# **Total vegetation cover soil protection Region:NRM Hunter NSW**

# Date: April 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:

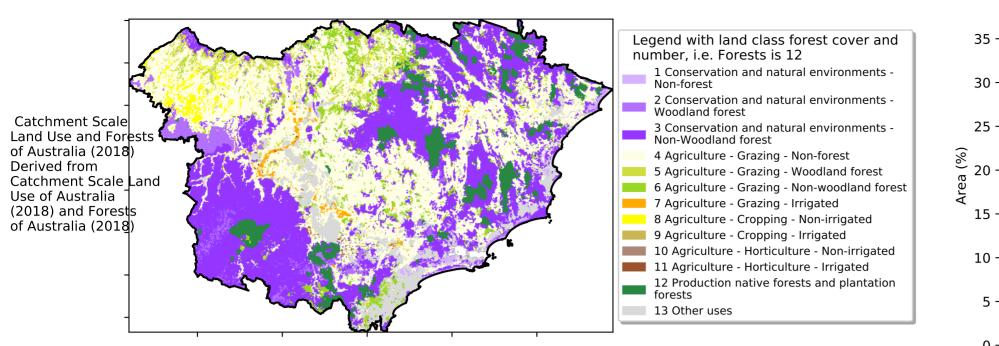
- 1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
- 2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
- 3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
- 4. MODIS Fractional cover algorithm:

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



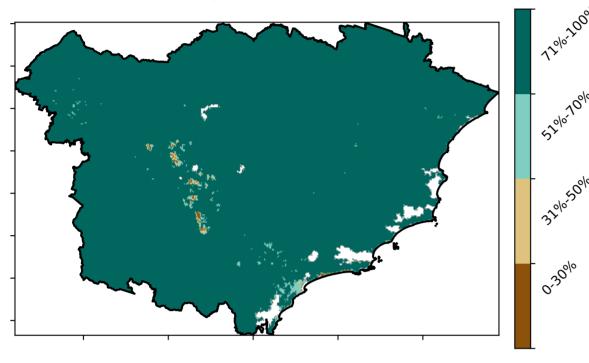
# **Vegetation Cover Apr 2021**

#### Proportion of each land class in area



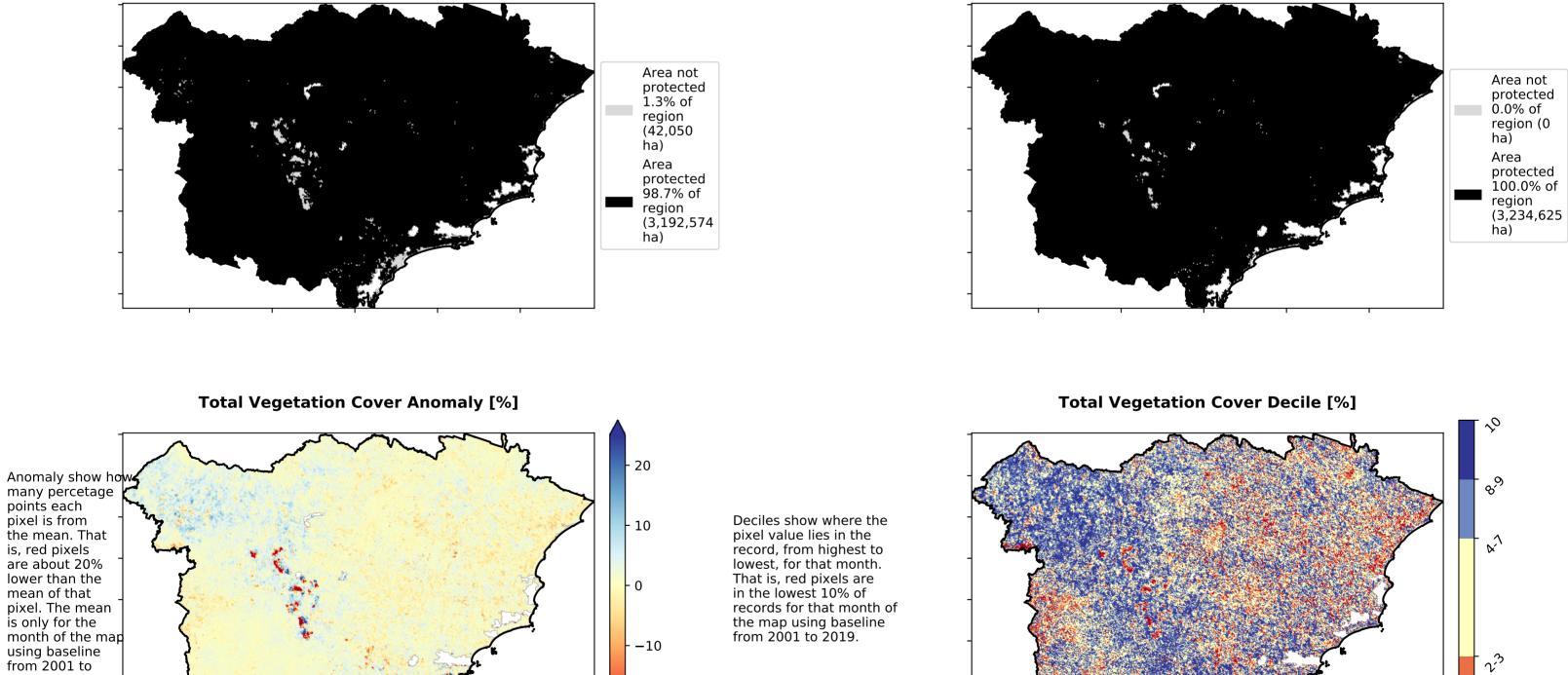


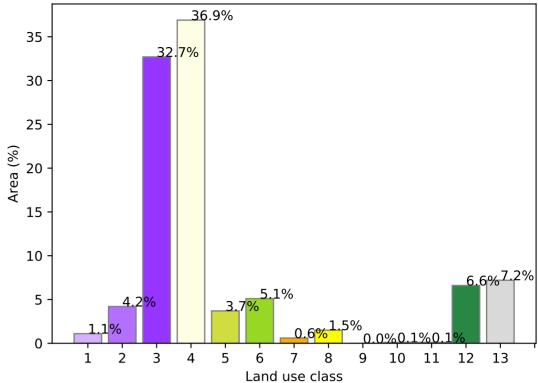
Land use and forest cover



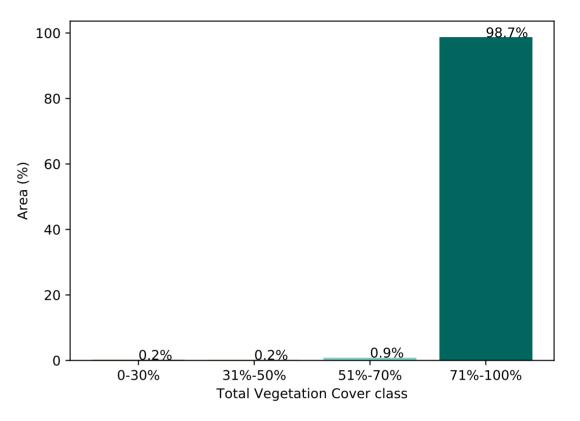
#### % Area protected from water erosion (>70%)

2019.

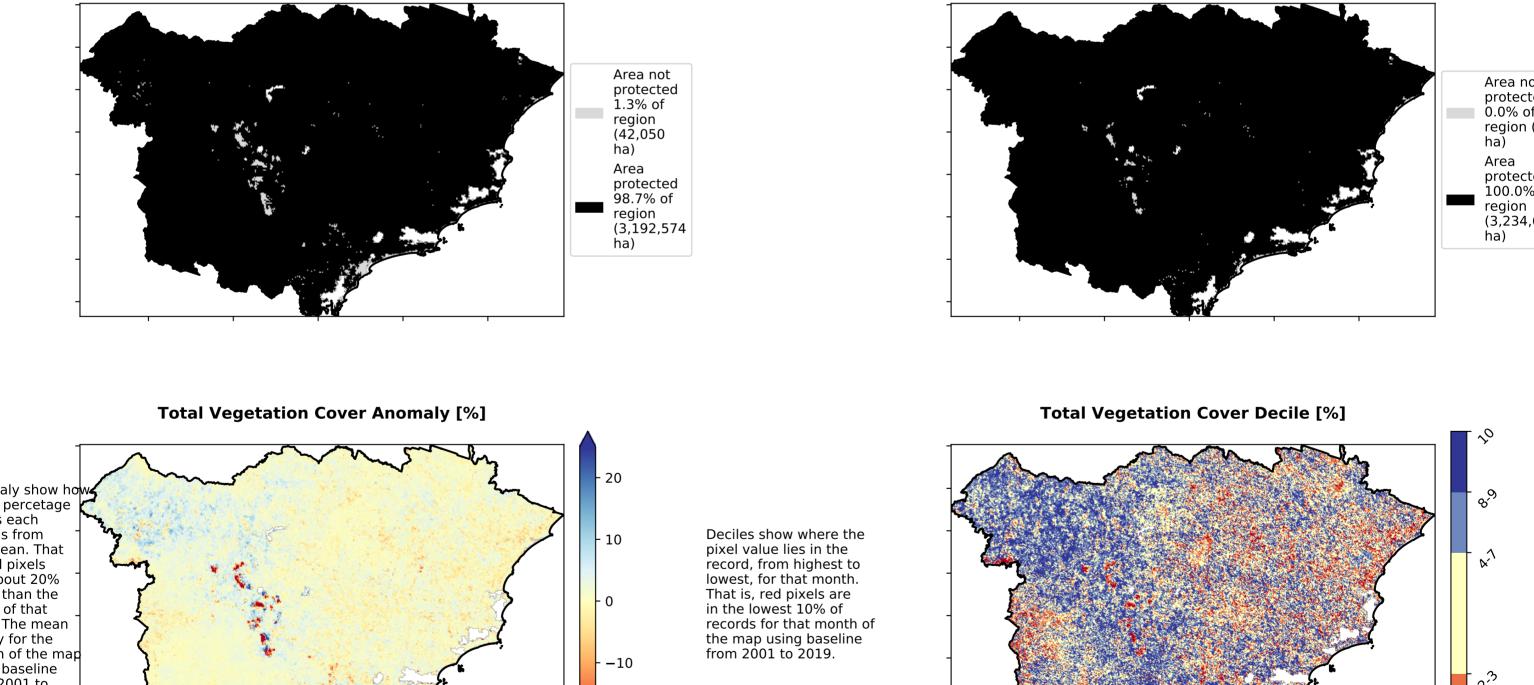




#### Proportion of vegetation cover class in area



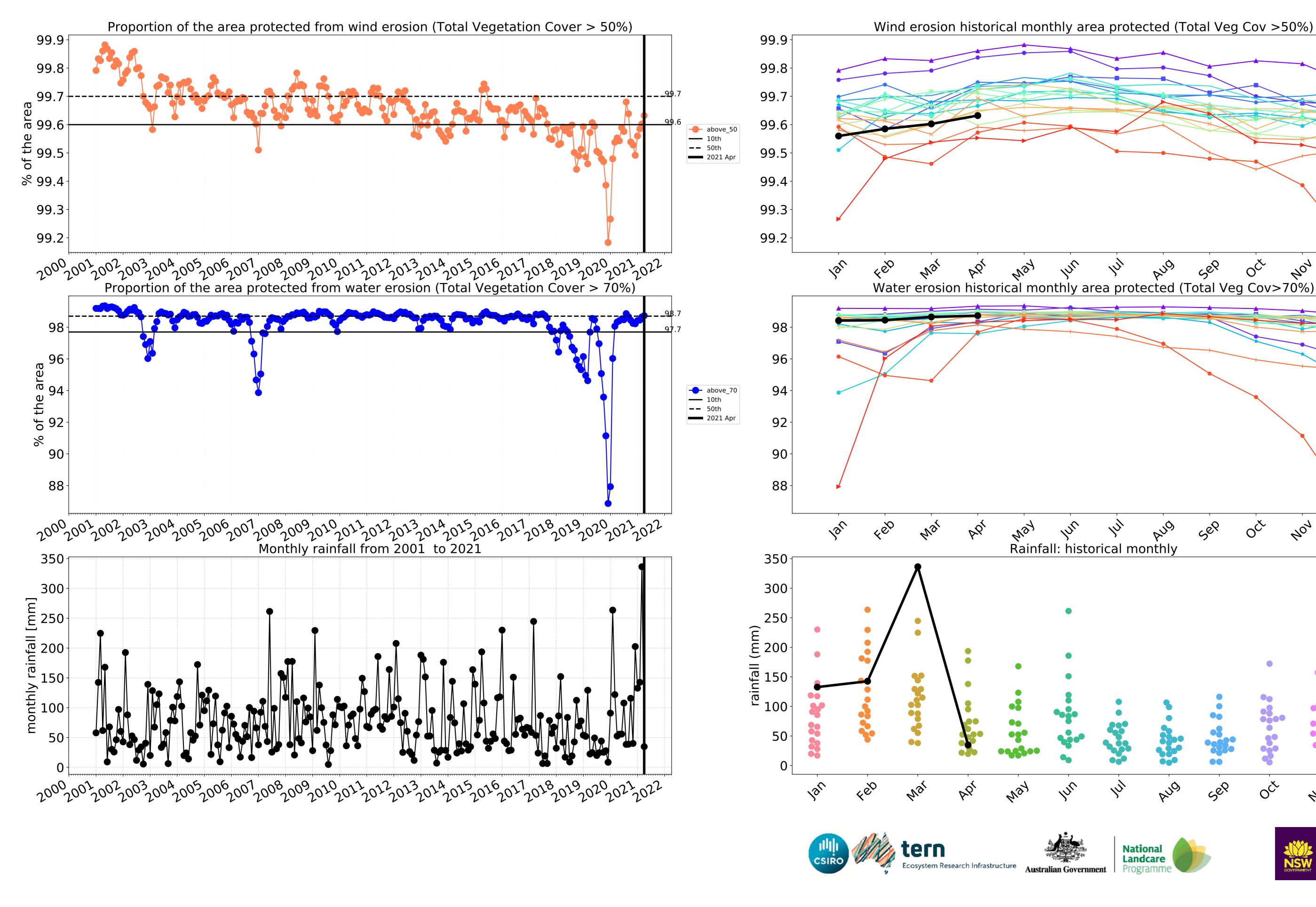
#### % Area protected from wind erosion (>50%)

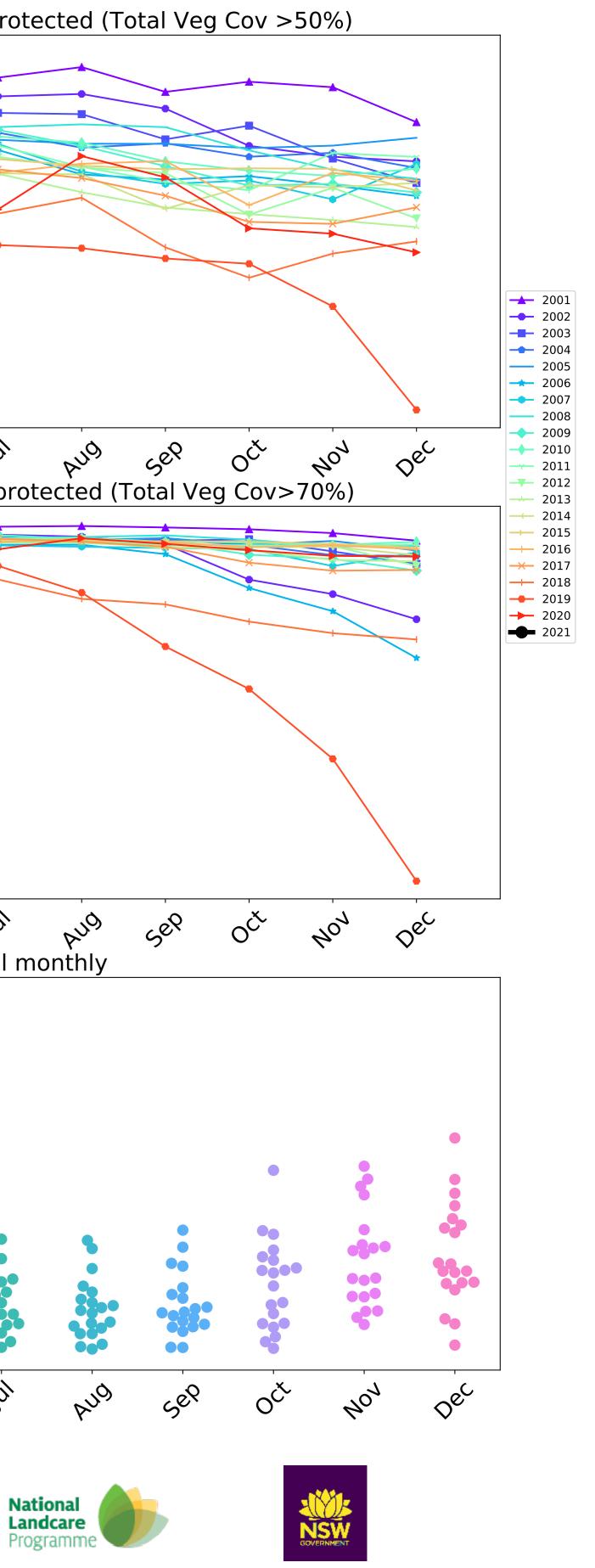


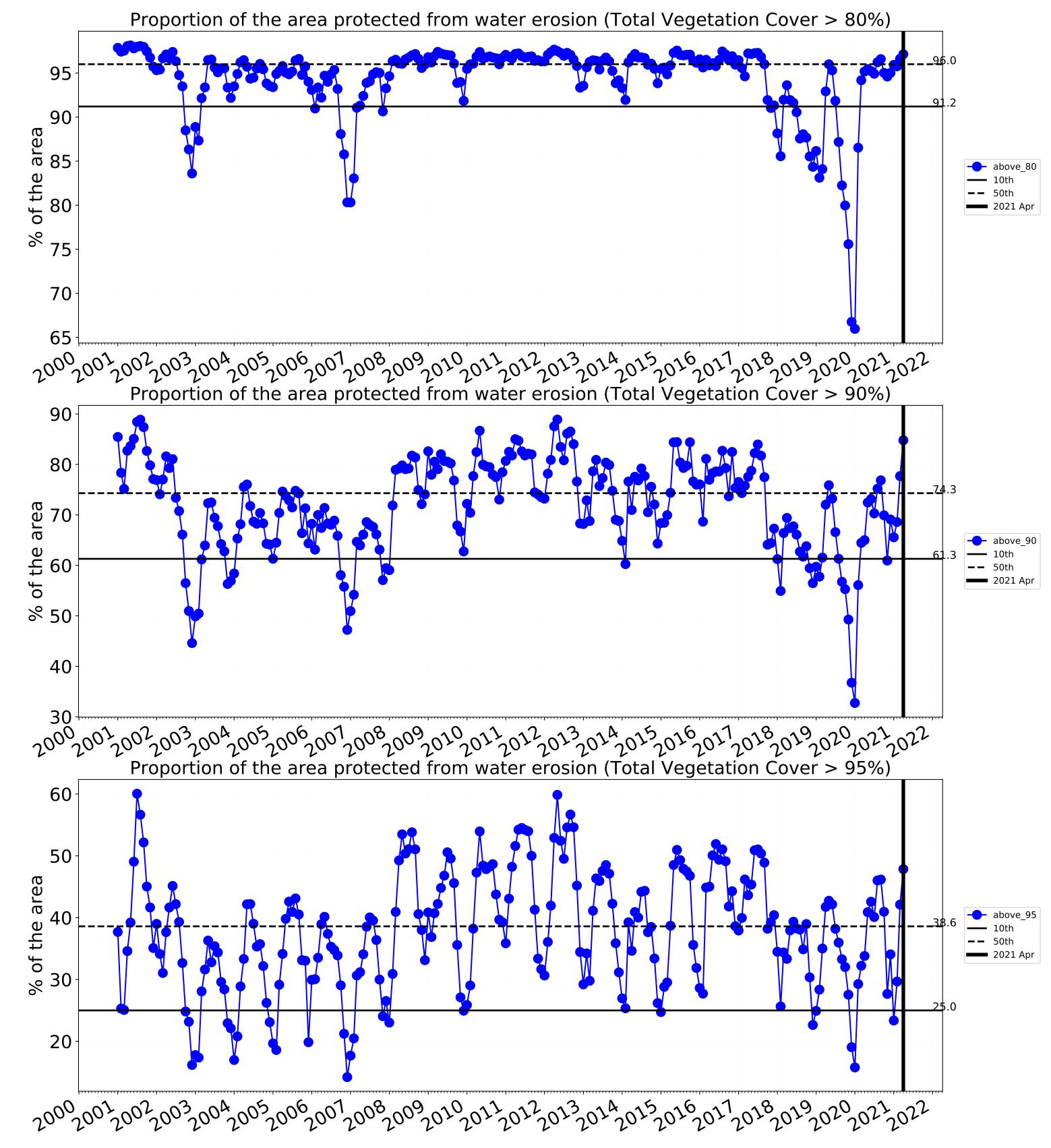
protected 0.0% of region (0

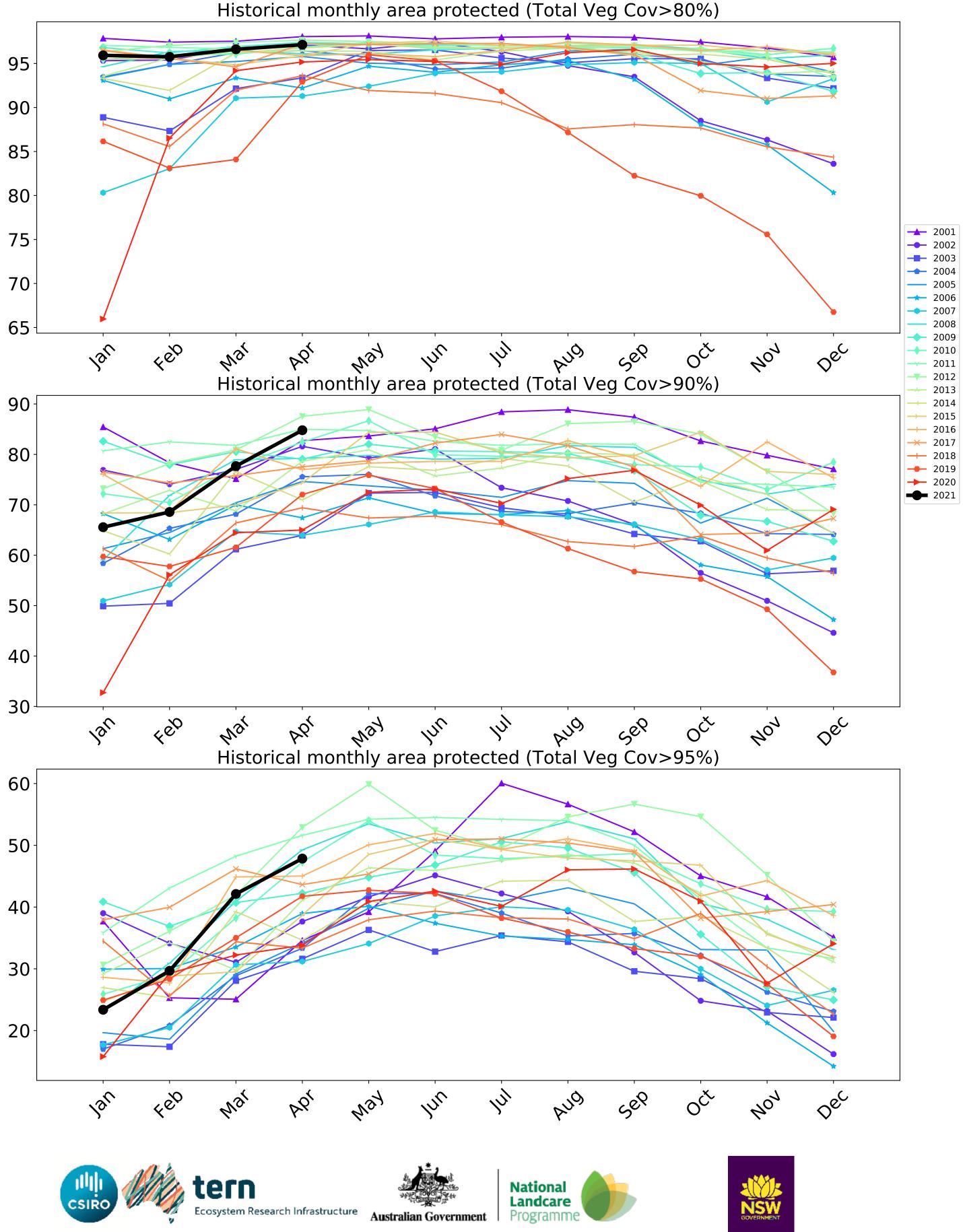


-20



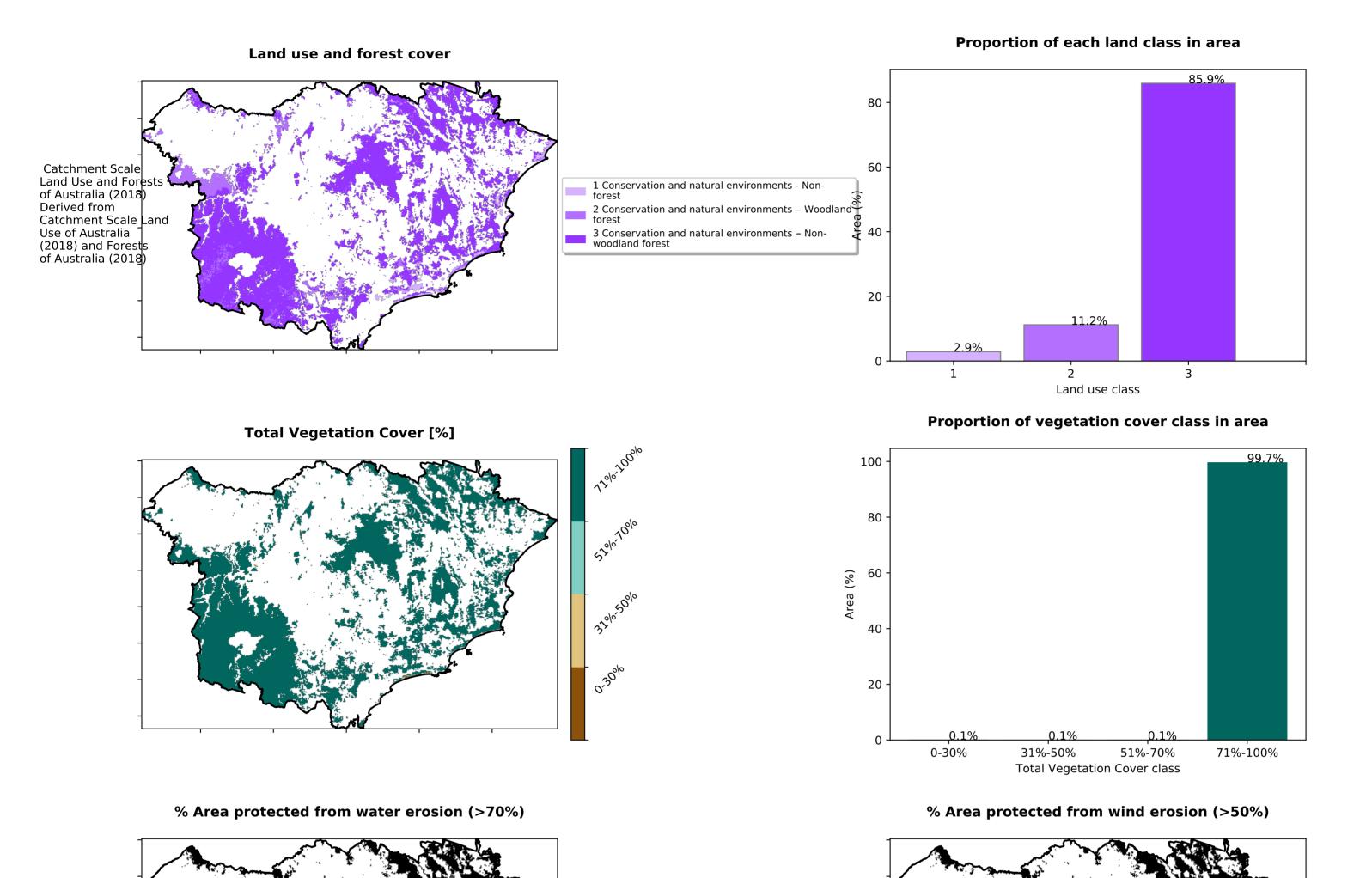


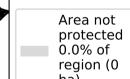


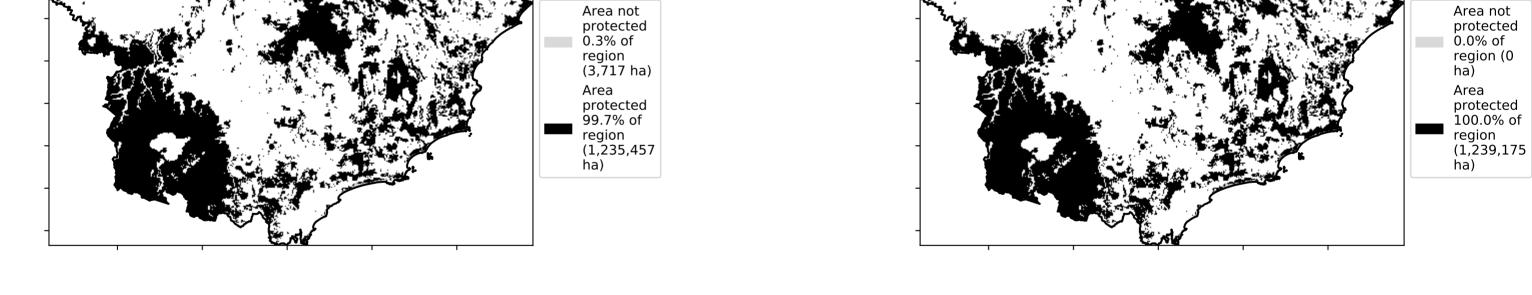




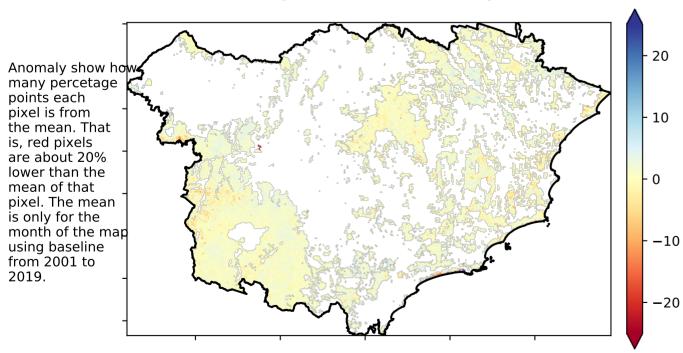
#### **Conservation and natural environments**



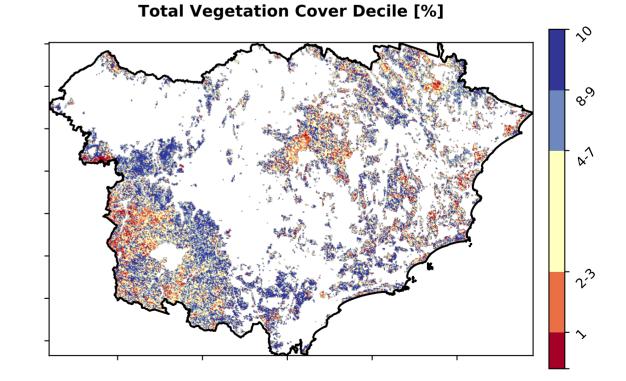




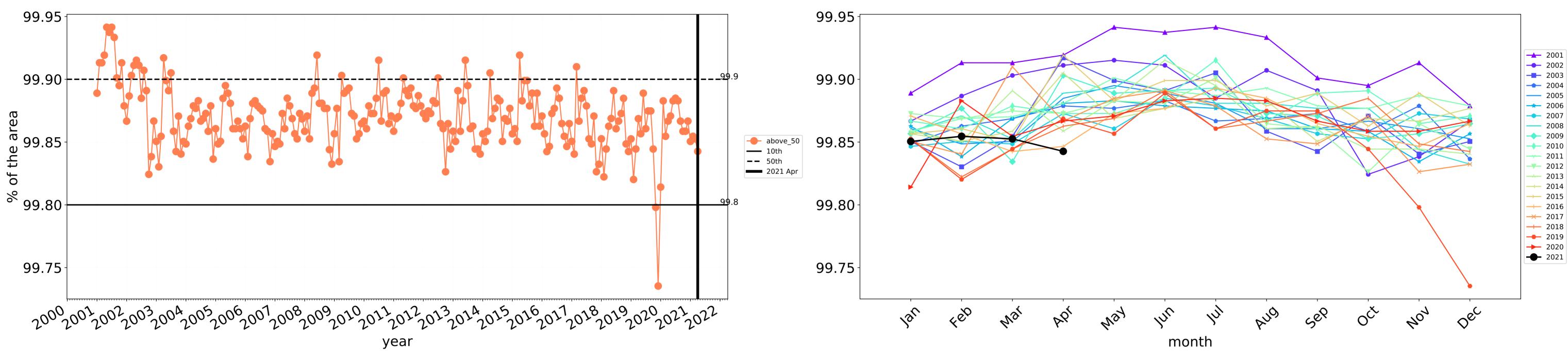
Total Vegetation Cover Anomaly [%]



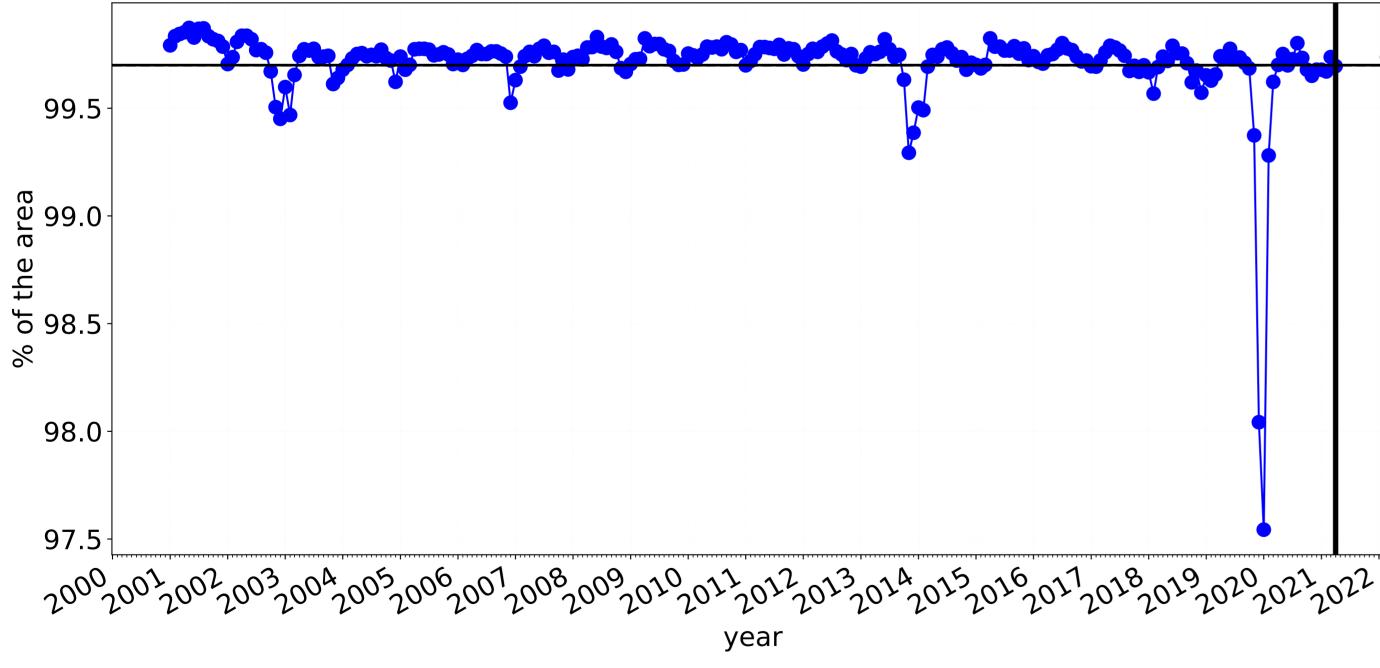
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.







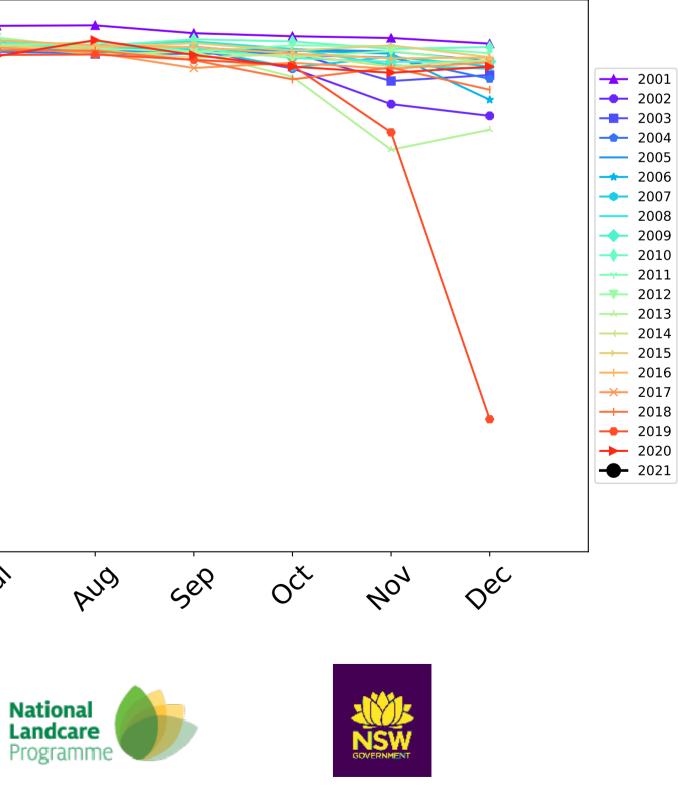
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

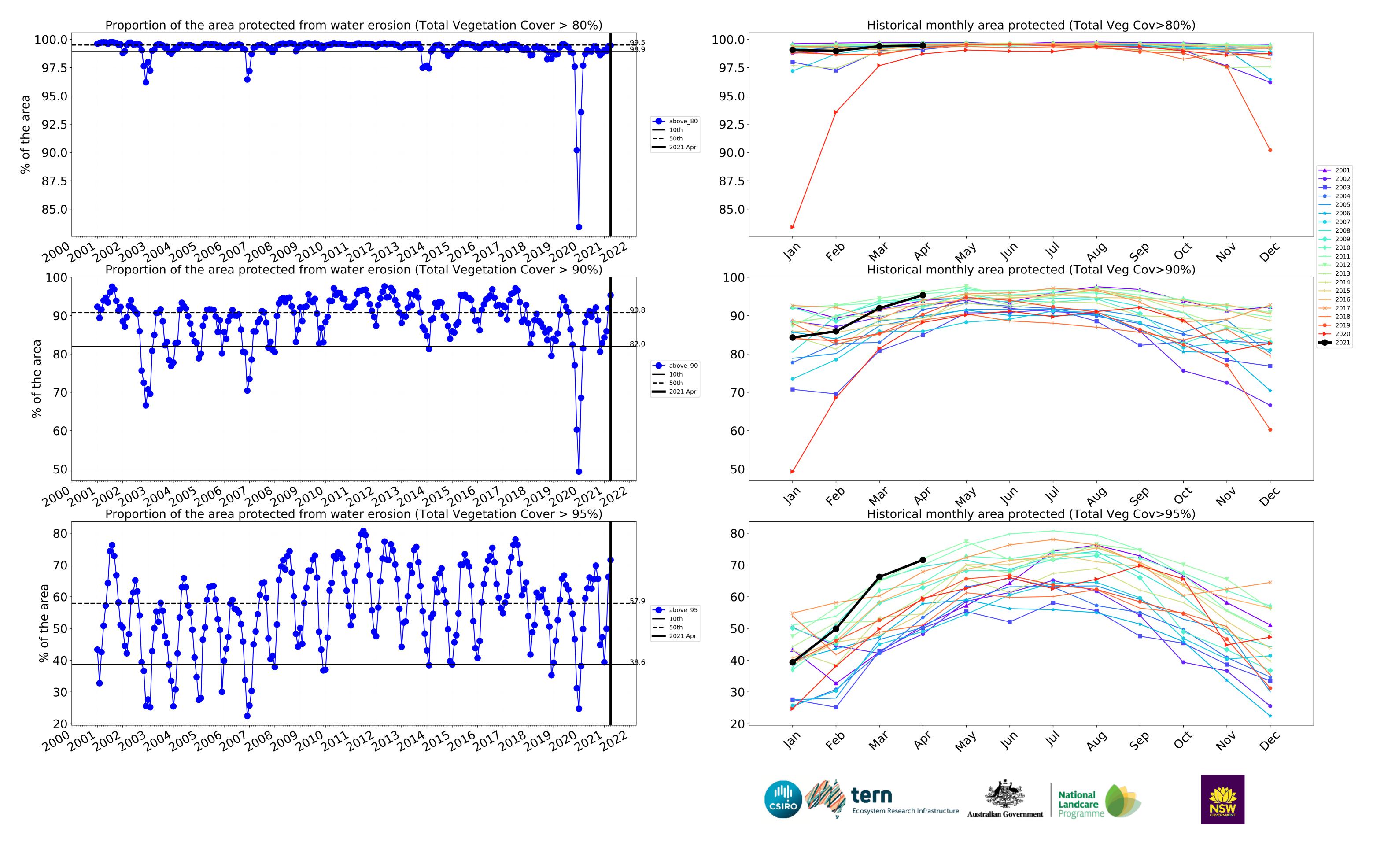


99.5 ---- above\_70 99.0 **—** 10th **——** 50th **—** 2021 Apr 98.5 98.0-97.5 Jan 4eb way In PQ 1st Mai month tern Ecosystem Research Infrastructure Australian Government

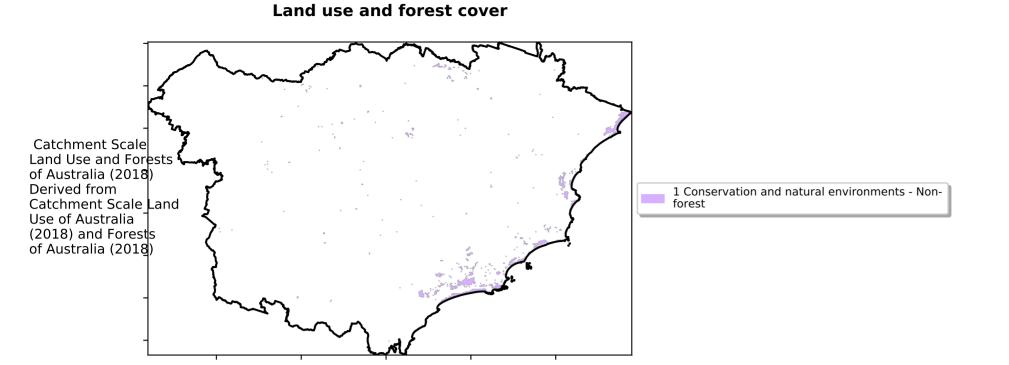
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

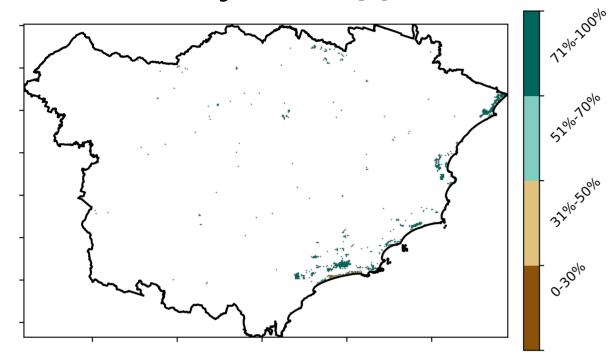




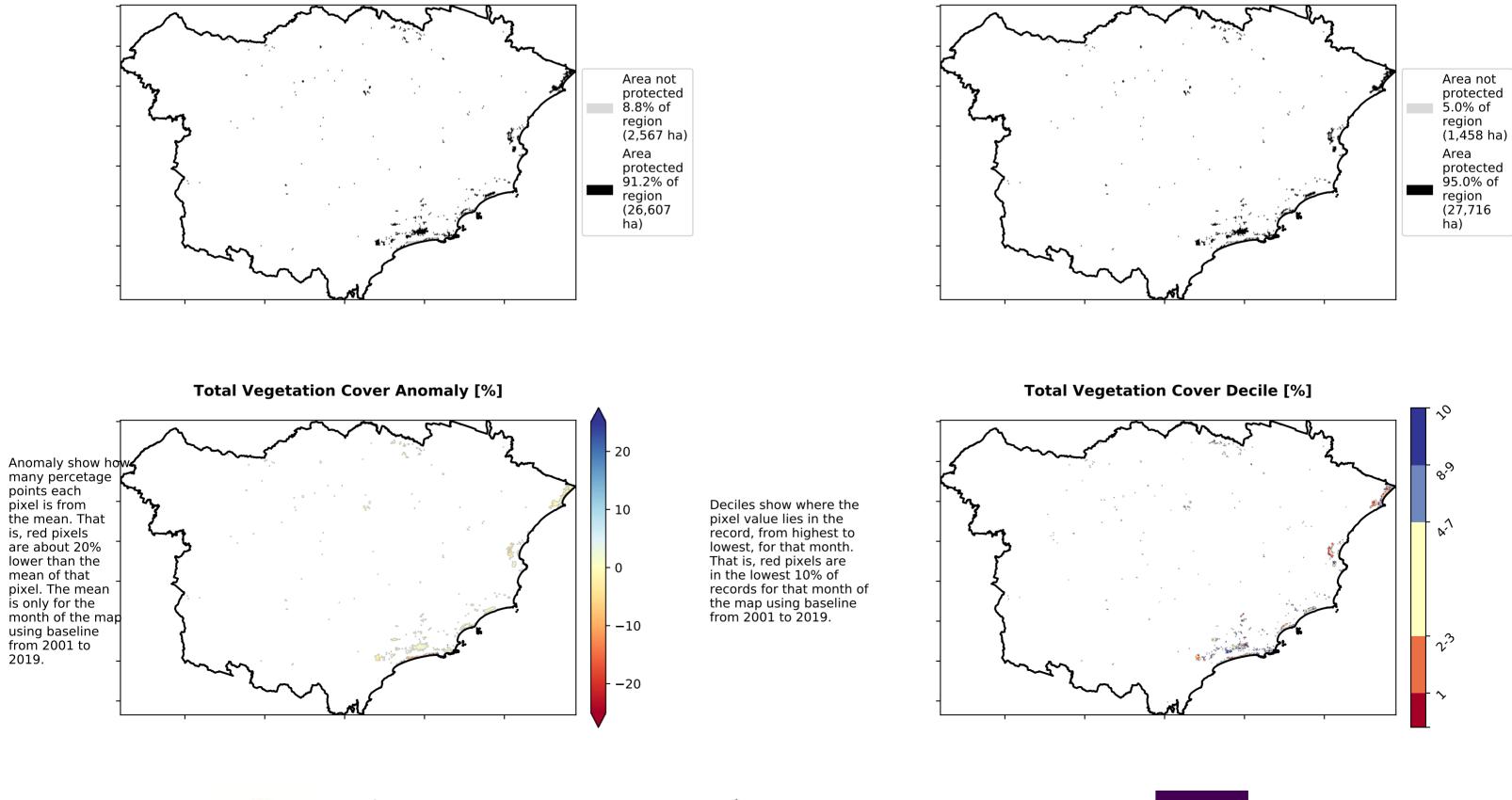
#### **Conservation and natural environments non forest**



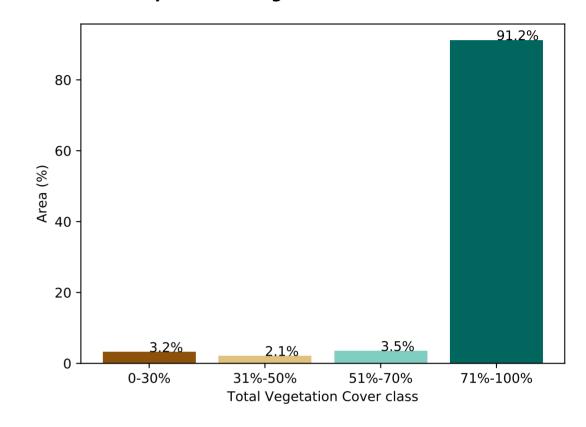
**Total Vegetation Cover [%]** 



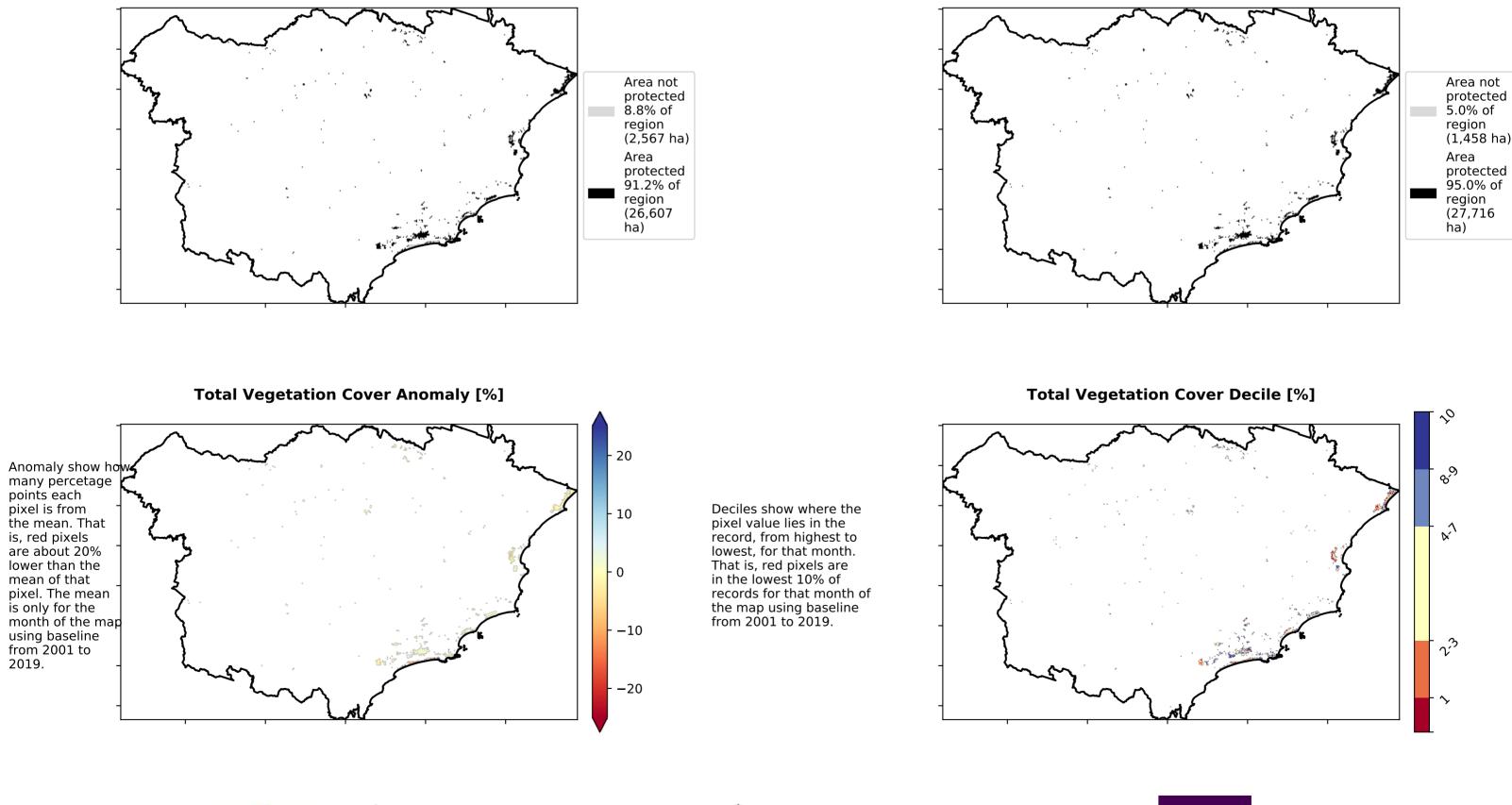
% Area protected from water erosion (>70%)



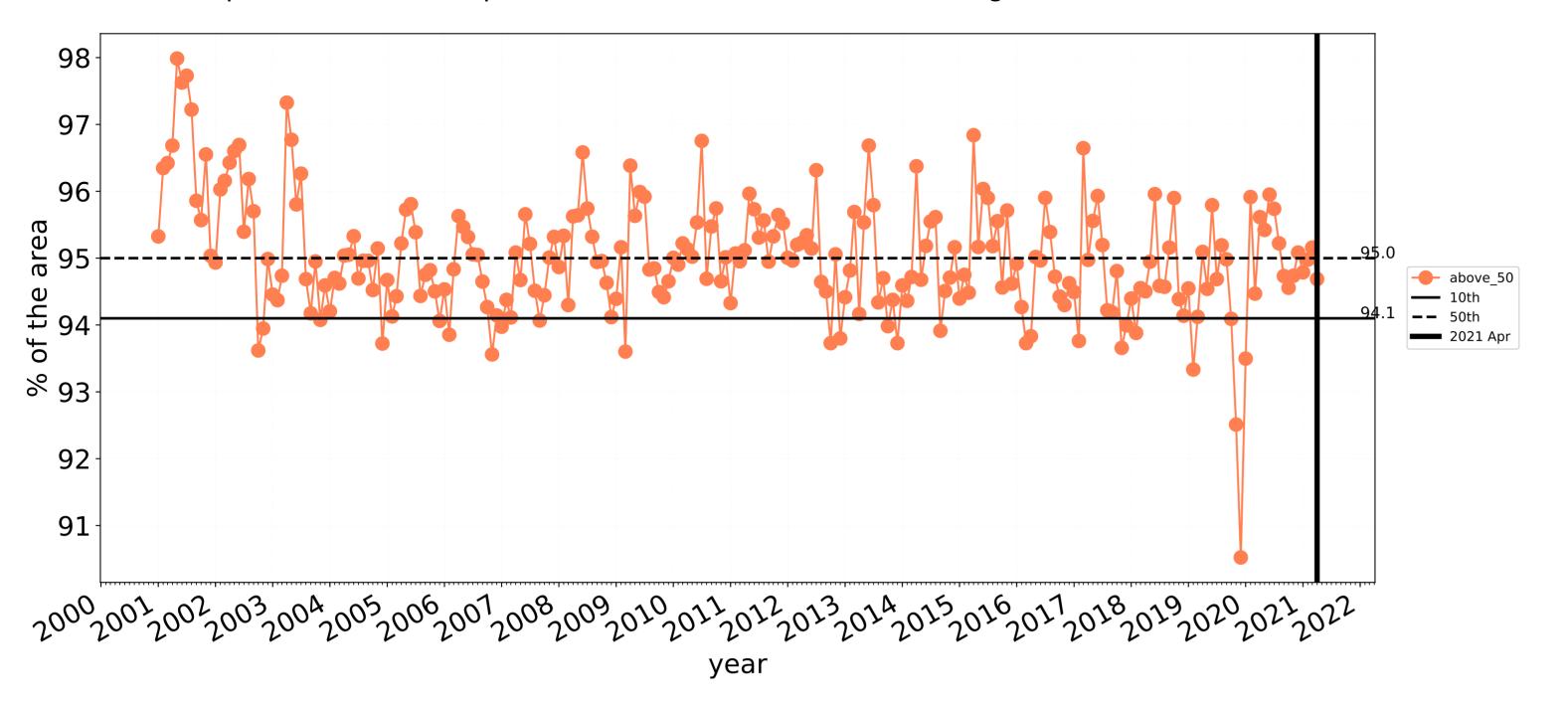
Proportion of vegetation cover class in area



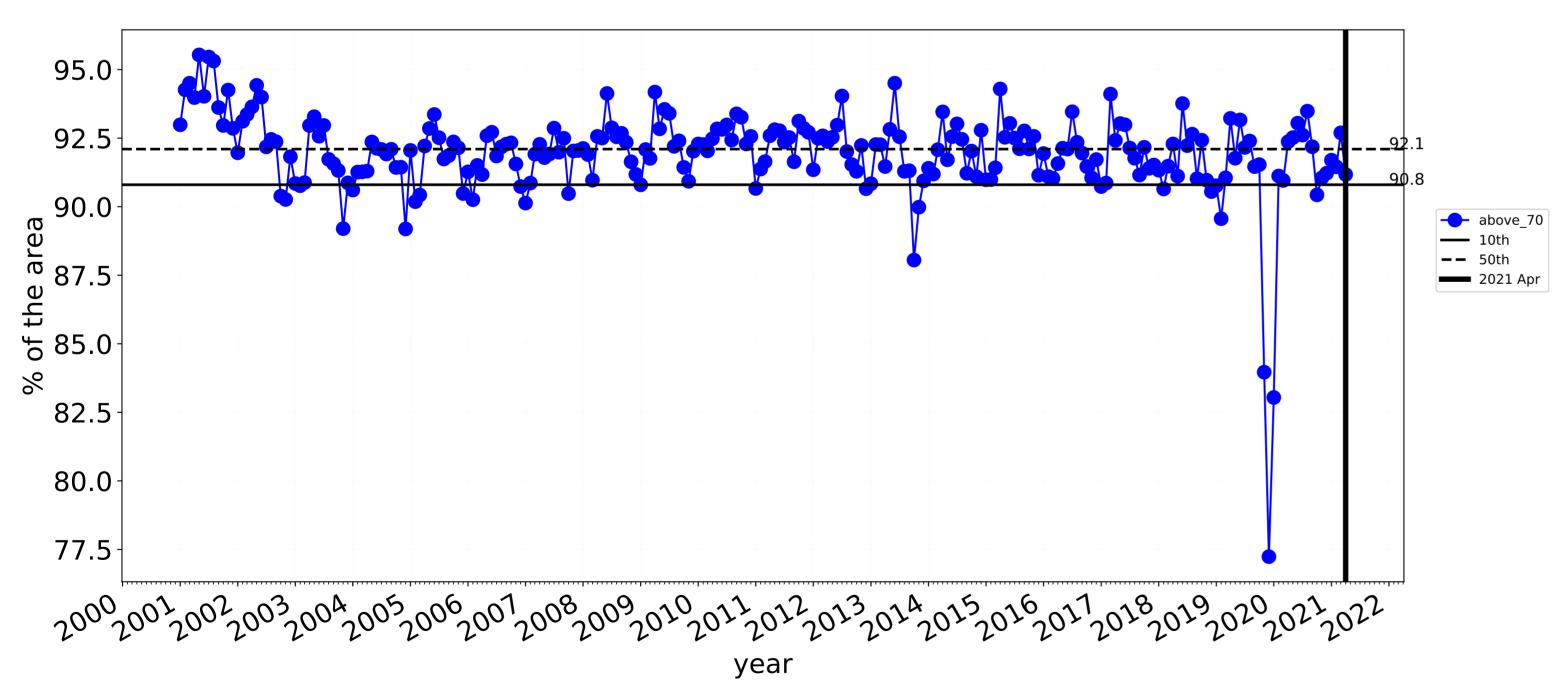
% Area protected from wind erosion (>50%)

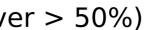




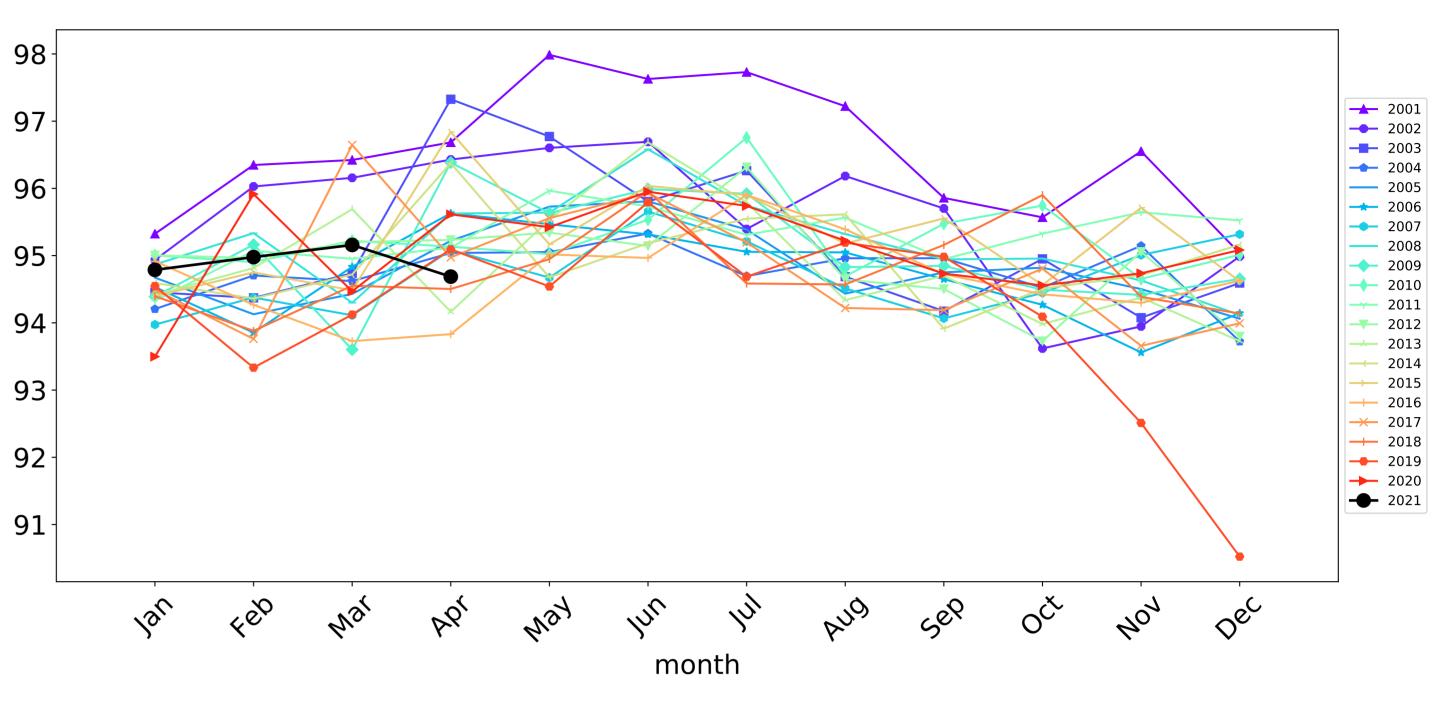


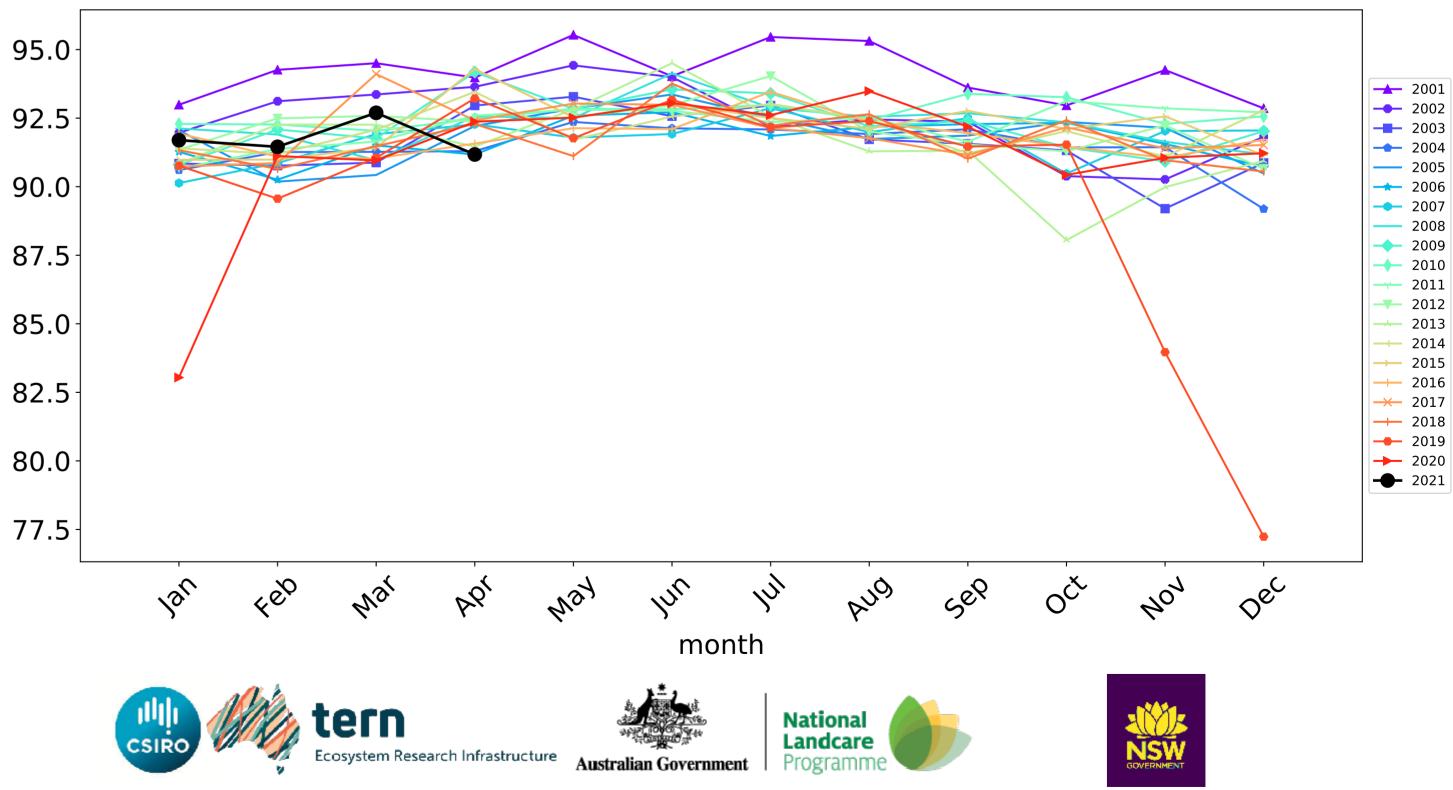
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





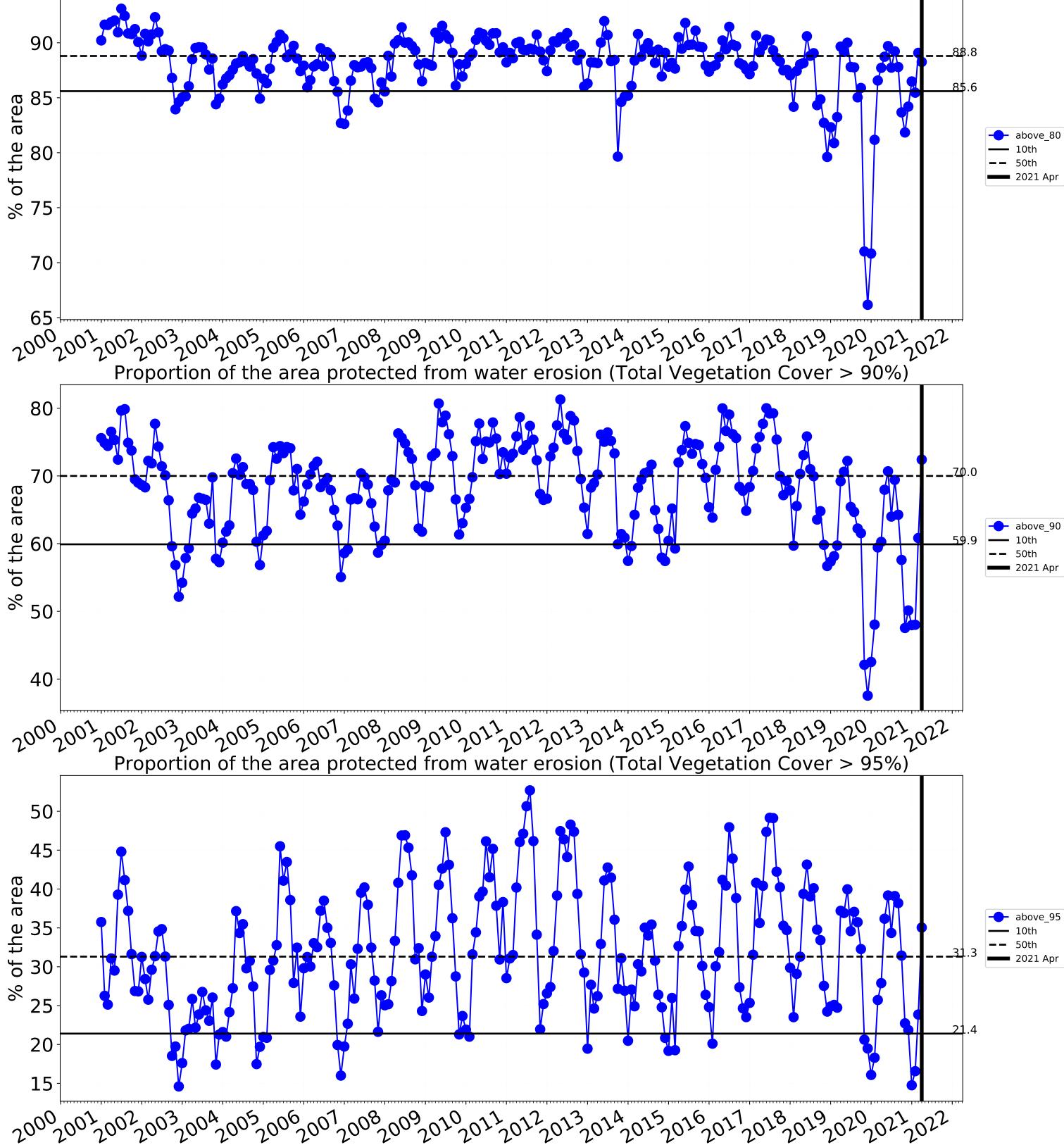
Wind erosion historical monthly area protected (Total Veg Cov >50%)

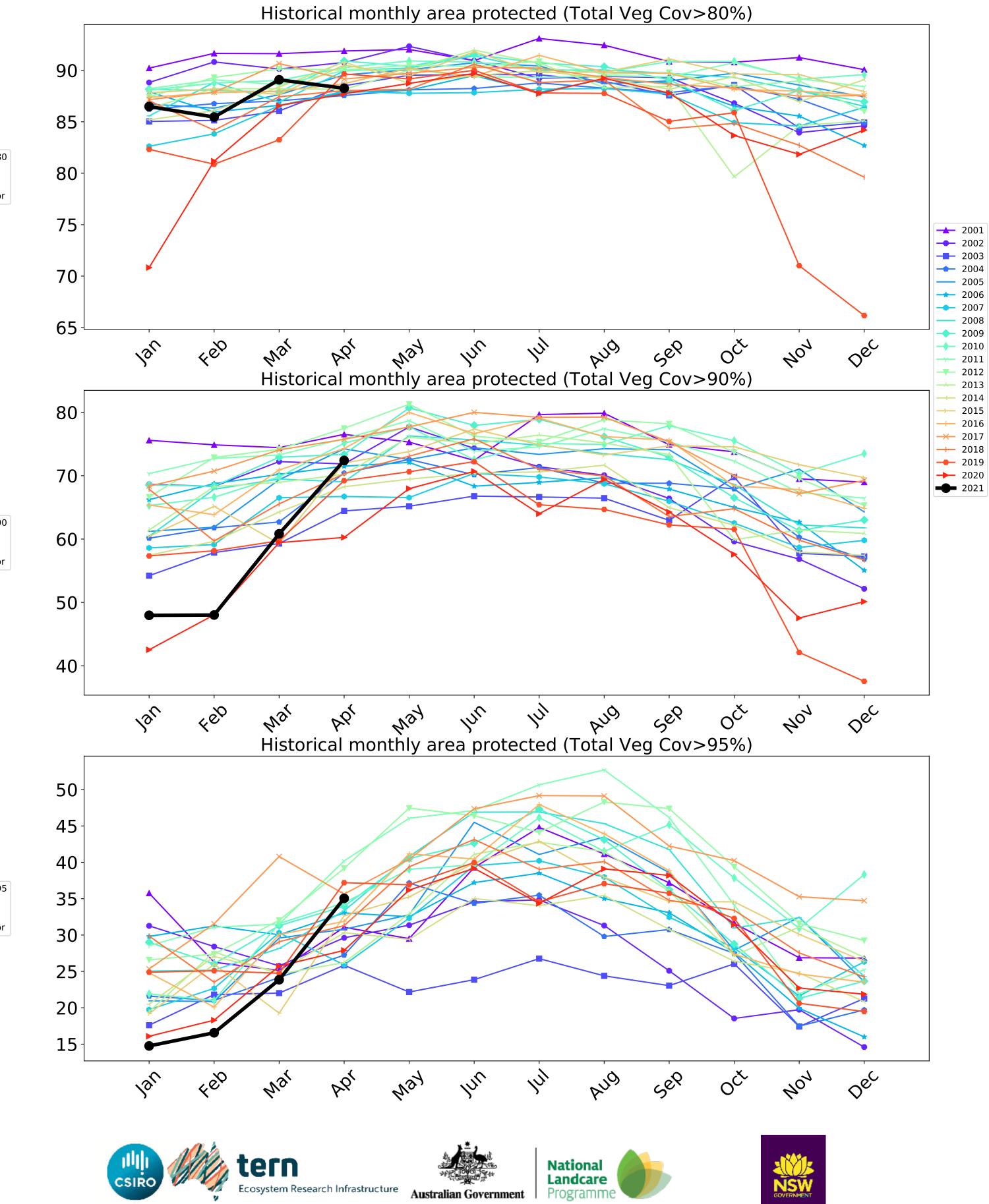




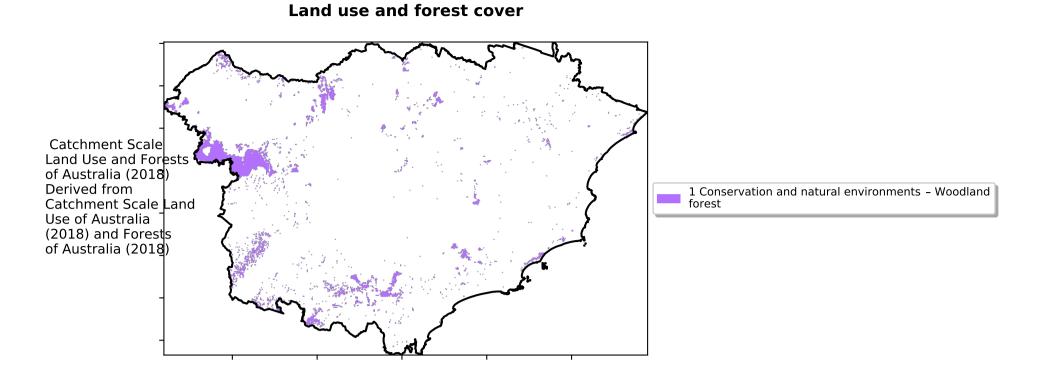
Water erosion historical monthly area protected (Total Veg Cov>70%)



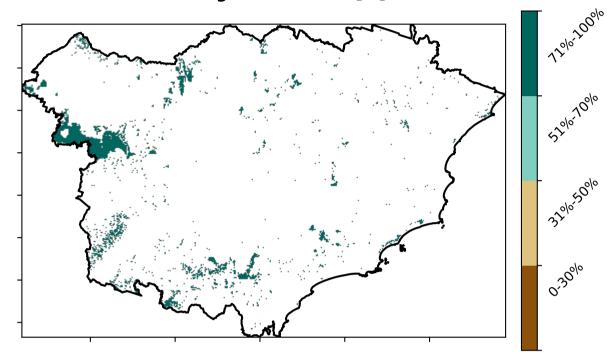




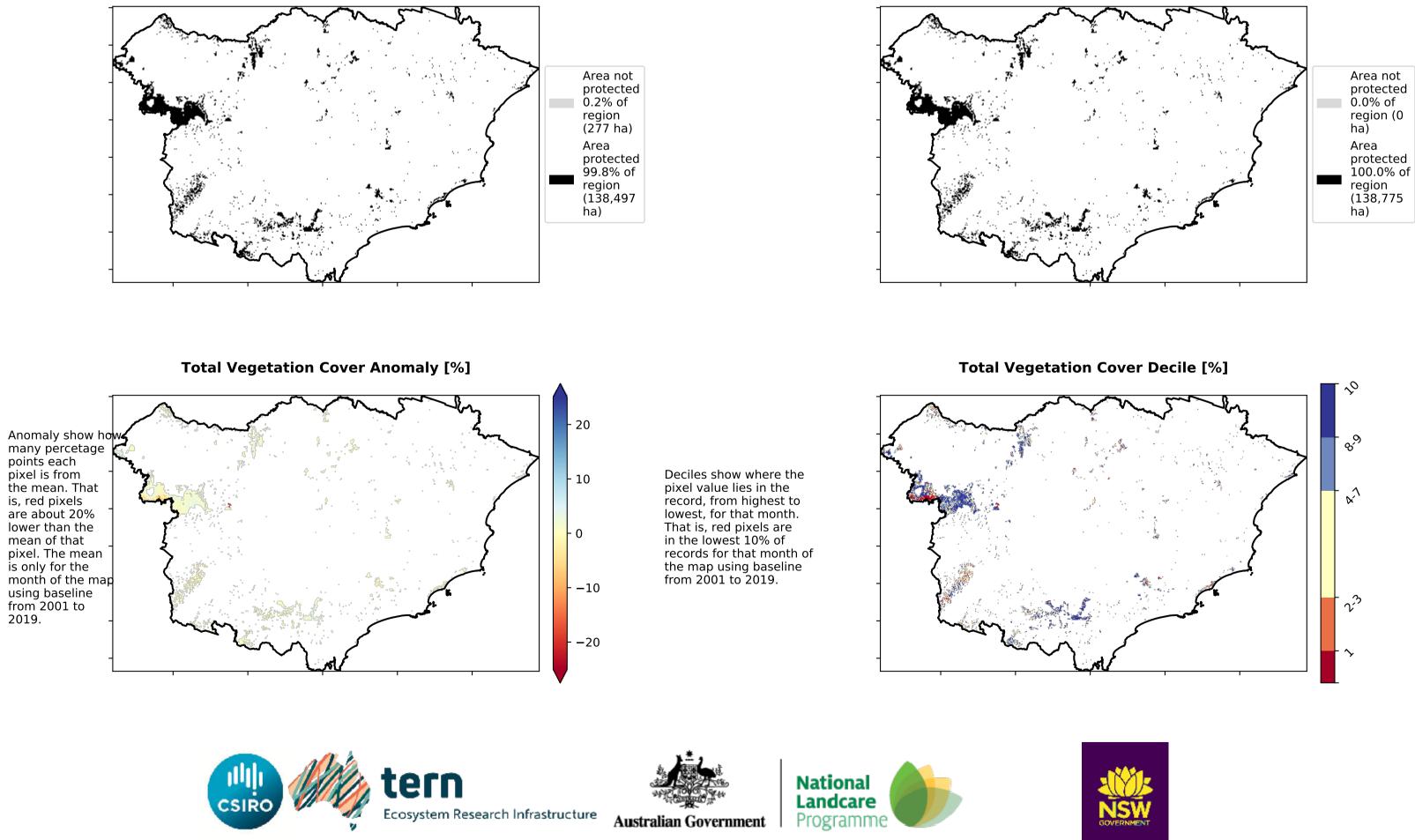
#### **Conservation and natural environments Woodland forest**



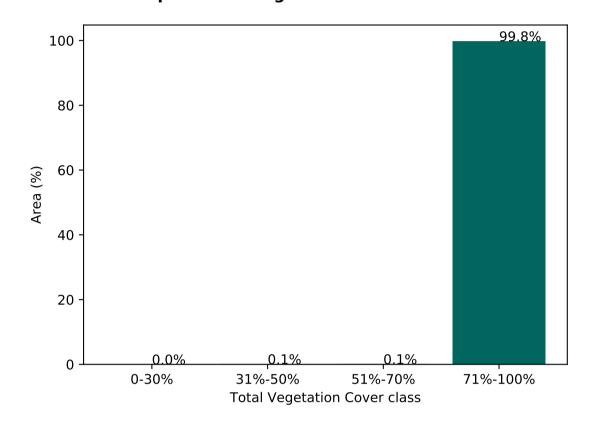
**Total Vegetation Cover [%]** 



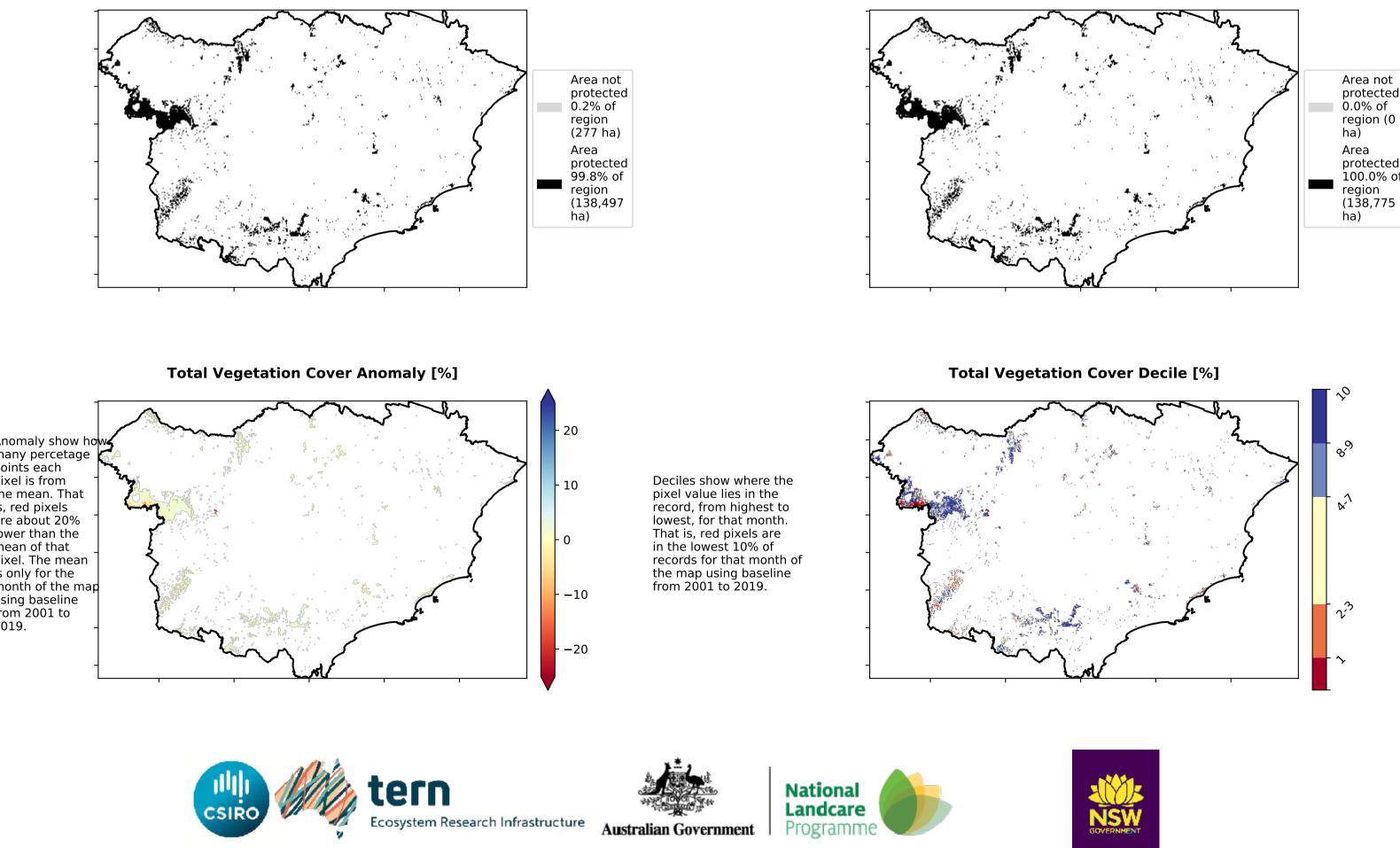
% Area protected from water erosion (>70%)



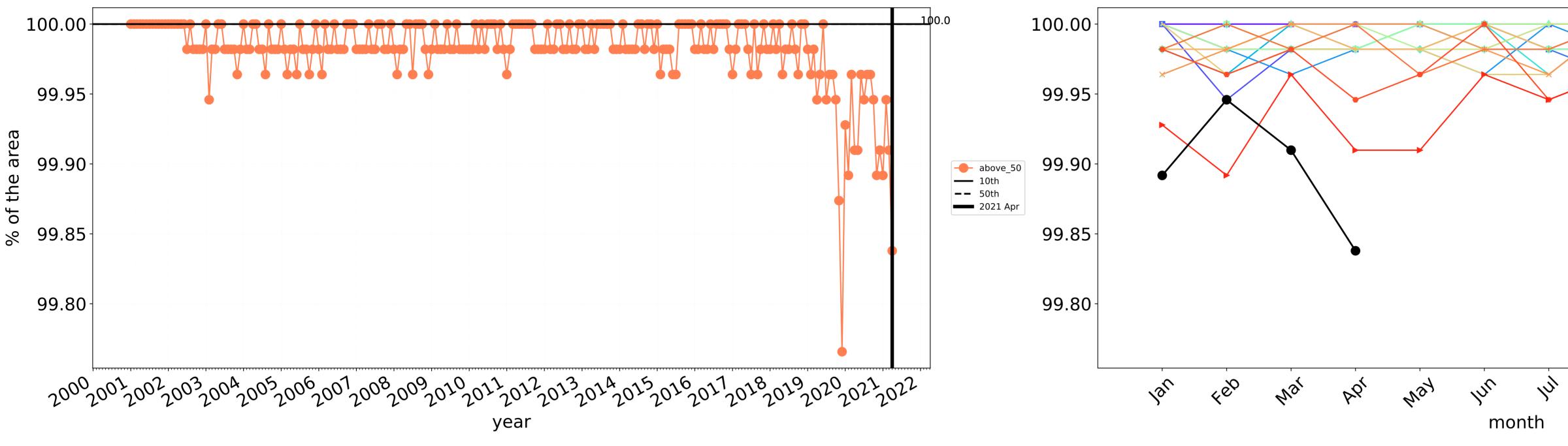
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

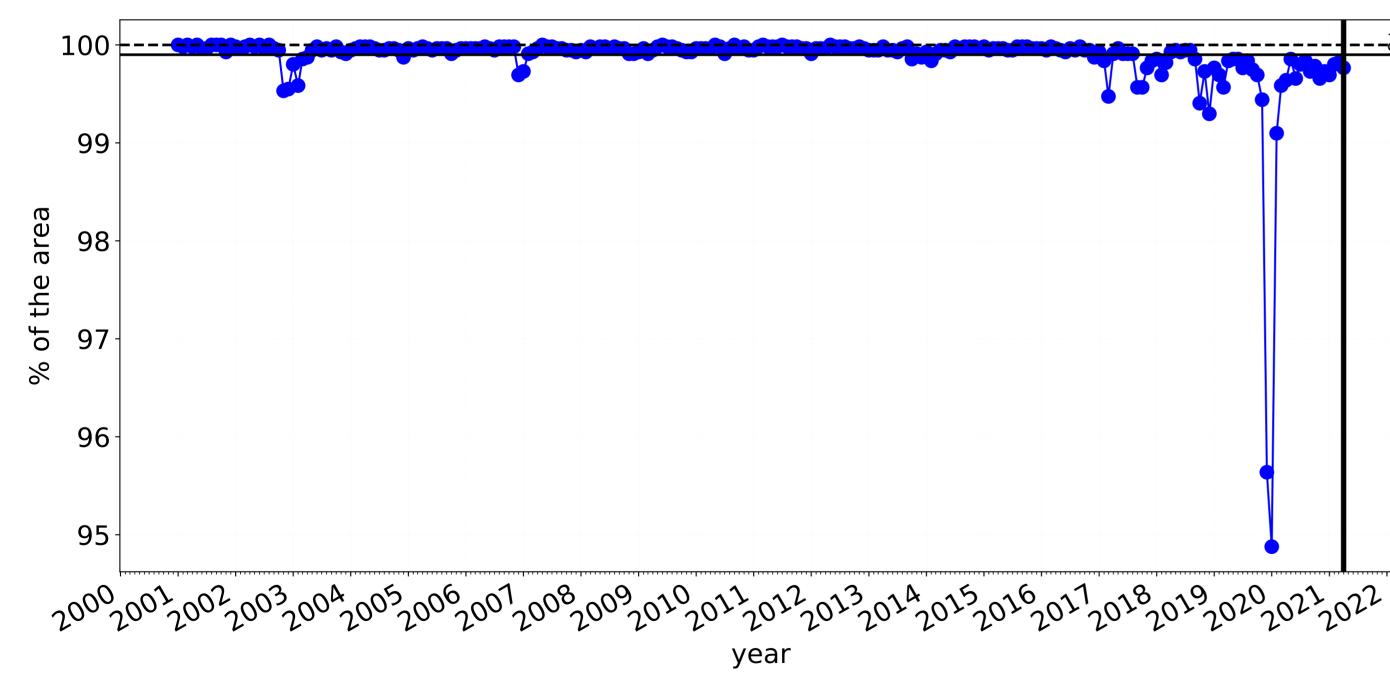


# **Conservation and natural environments Woodland forest timeseries**



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

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



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

100 **---** 2001 --- 2002 **→** 2003**→** 2004 99 \_\_\_\_ 2005 **→** 2006 ---- above\_70 --- 2007 **—** 10th 98 \_\_\_\_ 2008 **--** 50th **—** 2021 Apr --- 2010 97 \_\_\_\_ 2013 **→** 2014 → 2015 <mark>→</mark> 2016 <del>~~</del> 2017 **→** 2018 96 ---- 2019 --- 2020 ---- 2021 95 4eb AUD Ser lar OČ Dec Inu way 401 War PQ hy month mi tern National Landcare NSW Ecosystem Research Infrastructure Programn Australian Government

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

OČ

AUG

Ser

401

Dec

**\_\_\_** 2001 --- 2002 ---- 2003

--- 2004 \_\_\_\_ 2005 **----** 2006

--- 2007 2008

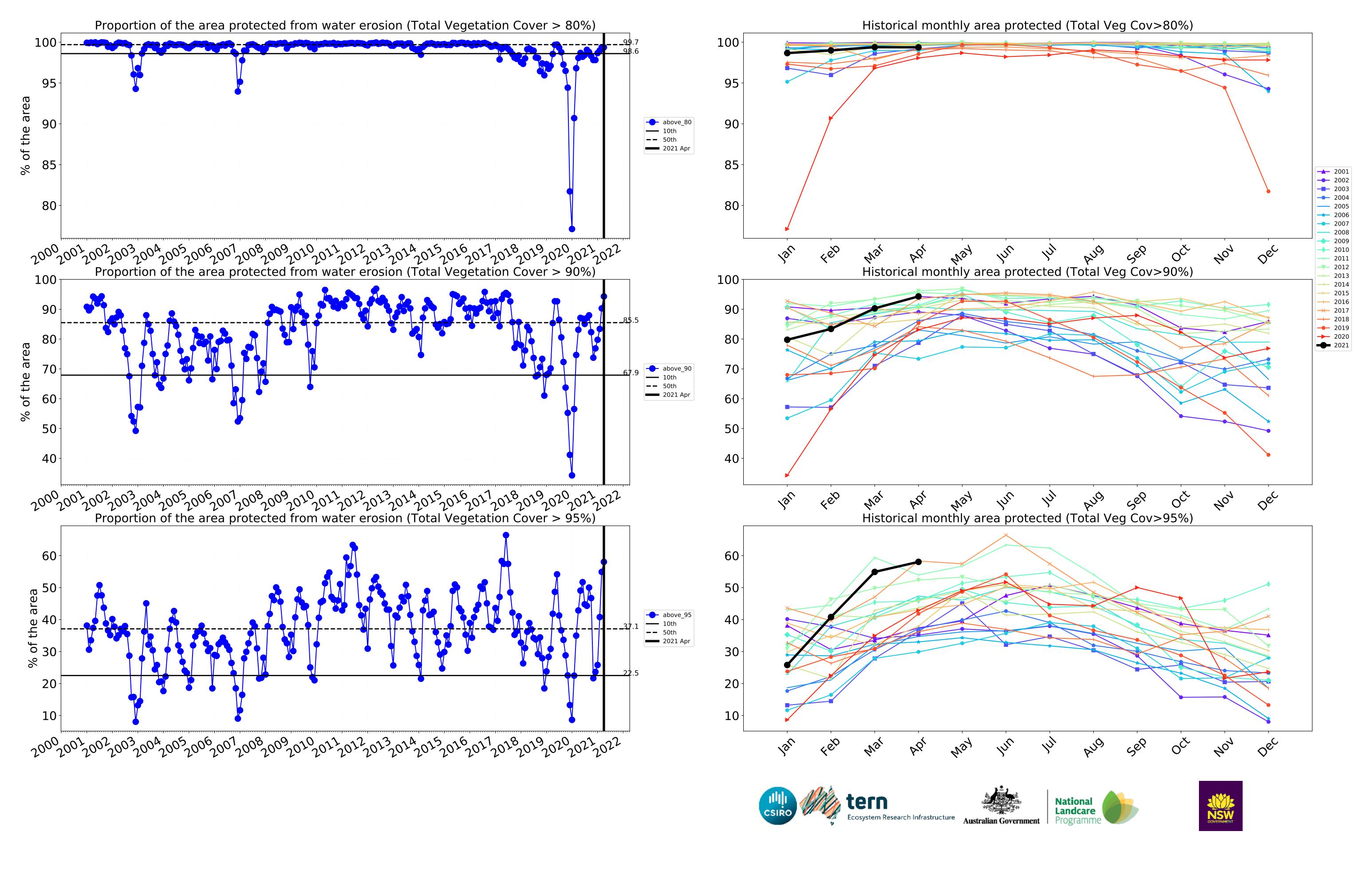
→ 2009→ 2010

---- 2011 ---- 2012

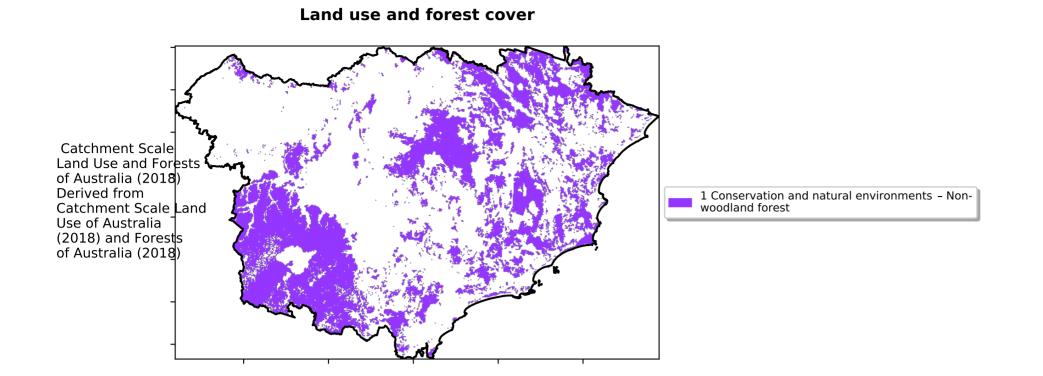
\_\_\_\_ 2013 **→** 2014

<mark>→</mark> 2015 --- 2016 <del>→</del> 2017 **→** 2018 --- 2019

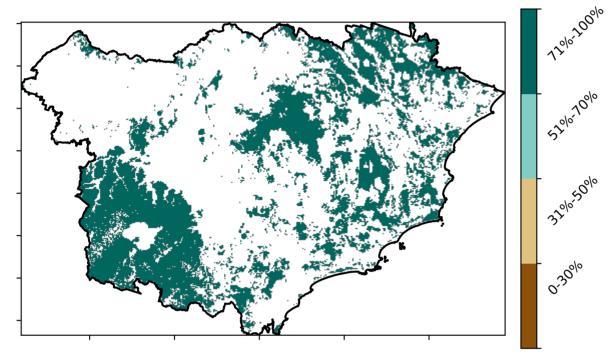
→ 2020 ---- 2021



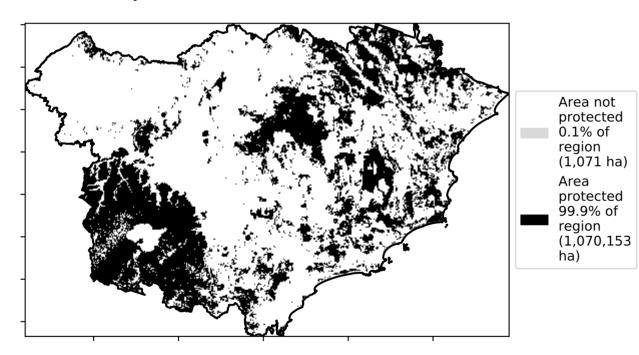
#### **Conservation and natural environments Forest (non woodland)**



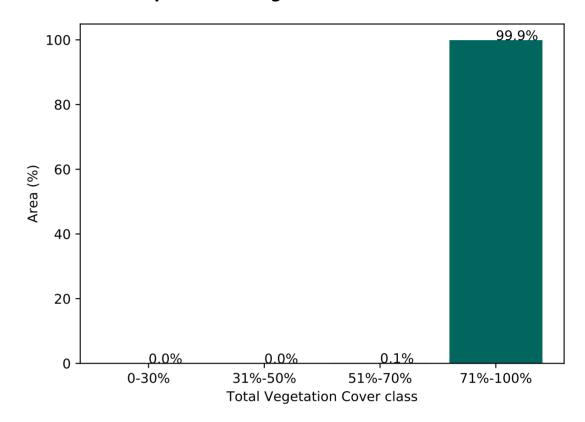
#### Total Vegetation Cover [%]



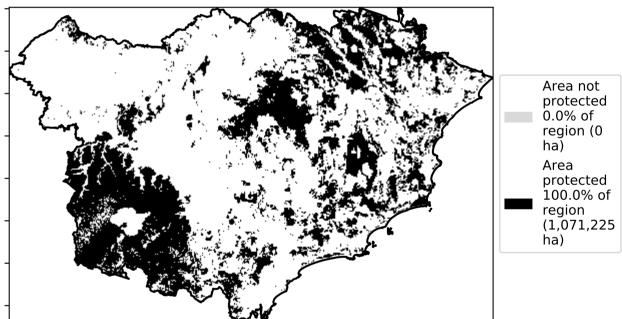
% Area protected from water erosion (>70%)



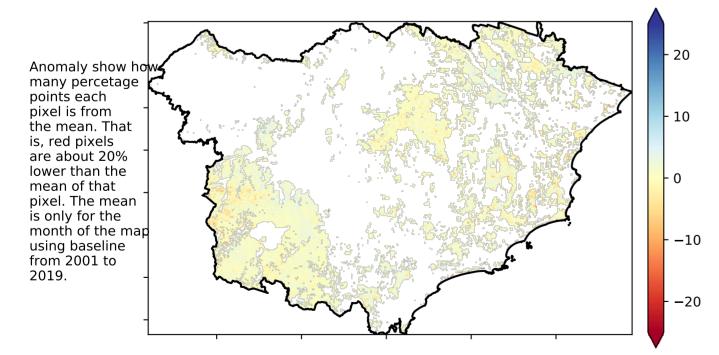
Proportion of vegetation cover class in area



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

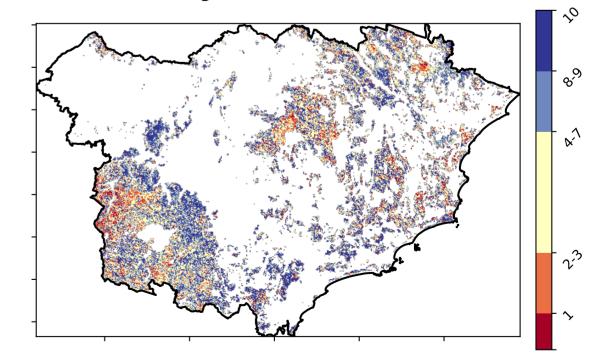


**Total Vegetation Cover Anomaly [%]** 

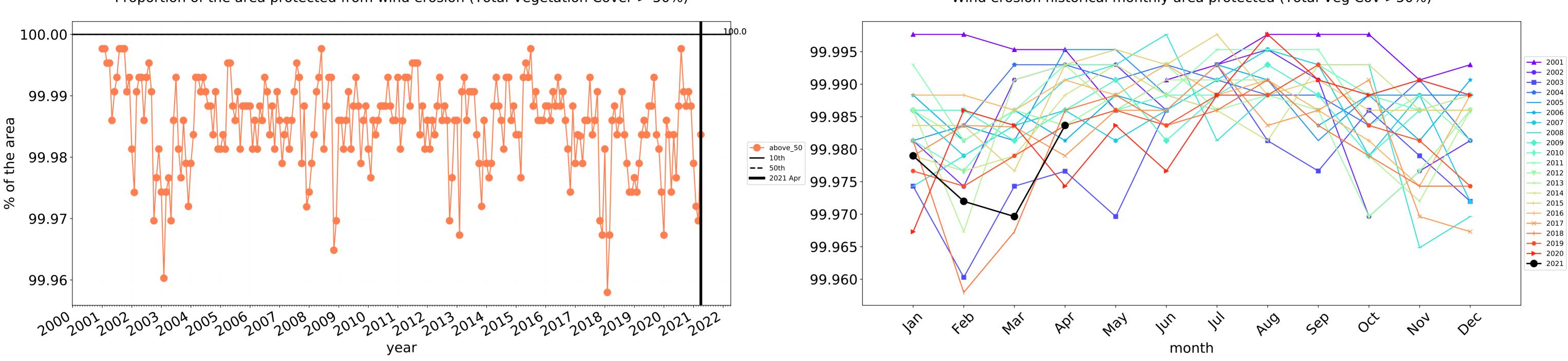


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

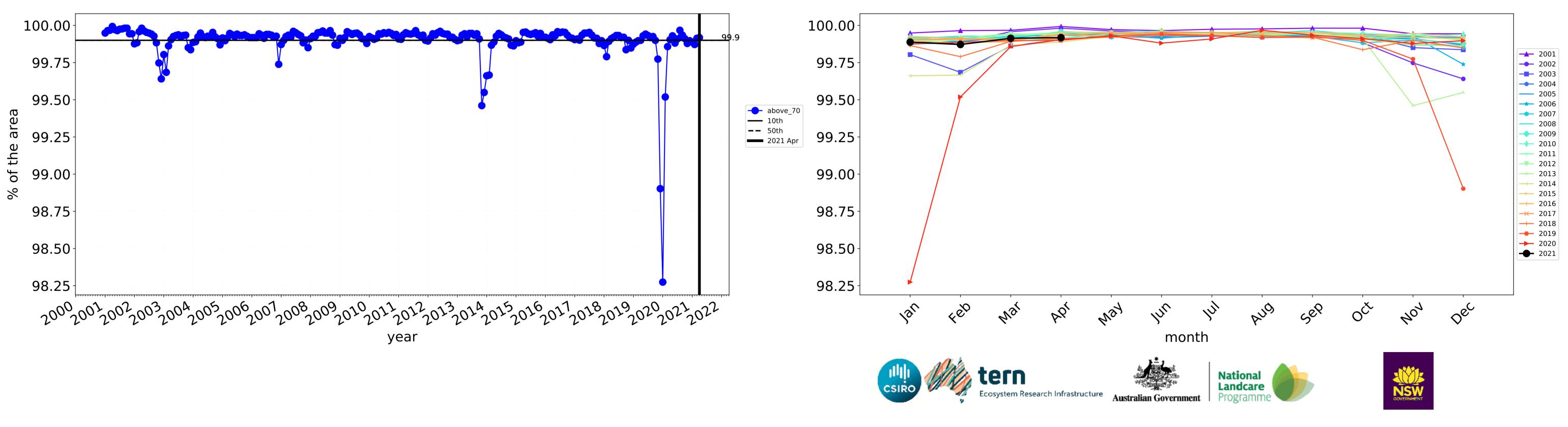
Total Vegetation Cover Decile [%]





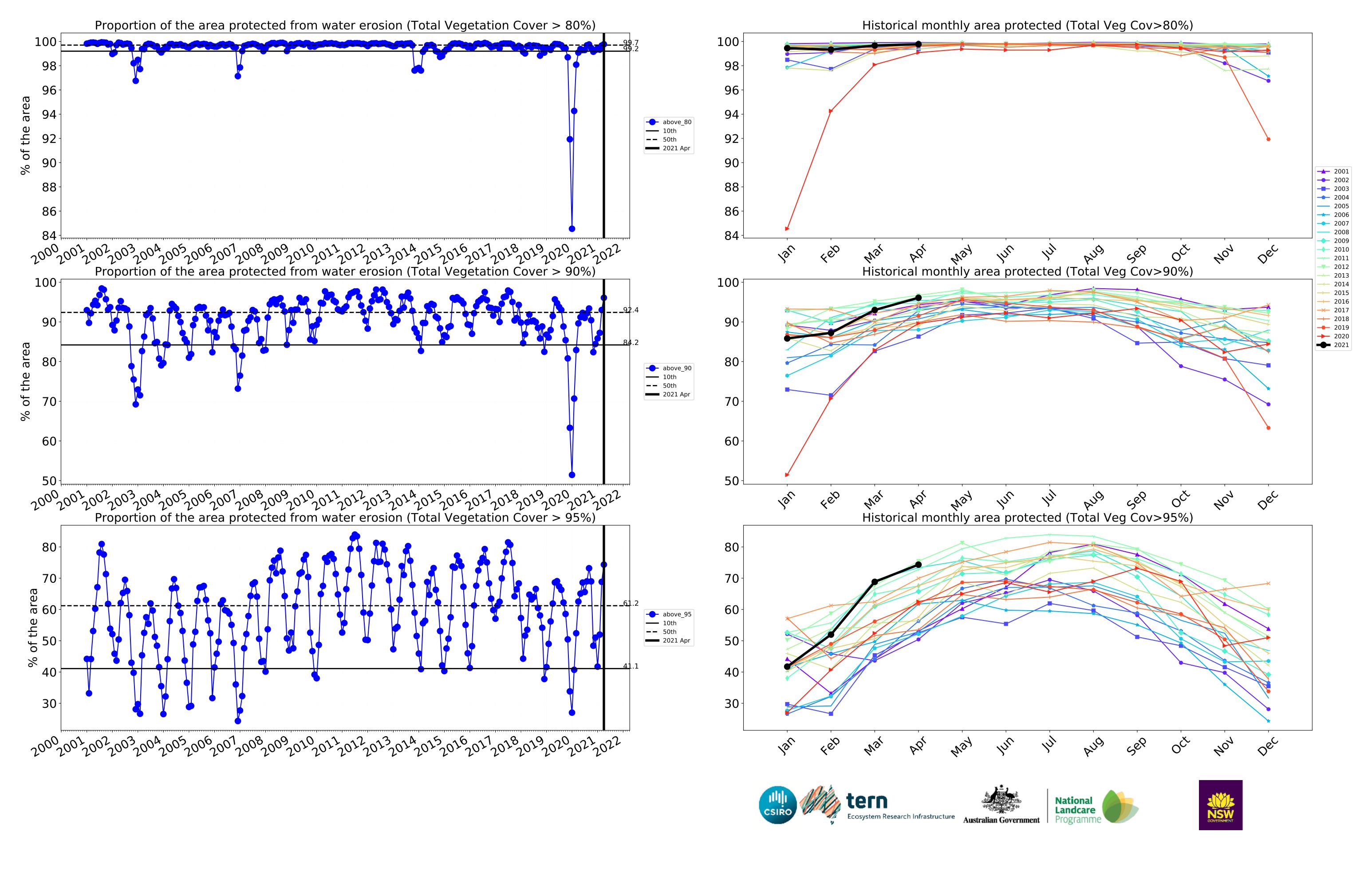


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



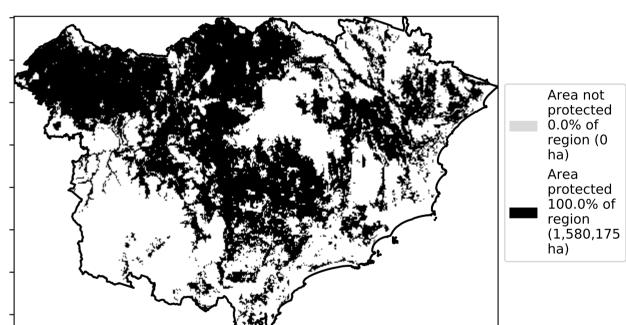
Water erosion historical monthly area protected (Total Veg Cov>70%)

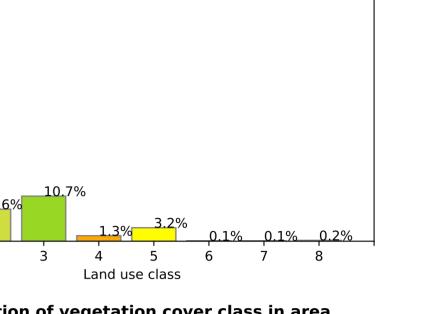
Wind erosion historical monthly area protected (Total Veg Cov >50%)



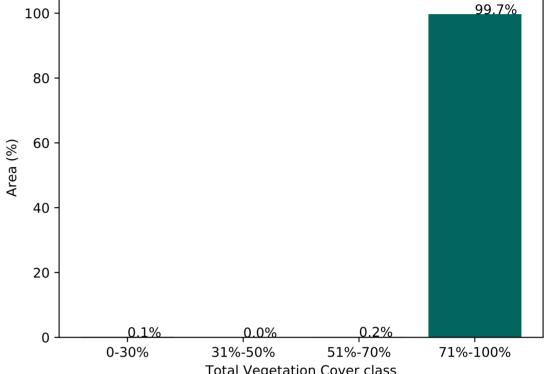
# Agriculture

Land use and forest cover 80 -<u>76.</u>7% 70 -60 Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Agriculture - Grazing - Non forest 50 2 Agriculture - Grazing - Woodland forest Area (%) 05 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated Catchment Scale Land 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests of Australia (2018) 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 30 8 Agriculture - Horticulture - Irrigated 20 <u>10.</u>7% 10 <u>7.6</u>% 0 1 2 3 Land use class **Total Vegetation Cover [%]** 12%-2001 100 80 52°10'10°1 60 Area (%) 32010 40 0.30% 20 0.0% 0.2% 0.1% 0 0-30% 31%-50% 51%-70% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)

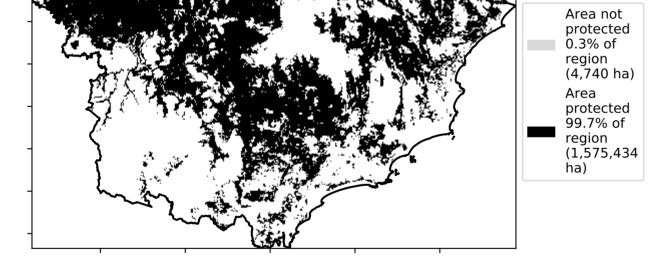




Proportion of vegetation cover class in area



Proportion of each land class in area



Total Vegetation Cover Anomaly [%]

· 20 Anomaly show how many percetage points each pixel is from the mean. That · 10 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 the map using baseline from 2001 to 2019.

0

-10

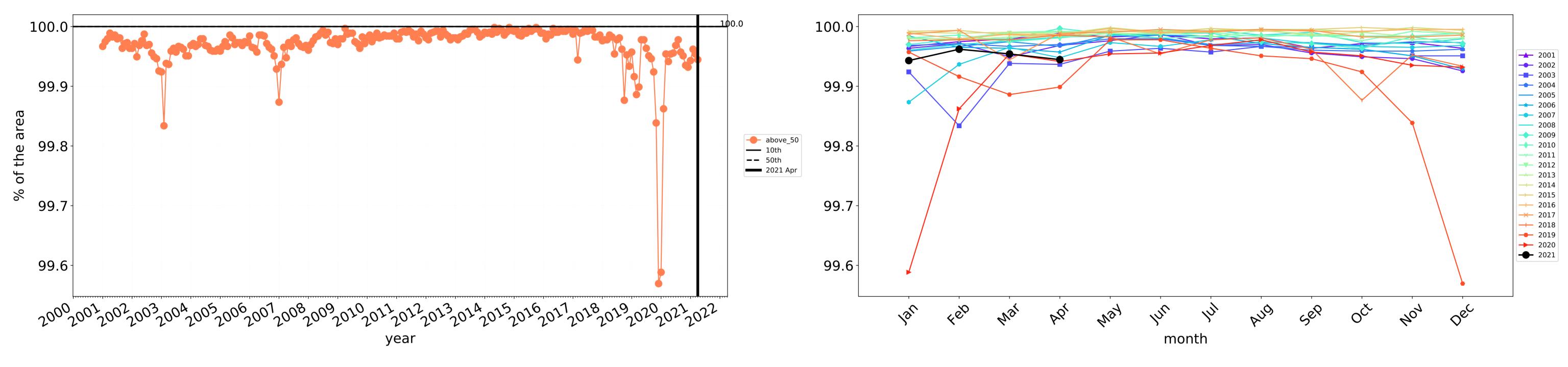
-20

 $\hat{\mathcal{S}}$ °, A.1 · 2<sup>3</sup>

**Total Vegetation Cover Decile [%]** 

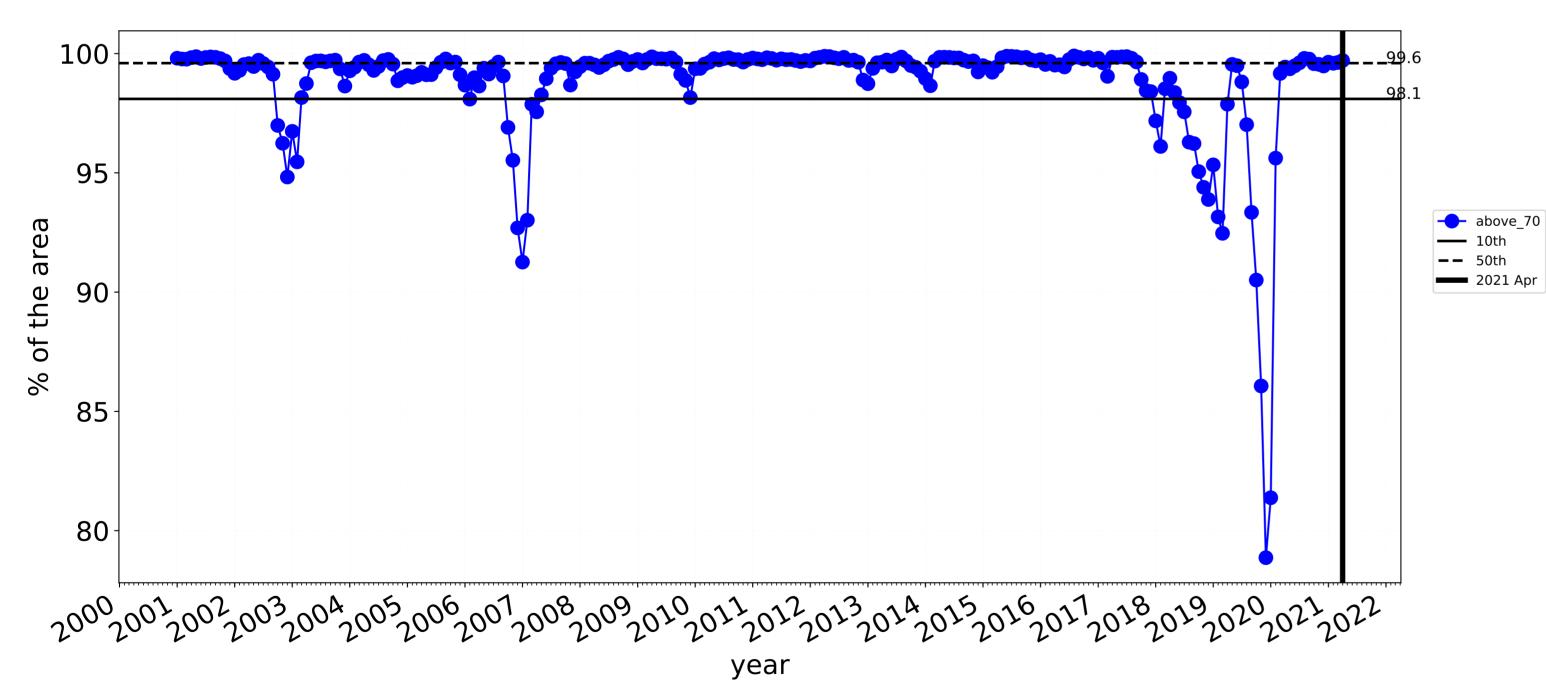


12



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

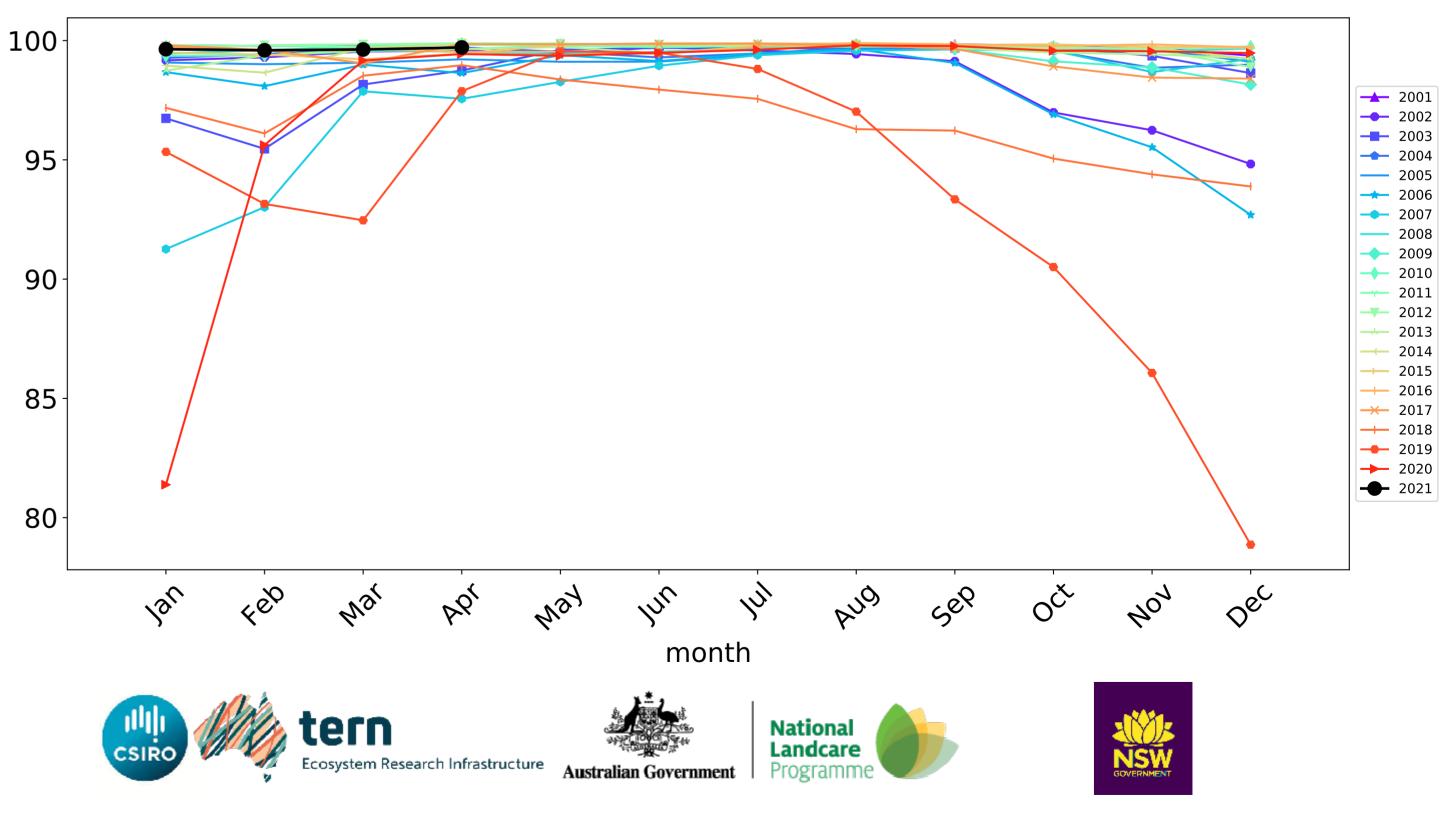
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

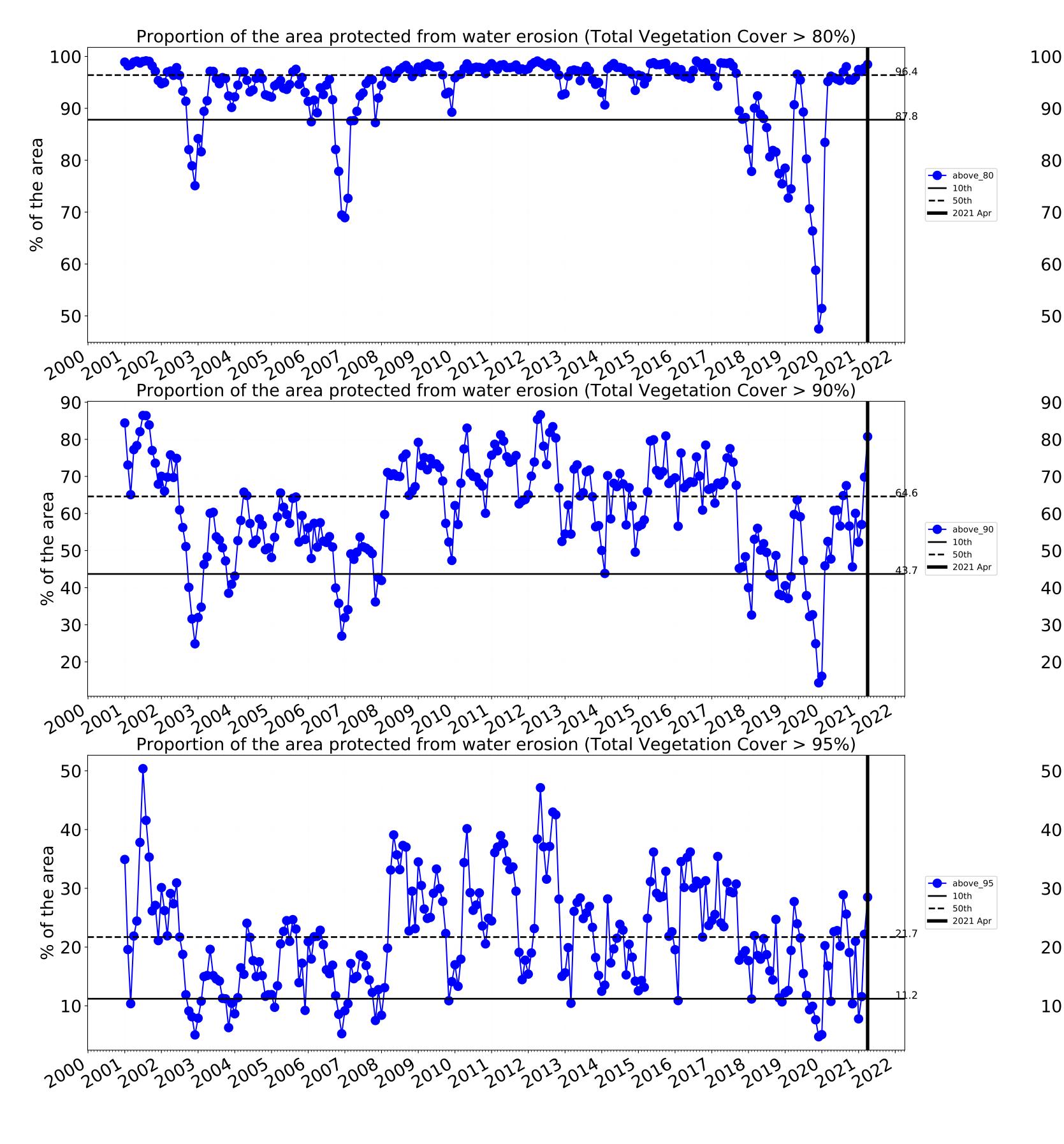


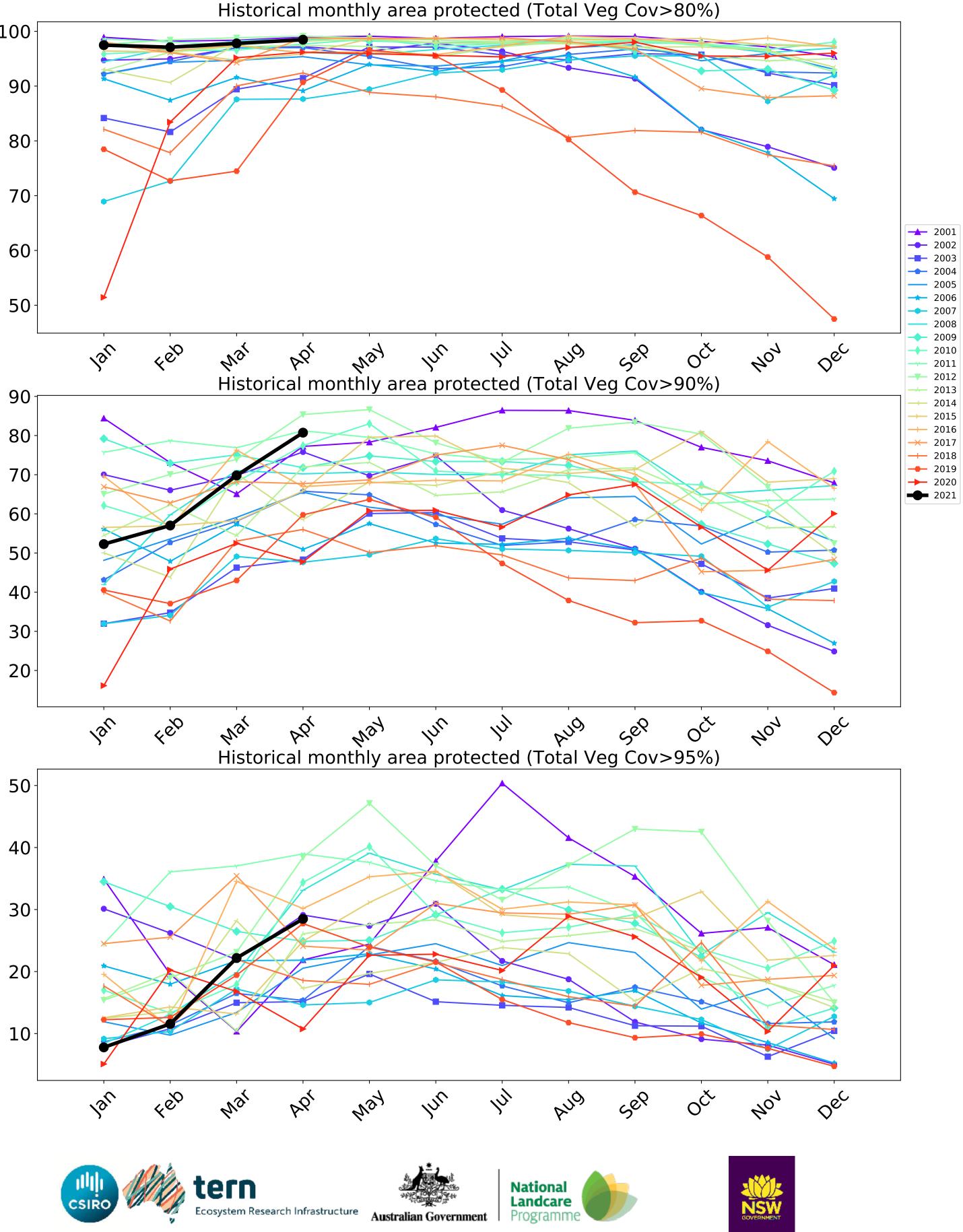
# Agriculture timeseries

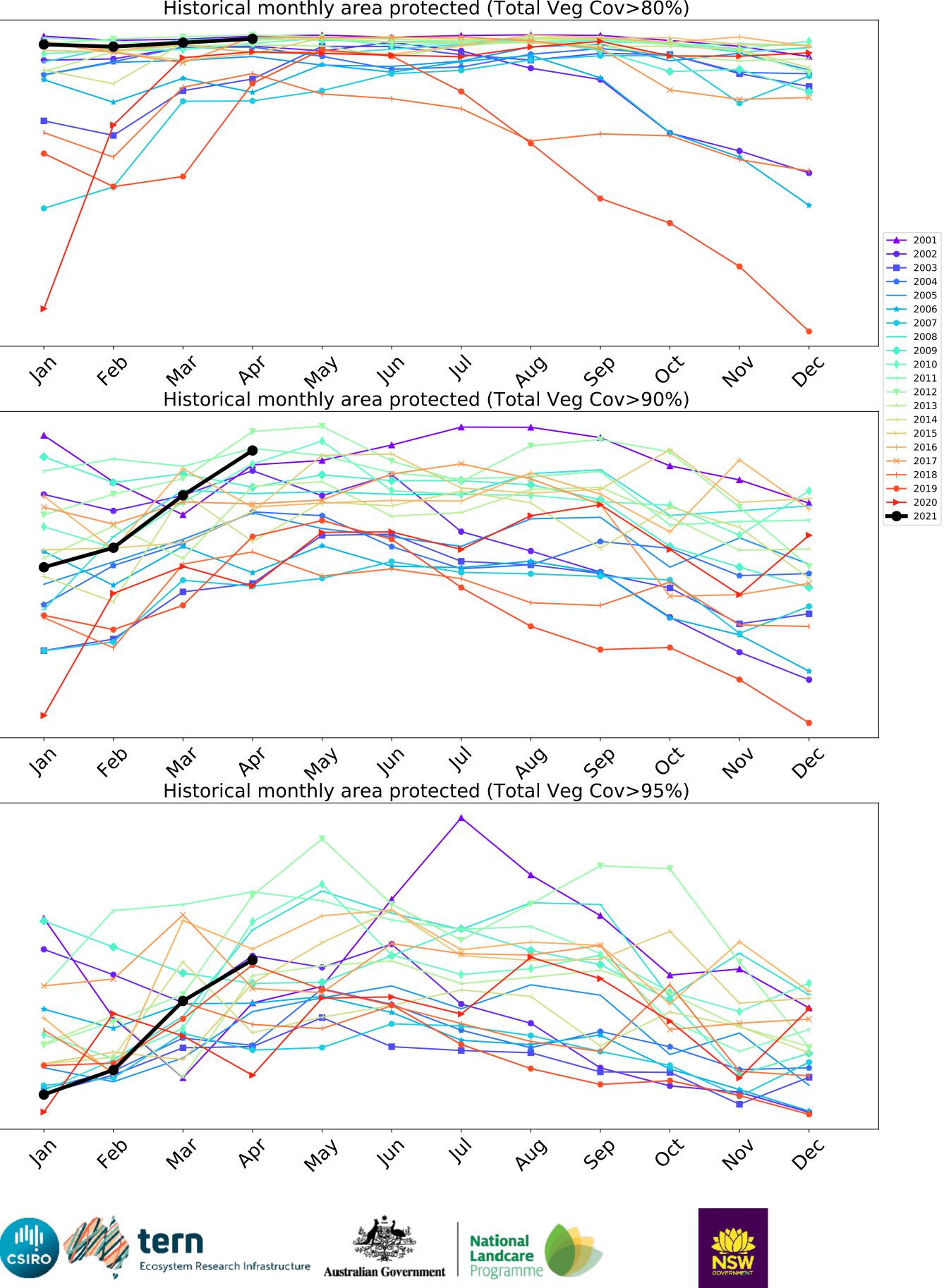
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

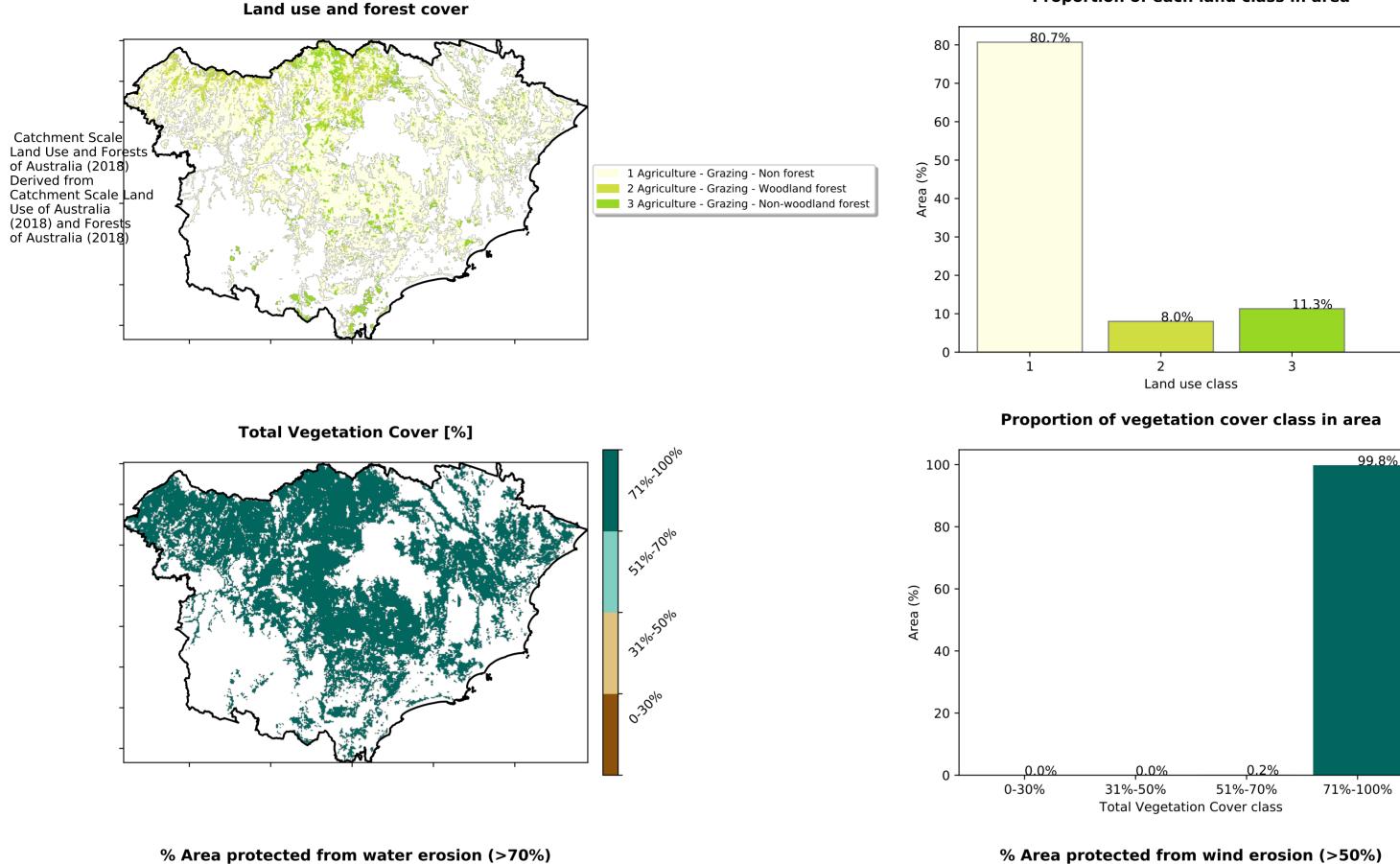


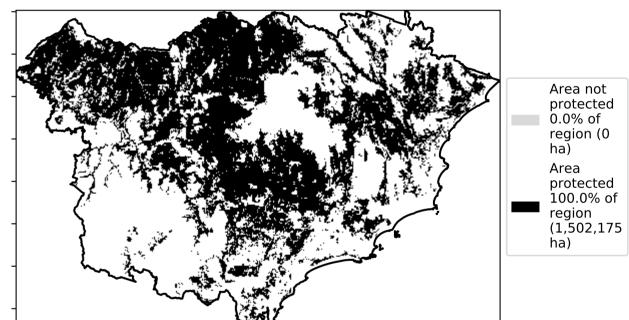




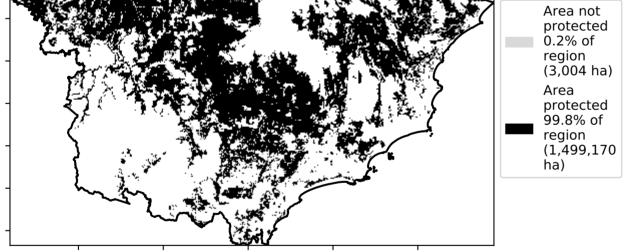


# Grazing





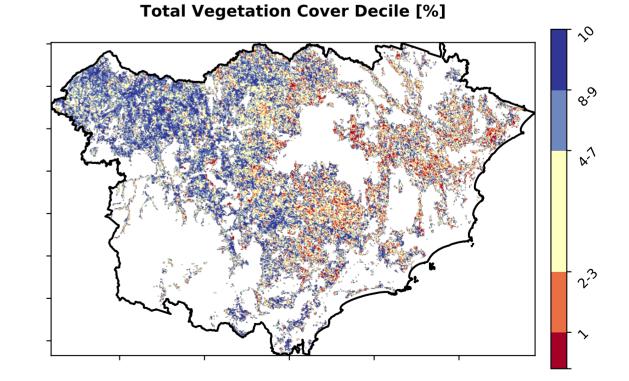
#### Proportion of each land class in area



Total Vegetation Cover Anomaly [%]

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

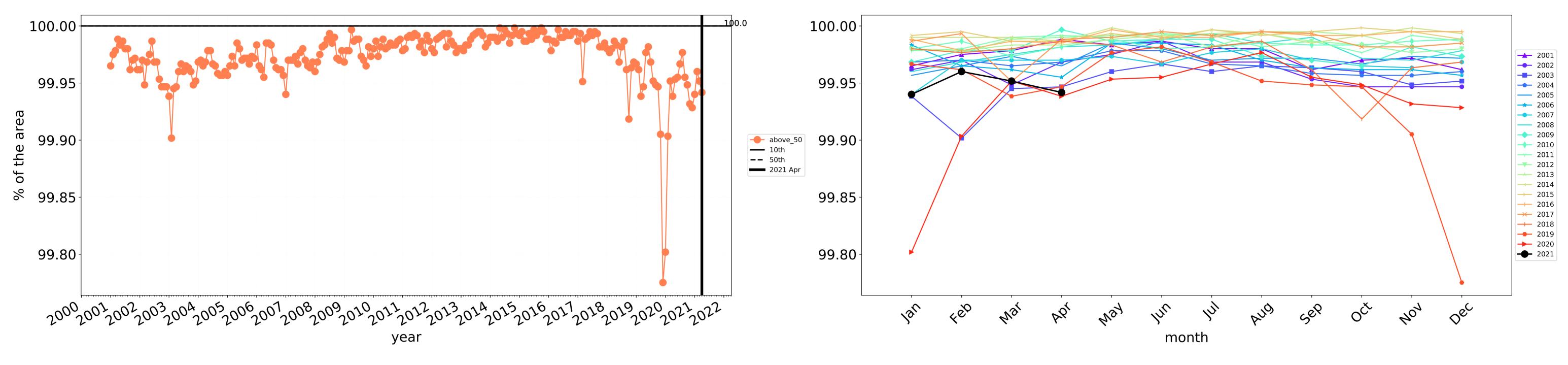
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.



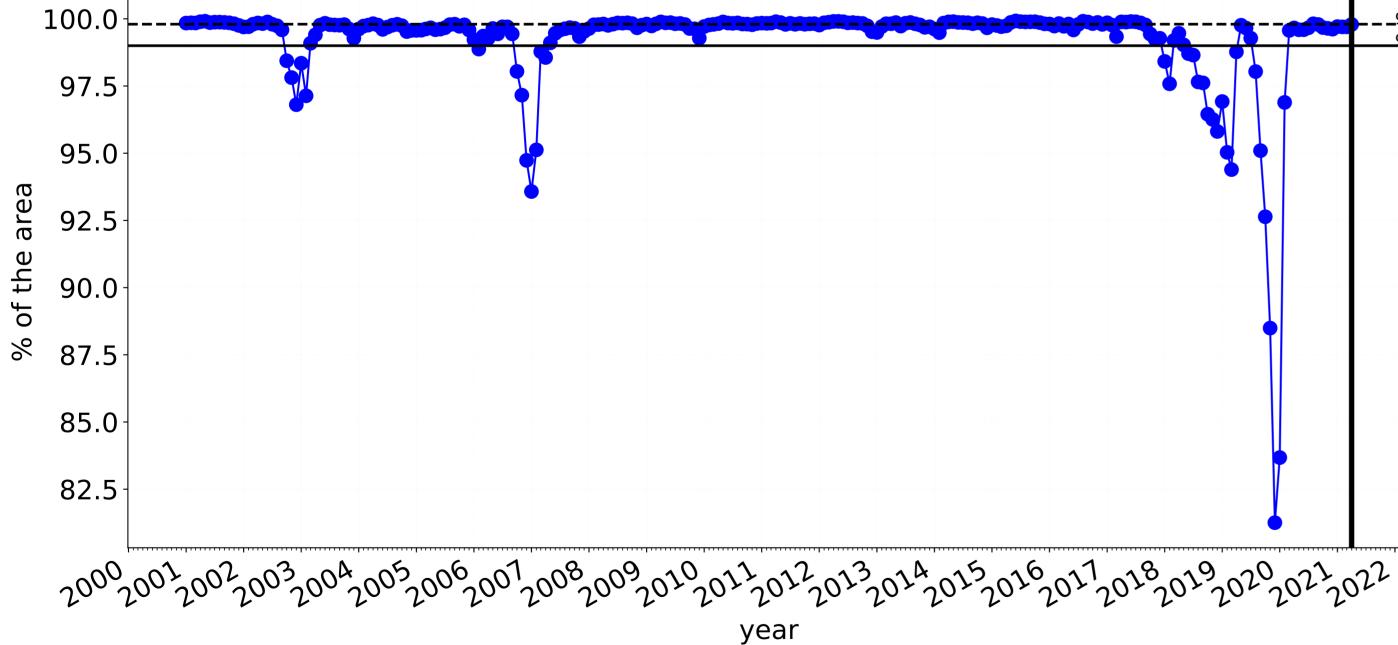


-10

-20



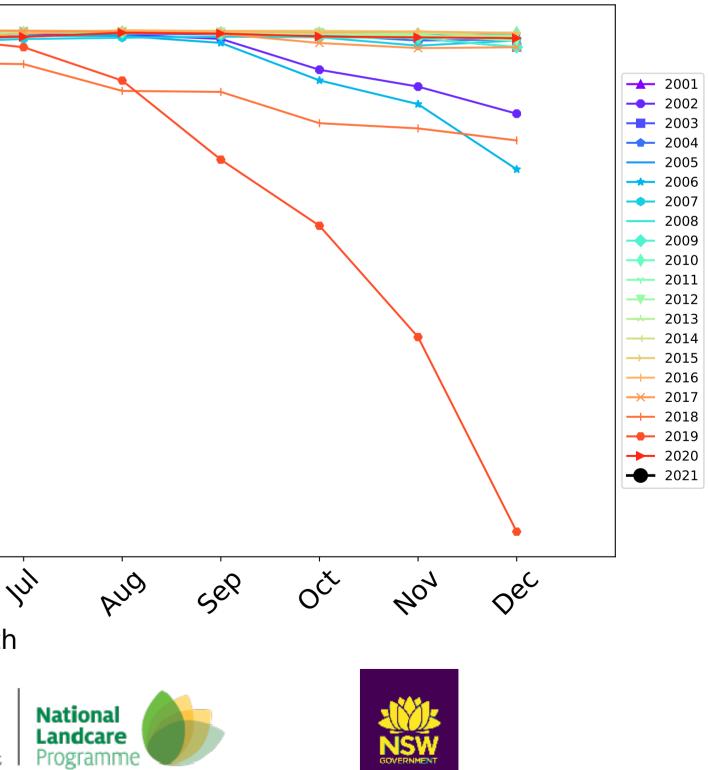
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

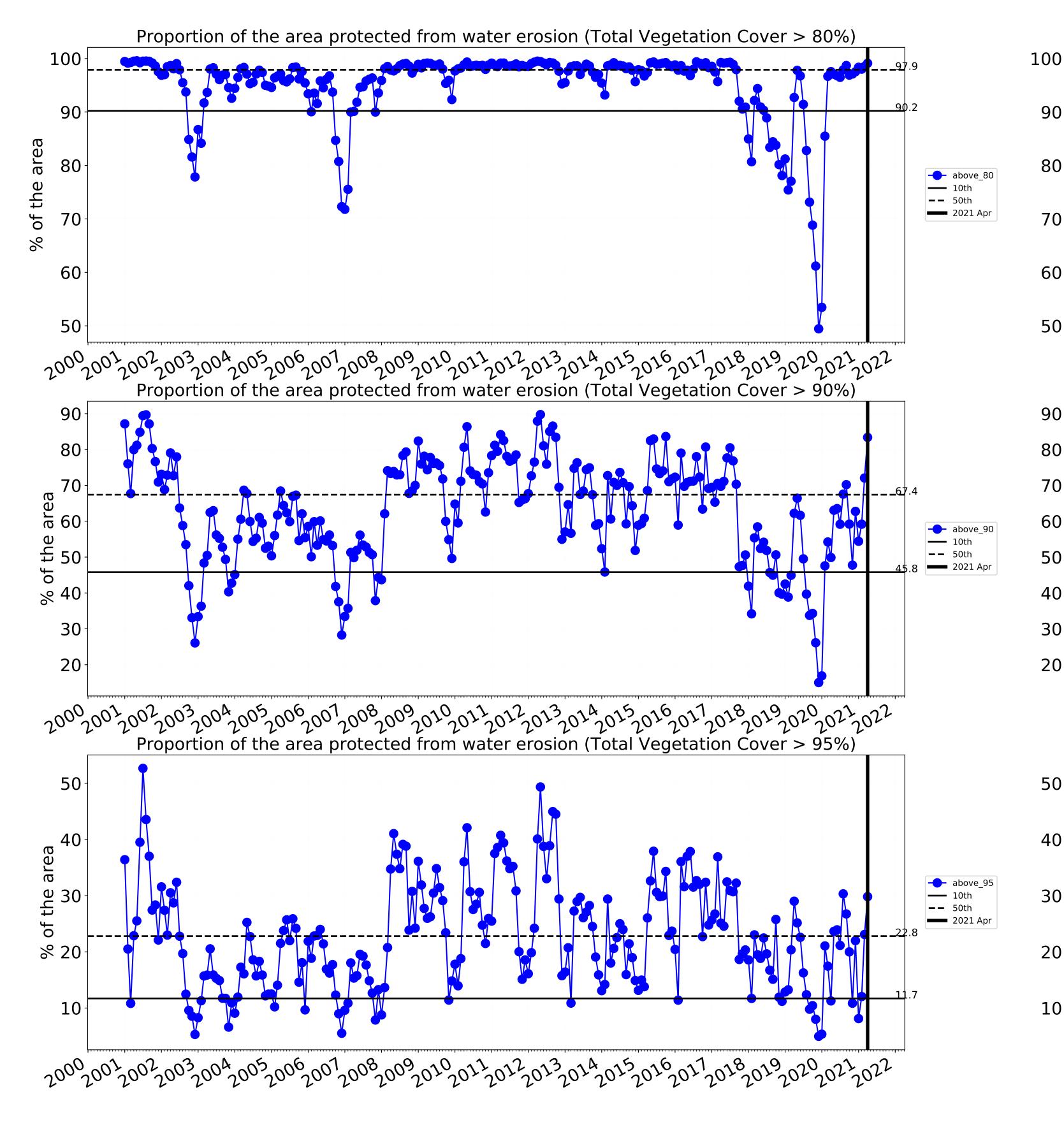


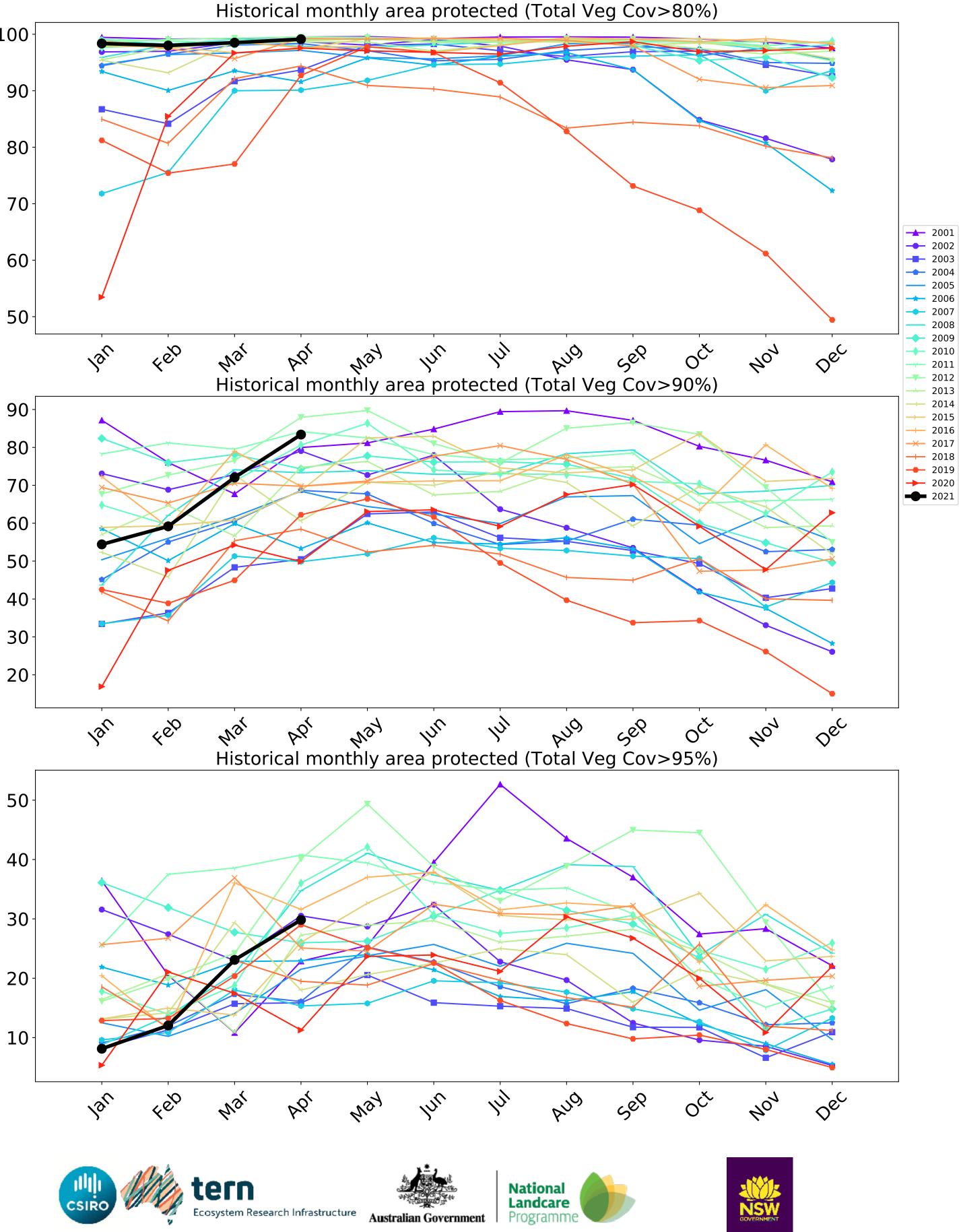
Wind erosion historical monthly area protected (Total Veg Cov >50%)

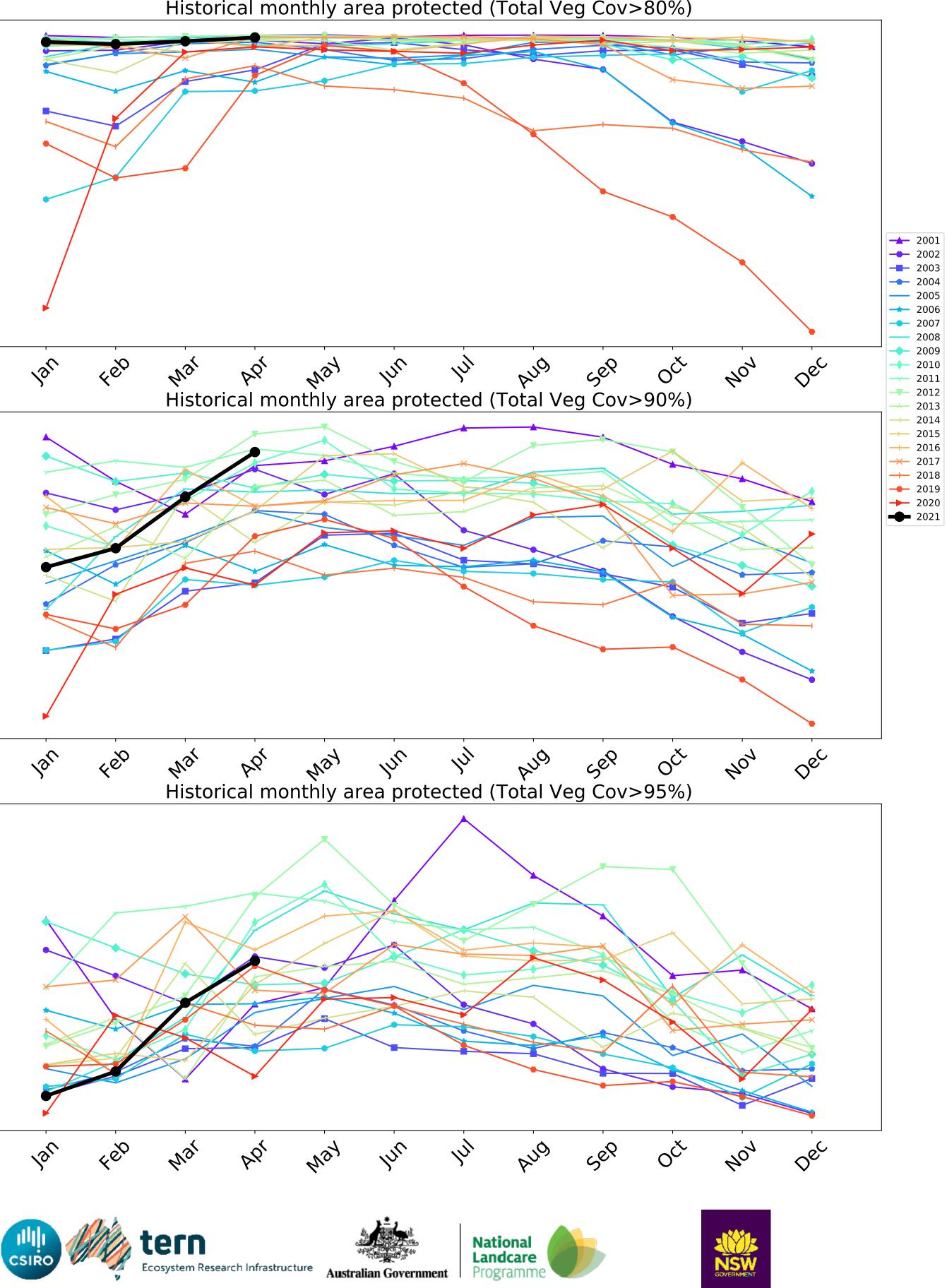
100.0-97.5 95.0 ---- above\_70 **—** 10th 92.5 **——** 50th **——** 2021 Apr 90.0 87.5 85.0 82.5 4eb Jan In way POL Mar month tern Ecosystem Research Infrastructure Australian Government

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





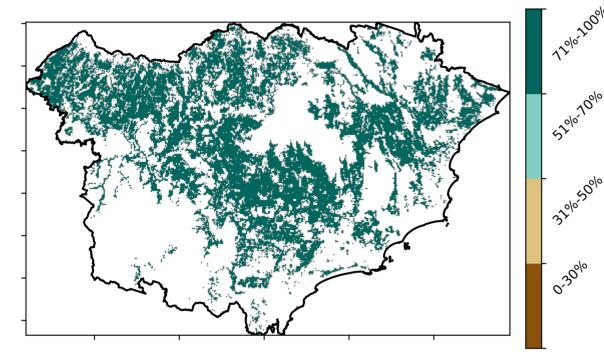




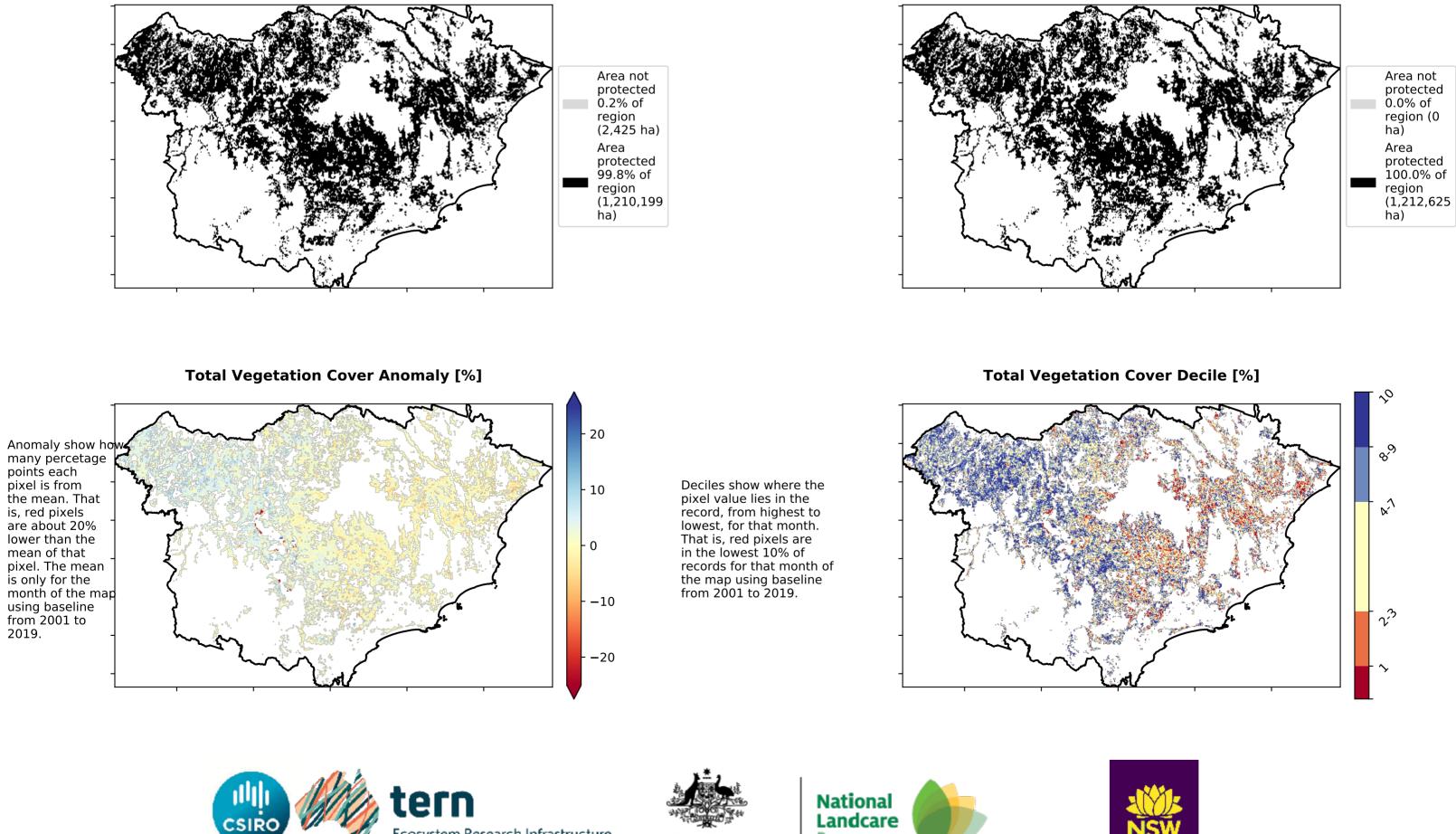
# **Grazing non forest**

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

**Total Vegetation Cover [%]** 

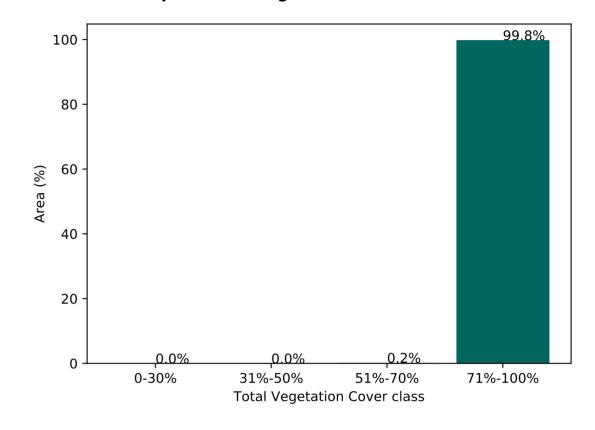


% Area protected from water erosion (>70%)

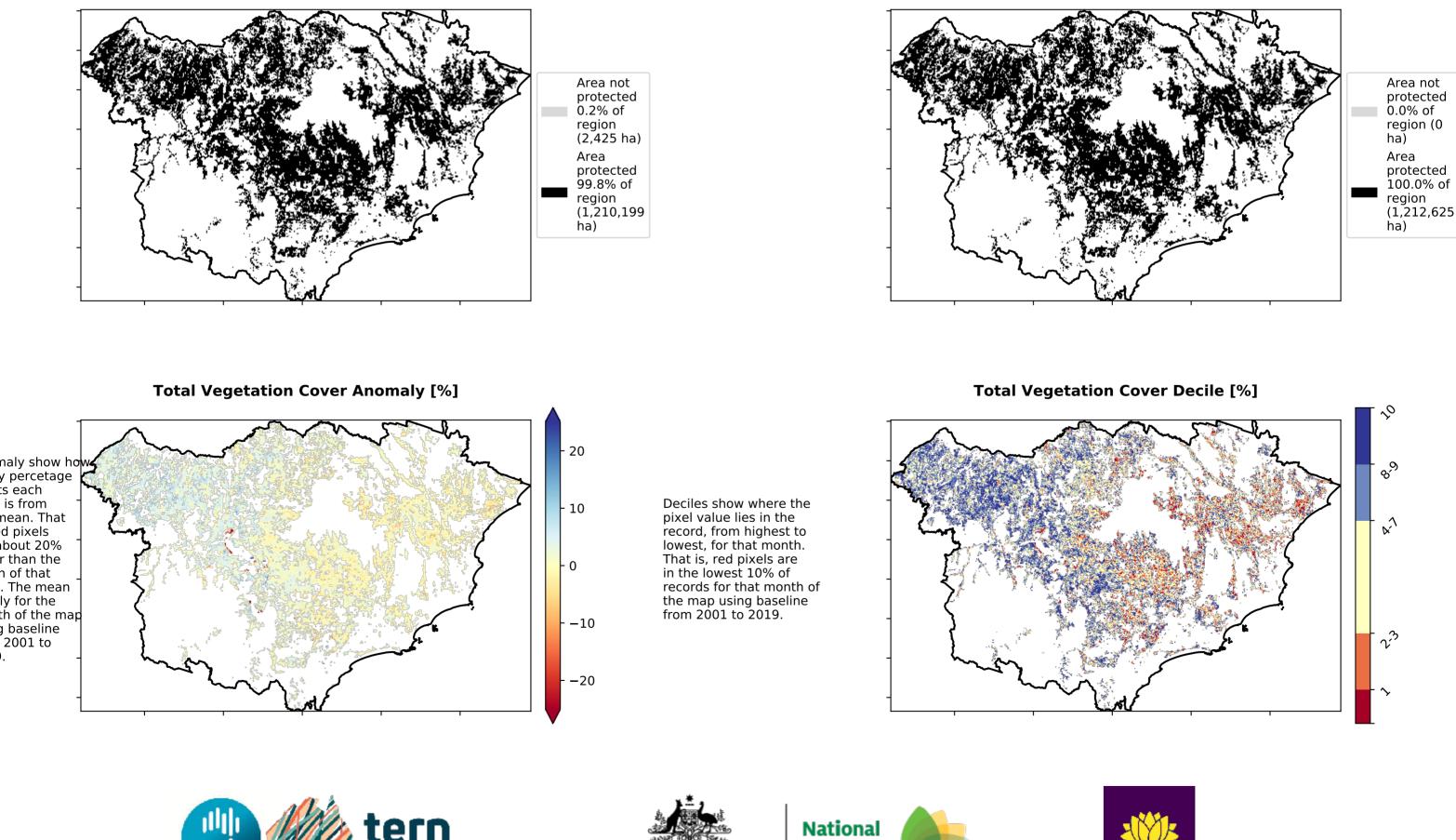


Programme

Proportion of vegetation cover class in area

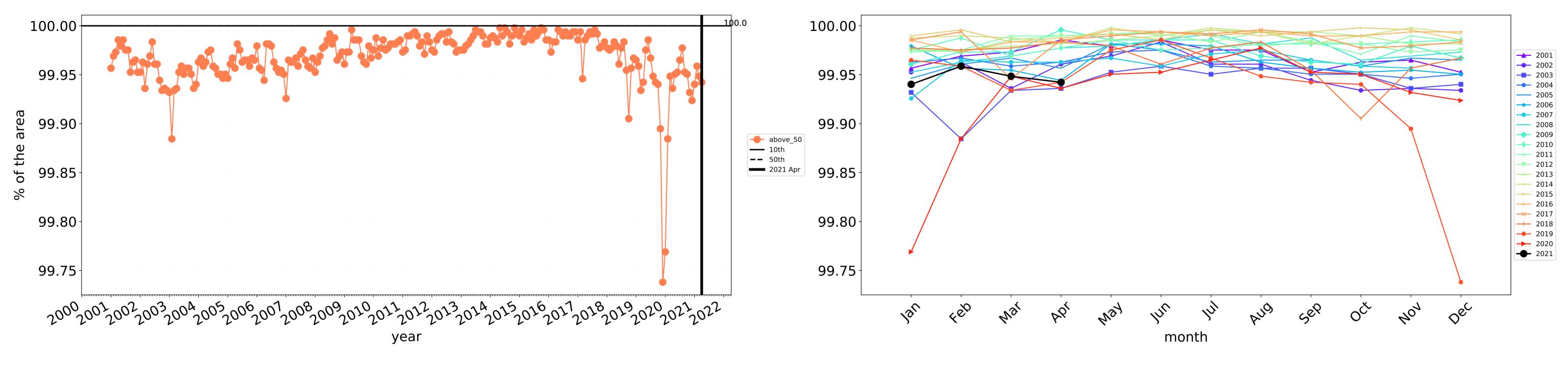


#### % Area protected from wind erosion (>50%)



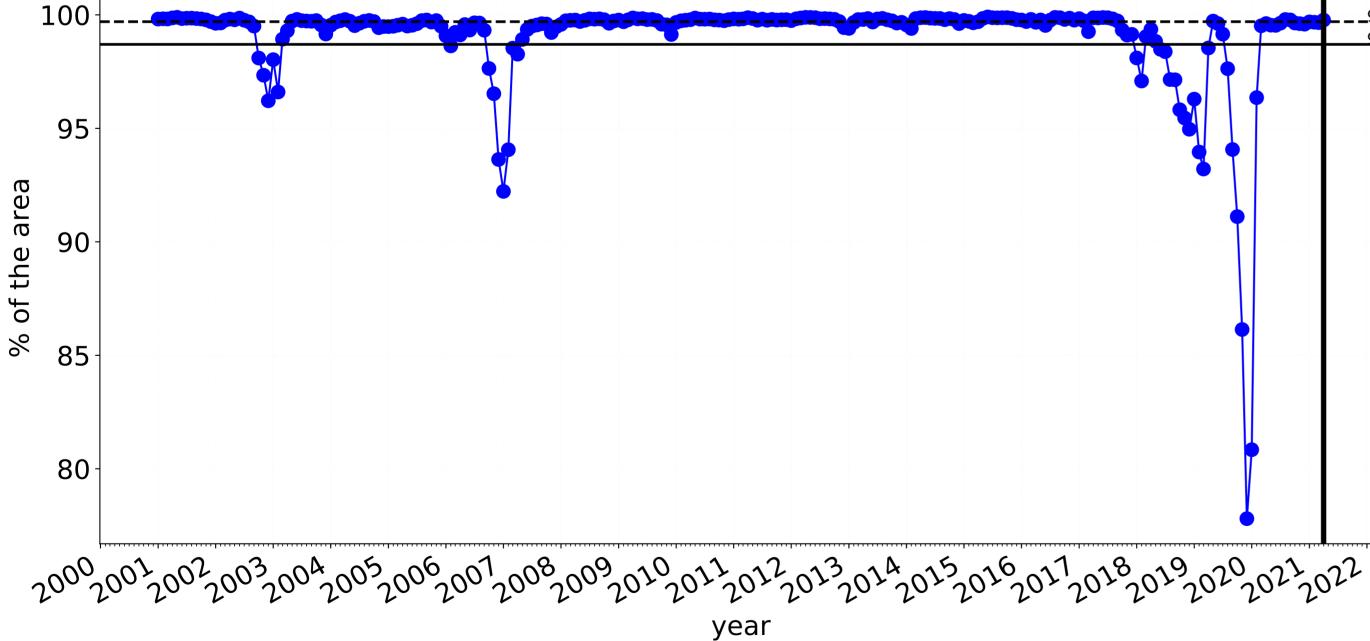
Australian Government

Ecosystem Research Infrastructure



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

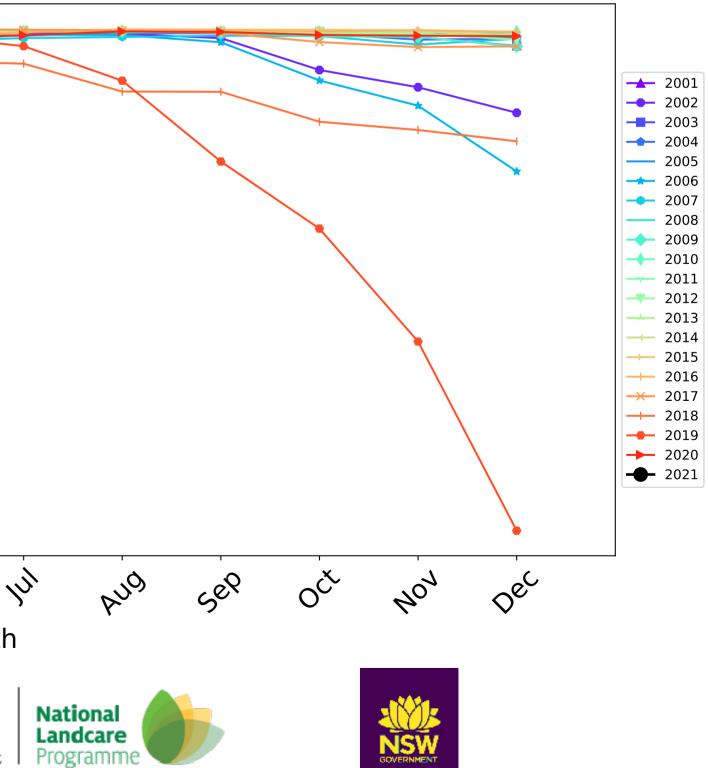
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

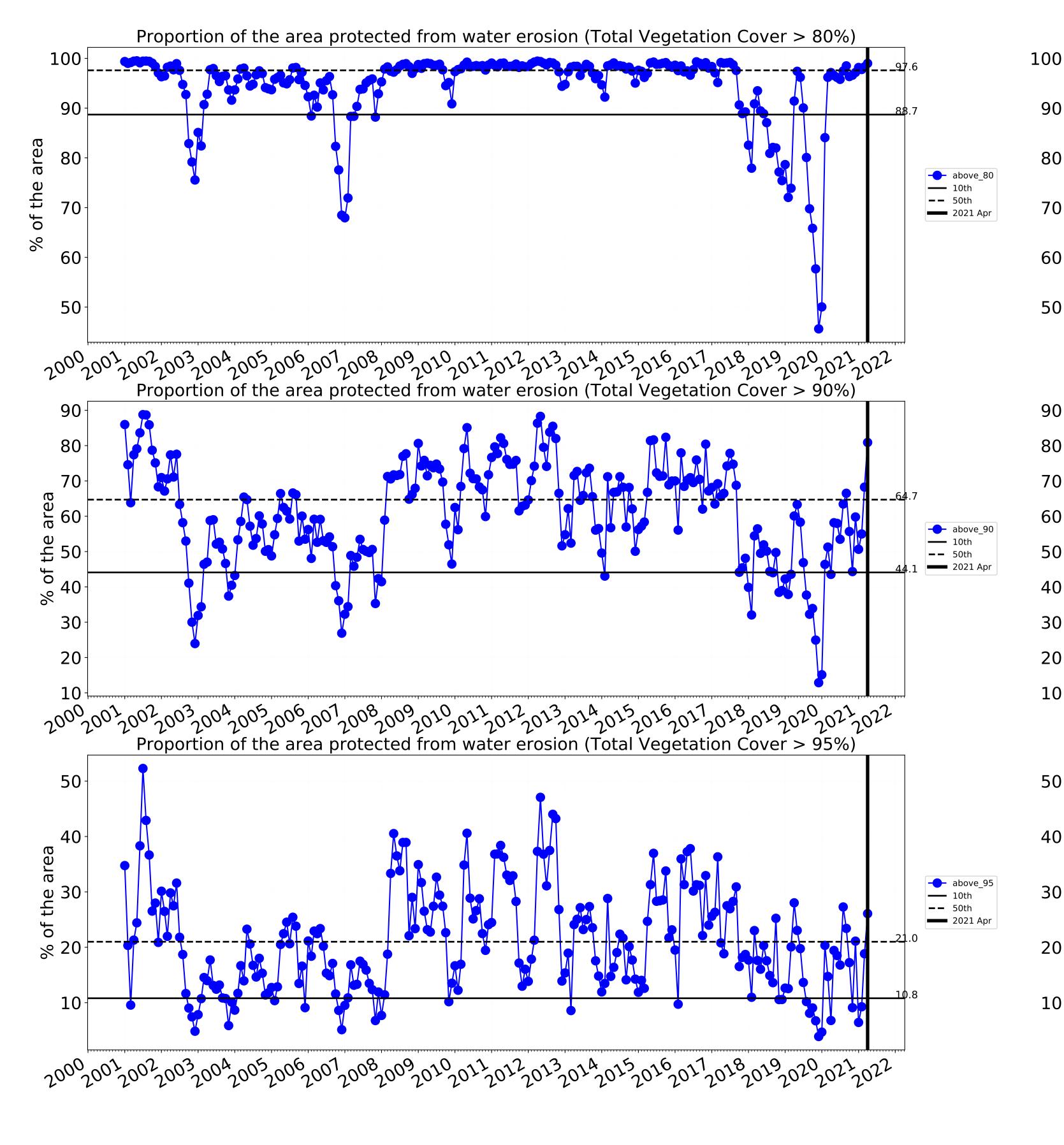


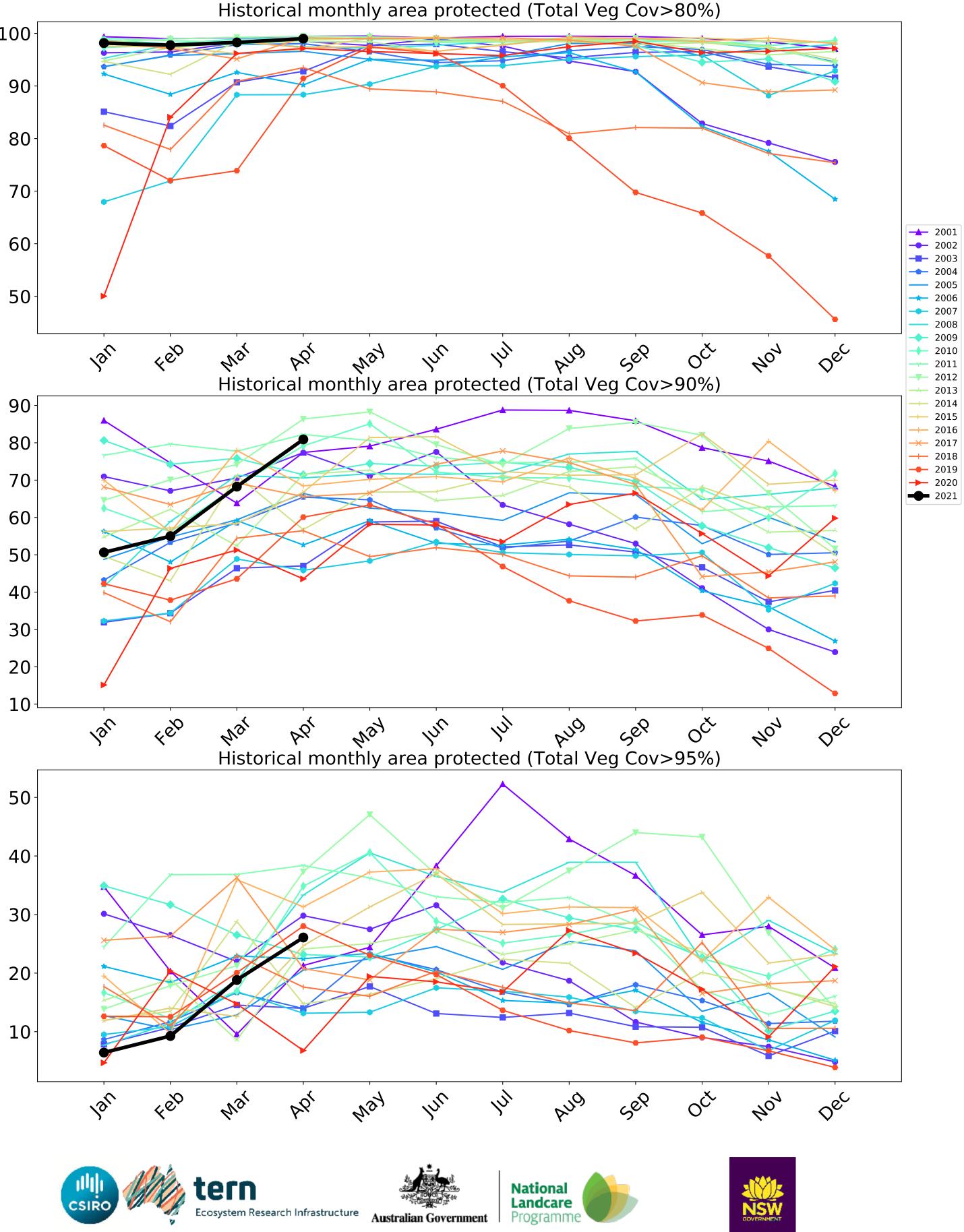
Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 95 --- above\_70 **—** 10th **--** 50th 90 **—** 2021 Apr 85 80 4eb lar May In hyar. P.Q. month tern Ecosystem Research Infrastructure Australian Government

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

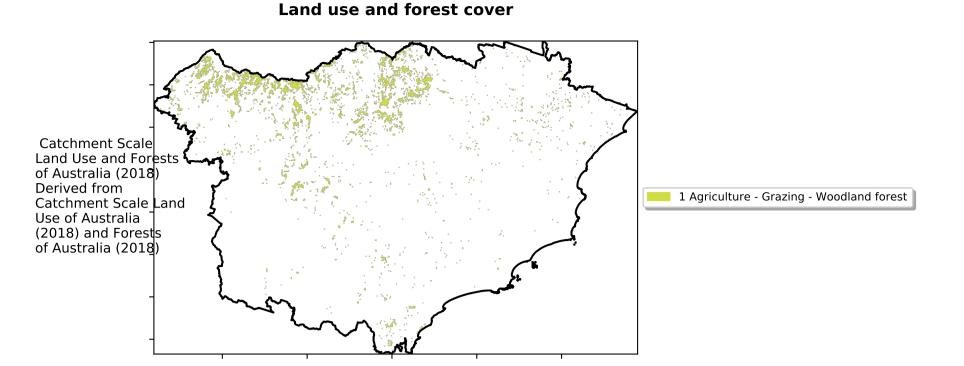




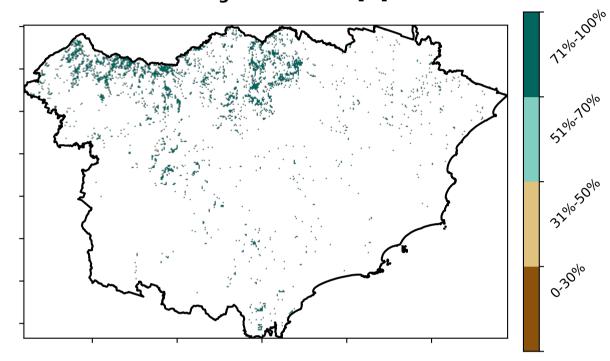




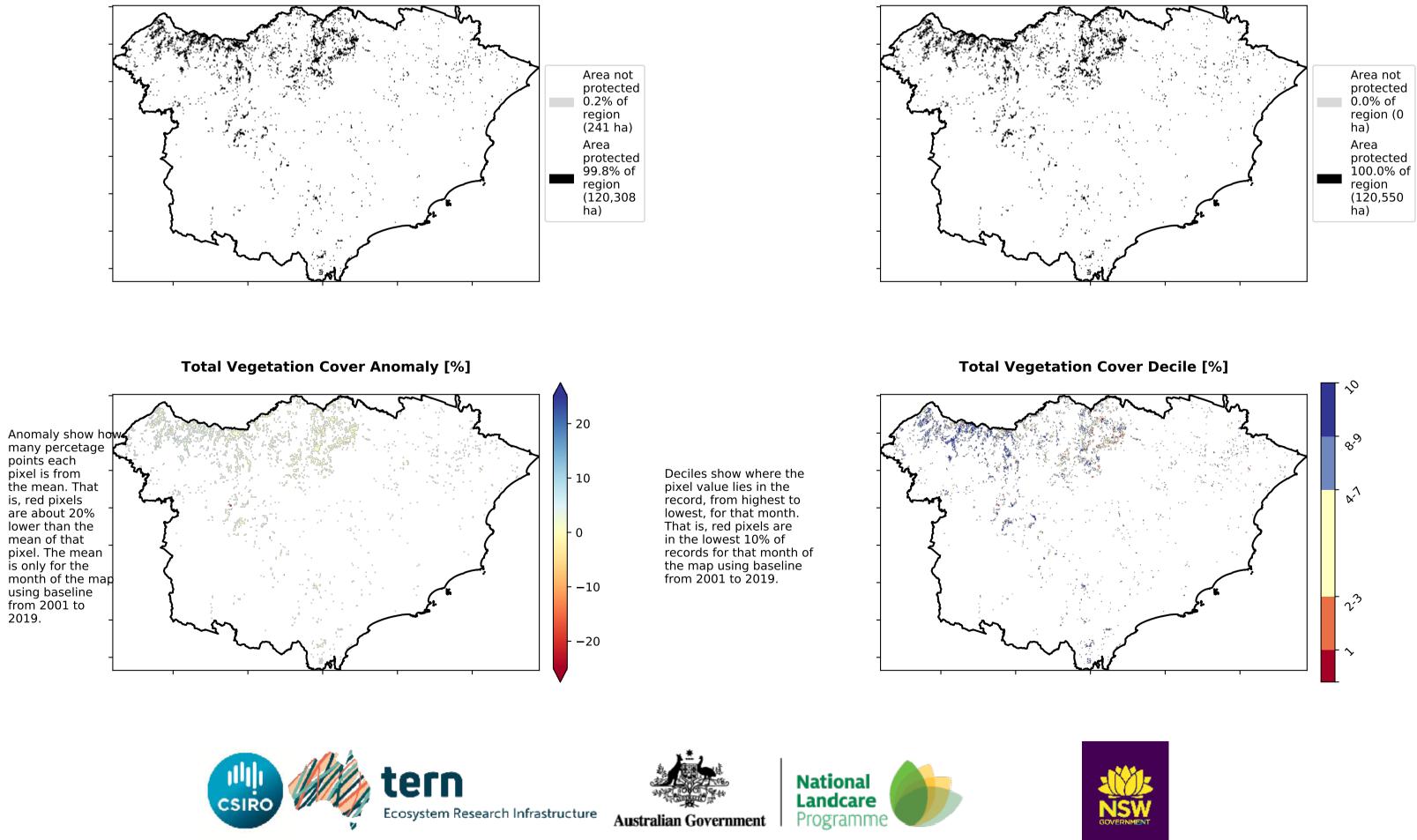
# **Grazing Woodland forest**



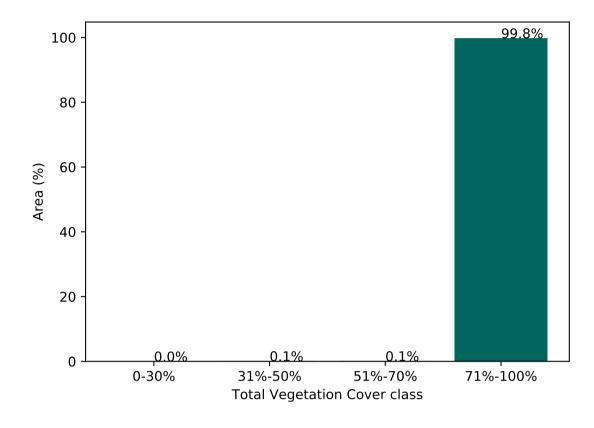
**Total Vegetation Cover [%]** 



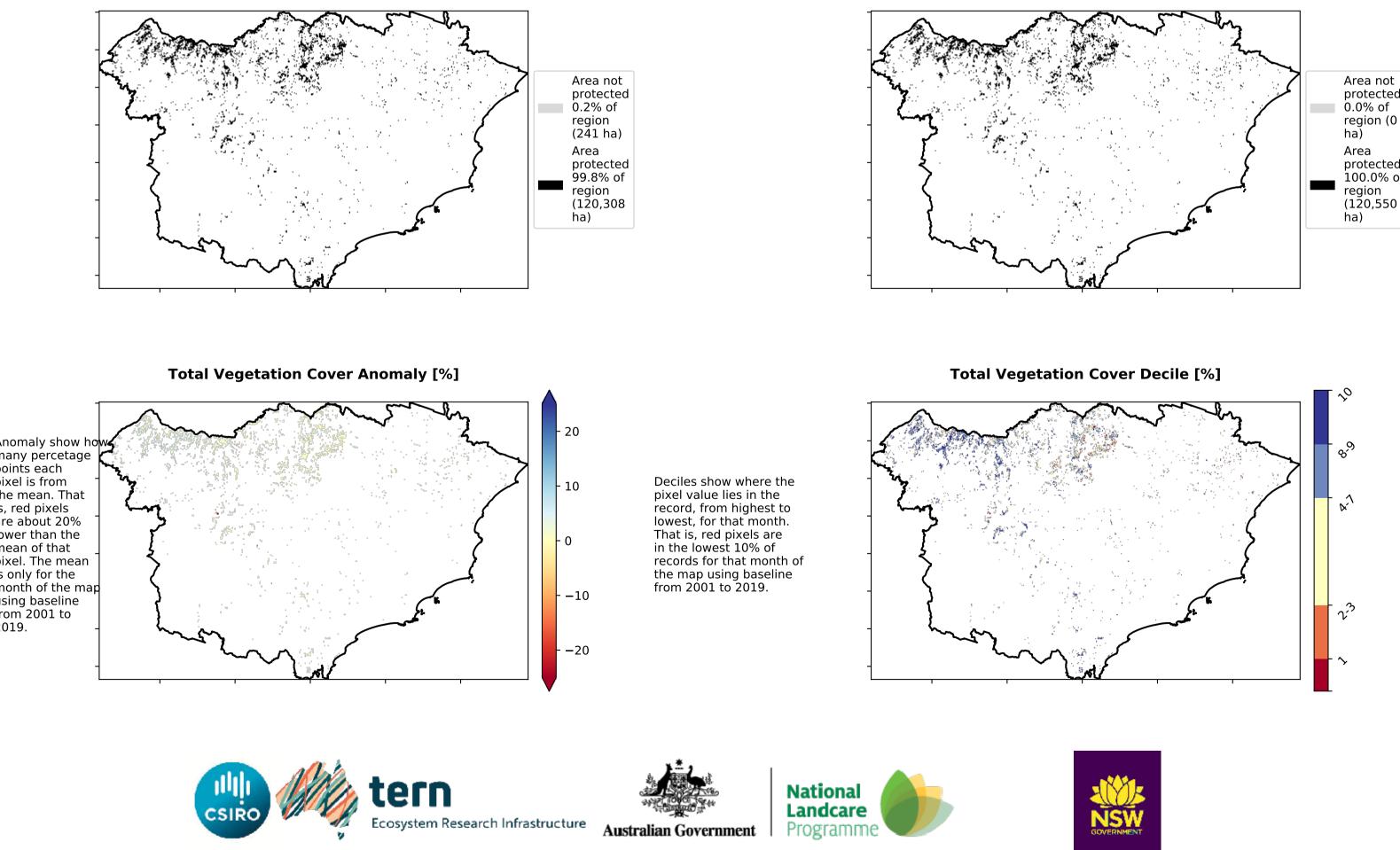
% Area protected from water erosion (>70%)

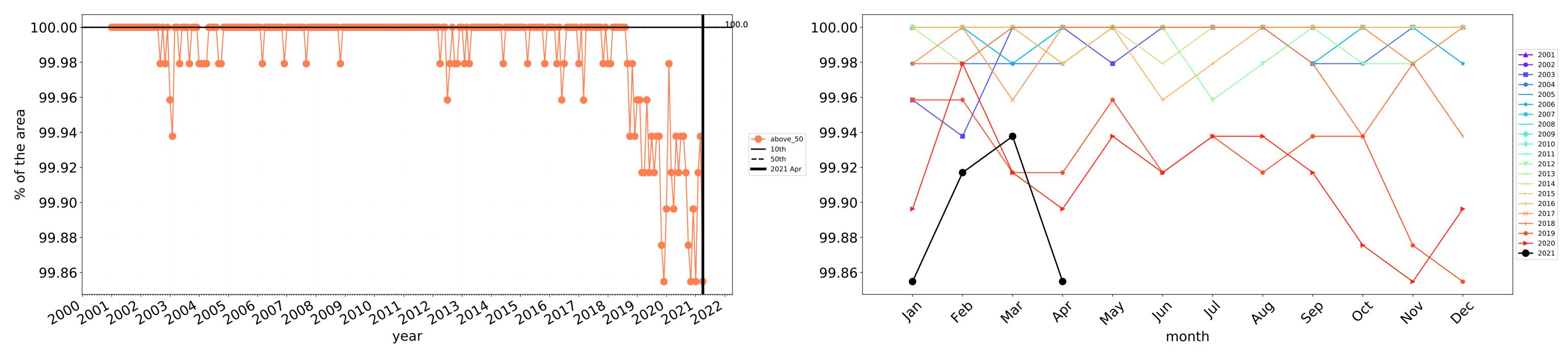


Proportion of vegetation cover class in area

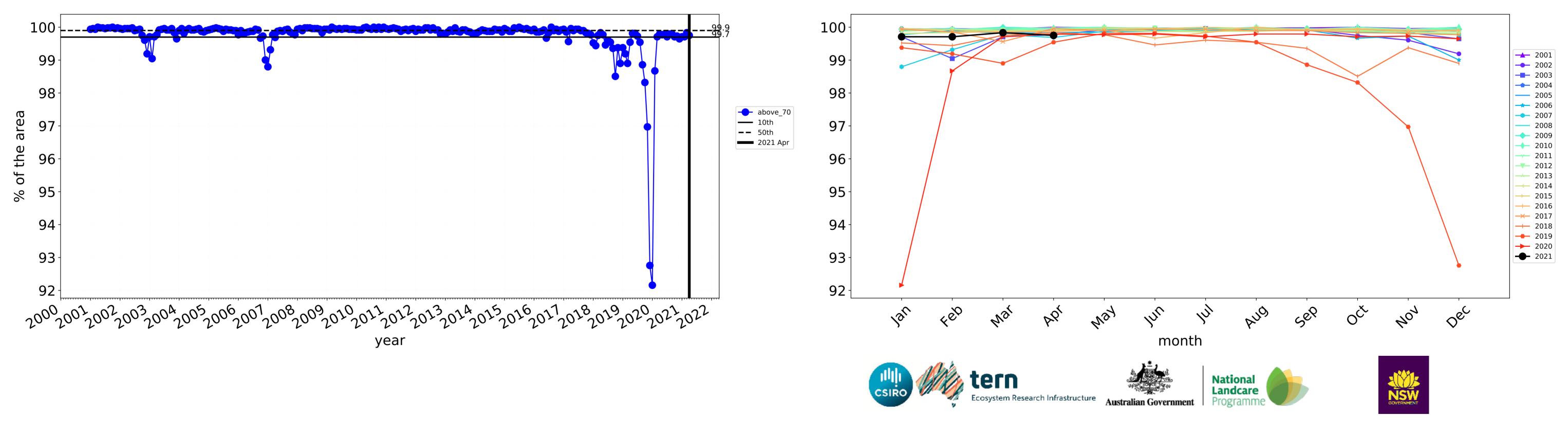


#### % Area protected from wind erosion (>50%)



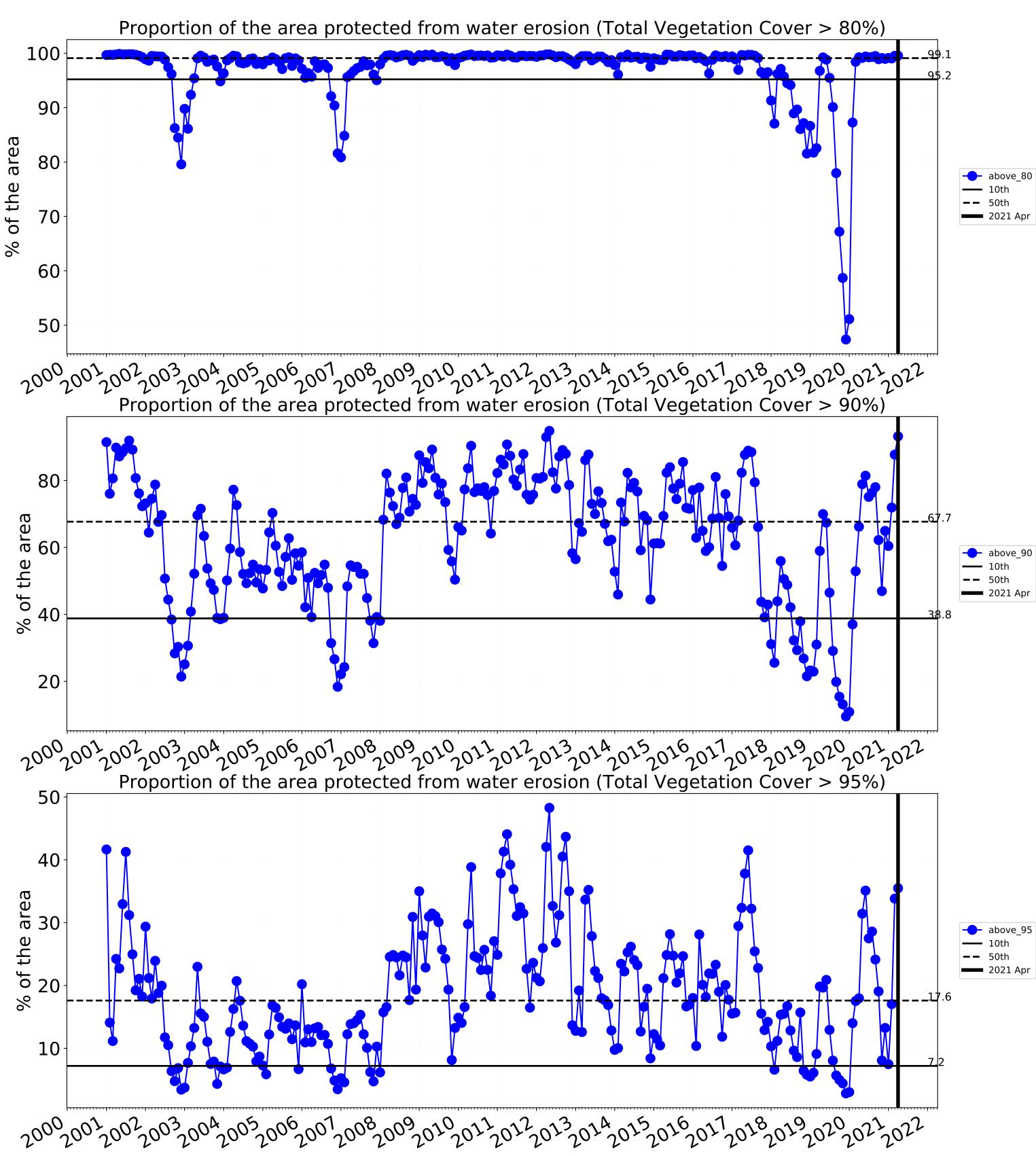


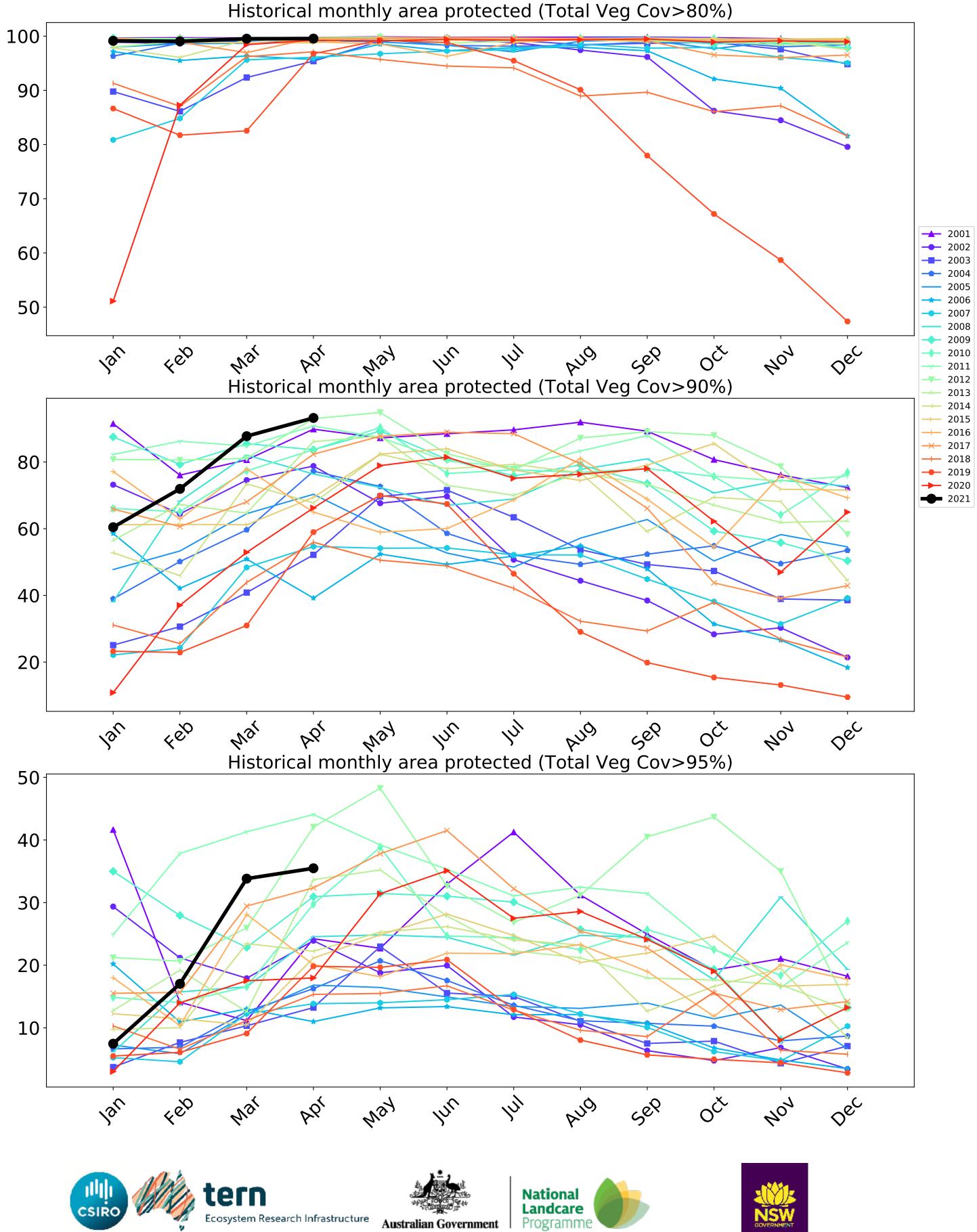
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

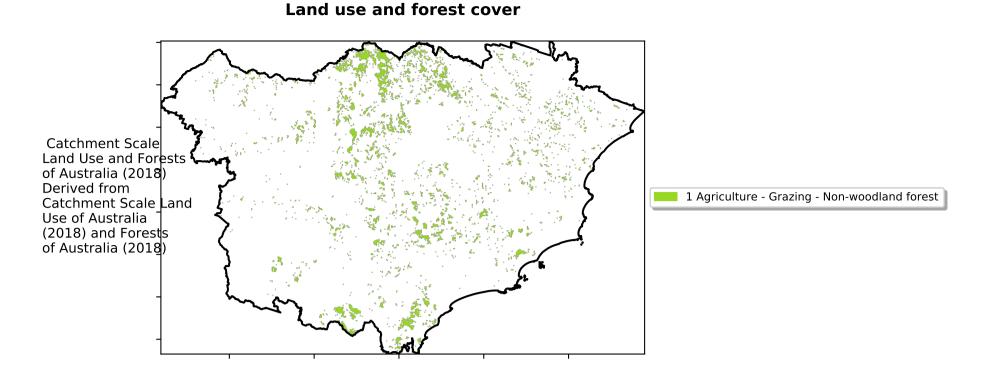
Water erosion historical monthly area protected (Total Veg Cov>70%)



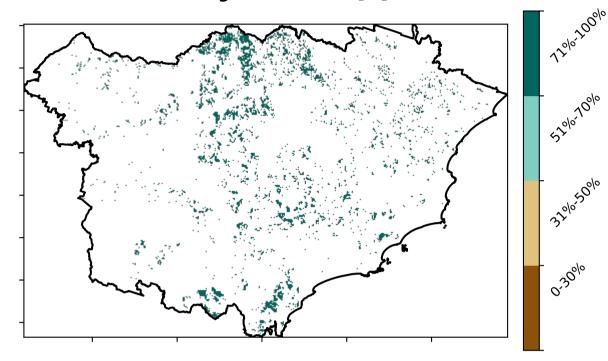




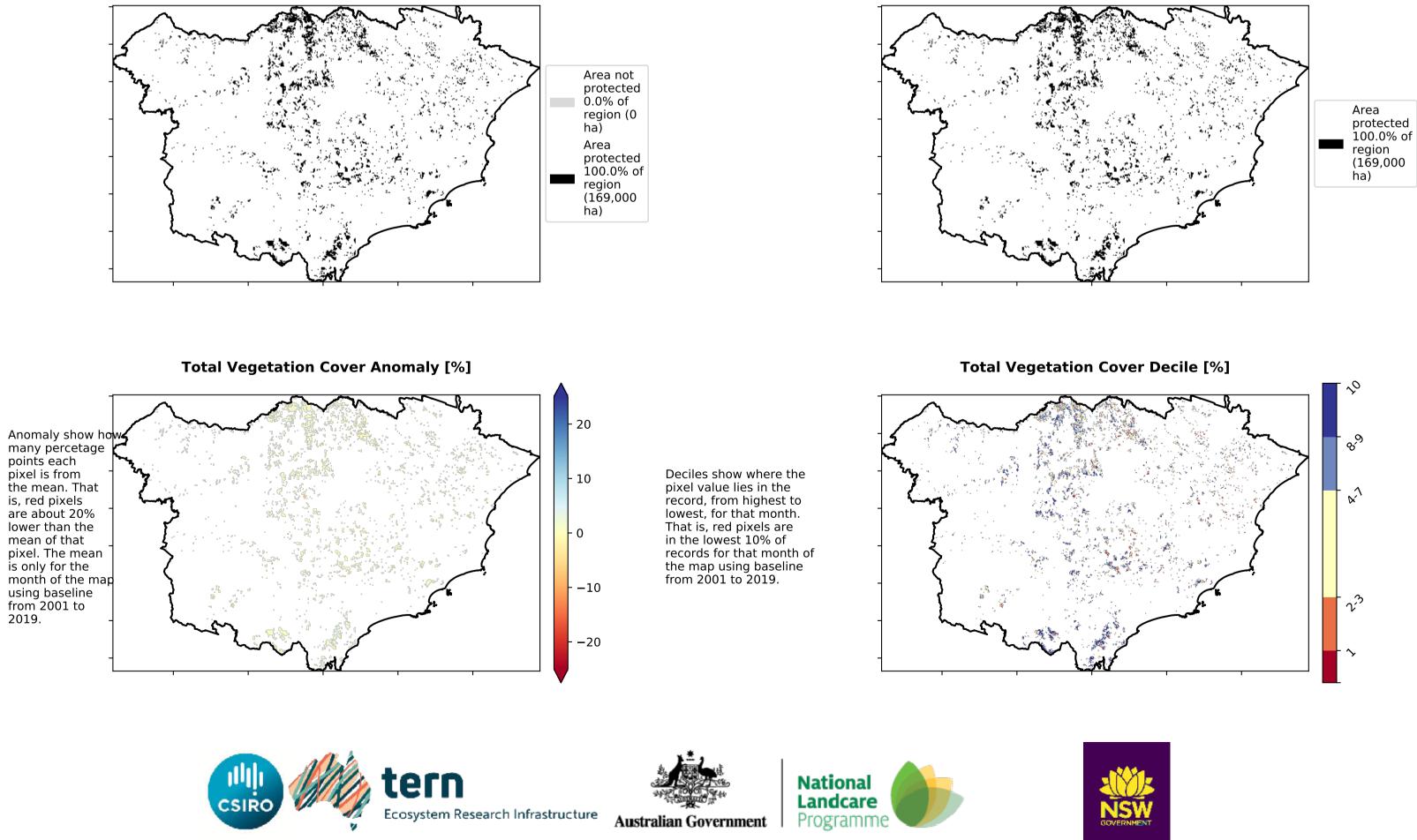
# Grazing - Forest (non woodland)



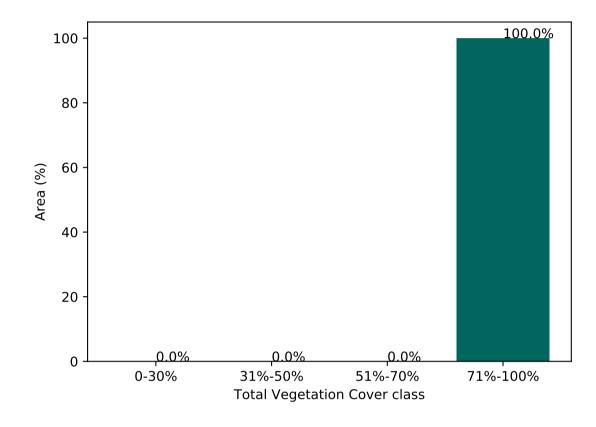
**Total Vegetation Cover [%]** 



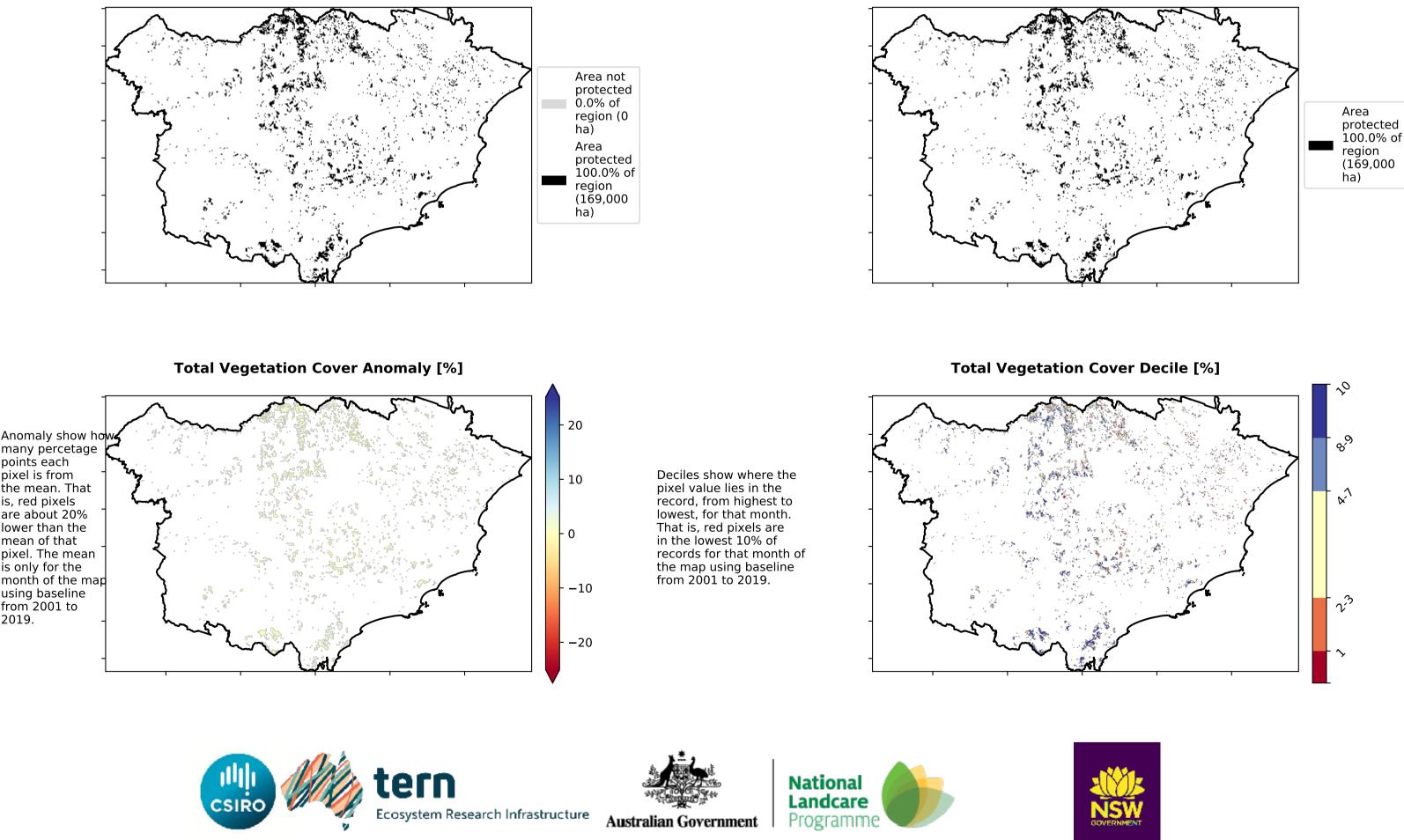
% Area protected from water erosion (>70%)

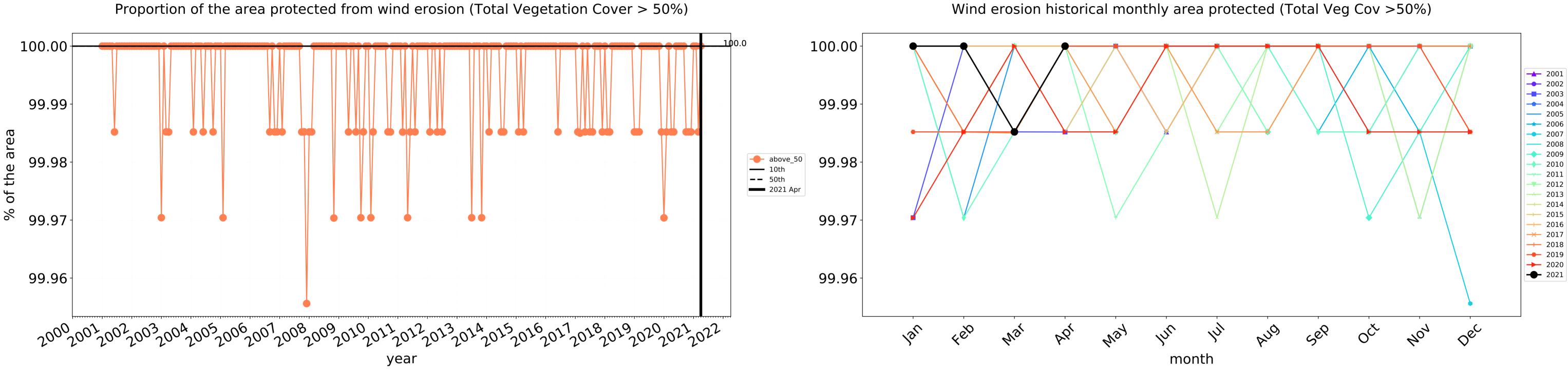


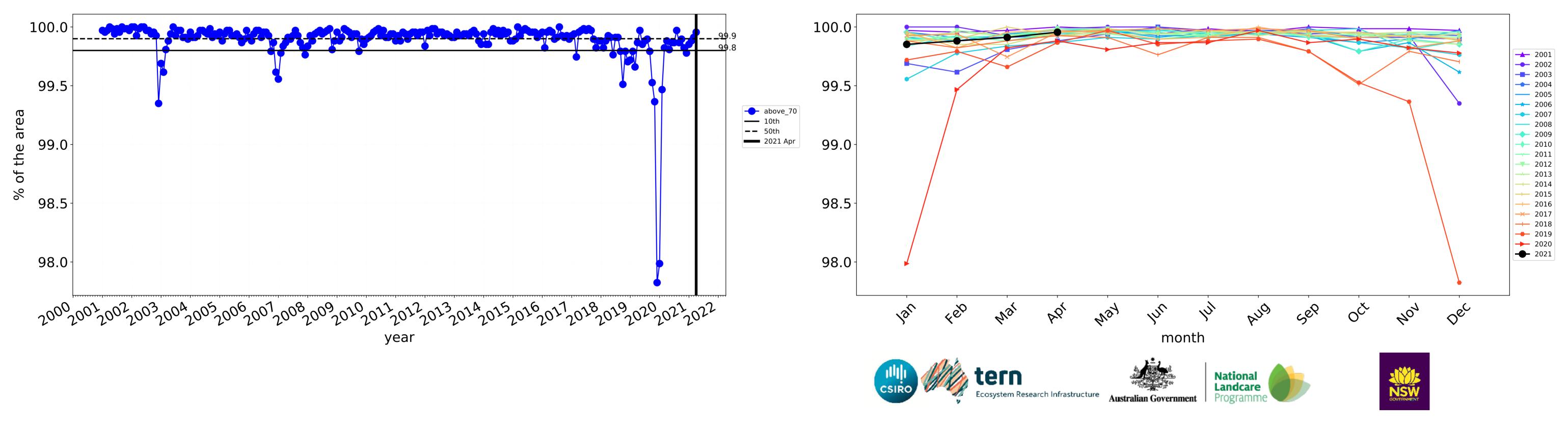
Proportion of vegetation cover class in area



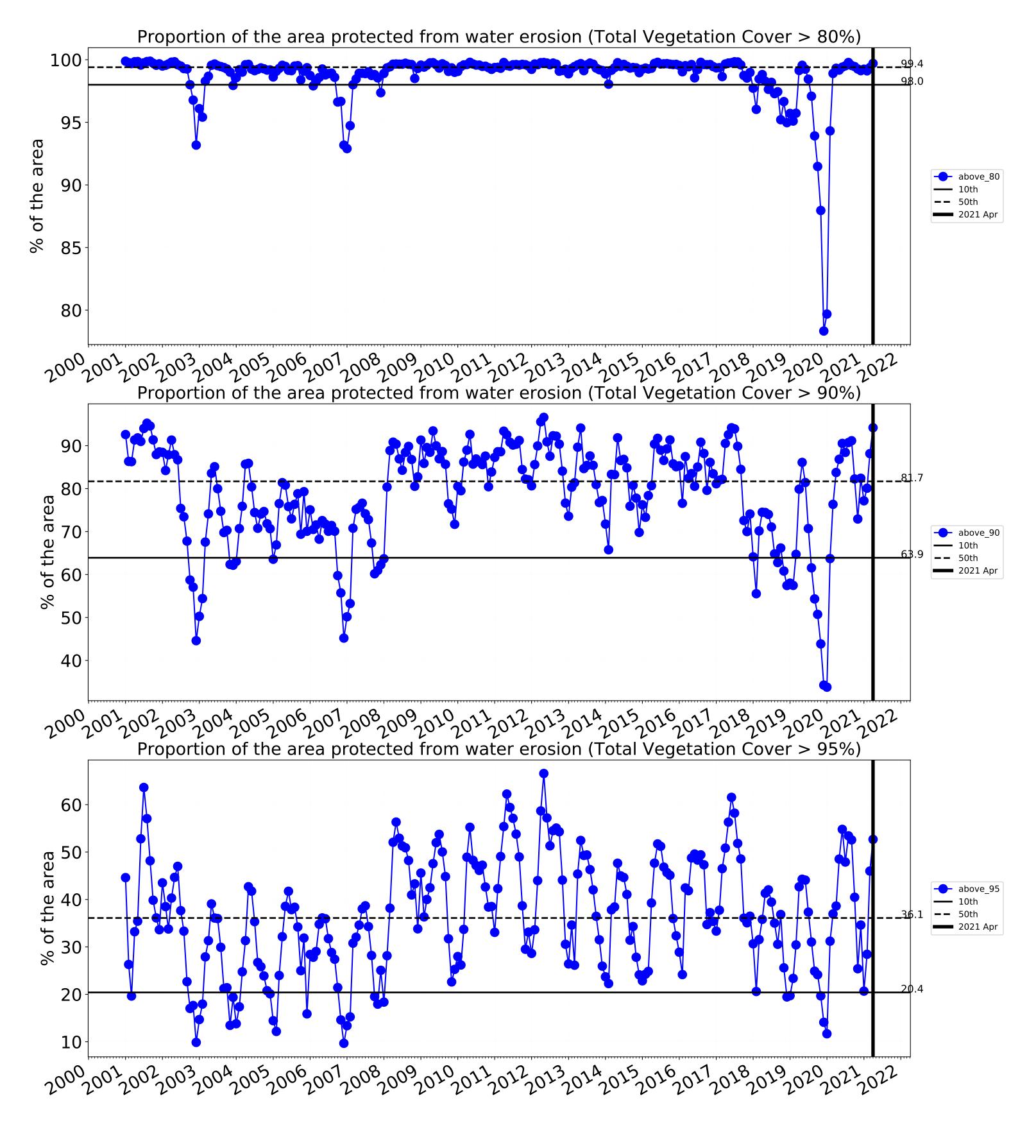
% Area protected from wind erosion (>50%)

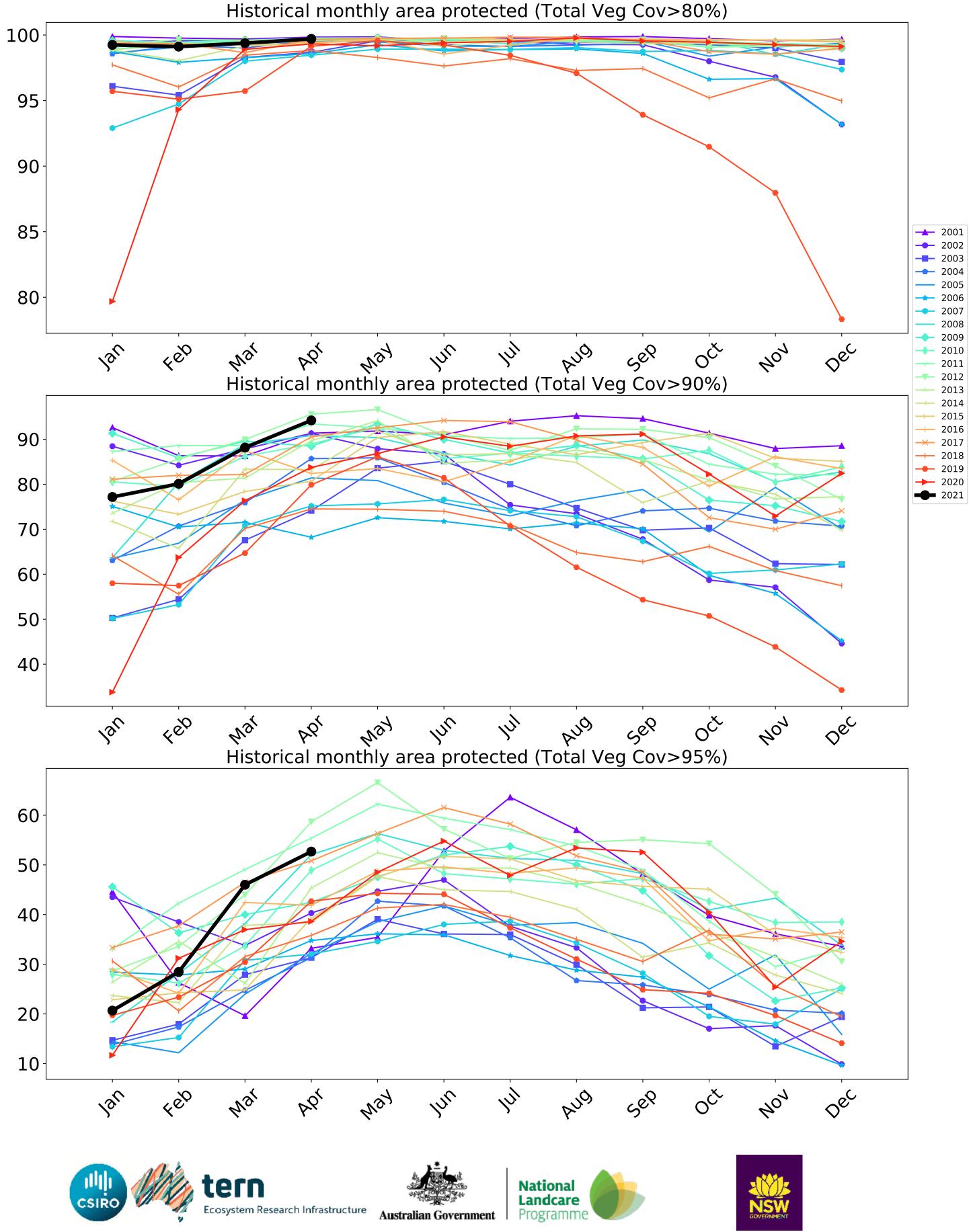






Water erosion historical monthly area protected (Total Veg Cov>70%)

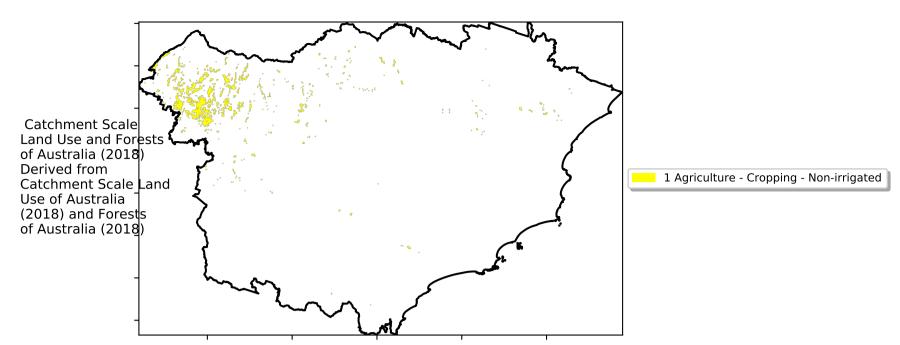




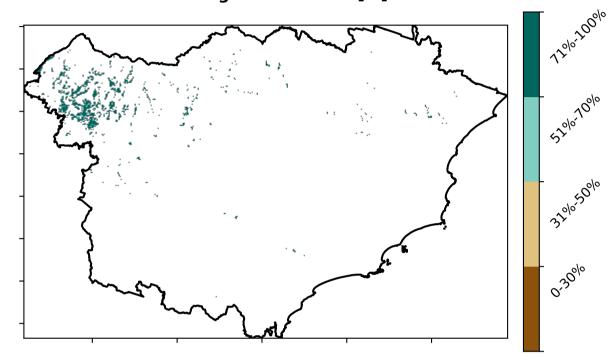


# Cropping

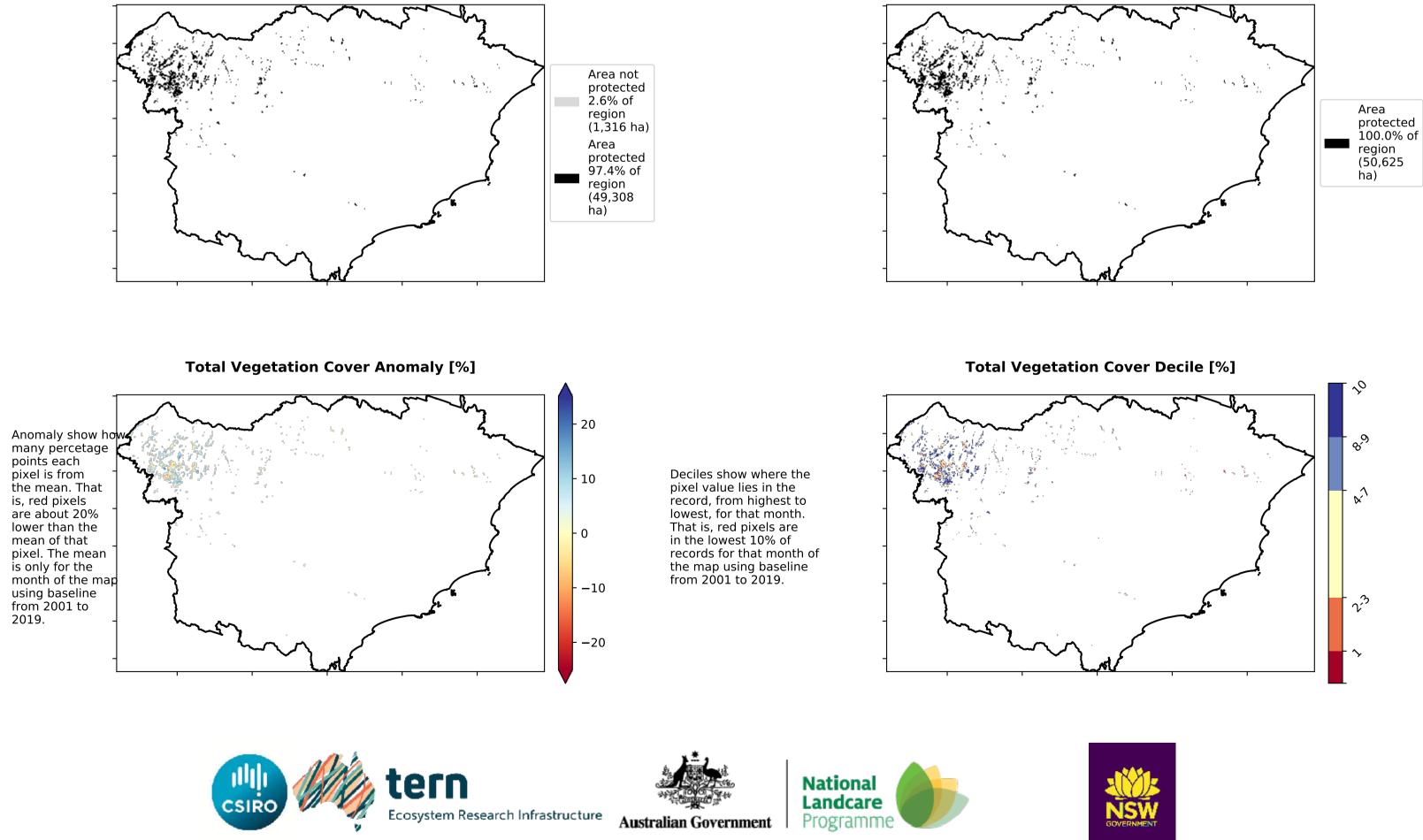
Land use and forest cover



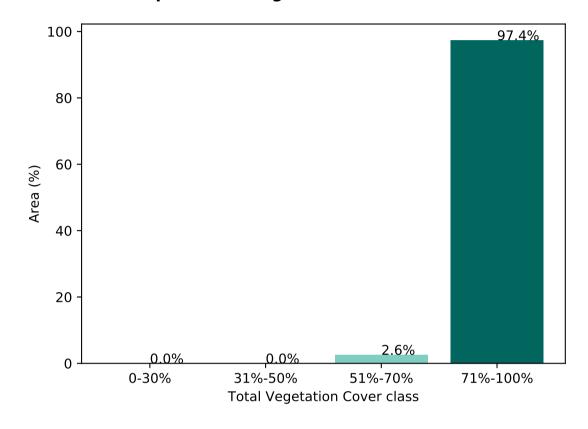
**Total Vegetation Cover [%]** 



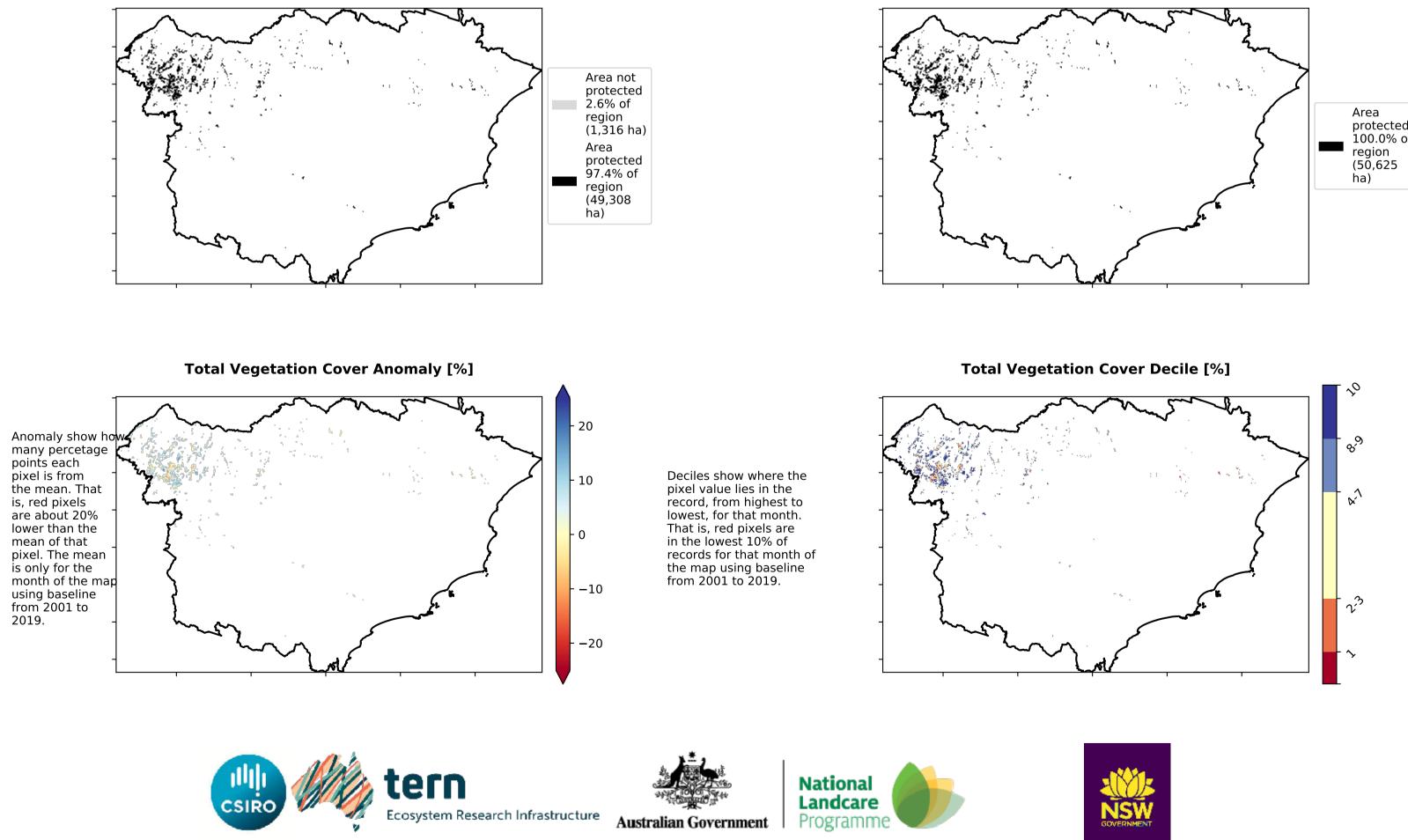
% Area protected from water erosion (>70%)



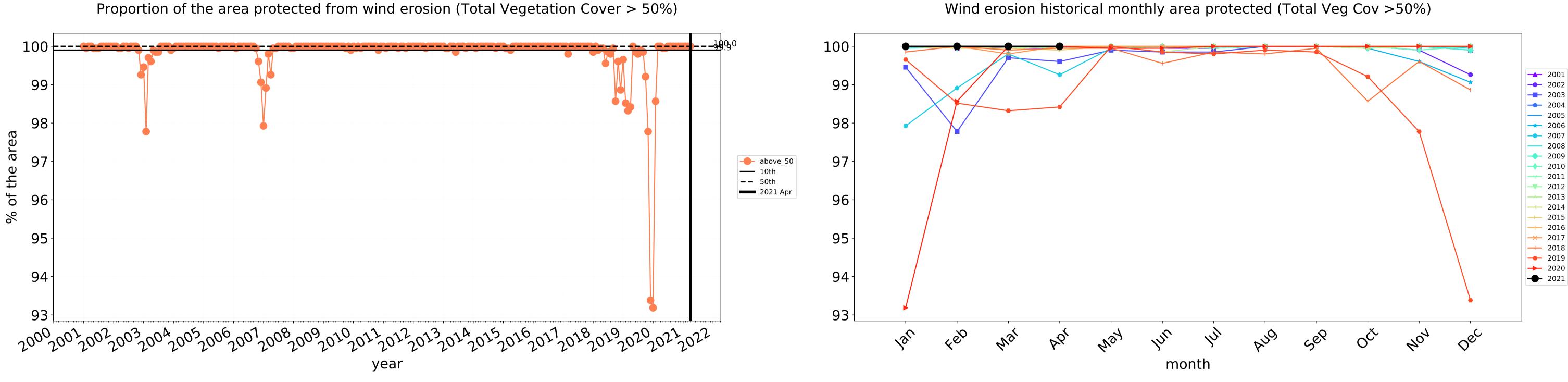
Proportion of vegetation cover class in area



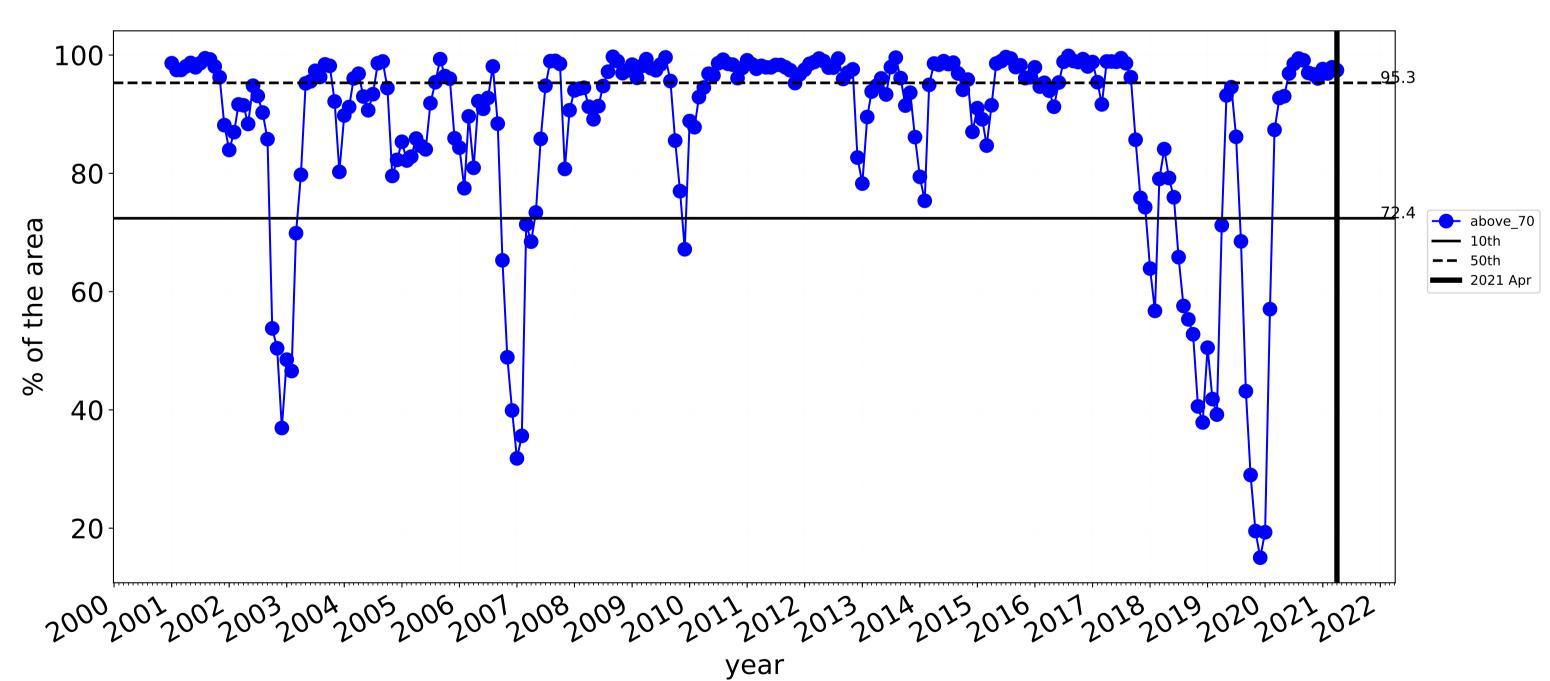
% Area protected from wind erosion (>50%)





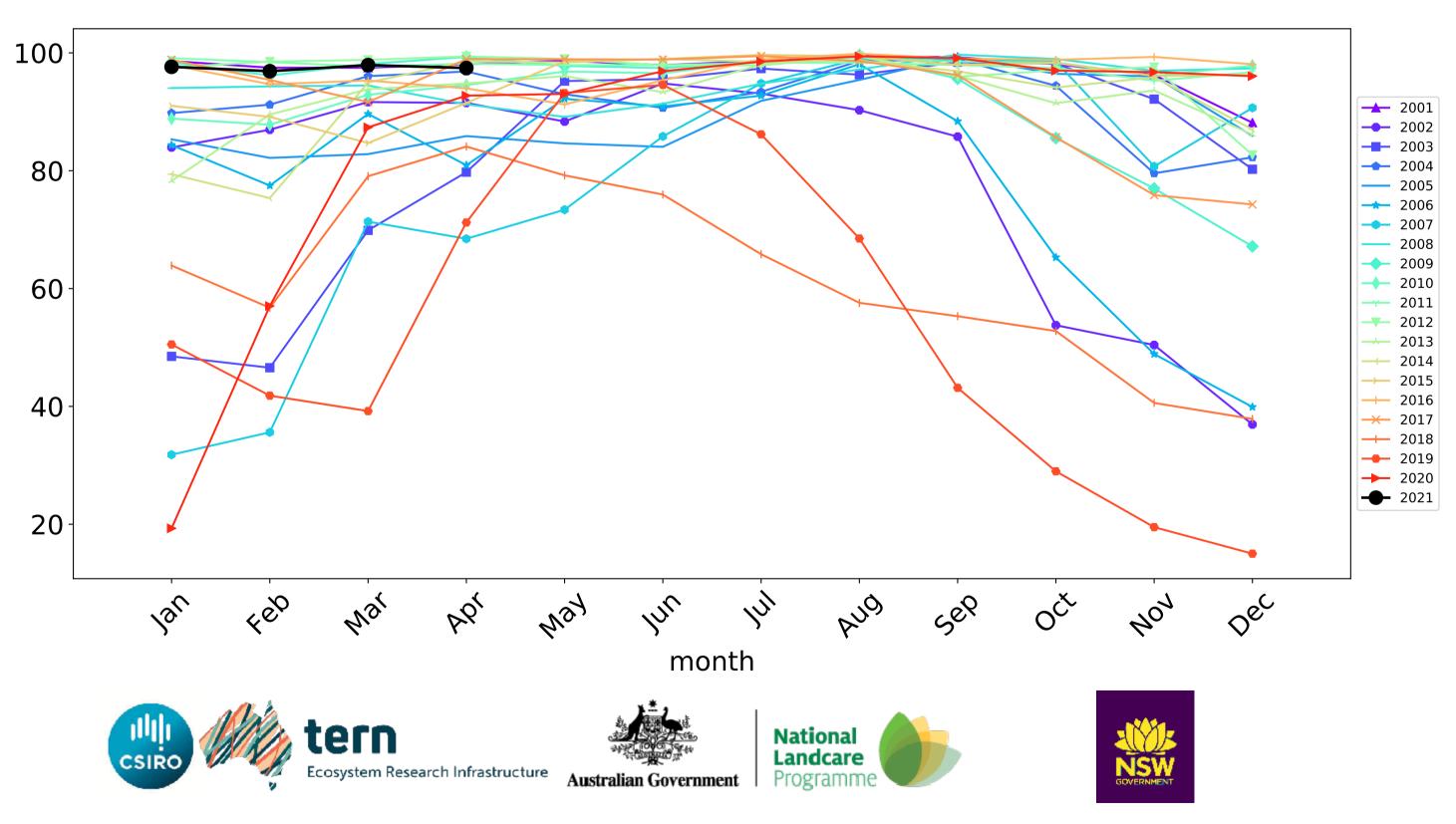


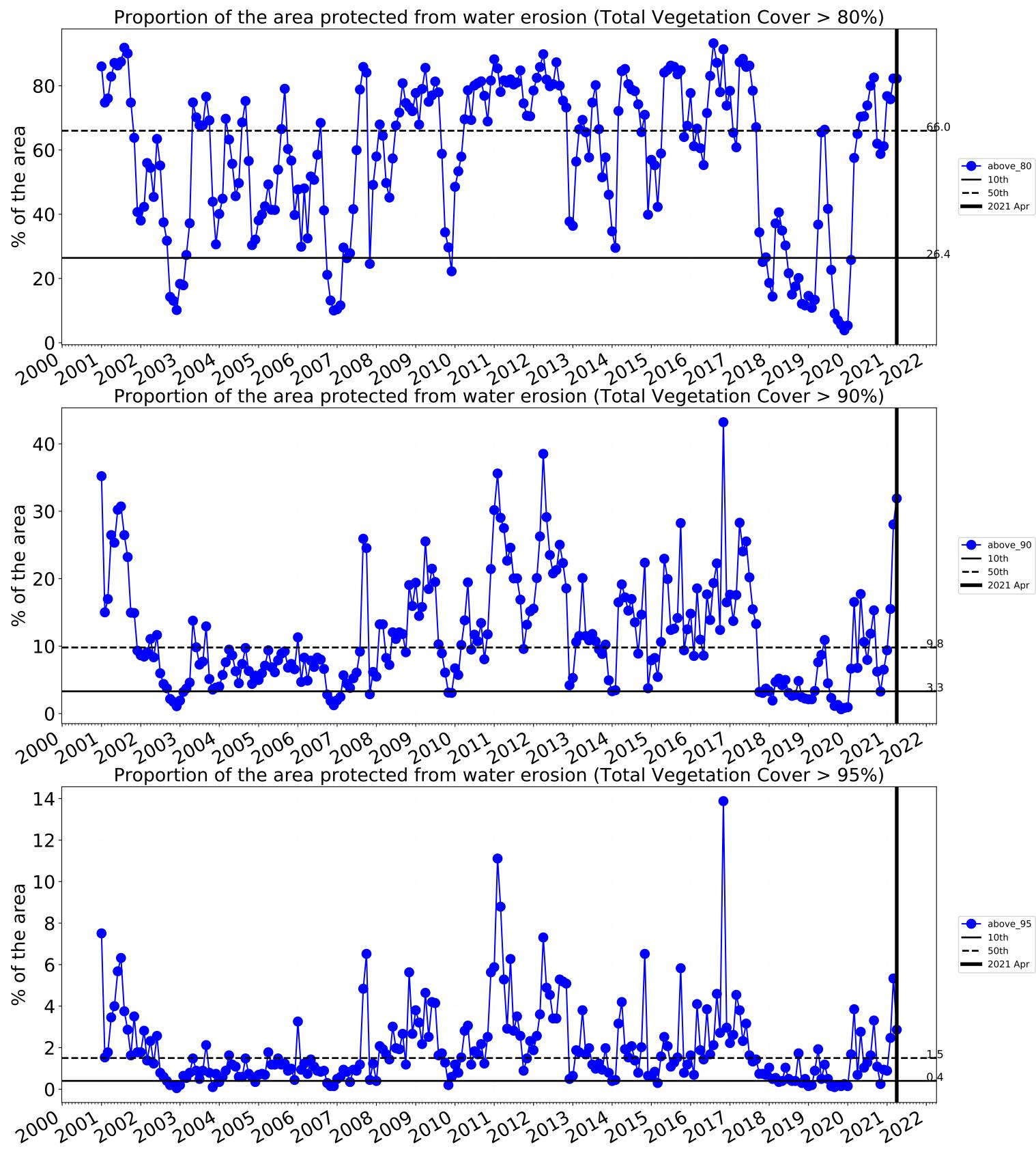
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

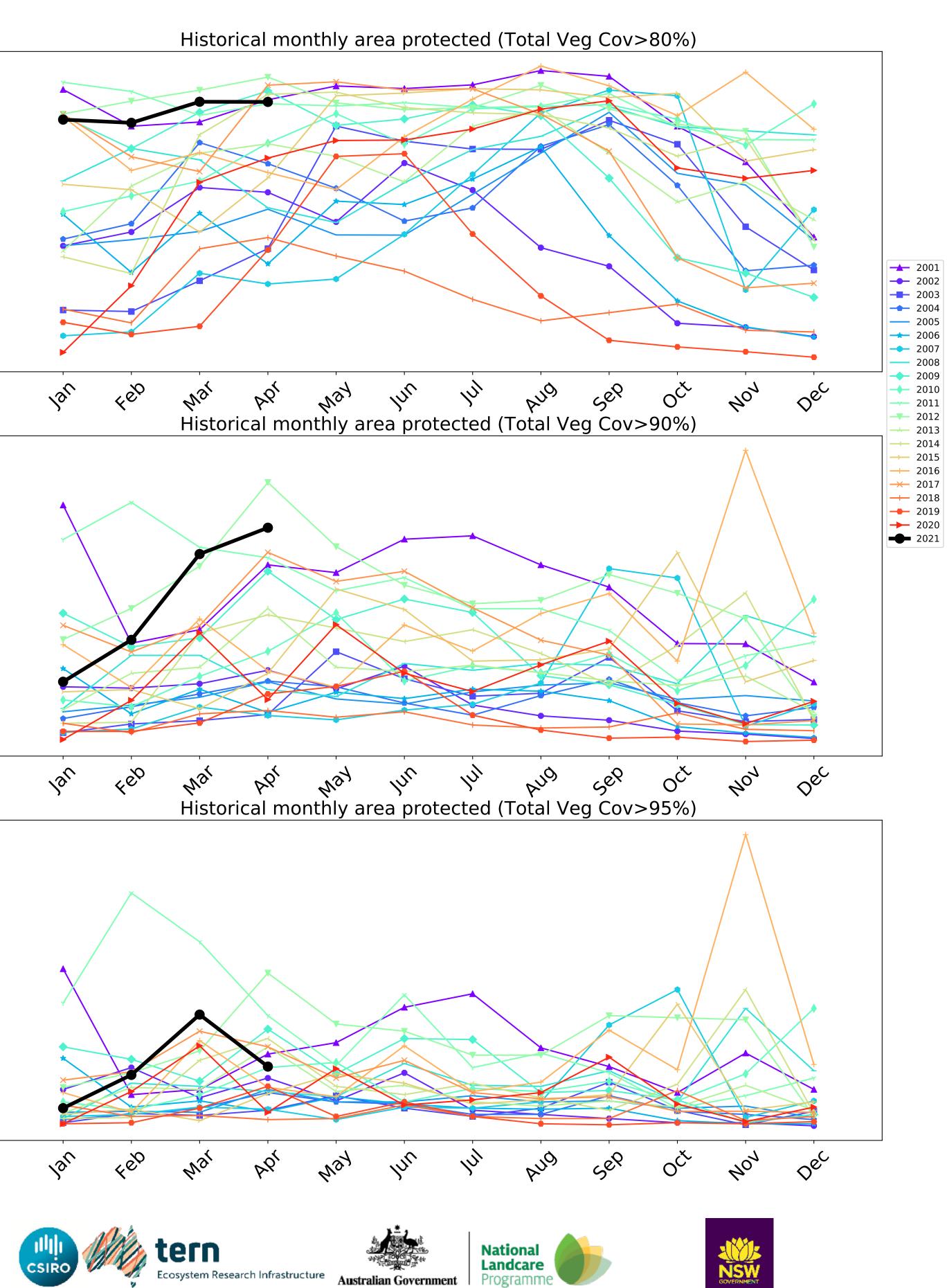


# **Cropping timeseries**

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

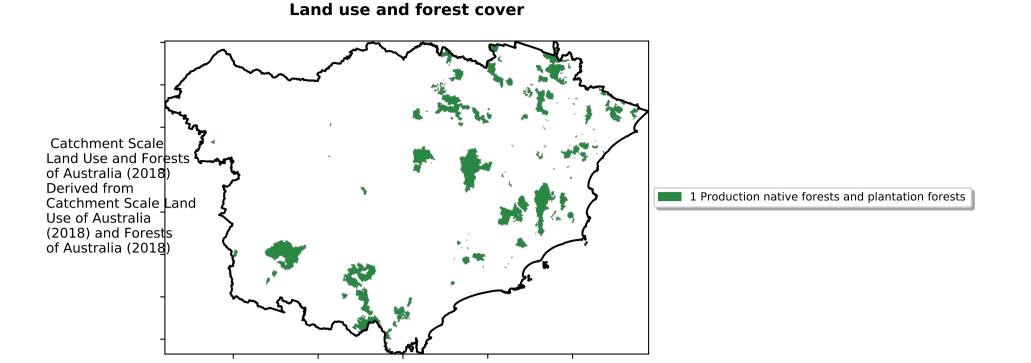




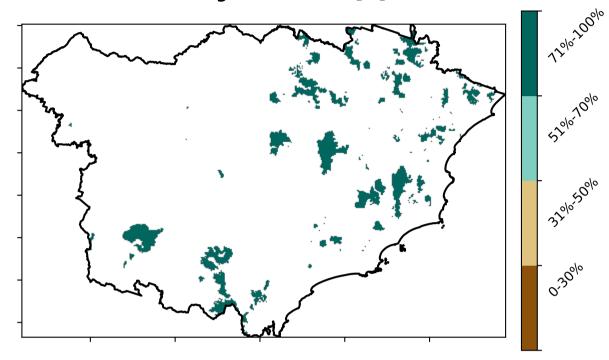




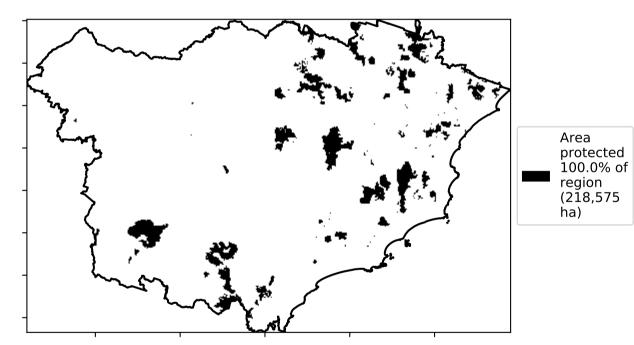
# **Production native forests and plantation forests**



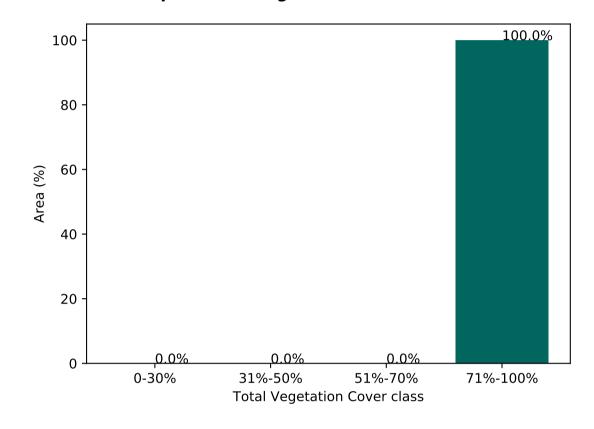
**Total Vegetation Cover [%]** 



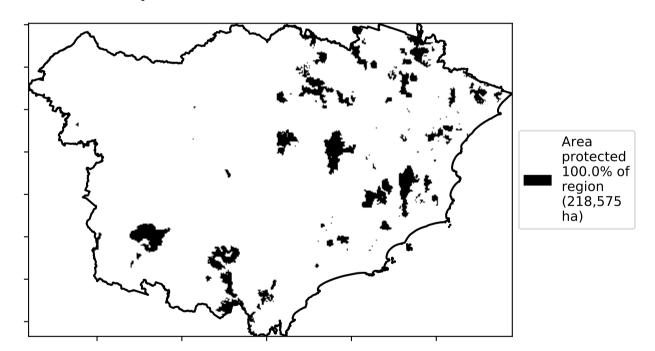
% Area protected from water erosion (>70%)



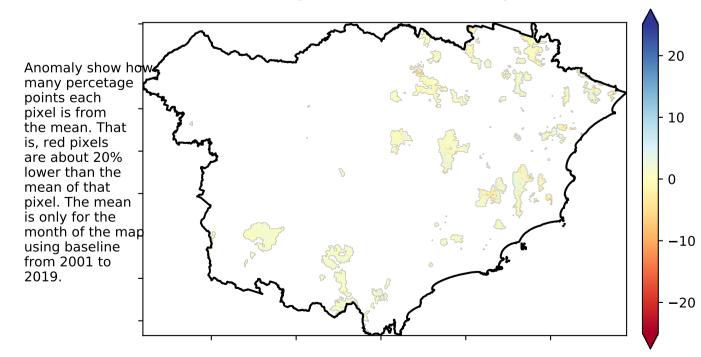
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

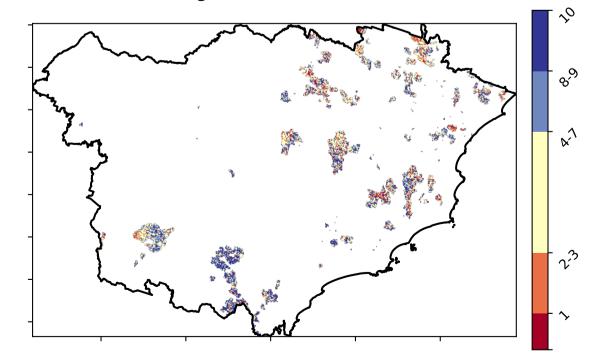


**Total Vegetation Cover Anomaly [%]** 



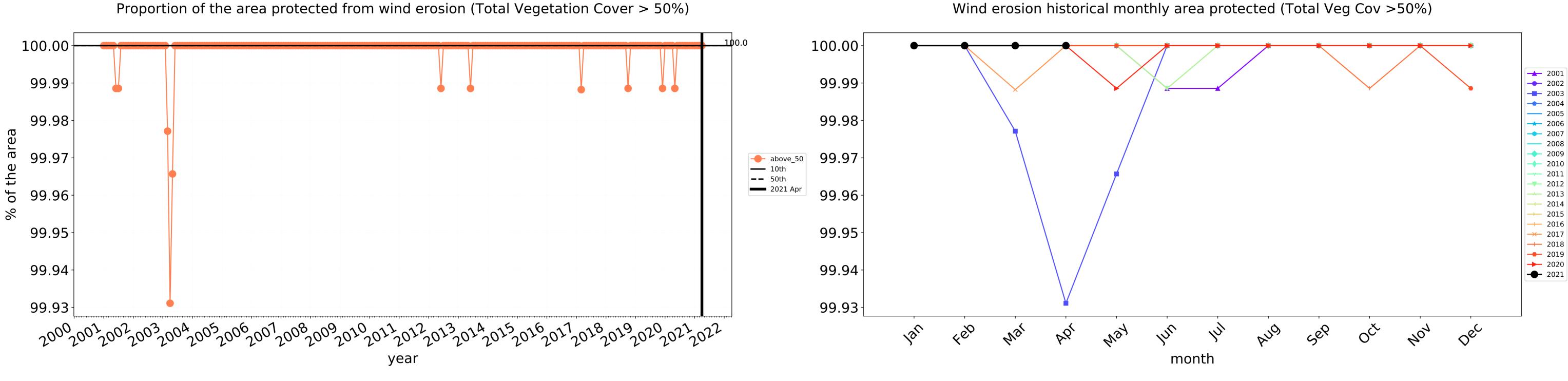
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

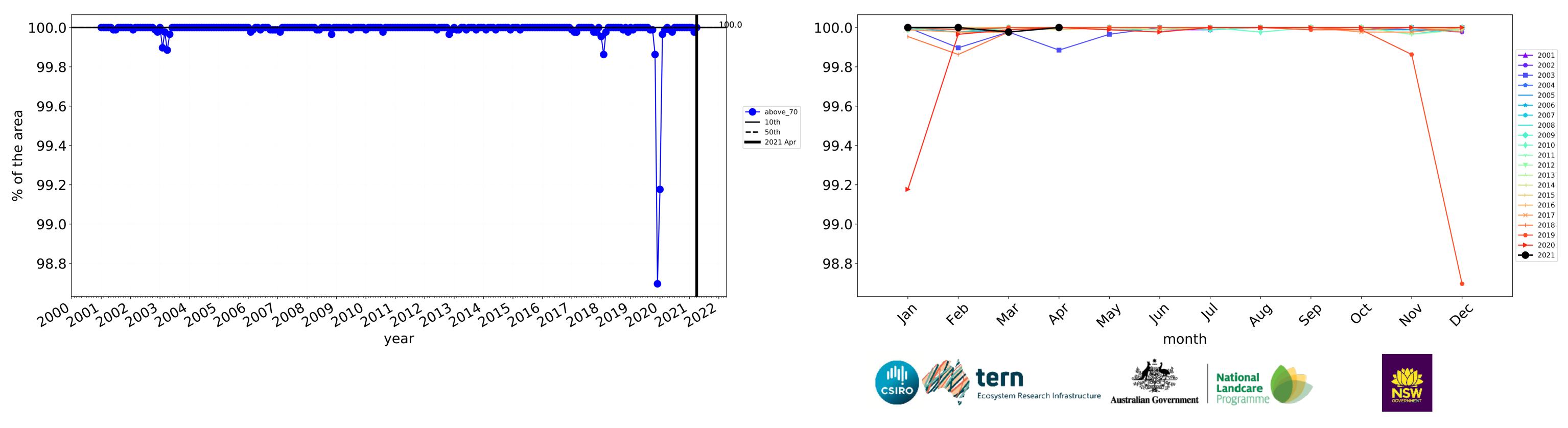
Total Vegetation Cover Decile [%]



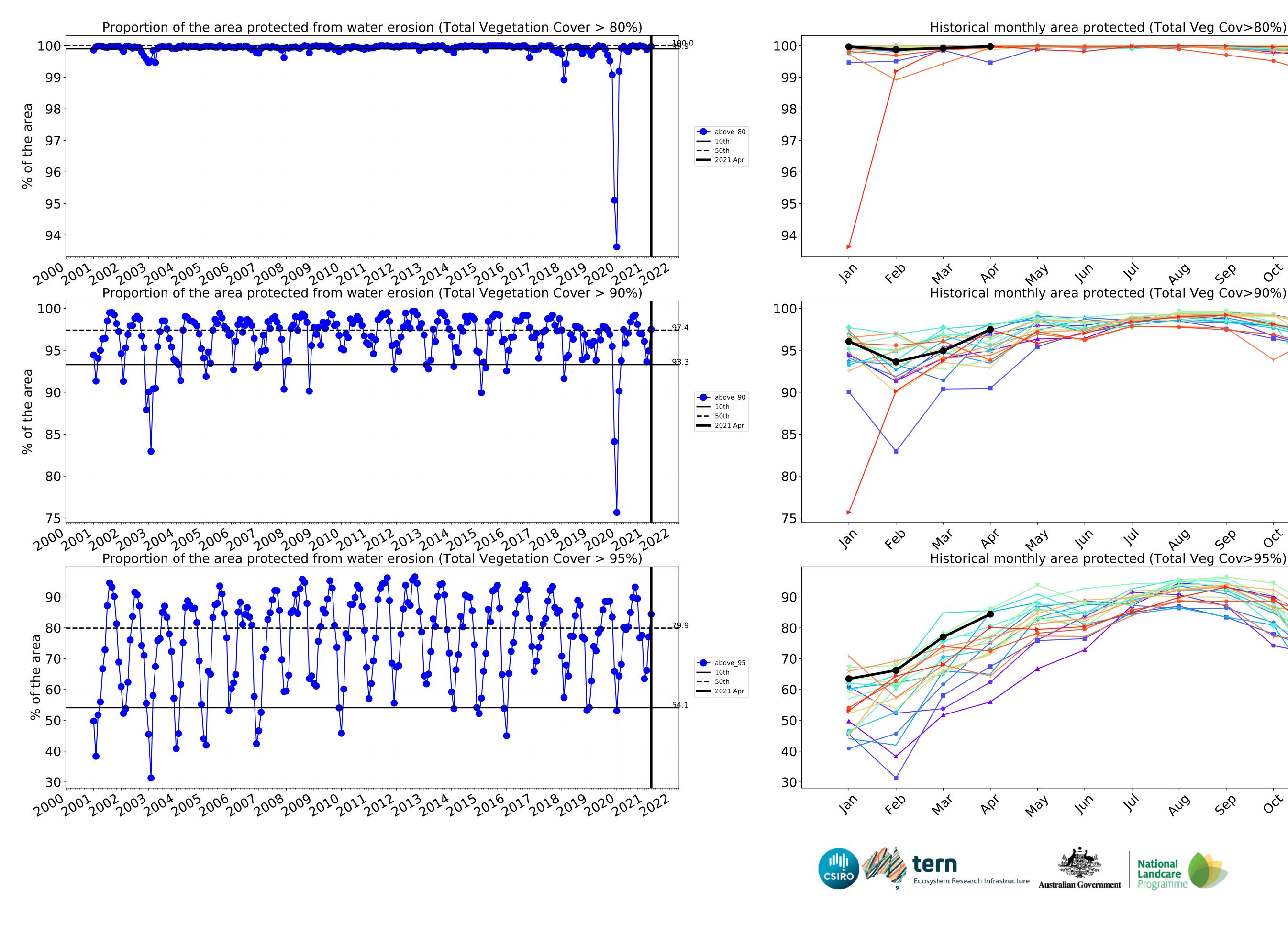


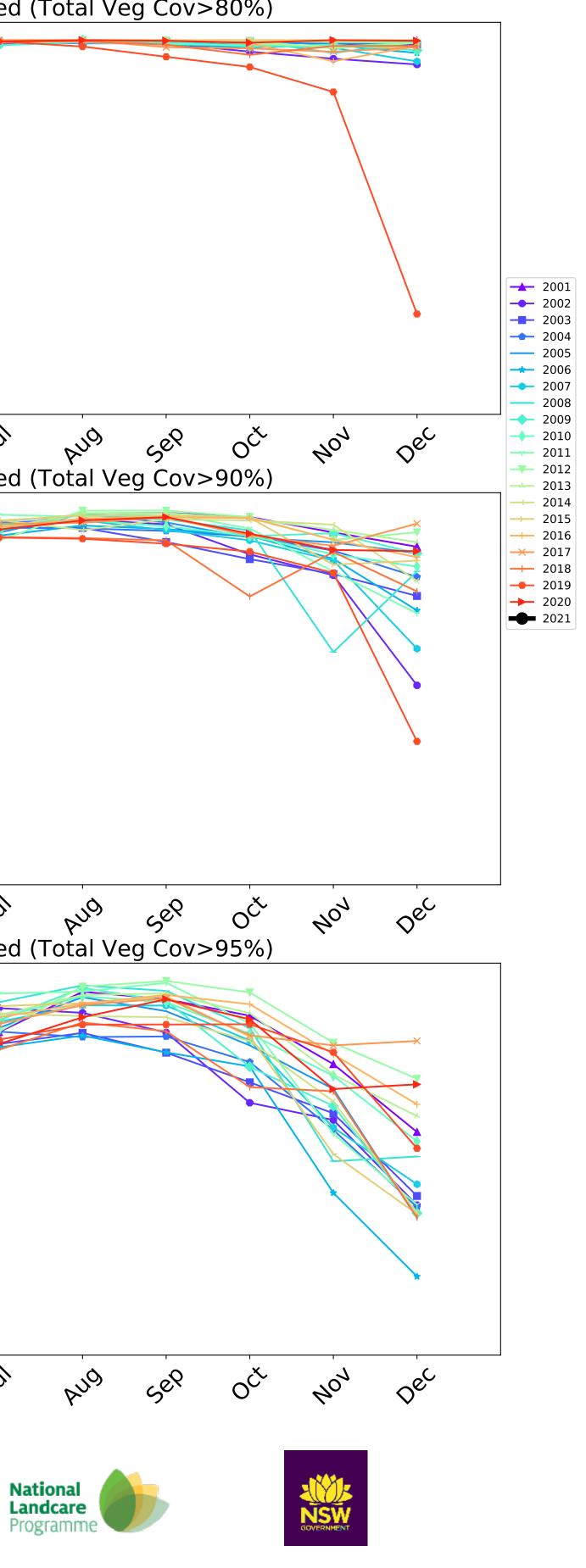
# Production native forests and plantation forests timeseries











# Hunter (3,234,625 ha and no data 65,800 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

Land use and forest cover Class	area(ha)	above_30	above_50	above_70	above_80	above_90	above_95
Entire region	3,234,625	99.9% 3,230,450	99.6% 3,222,725	98.7% 3,193,650	97.1% 3,141,975	84.8% 2,742,725	47.9% 1,547,850
Conservation and natural environments	1,239,175	99.9% 1,238,150	99.8% 1,237,225	99.7% 1,235,400	99.5% 1,232,425	95.3% 1,181,350	71.6% 887,125
Conservation and natural environments non forest	29,175	96.8% 28,250	94.7% 27,625	91.2% 26,600	88.3% 25,750	72.4% 21,125	35.0% 10,225
Conservation and natural environments Woodland forest	138,775	99.9% 138,700	99.8% 138,550	99.8% 138,450	99.4% 137,900	94.3% 130,875	58.0% 80,550
Conservation and natural environments Forest (non woodland)	1,071,225	100.0% 1,071,200	100.0% 1,071,050	99.9% 1,070,350	99.8% 1,068,775	96.1% 1,029,350	74.3% 796,350
Agriculture	1,580,175	100.0% 1,579,975	99.9% 1,579,300	99.7% 1,575,600	98.5% 1,555,950	80.7% 1,275,825	28.5% 450,300
Grazing	1,502,175	100.0% 1,501,975	99.9% 1,501,300	99.8% 1,499,025	99.1% 1,489,000	83.4% 1,252,525	29.8% 448,050
Grazing non forest	1,212,625	100.0% 1,212,500	99.9% 1,211,925	99.8% 1,209,850	99.0% 1,200,500	80.9% 981,000	26.1% 316,250
Grazing Woodland forest	120,550	99.9% 120,475	99.9% 120,375	99.8% 120,250	99.5% 120,000	93.2% 112,350	35.5% 42,775
Grazing - Forest (non woodland)	169,000	100.0% 169,000	100.0% 169,000	100.0% 168,925	99.7% 168,500	94.2% 159,175	52.7% 89,025
Cropping	50,625	100.0% 50,625	100.0% 50,625	97.4% 49,325	82.2% 41,625	31.9% 16,150	2.9% 1,450
Production native forests and plantation forests	218,575	100.0% 218,575	100.0% 218,575	100.0% 218,575	100.0% 218,525	97.5% 213,100	84.4% 184,550

