Total vegetation cover soil protection Region:LGA Mackay_(R) QLD

Date: January 2024

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

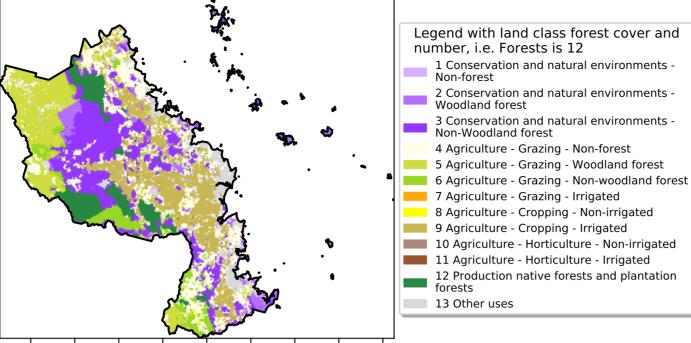


Vegetation Cover Jan 2024

Land use and forest cover

Proportion of each land class in area





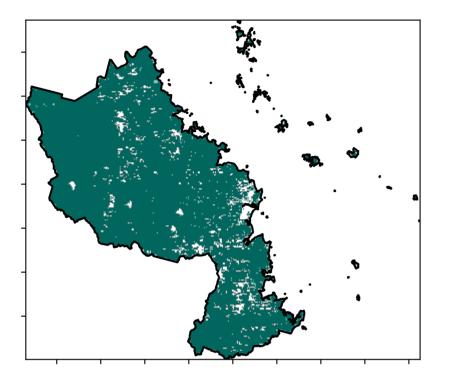
12010-20091

· 52°10'70°10

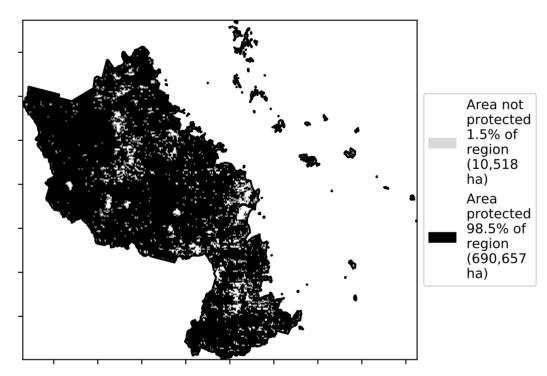
3201050010

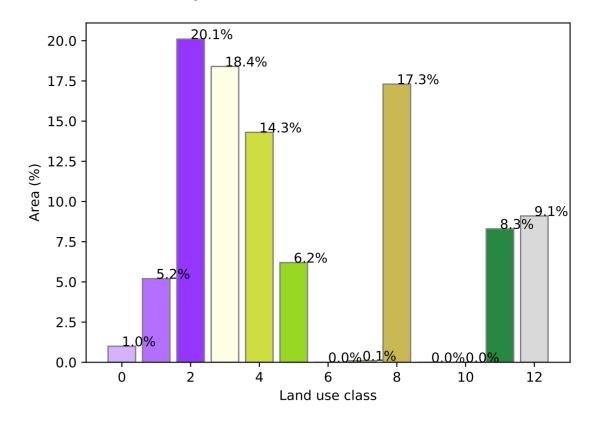
0.30%

Total Vegetation Cover [%]

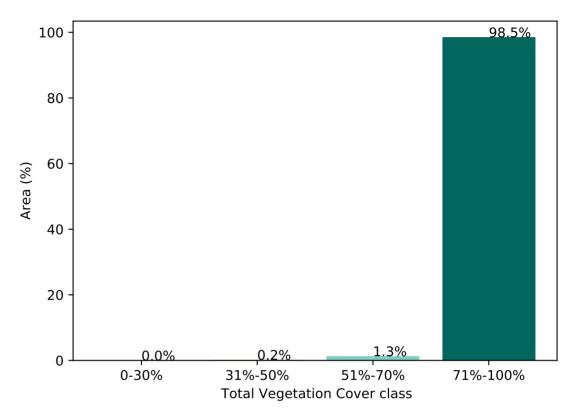


% Area protected from water erosion (>70%)

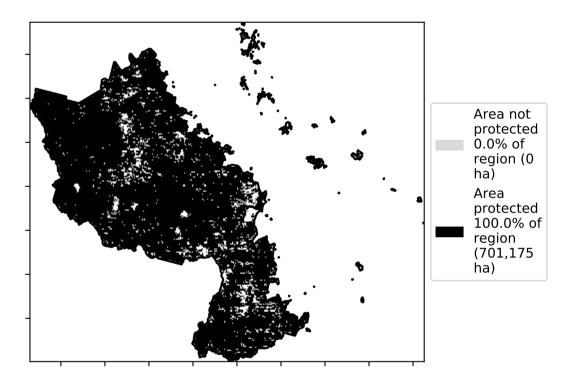




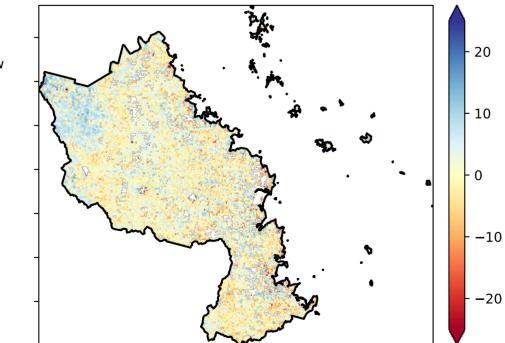
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

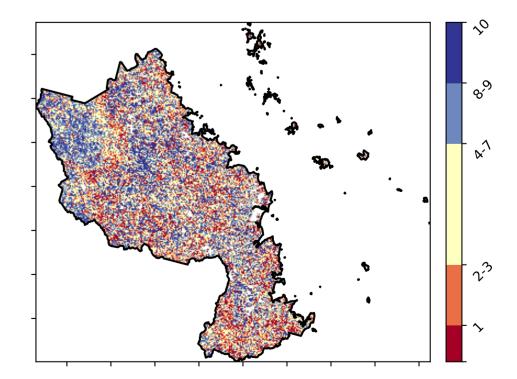


Total Vegetation Cover Anomaly [%]



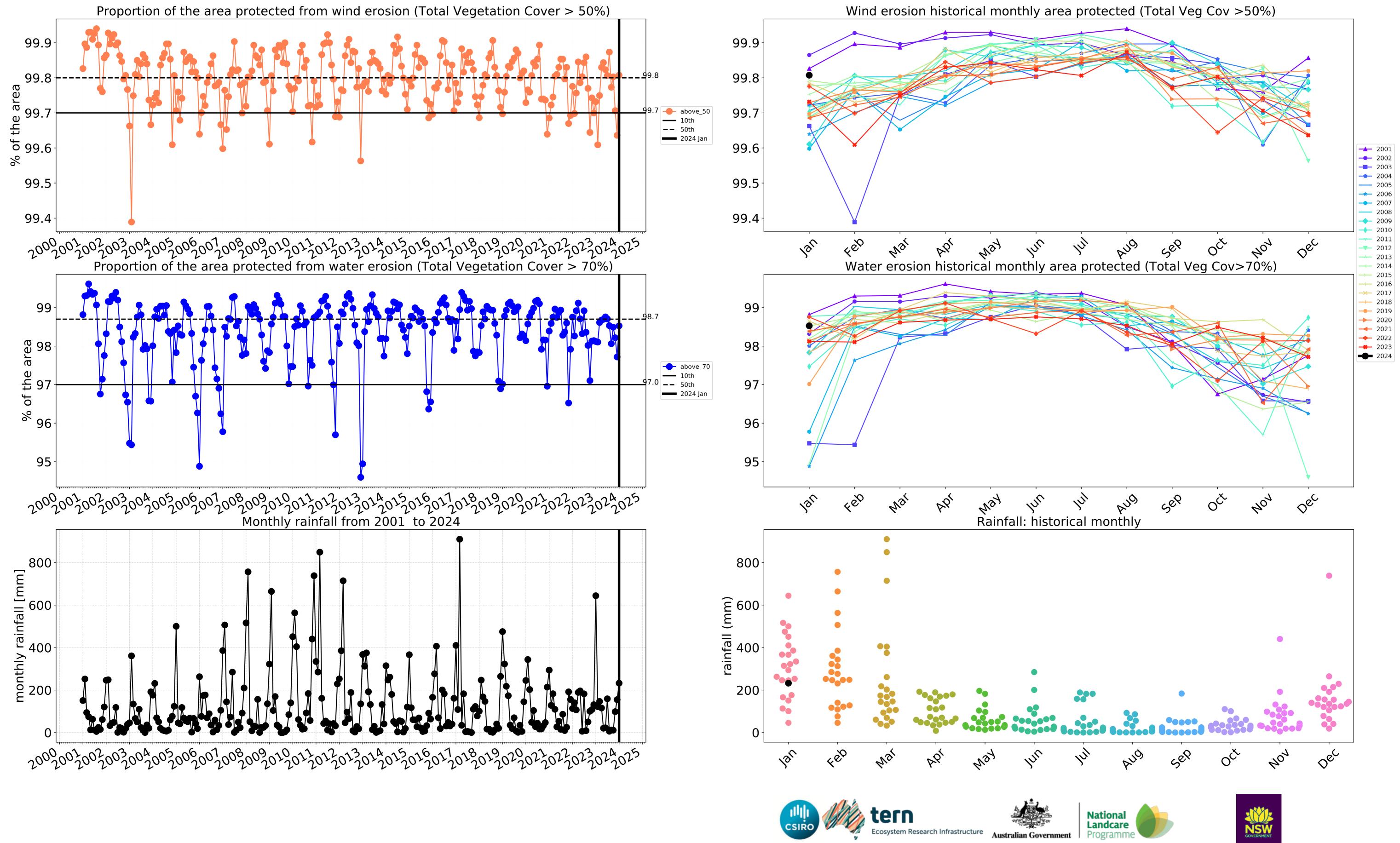
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

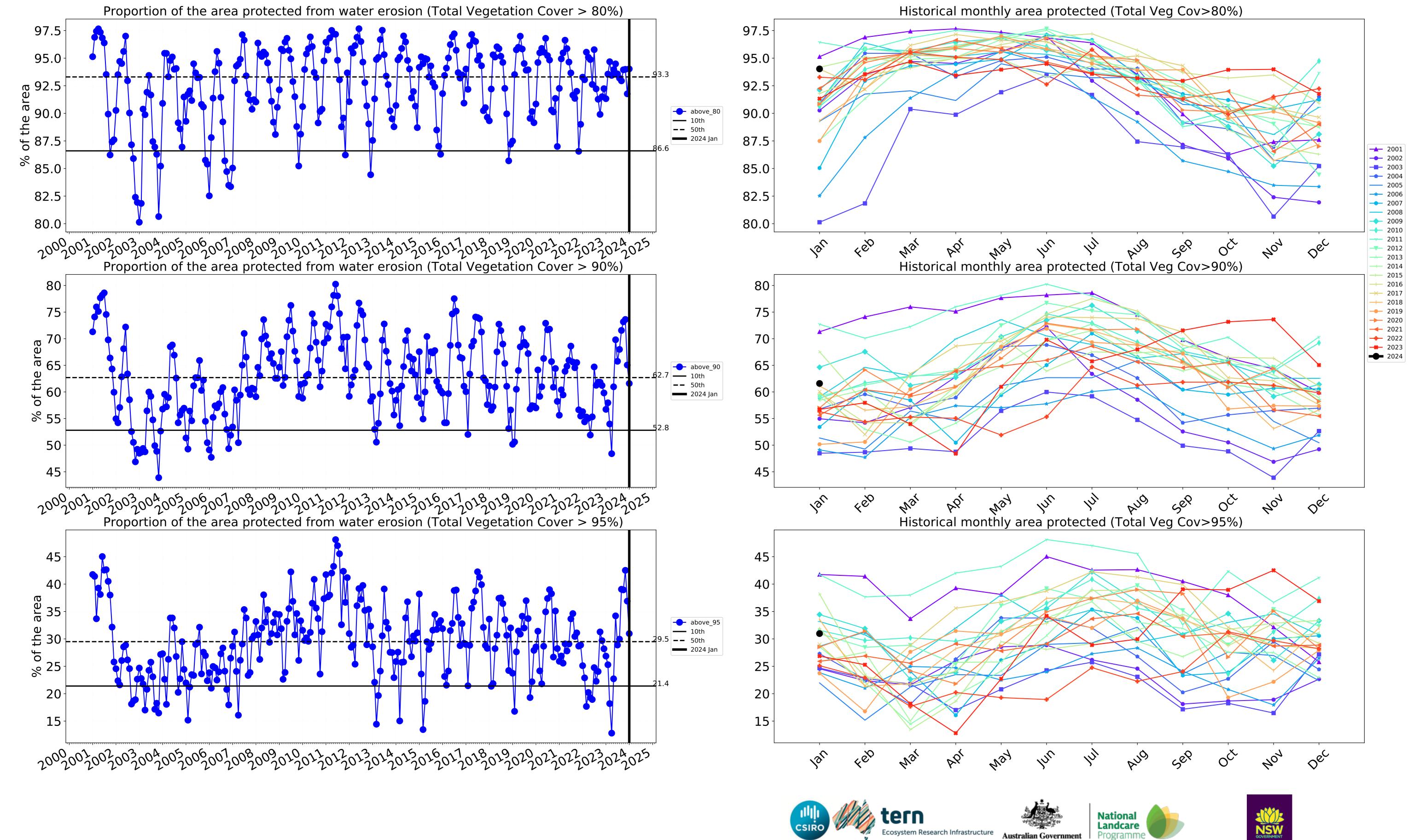
Total Vegetation Cover Decile [%]





2







Conservation and natural environments

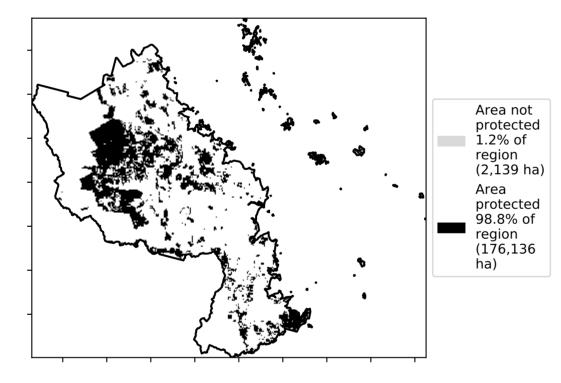
Catchment Scale Land

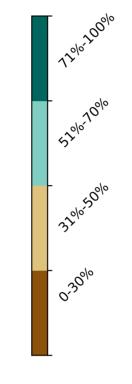
Land use and forest cover

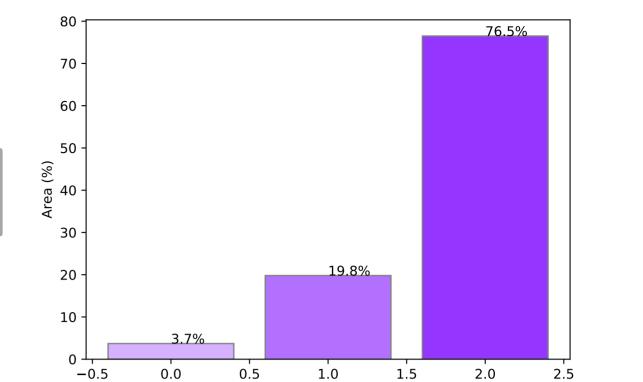
1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Nonwoodland forest

Total Vegetation Cover [%]

% Area protected from water erosion (>70%)



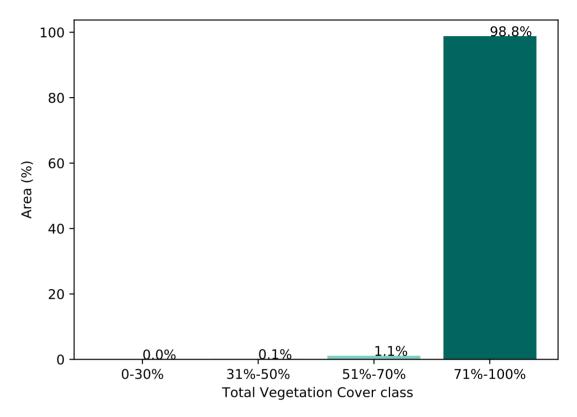




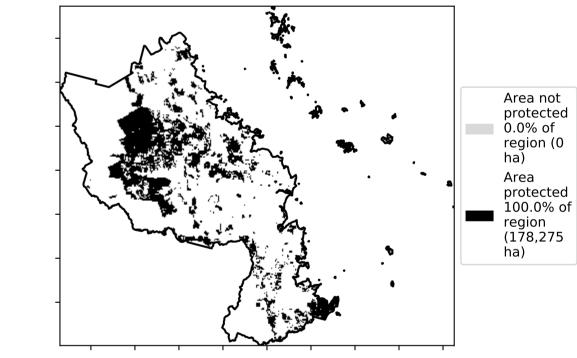
Proportion of each land class in area

Proportion of vegetation cover class in area

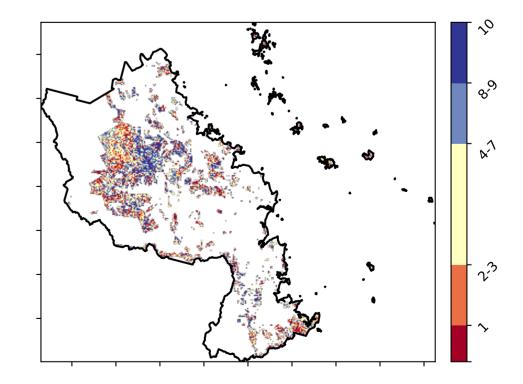
Land use class



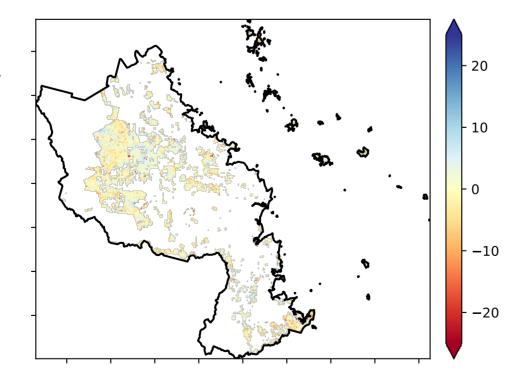
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



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





Anomaly show how many percetage points each pixel is from the mean That 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.

Catchment Scale

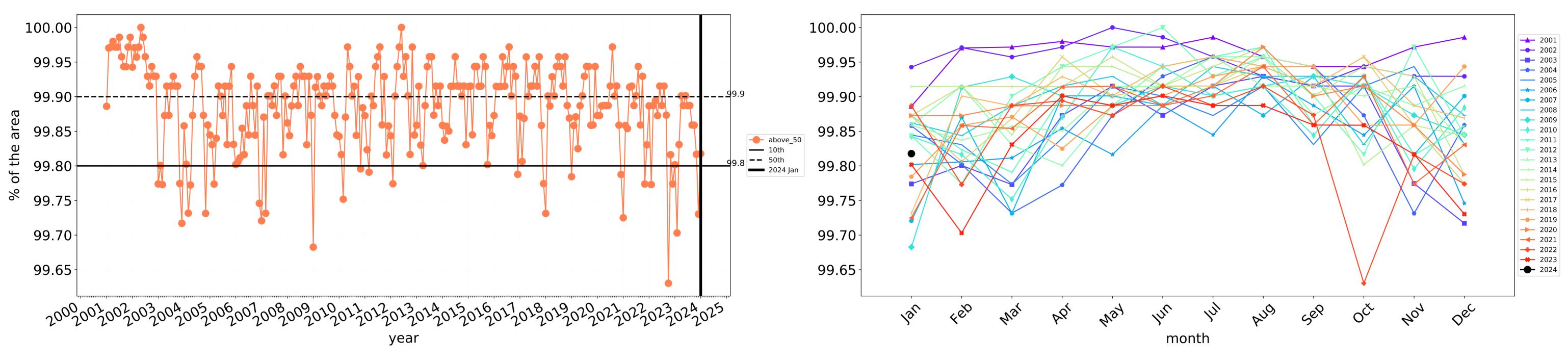
Derived from

Use of Australia

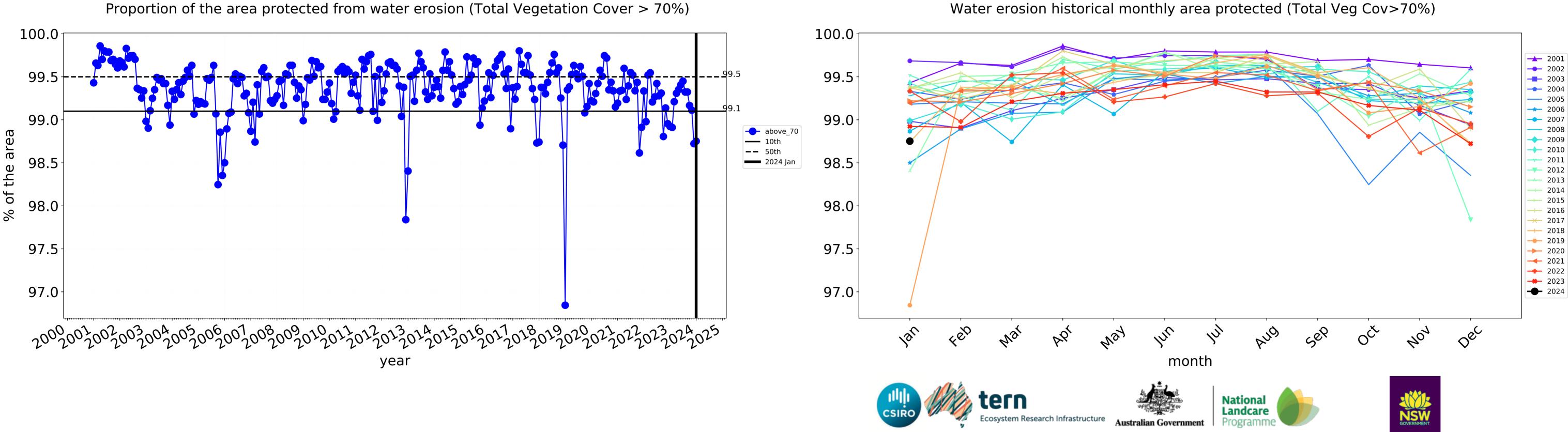
(2018) and Forests

of Australia (2018)

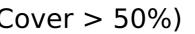
Land Use and Forests of Australia (2018)



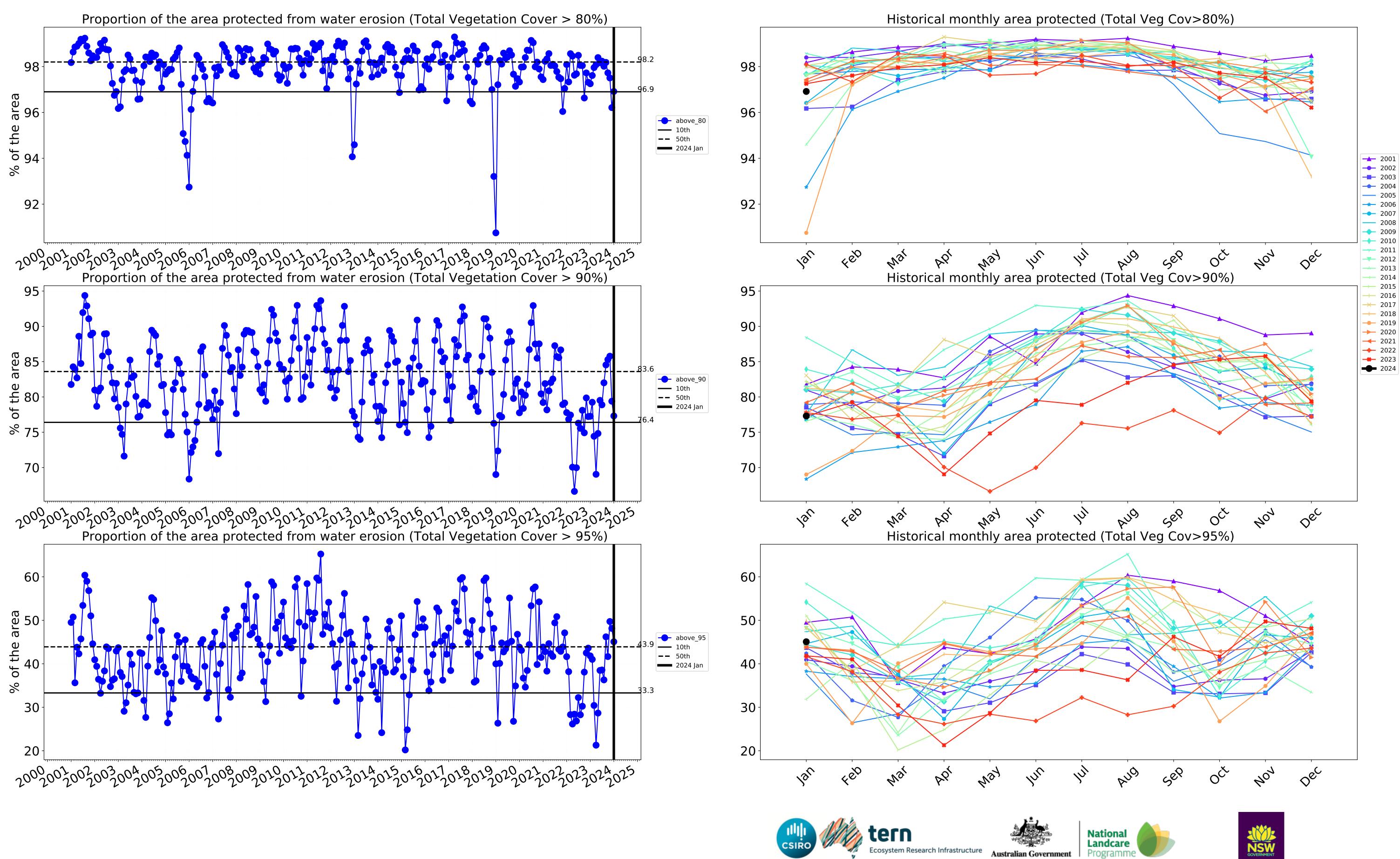
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



Conservation and natural environments timeseries



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



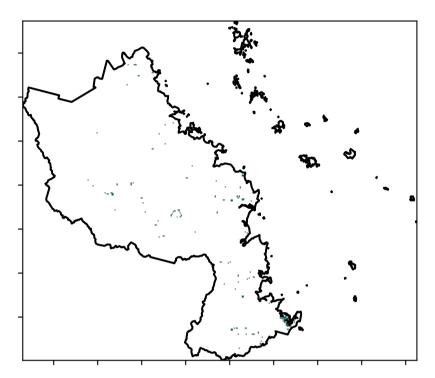


Conservation and natural environments non forest

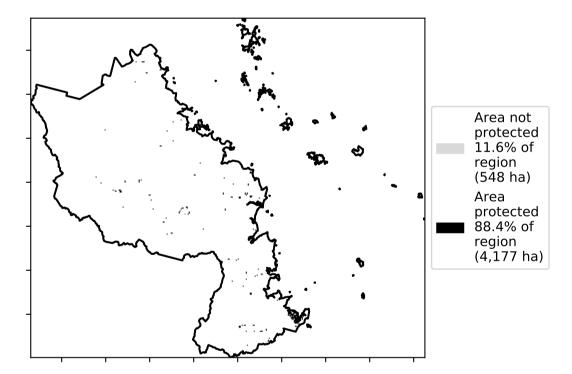
ቅዸ Catchment Scale Land Use and Forests of Australia (2018) 1 Conservation and natural environments - Non-forest Catchment Scale Land (2018) and Forests of Australia (2018)

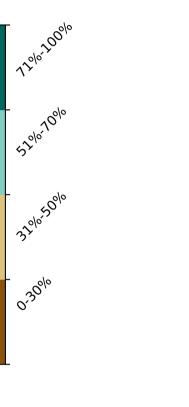
Land use and forest cover

Total Vegetation Cover [%]

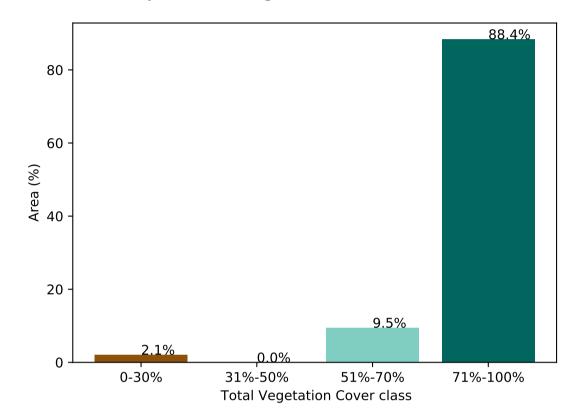


% Area protected from water erosion (>70%)

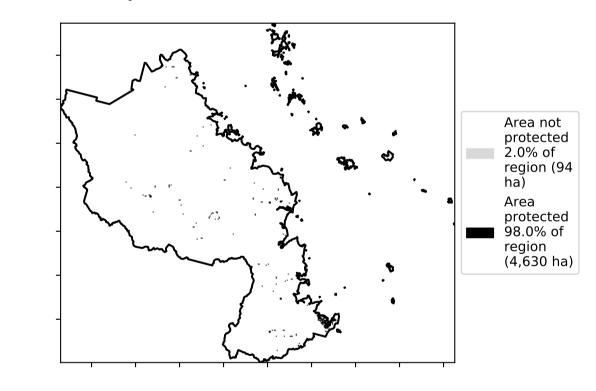




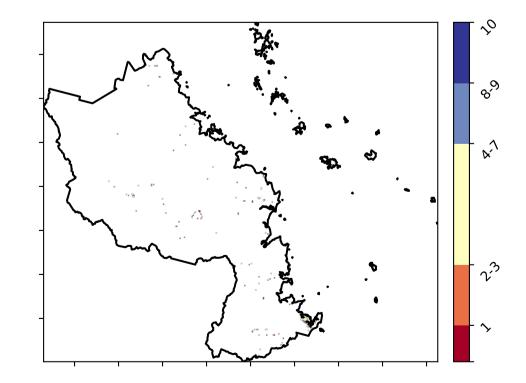
Proportion of vegetation cover class in area



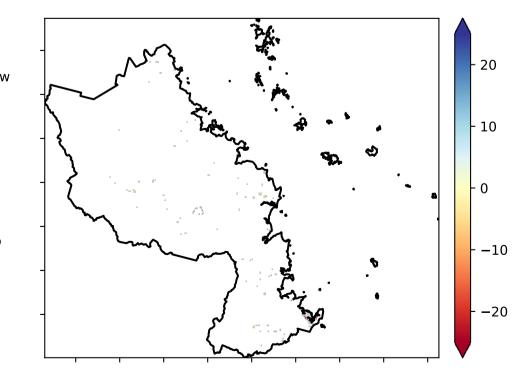
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



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

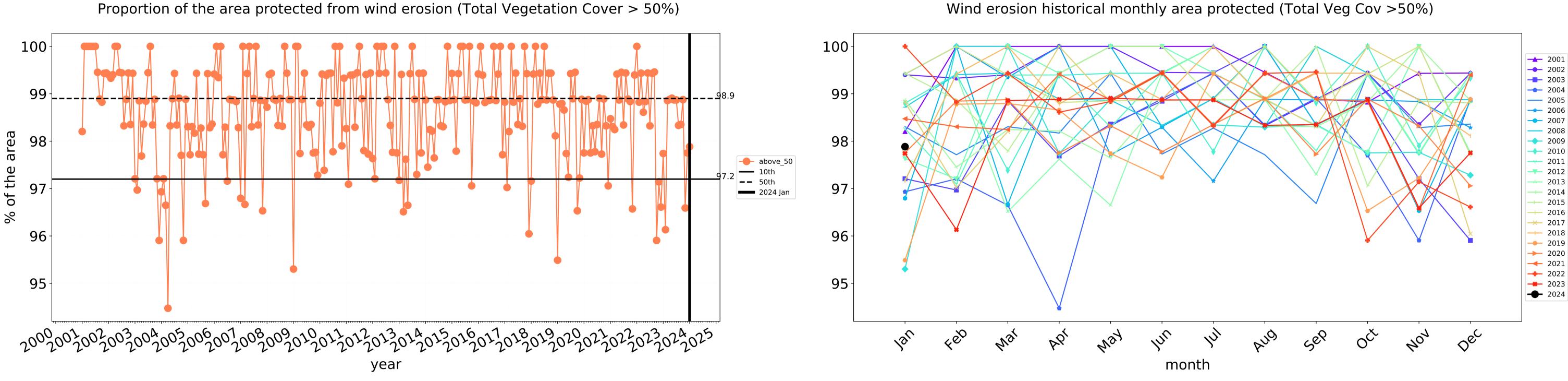




Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

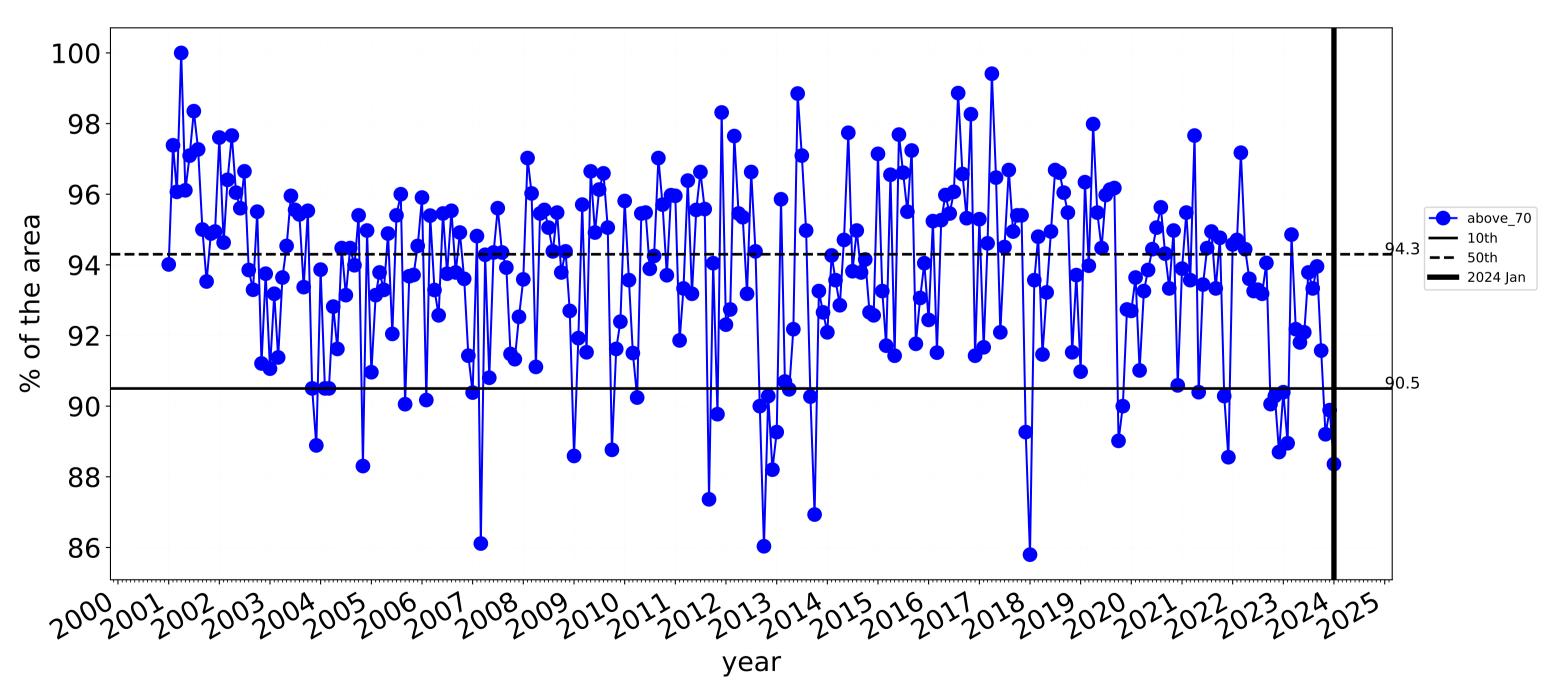
Derived from

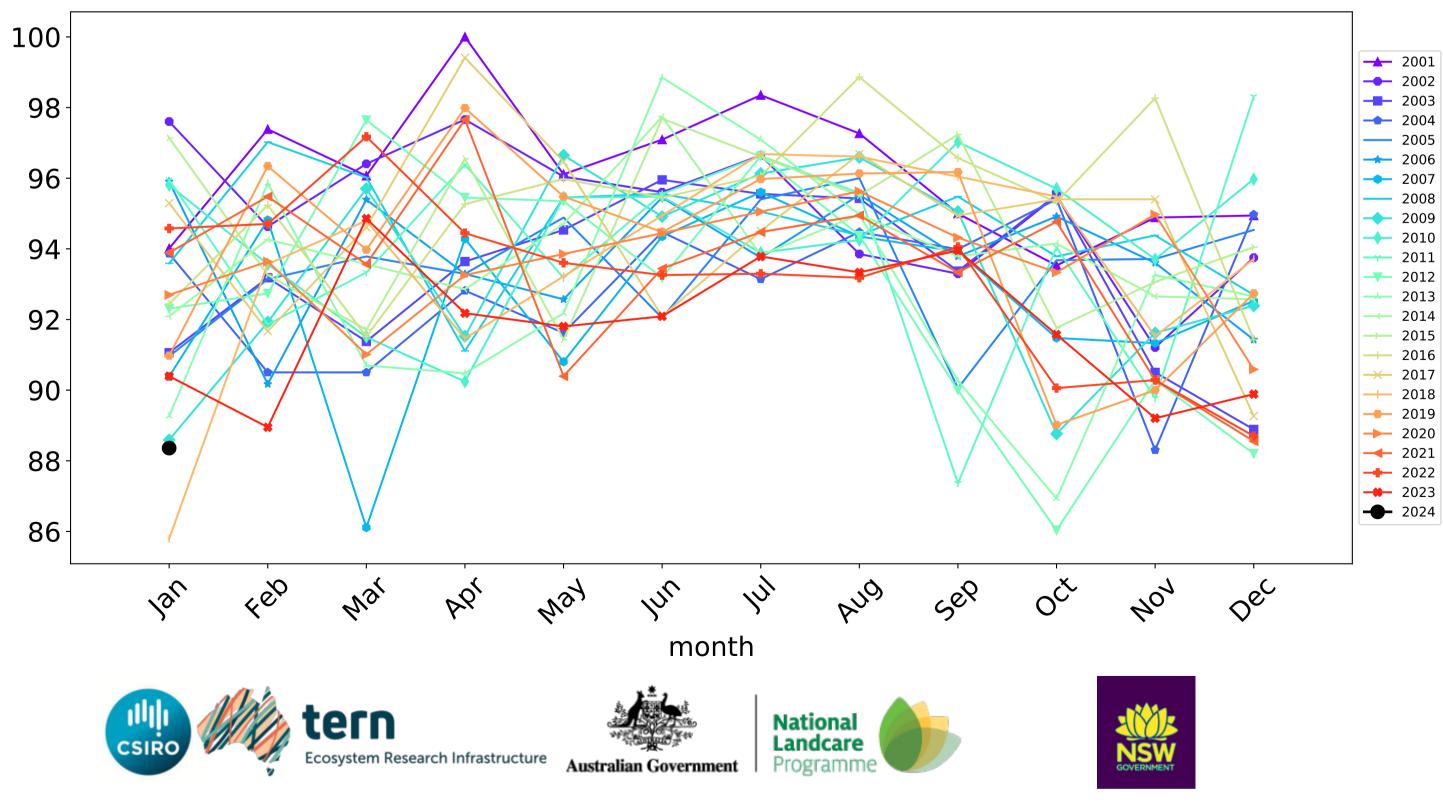
Use of Australia



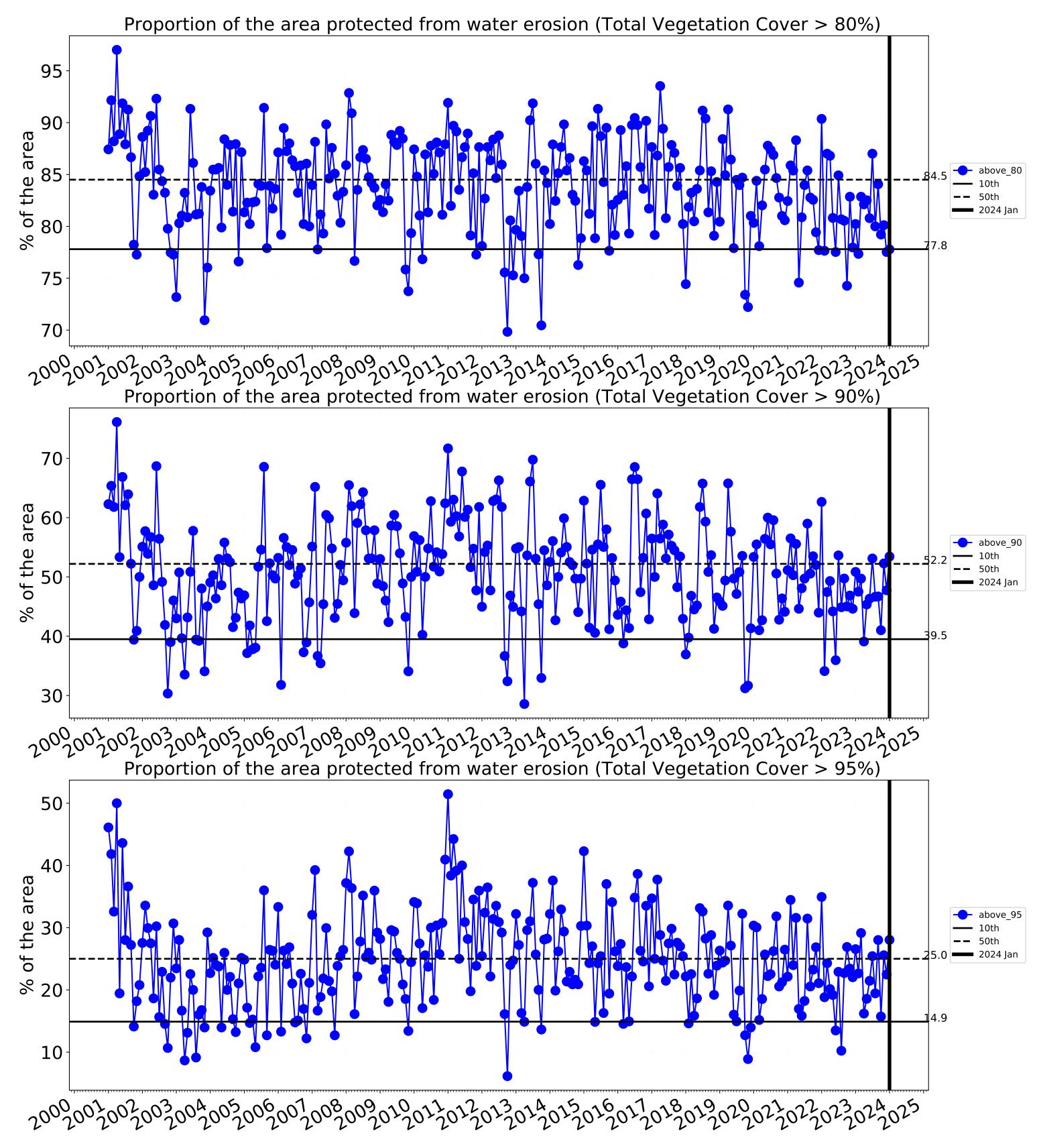
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

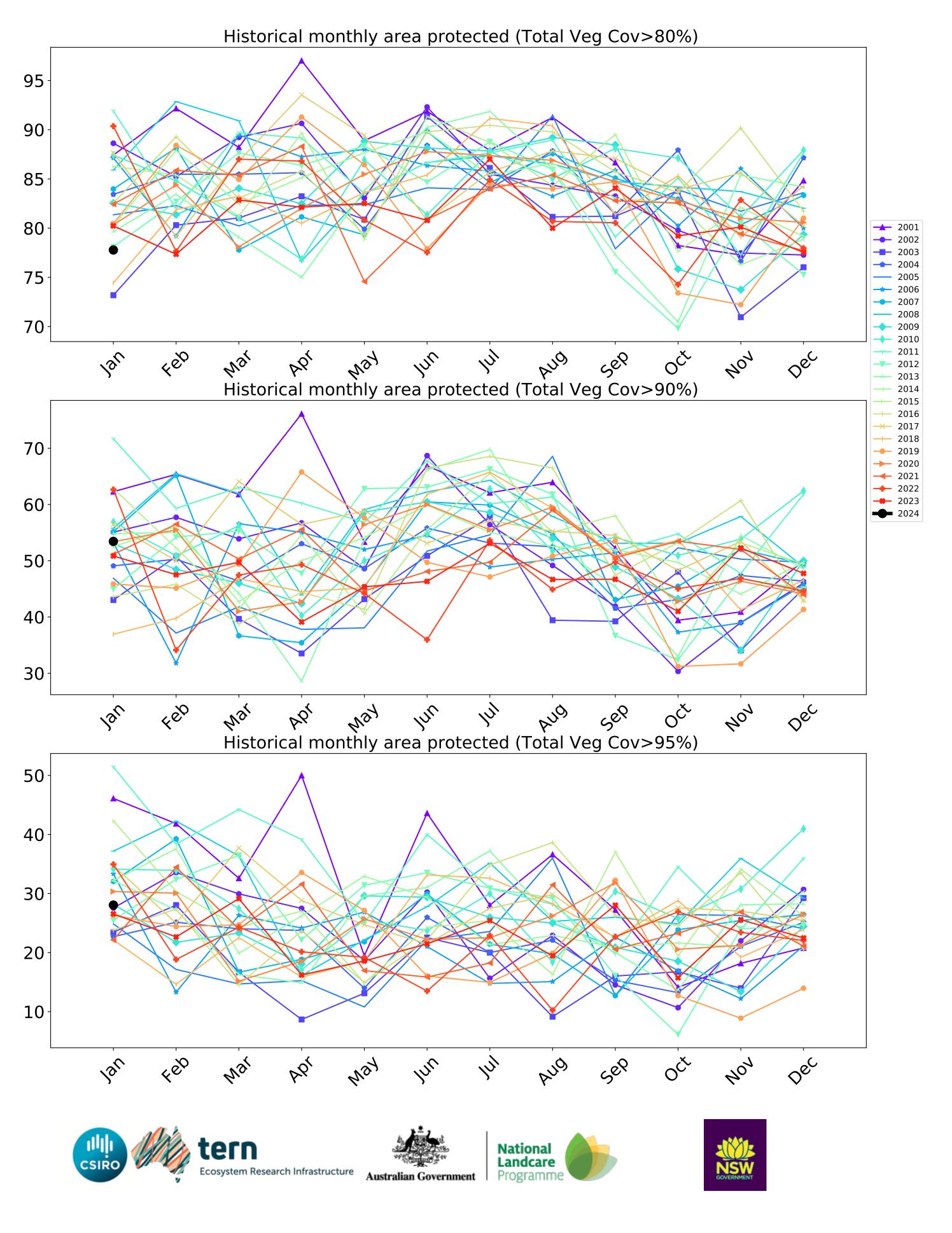






Water erosion historical monthly area protected (Total Veg Cov>70%)

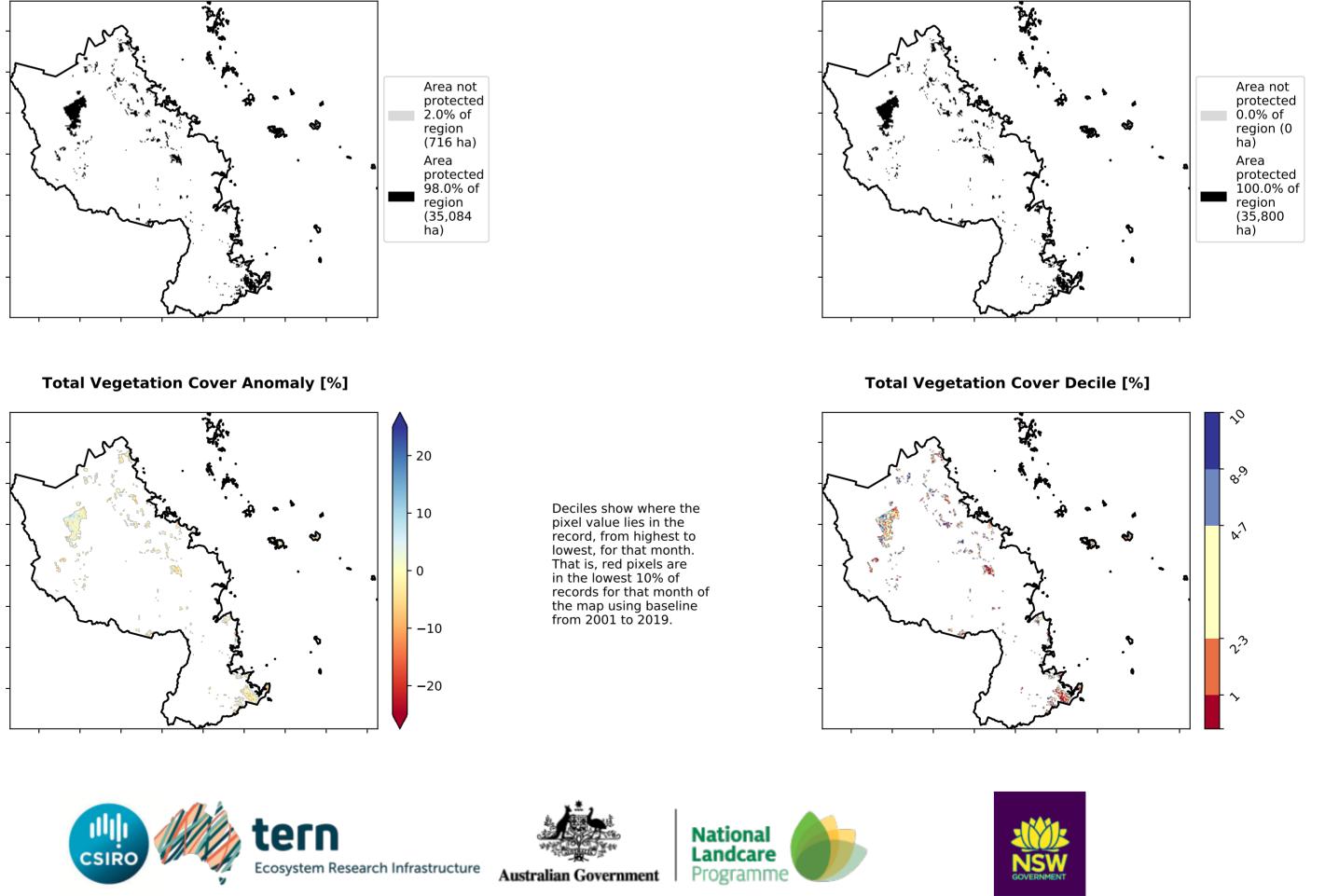


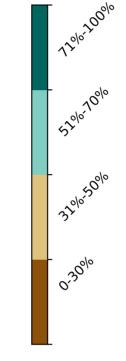


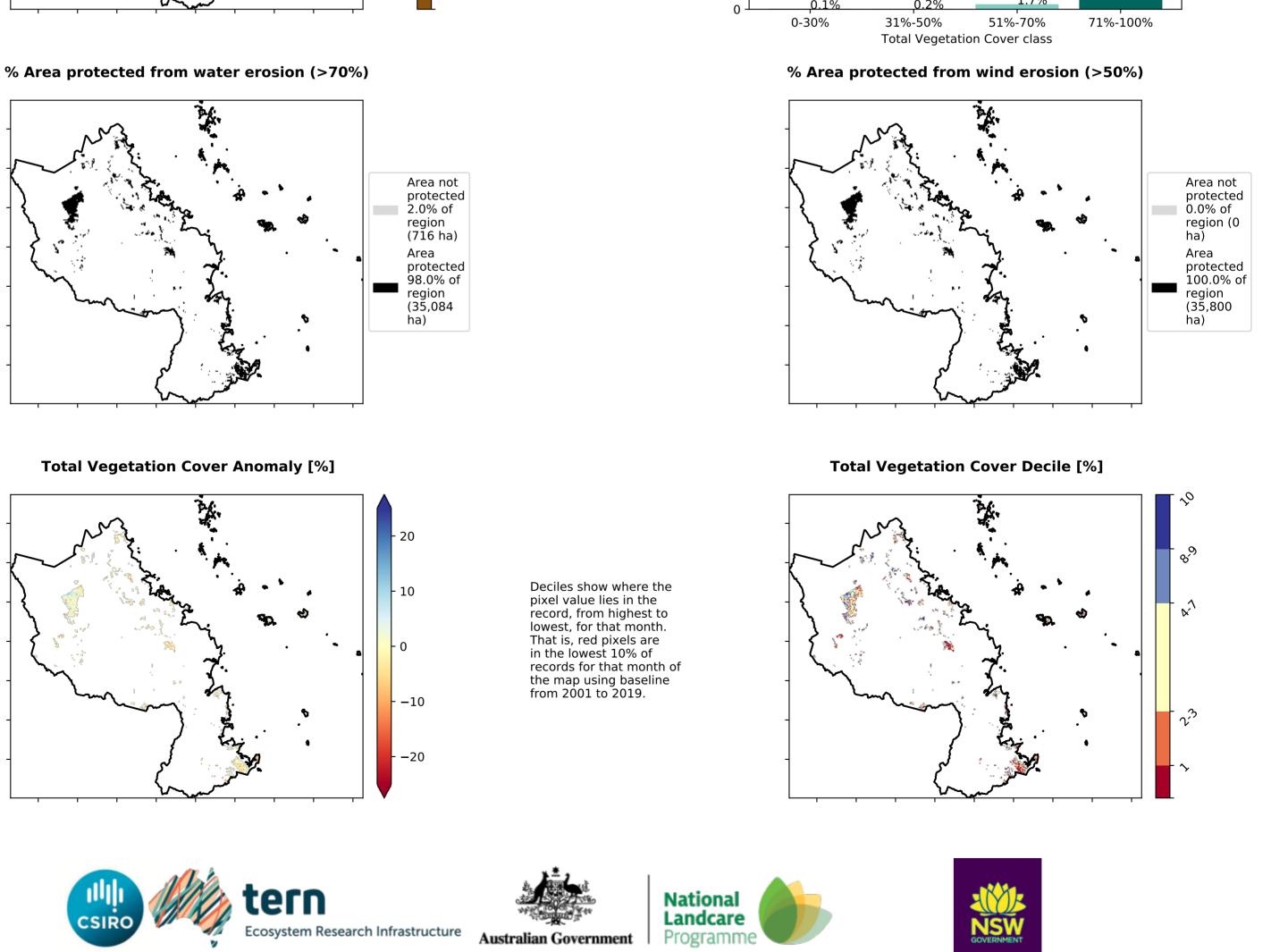
Conservation and natural environments Woodland forest

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

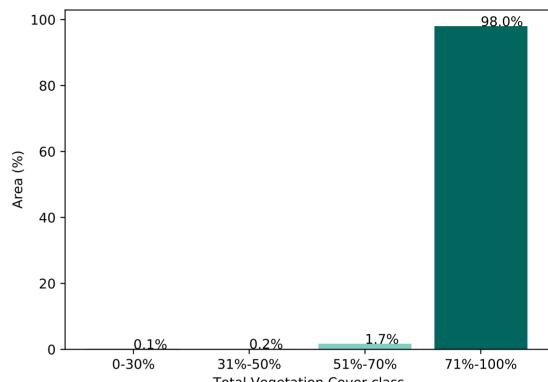
Total Vegetation Cover [%]

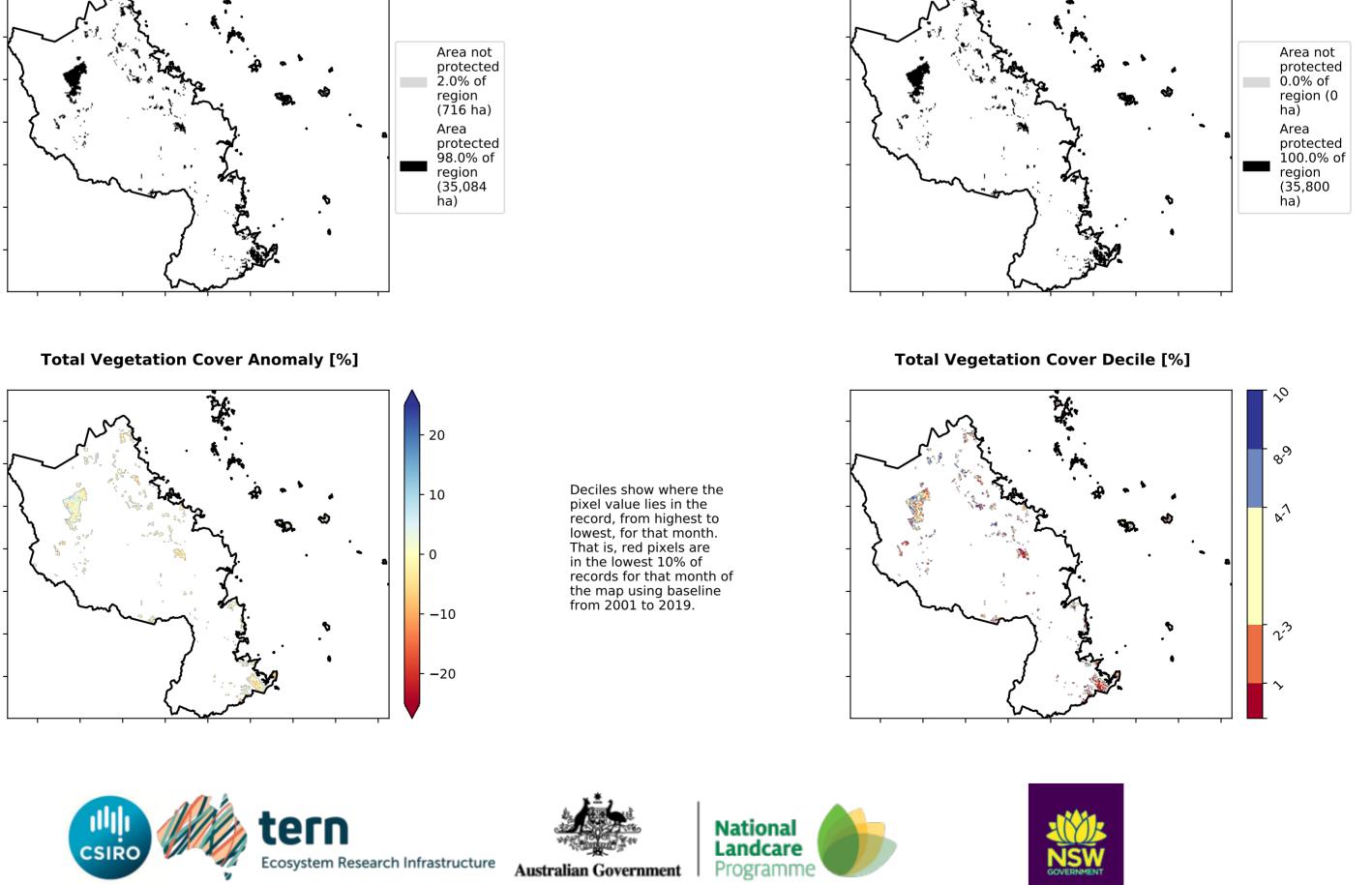






Proportion of vegetation cover class in area





1 Conservation and natural environments - Woodland

Land use and forest cover

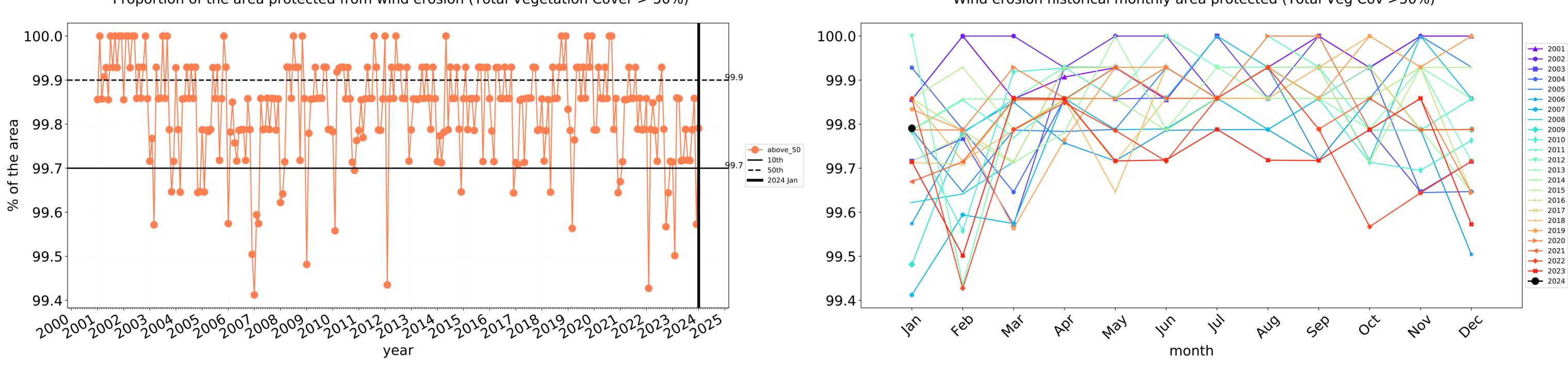
are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Anomaly show how many percetage points each pixel is from the mean That

the mean. That

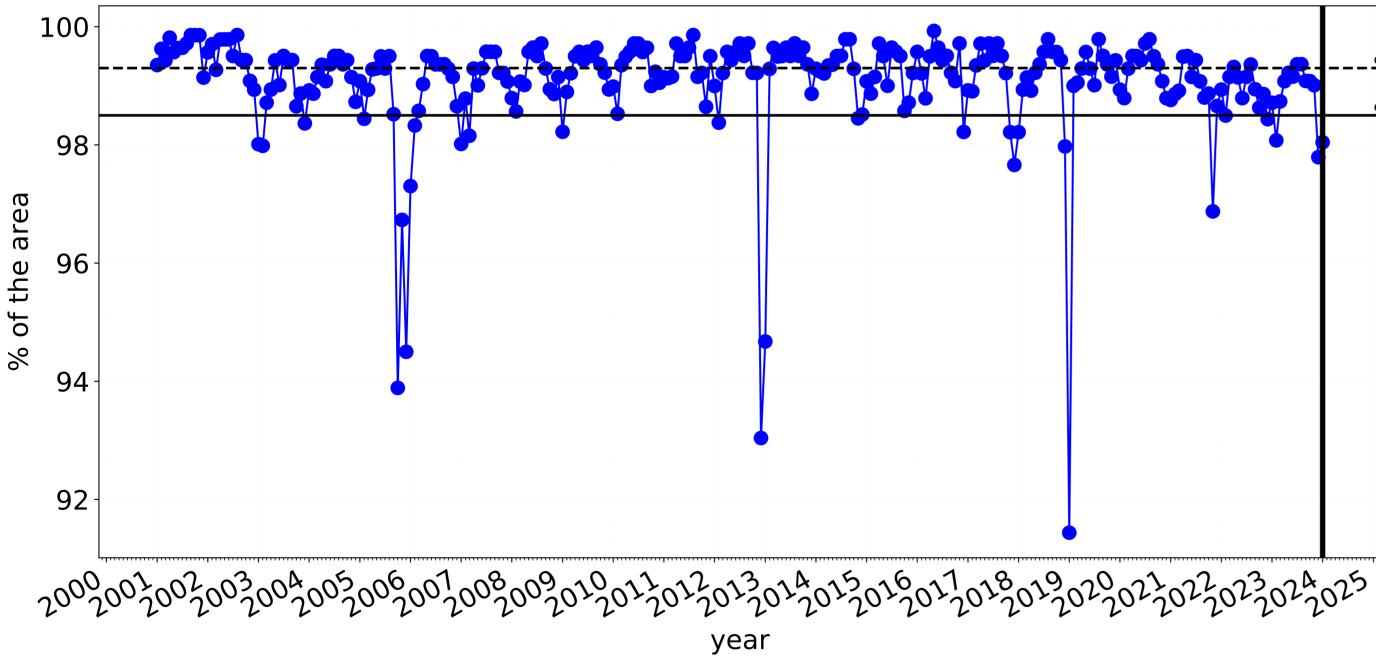
is, red pixels

Derived from



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

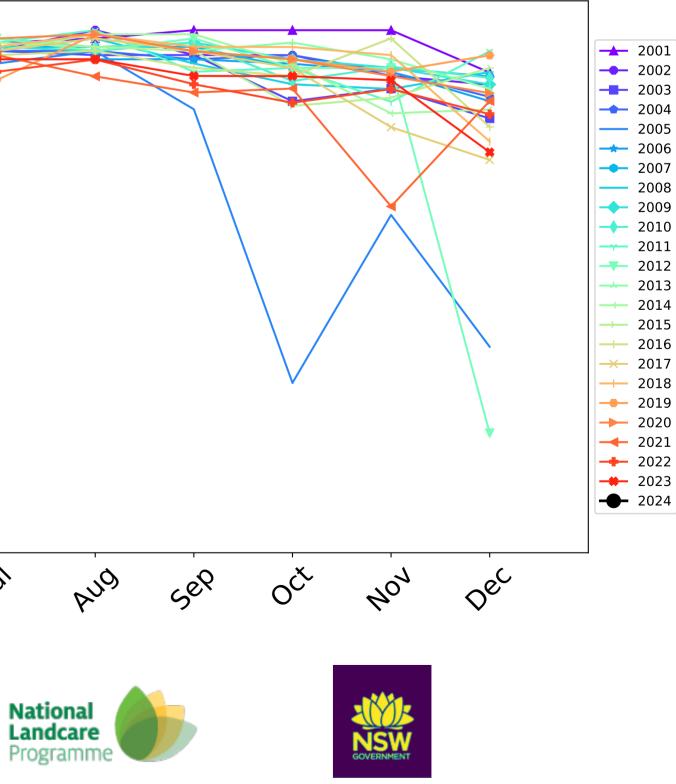
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

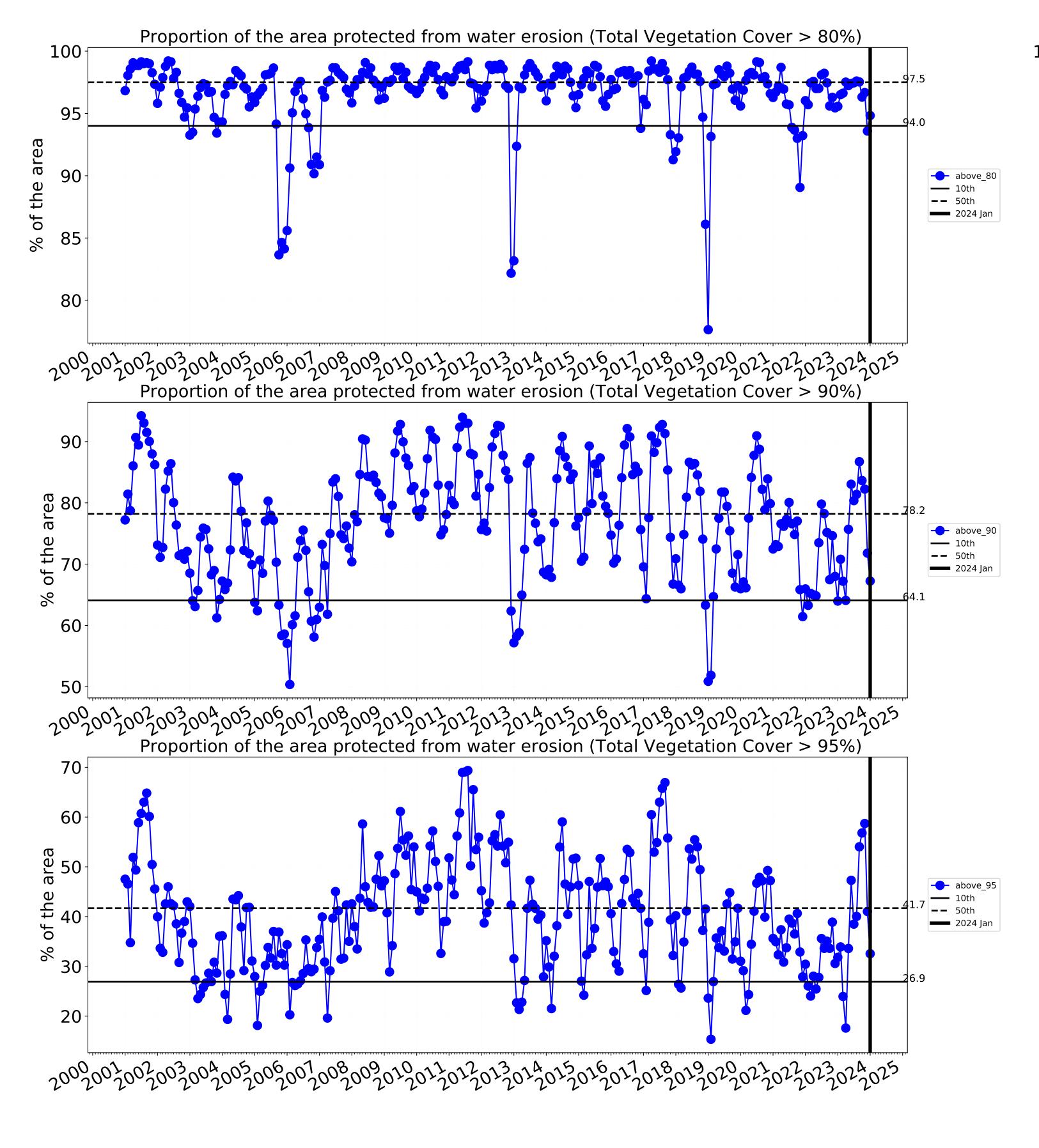


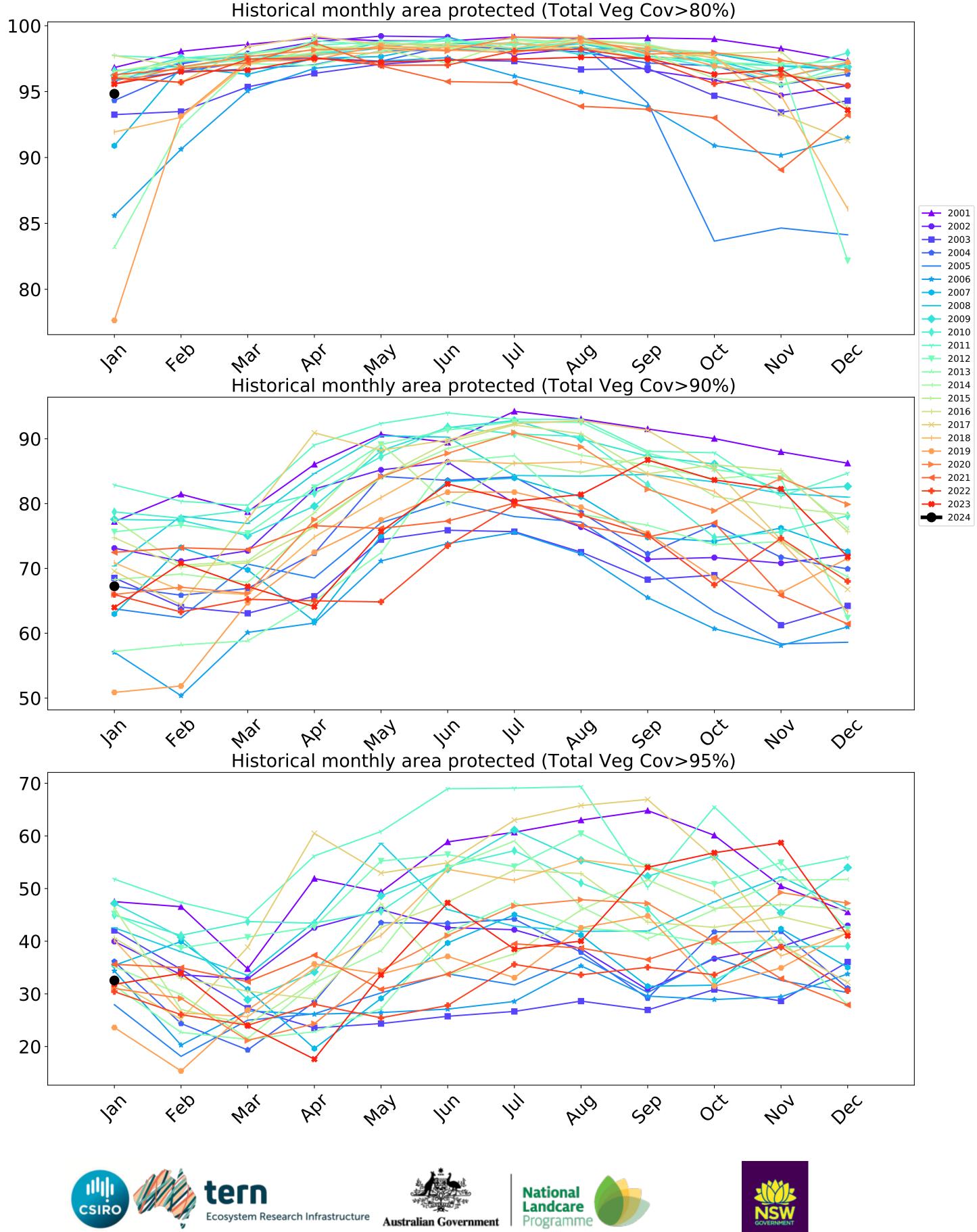
100-98 ---- above_70 **—** 10th **——** 50th **——** 2024 Jan 96 94 92 4eb Jan In way 1¹₁ Mai PQ1 month tern Ecosystem Research Infrastructure Australian Government

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

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





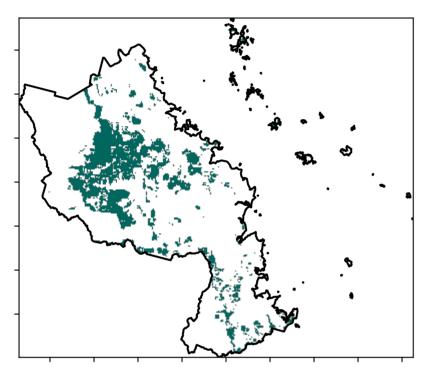




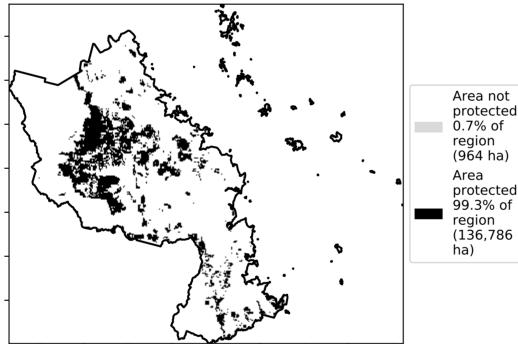
Conservation and natural environments Forest (non woodland)

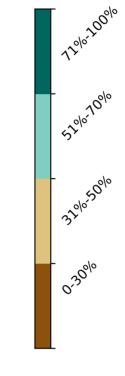
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]



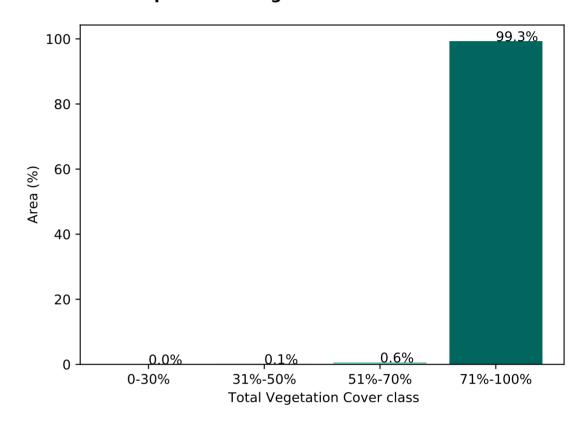
% Area protected from water erosion (>70%)



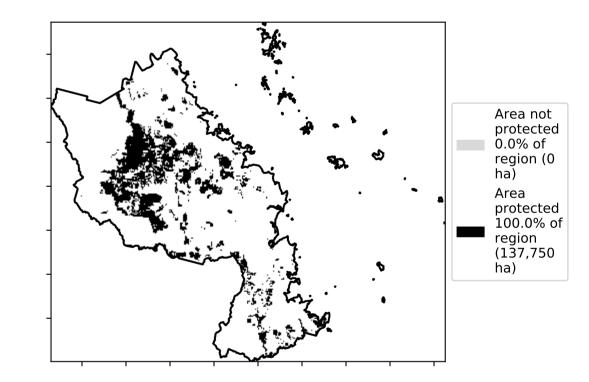




Proportion of vegetation cover class in area

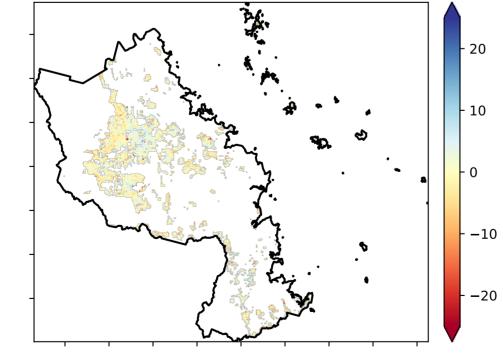


% Area protected from wind erosion (>50%)



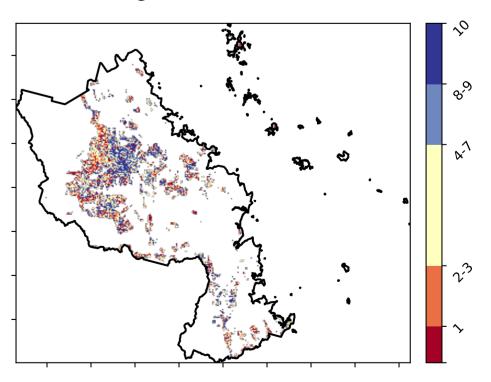
Total Vegetation Cover Anomaly [%]

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

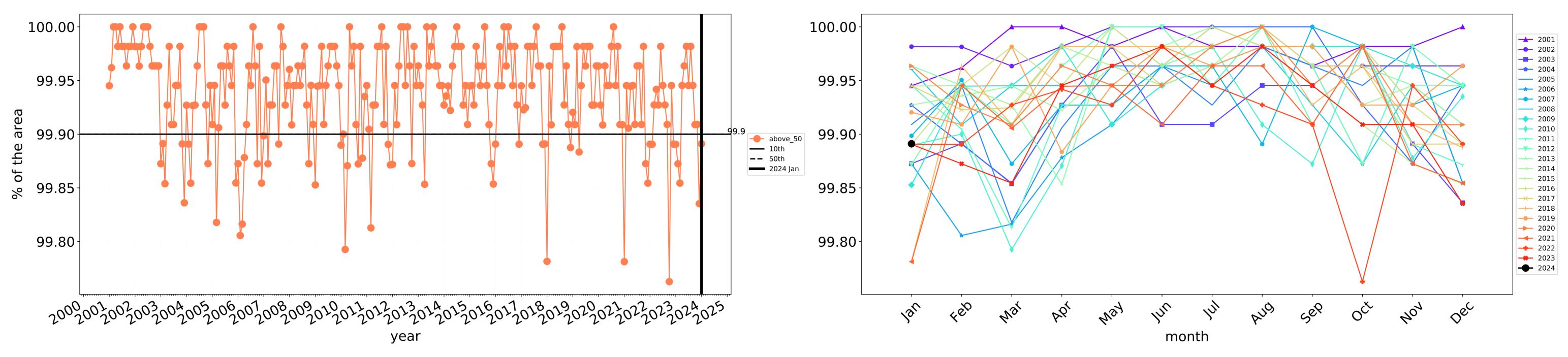


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

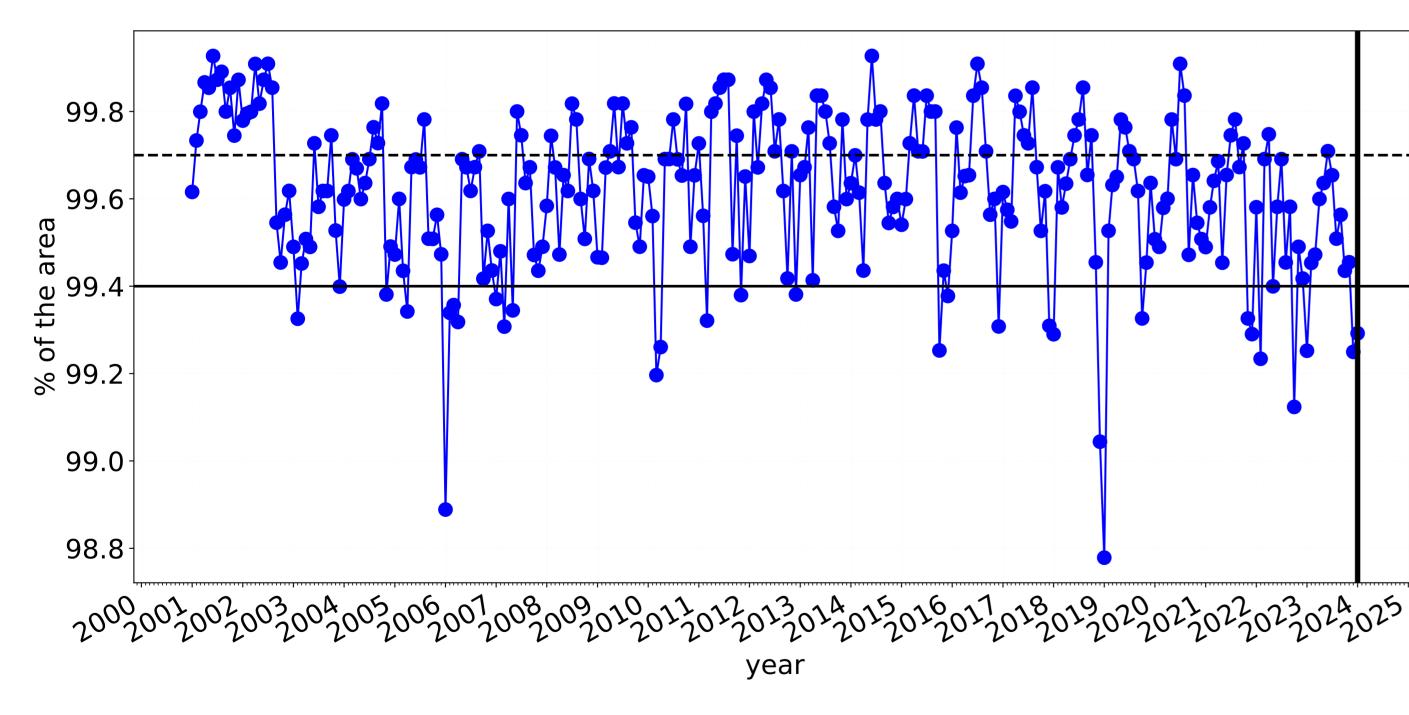






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



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

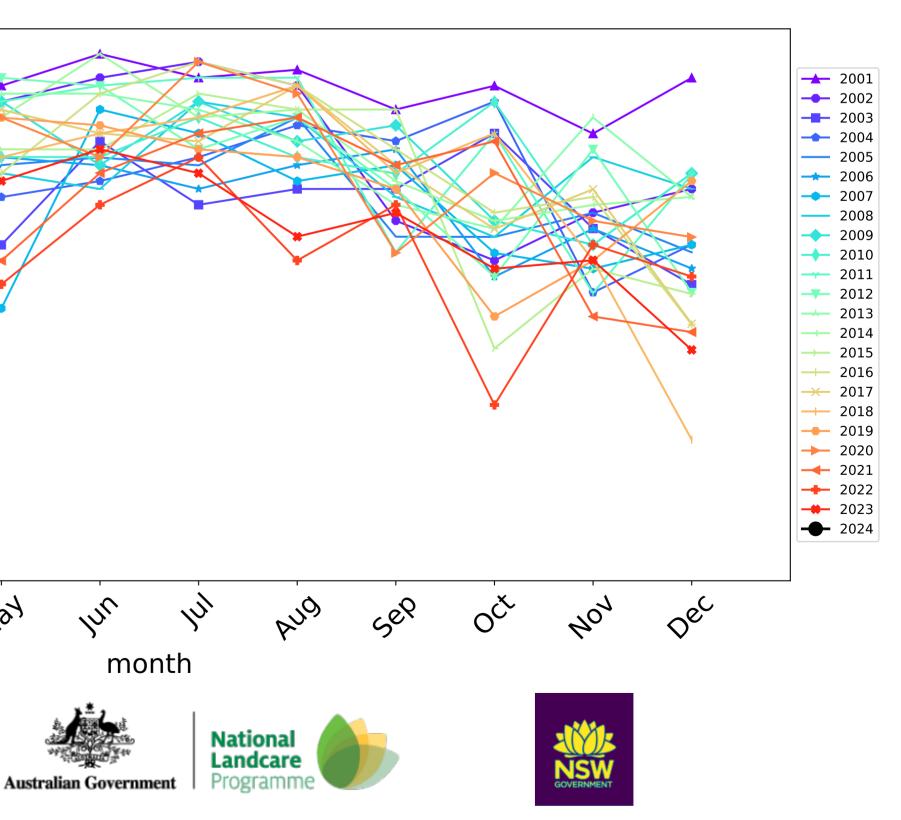


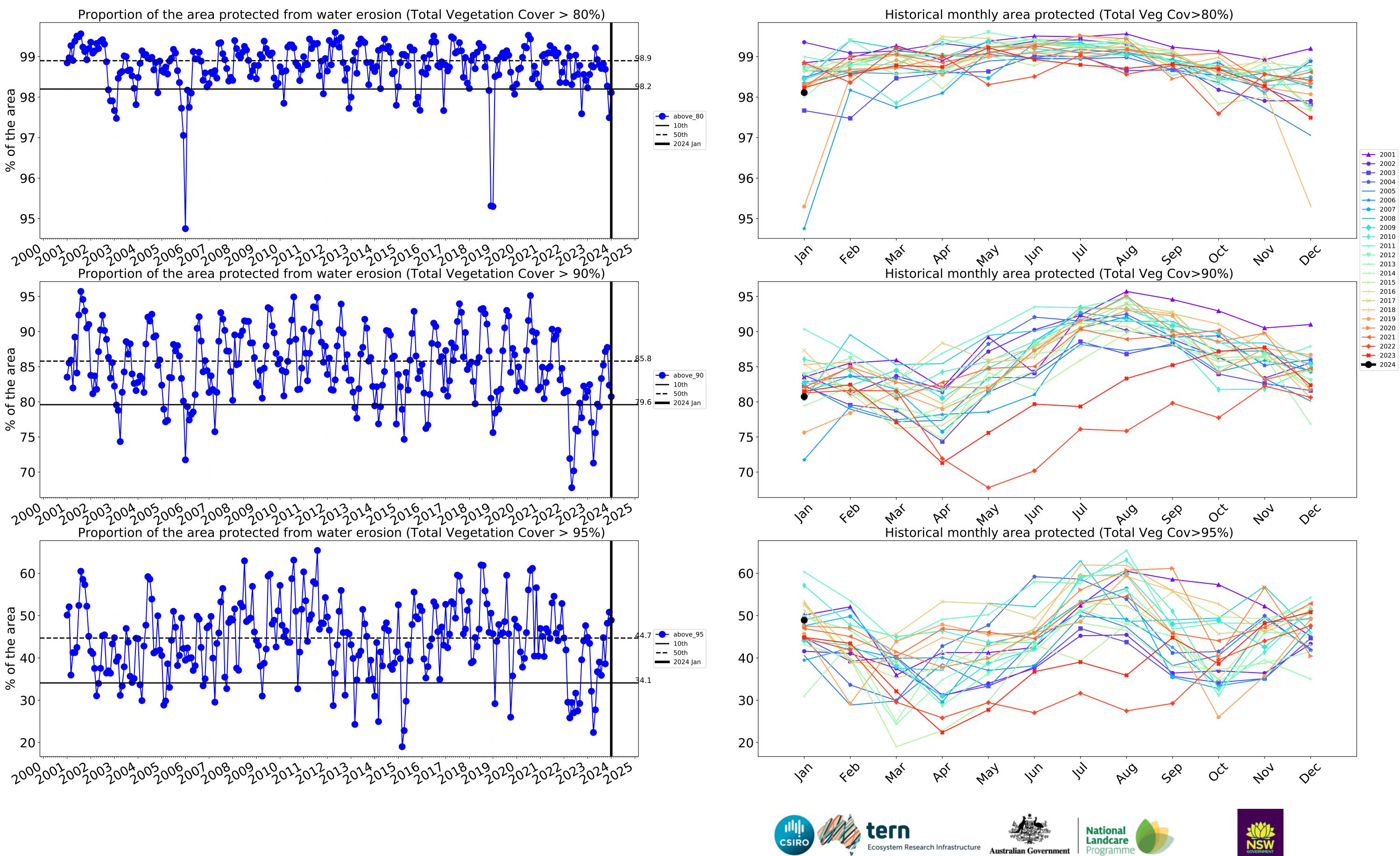
99.8 99.6 ---- above_70 --- 10th -- 50th 9.4 — 2024 Jan 99.4 99.2 99.0 98.8 feb ar In May PQ' Mal month mli tern

CSIRO

Ecosystem Research Infrastructure

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

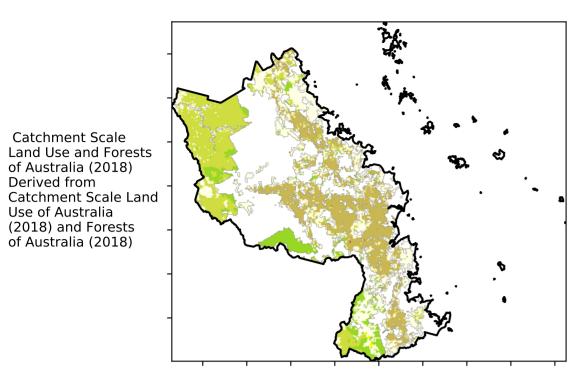




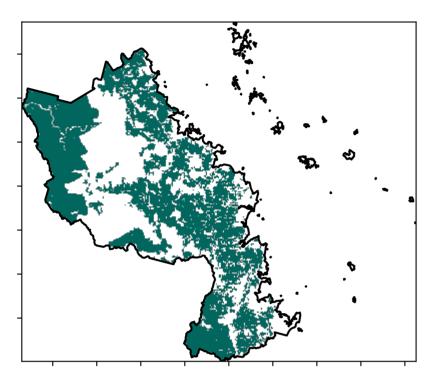


Agriculture

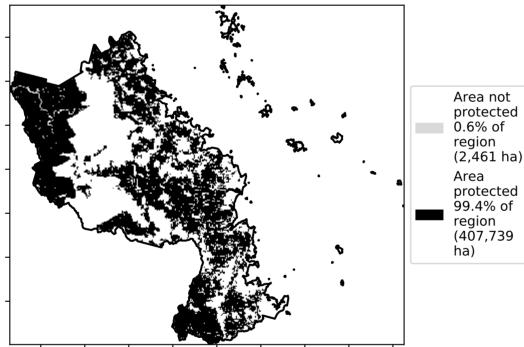
Land use and forest cover

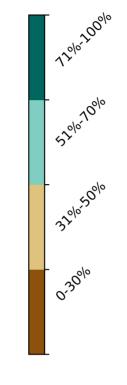


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest

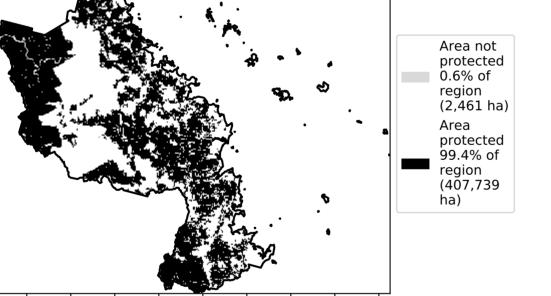
4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated

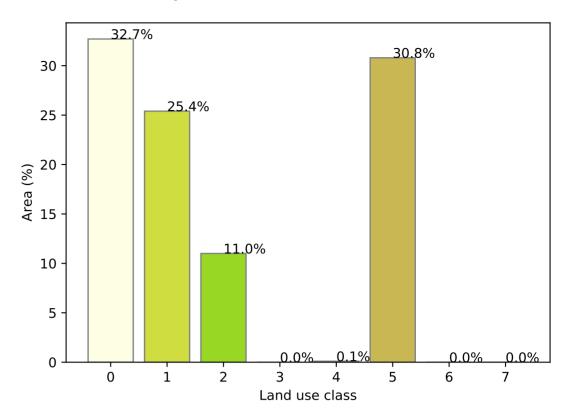
7 Agriculture - Horticulture - Non-irrigated

6 Agriculture - Cropping - Irrigated

8 Agriculture - Horticulture - Irrigated

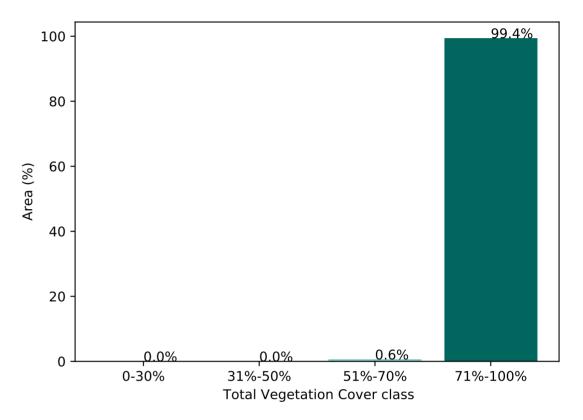
3 Agriculture - Grazing - Non-woodland forest



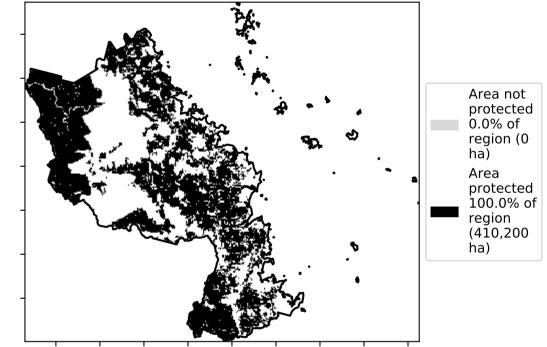


Proportion of each land class in area

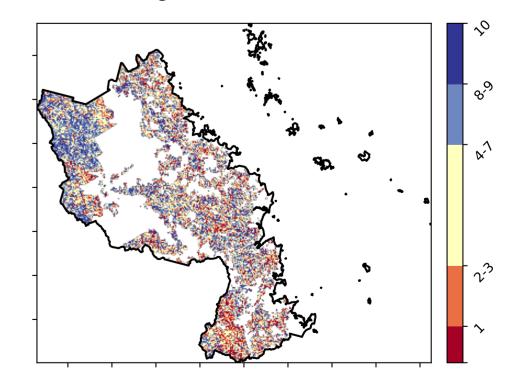
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

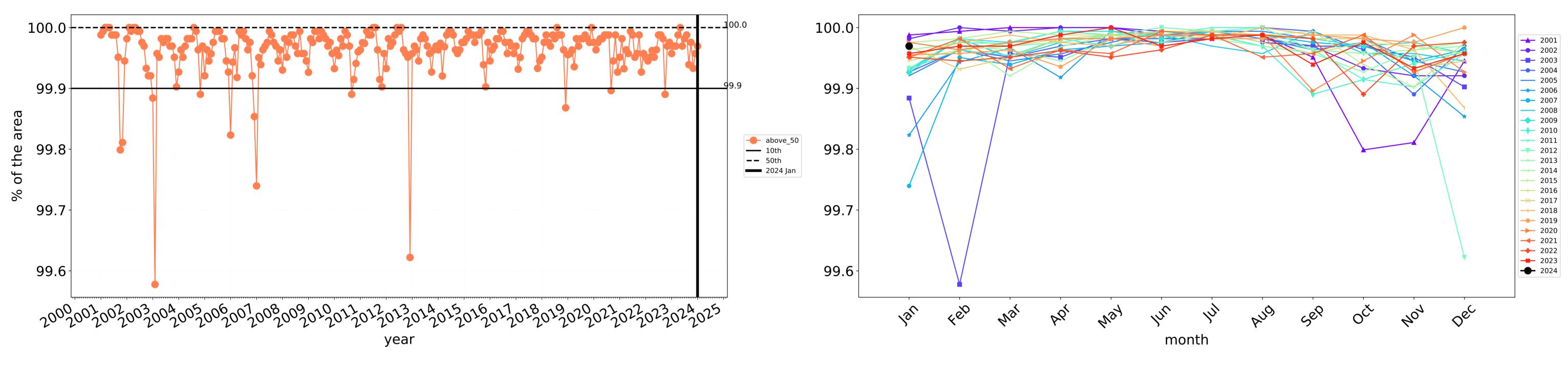
ቅያ - 20 - 10 0 -10 -20

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



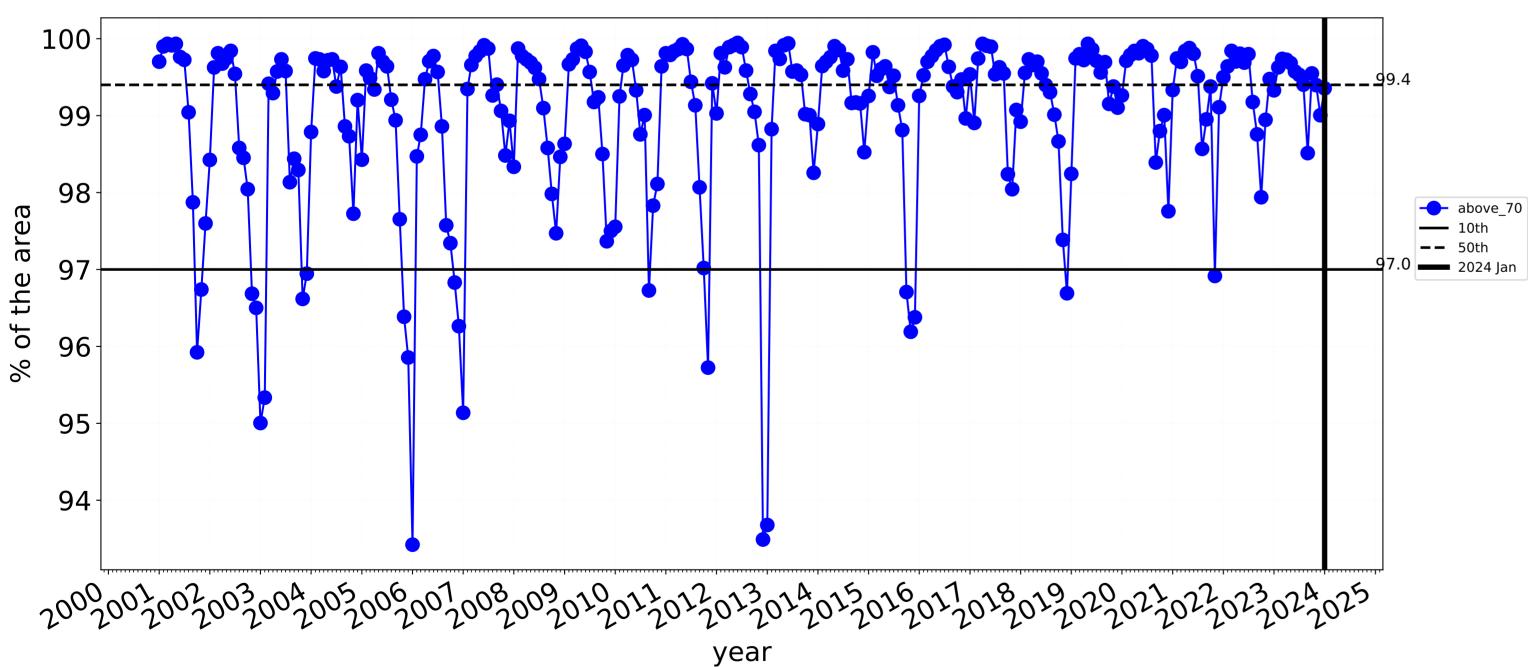


12



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

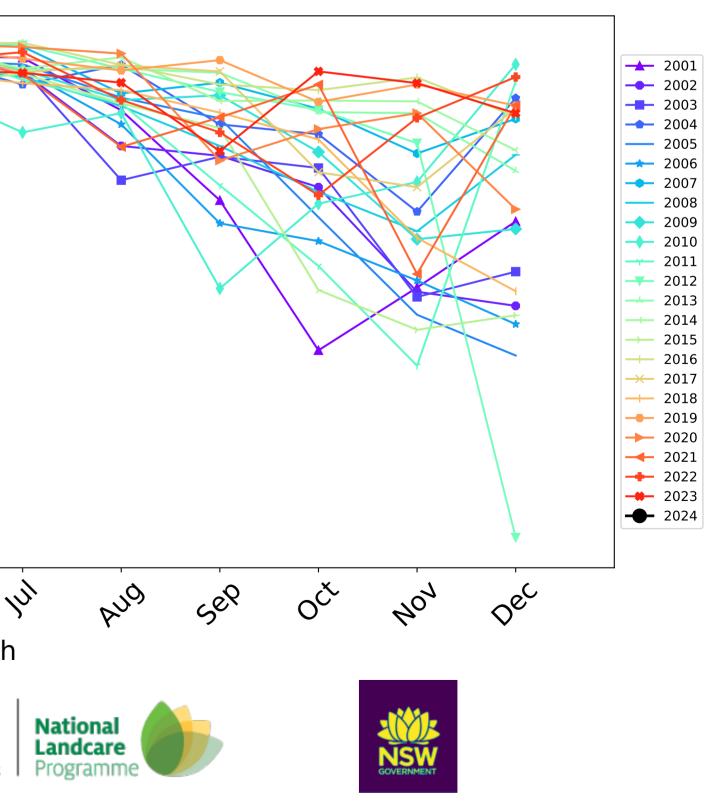


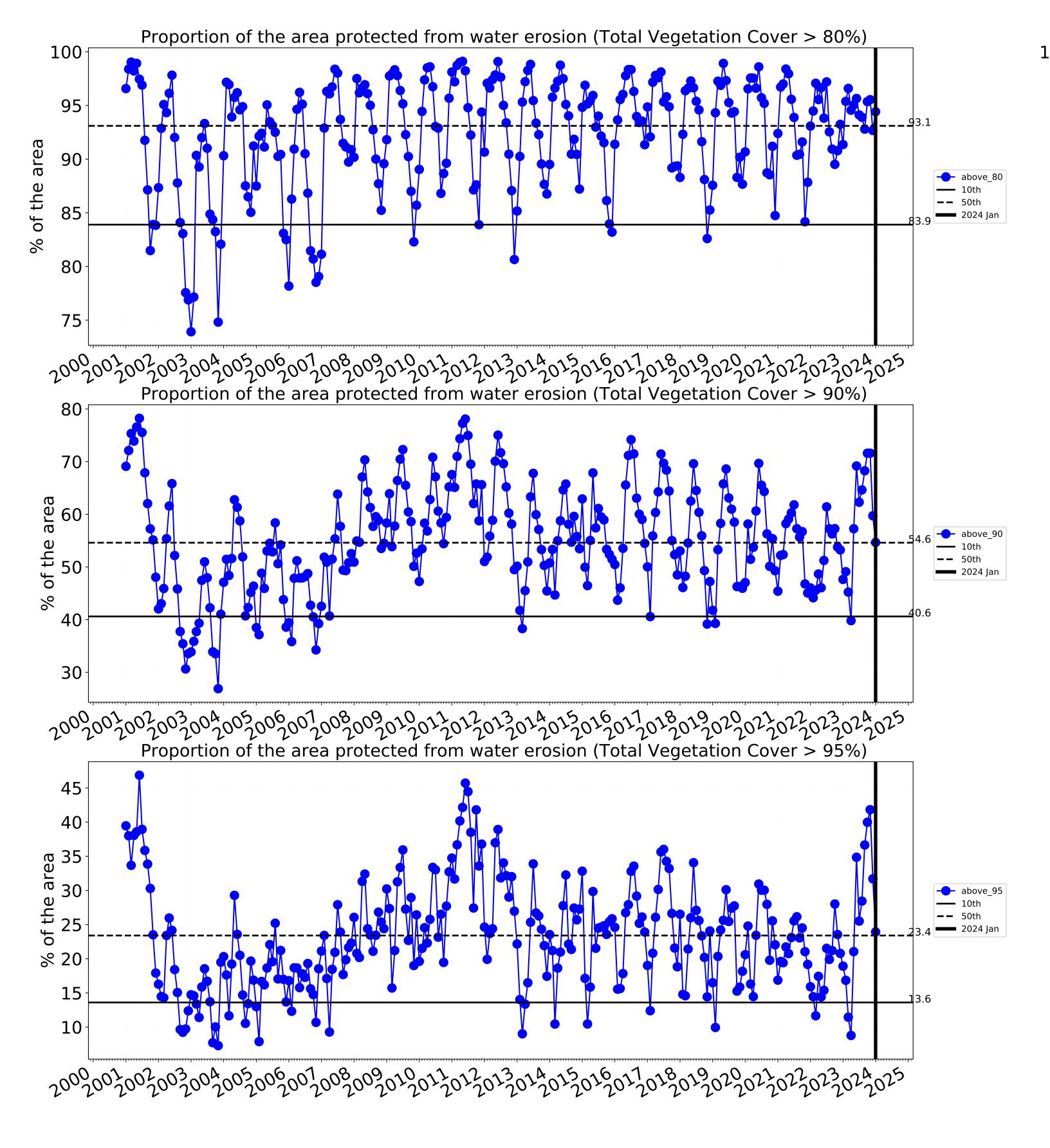


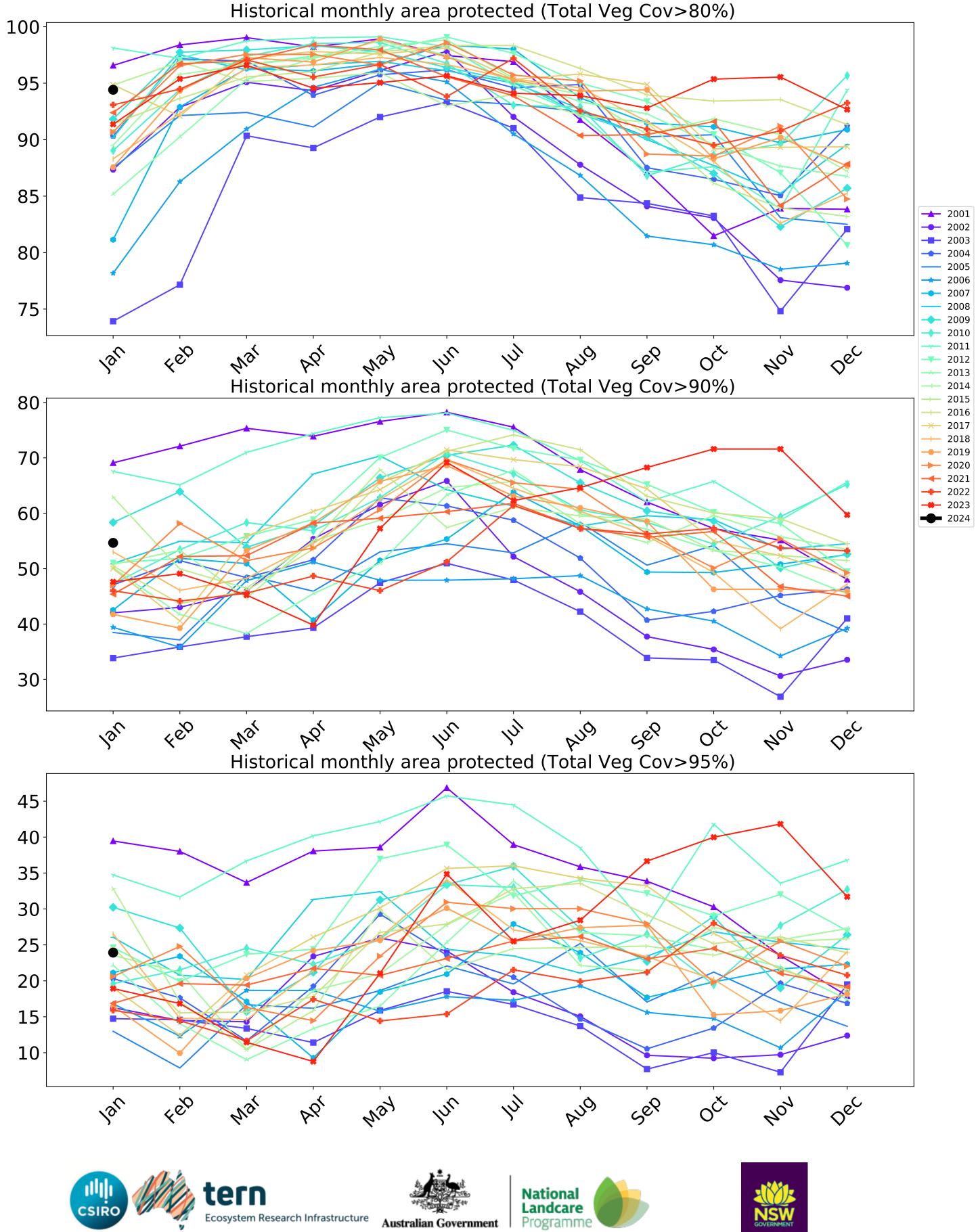
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 99 98 97 96 95⁻ 94 4e0 Jan May In PQ1 Mai month tern Ecosystem Research Infrastructure Australian Government

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



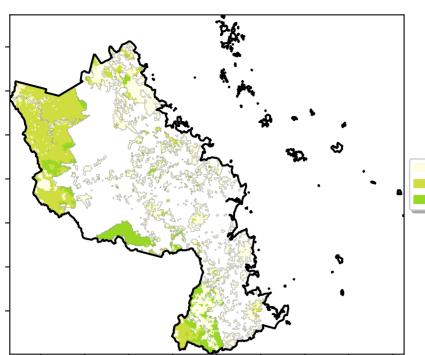






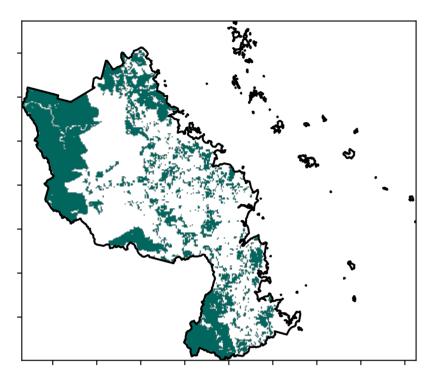
Grazing

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

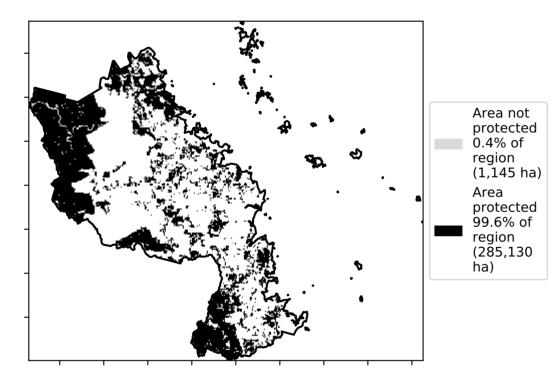


Land use and forest cover

Total Vegetation Cover [%]



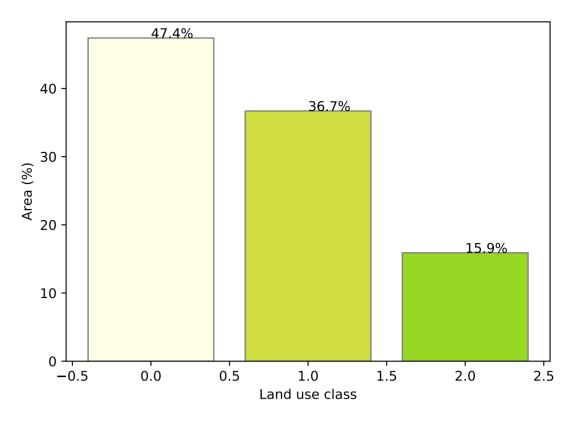
% Area protected from water erosion (>70%)



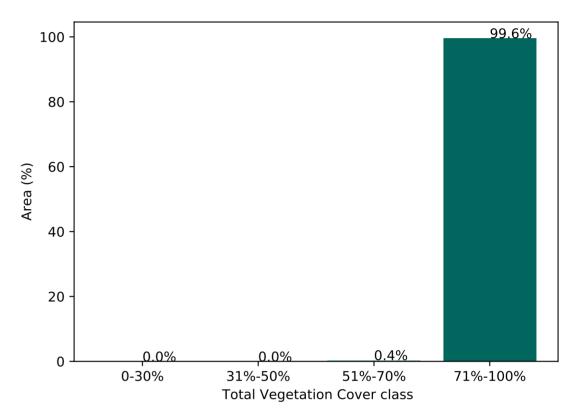
1200,1000 · 520/07/00/0 32005000 0.30%

1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest

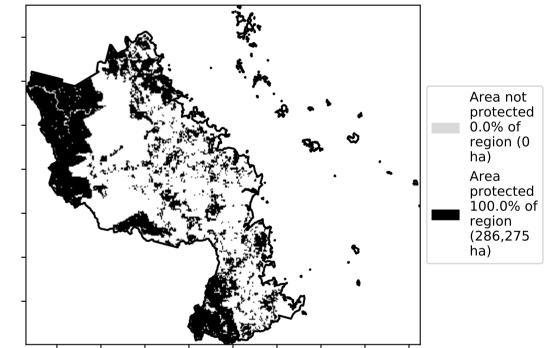
Proportion of each land class in area



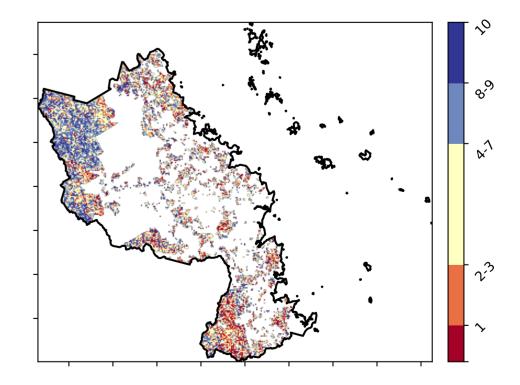
Proportion of vegetation cover class in area



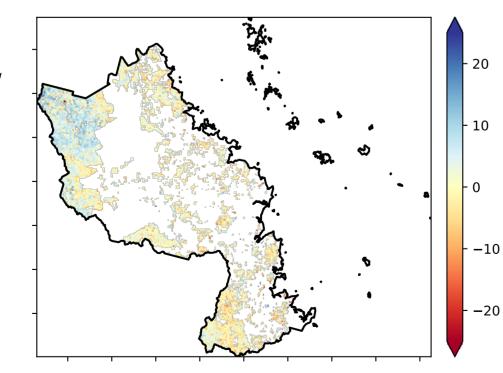
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



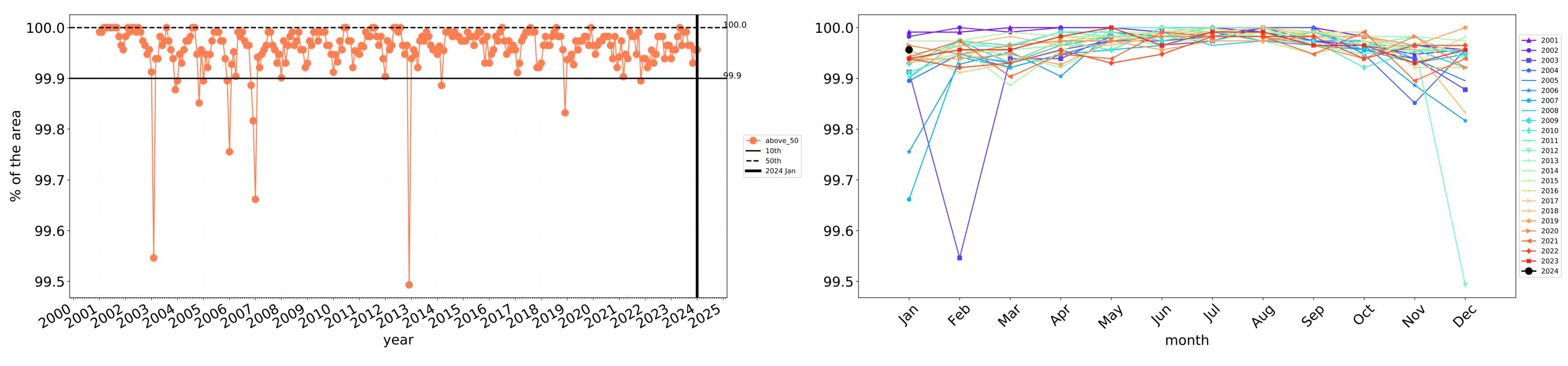
Total Vegetation Cover Anomaly [%]



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

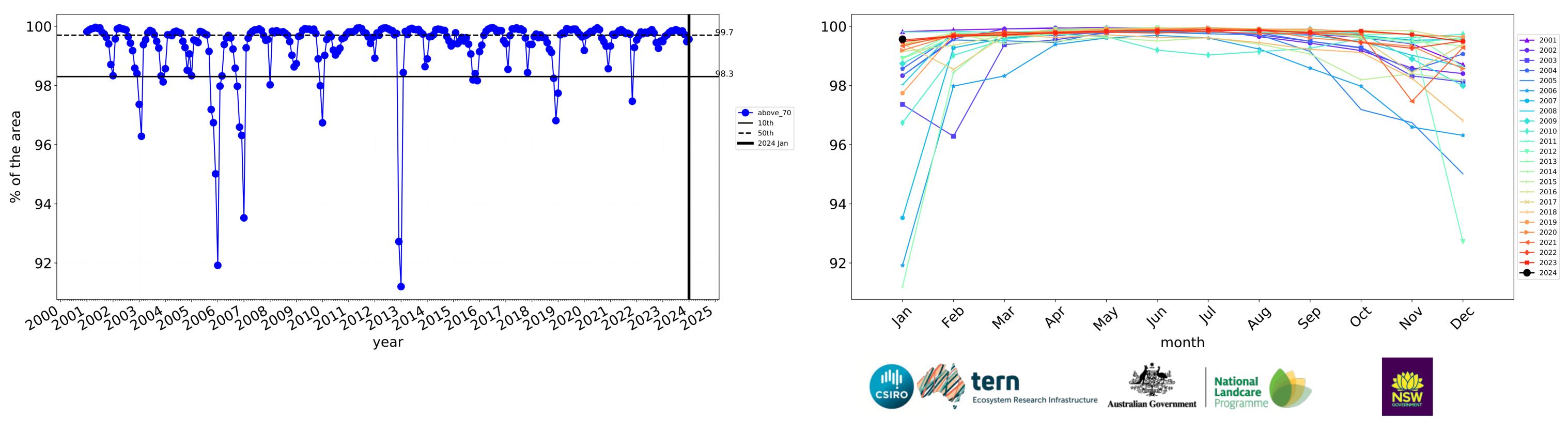


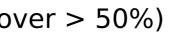




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

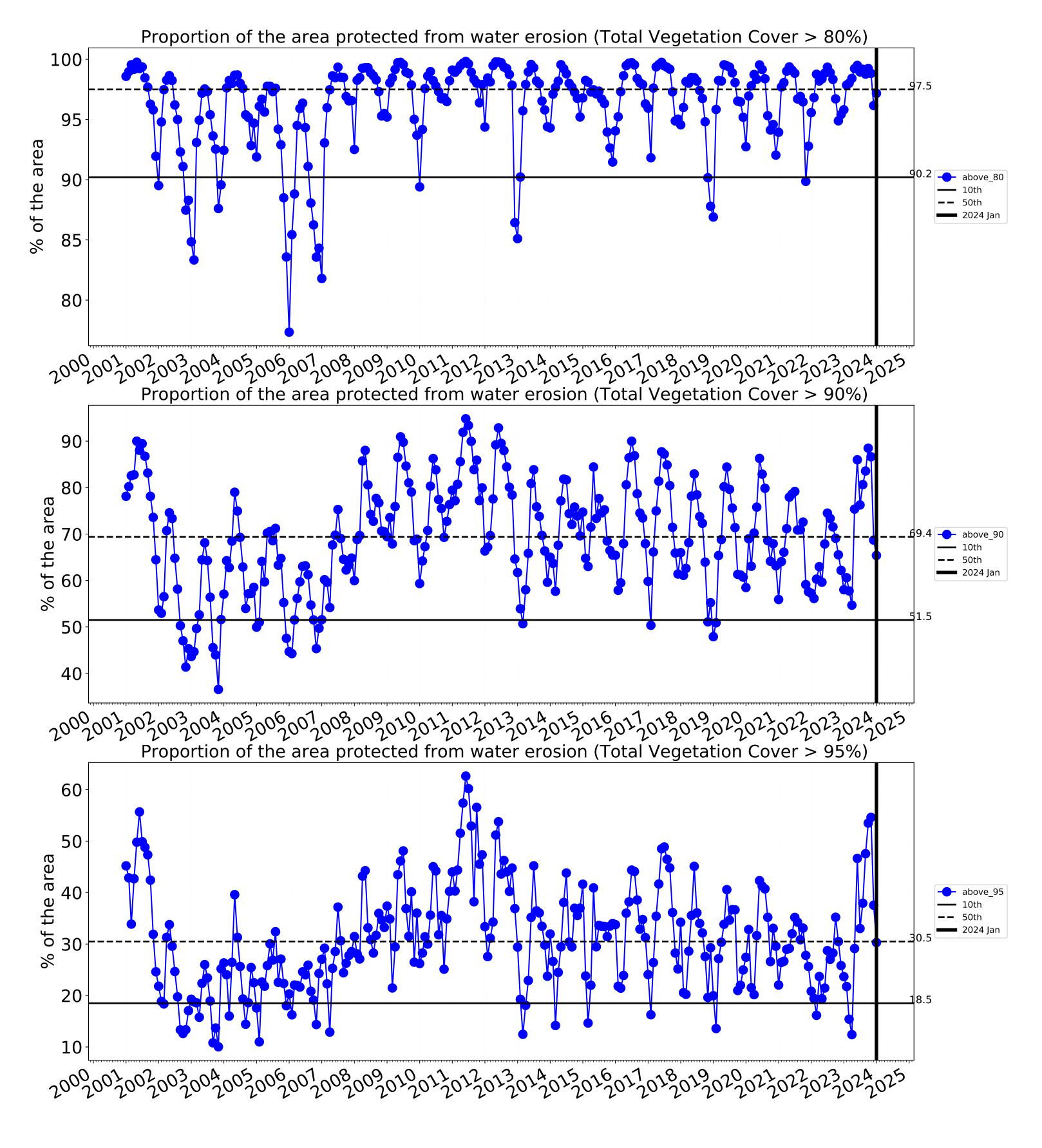


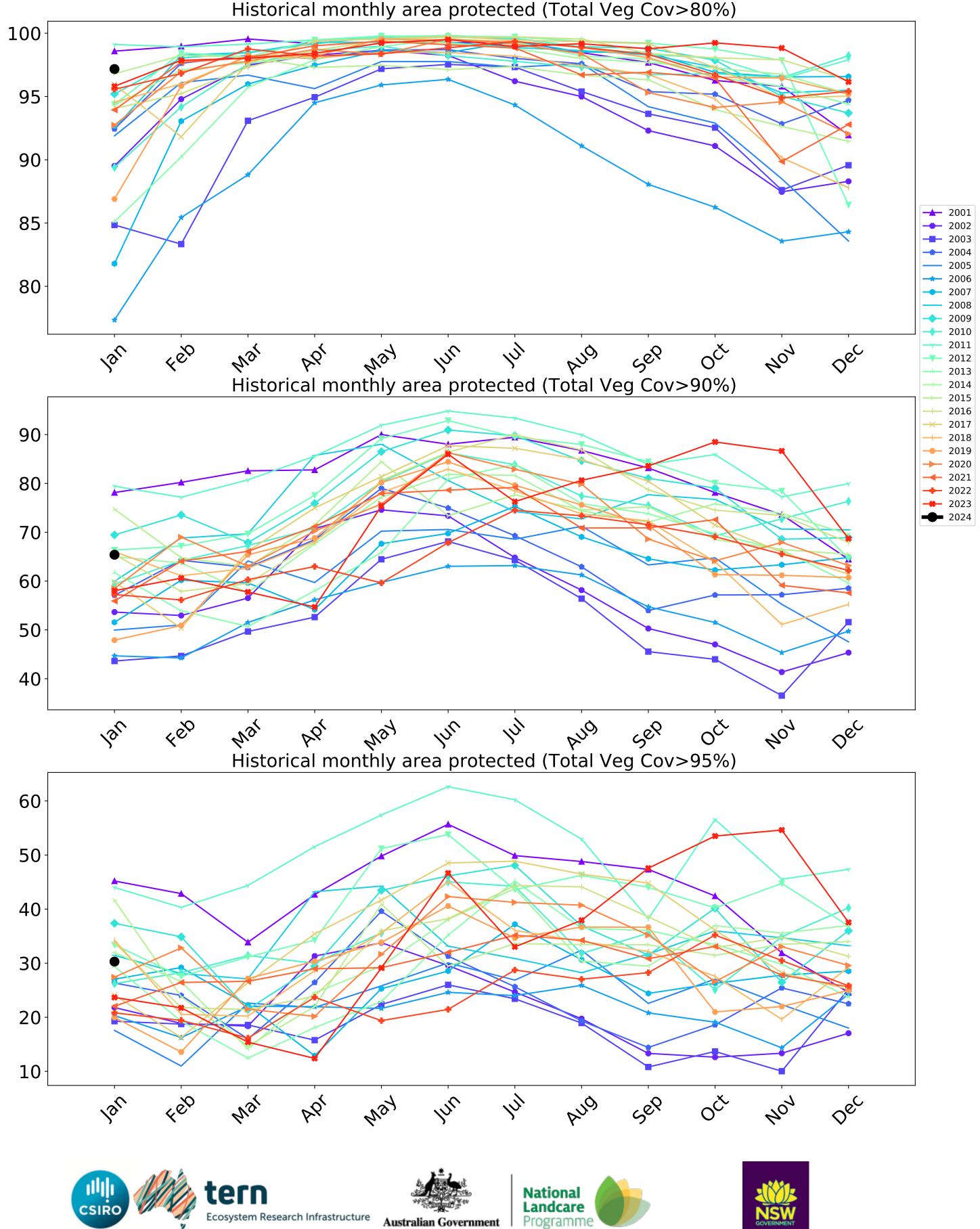




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

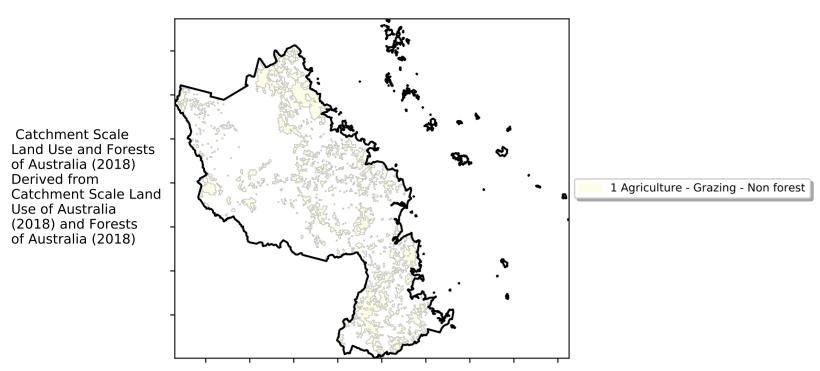




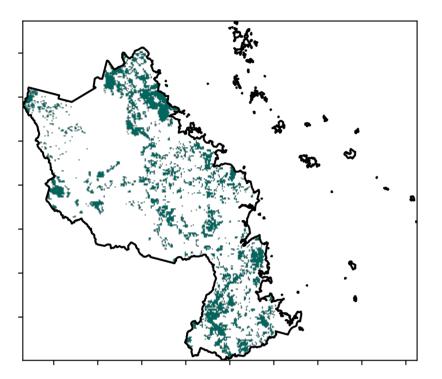


Grazing non forest

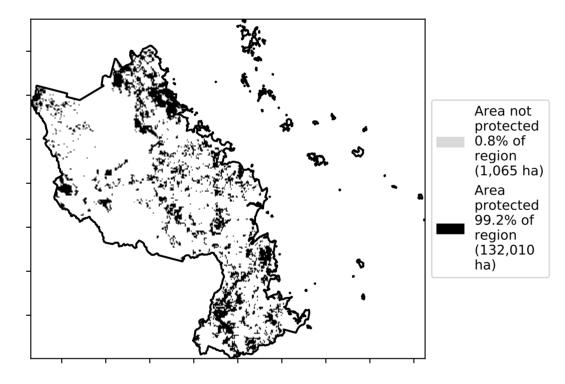
Land use and forest cover

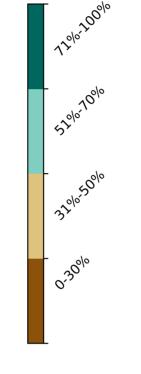


Total Vegetation Cover [%]

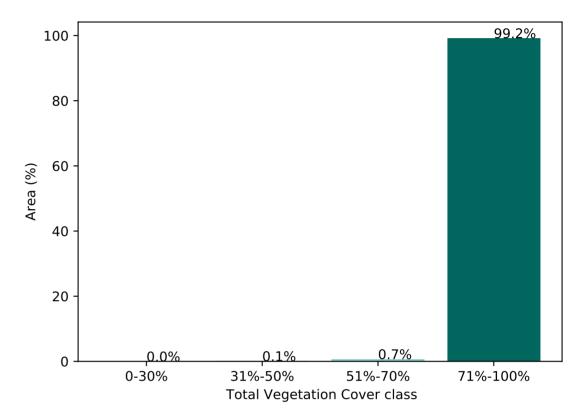


% Area protected from water erosion (>70%)

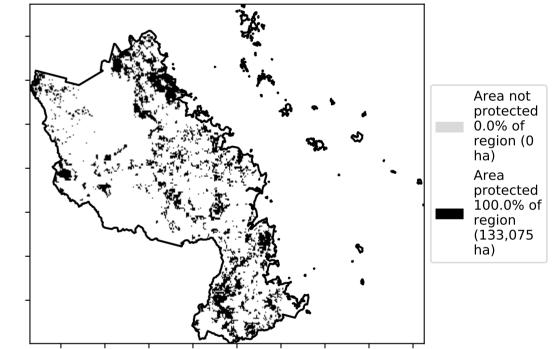




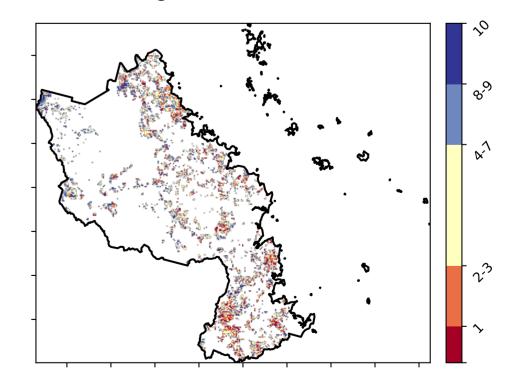
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]

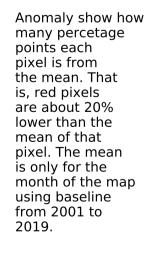


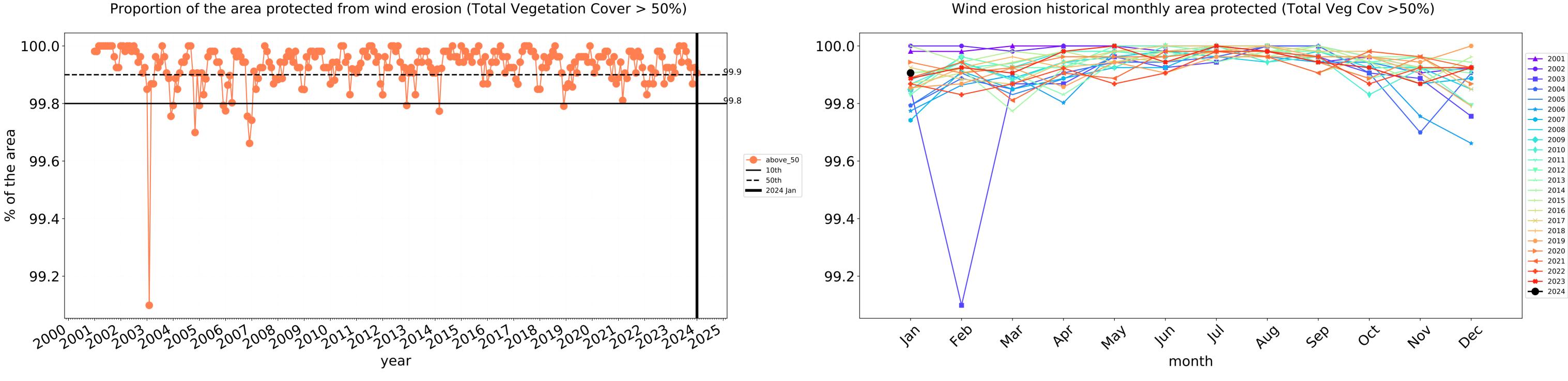
Total Vegetation Cover Anomaly [%]

26 - 20 - 10 0 -10 -20

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

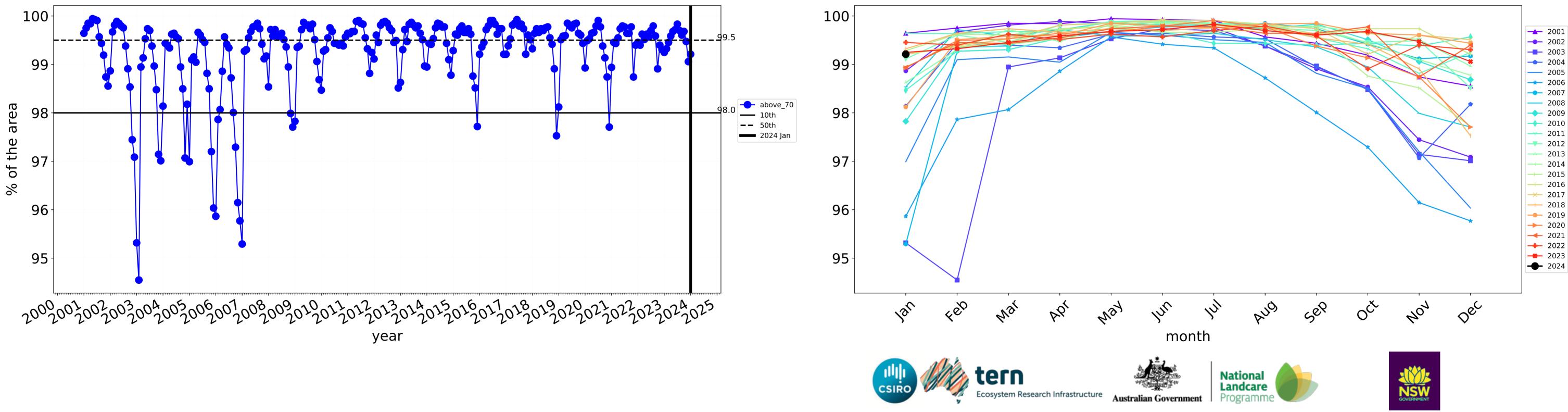




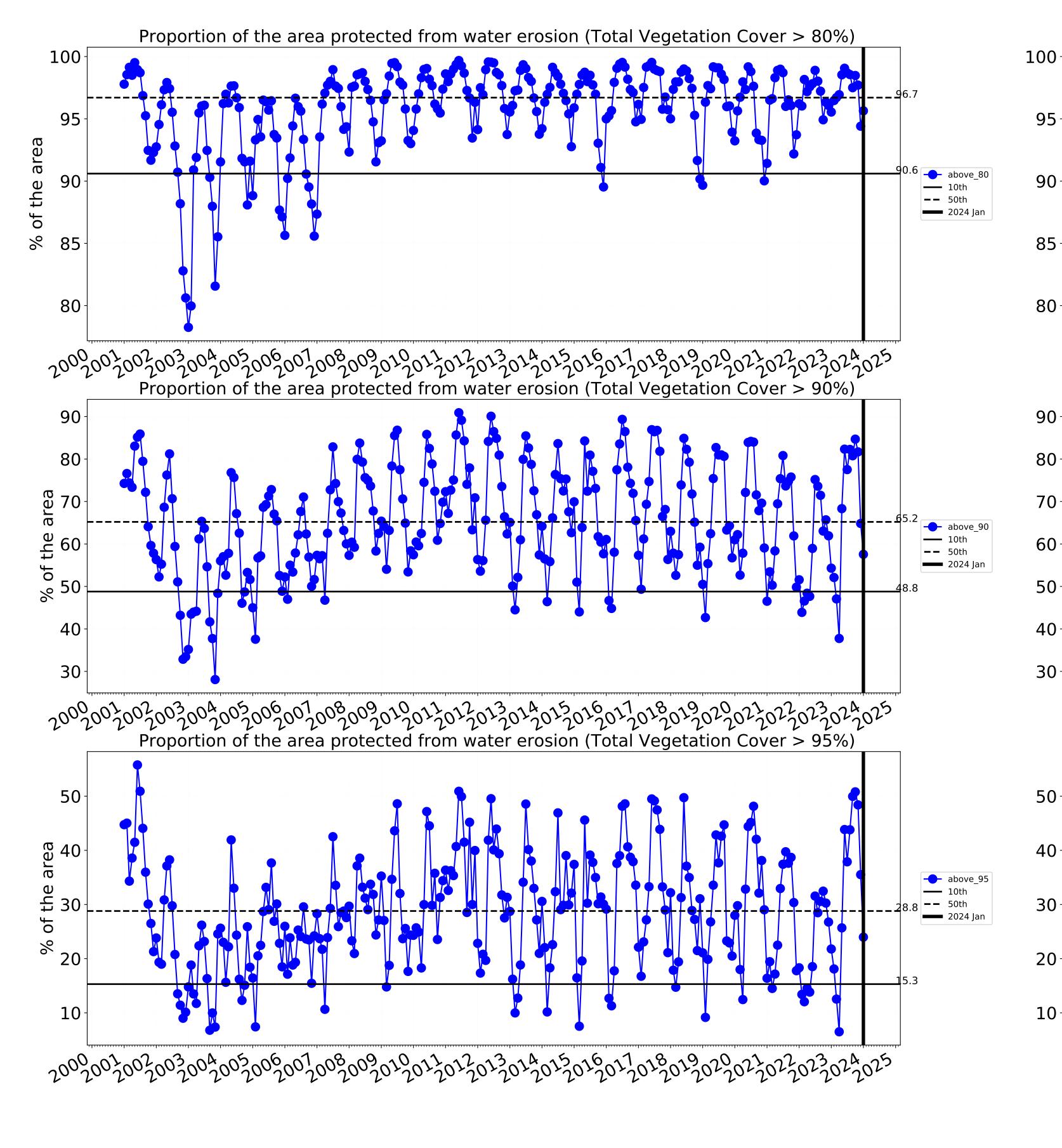


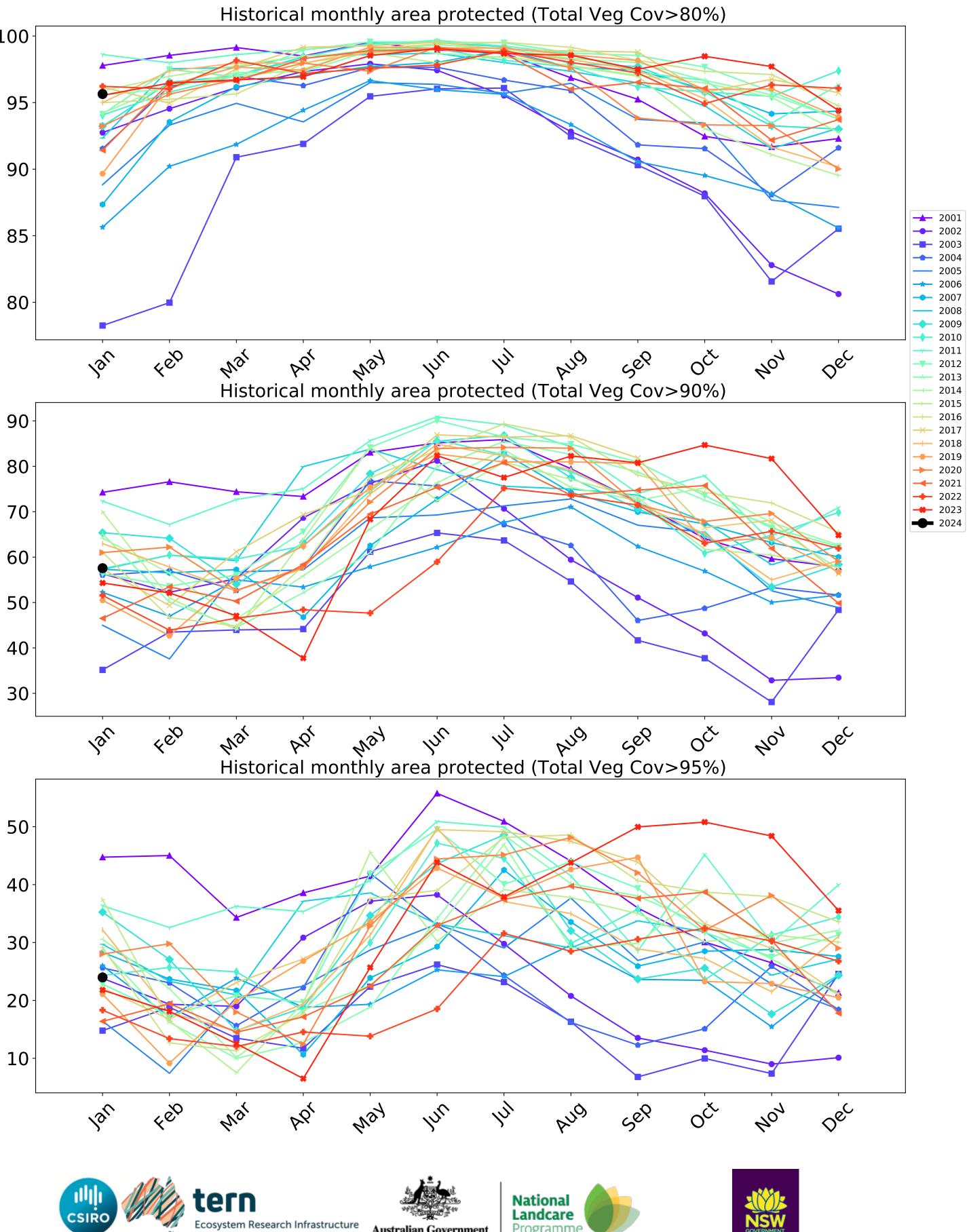
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





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





Programm

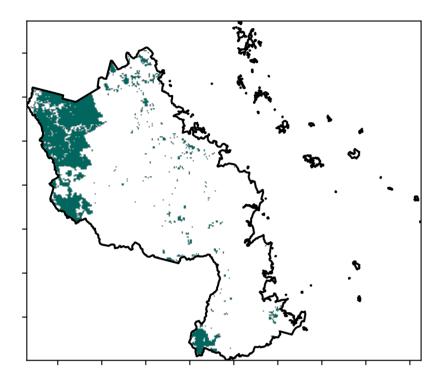


Grazing Woodland forest

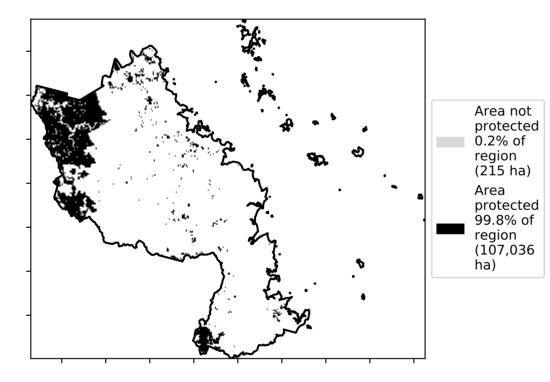
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

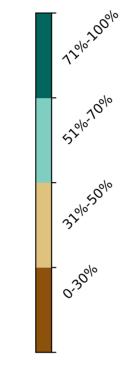
Total Vegetation Cover [%]

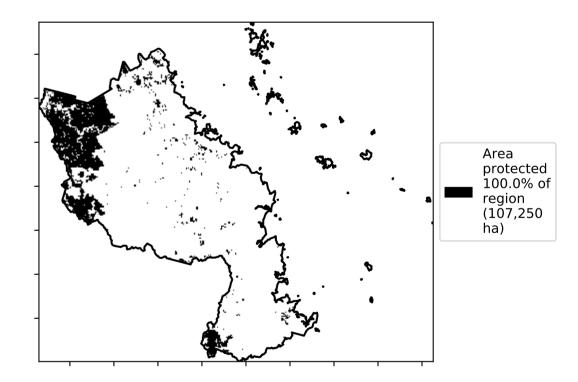
Land use and forest cover



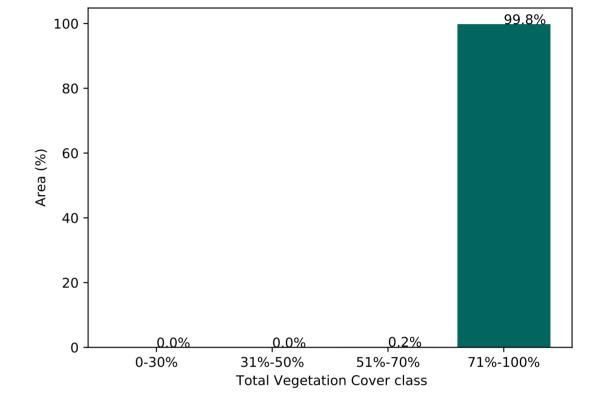
% Area protected from water erosion (>70%)





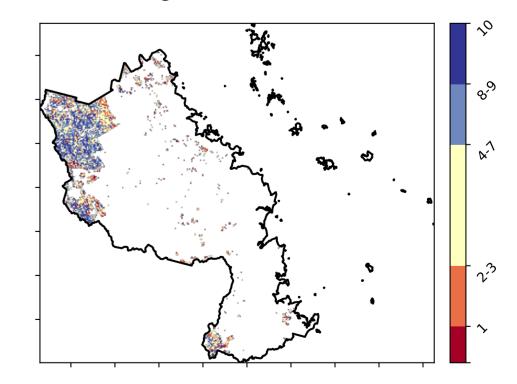


Proportion of vegetation cover class in area

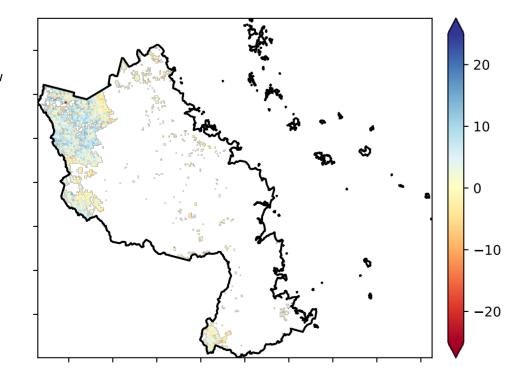


% Area protected from wind erosion (>50%)

Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

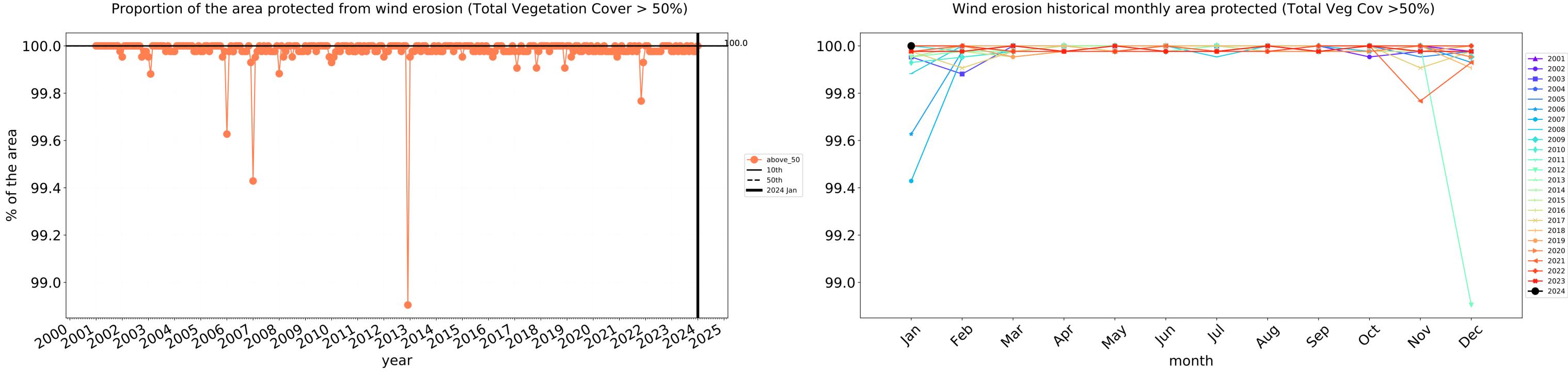


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



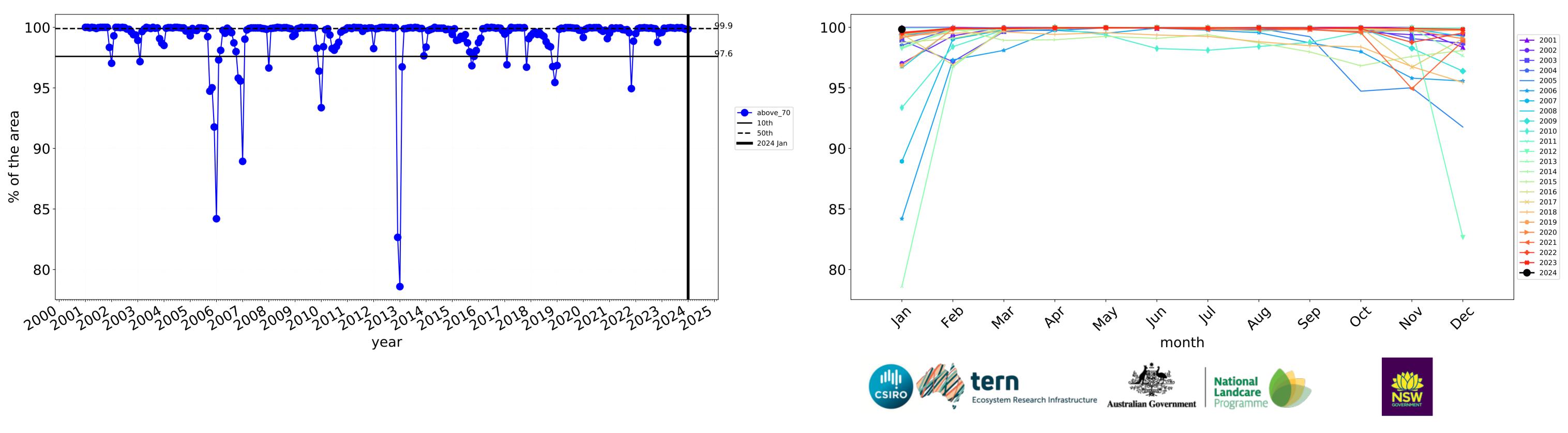


Grazing Woodland forest timeseries

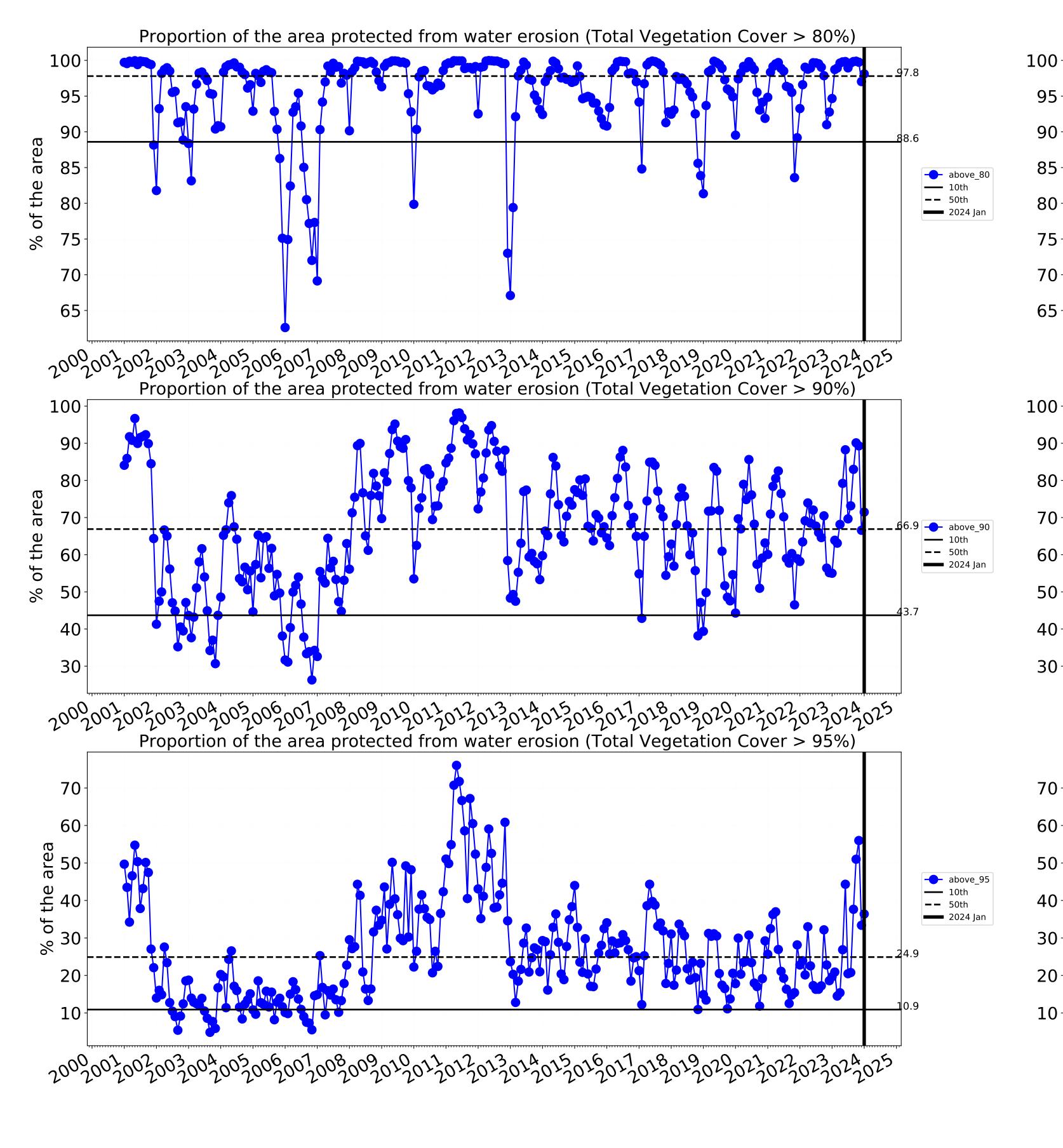


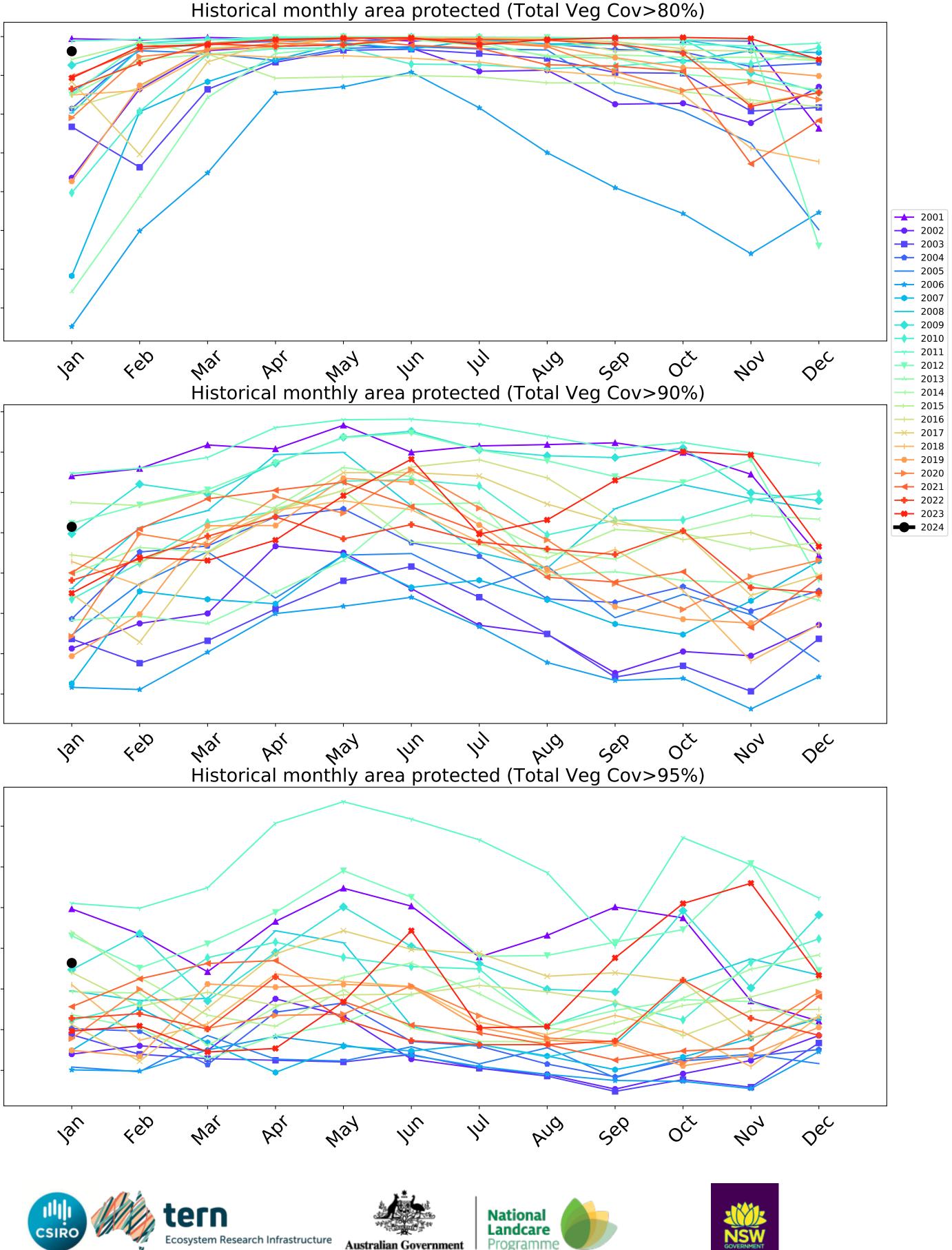
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

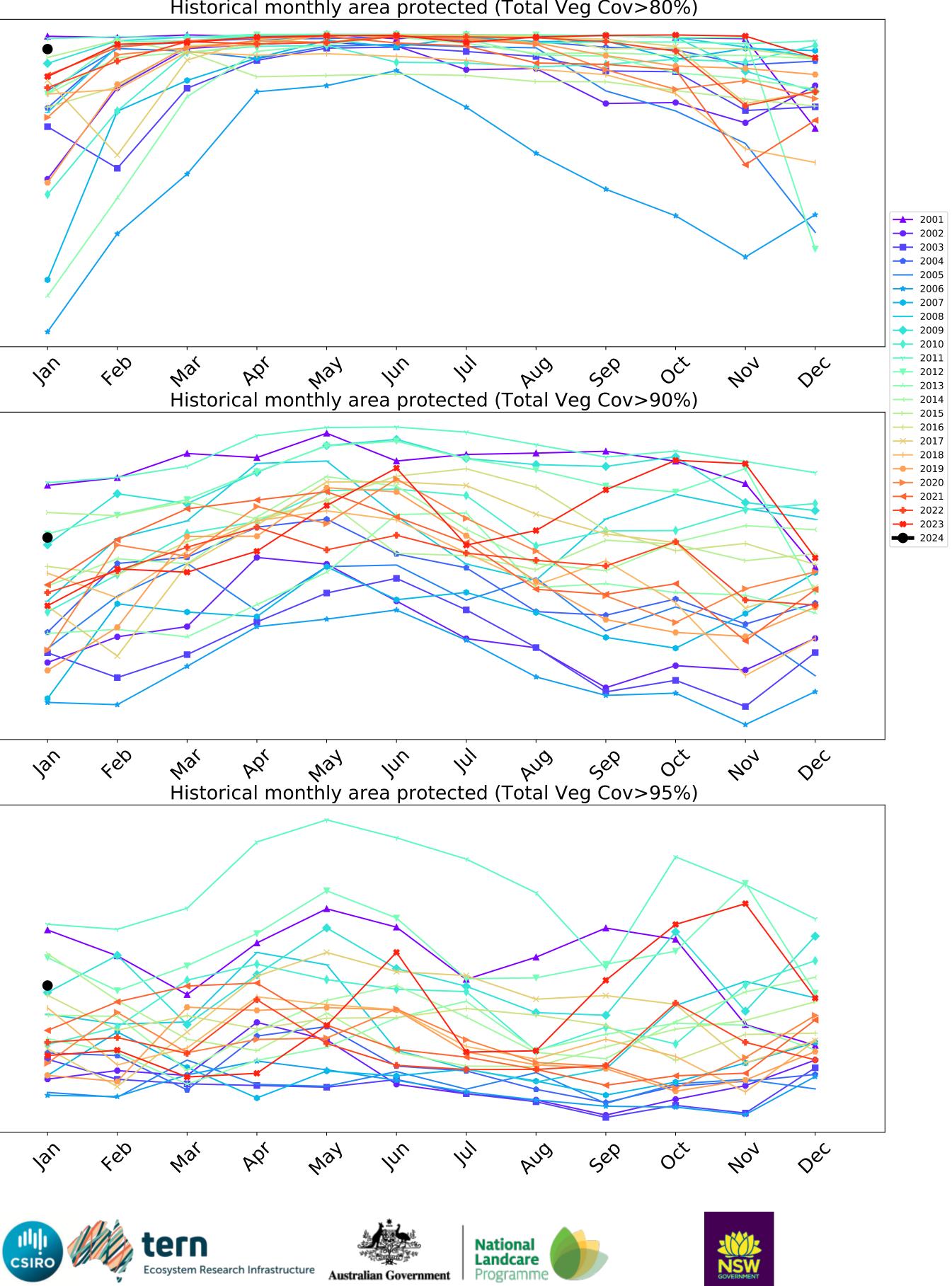
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



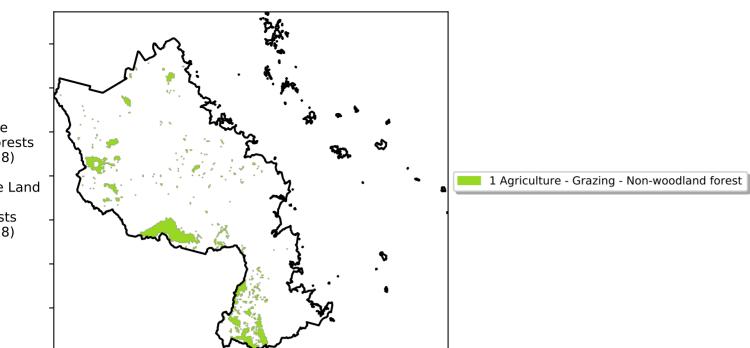
Water erosion historical monthly area protected (Total Veg Cov>70%)





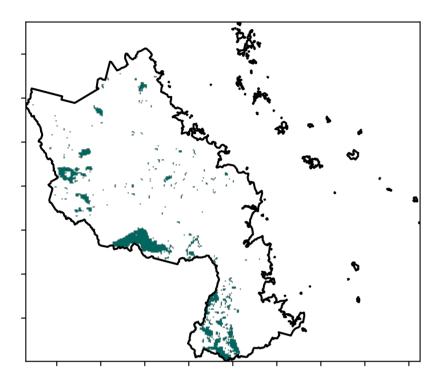


Grazing - Forest (non woodland)

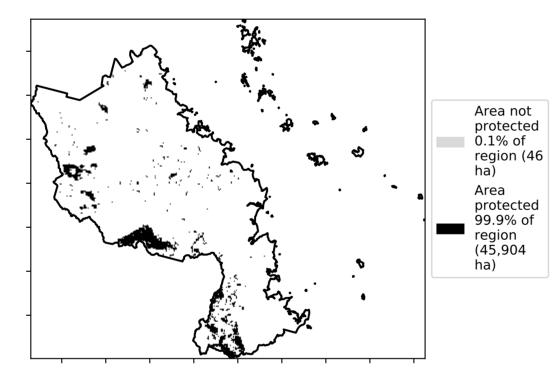


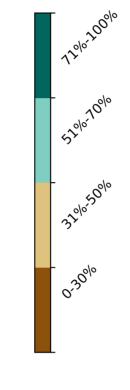
Total Vegetation Cover [%]

Land use and forest cover



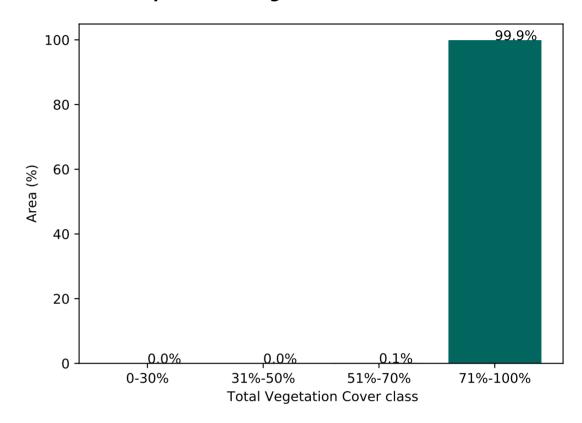
% Area protected from water erosion (>70%)



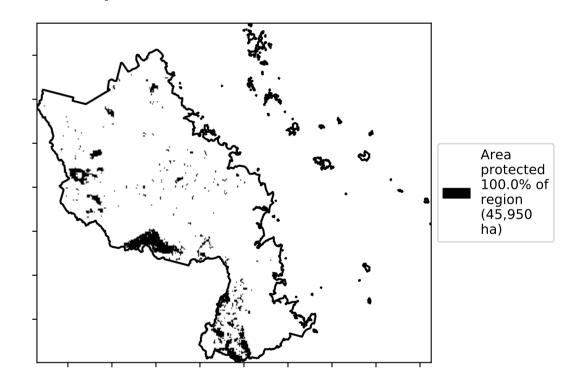




Proportion of vegetation cover class in area

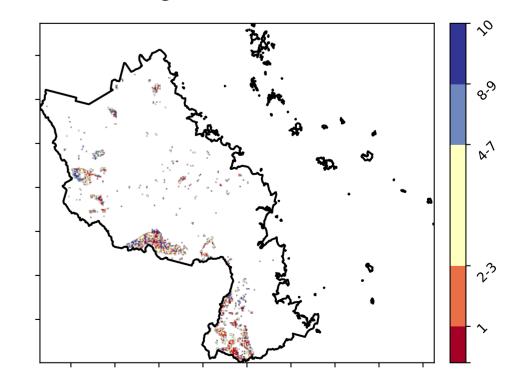


% Area protected from wind erosion (>50%)

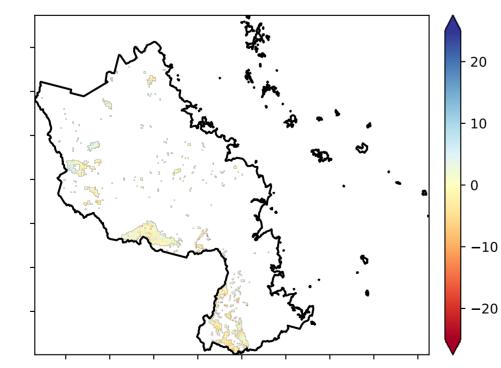


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



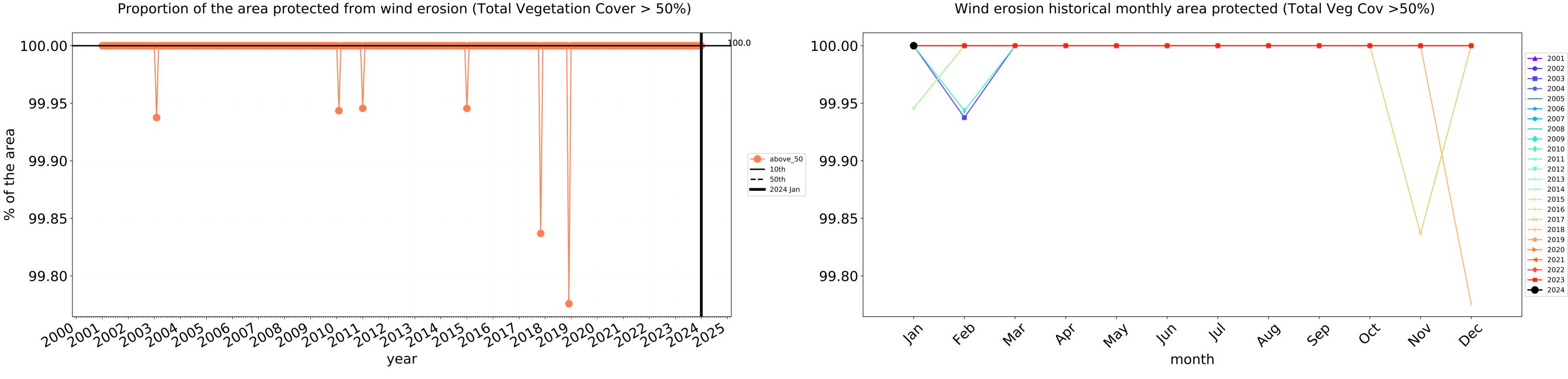
Total Vegetation Cover Anomaly [%]



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

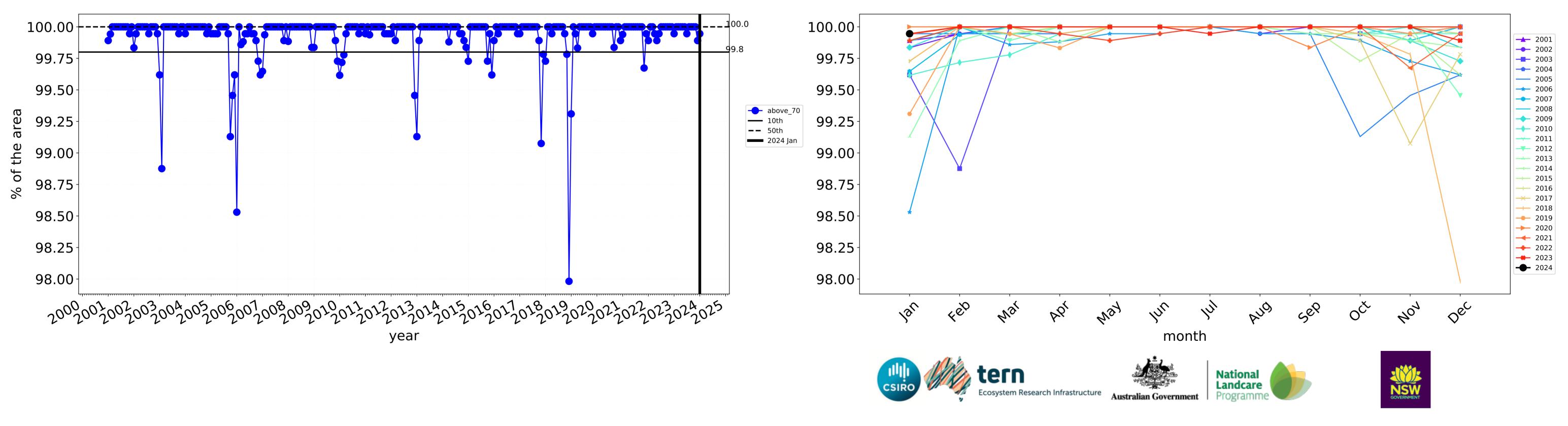




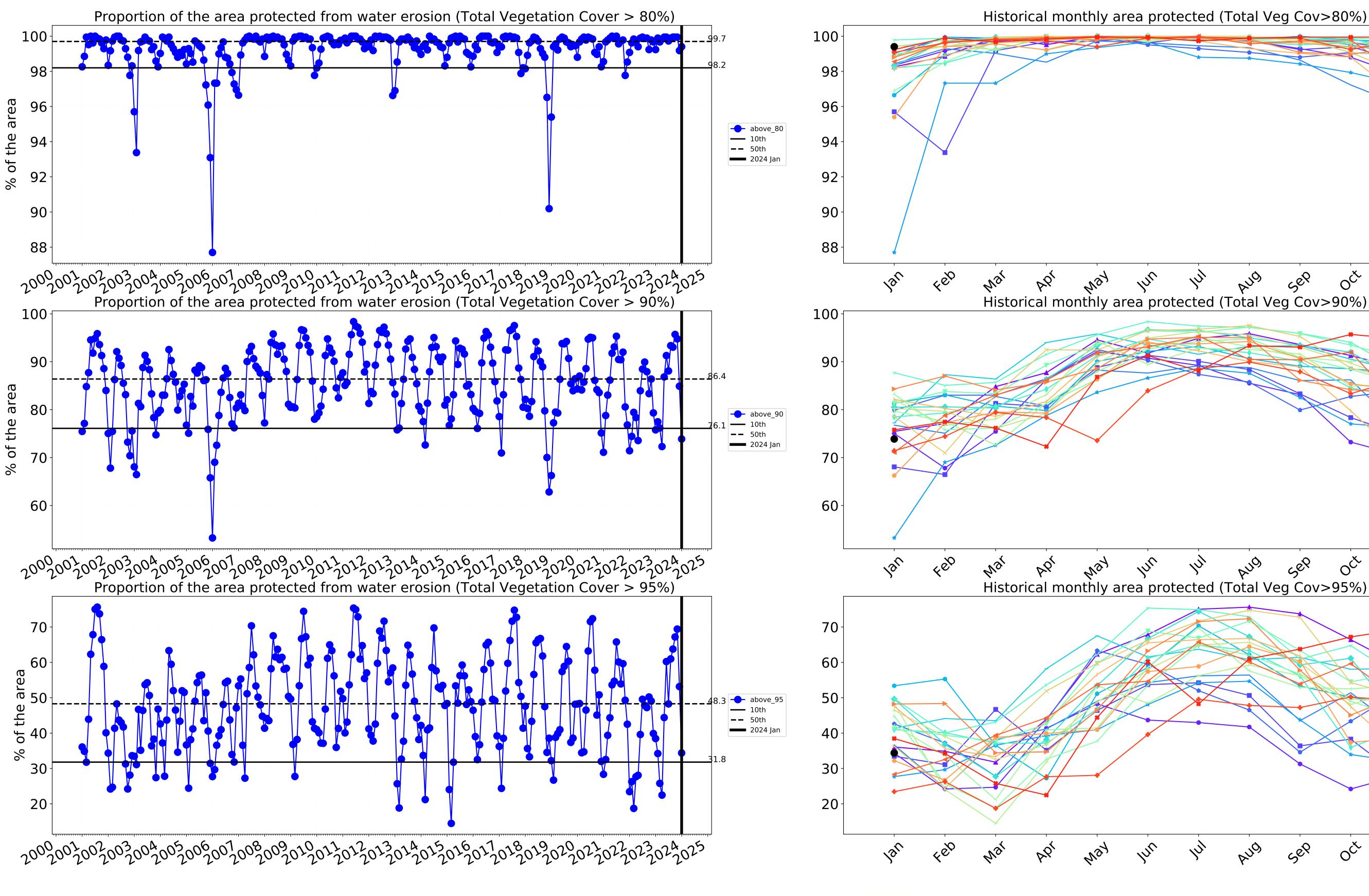


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

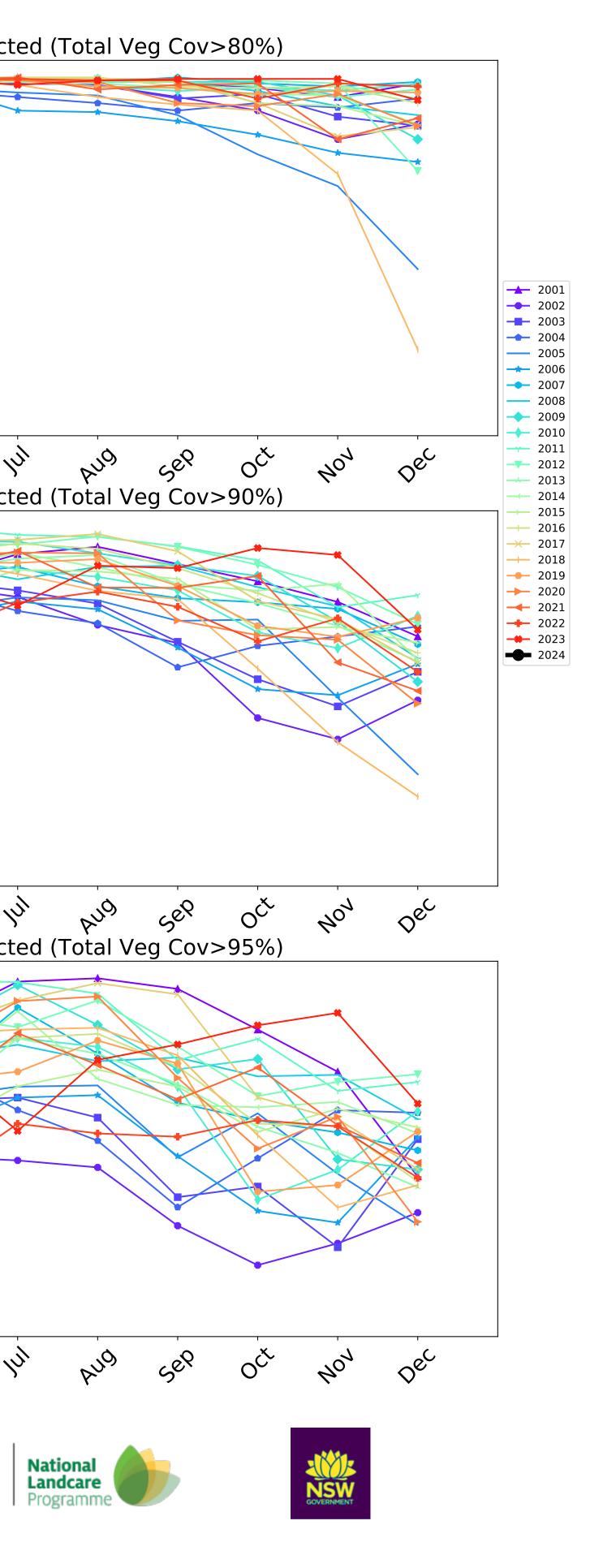
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Ecosystem Research Infrastructure Australian Government



Irrigation

Agriculture - Grazing - Irrigated
Agriculture - Cropping - Irrigated
Agriculture - Horticulture - Irrigated

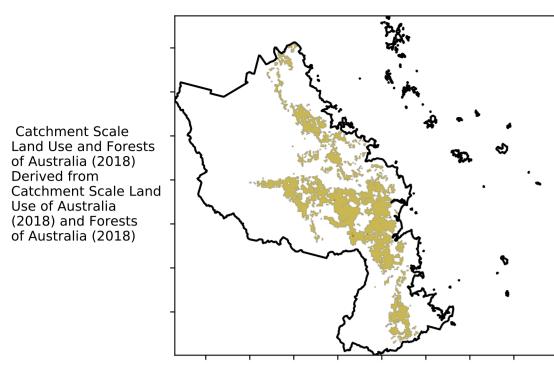
12%200%

52°1070°10

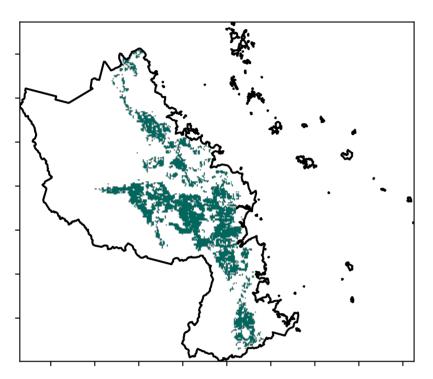
· 3200-50010

0.30%

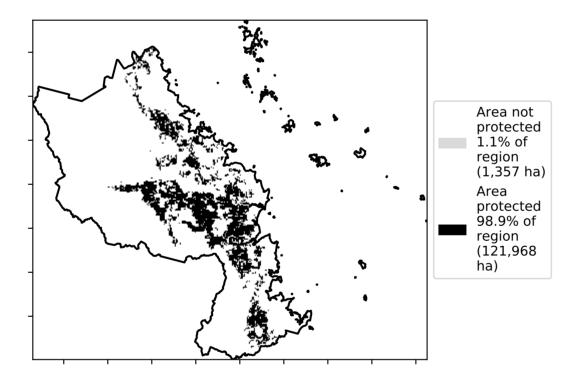
Land use and forest cover

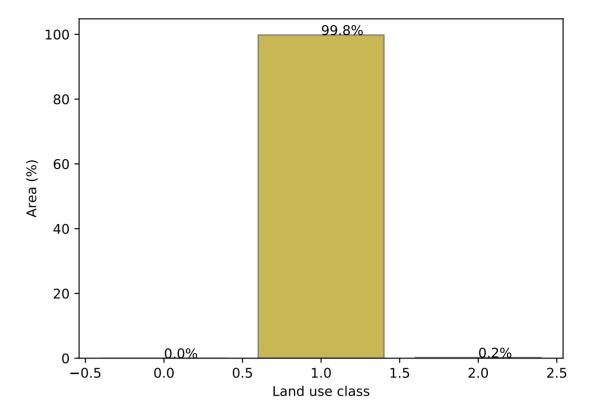


Total Vegetation Cover [%]



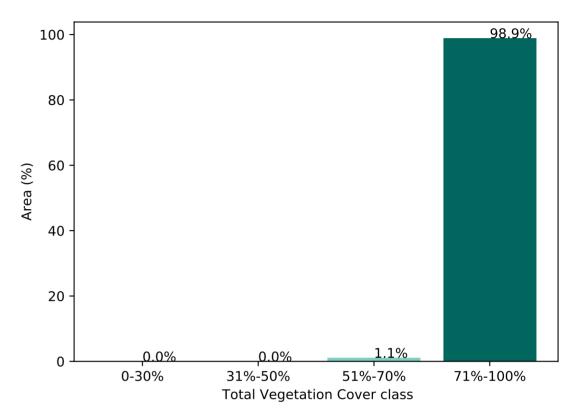
% Area protected from water erosion (>70%)



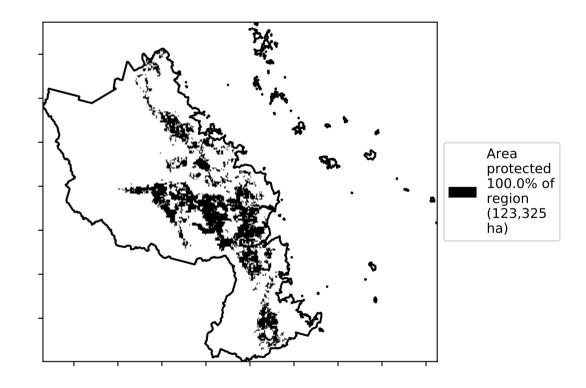


Proportion of each land class in area

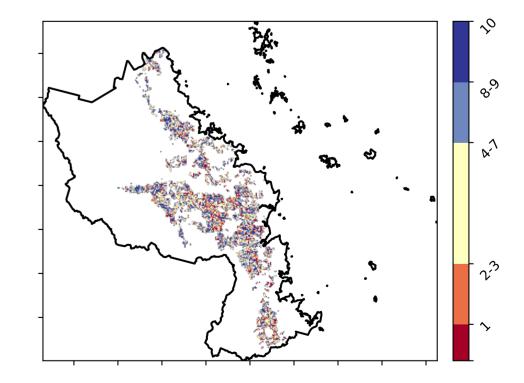
Proportion of vegetation cover class in area



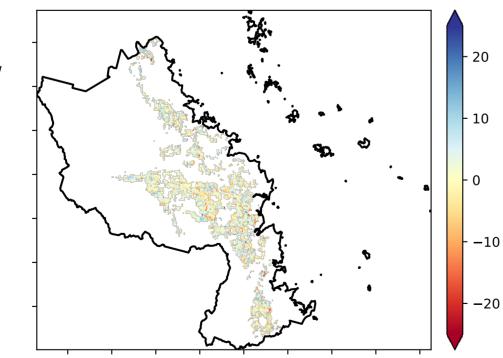
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



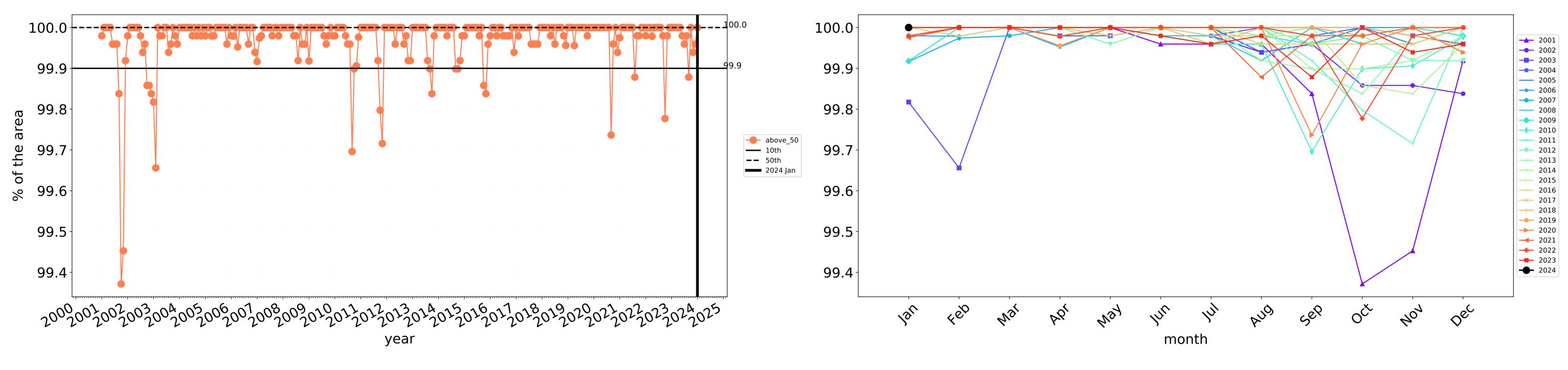
Total Vegetation Cover Anomaly [%]



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

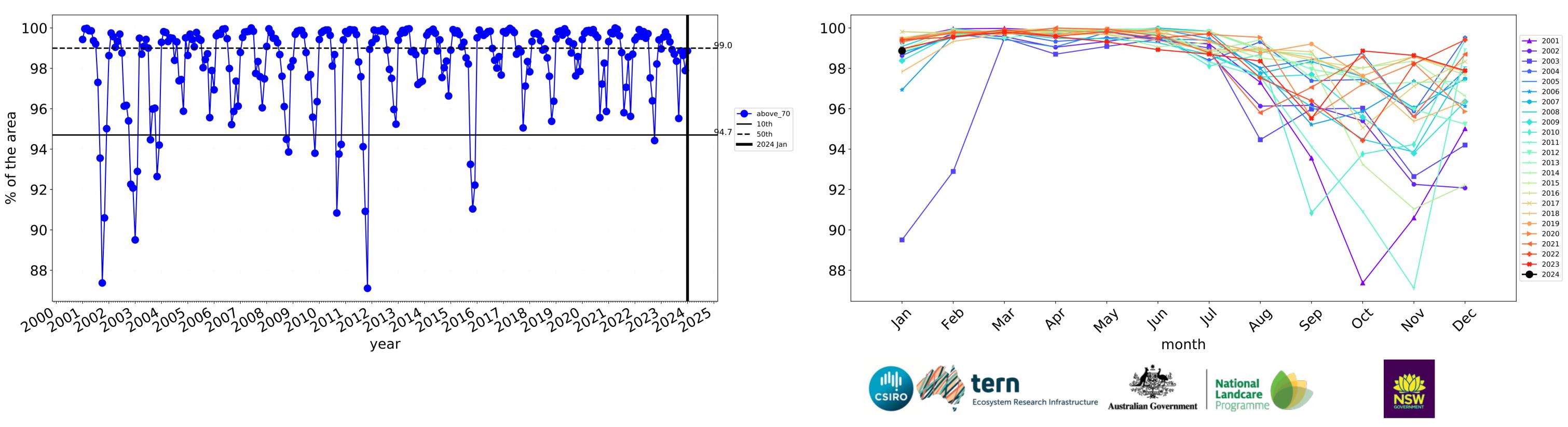


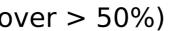




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

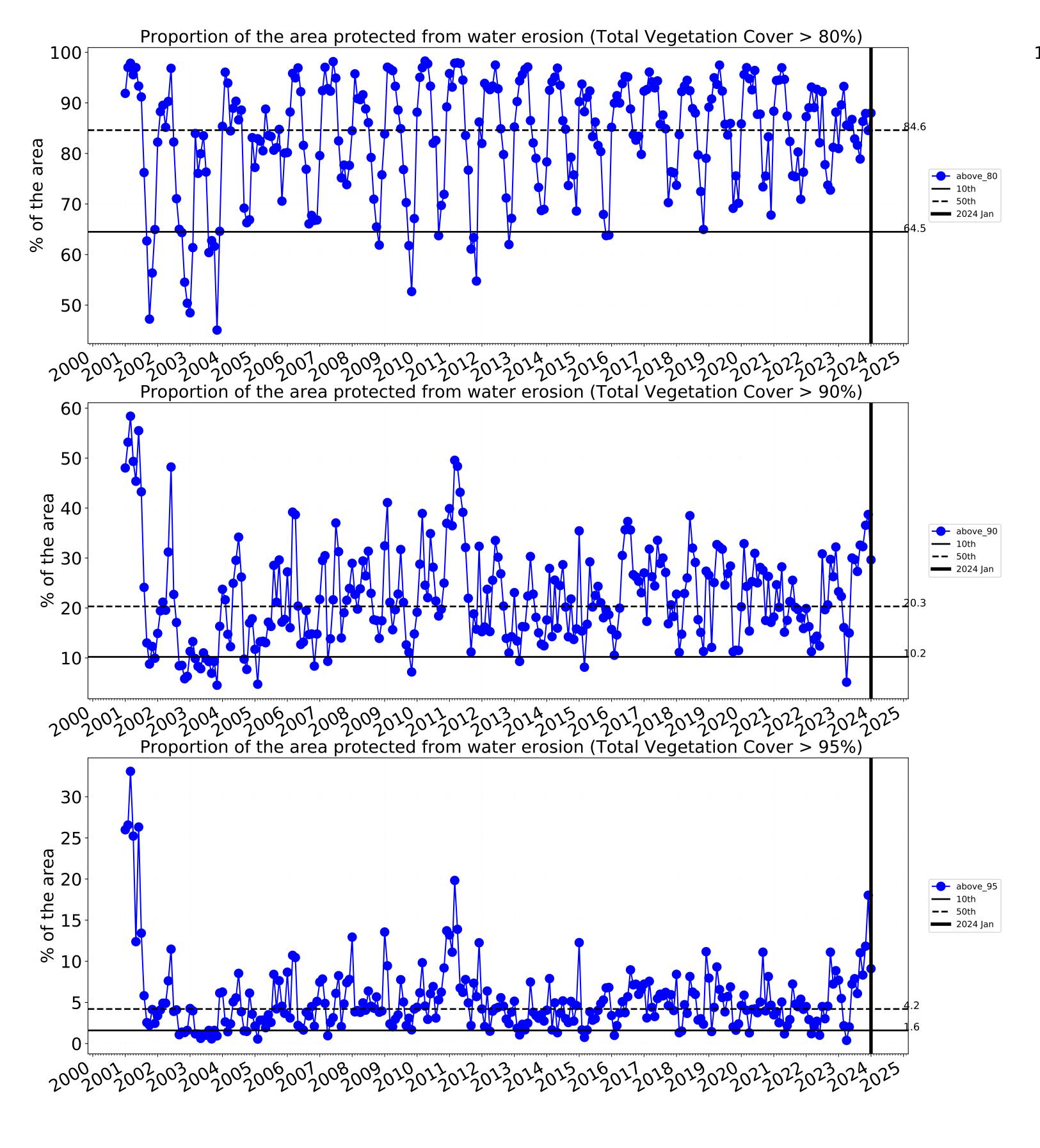
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

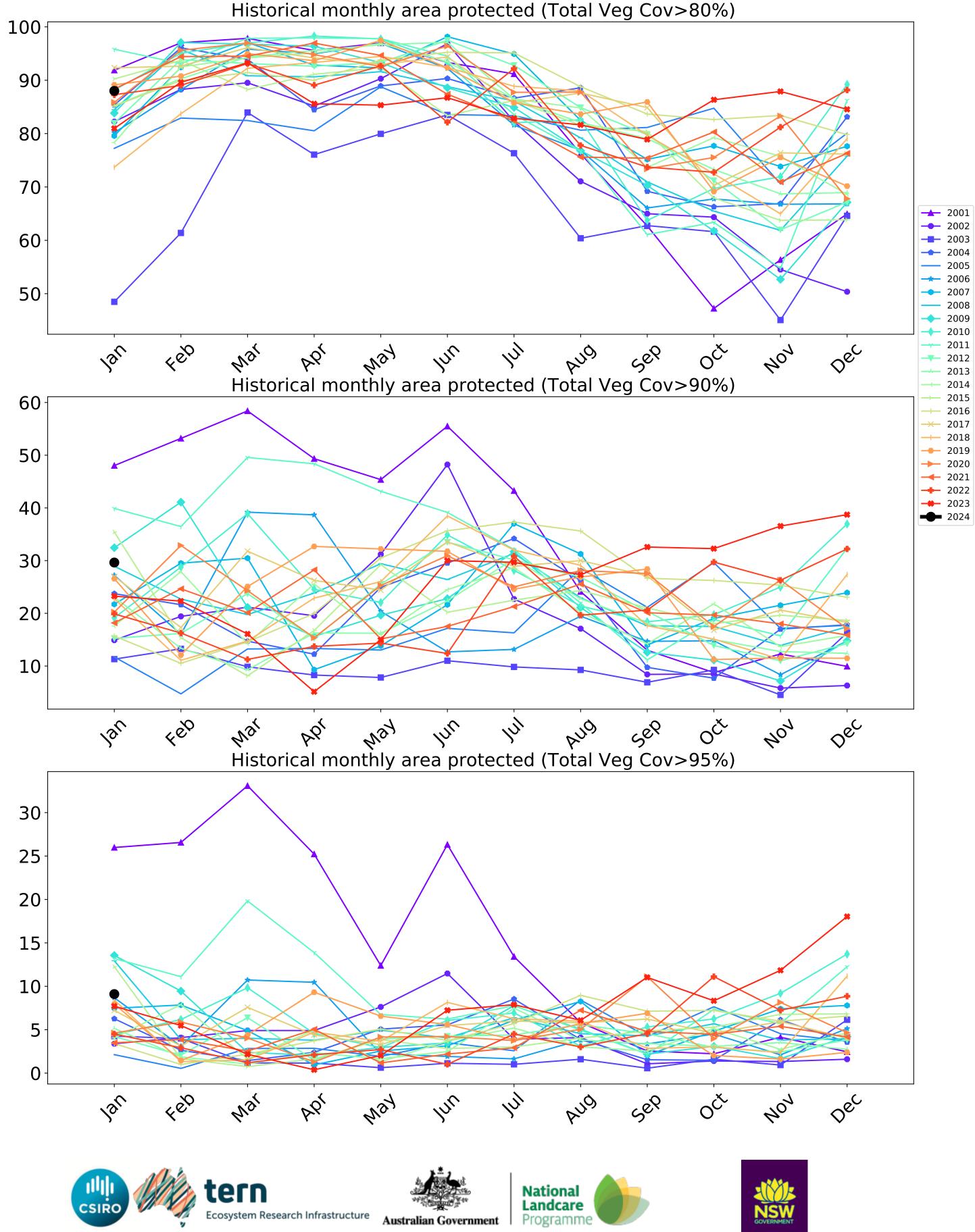




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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





Production native forests and plantation forests

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

12%200%

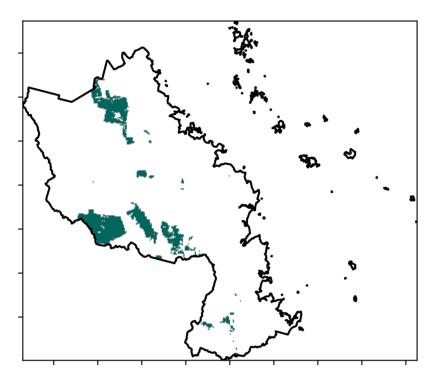
· 52°10010

· 320050010

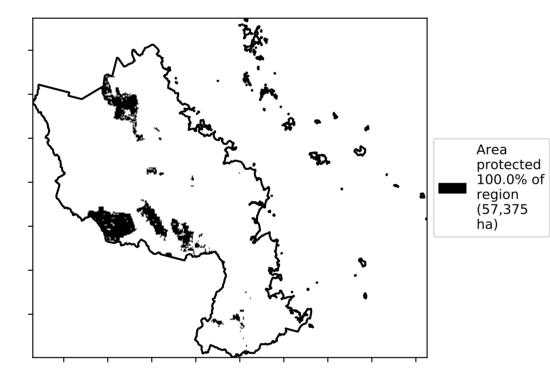
0.30%

Land use and forest cover

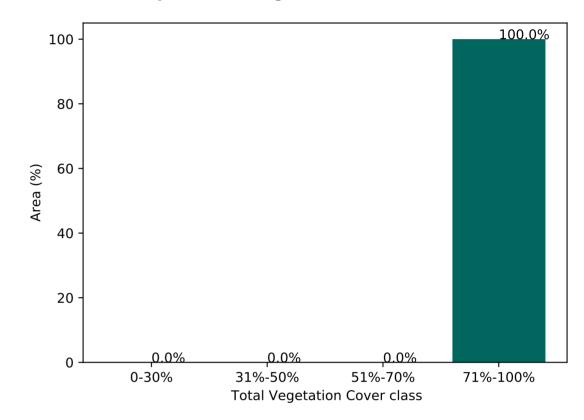
Total Vegetation Cover [%]



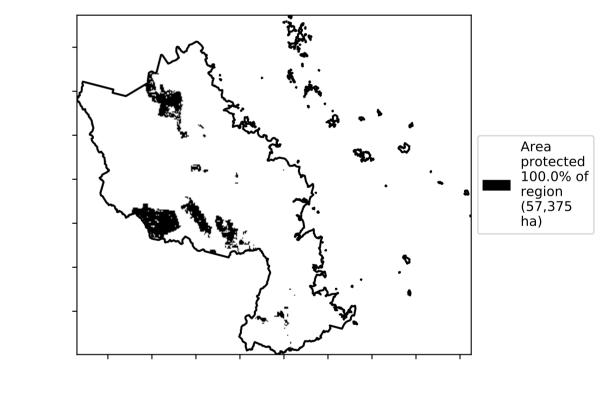
% Area protected from water erosion (>70%)



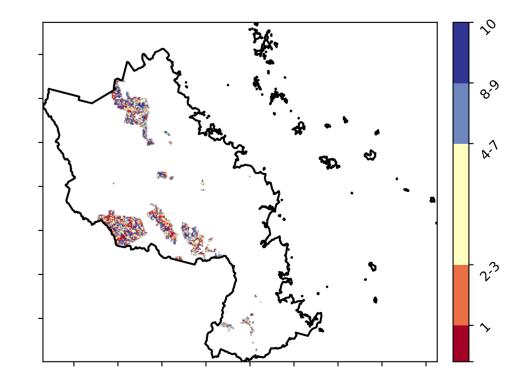




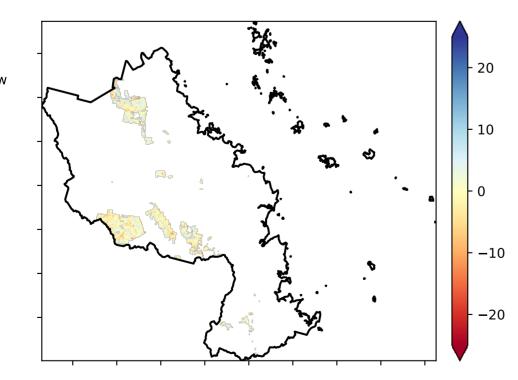
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

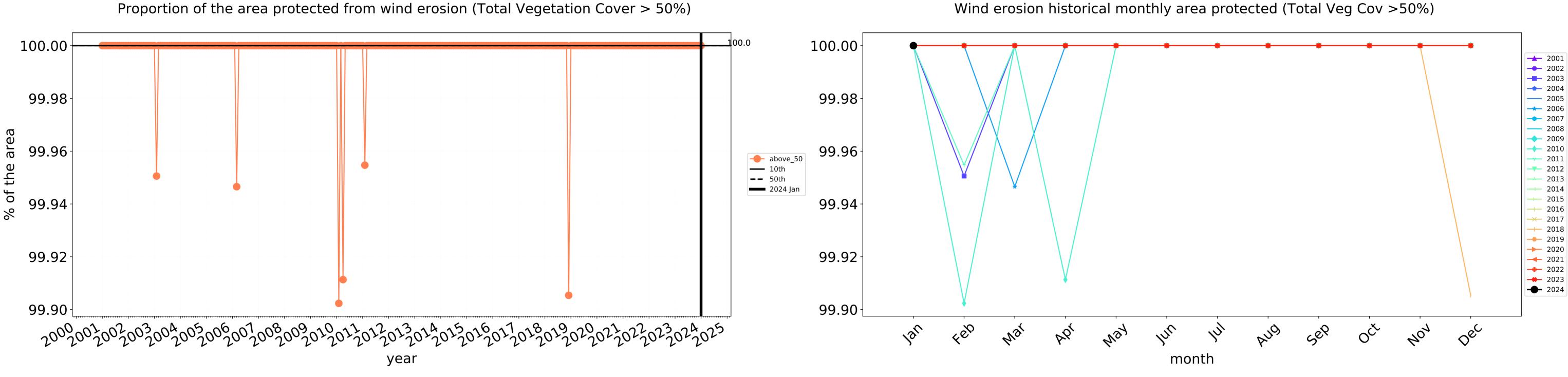


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

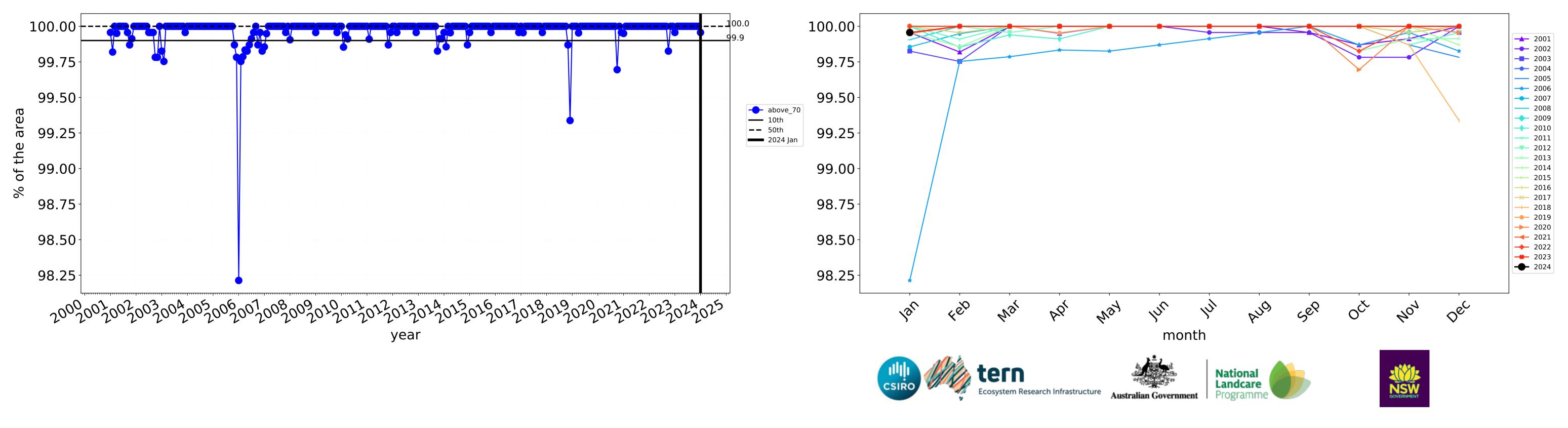




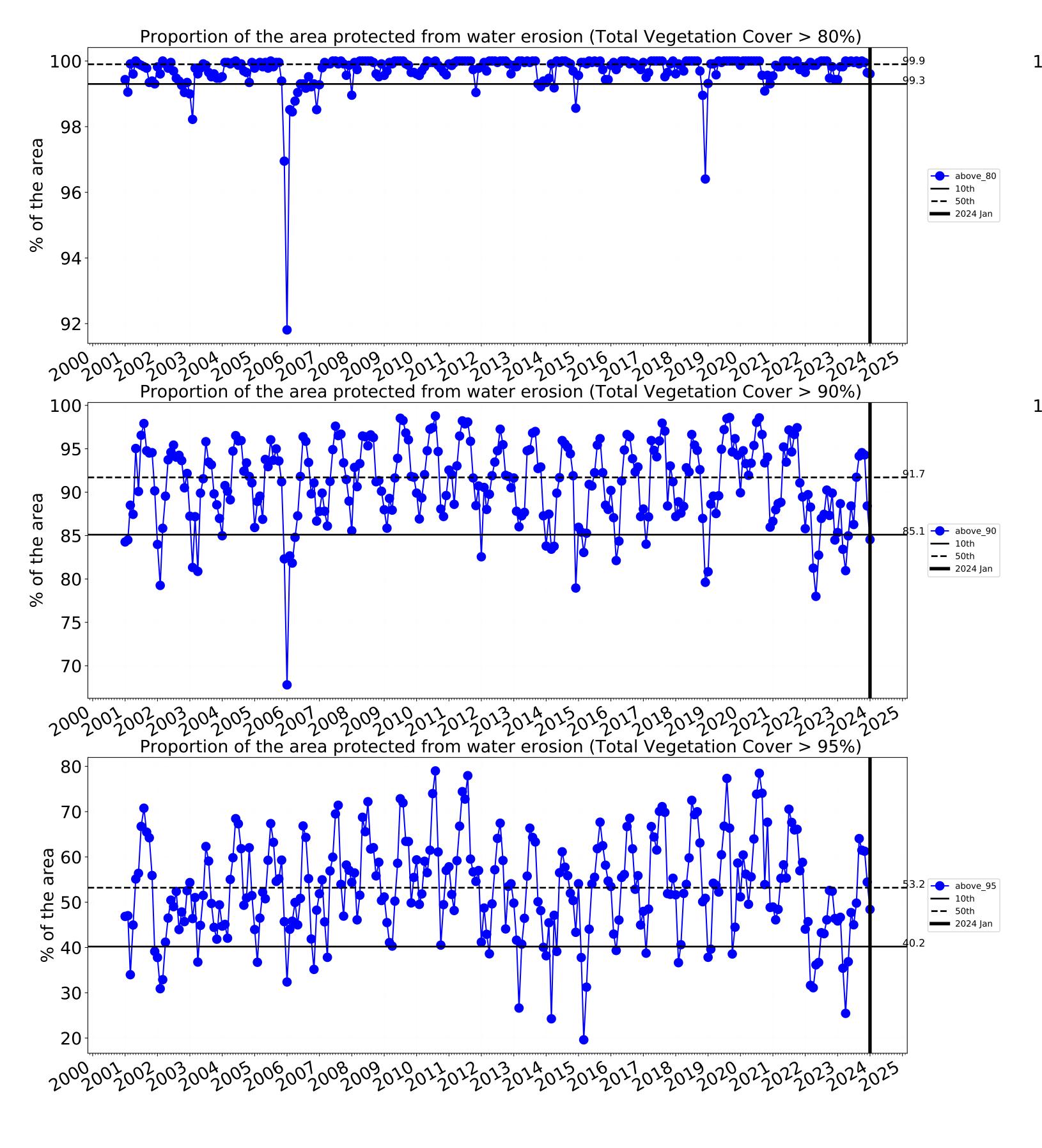
Production native forests and plantation forests timeseries

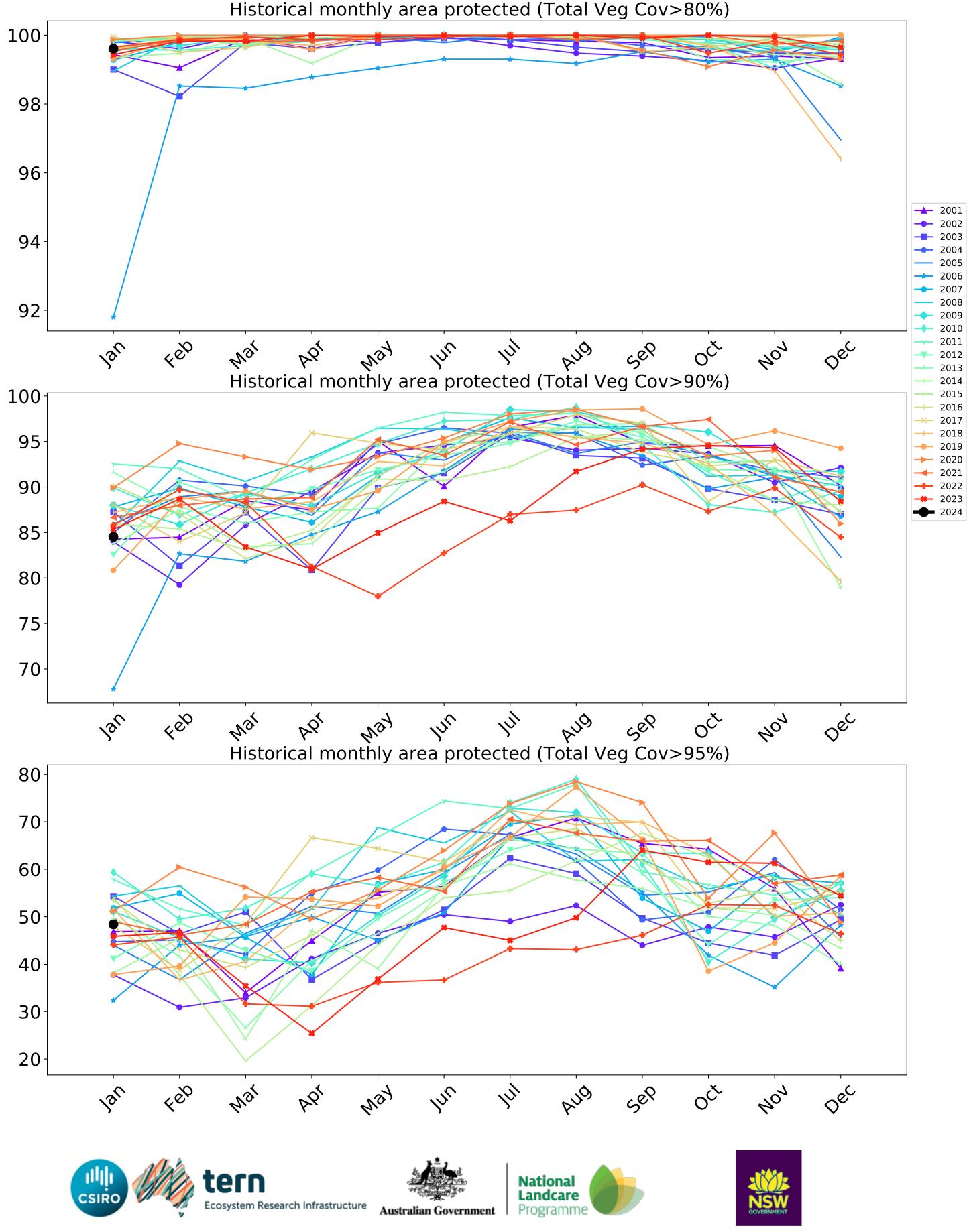


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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







Mackay_(R) (701,175 ha and no data 60,136 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	701,175	100.0% 700,900	99.8% 699,825	98.5% 690,850	94.0% 659,300	61.6% 431,875	31.0% 217,175
Conservation and natural environments	178,275	99.9% 178,175	99.8% 177,950	98.8% 176,050	96.9% 172,775	77.3% 137,825	45.1% 80,350
Conservation and natural environments non forest	4,725	97.9% 4,625	97.9% 4,625	88.4% 4,175	77.8% 3,675	53.4% 2,525	28.0% 1,325
Conservation and natural environments Woodland forest	35,800	100.0% 35,800	99.8% 35,725	98.0% 35,100	94.8% 33,950	67.2% 24,075	32.5% 11,650
Conservation and natural environments Forest (non woodland)	137,750	100.0% 137,750	99.9% 137,600	99.3% 136,775	98.1% 135,150	80.7% 111,225	48.9% 67,375
Agriculture	410,200	100.0% 410,175	100.0% 410,075	99.4% 407,550	94.4% 387,300	54.7% 224,200	23.9% 98,150
Grazing	286,275	100.0% 286,250	100.0% 286,150	99.6% 285,025	97.2% 278,175	65.4% 187,200	30.3% 86,725
Grazing non forest	133,075	100.0% 133,050	99.9% 132,950	99.2% 132,025	95.6% 127,275	57.6% 76,600	24.0% 31,900
Grazing Woodland forest	107,250	100.0% 107,250	100.0% 107,250	99.8% 107,075	98.1% 105,225	71.5% 76,650	36.4% 39,025
Grazing - Forest (non woodland)	45,950	100.0% 45,950	100.0% 45,950	99.9% 45,925	99.4% 45,675	73.9% 33,950	34.4% 15,800
Irrigation	123,325	100.0% 123,325	100.0% 123,325	98.9% 121,925	88.0% 108,525	29.6% 36,550	9.1% 11,225
Production native forests and plantation forests	57,375	100.0% 57,375	100.0% 57,375	100.0% 57,350	99.6% 57,150	84.5% 48,500	48.4% 27,775

