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

Date: July 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 Jul 2024

Land use and forest cover

Proportion of each land class in area



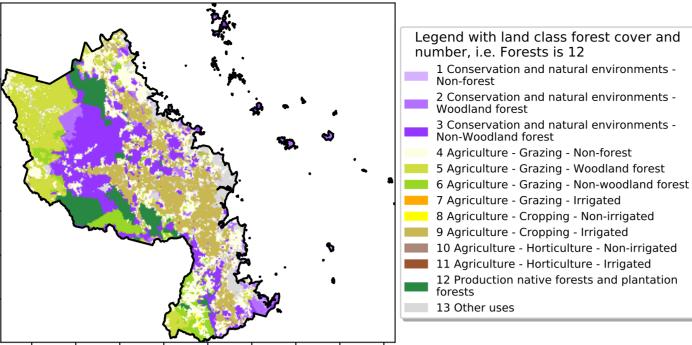
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2019.



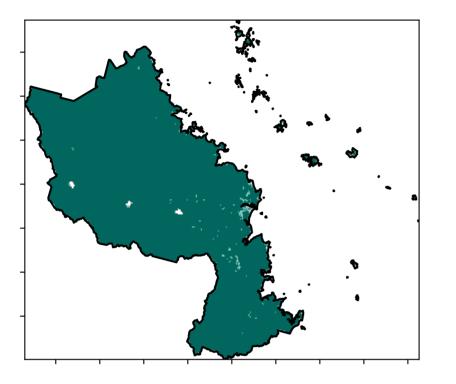
12%200%

· 52% 70%

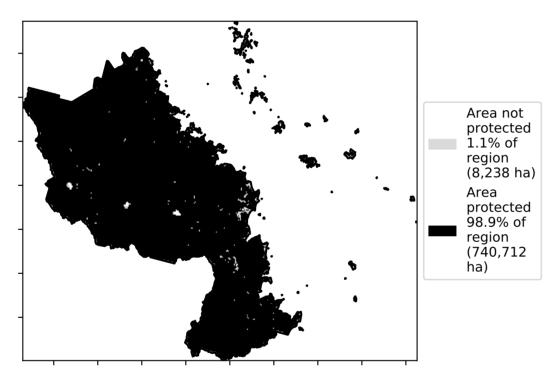
320050010

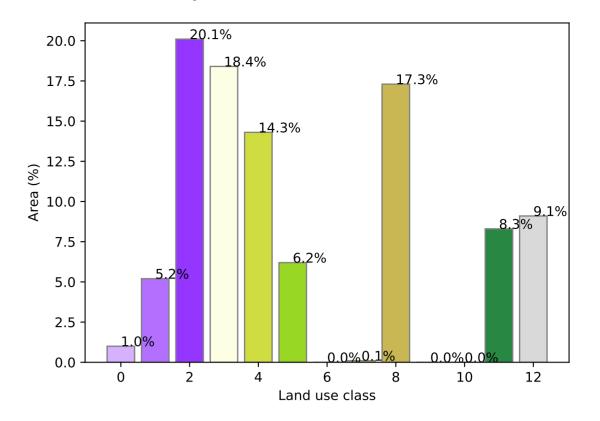
0.30%

Total Vegetation Cover [%]

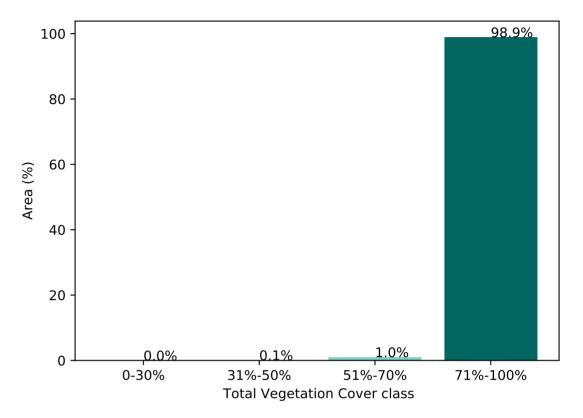


% Area protected from water erosion (>70%)

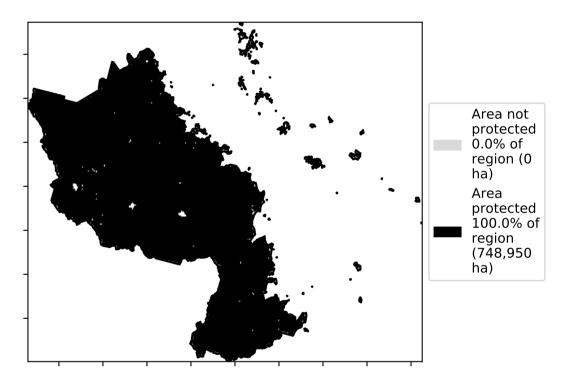




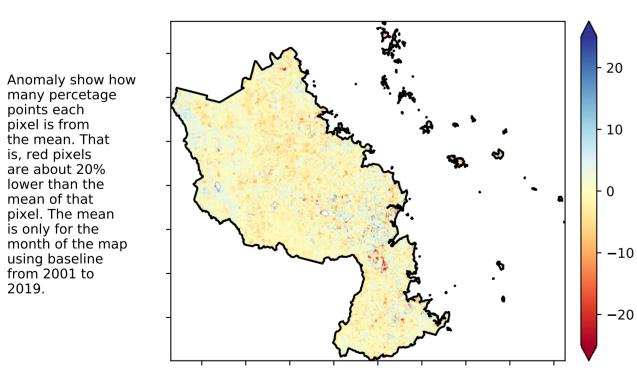
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

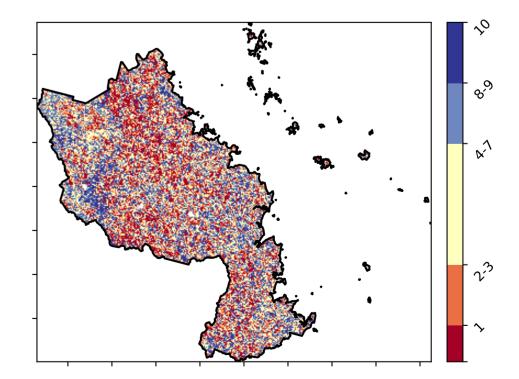


Total Vegetation Cover Anomaly [%]

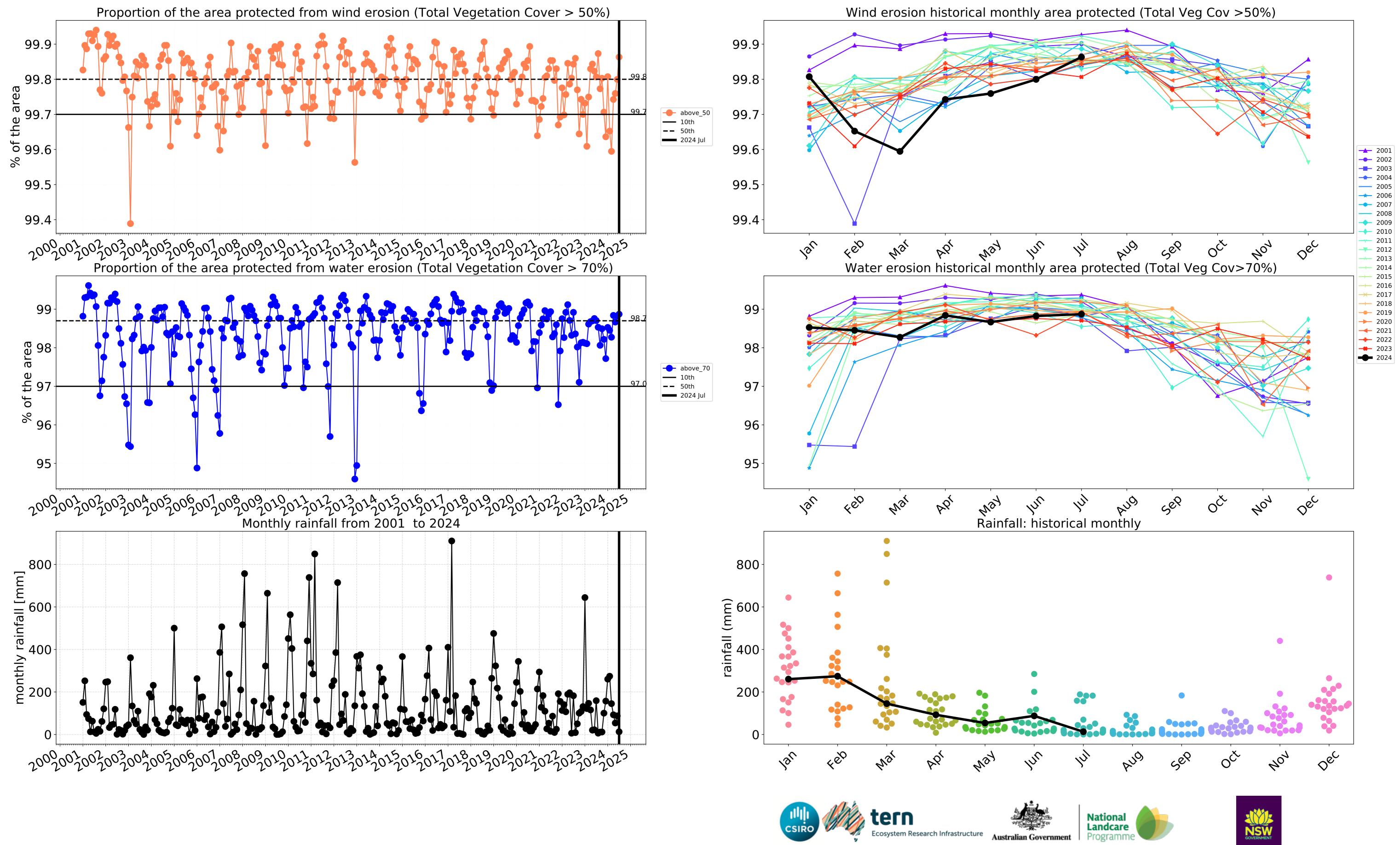


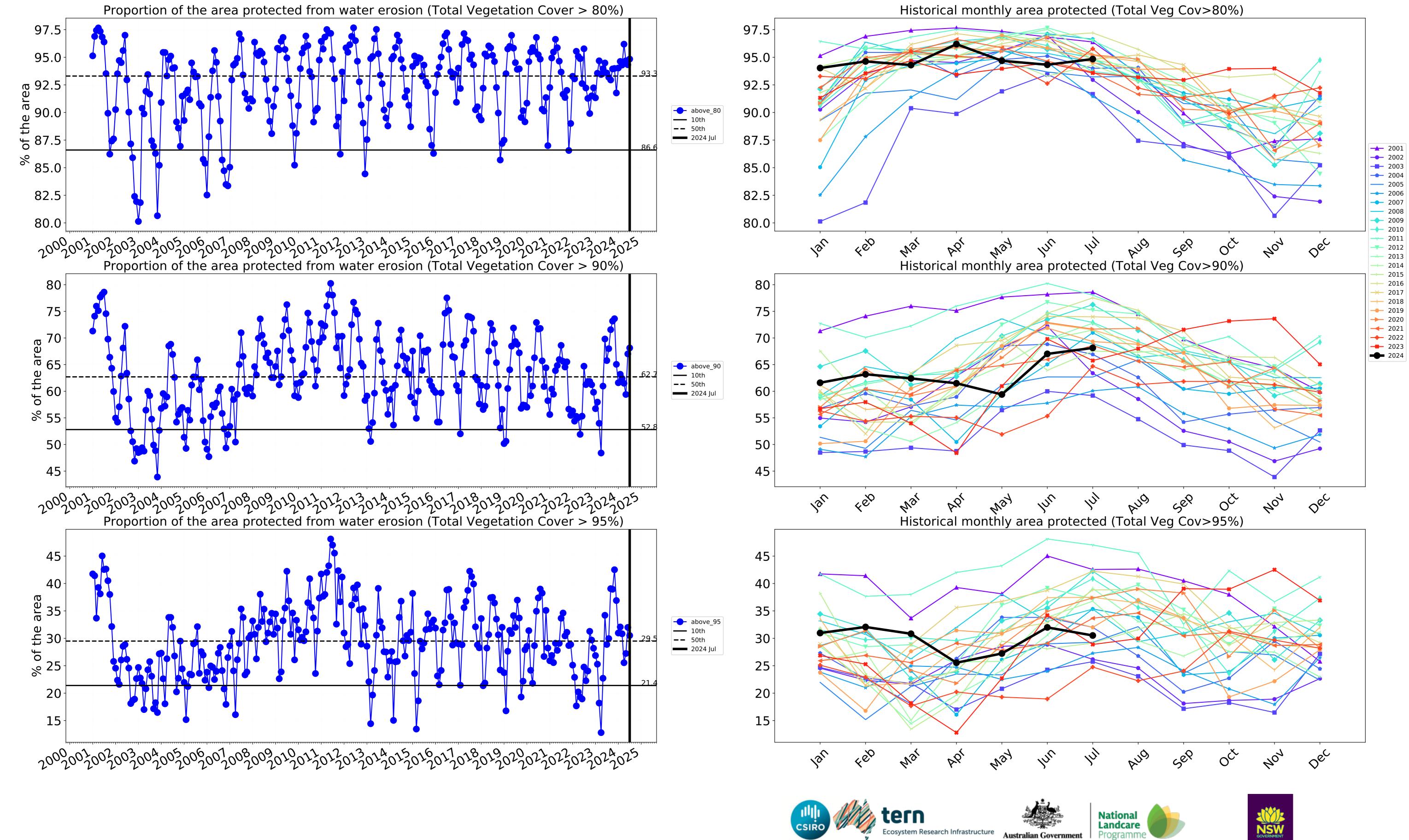
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]











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

80

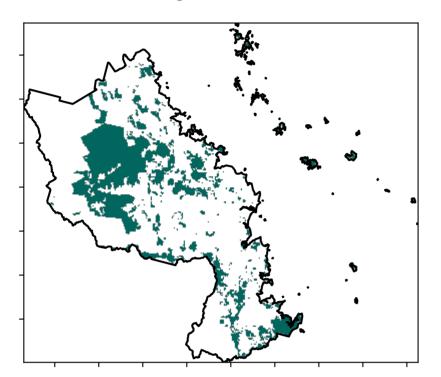
70

-0.5

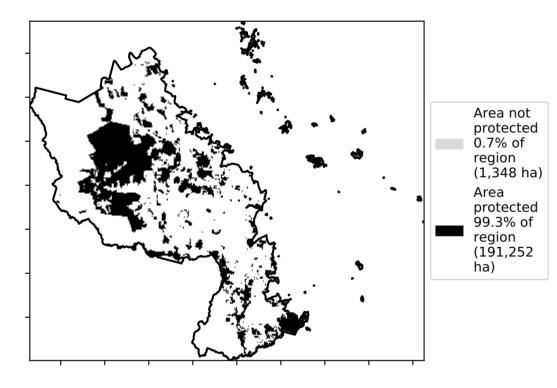
0.0

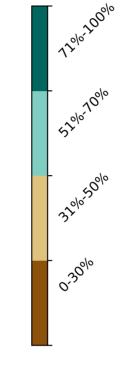
0.5

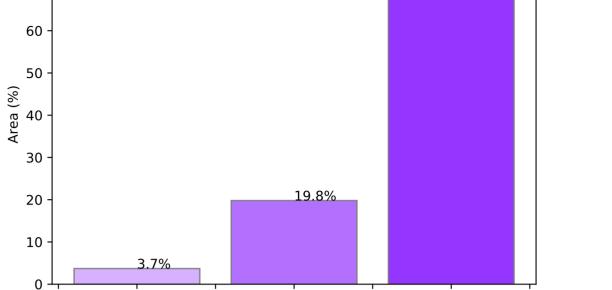
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)







Proportion of each land class in area

76.5%

2.0

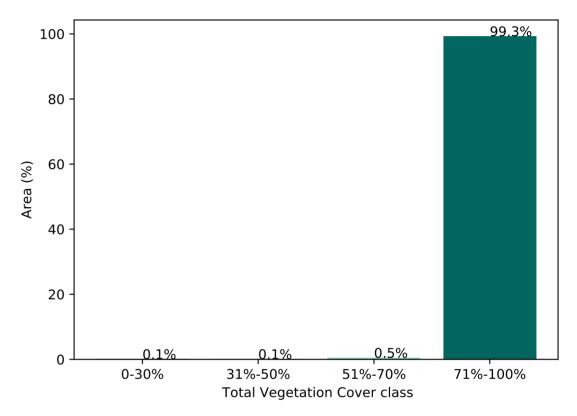
2.5

Proportion of vegetation cover class in area

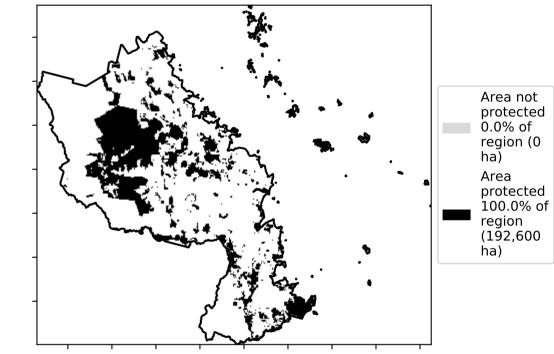
1.0

Land use class

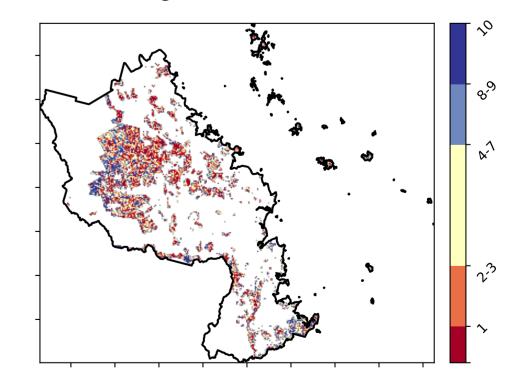
1.5



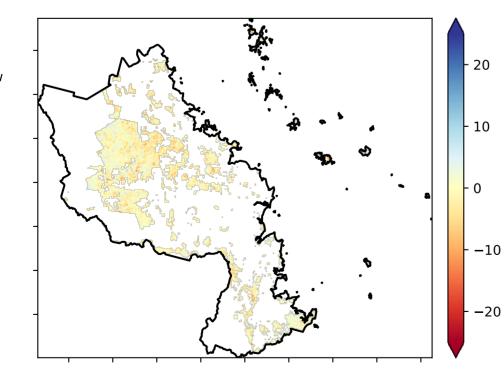
% Area protected from wind erosion (>50%)



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

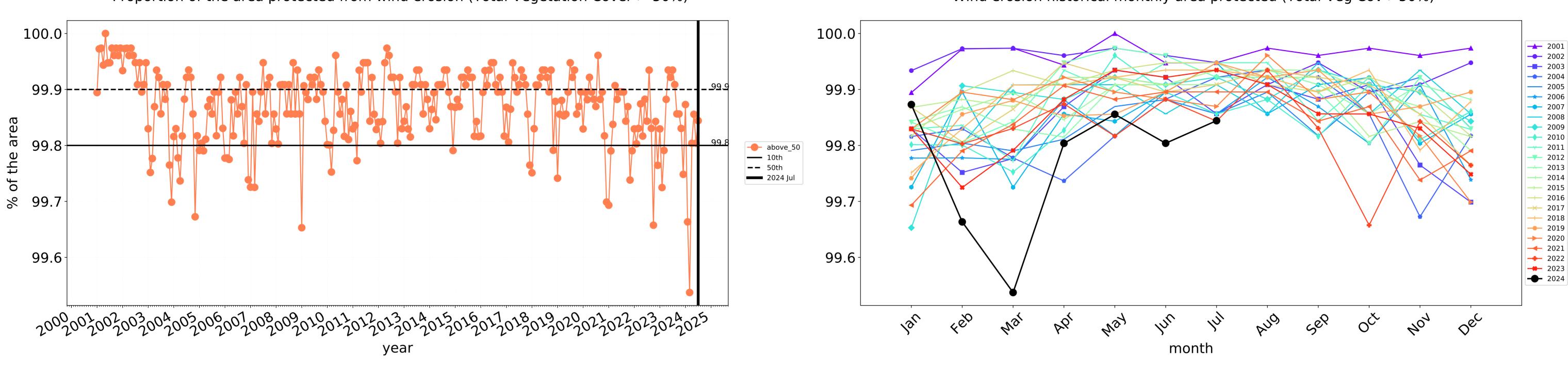
Derived from

Use of Australia

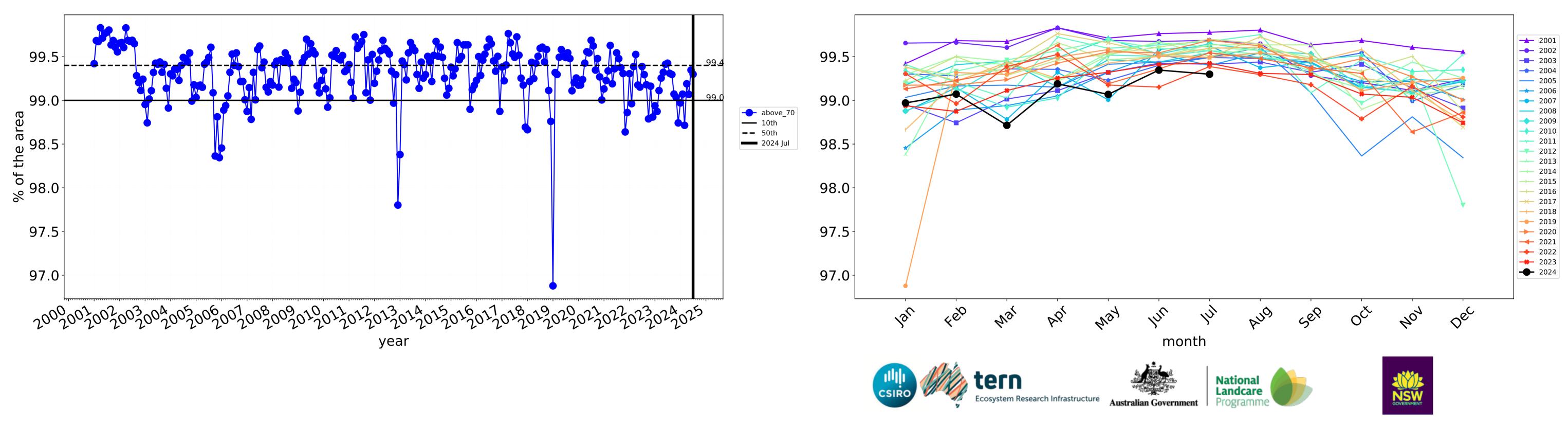
(2018) and Forests

of Australia (2018)

Land Use and Forests of Australia (2018)

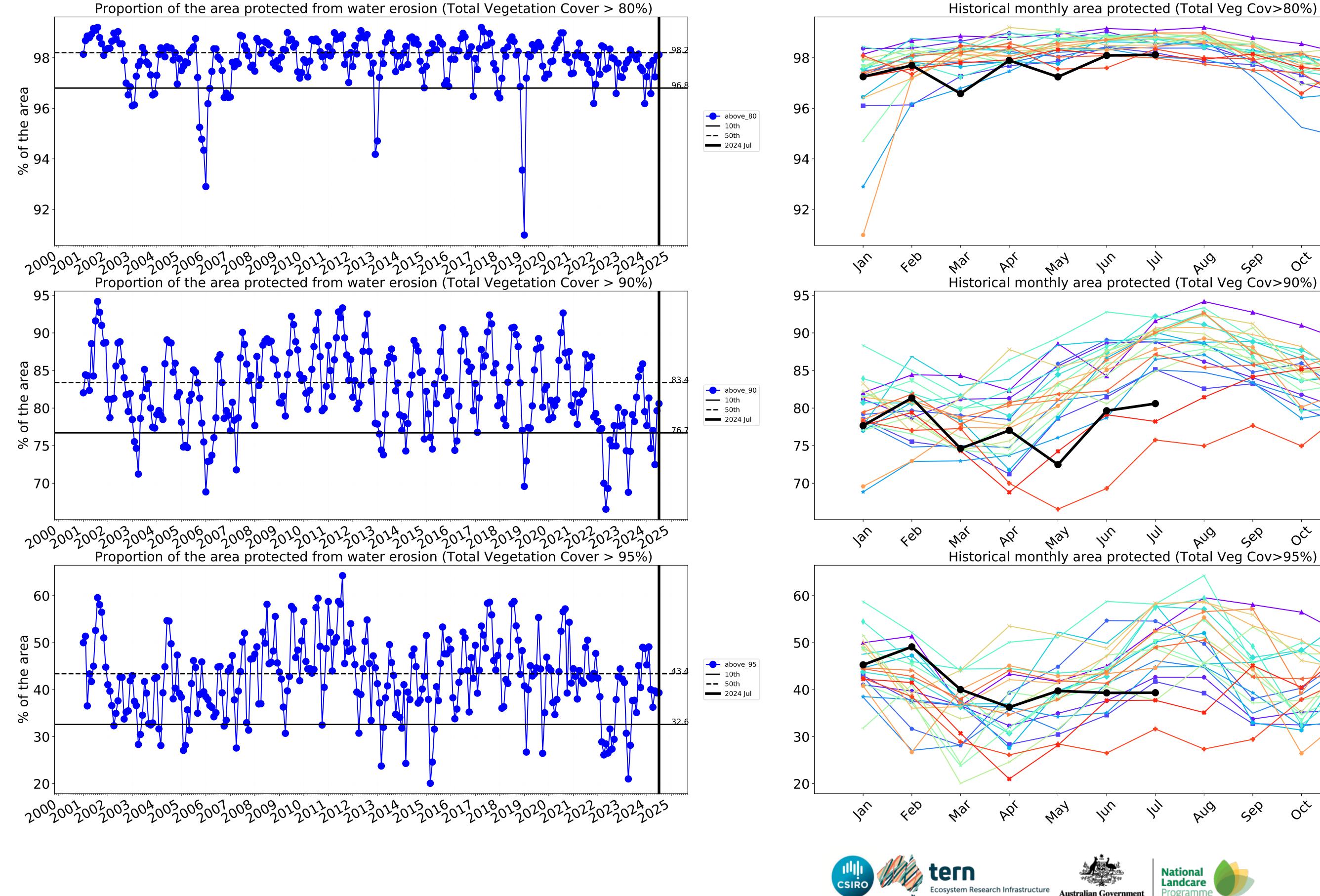


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





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

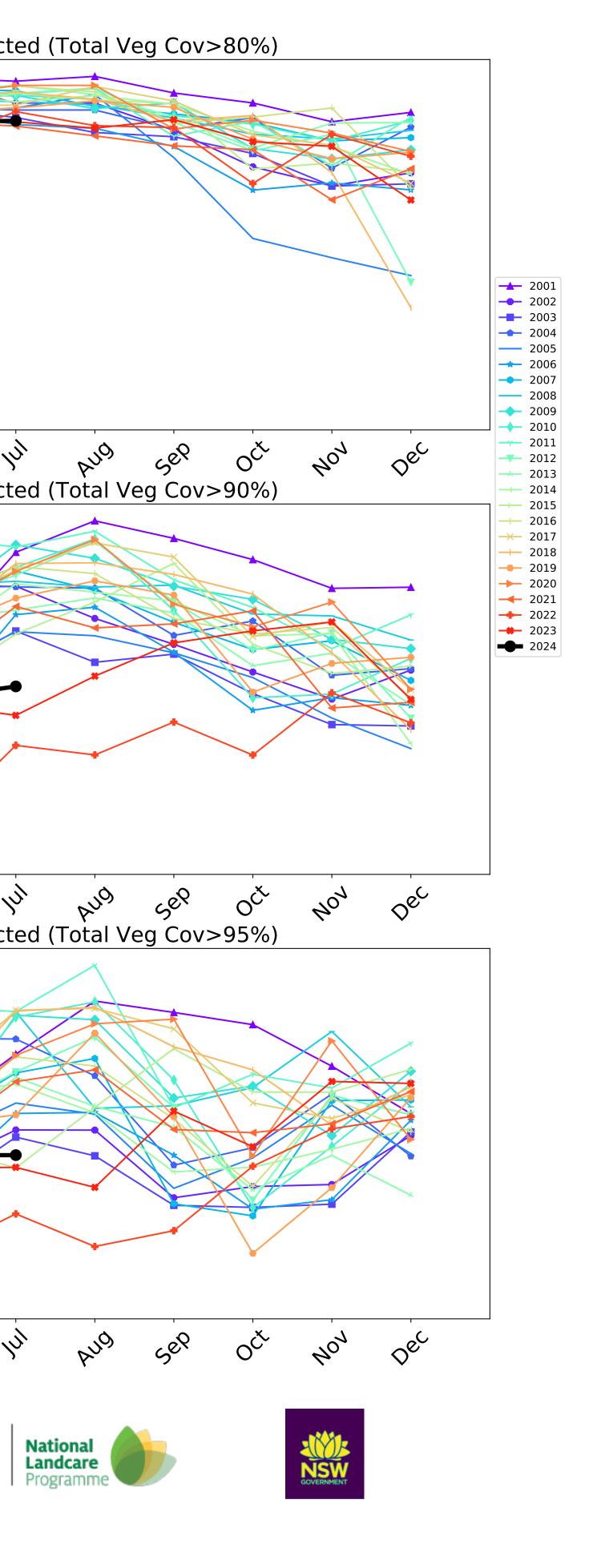


Australian Government

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4

Ecosystem Research Infrastructure



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)

12%200%

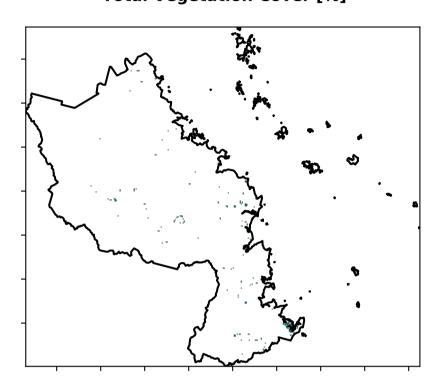
52°10'70°10

32°1050010

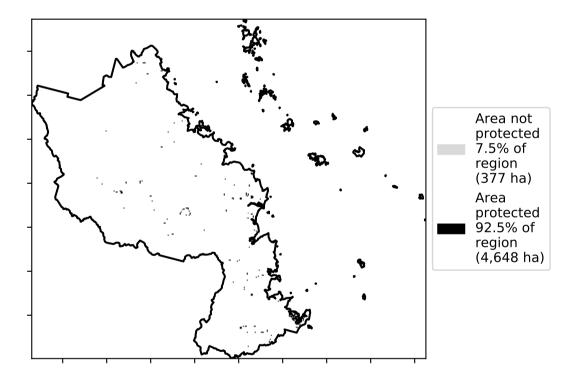
· 0.30%

Total Vegetation Cover [%]

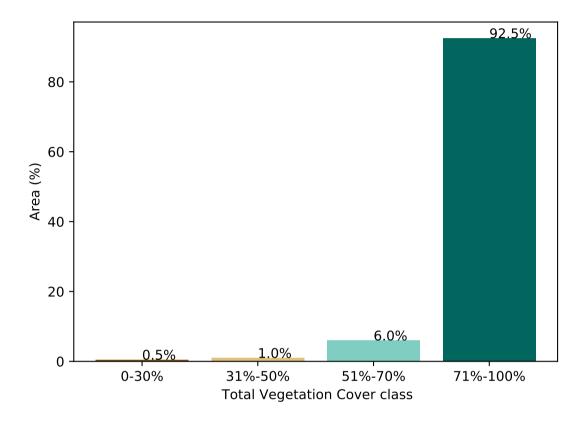
Land use and forest cover



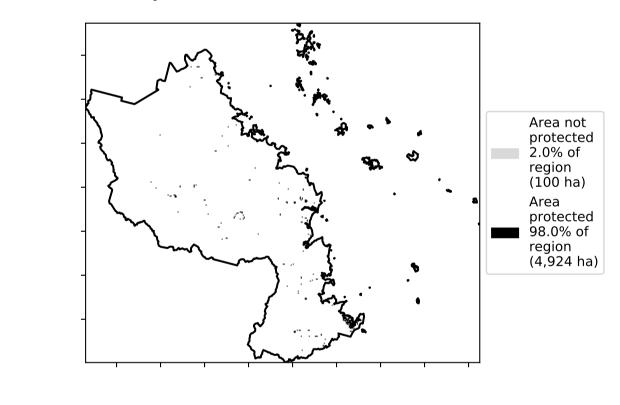
% Area protected from water erosion (>70%)



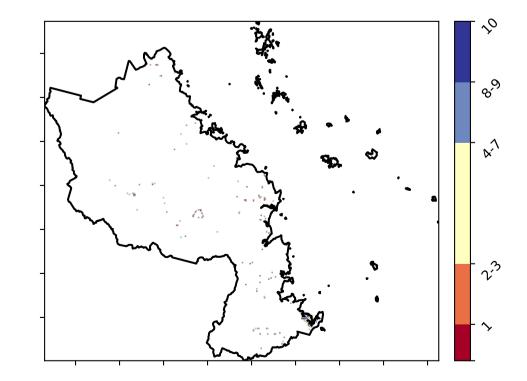




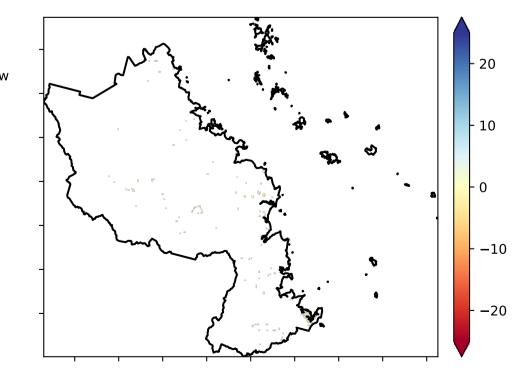
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



CSIRC



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.

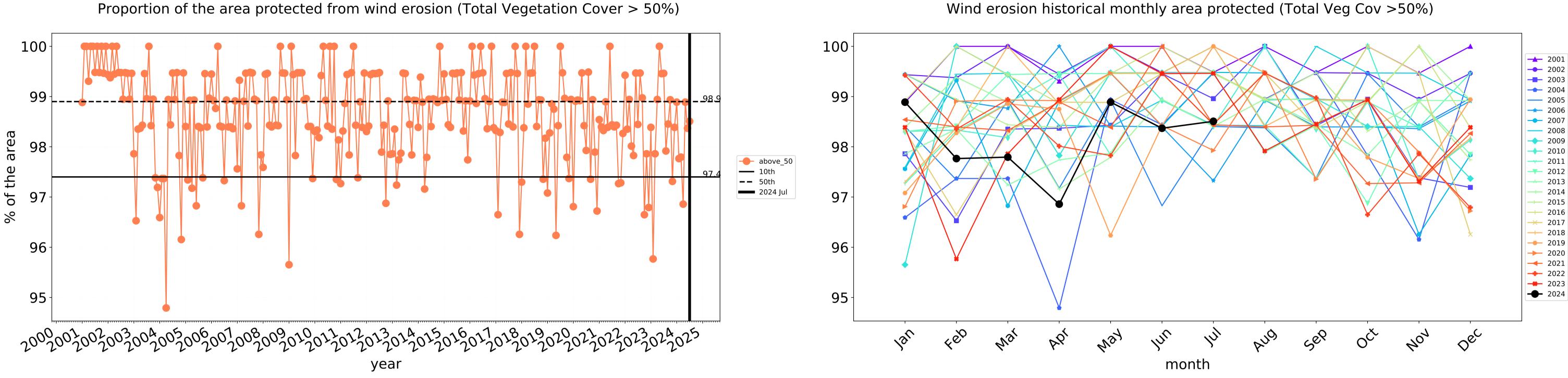
in the lowest 10% of



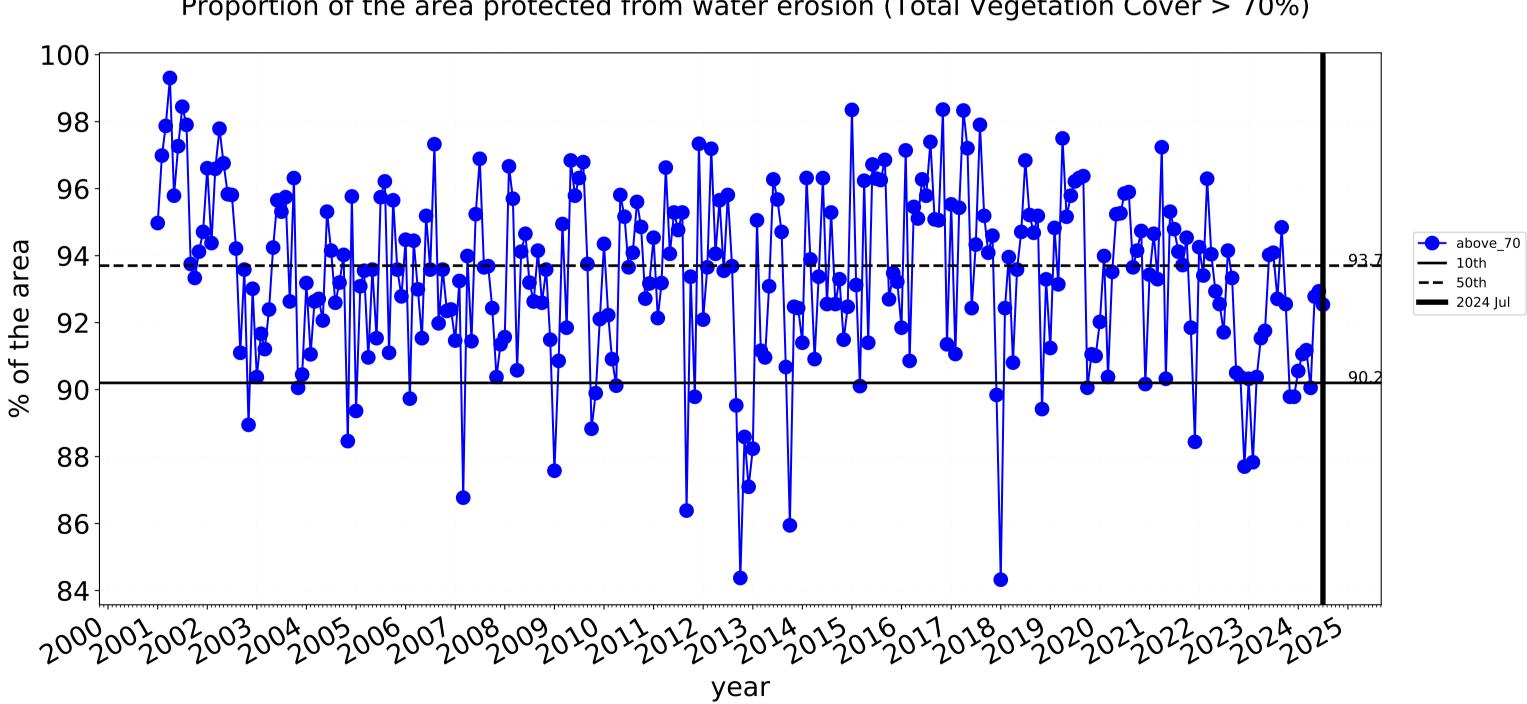
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Derived from

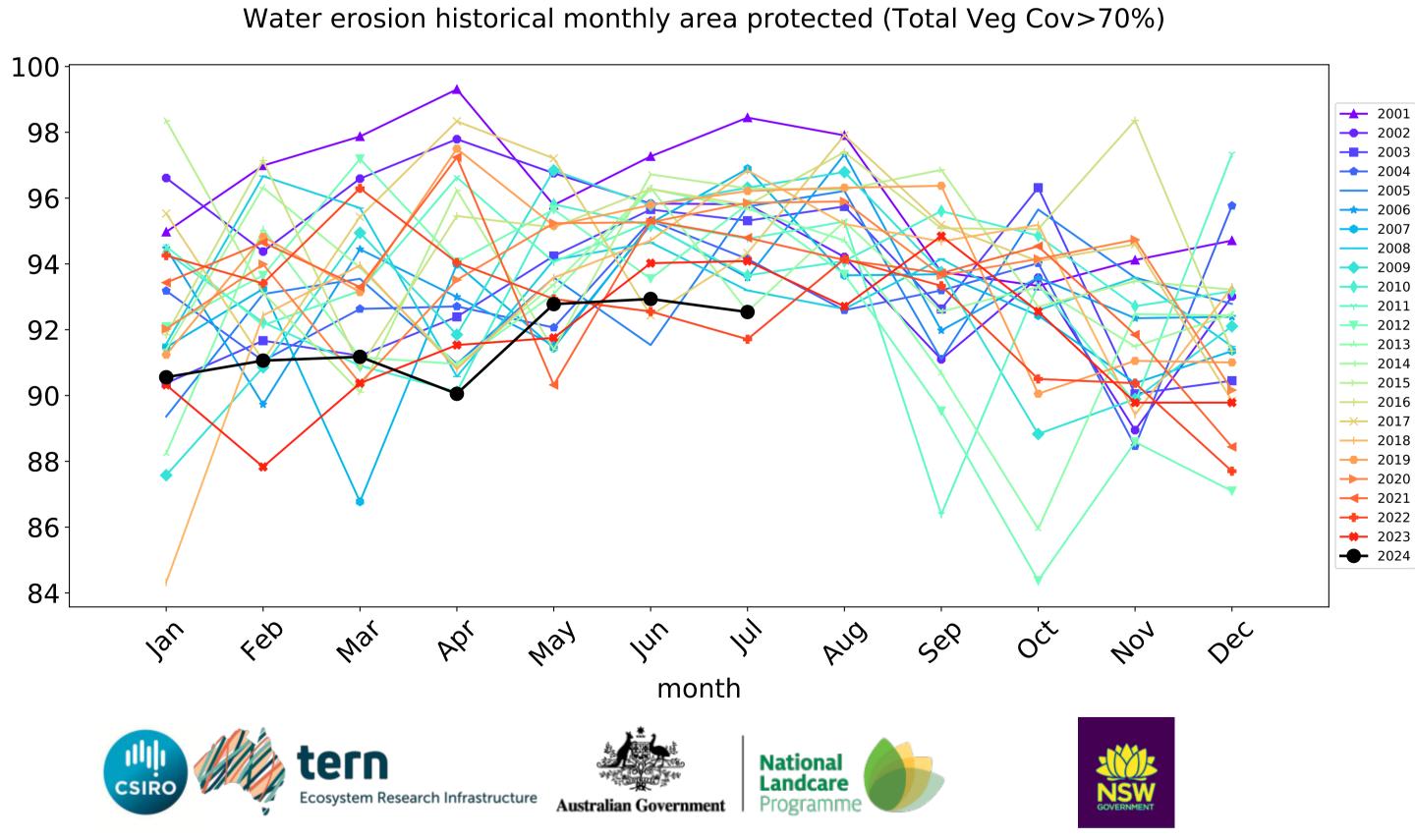
Use of Australia

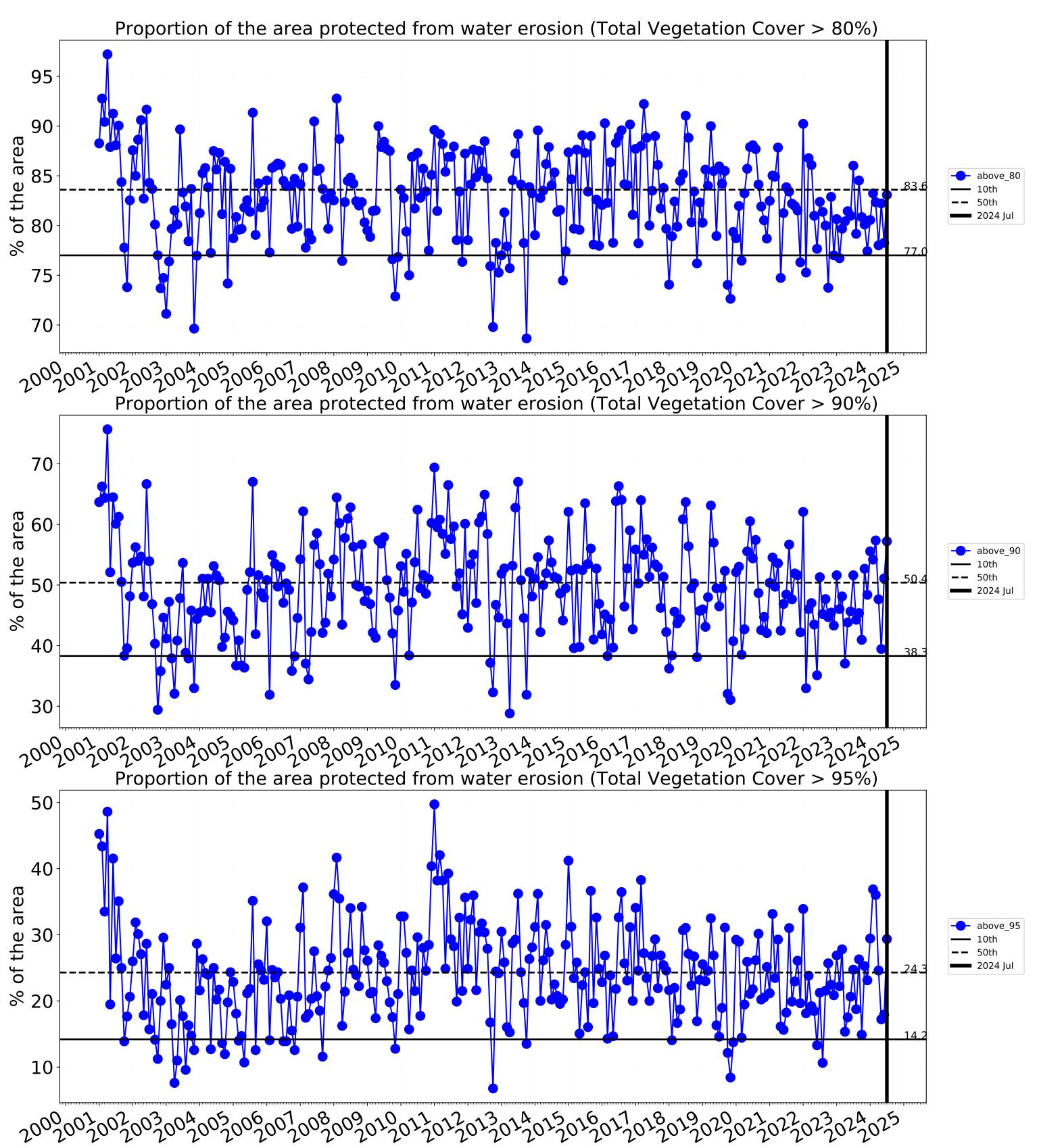


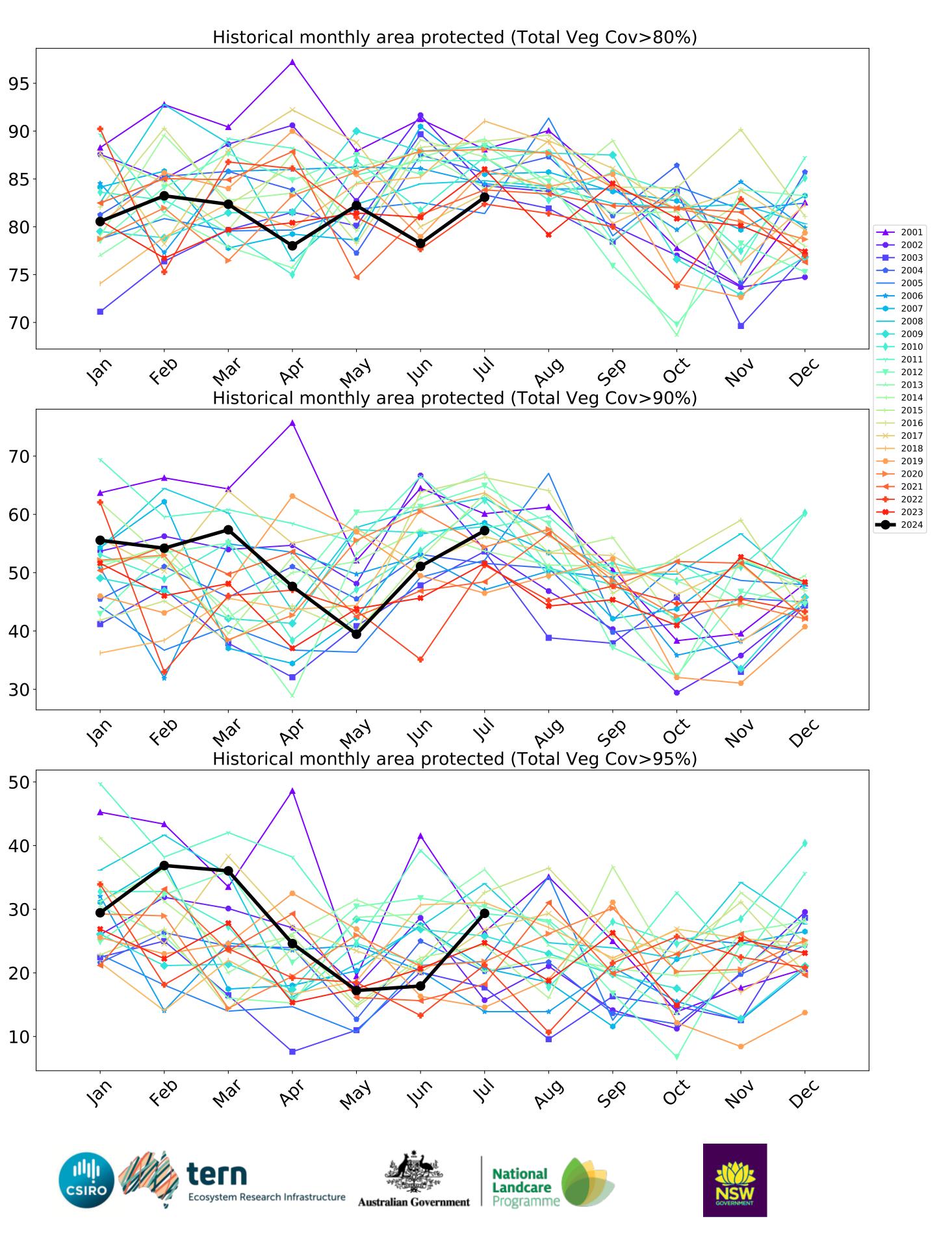
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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





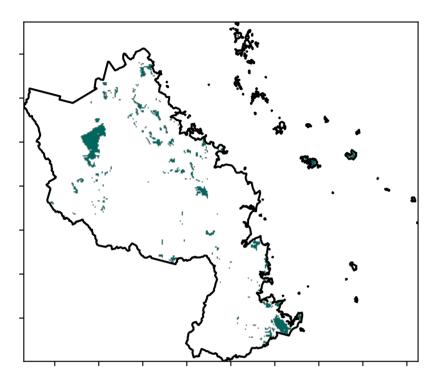


Conservation and natural environments Woodland forest

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

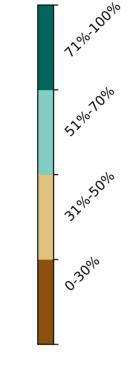
Land use and forest cover

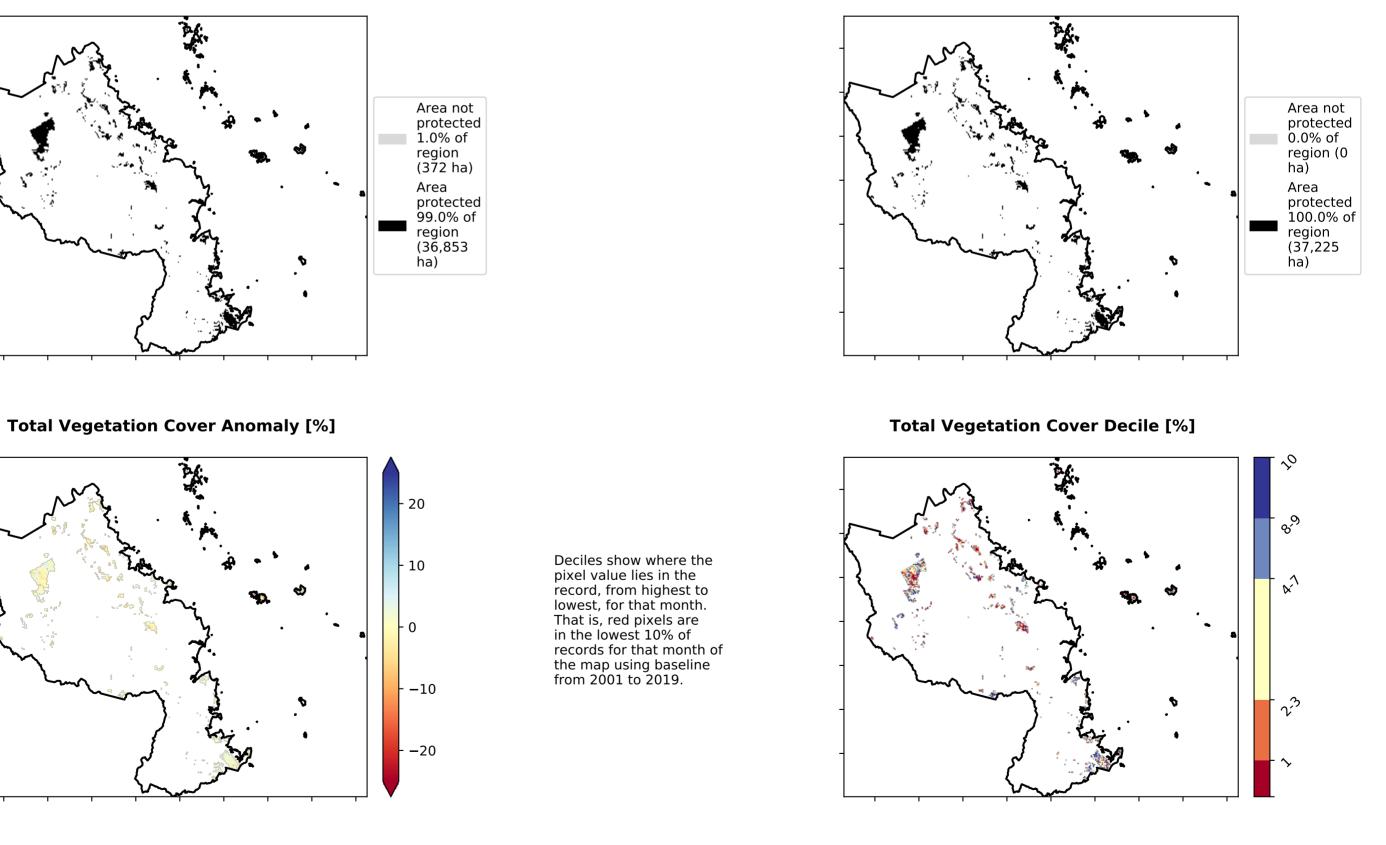
Total Vegetation Cover [%]



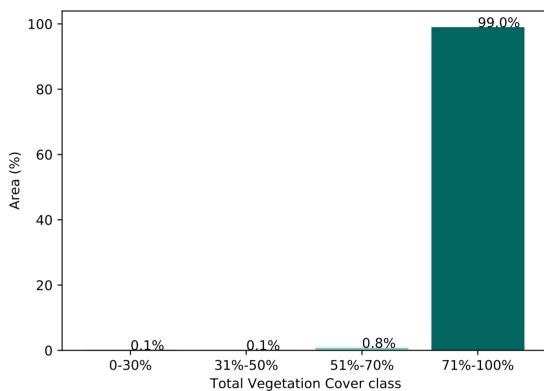
% Area protected from water erosion (>70%)







Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

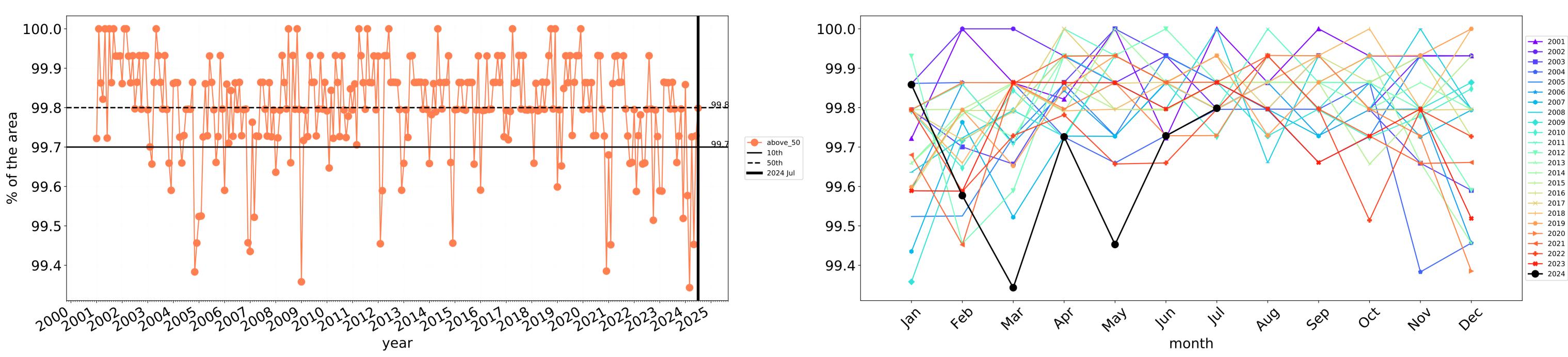




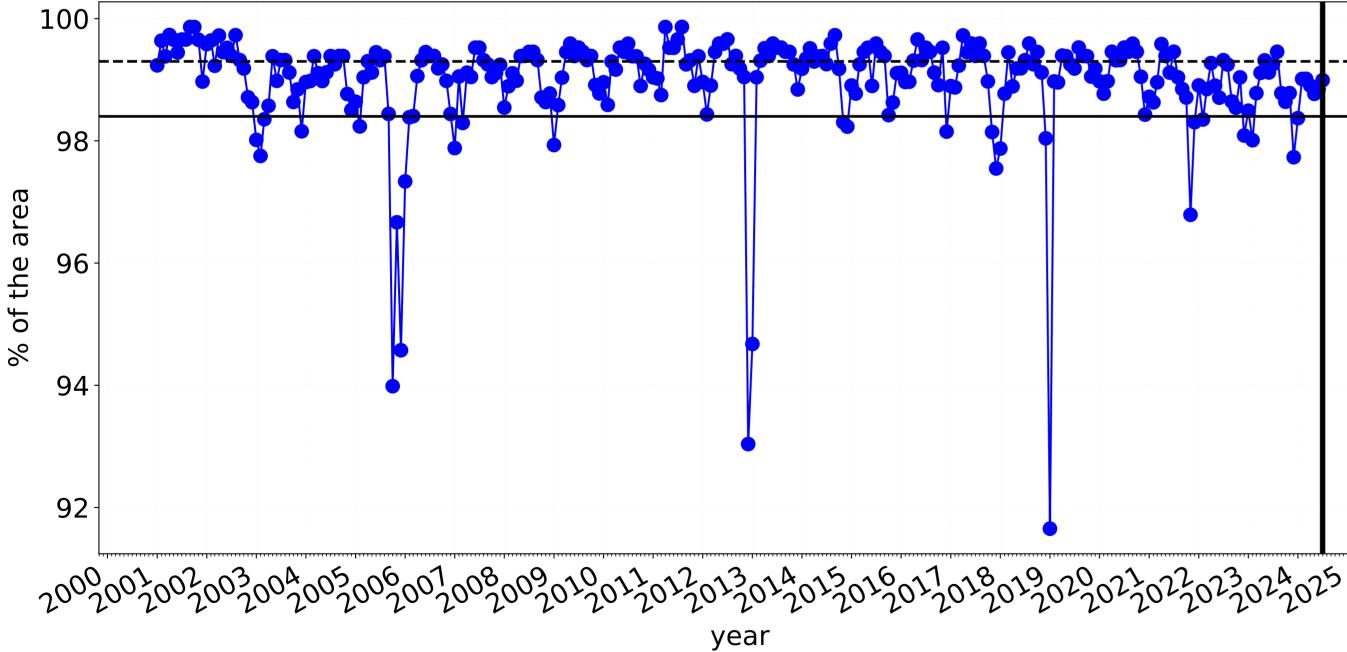


Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Derived from



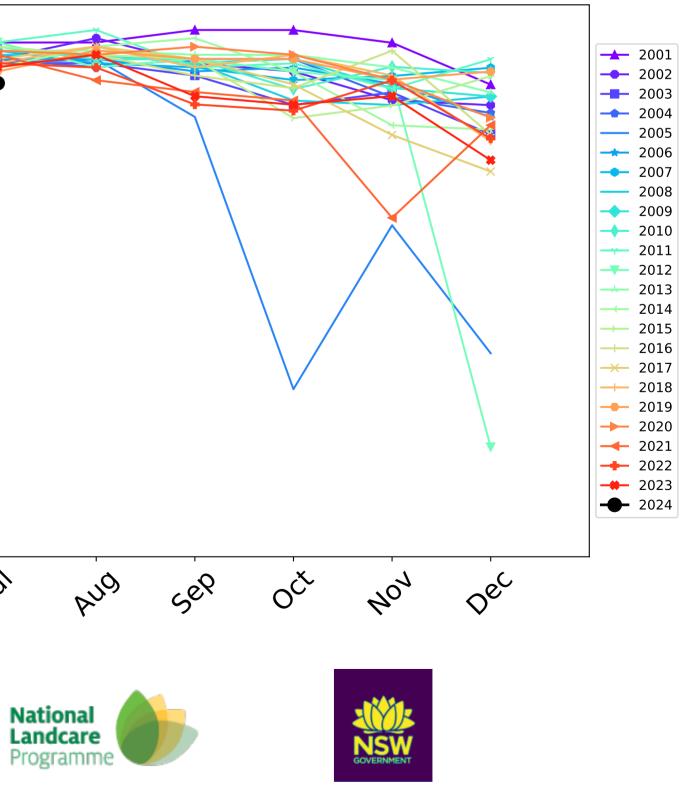
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

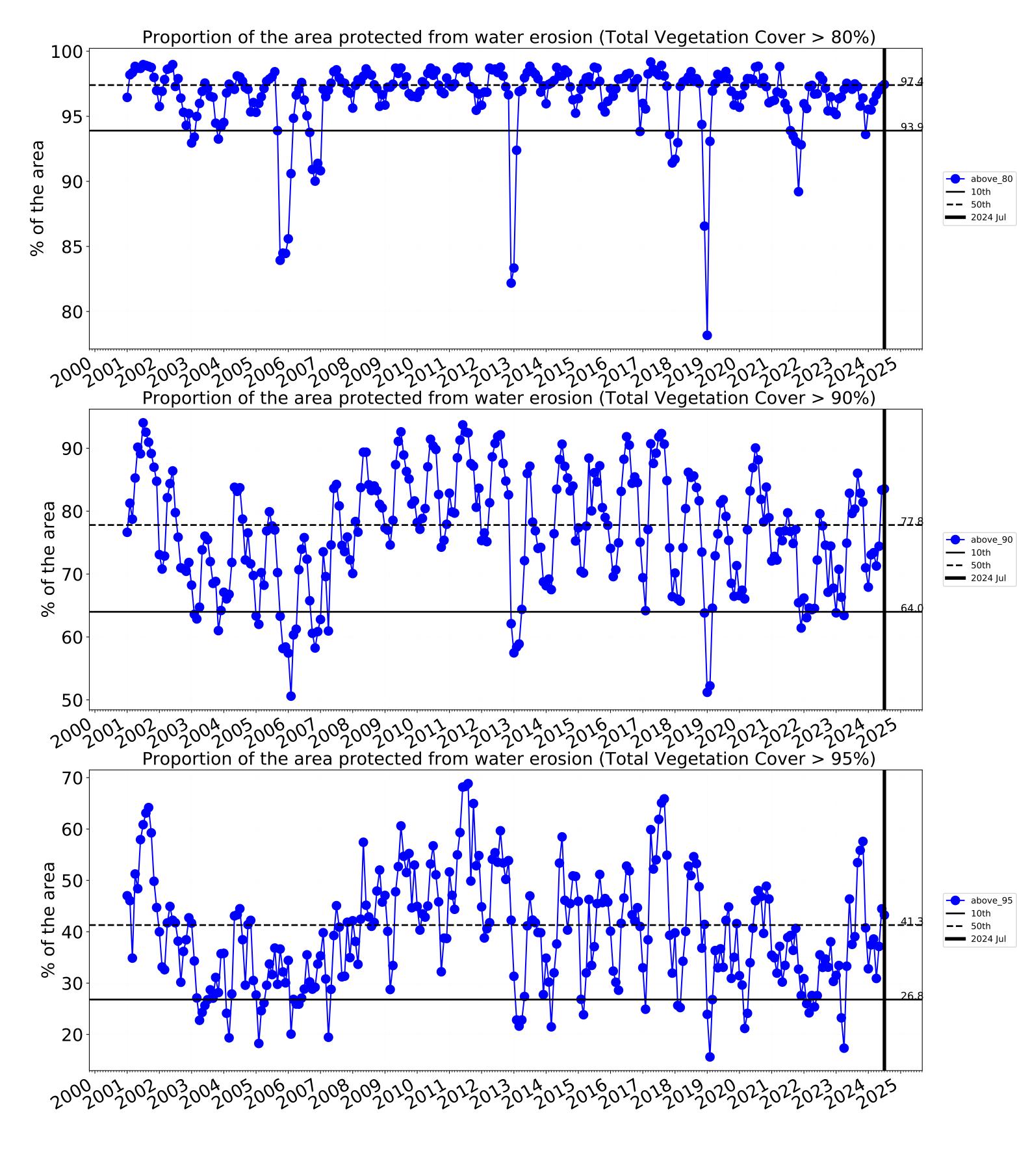


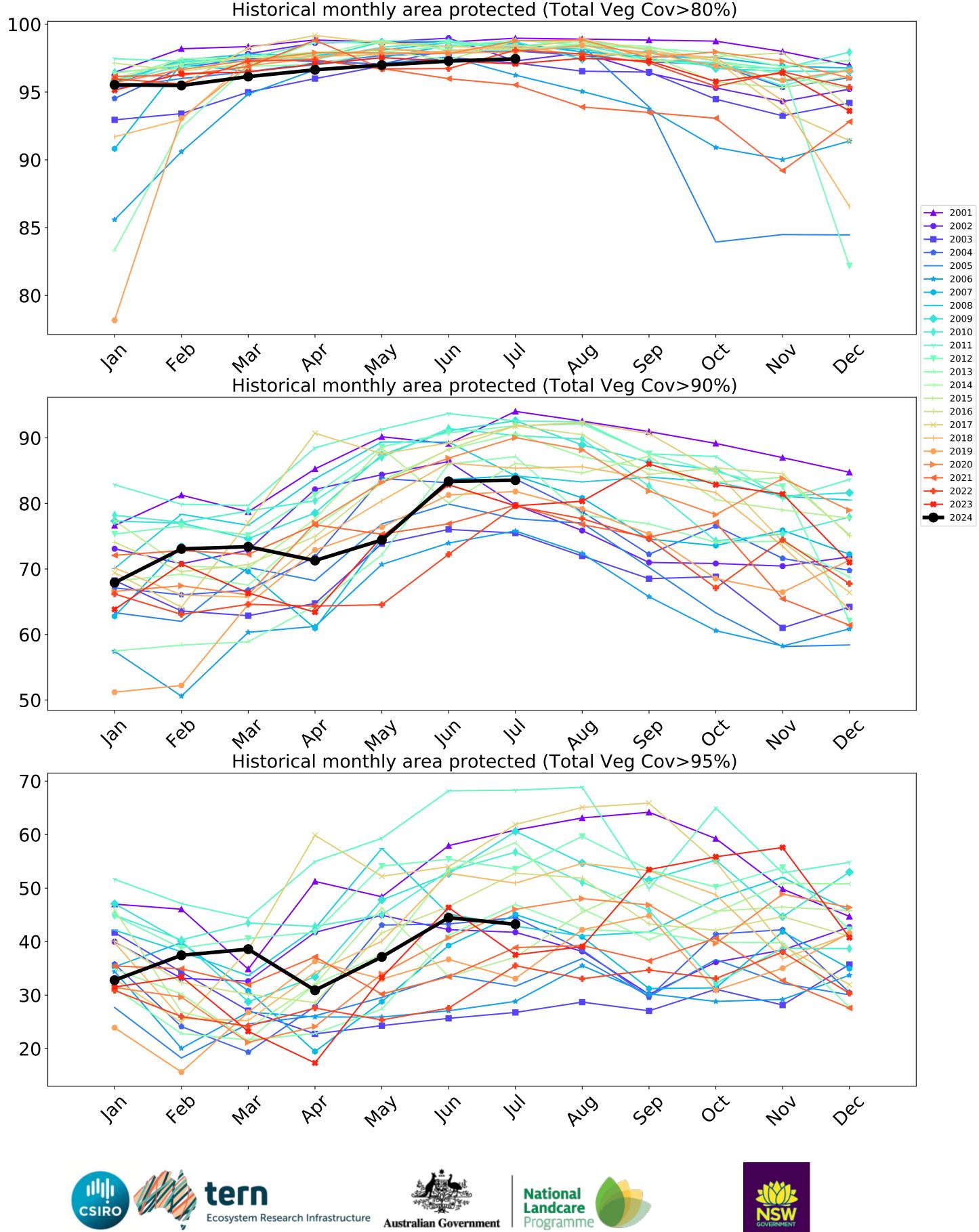
100-98 ---- above_70 **—** 10th **——** 50th **——** 2024 Jul 96 94 92 4eb Jan In May 1¹1 Mai PG, month tern Ecosystem Research Infrastructure Australian Government

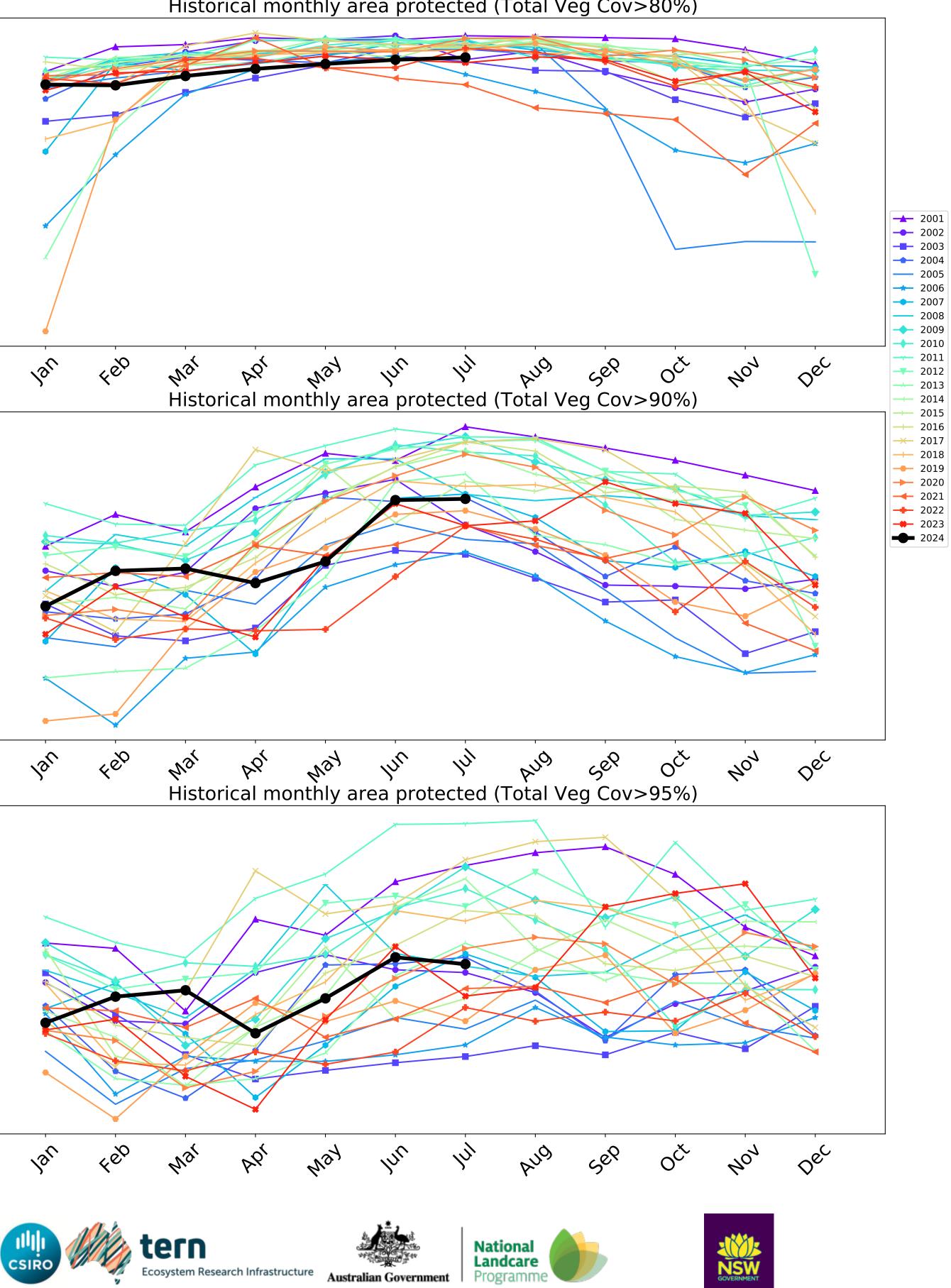
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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





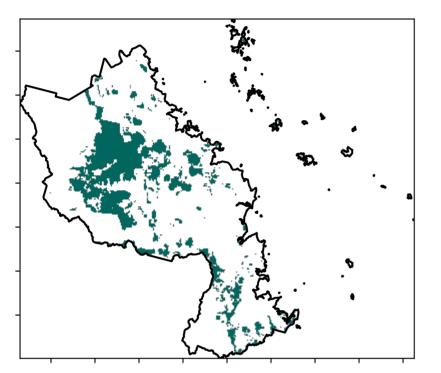




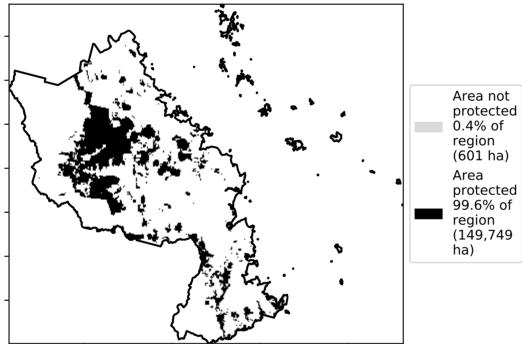
Conservation and natural environments Forest (non woodland)

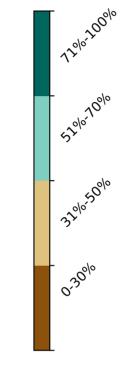
Land use and forest cover 1 Conservation and natural environments - Non-woodland forest

Total Vegetation Cover [%]



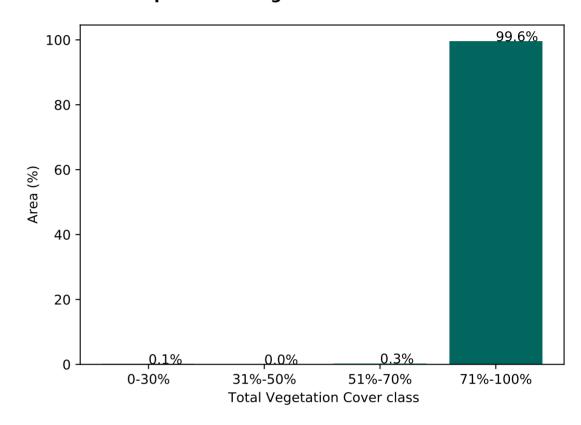
% Area protected from water erosion (>70%)



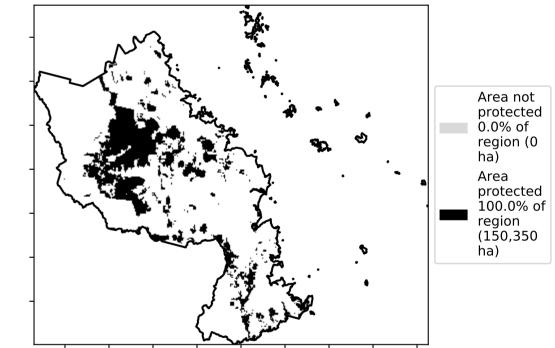




Proportion of vegetation cover class in area



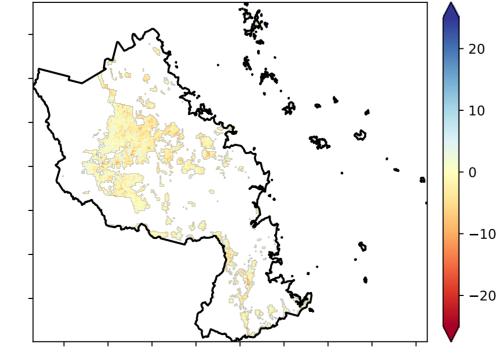
% Area protected from wind erosion (>50%)



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

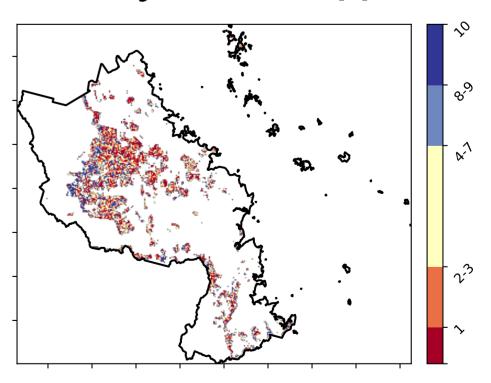
Total Vegetation Cover Anomaly [%]

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

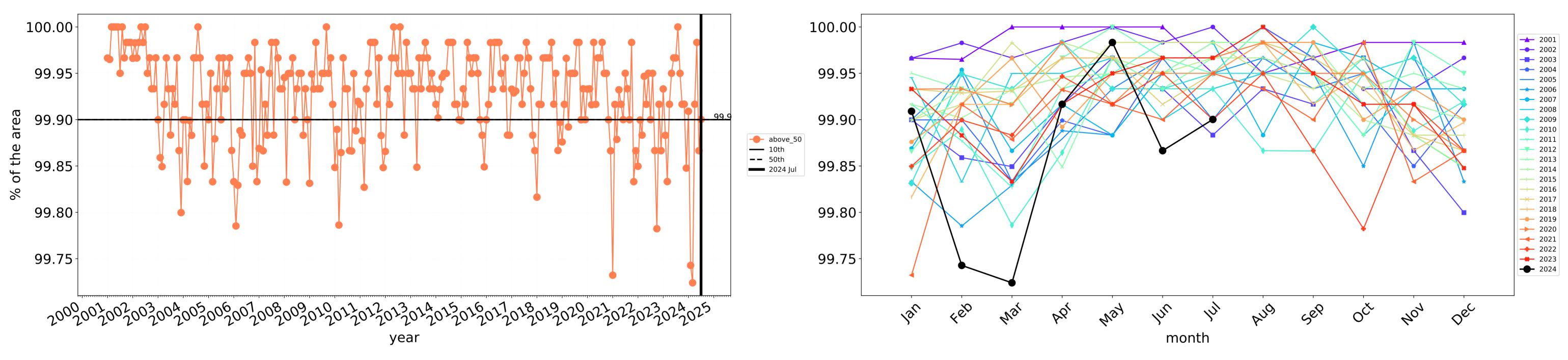


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.

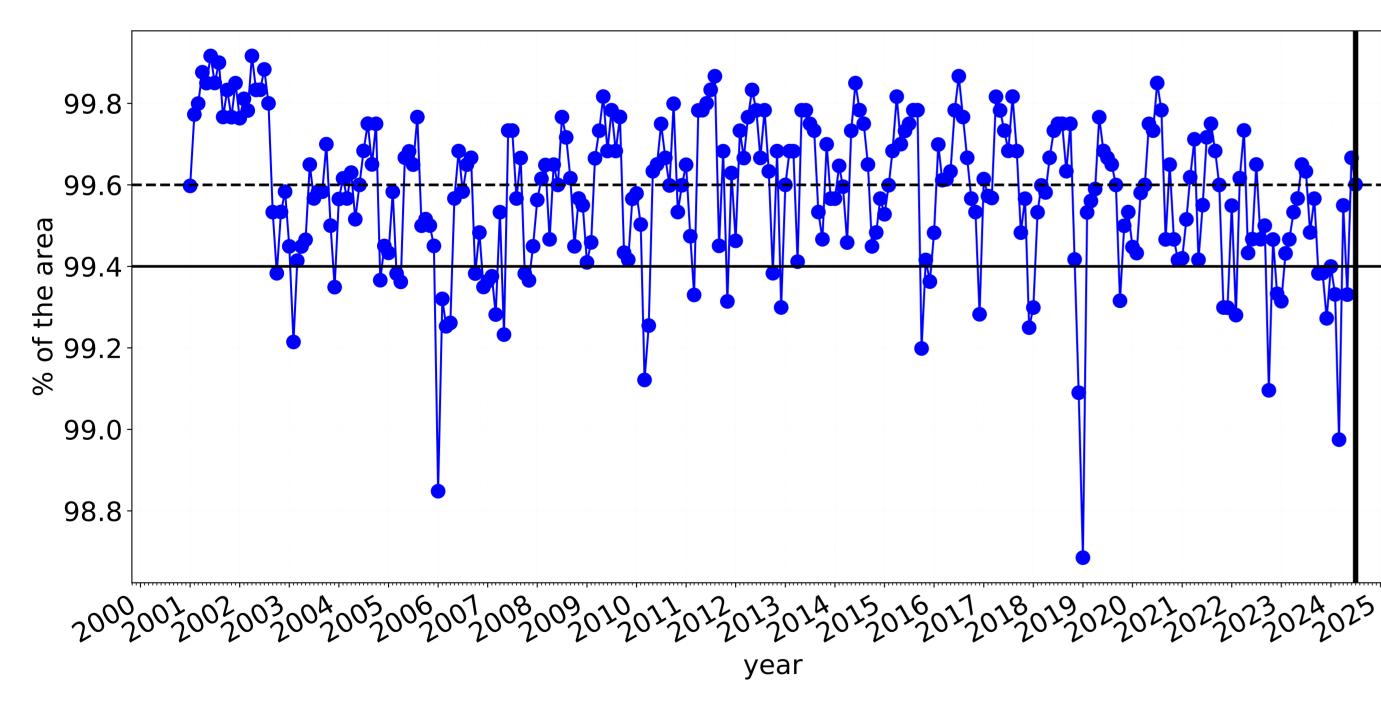
Total Vegetation Cover Decile [%]







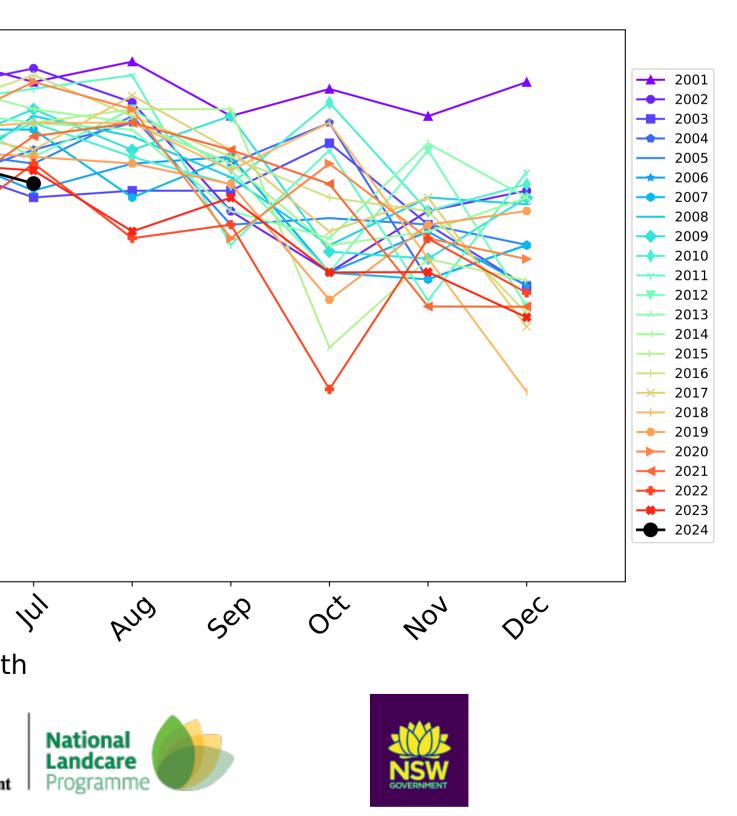
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

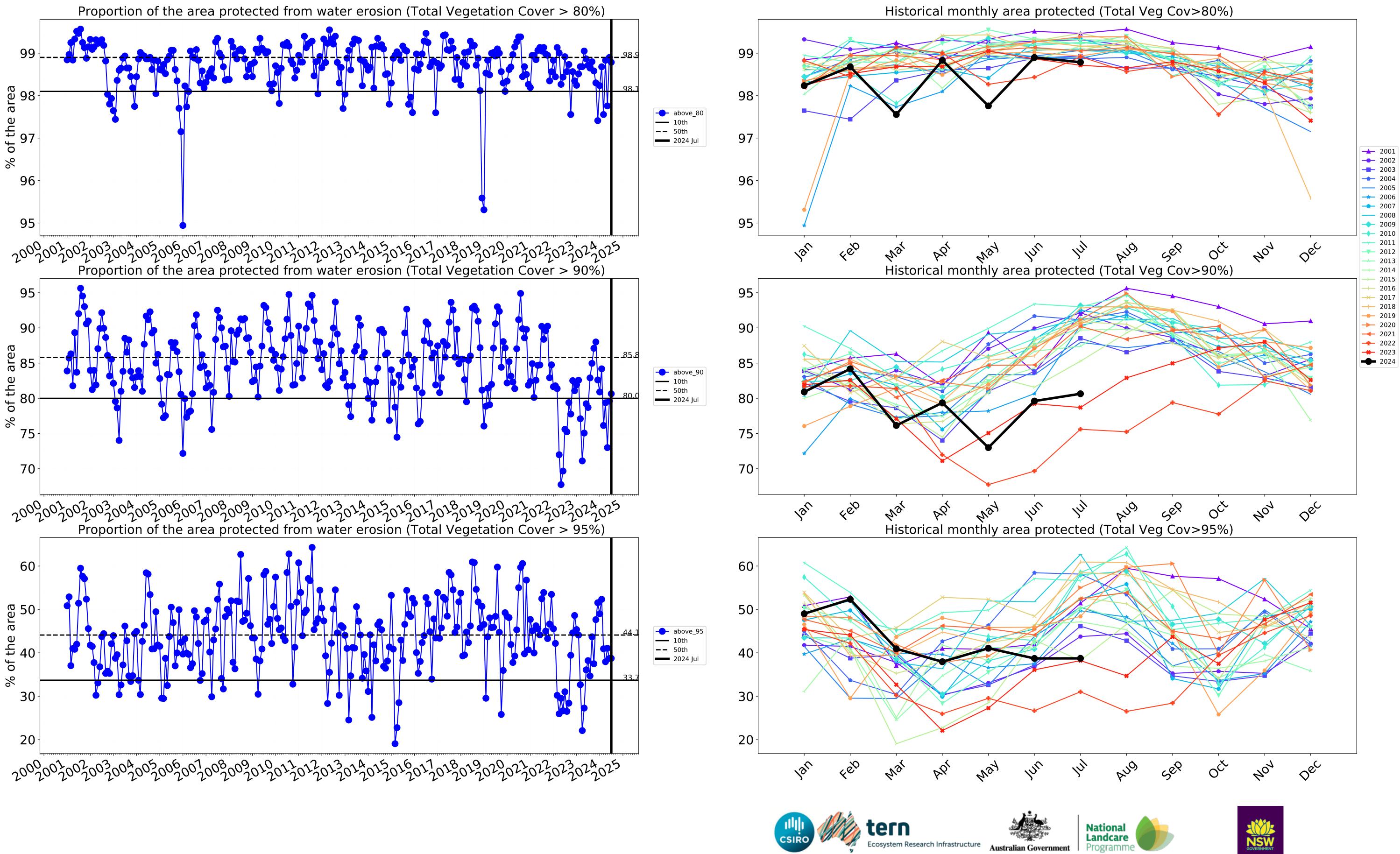


Wind erosion historical monthly area protected (Total Veg Cov >50%)

99.8 99.6 99.6 ---- above_70 **—** 10th **--** 50th 99.4 **——** 2024 Jul 99.2 99.0 98.8 4eb 1ar May In Wal PQ1 month tern Ecosystem Research Infrastructure Australian Government

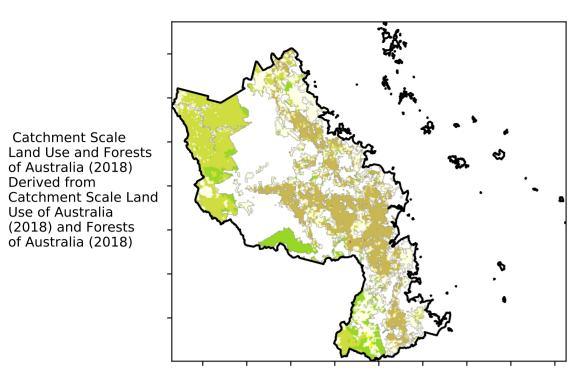
Water erosion historical monthly area protected (Total Veg Cov>70%)



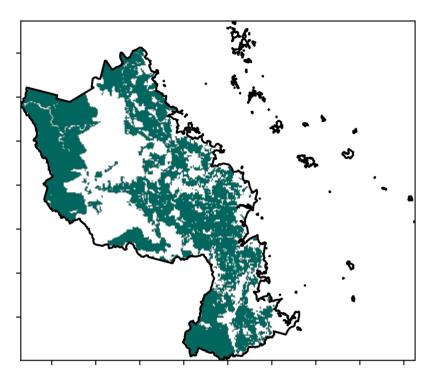


Agriculture

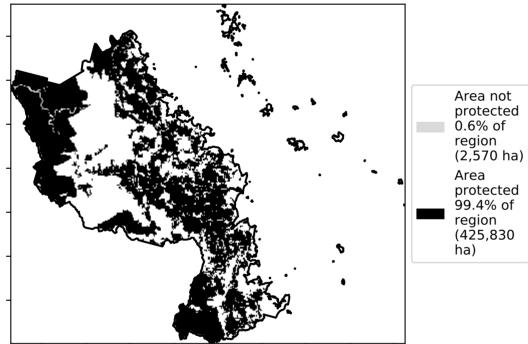
Land use and forest cover

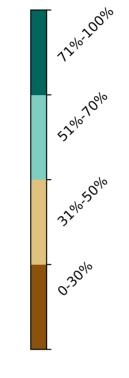


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





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

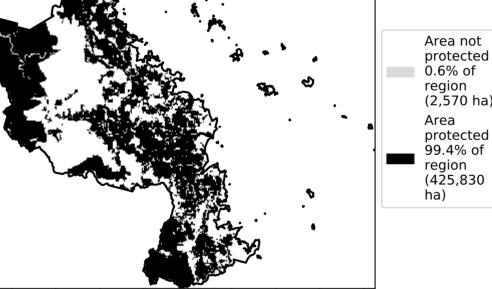
4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated

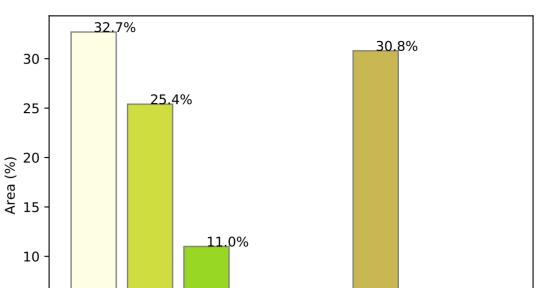
7 Agriculture - Horticulture - Non-irrigated

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

Land use class

0.0%

3

0 1 9

5

4

0.0%

6

0.0%

7

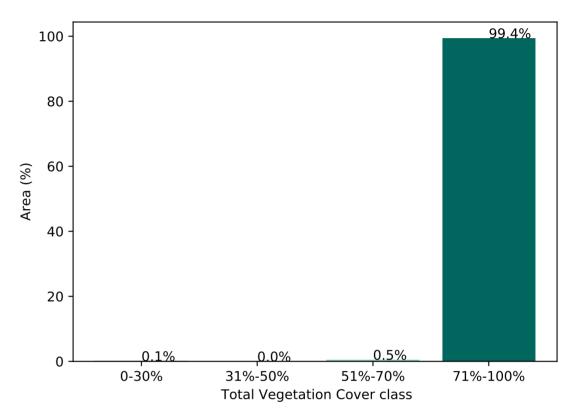
5

0

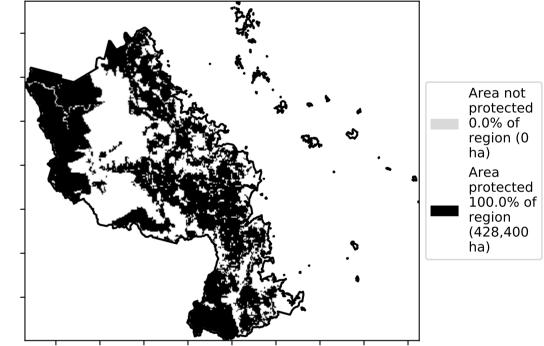
0

1

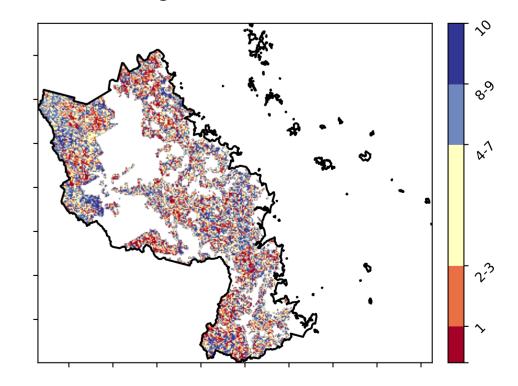
2



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

ቅያ - 20 - 10 0 -10 -20

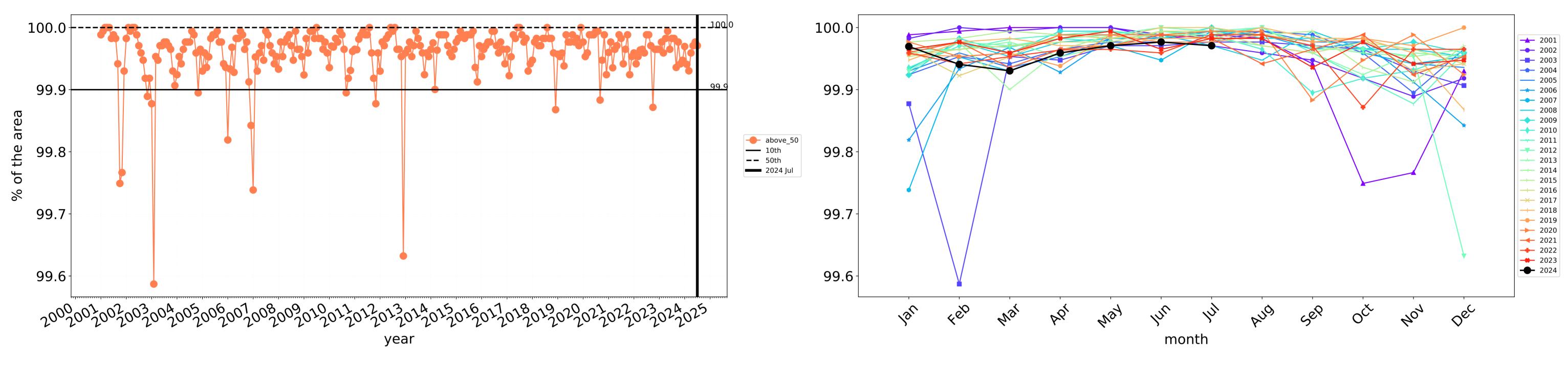
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





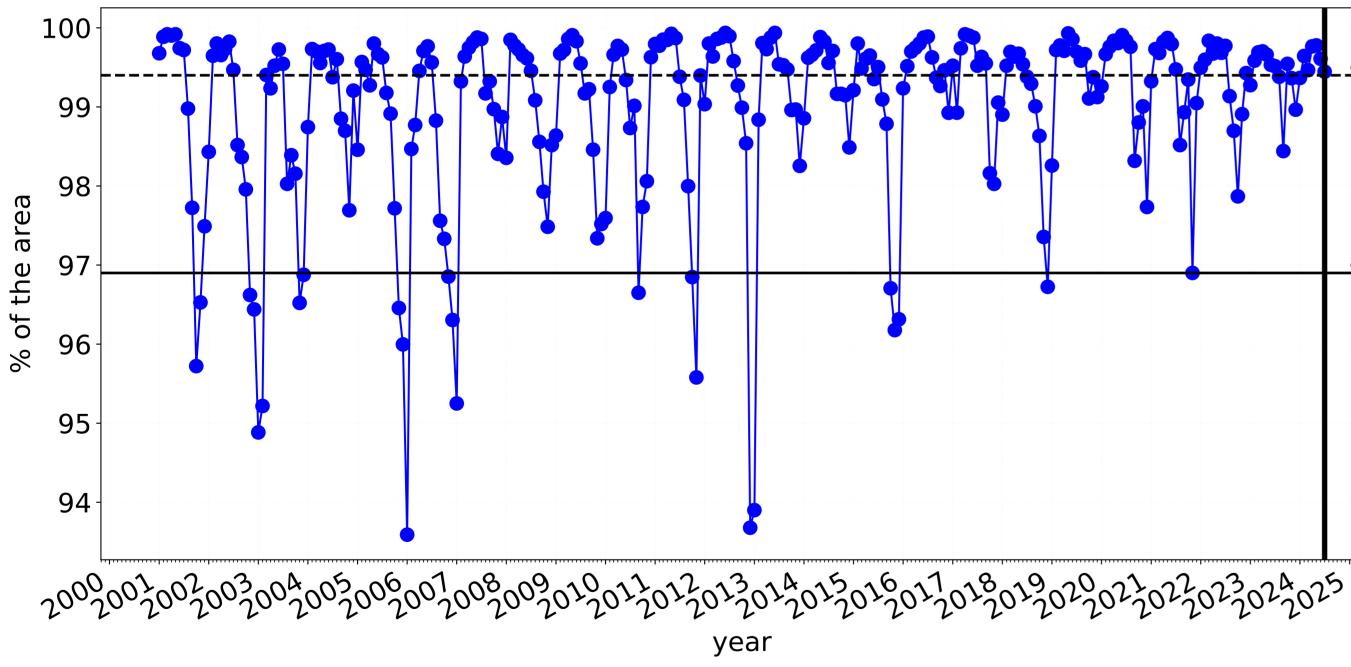
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

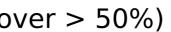
of Australia (2018)



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



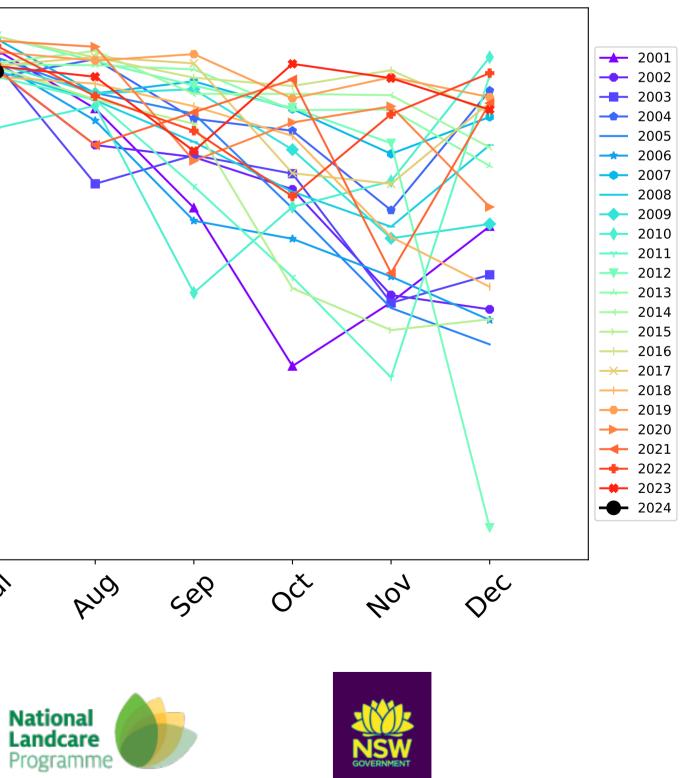


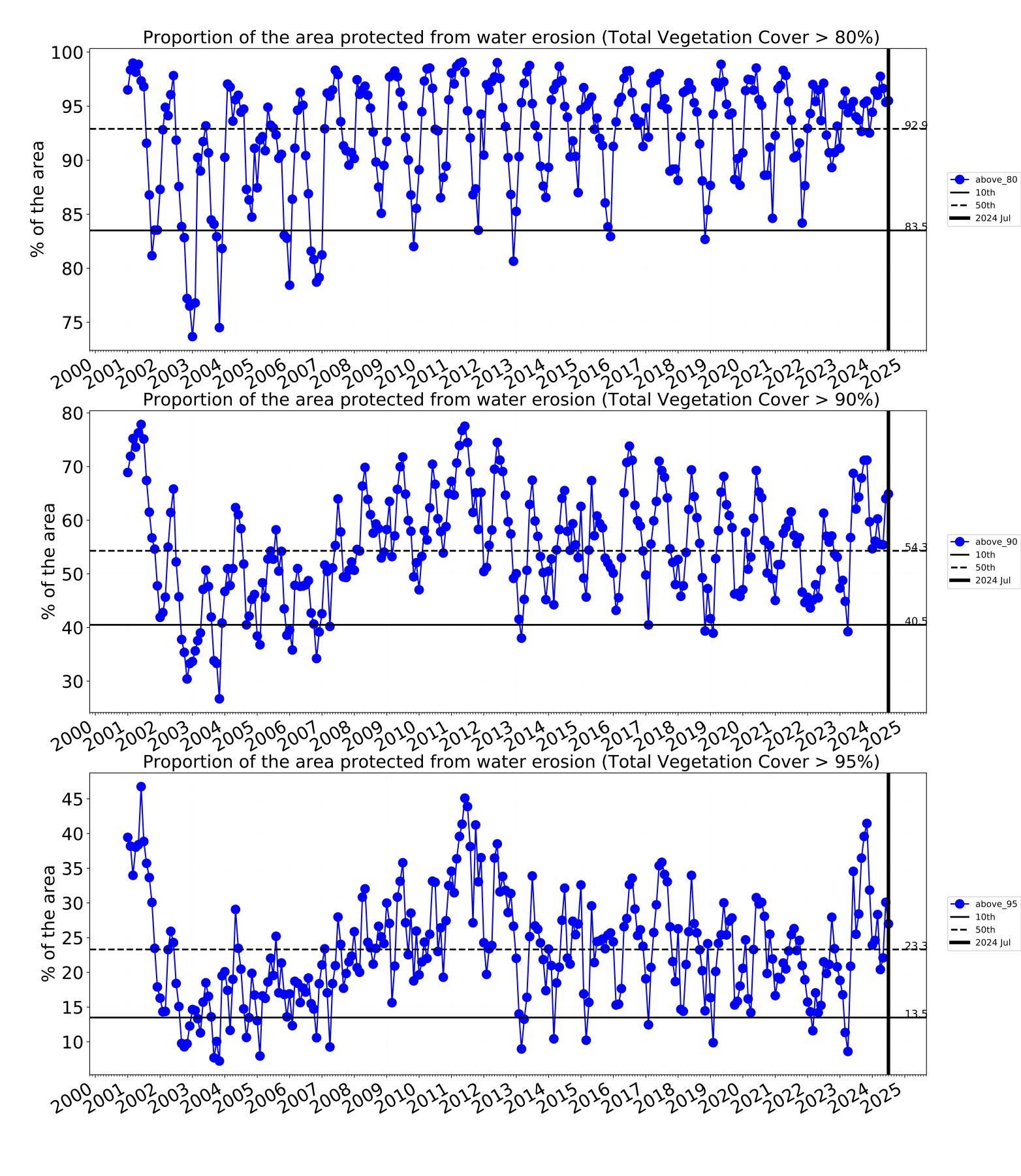


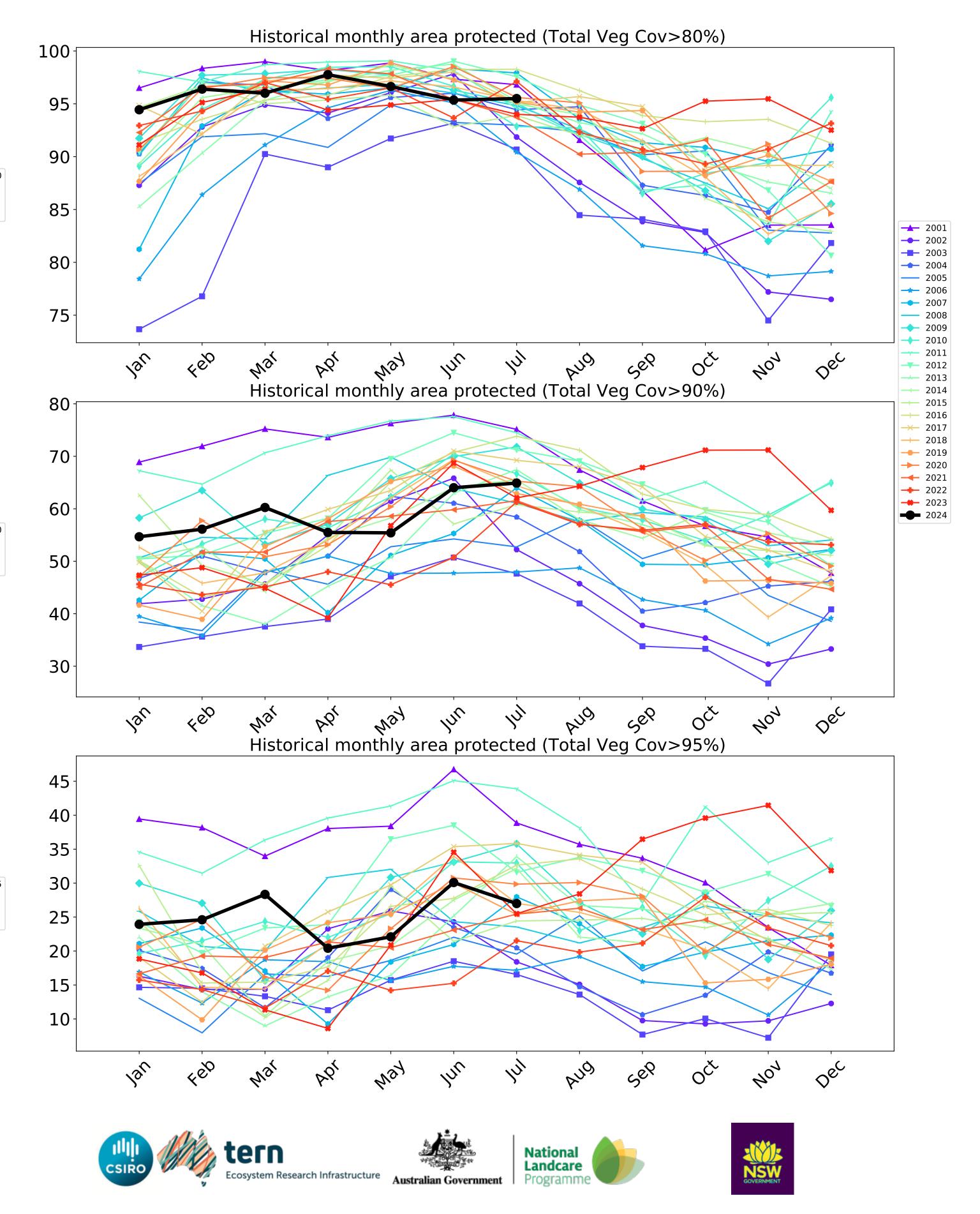
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 99 98 ---- above_70 **—** 10th **——** 50th **——** 2024 Jul 97 96 95 94 4e0 lar In May Mai 1's Þb, month tern Ecosystem Research Infrastructure Australian Government

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

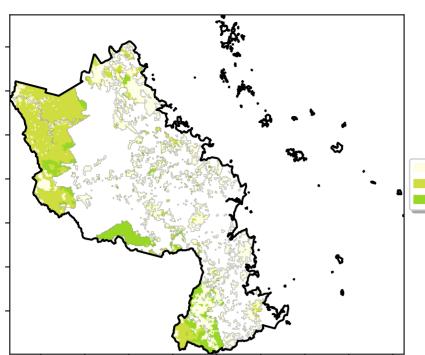






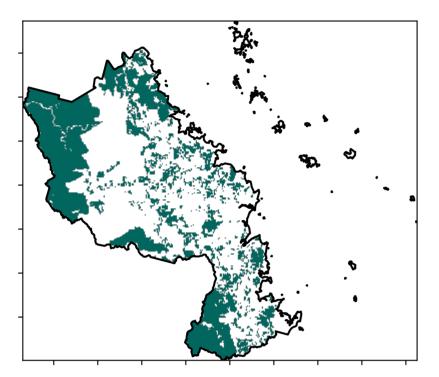
Grazing

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

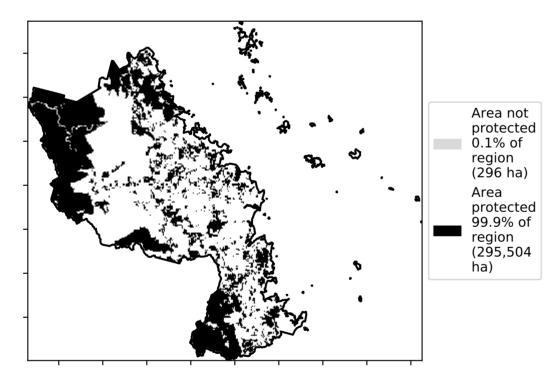


Land use and forest cover

Total Vegetation Cover [%]



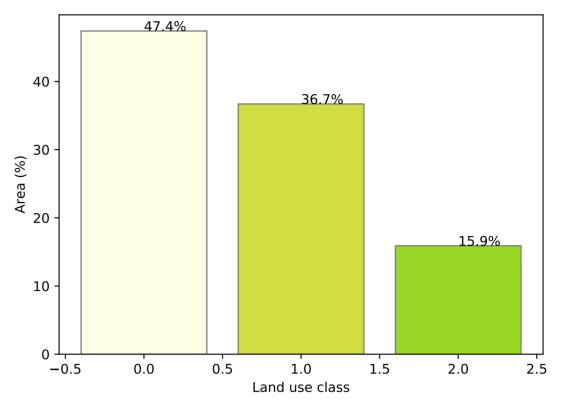
% Area protected from water erosion (>70%)



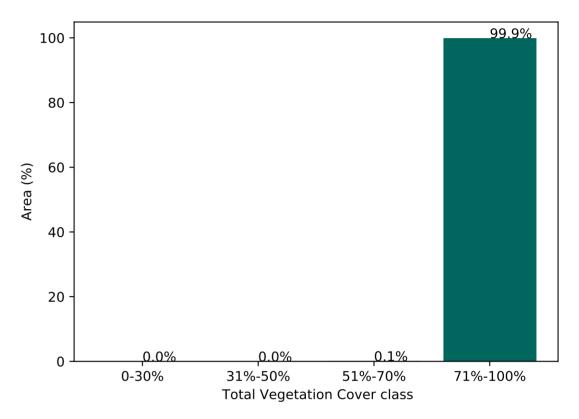
1200,1000 · 520/07/00/0 32005000 0.30%

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

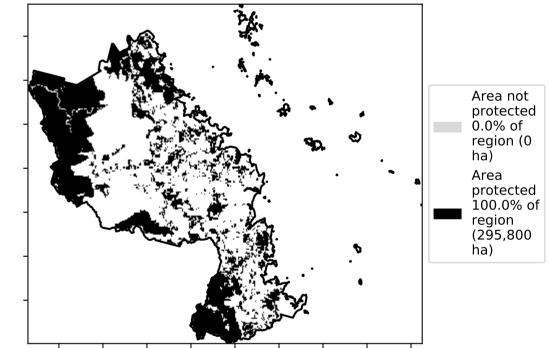
Proportion of each land class in area



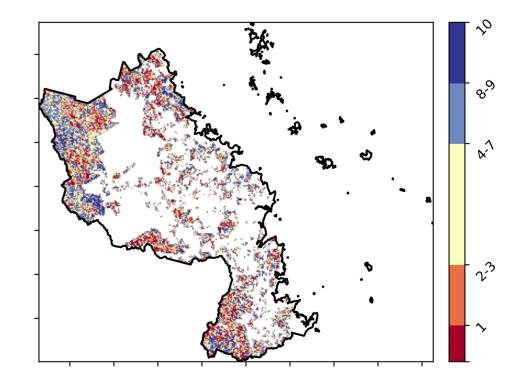
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

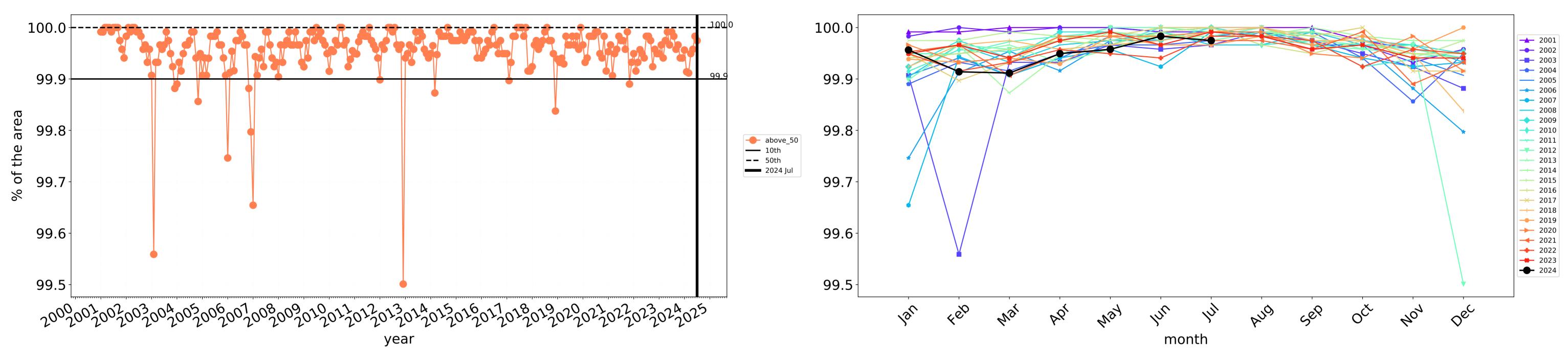
፞፝፞ዾዸ - 20 - 10 0 -10 -20

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.

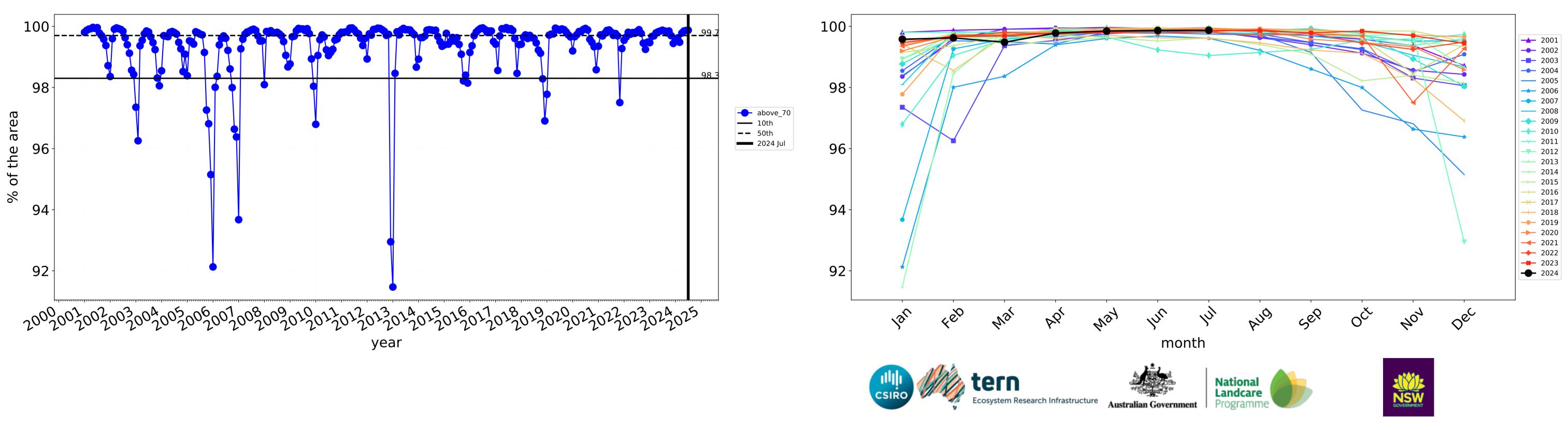


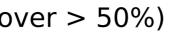


Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



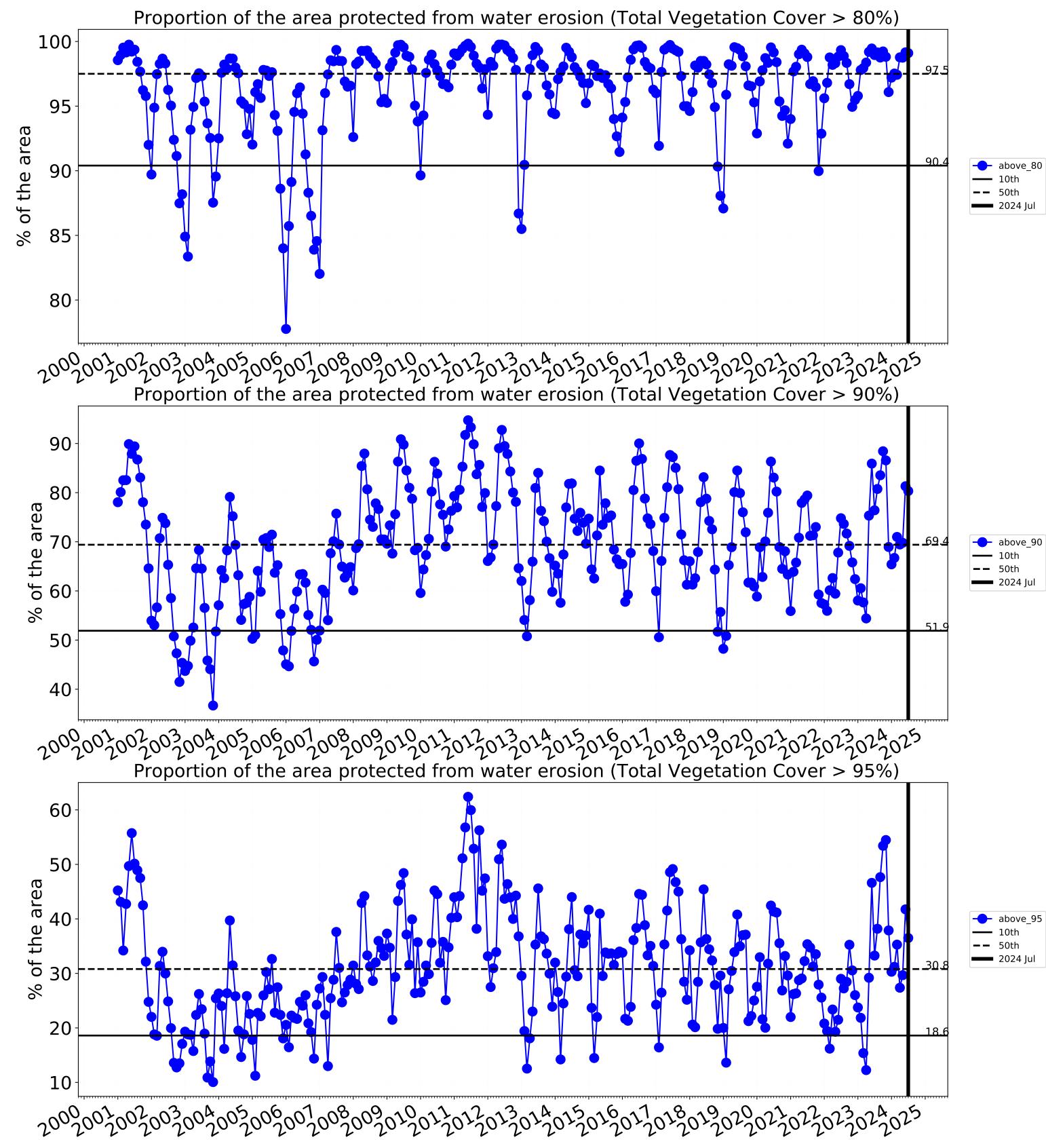
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

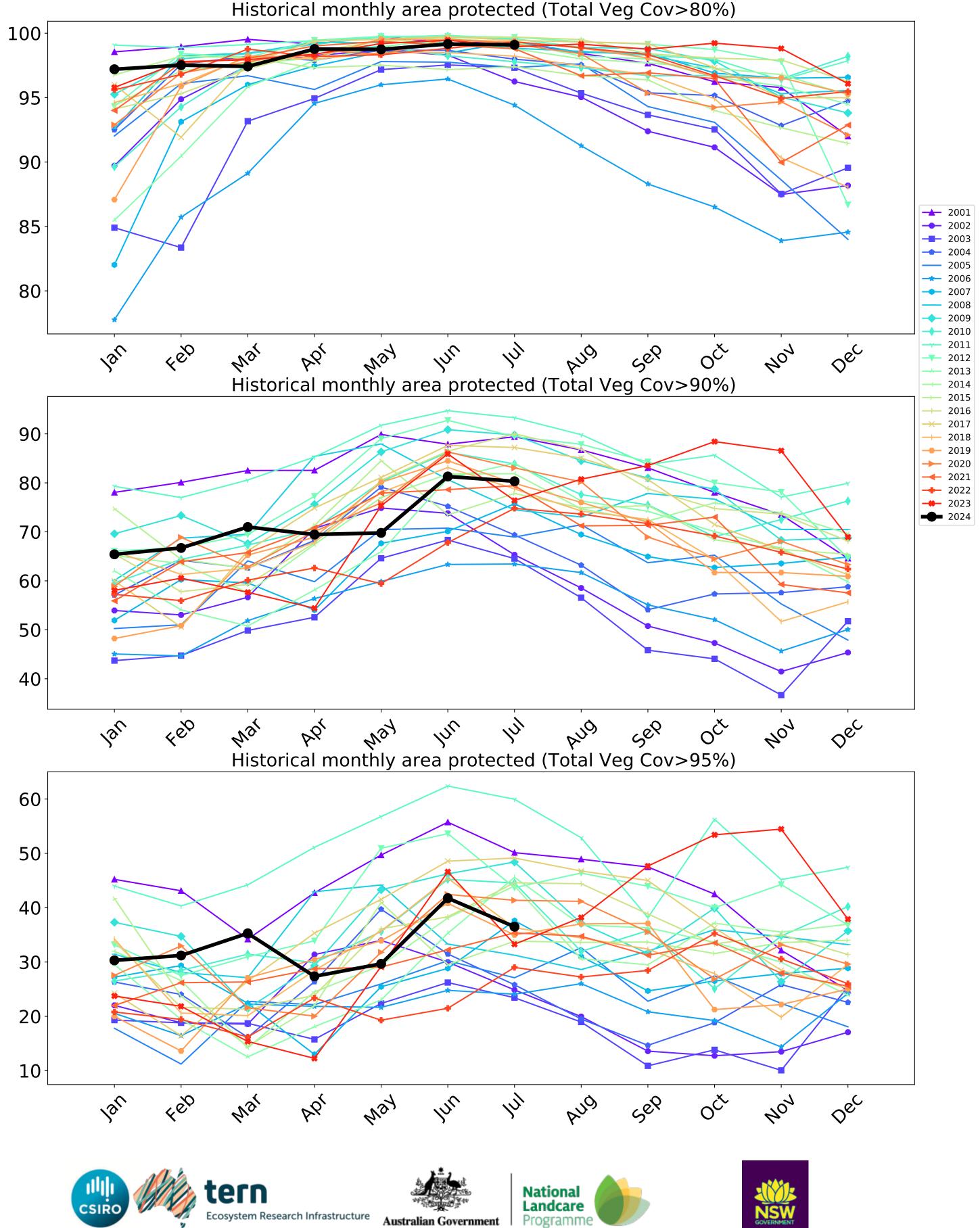




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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





Ecosystem Research Infrastructure Australian Government

Grazing non forest

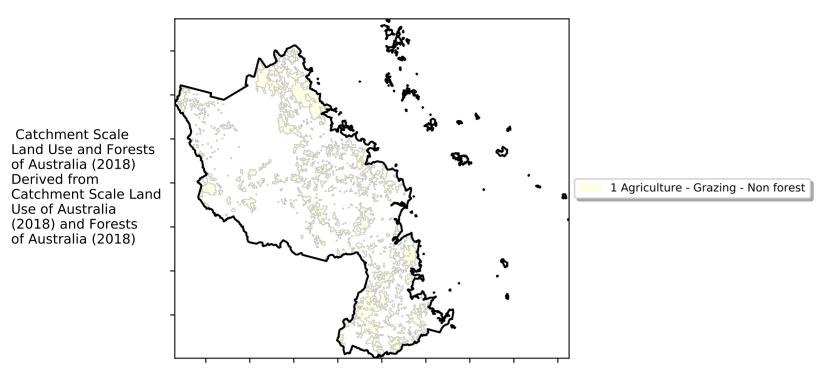
12%200%

52°1070°10

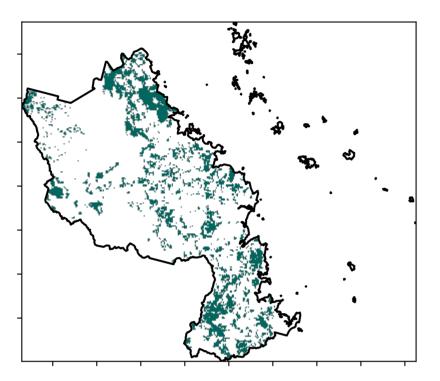
· 320050010

0.30%

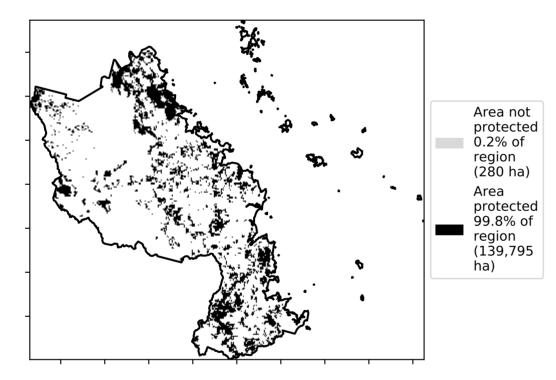
Land use and forest cover



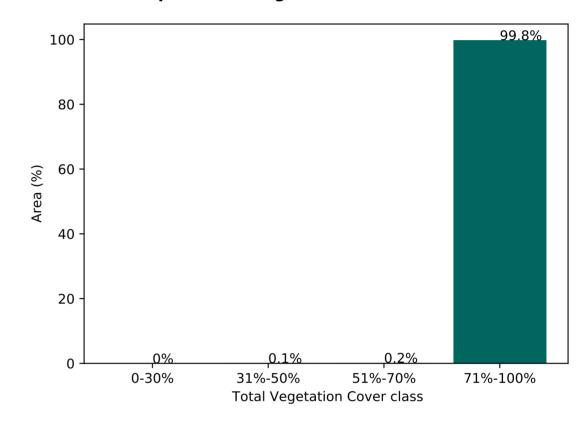
Total Vegetation Cover [%]



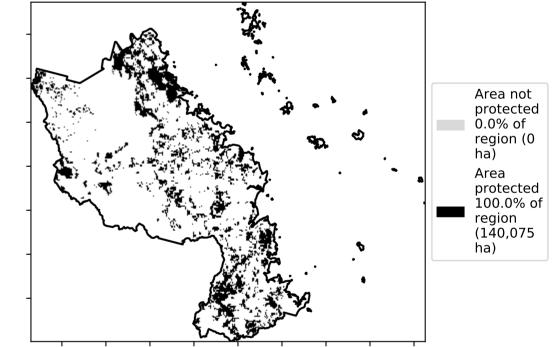
% Area protected from water erosion (>70%)



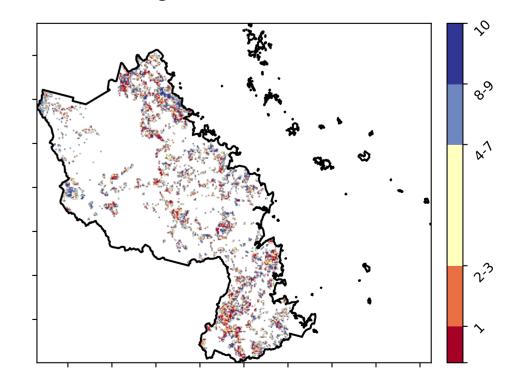
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

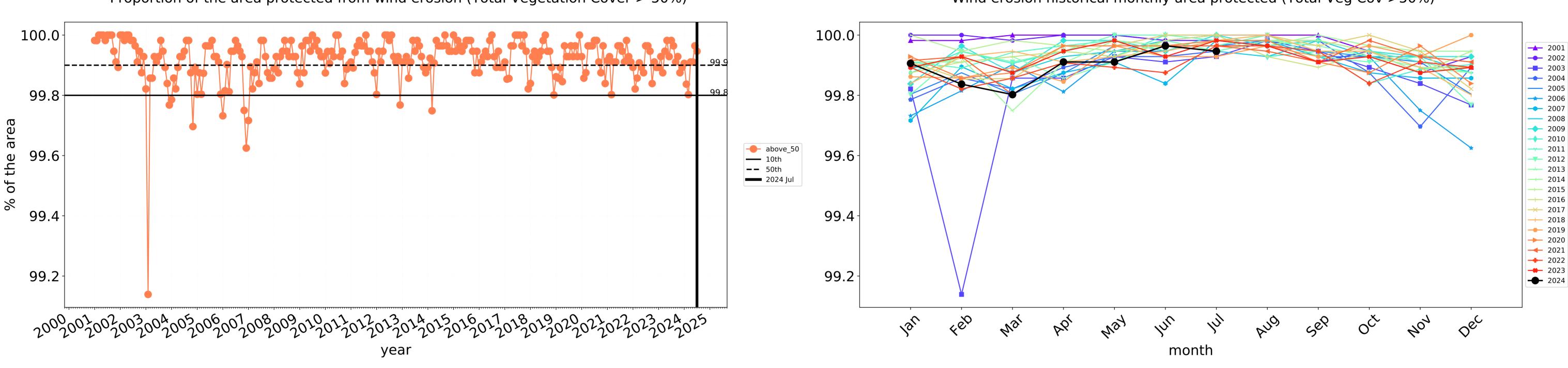
26 - 20 - 10 0 -10 -20

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.



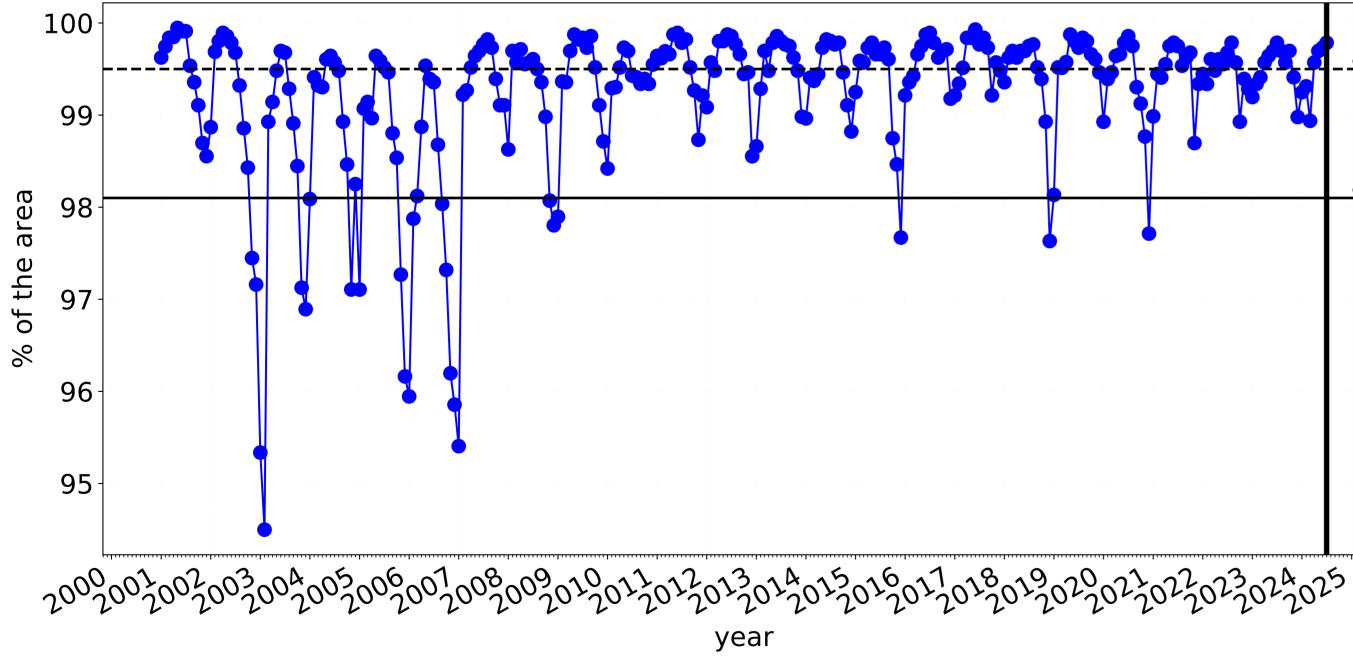


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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

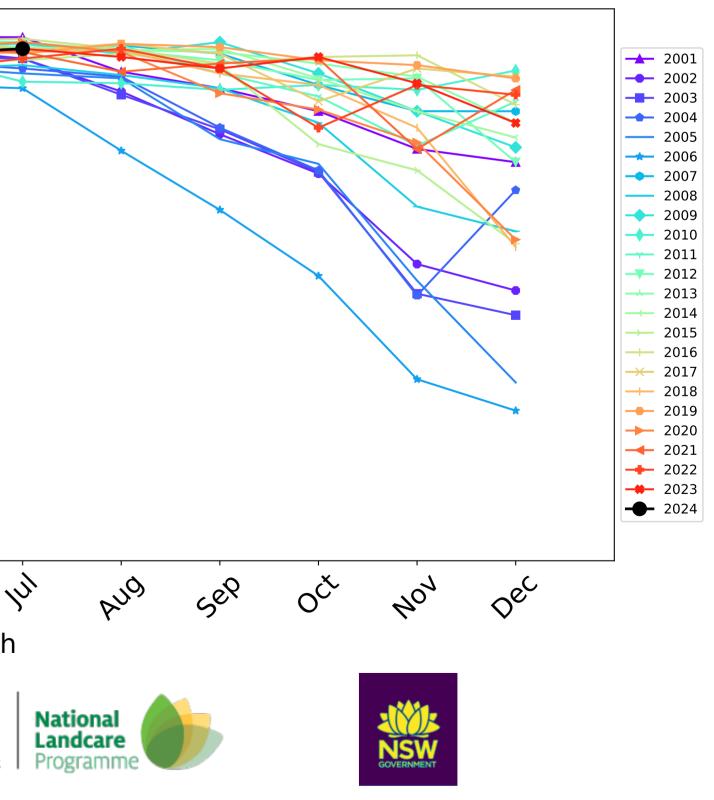


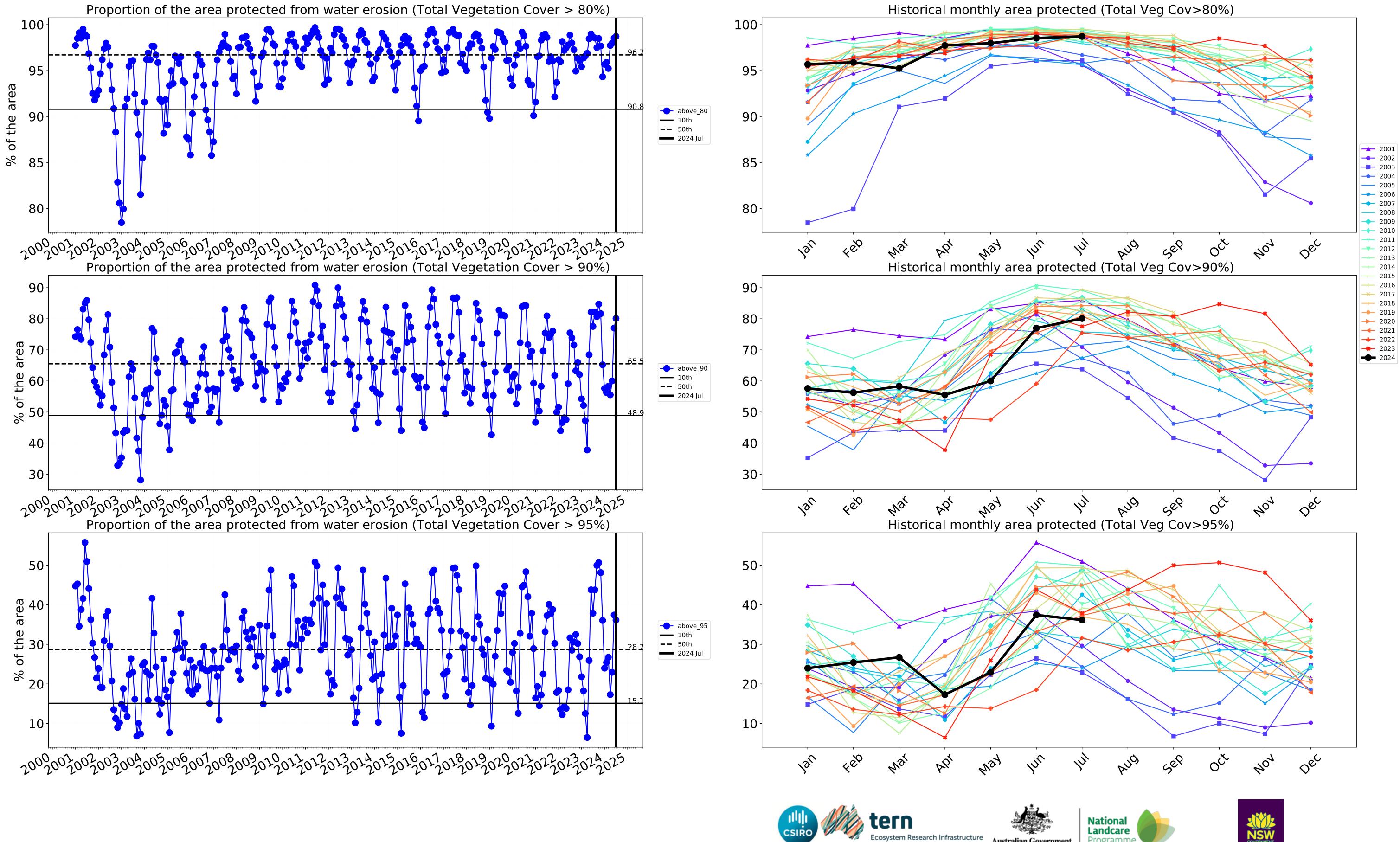


100-99.5 99 98 ---- above_70 98-**——** 10th **——** 50th **——** 2024 Jul 97 96 95 Jan 4eb In May Mai Þb, month tern Ecosystem Research Infrastructure Australian Government

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

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







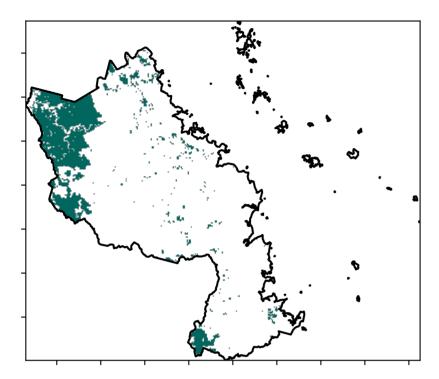
Programm

Grazing Woodland forest

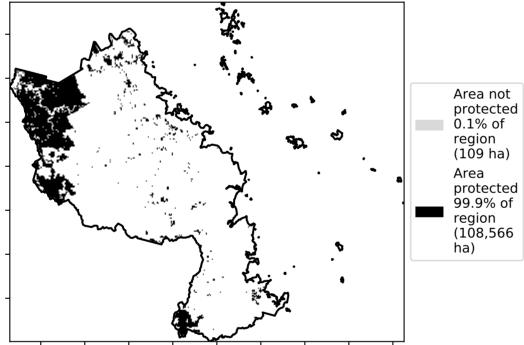
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Woodland forest

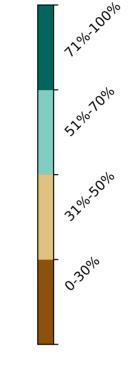
Total Vegetation Cover [%]

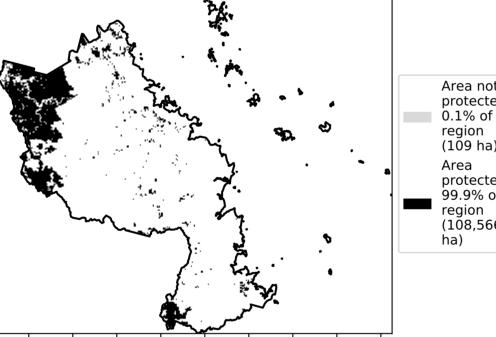
Land use and forest cover



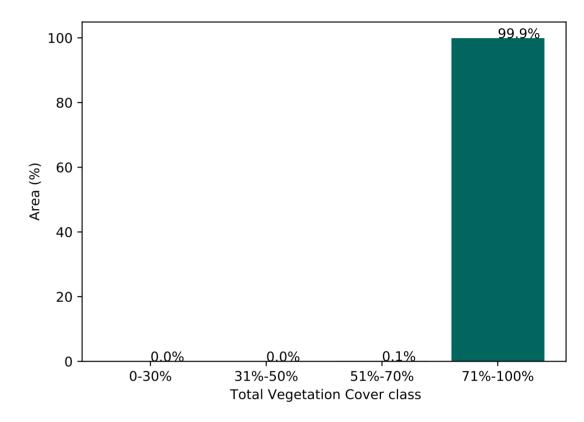
% Area protected from water erosion (>70%)



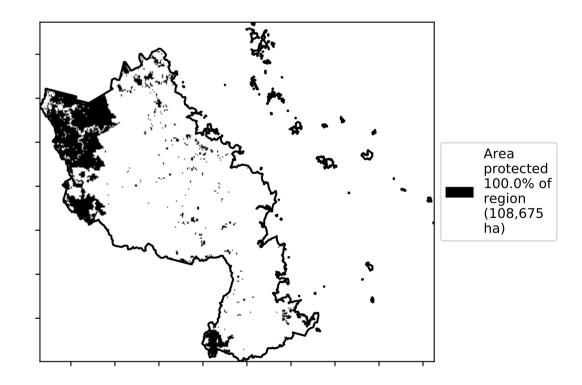




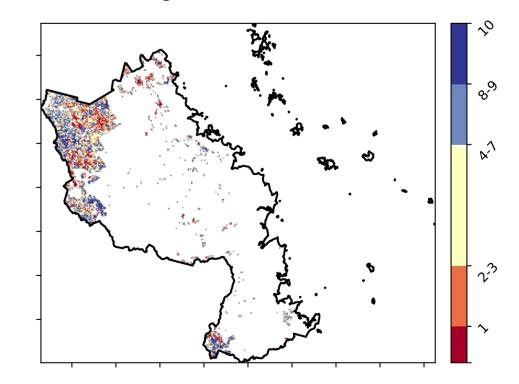
Proportion of vegetation cover class in area



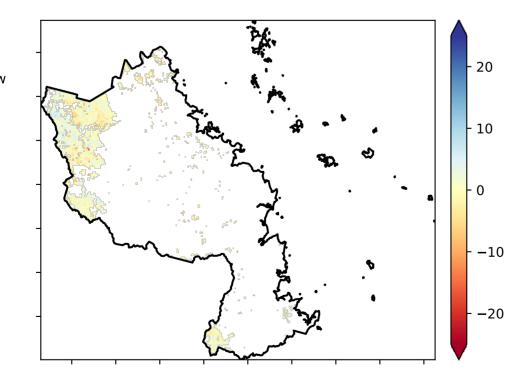
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



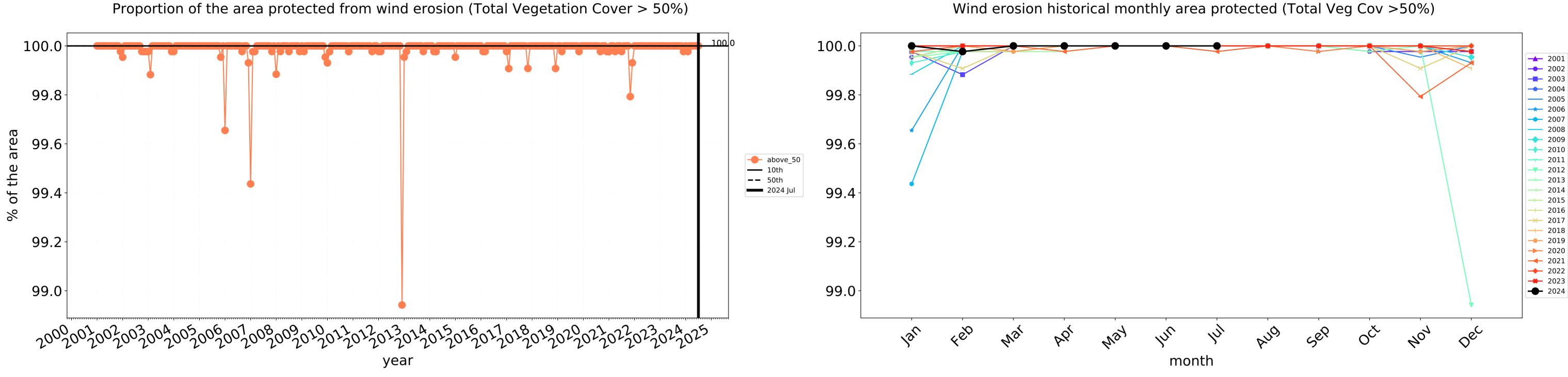
Total Vegetation Cover Anomaly [%]

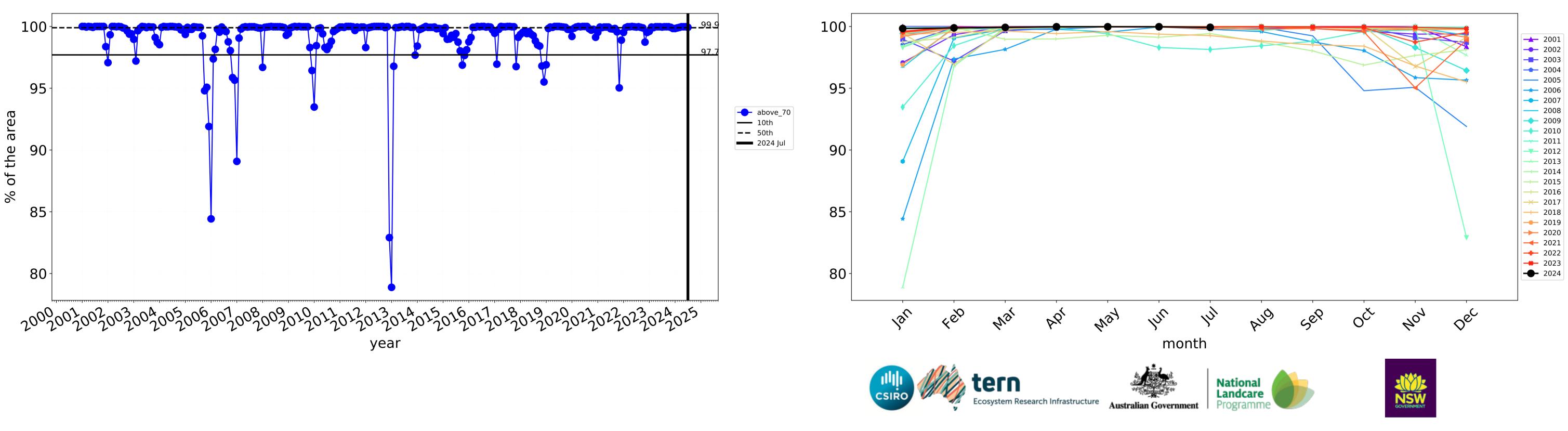


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



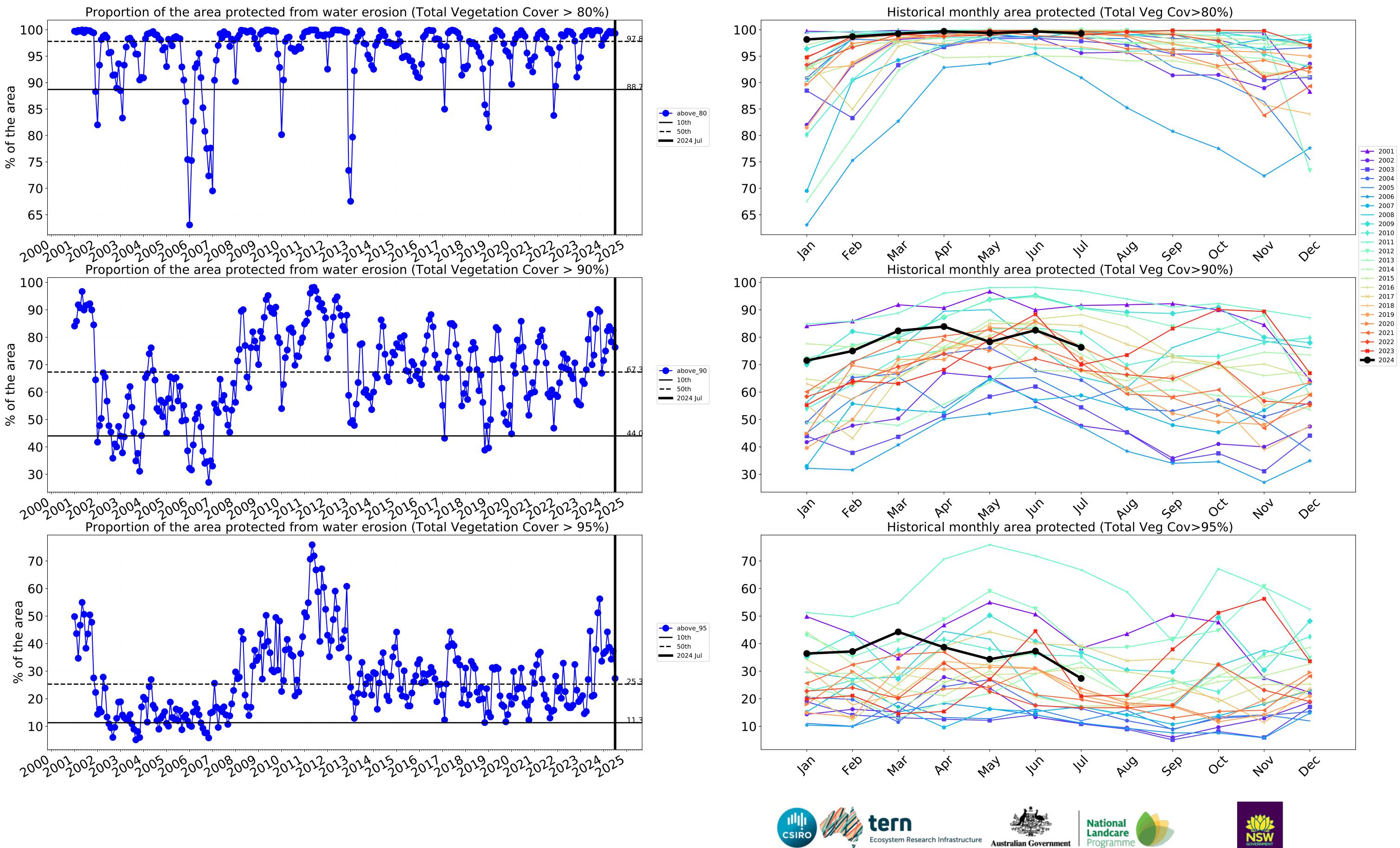
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

2**3**





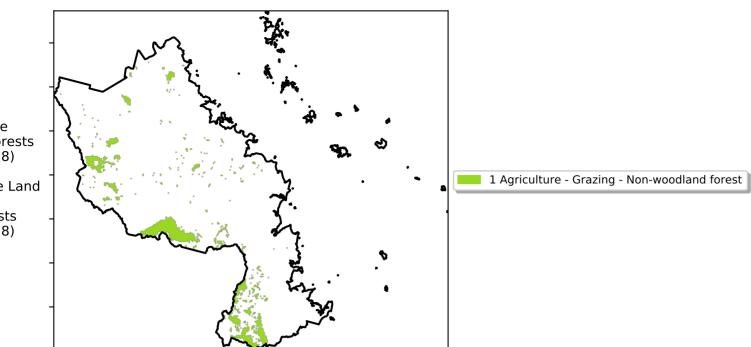
Grazing - Forest (non woodland)

12%100%

52°1070°10

· 320/0500/0

0.30%



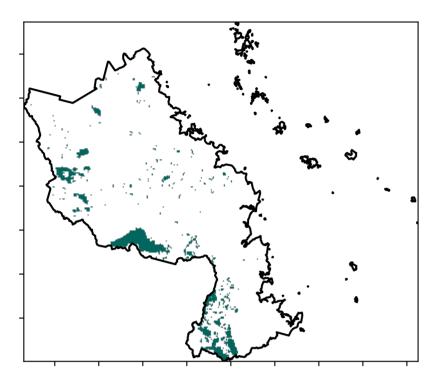
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

lower than the mean of that

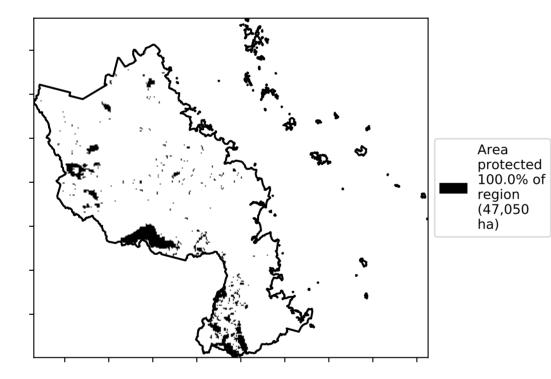
pixel. The mean

Total Vegetation Cover [%]

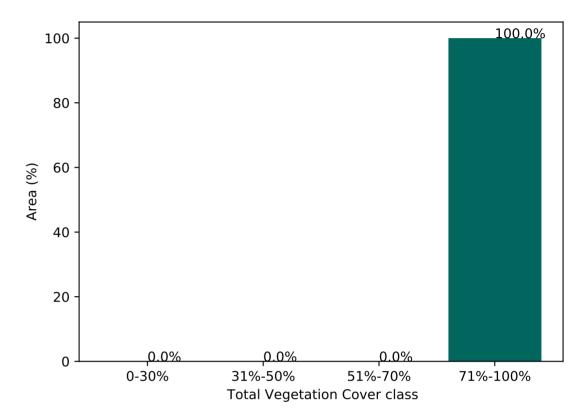
Land use and forest cover



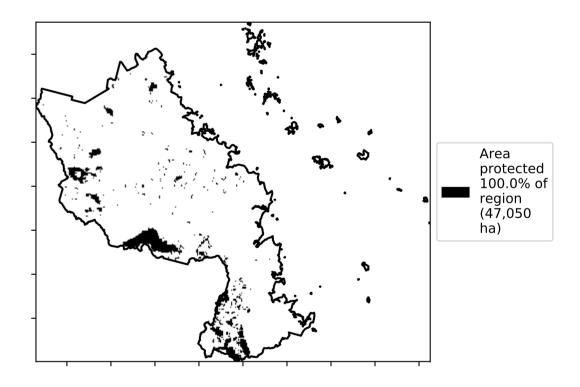
% Area protected from water erosion (>70%)



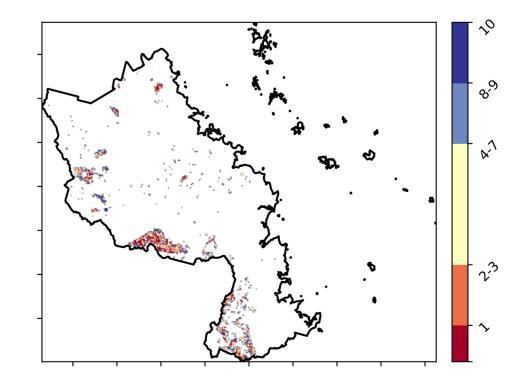
Proportion of vegetation cover class in area



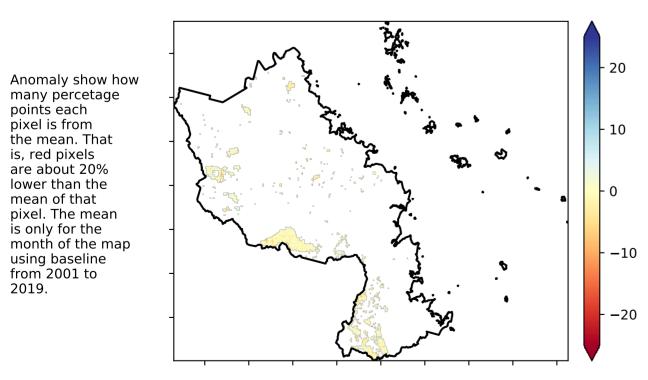
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



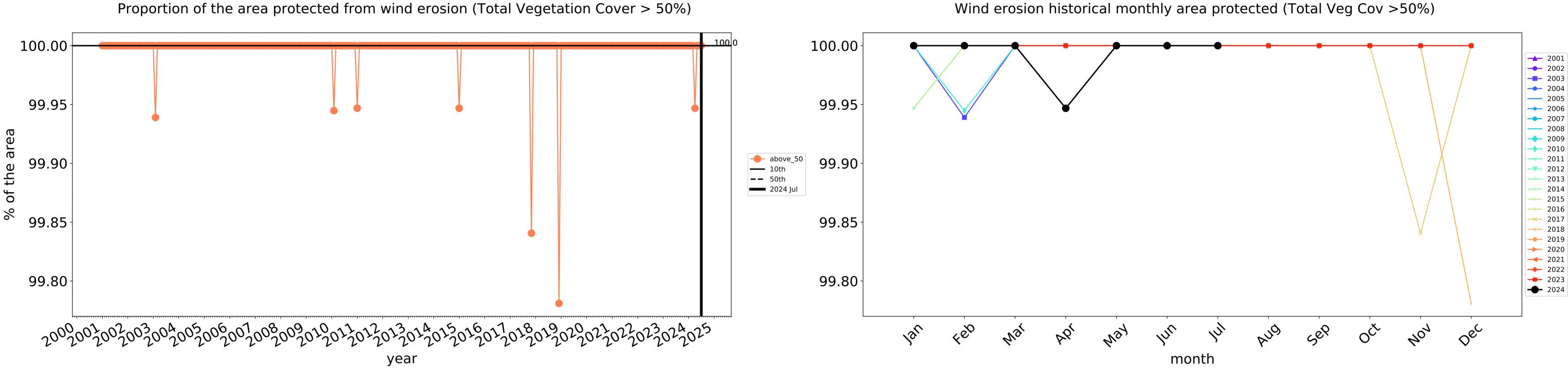
Total Vegetation Cover Anomaly [%]



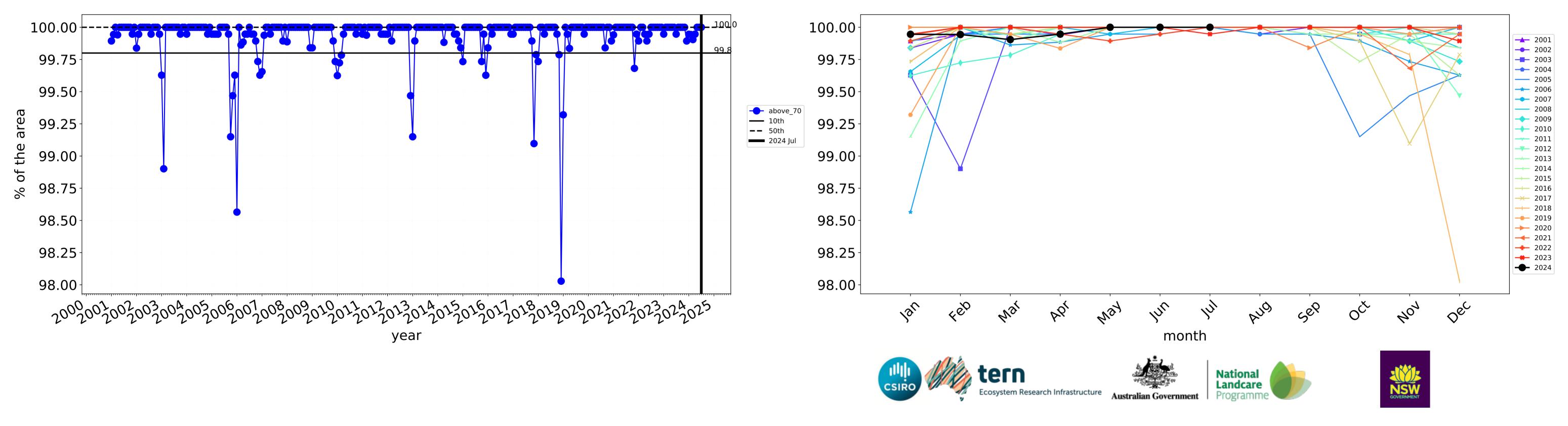
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



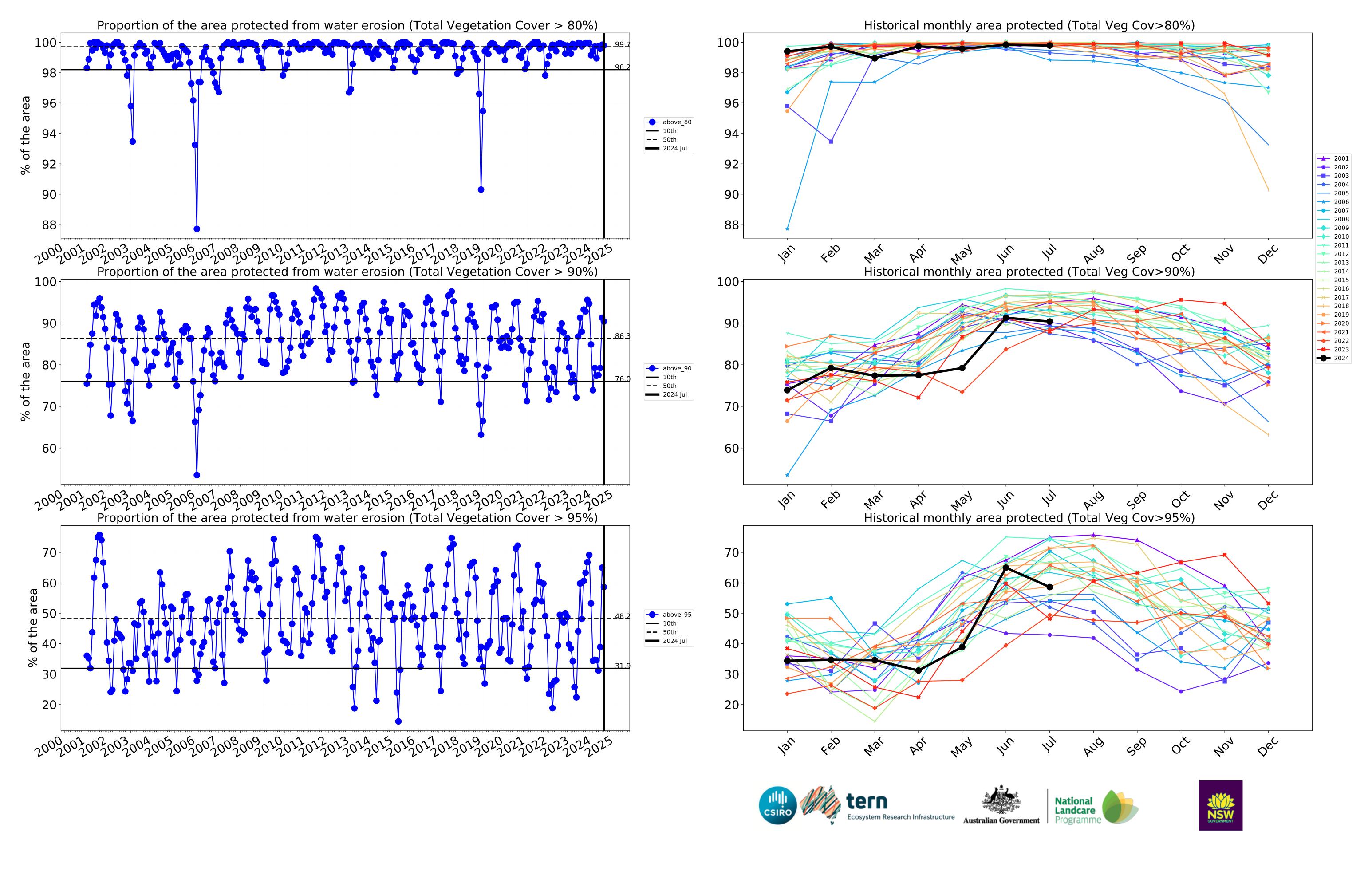




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



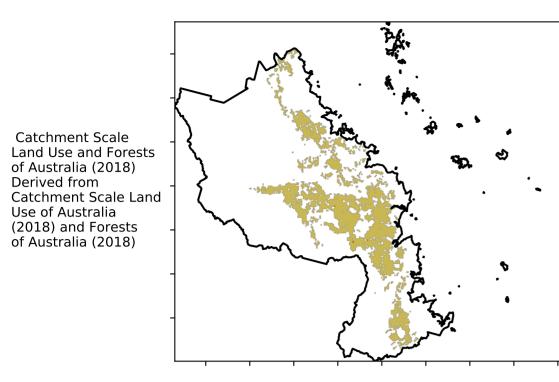
Water erosion historical monthly area protected (Total Veg Cov>70%)



4

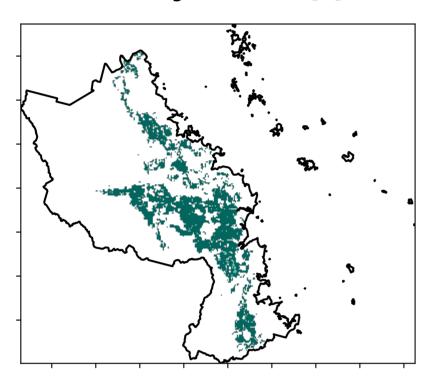
Irrigation

Land use and forest cover



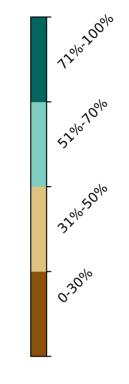
1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

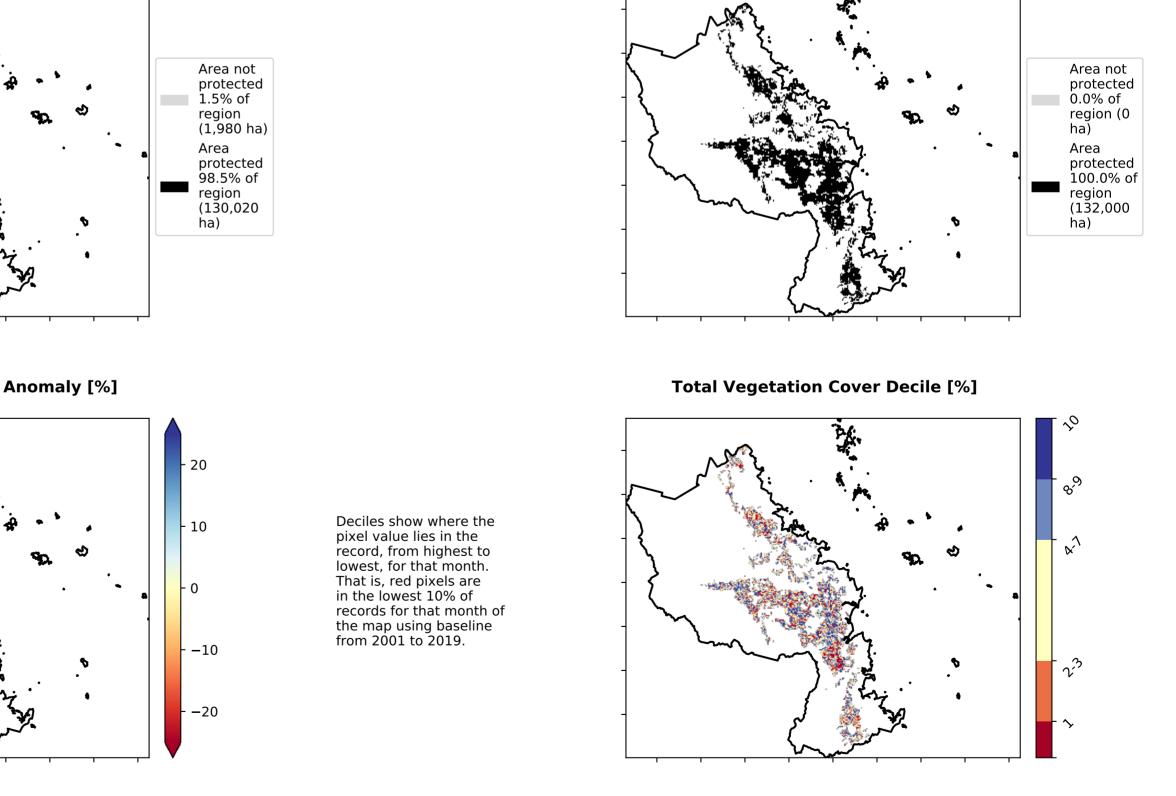
Total Vegetation Cover [%]

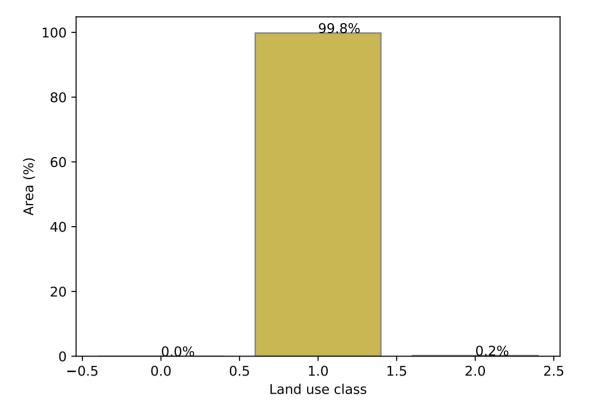


% Area protected from water erosion (>70%)



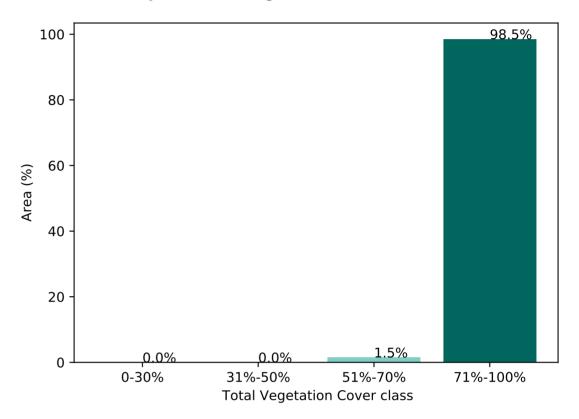




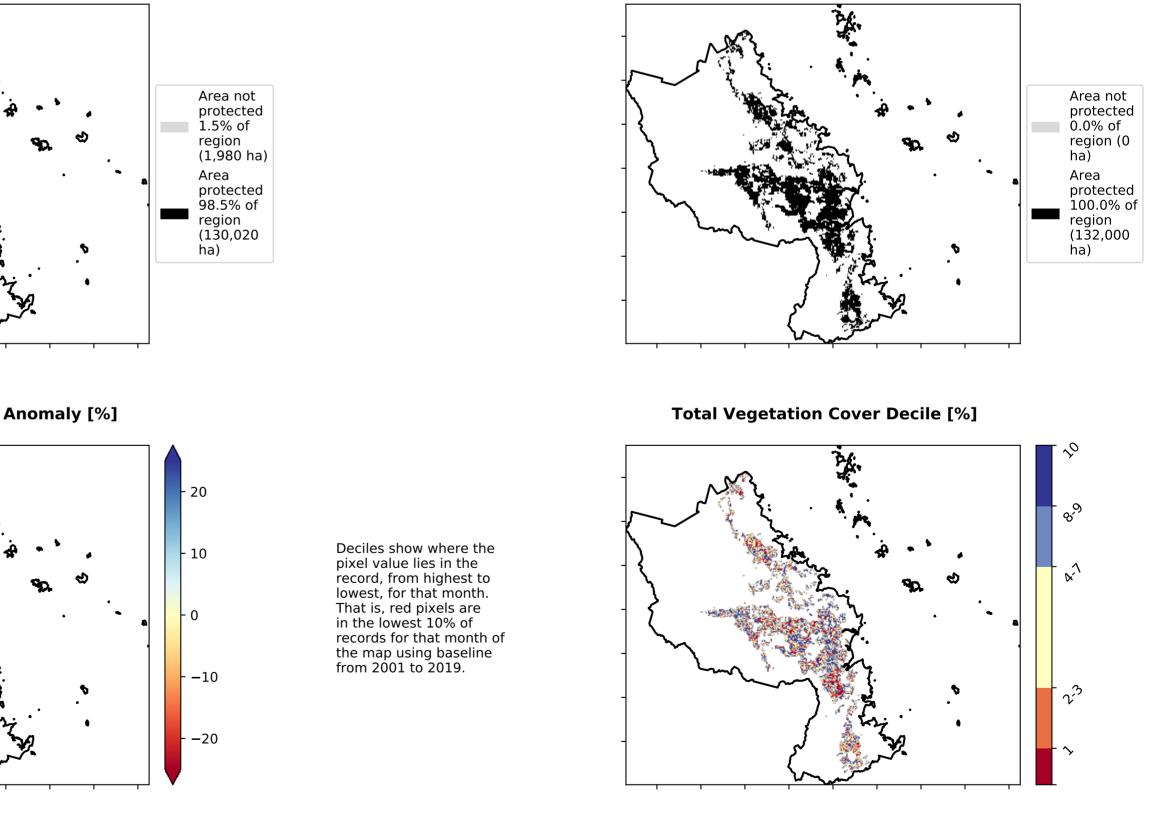


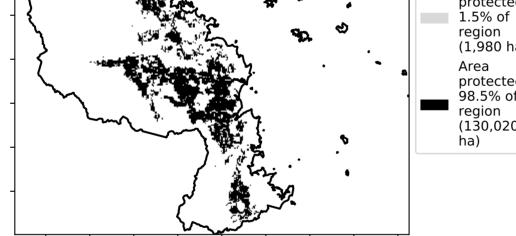
Proportion of each land class in area

Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)





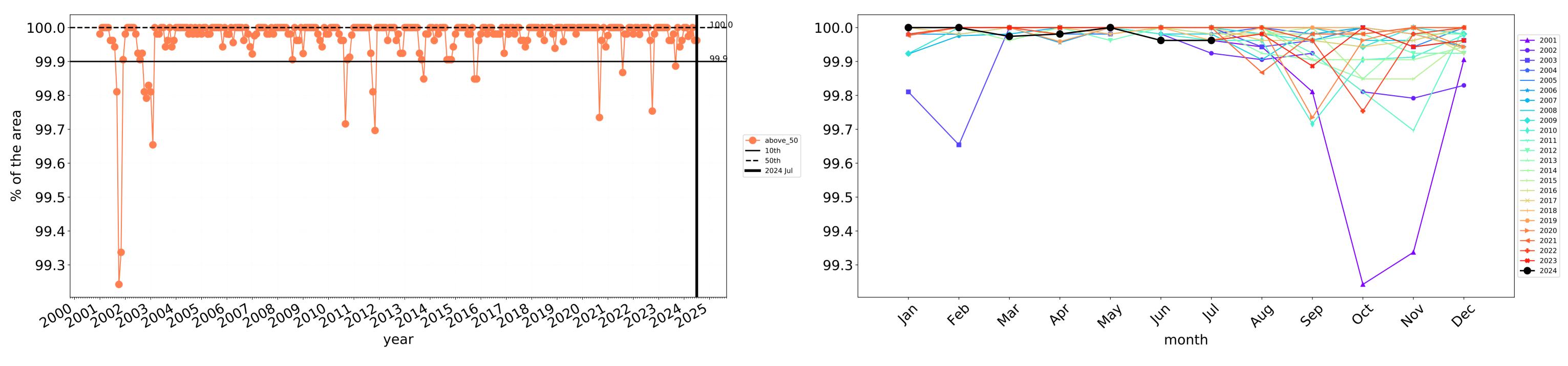
Total Vegetation Cover Anomaly [%]

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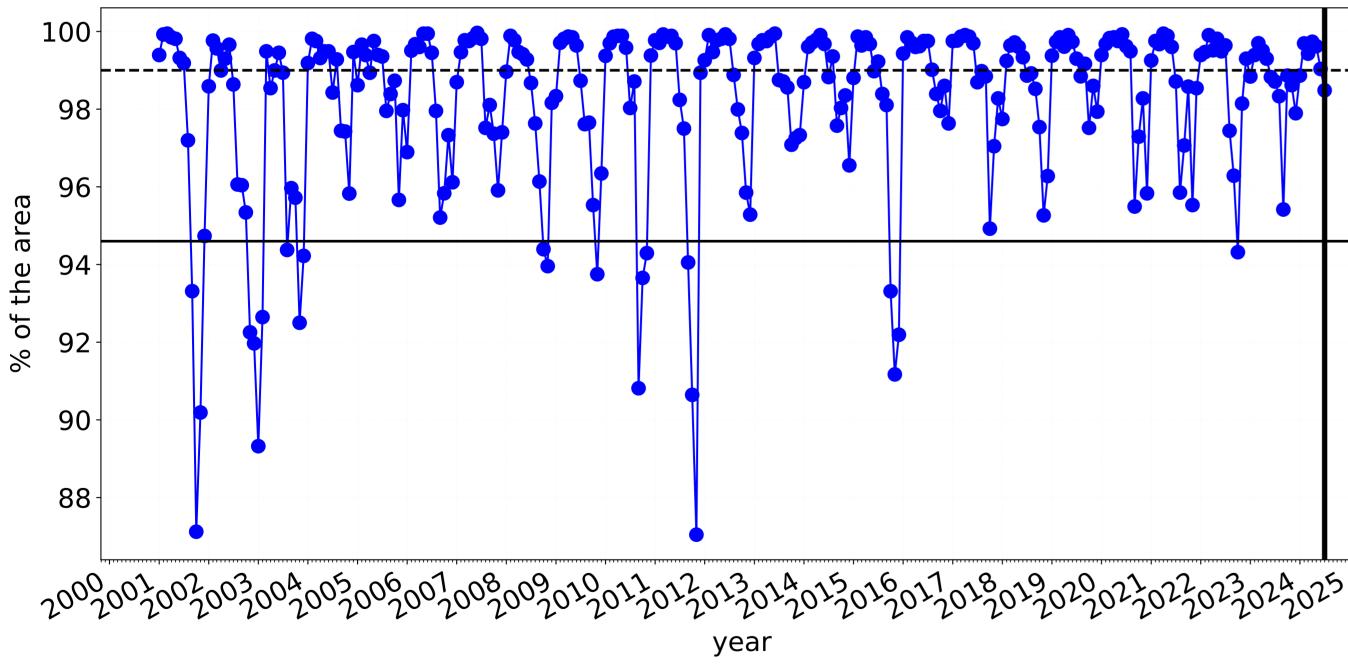


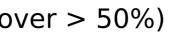
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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





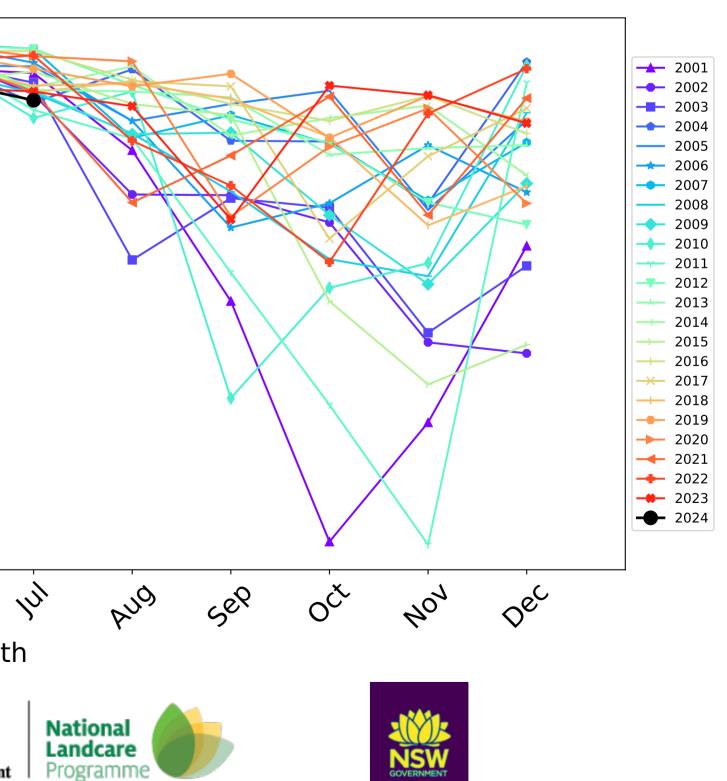


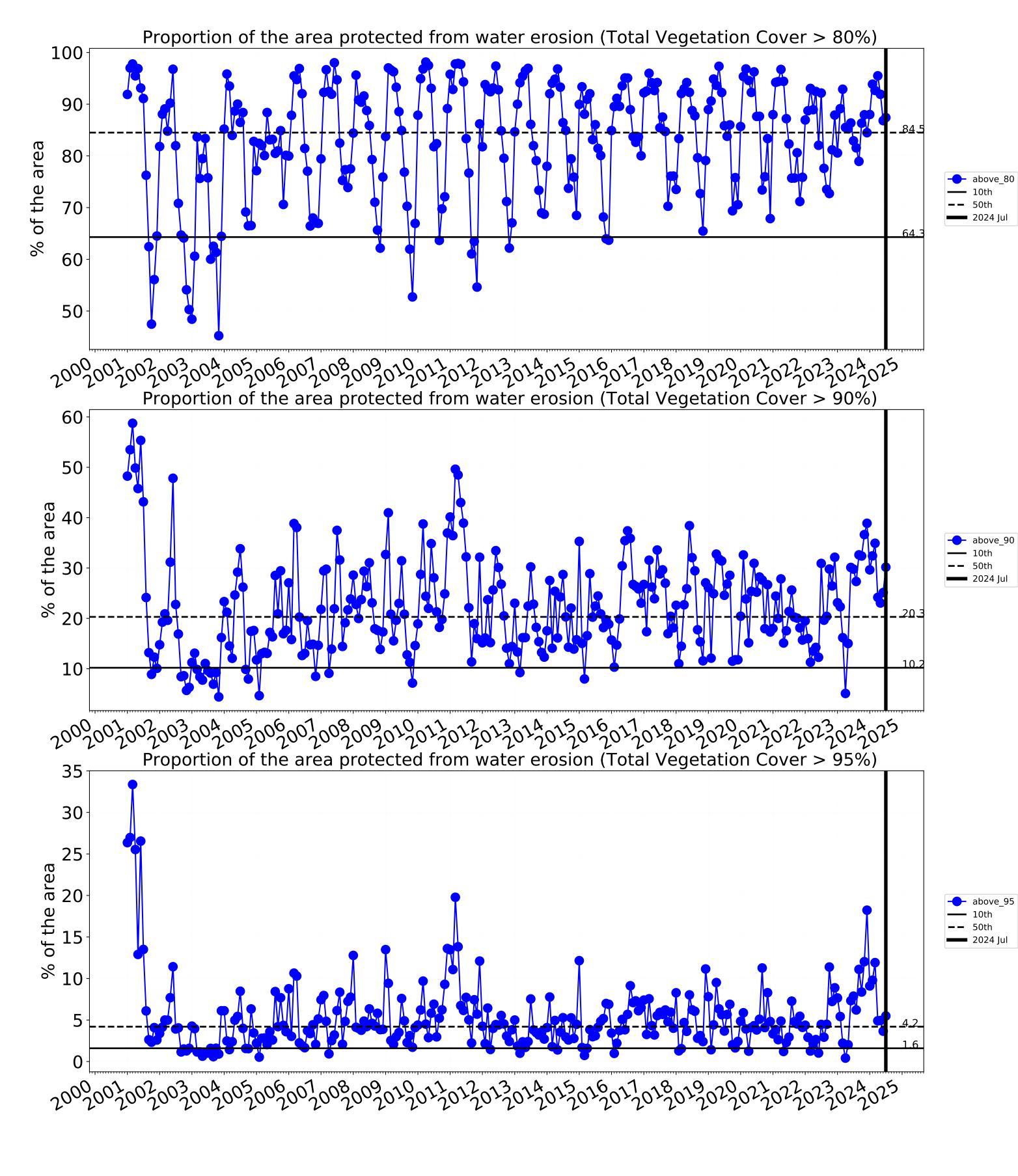
Wind erosion historical monthly area protected (Total Veg Cov >50%)

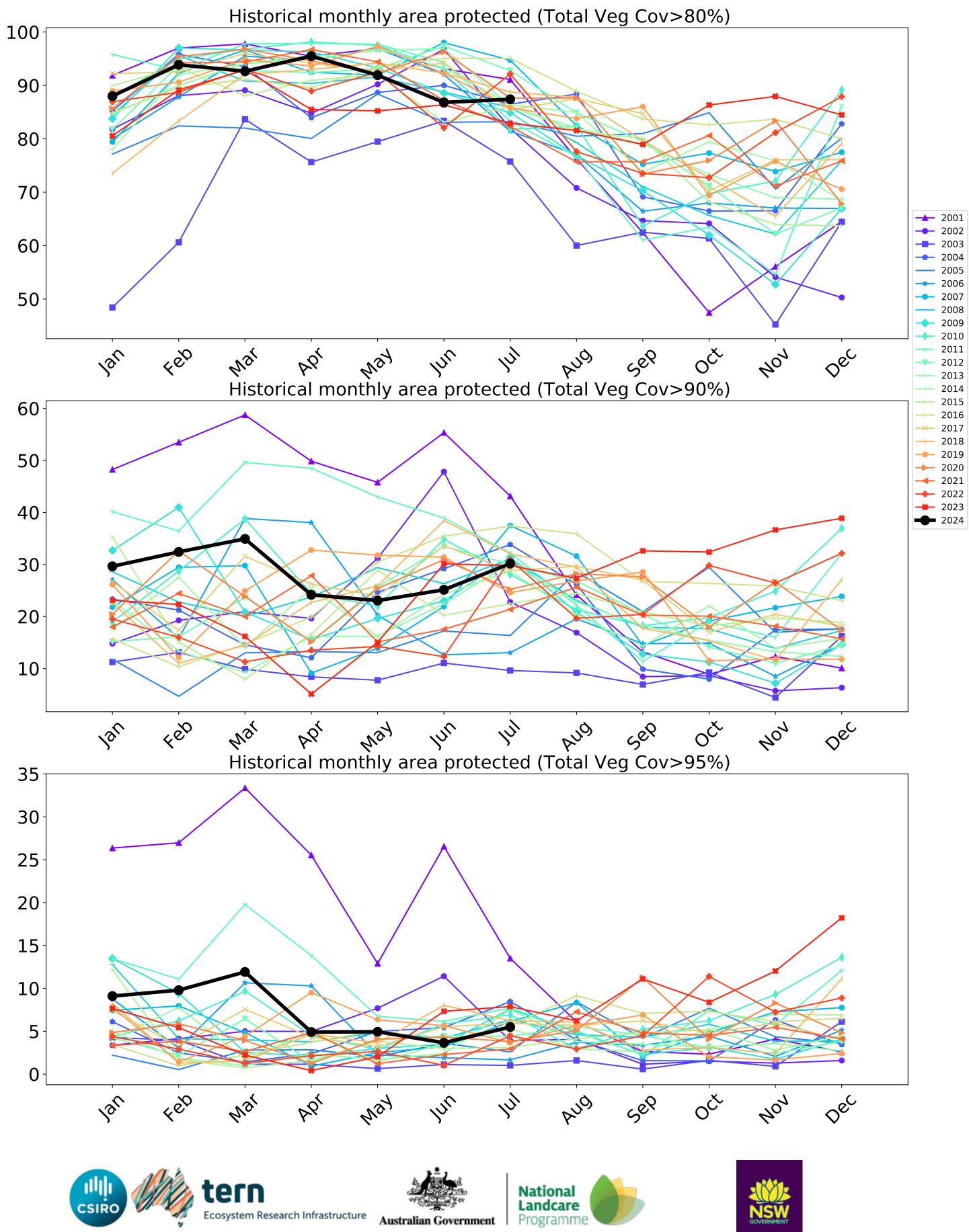
99.0 ---- above_70 **—** 10th **——** 50th

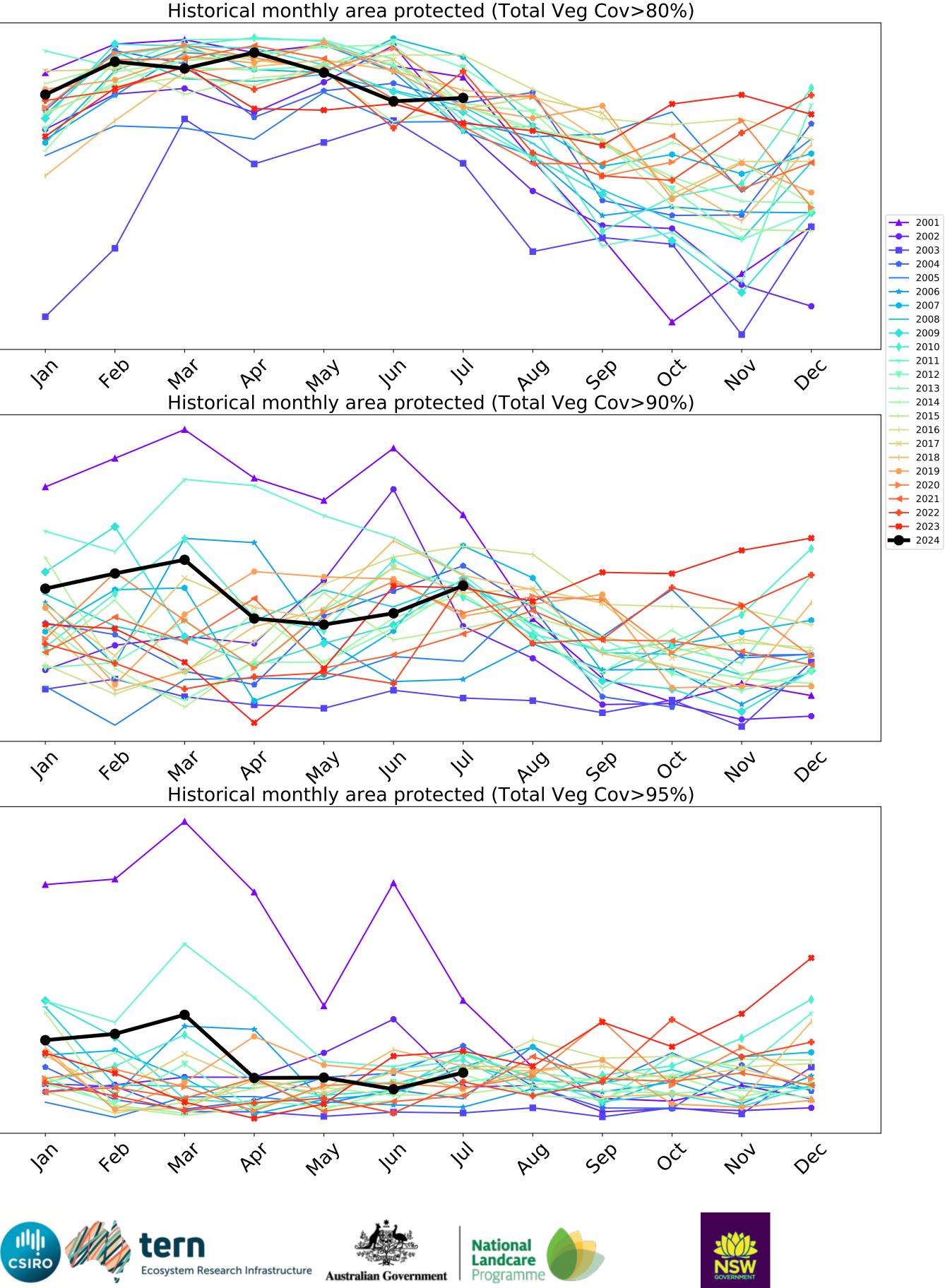
100 98 96-94 92 90 88 4eb Jan In May Mai PQ month tern Ecosystem Research Infrastructure Australian Government

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









Production native forests and plantation forests

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

12%200%

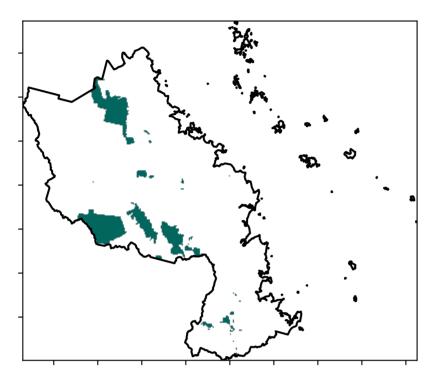
· 52°10010

· 320050010

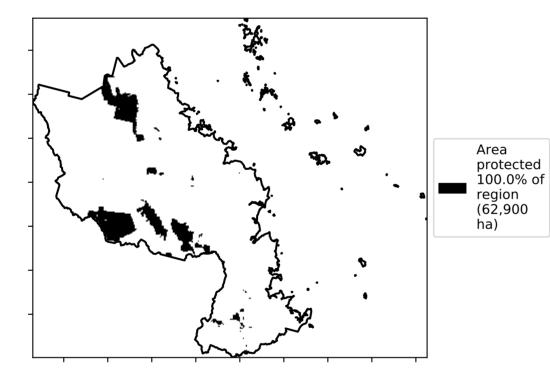
0.30%

Land use and forest cover

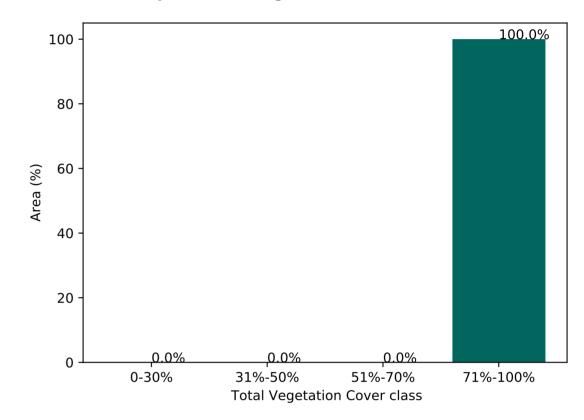
Total Vegetation Cover [%]



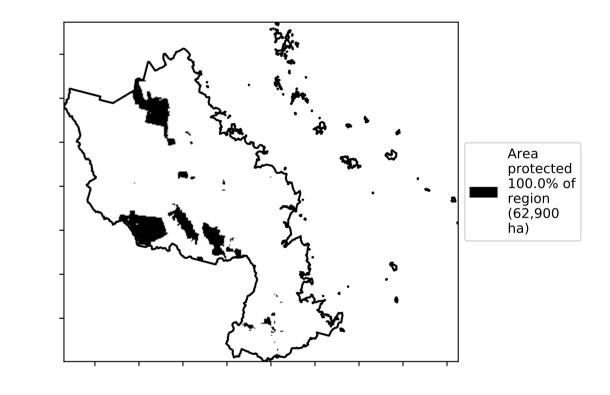
% Area protected from water erosion (>70%)



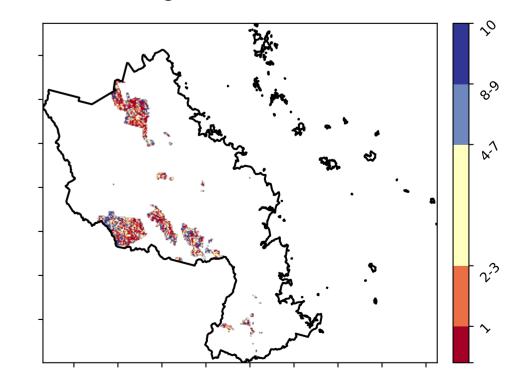




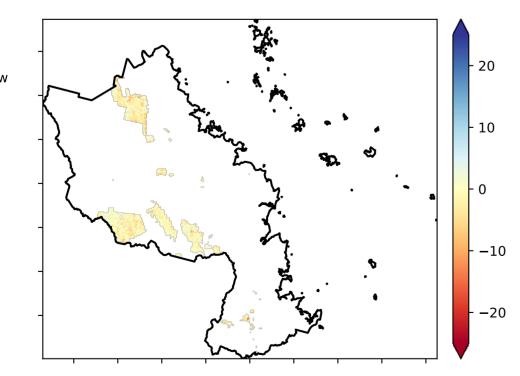
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



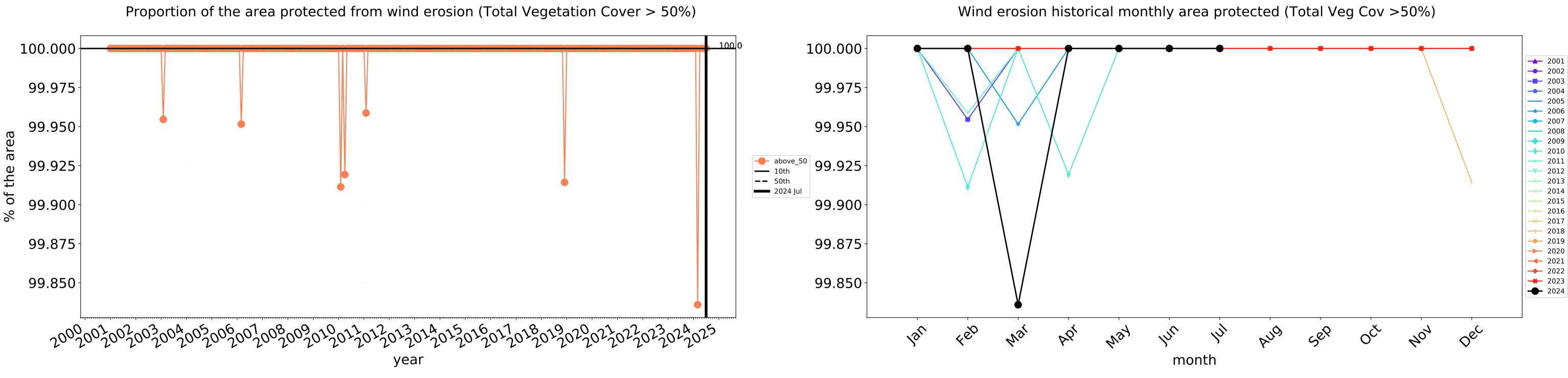
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

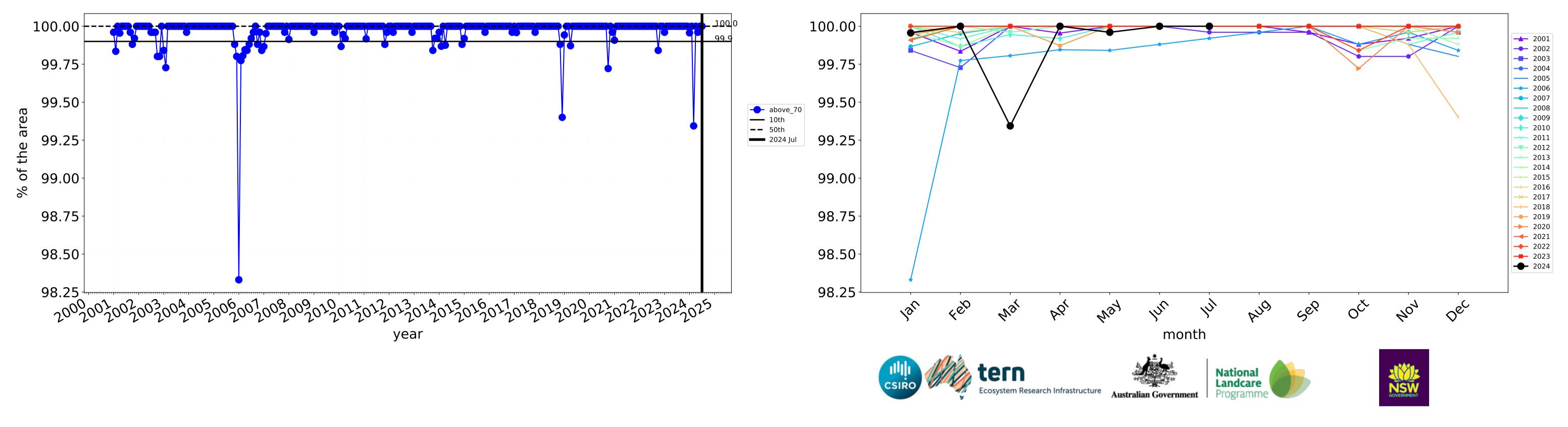




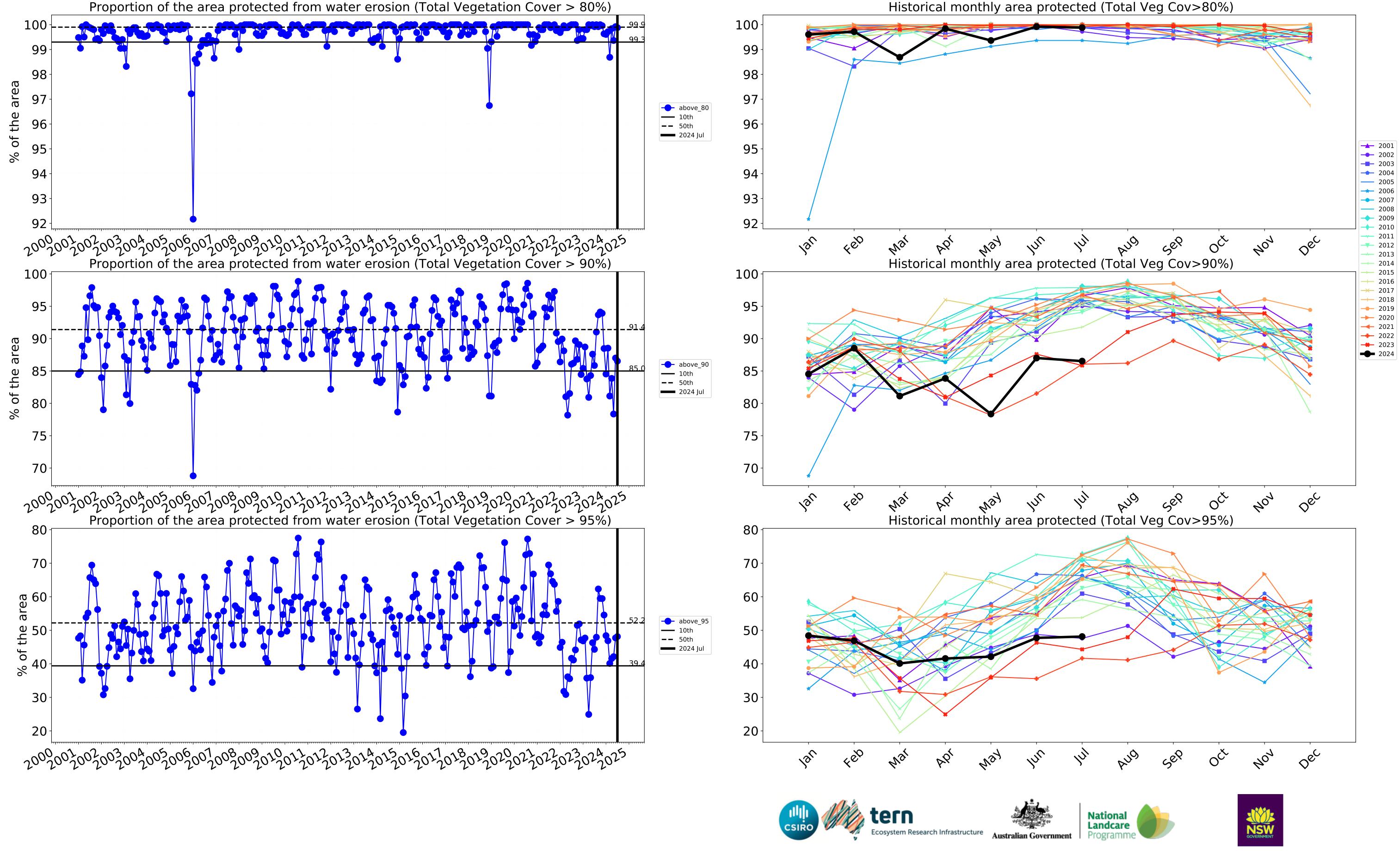
32

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.









4

Mackay_(R) (748,950 ha and no data 12,361 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	748,950	100.0% 748,700	99.9% 747,925	98.9% 740,500	94.8% 710,300	68.1% 510,275	30.5% 228,575
Conservation and natural environments	192,600	99.9% 192,475	99.8% 192,300	99.3% 191,250	98.1% 188,975	80.6% 155,225	39.4% 75,800
Conservation and natural environments non forest	5,025	99.5% 5,000	98.5% 4,950	92.5% 4,650	83.1% 4,175	57.2% 2,875	29.4% 1,475
Conservation and natural environments Woodland forest Conservation and	37,225	99.9% 37,200	99.8% 37,150	99.0% 36,850	97.4% 36,275	83.5% 31,100	43.3% 16,100
natural environments Forest (non woodland)	150,350	100.0% 150,275	99.9% 150,200	99.6% 149,750	98.8% 148,525	80.6% 121,250	38.7% 58,225
Agriculture	428,400	100.0% 428,400	100.0% 428,275	99.4% 426,025	95.5% 409,125	64.9% 278,050	27.0% 115,650
Grazing	295,800	100.0% 295,800	100.0% 295,725	99.9% 295,425	99.1% 293,150	80.3% 237,625	36.5% 107,950
Grazing non forest	140,075	100.0% 140,075	99.9% 140,000	99.8% 139,775	98.7% 138,275	80.1% 112,175	36.1% 50,625
Grazing Woodland forest	108,675	100.0% 108,675	100.0% 108,675	99.9% 108,600	99.3% 107,925	76.3% 82,925	27.4% 29,750
Grazing - Forest (non woodland)	47,050	100.0% 47,050	100.0% 47,050	100.0% 47,050	99.8% 46,950	90.4% 42,525	58.6% 27,575
Irrigation	132,000	100.0% 132,000	100.0% 131,950	98.5% 130,000	87.4% 115,375	30.2% 39,825	5.5% 7,250
Production native forests and plantation forests	62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	99.9% 62,825	86.5% 54,425	48.1% 30,275

