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

Date: June 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 Jun 2024

Land use and forest cover

Proportion of each land class in area



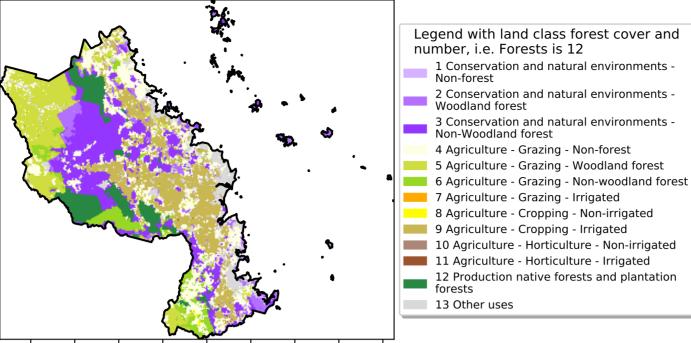
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2019.



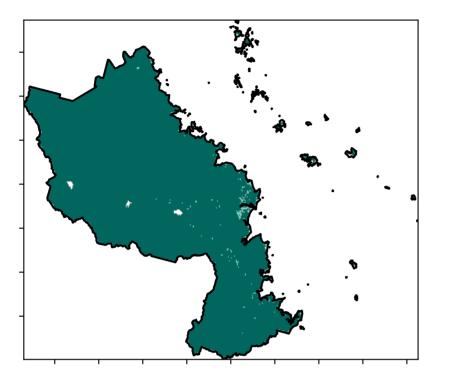
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· 52% 70%

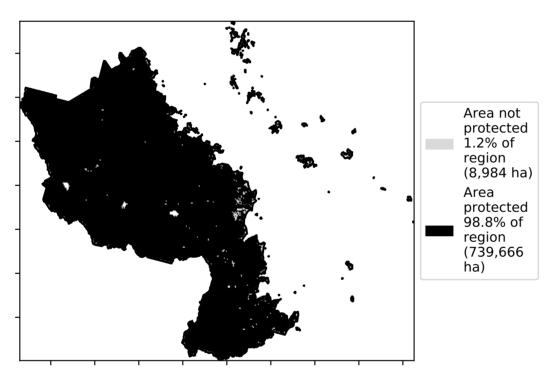
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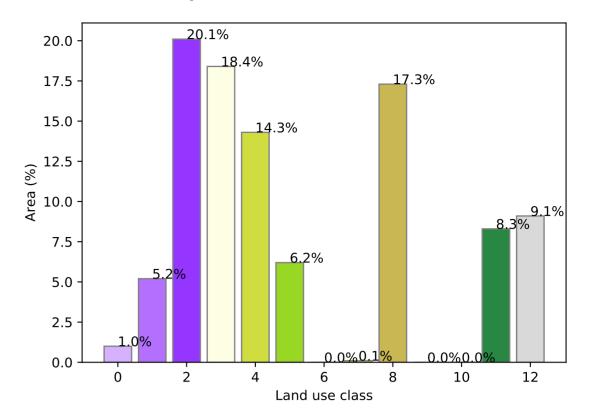
0.30%

Total Vegetation Cover [%]

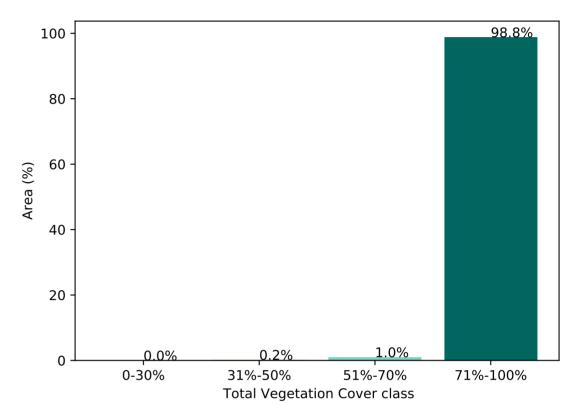


% Area protected from water erosion (>70%)

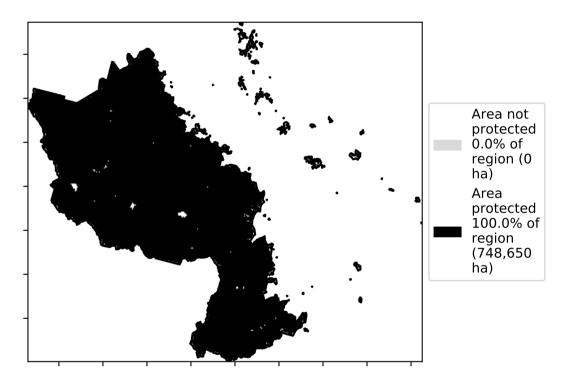




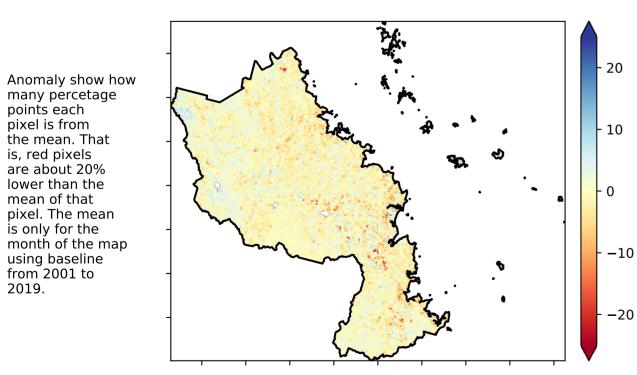
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

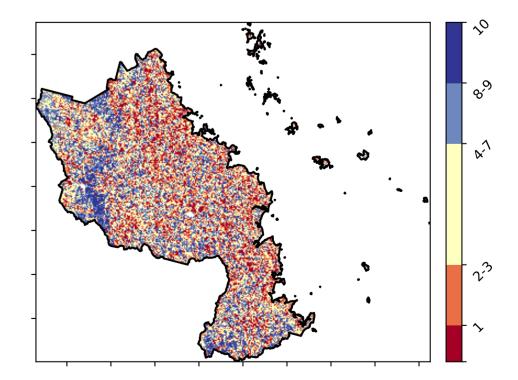


Total Vegetation Cover Anomaly [%]

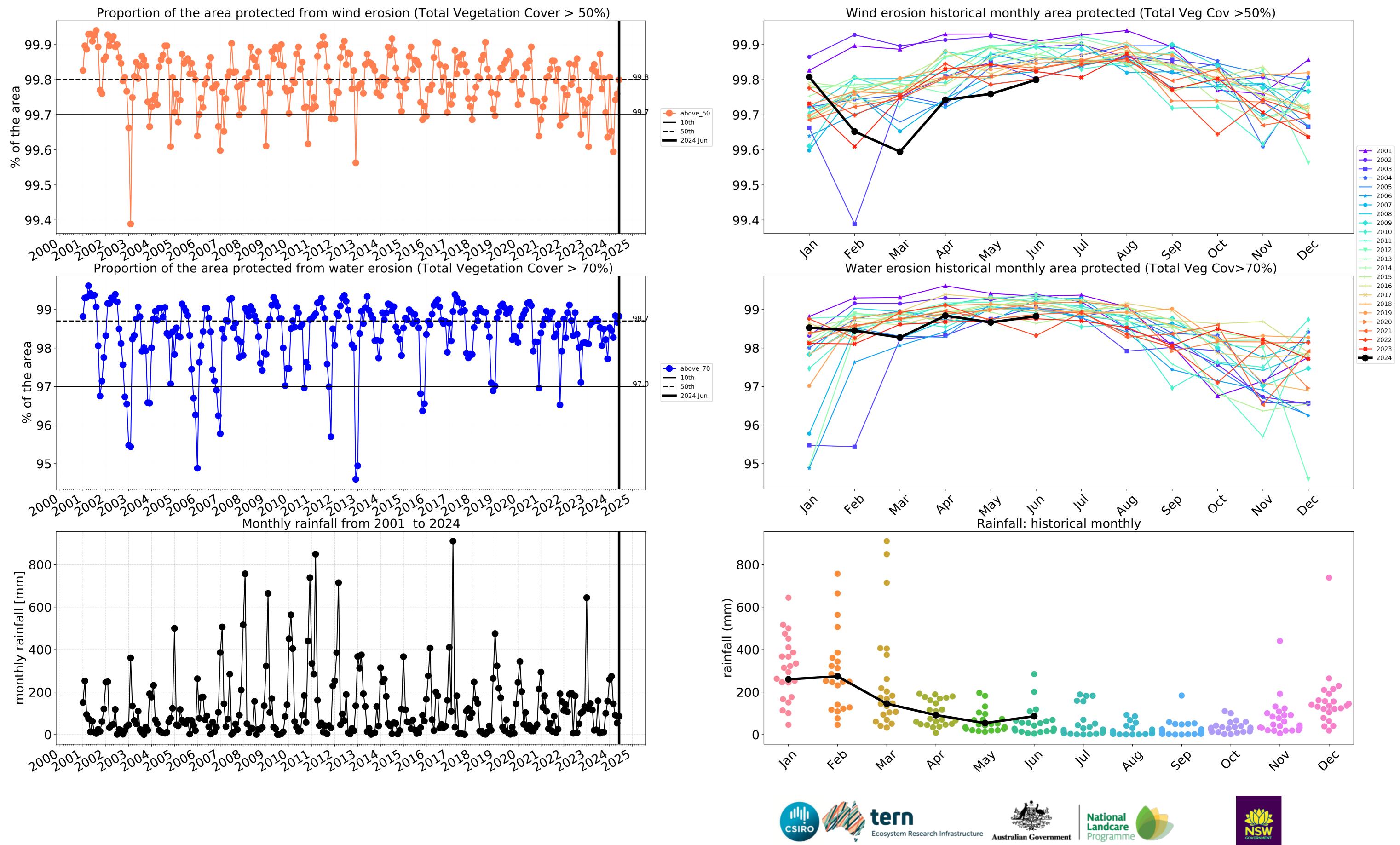


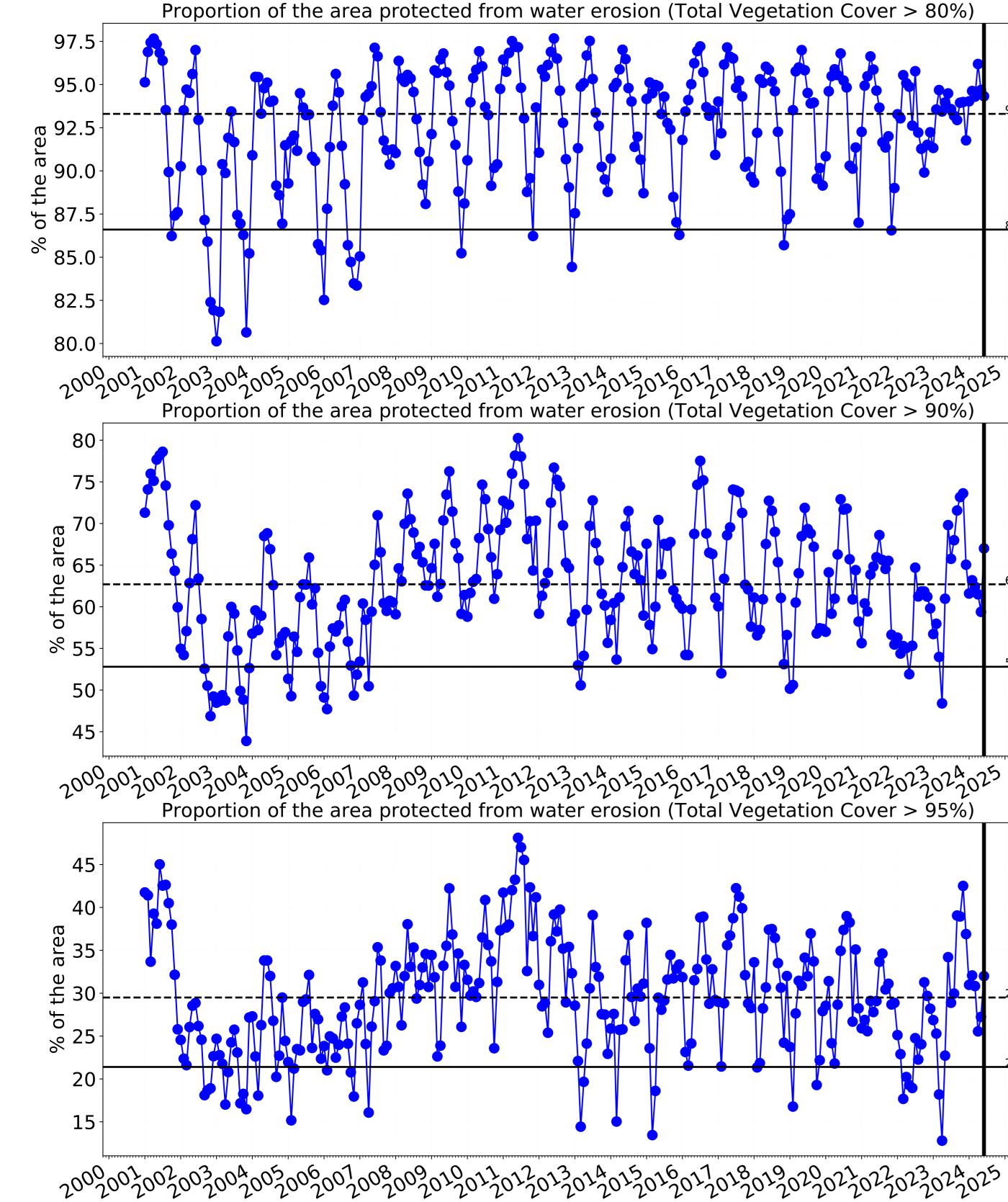
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

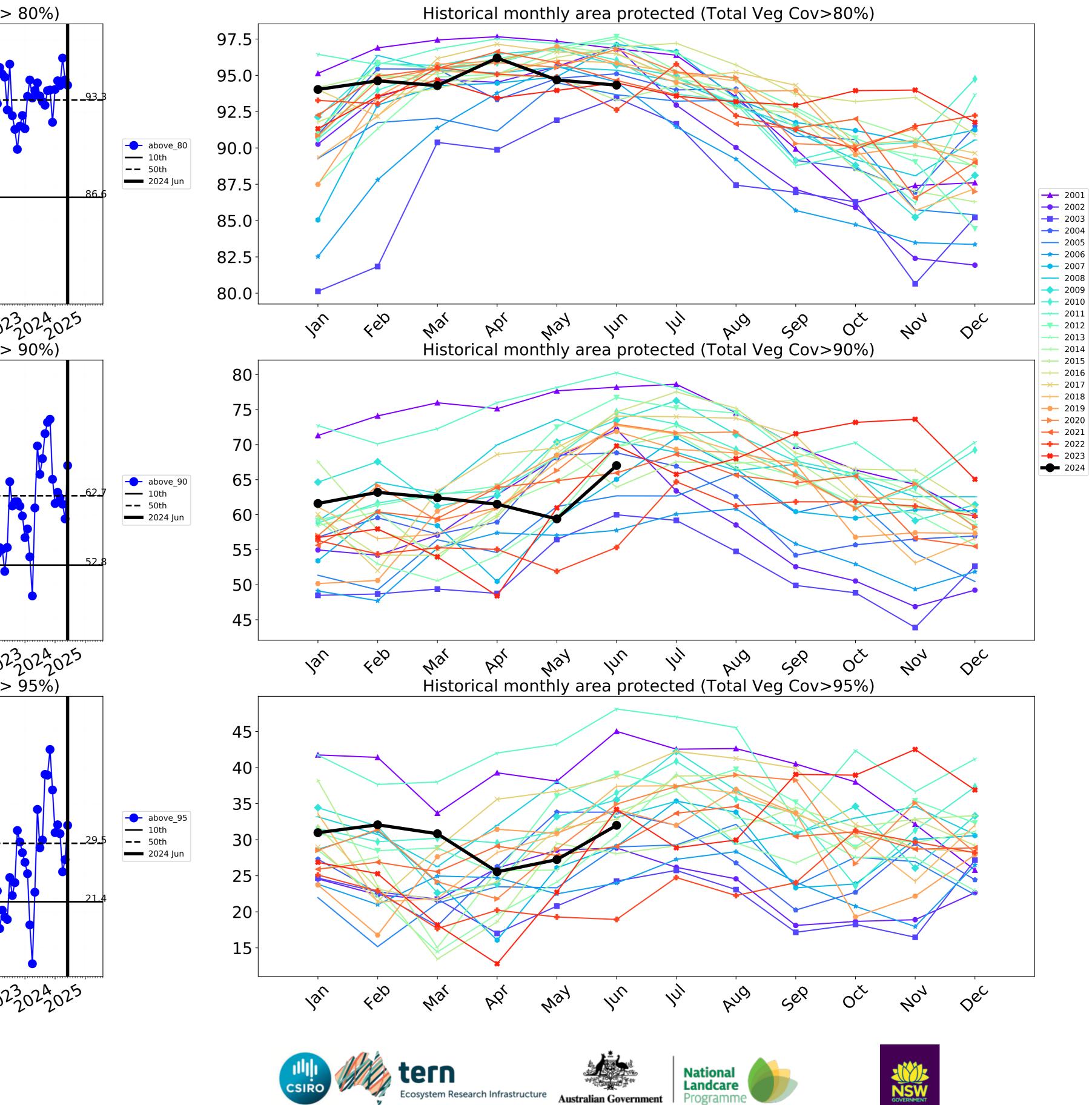
Total Vegetation Cover Decile [%]













Conservation and natural environments

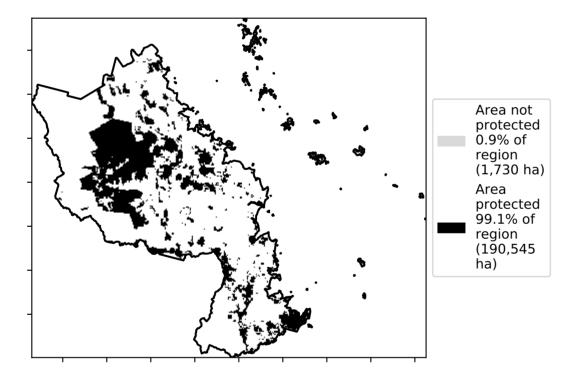
Catchment Scale Land

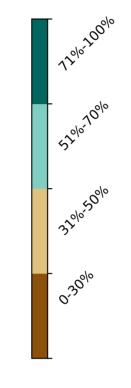
Land use and forest cover

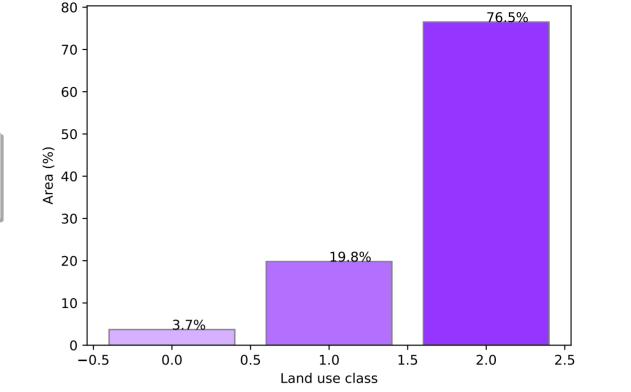
1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Nonwoodland forest

Total Vegetation Cover [%]

% Area protected from water erosion (>70%)

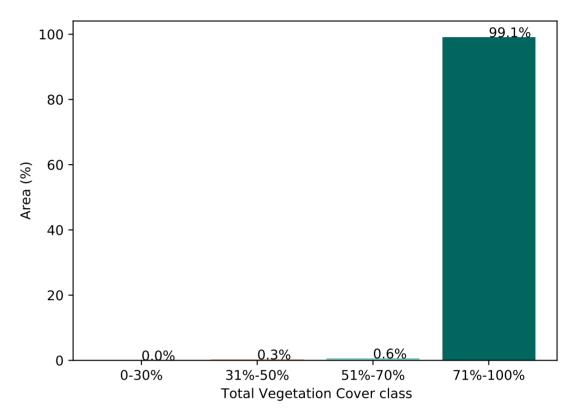




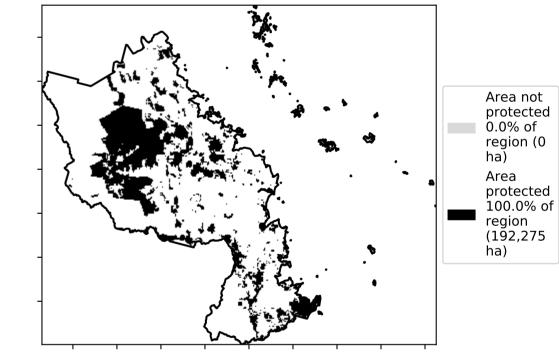


Proportion of each land class in area

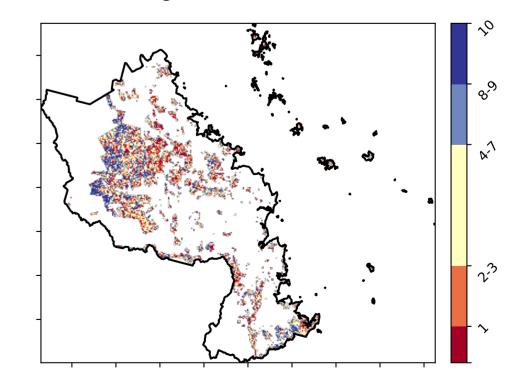
Proportion of vegetation cover class in area



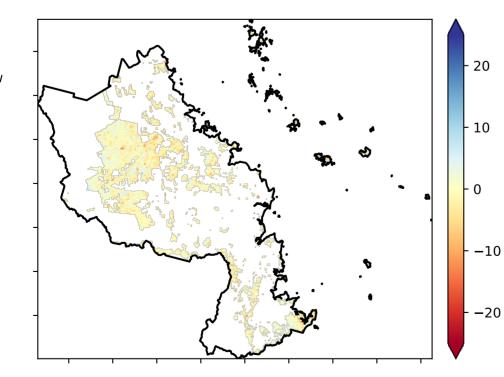
% Area protected from wind erosion (>50%)



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.





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

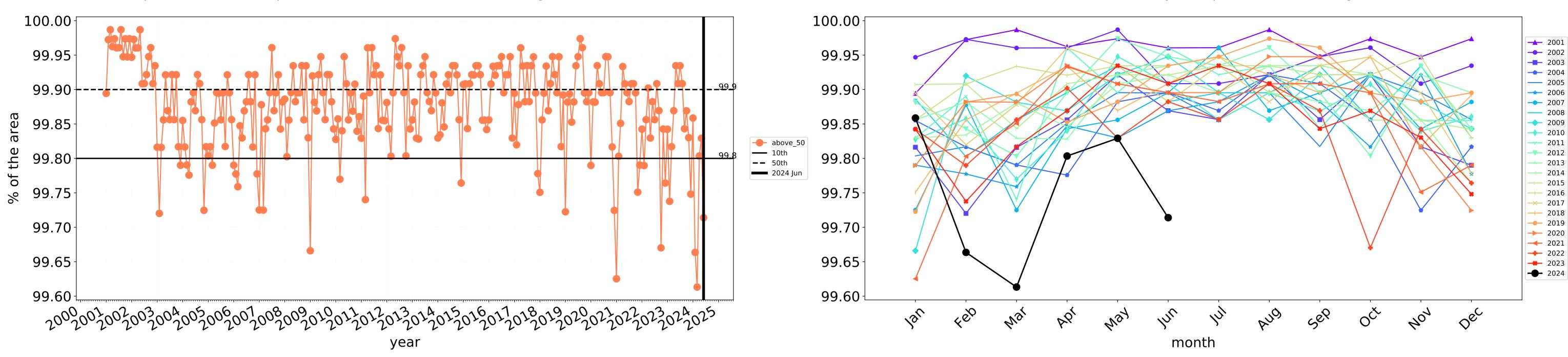
Use of Australia

(2018) and Forests

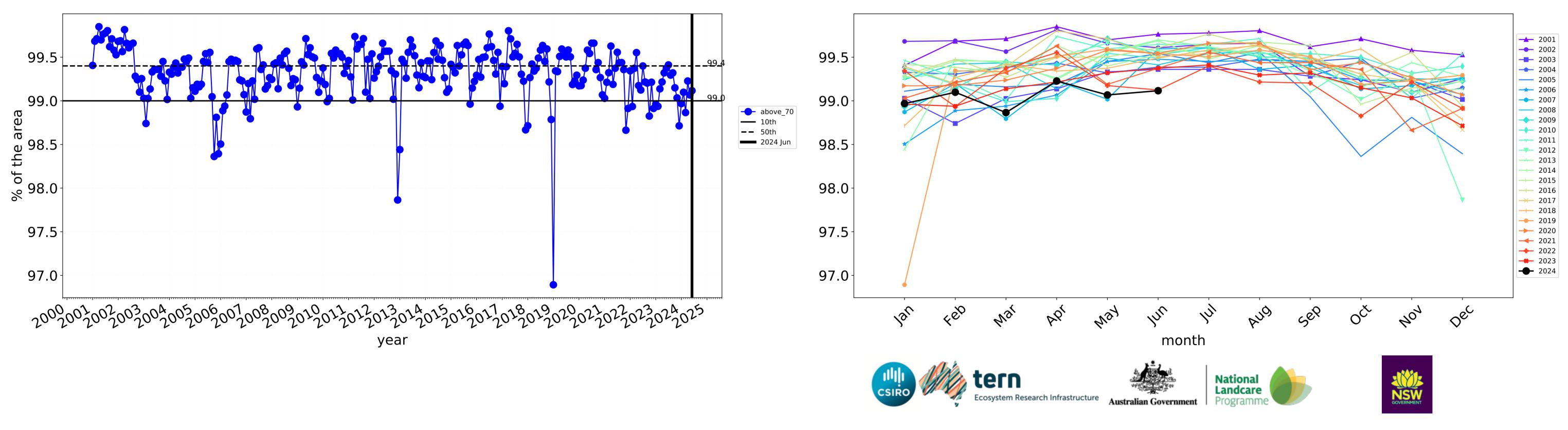
of Australia (2018)

Land Use and Forests of Australia (2018)





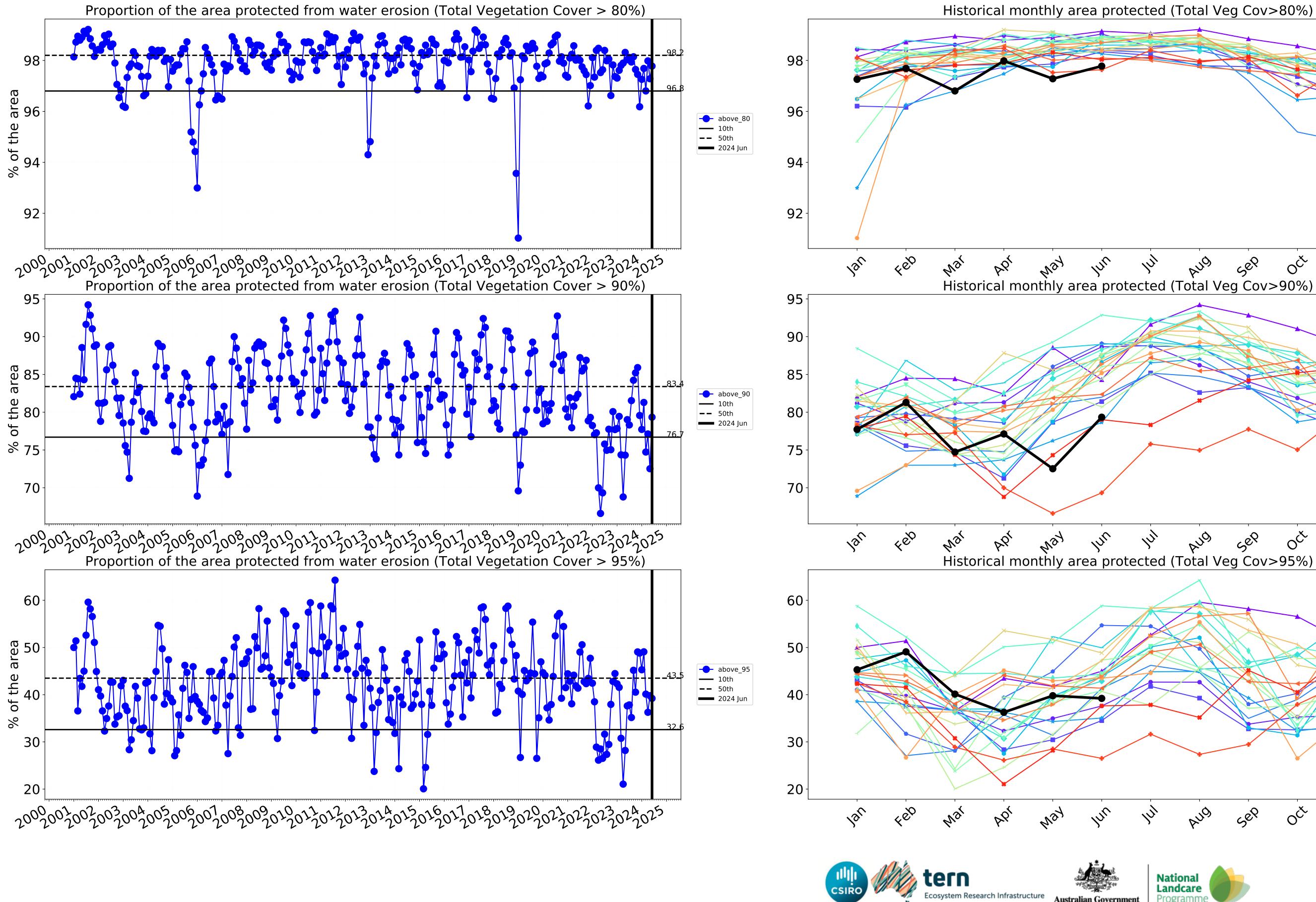
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



Conservation and natural environments timeseries

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

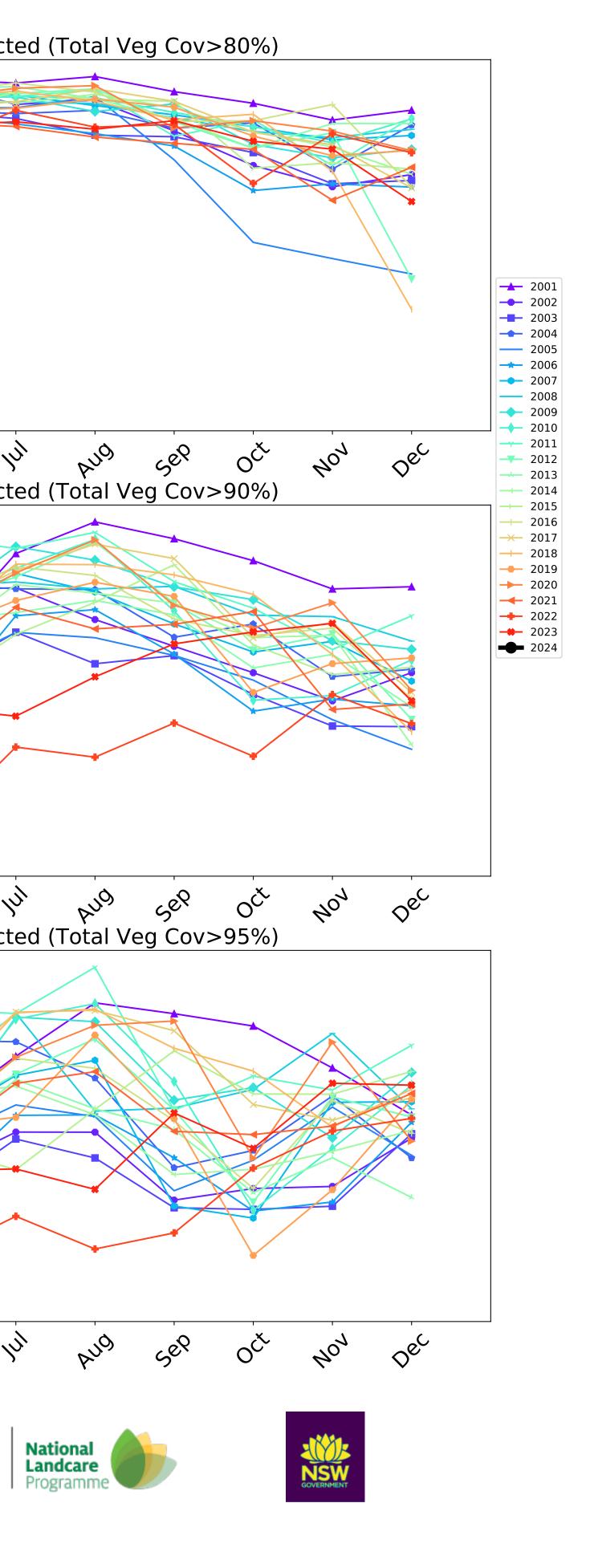
Wind erosion historical monthly area protected (Total Veg Cov >50%)



Australian Government

1)

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Conservation and natural environments non forest

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

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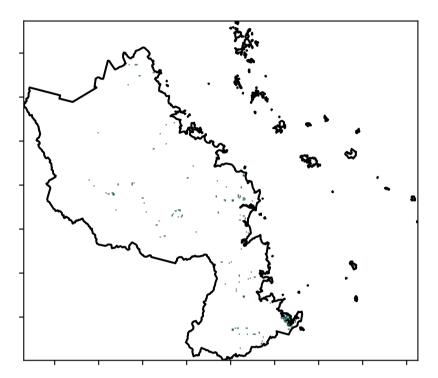
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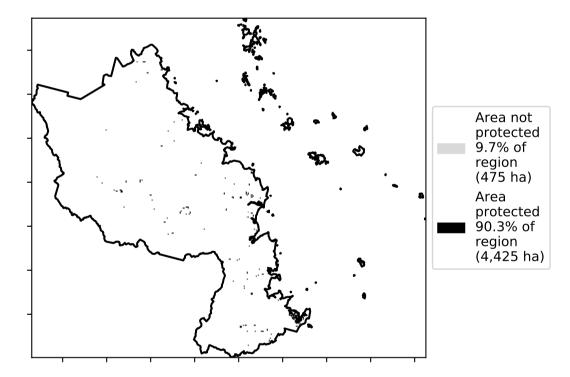
0.30%

Land use and forest cover

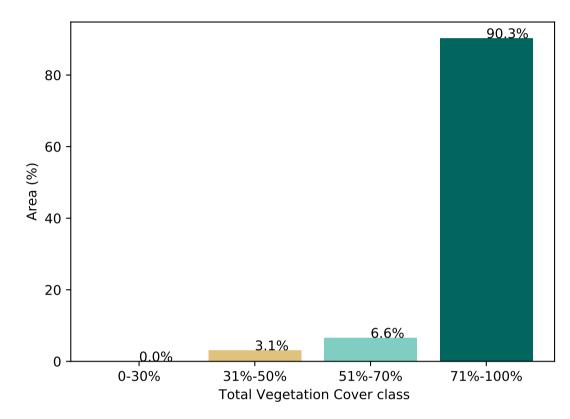
Total Vegetation Cover [%]



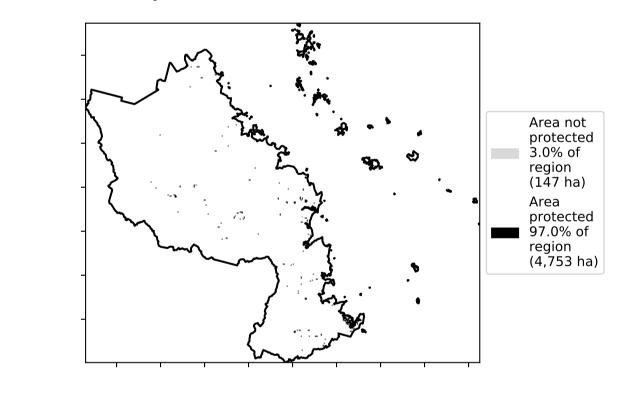
% Area protected from water erosion (>70%)



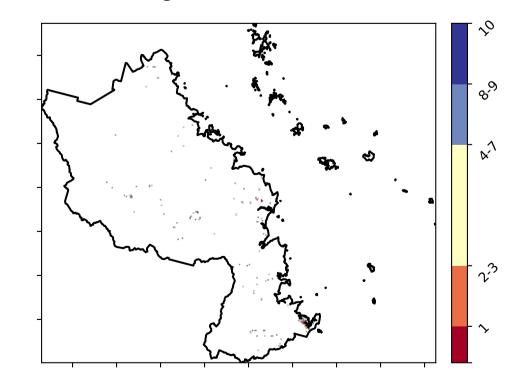




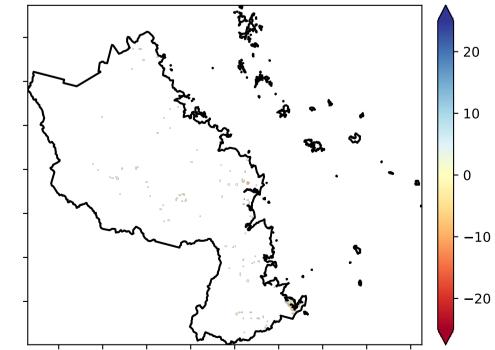
% Area protected from wind erosion (>50%)



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.



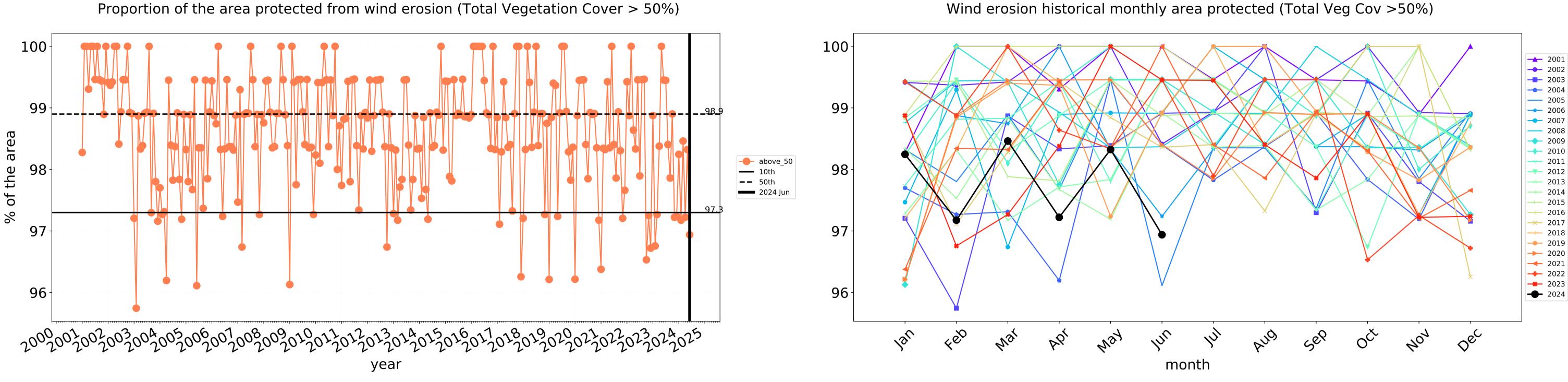


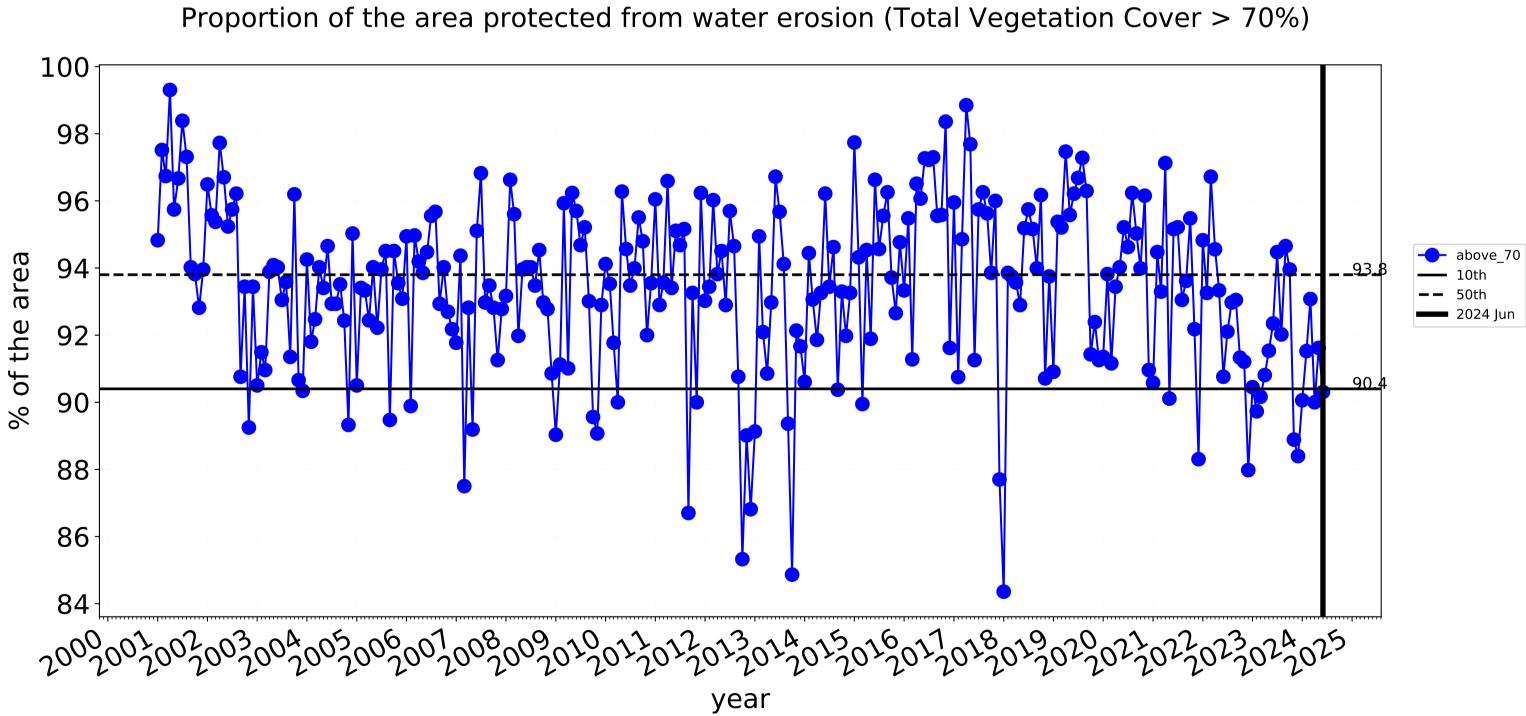
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Catchment Scale

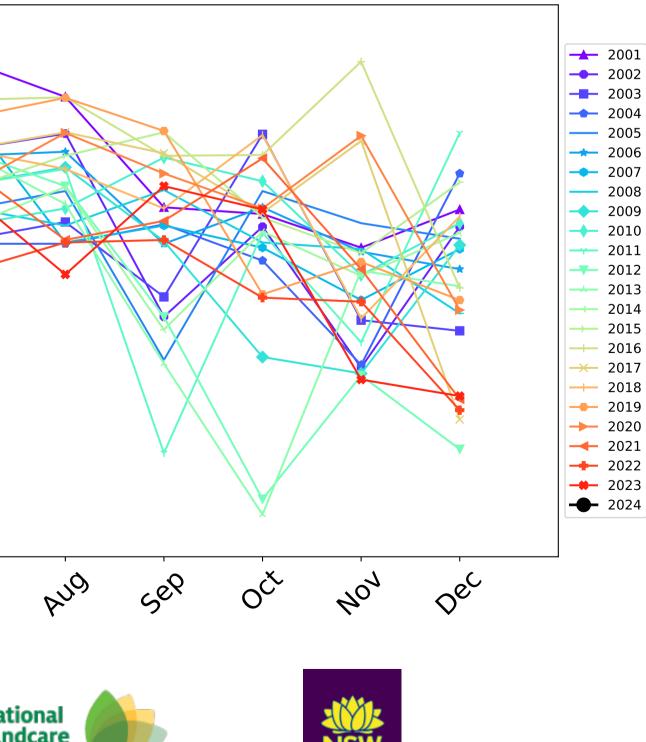
Derived from

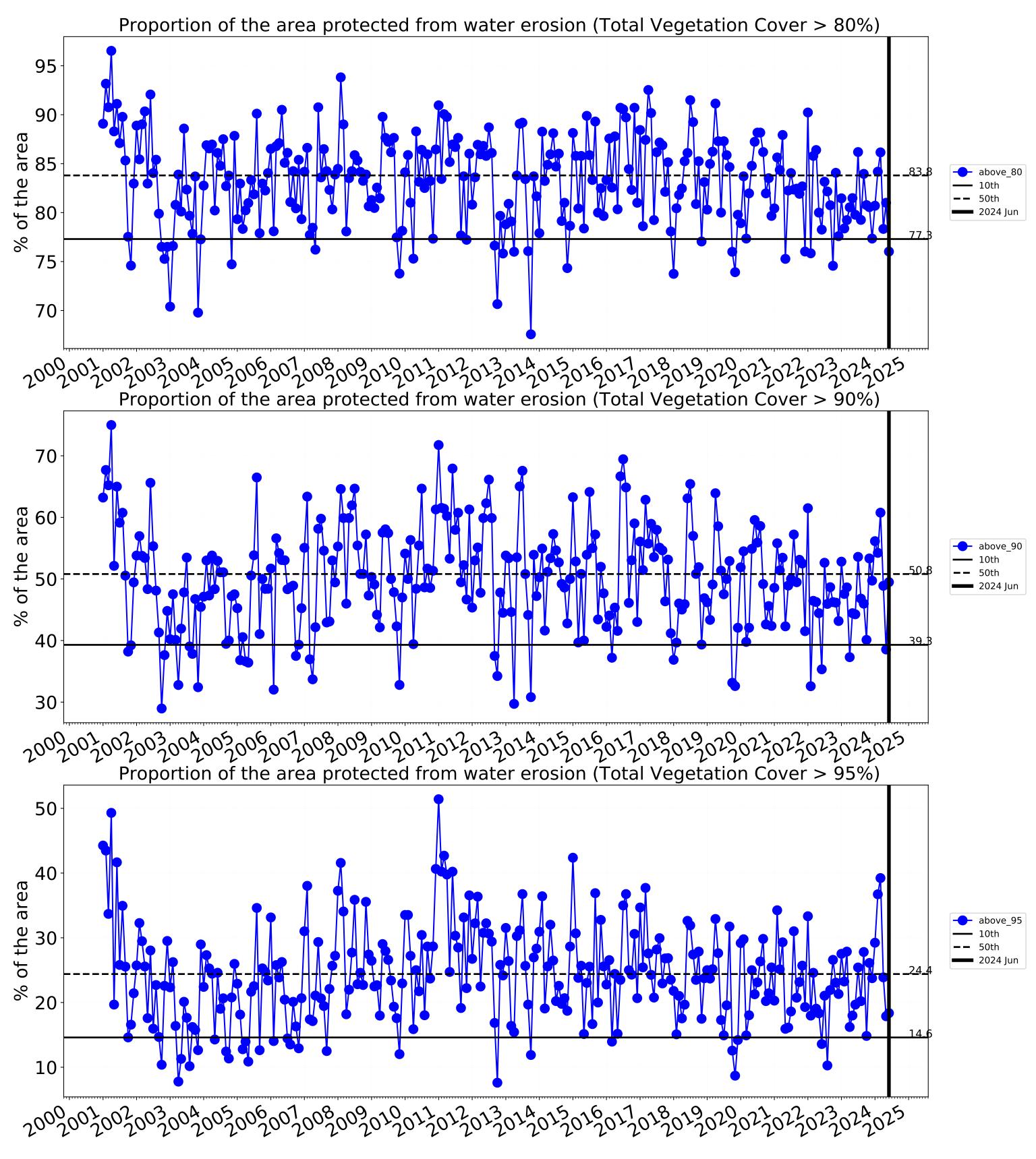
Use of Australia

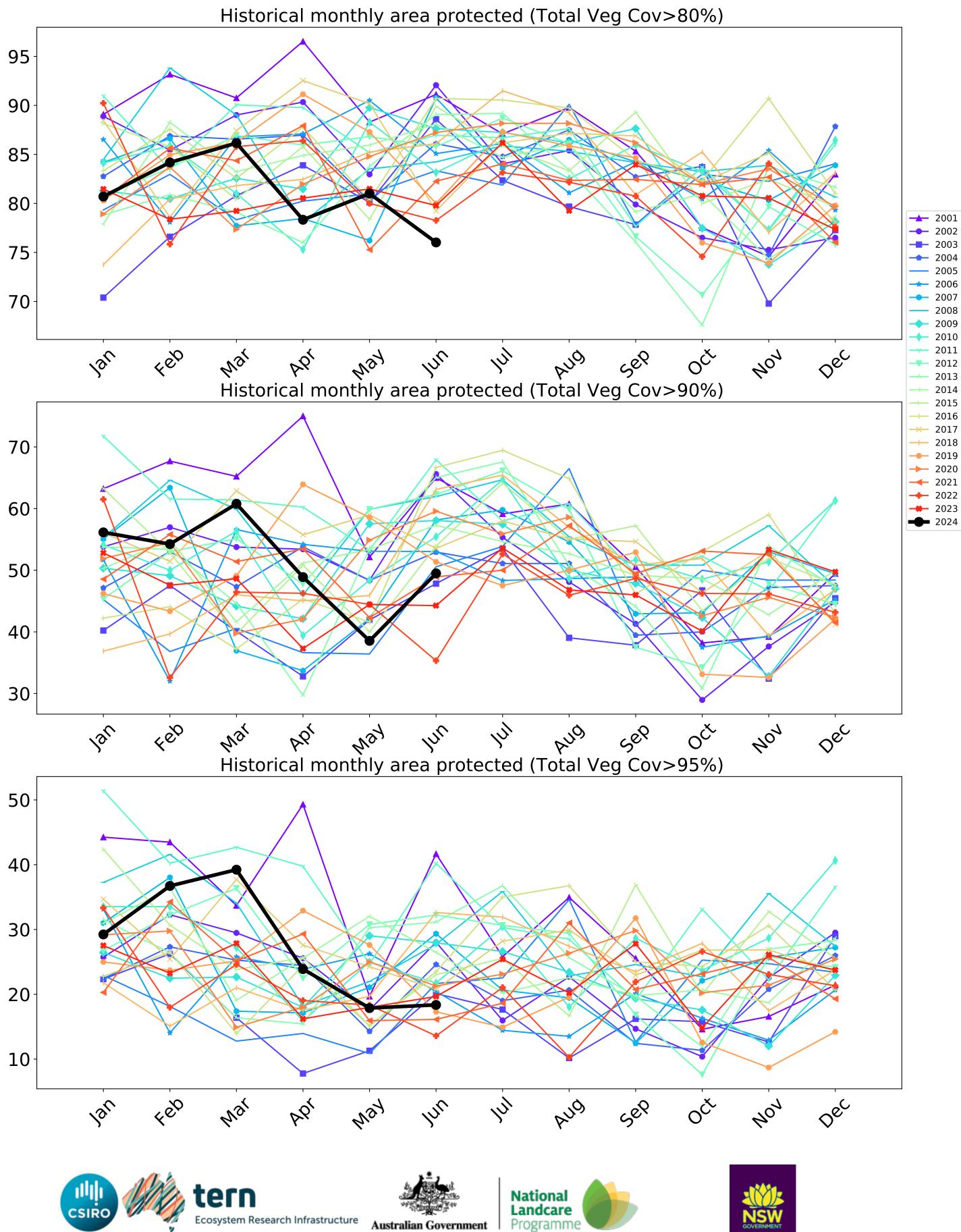




Water erosion historical monthly area protected (Total Veg Cov>70%) 100-98-96-94 92 90 88-86 84 4eb AUG lan May In Ser OČ IU) Mai 291 month tern National Landcare NSW Ecosystem Research Infrastructure Programm Australian Government







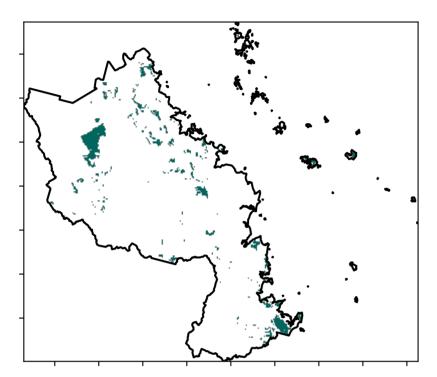


Conservation and natural environments Woodland forest

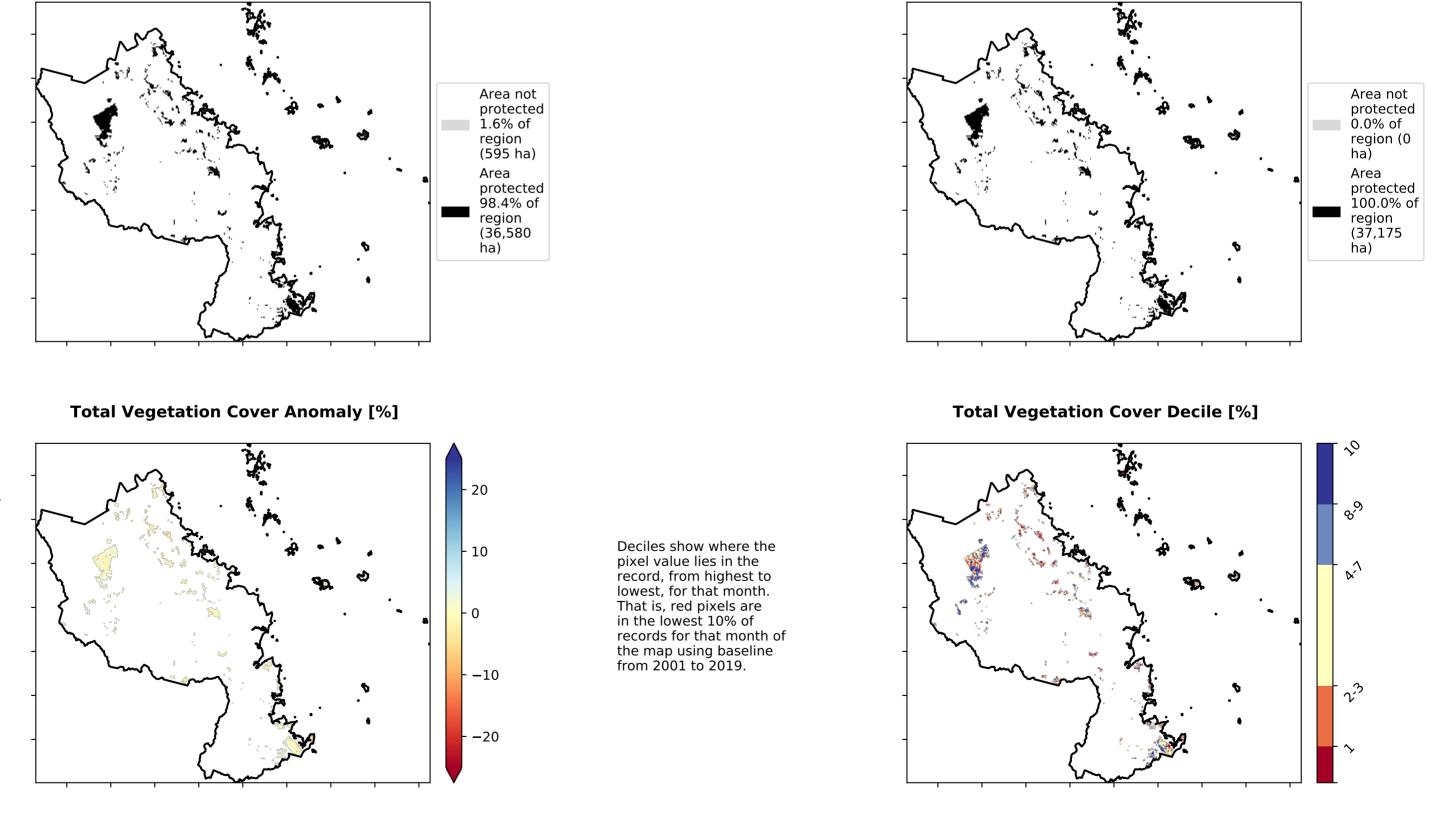
Catchment Scale Land Use and Forests of Australia (2018) 1 Conservation and natural environments - Woodland Catchment Scale Land forest Use of Australia (2018) and Forests of Australia (2018)

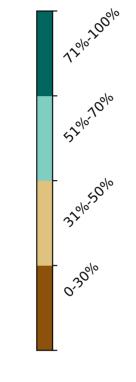
Land use and forest cover

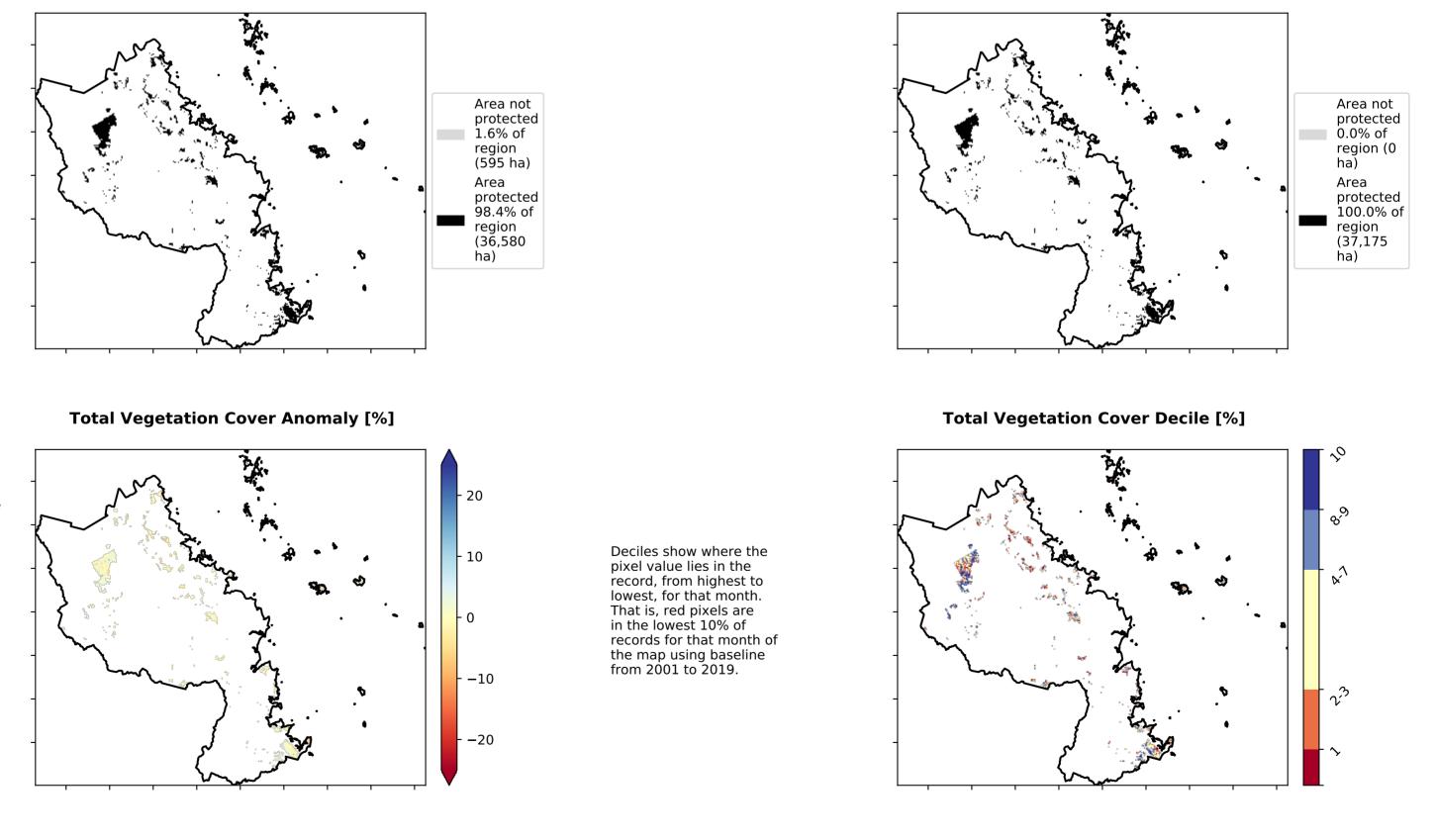
Total Vegetation Cover [%]



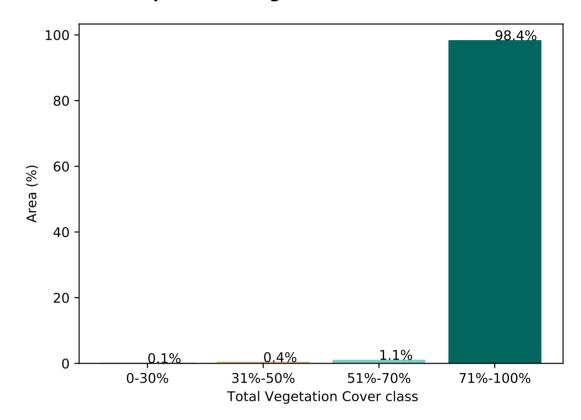
% Area protected from water erosion (>70%)



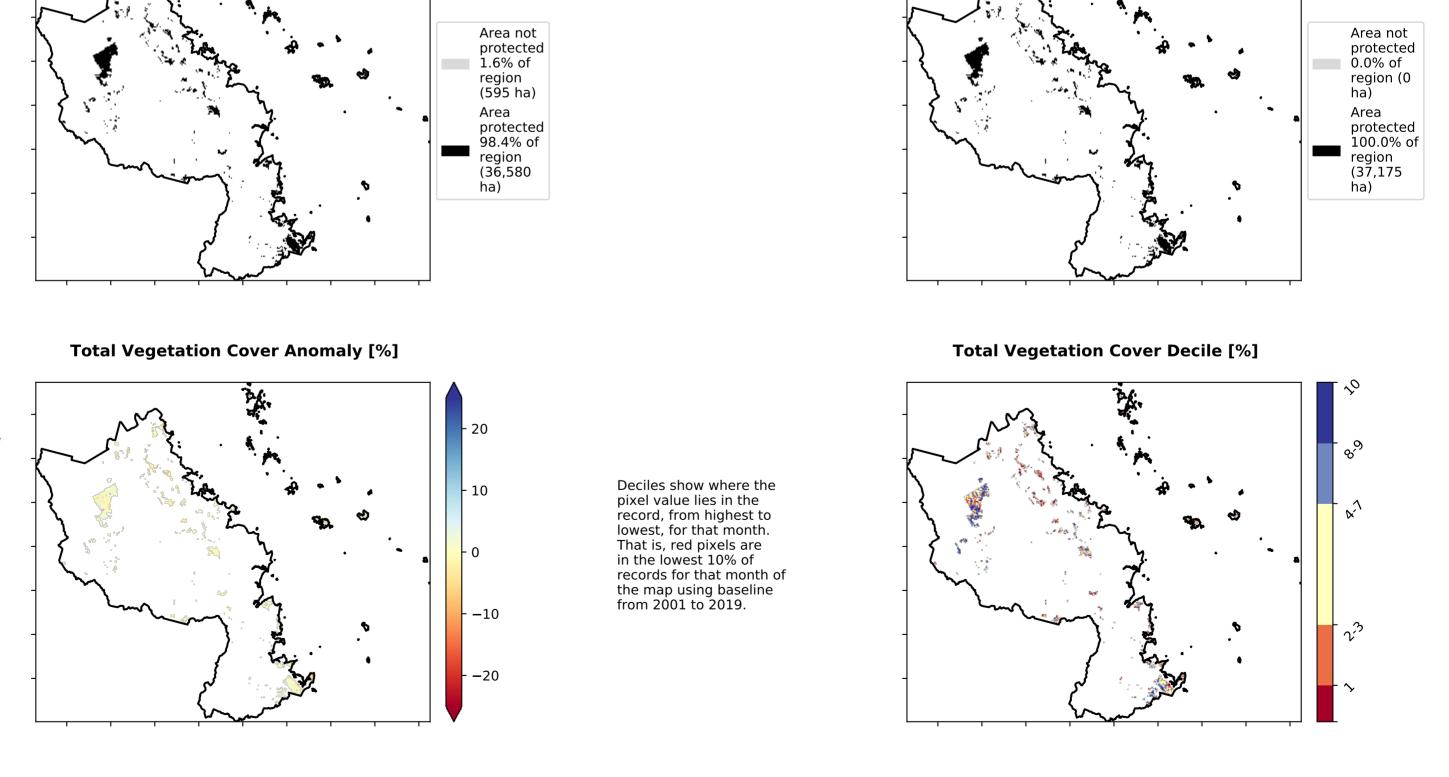




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

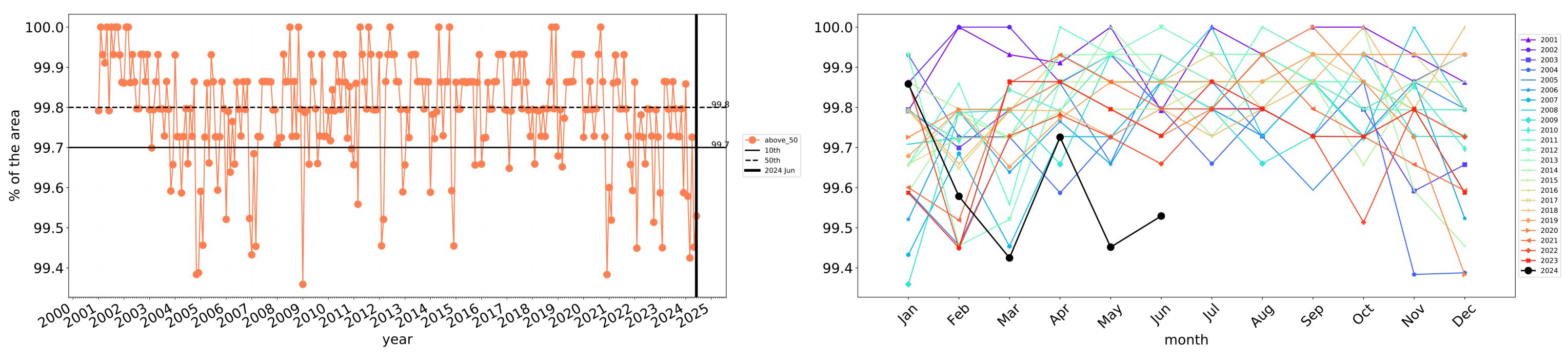




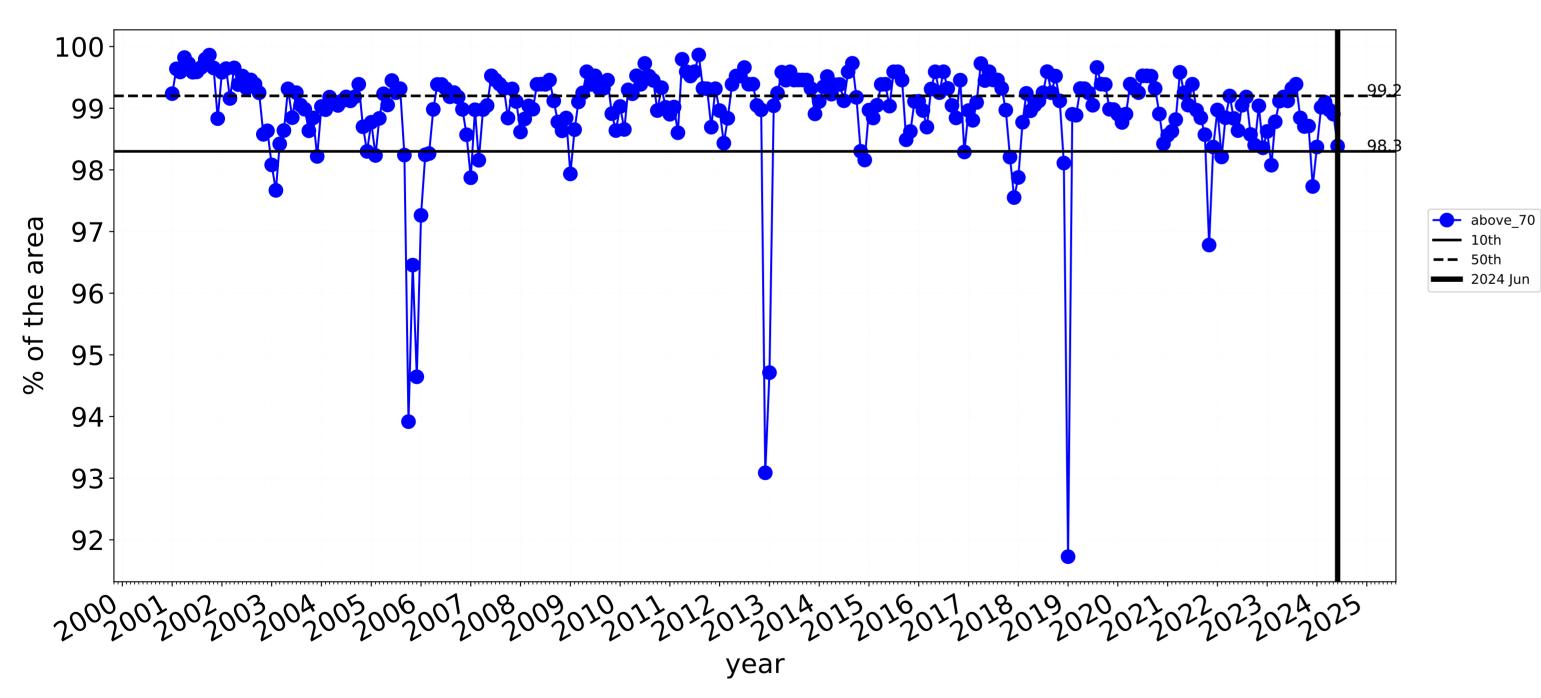


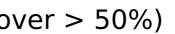
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Derived from



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

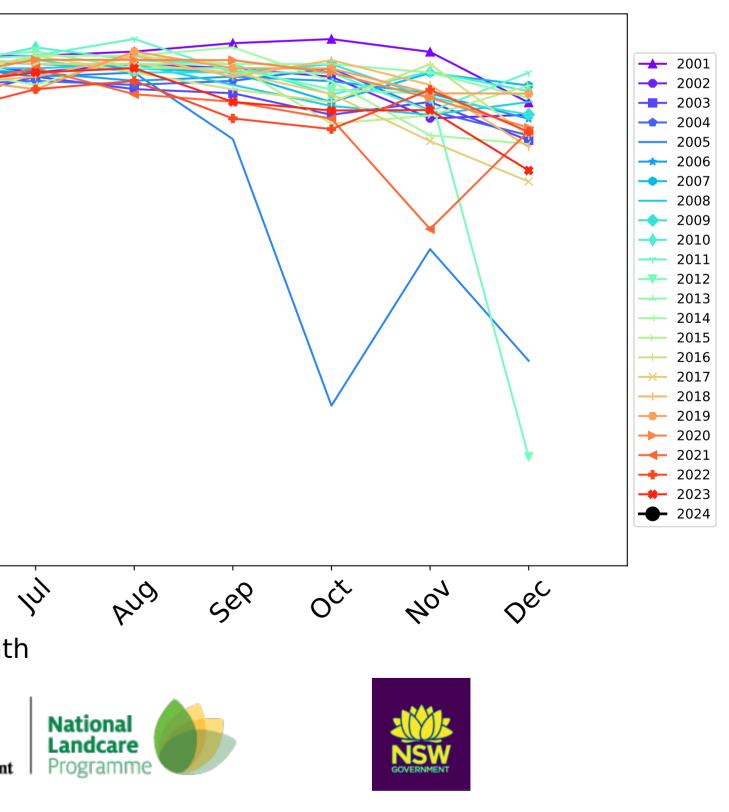


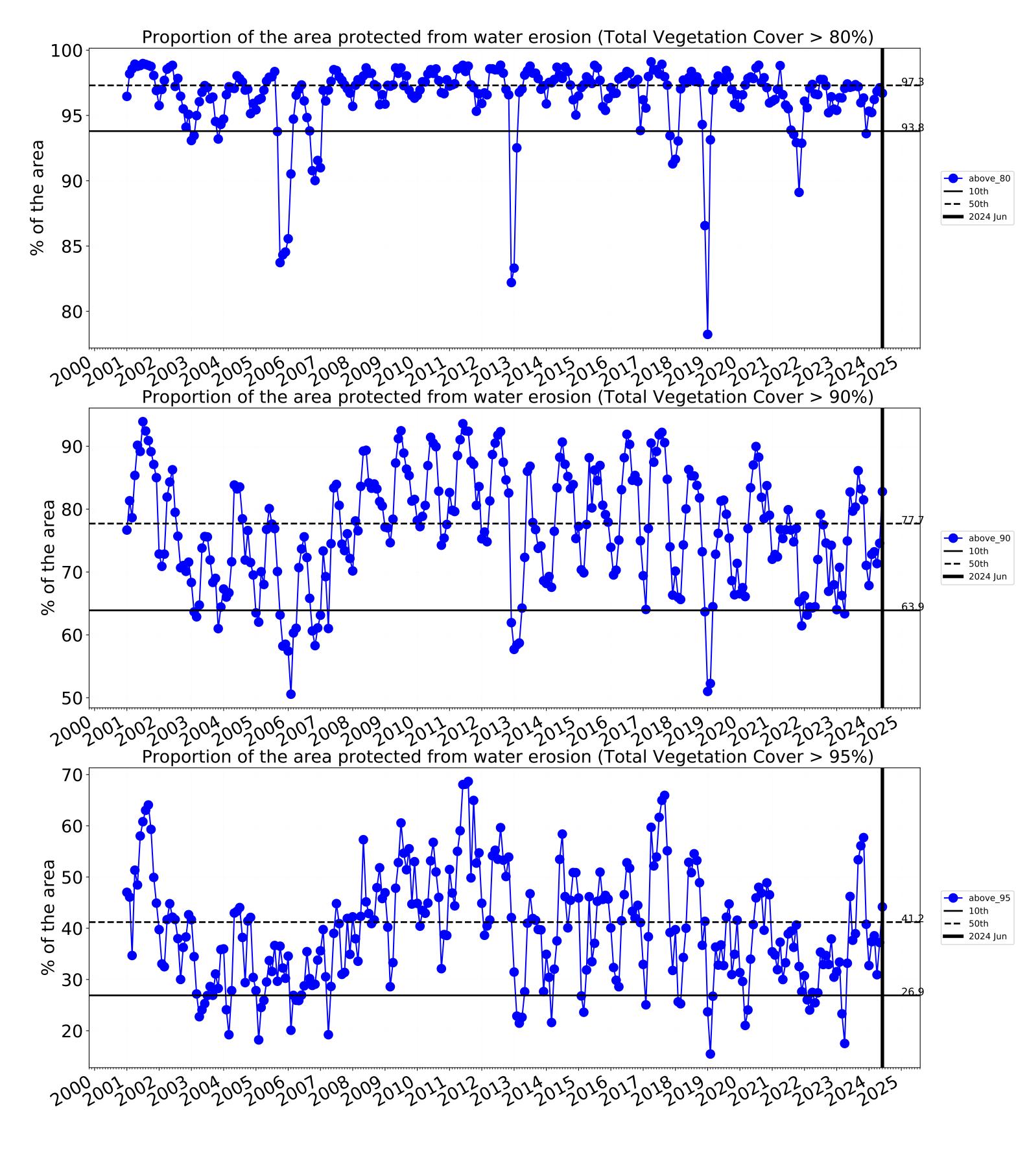


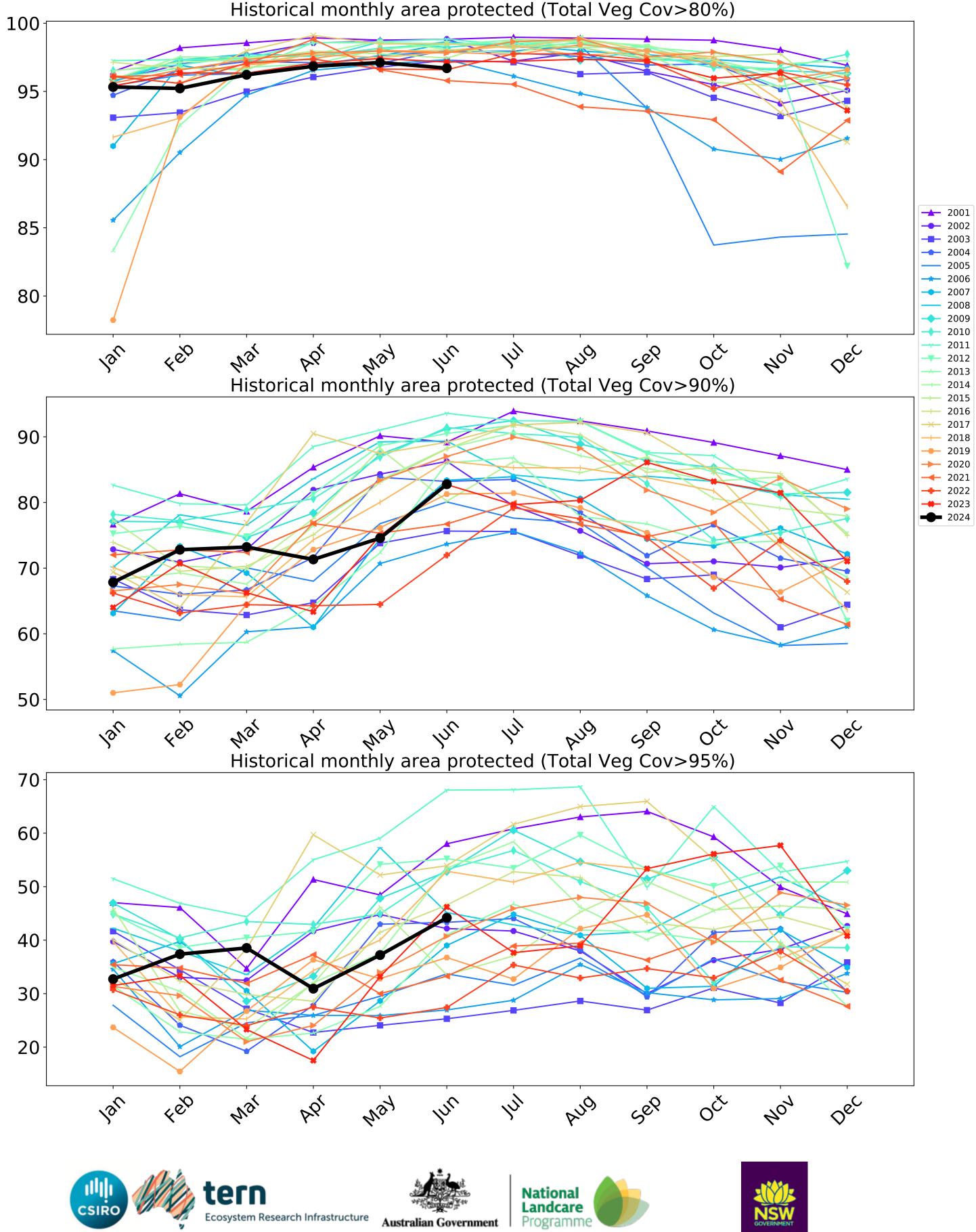
Wind erosion historical monthly area protected (Total Veg Cov >50%)

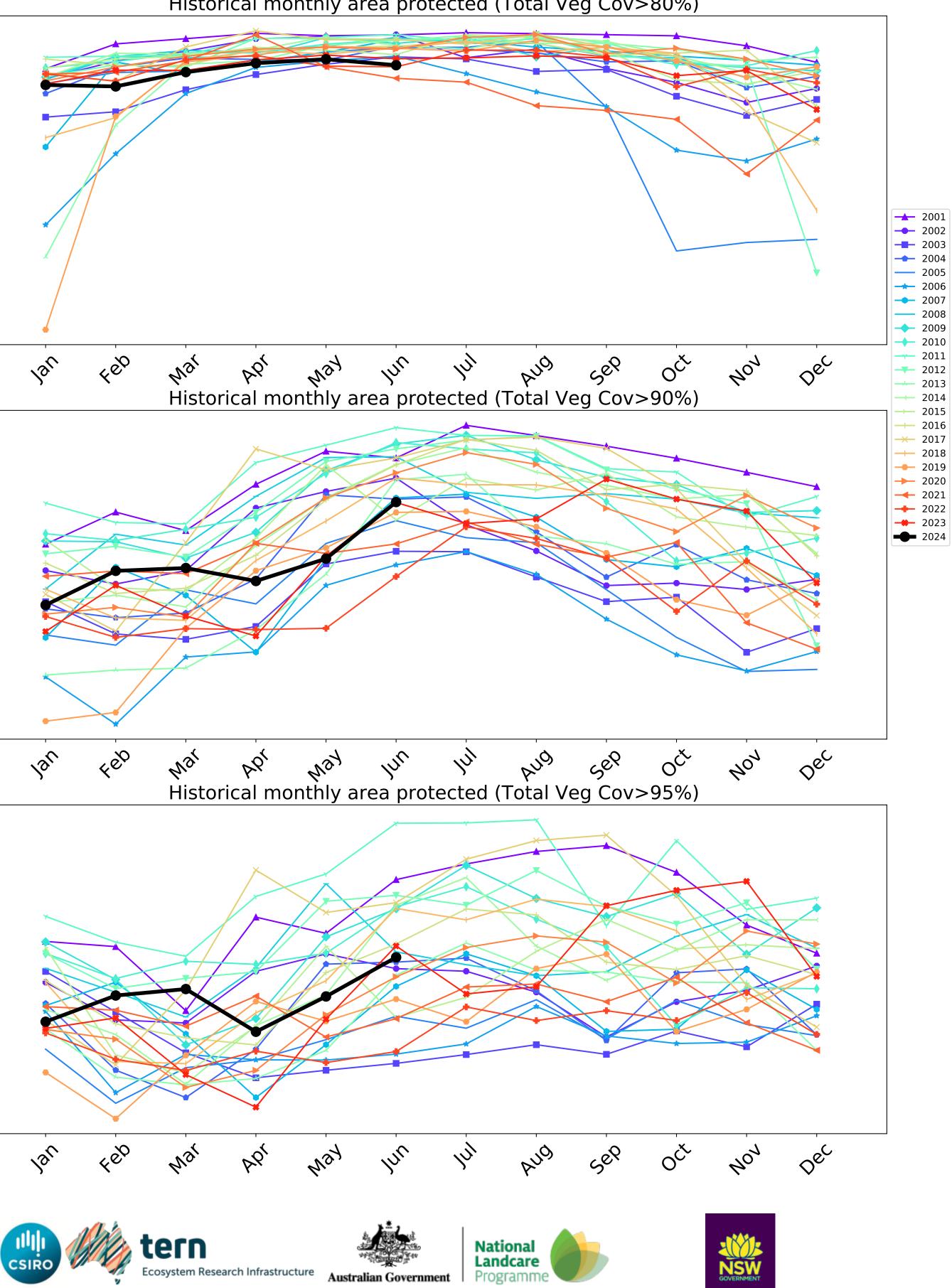
100 99 98 97 96 95⁻ 94 93 92 4eb Jan In way Mai PQ' month tern Ecosystem Research Infrastructure Australian Government

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





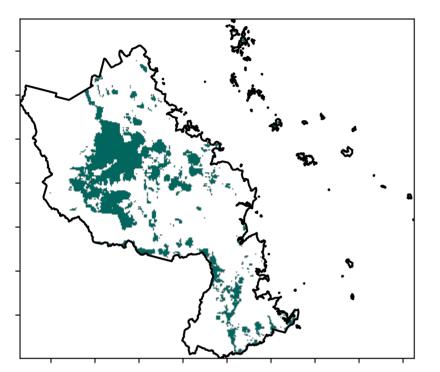




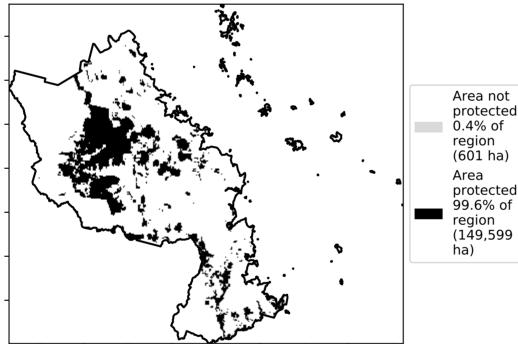
Conservation and natural environments Forest (non woodland)

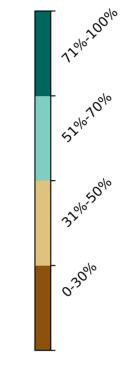
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

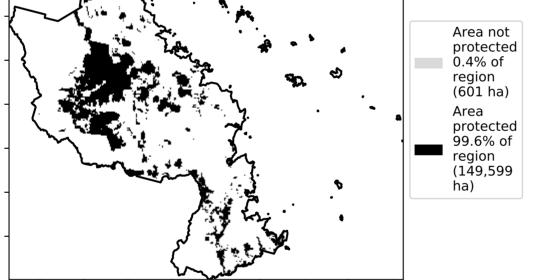
Total Vegetation Cover [%]



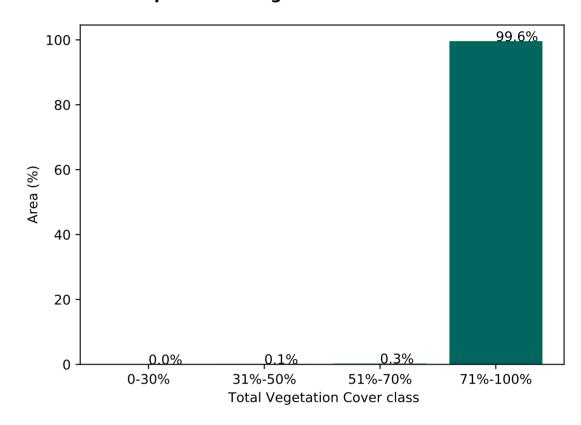
% Area protected from water erosion (>70%)



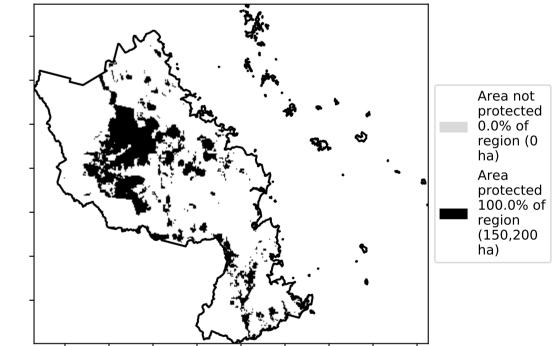




Proportion of vegetation cover class in area

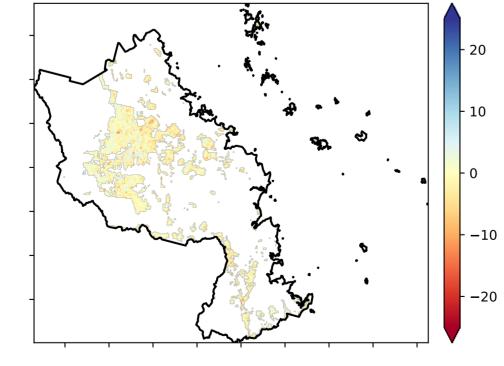


% Area protected from wind erosion (>50%)



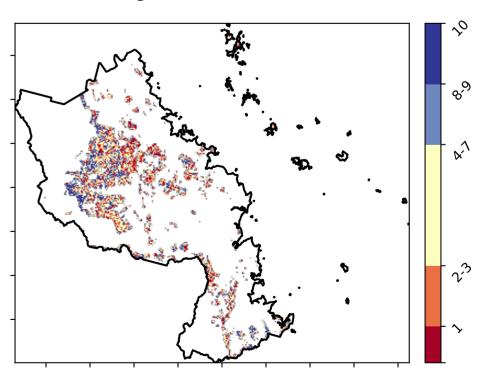
Total Vegetation Cover Anomaly [%]

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.

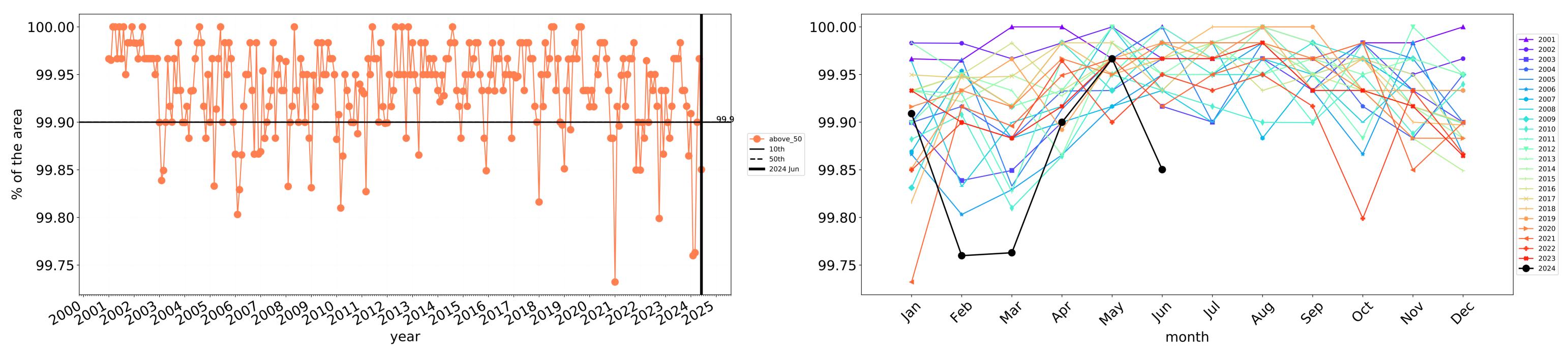


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.

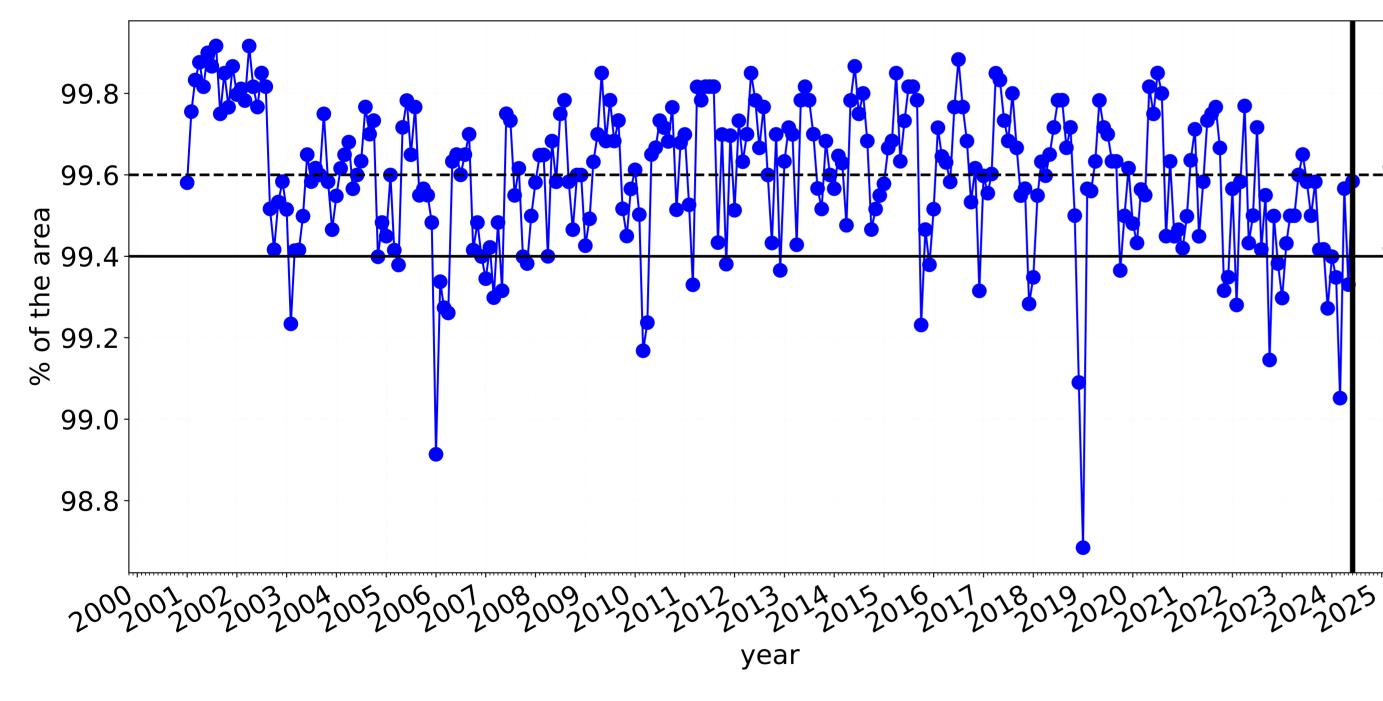
Total Vegetation Cover Decile [%]







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

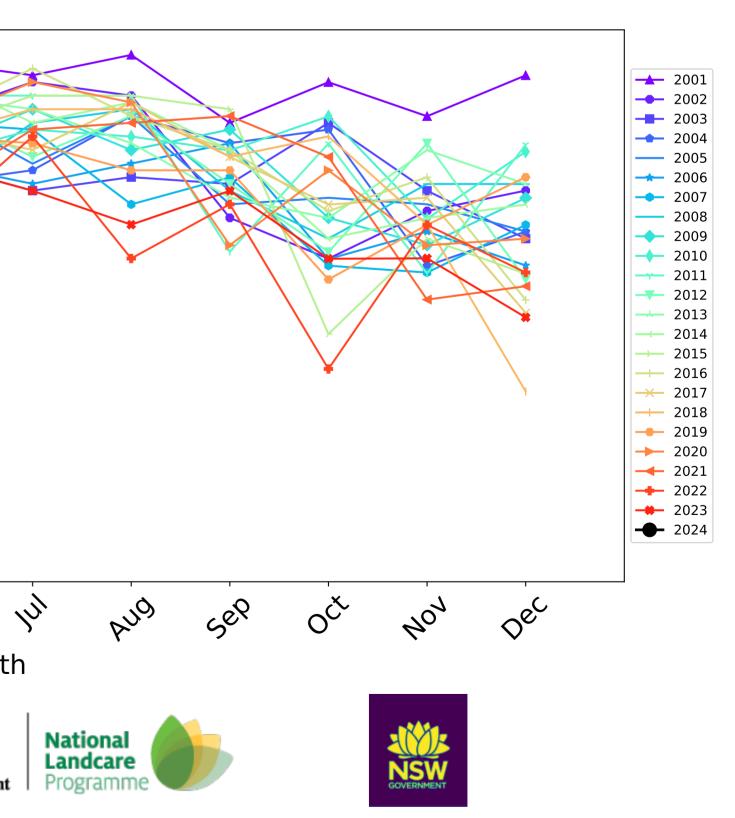


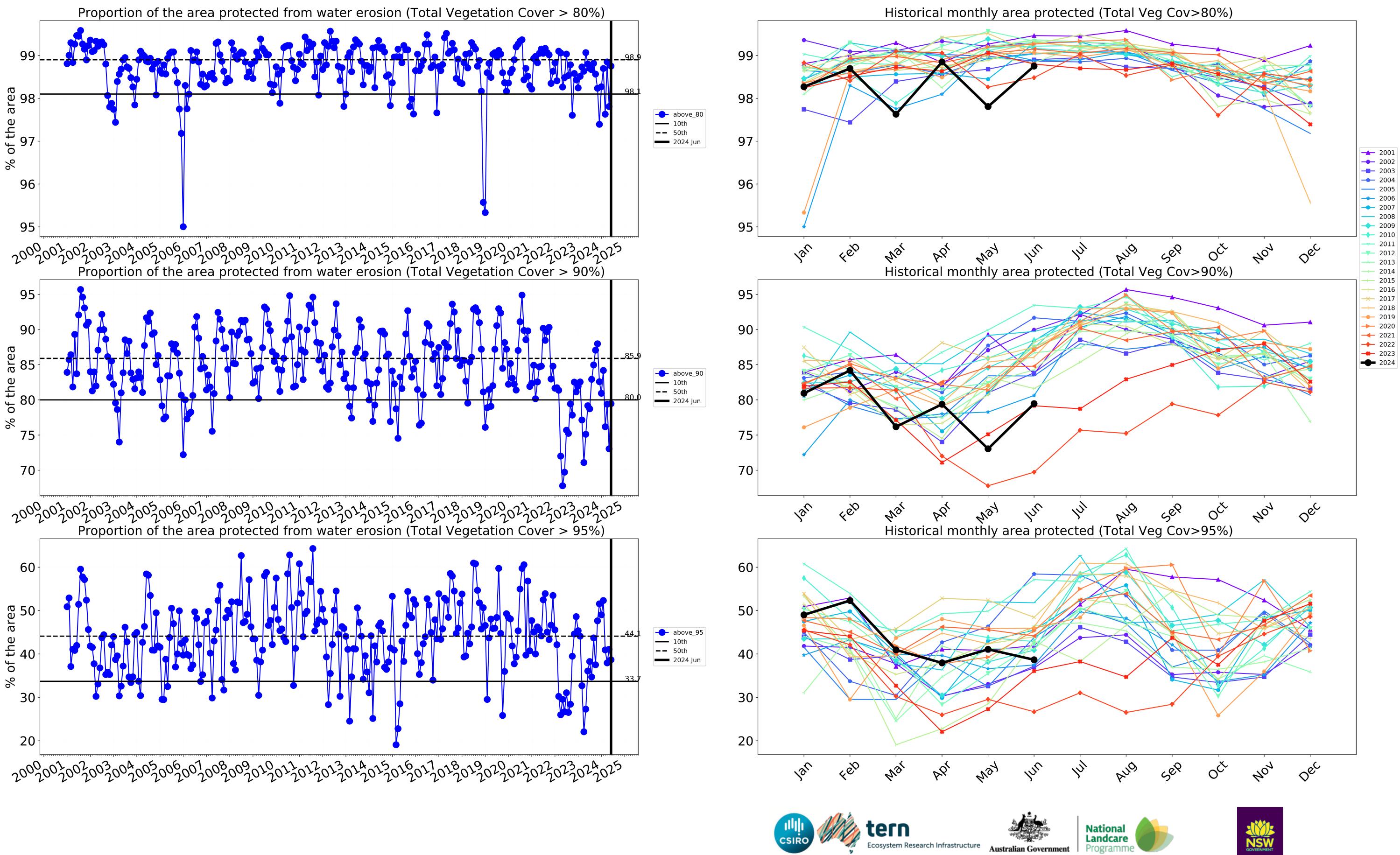
Wind erosion historical monthly area protected (Total Veg Cov >50%)

99.8 99.6 --- above_70 **—** 10th **--** 50th 99.4 **——** 2024 Jun 99.2 99.0 98.8 feb 12r May In P.Q1 Mai month mli tern Ecosystem Research Infrastructure Australian Government

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

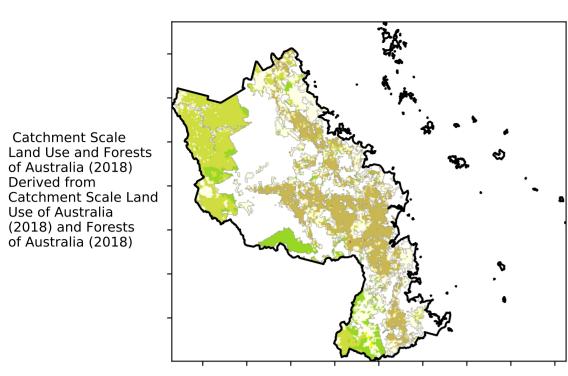




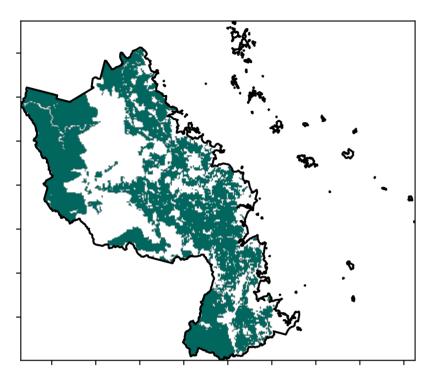


Agriculture

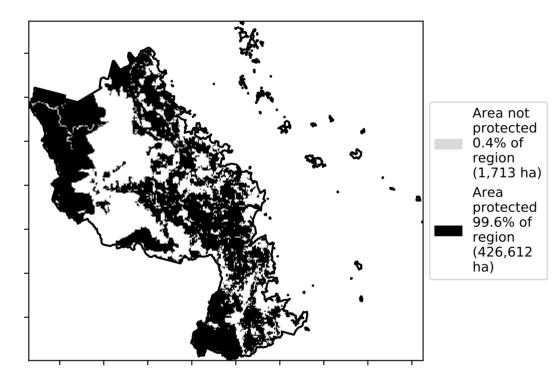
Land use and forest cover

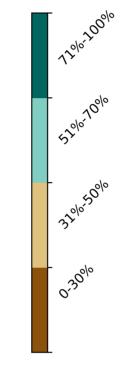


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





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

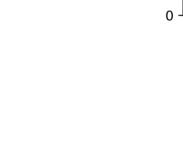
4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated

7 Agriculture - Horticulture - Non-irrigated

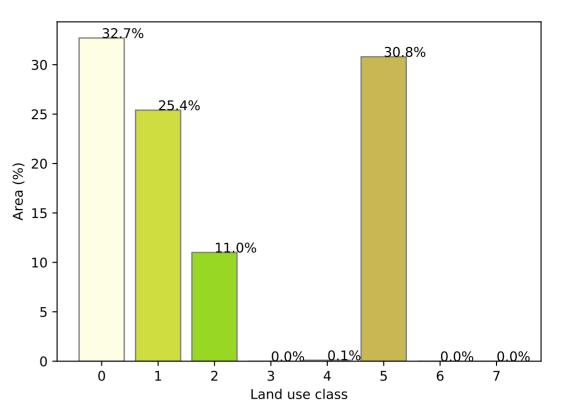
6 Agriculture - Cropping - Irrigated

8 Agriculture - Horticulture - Irrigated

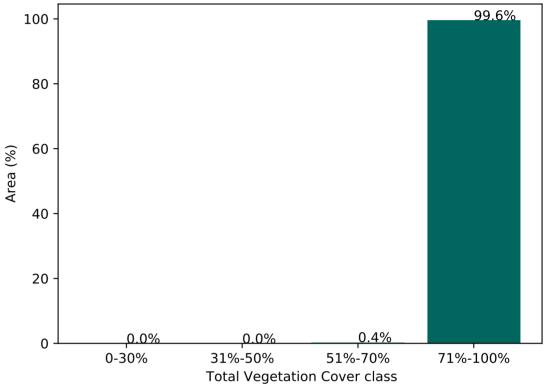
3 Agriculture - Grazing - Non-woodland forest



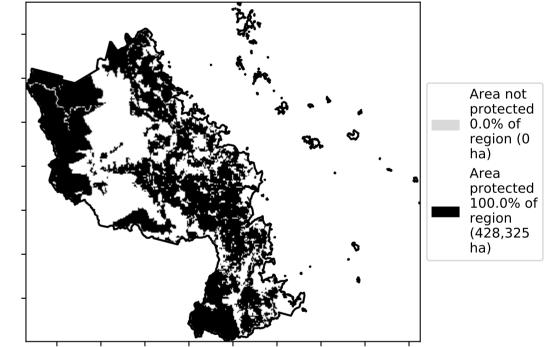
Proportion of each land class in area



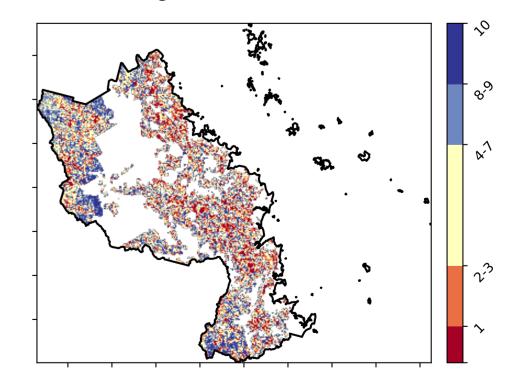
Proportion of vegetation cover class in area



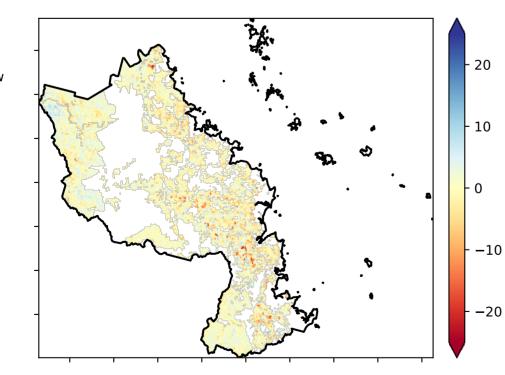
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



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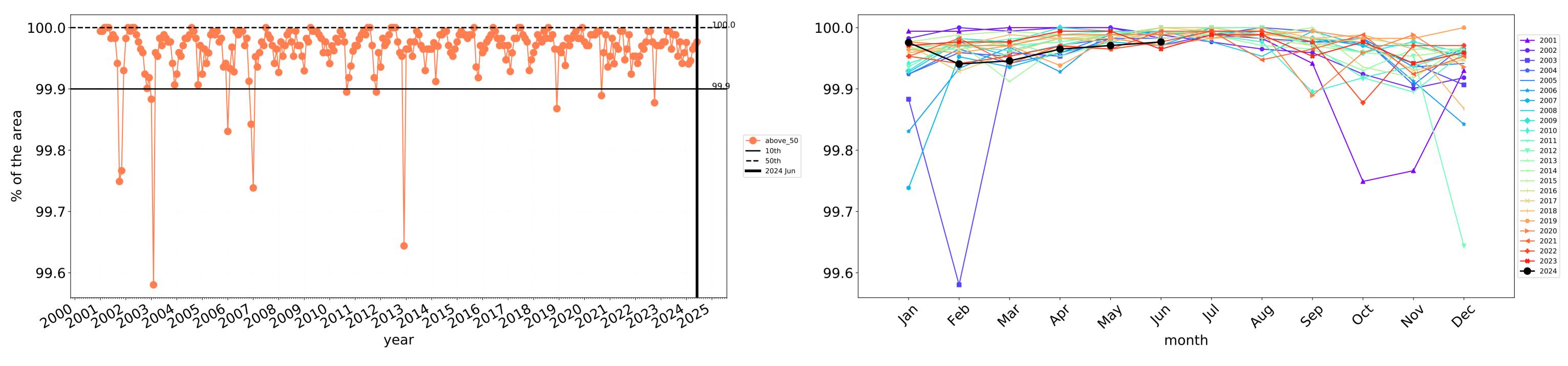




Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

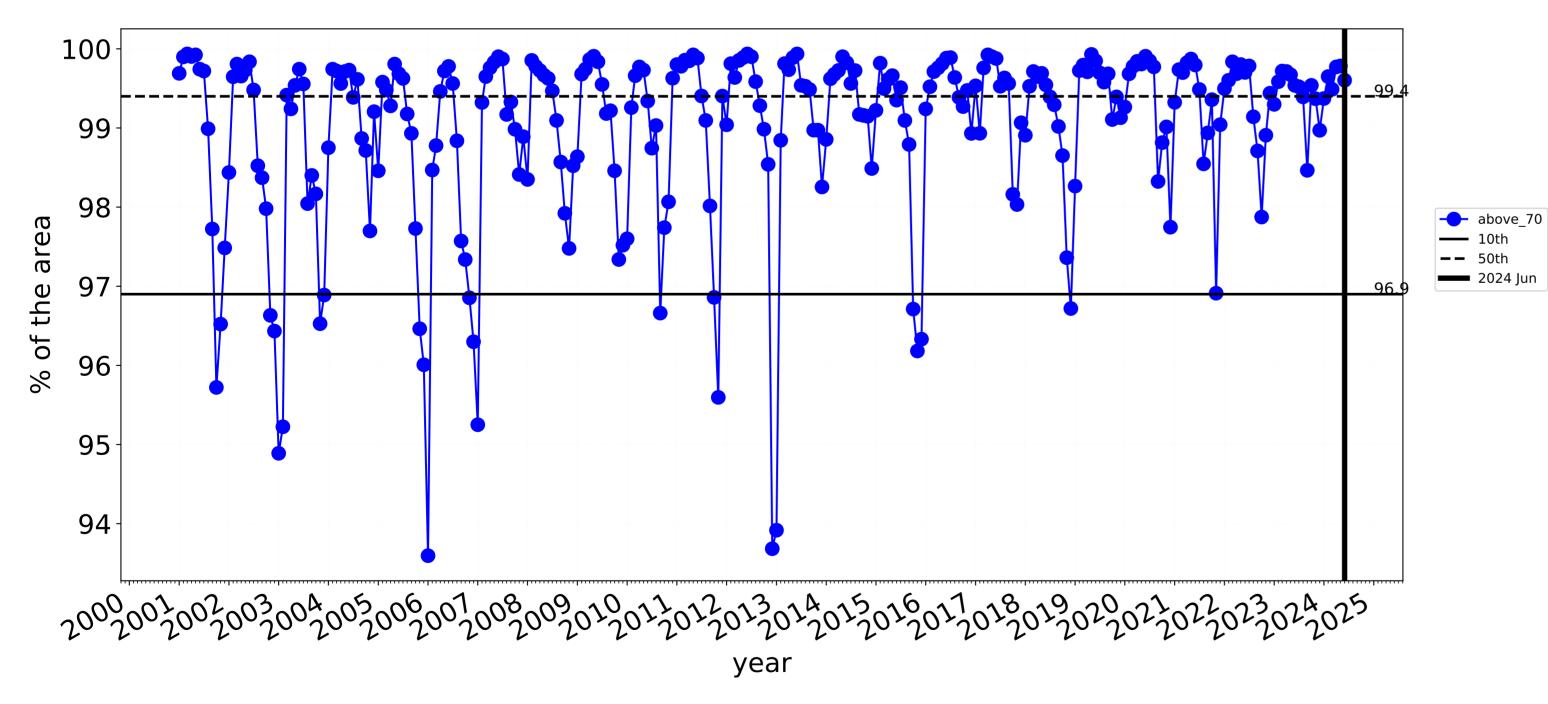
of Australia (2018)



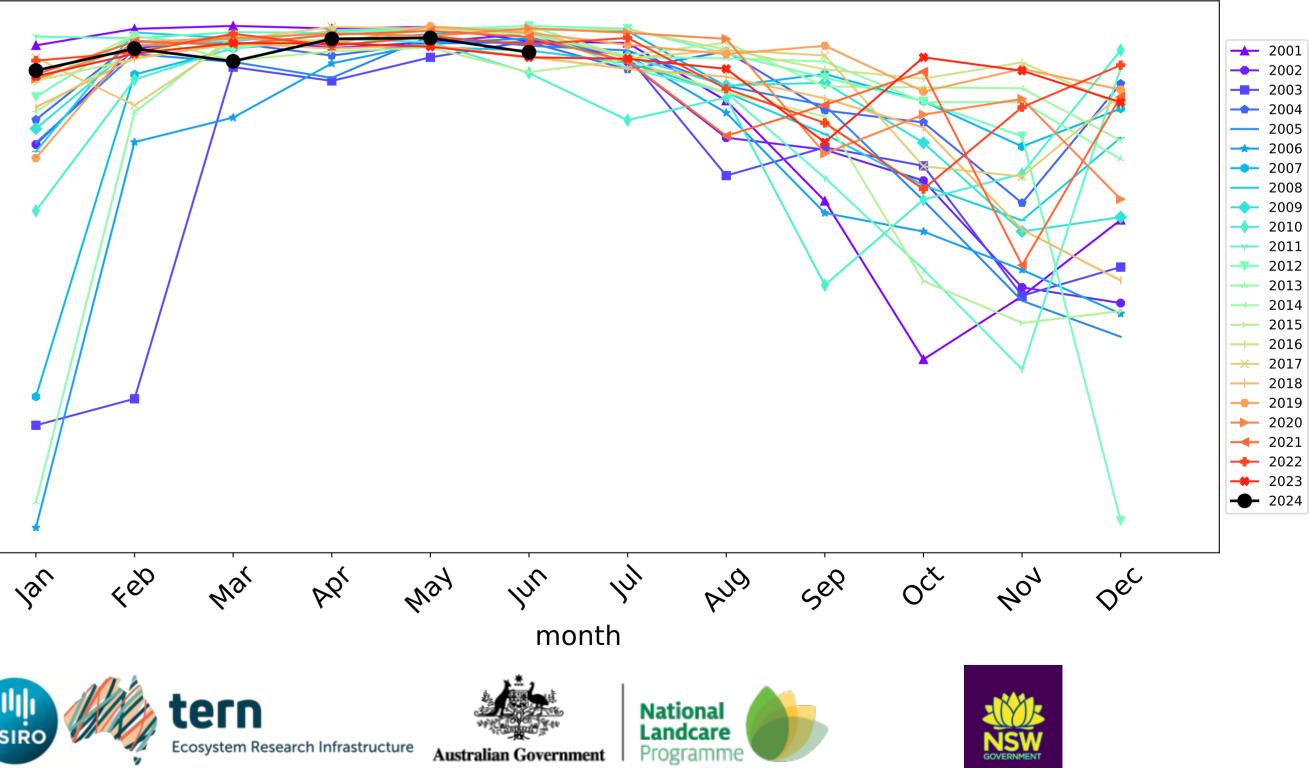


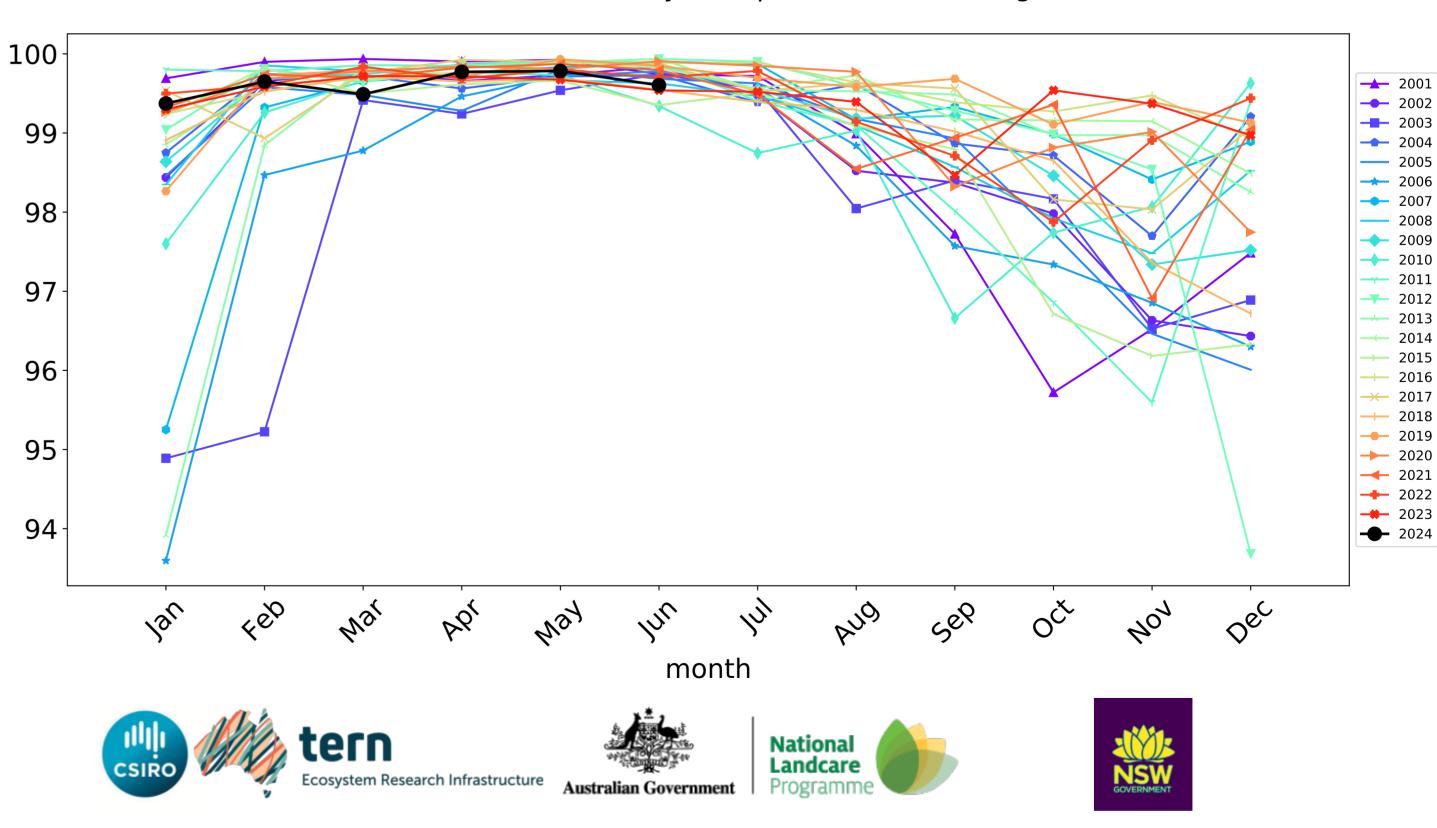
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



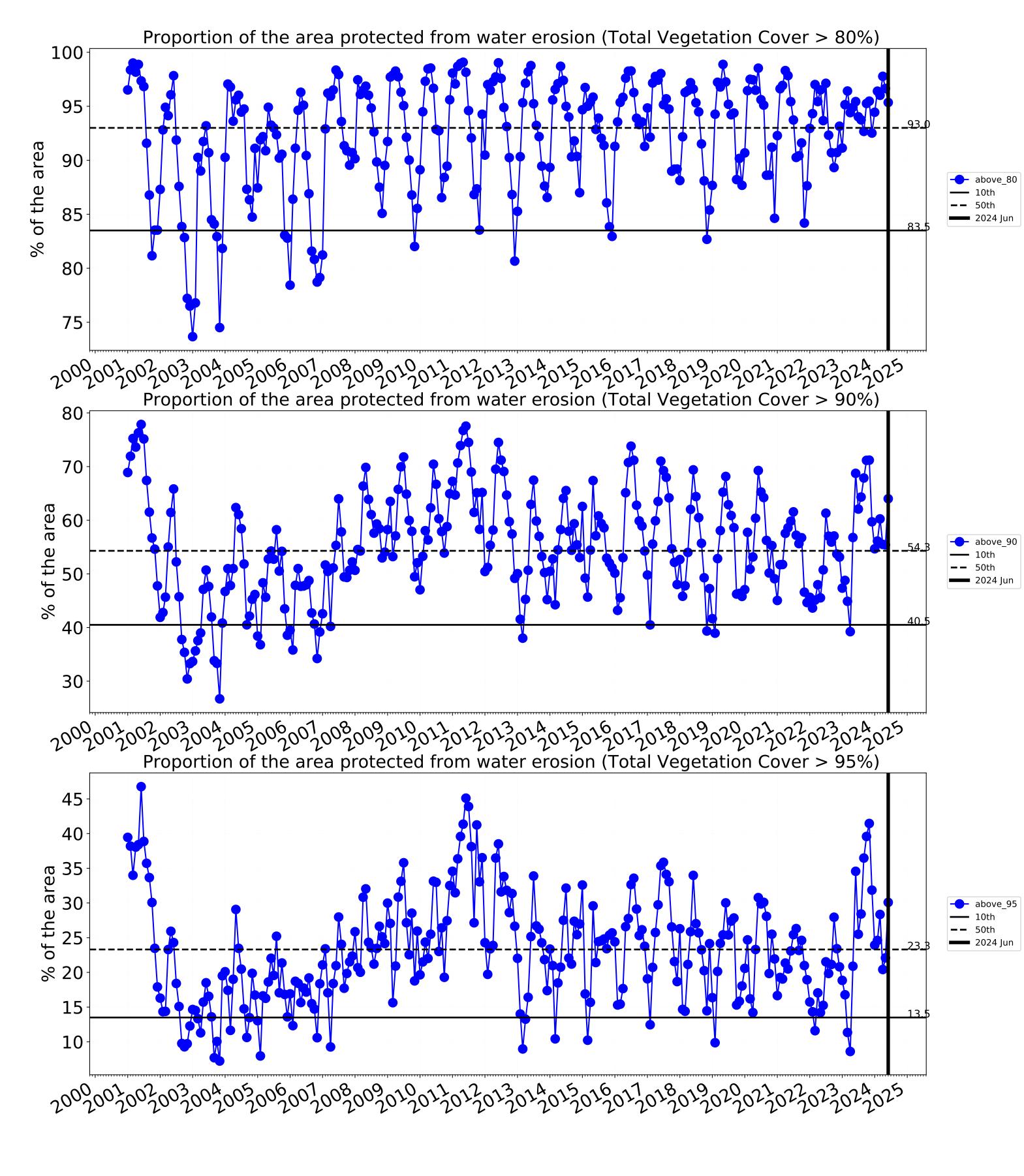


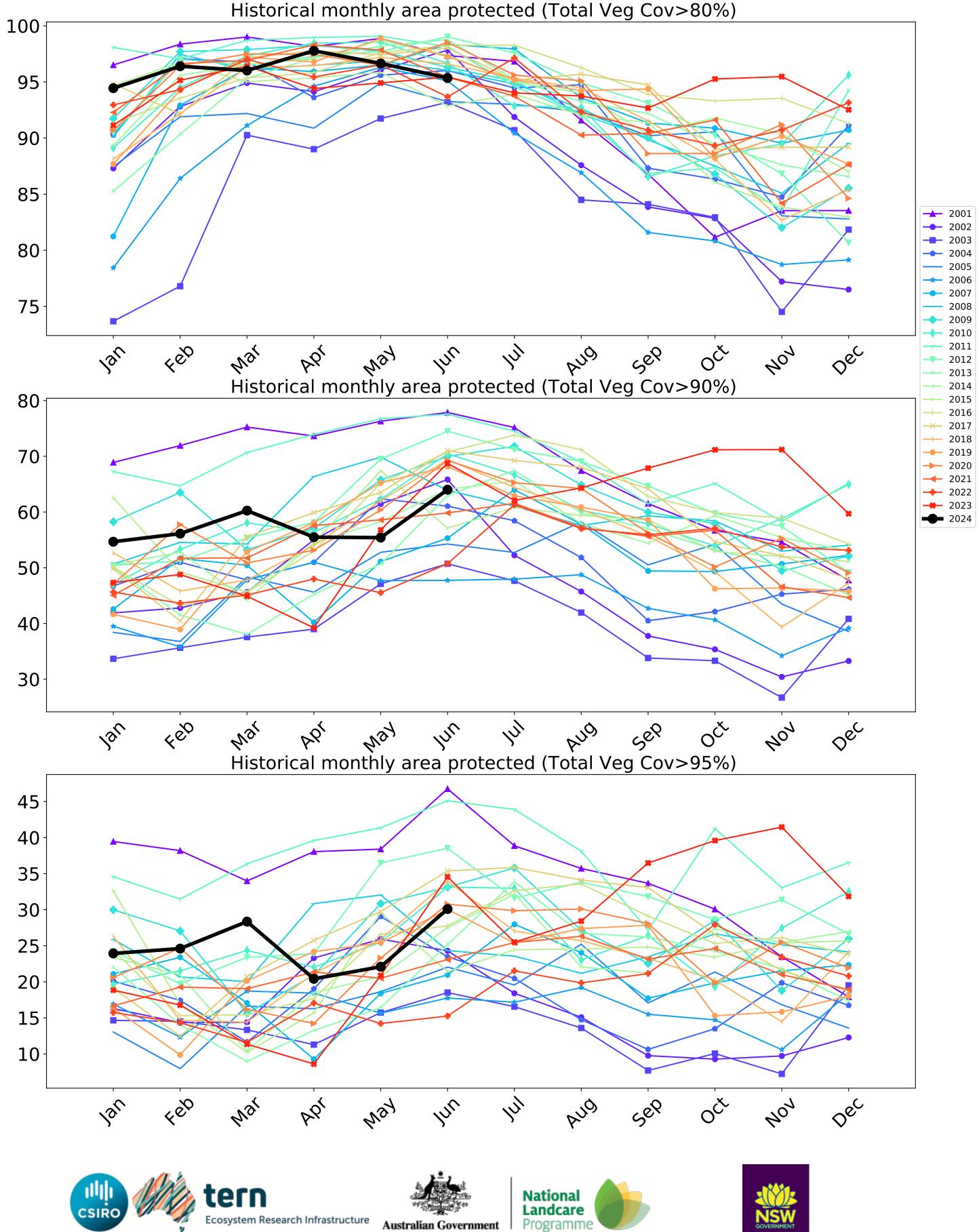
Wind erosion historical monthly area protected (Total Veg Cov >50%)





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

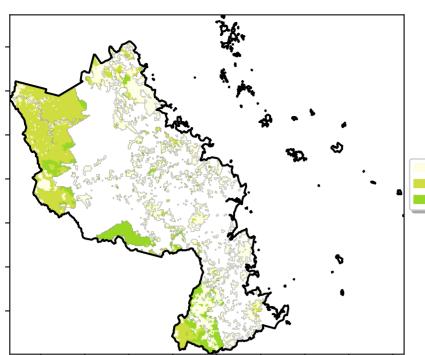






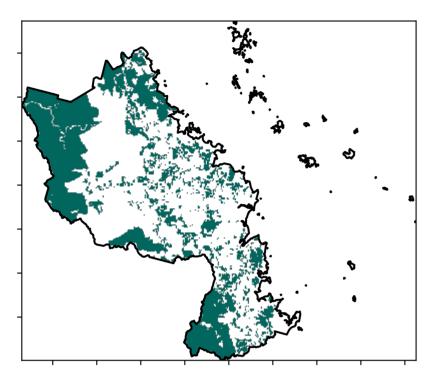
Grazing

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

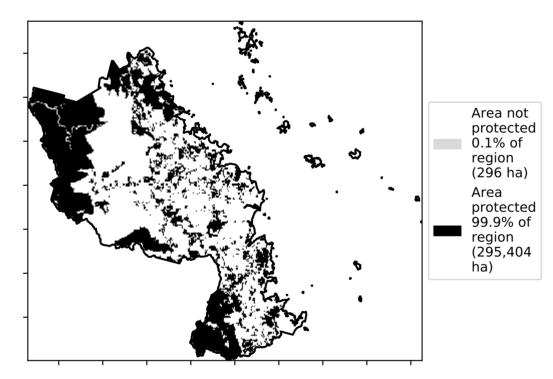


Land use and forest cover

Total Vegetation Cover [%]



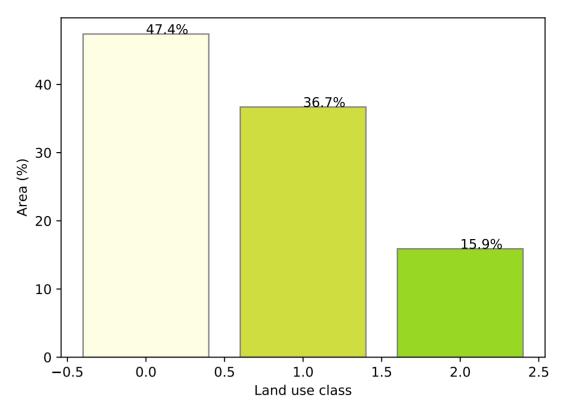
% Area protected from water erosion (>70%)



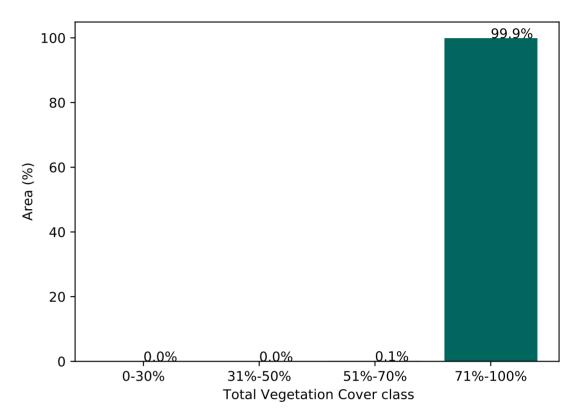
1200,1000 · 520/07/00/0 32005000 0.30%

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

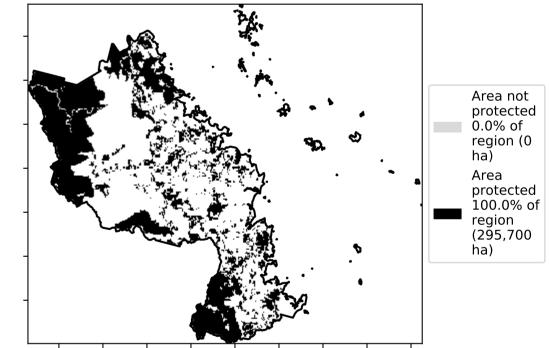
Proportion of each land class in area



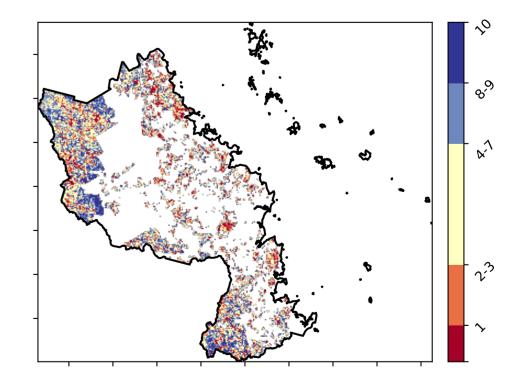
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

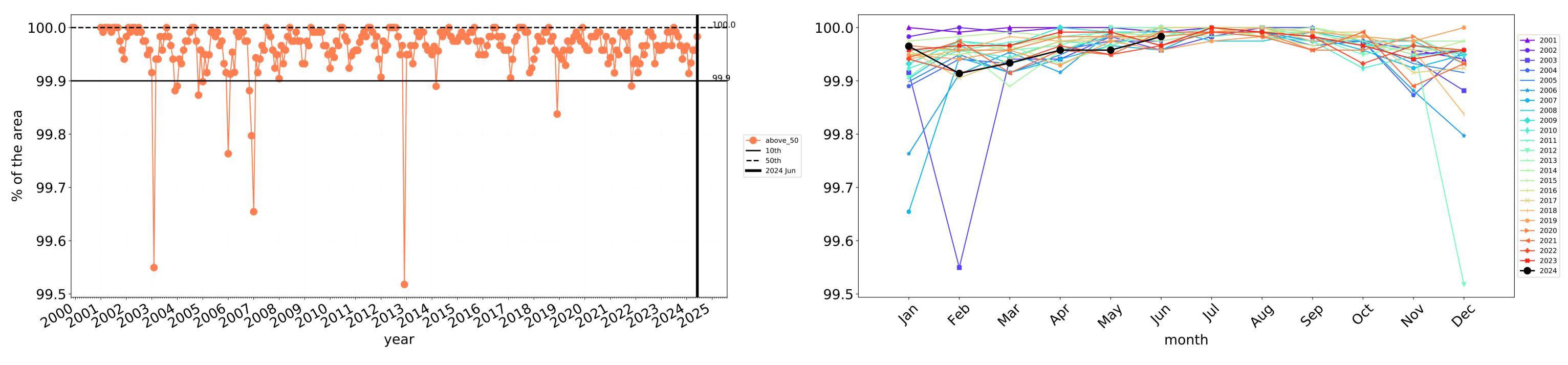
፞፝፞ዾዸ - 20 - 10 0 -10 -20

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.

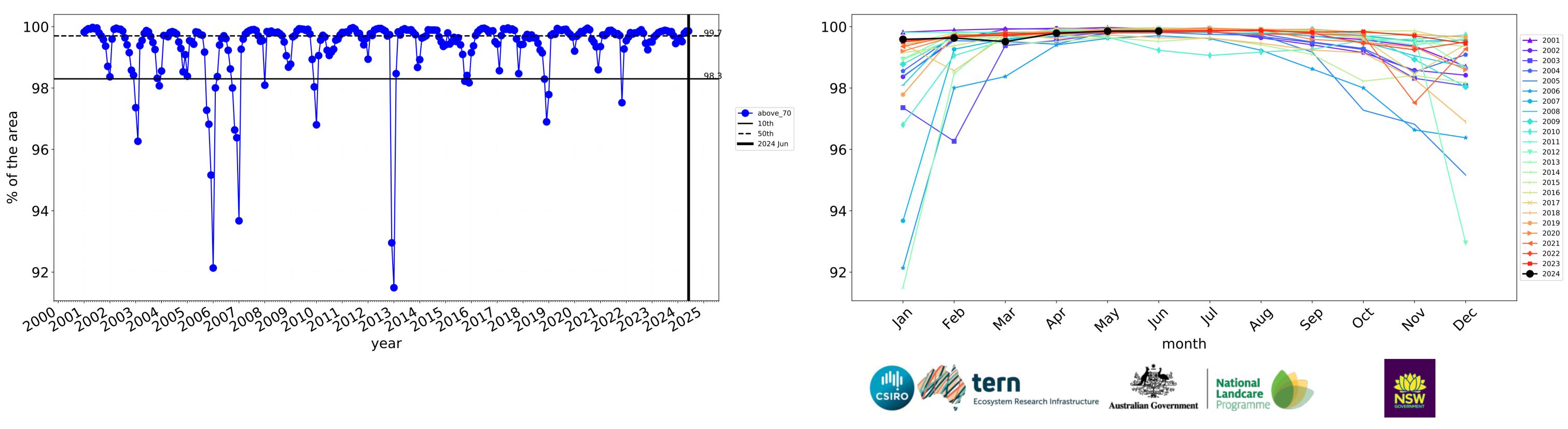


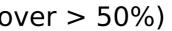


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



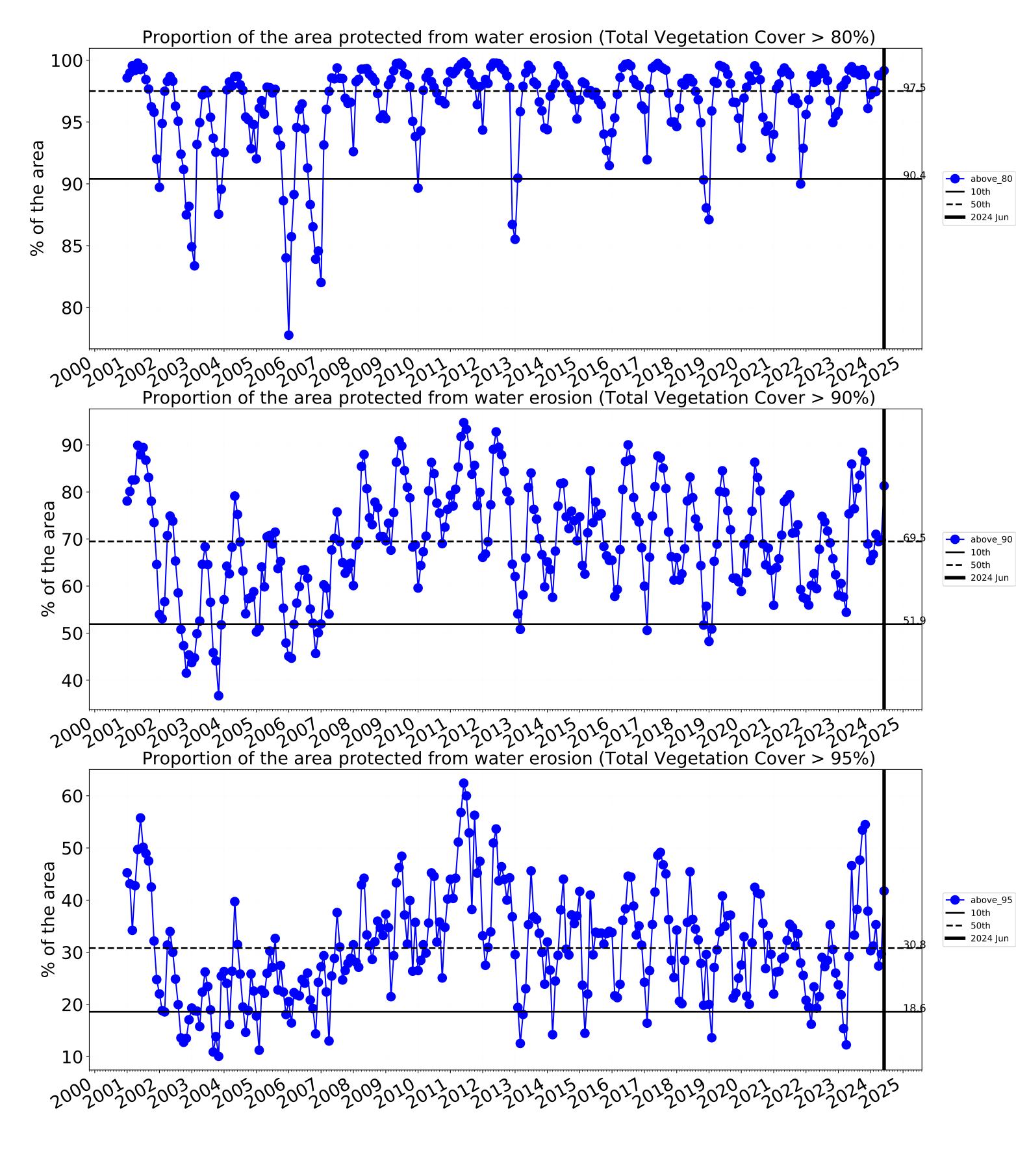
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

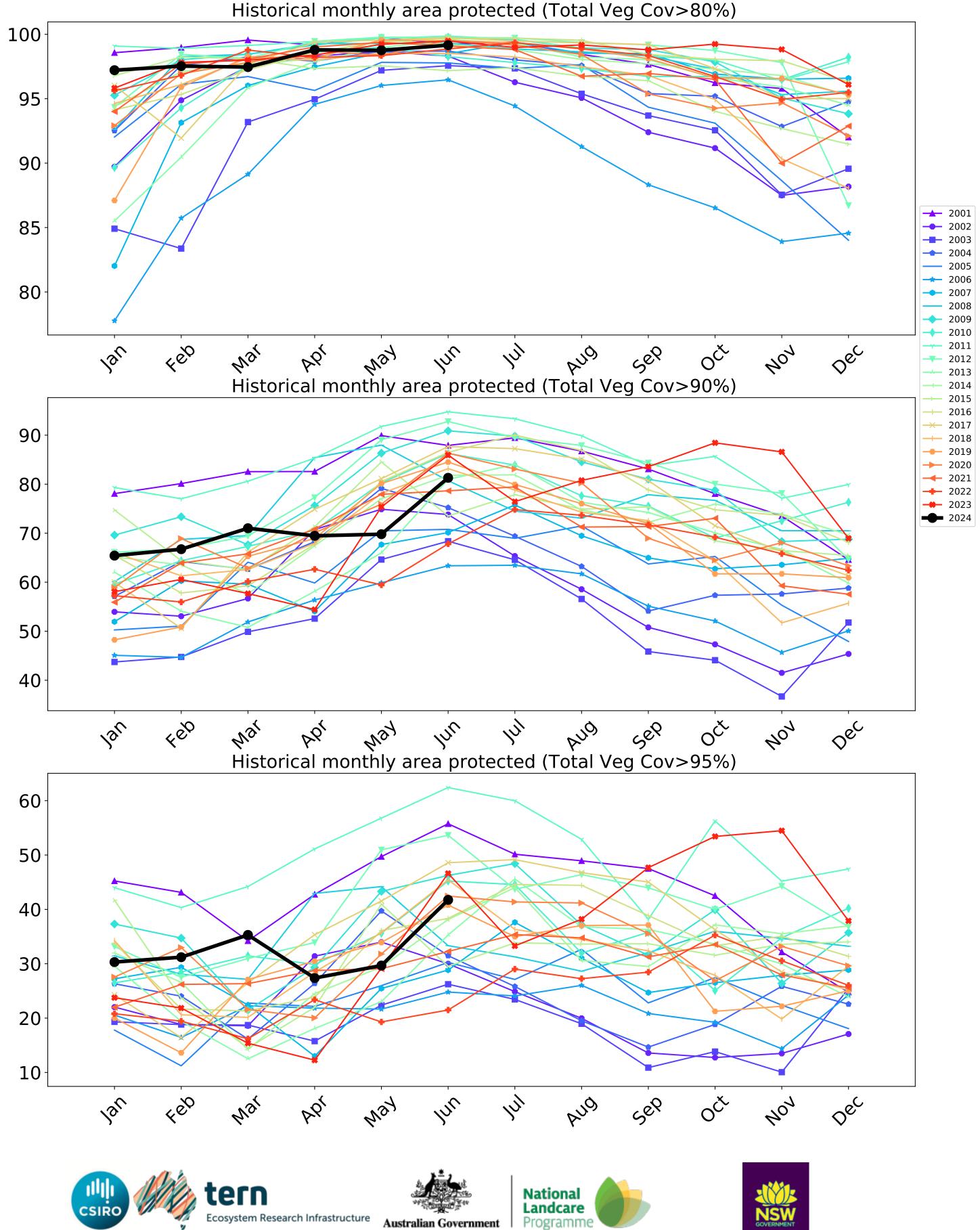




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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







Grazing non forest

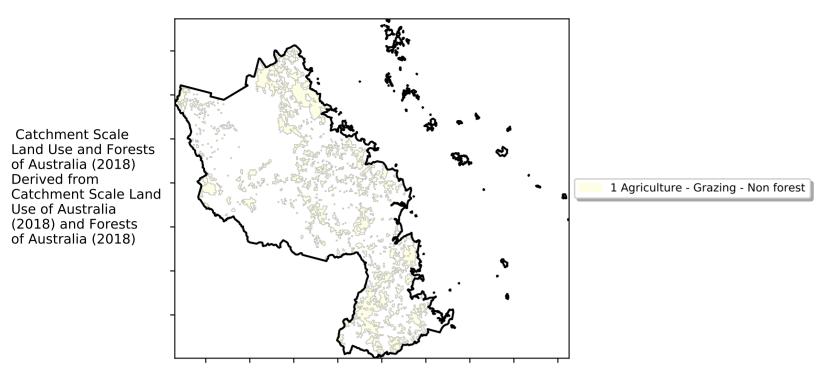
12%200%

· 52°1070010

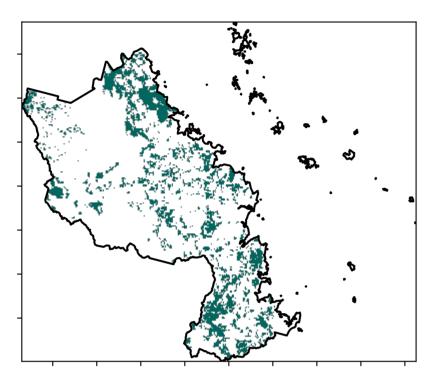
· 320050010

0.30%

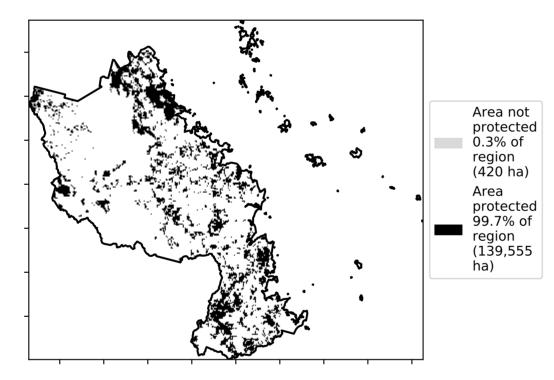
Land use and forest cover



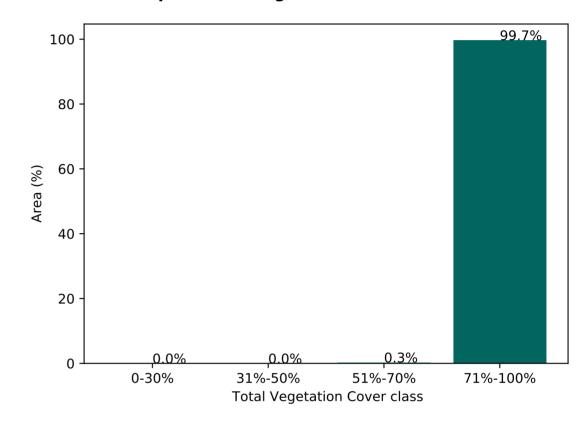
Total Vegetation Cover [%]



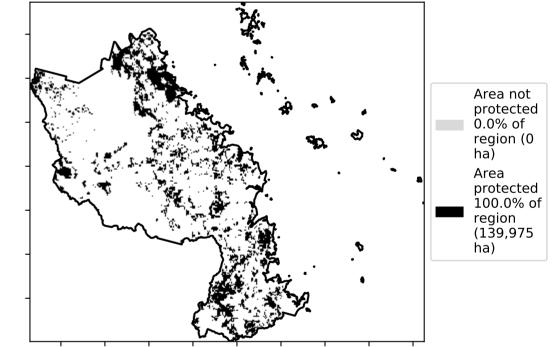
% Area protected from water erosion (>70%)



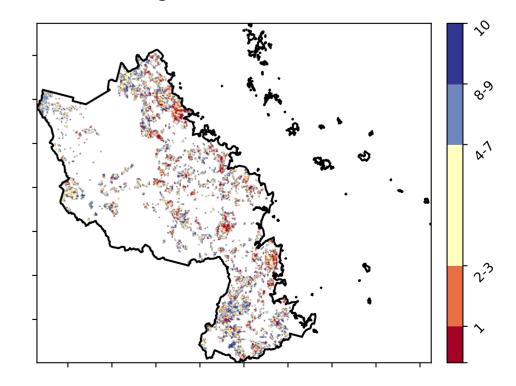
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

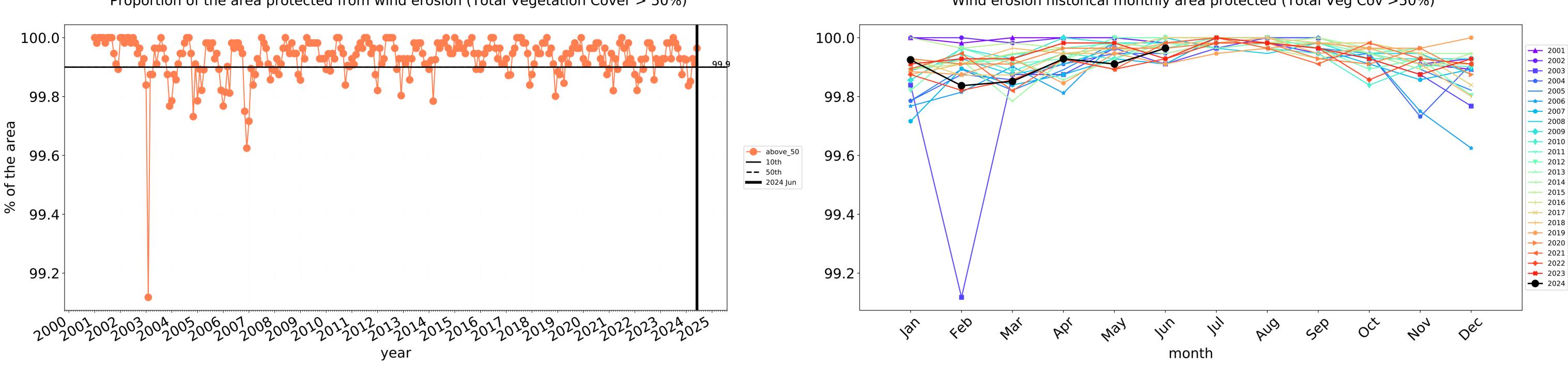
26 - 20 - 10 0 -10 -20

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.

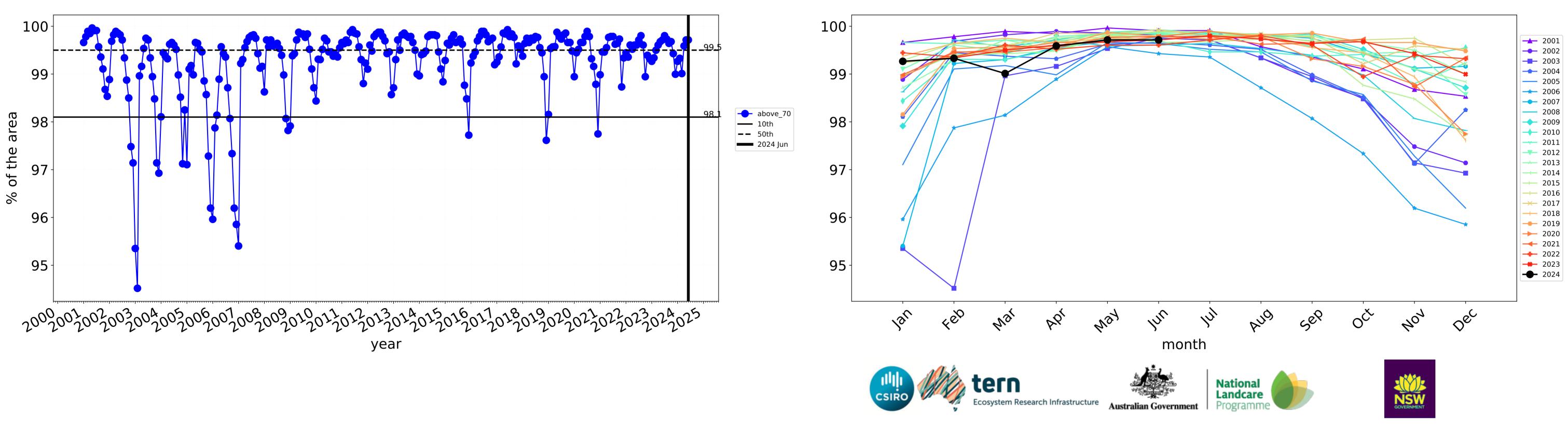




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

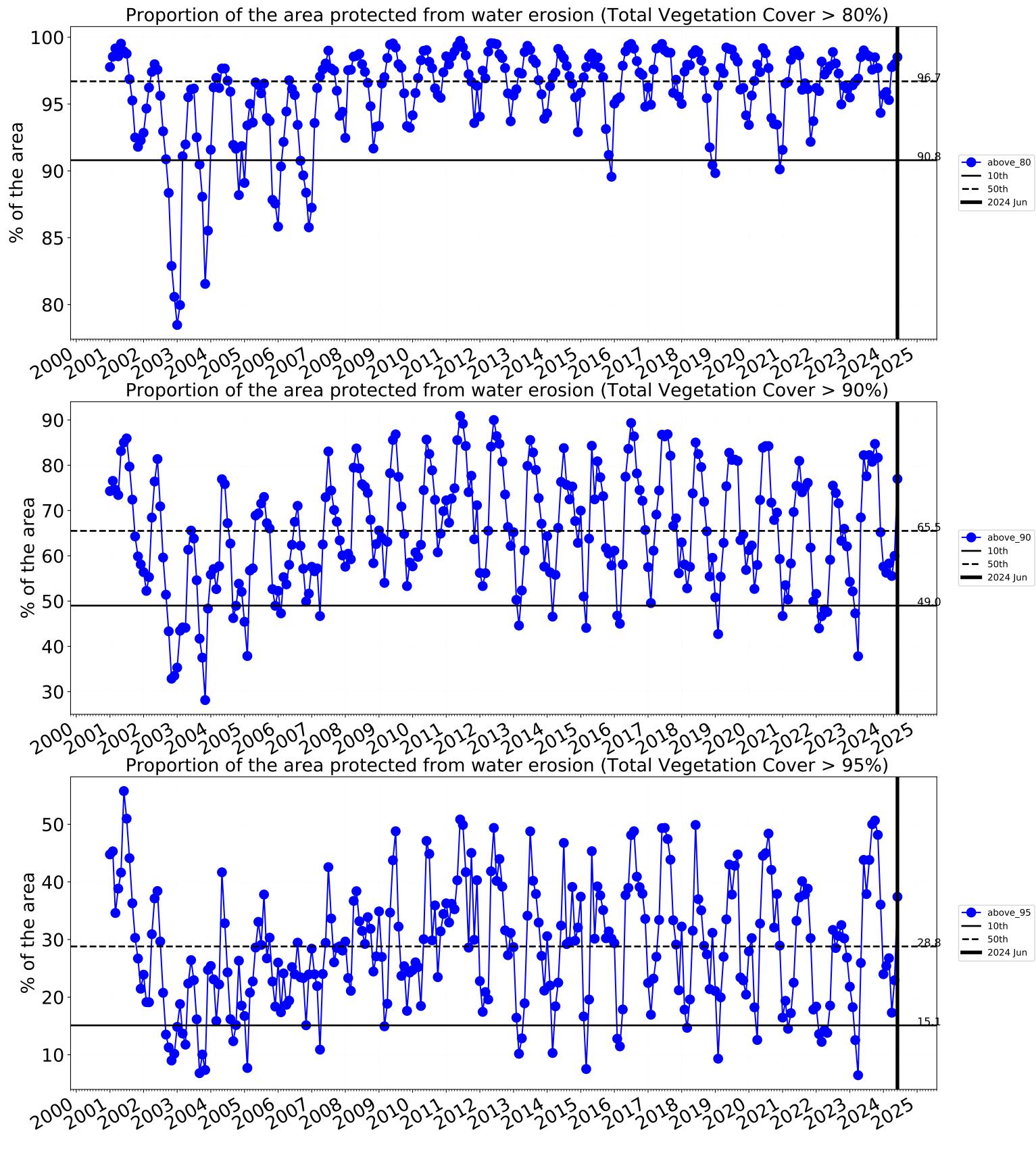


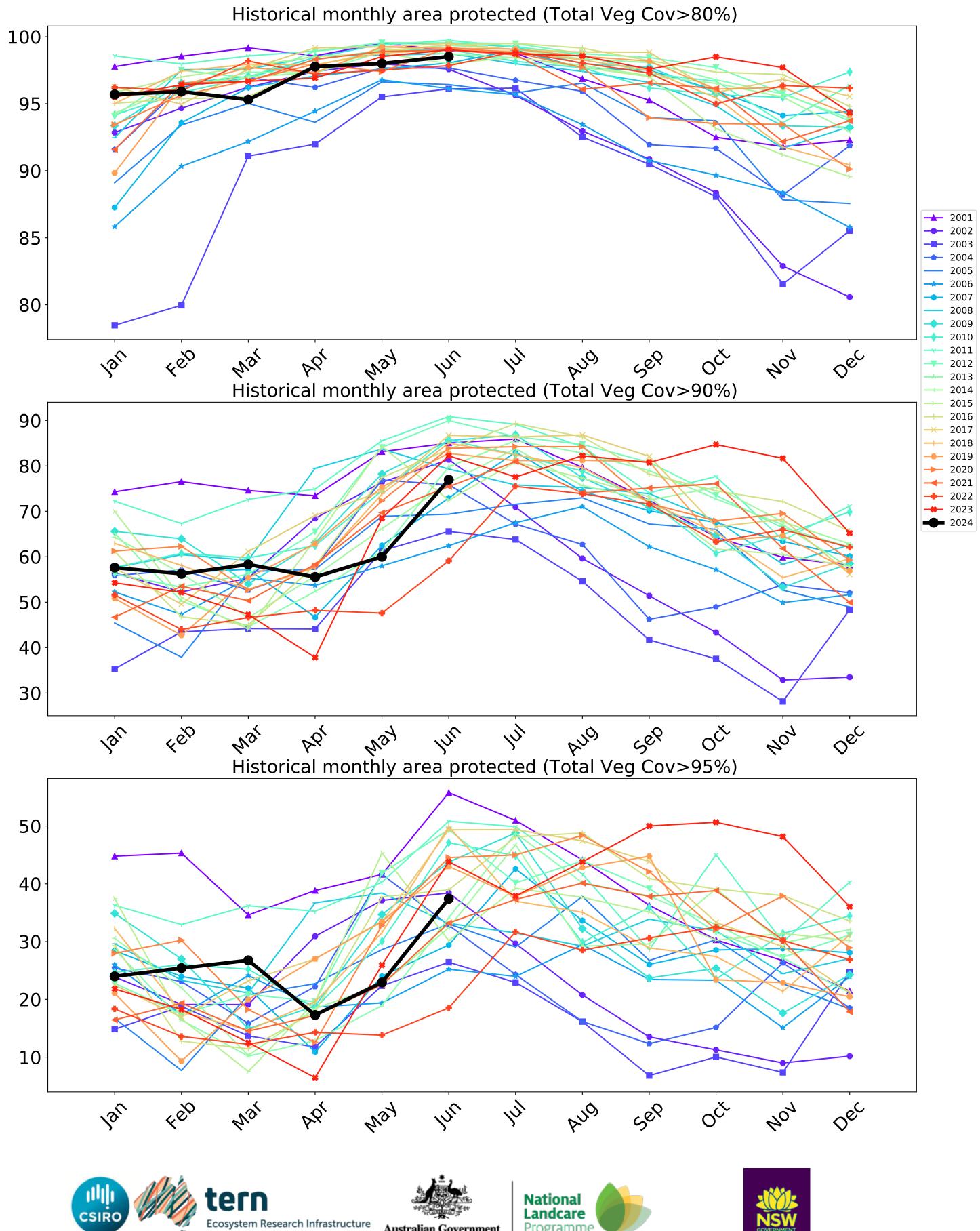
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





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





Programm

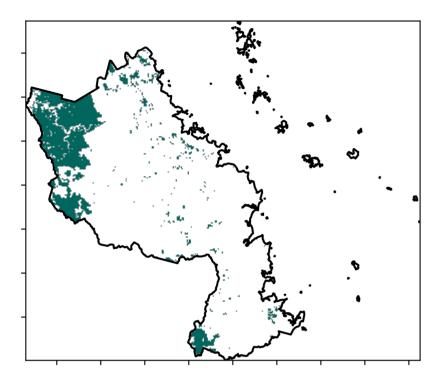


Grazing Woodland forest

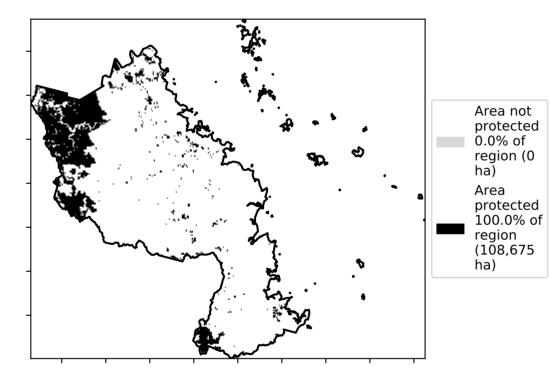
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

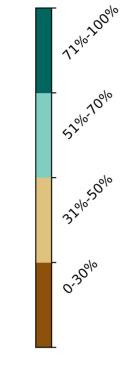
Total Vegetation Cover [%]

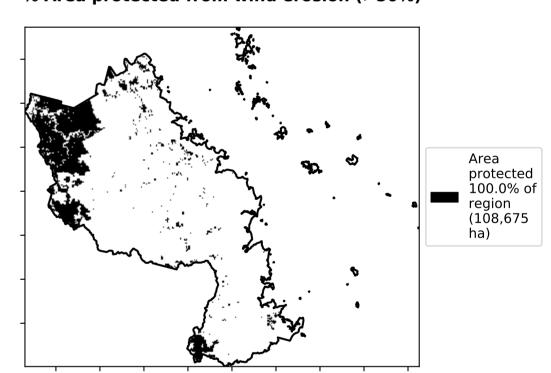
Land use and forest cover



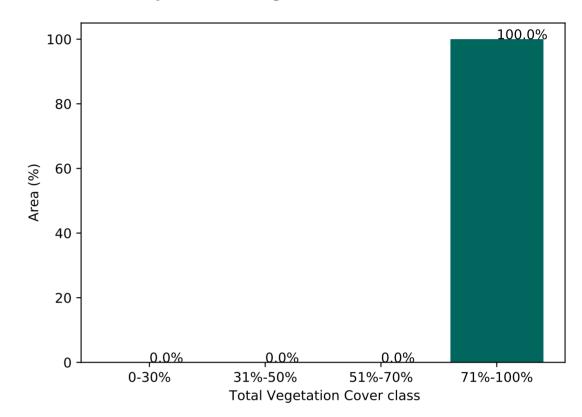
% Area protected from water erosion (>70%)





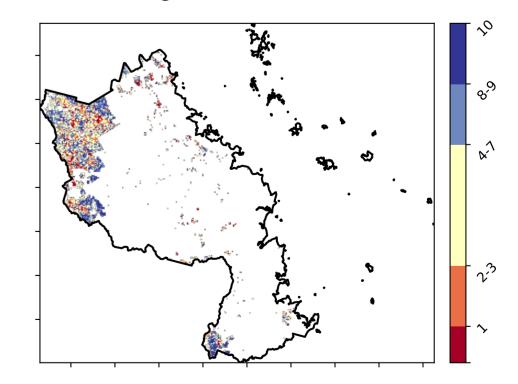


Proportion of vegetation cover class in area

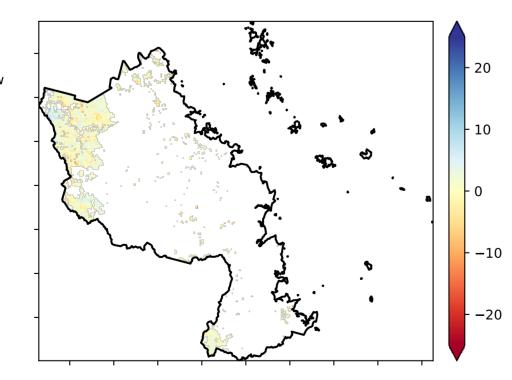


% Area protected from wind erosion (>50%)

Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

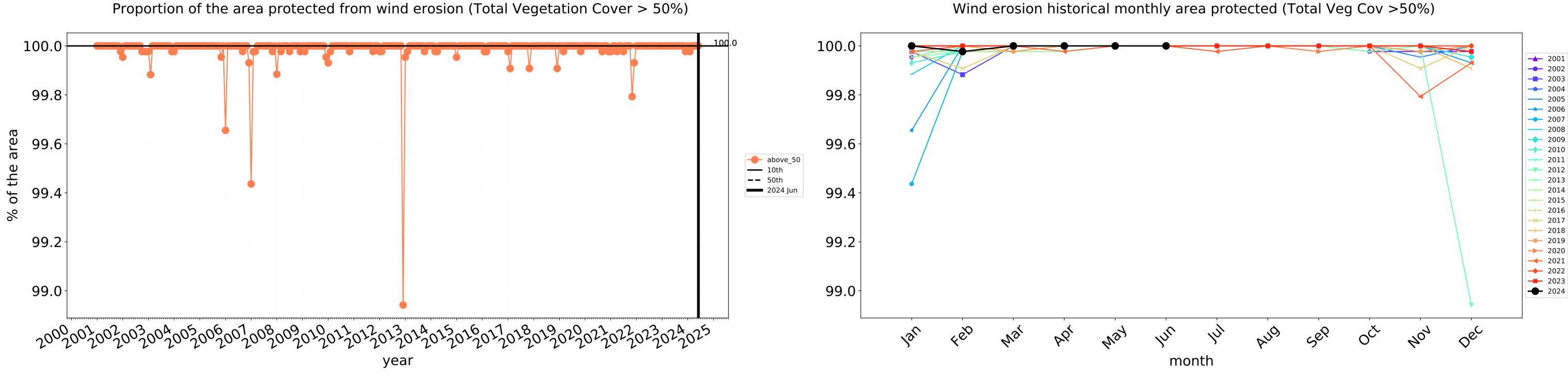


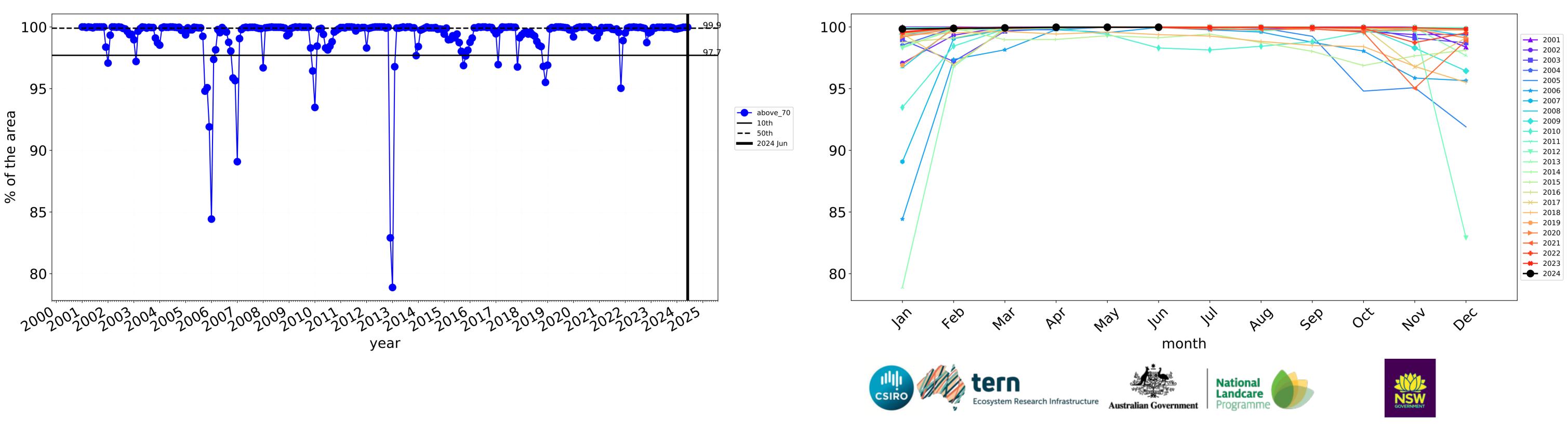
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



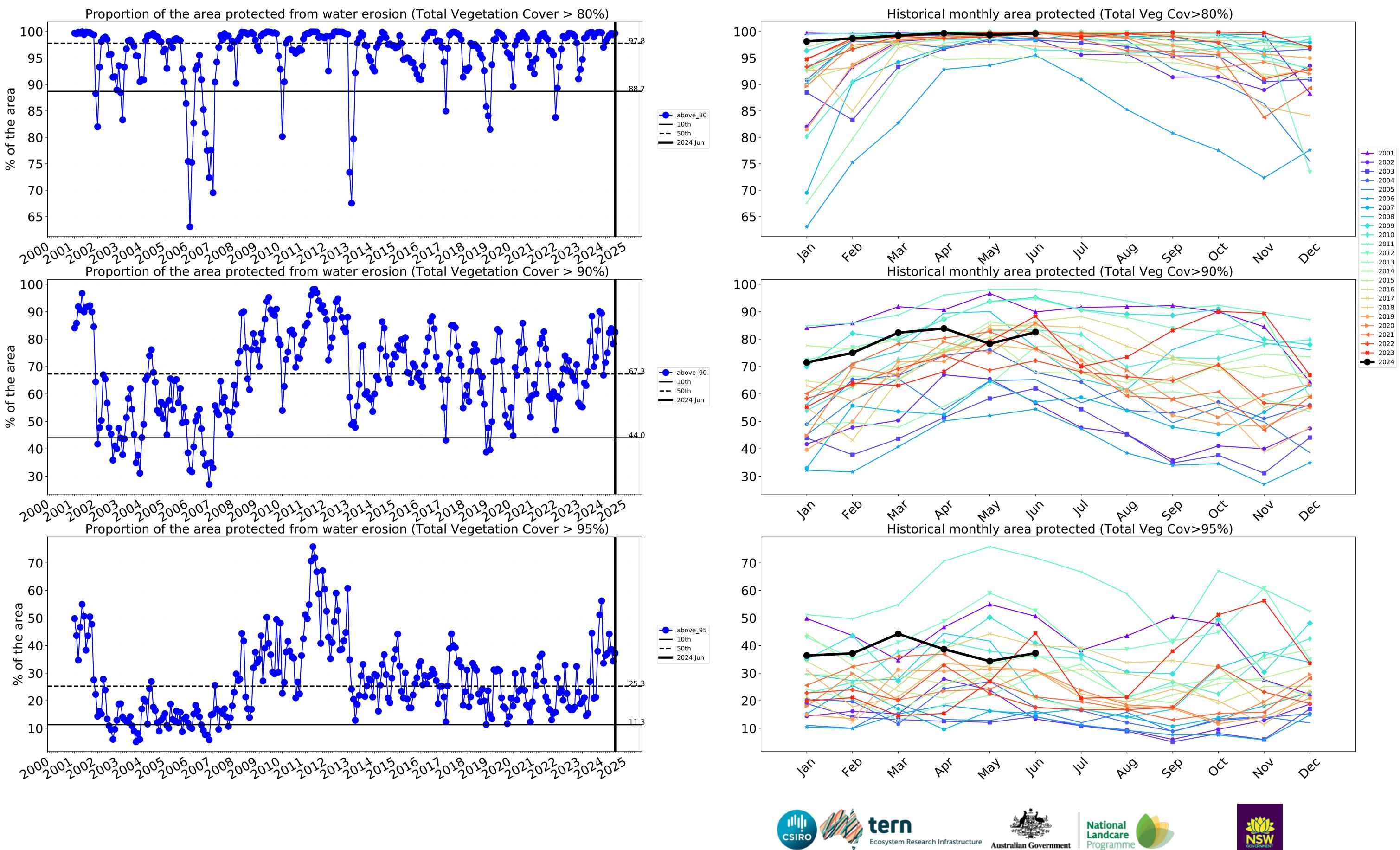


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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





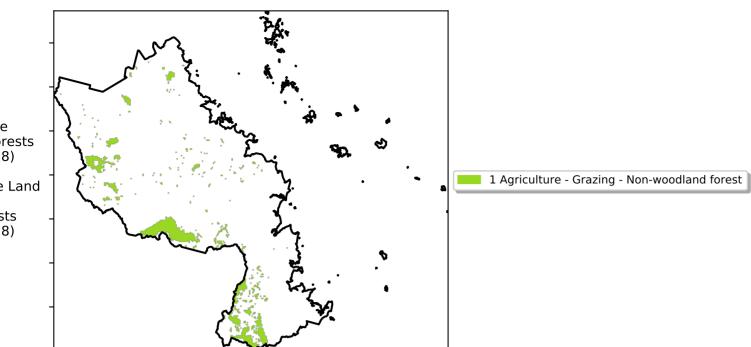
Grazing - Forest (non woodland)

12%100%

52°1070°10

· 3201050010

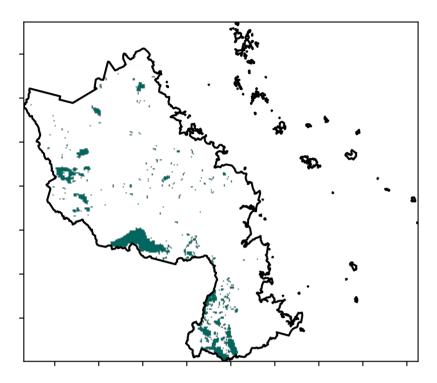
0.30%



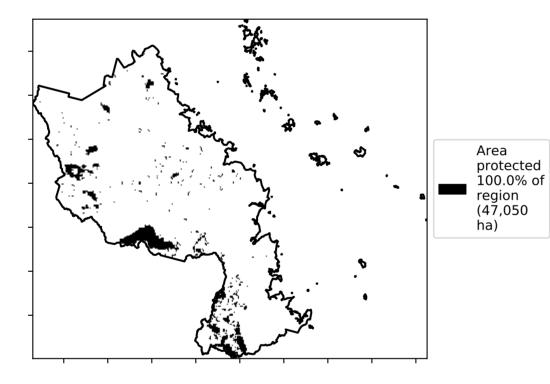
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]

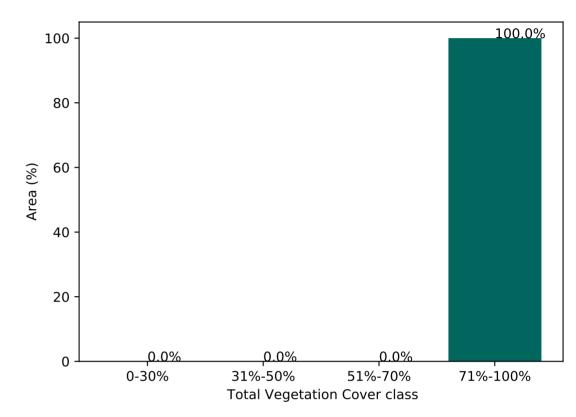
Land use and forest cover



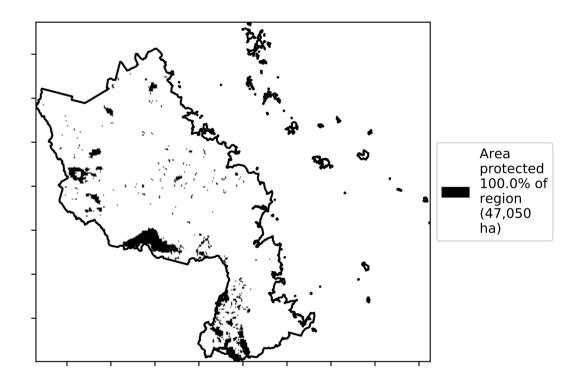
% Area protected from water erosion (>70%)



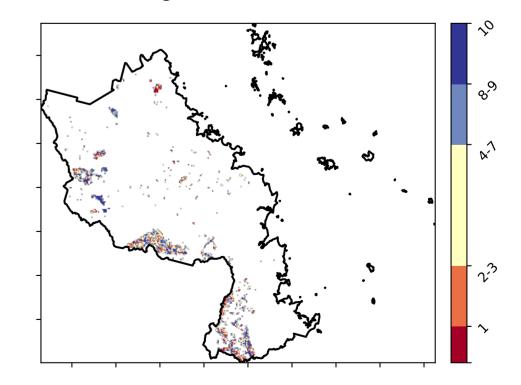
Proportion of vegetation cover class in area



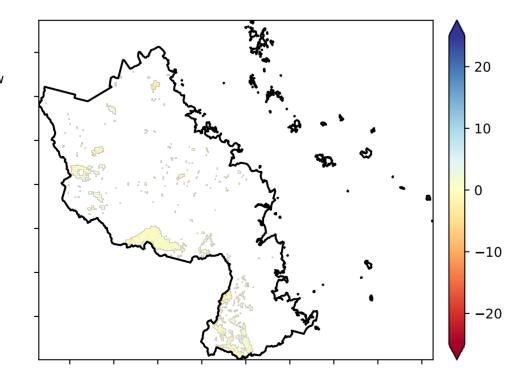
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

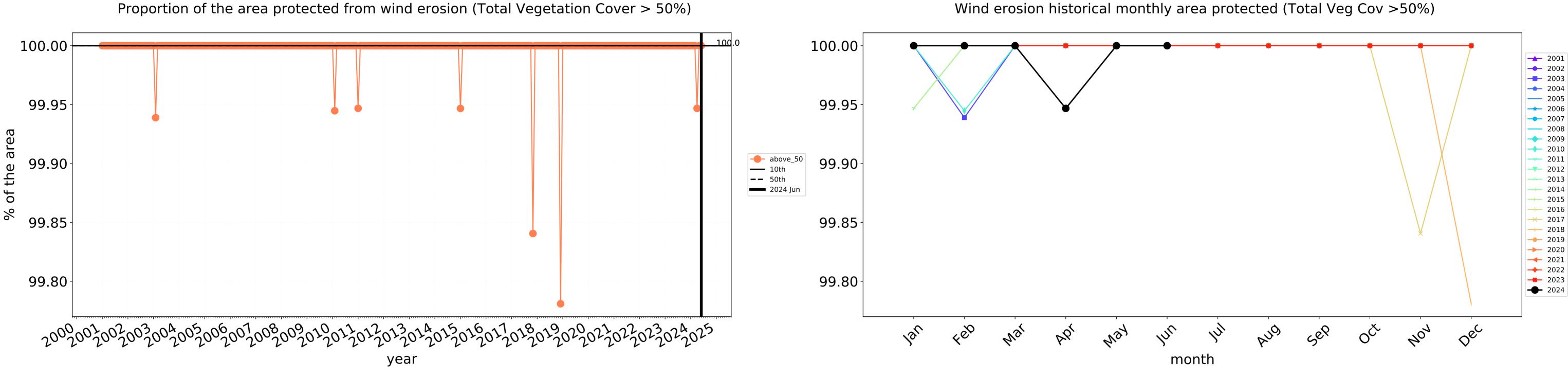


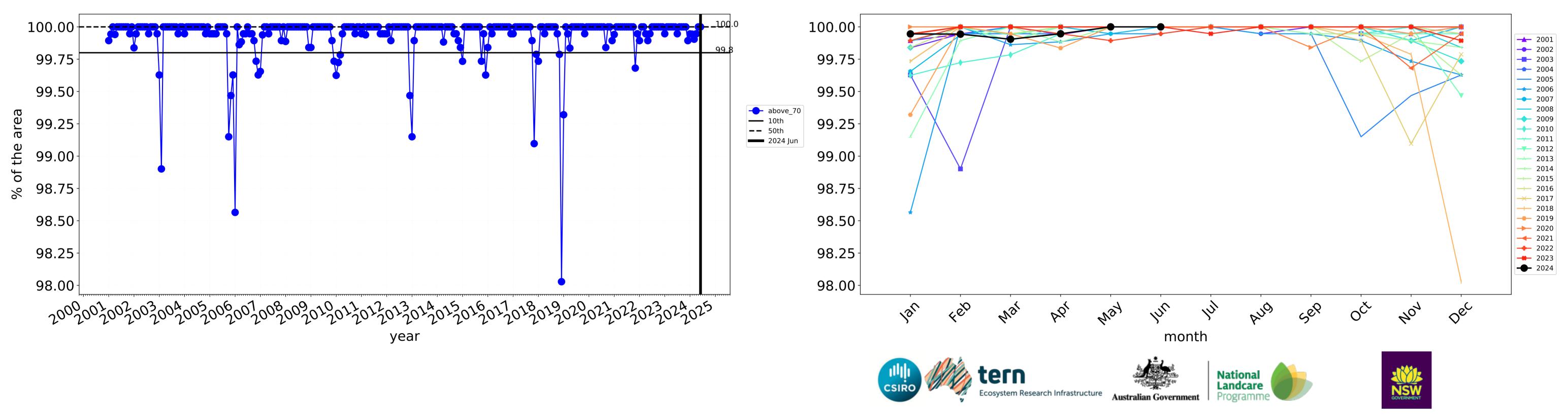
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

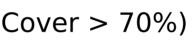




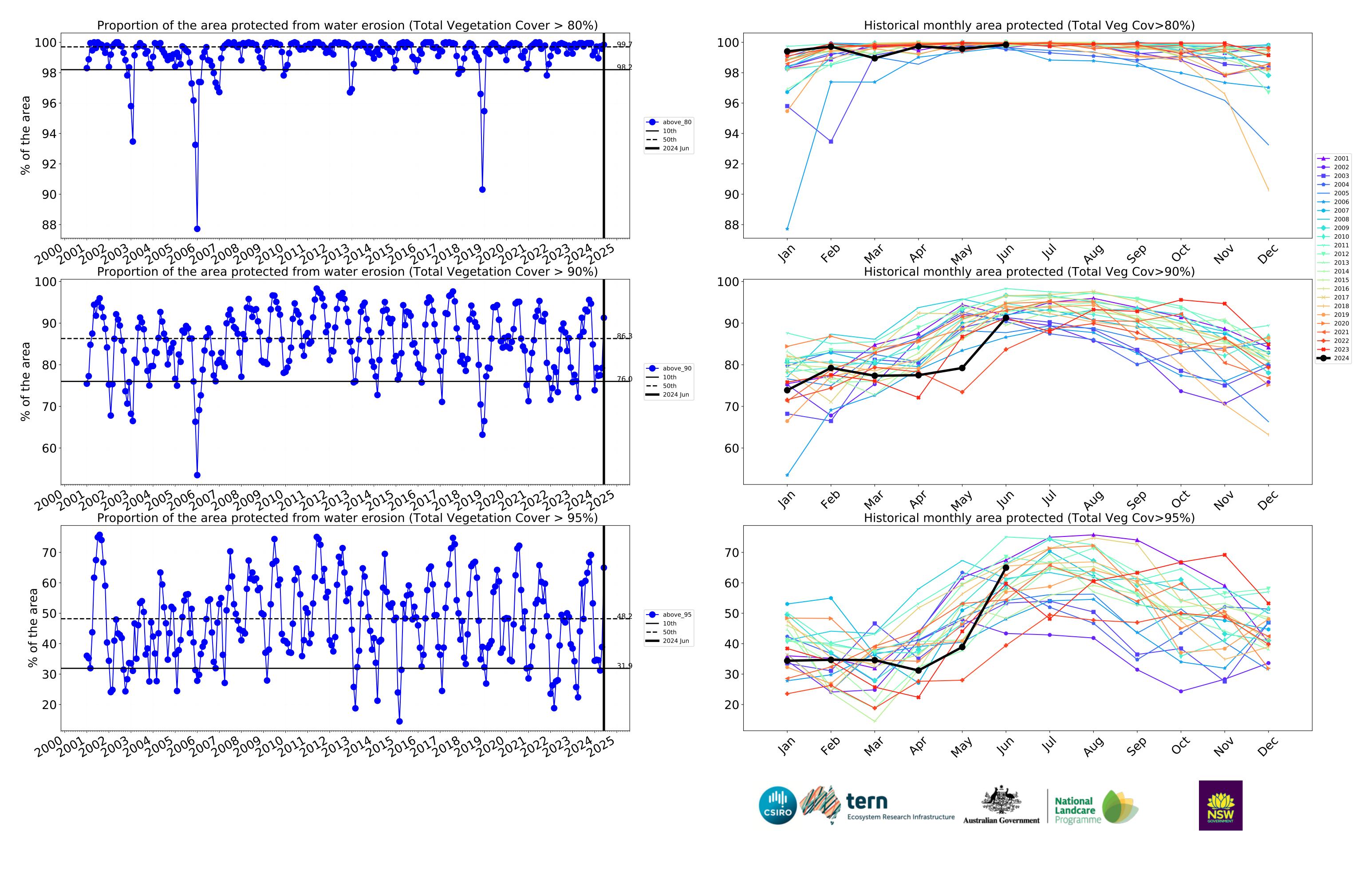
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





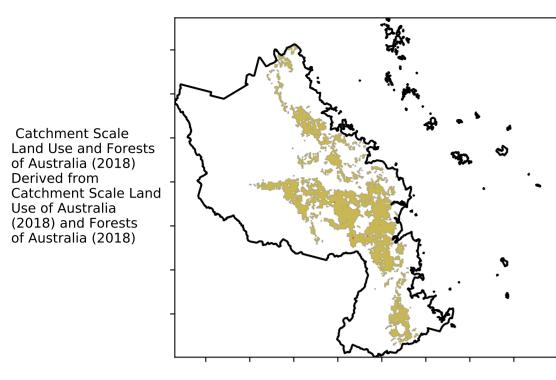


Water erosion historical monthly area protected (Total Veg Cov>70%)



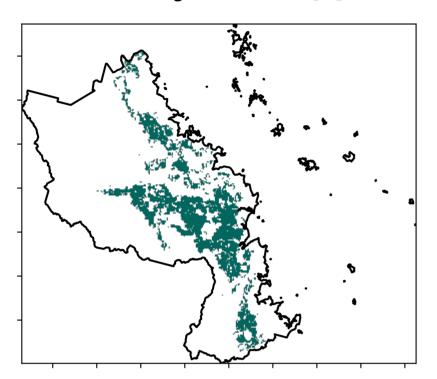
Irrigation

Land use and forest cover

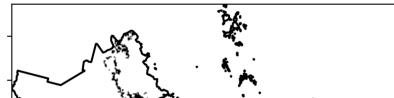


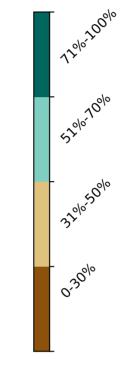
1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

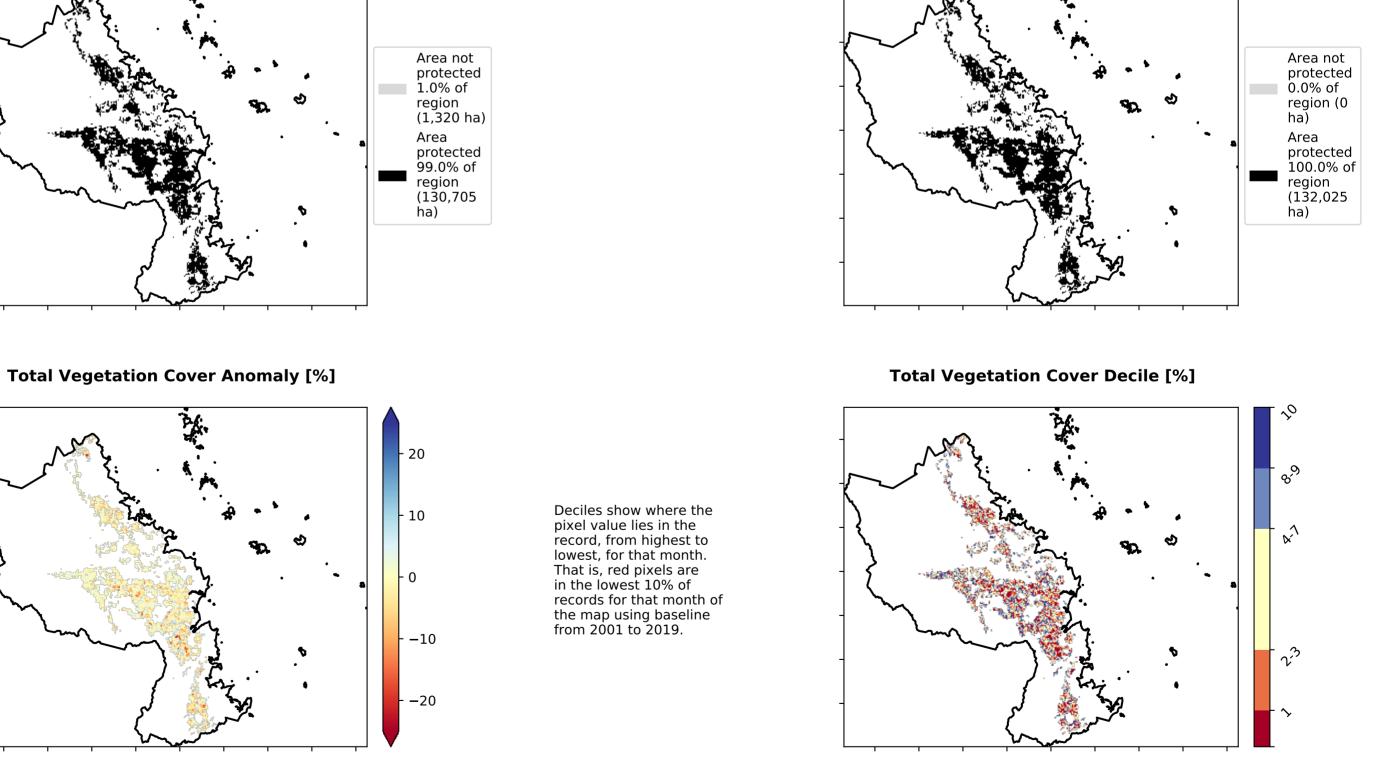
Total Vegetation Cover [%]

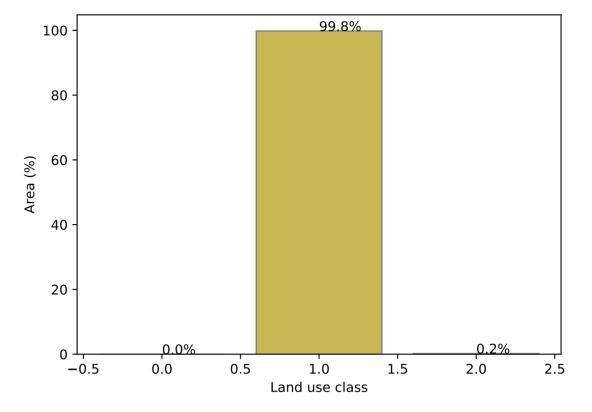


% Area protected from water erosion (>70%)



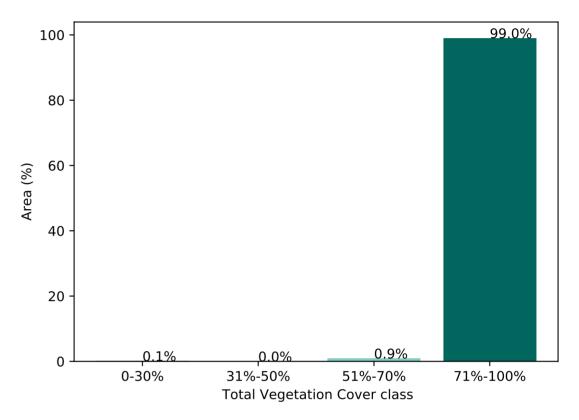




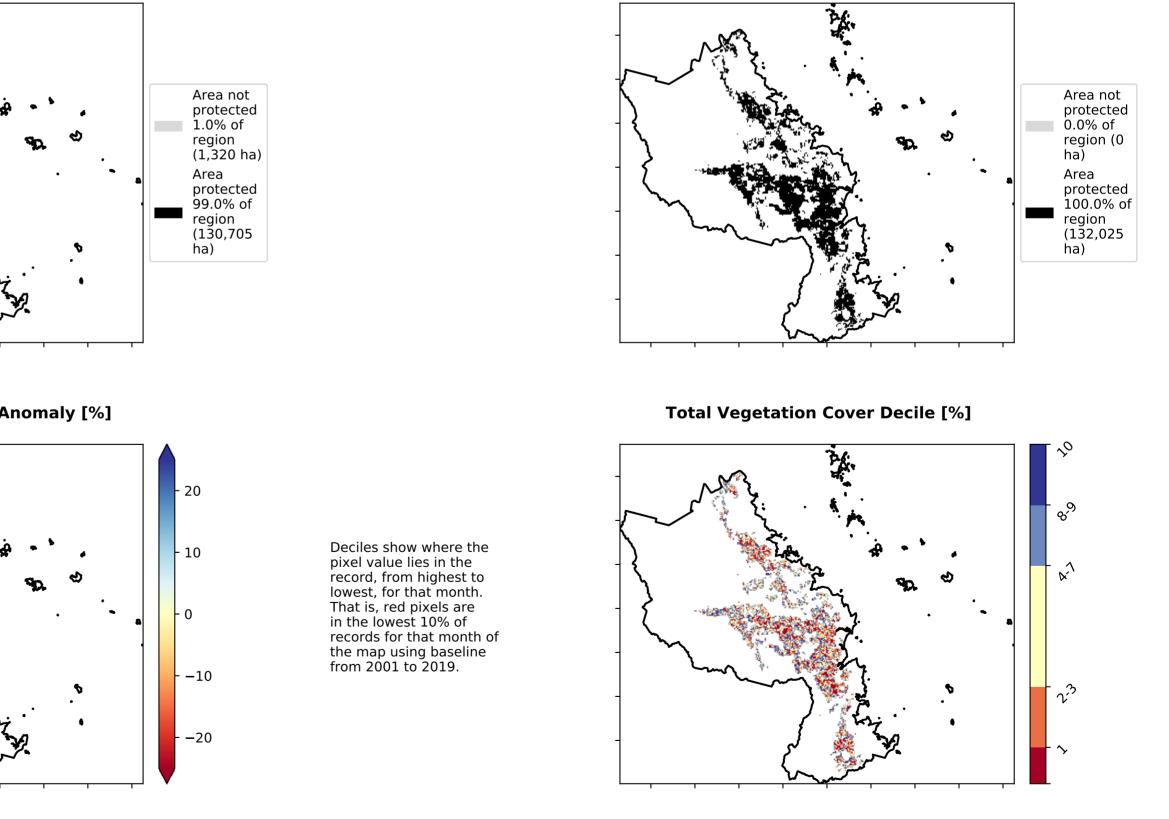


Proportion of each land class in area

Proportion of vegetation cover class in area



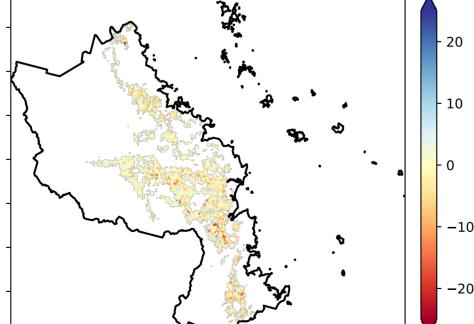
% Area protected from wind erosion (>50%)

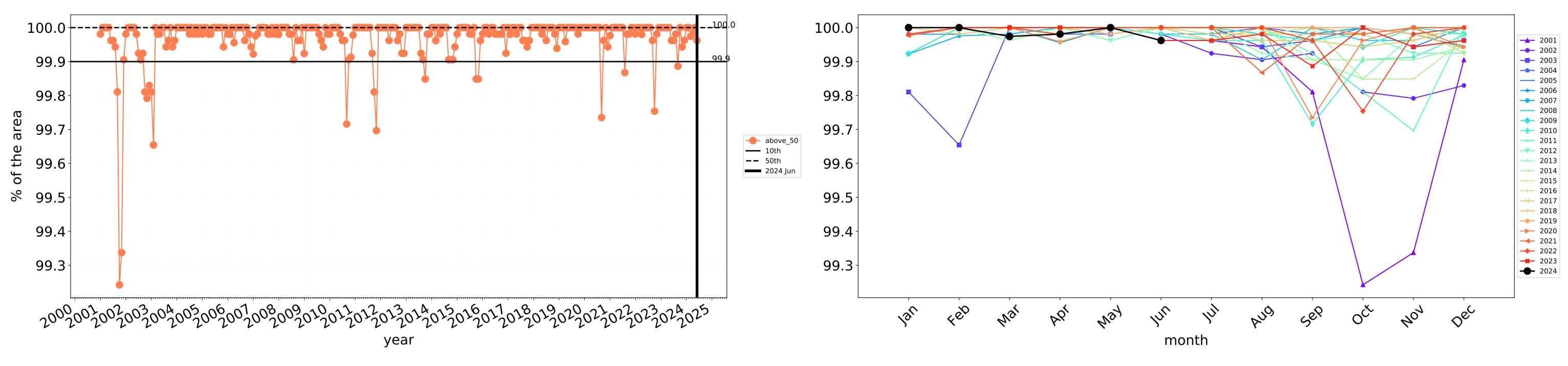






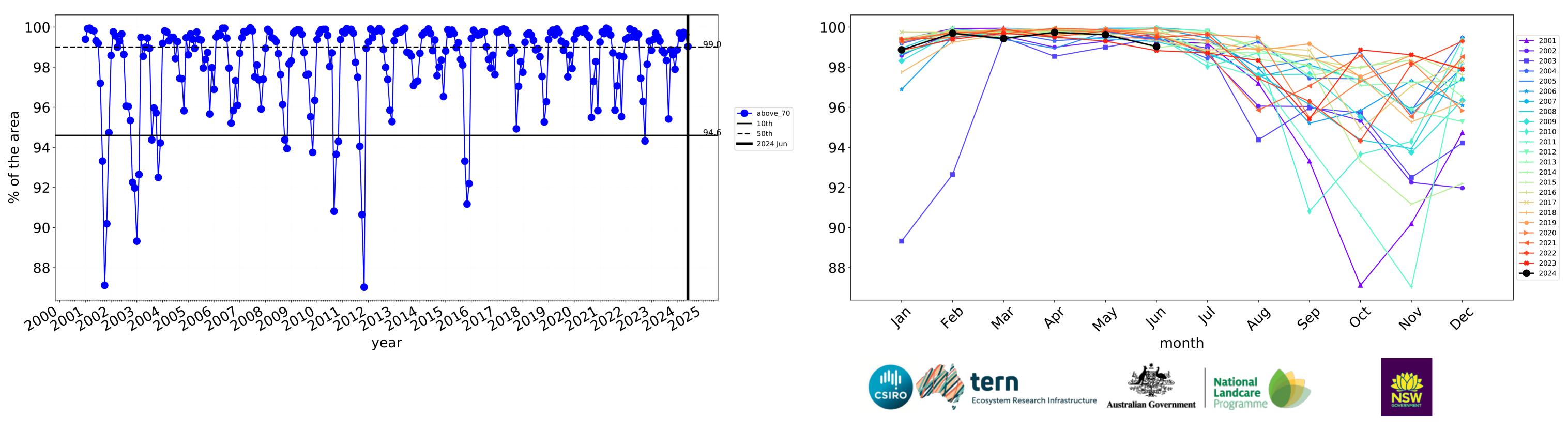
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

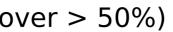




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

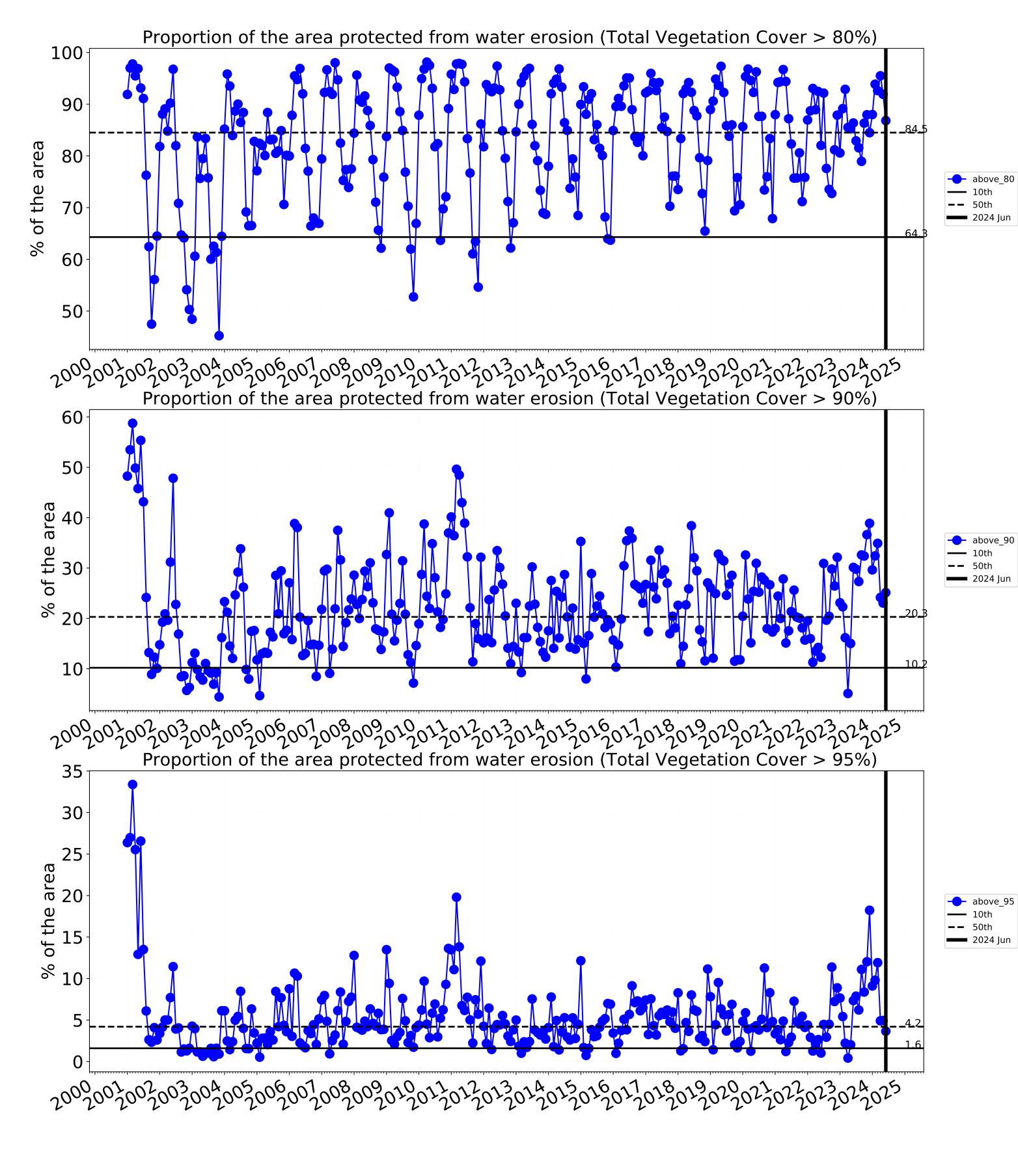


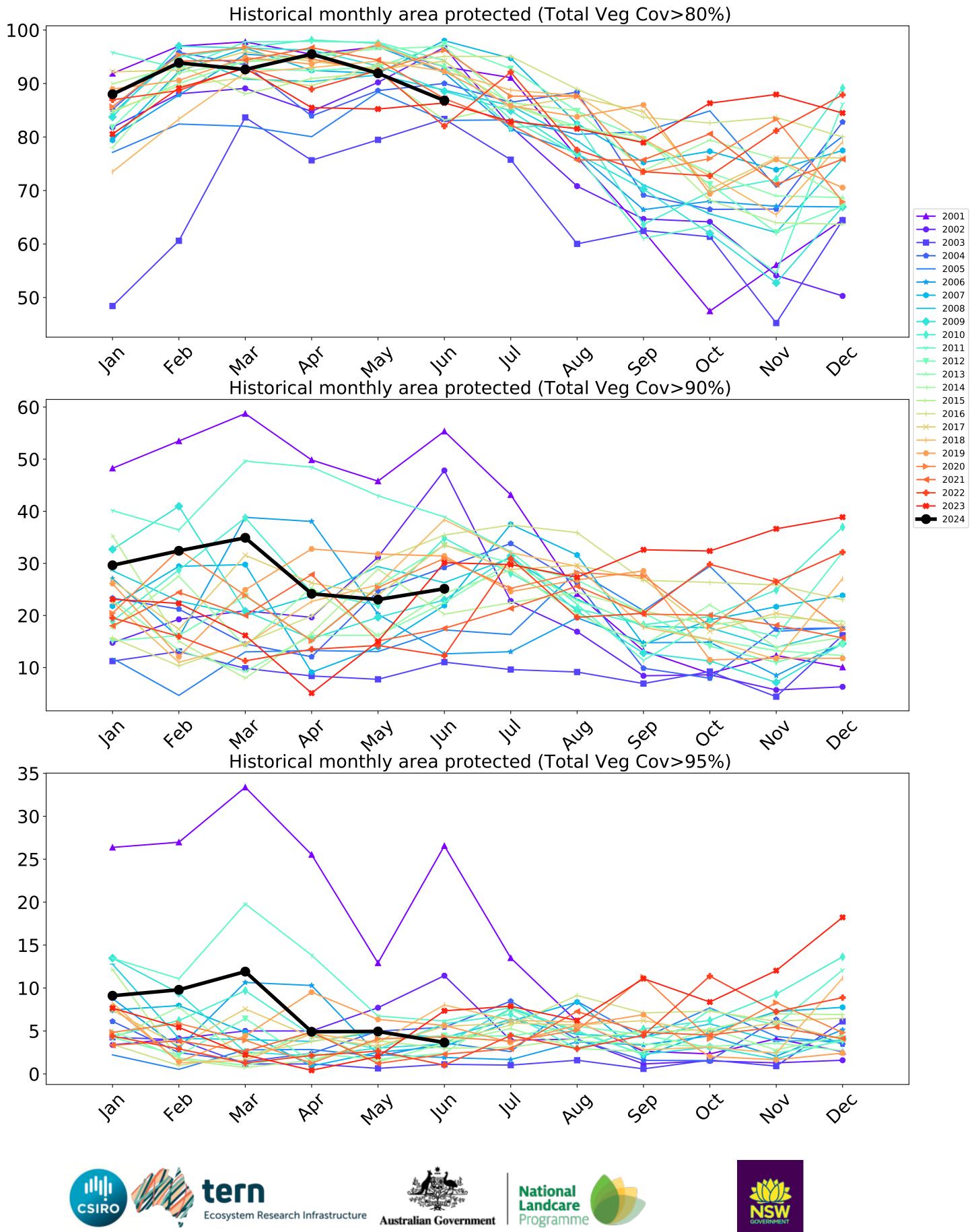




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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







Production native forests and plantation forests

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%

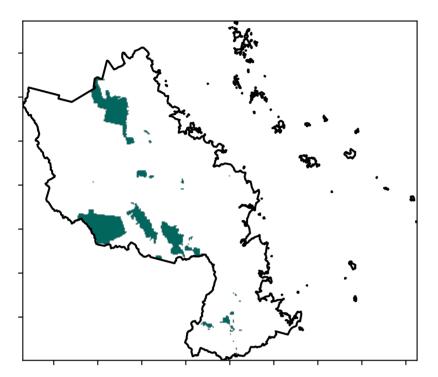
· 52°10010

320050010

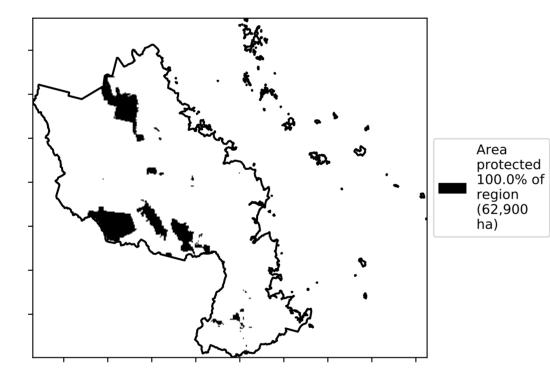
0.30%

Land use and forest cover

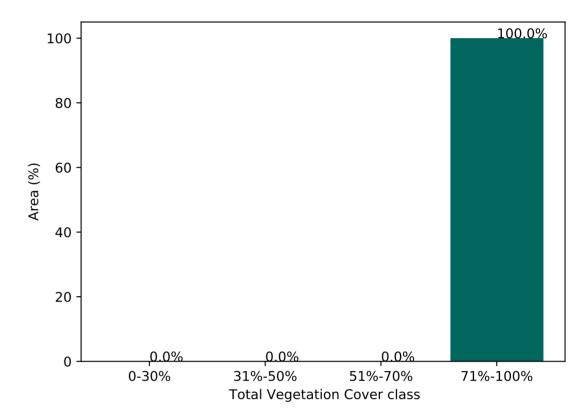
Total Vegetation Cover [%]



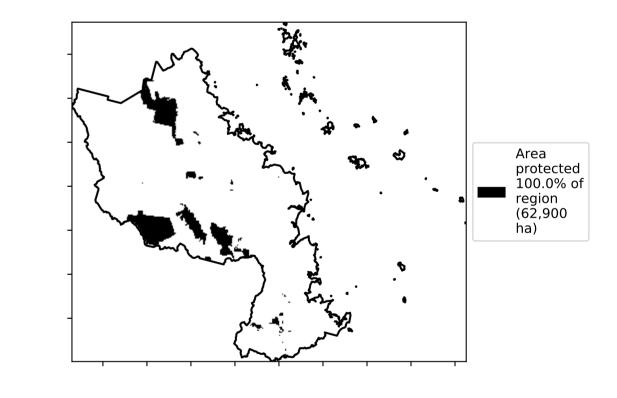
% Area protected from water erosion (>70%)



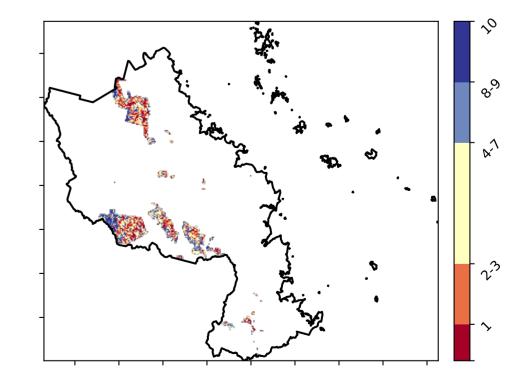




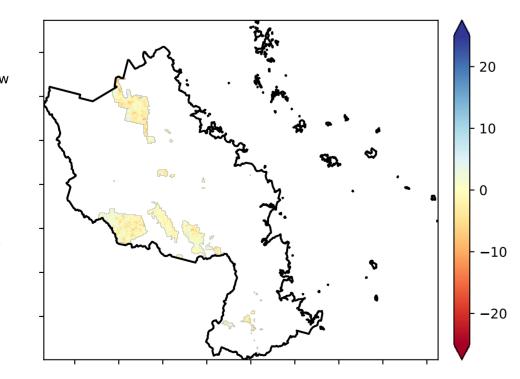
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]







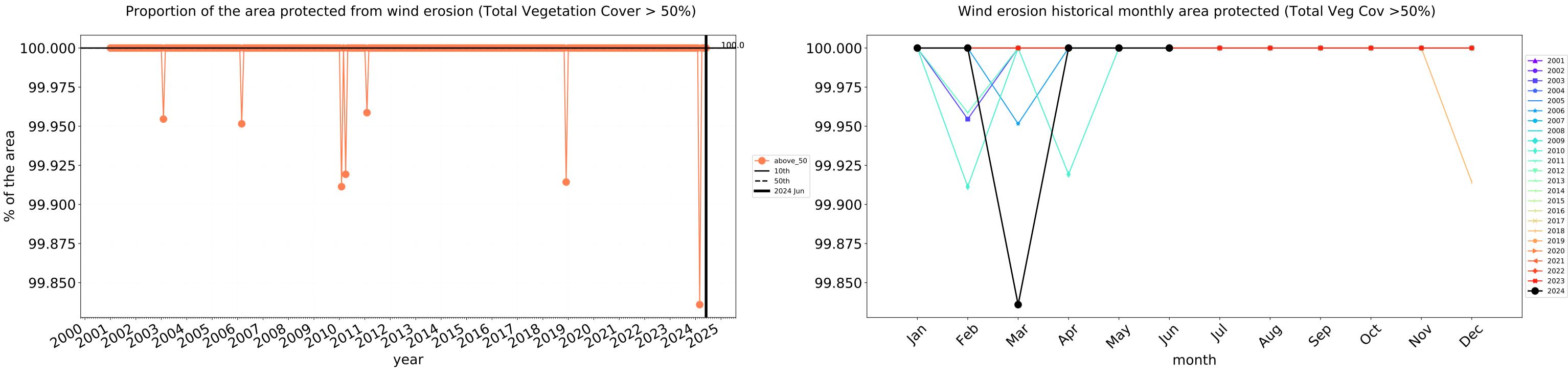
32

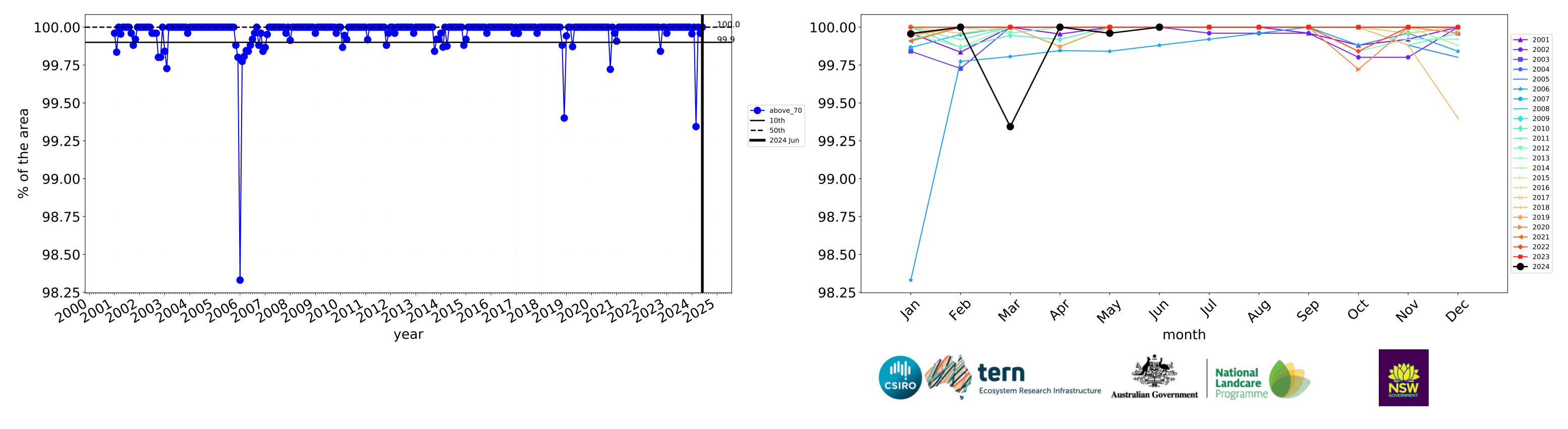
Deciles show where the pixel value lies in the

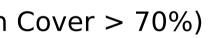
record, from highest to lowest, for that month. That is, red pixels are

in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

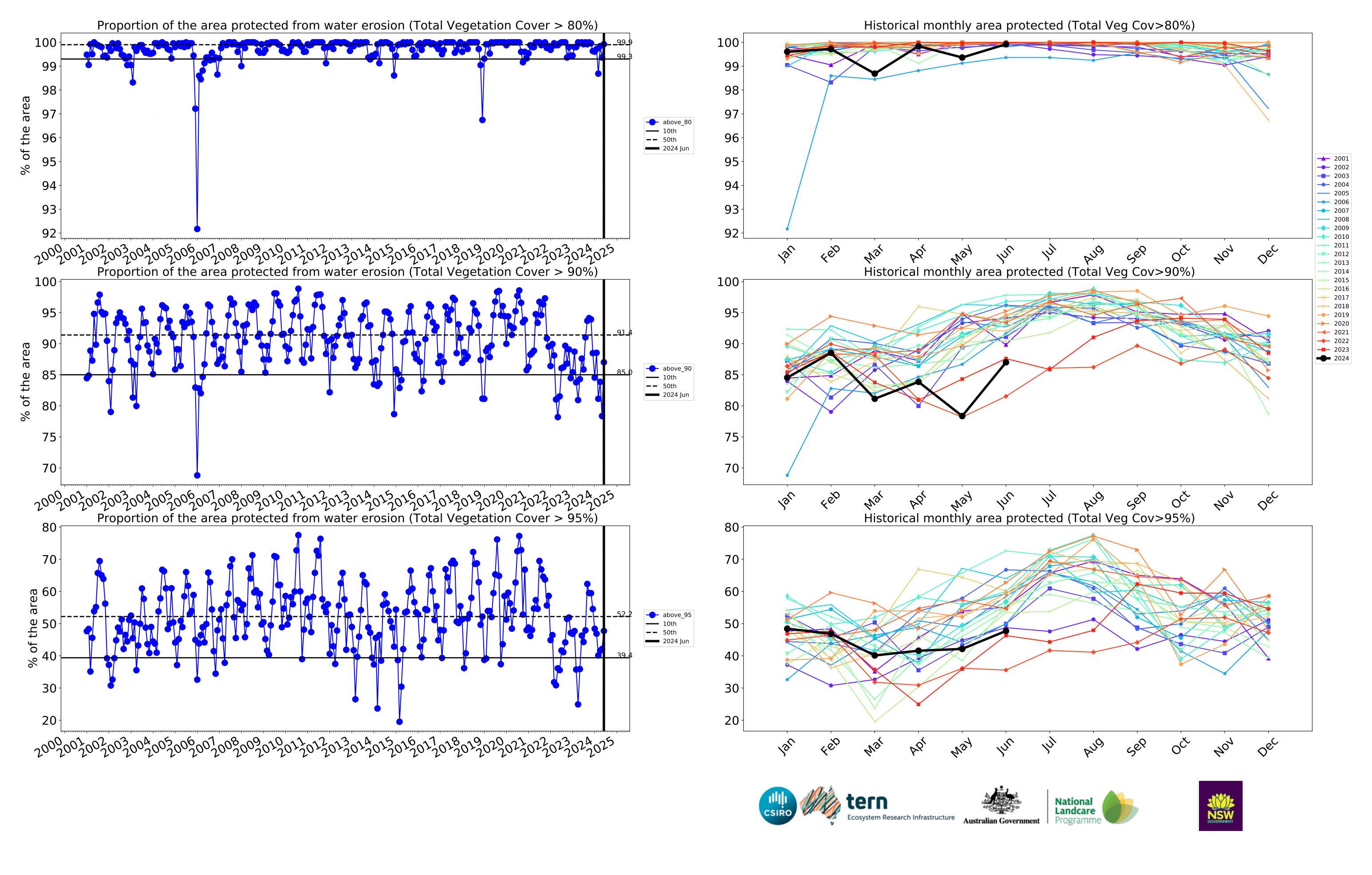
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.











4

Mackay_(R) (748,650 ha and no data 12,661 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	748,650	99.9% 748,275	99.8% 747,150	98.8% 739,850	94.3% 706,150	67.0% 501,675	32.0% 239,525
Conservation and natural environments	192,275	100.0% 192,225	99.7% 191,725	99.1% 190,575	97.8% 188,000	79.3% 152,550	39.2% 75,400
Conservation and natural environments non forest	4,900	100.0% 4,900	96.9% 4,750	90.3% 4,425	76.0% 3,725	49.5% 2,425	18.4% 900
Conservation and natural environments Woodland forest Conservation and	37,175	99.9% 37,150	99.5% 37,000	98.4% 36,575	96.7% 35,950	82.8% 30,775	44.2% 16,425
natural environments Forest (non woodland)	150,200	100.0% 150,175	99.9% 149,975	99.6% 149,575	98.8% 148,325	79.5% 119,350	38.7% 58,075
Agriculture	428,325	100.0% 428,275	100.0% 428,225	99.6% 426,625	95.4% 408,425	64.0% 274,175	30.1% 128,875
Grazing	295,700	100.0% 295,675	100.0% 295,650	99.9% 295,275	99.2% 293,200	81.3% 240,400	41.7% 123,450
Grazing non forest	139,975	100.0% 139,950	100.0% 139,925	99.7% 139,575	98.5% 137,900	77.0% 107,750	37.4% 52,375
Grazing Woodland forest	108,675	100.0% 108,675	100.0% 108,675	100.0% 108,650	99.7% 108,325	82.5% 89,700	37.3% 40,500
Grazing - Forest (non woodland)	47,050	100.0% 47,050	100.0% 47,050	100.0% 47,050	99.8% 46,975	91.3% 42,950	65.0% 30,575
Irrigation	132,025	100.0% 132,000	100.0% 131,975	99.0% 130,750	86.8% 114,625	25.1% 33,175	3.7% 4,825
Production native forests and plantation forests	62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	99.9% 62,850	87.0% 54,725	47.7% 30,025

