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

Date: February 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 Feb 2024

Land use and forest cover

Proportion of each land class in area



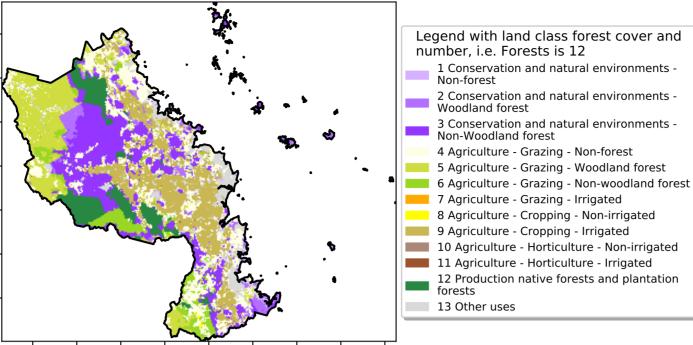
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is only for the

2019.



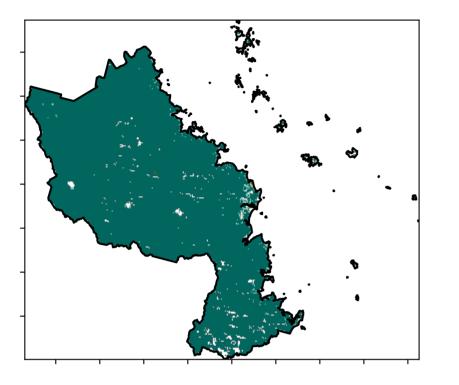
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· 52°10'10°10

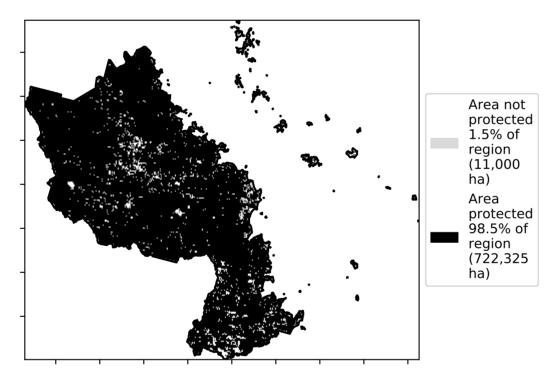
320050010

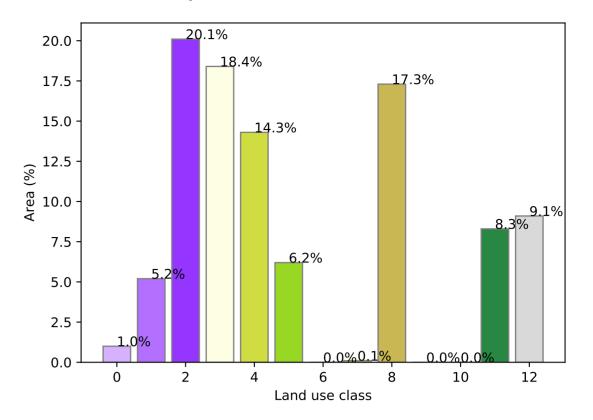
0.30%

Total Vegetation Cover [%]

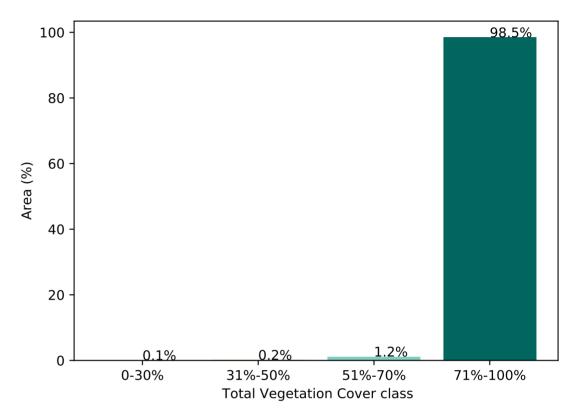


% Area protected from water erosion (>70%)

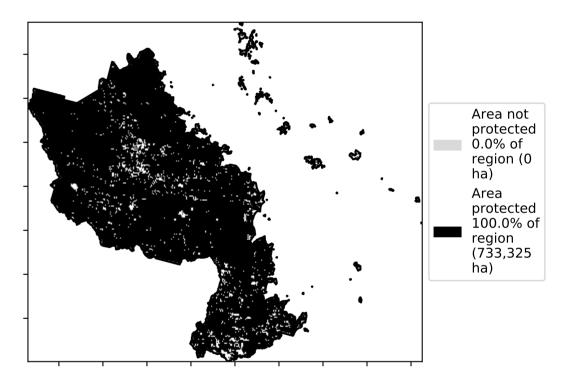




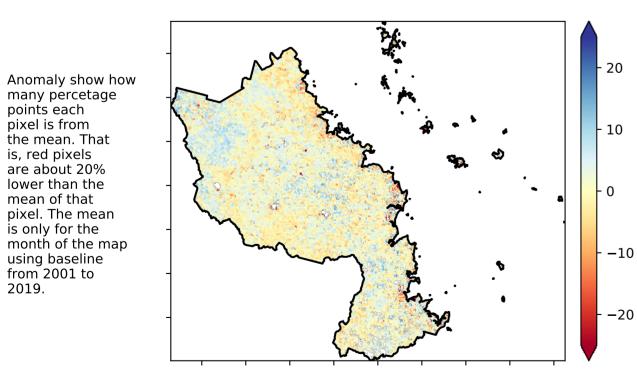
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

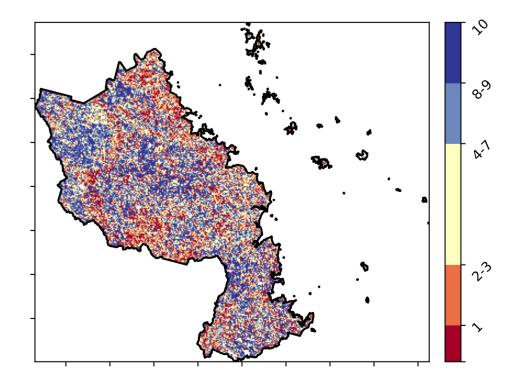


Total Vegetation Cover Anomaly [%]

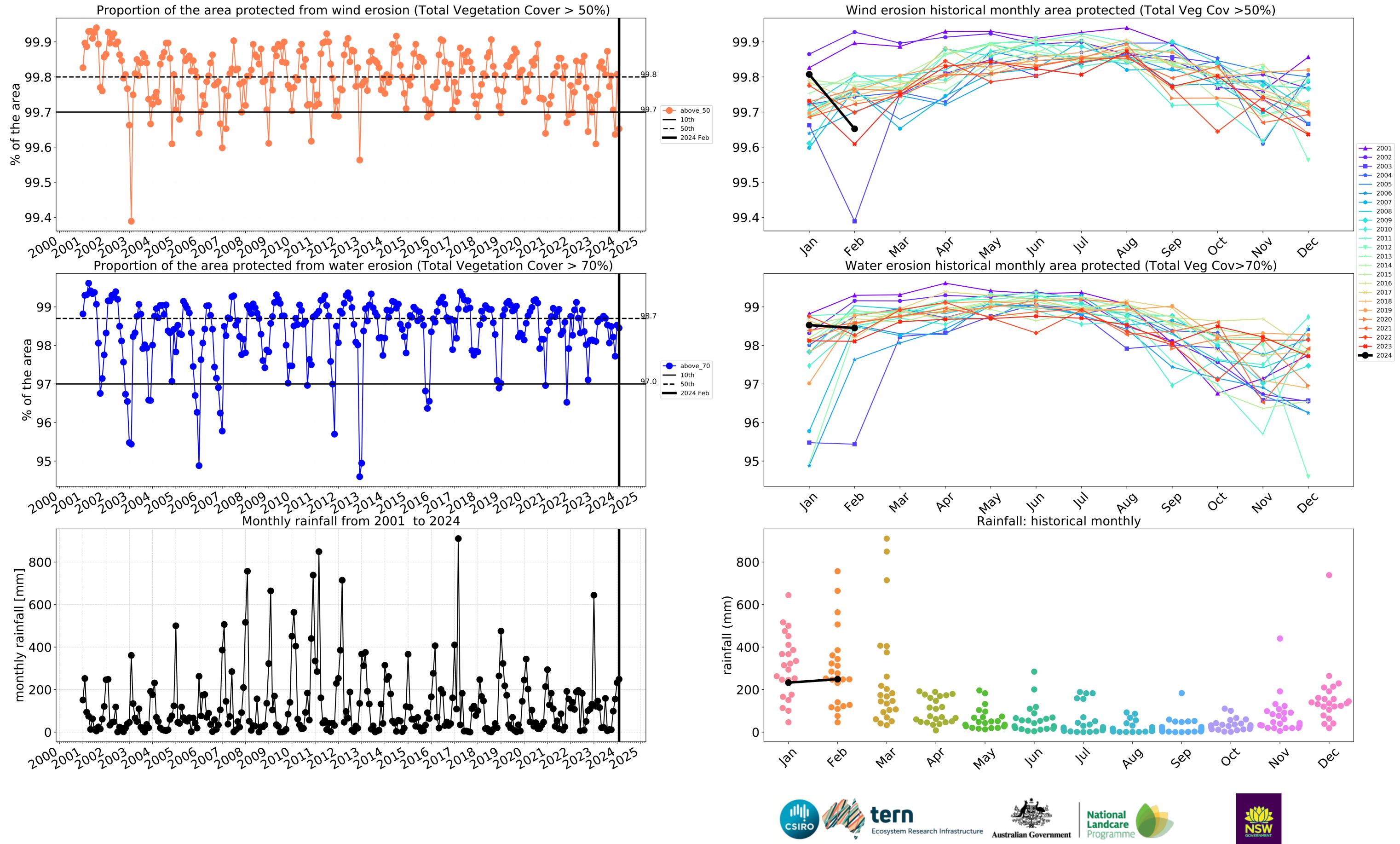


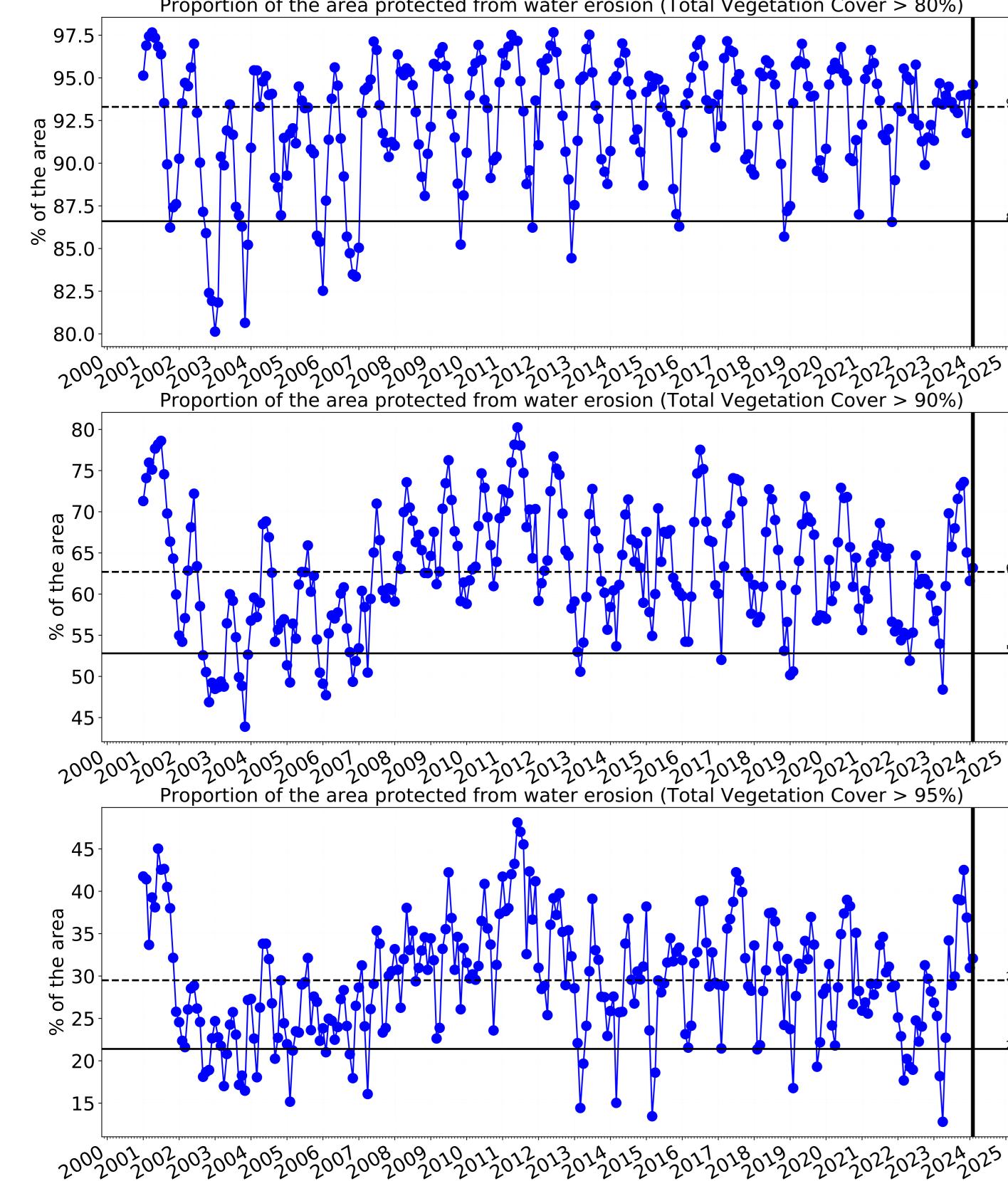
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

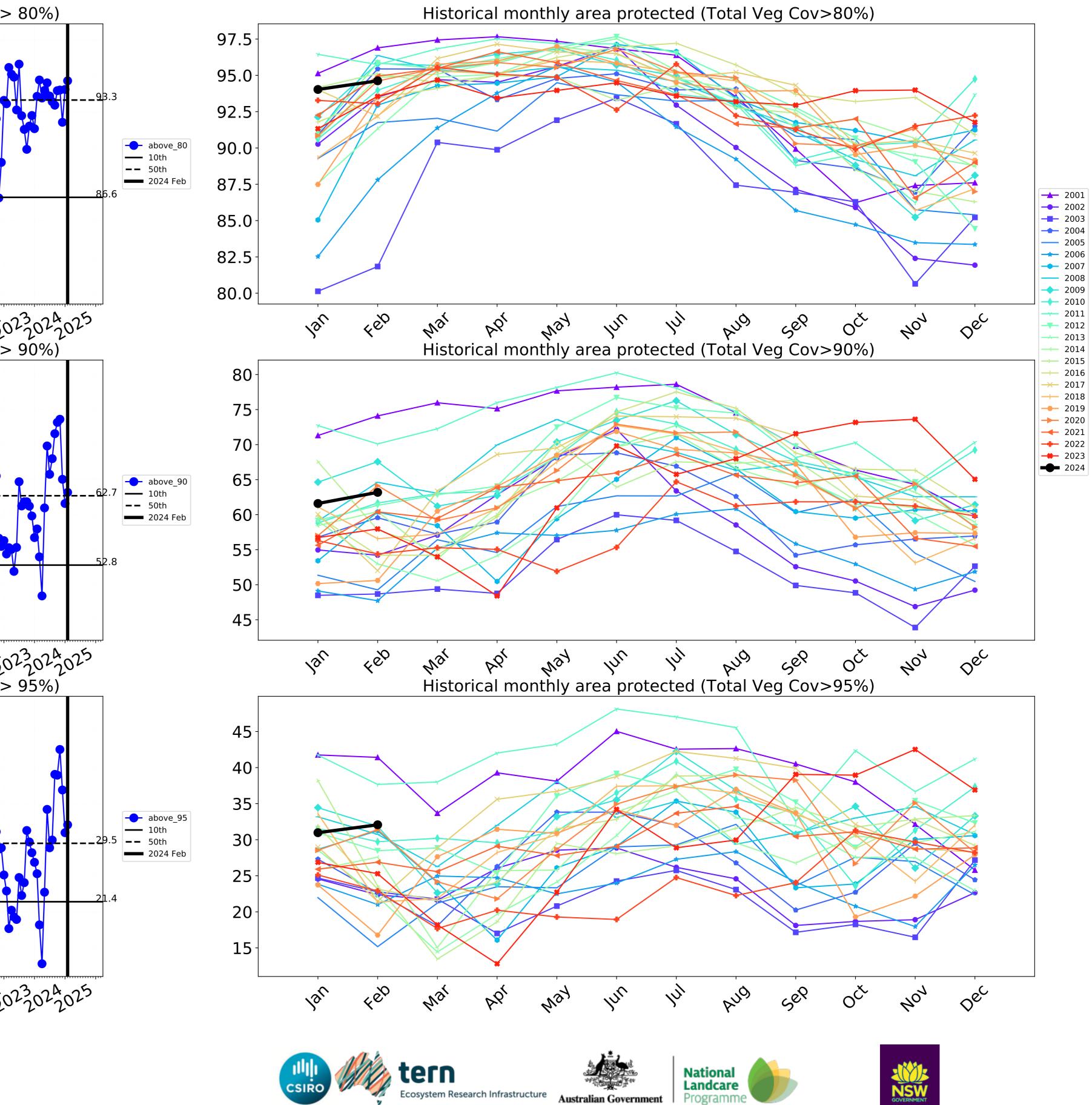








Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



Ecosystem Research Infrastructure

Conservation and natural environments

Catchment Scale Land

Catchment Scale

Derived from

Use of Australia

the mean. That

is, red pixels are about 20% lower than the

mean of that

pixel. The mean

from 2001 to 2019.

is only for the month of the map

(2018) and Forests

of Australia (2018)

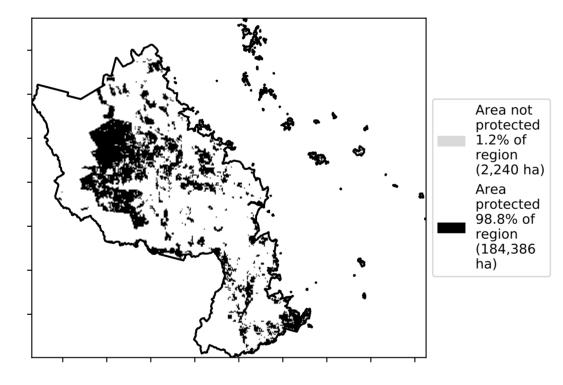
Land Use and Forests of Australia (2018)

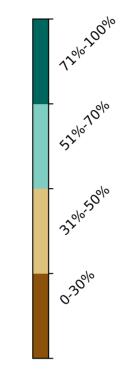
Land use and forest cover

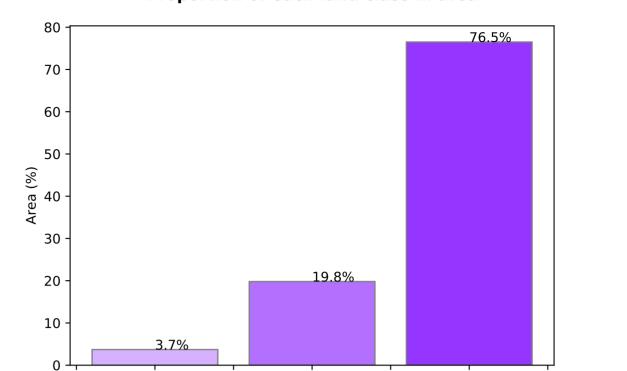
1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Nonwoodland forest

Total Vegetation Cover [%]

% Area protected from water erosion (>70%)







Proportion of each land class in area

Proportion of vegetation cover class in area

1.0

Land use class

-0.5

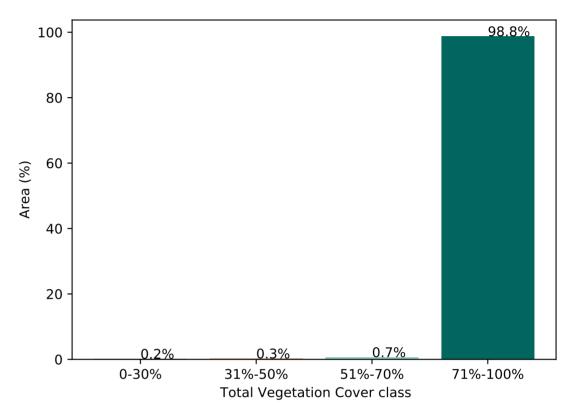
0.0

0.5

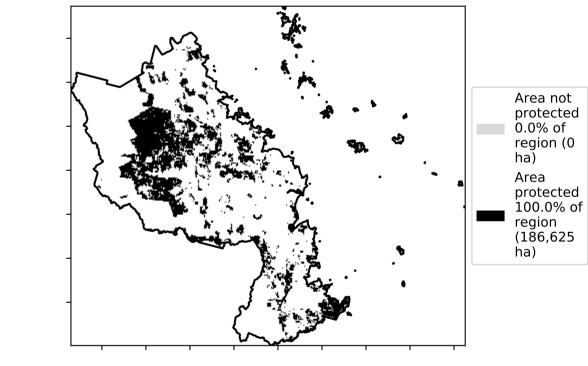
1.5

2.0

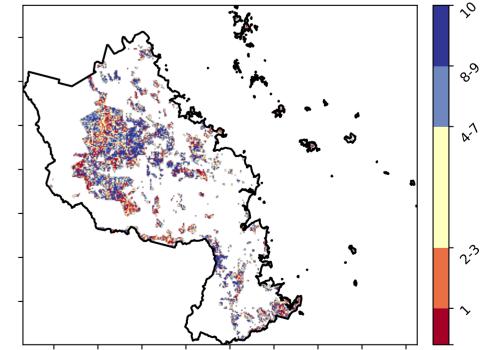
2.5



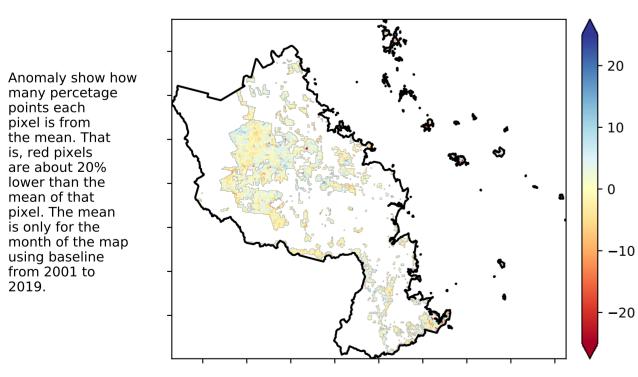
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

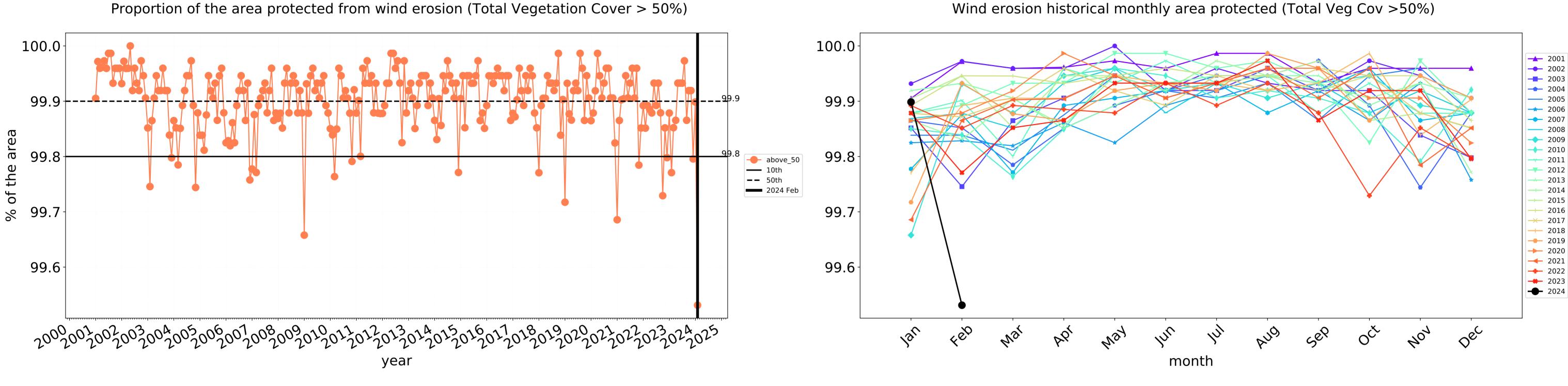


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

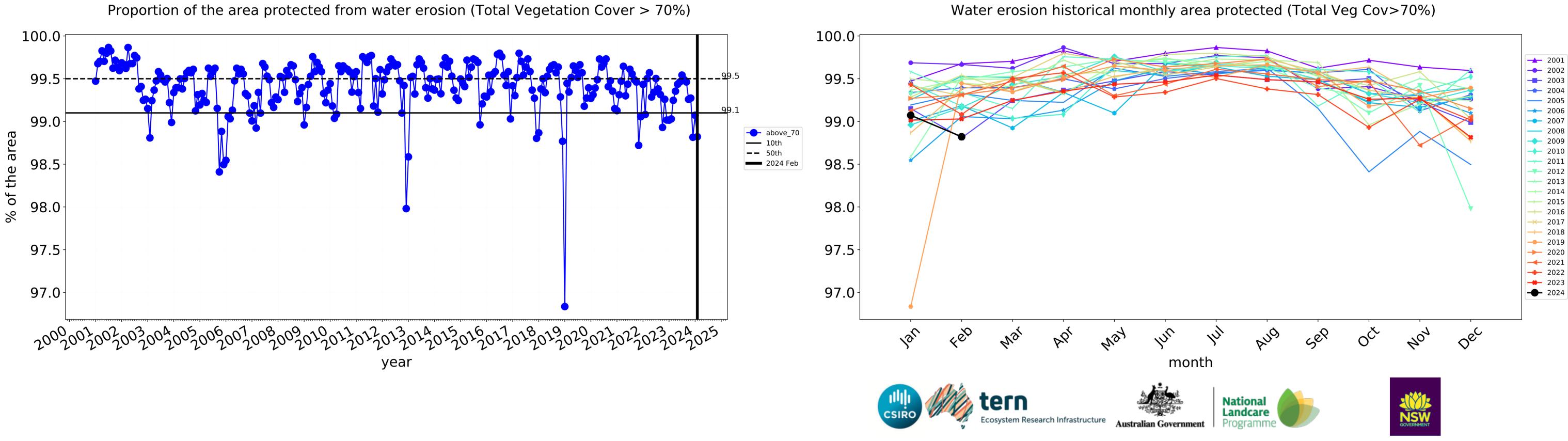


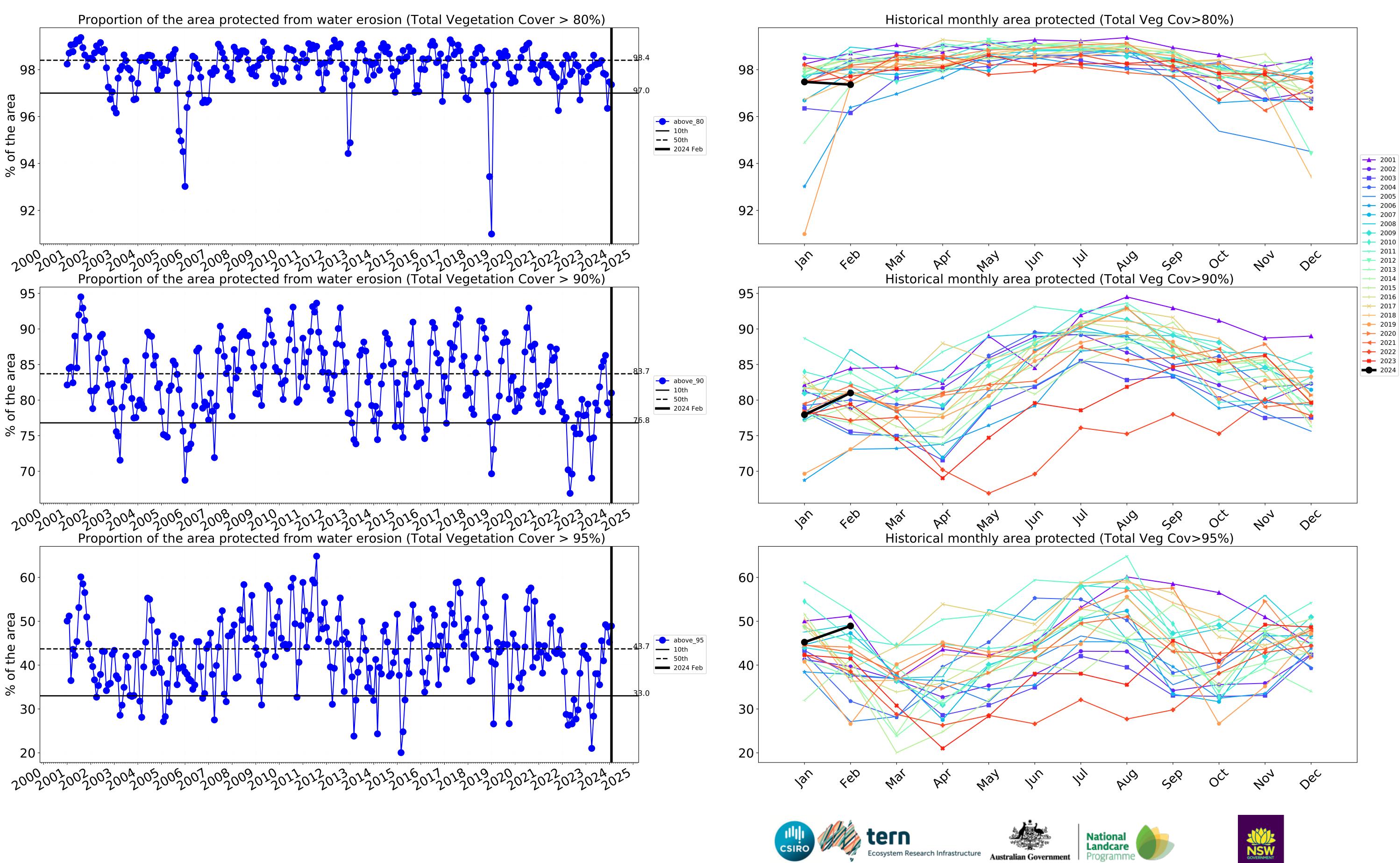






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)







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)

1200-200%

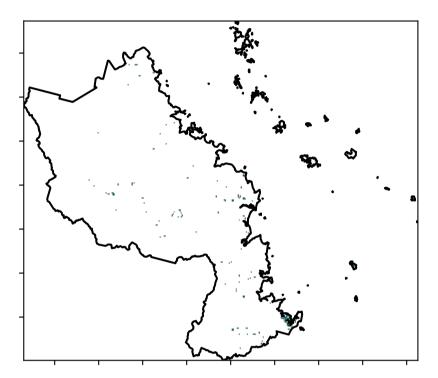
52% 70%

3201050010

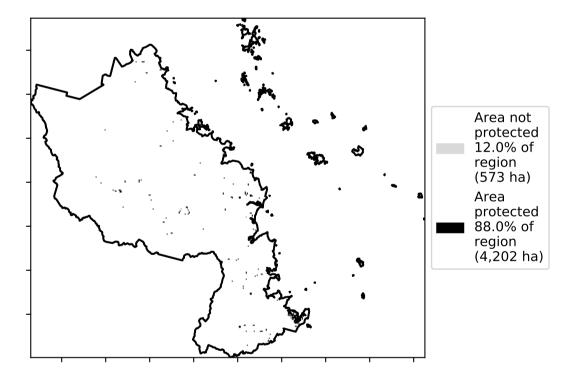
0.30%

Land use and forest cover

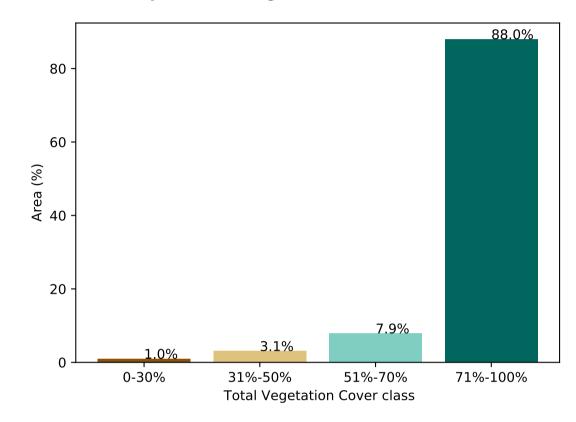
Total Vegetation Cover [%]



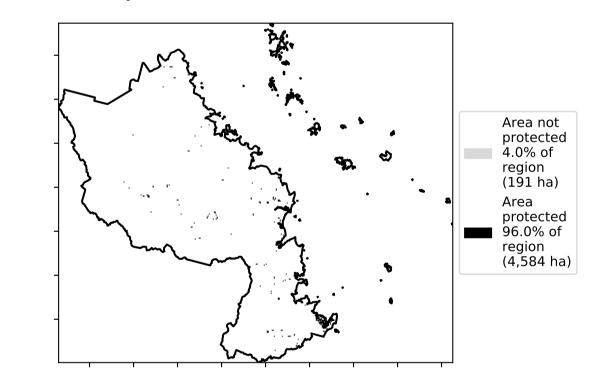
% Area protected from water erosion (>70%)



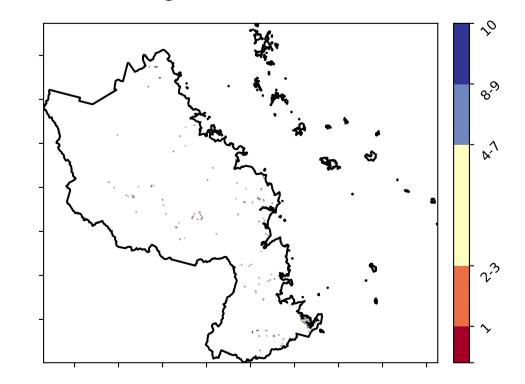




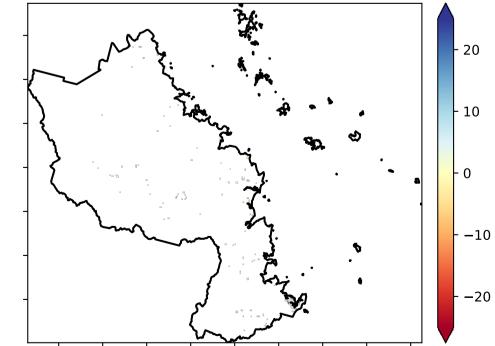
% Area protected from wind erosion (>50%)



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.





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.

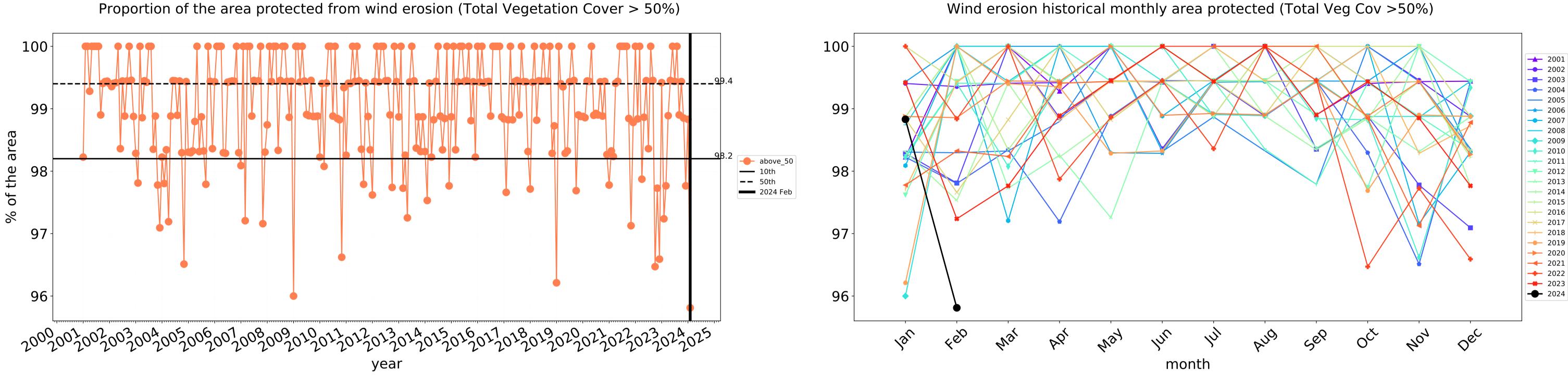
Anomaly show how many percetage points each pixel is from the mean That

the mean. That

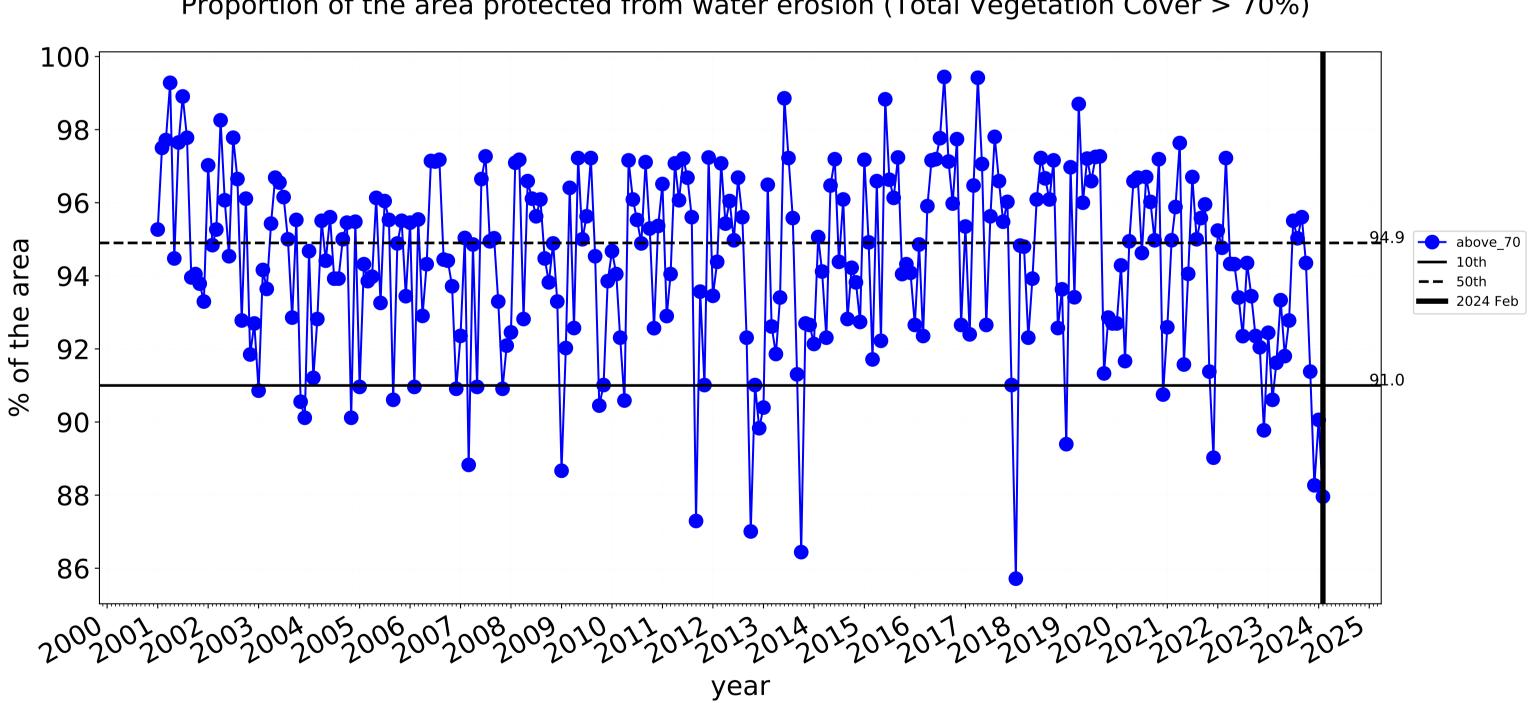
Catchment Scale

Derived from

Use of Australia



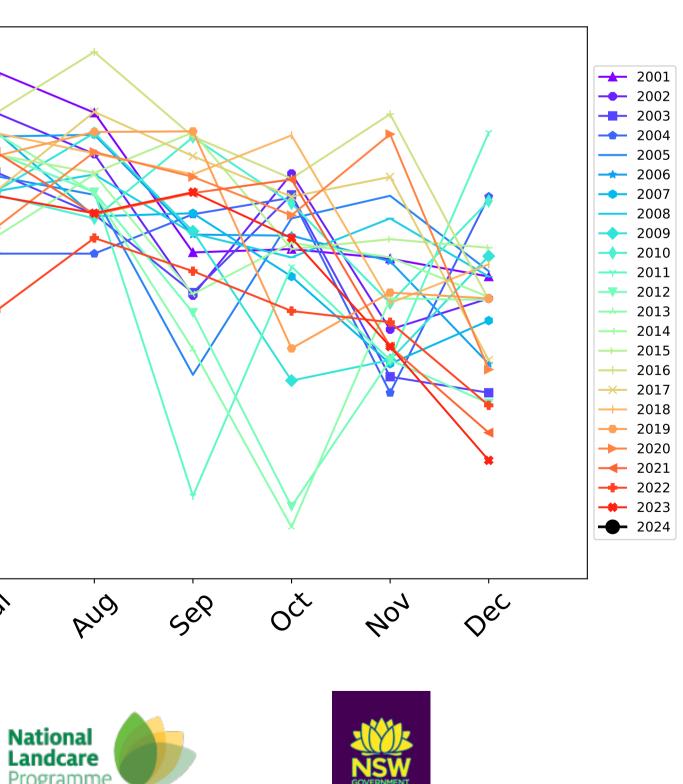
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

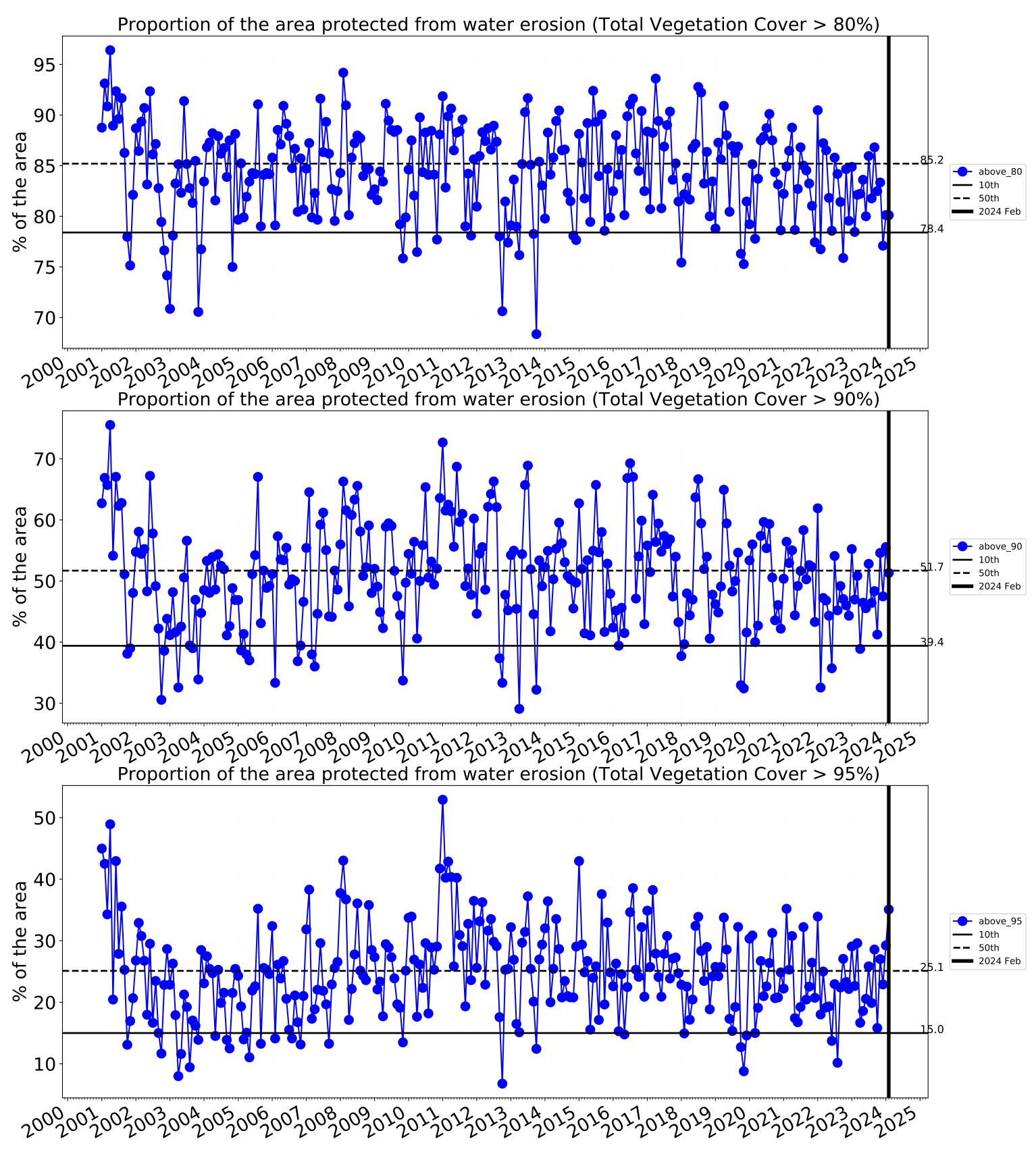


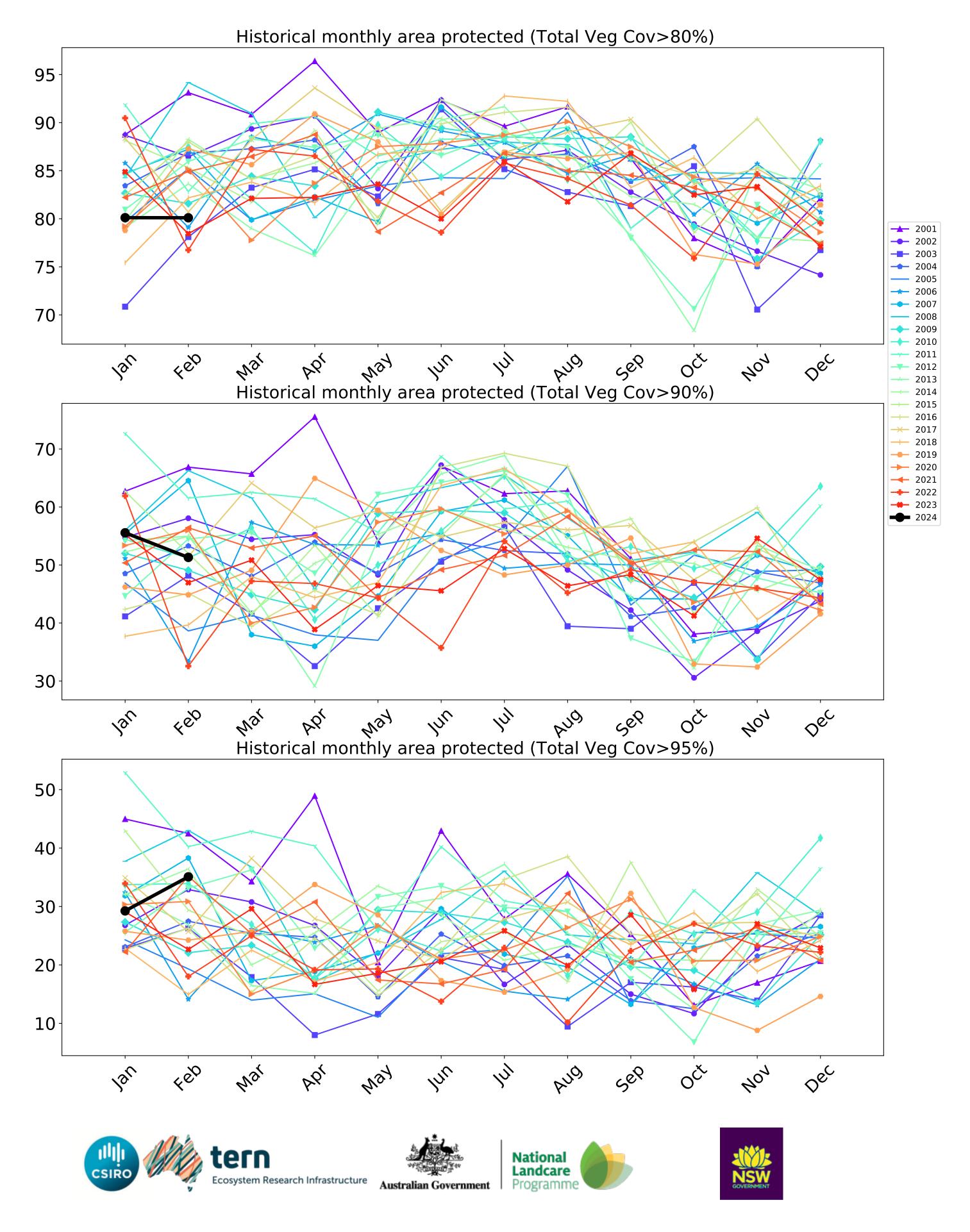
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

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

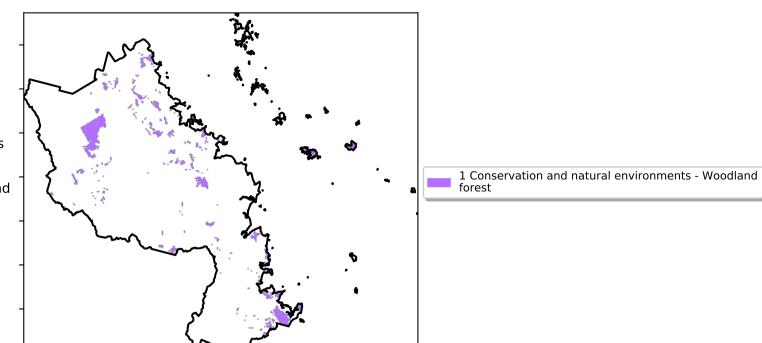






Conservation and natural environments Woodland forest

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



1 12º10-10010

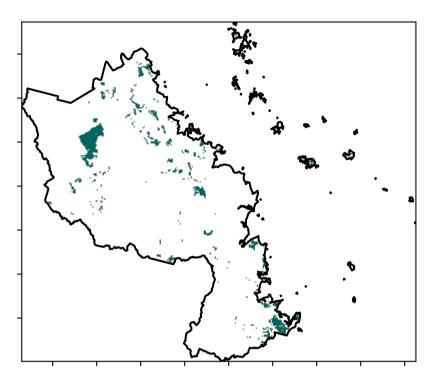
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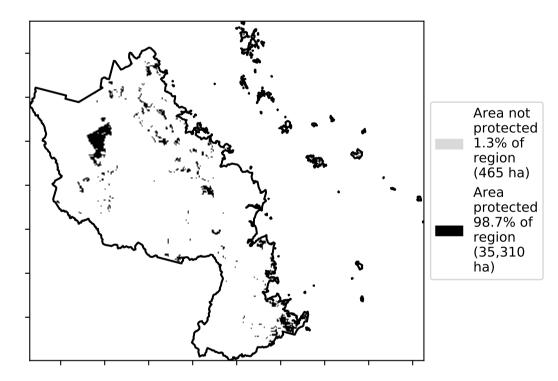
0.30%

Total Vegetation Cover [%]

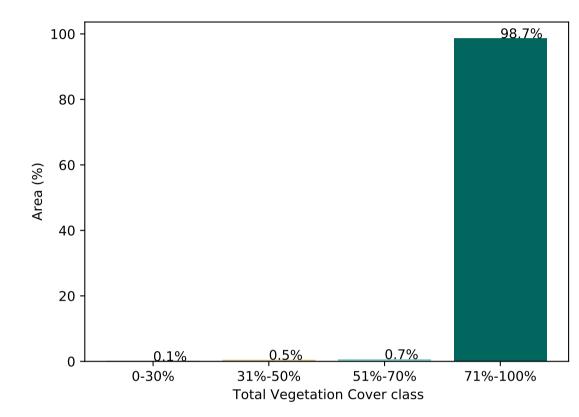
Land use and forest cover



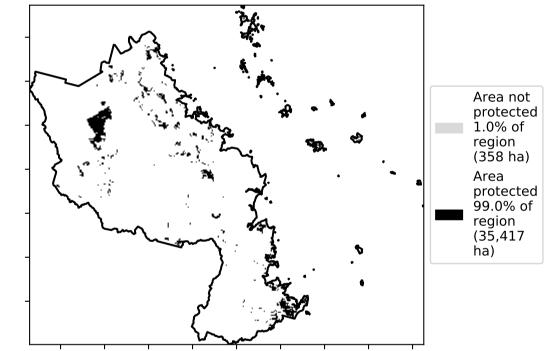
% Area protected from water erosion (>70%)



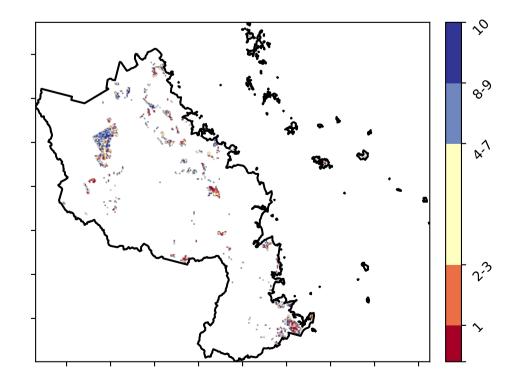




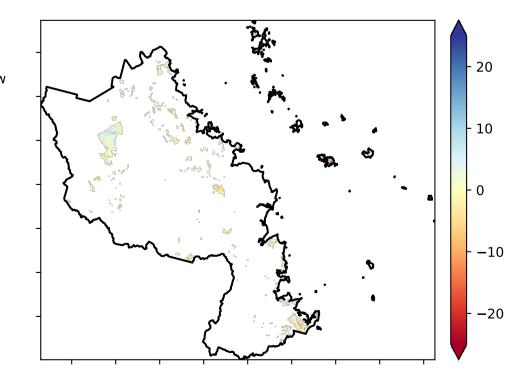
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]





Deciles show where the pixel value lies in the

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

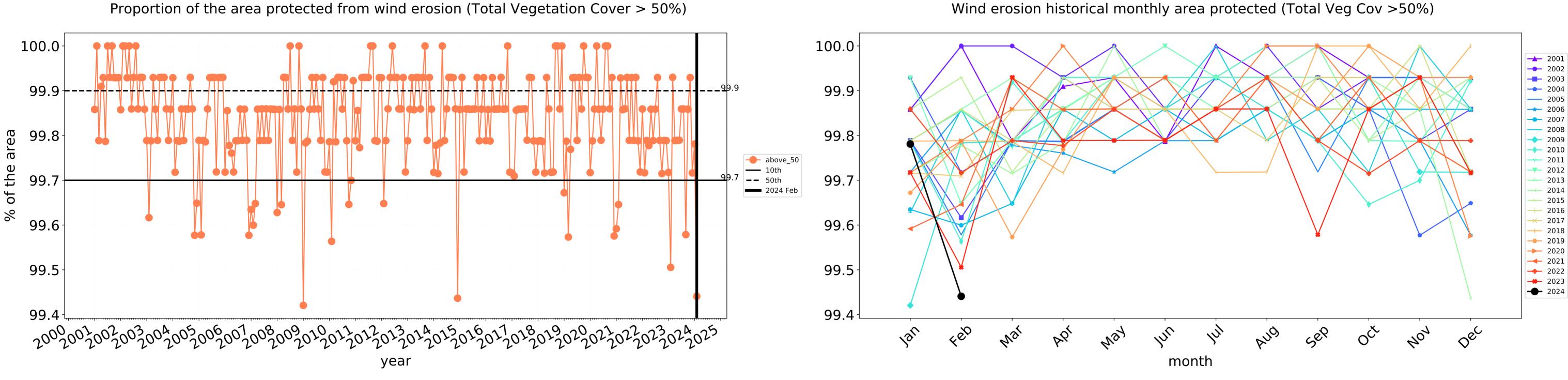
in the lowest 10% of

records for that month of

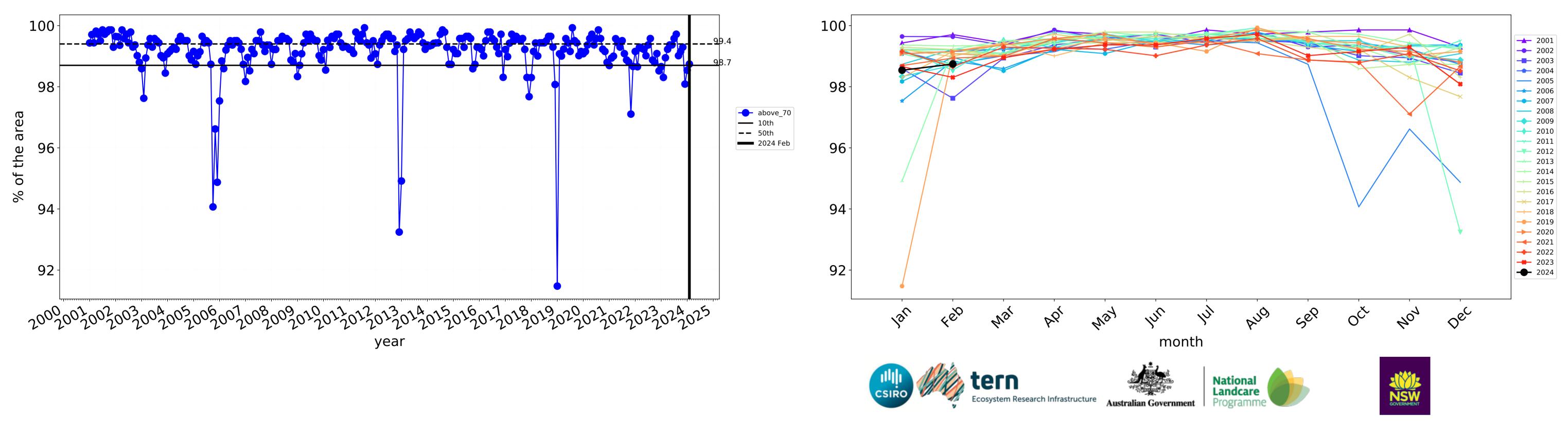
the map using baseline from 2001 to 2019.



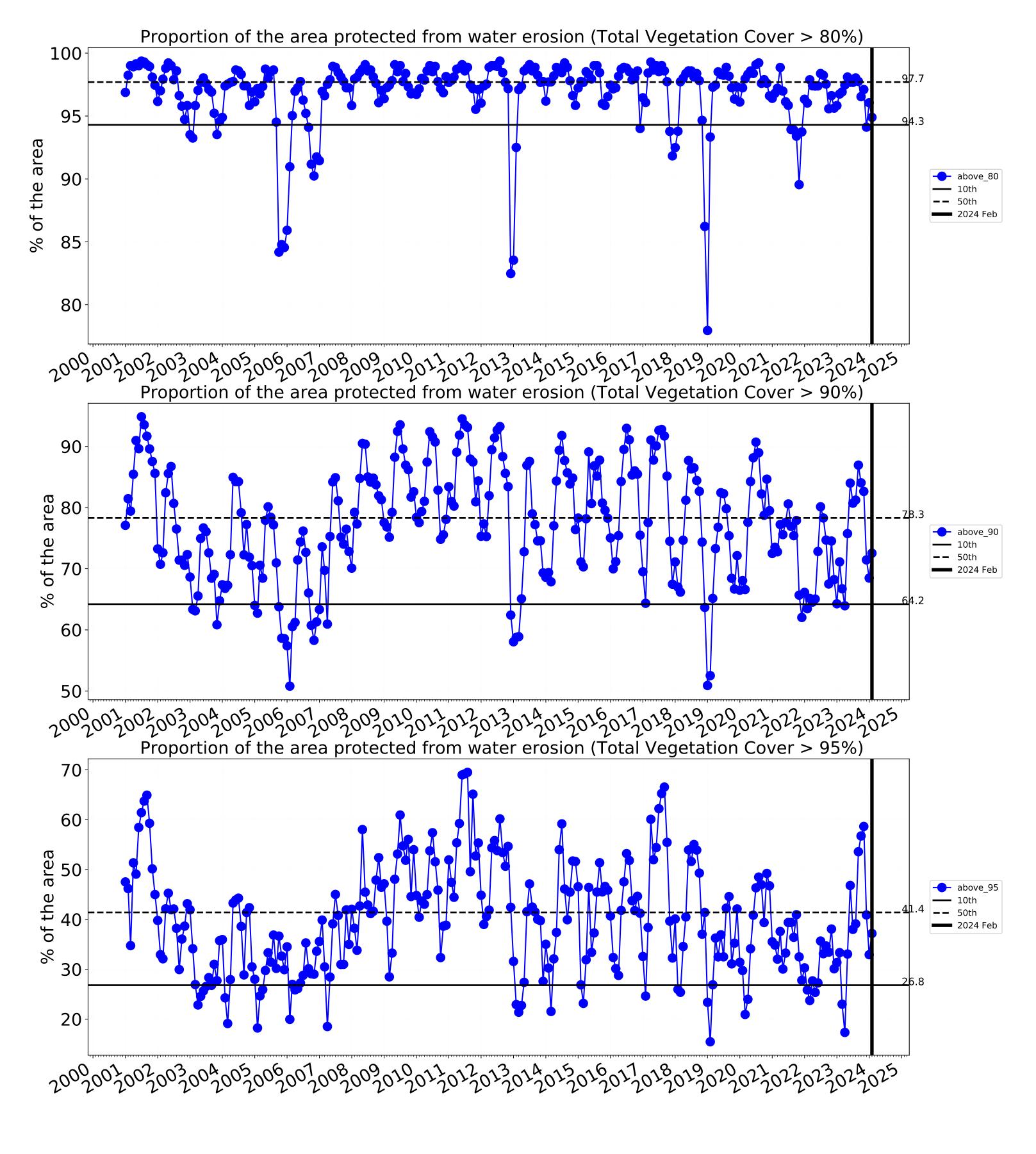
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

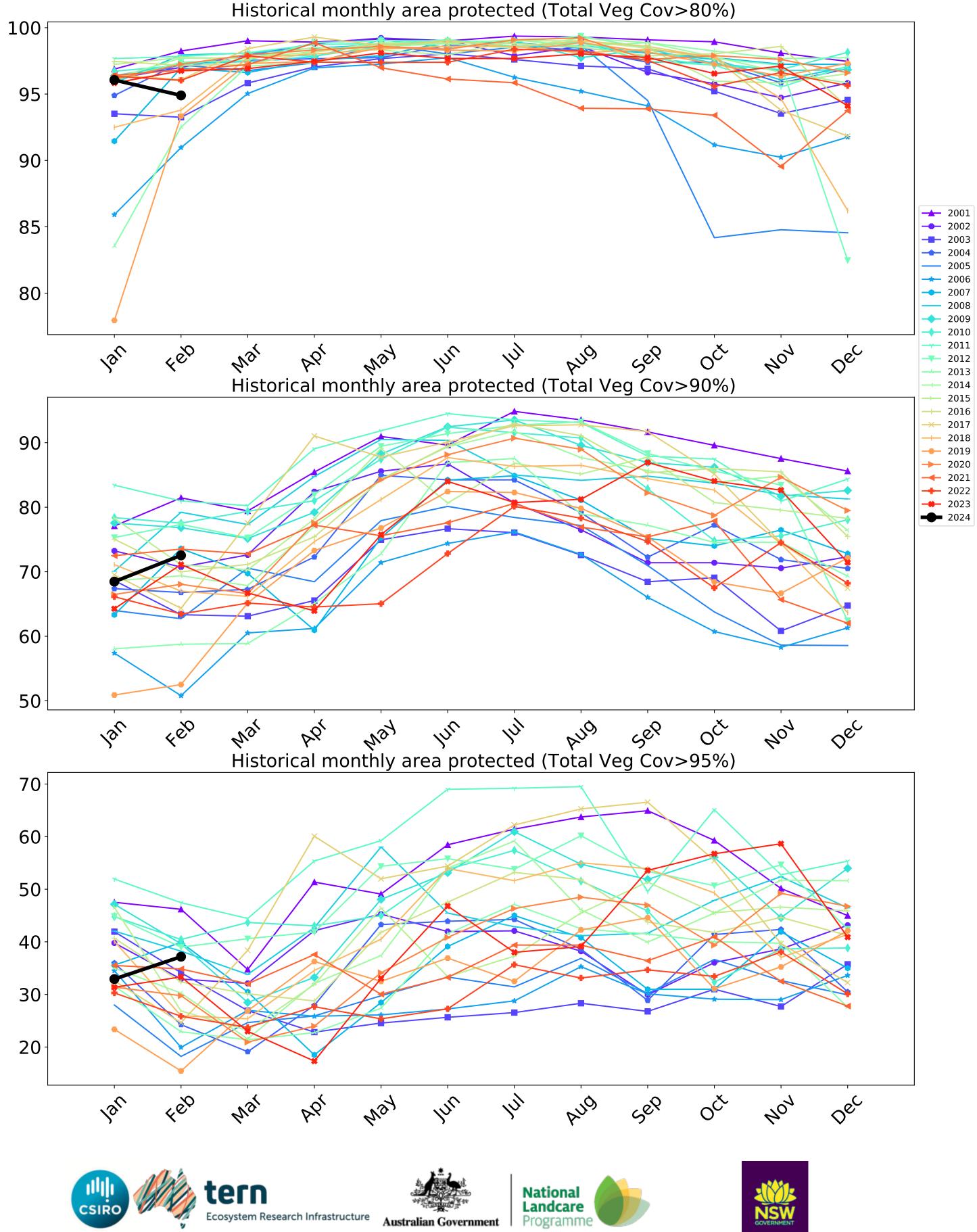


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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



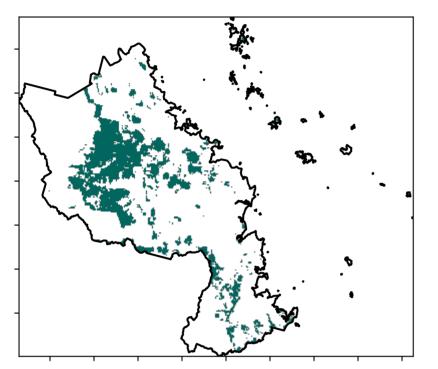




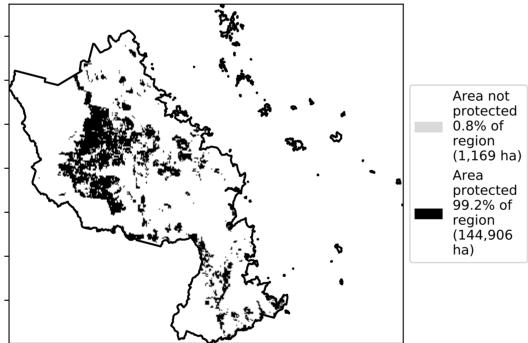
Conservation and natural environments Forest (non woodland)

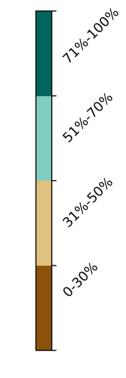
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) 1 Conservation and natural environments - Non-woodland forest

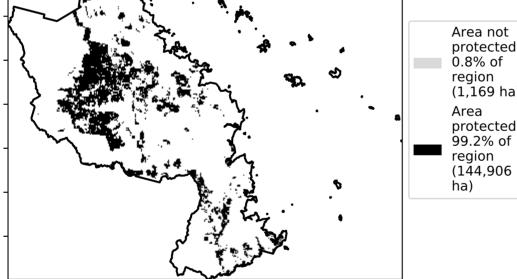
Total Vegetation Cover [%]



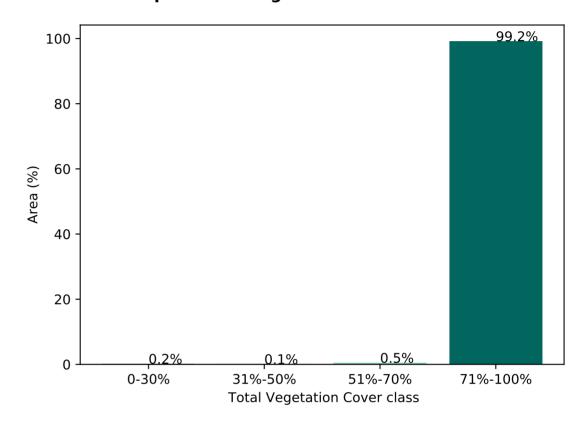
% Area protected from water erosion (>70%)



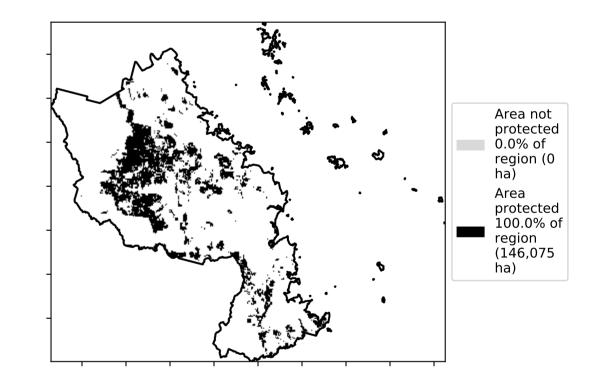




Proportion of vegetation cover class in area



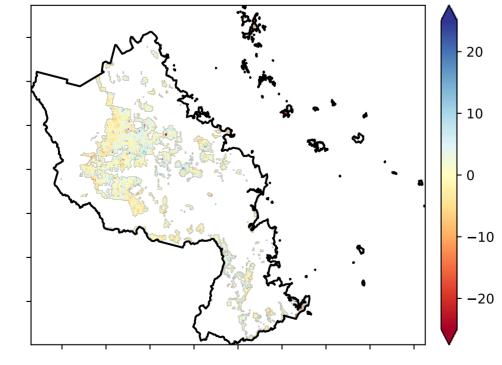
% Area protected from wind erosion (>50%)



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

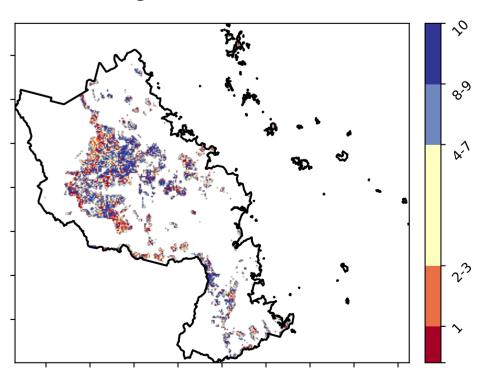
Total Vegetation Cover Anomaly [%]

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.

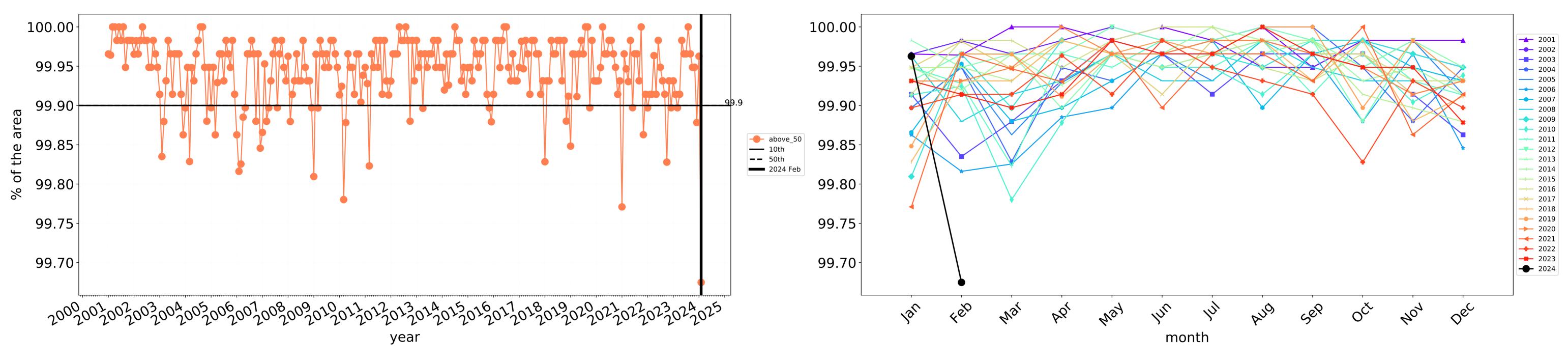


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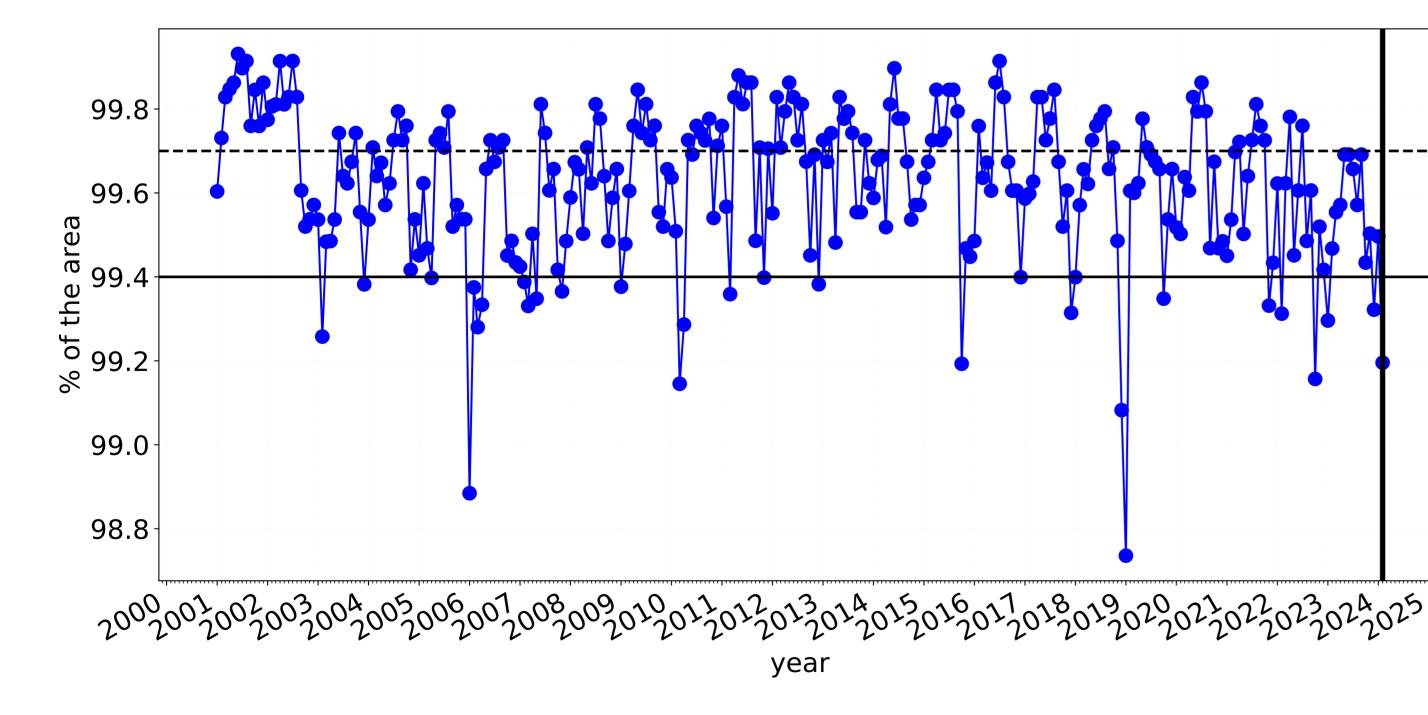
Total Vegetation Cover Decile [%]

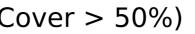






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

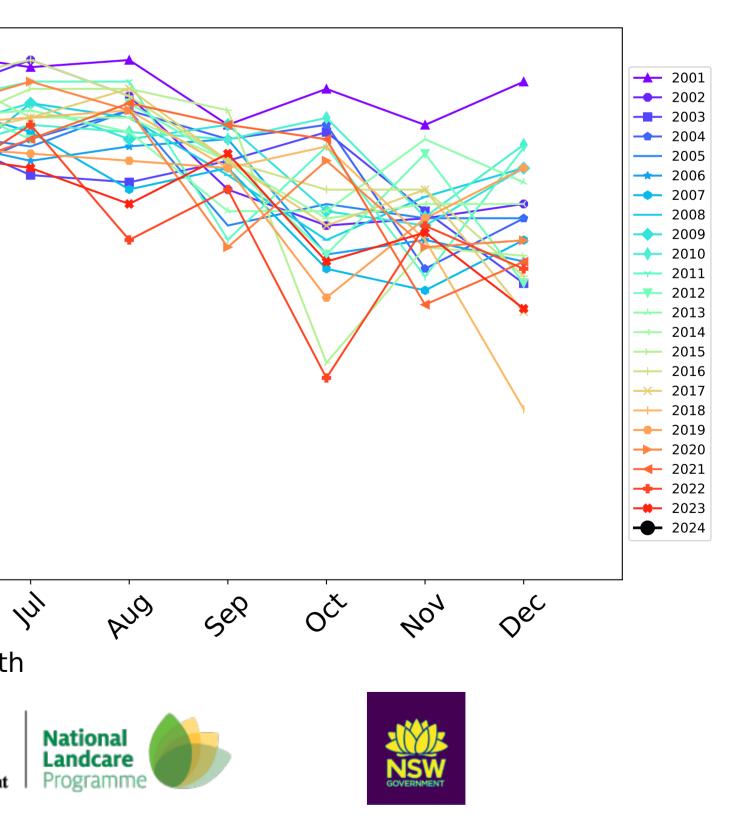


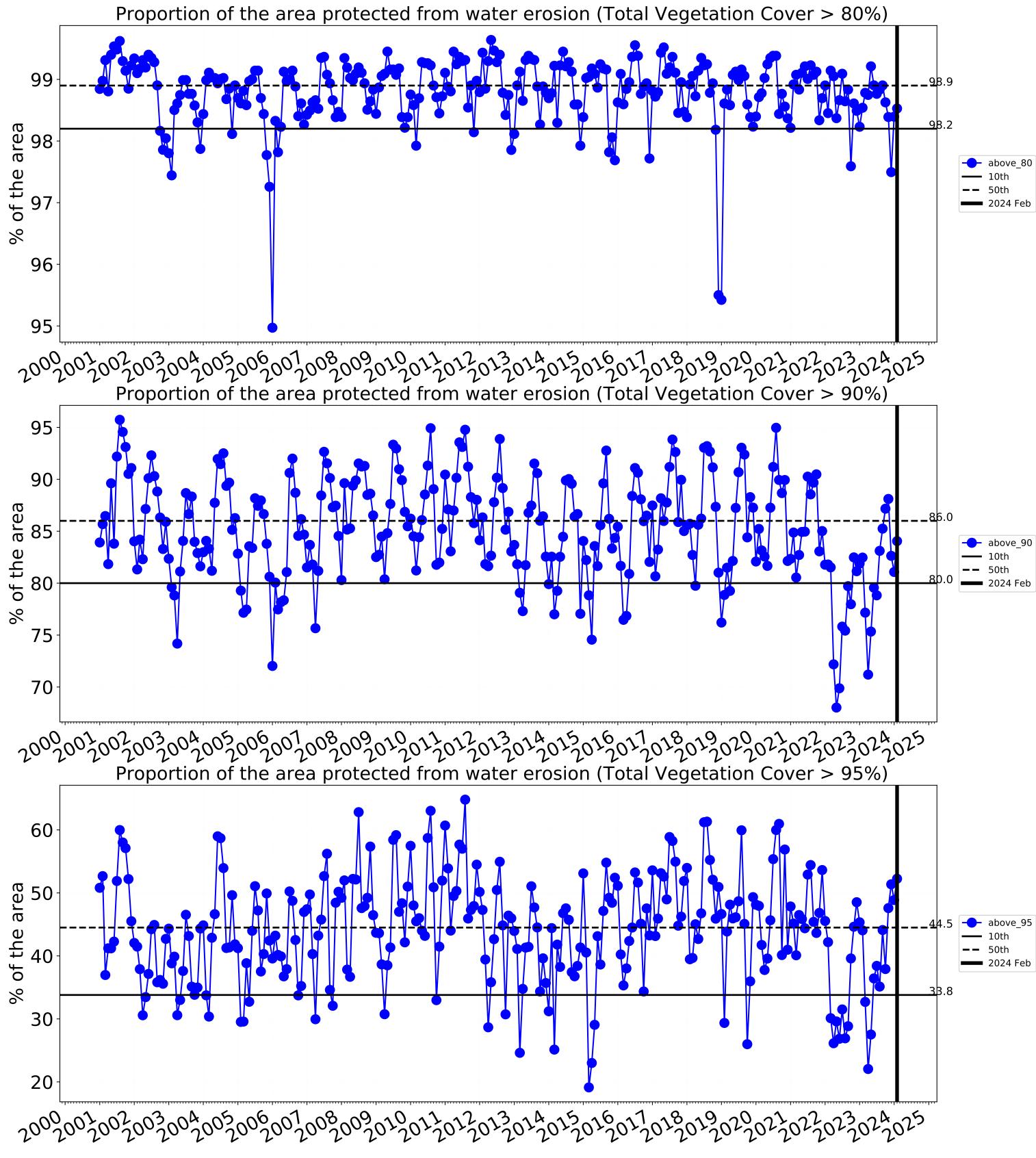


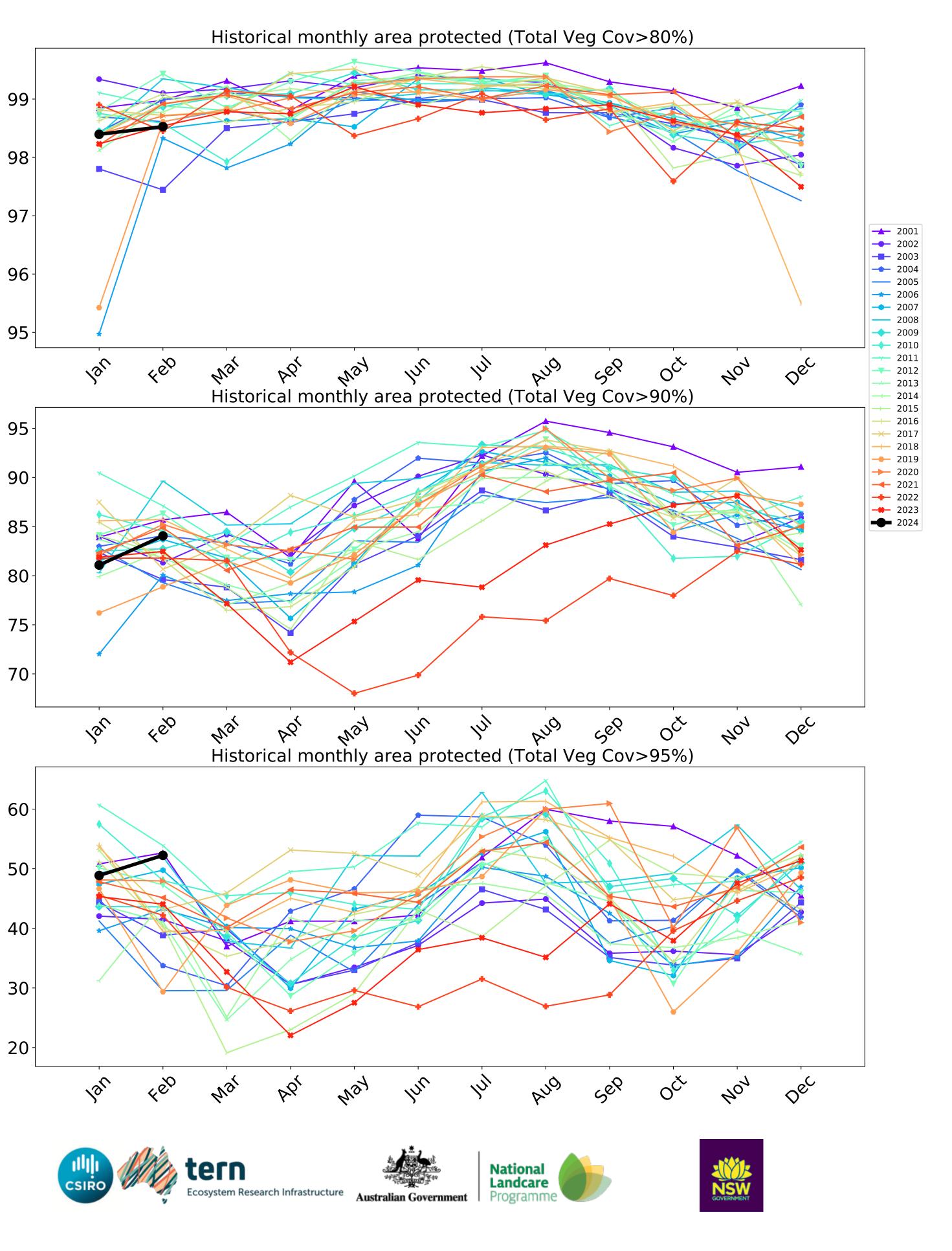
Wind erosion historical monthly area protected (Total Veg Cov >50%)

99.8 99.6 ---- above_70 **—** 10th **--** 50th 99.4 2024 Feb 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%)

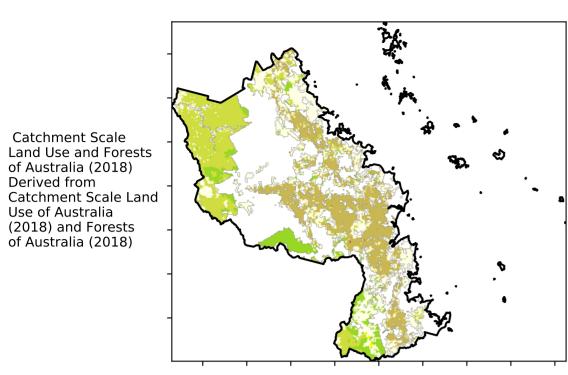




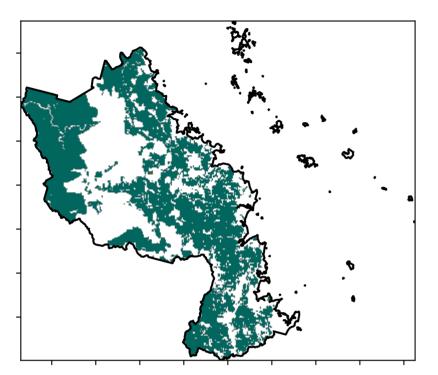


Agriculture

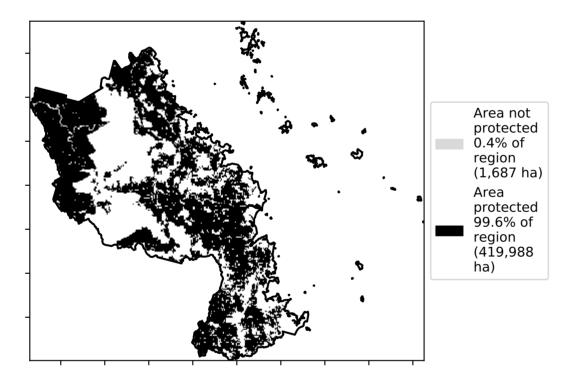
Land use and forest cover

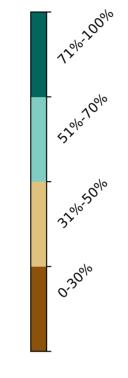


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





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

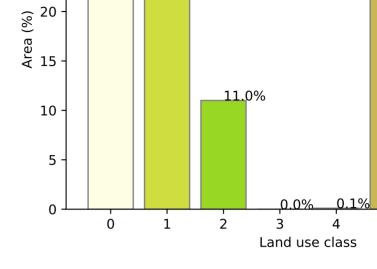
4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated

7 Agriculture - Horticulture - Non-irrigated

6 Agriculture - Cropping - Irrigated

8 Agriculture - Horticulture - Irrigated

3 Agriculture - Grazing - Non-woodland forest



25.4%

<u>32.</u>7%

30

25

Proportion of each land class in area

<mark>30.</mark>8%

0.0%

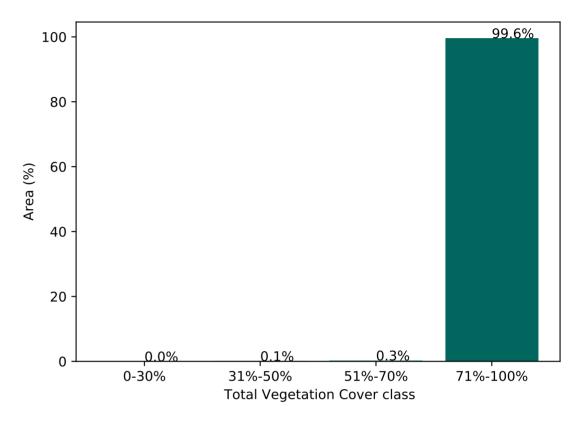
6

5

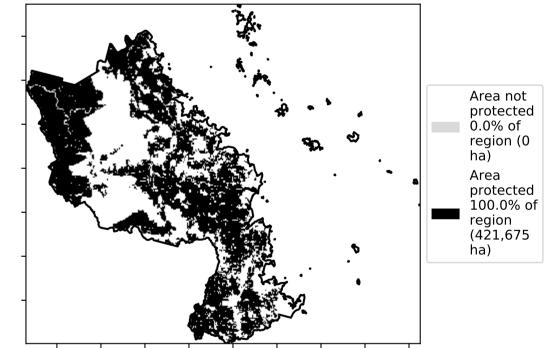
0.0%

7

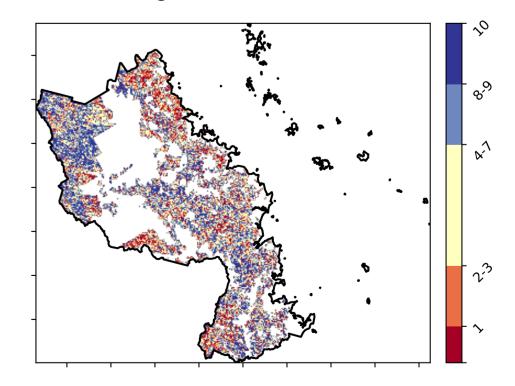
Proportion of vegetation cover class in area



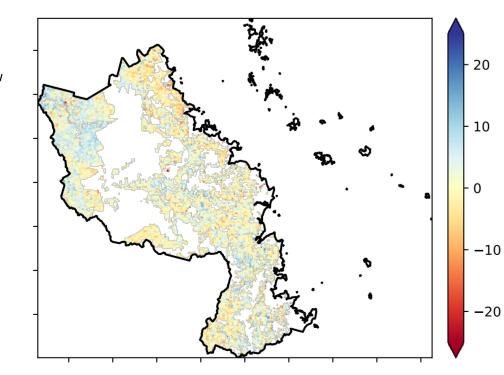
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



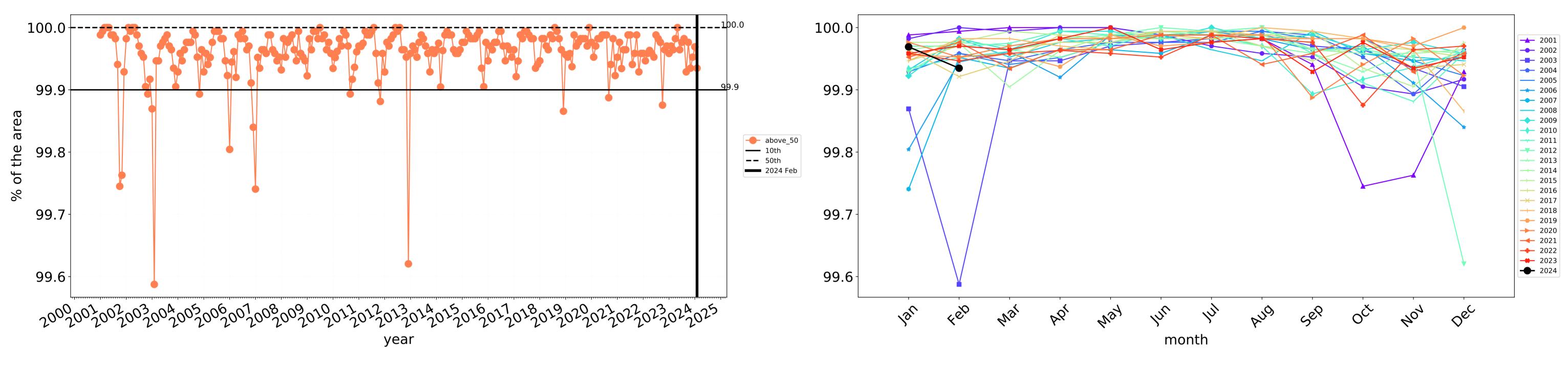
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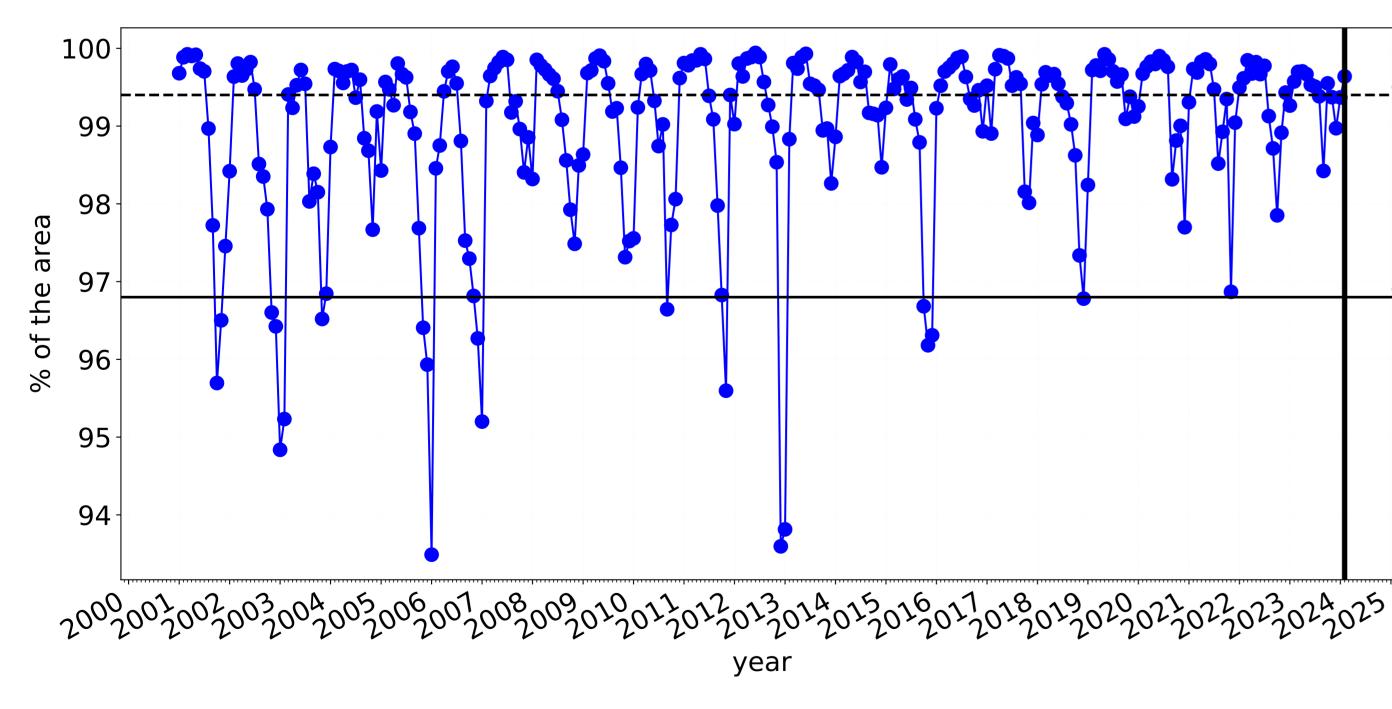
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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%)

100 99 98 ---- above_70 **—** 10th **——** 50th 97 2024 Feb 96 95 94 4e0 Jan Mai tern

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

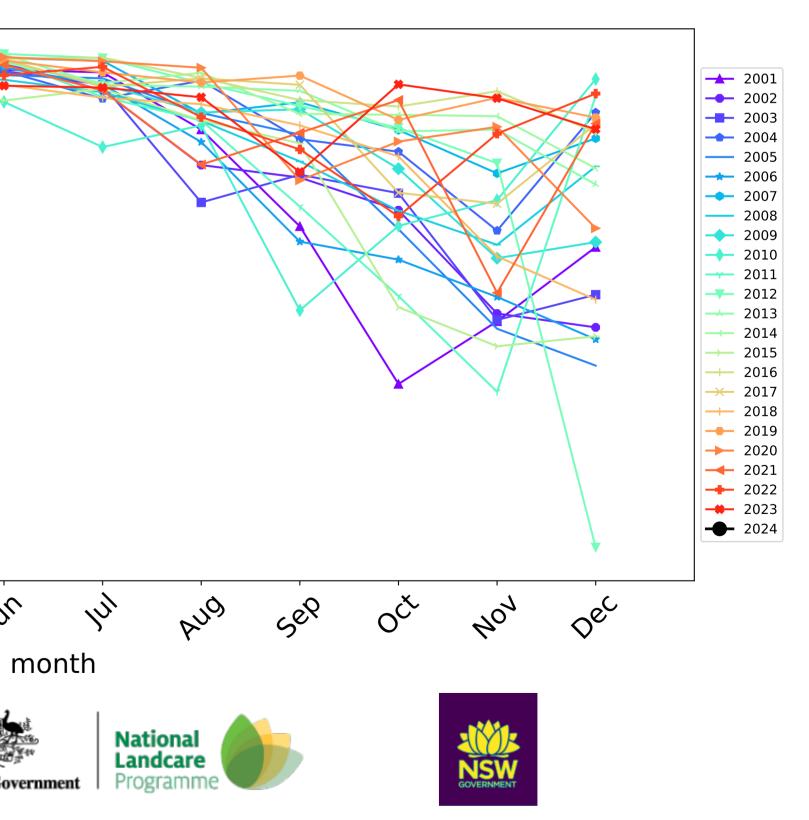
May

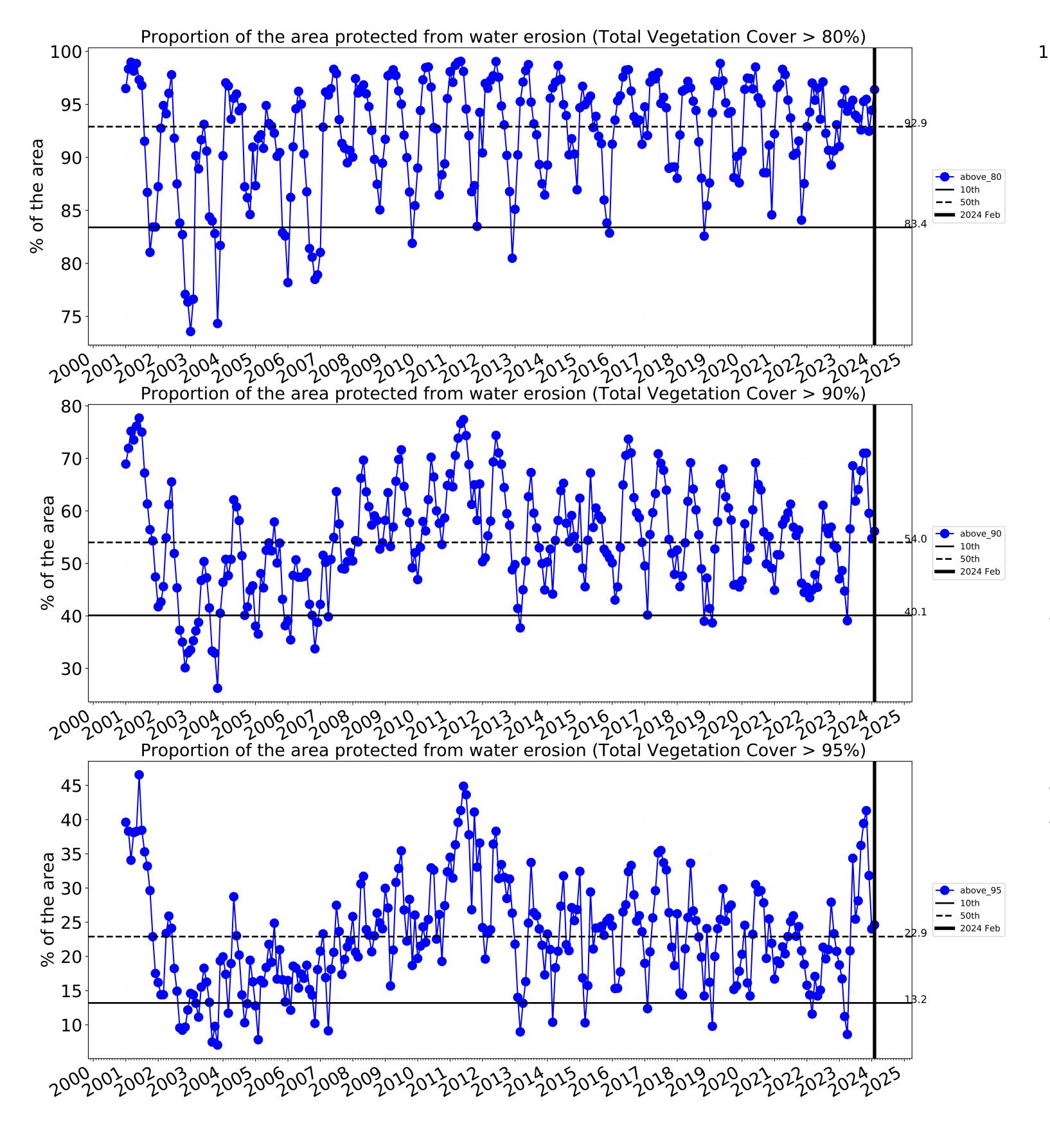
Þb,

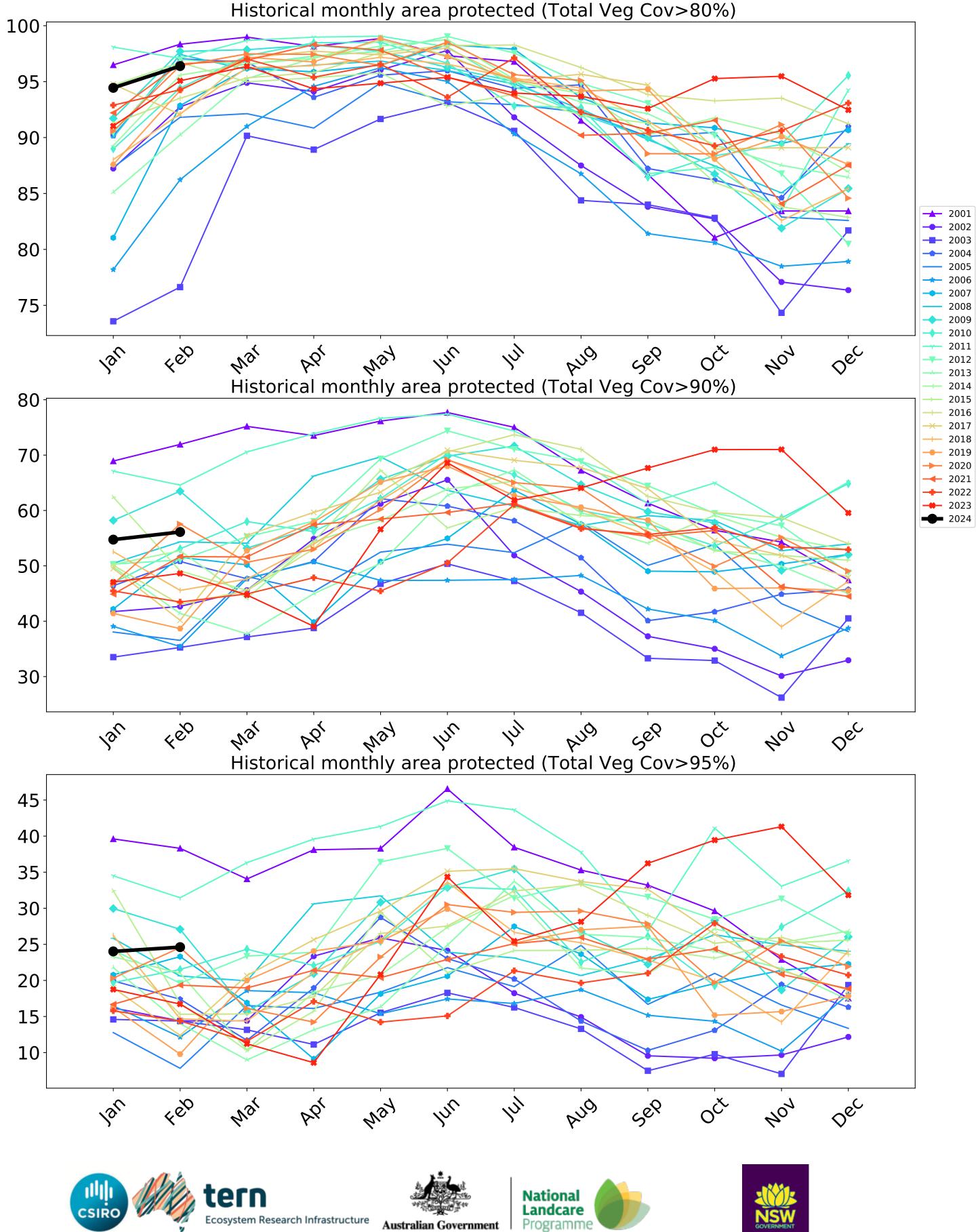
Ecosystem Research Infrastructure

In

Australian Government



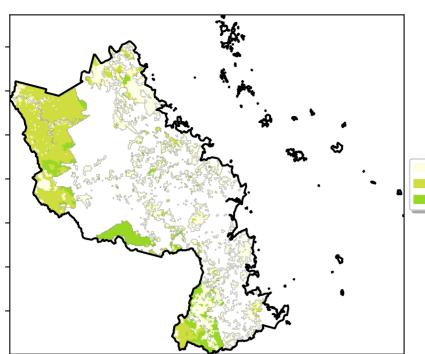






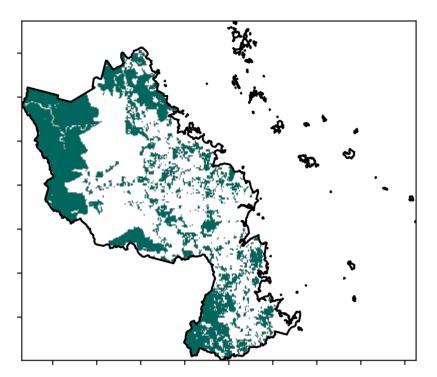
Grazing

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

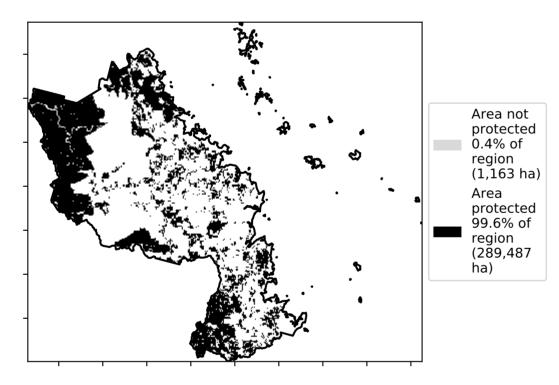


Land use and forest cover

Total Vegetation Cover [%]



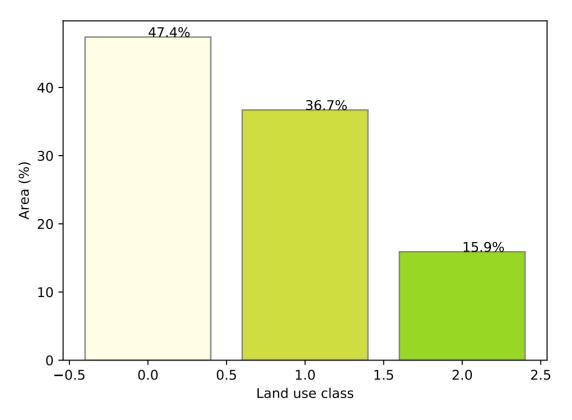
% Area protected from water erosion (>70%)



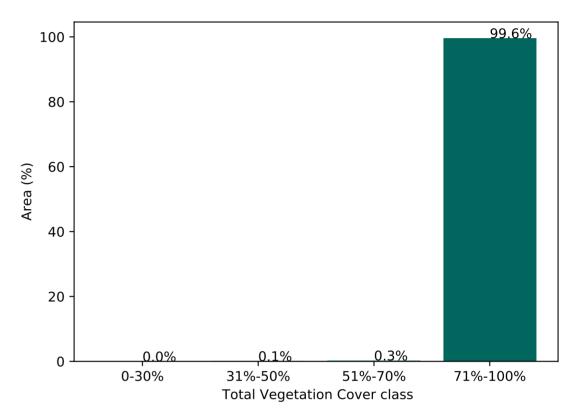
1200,1000 · 52°1070°10 32005000 0.30%

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

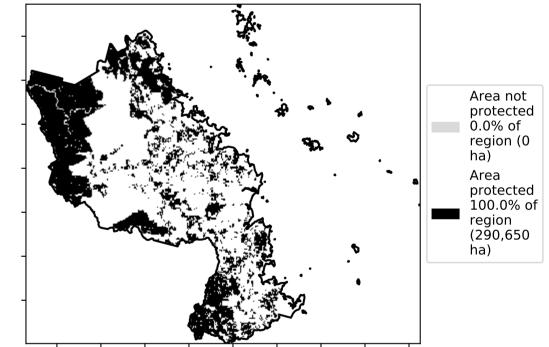
Proportion of each land class in area



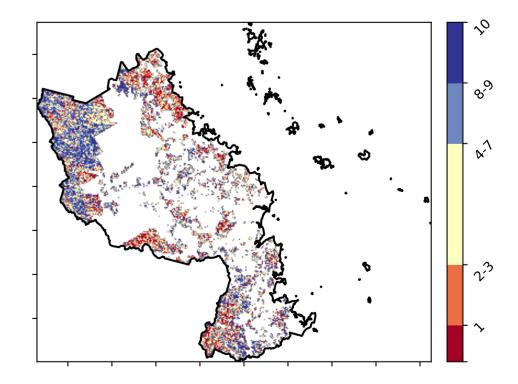
Proportion of vegetation cover class in area



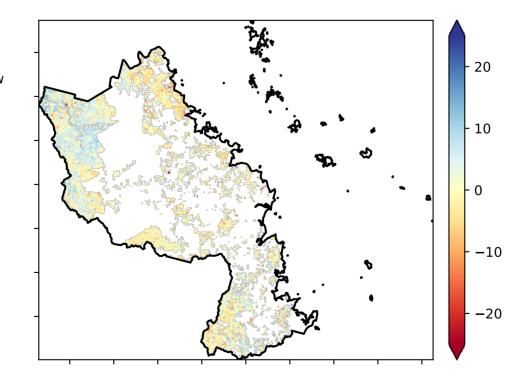
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

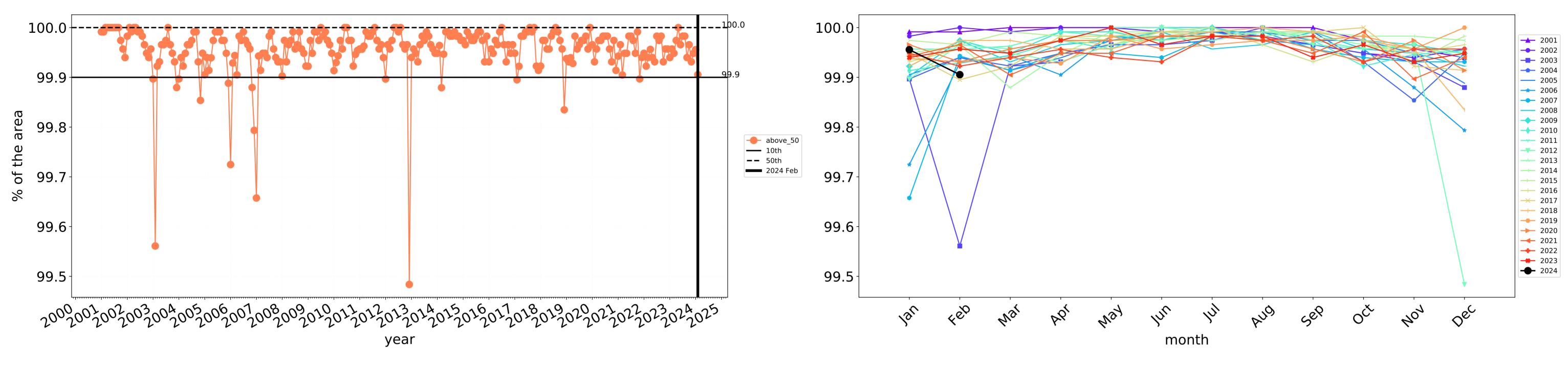


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

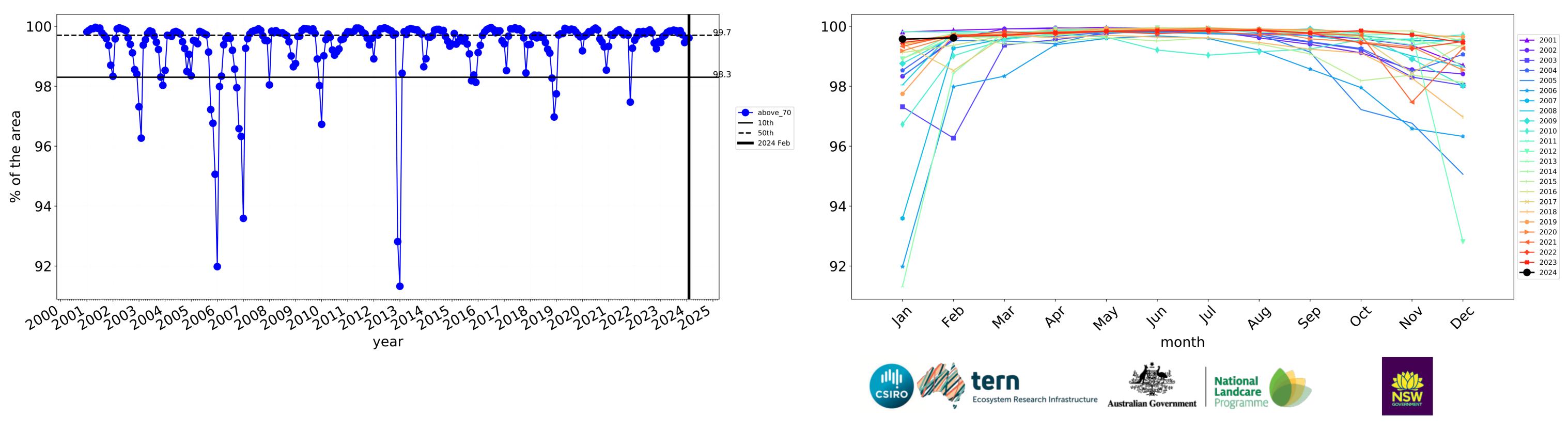




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

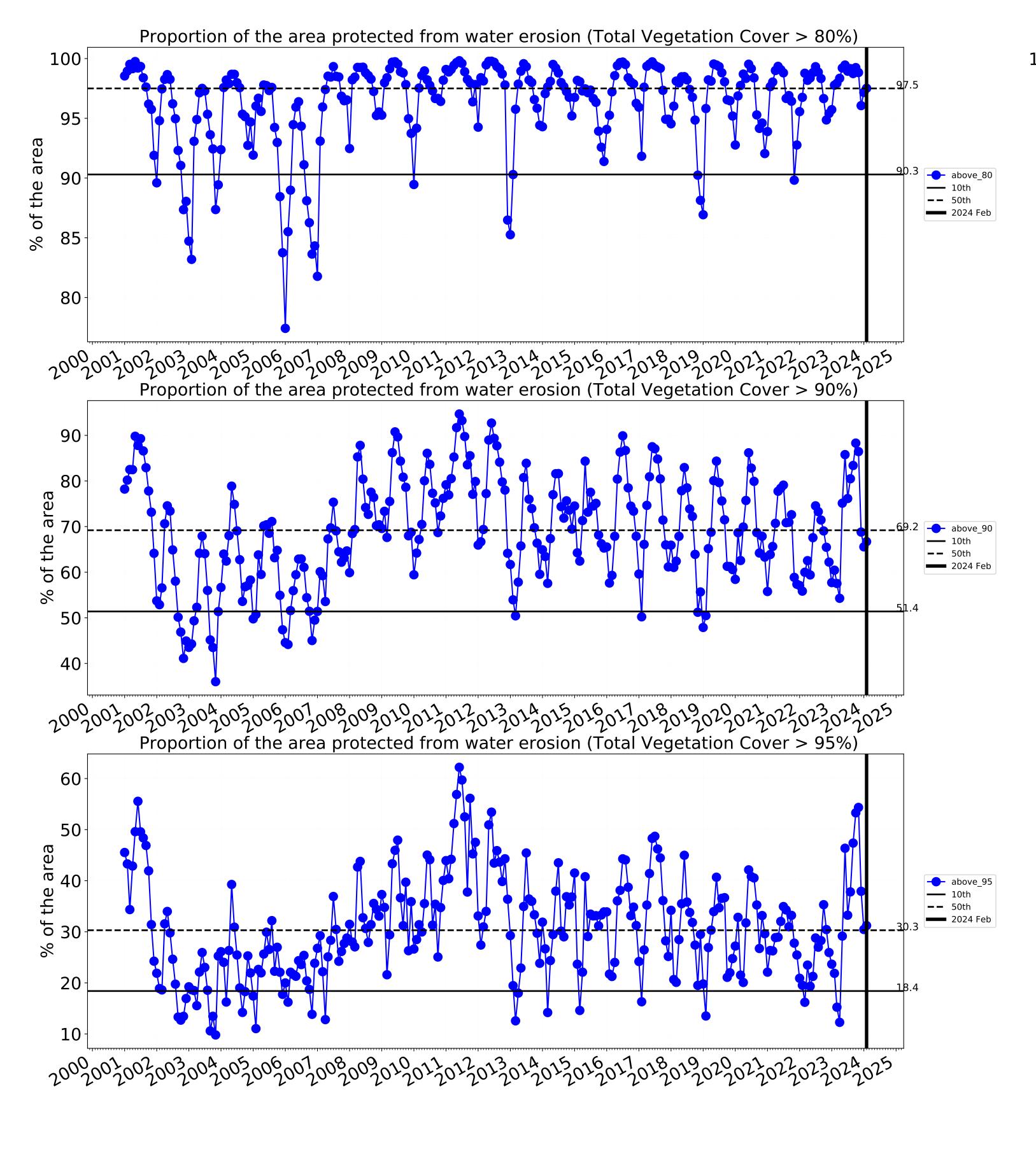


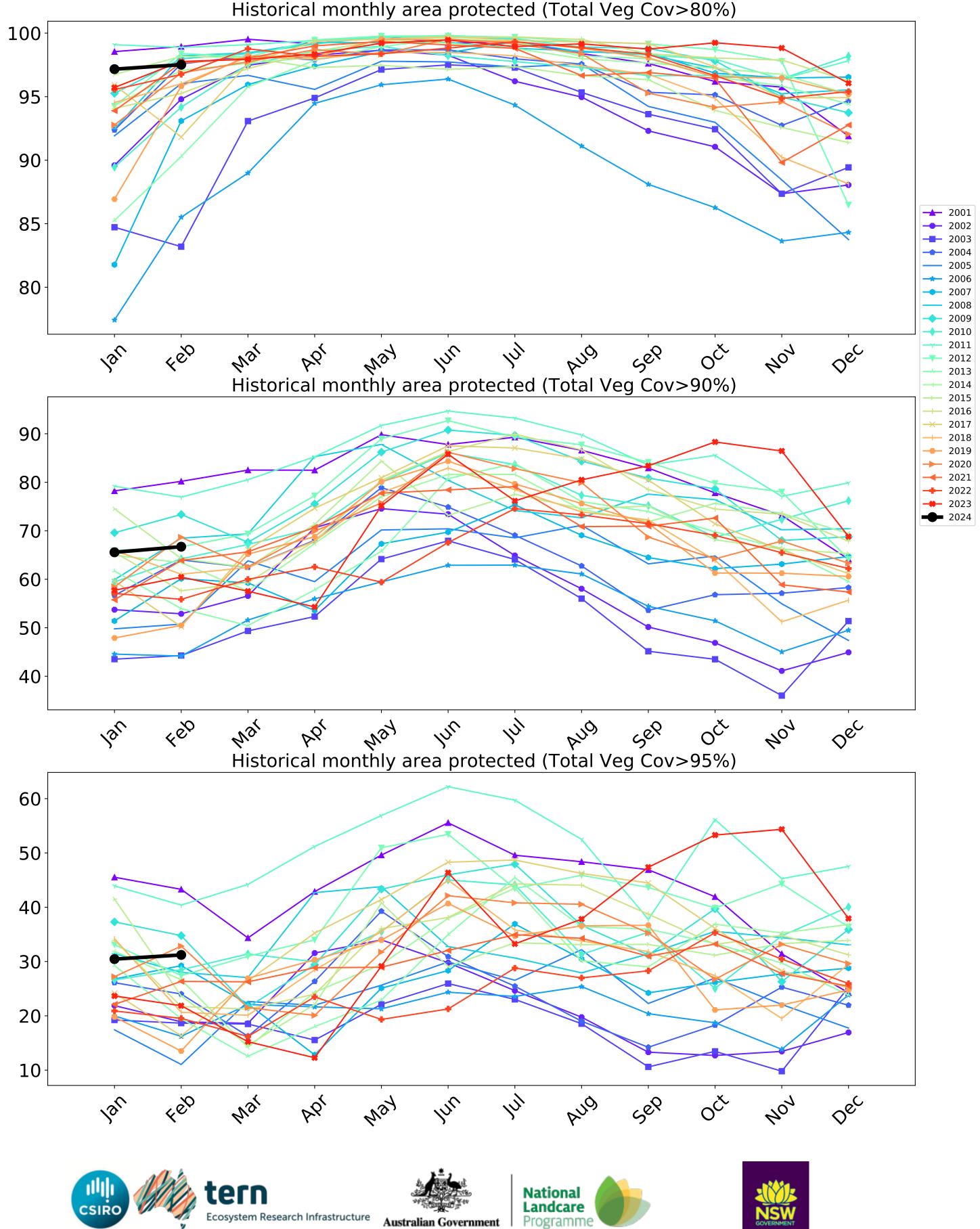
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

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







Grazing non forest

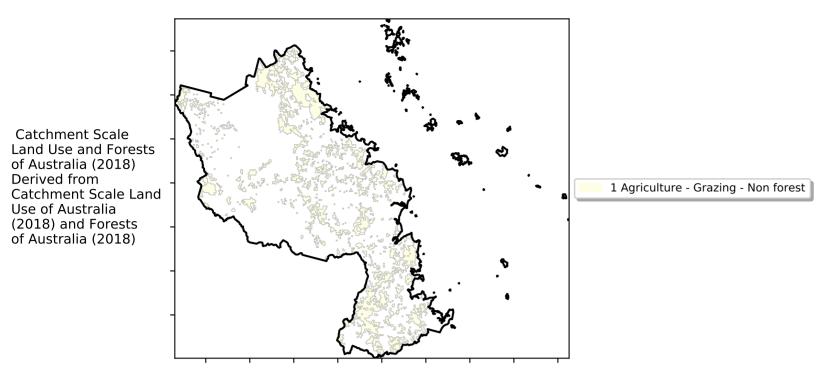
12%200%

· 52°1070010

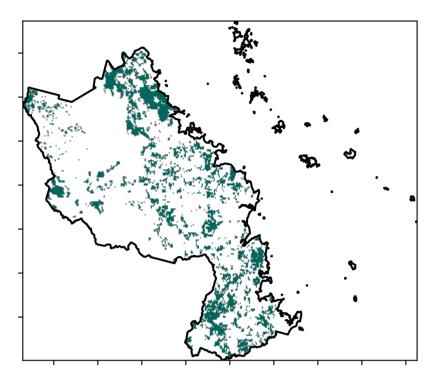
· 320050010

0.30%

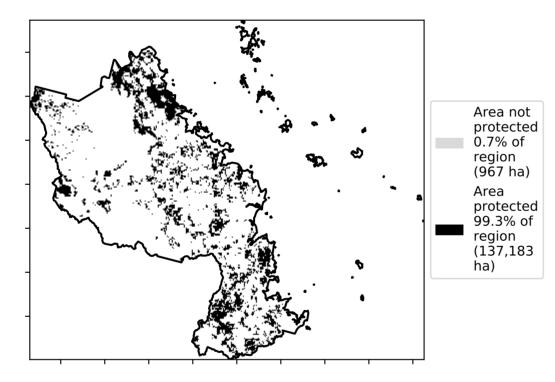
Land use and forest cover



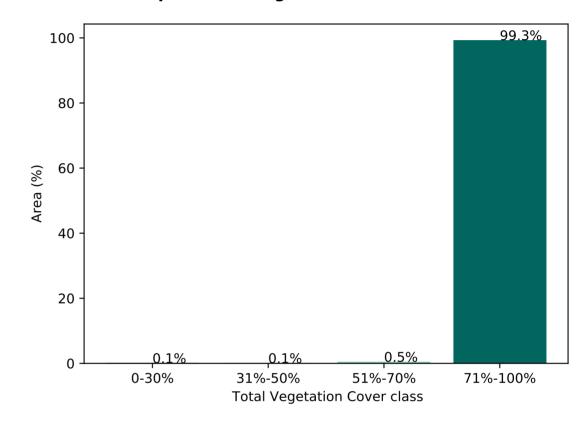
Total Vegetation Cover [%]



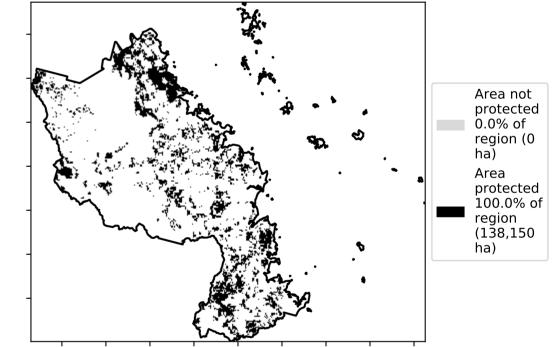
% Area protected from water erosion (>70%)



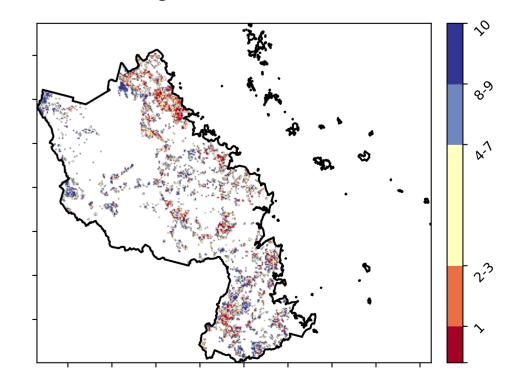
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

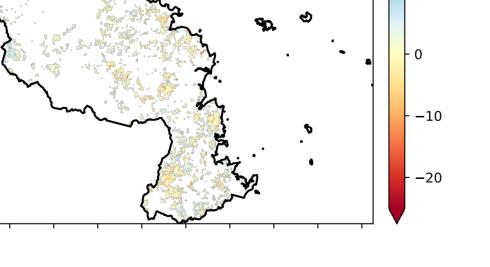
26 - 20 - 10

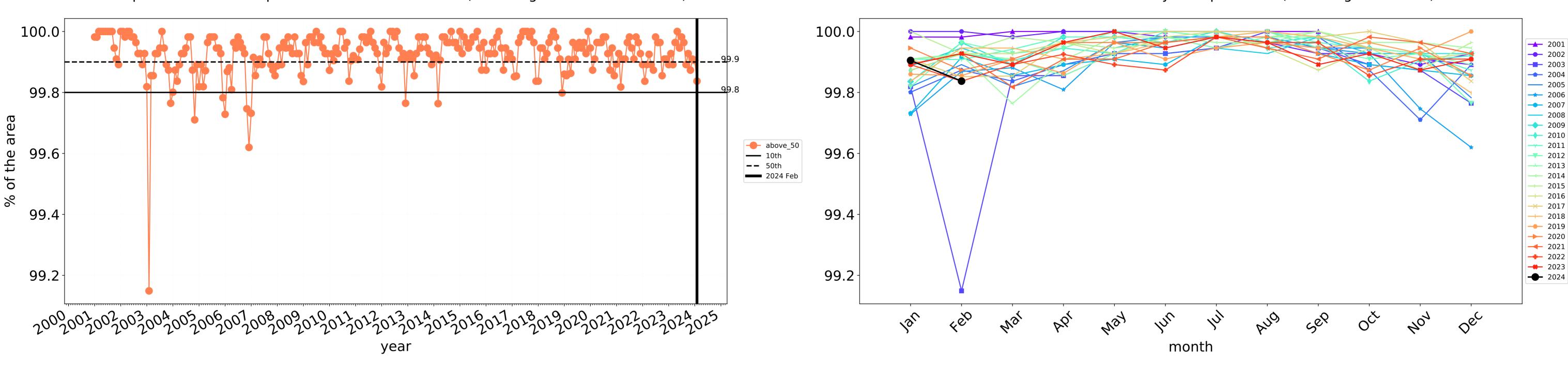
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





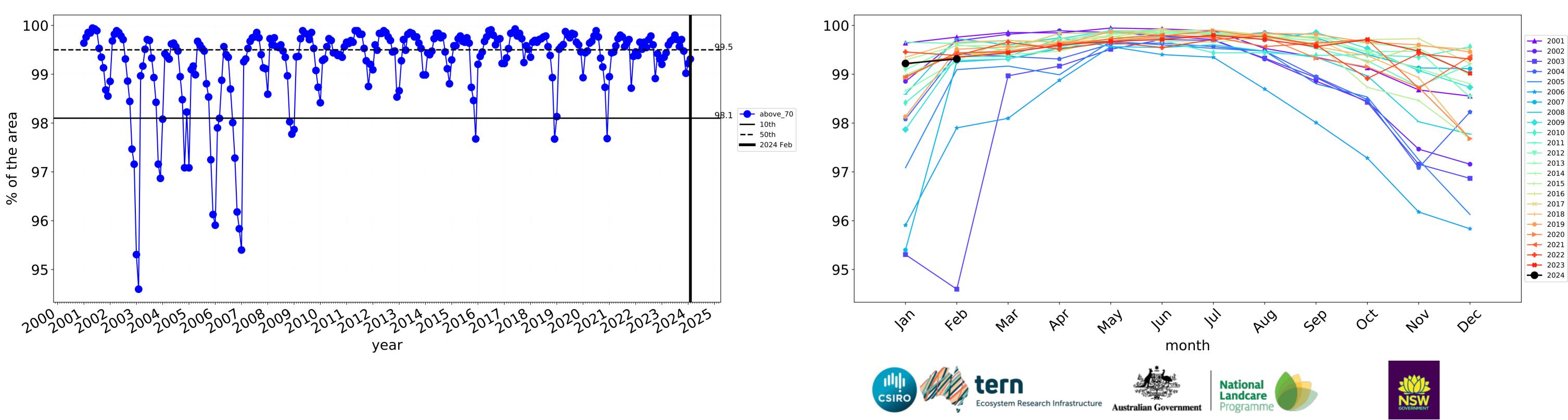
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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

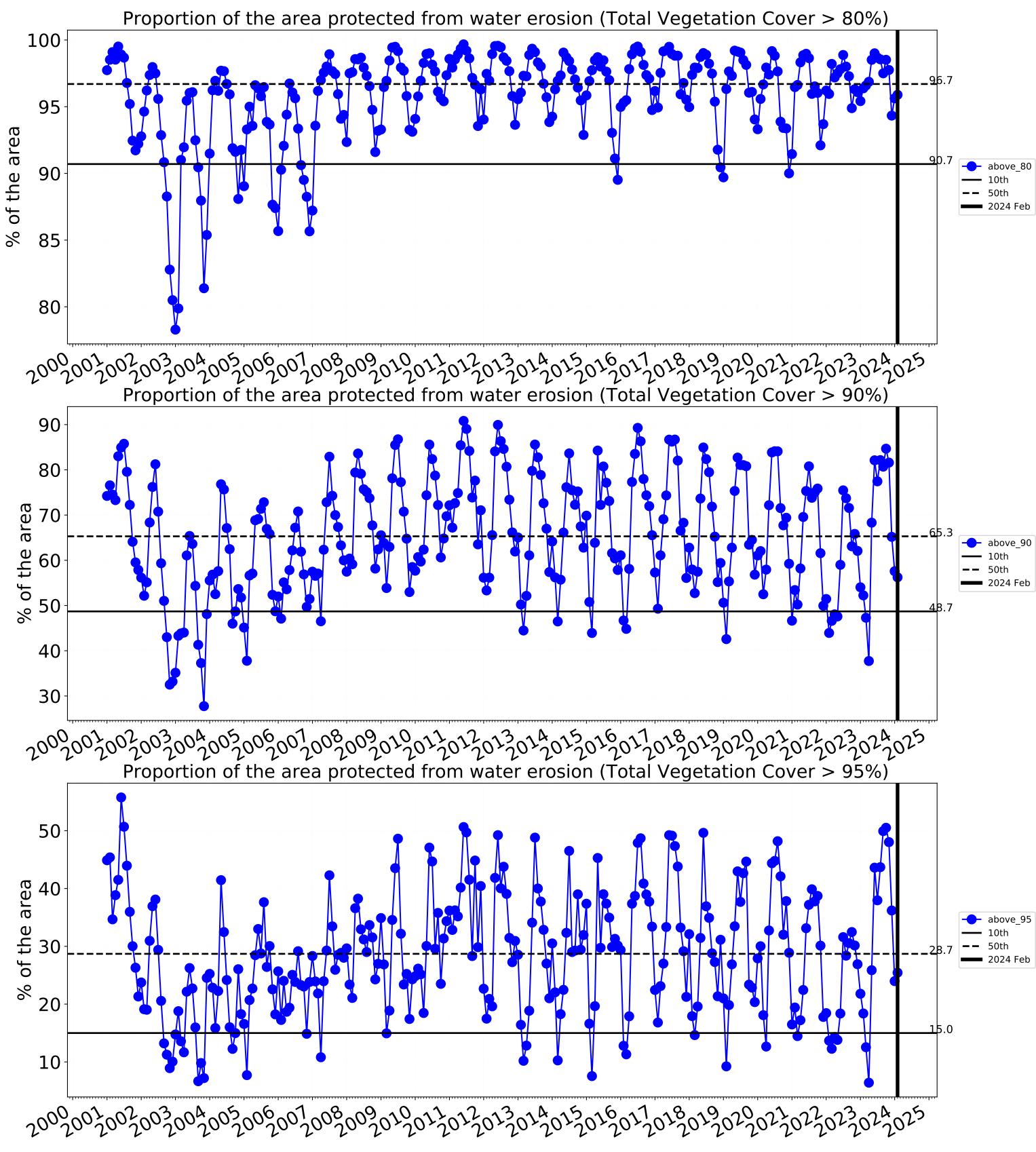


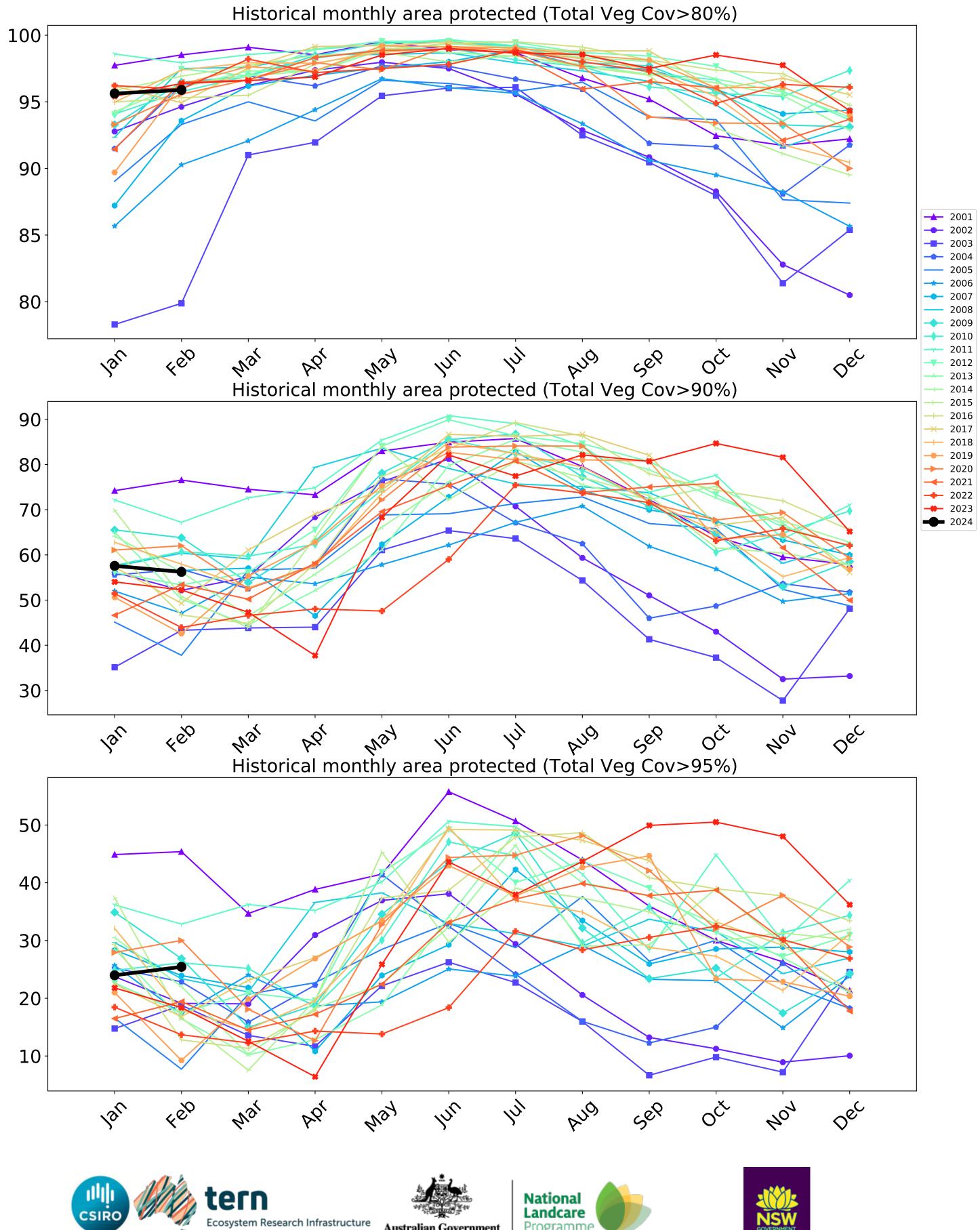


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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







Programm

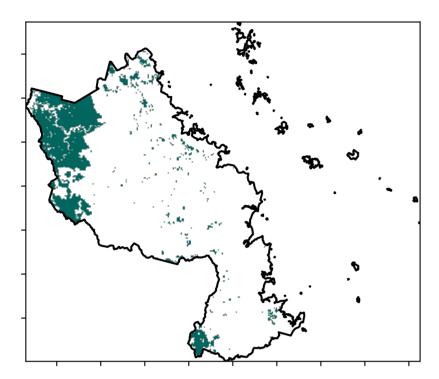


Grazing Woodland forest

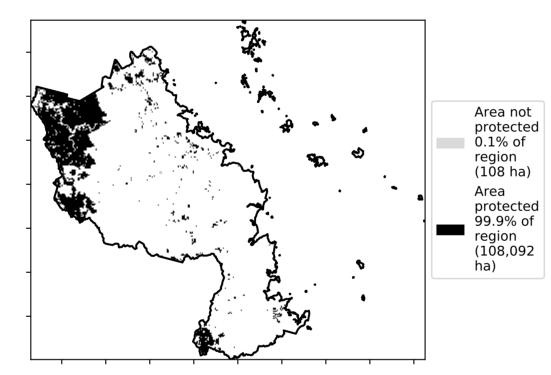
1 Agriculture - Grazing - Woodland forest

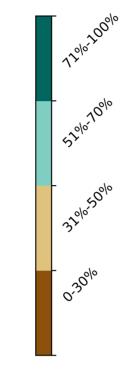
Total Vegetation Cover [%]

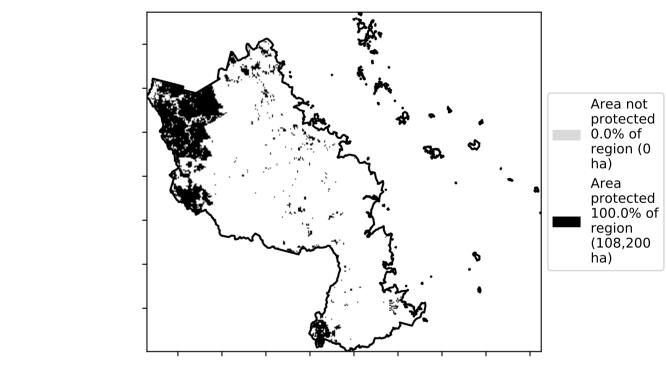
Land use and forest cover



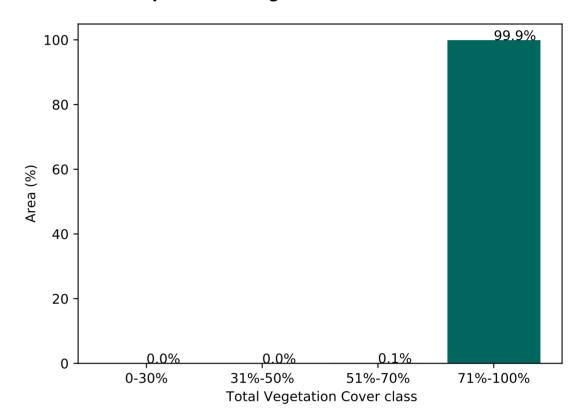
% Area protected from water erosion (>70%)





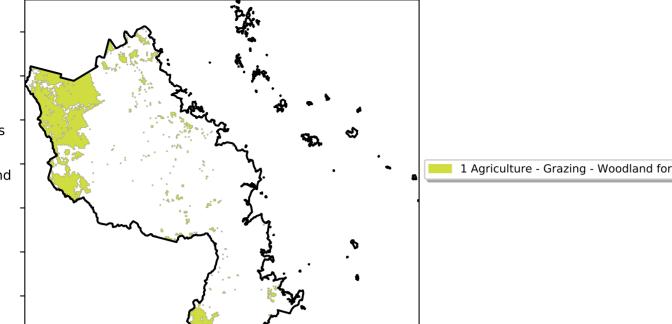


Proportion of vegetation cover class in area



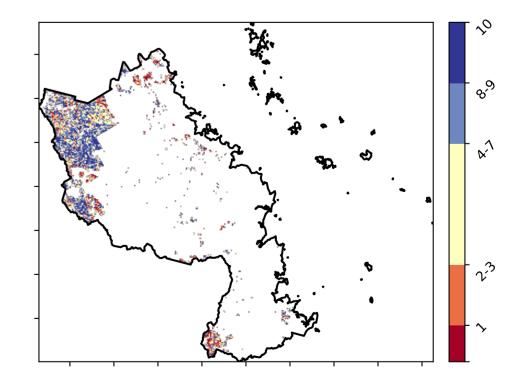
% Area protected from wind erosion (>50%)



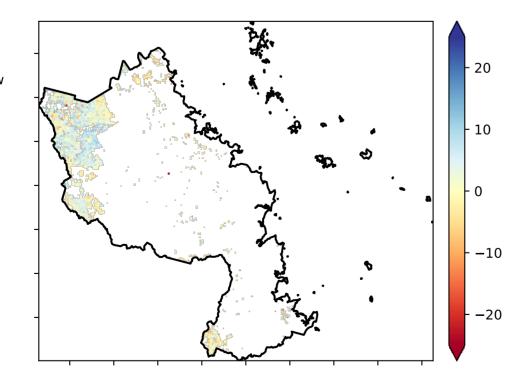


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

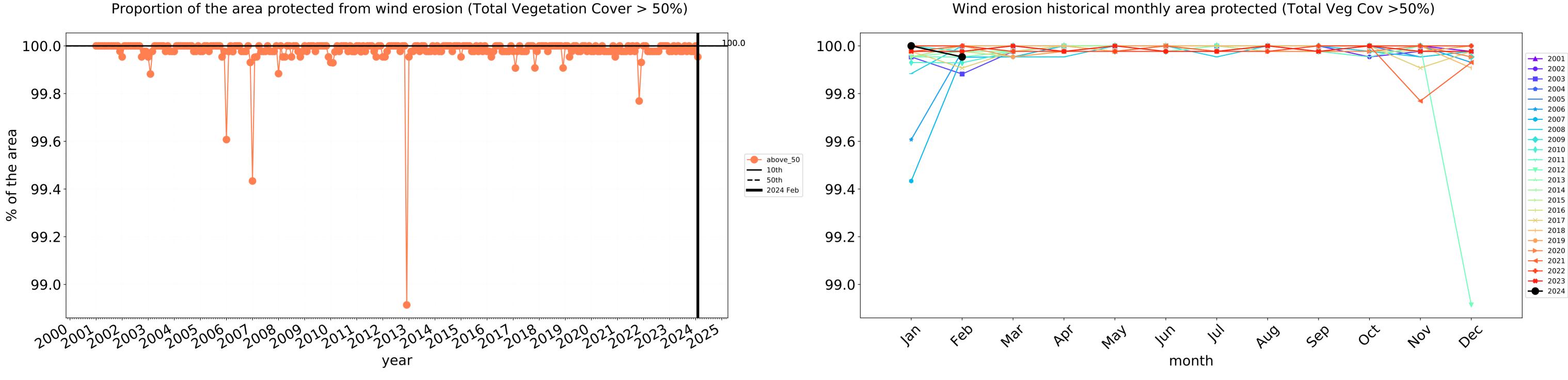


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

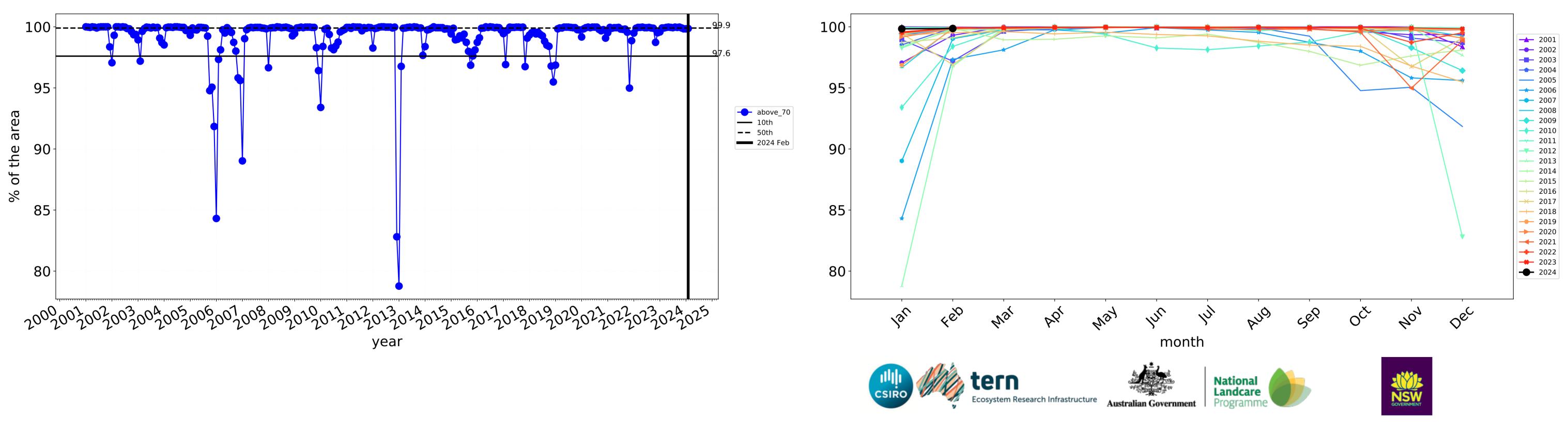




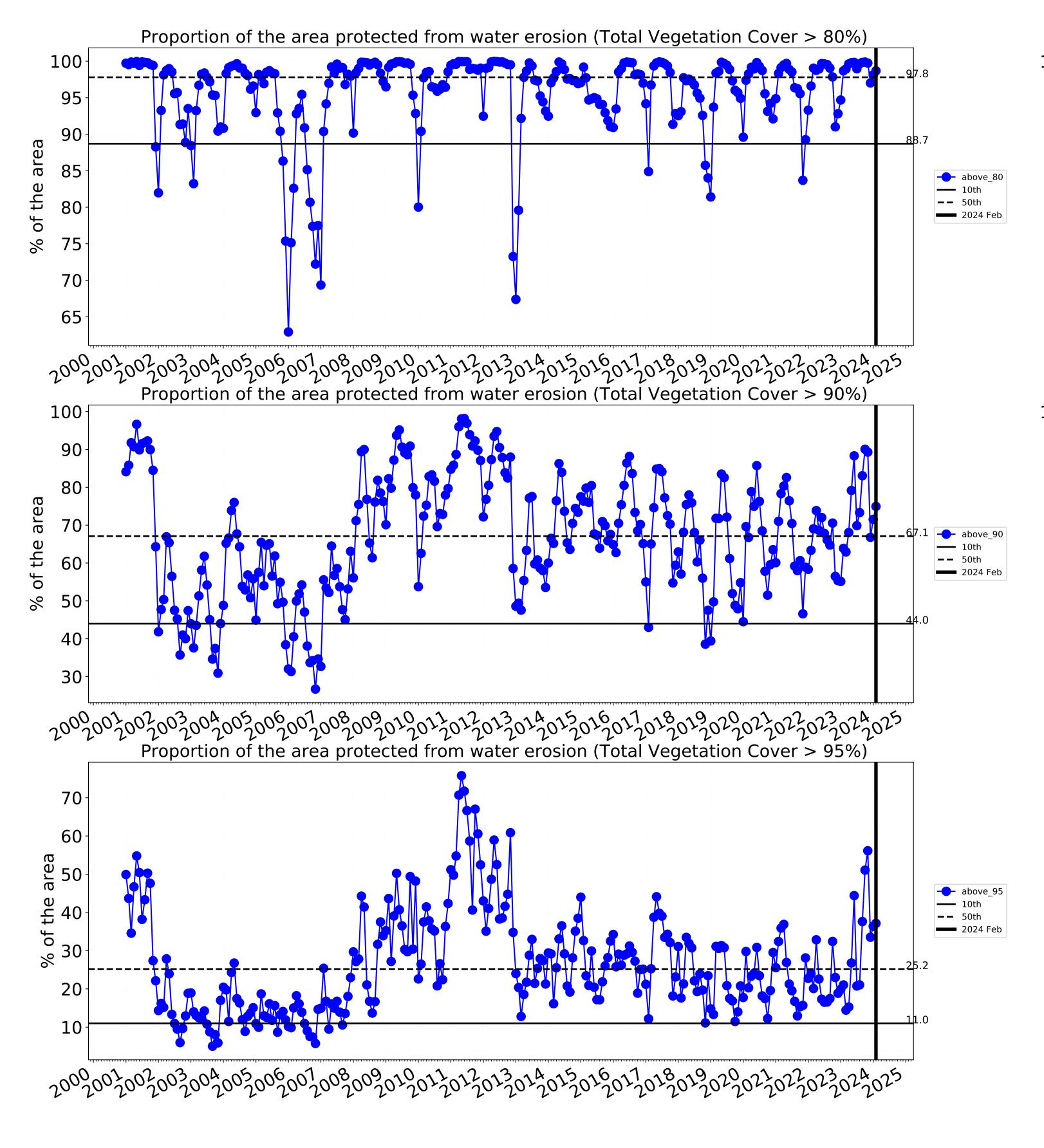
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

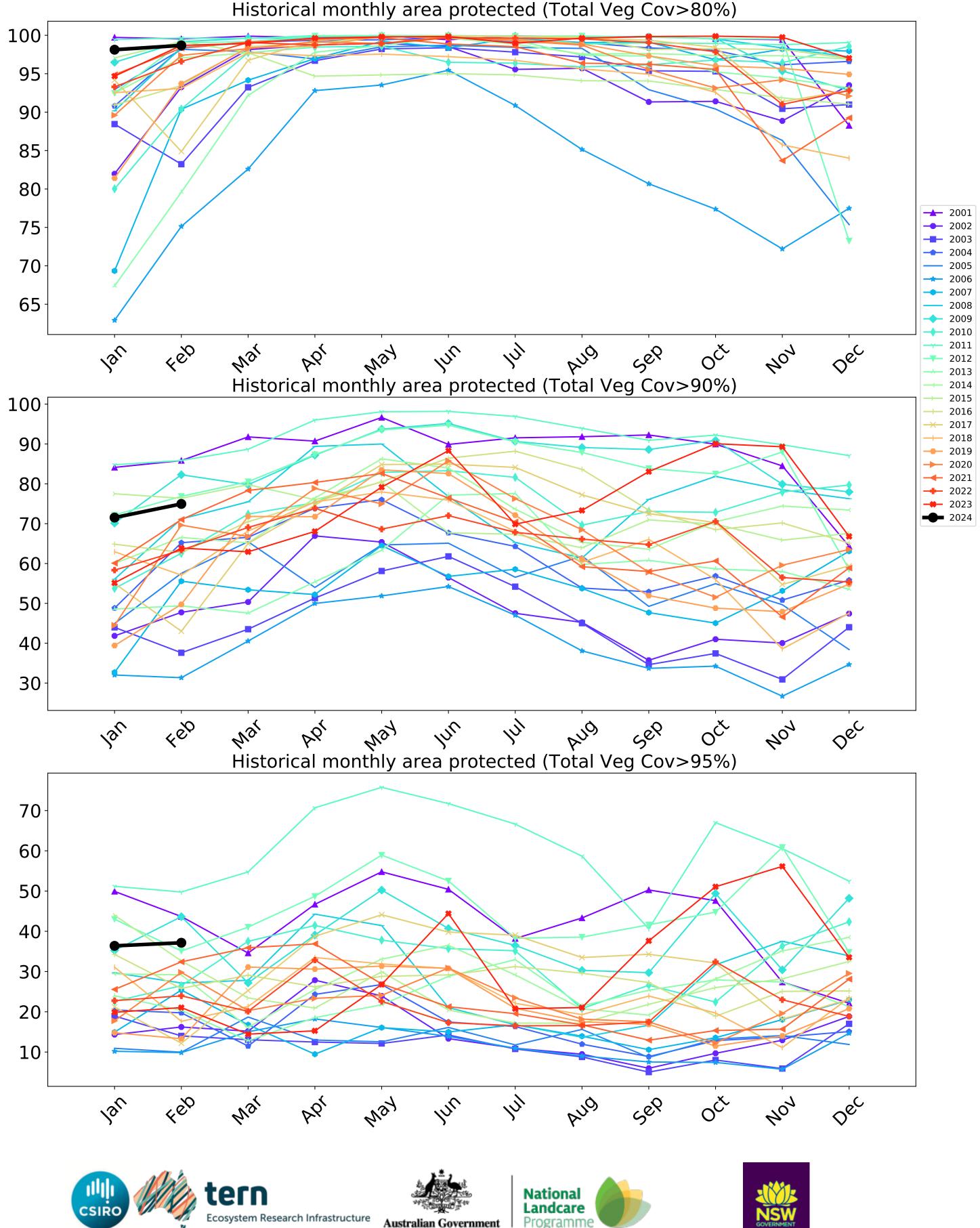


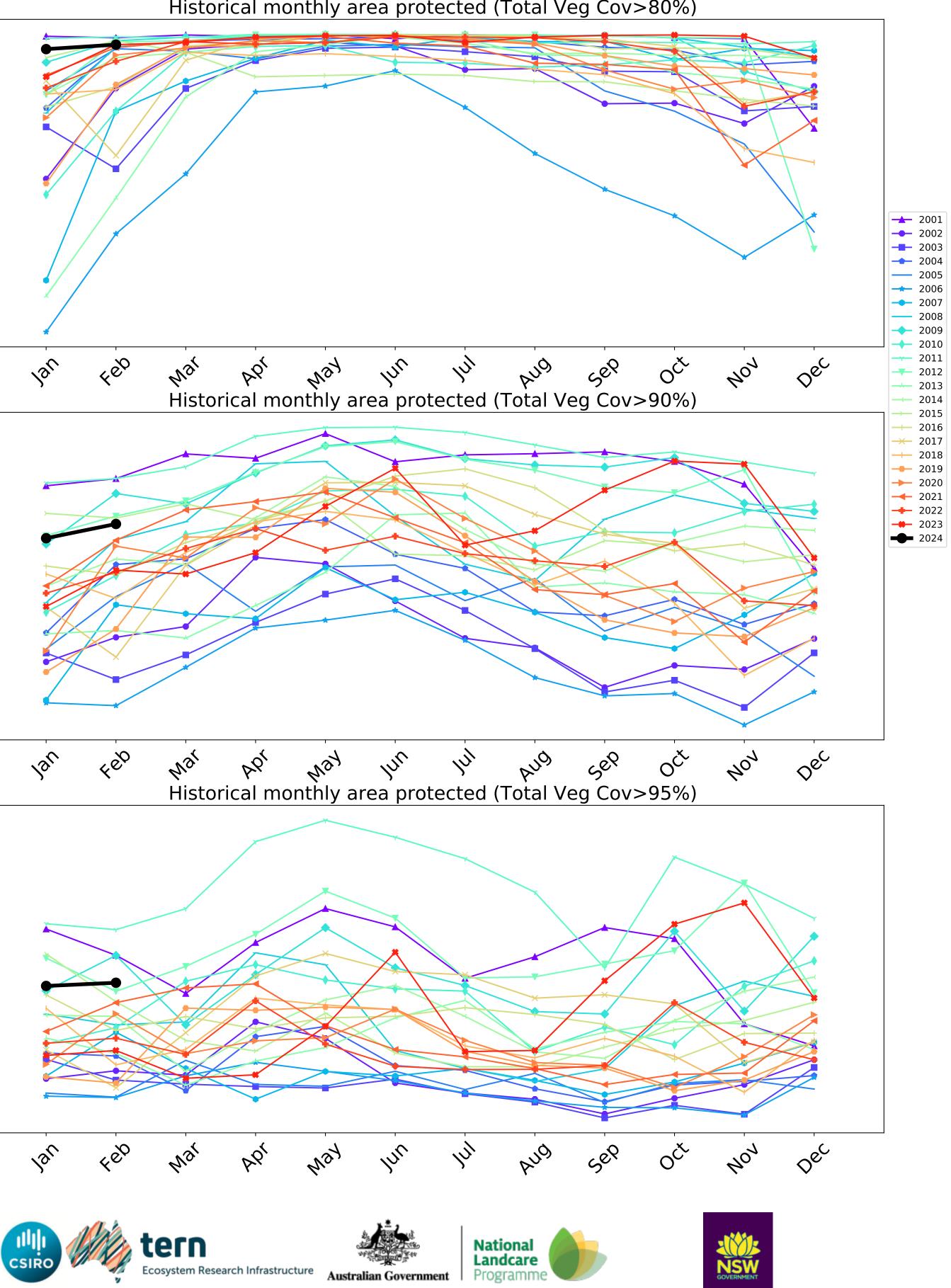
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



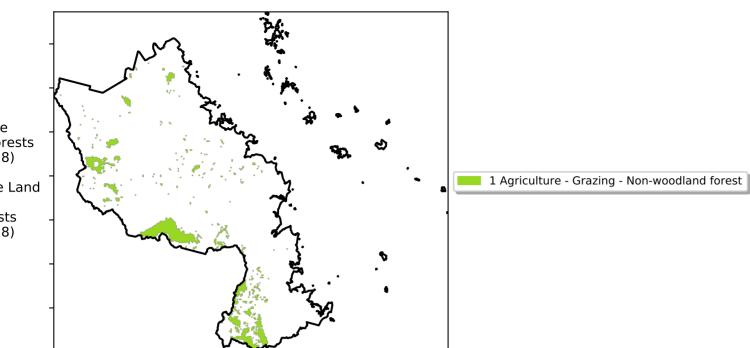
Water erosion historical monthly area protected (Total Veg Cov>70%)





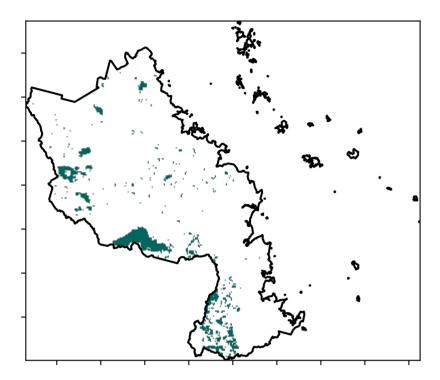


Grazing - Forest (non woodland)

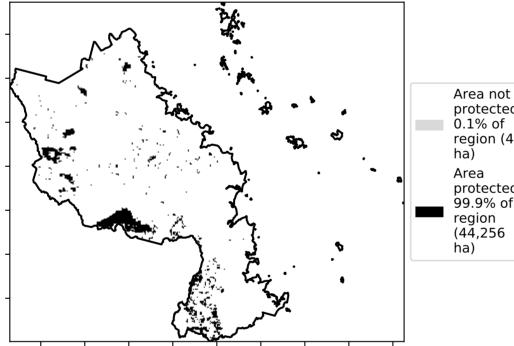


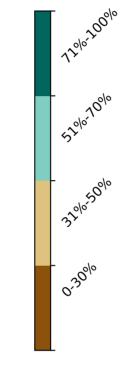
Total Vegetation Cover [%]

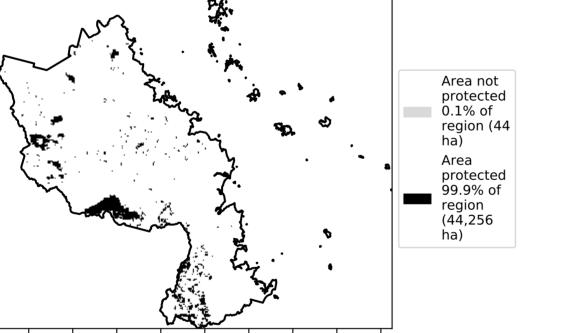
Land use and forest cover



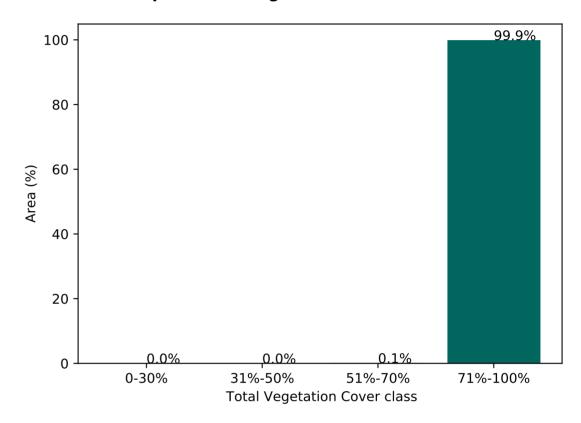
% Area protected from water erosion (>70%)



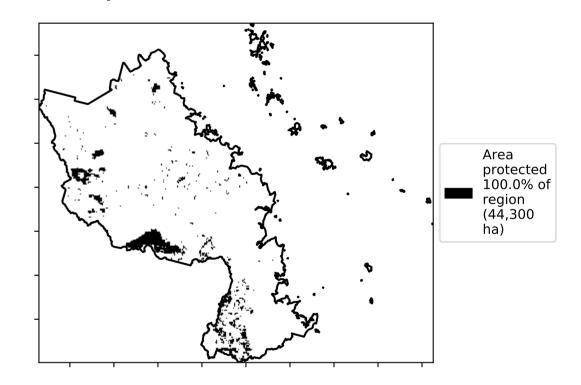




Proportion of vegetation cover class in area

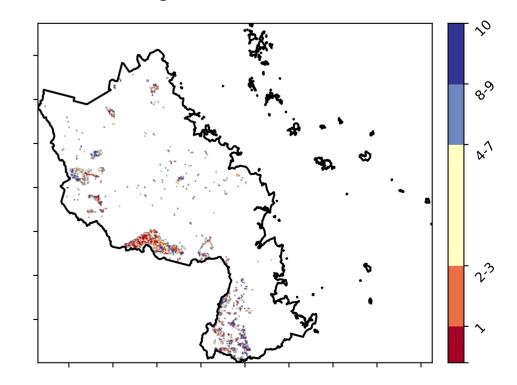


% Area protected from wind erosion (>50%)

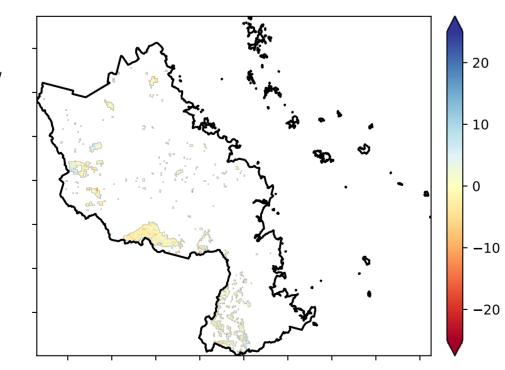


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



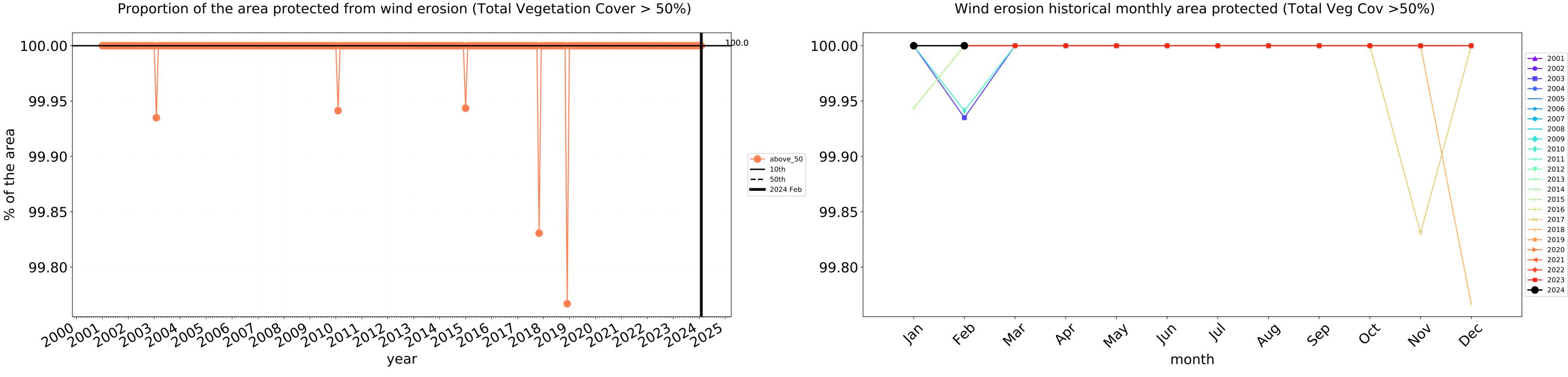
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



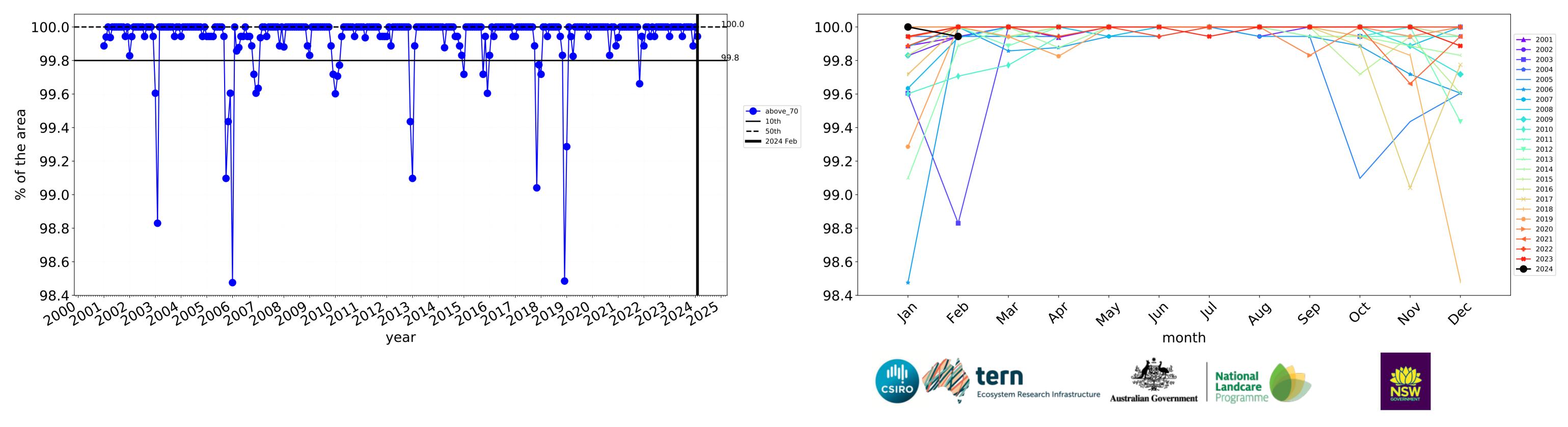


22

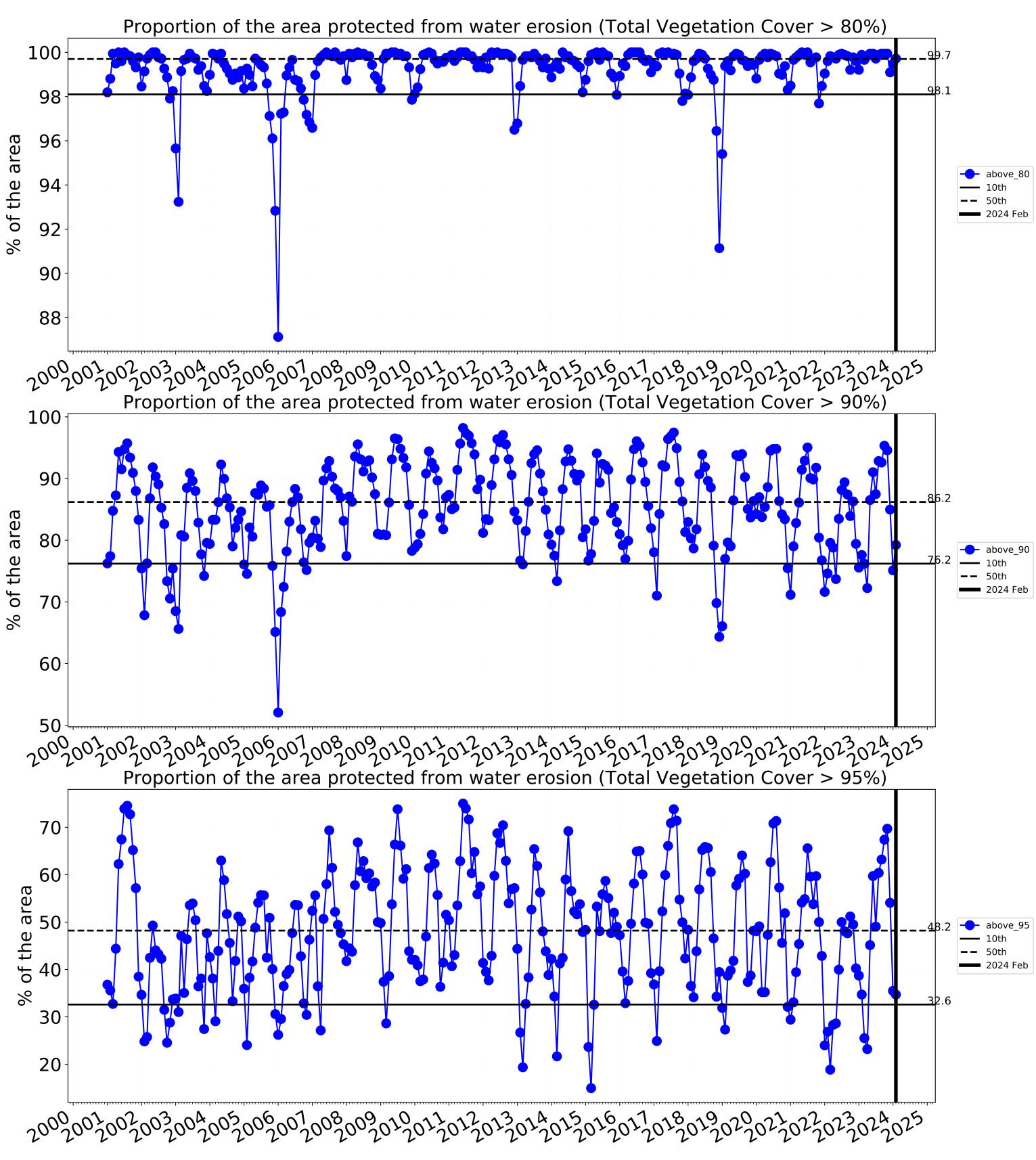
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

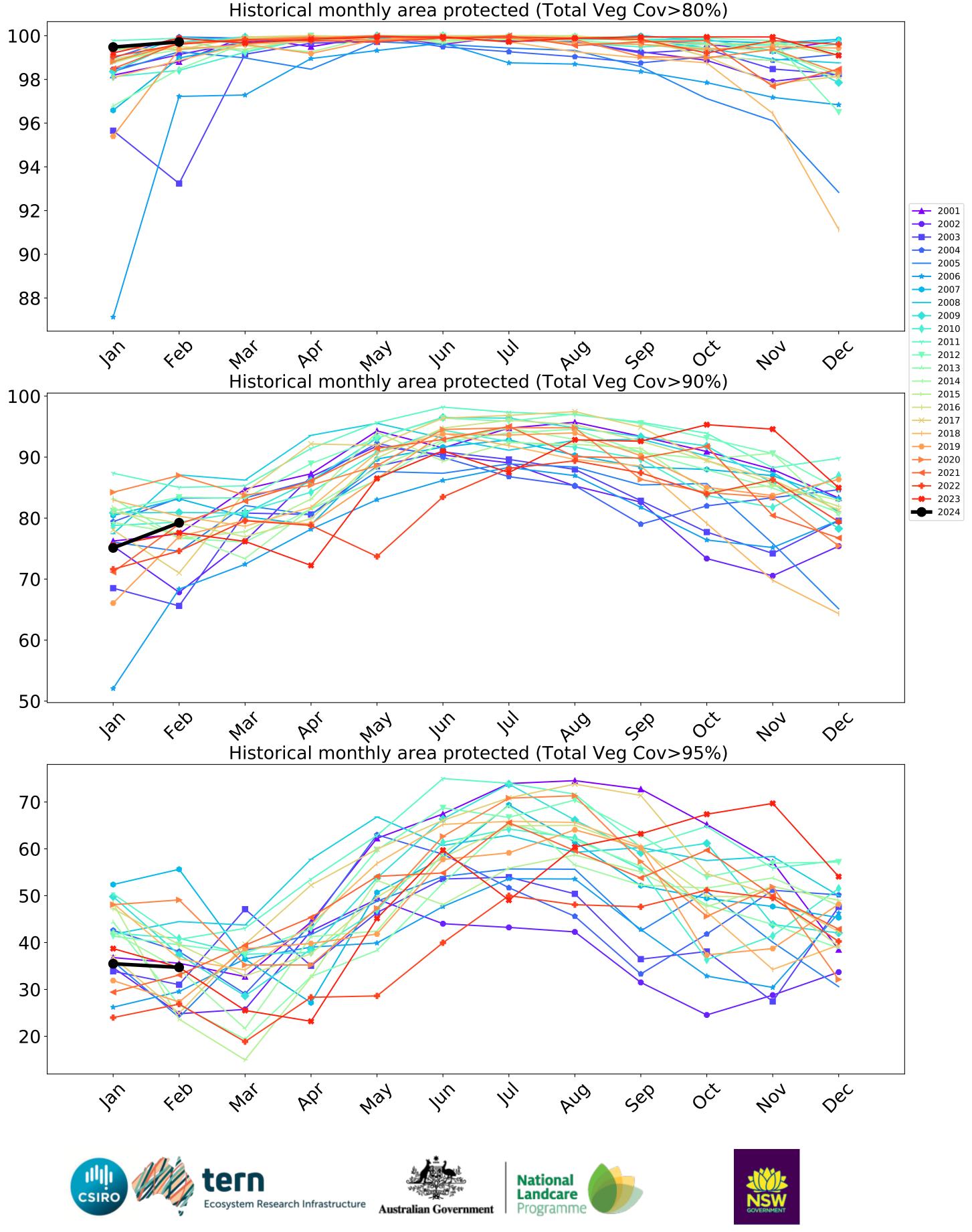


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



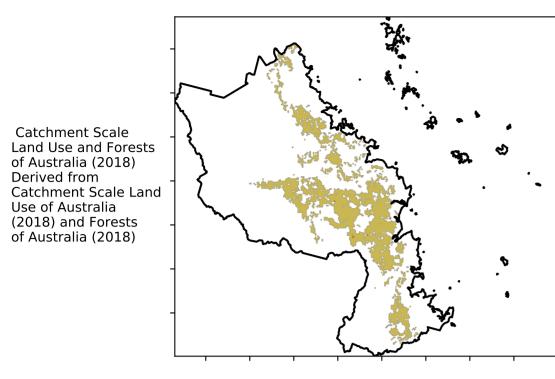
Water erosion historical monthly area protected (Total Veg Cov>70%)



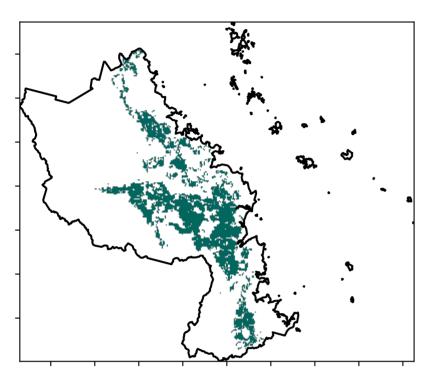


Irrigation

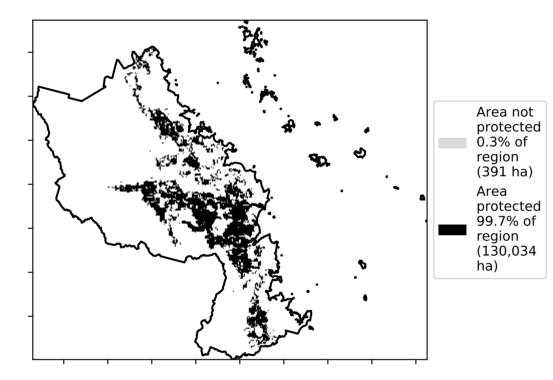
Land use and forest cover

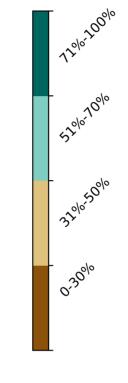


Total Vegetation Cover [%]

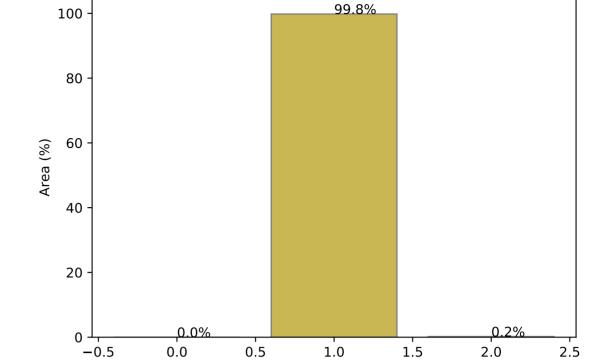


% Area protected from water erosion (>70%)





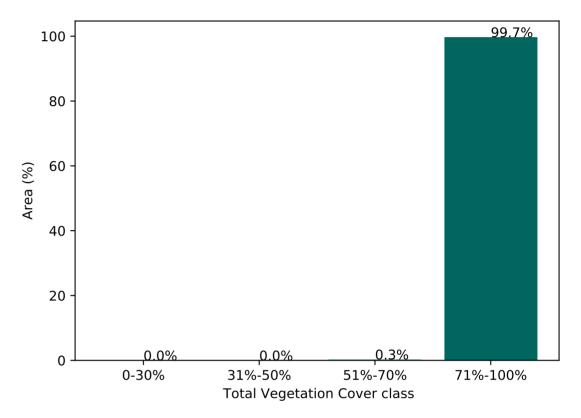
Agriculture - Grazing - Irrigated
Agriculture - Cropping - Irrigated
Agriculture - Horticulture - Irrigated



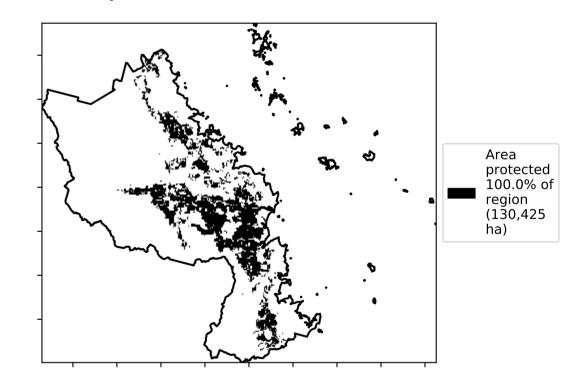
Proportion of each land class in area

Proportion of vegetation cover class in area

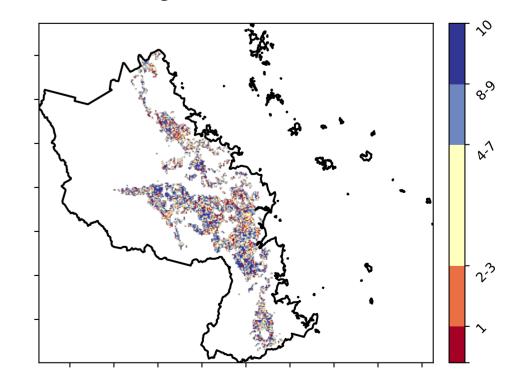
Land use class



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

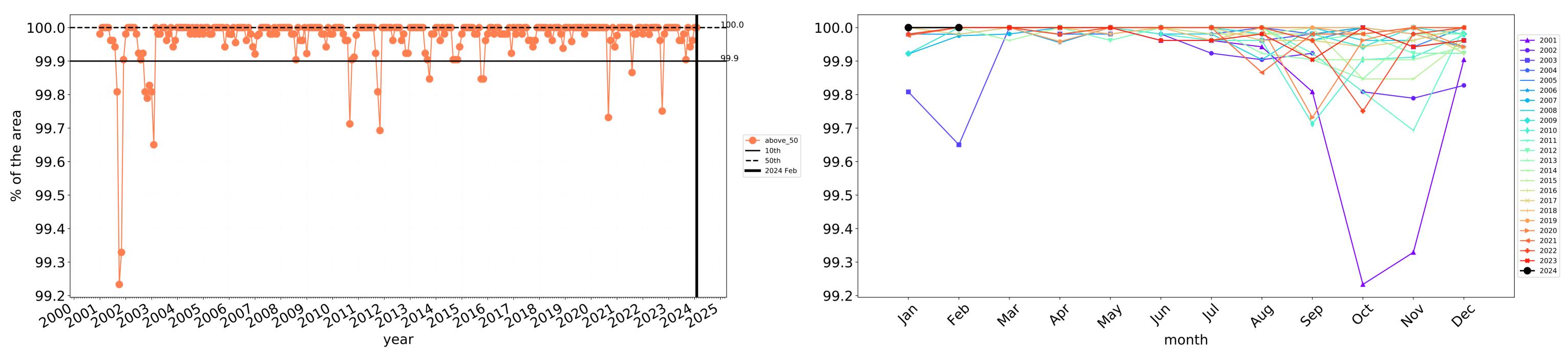
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





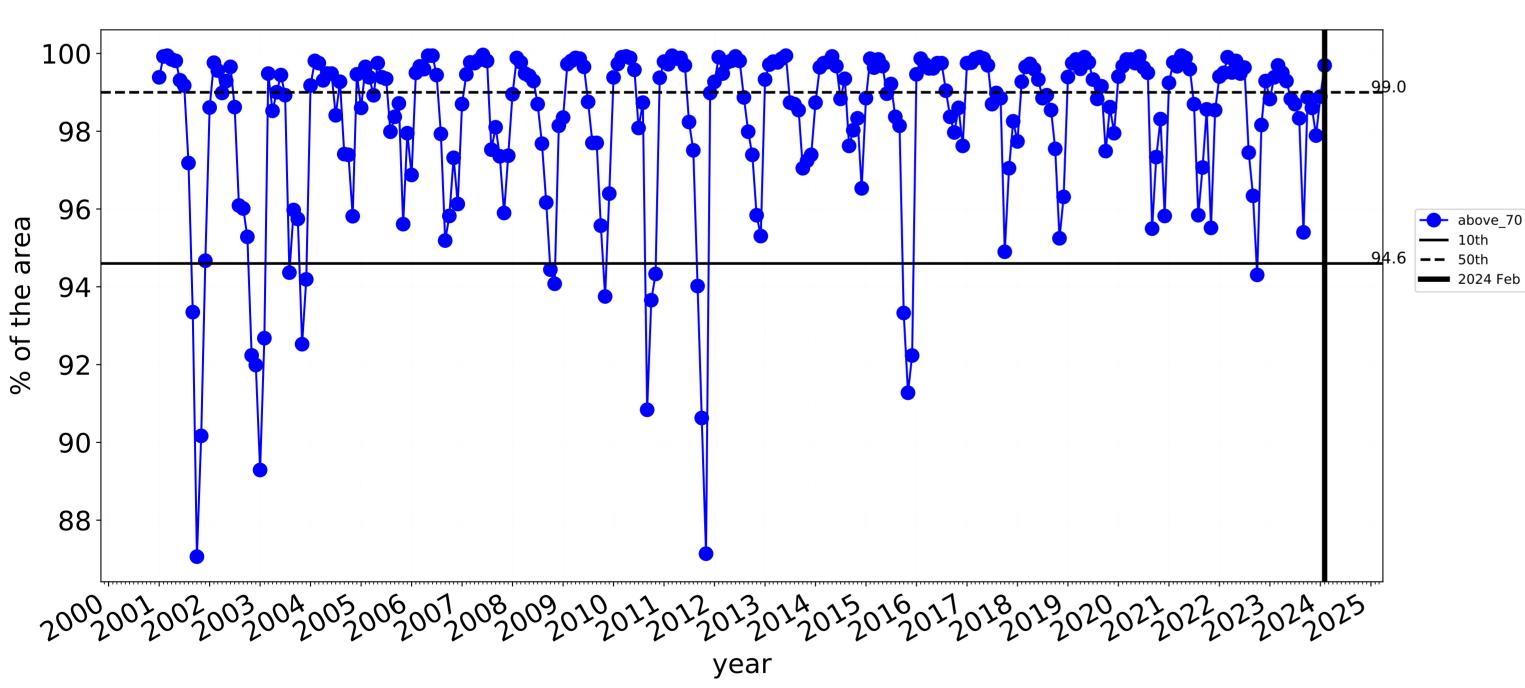
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

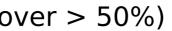




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



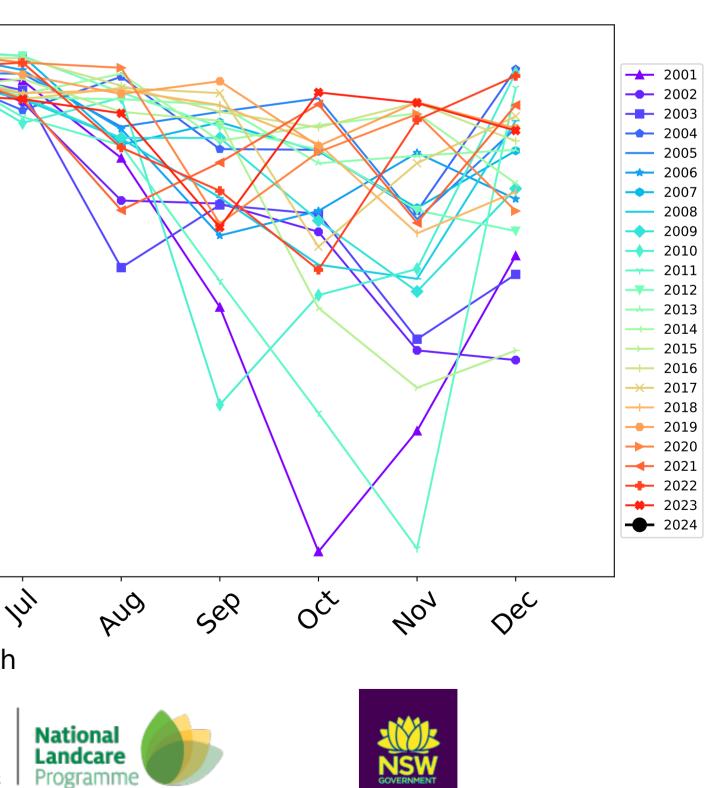


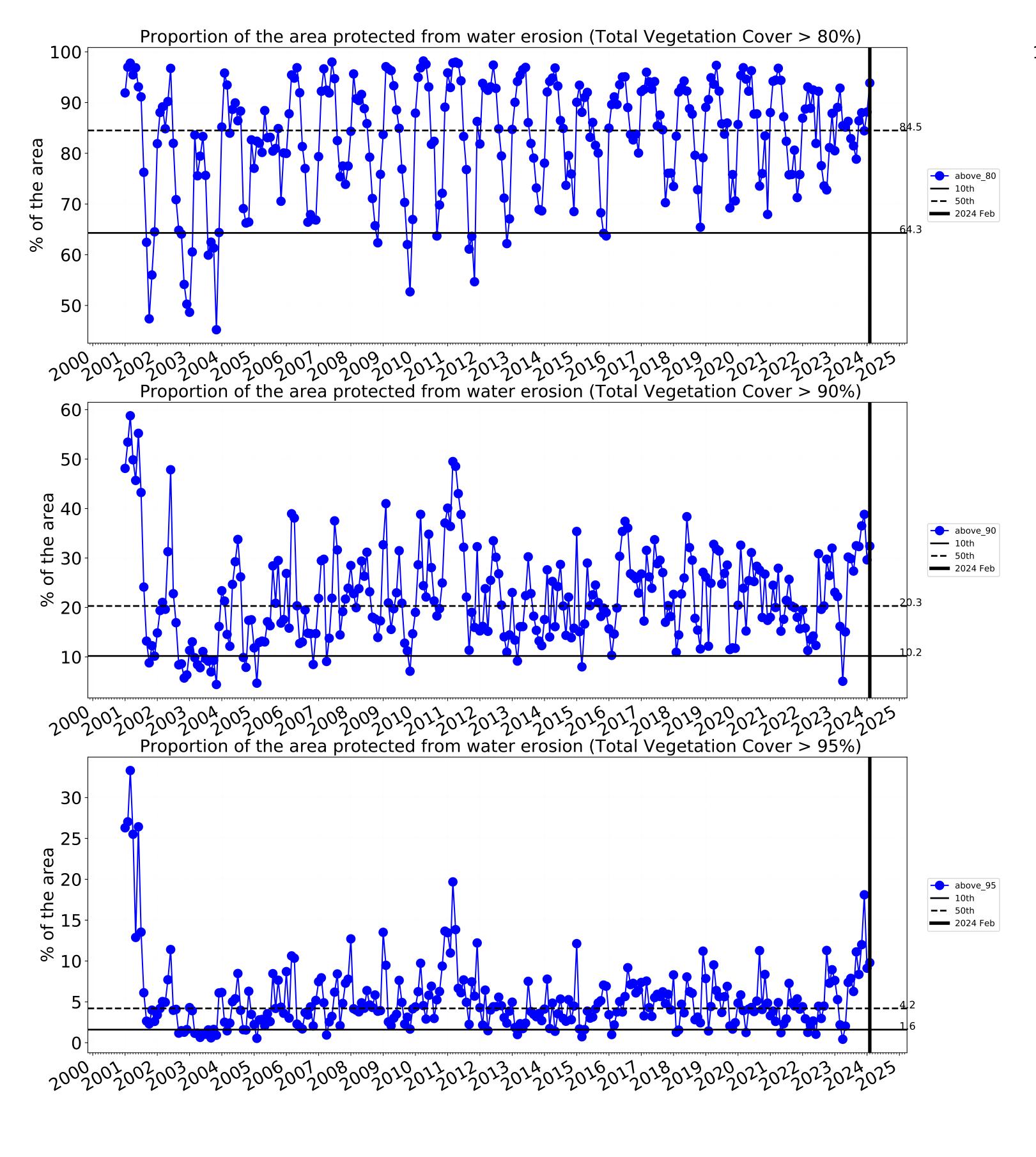


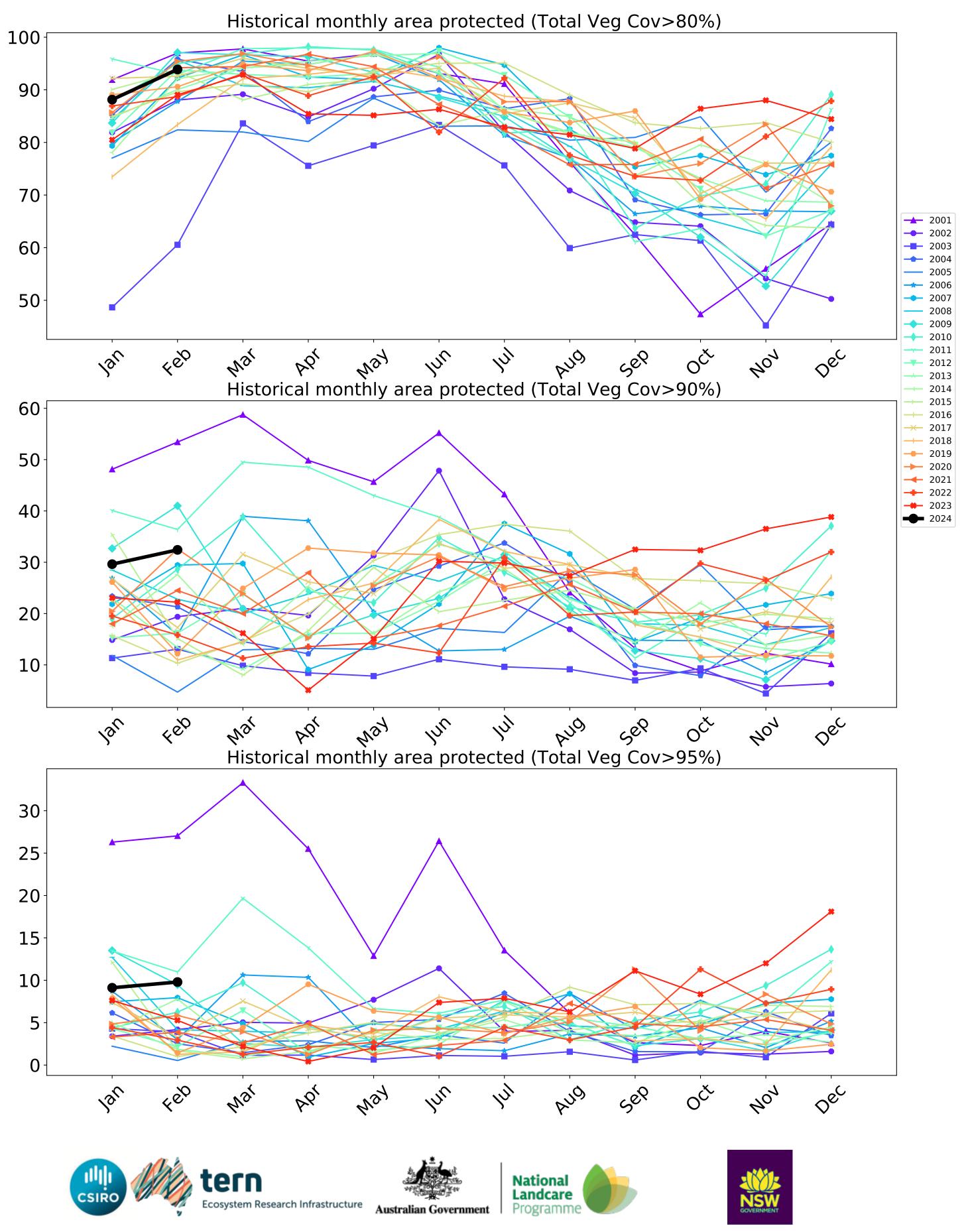
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 98 96-94 92 90 88 4eb Jan In Mai May 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 1 Production native forests and plantation forests Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

12%200%

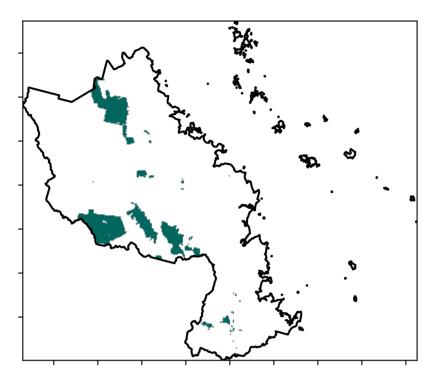
· 52°10010

320050010

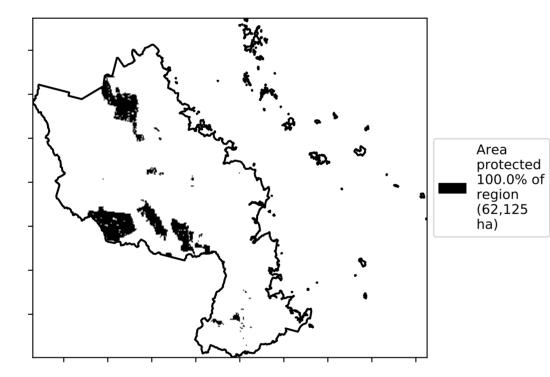
0.30%

Land use and forest cover

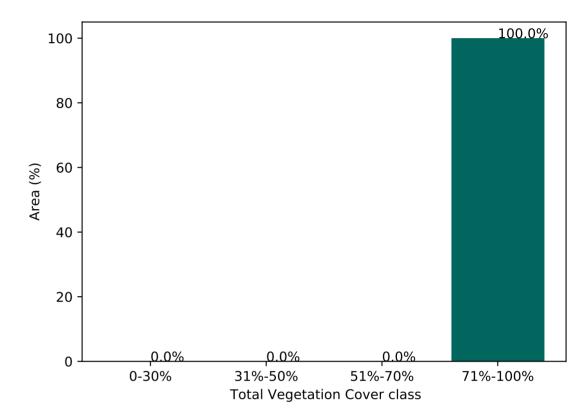
Total Vegetation Cover [%]



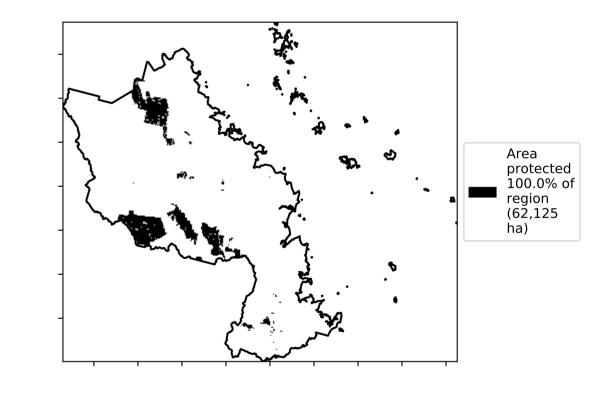
% Area protected from water erosion (>70%)



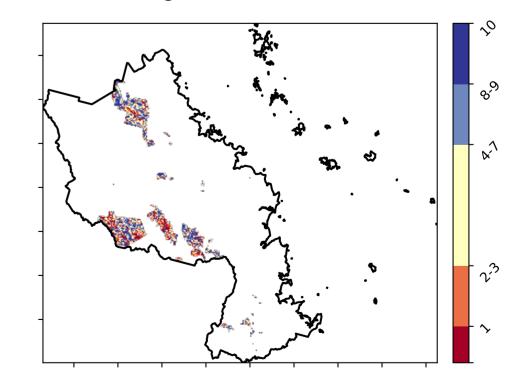




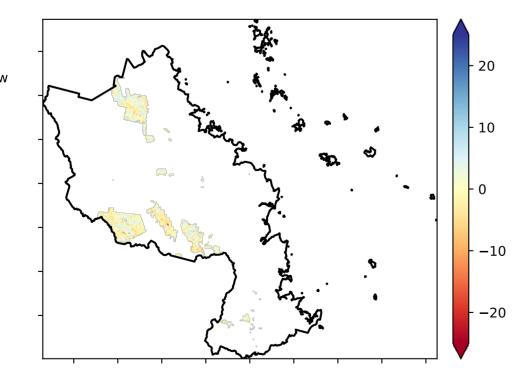
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]



CSIRC

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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.

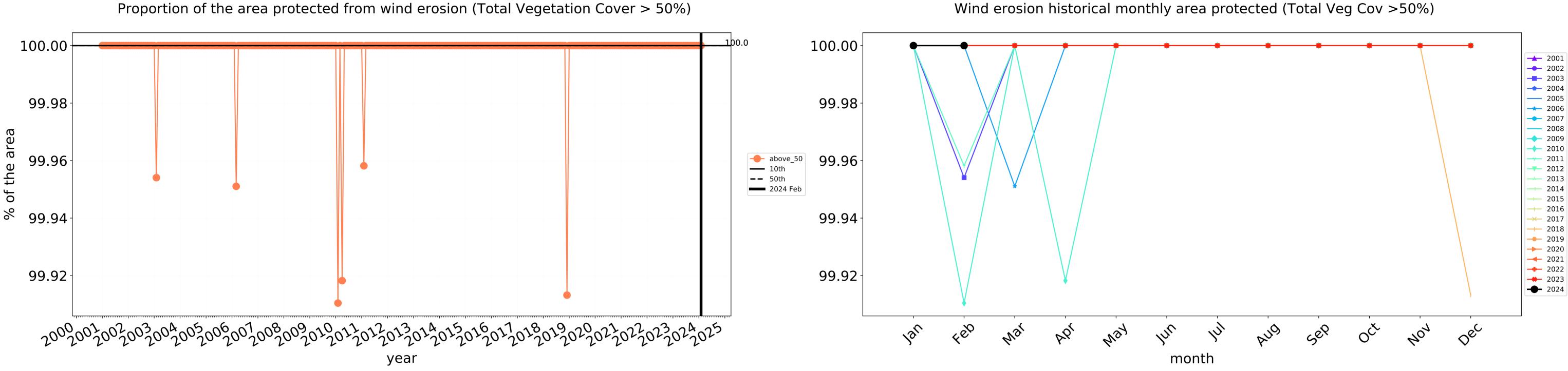


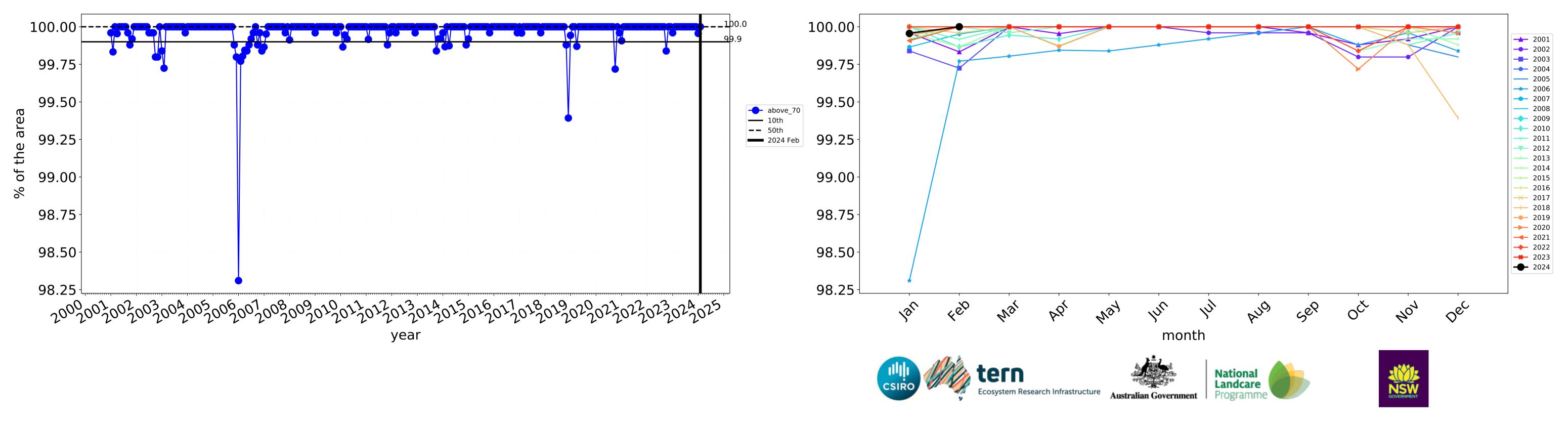


Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

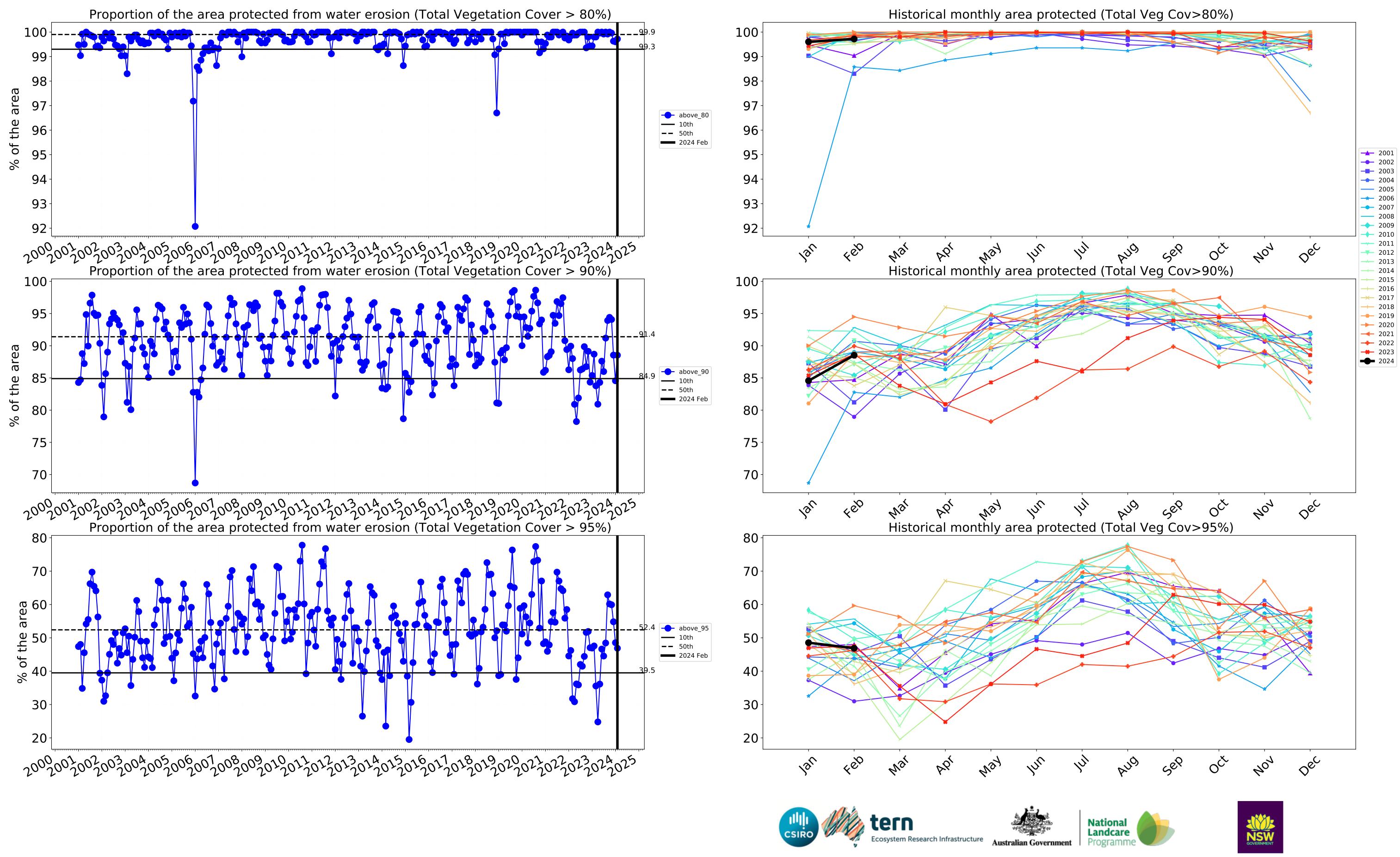


Production native forests and plantation forests timeseries





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





Mackay_(R) (733,325 ha and no data 27,986 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	733,325	99.9% 732,475	99.7% 730,775	98.5% 721,975	94.6% 693,900	63.2% 463,350	32.1% 235,175
Conservation and natural environments	186,625	99.8% 186,275	99.5% 185,750	98.8% 184,425	97.4% 181,700	81.0% 151,175	48.9% 91,300
Conservation and natural environments non forest	4,775	99.0% 4,725	95.8% 4,575	88.0% 4,200	80.1% 3,825	51.3% 2,450	35.1% 1,675
Conservation and natural environments Woodland forest	35,775	99.9% 35,750	99.4% 35,575	98.7% 35,325	94.9% 33,950	72.5% 25,950	37.2% 13,300
Conservation and natural environments Forest (non woodland)	146,075	99.8% 145,800	99.7% 145,600	99.2% 144,900	98.5% 143,925	84.0% 122,775	52.3% 76,325
Agriculture	421,675	100.0% 421,625	99.9% 421,400	99.6% 420,150	96.4% 406,450	56.1% 236,625	24.6% 103,800
Grazing	290,650	100.0% 290,600	99.9% 290,375	99.6% 289,525	97.5% 283,425	66.7% 193,900	31.2% 90,725
Grazing non forest	138,150	100.0% 138,125	99.8% 137,925	99.3% 137,200	95.9% 132,475	56.2% 77,700	25.4% 35,150
Grazing Woodland forest	108,200	100.0% 108,175	100.0% 108,150	99.9% 108,050	98.7% 106,775	75.0% 81,100	37.2% 40,200
Grazing - Forest (non woodland)	44,300	100.0% 44,300	100.0% 44,300	99.9% 44,275	99.7% 44,175	79.2% 35,100	34.7% 15,375
Irrigation	130,425	100.0% 130,425	100.0% 130,425	99.7% 130,025	93.9% 122,425	32.4% 42,275	9.8% 12,775
Production native forests and plantation forests	62,125	100.0% 62,125	100.0% 62,125	100.0% 62,125	99.7% 61,950	88.5% 55,000	46.9% 29,125

