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

Date: October 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:

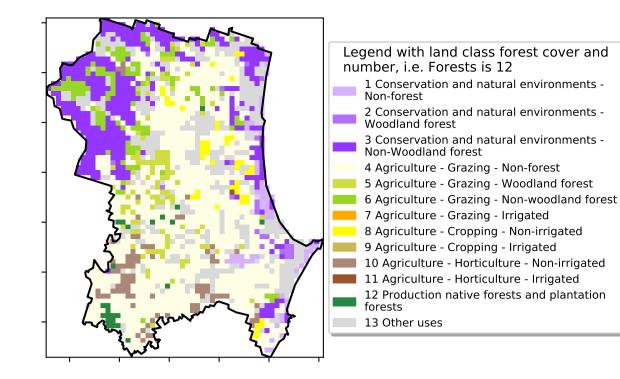
https://doi.org/10.4225/08/5848a3f19a7b3



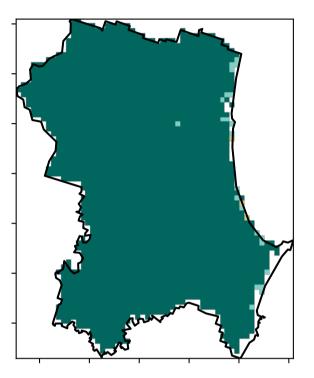
Vegetation Cover Oct 2021

Land use and forest cover

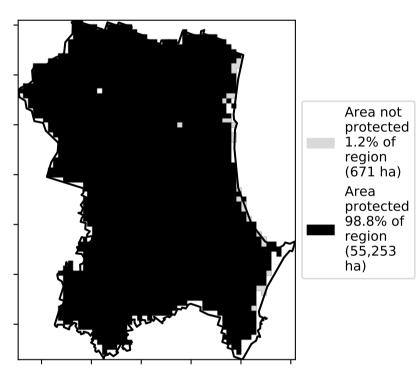
Proportion of each land class in area

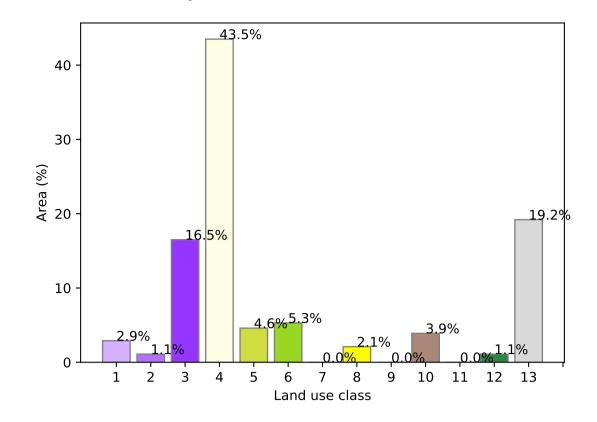


Total Vegetation Cover [%]

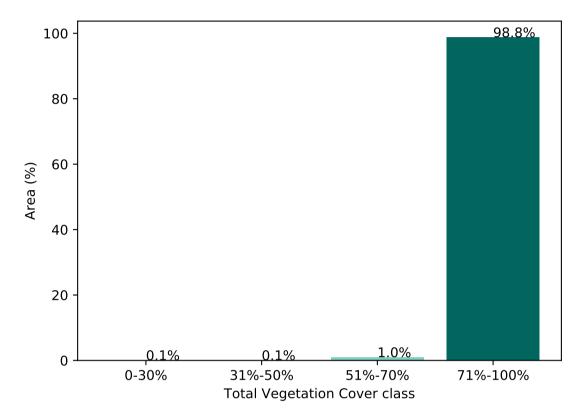


% Area protected from water erosion (>70%)

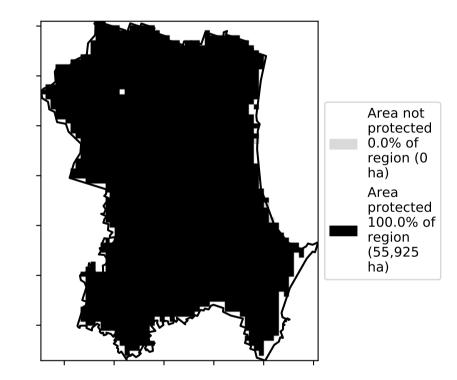




Proportion of vegetation cover class in area



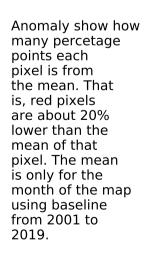
% Area protected from wind erosion (>50%)

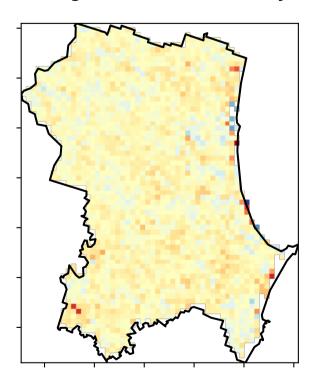


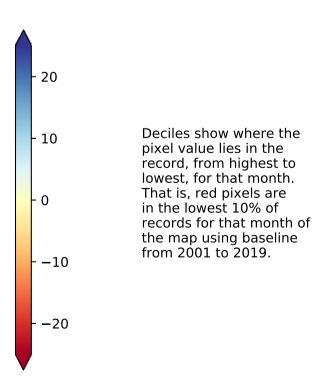
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Anomaly [%]

Total Vegetation Cover Decile [%]





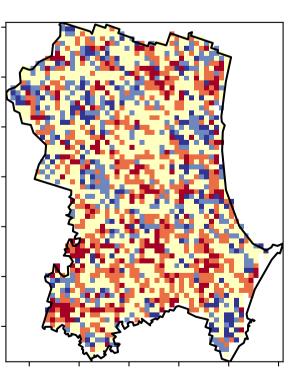


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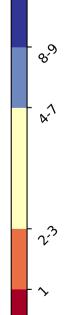
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0.30%

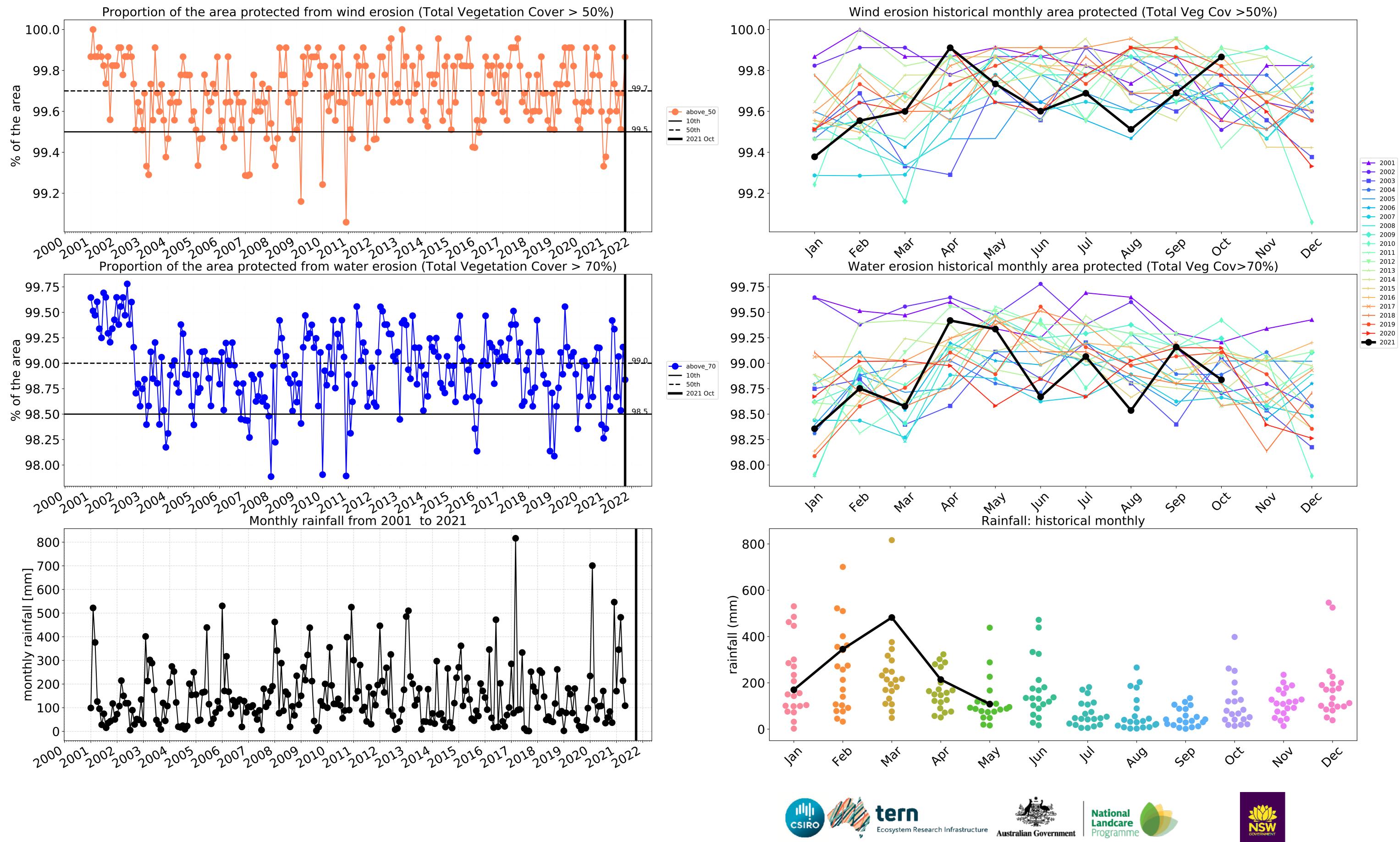






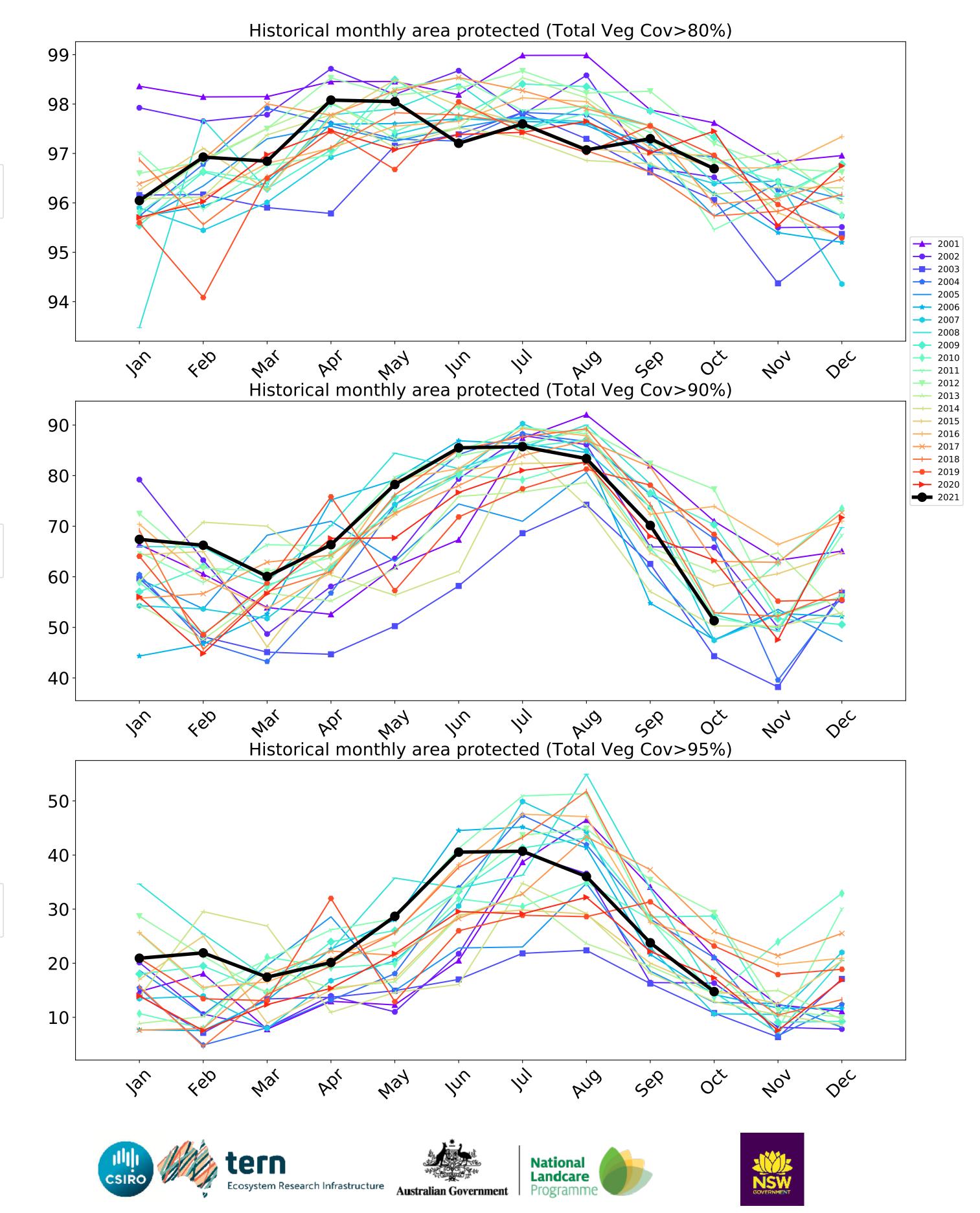


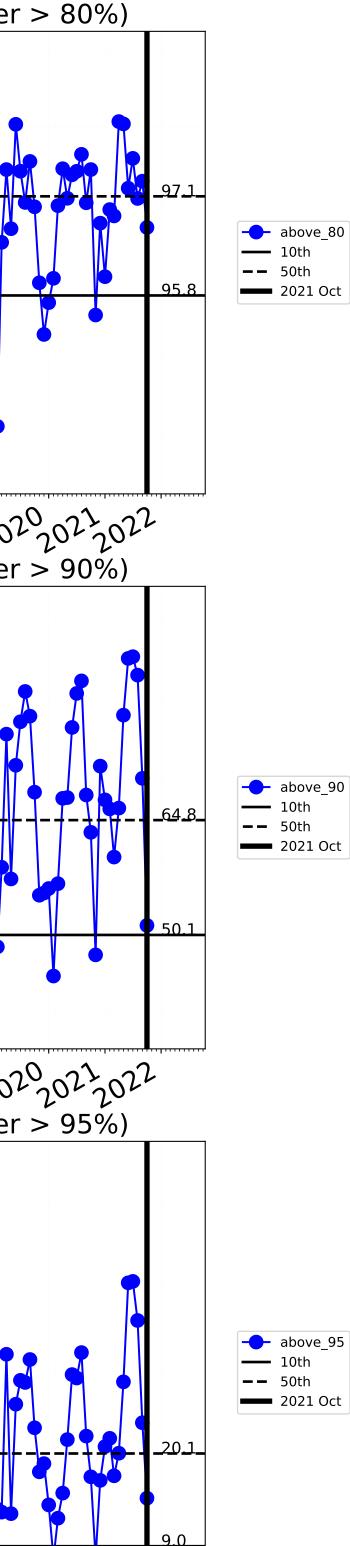
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99-98 area 9. 96 the of [∞]95+ 94 90 80 area 20 of the 09 % 50 40-Proportion of the area protected from water erosion (Total Vegetation Cover > 95%) 50-40 area of the 8 20 10

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

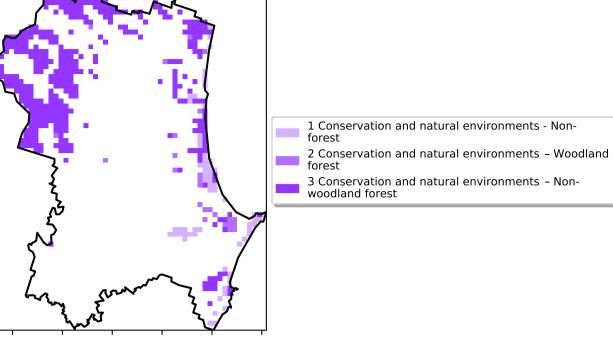




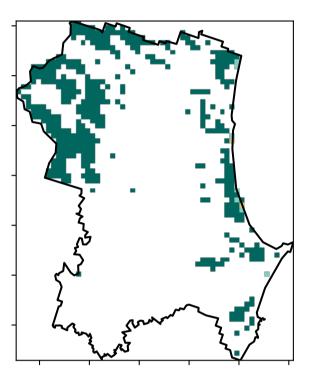
Conservation and natural environments

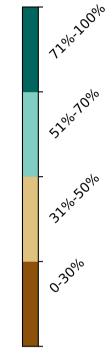
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Land use and forest cover

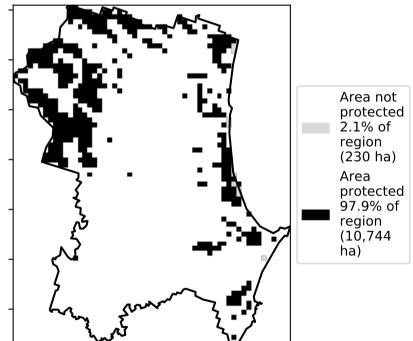


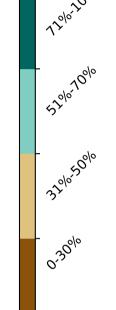
Total Vegetation Cover [%]

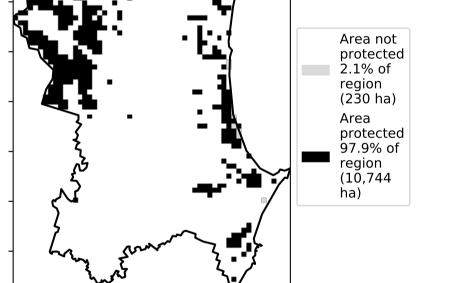




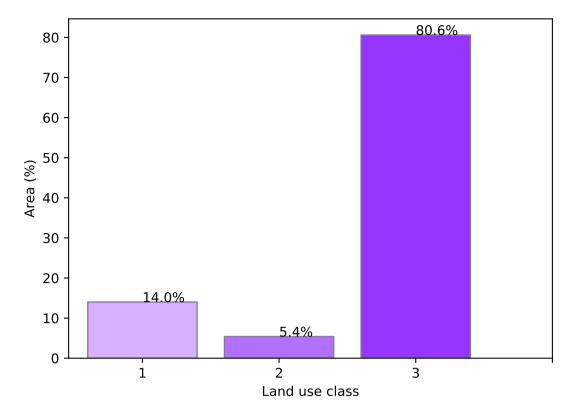
% Area protected from water erosion (>70%)



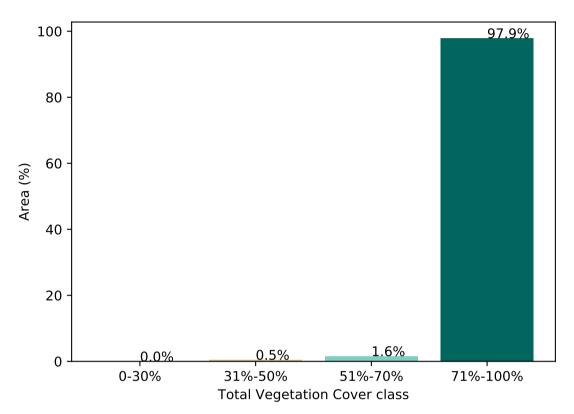




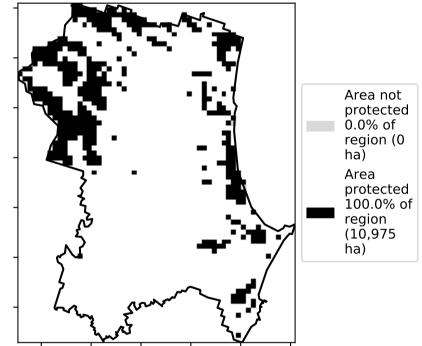
Proportion of each land class in area



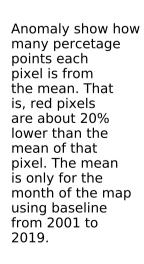
Proportion of vegetation cover class in area

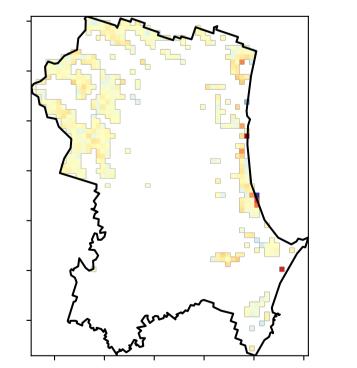


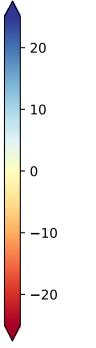
% Area protected from wind erosion (>50%)

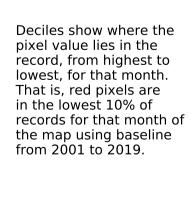


Total Vegetation Cover Anomaly [%]

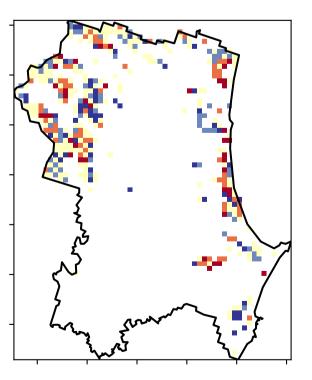


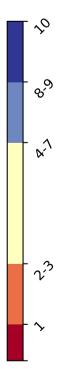




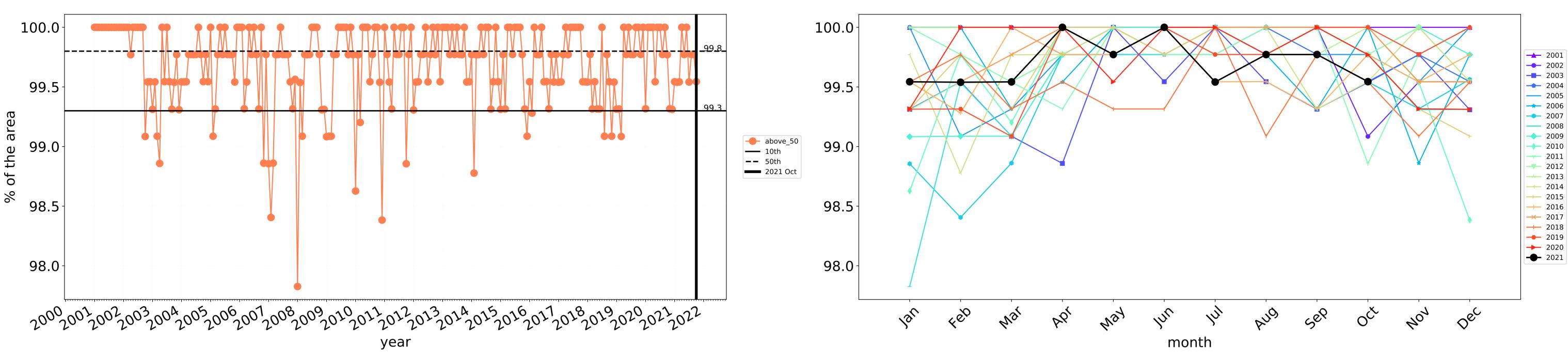


Total Vegetation Cover Decile [%]



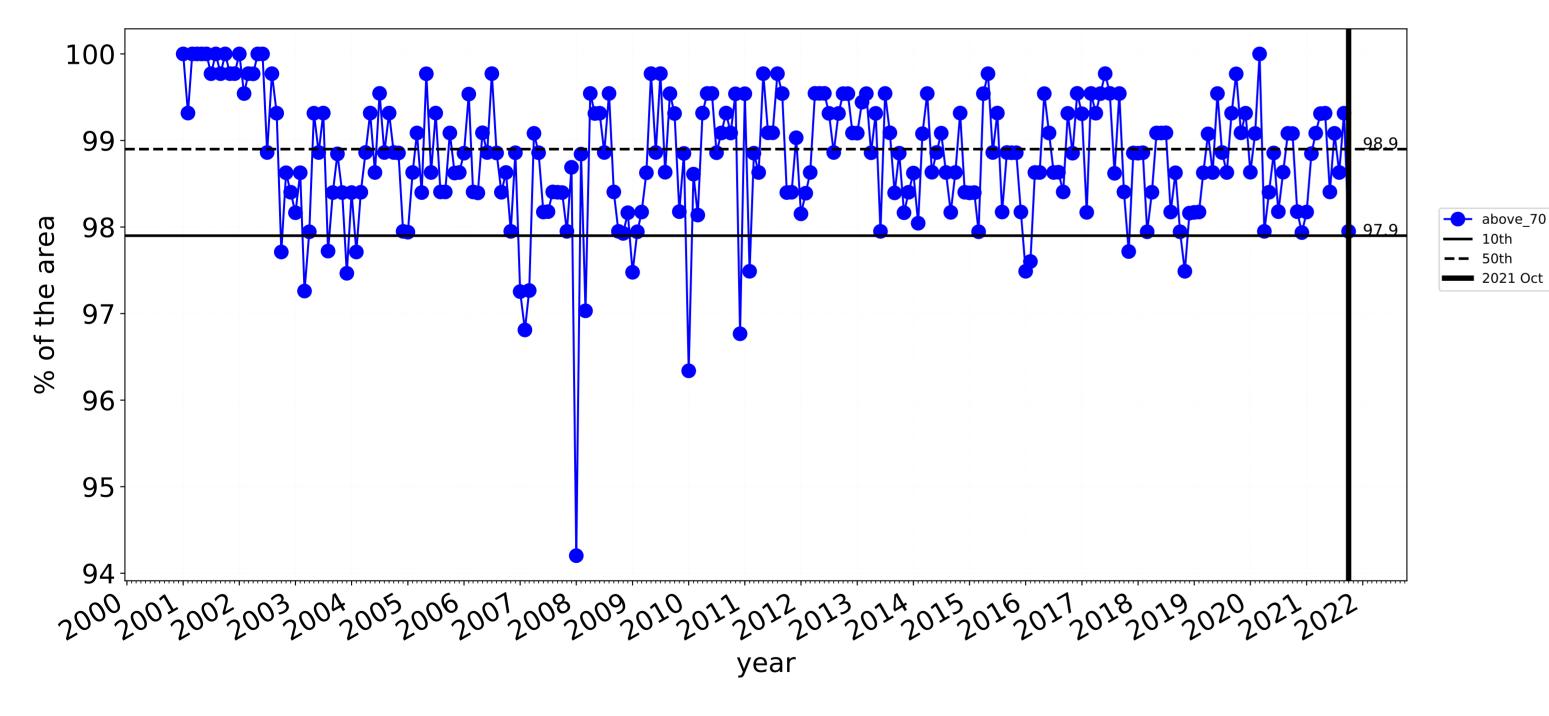






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

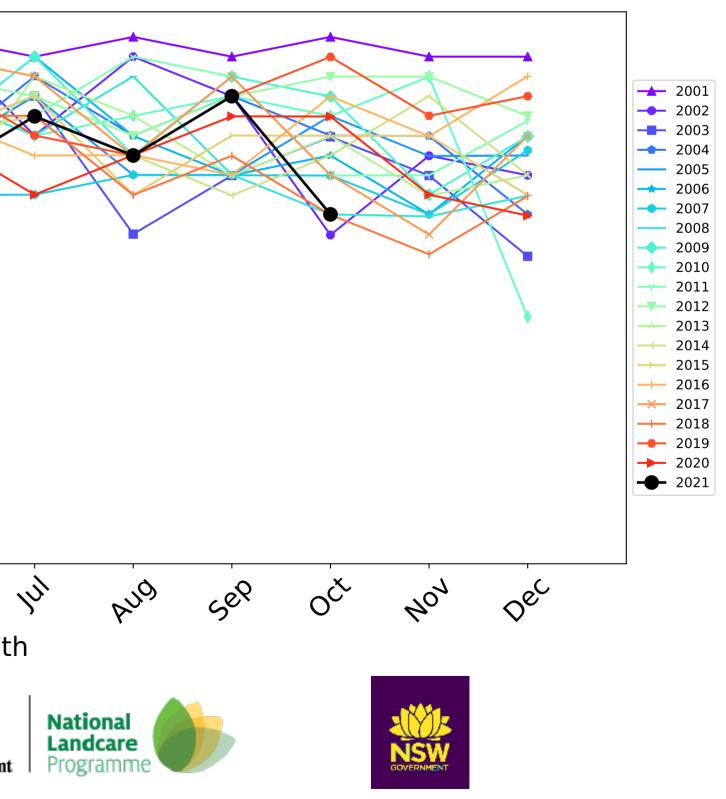
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

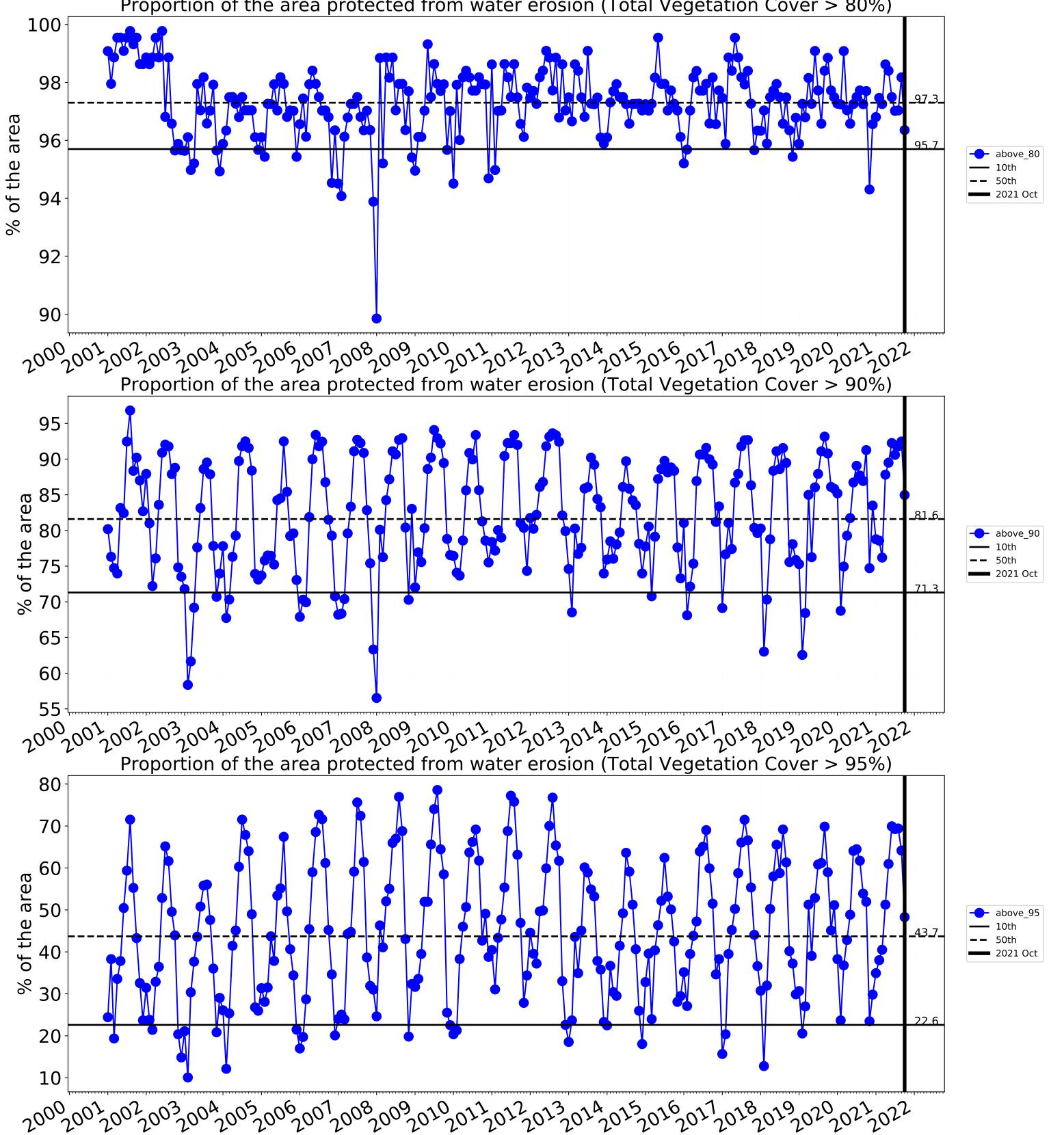


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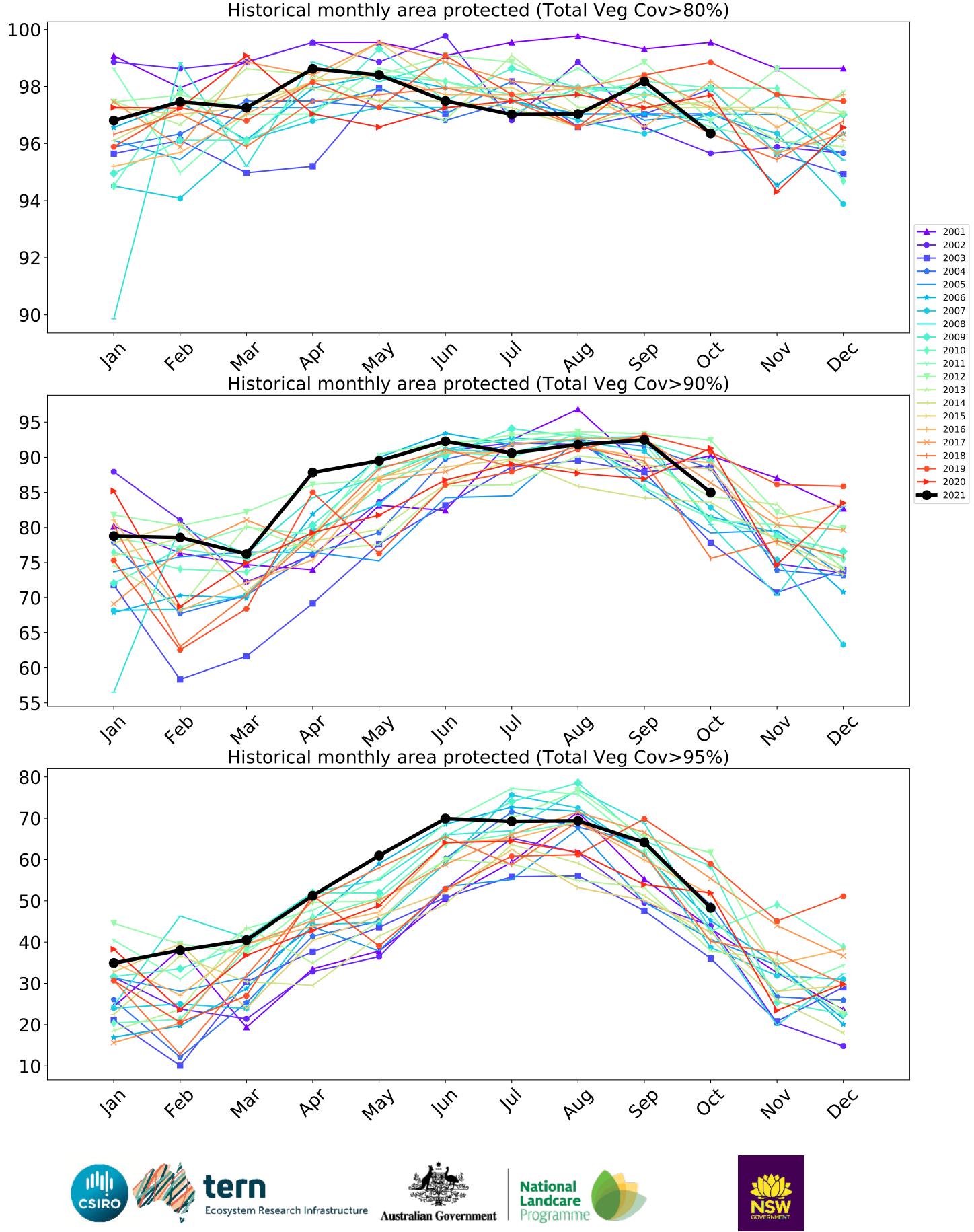
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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





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



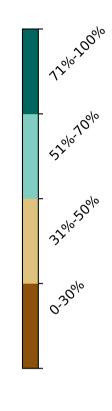


Conservation and natural environments non forest

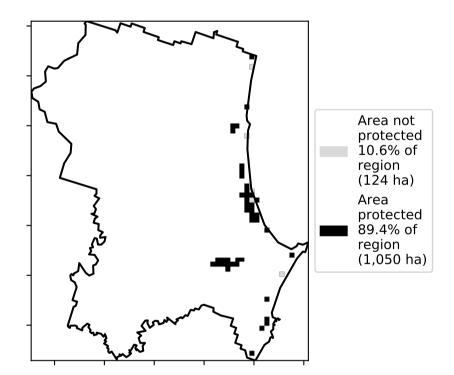
Land use and forest cover

1 Conservation and natural environments - Nonforest

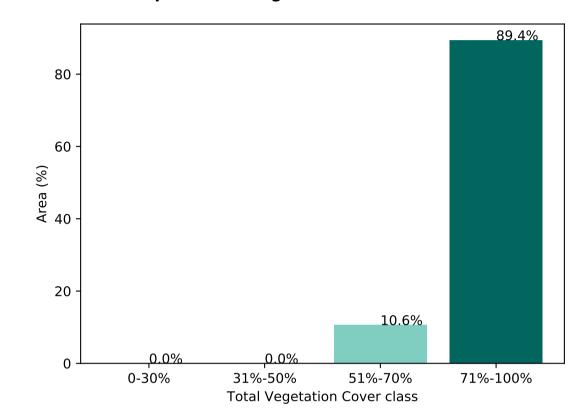
Total Vegetation Cover [%]



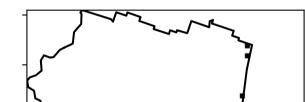
% Area protected from water erosion (>70%)



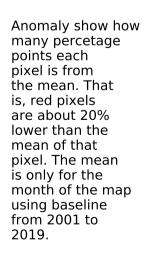
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

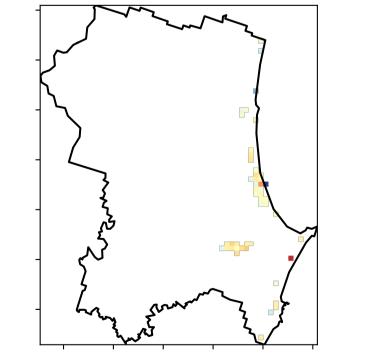


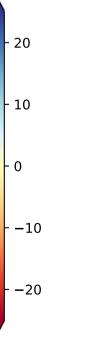
Total Vegetation Cover Anomaly [%]

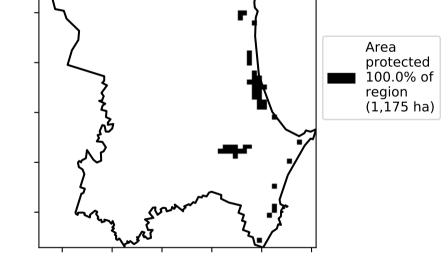


Catchment Scale Land Use and Forests of Australia (2018) Derived from

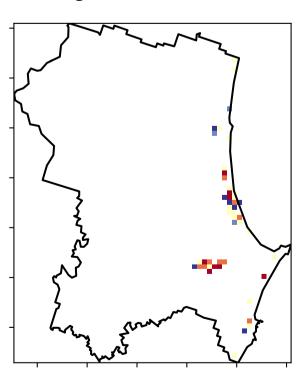
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

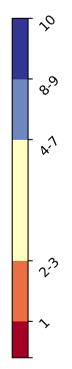






Total Vegetation Cover Decile [%]







Deciles show where the

pixel value lies in the

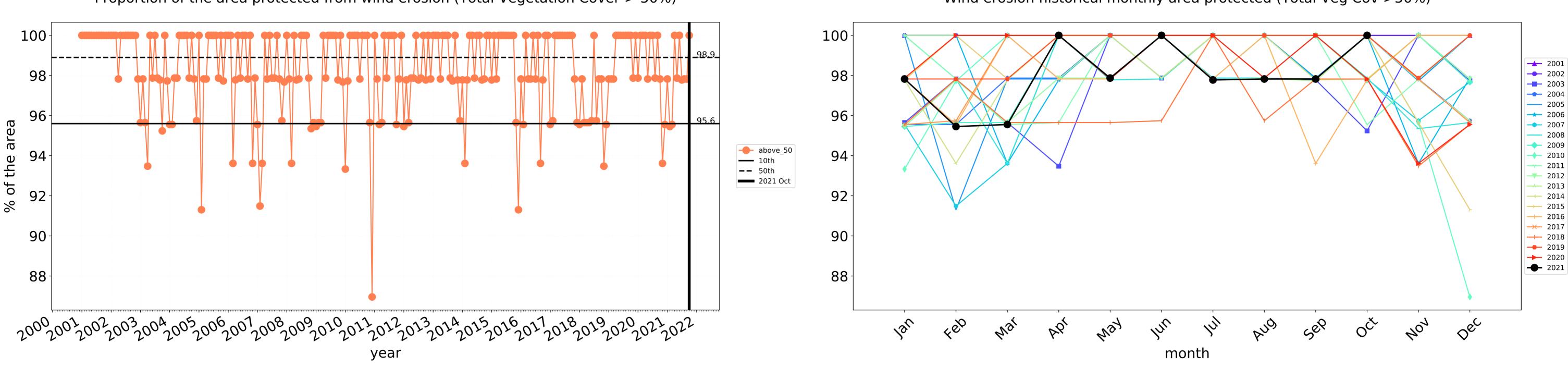
record, from highest to lowest, for that month. That is, red pixels are

records for that month of

the map using baseline from 2001 to 2019.

in the lowest 10% of

Conservation and natural environments non forest timeseries



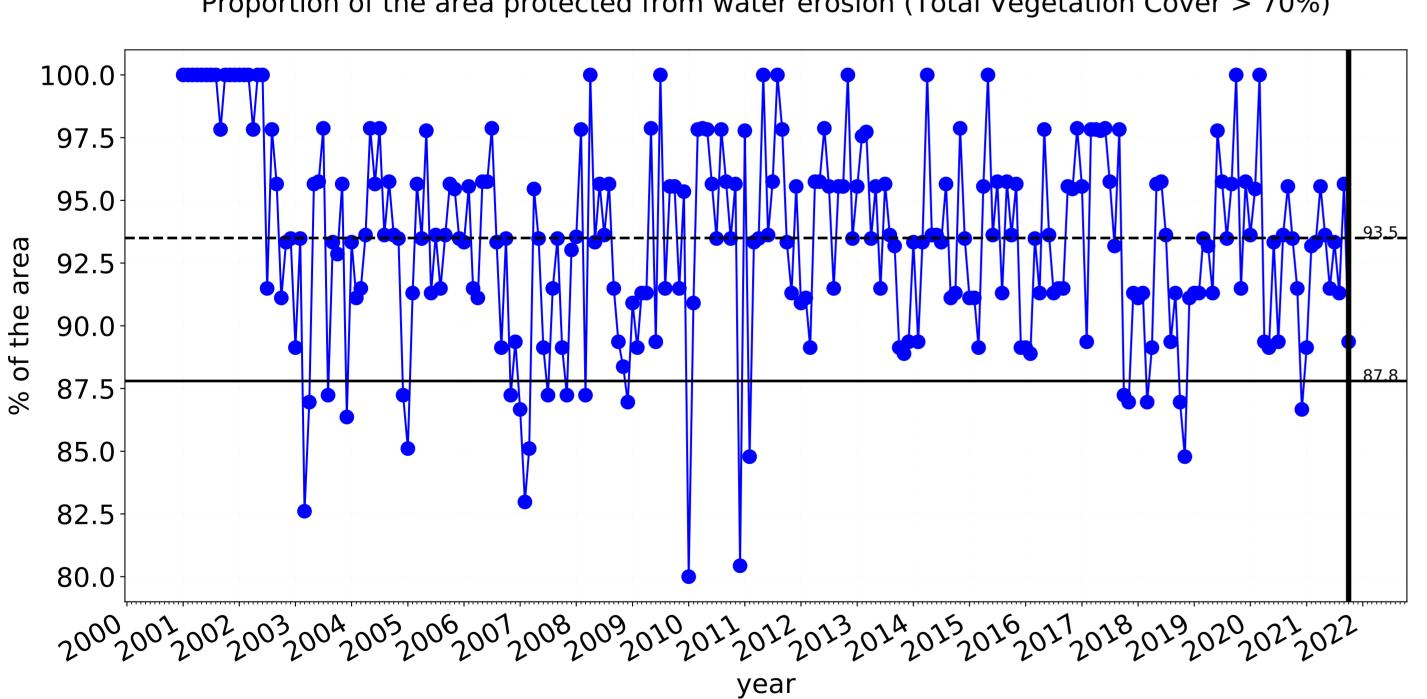
---- above_70

— 10th

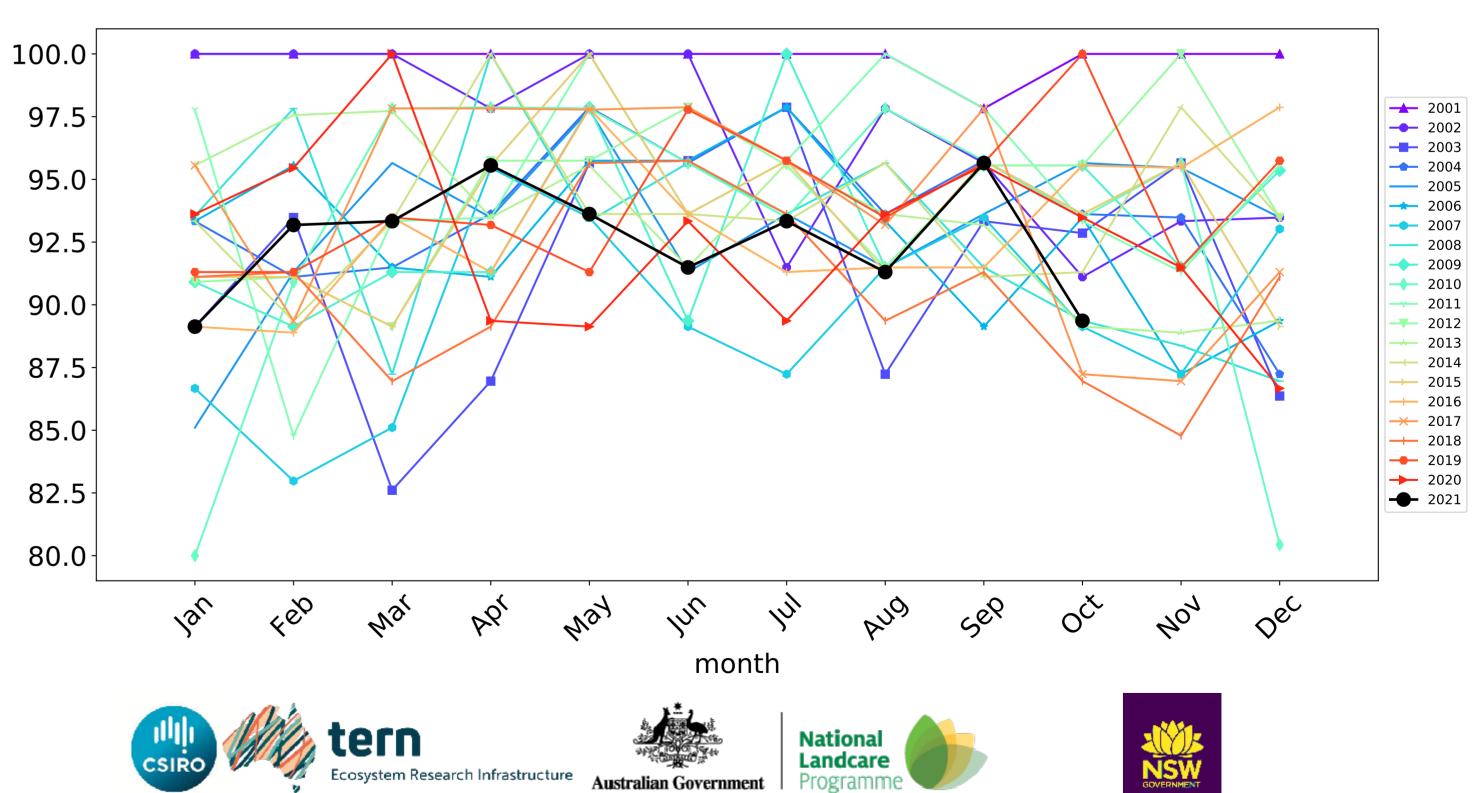
—— 50th

— 2021 Oct

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

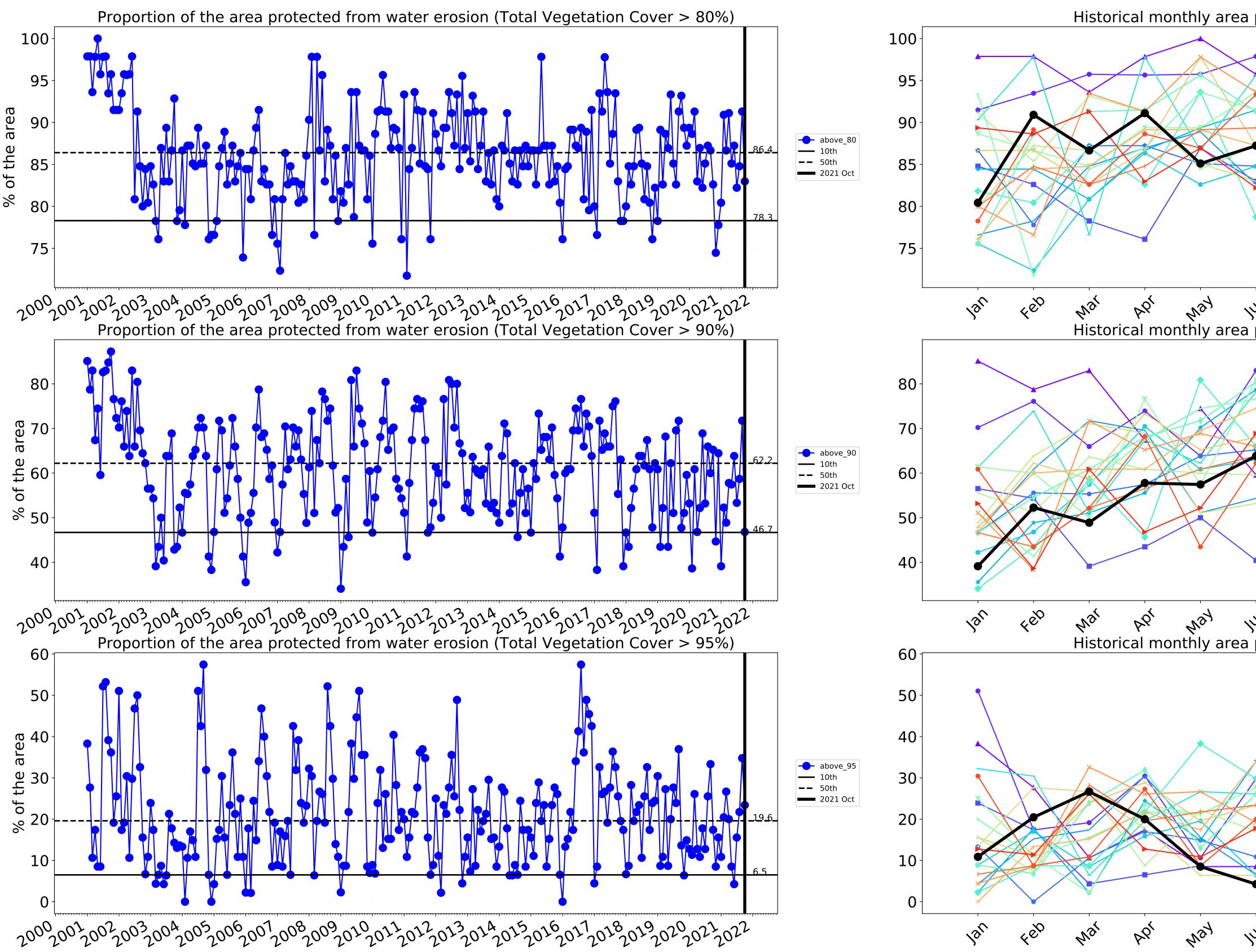


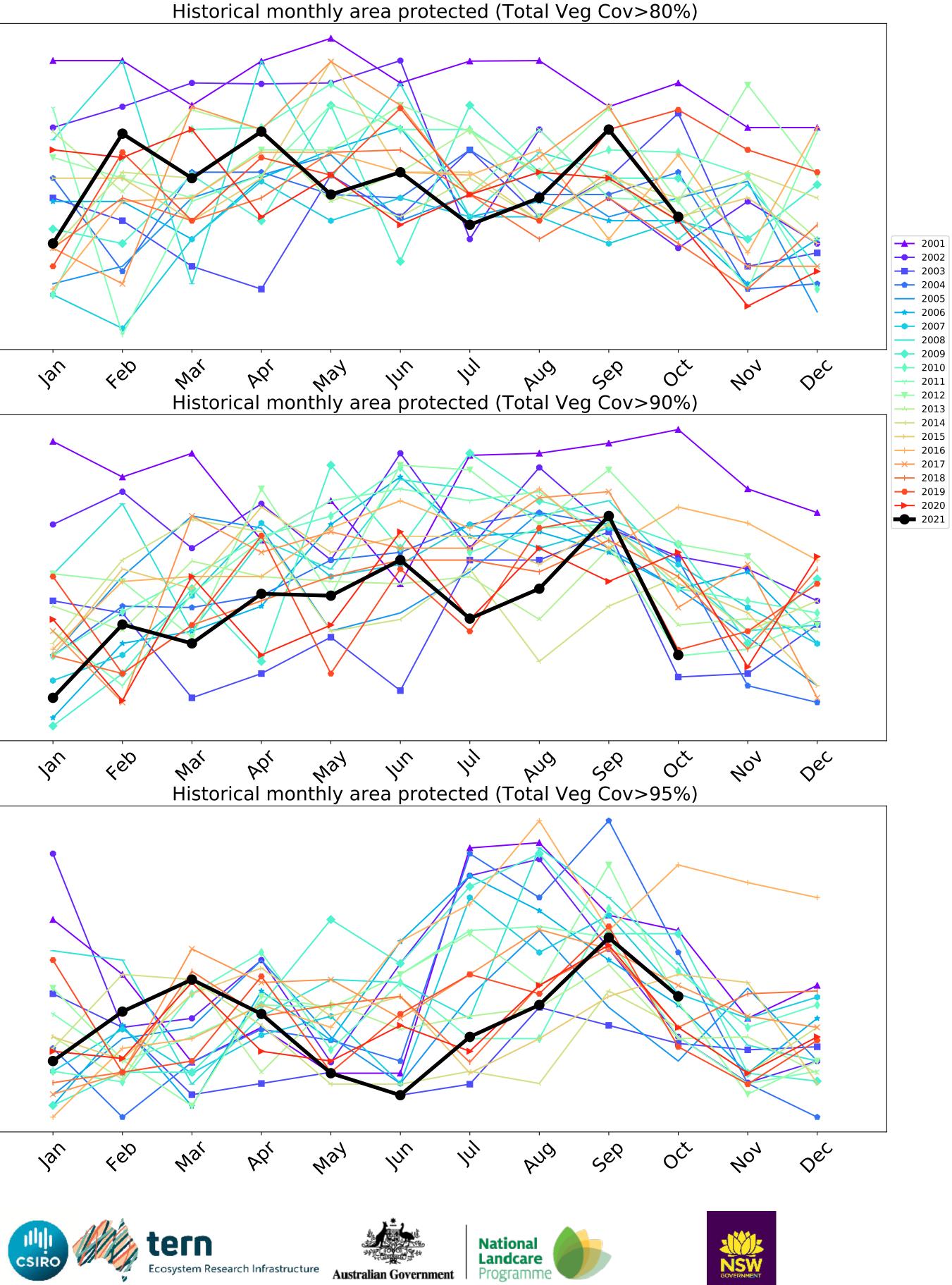
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

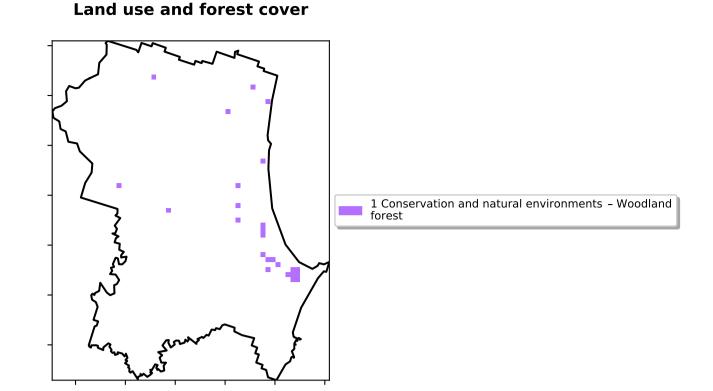
Water erosion historical monthly area protected (Total Veg Cov>70%)



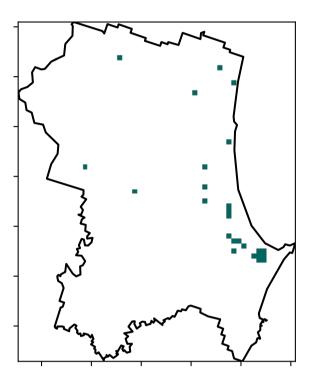


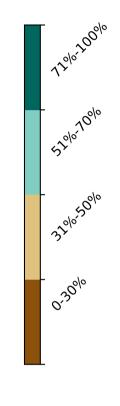
Conservation and natural environments Woodland forest

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

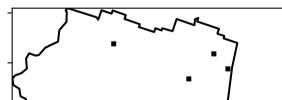


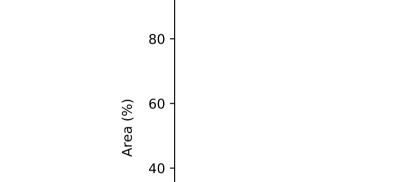
Total Vegetation Cover [%]





% Area protected from water erosion (>70%)





0.0%

0-30%

100

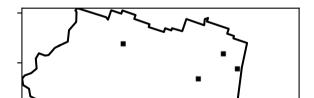
20

0

Proportion of vegetation cover class in area

100.0%

71%-100%

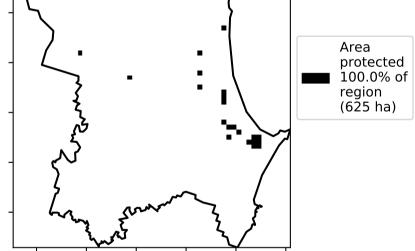


Total Vegetation Cover class

% Area protected from wind erosion (>50%)

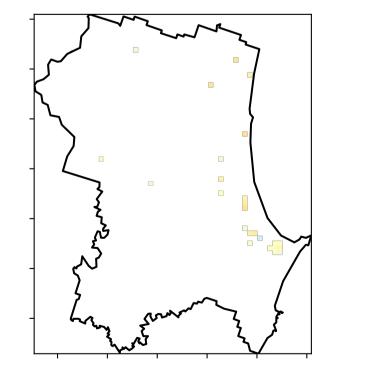
0.0%

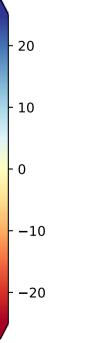
31%-50%

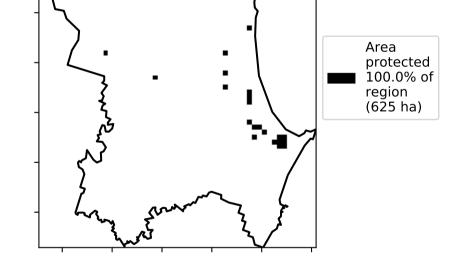


Total Vegetation Cover Anomaly [%]

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.



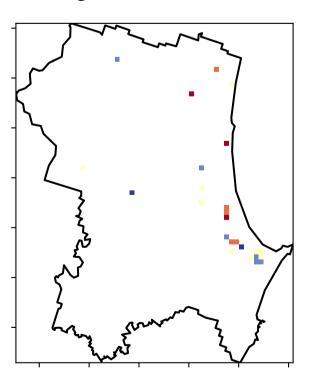


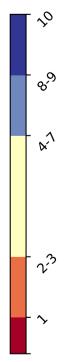


0.0%

51%-70%

Total Vegetation Cover Decile [%]







Deciles show where the

pixel value lies in the

record, from highest to lowest, for that month.

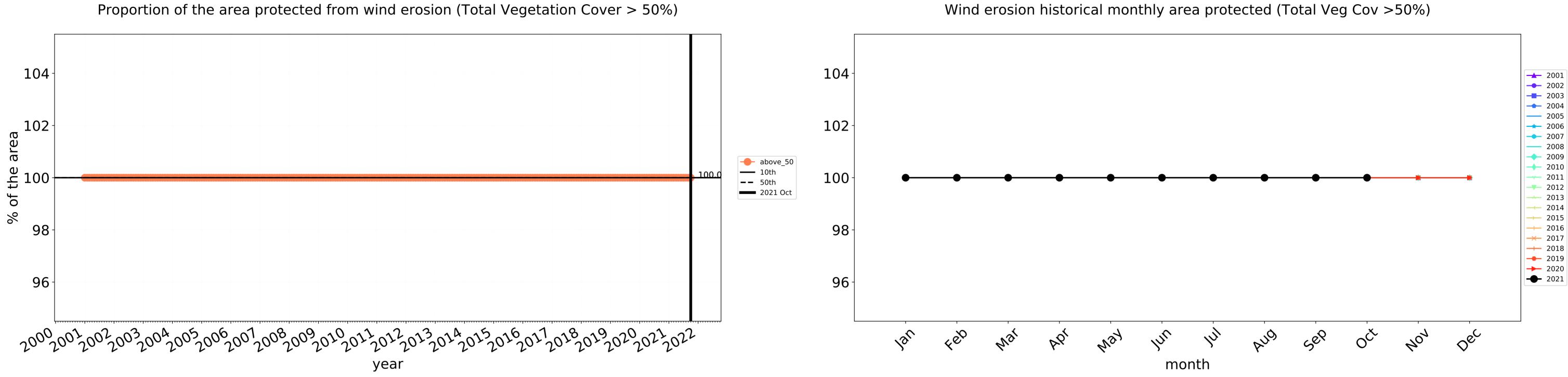
That is, red pixels are

records for that month of

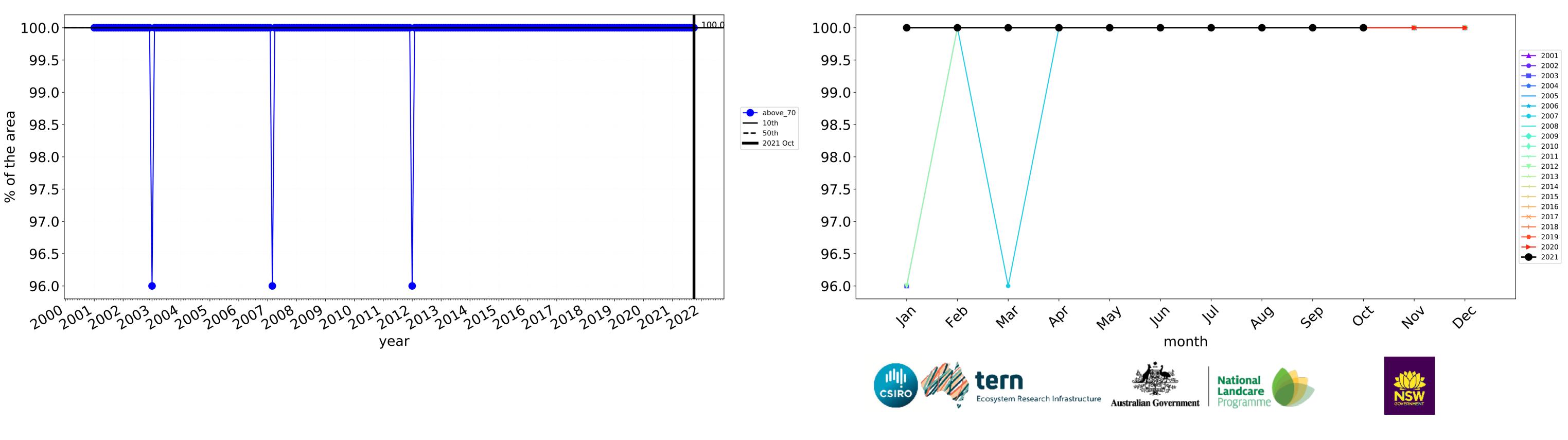
the map using baseline

in the lowest 10% of

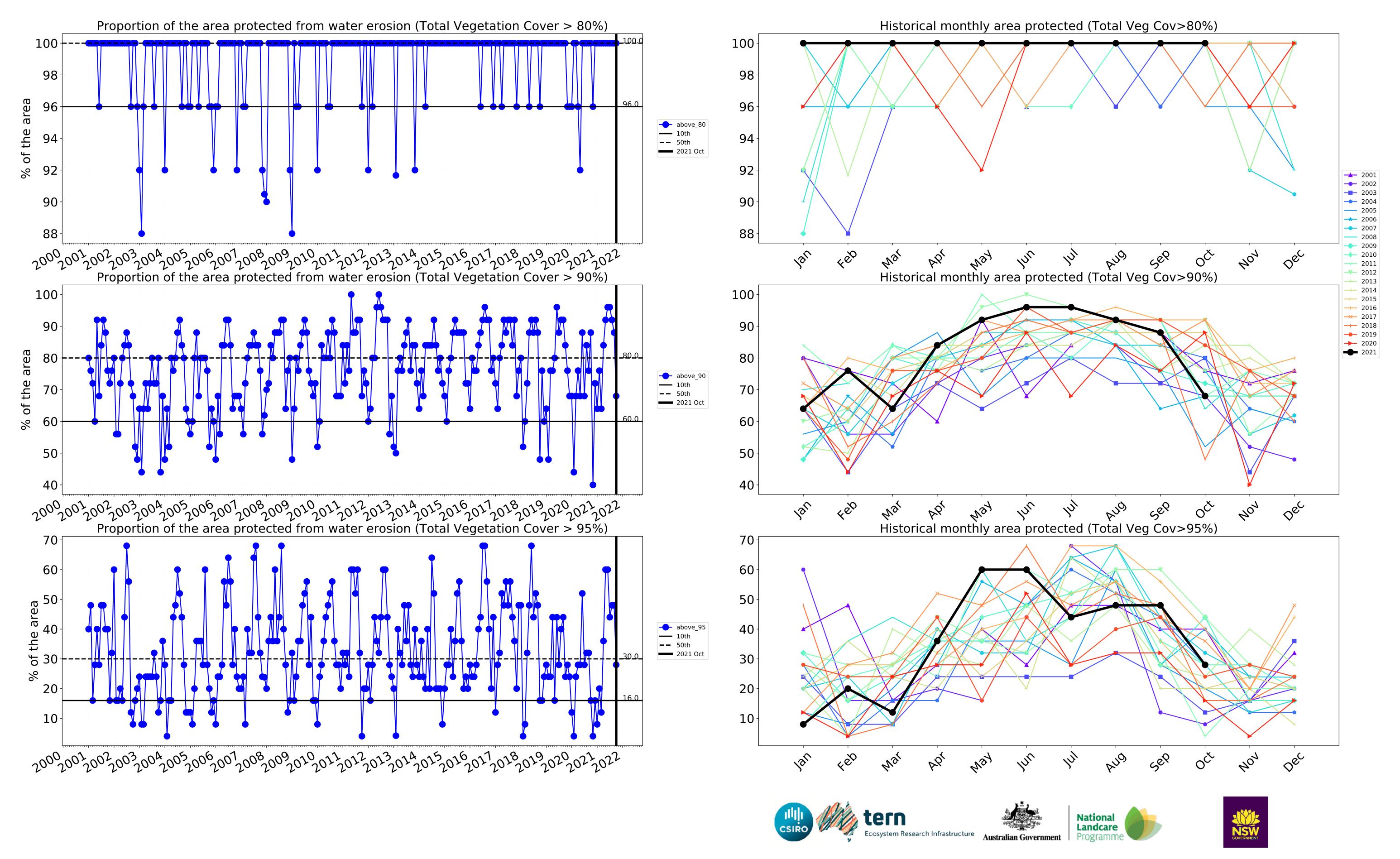
from 2001 to 2019.







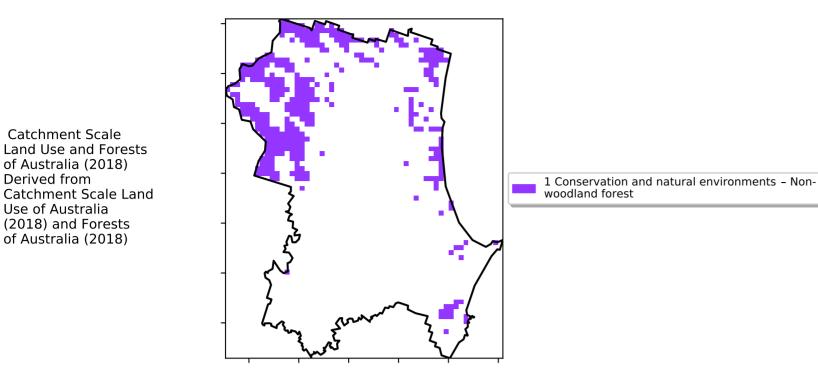




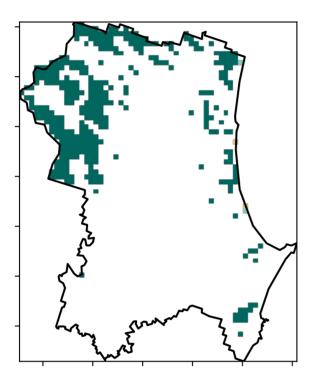


Conservation and natural environments Forest (non woodland)

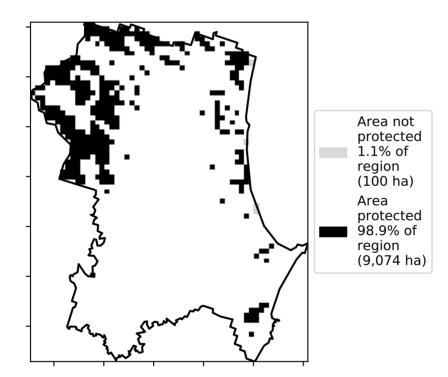
Land use and forest cover

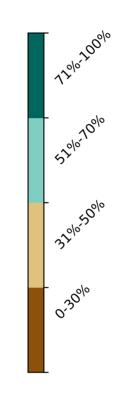


Total Vegetation Cover [%]

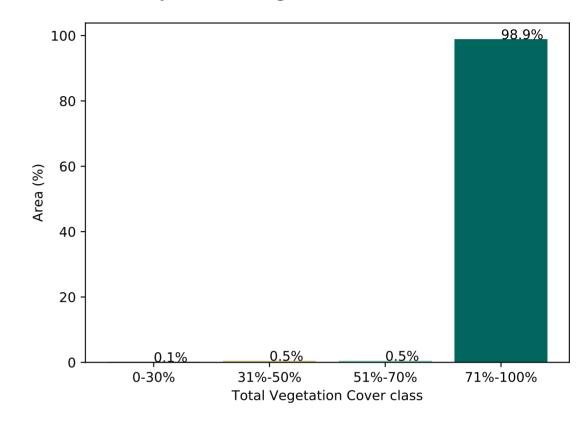


% Area protected from water erosion (>70%)

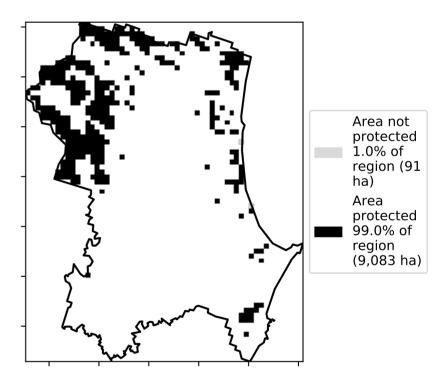




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



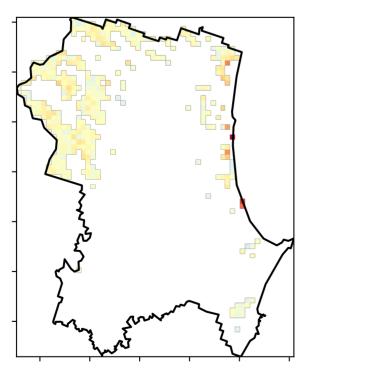
Total Vegetation Cover Anomaly [%]

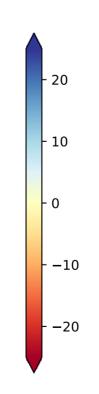
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

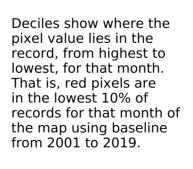
Catchment Scale

of Australia (2018) Derived from

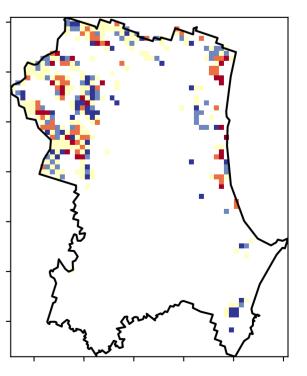
Use of Australia (2018) and Forests of Australia (2018)







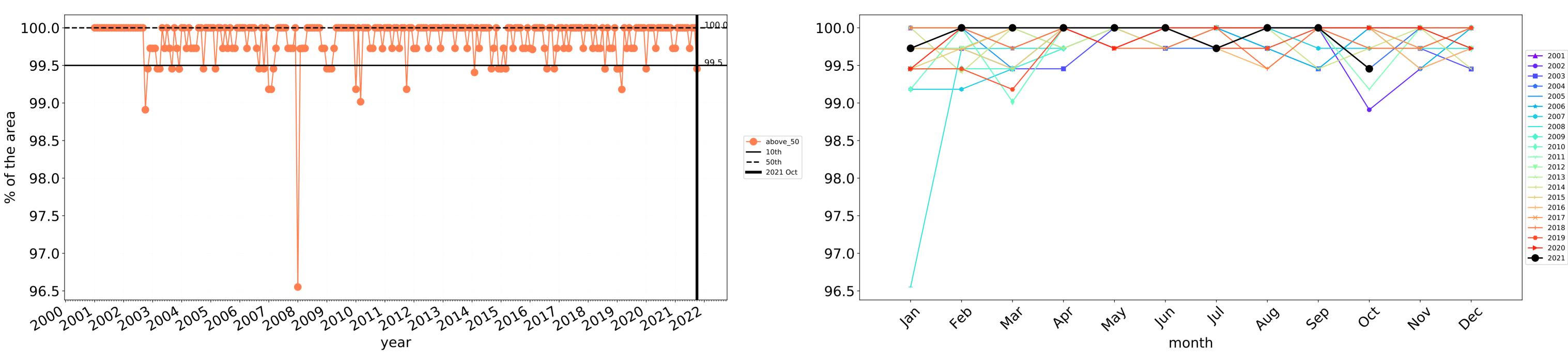
Total Vegetation Cover Decile [%]





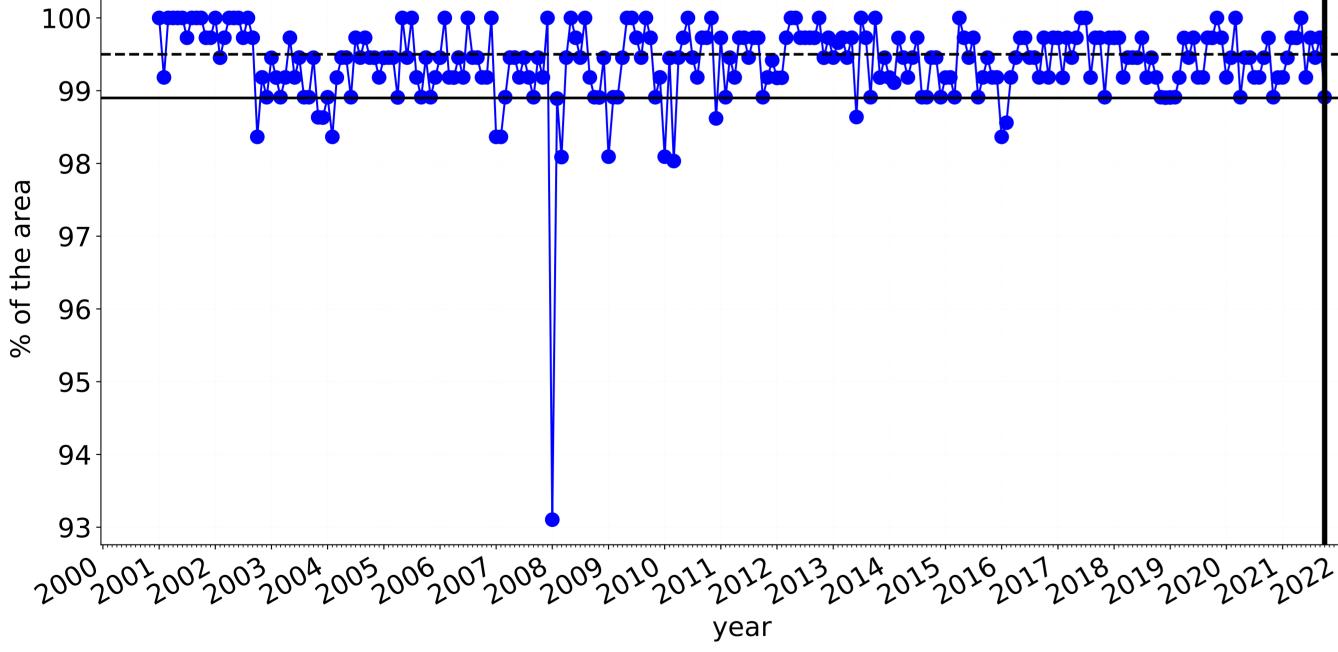


Conservation and natural environments Forest (non woodland) timeseries



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

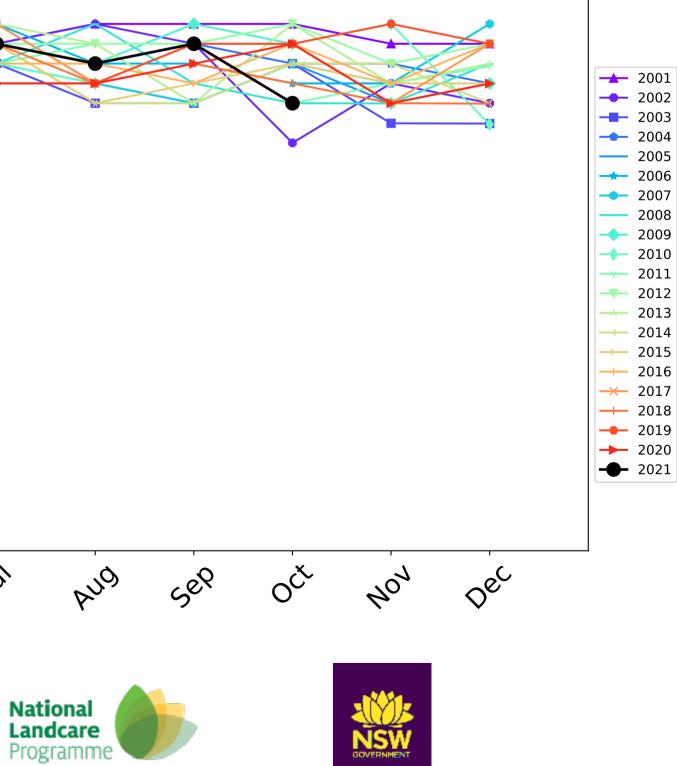
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

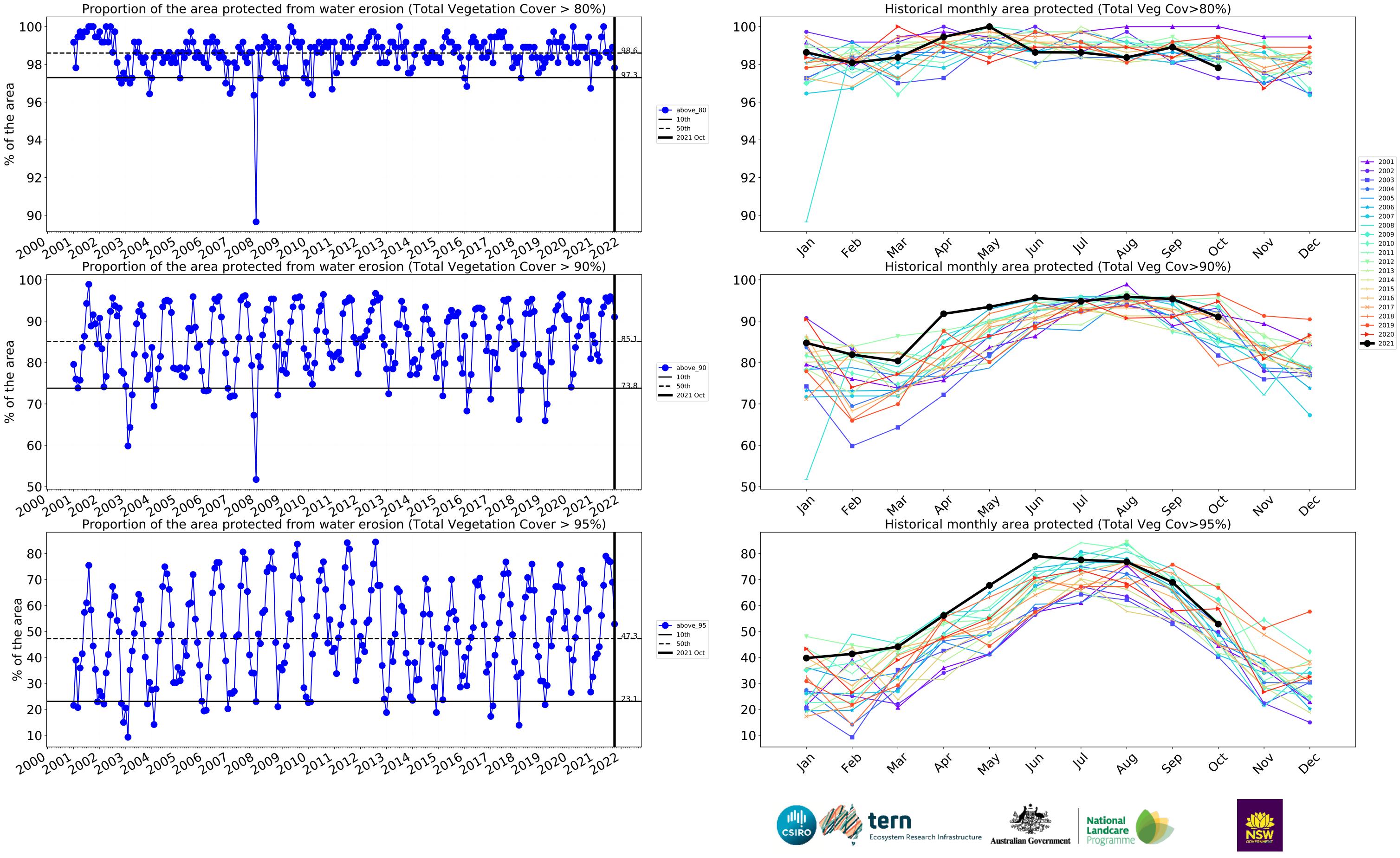


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Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

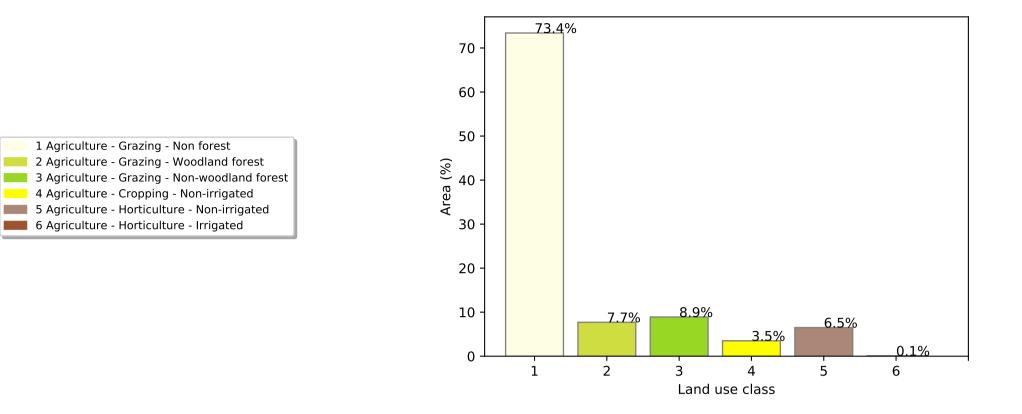




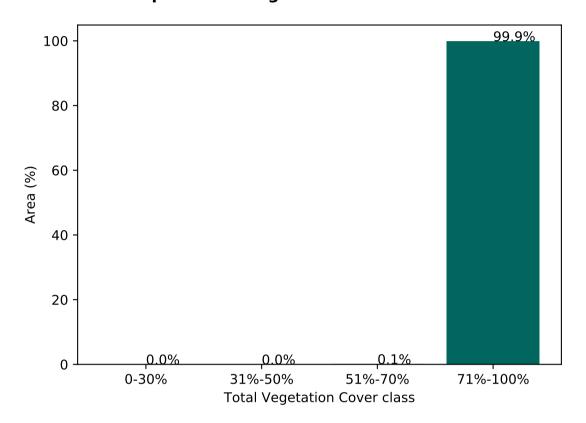
Agriculture

Land use and forest cover

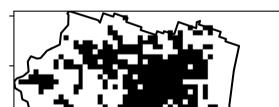


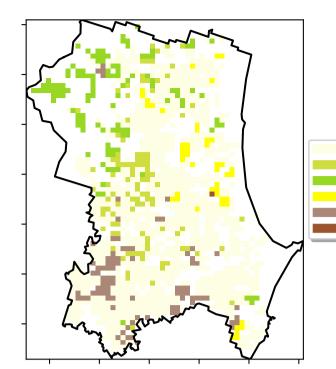


Proportion of vegetation cover class in area

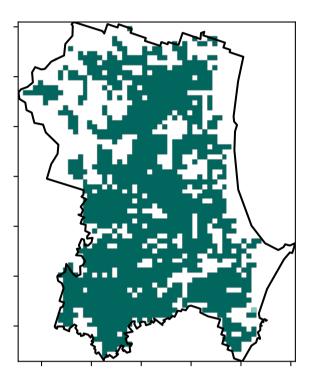


% Area protected from wind erosion (>50%)

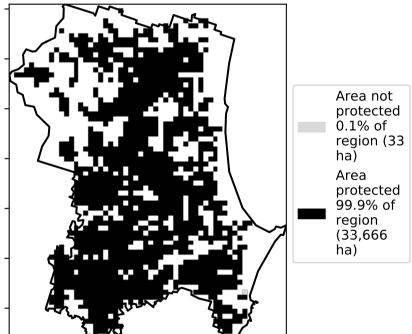


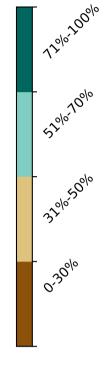


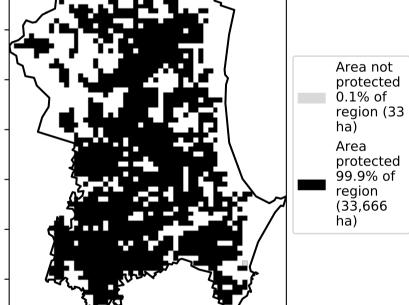
Total Vegetation Cover [%]



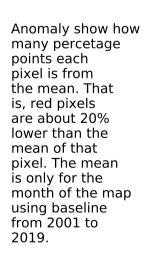
% Area protected from water erosion (>70%)







Total Vegetation Cover Anomaly [%]



Catchment Scale

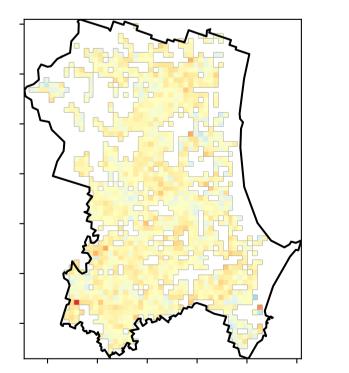
Derived from

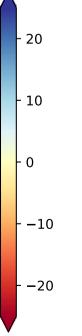
Use of Australia

(2018) and Forests of Australia (2018)

Land Use and Forests of Australia (2018)

Catchment Scale Land

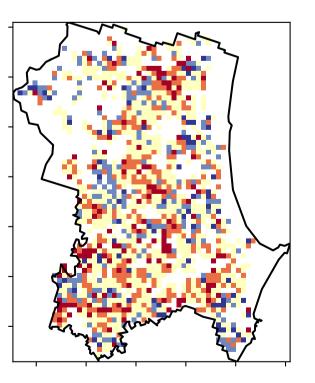


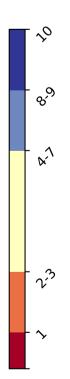




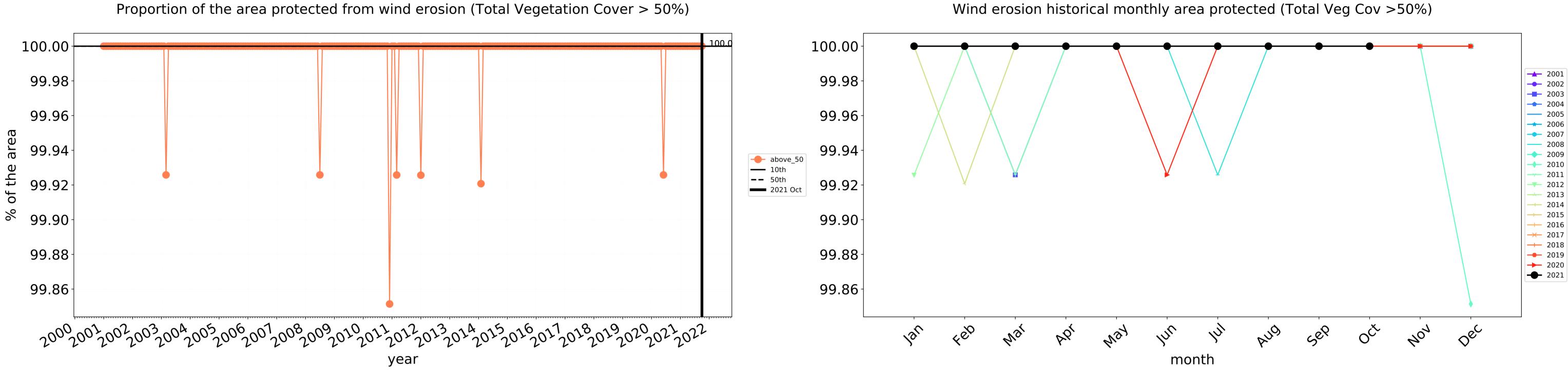


Total Vegetation Cover Decile [%]

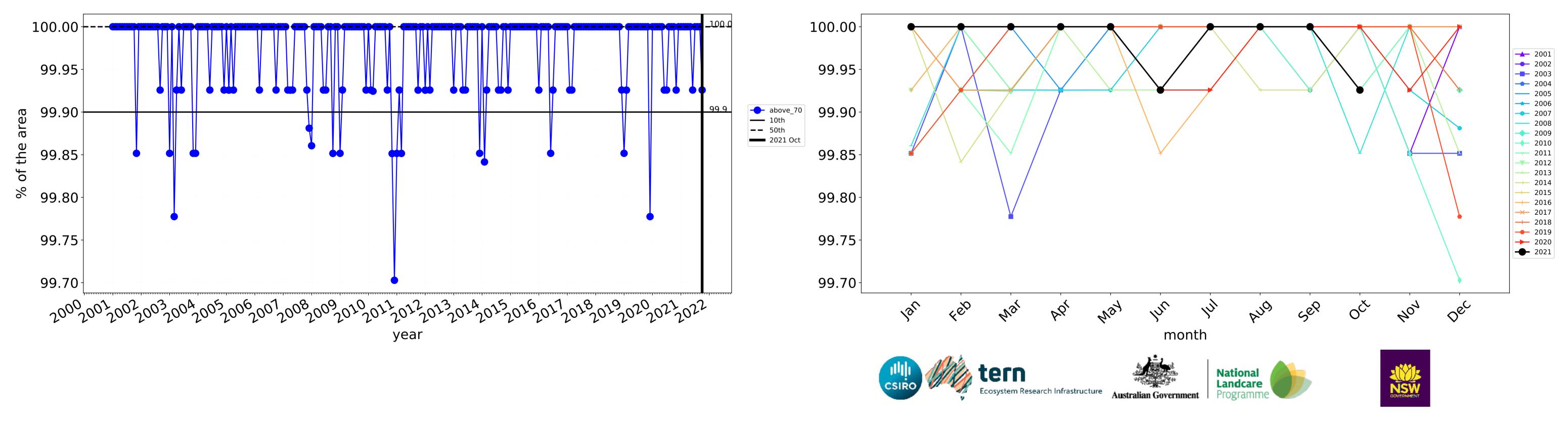






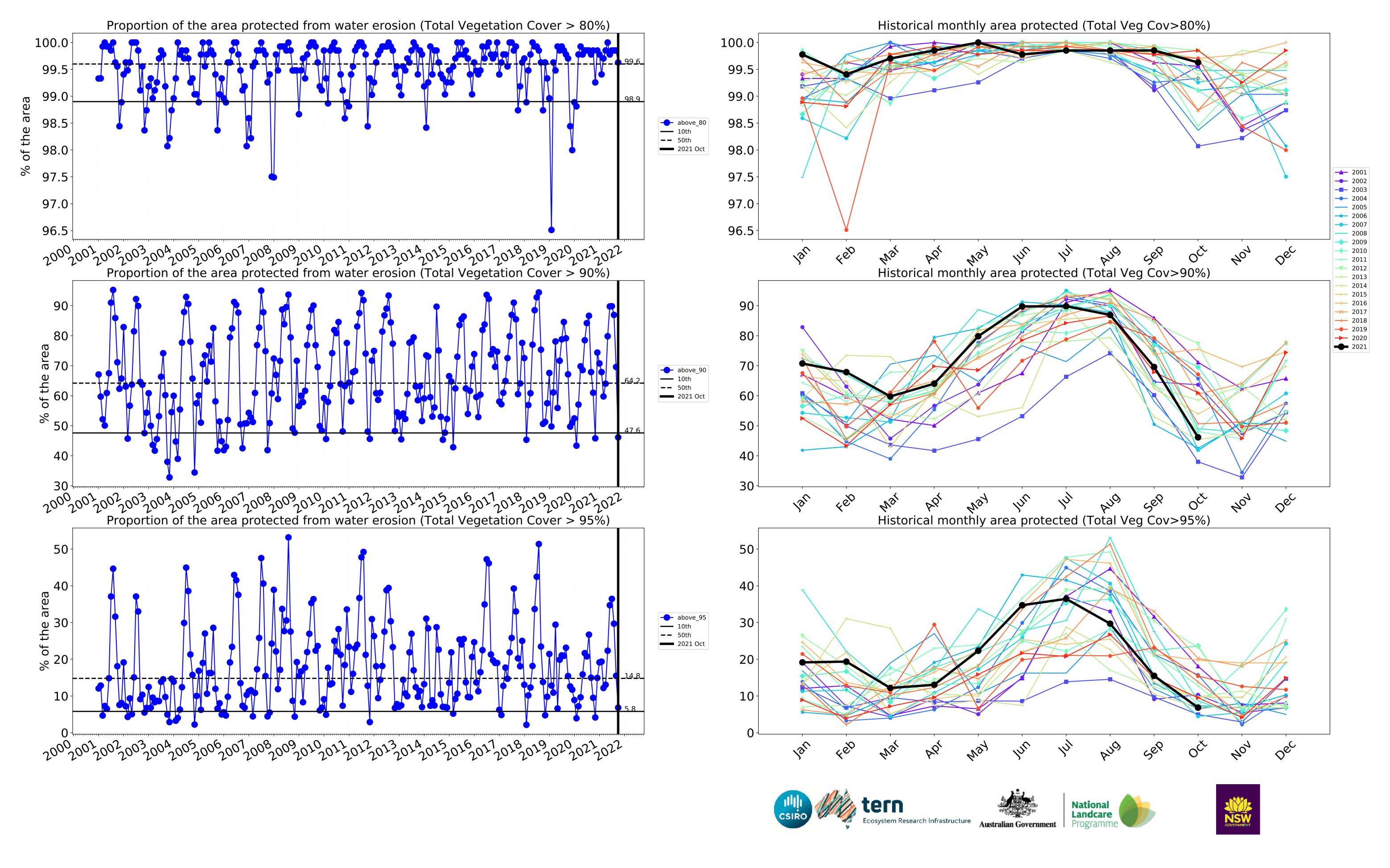


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



Agriculture timeseries

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



Grazing

1 Agriculture - Grazing - Non forest

2 Agriculture - Grazing - Woodland forest

3 Agriculture - Grazing - Non-woodland forest

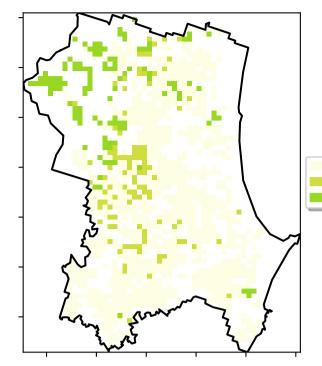
12010-200%

52°10-70°10

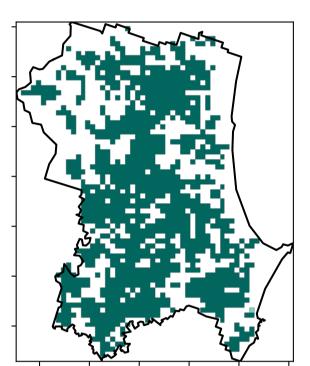
3201050010

0.30%

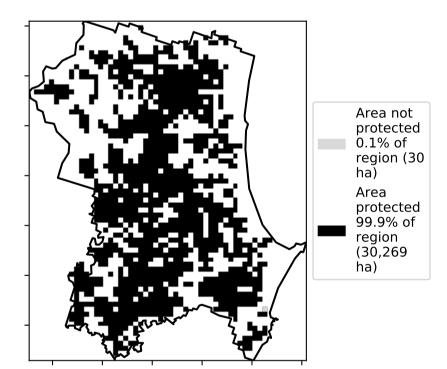
Land use and forest cover

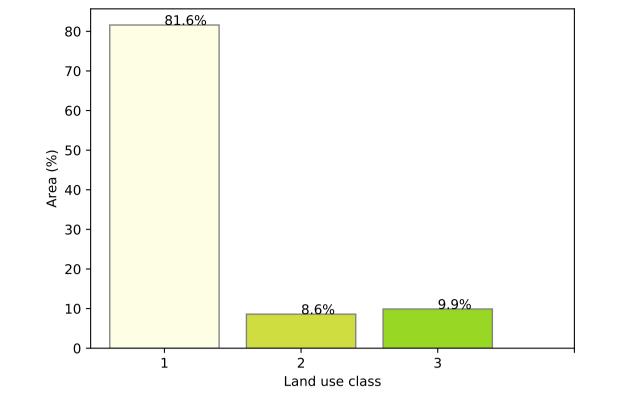


Total Vegetation Cover [%]



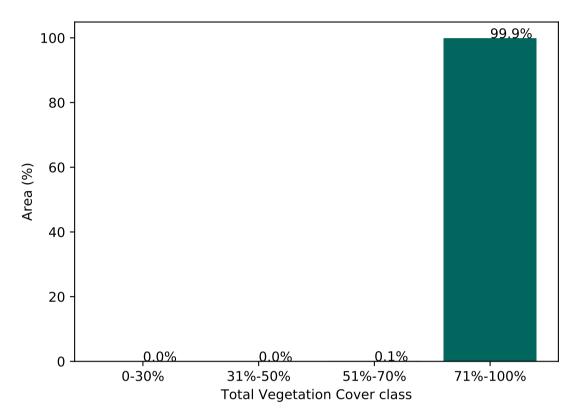
% Area protected from water erosion (>70%)



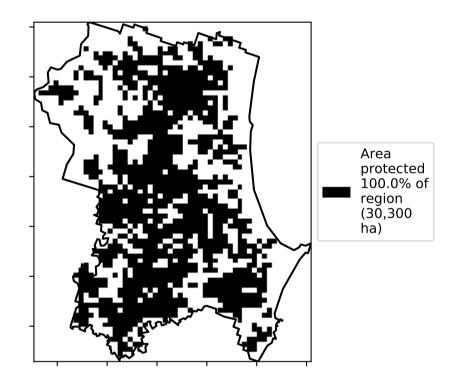


Proportion of each land class in area

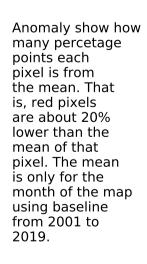
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

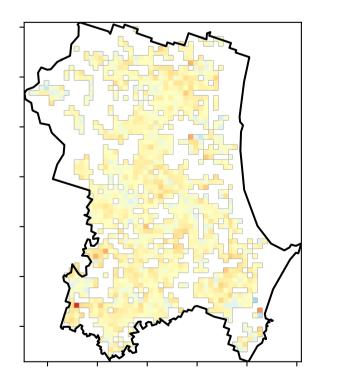


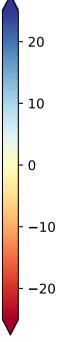
Catchment Scale Land Use and Forests of Australia (2018)

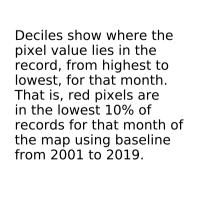
Catchment Scale Land Use of Australia

(2018) and Forests of Australia (2018)

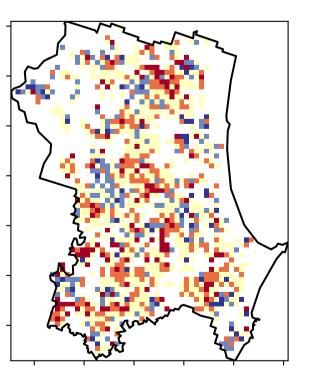
Derived from

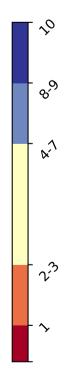




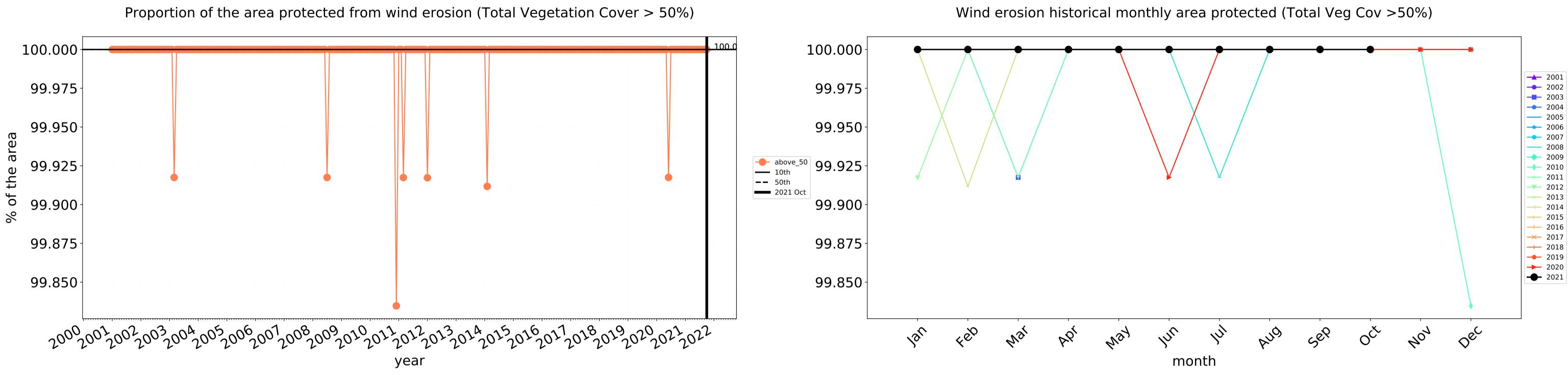


Total Vegetation Cover Decile [%]

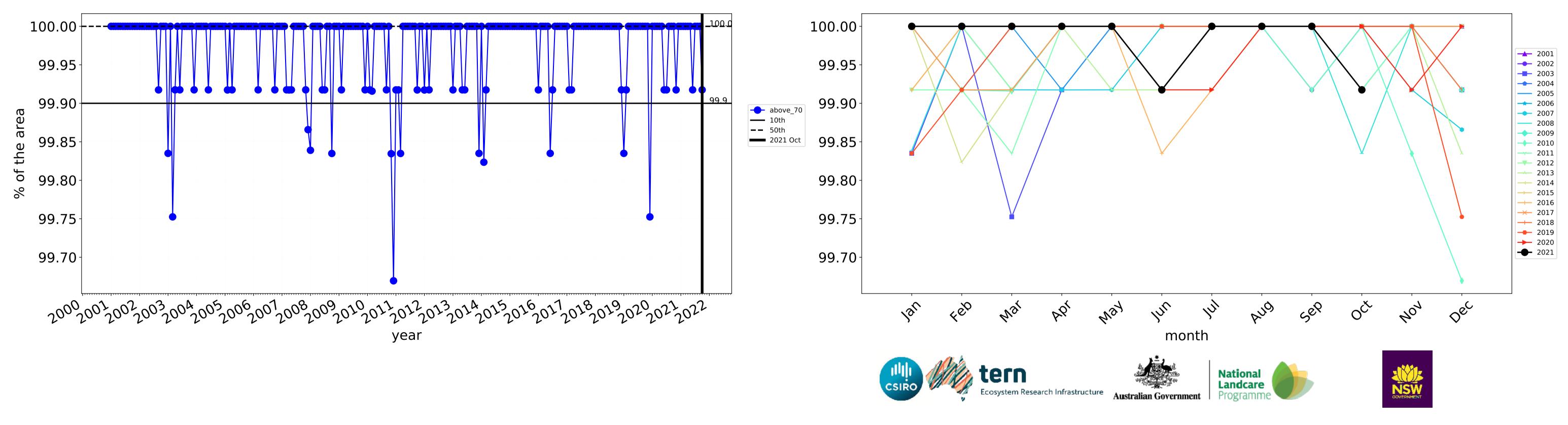




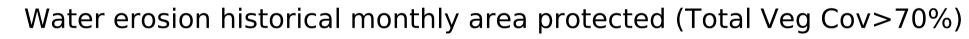


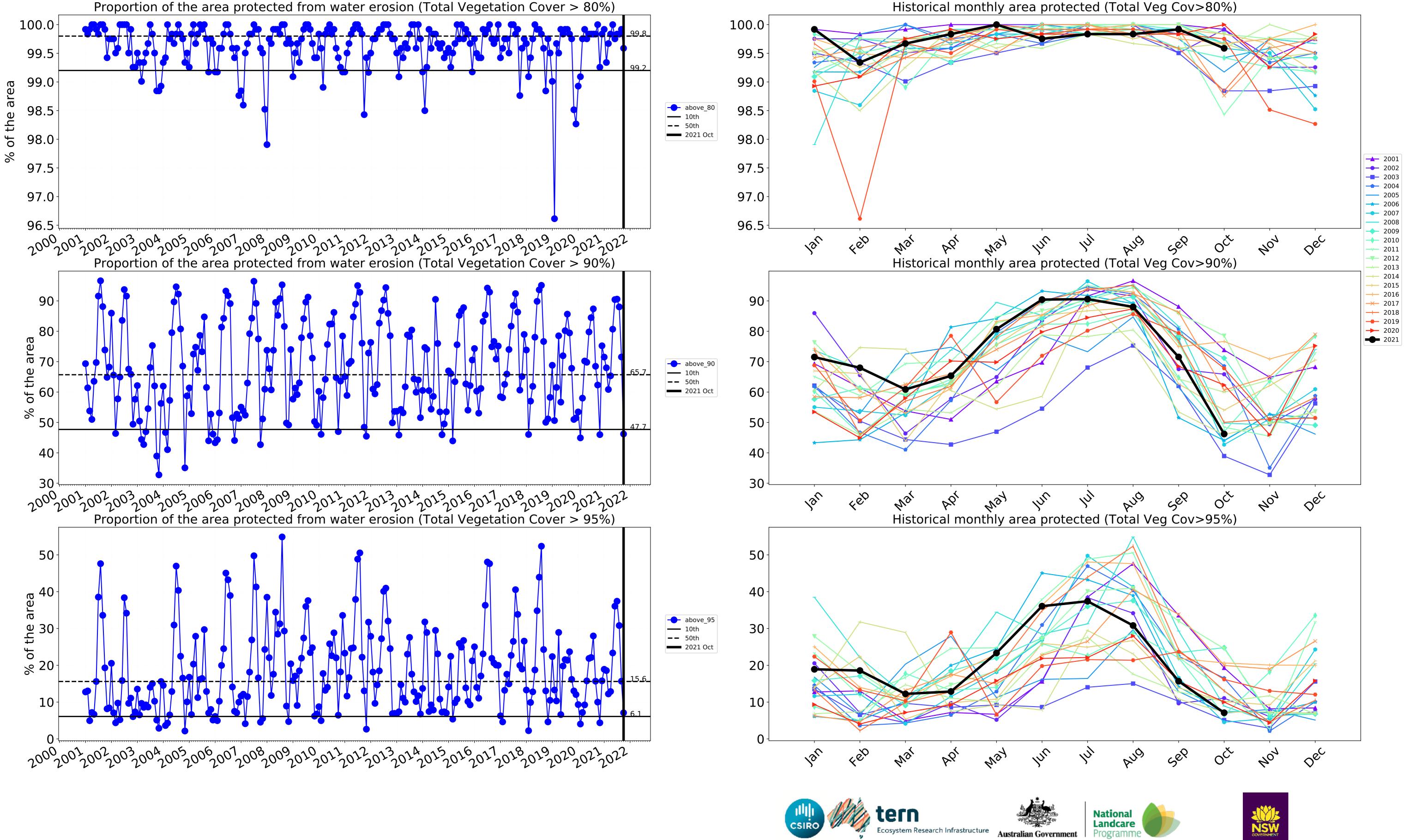


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



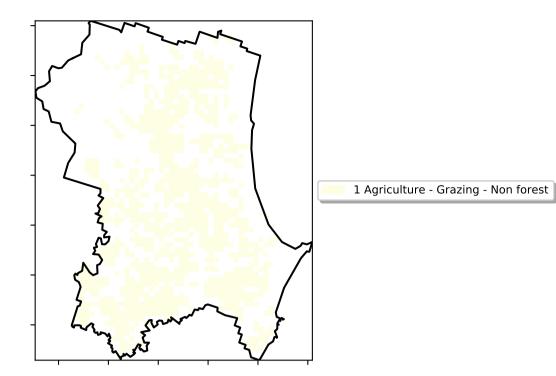
Grazing timeseries



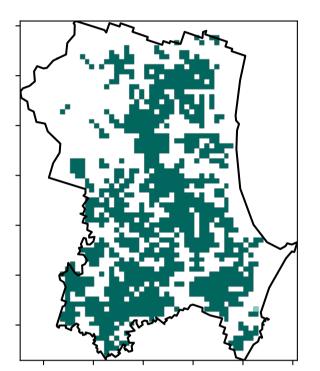


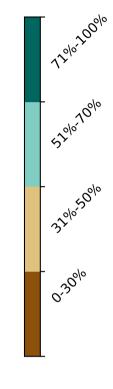
Grazing non forest

Land use and forest cover

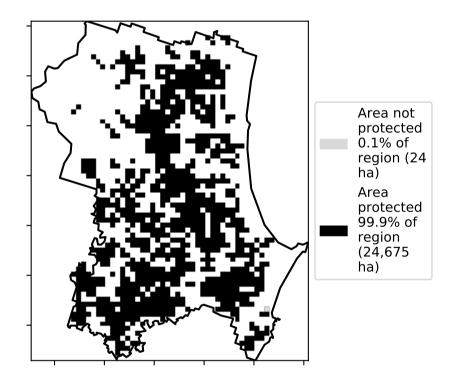


Total Vegetation Cover [%]

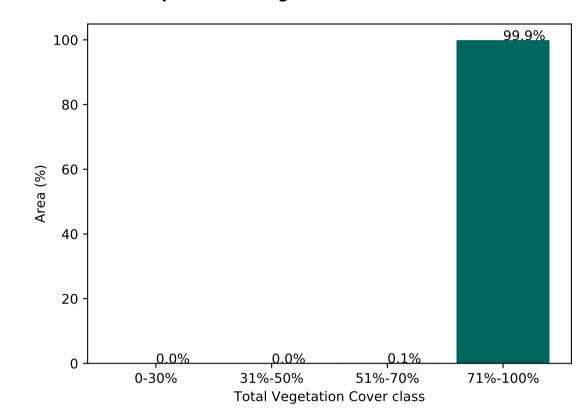




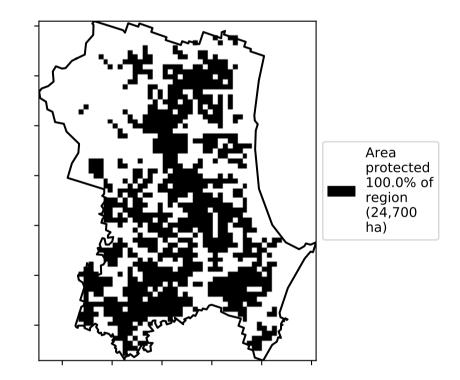
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



\$

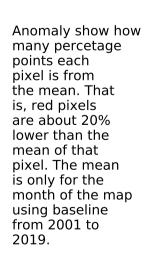
ଚ୍ଚ

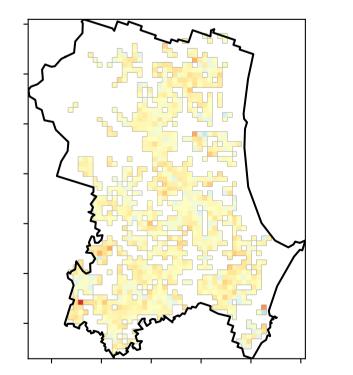
A-1

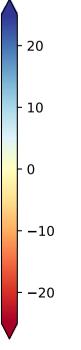
2??

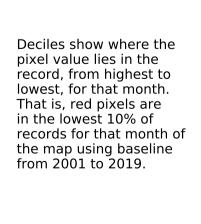
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Anomaly [%]

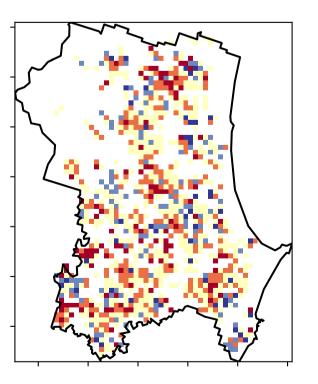




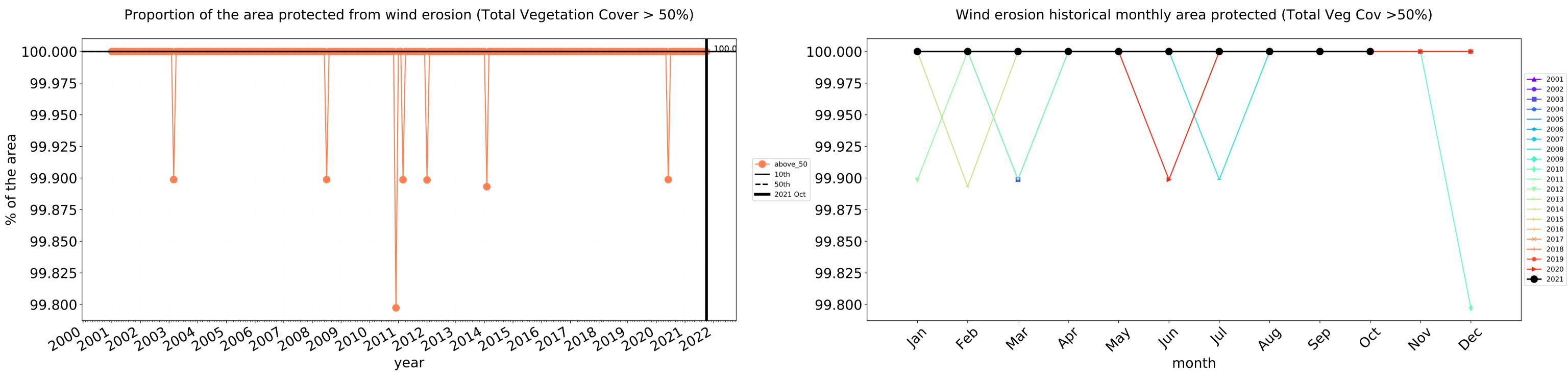




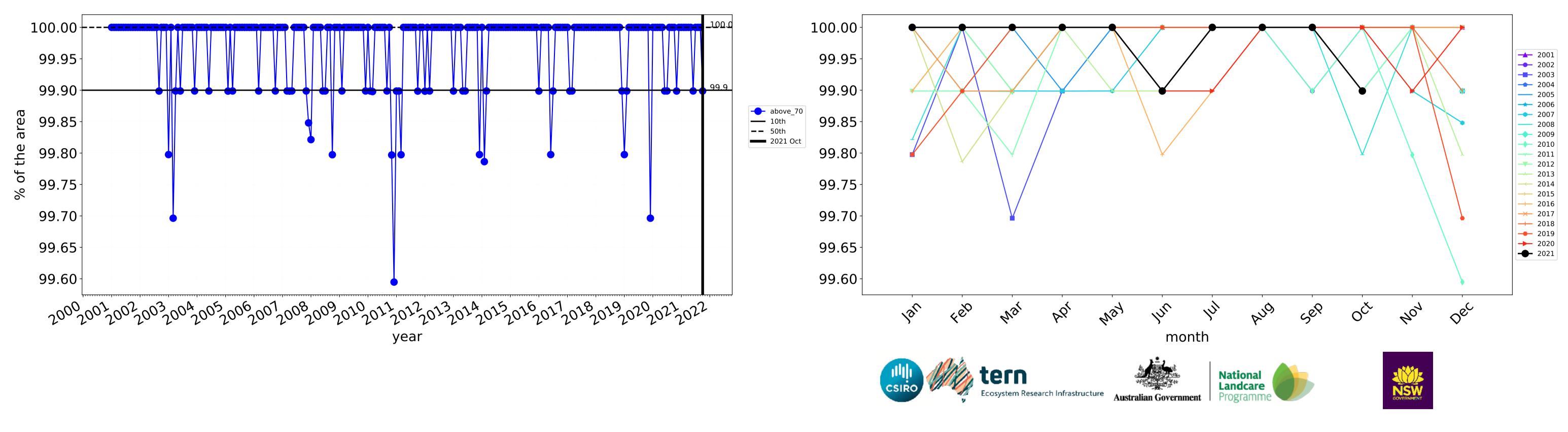
Total Vegetation Cover Decile [%]



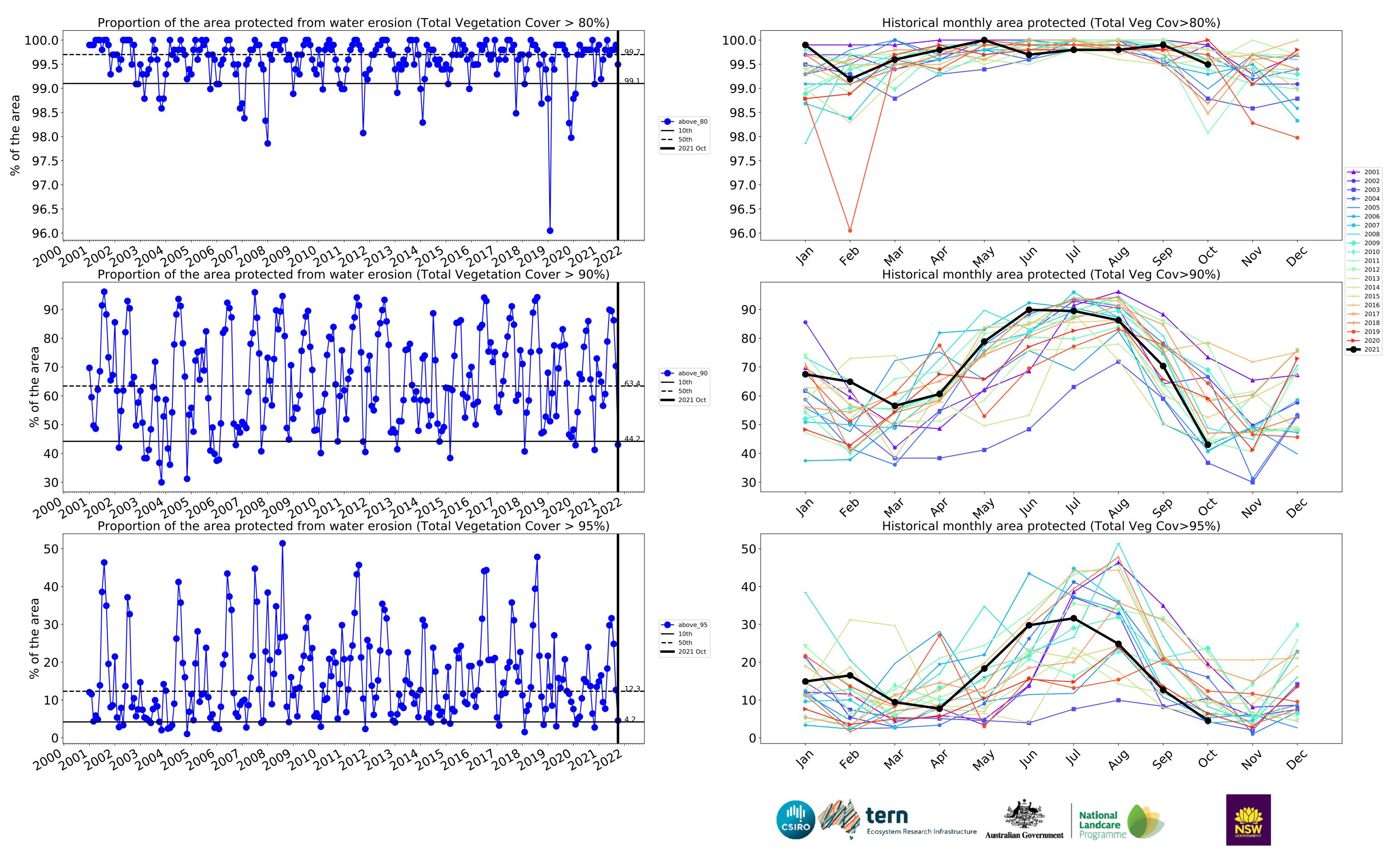




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

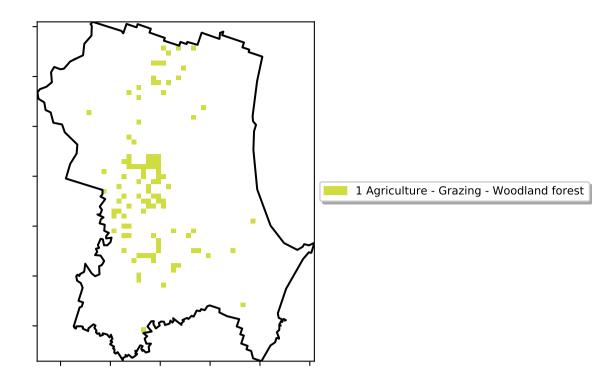


Water erosion historical monthly area protected (Total Veg Cov>70%)

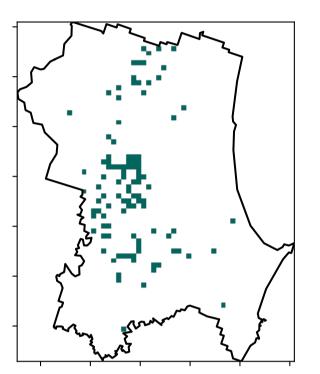


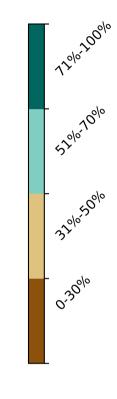
Grazing Woodland forest

Land use and forest cover

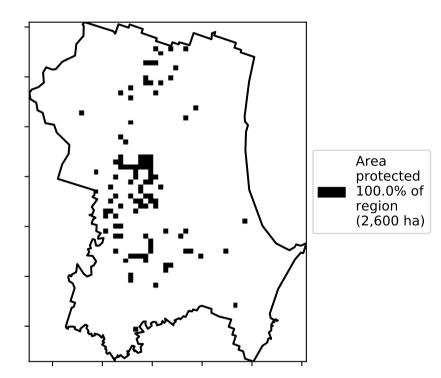


Total Vegetation Cover [%]

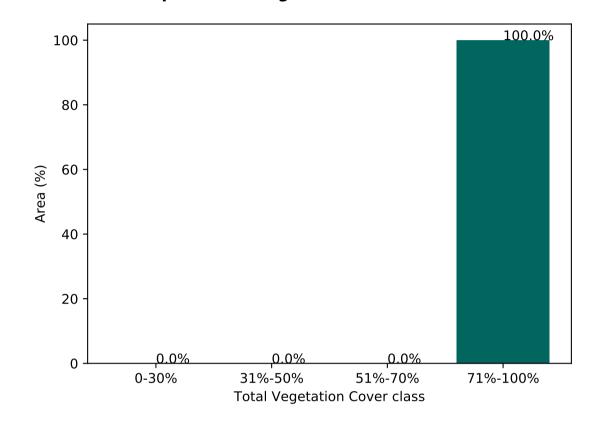




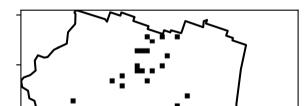
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



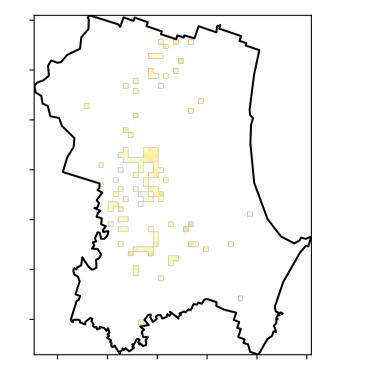
% Area protected from wind erosion (>50%)

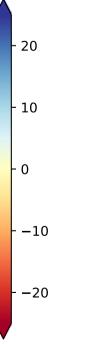


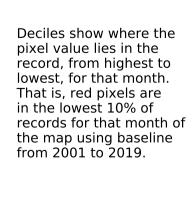
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

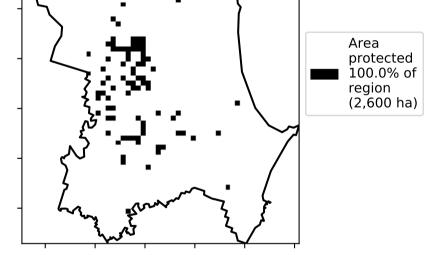
Total Vegetation Cover Anomaly [%]

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.

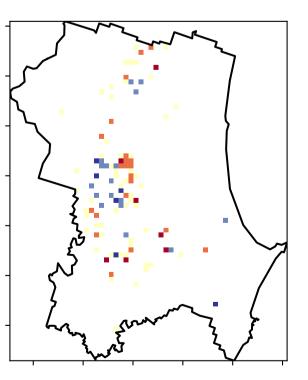


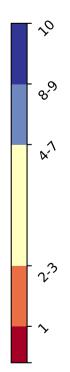




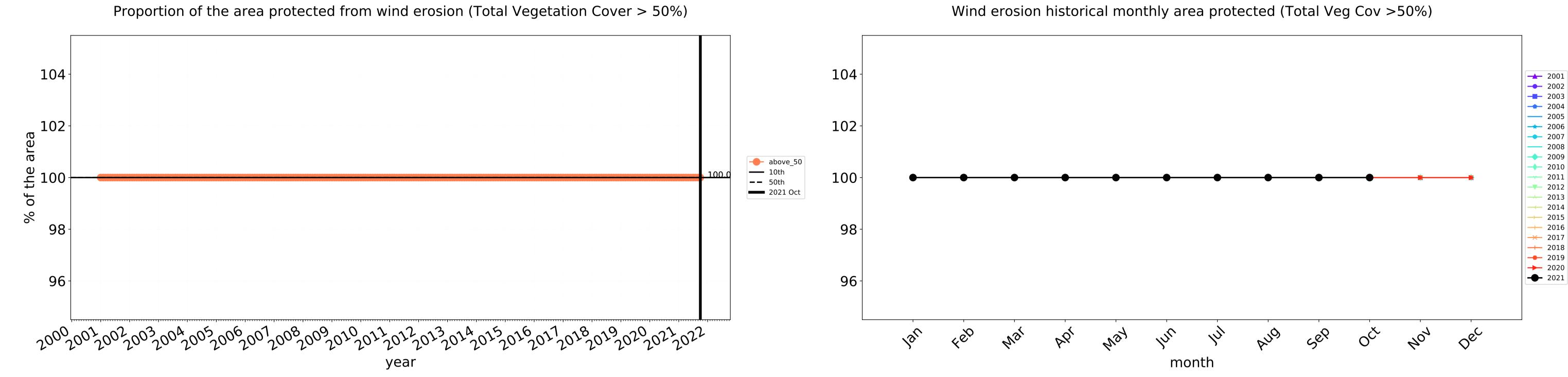


Total Vegetation Cover Decile [%]

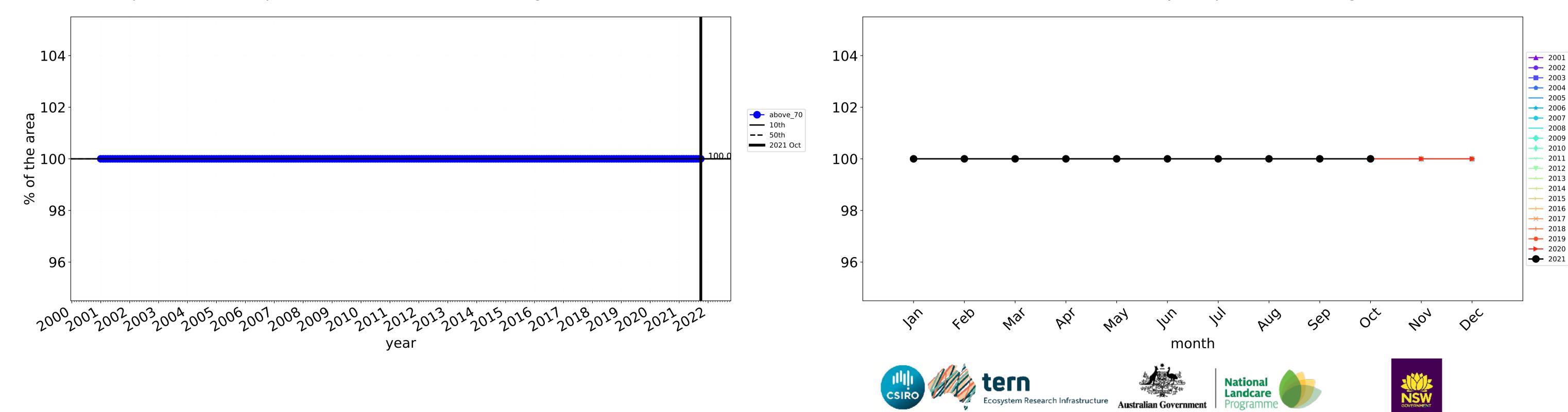






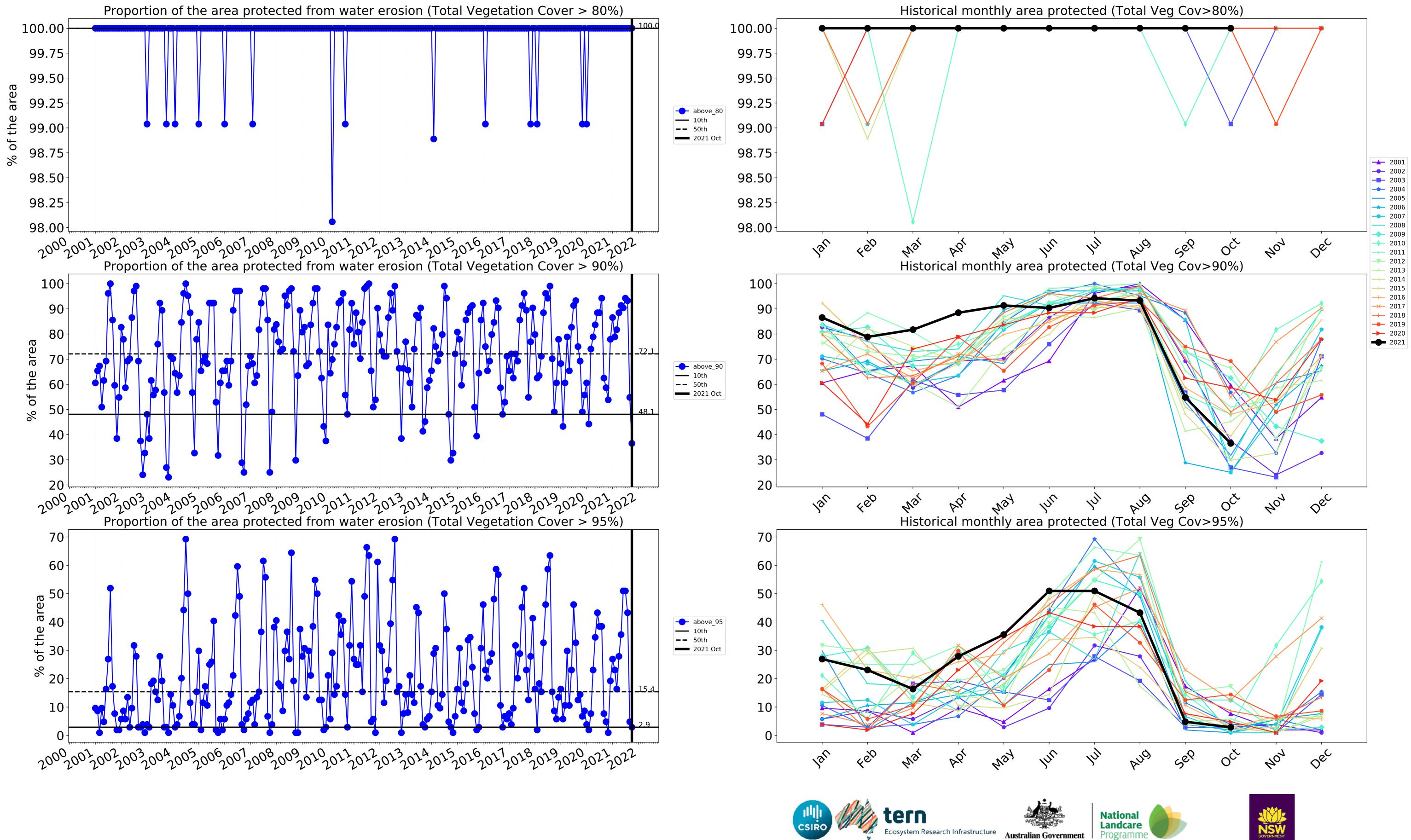






Grazing Woodland forest timeseries

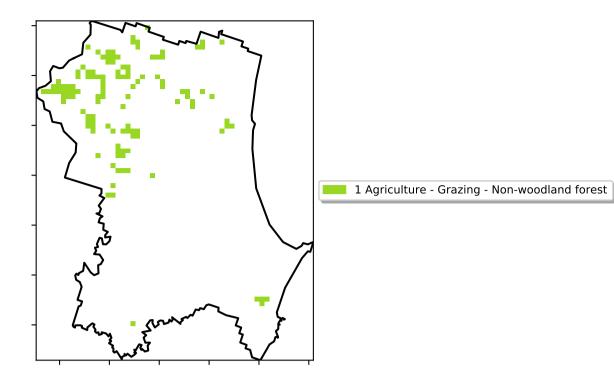
Water erosion historical monthly area protected (Total Veg Cov>70%)



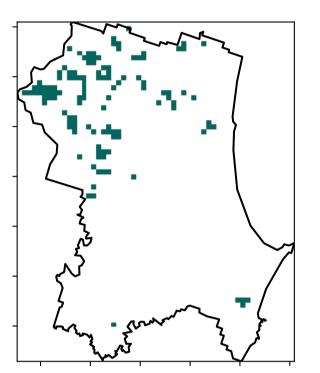
Australian Government

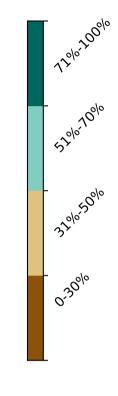
Grazing - Forest (non woodland)

Land use and forest cover

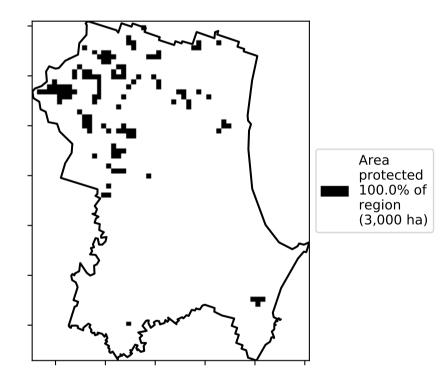


Total Vegetation Cover [%]

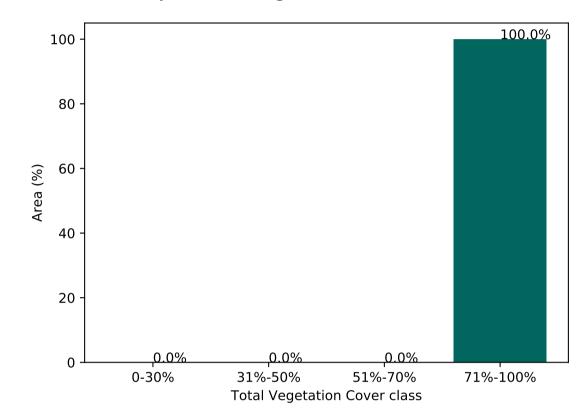




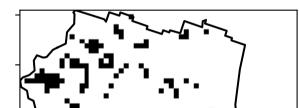
% Area protected from water erosion (>70%)





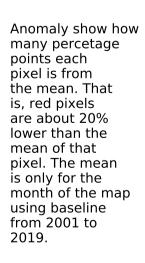


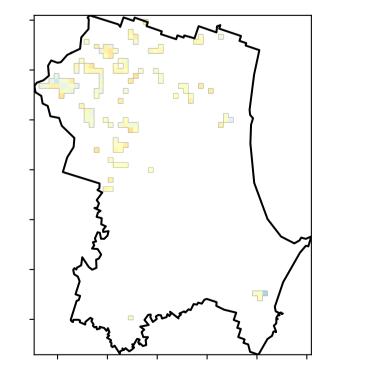
% Area protected from wind erosion (>50%)

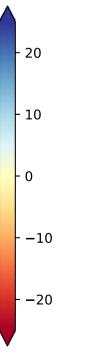


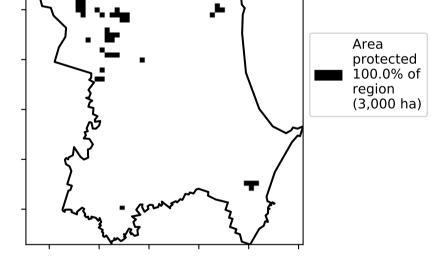
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Anomaly [%]

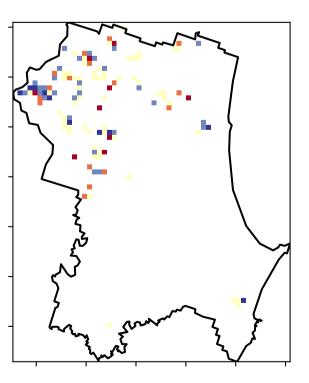


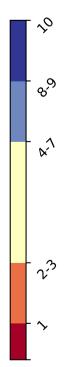






Total Vegetation Cover Decile [%]







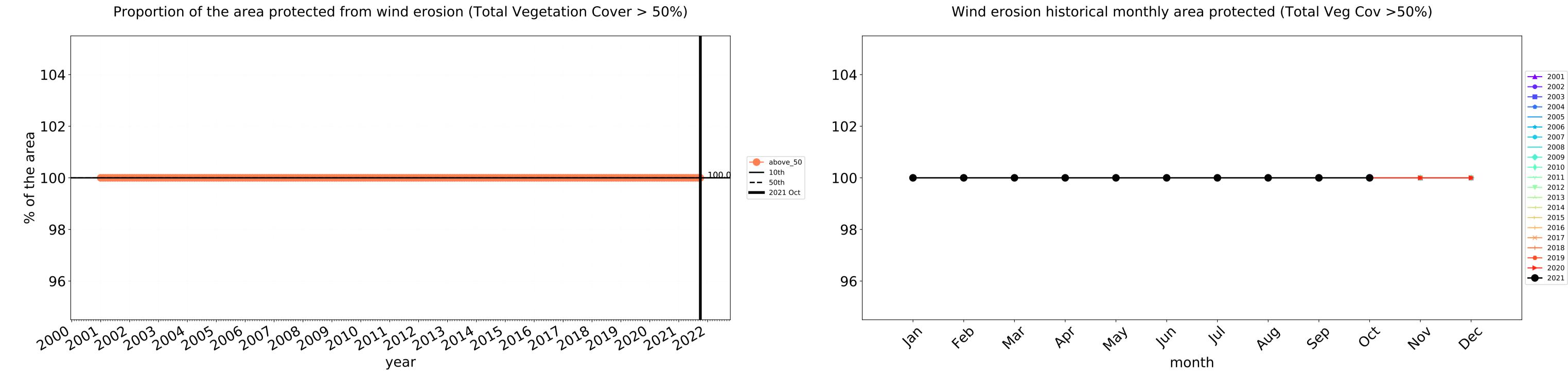
Deciles show where the pixel value lies in the

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

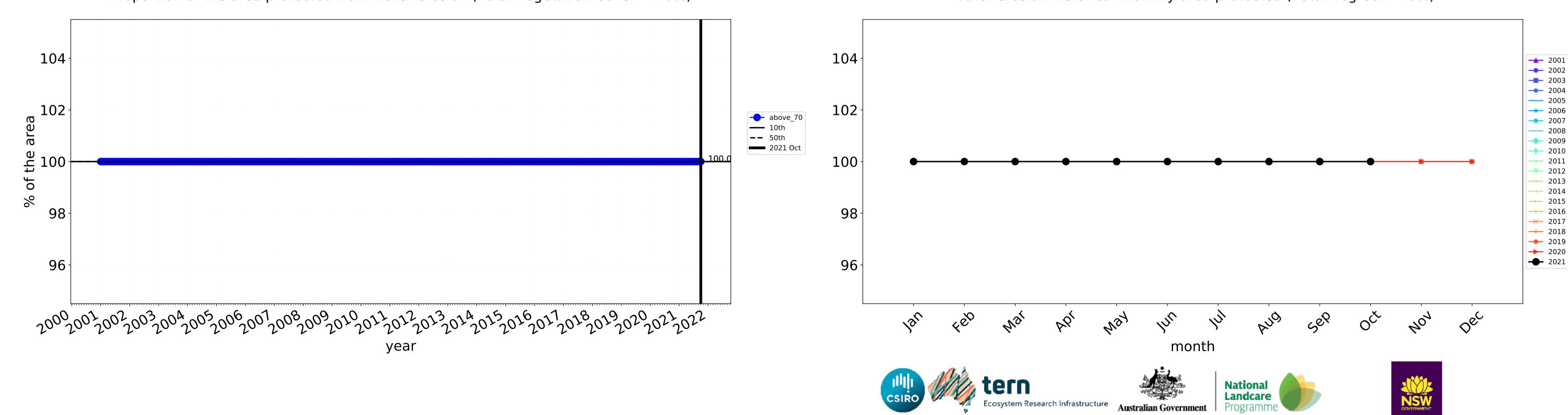
records for that month of

the map using baseline from 2001 to 2019.

in the lowest 10% of

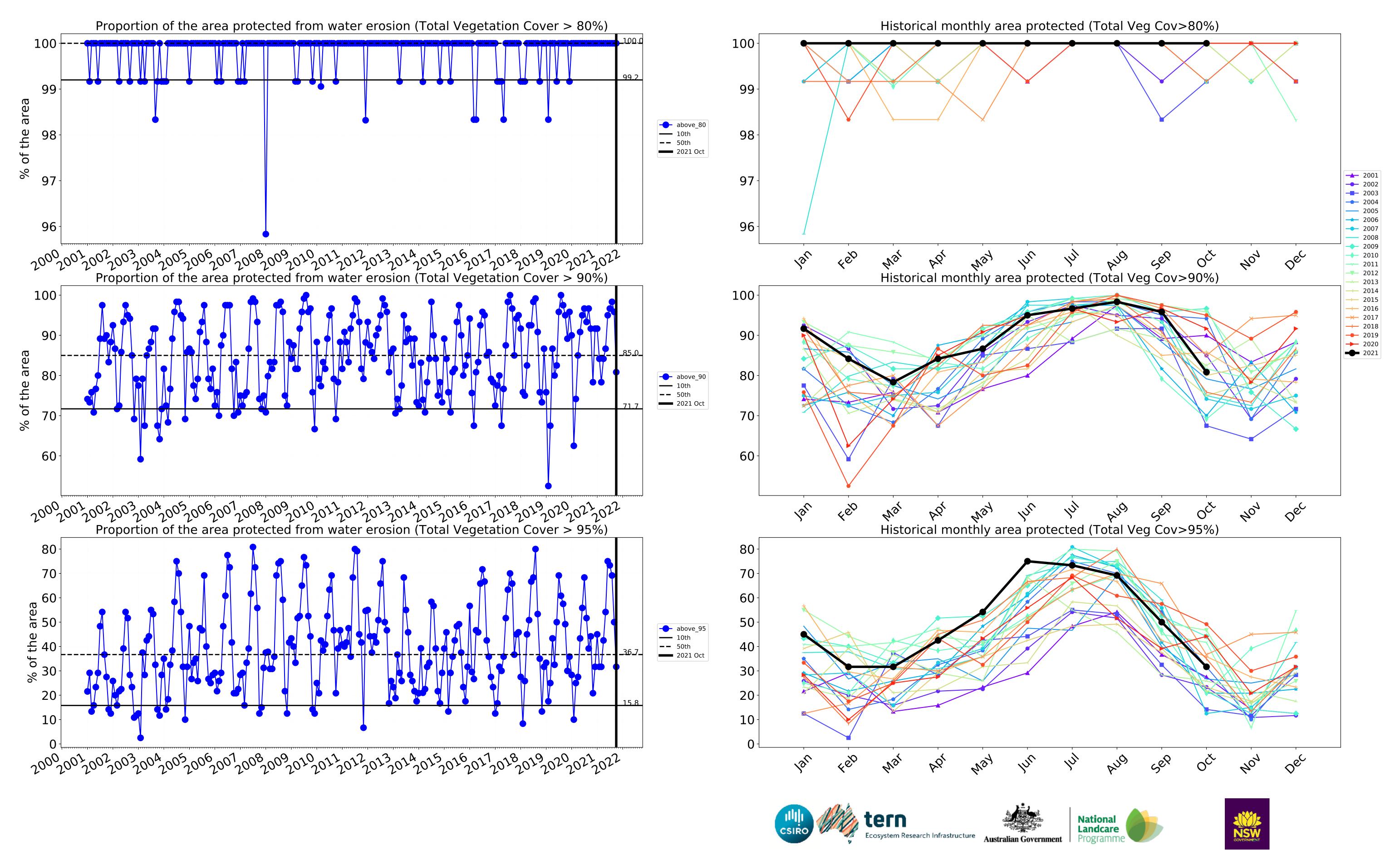






Grazing - Forest (non woodland) timeseries

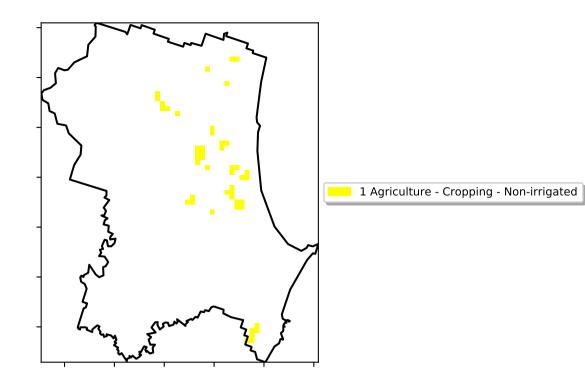
Water erosion historical monthly area protected (Total Veg Cov>70%)



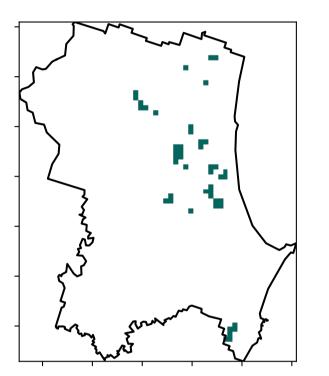


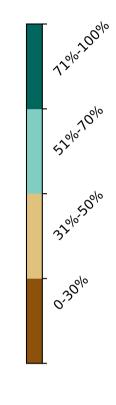
Cropping

Land use and forest cover

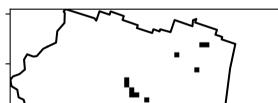


Total Vegetation Cover [%]

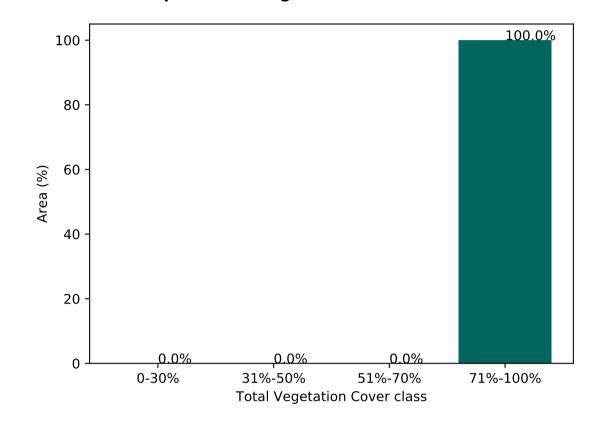




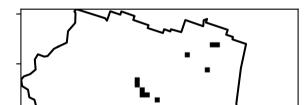
% Area protected from water erosion (>70%)



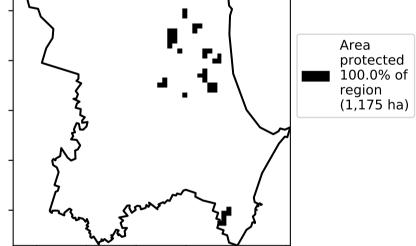
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

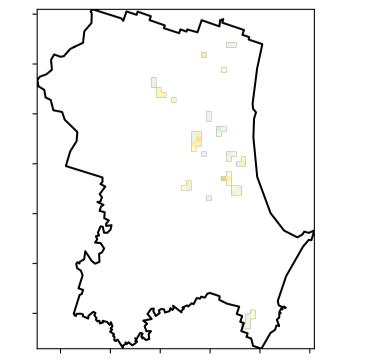


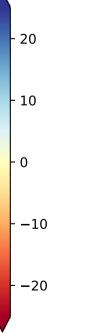
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

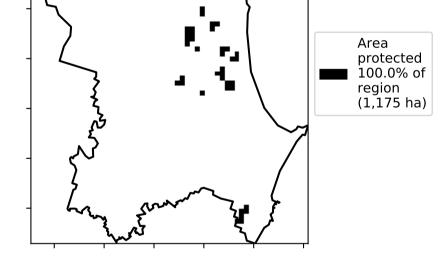


Total Vegetation Cover Anomaly [%]

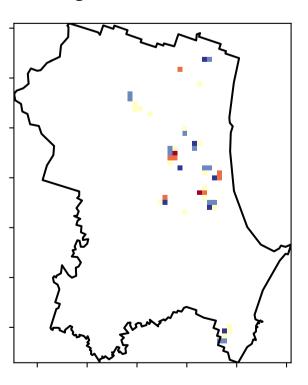
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

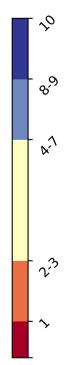






Total Vegetation Cover Decile [%]





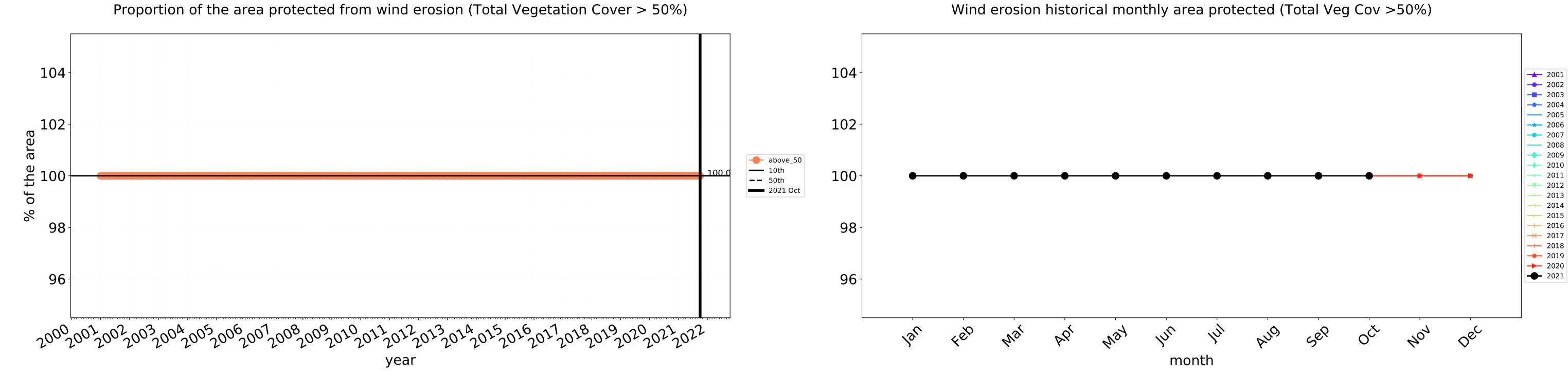


Deciles show where the pixel value lies in the

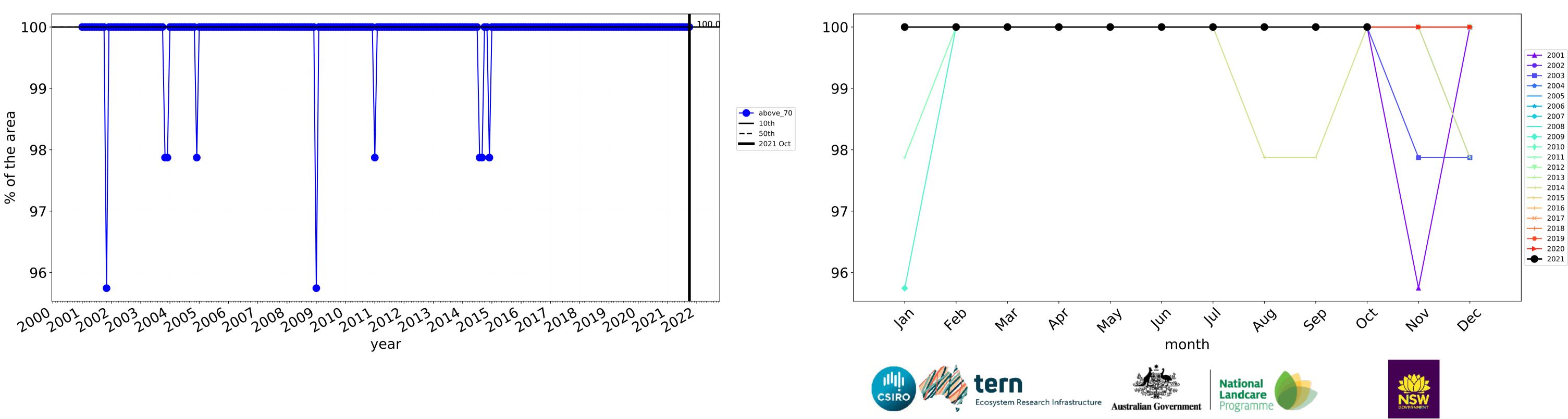
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

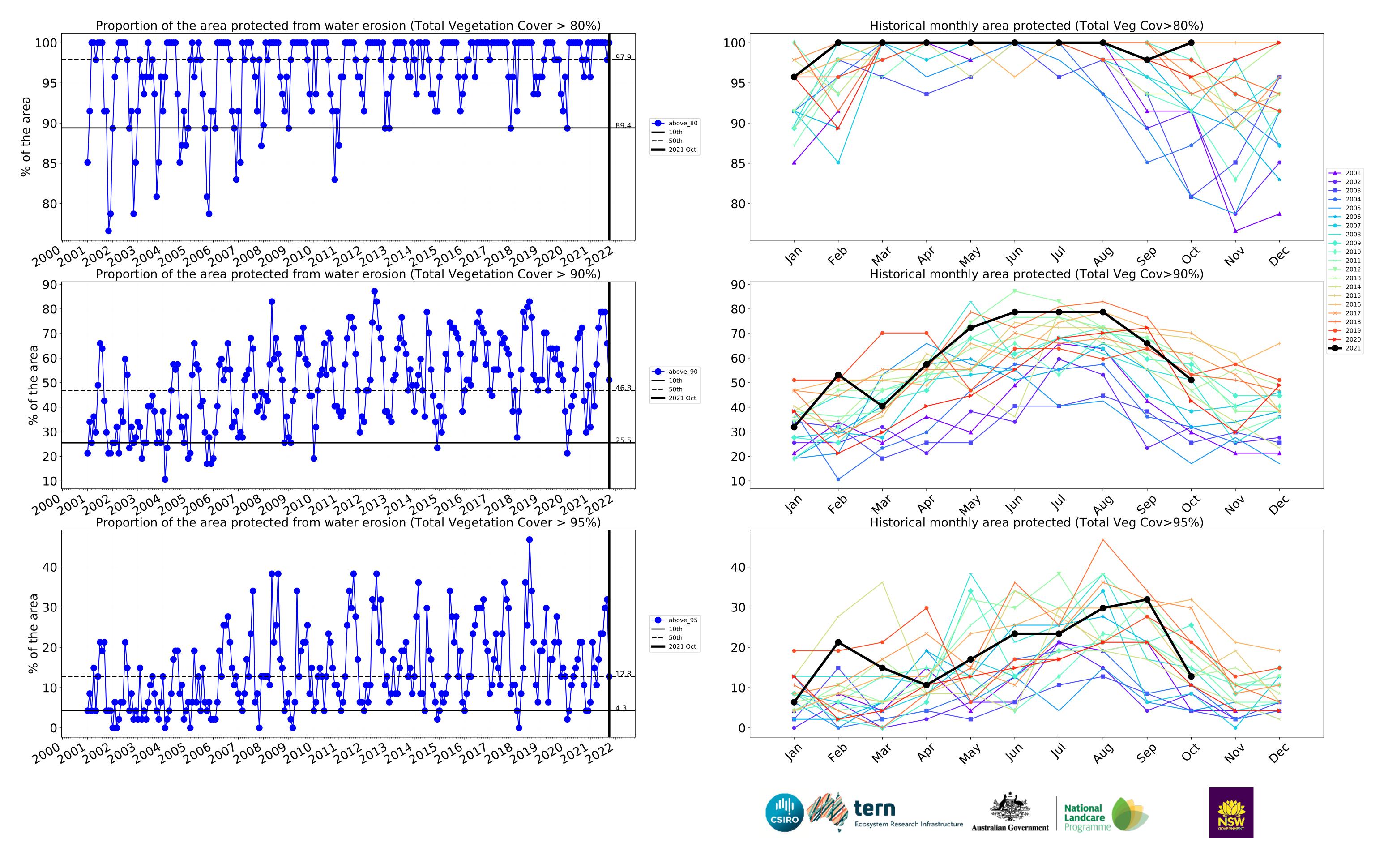






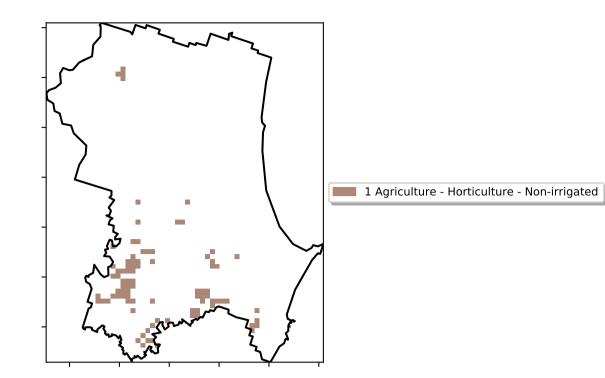
Cropping timeseries

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

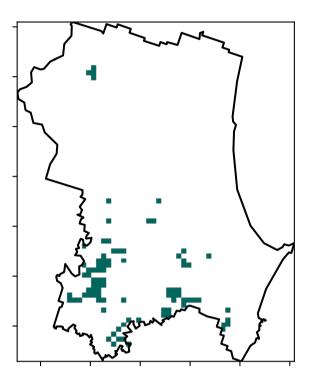


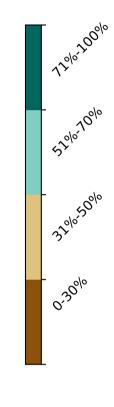
Horticulture

Land use and forest cover

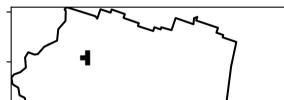


Total Vegetation Cover [%]

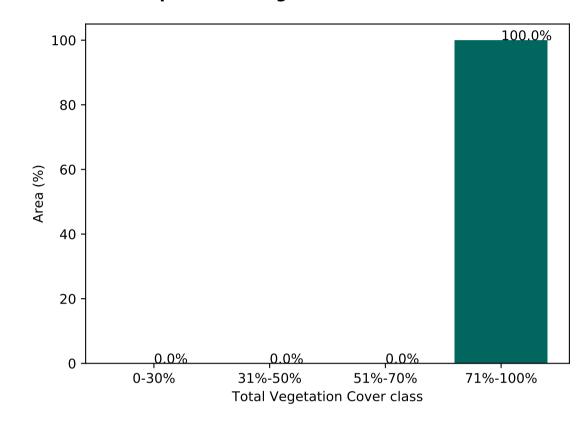




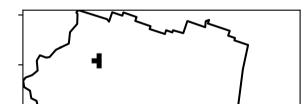
% Area protected from water erosion (>70%)



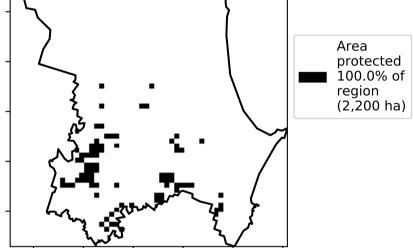
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

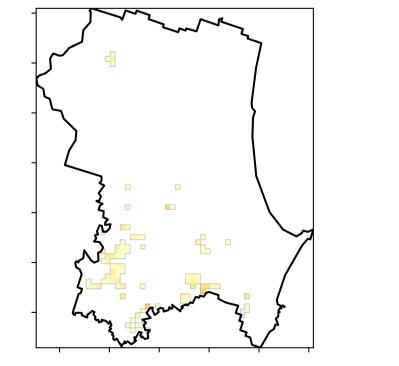


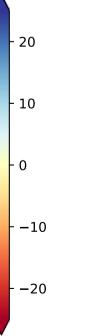
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

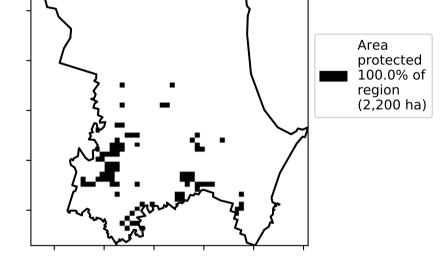


Total Vegetation Cover Anomaly [%]

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







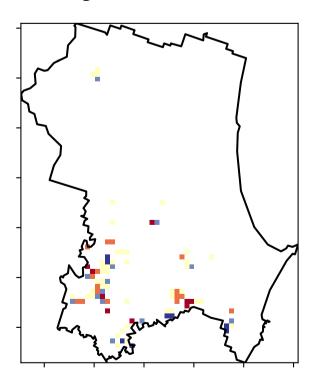
\$

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A-1

2??

Total Vegetation Cover Decile [%]



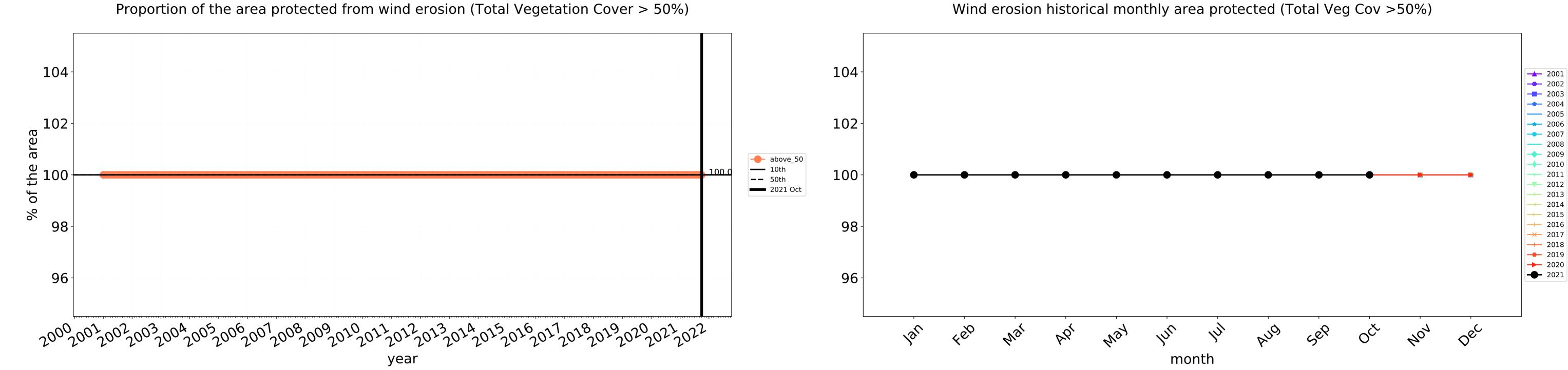


Deciles show where the pixel value lies in the

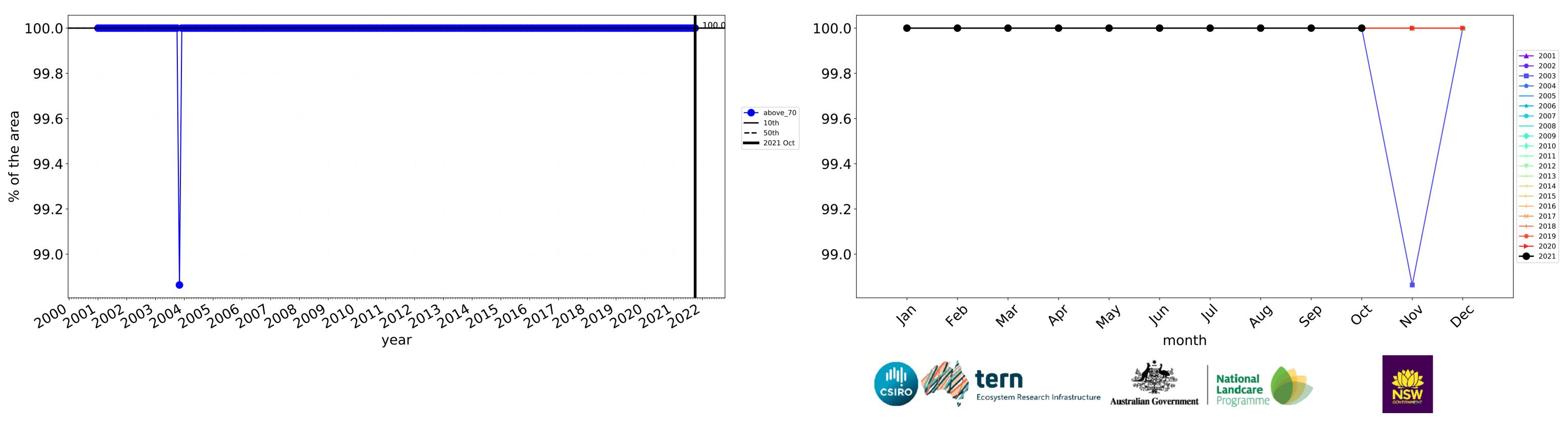
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

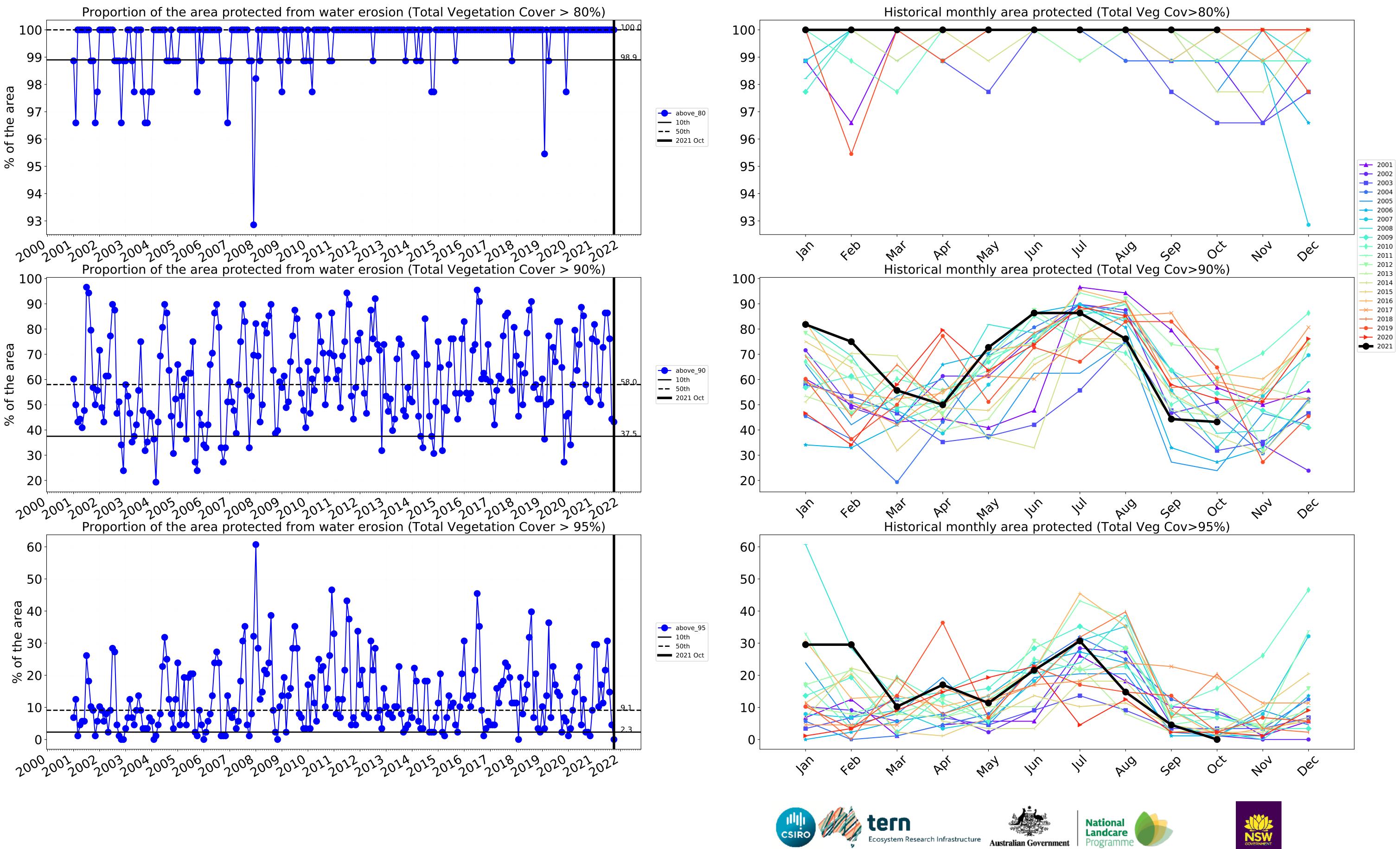






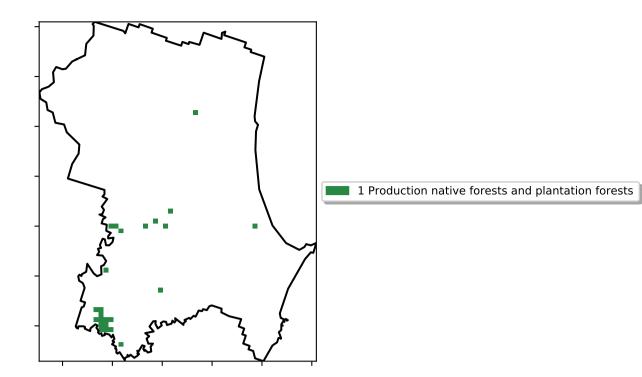
Horticulture timeseries

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

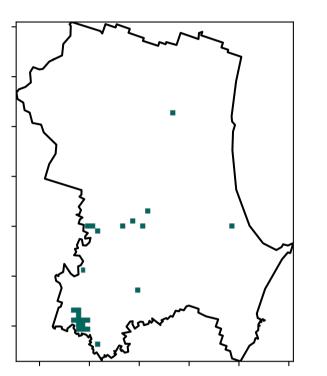


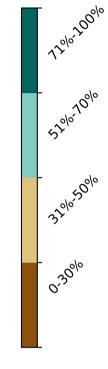
Production native forests and plantation forests

Land use and forest cover

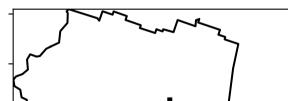


Total Vegetation Cover [%]





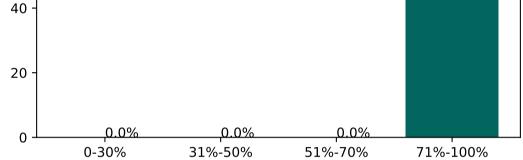
% Area protected from water erosion (>70%)





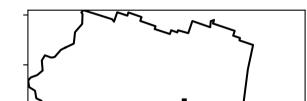


100.0%



% Area protected from wind erosion (>50%)

Total Vegetation Cover class



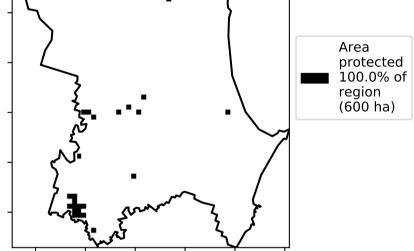
Proportion of vegetation cover class in area

100

80

60

Area (%)

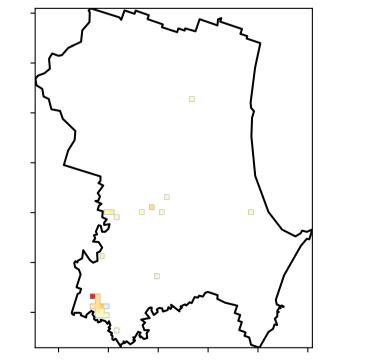


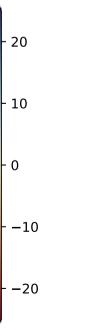
Total Vegetation Cover Anomaly [%]

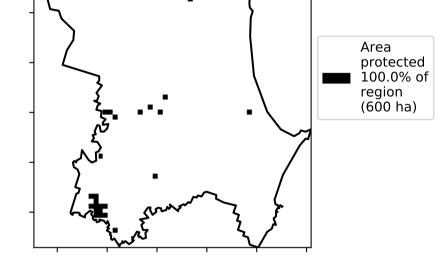
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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

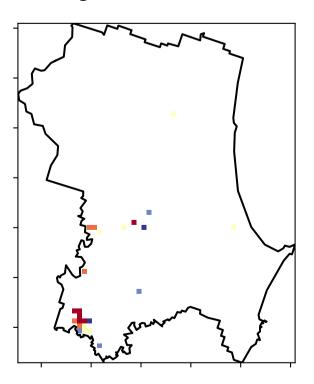
Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

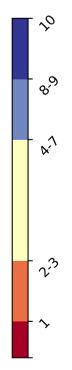






Total Vegetation Cover Decile [%]







Deciles show where the pixel value lies in the

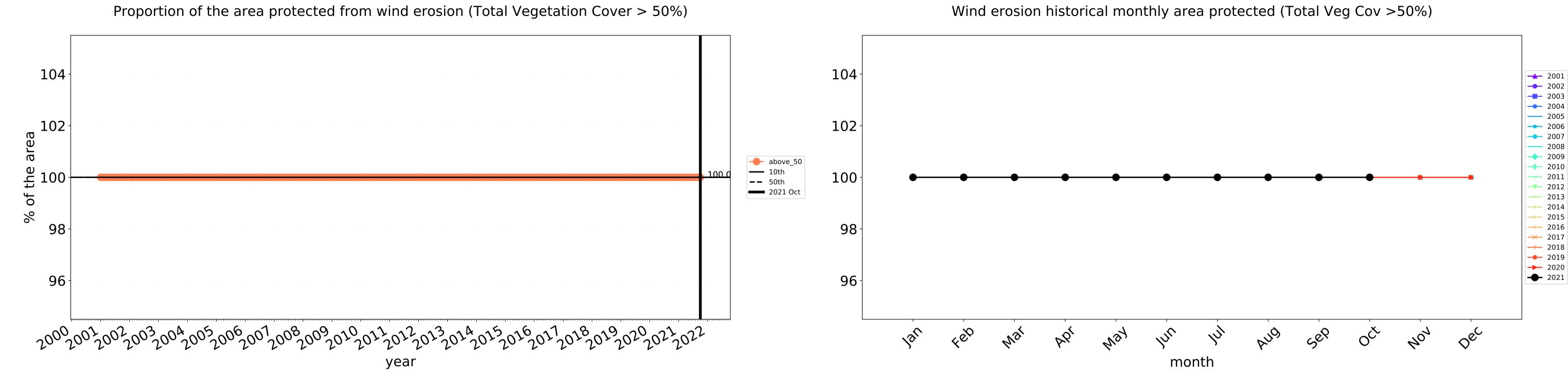
record, from highest to lowest, for that month.

That is, red pixels are

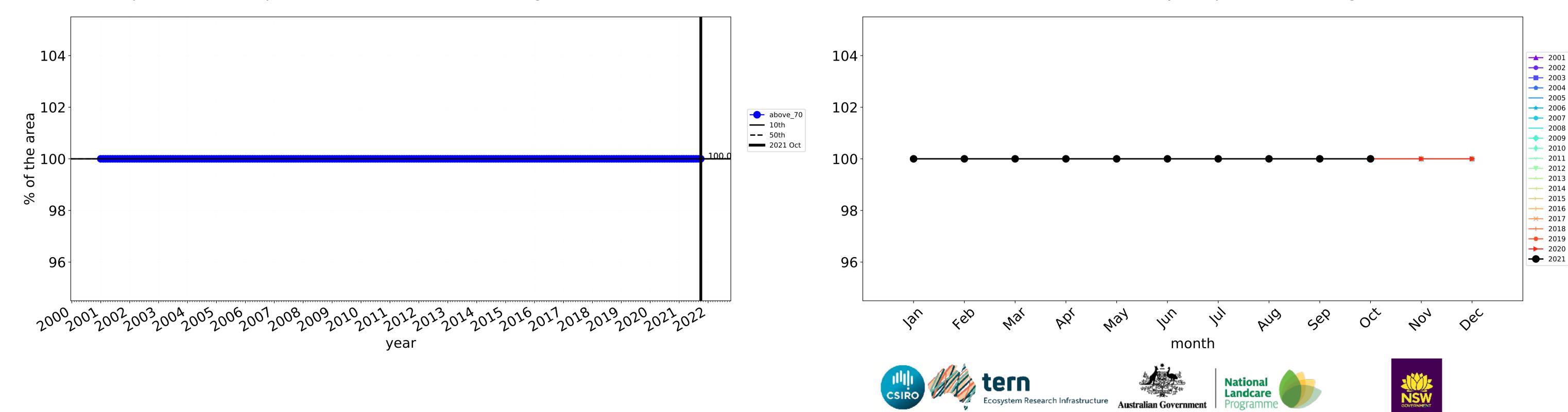
records for that month of

the map using baseline from 2001 to 2019.

in the lowest 10% of

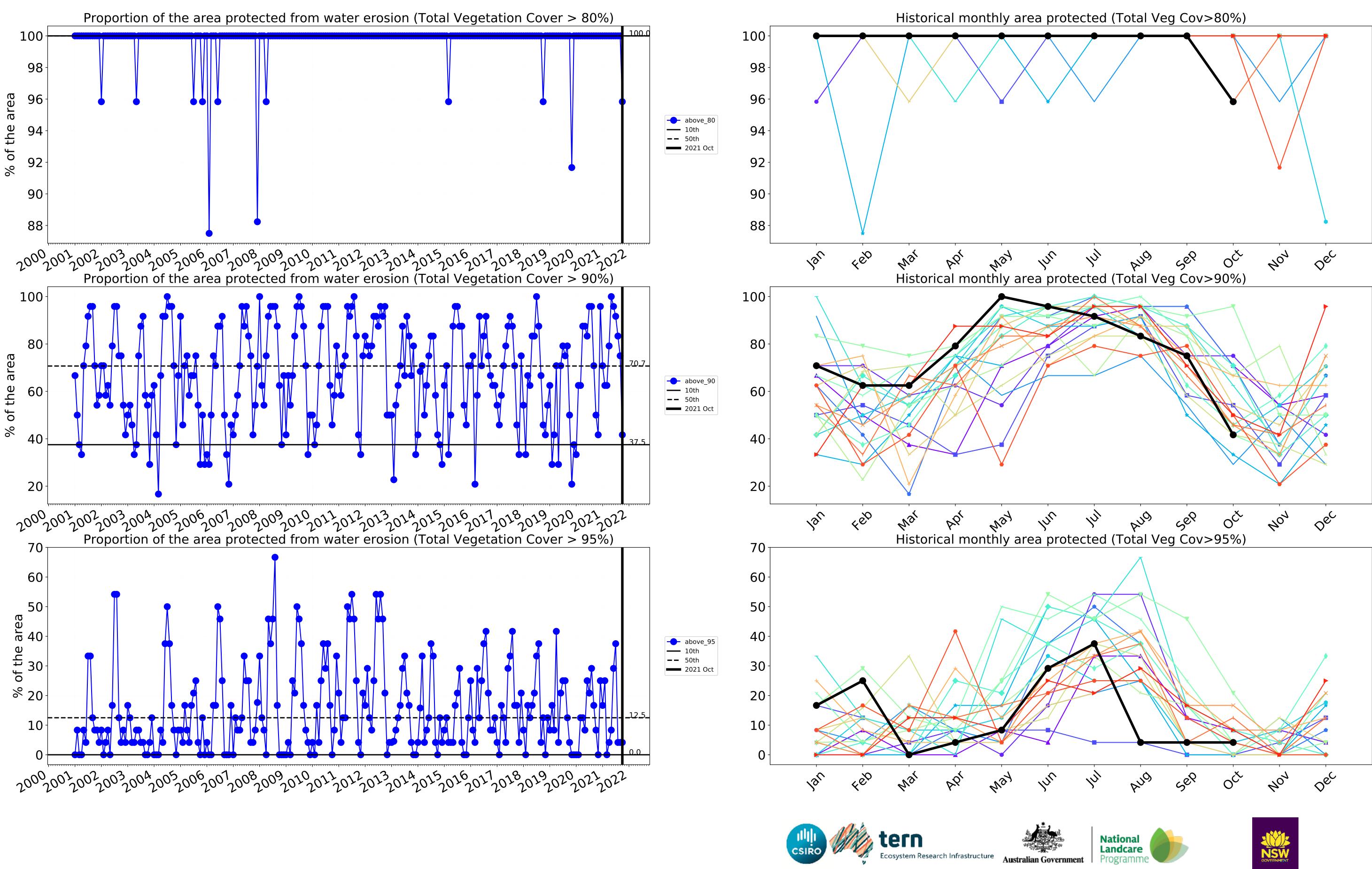






3**9**

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



— 2001 --- 2002 **—** 2003 **---** 2004 - 2005 **----** 2006 --- 2007 2008 **-** 2009 **—** 2010 <u>→</u> 2011 → 2012 → 2013 2014 2015 ← 2016 <mark>→</mark> 2017 --- 2018 **—** 2019 --- 2020

--- 2021

Byron_(A) (55,925 ha and no data 770 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	55,925	100.0% 55,925	99.9% 55,850	98.8% 55,275	96.7% 54,075	51.3% 28,700	14.8% 8,250
Conservation and natural environments	10,975	100.0% 10,975	99.5% 10,925	97.9% 10,750	96.4% 10,575	85.0% 9,325	48.3% 5,300
Conservation and natural environments non forest	1,175	100.0% 1,175	100.0% 1,175	89.4% 1,050	83.0% 975	46.8% 550	23.4% 275
Conservation and natural environments Woodland forest	625	100.0% 625	100.0% 625	100.0% 625	100.0% 625	68.0% 425	28.0% 175
Conservation and natural environments Forest (non woodland)	9,175	100.0% 9,175	99.5% 9,125	98.9% 9,075	97.8% 8,975	91.0% 8,350	52.9% 4,850
Agriculture	33,700	100.0% 33,700	100.0% 33,700	99.9% 33,675	99.6% 33,575	46.1% 15,550	6.8% 2,300
Grazing	30,300	100.0% 30,300	100.0% 30,300	99.9% 30,275	99.6% 30,175	46.2% 14,000	7.1% 2,150
Grazing non forest	24,700	100.0% 24,700	100.0% 24,700	99.9% 24,675	99.5% 24,575	43.0% 10,625	4.6% 1,125
Grazing Woodland forest	2,600	100.0% 2,600	100.0% 2,600	100.0% 2,600	100.0% 2,600	36.5% 950	2.9% 75
Grazing - Forest (non woodland)	3,000	100.0% 3,000	100.0% 3,000	100.0% 3,000	100.0% 3,000	80.8% 2,425	31.7% 950
Cropping	1,175	100.0% 1,175	100.0% 1,175	100.0% 1,175	100.0% 1,175	51.1% 600	12.8% 150
Horticulture	2,200	100.0% 2,200	100.0% 2,200	100.0% 2,200	100.0% 2,200	43.2% 950	0.0%
Production native forests and plantation forests	600	100.0% 600	100.0% 600	100.0% 600	95.8% 575	41.7% 250	4.2% 25

