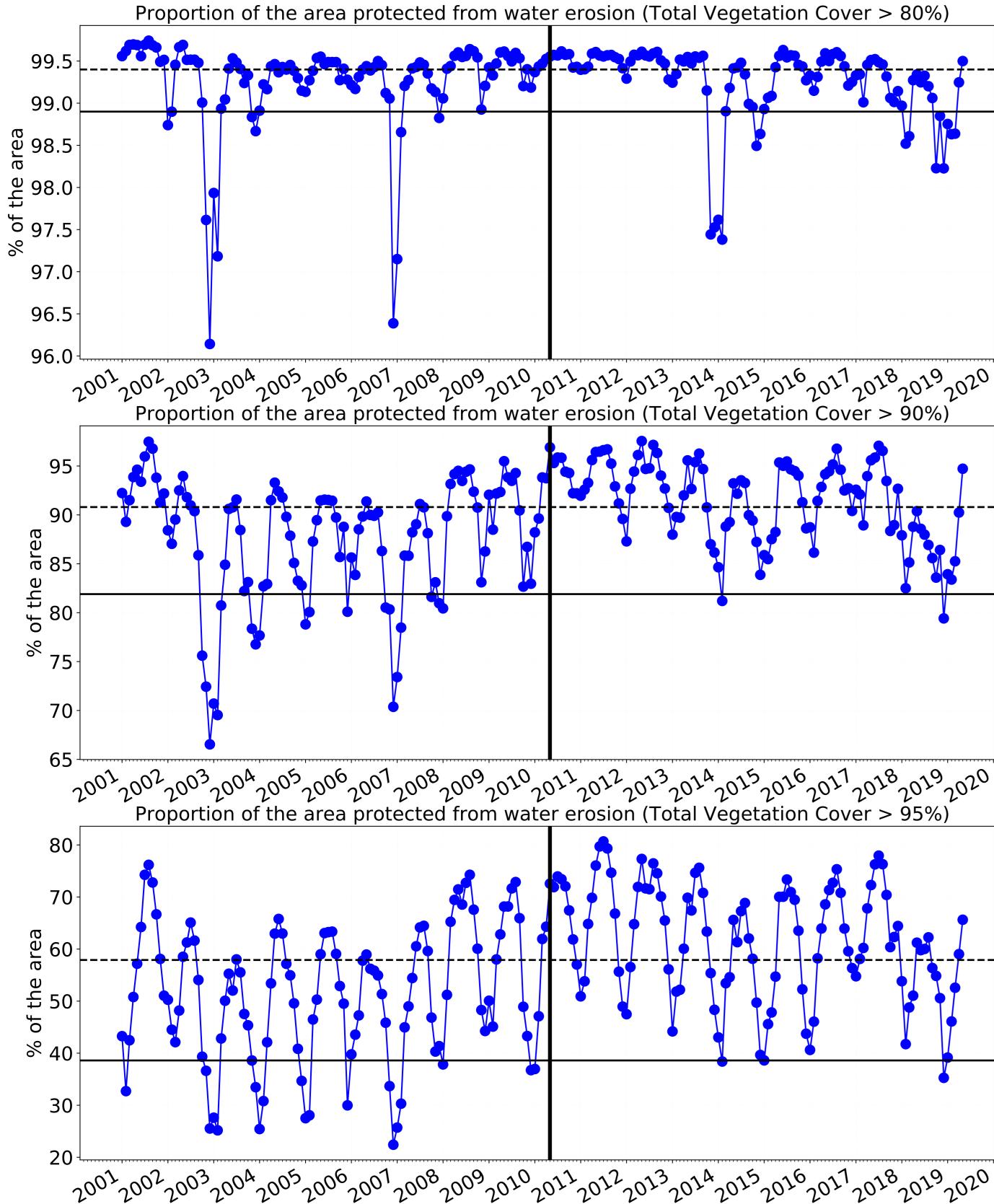


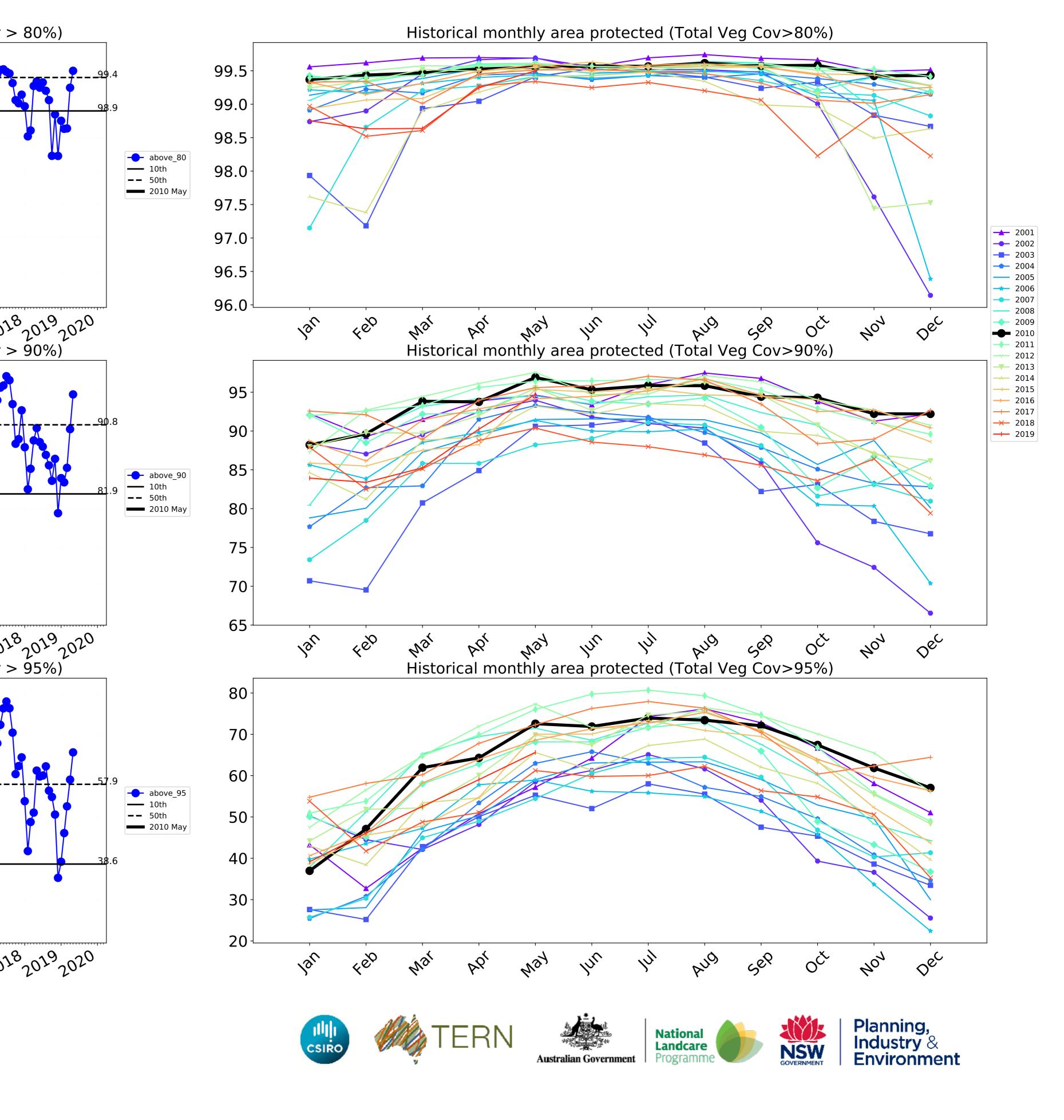
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



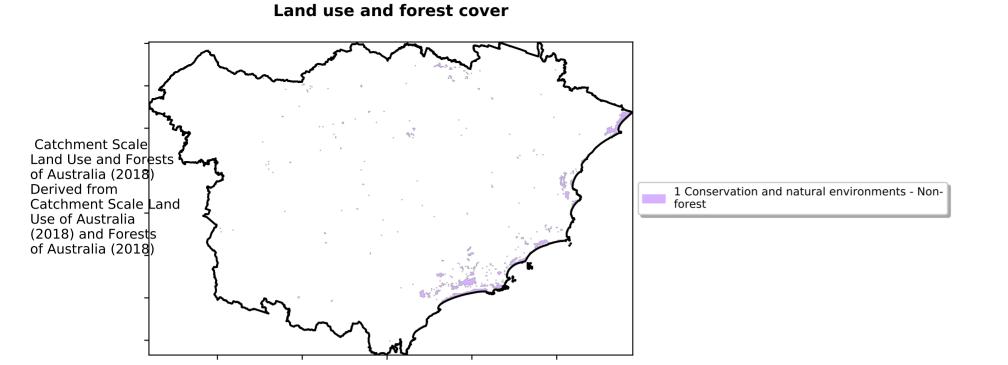
Conservation and natural environments timeseries



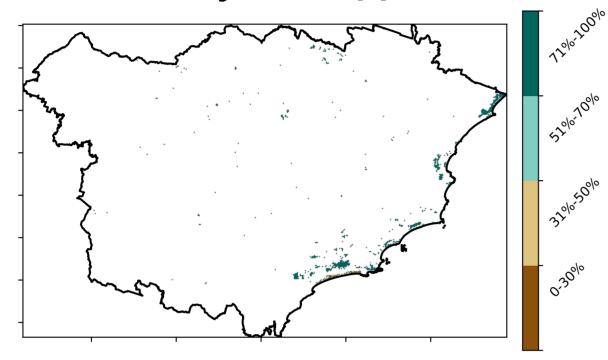




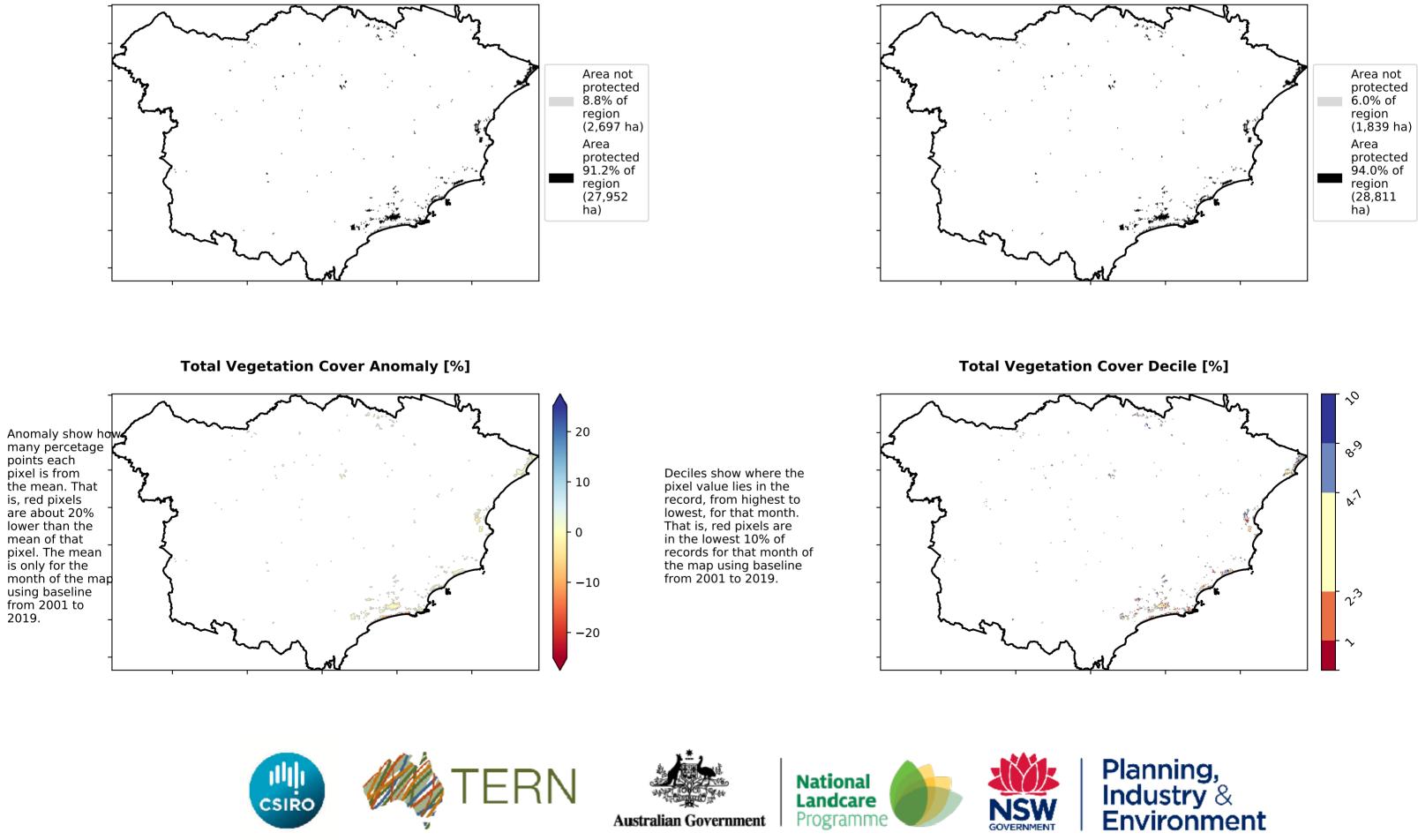
Conservation and natural environments non forest



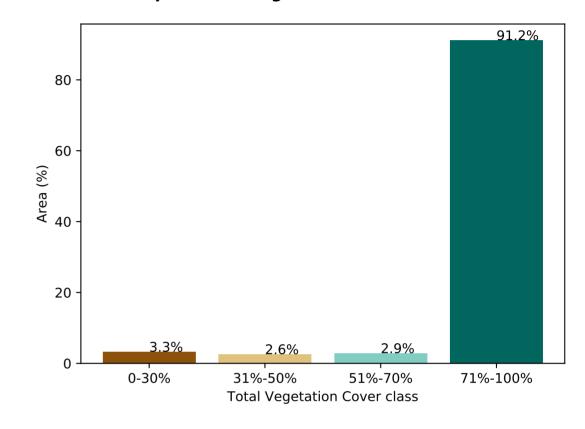
Total Vegetation Cover [%]



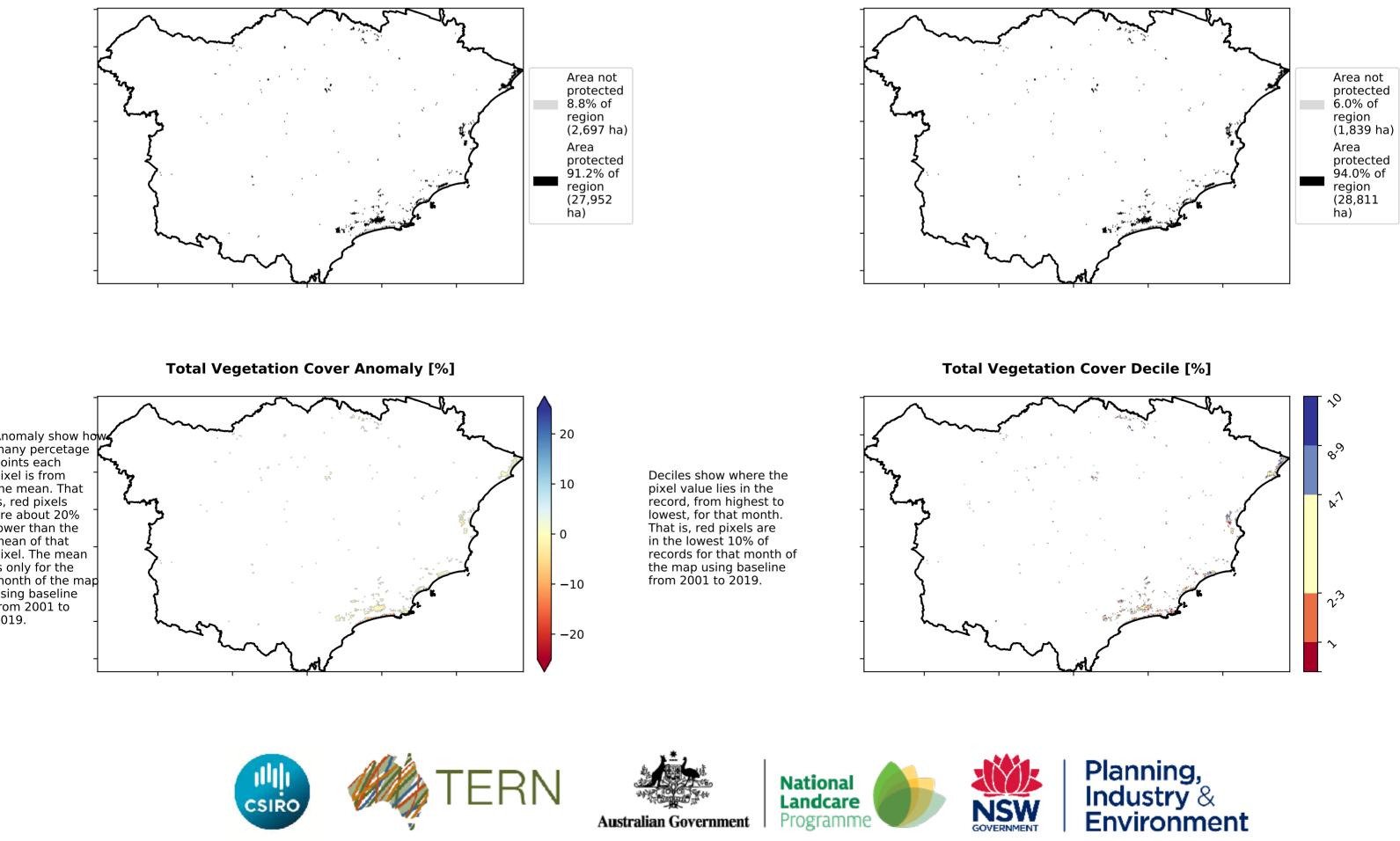
% Area protected from water erosion (>70%)

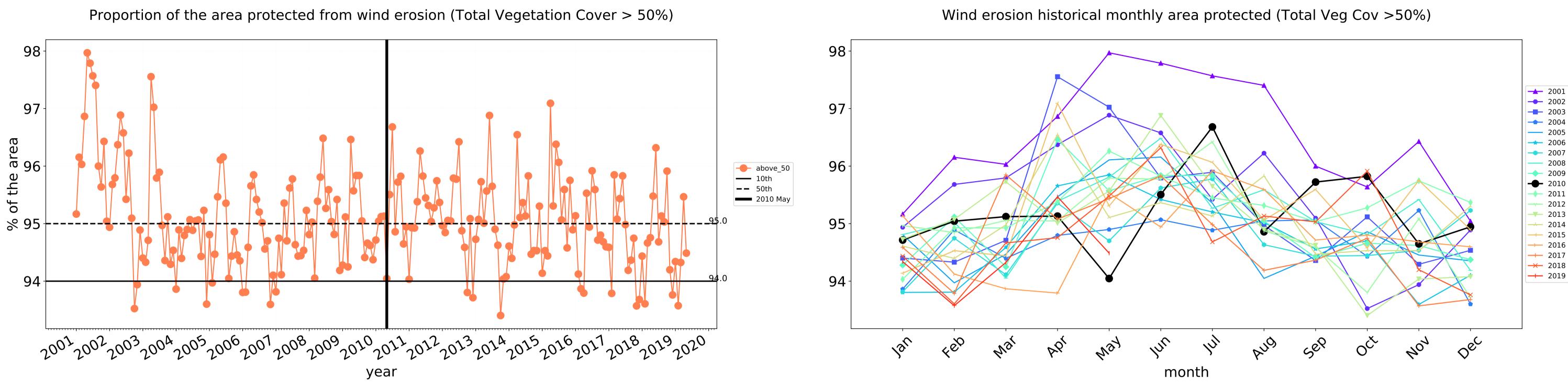


Proportion of vegetation cover class in area

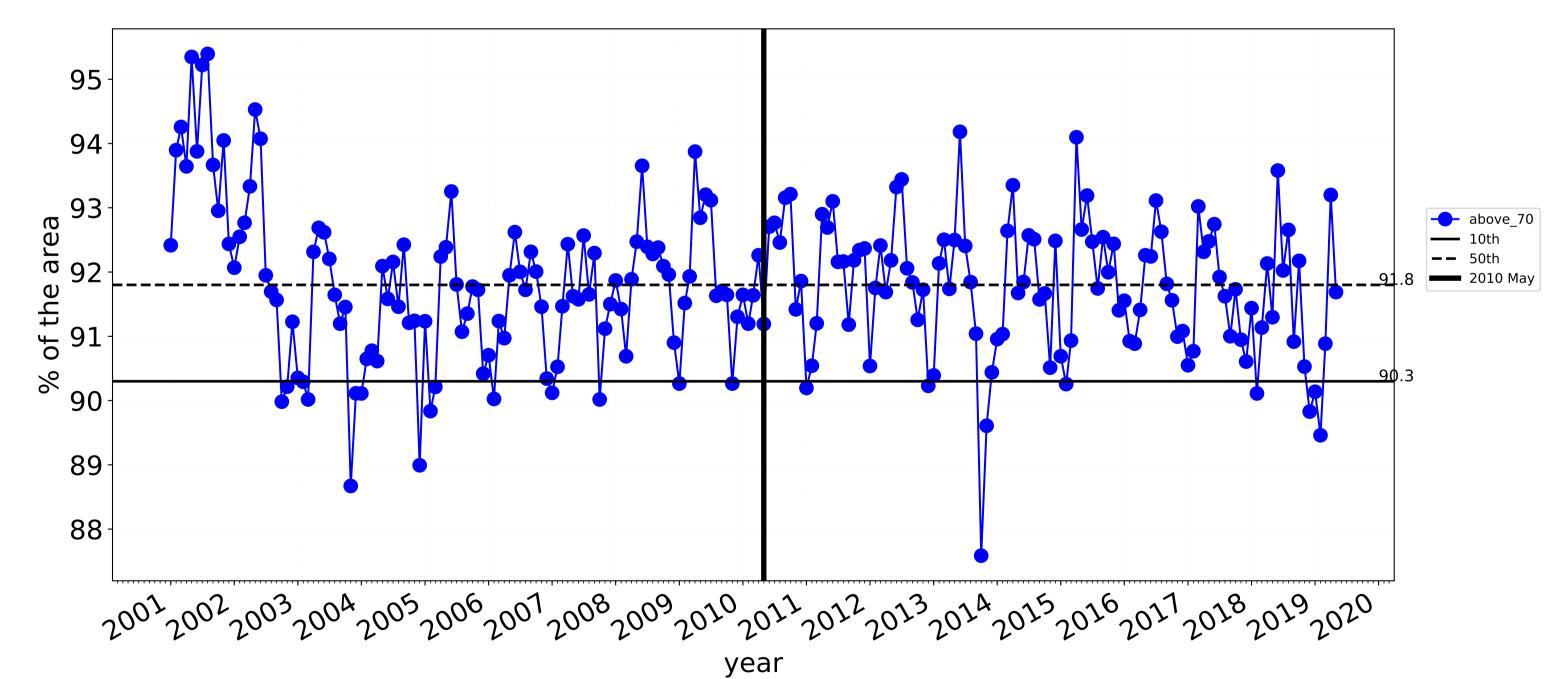


% Area protected from wind erosion (>50%)

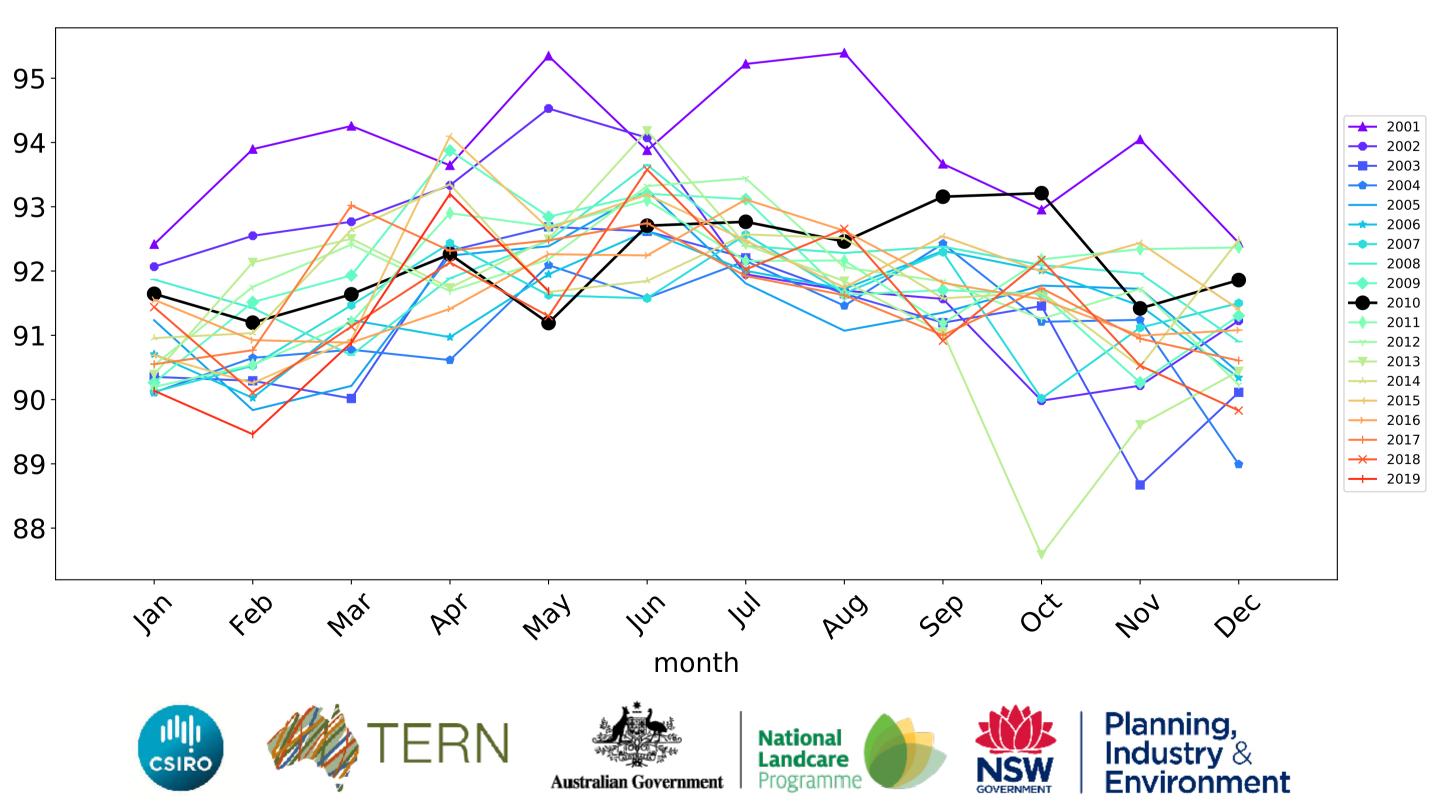




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

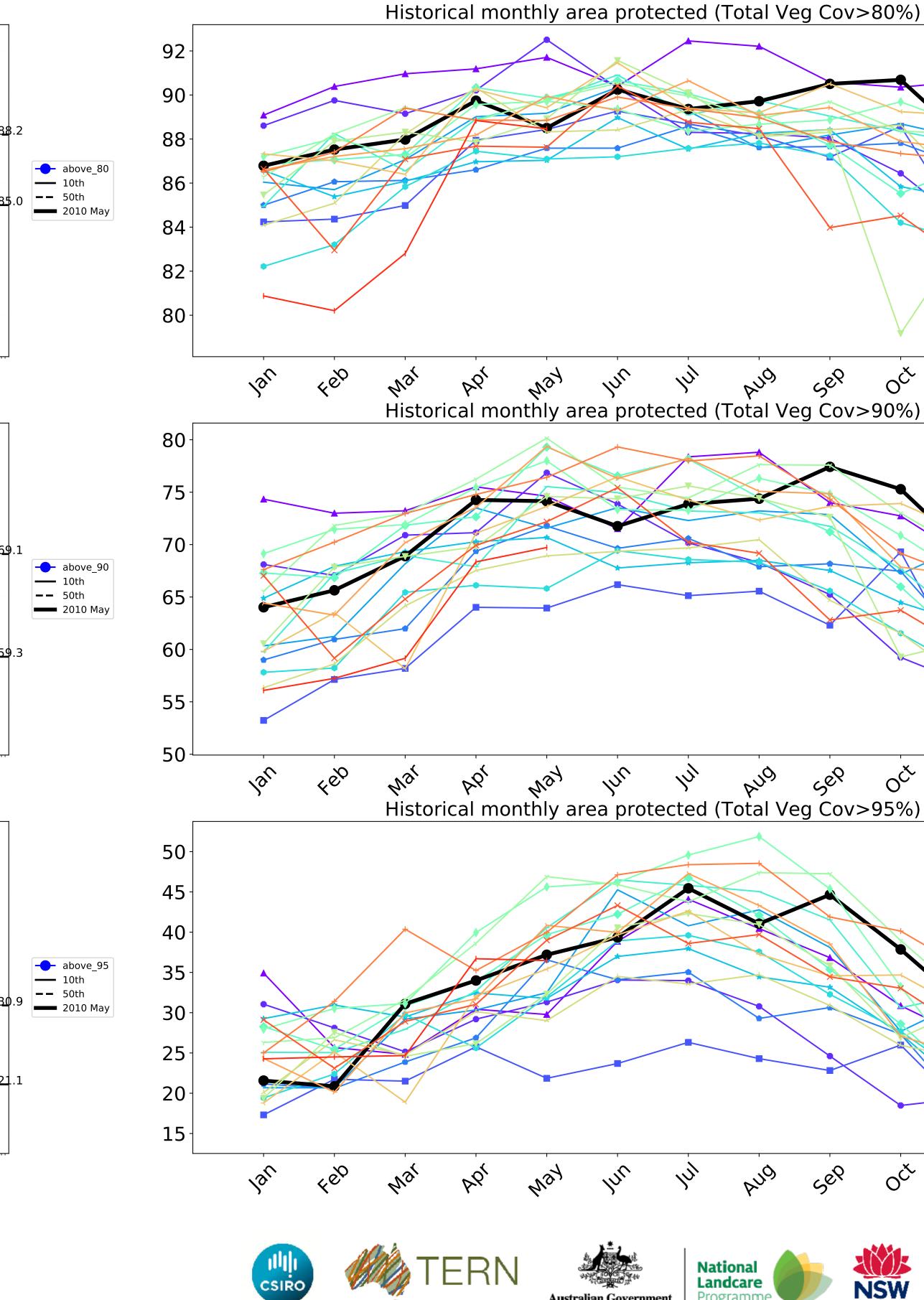


Water erosion historical monthly area protected (Total Veg Cov>70%)

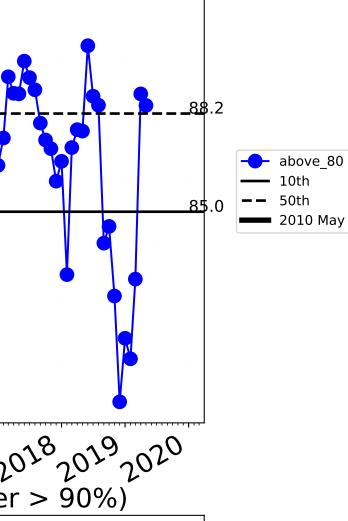


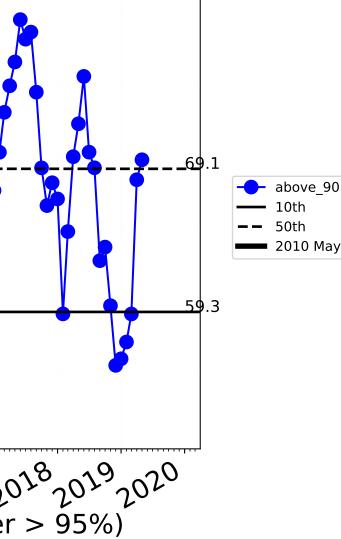
92 90 area 88 of the 86 % 82 80 $\frac{20^{2} 20^{2} 20^{2} 20^{3} 20^{4} 20^{5} 20^{6} 20^{1} 20^{2} 20^{9} 20^{9} 20^{1$ 80-75 area 0e 45 of 8 60-55 50 $\frac{20^{2} 20^{2} 20^{2} 20^{3} 20^{4} 20^{5} 20^{6} 20^{1} 20^{8} 20^{9} 20^{1$ 50 45 40 35 30 25 25 20 15 20012002200320042005200620012008200920102011201220132014201520162011201820192020

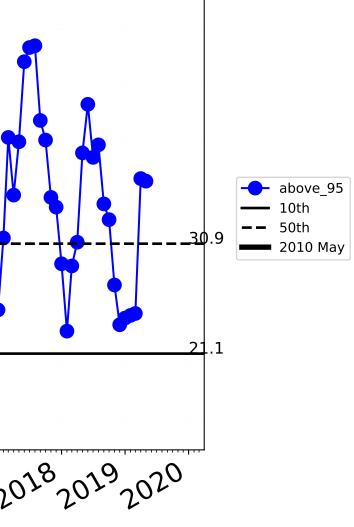
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



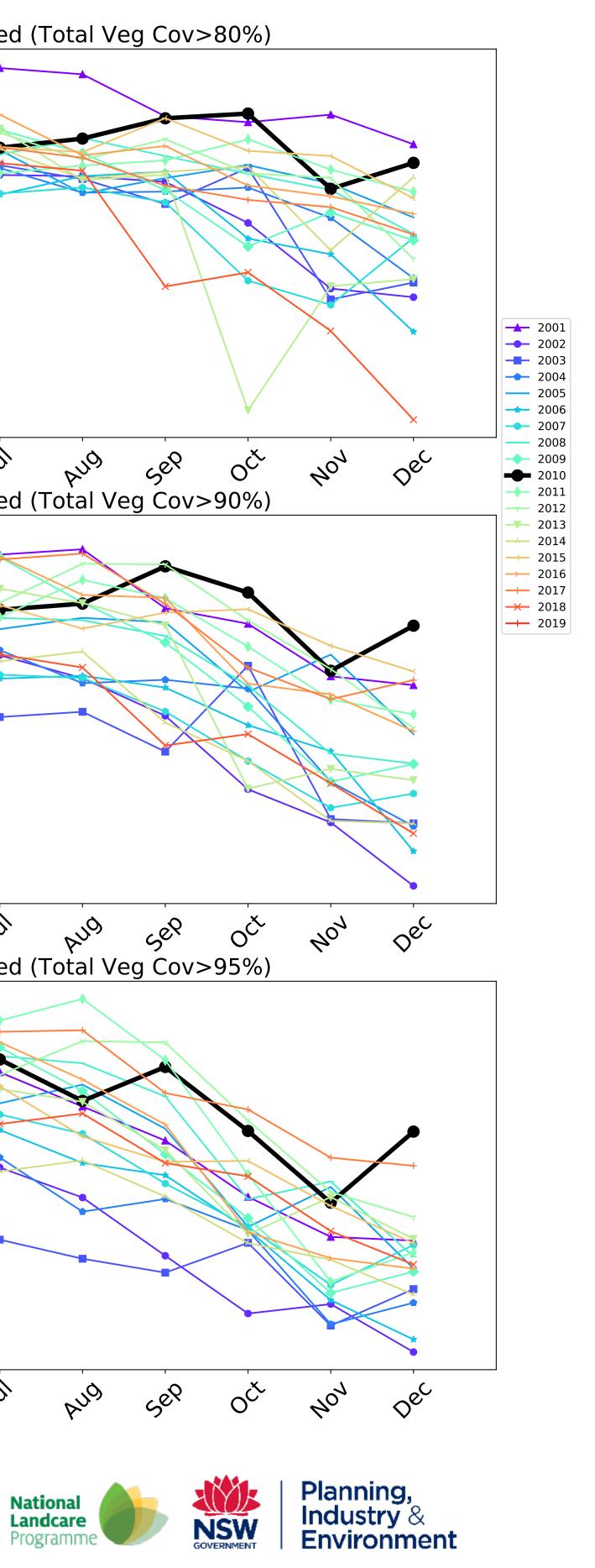
CSIRO







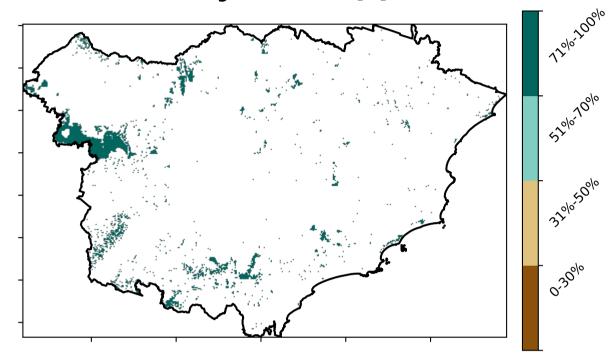
Australian Government



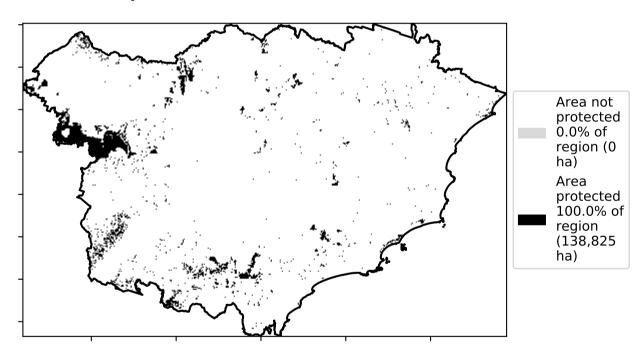
Conservation and natural environments Woodland forest



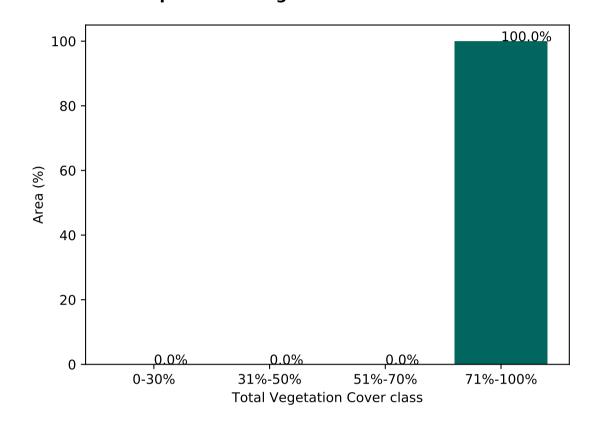
Total Vegetation Cover [%]



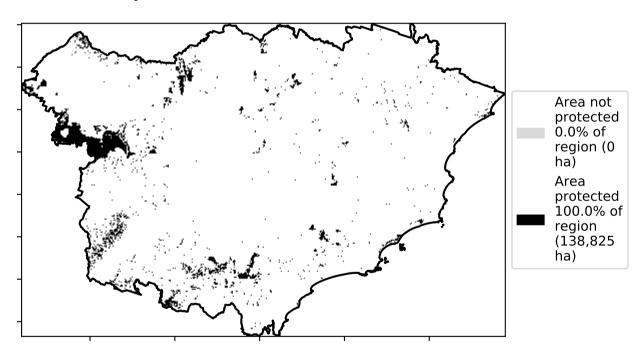
% Area protected from water erosion (>70%)



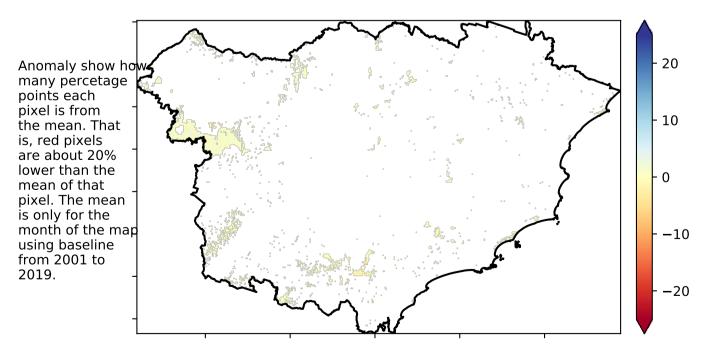
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

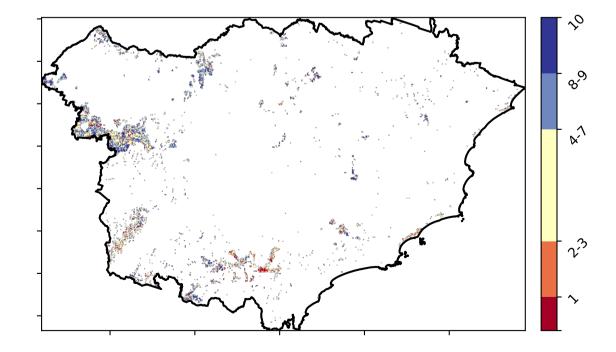


Total Vegetation Cover Anomaly [%]

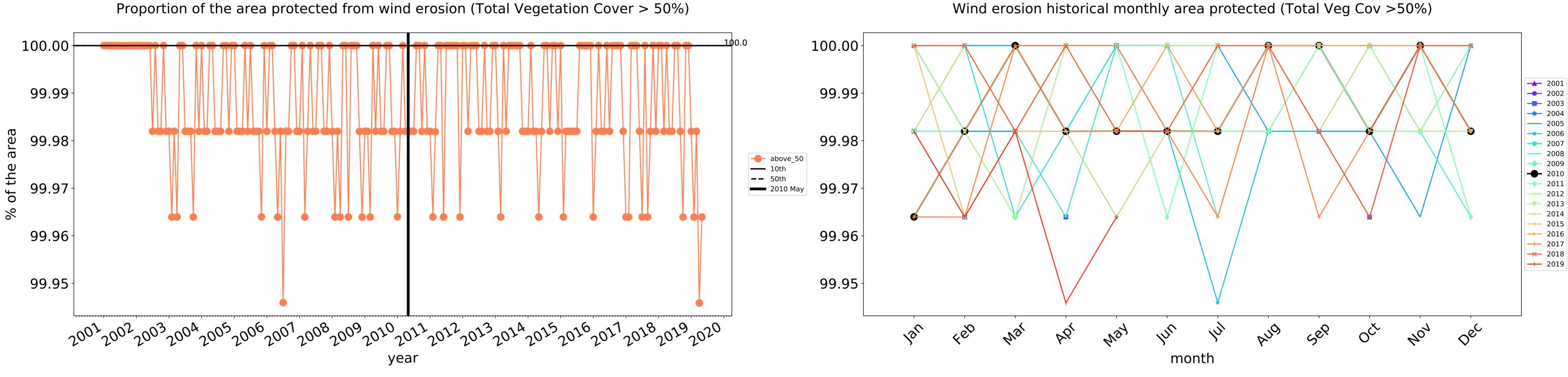


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

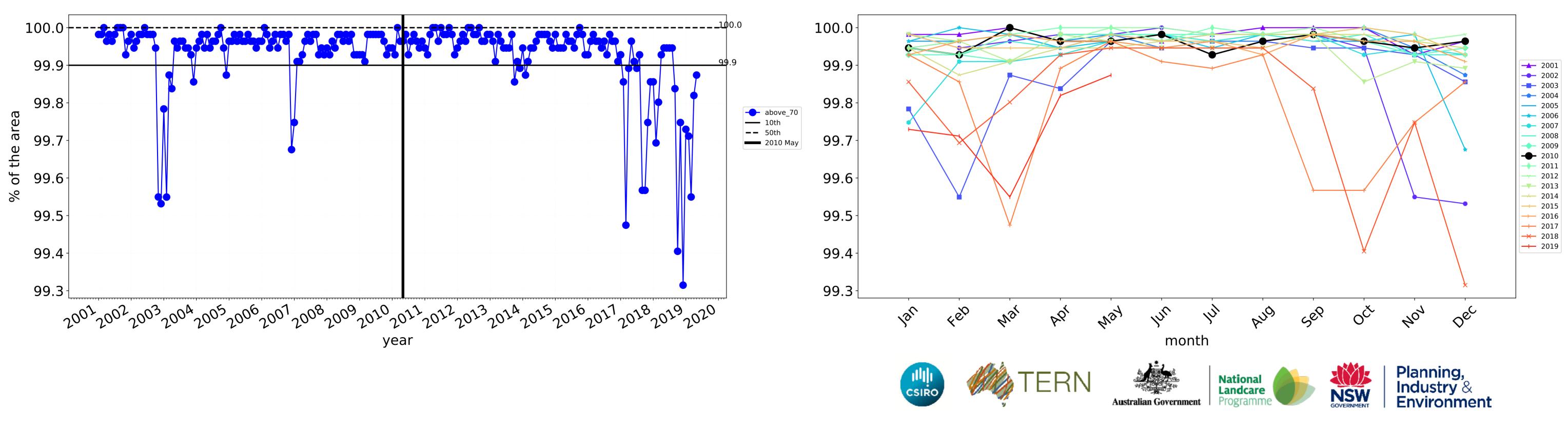
Total Vegetation Cover Decile [%]



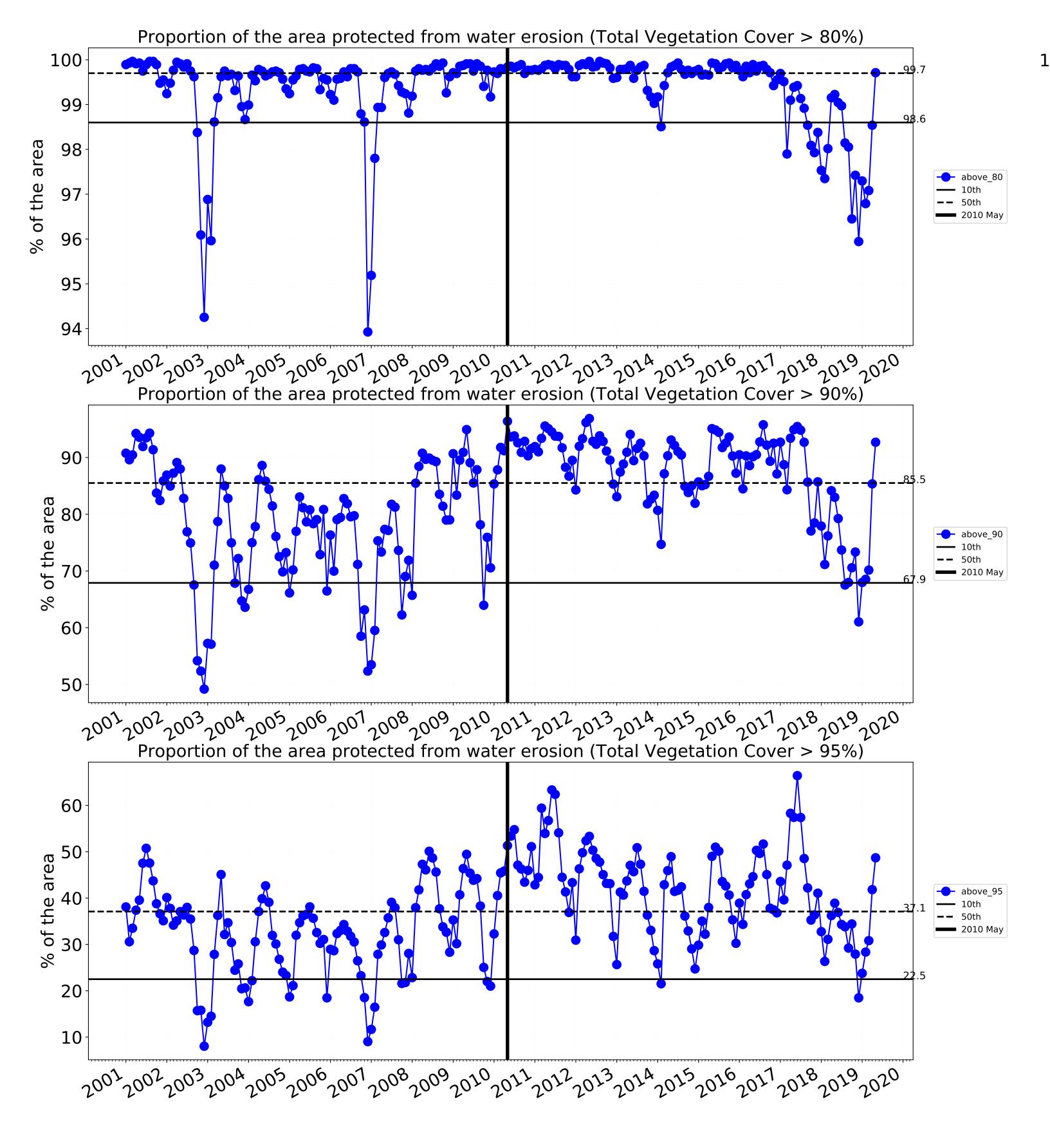


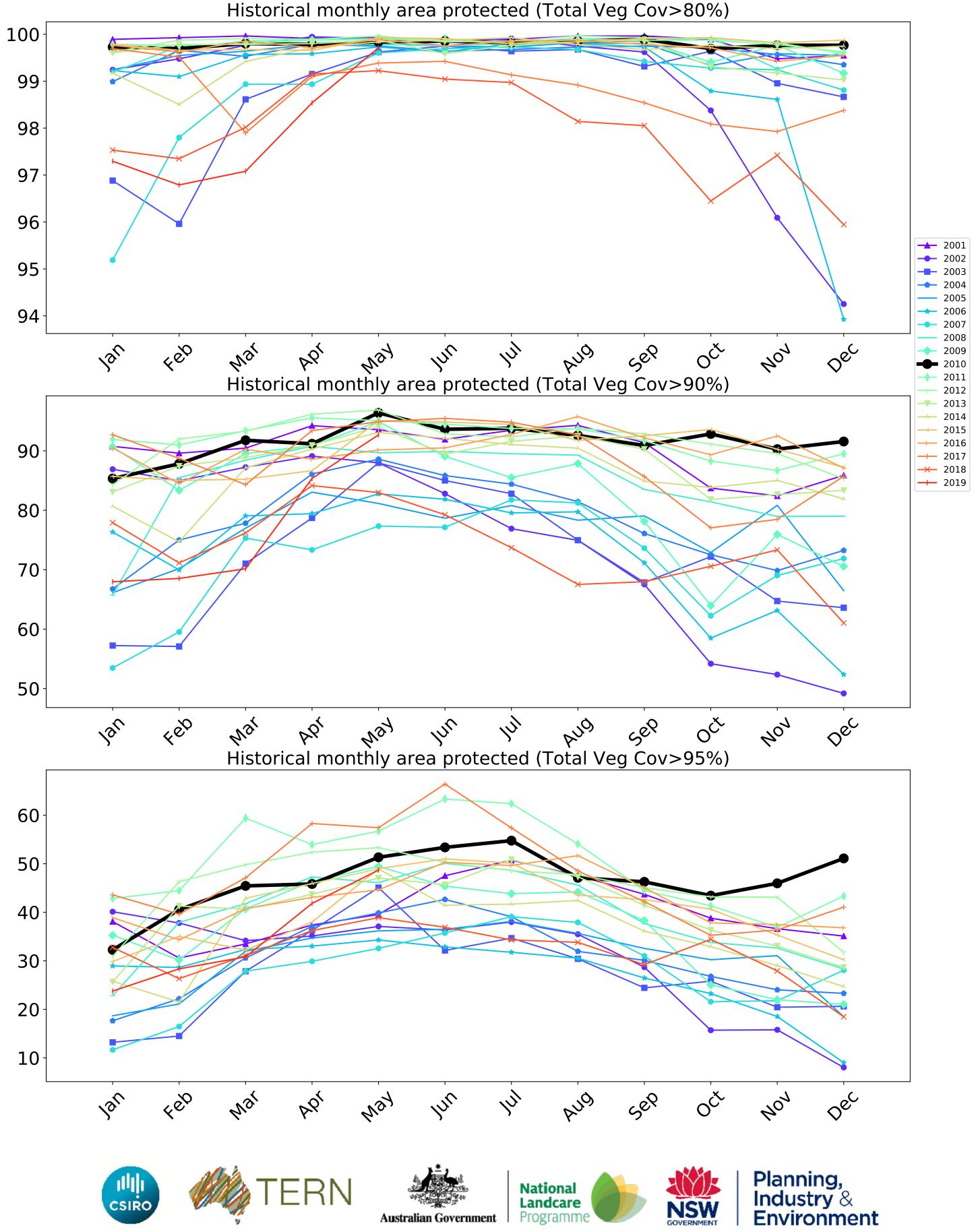


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

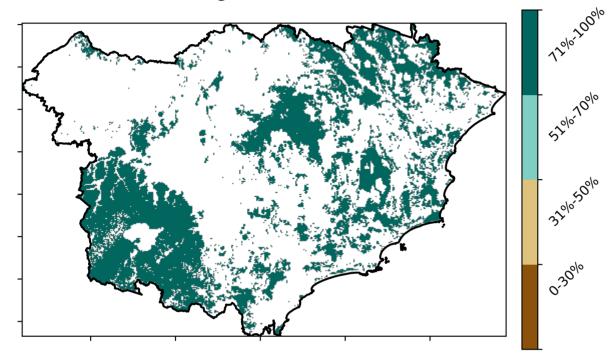




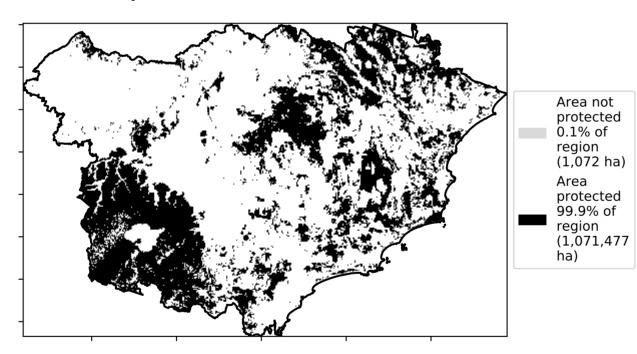
Conservation and natural environments Forest (non woodland)



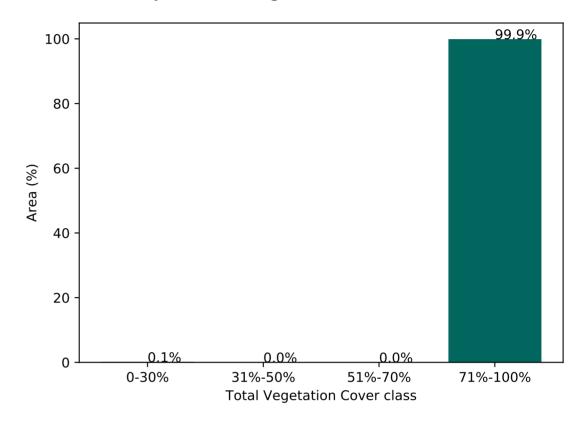
Total Vegetation Cover [%]



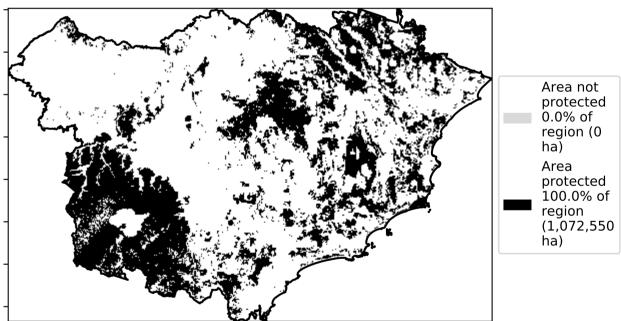
% Area protected from water erosion (>70%)



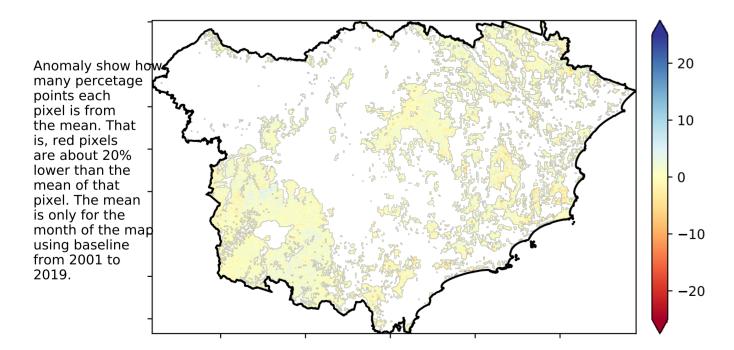
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

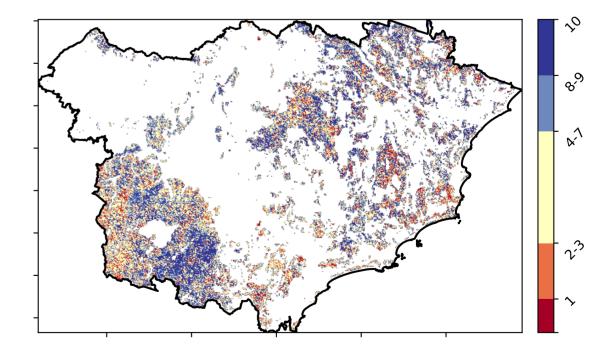


Total Vegetation Cover Anomaly [%]

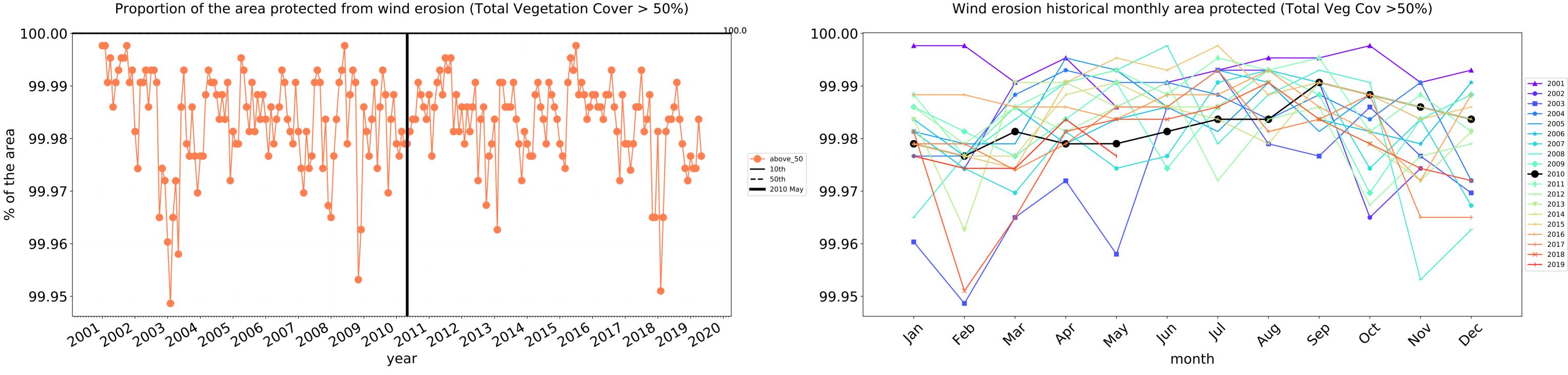


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

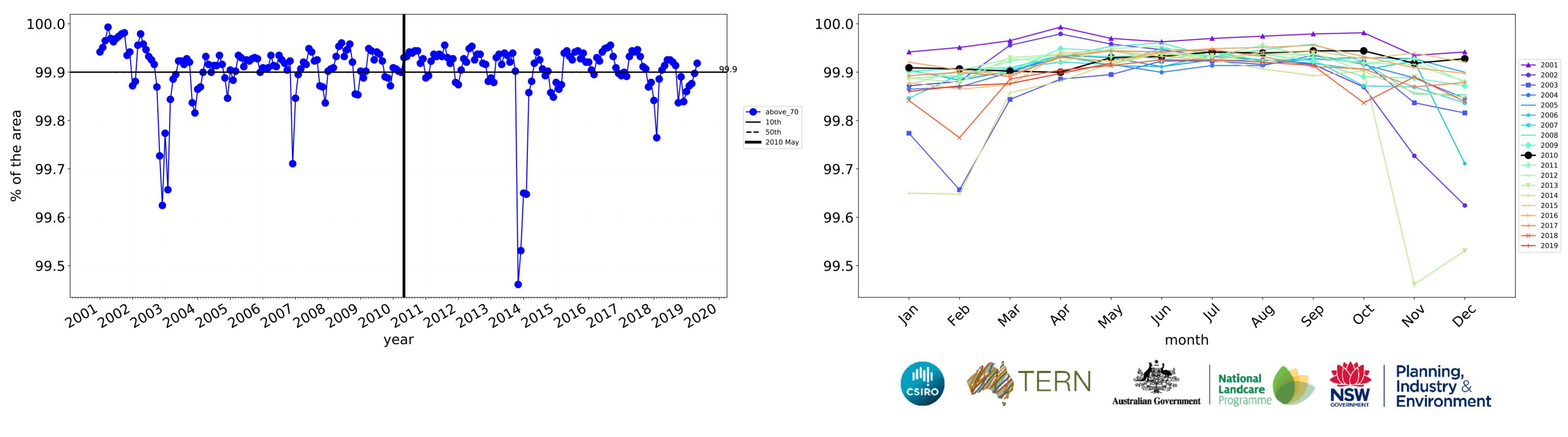
Total Vegetation Cover Decile [%]



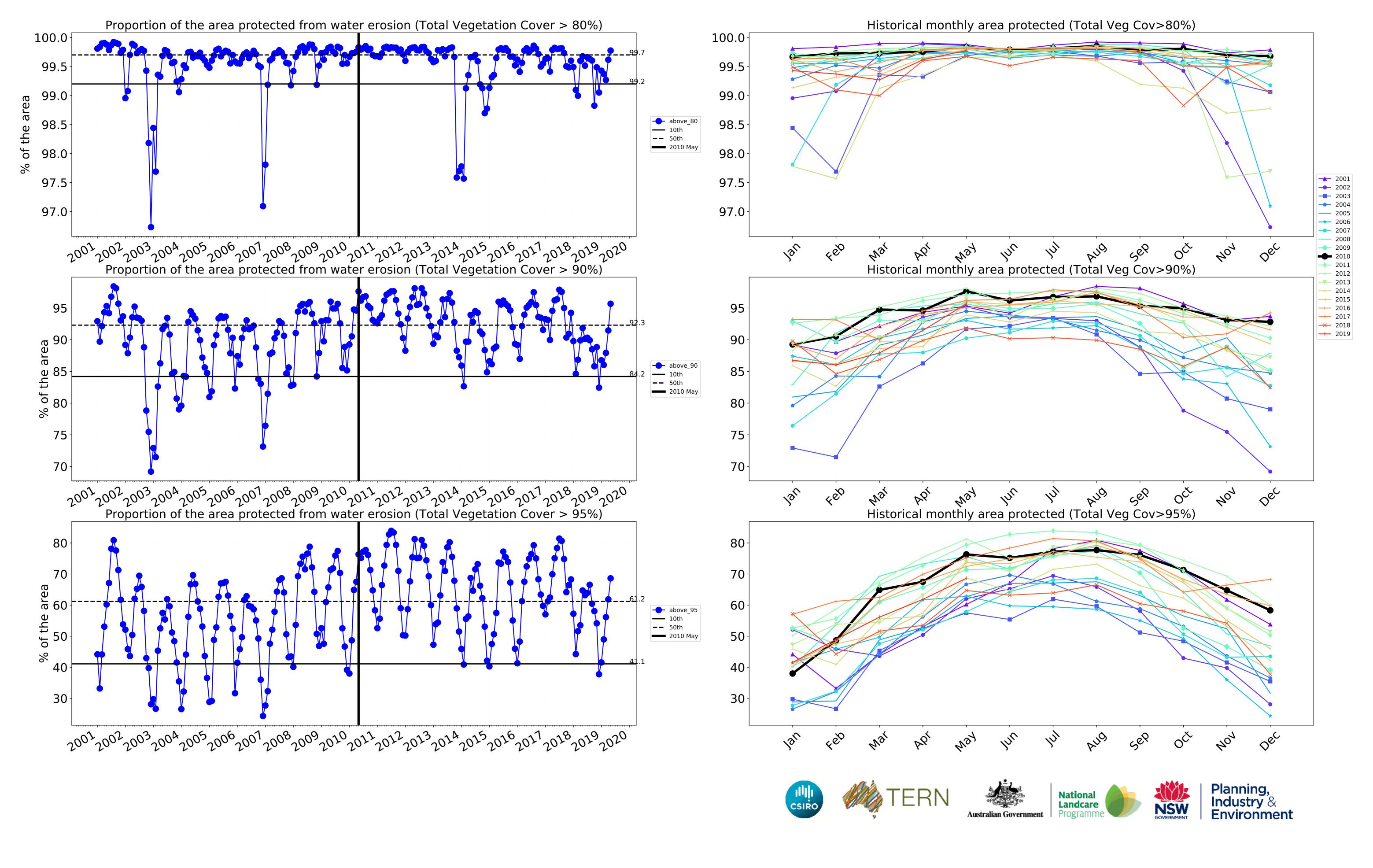




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



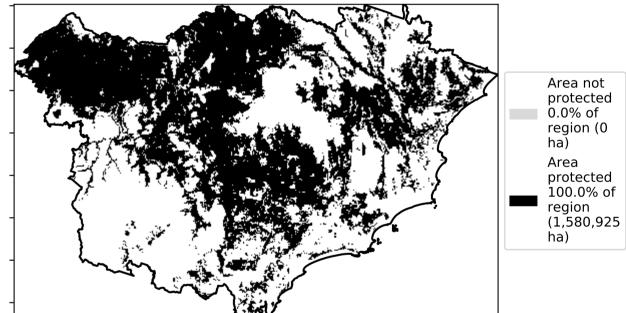
Water erosion historical monthly area protected (Total Veg Cov>70%)



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 Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 12%,100 100 80 52%70% 60 Area (%) 32010 40 0.30% 20 0.2% 0.0% 0.0% 0 0-30% 31%-50% 51%-70% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)

Proportion of each land class in area

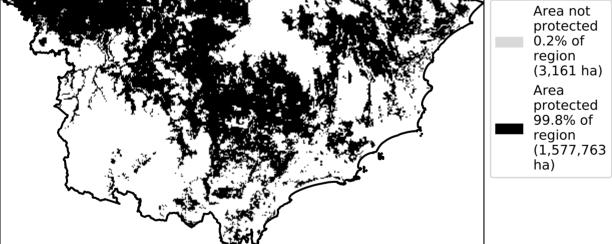


0.2%

8

99.8%

71%-100%

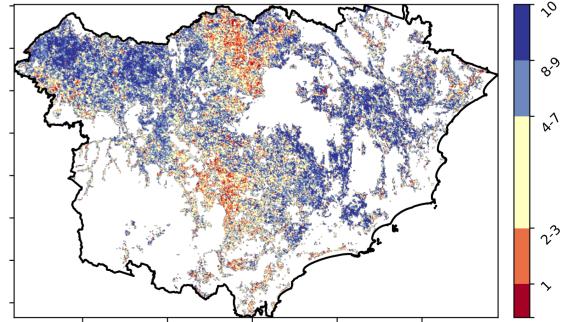


Total Vegetation Cover Anomaly [%]

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

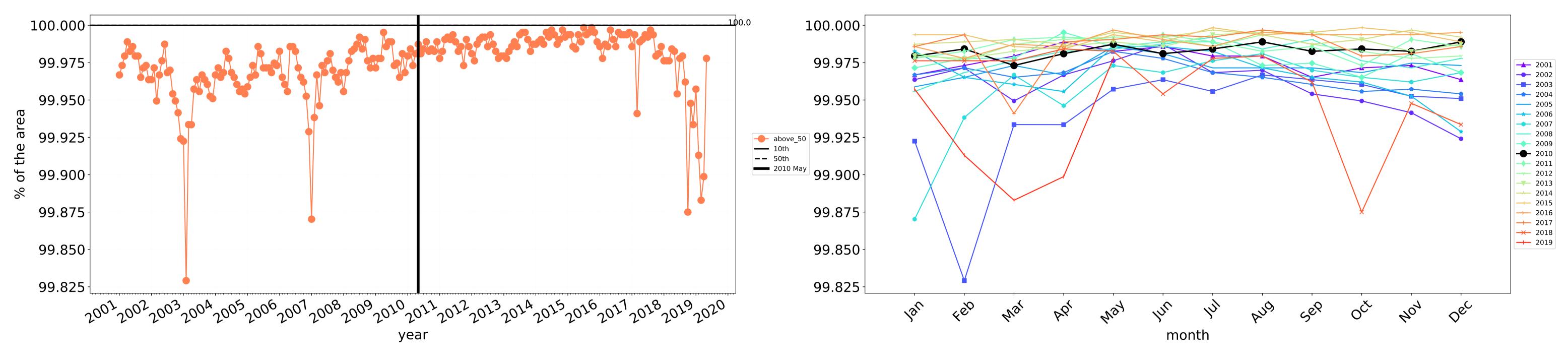
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



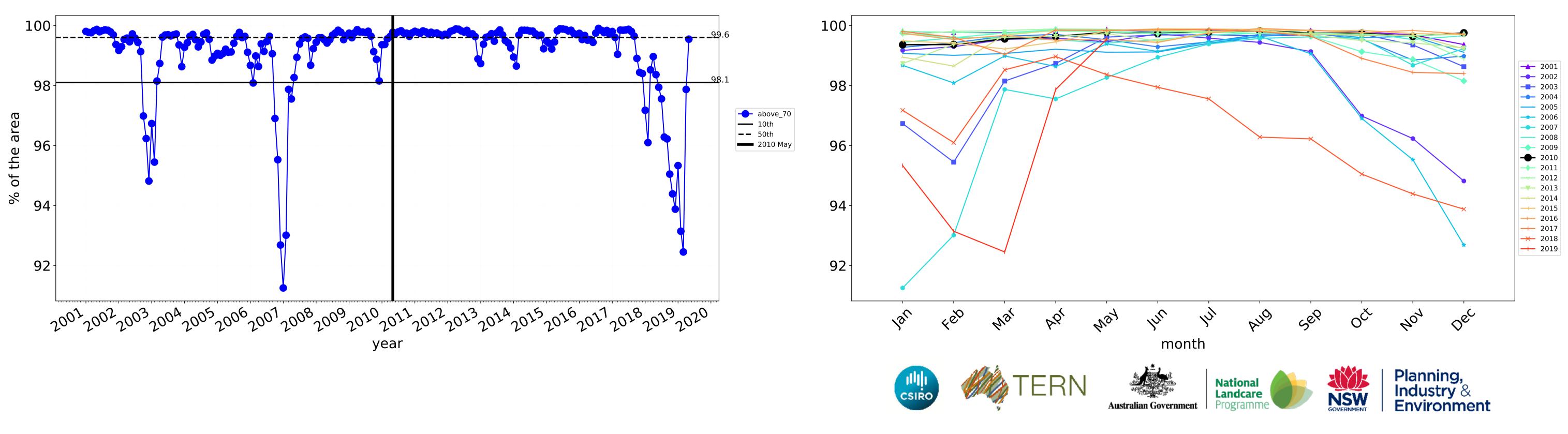


12



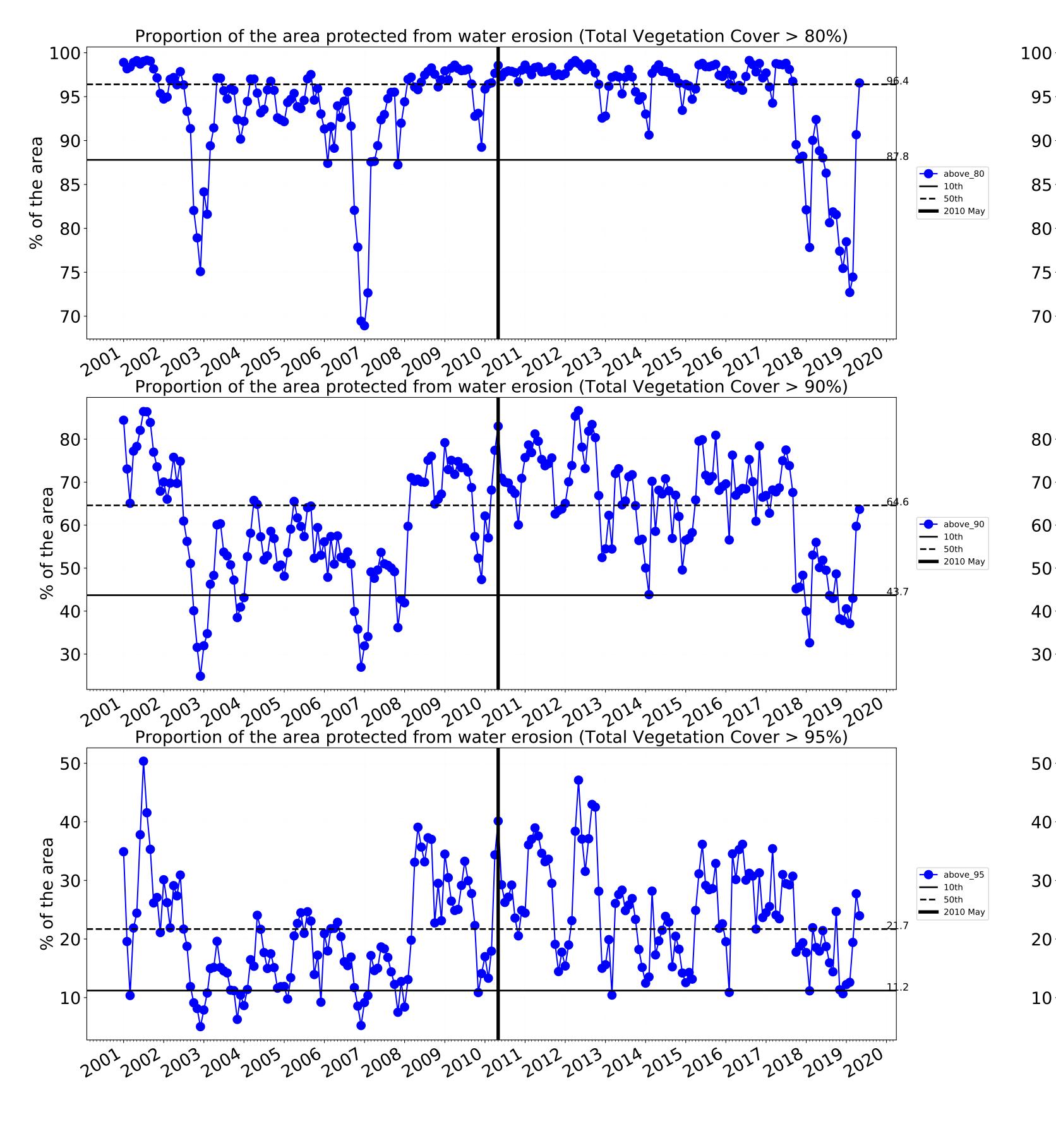
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

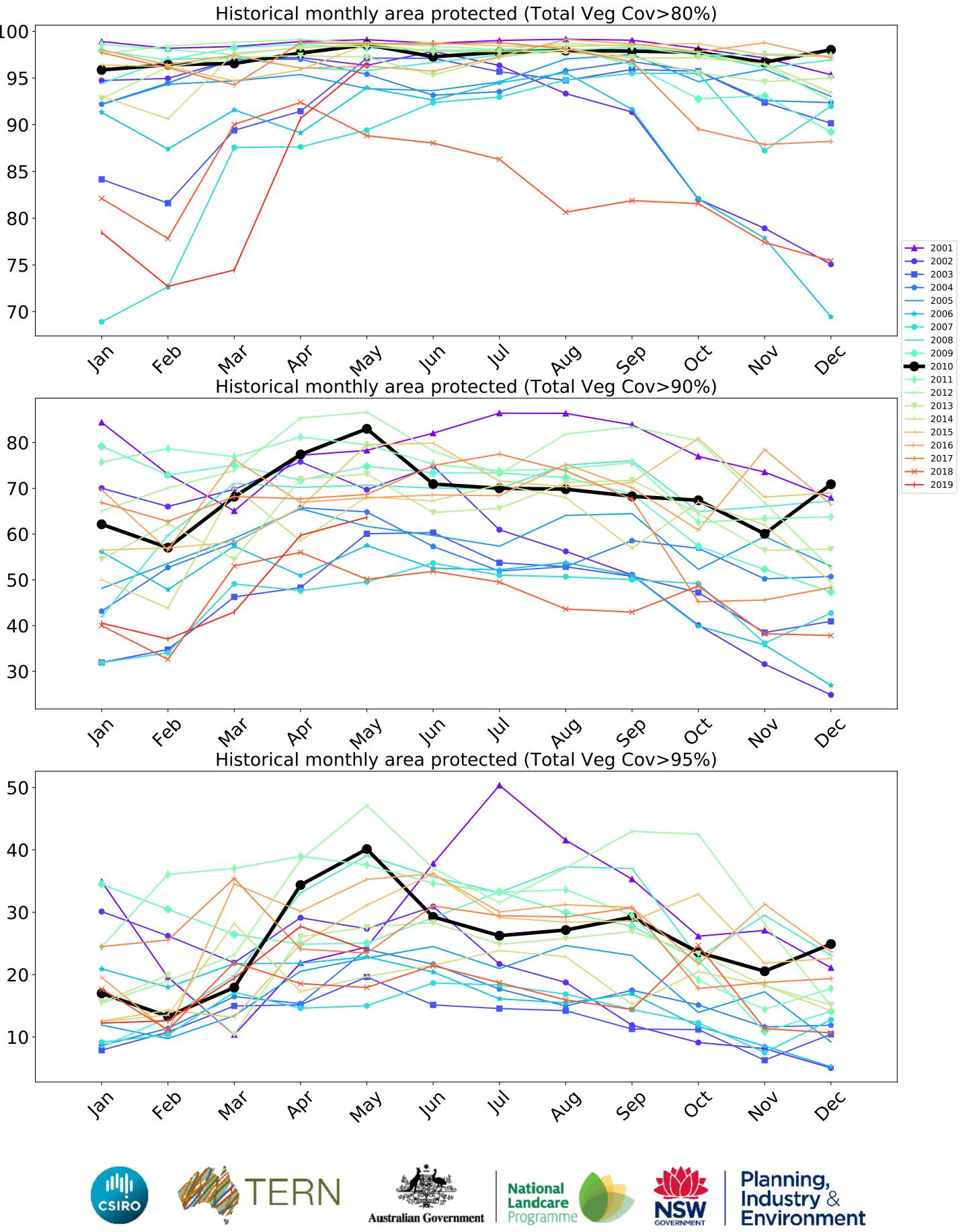
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



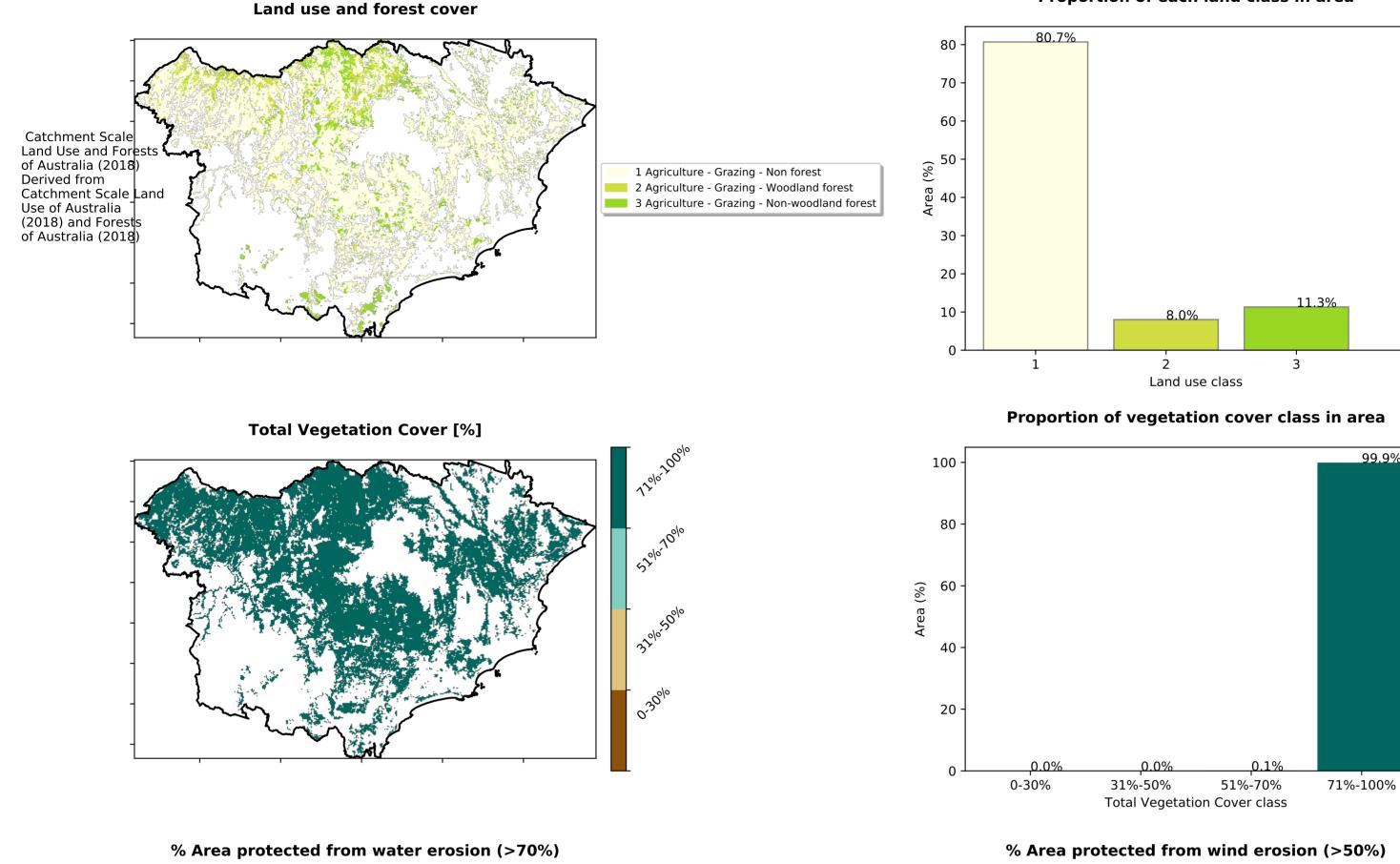
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



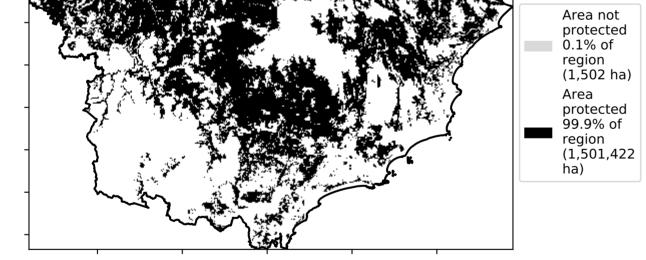


Grazing





99.9%





Total Vegetation Cover Anomaly [%]

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.

Anomaly show how many percetage points each pixel is from the mean. That · 20 - 10 0 -10

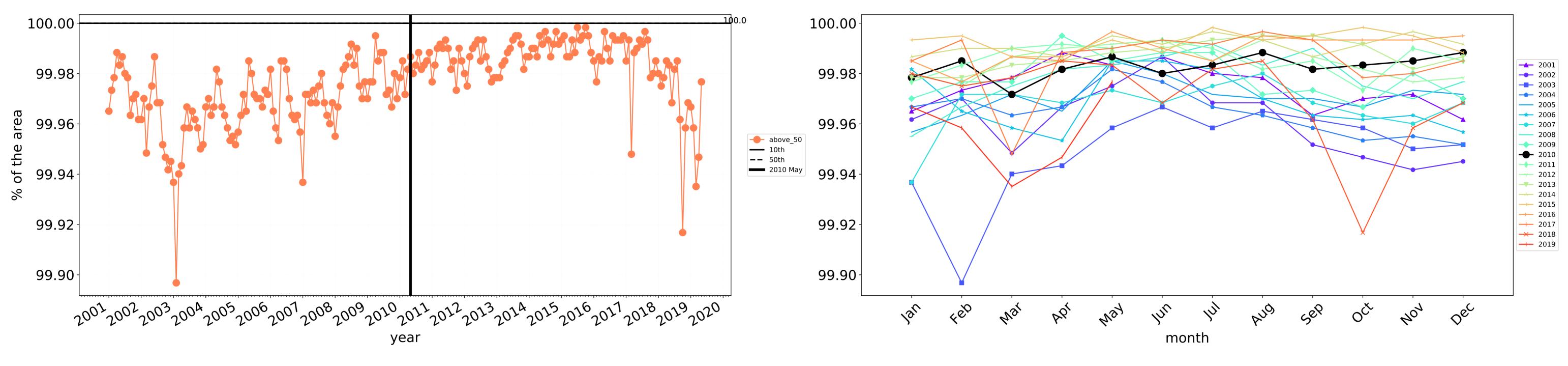
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

 $\hat{\mathcal{V}}$ °, A.1 · ~??

Total Vegetation Cover Decile [%]

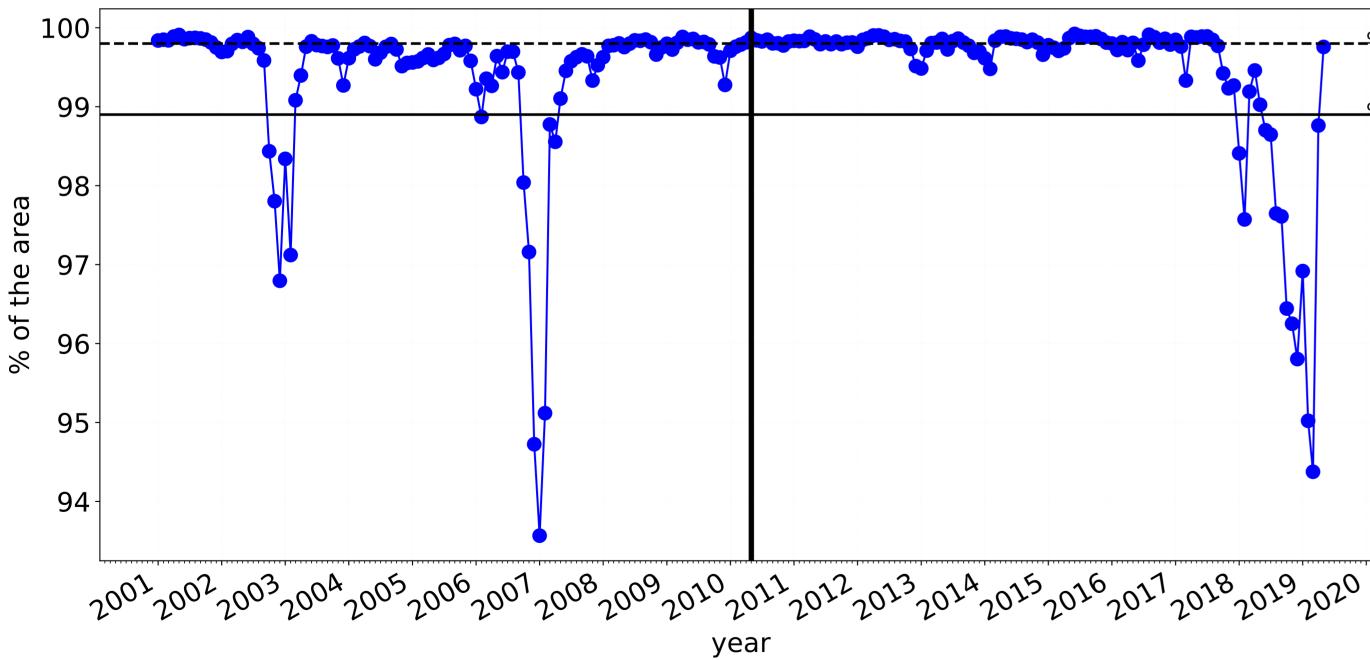


-20

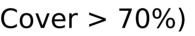


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

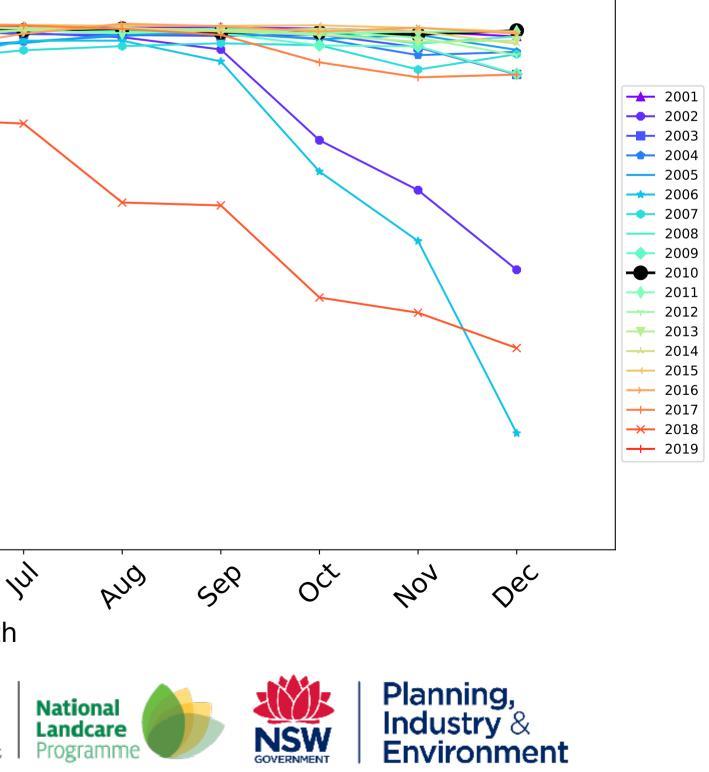


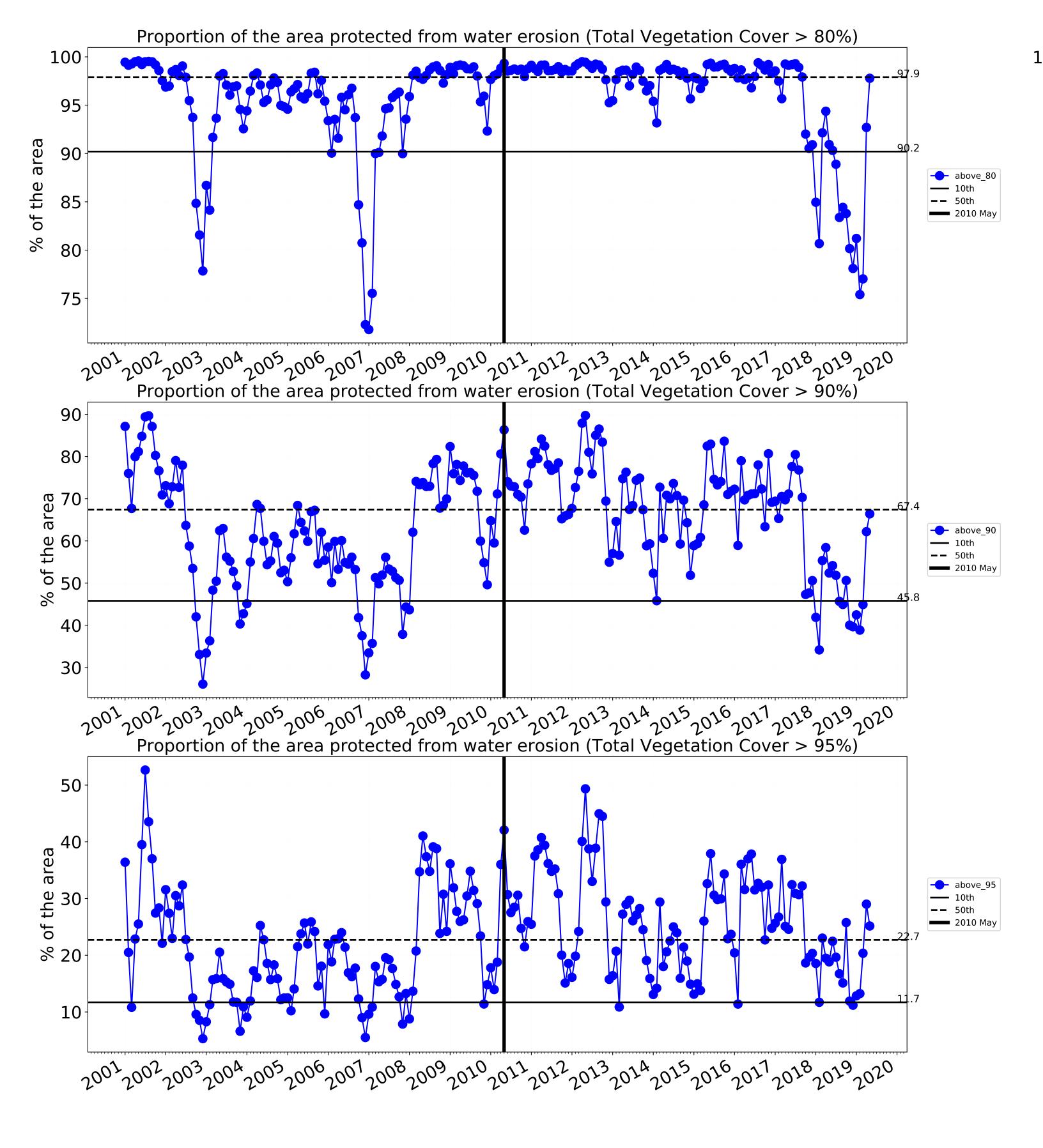
Wind erosion historical monthly area protected (Total Veg Cov >50%)

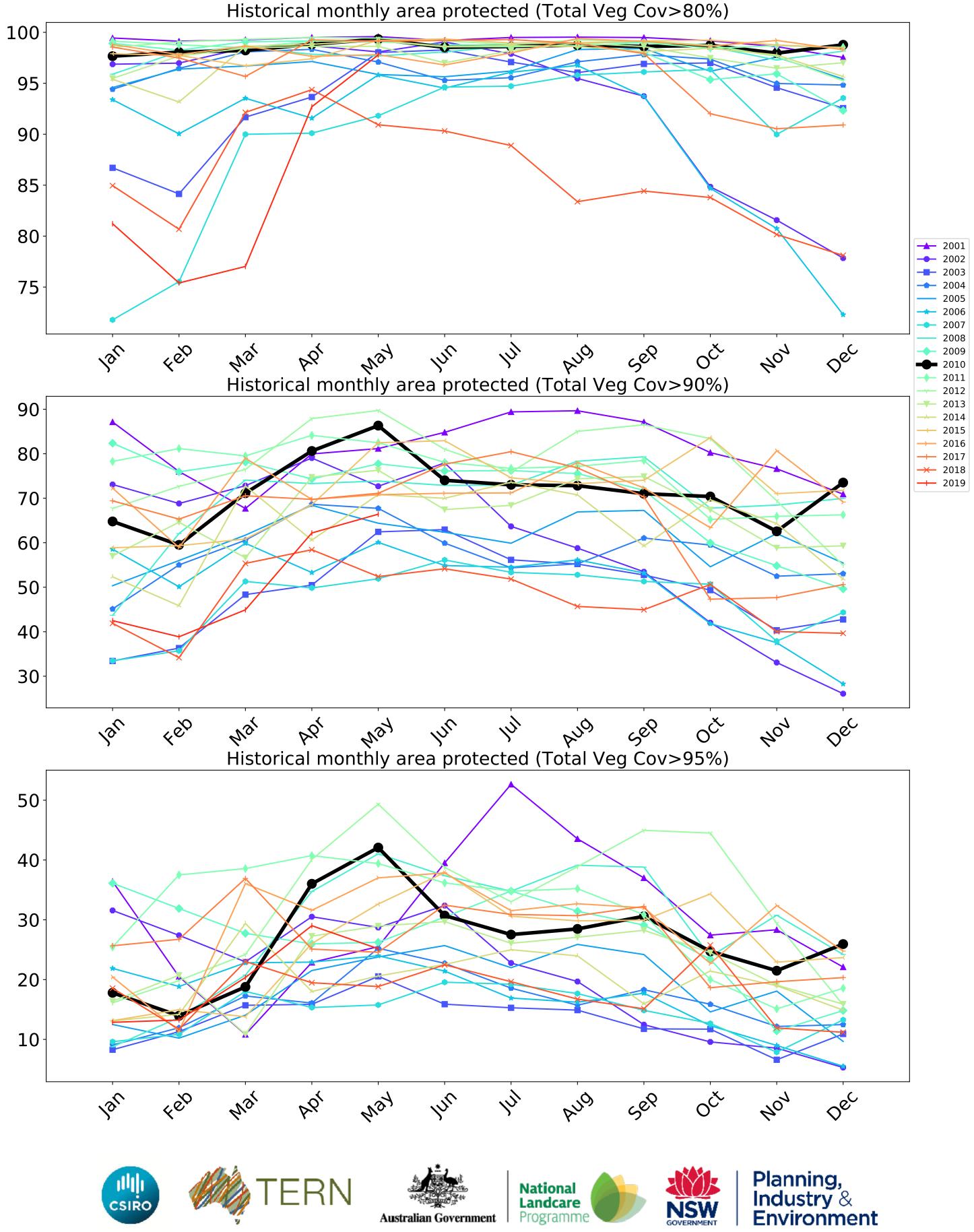


100 99 98 ---- above_70 **—** 10th **--** 50th **——** 2010 May 97 96 95 94 feb lar way Inc PQ War month **FERN HOUR** CSIRO Australian Government

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



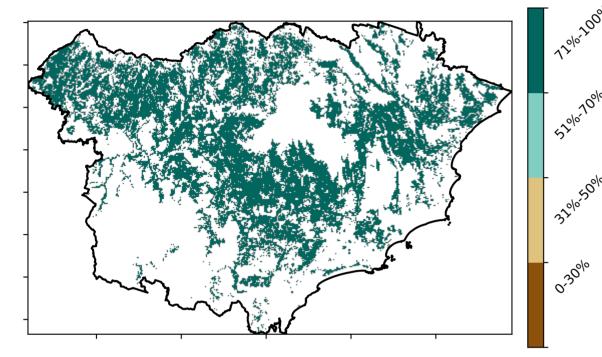




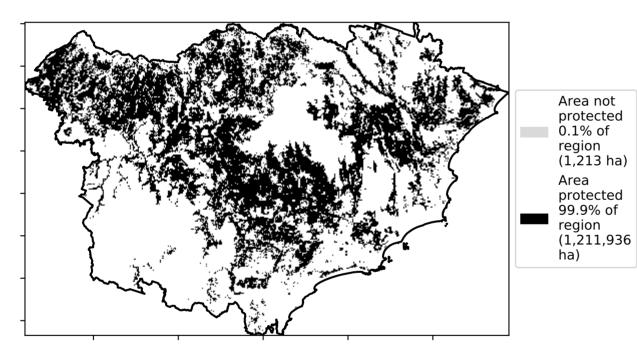
Grazing non forest

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)

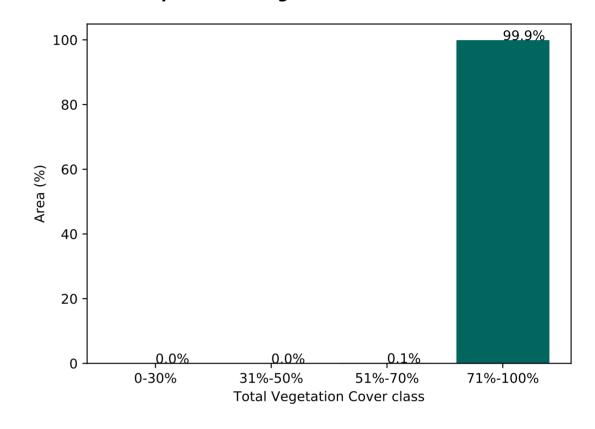
Total Vegetation Cover [%]



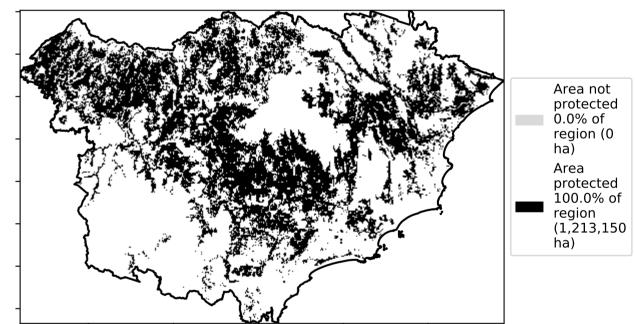
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

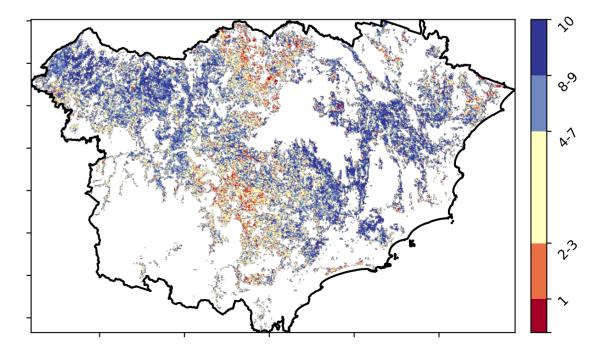
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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 - 10 0 the map using baseline from 2001 to 2019. -10

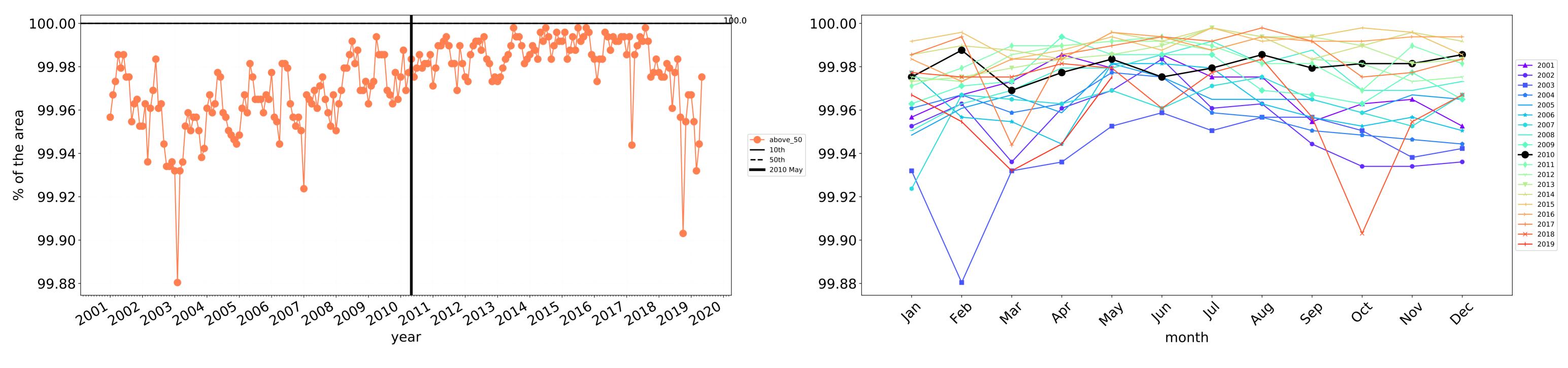
· 20

-20

Total Vegetation Cover Decile [%]

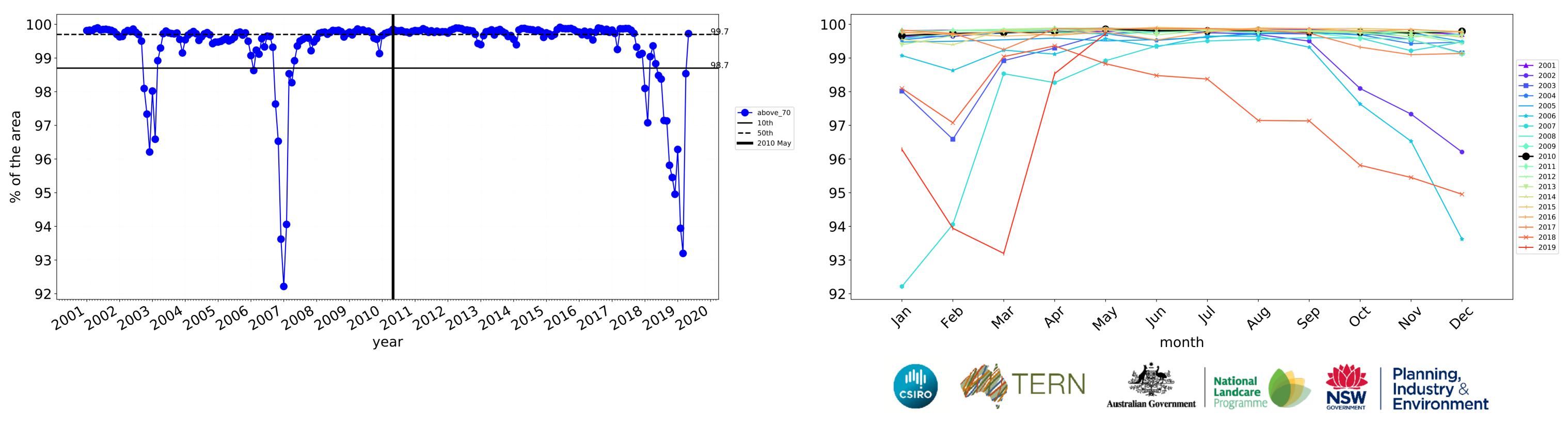






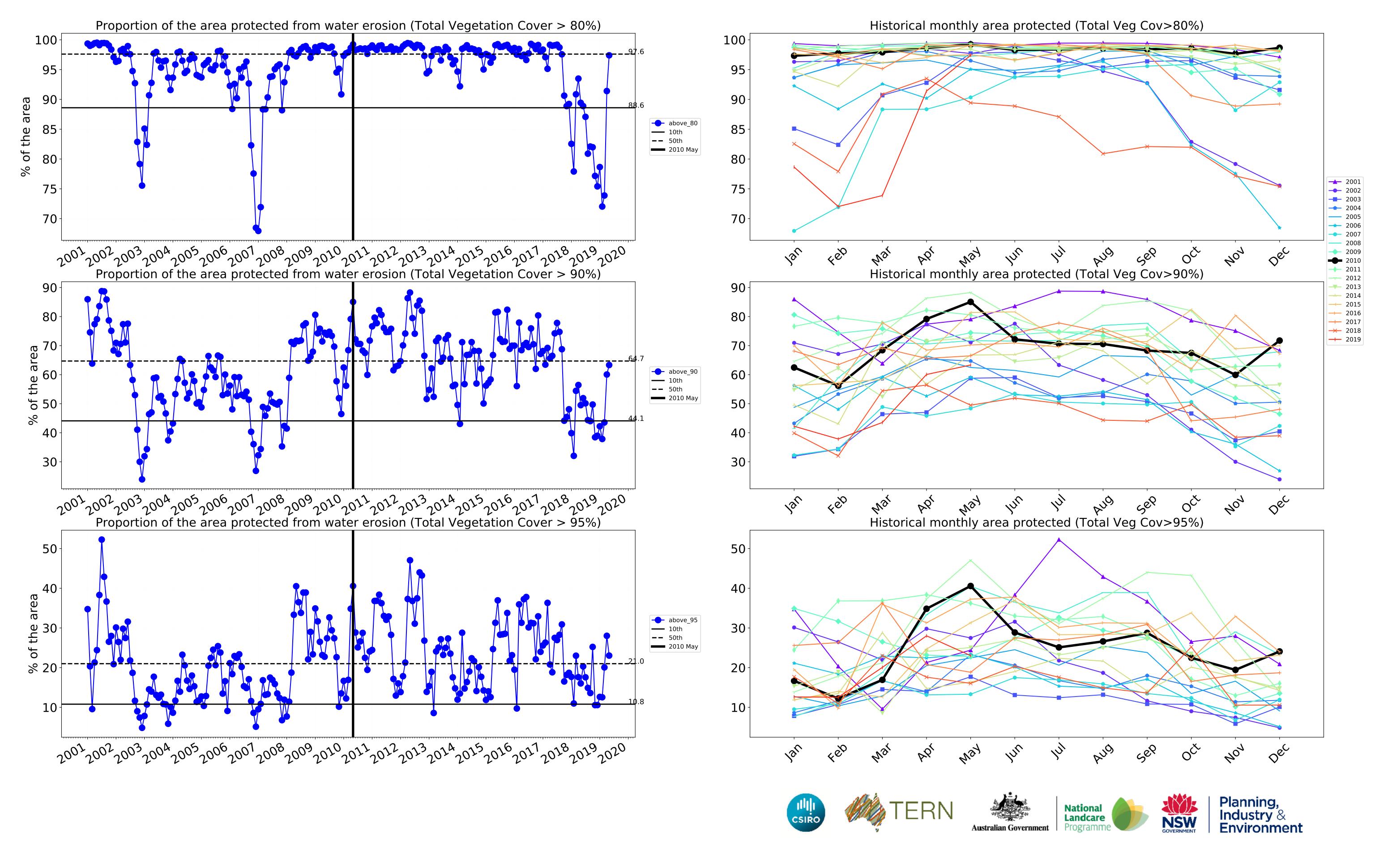
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

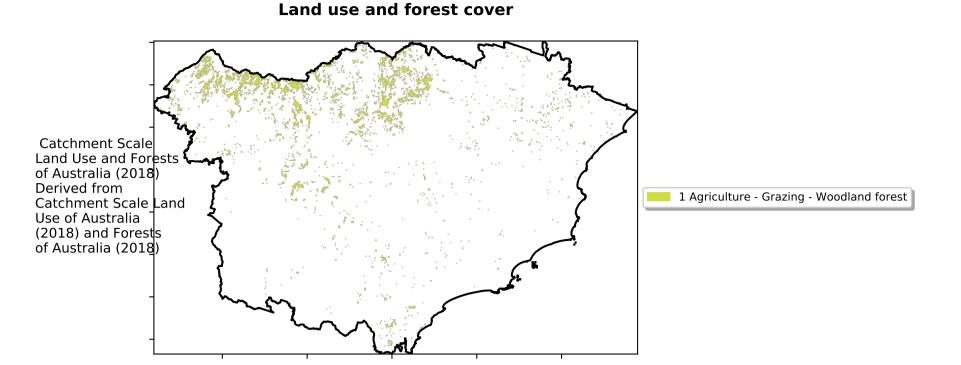


Wind erosion historical monthly area protected (Total Veg Cov >50%)

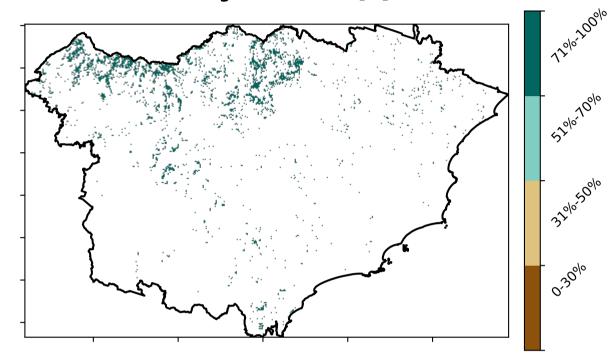
Water erosion historical monthly area protected (Total Veg Cov>70%)



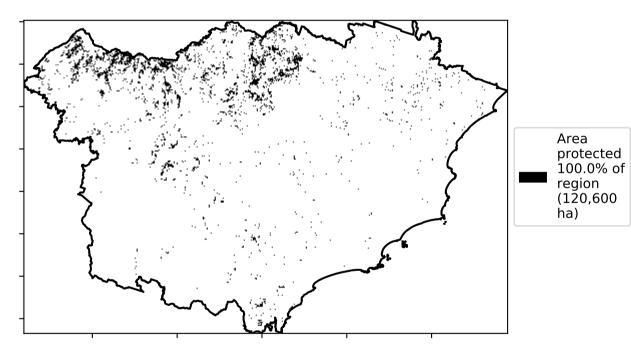
Grazing Woodland forest



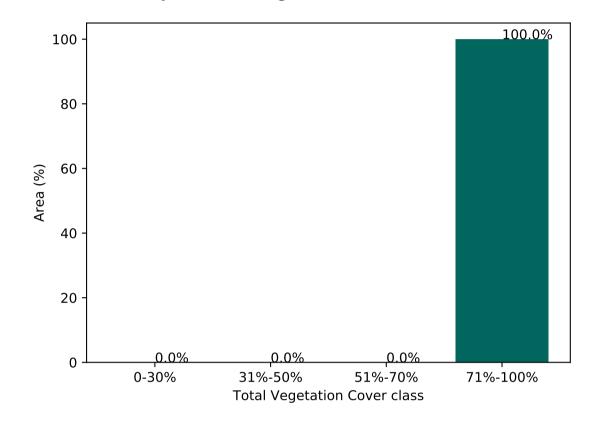
Total Vegetation Cover [%]



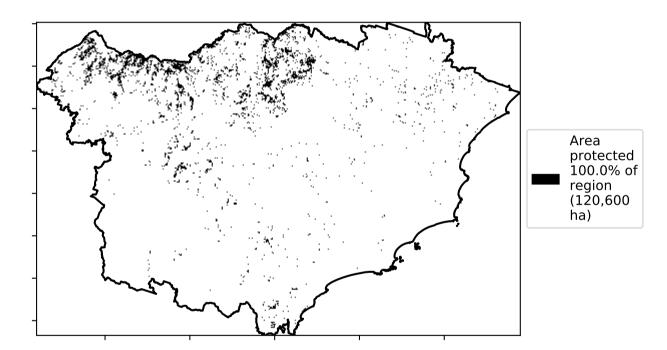
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

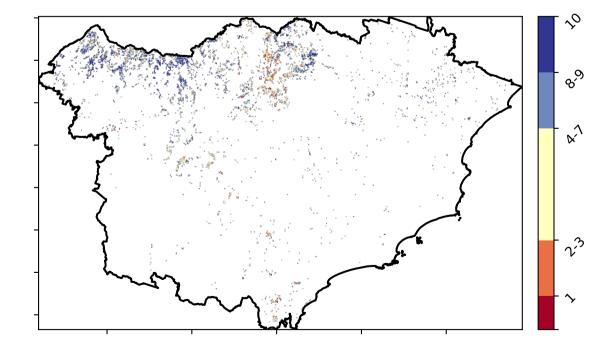


Total Vegetation Cover Anomaly [%]

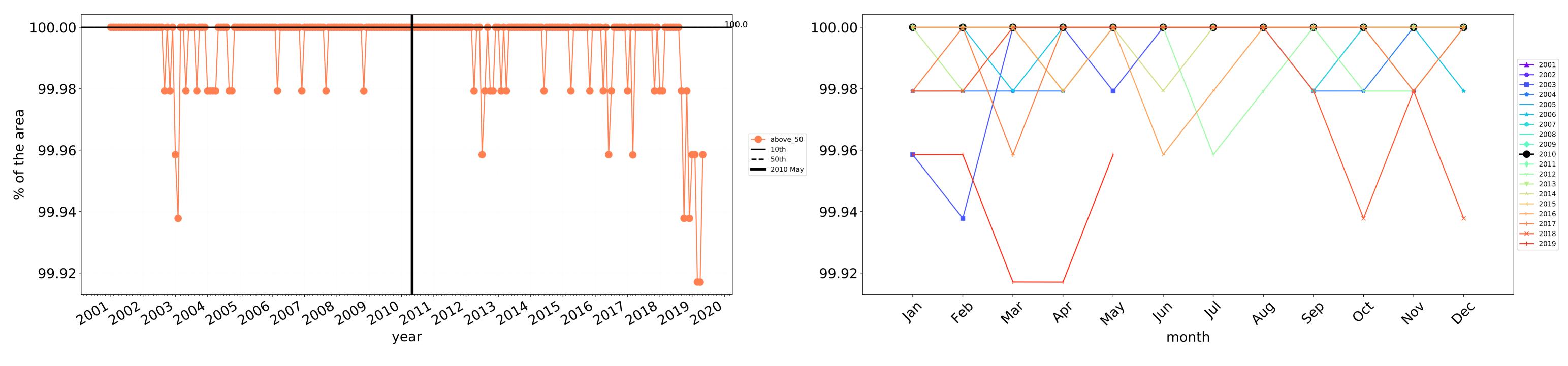
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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 [%]

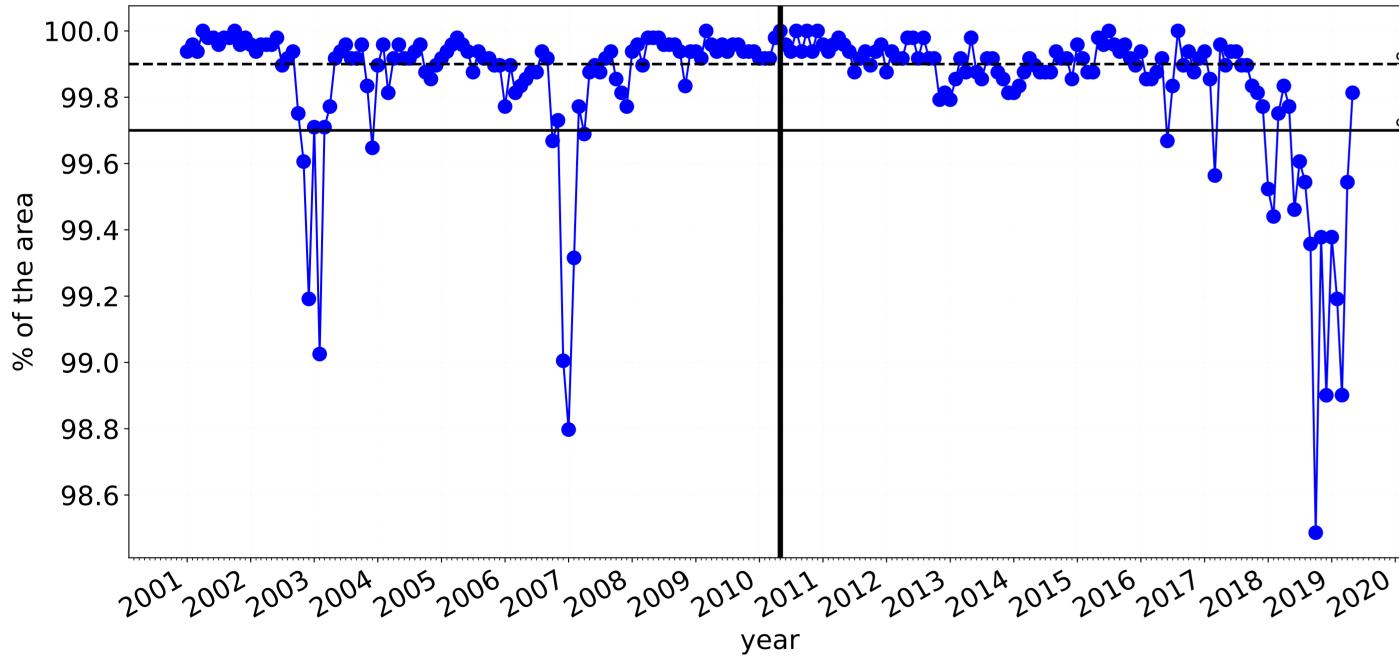






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

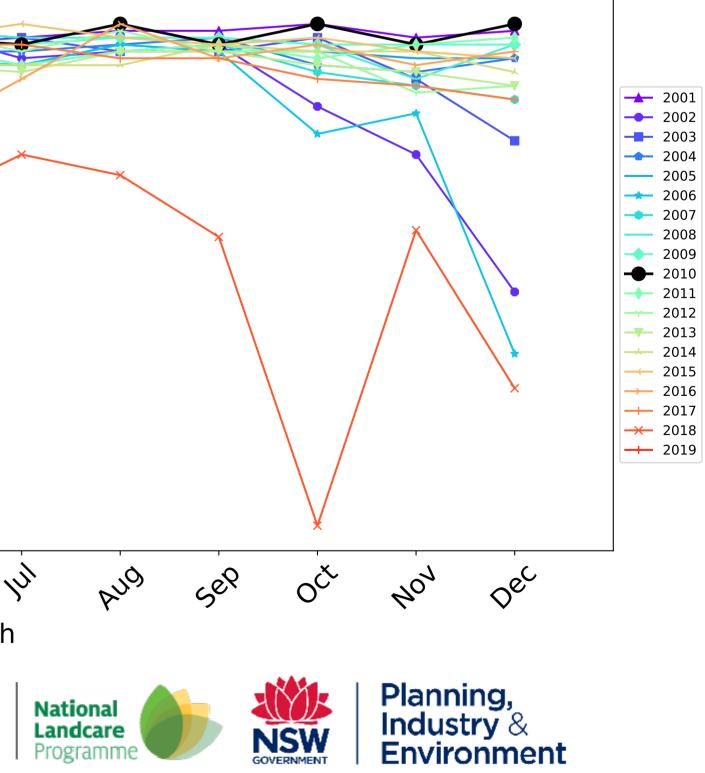


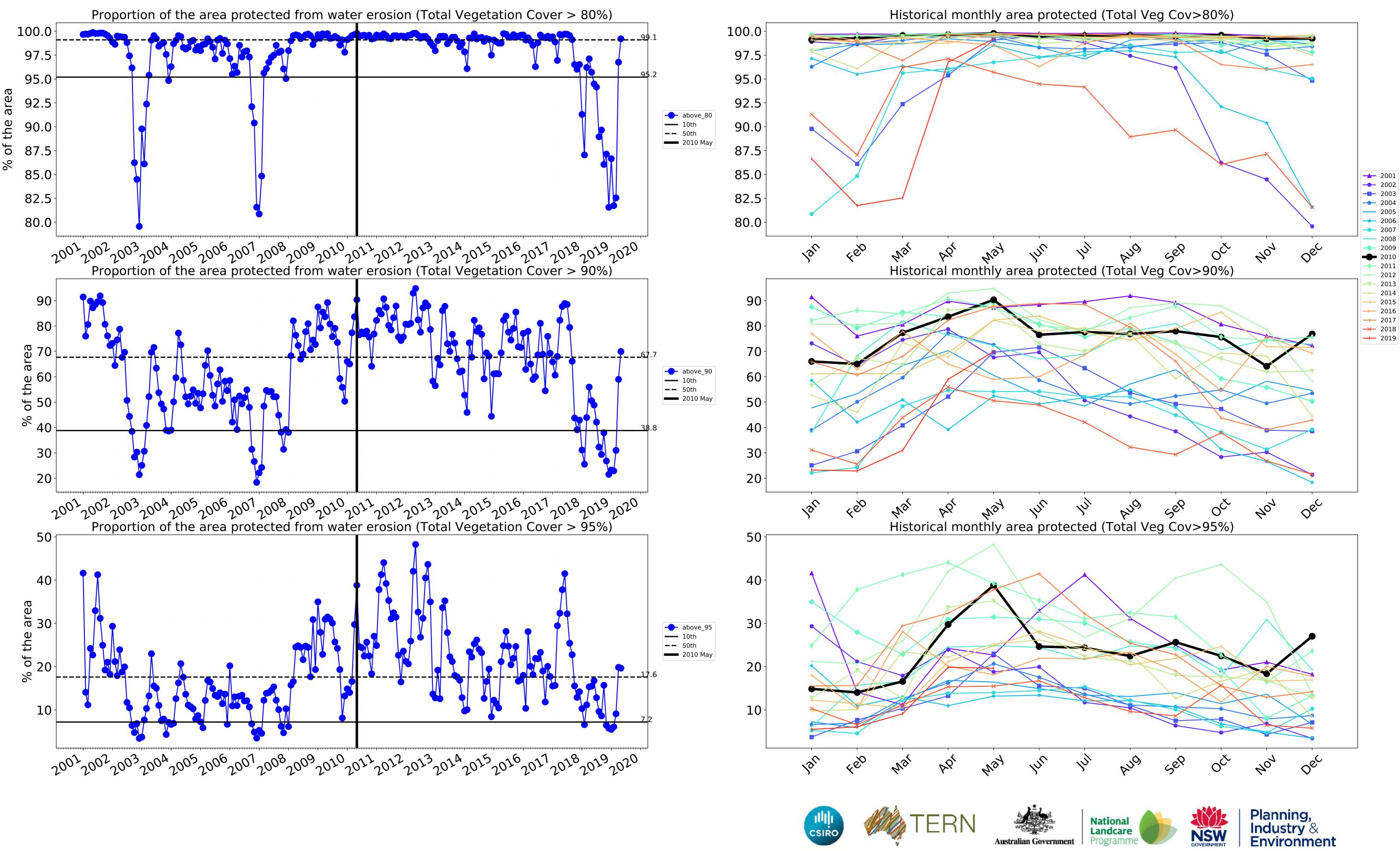
Wind erosion historical monthly area protected (Total Veg Cov >50%)



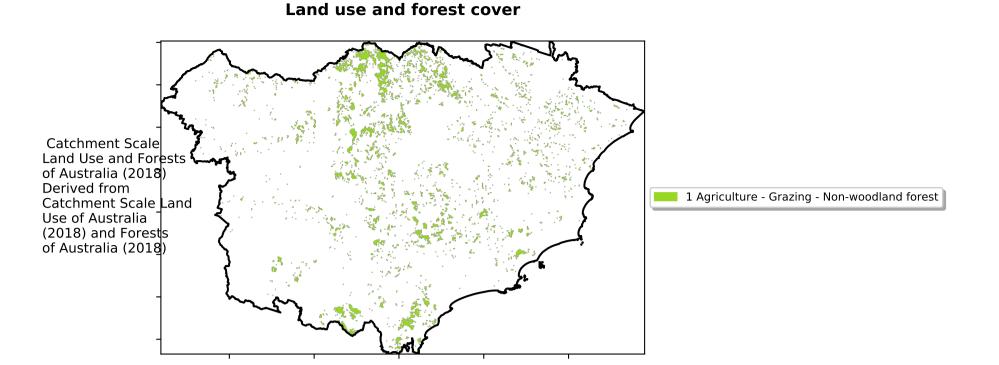
100.0-99.8 99.6 ---- above_70 **—** 10th 99.4 **——** 50th ------ 2010 May 99.2 99.0 98.8 98.6 feb Jan way In Mai PQ month ΓERN CSIRO Australian Government

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

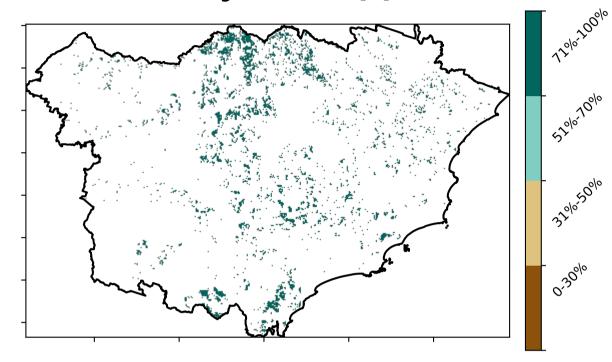




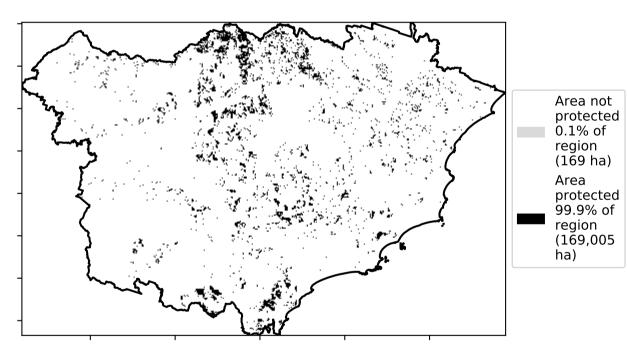
Grazing - Forest (non woodland)



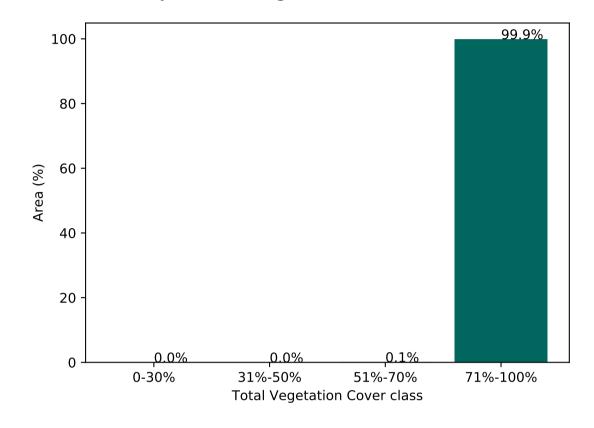
Total Vegetation Cover [%]



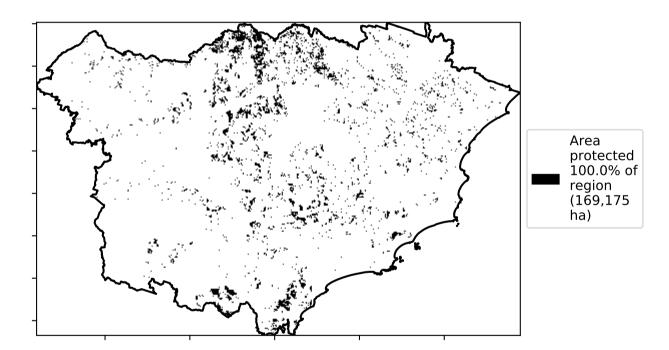
% Area protected from water erosion (>70%)



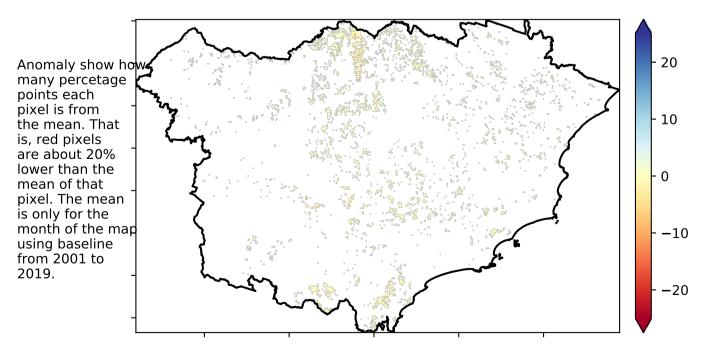
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

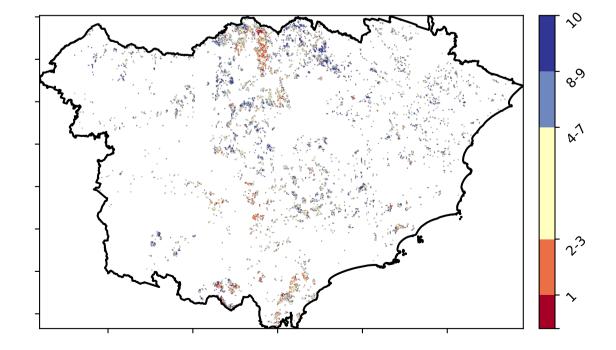


Total Vegetation Cover Anomaly [%]

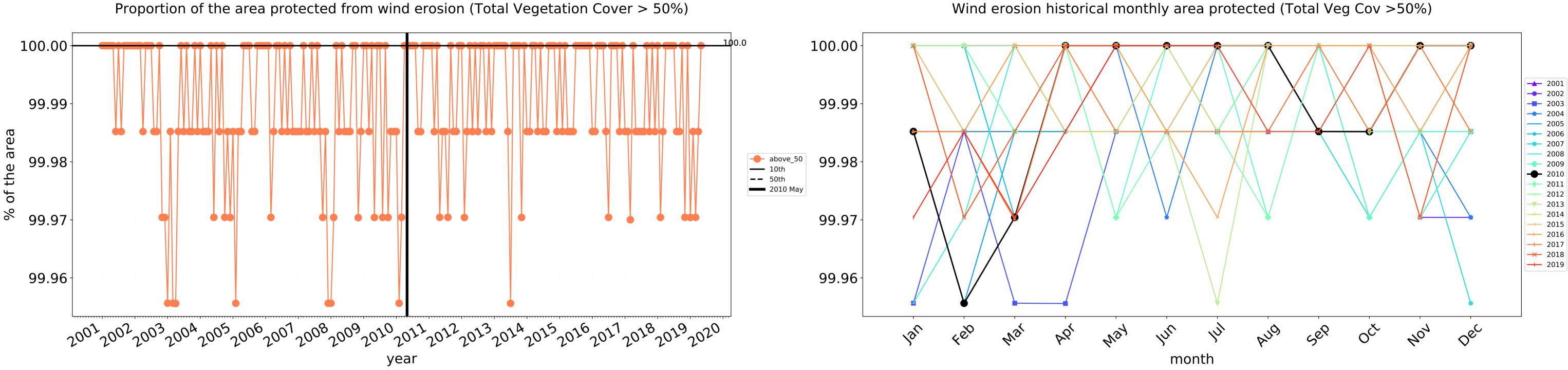


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

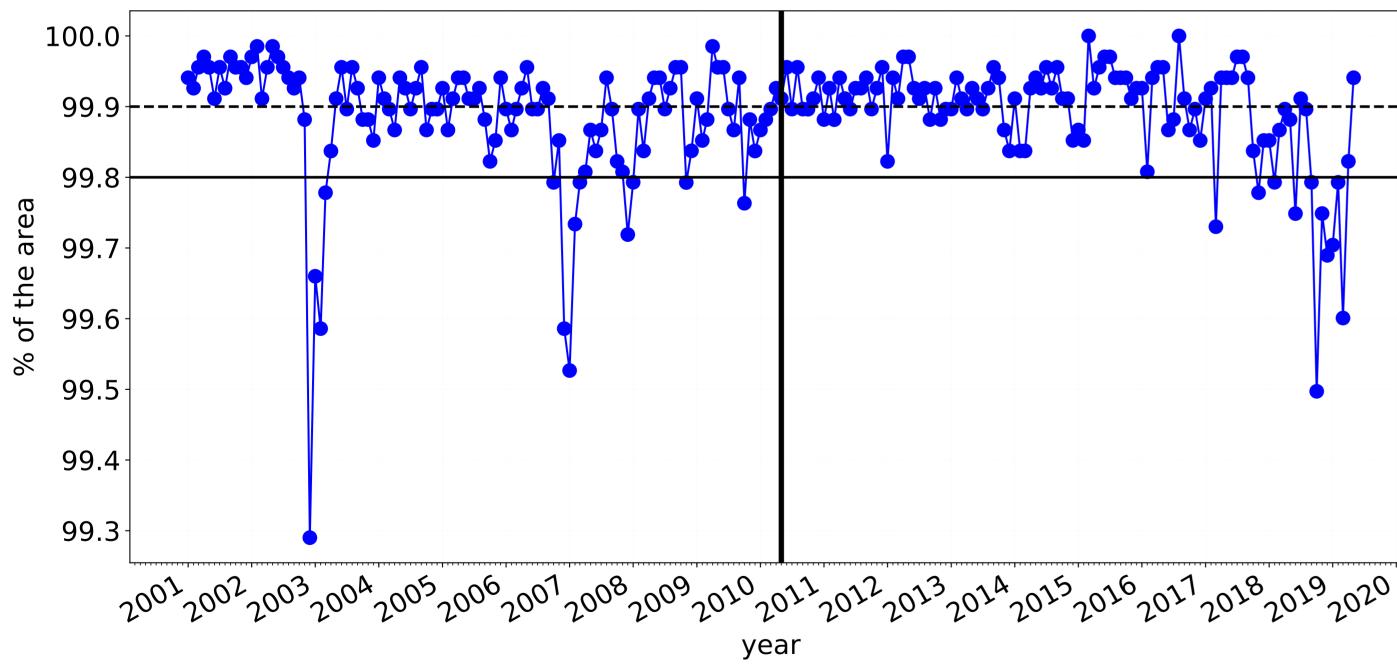


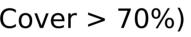




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

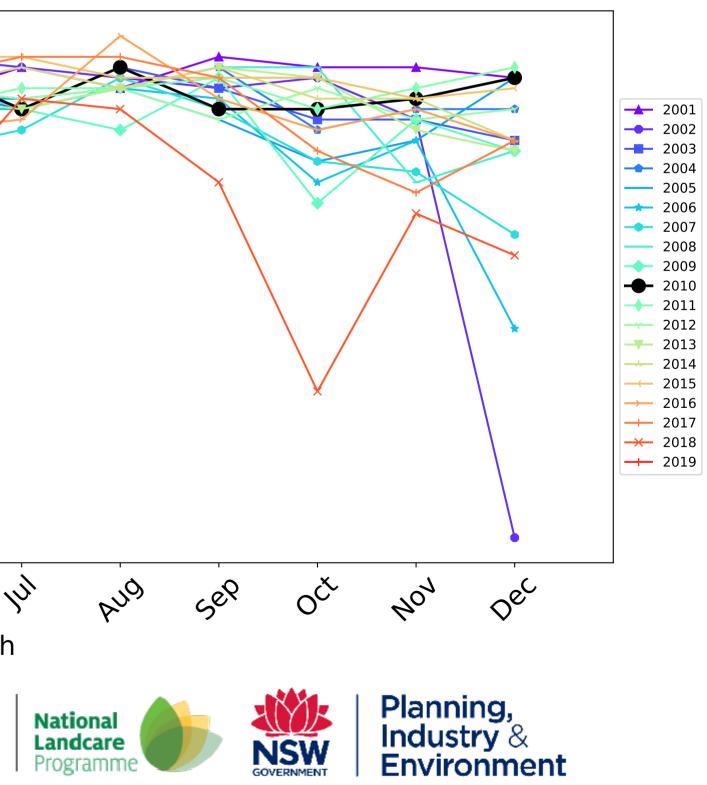
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

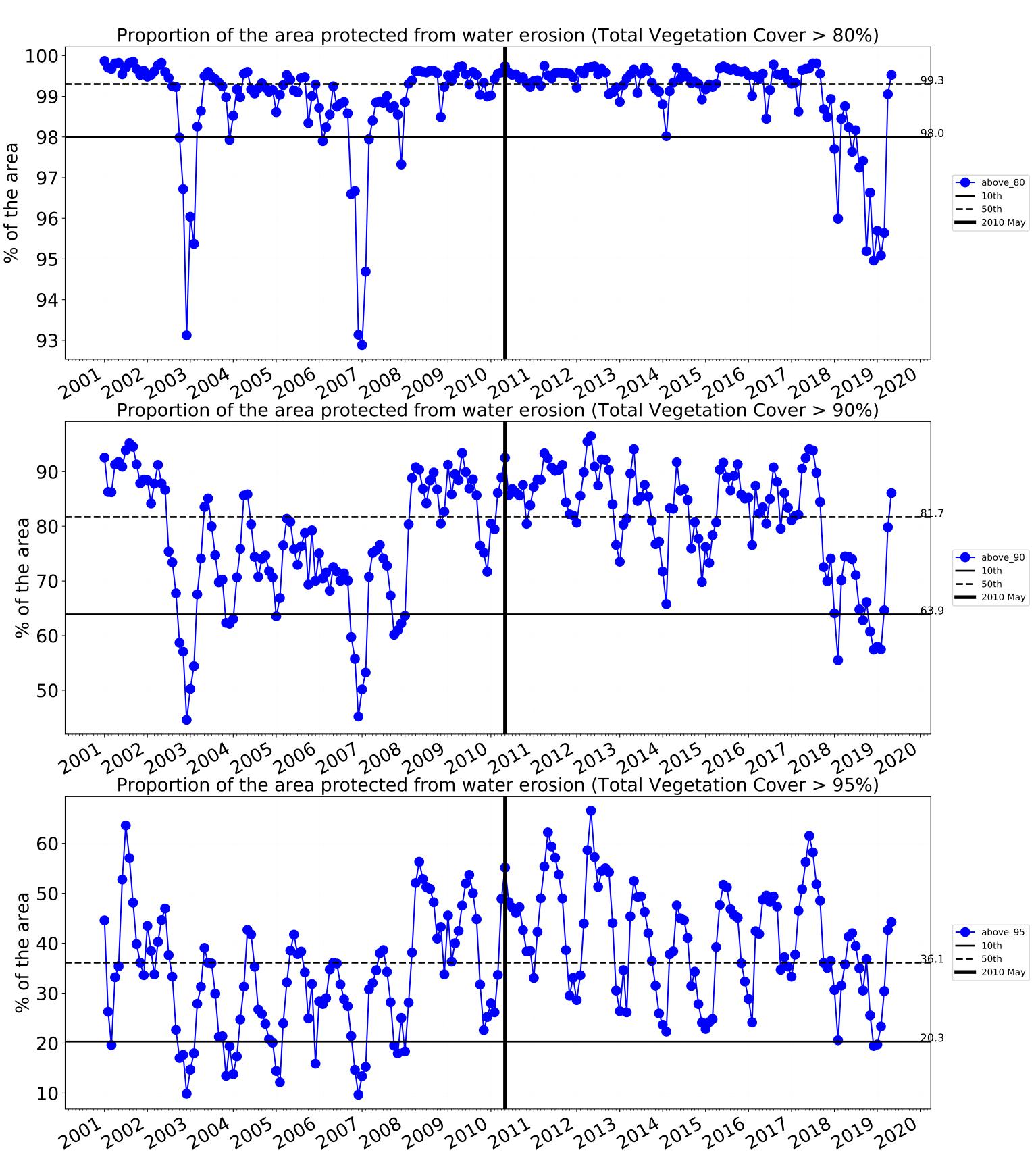


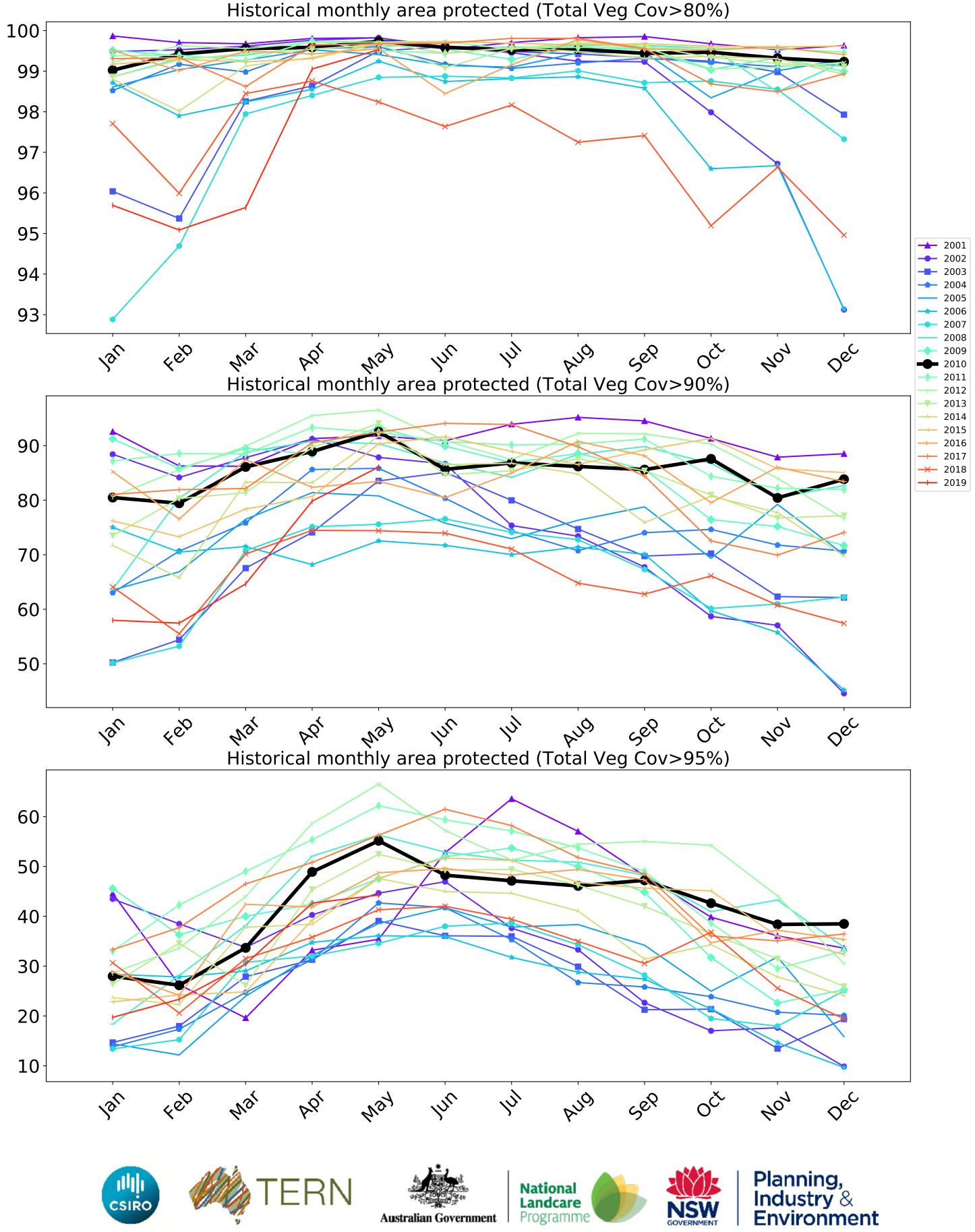


100.0-99.9 99.8 ---- above_70 **—** 10th **——** 50th 99.7 ----- 2010 May 99.6 99.5 99.4 99.3 Jan feb May In PQ Wal month ERN CSIRO Australian Government

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



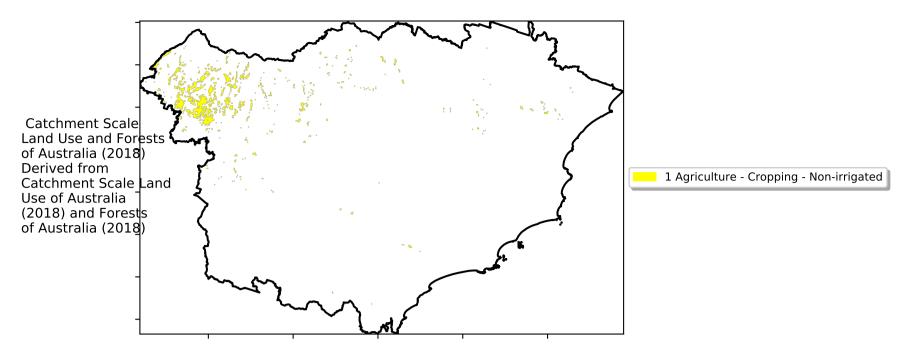




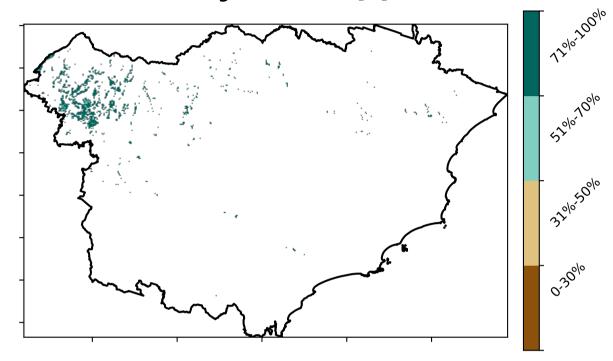
Australian Government

Cropping

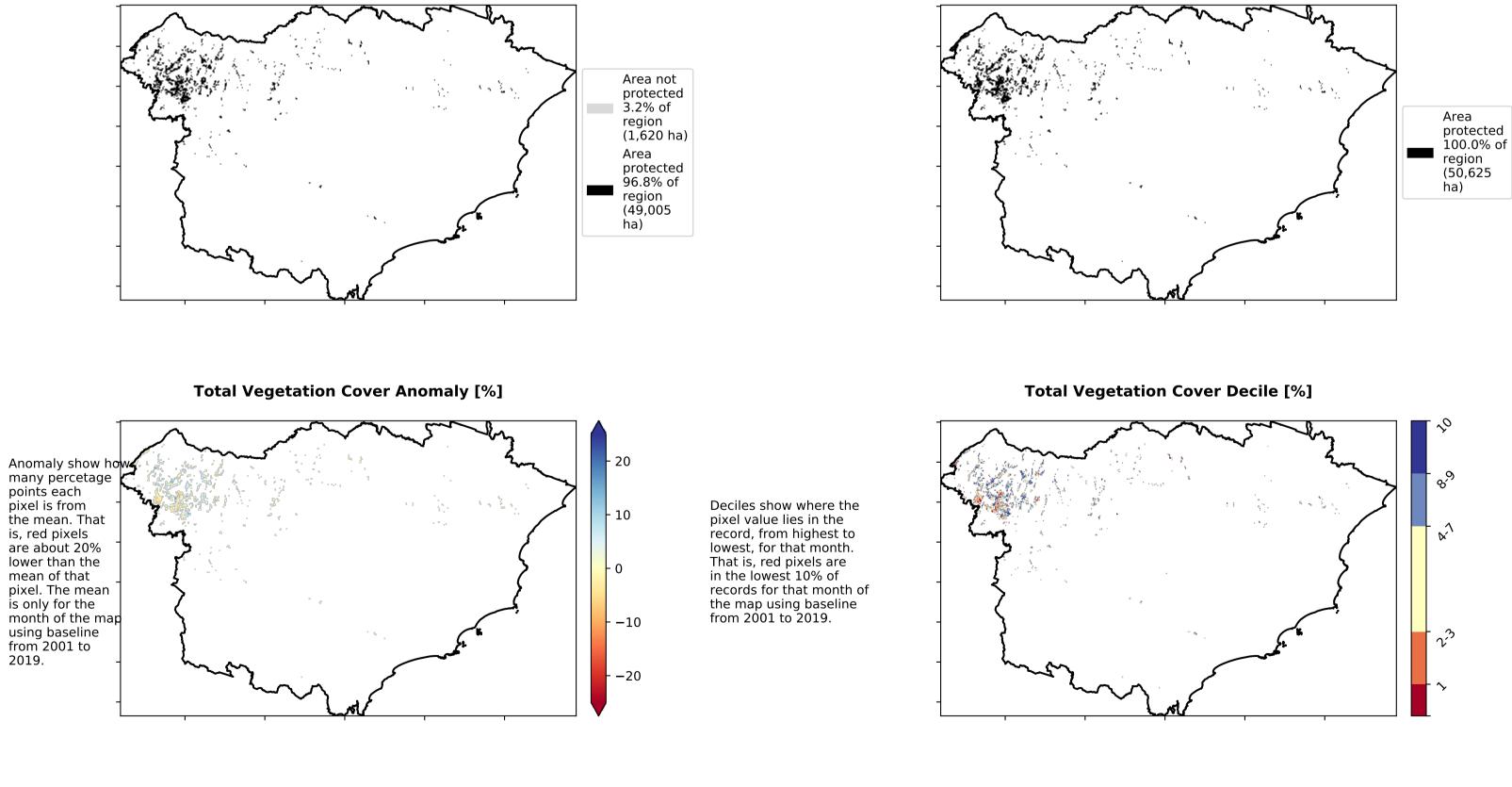
Land use and forest cover



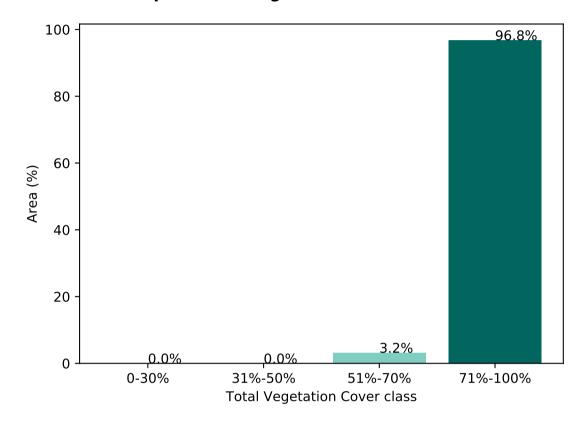
Total Vegetation Cover [%]



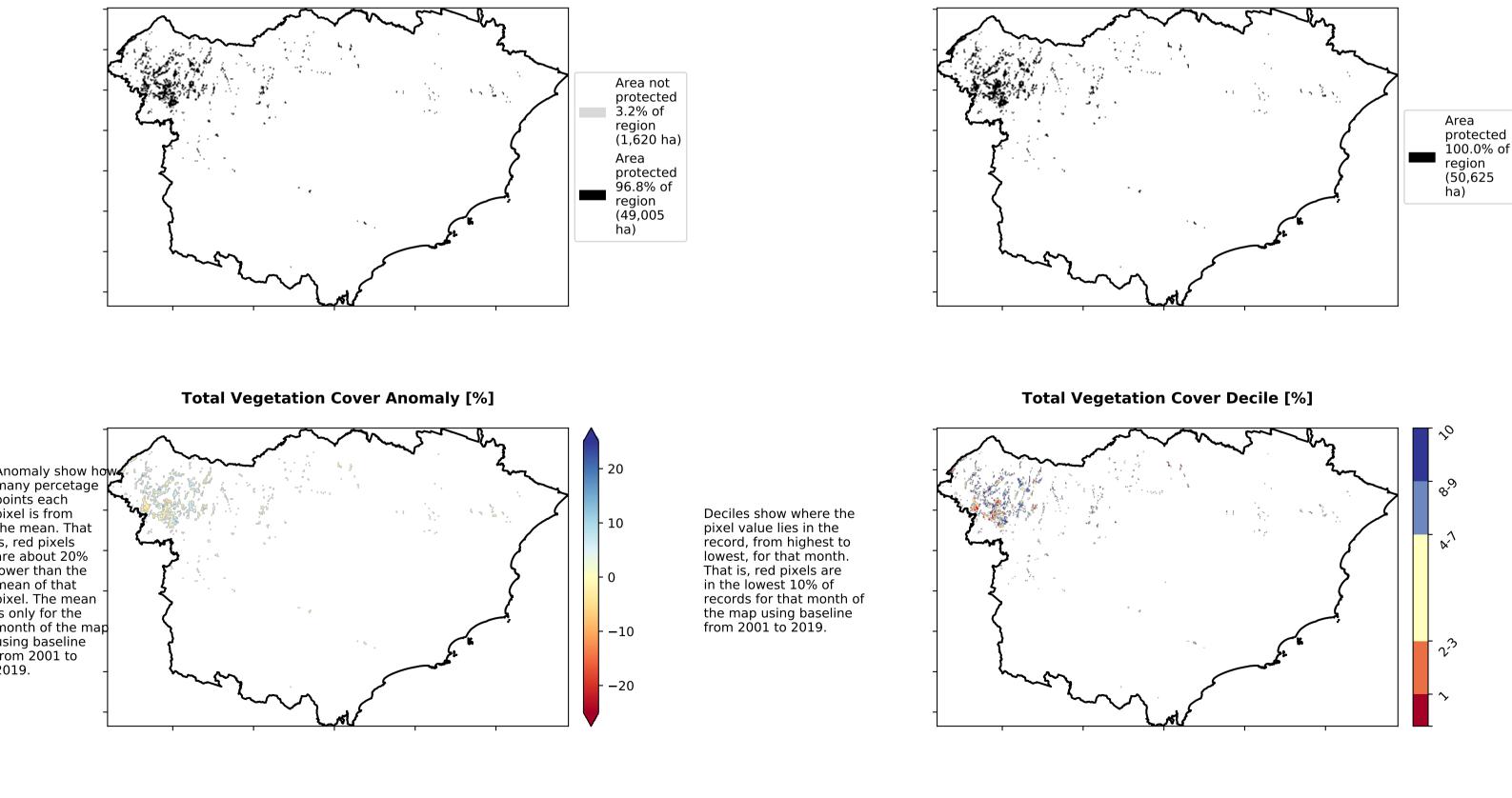
% Area protected from water erosion (>70%)



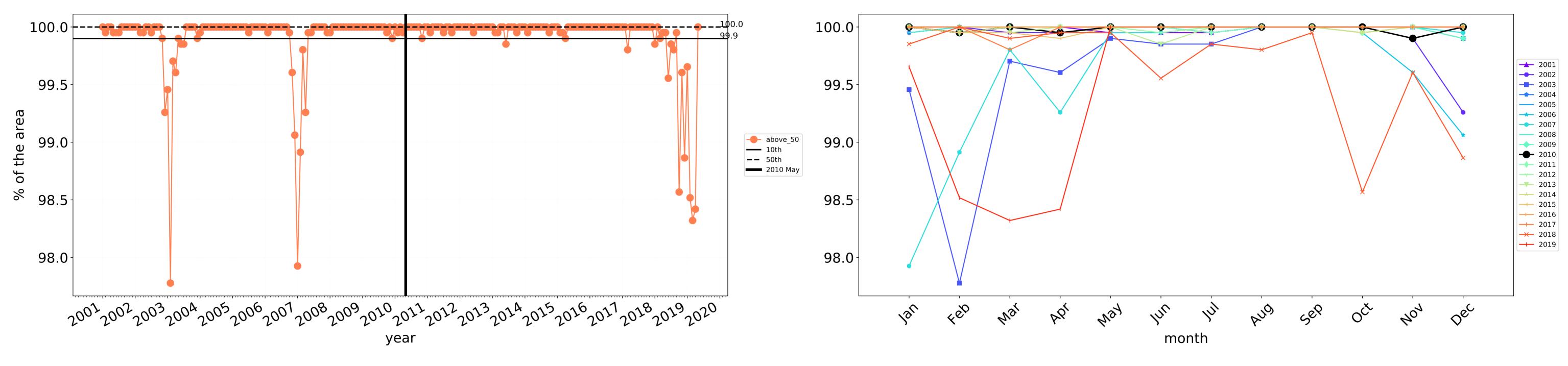
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

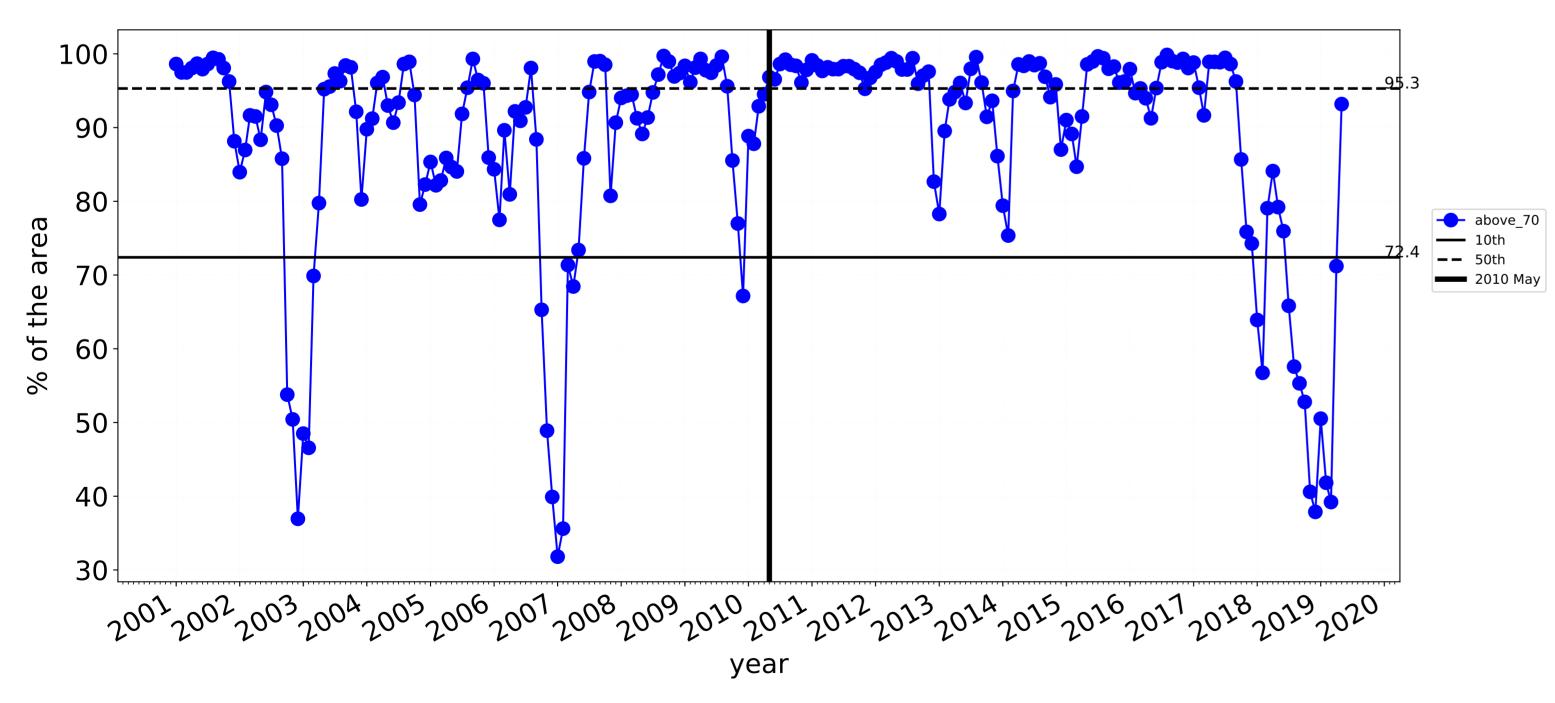




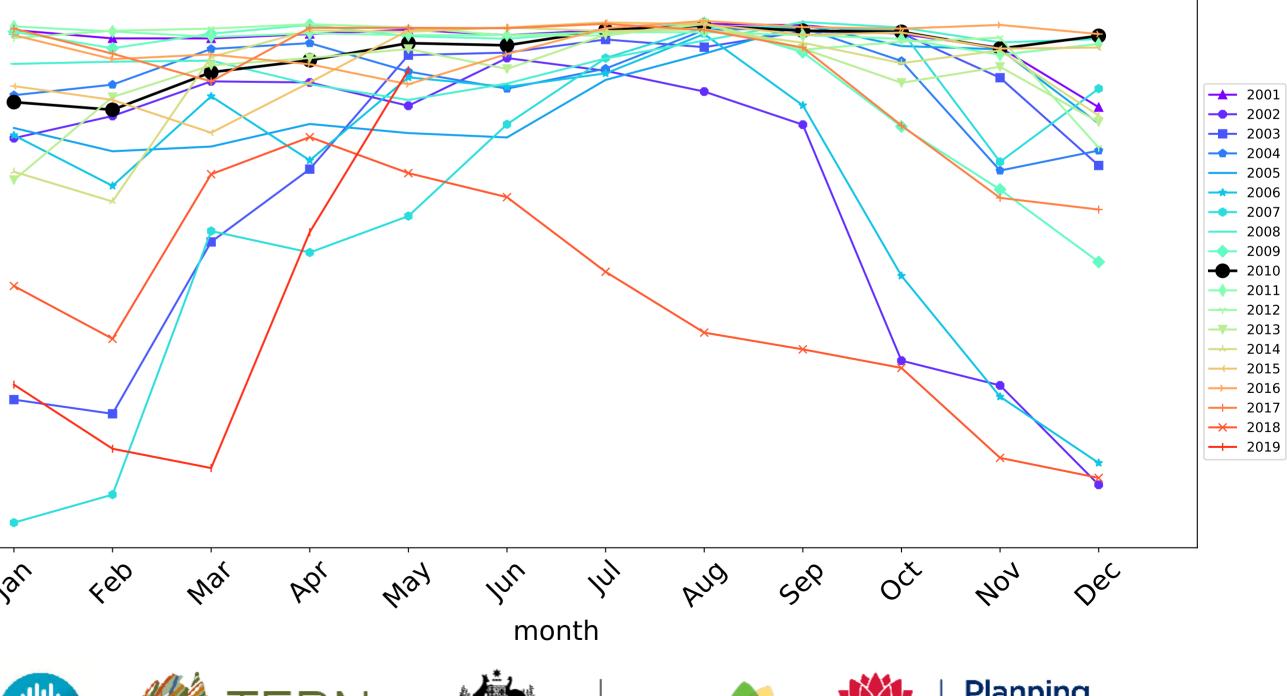


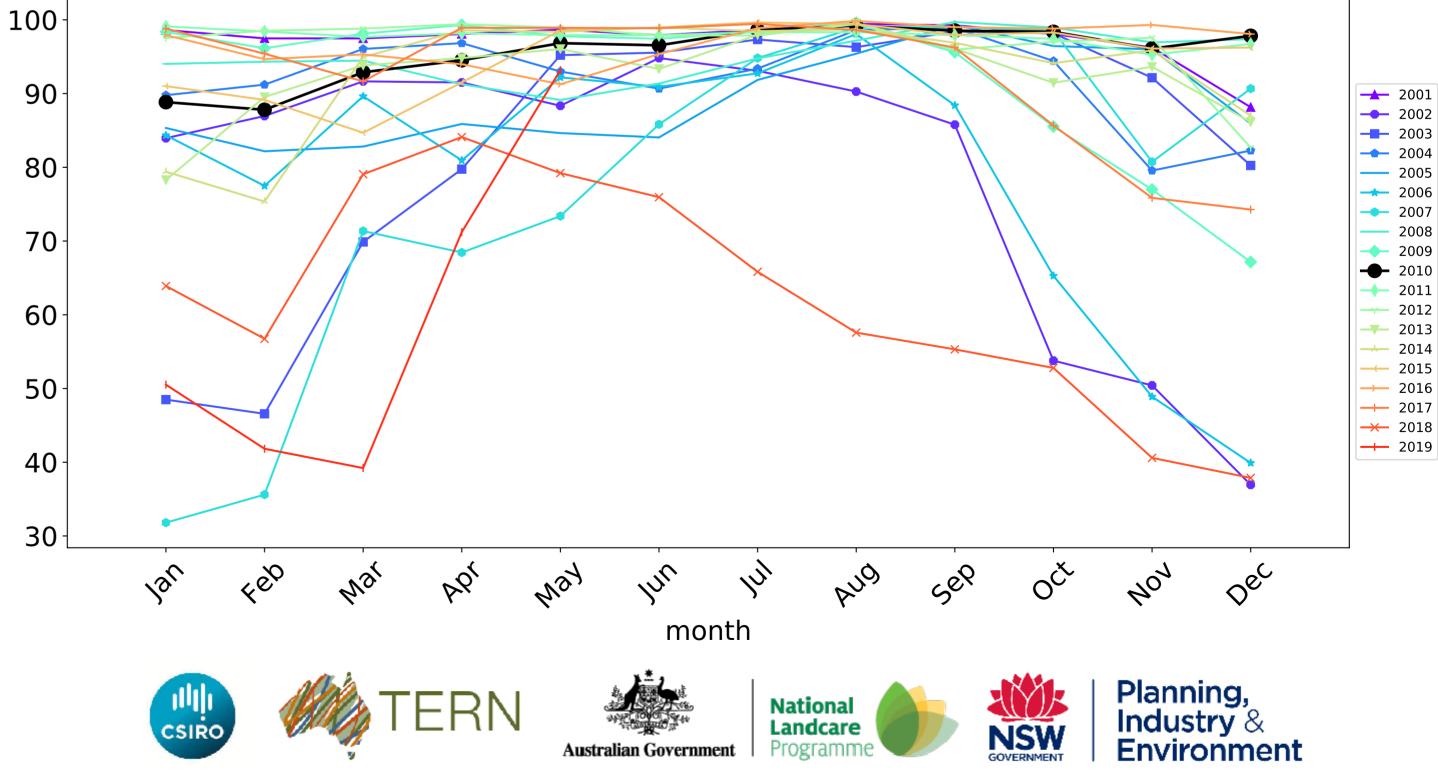
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

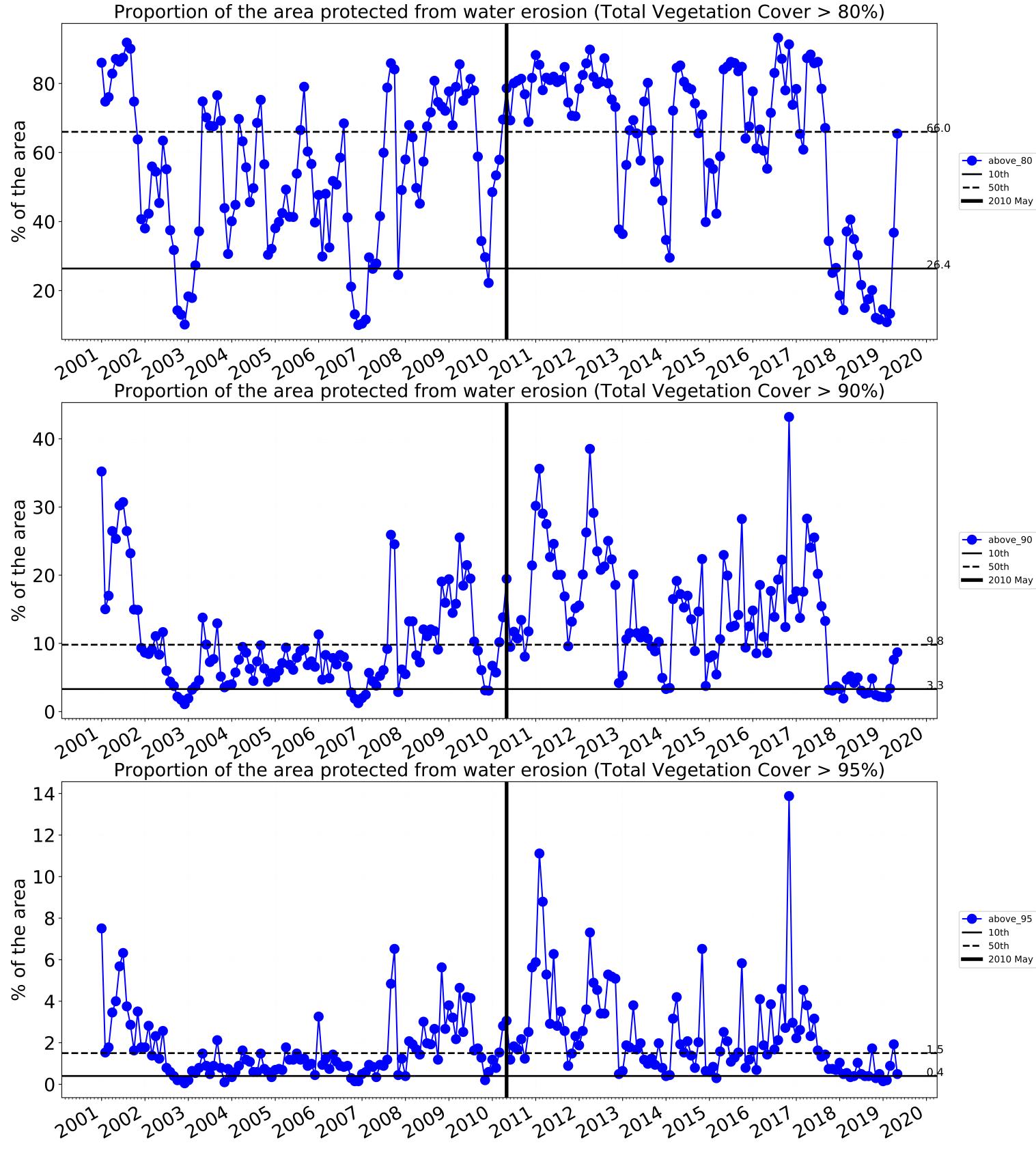


Wind erosion historical monthly area protected (Total Veg Cov >50%)

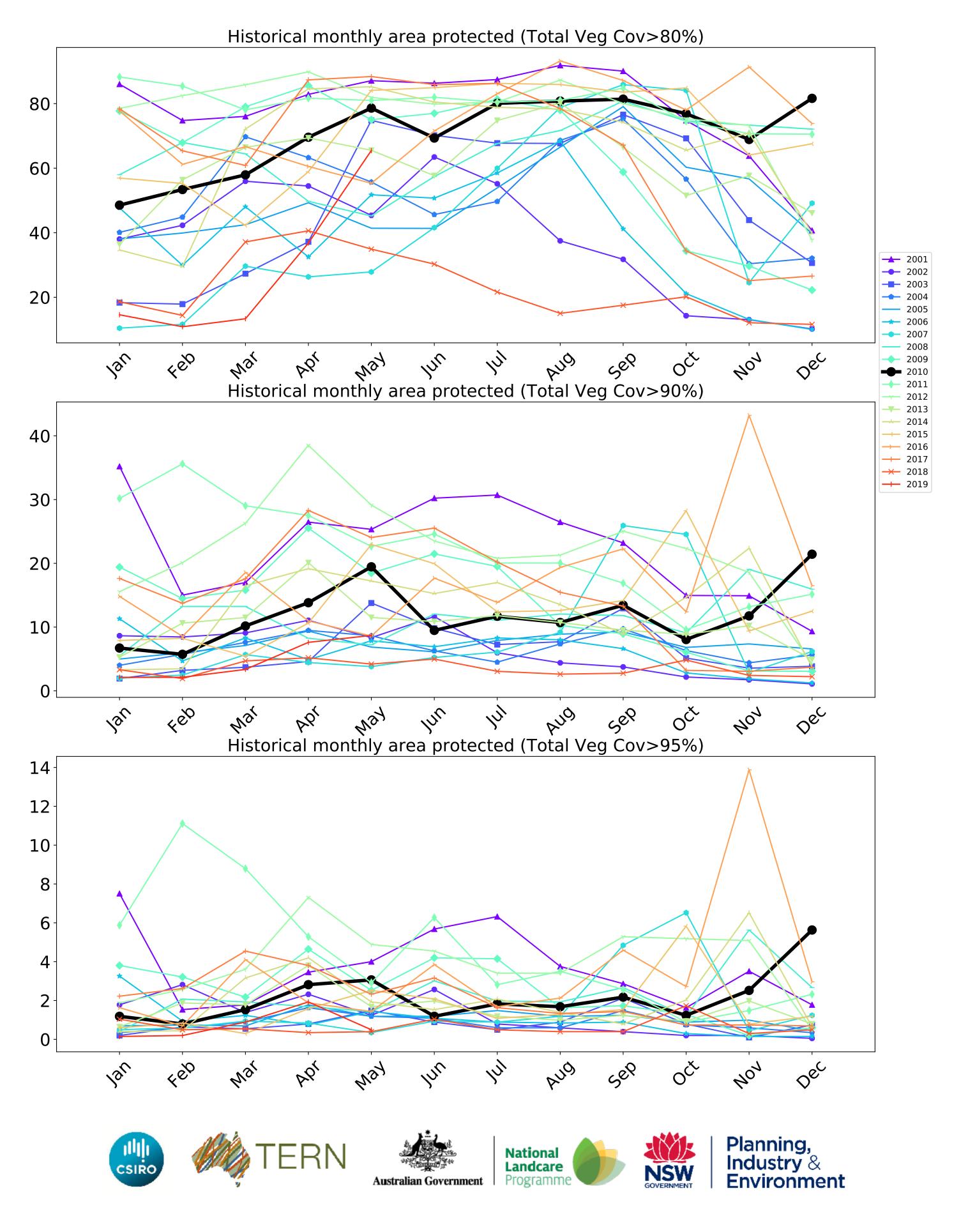




Water erosion historical monthly area protected (Total Veg Cov>70%)



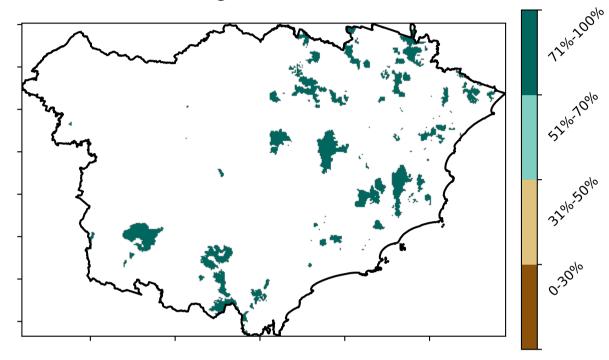




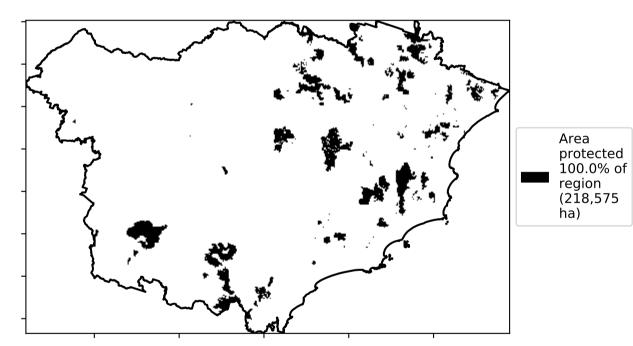
Production native forests and plantation forests



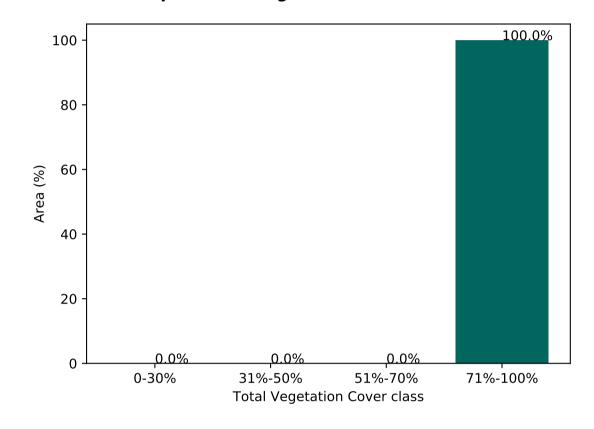
Total Vegetation Cover [%]



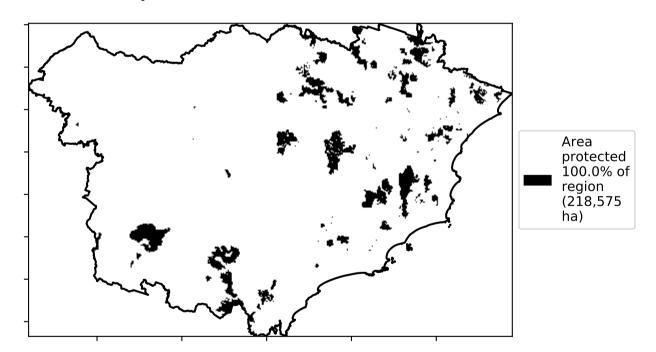
% Area protected from water erosion (>70%)



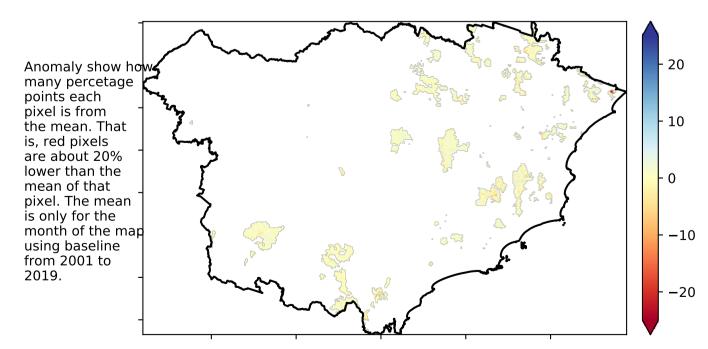
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

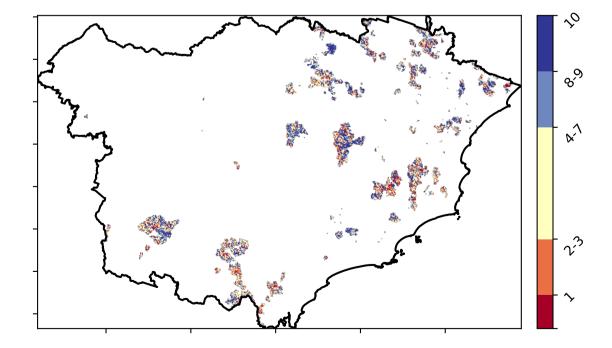


Total Vegetation Cover Anomaly [%]



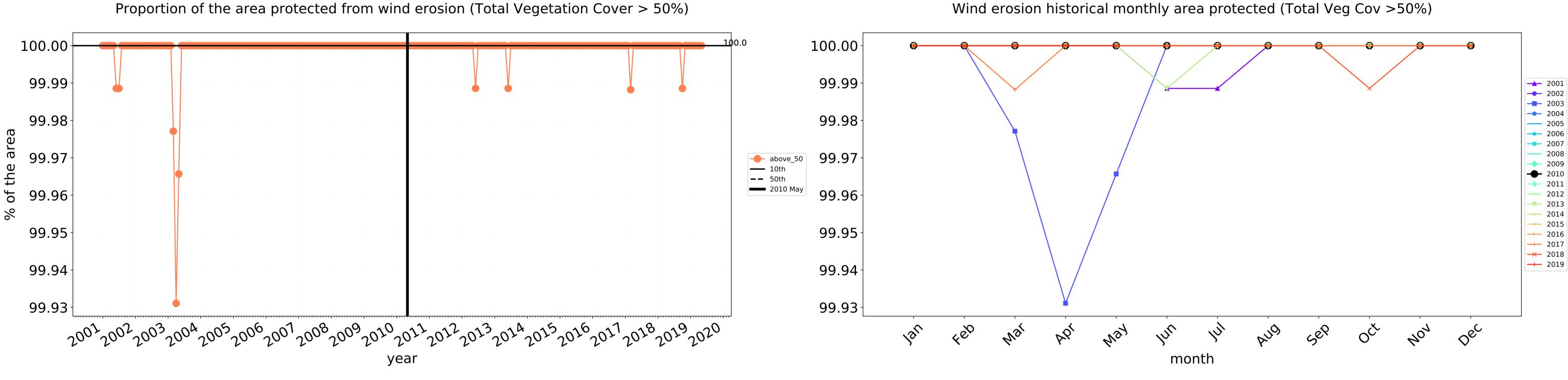
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



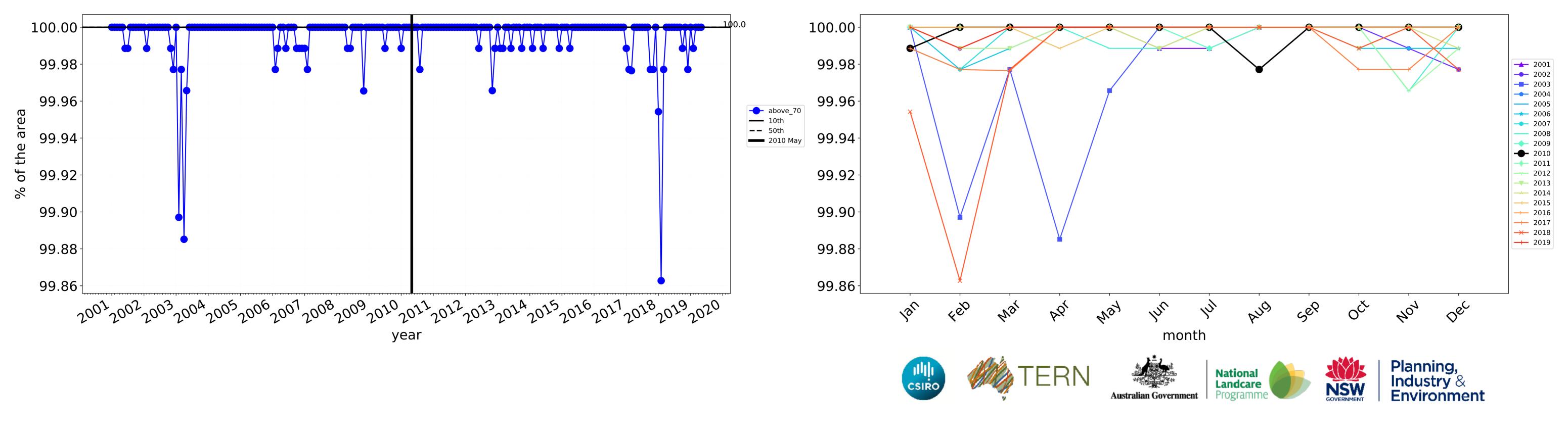


Production native forests and plantation forests timeseries

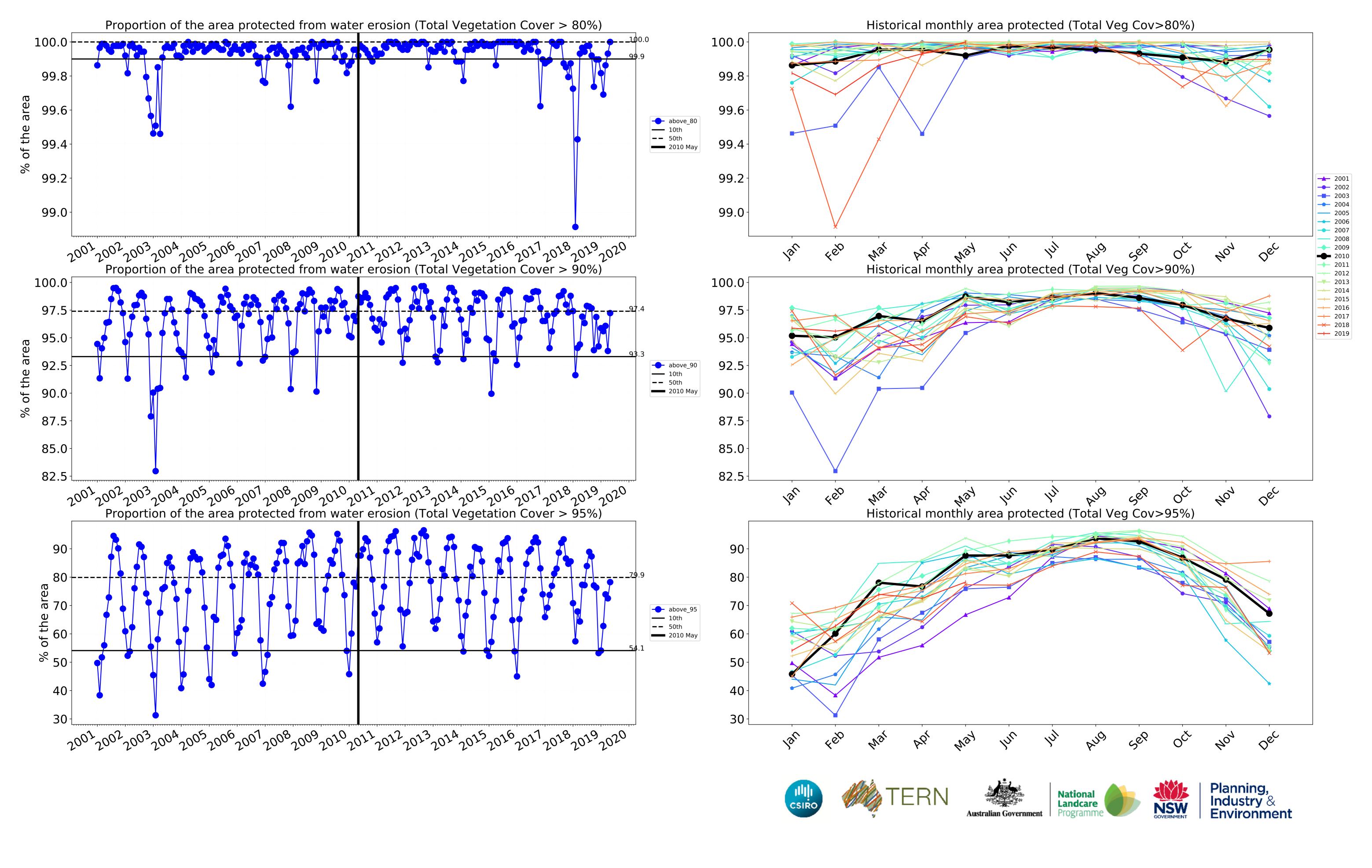


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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







Hunter (3,239,200 ha and no data 61,225 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	3,239,200	99.9% 3,236,476	99.7% 3,230,005	98.9% 3,204,820	97.4% 3,154,524	86.7% 2,807,678	54.0% 1,747,599
Conservation and natural environments	1,242,025	99.9% 1,240,925	99.8% 1,239,950	99.7% 1,238,525	99.6% 1,236,475	96.9% 1,203,625	72.6% 901,350
Conservation and natural environments non forest	30,650	96.7% 29,625	94.0% 28,825	91.2% 27,950	88.5% 27,125	74.1% 22,725	37.2% 11,400
Conservation and natural environments Woodland forest	138,825	100.0% 138,825	100.0% 138,800	100.0% 138,775	99.8% 138,600	96.4% 133,800	51.3% 71,250
Conservation and natural environments Forest (non woodland)	1,072,550	100.0% 1,072,475	100.0% 1,072,325	99.9% 1,071,800	99.8% 1,070,750	97.6% 1,047,100	76.3% 818,700
Agriculture	1,580,925	100.0% 1,580,900	100.0% 1,580,725	99.8% 1,577,400	98.6% 1,558,150	83.0% 1,312,175	40.1% 634,450
Grazing	1,502,925	100.0% 1,502,900	100.0% 1,502,725	99.9% 1,501,000	99.3% 1,492,875	86.3% 1,297,425	42.1% 632,375
Grazing non forest	1,213,150	100.0% 1,213,125	100.0% 1,212,950	99.9% 1,211,375	99.2% 1,203,825	85.1% 1,031,900	40.6% 492,250
Grazing Woodland forest	120,600	100.0% 120,600	100.0% 120,600	100.0% 120,600	99.8% 120,325	90.4% 108,975	38.8% 46,825
Grazing - Forest (non woodland)	169,175	100.0% 169,175	100.0% 169,175	99.9% 169,025	99.7% 168,725	92.5% 156,550	55.1% 93,300
Cropping	50,625	100.0% 50,625	100.0% 50,625	96.8% 49,025	78.6% 39,800	19.5% 9,850	3.1% 1,550
Production native forests and plantation forests	218,575	100.0% 218,575	100.0% 218,575	100.0% 218,575	99.9% 218,400	98.7% 215,825	87.6% 191,525

