# Total vegetation cover soil protection Region:LGA Mackay\_(R) QLD

# **Date: February 2025**

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 2025**

### Land use and forest cover

### Proportion of each land class in area



pixel is from

is, red pixels are about 20%

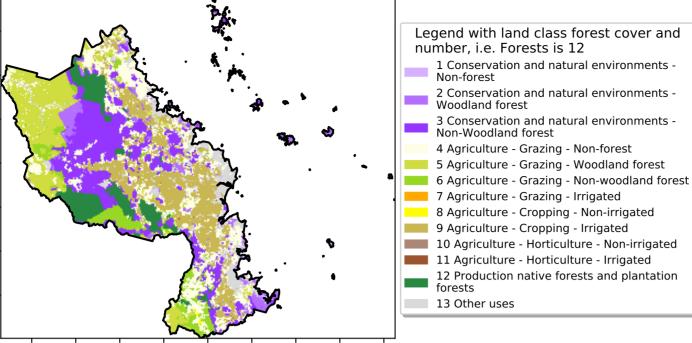
lower than the

mean of that

is only for the

using baseline from 2001 to

2019.



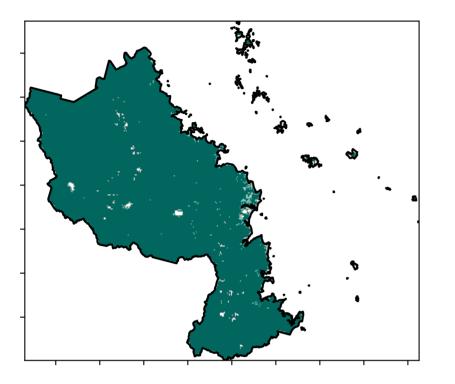
12%200%

· 52% 70%

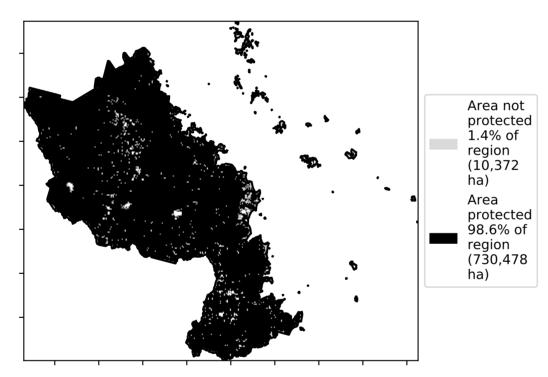
320050010

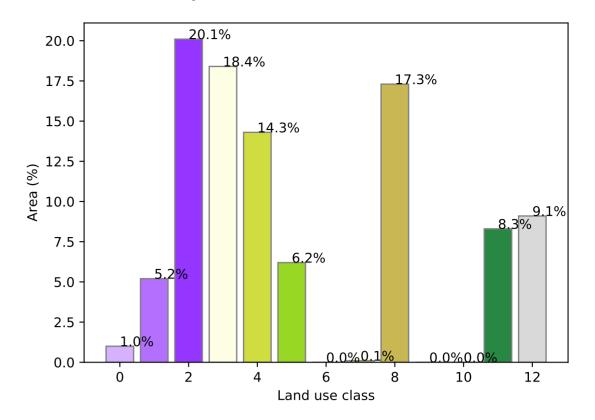
0.30%

### **Total Vegetation Cover [%]**

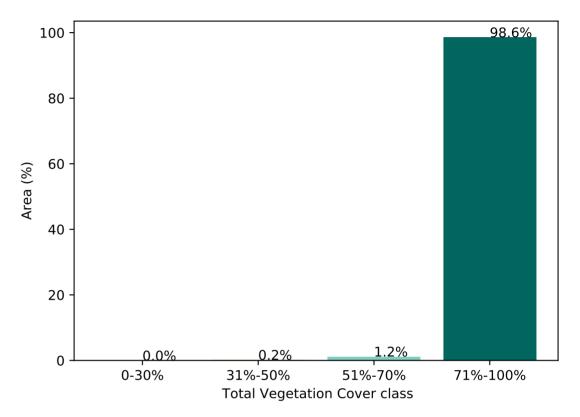


### % Area protected from water erosion (>70%)

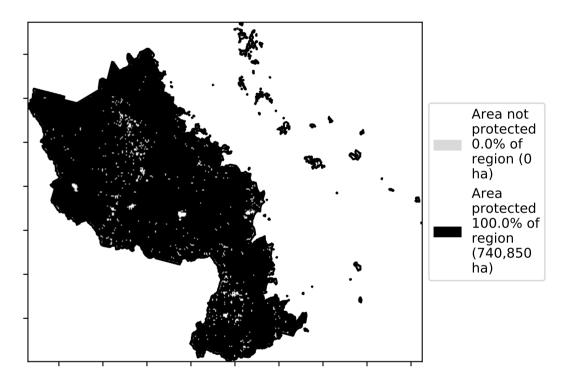




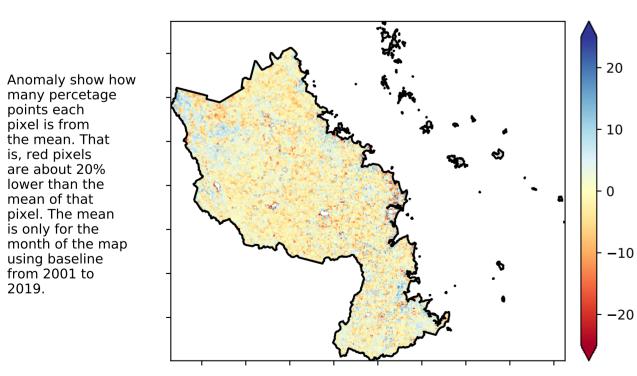
### Proportion of vegetation cover class in area



### % Area protected from wind erosion (>50%)

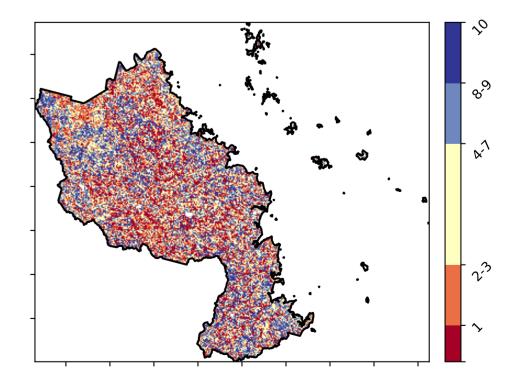


**Total Vegetation Cover Anomaly [%]** 

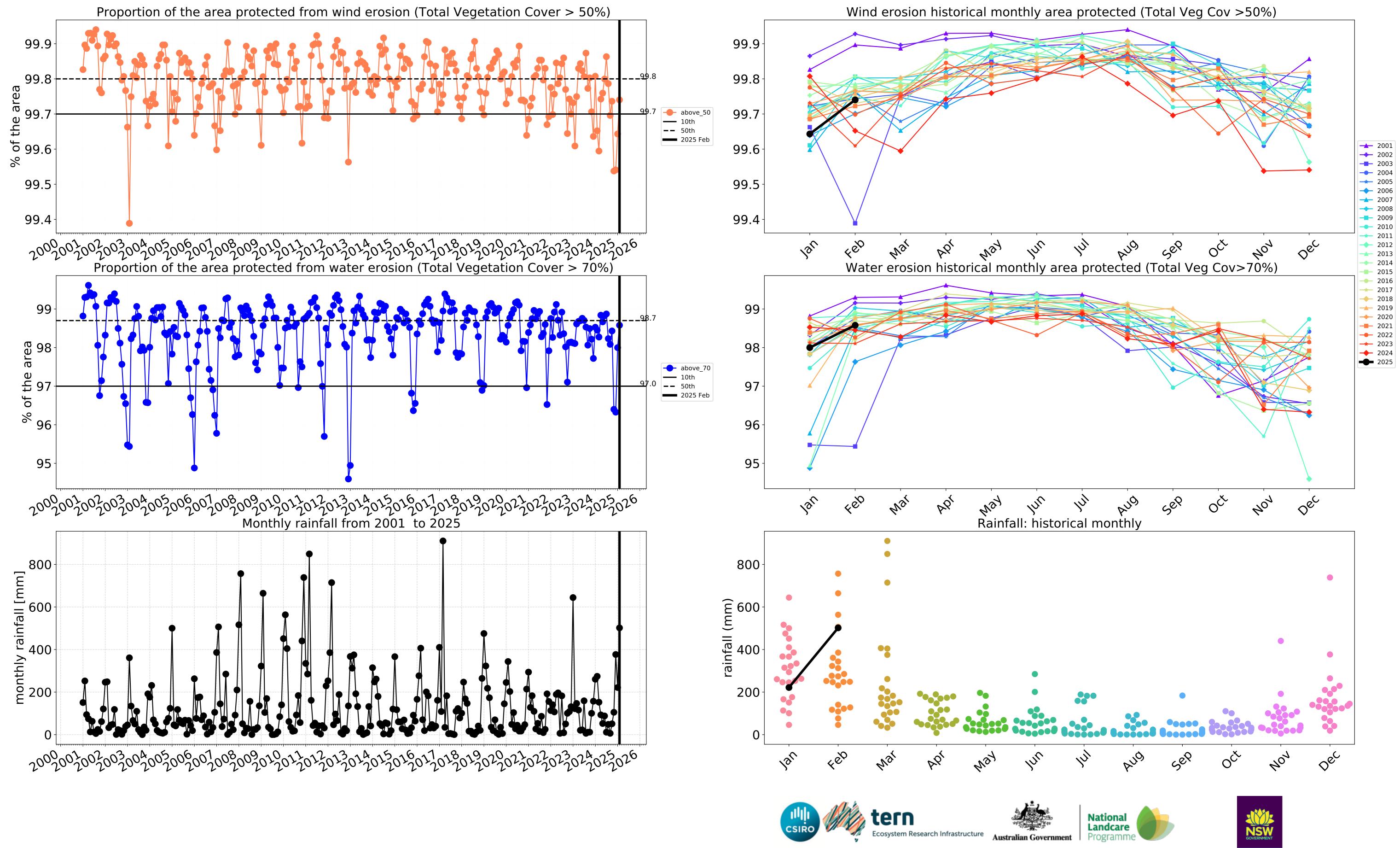


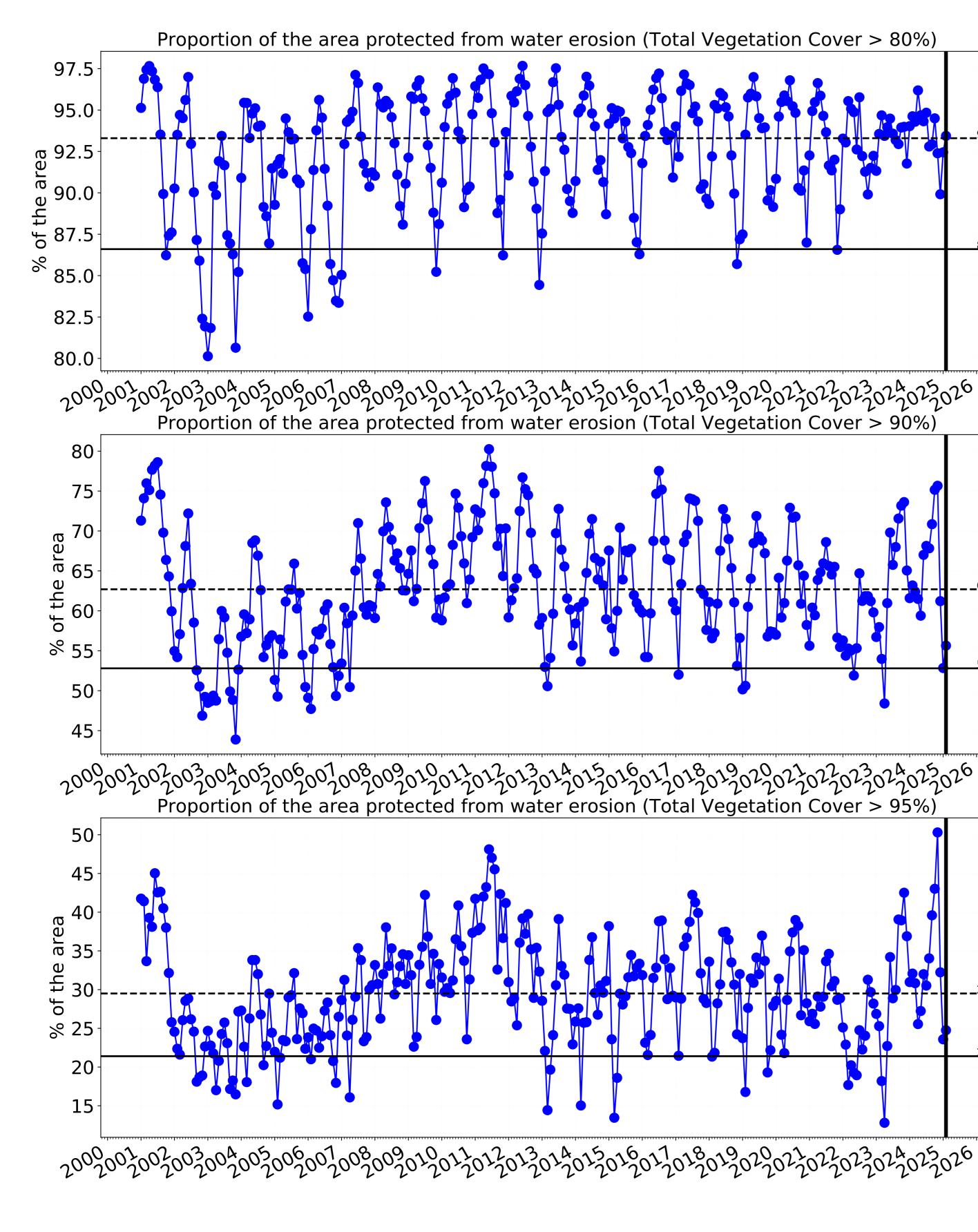
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

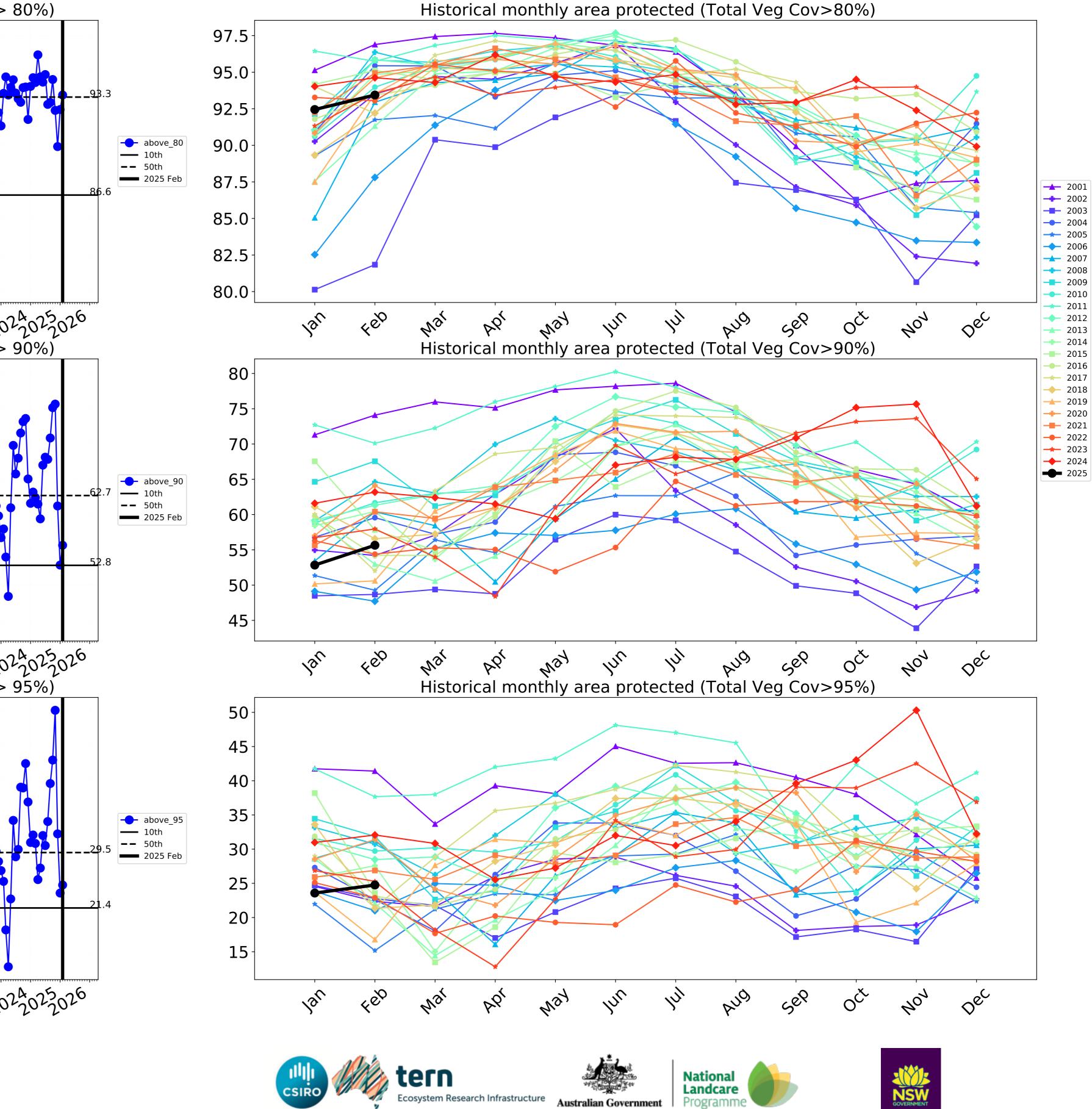
**Total Vegetation Cover Decile [%]** 













### **Conservation and natural environments**

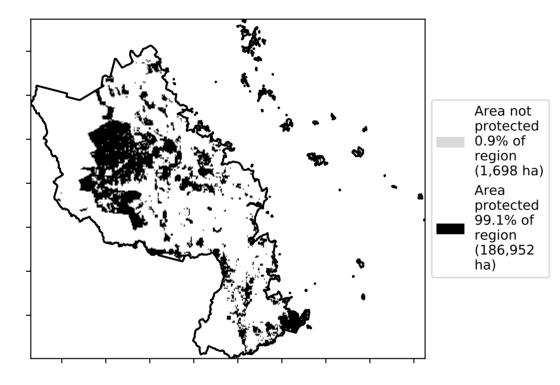
Catchment Scale Land

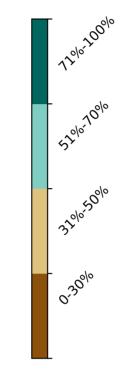
Land use and forest cover

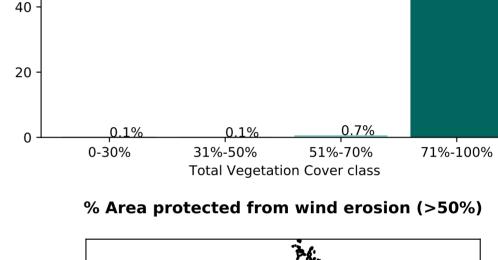
1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Nonwoodland forest

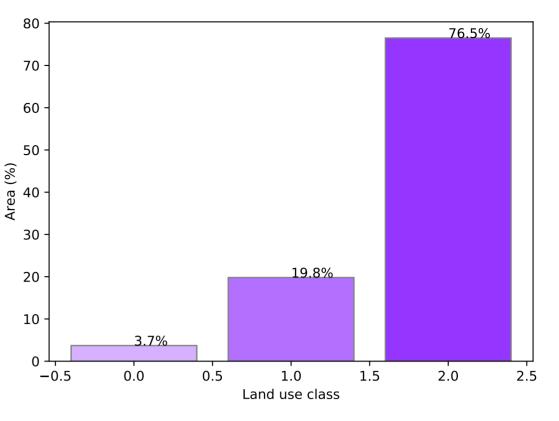
**Total Vegetation Cover [%]** 

% Area protected from water erosion (>70%)









### Proportion of each land class in area

Proportion of vegetation cover class in area

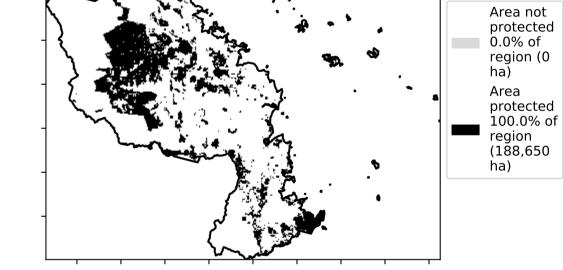
100

80

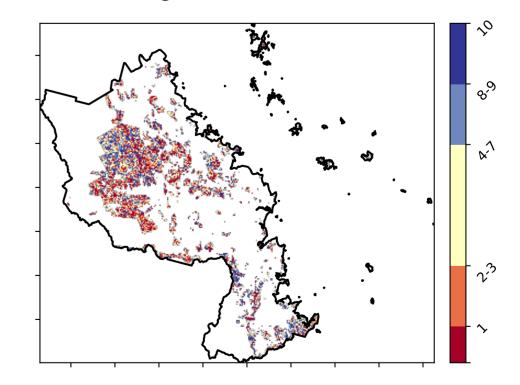
60

Area (%)

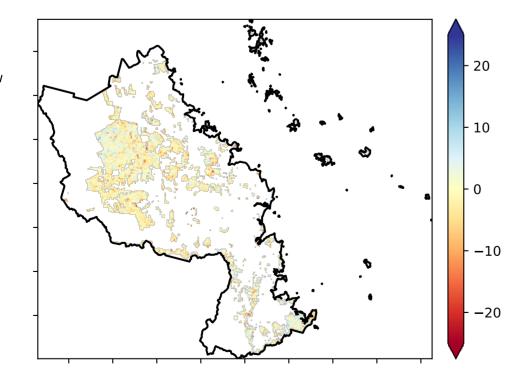
99.1%



**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

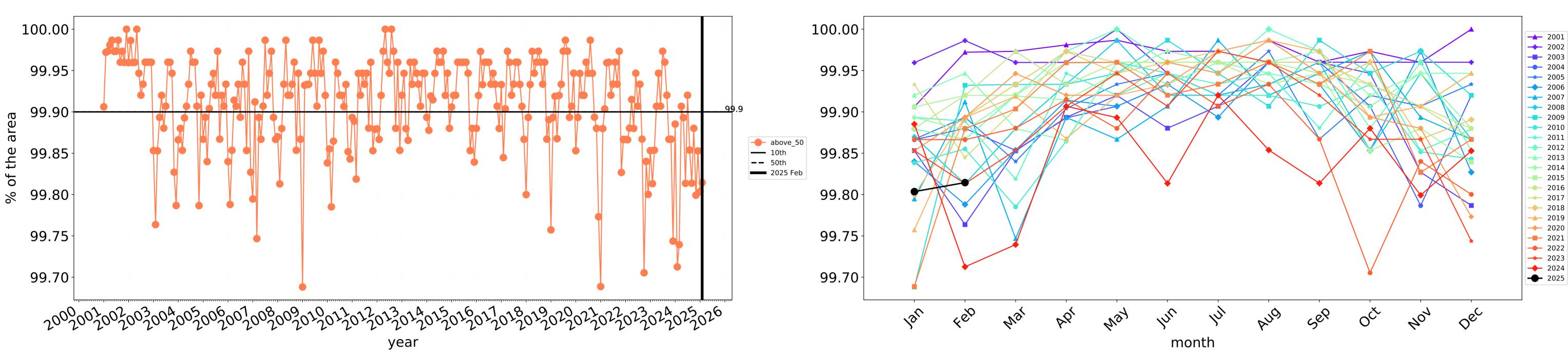
Derived from

Use of Australia

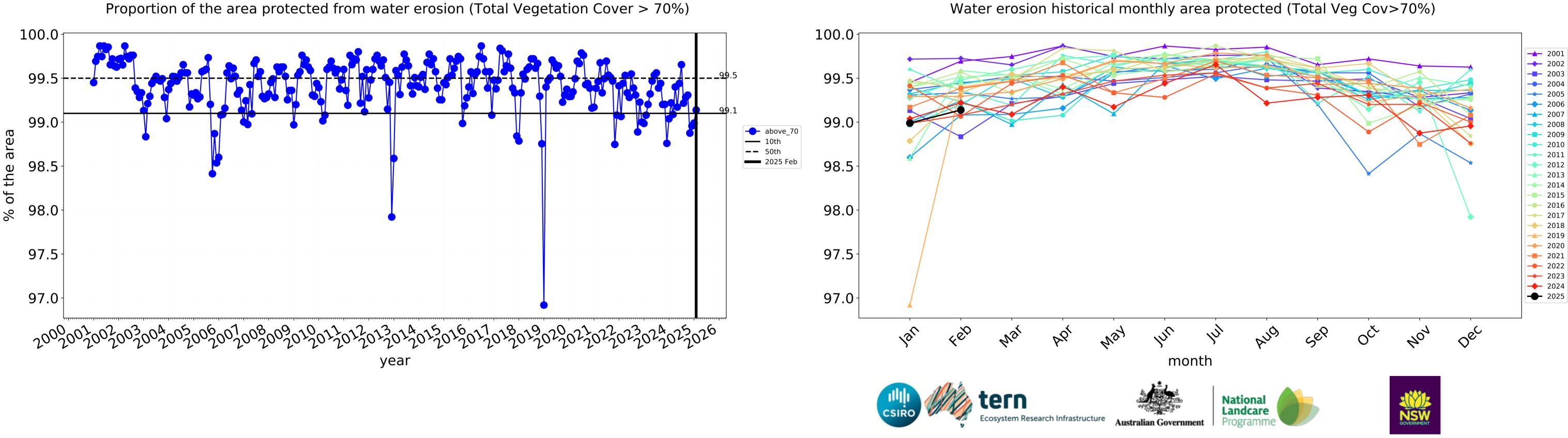
(2018) and Forests

of Australia (2018)

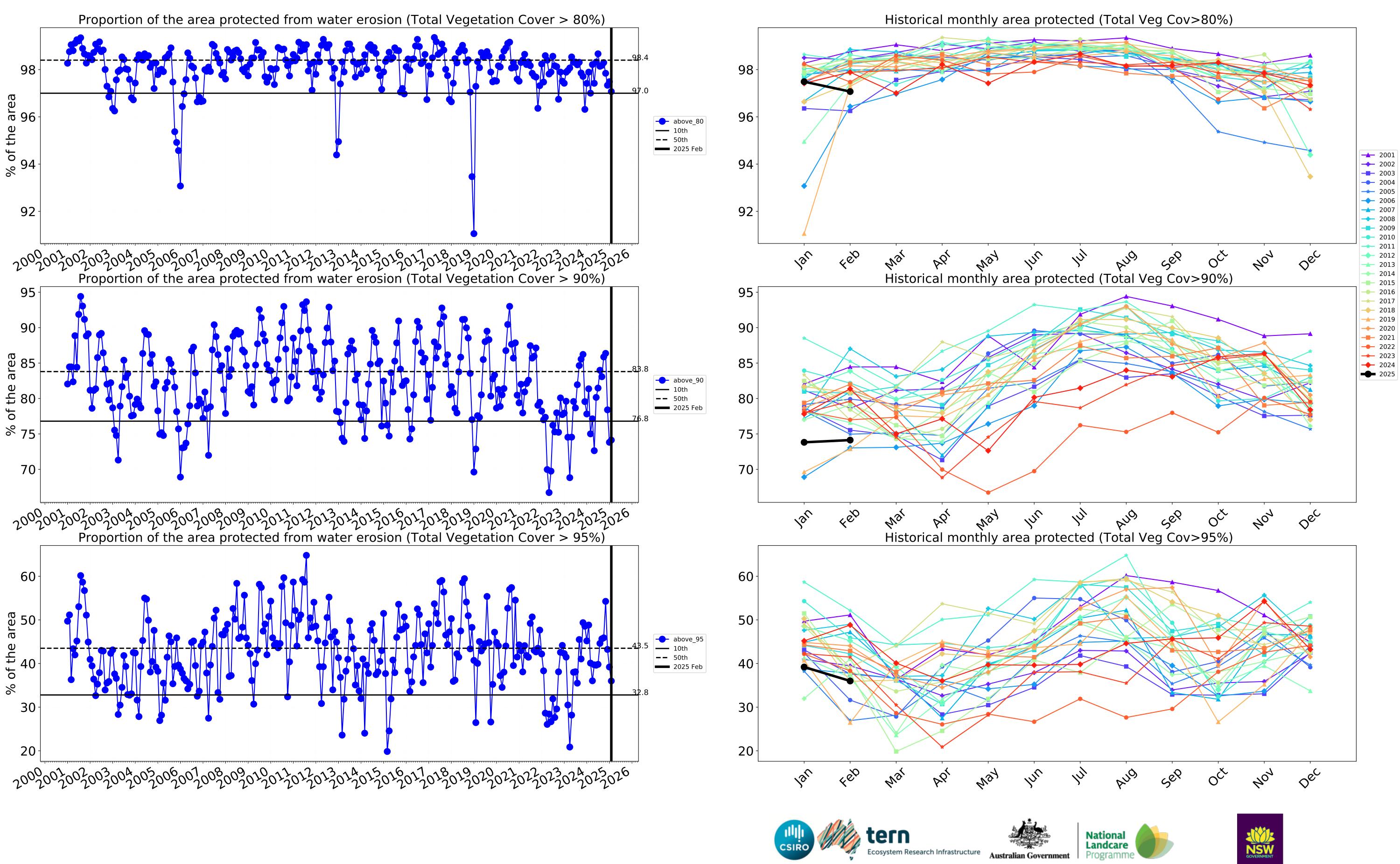
Land Use and Forests of Australia (2018)













### **Conservation and natural environments non forest**

ቅዸ 1 Conservation and natural environments - Non-forest

12%200%

52°10'70°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)

the mean. That

is, red pixels are about 20% lower than the

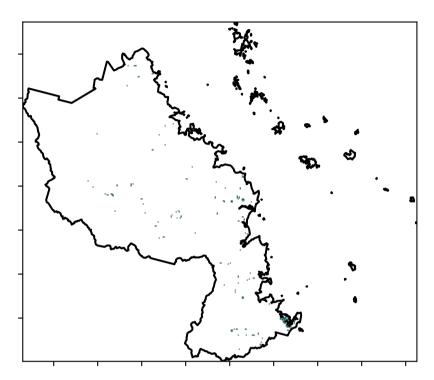
mean of that

pixel. The mean

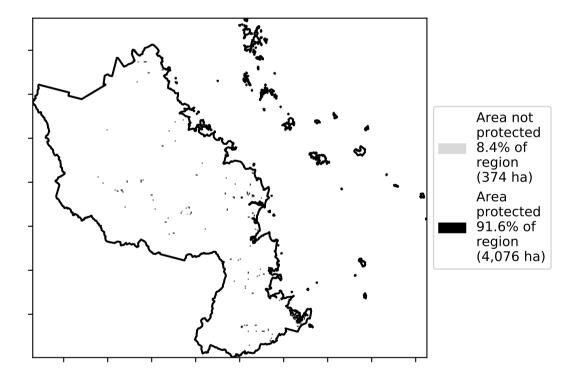
using baseline from 2001 to 2019.

**Total Vegetation Cover [%]** 

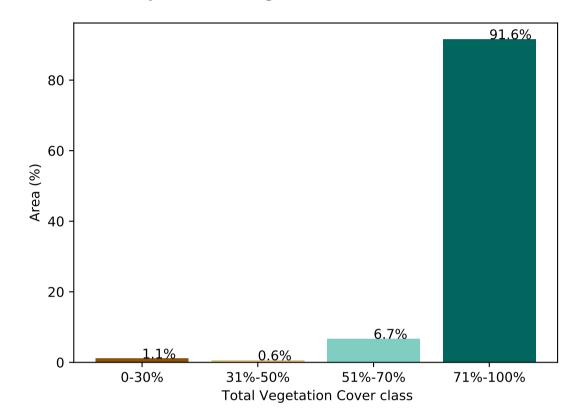
Land use and forest cover



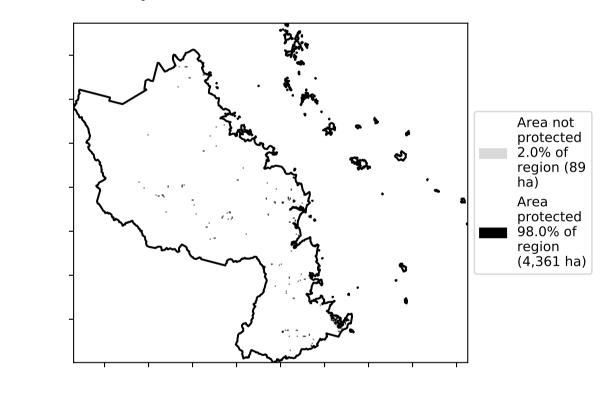
% Area protected from water erosion (>70%)



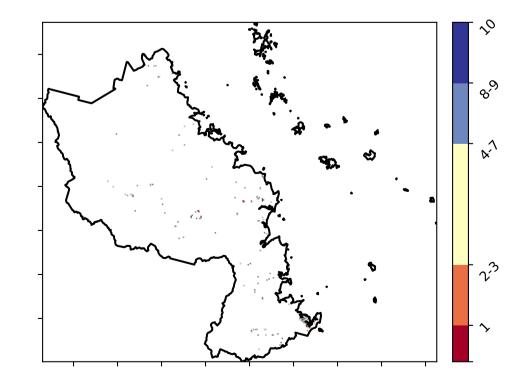




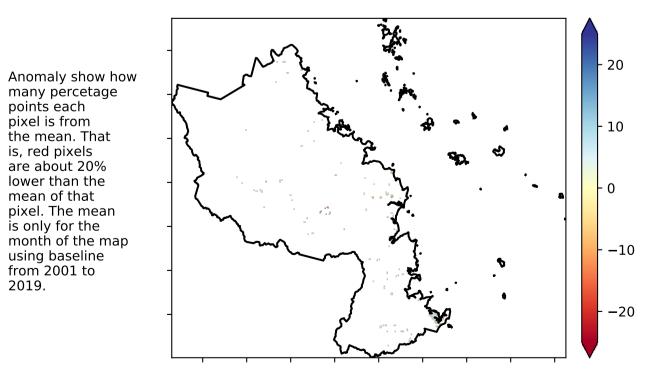
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 

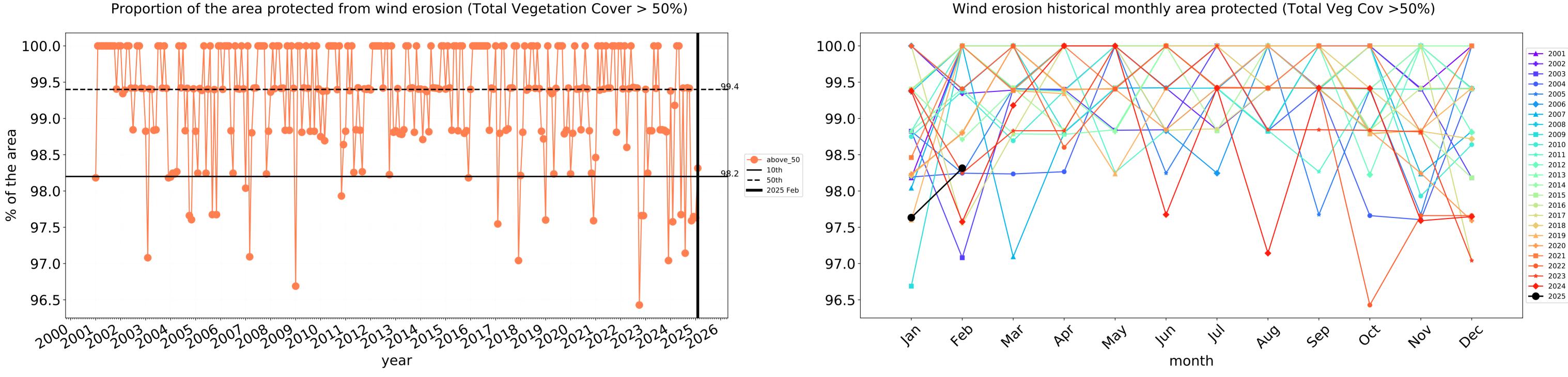


**Total Vegetation Cover Anomaly [%]** 



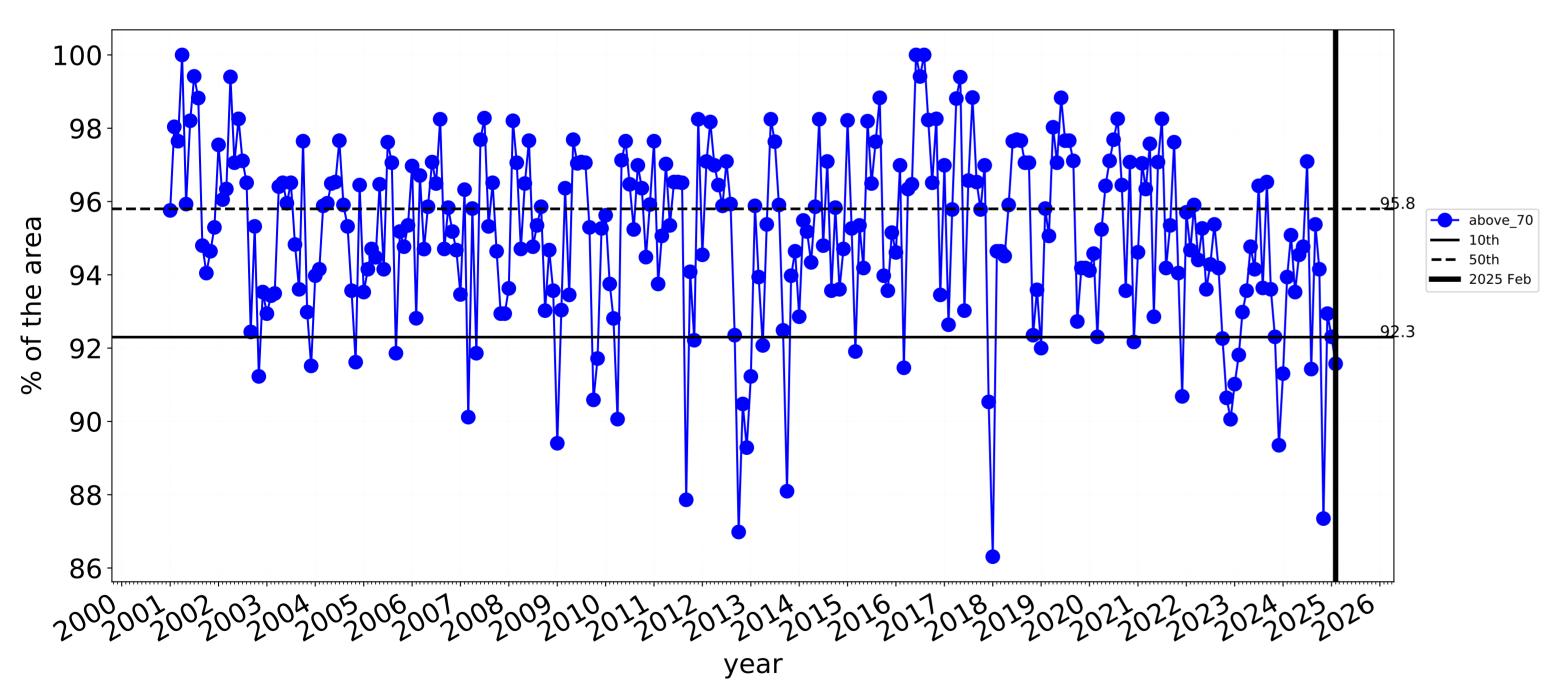
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

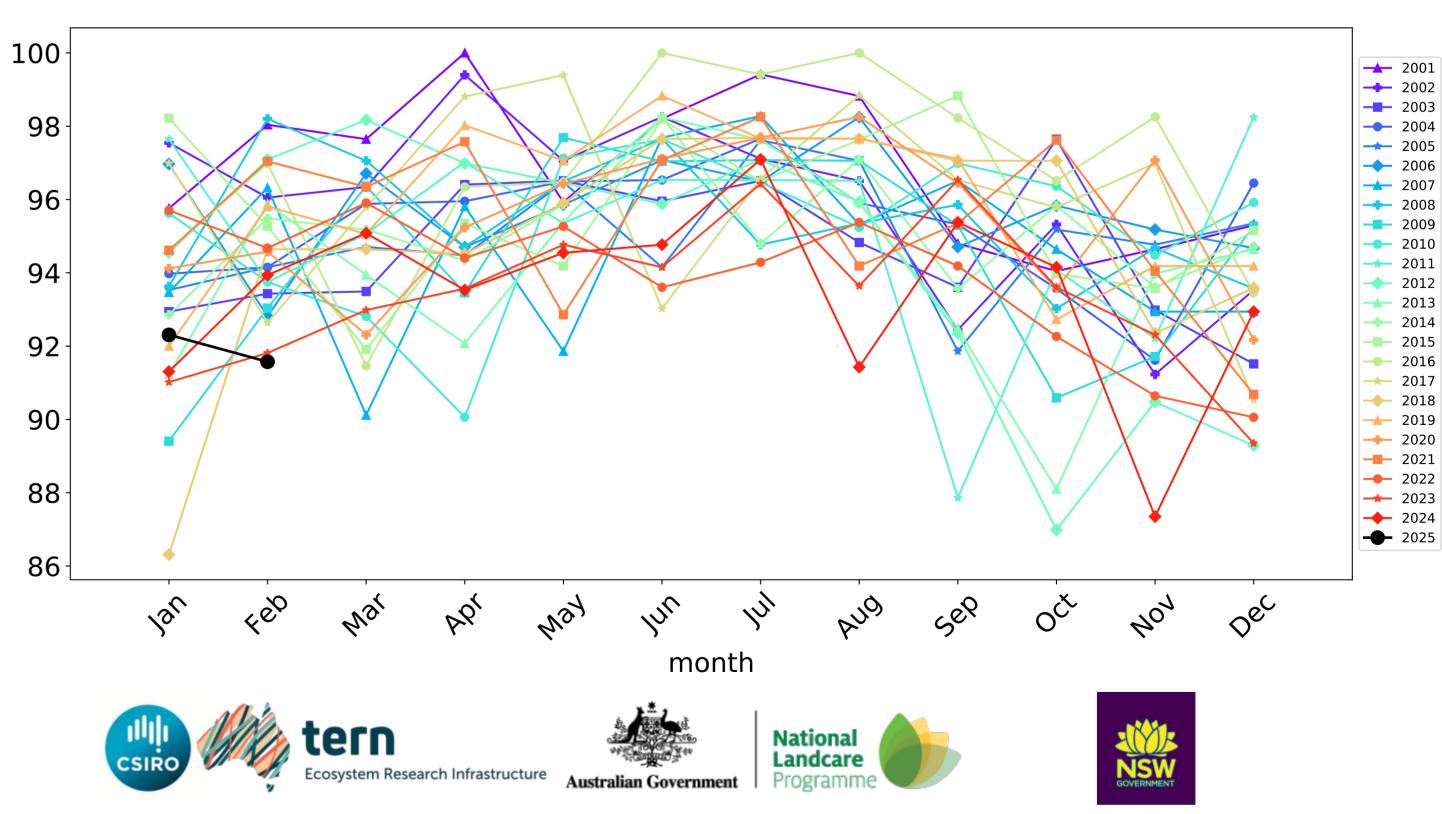




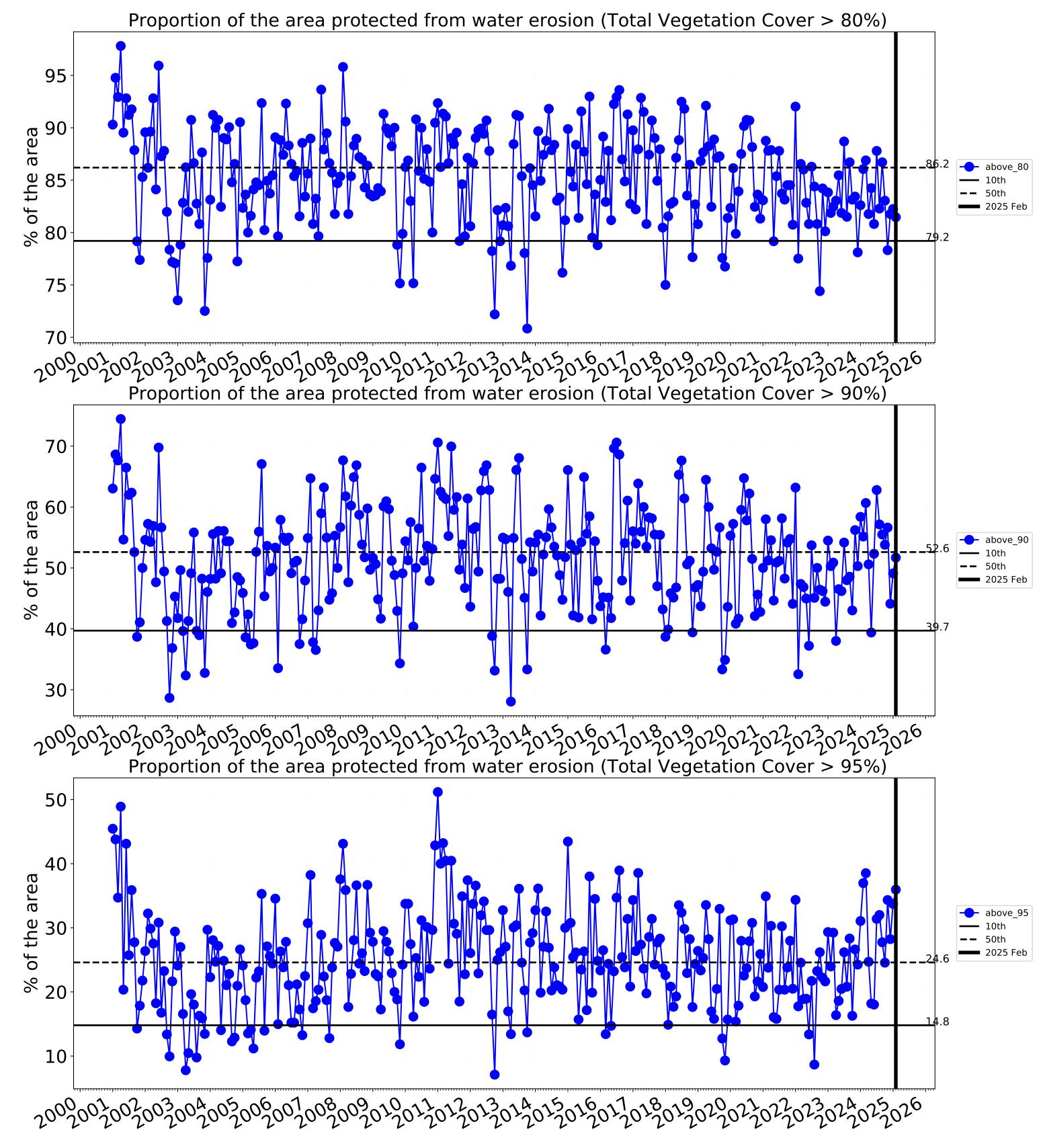
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

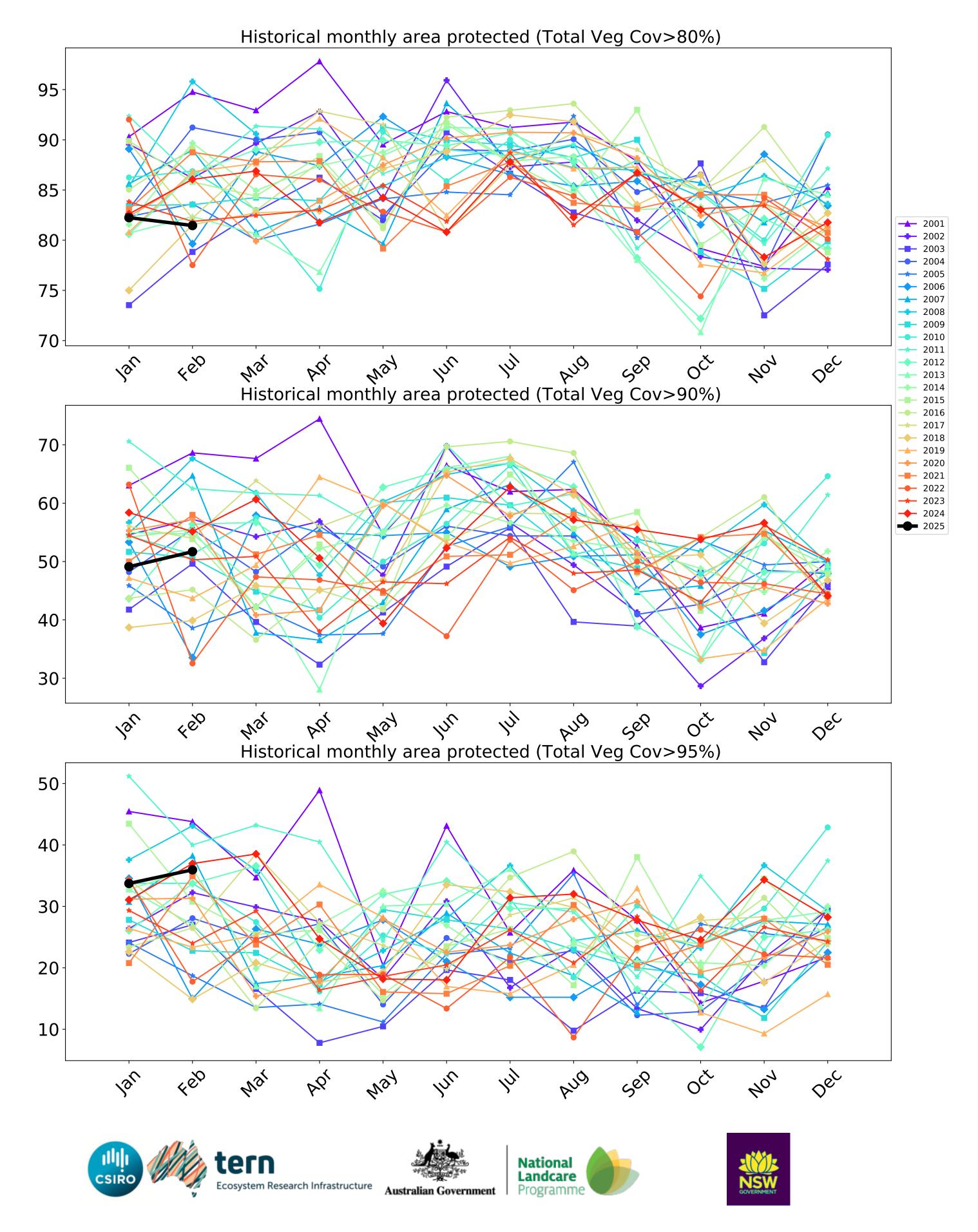






Water erosion historical monthly area protected (Total Veg Cov>70%)



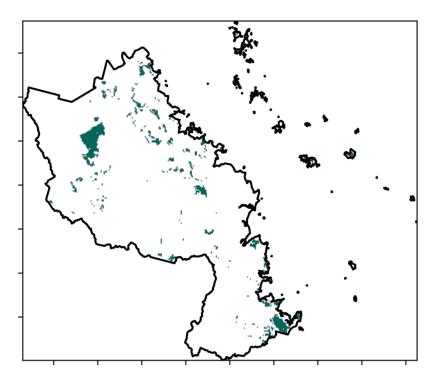


# **Conservation and natural environments Woodland forest**

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

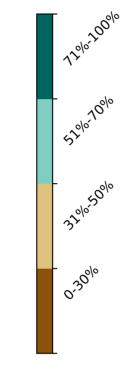
Land use and forest cover

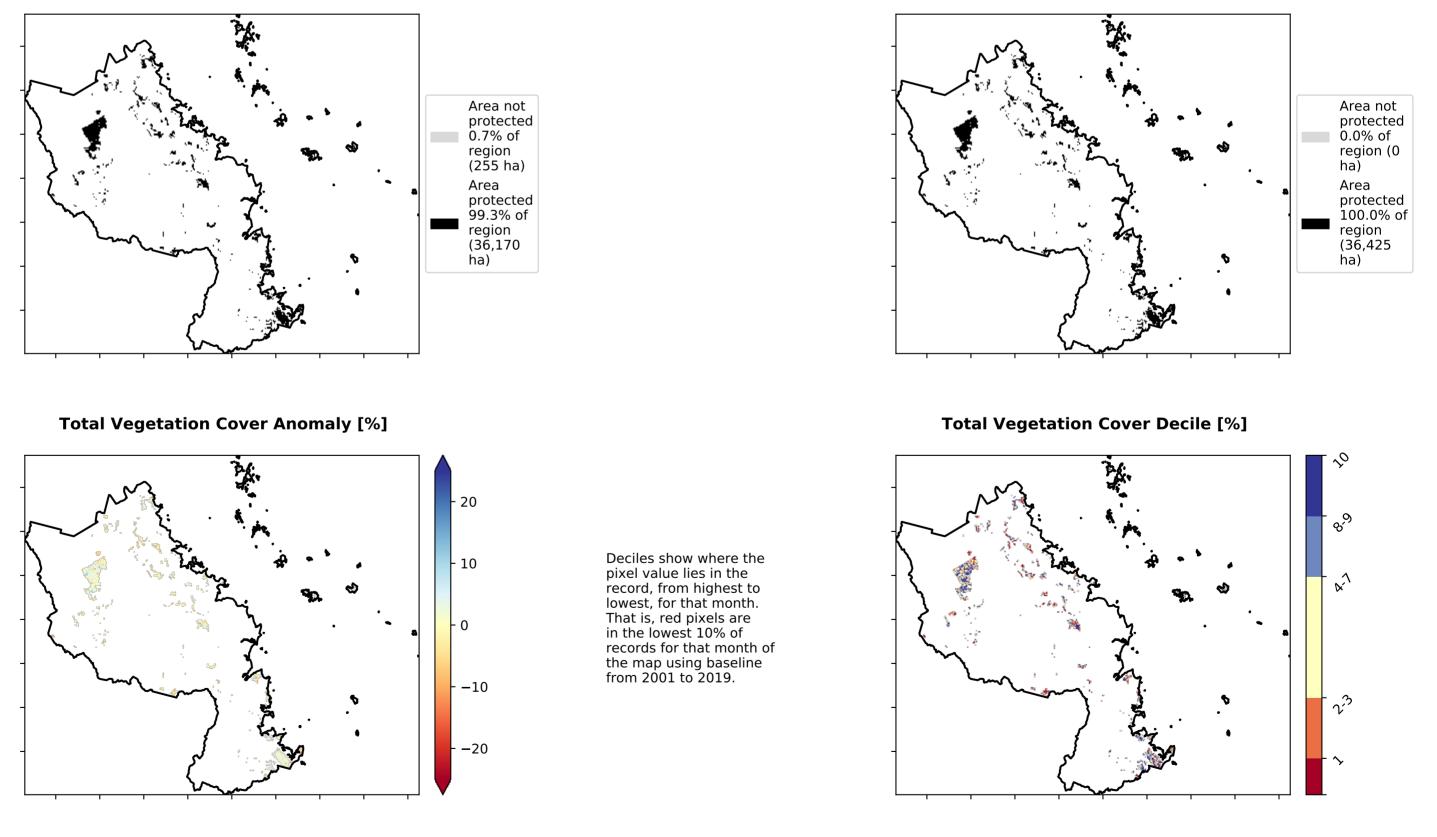
Total Vegetation Cover [%]



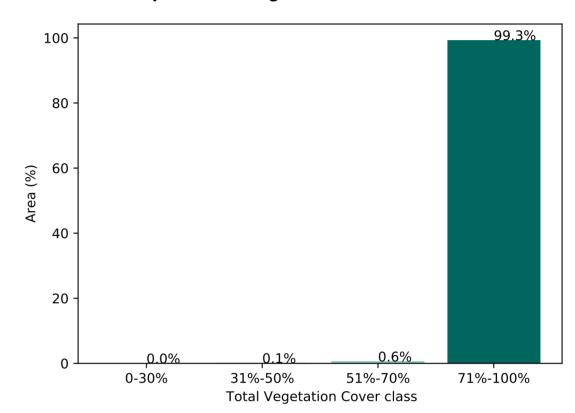
% Area protected from water erosion (>70%)



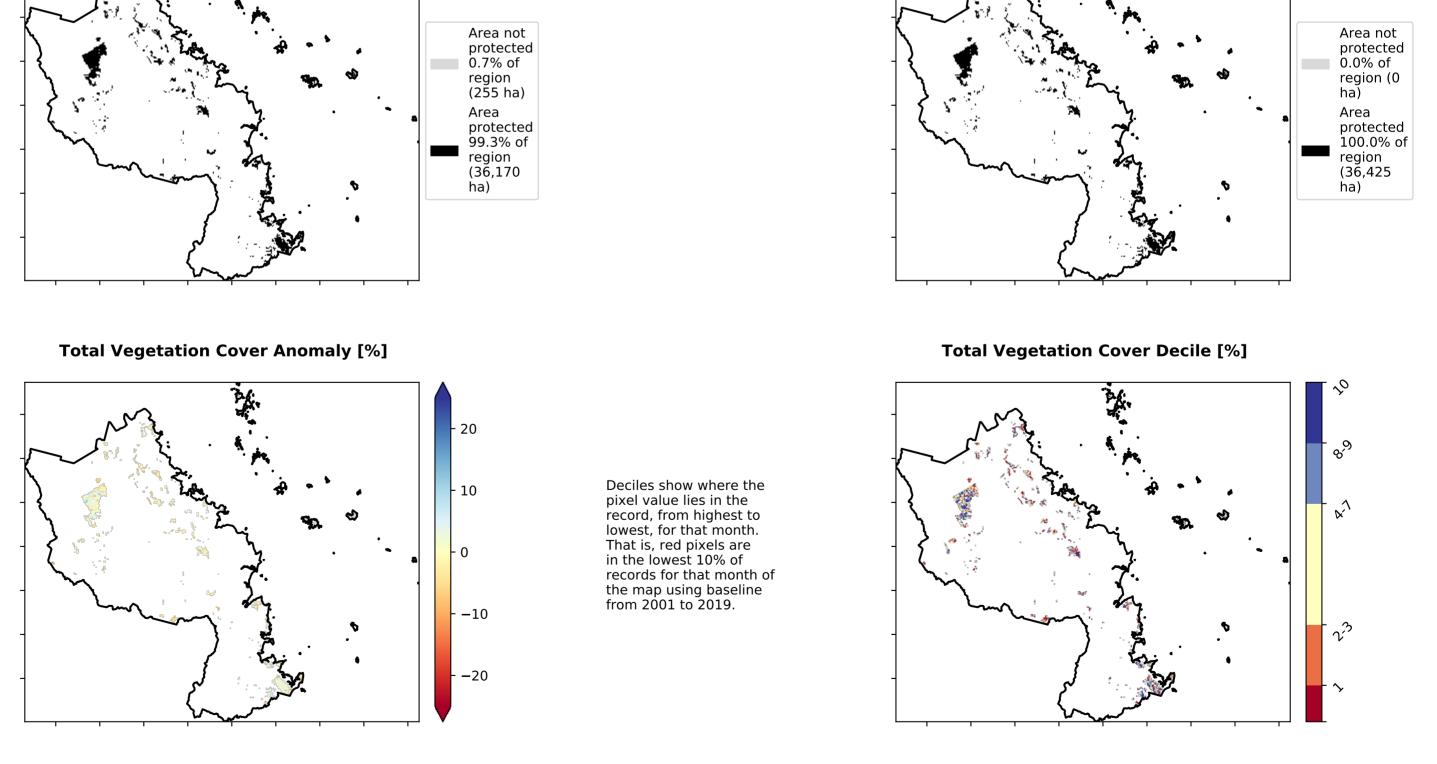




### Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

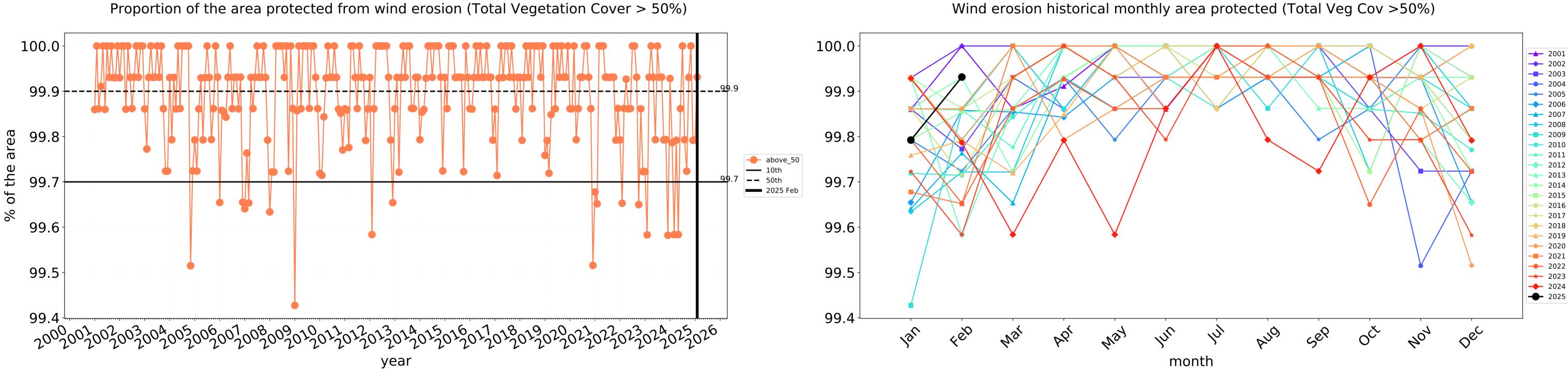




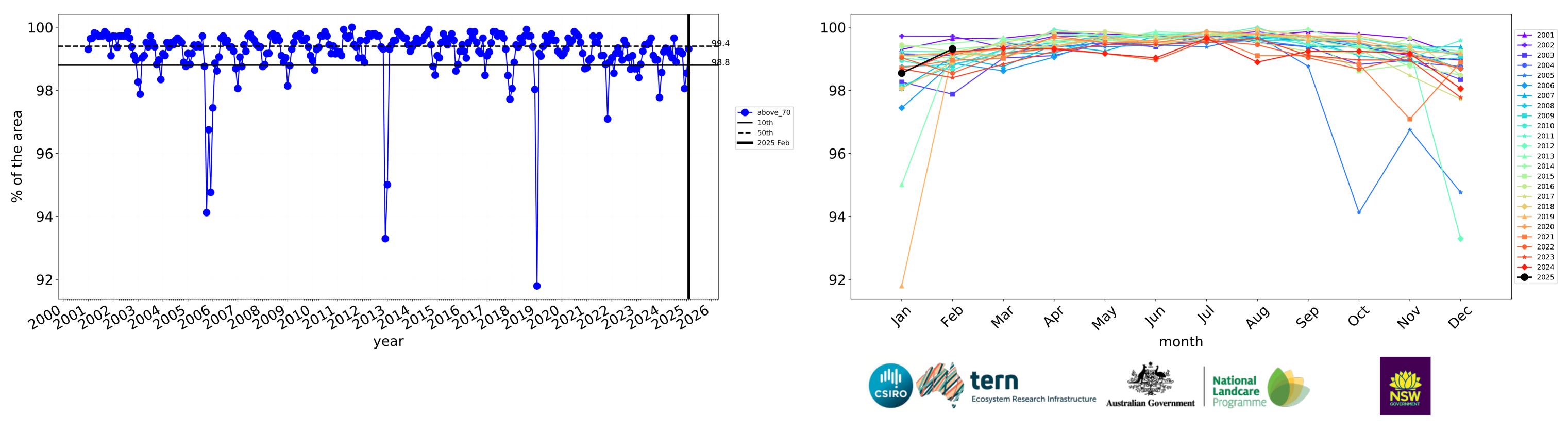


Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

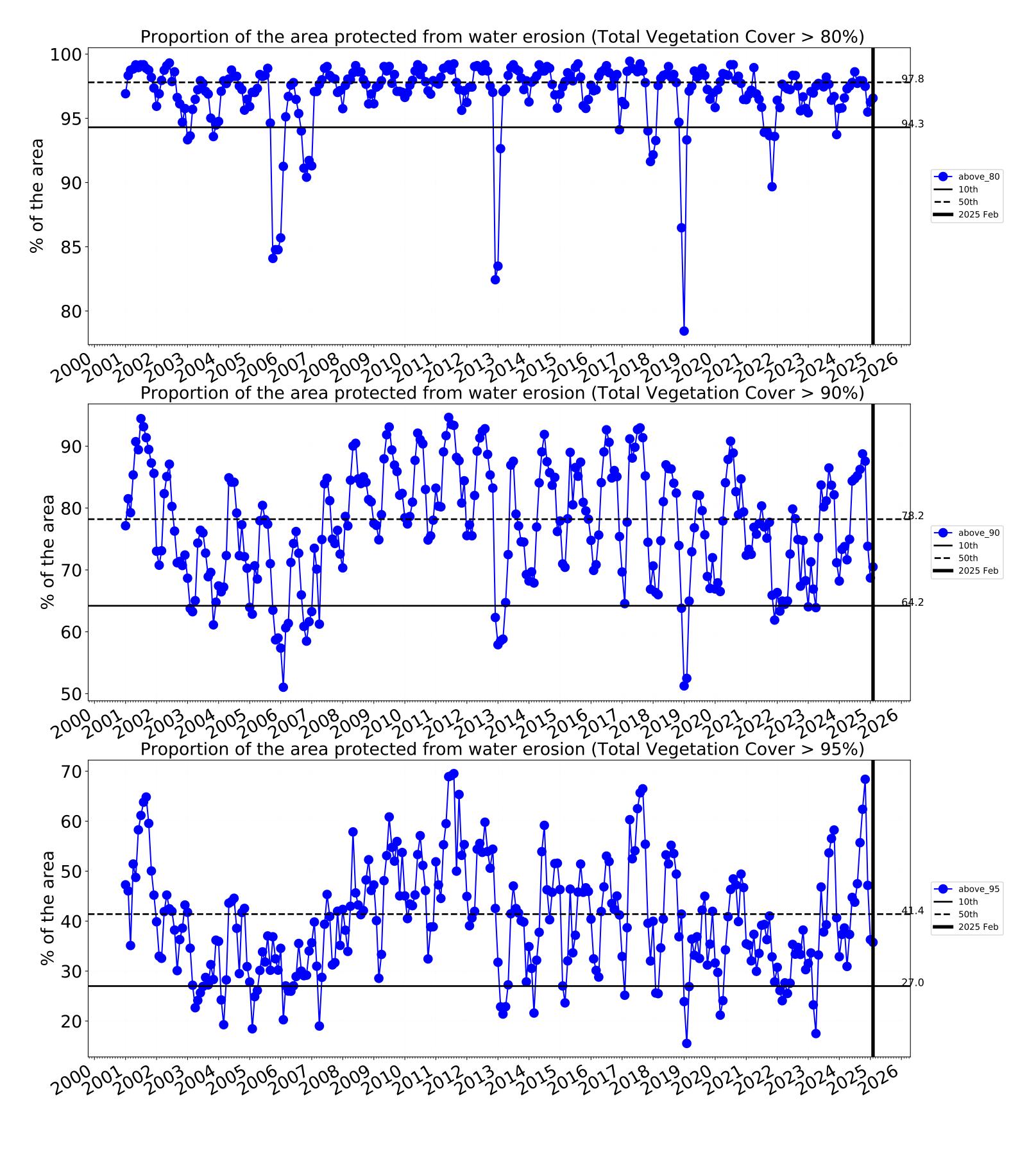
Derived from

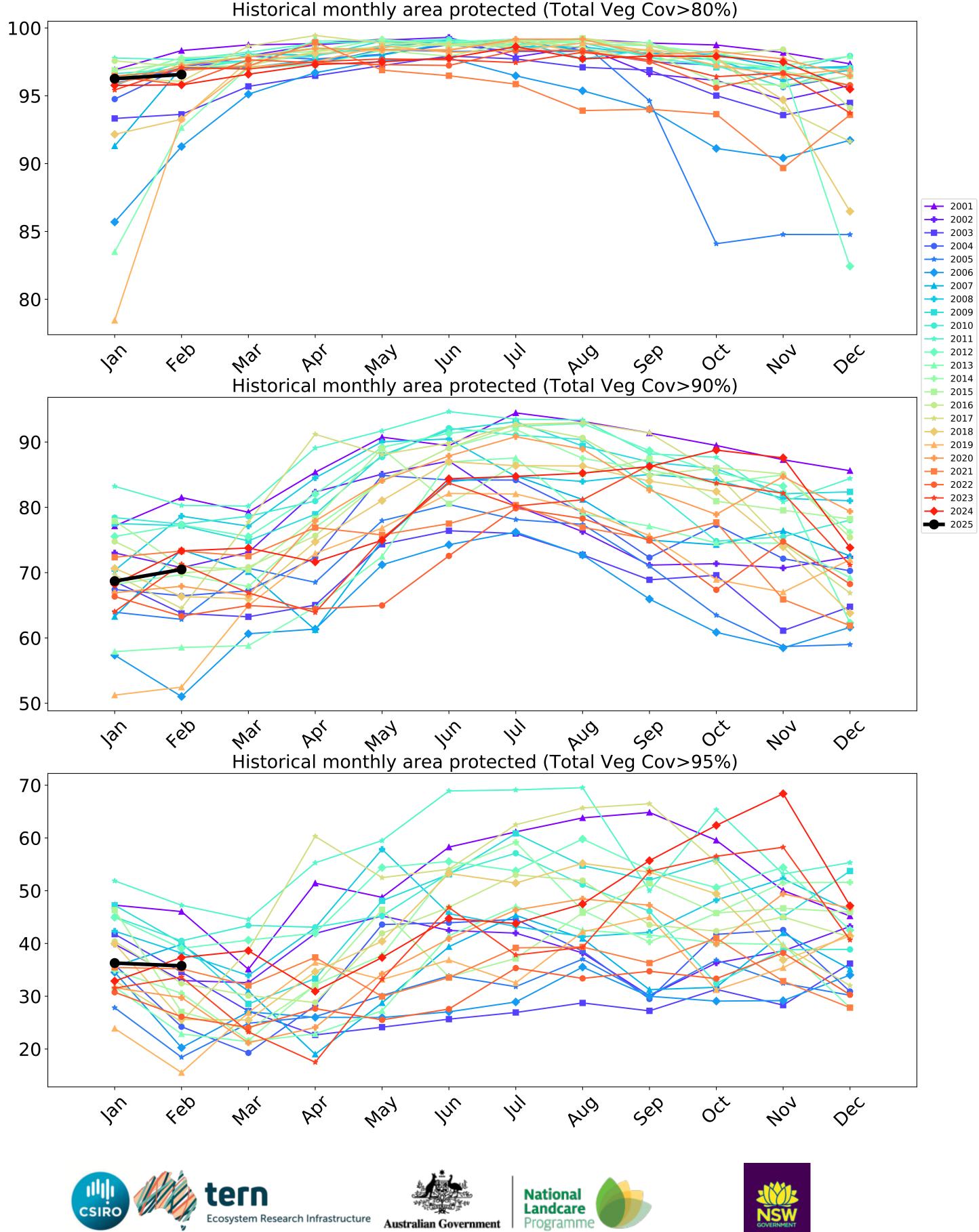


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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



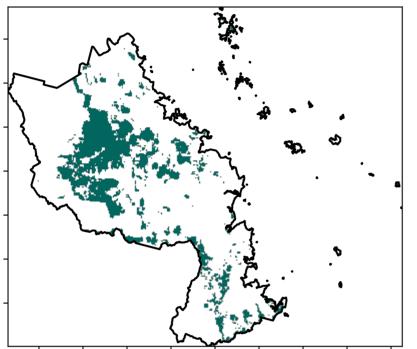




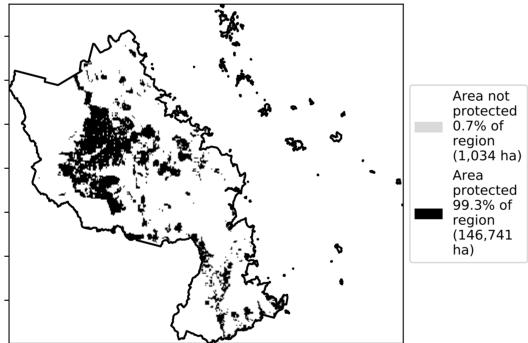
# **Conservation and natural environments Forest (non woodland)**

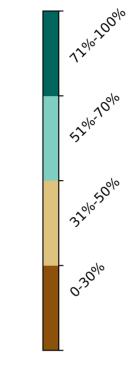
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover [%]** 



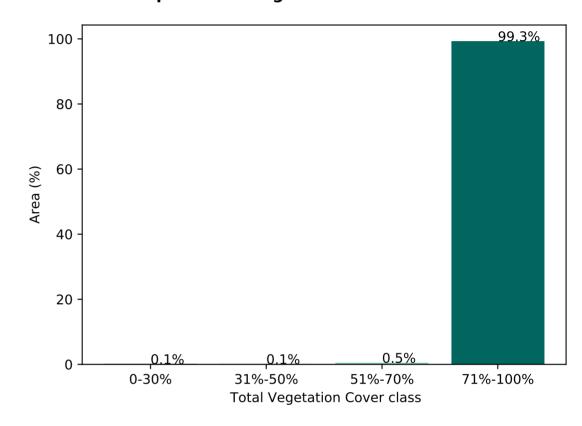
% Area protected from water erosion (>70%)



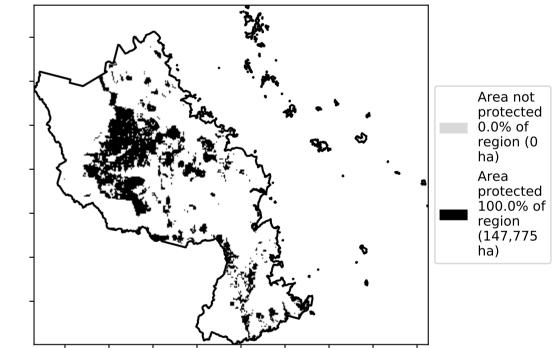




Proportion of vegetation cover class in area

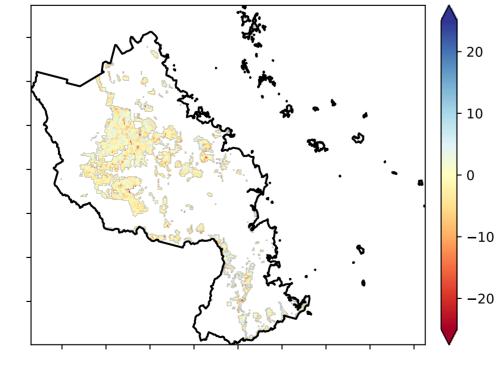


% Area protected from wind erosion (>50%)



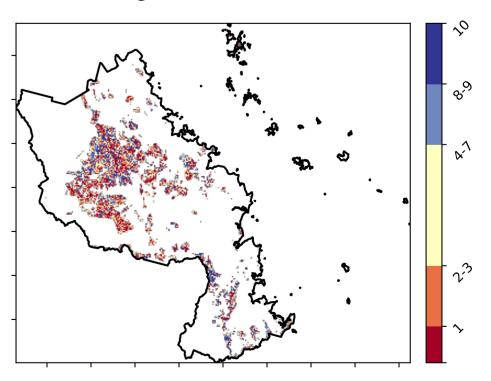
Total Vegetation Cover Anomaly [%]

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.

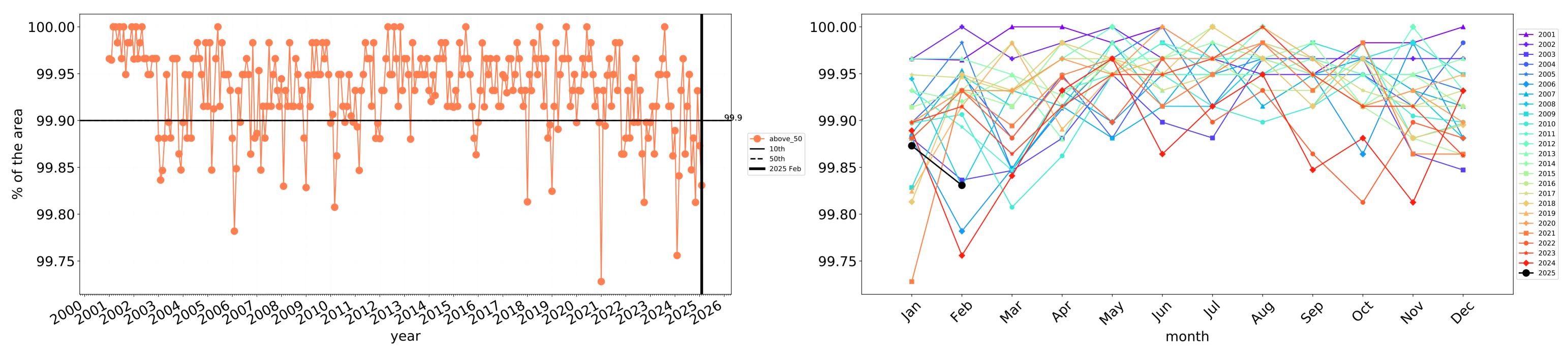


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.

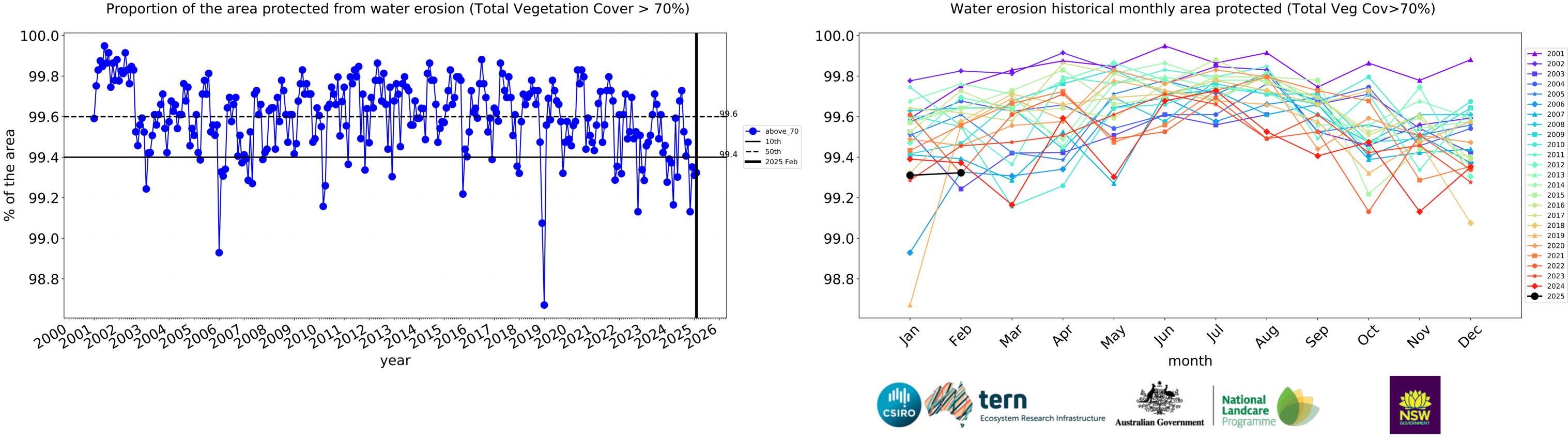
Total Vegetation Cover Decile [%]





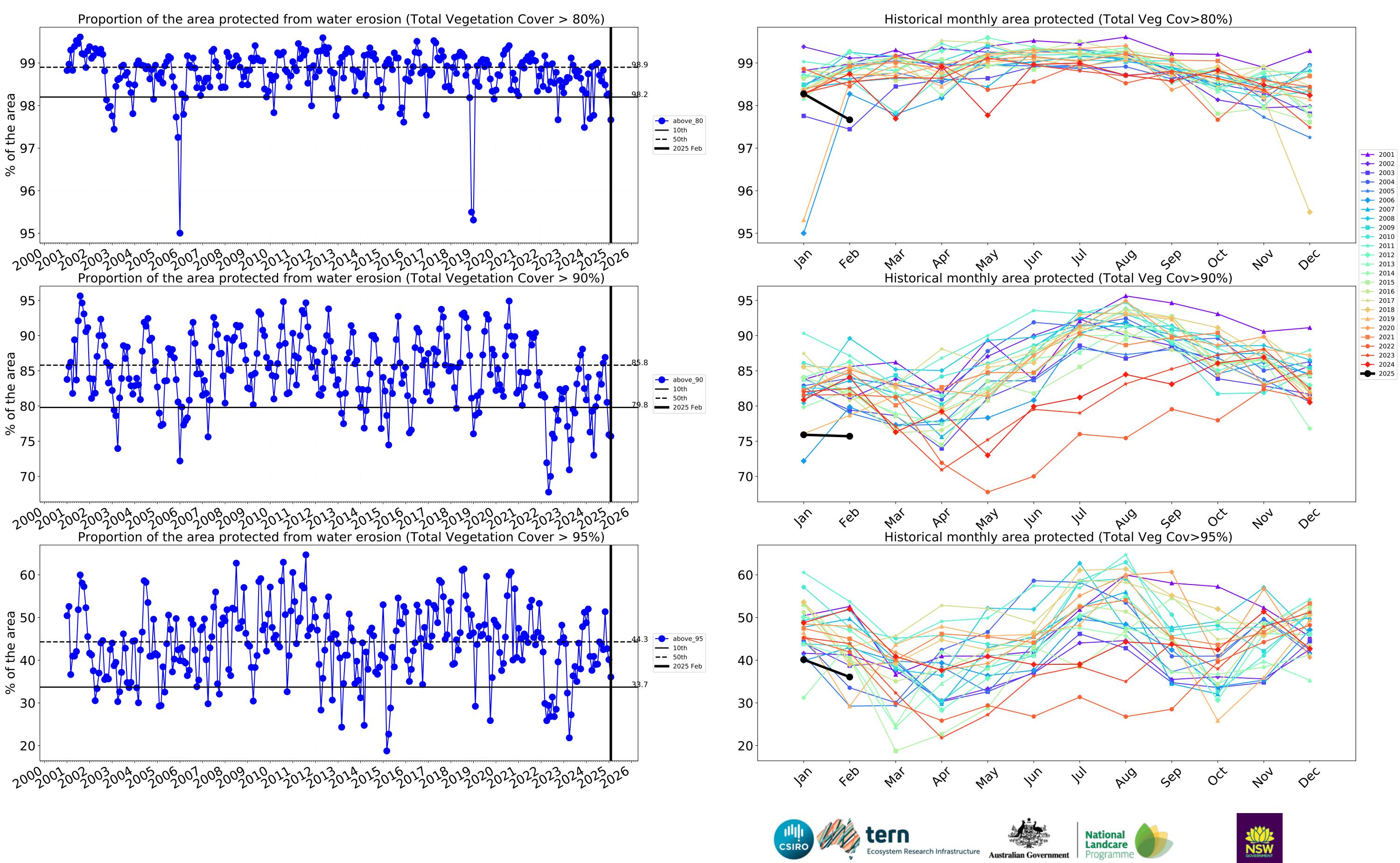


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

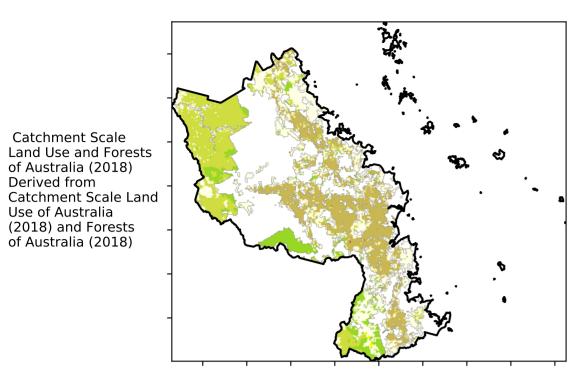




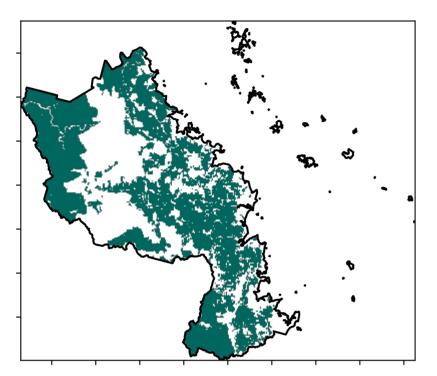


## Agriculture

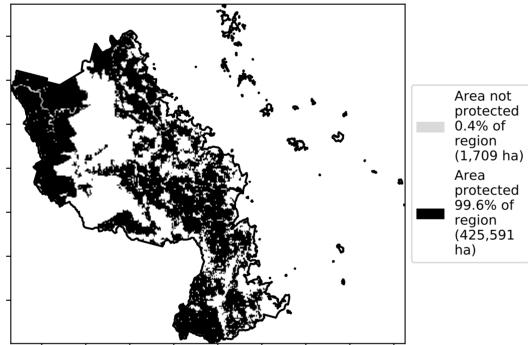
Land use and forest cover

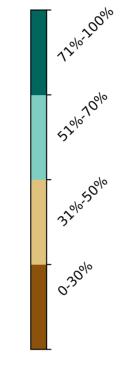


**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)





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

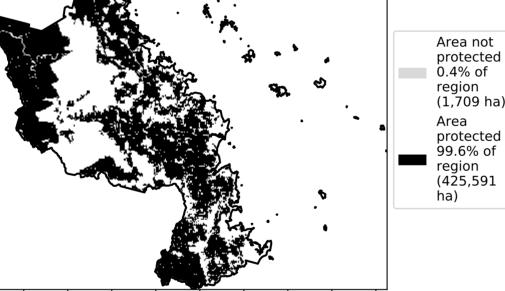
4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated

7 Agriculture - Horticulture - Non-irrigated

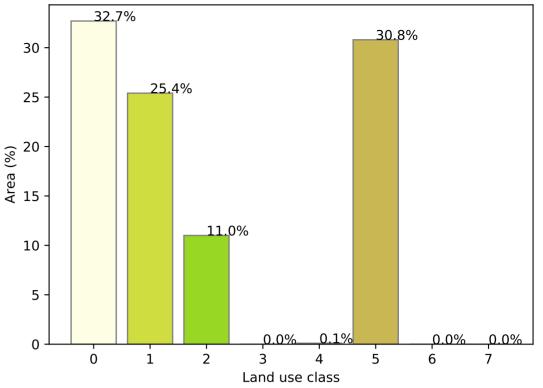
6 Agriculture - Cropping - Irrigated

8 Agriculture - Horticulture - Irrigated

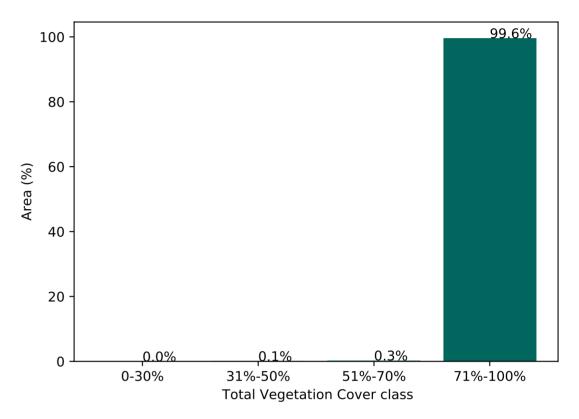
3 Agriculture - Grazing - Non-woodland forest



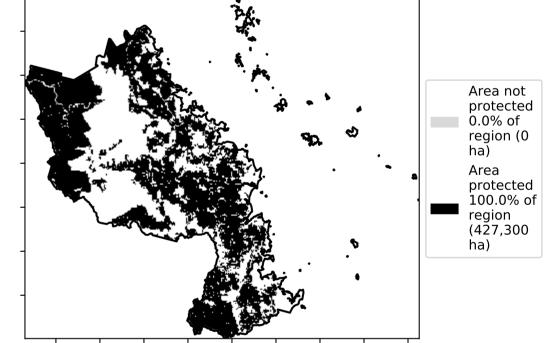




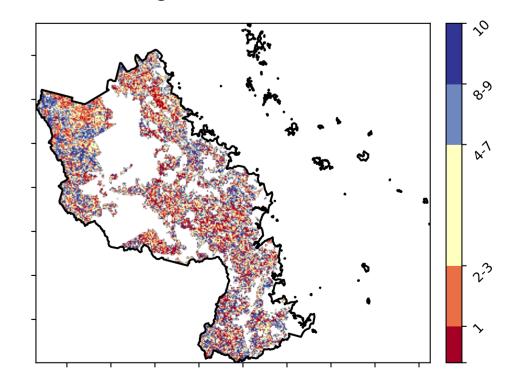
Proportion of vegetation cover class in area



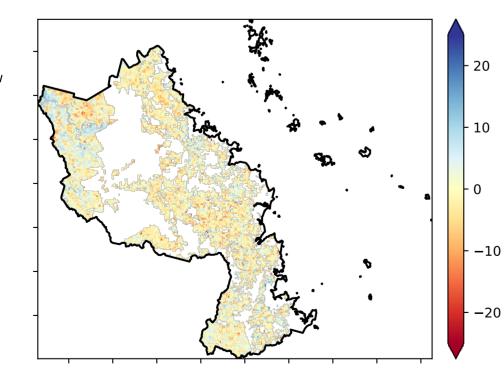
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 



**Total Vegetation Cover Anomaly [%]** 



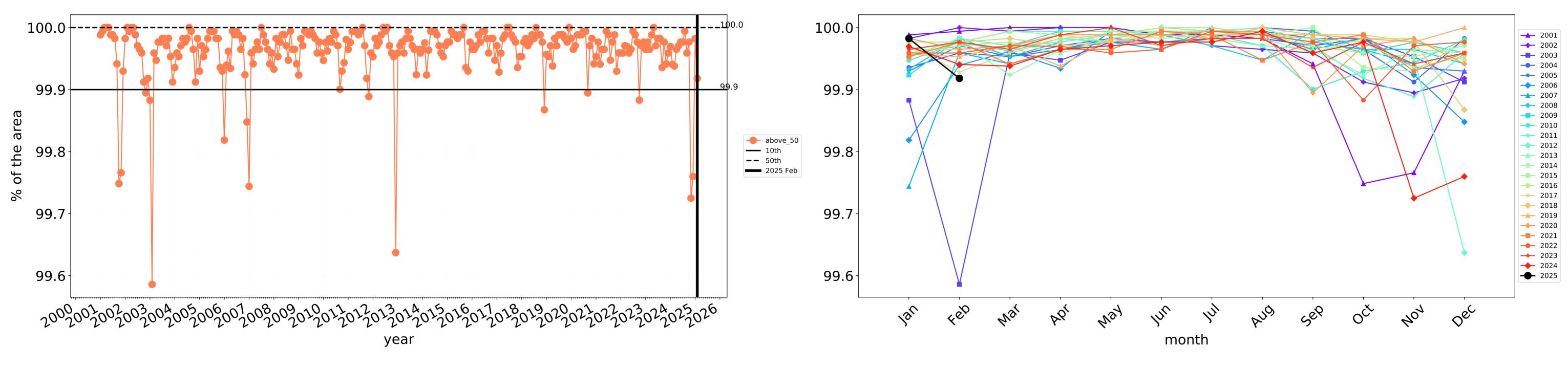
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





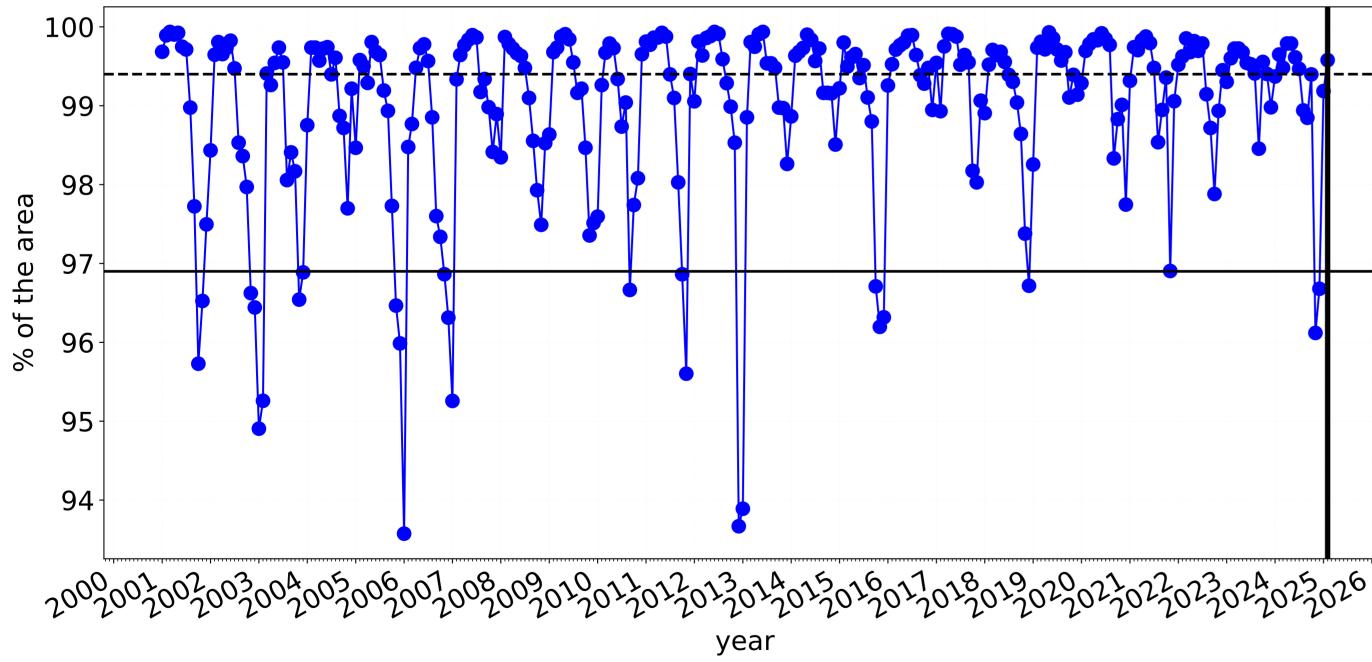
Anomaly show how many percetage points each pixel is from the mean That the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

of Australia (2018)



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



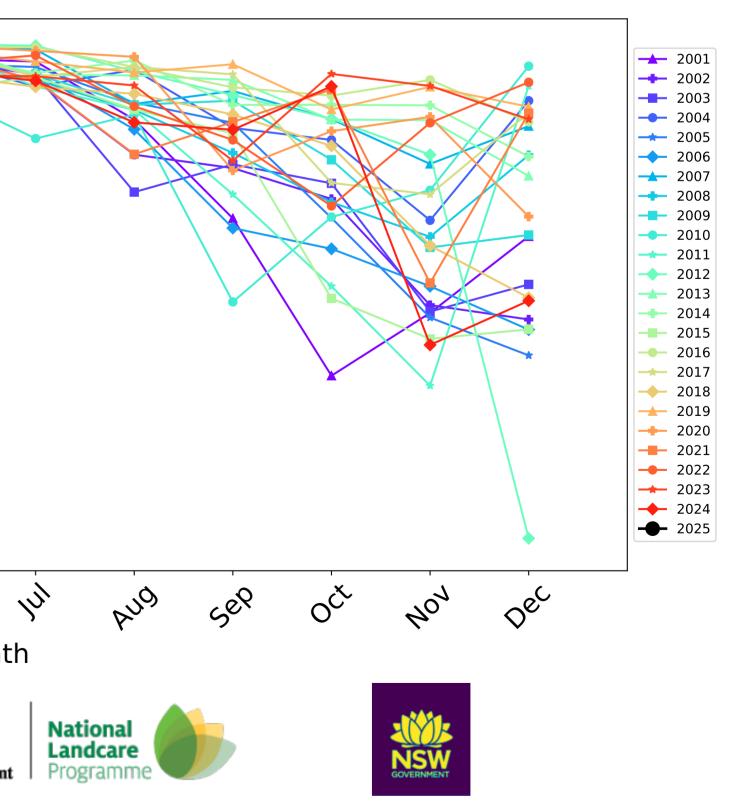


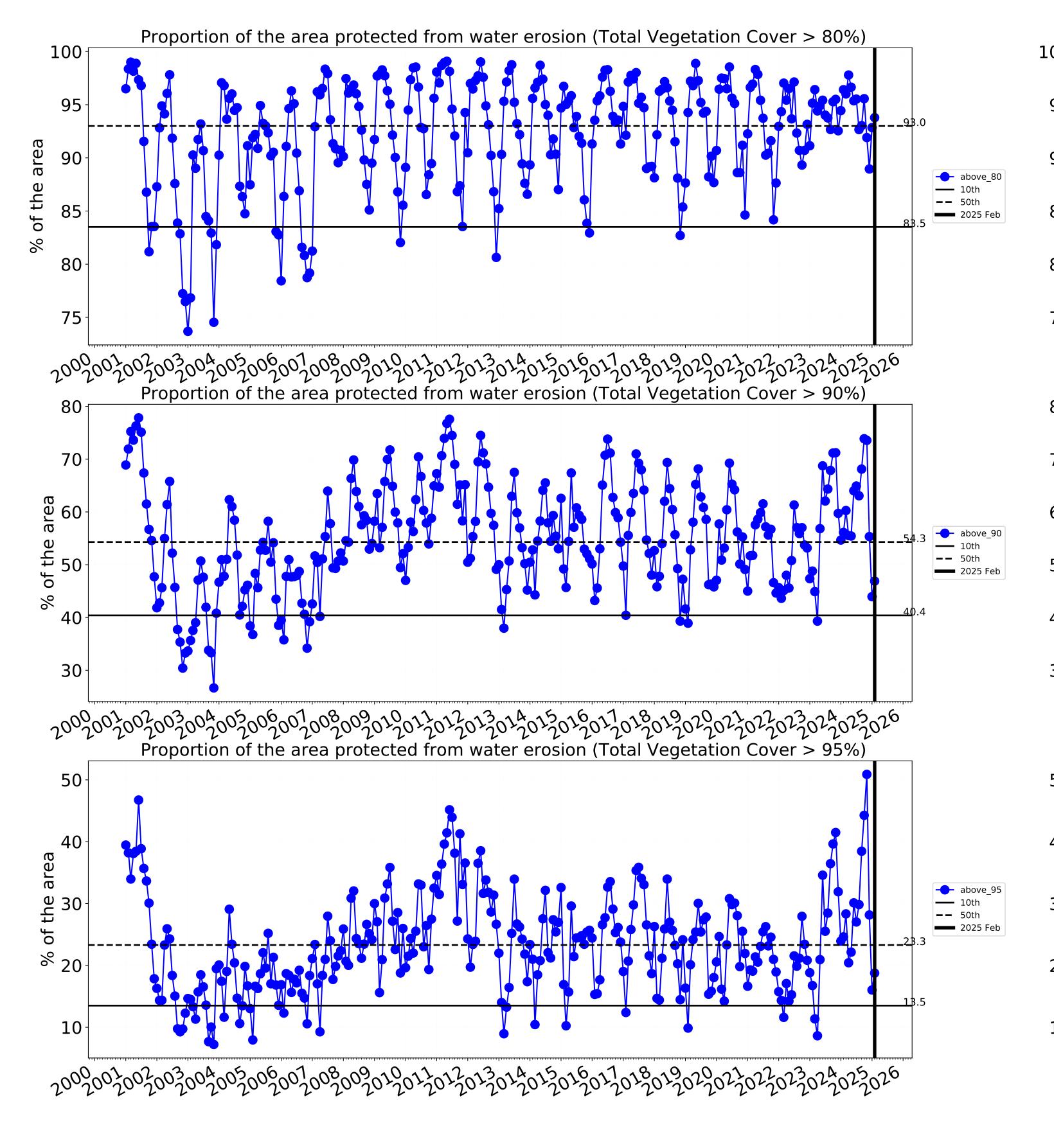
Wind erosion historical monthly area protected (Total Veg Cov >50%)

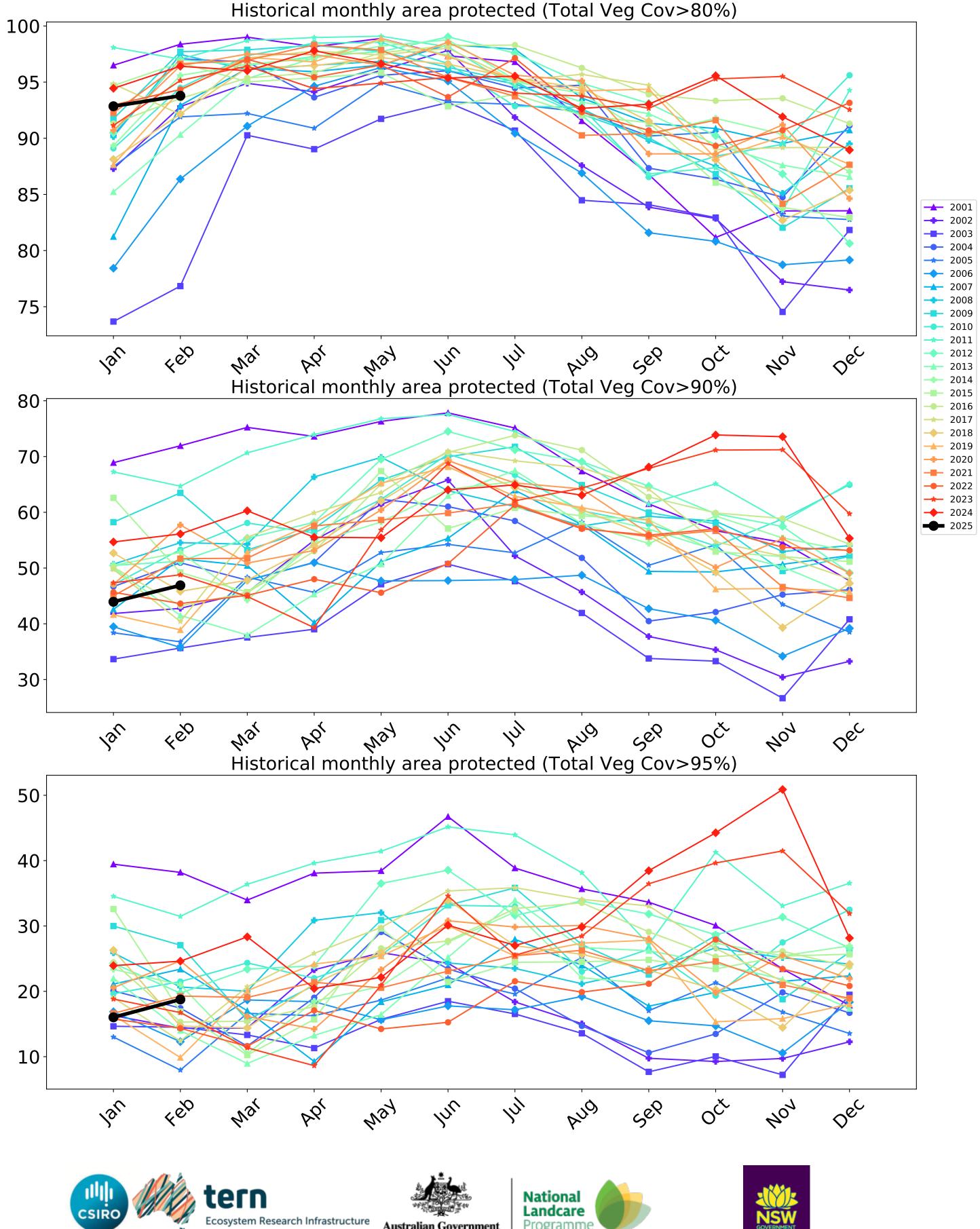
---- above\_70 **—** 10th **——** 50th 2025 Feb

100-99 98 97 96<sup>-</sup> 95 94 Jan 4e0 In way Mai PQ' month tern Ecosystem Research Infrastructure Australian Government

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







Programm

Australian Government

Ecosystem Research Infrastructure

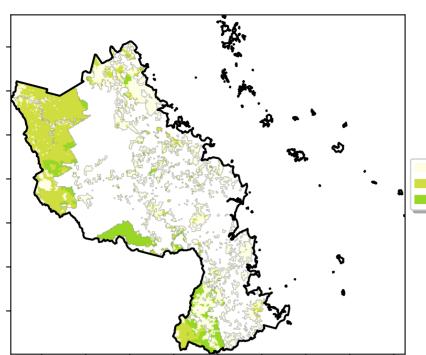
### Grazing

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

lower than the

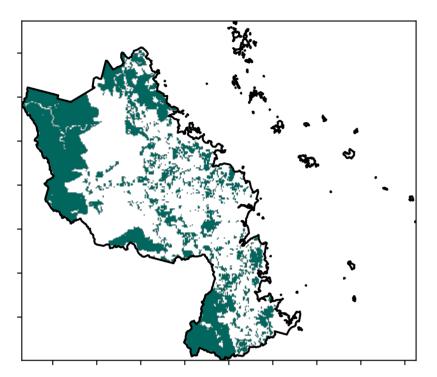
using baseline from 2001 to 2019.

mean of that pixel. The mean

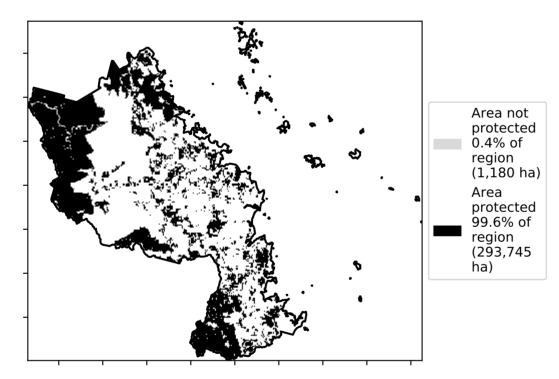


Land use and forest cover

**Total Vegetation Cover [%]** 



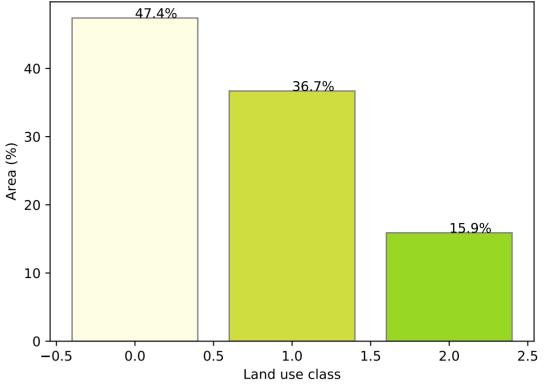
% Area protected from water erosion (>70%)



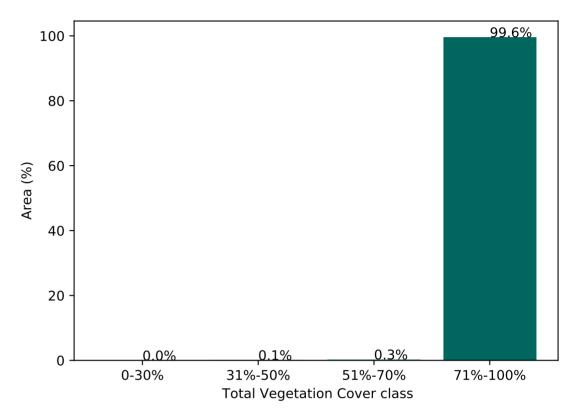
1200,1000 · 52°1070°10 32005000 0.30%

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

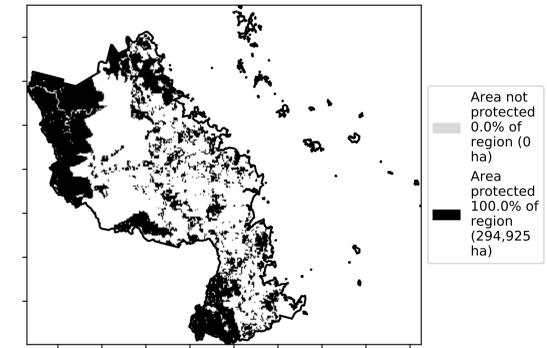
# Proportion of each land class in area



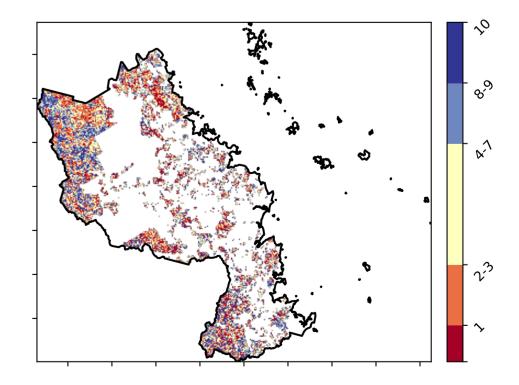
### Proportion of vegetation cover class in area



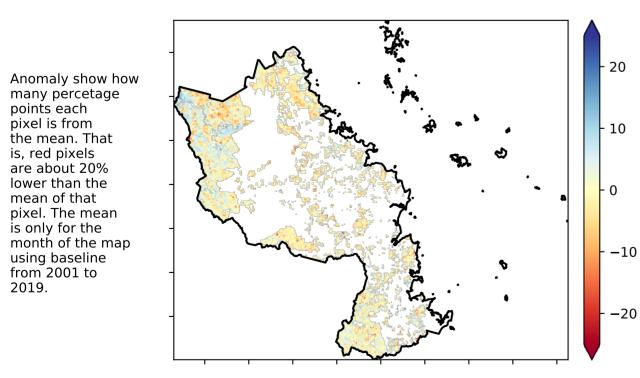
### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 



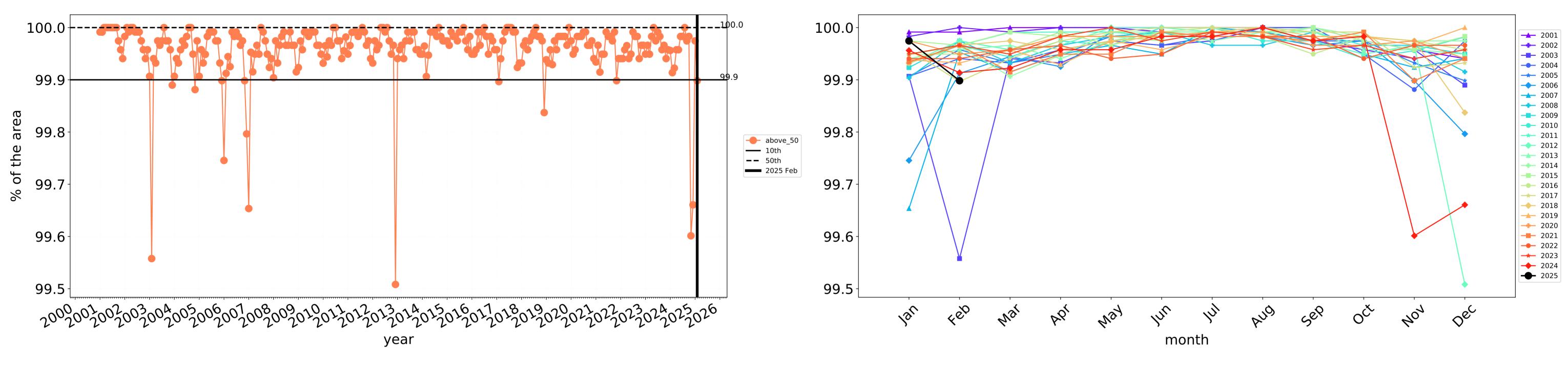
Total Vegetation Cover Anomaly [%]



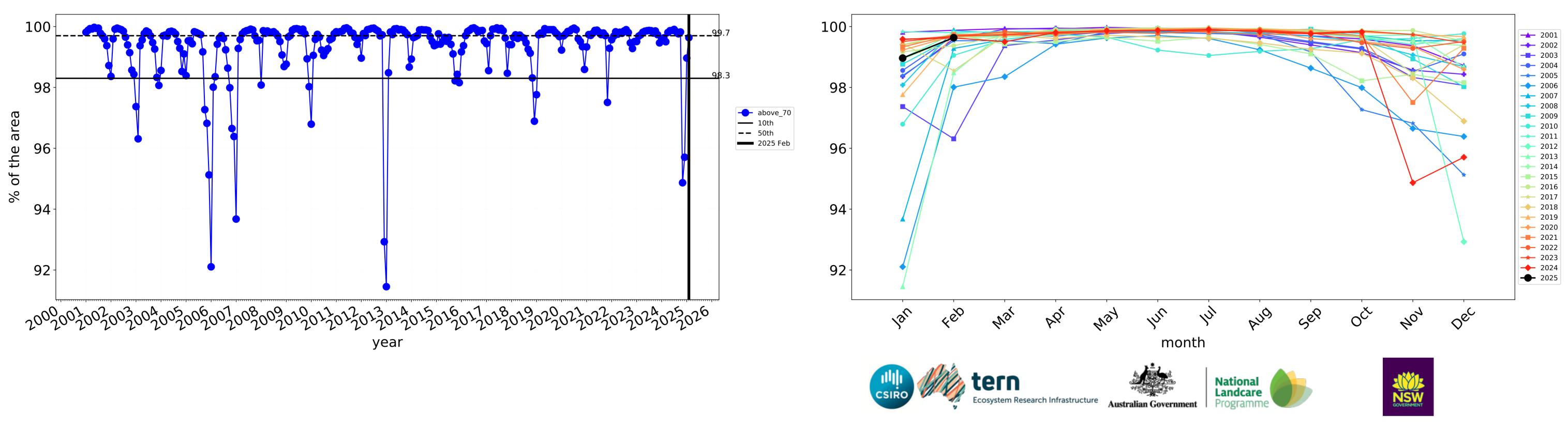
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

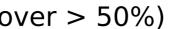


Deciles show where the pixel value lies in the



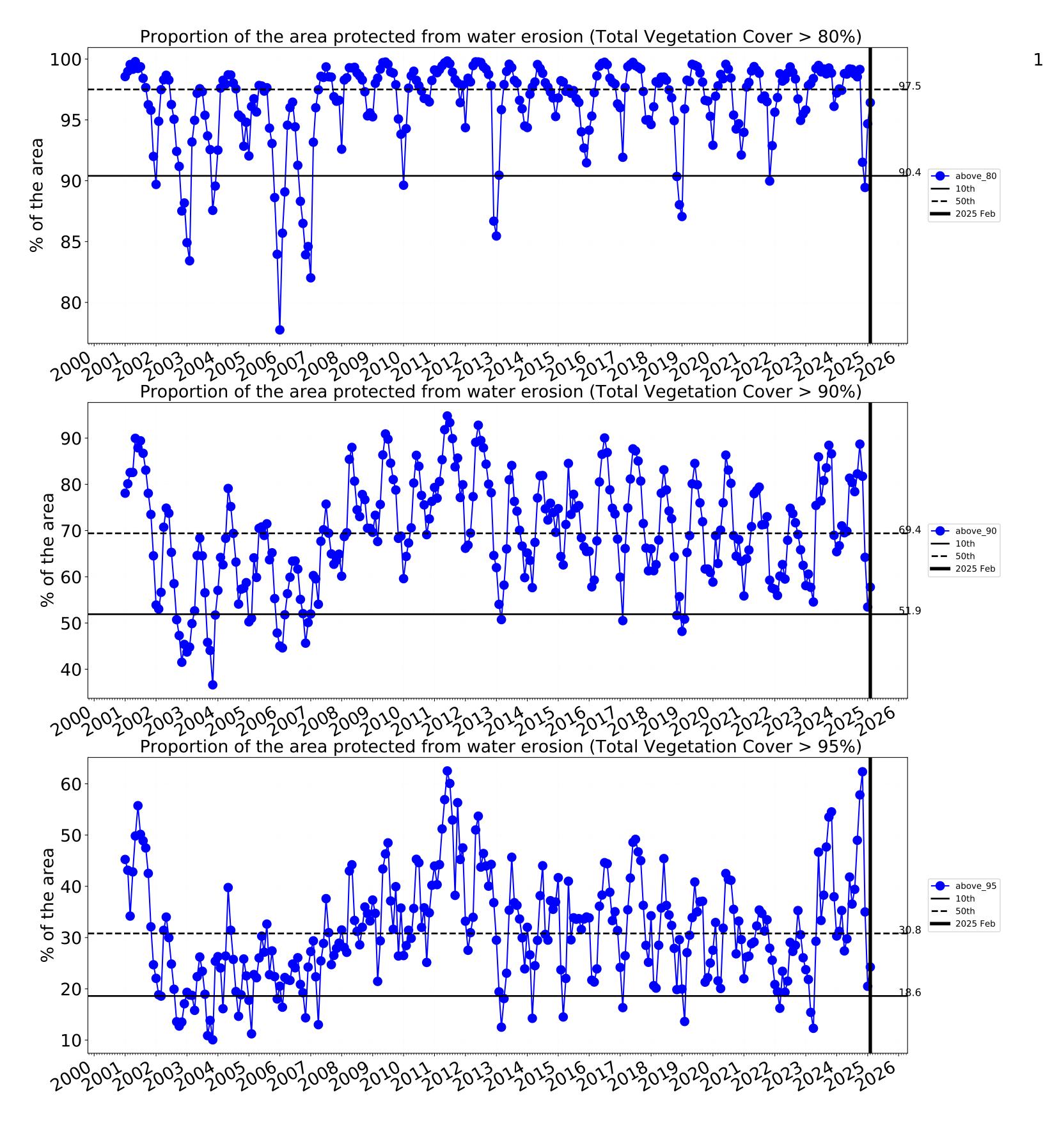
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

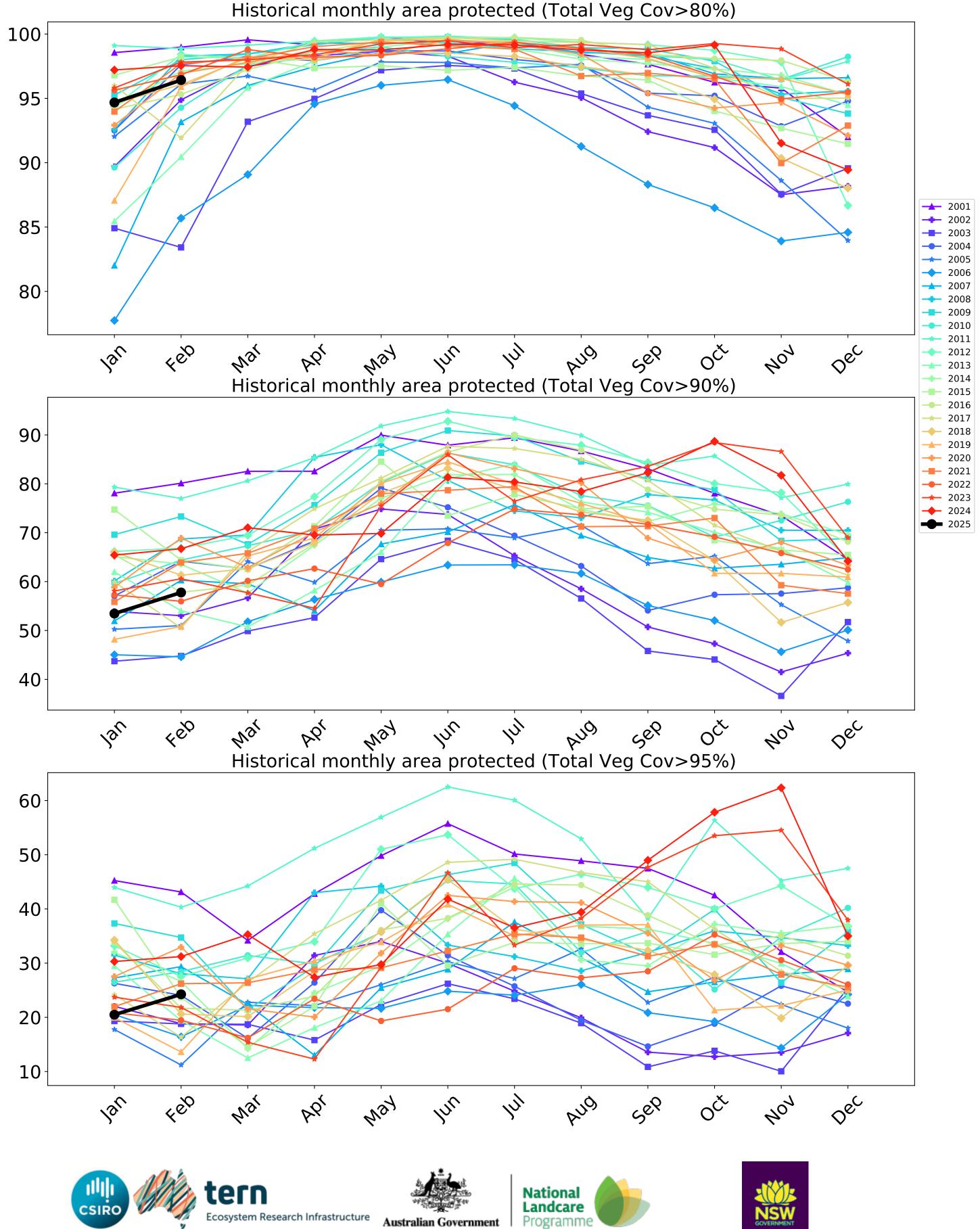




Wind erosion historical monthly area protected (Total Veg Cov >50%)









# **Grazing non forest**

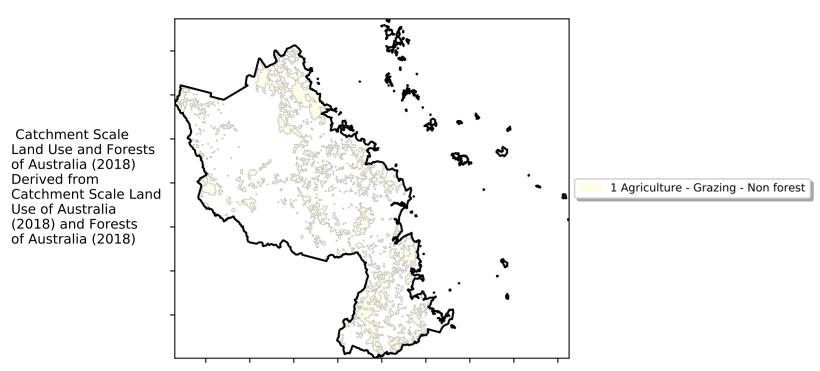
12%200%

· 52°1070010

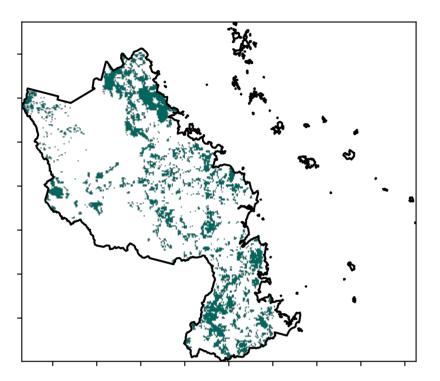
· 320050010

0.30%

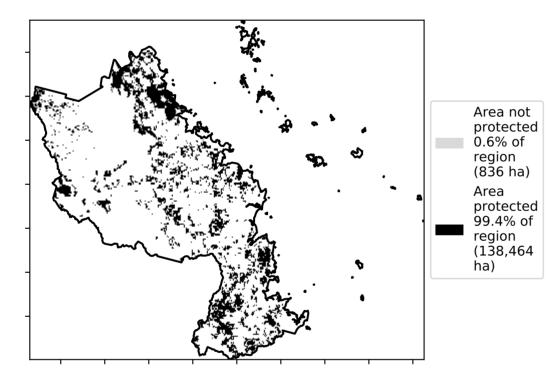
Land use and forest cover



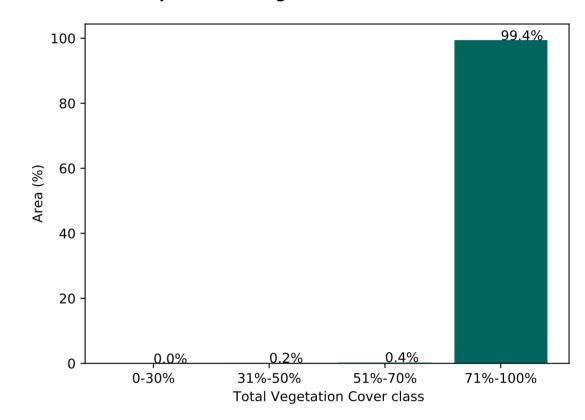
**Total Vegetation Cover [%]** 



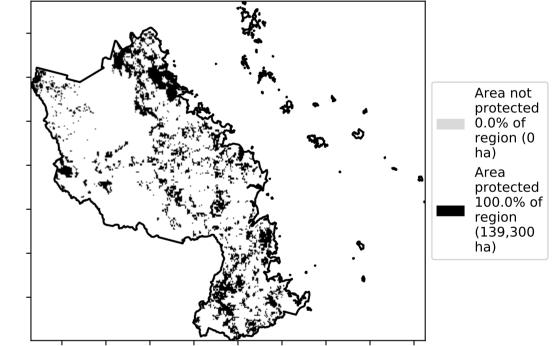
% Area protected from water erosion (>70%)



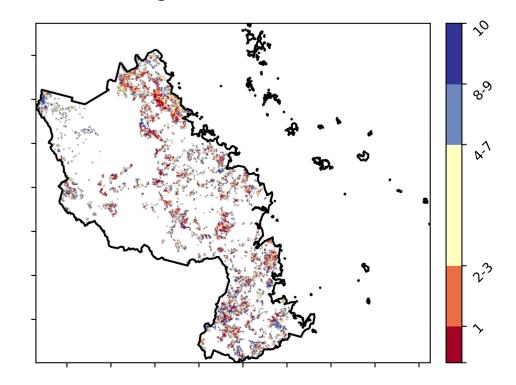
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 



Total Vegetation Cover Anomaly [%]

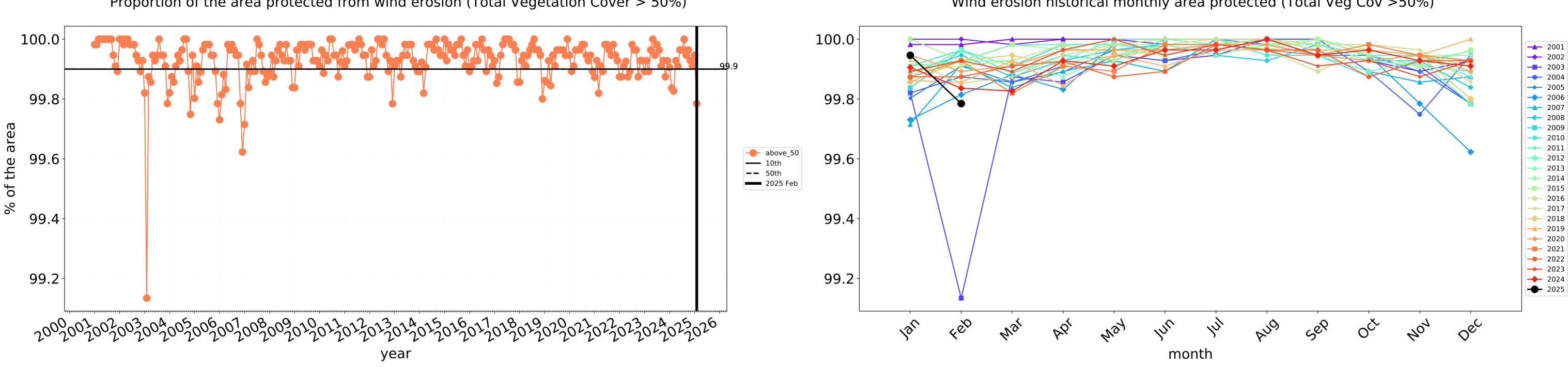
26 - 20 - 10 0 -10 -20

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.



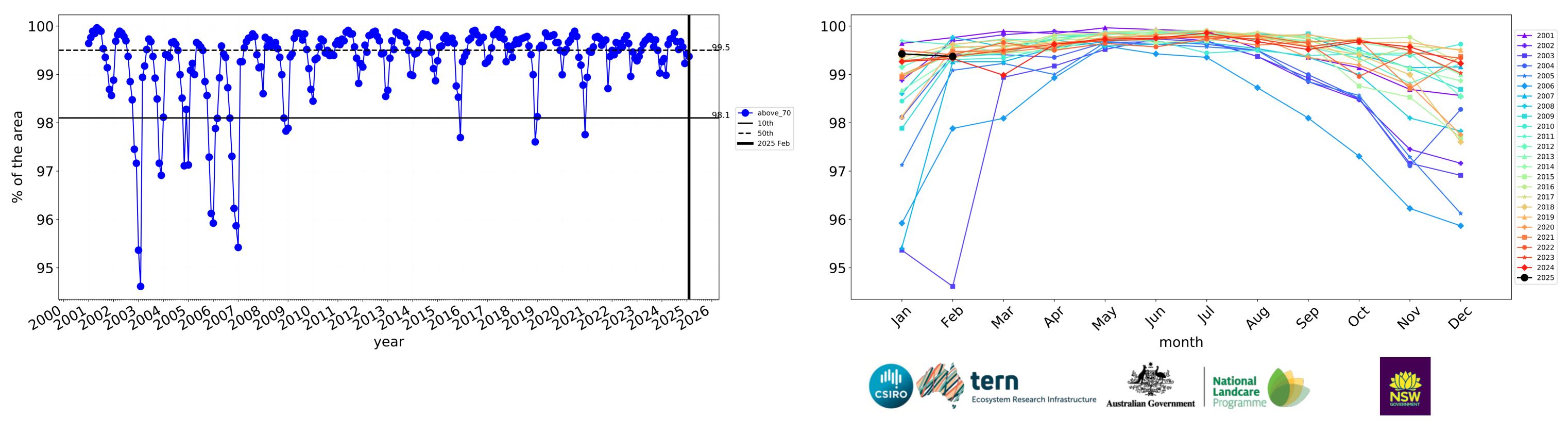


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



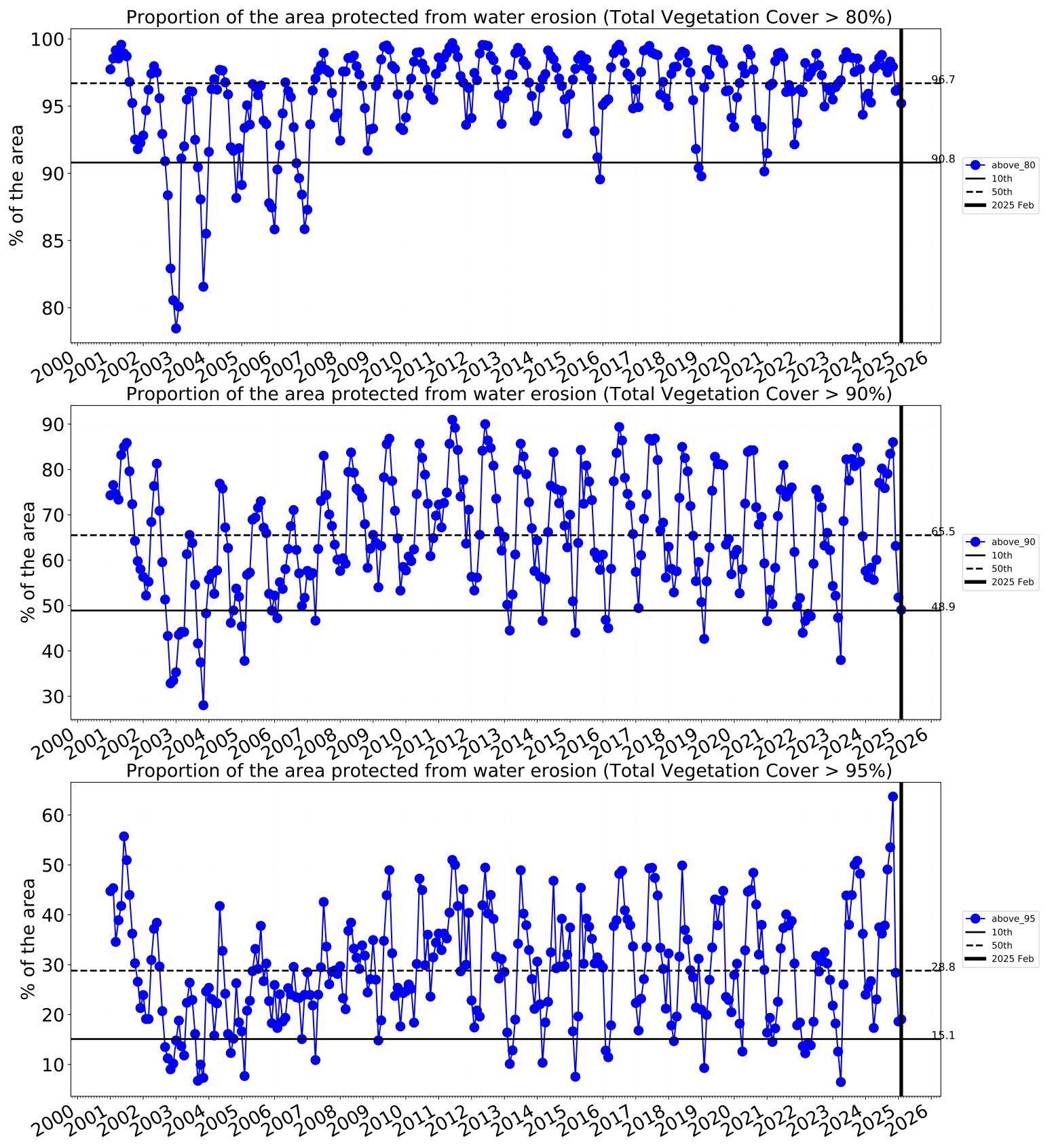
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

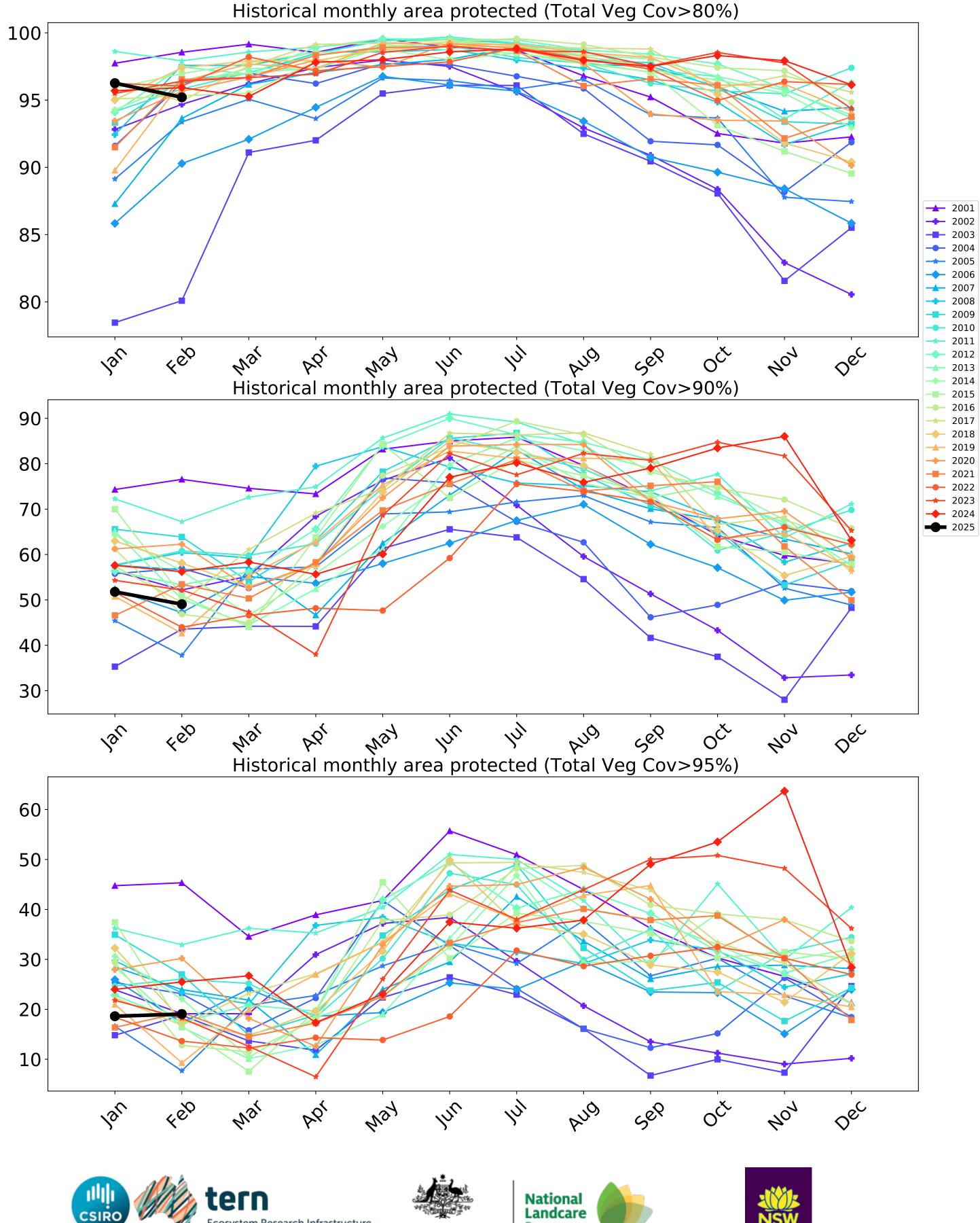




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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







Programm

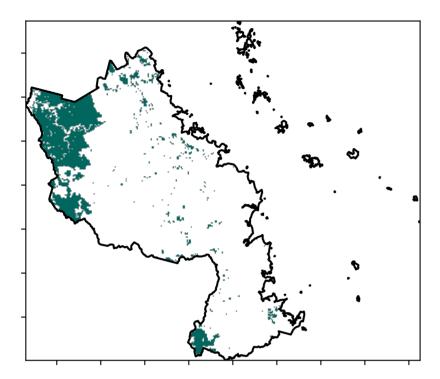
NSW

# **Grazing Woodland forest**

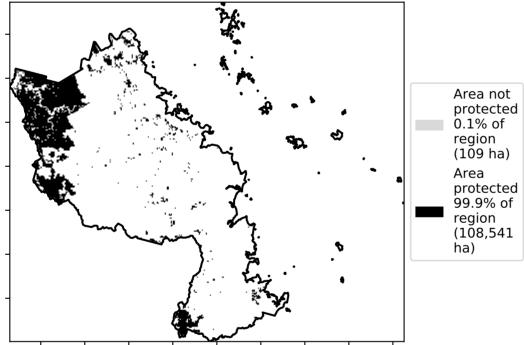
1 Agriculture - Grazing - Woodland forest

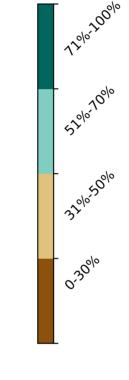
**Total Vegetation Cover [%]** 

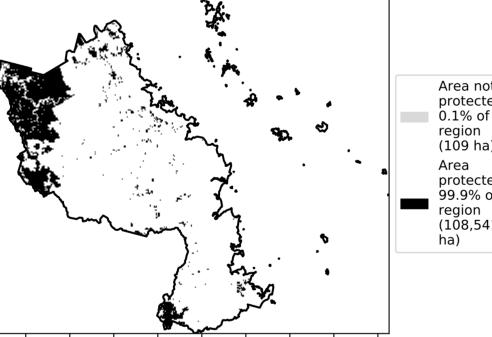
Land use and forest cover



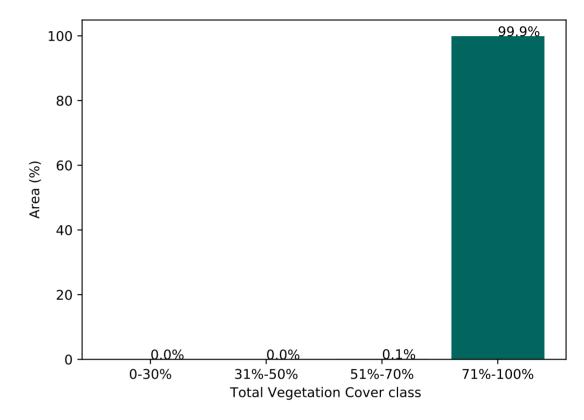
% Area protected from water erosion (>70%)



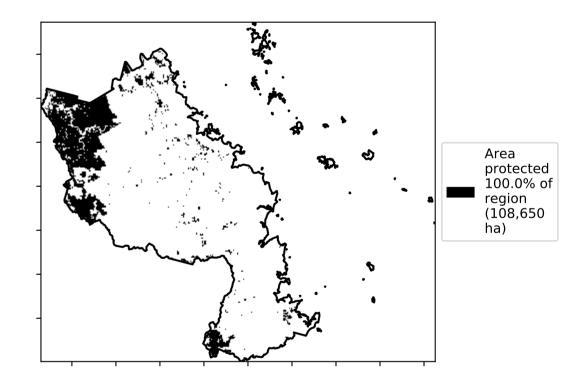


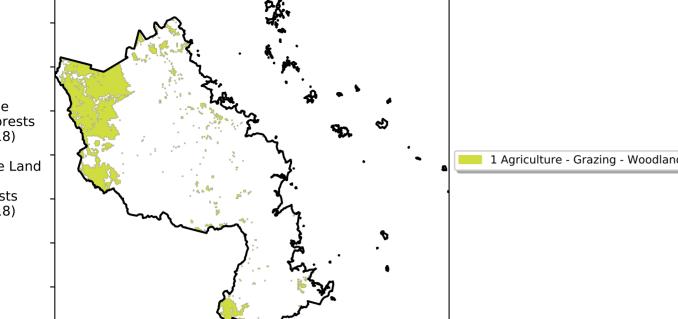


Proportion of vegetation cover class in area



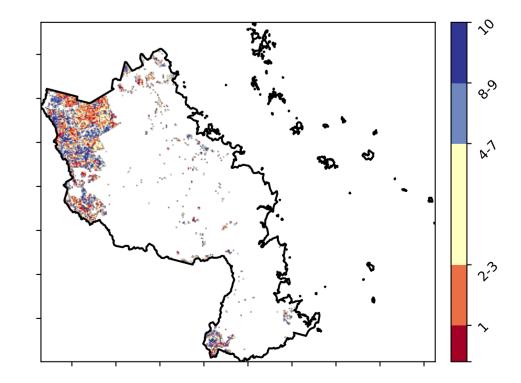
% Area protected from wind erosion (>50%)



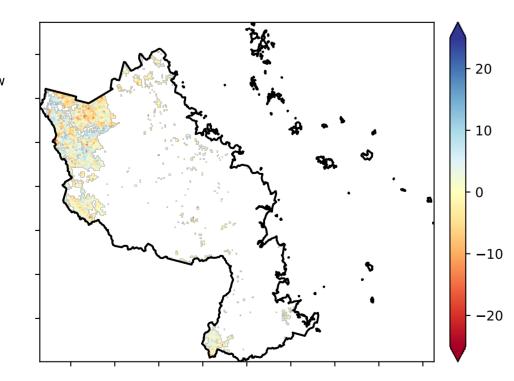


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover Decile [%]** 



Total Vegetation Cover Anomaly [%]

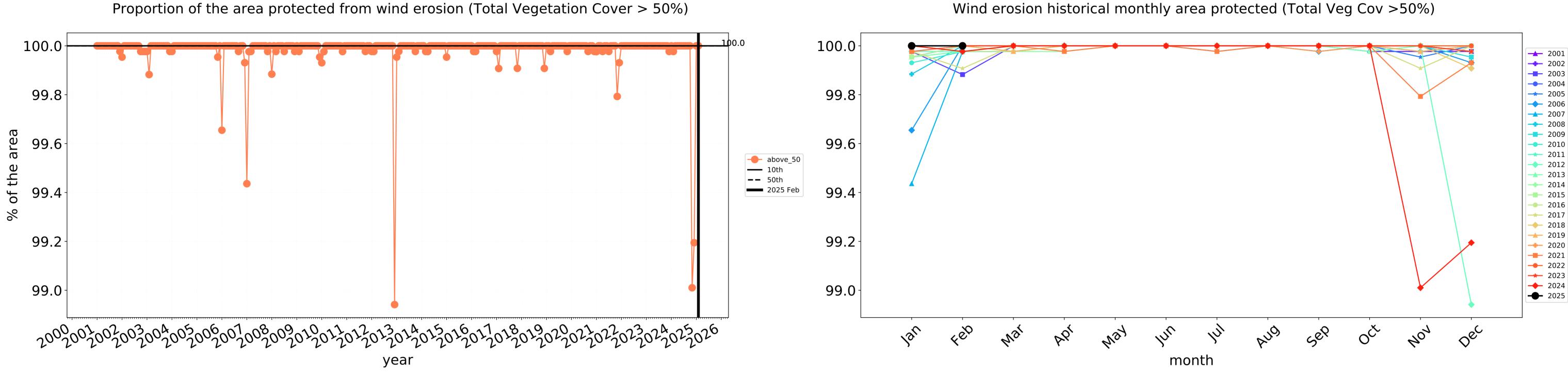


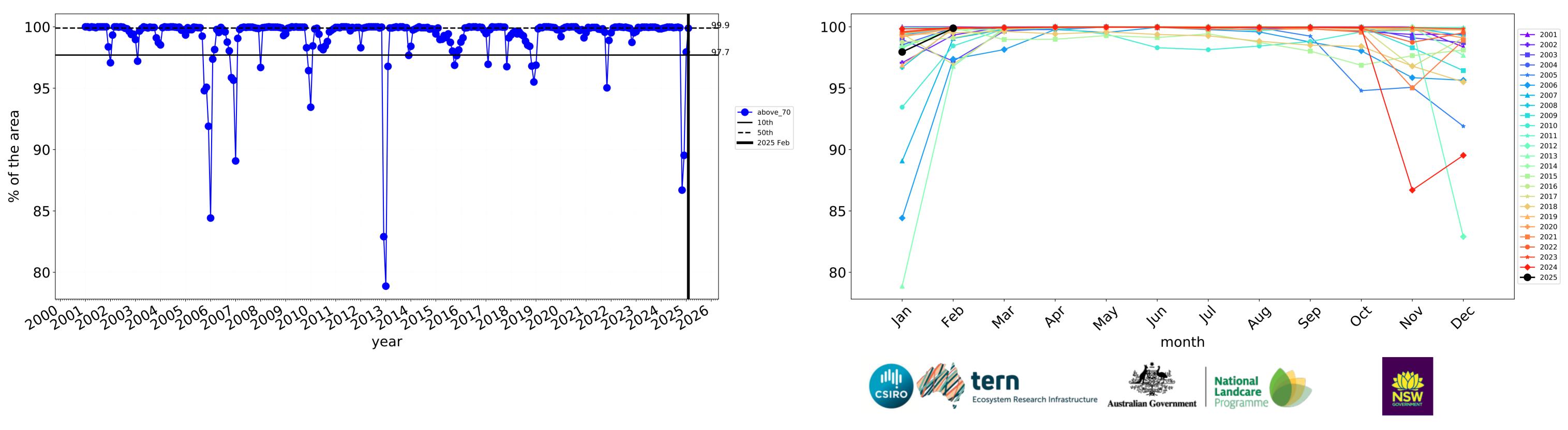
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



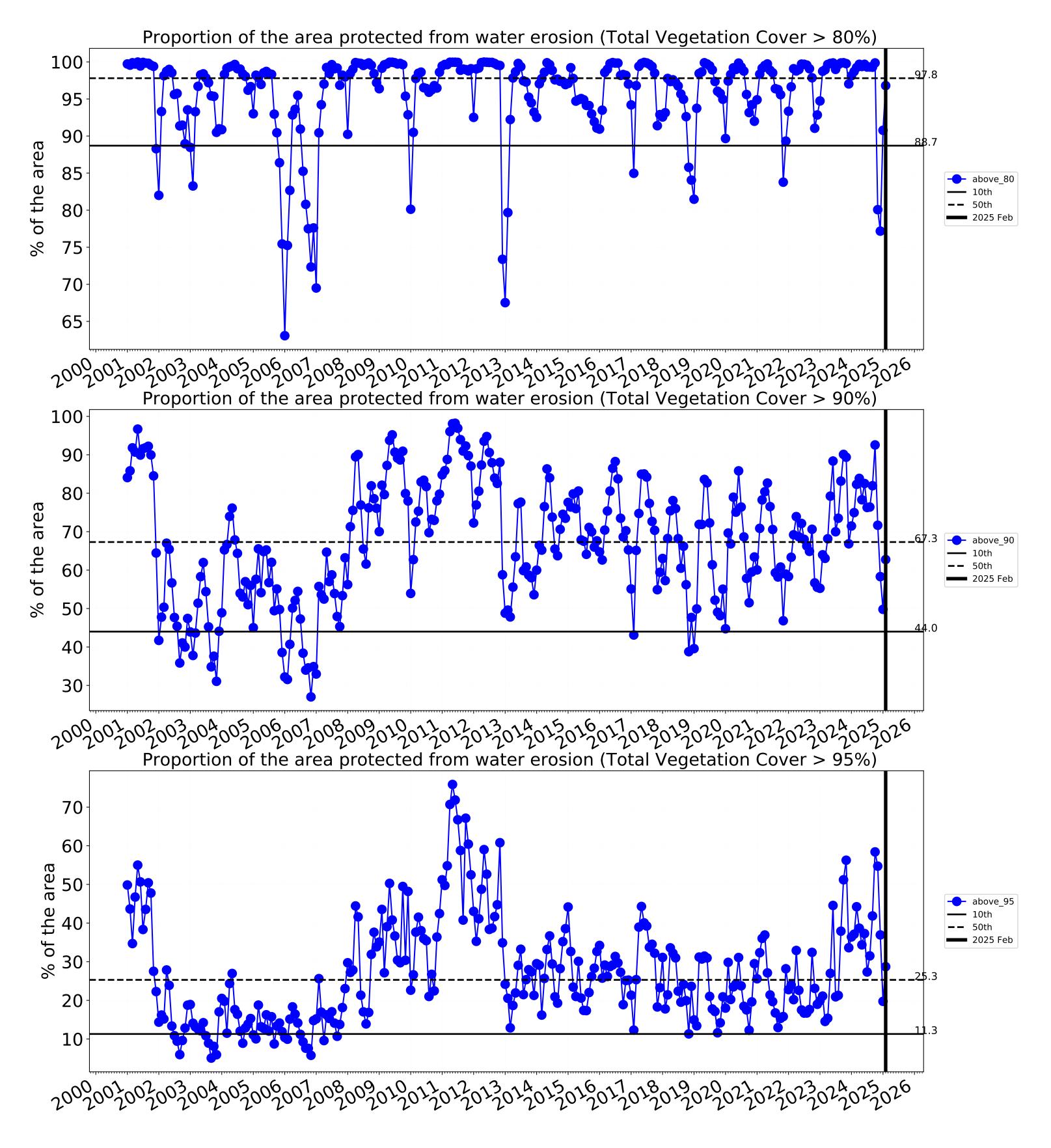


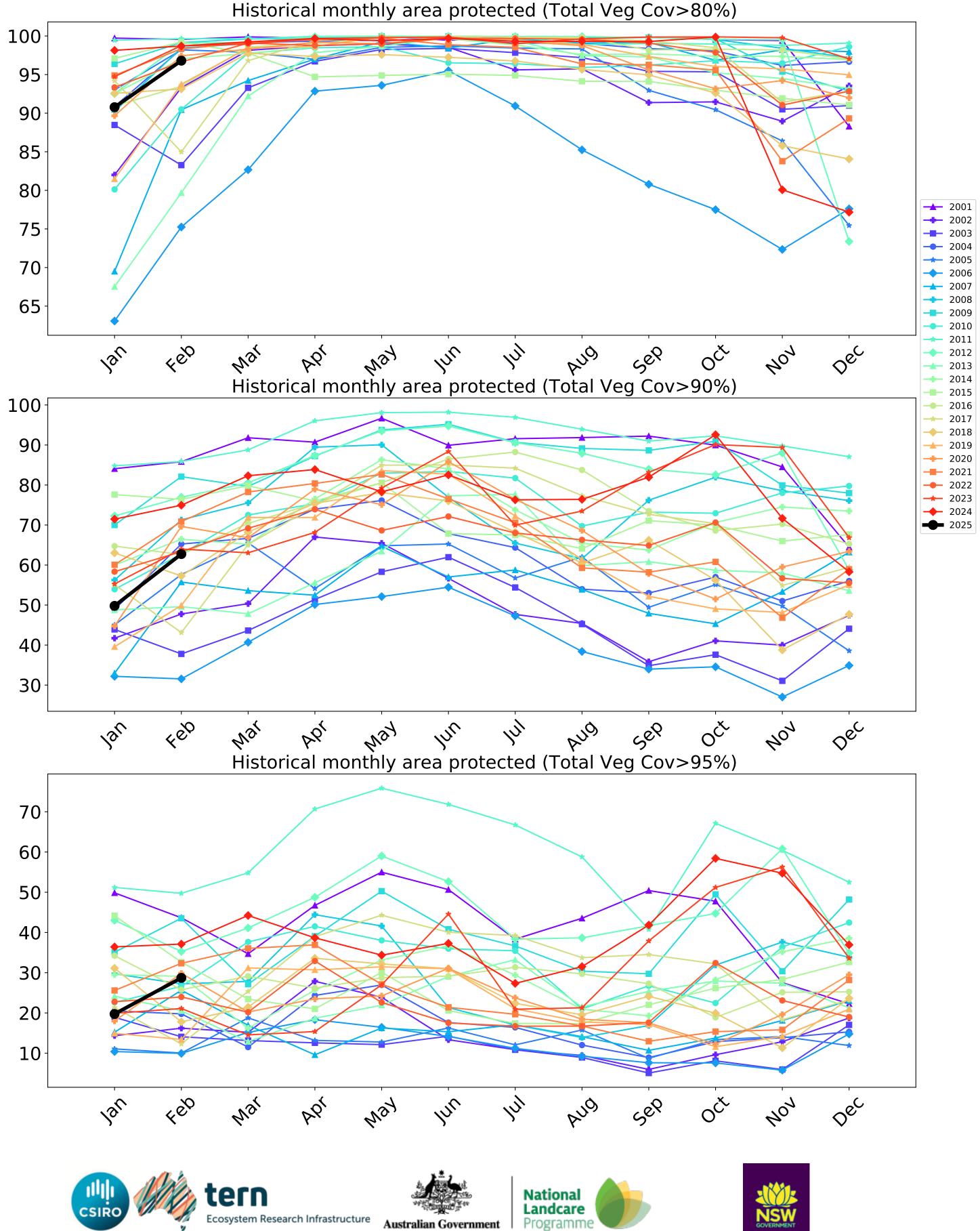
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





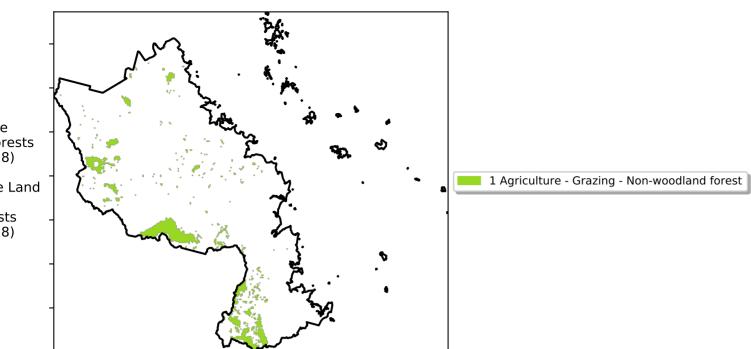
Water erosion historical monthly area protected (Total Veg Cov>70%)



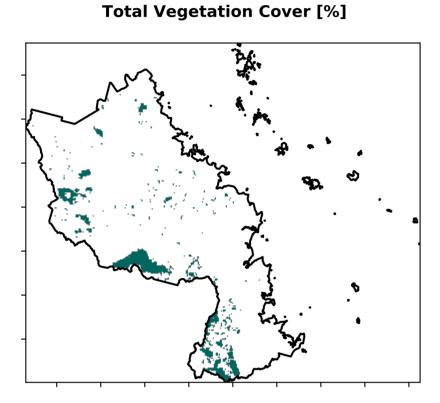




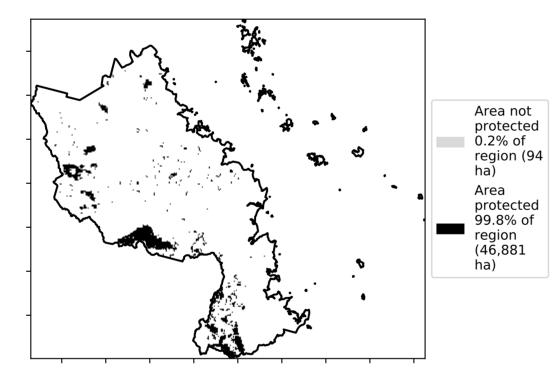
# Grazing - Forest (non woodland)

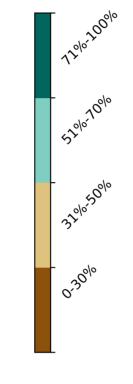


Land use and forest cover



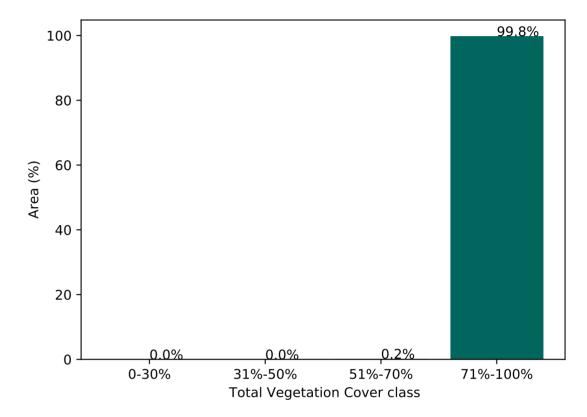
% Area protected from water erosion (>70%)



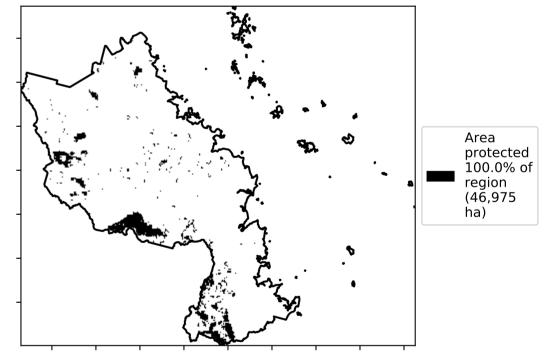




Proportion of vegetation cover class in area

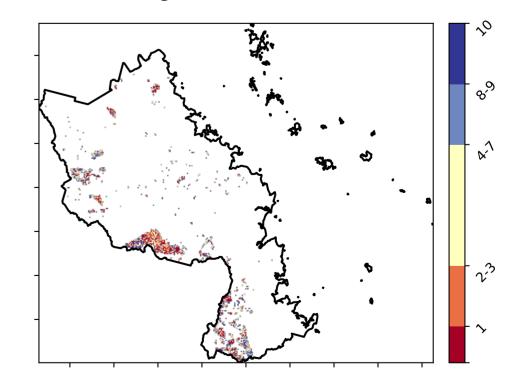


% Area protected from wind erosion (>50%)

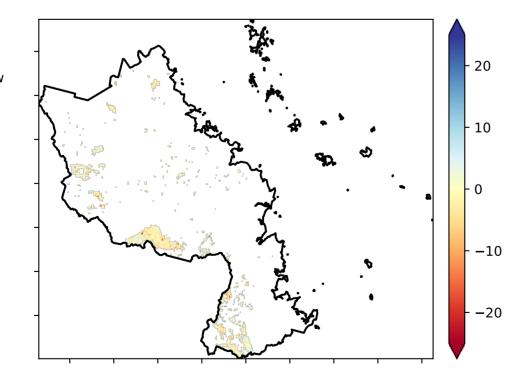


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

**Total Vegetation Cover Decile [%]** 



Total Vegetation Cover Anomaly [%]

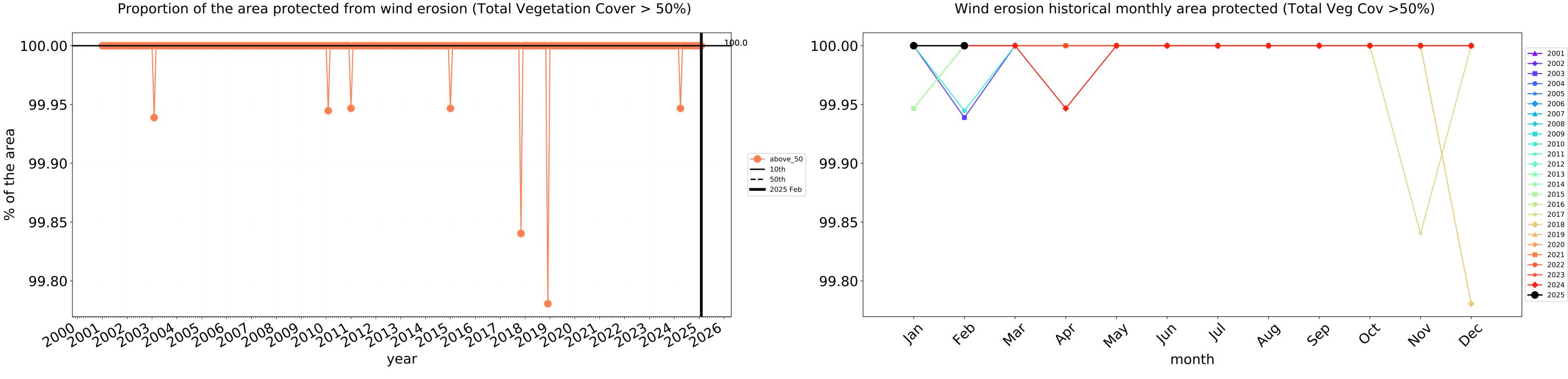


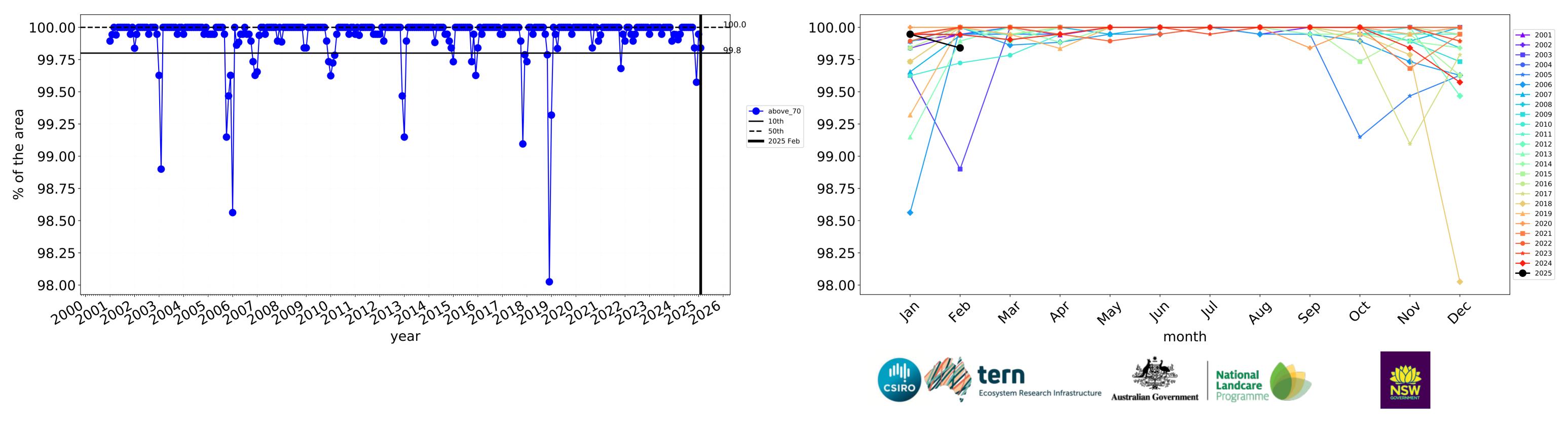
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



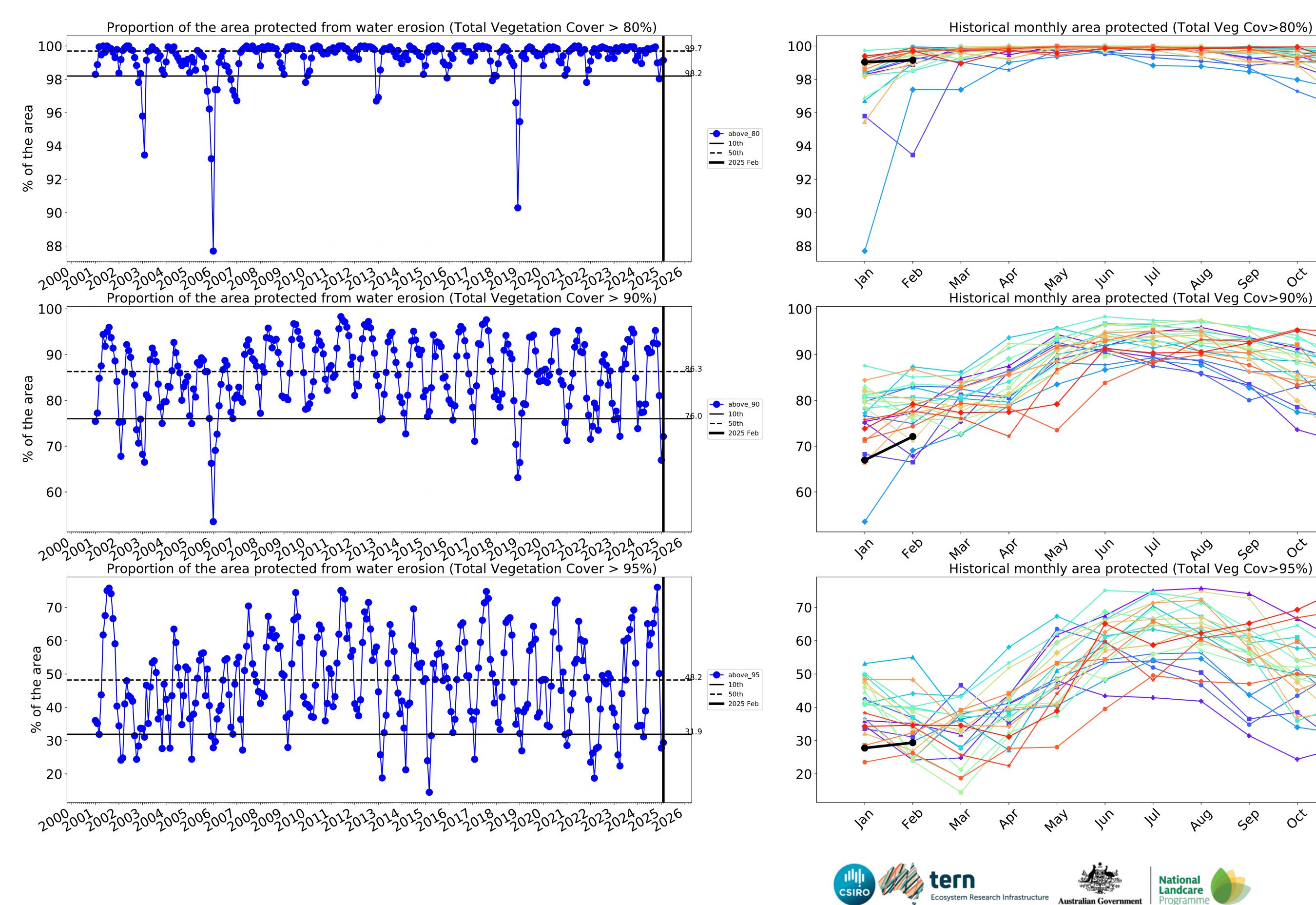


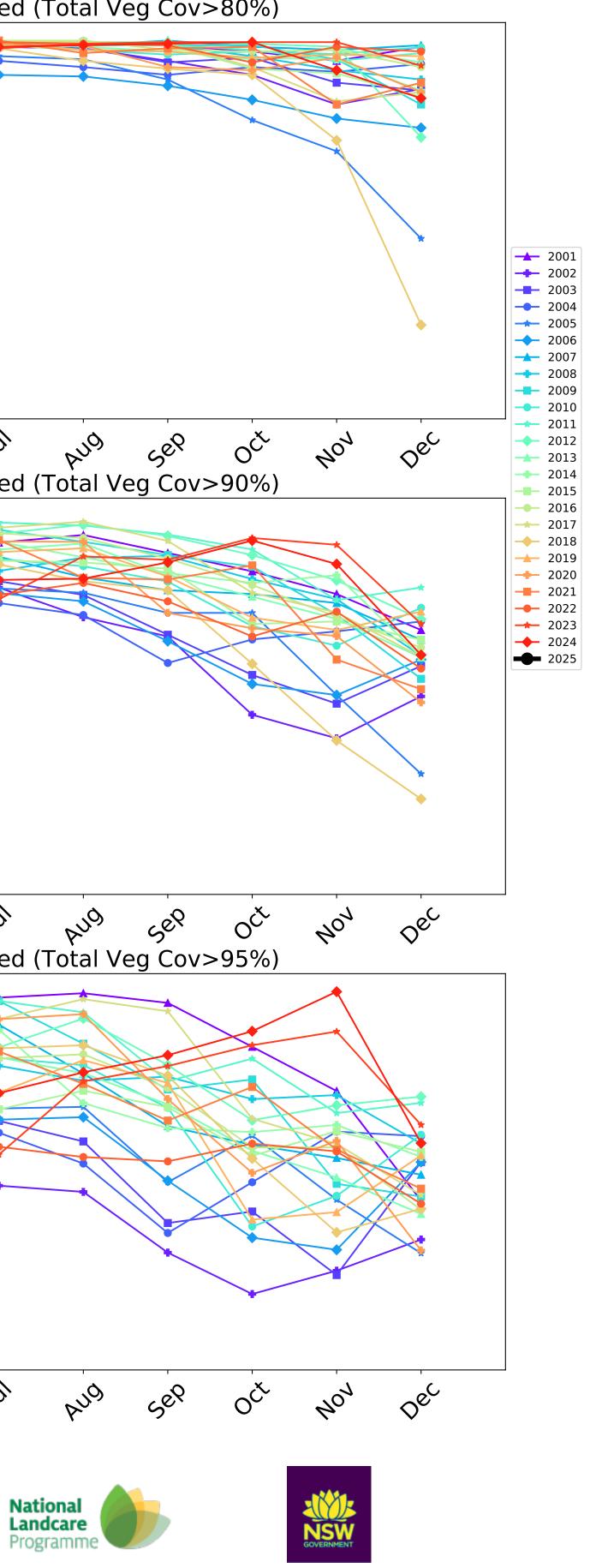
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





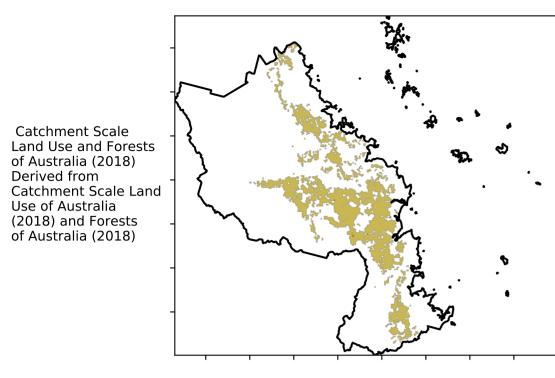
Water erosion historical monthly area protected (Total Veg Cov>70%)



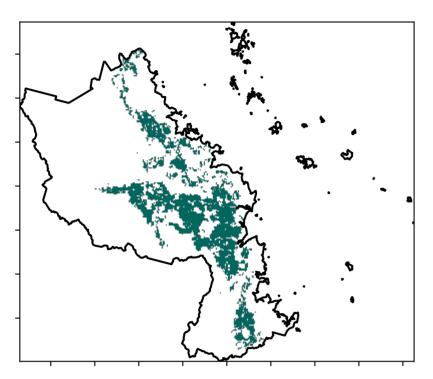


# Irrigation

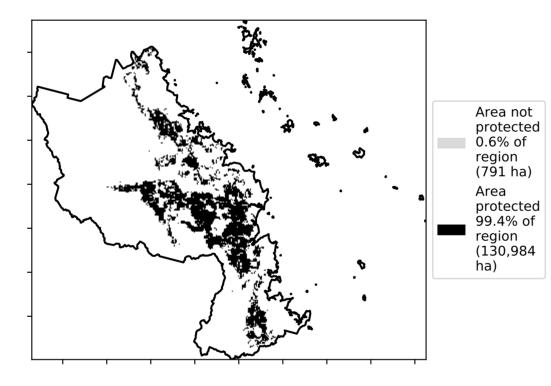
Land use and forest cover

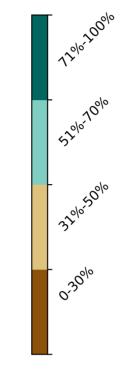


Total Vegetation Cover [%]

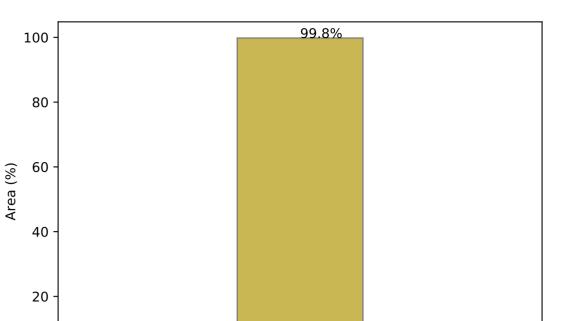


% Area protected from water erosion (>70%)





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



### Proportion of each land class in area

Proportion of vegetation cover class in area

1.0

Land use class

1.5

0.2%

2.0

2.5

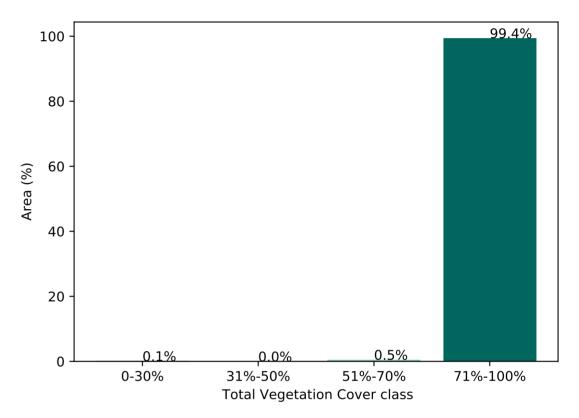
0.0%

0.5

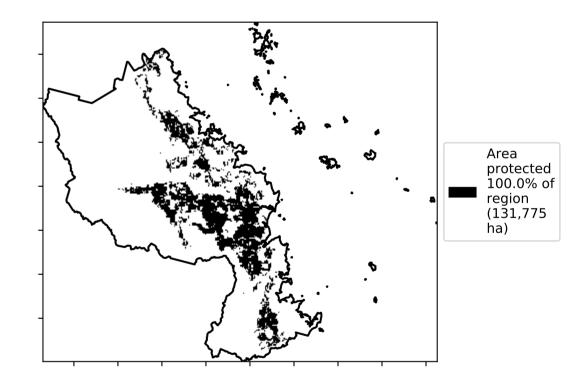
0.0

0

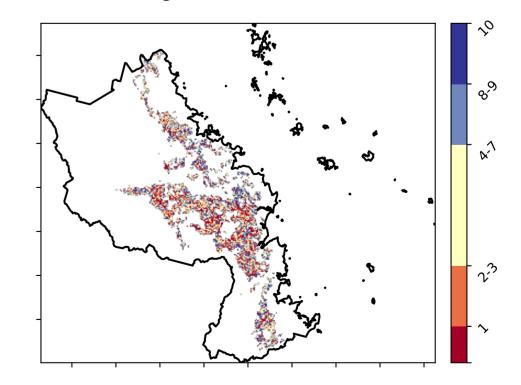
-0.5



### % Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 



Total Vegetation Cover Anomaly [%]

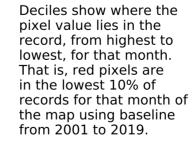
ቅያ - 20 Anomaly show how many percetage points each pixel is from the mean That - 10 0 -10 -20

the mean. That is, red pixels

are about 20% lower than the

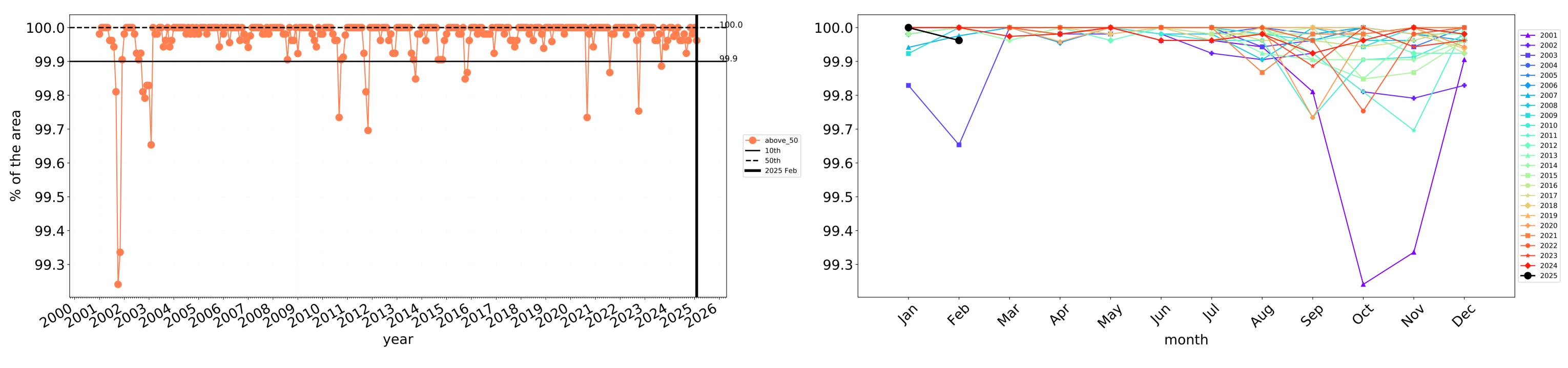
mean of that pixel. The mean is only for the month of the map

using baseline from 2001 to 2019.

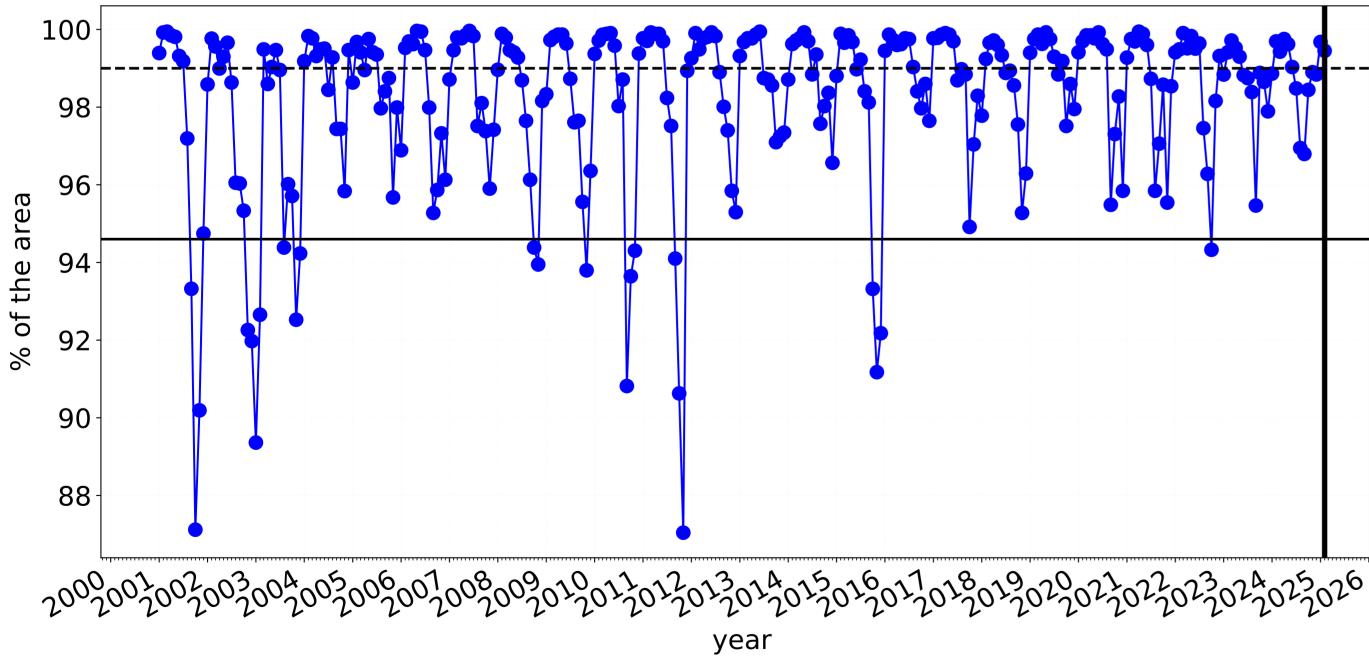


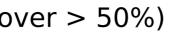




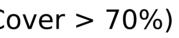


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





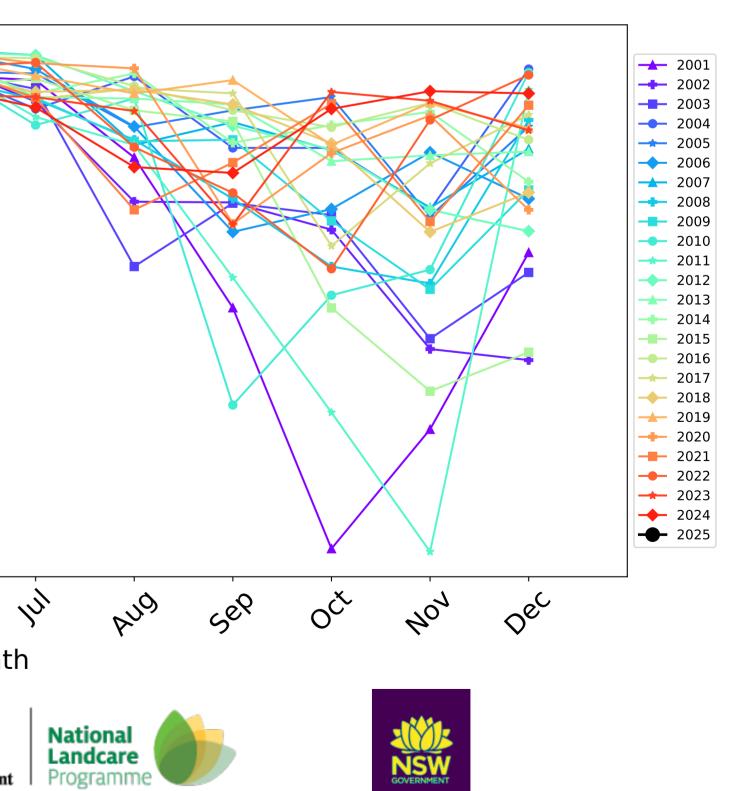
Wind erosion historical monthly area protected (Total Veg Cov >50%)

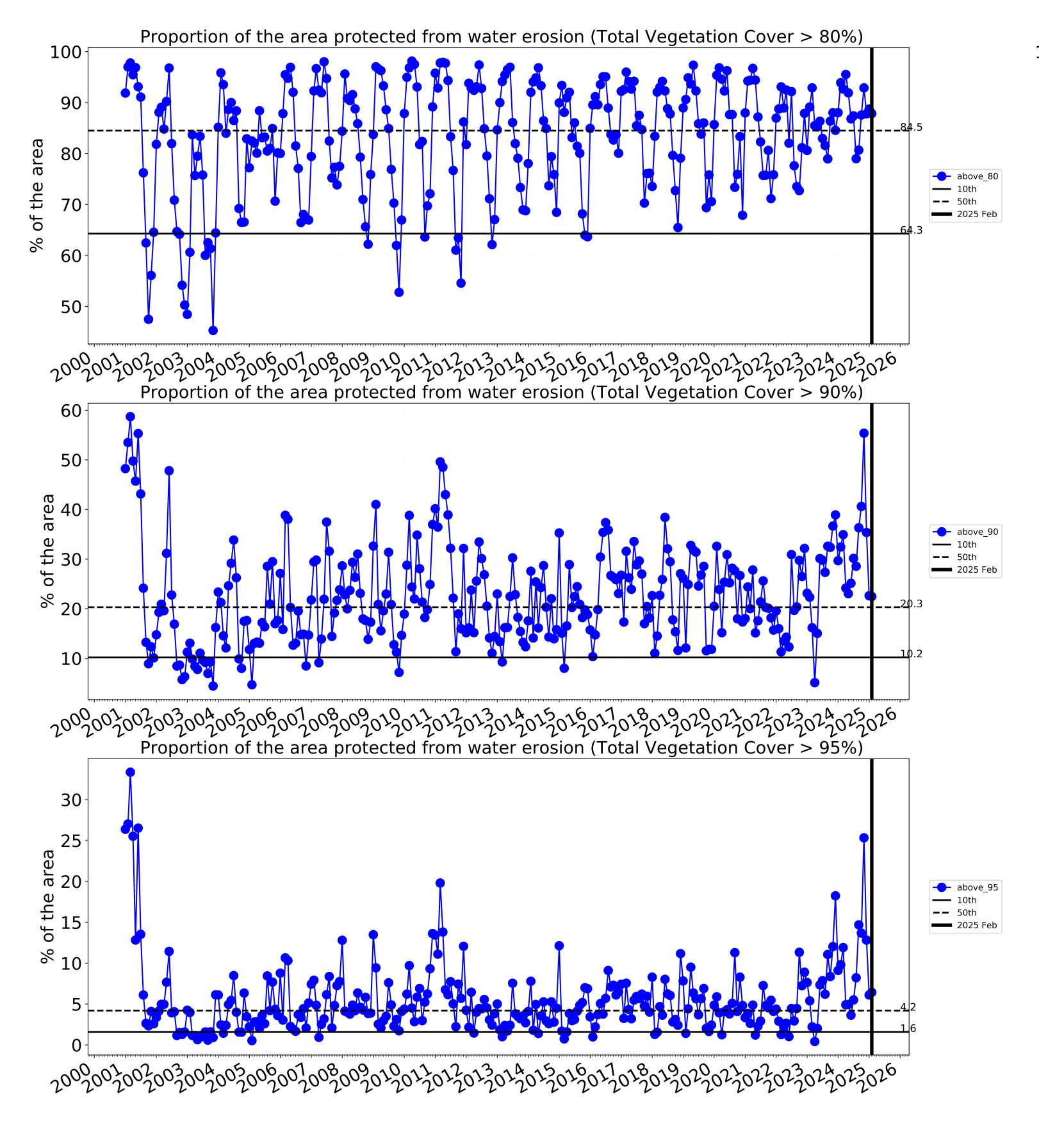


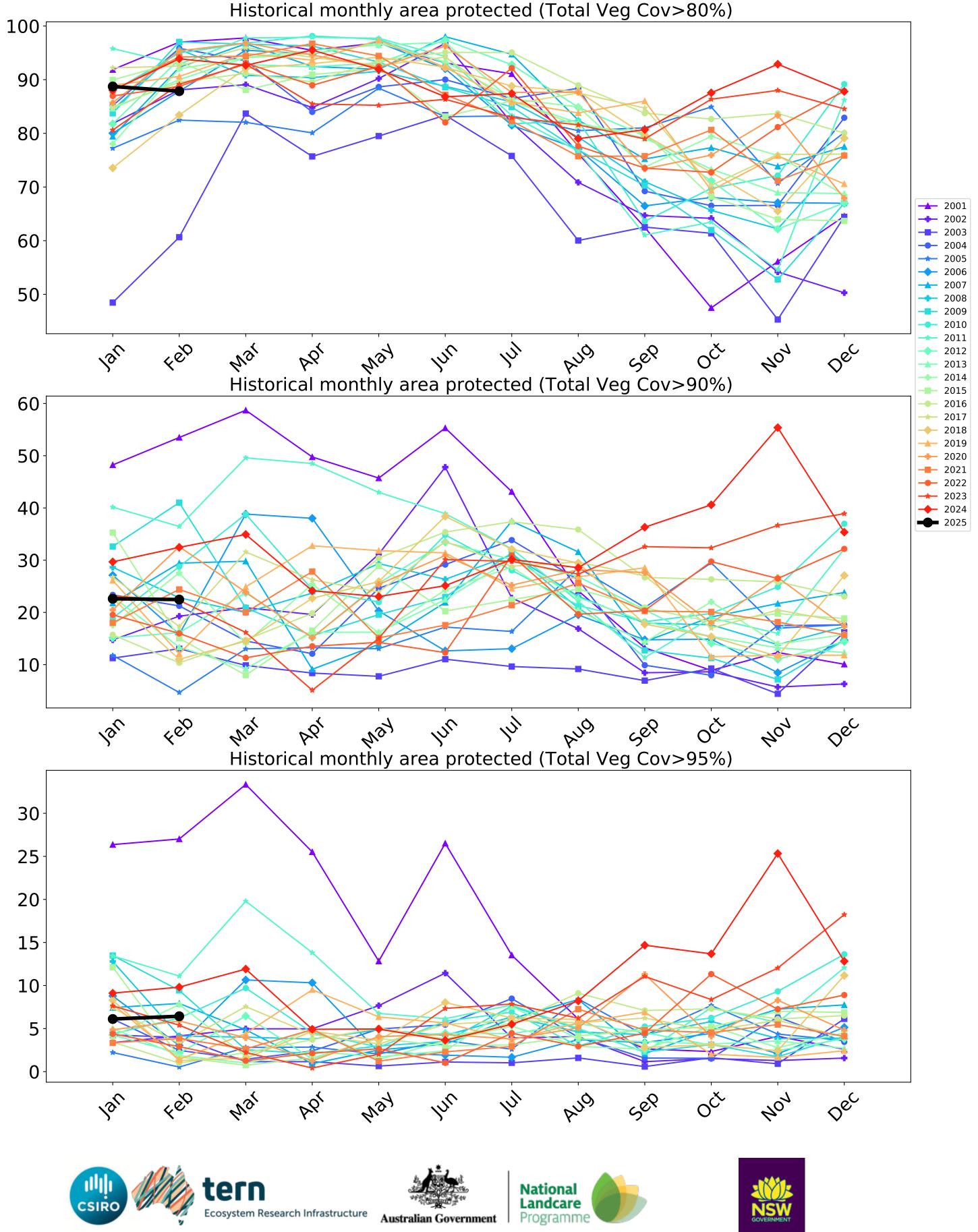
---- above\_70 **—** 10th **——** 50th 2025 Feb

100 98 96-94 92 90 88 4eb lan In way Mai PQ1 month tern Ecosystem Research Infrastructure Australian Government

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





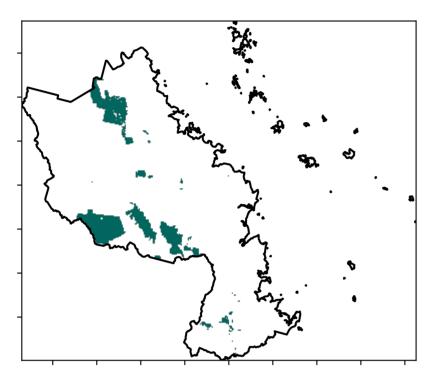


# **Production native forests and plantation forests**

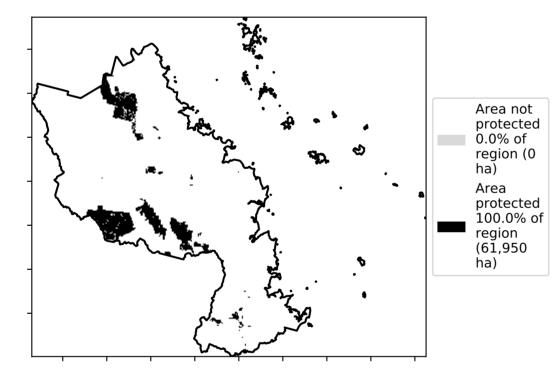
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

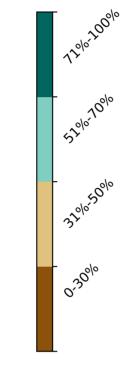
Land use and forest cover

**Total Vegetation Cover [%]** 



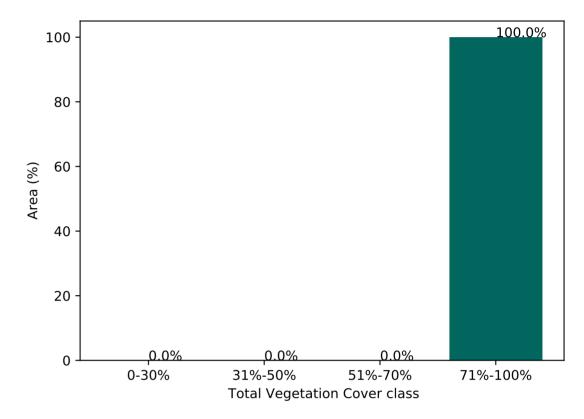
% Area protected from water erosion (>70%)



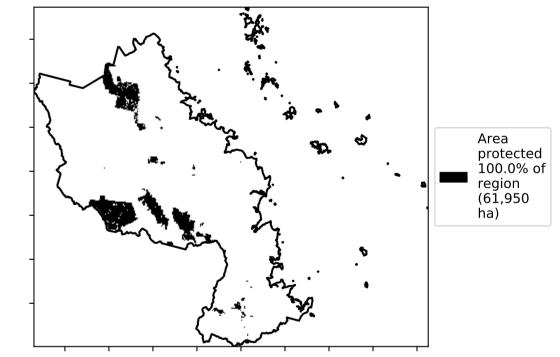




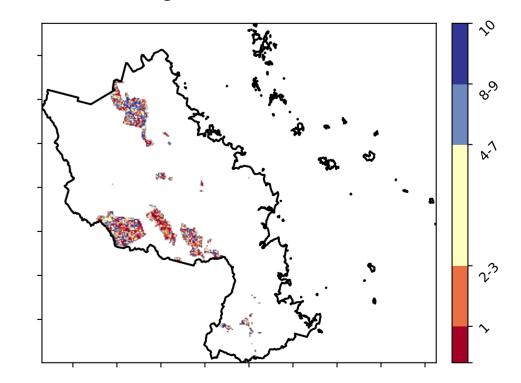
Proportion of vegetation cover class in area



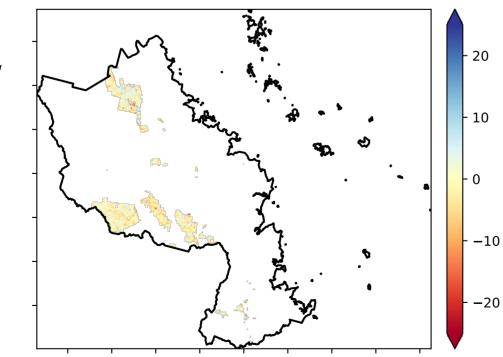
% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 



Total Vegetation Cover Anomaly [%]



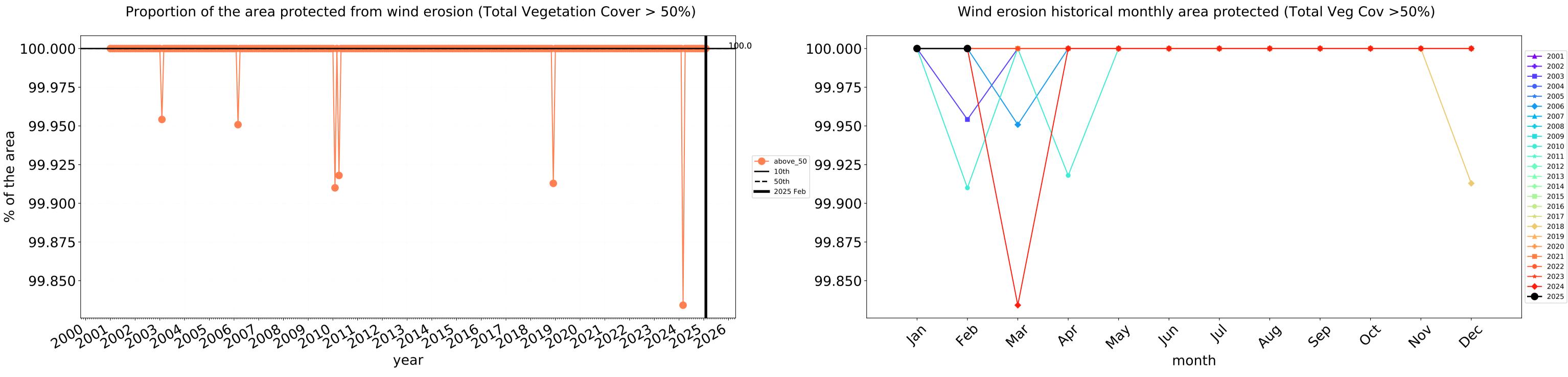
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

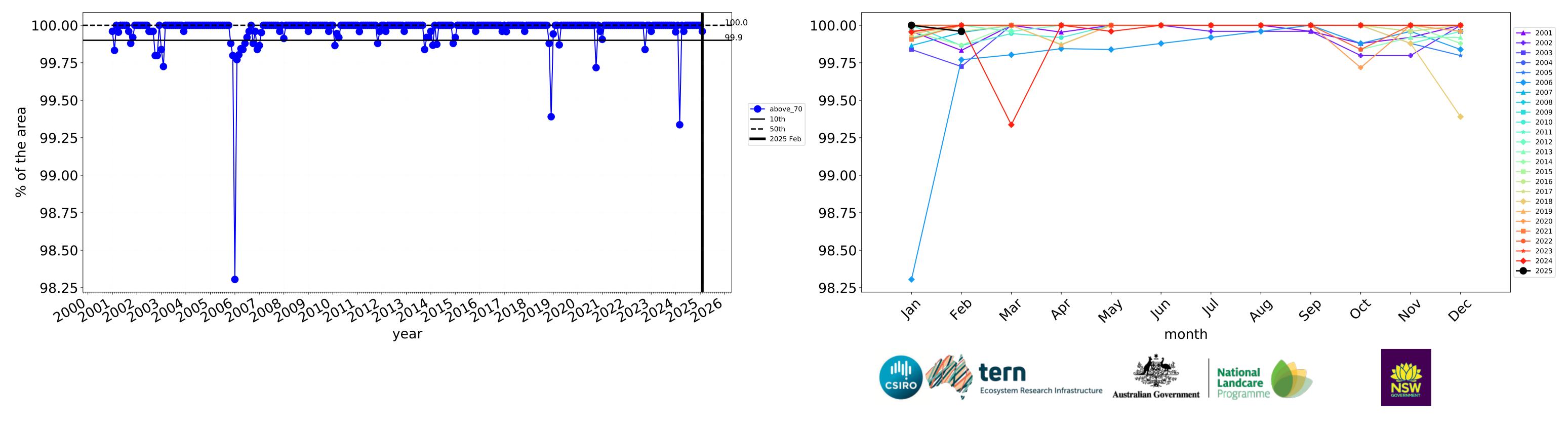


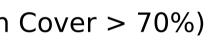


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

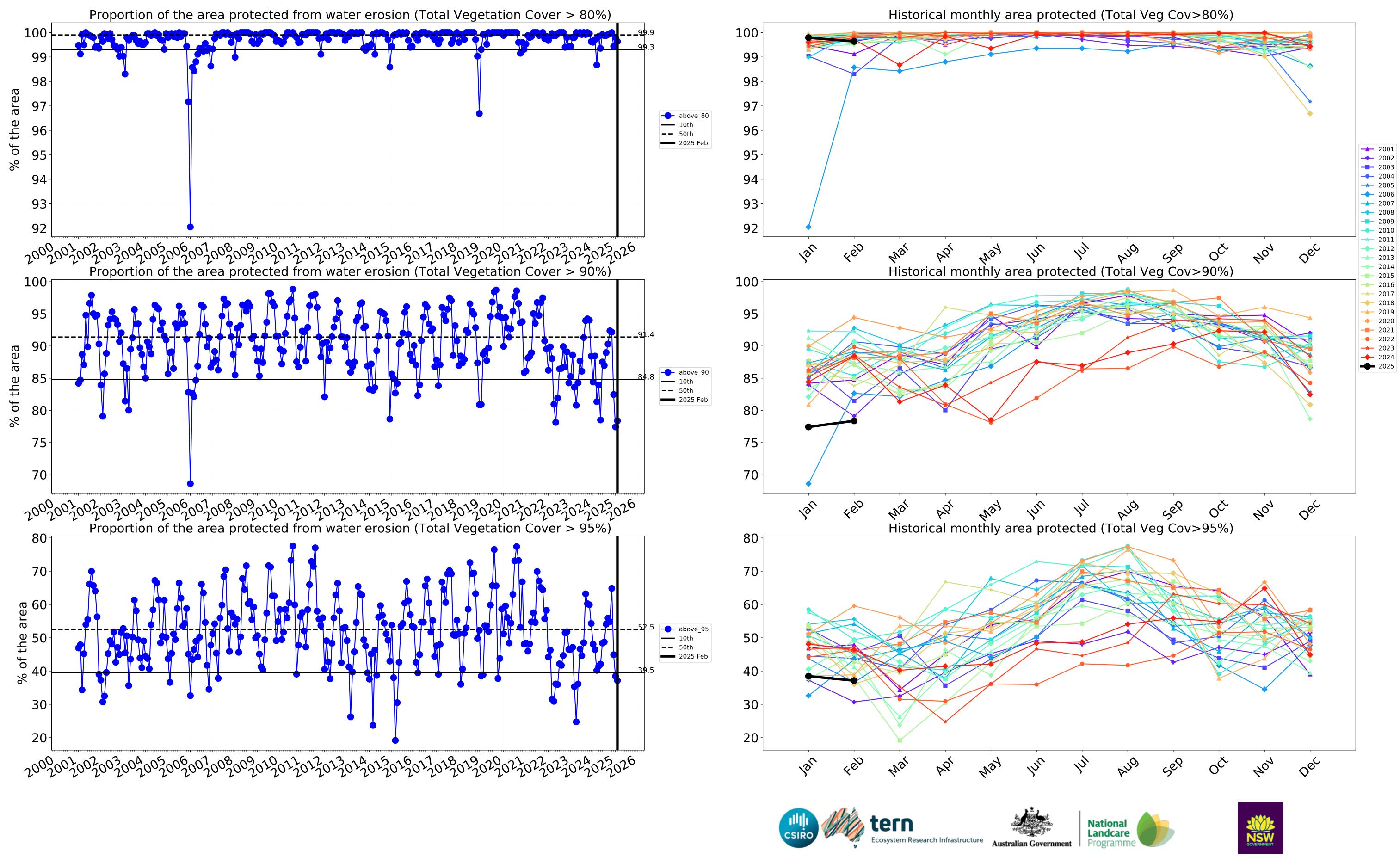


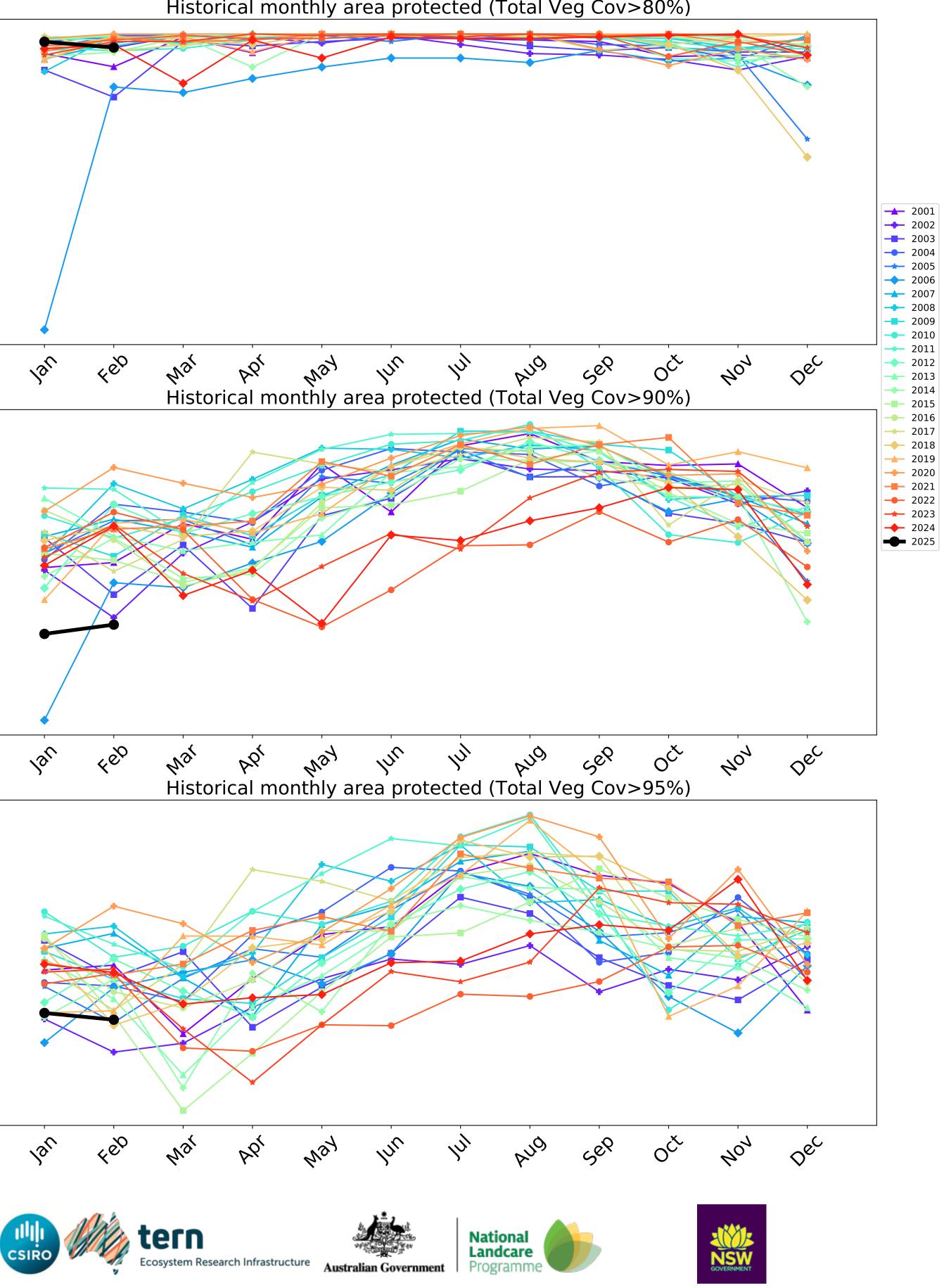






Water erosion historical monthly area protected (Total Veg Cov>70%)





# Mackay\_(R) (740,850 ha and no data 20,461 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

| Land use and<br>forest cover<br>Class  | area(ha) | above_30          | above_50          | above_70         | above_80         | above_90         | above_95         |
|--|----------|-------------------|-------------------|------------------|------------------|------------------|------------------|
| Entire region  | 740,850  | 99.9%<br>740,450  | 99.7%<br>738,925  | 98.6%<br>730,325 | 93.4%<br>692,250 | 55.6%<br>412,275 | 24.8%<br>183,400 |
| Conservation and<br>natural<br>environments  | 188,650  | 99.9%<br>188,500  | 99.8%<br>188,300  | 99.1%<br>187,025 | 97.1%<br>183,125 | 74.1%<br>139,850 | 36.0%<br>67,925  |
| Conservation and<br>natural<br>environments non<br>forest                          | 4,450    | 98.9%<br>4,400    | 98.3%<br>4,375    | 91.6%<br>4,075   | 81.5%<br>3,625   | 51.7%<br>2,300   | 36.0%<br>1,600   |
| Conservation and<br>natural<br>environments<br>Woodland forest<br>Conservation and | 36,425   | 100.0%<br>36,425  | 99.9%<br>36,400   | 99.3%<br>36,175  | 96.6%<br>35,175  | 70.5%<br>25,675  | 35.8%<br>13,025  |
| natural<br>environments<br>Forest (non<br>woodland)                                | 147,775  | 99.9%<br>147,675  | 99.8%<br>147,525  | 99.3%<br>146,775 | 97.7%<br>144,325 | 75.7%<br>111,875 | 36.1%<br>53,300  |
| Agriculture  | 427,300  | 100.0%<br>427,300 | 99.9%<br>426,950  | 99.6%<br>425,500 | 93.8%<br>400,750 | 46.9%<br>200,375 | 18.8%<br>80,150  |
| Grazing  | 294,925  | 100.0%<br>294,925 | 99.9%<br>294,625  | 99.6%<br>293,850 | 96.4%<br>284,375 | 57.8%<br>170,375 | 24.3%<br>71,525  |
| Grazing non<br>forest  | 139,300  | 100.0%<br>139,300 | 99.8%<br>139,000  | 99.4%<br>138,425 | 95.2%<br>132,625 | 49.0%<br>68,325  | 19.0%<br>26,525  |
| Grazing Woodland<br>forest   | 108,650  | 100.0%<br>108,650 | 100.0%<br>108,650 | 99.9%<br>108,525 | 96.8%<br>105,175 | 62.7%<br>68,175  | 28.7%<br>31,200  |
| Grazing - Forest<br>(non woodland)   | 46,975   | 100.0%<br>46,975  | 100.0%<br>46,975  | 99.8%<br>46,900  | 99.1%<br>46,575  | 72.1%<br>33,875  | 29.4%<br>13,800  |
| Irrigation   | 131,775  | 100.0%<br>131,775 | 100.0%<br>131,725 | 99.4%<br>131,050 | 87.9%<br>115,775 | 22.5%<br>29,600  | 6.4%<br>8,475    |
| Production native<br>forests and<br>plantation<br>forests                          | 61,950   | 100.0%<br>61,950  | 100.0%<br>61,950  | 100.0%<br>61,925 | 99.6%<br>61,725  | 78.4%<br>48,550  | 37.1%<br>23,000  |

