Total vegetation cover soil protection Region:NRM Wet Tropics QLD

Date: October 2019

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

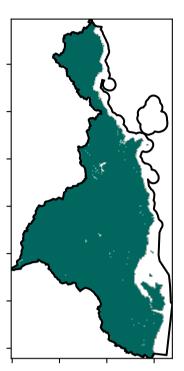


Vegetation Cover Oct 2019

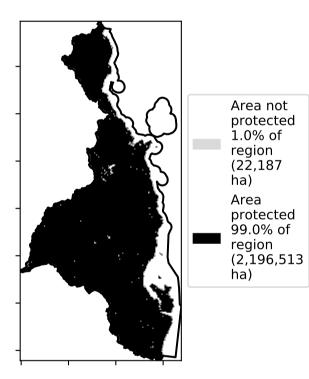
Land use and forest cover

Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments -Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - Woodland forest 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

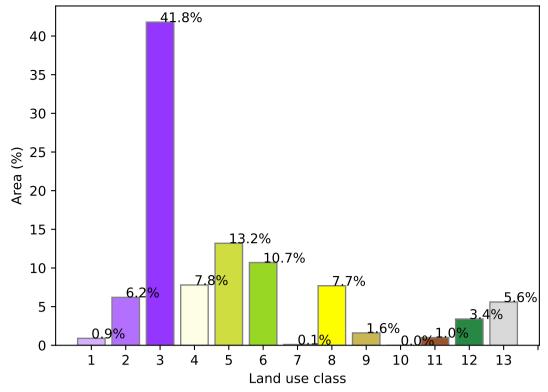
Total Vegetation Cover [%]



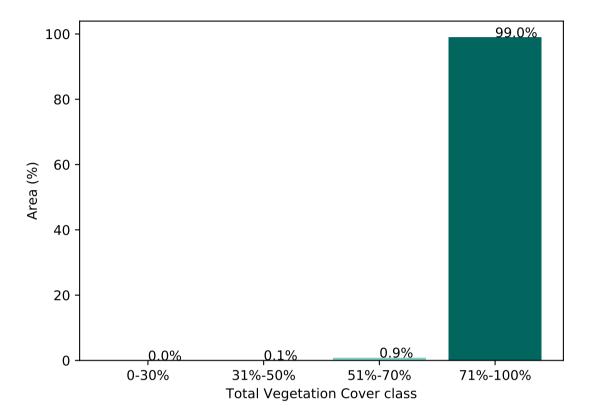
% Area protected from water erosion (>70%)



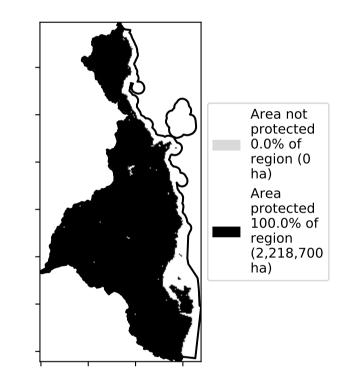


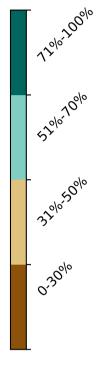


Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





Total Vegetation Cover Anomaly [%]

Total Vegetation Cover Decile [%]

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.

Catchment Scale

of Australia (2018)

(2018) and Forests

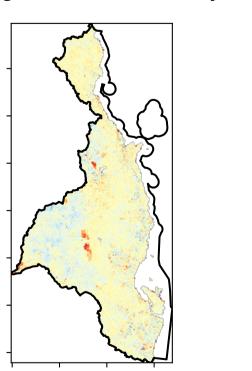
of Australia (2018)

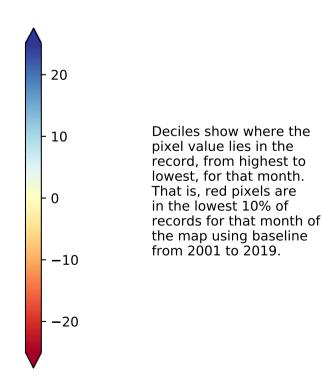
Derived from

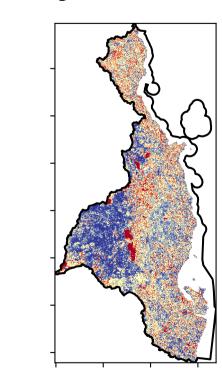
Use of Australia

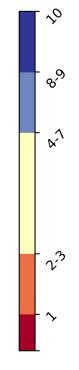
Land Use and Forests

Catchment Scale Land

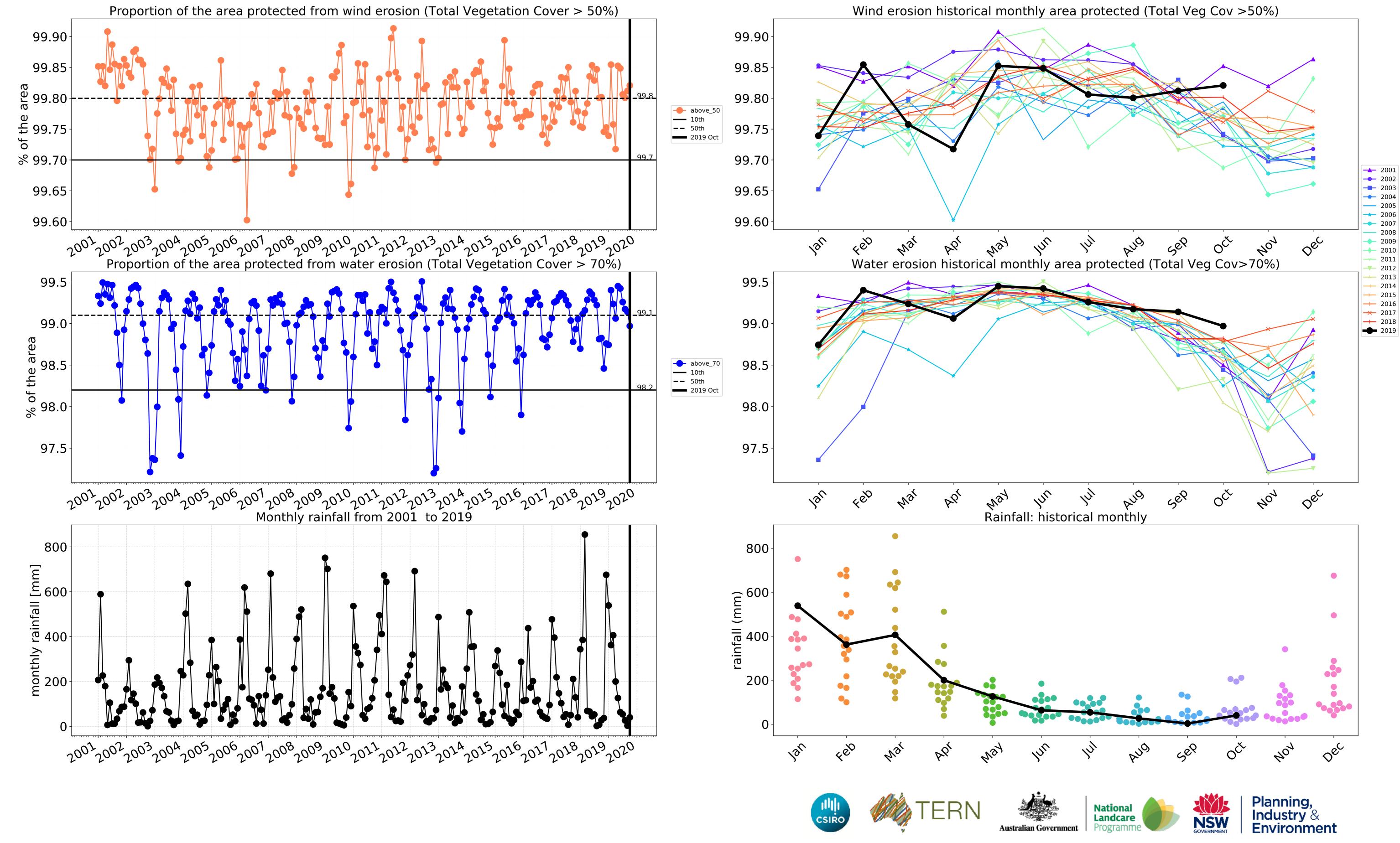


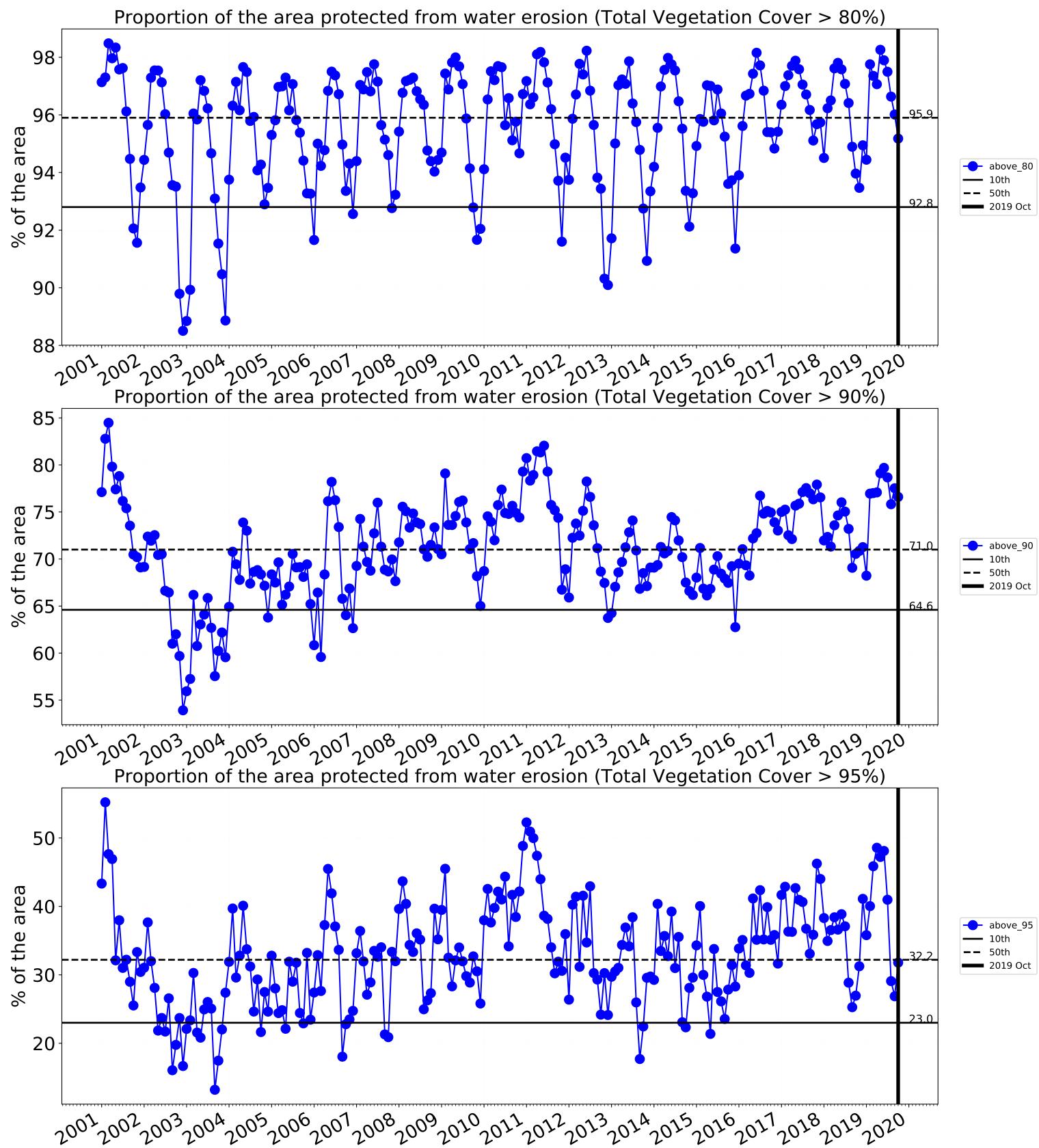


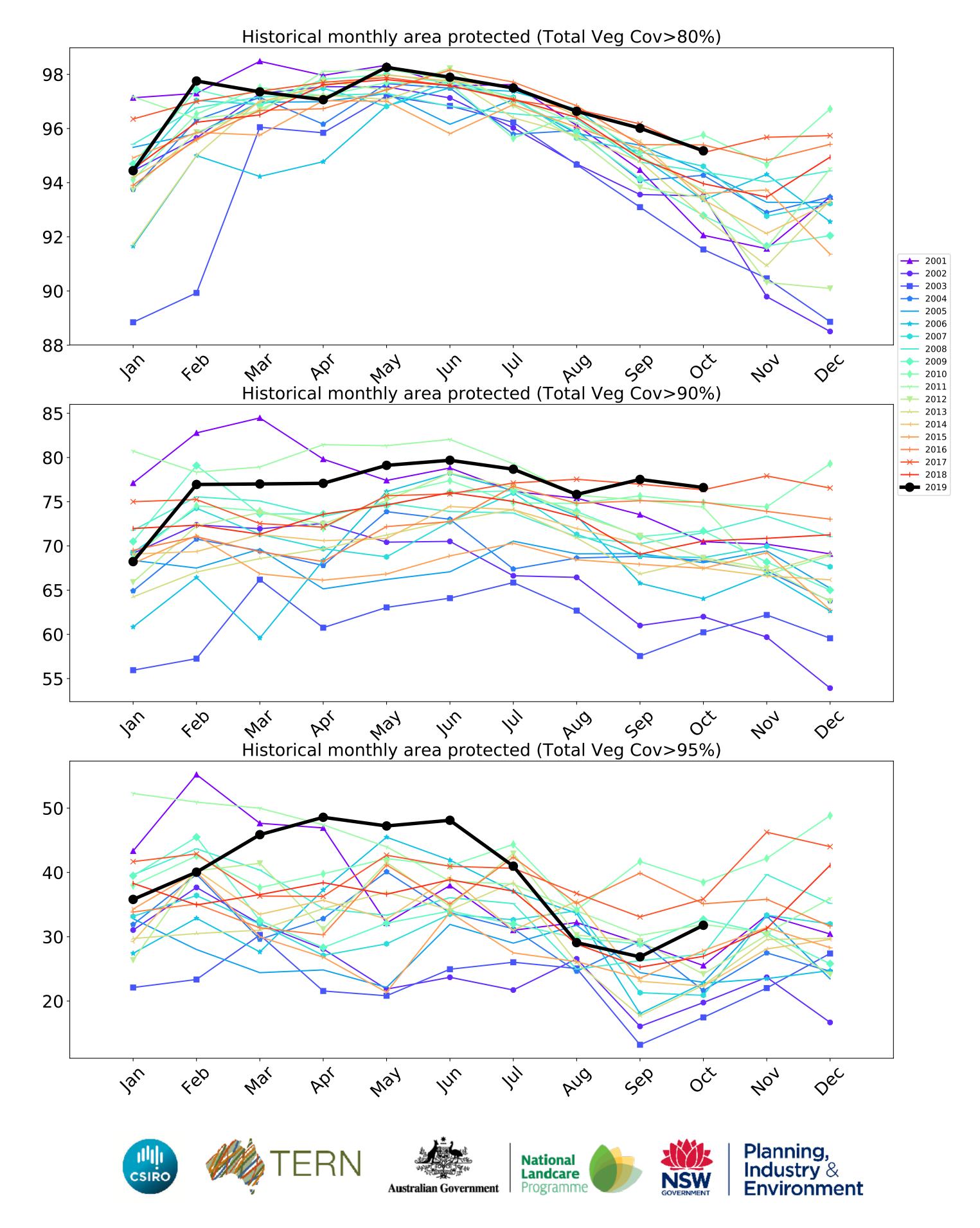






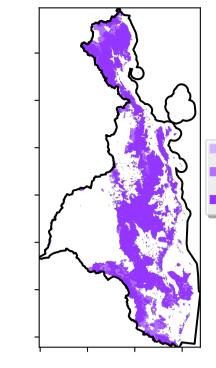






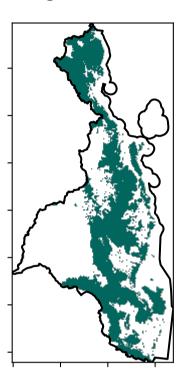
Conservation and natural environments

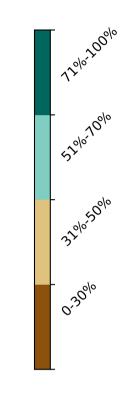
Land use and forest cover



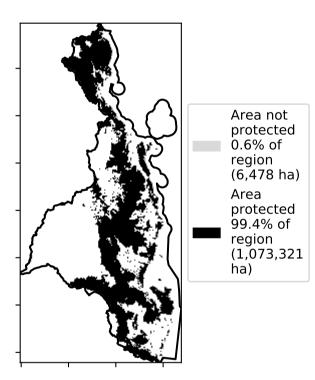
Conservation and natural environments - Non-forest Conservation and natural environments - Woodland forest Conservation and natural environments - Nonwoodland forest

Total Vegetation Cover [%]

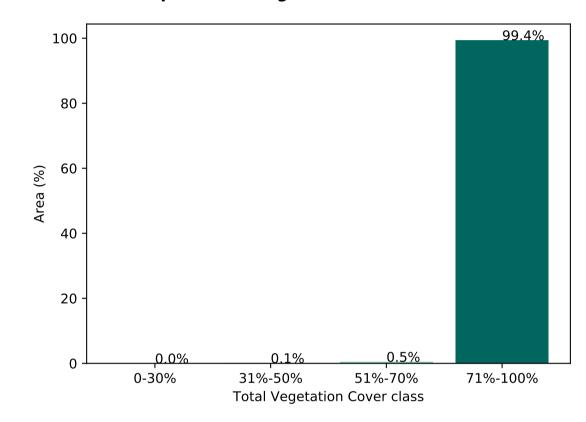




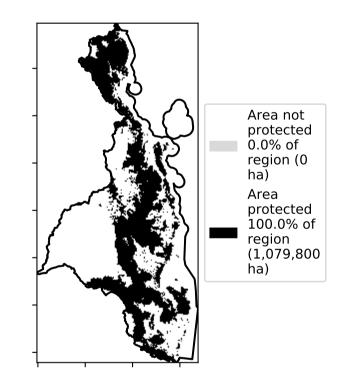
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

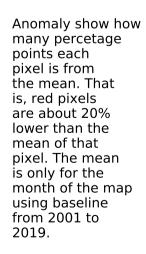


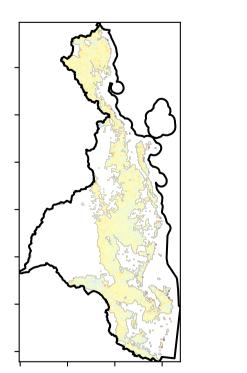
% Area protected from wind erosion (>50%)

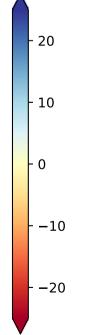


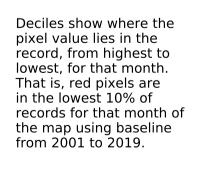
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

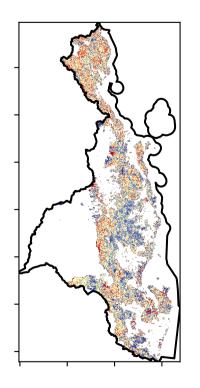
Total Vegetation Cover Anomaly [%]

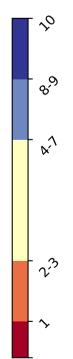




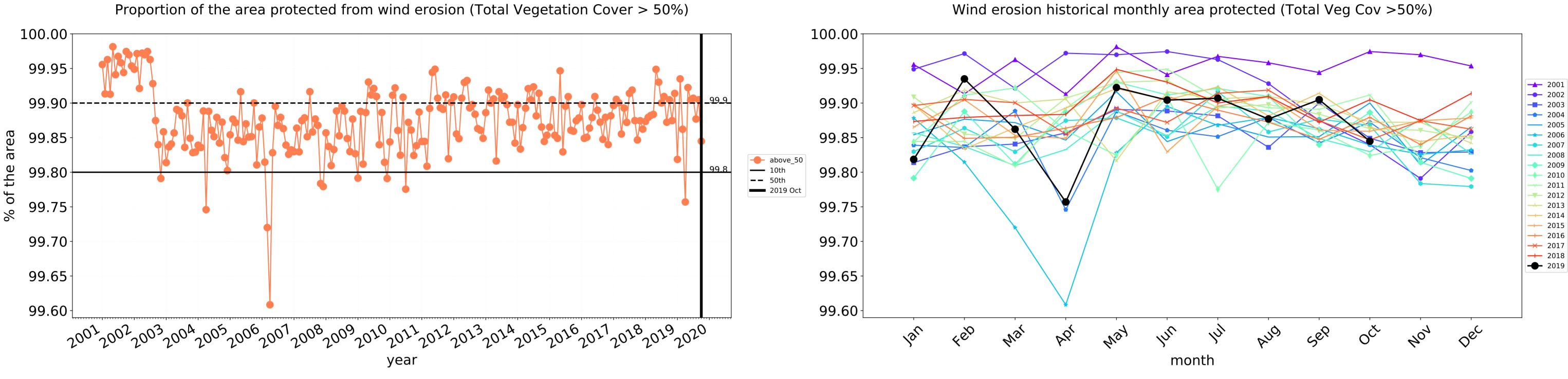




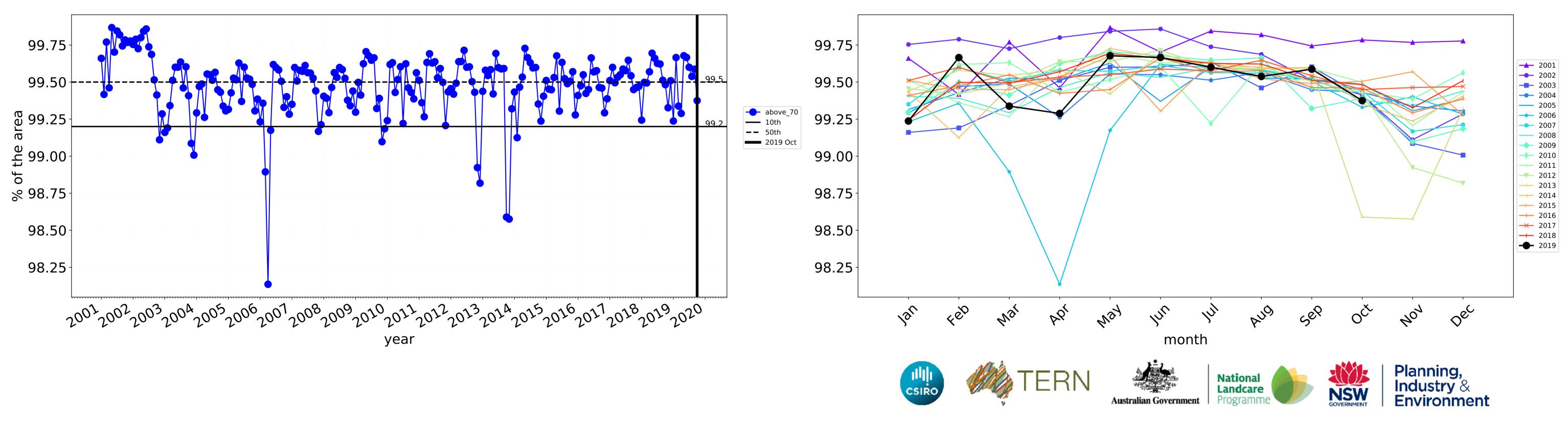




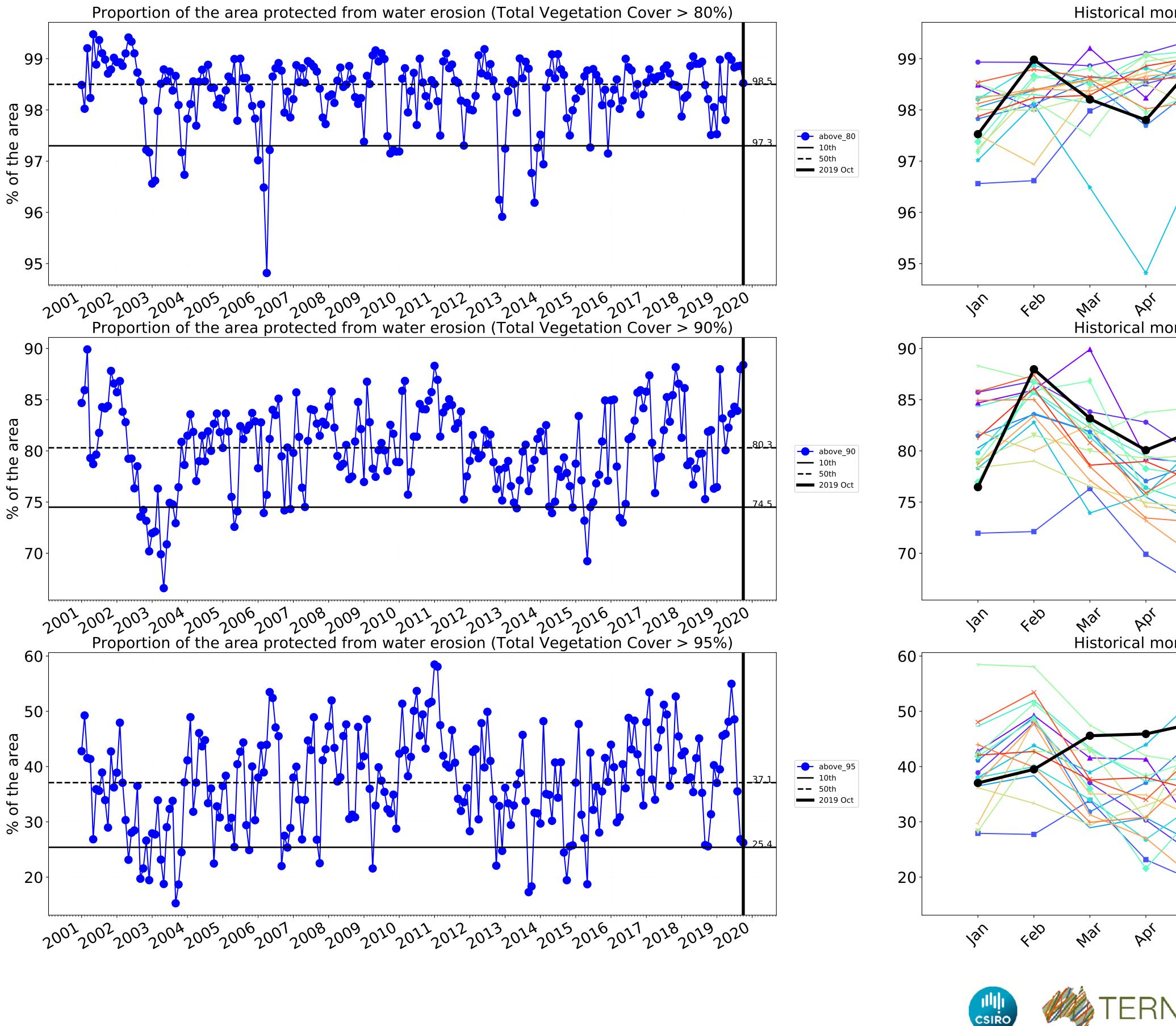




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



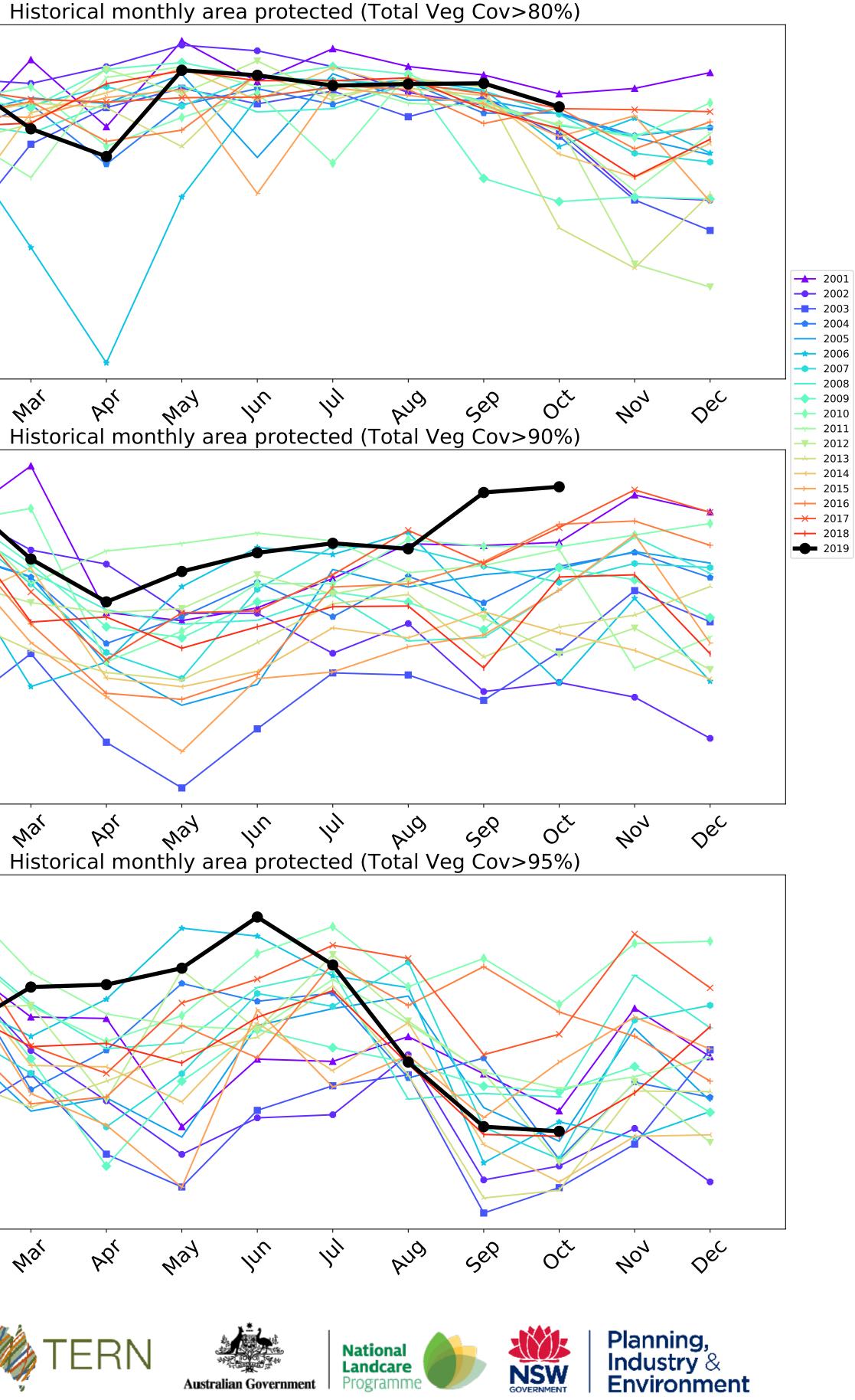
Water erosion historical monthly area protected (Total Veg Cov>70%)







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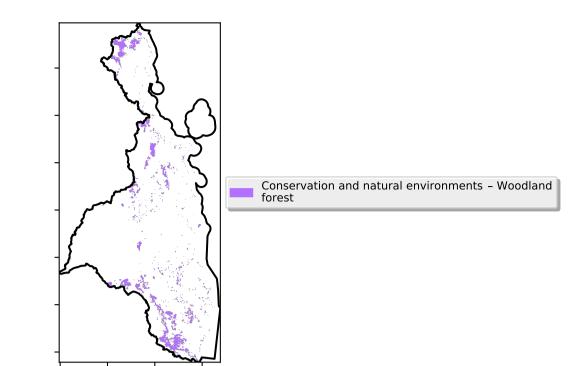
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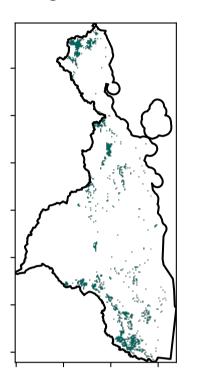
P.91

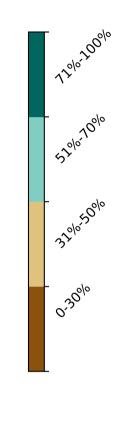
Conservation and natural environments Woodland forest

Land use and forest cover

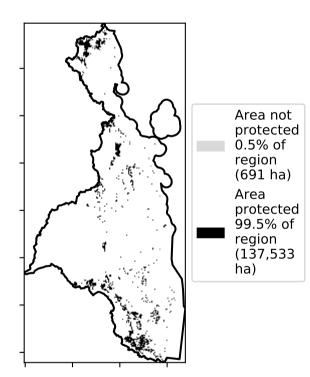


Total Vegetation Cover [%]

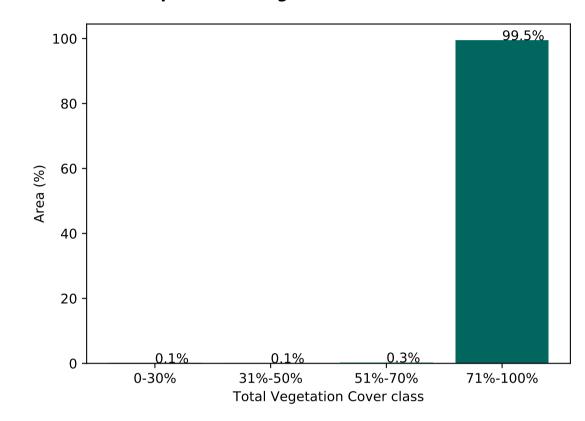




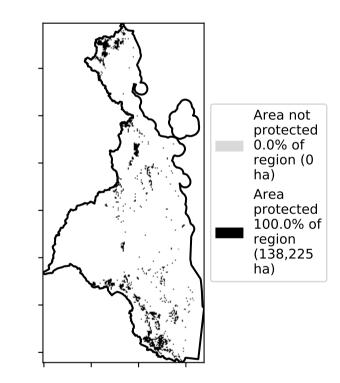
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

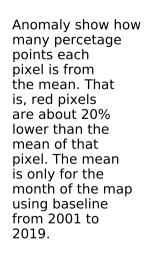


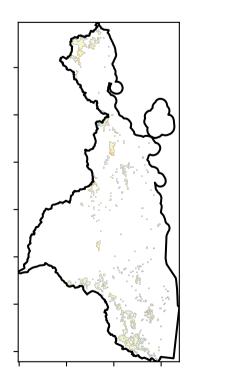
% Area protected from wind erosion (>50%)

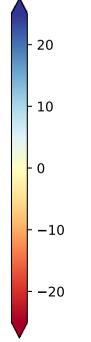


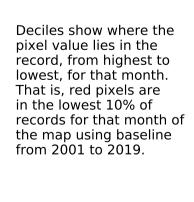
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

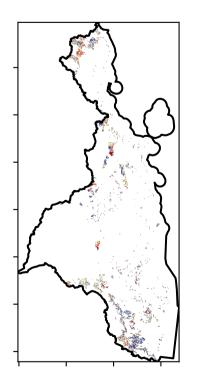
Total Vegetation Cover Anomaly [%]

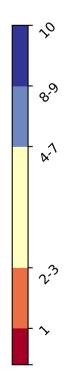






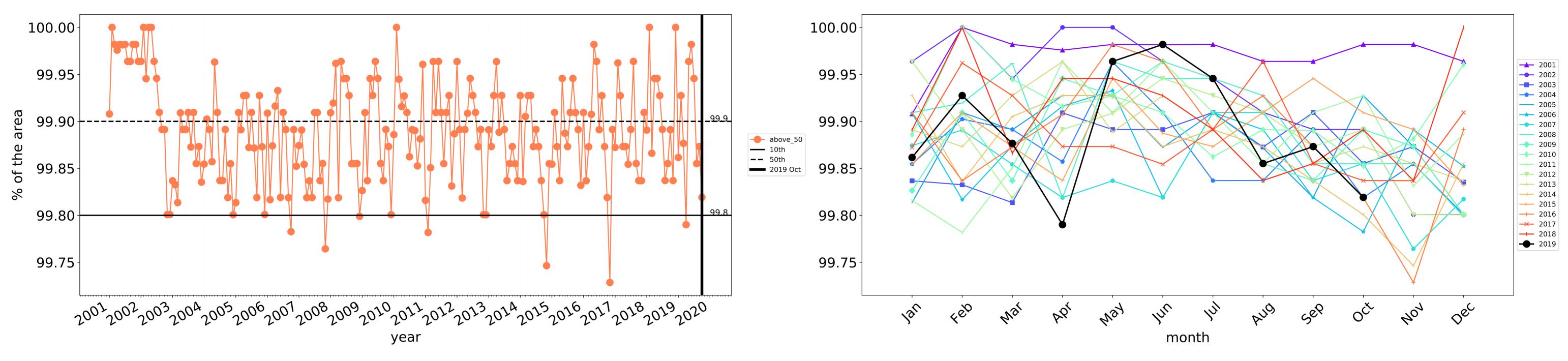






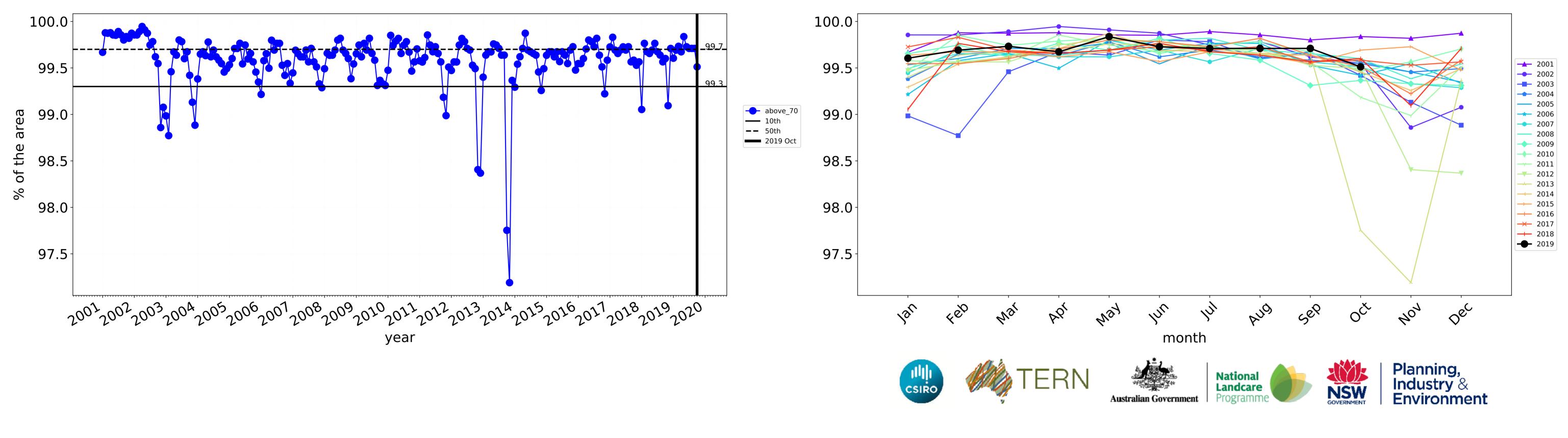


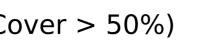
Conservation and natural environments Woodland forest timeseries



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

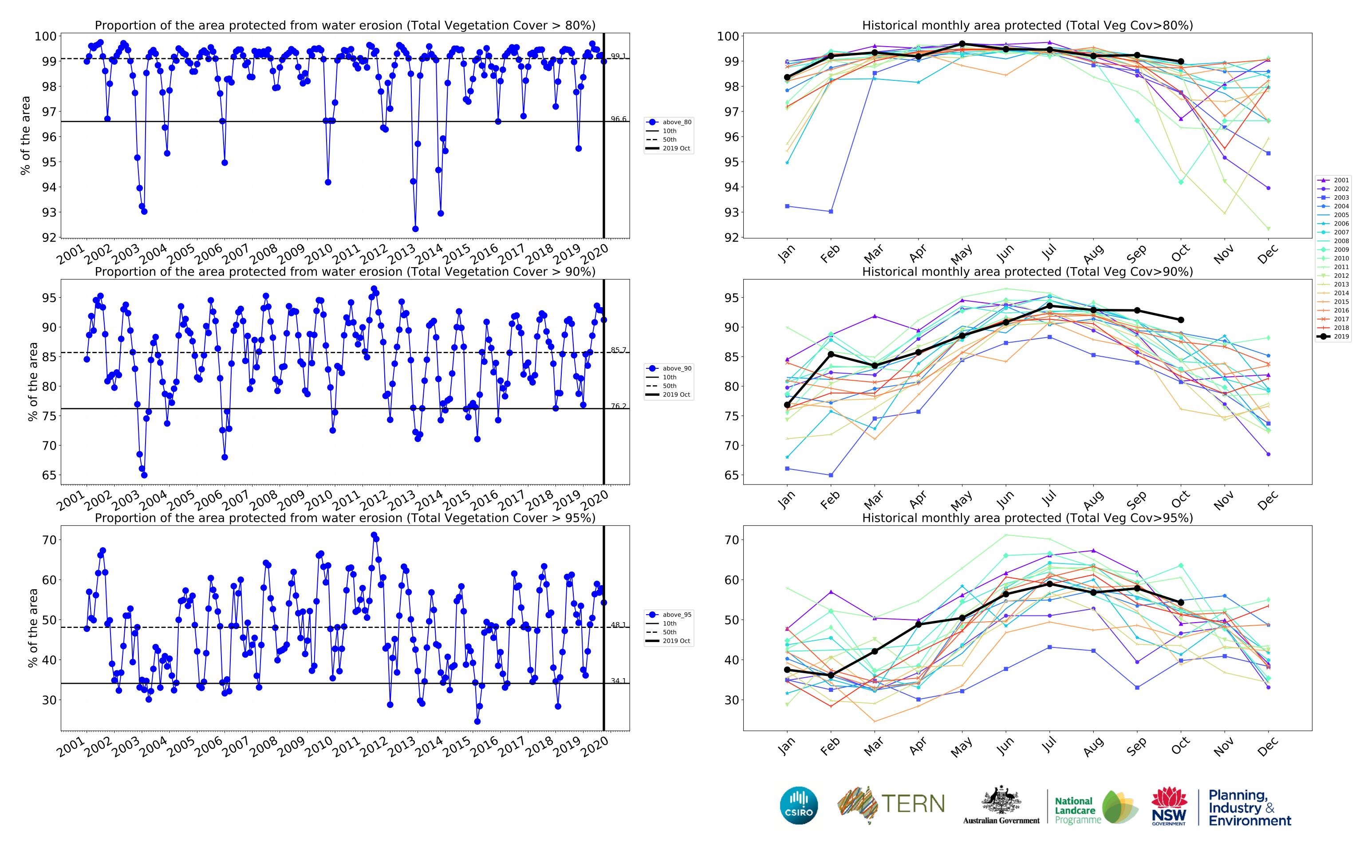
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





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

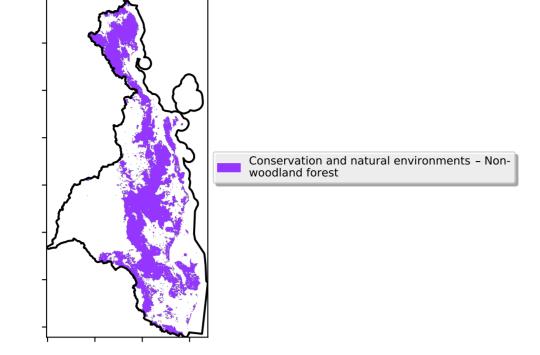
Water erosion historical monthly area protected (Total Veg Cov>70%)



Conservation and natural environments Forest (non woodland)

Land use and forest cover





12%200%

52% 70%

· 320/050012

0.30%

- 20

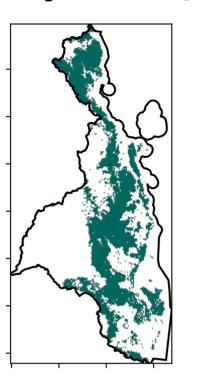
· 10

0

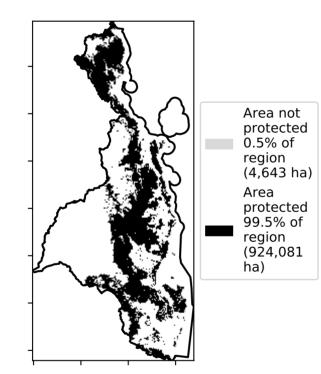
-10

-20

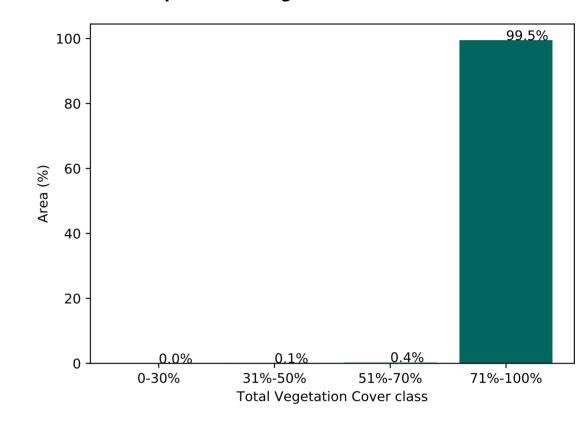
Total Vegetation Cover [%]



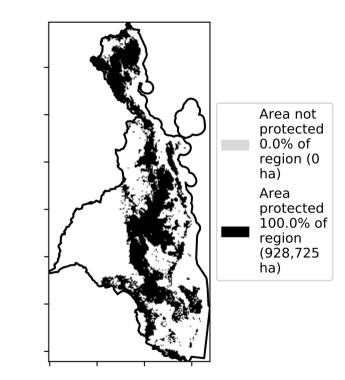




Proportion of vegetation cover class in area

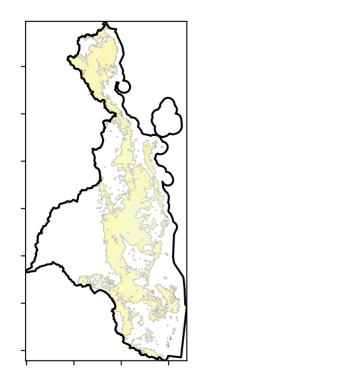


% Area protected from wind erosion (>50%)

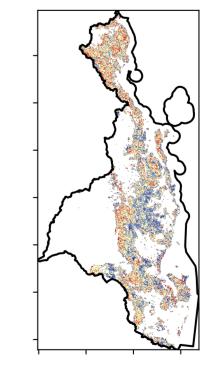


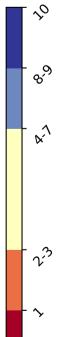
Total Vegetation Cover Anomaly [%]

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.



Total Vegetation Cover Decile [%]







Deciles show where the

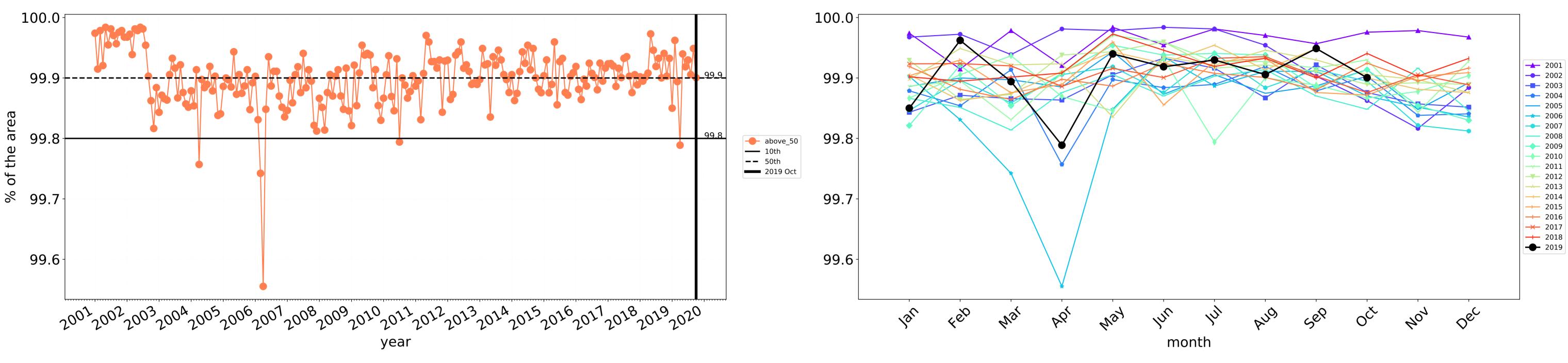
pixel value lies in the

record, from highest to lowest, for that month. That is, red pixels are

records for that month of

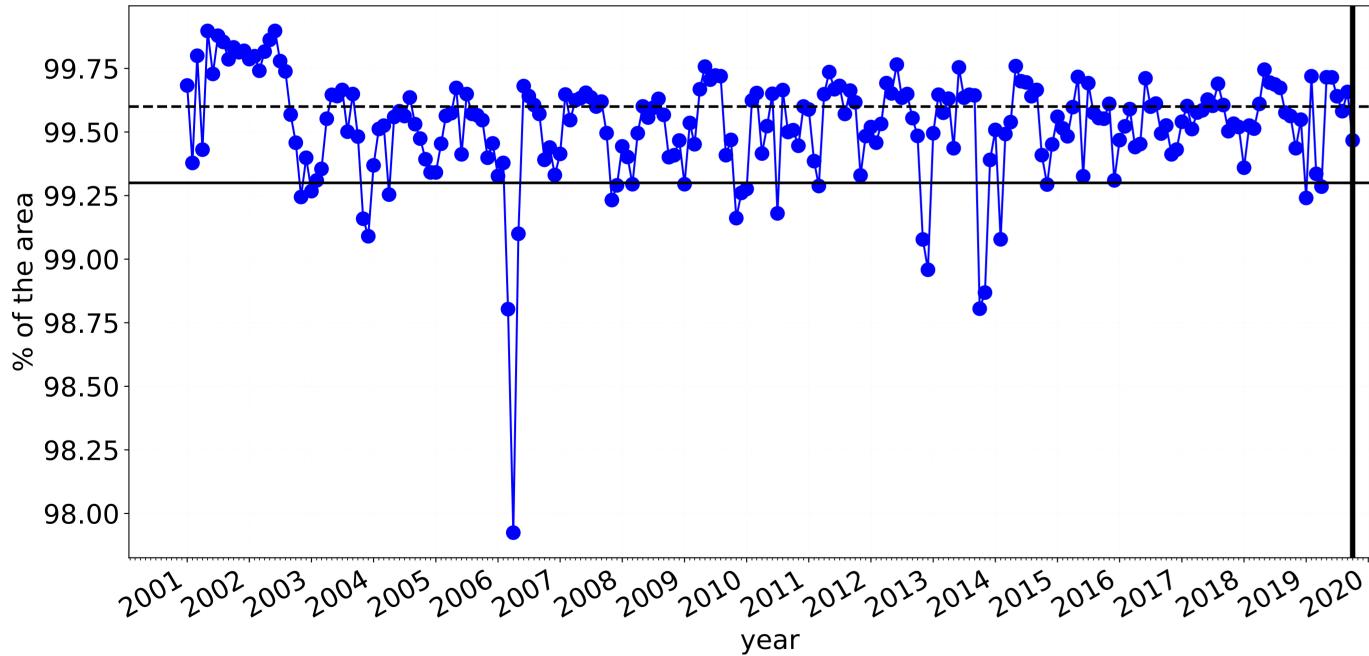
the map using baseline from 2001 to 2019.

in the lowest 10% of



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

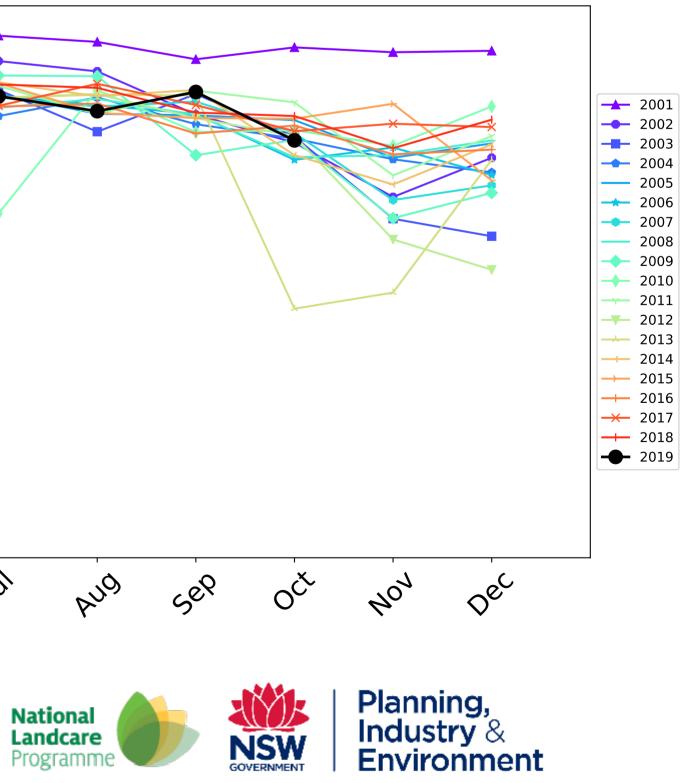
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

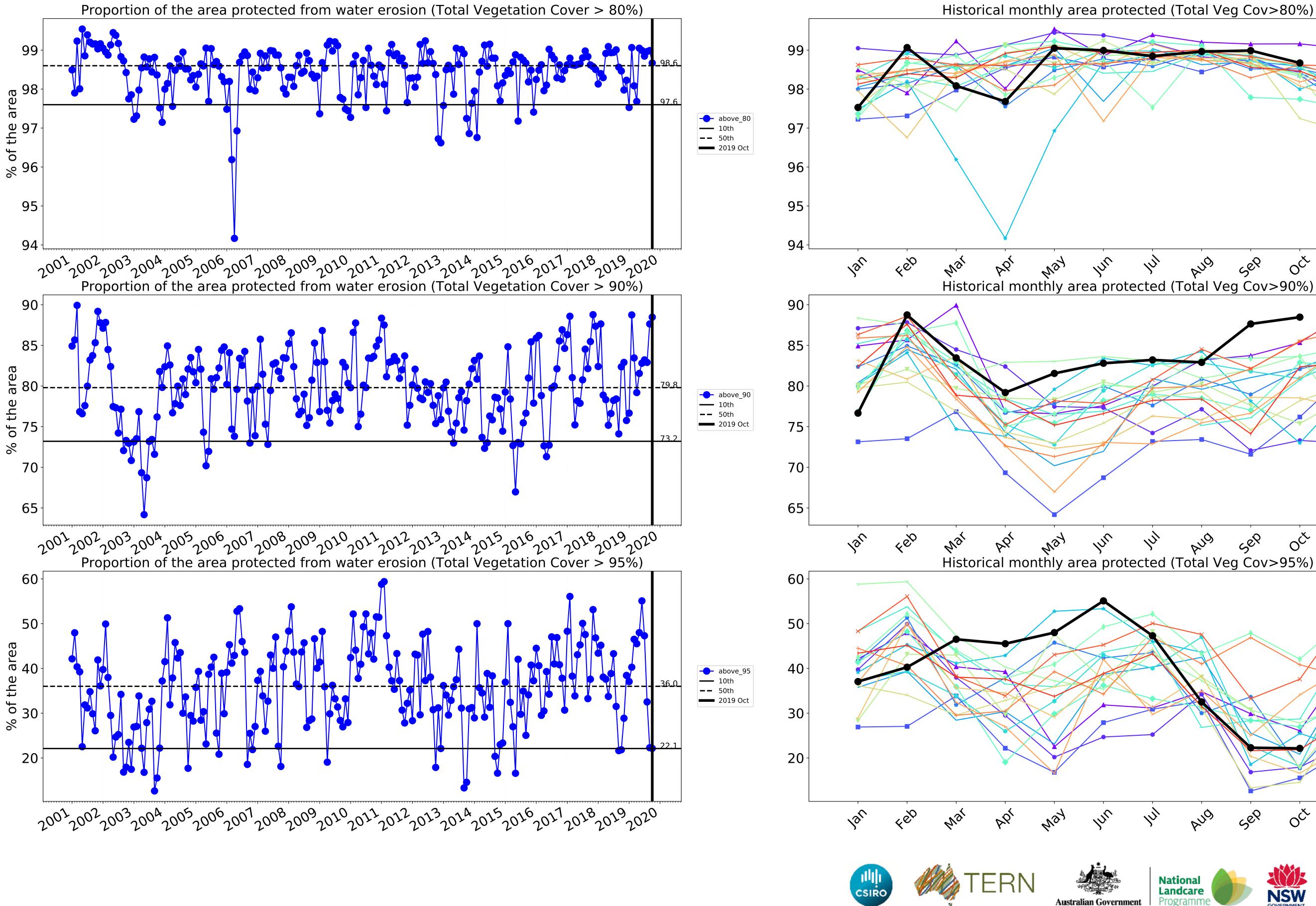


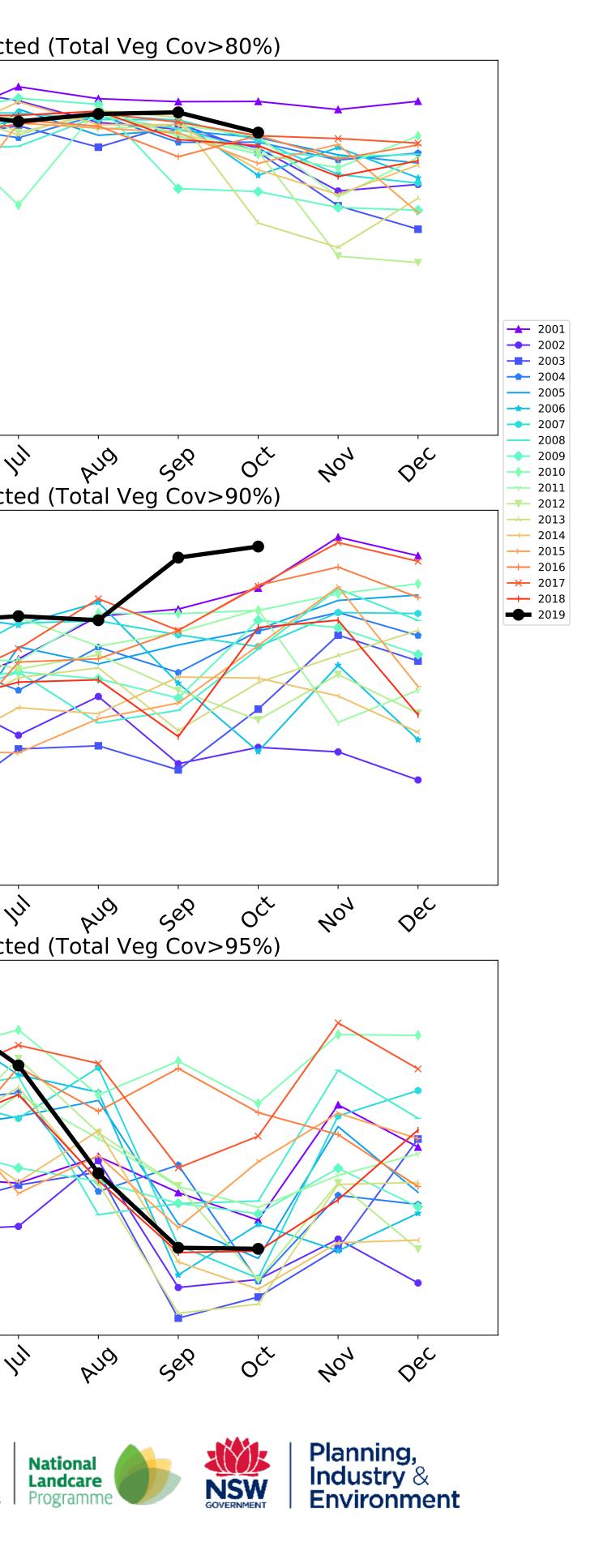
Wind erosion historical monthly area protected (Total Veg Cov >50%)

99.75 99.50-99.25 --- above_70 **—** 10th **——** 50th 99.00 **——** 2019 Oct 98.75 98.50 98.25-98.00 feb Par In way PQ Mai In, month FERN 1000g CSIRC Australian Government

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

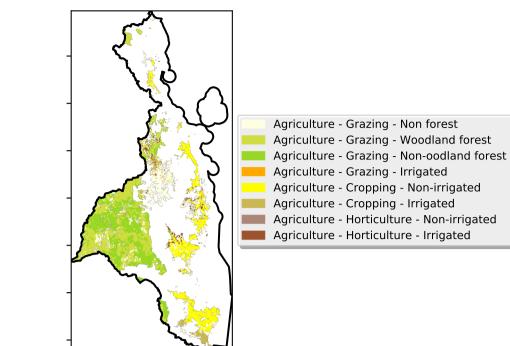




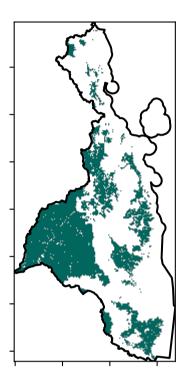


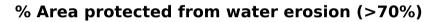
Agriculture

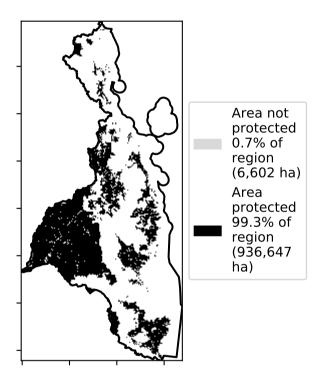
Land use and forest cover



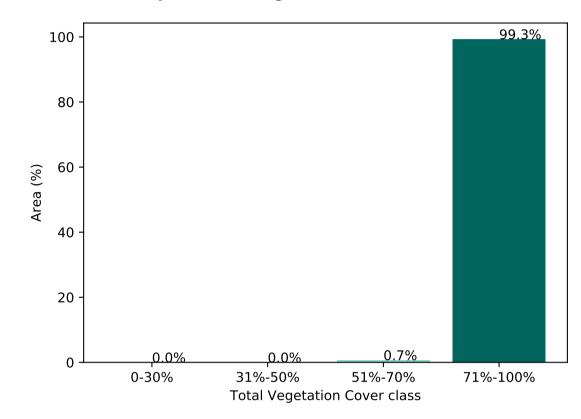
Total Vegetation Cover [%]



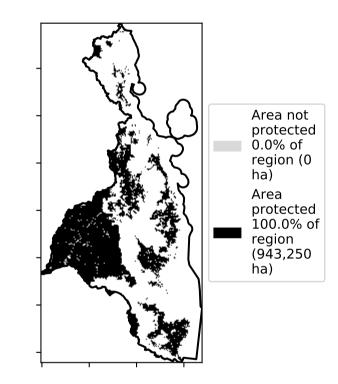








% Area protected from wind erosion (>50%)



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.

Catchment Scale

Derived from

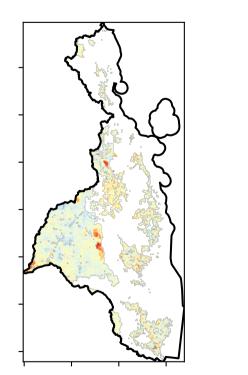
Use of Australia

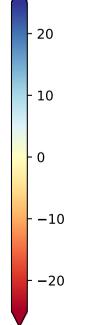
(2018) and Forests

of Australia (2018)

Land Use and Forests of Australia (2018)

Catchment Scale Land





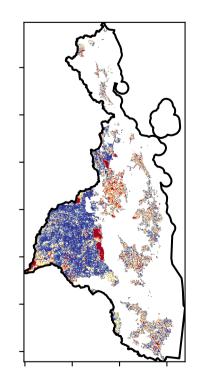
120001

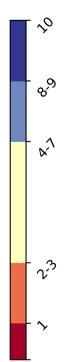
· 52% 70%

· 320050010

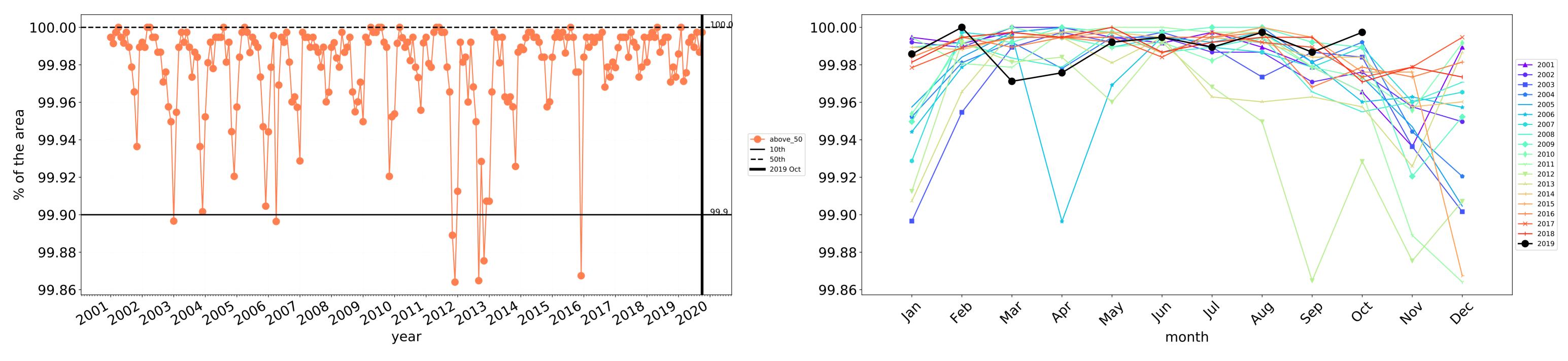
0.30%





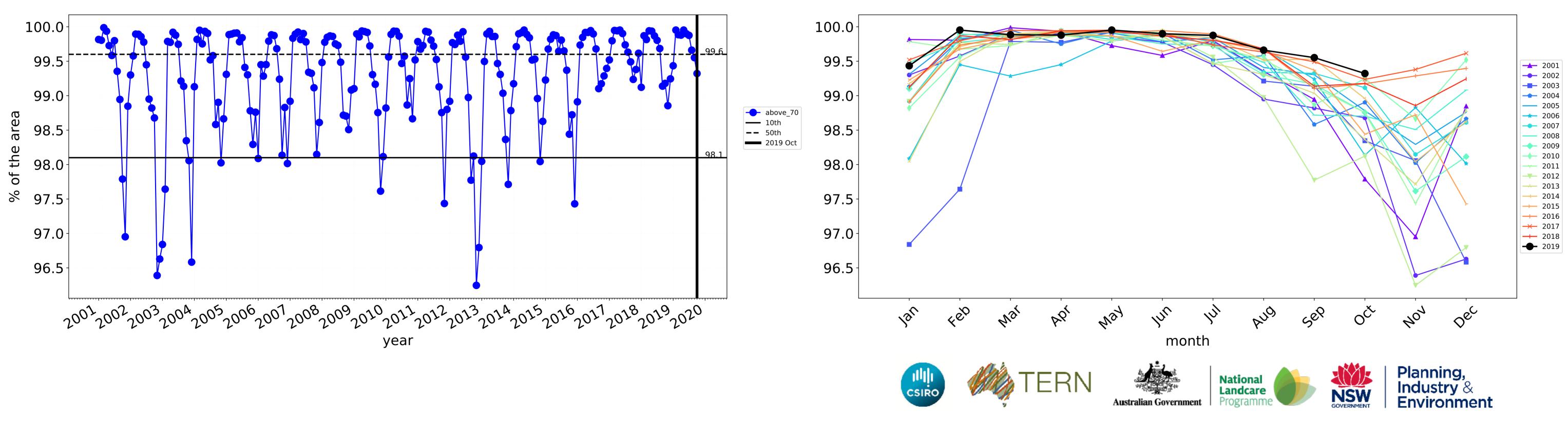






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

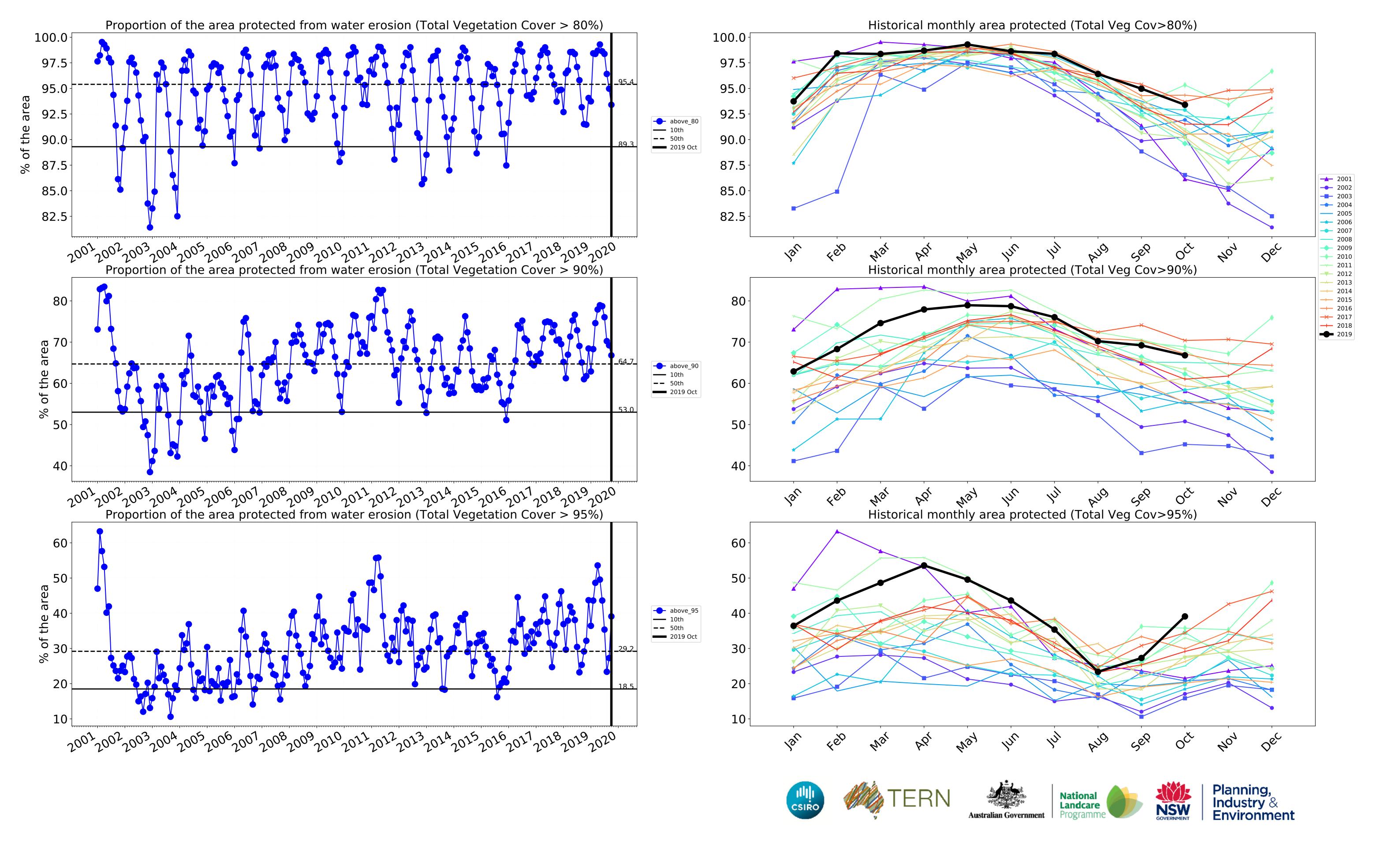






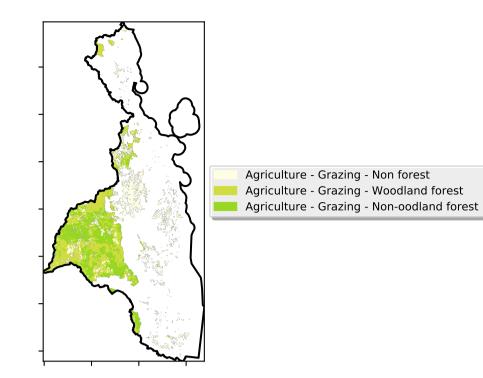
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

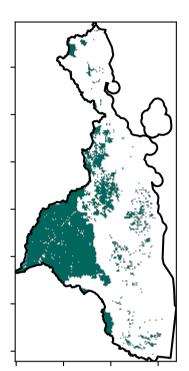


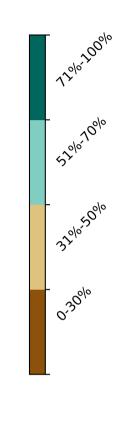
Grazing

Land use and forest cover

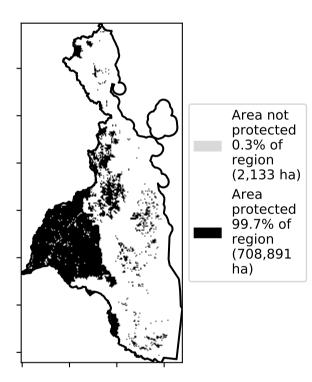


Total Vegetation Cover [%]

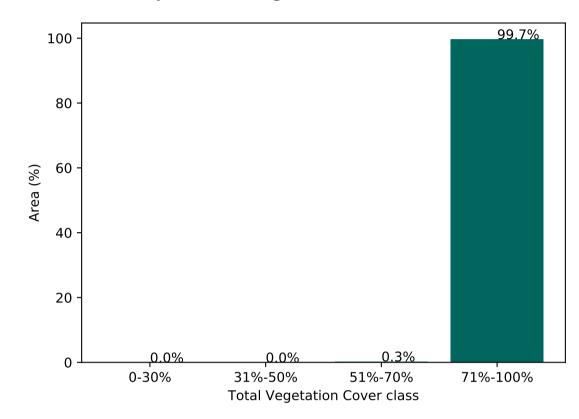




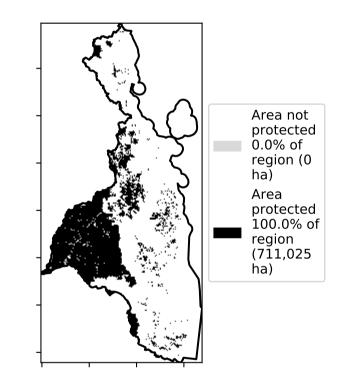
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



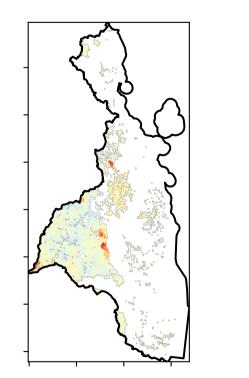
% Area protected from wind erosion (>50%)

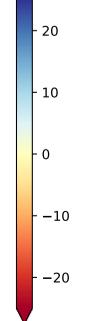


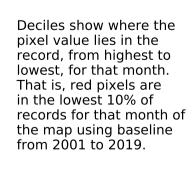
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

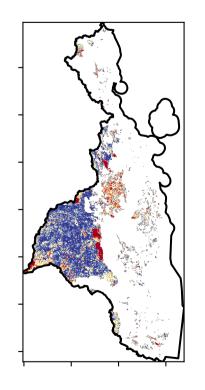
Total Vegetation Cover Anomaly [%]

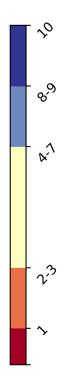
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



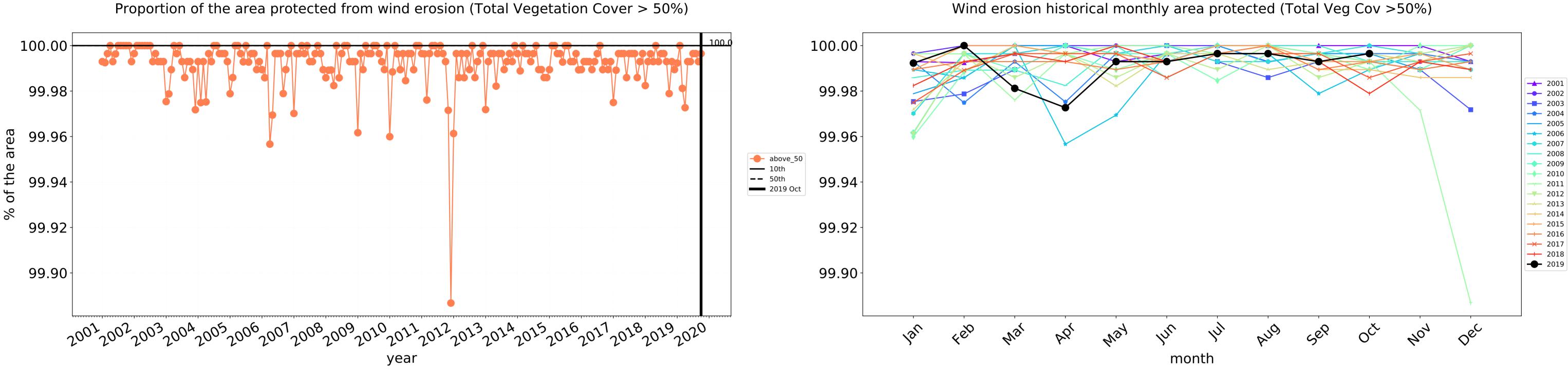




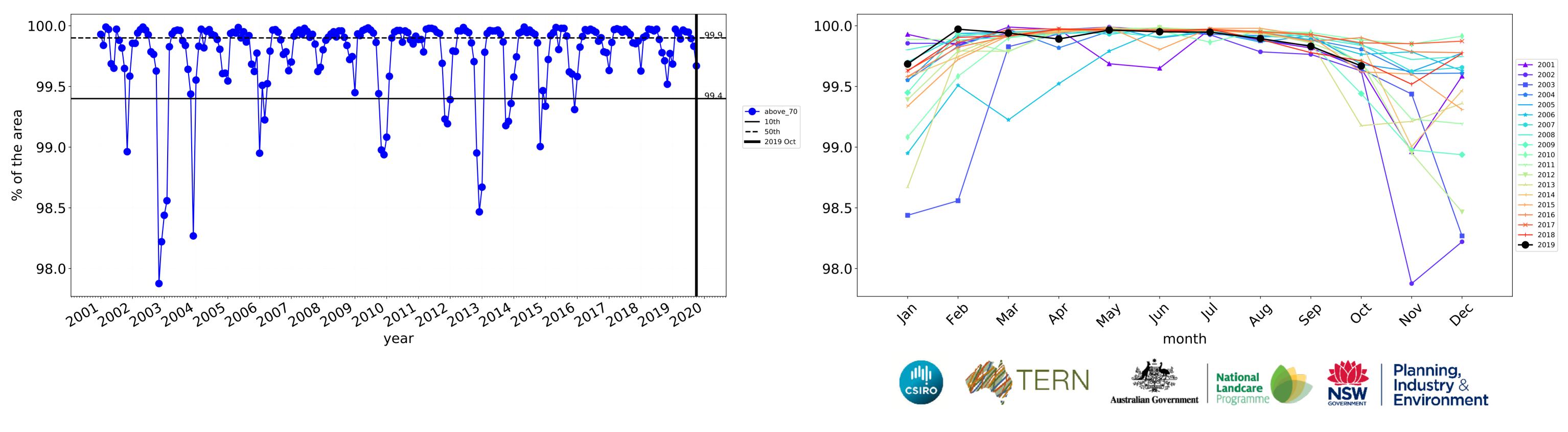




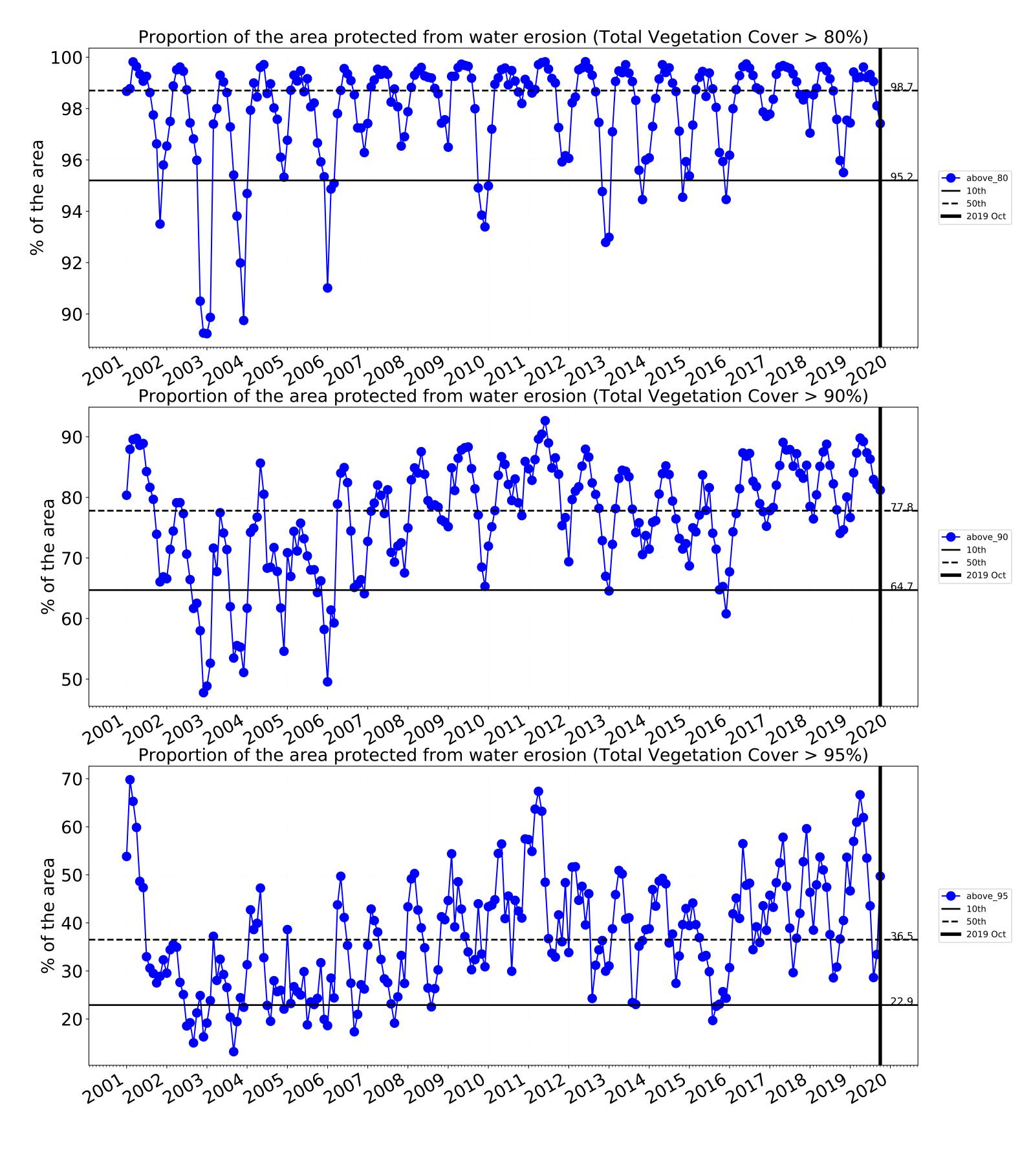


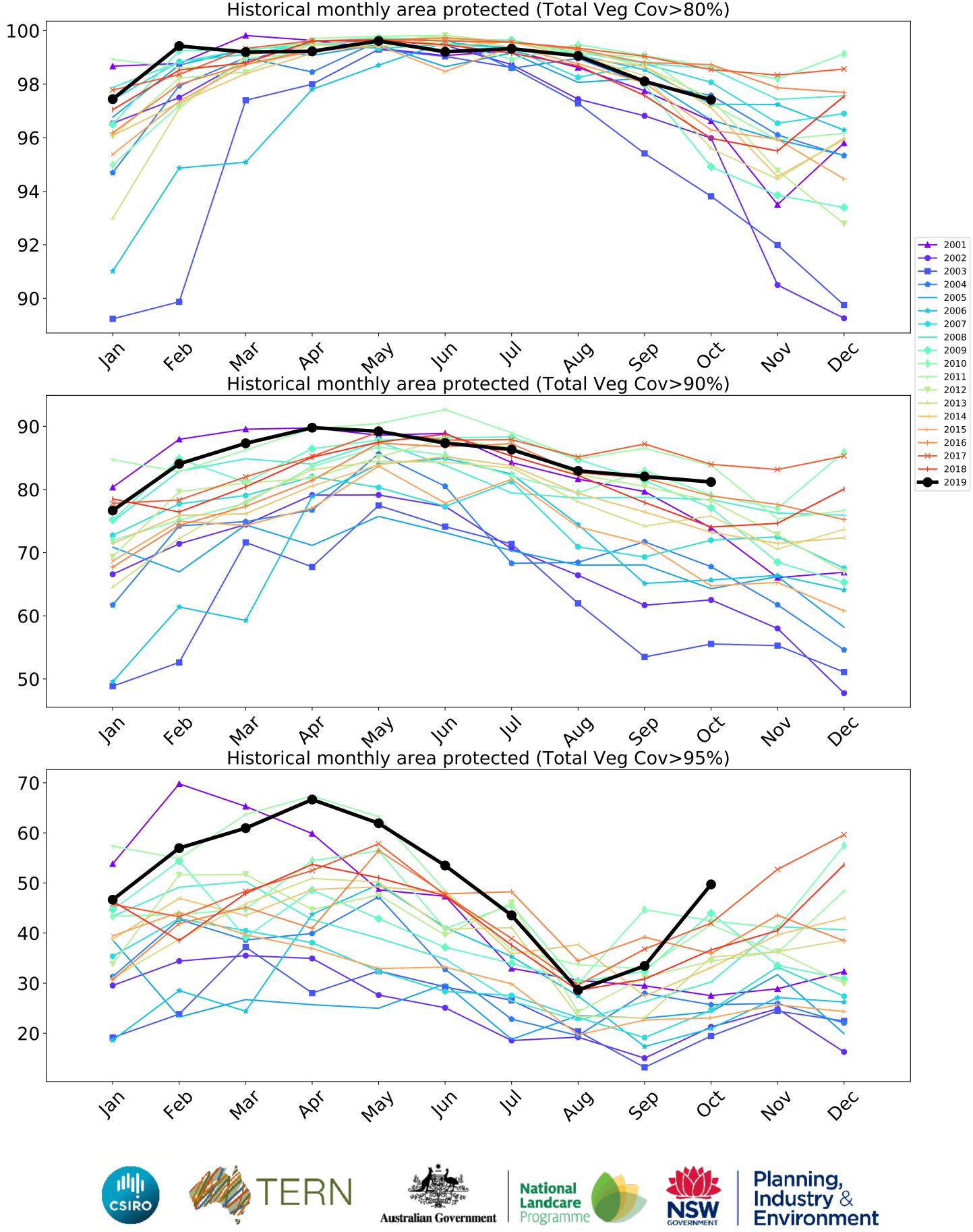


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

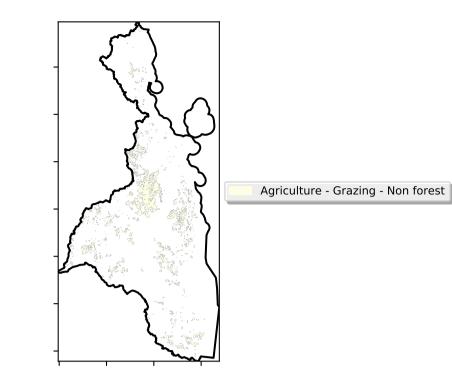




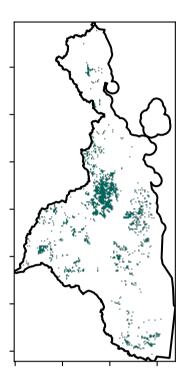
Australian Government

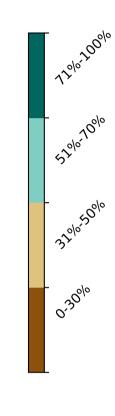
Grazing non forest

Land use and forest cover

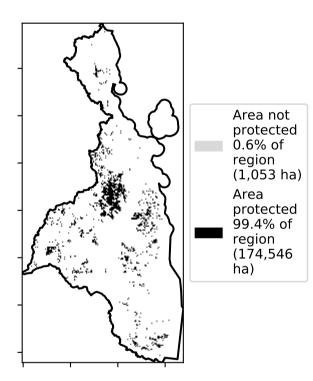


Total Vegetation Cover [%]

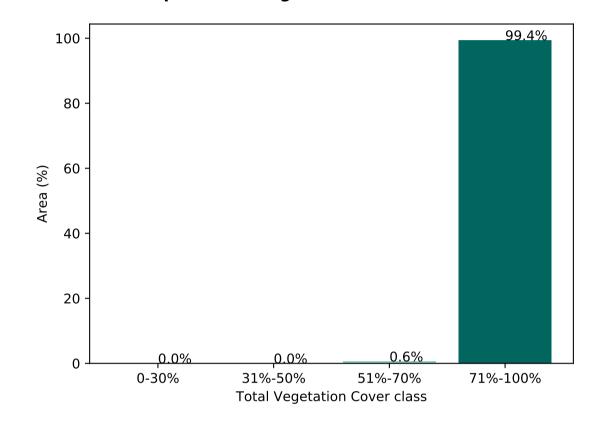




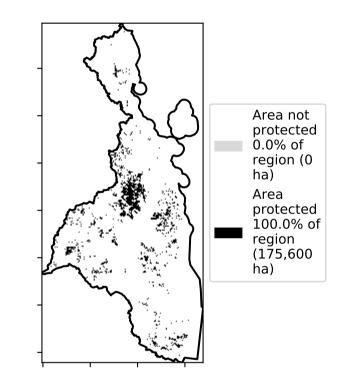
% Area protected from water erosion (>70%)



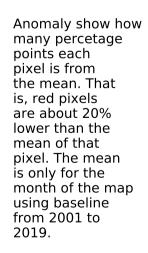
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

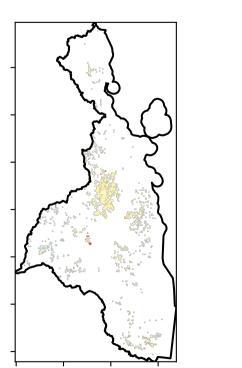


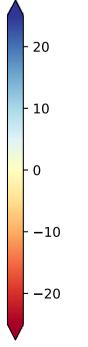
Total Vegetation Cover Anomaly [%]

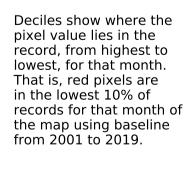


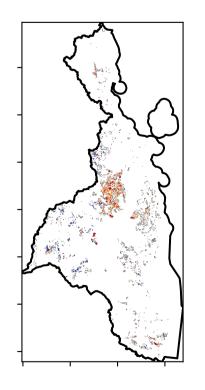
Catchment Scale Land Use and Forests of Australia (2018) Derived from

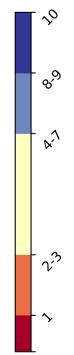
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



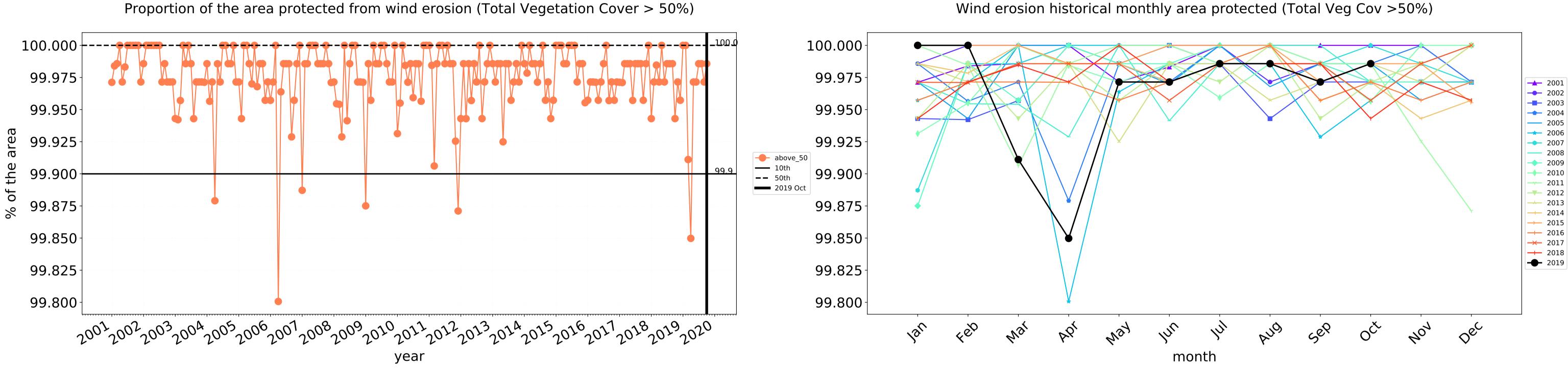






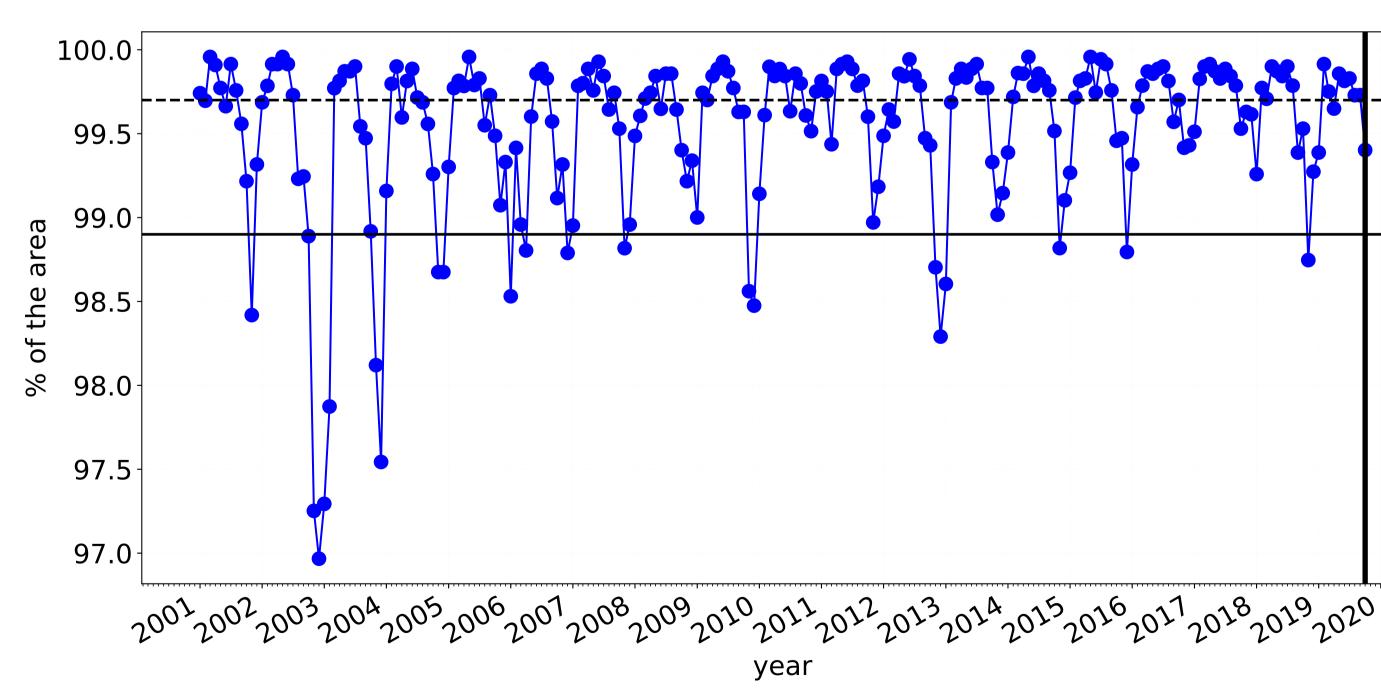


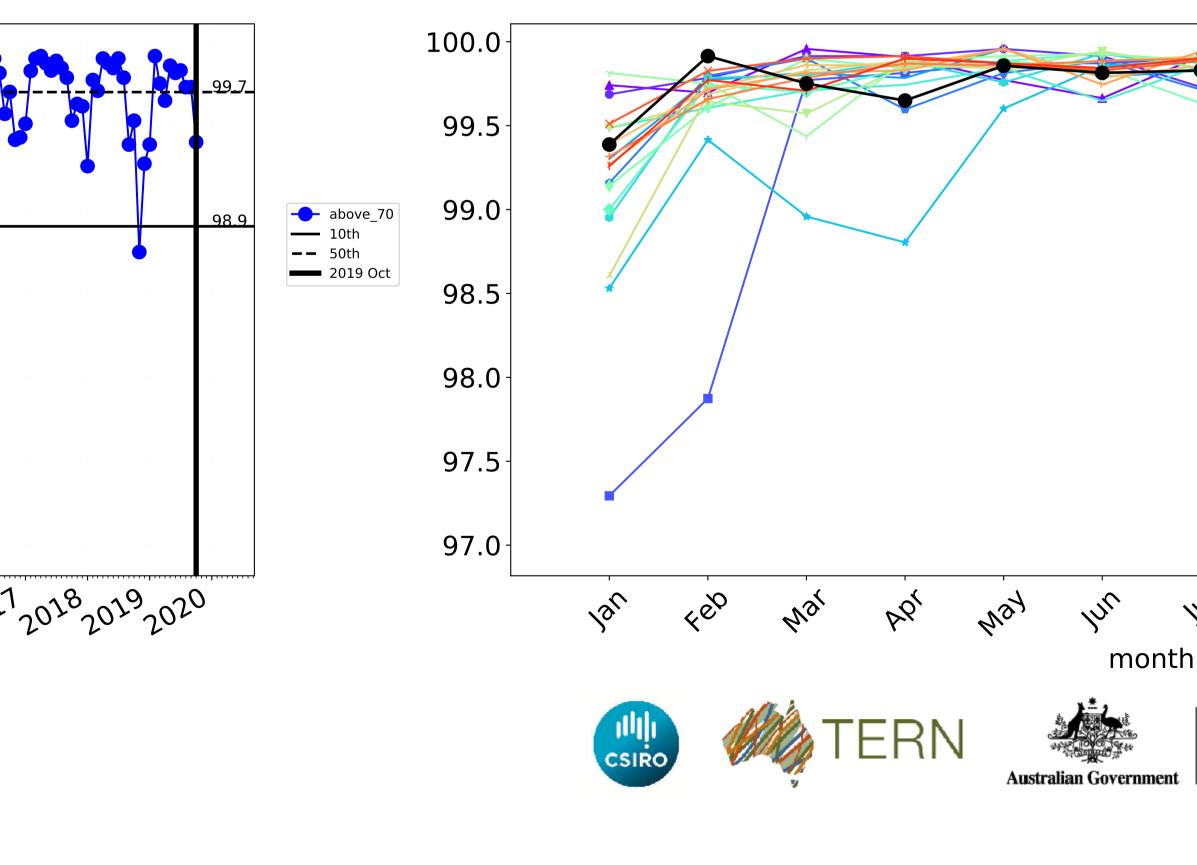




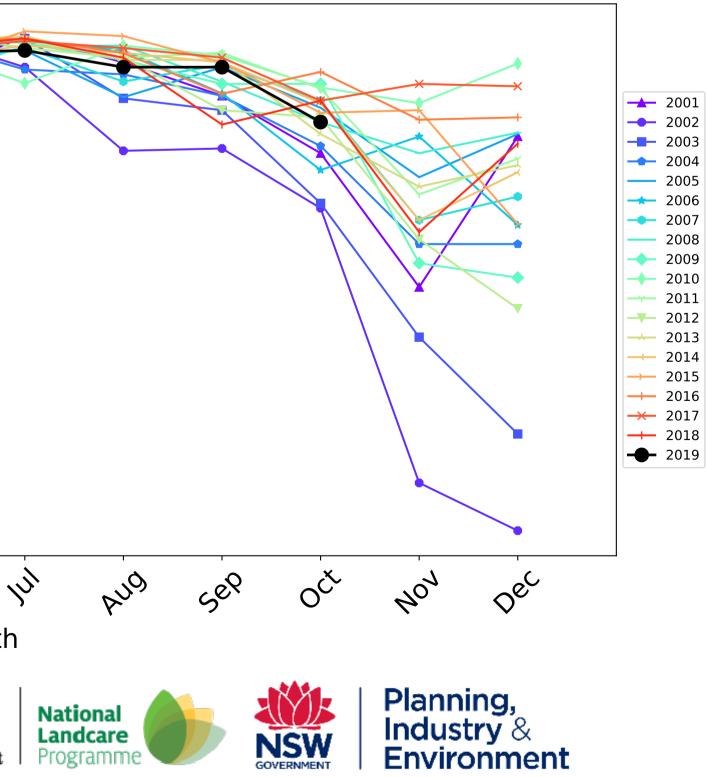
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

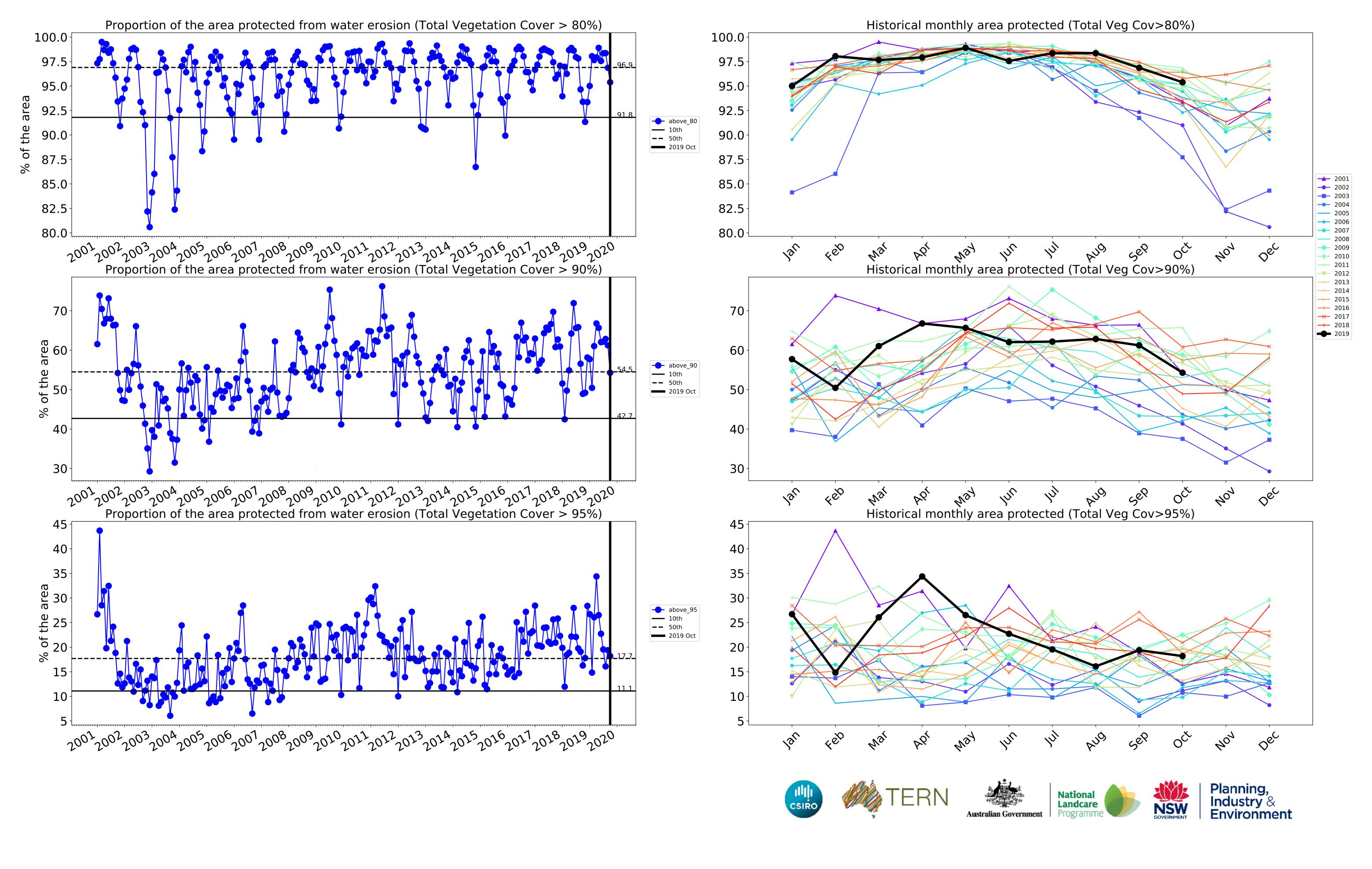
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





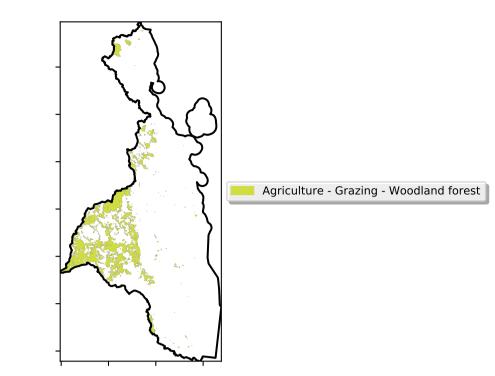
Water erosion historical monthly area protected (Total Veg Cov>70%)



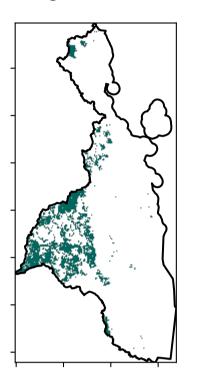


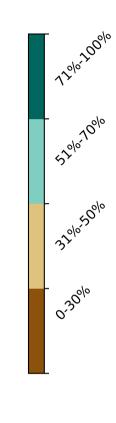
Grazing Woodland forest

Land use and forest cover

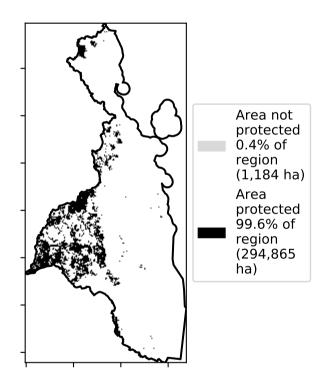


Total Vegetation Cover [%]

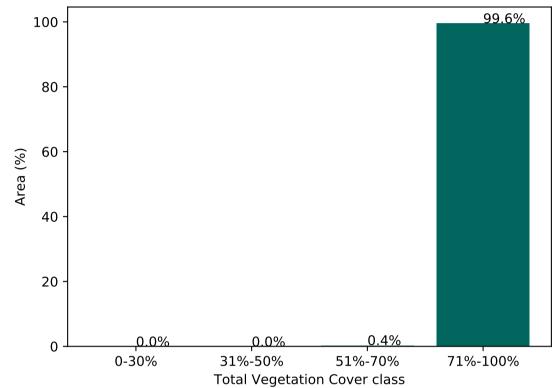




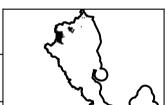
% Area protected from water erosion (>70%)

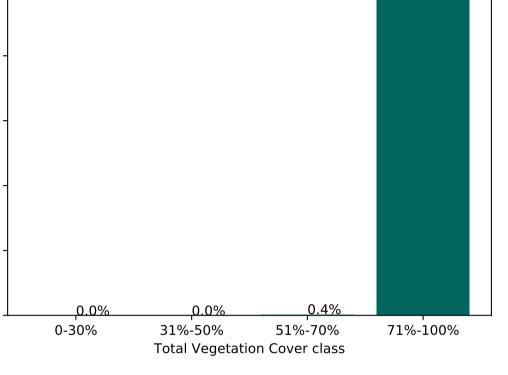


Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



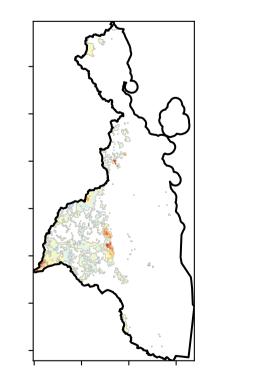


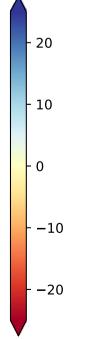
Total Vegetation Cover Anomaly [%]

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.

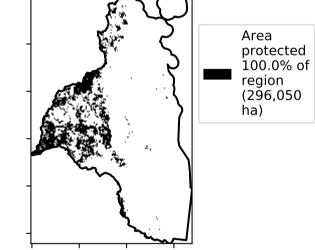
Catchment Scale Land Use and Forests of Australia (2018) Derived from

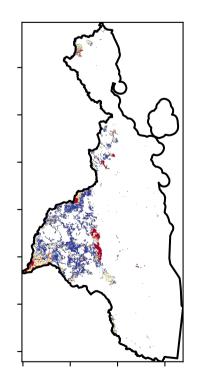
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

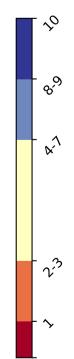




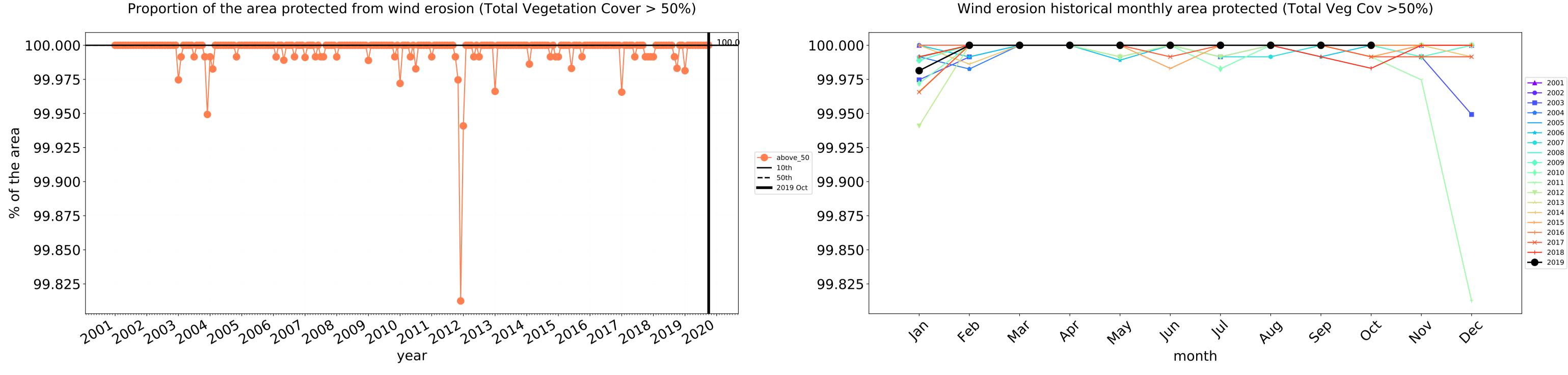




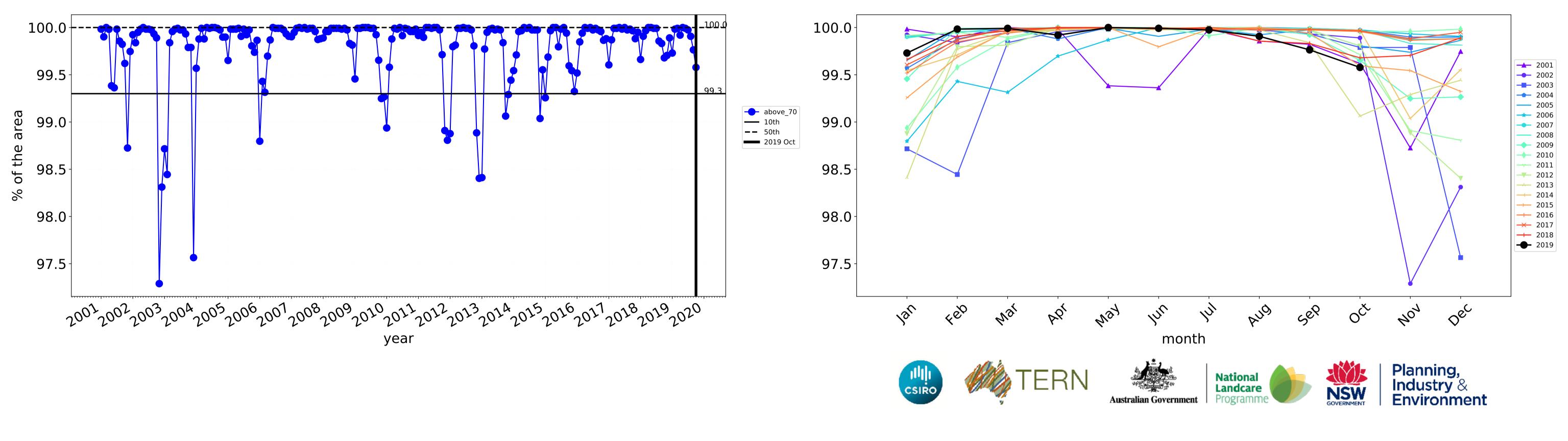






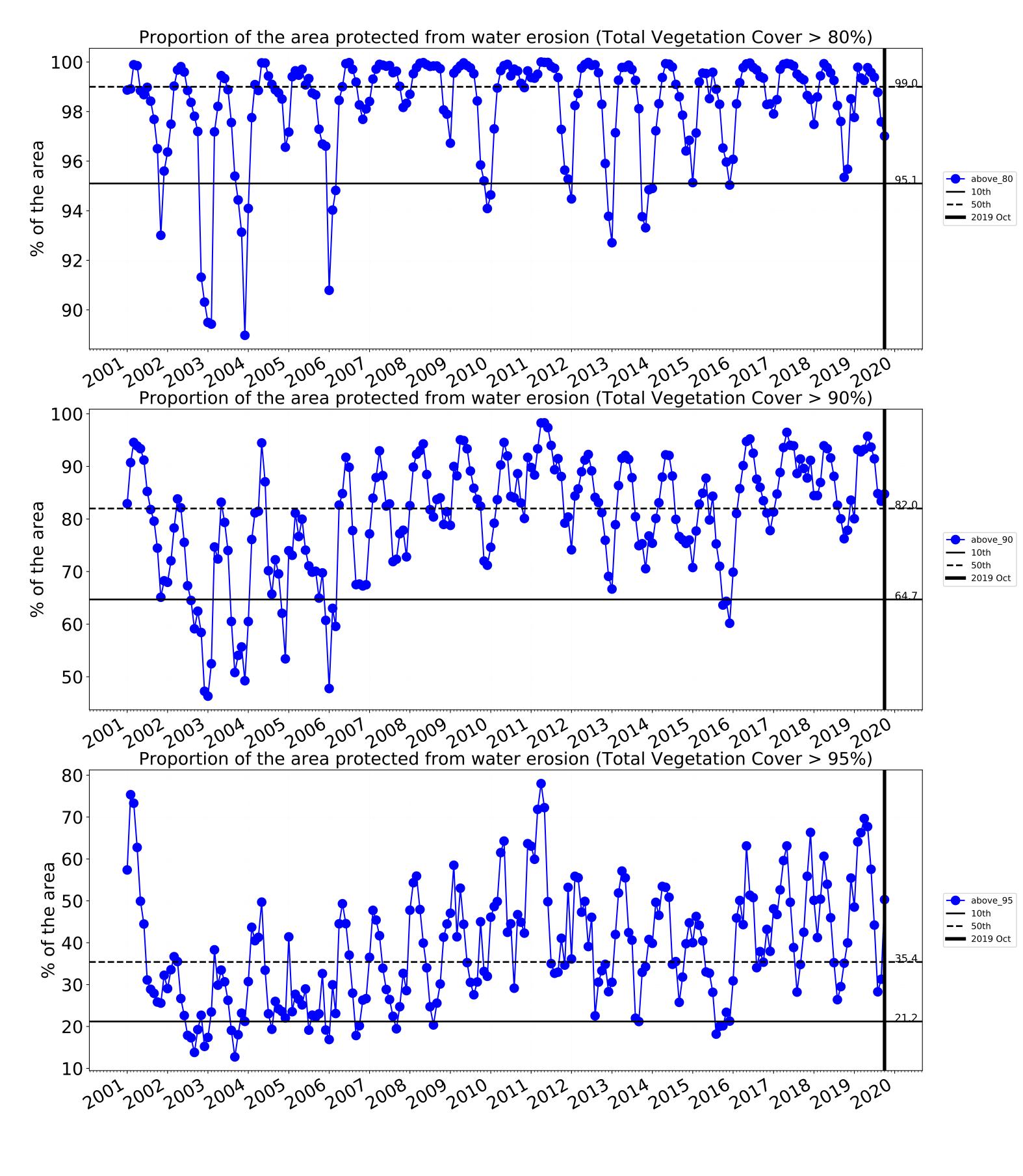


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

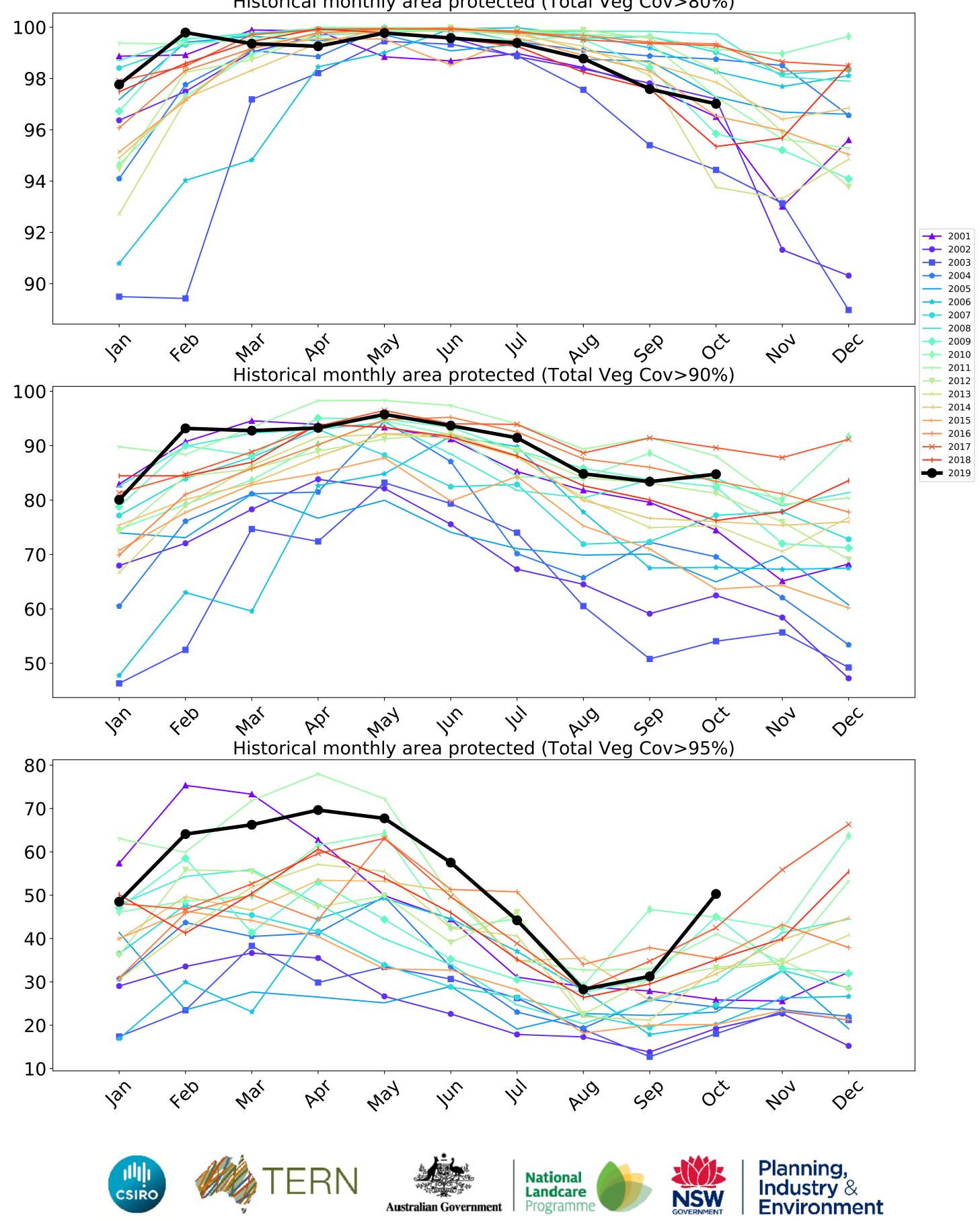


Grazing Woodland forest timeseries

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



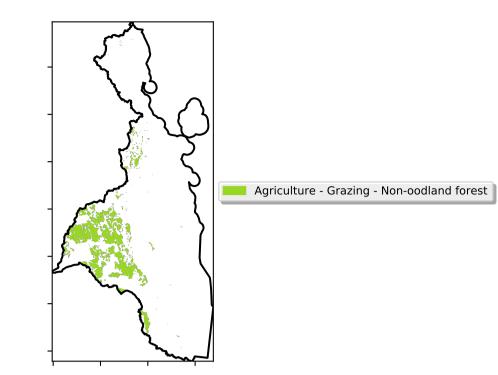
Historical monthly area protected (Total Veg Cov>80%)



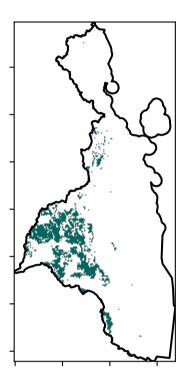
Australian Government

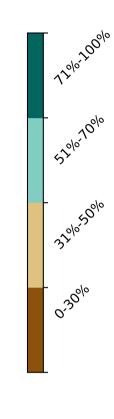
Grazing - Forest (non woodland)

Land use and forest cover

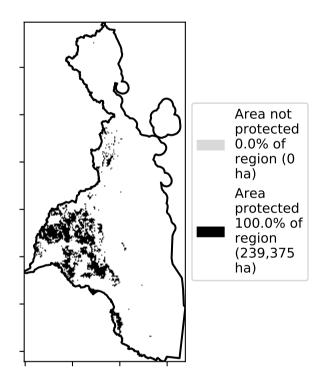


Total Vegetation Cover [%]

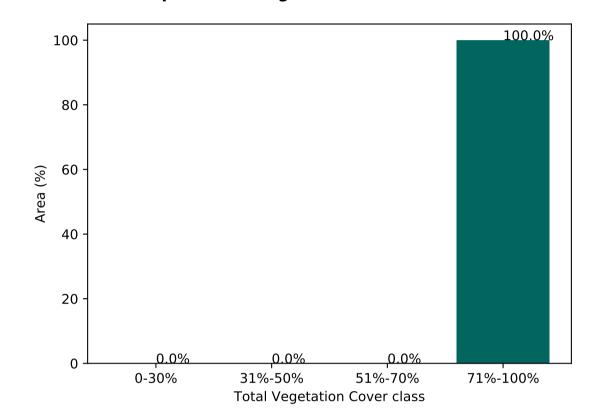




% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



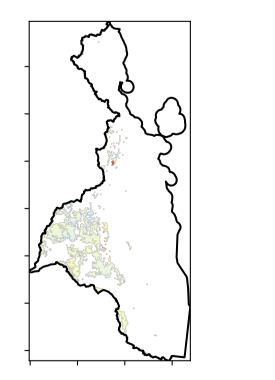
% Area protected from wind erosion (>50%)

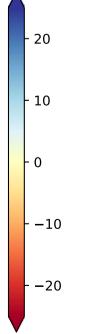


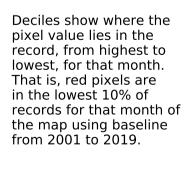
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

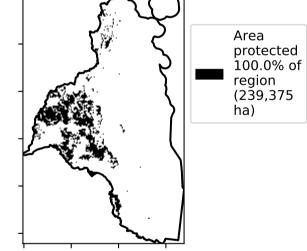
Total Vegetation Cover Anomaly [%]

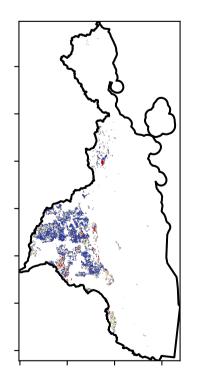
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

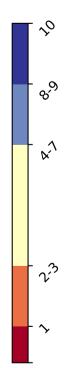




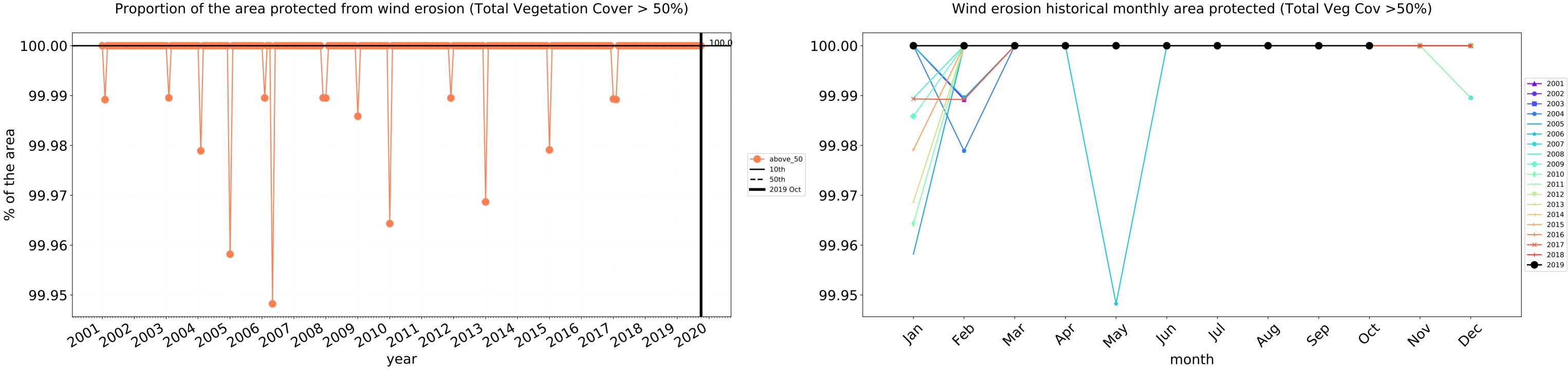






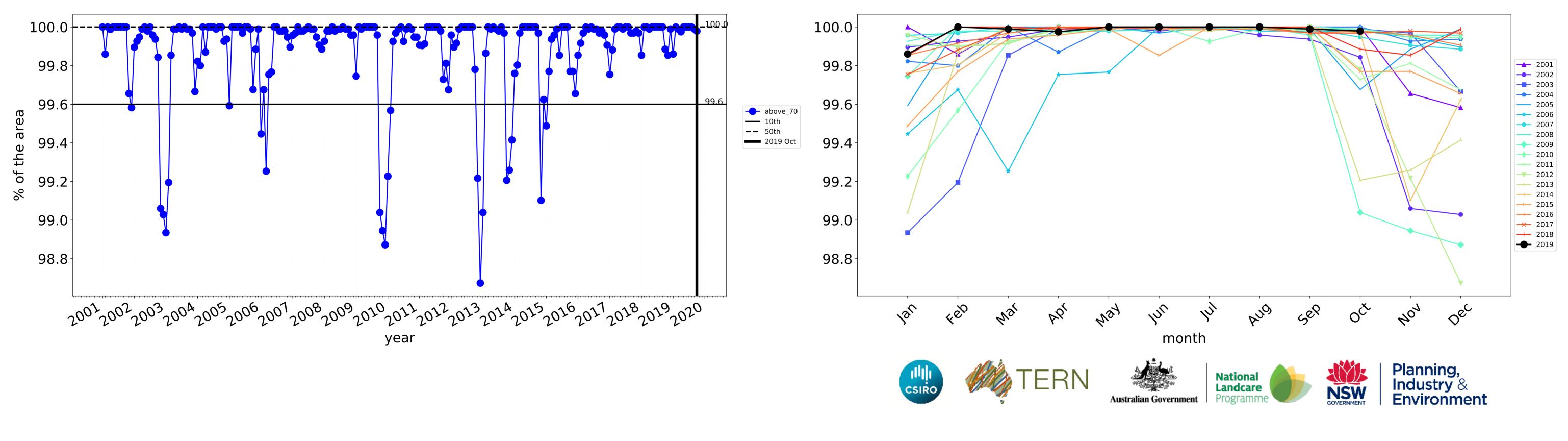




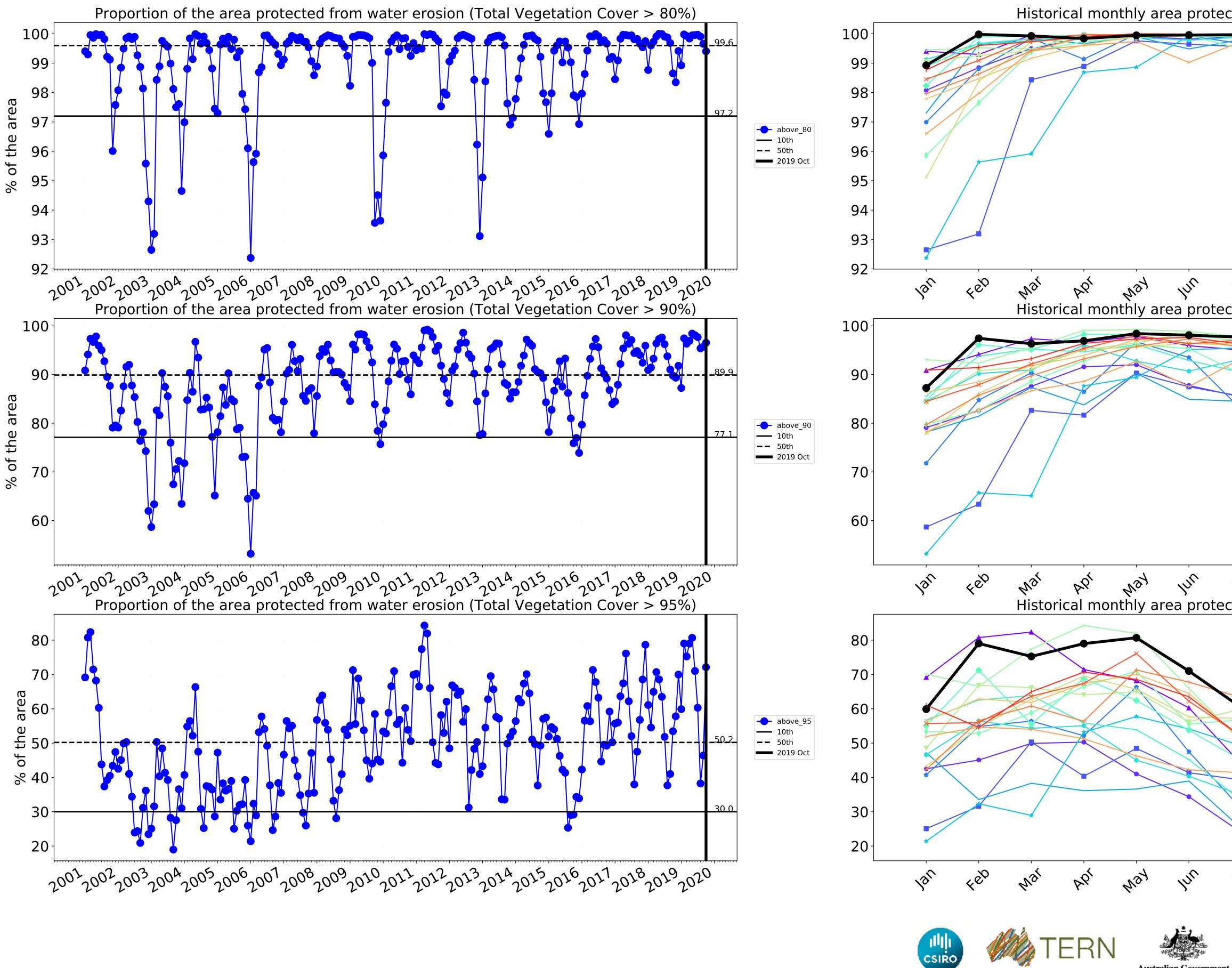


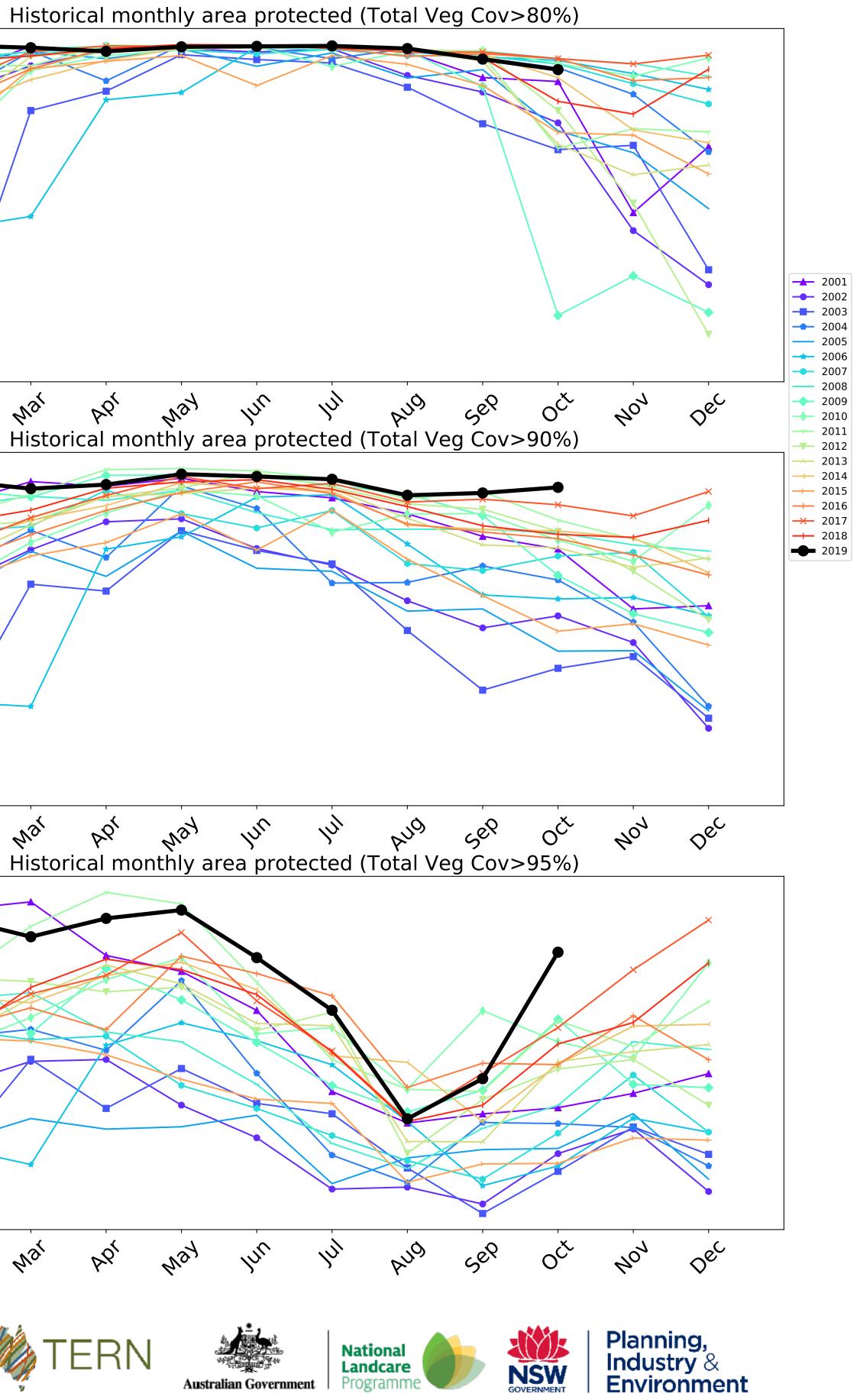
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



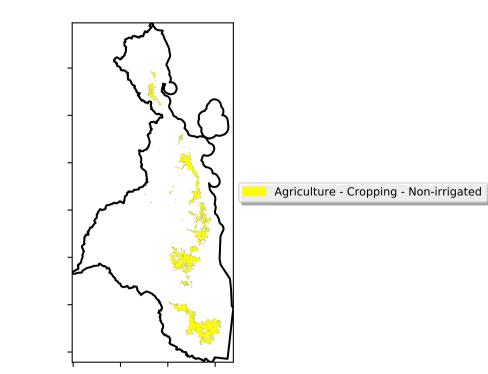
Water erosion historical monthly area protected (Total Veg Cov>70%)



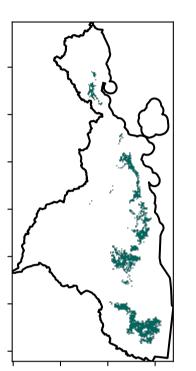


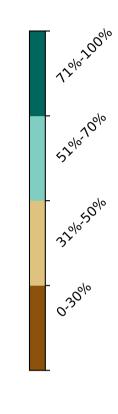
Cropping

Land use and forest cover

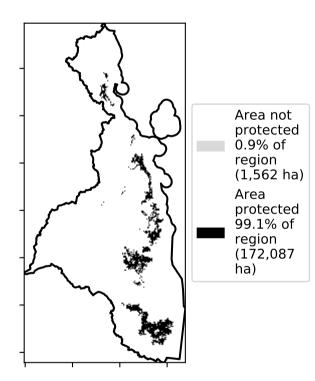


Total Vegetation Cover [%]

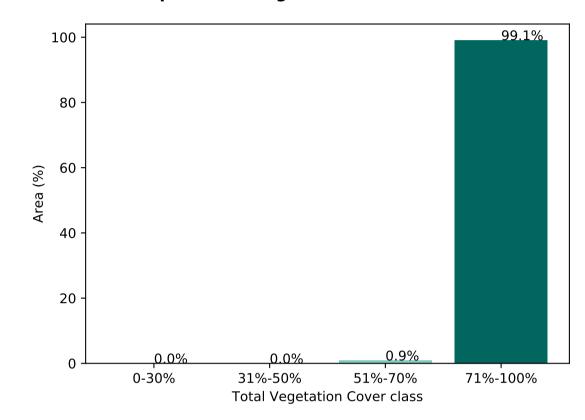




% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



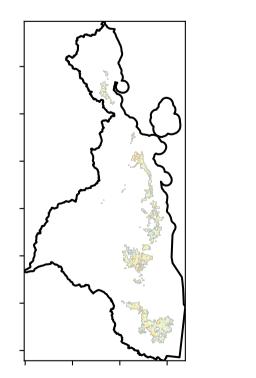
% Area protected from wind erosion (>50%)

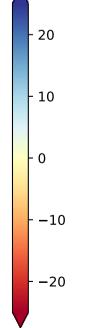


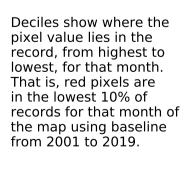
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

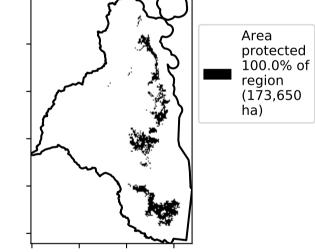
Total Vegetation Cover Anomaly [%]

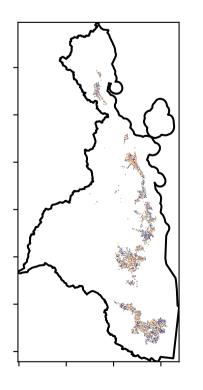
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

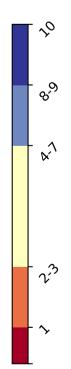




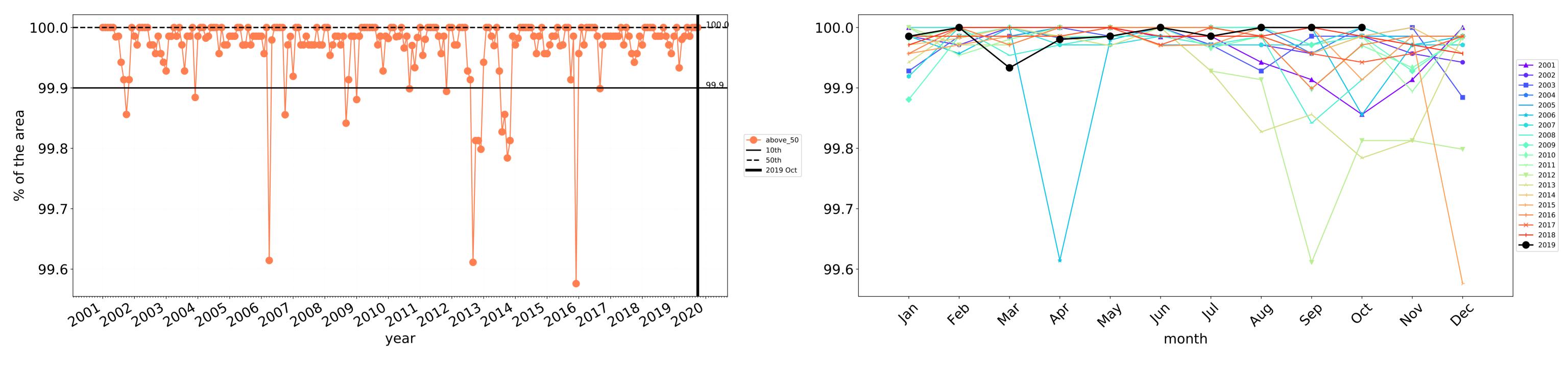






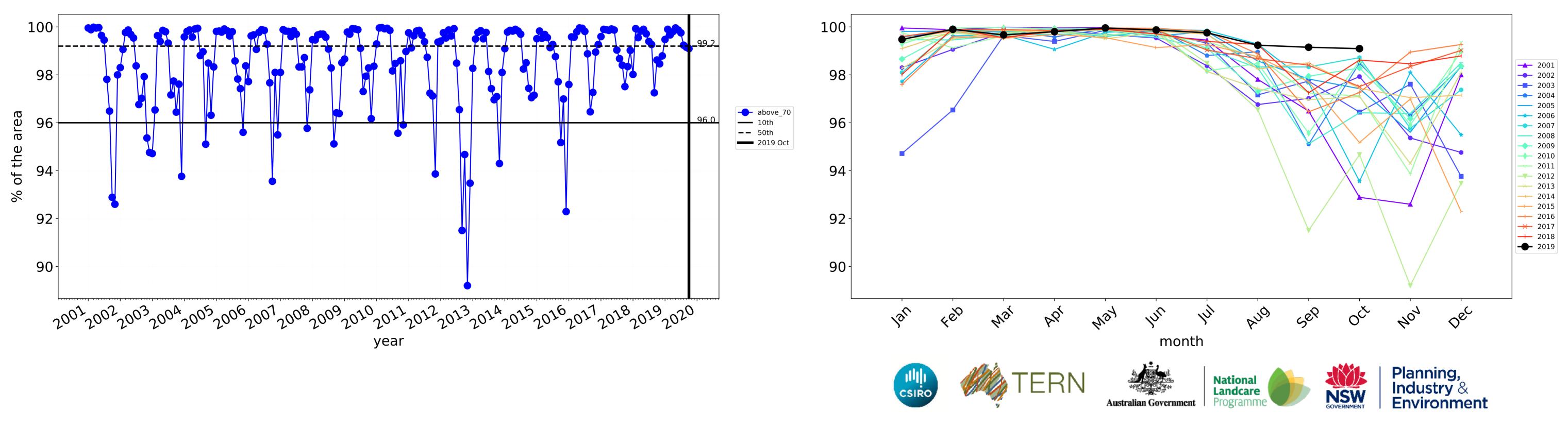




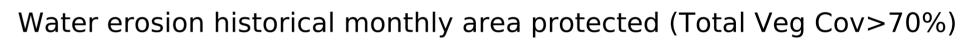


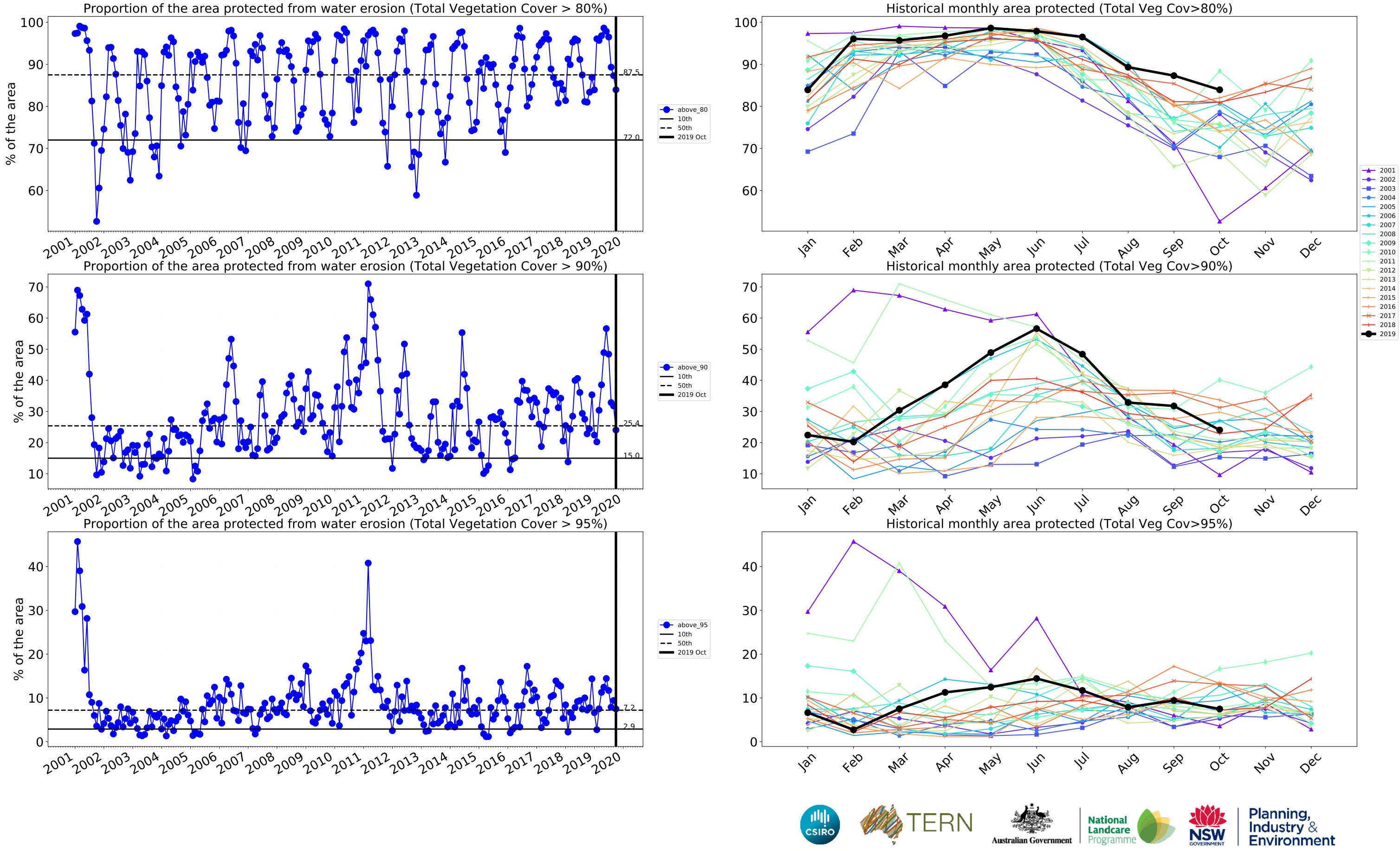
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



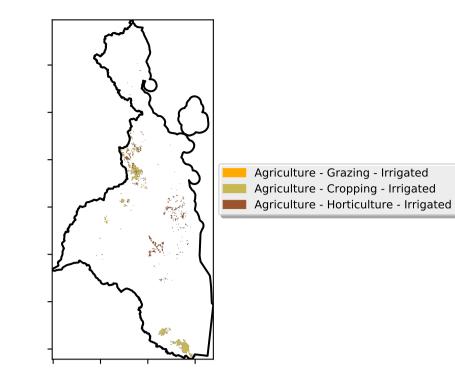




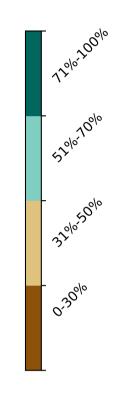


Irrigation

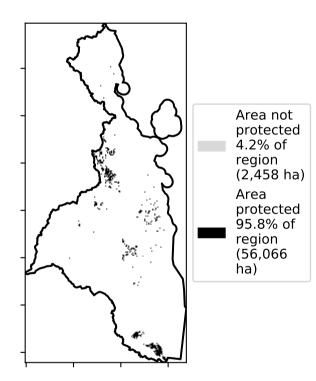
Land use and forest cover



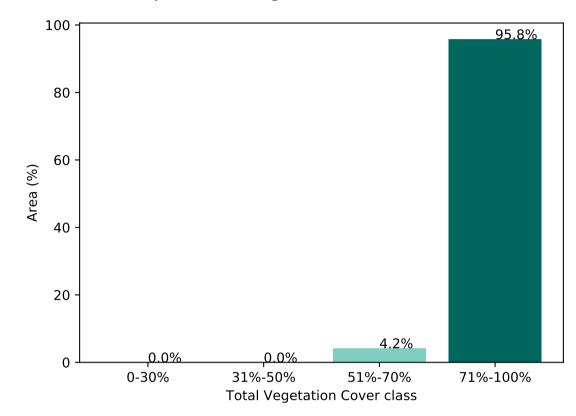
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



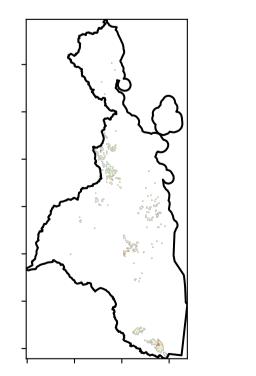
% Area protected from wind erosion (>50%)

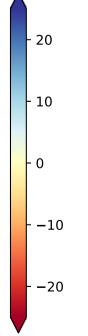


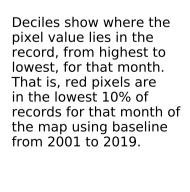
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

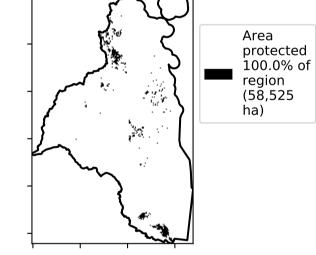
Total Vegetation Cover Anomaly [%]

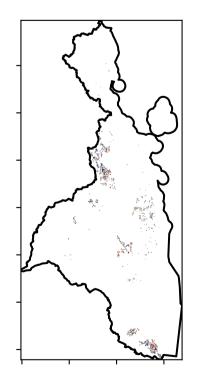
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

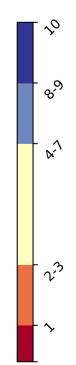




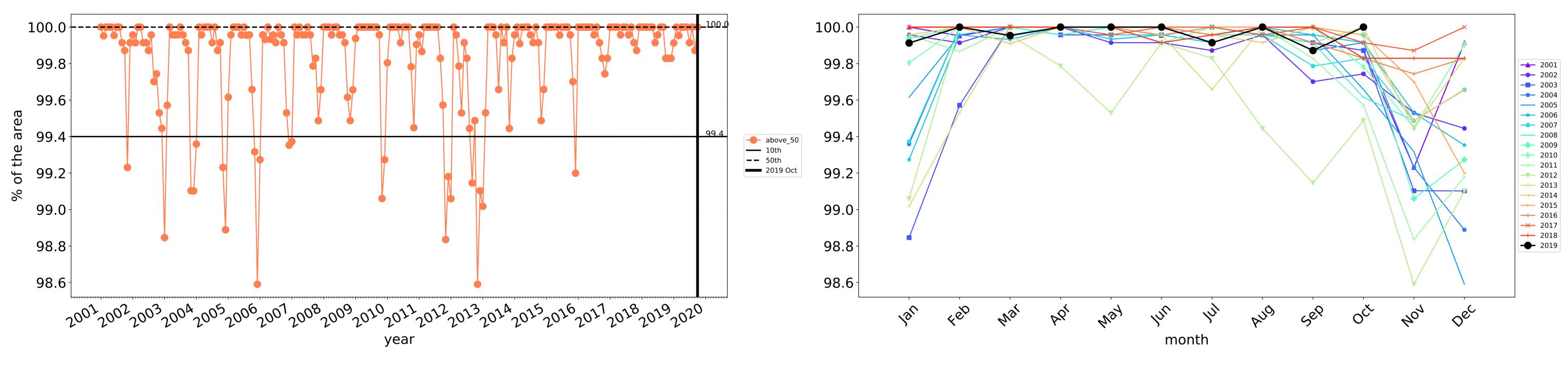






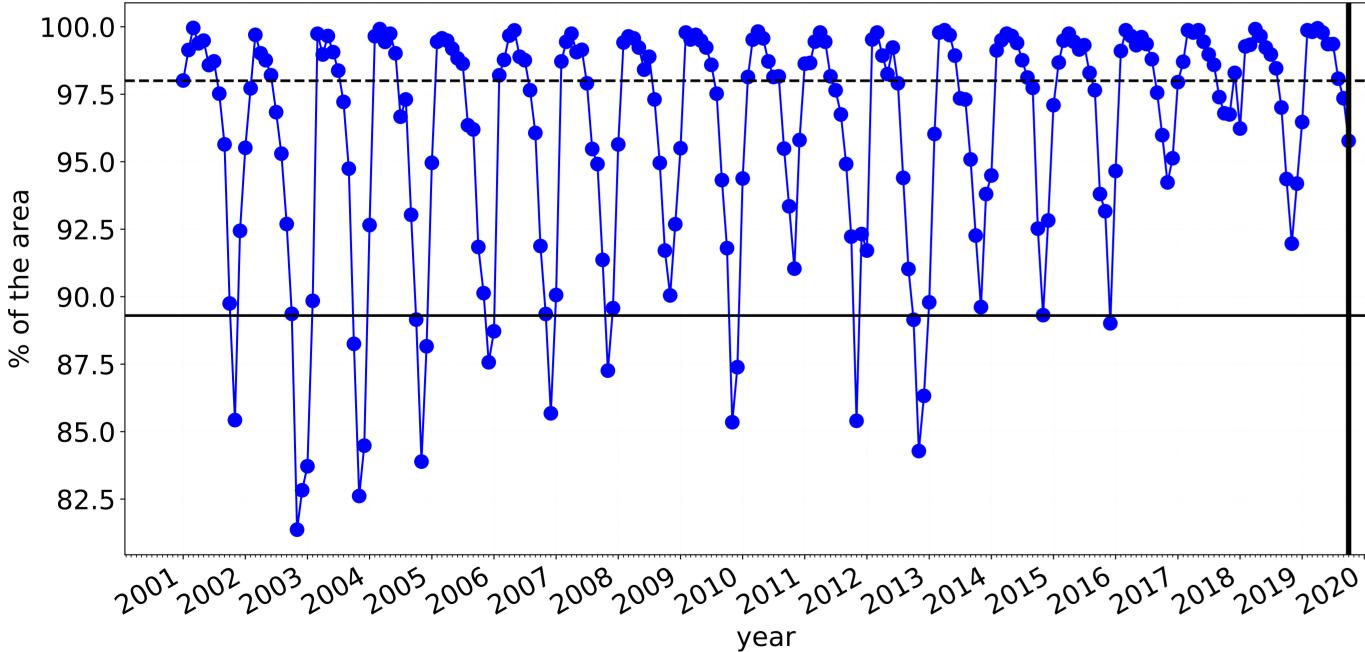


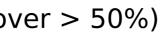




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



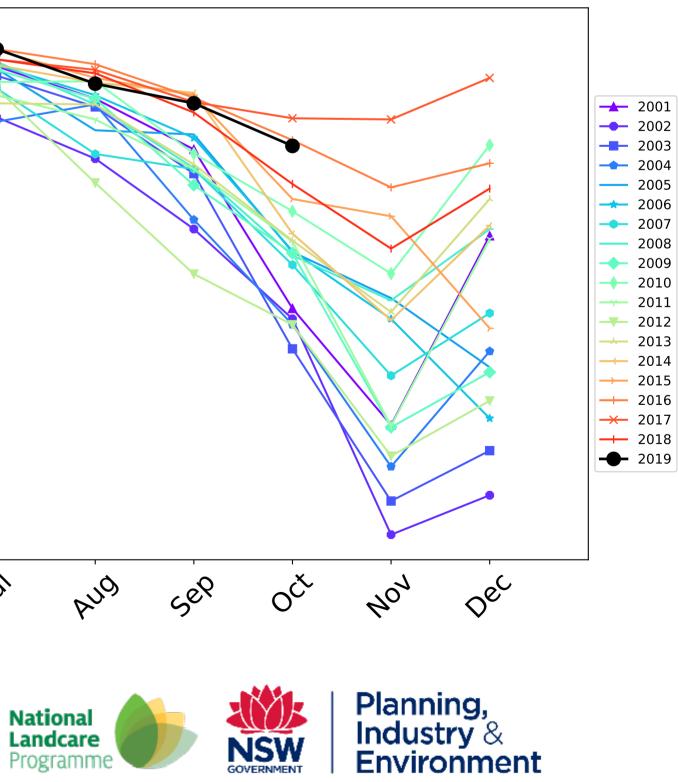


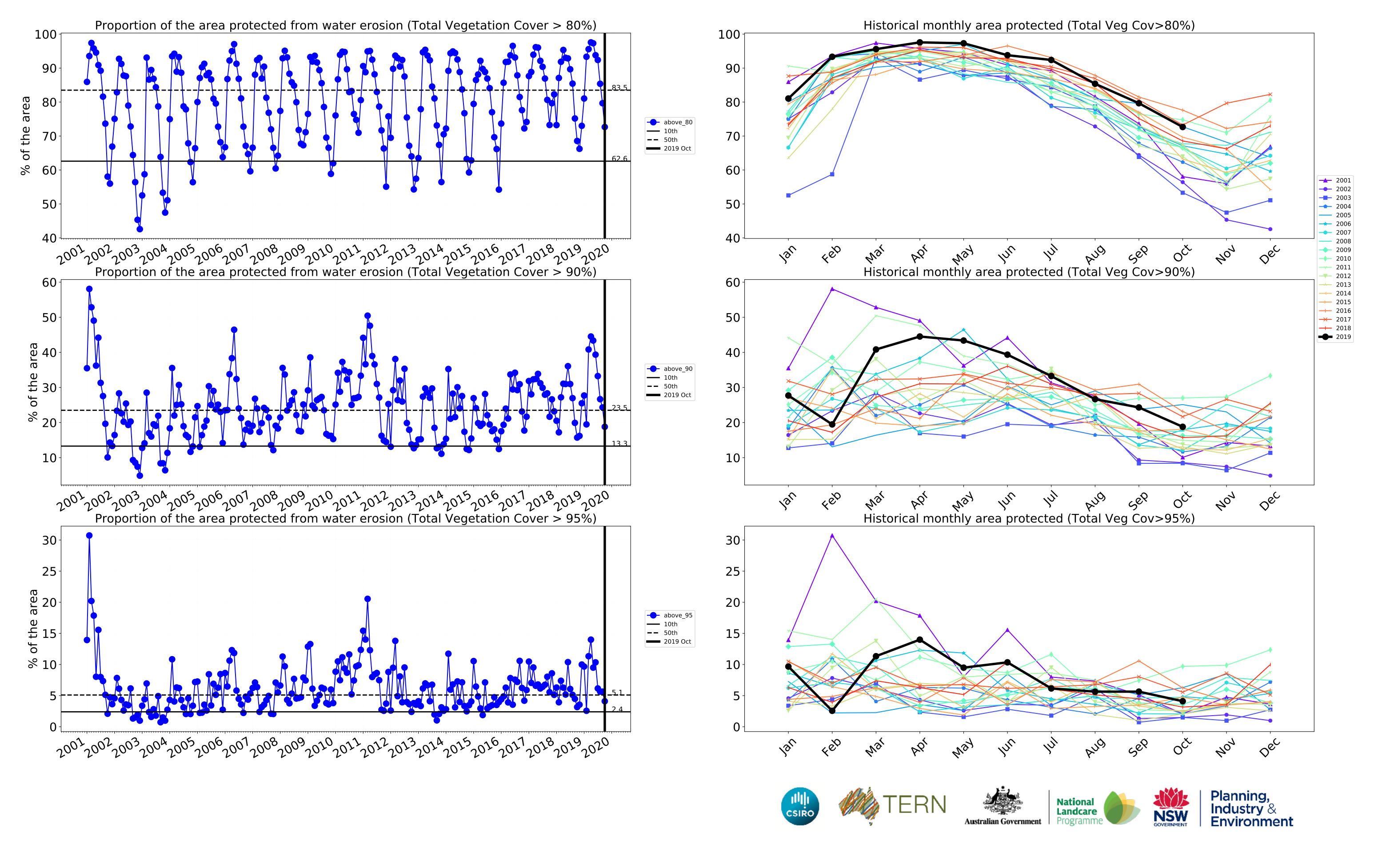


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0 97.5⁻ 95.0 ---- above_70 **—** 10th 92.5 **——** 50th **—** 2019 Oct 90.0 893 87.5-85.0-82.5 Jan feb In May Mai PQ 1¹1 month ERN CSIRC Australian Government

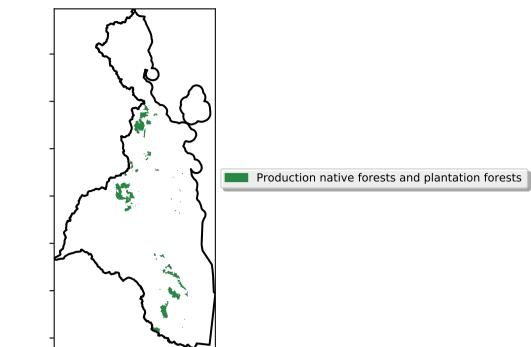
Water erosion historical monthly area protected (Total Veg Cov>70%)



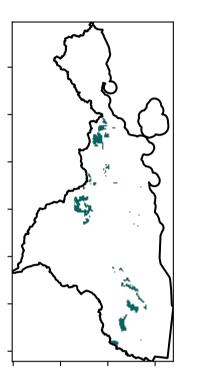


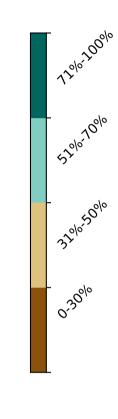
Production native forests and plantation forests

Land use and forest cover

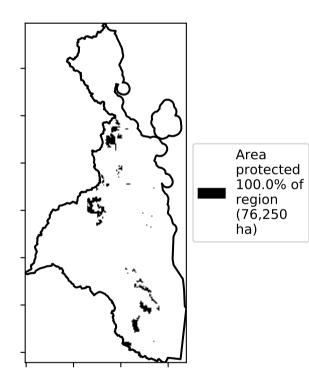


Total Vegetation Cover [%]

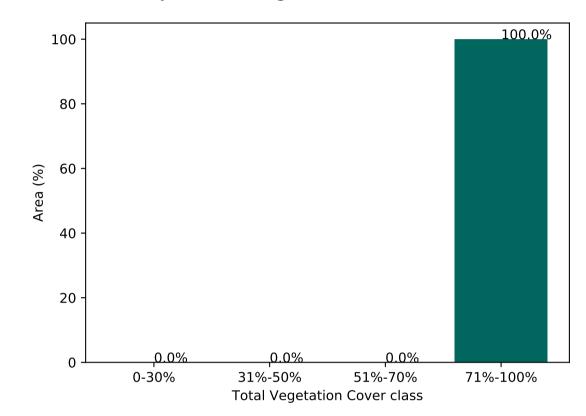




% Area protected from water erosion (>70%)

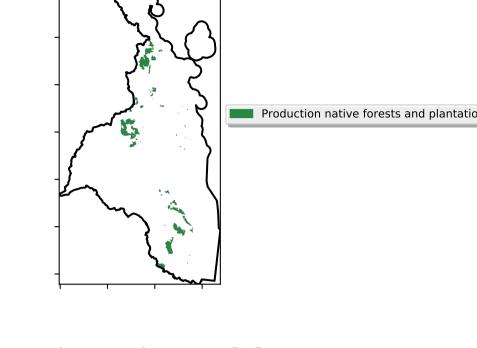




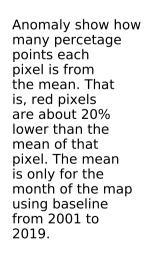


% Area protected from wind erosion (>50%)



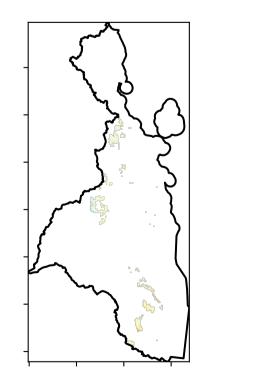


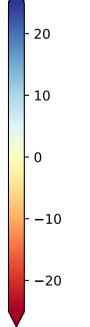
Total Vegetation Cover Anomaly [%]

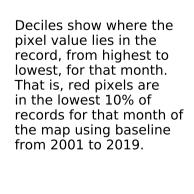


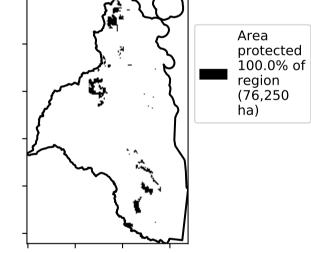
Catchment Scale Land Use and Forests of Australia (2018) Derived from

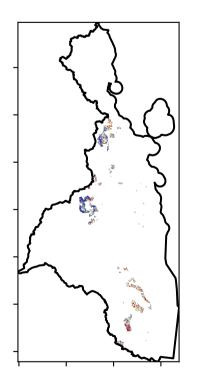
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

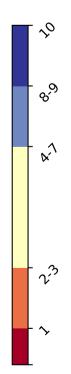




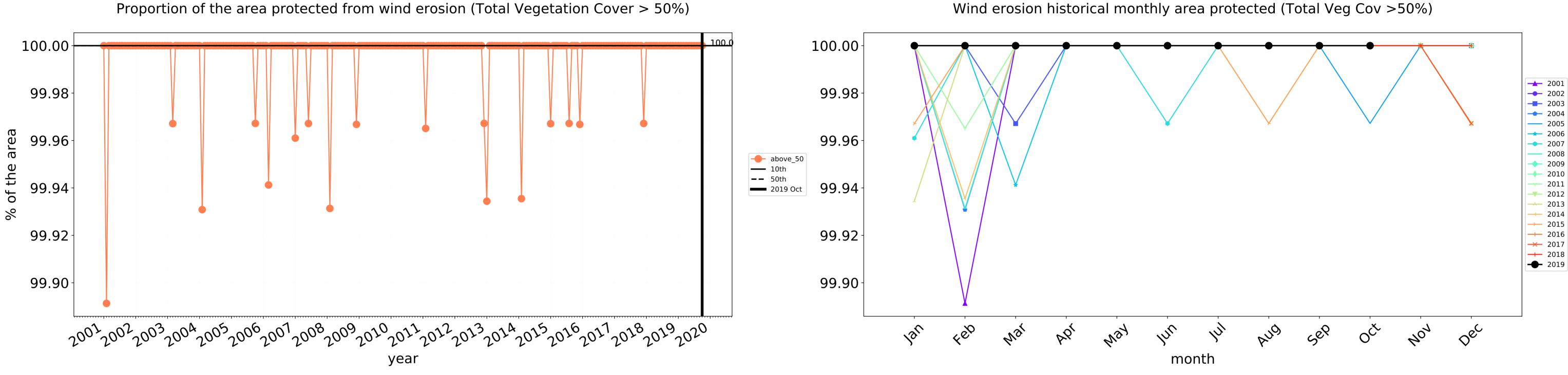




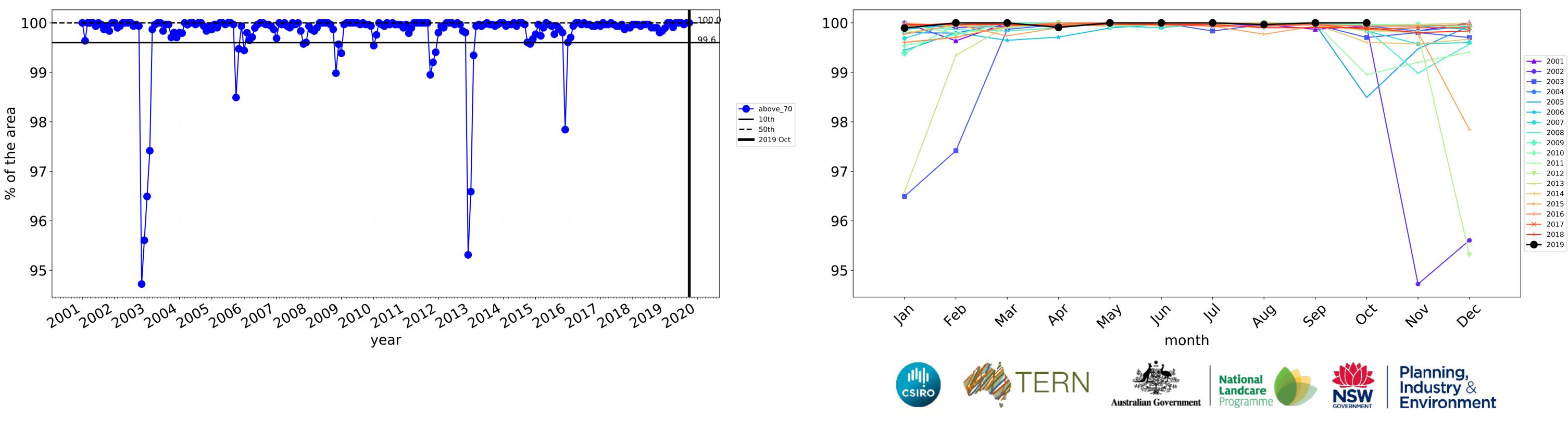




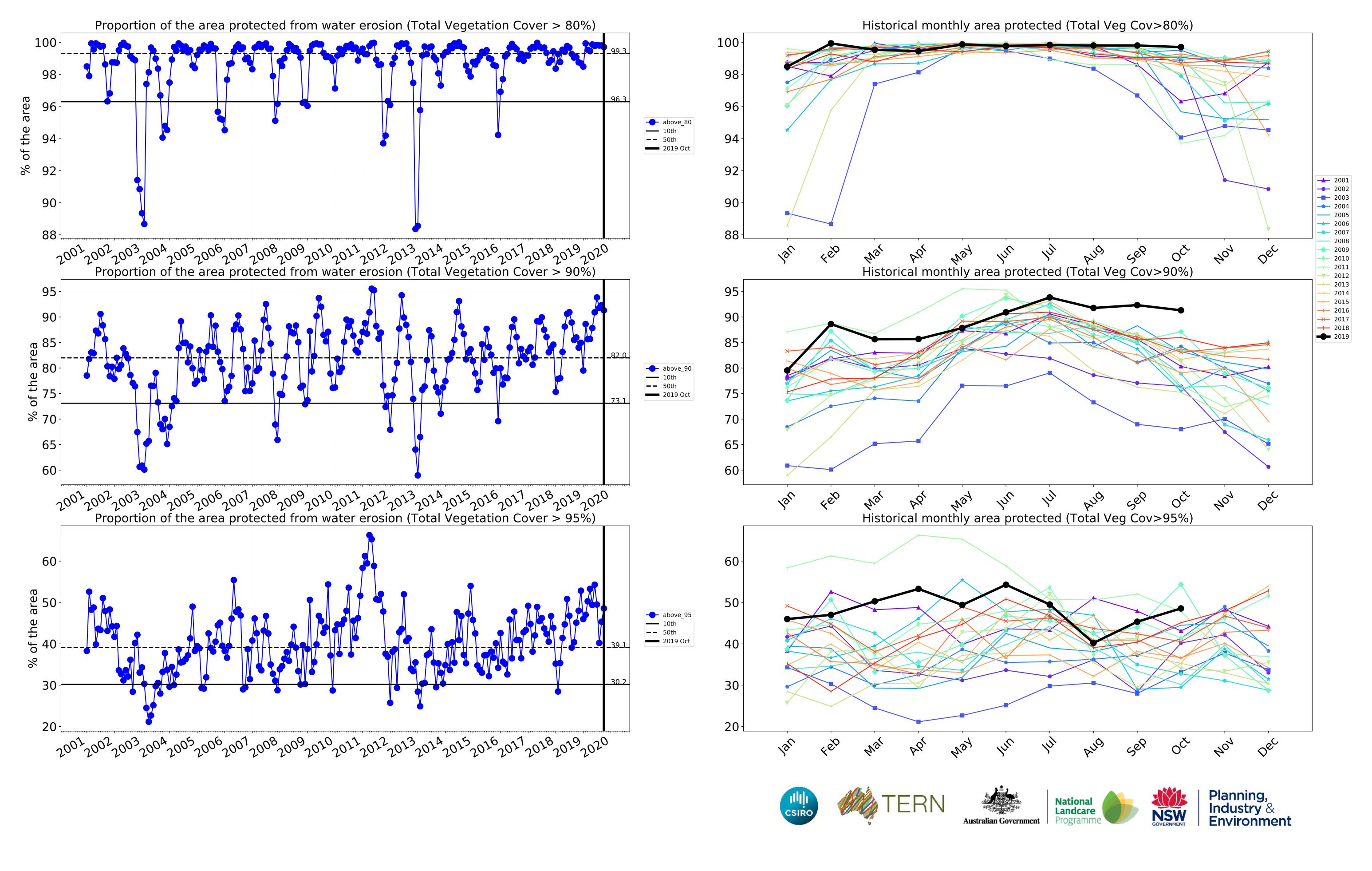




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Wet Tropics (2,218,700 ha and no data 536,343 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	2,218,700	99.9% 2,217,325	99.8% 2,214,725	99.0% 2,195,850	95.2% 2,111,700	76.6% 1,699,550	31.8% 705,225
Conservation and natural environments	1,079,800	100.0% 1,079,275	99.8% 1,078,125	99.4% 1,073,050	98.5% 1,063,850	88.4% 954,525	26.2% 283,250
Conservation and natural environments Woodland forest	138,225	100.0% 138,175	99.8% 137,975	99.5% 137,550	99.0% 136,825	91.2% 126,075	54.3% 75,025
Conservation and natural environments Forest (non woodland)	928,725	100.0% 928,350	99.9% 927,800	99.5% 923,775	98.7% 916,375	88.5% 821,675	22.1% 205,625
Agriculture	943,250	100.0% 943,250	100.0% 943,225	99.3% 936,850	93.4% 881,000	66.8% 630,075	39.1% 368,875
Grazing	711,025	100.0% 711,025	100.0% 711,000	99.7% 708,675	97.4% 692,650	81.2% 577,300	49.7% 353,475
Grazing non forest	175,600	100.0% 175,600	100.0% 175,575	99.4% 174,550	95.4% 167,500	54.3% 95,325	18.2% 31,950
Grazing Woodland forest	296,050	100.0% 296,050	100.0% 296,050	99.6% 294,800	97.0% 287,200	84.8% 250,925	50.3% 148,900
Grazing - Forest (non woodland)	239,375	100.0% 239,375	100.0% 239,375	100.0% 239,325	99.4% 237,950	96.5% 231,050	72.1% 172,625
Cropping	173,650	100.0% 173,650	100.0% 173,650	99.1% 172,075	83.9% 145,775	24.1% 41,775	7.5% 13,000
Irrigation	58,525	100.0% 58,525	100.0% 58,525	95.8% 56,050	72.7% 42,525	18.8% 11,000	4.1% 2,400
Production native forests and plantation forests	76,250	100.0% 76,250	100.0% 76,250	100.0% 76,250	99.7% 76,025	91.3% 69,625	48.6% 37,025

