Total vegetation cover soil protection Region:NRM Hunter NSW

Date: March 2012

This report describes vegetation protecting the soil surface from erosion during a chosen month compared to previous years. This report has been generated using MODIS fractional vegetation cover information available in Rangelands and Pasture Productivity (RAPP) map tool https://map.geo-rapp.org/#australia. The report is based on 500 metre pixel data on monthly time steps. Land use forest cover:

Results can be shown for the whole region (polygon), and separated by land use and forest cover classes which are likely to show different cover patterns and targets. Land use is divided into four broad classes: Conservation and natural environments, Agriculture, production native forests and plantation forests (no report), and other (no report). Agriculture is divided into grazing, crops and horticulture which are sub-divided into non-irrigated and irrigated. If forest is present land use is further divided into: non-forest, woodland forest and non-woodland forest. The area of each land use and forest class are shown as a map and chart. The report content is repeated for each land use and forest covers at least 1% of the area of the chosen region. Total vegetation Cover:

The total vegetation cover indicates where soil is likely to be protected from wind and or water hillslope erosion. Total vegetation cover for this month is shown on a map and chart classified into 4 classes.

• 71-100% High cover – protected from wind and usually water erosion (high rainfall, steep slopes, and erodible soils may need greater than 80, 90, 95 and up to 100% cover)

- 51-70% Moderate cover protected from wind erosion
- 31-50% Low cover not protected
- 0-30% Very Low cover not protected

Erosion protection: Wind erosion 50% total vegetation cover

The vegetation cover threshold required to prevent soil erosion is usually 50% to reduce wind erosion, 70% or 80% to reduce water (hillslope) erosion depending on the steepness and rainfall. Areas protected from erosion for the month:

- Map: water erosion protection (>70% cover) percentage area and hectares.
- Map: wind erosion protection (>50% cover) percentage area and hectares. Comparison with previous years:
 - Map: anomaly comparing this month to the average cover from the same month in previous years.
 - Map: deciles rank of month against the same month in previous years.

Anomalies and deciles until September 2019 are calculated comparing to the same months 2001 to 2019. Extra monthly data will be used to calculate anomalies and deciles post September 2019 as they become available. Time series monthly from January 2001 to current:

Erosion protection

- Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for each month (orange lines). Horizontal lines are 10th (cover target) and 50th percentiles.
- Water erosion protection time series: percentage of the area of the region with greater than 70% cover for each month (blue line). Horizontal lines are 10th (cover target) and 50th percentiles.

Rainfall

• Millimetres rainfall each month (black line).

Each time series is also stacked by year. The black line shows the current year of data. Water erosion protection for higher rainfall and steeper slopes:

Water erosion protection on higher slopes. As slope increases, more cover is required to control water erosion. The thresholds reported are:

- the percentage area with pixels greater than 80% total cover.
- the percentage area with pixels greater than 90% total cover.
- the percentage area with pixels greater than 95% total cover.

Acknowledgment of data:

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

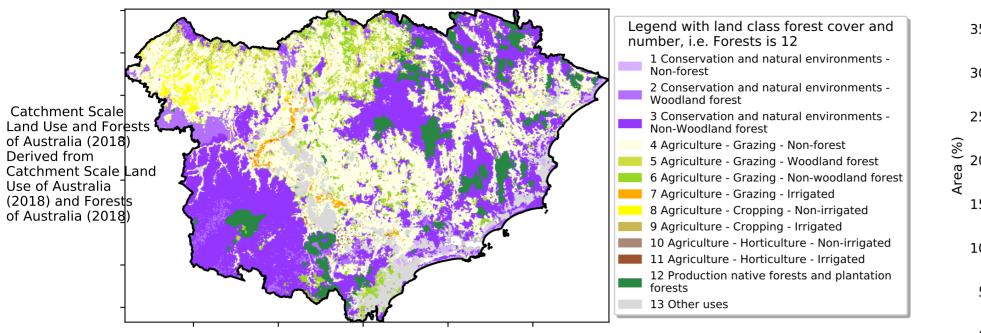
https://doi.org/10.4225/08/5848a3f19a7b3

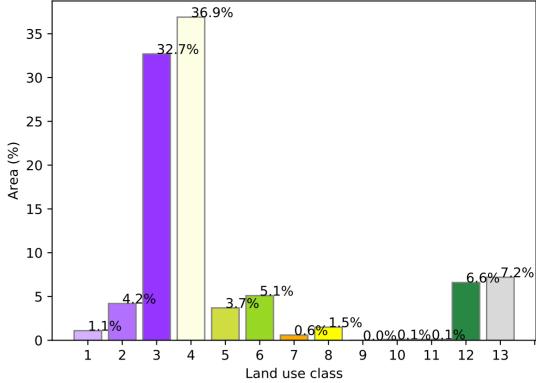


Vegetation Cover Mar 2012

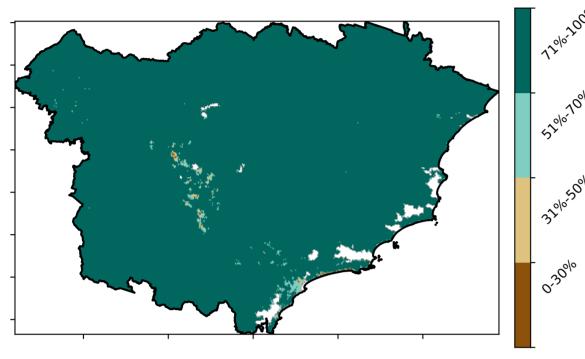
Land use and forest cover

Proportion of each land class in area

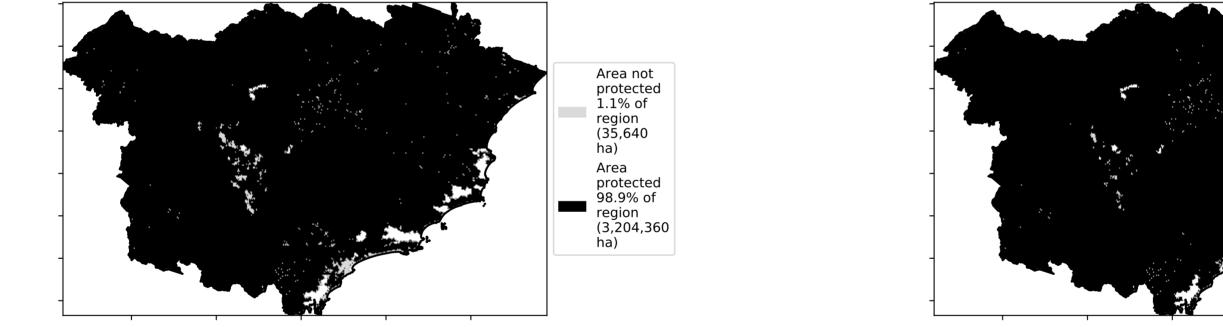




Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



20

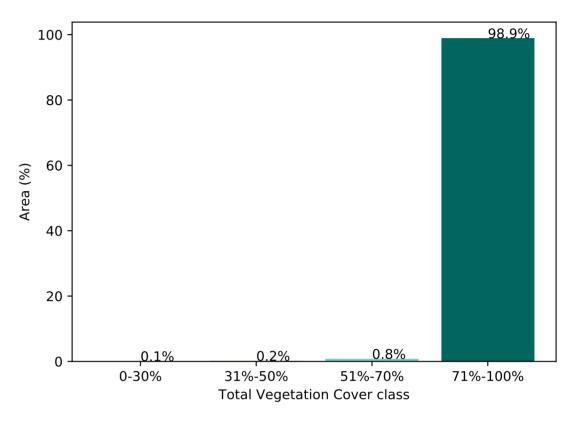
· 10

0

-10

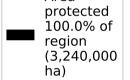
-20

Proportion of vegetation cover class in area

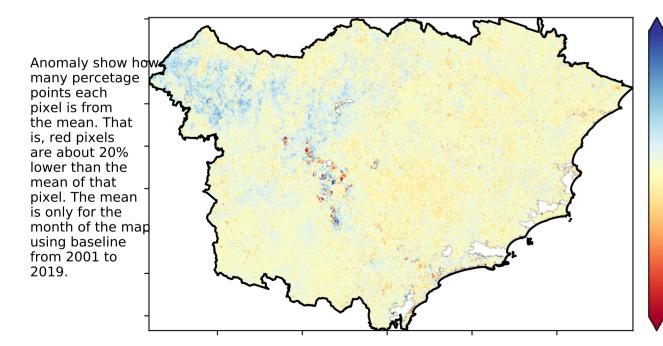


% Area protected from wind erosion (>50%)



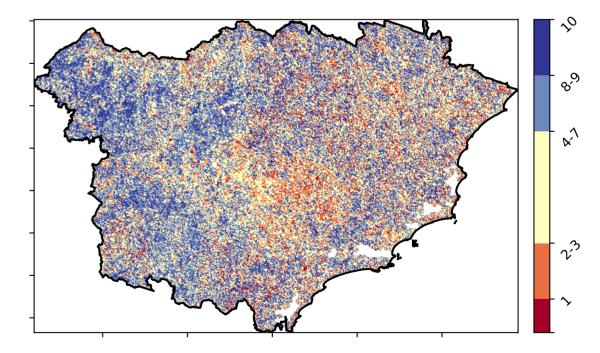


Total Vegetation Cover Anomaly [%]

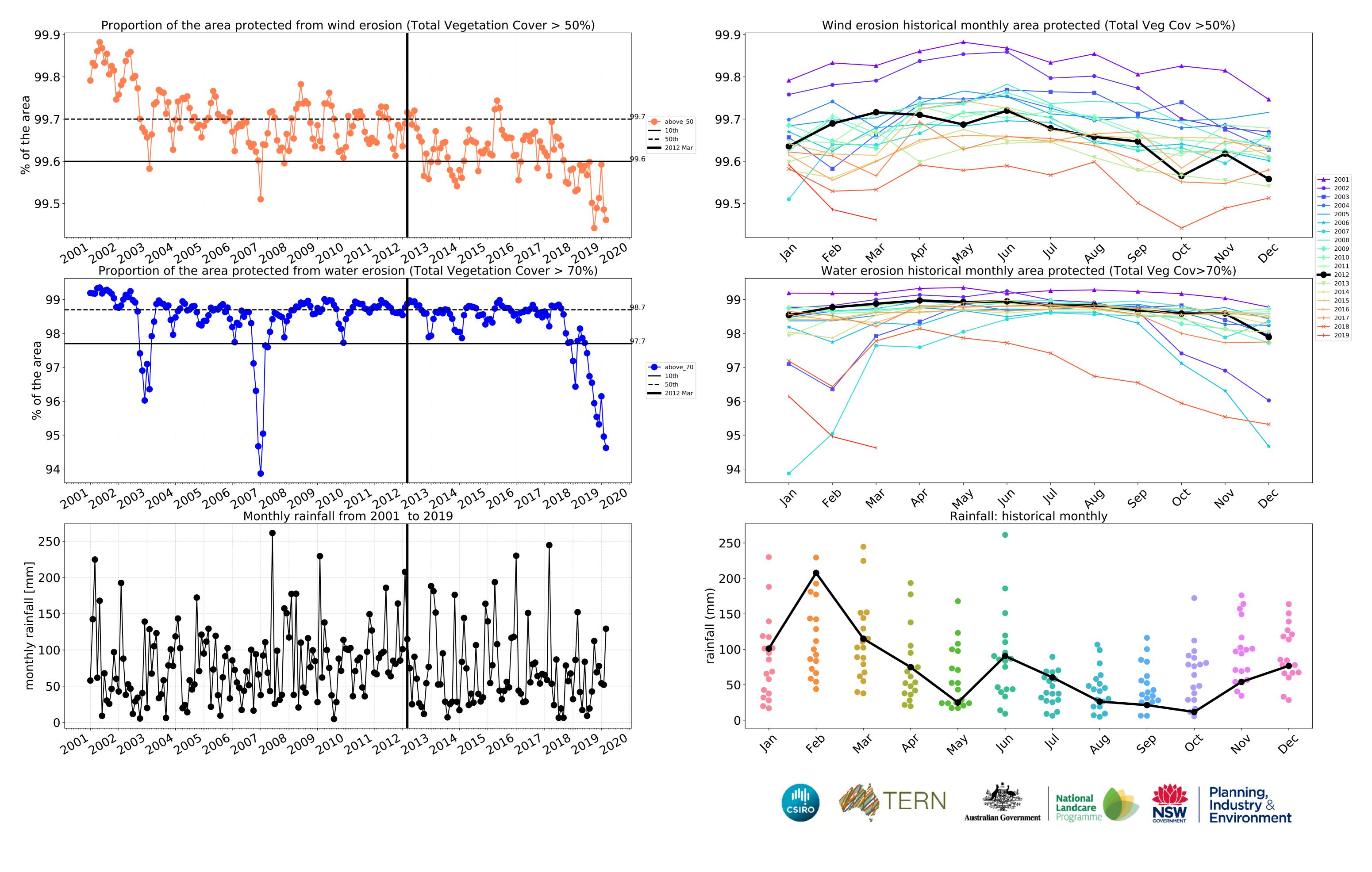


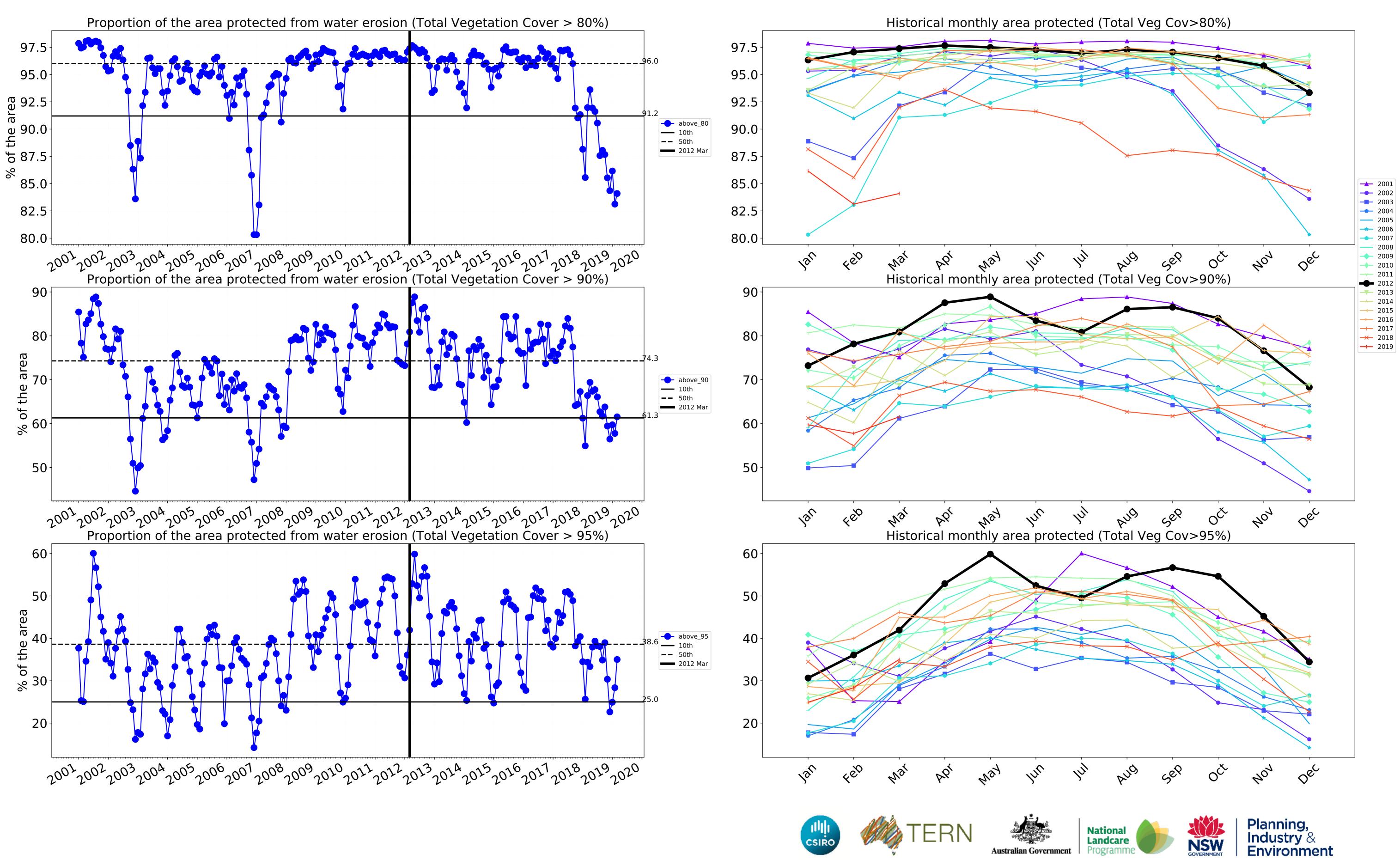
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



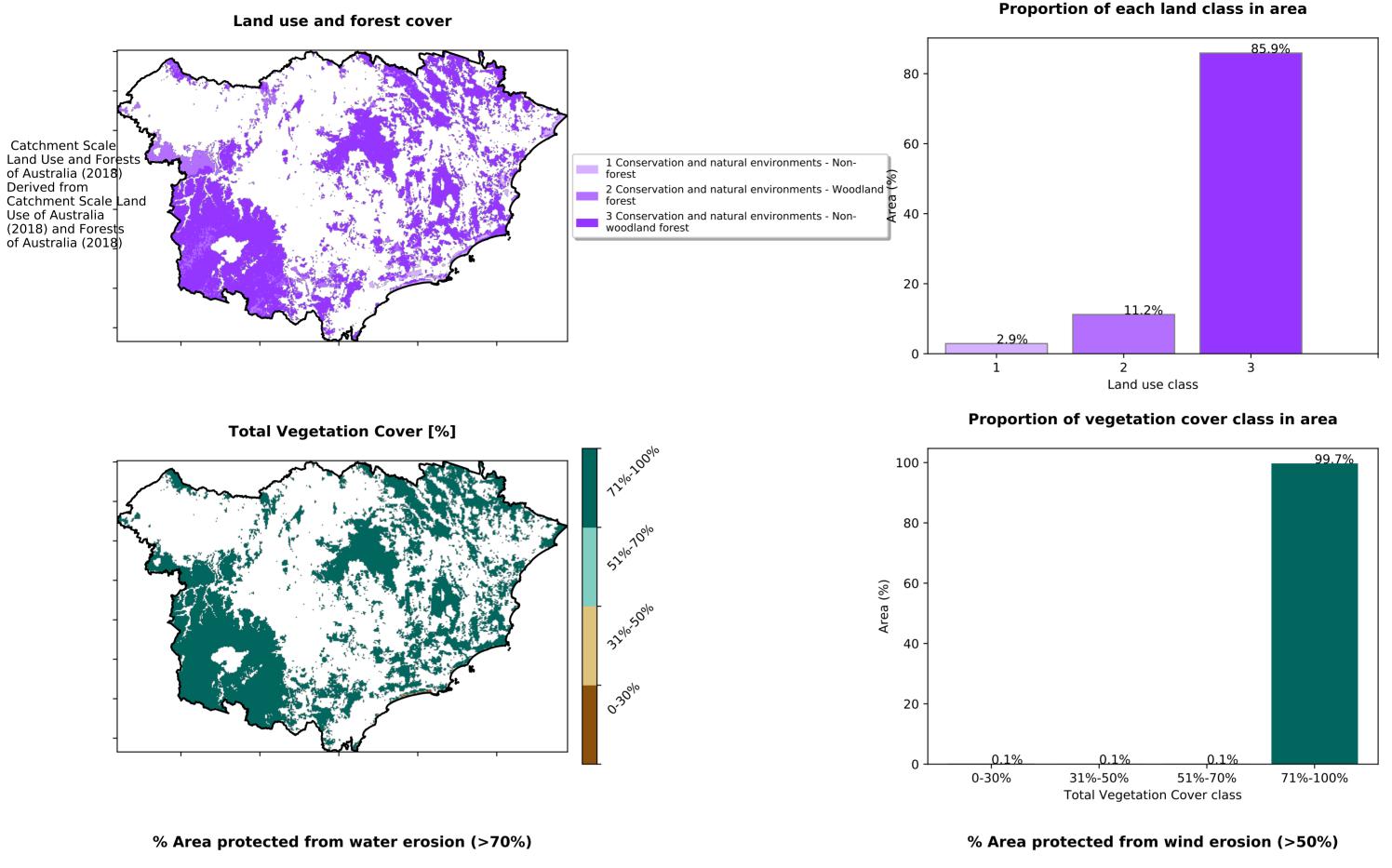


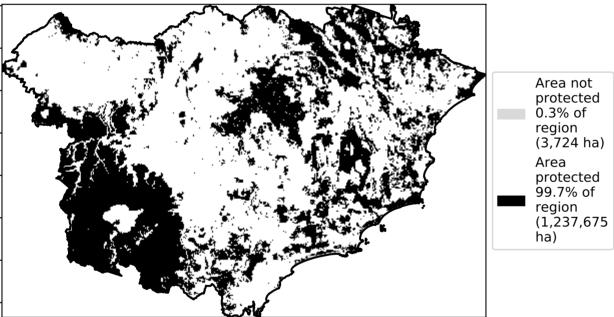






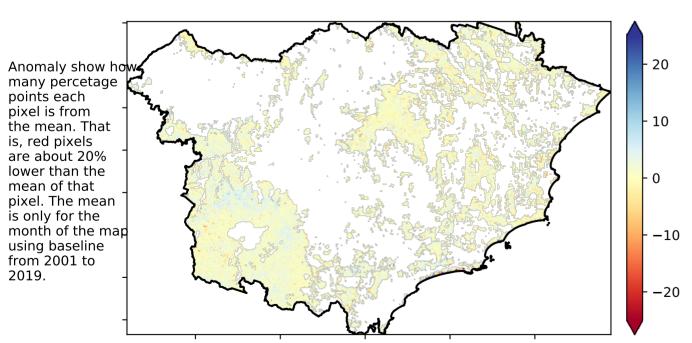
Conservation and natural environments





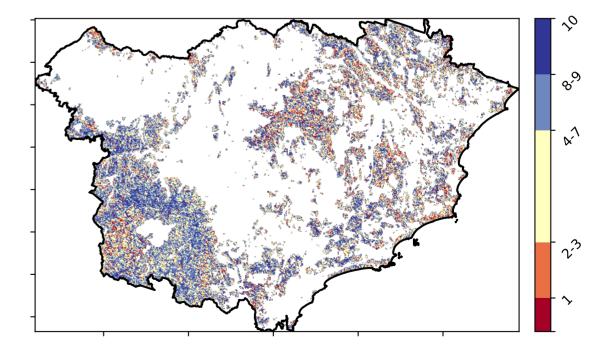


Total Vegetation Cover Anomaly [%]



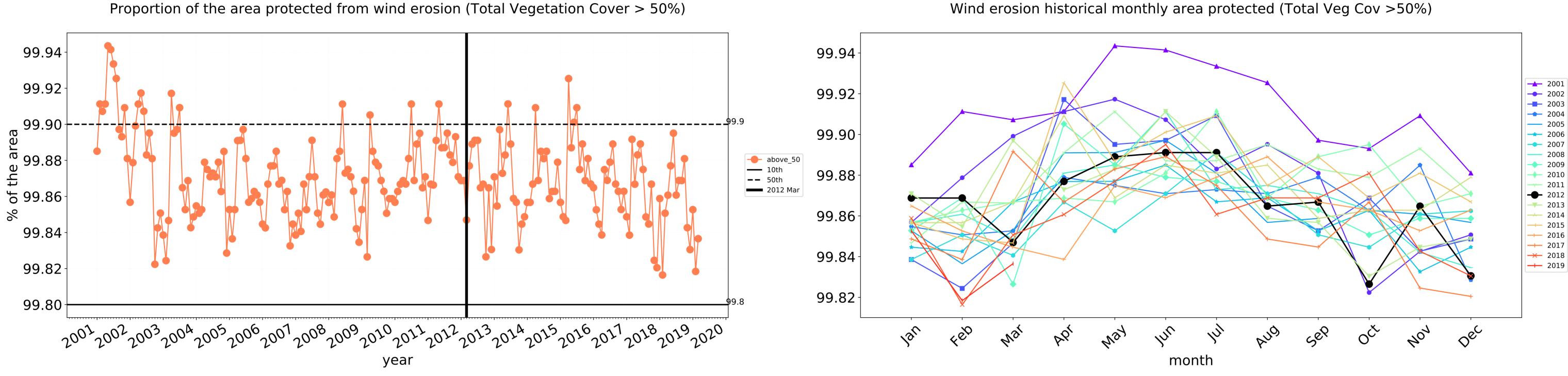
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

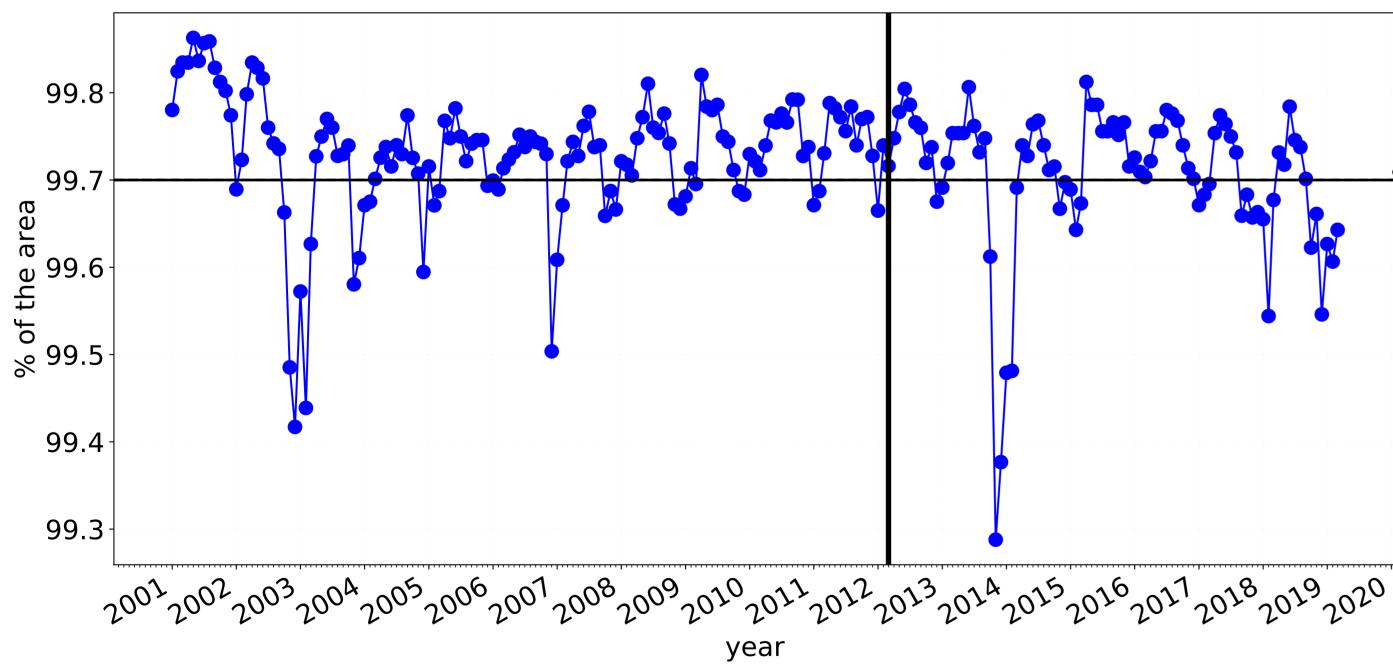




8



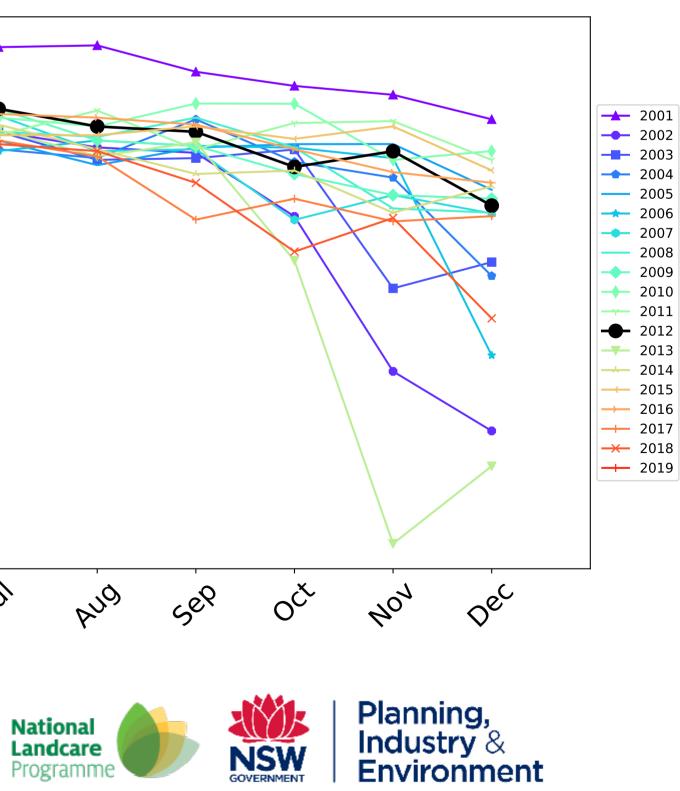
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

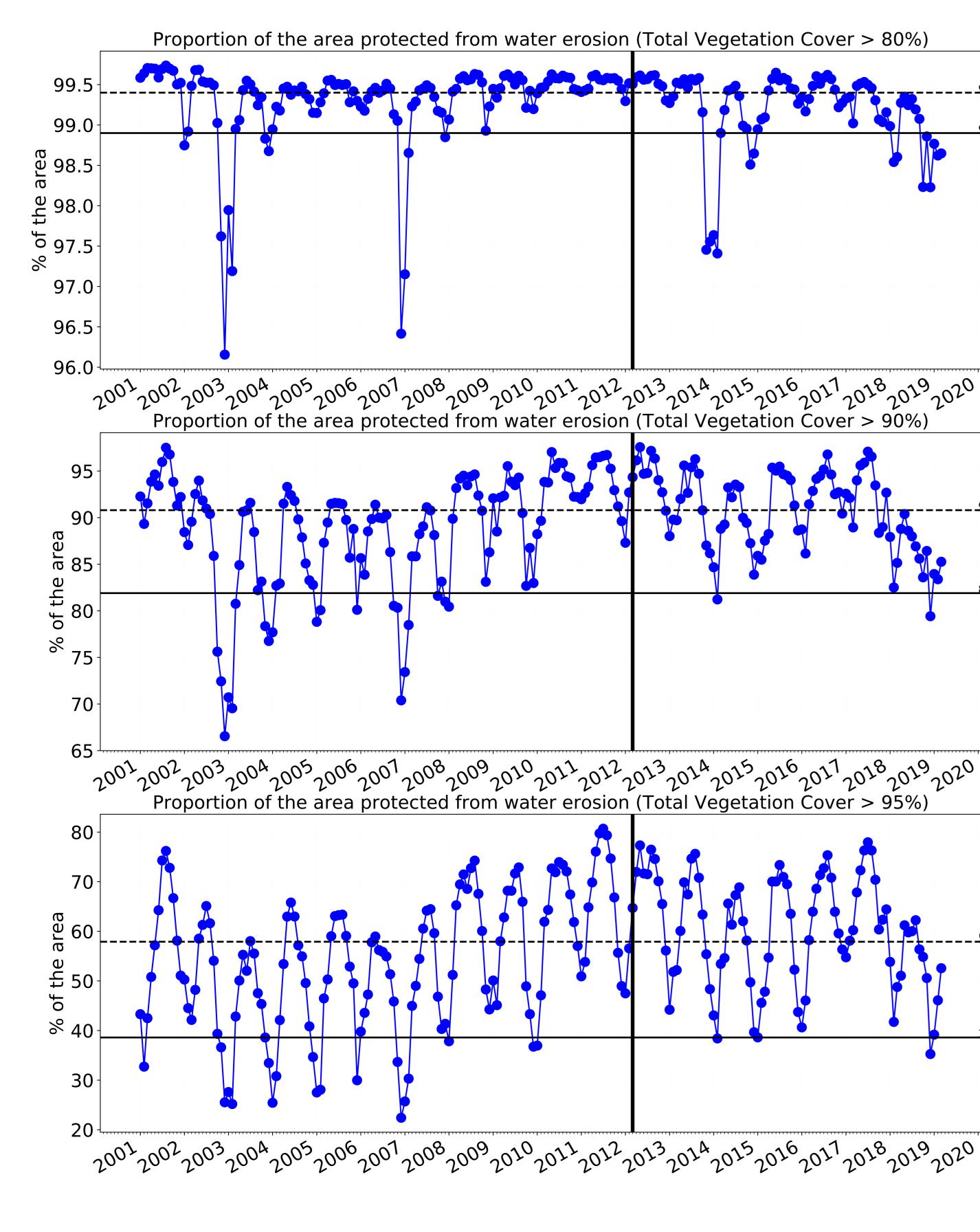


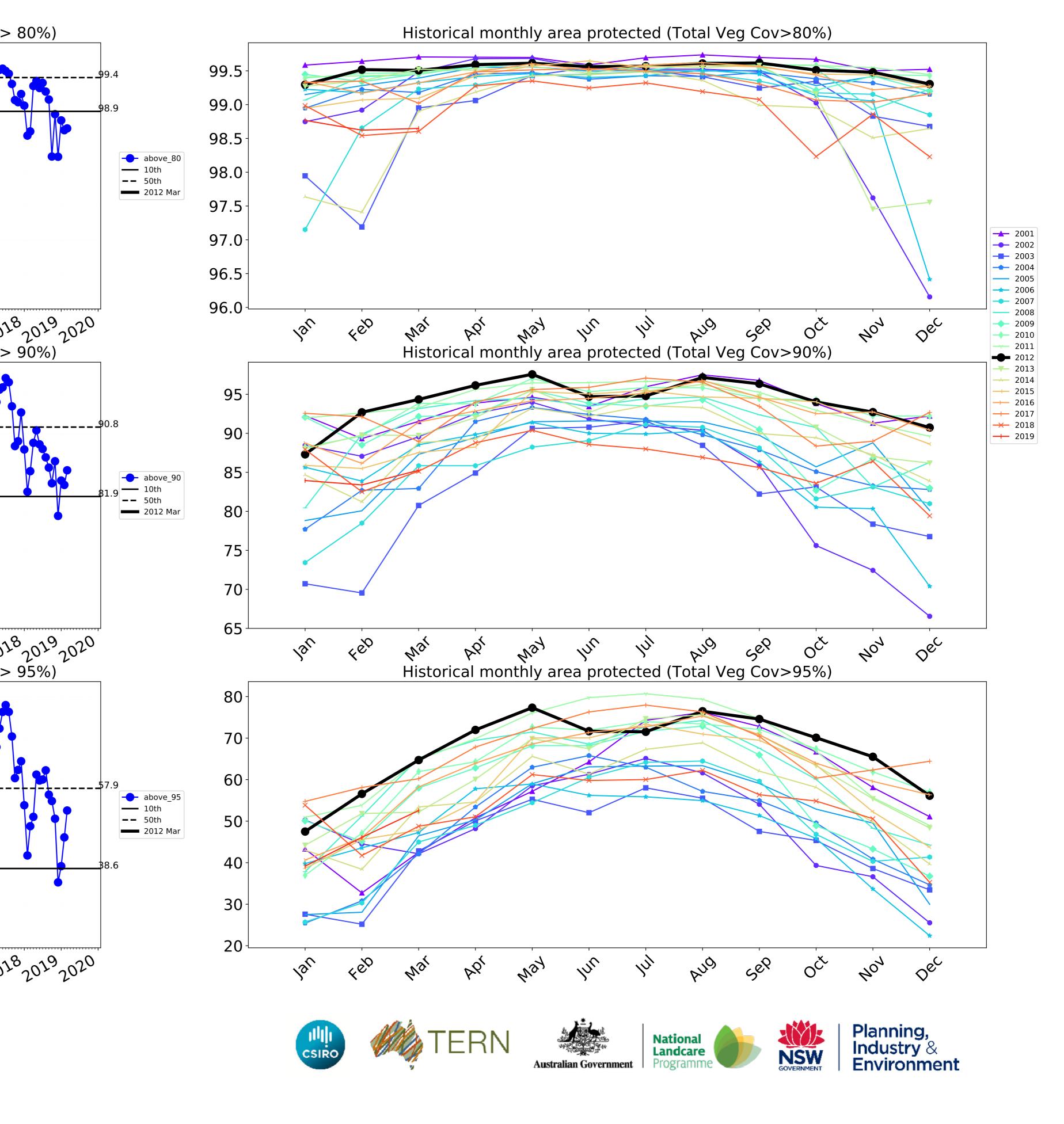
Conservation and natural environments timeseries

99.8 99.7 ---- above_70 **—** 10th **——** 50th **——** 2012 Mar 99.6⁻ 99.5 99.4⁻ 99.3-Jan fer May In PQ1 1's Mai month TERN CSIRC Australian Government

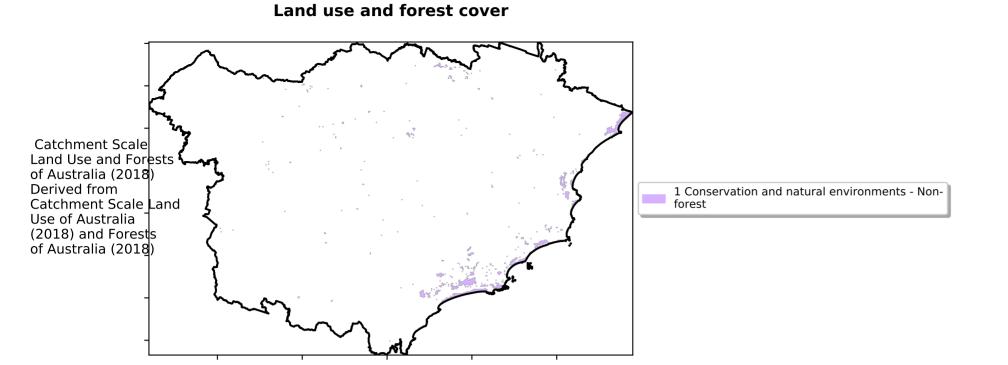
Water erosion historical monthly area protected (Total Veg Cov>70%)



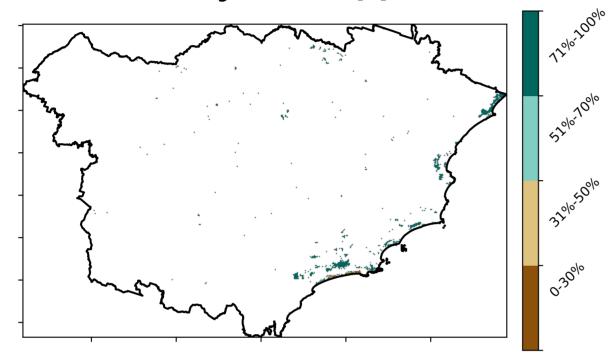




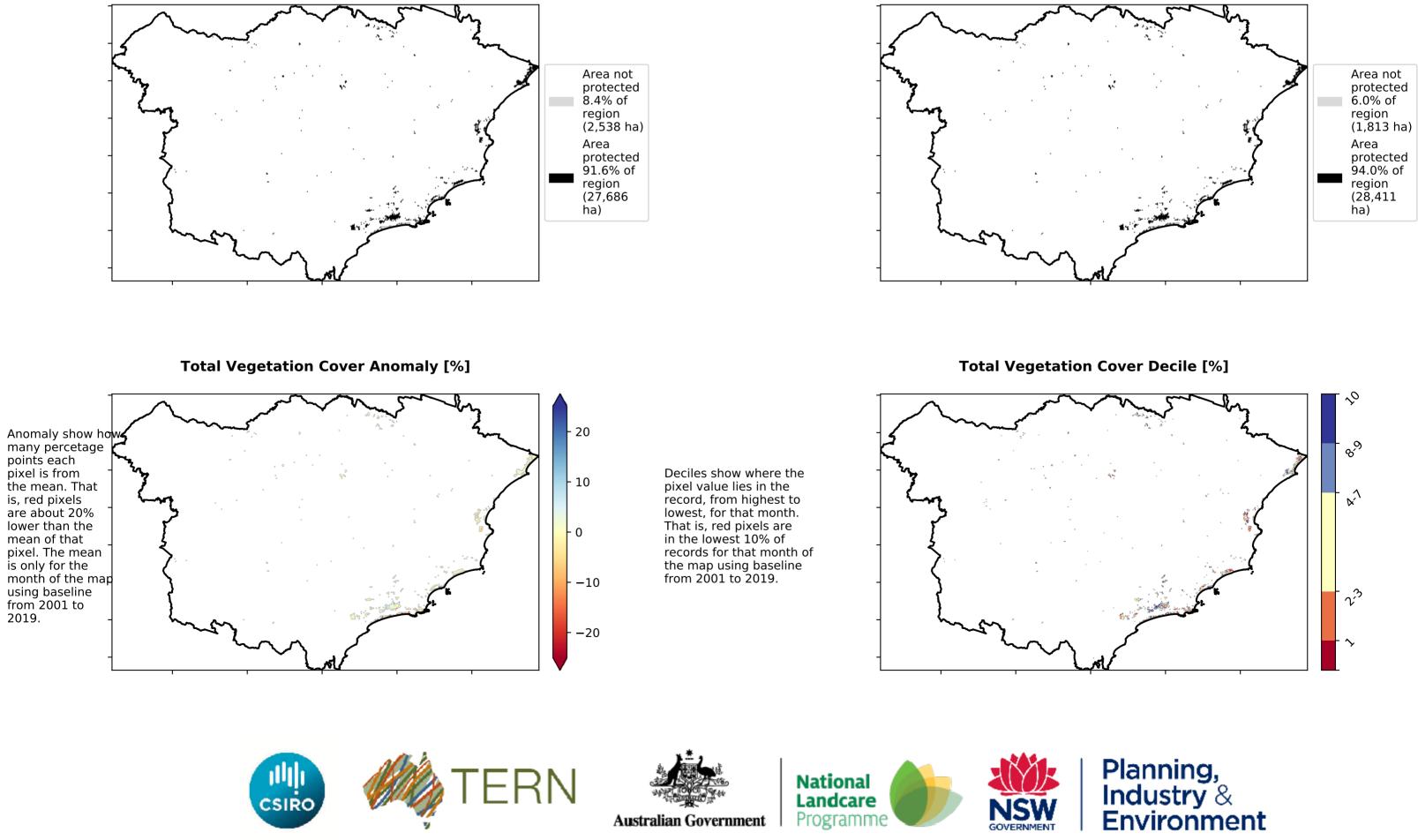
Conservation and natural environments non forest



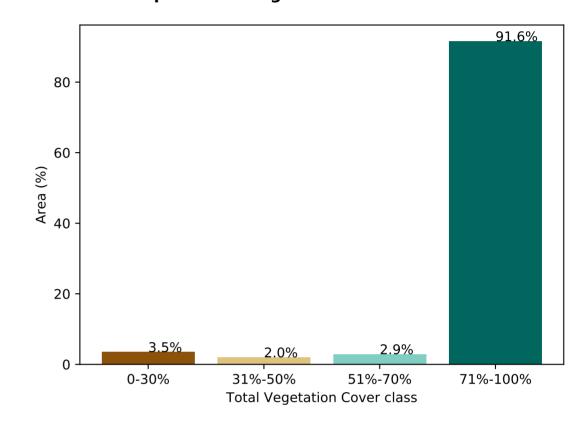
Total Vegetation Cover [%]



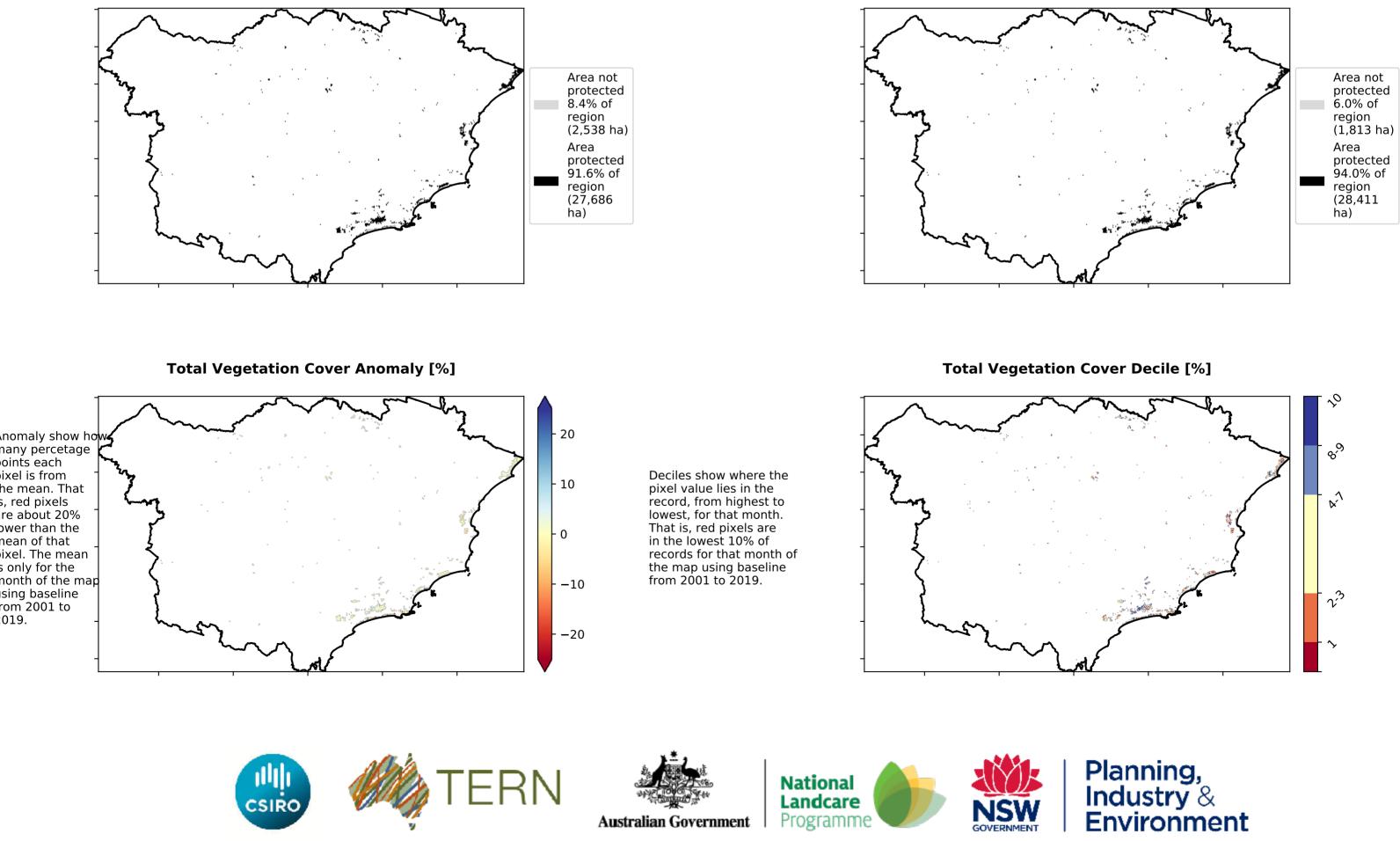
% Area protected from water erosion (>70%)

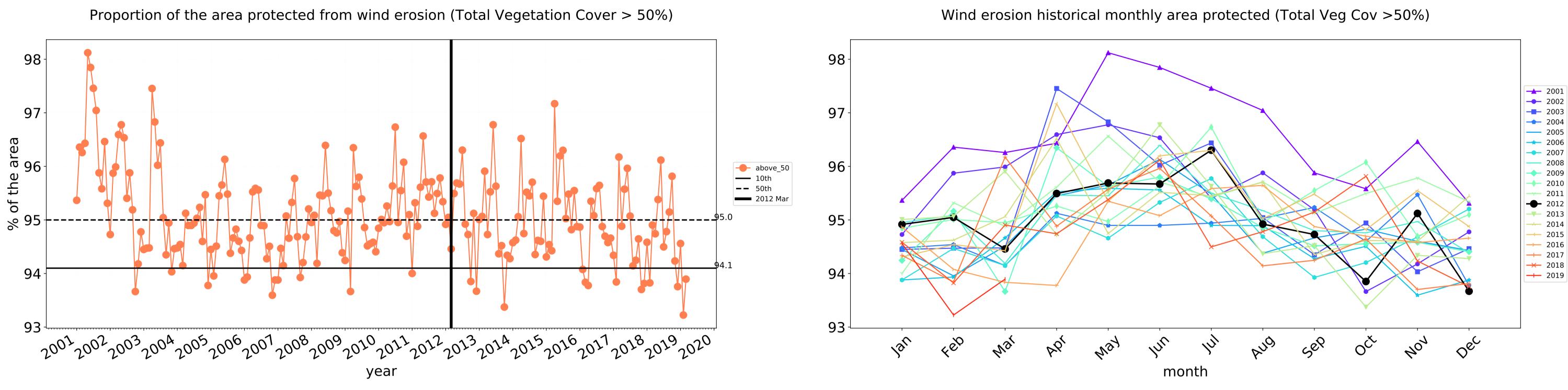


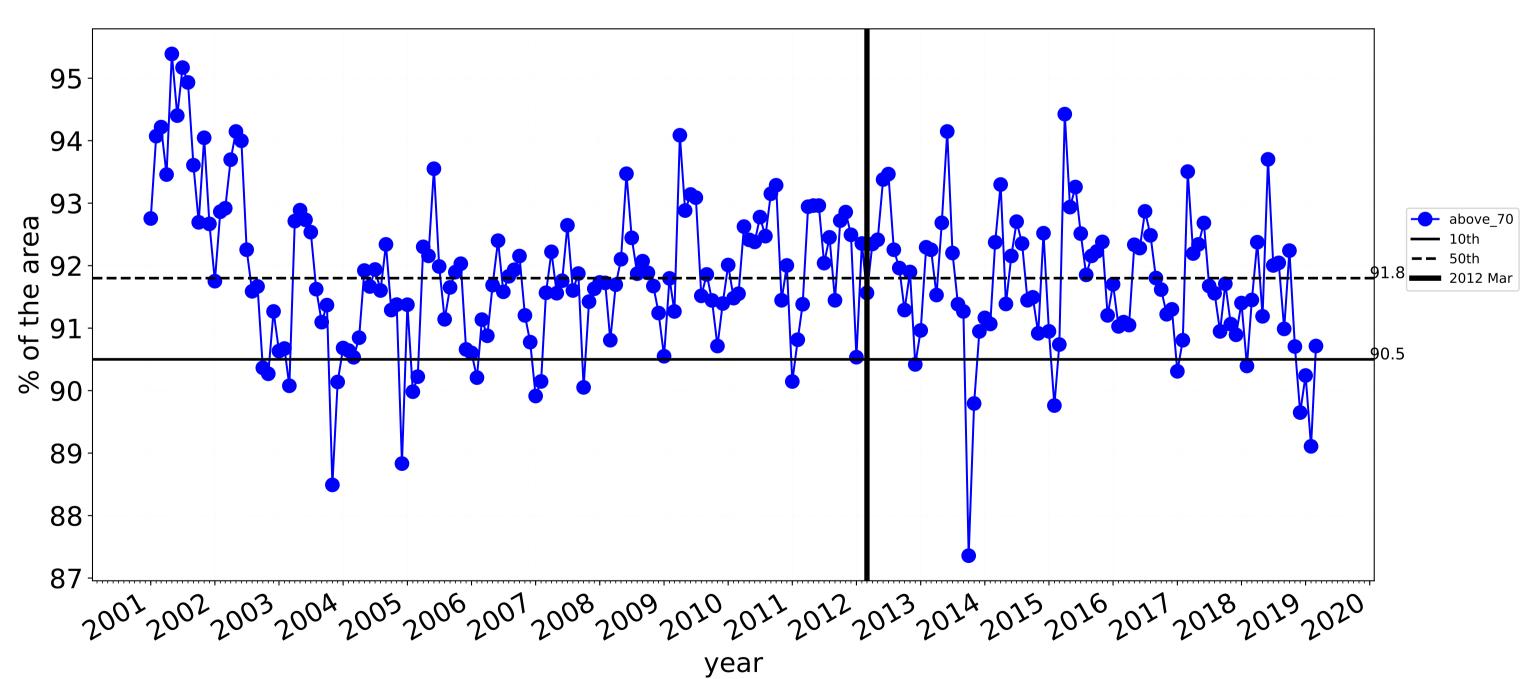
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



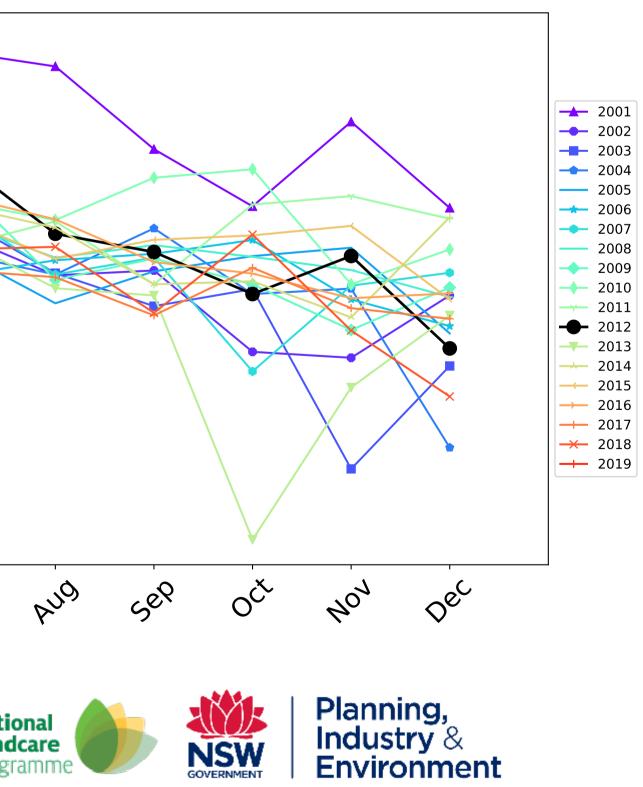




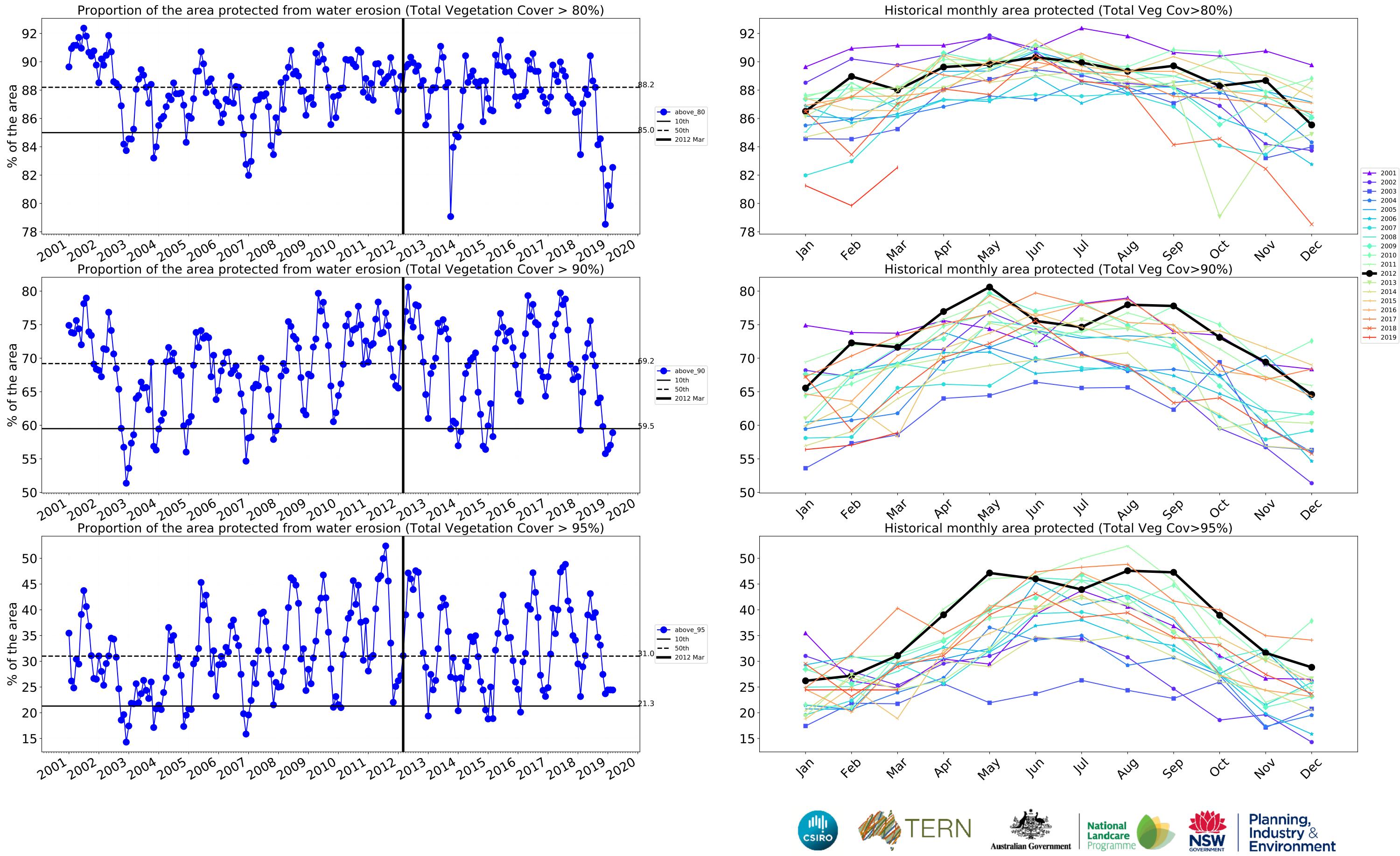


95 94 93 92 91 90 89 88 87 4eb Jan May In Mai 1¹1 Þb, month ERN National Landcare CSIRO Programm Australian Government

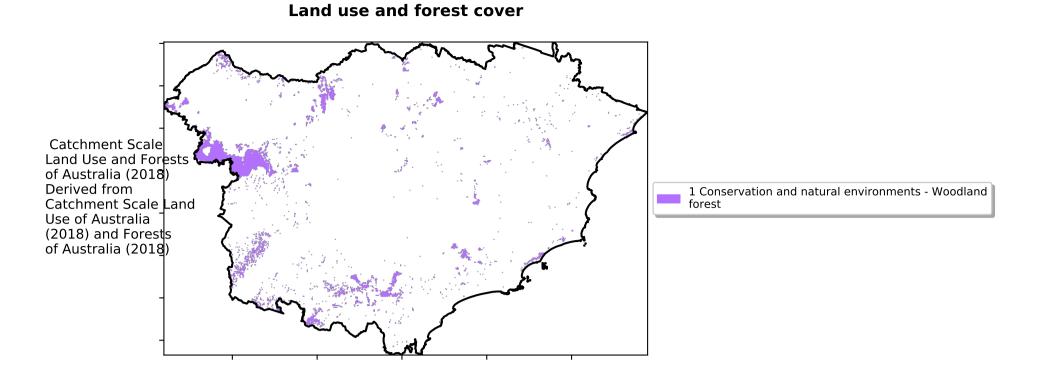
Water erosion historical monthly area protected (Total Veg Cov>70%)



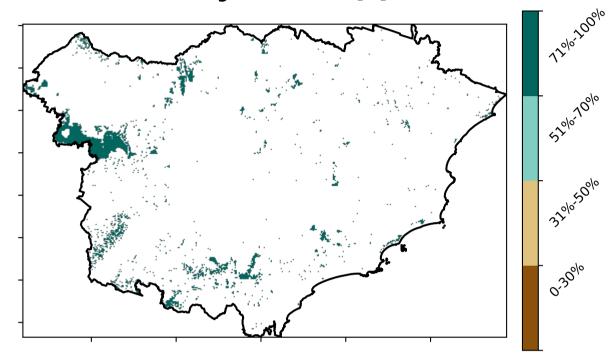
NSW GOVERNMENT



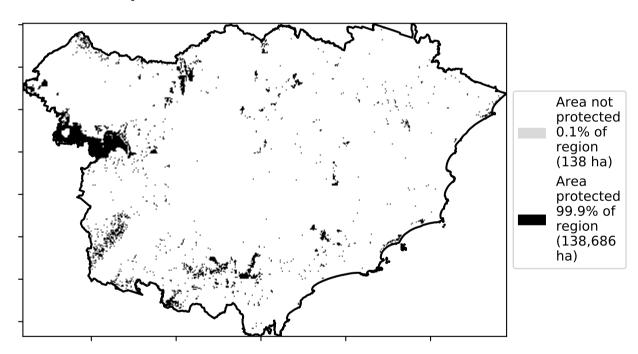
Conservation and natural environments Woodland forest



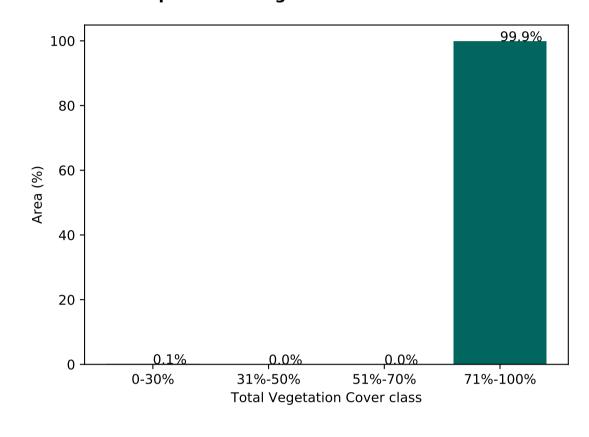
Total Vegetation Cover [%]



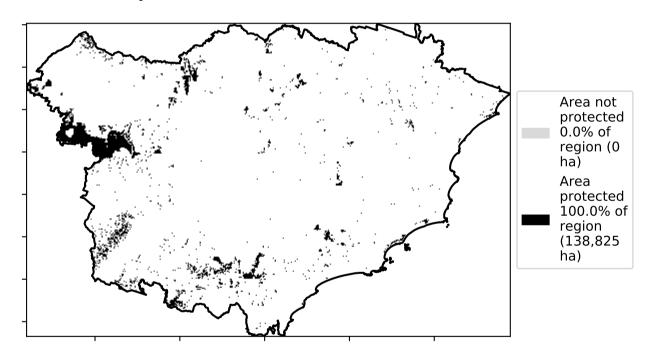
% Area protected from water erosion (>70%)



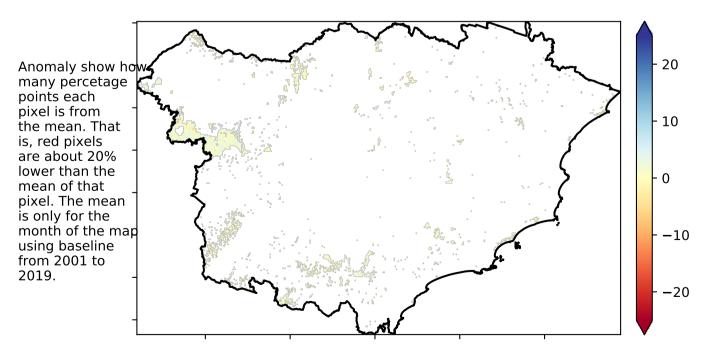
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

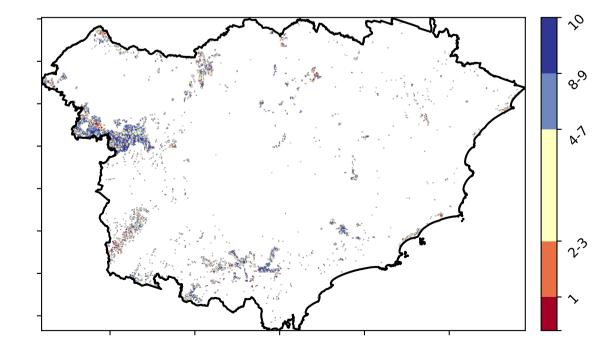


Total Vegetation Cover Anomaly [%]

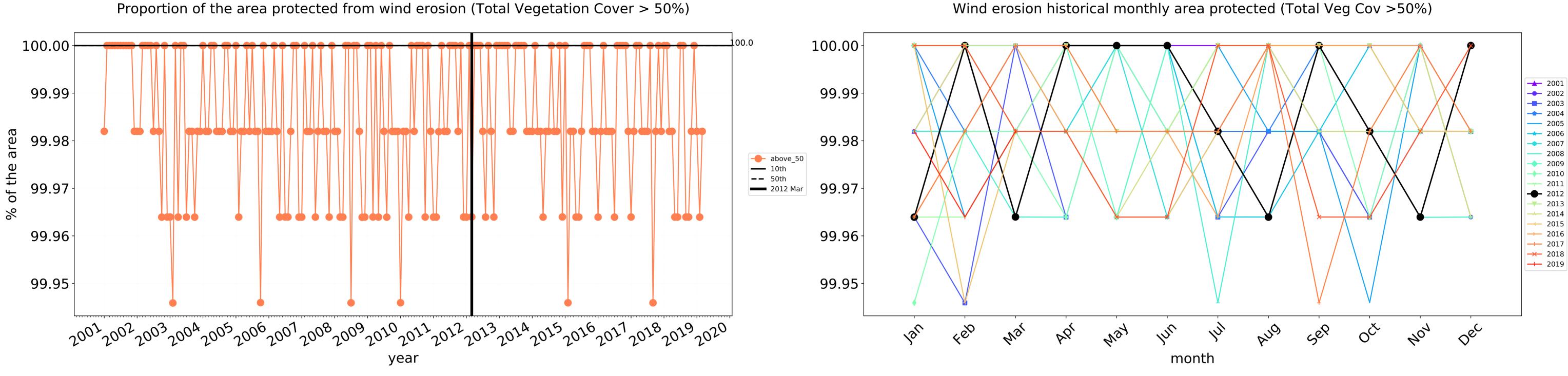


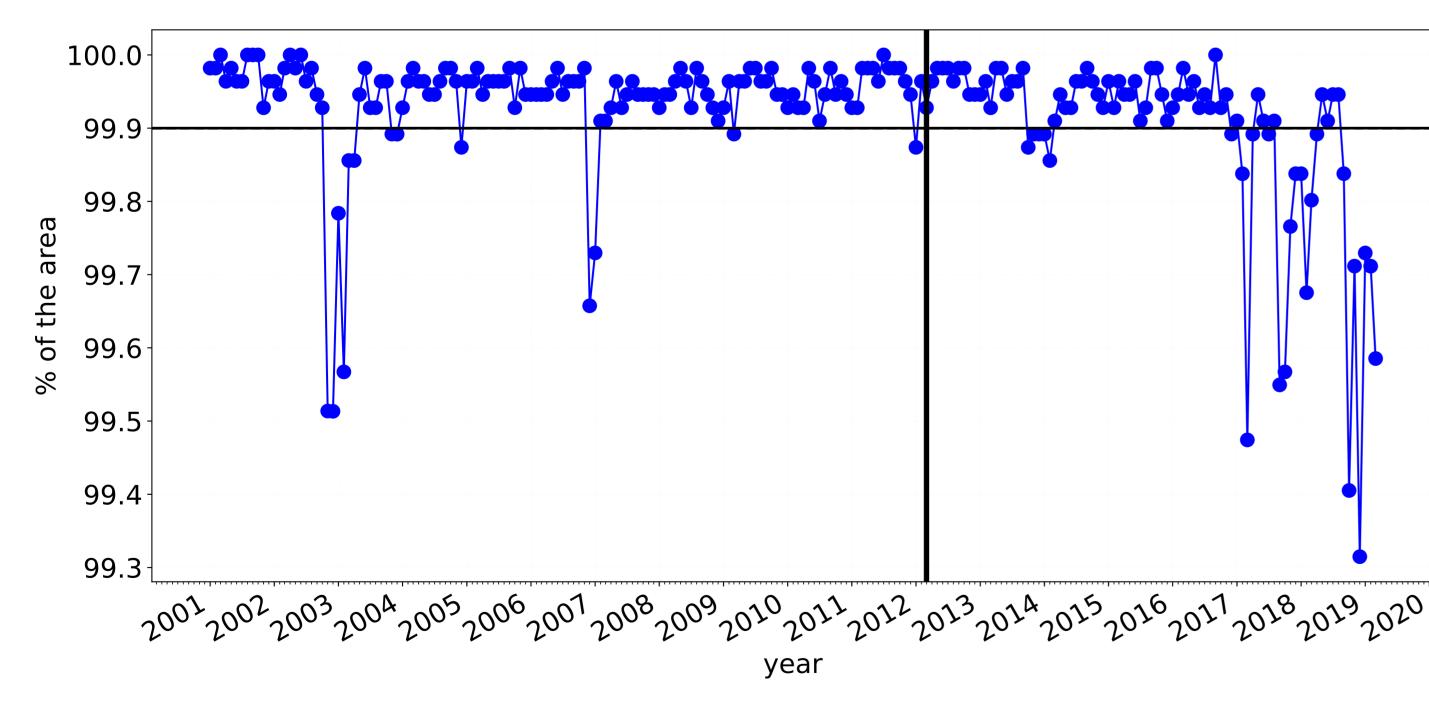
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Total Vegetation Cover Decile [%]



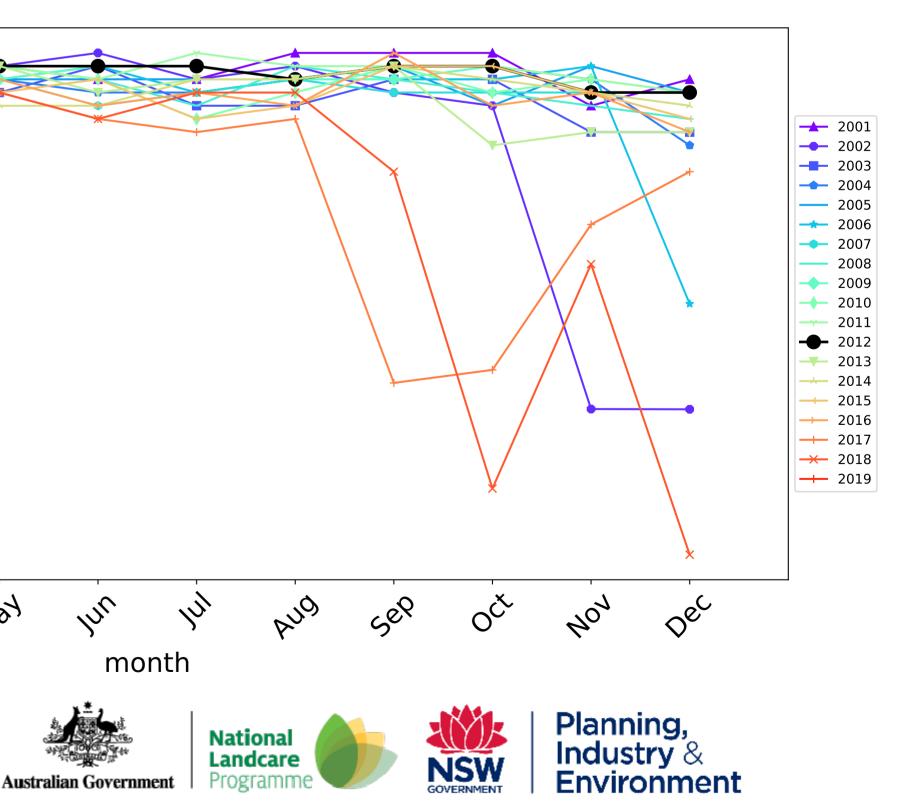


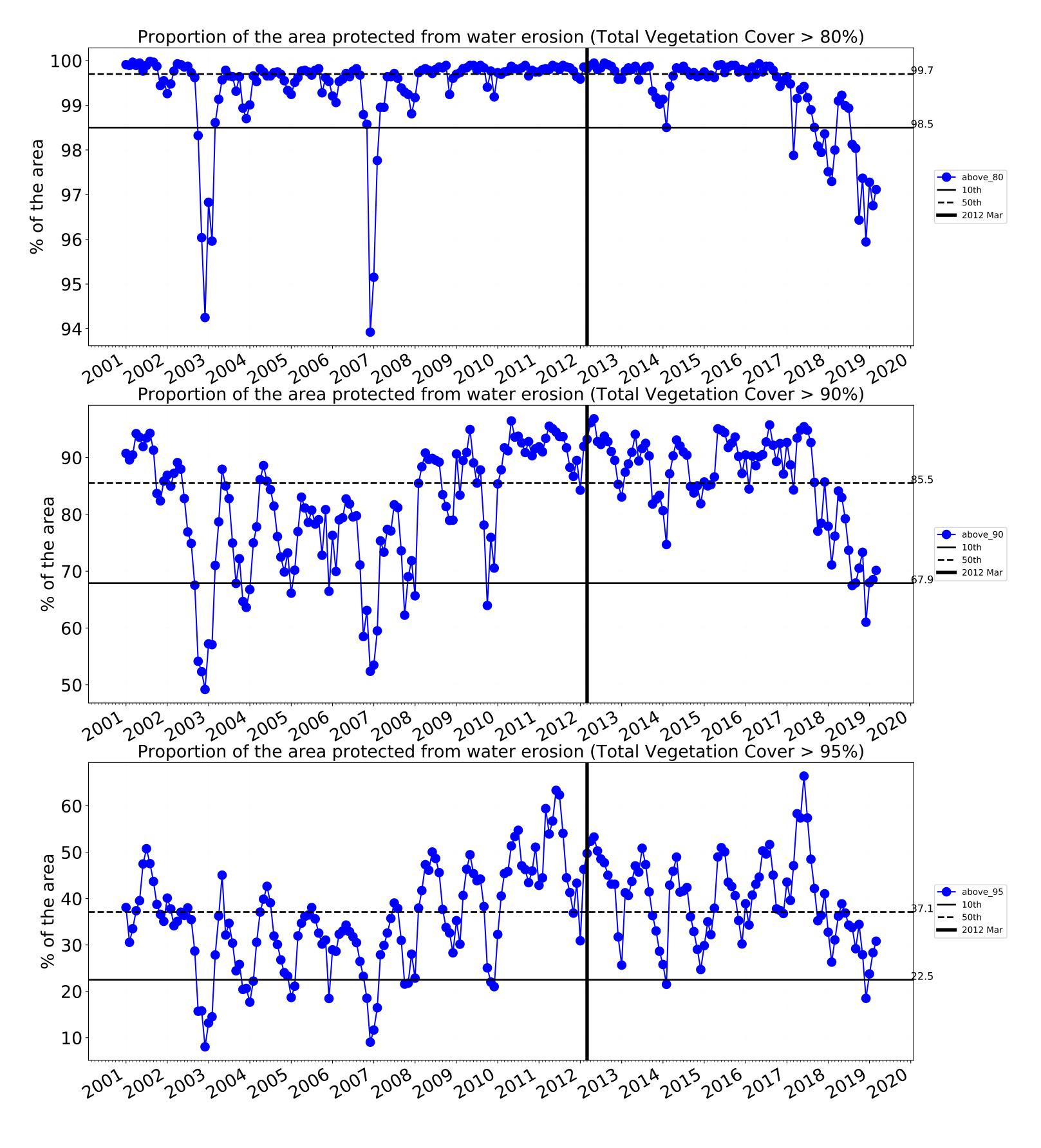


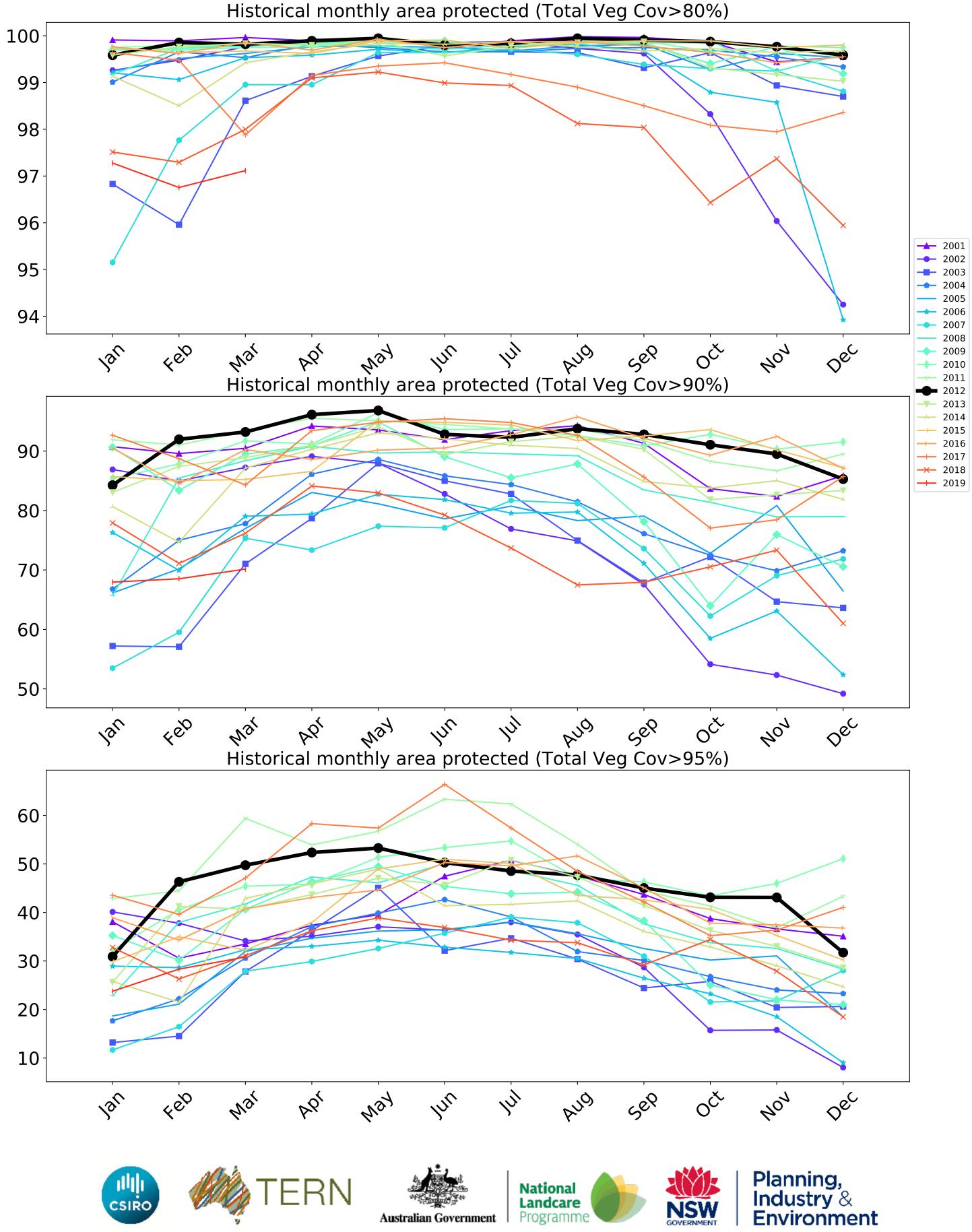


100.0 99.9 99.8 ---- above_70 **—** 10th **--** 50th 99.7 **—** 2012 Mar 99.6 99.5 99.4 99.3 feb lar In May PQ Mai month ERN CSIRO

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





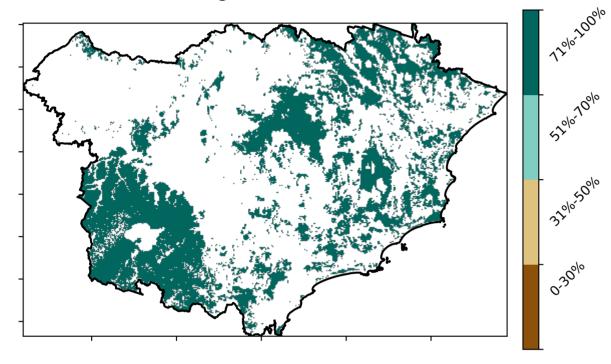


Australian Government

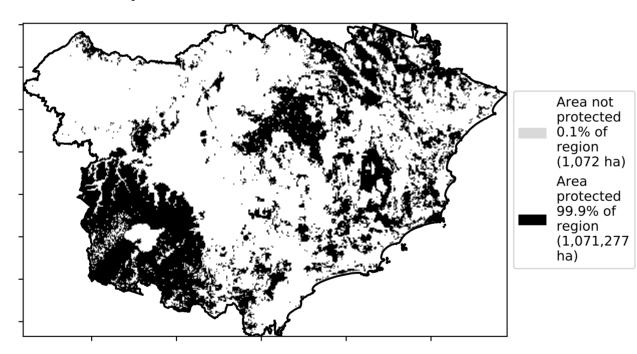
Conservation and natural environments Forest (non woodland)



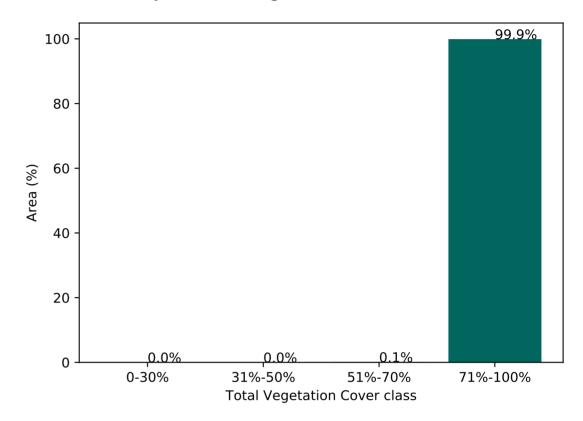
Total Vegetation Cover [%]



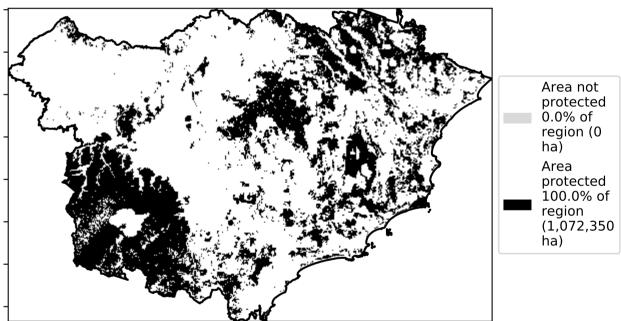
% Area protected from water erosion (>70%)



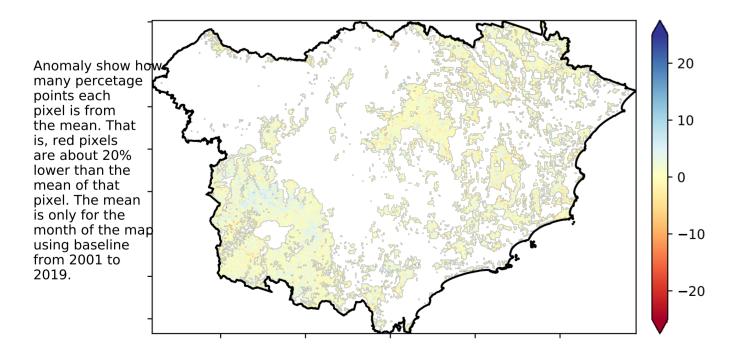
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

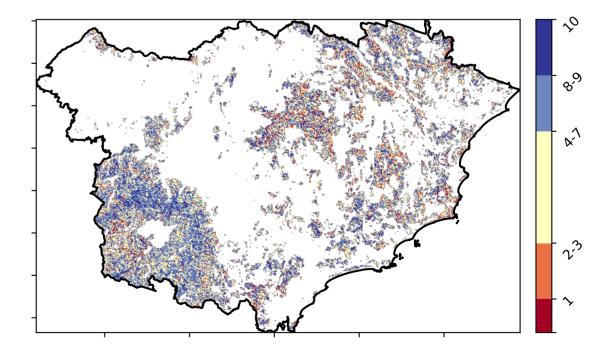


Total Vegetation Cover Anomaly [%]

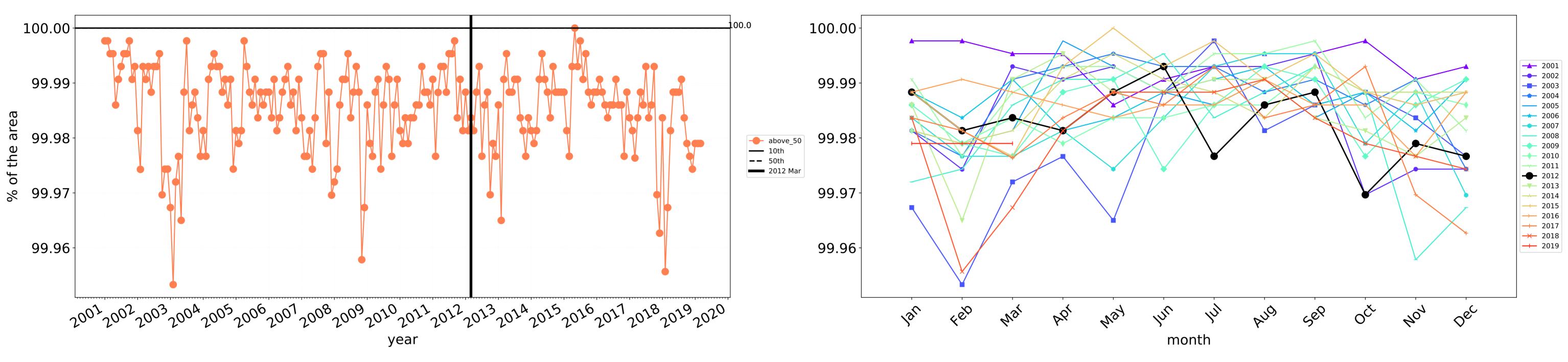


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Total Vegetation Cover Decile [%]

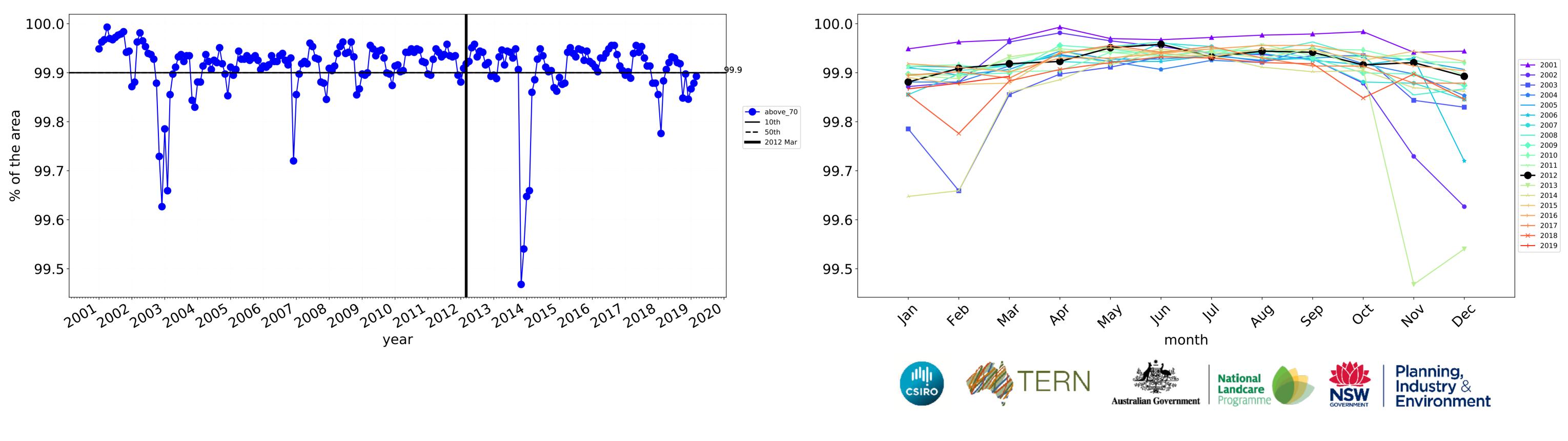






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

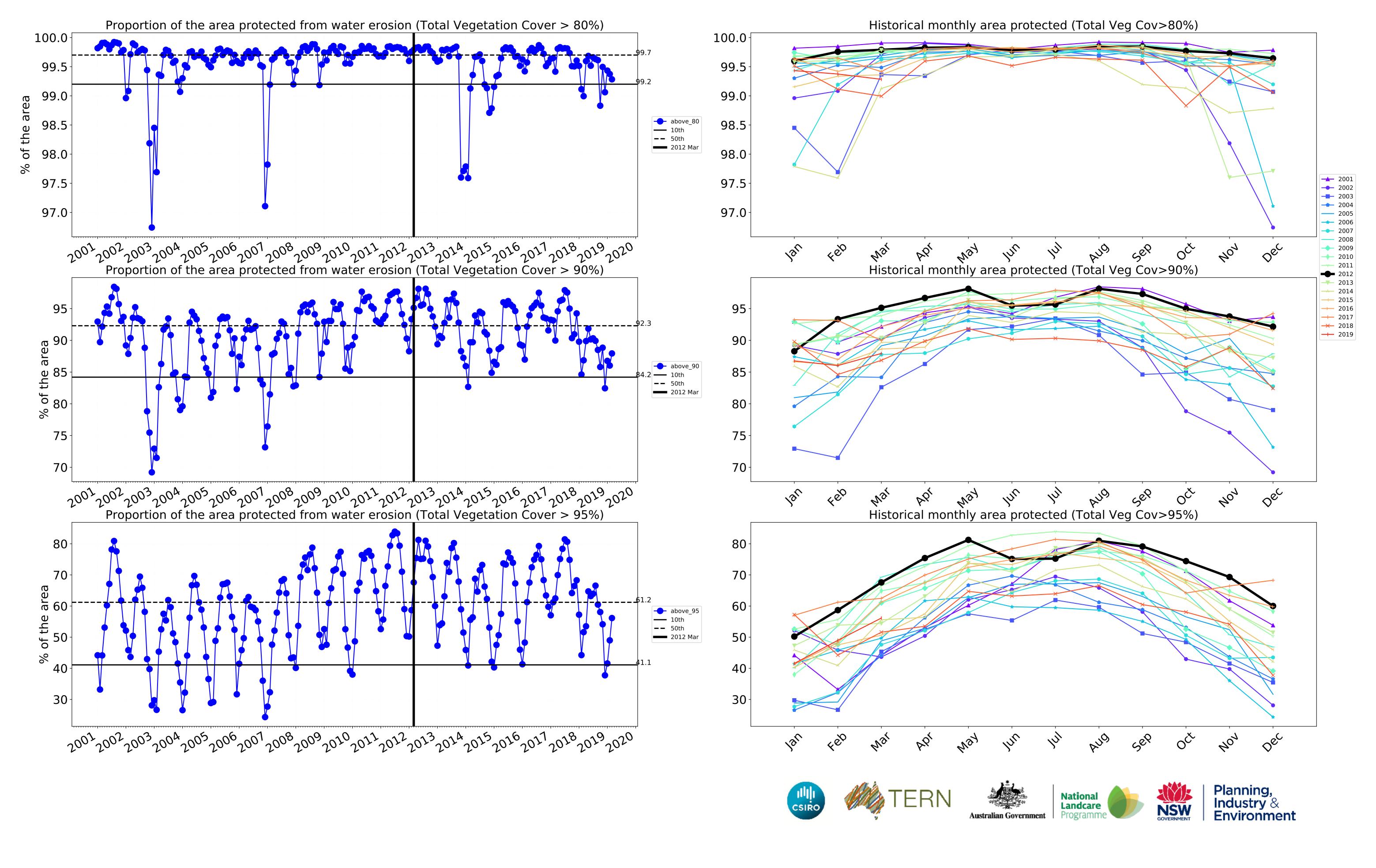
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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 80 -<u>76.</u>7% 70 · 60 Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 50 Area (%) - 05 3 Agriculture - Grazing - Non-woodland forest Derived from 4 Agriculture - Grazing - Irrigated Catchment Scale Land 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests of Australia (2018) 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 30 8 Agriculture - Horticulture - Irrigated 20 <u>10.</u>7% 10 <u>7.6</u>% 0 1 2 3 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 1200,1000 100 80 52%70% 60 Area (%) 32010 40 0.30% 20 0.2% 0.0% 0.0% 0 0-30% 31%-50% 51%-70% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)

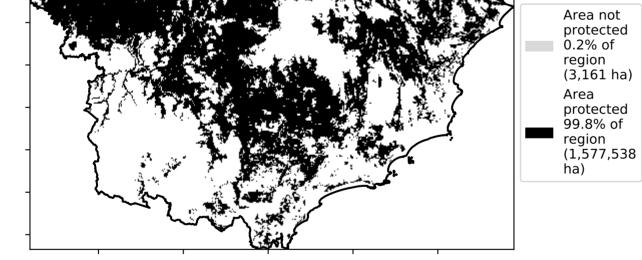
Proportion of each land class in area

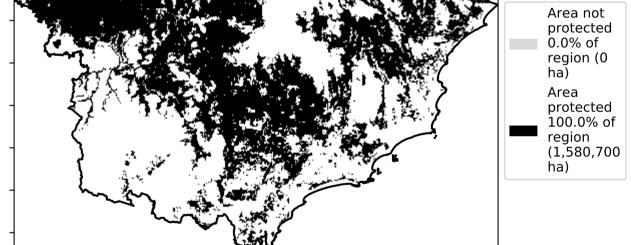
0.2%

8

99.8%

71%-100%



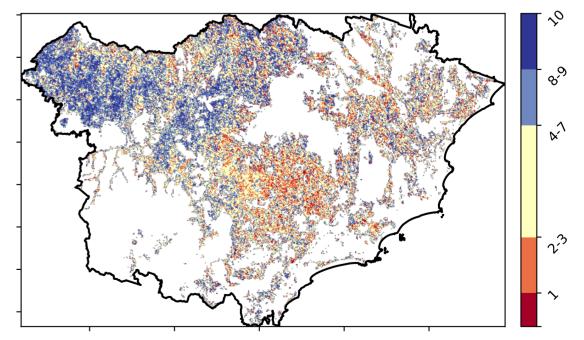


Total Vegetation Cover Anomaly [%]

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

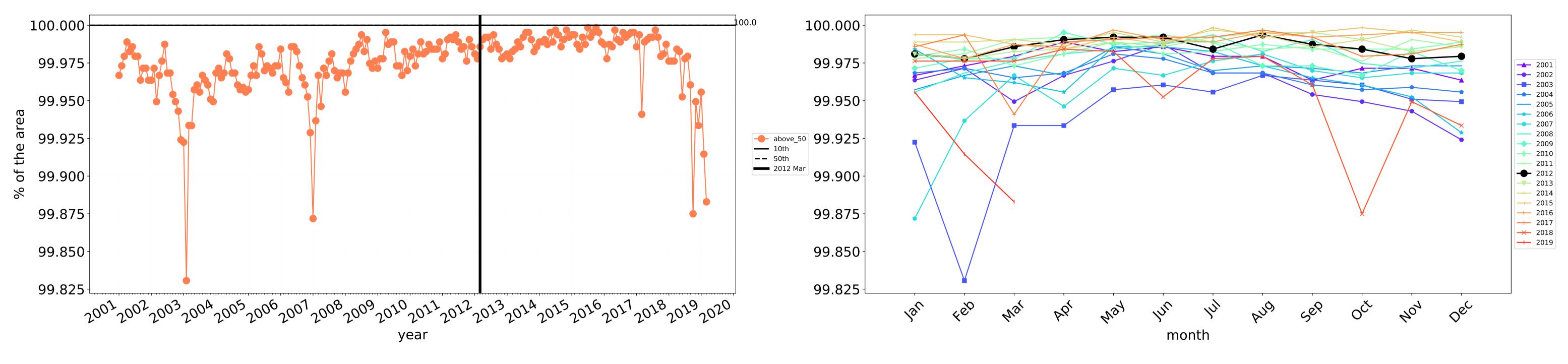
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

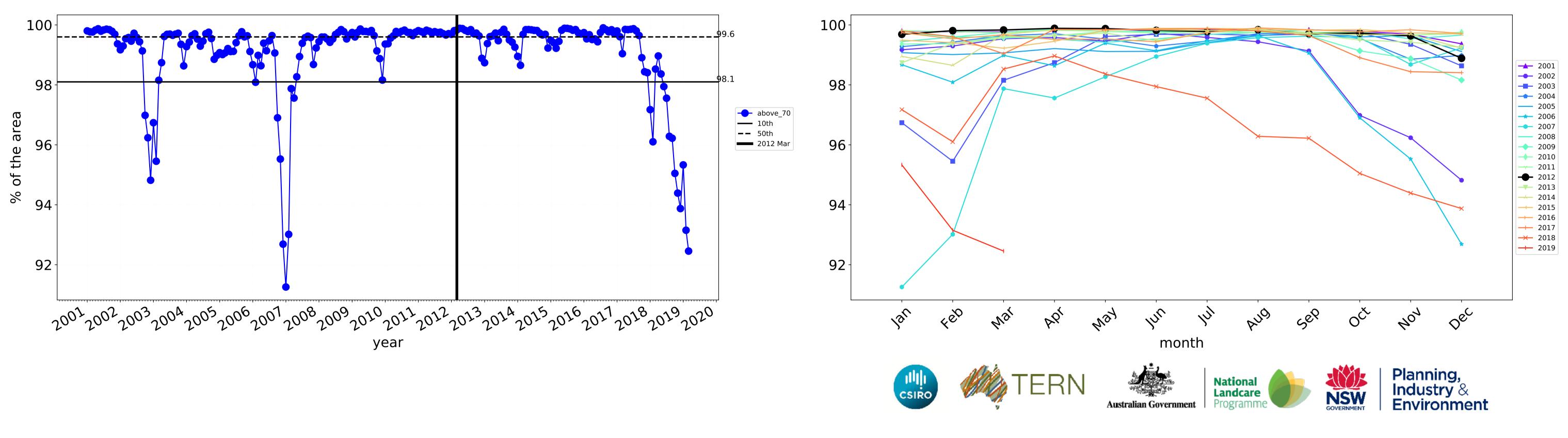




12

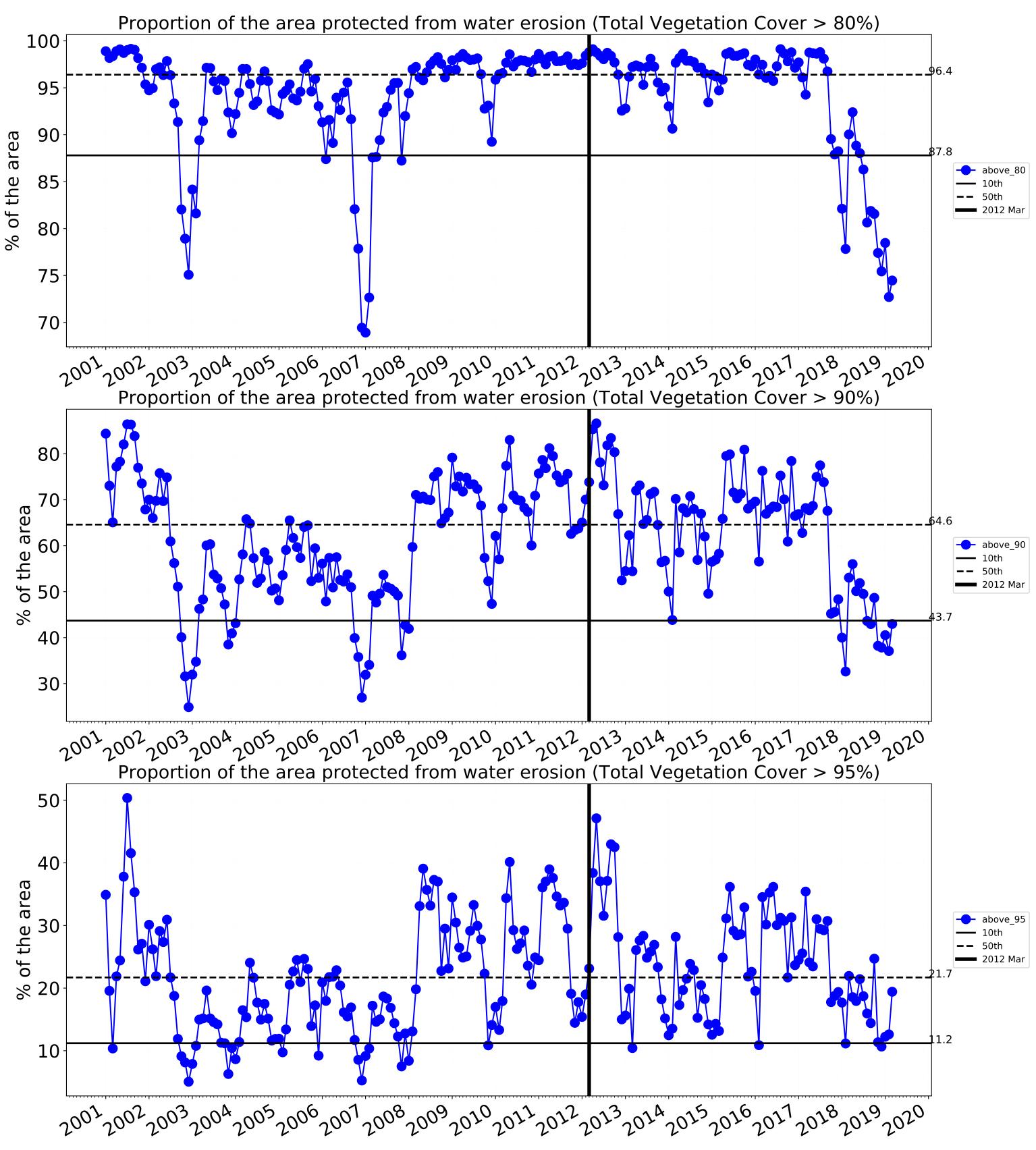


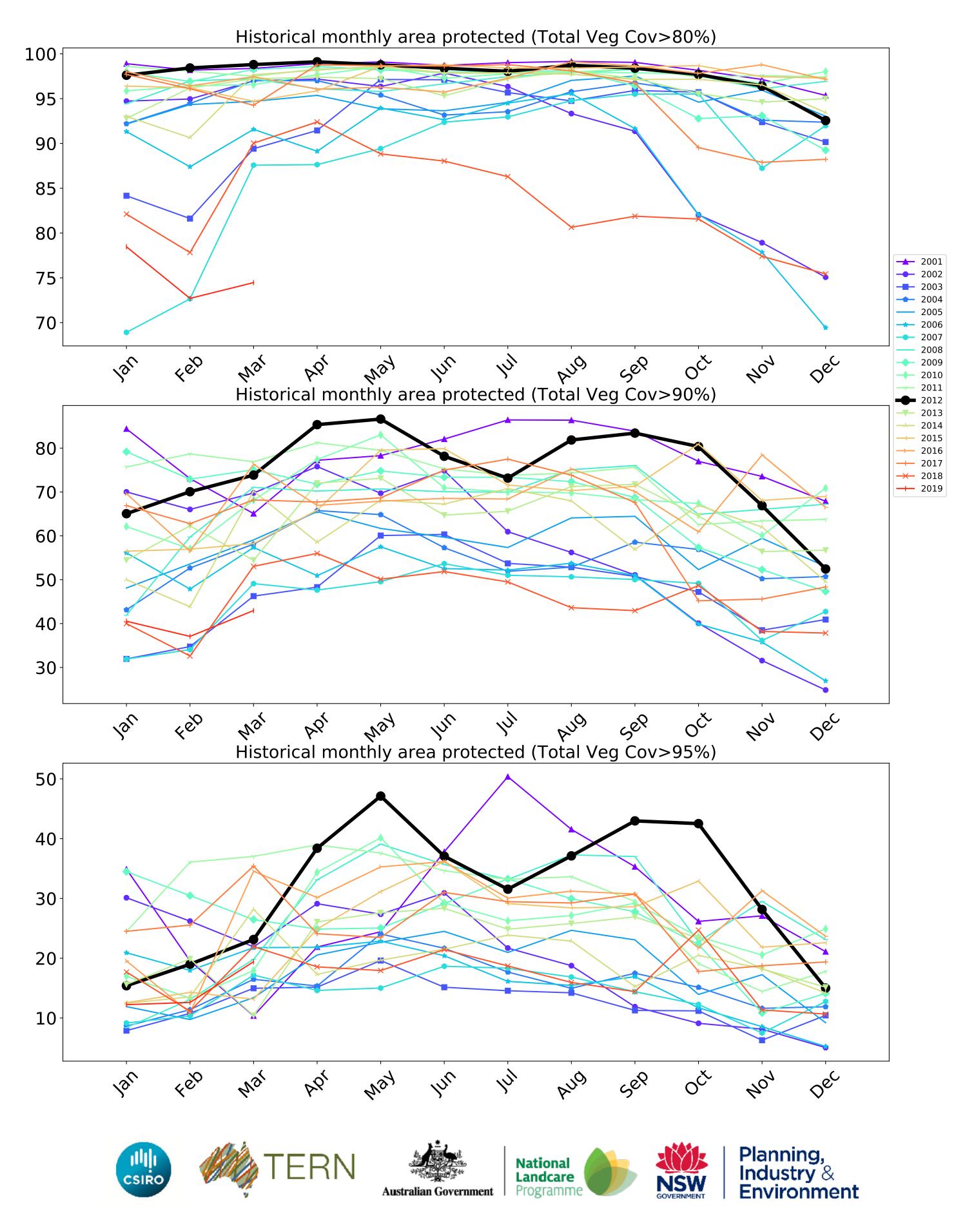
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



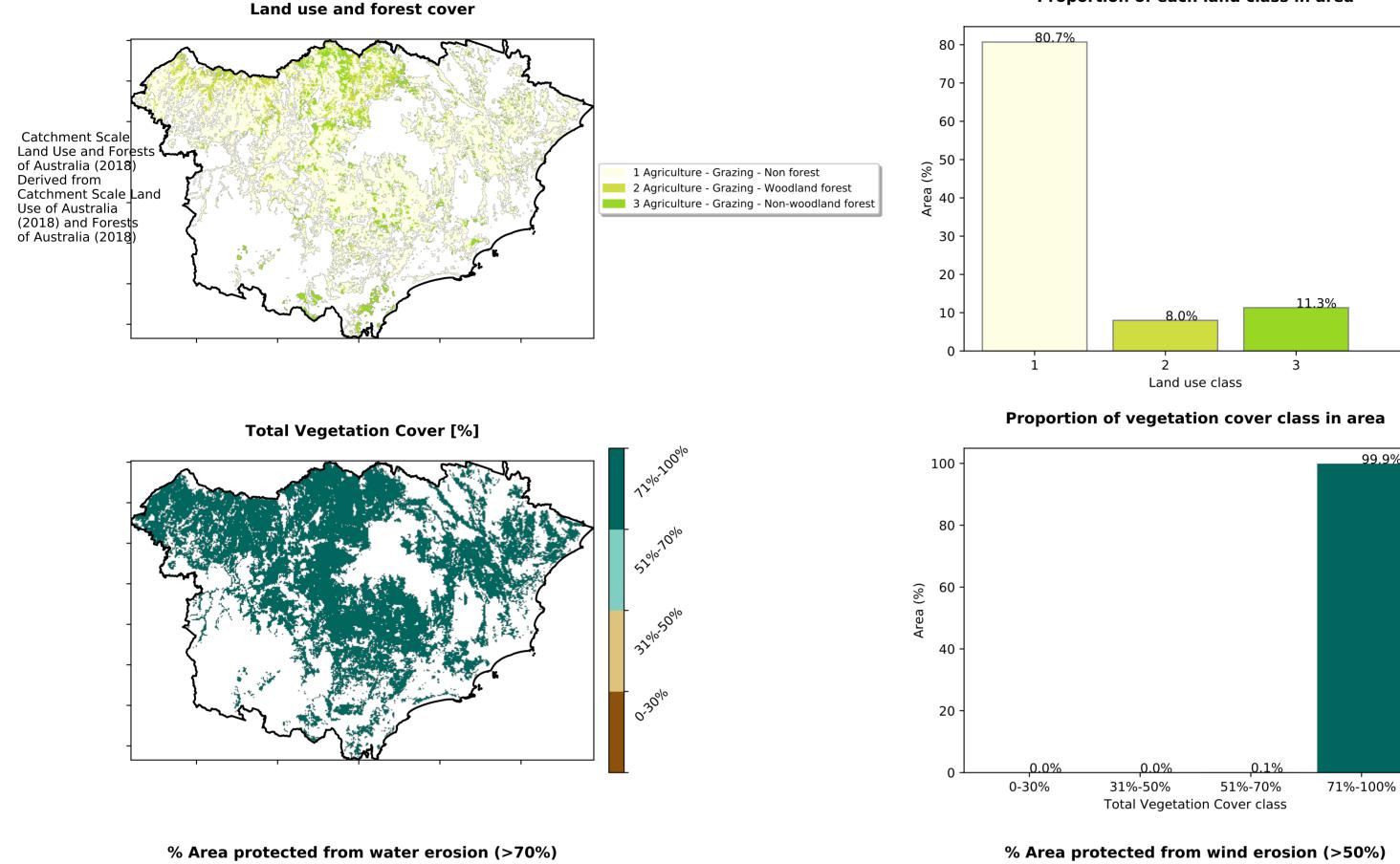
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

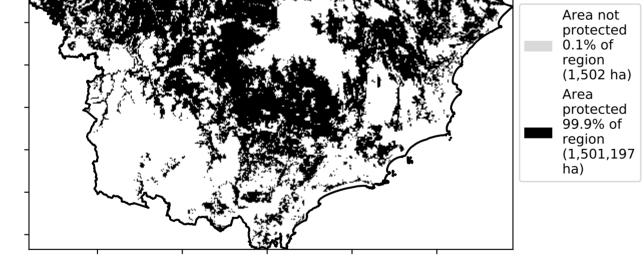


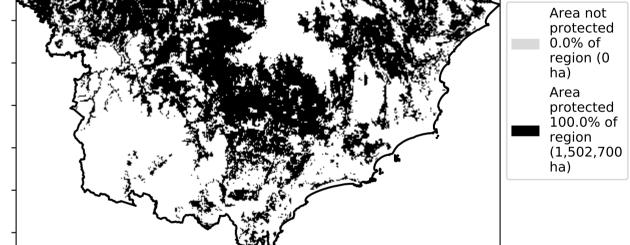


Grazing









99.9%

Total Vegetation Cover Anomaly [%]

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

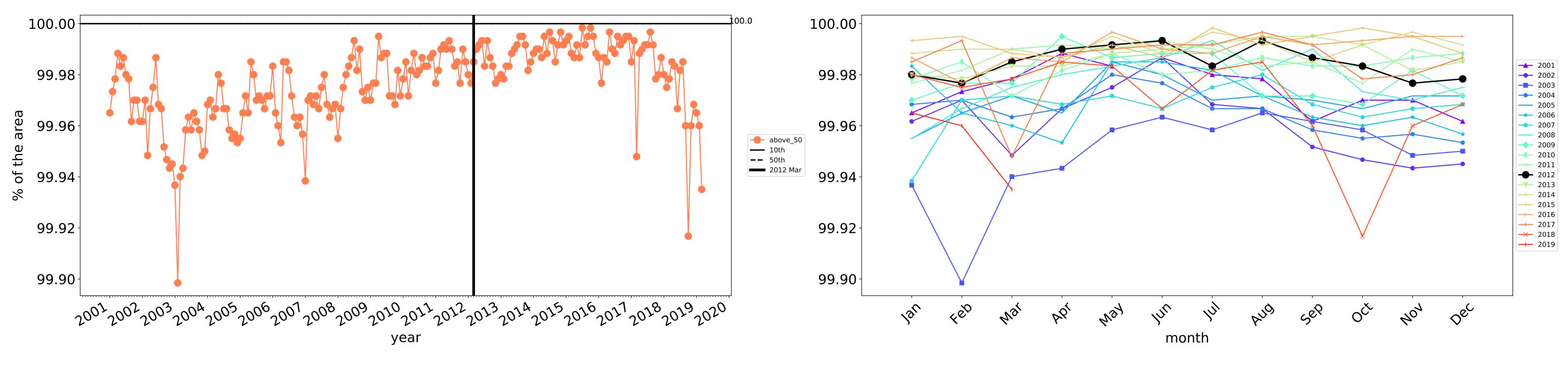
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

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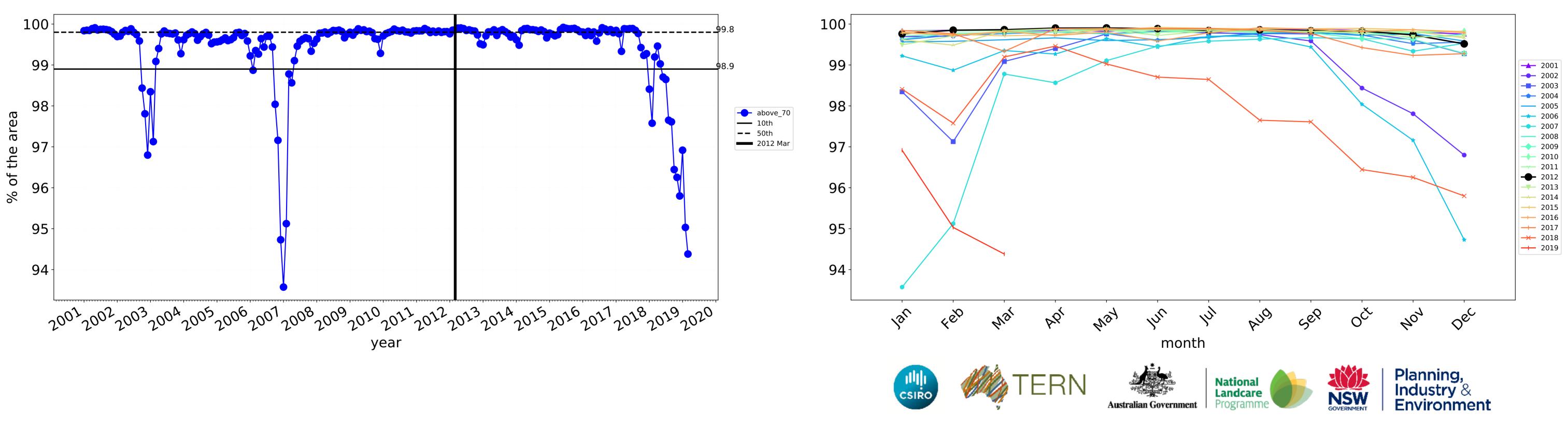
Total Vegetation Cover Decile [%]



20



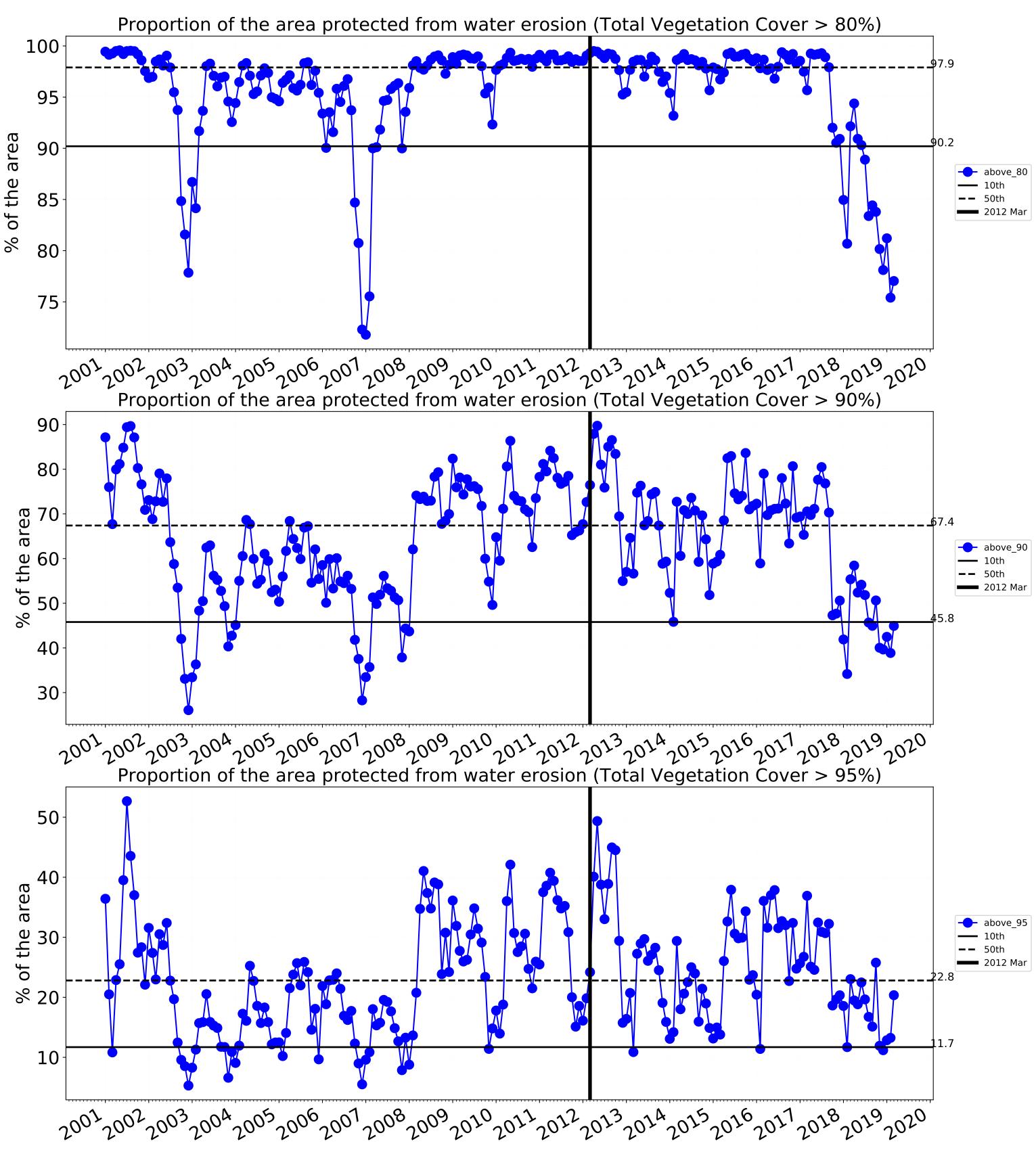
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

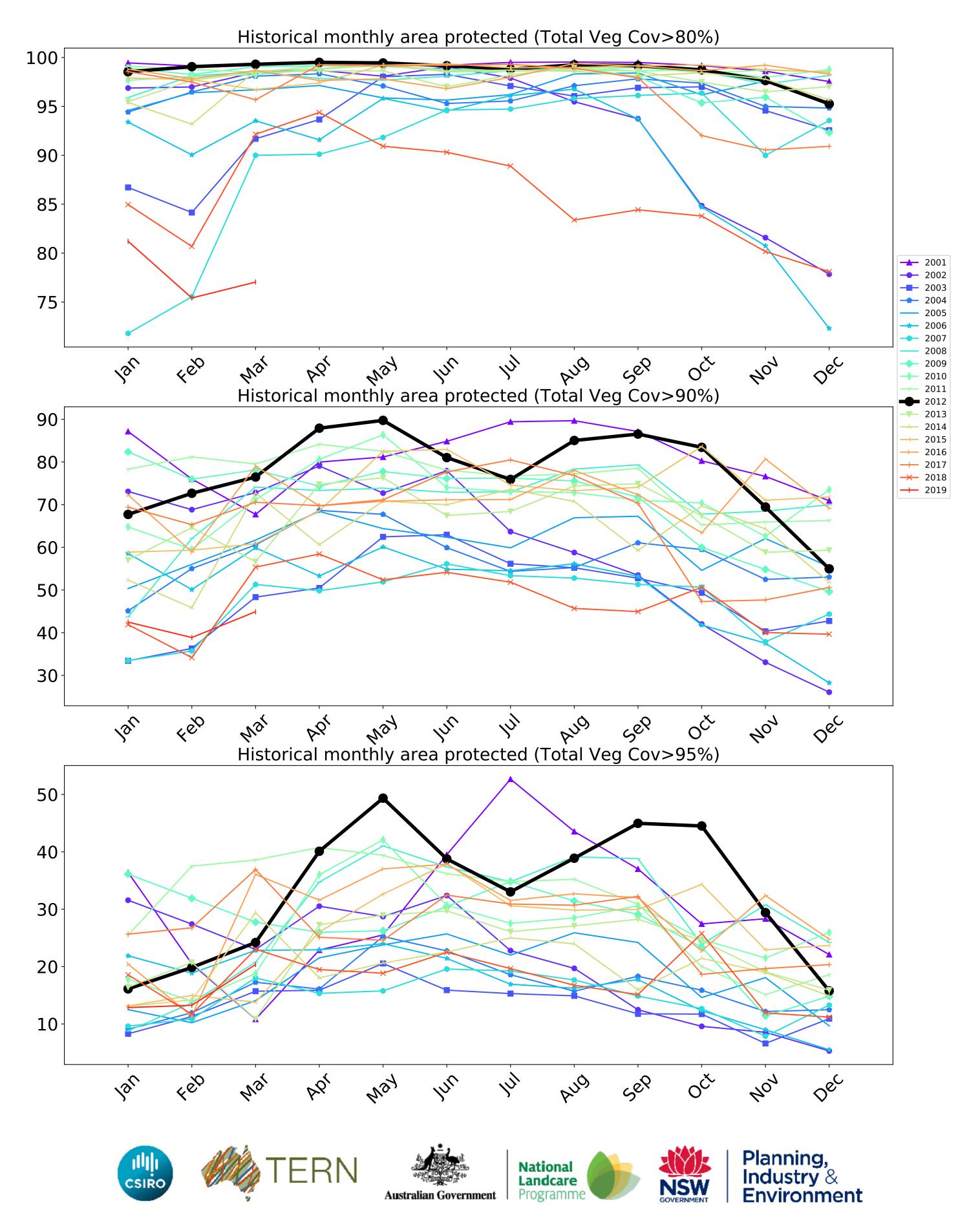


Wind erosion historical monthly area protected (Total Veg Cov >50%)



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

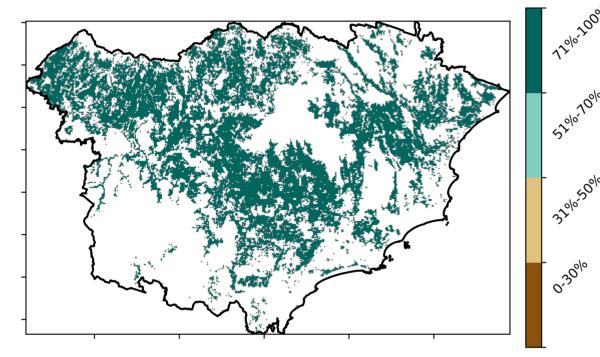




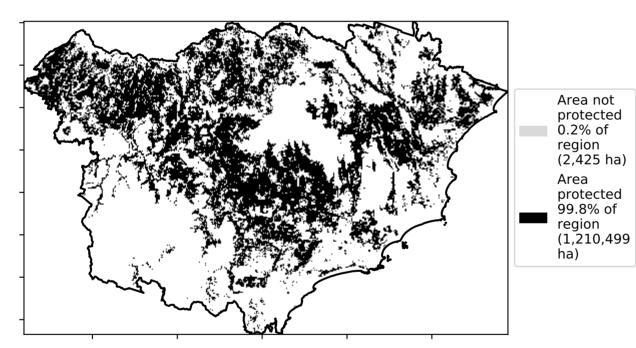
Grazing non forest

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

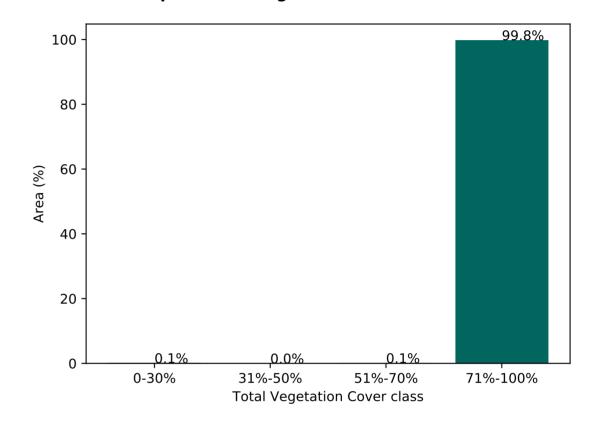
Total Vegetation Cover [%]



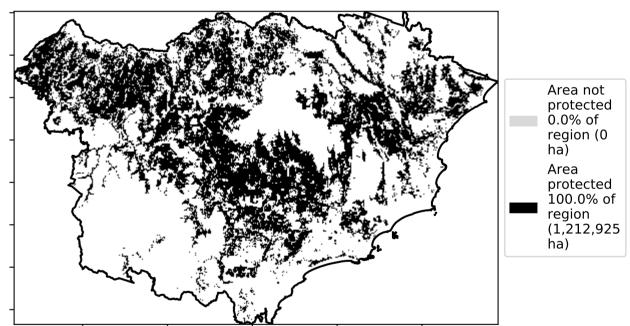
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

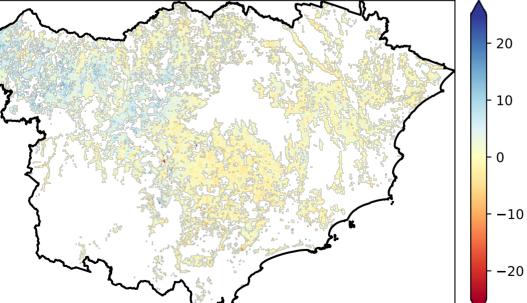


% Area protected from wind erosion (>50%)



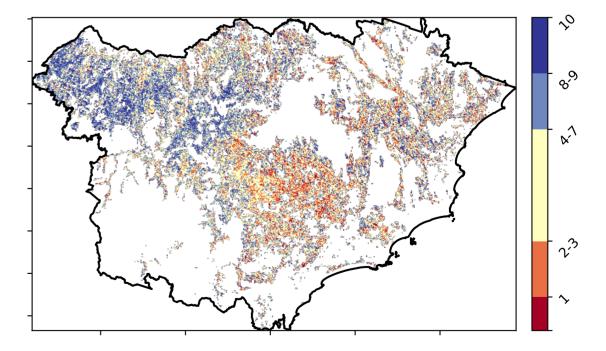
Total Vegetation Cover Anomaly [%]

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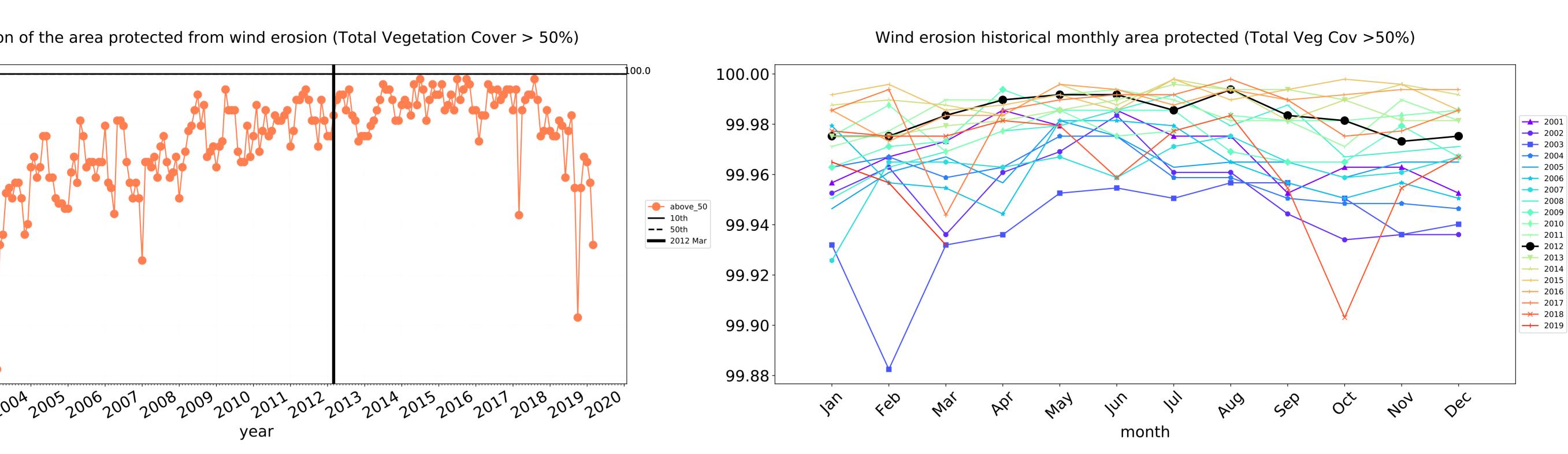


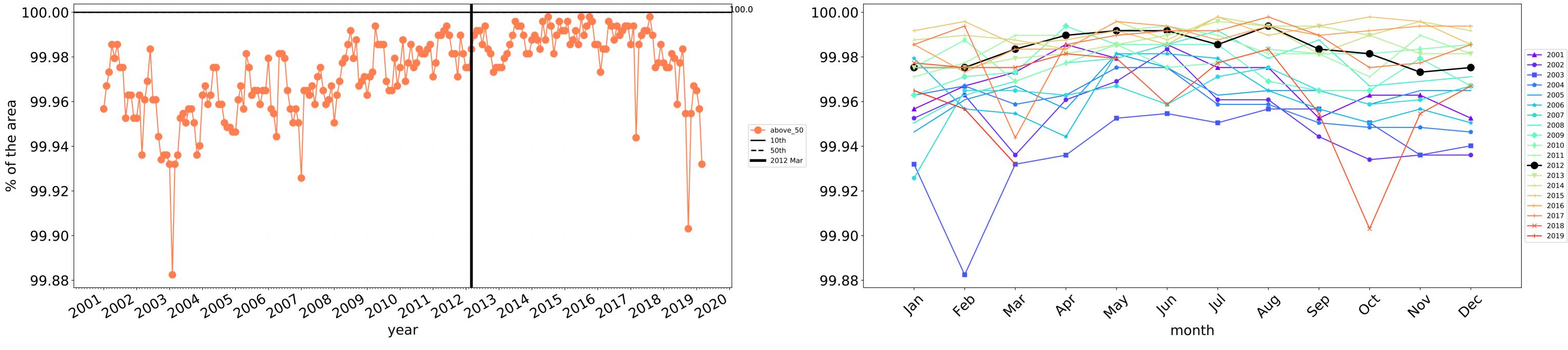
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



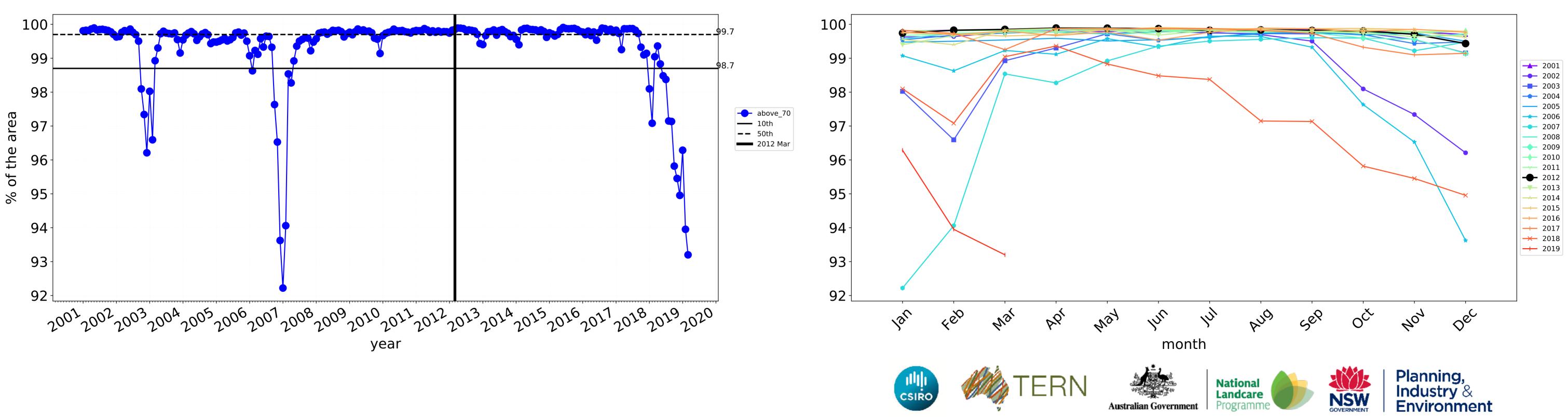




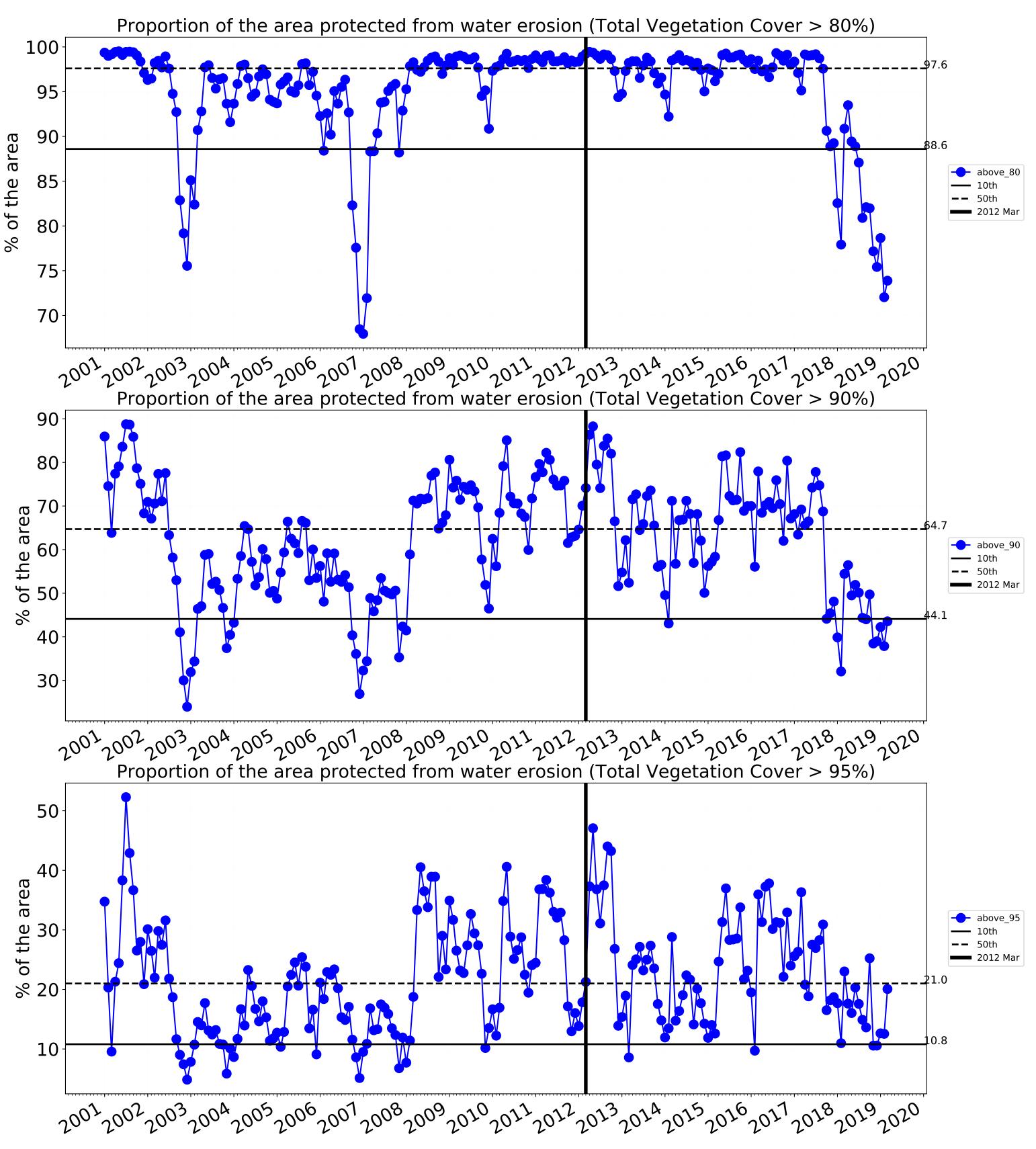


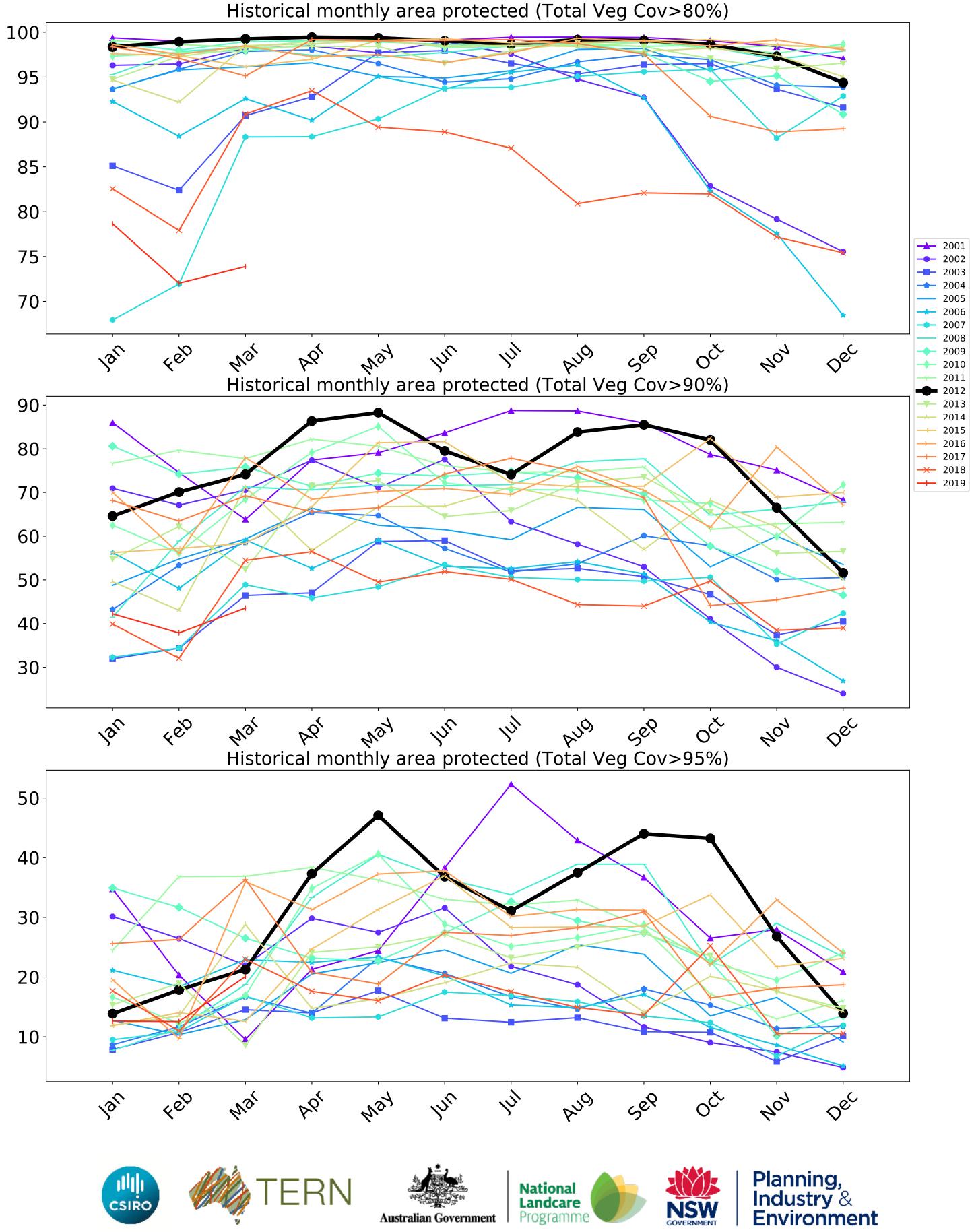
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



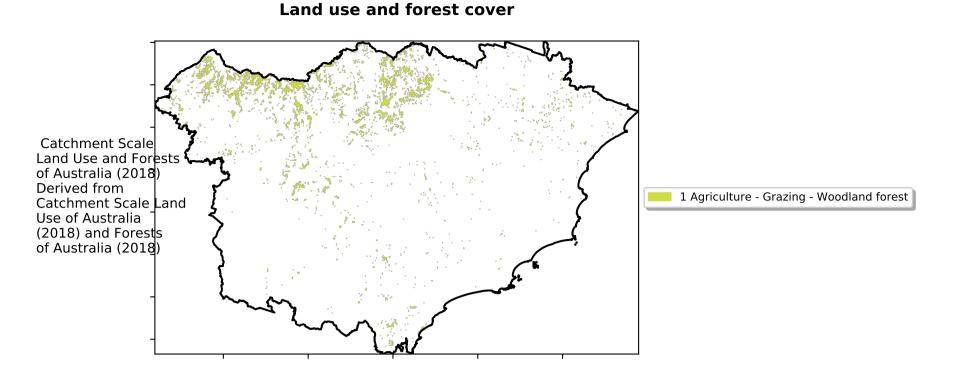
Water erosion historical monthly area protected (Total Veg Cov>70%)



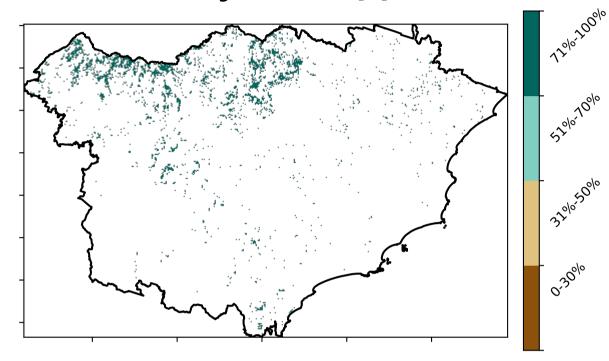




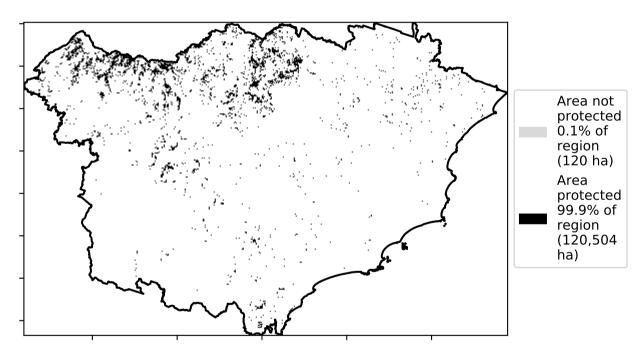
Grazing Woodland forest



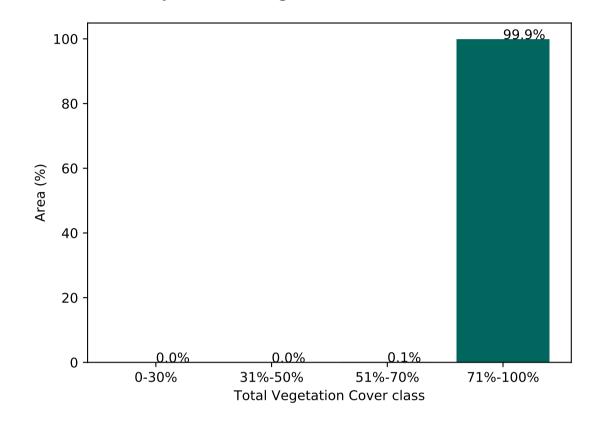
Total Vegetation Cover [%]



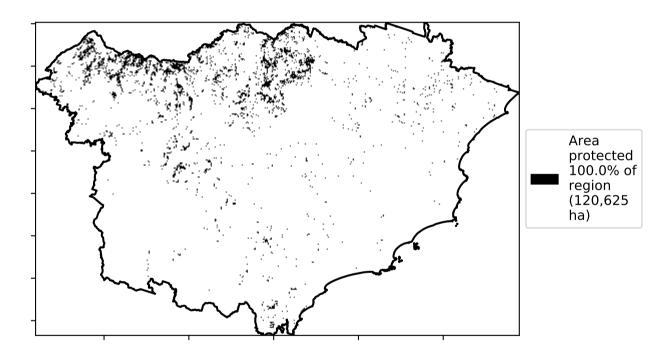
% Area protected from water erosion (>70%)



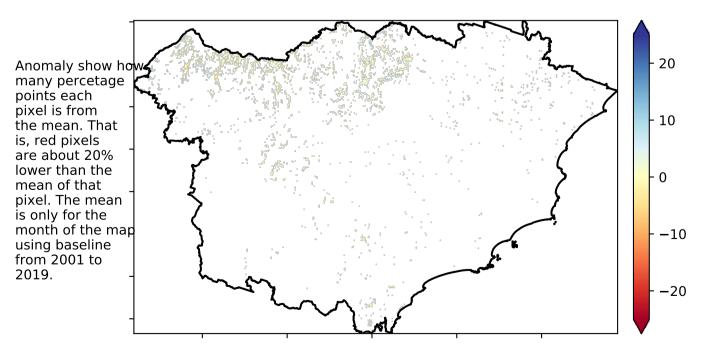
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

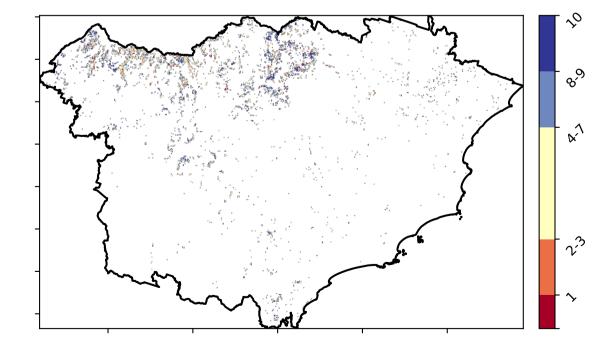


Total Vegetation Cover Anomaly [%]

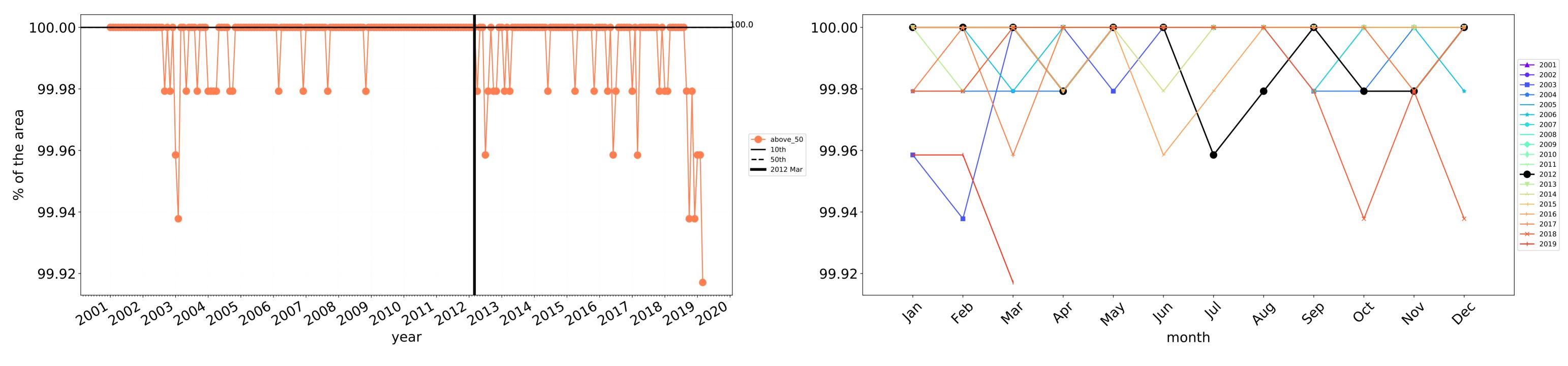


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

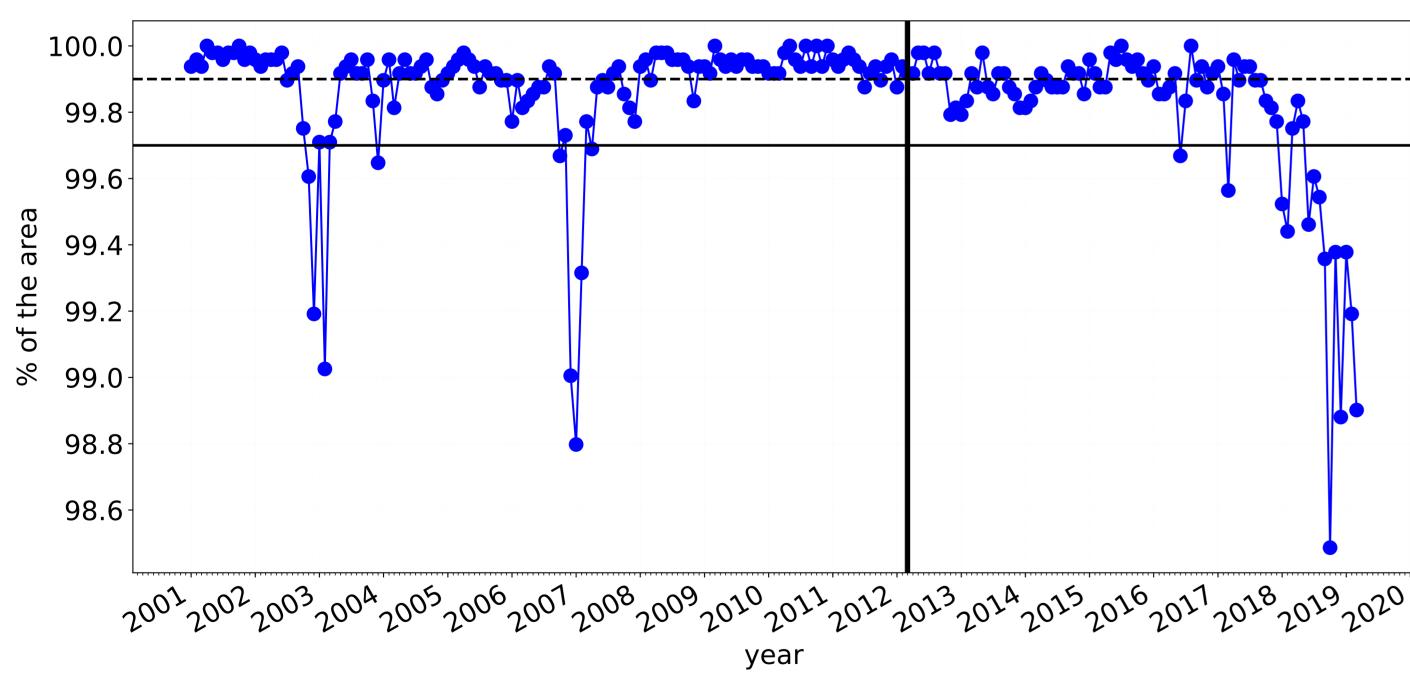






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

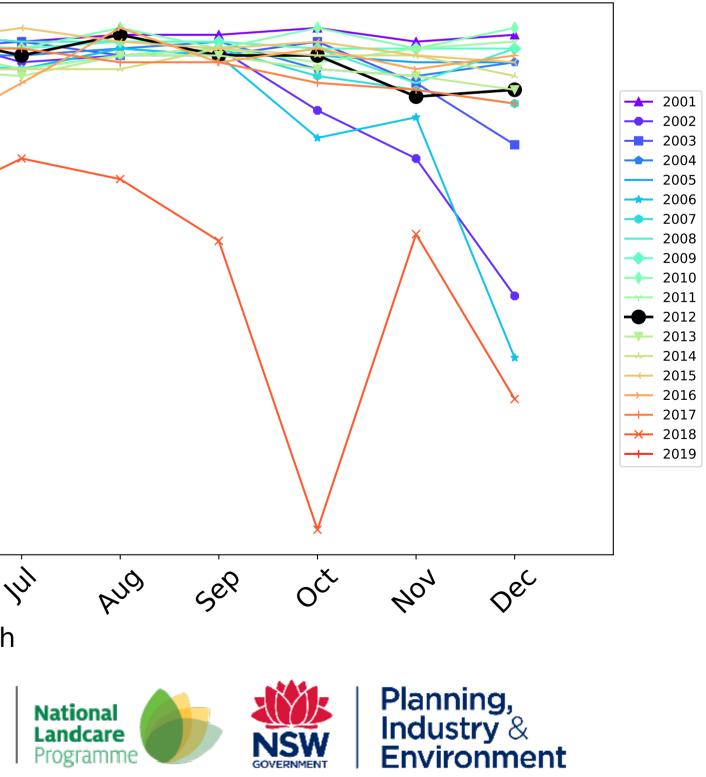


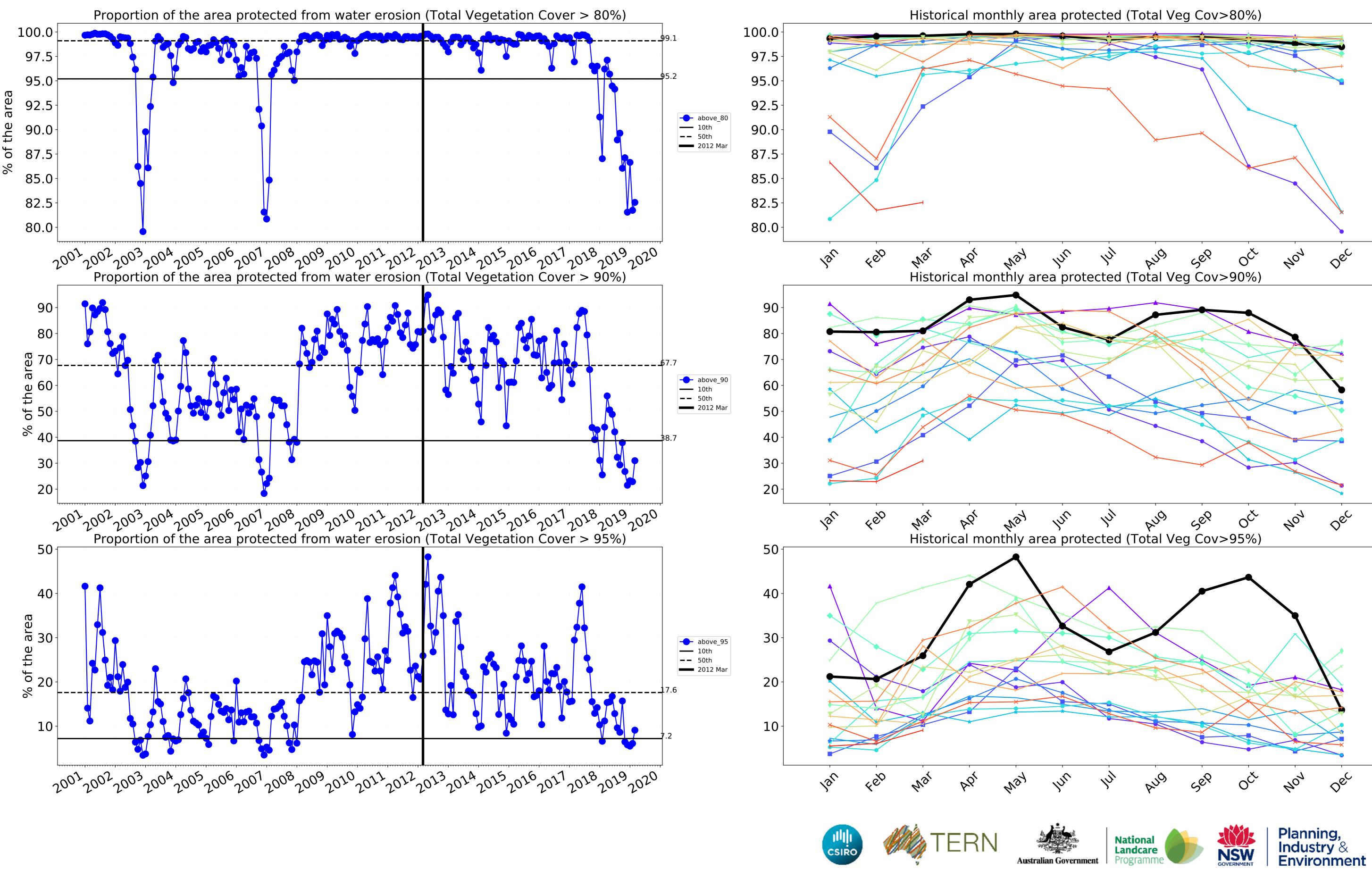
Wind erosion historical monthly area protected (Total Veg Cov >50%)



100.0 99.8 99.6 ---- above_70 **—** 10th 99.4 **——** 50th **——** 2012 Mar 99.2 99.0 98.8 98.6 feb Jan May In Mai PQ month ΓERN CSIRO Australian Government

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





— 2001 --- 2002 **—** 2003 --- 2004 ____ 2005 **___** 2006 **---** 2007 **-** 2009 2011 2012 **—** 2013 <mark>→</mark> 2016 --- 2017 → 2018 → 2019

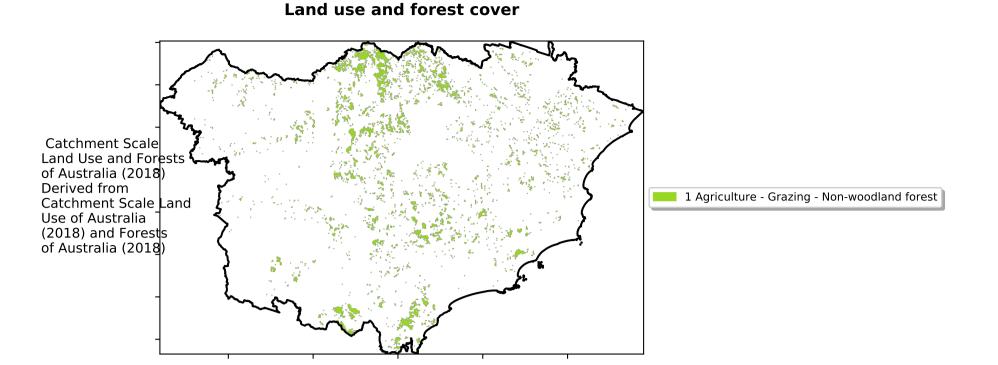
2008

- 2010

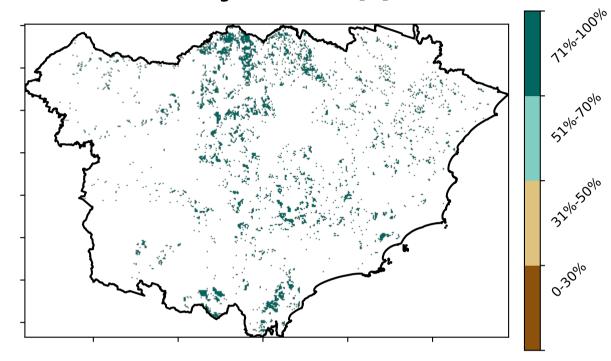
- 2014

← 2015

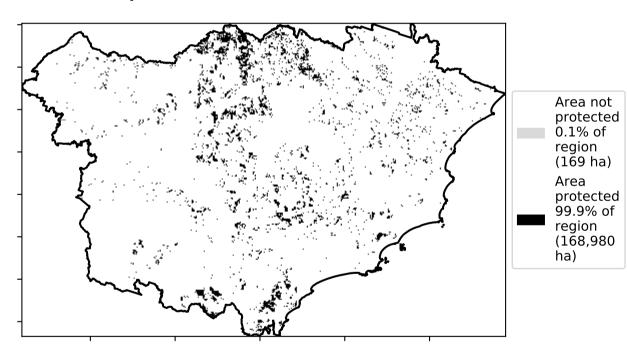
Grazing - Forest (non woodland)



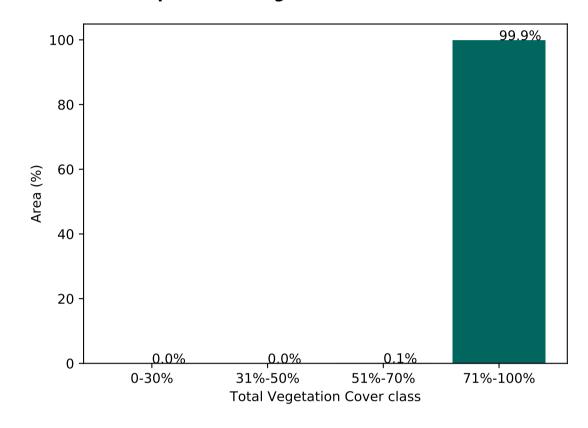
Total Vegetation Cover [%]



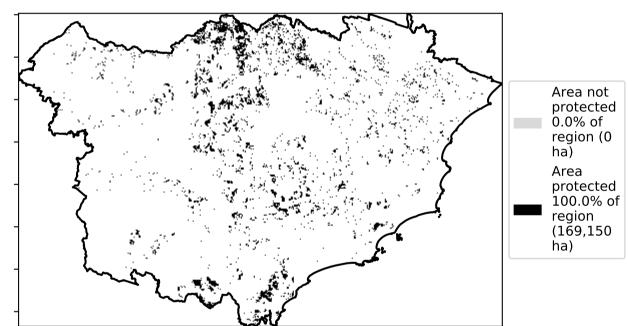
% Area protected from water erosion (>70%)



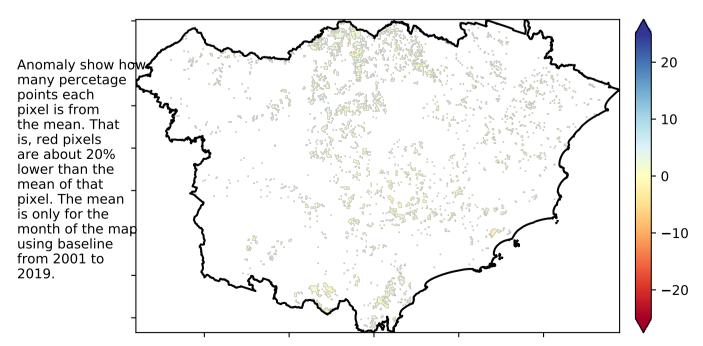
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

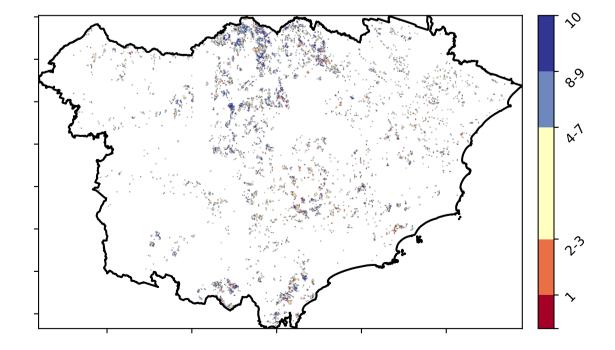


Total Vegetation Cover Anomaly [%]

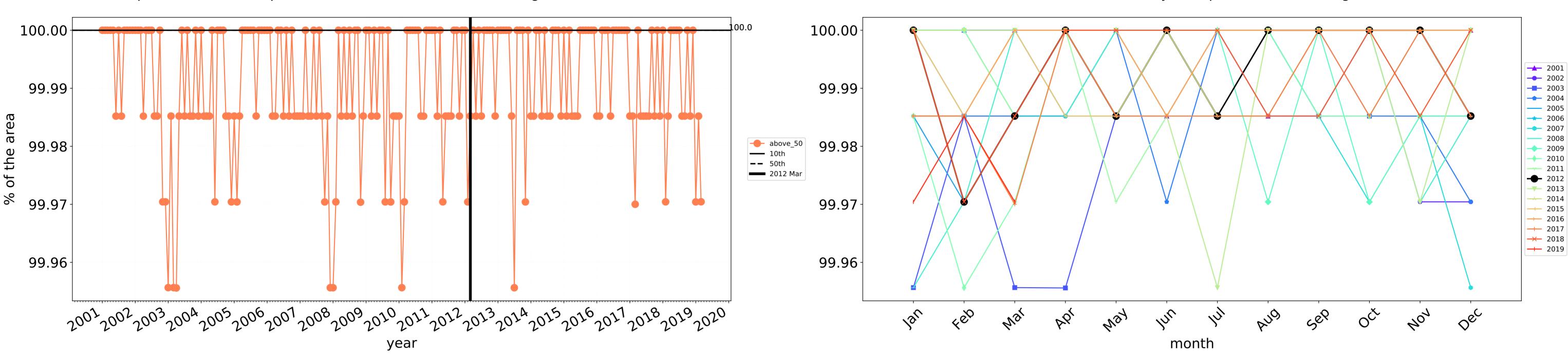


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

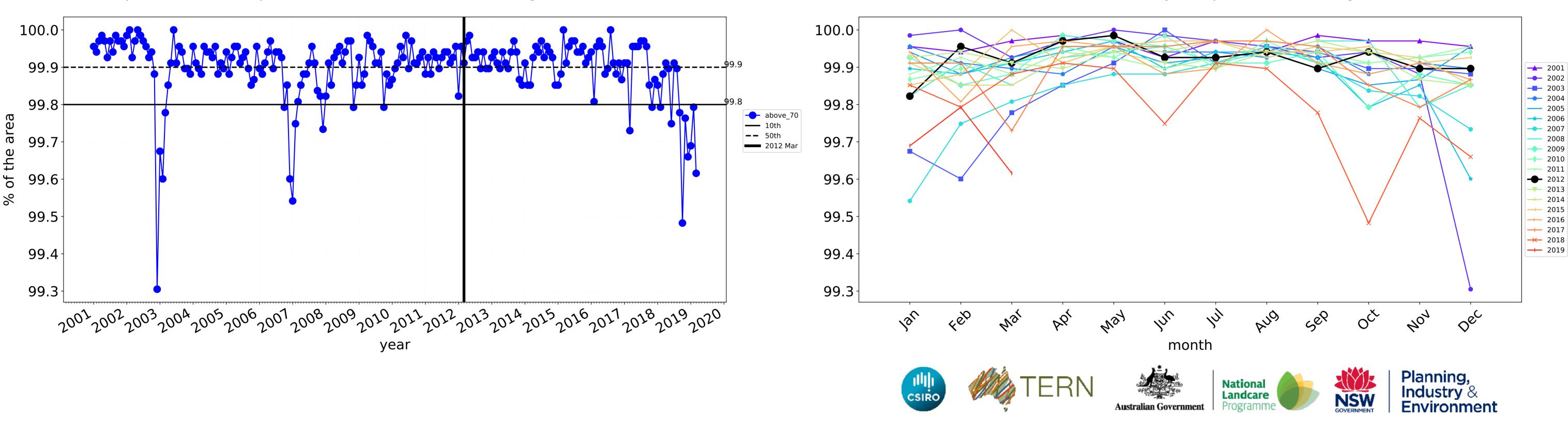






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

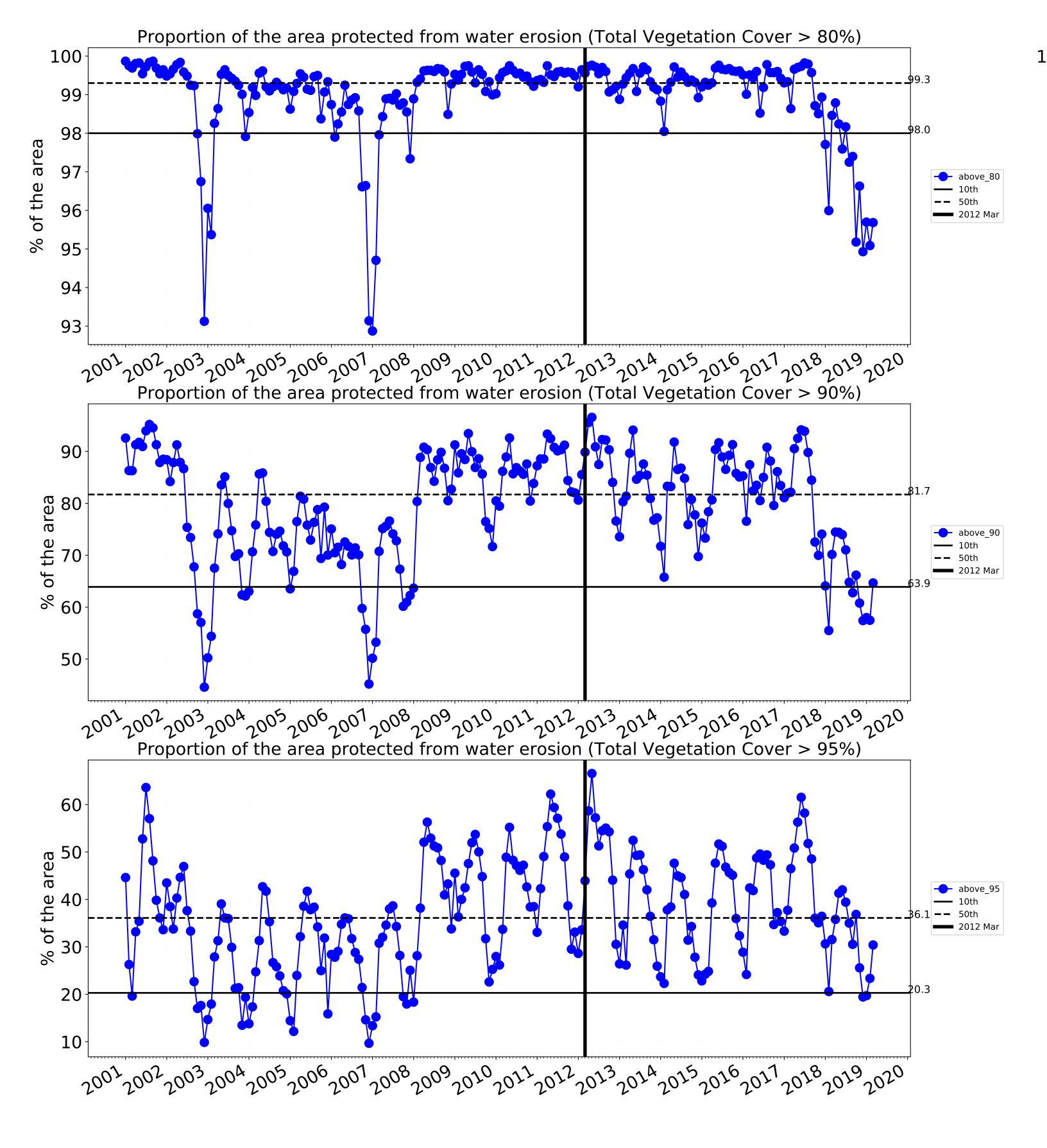
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

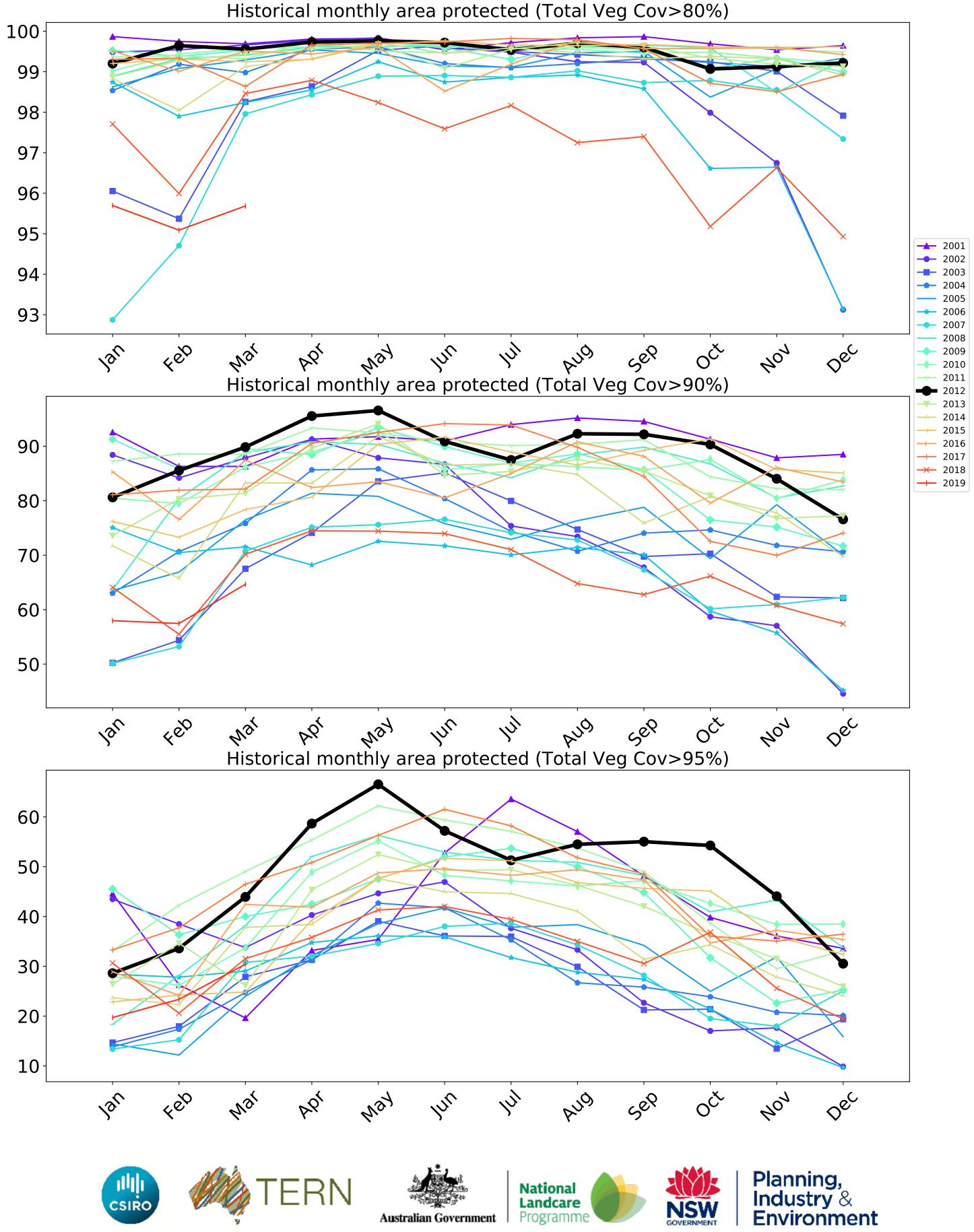


Wind erosion historical monthly area protected (Total Veg Cov >50%)



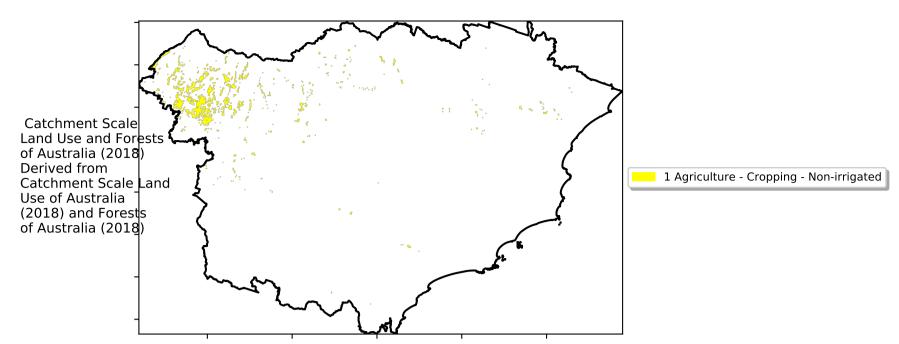
Water erosion historical monthly area protected (Total Veg Cov>70%)



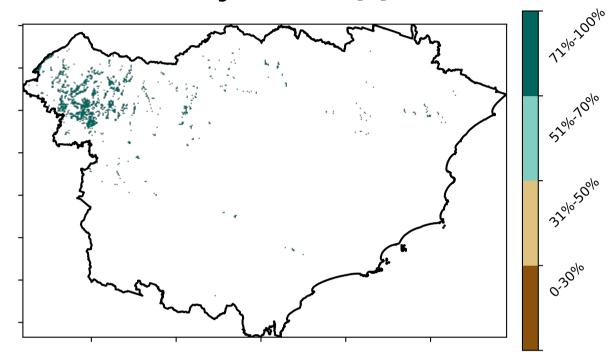


Cropping

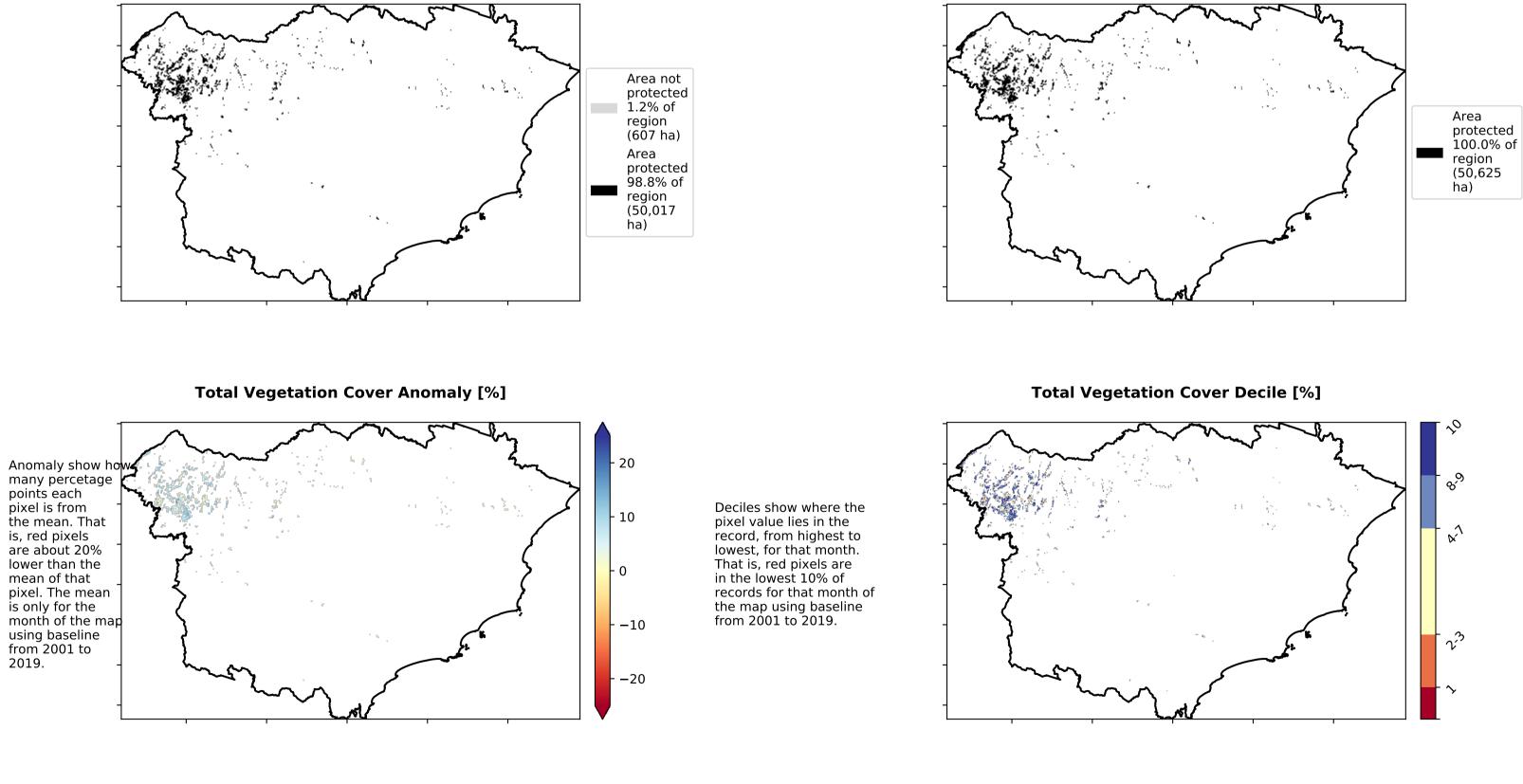
Land use and forest cover



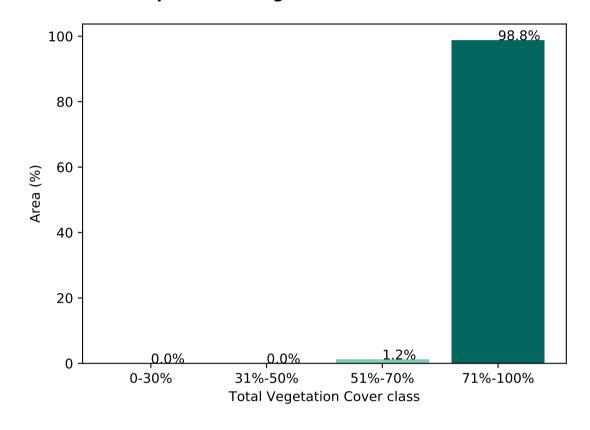
Total Vegetation Cover [%]



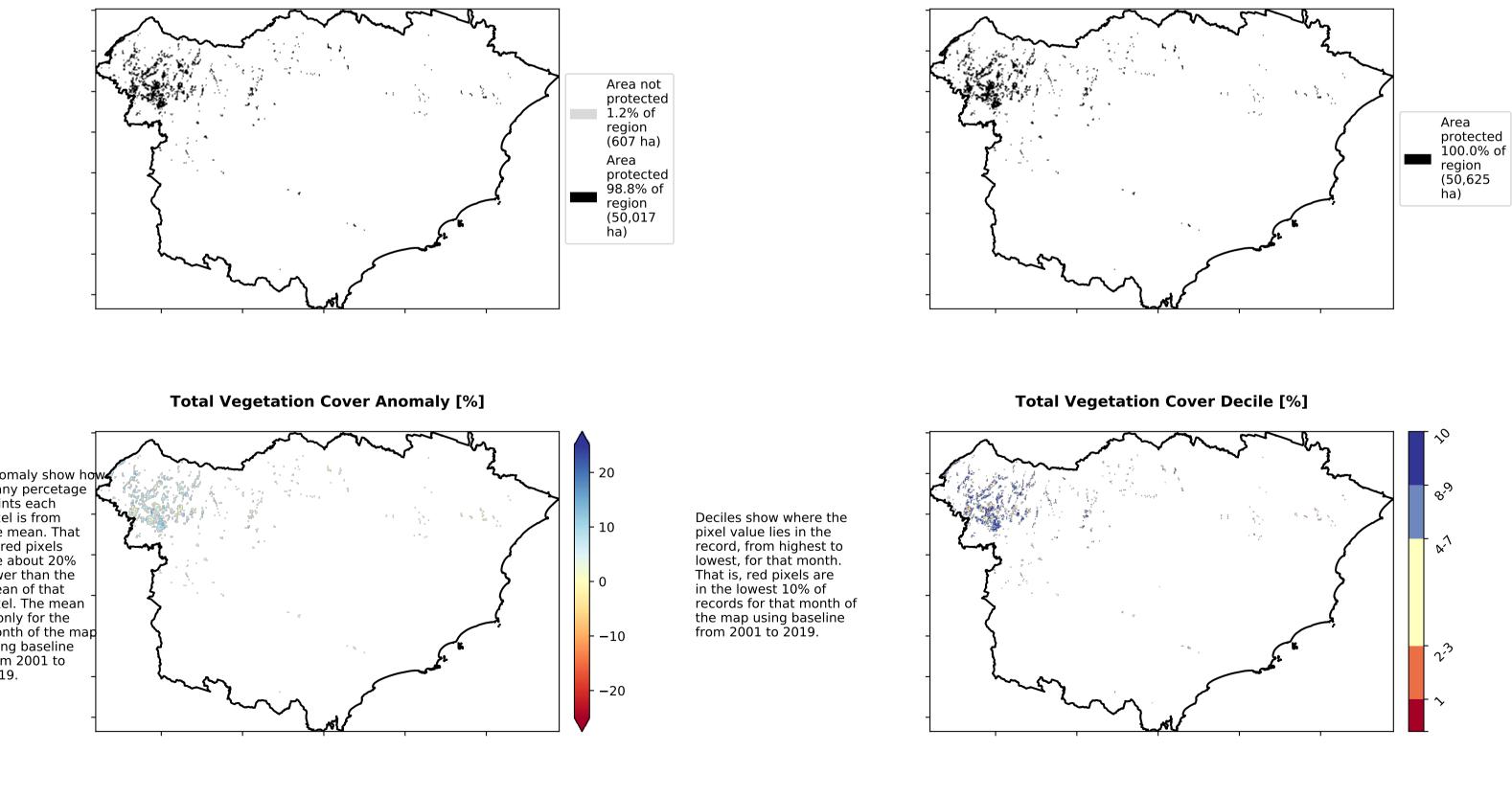
% Area protected from water erosion (>70%)



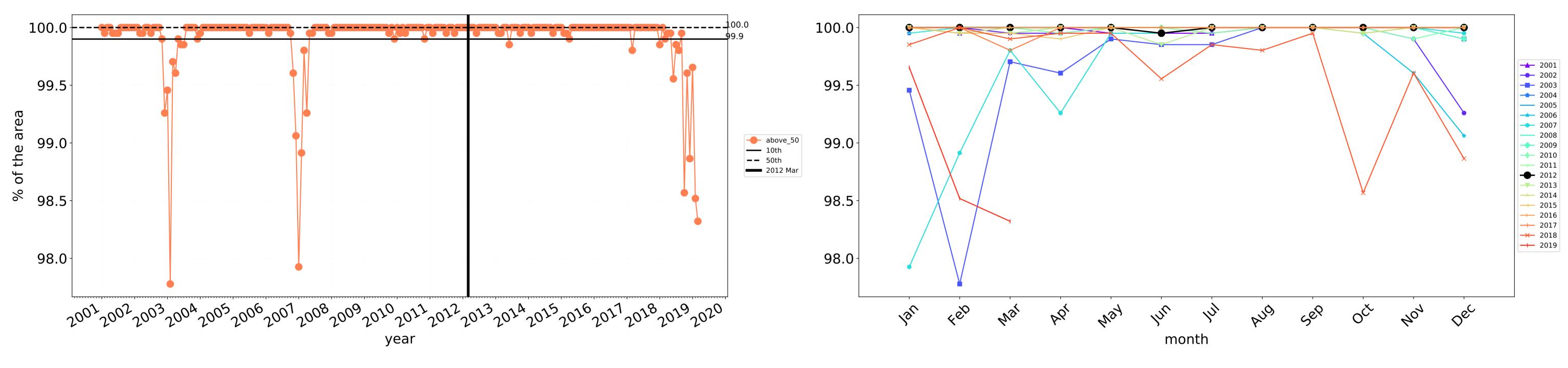
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

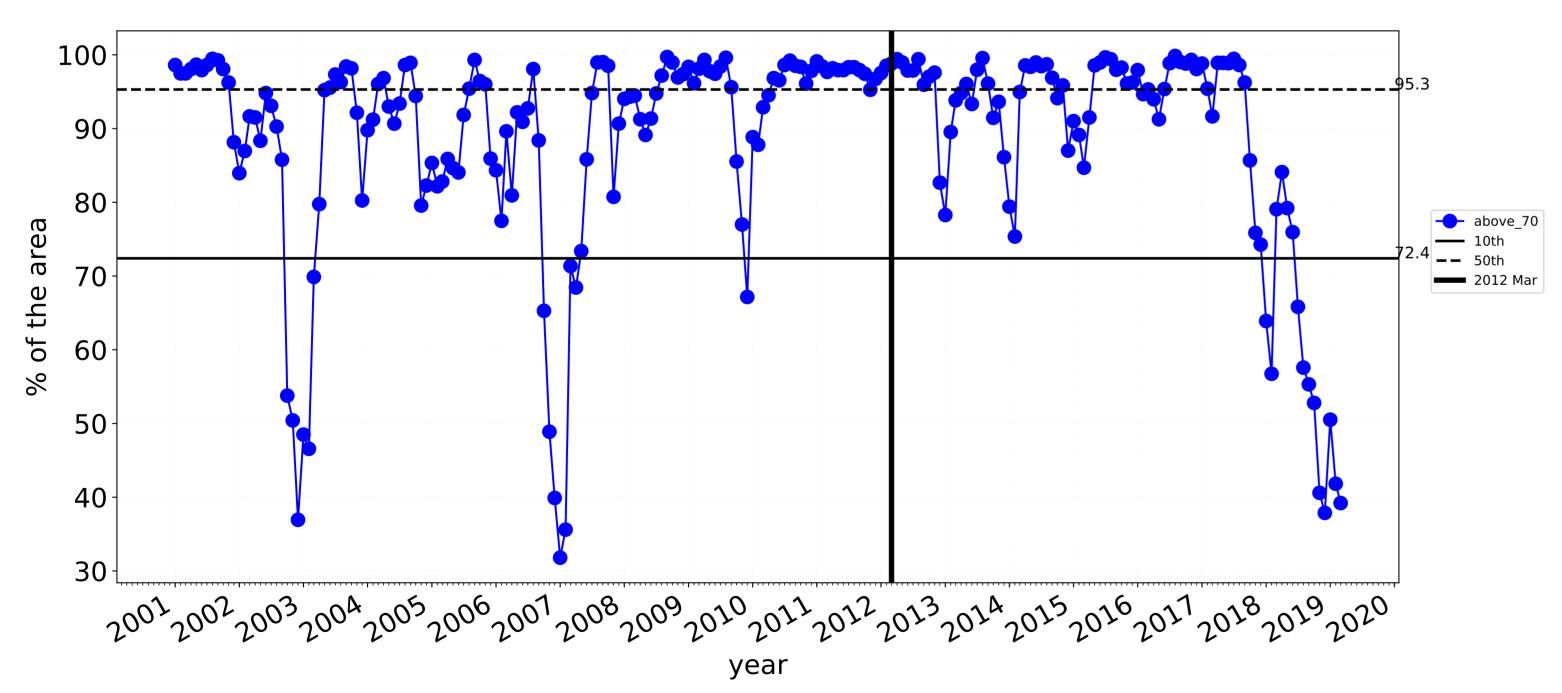




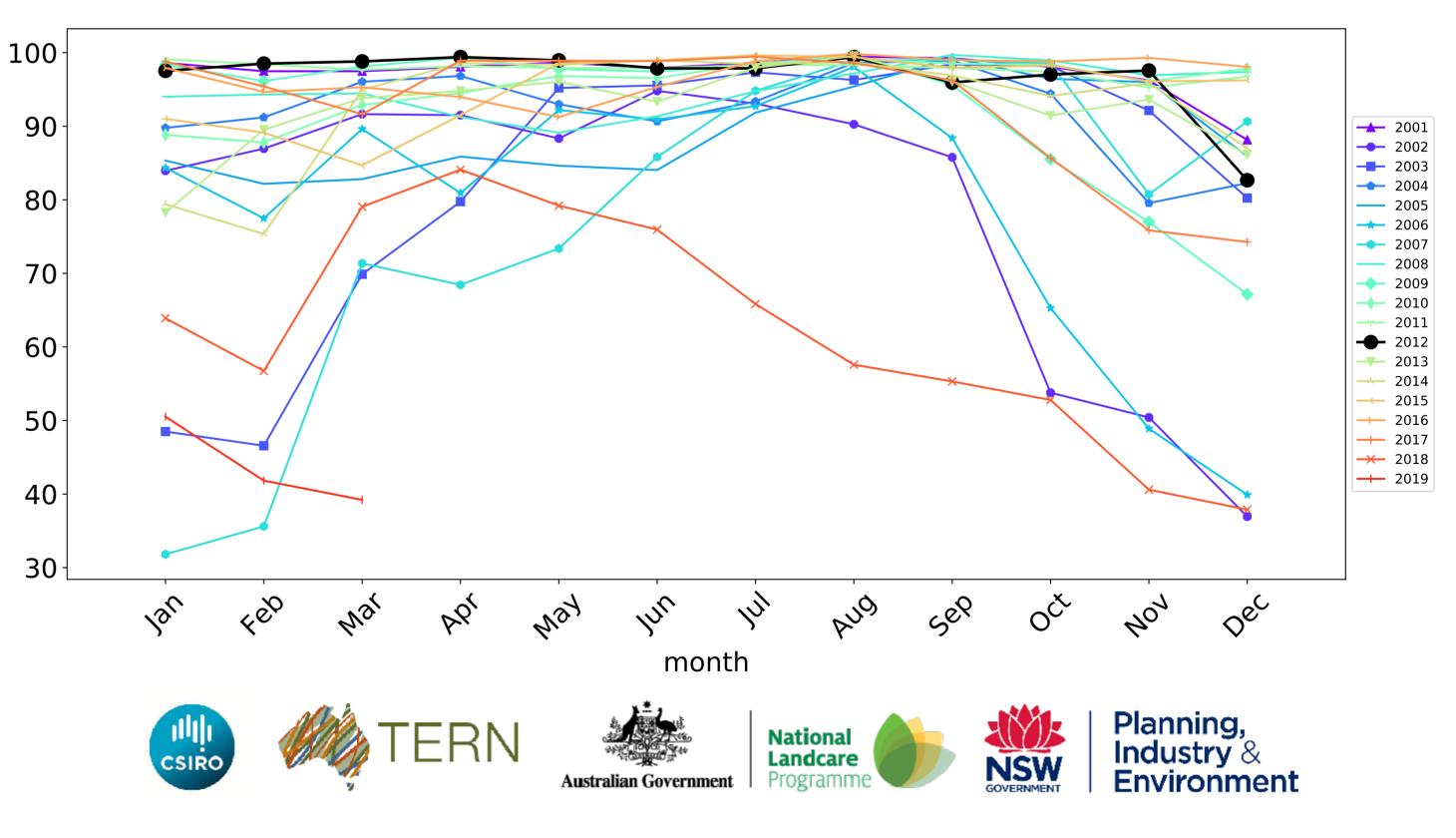


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

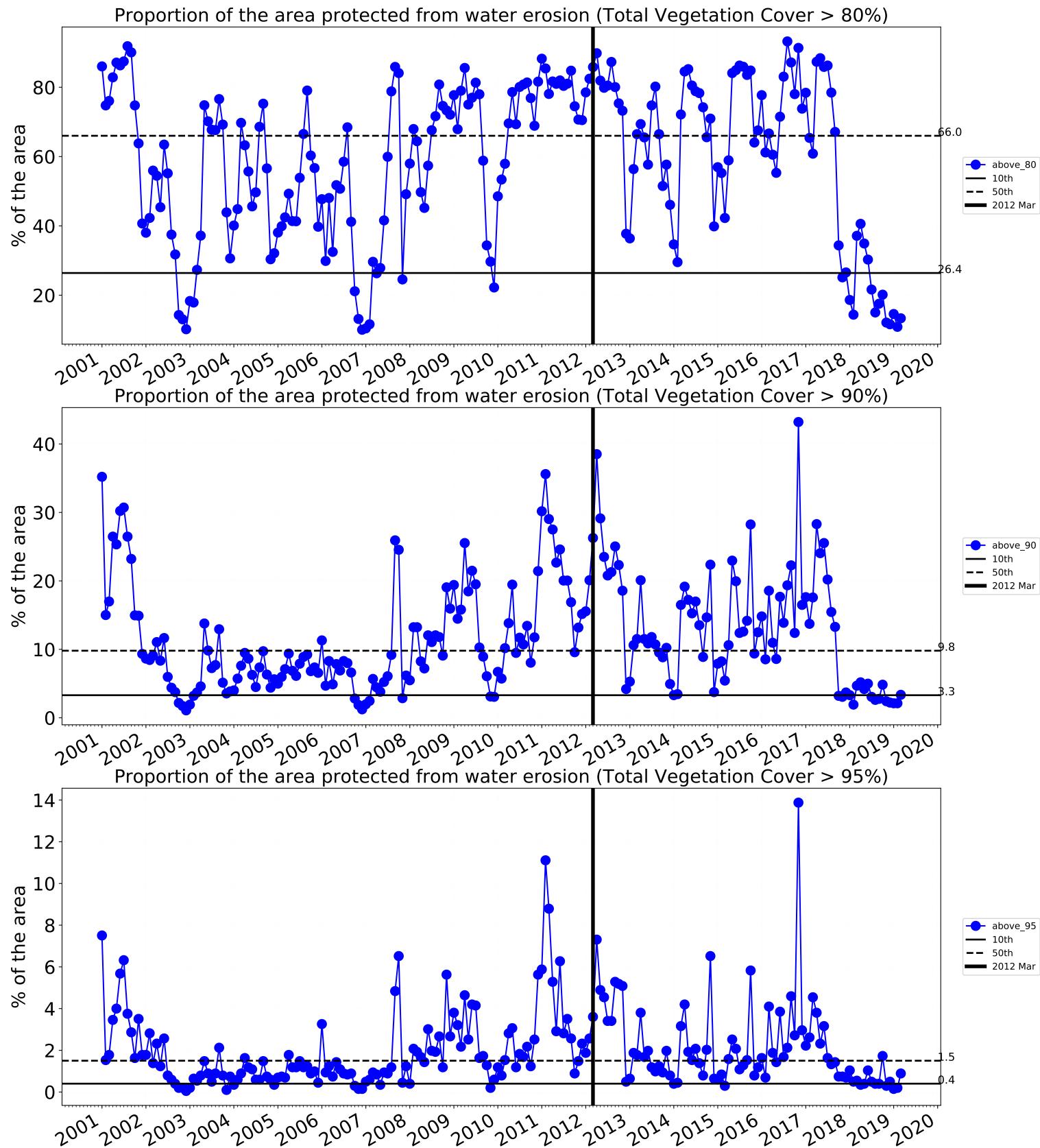
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

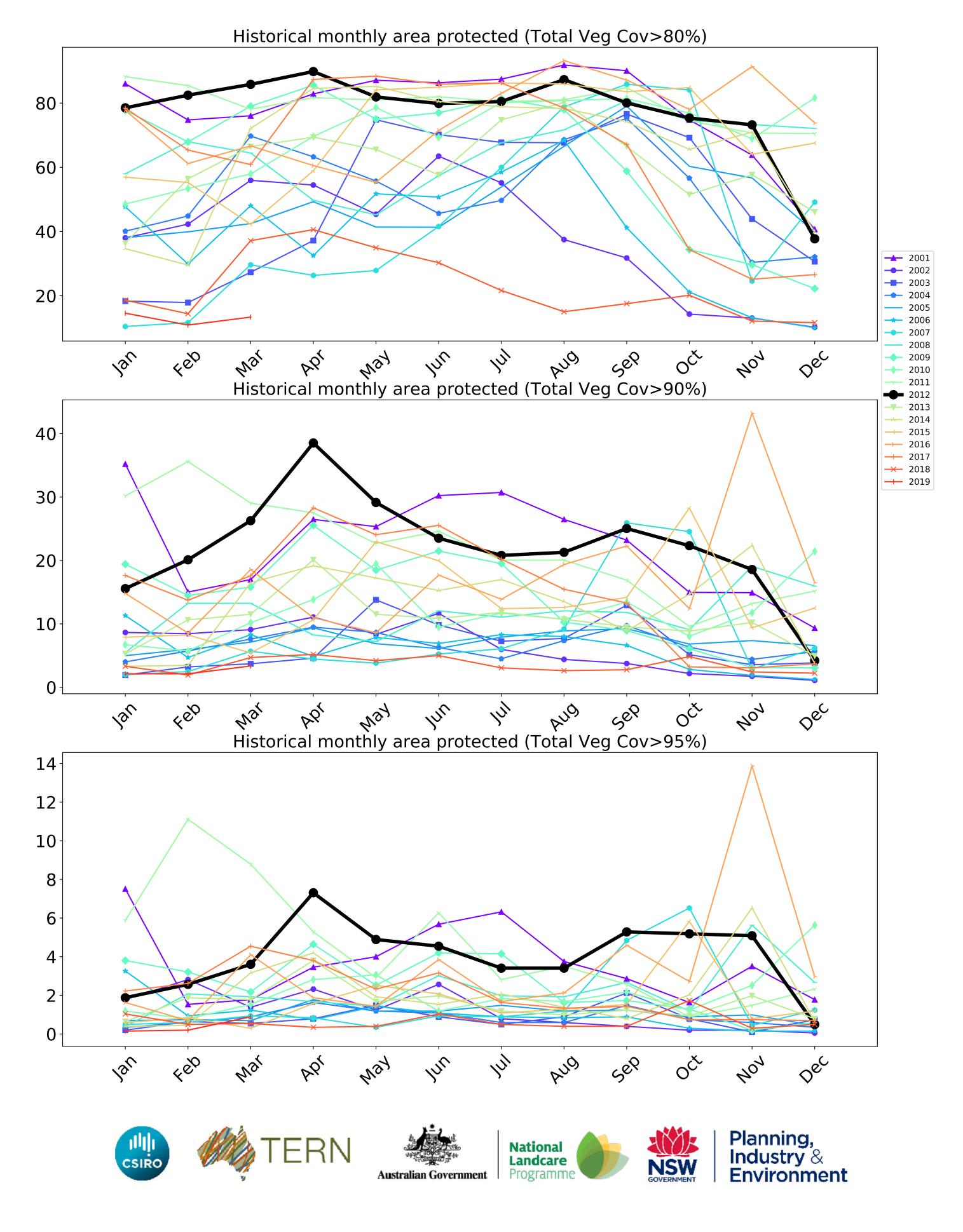


Wind erosion historical monthly area protected (Total Veg Cov >50%)



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

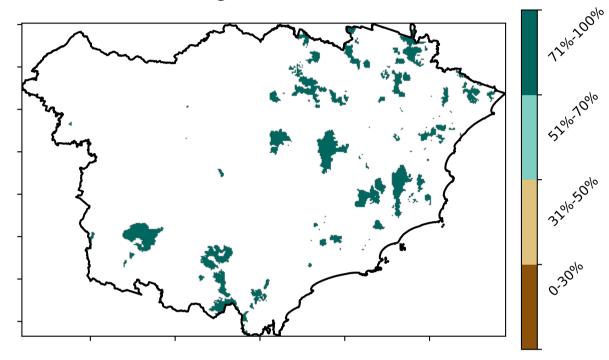




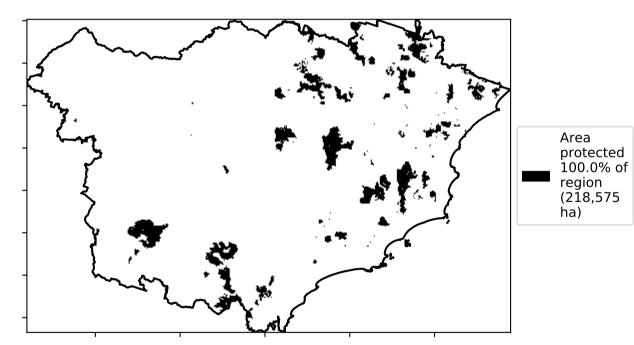
Production native forests and plantation forests



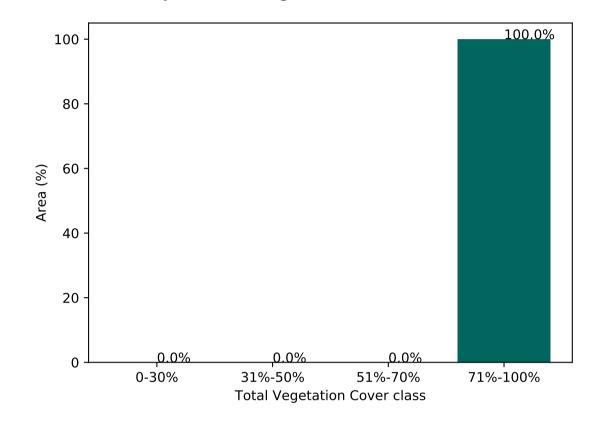
Total Vegetation Cover [%]



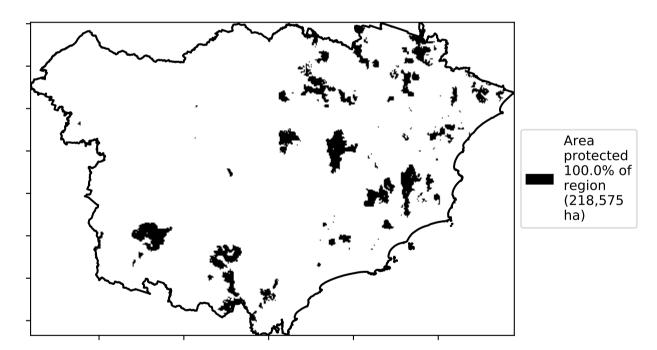
% Area protected from water erosion (>70%)



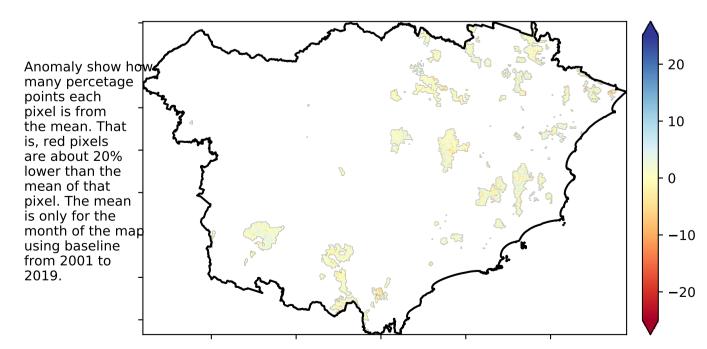
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

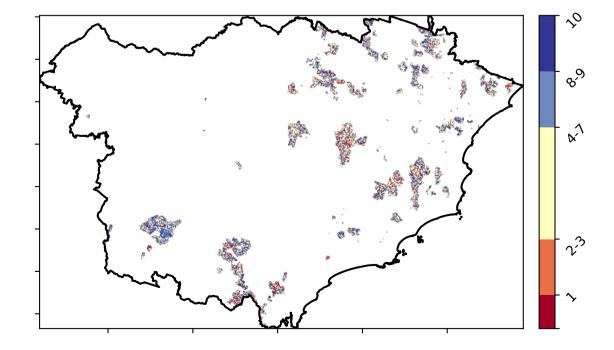


Total Vegetation Cover Anomaly [%]

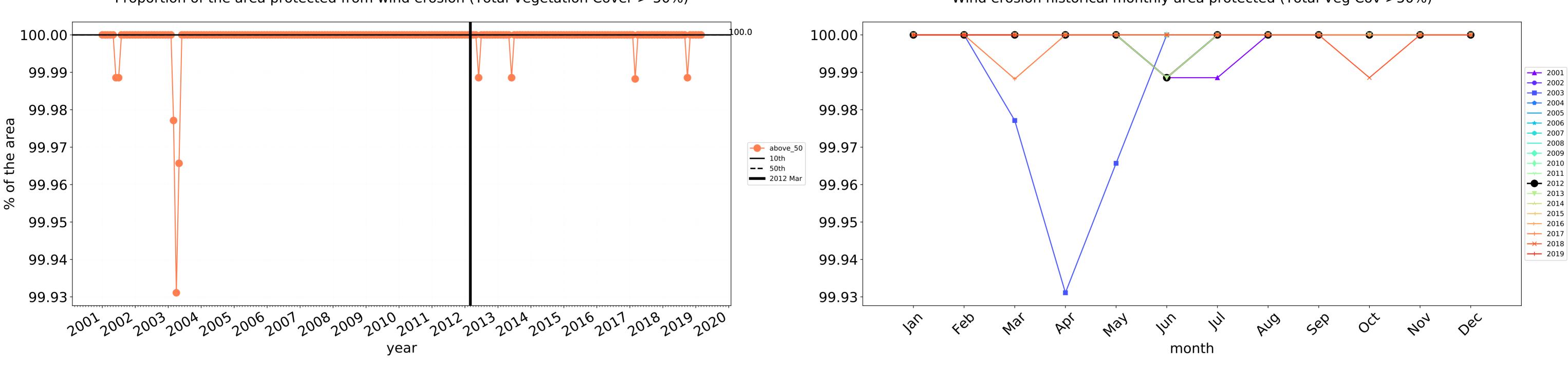


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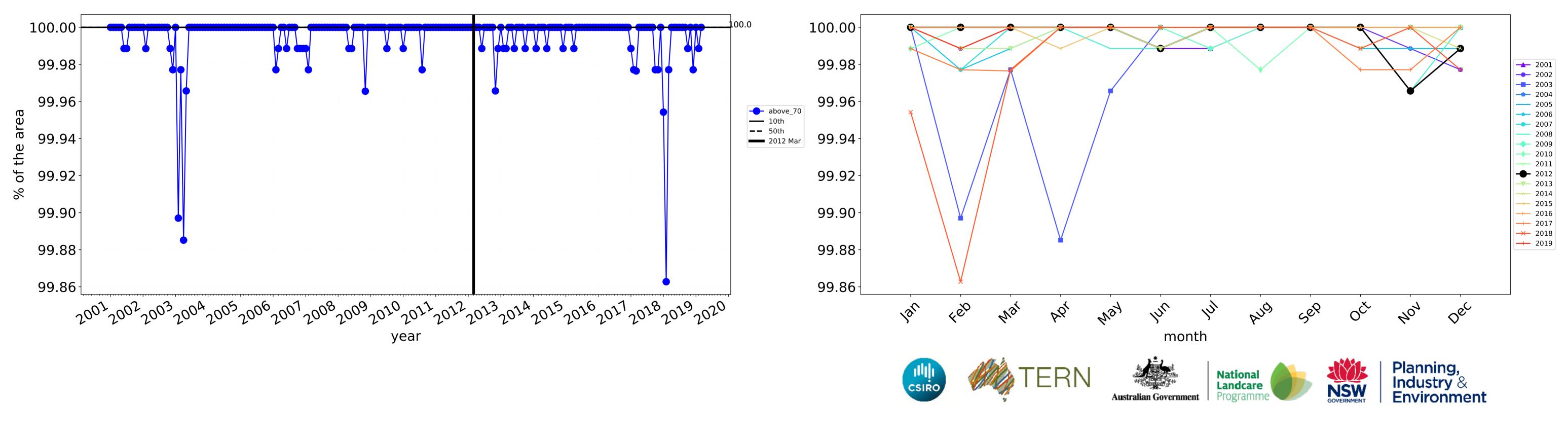
Total Vegetation Cover Decile [%]





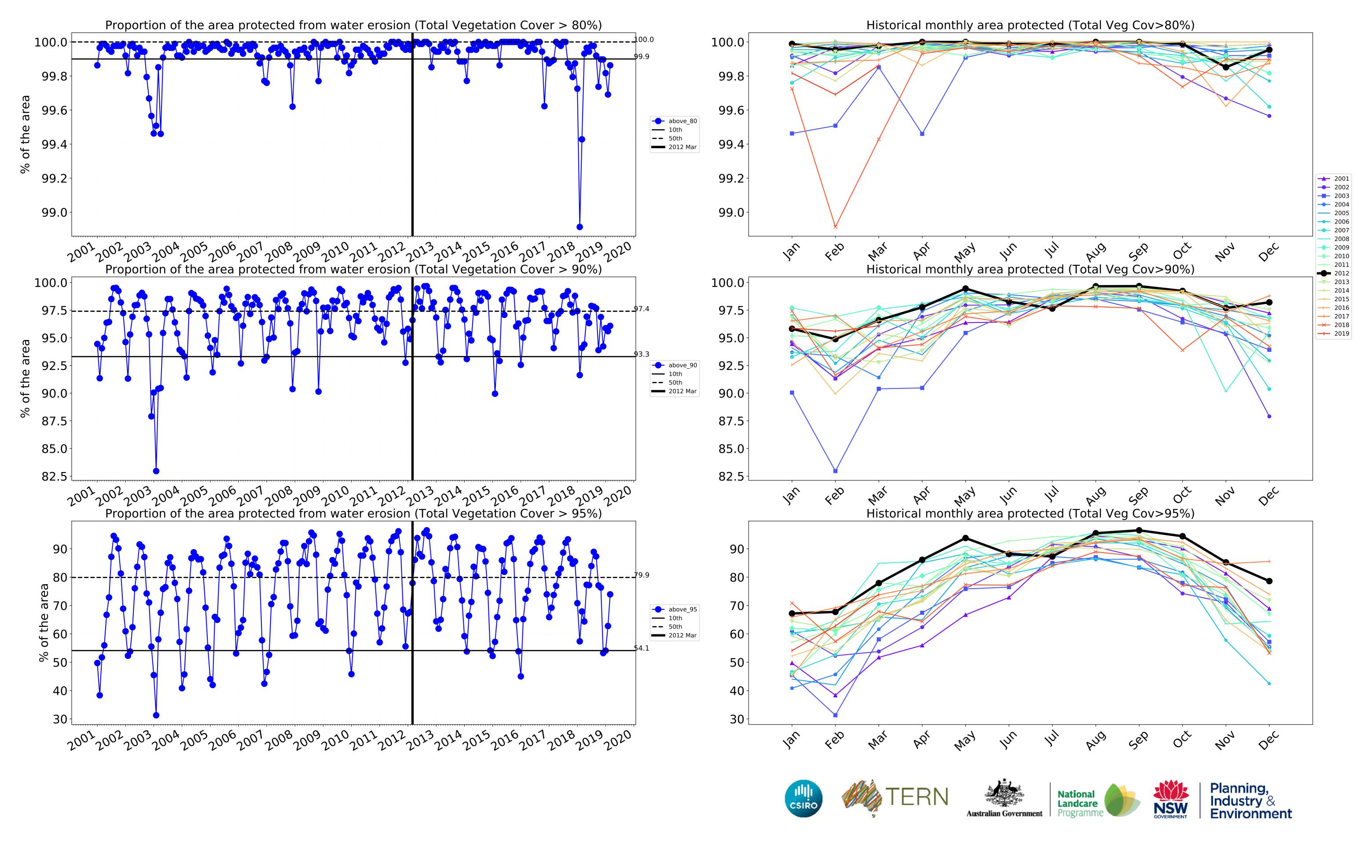


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





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



Hunter (3,240,000 ha and no data 60,425 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	3,240,000	99.9% 3,237,500	99.7% 3,230,800	98.9% 3,203,703	97.4% 3,154,983	80.9% 2,621,087	41.9% 1,359,138
Conservation and natural environments	1,241,400	99.9% 1,240,250	99.8% 1,239,500	99.7% 1,237,875	99.5% 1,235,275	94.3% 1,171,150	64.7% 803,300
Conservation and natural environments non forest	30,225	96.4% 29,150	94.5% 28,550	91.6% 27,675	88.0% 26,600	71.6% 21,650	31.1% 9,400
Conservation and natural environments Woodland forest	138,825	100.0% 138,800	100.0% 138,775	99.9% 138,725	99.8% 138,575	93.2% 129,400	49.7% 69,050
Conservation and natural environments Forest (non woodland)	1,072,350	100.0% 1,072,300	100.0% 1,072,175	99.9% 1,071,475	99.8% 1,070,100	95.1% 1,020,100	67.6% 724,850
Agriculture	1,580,700	100.0% 1,580,675	100.0% 1,580,475	99.8% 1,578,025	98.8% 1,561,800	73.9% 1,167,400	23.1% 365,675
Grazing	1,502,700	100.0% 1,502,675	100.0% 1,502,475	99.9% 1,500,625	99.3% 1,492,275	76.5% 1,149,075	24.2% 363,550
Grazing non forest	1,212,925	100.0% 1,212,925	100.0% 1,212,725	99.8% 1,211,100	99.2% 1,203,725	74.1% 899,375	21.3% 257,950
Grazing Woodland forest	120,625	100.0% 120,625	100.0% 120,625	99.9% 120,525	99.6% 120,150	81.0% 97,725	25.9% 31,275
Grazing - Forest (non woodland)	169,150	100.0% 169,125	100.0% 169,125	99.9% 169,000	99.6% 168,400	89.8% 151,975	43.9% 74,325
Cropping	50,625	100.0% 50,625	100.0% 50,625	98.8% 50,025	85.8% 43,450	26.3% 13,300	3.6% 1,825
Production native forests and plantation forests	218,575	100.0% 218,575	100.0% 218,575	100.0% 218,575	100.0% 218,525	96.6% 211,125	77.9% 170,275

