Total vegetation cover soil protection Region:NRM Mackay Whitsunday QLD

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

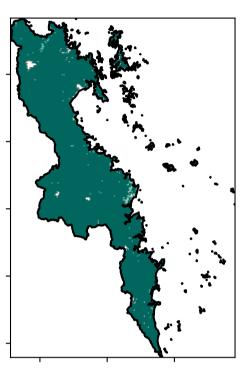


Vegetation Cover Jan 2020

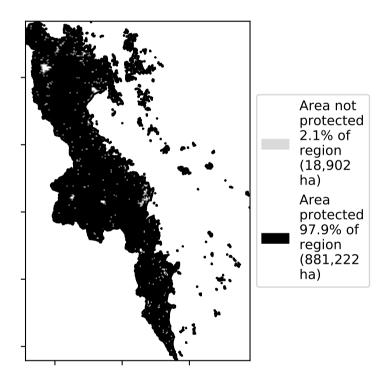
Land use and forest cover

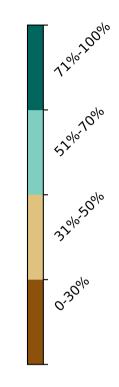
Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - 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 [%]

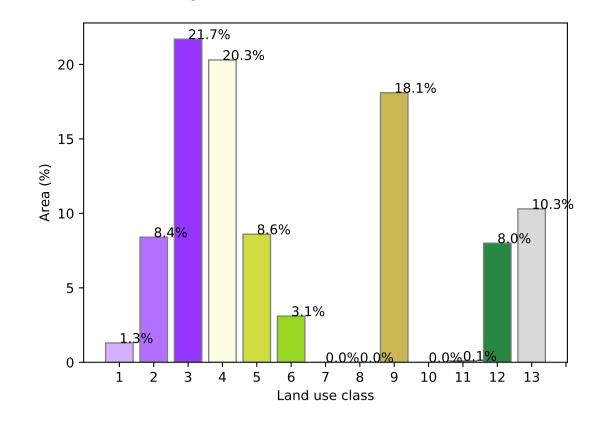


% Area protected from water erosion (>70%)

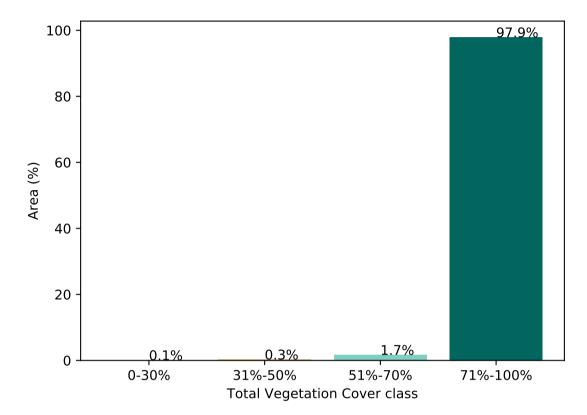




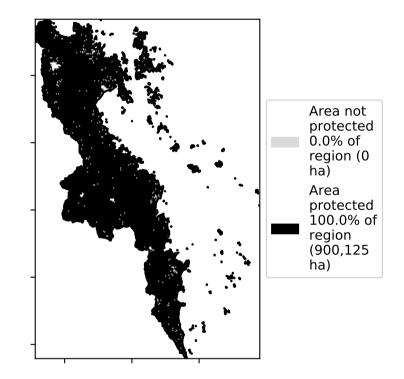
Proportion of each land class in area



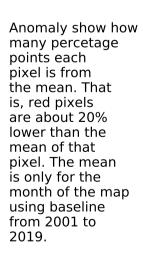
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



Catchment Scale

of Australia (2018)

(2018) and Forests

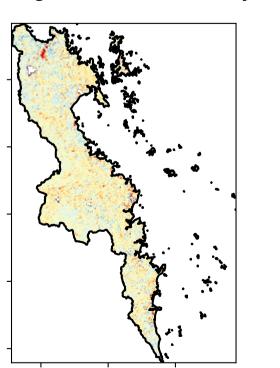
of Australia (2018)

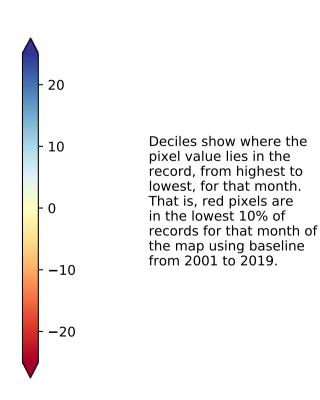
Derived from

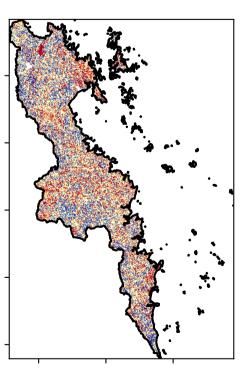
Use of Australia

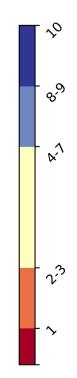
Land Use and Forests

Catchment Scale Land

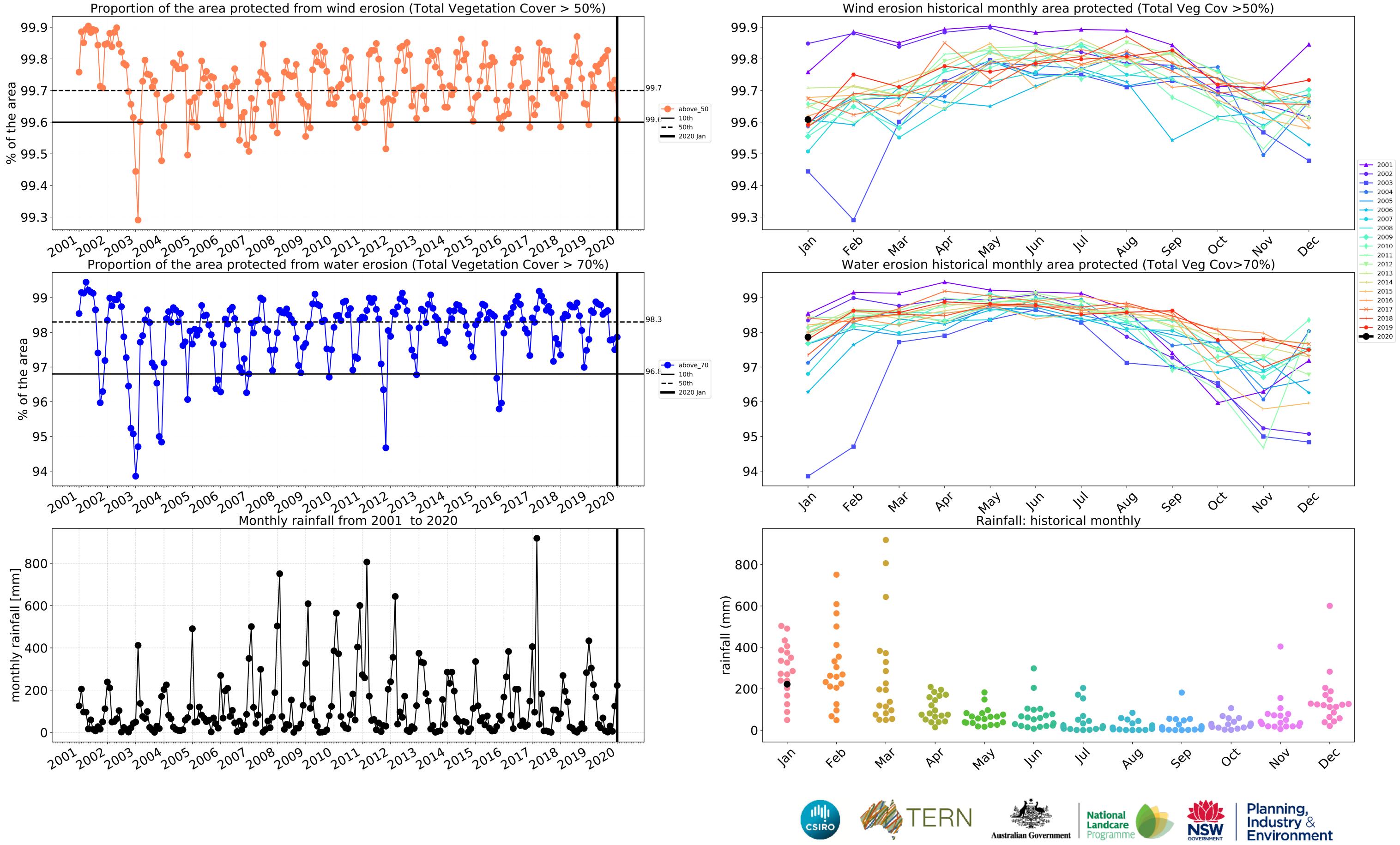


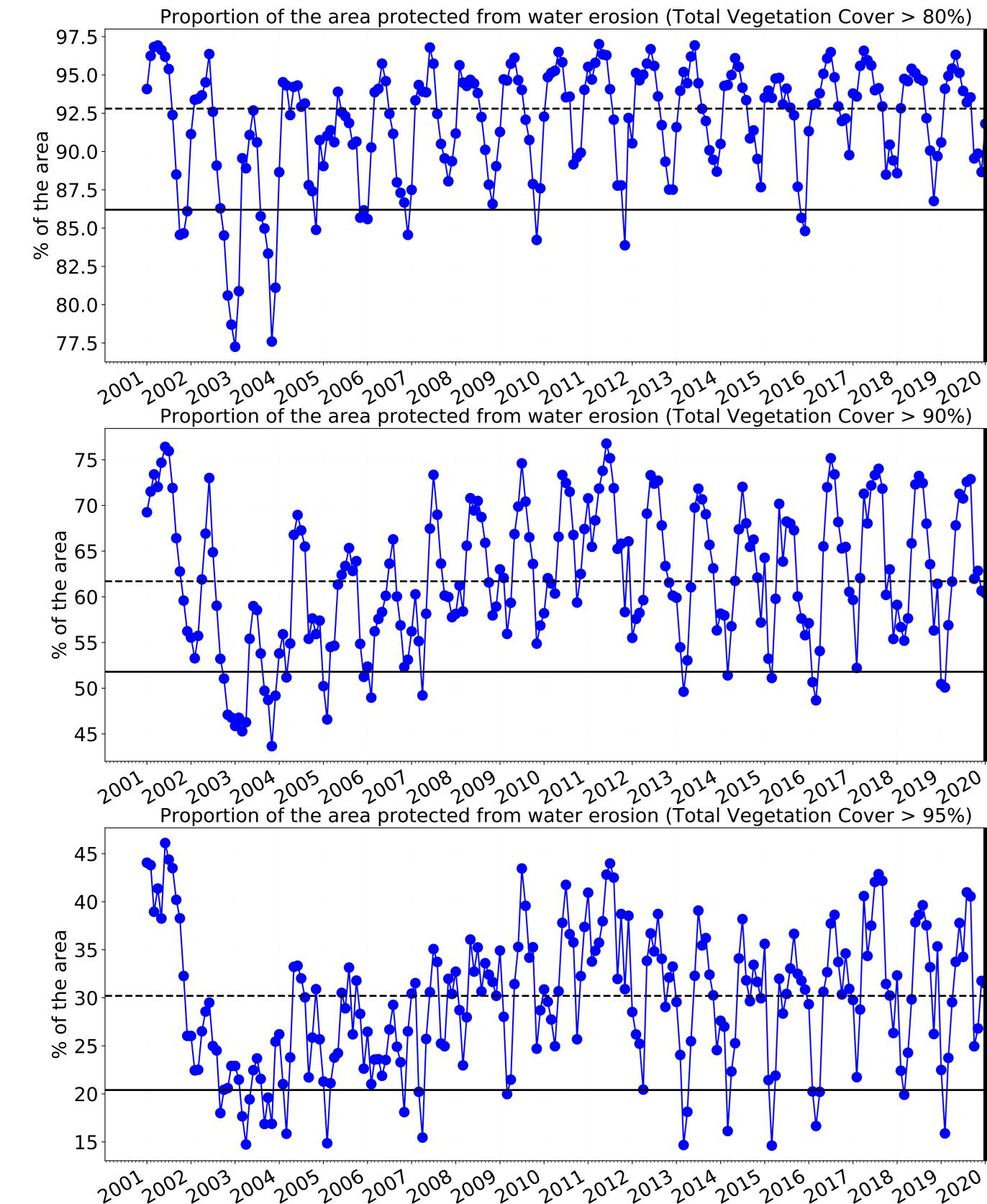


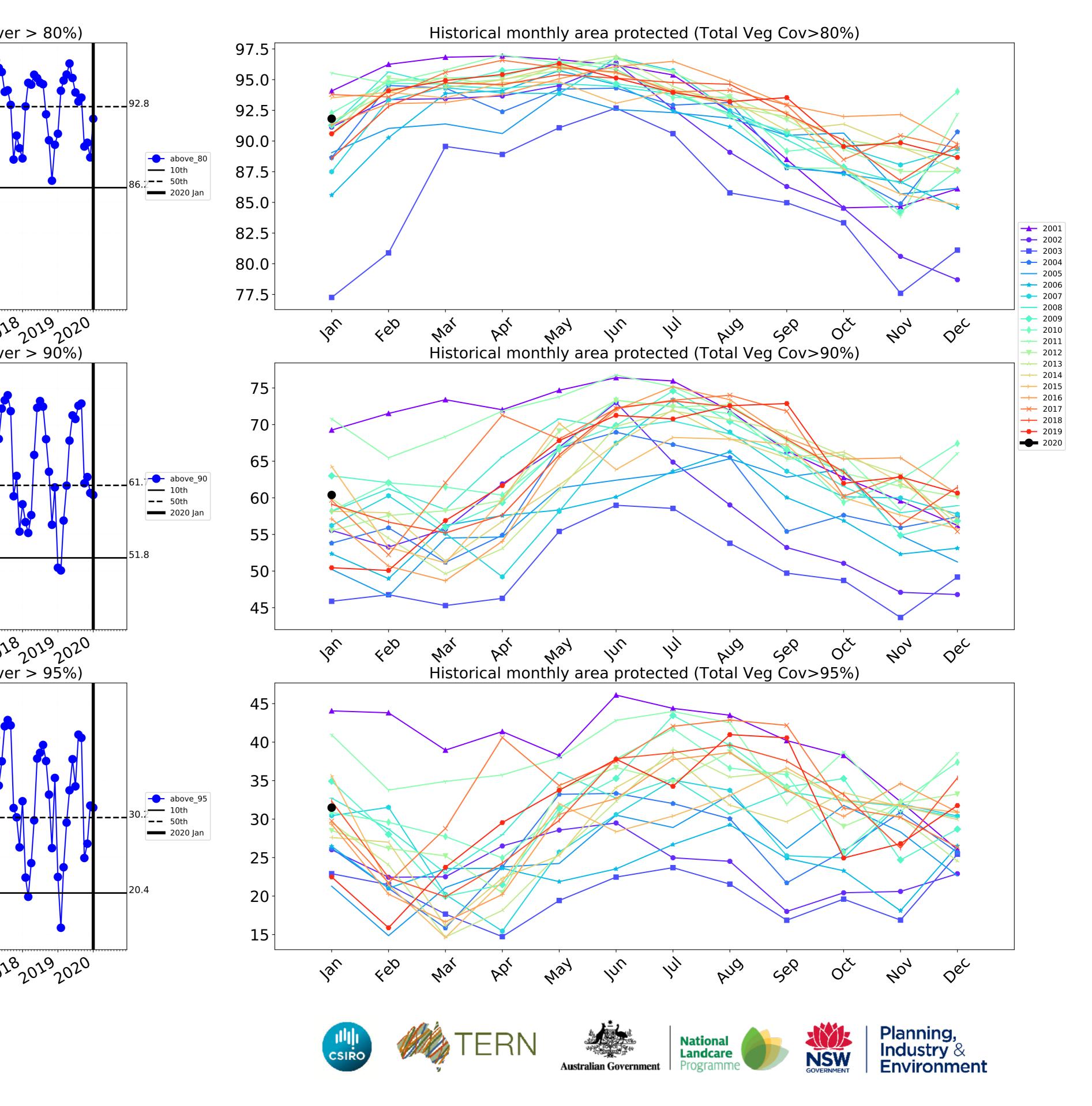










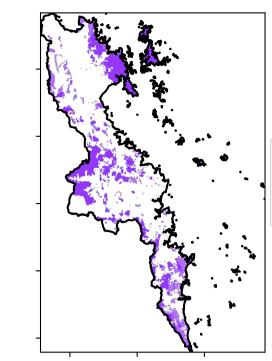


Conservation and natural environments

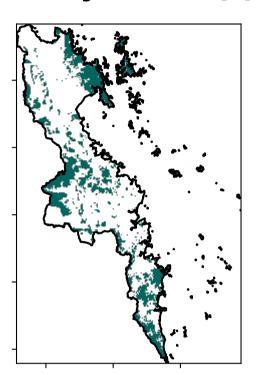
forest

forest

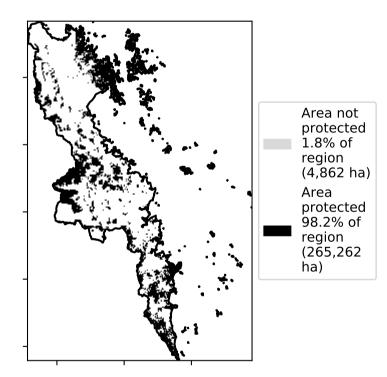
Land use and forest cover

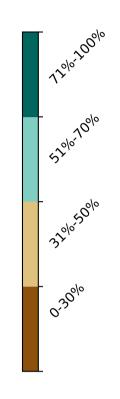


Total Vegetation Cover [%]





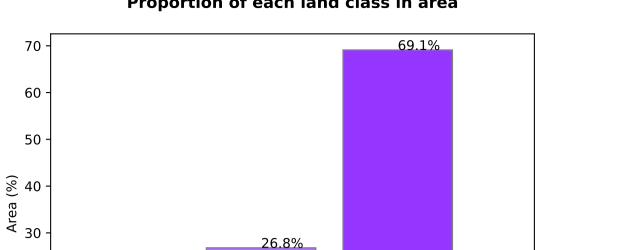




1 Conservation and natural environments - Non-

3 Conservation and natural environments - Non-woodland forest

2 Conservation and natural environments – Woodland



Proportion of each land class in area

Proportion of vegetation cover class in area

Land use class

3

2

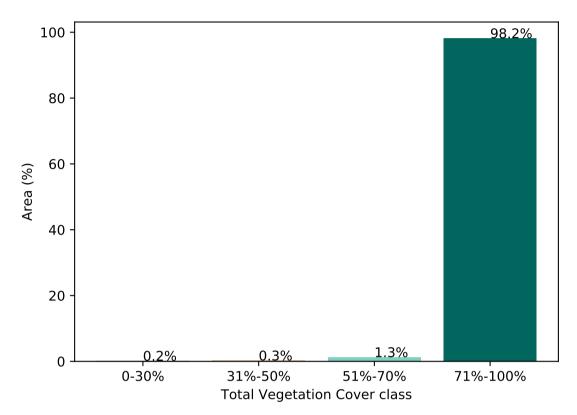
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10

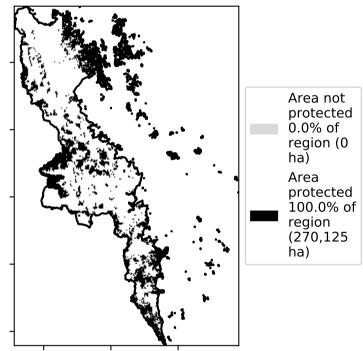
0

4.0%

1



% 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)

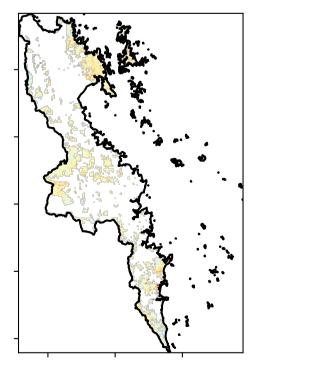
(2018) and Forests

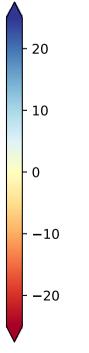
of Australia (2018)

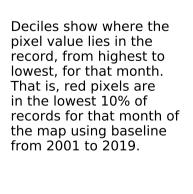
Catchment Scale Land

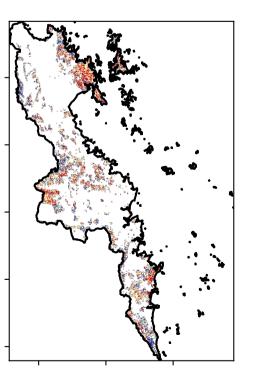
Derived from

Use of Australia



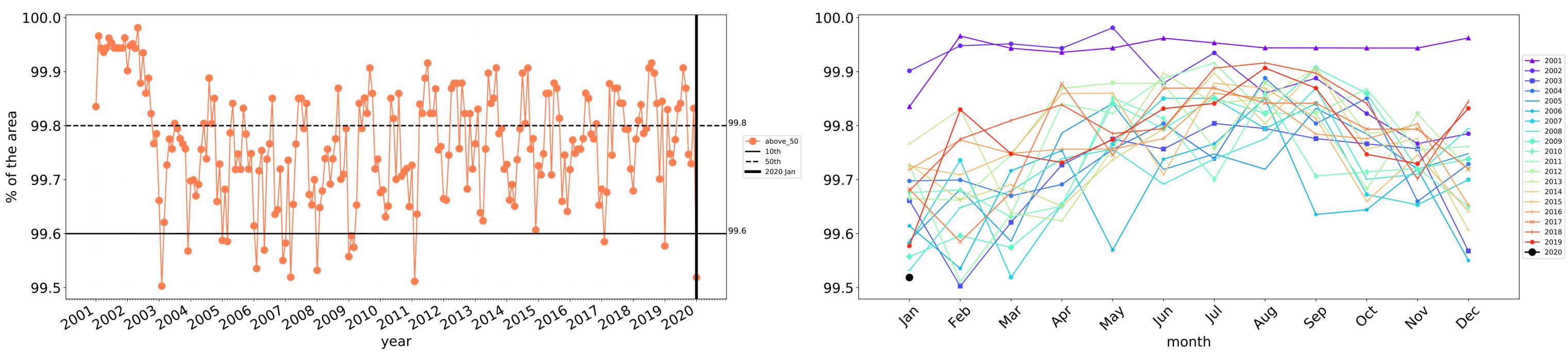






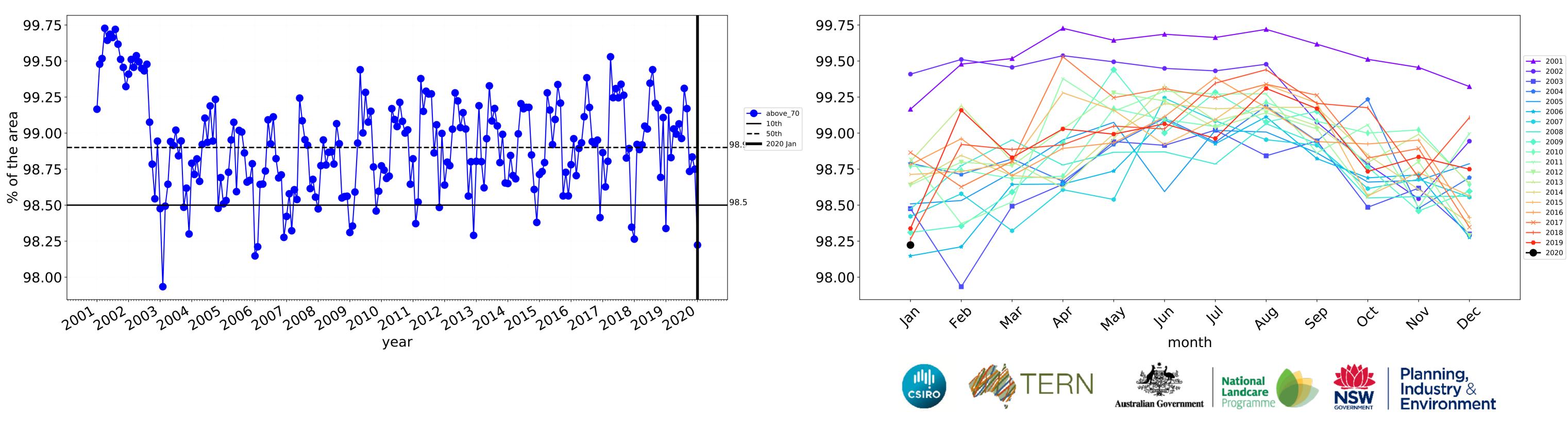




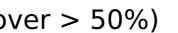


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

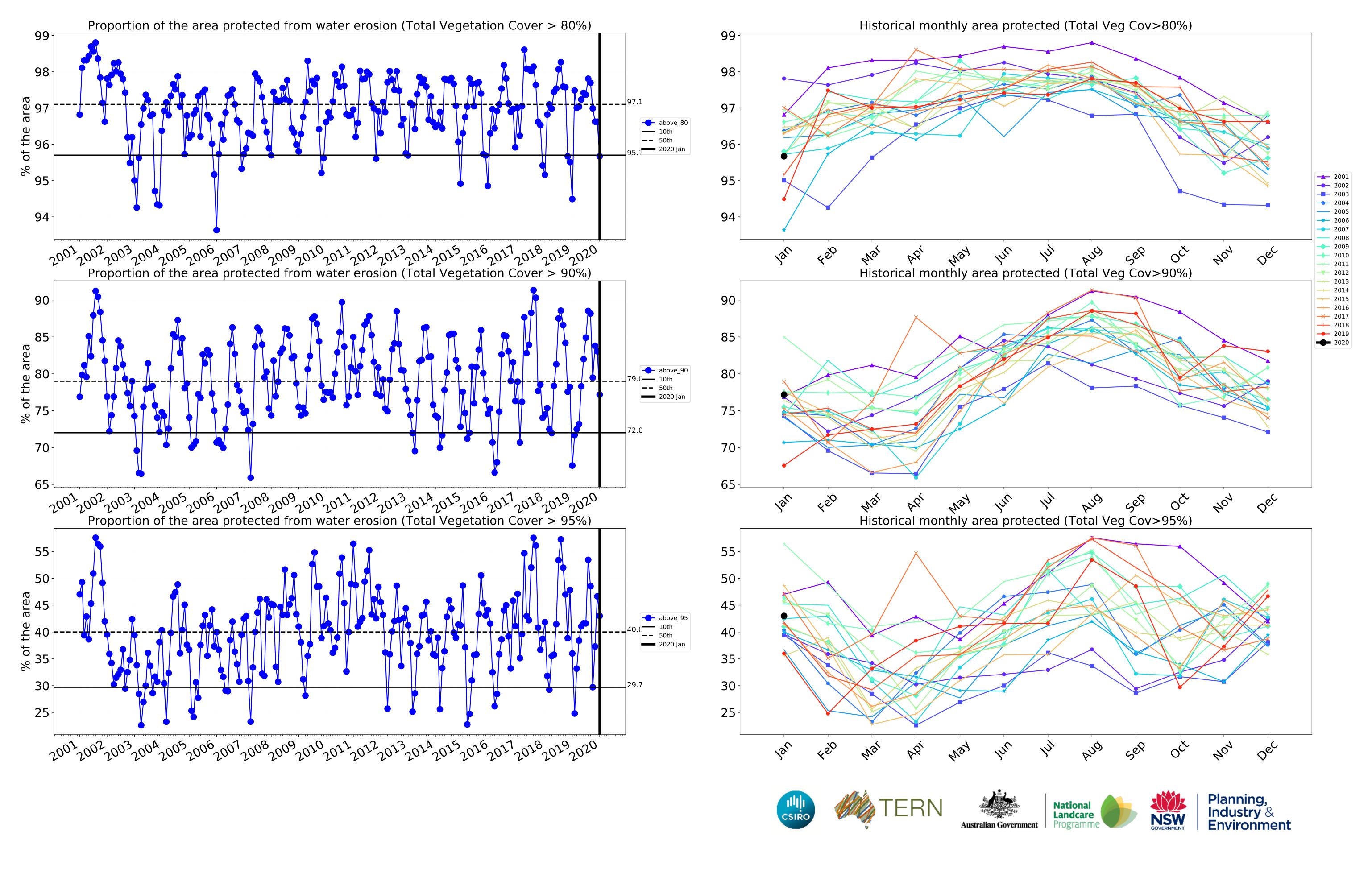


Conservation and natural environments timeseries



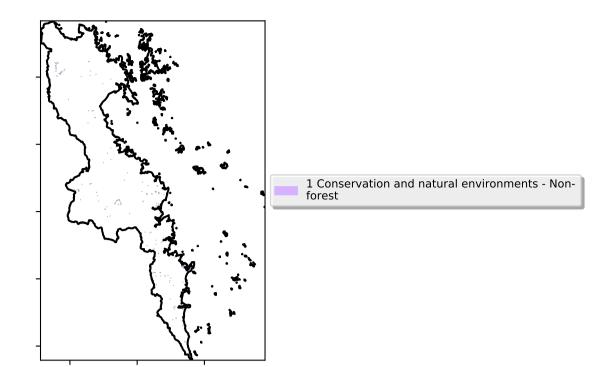
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

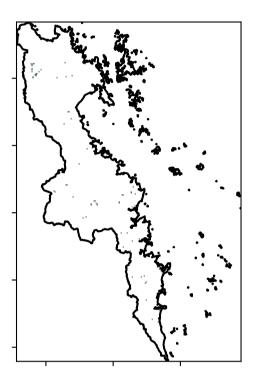


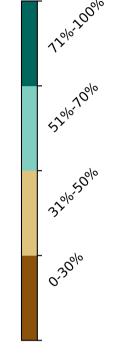
Conservation and natural environments non forest

Land use and forest cover

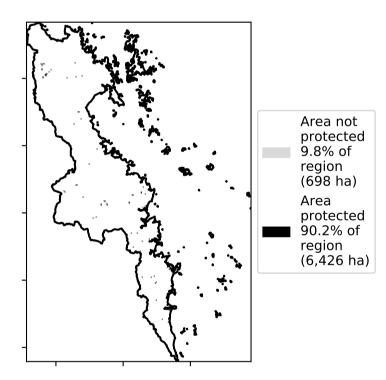


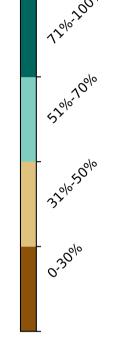
Total Vegetation Cover [%]

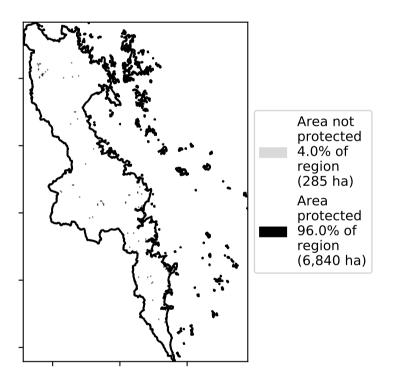




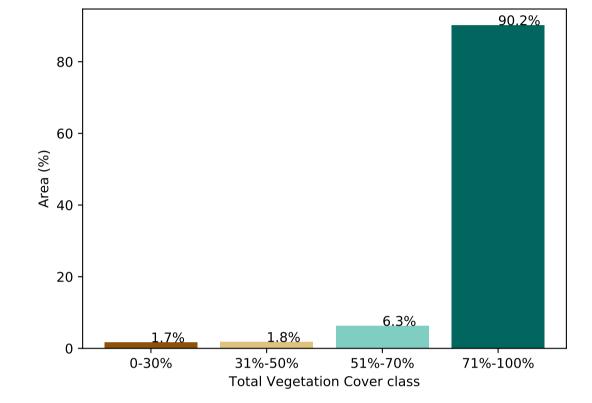
% Area protected from water erosion (>70%)





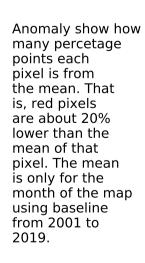


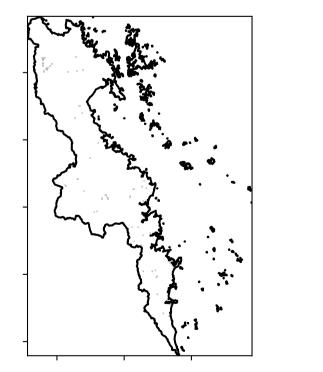
Proportion of vegetation cover class in area

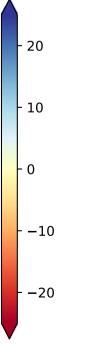


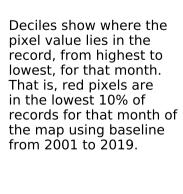
% Area protected from wind erosion (>50%)

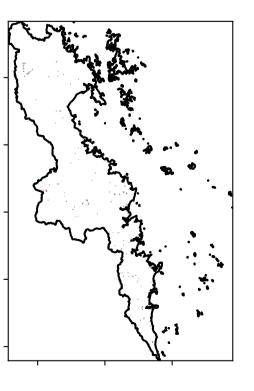
Total Vegetation Cover Anomaly [%]

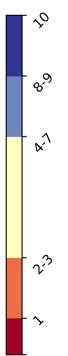




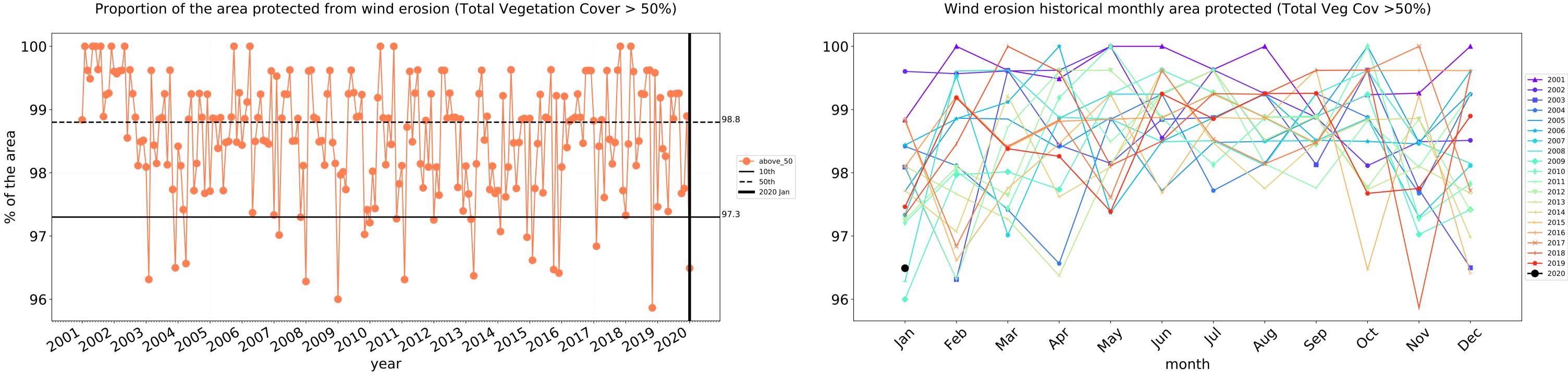


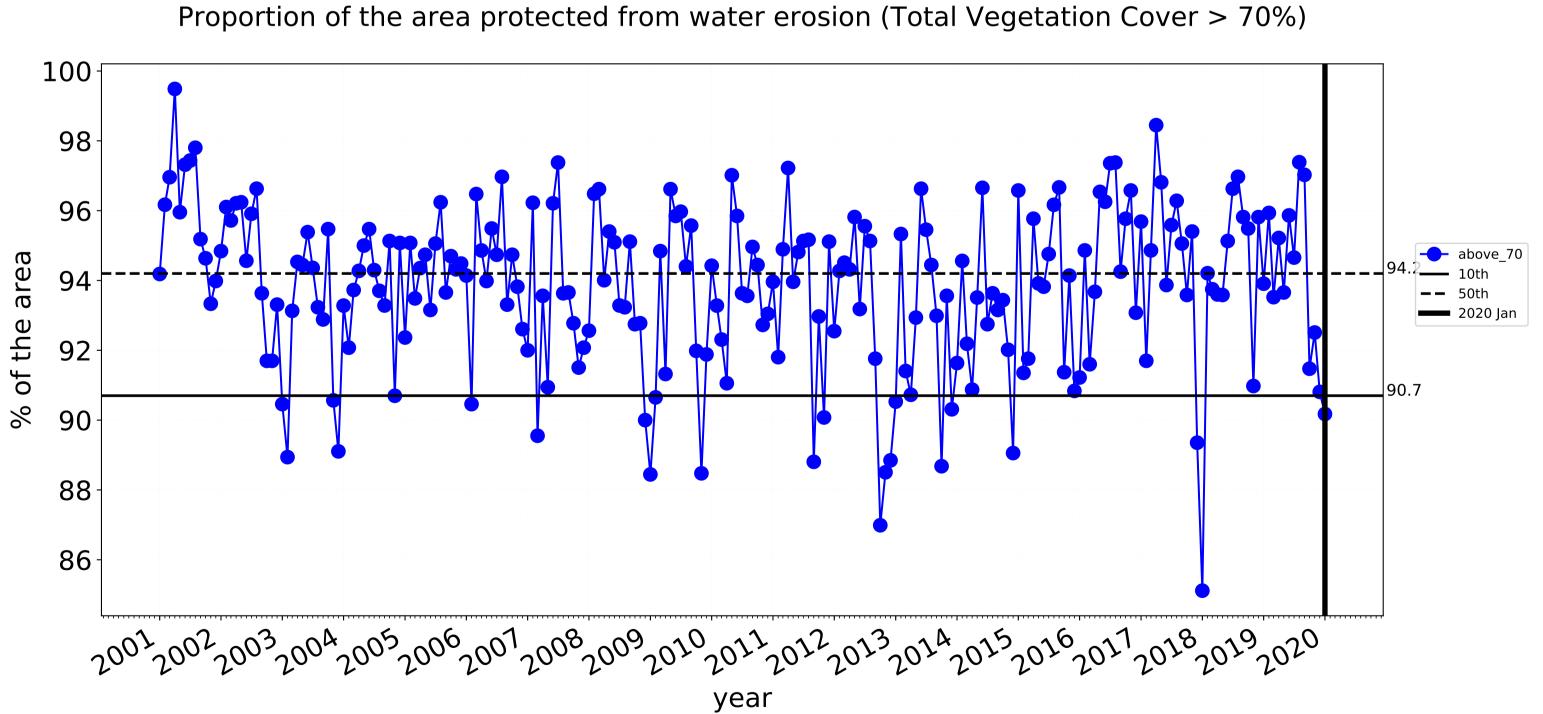






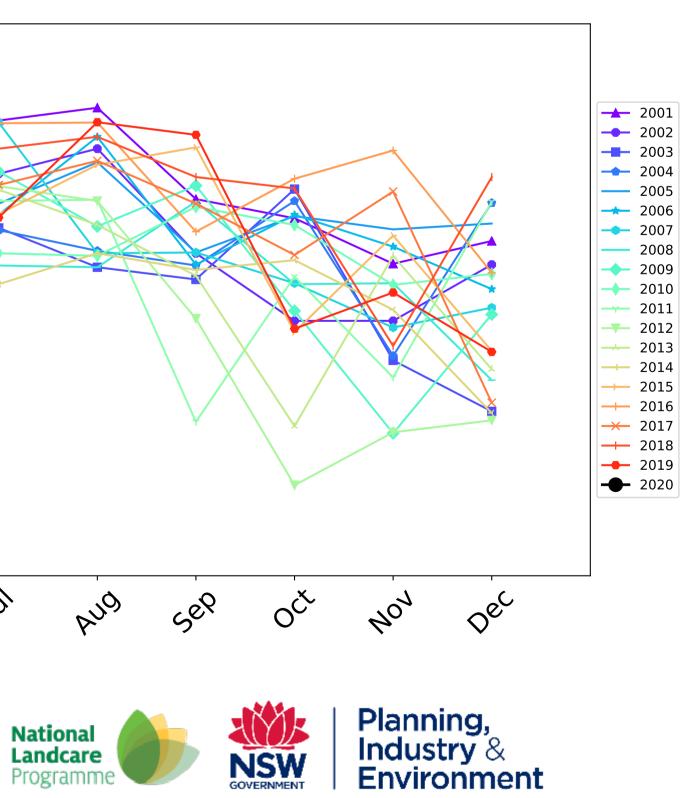


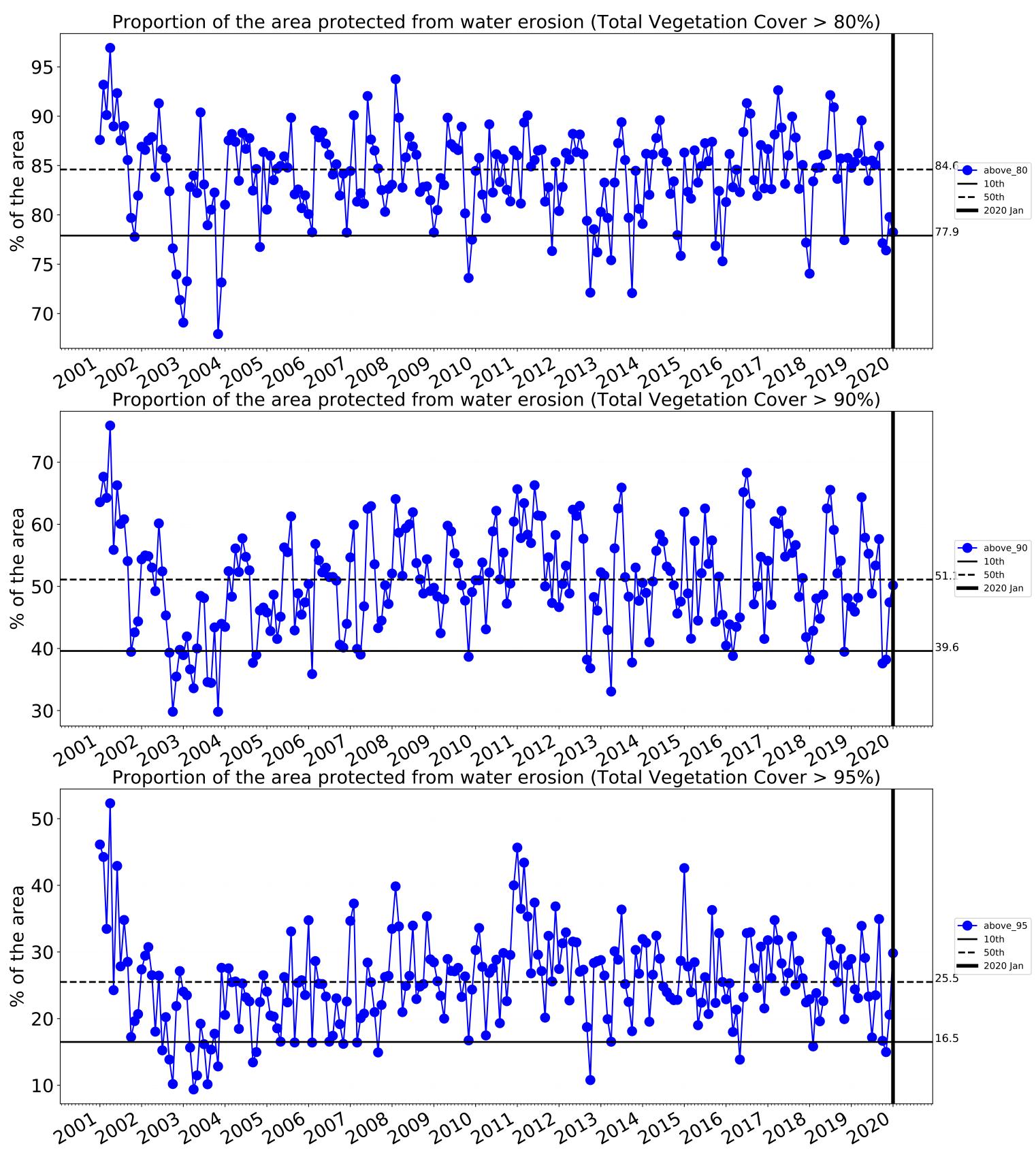


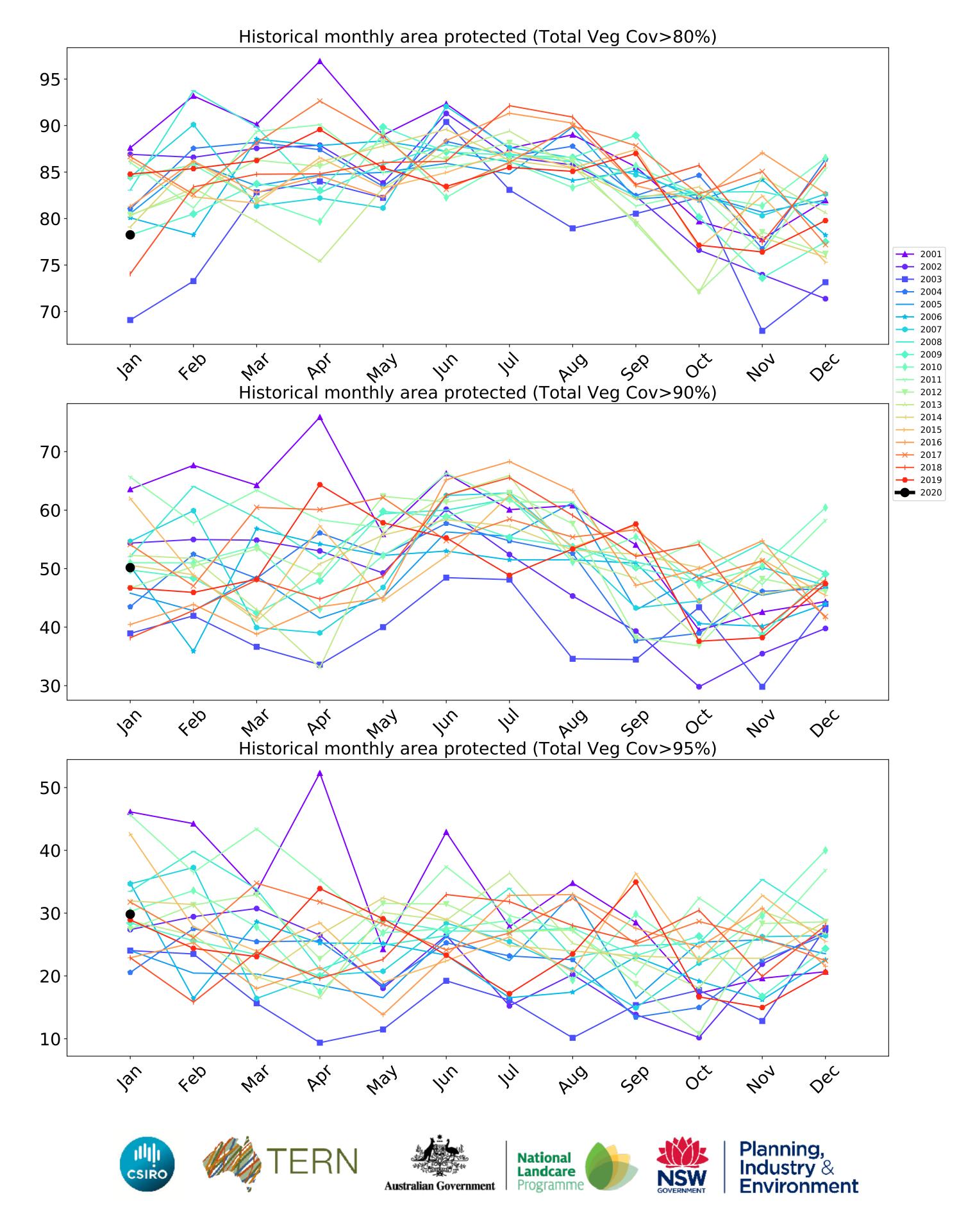


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Water erosion historical monthly area protected (Total Veg Cov>70%)

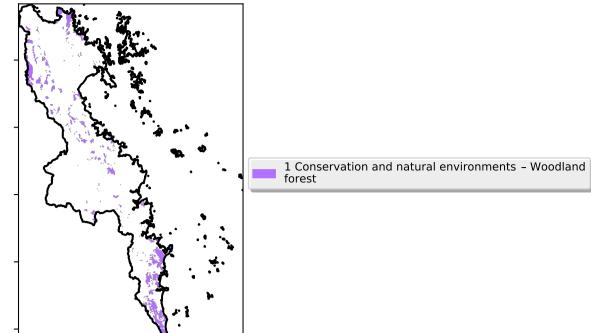




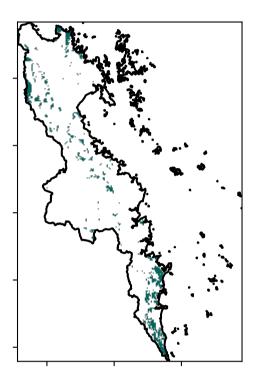


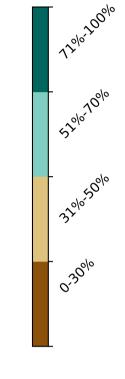
Conservation and natural environments Woodland forest

Land use and forest cover

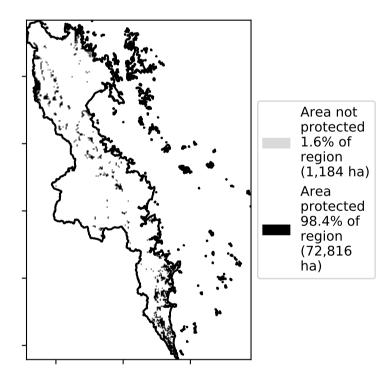


Total Vegetation Cover [%]

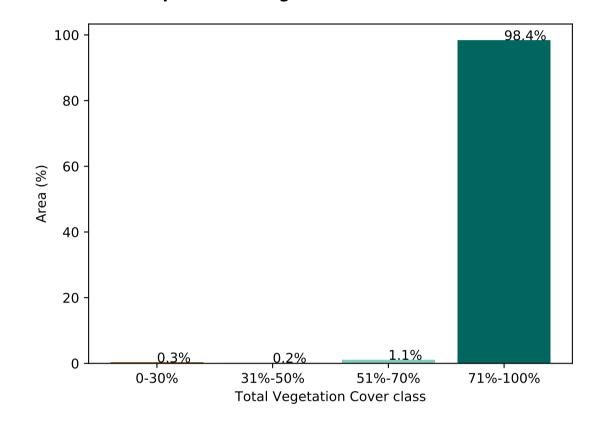




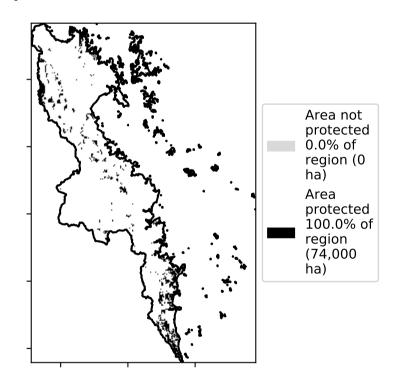
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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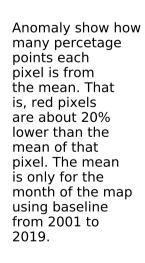
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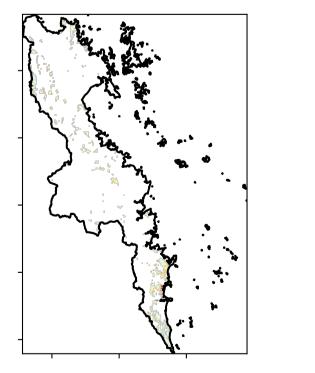
A-1

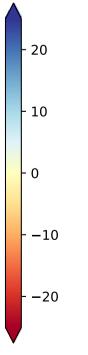
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Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

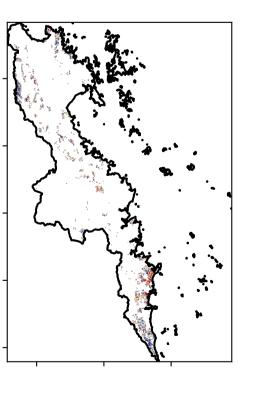
Total Vegetation Cover Anomaly [%]



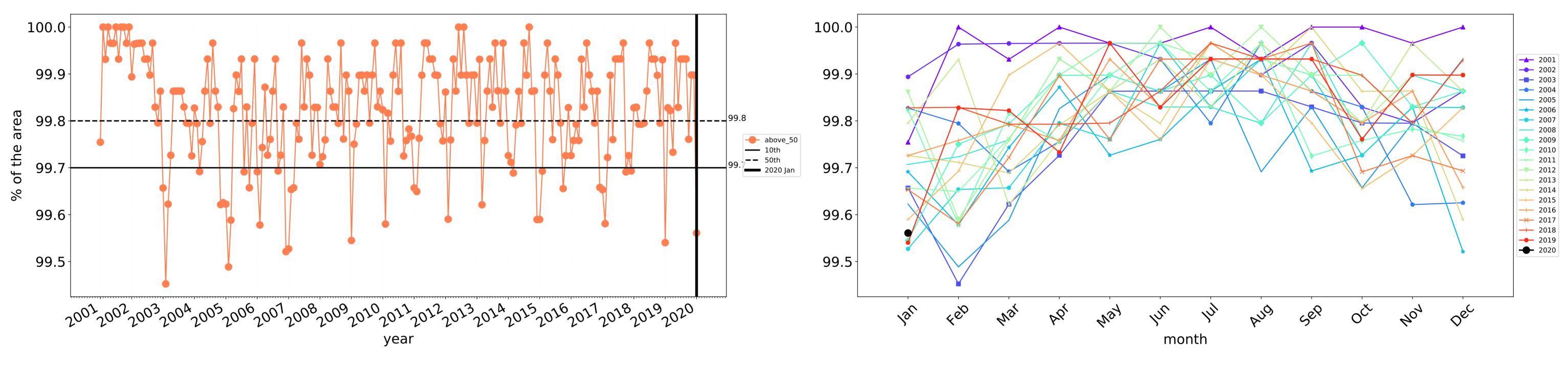






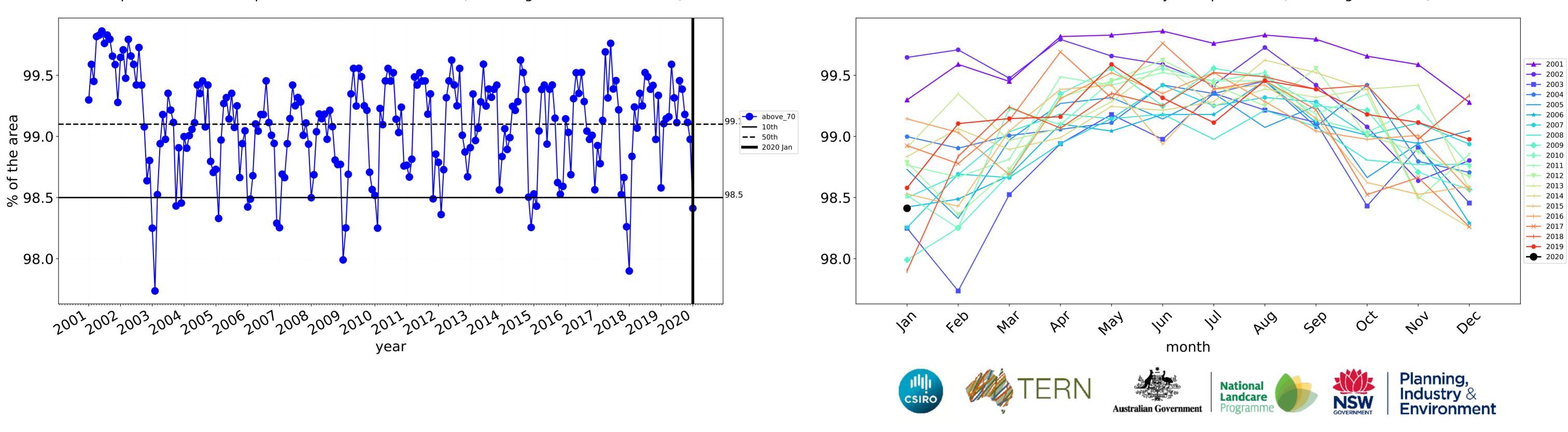


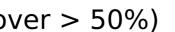




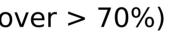
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

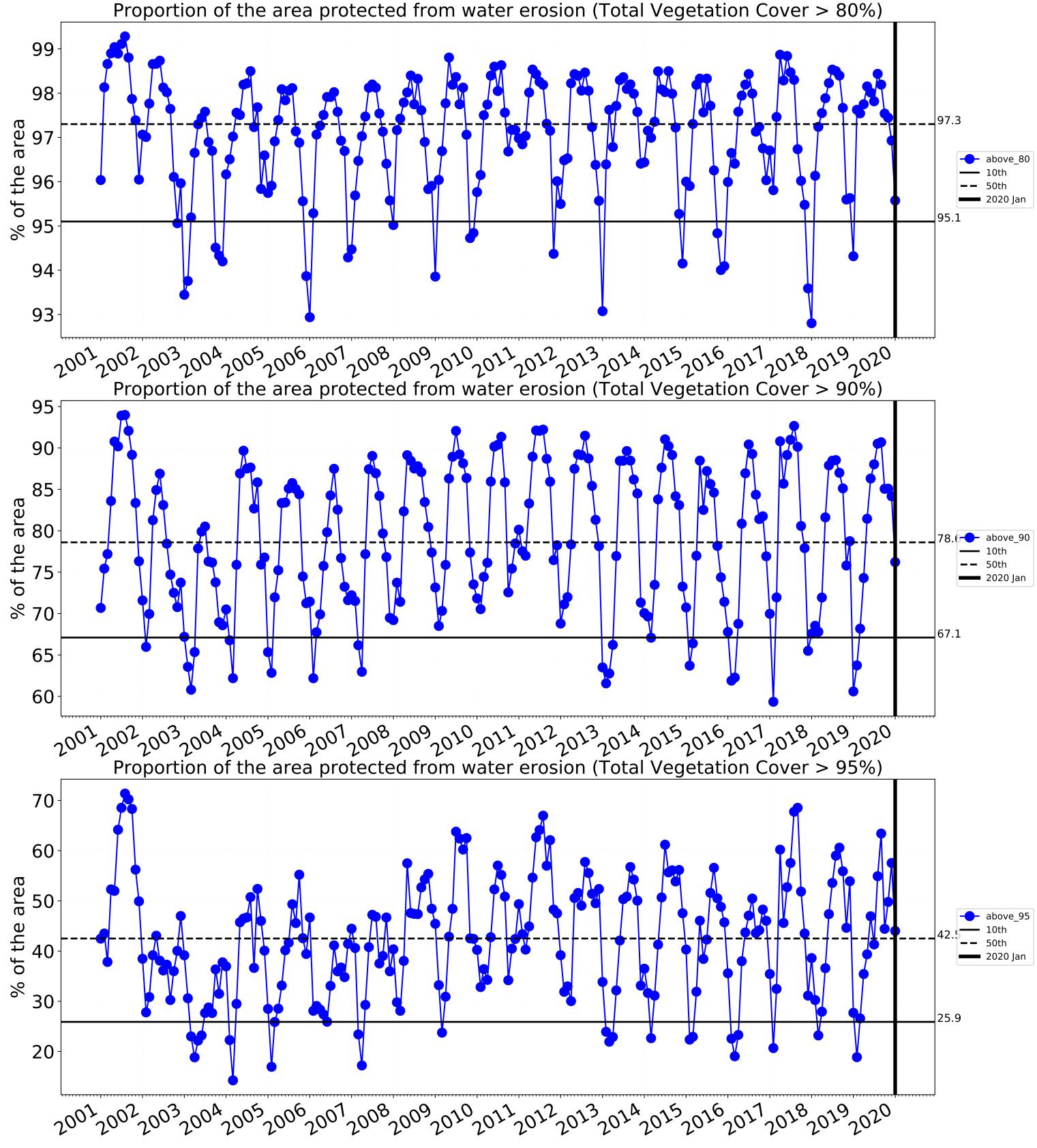


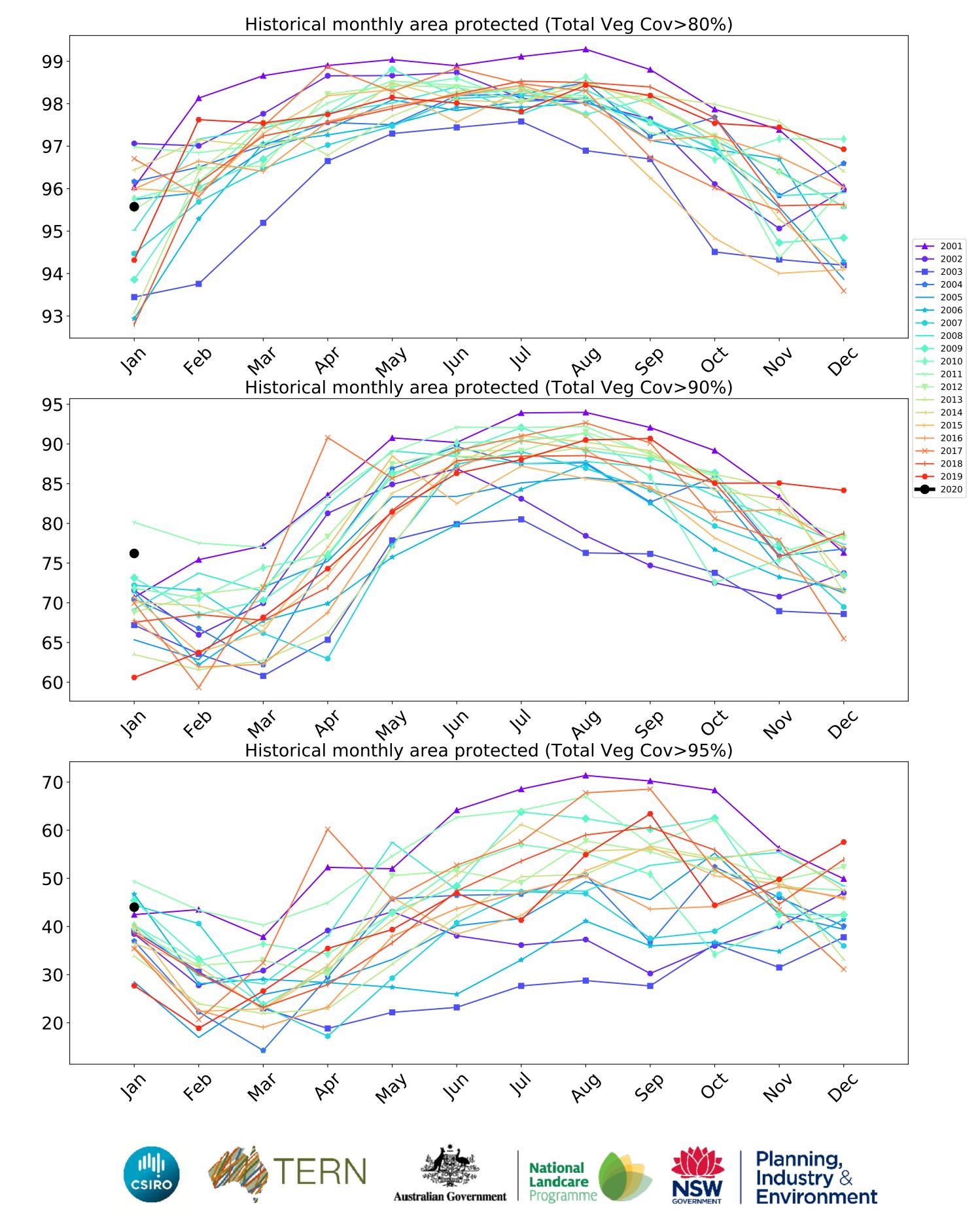


Wind erosion historical monthly area protected (Total Veg Cov >50%)



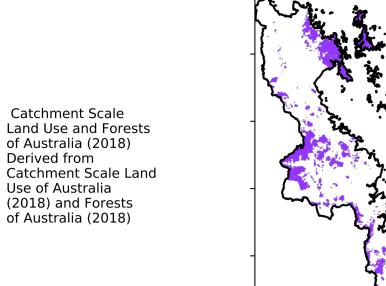
Water erosion historical monthly area protected (Total Veg Cov>70%)





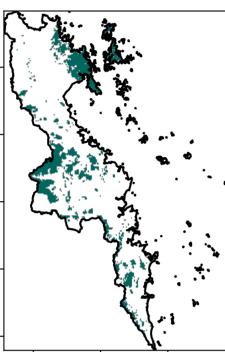
Conservation and natural environments Forest (non woodland)

Land use and forest cover



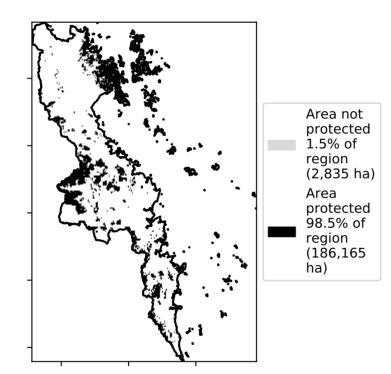
1 Conservation and natural environments – Nonwoodland forest

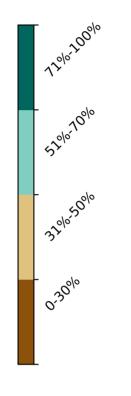
Total Vegetation Cover [%]





% Area protected from water erosion (>70%)





- 20

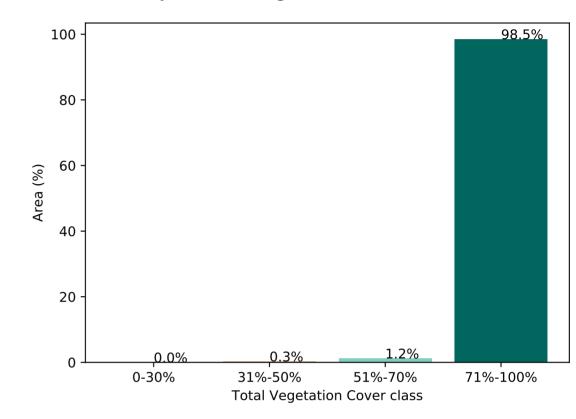
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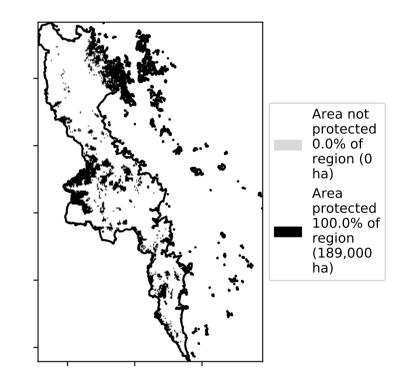
-10

-20

Proportion of vegetation cover class in area

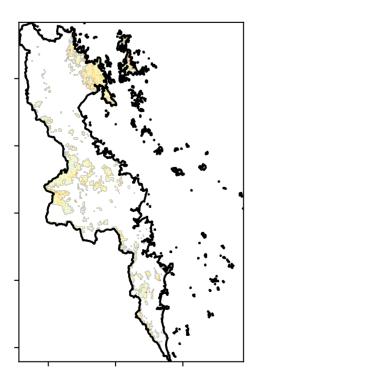


% Area protected from wind erosion (>50%)

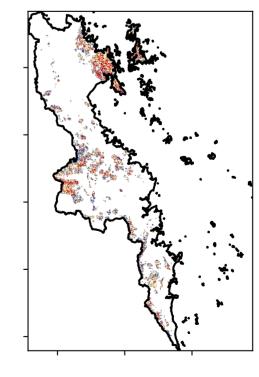


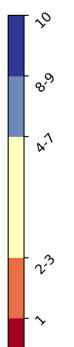
Total Vegetation Cover Anomaly [%]

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

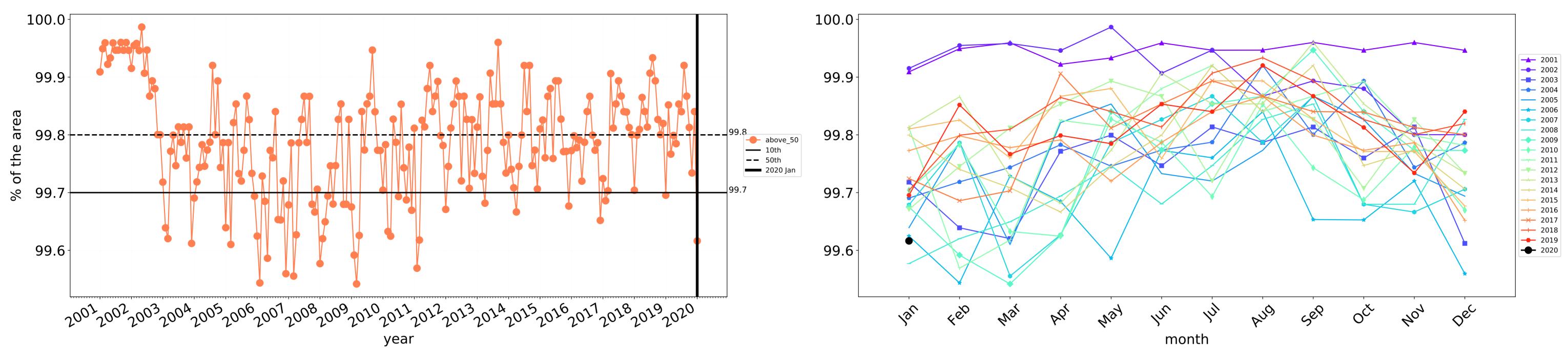
record, from highest to lowest, for that month. That is, red pixels are

records for that month of

the map using baseline from 2001 to 2019.

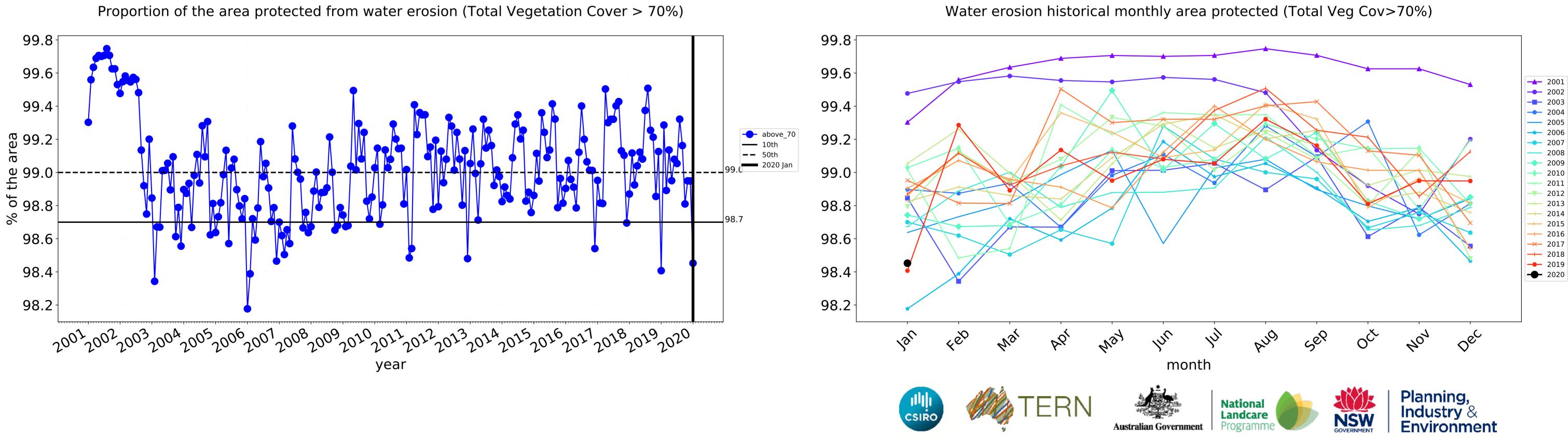
in the lowest 10% of

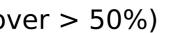
Conservation and natural environments Forest (non woodland) timeseries



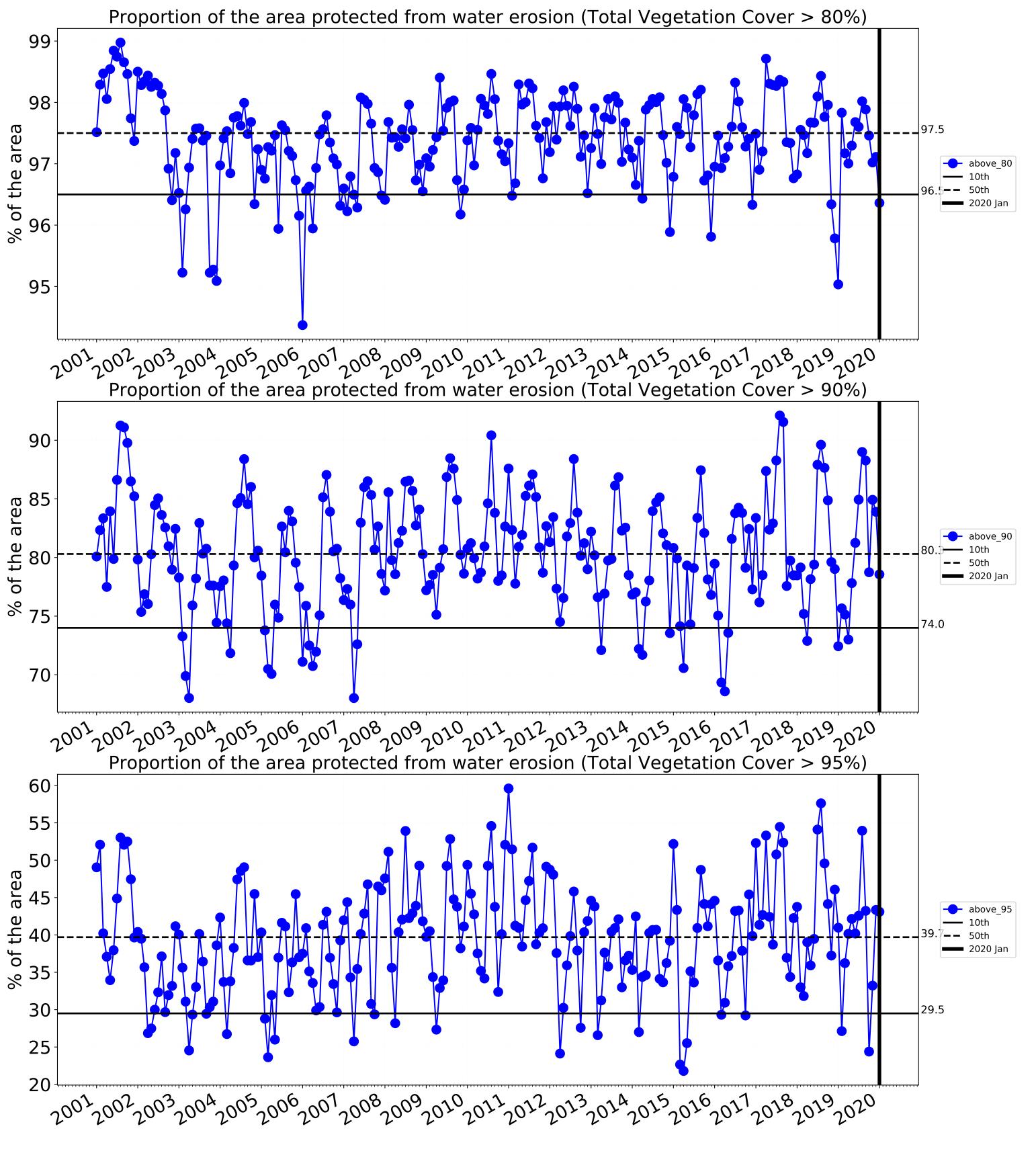
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

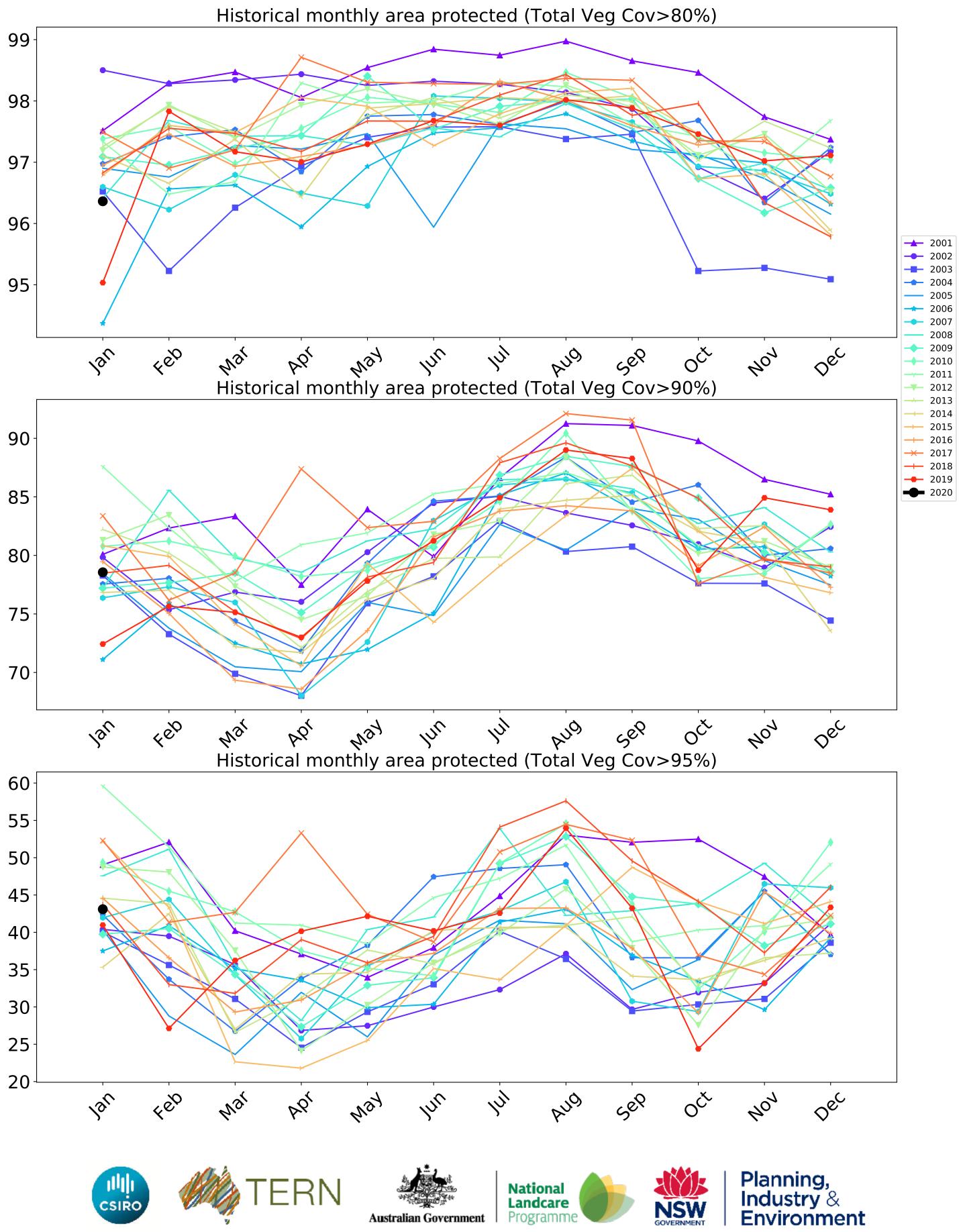






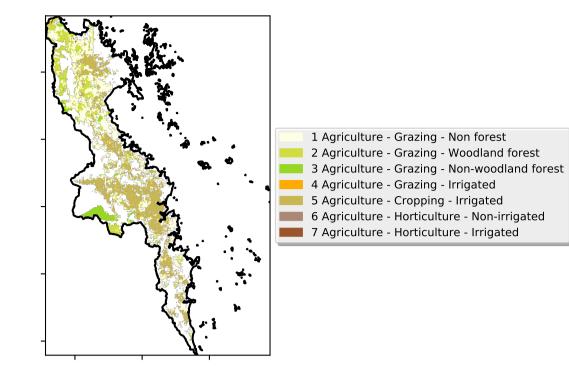
Wind erosion historical monthly area protected (Total Veg Cov >50%)



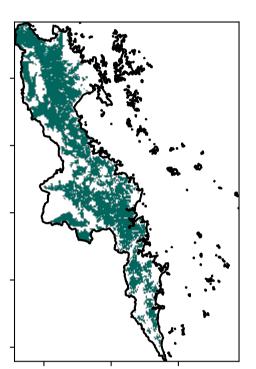


Agriculture

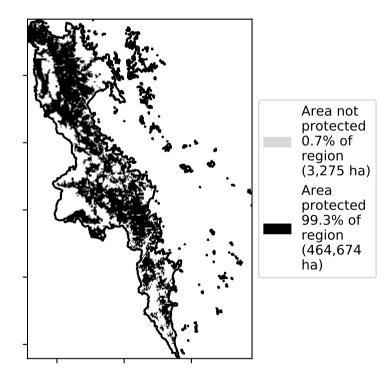
Land use and forest cover

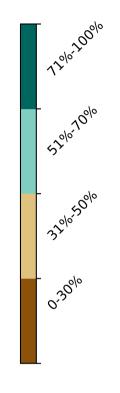


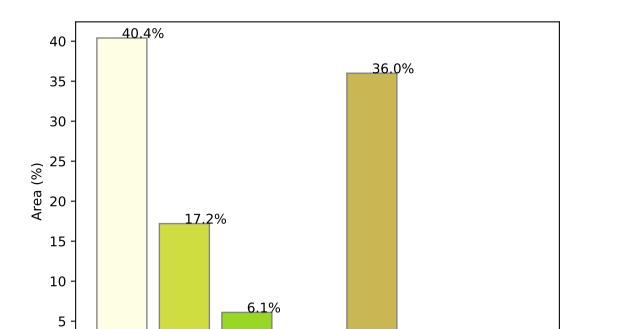
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)







Proportion of each land class in area

Proportion of vegetation cover class in area

4

Land use class

0

1

2

3

0.0%

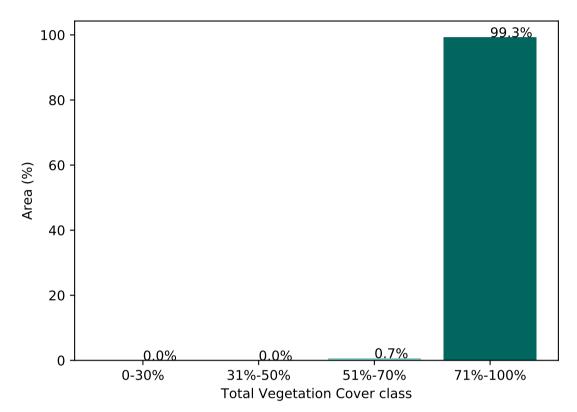
5

0.2%

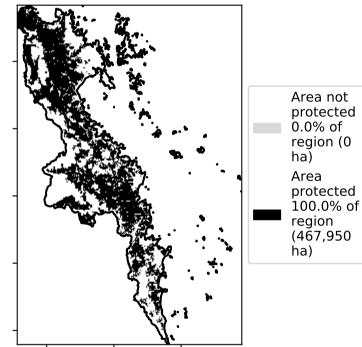
7

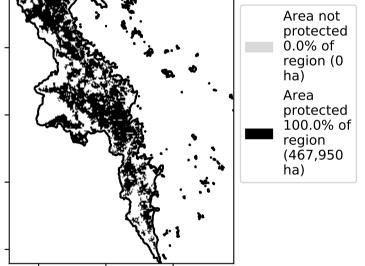
0.0%

6

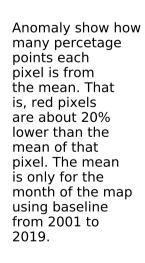


% Area protected from wind erosion (>50%)





Total Vegetation Cover Anomaly [%]



Catchment Scale

of Australia (2018)

Derived from

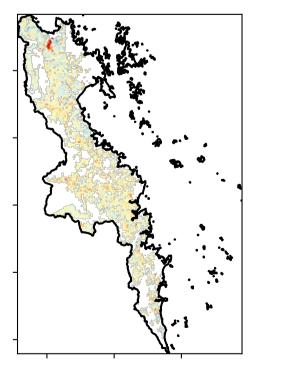
Use of Australia

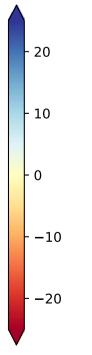
(2018) and Forests

of Australia (2018)

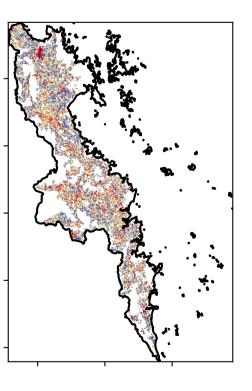
Land Use and Forests

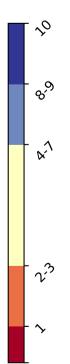
Catchment Scale Land



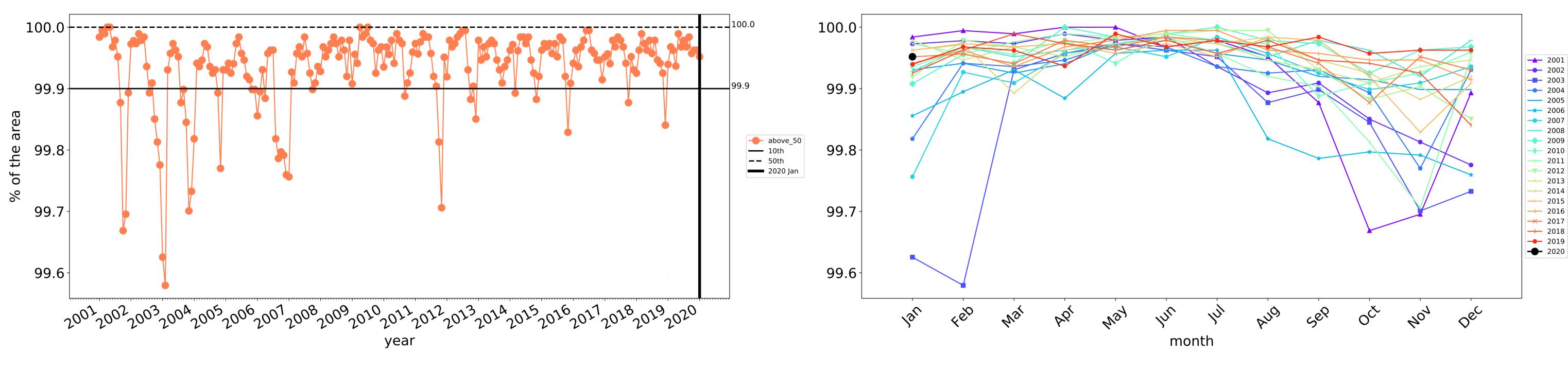






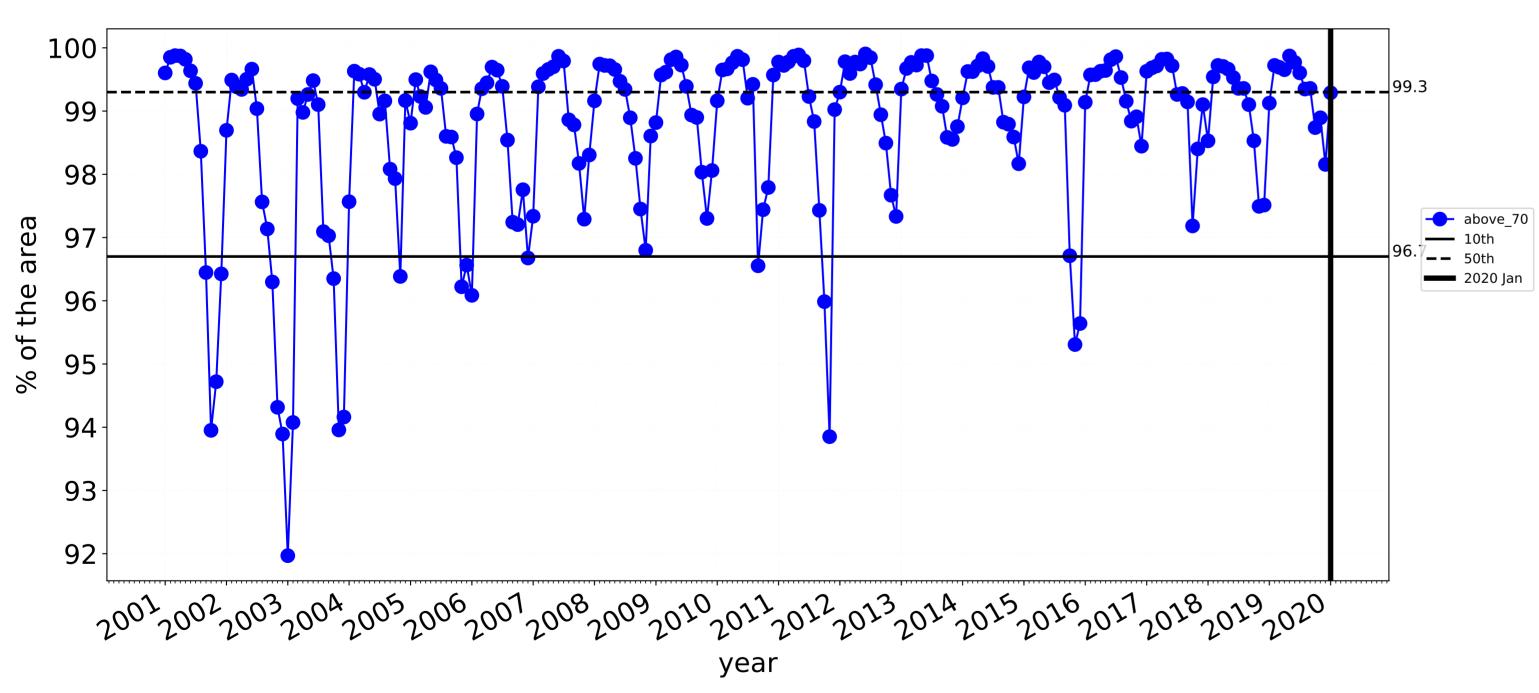






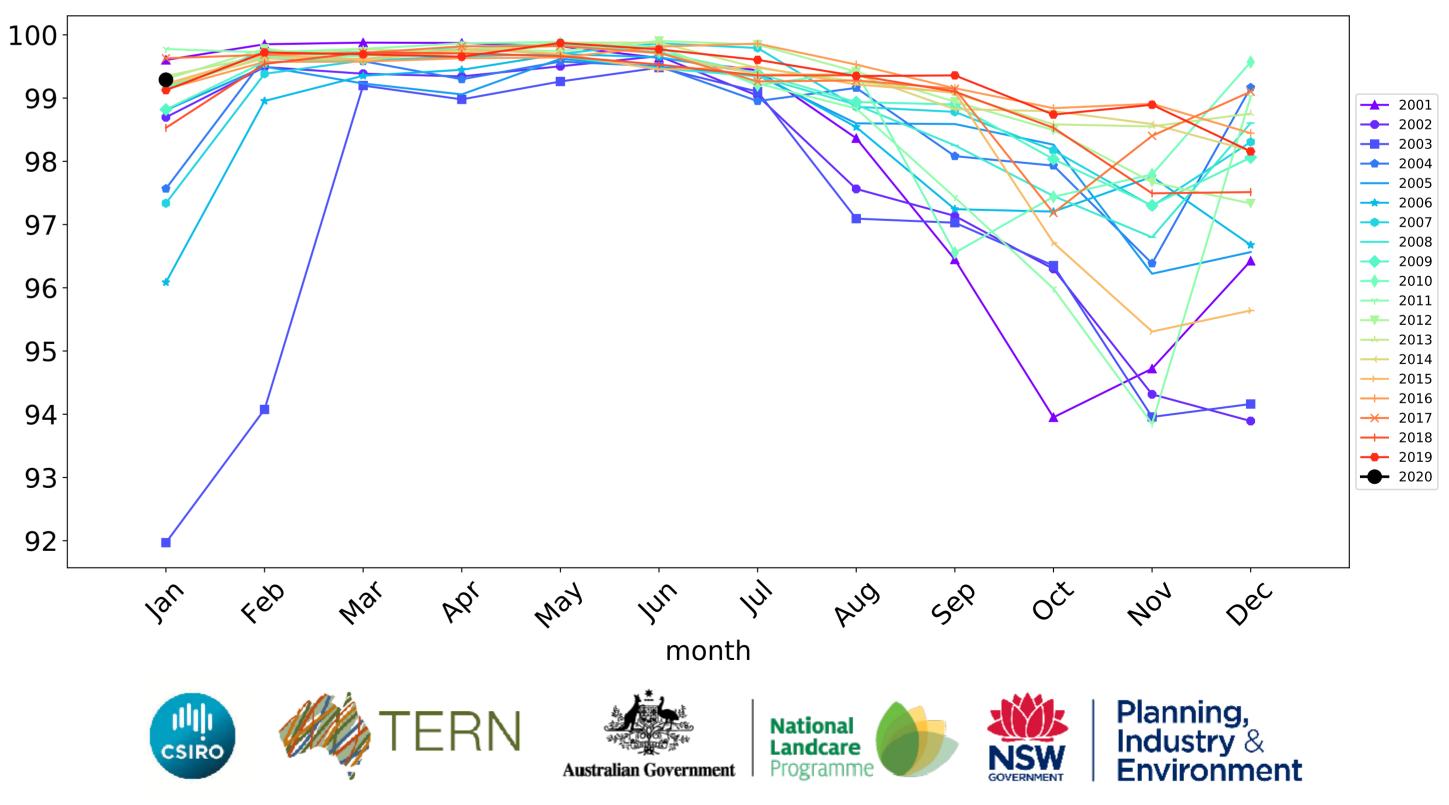
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

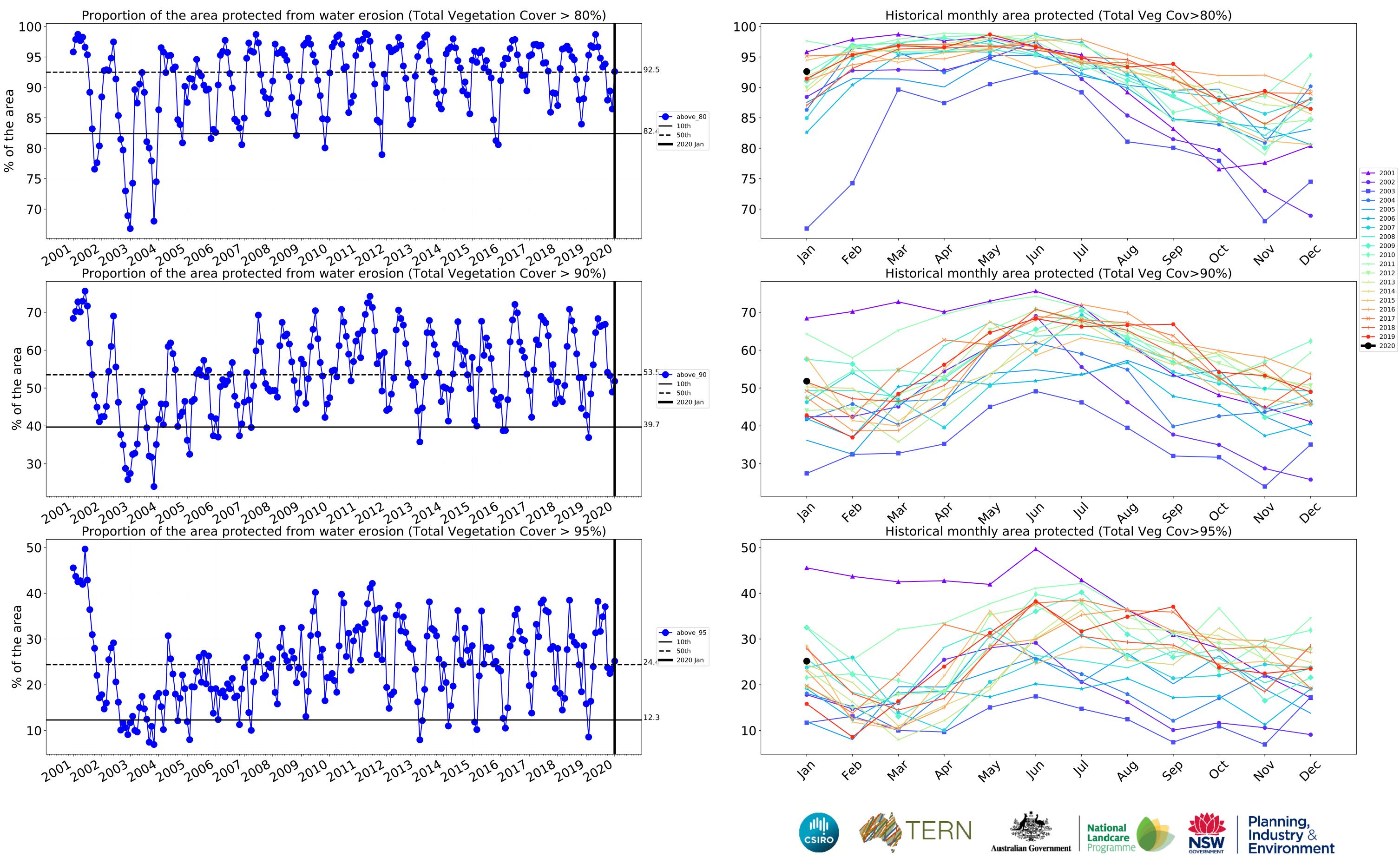




Wind erosion historical monthly area protected (Total Veg Cov >50%)

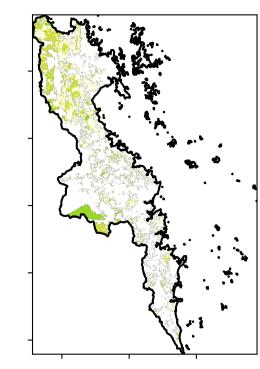
Water erosion historical monthly area protected (Total Veg Cov>70%)



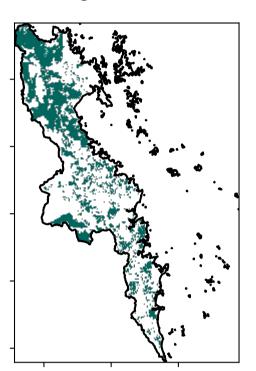


Grazing

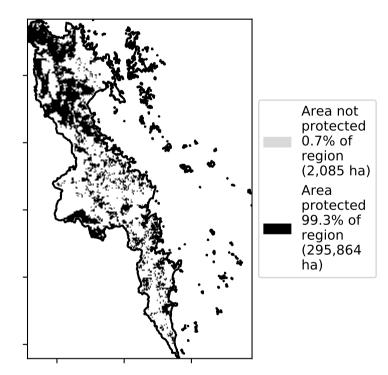
Land use and forest cover

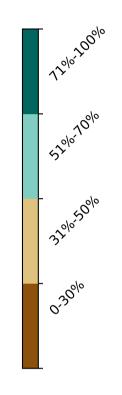


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)

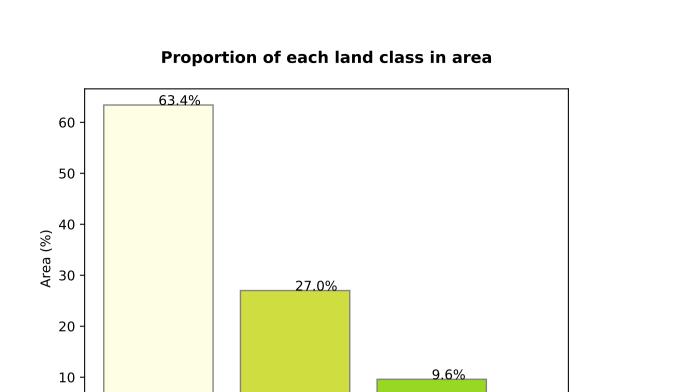




1 Agriculture - Grazing - Non forest

2 Agriculture - Grazing - Woodland forest

3 Agriculture - Grazing - Non-woodland forest



Proportion of vegetation cover class in area

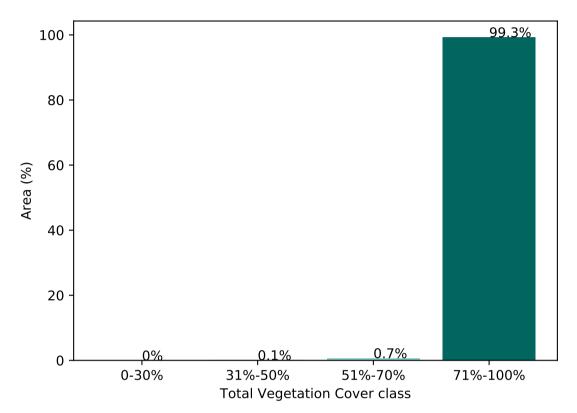
Land use class

3

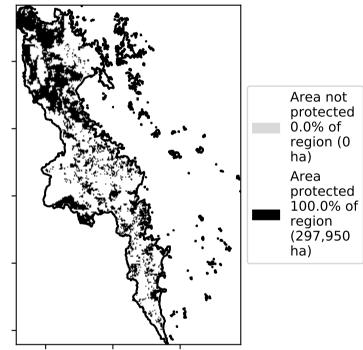
2

0

1

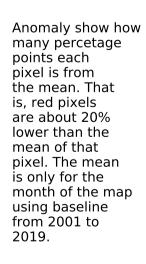


% Area protected from wind erosion (>50%)





Total Vegetation Cover Anomaly [%]



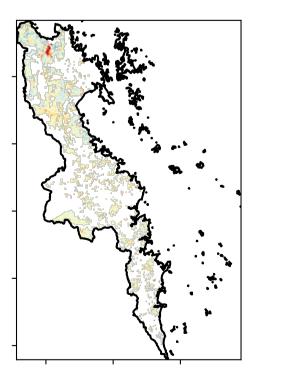
Catchment Scale Land Use and Forests of Australia (2018)

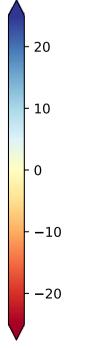
Catchment Scale Land

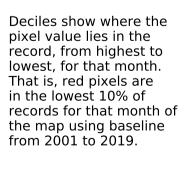
Derived from

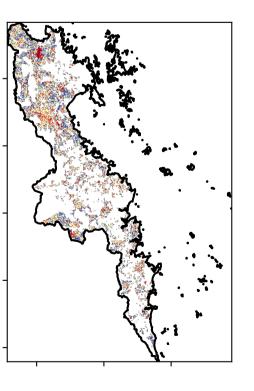
Use of Australia

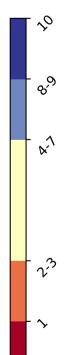
(2018) and Forests of Australia (2018)



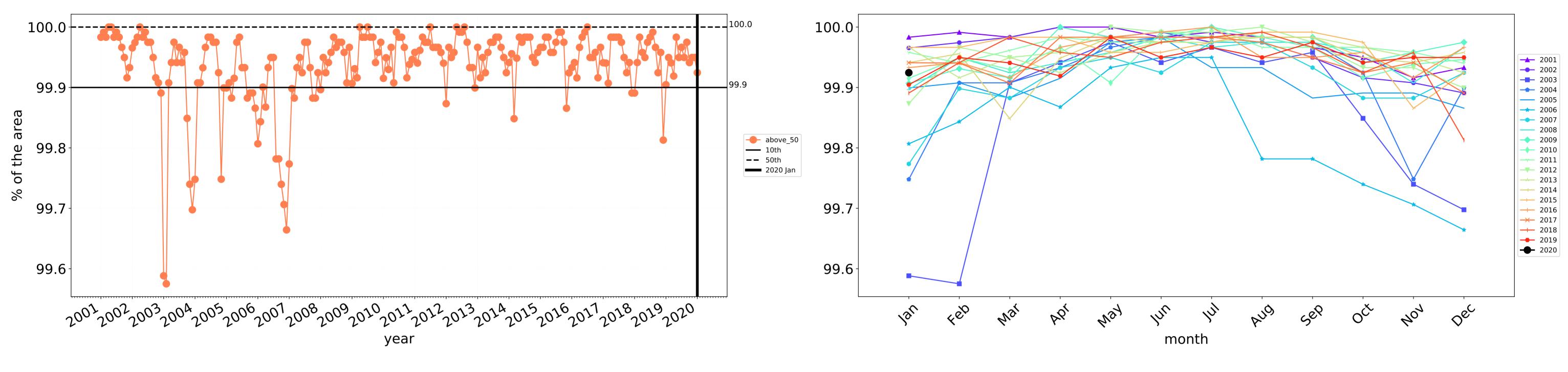




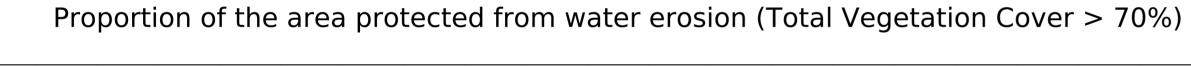


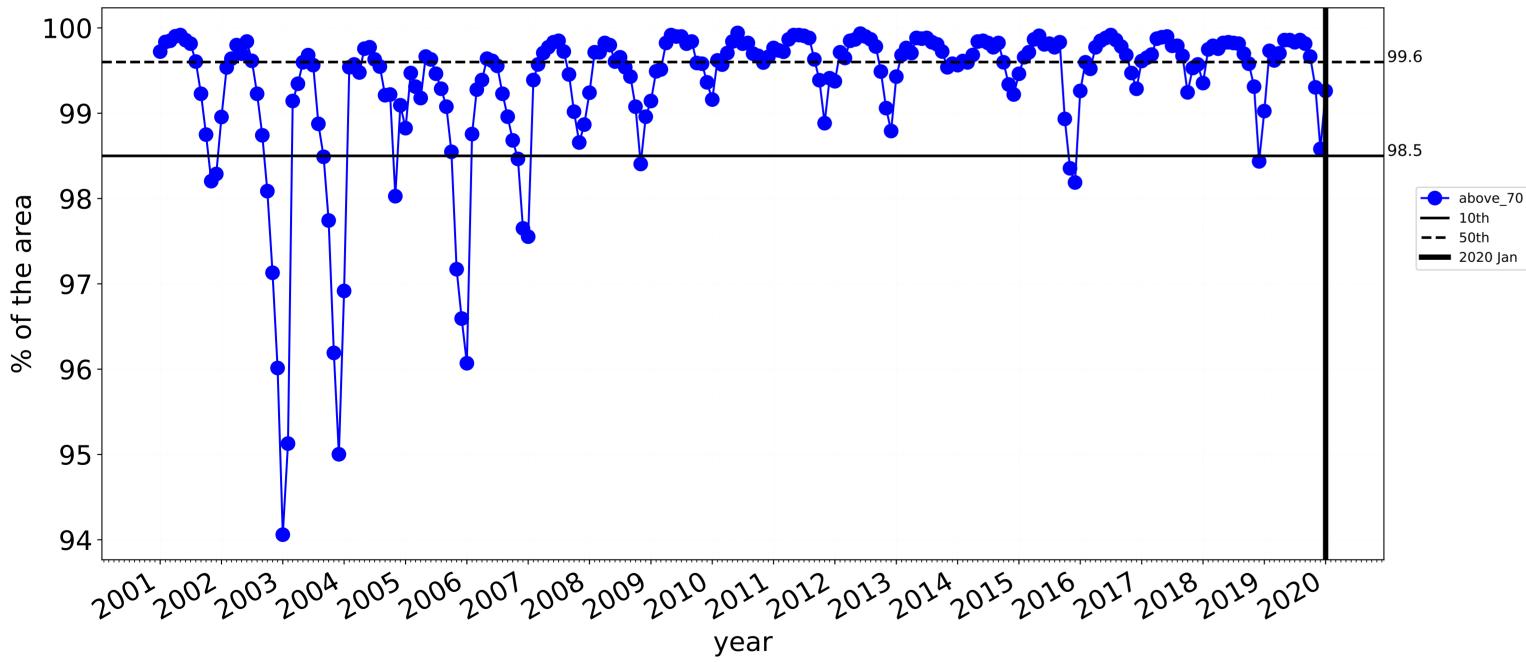


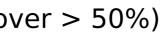




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

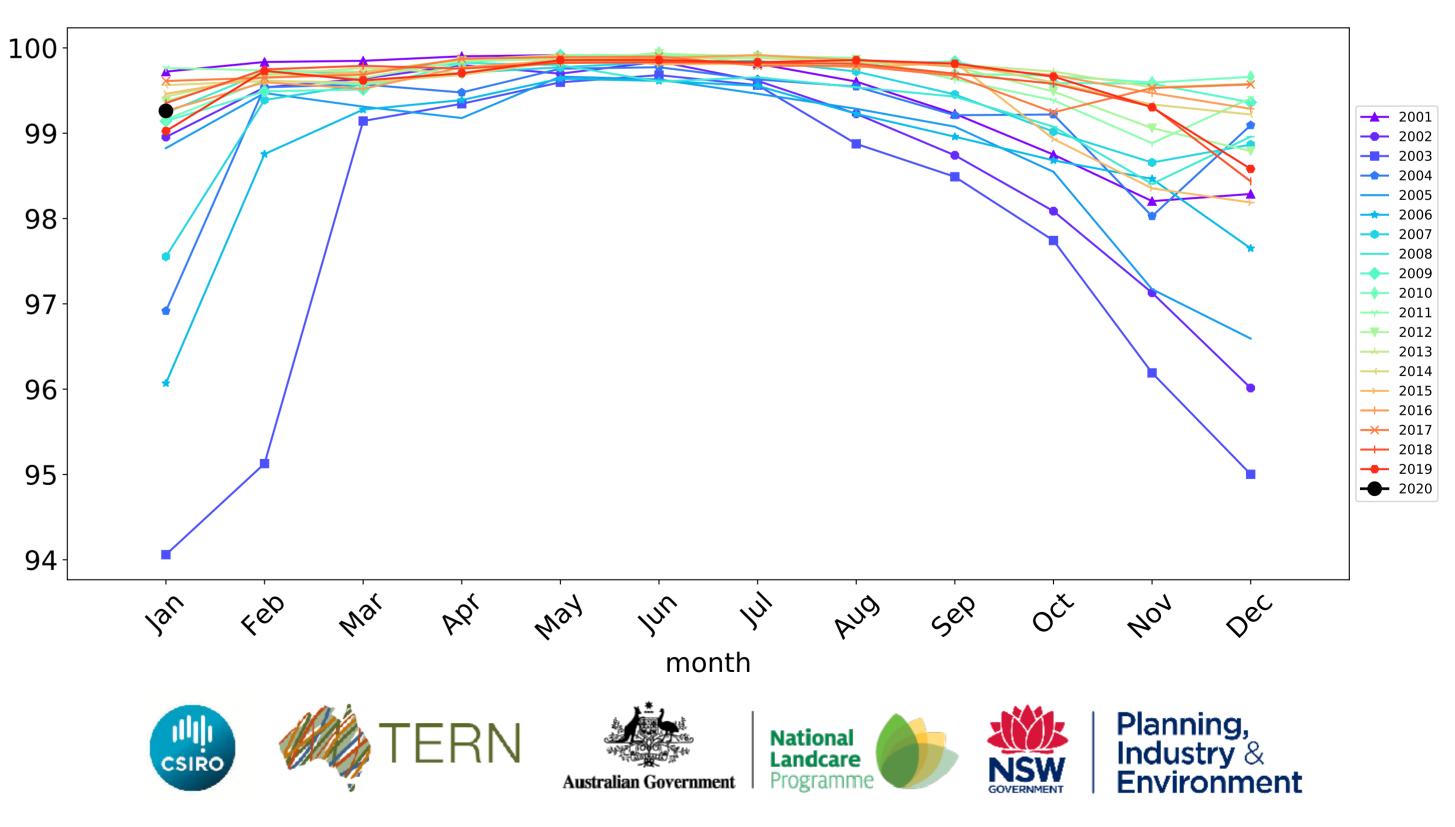


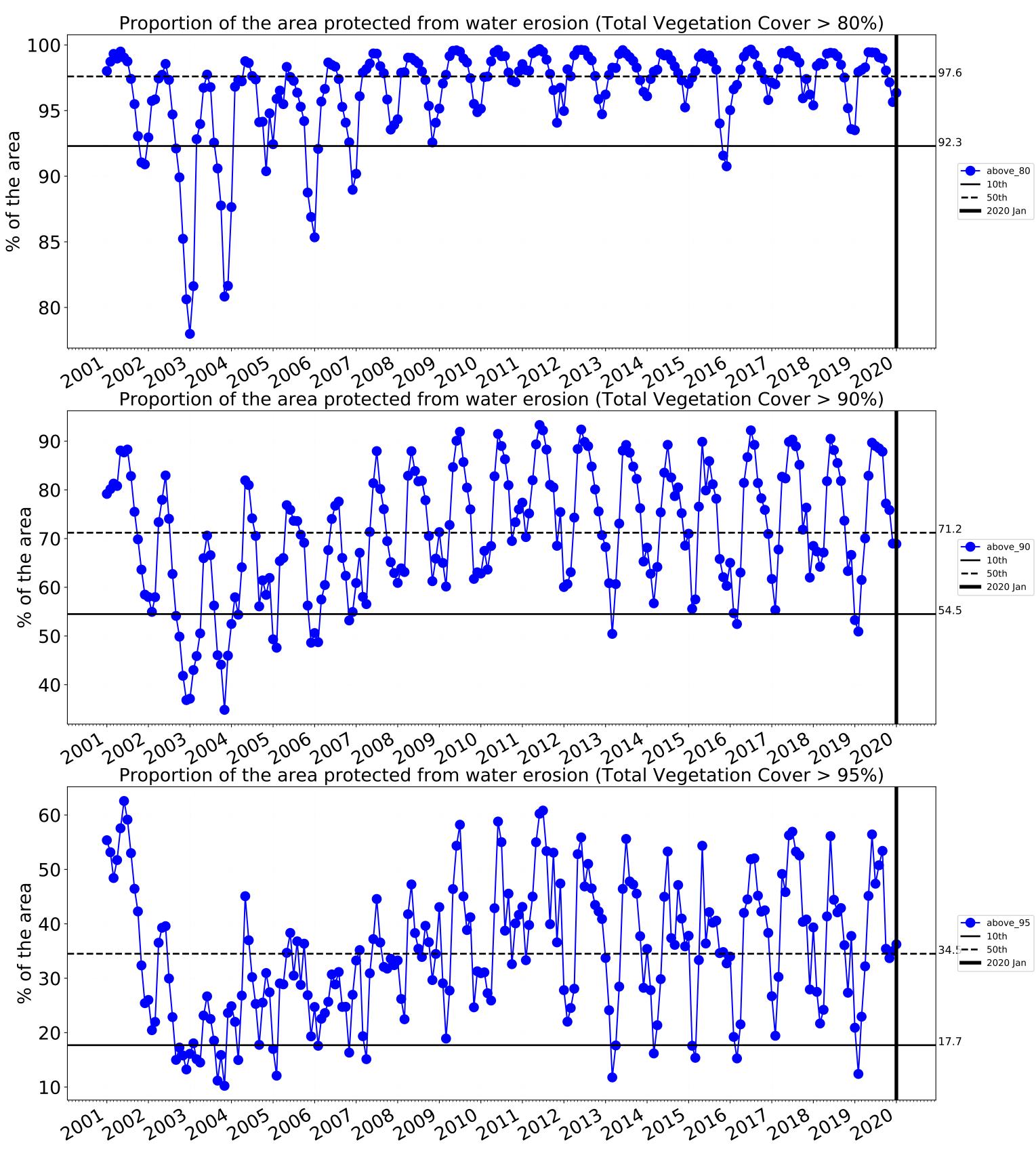


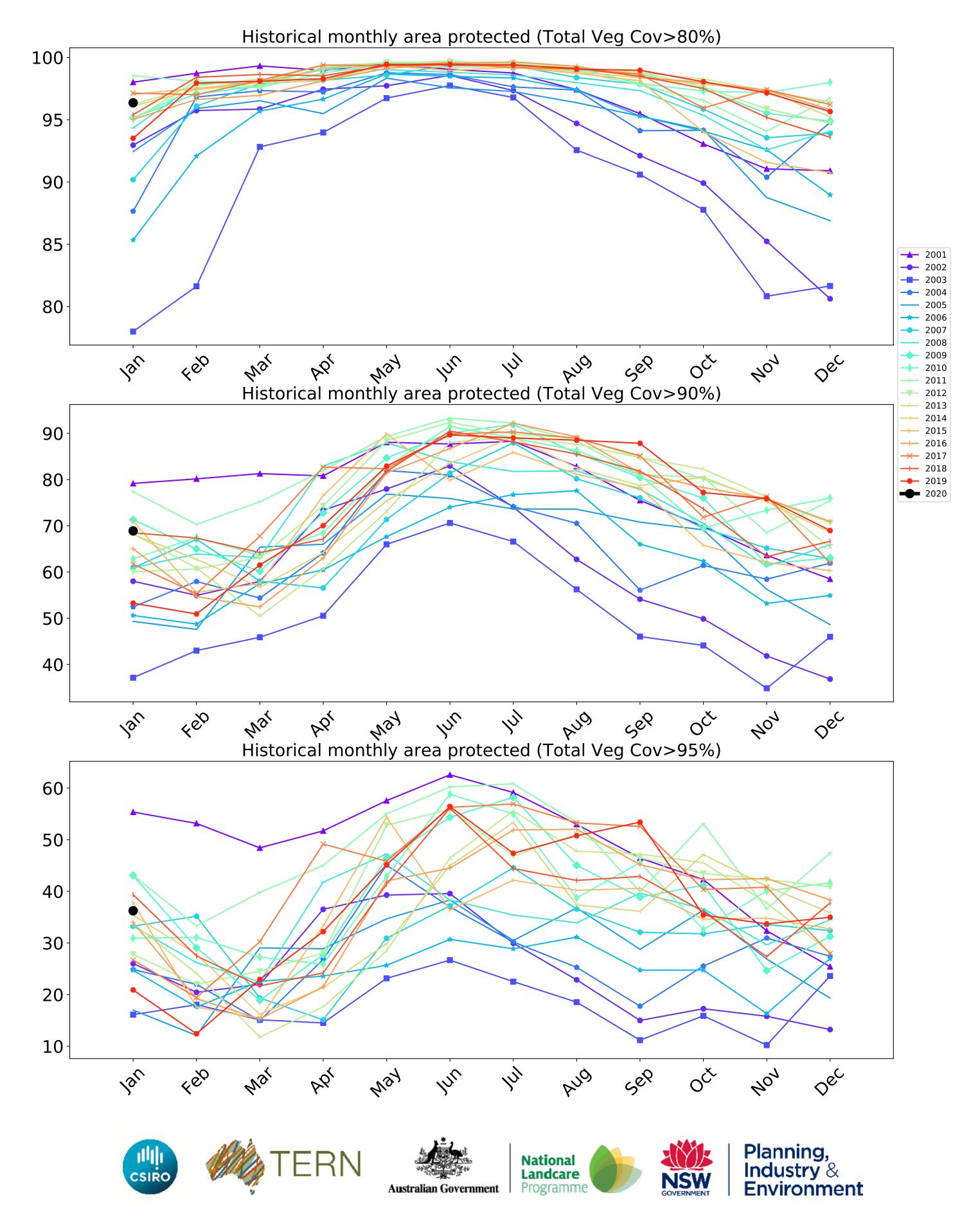


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

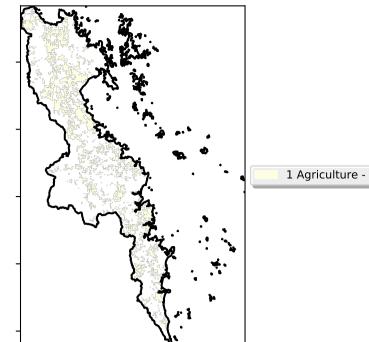






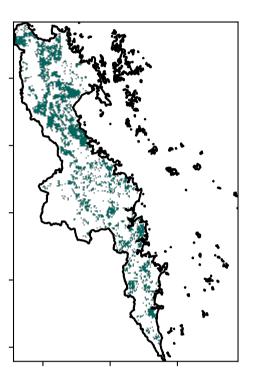
Grazing non forest

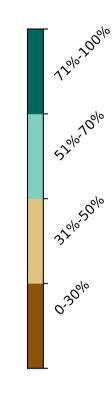
Land use and forest cover



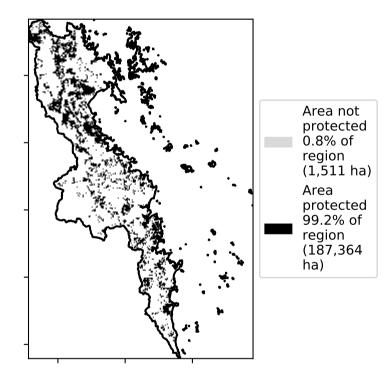
1 Agriculture - Grazing - Non forest

Total Vegetation Cover [%]

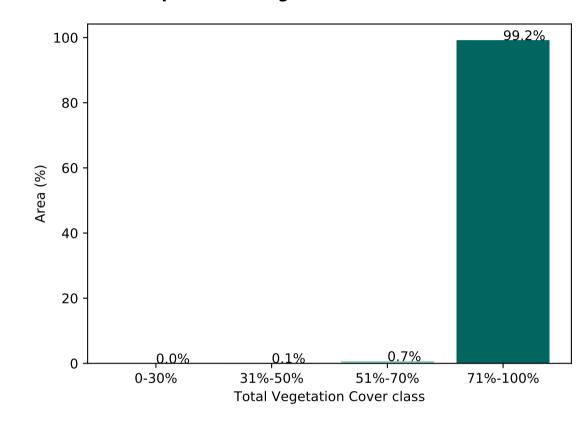




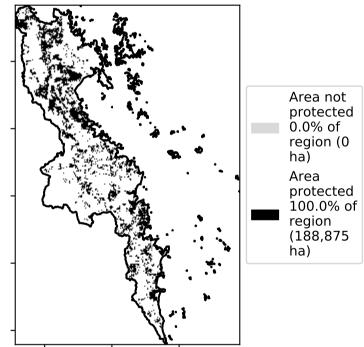
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



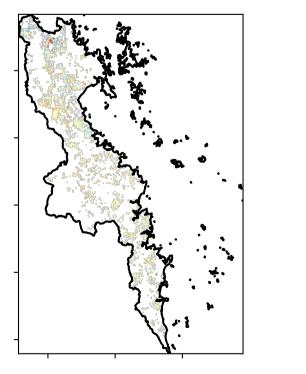
% Area protected from wind erosion (>50%)

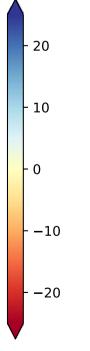


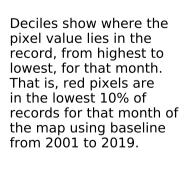
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

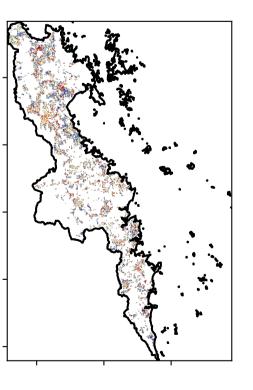
Total Vegetation Cover Anomaly [%]

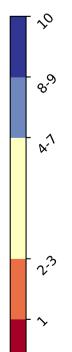
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.



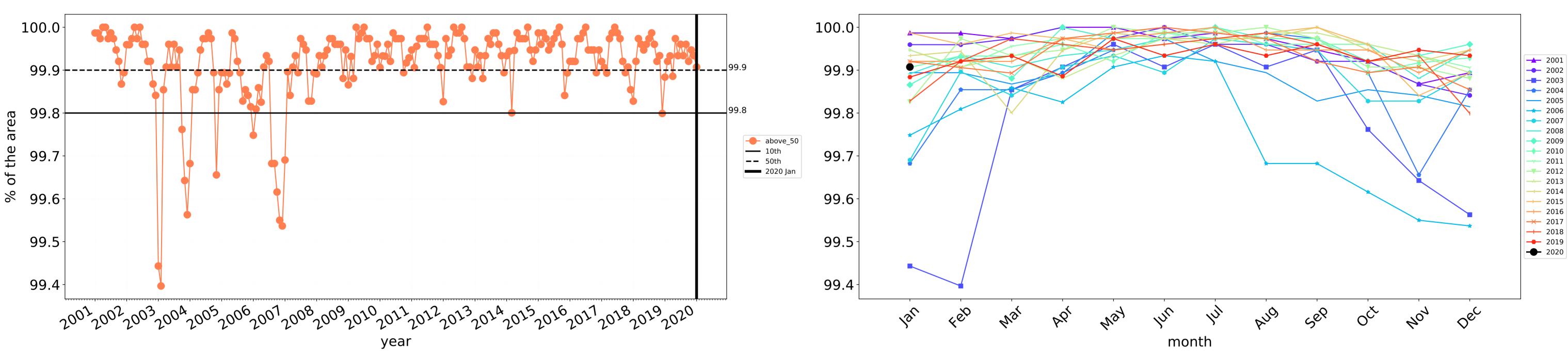






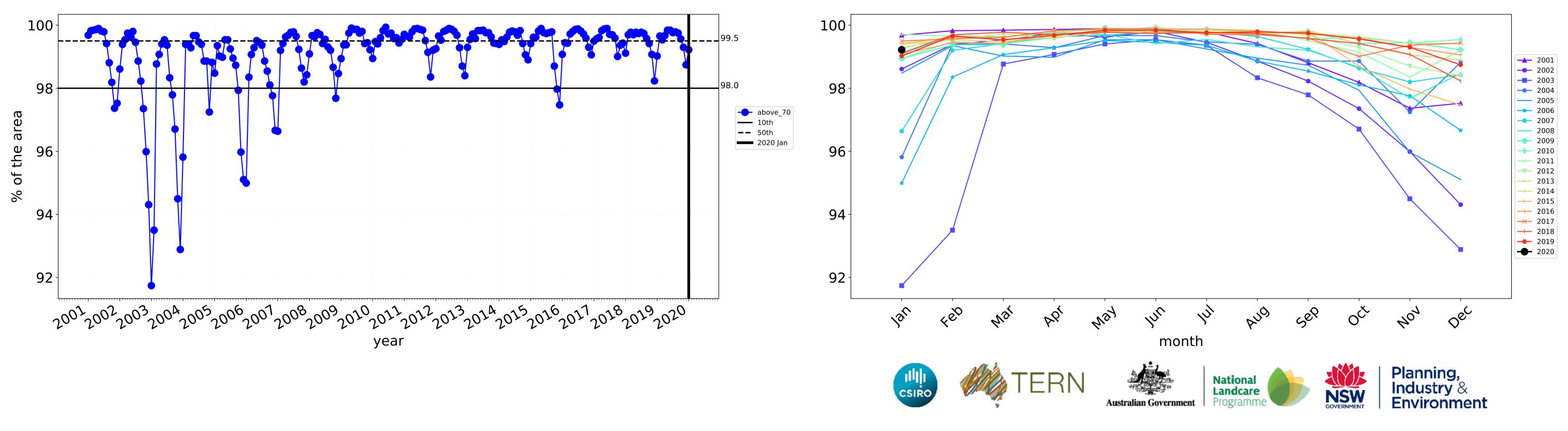






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

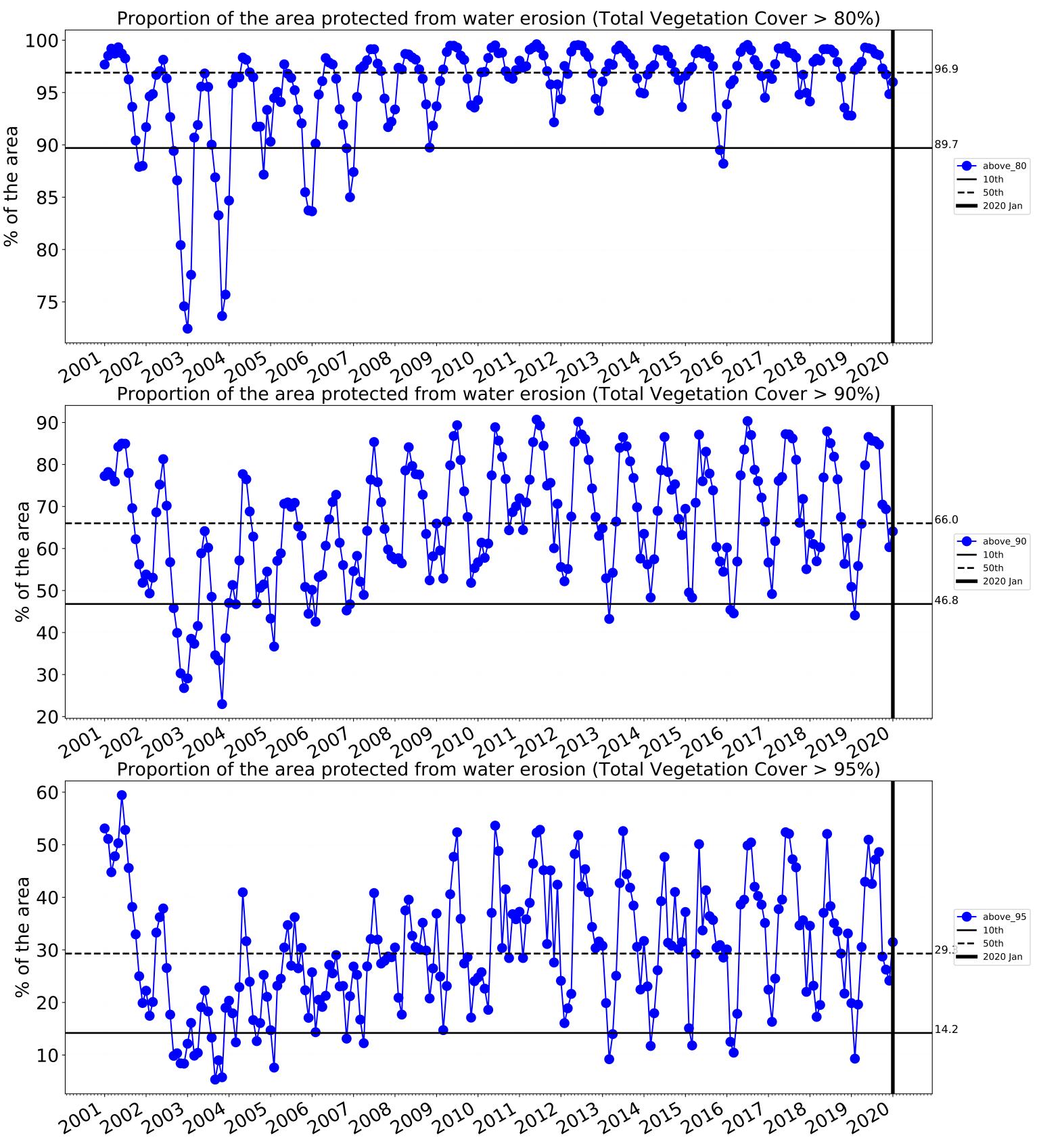
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

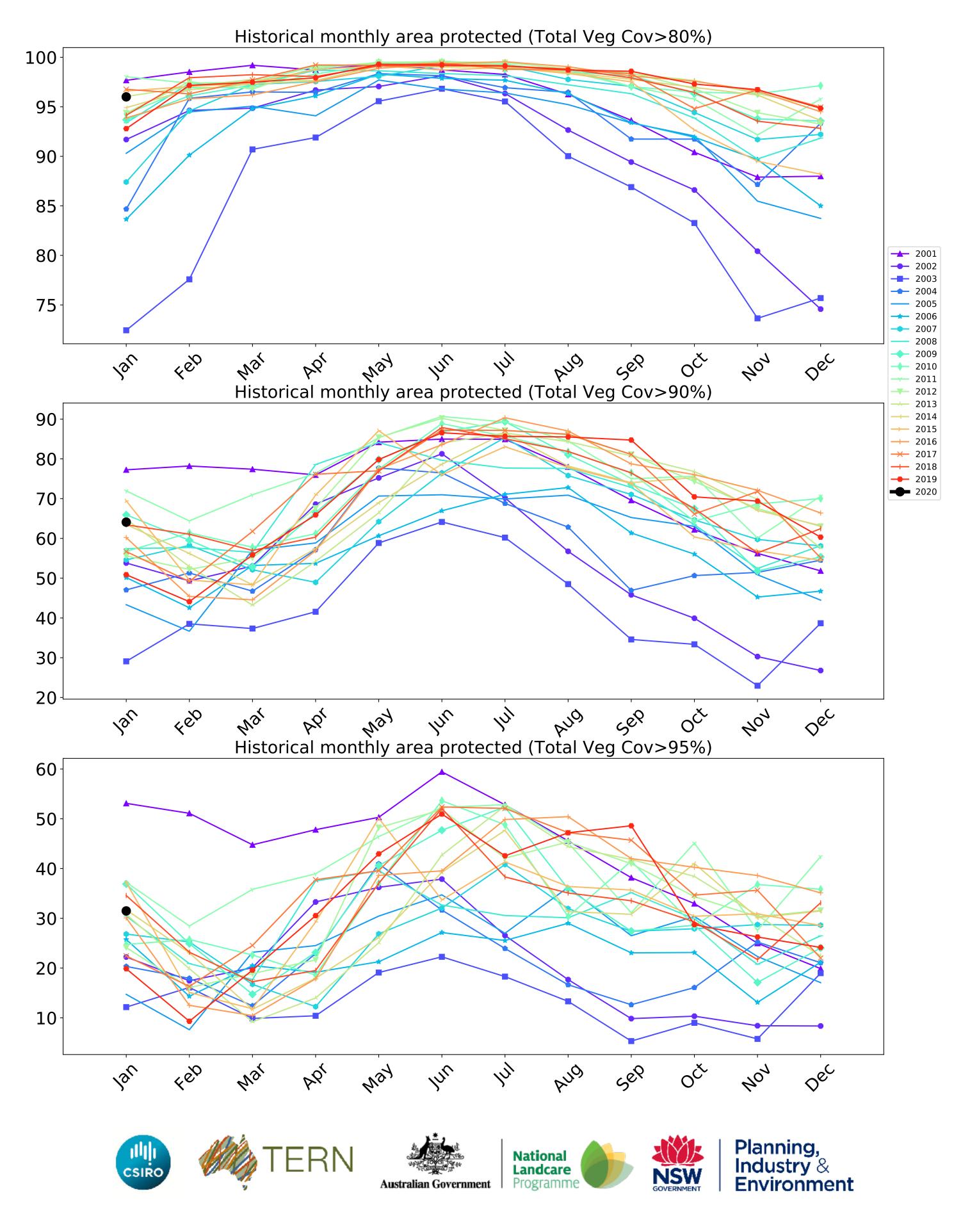


Grazing non forest timeseries

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

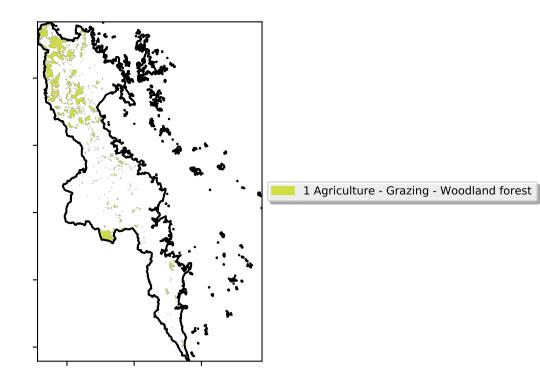
Wind erosion historical monthly area protected (Total Veg Cov >50%)



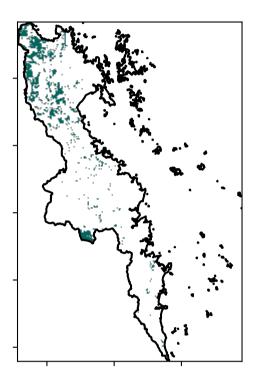


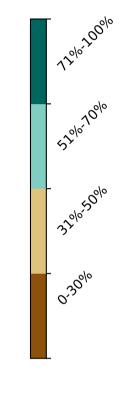
Grazing Woodland forest

Land use and forest cover

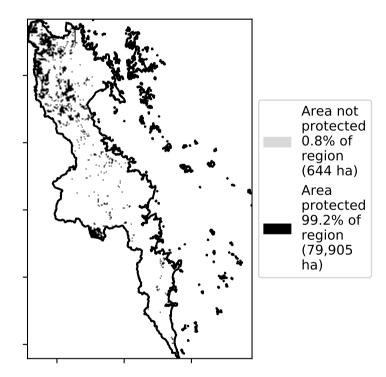


Total Vegetation Cover [%]

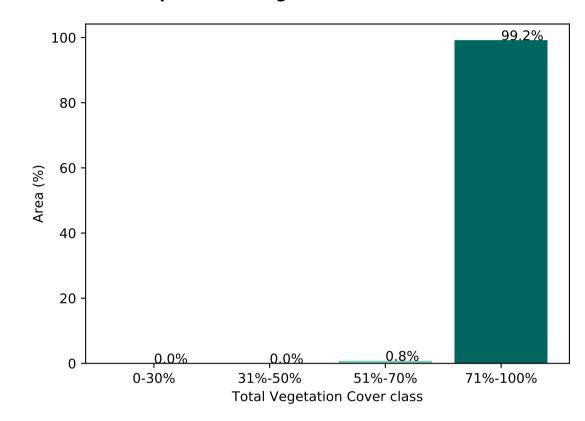




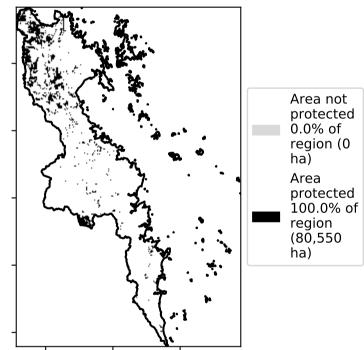
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

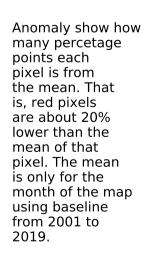


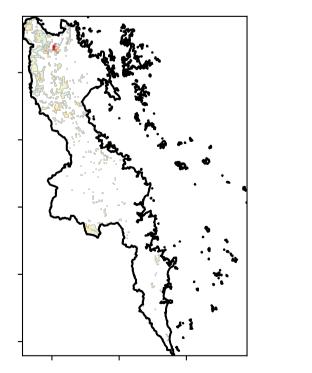
% Area protected from wind erosion (>50%)

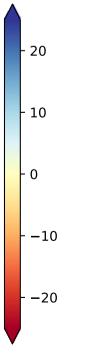


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

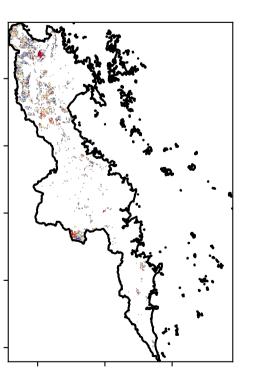
Total Vegetation Cover Anomaly [%]

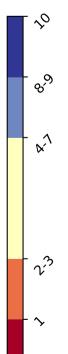




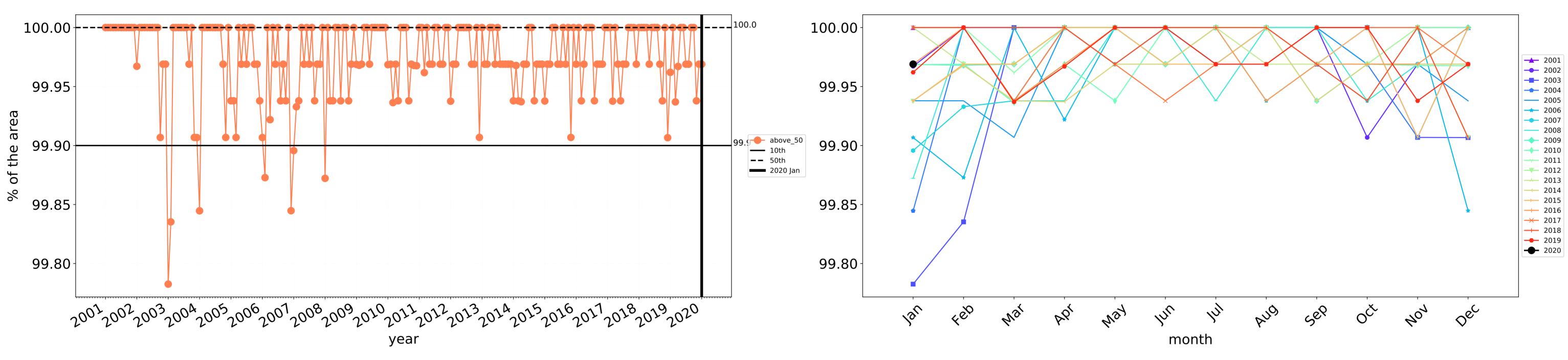






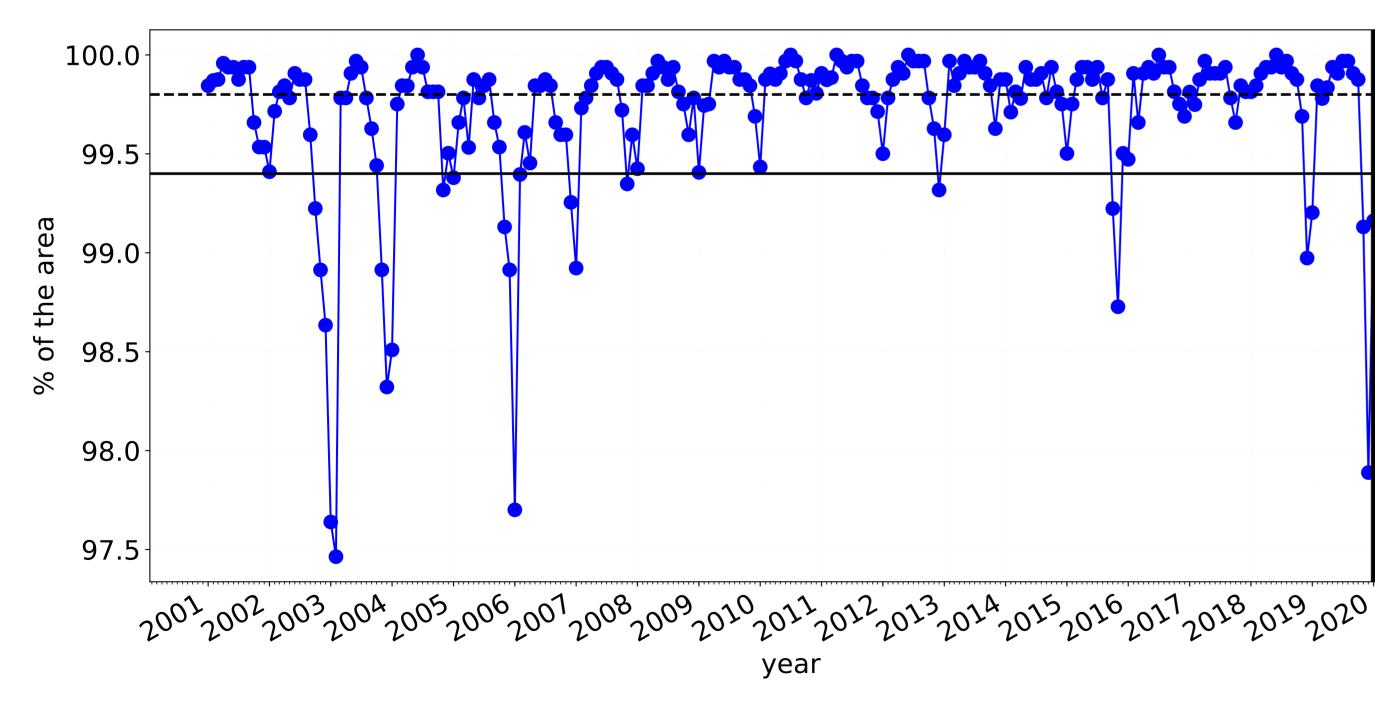






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

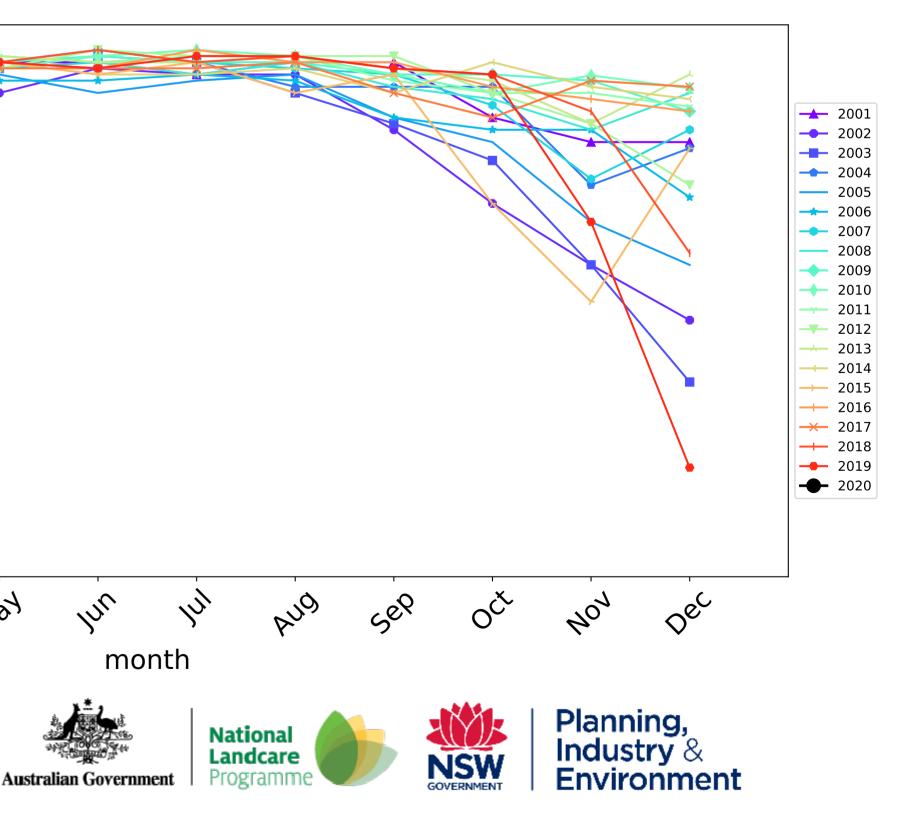
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

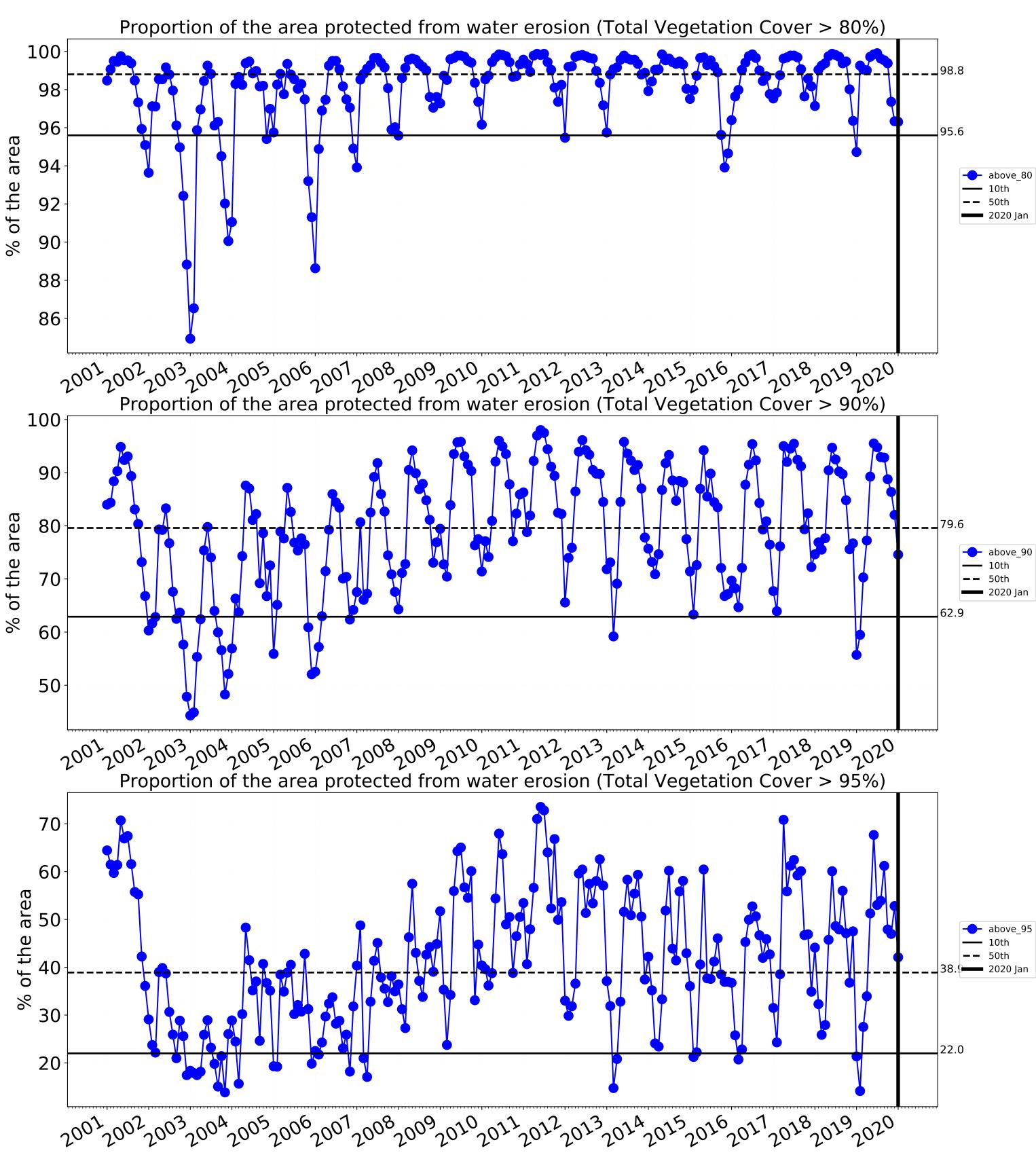


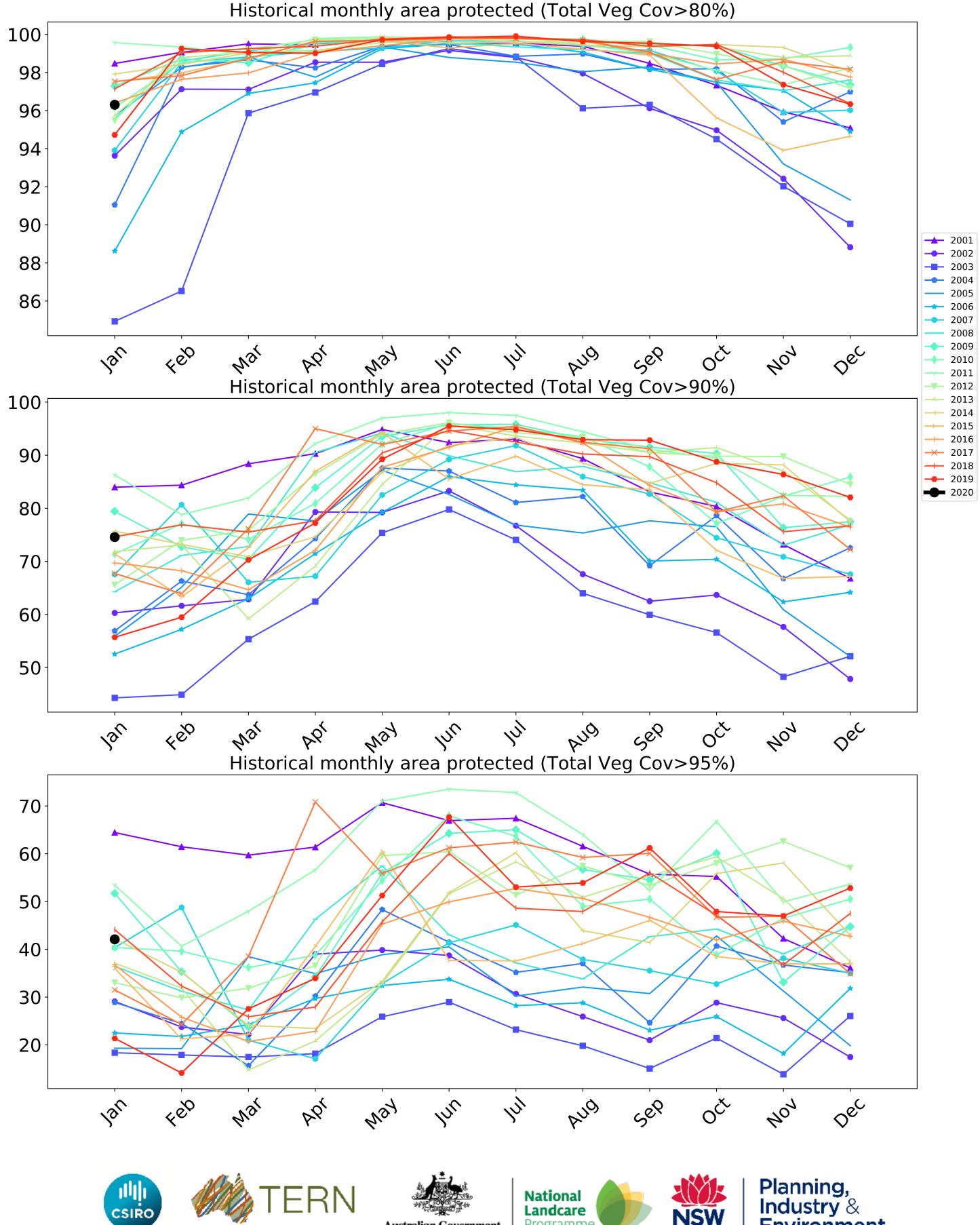
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0-99.5 ---- above_70 **—** 10th 99.0 **--** 50th 🗕 2020 Jan 98.5 98.0 97.5 feb lan May In Wai PQ month ERN csiro

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





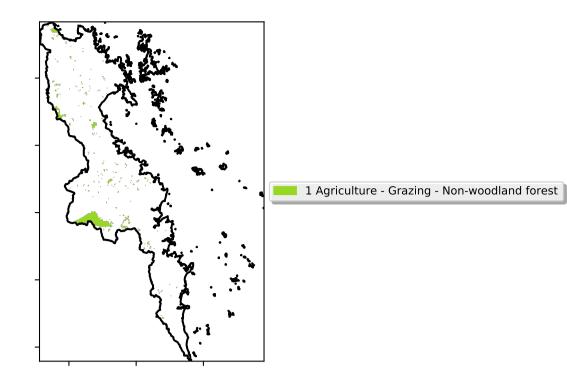


Australian Government

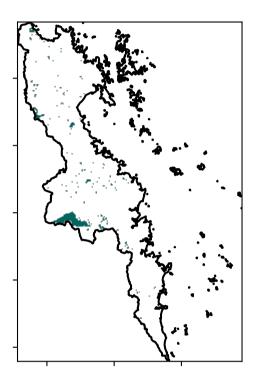


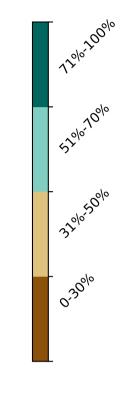
Grazing - Forest (non woodland)

Land use and forest cover

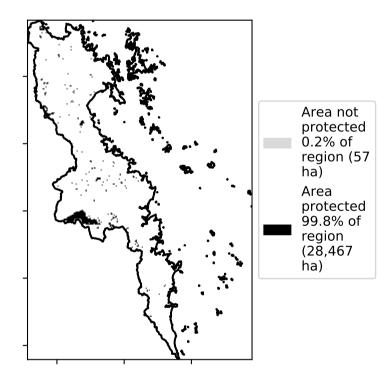


Total Vegetation Cover [%]

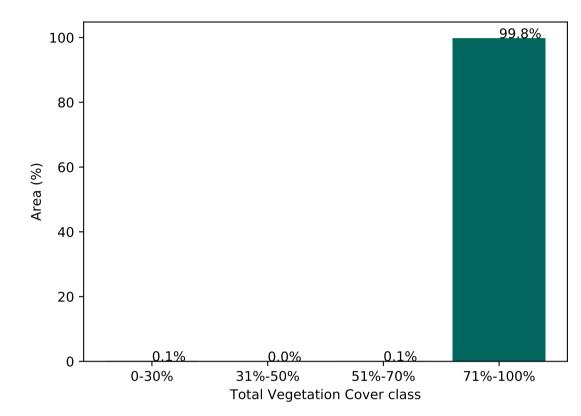




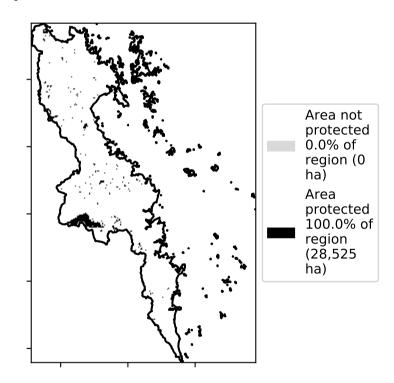
% Area protected from water erosion (>70%)





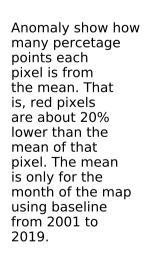


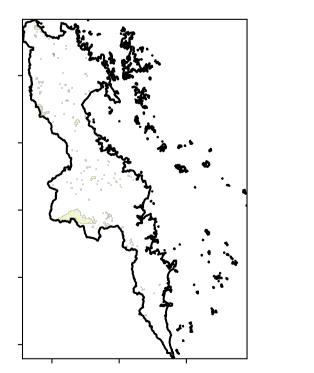
% Area protected from wind erosion (>50%)

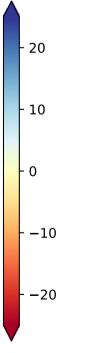


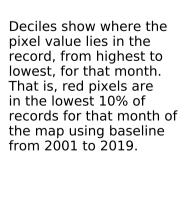
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

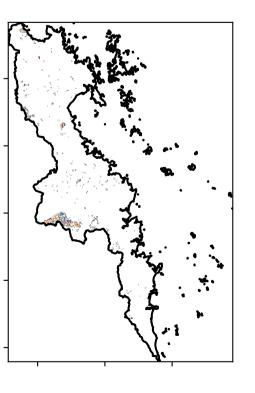
Total Vegetation Cover Anomaly [%]

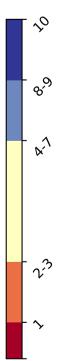




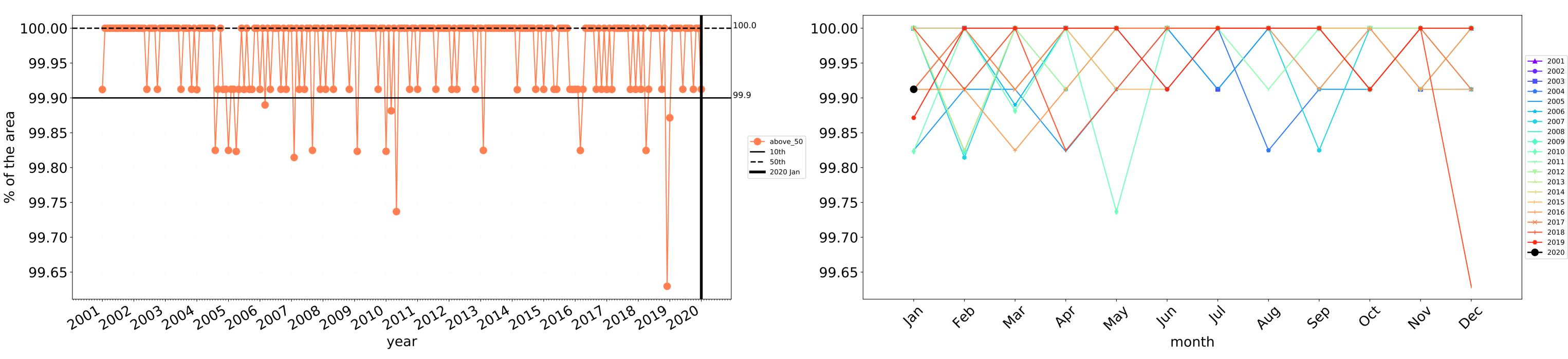






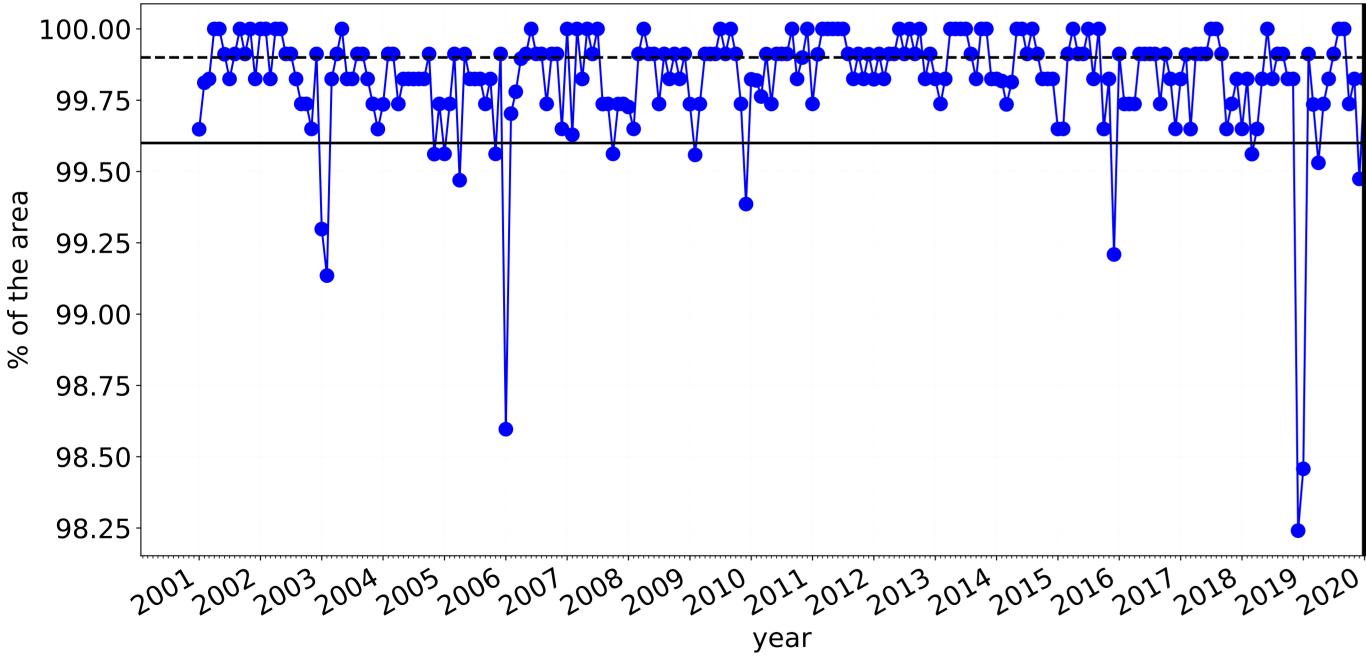






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

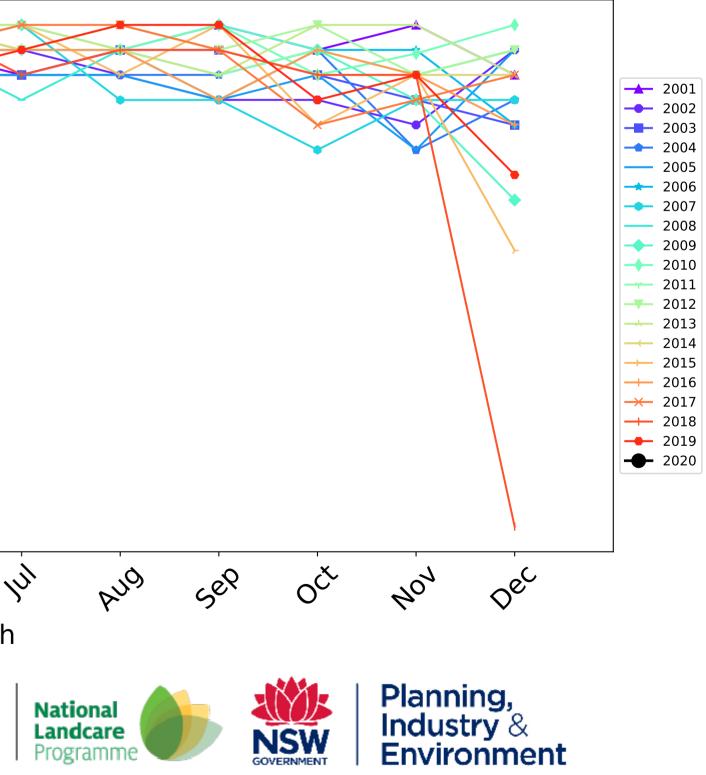
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

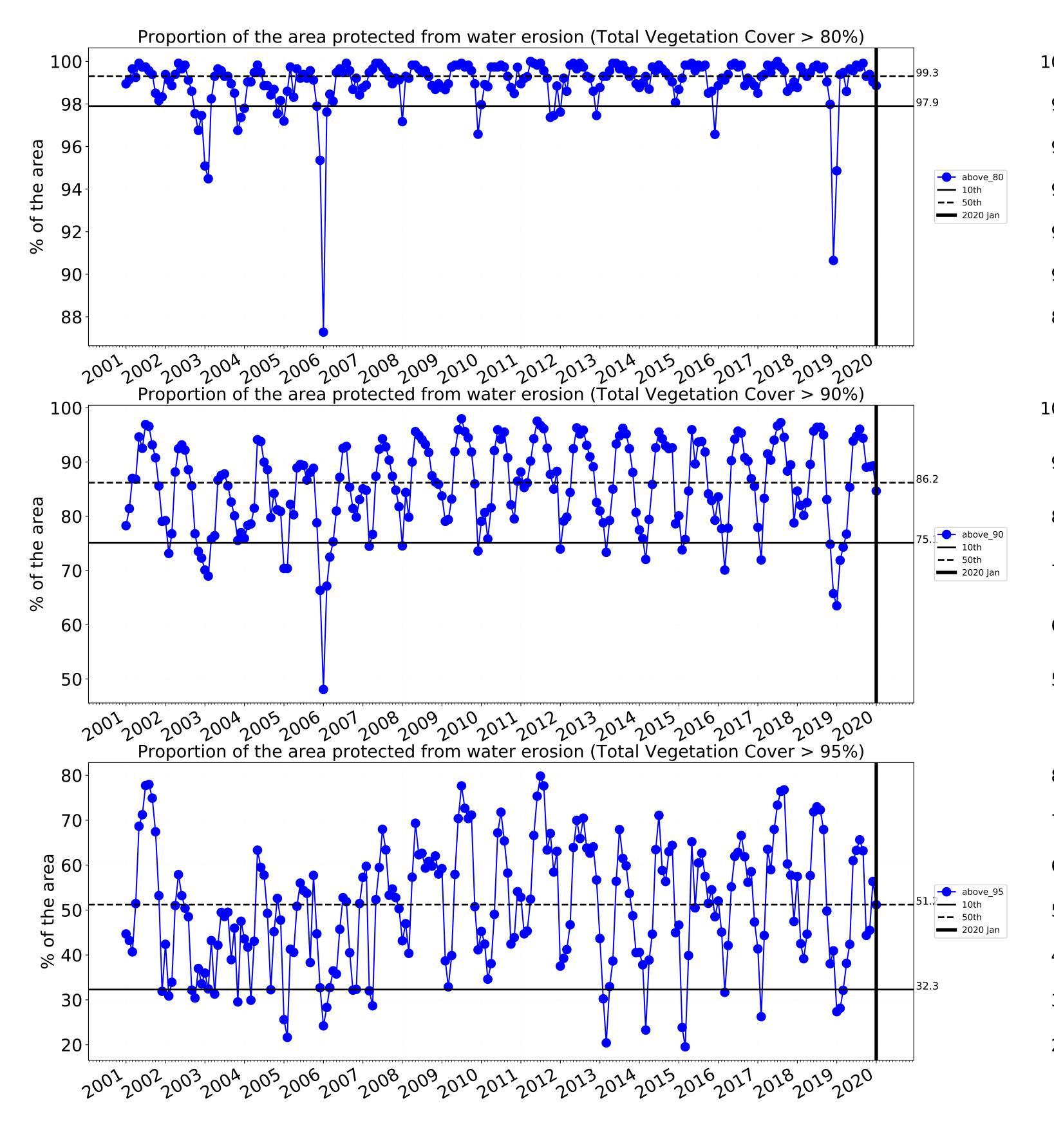


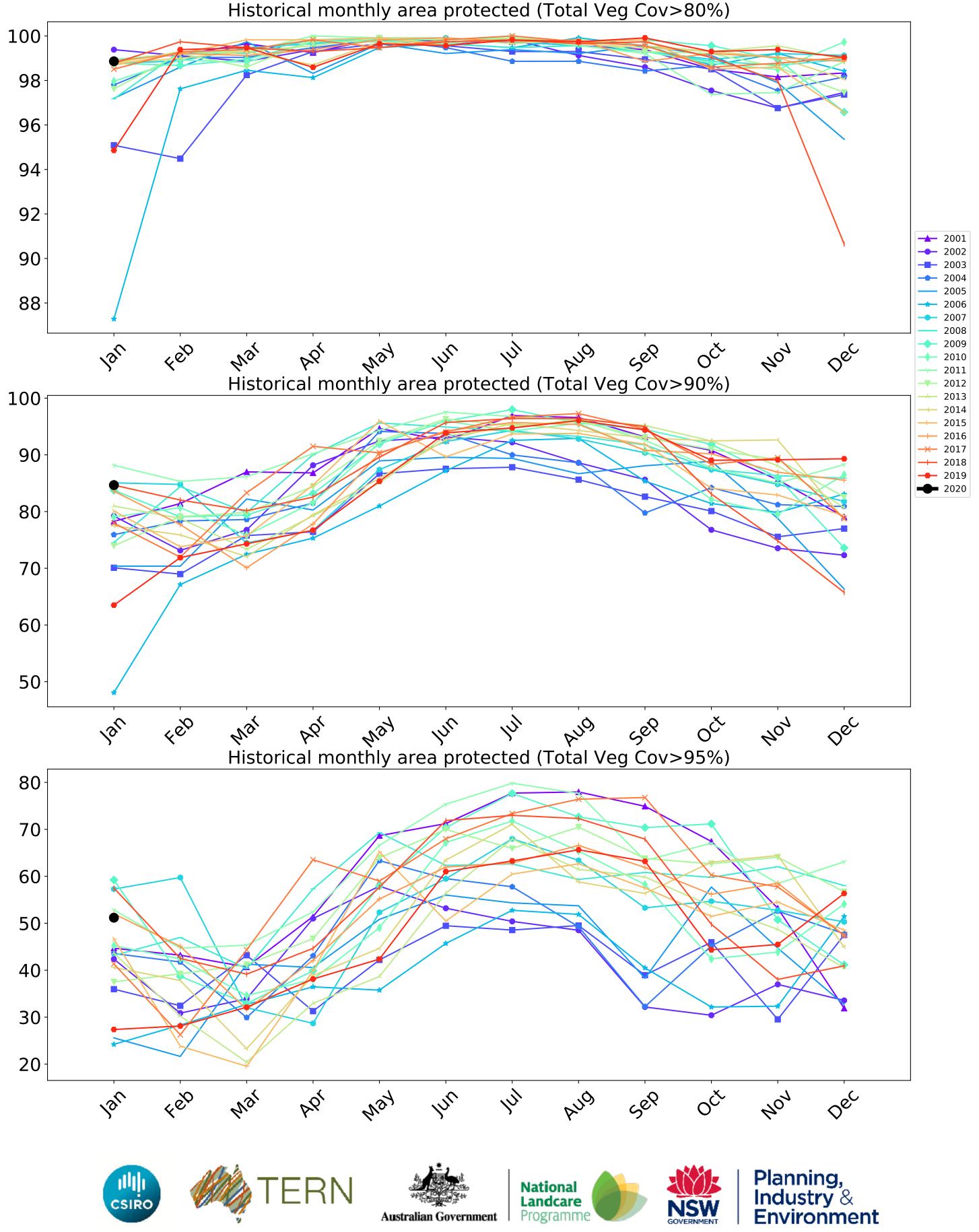
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.00-99.75 99.50 --- above_70 **—** 10th **--** 50th 99.25 **——** 2020 Jan 99.00 98.75 98.50 98.25 feb lar In May PQ' Mai month ERN CSIRO Australian Government

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



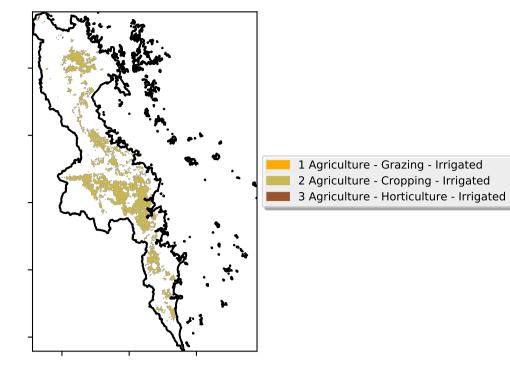




Irrigation

Land use and forest cover

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



1 Agriculture - Grazing - Irrigated

2 Agriculture - Cropping - Irrigated

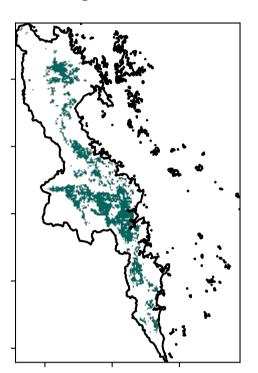
12%200%

· 52°10'TOON

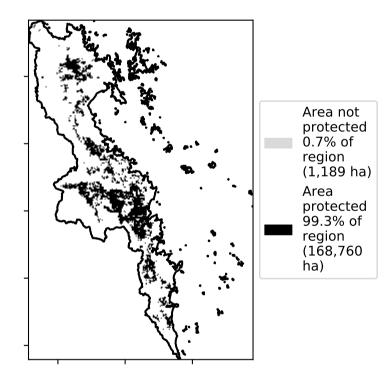
3201050010

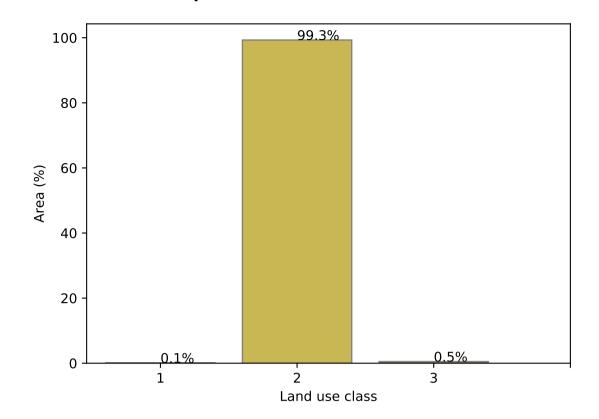
0.30%

Total Vegetation Cover [%]



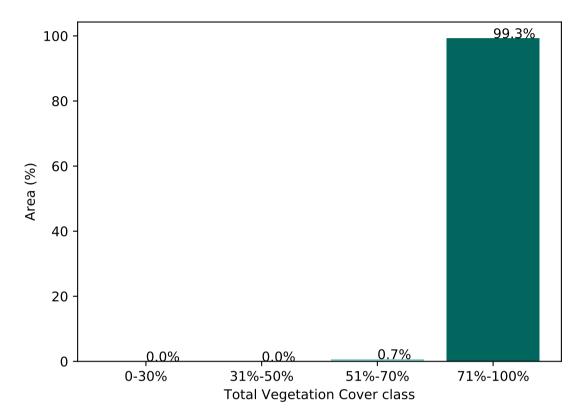
% Area protected from water erosion (>70%)





Proportion of each land class in area

Proportion of vegetation cover class in area

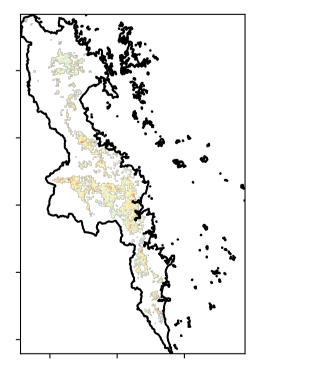


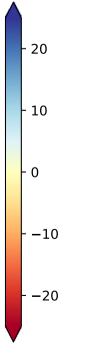
% Area protected from wind erosion (>50%)

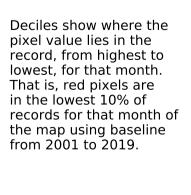


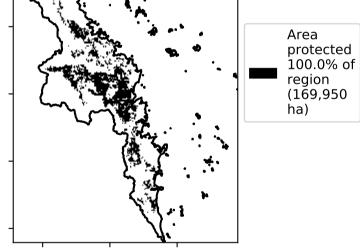
Total Vegetation Cover Anomaly [%]

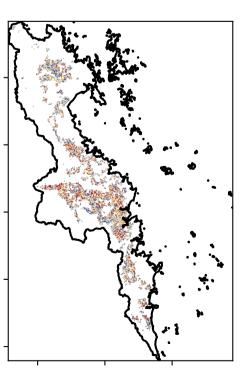
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





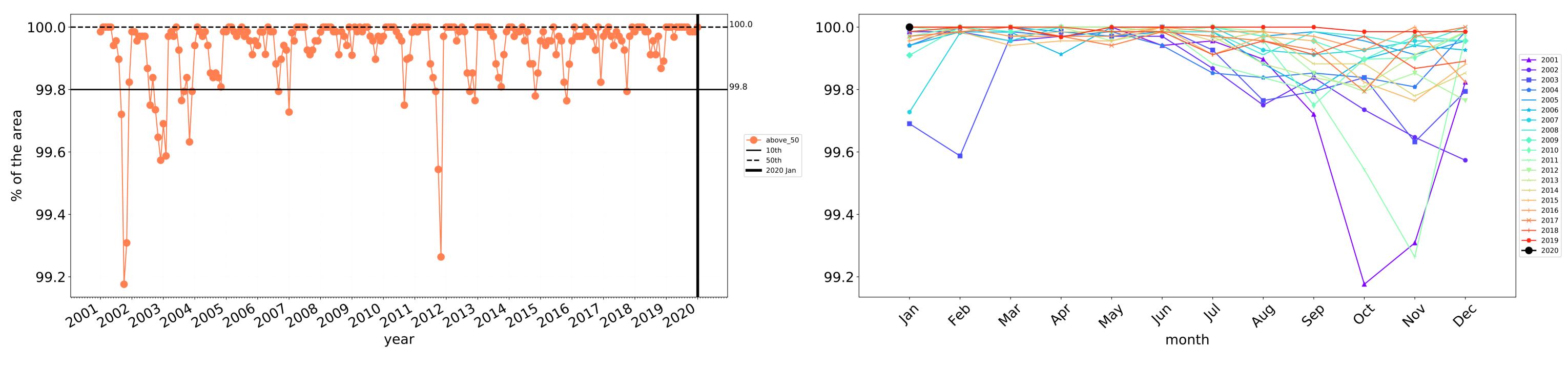






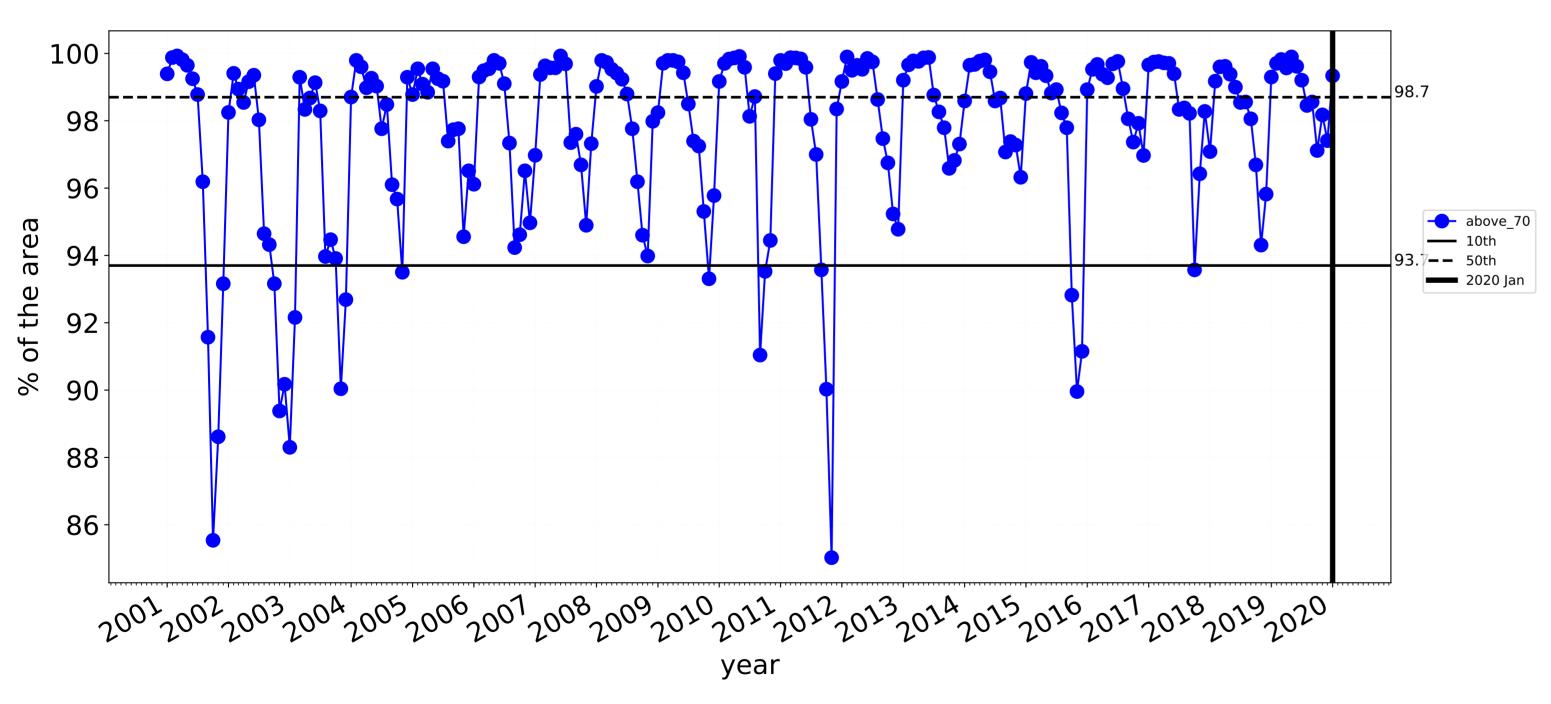




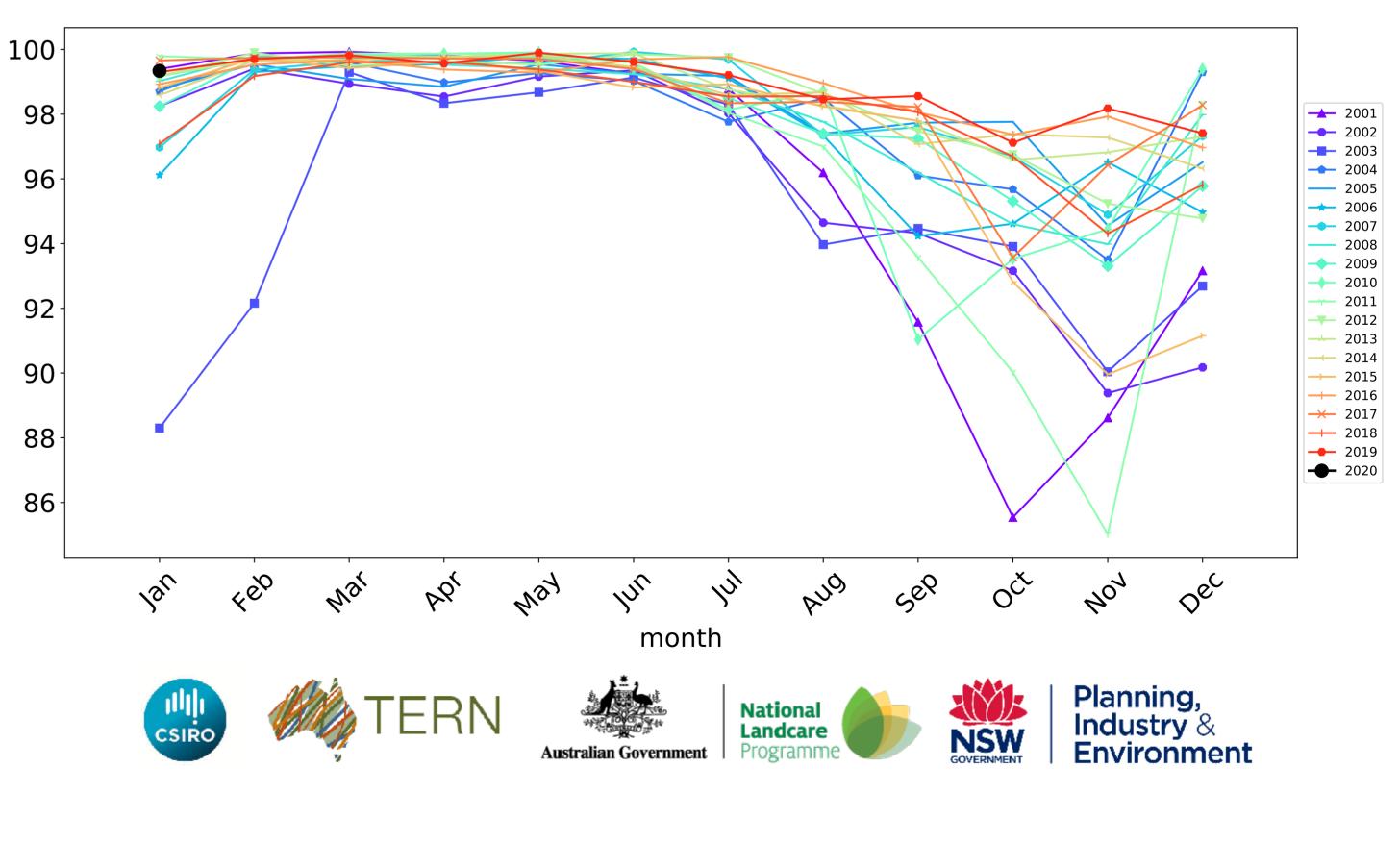


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

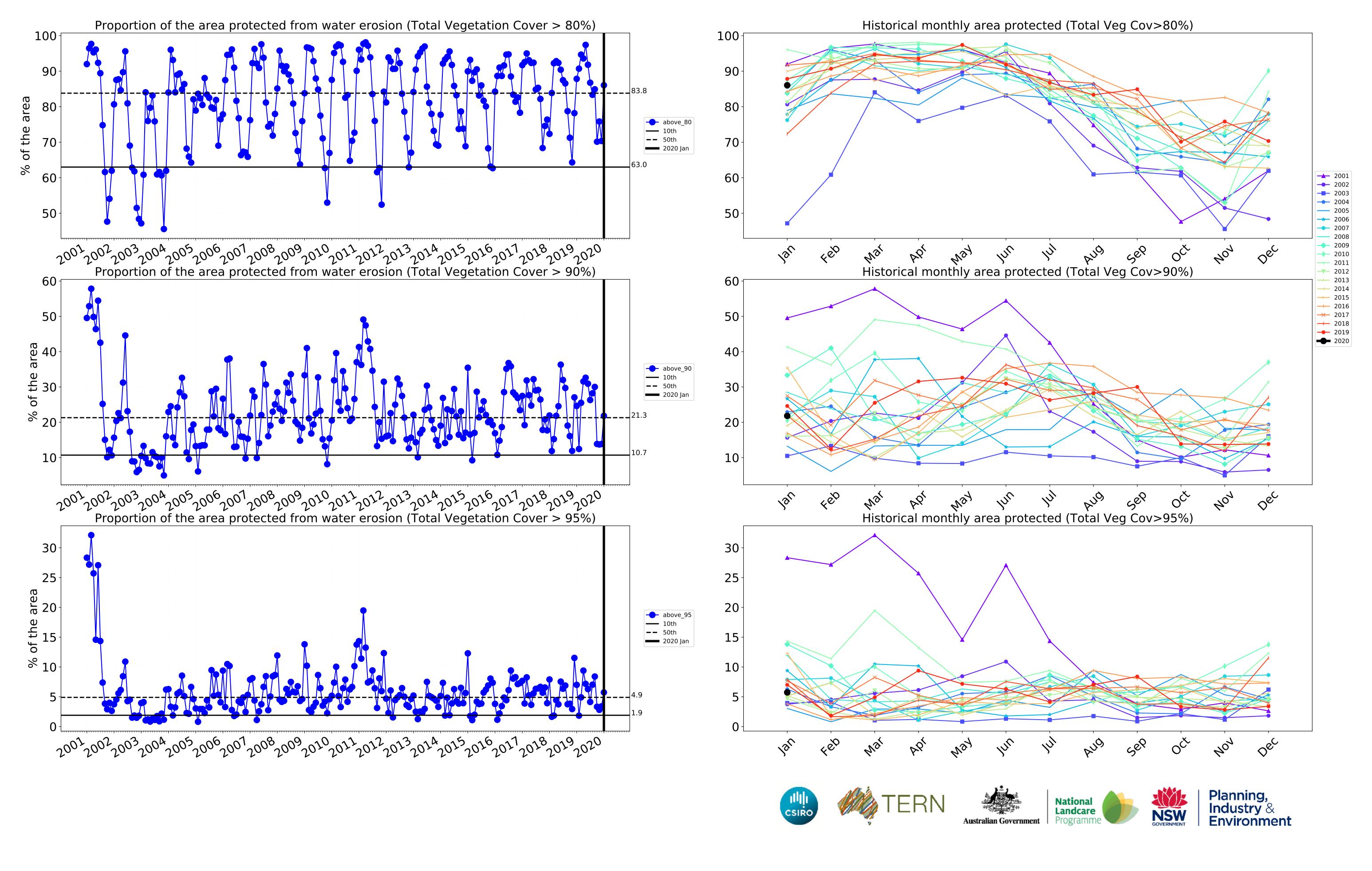




Wind erosion historical monthly area protected (Total Veg Cov >50%)

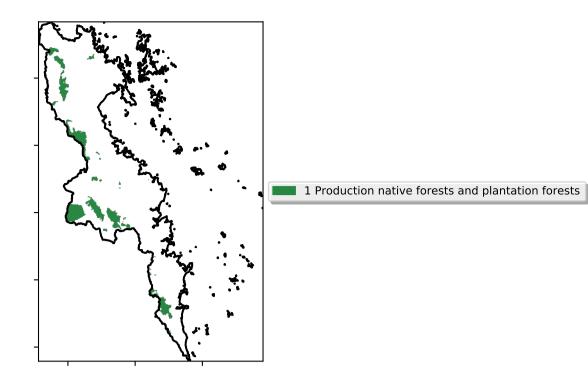


Water erosion historical monthly area protected (Total Veg Cov>70%)

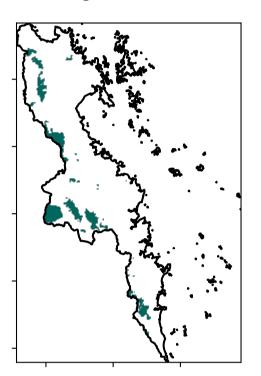


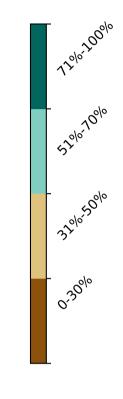
Production native forests and plantation forests

Land use and forest cover

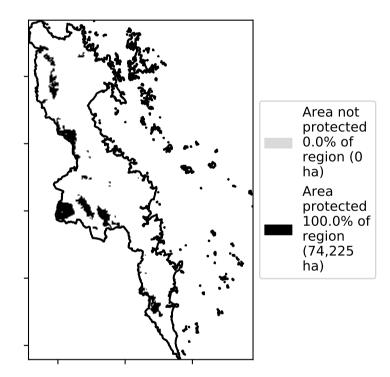


Total Vegetation Cover [%]

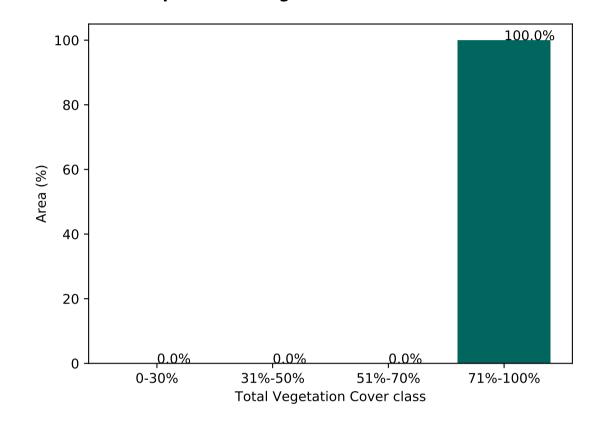




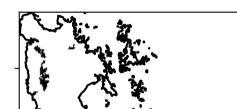
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



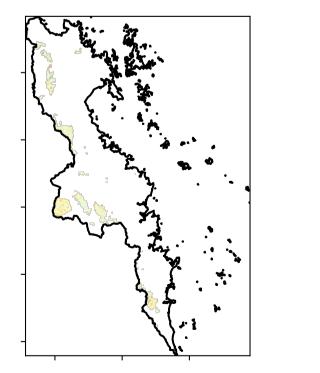
% Area protected from wind erosion (>50%)

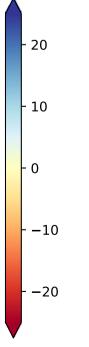


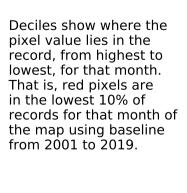
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

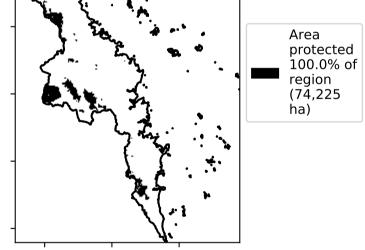
Total Vegetation Cover Anomaly [%]

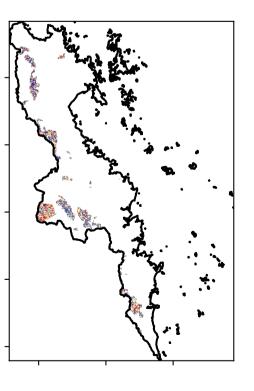
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

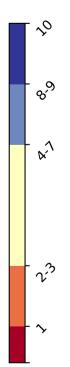




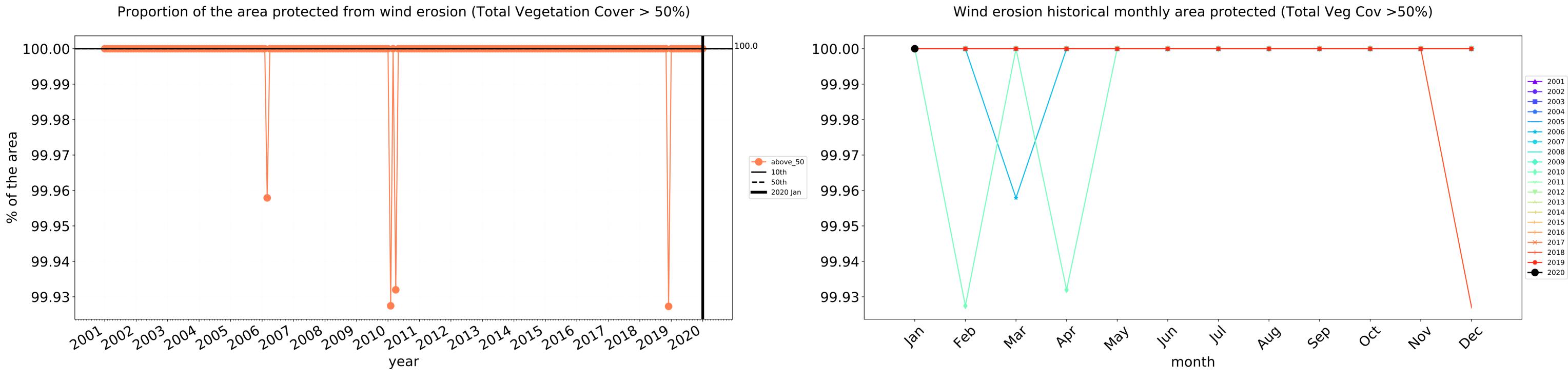




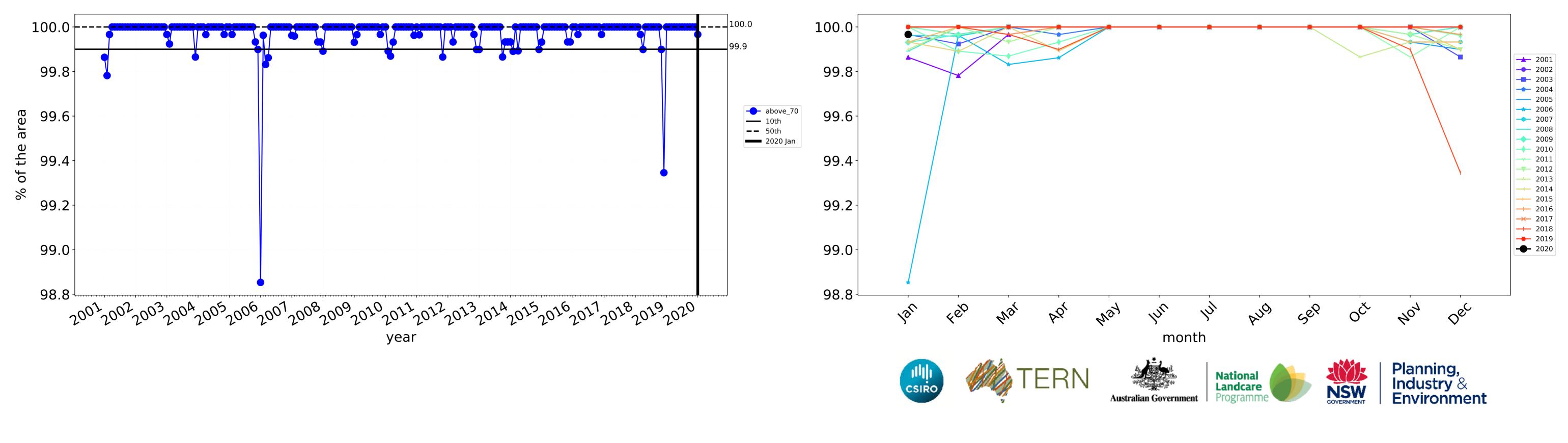




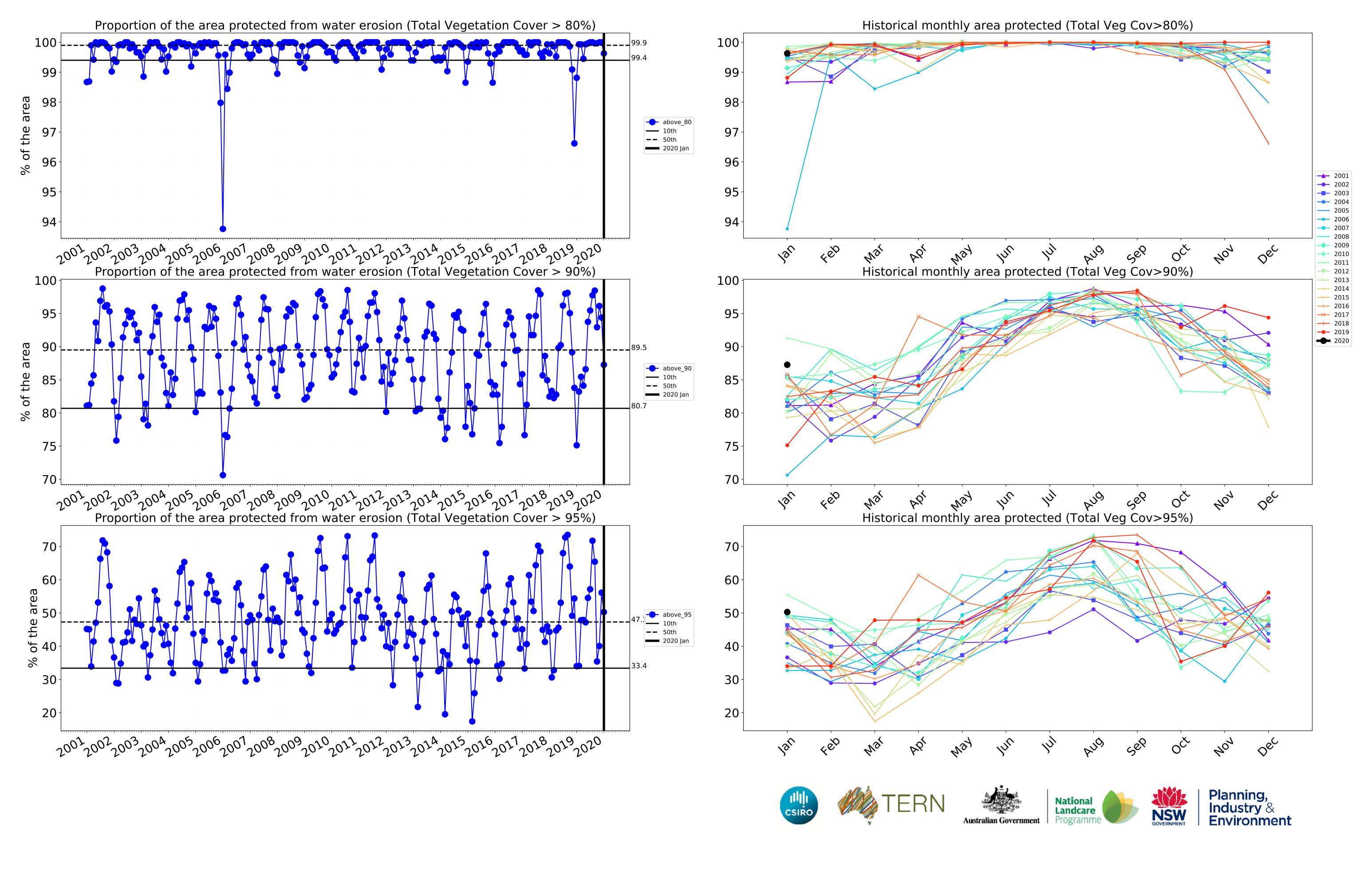




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Mackay Whitsunday (900,125 ha and no data 32,935 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	900,125	99.9% 899,150	99.6% 896,600	97.9% 880,900	91.8% 826,450	60.4% 543,575	31.5% 283,425
Conservation and natural environments	270,125	99.8% 269,650	99.5% 268,825	98.2% 265,325	95.7% 258,425	77.2% 208,450	43.0% 116,150
Conservation and natural environments non forest	7,125	98.2% 7,000	96.5% 6,875	90.2% 6,425	78.2% 5,575	50.2% 3,575	29.8% 2,125
Conservation and natural environments Woodland forest	74,000	99.8% 73,825	99.6% 73,675	98.4% 72,825	95.6% 70,725	76.2% 56,400	44.0% 32,575
Conservation and natural environments Forest (non woodland)	189,000	99.9% 188,825	99.6% 188,275	98.5% 186,075	96.4% 182,125	78.6% 148,475	43.1% 81,450
Agriculture	467,950	100.0% 467,900	100.0% 467,725	99.3% 464,625	92.6% 433,375	51.8% 242,400	25.2% 117,750
Grazing	297,950	100.0% 297,900	99.9% 297,725	99.3% 295,750	96.4% 287,100	68.9% 205,275	36.2% 107,975
Grazing non forest	188,875	100.0% 188,850	99.9% 188,700	99.2% 187,400	96.0% 181,325	64.1% 121,050	31.5% 59,475
Grazing Woodland forest	80,550	100.0% 80,550	100.0% 80,525	99.2% 79,875	96.3% 77,575	74.6% 60,075	42.1% 33,900
Grazing - Forest (non woodland)	28,525	99.9% 28,500	99.9% 28,500	99.8% 28,475	98.9% 28,200	84.7% 24,150	51.2% 14,600
Irrigation	169,950	100.0% 169,950	100.0% 169,950	99.3% 168,825	86.0% 146,225	21.8% 37,075	5.7% 9,750
Production native forests and plantation forests	74,225	100.0% 74,225	100.0% 74,225	100.0% 74,200	99.6% 73,950	87.3% 64,775	50.3% 37,325

