Total vegetation cover soil protection Region:LGA Muswellbrook_(A) NSW

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:

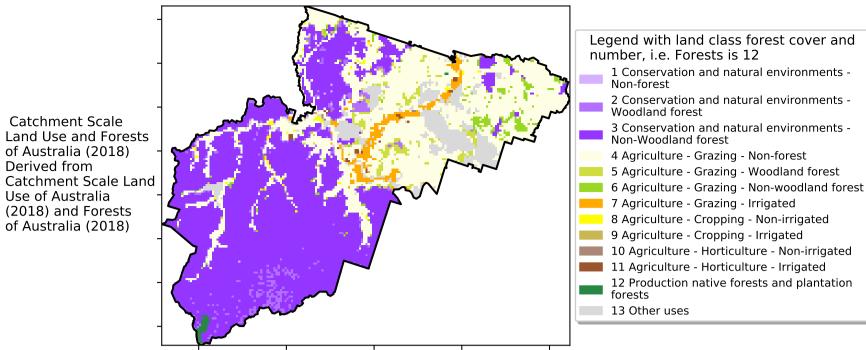
https://doi.org/10.4225/08/5848a3f19a7b3



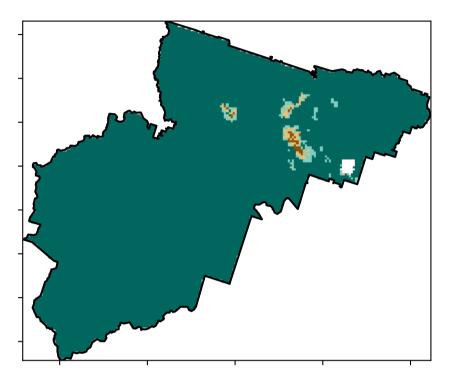
Vegetation Cover May 2021

Land use and forest cover

Proportion of each land class in area



Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



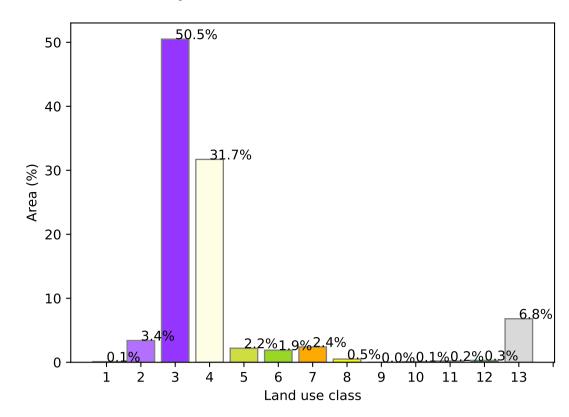
Area not protected (6,793 ha)

12%100%

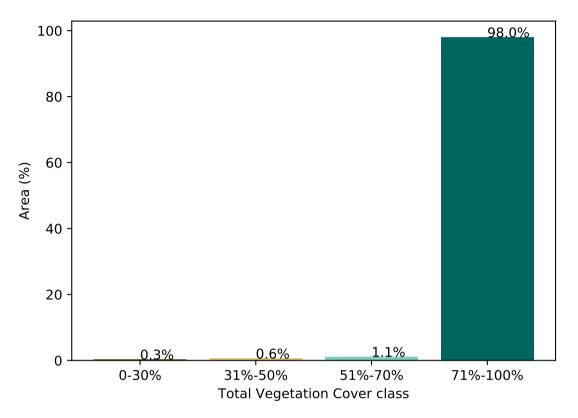
5201010010

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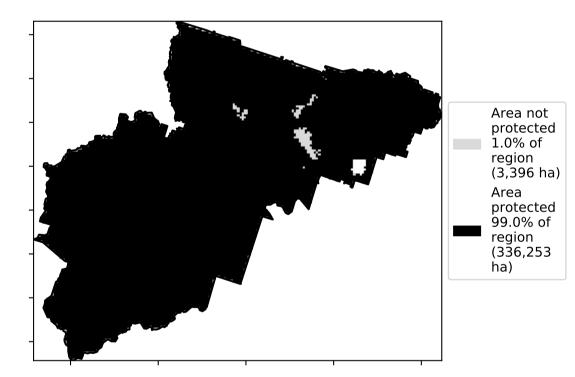
0.30%



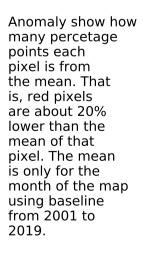
Proportion of vegetation cover class in area

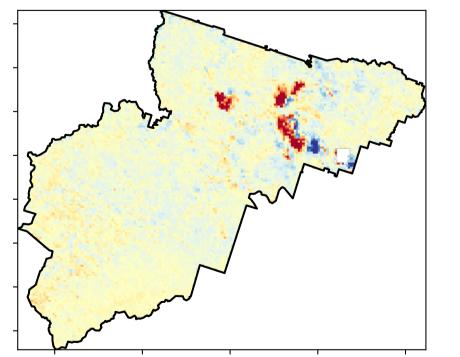


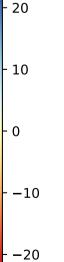
% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

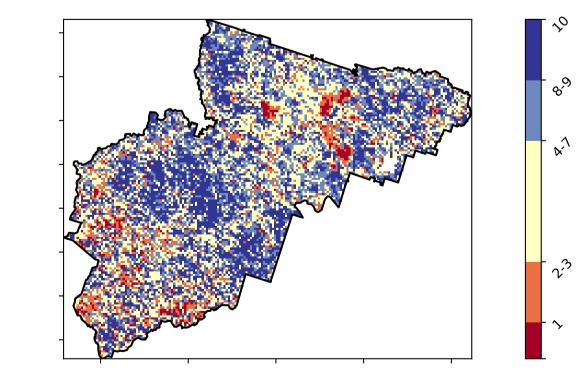




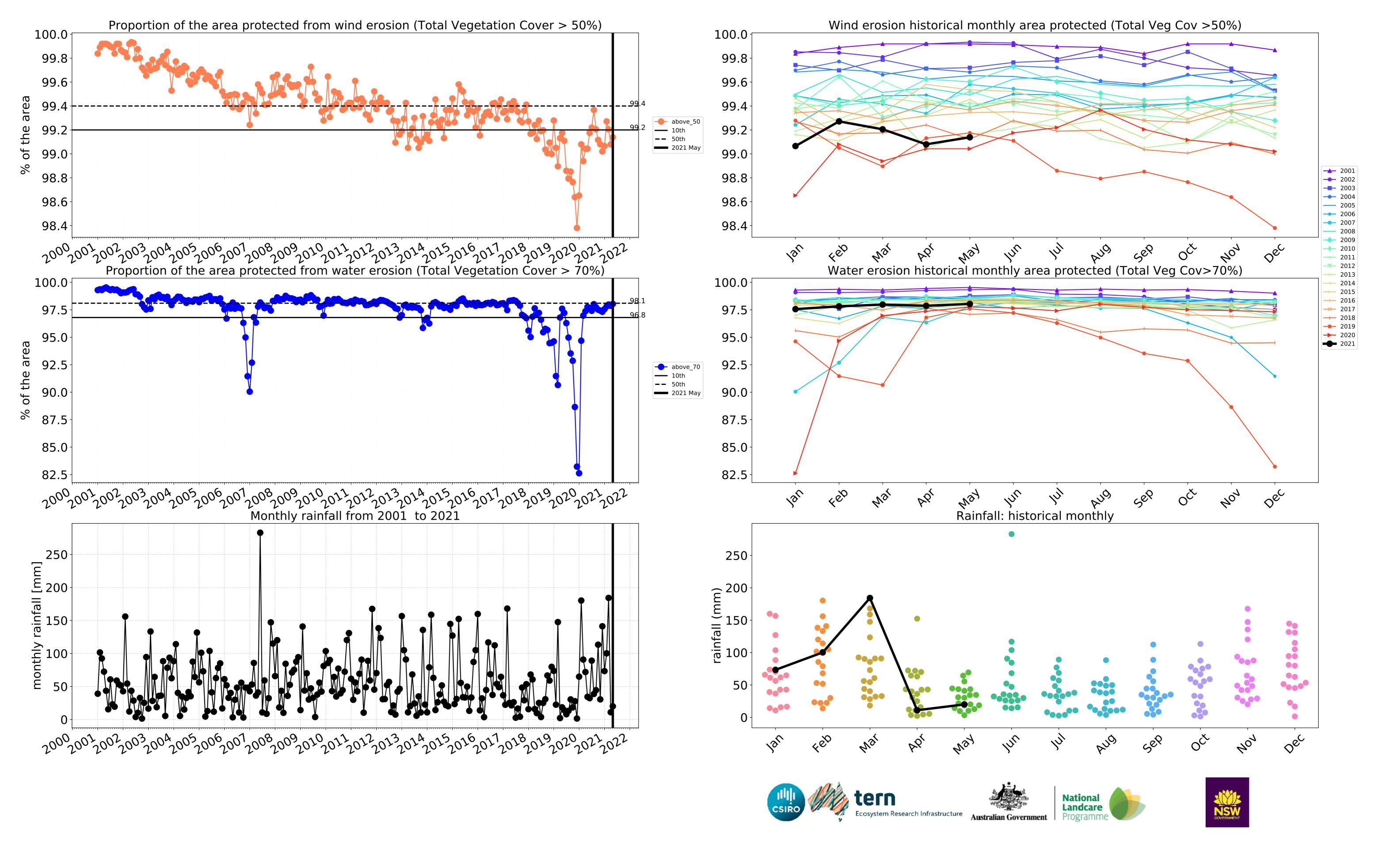


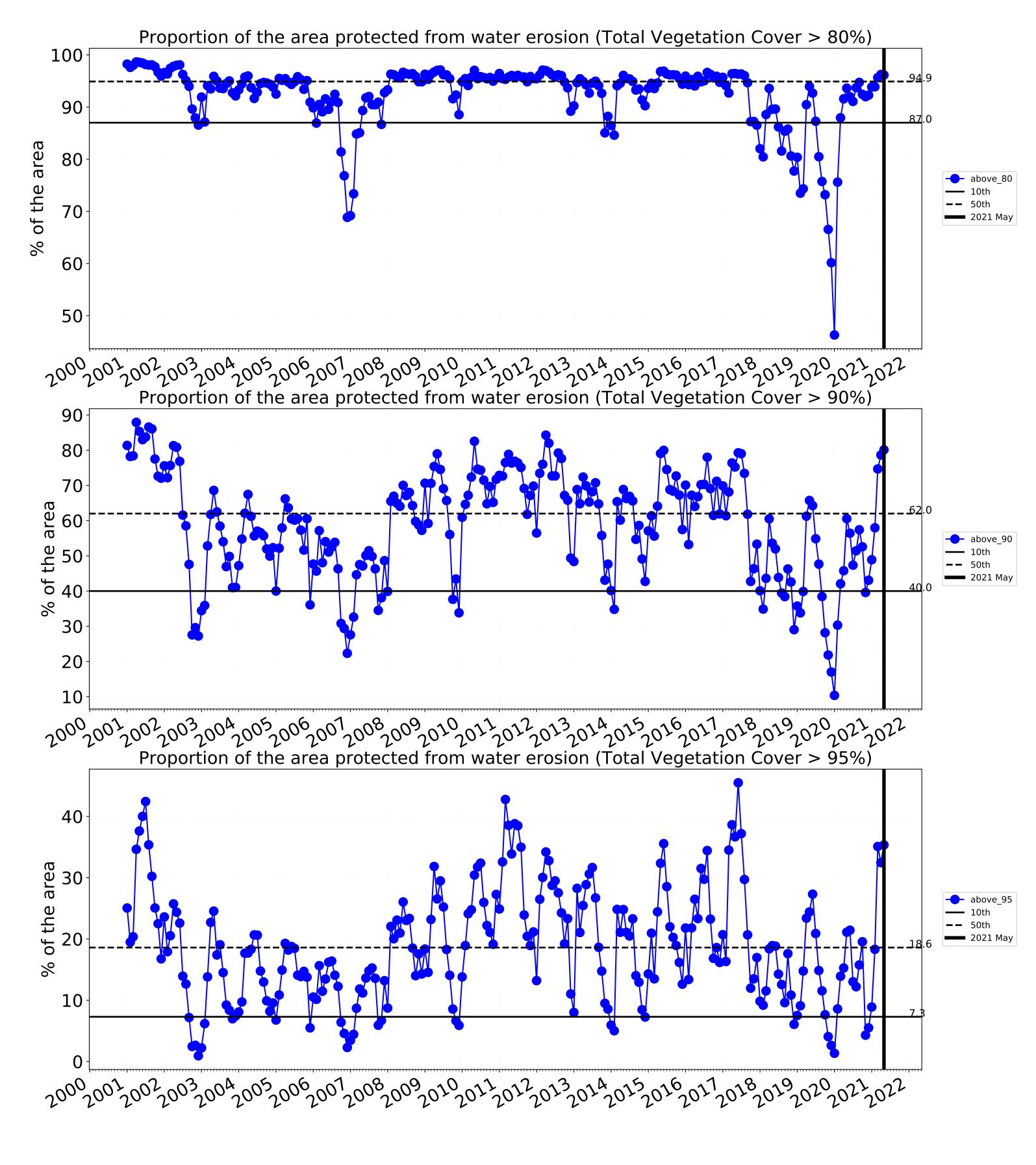
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

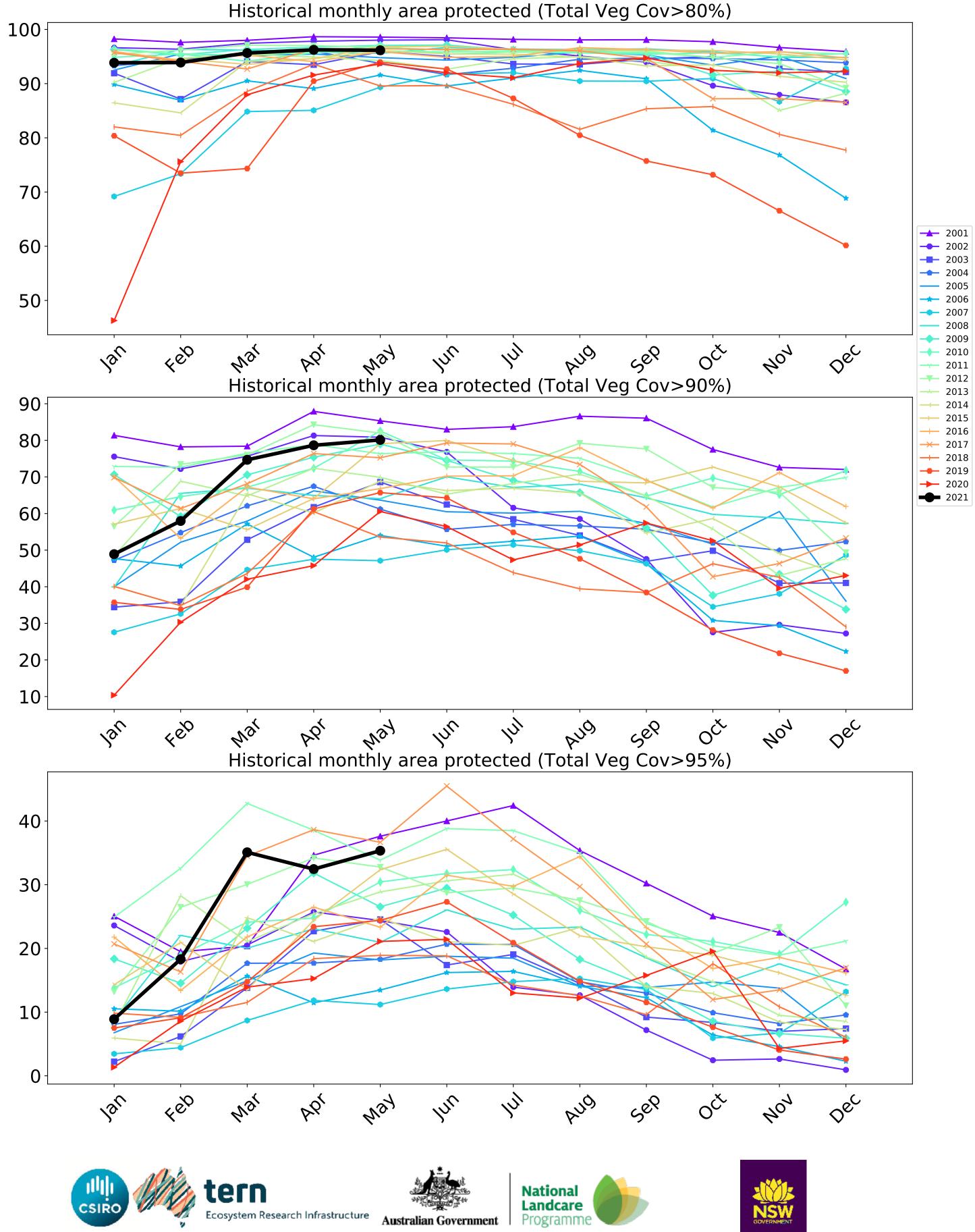
Total Vegetation Cover Decile [%]













Conservation and natural environments

forest

12%100%

52% 70%

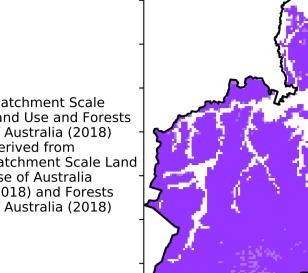
3201050010

0.30%

1 Conservation and natural environments - Non-forest

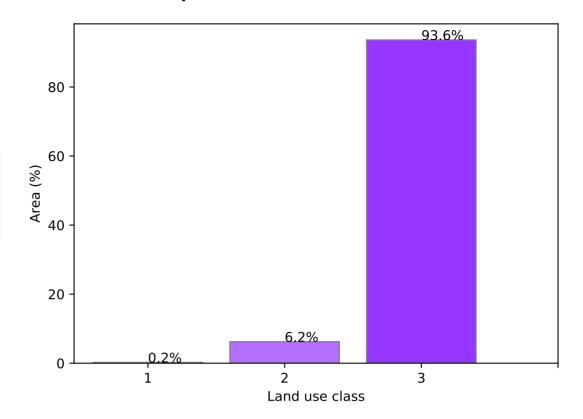
3 Conservation and natural environments - Non-woodland forest

2 Conservation and natural environments - Woodland

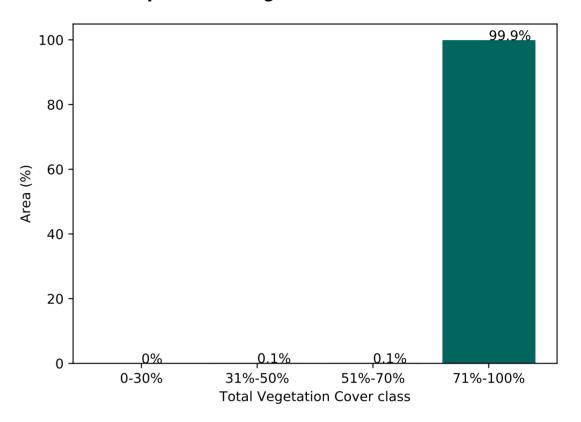


Land use and forest cover

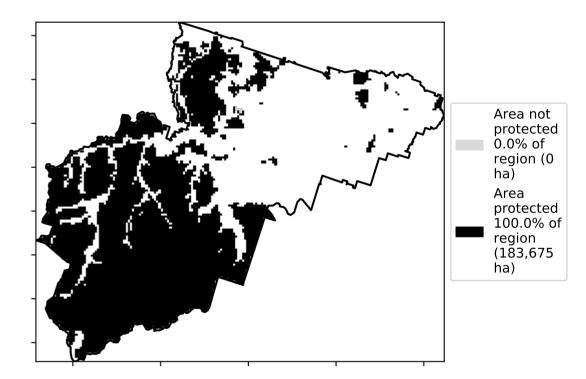
Proportion of each land class in area



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)

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

the mean. That

are about 20% lower than the

is, red pixels

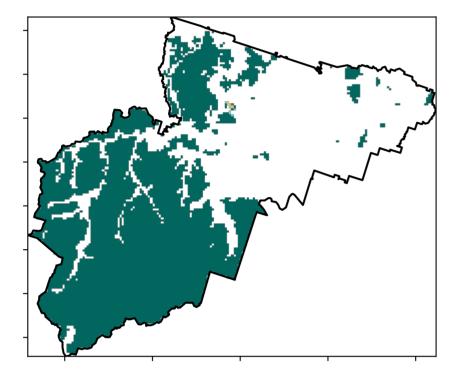
mean of that

pixel. The mean

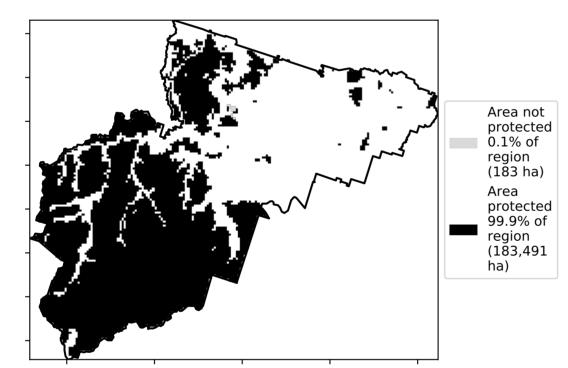
using baseline from 2001 to 2019.

is only for the month of the map

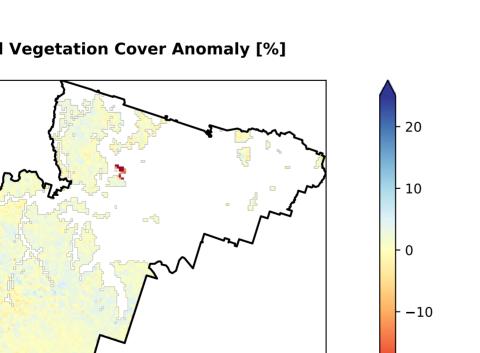
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)

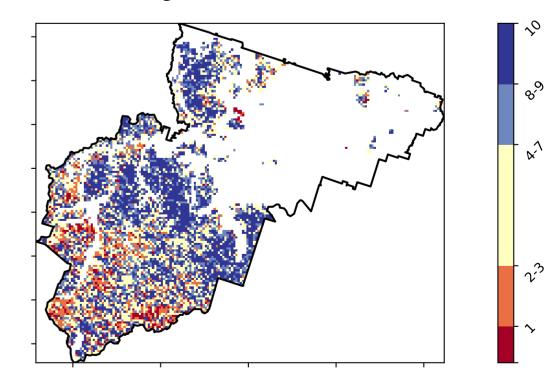


Total Vegetation Cover Anomaly [%]



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 [%]

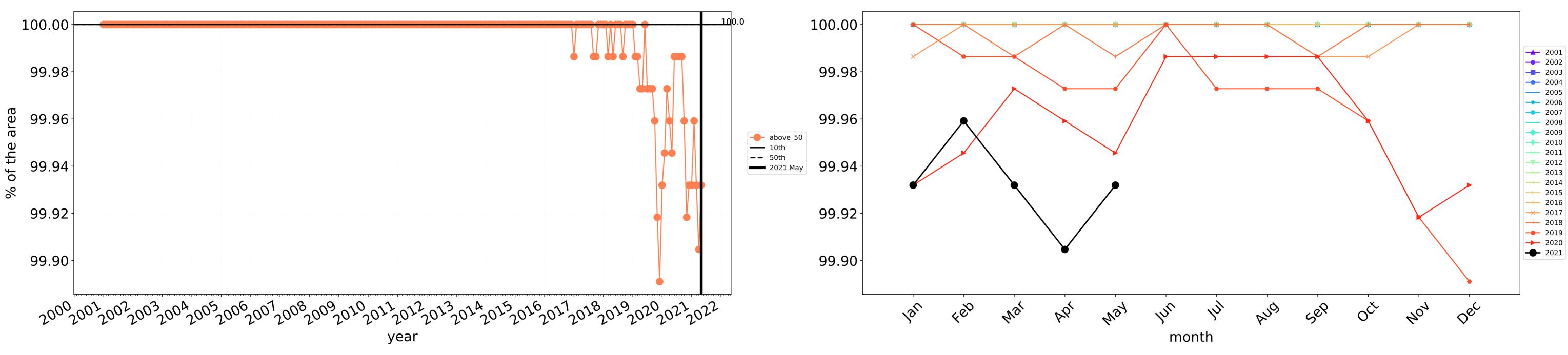




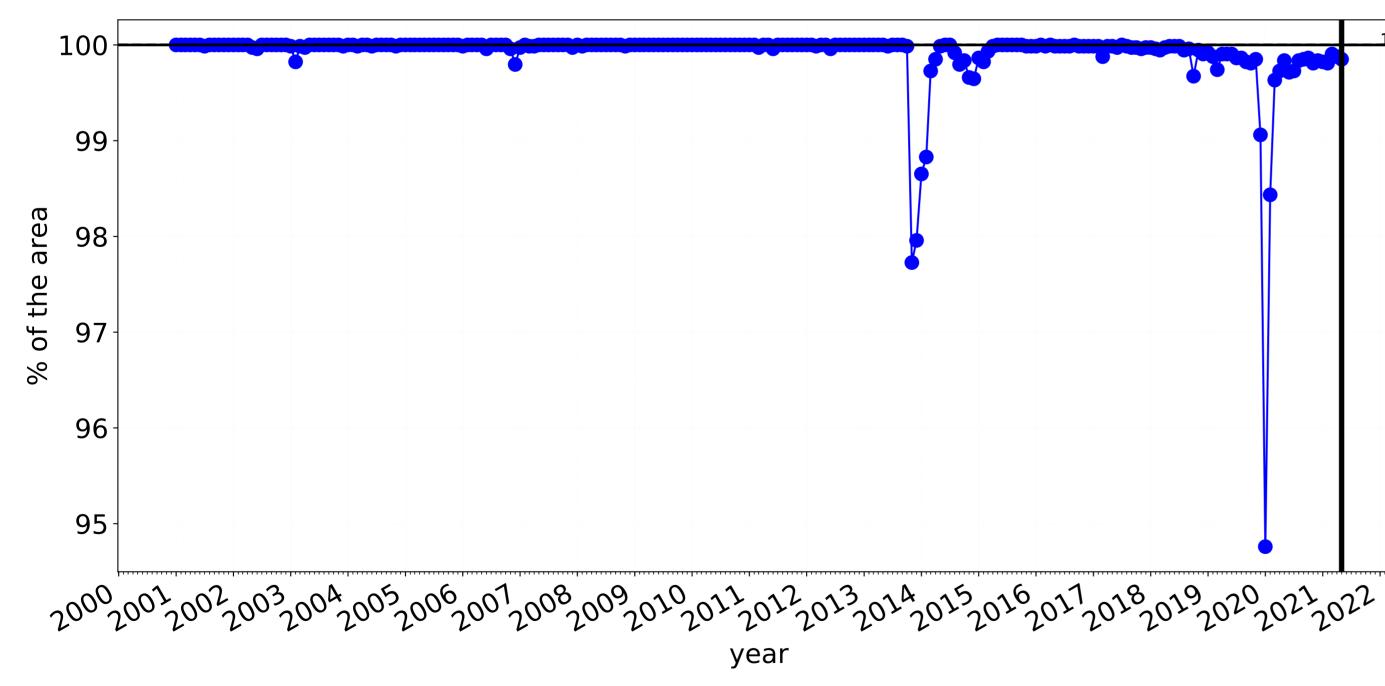
3

-20





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

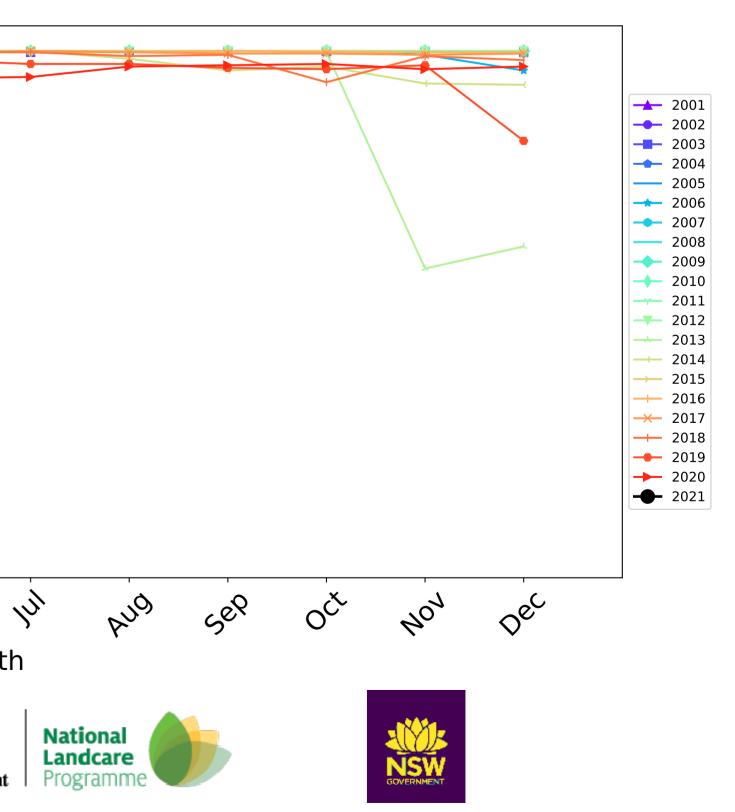


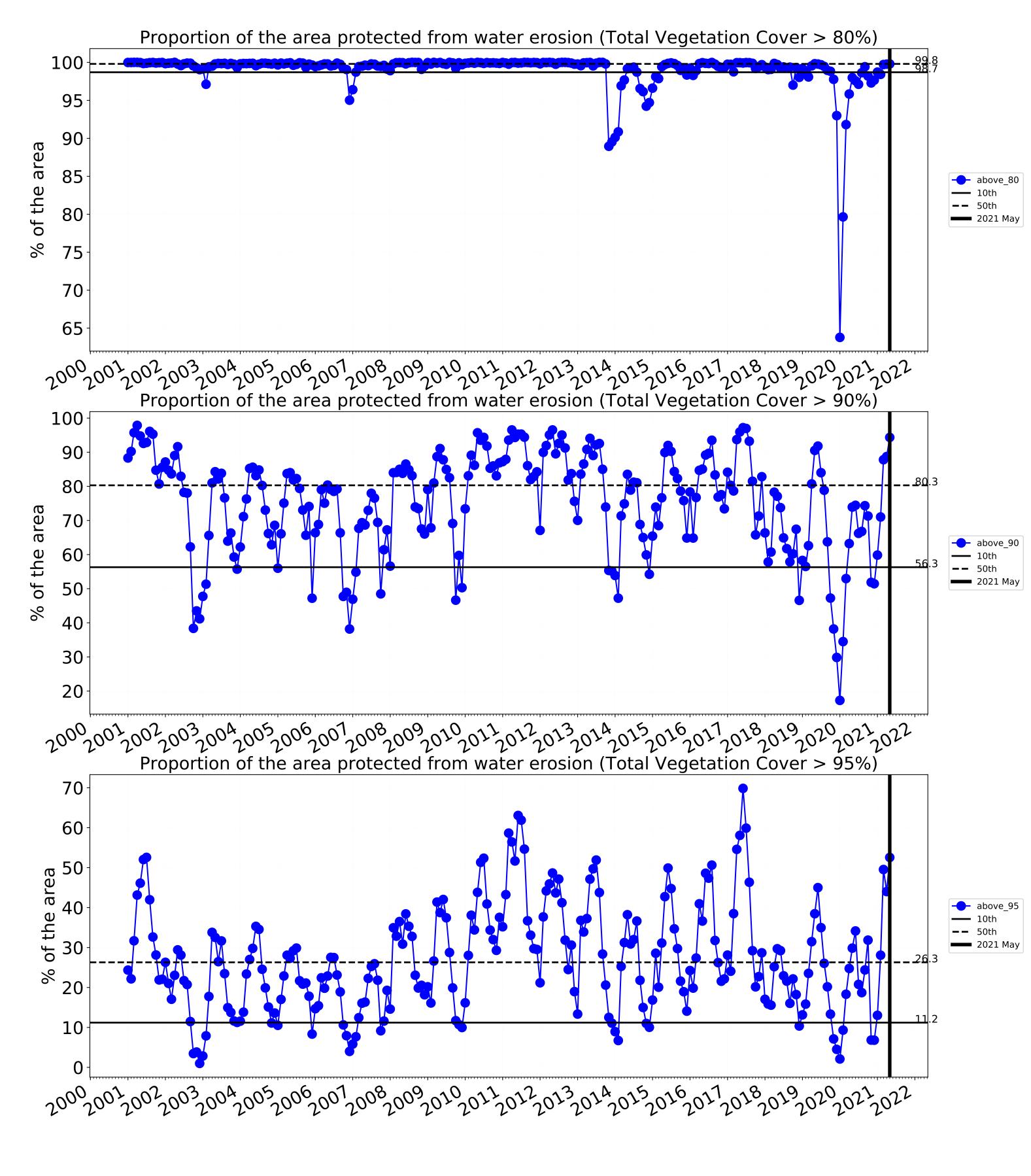
Wind erosion historical monthly area protected (Total Veg Cov >50%)

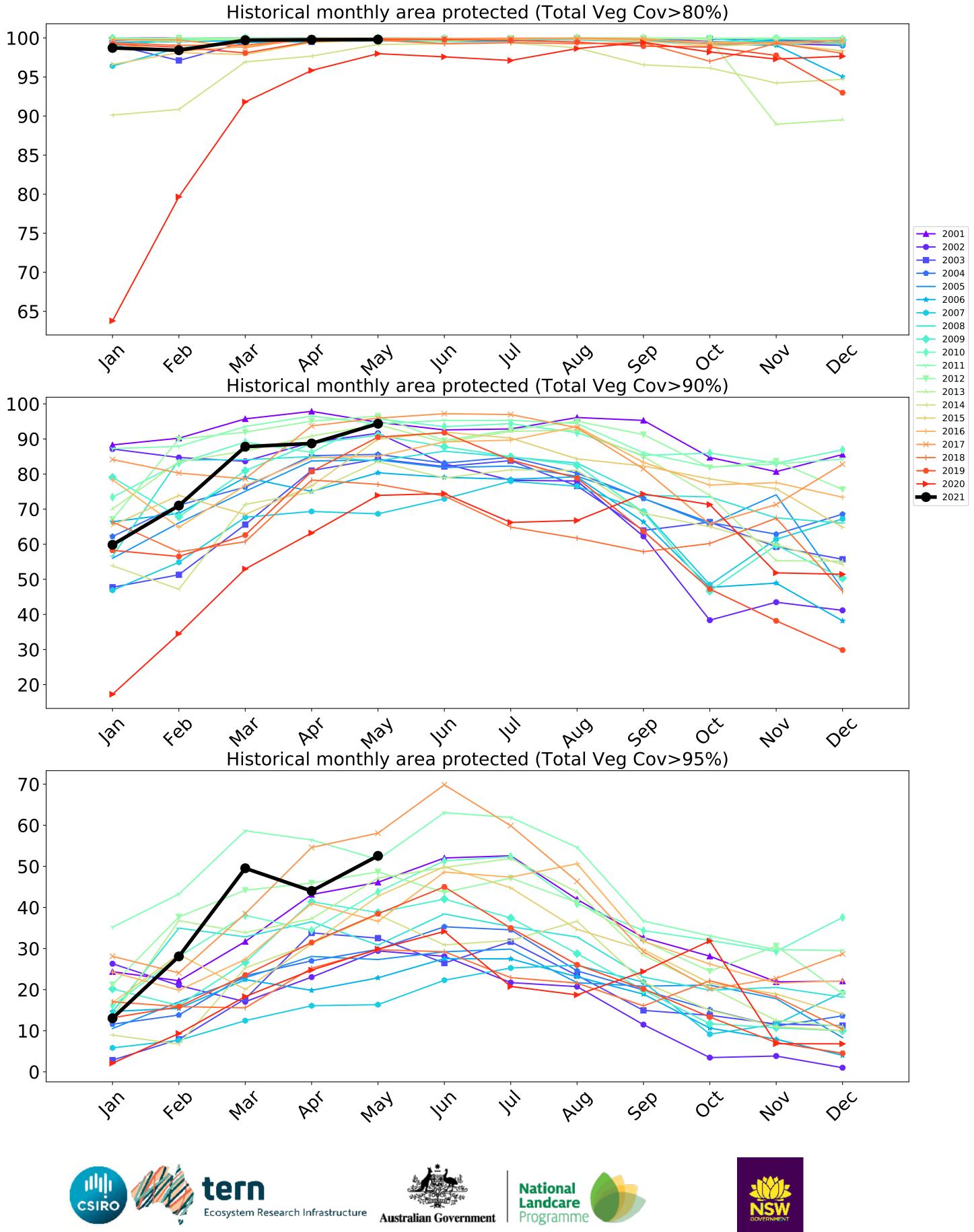
100.0100 99 ---- above_70 **—** 10th 98 **--** 50th **——** 2021 May 97 96 95 4eb lar May In PQ Mar month - Mi tern Ecosystem Research Infrastructure Australian Government



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







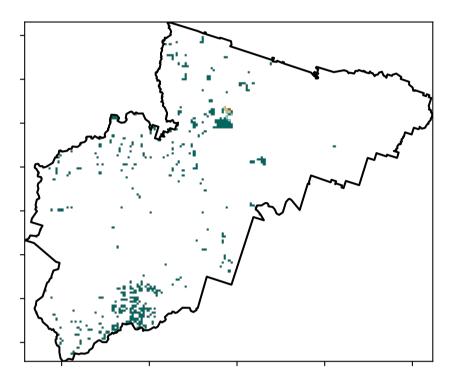


Conservation and natural environments Woodland forest

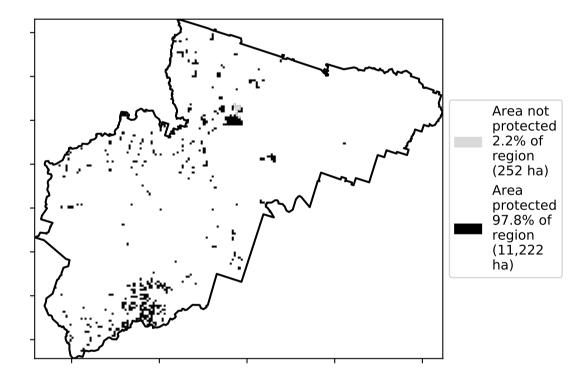
Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments – Woodland Catchment Scale Land forest Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]

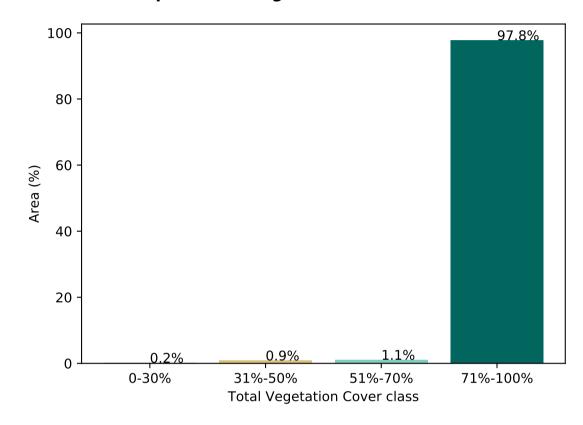
Land use and forest cover



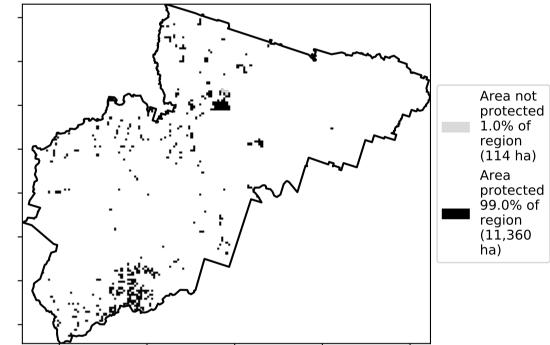
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



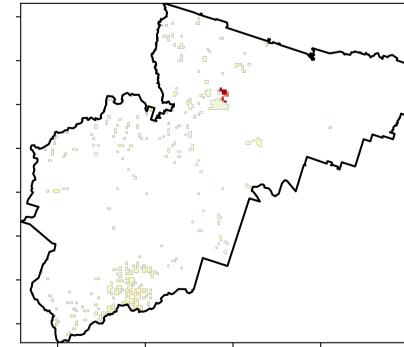
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Total Vegetation Cover Anomaly [%]



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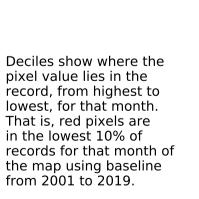
- 20

12º10-200%

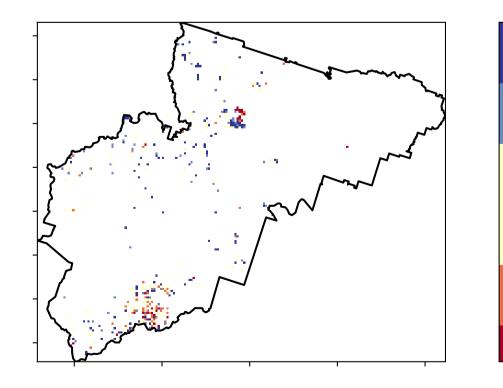
· 52°10°70°10

320050010

· 0-30%



Total Vegetation Cover Decile [%]

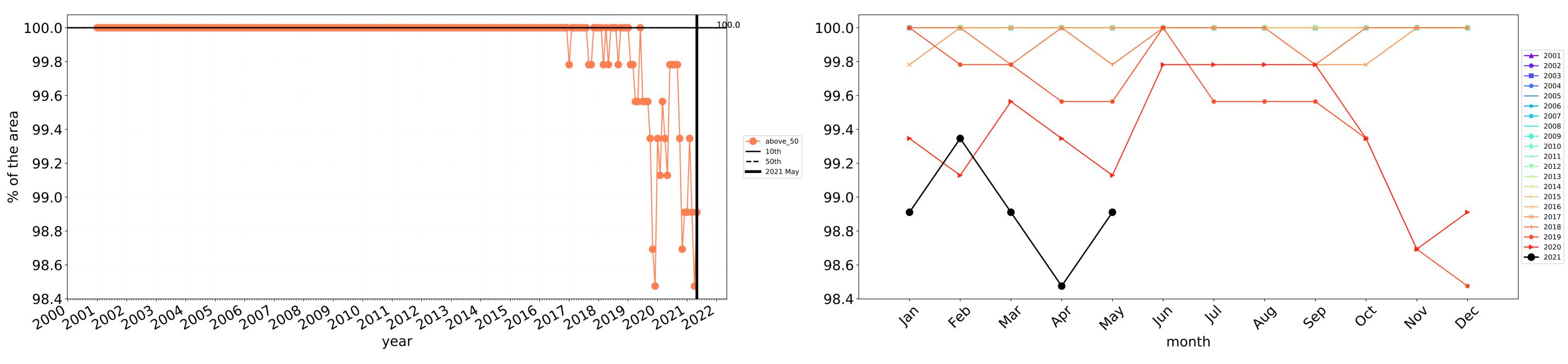




Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

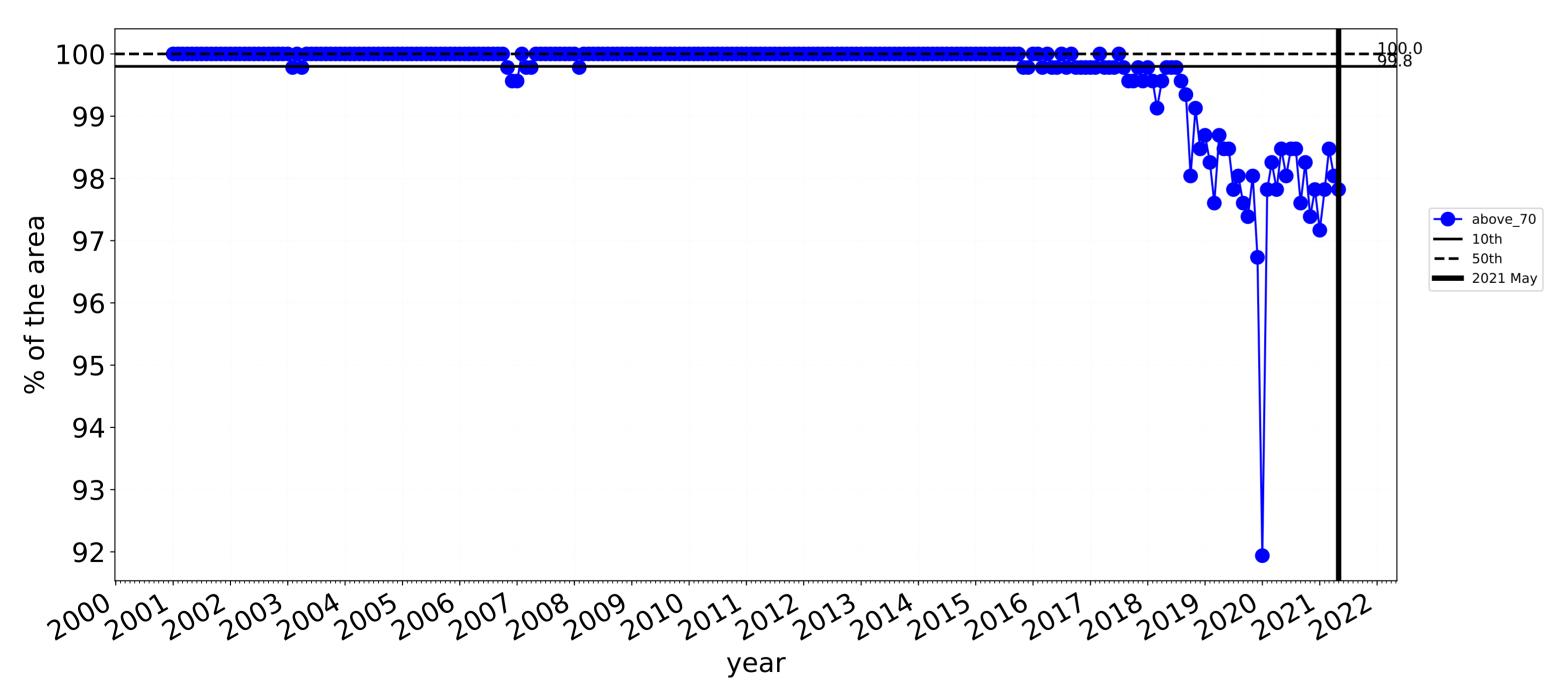


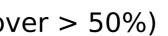
Conservation and natural environments Woodland forest timeseries



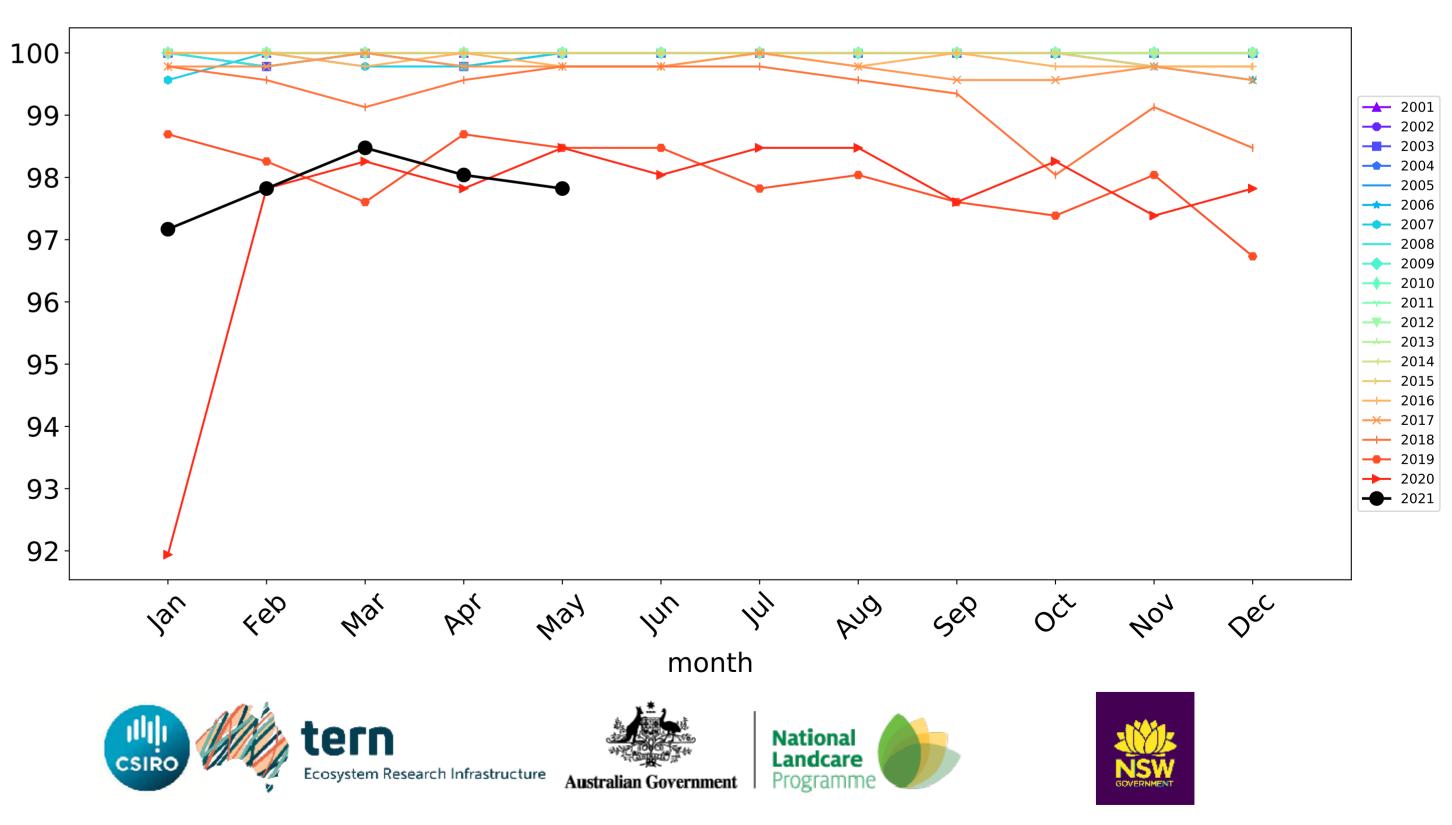
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

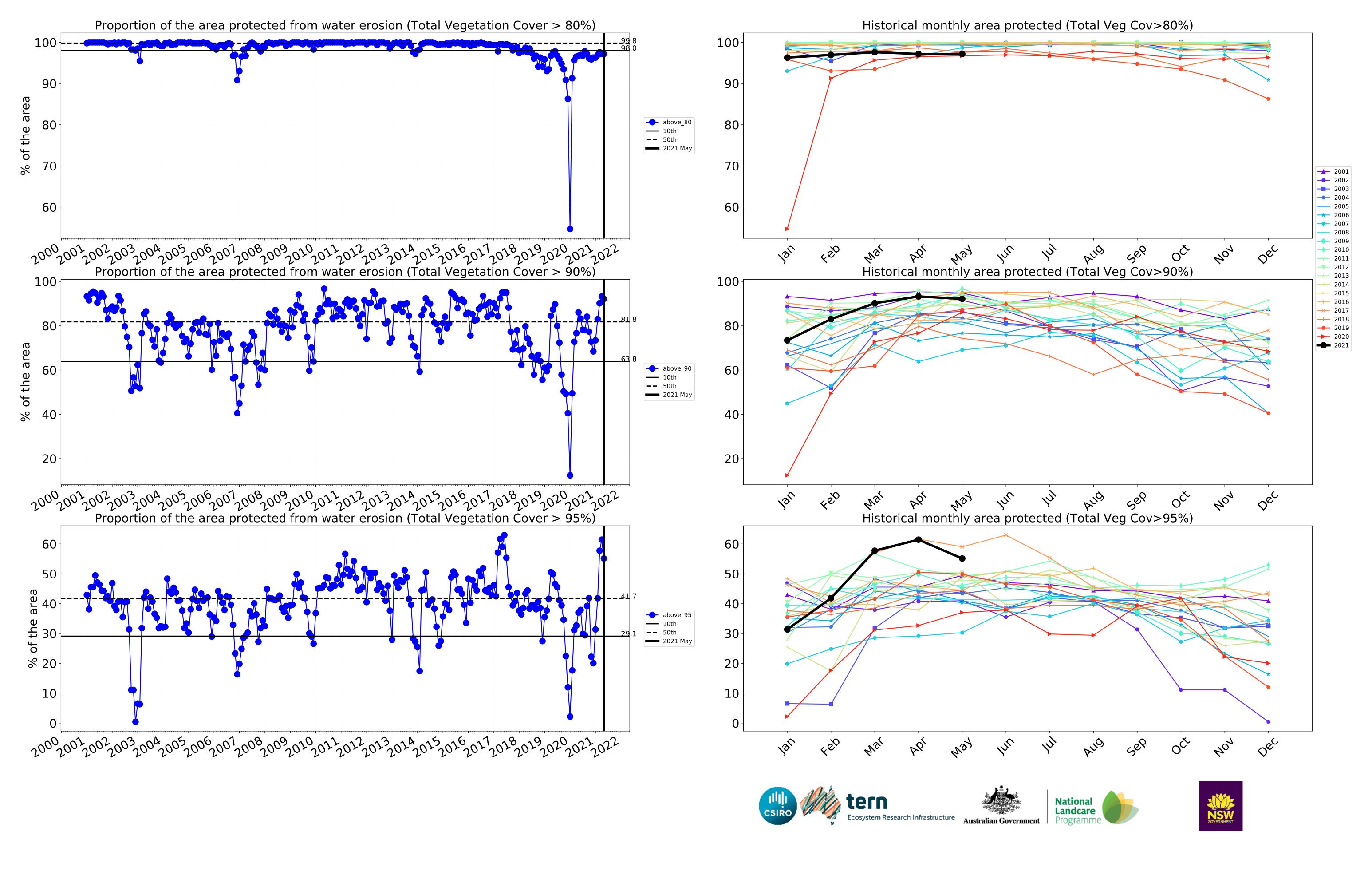
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



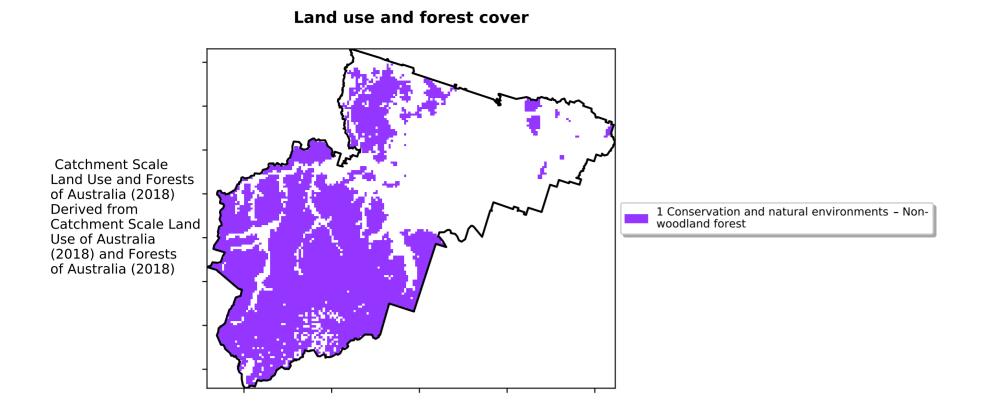


Wind erosion historical monthly area protected (Total Veg Cov >50%)





Conservation and natural environments Forest (non woodland)



12%200%

· 52°10'70°10

320050010

0.30%

· 20

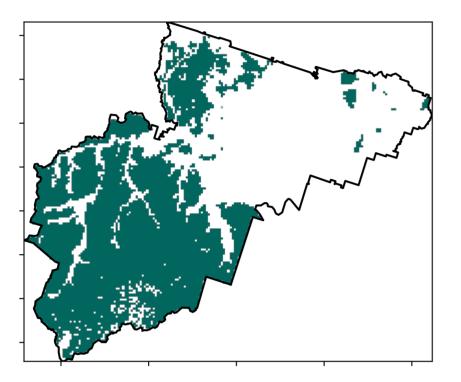
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0

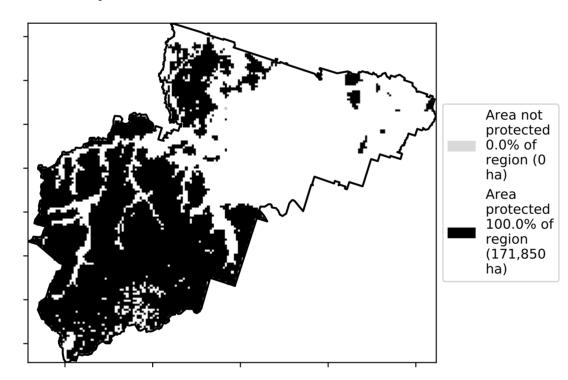
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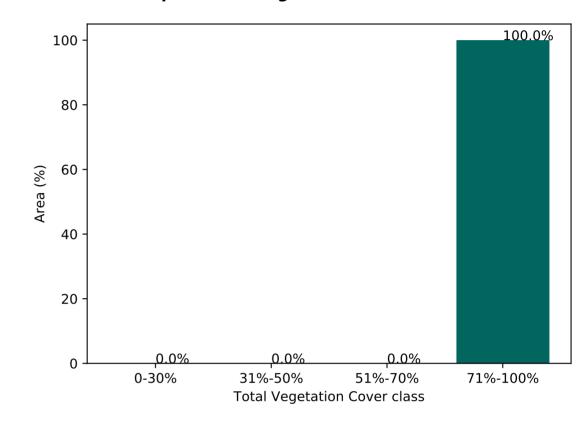
Total Vegetation Cover [%]



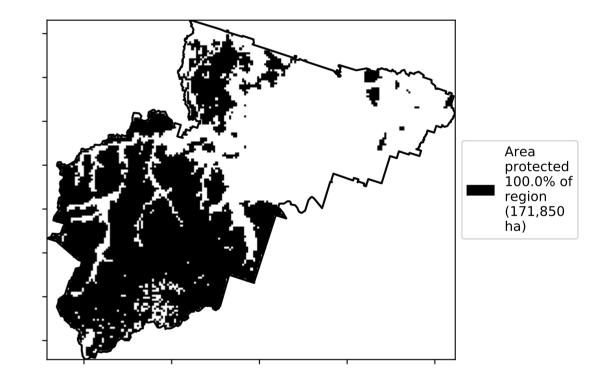
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

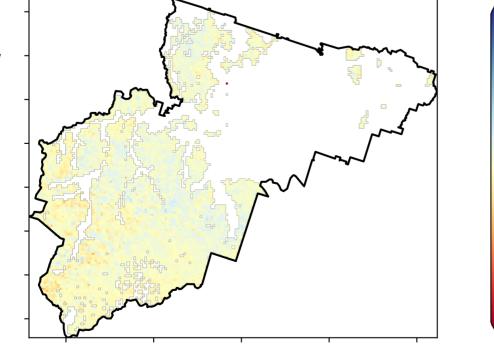


% Area protected from wind erosion (>50%)



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.



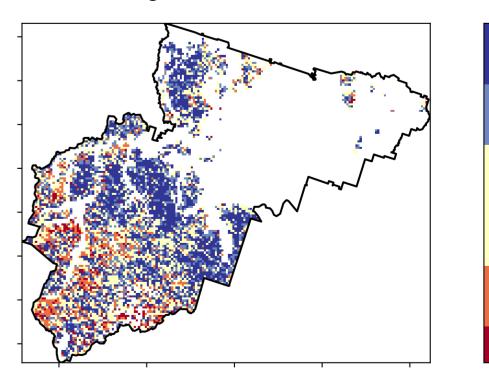
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. Total Vegetation Cover Decile [%]

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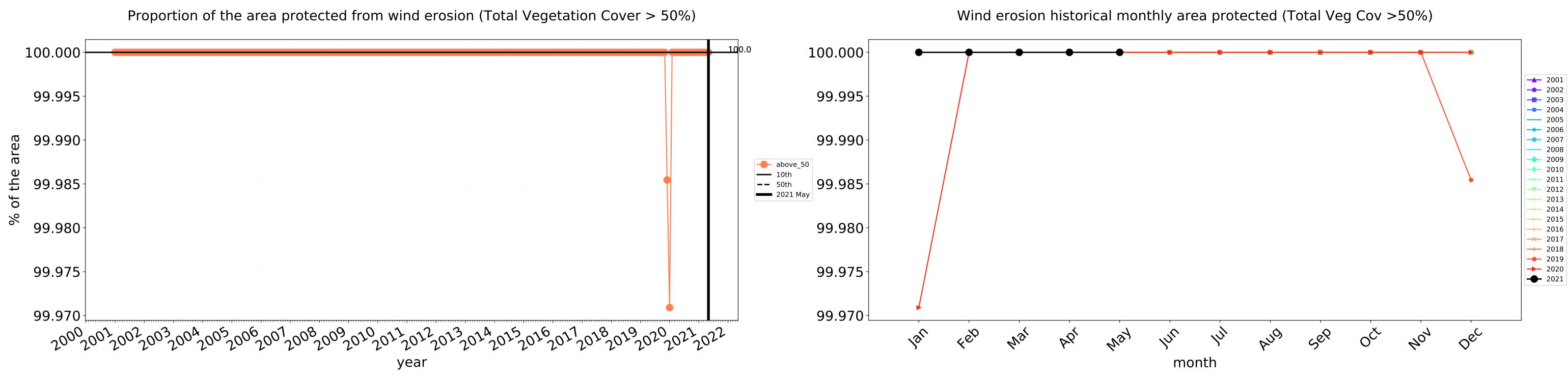
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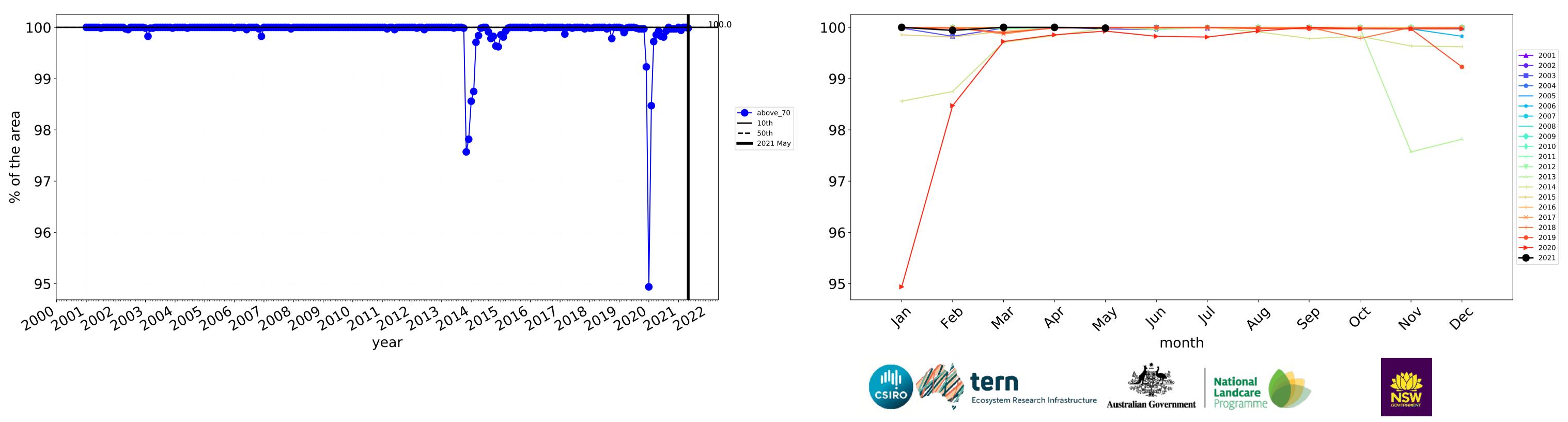
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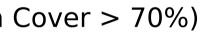




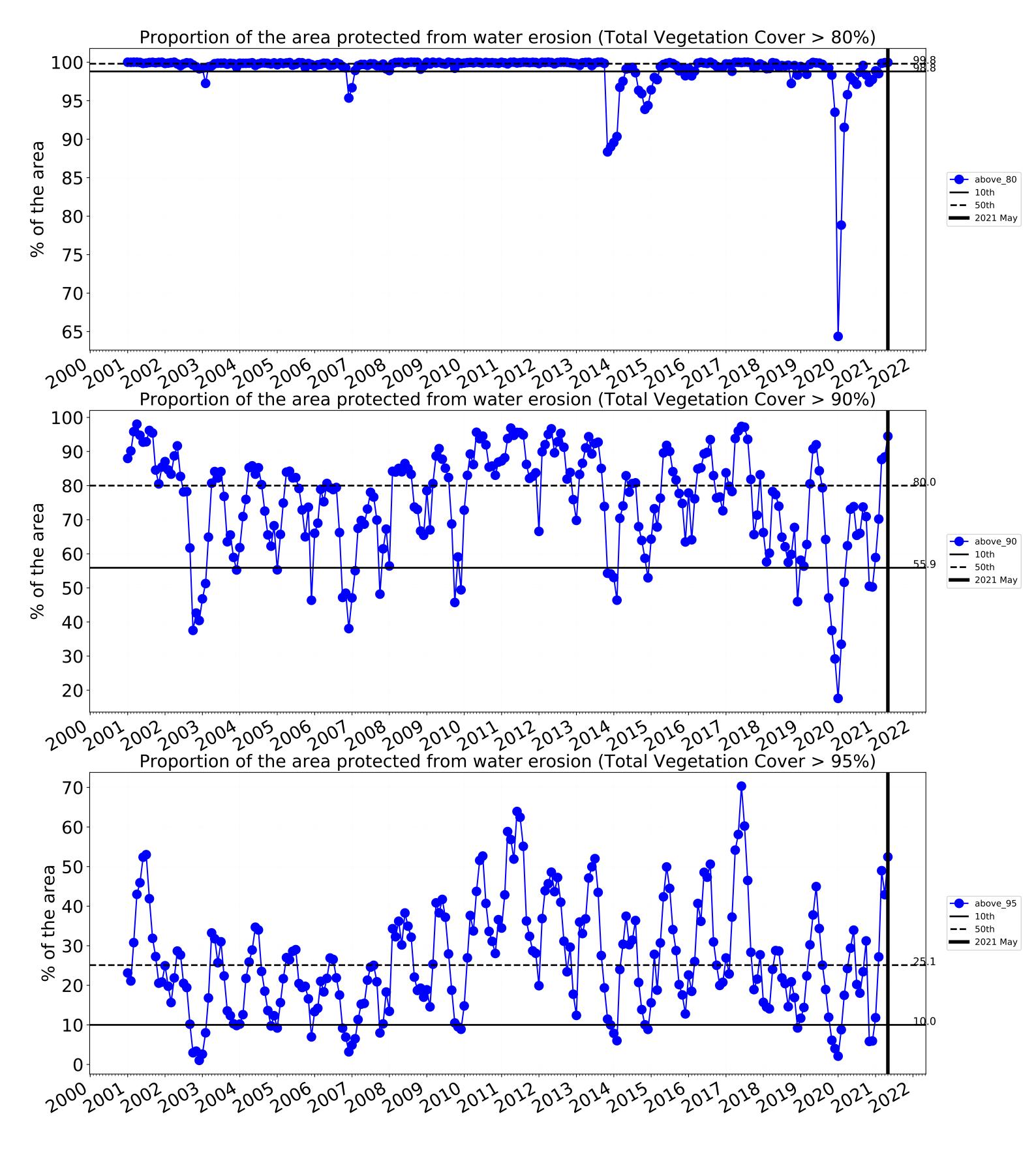


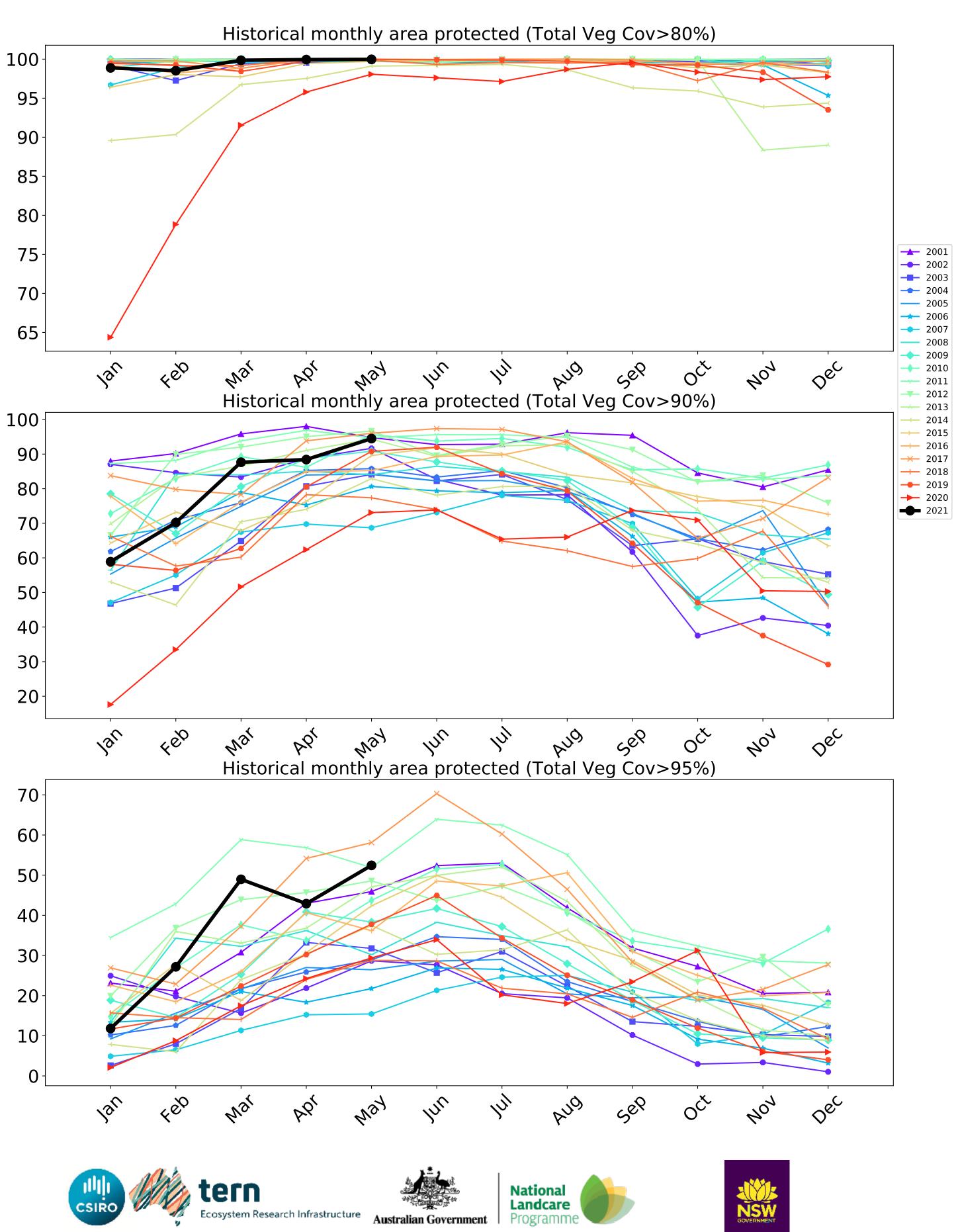


Conservation and natural environments Forest (non woodland) timeseries



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







Agriculture

Land use and forest cover

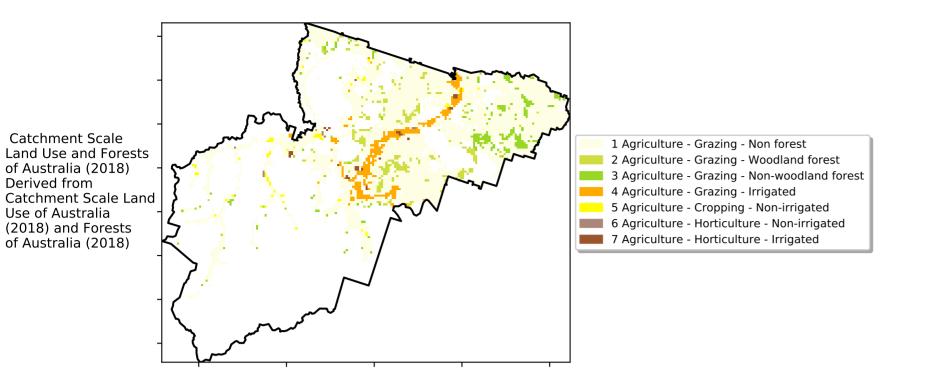
Proportion of each land class in area

81.4%

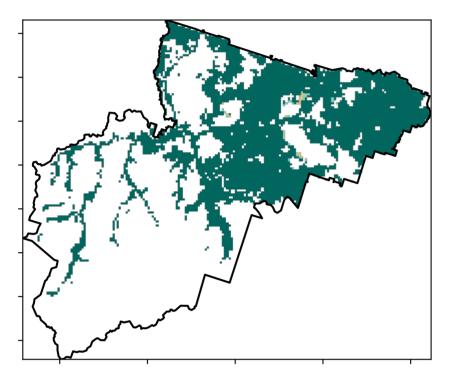
80

70

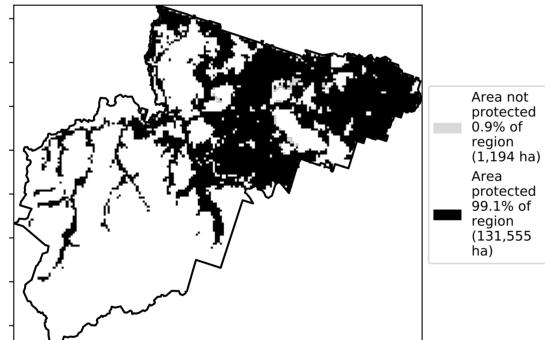
60

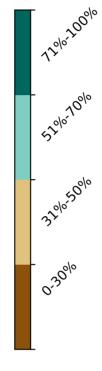


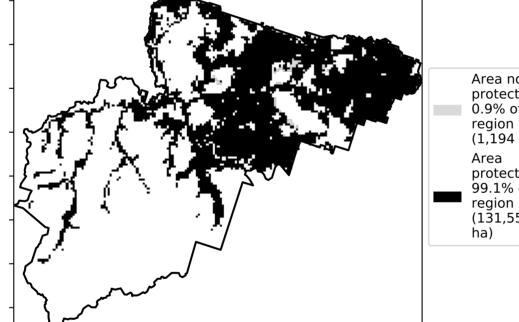
Total Vegetation Cover [%]

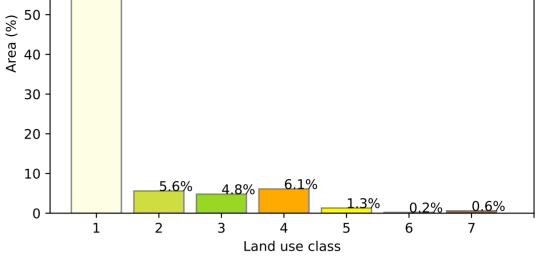


% Area protected from water erosion (>70%)

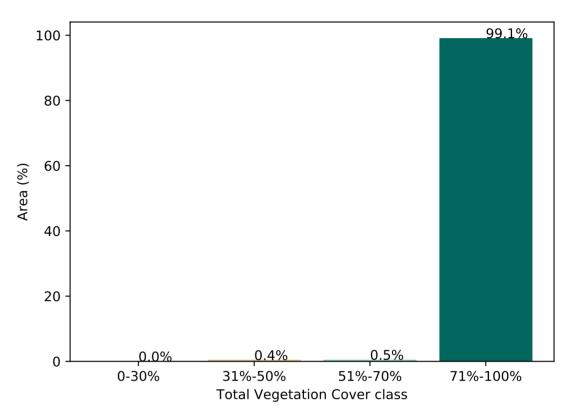




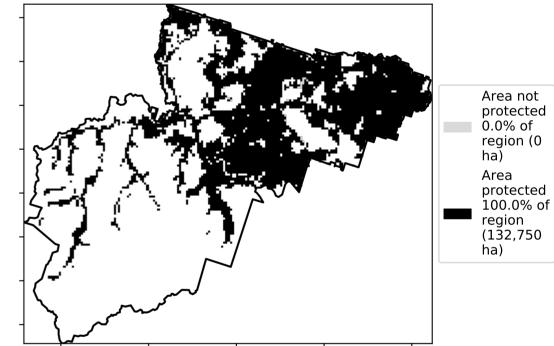




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



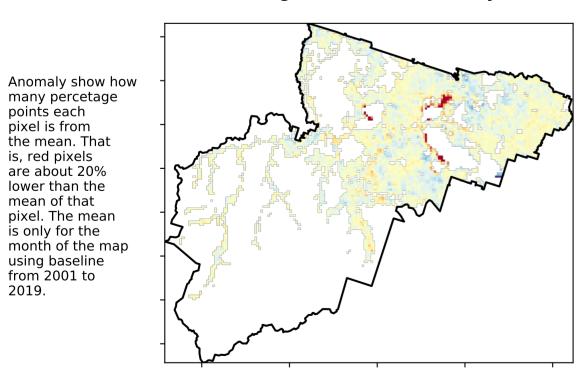
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Total Vegetation Cover Anomaly [%]



the mean. That

are about 20% lower than the

is, red pixels

mean of that

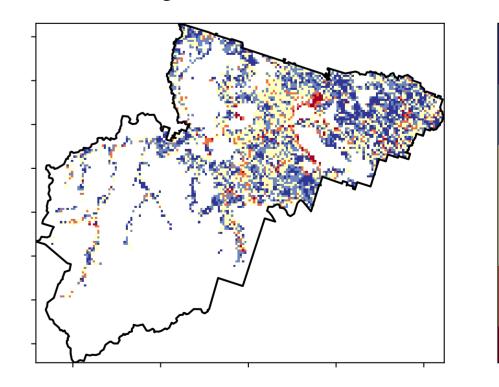
from 2001 to 2019.

10 0 -10

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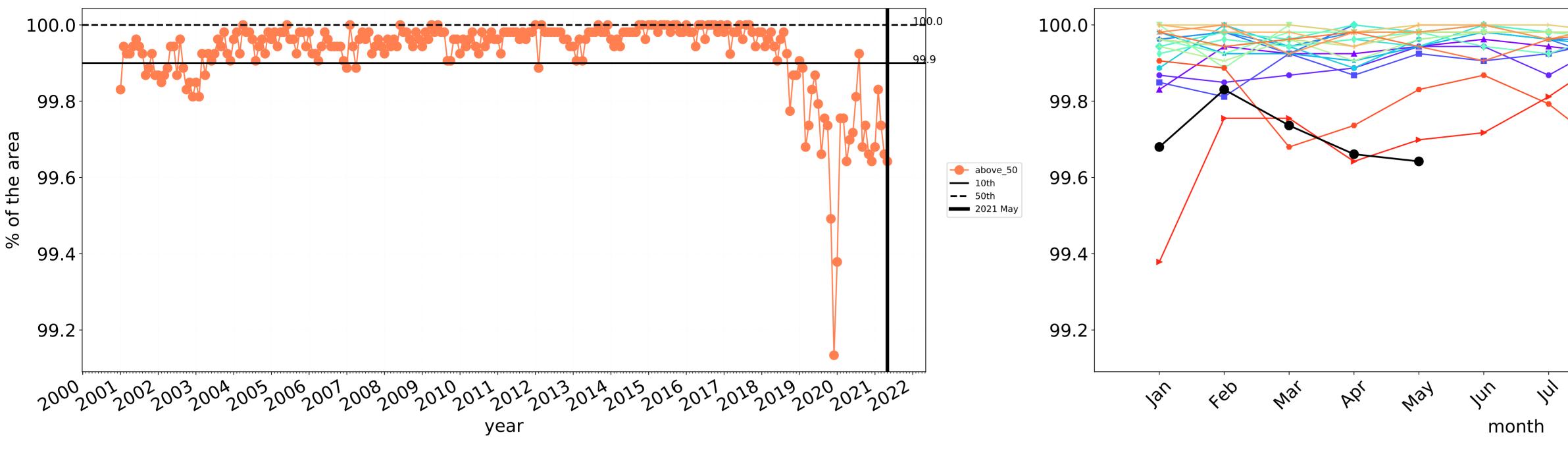
- 20

Total Vegetation Cover Decile [%]

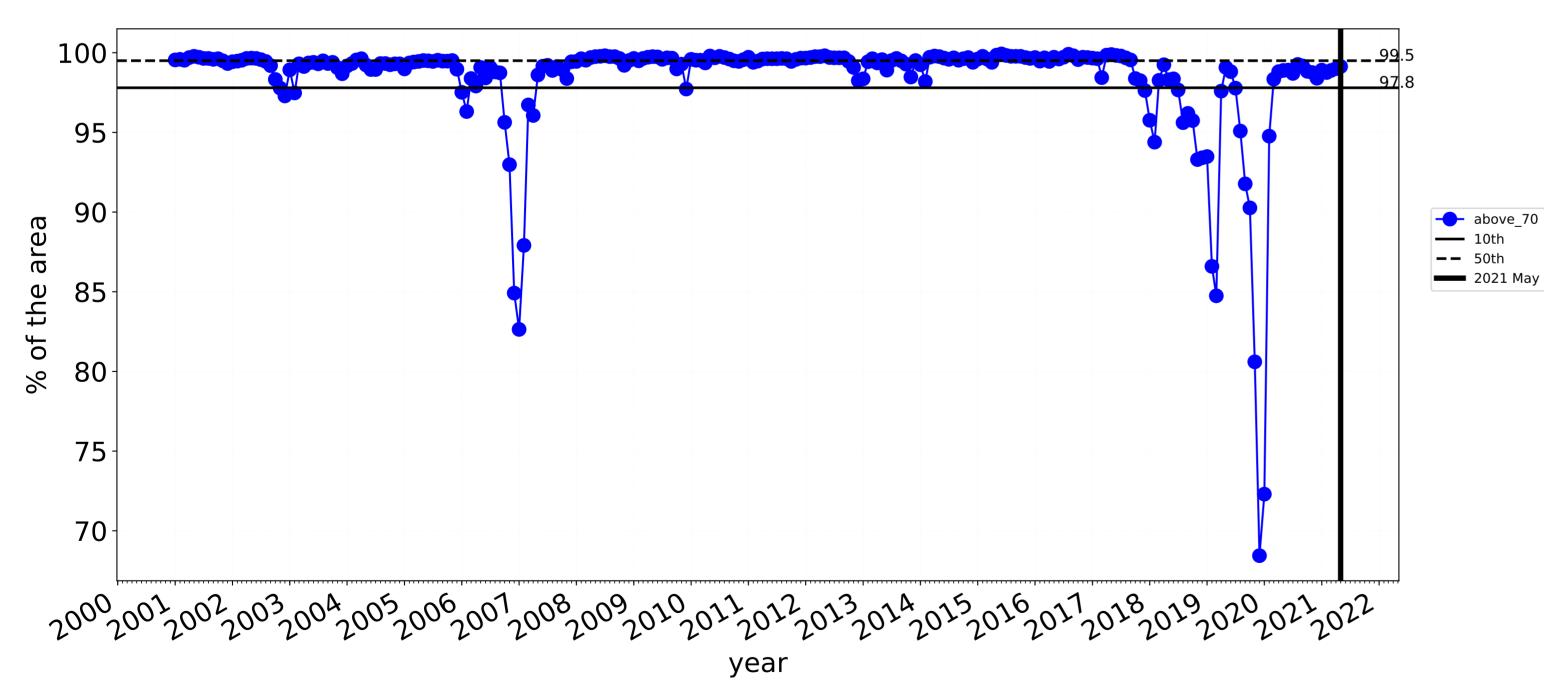


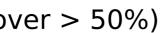


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

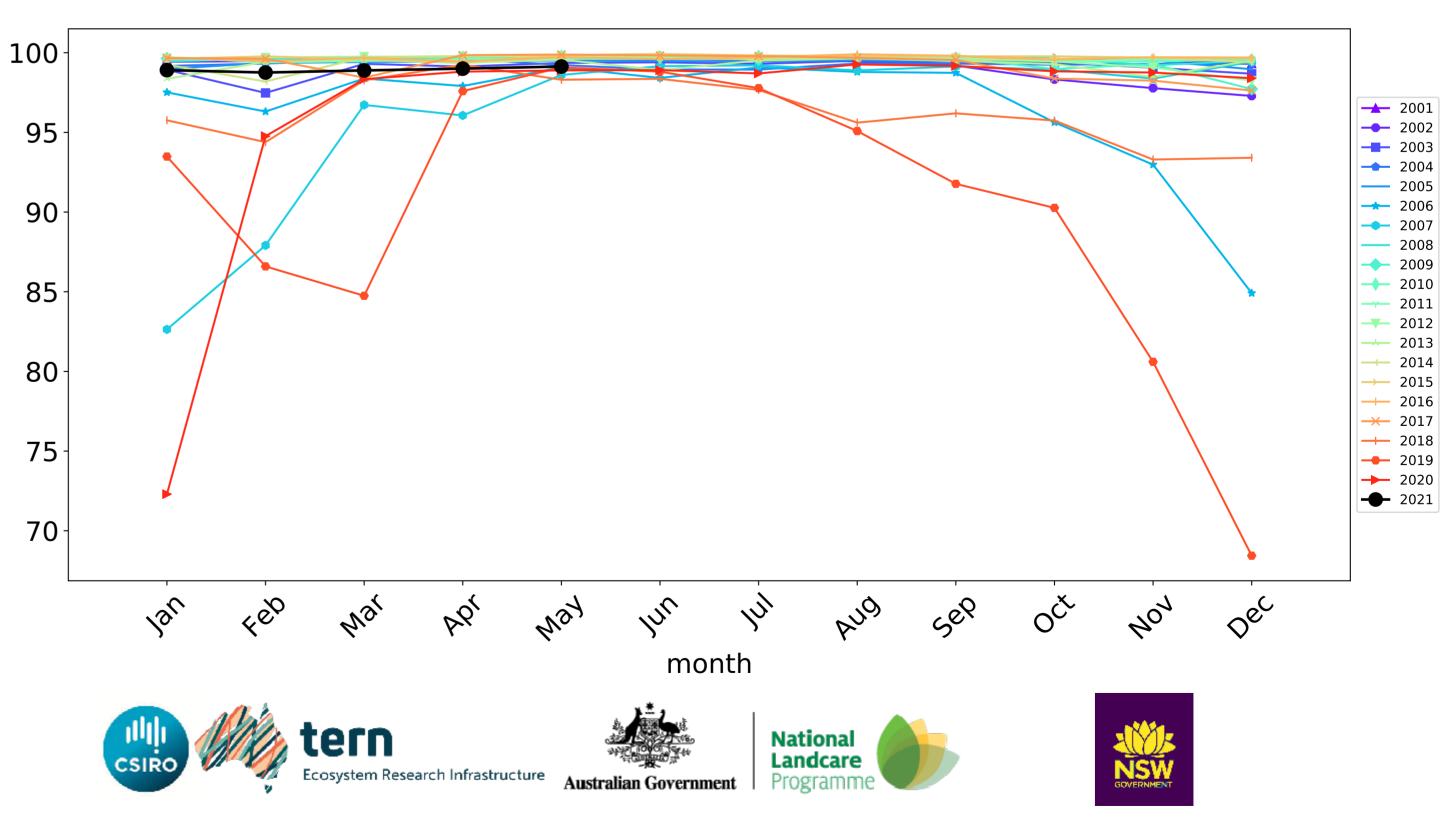


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

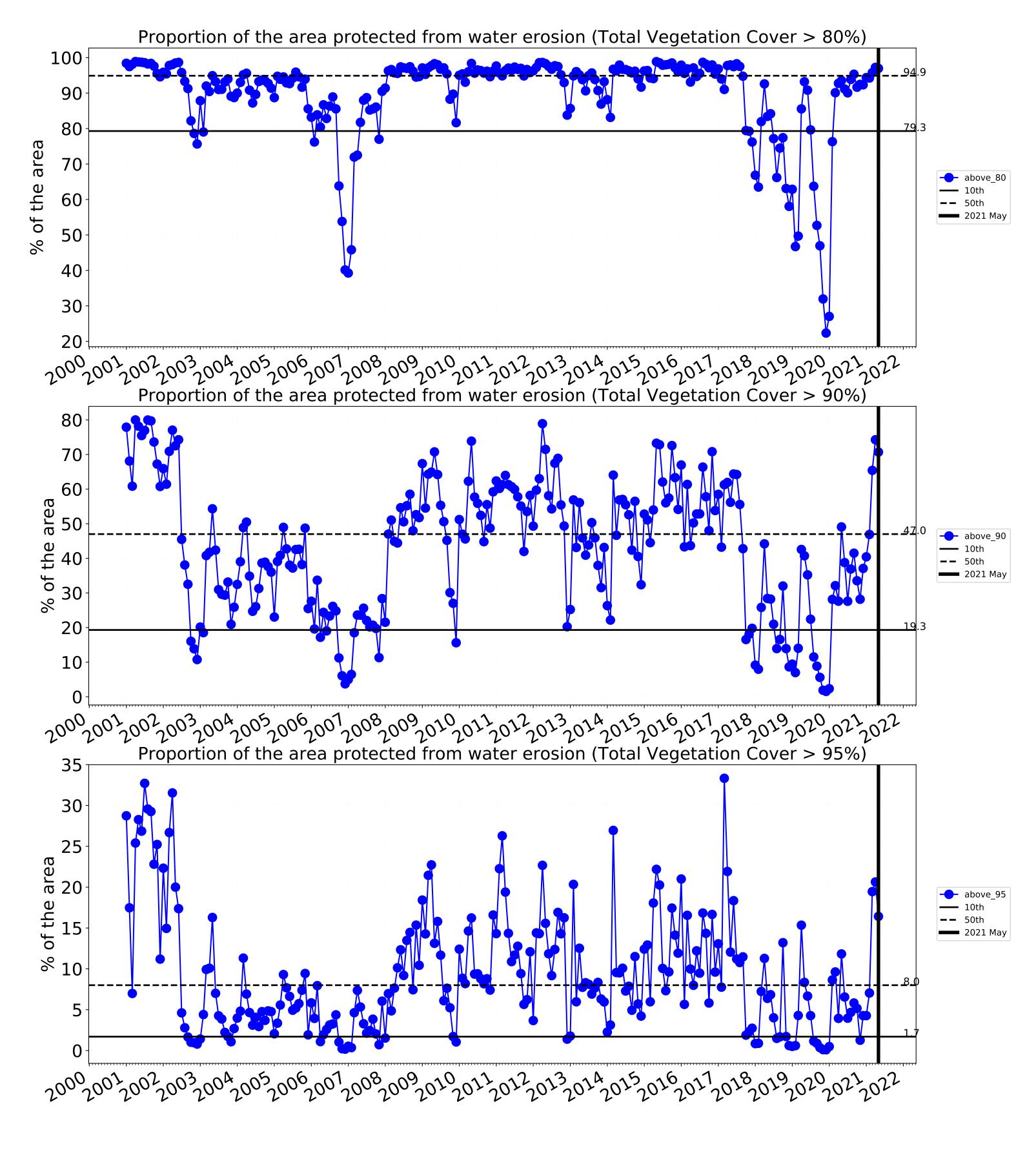


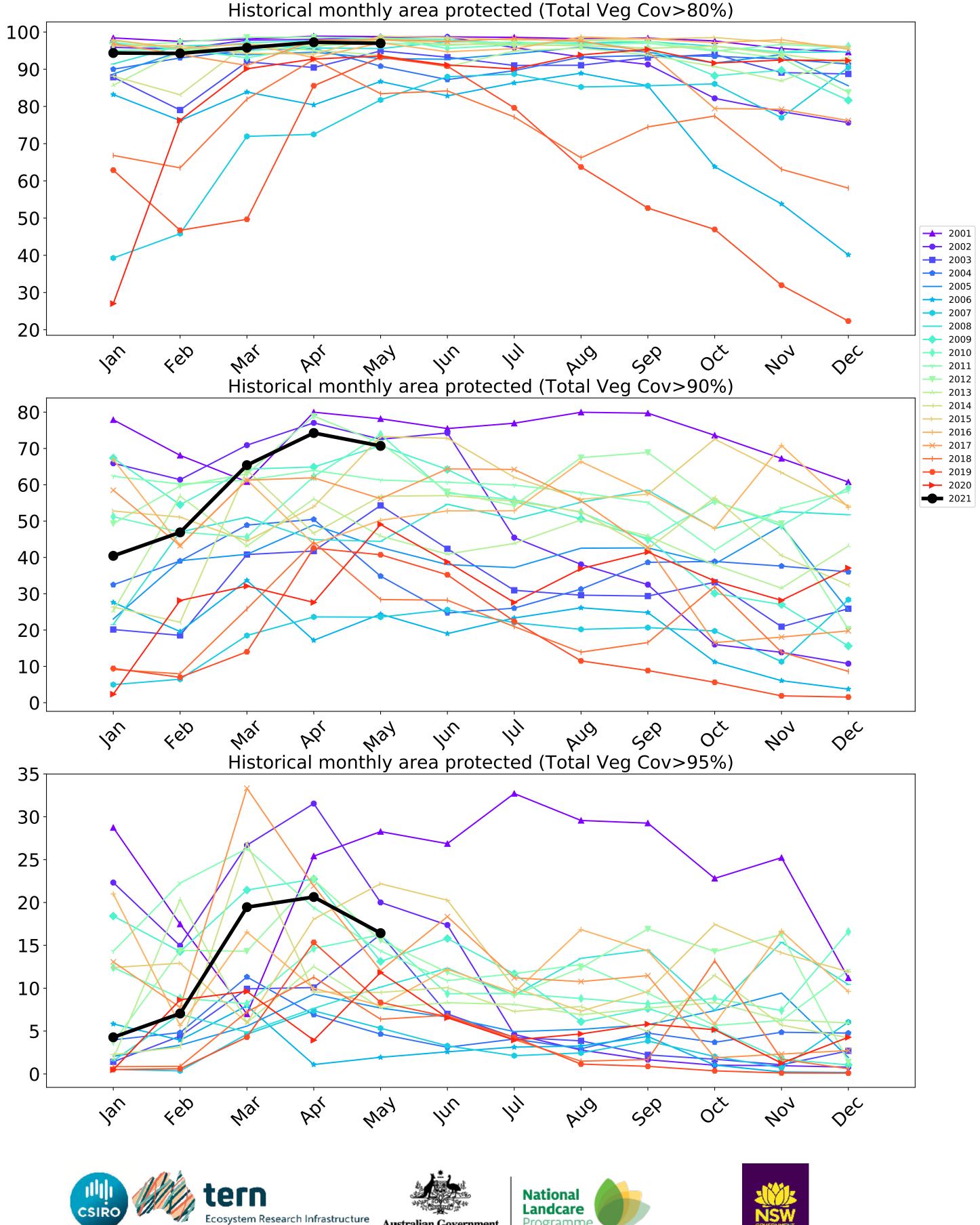


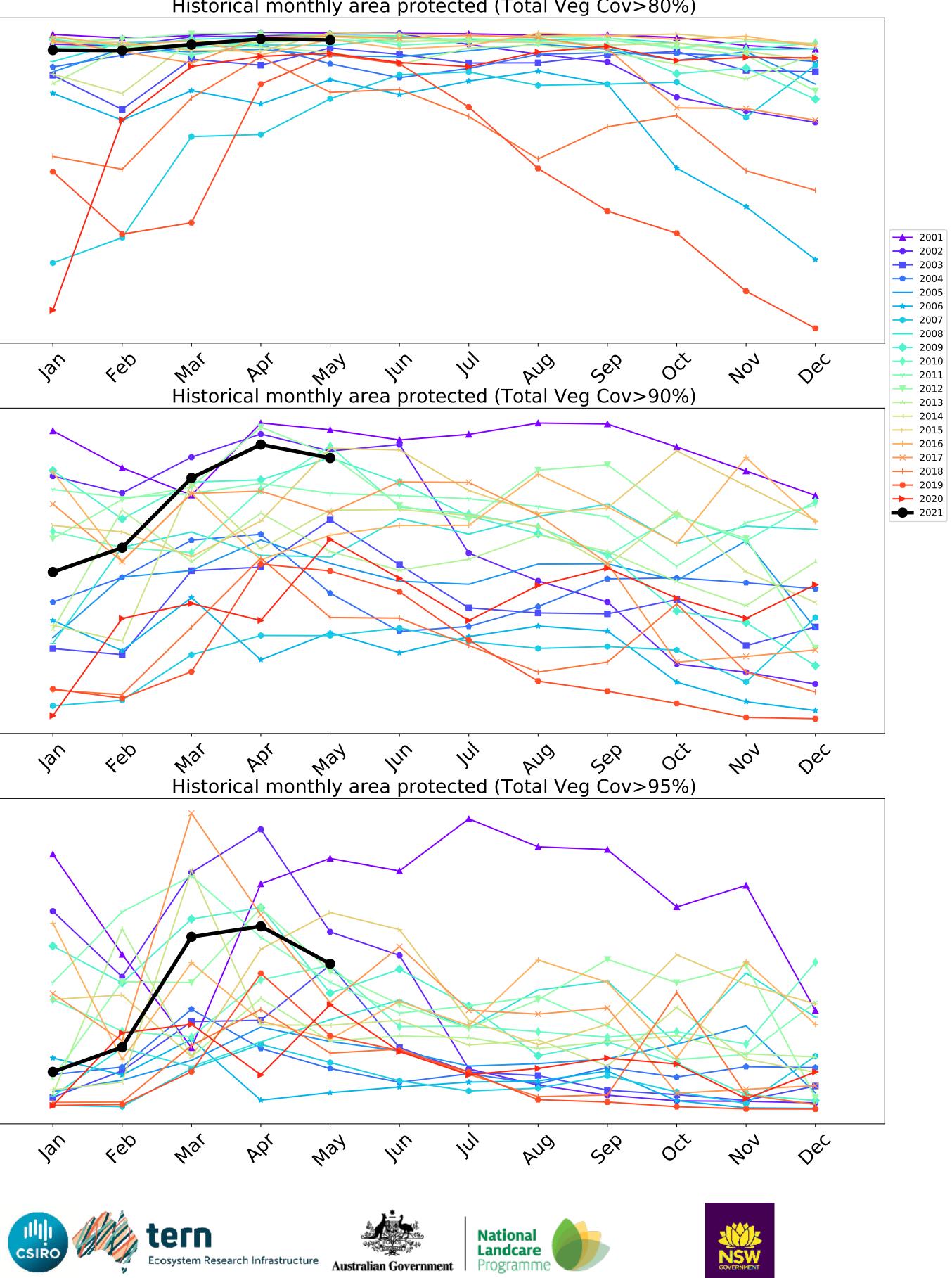
Wind erosion historical monthly area protected (Total Veg Cov >50%)



— 2001 --- 2002 ---- 2003 **---** 2004 ____ 2005 **----** 2006 --- 2007 2008 --- 2009 **—** 2010 ---- 2011 ---- 2012 2013 **→** 2014 <mark>→</mark> 2015 <mark>→</mark> 2016 → 2017 **→** 2018 ---- 2019 → 2020 ---- 2021 404 Dec AUG Ser OC



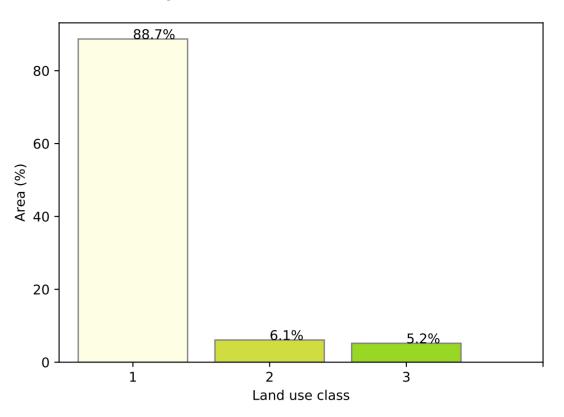




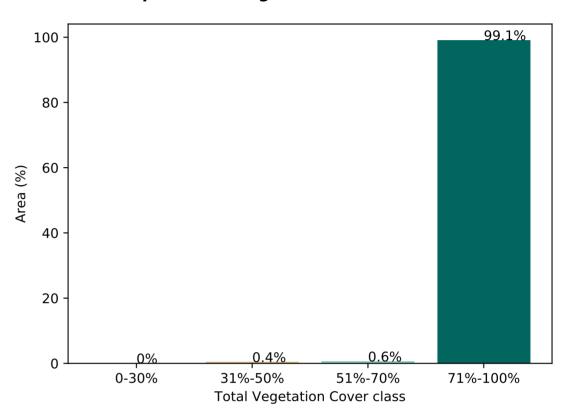
Grazing

Land use and forest cover

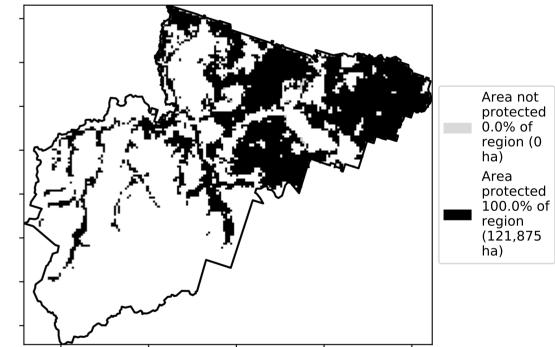
Proportion of each land class in area



Proportion of vegetation cover class in area

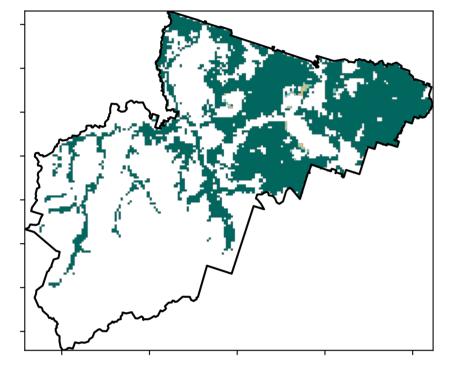


% Area protected from wind erosion (>50%)

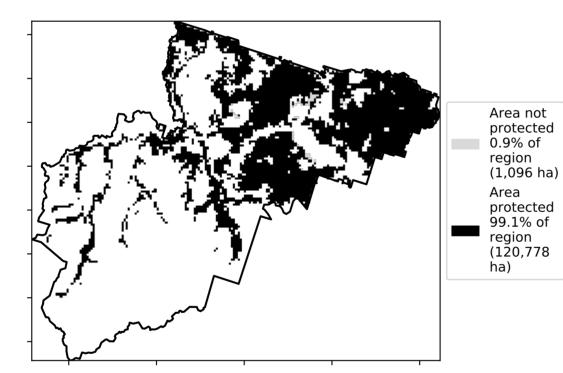


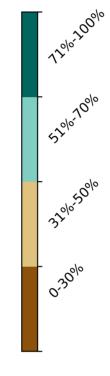
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





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

3 Agriculture - Grazing - Non-woodland forest

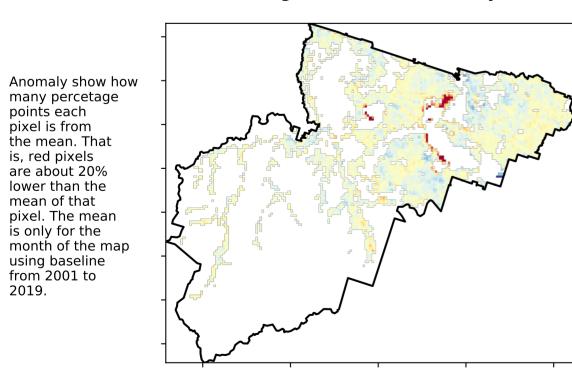
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Total Vegetation Cover Anomaly [%]



is, red pixels are about 20% lower than the

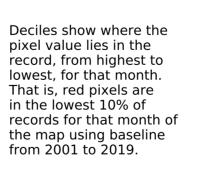
mean of that

from 2001 to 2019.

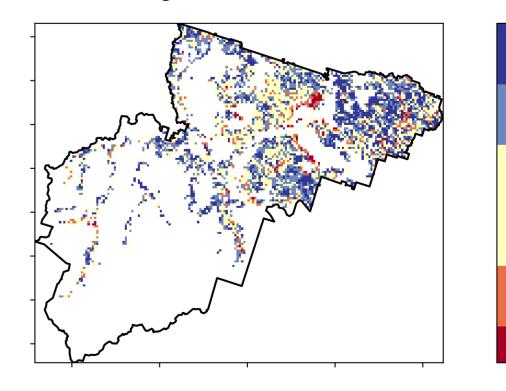
10 0 -10

-20

- 20

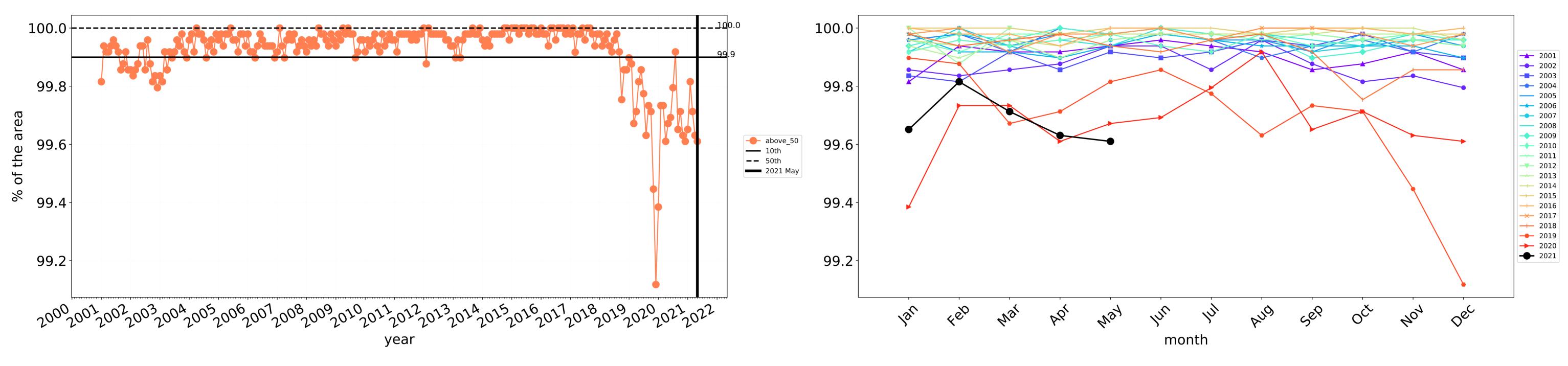


Total Vegetation Cover Decile [%]

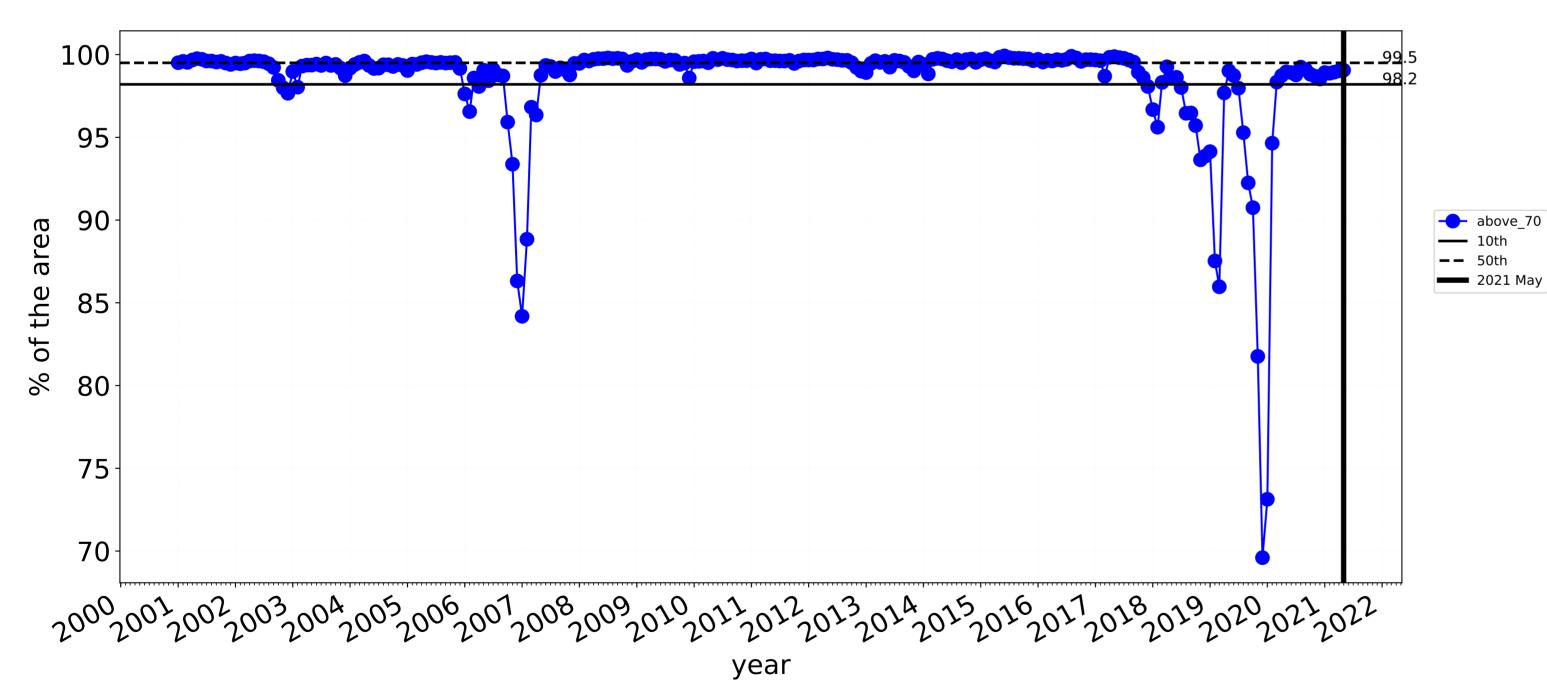


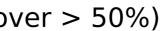


1**2**



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

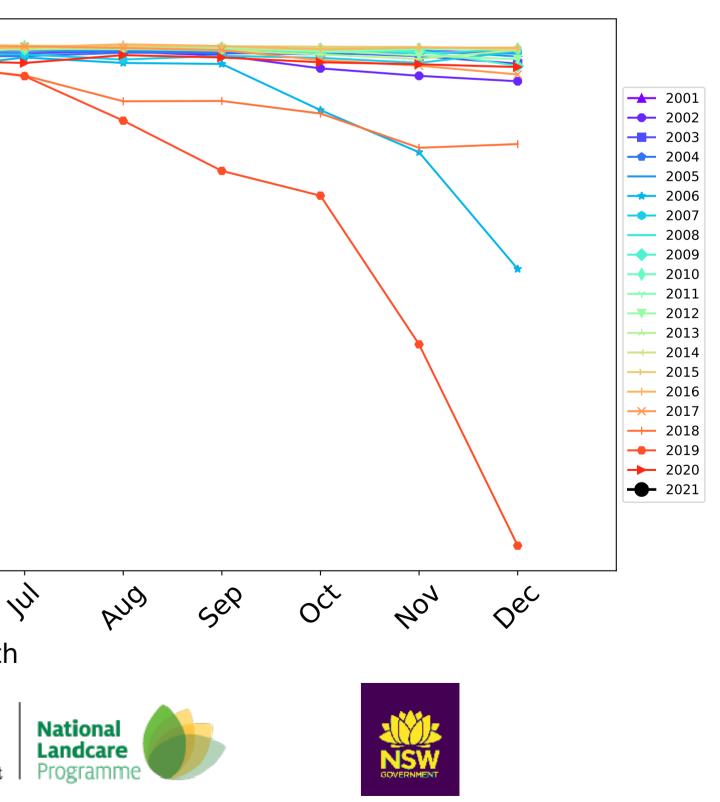


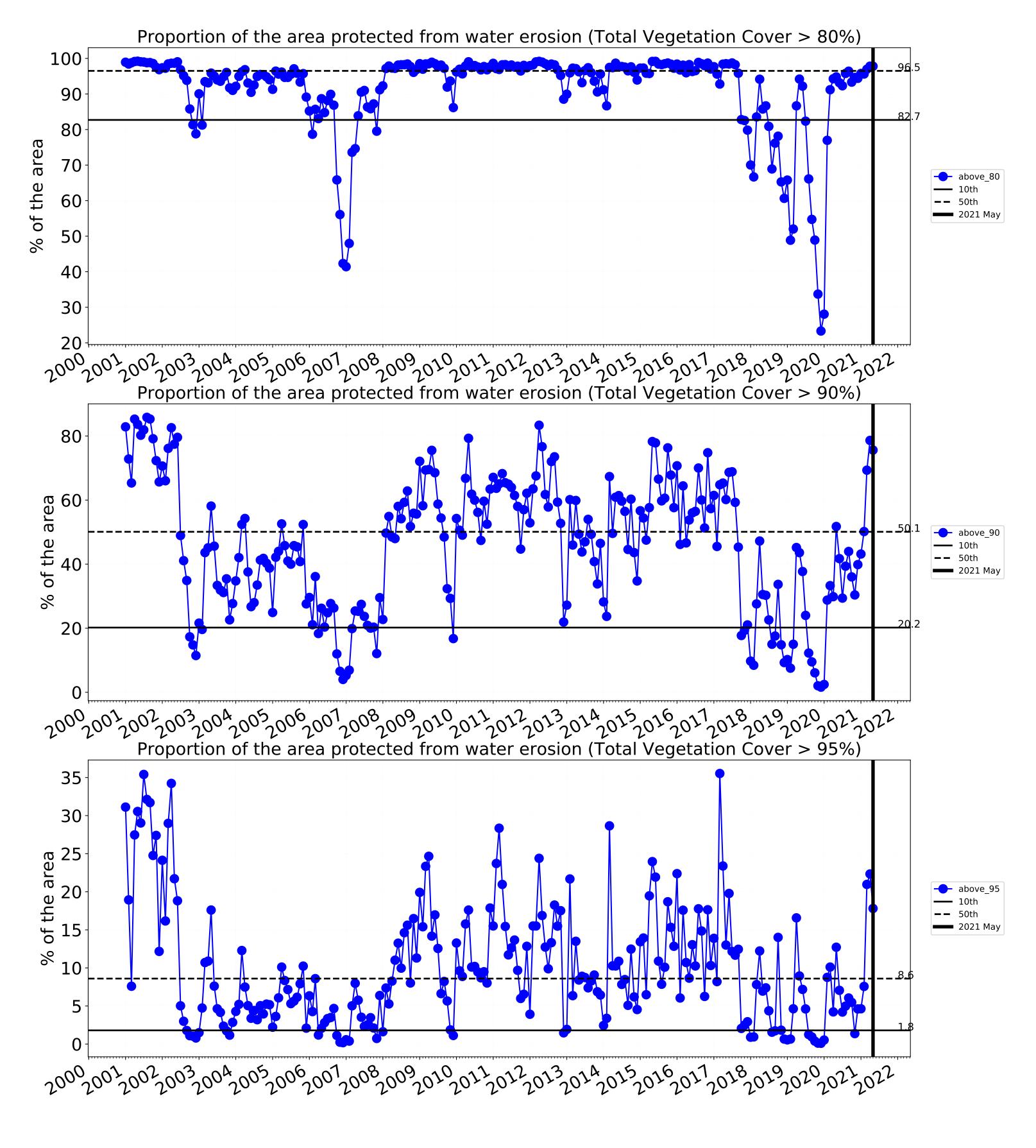


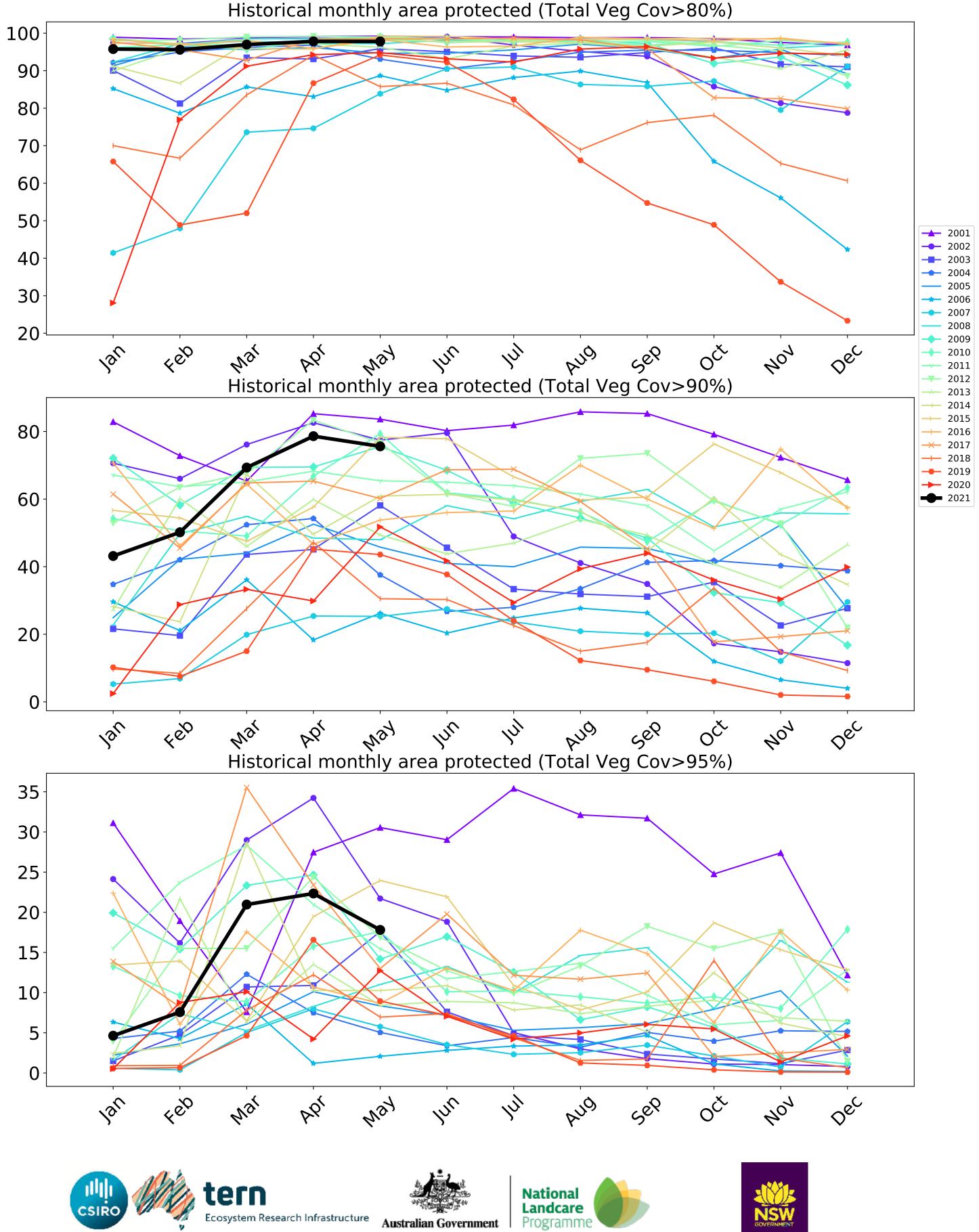
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 95⁻ 90 85 80 75 70-Jan 4^{eb} way hu PQ War month tern Ecosystem Research Infrastructure Australian Government

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









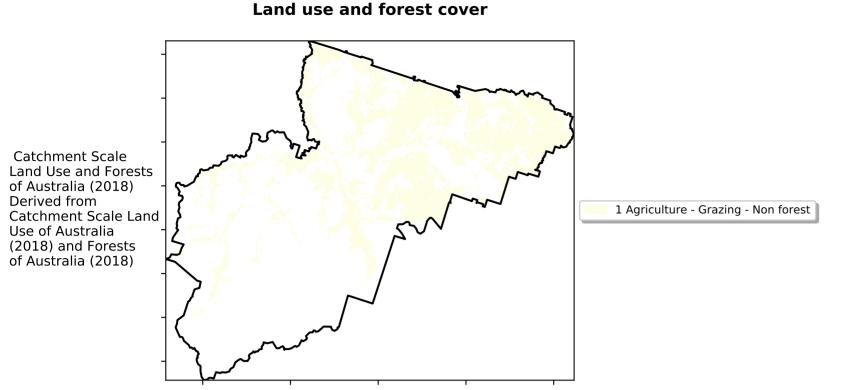
Grazing non forest

12%200%

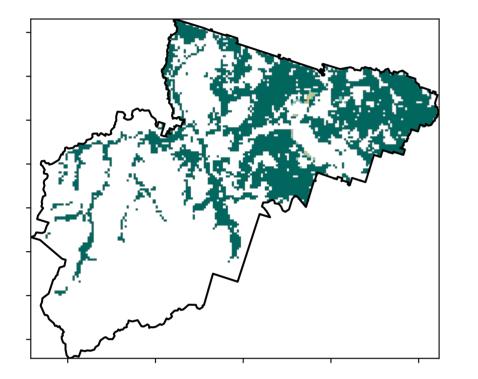
52% 70%

32005000

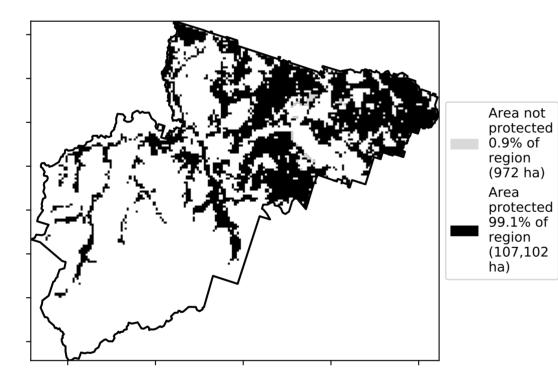
0.30%



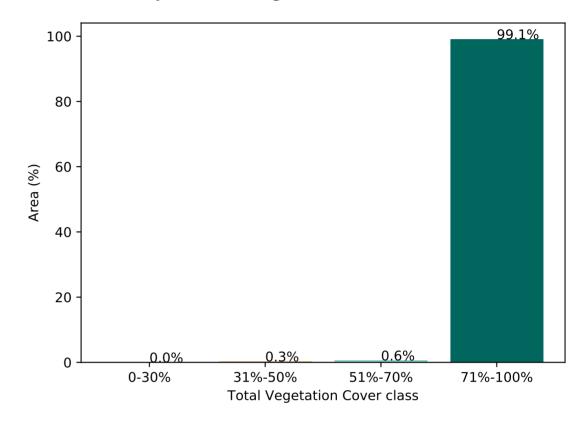
Total Vegetation Cover [%]



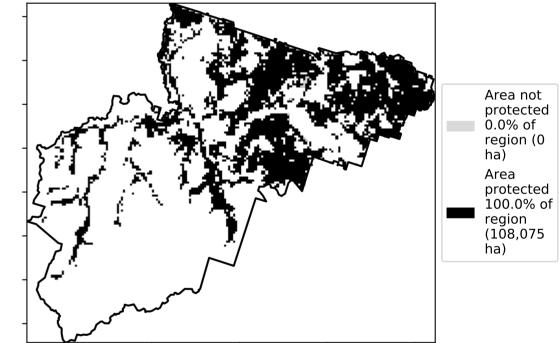
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



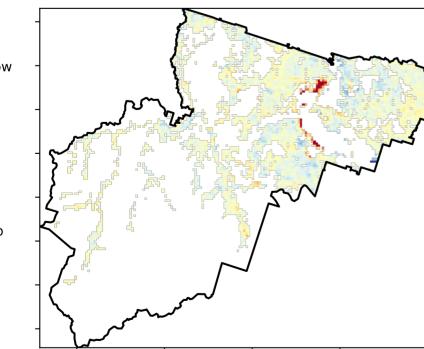
\$

°,

A.1

2³⁵

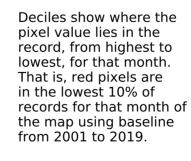
Total Vegetation Cover Anomaly [%]



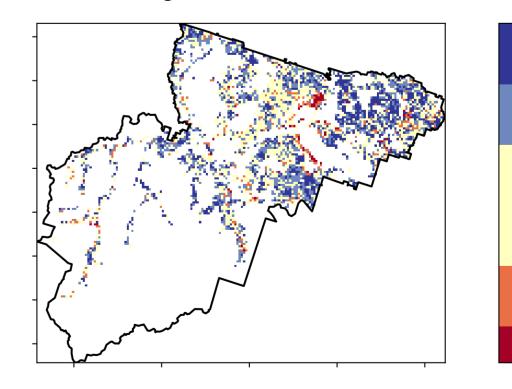
10 0 -10

-20

- 20

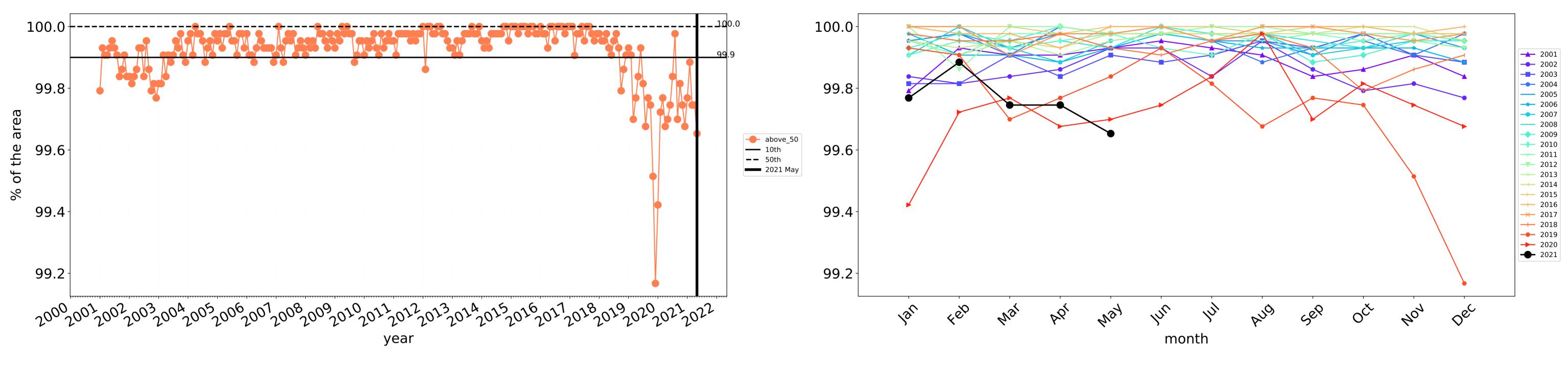


Total Vegetation Cover Decile [%]

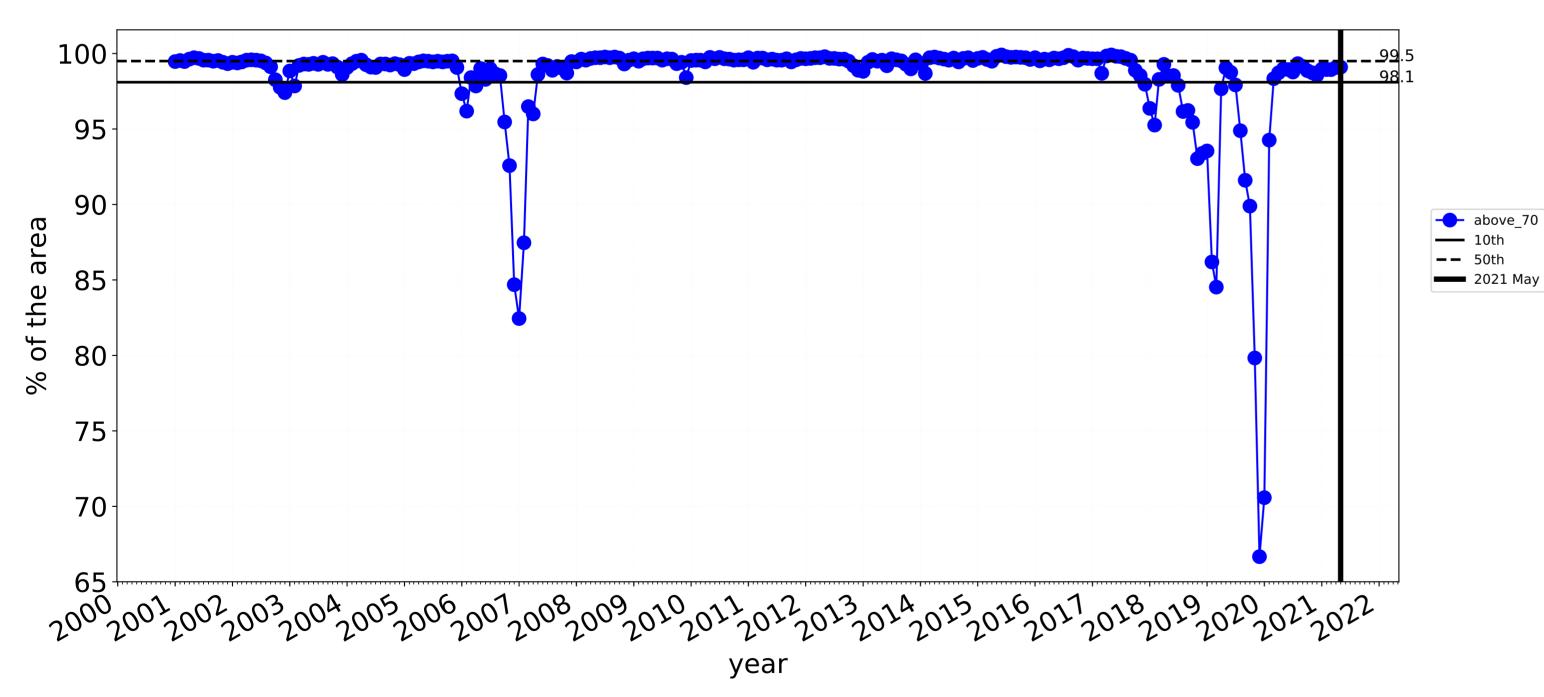


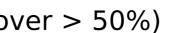






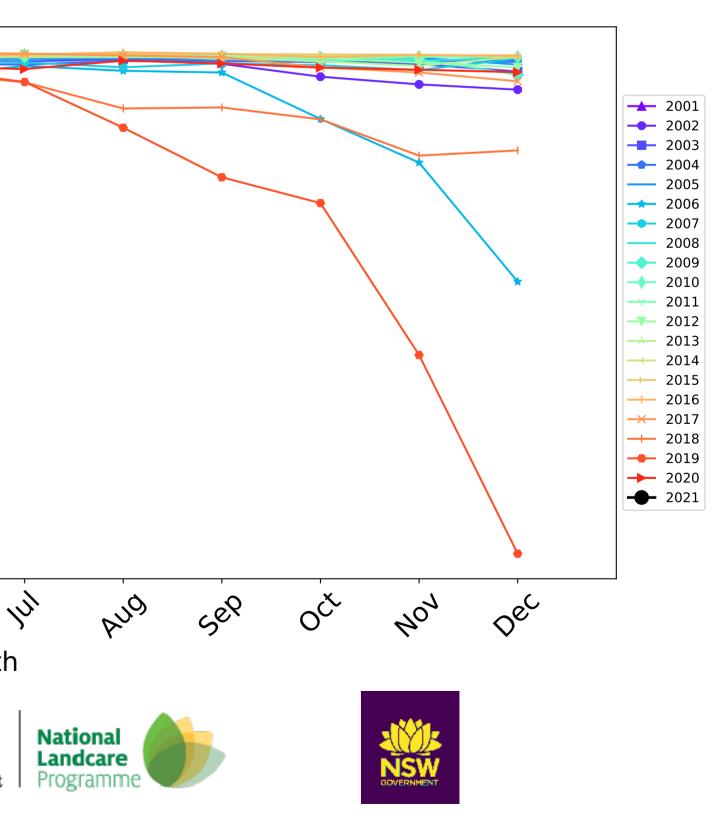
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

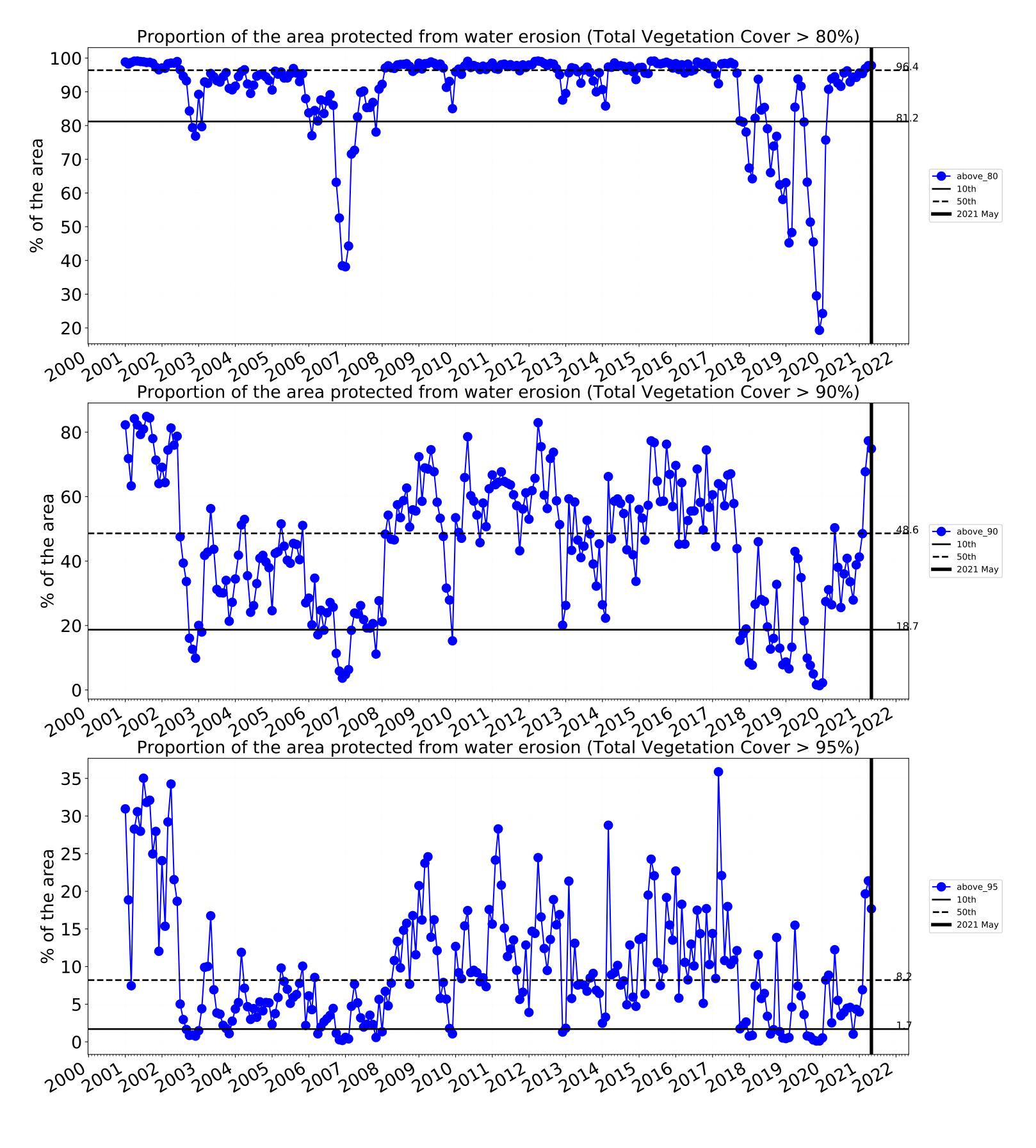


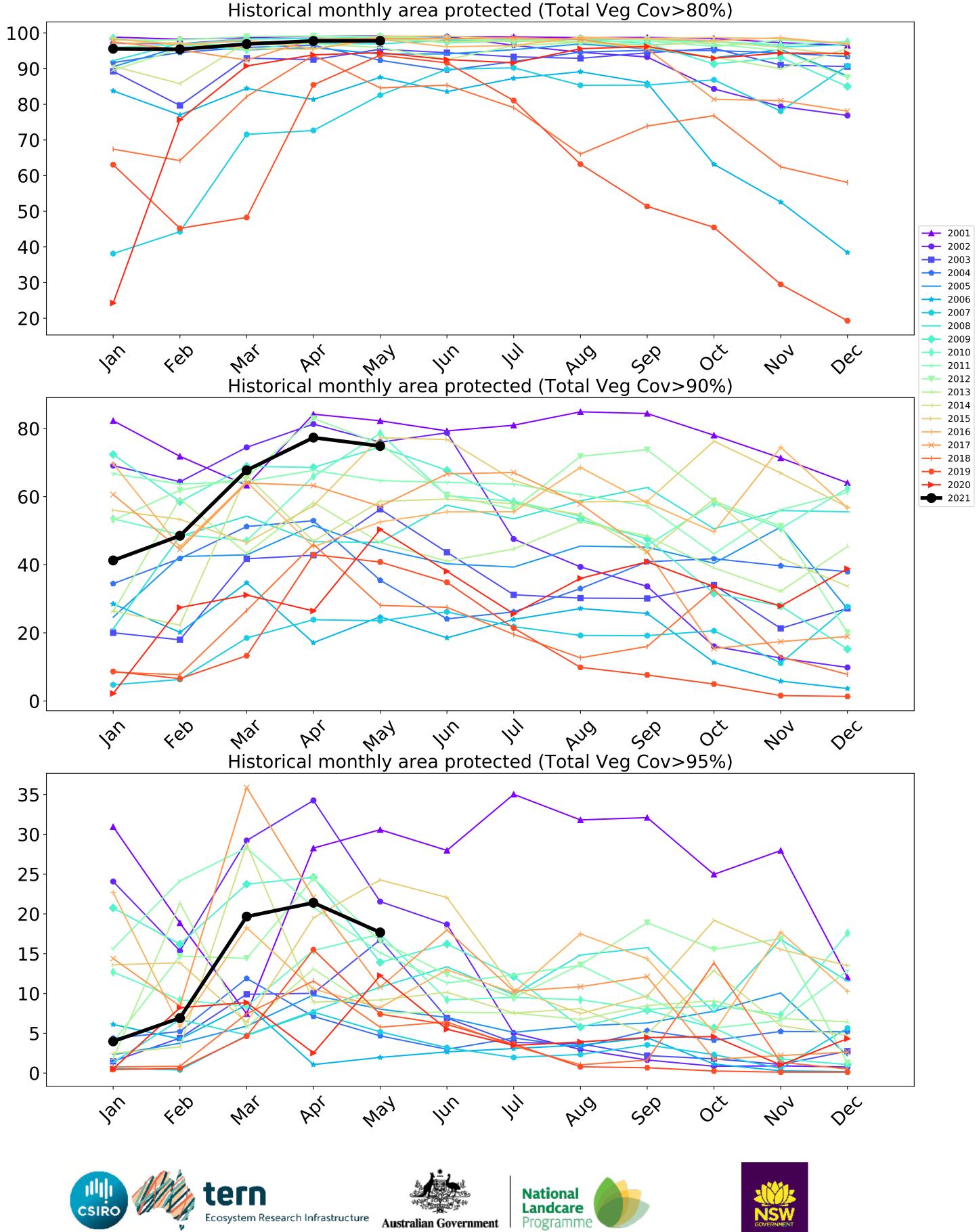


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 95 90 85 80 75 70 65 4eb Jan In way PQ War month tern Ecosystem Research Infrastructure Australian Government









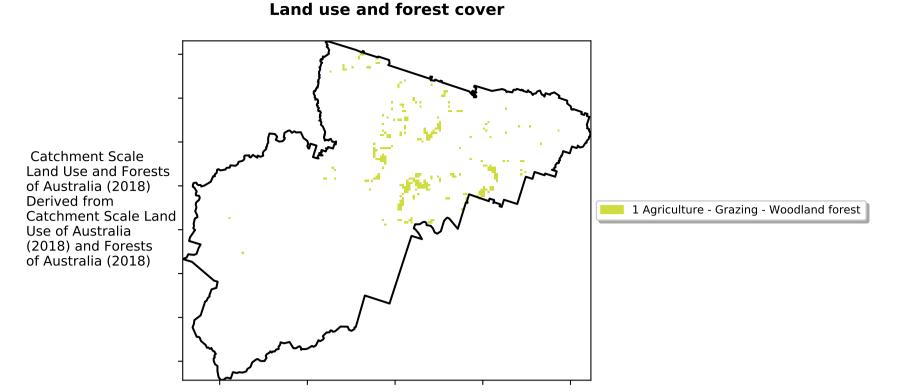
Grazing Woodland forest

12% 100%

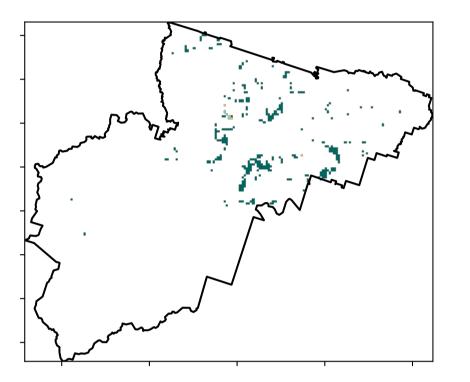
5201070010

3701050010

0-30%

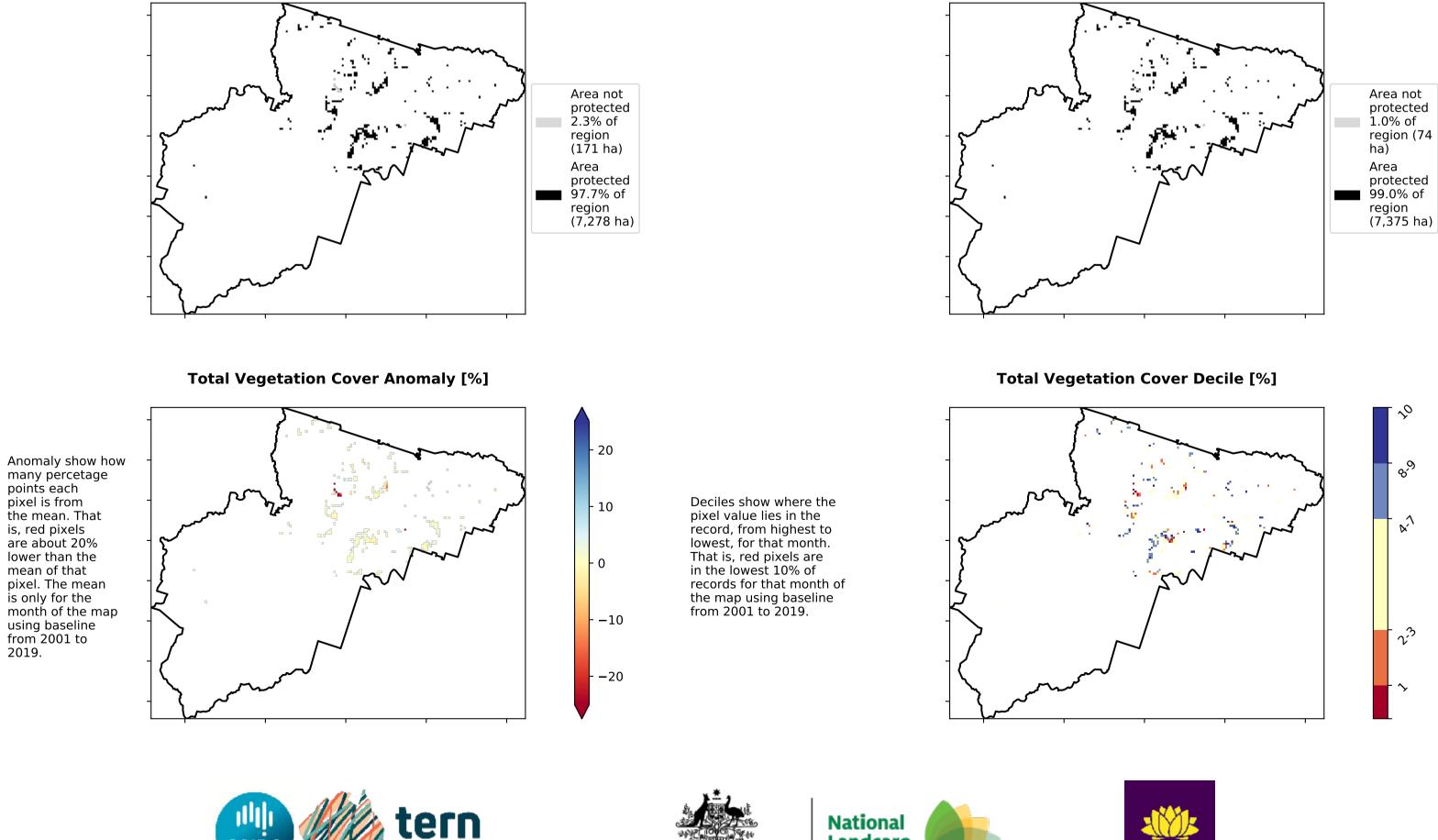


Total Vegetation Cover [%]

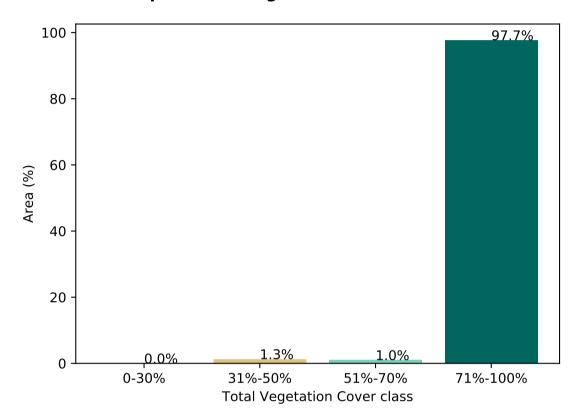


% Area protected from water erosion (>70%)

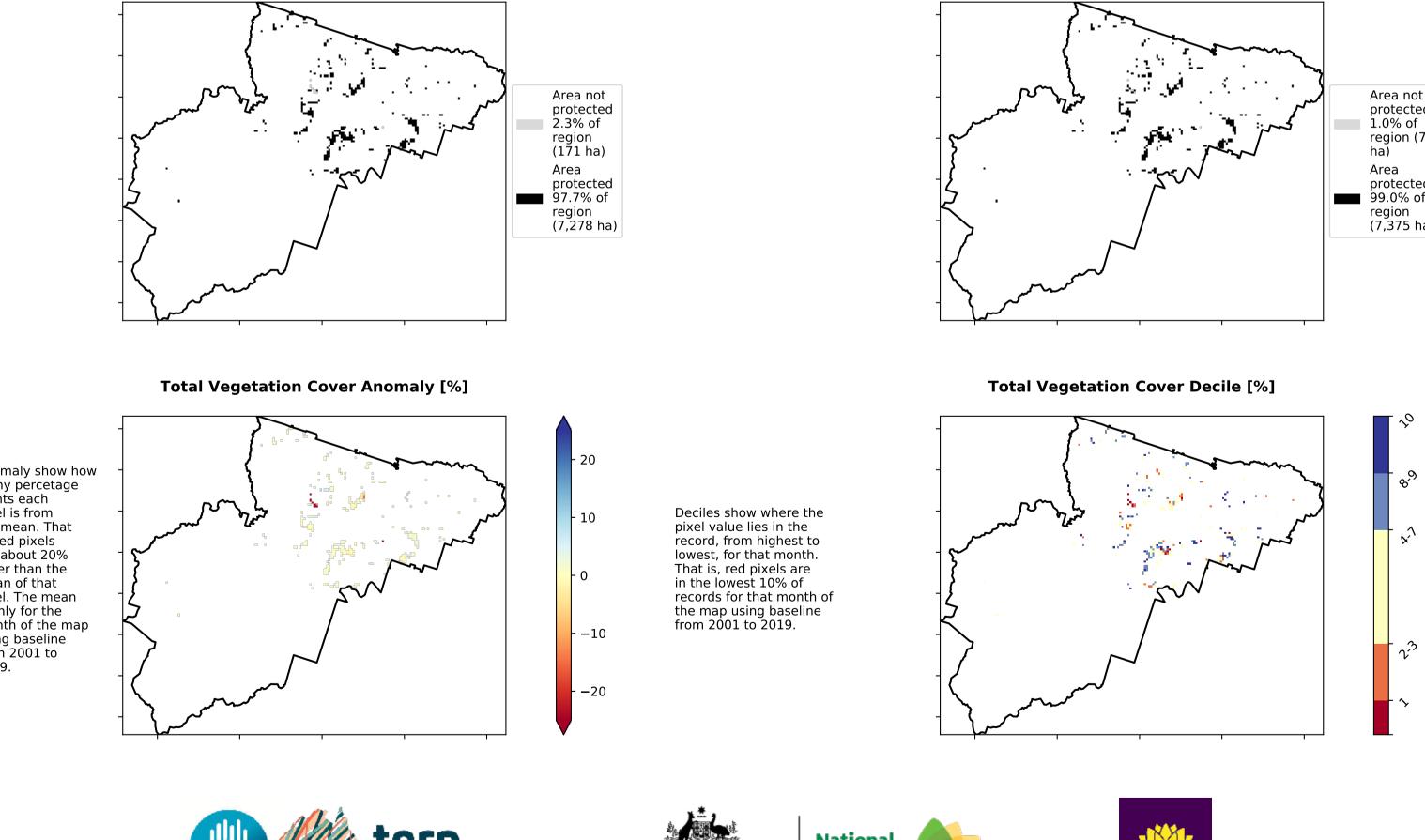
CSIRC



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

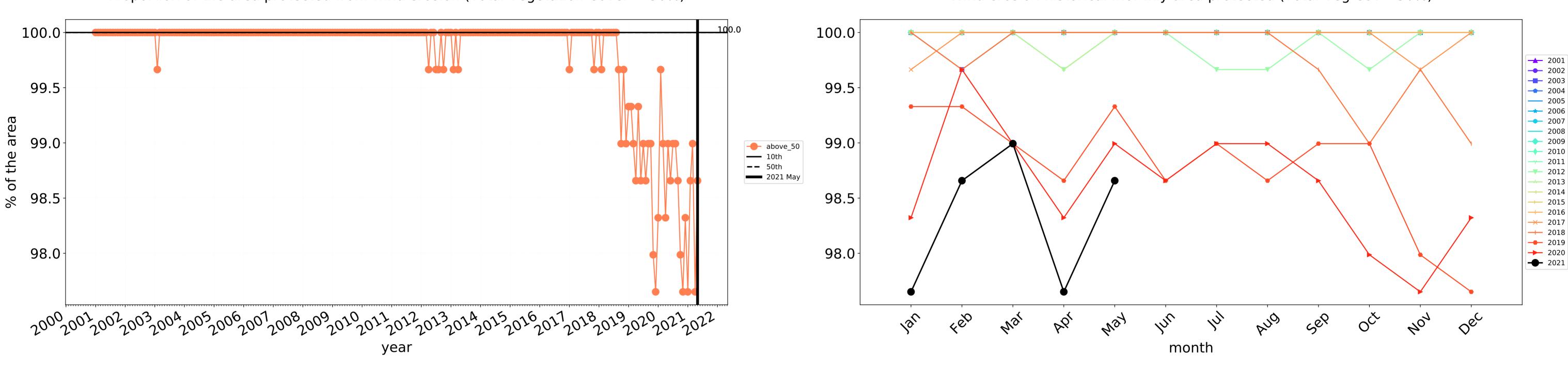


Landcare

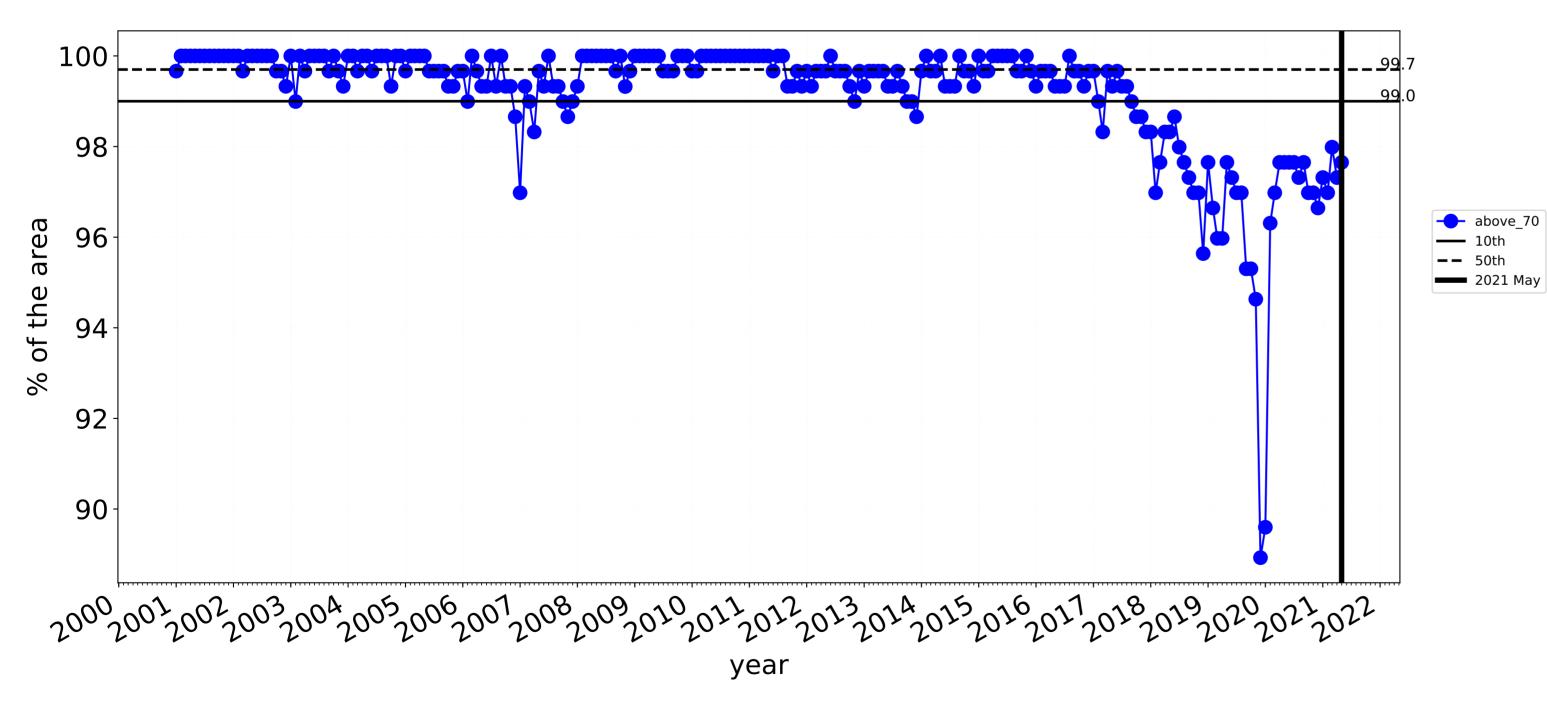
Programme

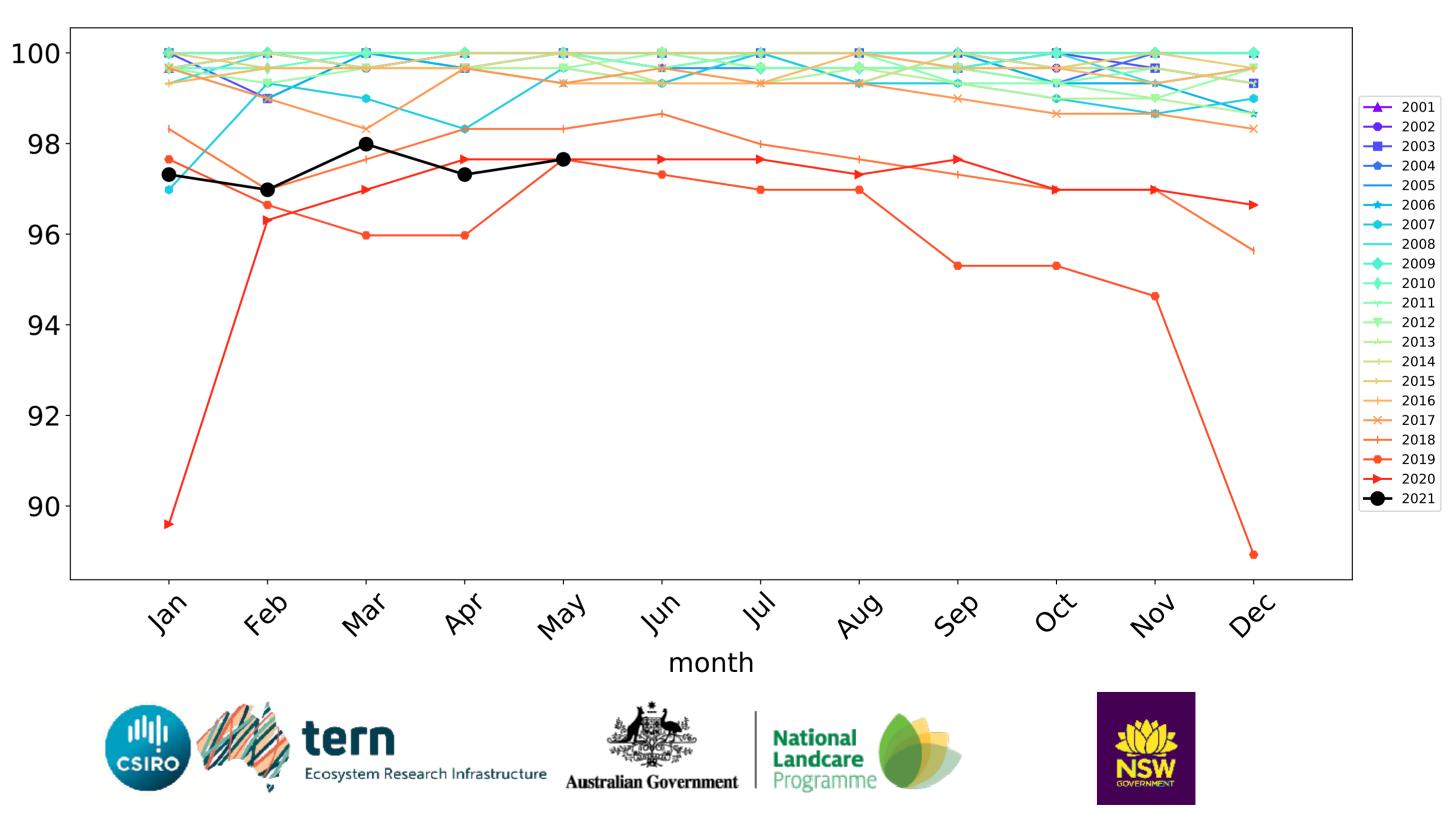
Australian Government

Ecosystem Research Infrastructure

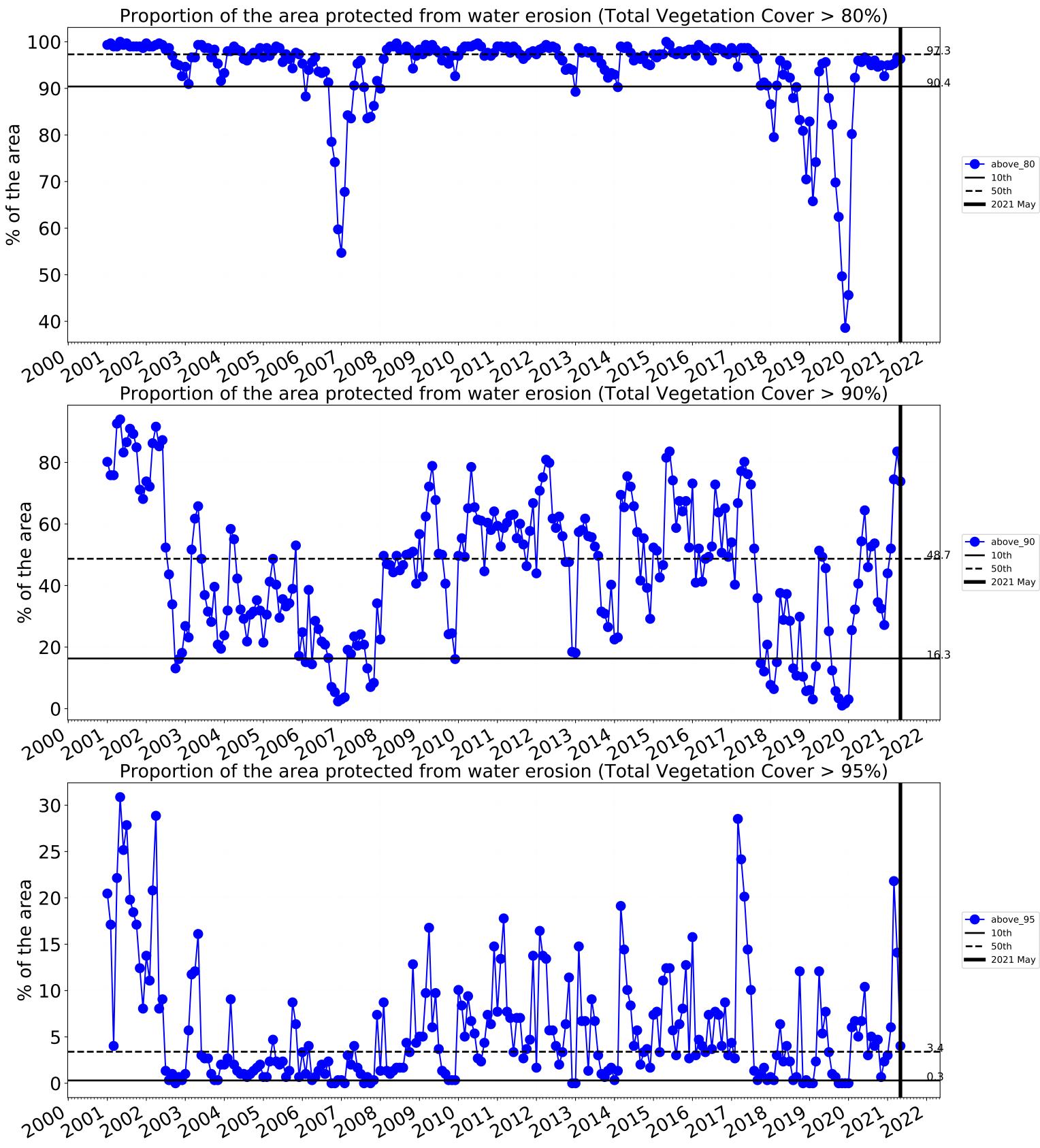


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

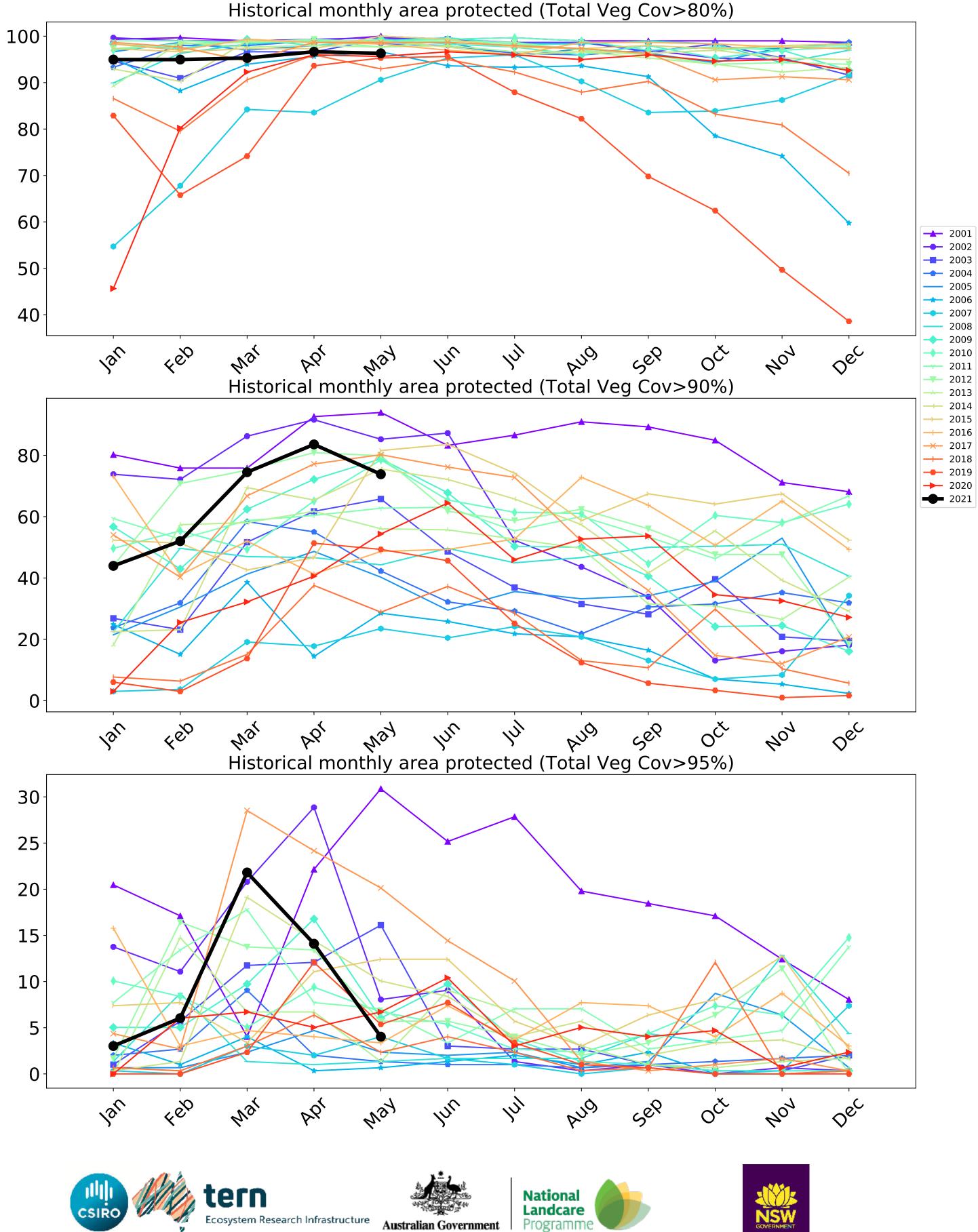




Wind erosion historical monthly area protected (Total Veg Cov >50%)









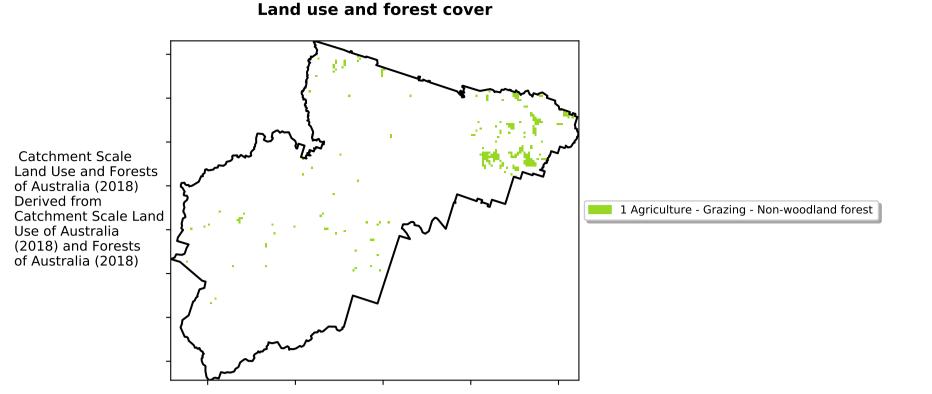
Grazing - Forest (non woodland)

12% 100%

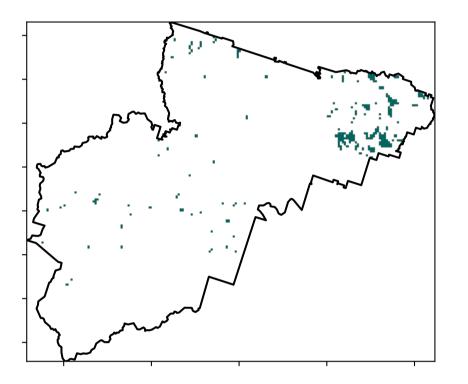
· 52°10'70°10

3701050010

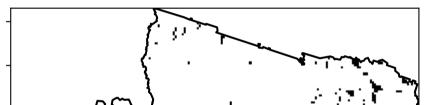
0.30%



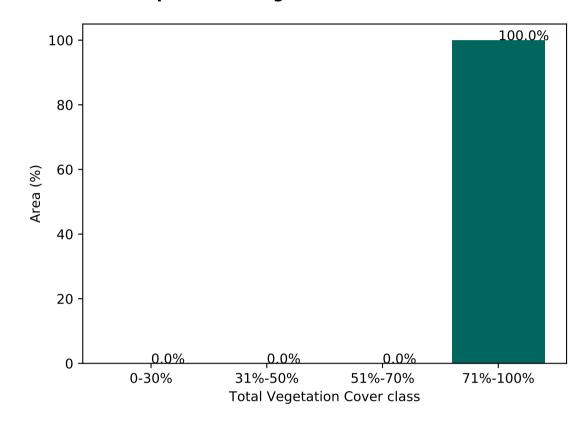
Total Vegetation Cover [%]



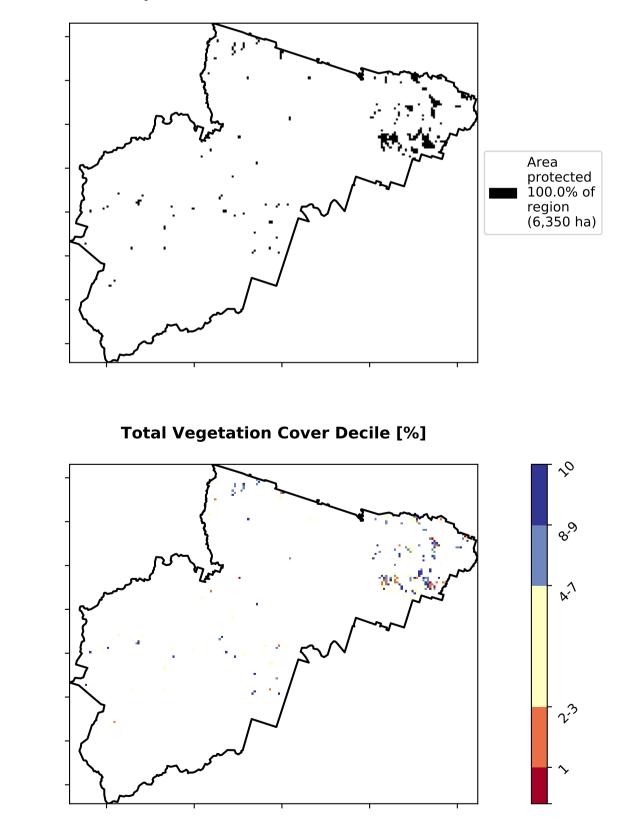
% Area protected from water erosion (>70%)

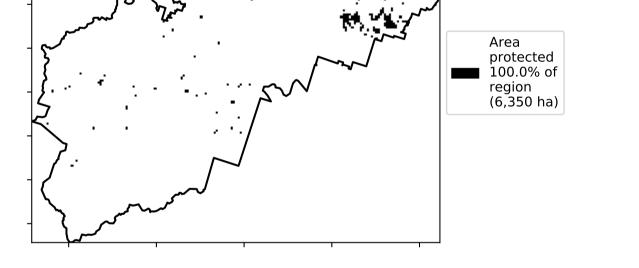


Proportion of vegetation cover class in area

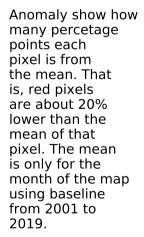


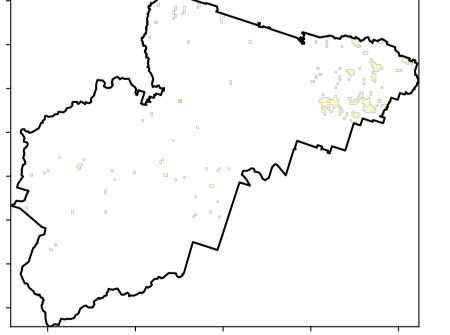
% Area protected from wind erosion (>50%)





Total Vegetation Cover Anomaly [%]





10 0 -10

-20

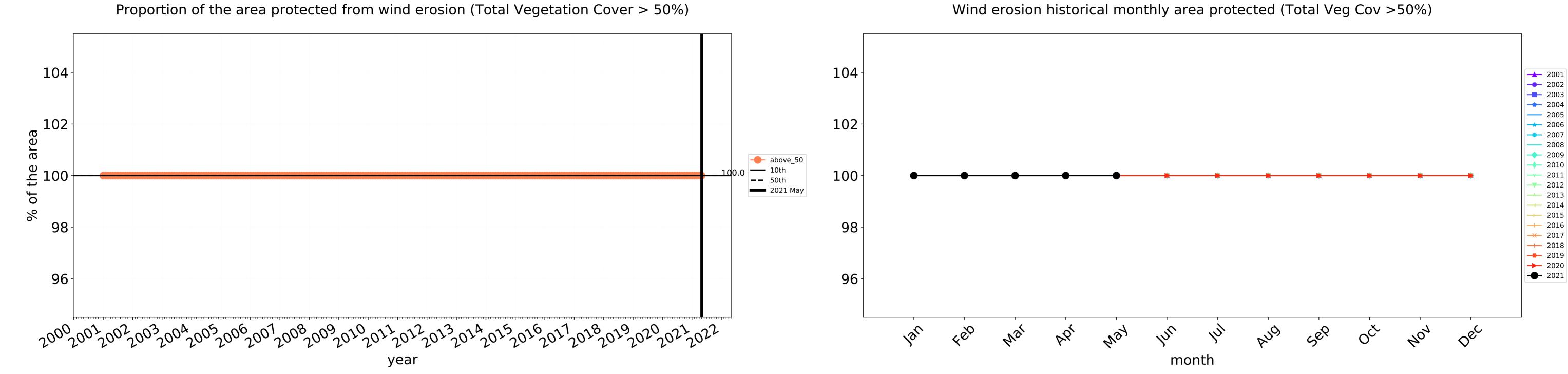
- 20

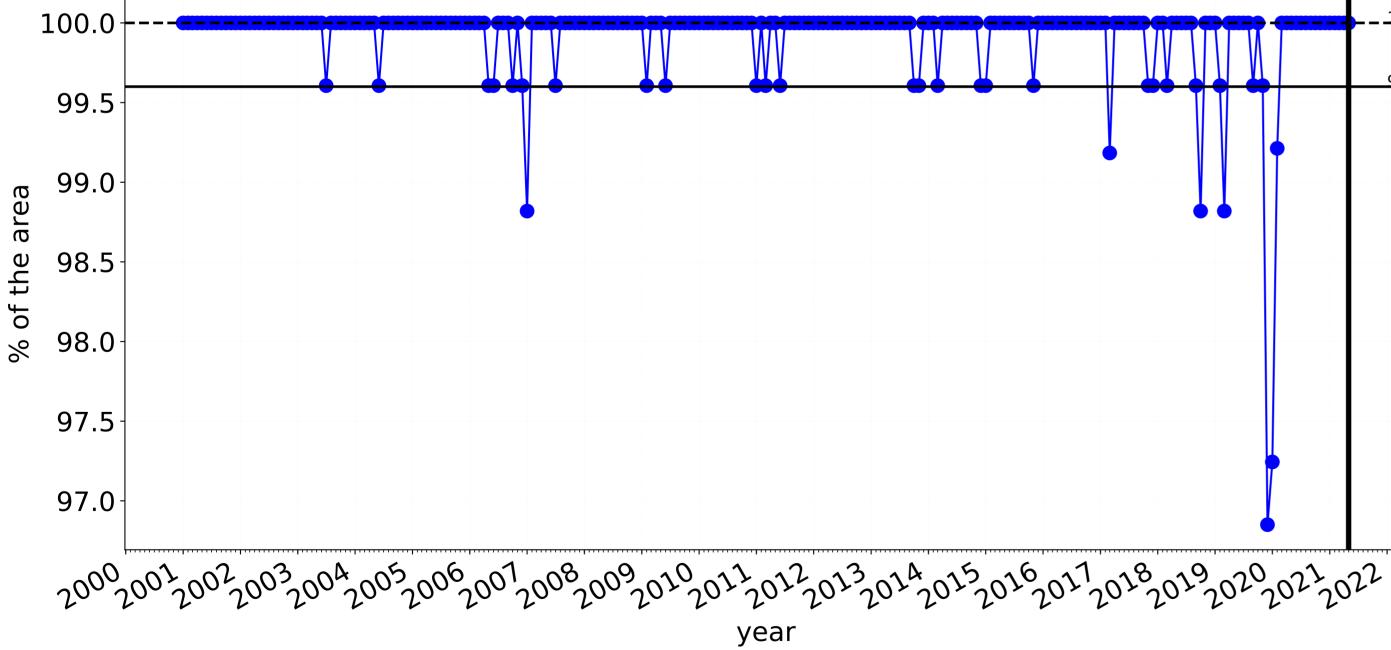


Deciles show where the pixel value lies in the

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.

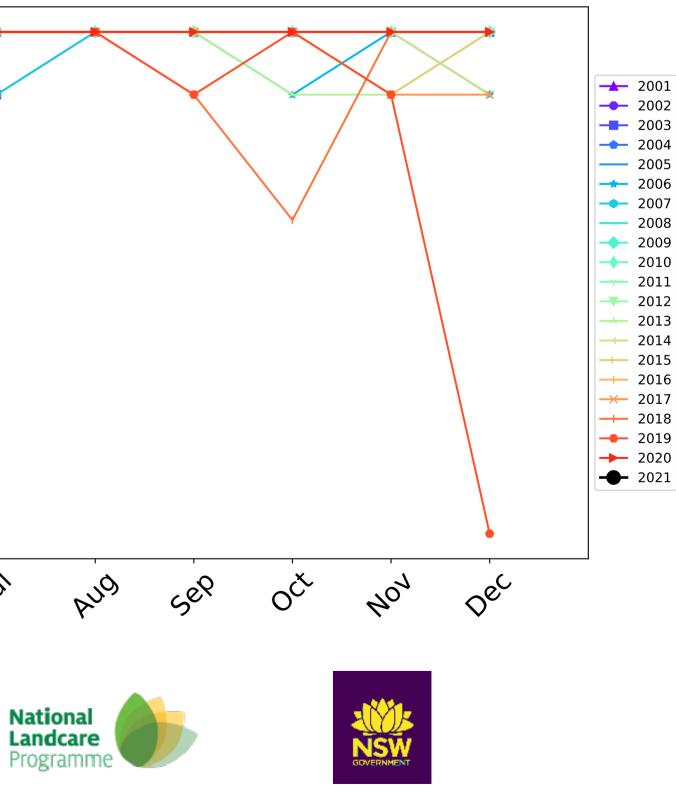


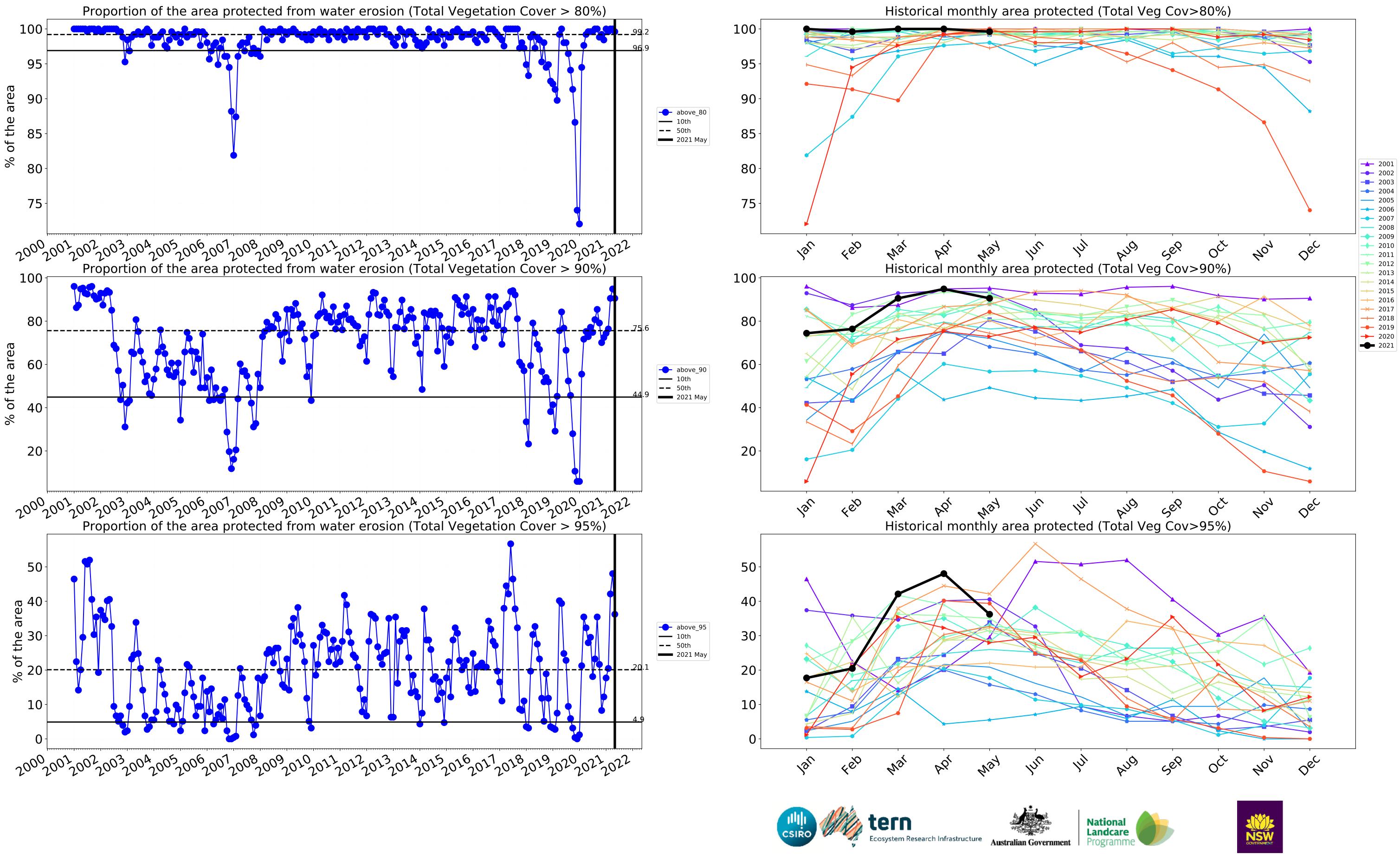


Grazing - Forest (non woodland) timeseries

_____0.0 100.0-99.5 99.0 ---- above_70 **—** 10th **——** 50th **——** 2021 May 98.5 98.0 97.5 97.0 4eb Par way Inc PQ hy War month tern Ecosystem Research Infrastructure Australian Government

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







Irrigation

12% 100%

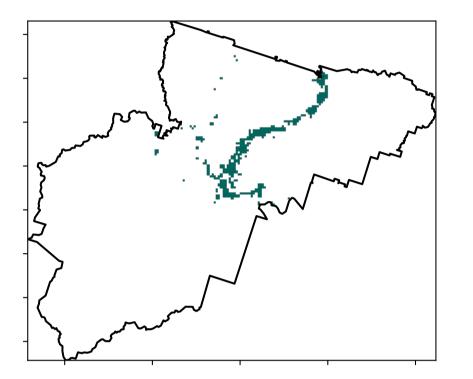
52°10'70°10

3201050010

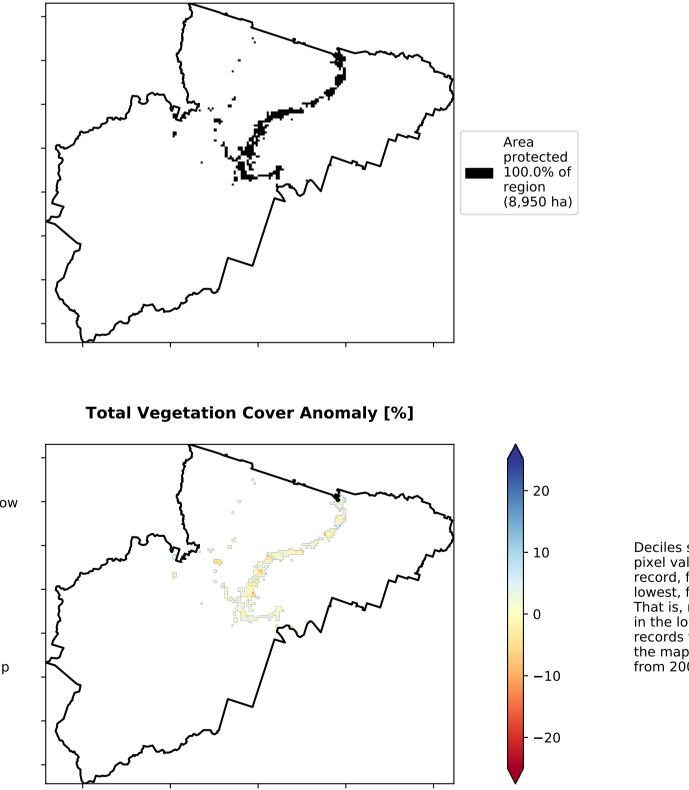
0-30%

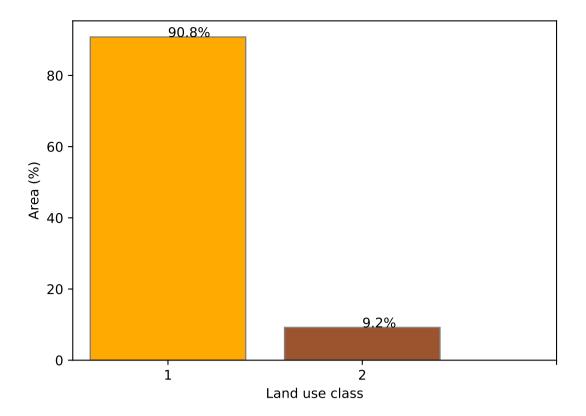
Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) -Derived from Catchment Scale Land 1 Agriculture - Grazing - Irrigated 2 Agriculture - Horticulture - Irrigated Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]



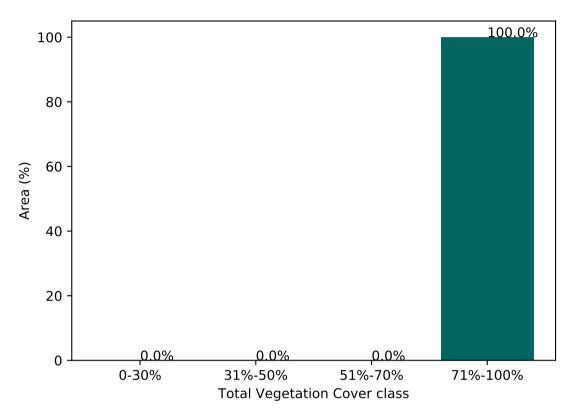
% Area protected from water erosion (>70%)



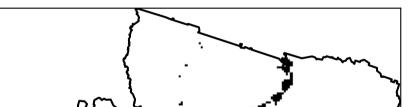


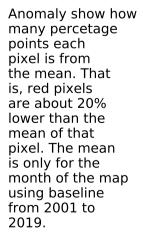
Proportion of each land class in area

Proportion of vegetation cover class in area

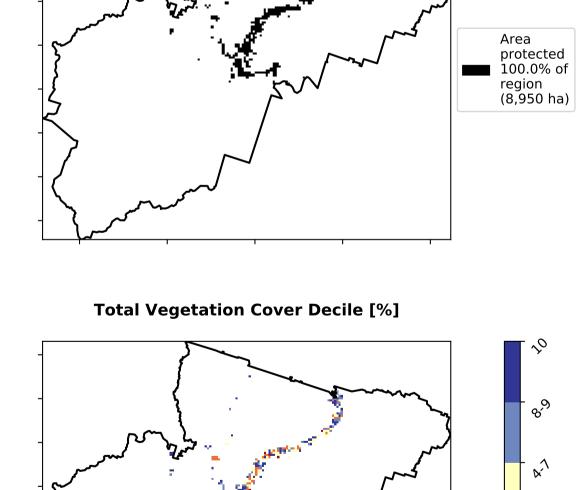


% Area protected from wind erosion (>50%)





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.

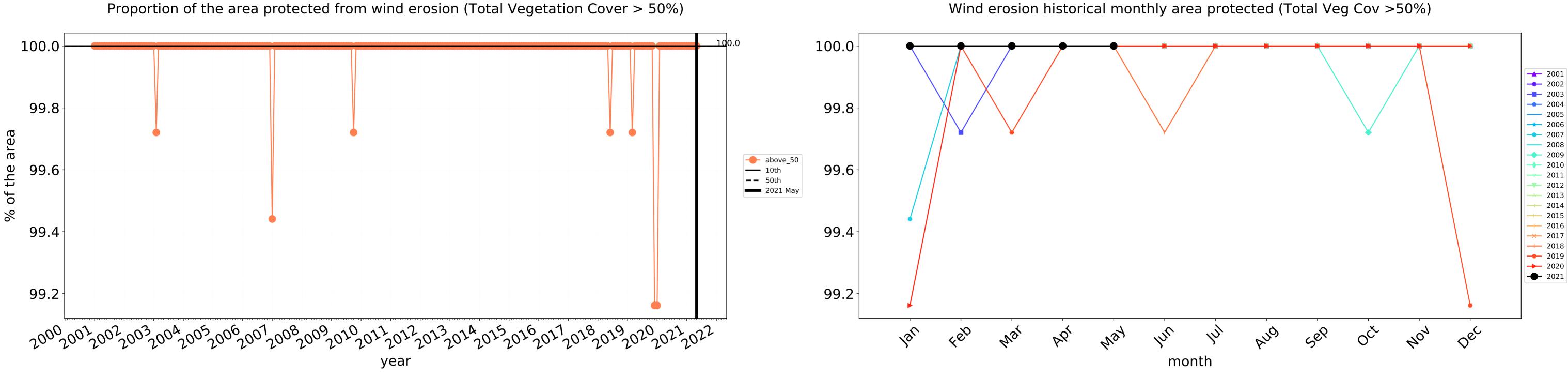




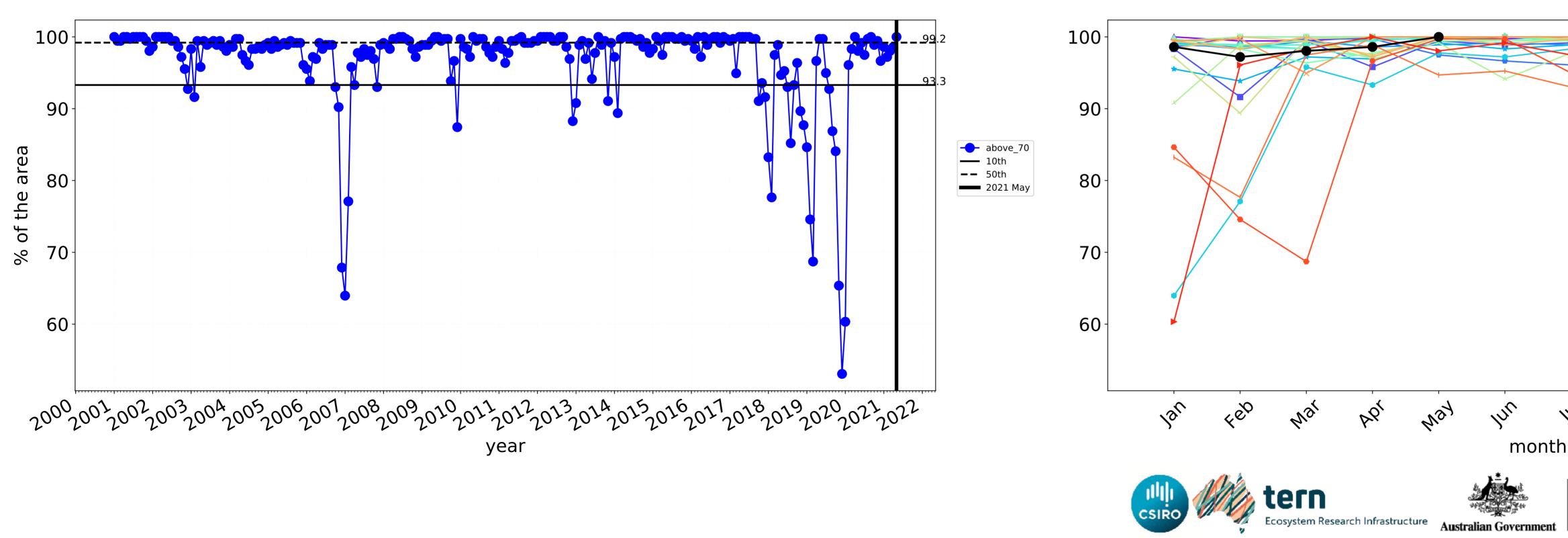
292



2³³

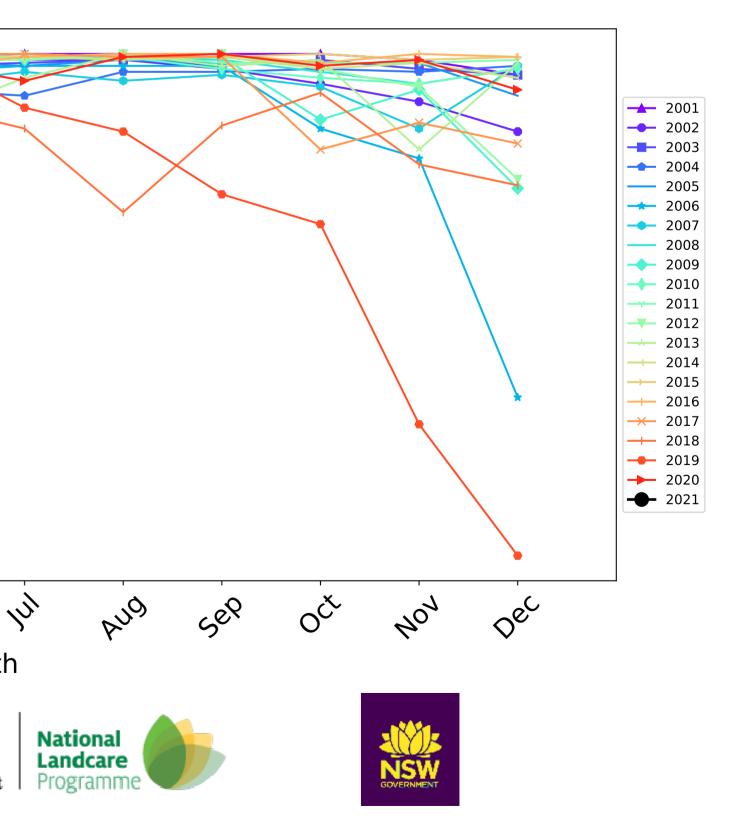


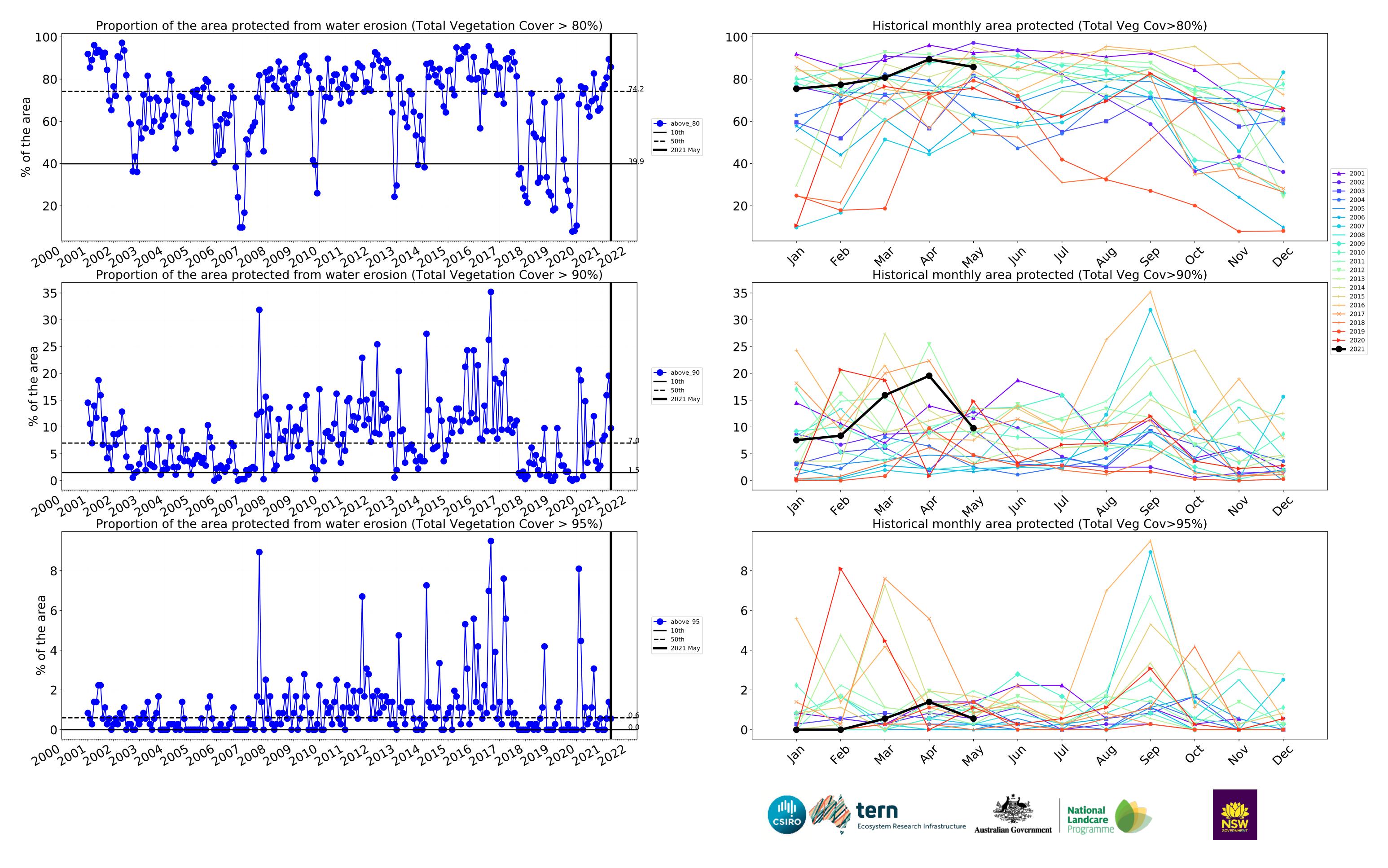
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

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





Muswellbrook_(A) (339,650 ha and no data 814 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	339,650	99.8% 338,850	99.1% 336,725	98.0% 332,975	96.2% 326,575	80.1% 272,125	35.3% 120,025
Conservation and natural environments	183,675	100.0% 183,650	99.9% 183,550	99.9% 183,400	99.8% 183,300	94.3% 173,275	52.6% 96,525
Conservation and natural environments Woodland forest	11,475	99.8% 11,450	98.9% 11,350	97.8% 11,225	97.2% 11,150	92.2% 10,575	55.1% 6,325
Conservation and natural environments Forest (non woodland)	171,850	100.0% 171,850	100.0% 171,850	100.0% 171,825	100.0% 171,800	94.5% 162,375	52.4% 90,125
Agriculture	132,750	100.0% 132,750	99.6% 132,275	99.1% 131,600	97.0% 128,725	70.7% 93,850	16.4% 21,800
Grazing	121,875	100.0% 121,875	99.6% 121,400	99.1% 120,725	97.8% 119,200	75.6% 92,150	17.8% 21,700
Grazing non forest	108,075	100.0% 108,075	99.7% 107,700	99.1% 107,100	97.8% 105,700	74.9% 80,900	17.7% 19,100
Grazing Woodland forest	7,450	100.0% 7,450	98.7% 7,350	97.7% 7,275	96.3% 7,175	73.8% 5,500	4.0% 300
Grazing - Forest (non woodland)	6,350	100.0% 6,350	100.0% 6,350	100.0% 6,350	99.6% 6,325	90.6% 5,750	36.2% 2,300
Irrigation	8,950	100.0% 8,950	100.0% 8,950	100.0% 8,950	85.8% 7,675	9.8% 875	0.6% 50

