# Total vegetation cover soil protection Region:LGA Logan\_(C) QLD

# Date: March 2021

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:

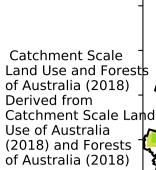
https://doi.org/10.4225/08/5848a3f19a7b3

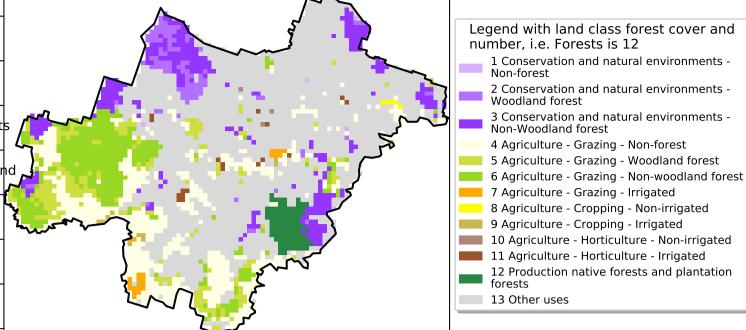


# **Vegetation Cover Mar 2021**

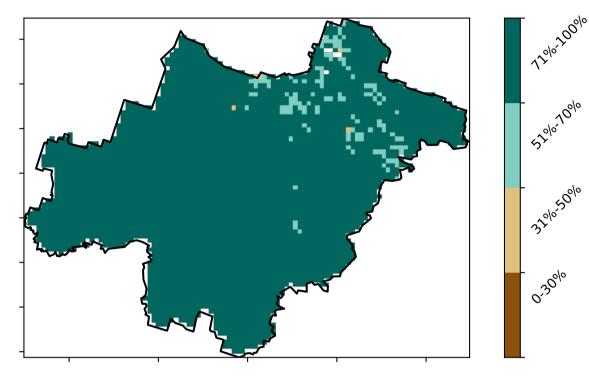
#### Land use and forest cover

#### Proportion of each land class in area

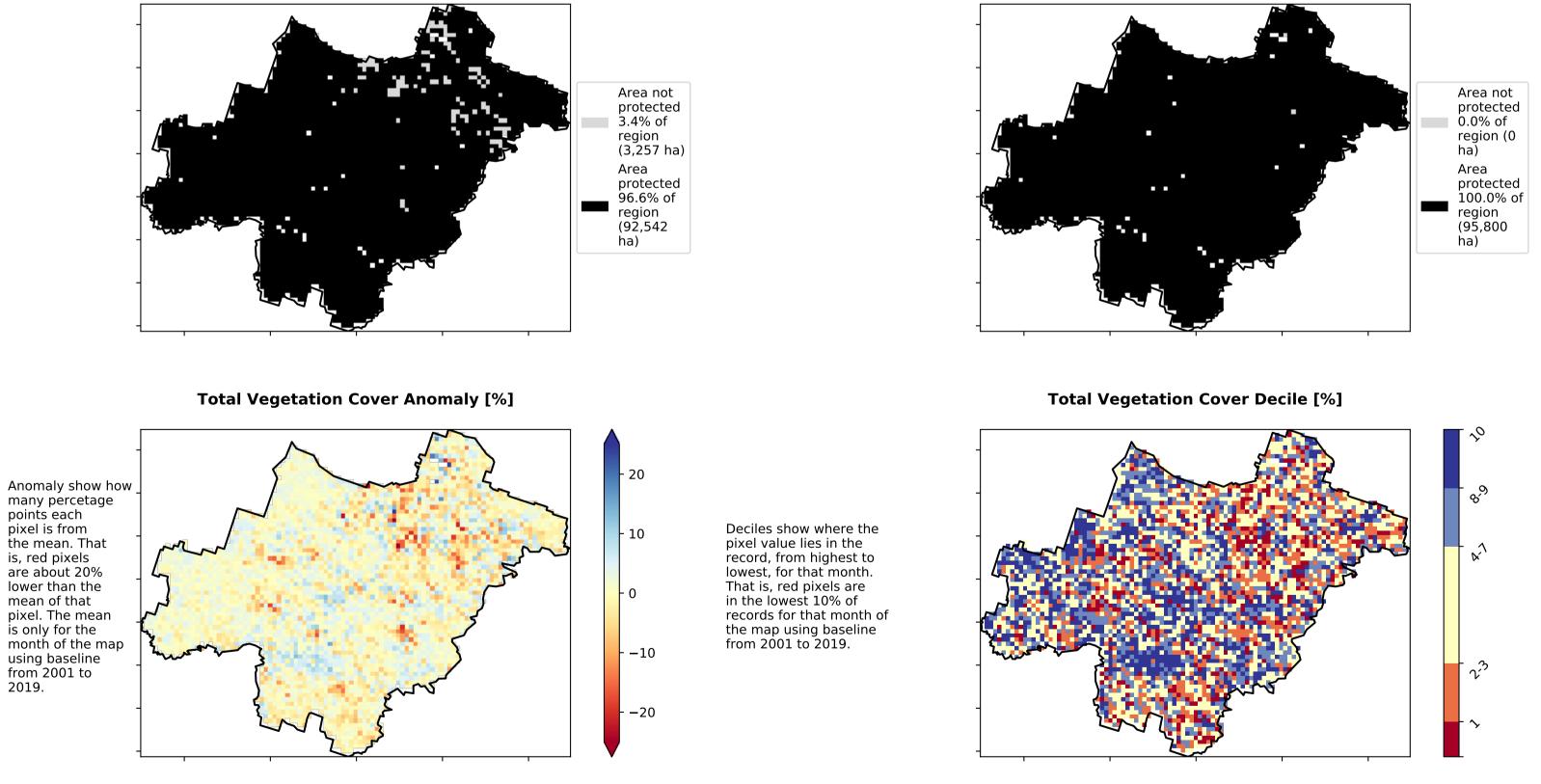


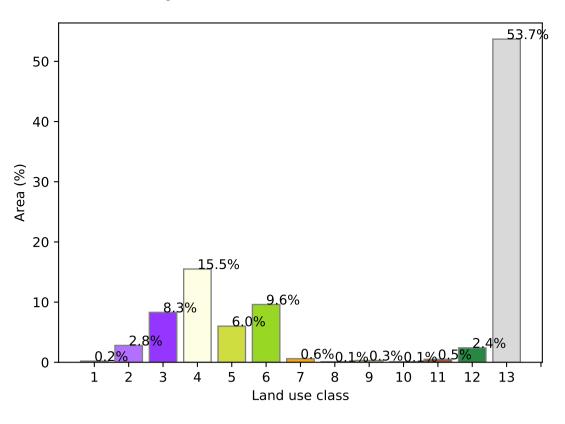


### **Total Vegetation Cover [%]**

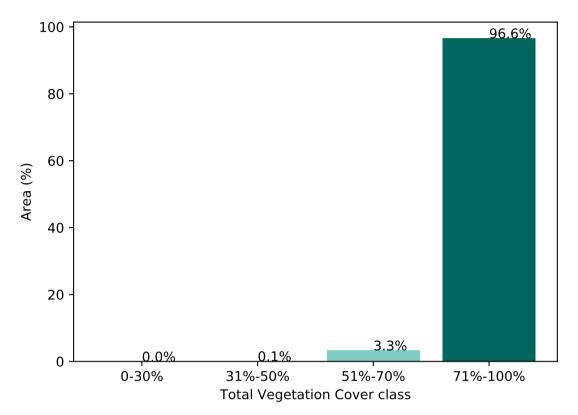


### % Area protected from water erosion (>70%)

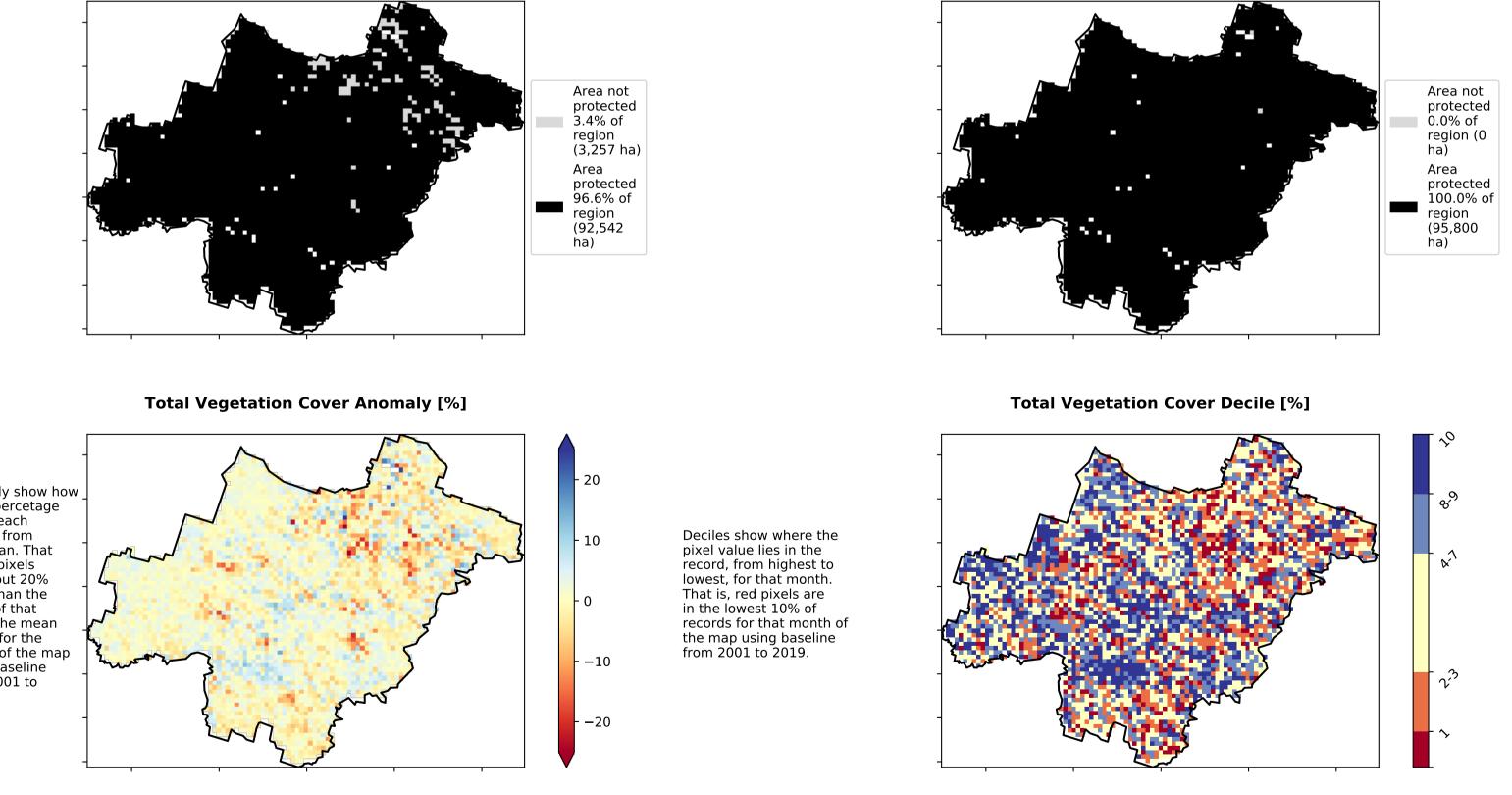




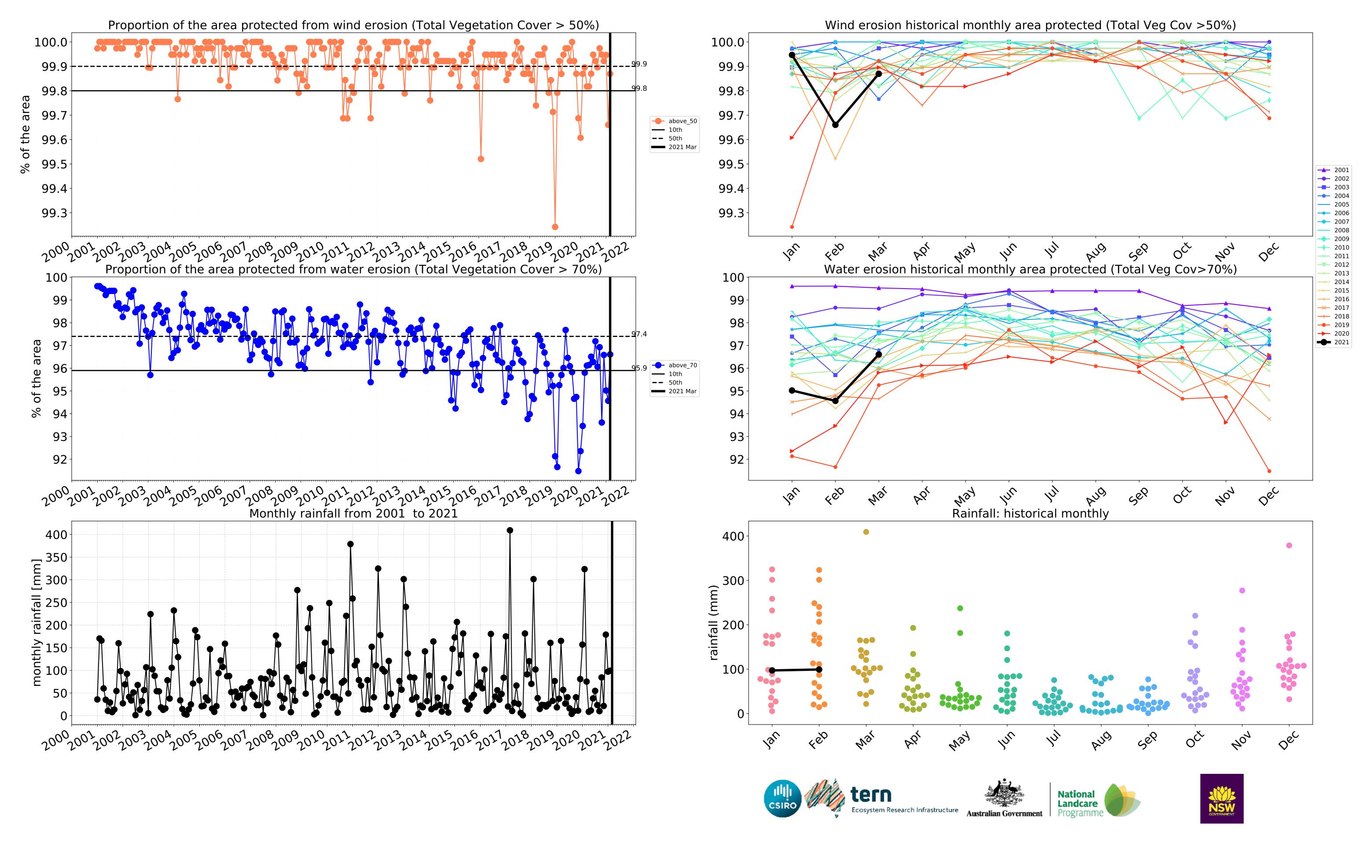
#### **Proportion of vegetation cover class in area**

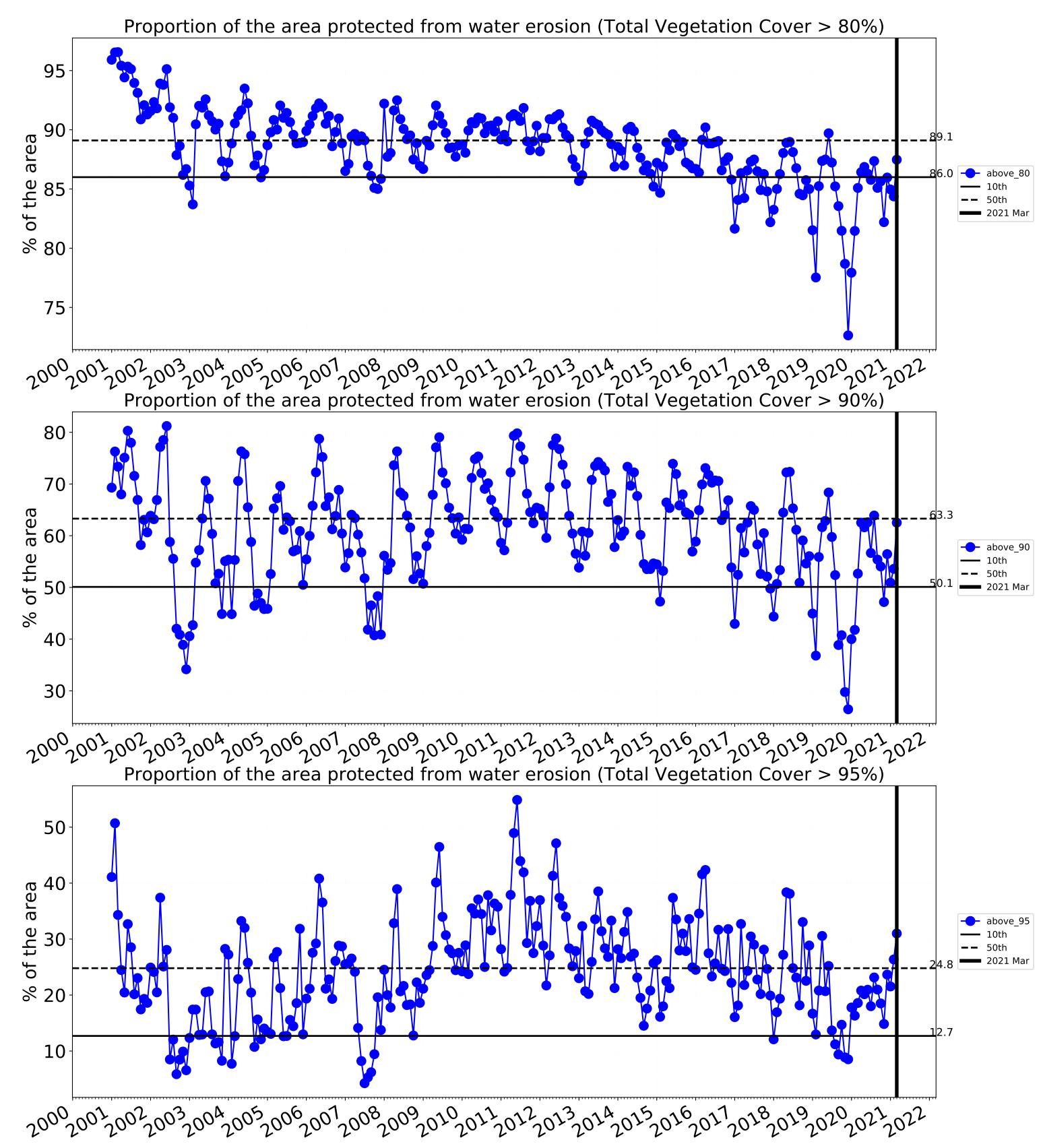


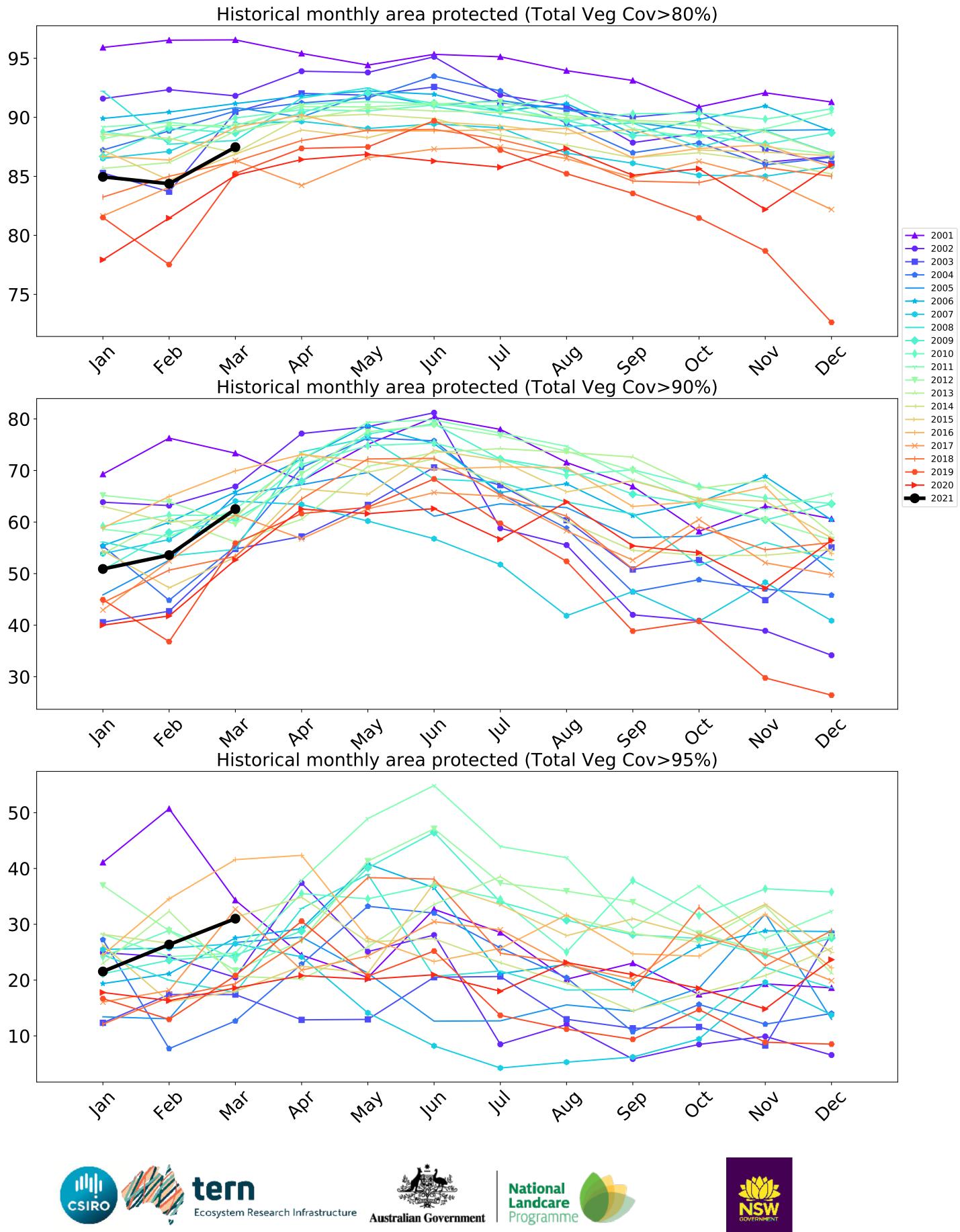
#### % Area protected from wind erosion (>50%)





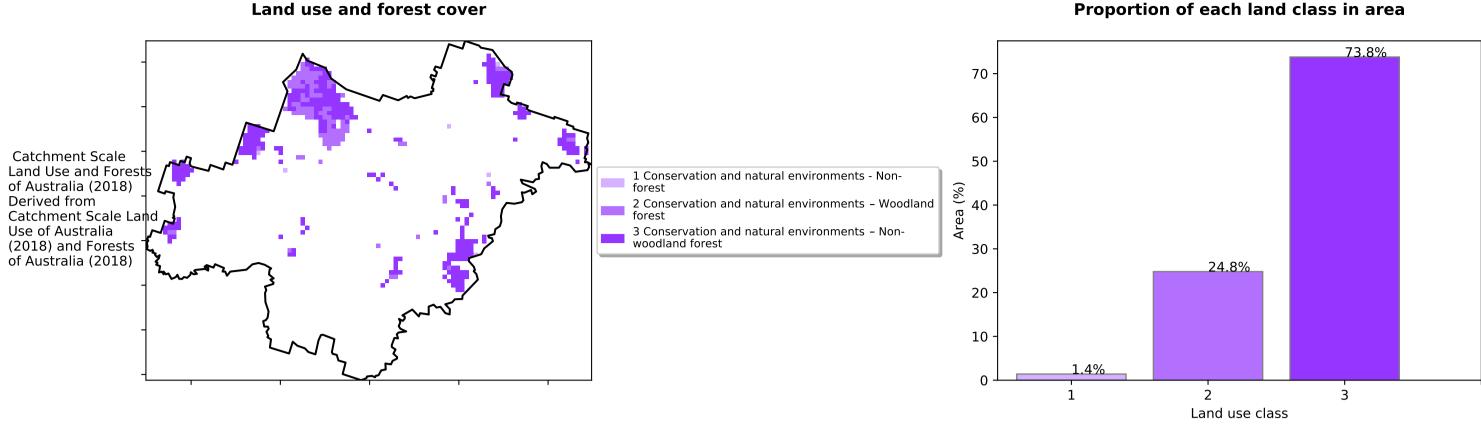








### **Conservation and natural environments**



12% 200%

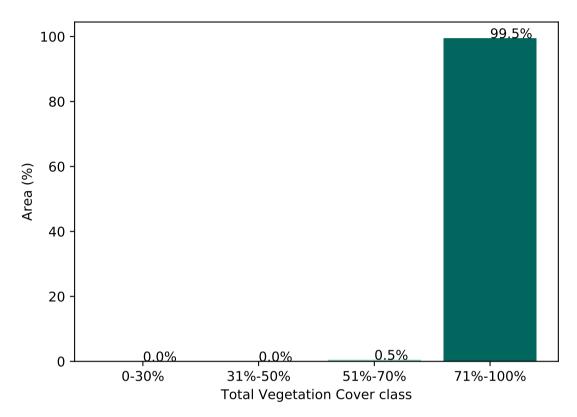
52°10'70°10

32%50%

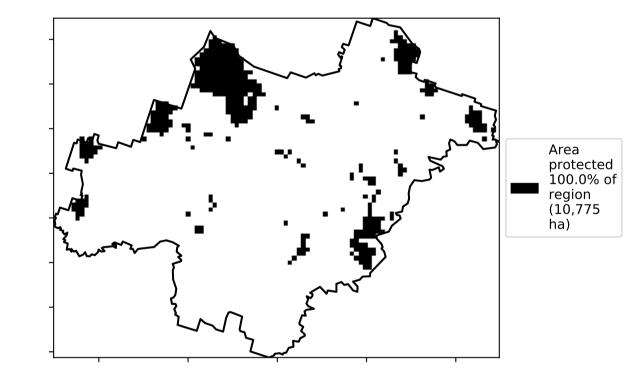
0.30%

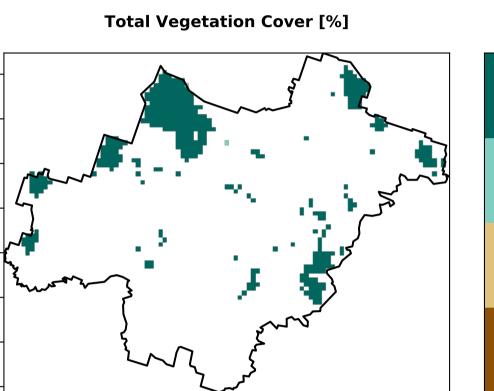
Proportion of each land class in area

Proportion of vegetation cover class in area

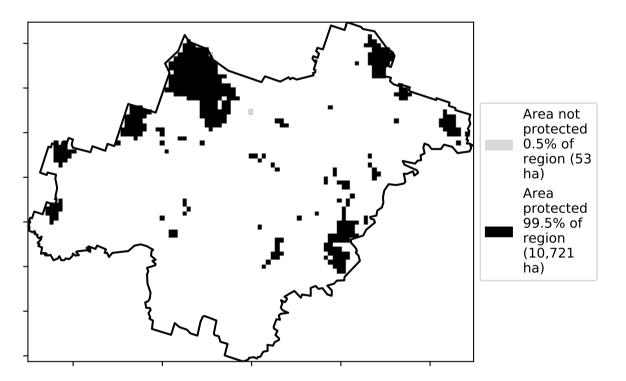


% Area protected from wind erosion (>50%)

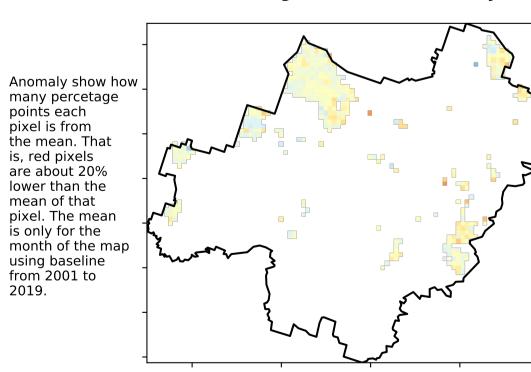




% Area protected from water erosion (>70%)



**Total Vegetation Cover Anomaly [%]** 

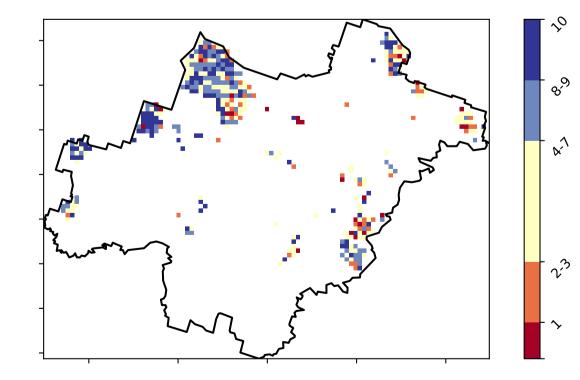


- 10 0 -10

-20

- 20

**Total Vegetation Cover Decile [%]** 



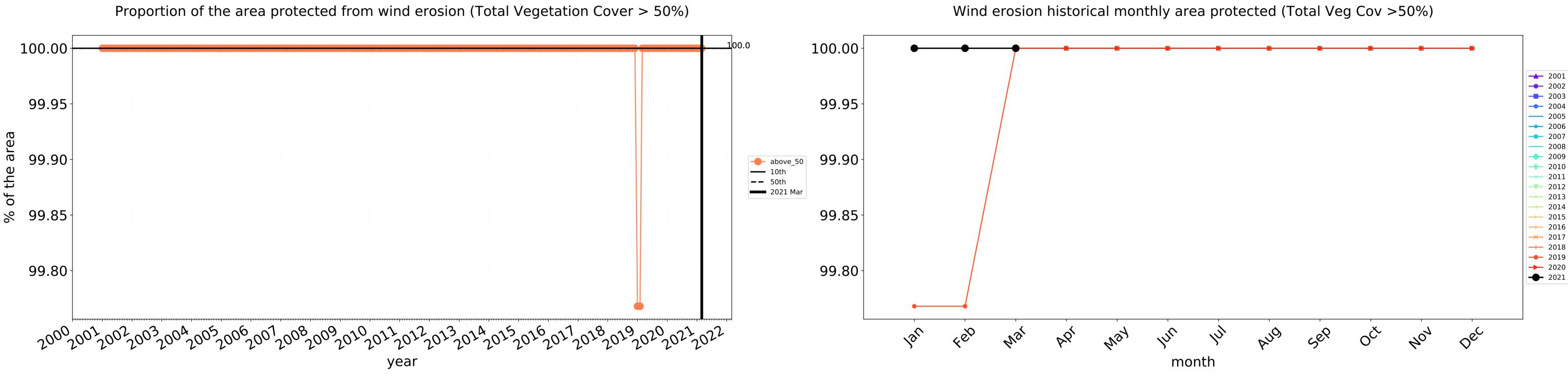


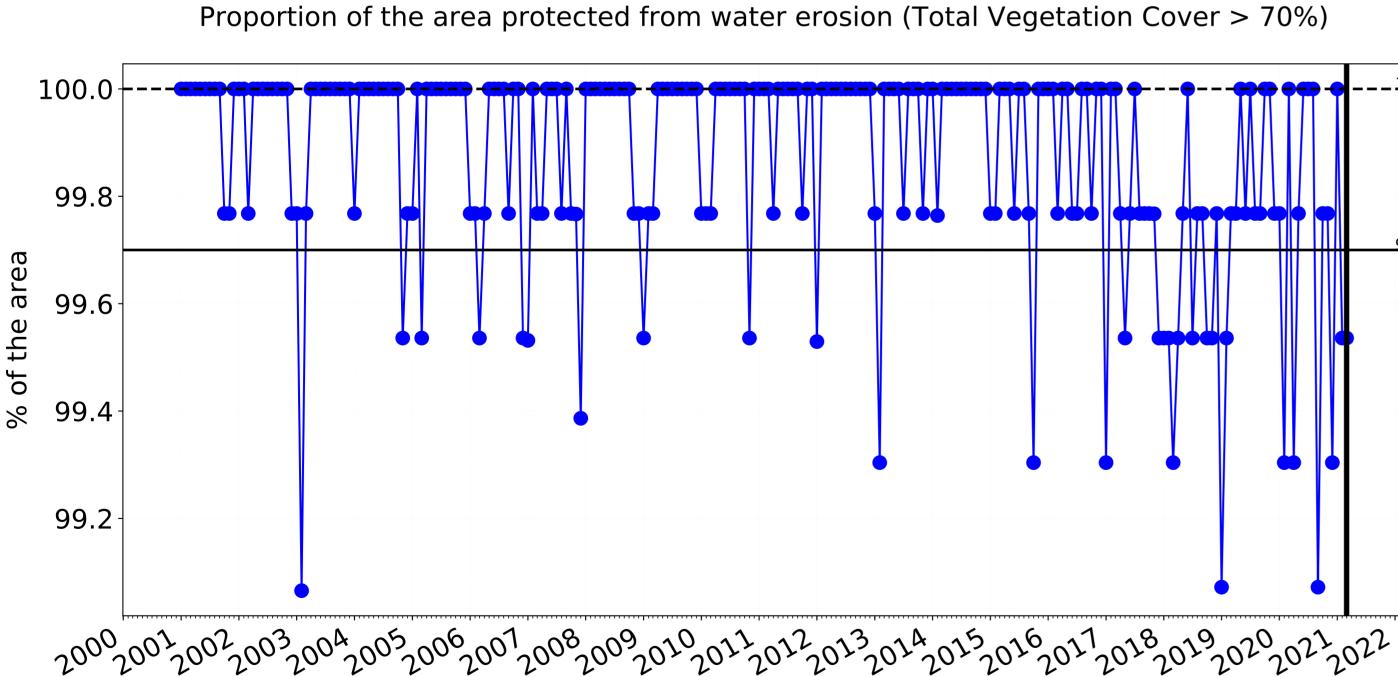
Deciles show where the pixel value lies in the

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.

3



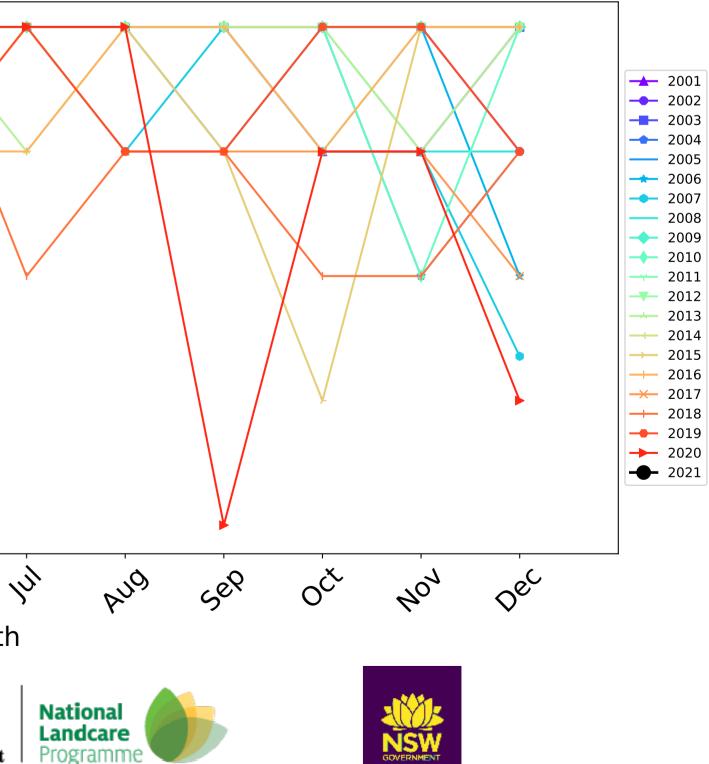


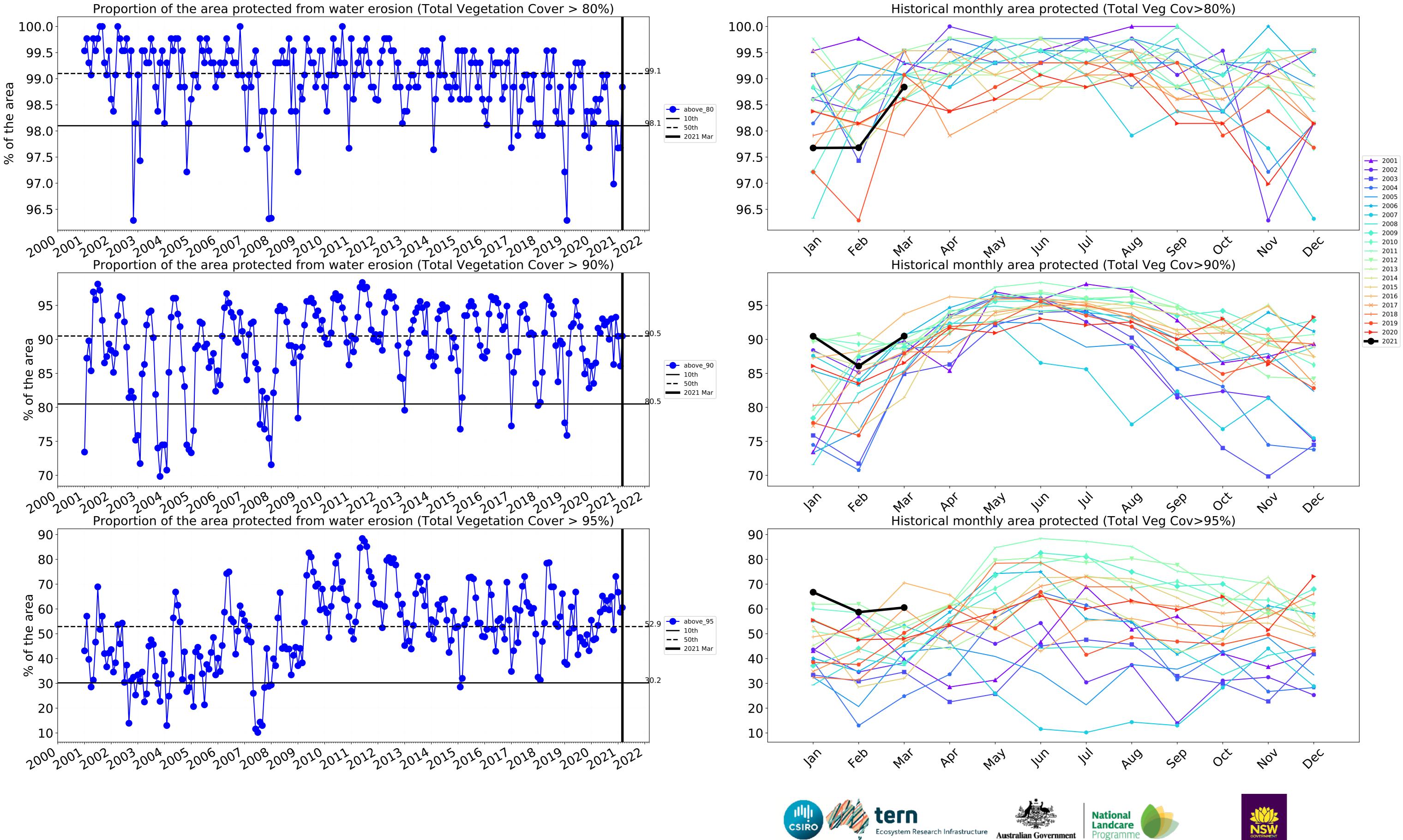
year

# **Conservation and natural environments timeseries**

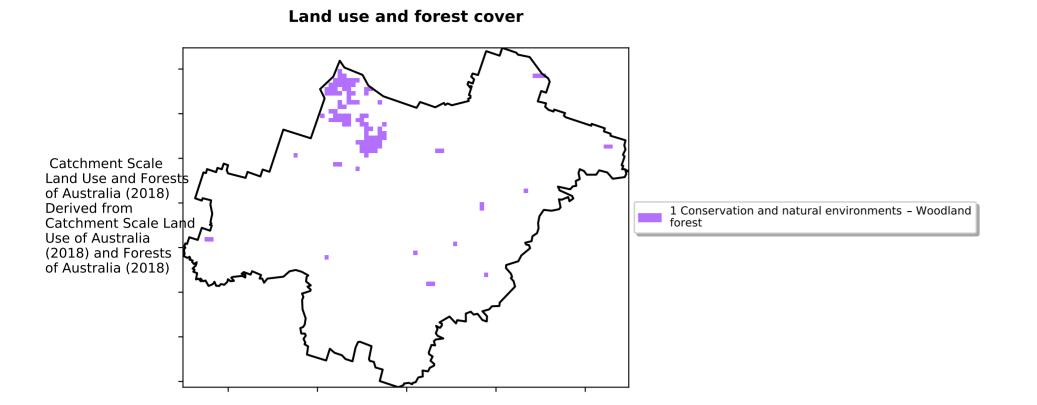
100.0-\_100.0 99.8 ---- above\_70 **—** 10th **--** 50th 99.6 **——** 2021 Mar 99.4 99.2 feb lar In May War PQ month tern Ecosystem Research Infrastructure Australian Government

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

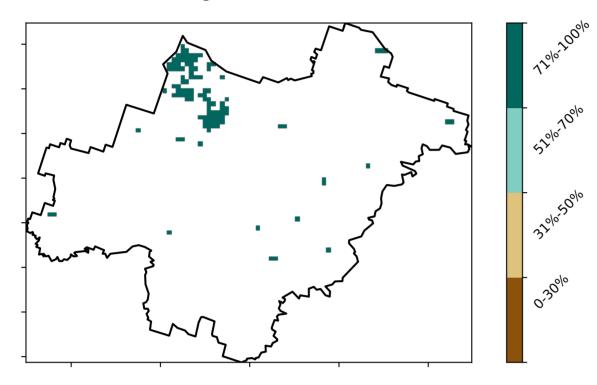




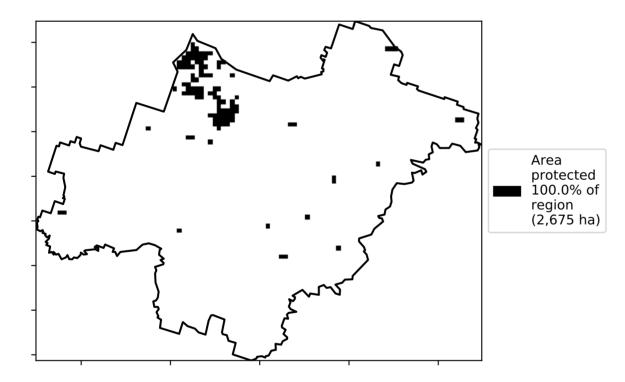
### **Conservation and natural environments Woodland forest**



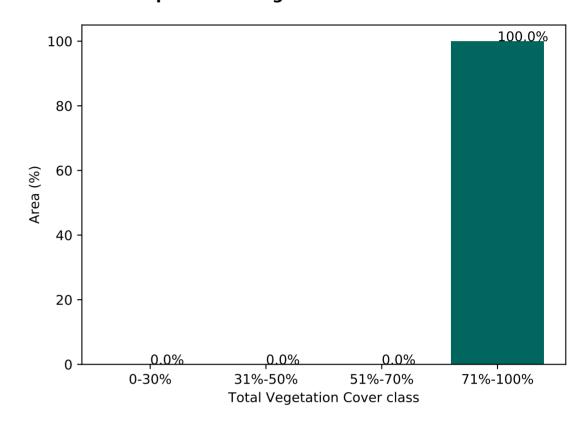
Total Vegetation Cover [%]



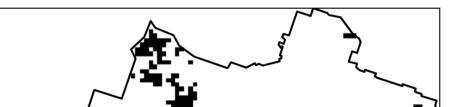
% Area protected from water erosion (>70%)



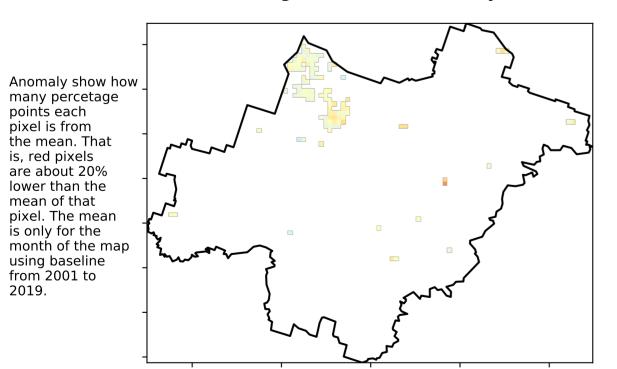
Proportion of vegetation cover class in area



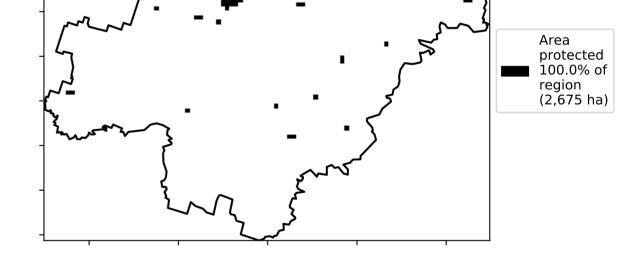
% Area protected from wind erosion (>50%)



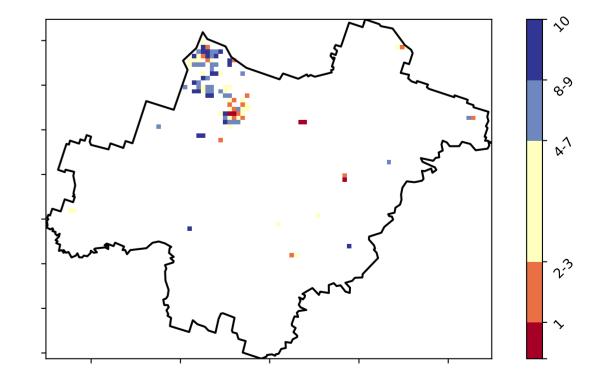
Total Vegetation Cover Anomaly [%]



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 [%]





- 20

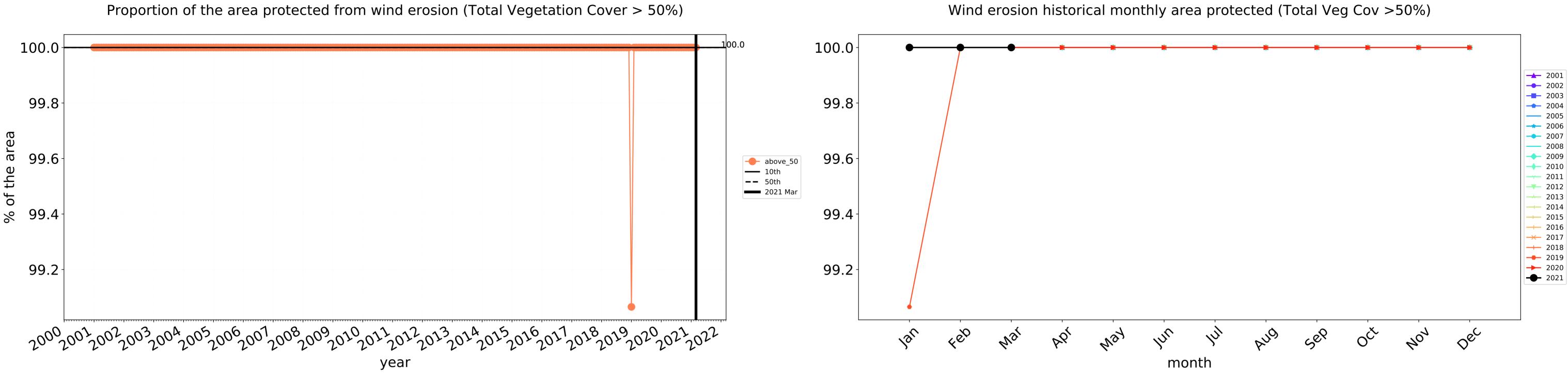
- 10

0

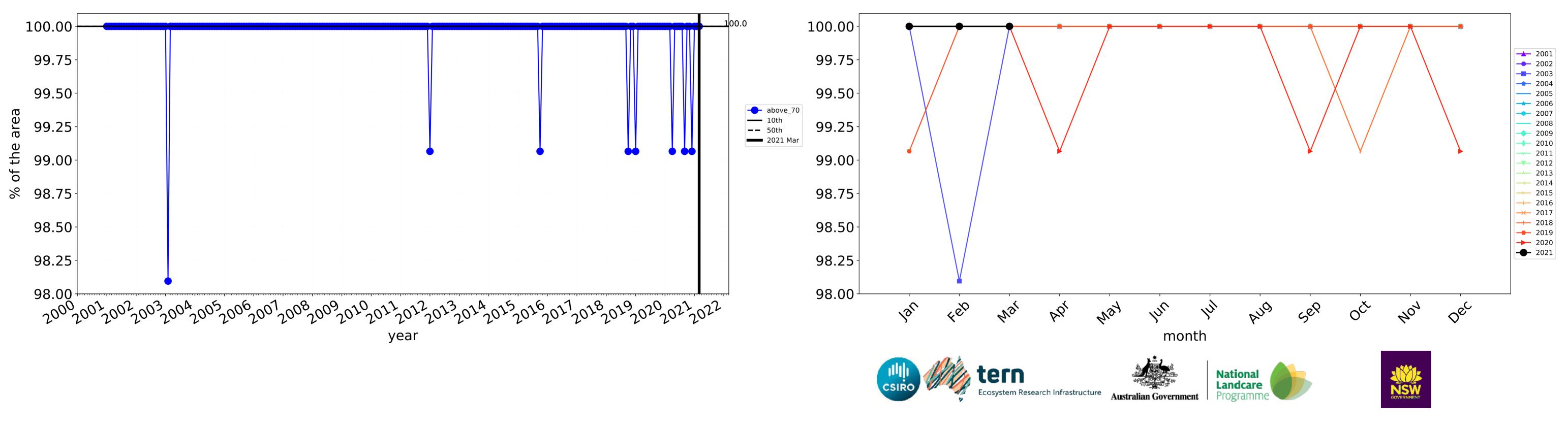
-10

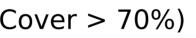
-20

# **Conservation and natural environments Woodland forest timeseries**

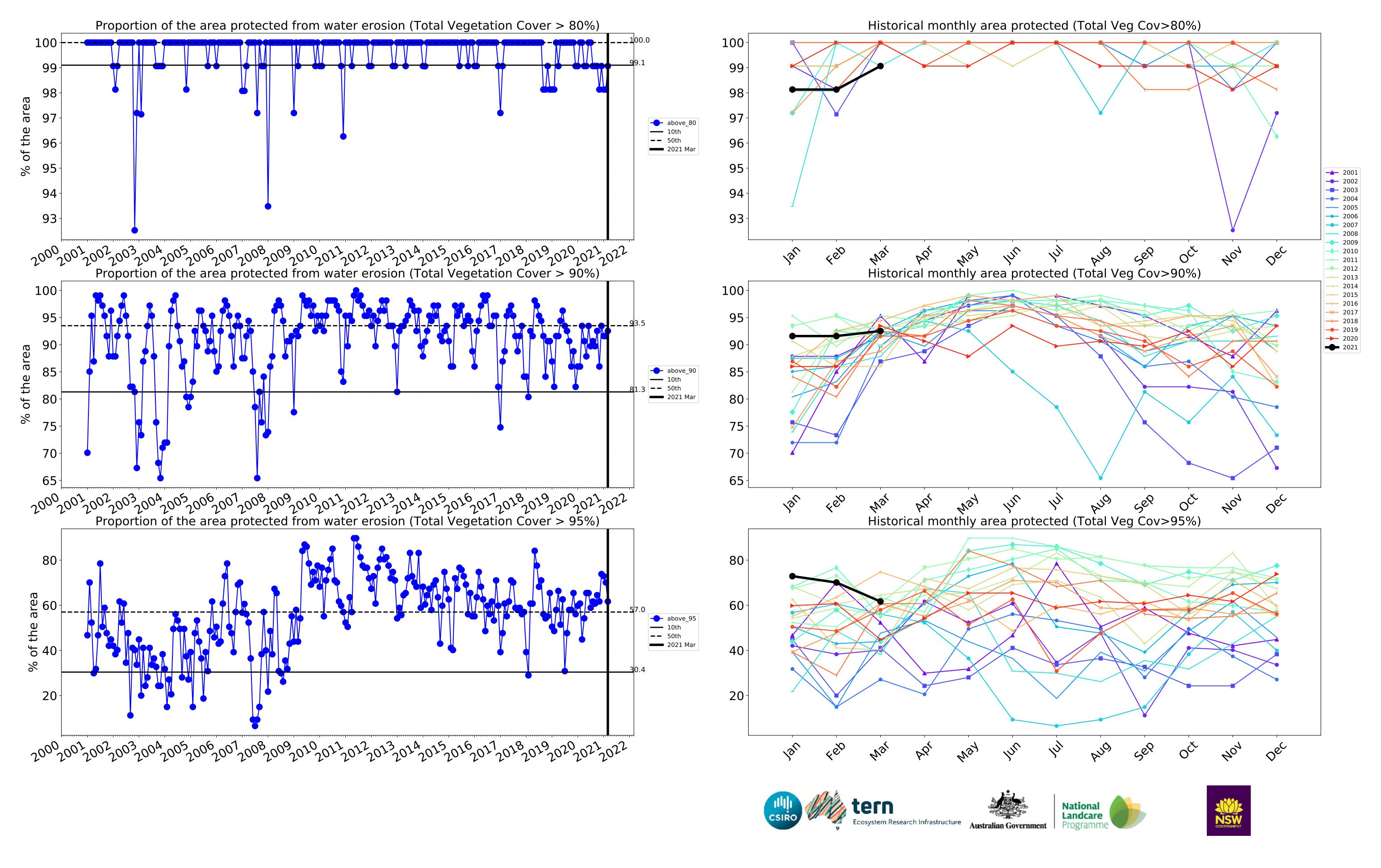


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

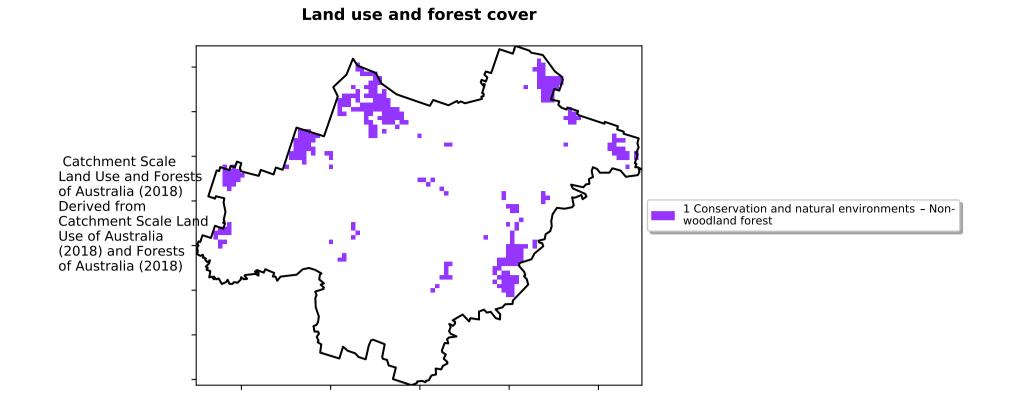




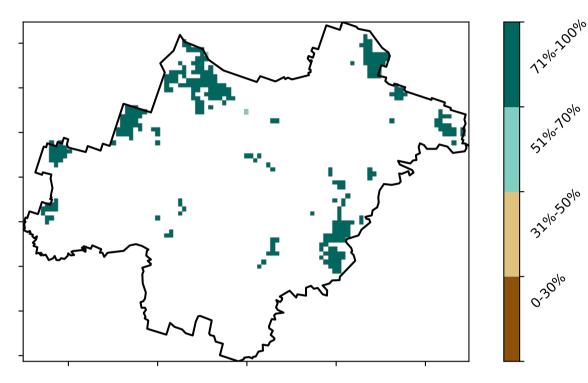
Water erosion historical monthly area protected (Total Veg Cov>70%)



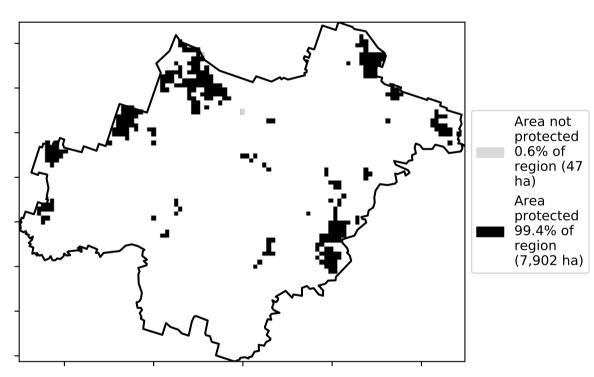
### **Conservation and natural environments Forest (non woodland)**



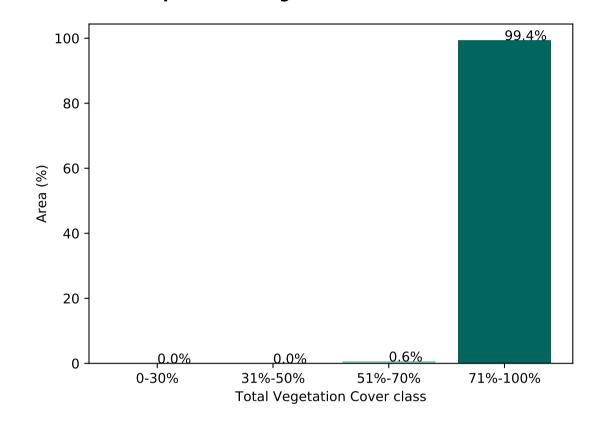
**Total Vegetation Cover [%]** 



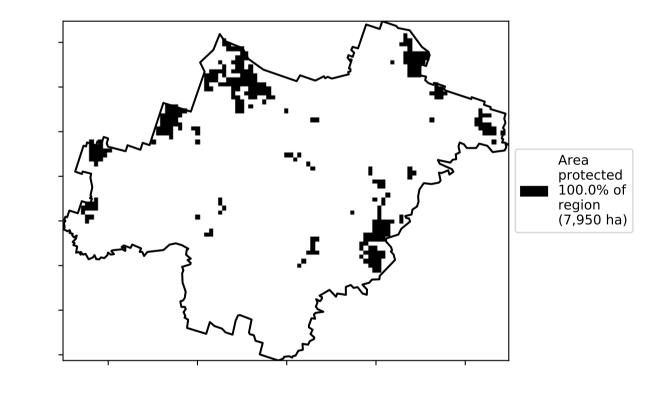
% Area protected from water erosion (>70%)



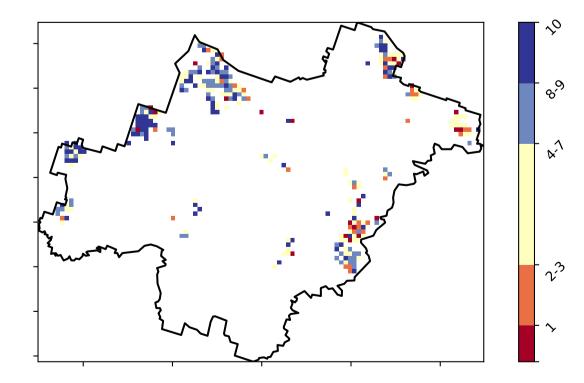
Proportion of vegetation cover class in area



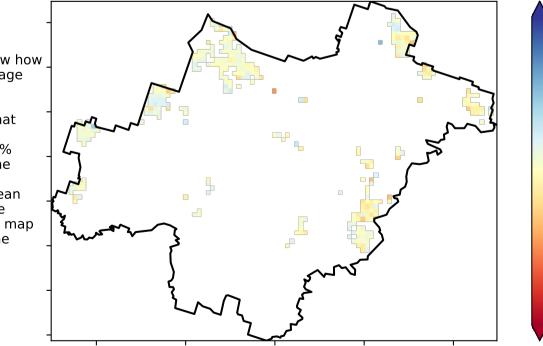
% Area protected from wind erosion (>50%)



**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.



- 20

· 10

0

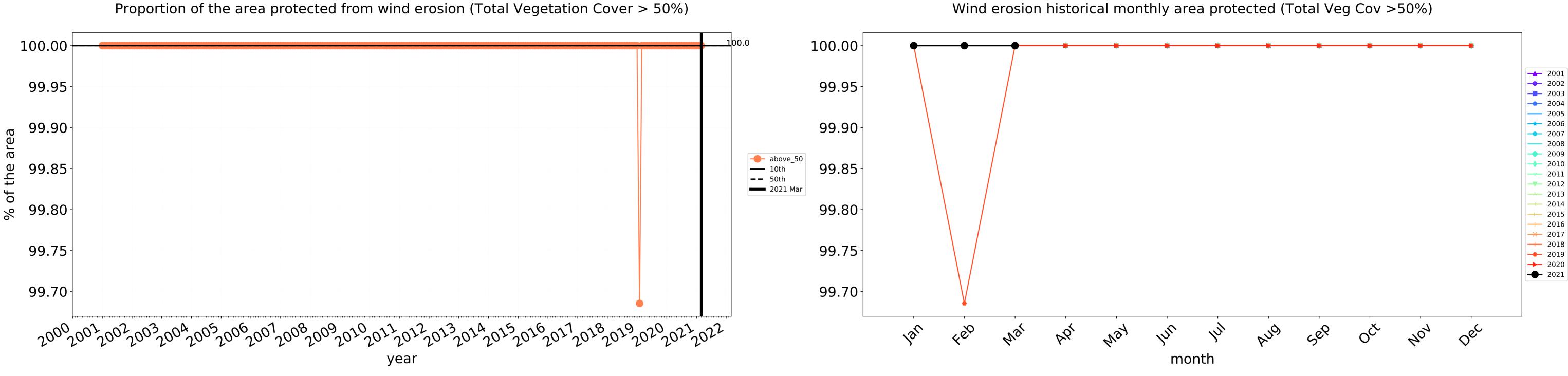
-10

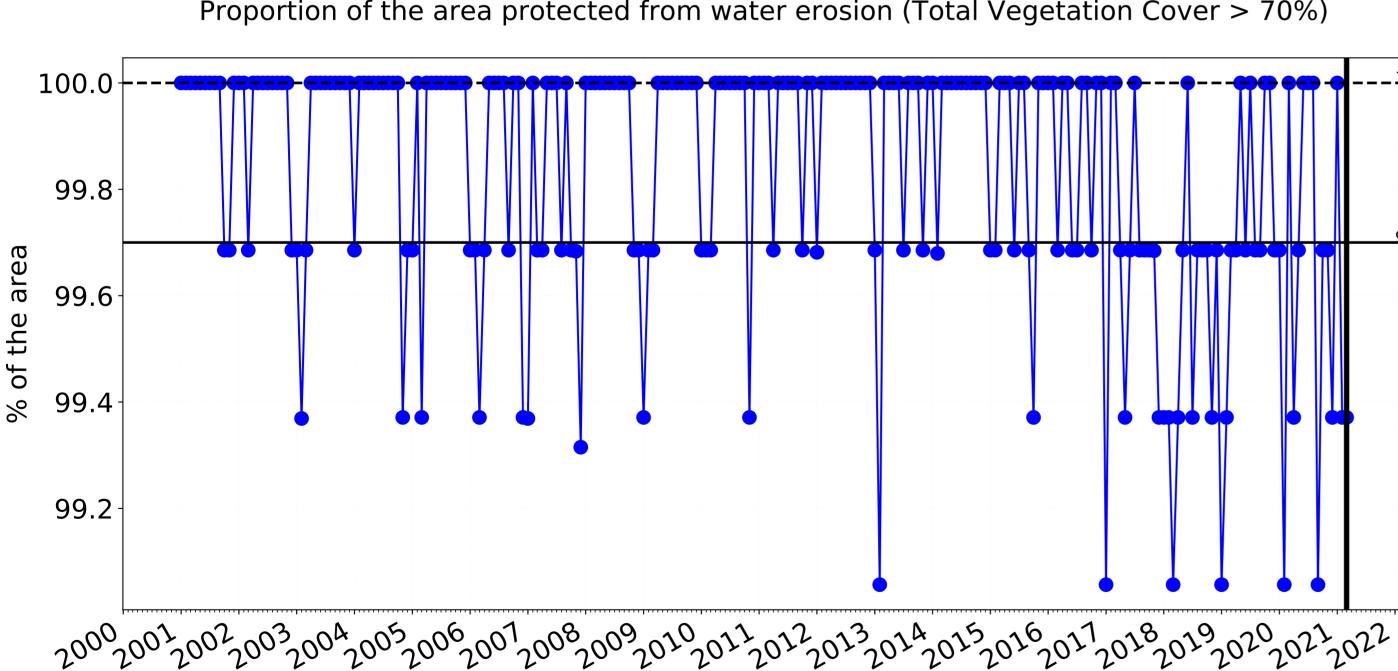
-20

500%

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.

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



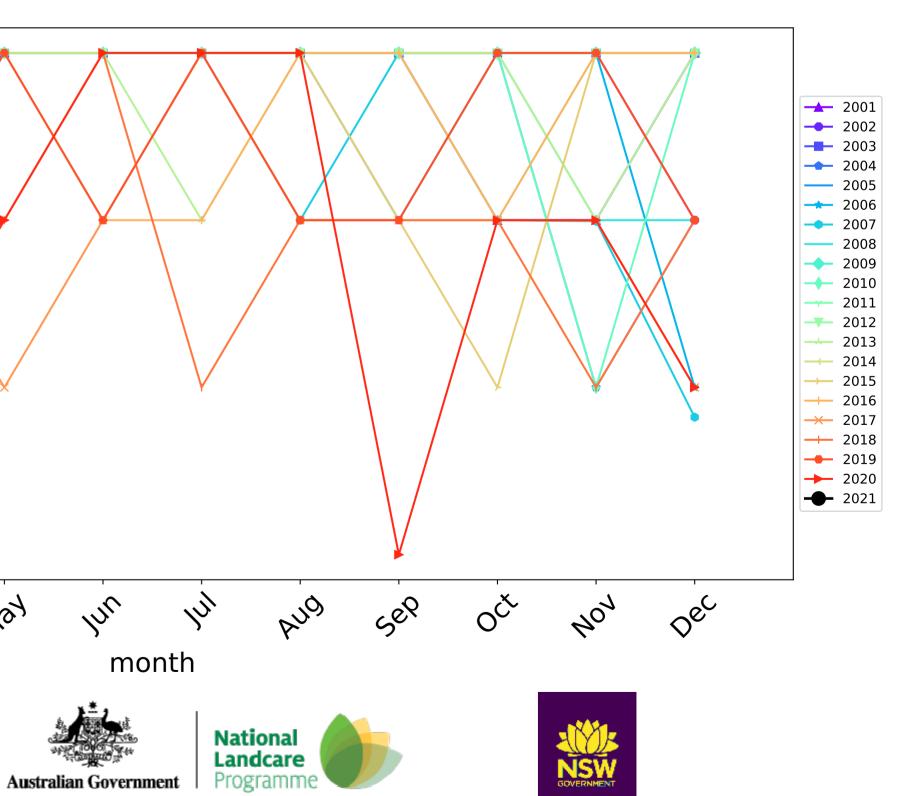


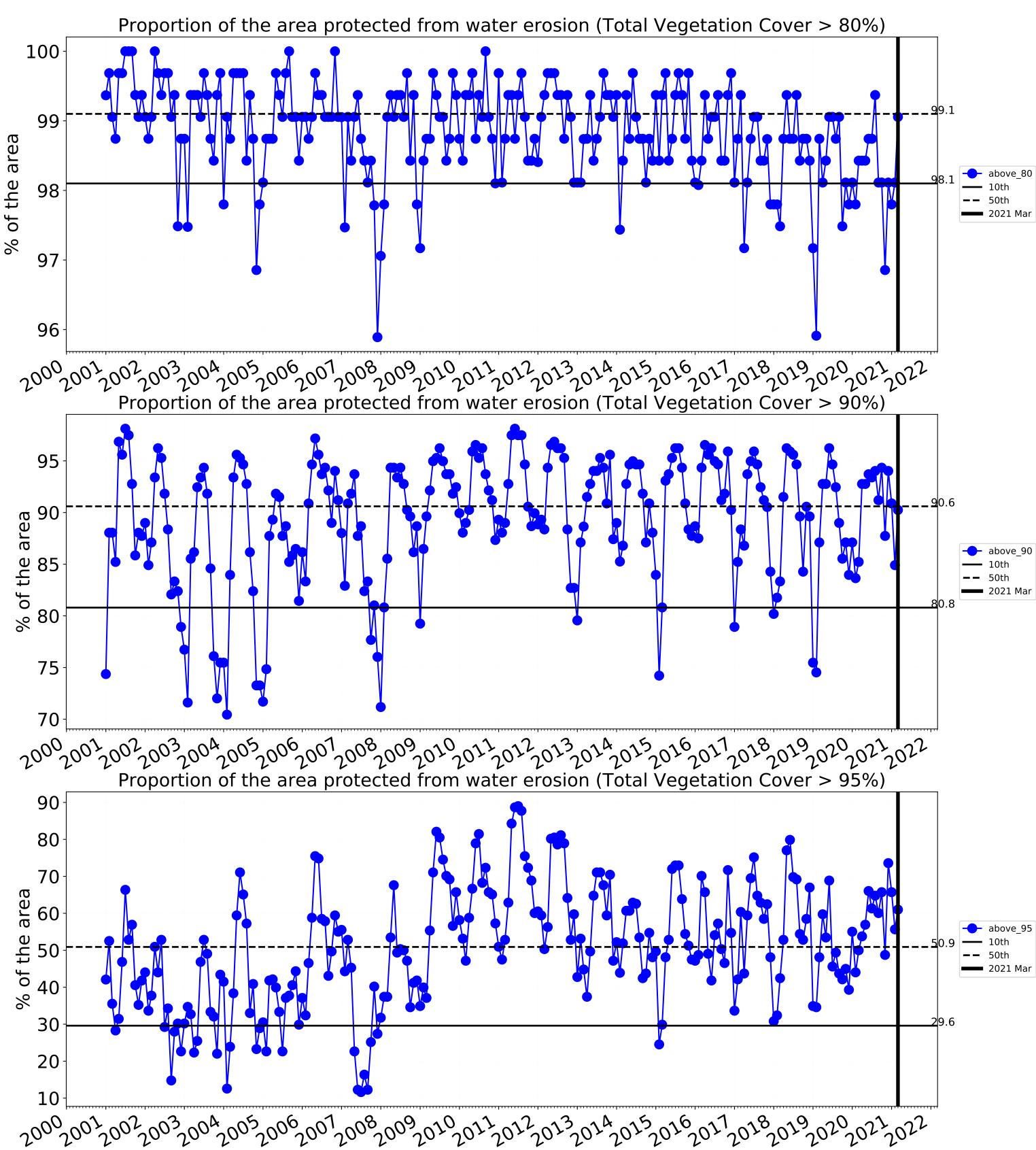
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

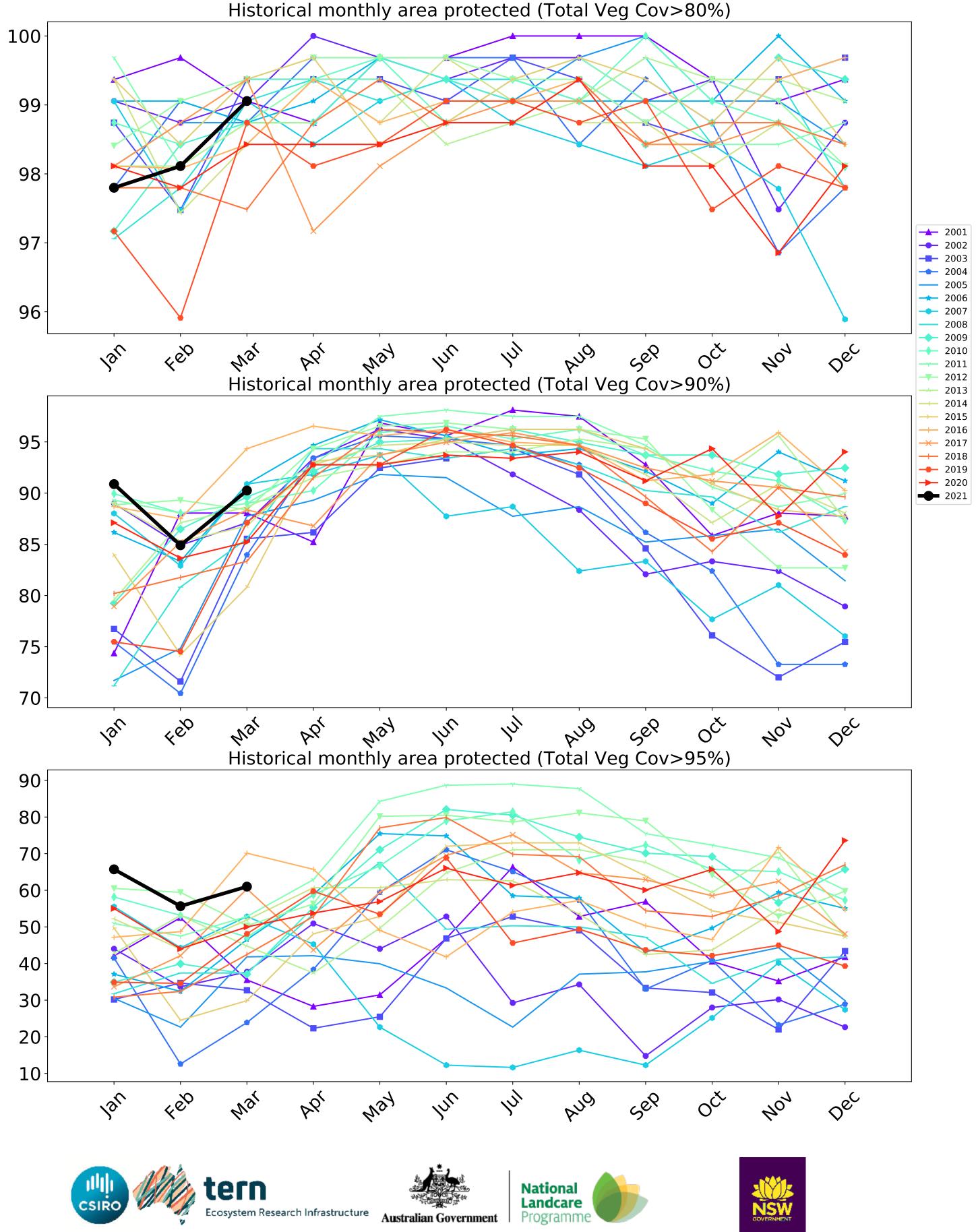
year

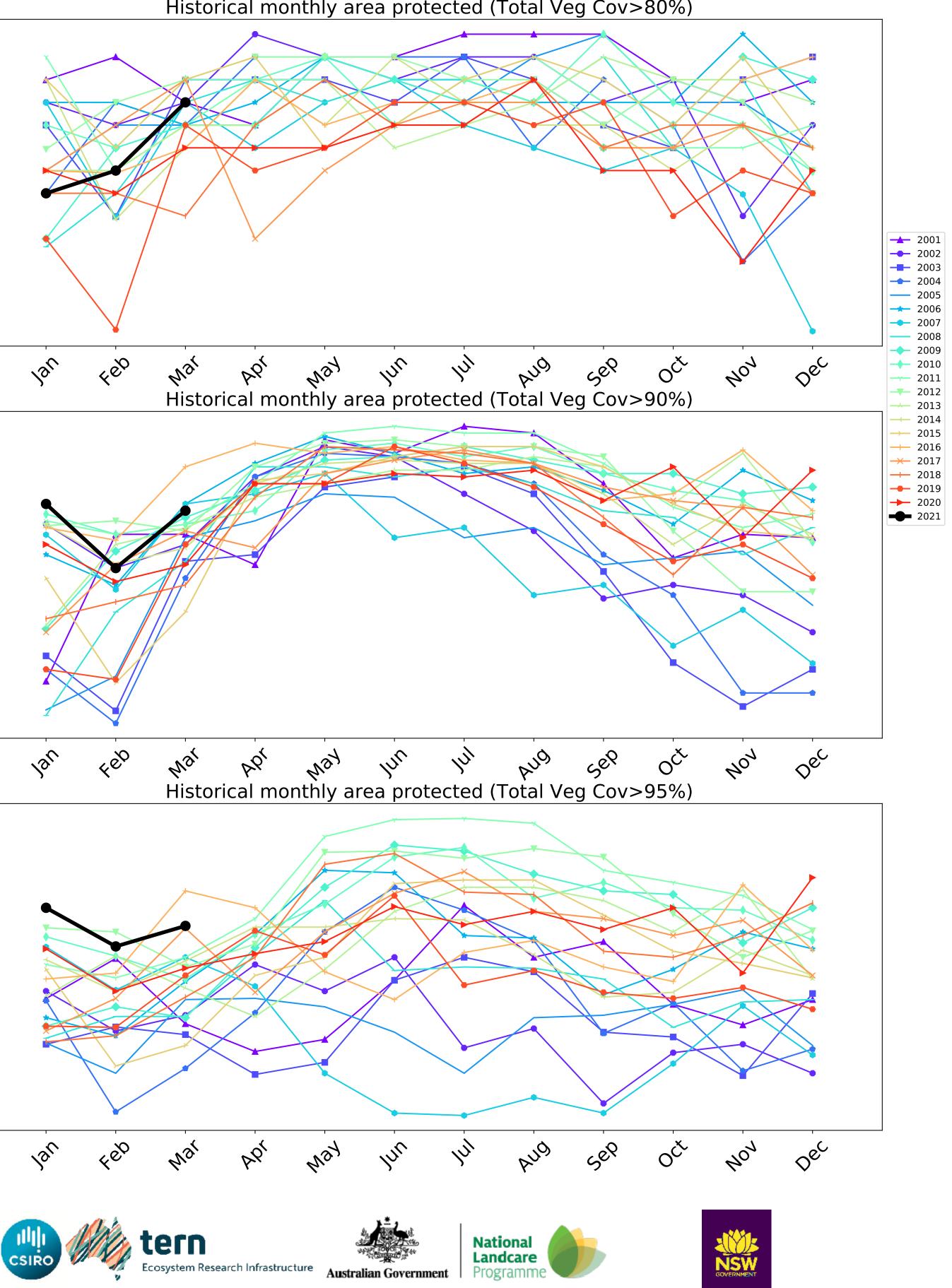
100.0 <u> 1</u>00.0 99.8 ---- above\_70 **—** 10th **--** 50th 99.6 **—** 2021 Mar 99.4 99.2 feb lar In May War PQ month tern Ecosystem Research Infrastructure

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







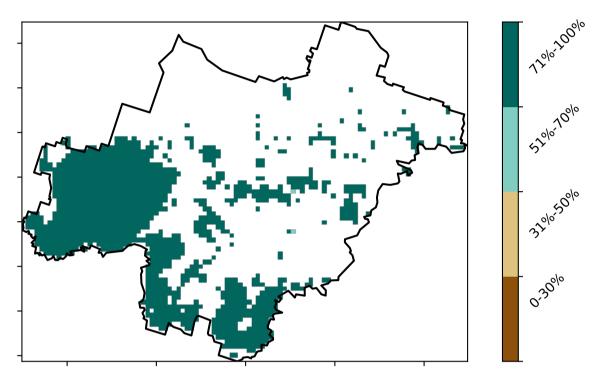


### Agriculture

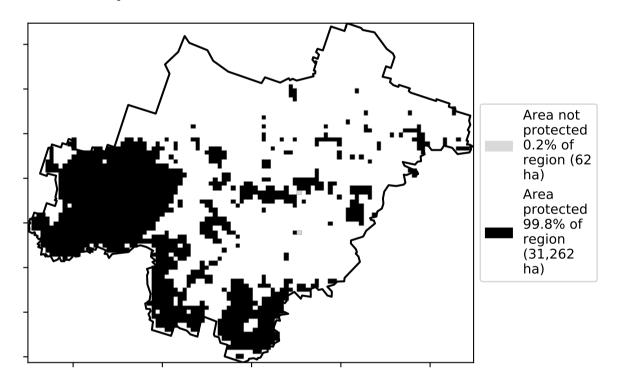
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated of Australia (2018) 8 Agriculture - Horticulture - Irrigated

**Total Vegetation Cover [%]** 

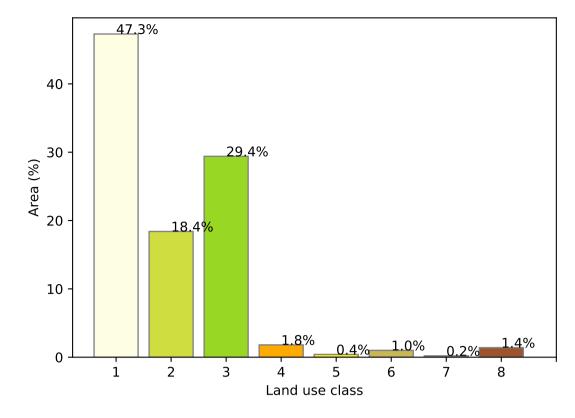
Land use and forest cover



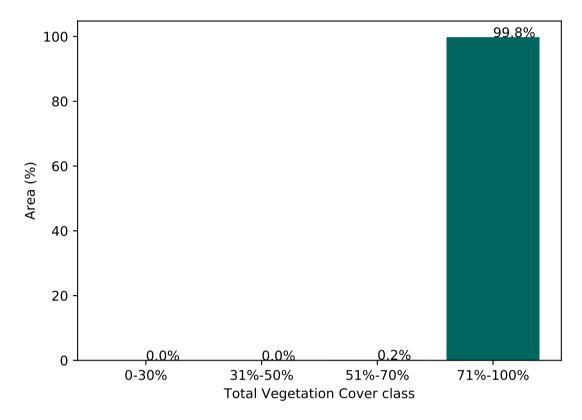
% Area protected from water erosion (>70%)



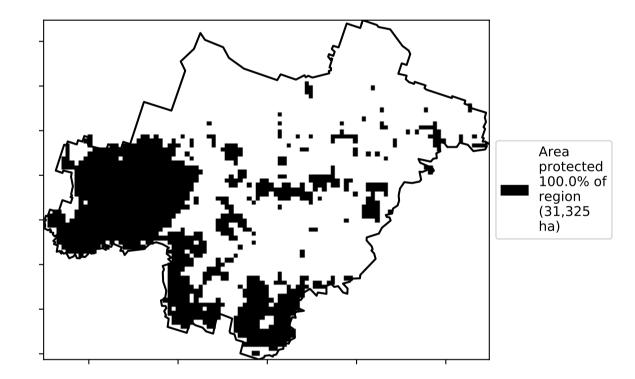
Proportion of each land class in area



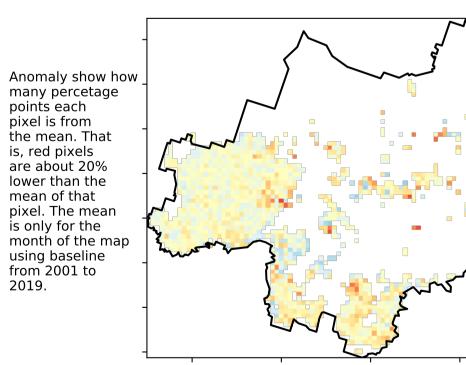
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Anomaly [%]** 

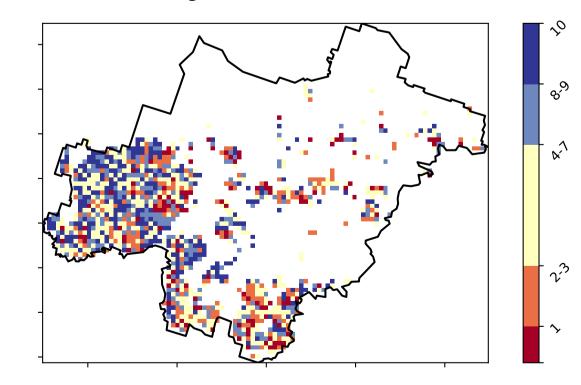


- 10 0 -10-20

- 20

32%50%

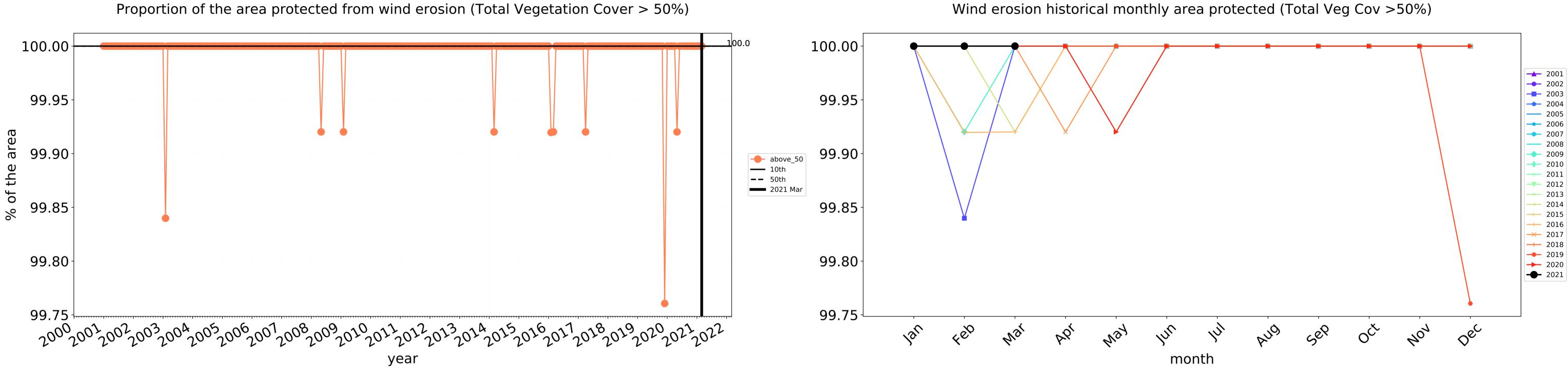
**Total Vegetation Cover Decile [%]** 



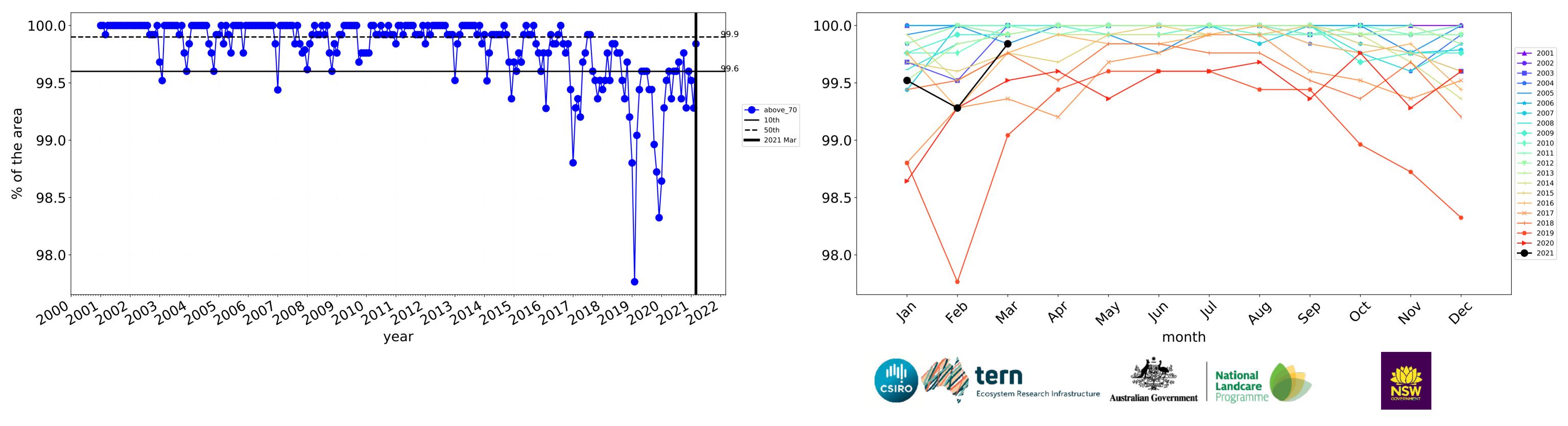


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline

the map using baseline from 2001 to 2019.

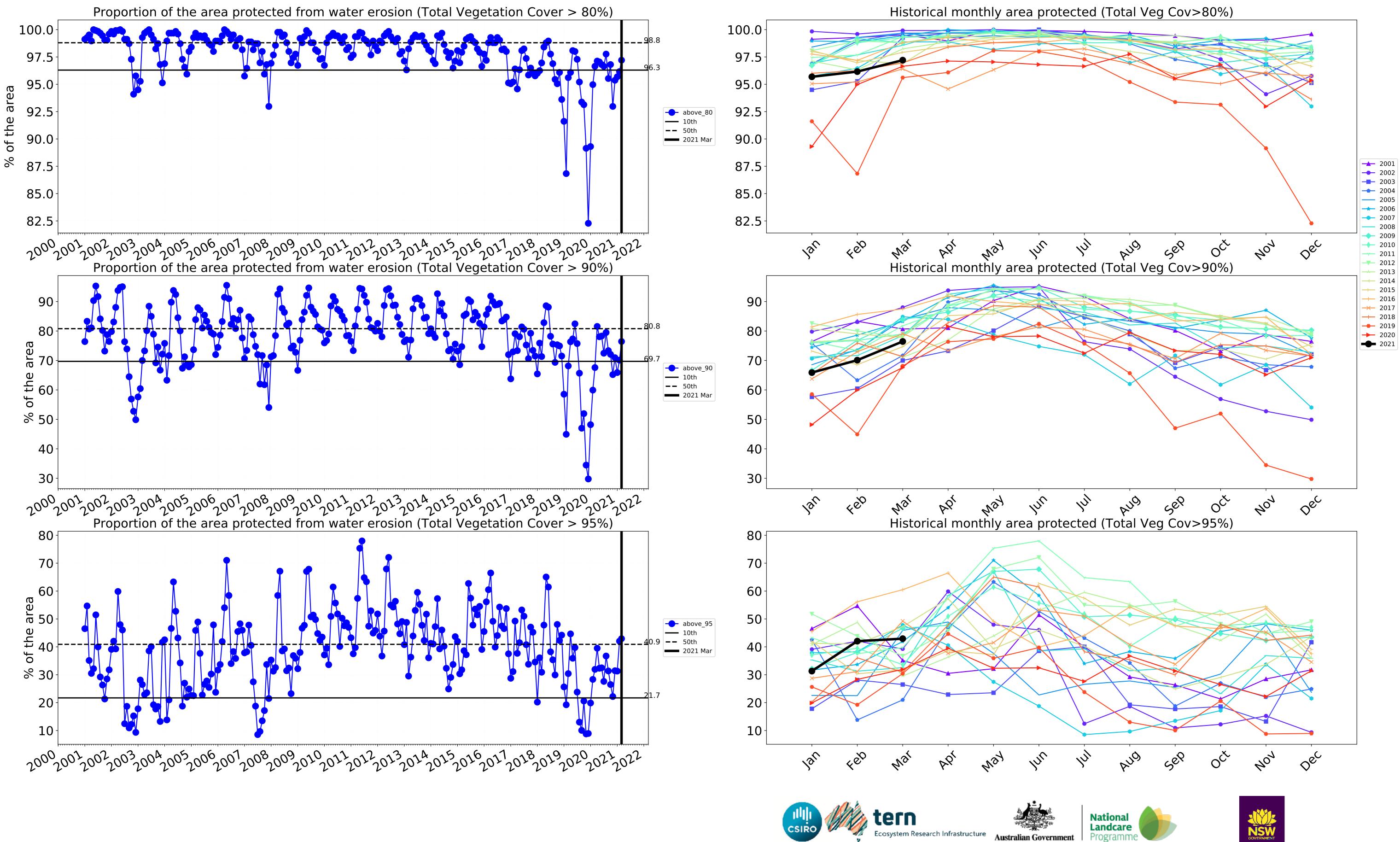


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



# Agriculture timeseries

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

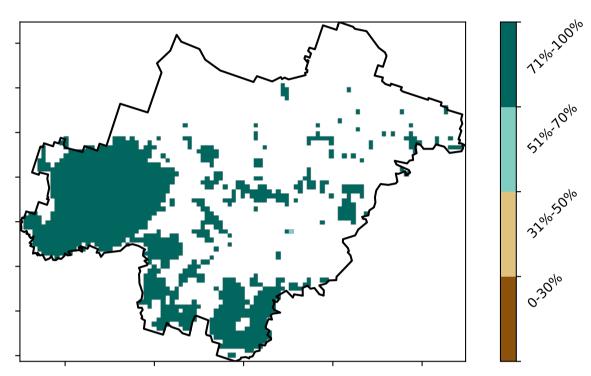


# Grazing

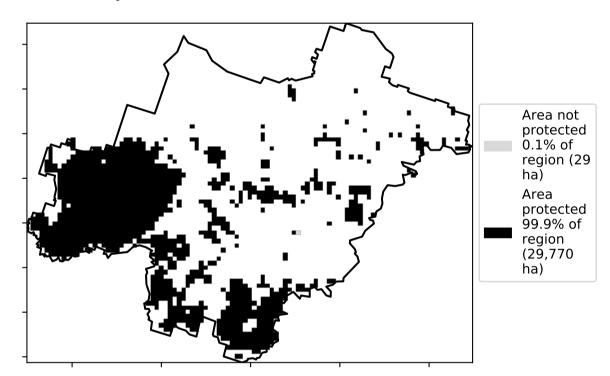
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest

Land use and forest cover

**Total Vegetation Cover [%]** 



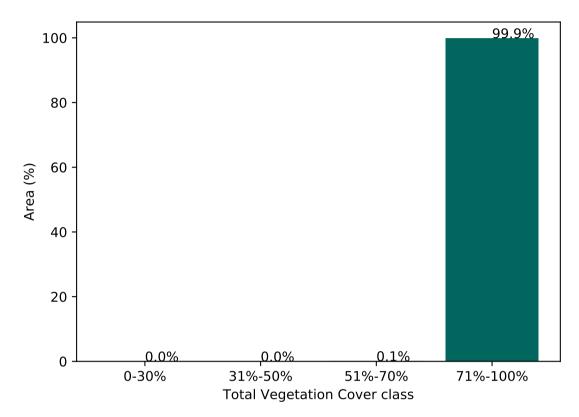
% Area protected from water erosion (>70%)



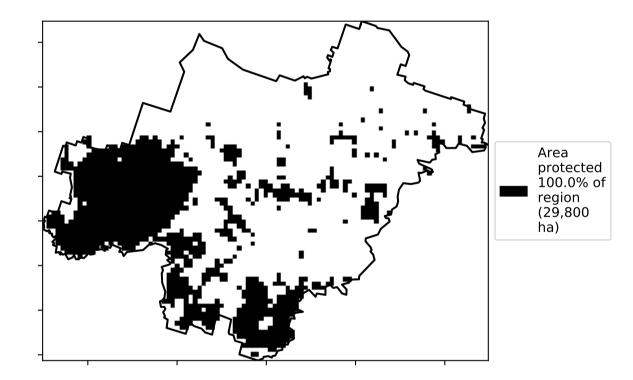
49.7% 50 40 30.9% Area (%) 05 19.4% 20 10 0 3 2 1 Land use class

#### Proportion of each land class in area

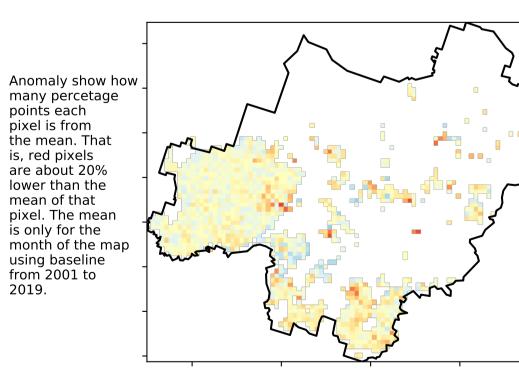
### Proportion of vegetation cover class in area



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



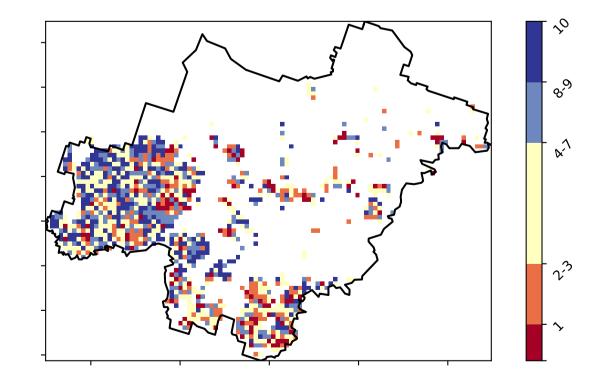
**Total Vegetation Cover Anomaly [%]** 





0.30%

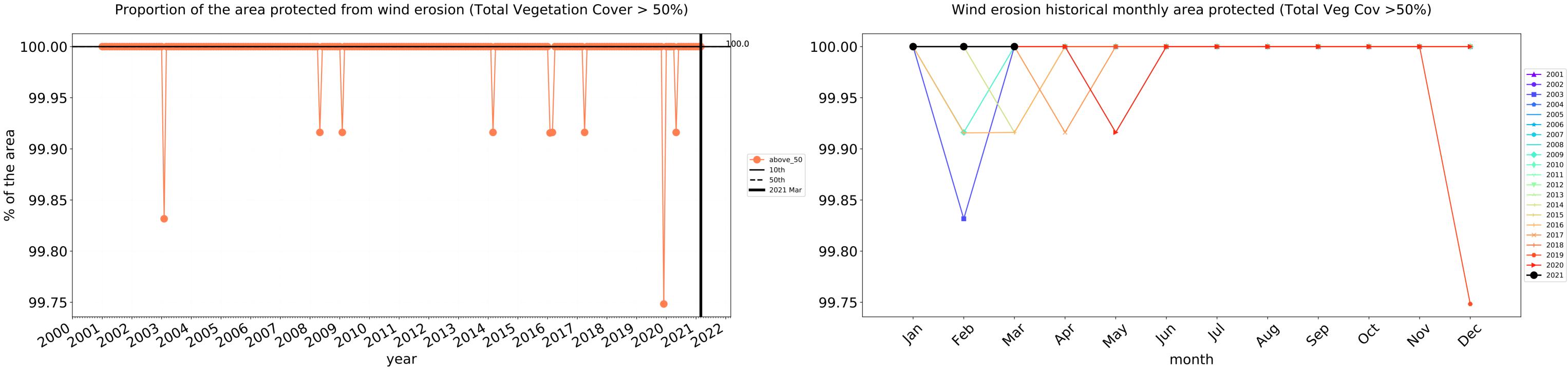
**Total Vegetation Cover Decile [%]** 



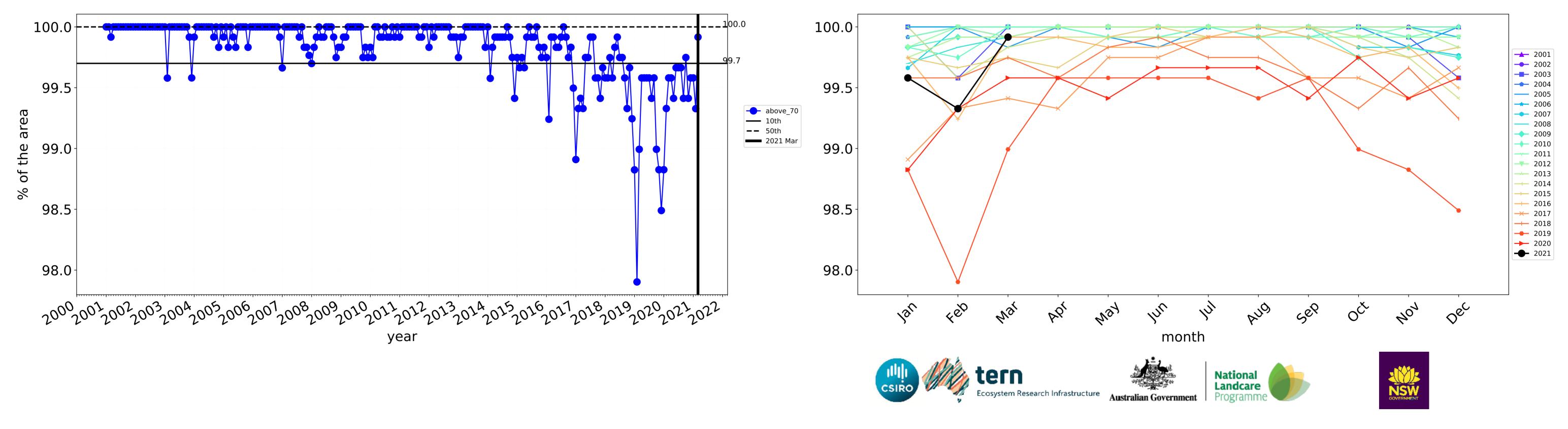


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline

the map using baseline from 2001 to 2019.

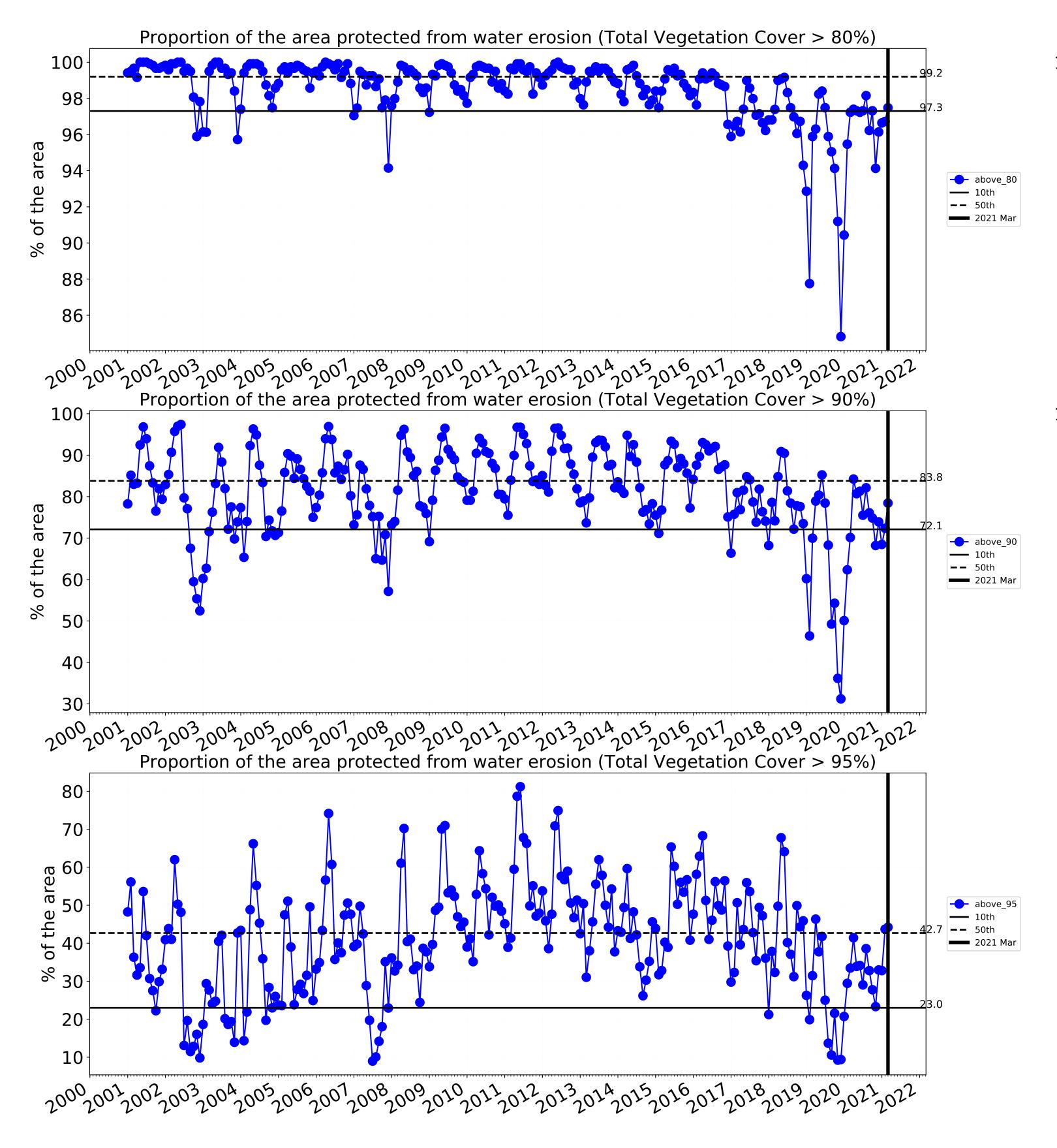


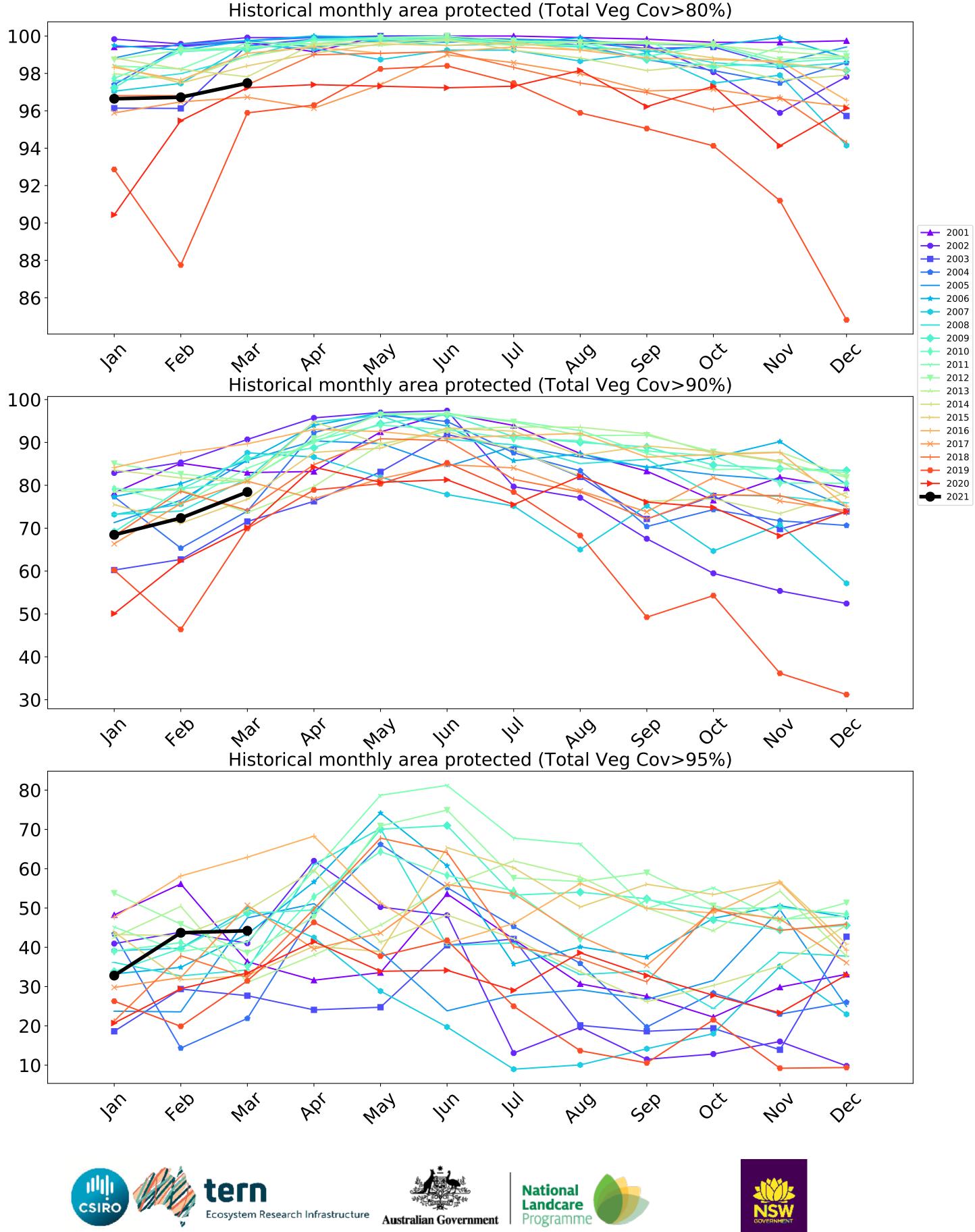
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



# Grazing timeseries

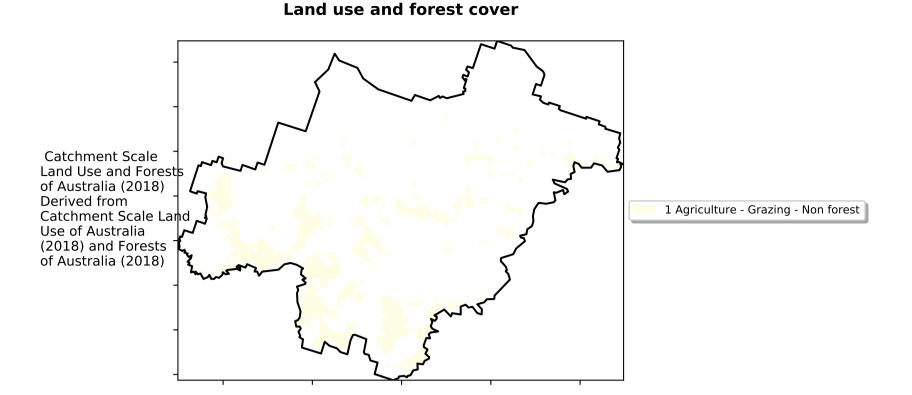
Water erosion historical monthly area protected (Total Veg Cov>70%)



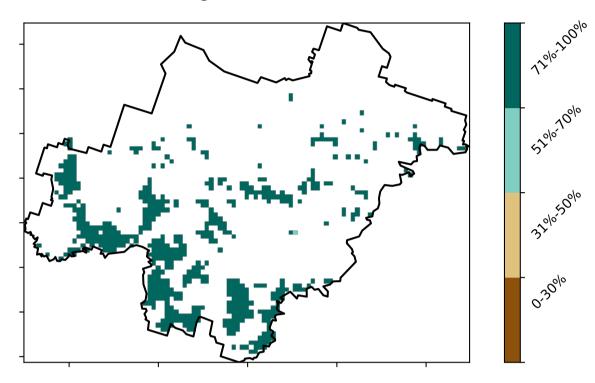




### **Grazing non forest**



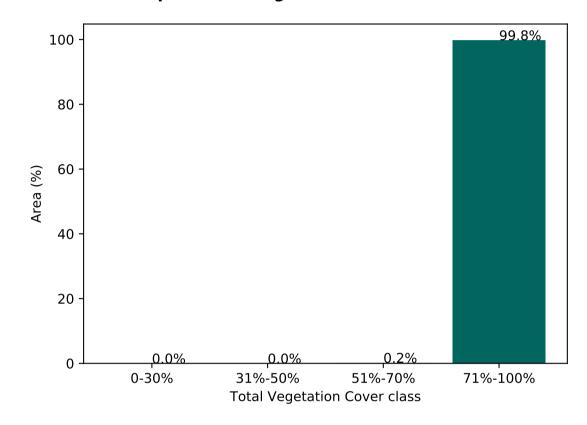
**Total Vegetation Cover [%]** 



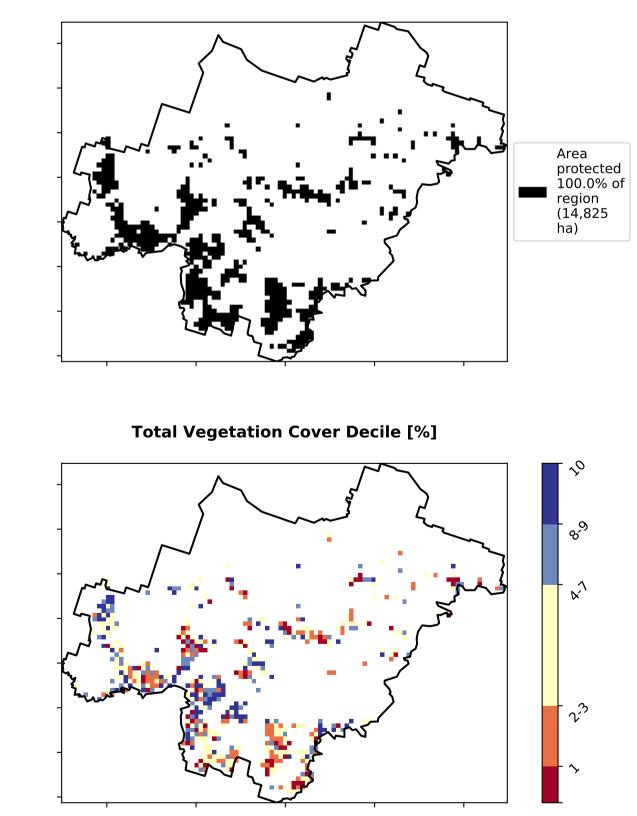
% Area protected from water erosion (>70%)

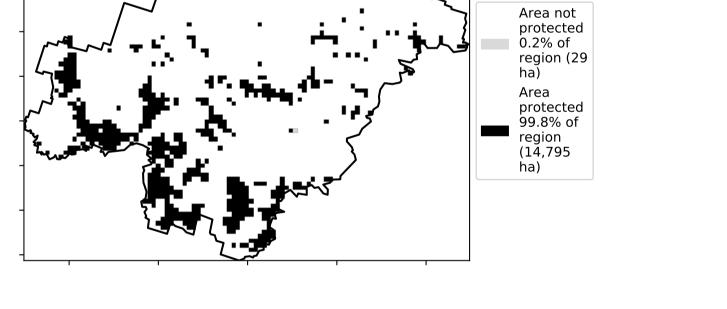


Proportion of vegetation cover class in area

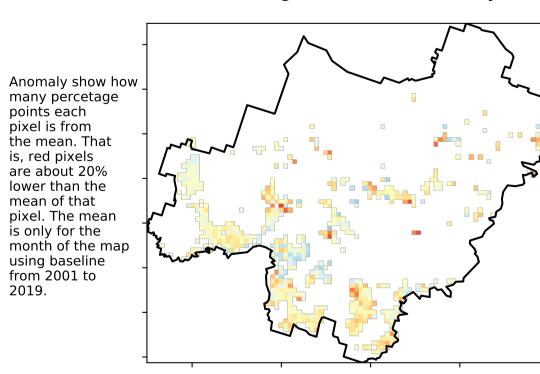


% Area protected from wind erosion (>50%)





**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. -10

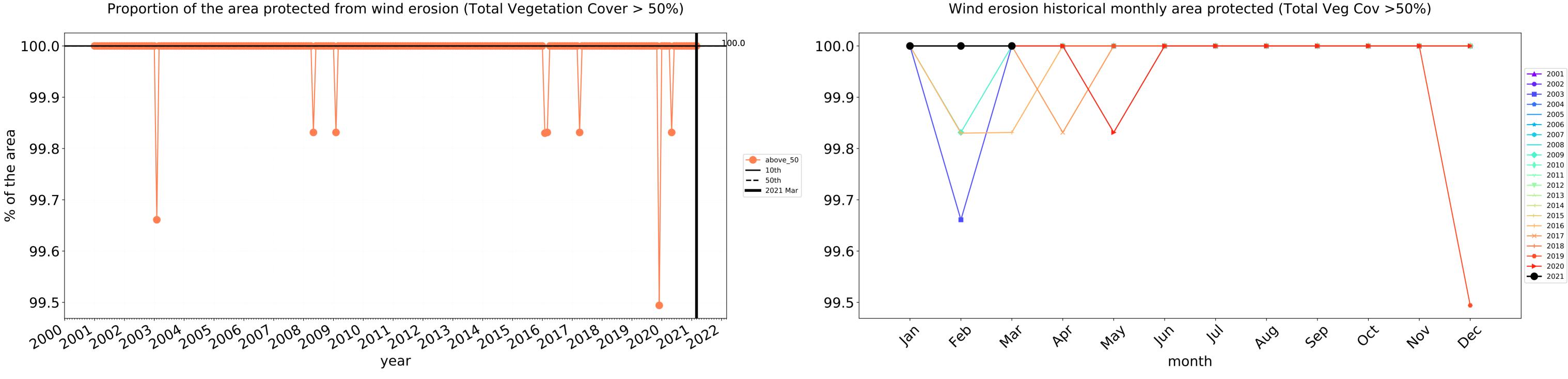
- 20

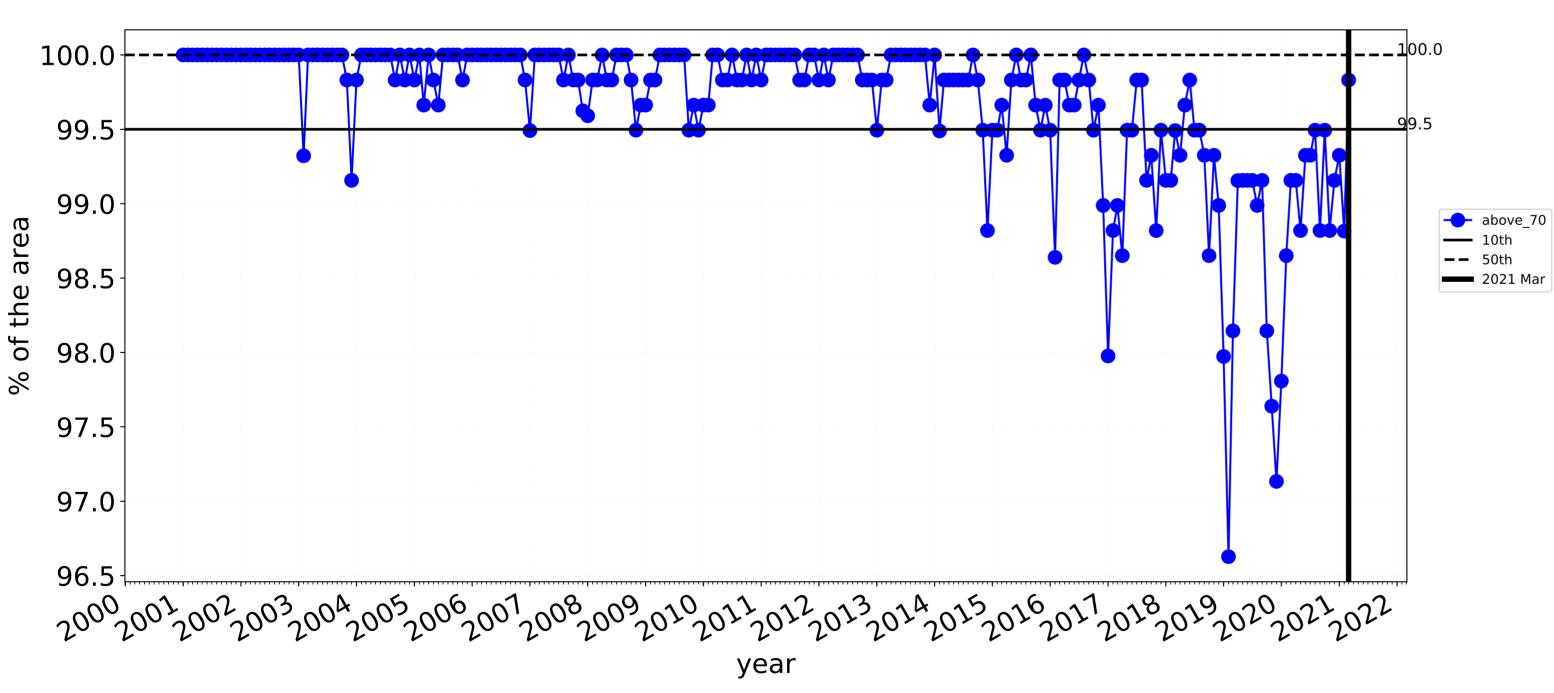
- 10

0

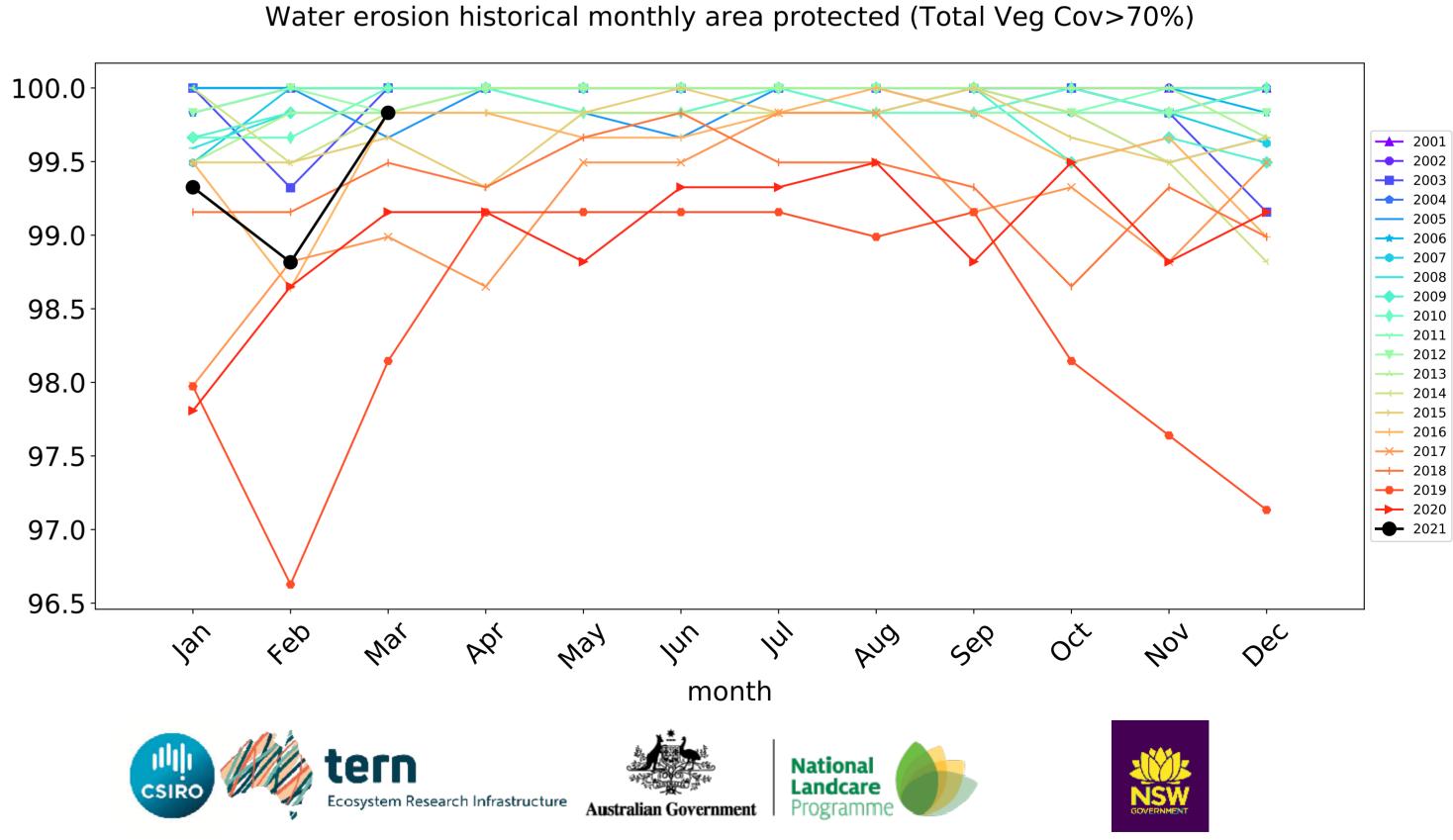
-20

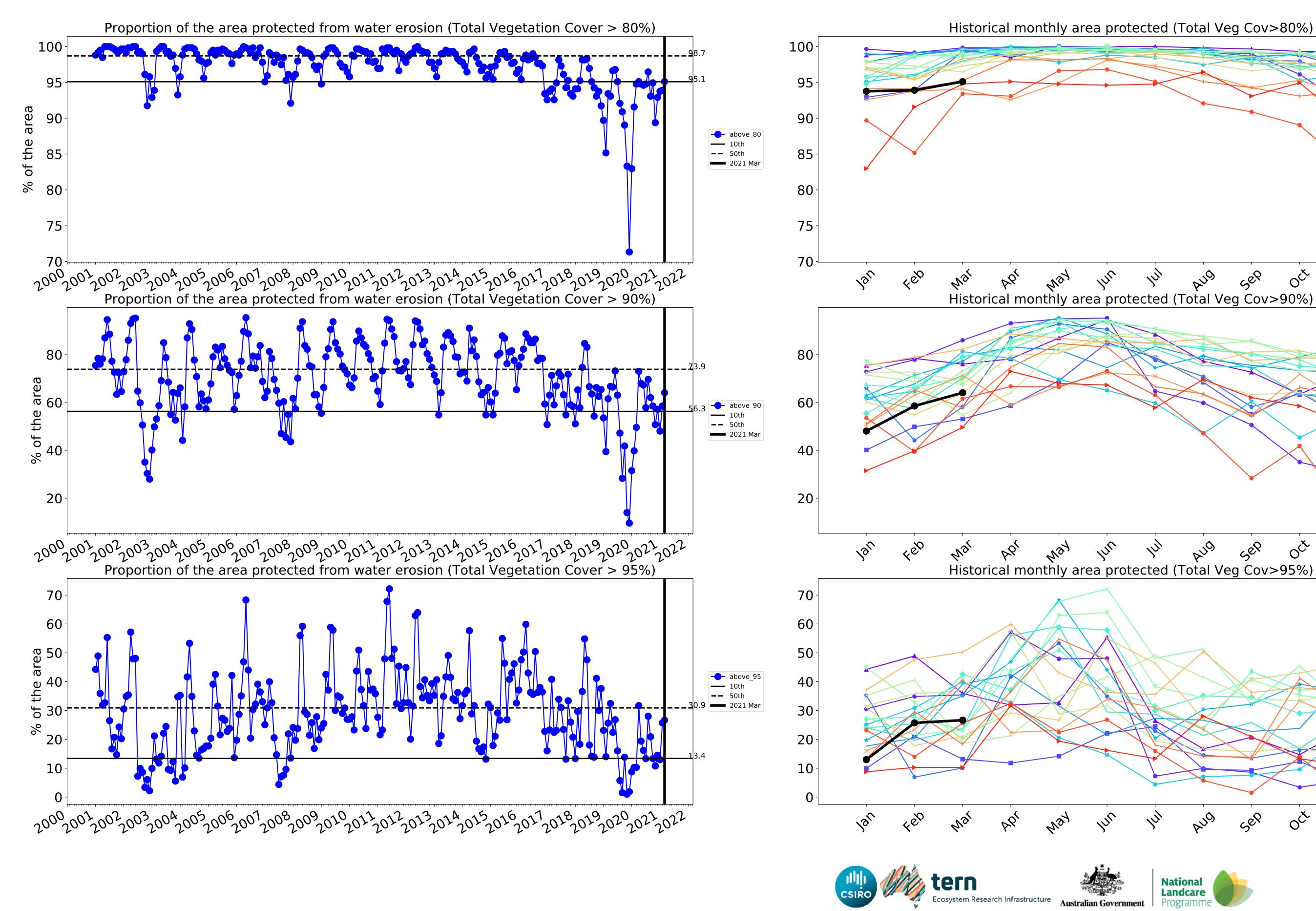


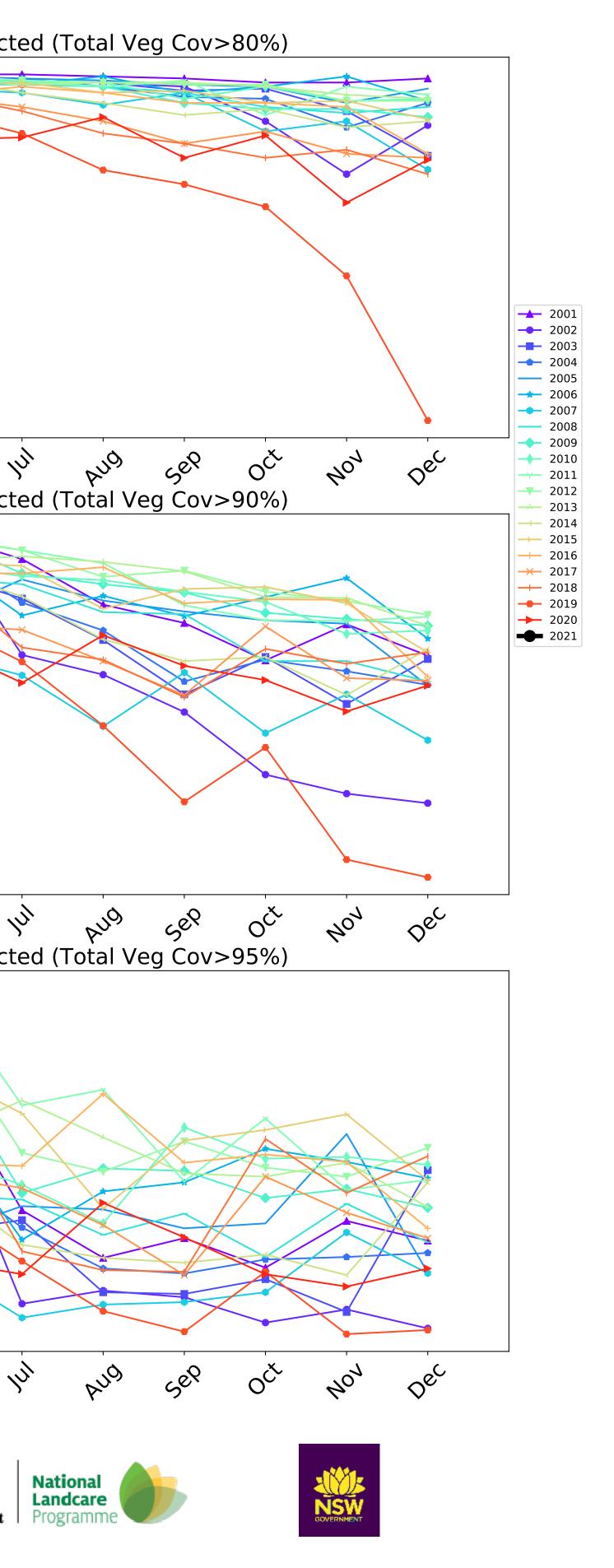




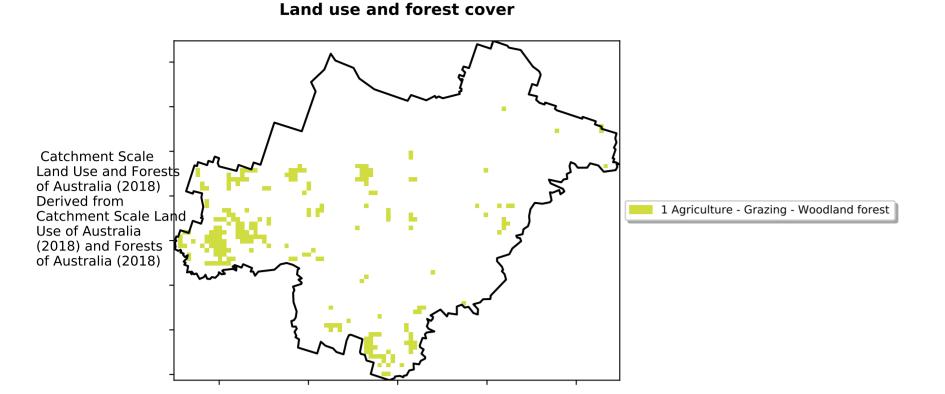
# Grazing non forest timeseries



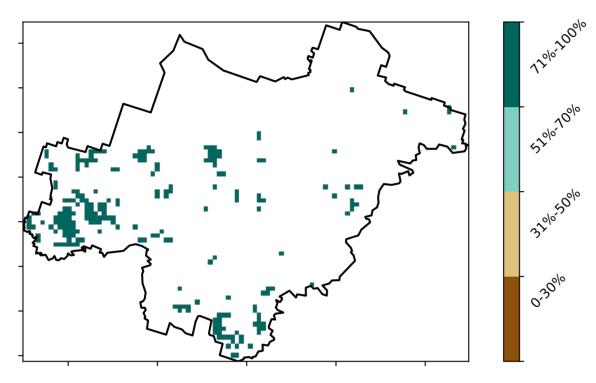




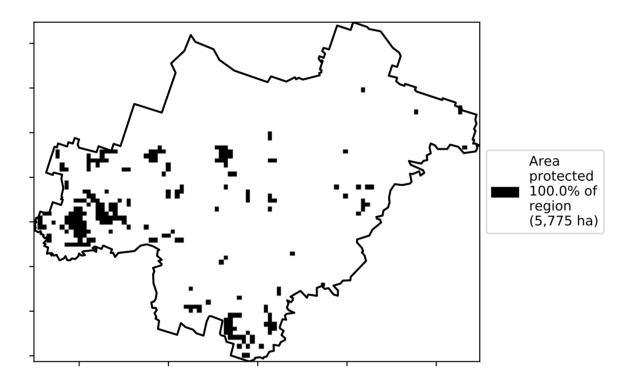
### **Grazing Woodland forest**



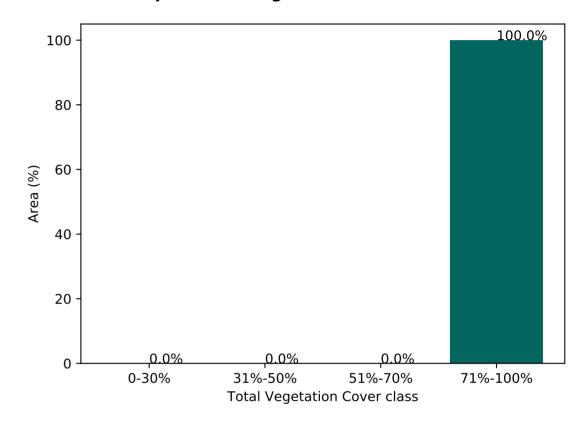
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

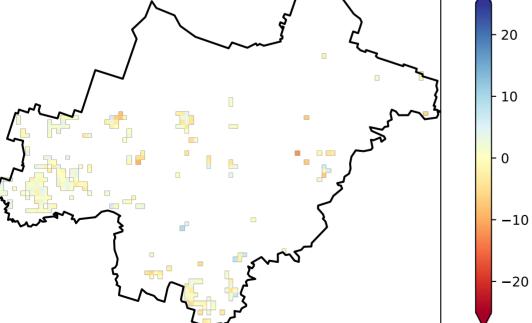


% Area protected from wind erosion (>50%)

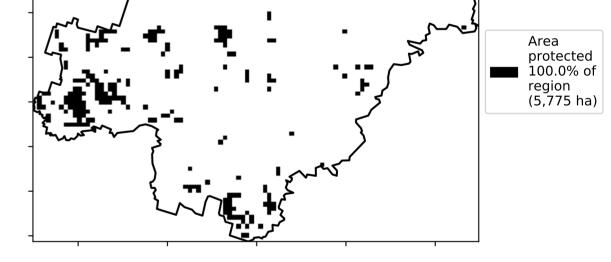


Total Vegetation Cover Anomaly [%]

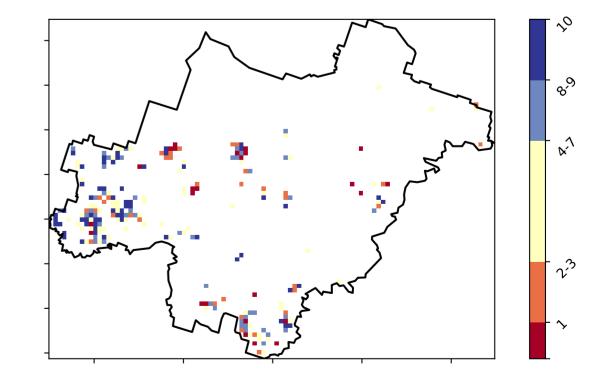
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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 map using baseline from 2001 to 2019.

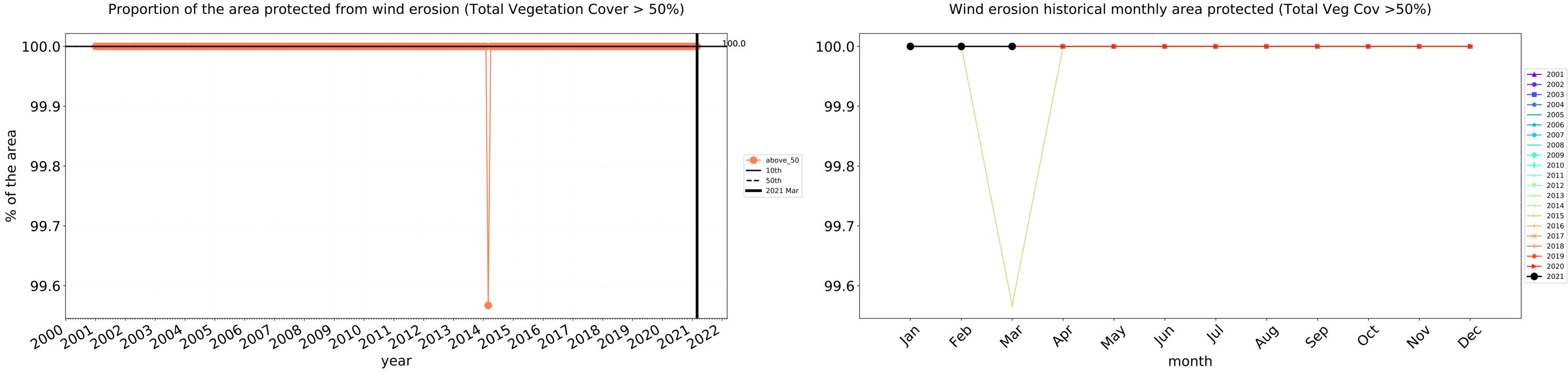


Total Vegetation Cover Decile [%]

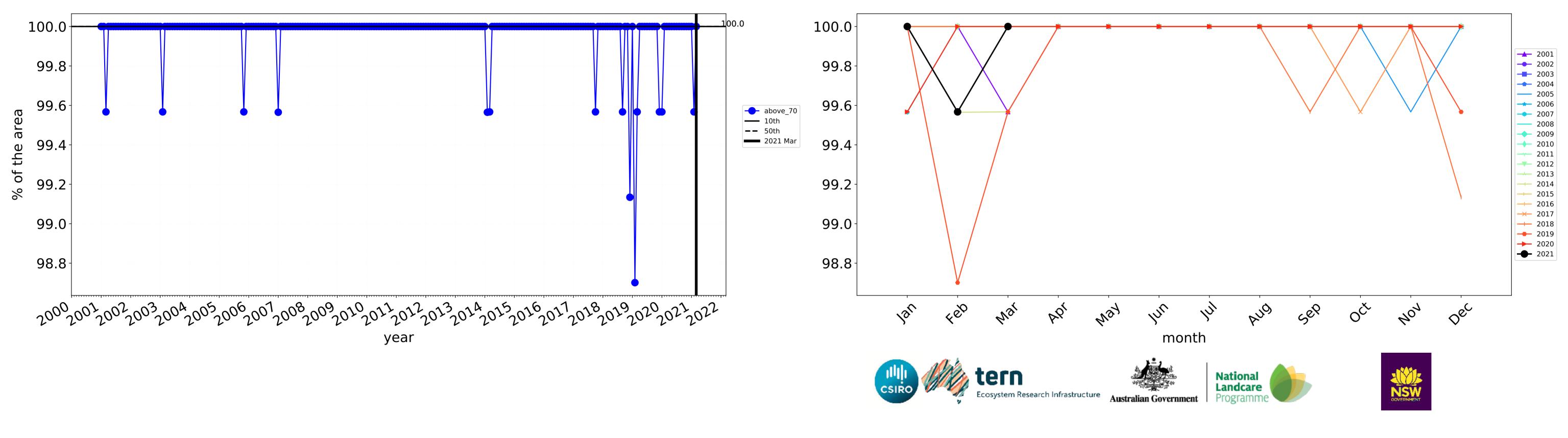




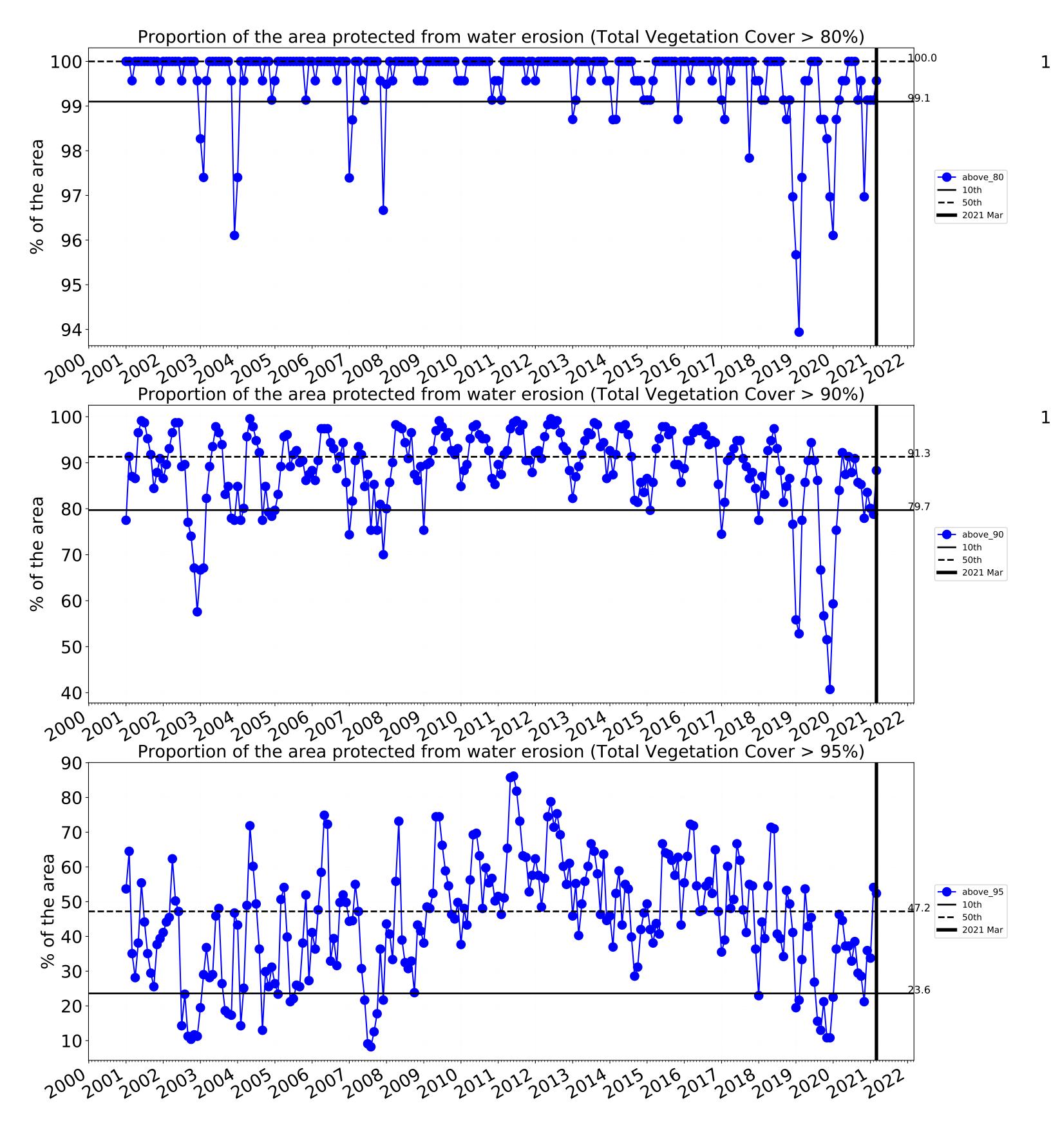
# Grazing Woodland forest timeseries

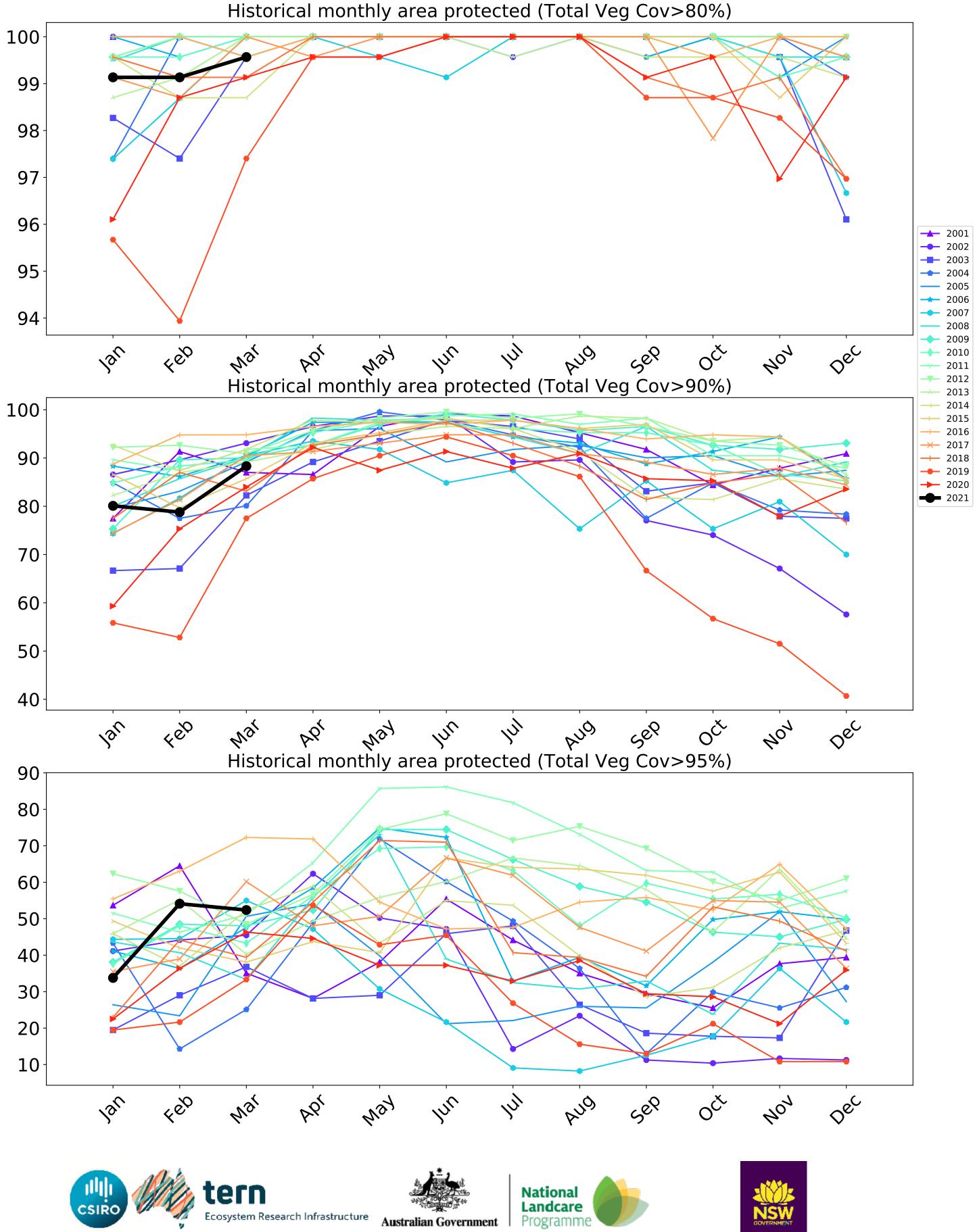


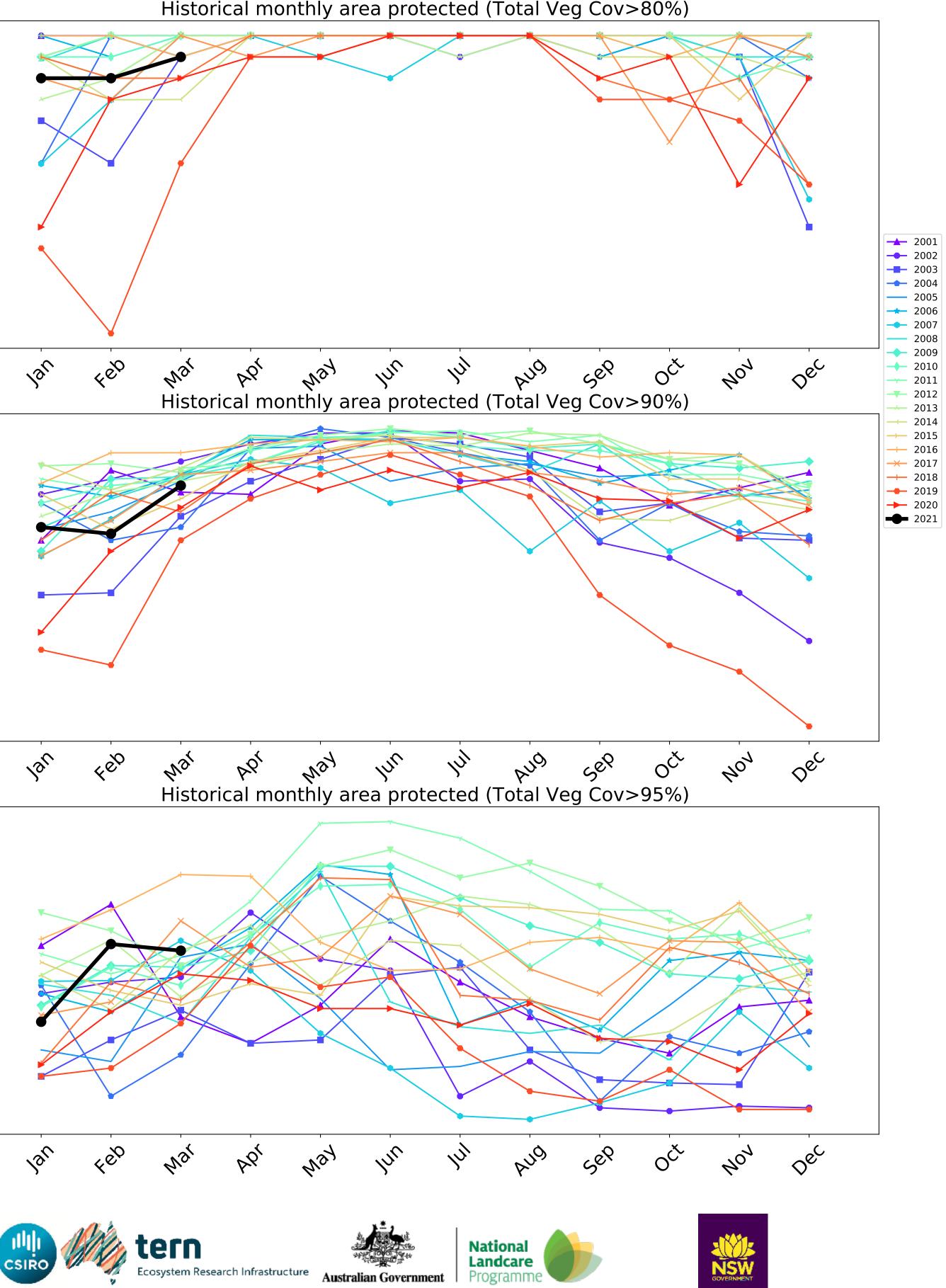
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



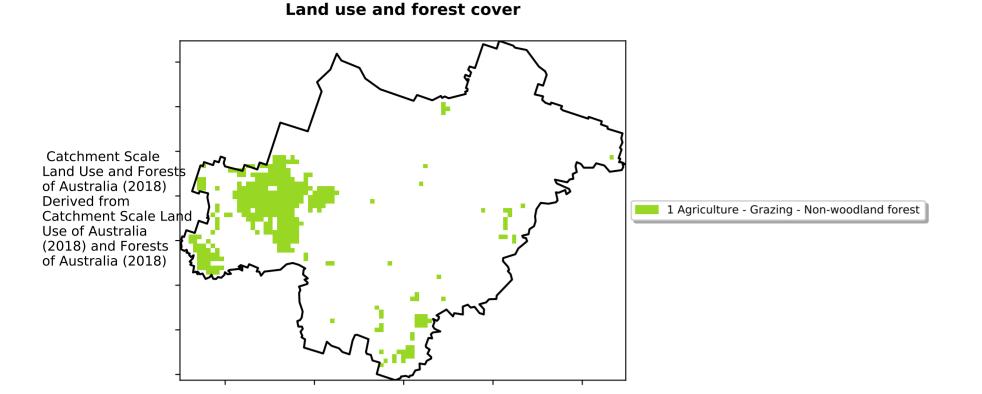
Water erosion historical monthly area protected (Total Veg Cov>70%)



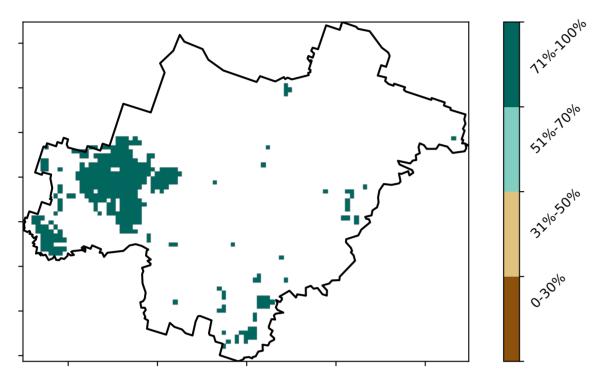




### Grazing - Forest (non woodland)



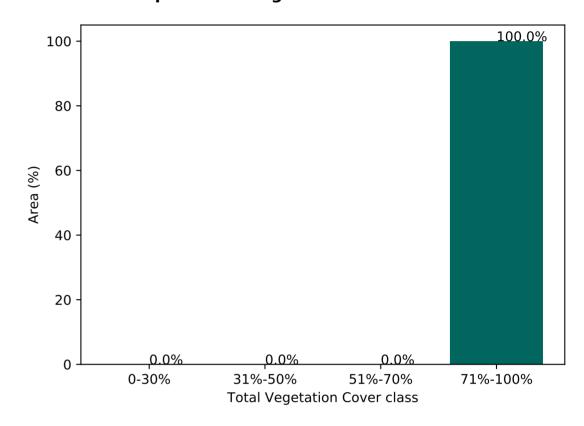
**Total Vegetation Cover [%]** 



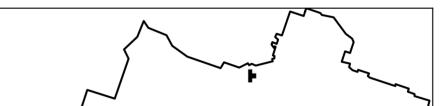
% Area protected from water erosion (>70%)

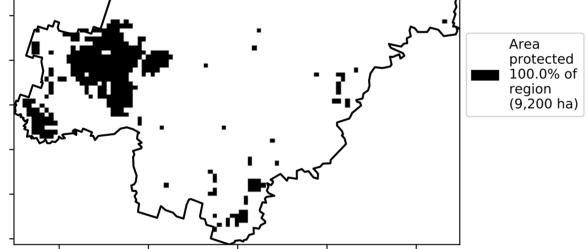


Proportion of vegetation cover class in area

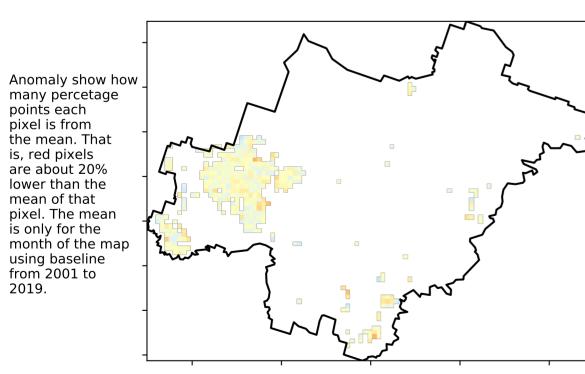


% Area protected from wind erosion (>50%)





Total Vegetation Cover Anomaly [%]

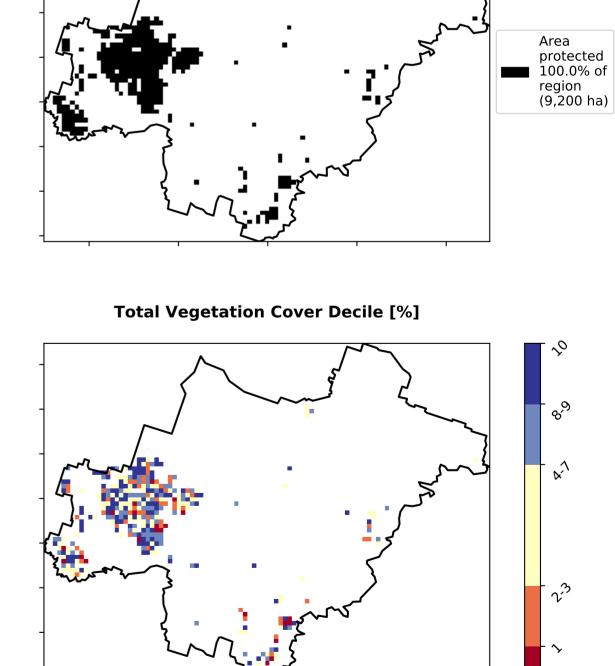


Deciles show where the pixel value lies in the - 10 record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. -10

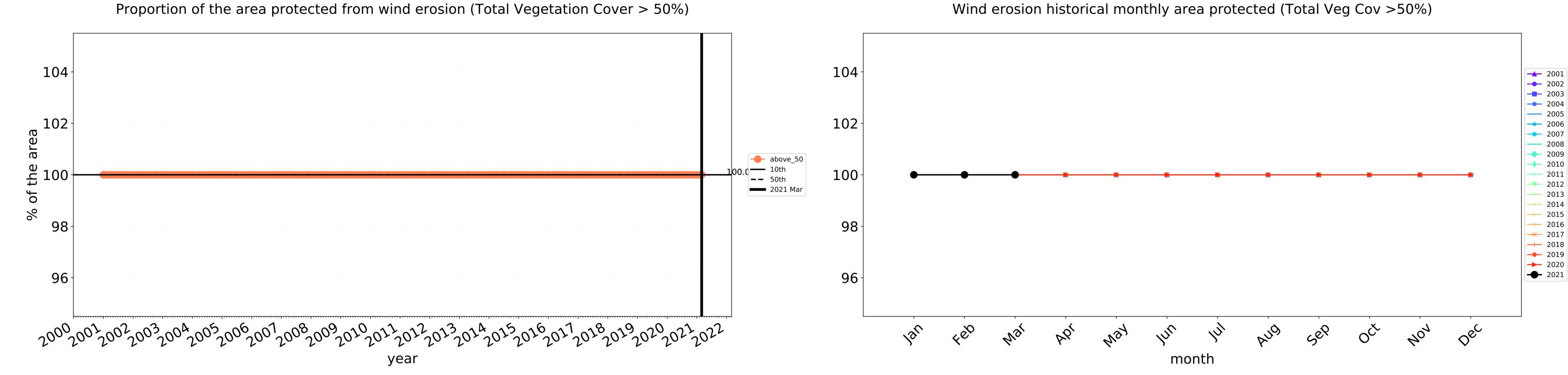
- 20

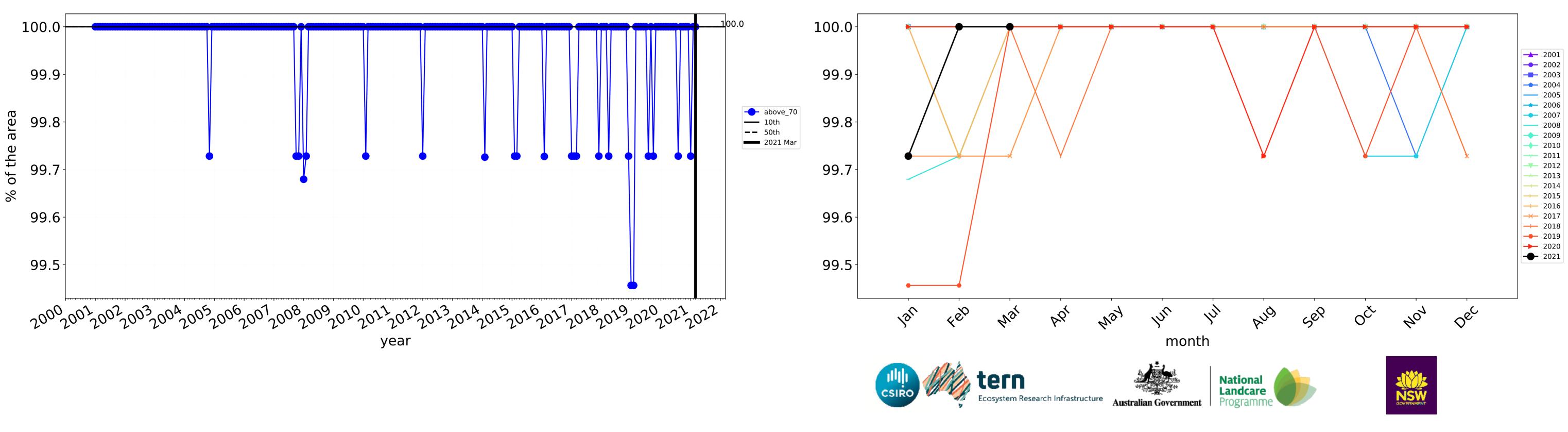
0

-20

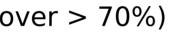




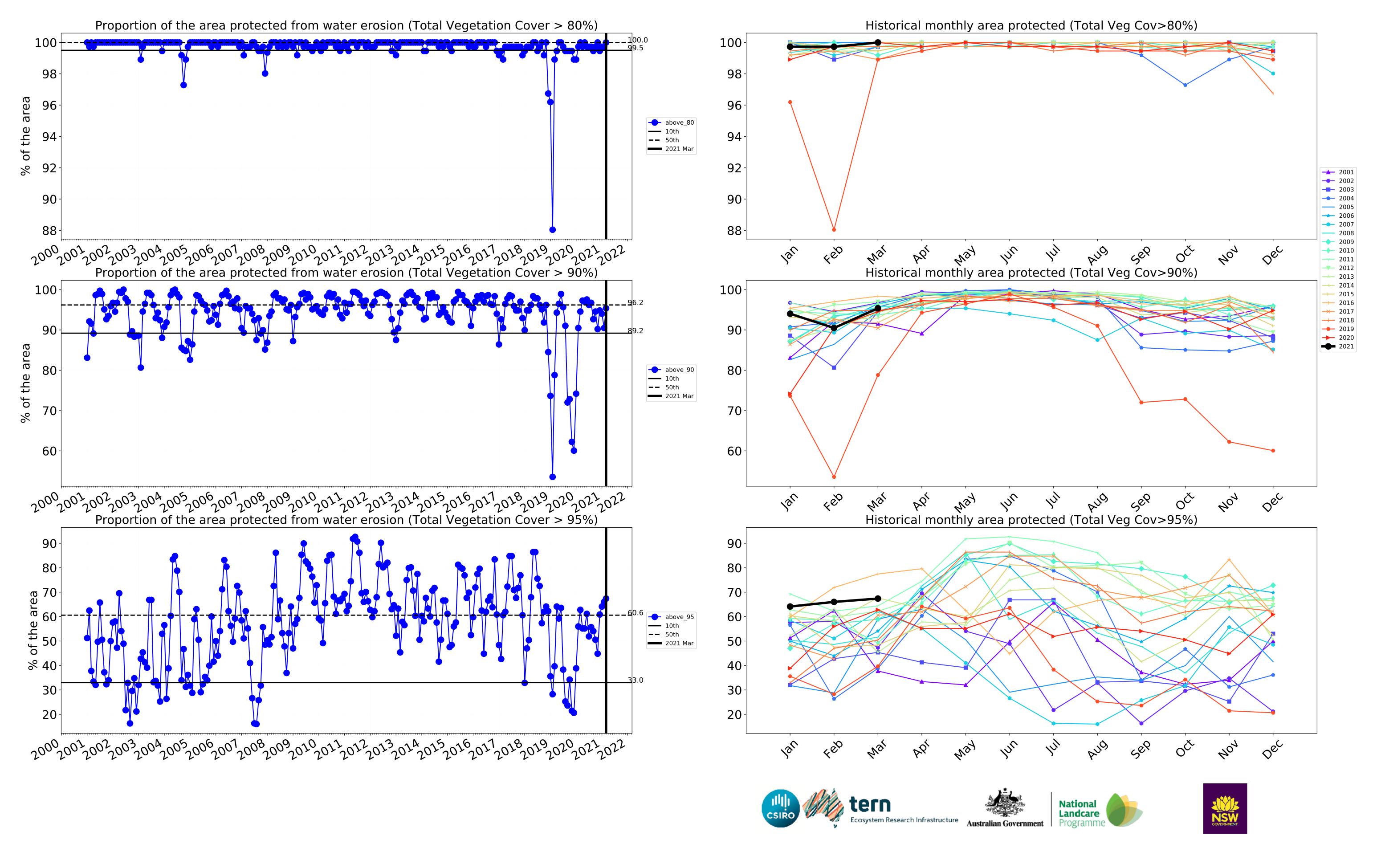




# Grazing - Forest (non woodland) timeseries



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

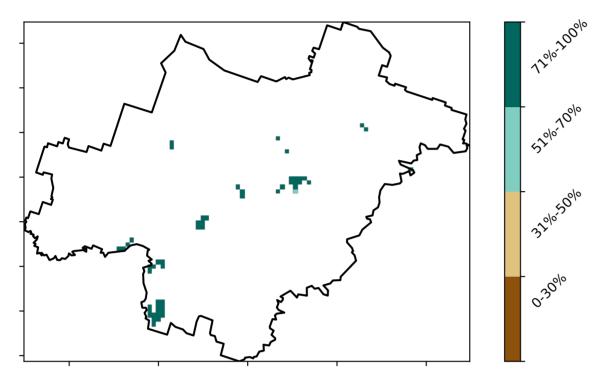


# Irrigation

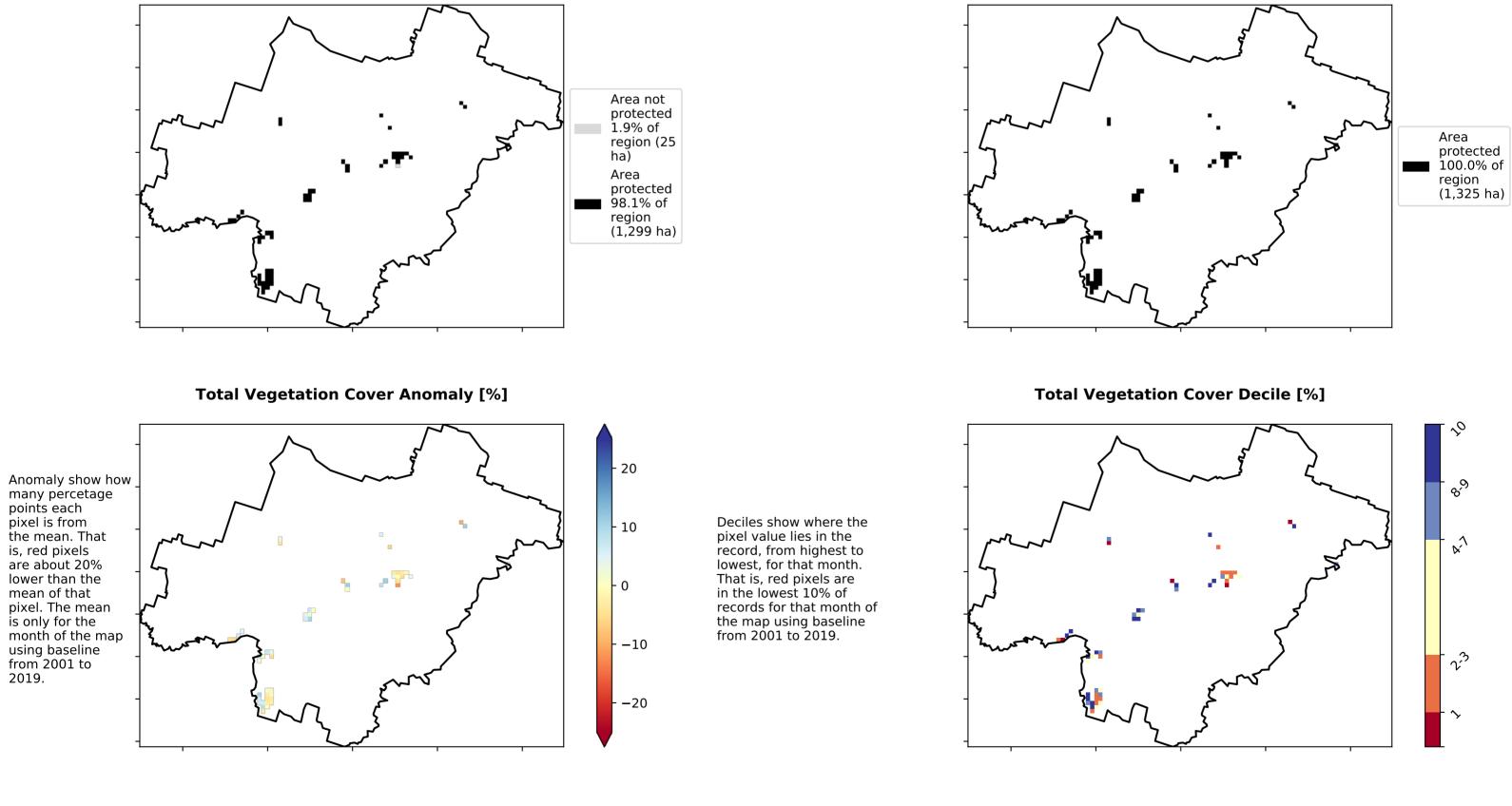
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 2 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated of Australia (2018)

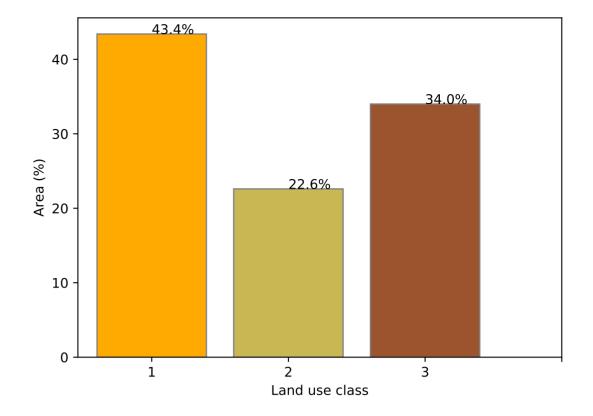
Land use and forest cover

**Total Vegetation Cover [%]** 



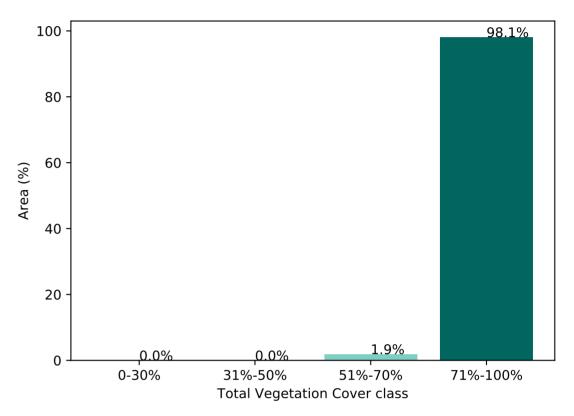
% Area protected from water erosion (>70%)



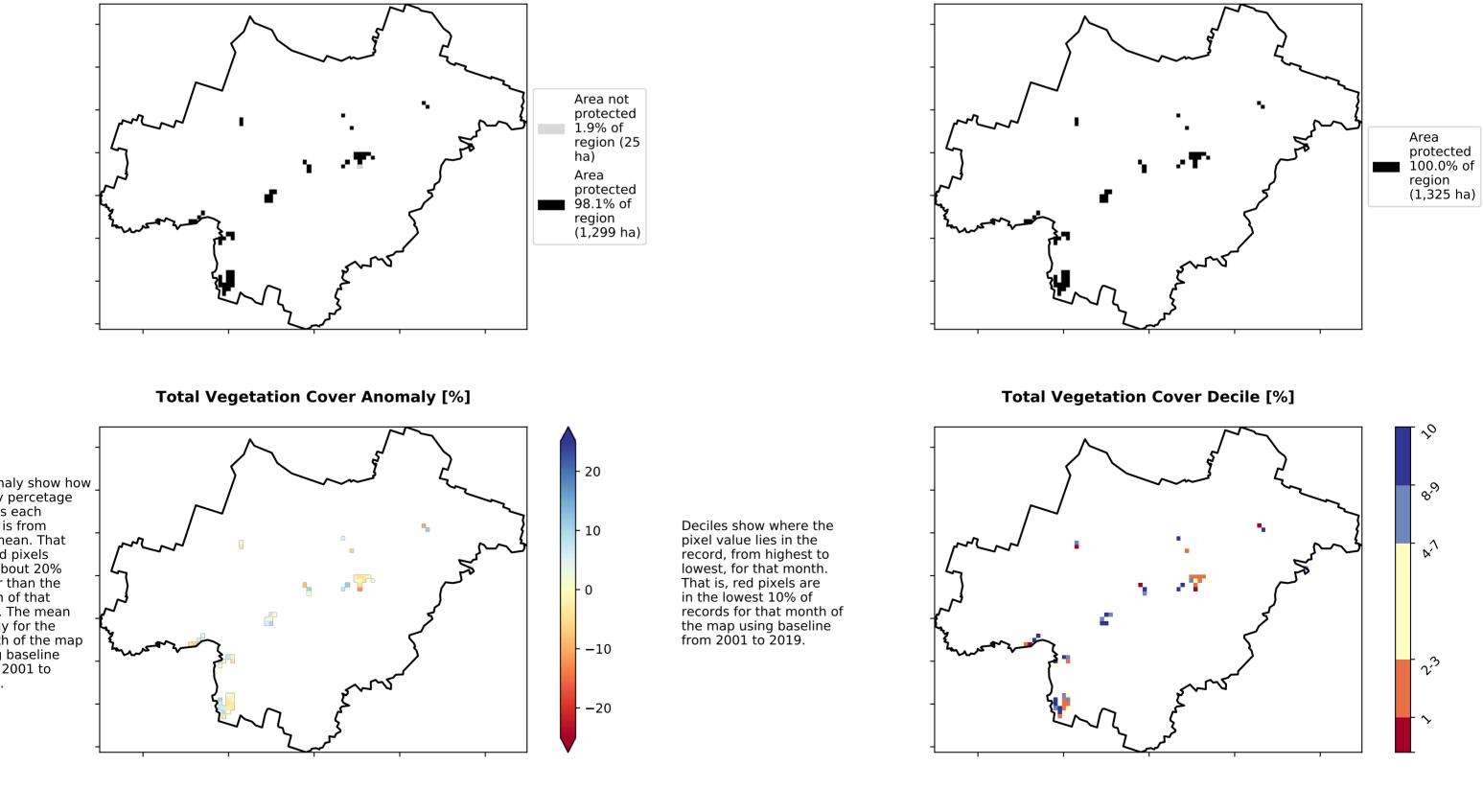


Proportion of each land class in area

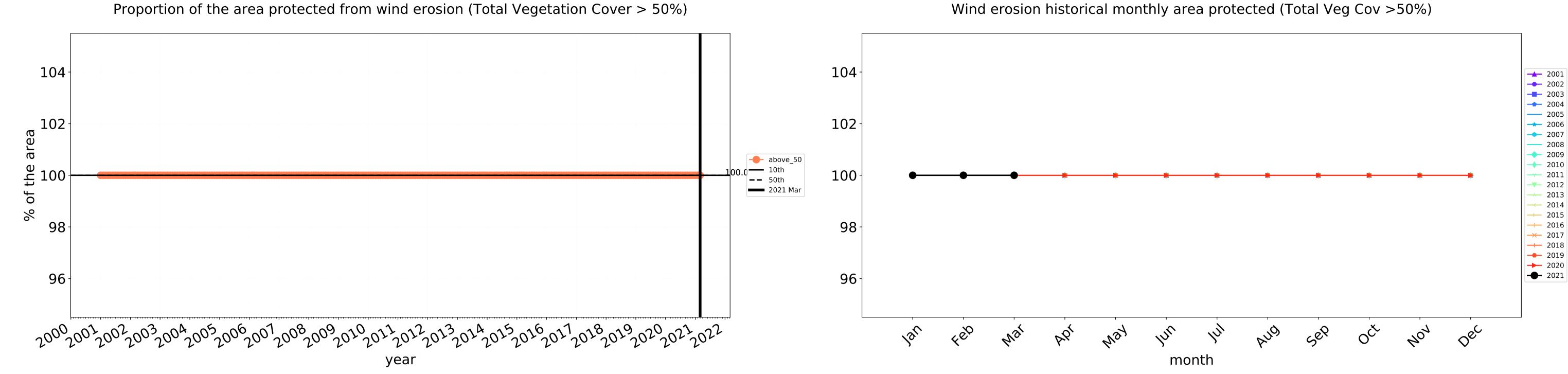
### Proportion of vegetation cover class in area

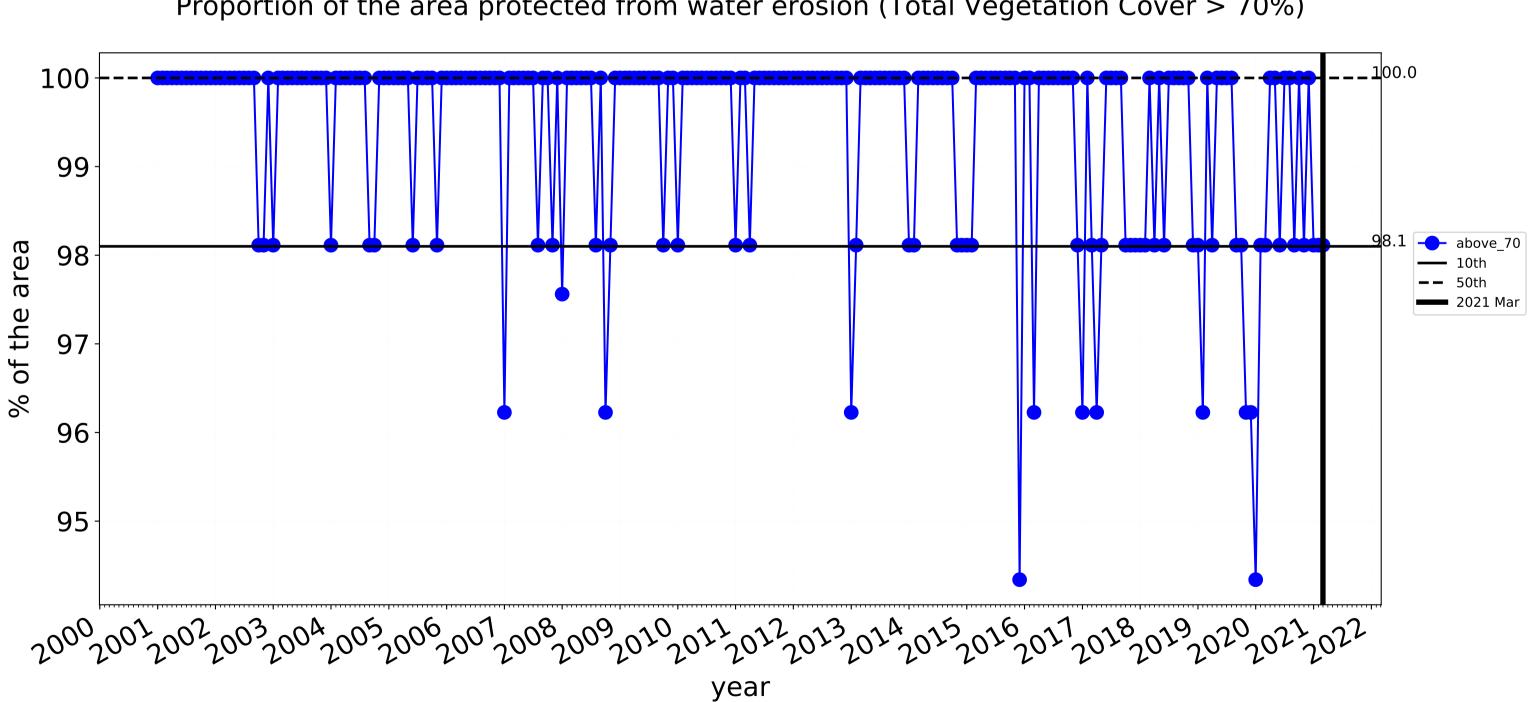


% Area protected from wind erosion (>50%)



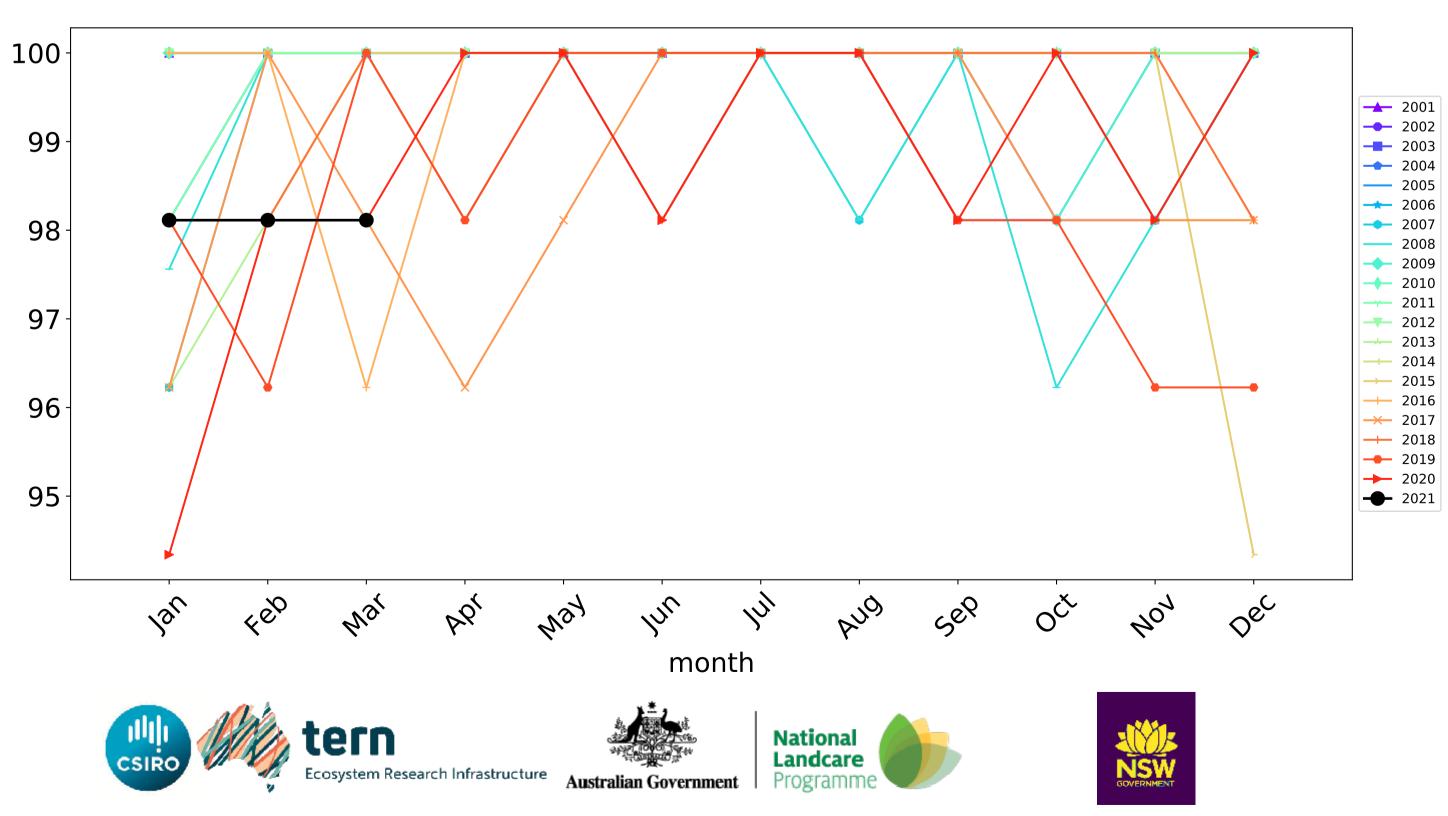


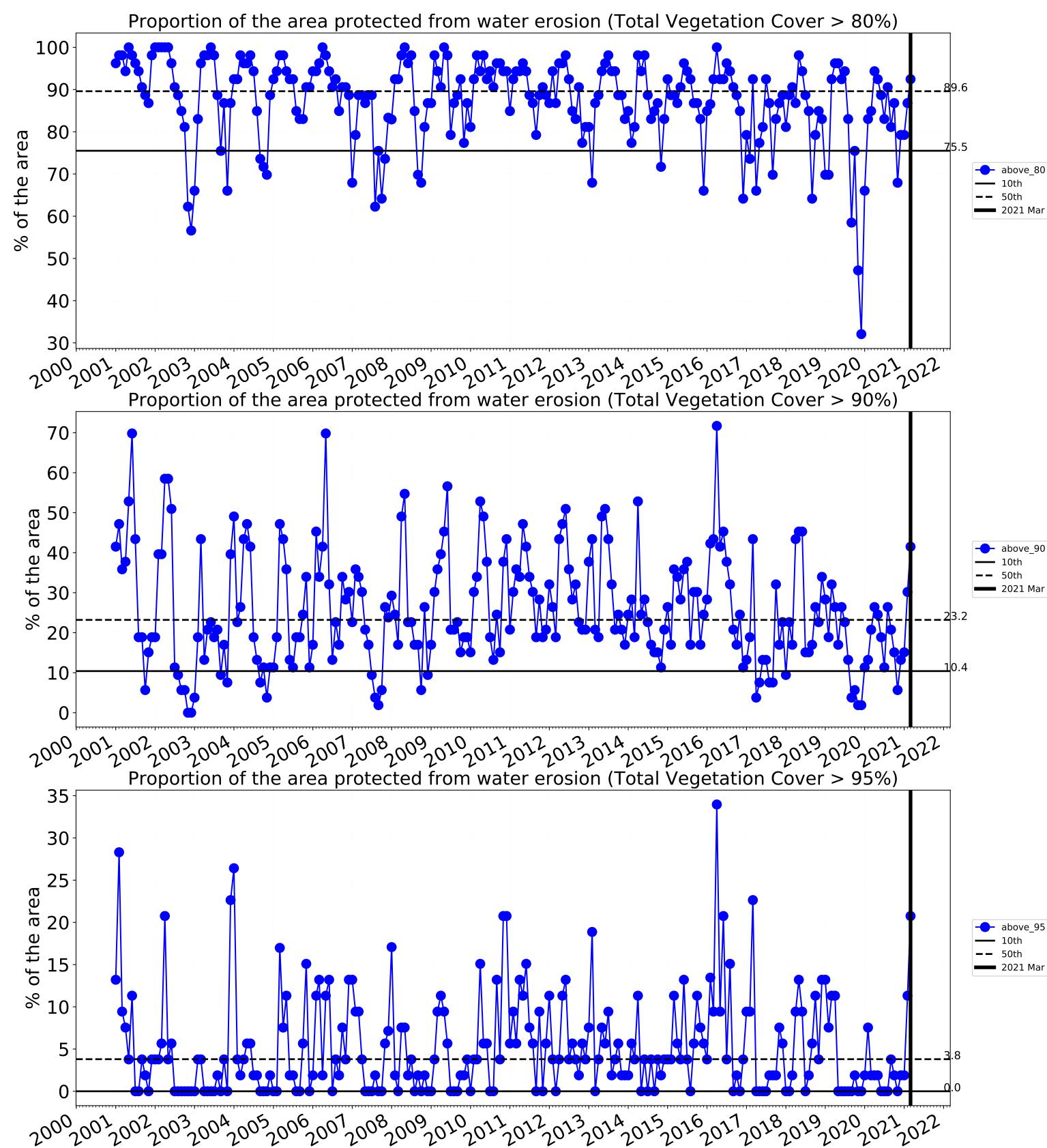


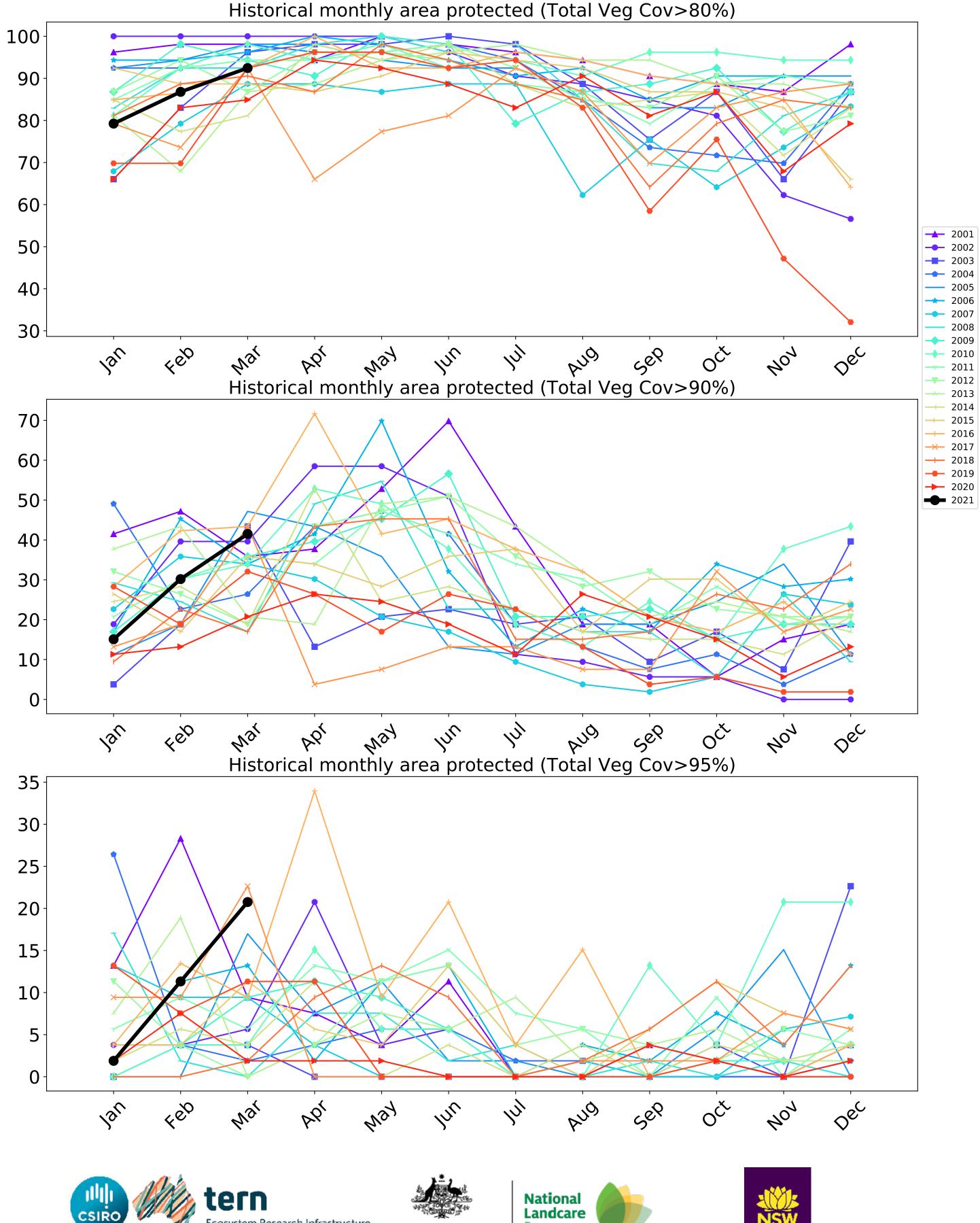


# Irrigation timeseries

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



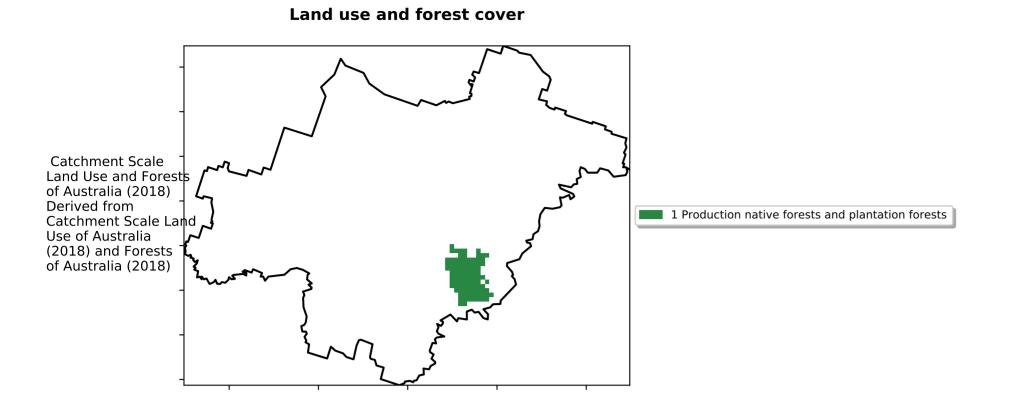




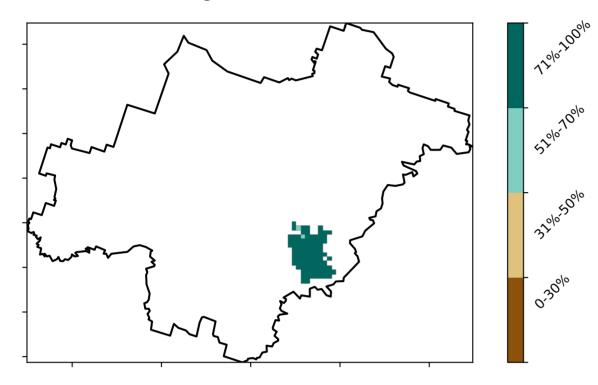
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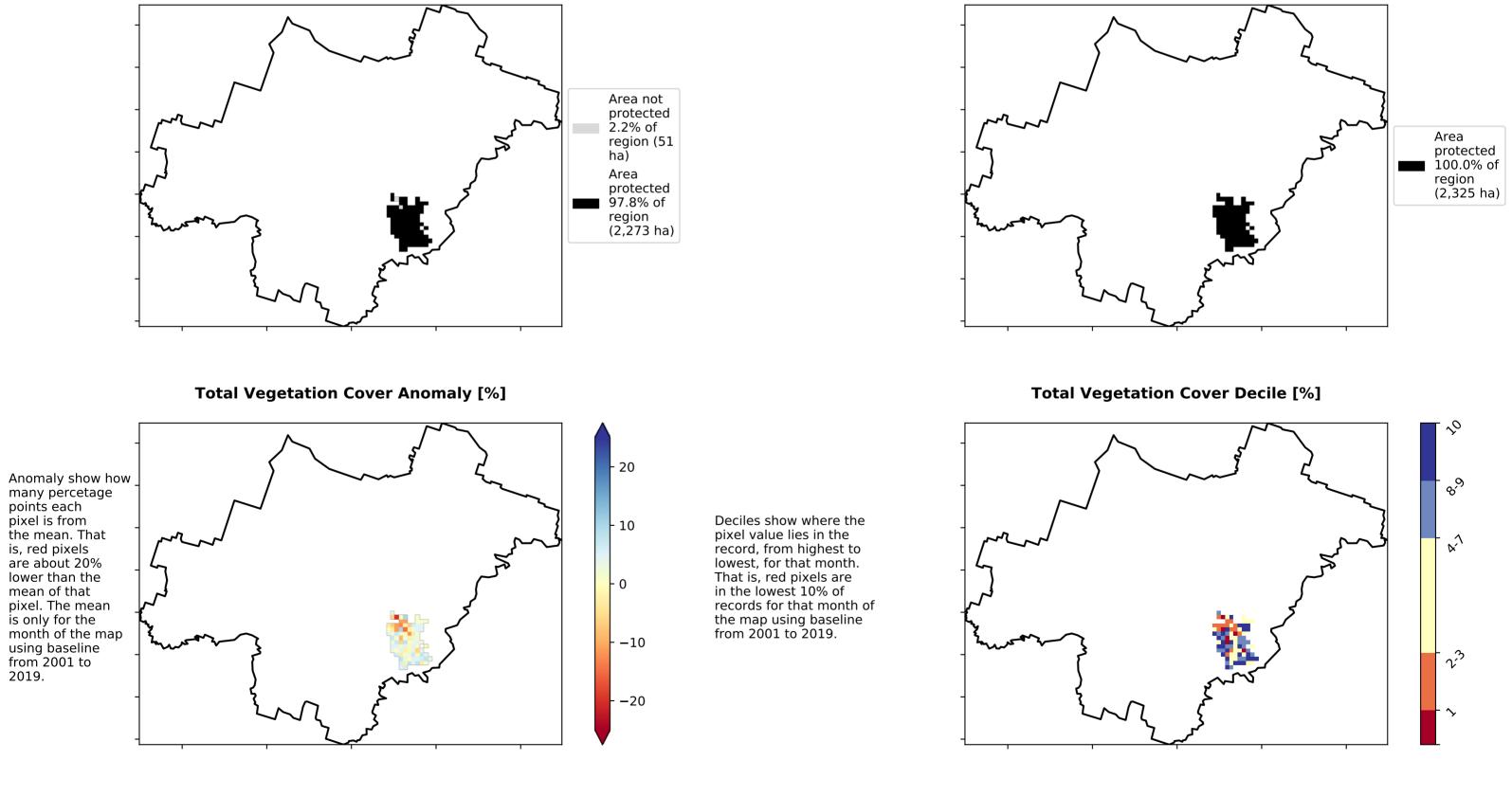
# **Production native forests and plantation forests**



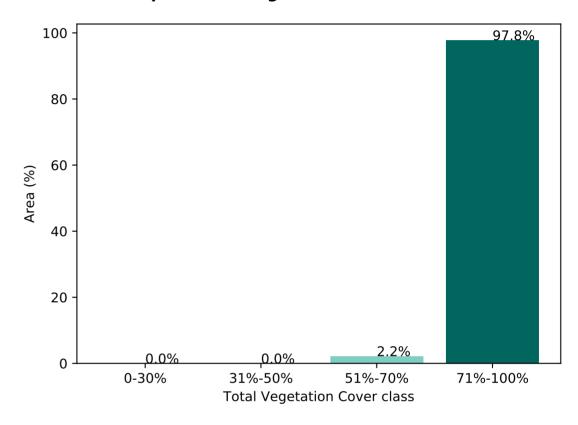
**Total Vegetation Cover [%]** 



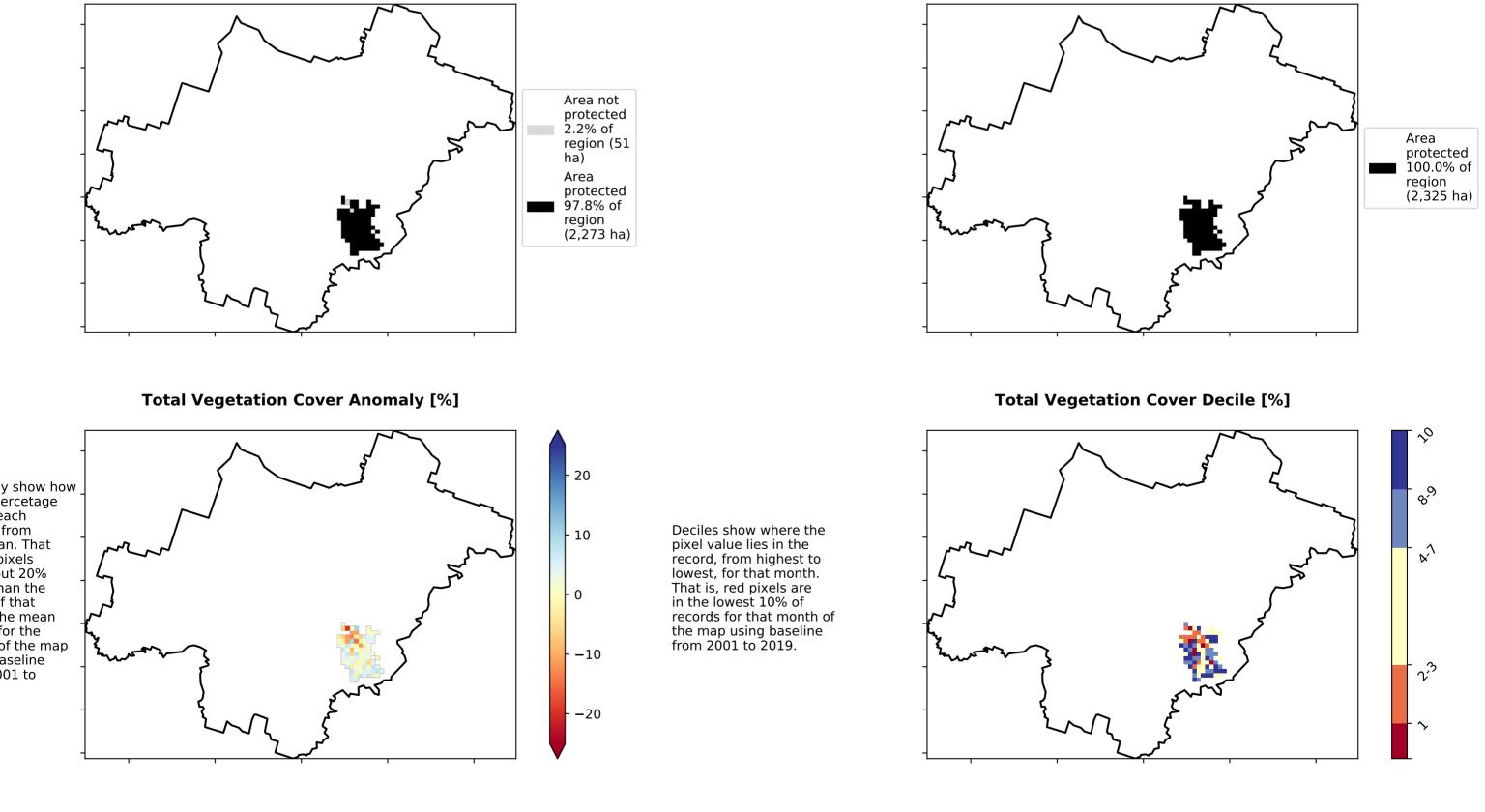
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

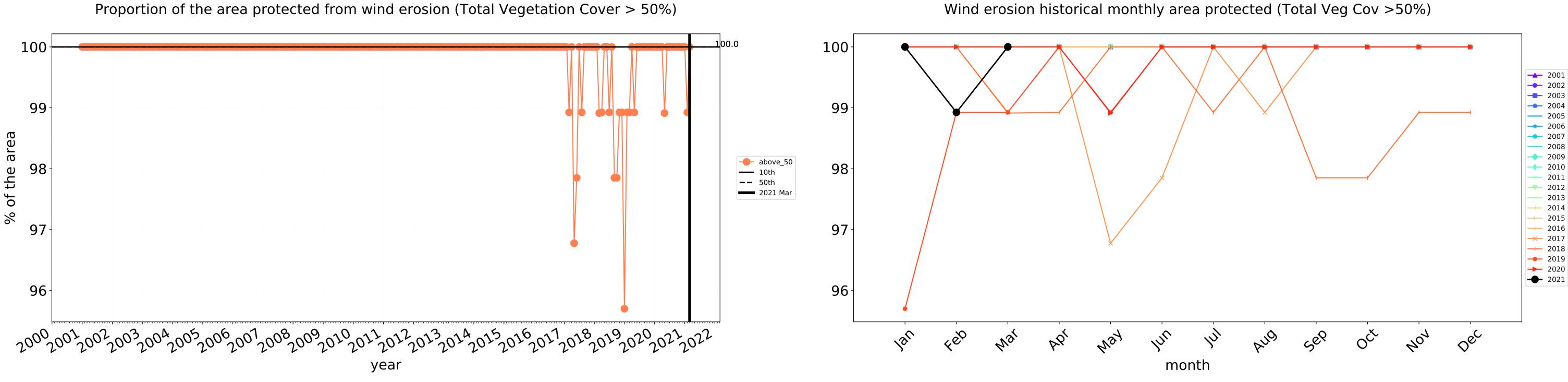


% Area protected from wind erosion (>50%)

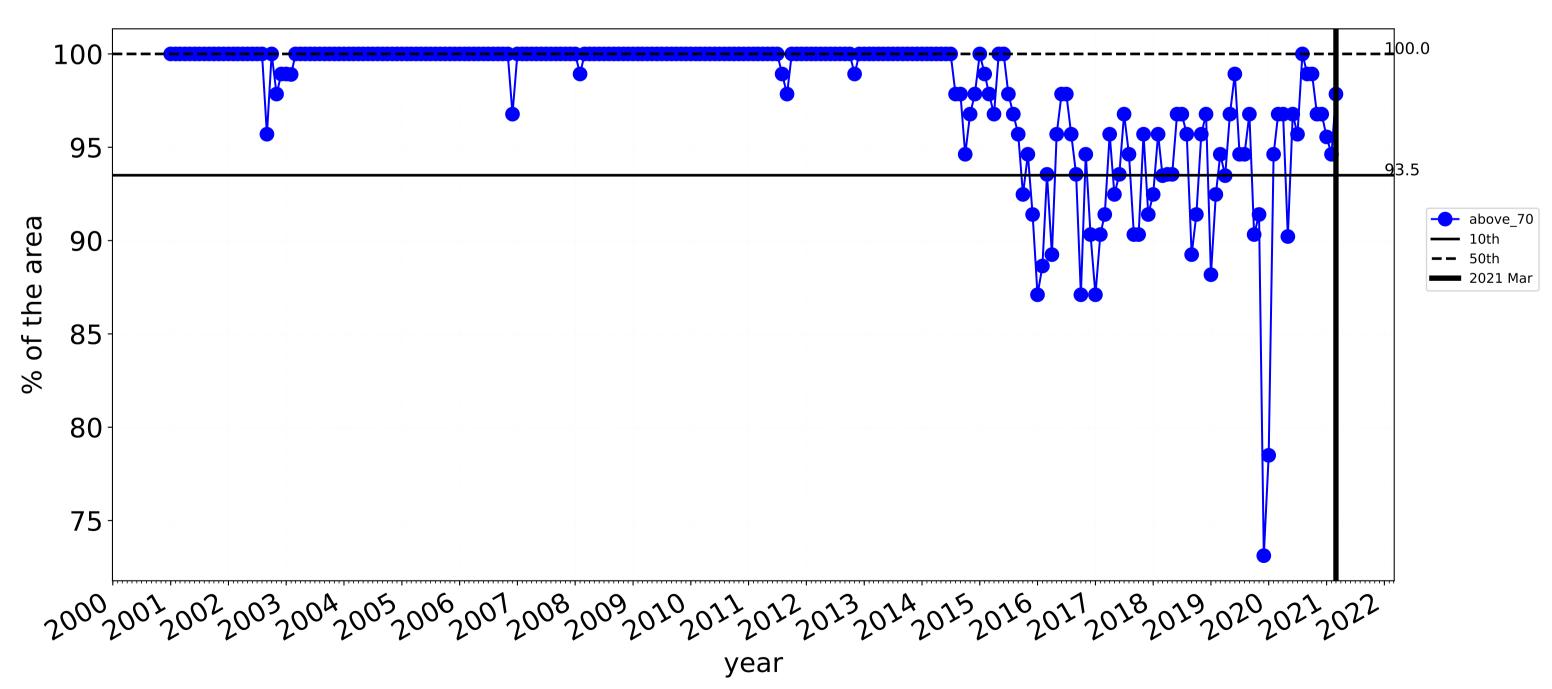




# **Production native forests and plantation forests timeseries**

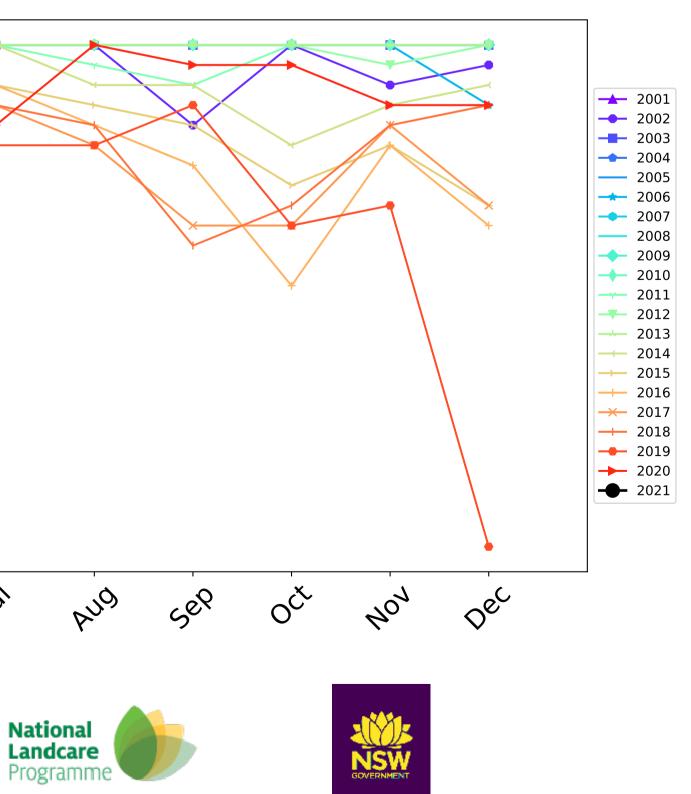


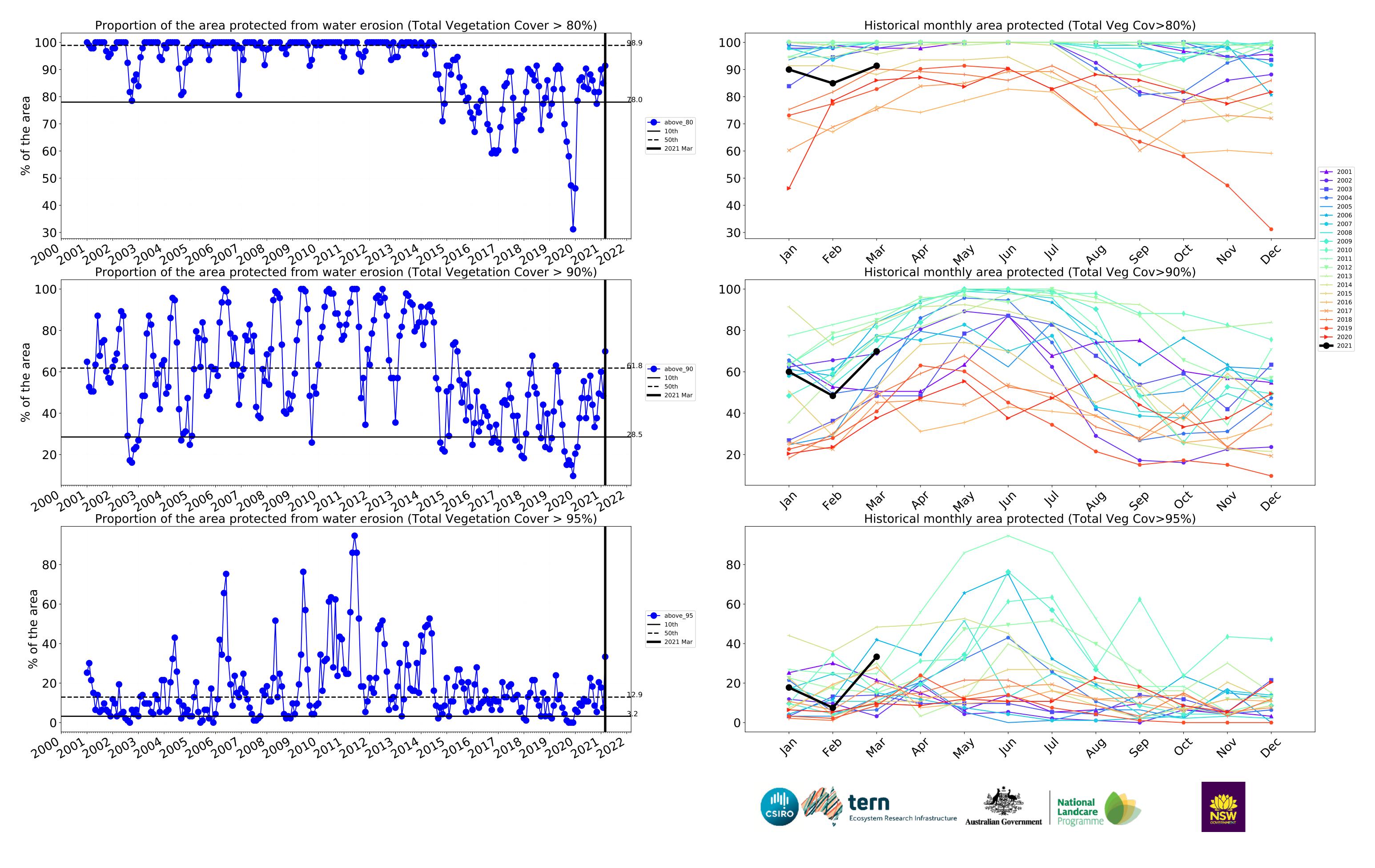
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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





# Logan\_(C) (total 95,800 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	95,800	100.0% 95,800	99.9% 95,675	96.6% 92,550	87.5% 83,800	62.5% 59,900	31.0% 29,700
Conservation and natural environments	10,775	100.0% 10,775	100.0% 10,775	99.5% 10,725	98.8% 10,650	90.5% 9,750	60.6% 6,525
Conservation and natural environments Woodland forest	2,675	100.0% 2,675	100.0% 2,675	100.0% 2,675	99.1% 2,650	92.5% 2,475	61.7% 1,650
Conservation and natural environments Forest (non woodland)	7,950	100.0% 7,950	100.0% 7,950	99.4% 7,900	99.1% 7,875	90.3% 7,175	61.0% 4,850
Agriculture	31,325	100.0% 31,325	100.0% 31,325	99.8% 31,275	97.2% 30,450	76.5% 23,950	42.9% 13,450
Grazing	29,800	100.0% 29,800	100.0% 29,800	99.9% 29,775	97.5% 29,050	78.4% 23,375	44.2% 13,175
Grazing non forest	14,825	100.0% 14,825	100.0% 14,825	99.8% 14,800	95.1% 14,100	64.1% 9,500	26.6% 3,950
Grazing Woodland forest	5,775	100.0% 5,775	100.0% 5,775	100.0% 5,775	99.6% 5,750	88.3% 5,100	52.4% 3,025
Grazing - Forest (non woodland)	9,200	100.0% 9,200	100.0% 9,200	100.0% 9,200	100.0% 9,200	95.4% 8,775	67.4% 6,200
Irrigation	1,325	100.0% 1,325	100.0% 1,325	98.1% 1,300	92.5% 1,225	41.5% 550	20.8% 275
Production native forests and plantation forests	2,325	100.0% 2,325	100.0% 2,325	97.8% 2,275	91.4% 2,125	69.9% 1,625	33.3% 775

