Total vegetation cover soil protection Region:NRM Hunter NSW

Date: July 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 Jul 2021

Land use and forest cover

Proportion of each land class in area

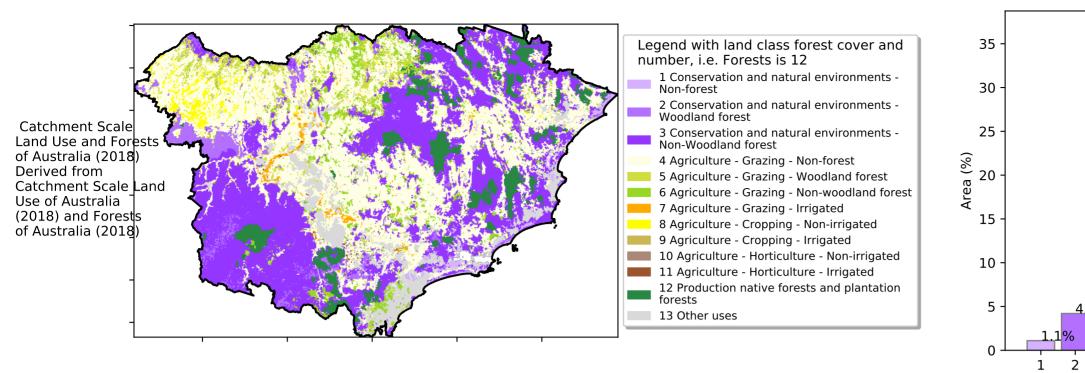
36.9%

32.7%

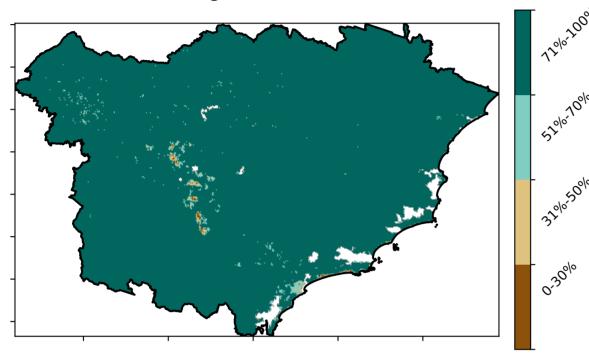
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4

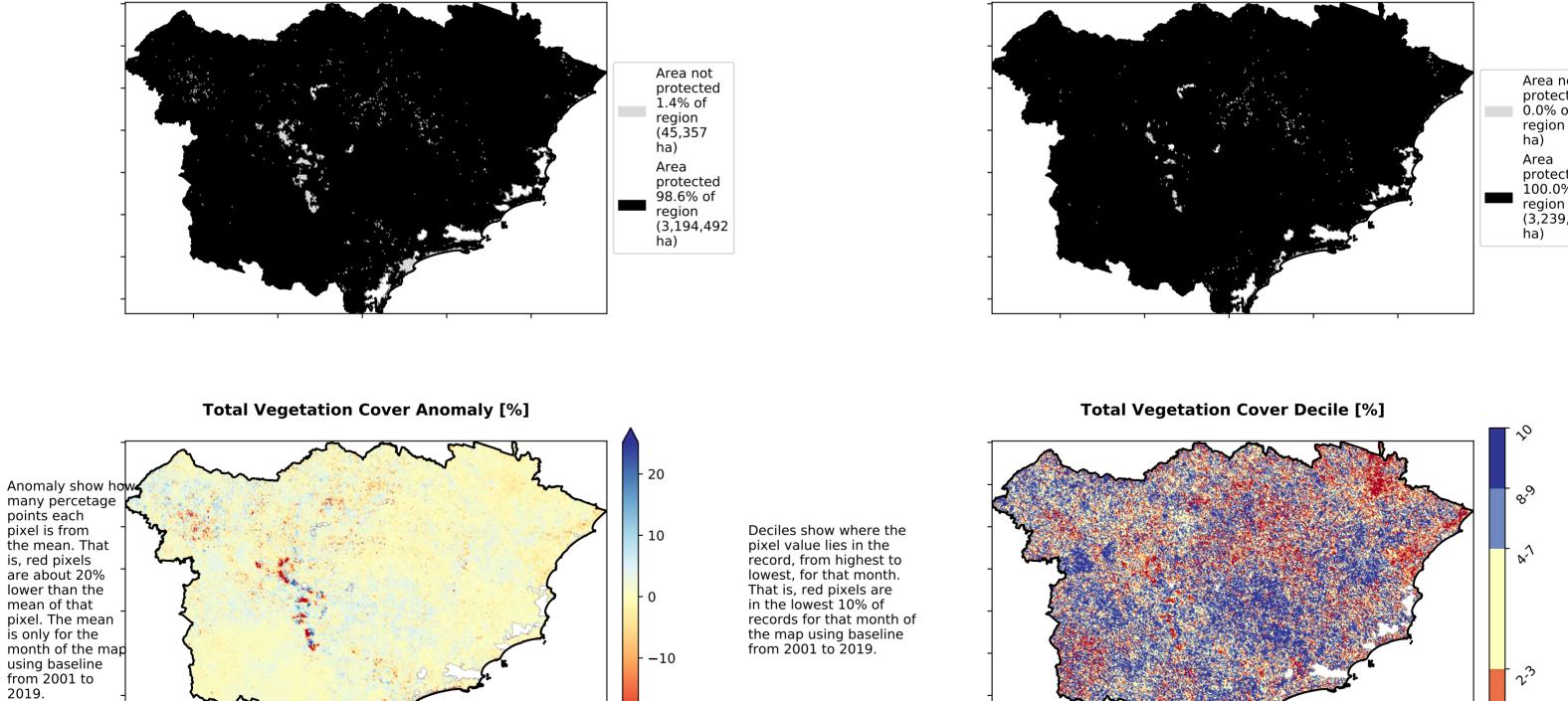
5



Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

7

Land use class

8

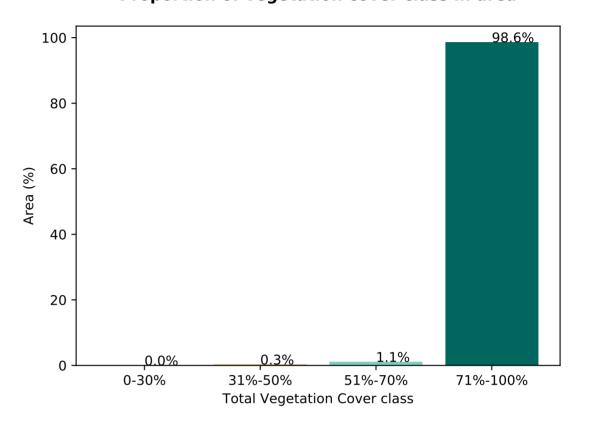
9

5.1%

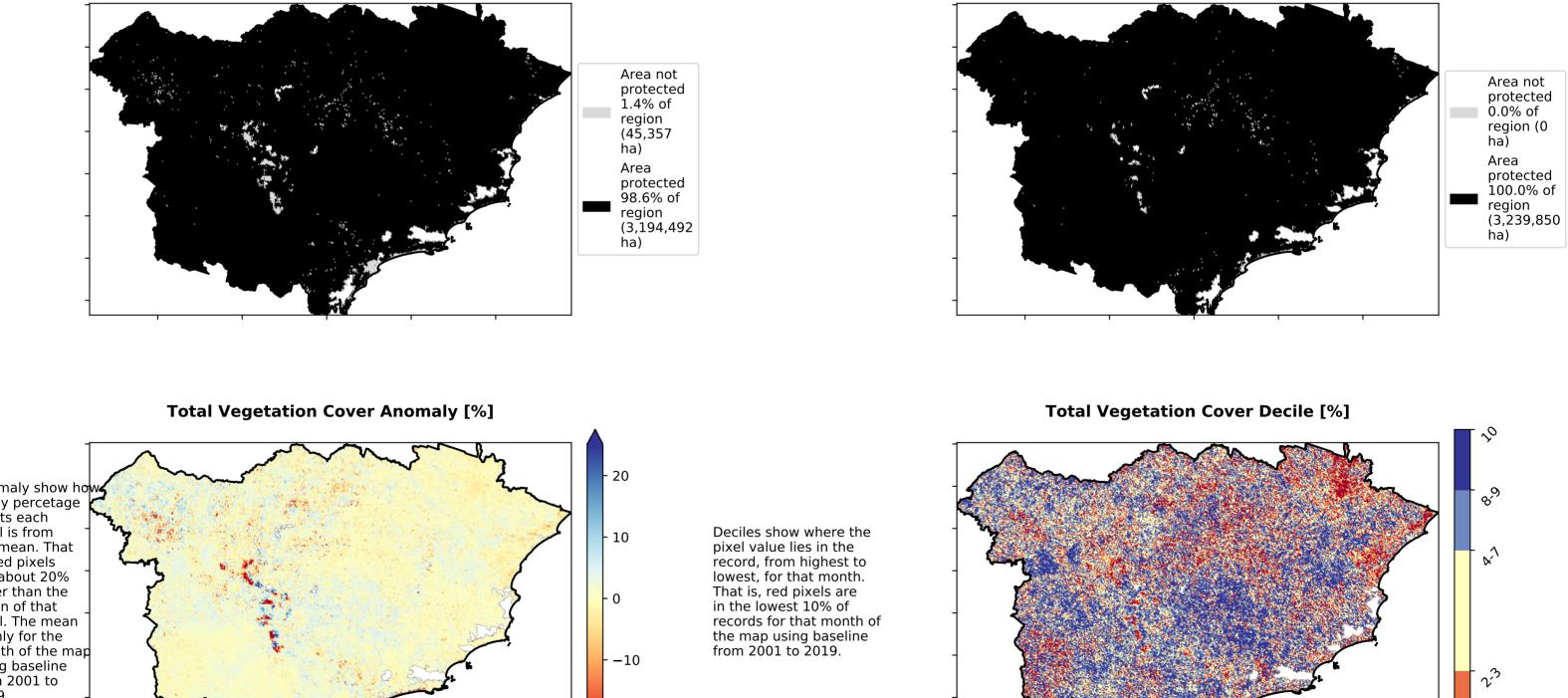
6

5.6%7.2%

10 11 12 13

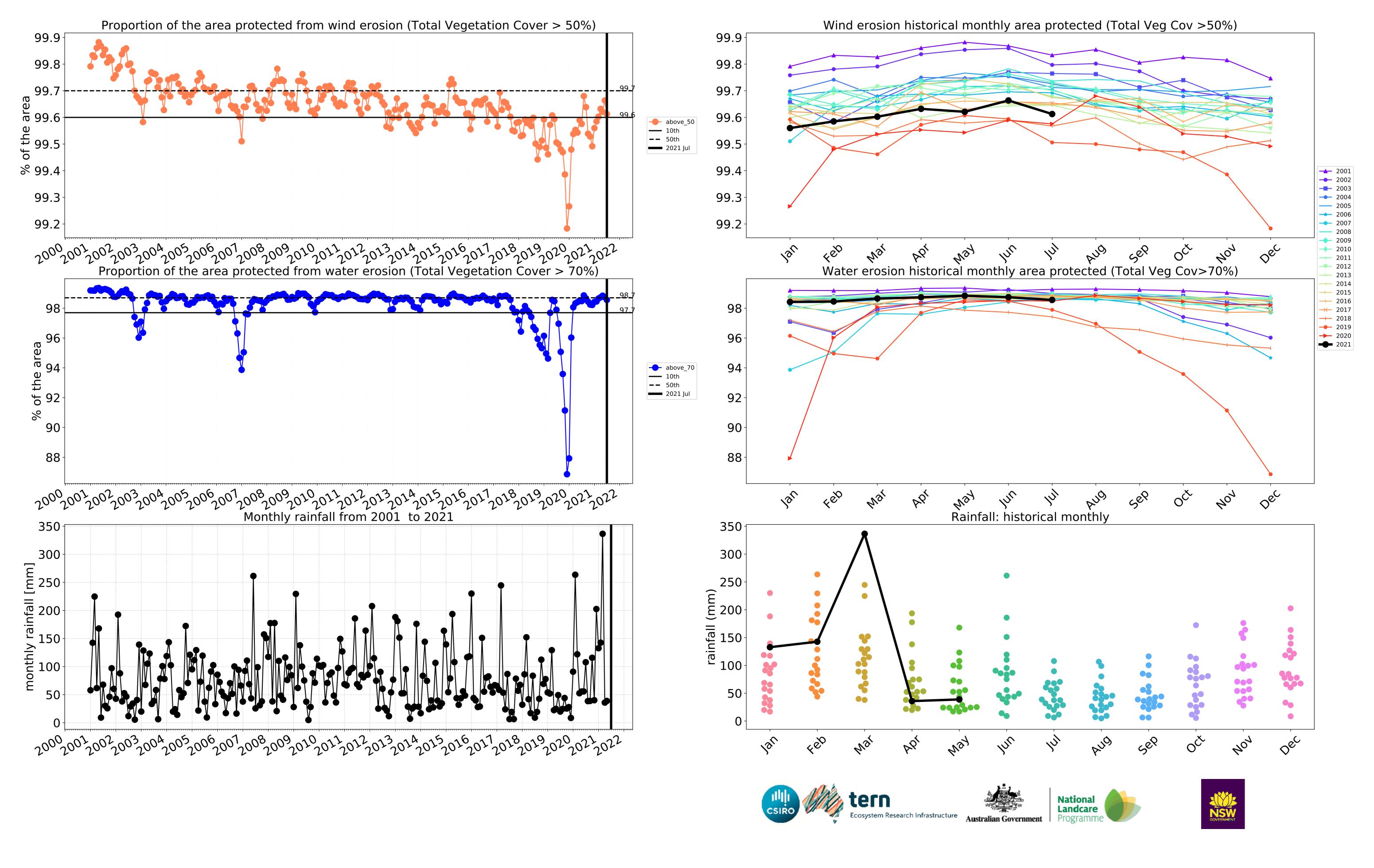


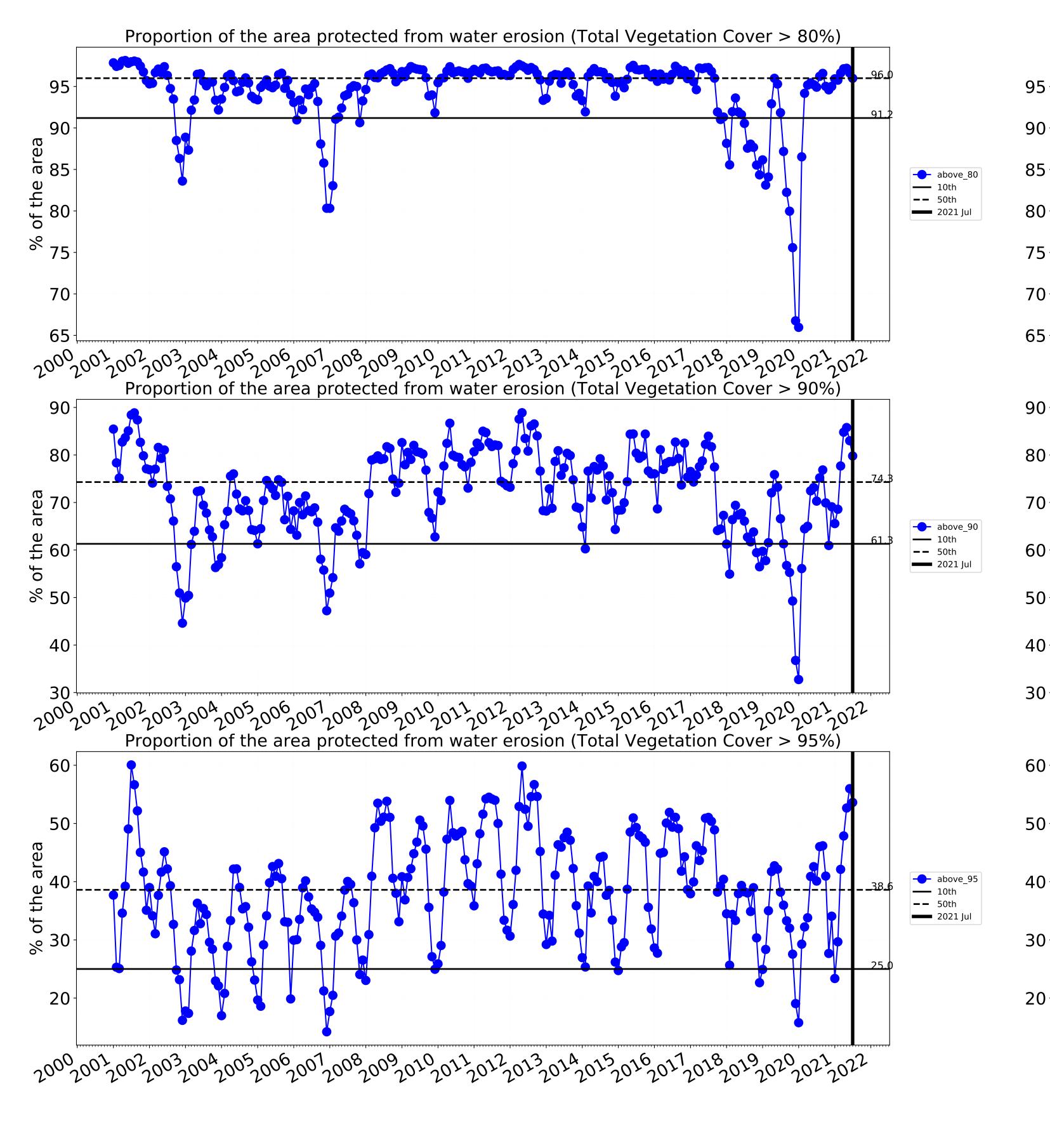
% Area protected from wind erosion (>50%)

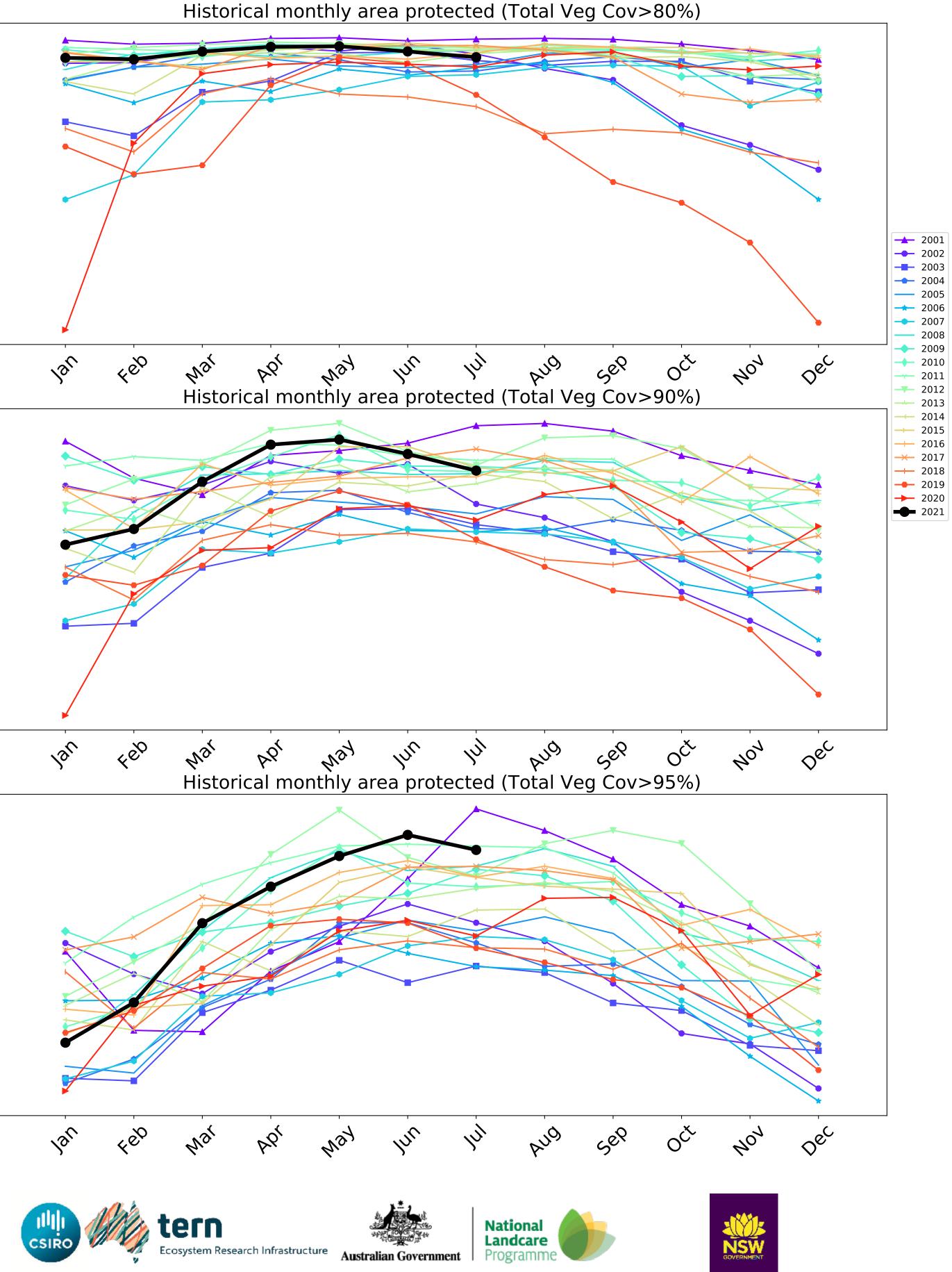




-20

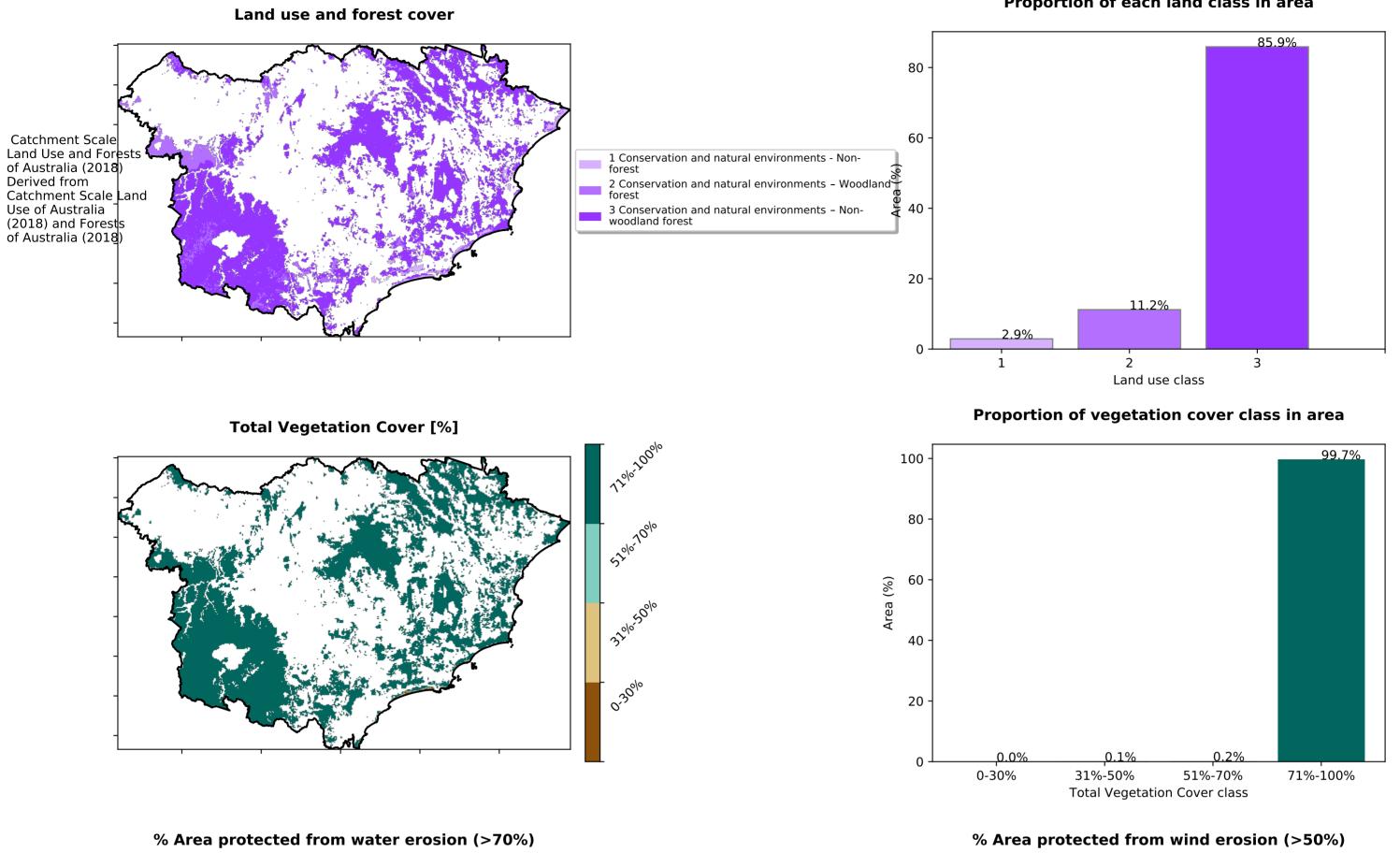




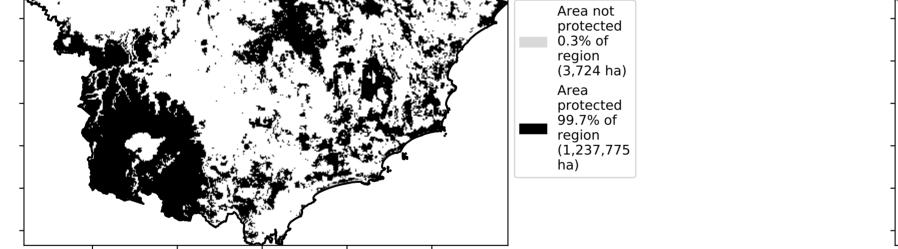




Conservation and natural environments

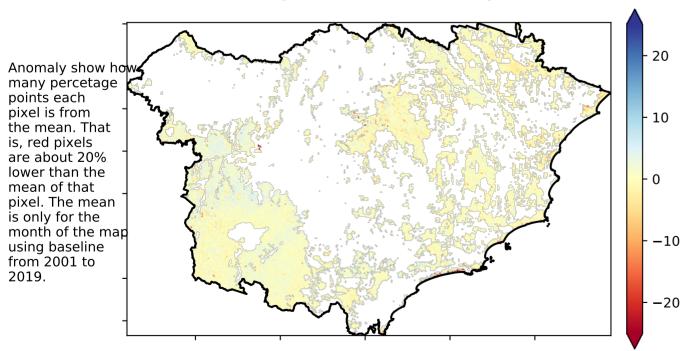


Proportion of each land class in area



Area not protected 0.0% of region (0 ha) Area protected 100.0% of region (1,241,500 ha)

Total Vegetation Cover Anomaly [%]



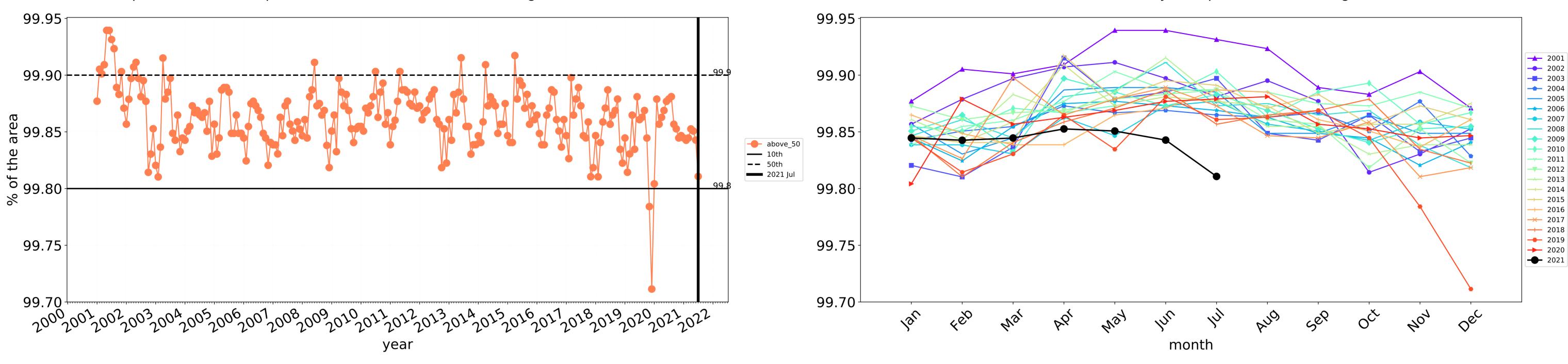
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

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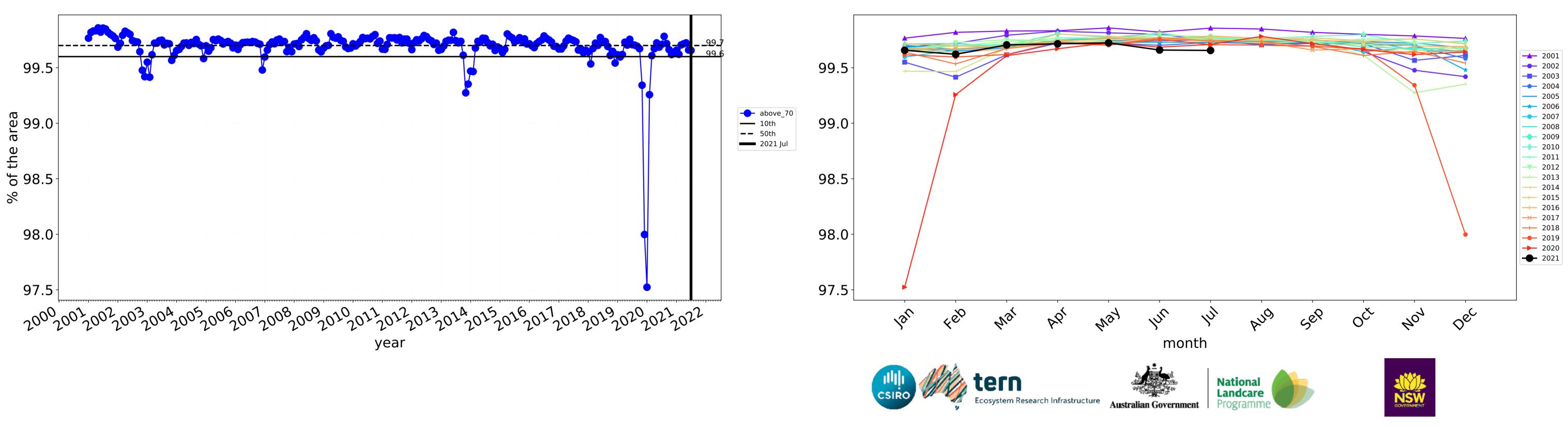
Total Vegetation Cover Decile [%]



8

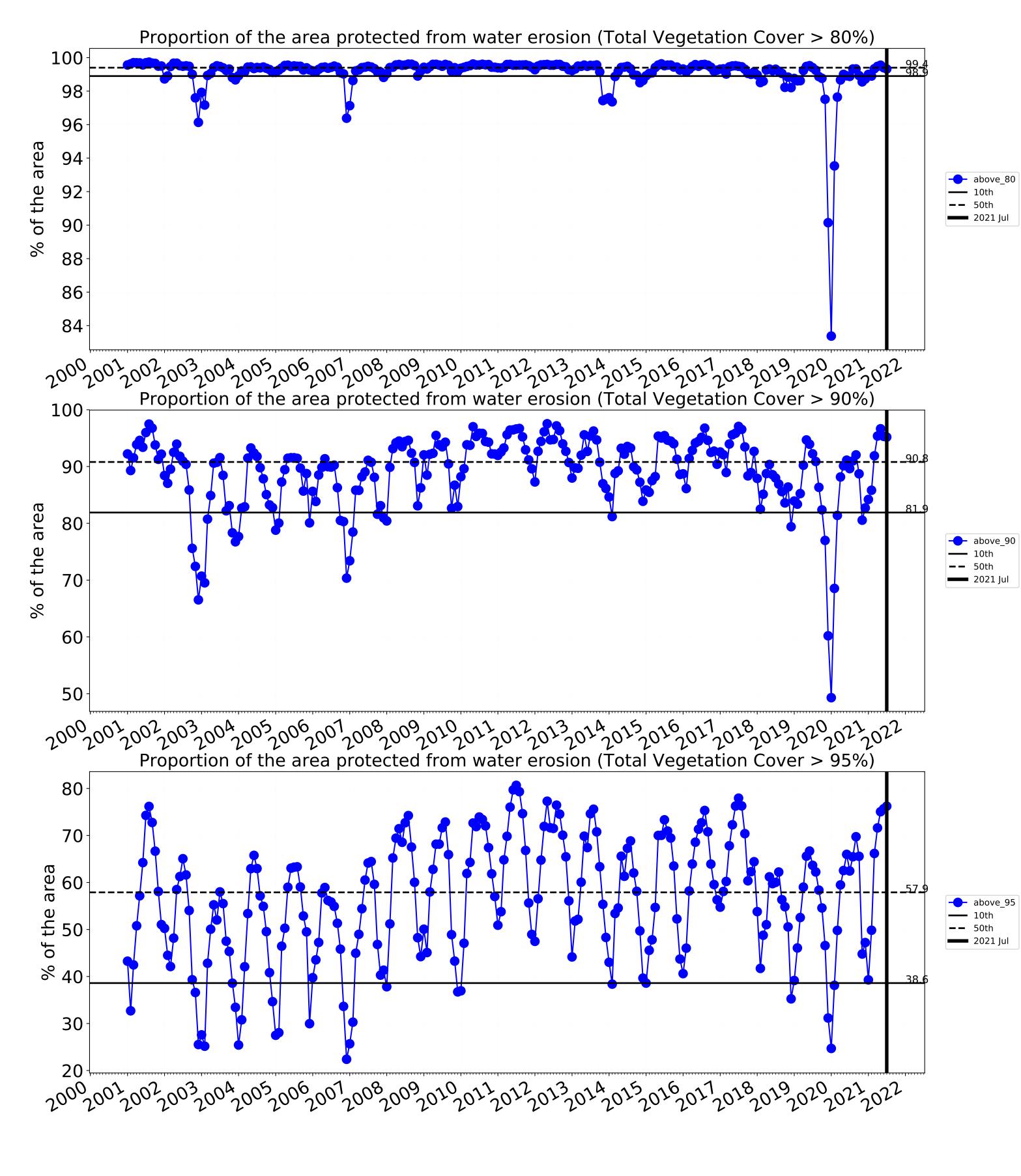


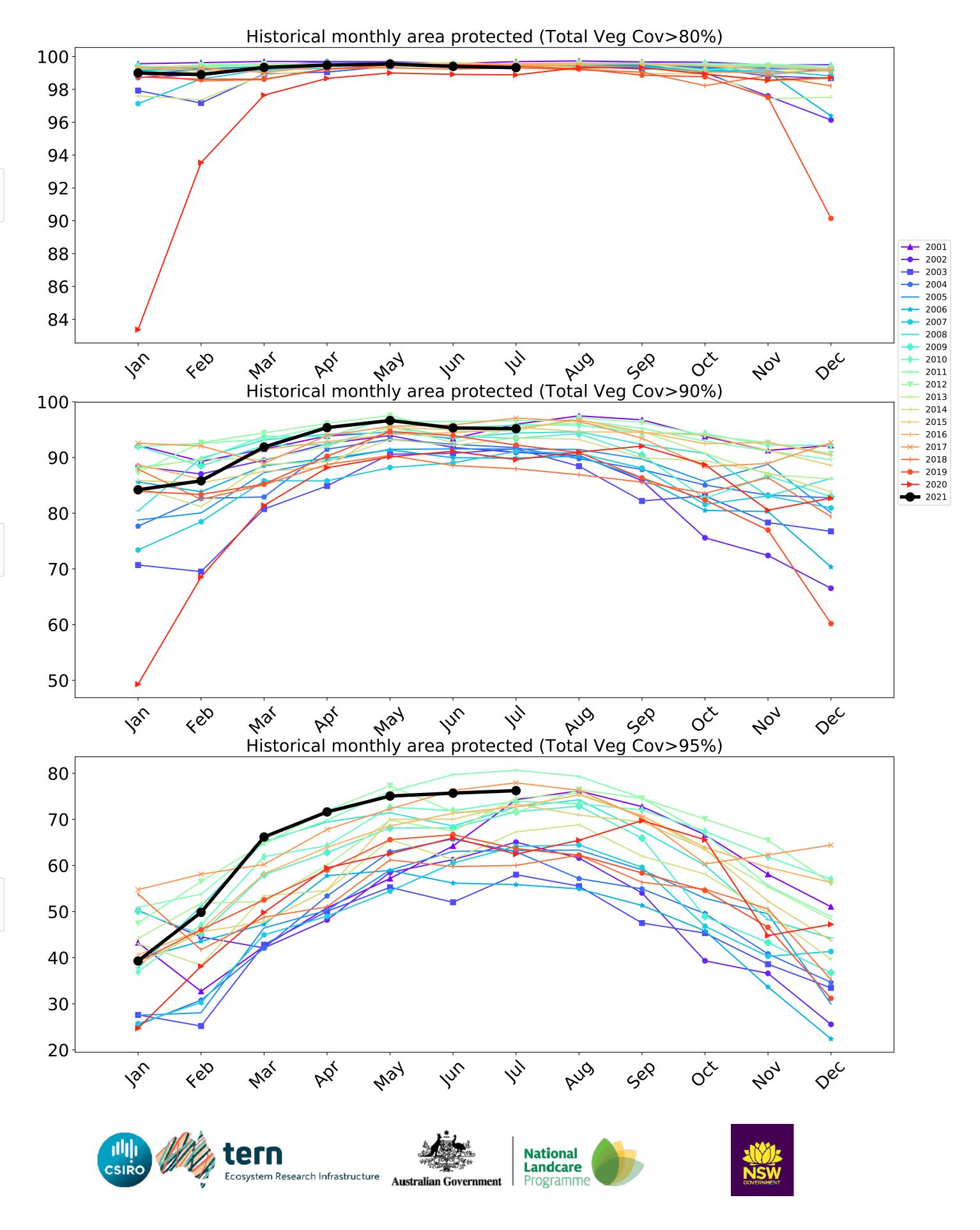
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



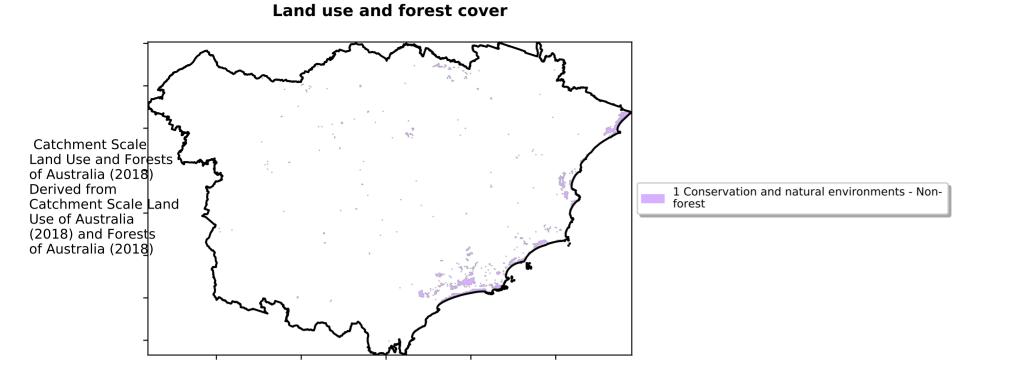
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

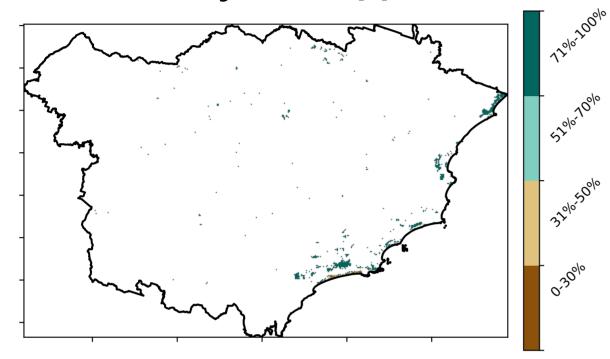




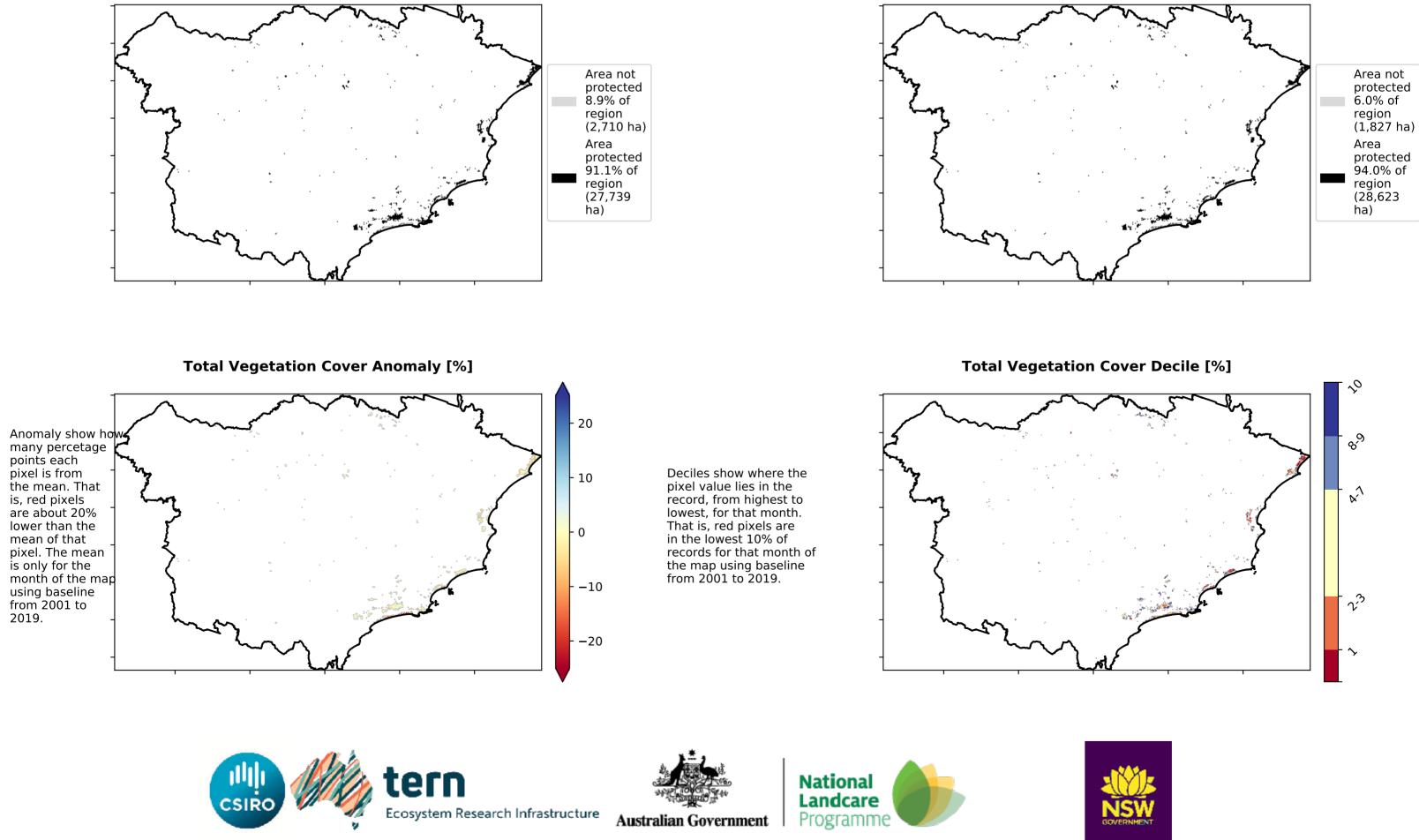
Conservation and natural environments non forest



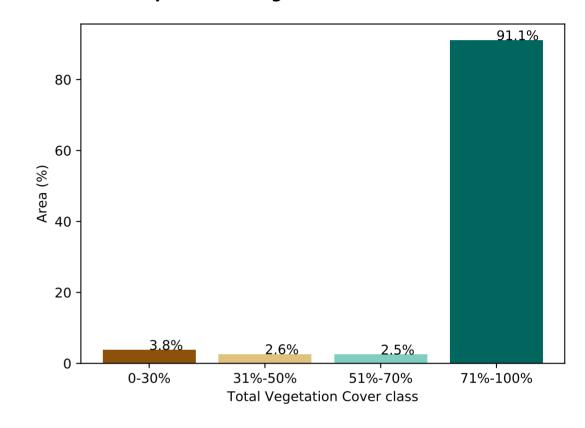
Total Vegetation Cover [%]



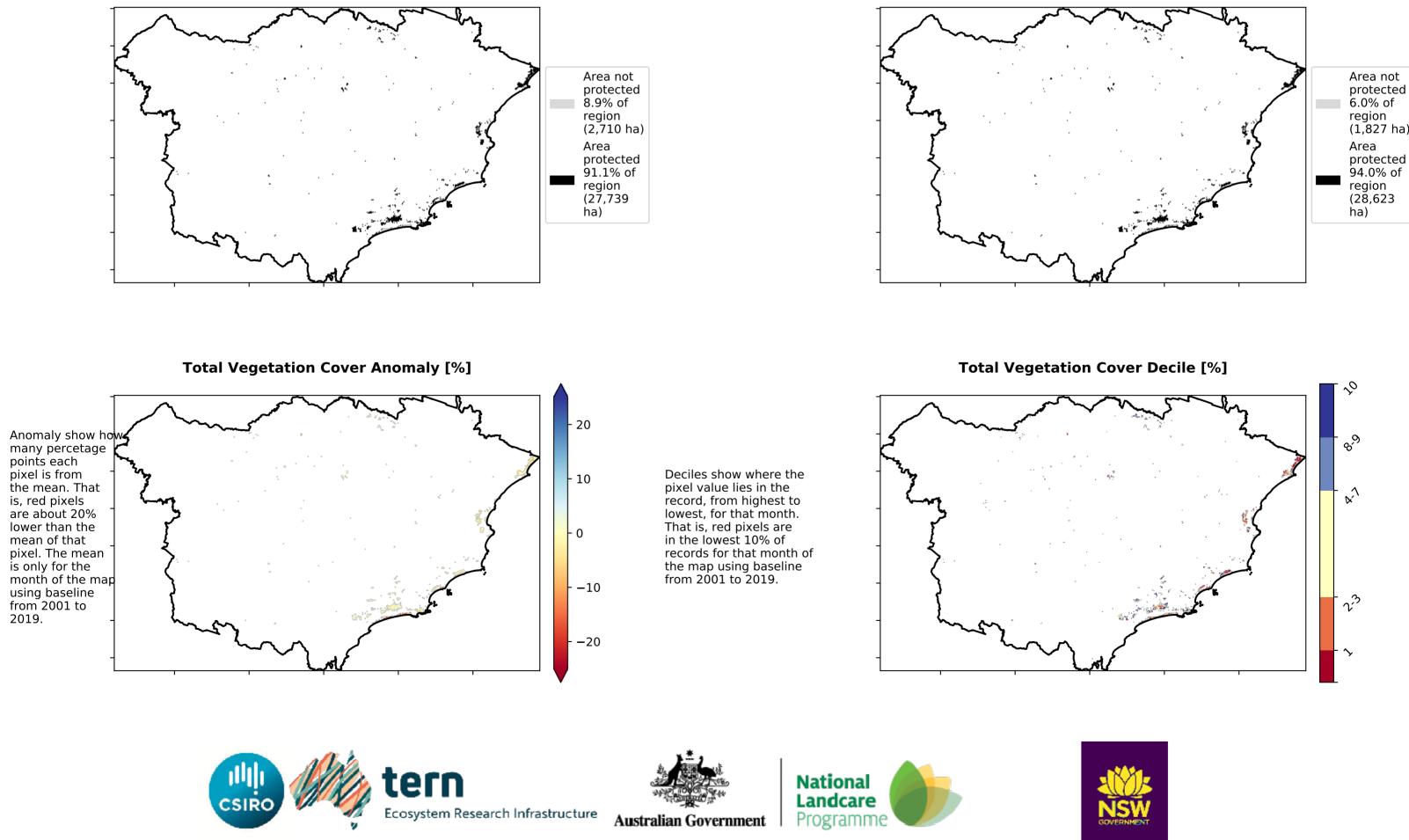
% Area protected from water erosion (>70%)

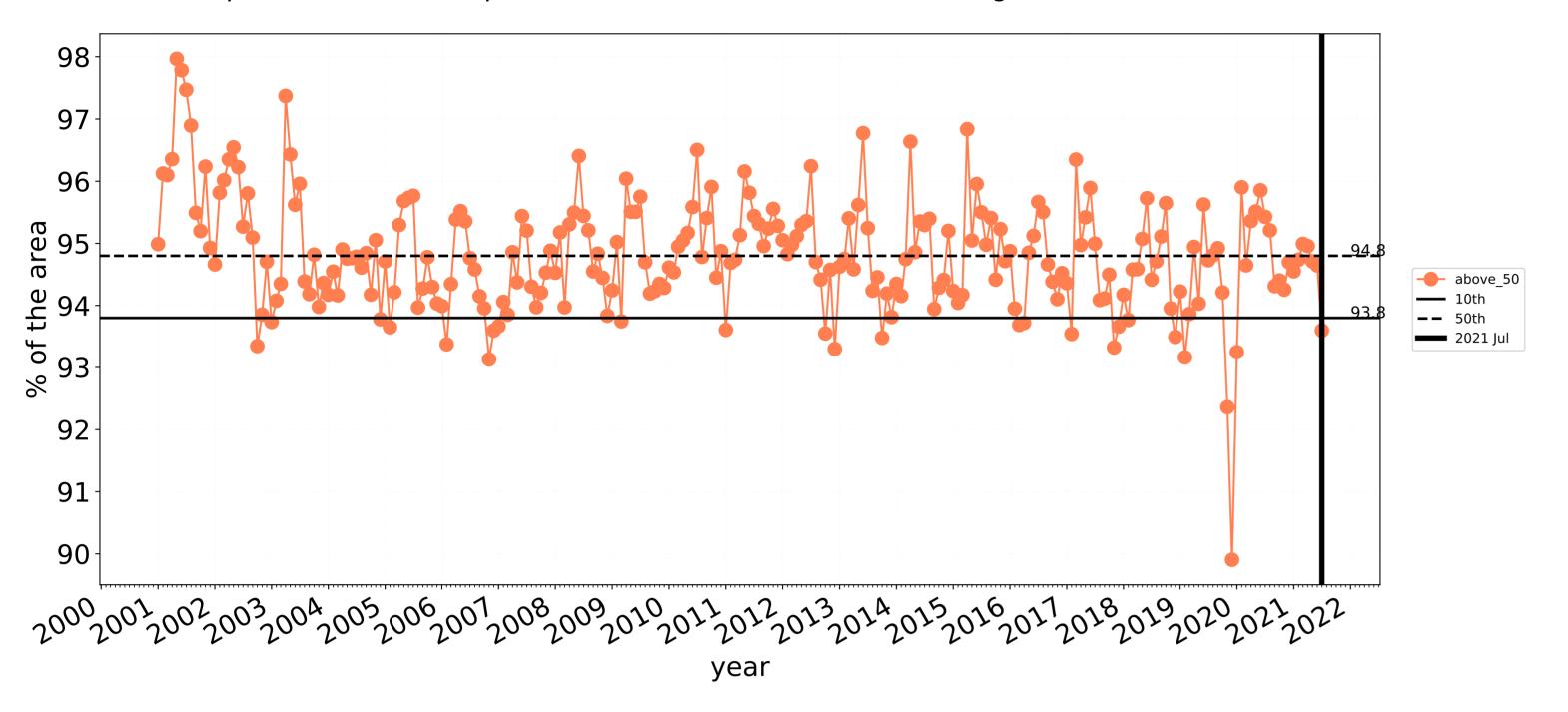


Proportion of vegetation cover class in area

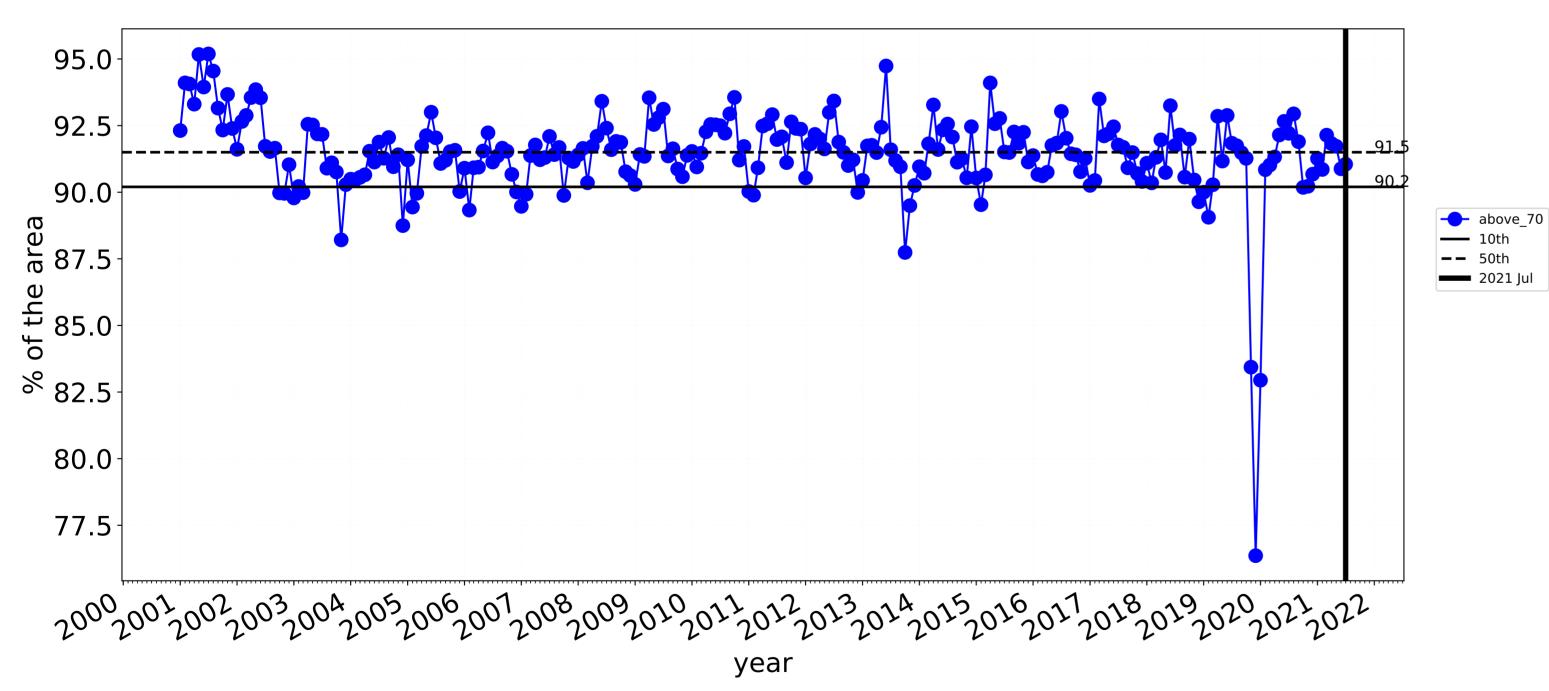


% Area protected from wind erosion (>50%)



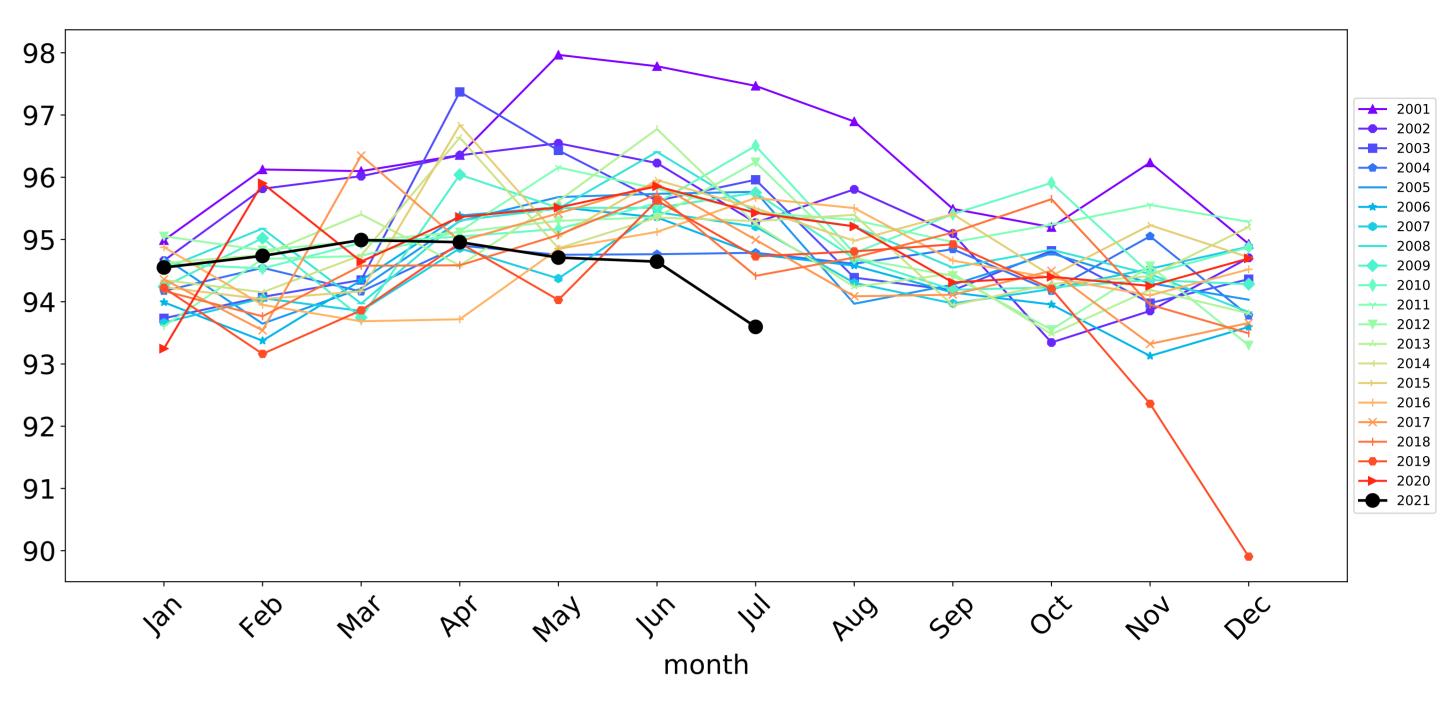


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

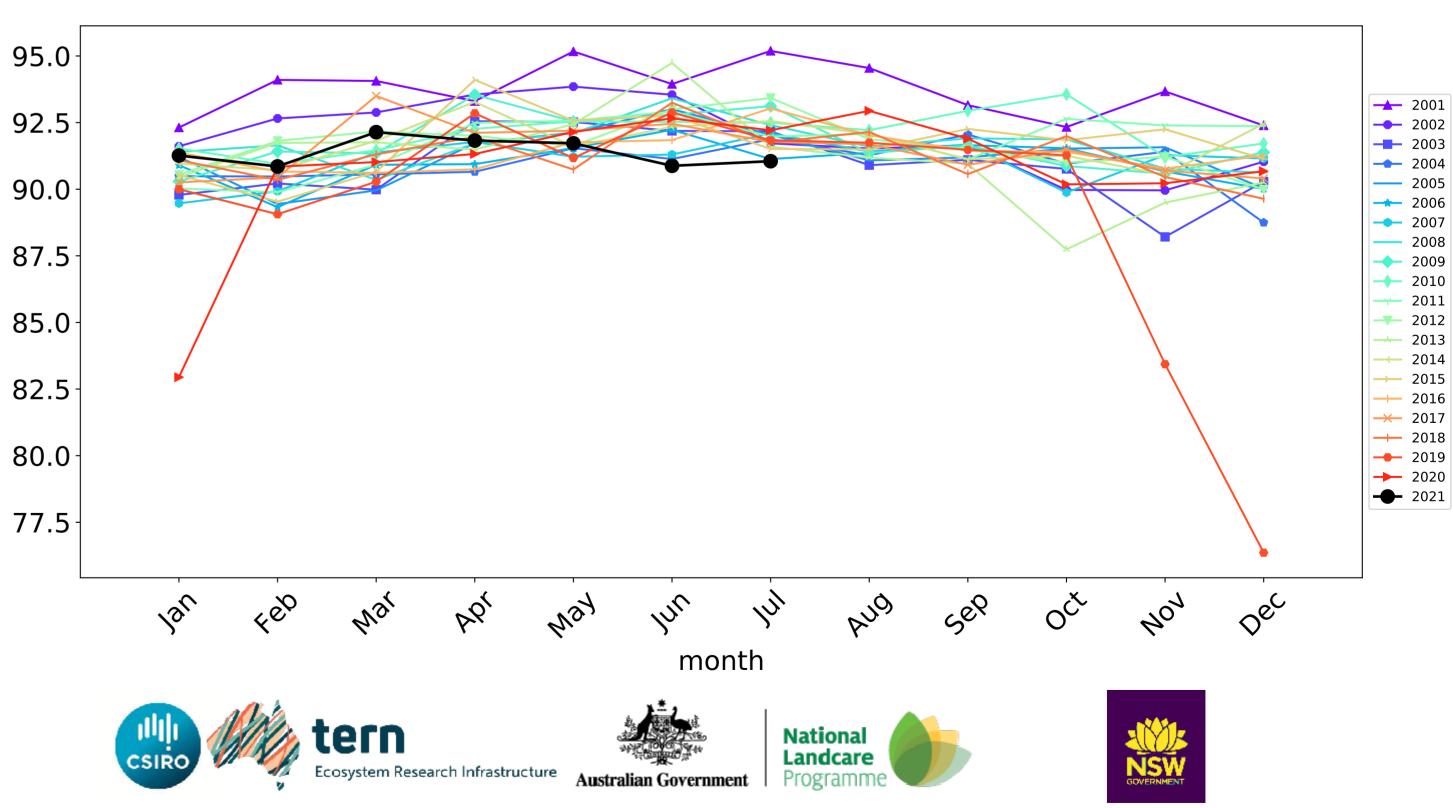


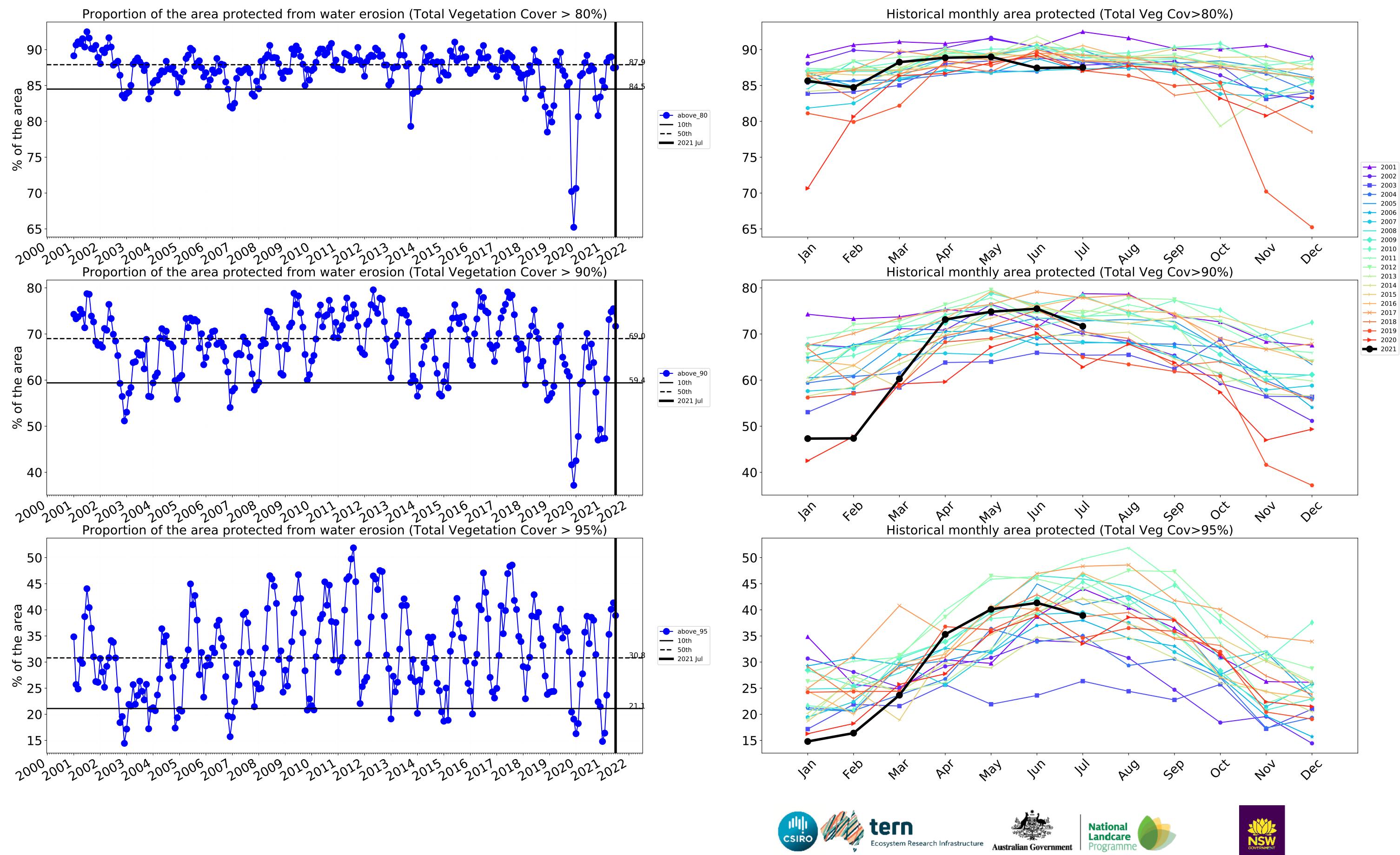


Wind erosion historical monthly area protected (Total Veg Cov >50%)

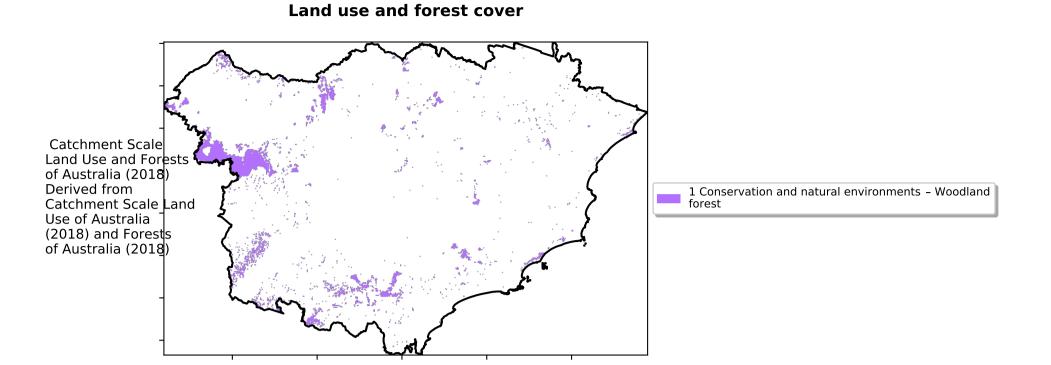


Water erosion historical monthly area protected (Total Veg Cov>70%)

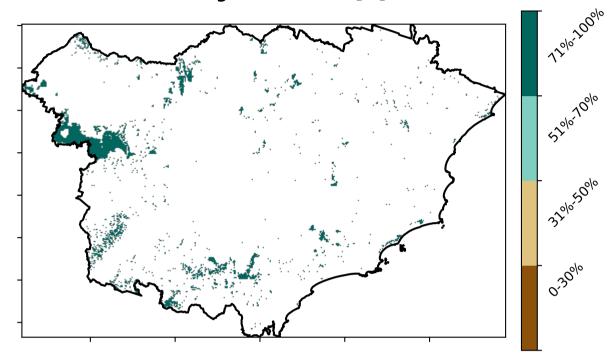




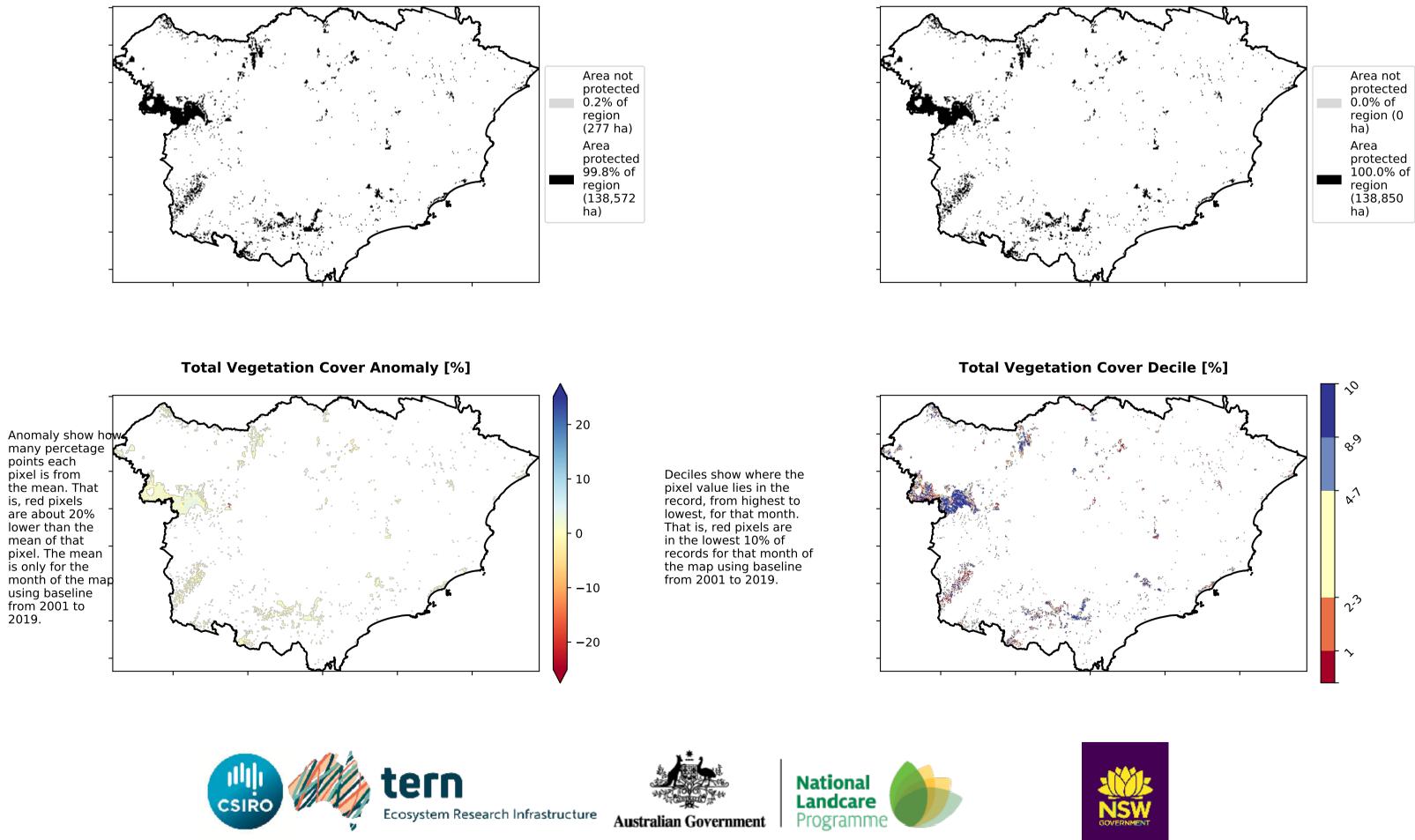
Conservation and natural environments Woodland forest



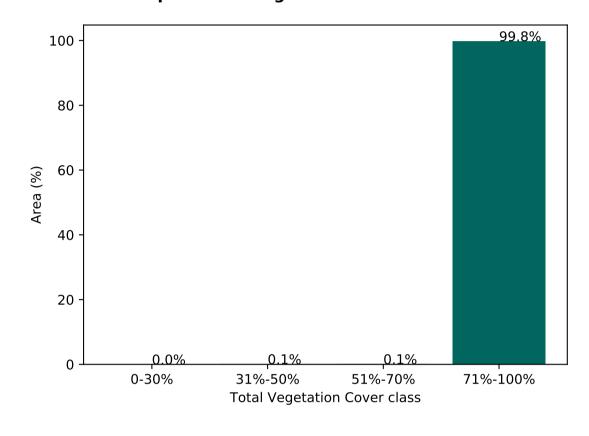
Total Vegetation Cover [%]



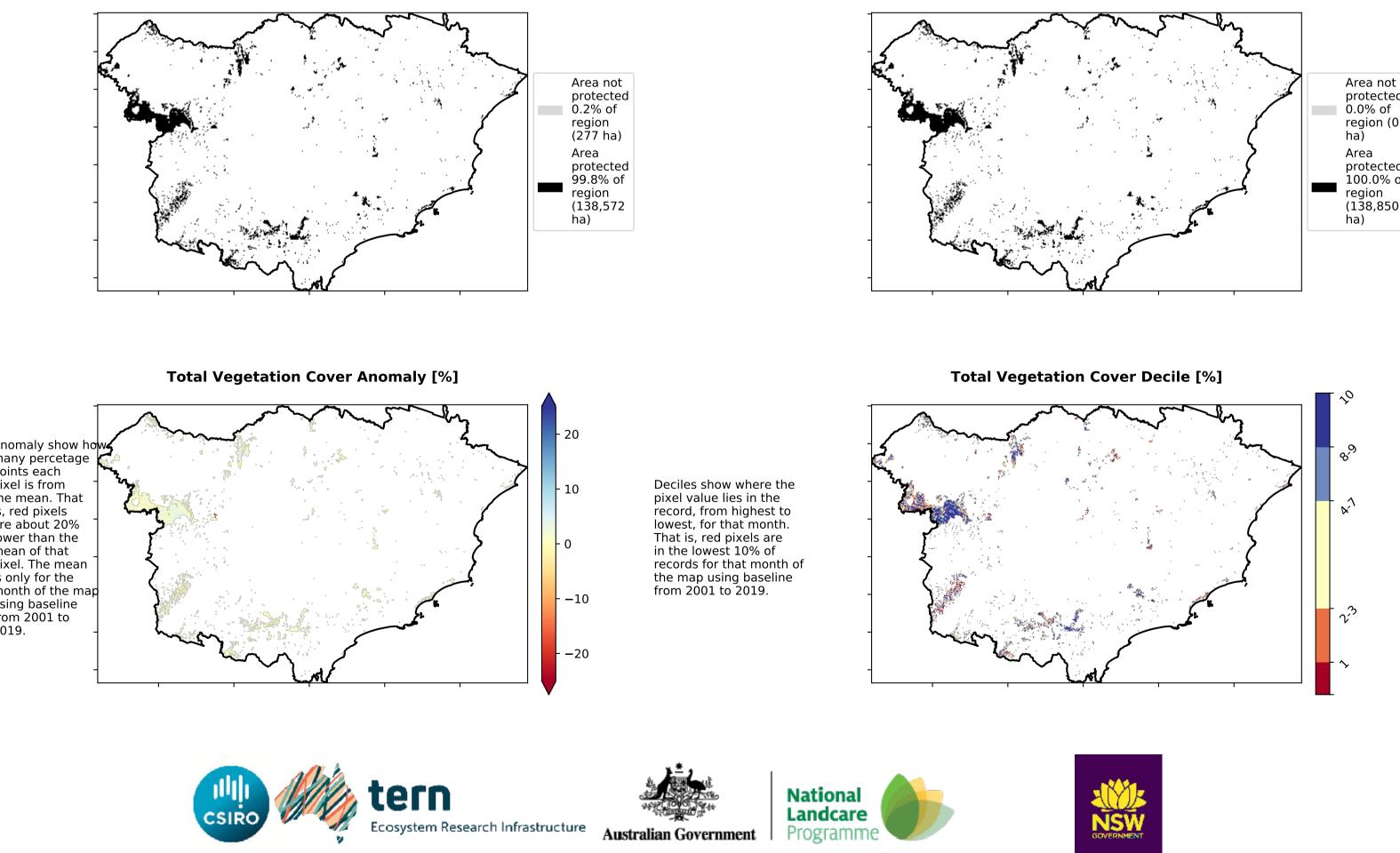
% Area protected from water erosion (>70%)



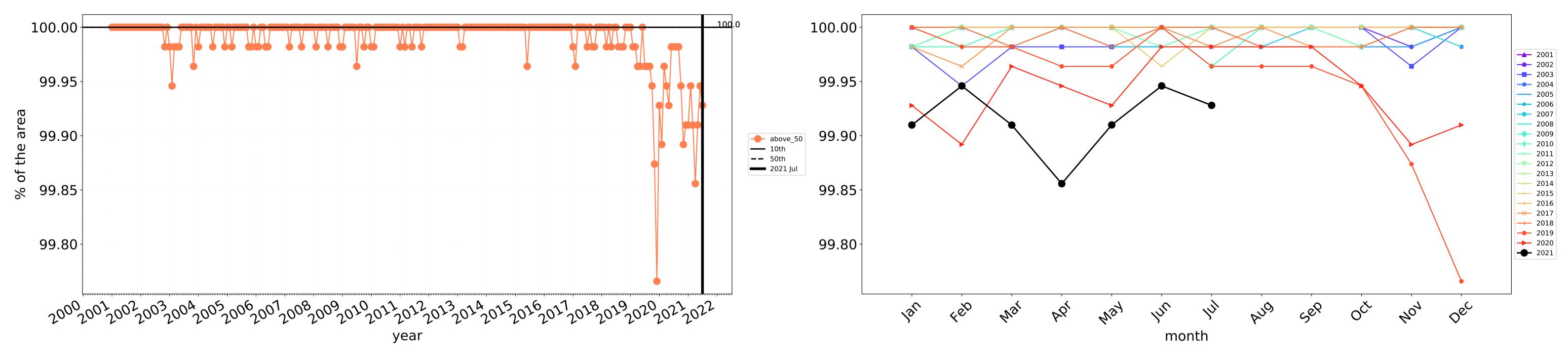
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

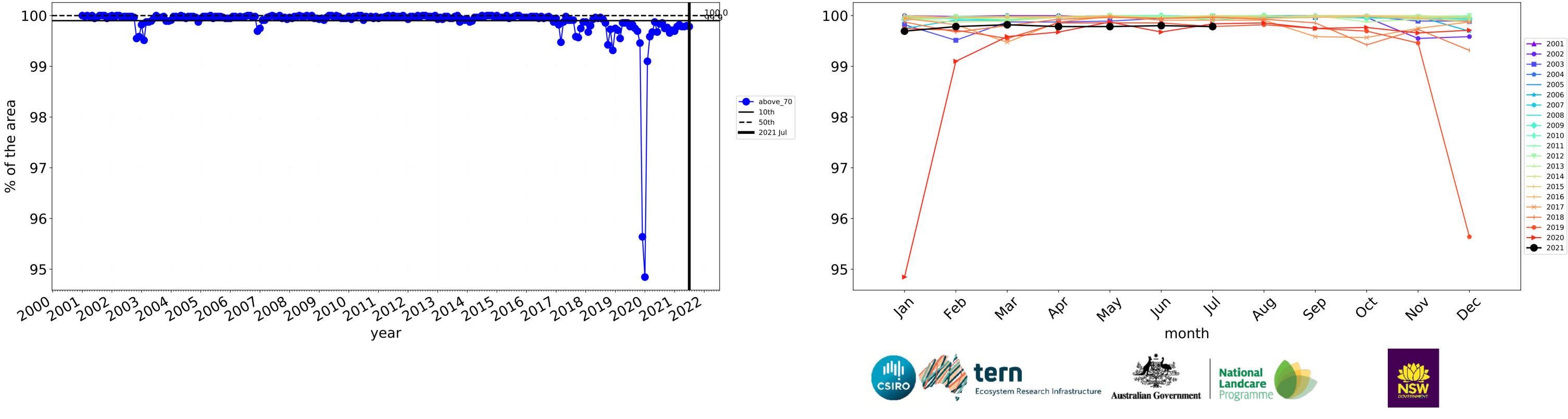


Conservation and natural environments Woodland forest timeseries



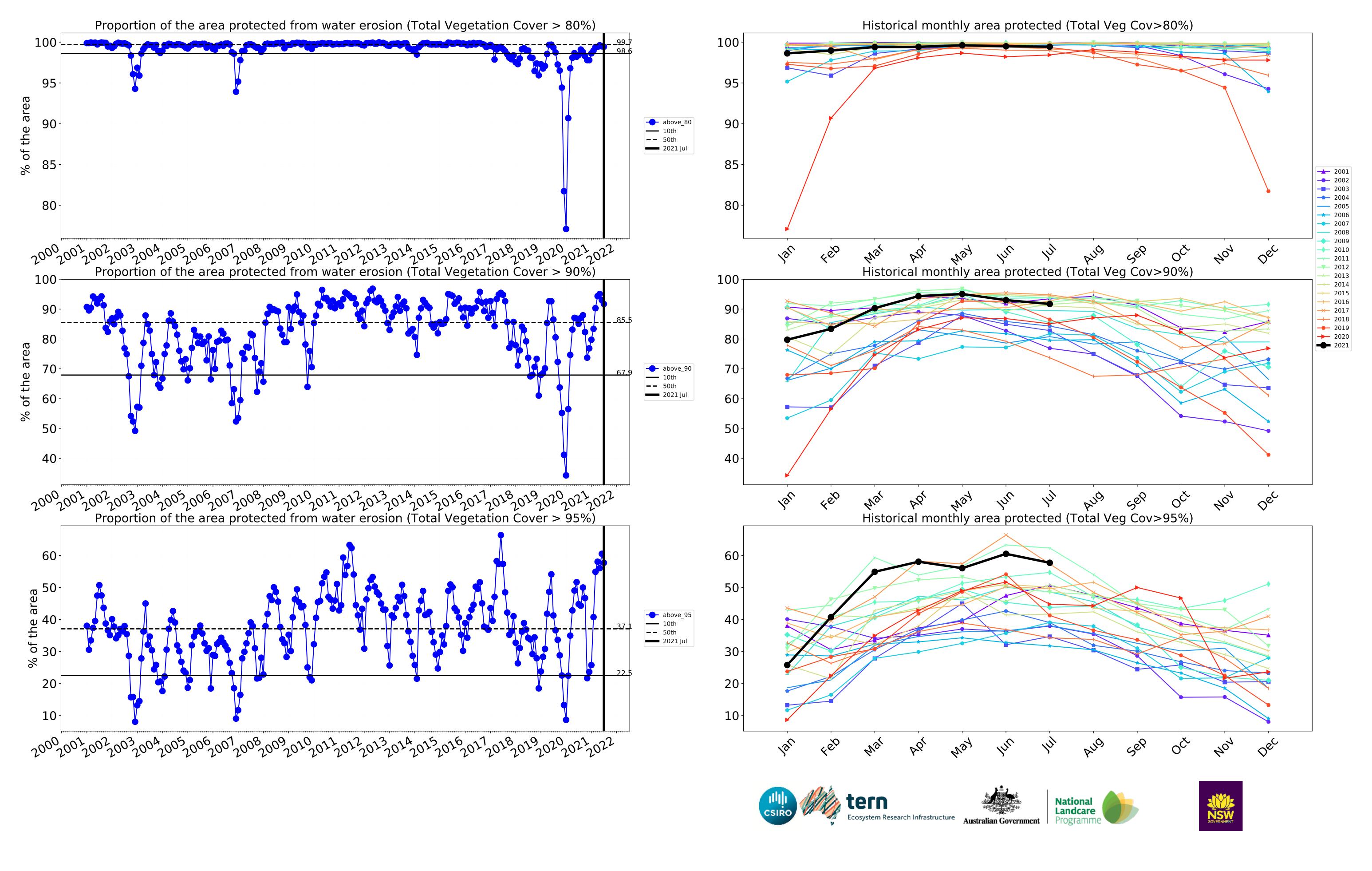
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

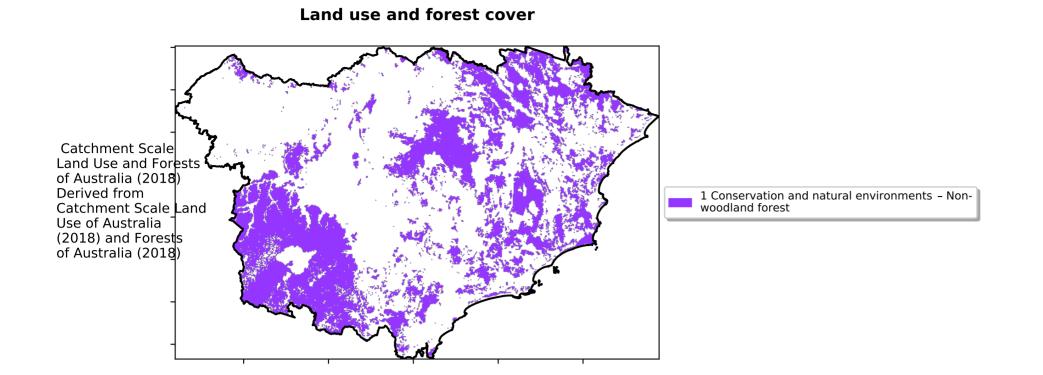


Wind erosion historical monthly area protected (Total Veg Cov >50%)

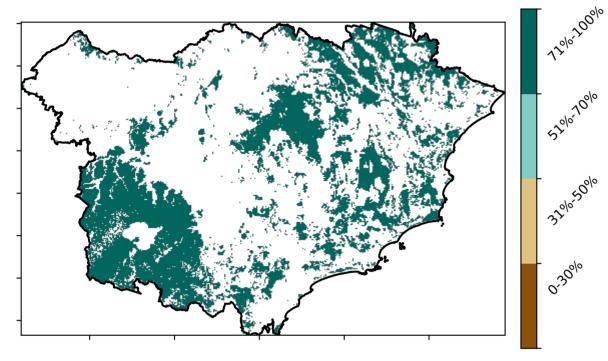
Water erosion historical monthly area protected (Total Veg Cov>70%)



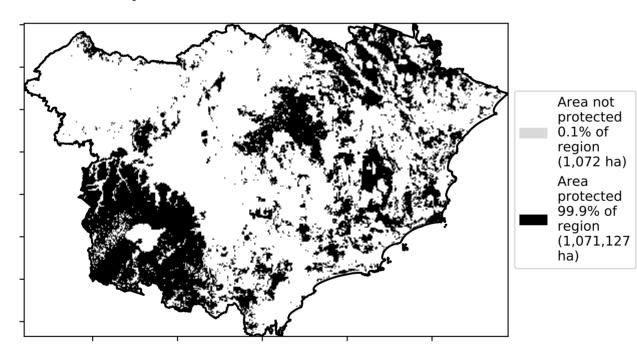
Conservation and natural environments Forest (non woodland)



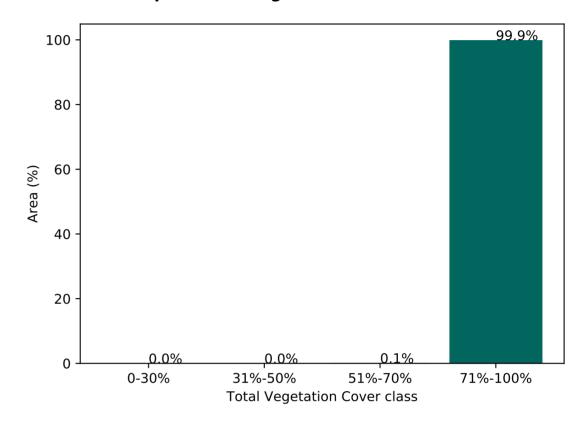
Total Vegetation Cover [%]



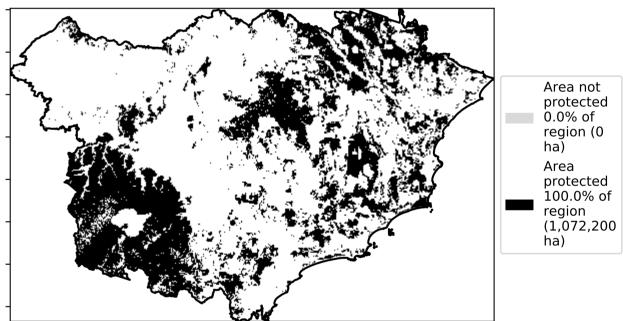
% Area protected from water erosion (>70%)



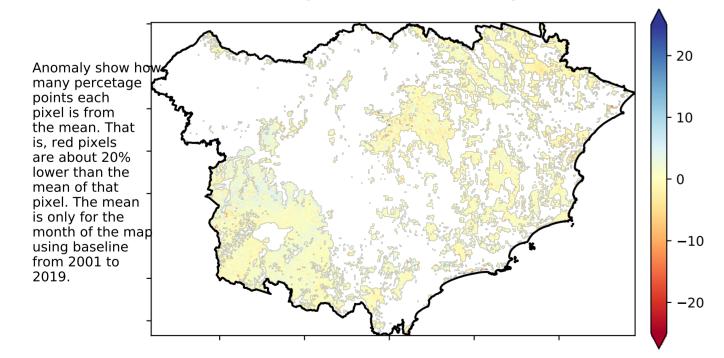
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



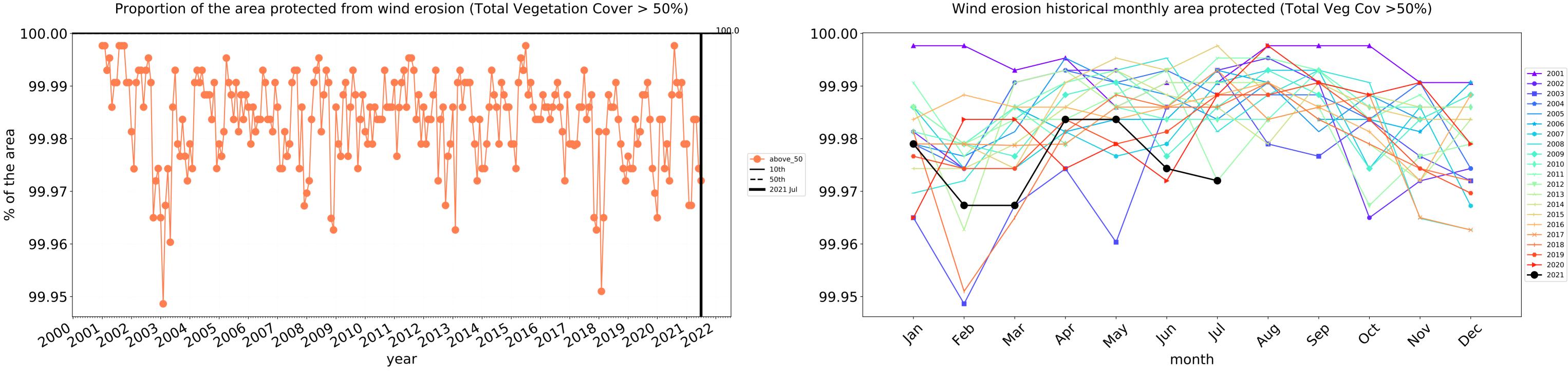
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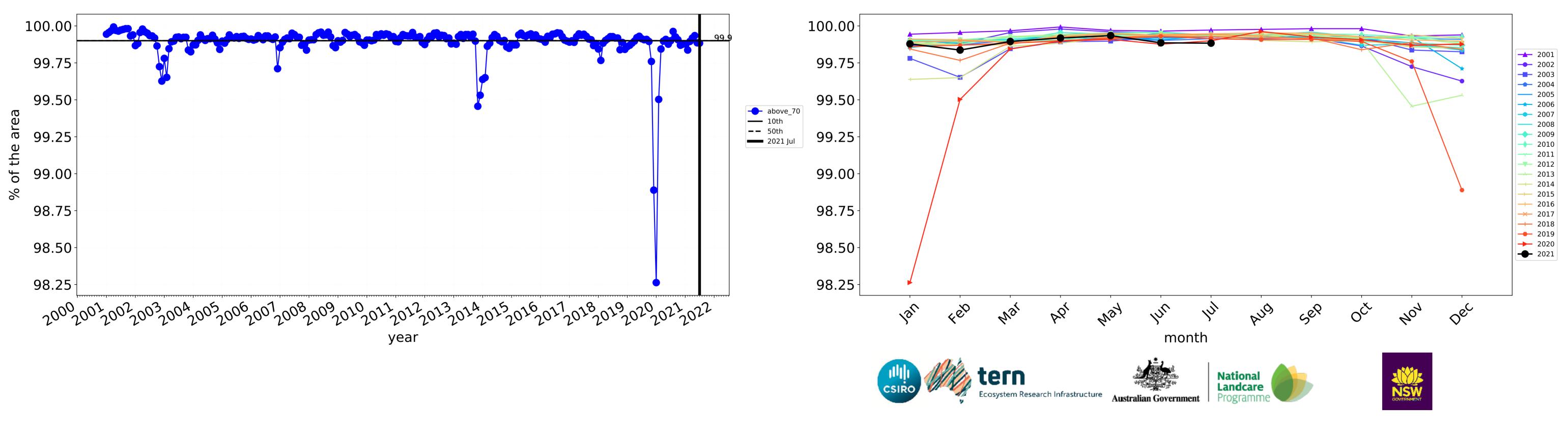
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Total Vegetation Cover Decile [%]



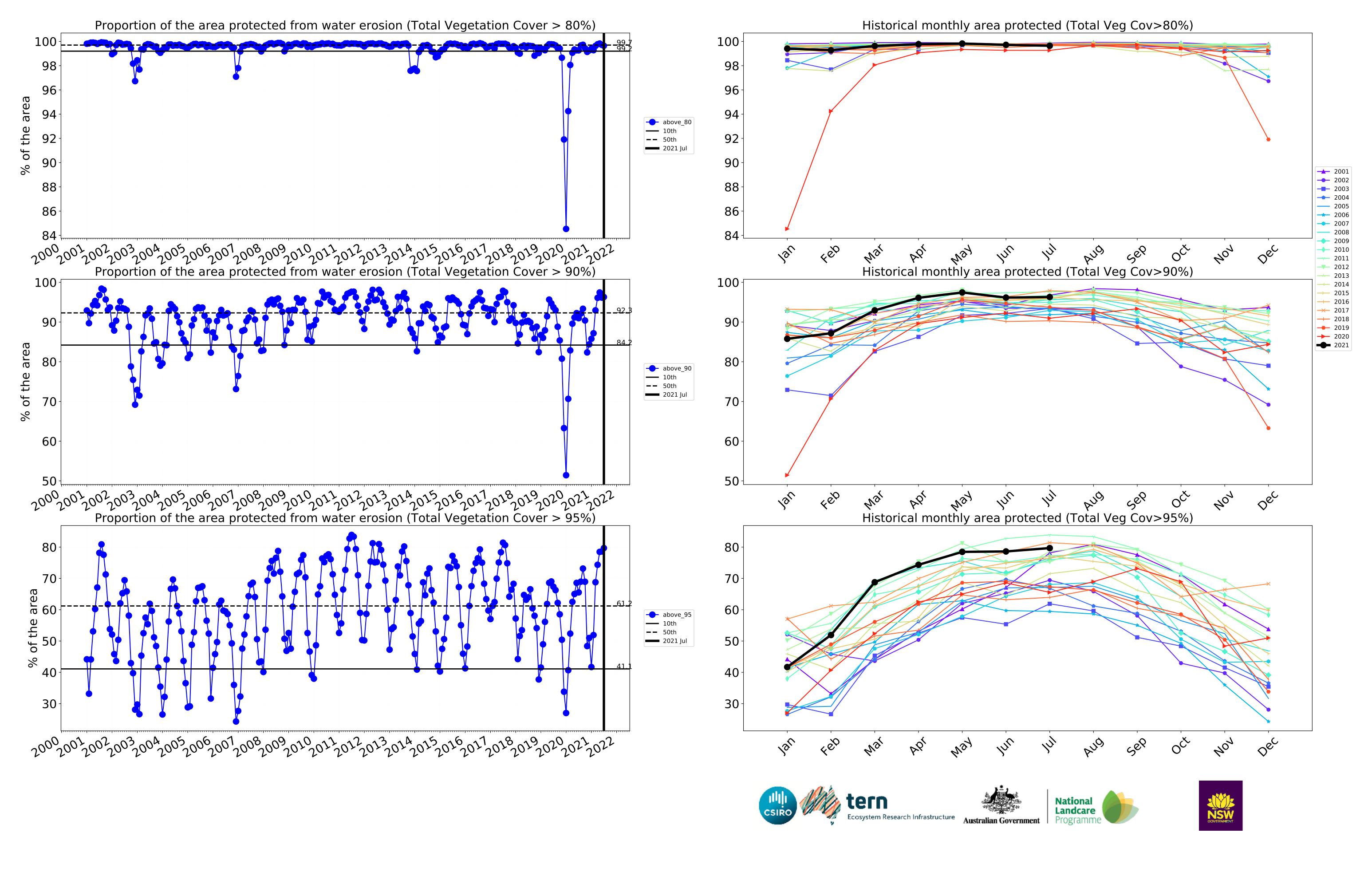
124





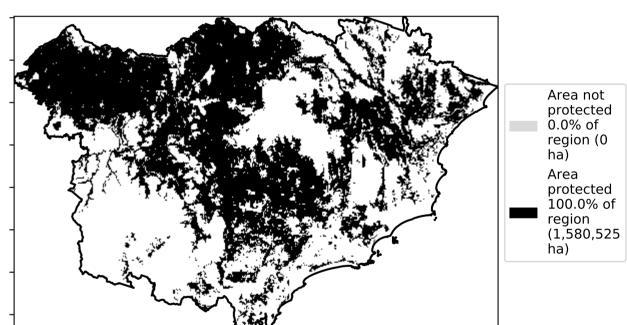
Water erosion historical monthly area protected (Total Veg Cov>70%)

15



Agriculture

Land use and forest cover 80 -<u>76.</u>7% 70 -60 Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Agriculture - Grazing - Non forest 50 2 Agriculture - Grazing - Woodland forest Area (%) 05 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated Catchment Scale Land 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests of Australia (2018) 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 30 8 Agriculture - Horticulture - Irrigated 20 <u>10.</u>7% 10 <u>7.6</u>% 0 1 2 3 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 120001 100 80 52°10'10°1 60 Area (%) 320/01 40 0.30% 20 0.1% 0.6% 0% 0 0-30% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)



Proportion of each land class in area

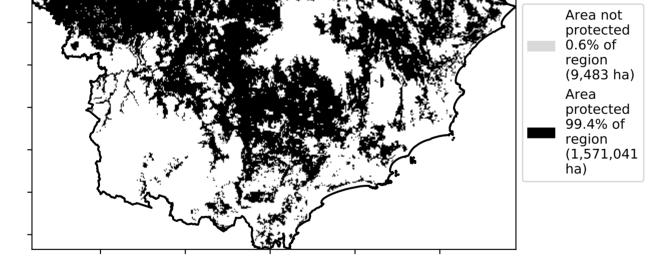
0.2%

8

99.4%

01%

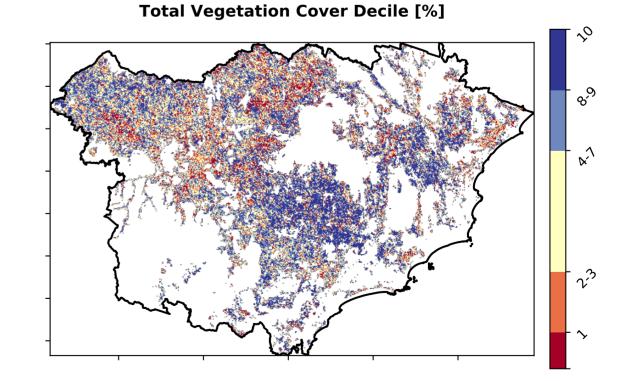




Total Vegetation Cover Anomaly [%]

· 20 Anomaly show how many percetage points each pixel is from the mean. That · 10 is, red pixels are about 20% lower than the mean of that 0 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 the map using baseline from 2001 to 2019.

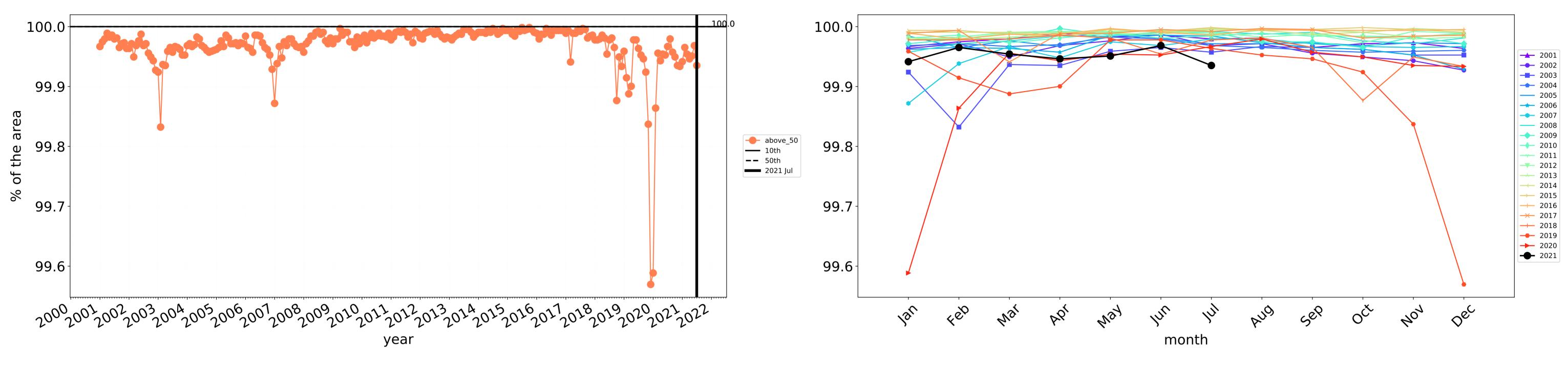




12

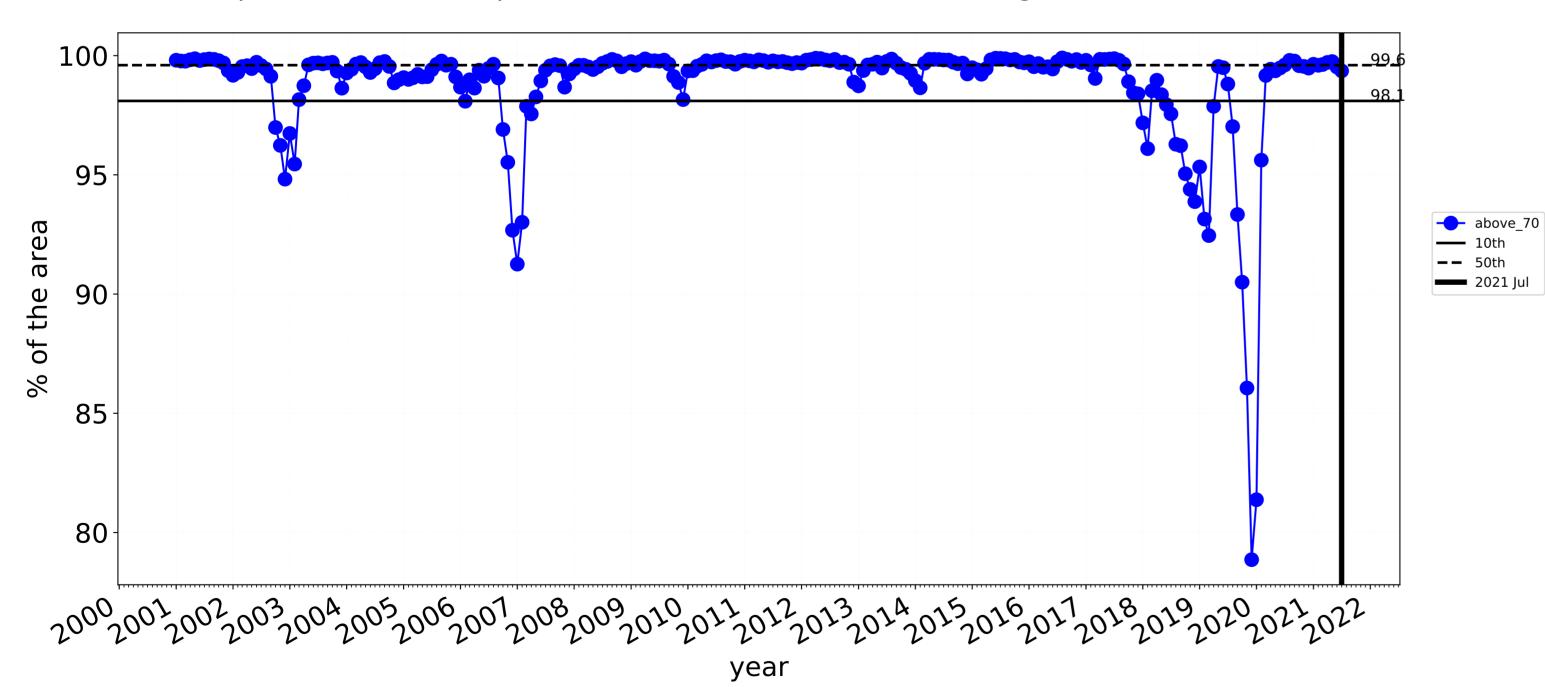
-10

-20



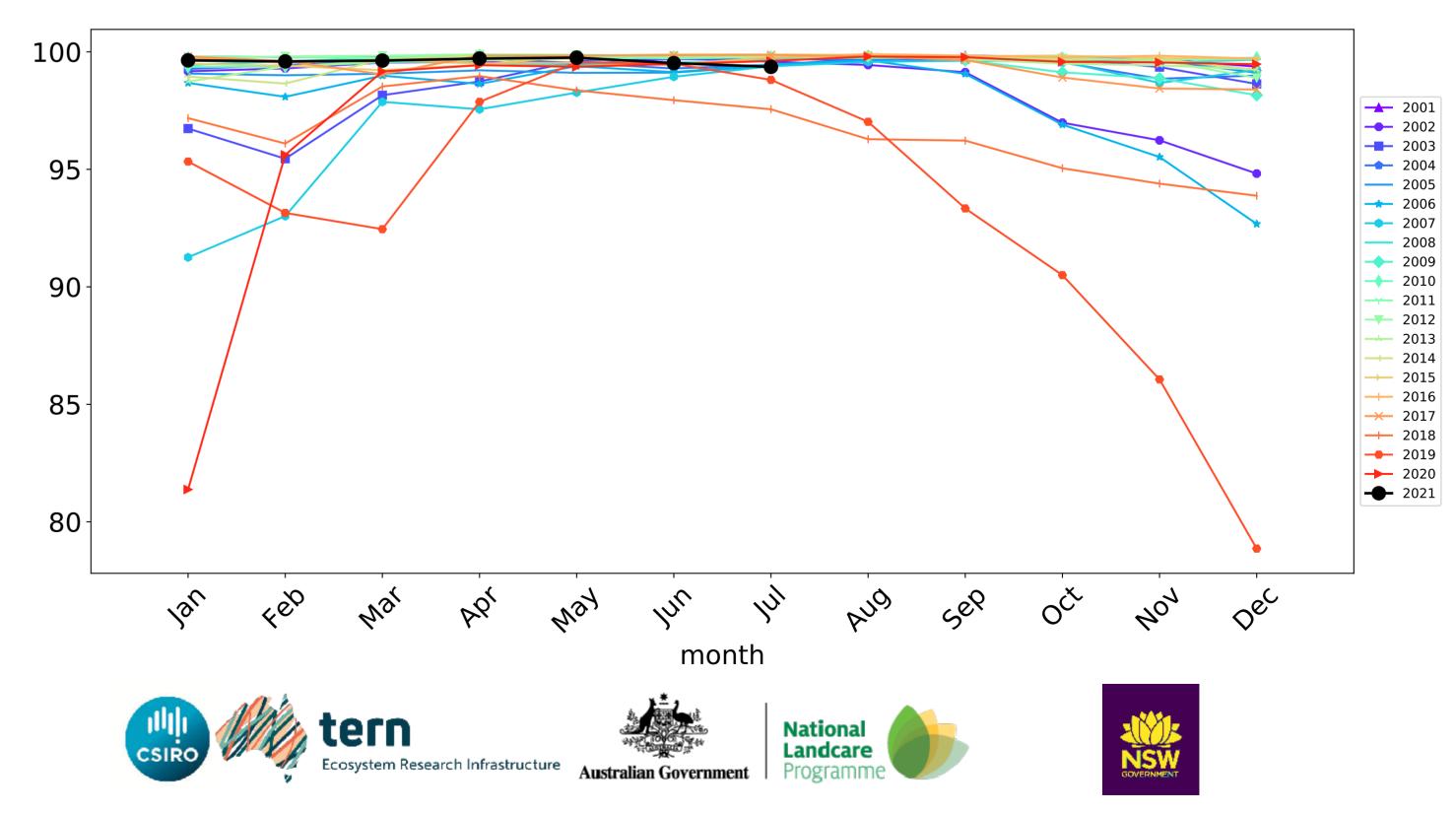
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

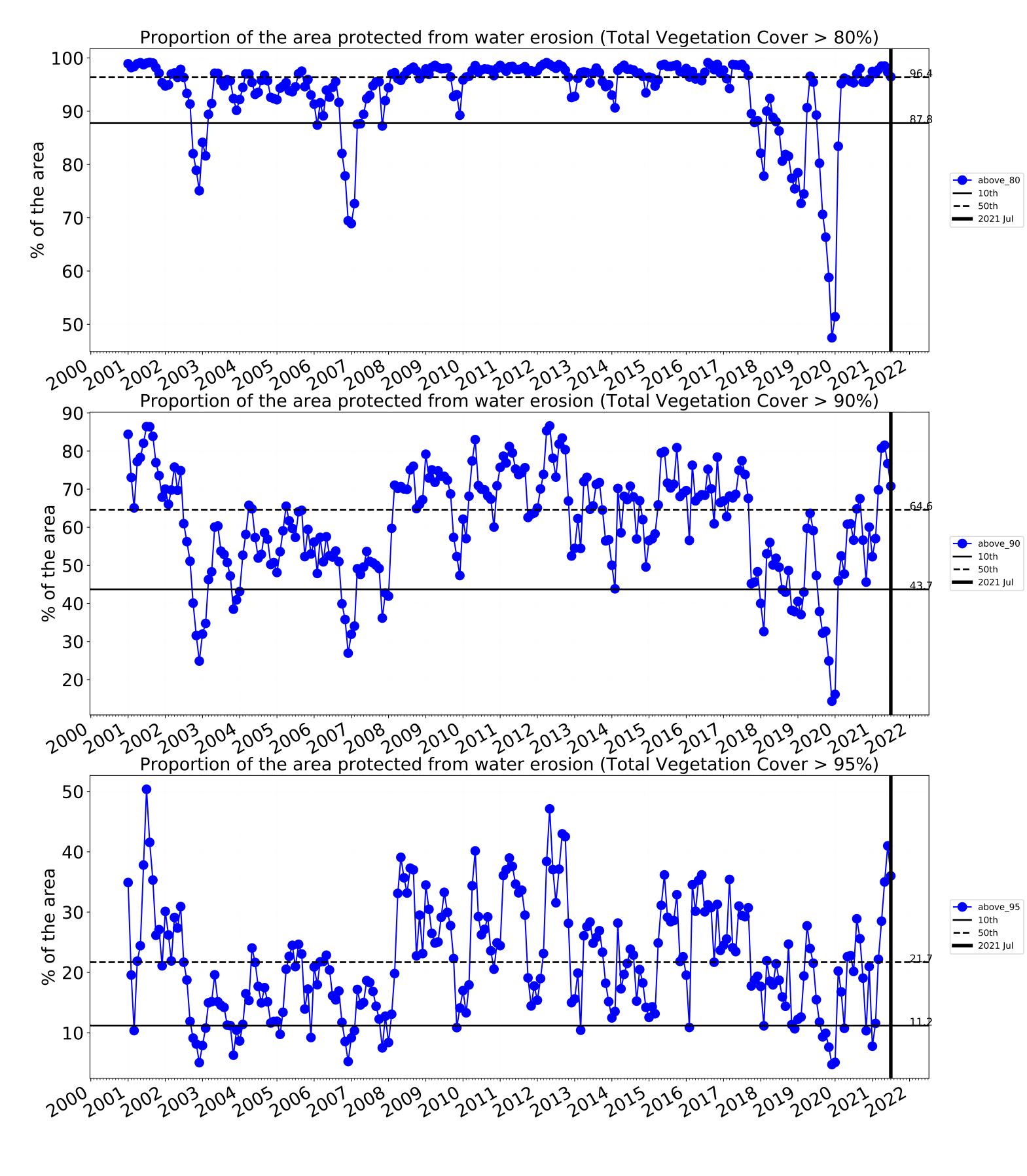
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

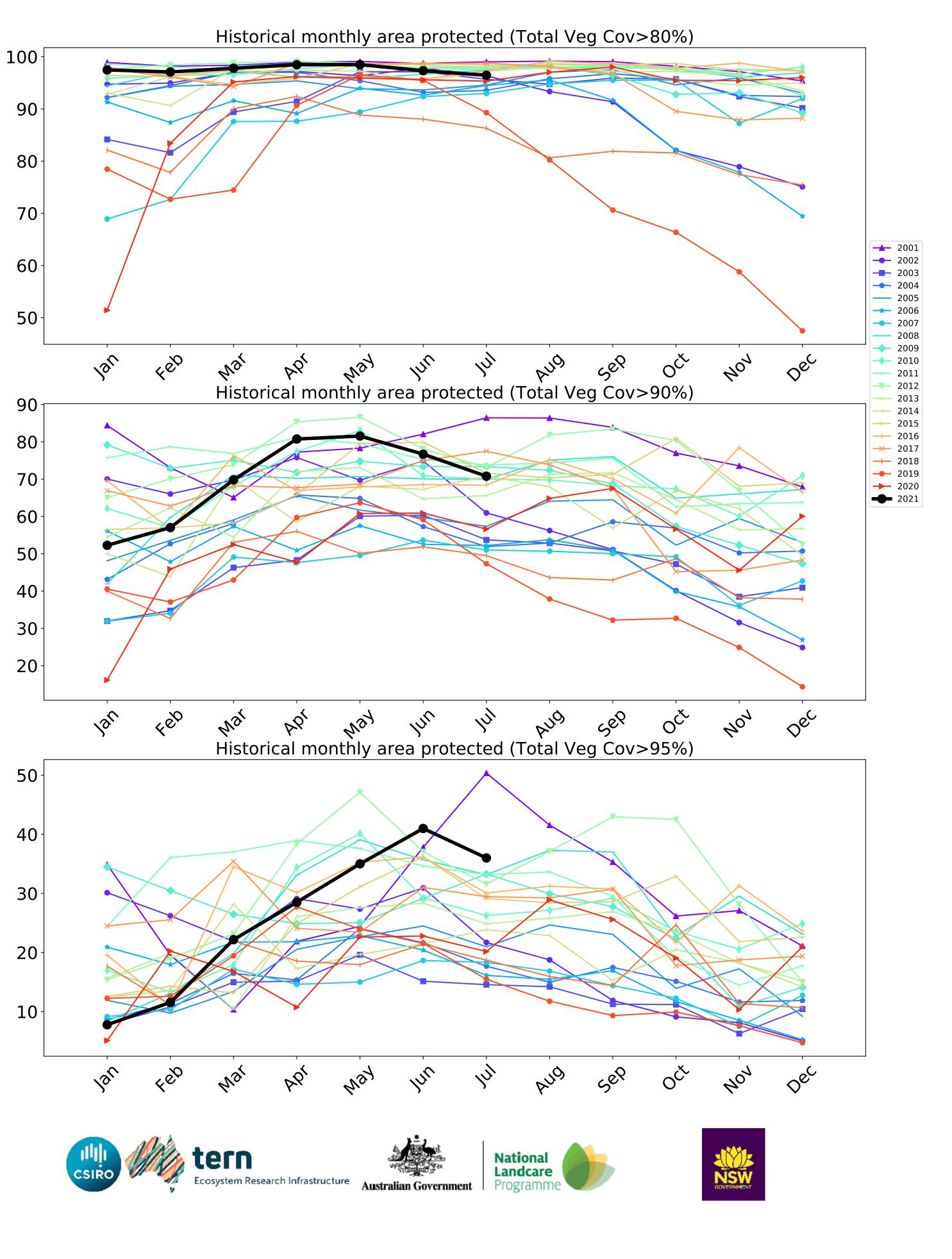


Wind erosion historical monthly area protected (Total Veg Cov >50%)

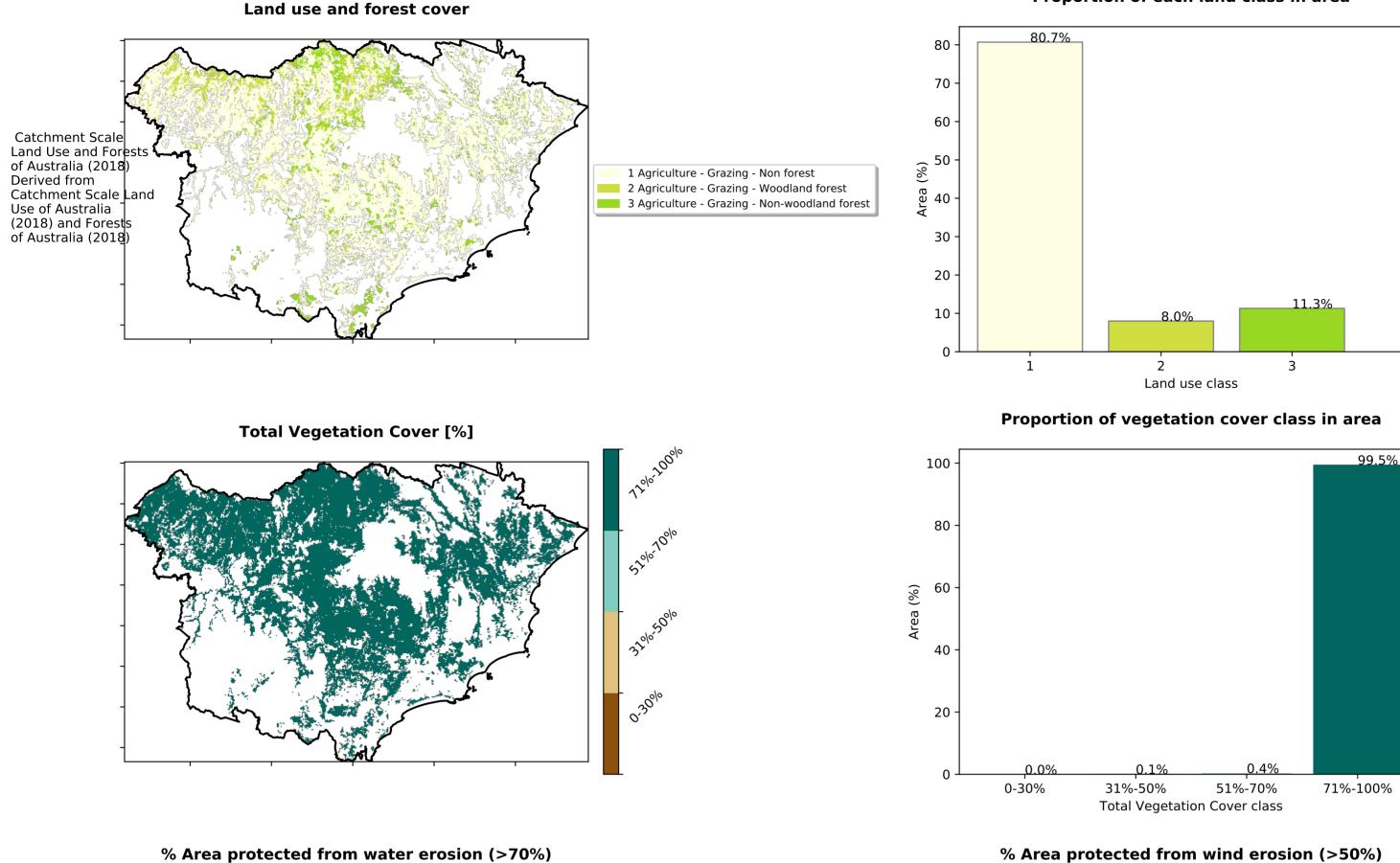
Water erosion historical monthly area protected (Total Veg Cov>70%)



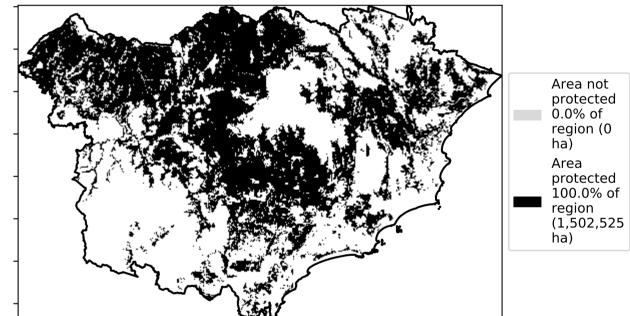




Grazing



Proportion of each land class in area





Total Vegetation Cover Anomaly [%]

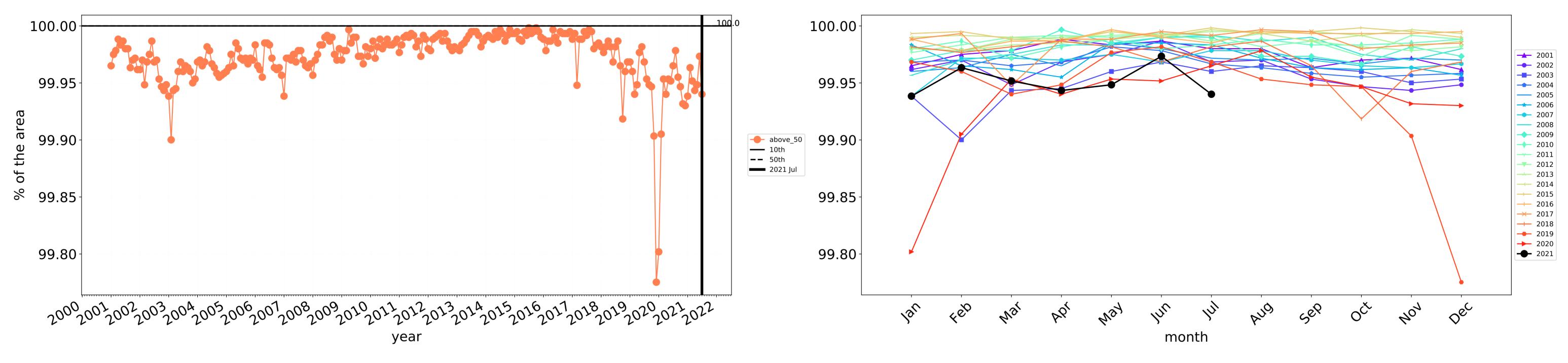
· 20 Anomaly show how many percetage points each pixel is from the mean. That is, red pixels 10 are about 20% lower than the mean of that 0 pixel. The mean is only for the month of the map using baseline from 2001 to 2019. -10-20

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 the map using baseline from 2001 to 2019.

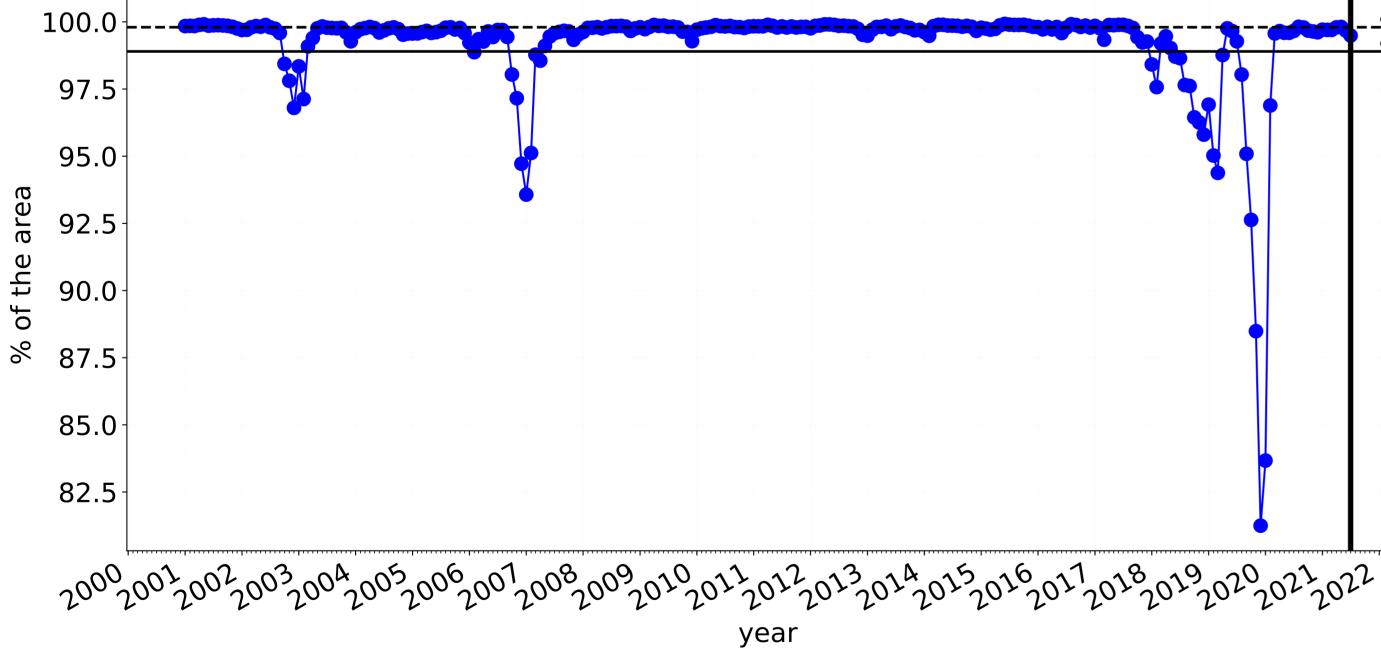
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Total Vegetation Cover Decile [%]





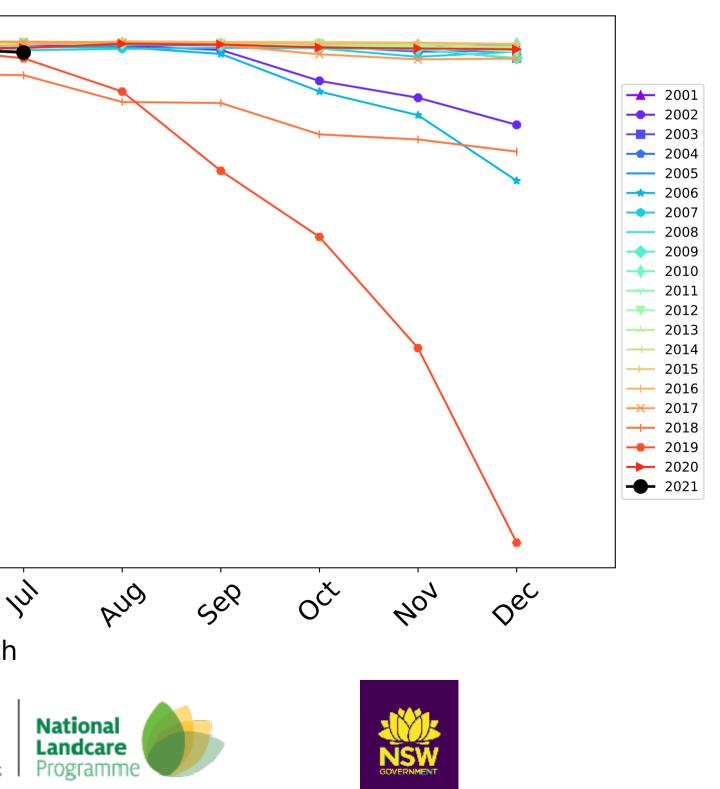
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

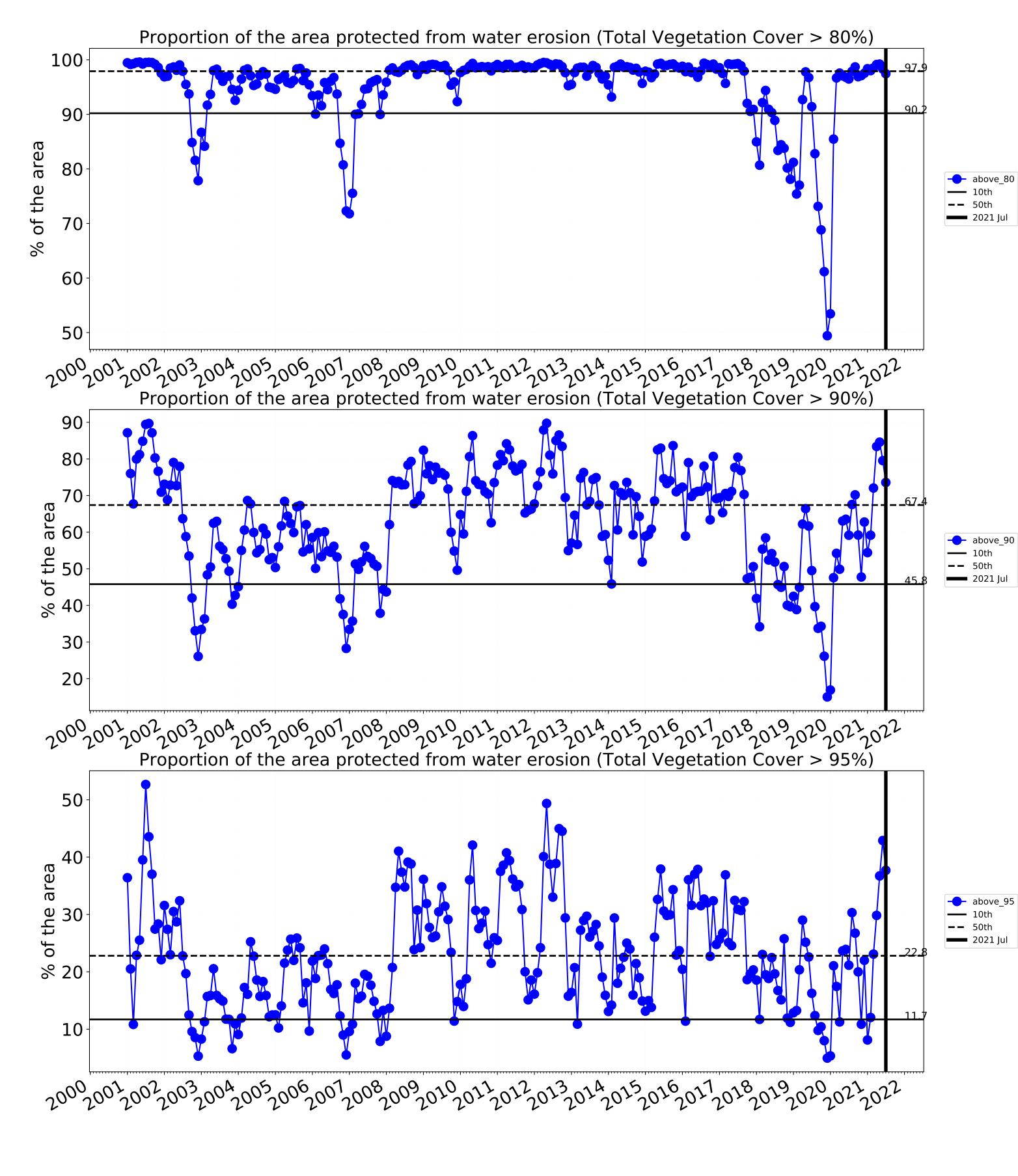


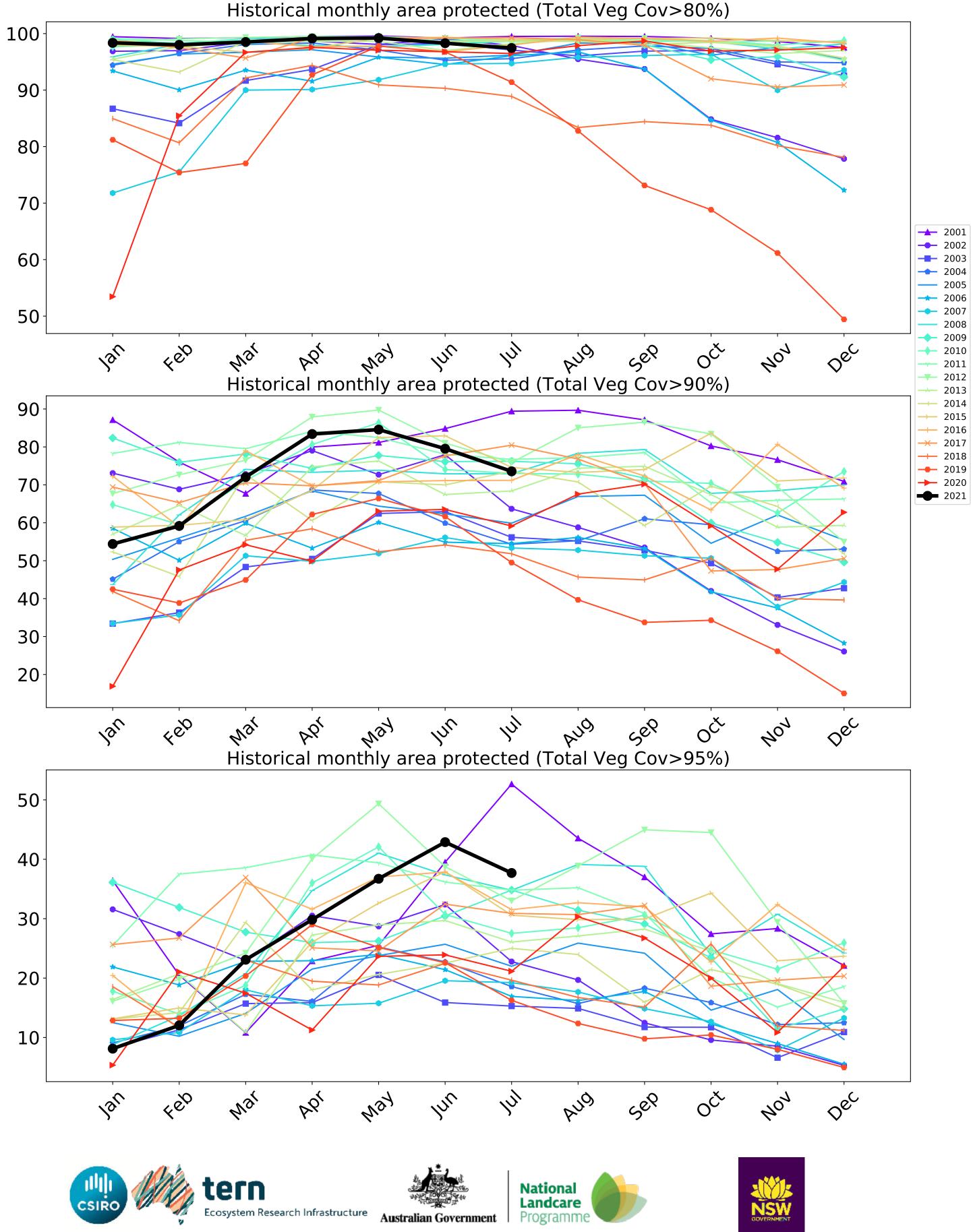
Wind erosion historical monthly area protected (Total Veg Cov >50%)

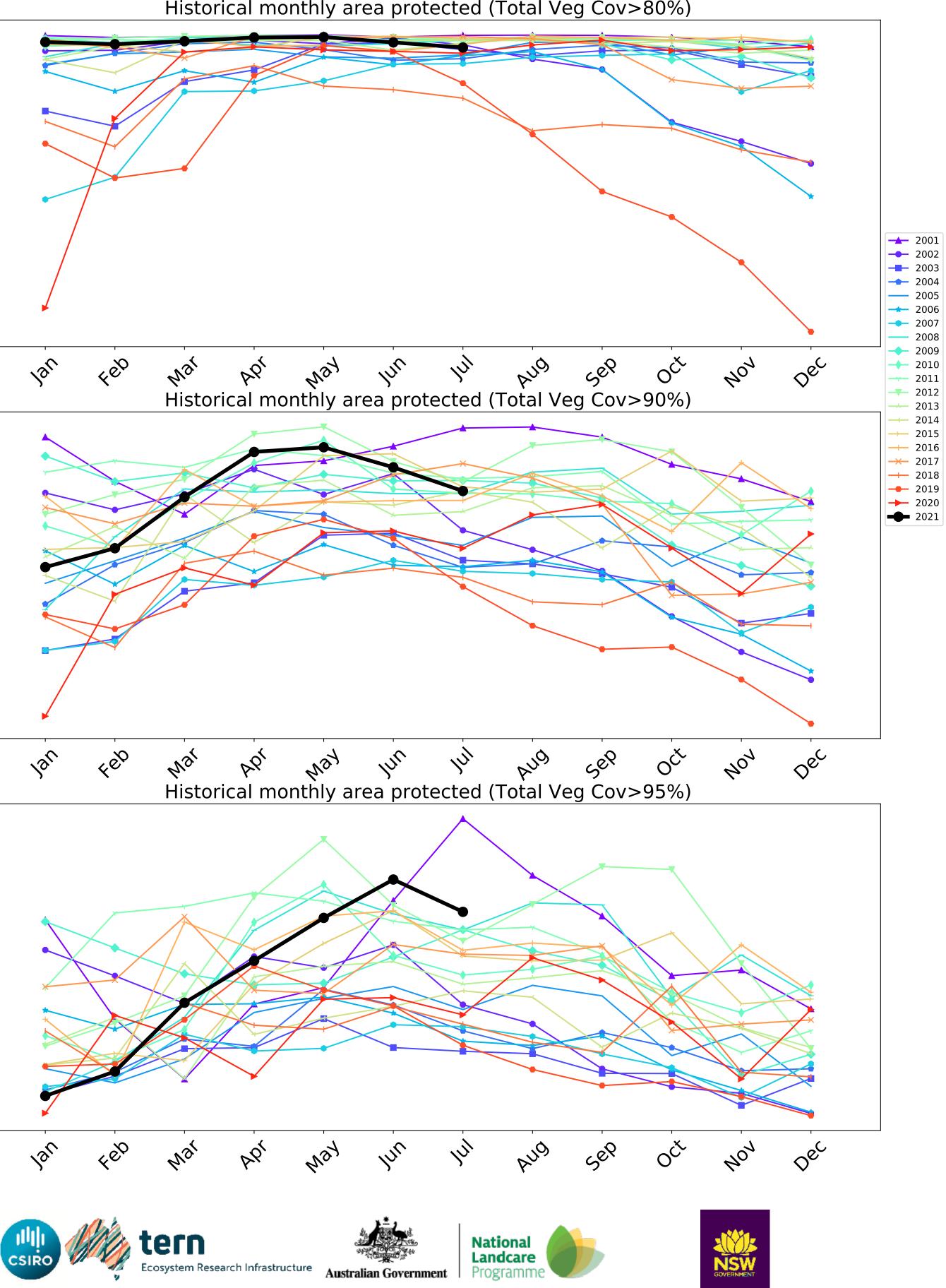
100.0-_99_8 98 97.5 95.0 ---- above_70 **—** 10th 92.5 **——** 50th **——** 2021 Jul 90.0 87.5 85.0 82.5 4eb lar In way hysi. PQ month tern Ecosystem Research Infrastructure Australian Government

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





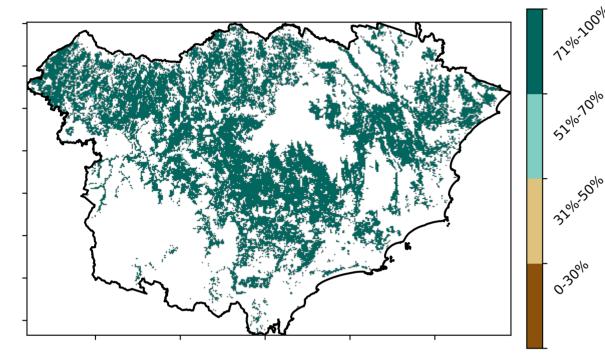




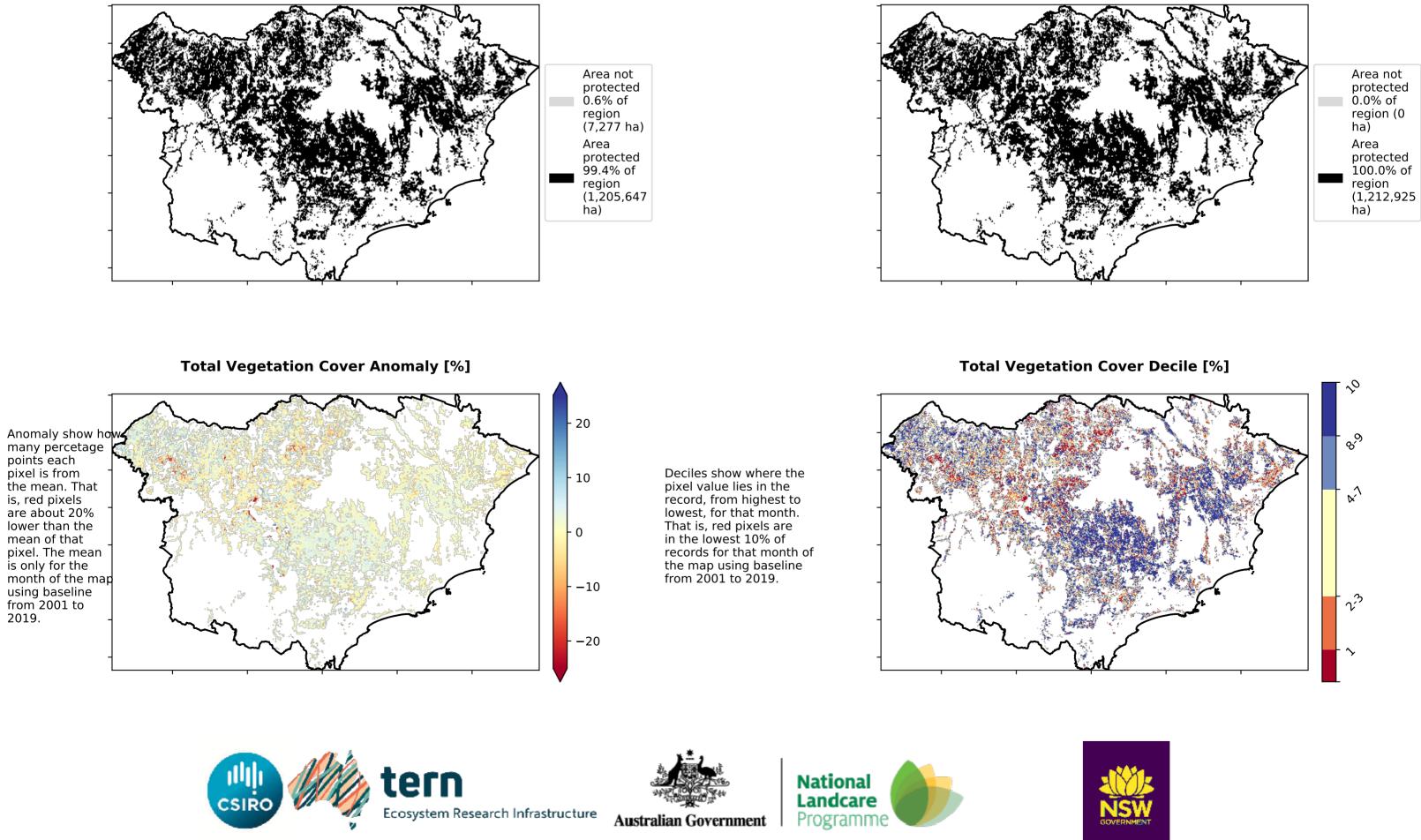
Grazing non forest

Land use and forest cover 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

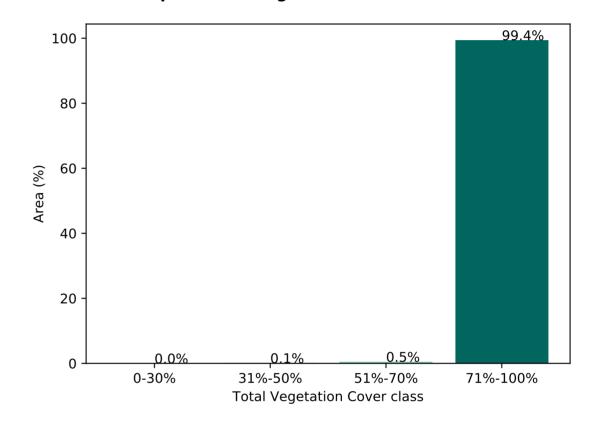
Total Vegetation Cover [%]



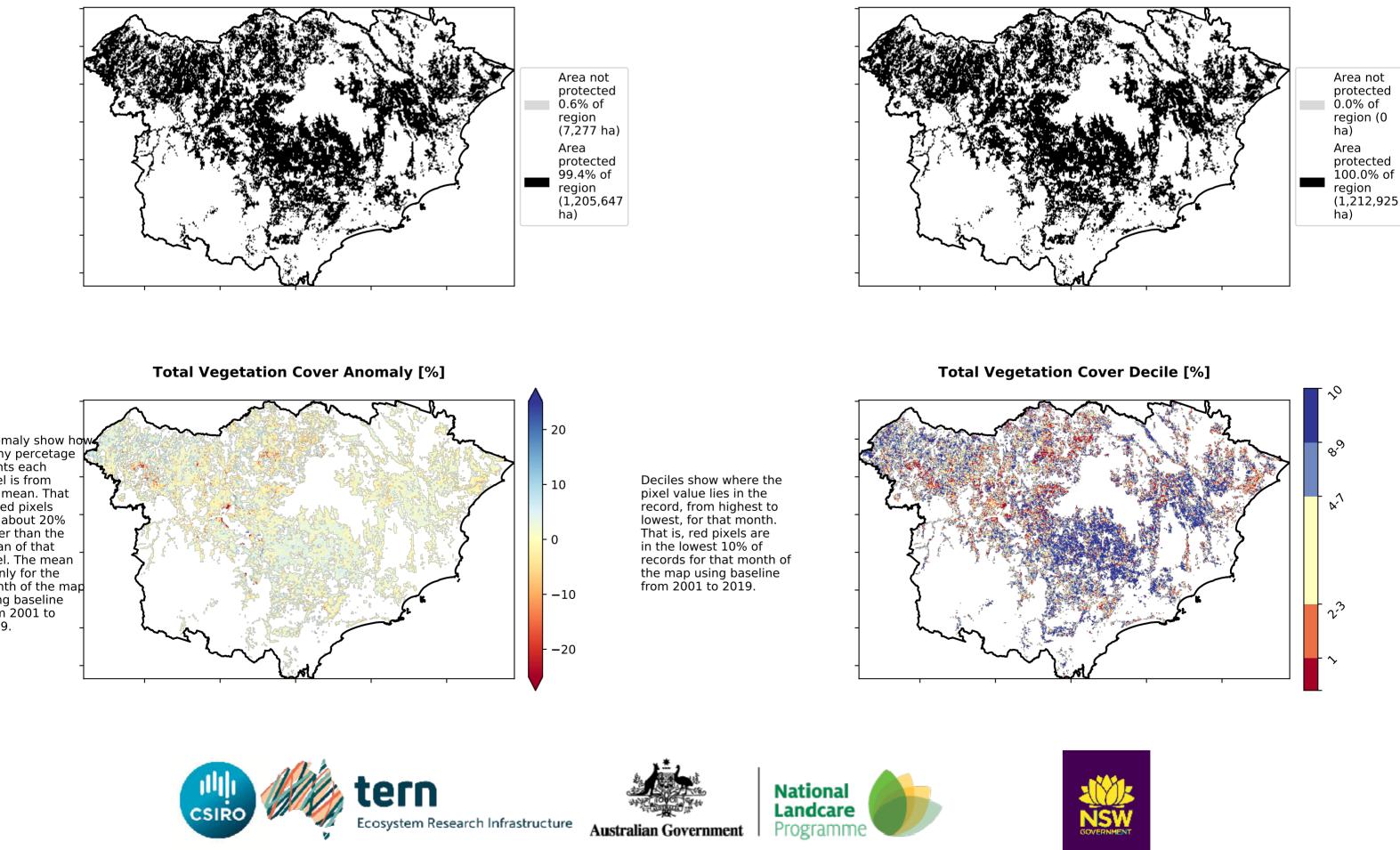
% Area protected from water erosion (>70%)

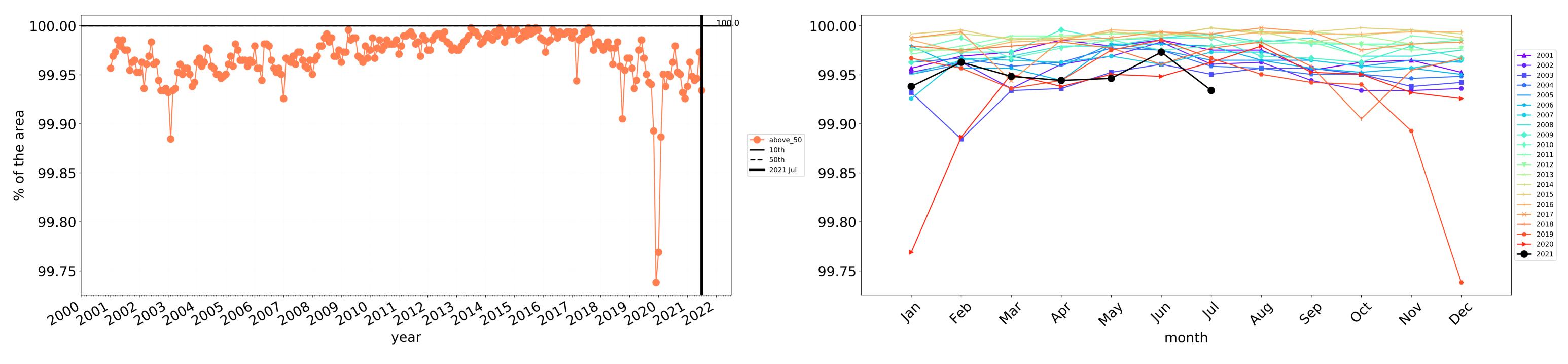


Proportion of vegetation cover class in area



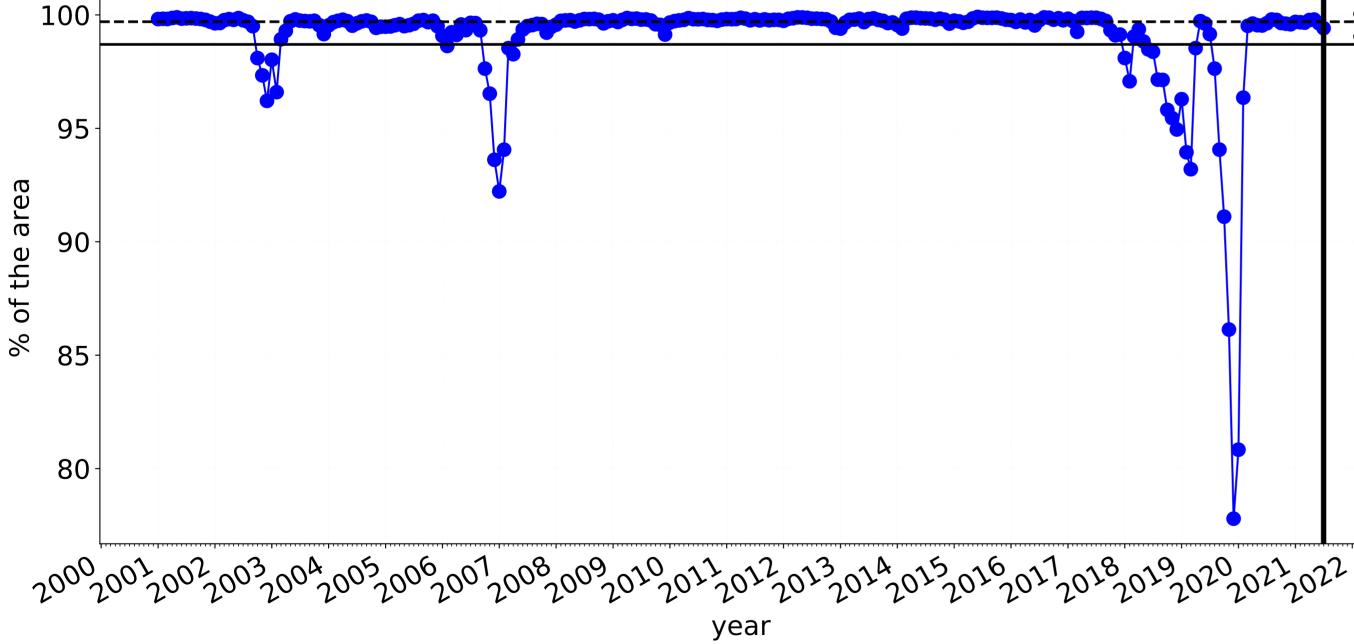
% Area protected from wind erosion (>50%)





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

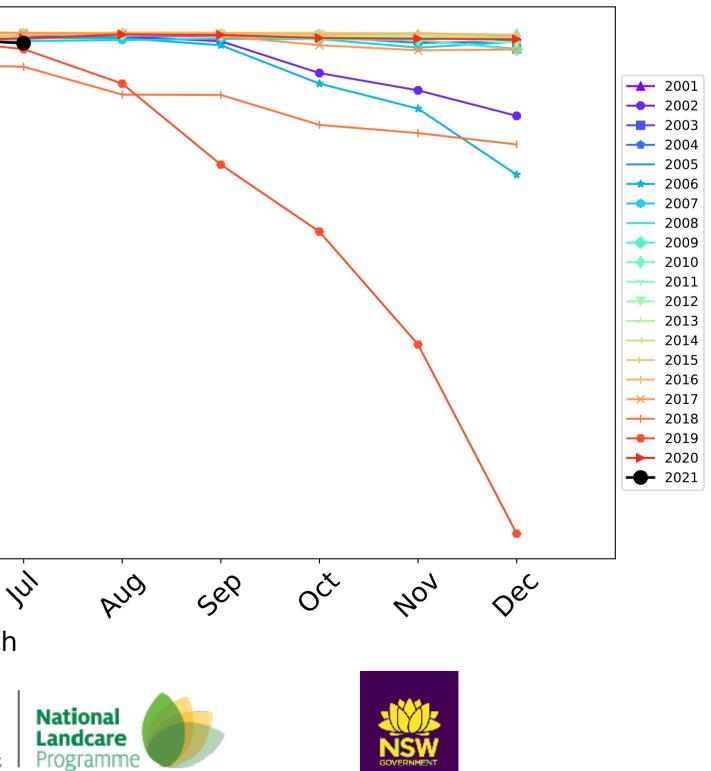
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

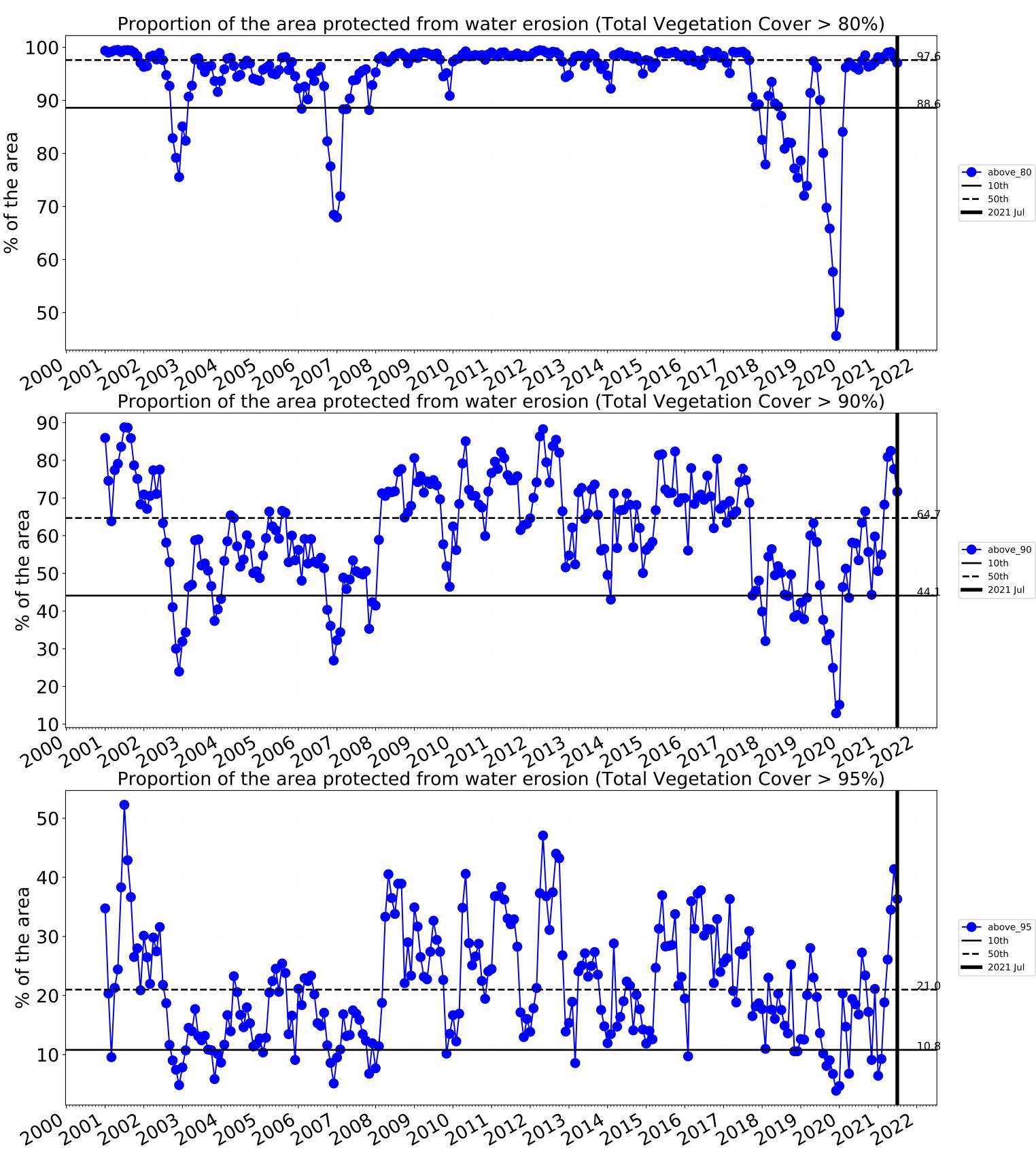


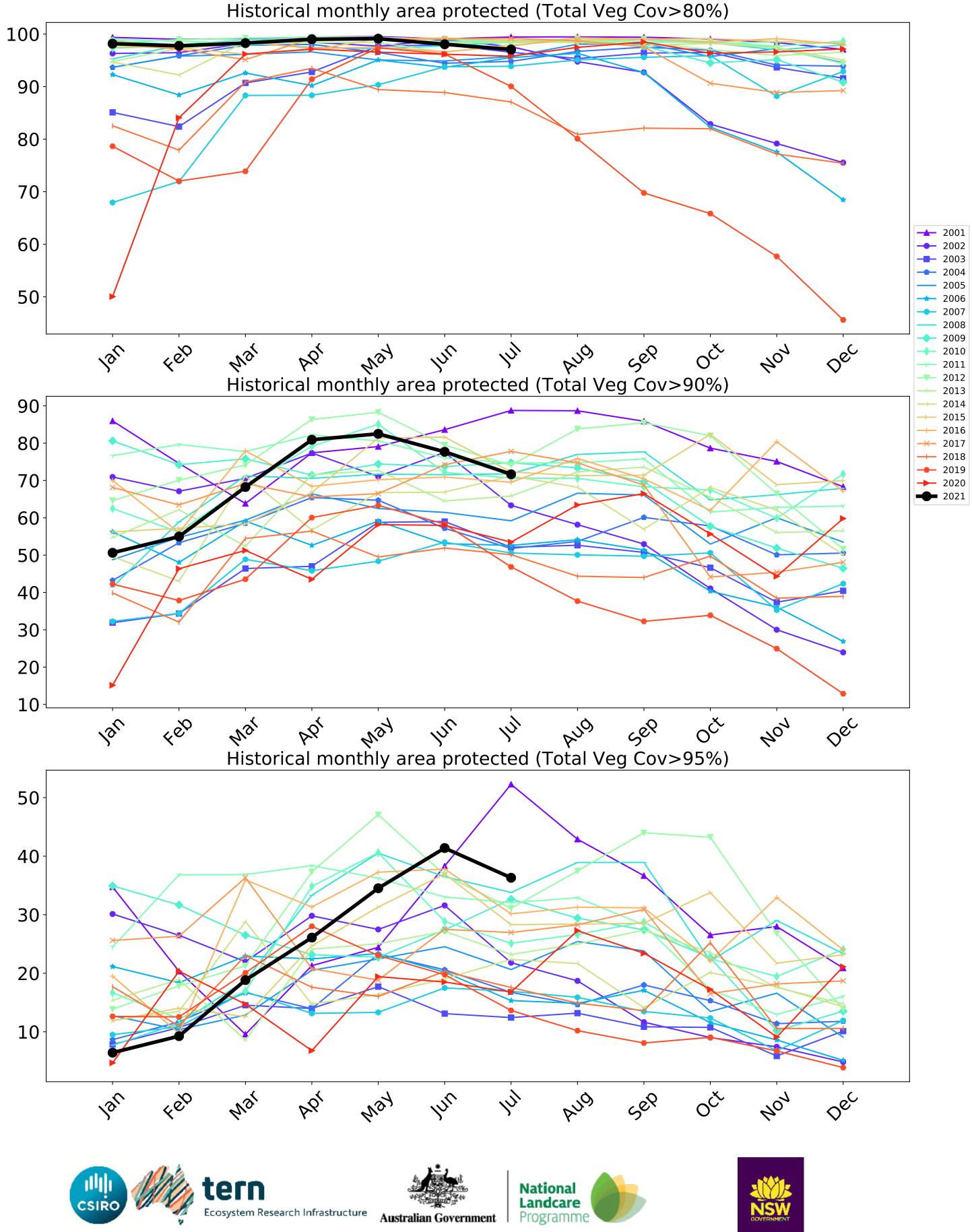
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 _99_1 98 95 ---- above_70 **—** 10th **--** 50th 90 **——** 2021 Jul 85 80 4eb lar May In hyar. P.Q. month tern Ecosystem Research Infrastructure Australian Government

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

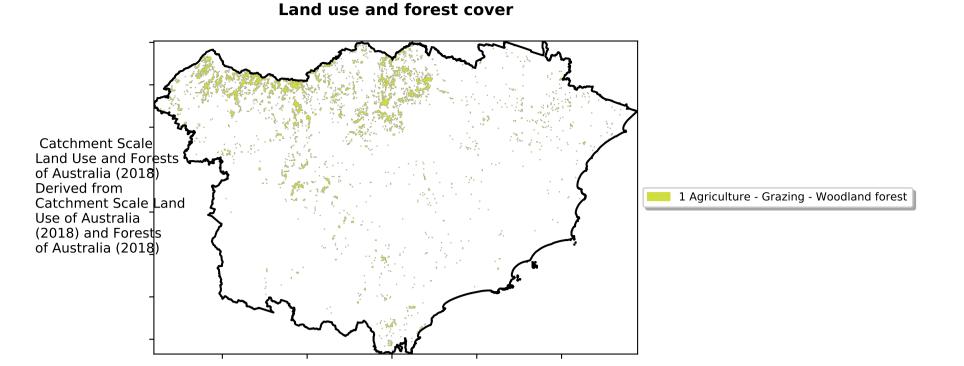




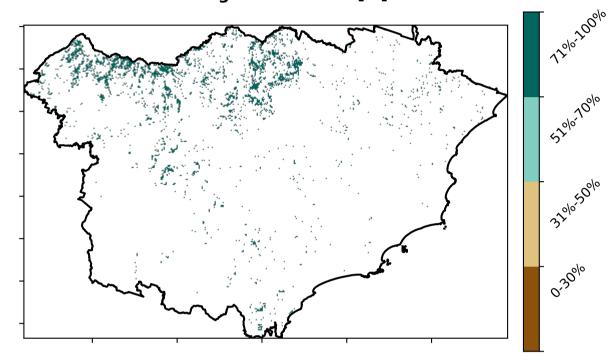




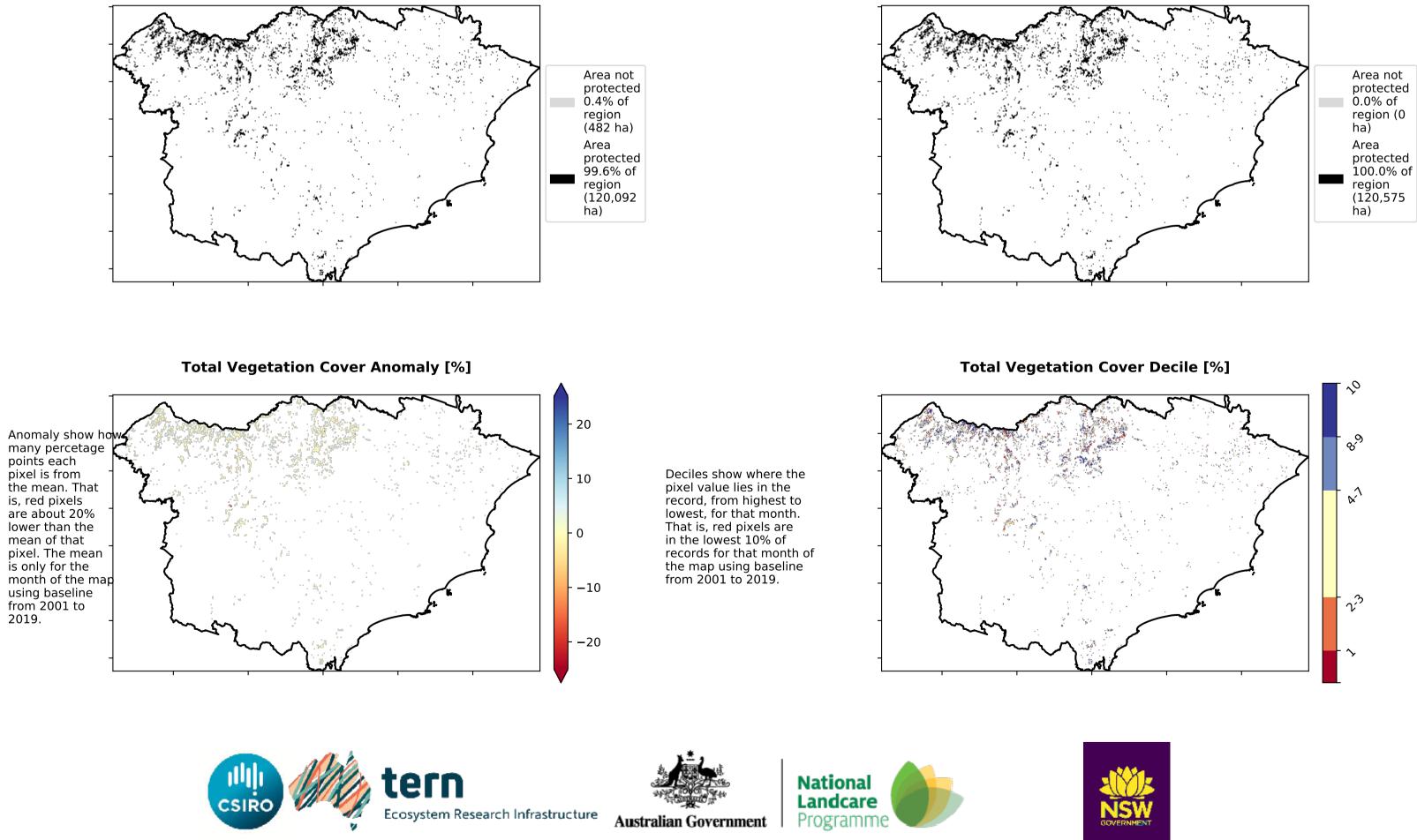
Grazing Woodland forest



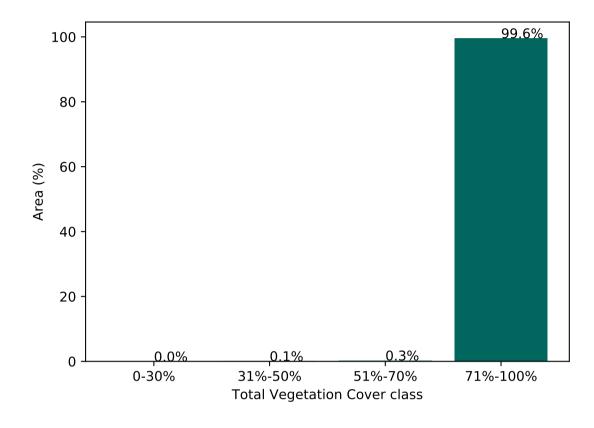
Total Vegetation Cover [%]



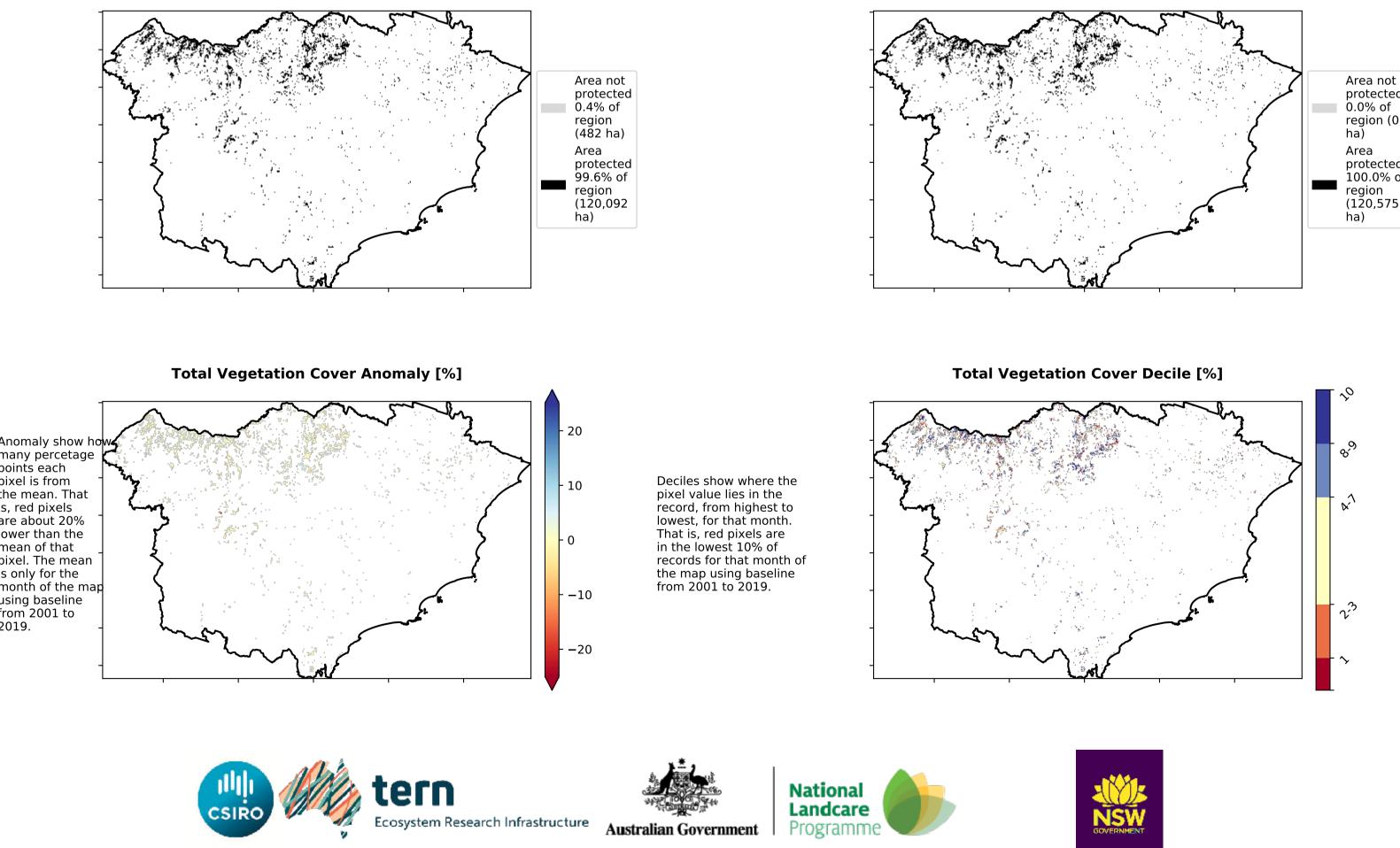
% Area protected from water erosion (>70%)

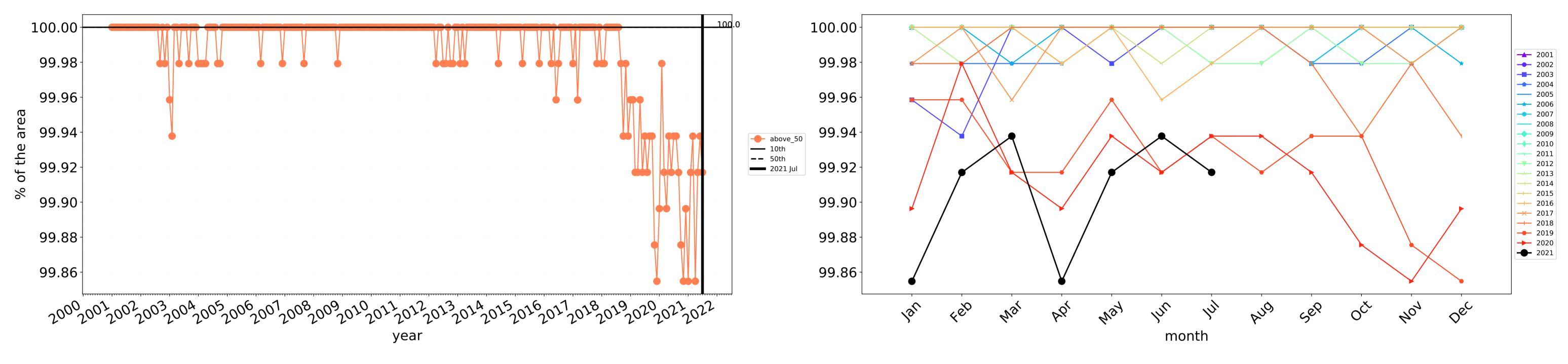


Proportion of vegetation cover class in area

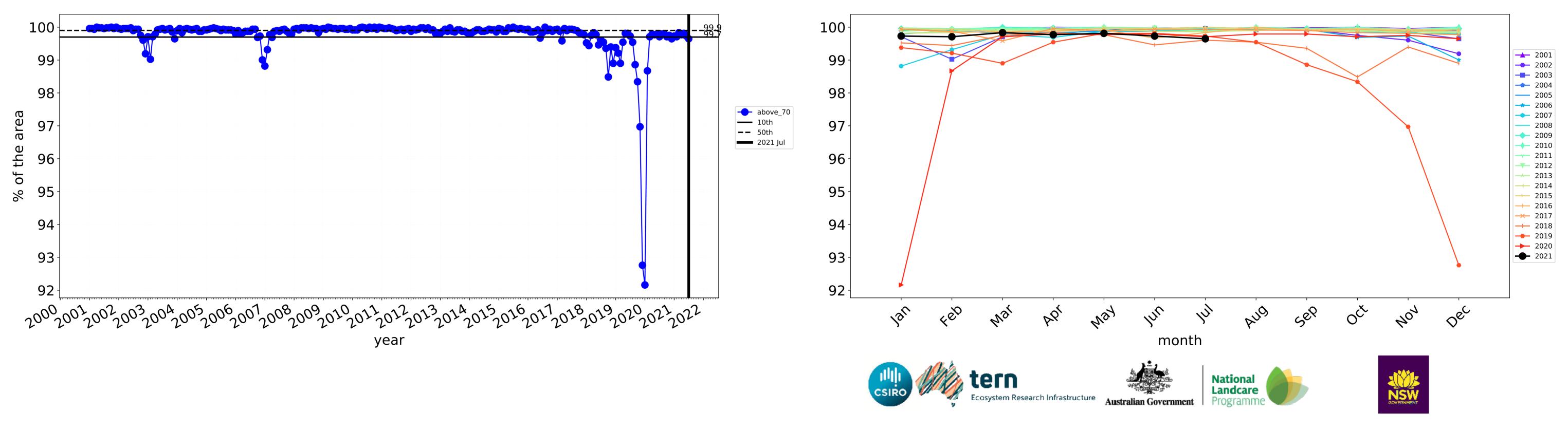


% Area protected from wind erosion (>50%)



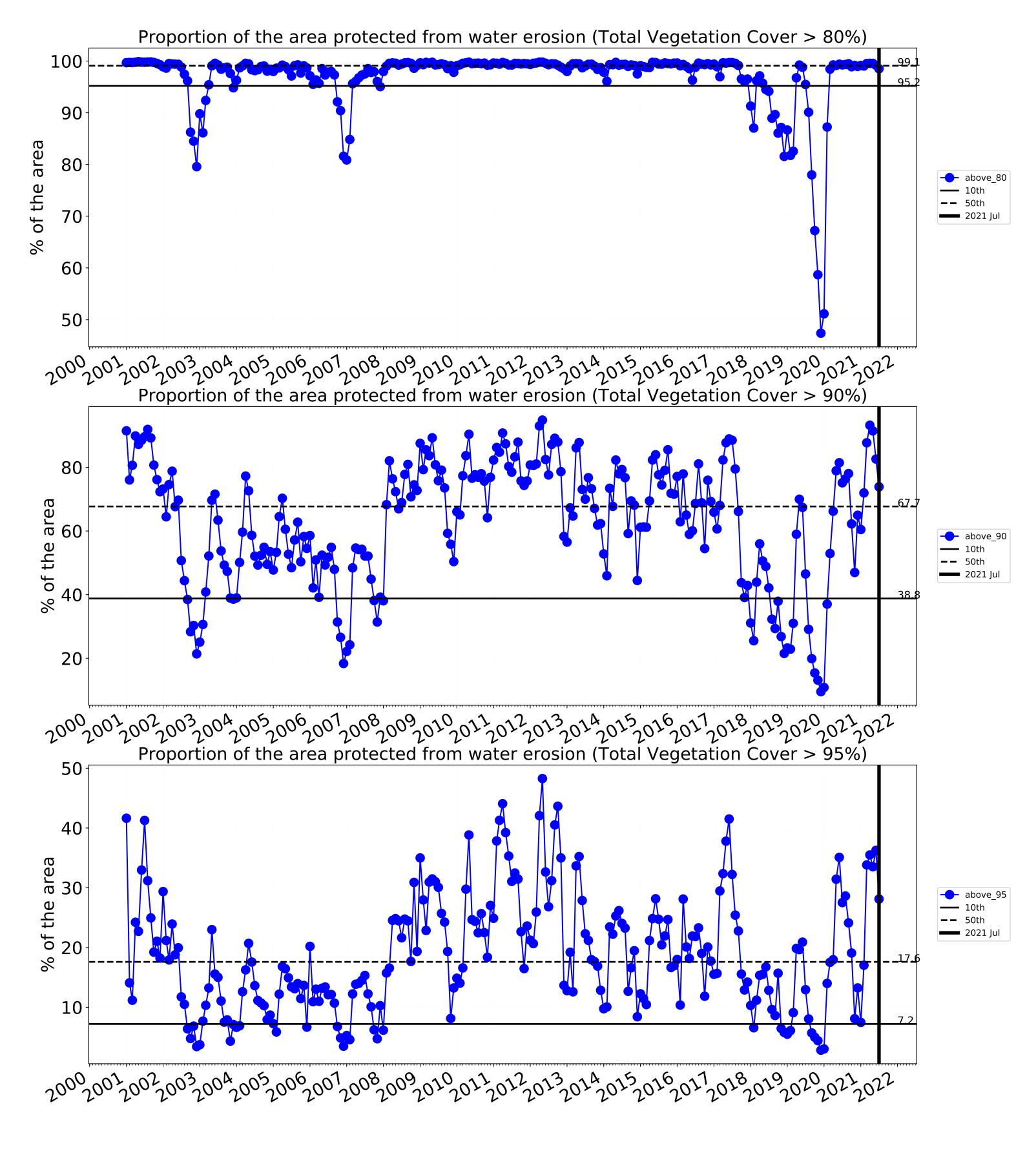


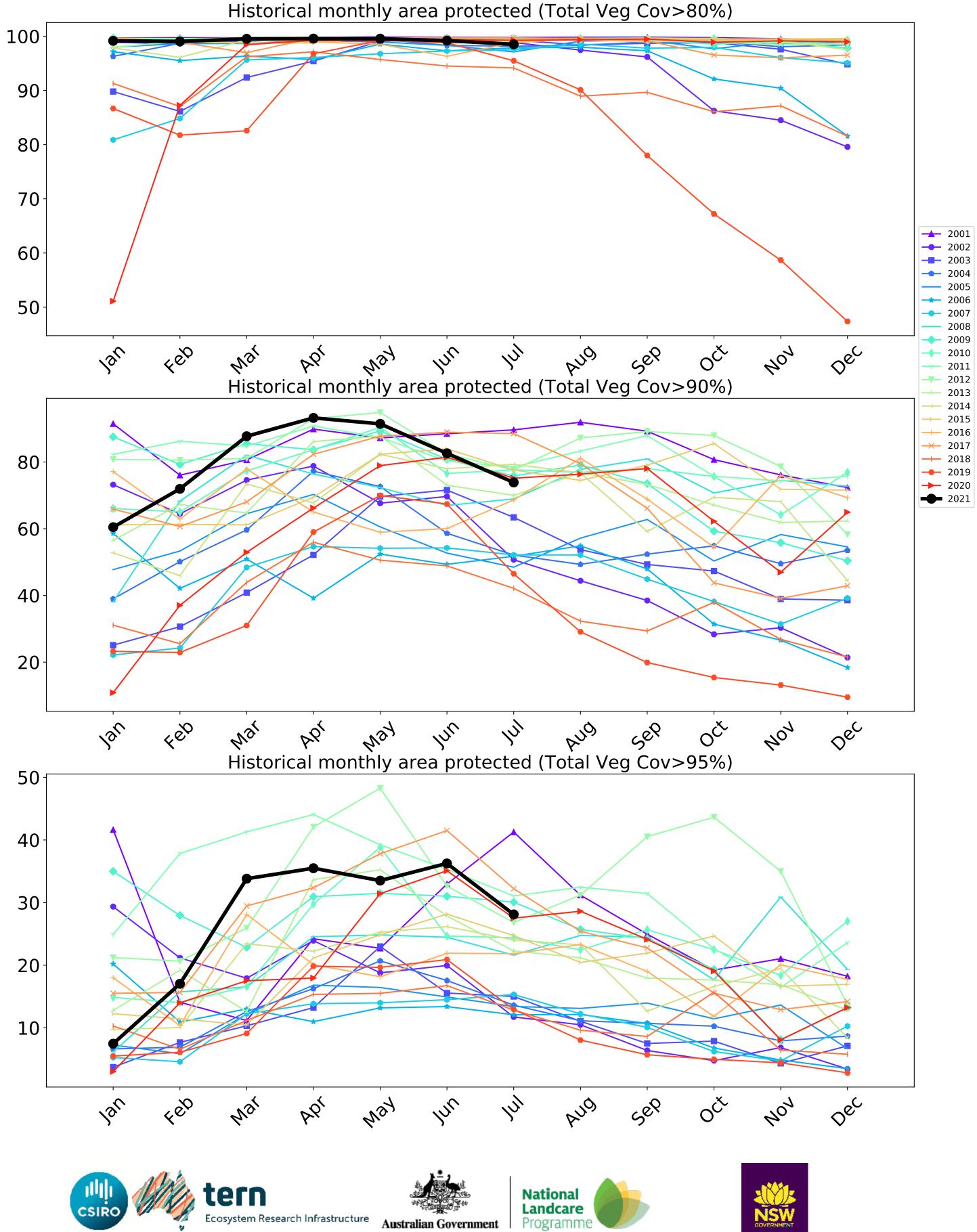
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

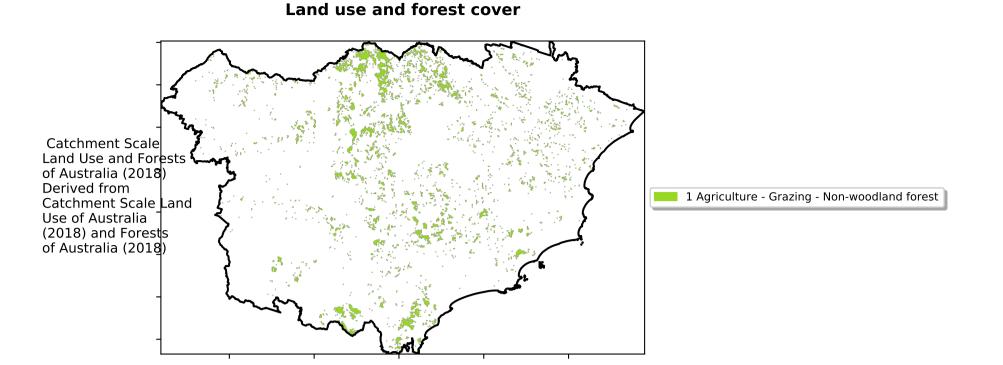
Water erosion historical monthly area protected (Total Veg Cov>70%)



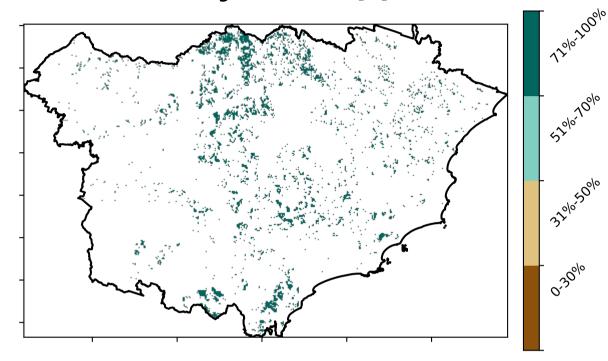




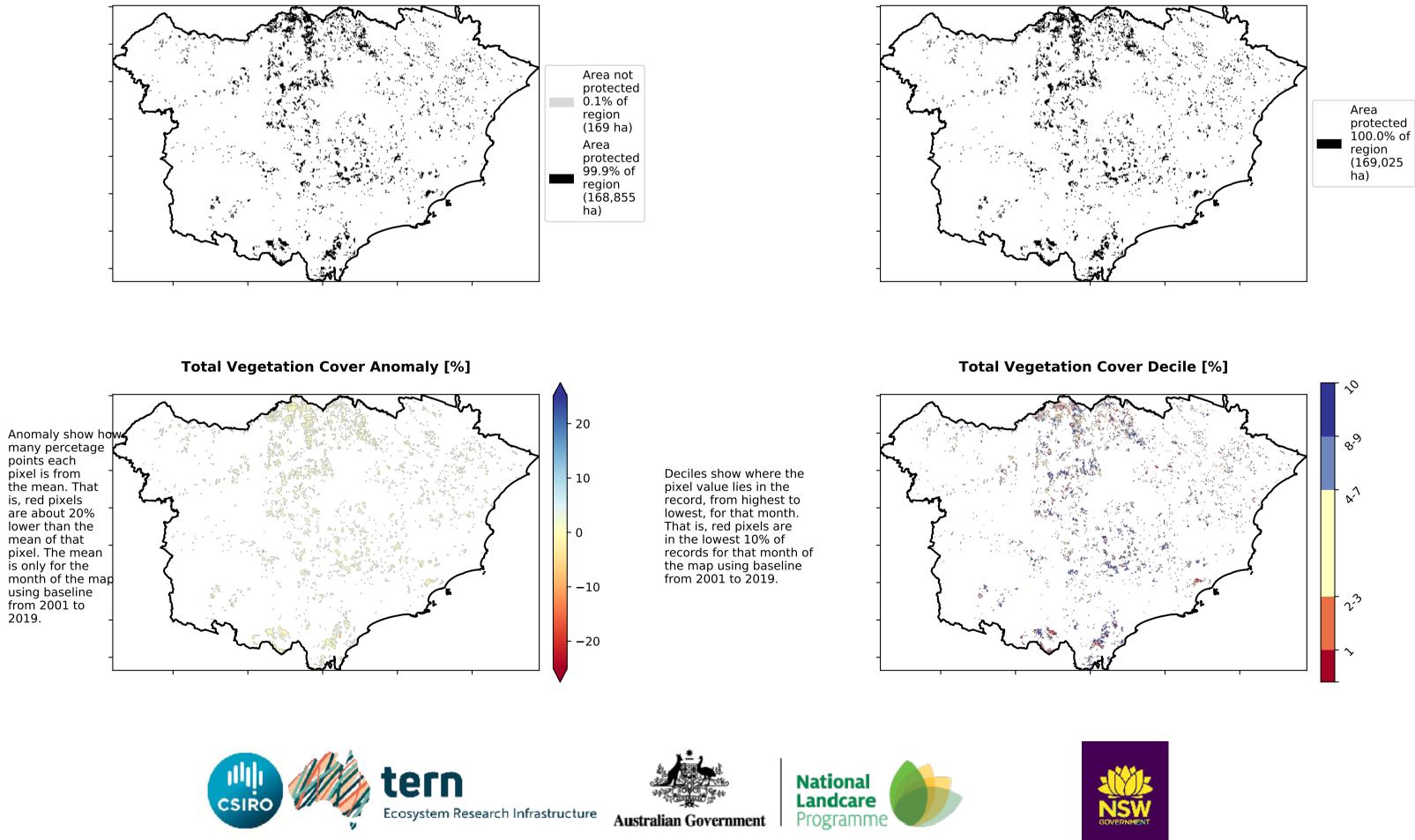
Grazing - Forest (non woodland)



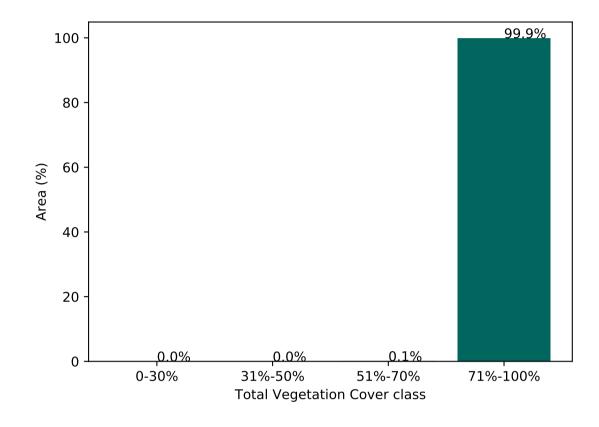
Total Vegetation Cover [%]



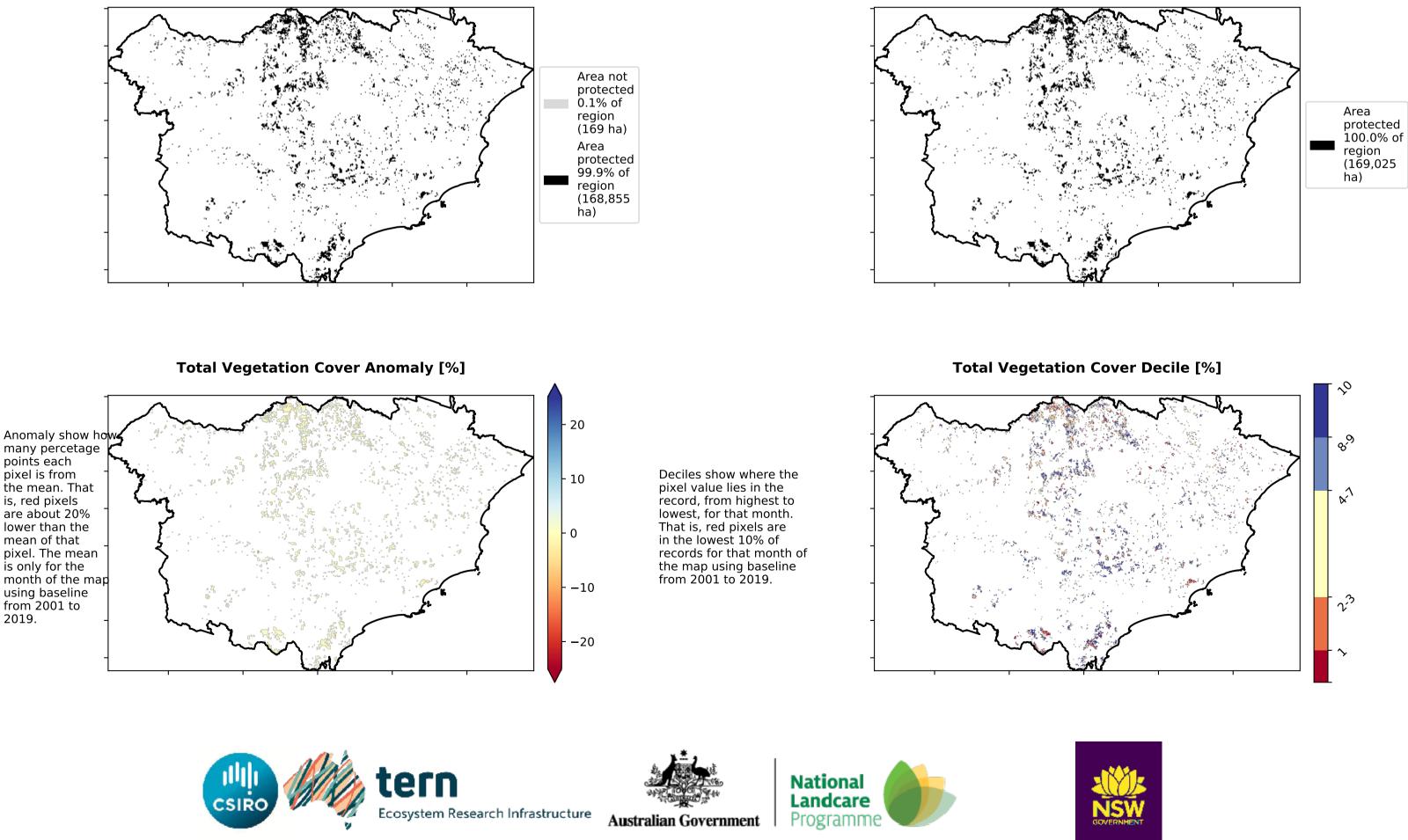
% Area protected from water erosion (>70%)

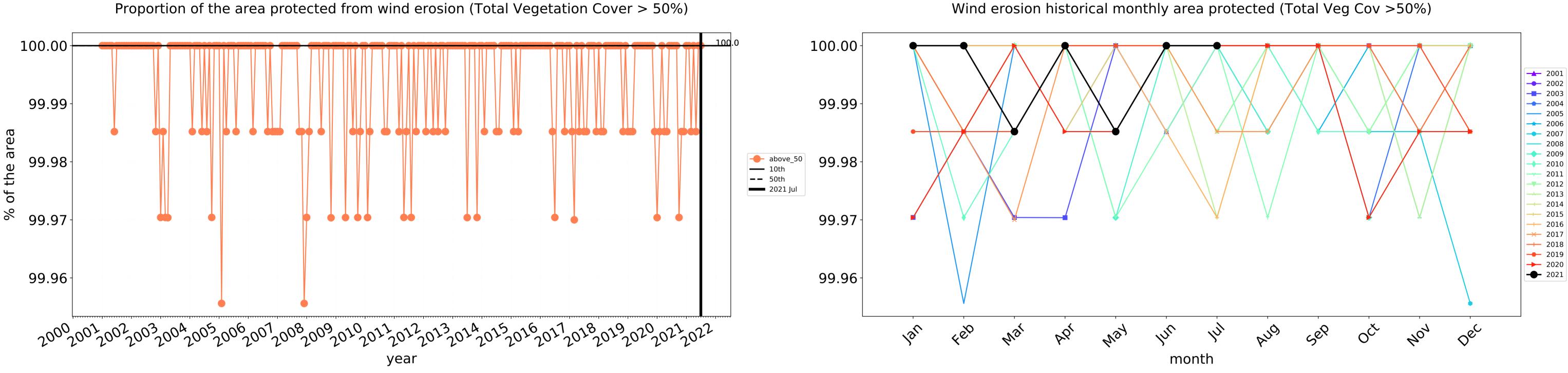


Proportion of vegetation cover class in area

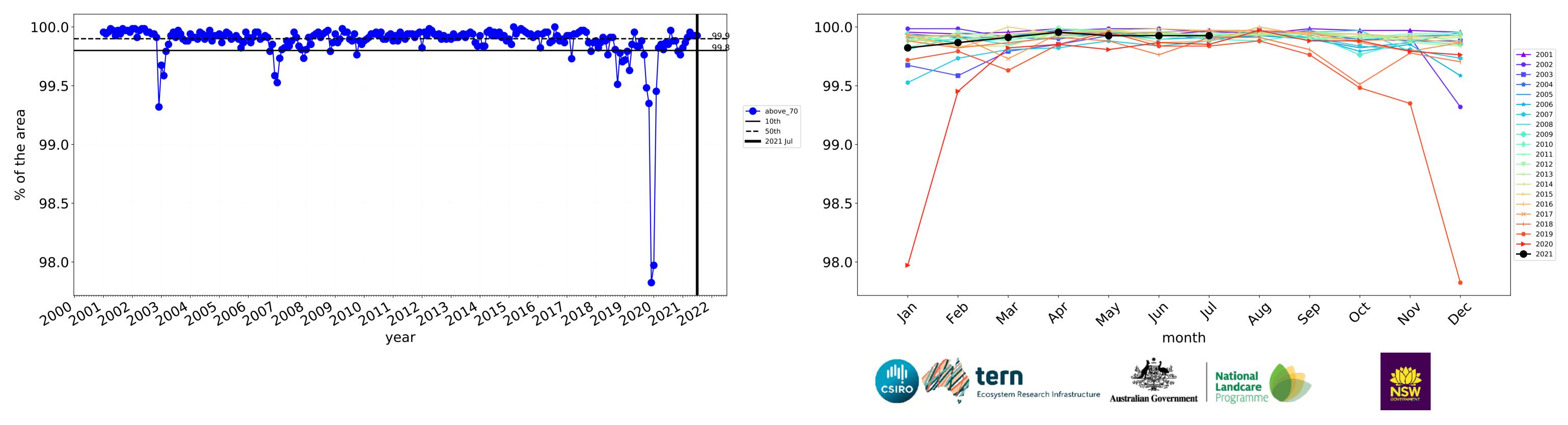


% Area protected from wind erosion (>50%)

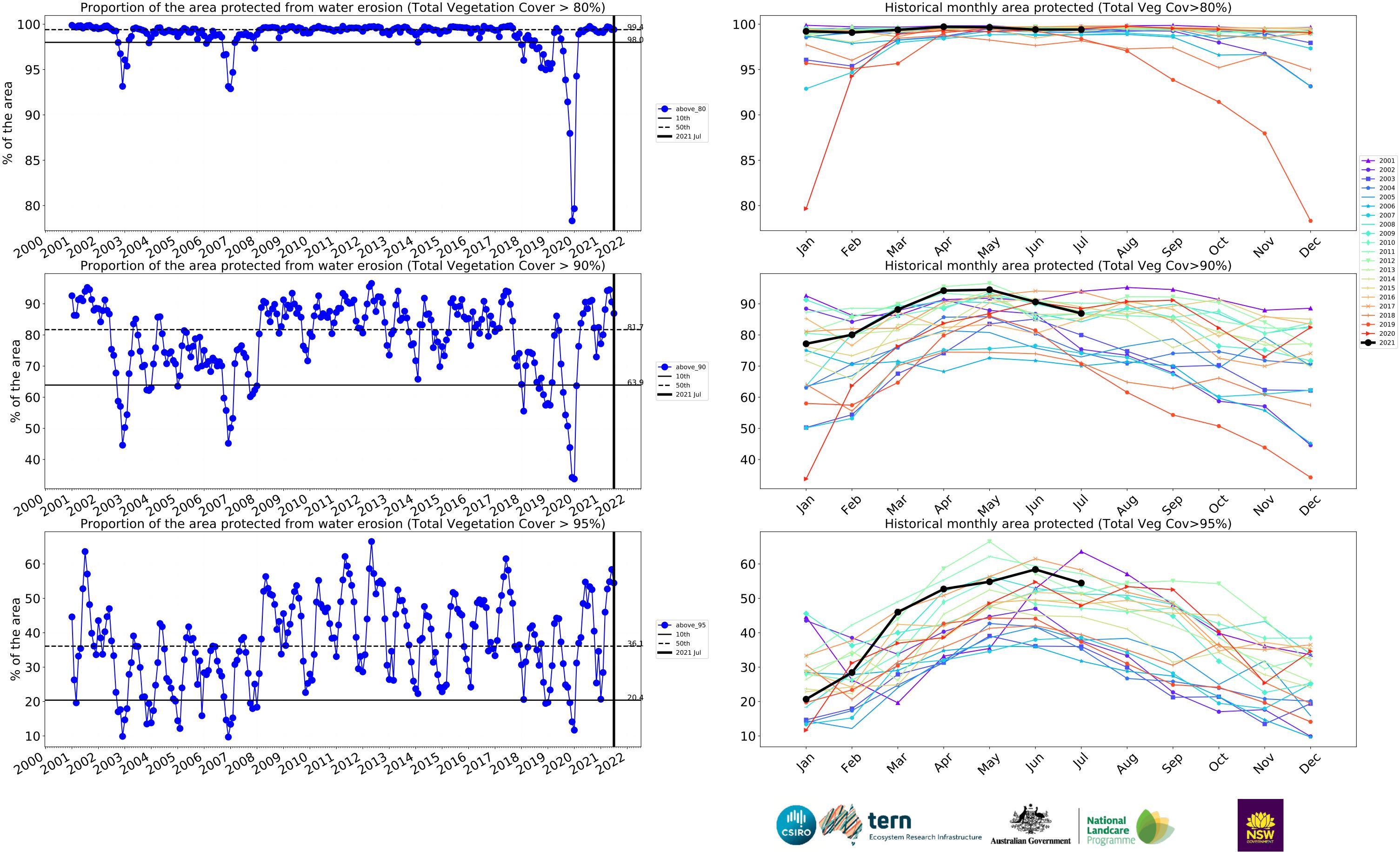




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

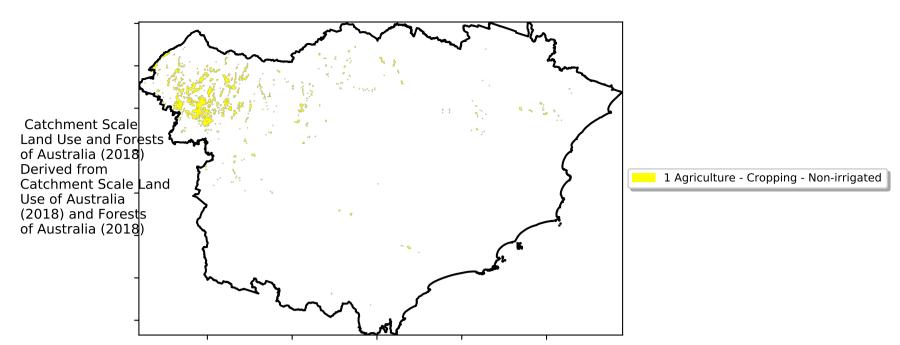


Water erosion historical monthly area protected (Total Veg Cov>70%)

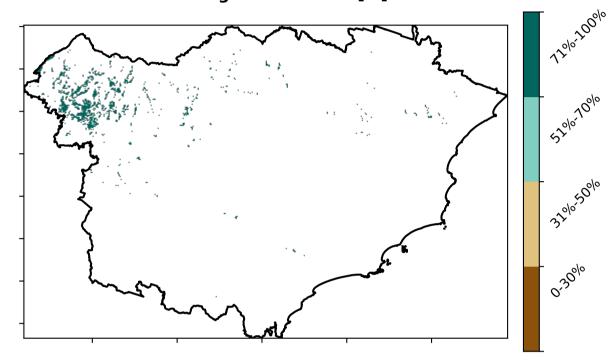


Cropping

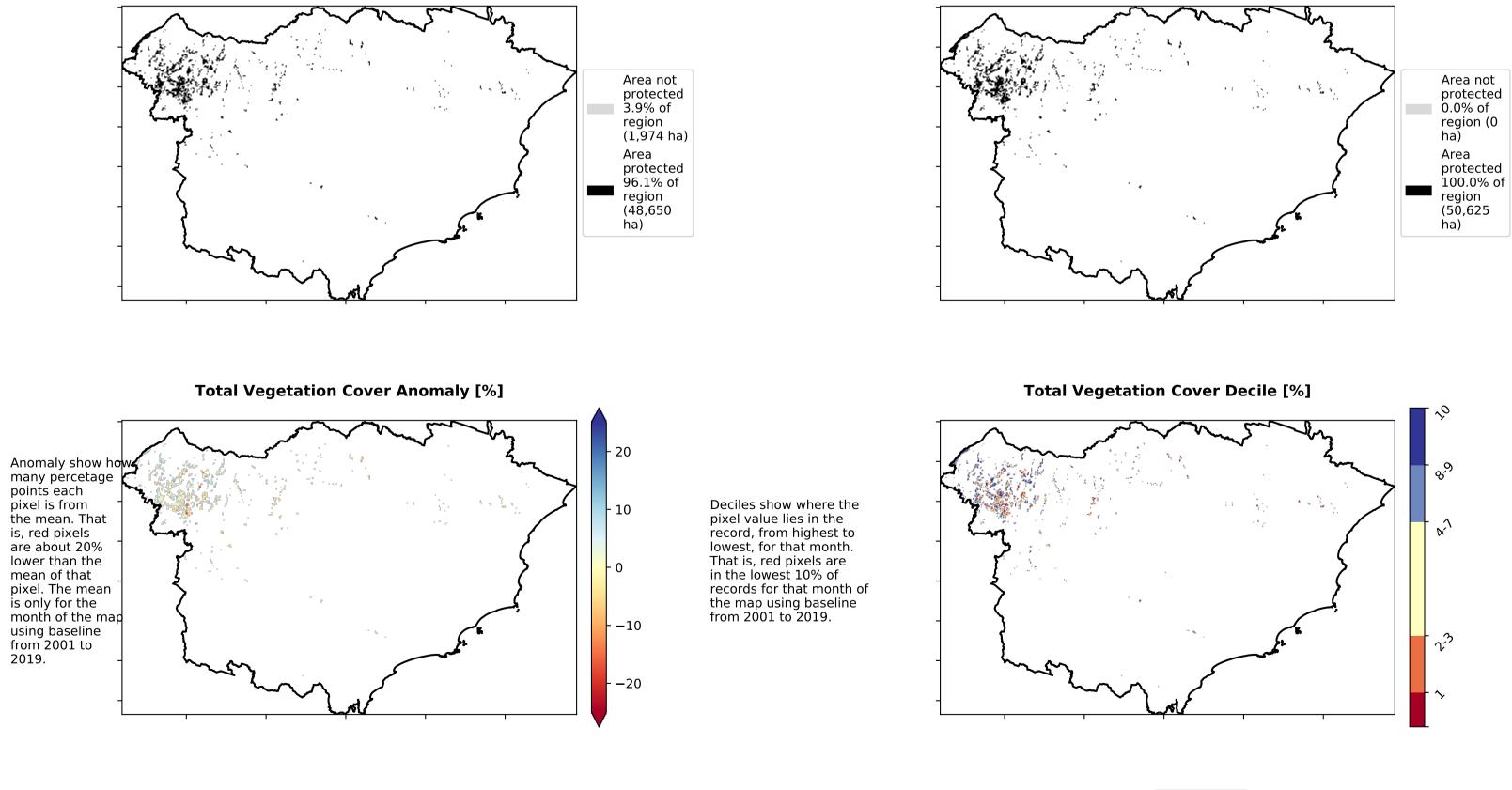
Land use and forest cover



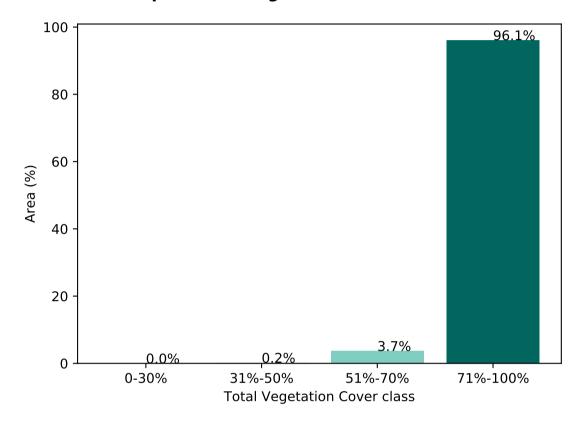
Total Vegetation Cover [%]



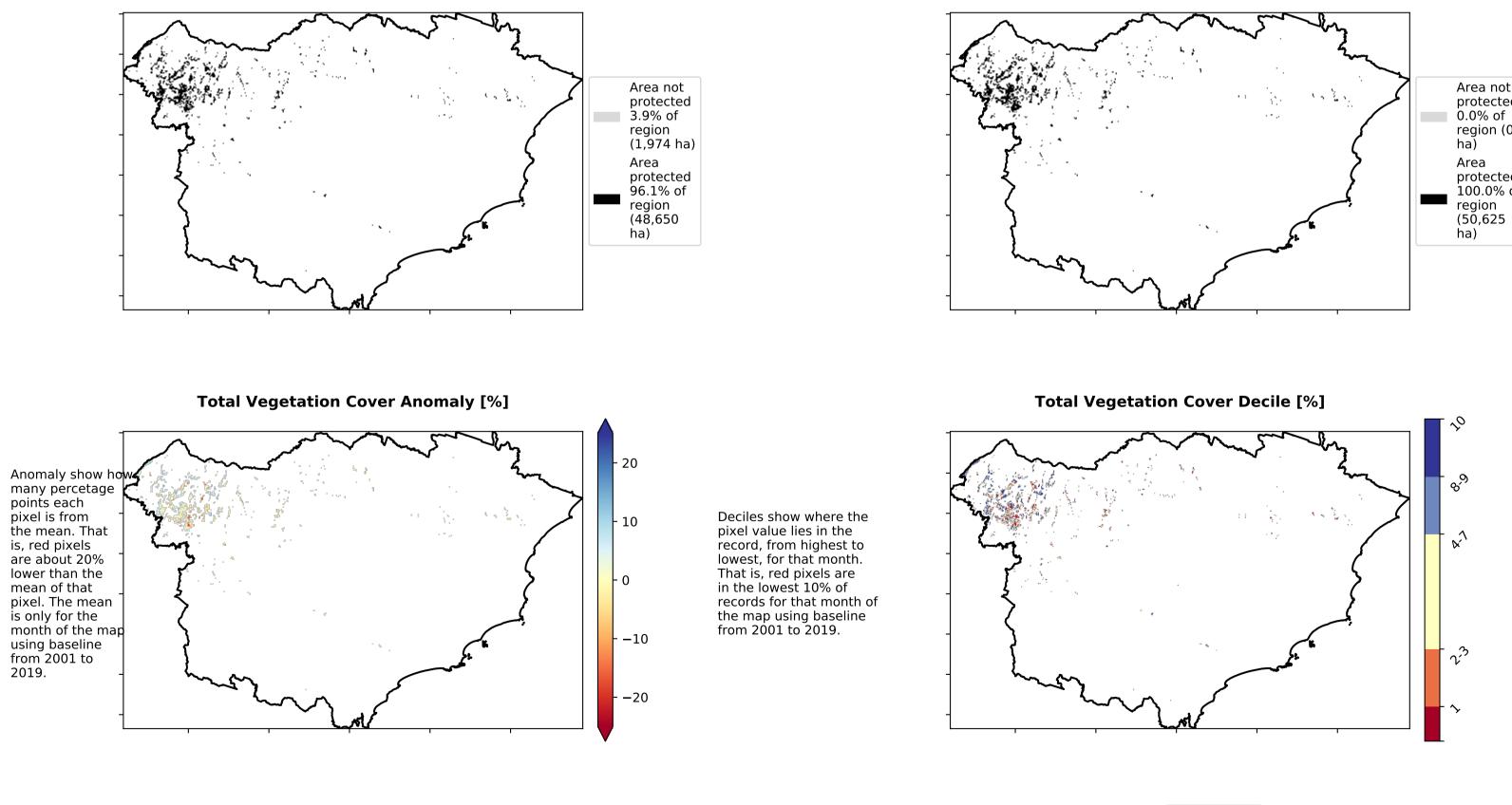
% Area protected from water erosion (>70%)



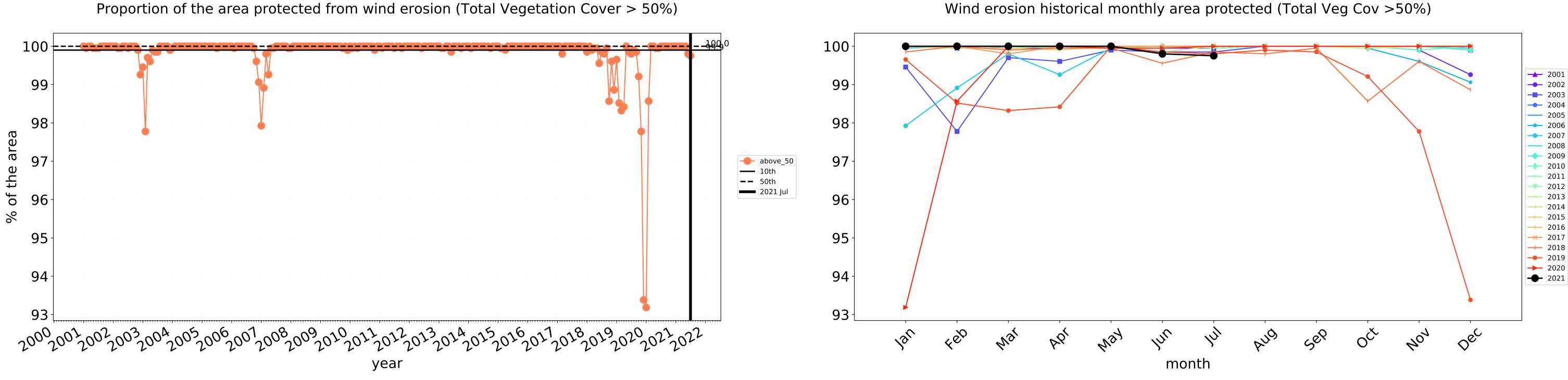
Proportion of vegetation cover class in area



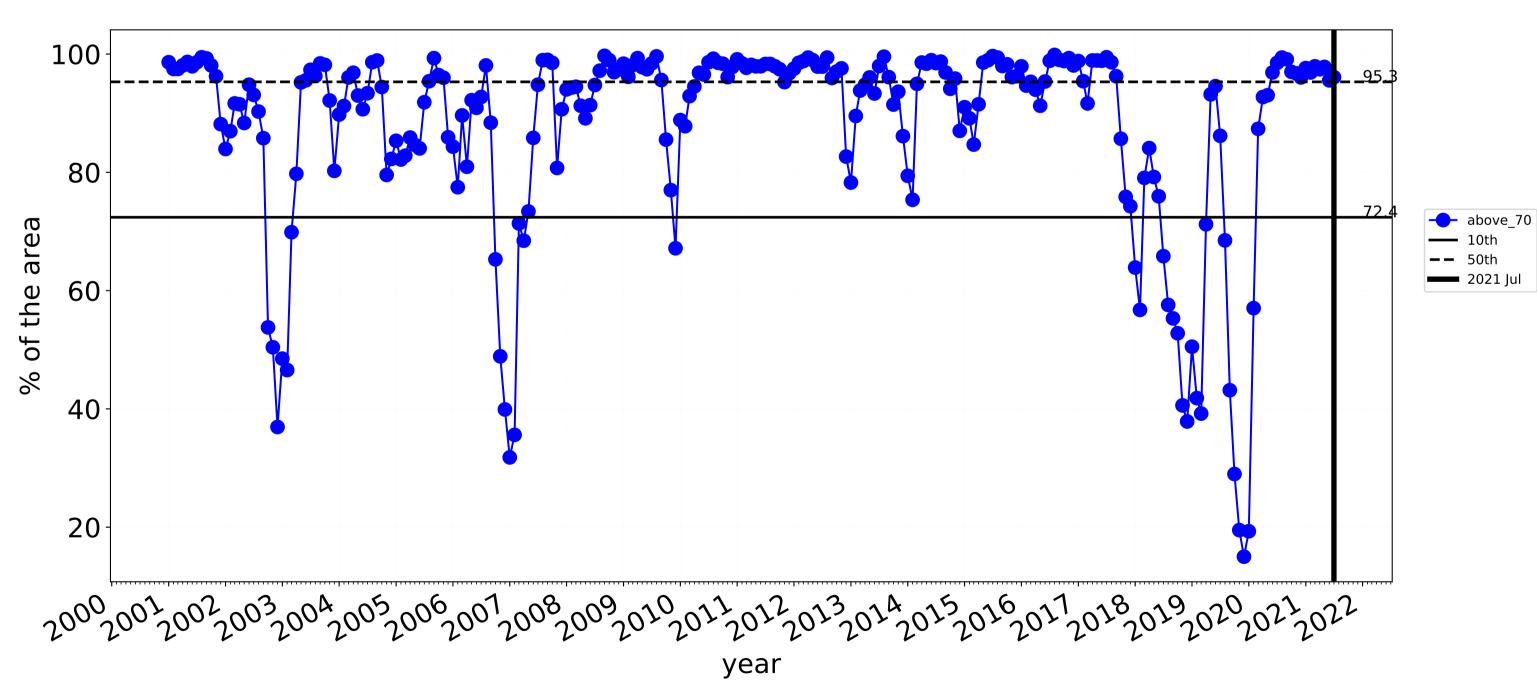
% Area protected from wind erosion (>50%)



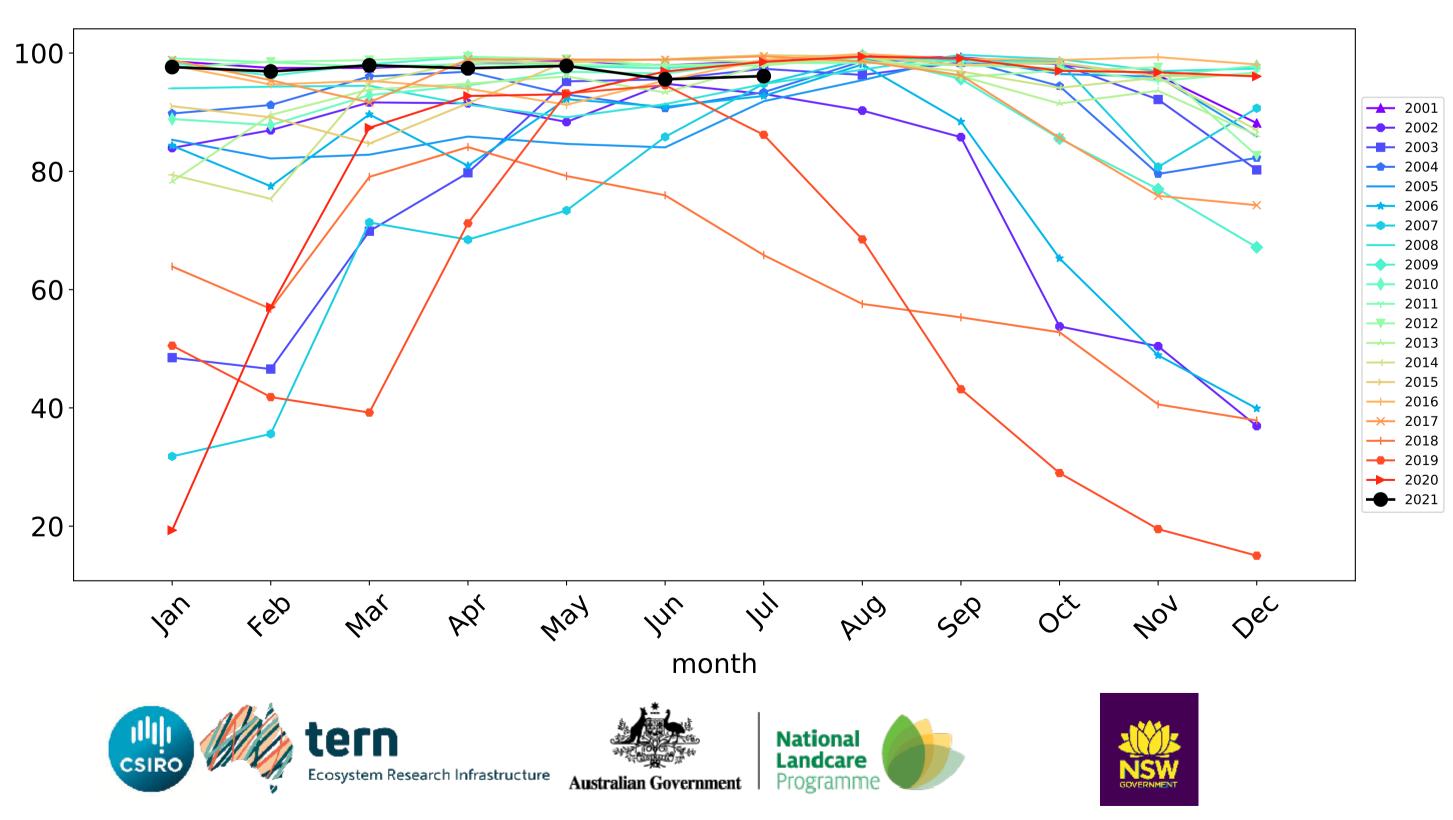




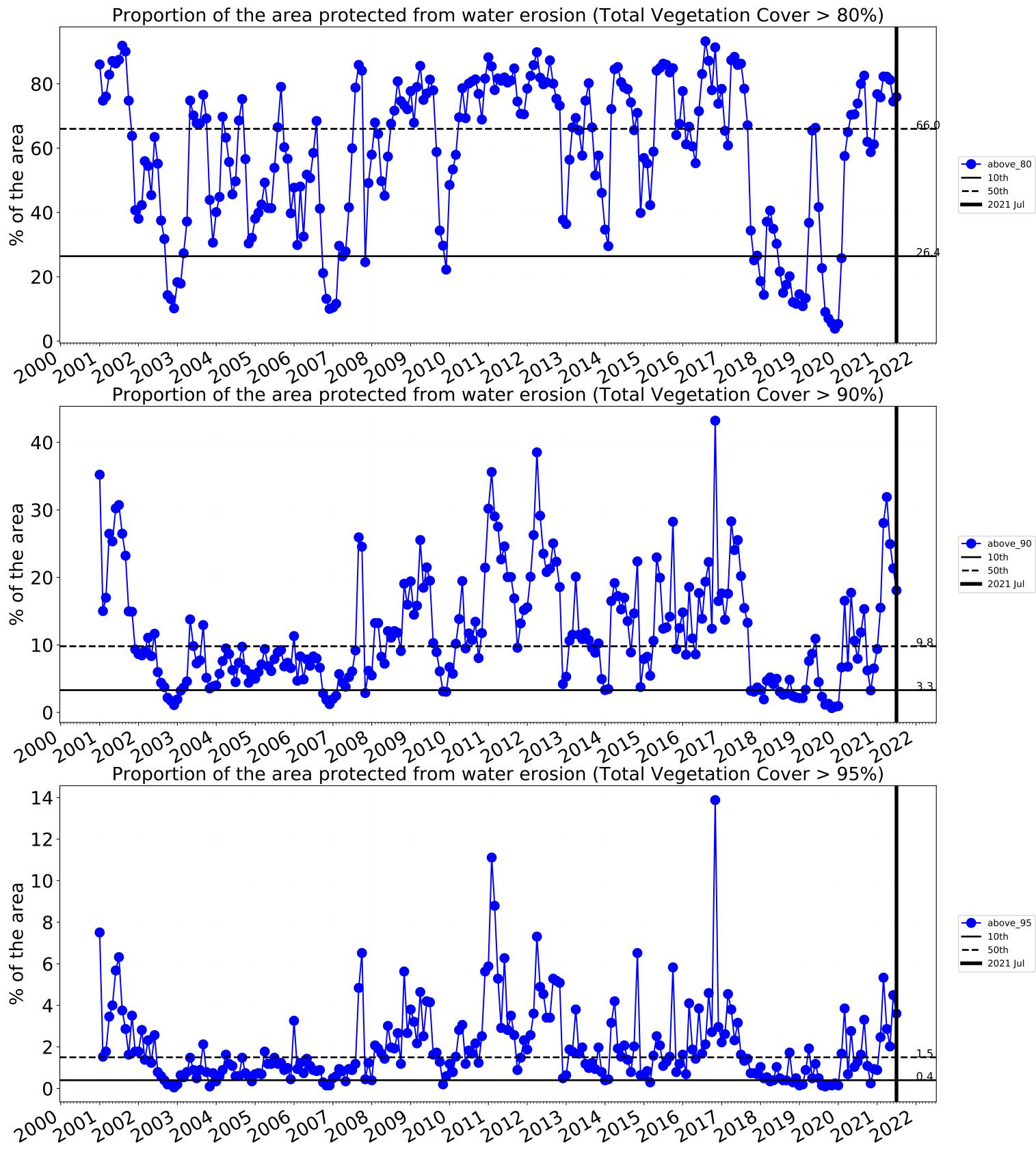
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

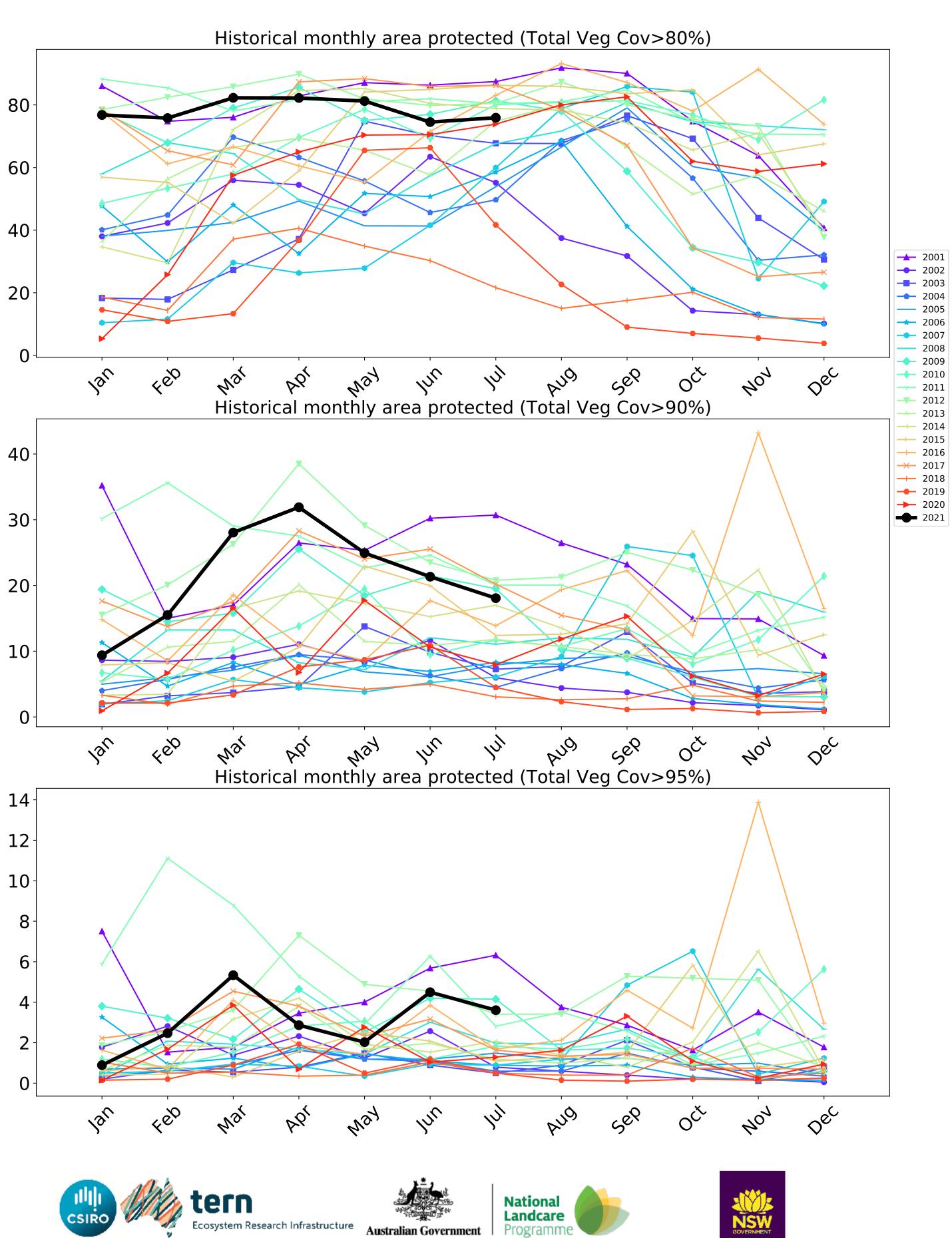


Cropping timeseries



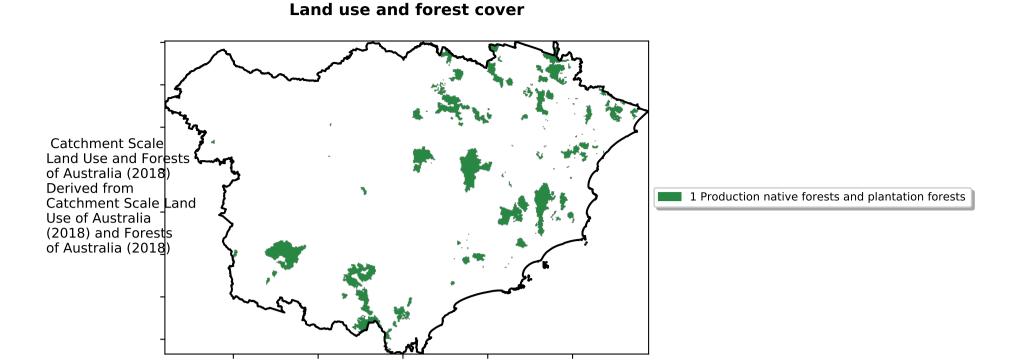
Water erosion historical monthly area protected (Total Veg Cov>70%)



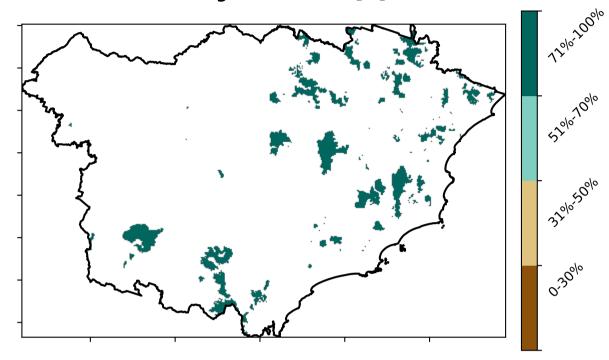


Australian Government

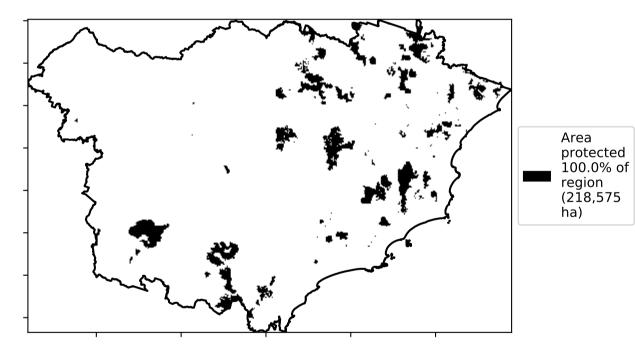
Production native forests and plantation forests



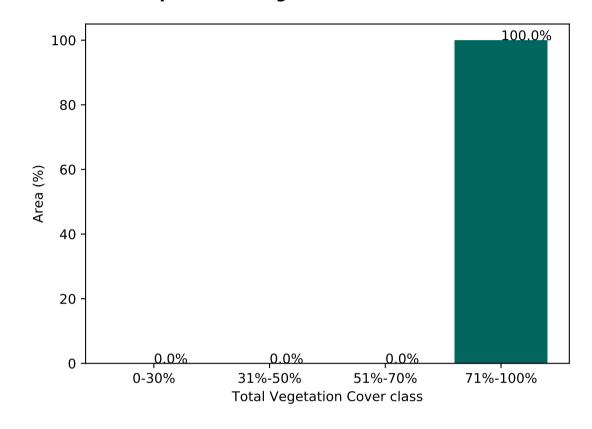
Total Vegetation Cover [%]



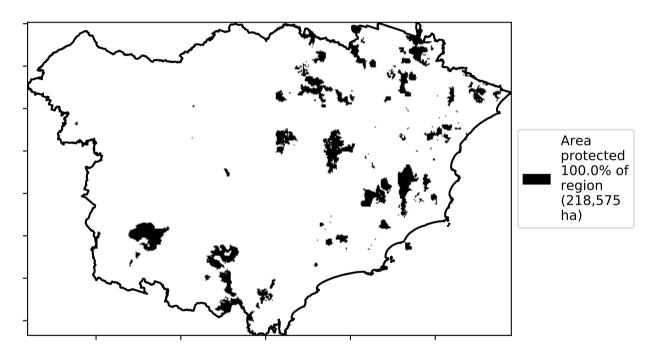
% Area protected from water erosion (>70%)



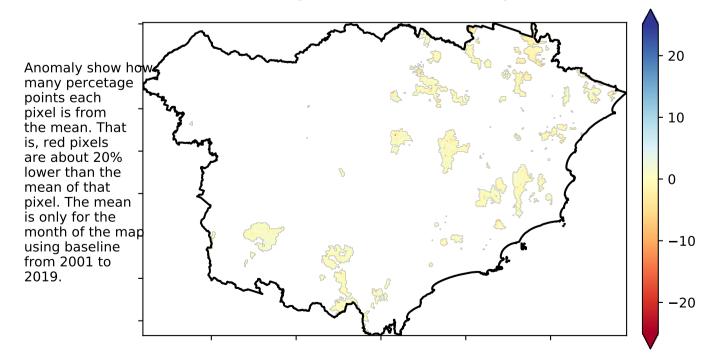
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

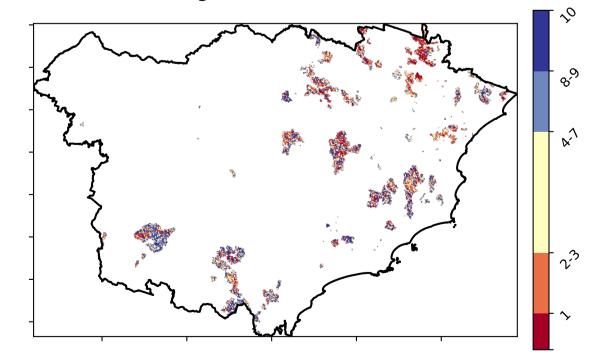


Total Vegetation Cover Anomaly [%]



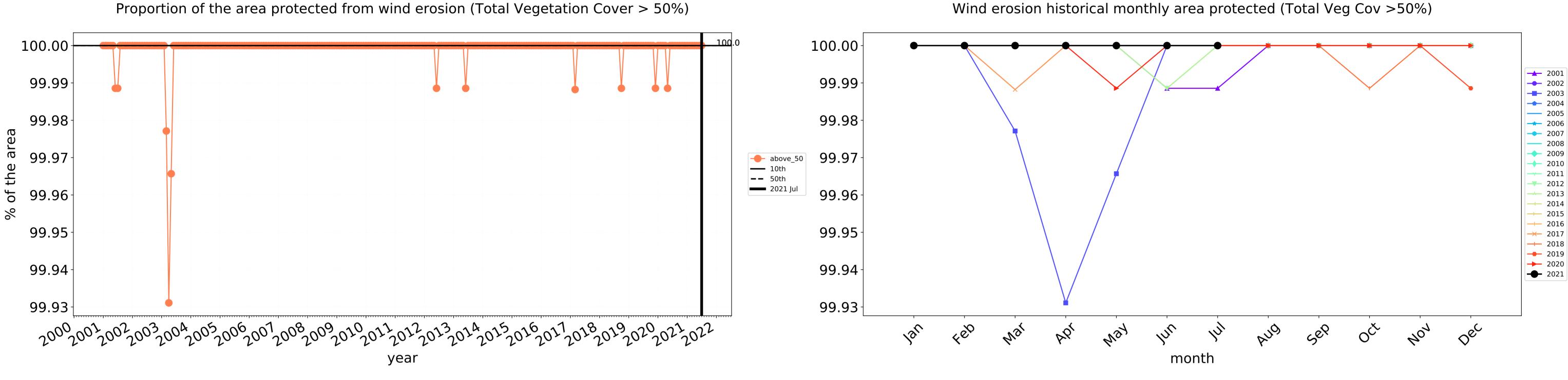
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

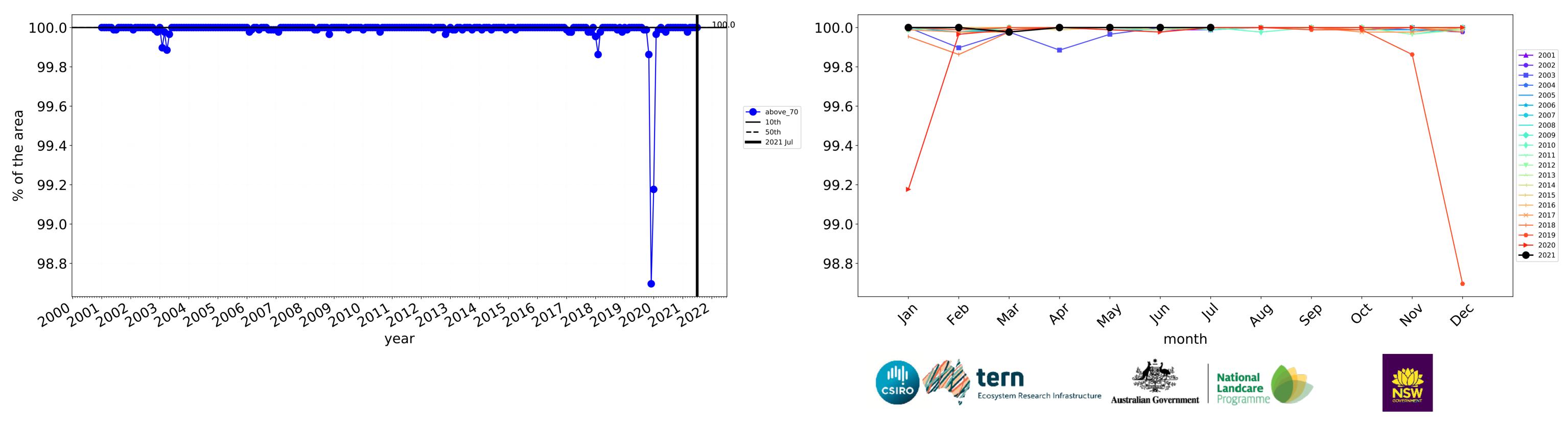




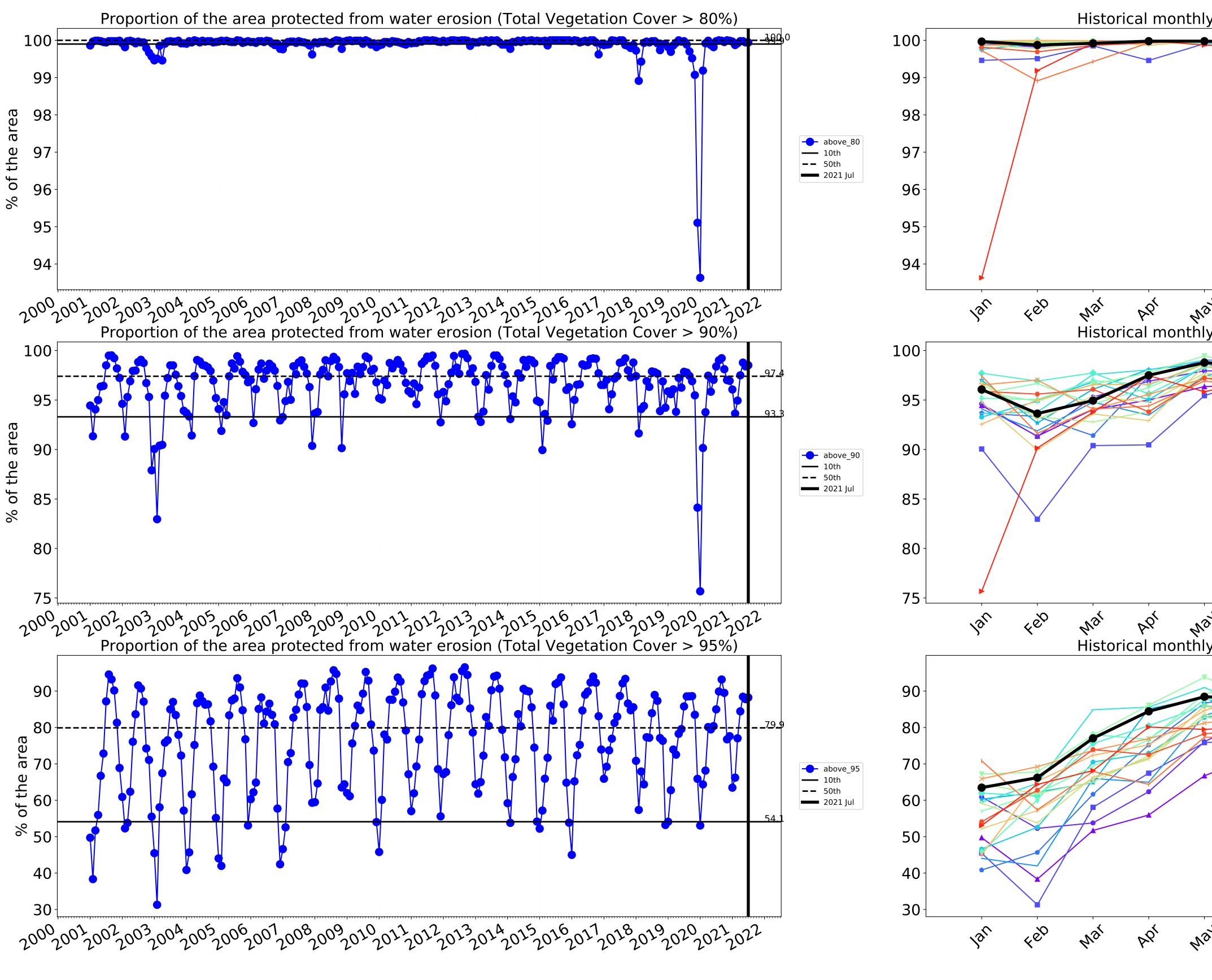
Production native forests and plantation forests timeseries

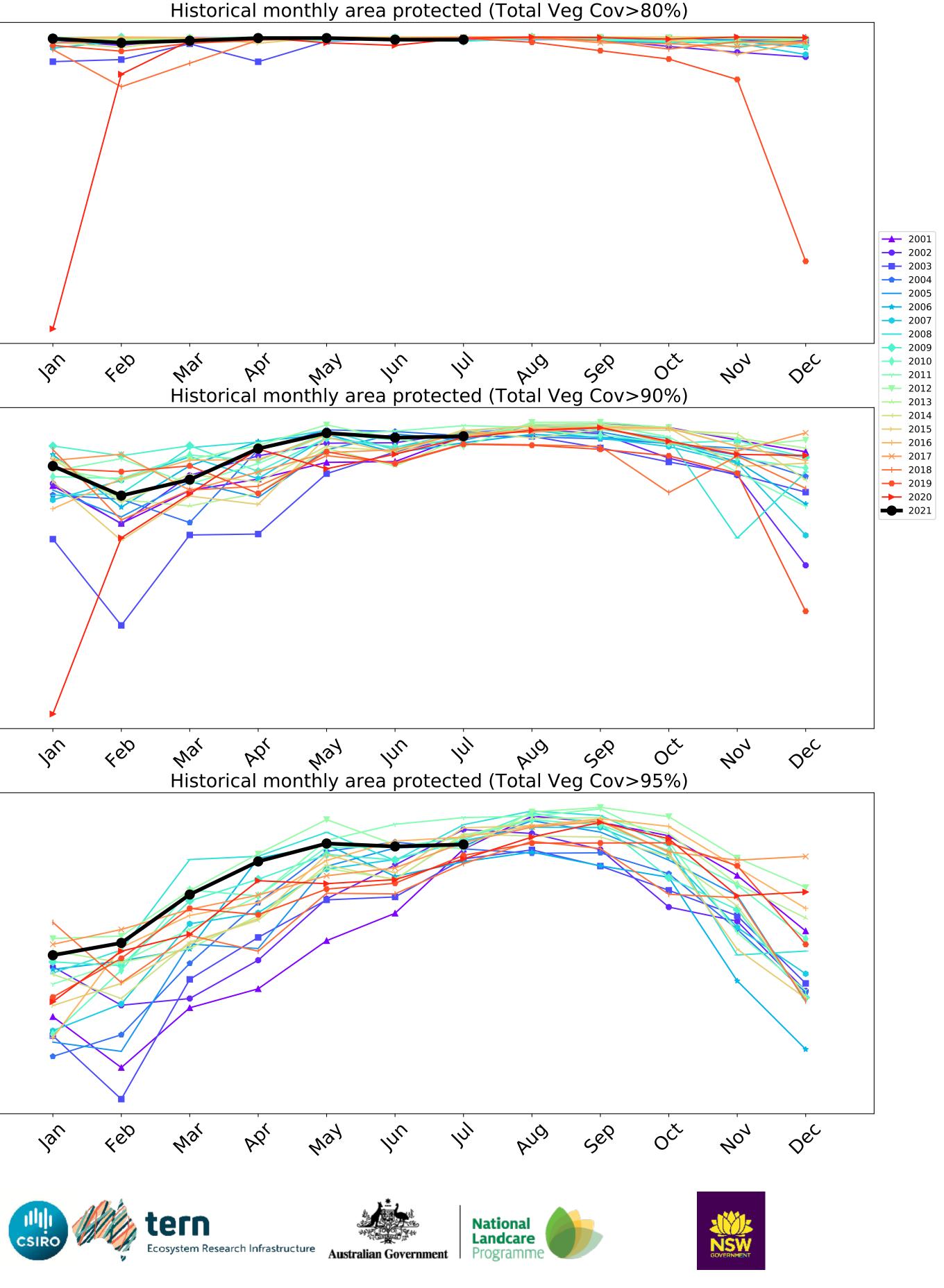


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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





Hunter (3,239,850 ha and no data 60,575 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	3,239,850	99.9% 3,235,675	99.6% 3,227,300	98.6% 3,193,050	96.0% 3,109,825	79.8% 2,585,200	53.6% 1,736,950
Conservation and natural environments	1,241,500	99.9% 1,240,300	99.8% 1,239,150	99.7% 1,237,225	99.3% 1,233,100	95.2% 1,181,700	76.2% 946,450
Conservation and natural environments non forest	30,450	96.2% 29,300	93.6% 28,500	91.1% 27,725	87.5% 26,650	71.7% 21,825	38.9% 11,850
Conservation and natural environments Woodland forest	138,850	100.0% 138,850	99.9% 138,750	99.8% 138,550	99.4% 138,075	91.7% 127,350	57.7% 80,175
Conservation and natural environments Forest (non woodland)	1,072,200	100.0% 1,072,150	100.0% 1,071,900	99.9% 1,070,950	99.6% 1,068,375	96.3% 1,032,525	79.7% 854,425
Agriculture	1,580,525	100.0% 1,580,450	99.9% 1,579,500	99.4% 1,570,425	96.5% 1,524,425	70.8% 1,118,800	36.0% 569,025
Grazing	1,502,525	100.0% 1,502,450	99.9% 1,501,625	99.5% 1,494,875	97.4% 1,464,150	73.6% 1,105,325	37.7% 566,350
Grazing non forest	1,212,925	100.0% 1,212,875	99.9% 1,212,125	99.4% 1,205,825	97.1% 1,177,350	71.7% 869,350	36.3% 440,400
Grazing Woodland forest	120,575	100.0% 120,550	99.9% 120,475	99.6% 120,150	98.5% 118,775	73.9% 89,075	28.1% 33,900
Grazing - Forest (non woodland)	169,025	100.0% 169,025	100.0% 169,025	99.9% 168,900	99.4% 168,025	86.9% 146,900	54.5% 92,050
Cropping	50,625	100.0% 50,625	99.8% 50,500	96.1% 48,650	75.9% 38,425	18.1% 9,150	3.6% 1,825
Production native forests and plantation forests	218,575	100.0% 218,575	100.0% 218,575	100.0% 218,575	99.9% 218,450	98.5% 215,325	88.2% 192,875

