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

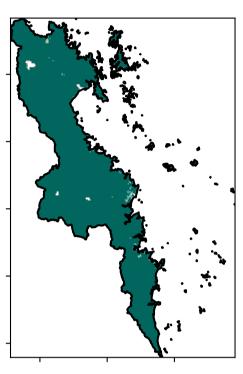


Vegetation Cover May 2021

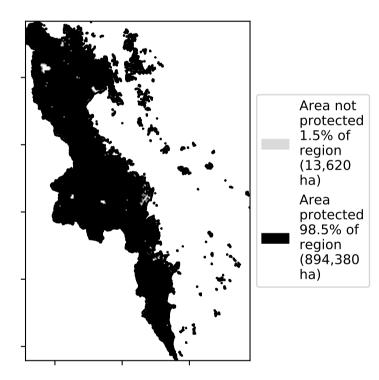
Land use and forest cover

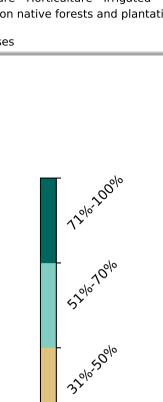
Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments -Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing -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



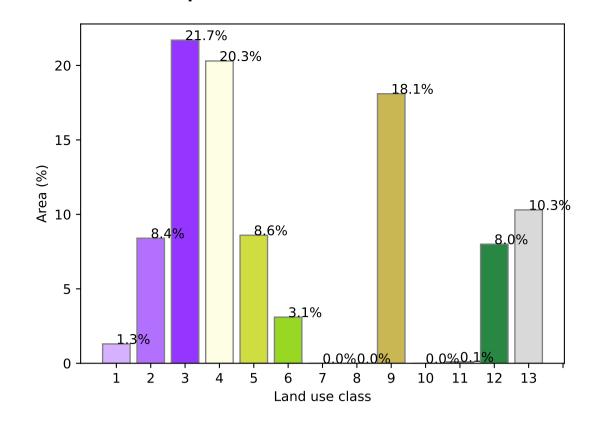
% Area protected from water erosion (>70%)



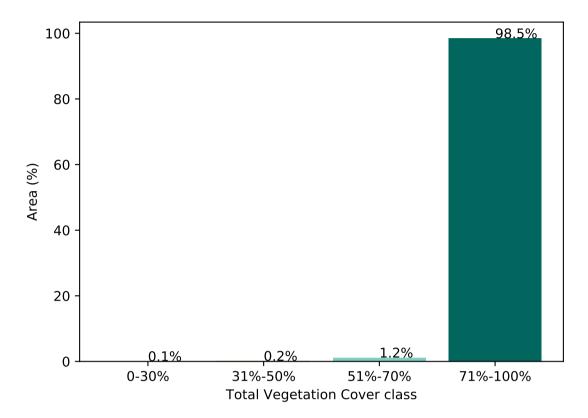


0-30%

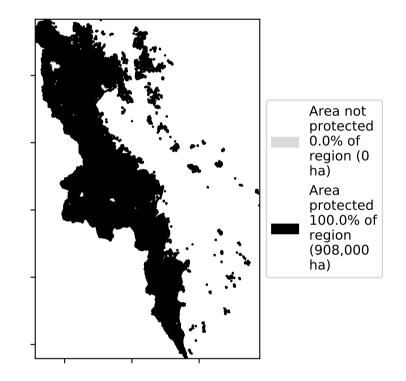
Proportion of each land class in area



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.

Catchment Scale

of Australia (2018)

(2018) and Forests

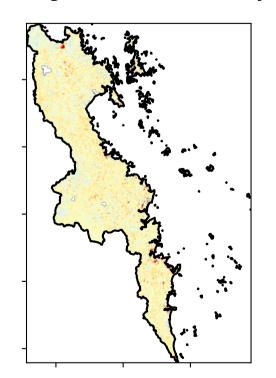
of Australia (2018)

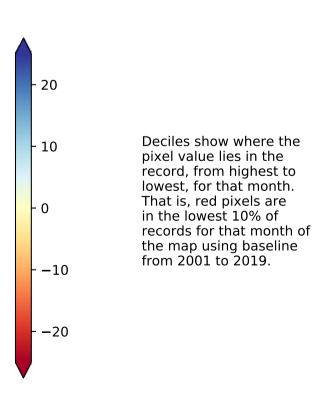
Derived from

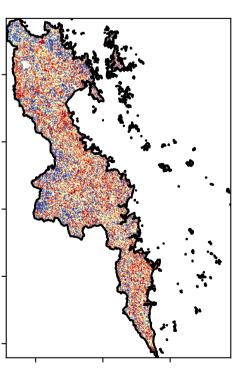
Use of Australia

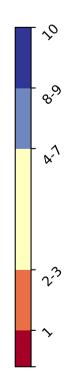
Land Use and Forests

Catchment Scale Land

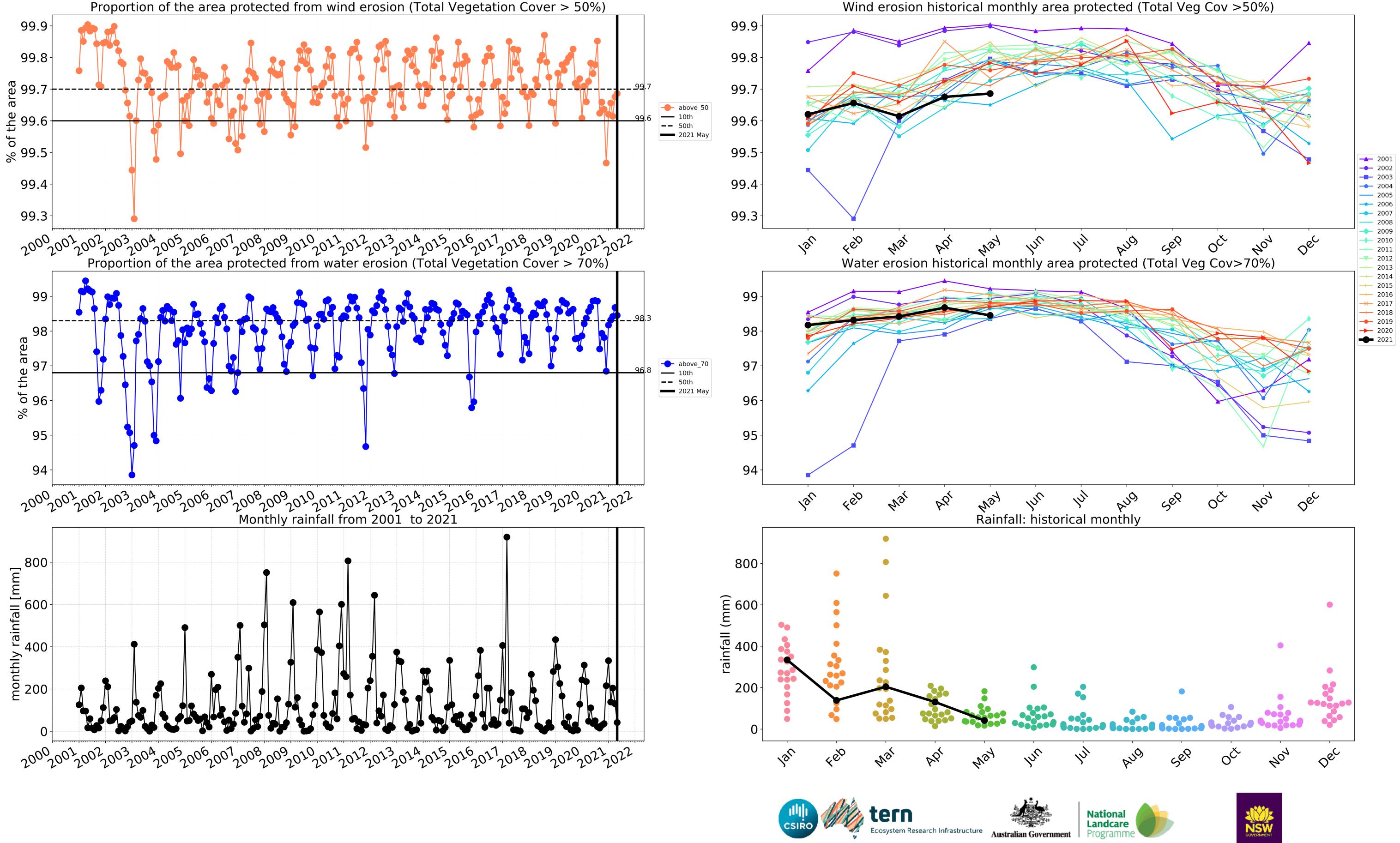


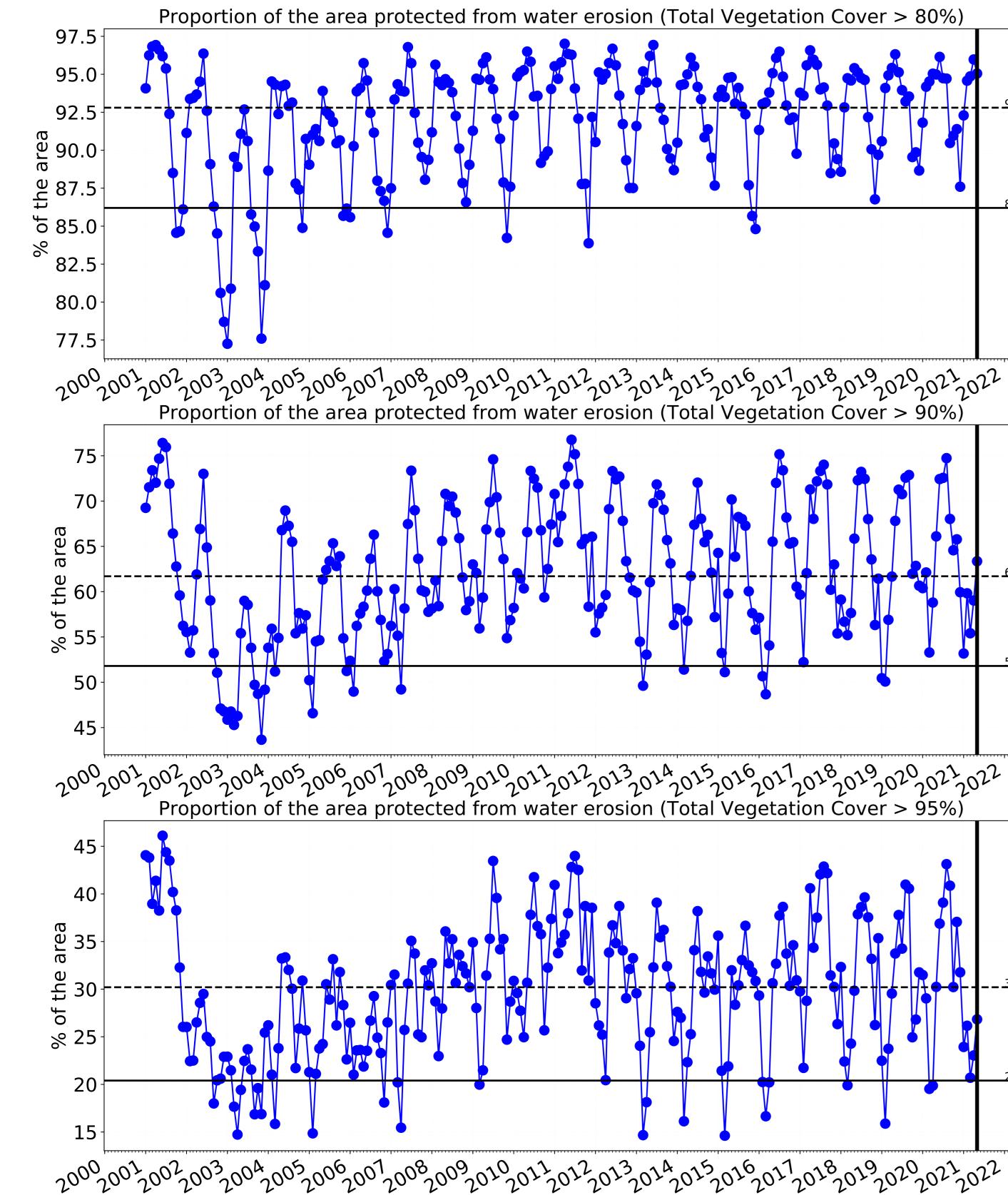


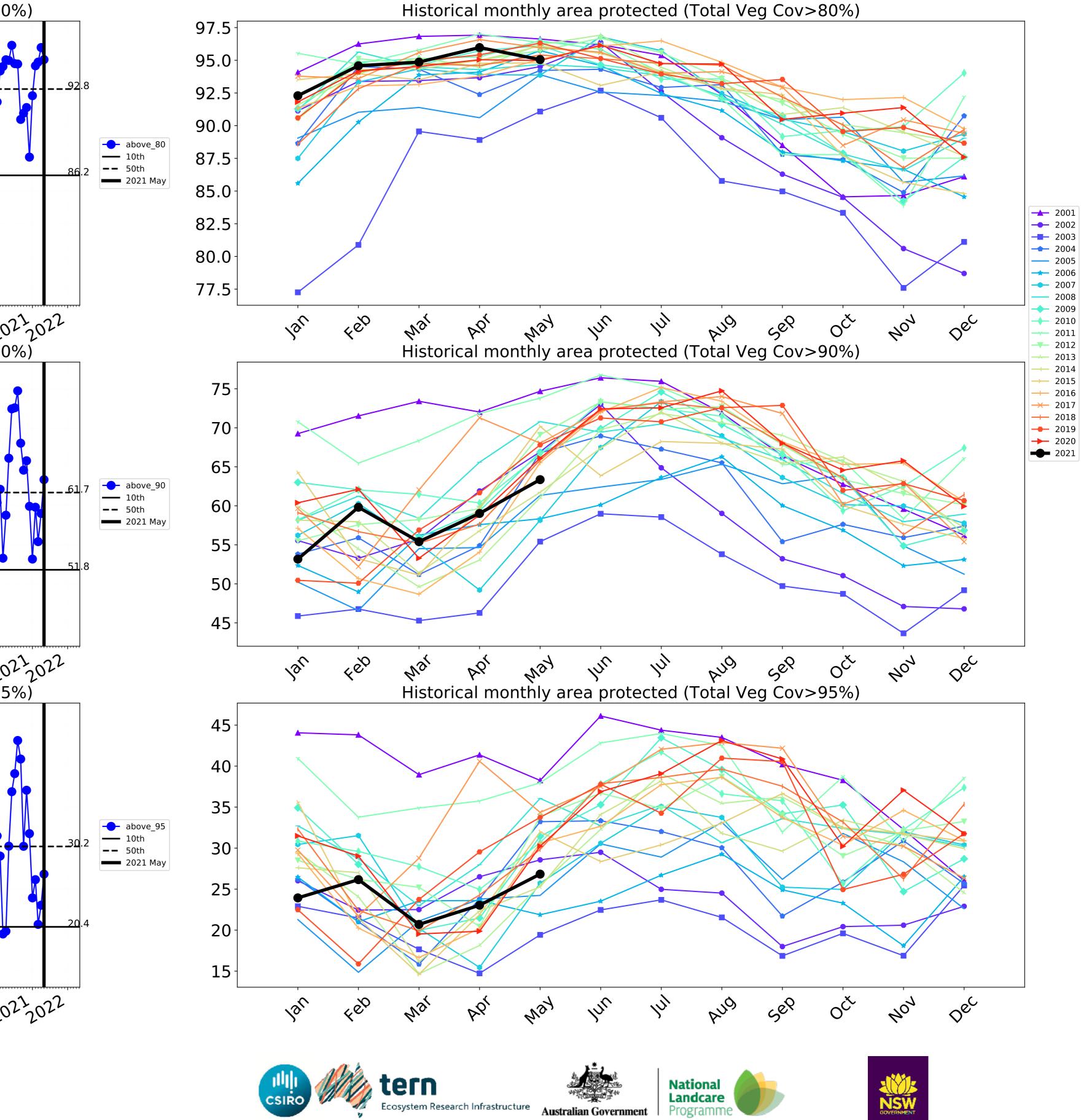












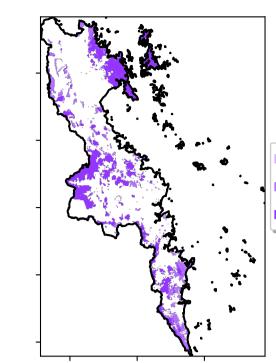


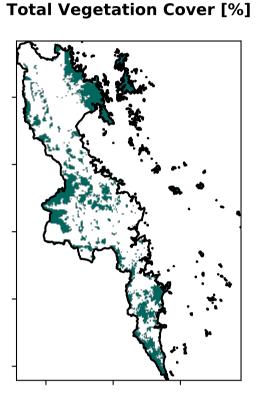
Conservation and natural environments

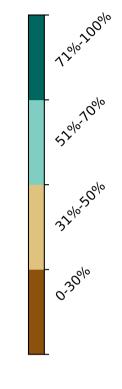
forest

forest

Land use and forest cover





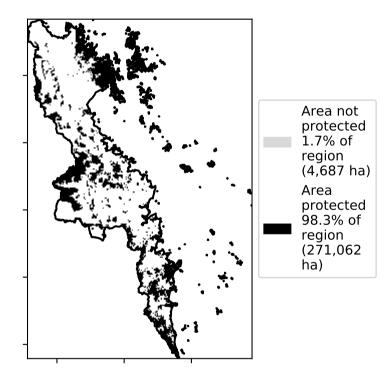


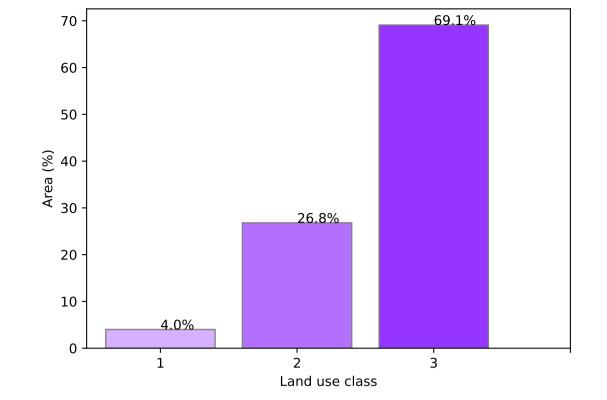
1 Conservation and natural environments - Non-

3 Conservation and natural environments - Non-woodland forest

2 Conservation and natural environments – Woodland

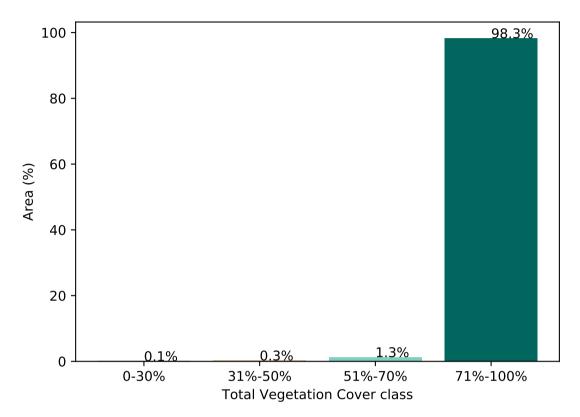
% Area protected from water erosion (>70%)



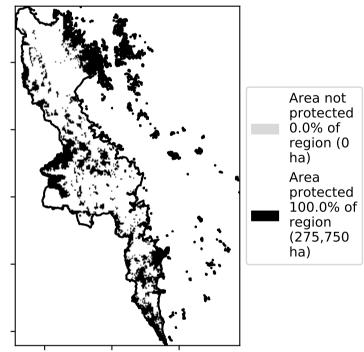


Proportion of each land class in area

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.

Catchment Scale Land Use and Forests

of Australia (2018)

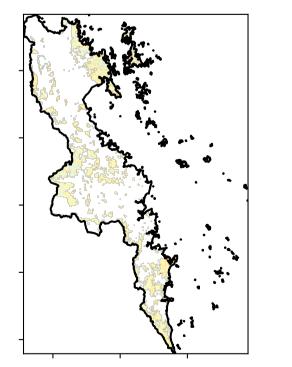
(2018) and Forests

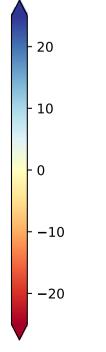
of Australia (2018)

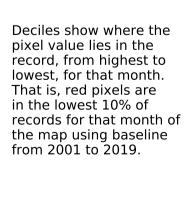
Catchment Scale Land

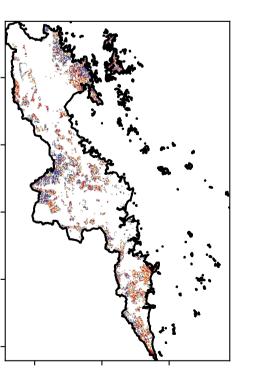
Derived from

Use of Australia



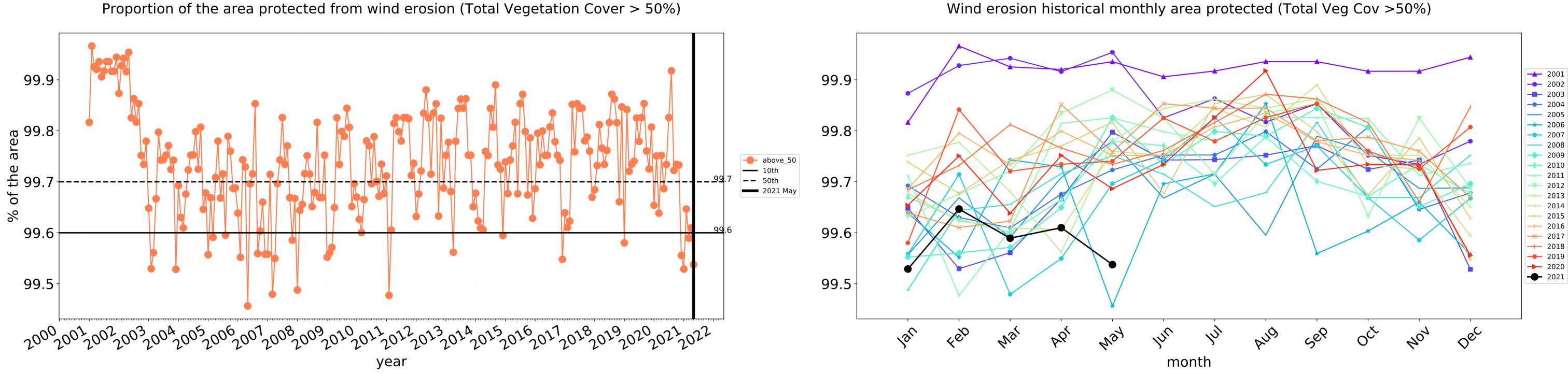






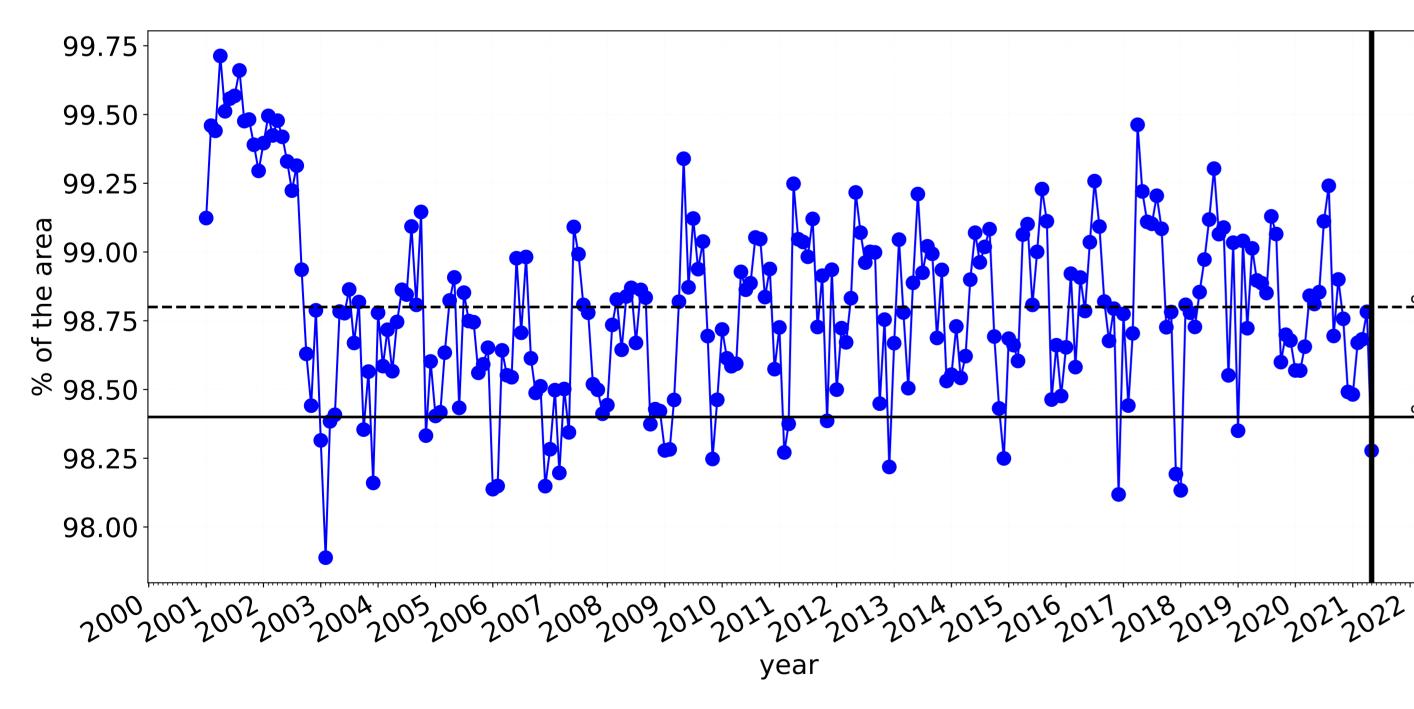






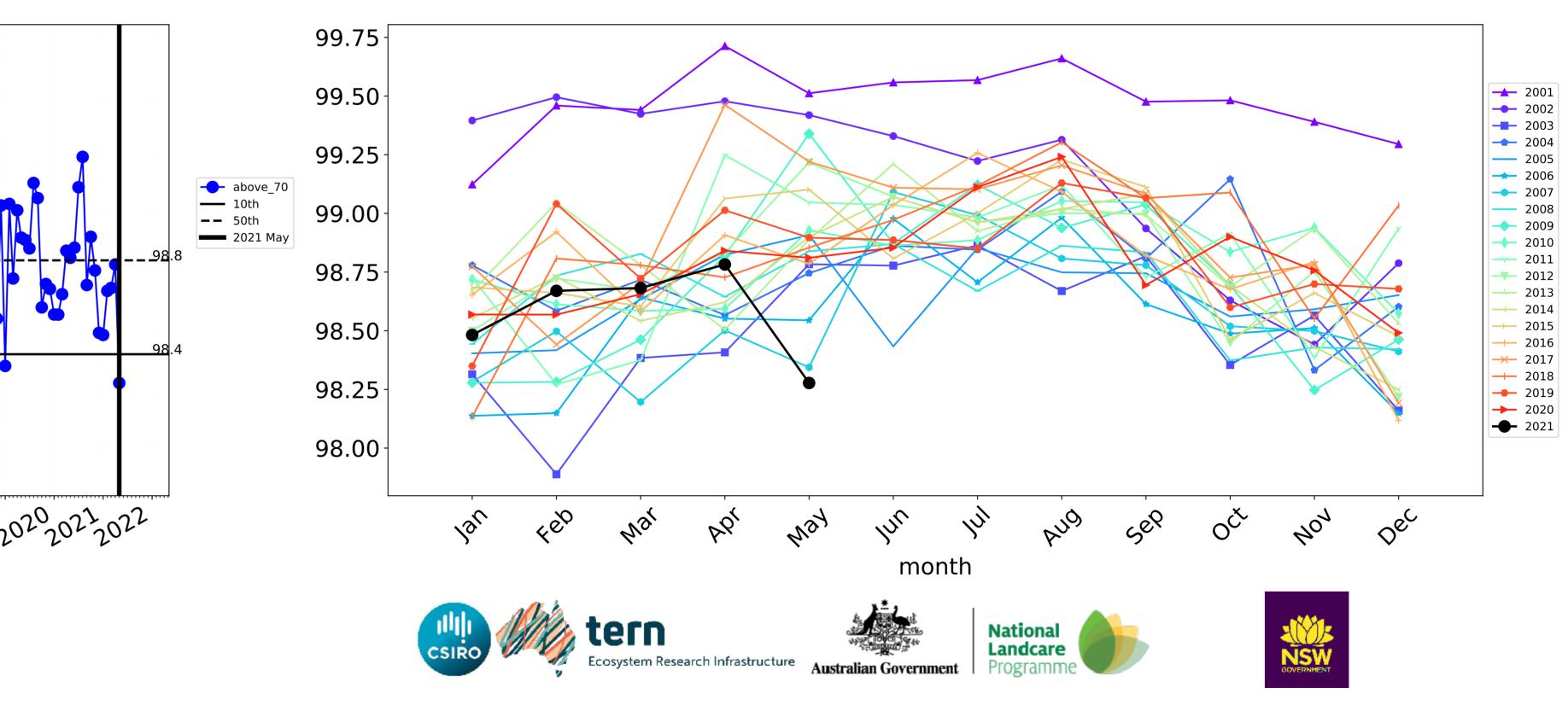
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

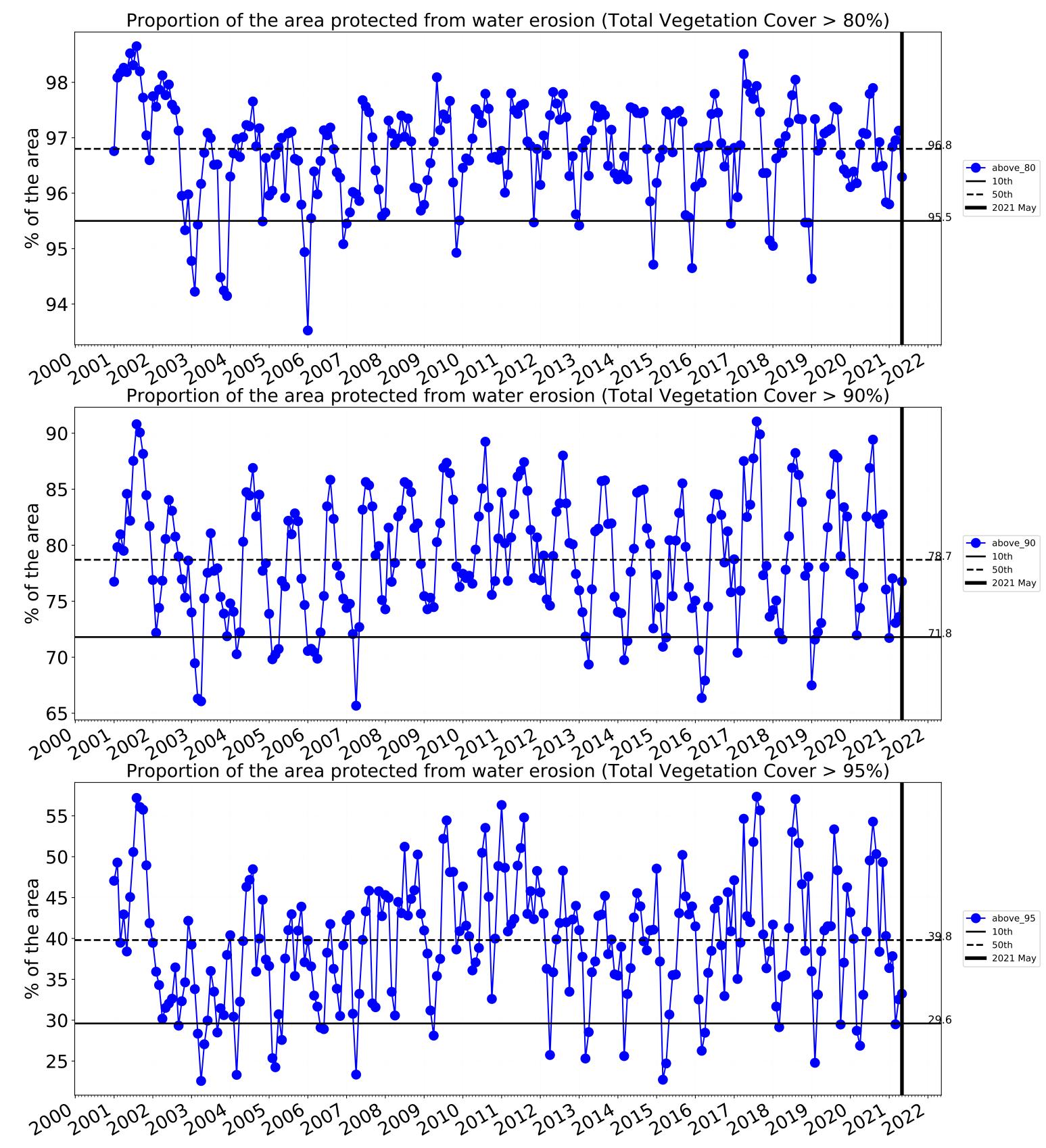
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

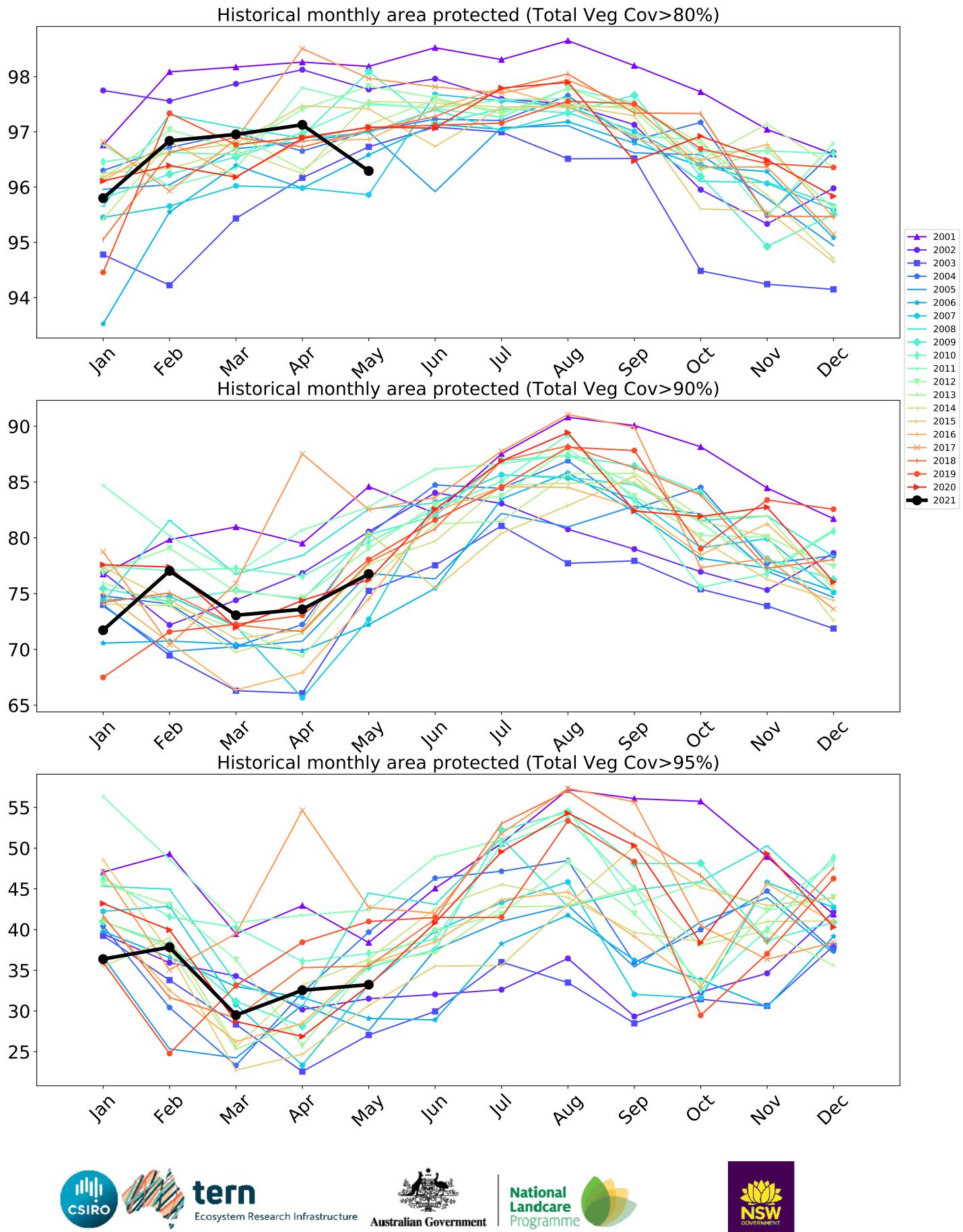


Conservation and natural environments timeseries

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



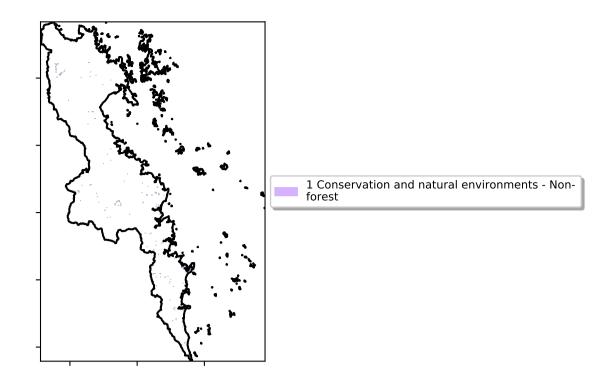




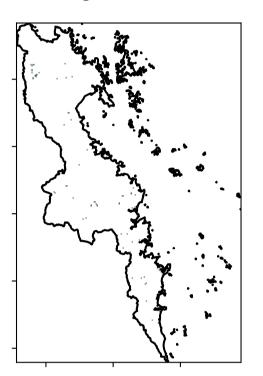


Conservation and natural environments non forest

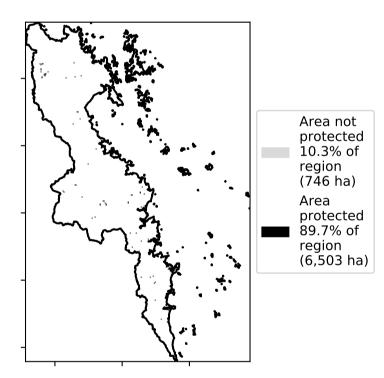
Land use and forest cover



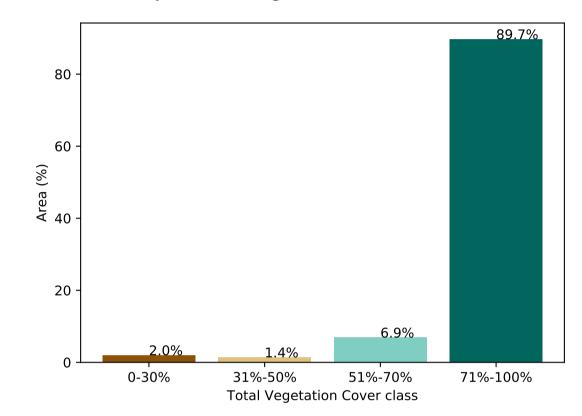
Total Vegetation Cover [%]



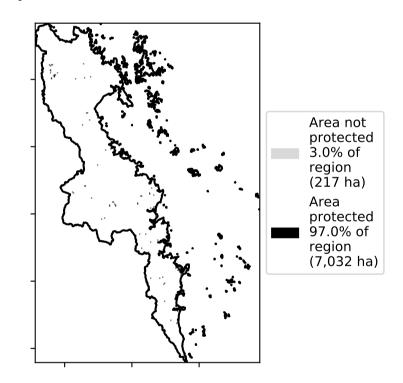






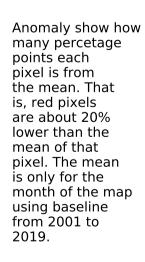


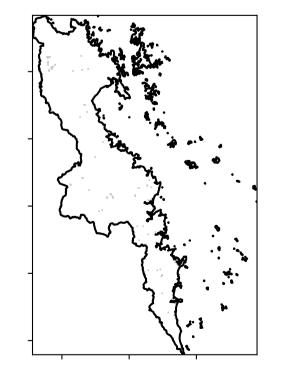
% Area protected from wind erosion (>50%)

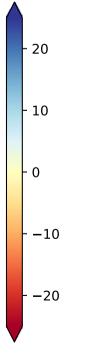


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Anomaly [%]





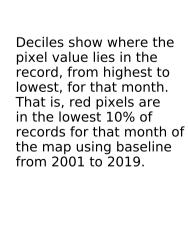


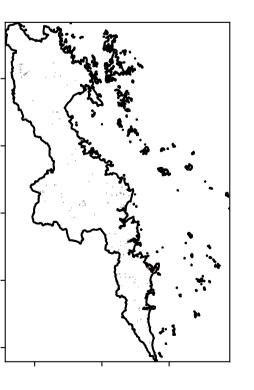
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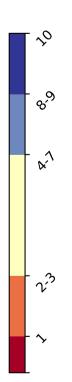
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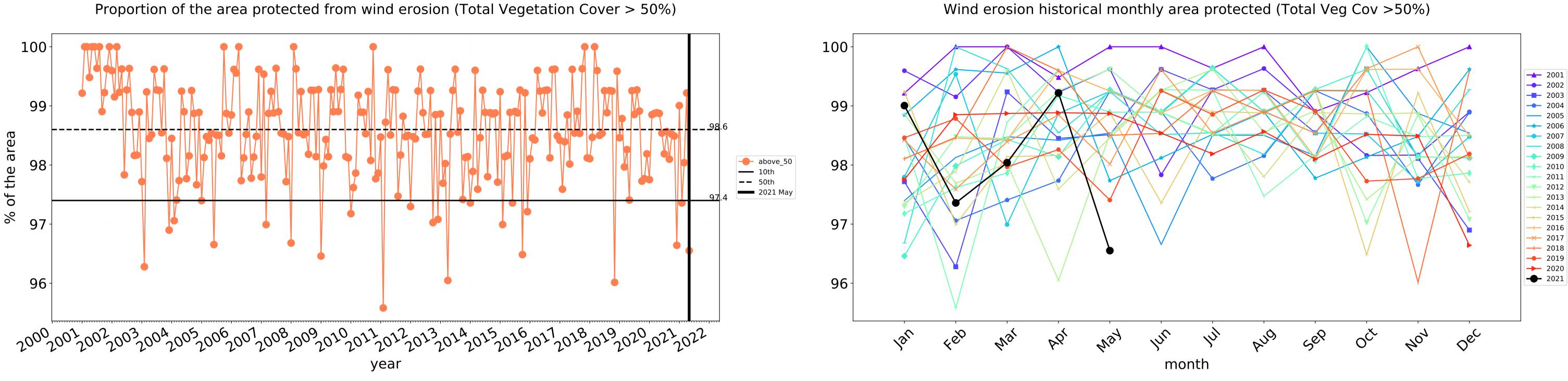
0.30%

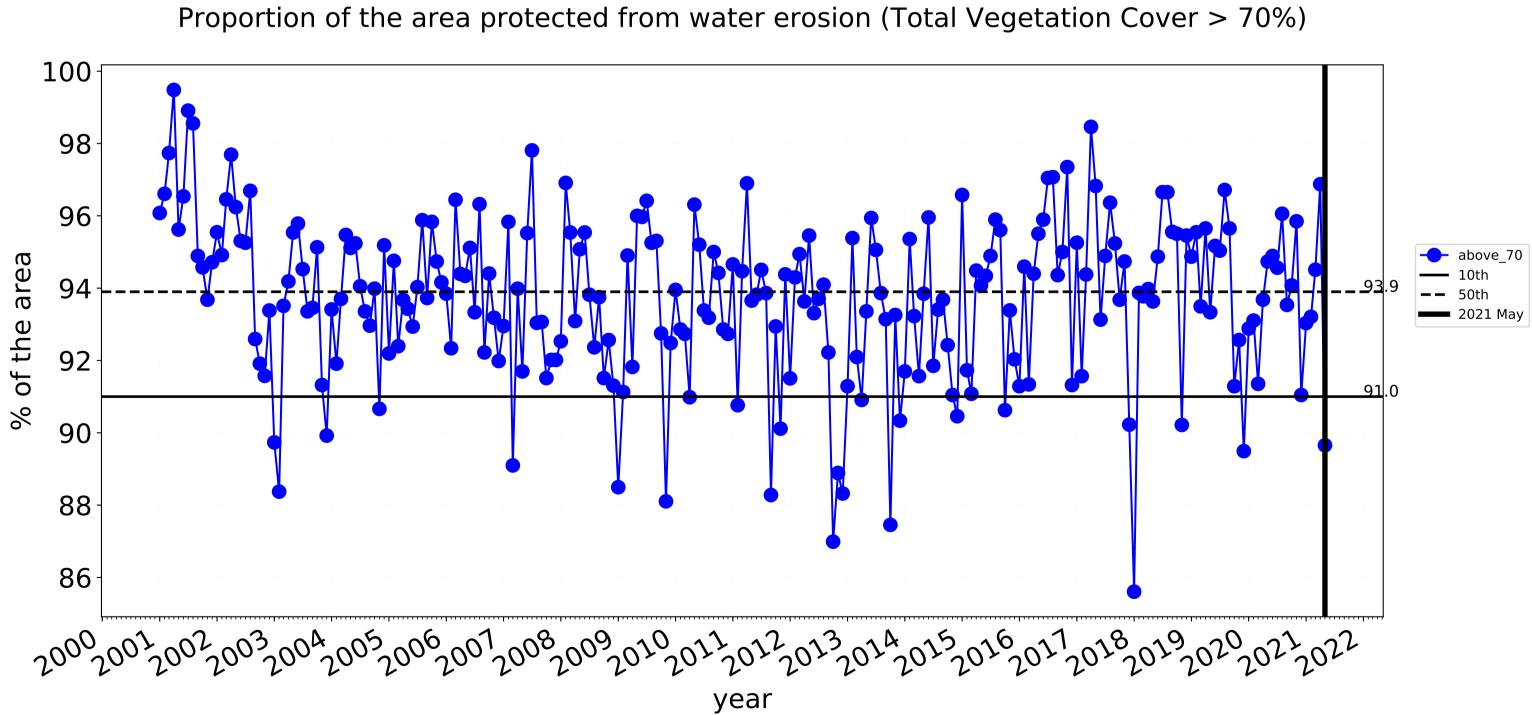




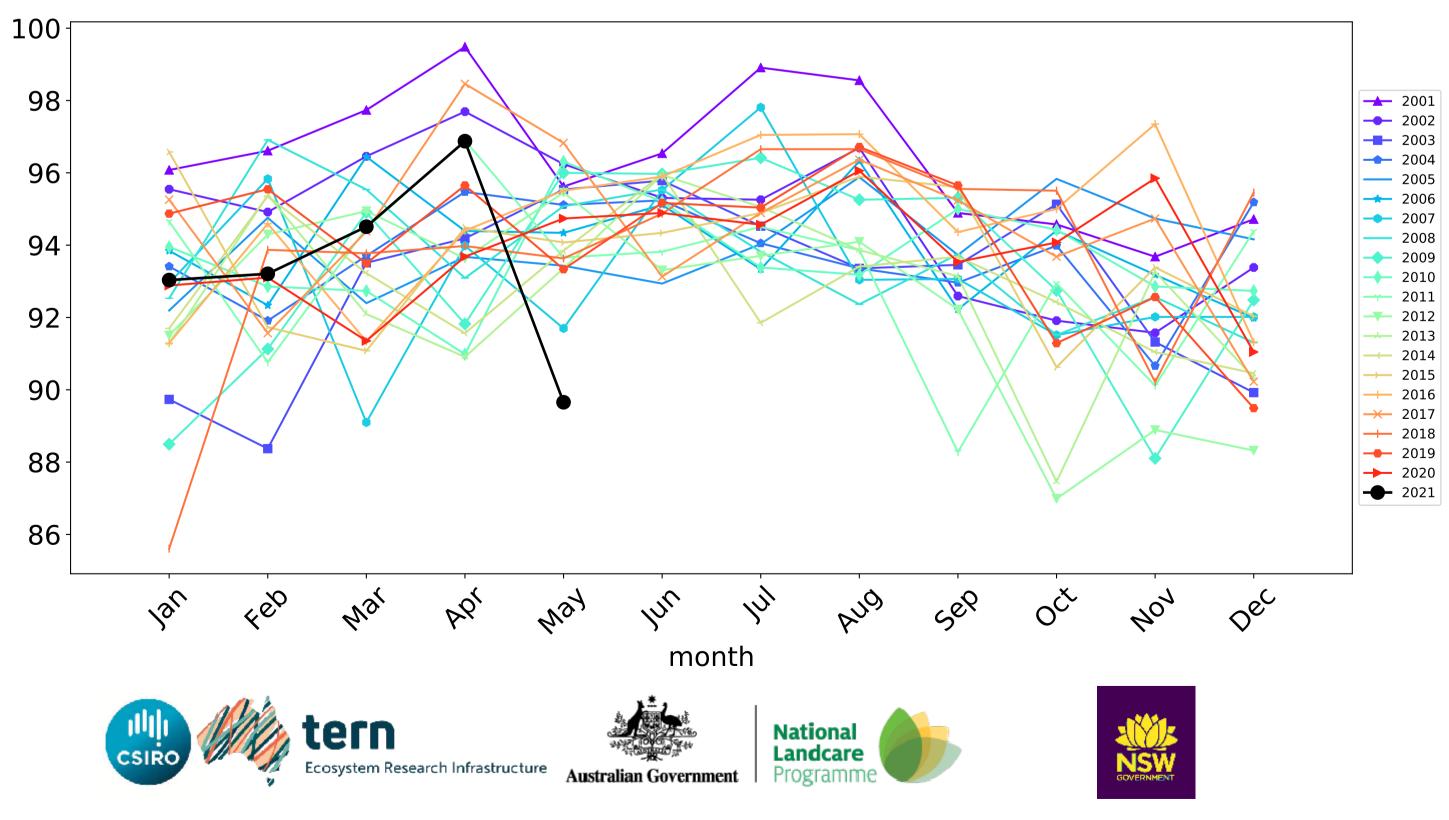


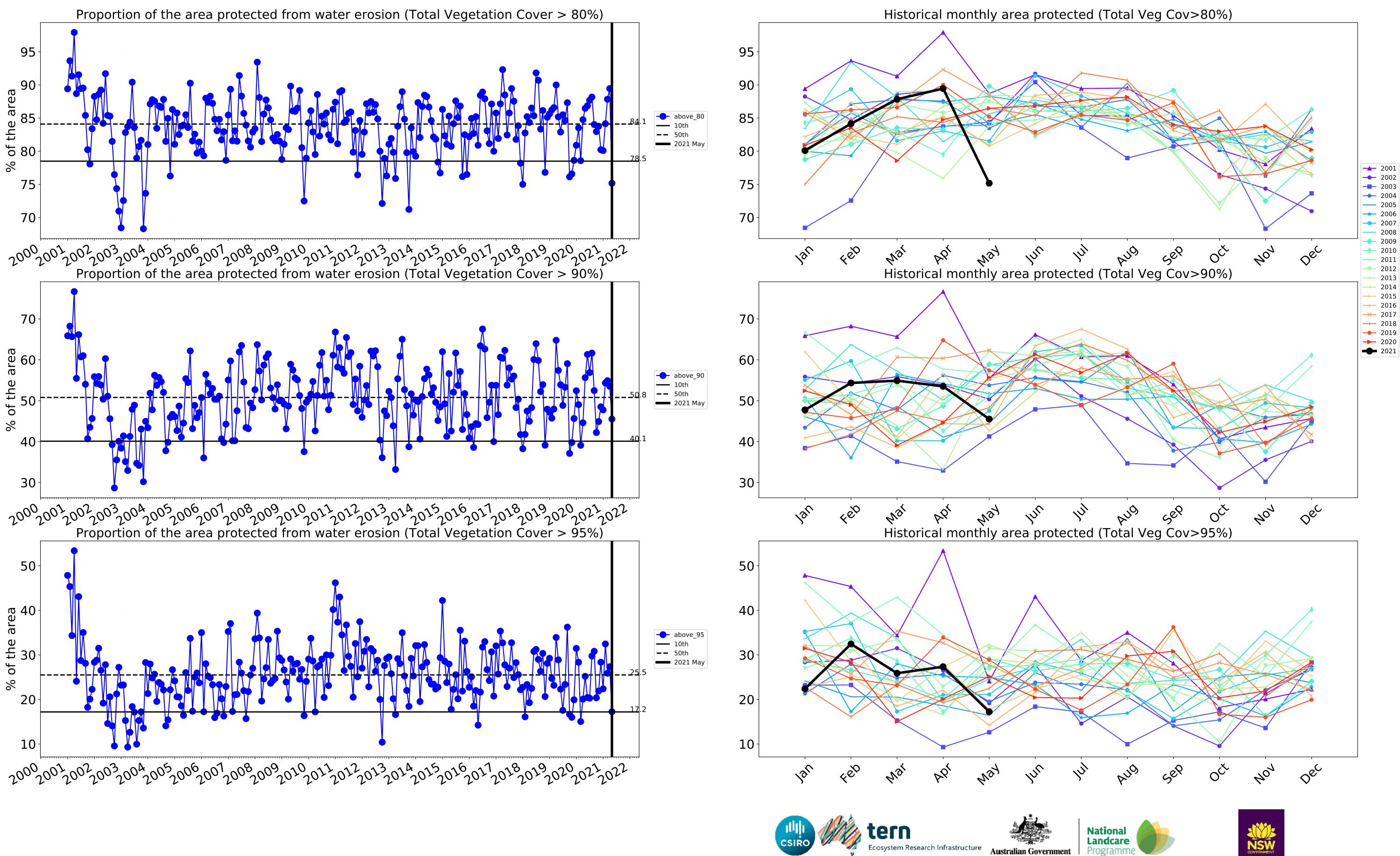






Water erosion historical monthly area protected (Total Veg Cov>70%)

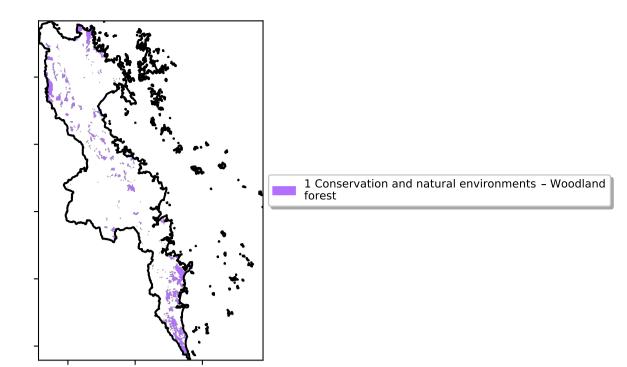




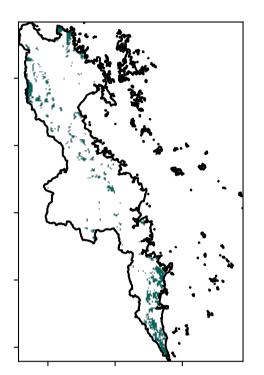


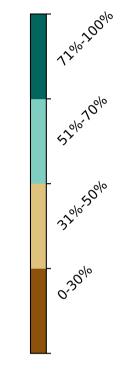
Conservation and natural environments Woodland forest

Land use and forest cover

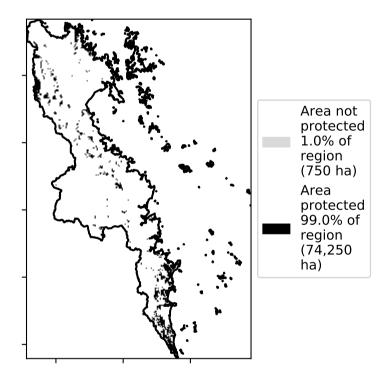


Total Vegetation Cover [%]

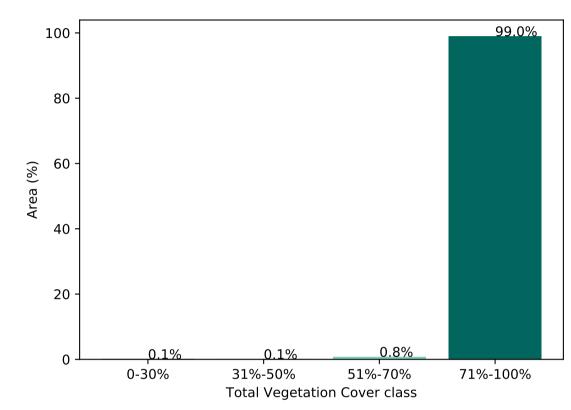




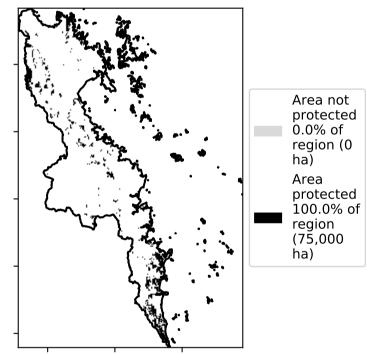
% Area protected from water erosion (>70%)







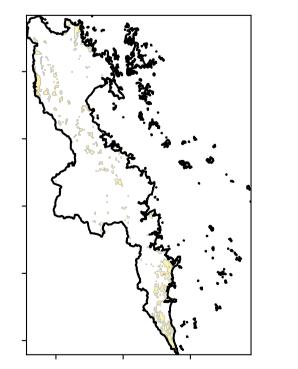
% Area protected from wind erosion (>50%)

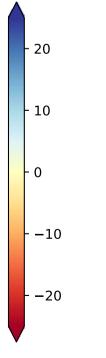


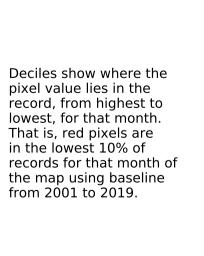
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

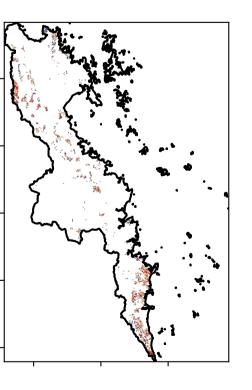
Total Vegetation Cover Anomaly [%]

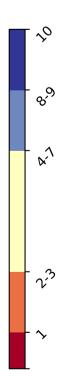
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



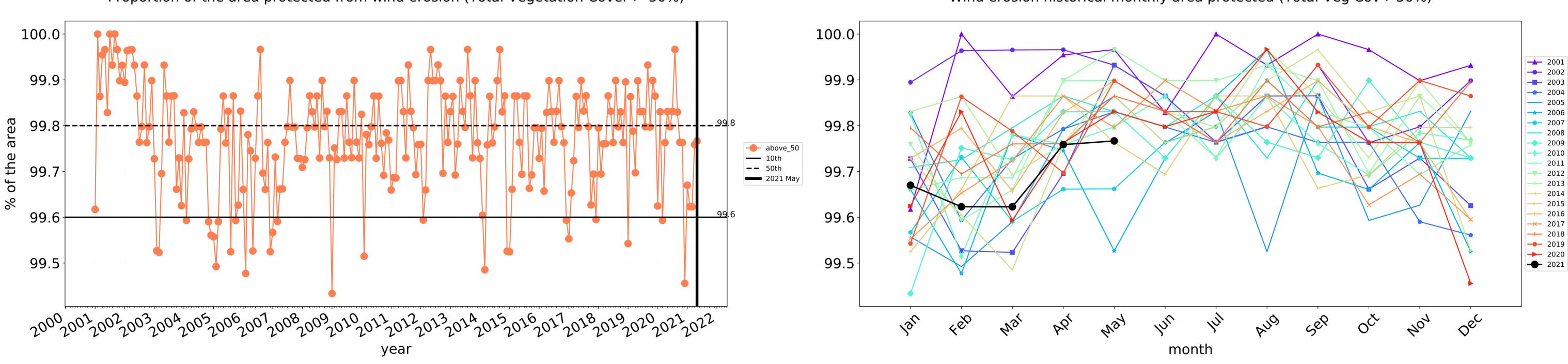






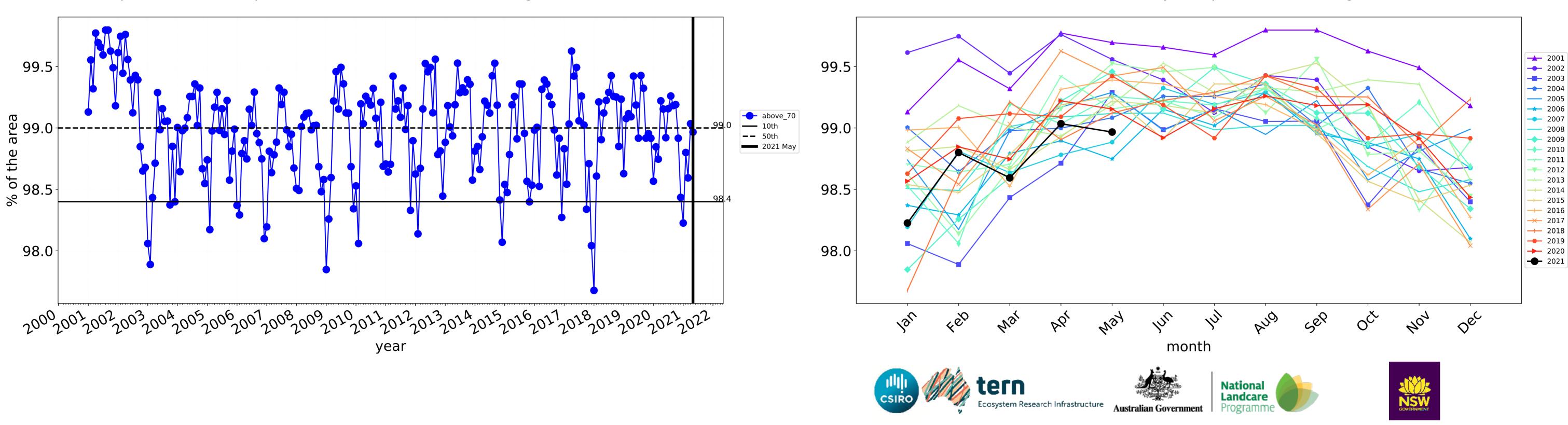






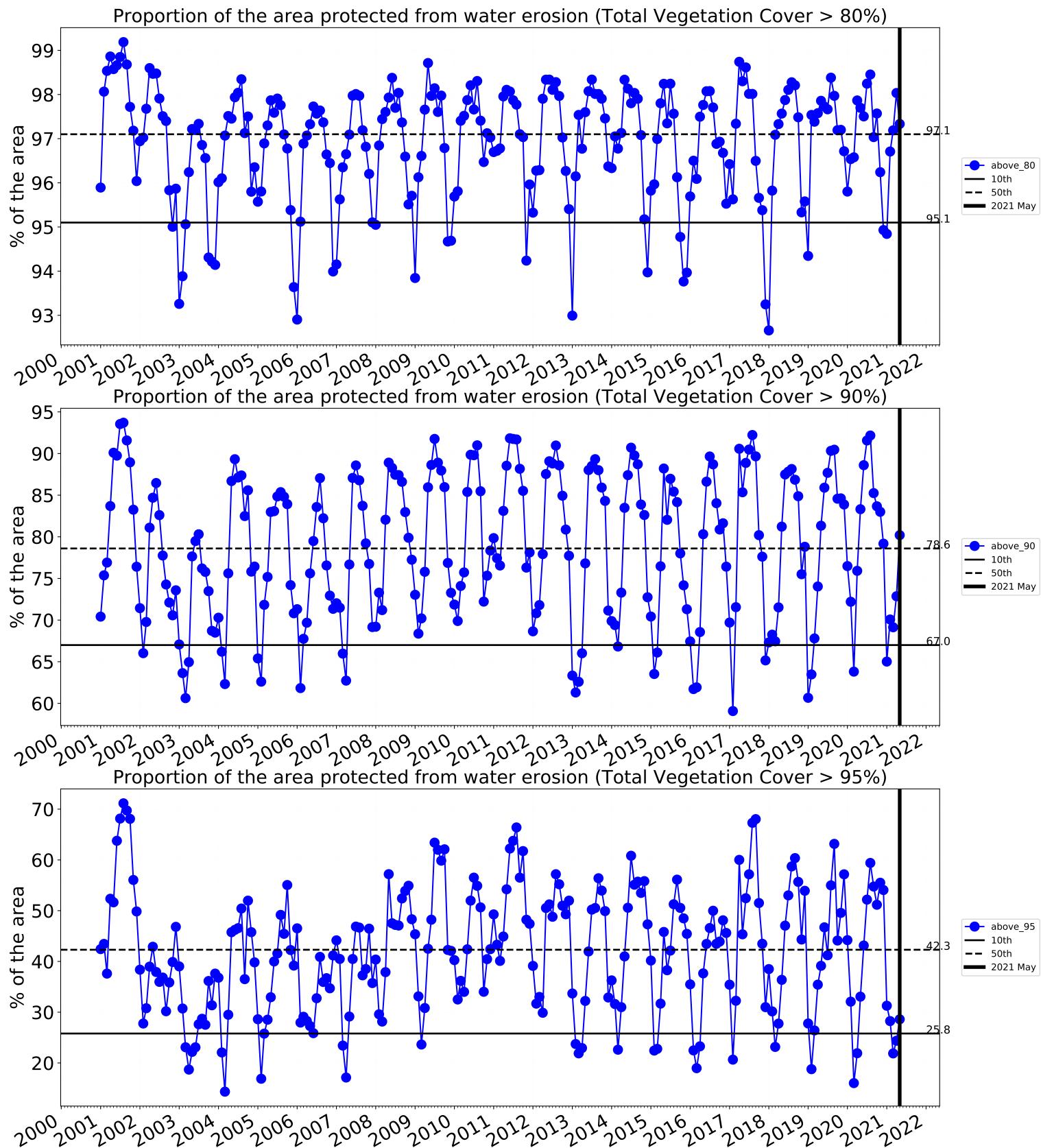
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

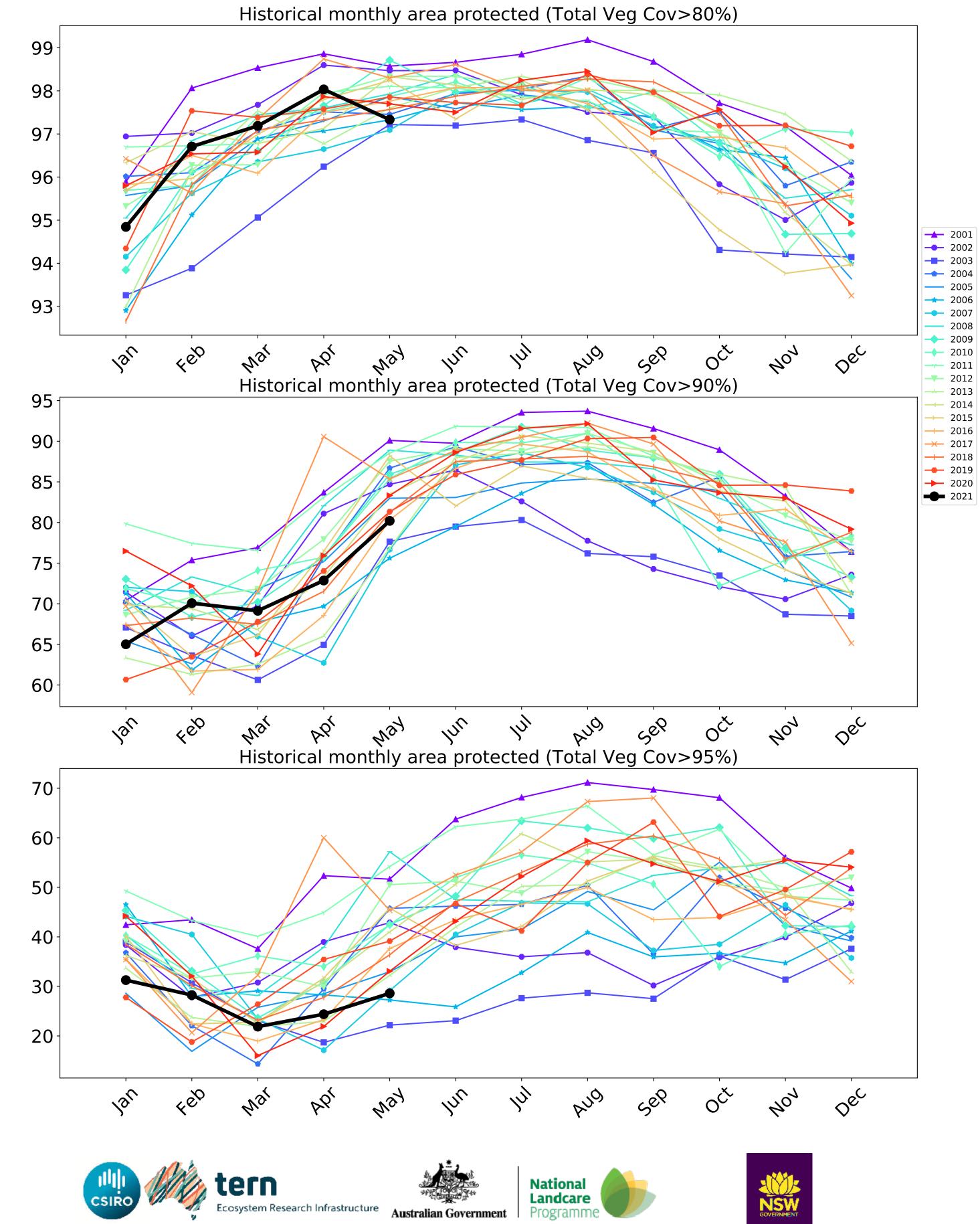
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

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

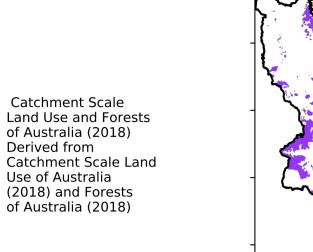






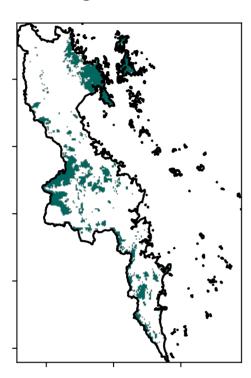
Conservation and natural environments Forest (non woodland)

Land use and forest cover

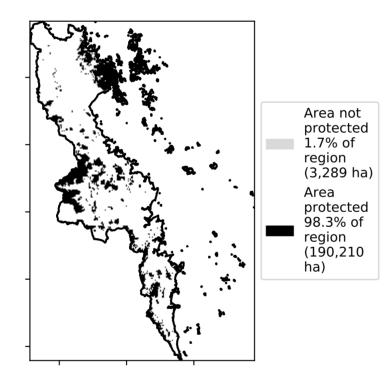


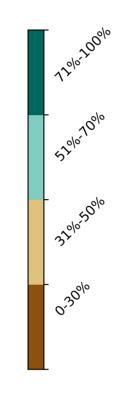
1 Conservation and natural environments – Nonwoodland forest

Total Vegetation Cover [%]

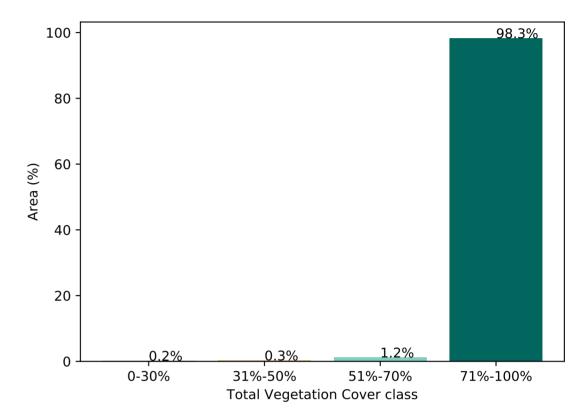




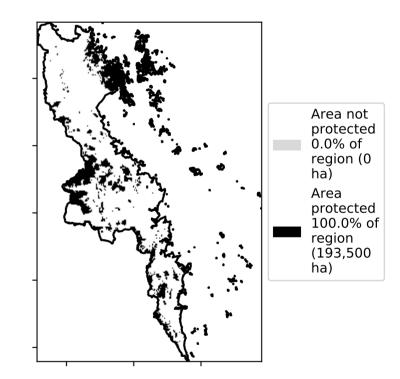






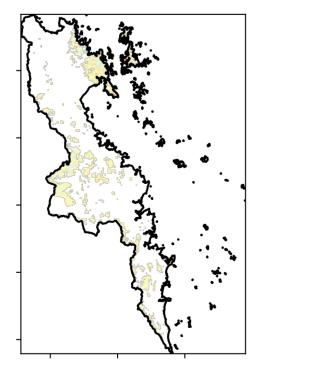


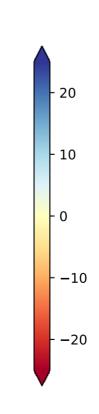
% Area protected from wind erosion (>50%)

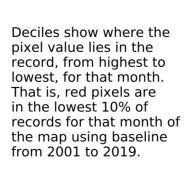


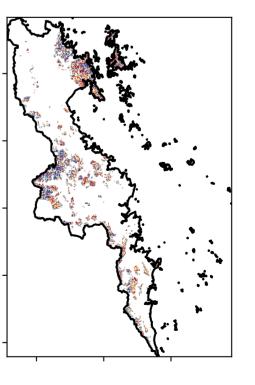
Total Vegetation Cover Anomaly [%]

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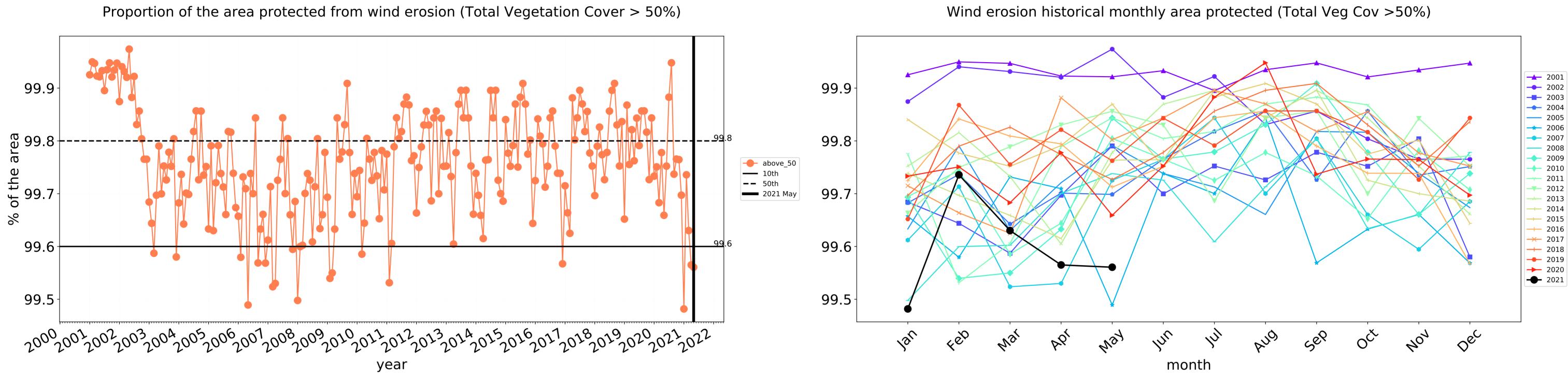




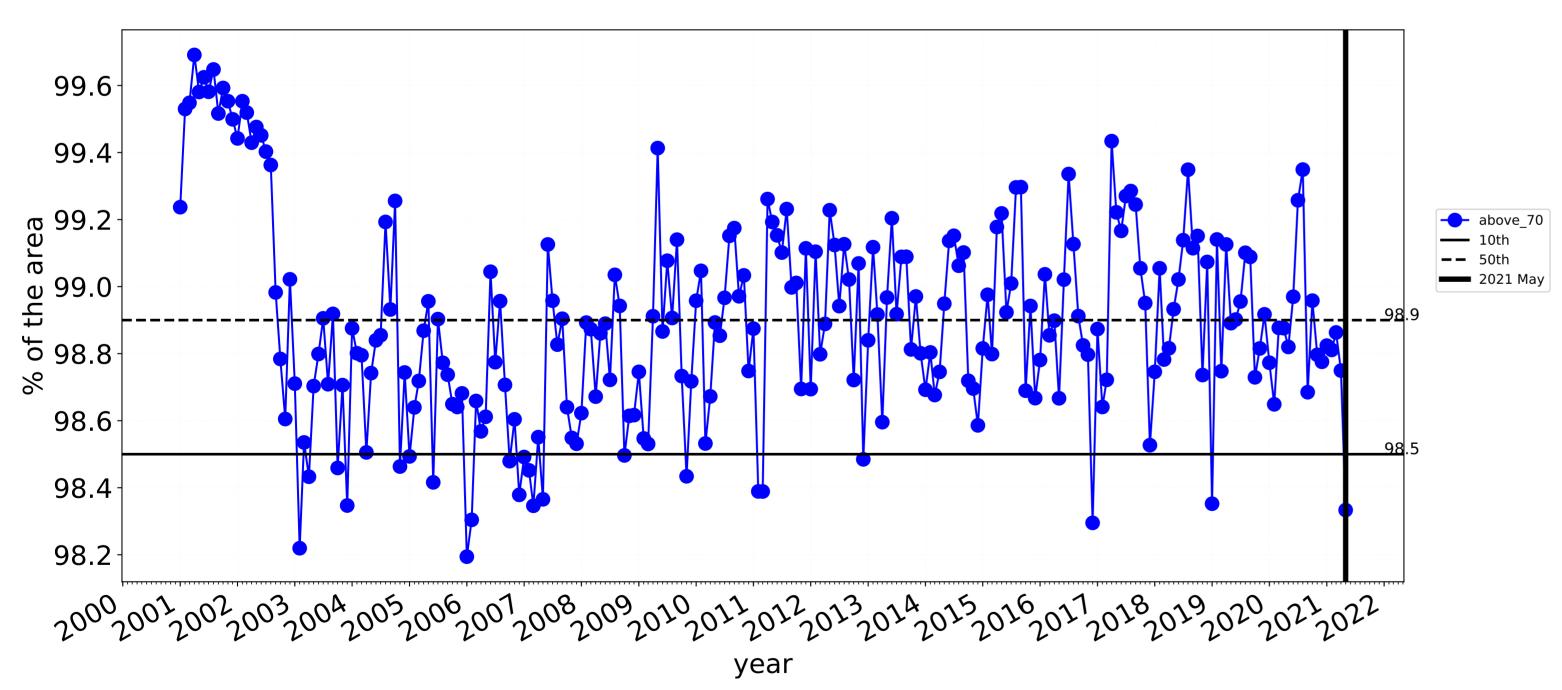


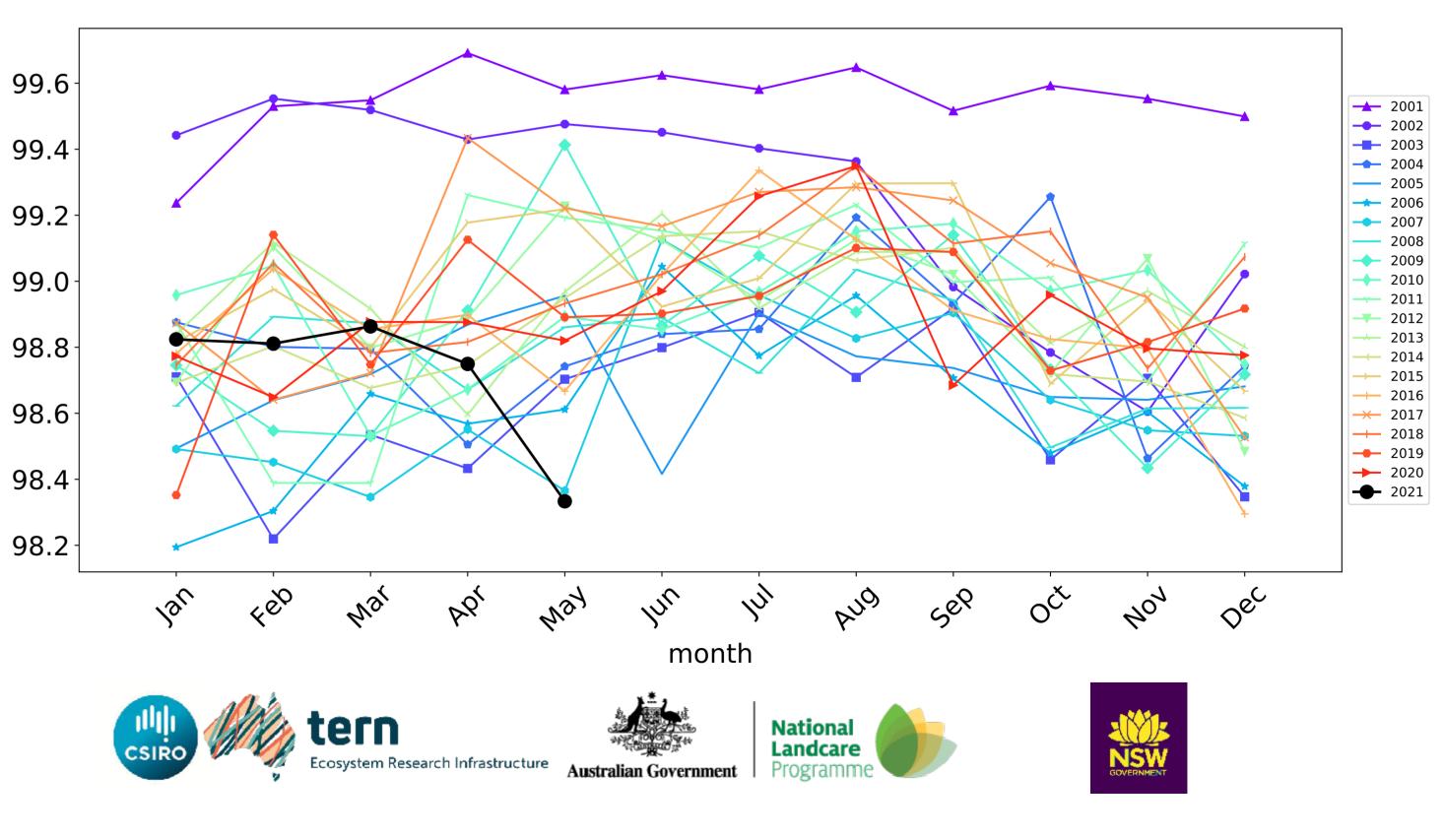




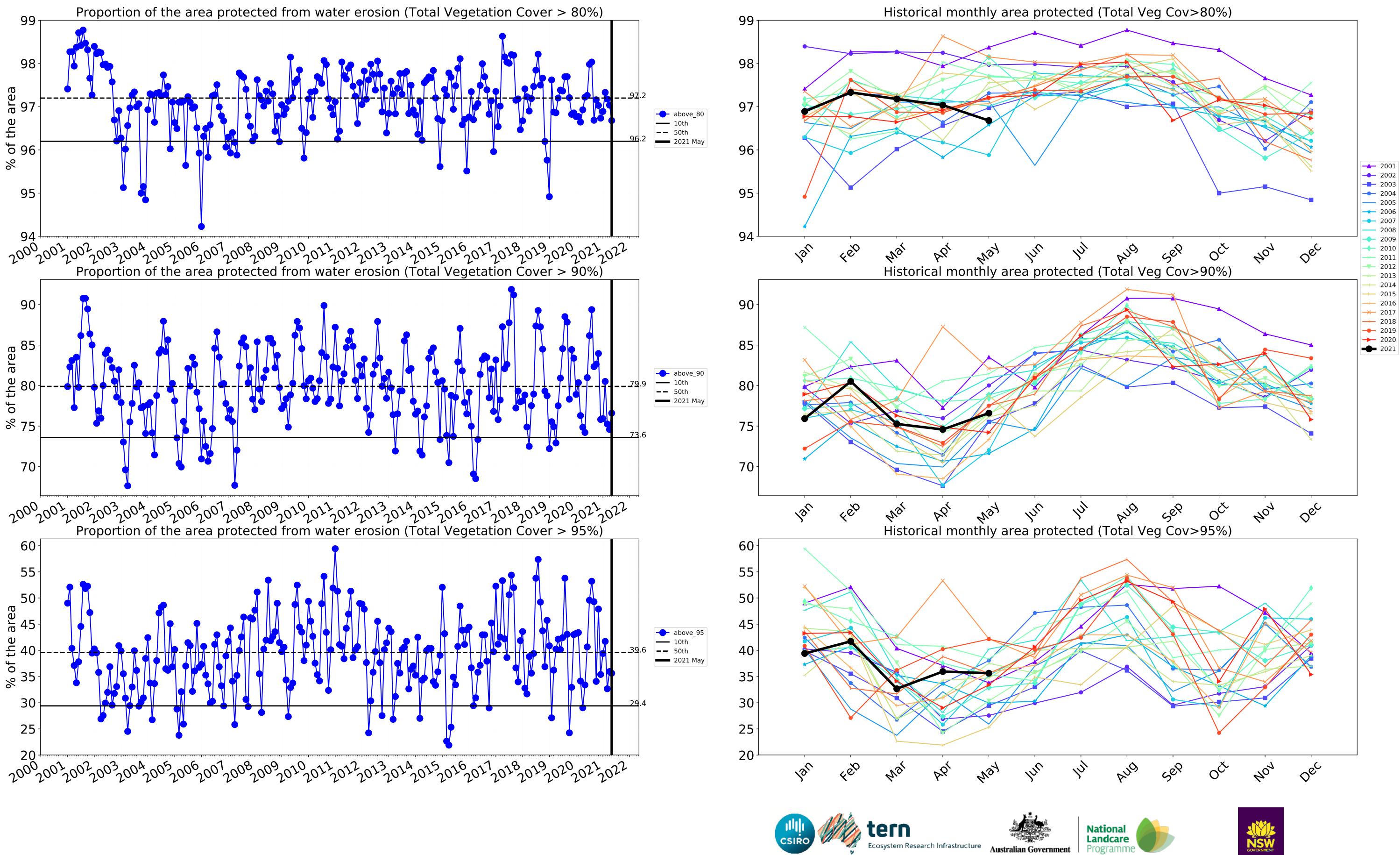


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





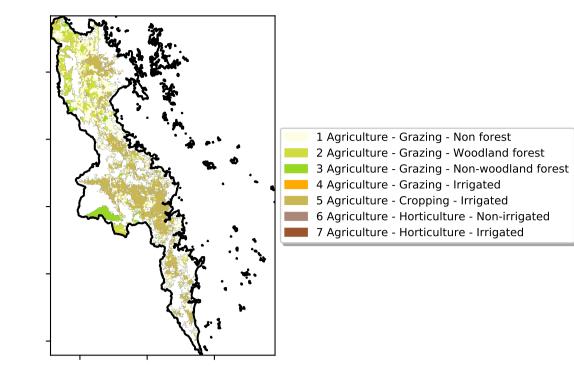
Water erosion historical monthly area protected (Total Veg Cov>70%)



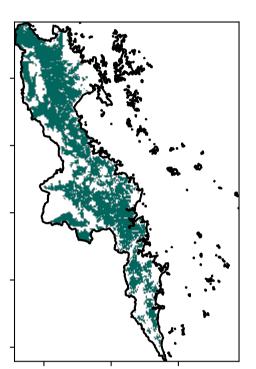


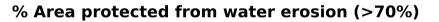
Agriculture

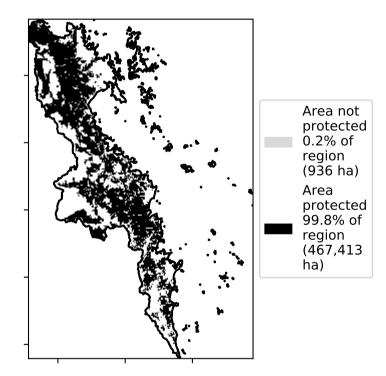
Land use and forest cover

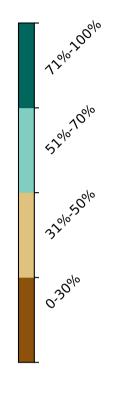


Total Vegetation Cover [%]

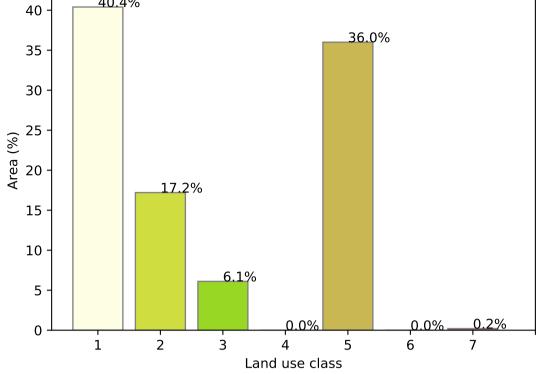






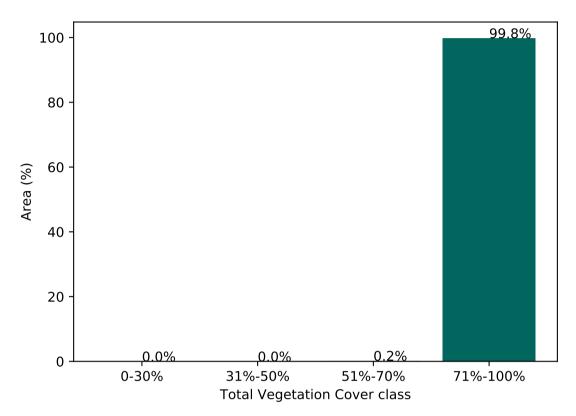




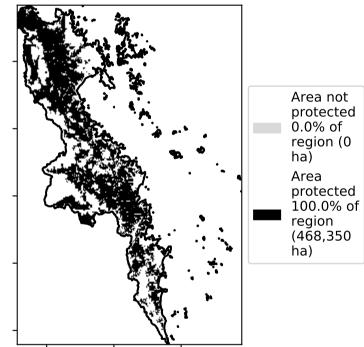


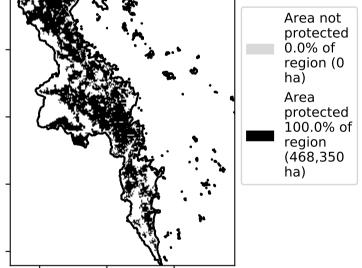
Proportion of each land class in area

Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





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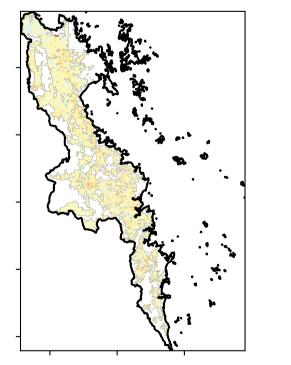
A-1

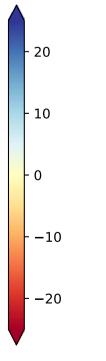
2?

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

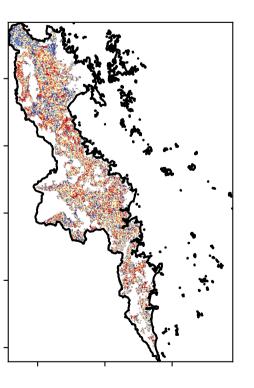
Total Vegetation Cover Anomaly [%]

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.





Total Vegetation Cover Decile [%]





Deciles show where the

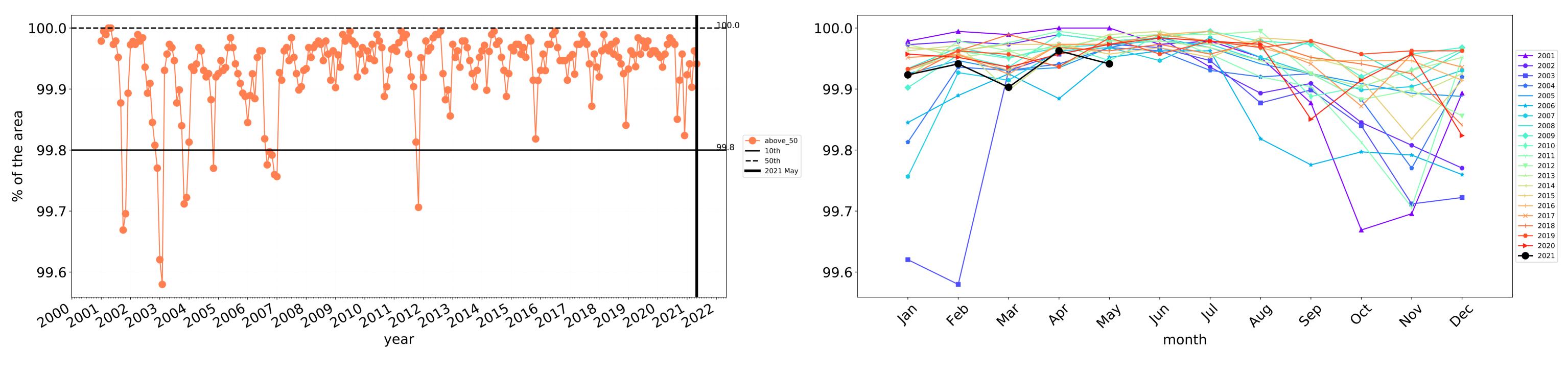
pixel value lies in the

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

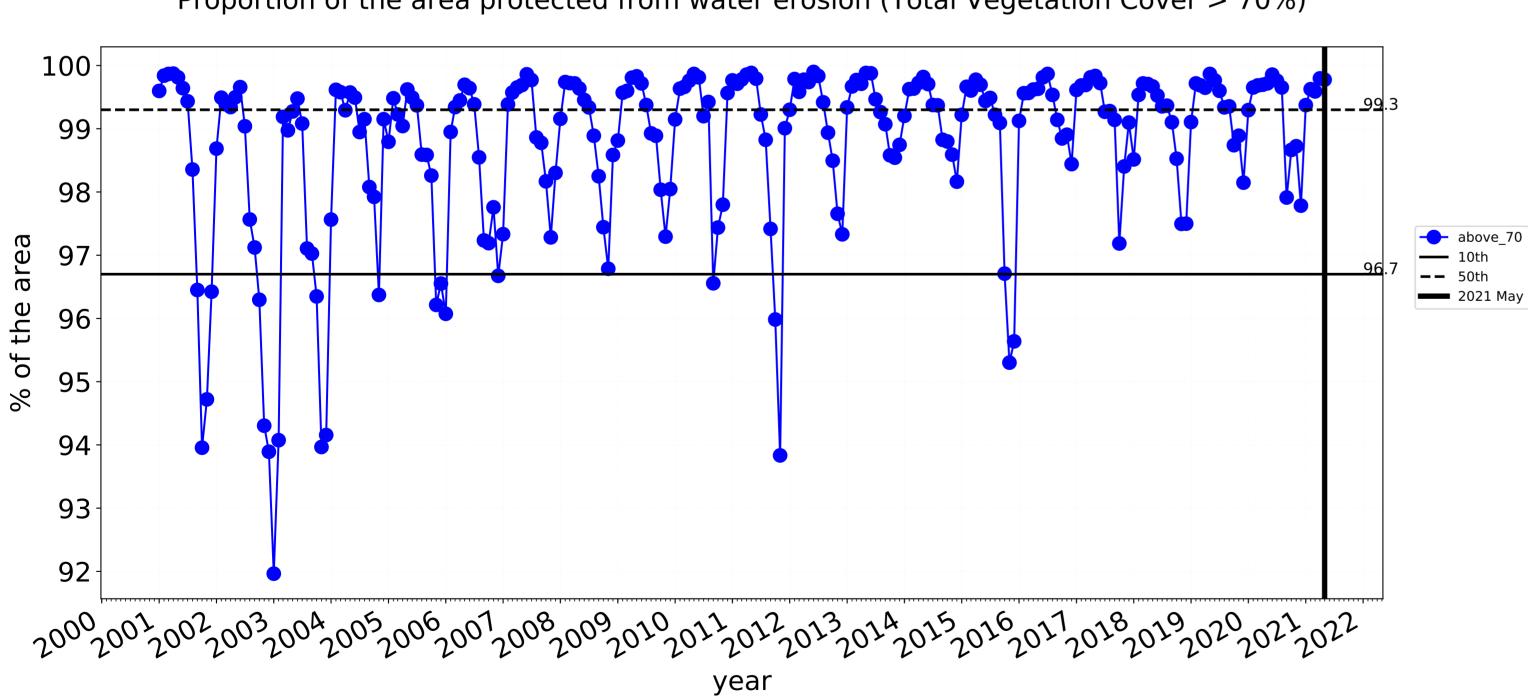
records for that month of

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%)

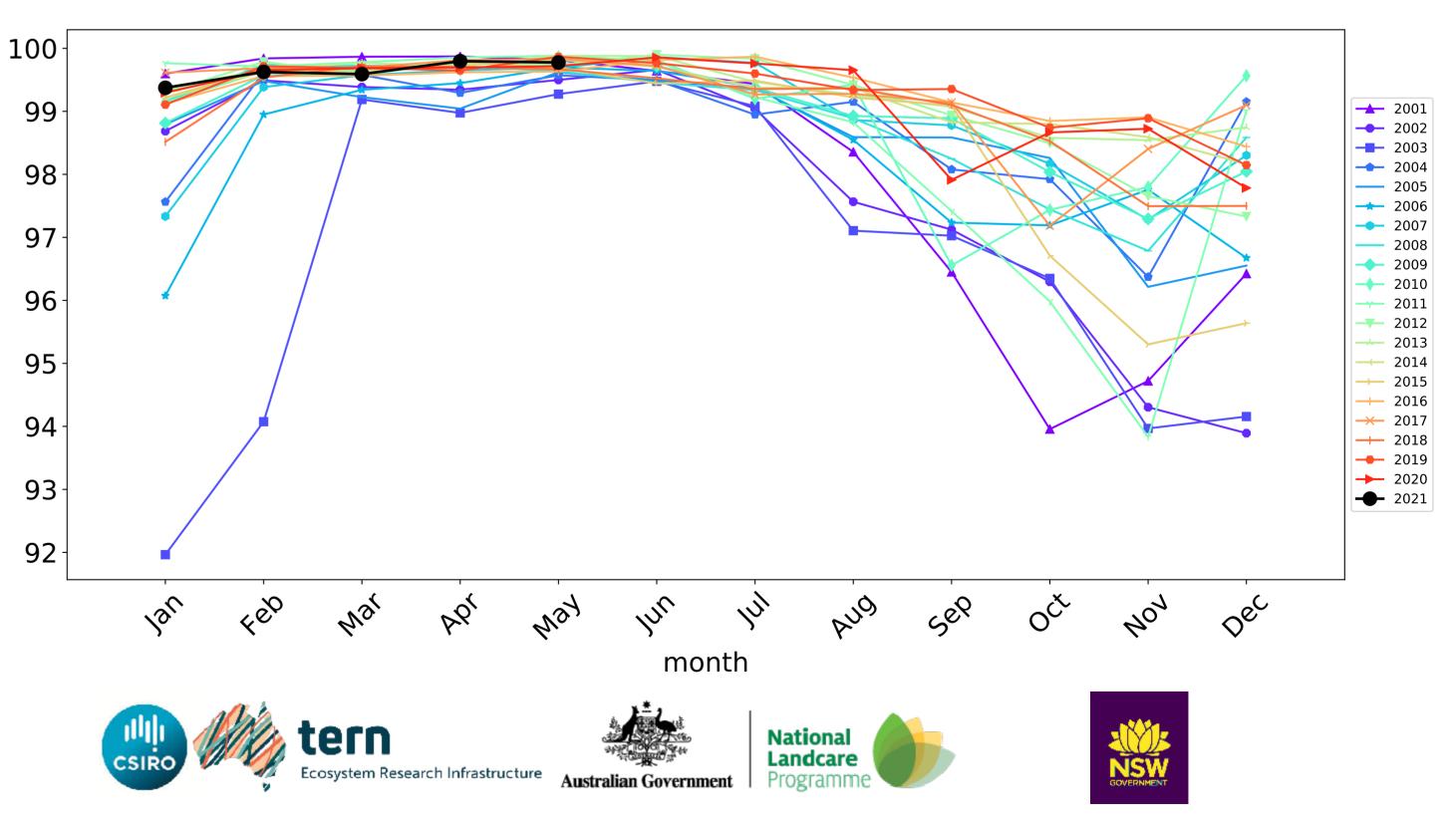


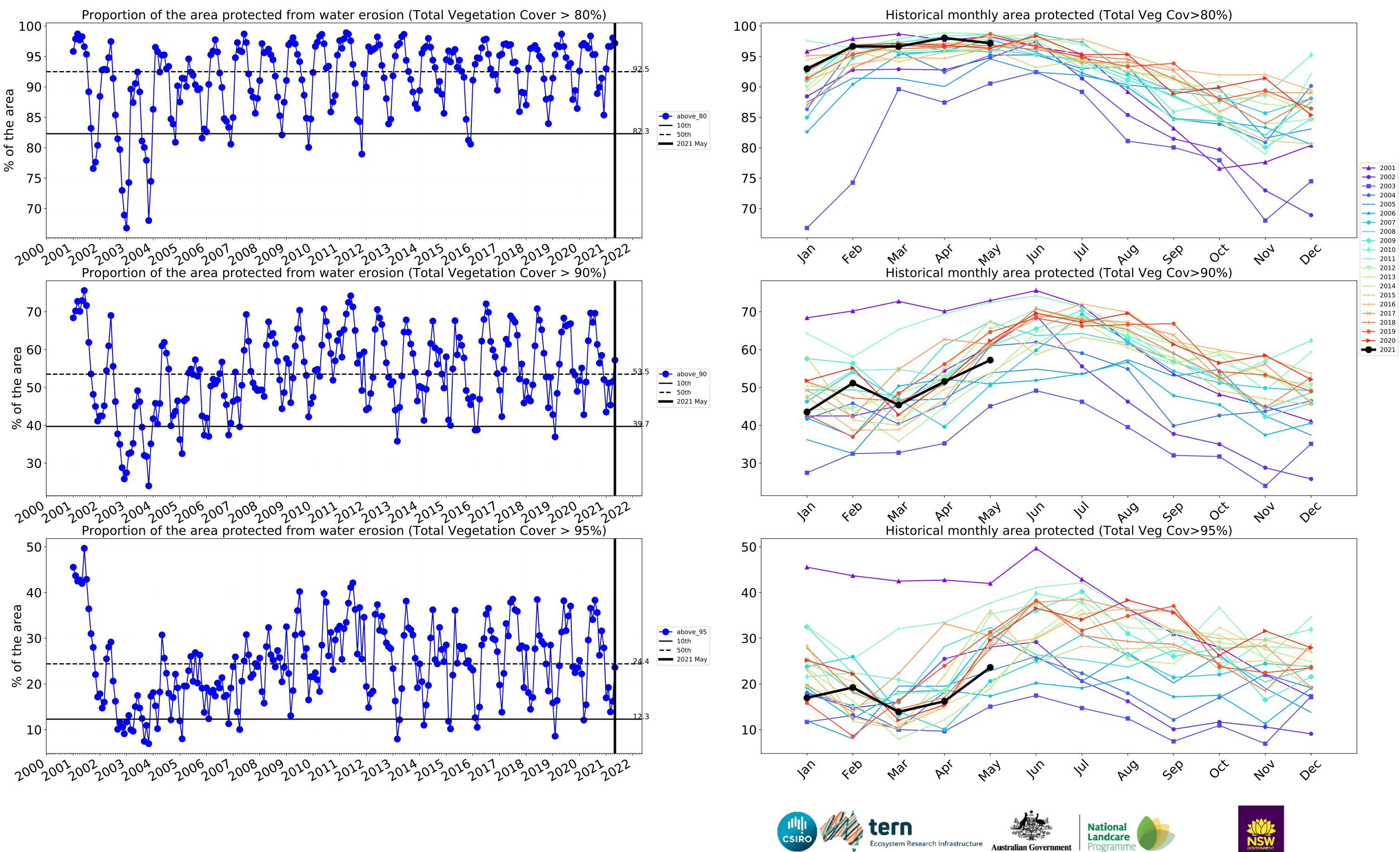
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

Agriculture timeseries

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

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







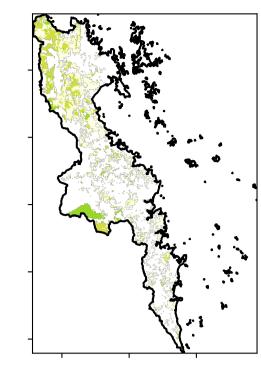
Grazing

10

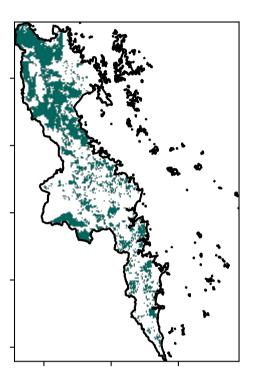
0

1

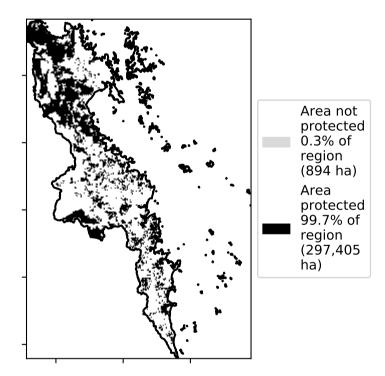
Land use and forest cover

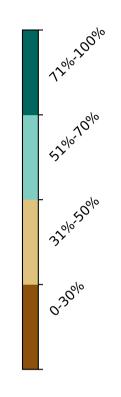


Total Vegetation Cover [%]





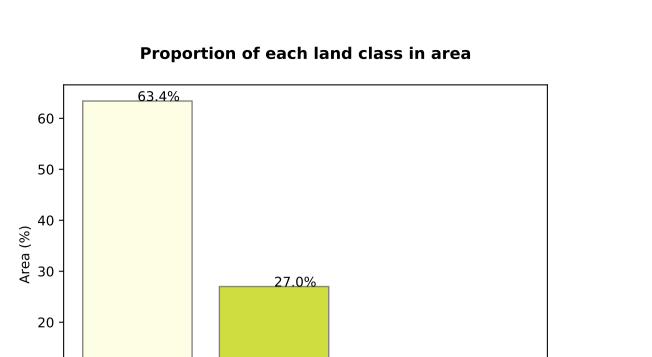




1 Agriculture - Grazing - Non forest

2 Agriculture - Grazing - Woodland forest

3 Agriculture - Grazing - Non-woodland forest



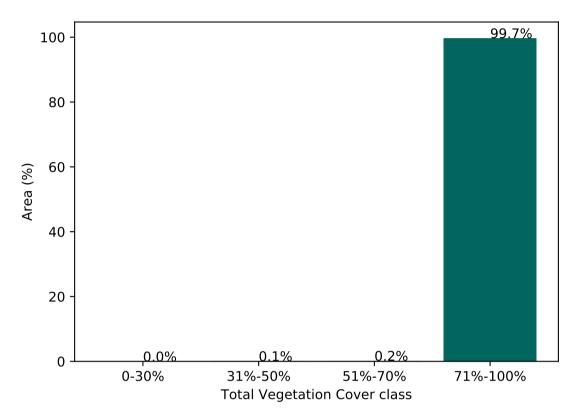
9.6%

3

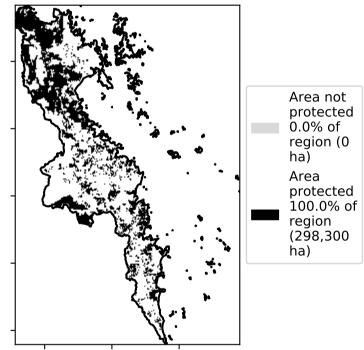
Proportion of vegetation cover class in area

Land use class

2



% 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.

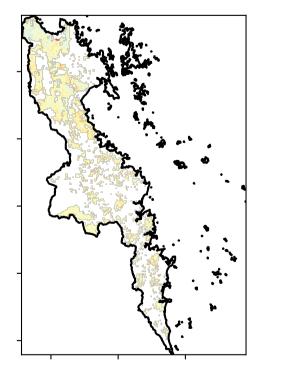
Catchment Scale Land Use and Forests of Australia (2018)

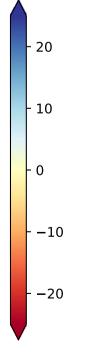
Catchment Scale Land

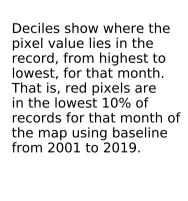
Derived from

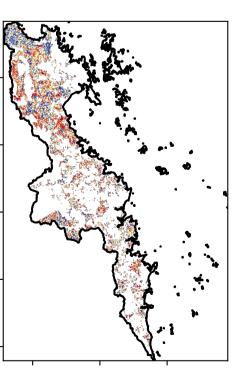
Use of Australia

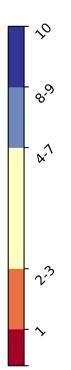
(2018) and Forests of Australia (2018)



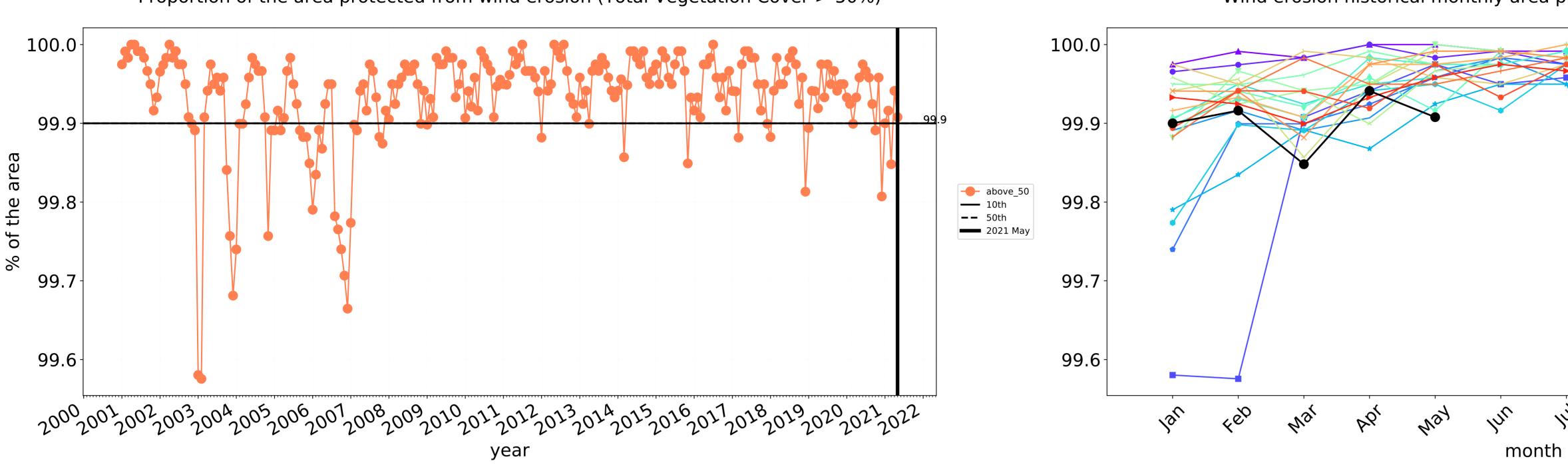






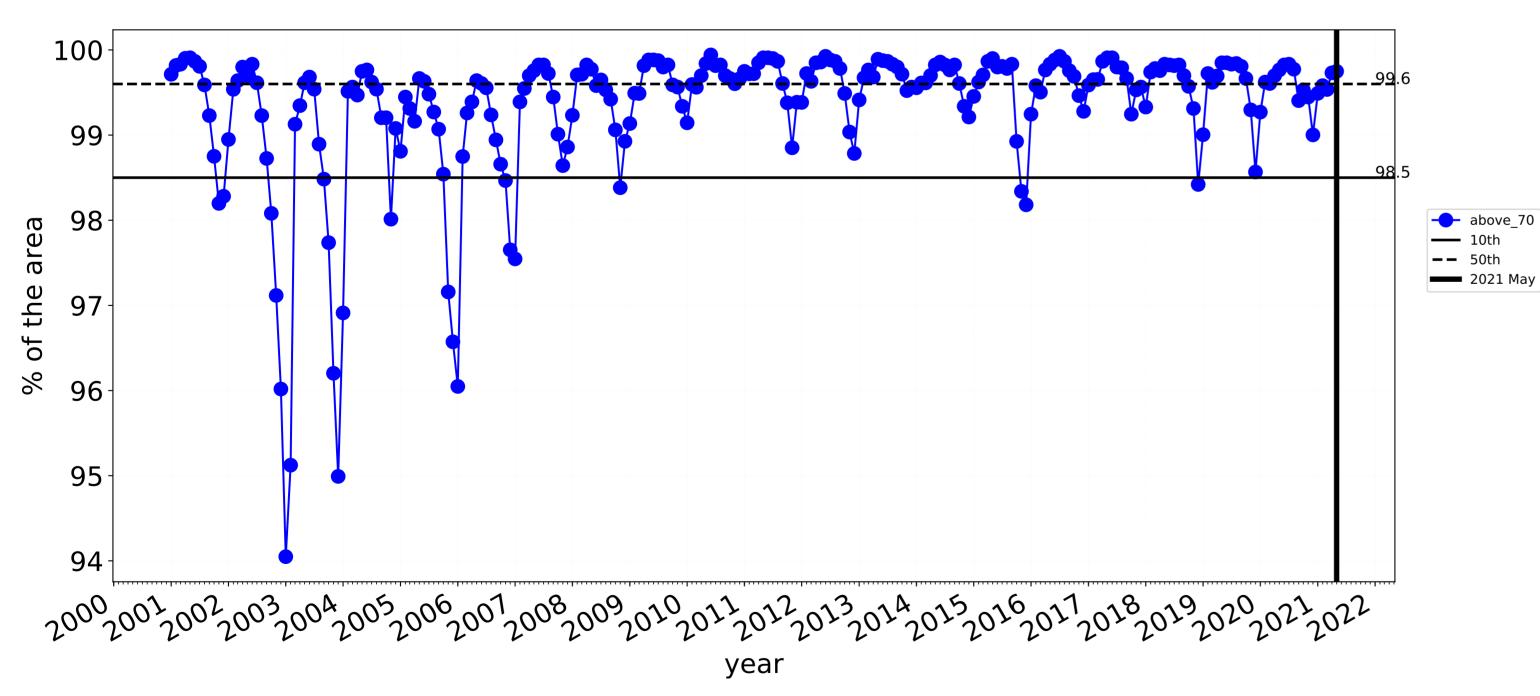






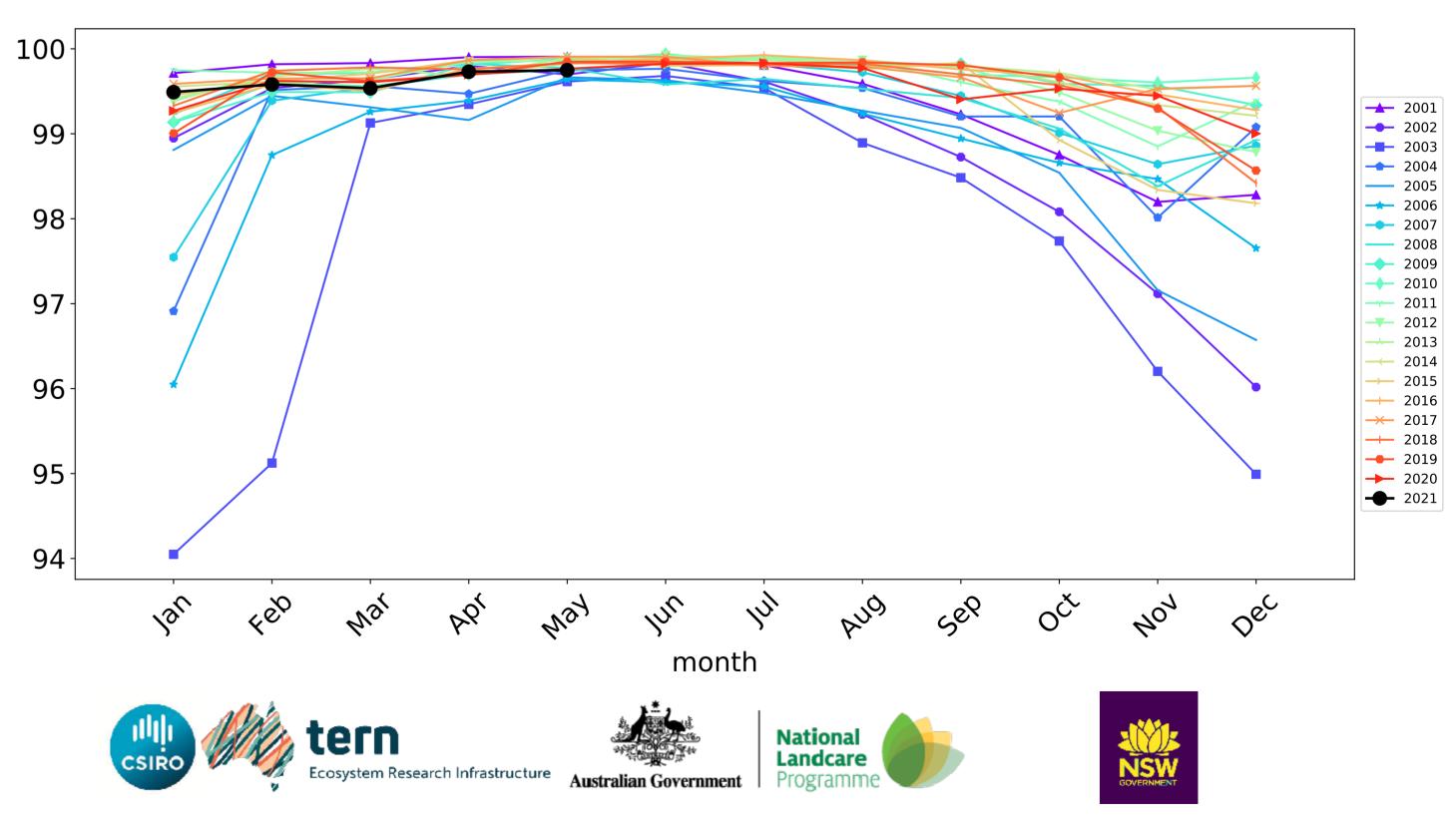
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

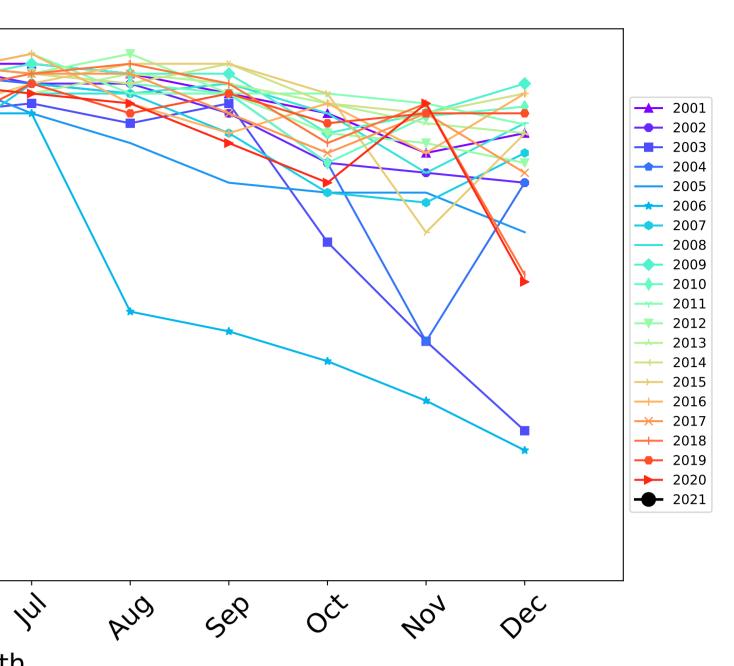
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

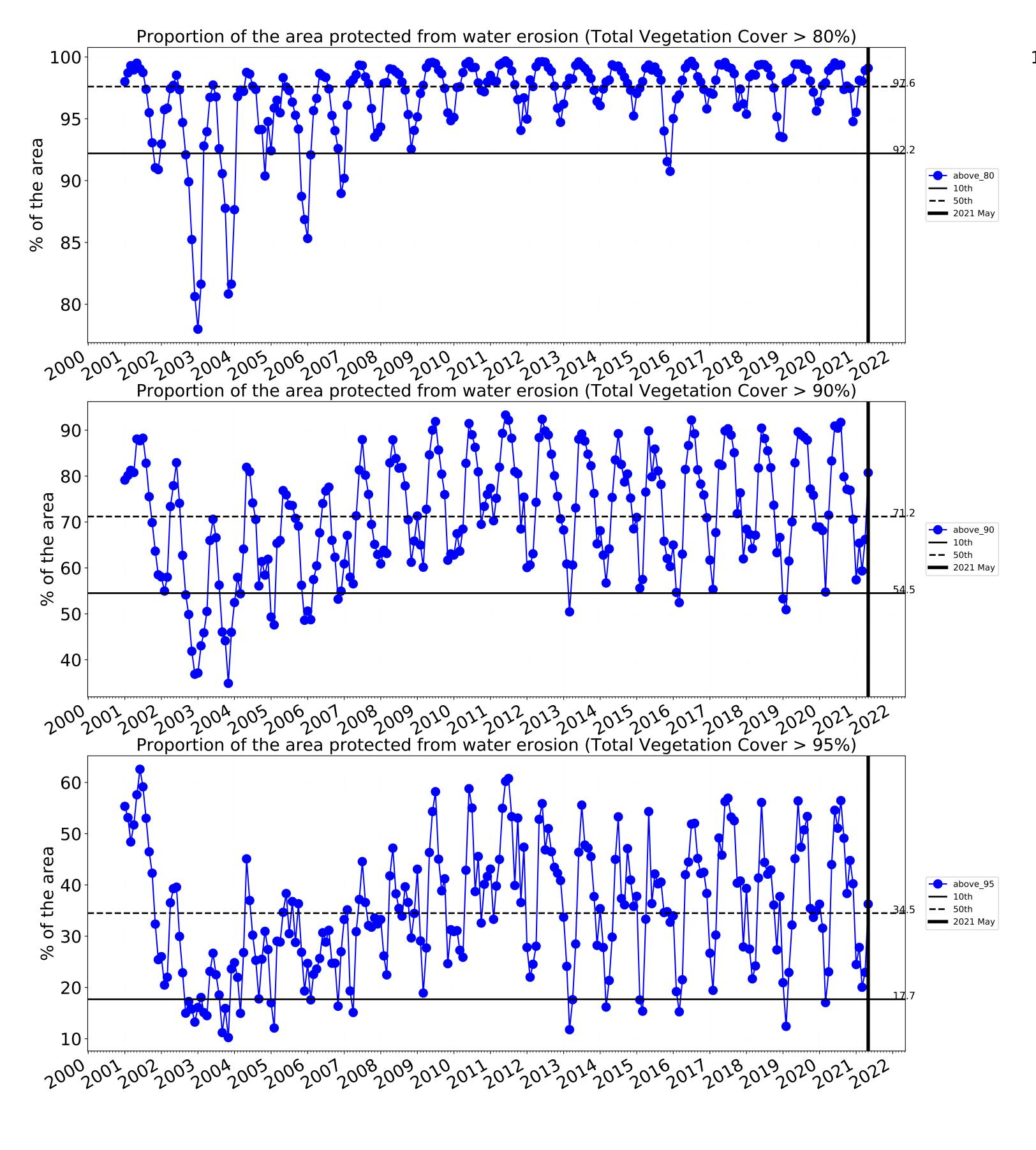


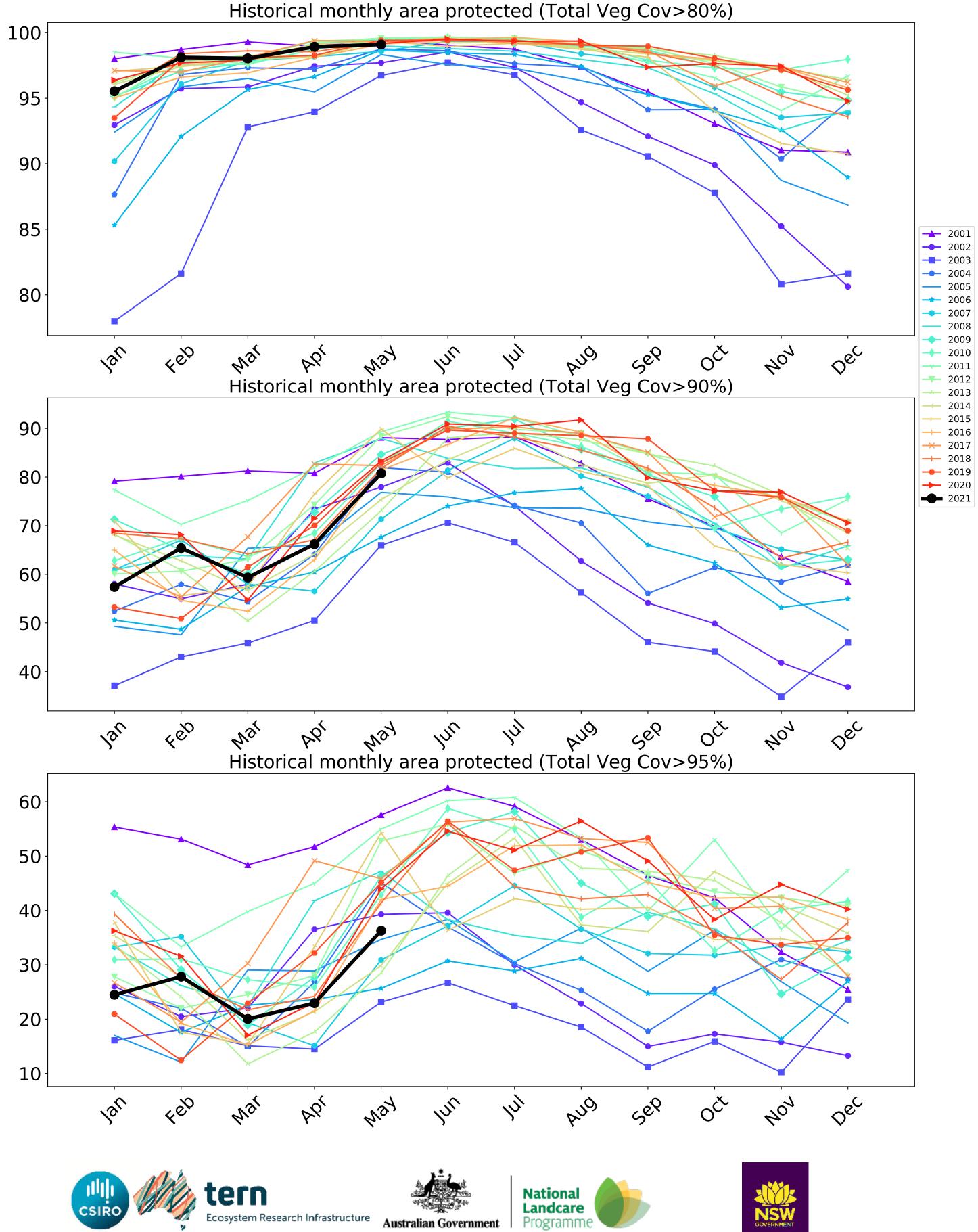
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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





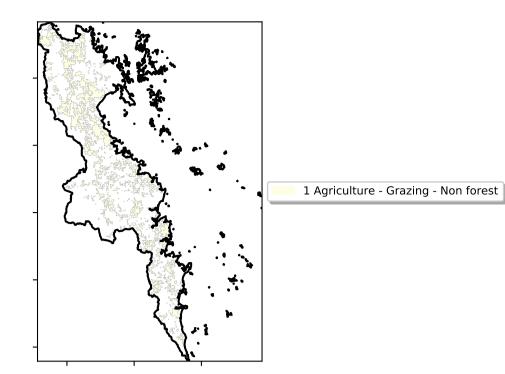




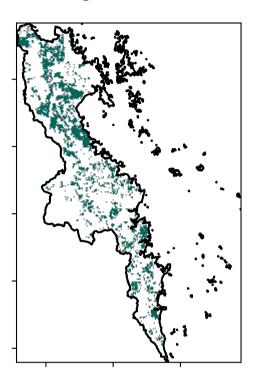


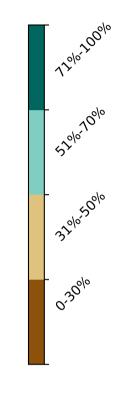
Grazing non forest

Land use and forest cover

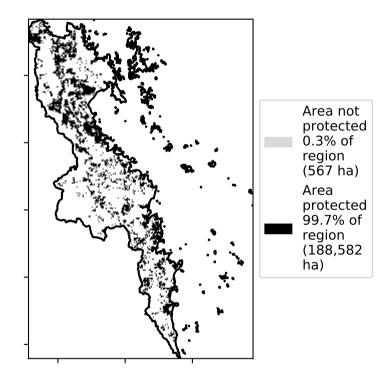


Total Vegetation Cover [%]

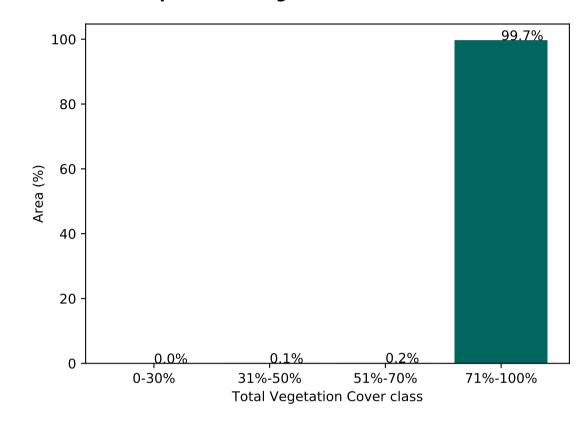




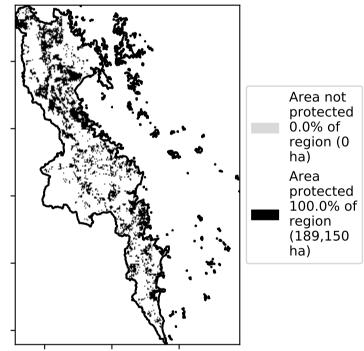
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



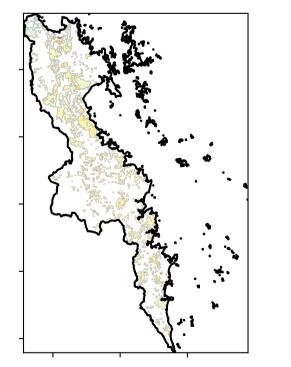
% Area protected from wind erosion (>50%)

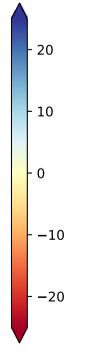


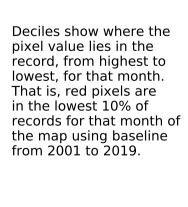
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

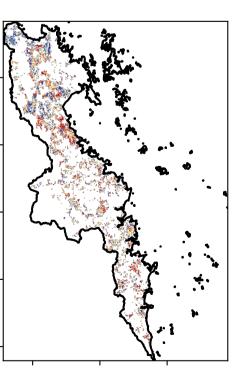
Total Vegetation Cover Anomaly [%]

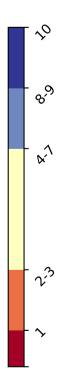
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



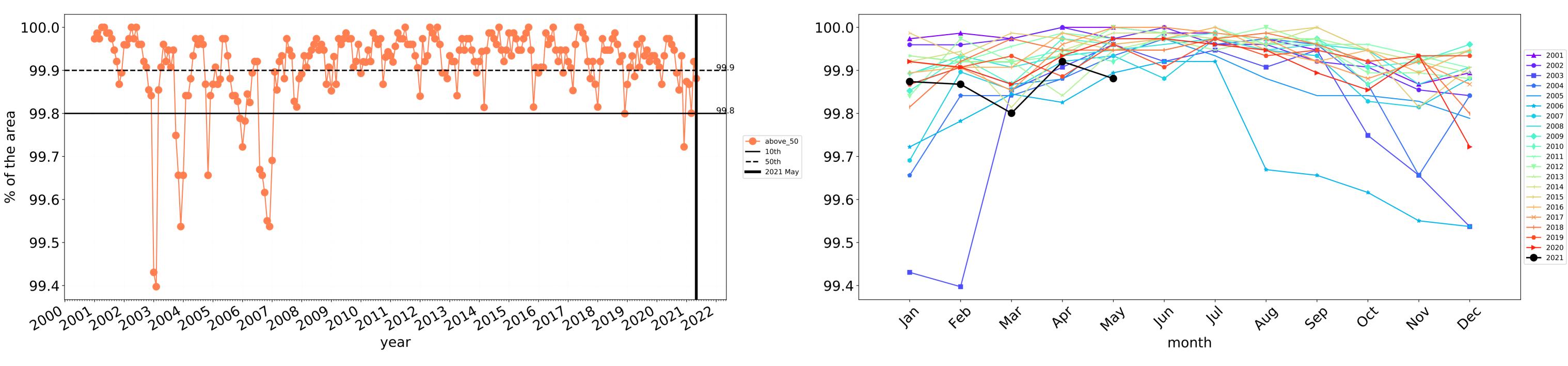






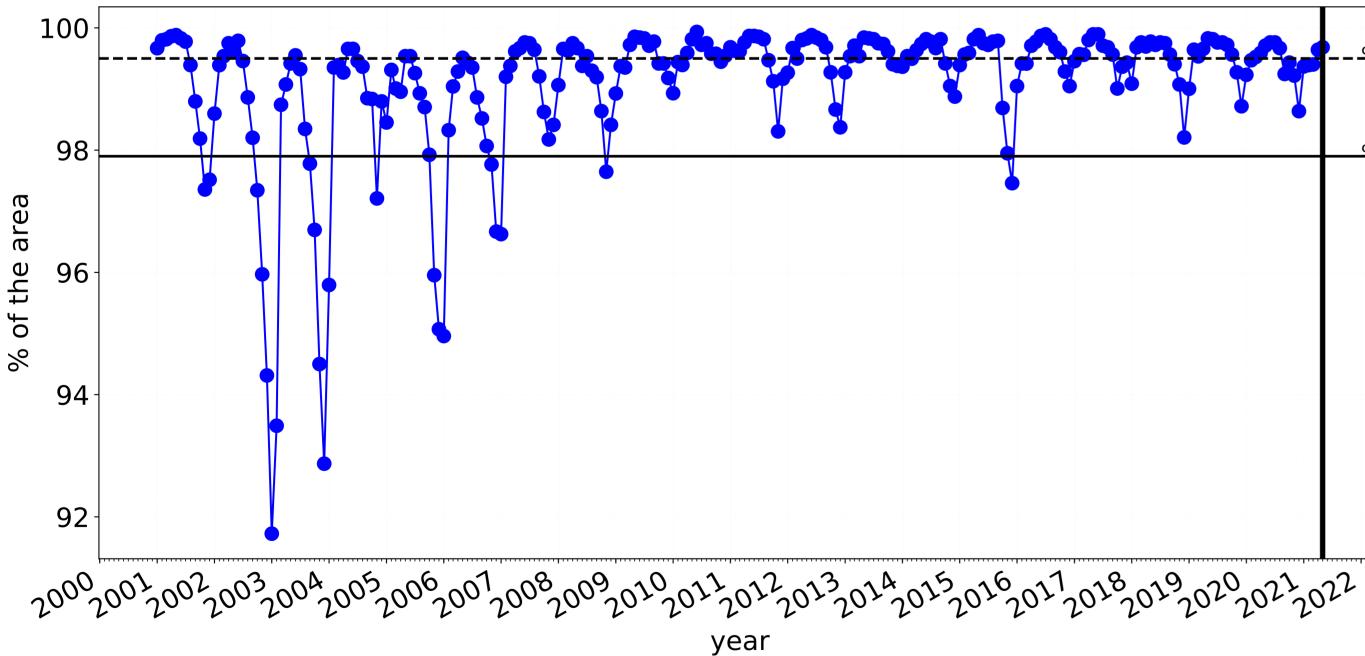






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

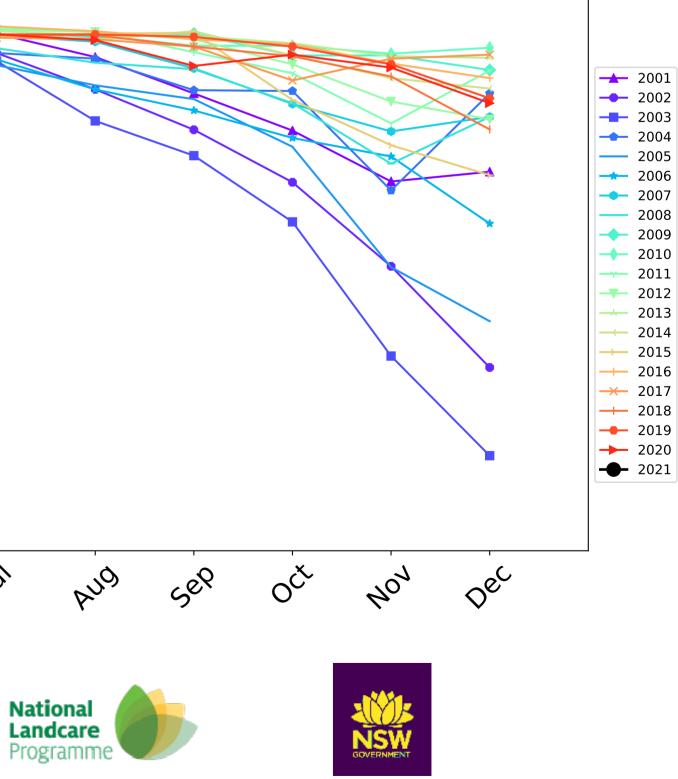


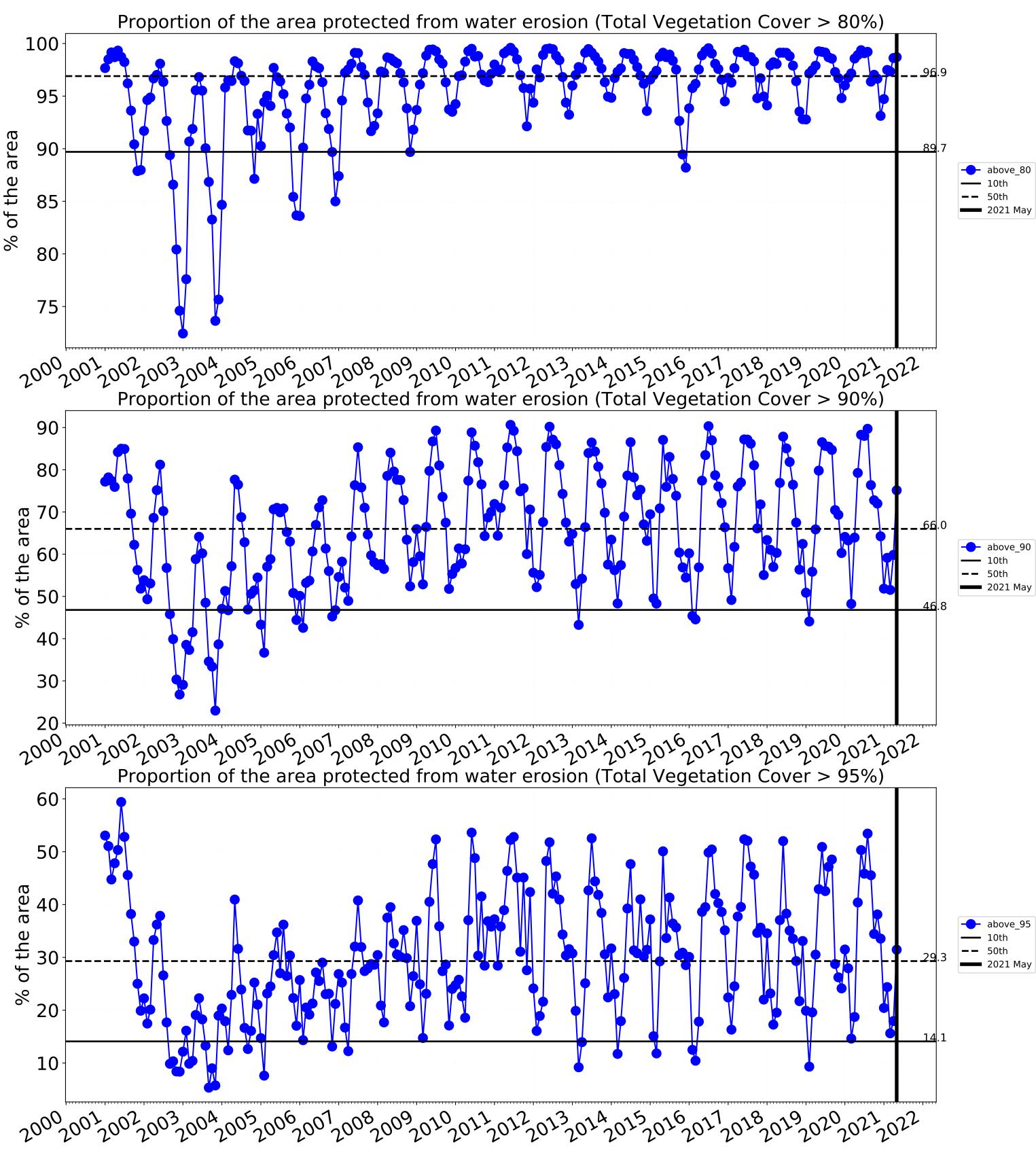
Grazing non forest timeseries

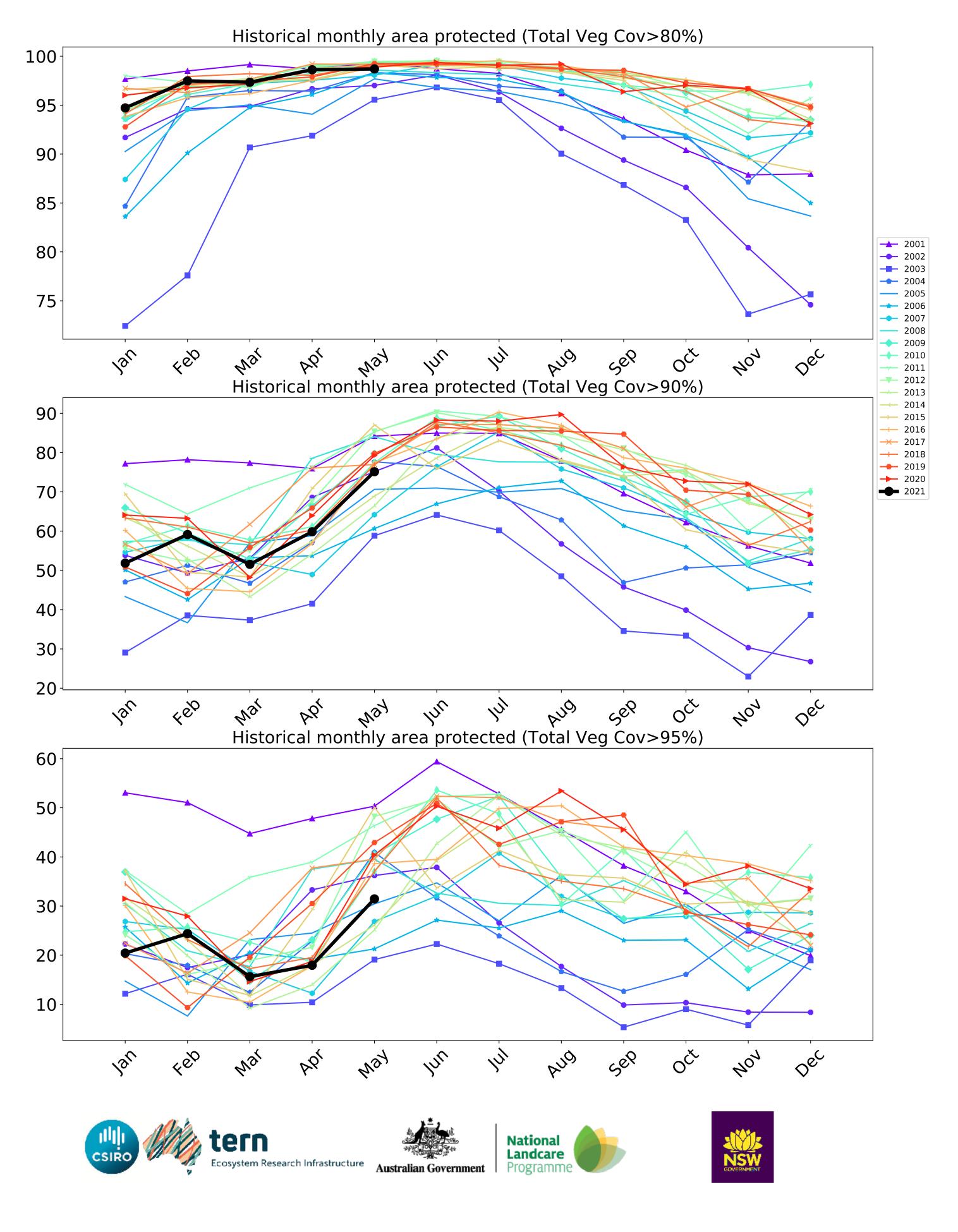
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100-98 ---- above_70 **—** 10th **——** 50th **—** 2021 May 96 94 92 Jan 4eb way PQ In In In Mai month tern Ecosystem Research Infrastructure Australian Government

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

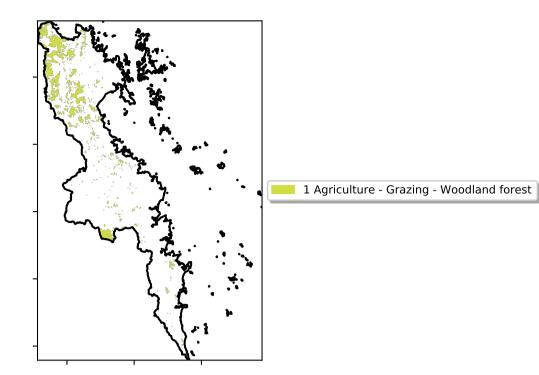




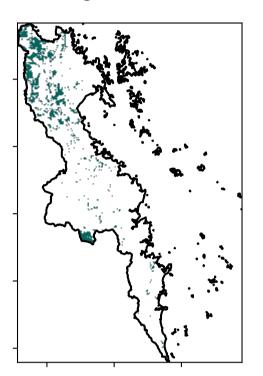


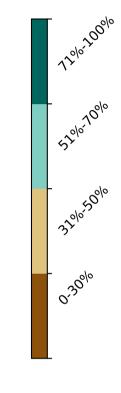
Grazing Woodland forest

Land use and forest cover

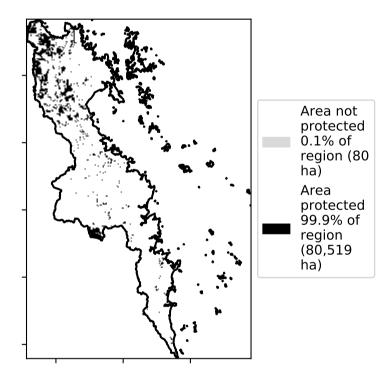


Total Vegetation Cover [%]

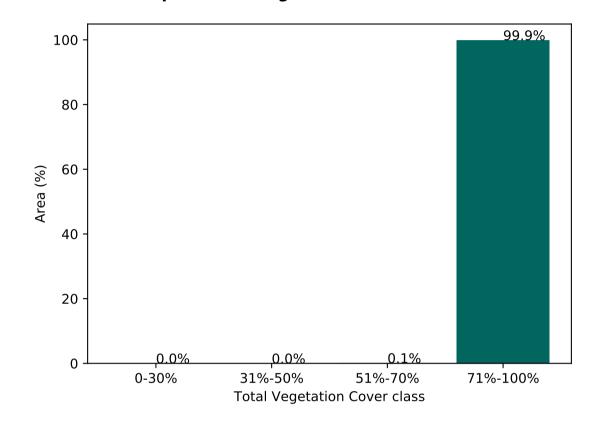




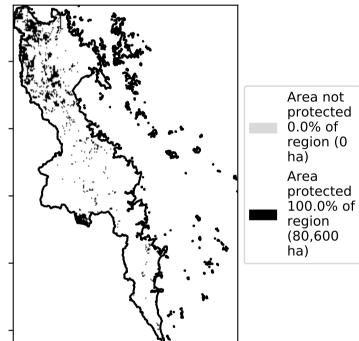
% Area protected from water erosion (>70%)

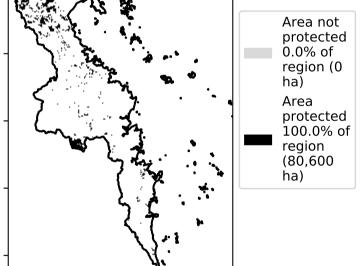


Proportion of vegetation cover class in area



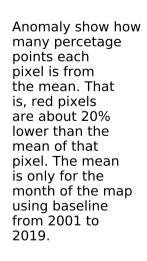
% Area protected from wind erosion (>50%)

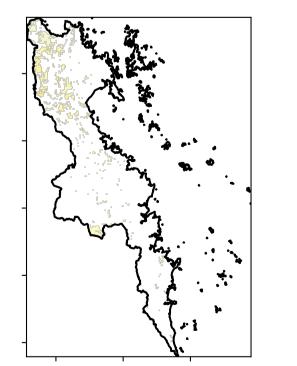


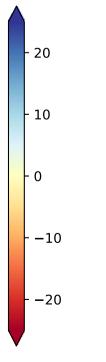


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

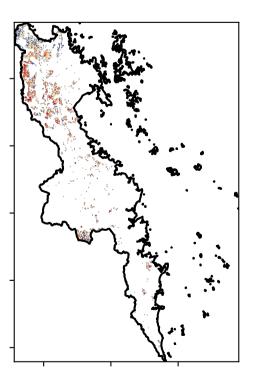
Total Vegetation Cover Anomaly [%]

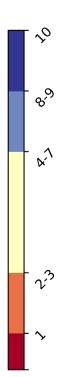






Total Vegetation Cover Decile [%]



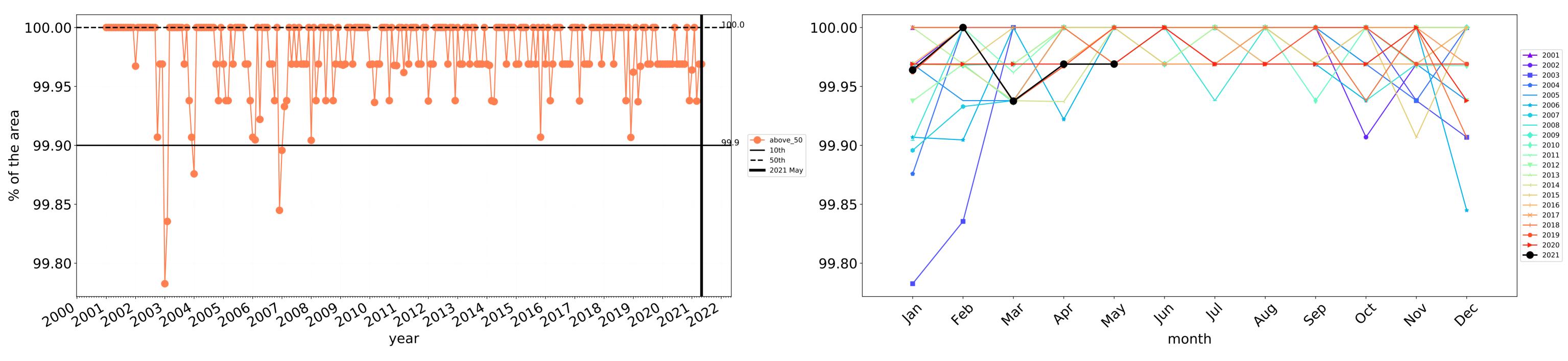




Deciles show where the pixel value lies in the

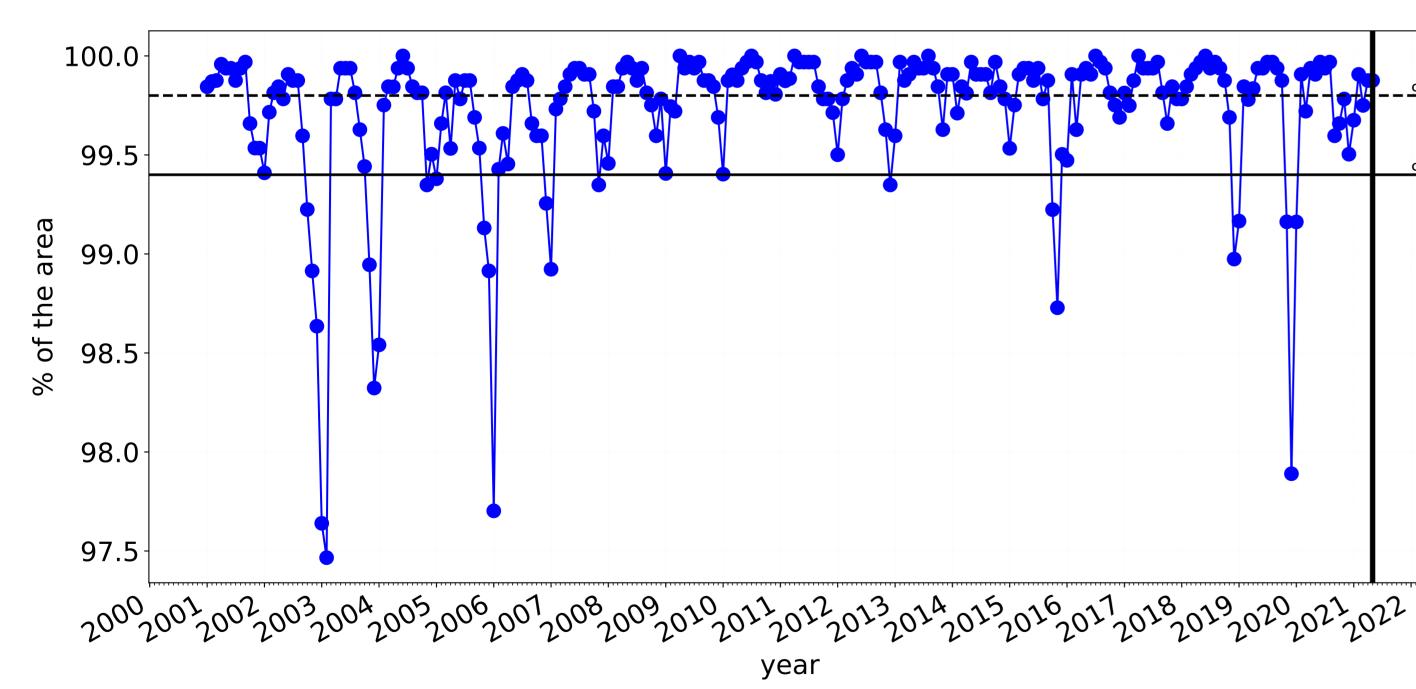
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of the map using baseline from 2001 to 2019.

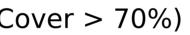


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



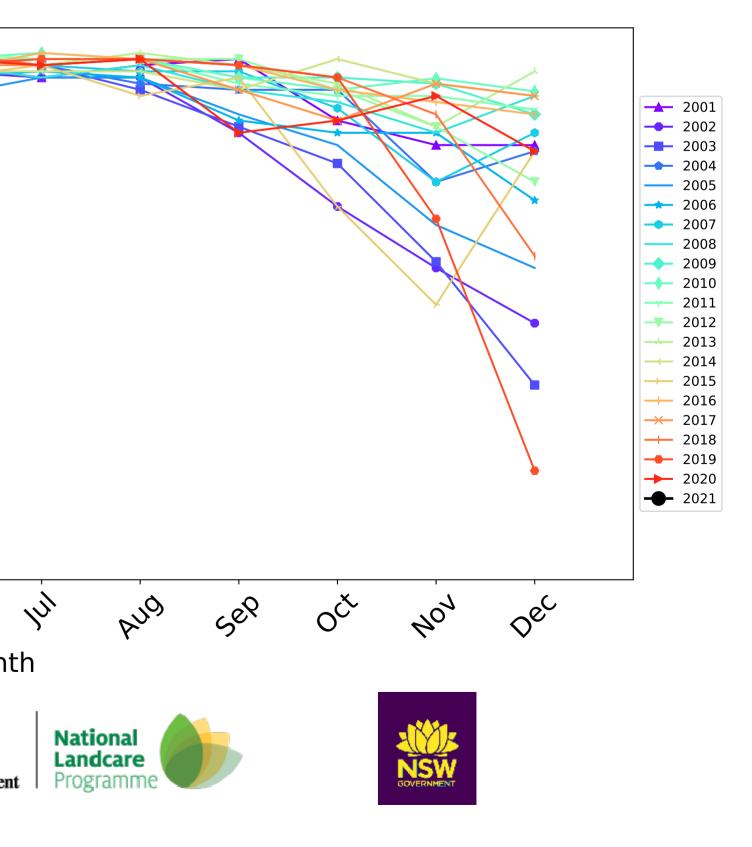
Wind erosion historical monthly area protected (Total Veg Cov >50%)

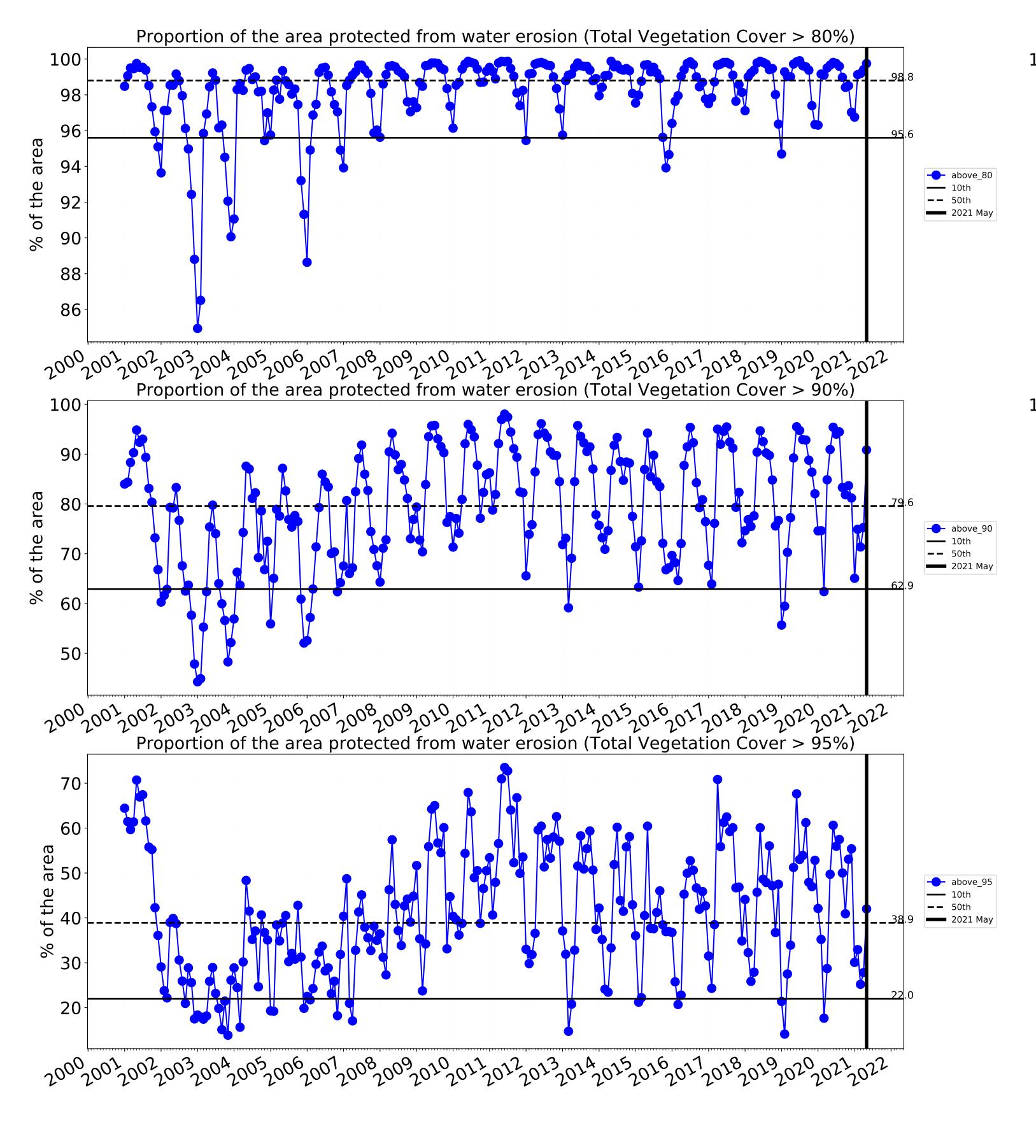


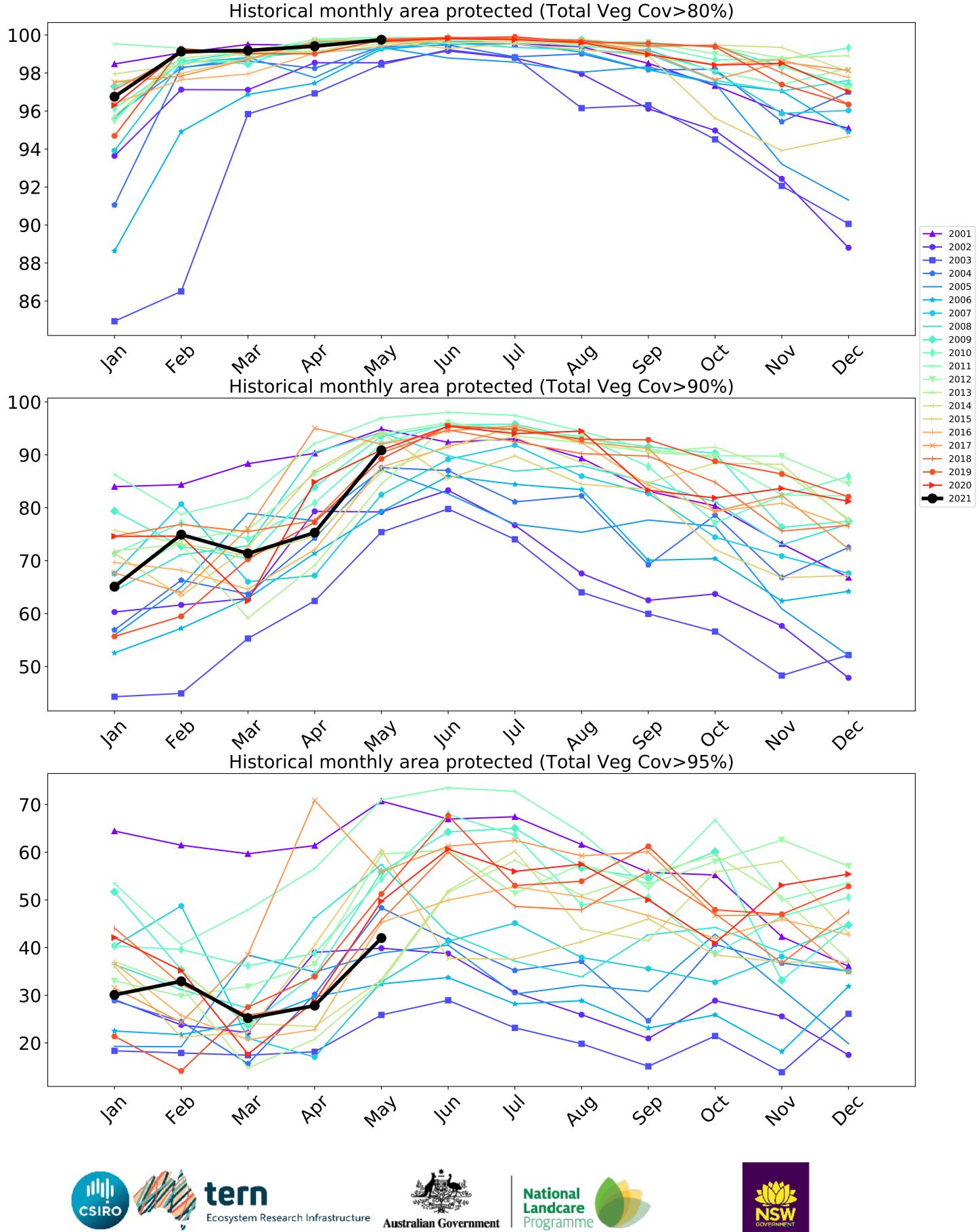
100.0-99.5 ---- above_70 **—** 10th 99.0 **--** 50th 98.5 98.0 97.5 feb 12r In Mai May PQ' month tern Ecosystem Research Infrastructure Australian Government

23

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



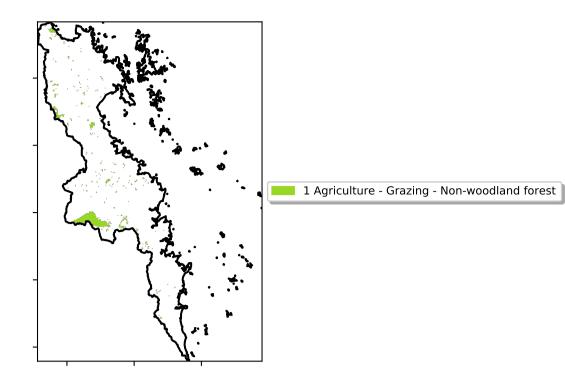




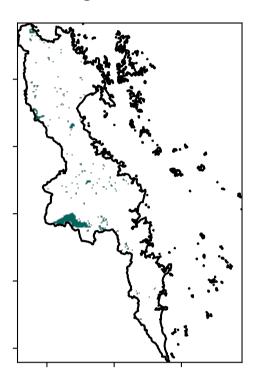


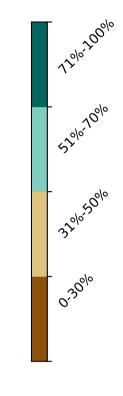
Grazing - Forest (non woodland)

Land use and forest cover

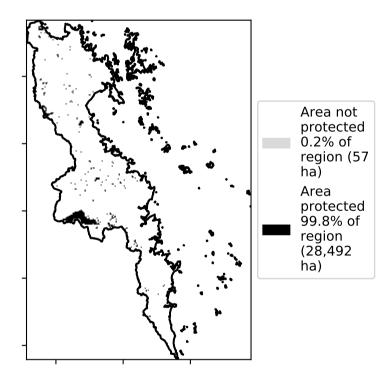


Total Vegetation Cover [%]

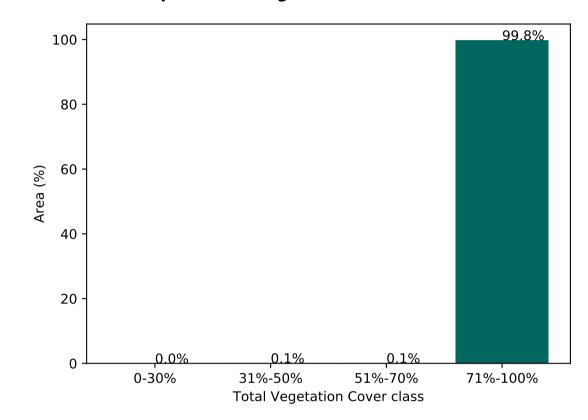




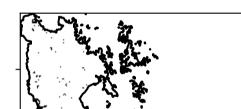
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



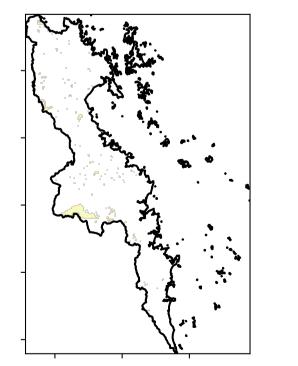
% Area protected from wind erosion (>50%)

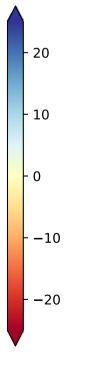


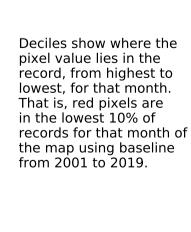
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

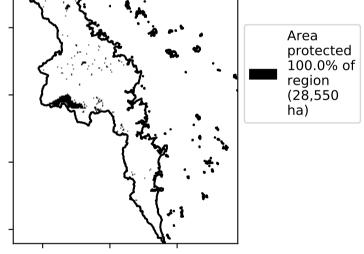
Total Vegetation Cover Anomaly [%]

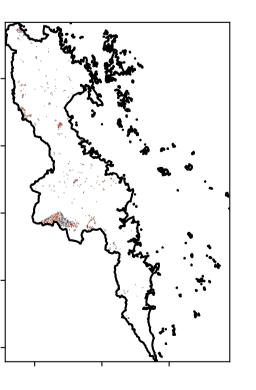
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

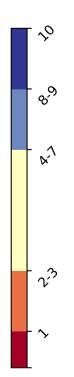




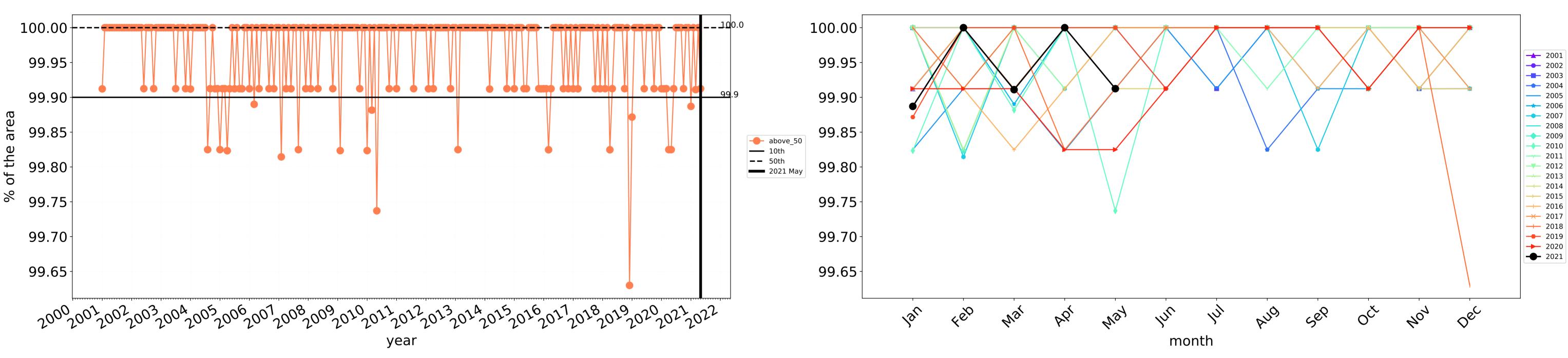






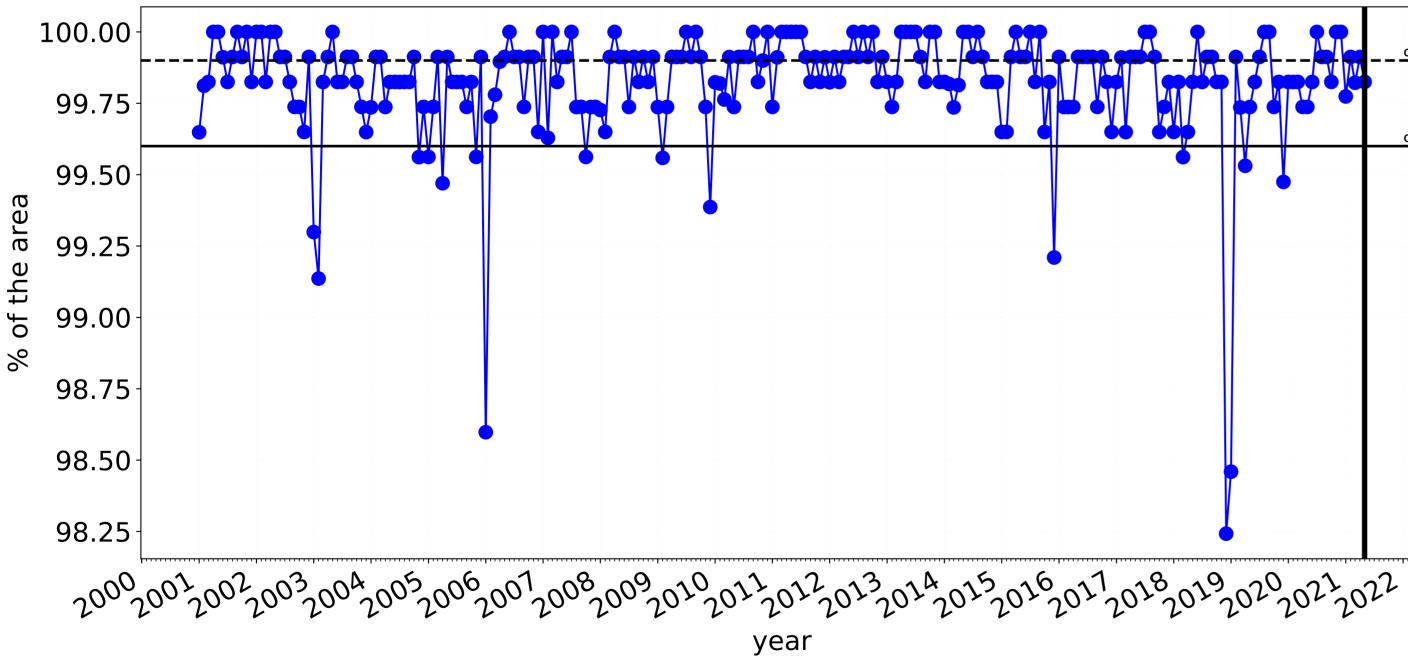


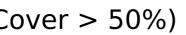




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

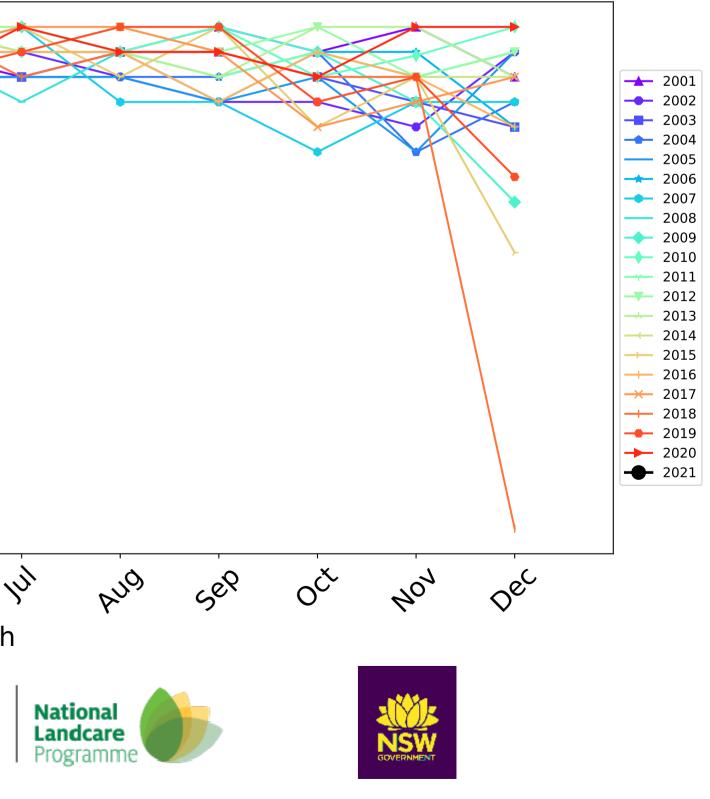


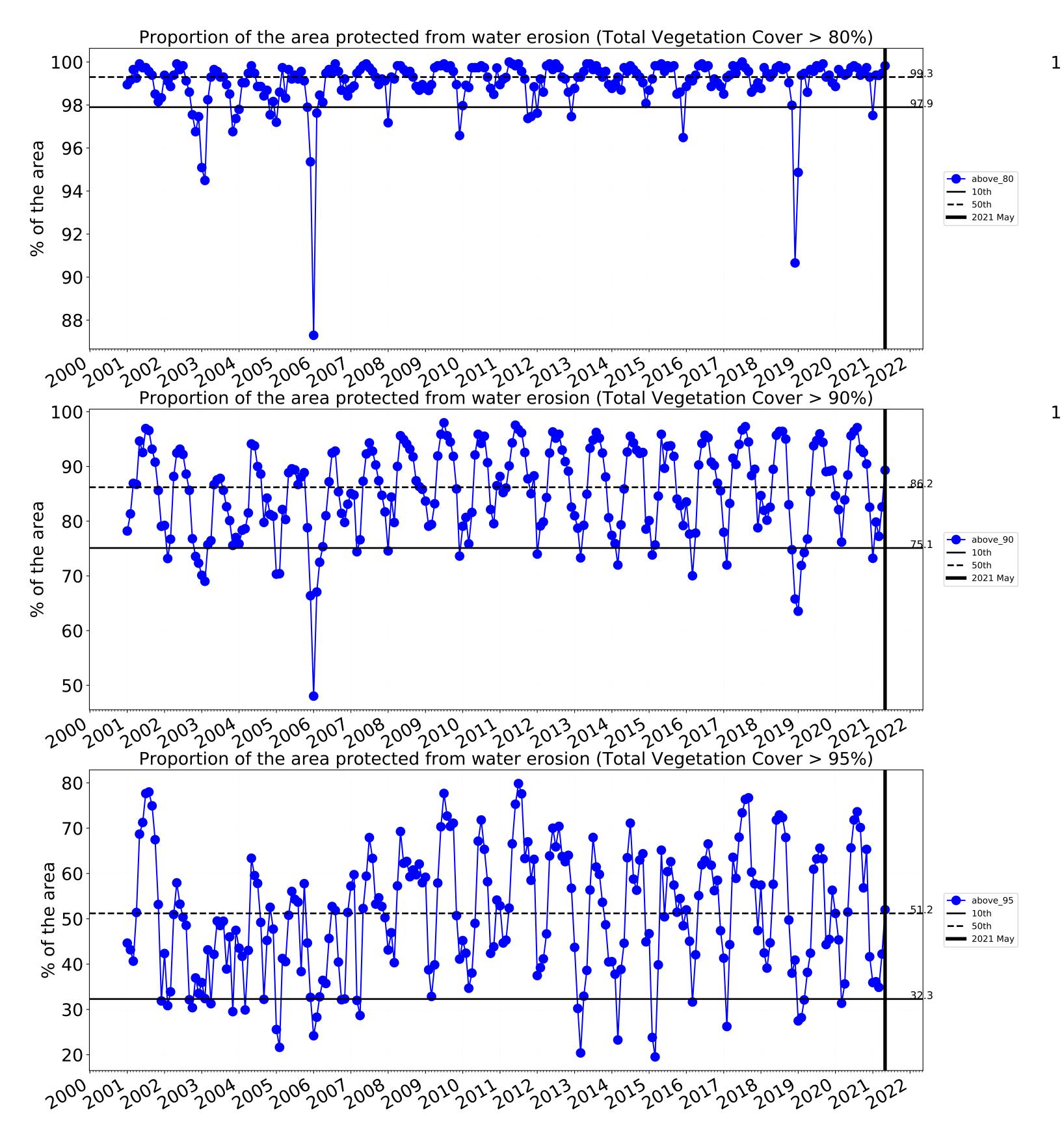


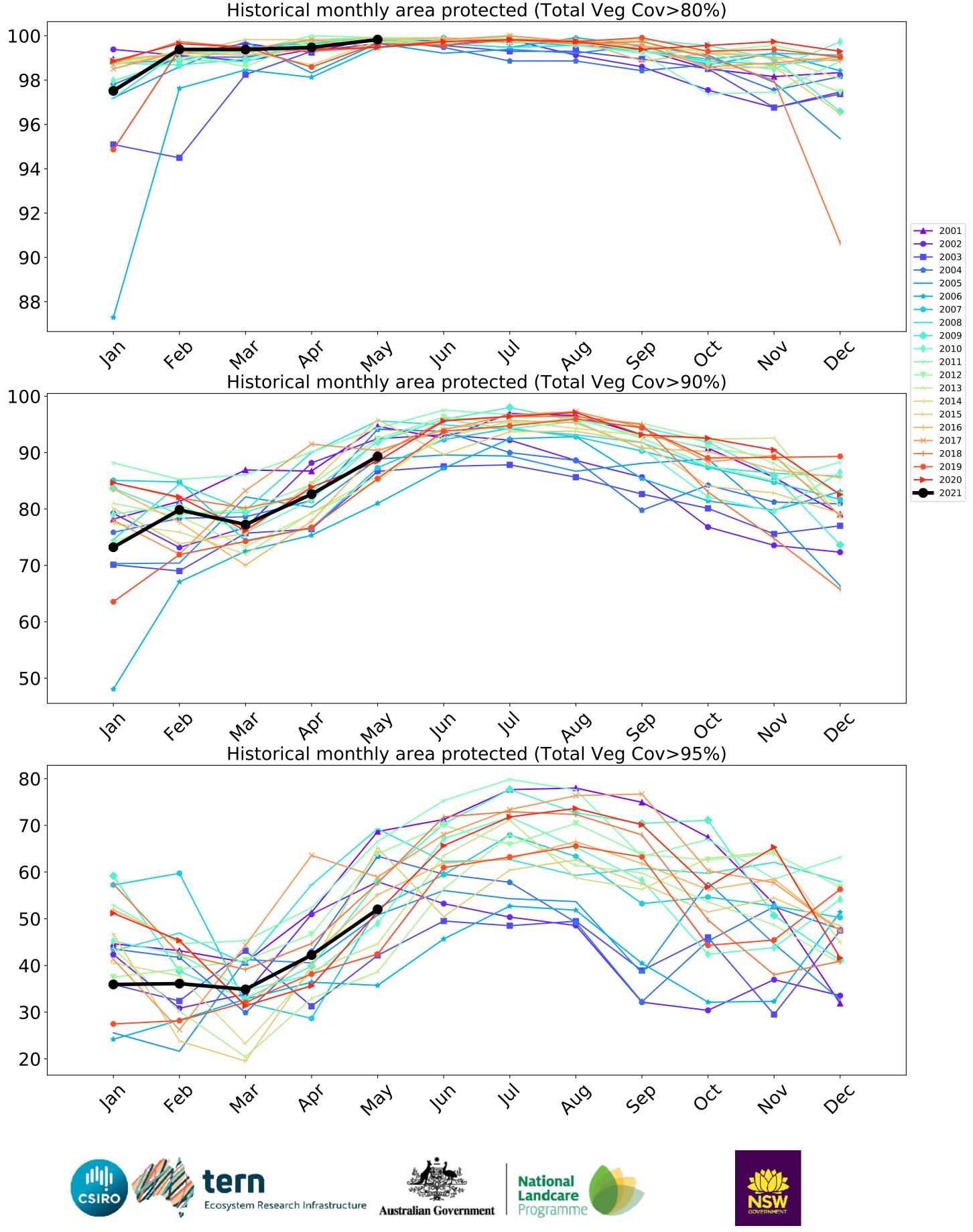
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.00-99.75 99.50 ---- above_70 **—** 10th **——** 50th 99.25 99.00 98.75 98.50 98.25 feb 1ar hill May W31 PQ' month tern Ecosystem Research Infrastructure Australian Government

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





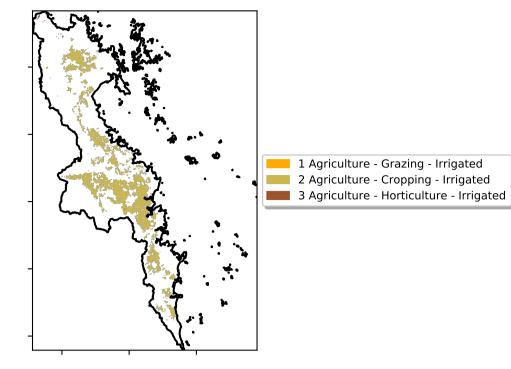




Irrigation

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

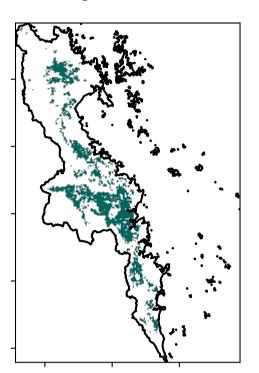
1210-200°

· 52% 70%

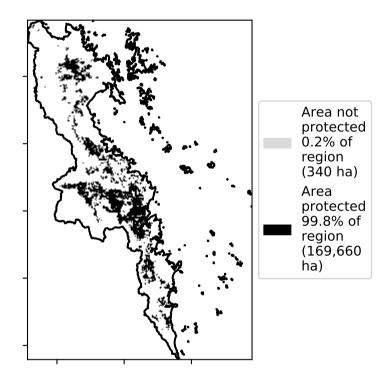
3201050010

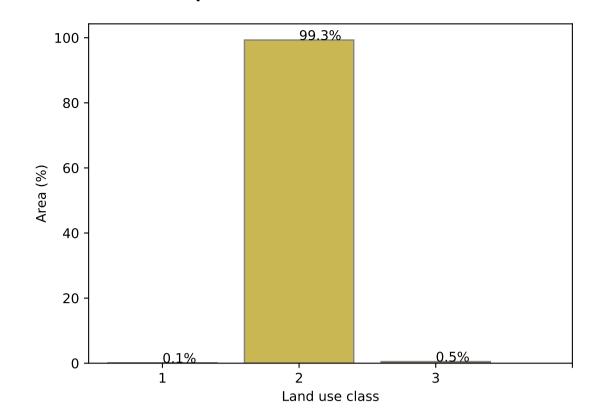
0.30%

Total Vegetation Cover [%]



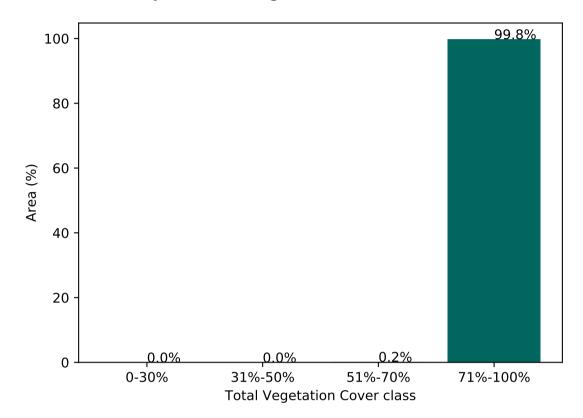
% Area protected from water erosion (>70%)





Proportion of each land class in area

Proportion of vegetation cover class in area

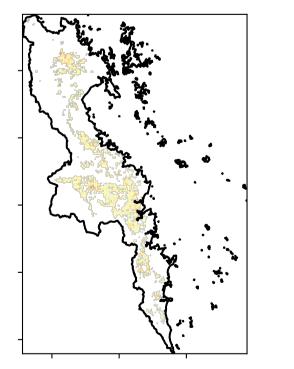


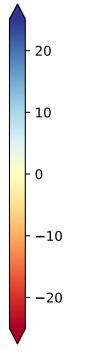
% Area protected from wind erosion (>50%)

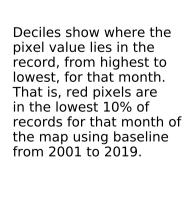


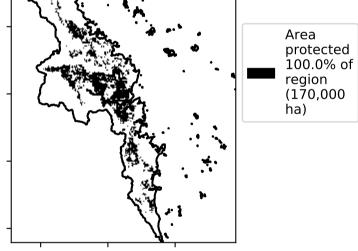
Total Vegetation Cover Anomaly [%]

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.







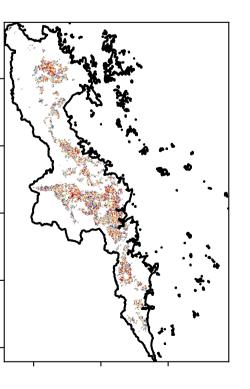


\$

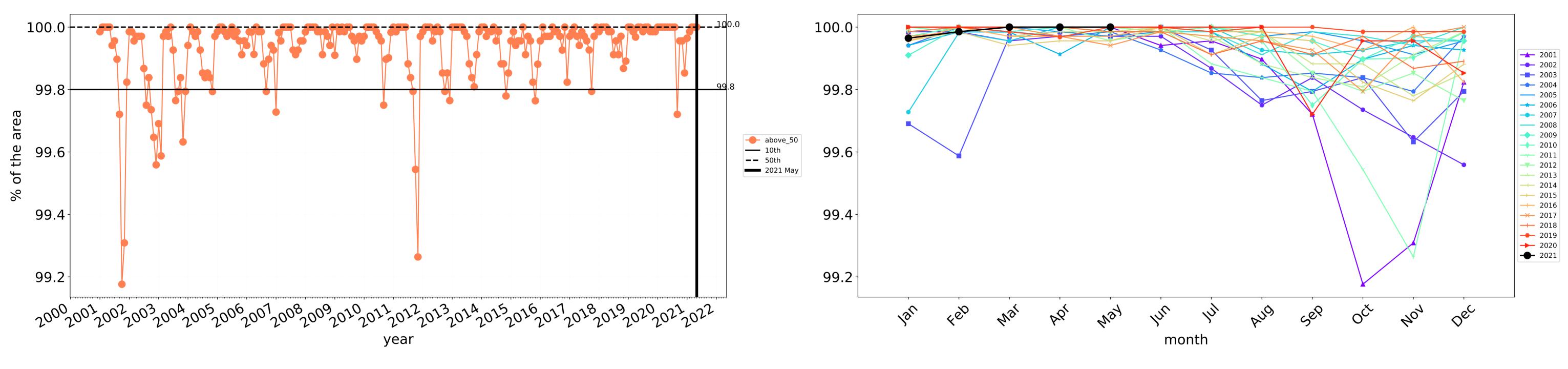
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A-1

2?

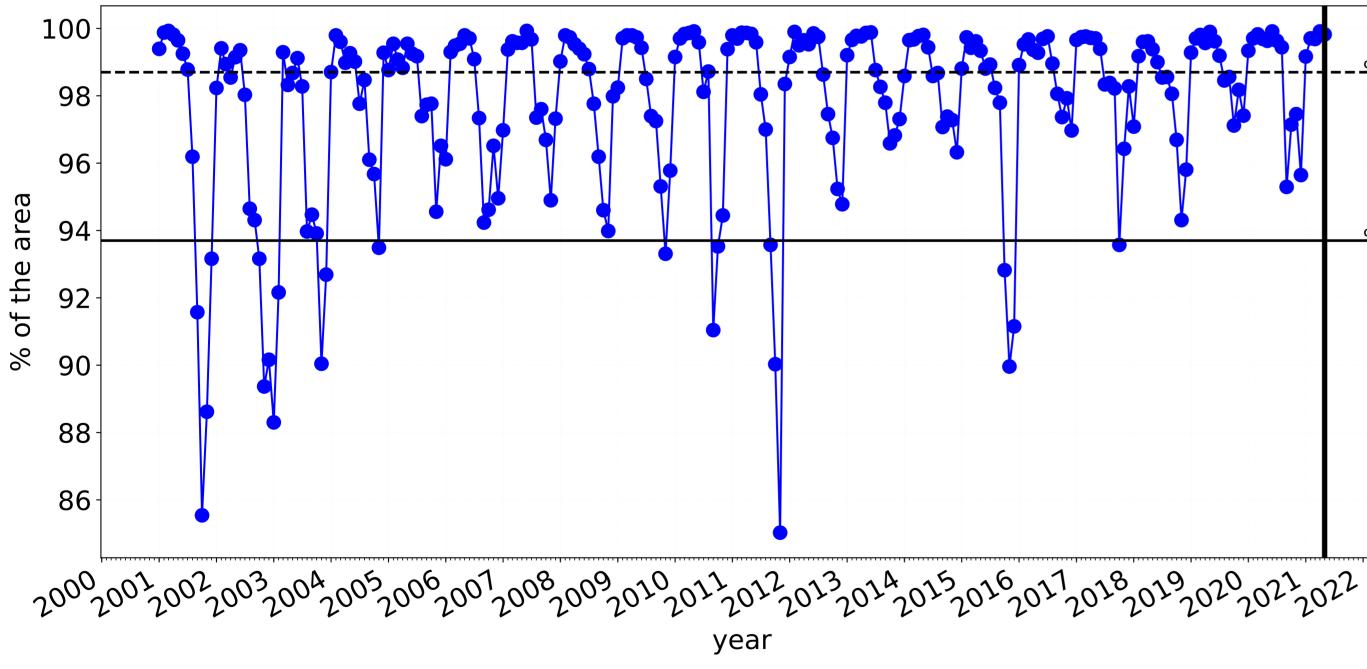






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



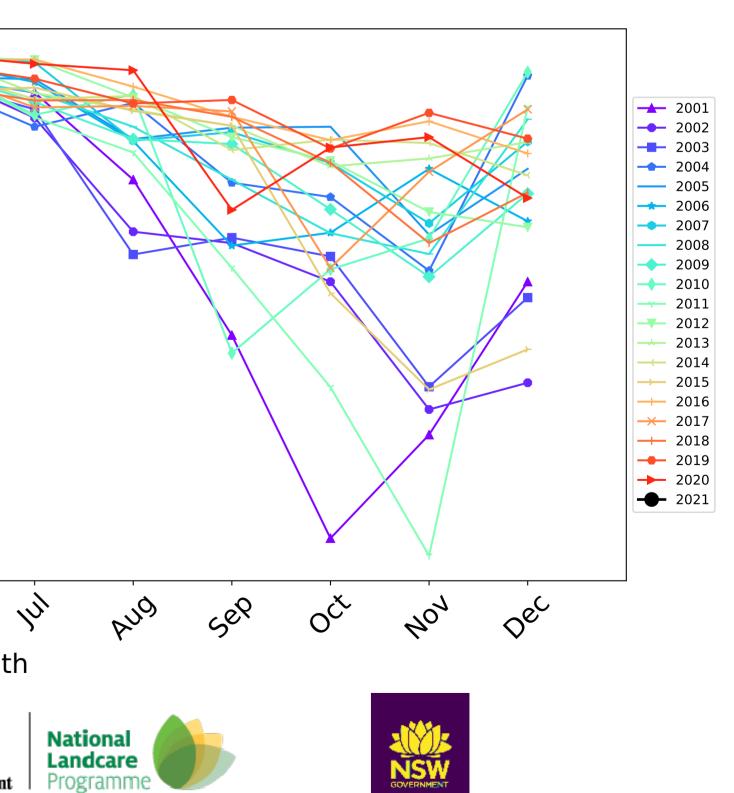


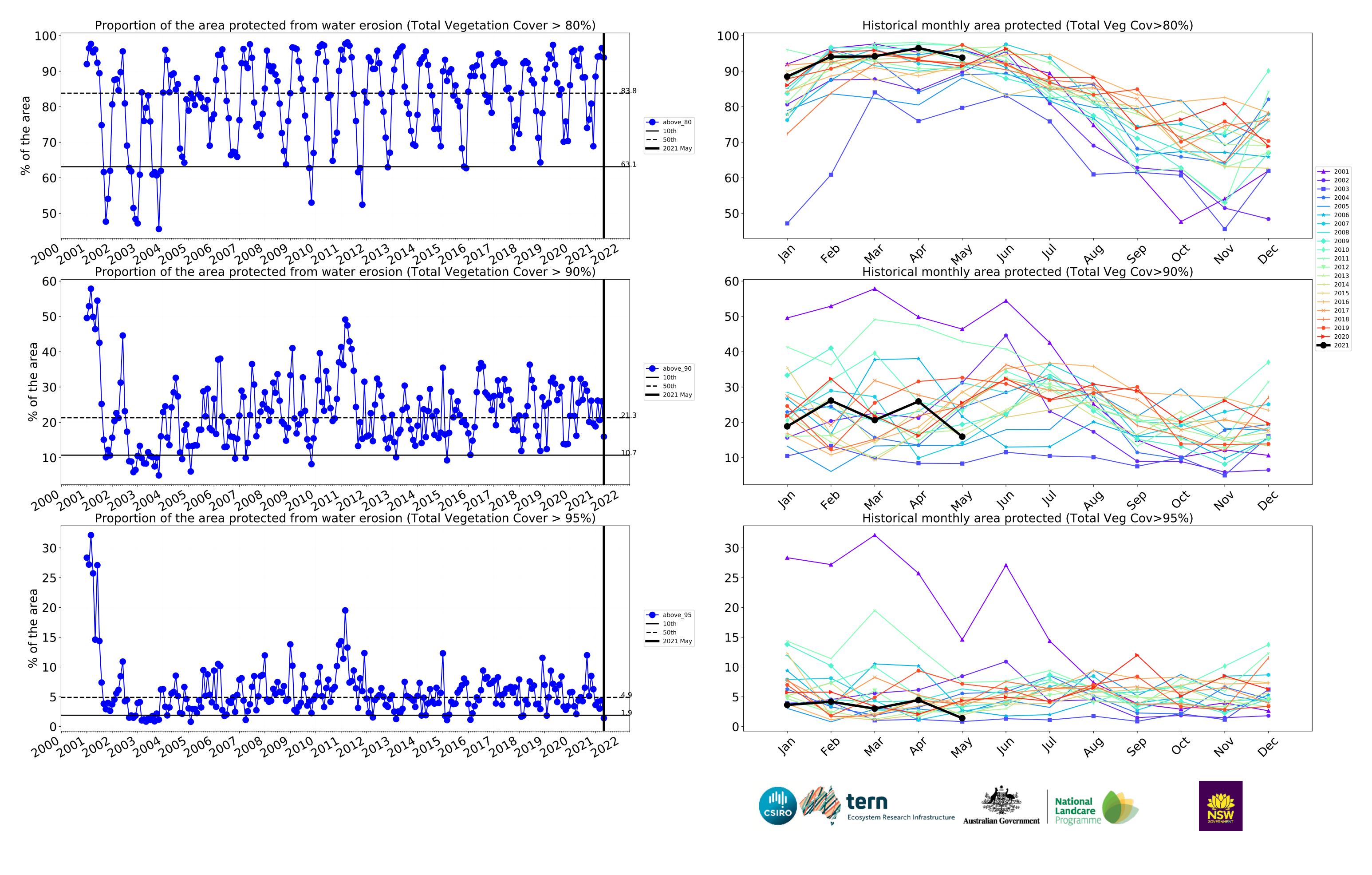
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100-98 96 ---- above_70 **—** 10th 94 **——** 50th **——** 2021 May 92 90 88 86 Jan 4eb May PP In Mar month **UNU** tern Ecosystem Research Infrastructure

Australian Government

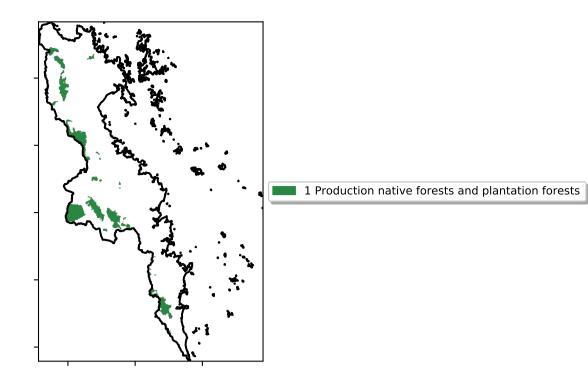
Water erosion historical monthly area protected (Total Veg Cov>70%)



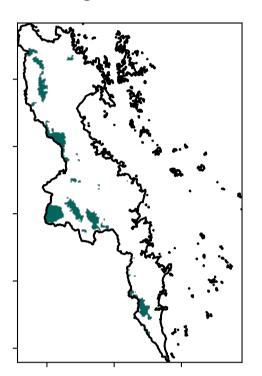


Production native forests and plantation forests

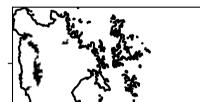
Land use and forest cover

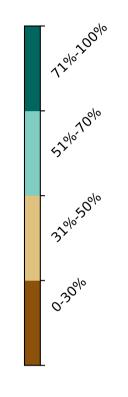


Total Vegetation Cover [%]

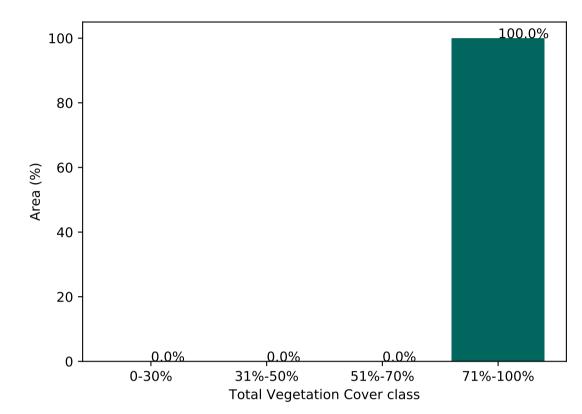




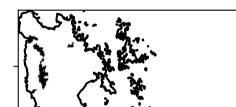




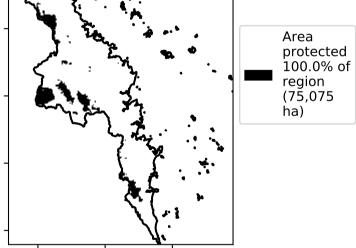
Proportion of vegetation cover class in area



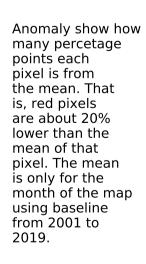
% Area protected from wind erosion (>50%)

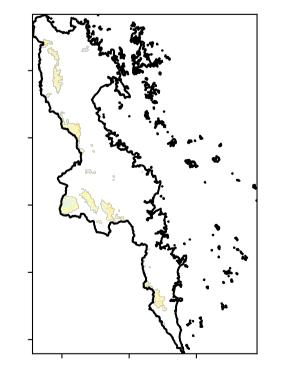


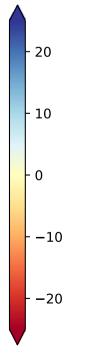
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

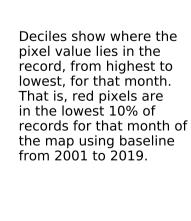


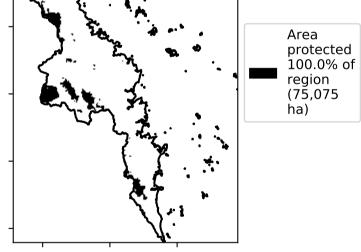
Total Vegetation Cover Anomaly [%]

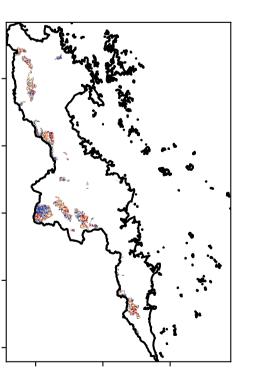






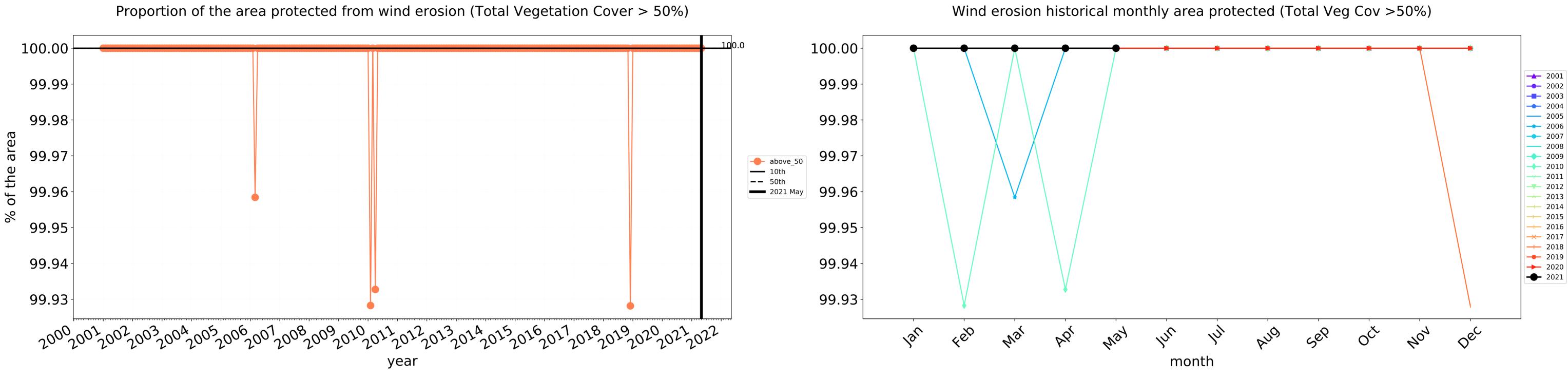




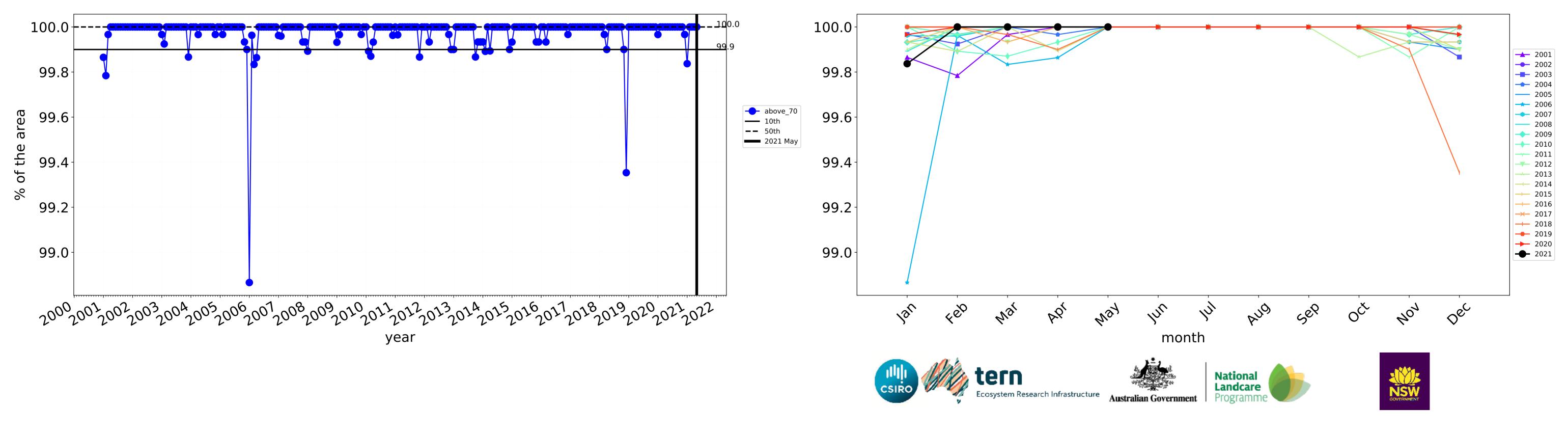




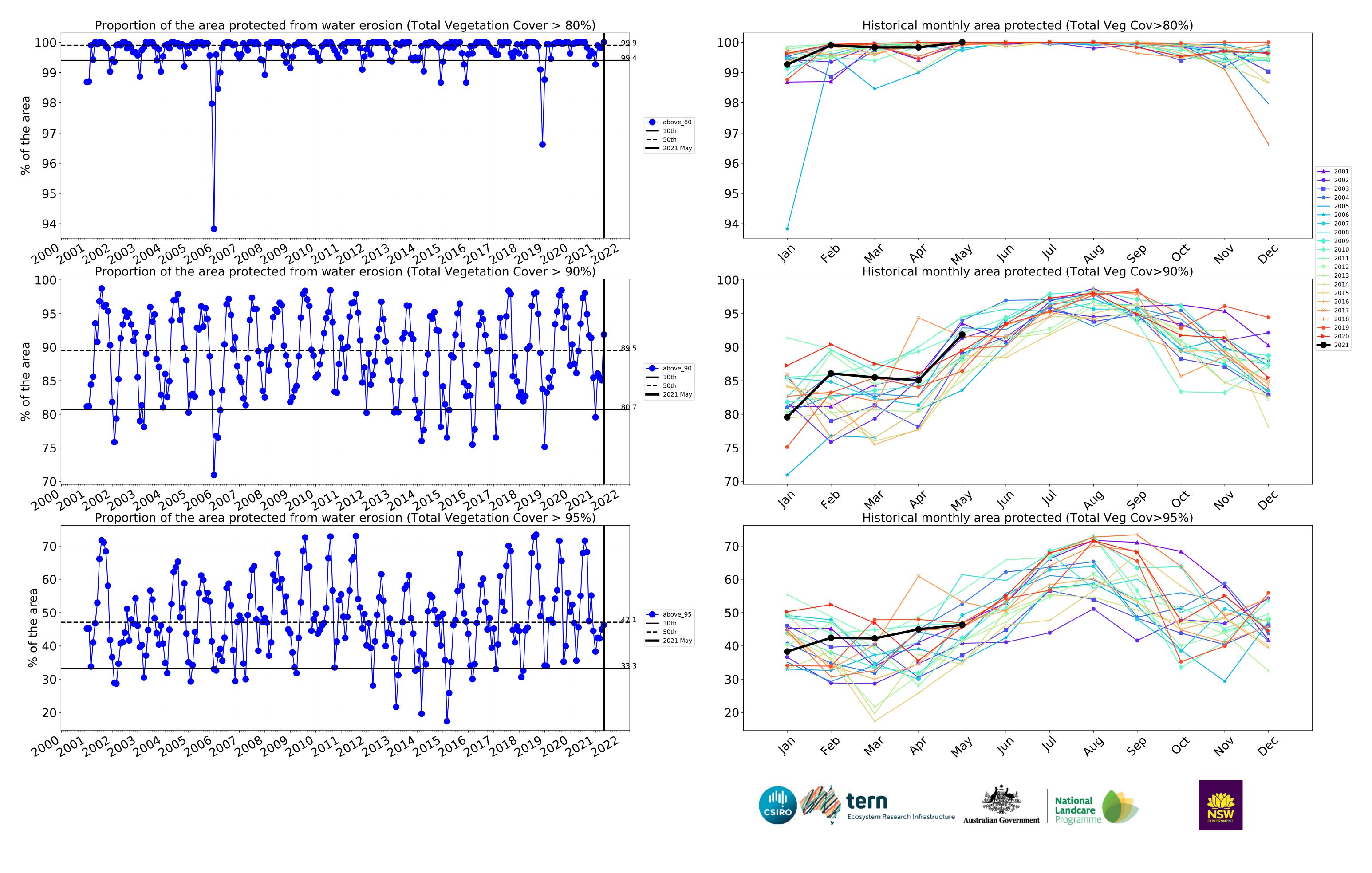




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Mackay Whitsunday (908,000 ha and no data 25,060 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	908,000	99.9% 907,150	99.7% 905,150	98.5% 893,950	95.1% 863,075	63.4% 575,275	26.8% 243,625
Conservation and natural environments	275,750	99.8% 275,300	99.5% 274,475	98.3% 271,000	96.3% 265,525	76.8% 211,675	33.2% 91,650
Conservation and natural environments non forest	7,250	97.9% 7,100	96.6% 7,000	89.7% 6,500	75.2% 5,450	45.5% 3,300	17.2% 1,250
Conservation and natural environments Woodland forest	75,000	99.9% 74,925	99.8% 74,825	99.0% 74,225	97.3% 73,000	80.2% 60,150	28.6% 21,450
Conservation and natural environments Forest (non woodland)	193,500	99.9% 193,275	99.6% 192,650	98.3% 190,275	96.7% 187,075	76.6% 148,225	35.6% 68,950
Agriculture	468,350	100.0% 468,275	99.9% 468,075	99.8% 467,300	97.2% 455,125	57.2% 268,000	23.6% 110,600
Grazing	298,300	100.0% 298,225	99.9% 298,025	99.7% 297,550	99.1% 295,600	80.7% 240,850	36.3% 108,200
Grazing non forest	189,150	100.0% 189,075	99.9% 188,925	99.7% 188,550	98.7% 186,700	75.1% 142,125	31.5% 59,500
Grazing Woodland forest	80,600	100.0% 80,600	100.0% 80,575	99.9% 80,500	99.8% 80,400	90.8% 73,225	42.0% 33,850
Grazing - Forest (non woodland)	28,550	100.0% 28,550	99.9% 28,525	99.8% 28,500	99.8% 28,500	89.3% 25,500	52.0% 14,850
Irrigation	170,000	100.0% 170,000	100.0% 170,000	99.8% 169,700	93.8% 159,475	15.9% 27,100	1.4% 2,400
Production native forests and plantation forests	75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	91.9% 68,975	46.3% 34,775

