Total vegetation cover soil protection Region:NRM West Gippsland VIC

Date: December 2016

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

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

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

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

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

Erosion protection: Wind erosion 50% total vegetation cover

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

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

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

Erosion protection

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

Rainfall

• Millimetres rainfall each month (black line).

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

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

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

Acknowledgment of data:

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

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

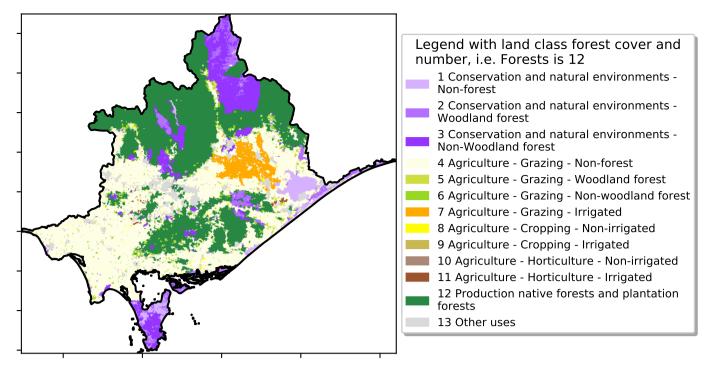


Vegetation Cover Dec 2016

Land use and forest cover

Proportion of each land class in area

2019.



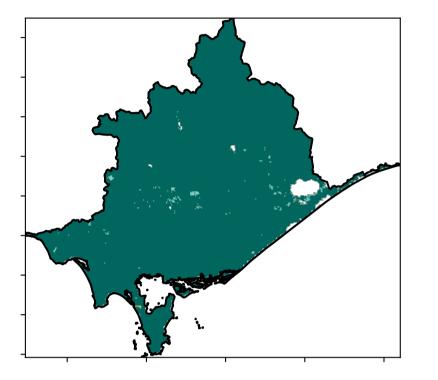
12%100%

· 52°10'70°10

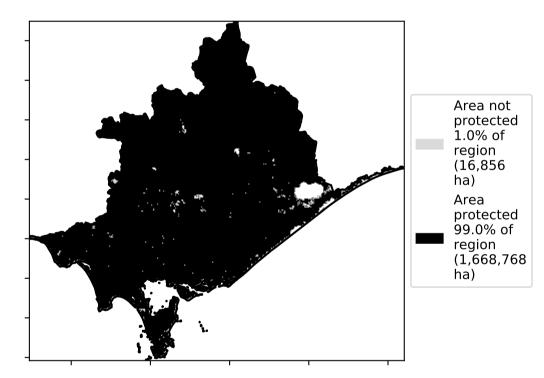
320050010

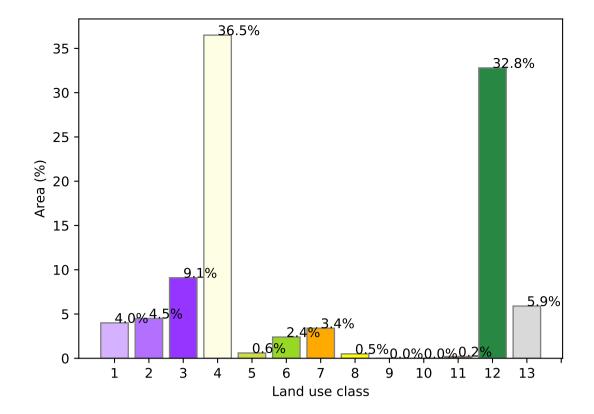
0.30%

Total Vegetation Cover [%]

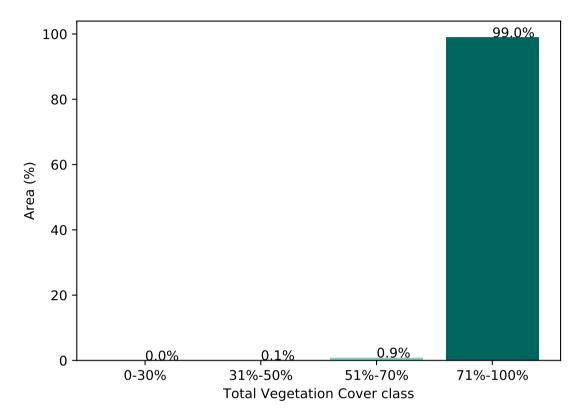


% Area protected from water erosion (>70%)

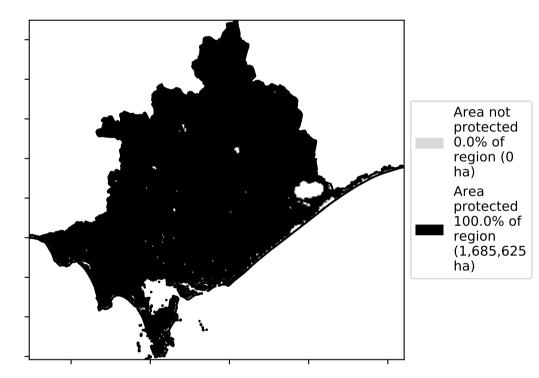




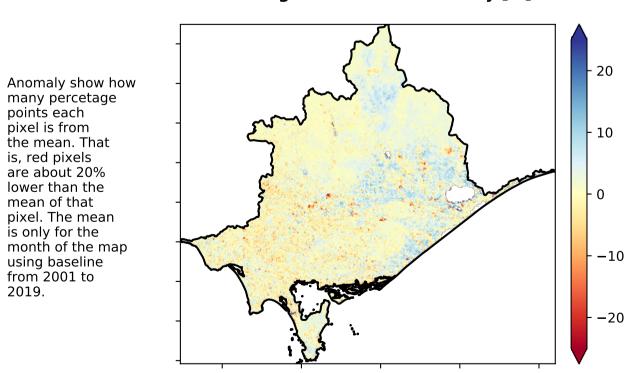
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

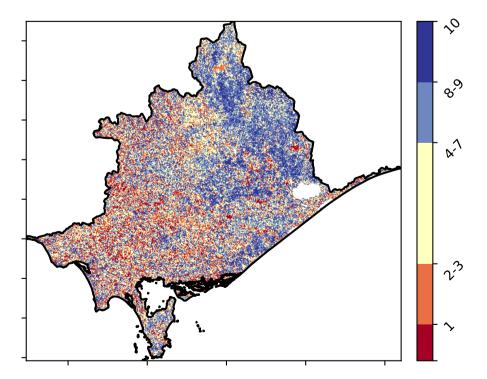


Total Vegetation Cover Anomaly [%]

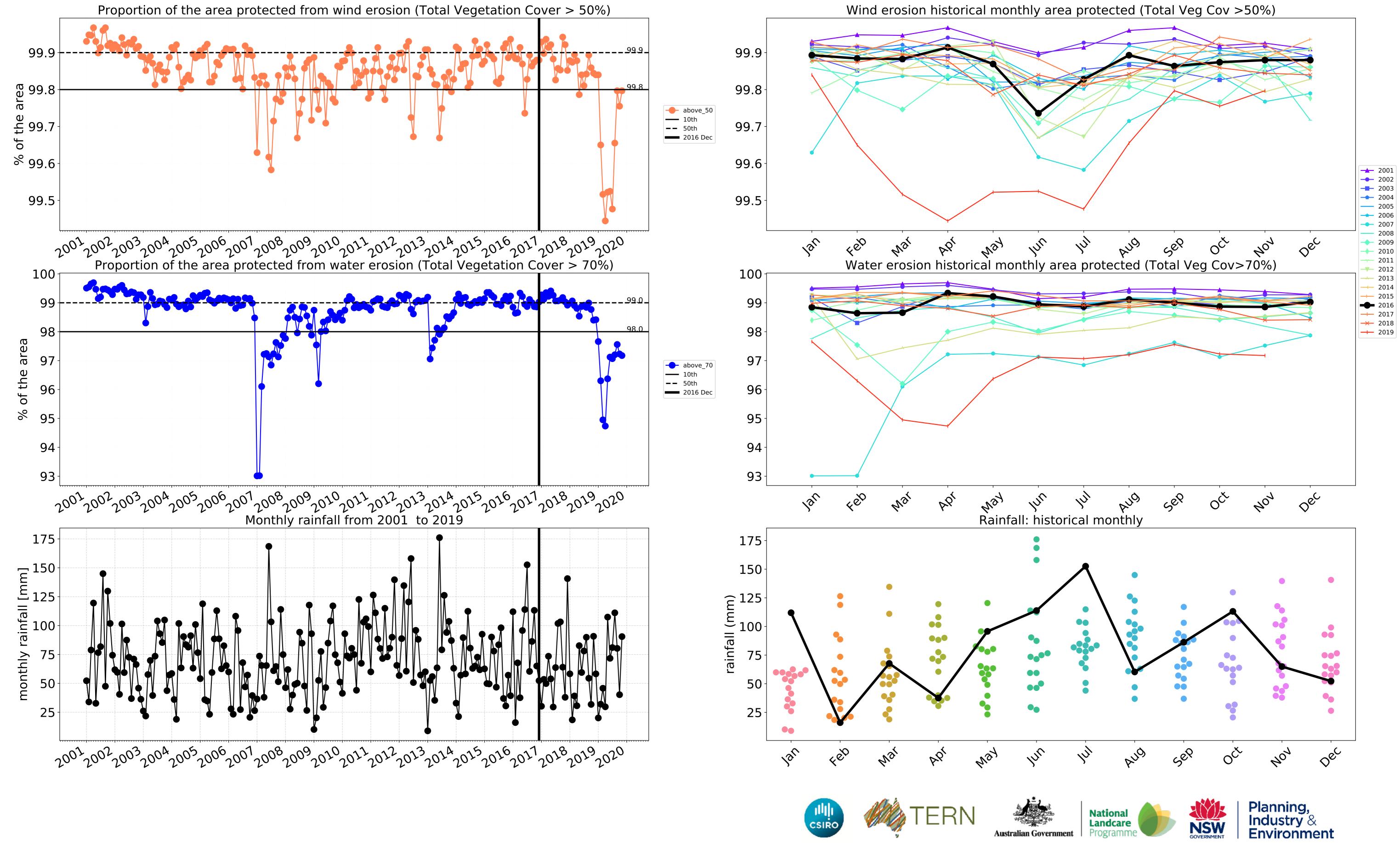


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

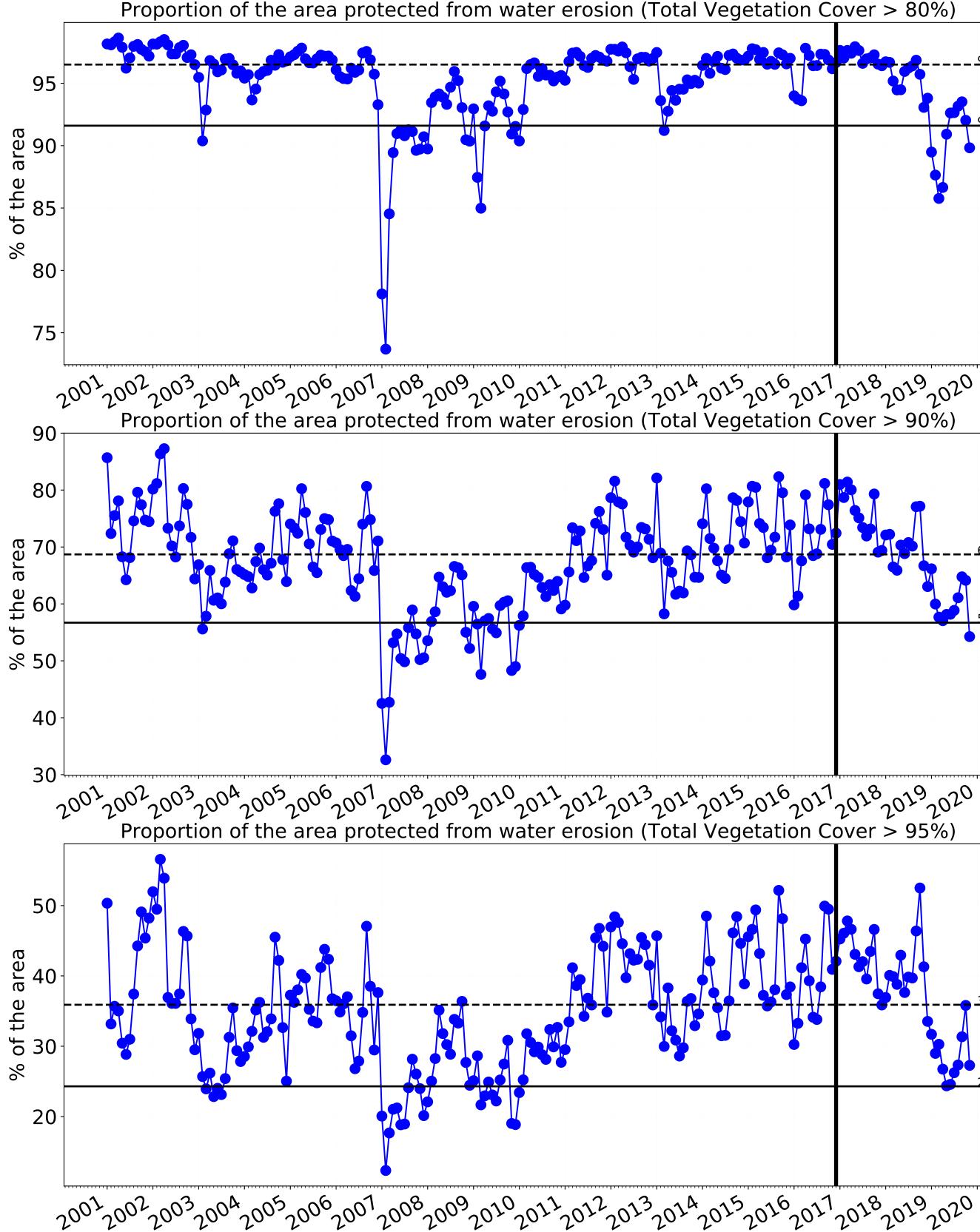
Total Vegetation Cover Decile [%]



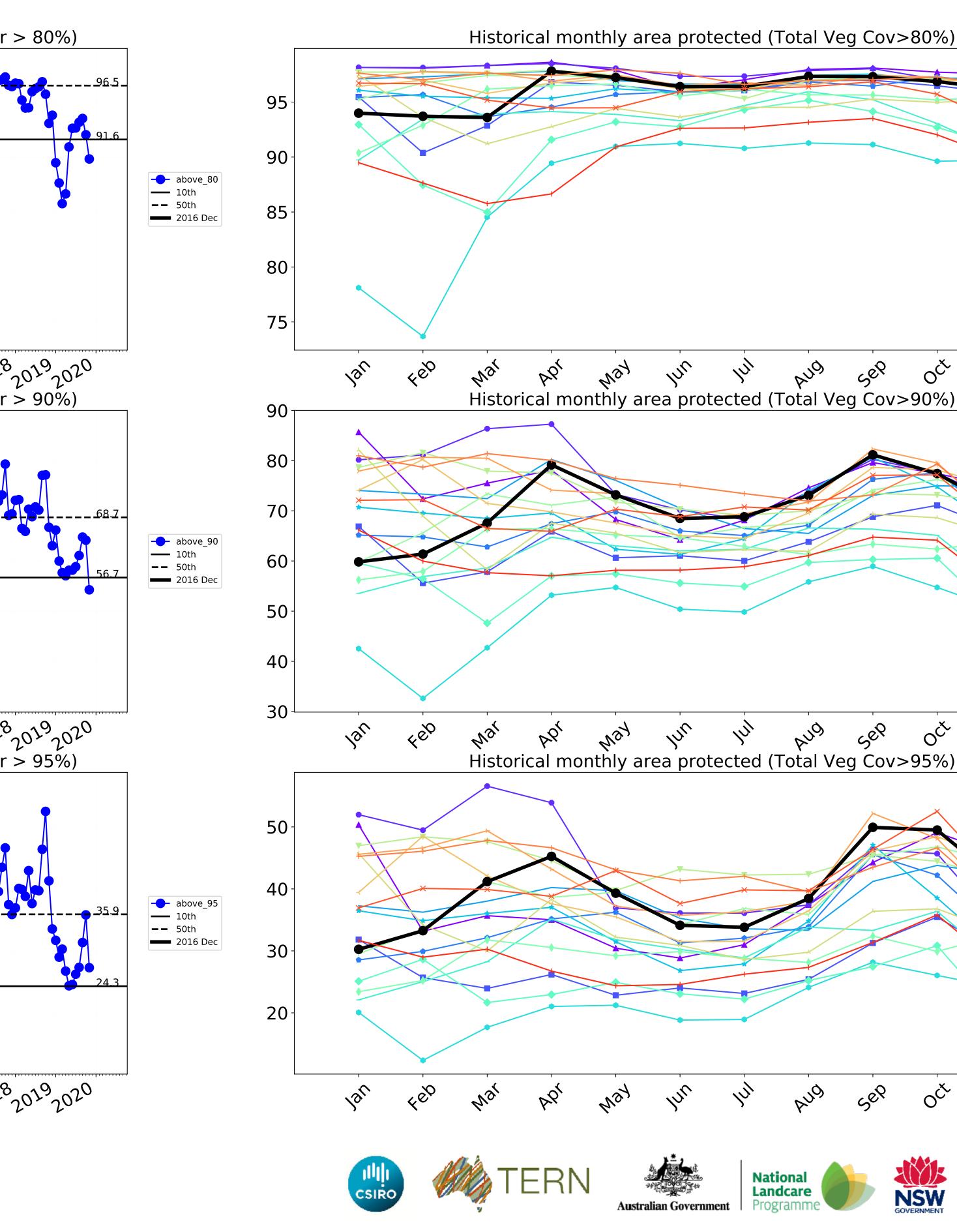








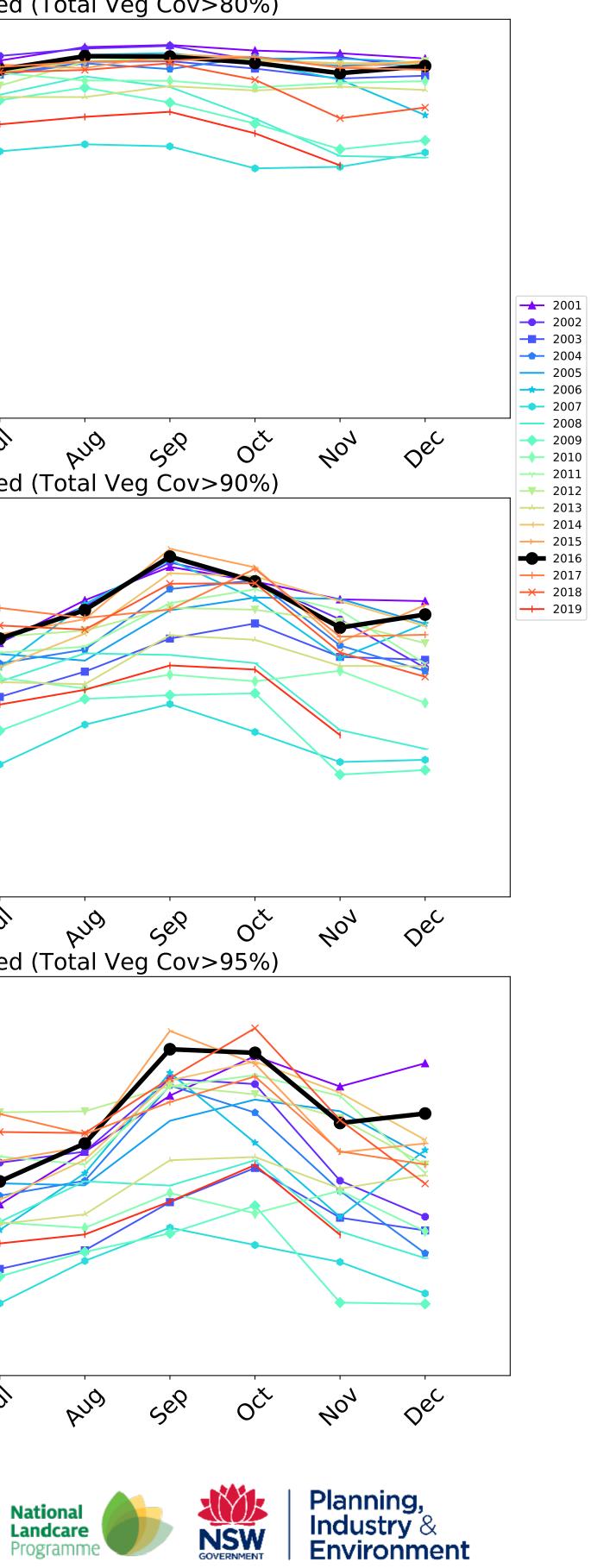
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



(J)

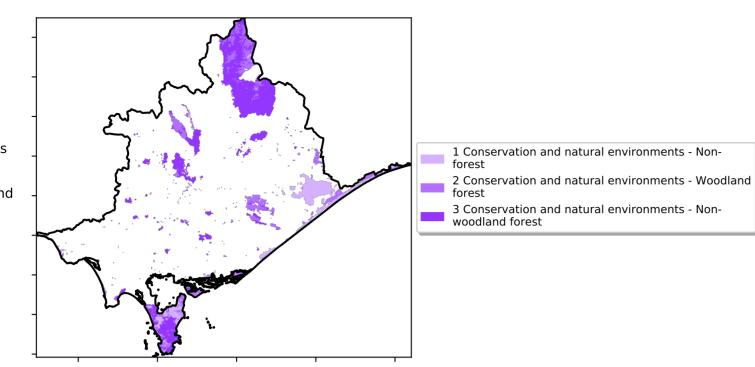
J'S

1)



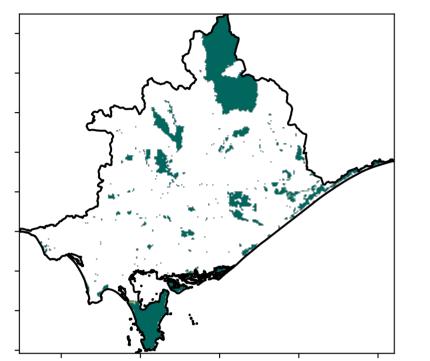
Conservation and natural environments

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

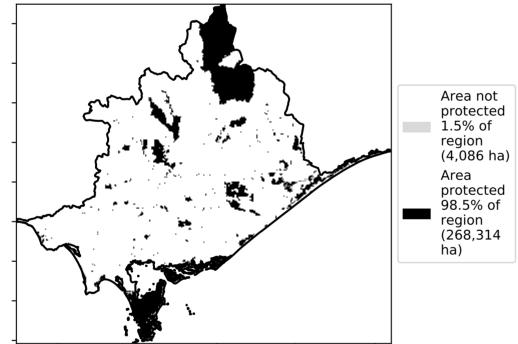


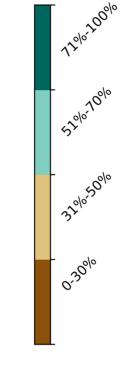
Total Vegetation Cover [%]

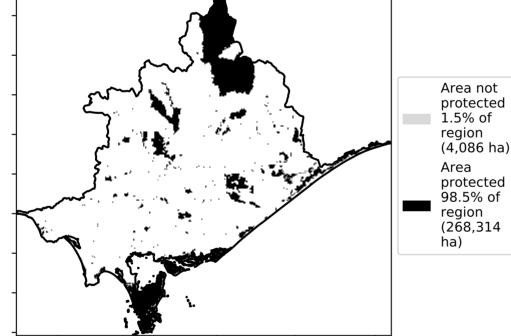
Land use and forest cover



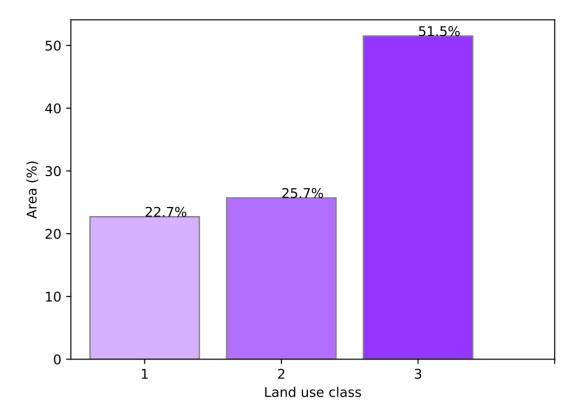
% Area protected from water erosion (>70%)



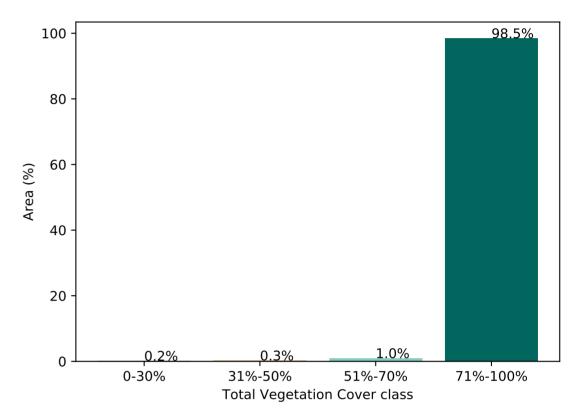




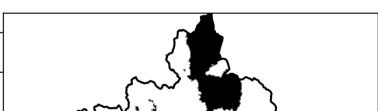
Proportion of each land class in area



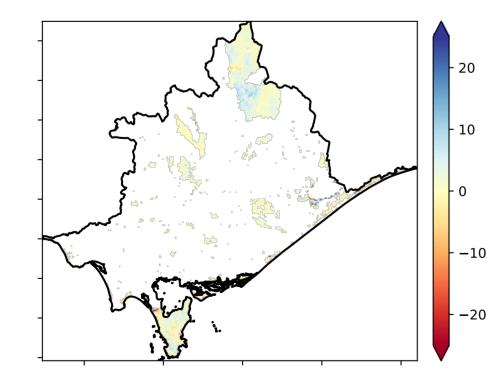
Proportion of vegetation cover class in area



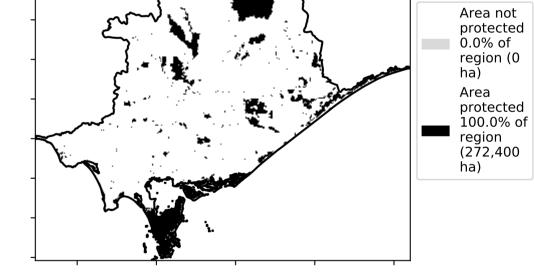
% Area protected from wind erosion (>50%)



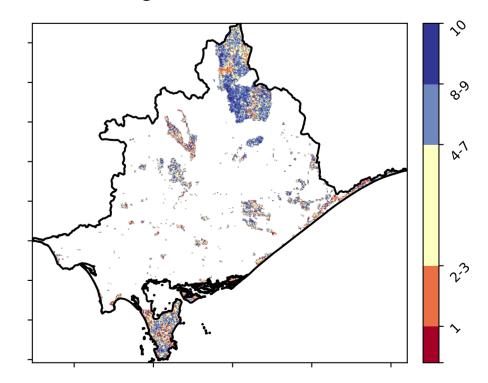
Total Vegetation Cover Anomaly [%]



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



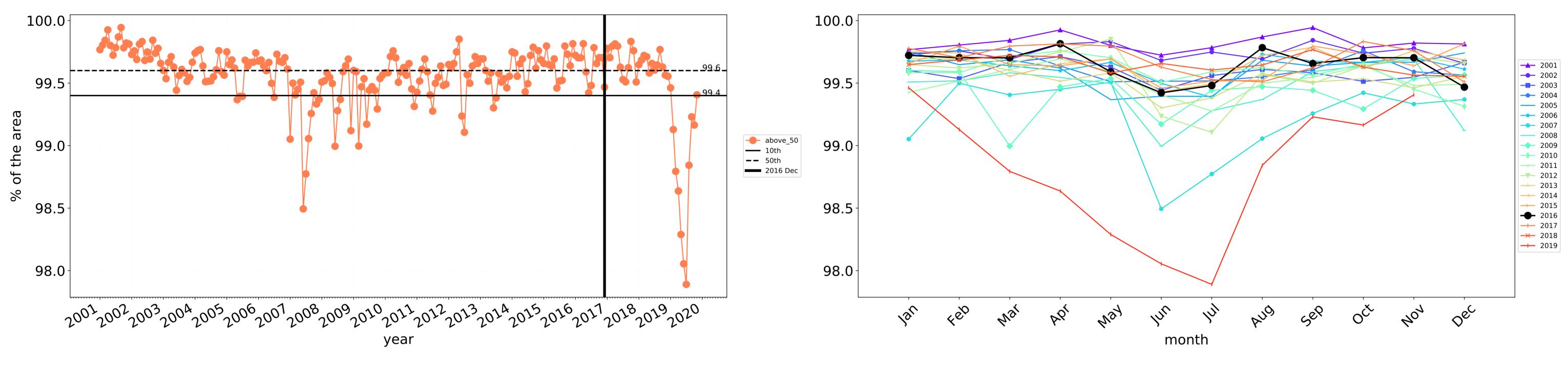
Total Vegetation Cover Decile [%]





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





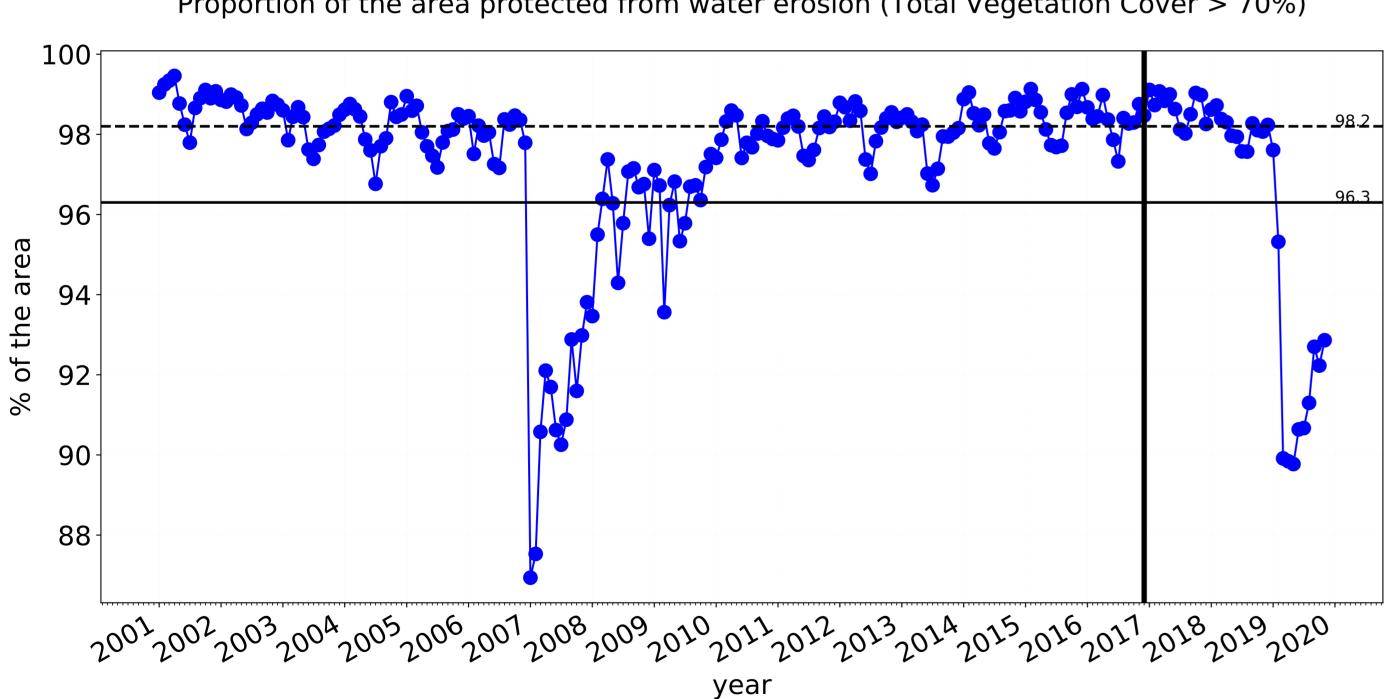
--- above_70

— 2016 Dec

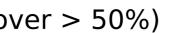
—— 10th

—— 50th

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

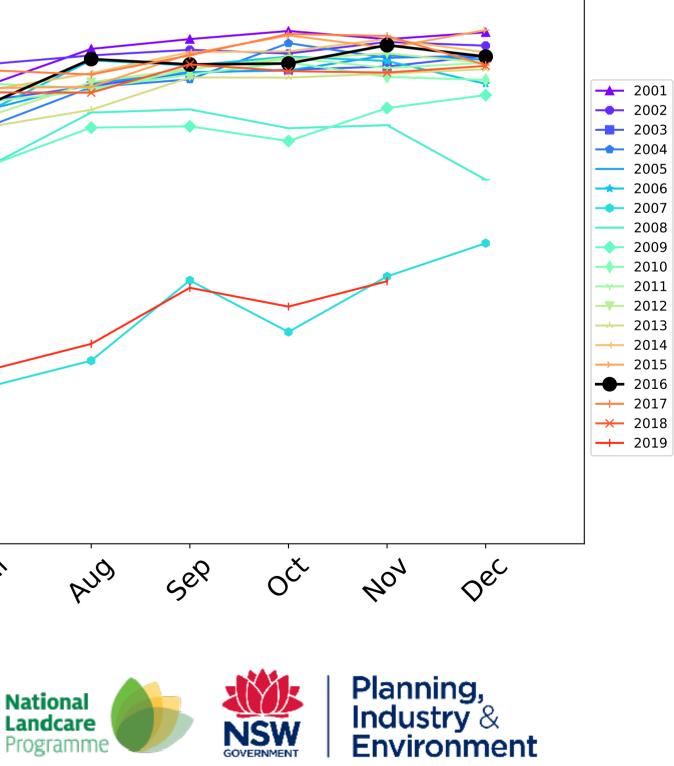


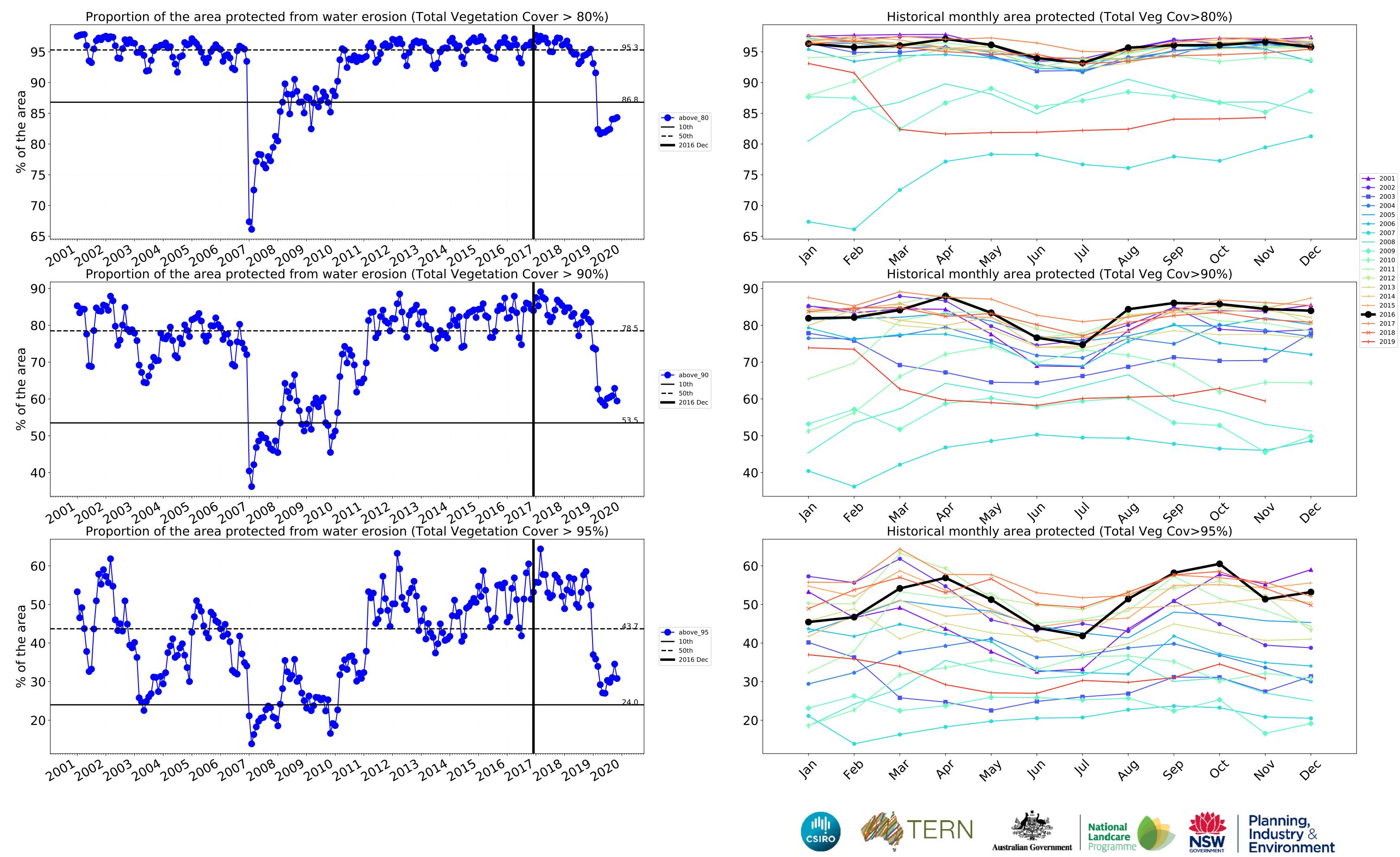
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

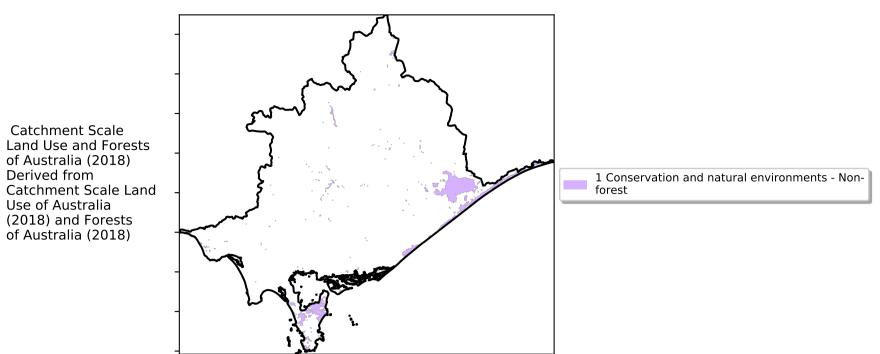
Water erosion historical monthly area protected (Total Veg Cov>70%) 100-98 96 94 92 90 88 Jan fer AUG Sep OČ In way 401 PQ1 1¹₁ Mal month FERN **Harden** NSW GOVERNMENT National Landcare CSIRC Programm Australian Government







Conservation and natural environments non forest



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

pixel is from

mean of that

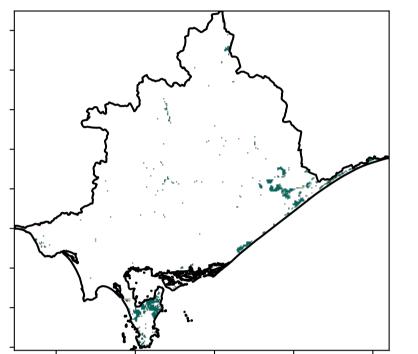
pixel. The mean

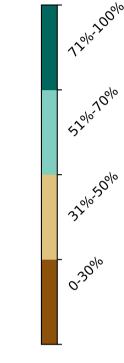
from 2001 to 2019.

the mean. That is, red pixels are about 20% lower than the

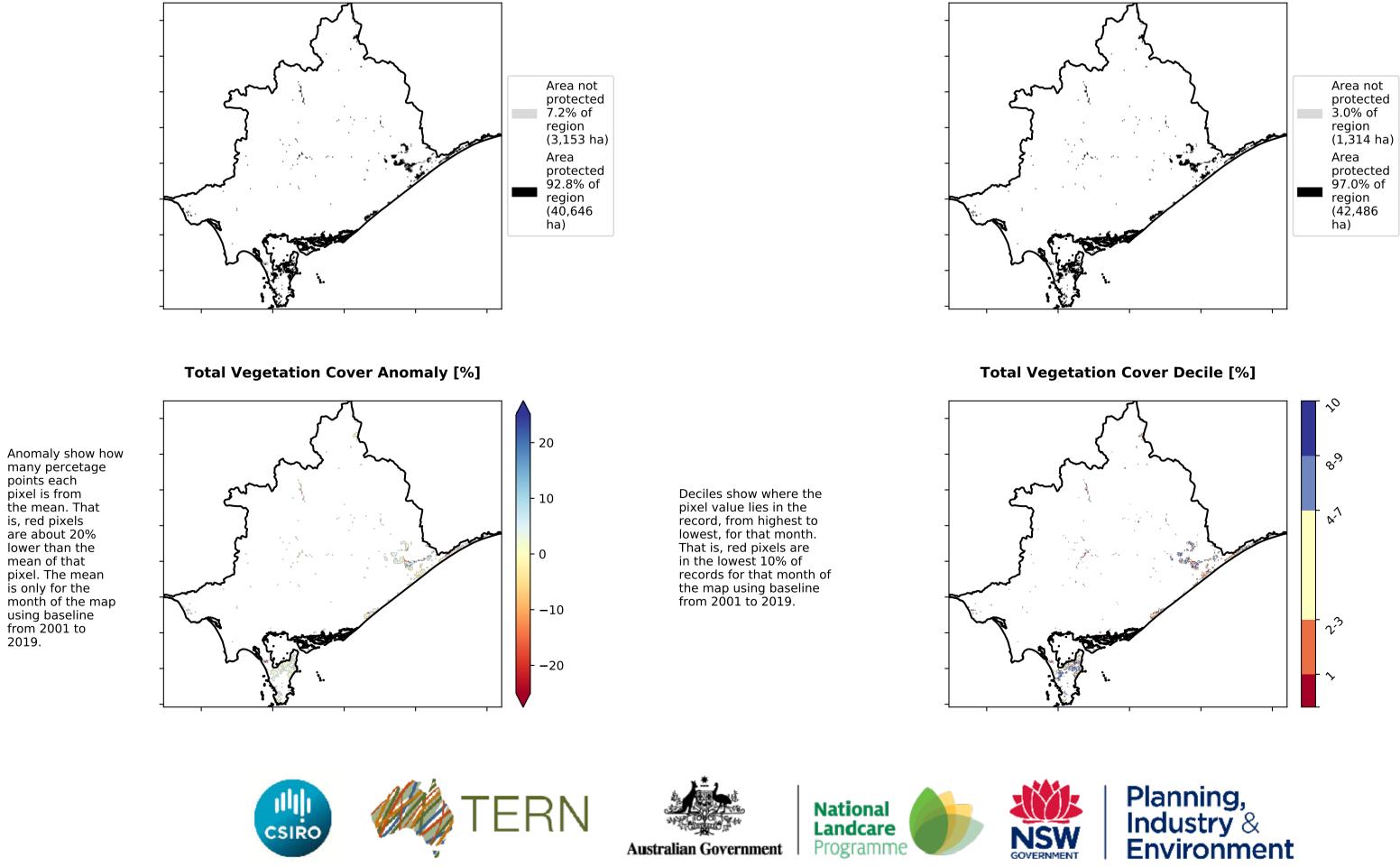
Total Vegetation Cover [%]

Land use and forest cover

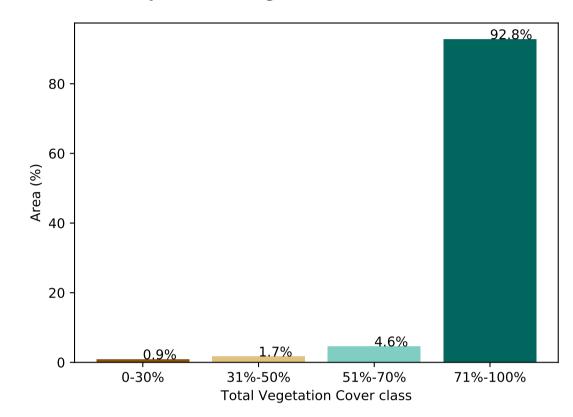




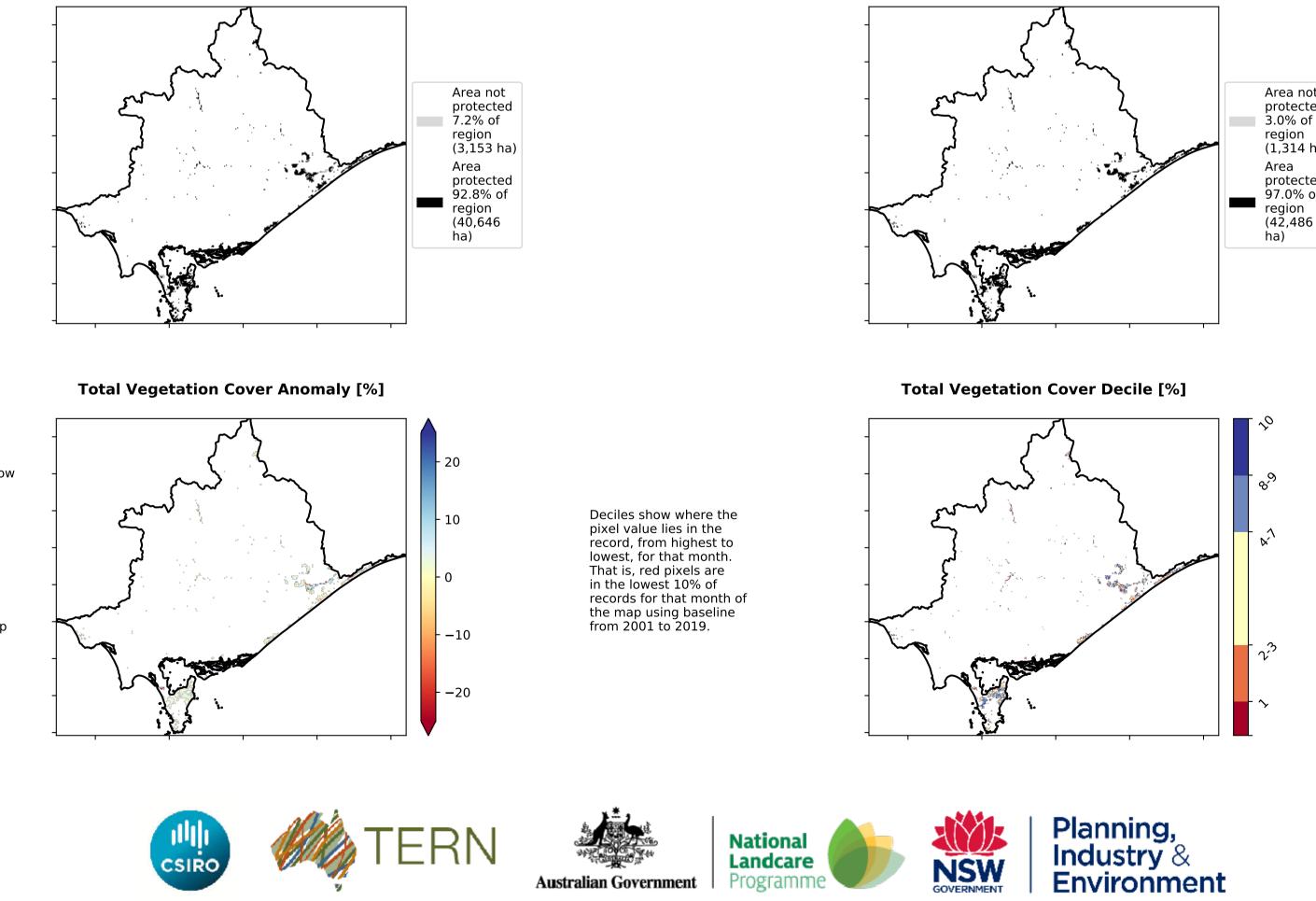
% Area protected from water erosion (>70%)

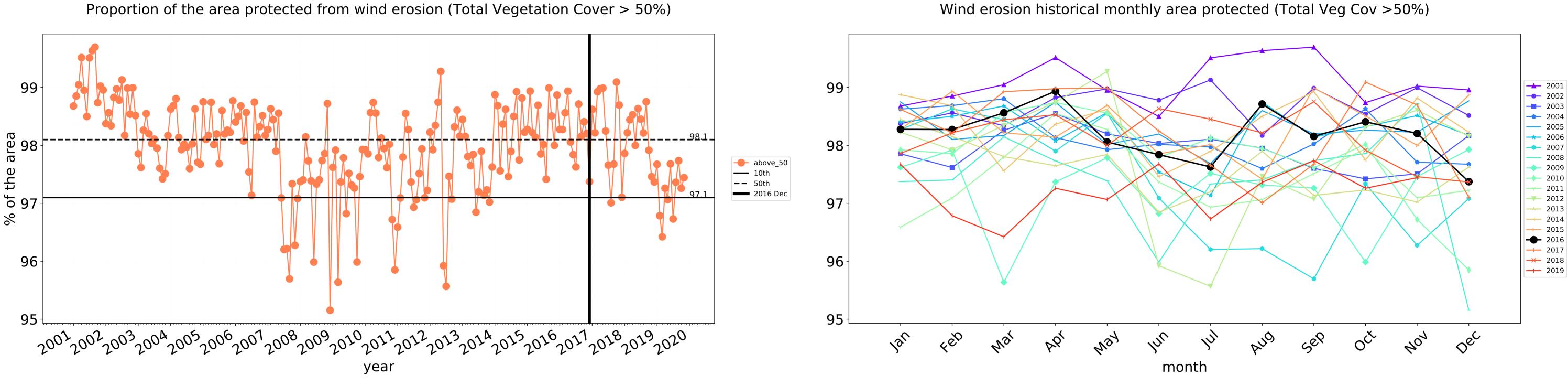






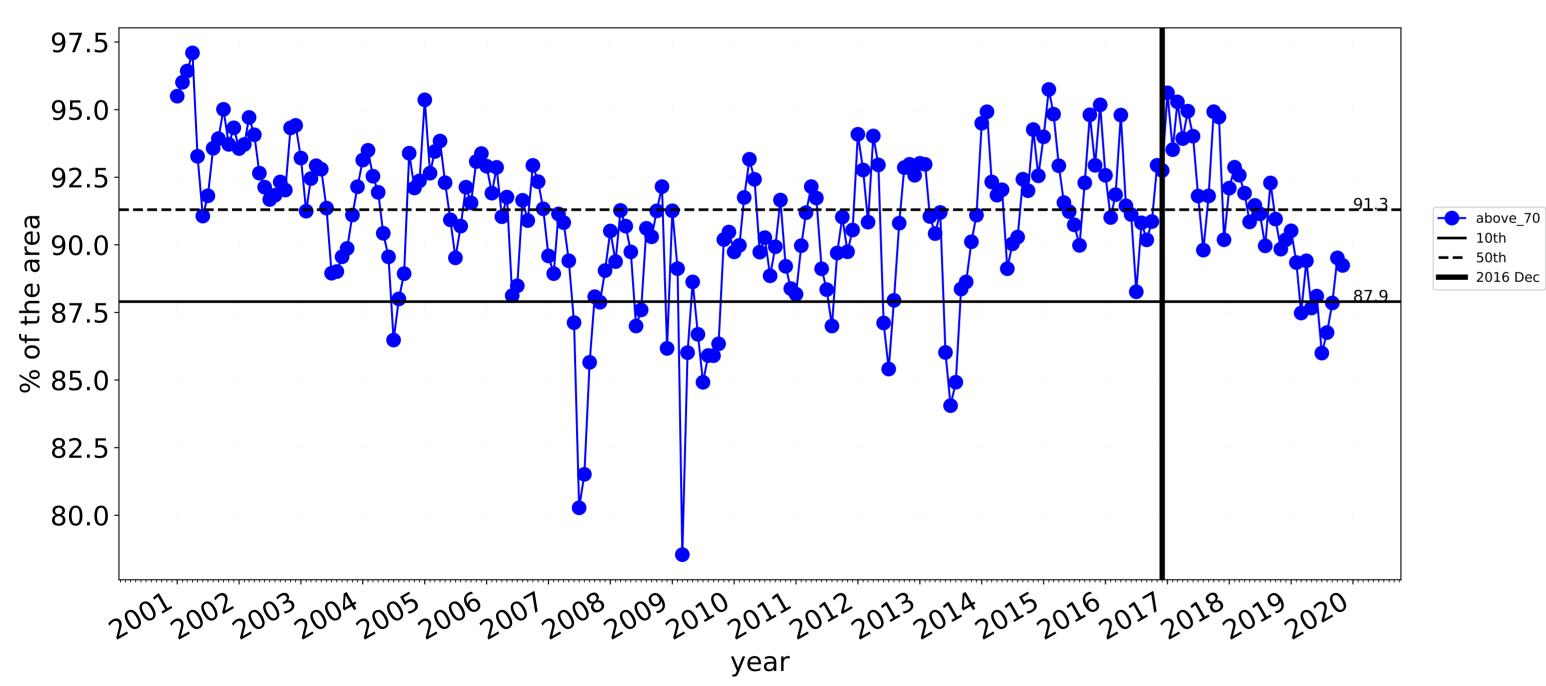
% Area protected from wind erosion (>50%)

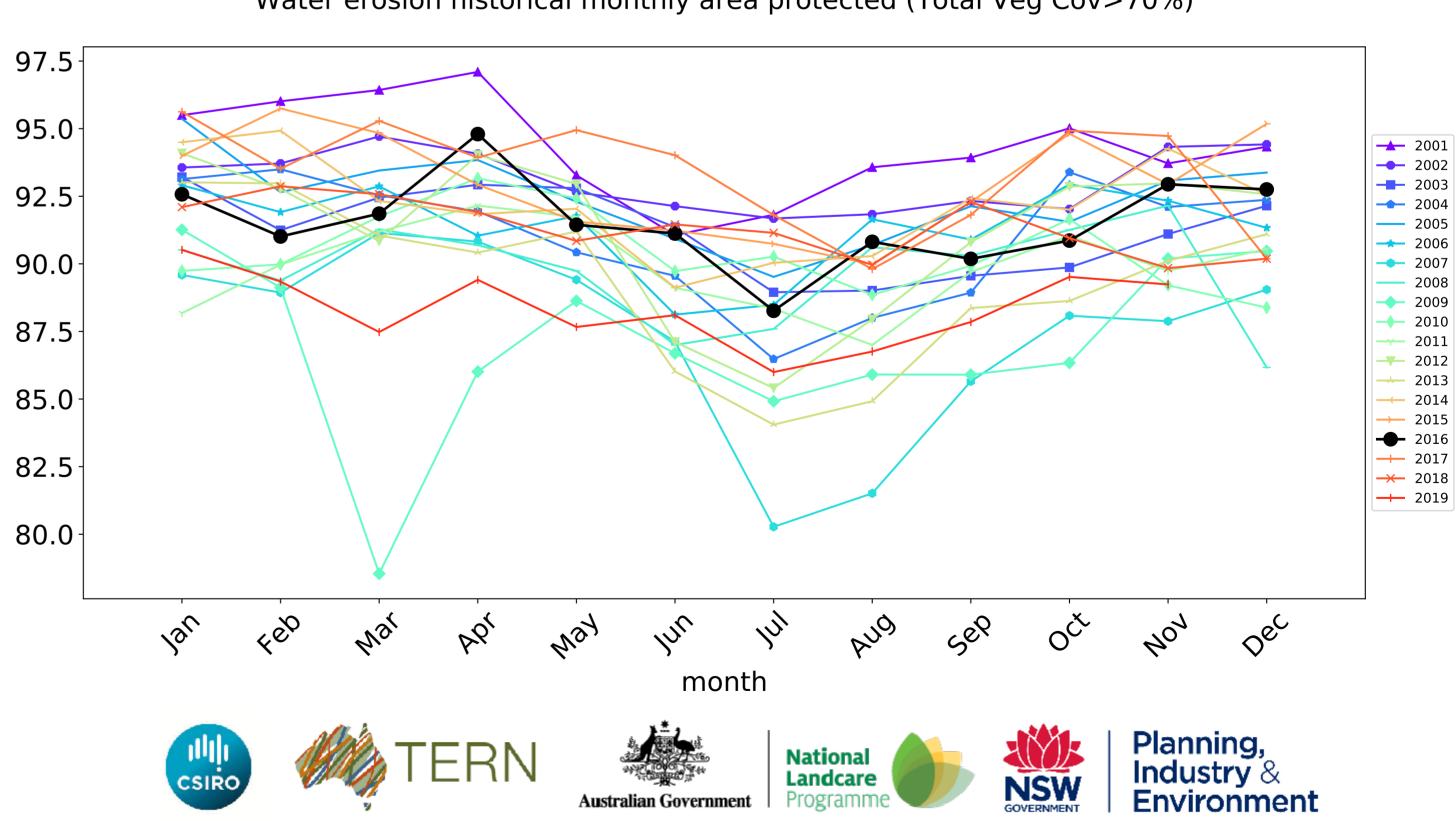




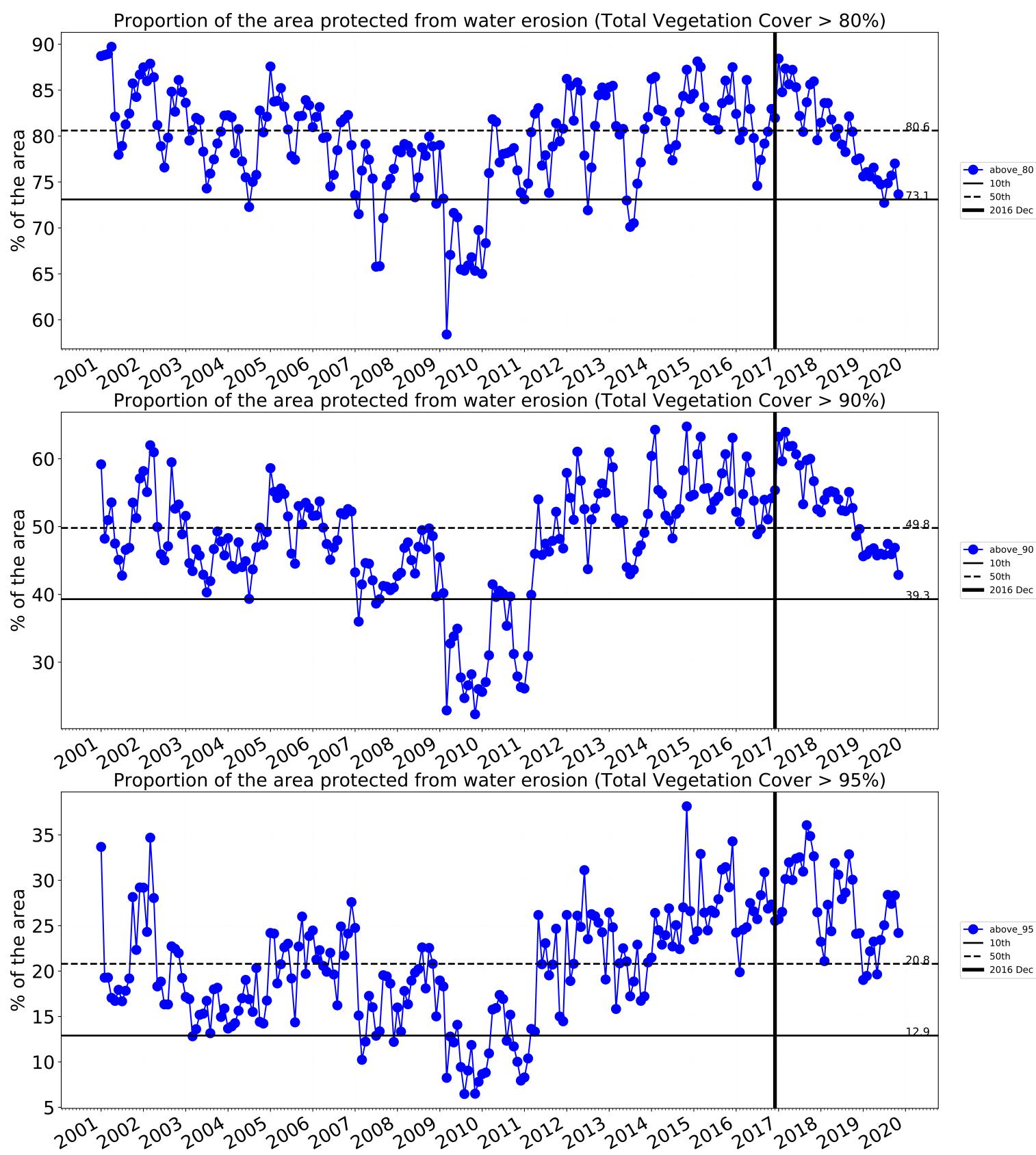
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

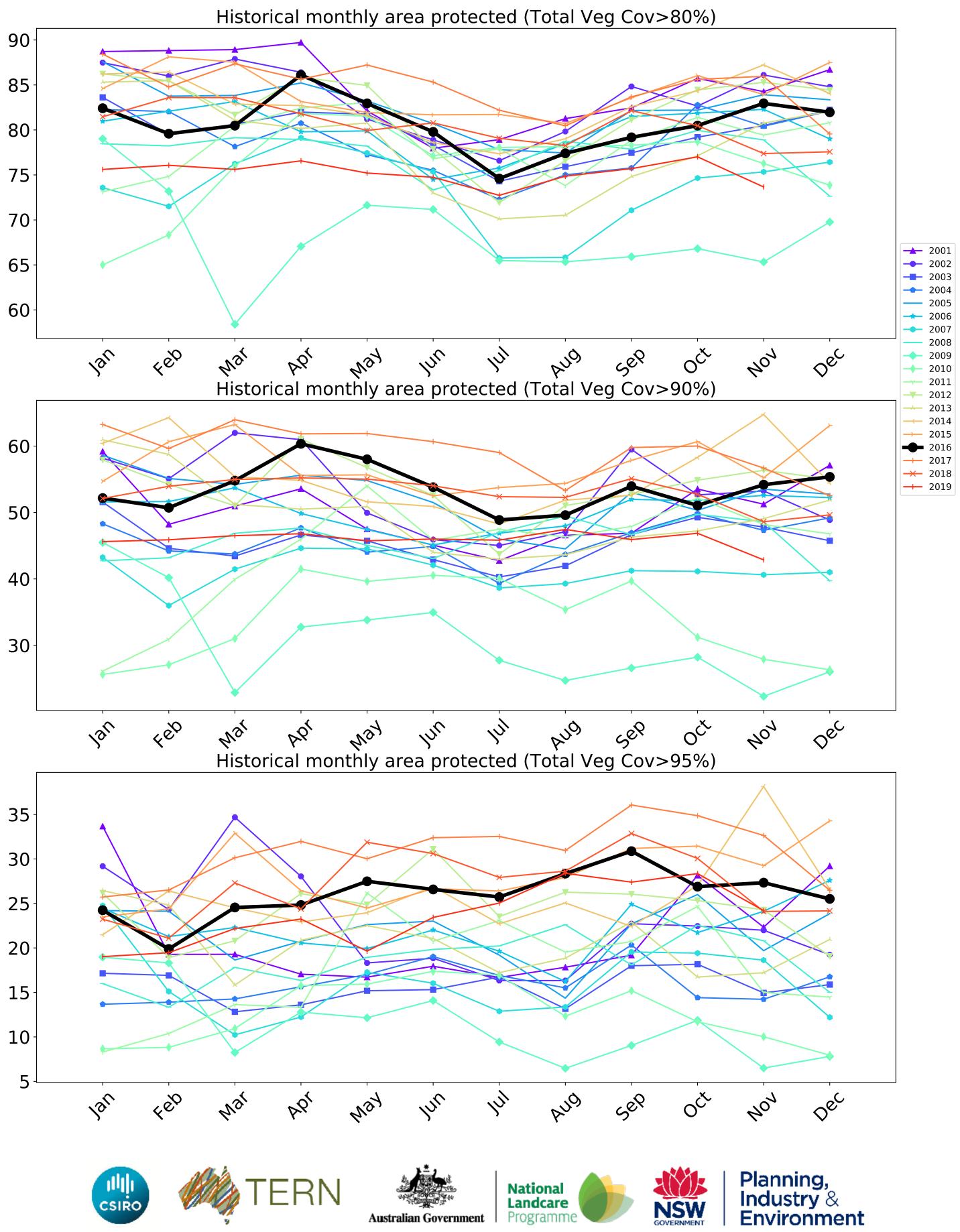
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





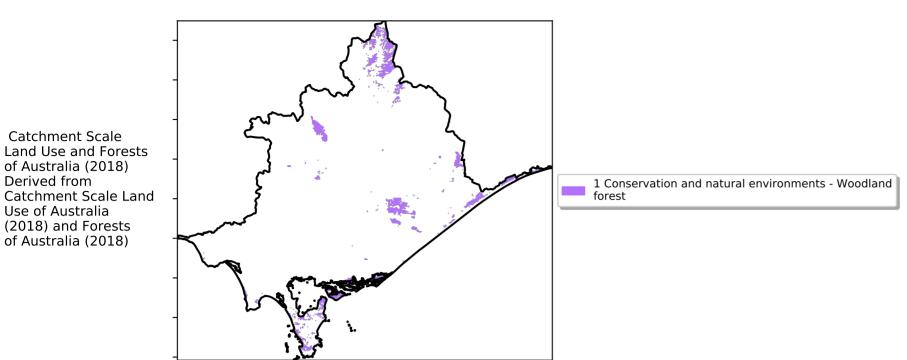
Water erosion historical monthly area protected (Total Veg Cov>70%)







Conservation and natural environments Woodland forest



12%100%

· 52°10°10°10

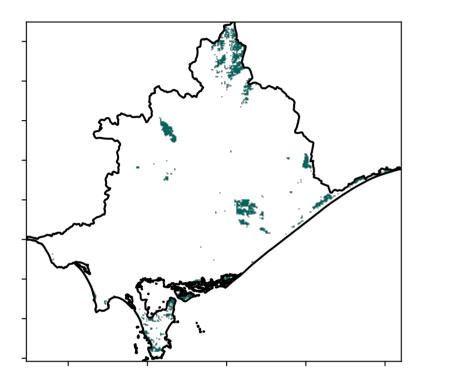
320105001

0.30%

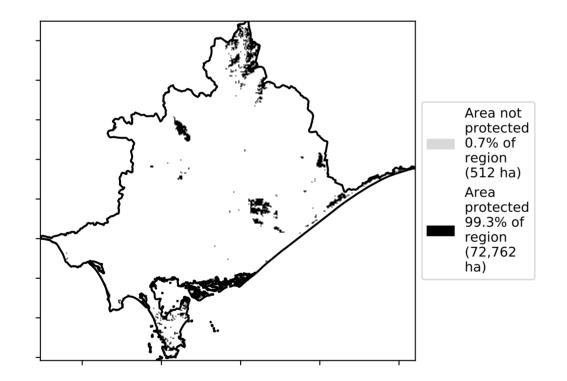
Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]

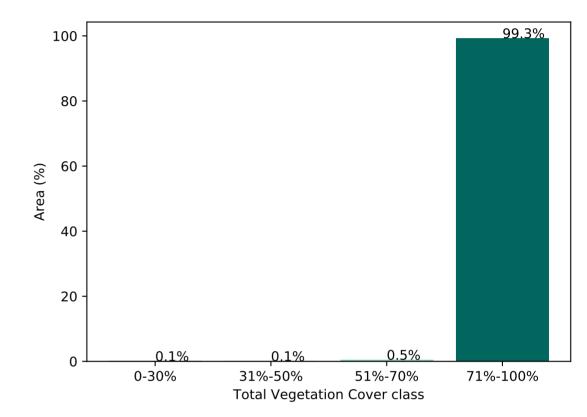
Land use and forest cover



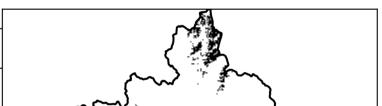
% Area protected from water erosion (>70%)



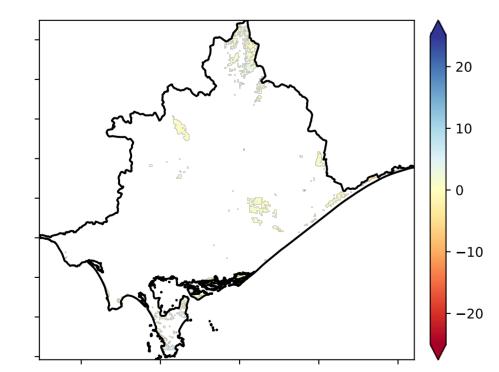




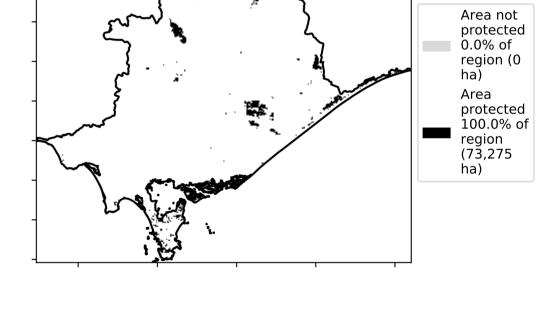
% Area protected from wind erosion (>50%)



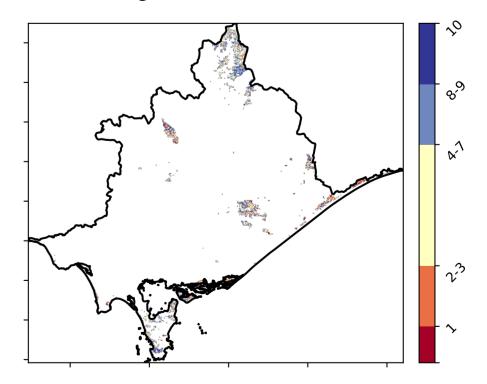
Total Vegetation Cover Anomaly [%]



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

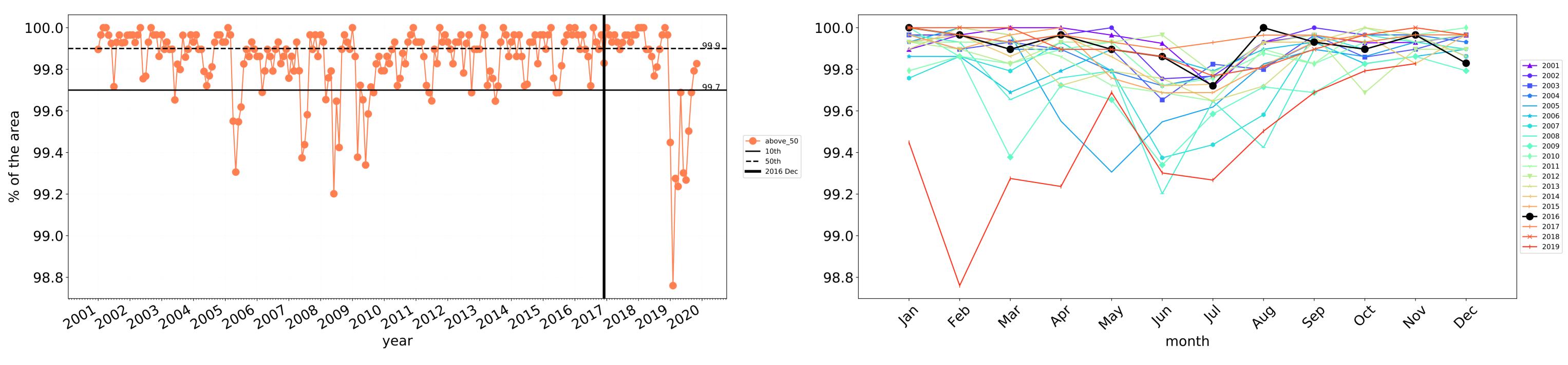


Total Vegetation Cover Decile [%]



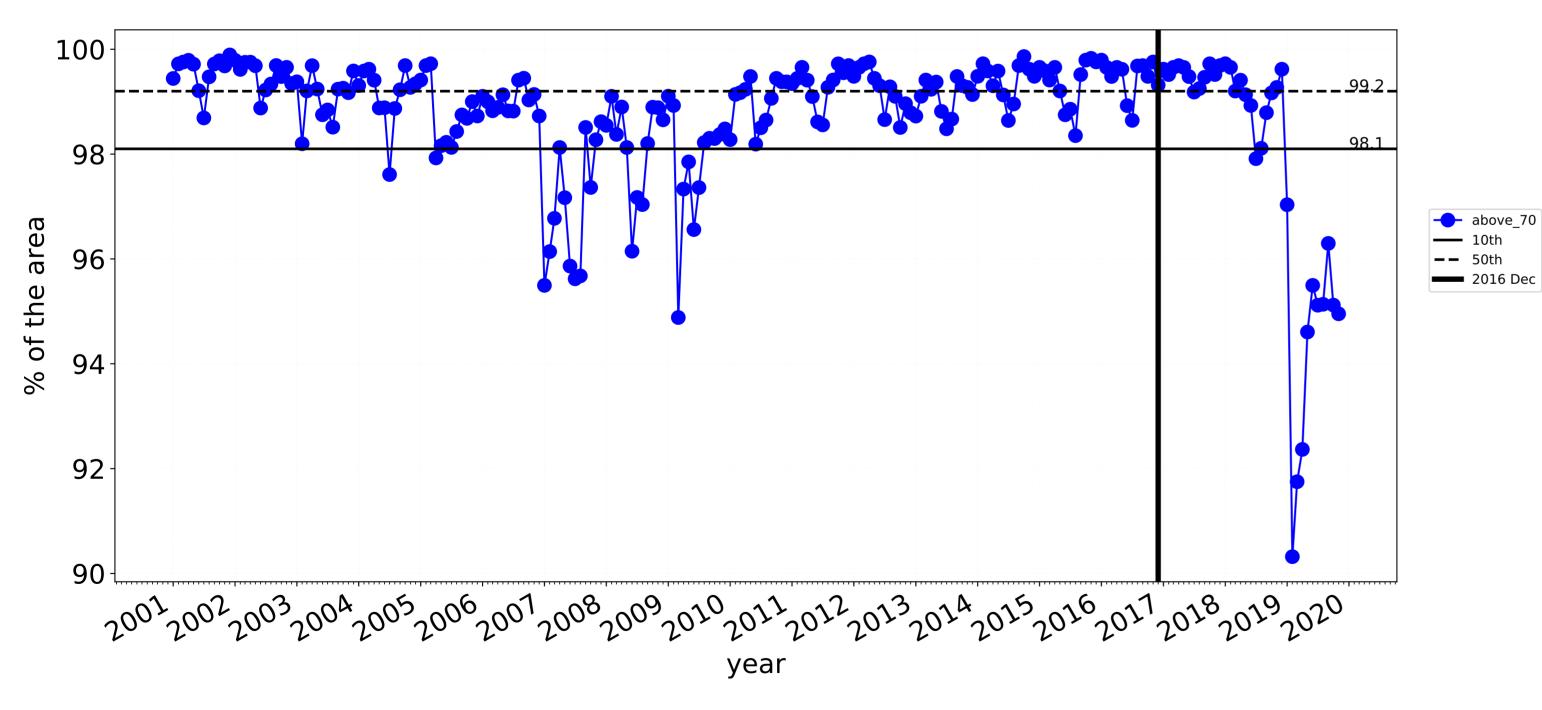


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.



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

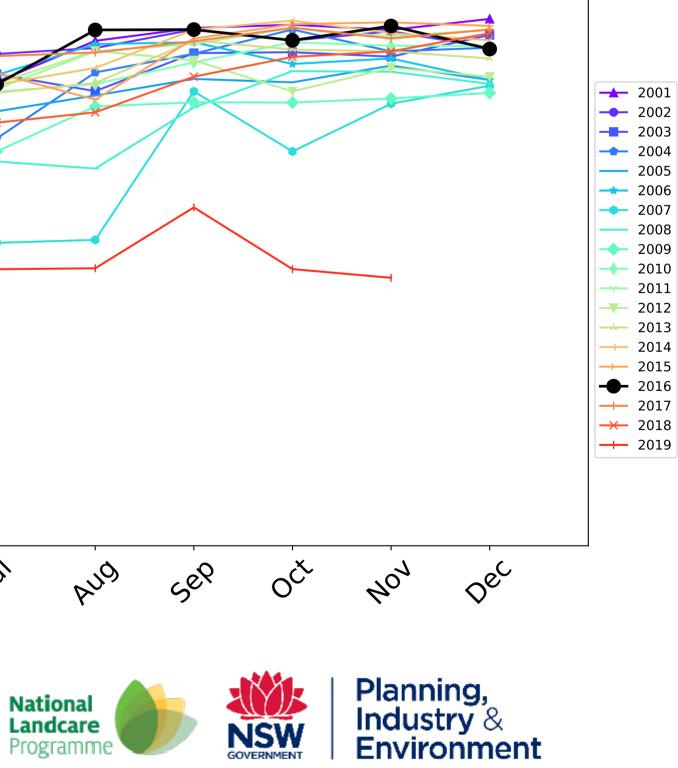
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

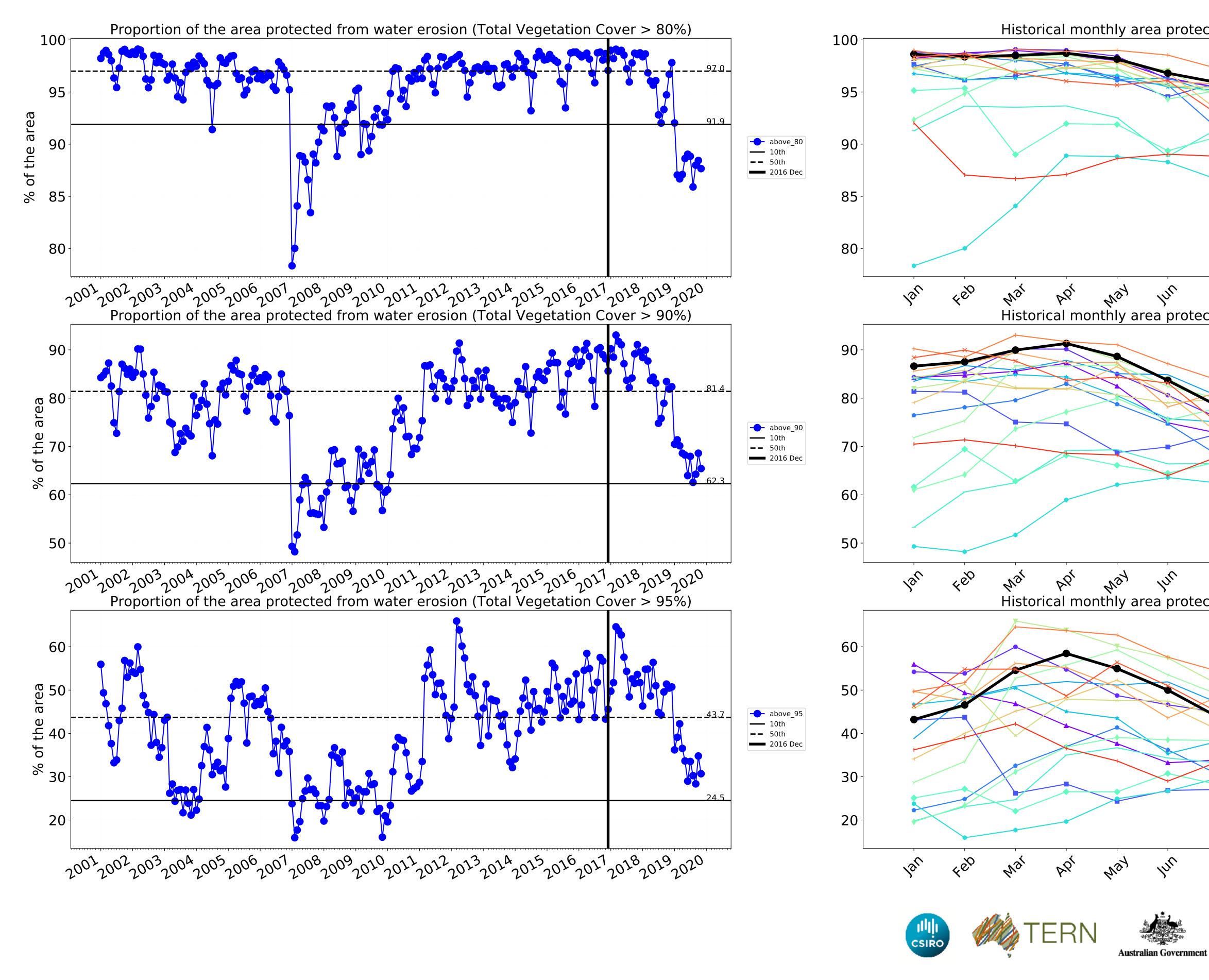


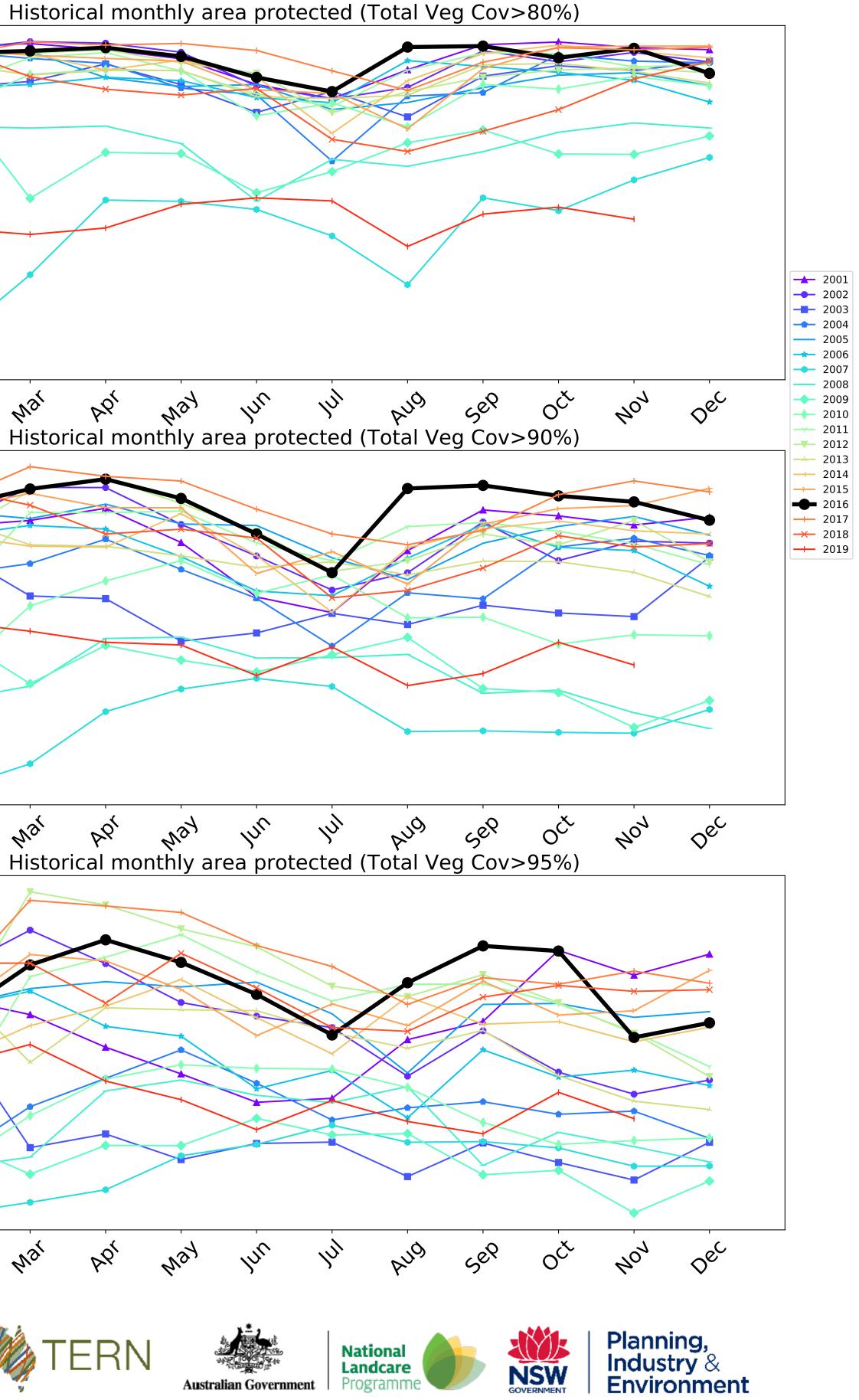
Wind erosion historical monthly area protected (Total Veg Cov >50%)

 100^{-1} 98 96 94 92 90 Jan feb way In 1's Þ6, Mai month ERN (III) CSIRC Australian Government

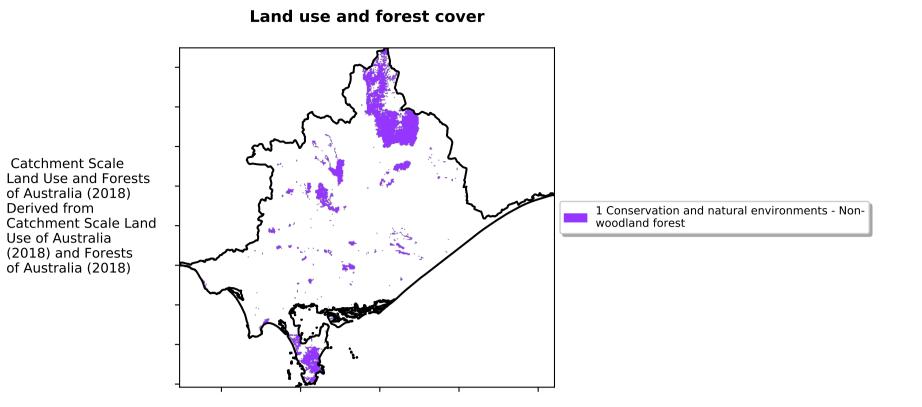
Water erosion historical monthly area protected (Total Veg Cov>70%)



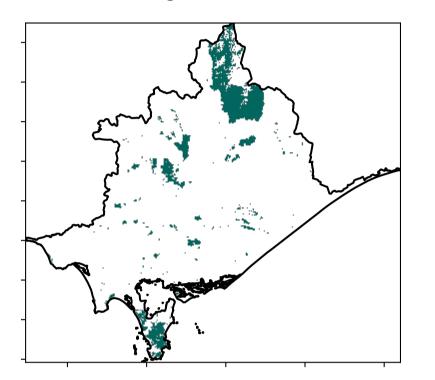




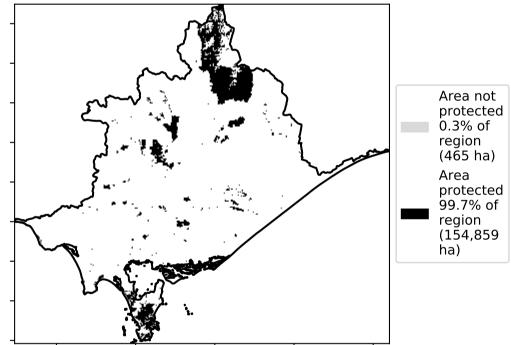
Conservation and natural environments Forest (non woodland)

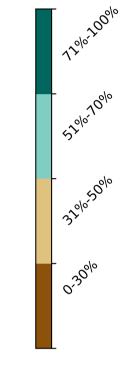


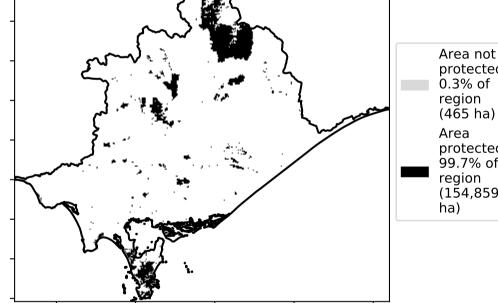
Total Vegetation Cover [%]



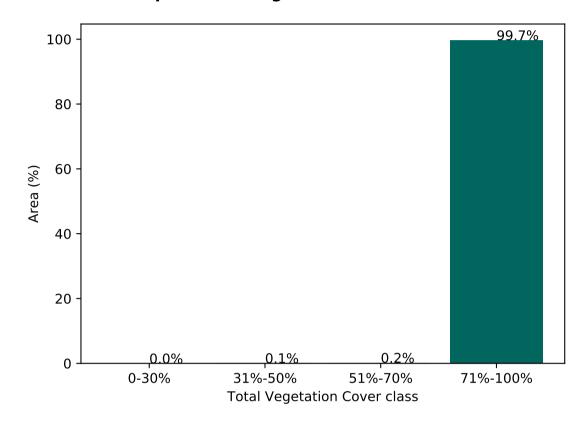
% Area protected from water erosion (>70%)



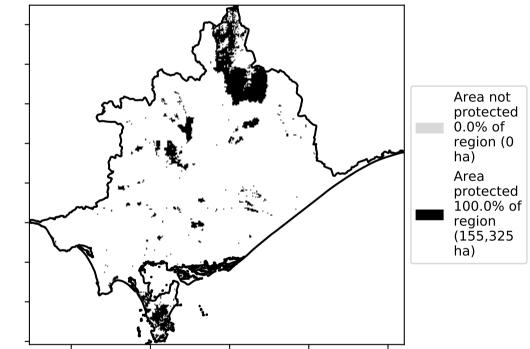




Proportion of vegetation cover class in area

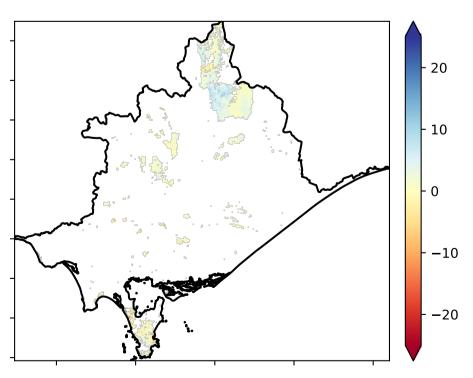


% Area protected from wind erosion (>50%)



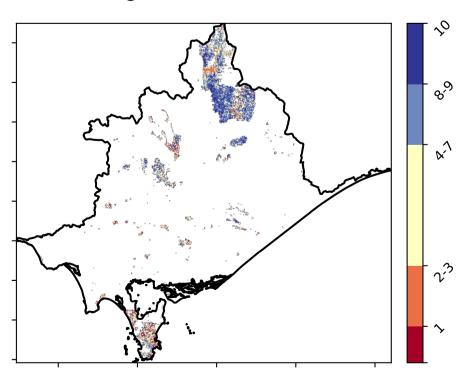
Total Vegetation Cover Anomaly [%]

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.



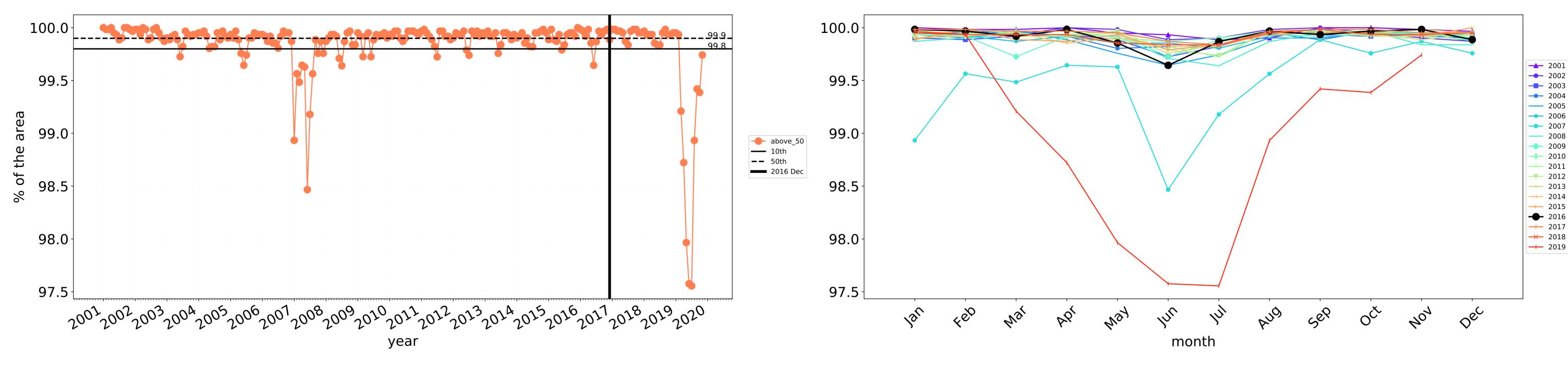
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



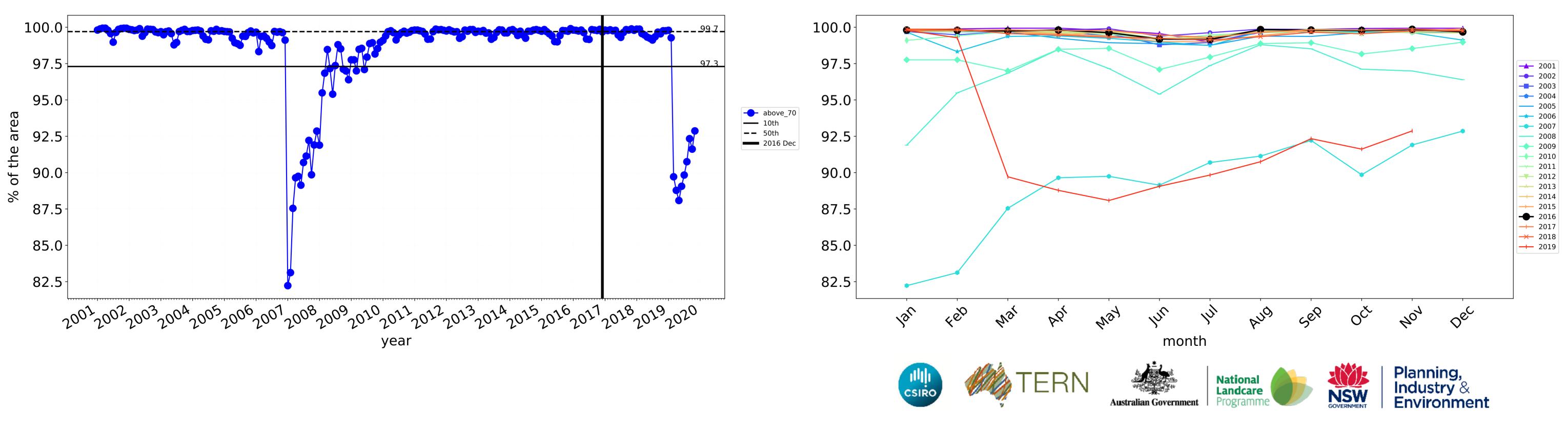


Conservation and natural environments Forest (non woodland) timeseries



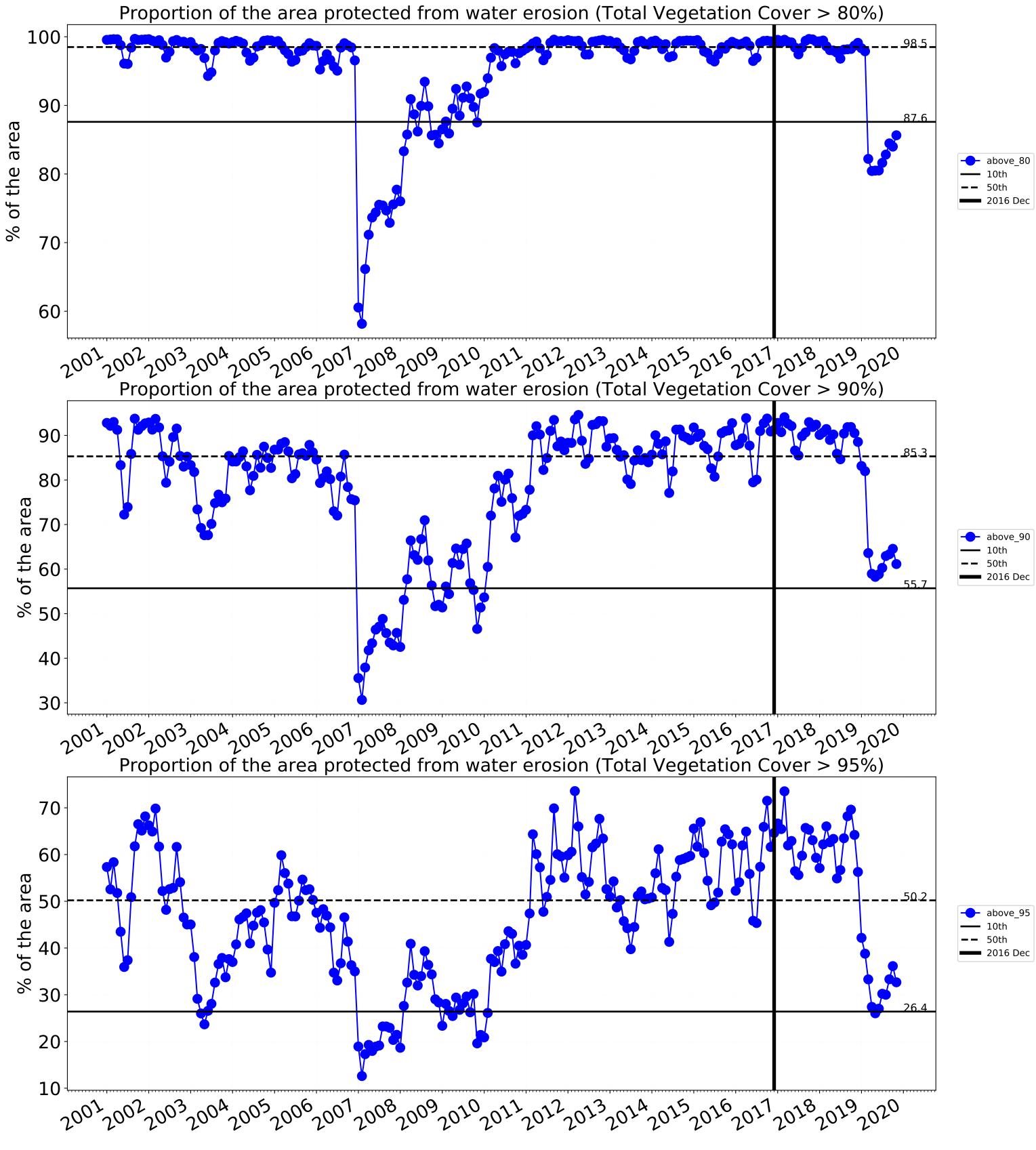
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

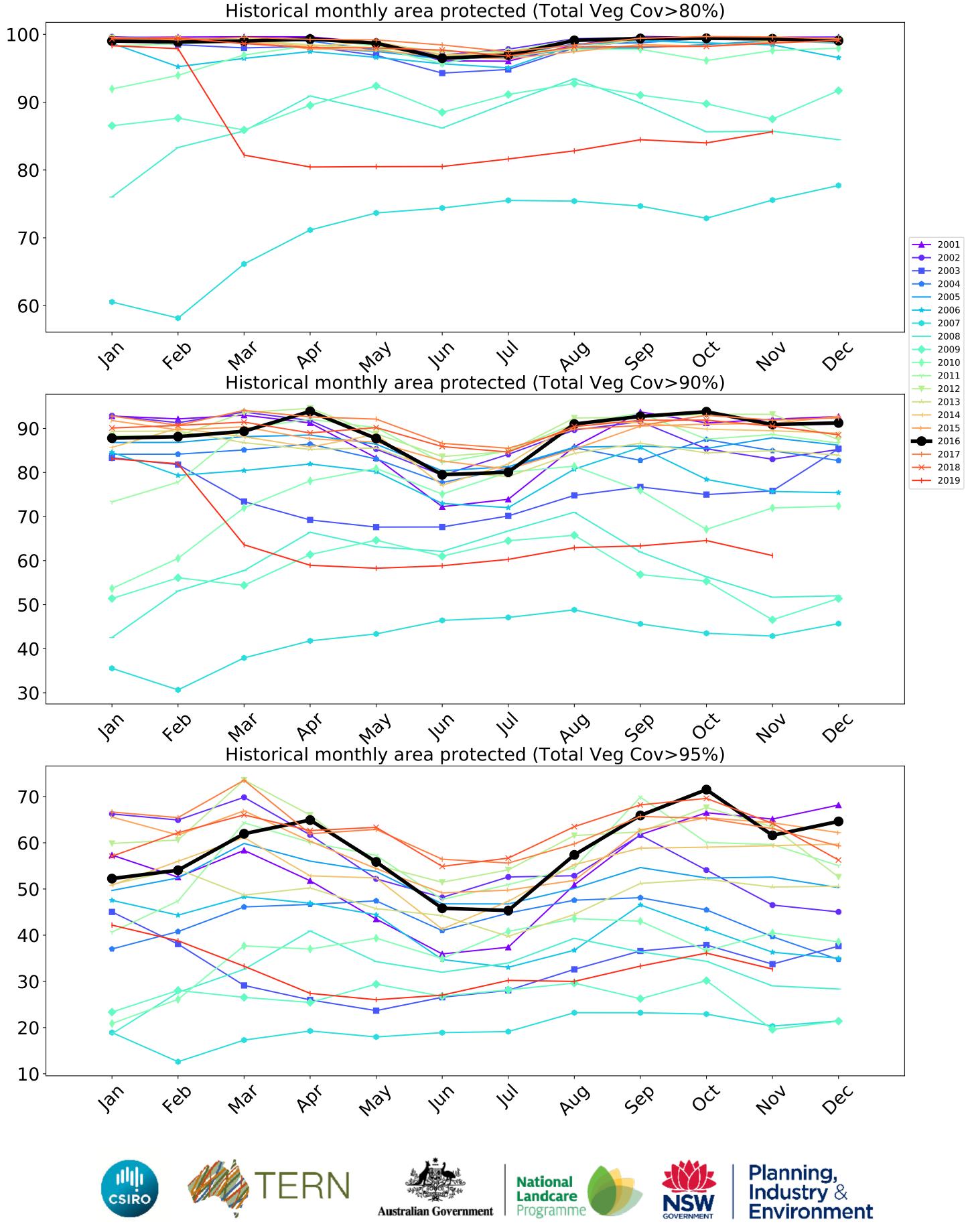


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



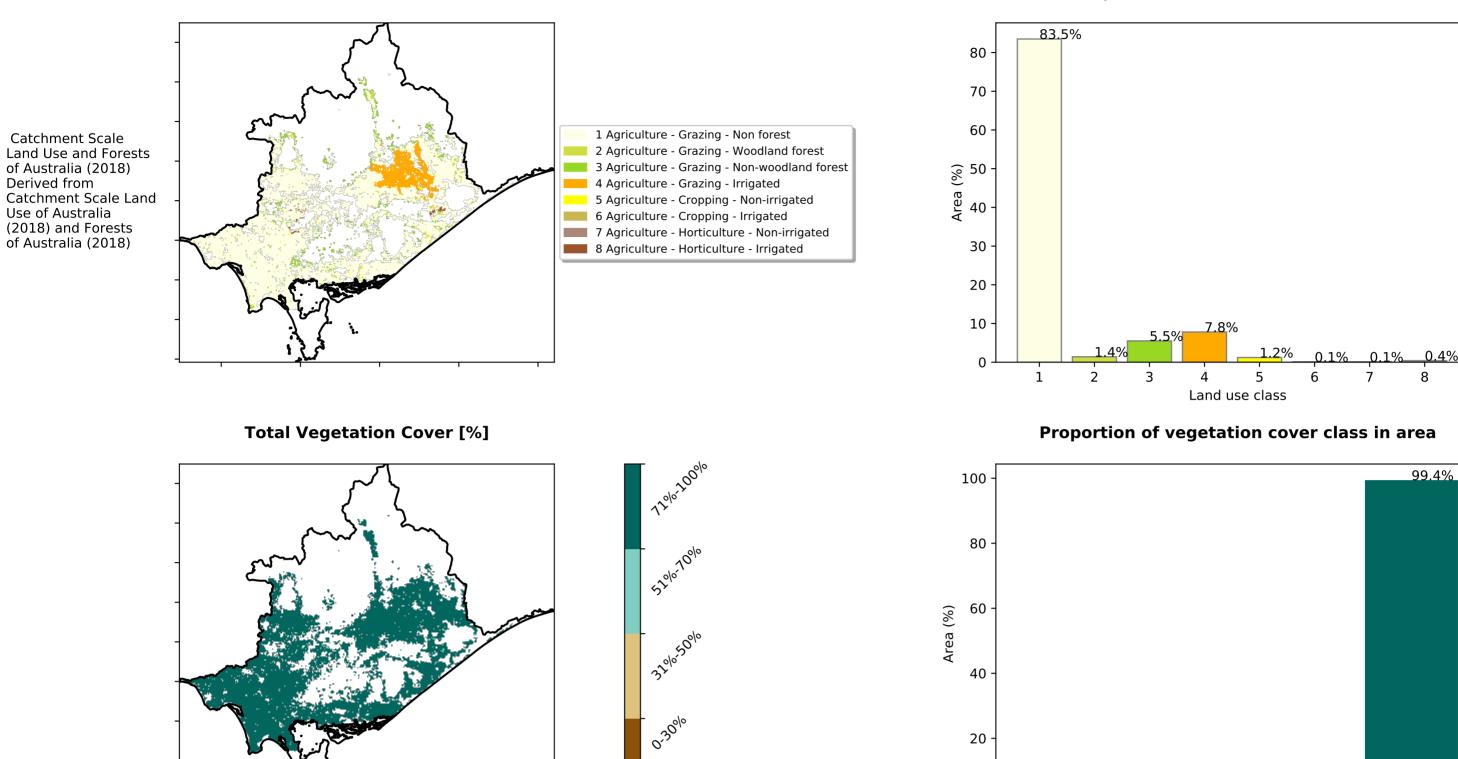
above_80



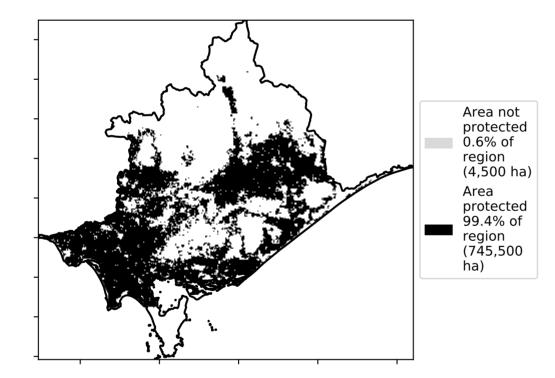
Agriculture

Land use and forest cover

Proportion of each land class in area



% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

Total Vegetation Cover class

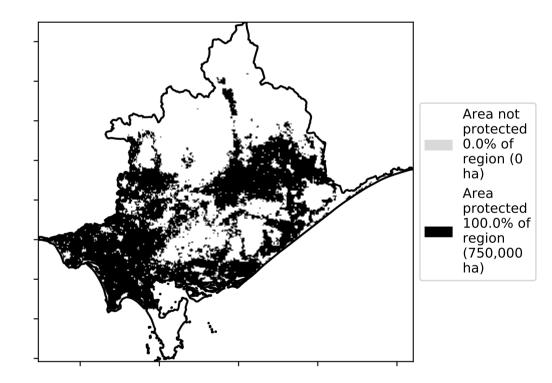
0.0%

31%-50%

0.1%

0-30%

0

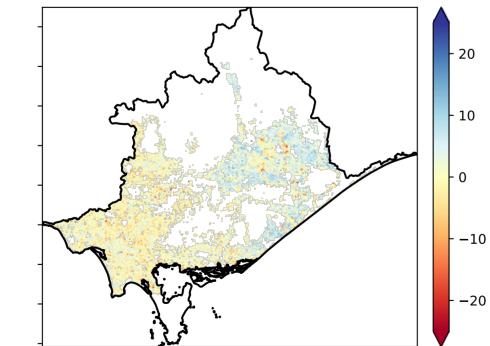


0.5%

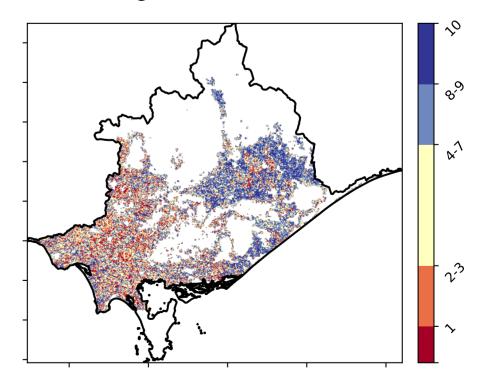
71%-100%

51%-70%

Total Vegetation Cover Anomaly [%]



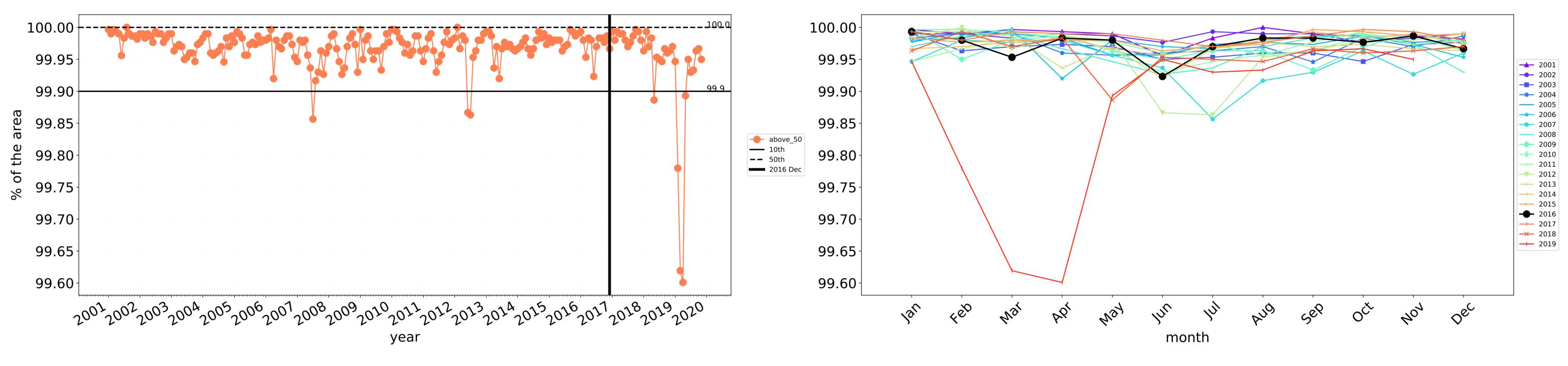
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. **Total Vegetation Cover Decile [%]**





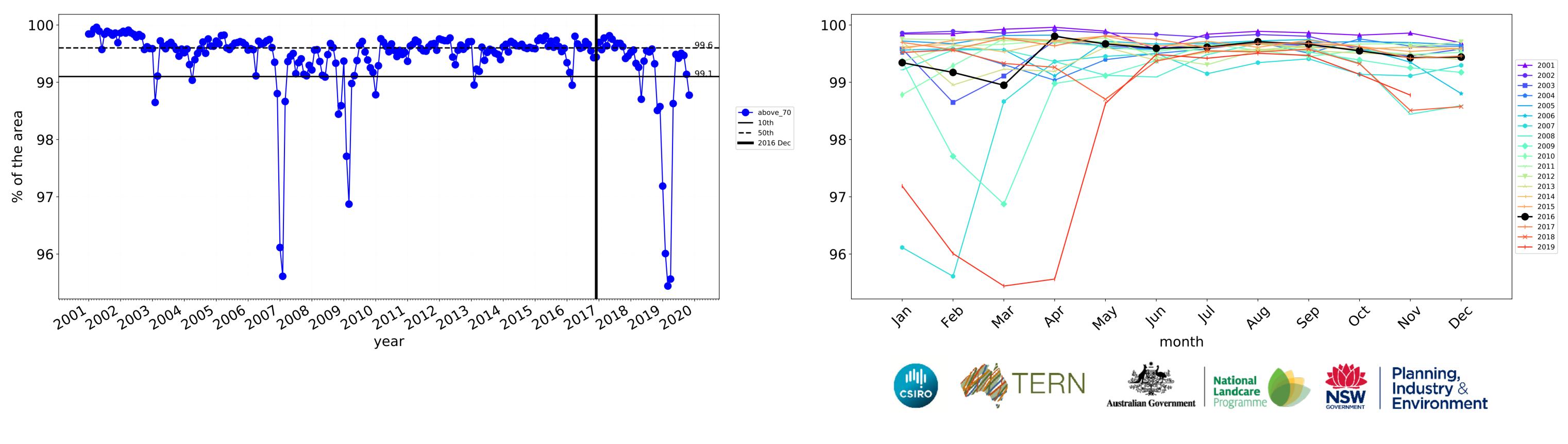
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





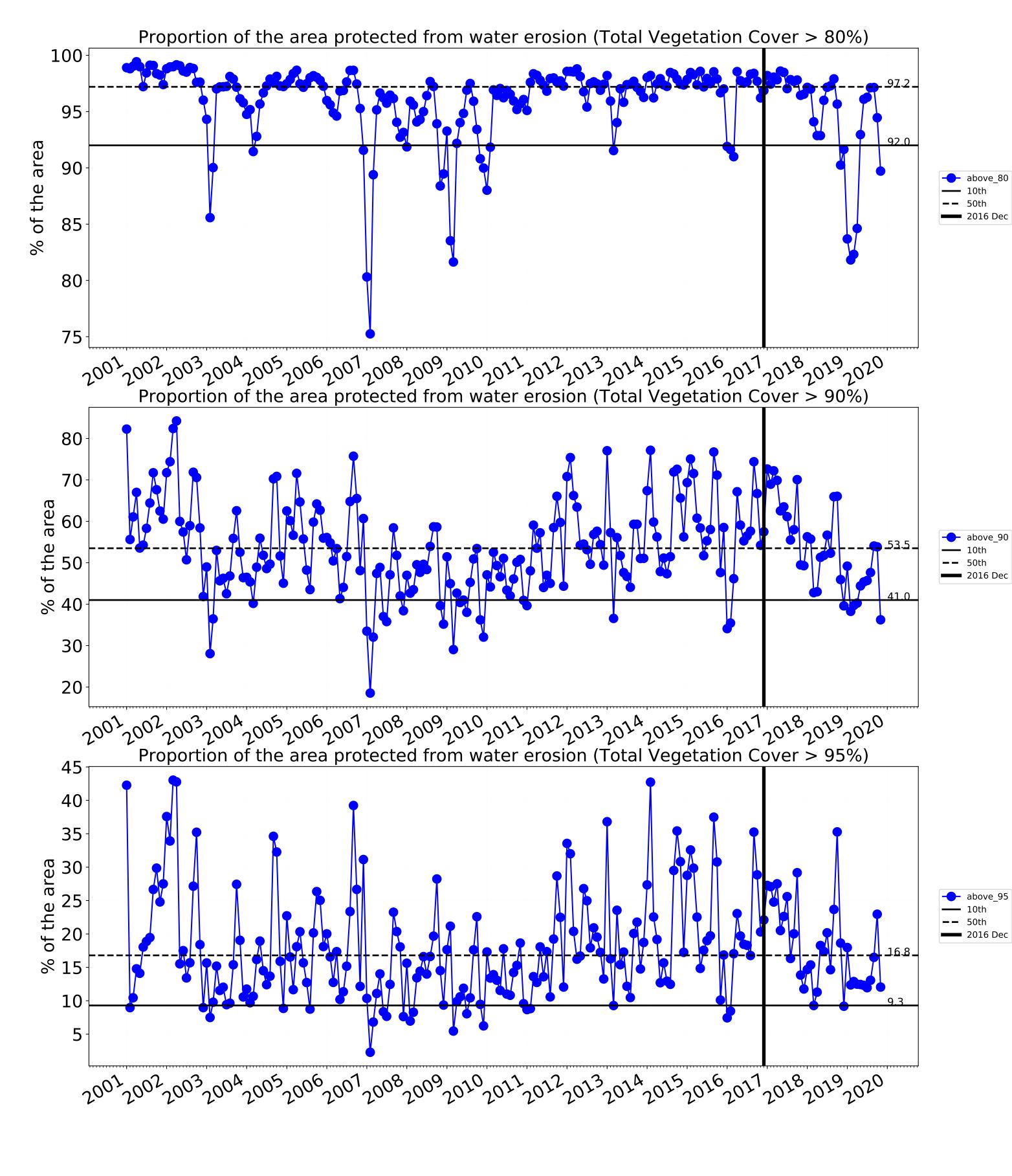
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

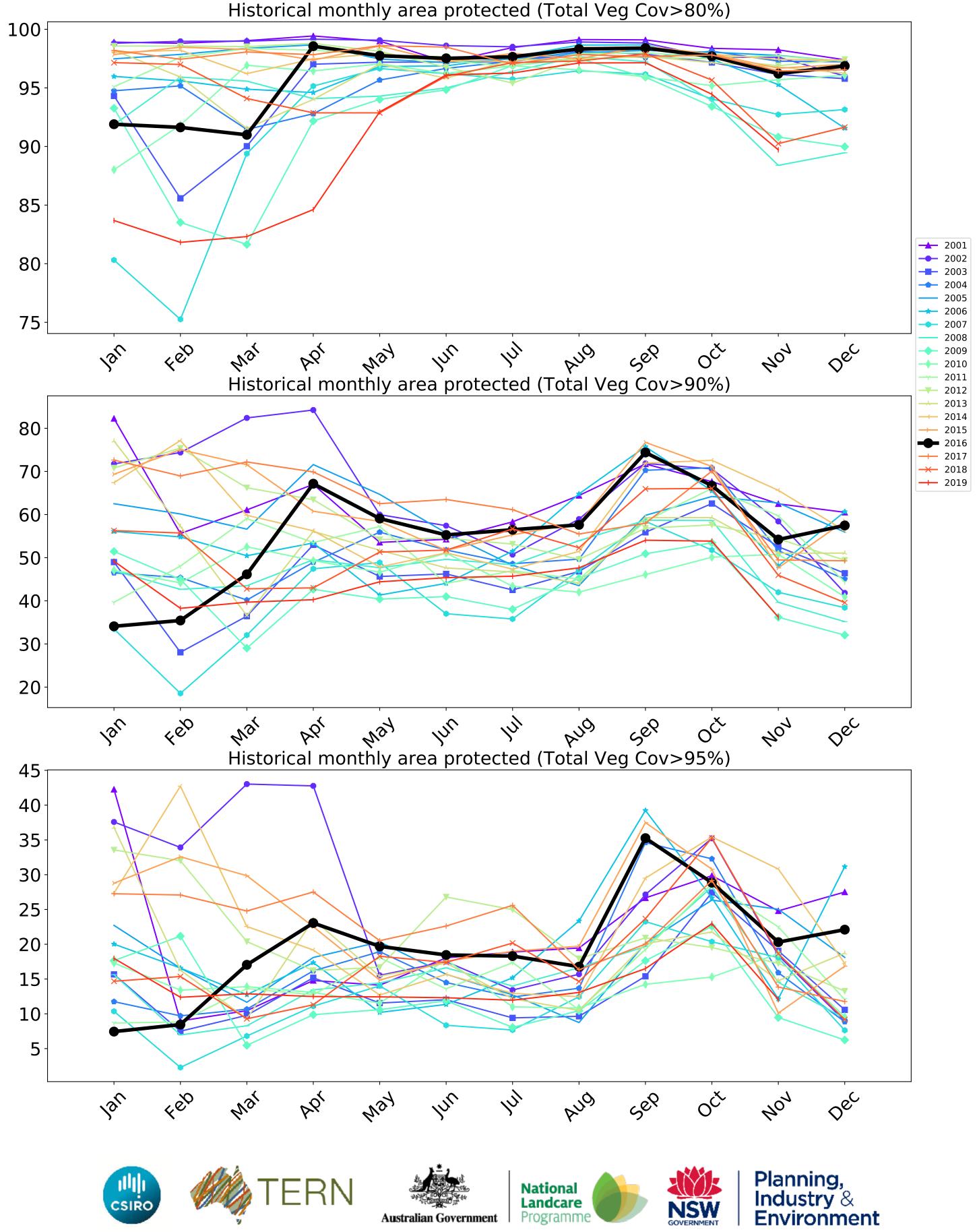
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

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

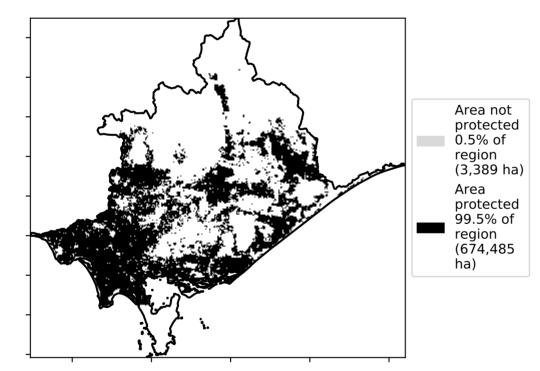


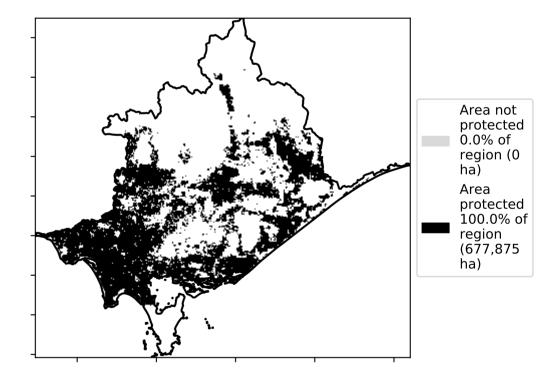




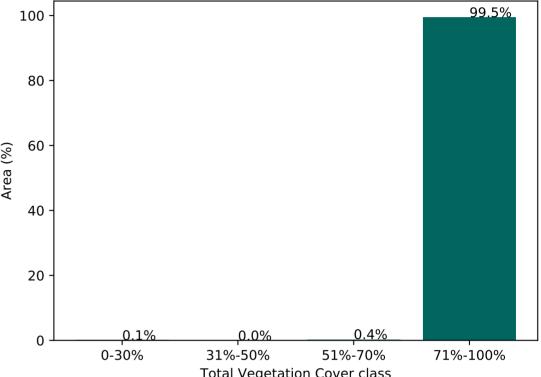
Grazing

92.4% 80 · Catchment Scale Land Use and Forests 60 of Australia (2018) Area (%) 1 Agriculture - Grazing - Non forest Derived from 2 Agriculture - Grazing - Woodland forest Catchment Scale Land 3 Agriculture - Grazing - Non-woodland forest Use of Australia 40 (2018) and Forests of Australia (2018) 20 6.1% 1.6% 0 2 1 3 Land use class **Total Vegetation Cover [%]** Proportion of vegetation cover class in area 1200,000 100 80 , 52°1070010 Area (%) 60 320050010 40 0.30% 20 0.0% 0.4% 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%)



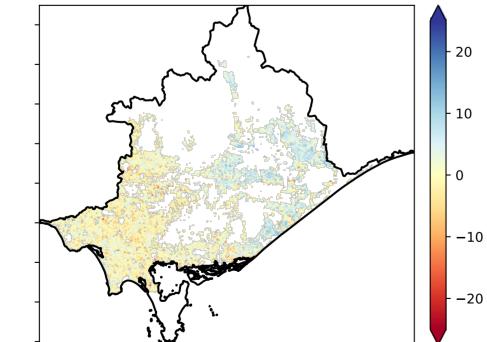


Proportion of each land class in area



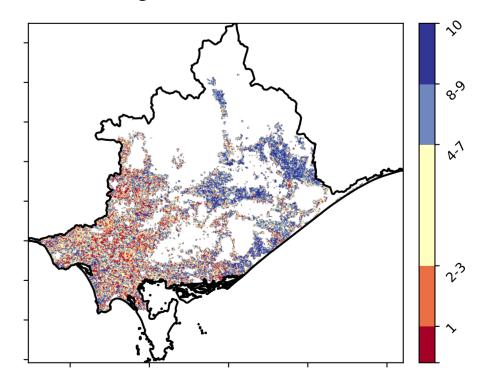
Total Vegetation Cover Anomaly [%]

Land use and forest cover



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

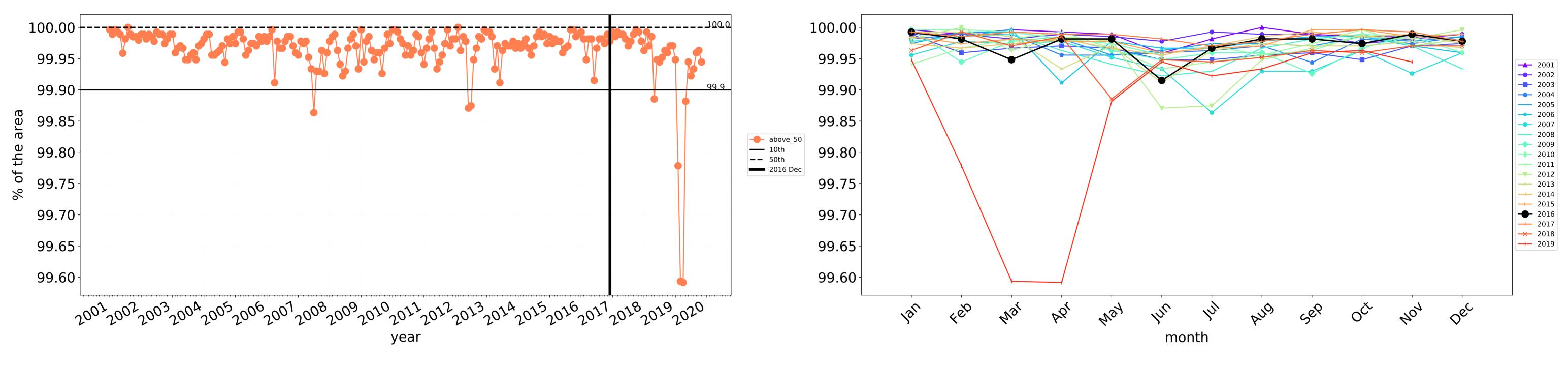
Total Vegetation Cover Decile [%]





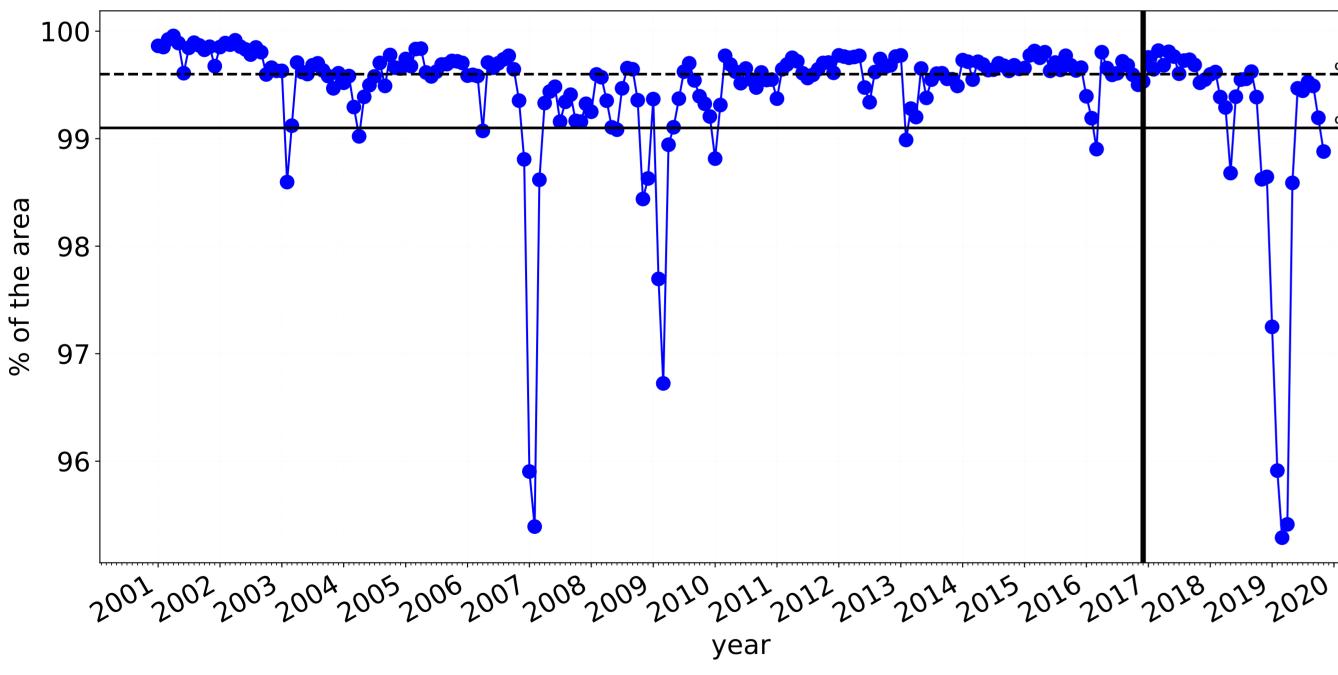
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

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

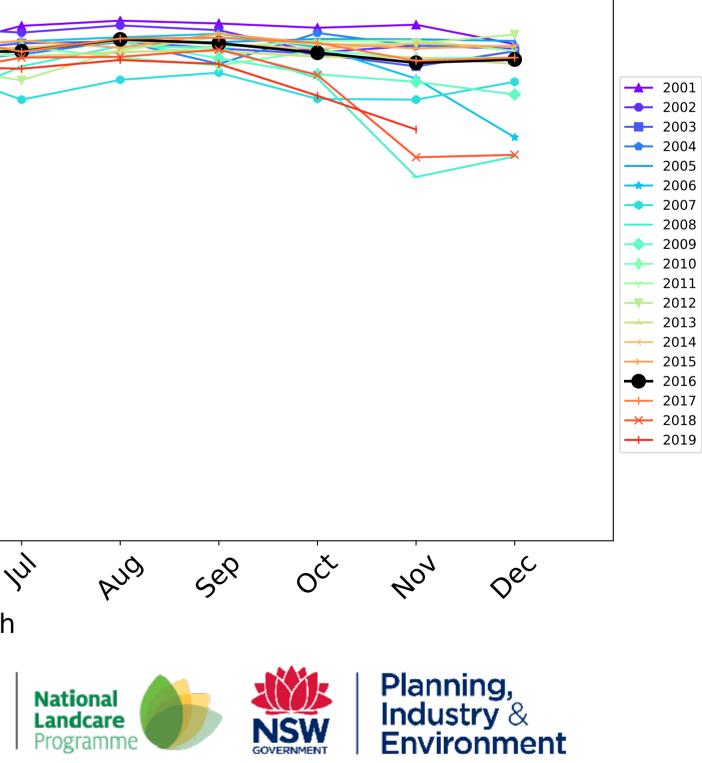


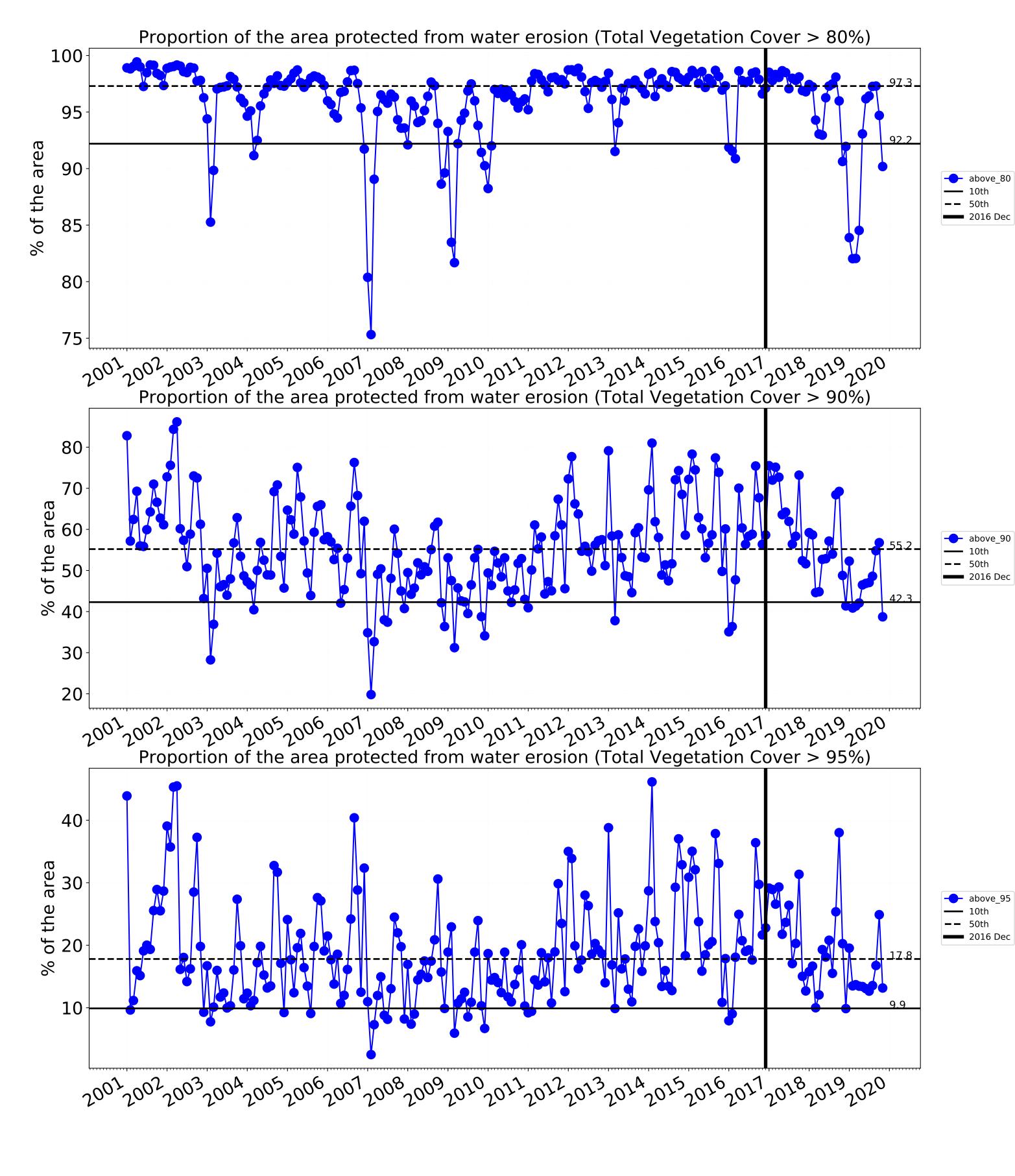


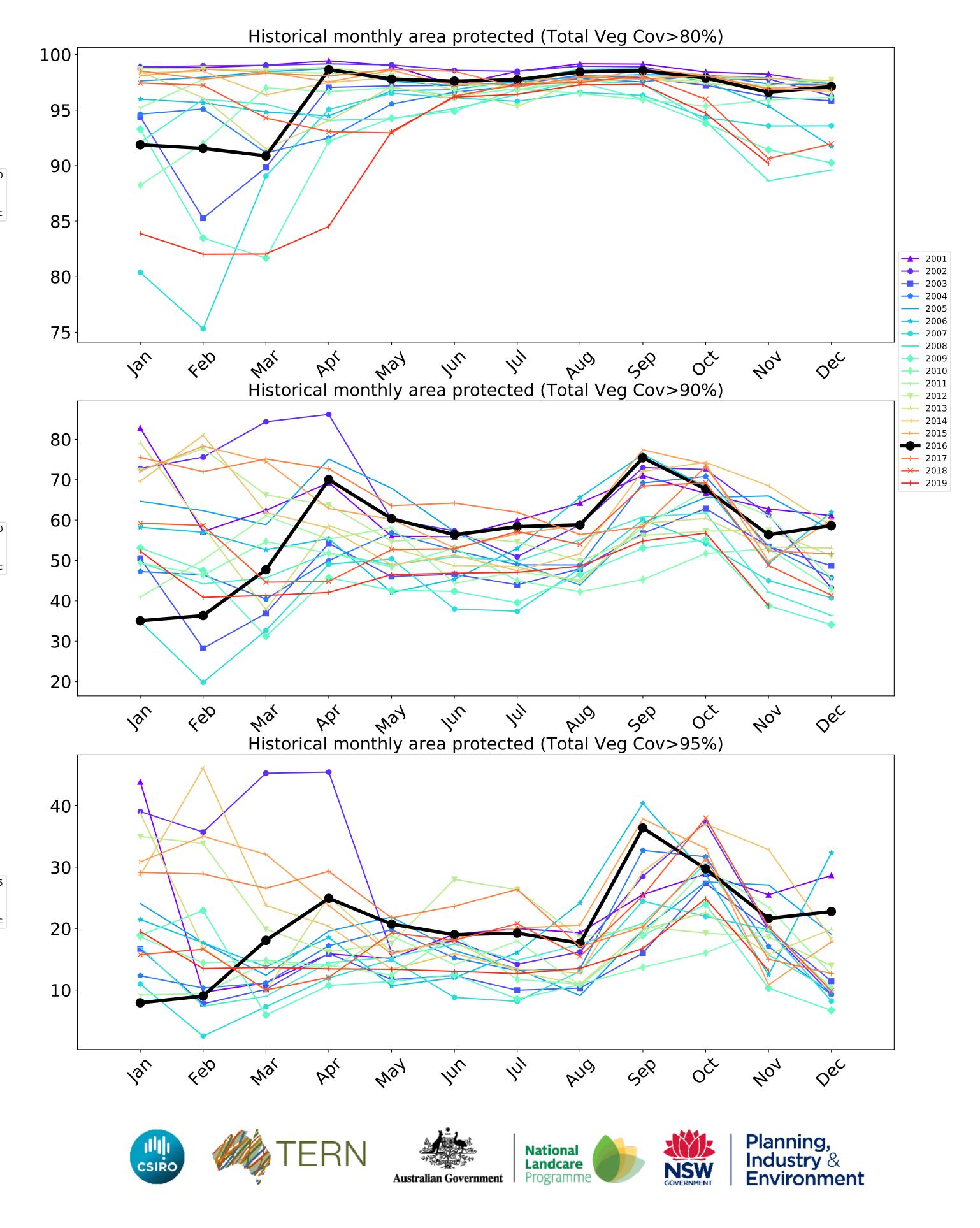
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 99 ---- above_70 **—** 10th **--** 50th 98 **—** 2016 Dec 97 96 lan feb In May PQ' WS, month **FERN** CSIRO Australian Government

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







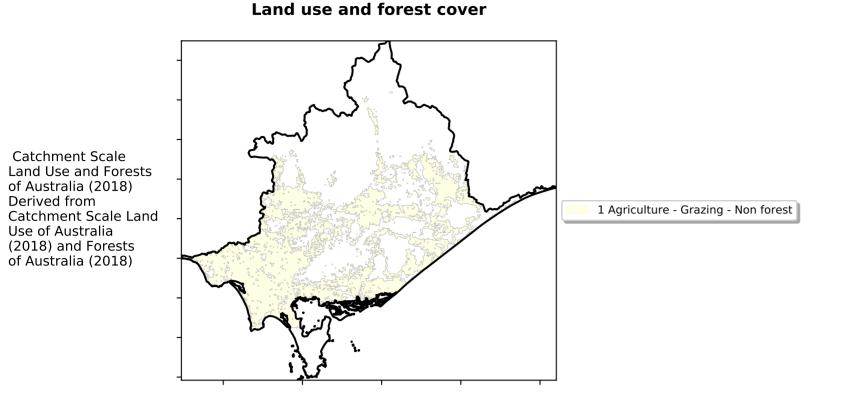
Grazing non forest

12%100%

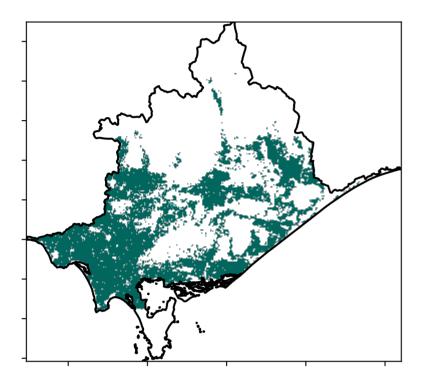
52010010

32010-50010

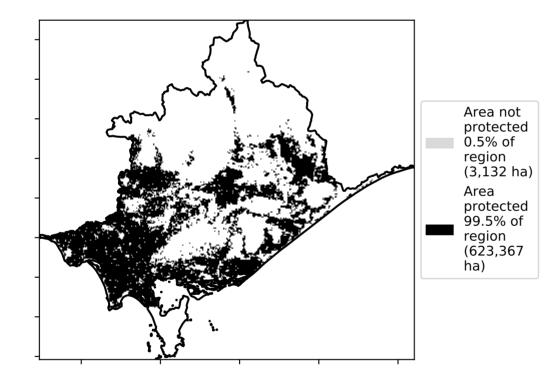
0.30%



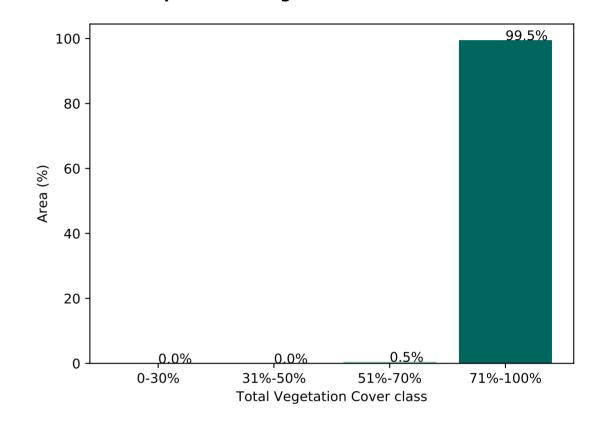
Total Vegetation Cover [%]



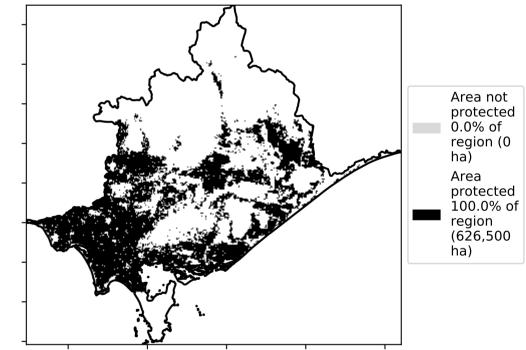
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



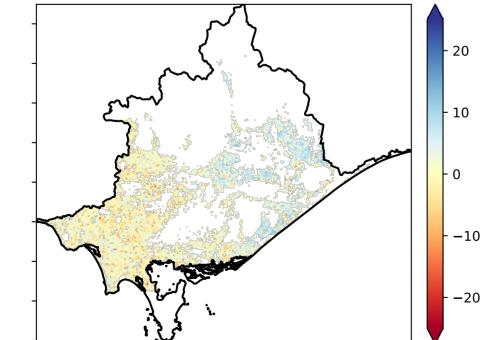
Total Vegetation Cover Anomaly [%]

Anomaly show how many percetage points each

pixel is from the mean. That is, red pixels are about 20% lower than the

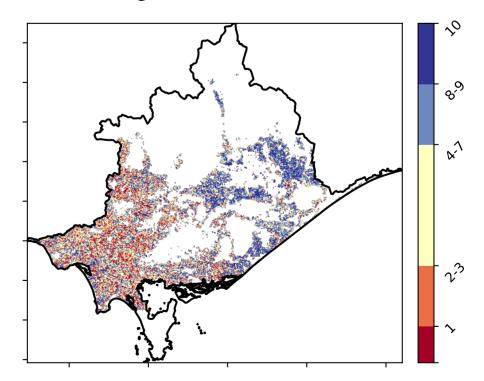
mean of that

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.

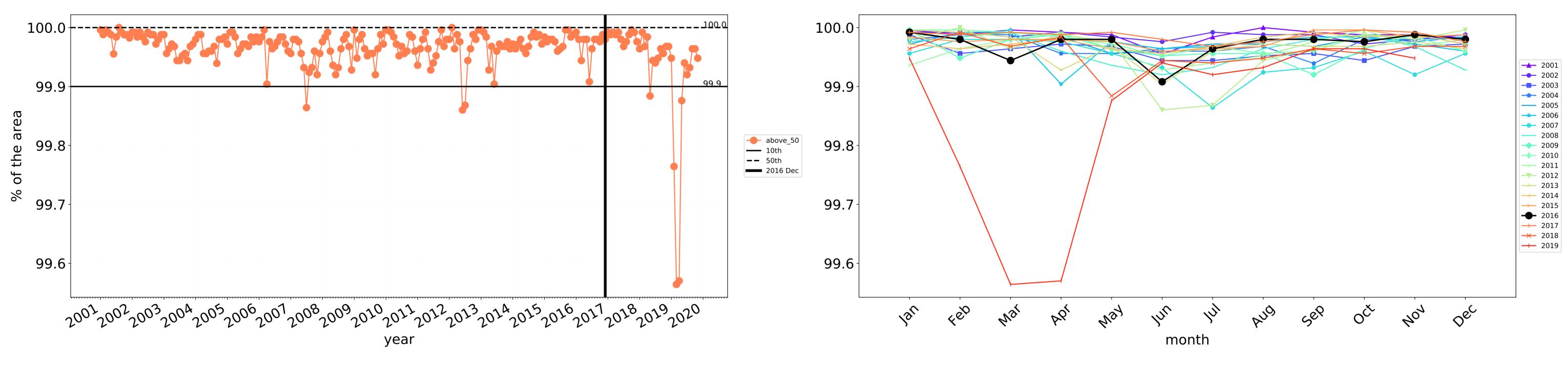
Total Vegetation Cover Decile [%]





- 20

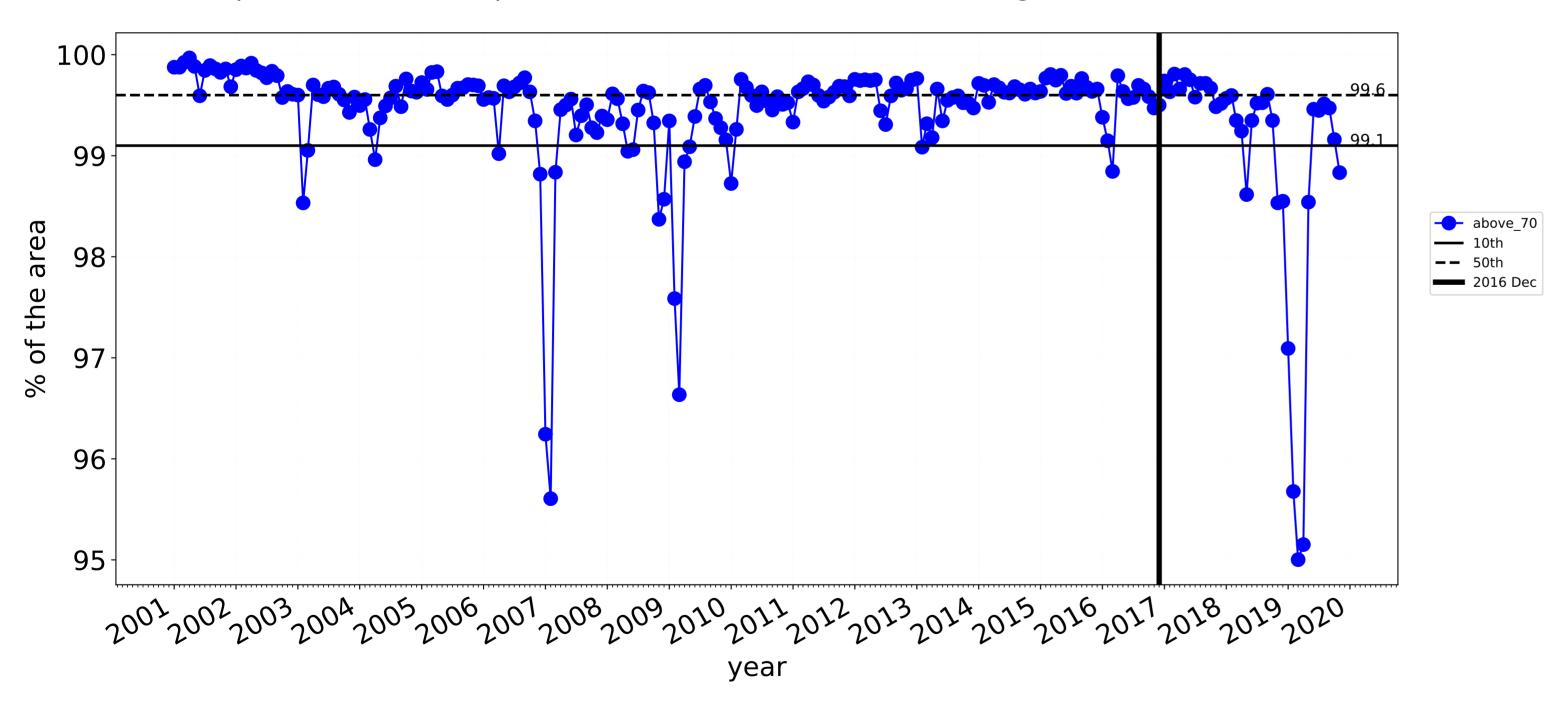
23

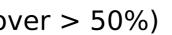


100-

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

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

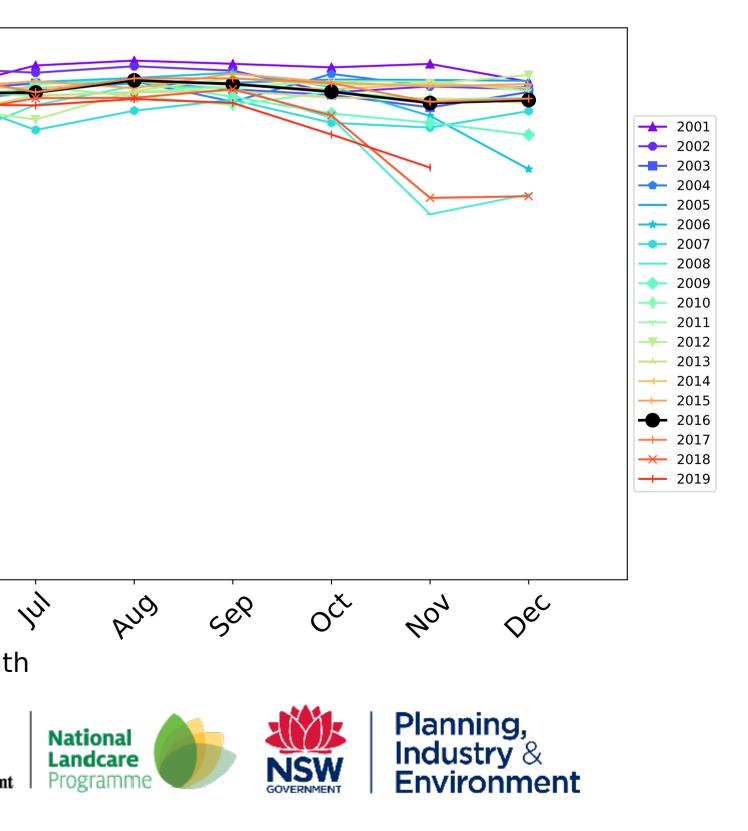


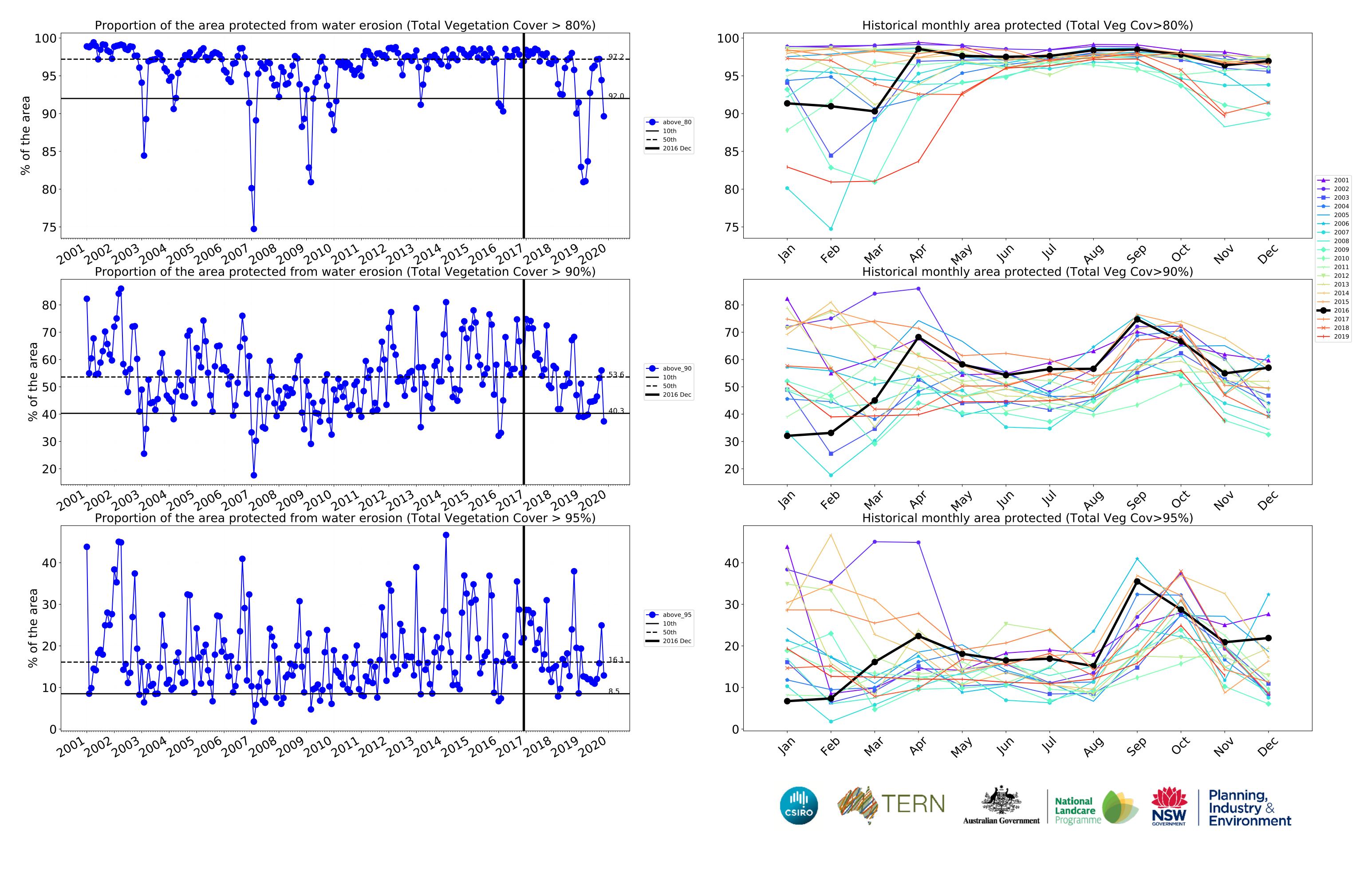


Wind erosion historical monthly area protected (Total Veg Cov >50%)

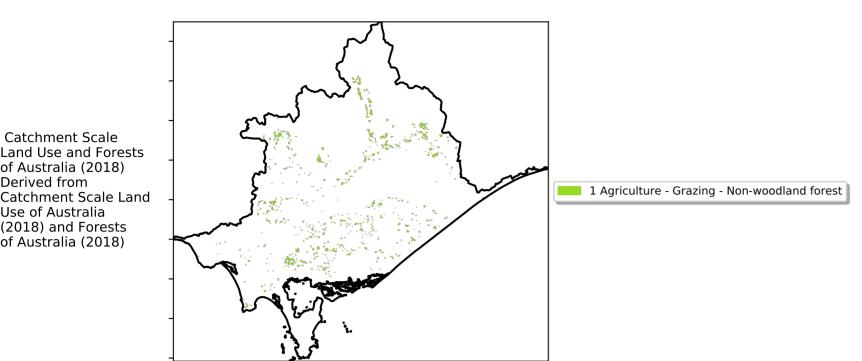
99 98-97 96 95 Jan fed way In Mai PQ' month FERN CSIRC Australian Government

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





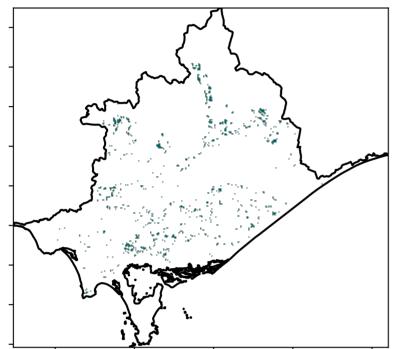
Grazing - Forest (non woodland)

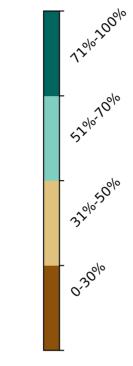


Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

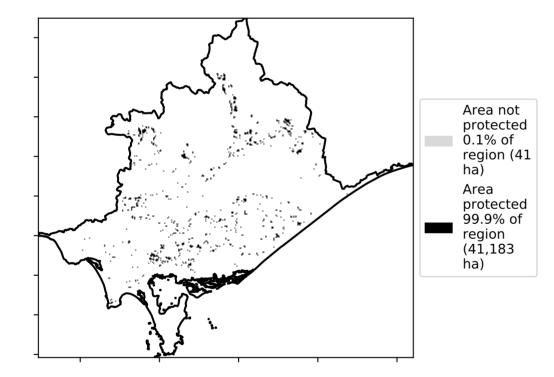
Total Vegetation Cover [%]

Land use and forest cover

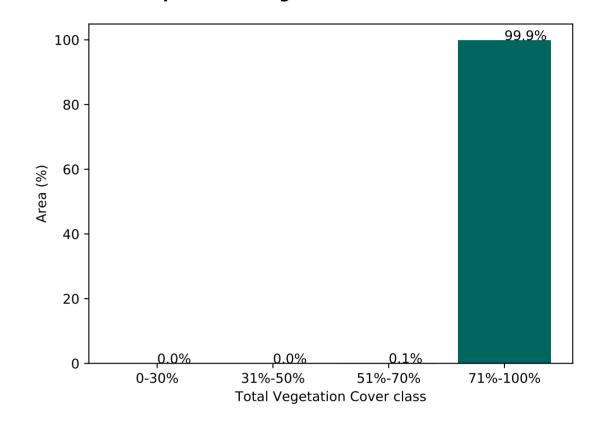




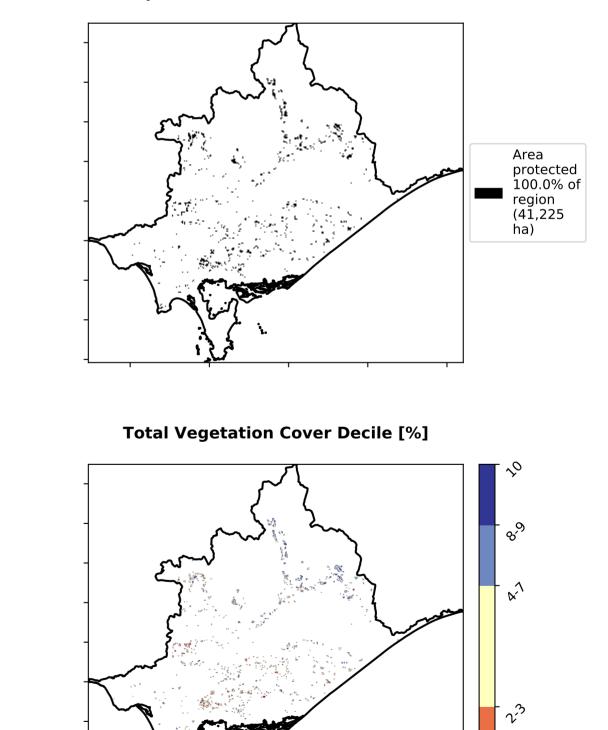
% Area protected from water erosion (>70%)



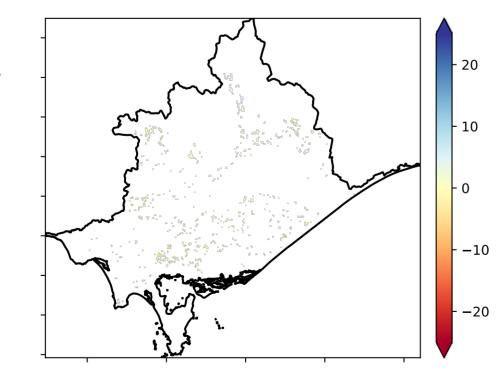
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

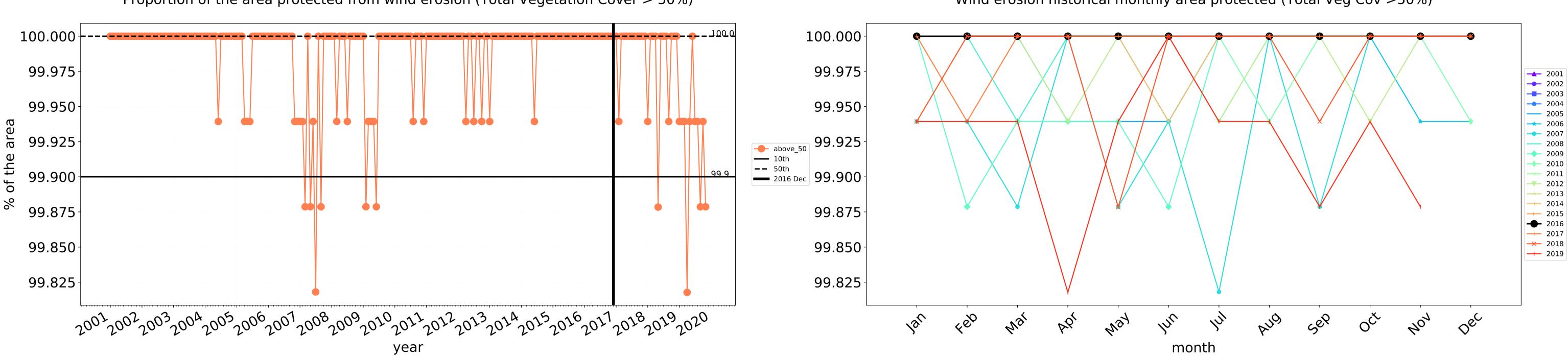


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



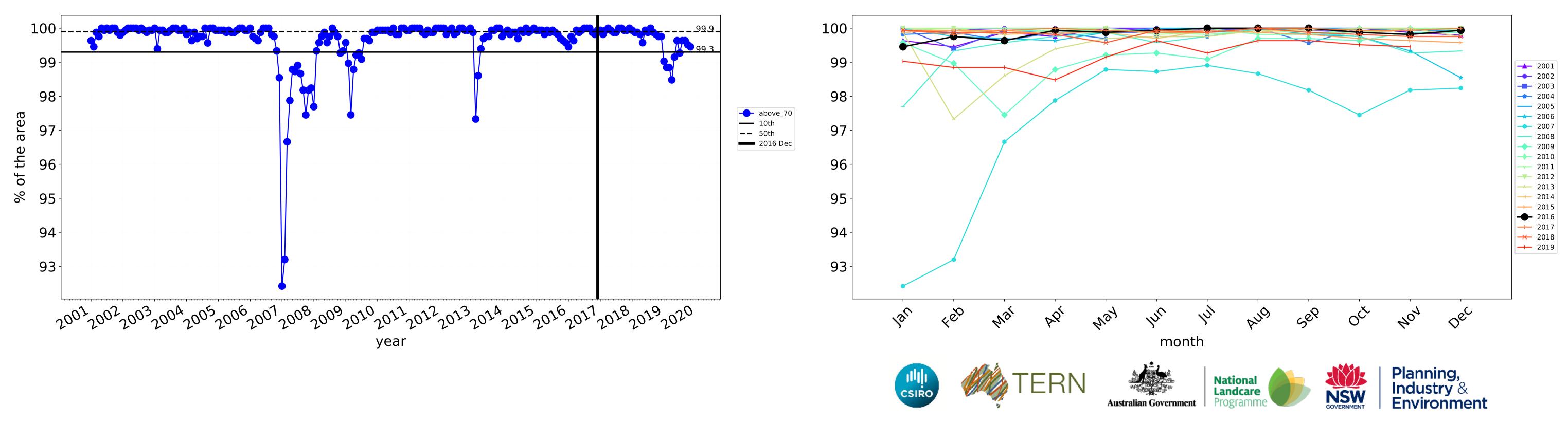
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





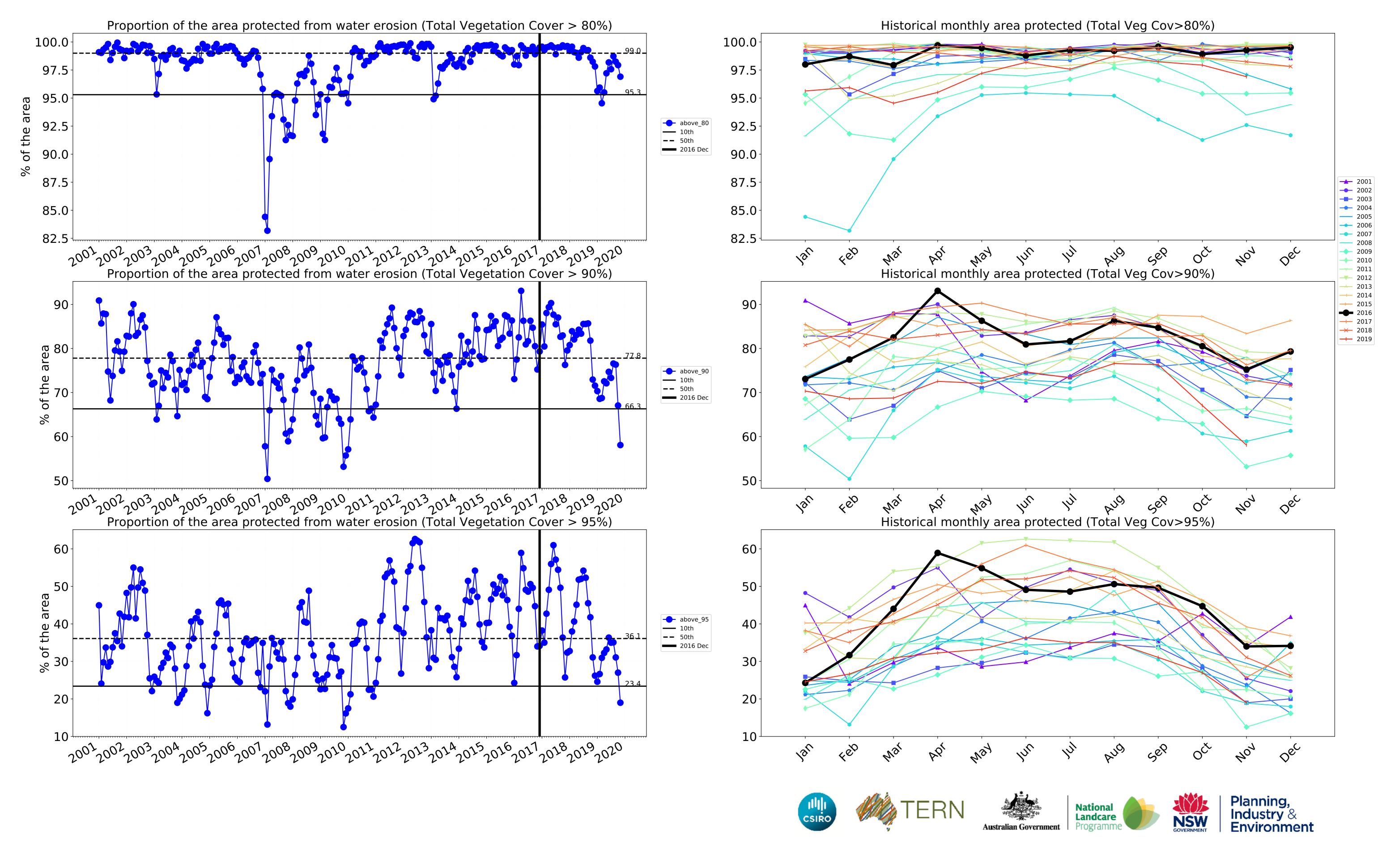
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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





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

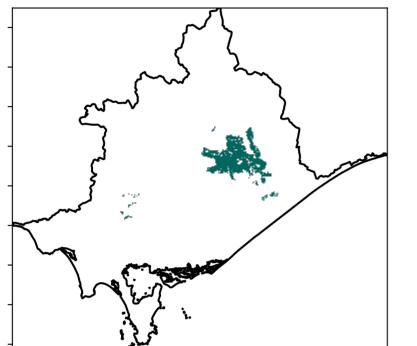


Irrigation

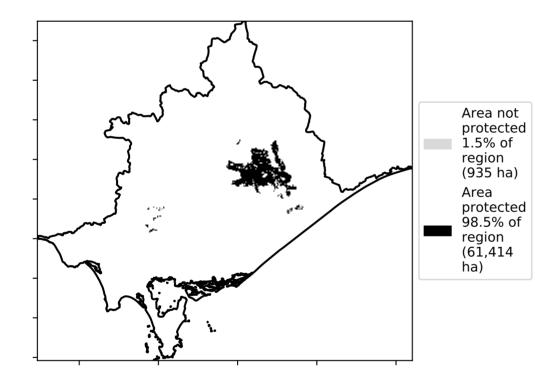
Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Irrigated Derived from 2 Agriculture - Cropping - Irrigated Catchment Scale Land 3 Agriculture - Horticulture - Irrigated Use of Australia (2018) and Forests of Australia (2018)

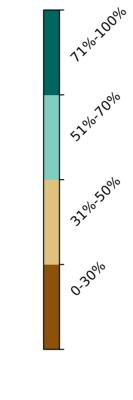
Land use and forest cover

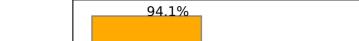
Total Vegetation Cover [%]

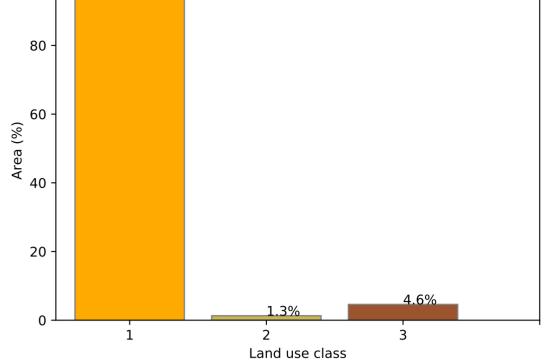






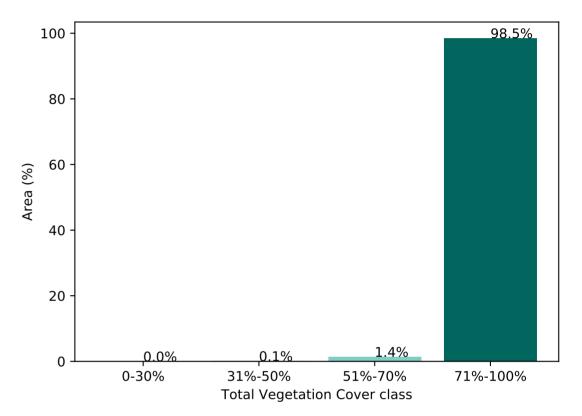




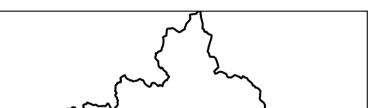


Proportion of each land class in area

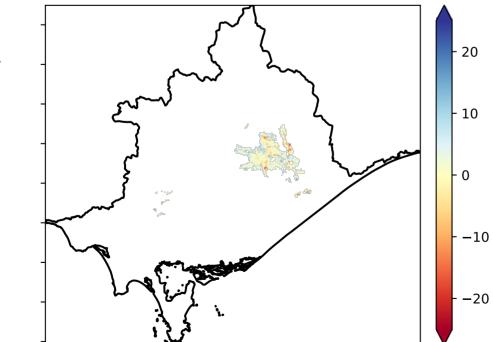
Proportion of vegetation cover class in area



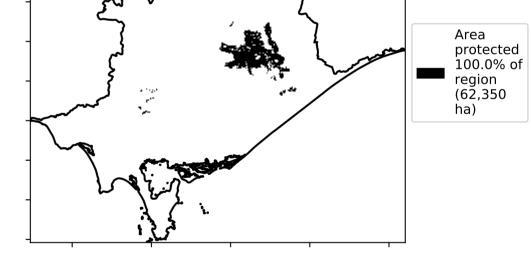
% Area protected from wind erosion (>50%)



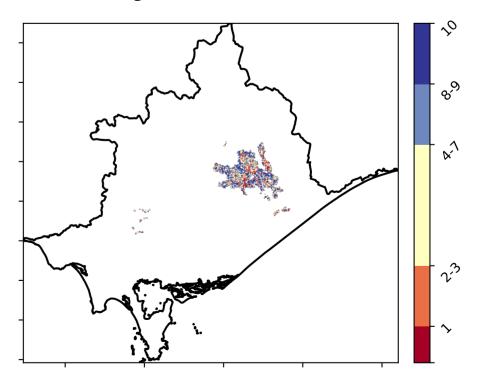
Total Vegetation Cover Anomaly [%]



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



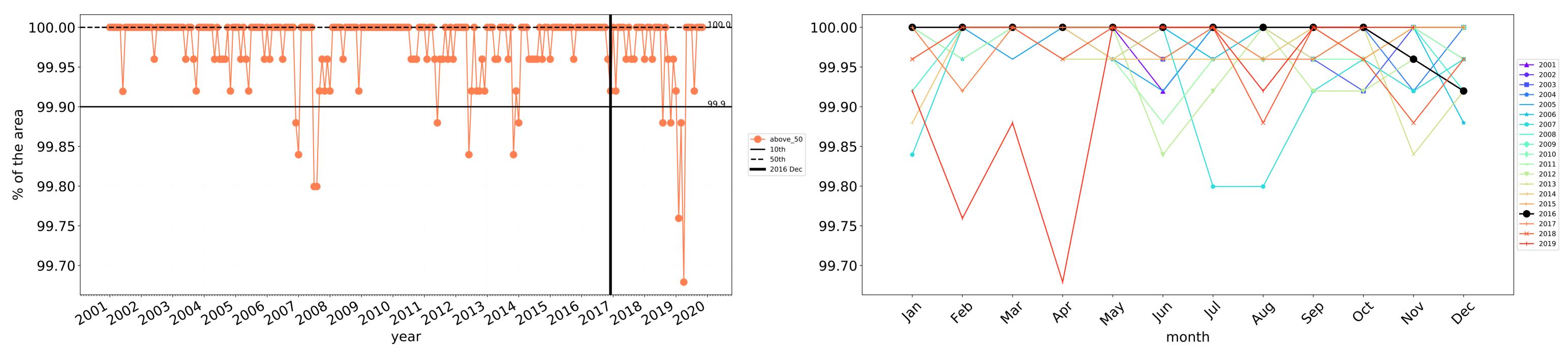
Total Vegetation Cover Decile [%]





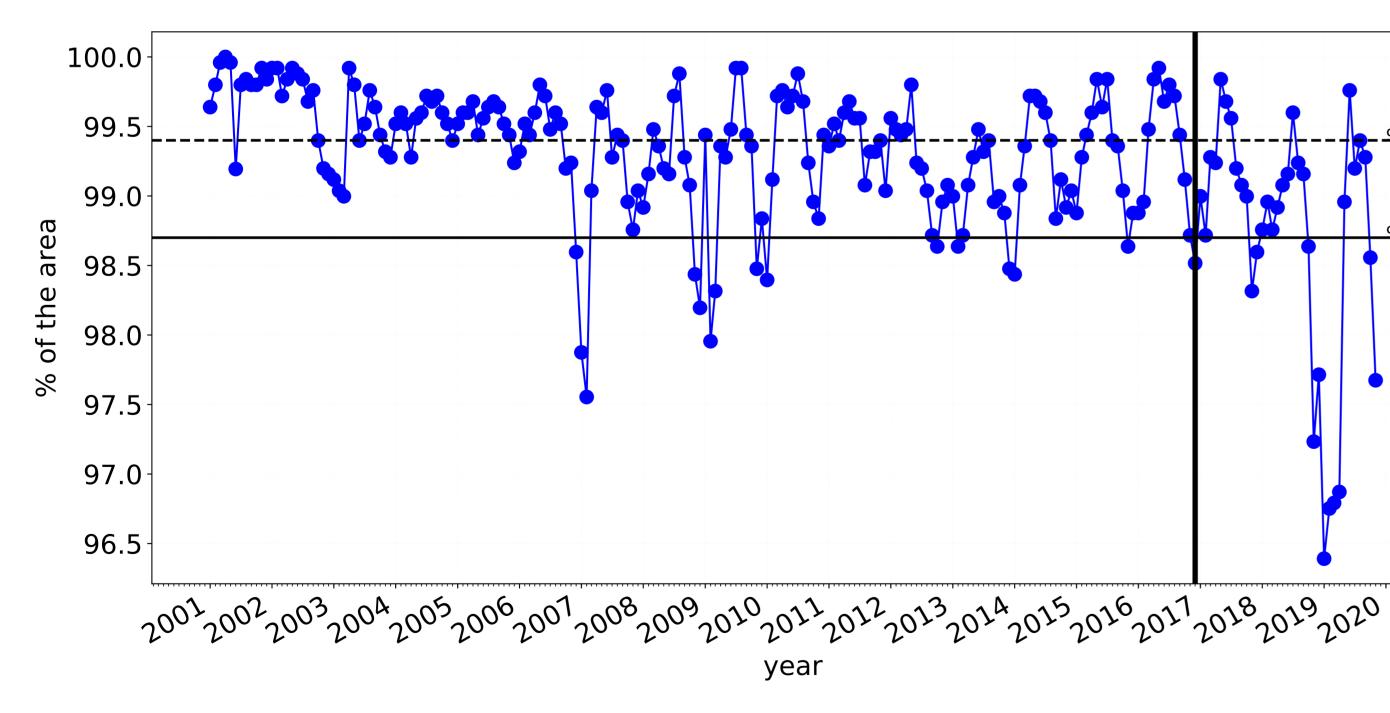
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.





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

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

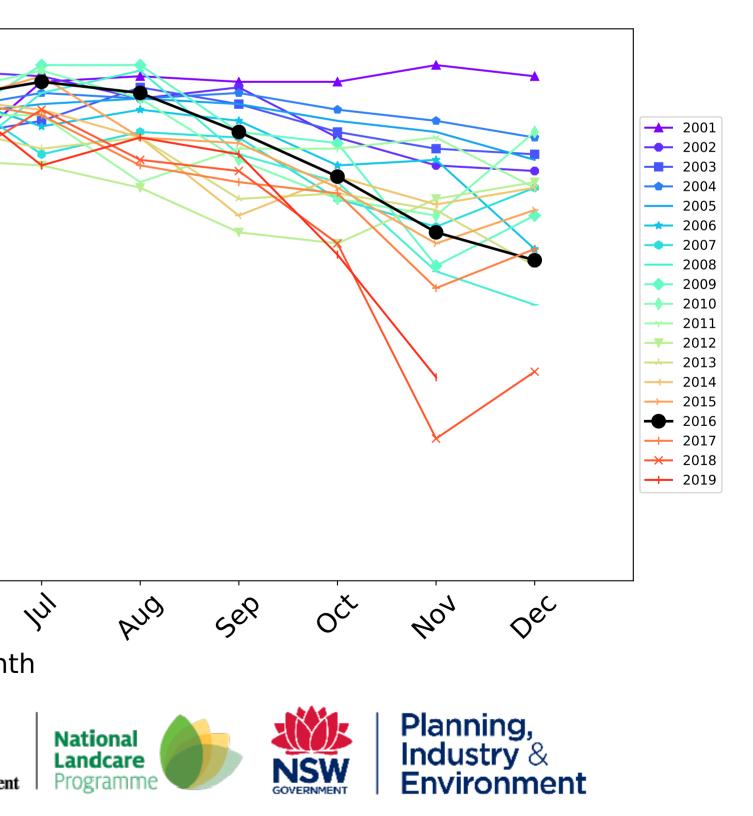


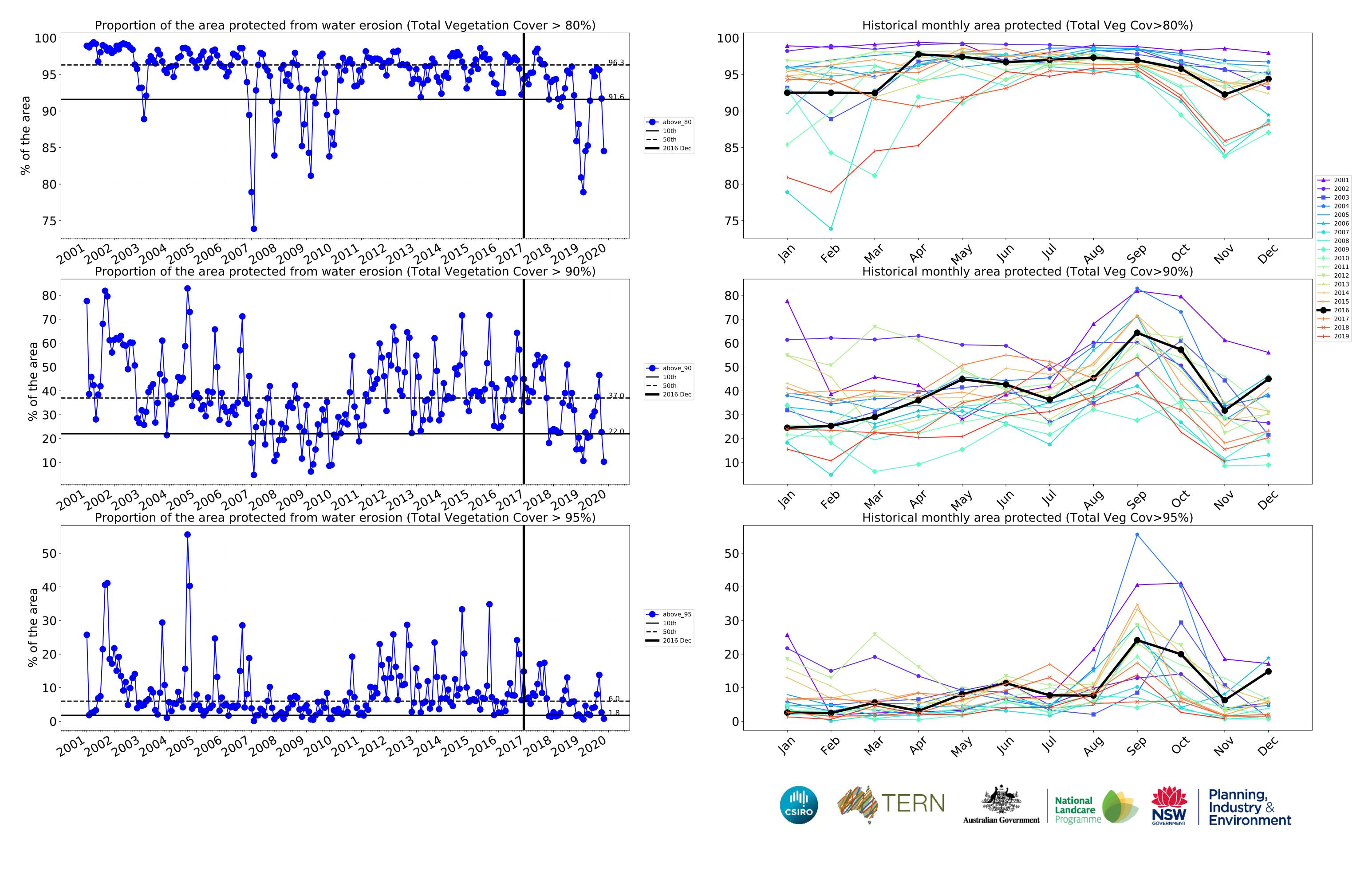
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0-99.5 99.0 ---- above_70 **—** 10th 98.5 **--** 50th 98.0 97.5 97.0 96.5 4eb Jan May In PQ' W31 month ERN CSIRO Australian Government

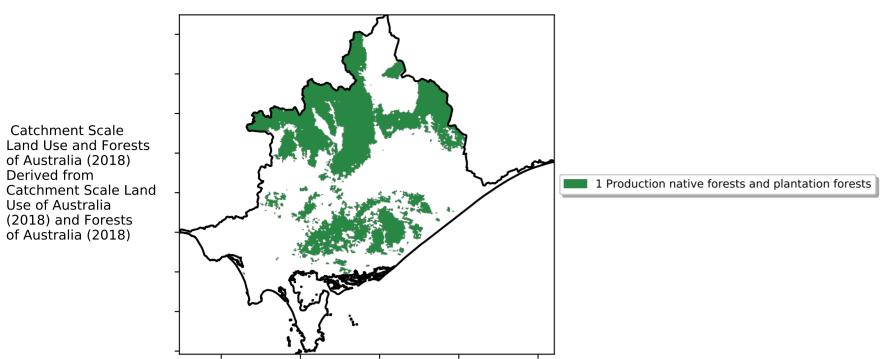
Water erosion historical monthly area protected (Total Veg Cov>70%)







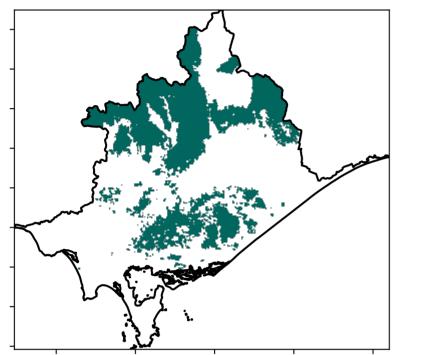
Production native forests and plantation forests



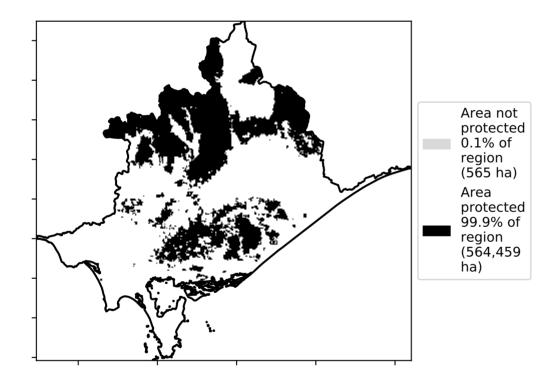
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests

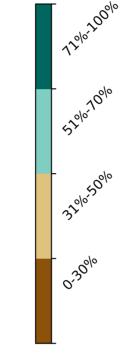
Total Vegetation Cover [%]

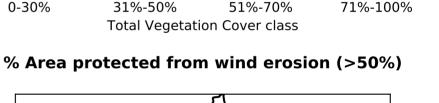
Land use and forest cover

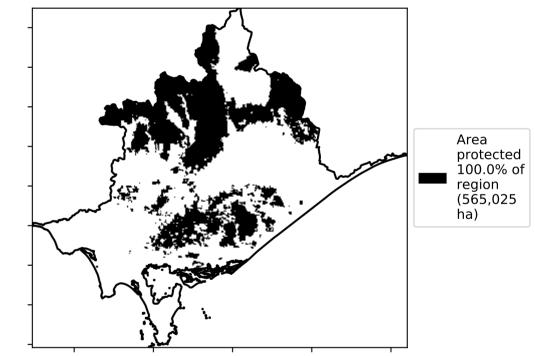


% Area protected from water erosion (>70%)

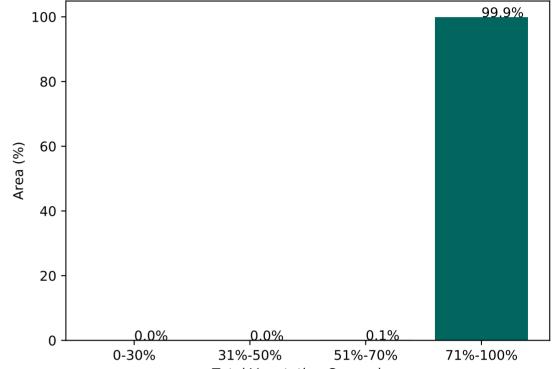




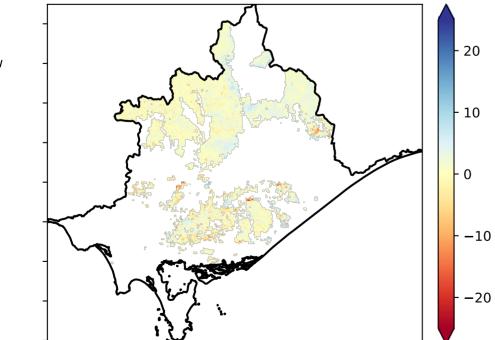




Proportion of vegetation cover class in area

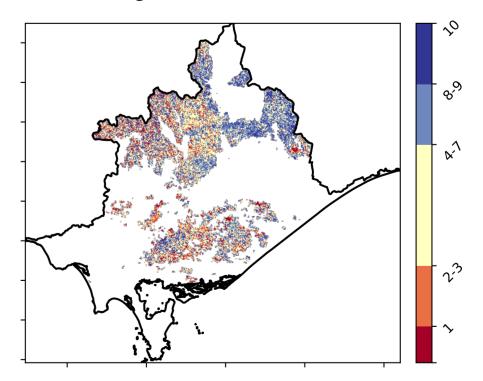


Total Vegetation Cover Anomaly [%]



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

Total Vegetation Cover Decile [%]

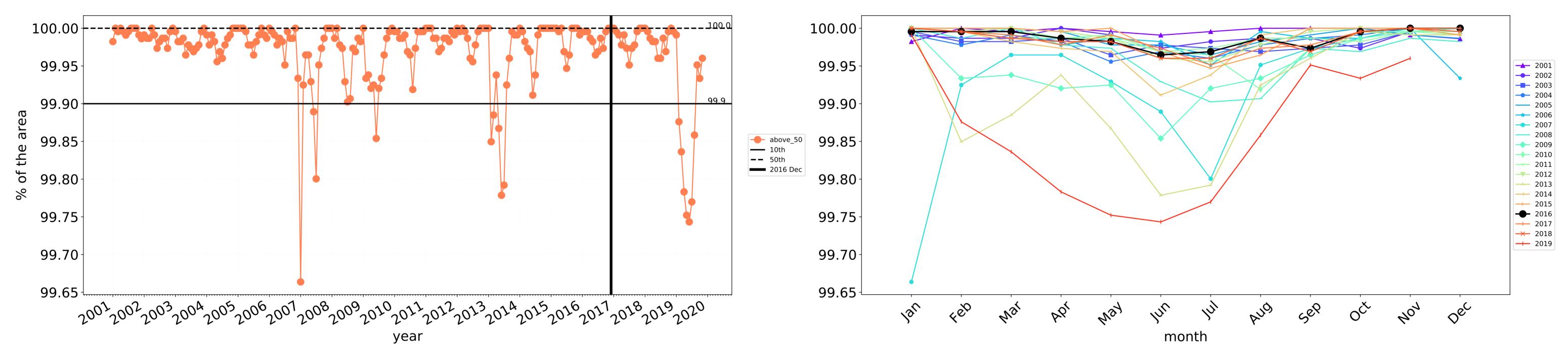




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.

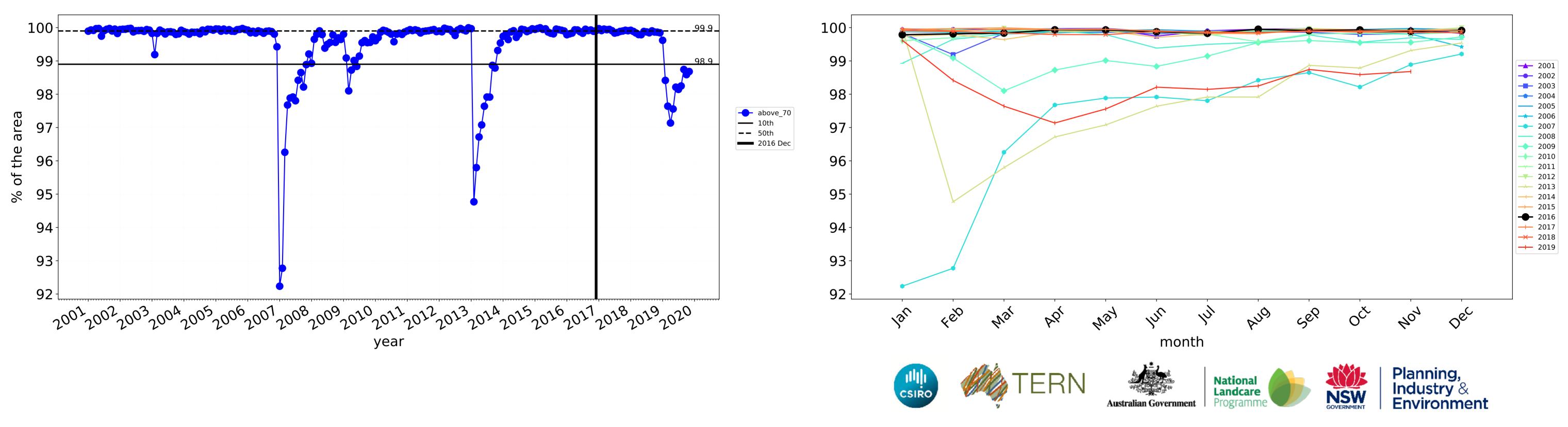


Production native forests and plantation forests timeseries



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

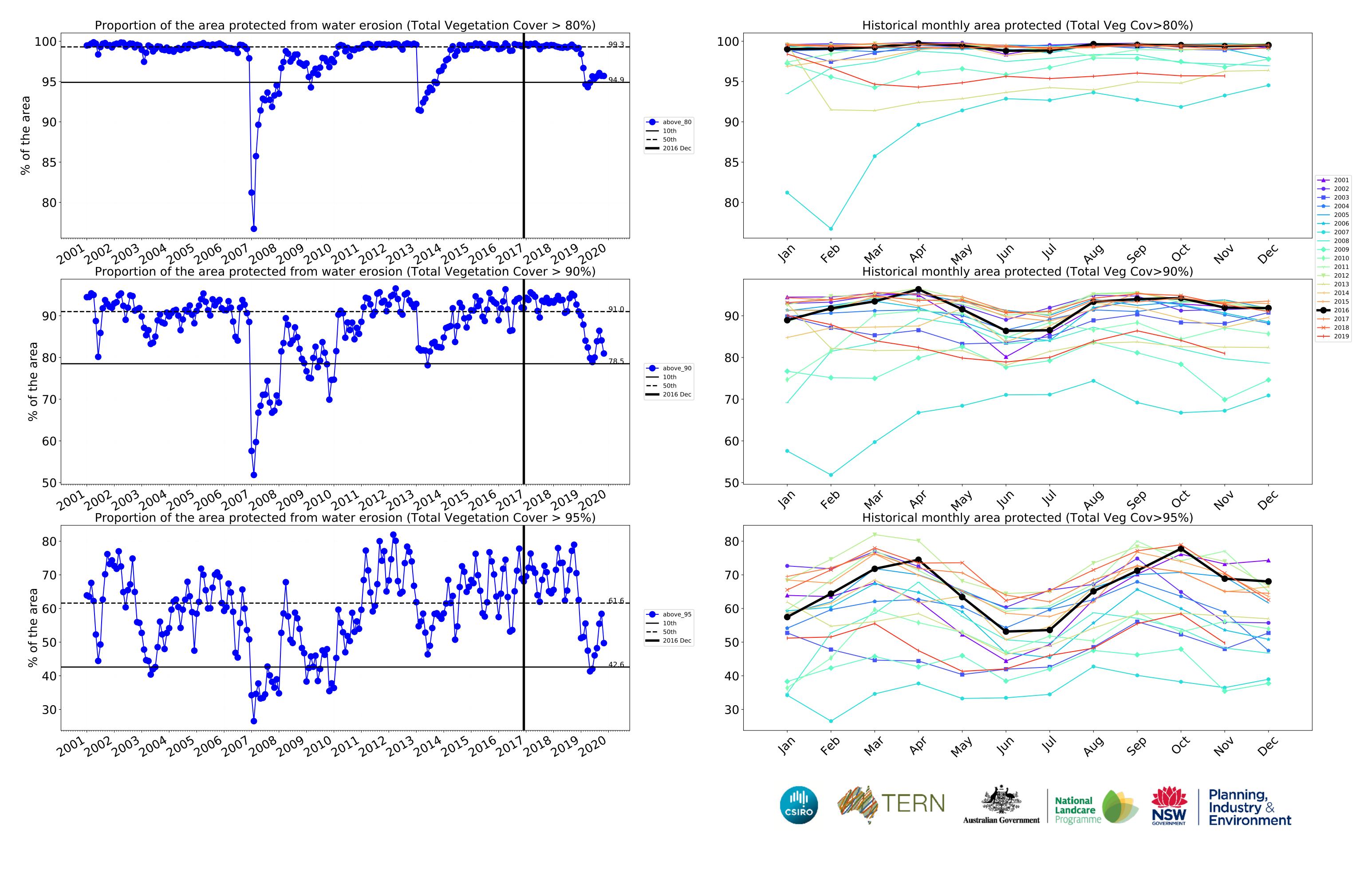
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





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

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



West Gippsland (1,685,625 ha and no data 40,019 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	1,685,625	100.0% 1,684,999	99.9% 1,683,599	99.0% 1,669,217	96.7% 1,629,375	72.4% 1,220,925	42.1% 709,430
Conservation and natural environments	272,400	99.8% 271,900	99.5% 270,950	98.5% 268,225	95.8% 260,900	84.0% 228,700	53.2% 144,950
Conservation and natural environments non forest	43,800	99.1% 43,400	97.4% 42,650	92.8% 40,625	82.0% 35,900	55.4% 24,250	25.5% 11,175
Conservation and natural environments Woodland forest	73,275	100.0% 73,250	99.8% 73,150	99.3% 72,775	97.1% 71,125	85.6% 62,725	45.6% 33,400
Conservation and natural environments Forest (non woodland)	155,325	100.0% 155,250	99.9% 155,150	99.7% 154,825	99.1% 153,875	91.2% 141,725	64.6% 100,375
Agriculture	750,000	100.0% 749,950	100.0% 749,750	99.4% 745,800	96.9% 726,525	57.5% 431,050	22.1% 165,750
Grazing	677,875	100.0% 677,850	100.0% 677,725	99.5% 674,700	97.1% 658,325	58.6% 397,475	22.8% 154,425
Grazing non forest	626,500	100.0% 626,475	100.0% 626,375	99.5% 623,375	96.9% 607,350	57.0% 357,075	21.9% 137,150
Grazing - Forest (non woodland)	41,225	100.0% 41,225	100.0% 41,225	99.9% 41,200	99.5% 41,025	79.3% 32,700	34.1% 14,075
Irrigation	62,350	100.0% 62,350	99.9% 62,300	98.5% 61,425	94.4% 58,850	45.0% 28,050	14.8% 9,250
Production native forests and plantation forests	565,025	100.0% 565,025	100.0% 565,025	99.9% 564,525	99.5% 562,300	91.8% 518,900	68.0% 384,450

