Total vegetation cover soil protection Region:LGA Waroona (S) WA

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:

Date: January 2023

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 cover class that 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





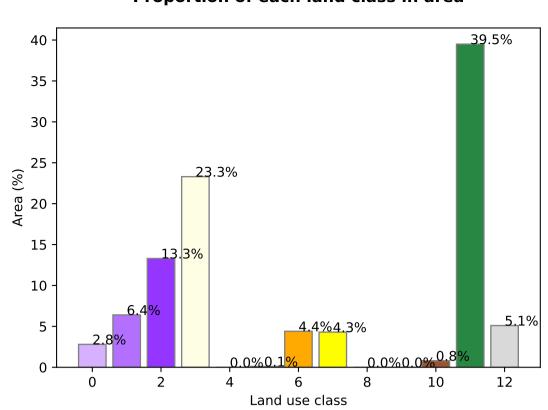




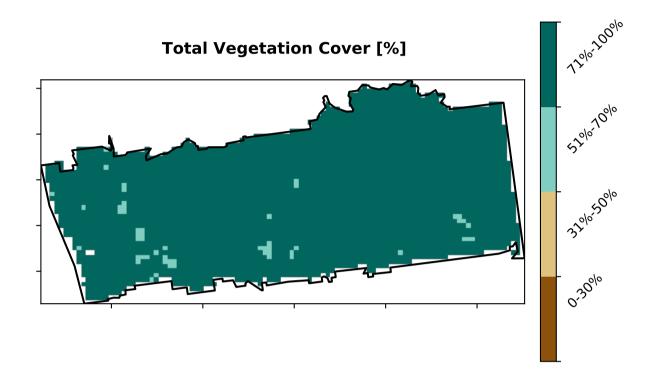
Vegetation Cover Jan 2023

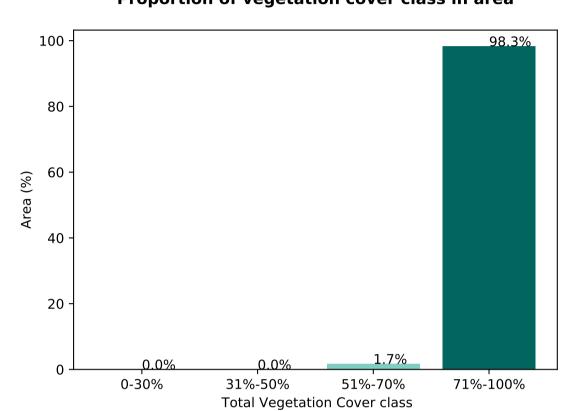
Land use and forest cover Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest Catchment Scale 3 Conservation and natural environments -Land Use and Forests Non-Woodland forest of Australia (2018) 4 Agriculture - Grazing - Non-forest Derived from 5 Agriculture - Grazing - Woodland forest Catchment Scale 6 Agriculture - Grazing - Non-woodland forest Use of Australia 7 Agriculture - Grazing - Irrigated (2018) and Forests 8 Agriculture - Cropping - Non-irrigated of Australia (2018) 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

Proportion of each land class in area

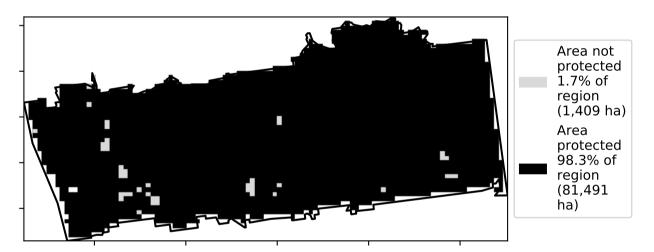


Proportion of vegetation cover class in area

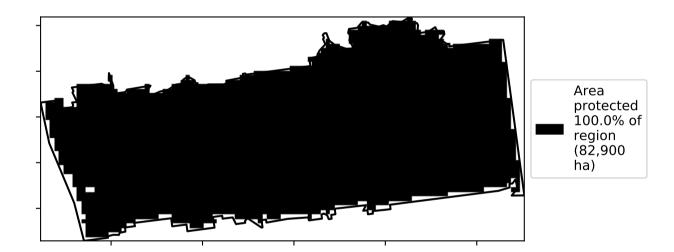




% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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

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

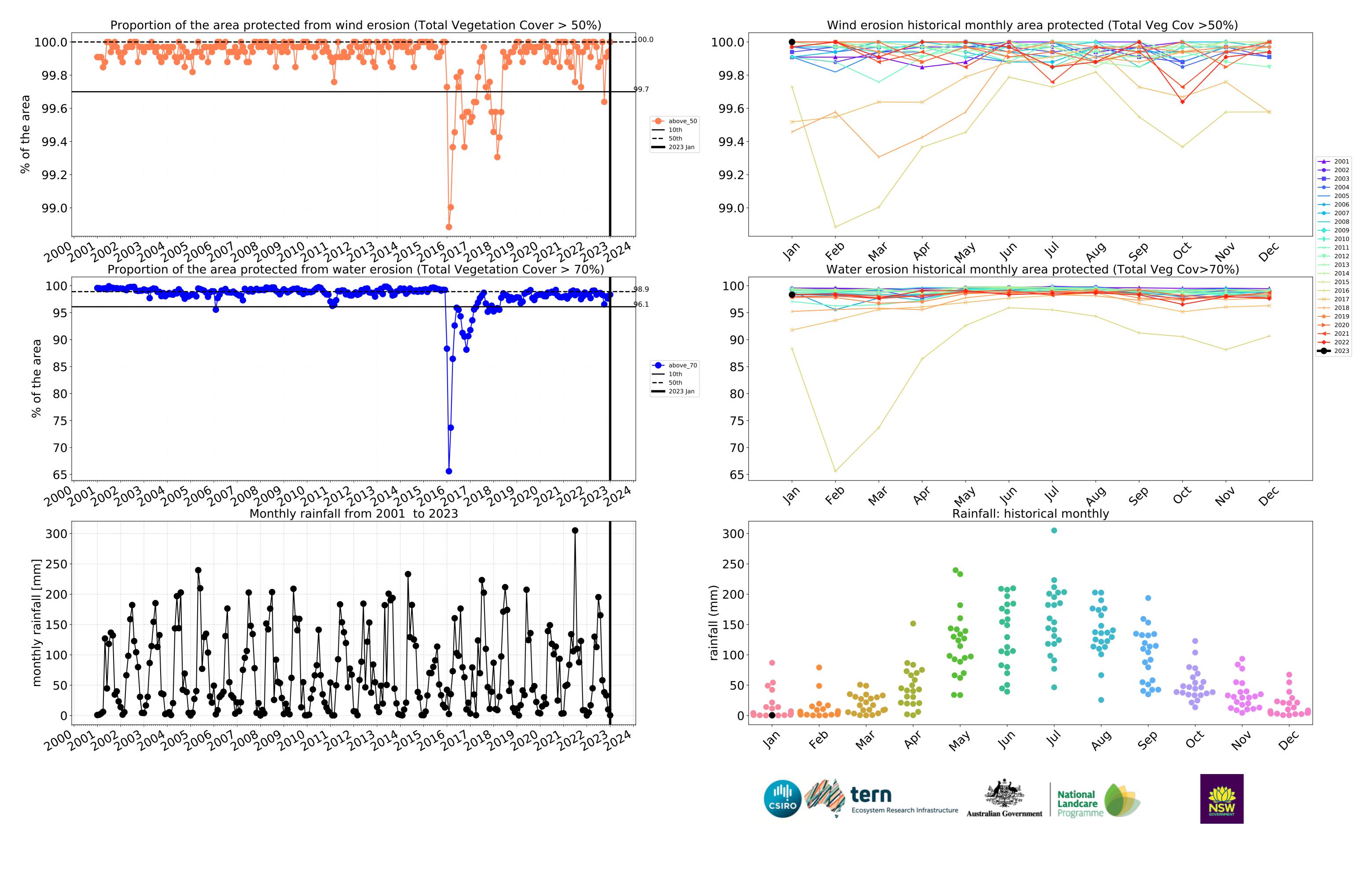
Total Vegetation Cover Decile [%]

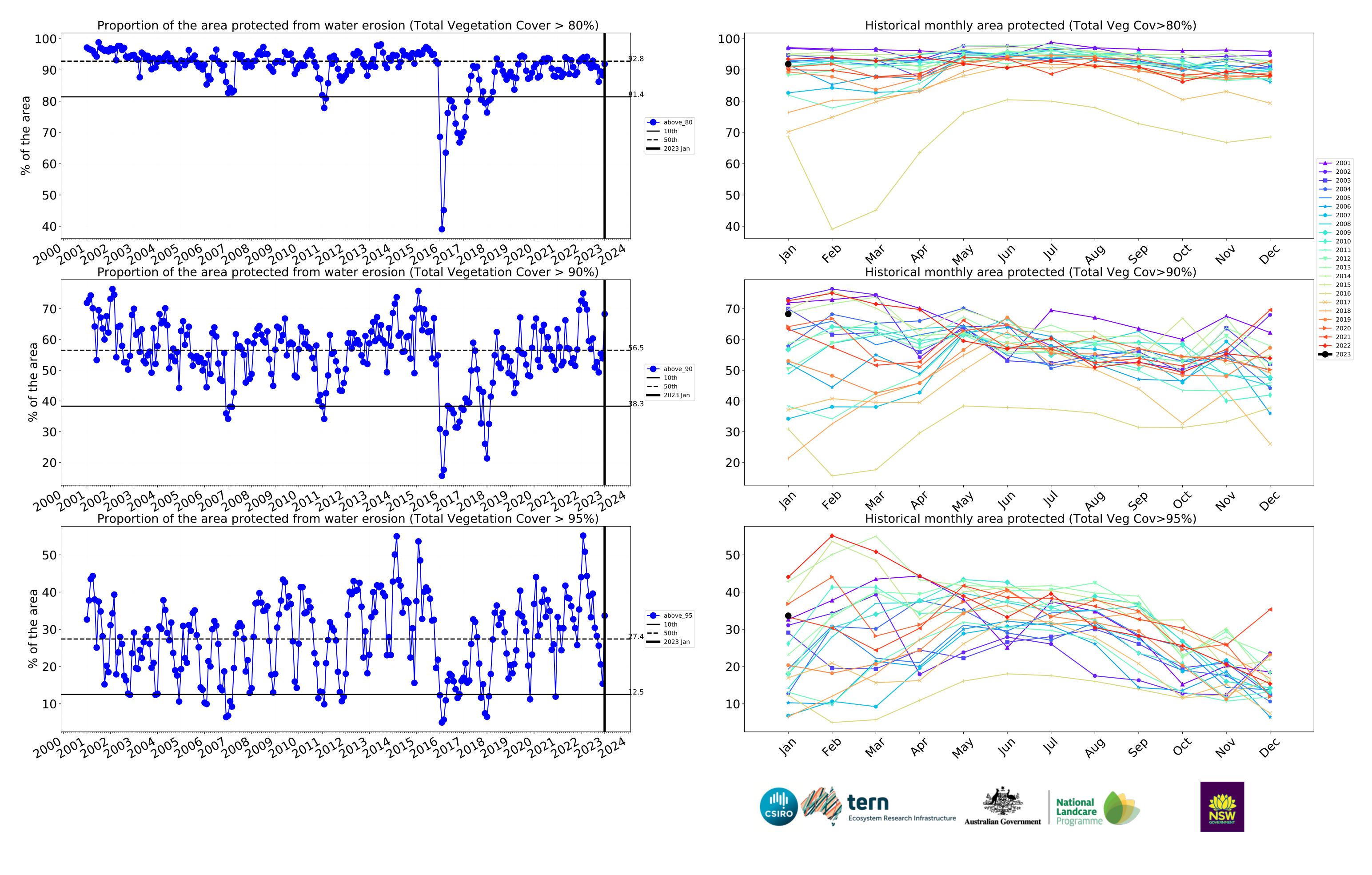
tern Ecosystem Research Infrastructure





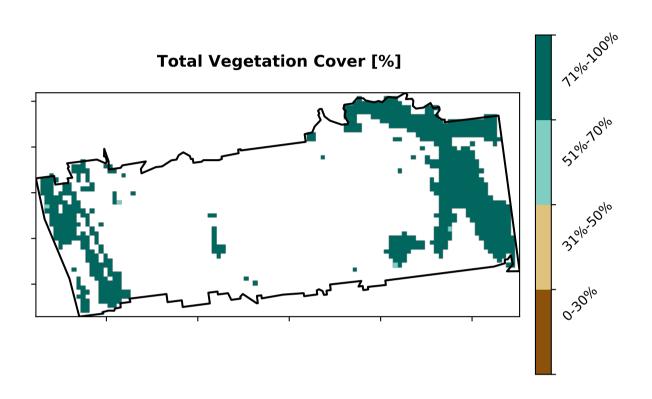


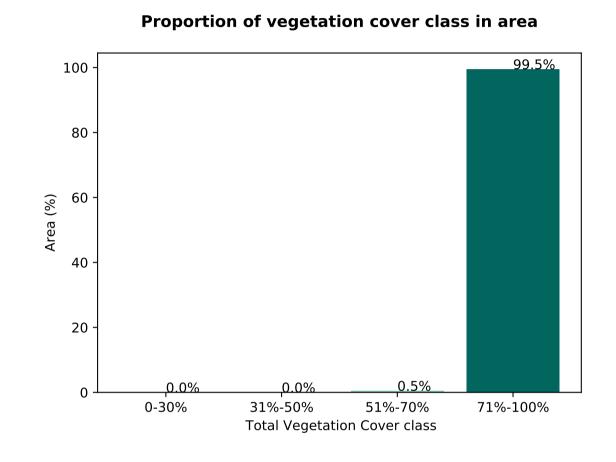




Conservation and natural environments

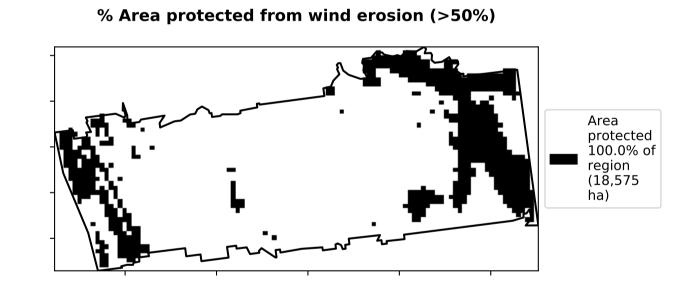
60 59.0% **Land use and forest cover** 50 Catchment Scale Land Use and Forests of Australia (2018) ${\bf 1}$ Conservation and natural environments - Nonforest 2 Conservation and natural environments - Woodland forest Derived from Catchment Scale Land 30 28.4% Use of Australia 3 Conservation and natural environments - Non-woodland forest (2018) and Forests of Australia (2018) 20 12.6% 10 · -0.5 1.5 0.5 1.0 2.0 0.0 Land use class

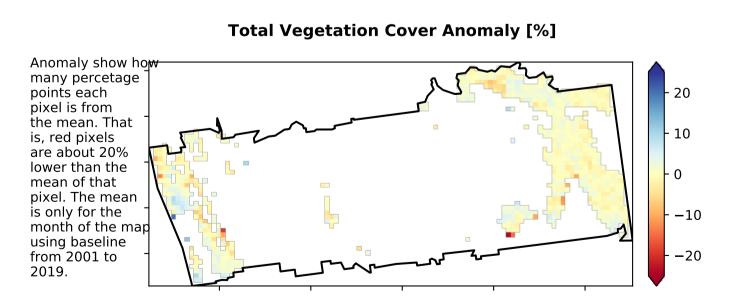




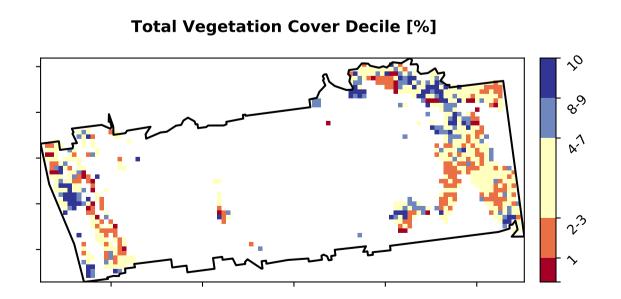
Proportion of each land class in area

Area not protected 0.5% of region (93 ha) Area protected 99.5% of region (18,482 ha)





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.



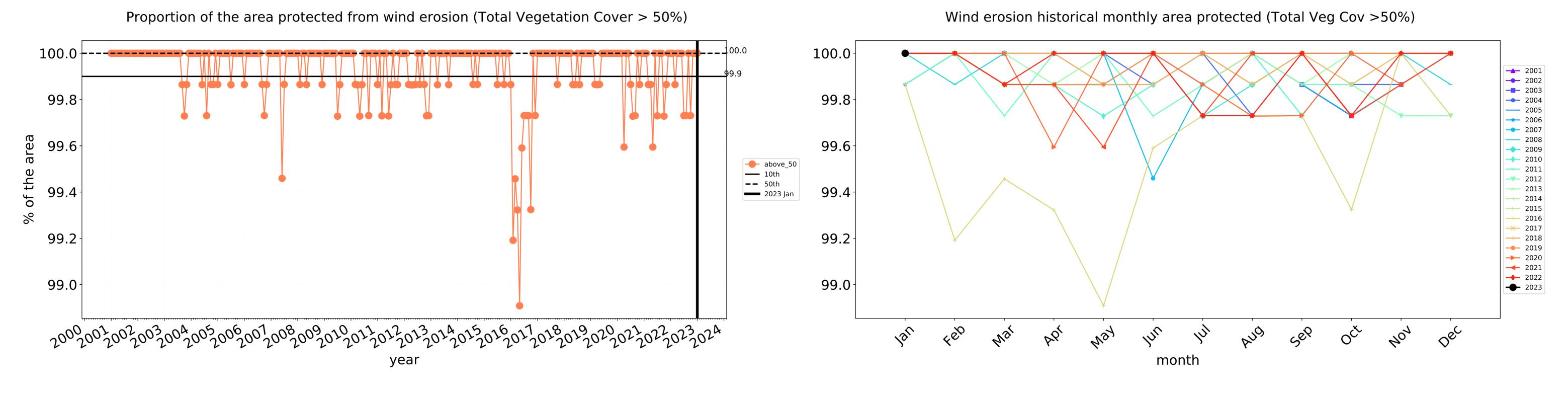


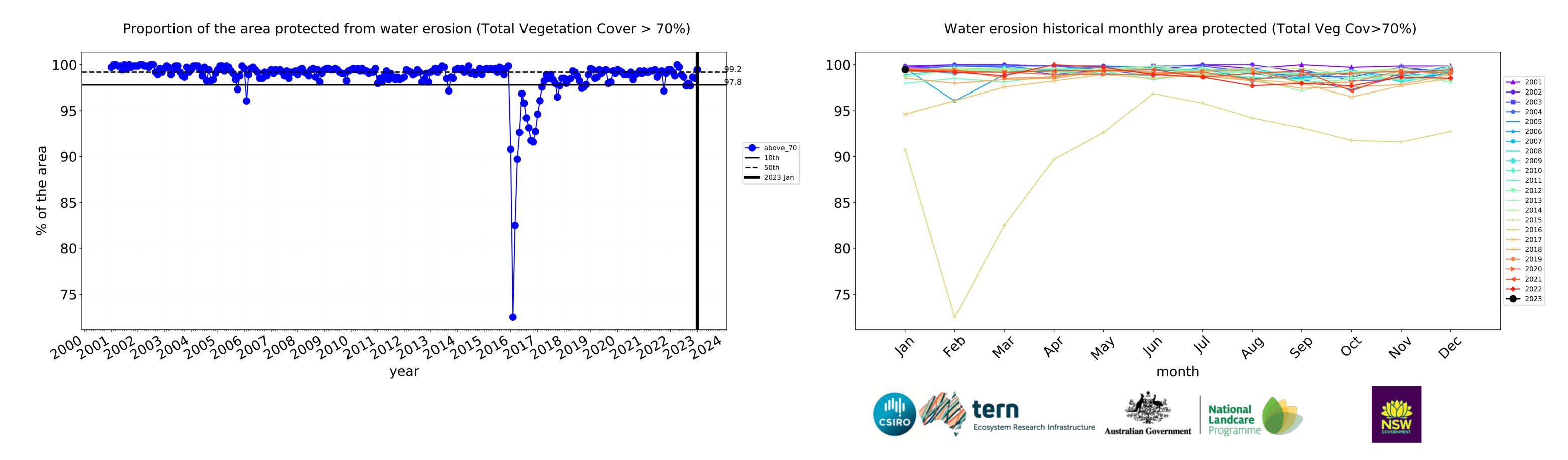


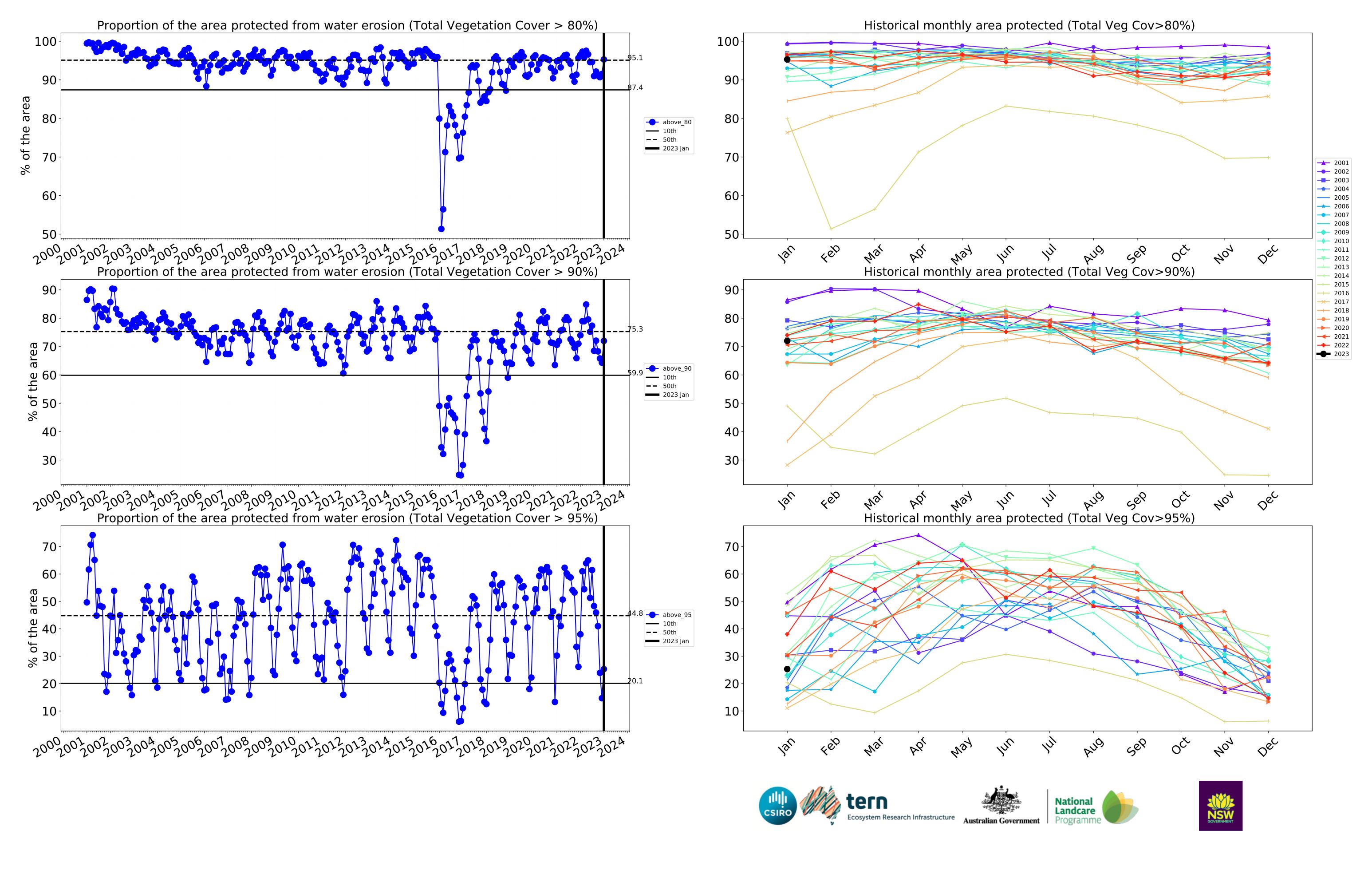




Conservation and natural environments timeseries







Conservation and natural environments non forest

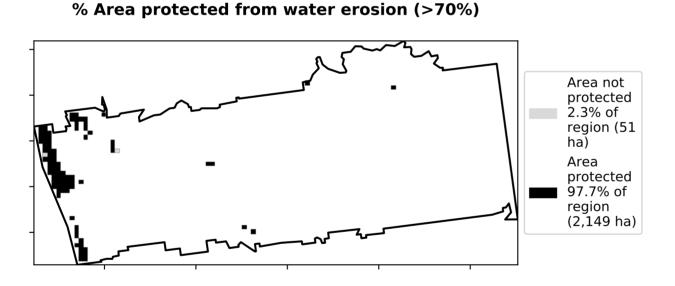
Land use and forest cover Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Nonforest Catchment Scale Land

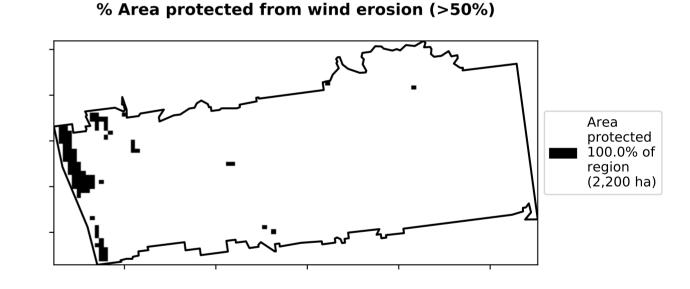
Total Vegetation Cover [%]

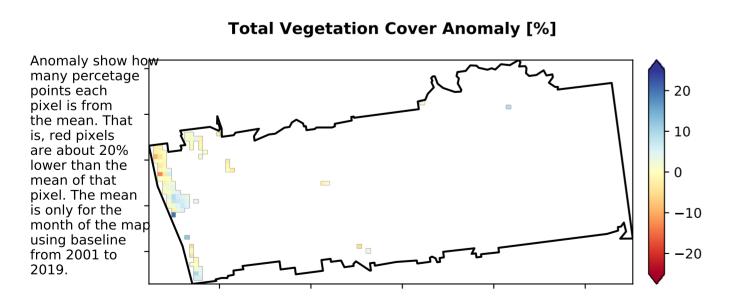
Catchment Scale

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

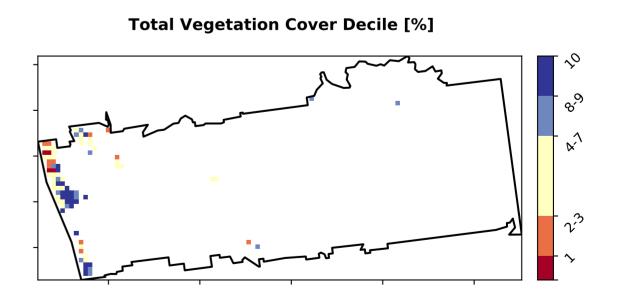
Proportion of vegetation cover class in area 100 97.7% 80 Area (%) 40 20 2.3% 51%-70% 0-30% 31%-50% 71%-100% **Total Vegetation Cover class**







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.



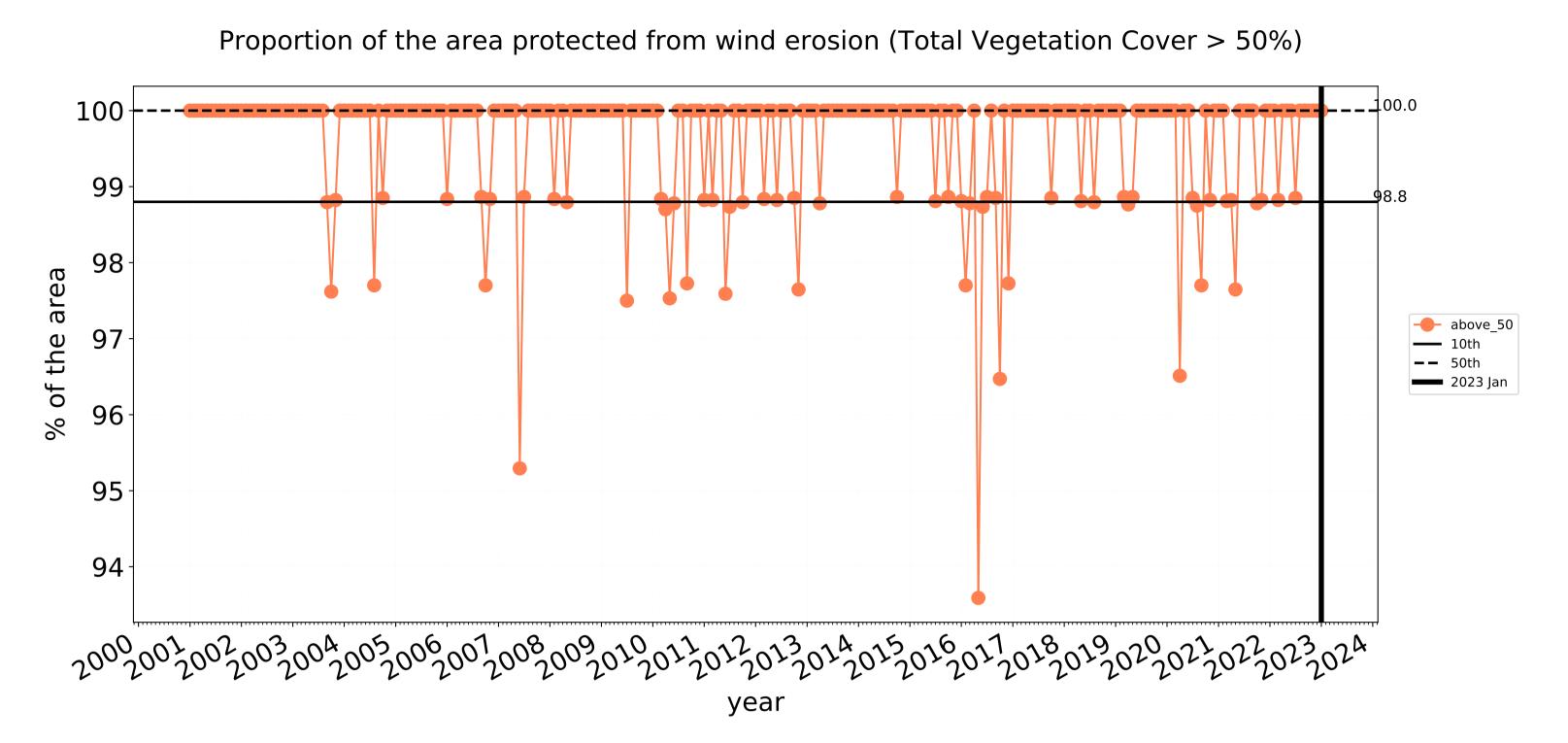


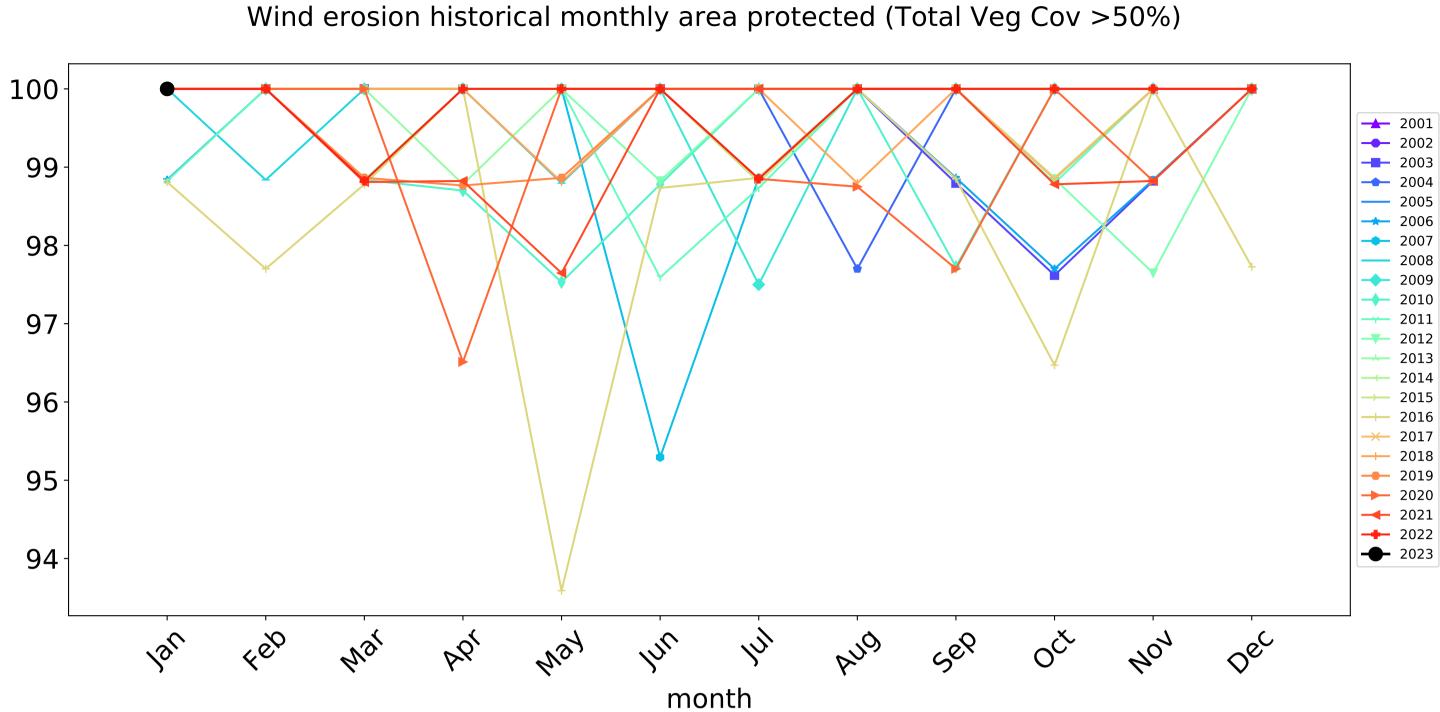


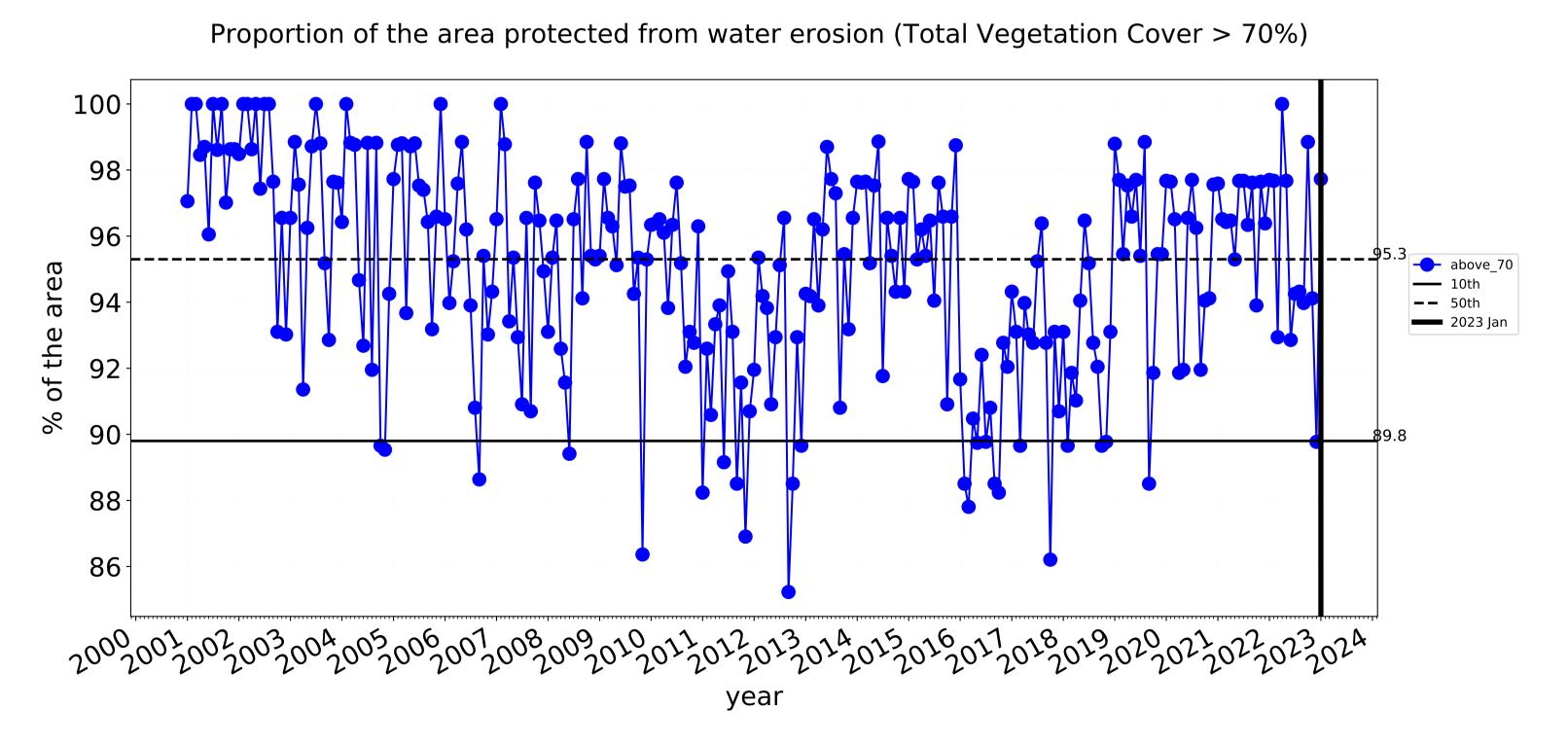


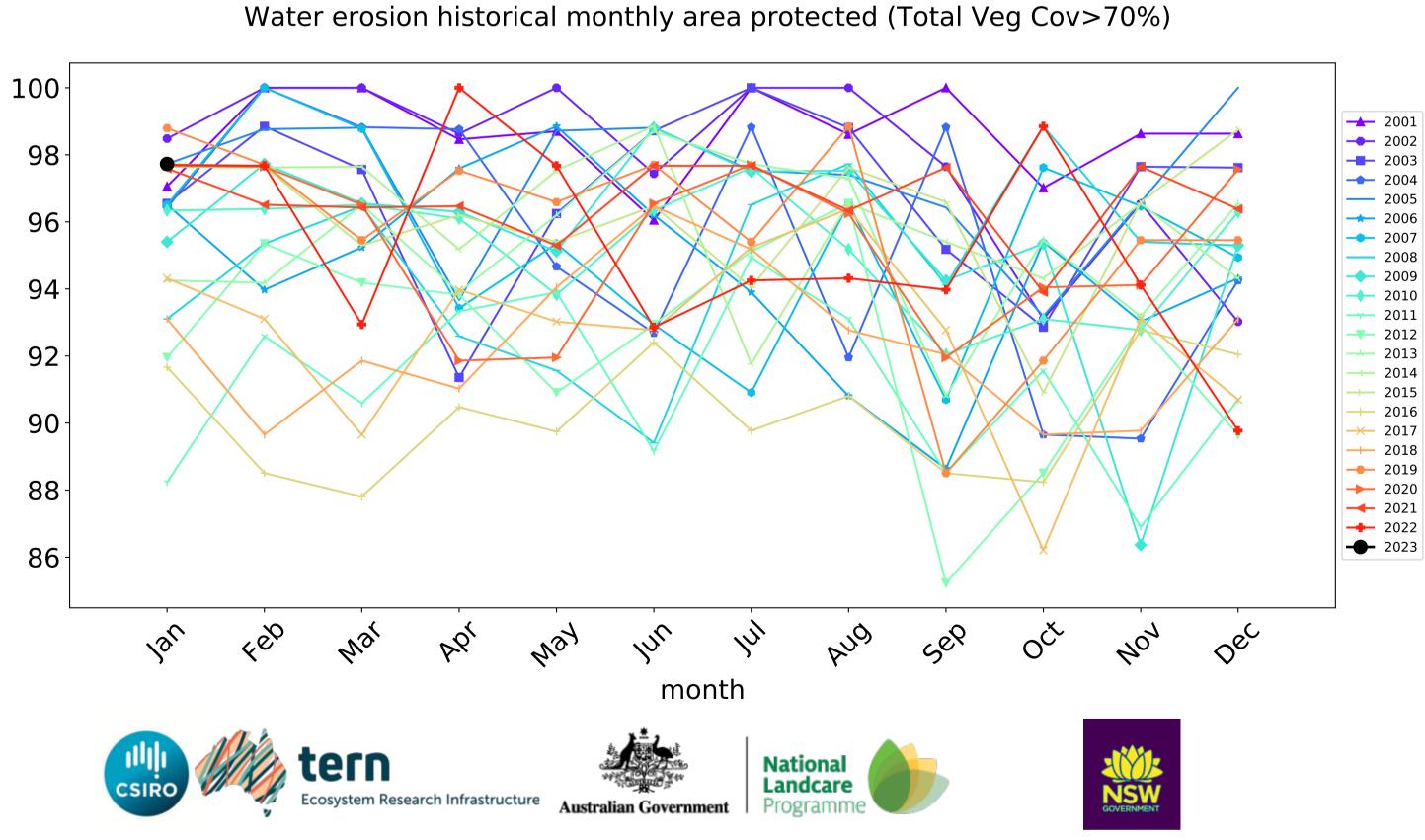


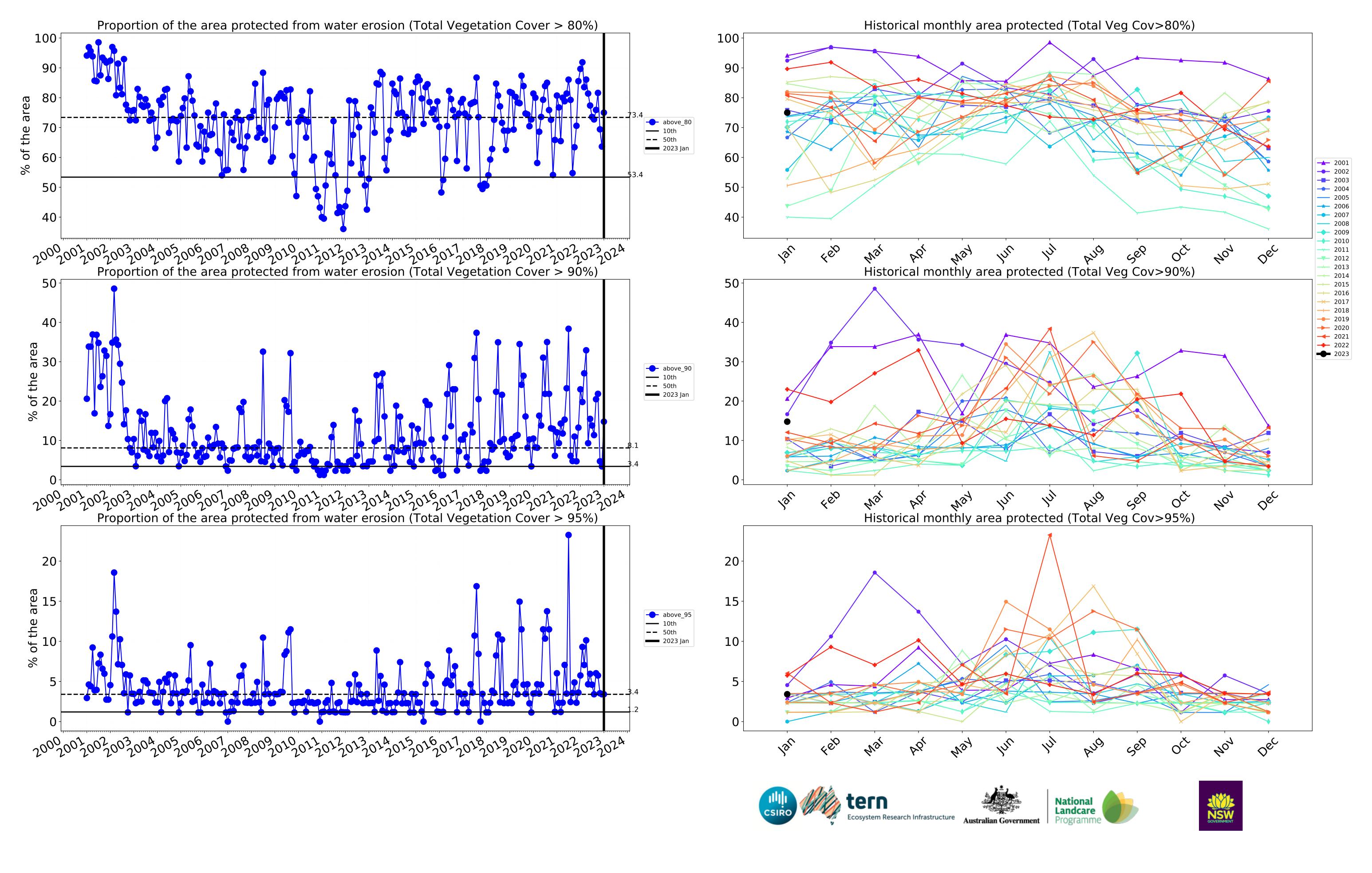
Conservation and natural environments non forest timeseries









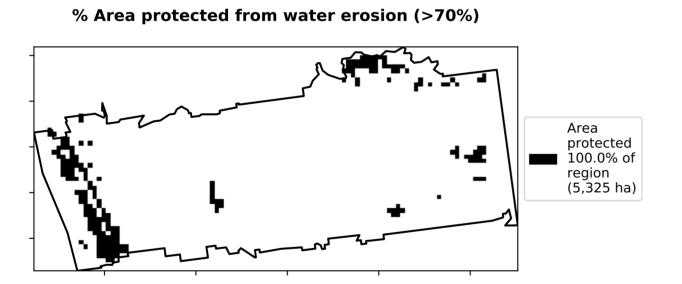


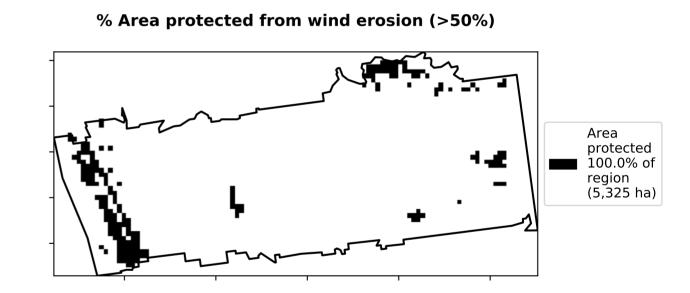
Conservation and natural environments Woodland forest

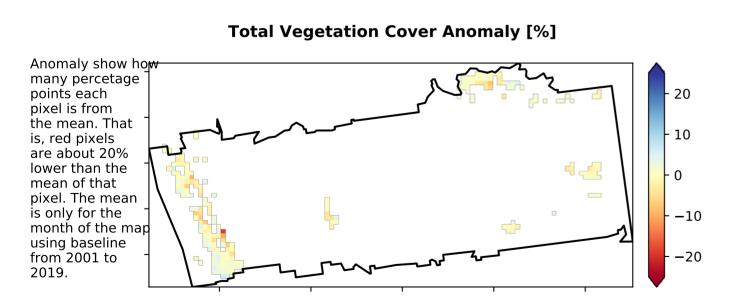
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Use of Australia (2018) 1 Conservation and natural environments - Woodland forest

Total Vegetation Cover [%] Trelo Idolo Spelo Idolo Spe

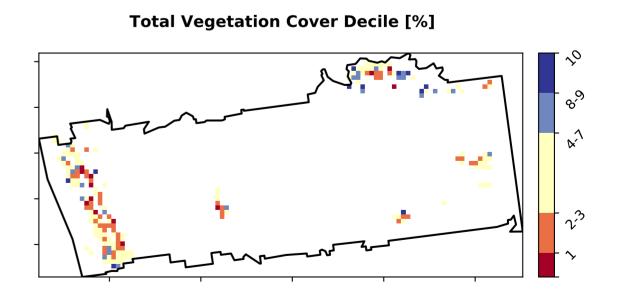
Proportion of vegetation cover class in area 100 - 100.0% 80 - 20 - 20 - 20 - 0.0% 0-30% 31%-50% Total Vegetation Cover class







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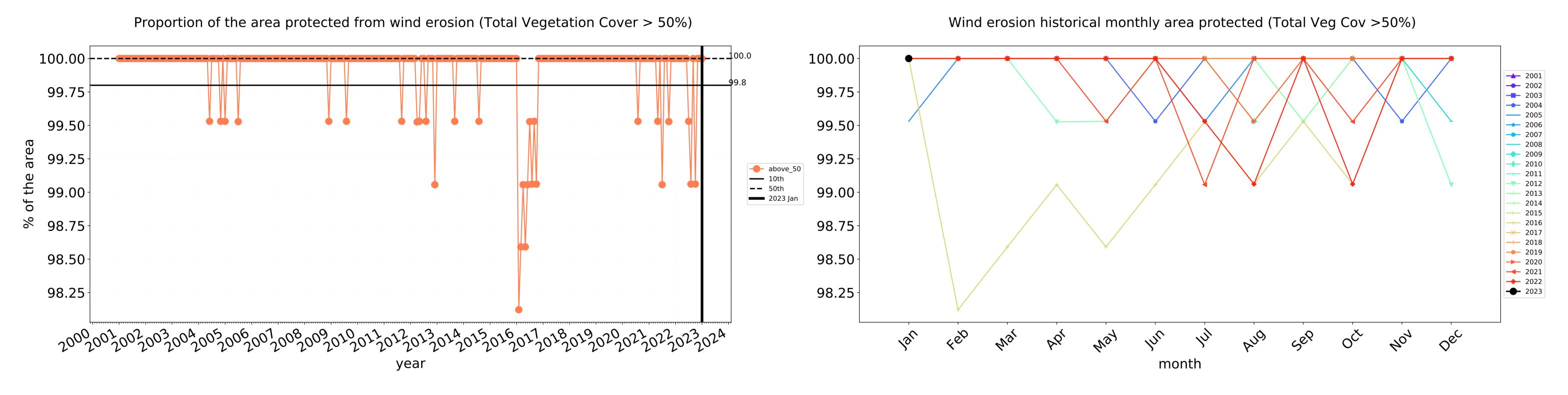


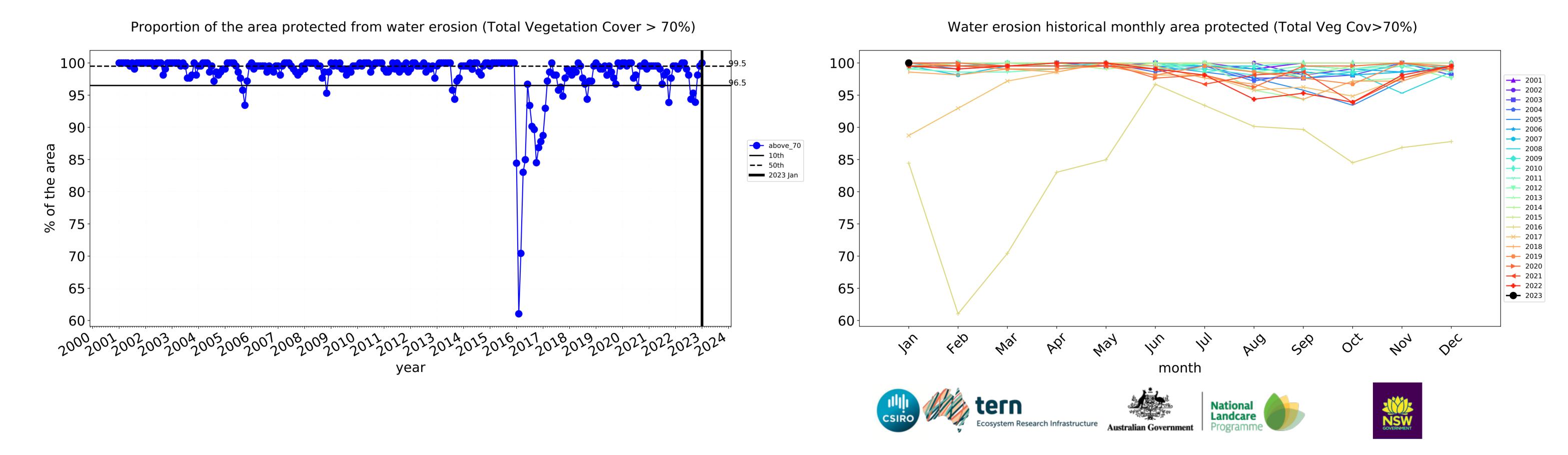


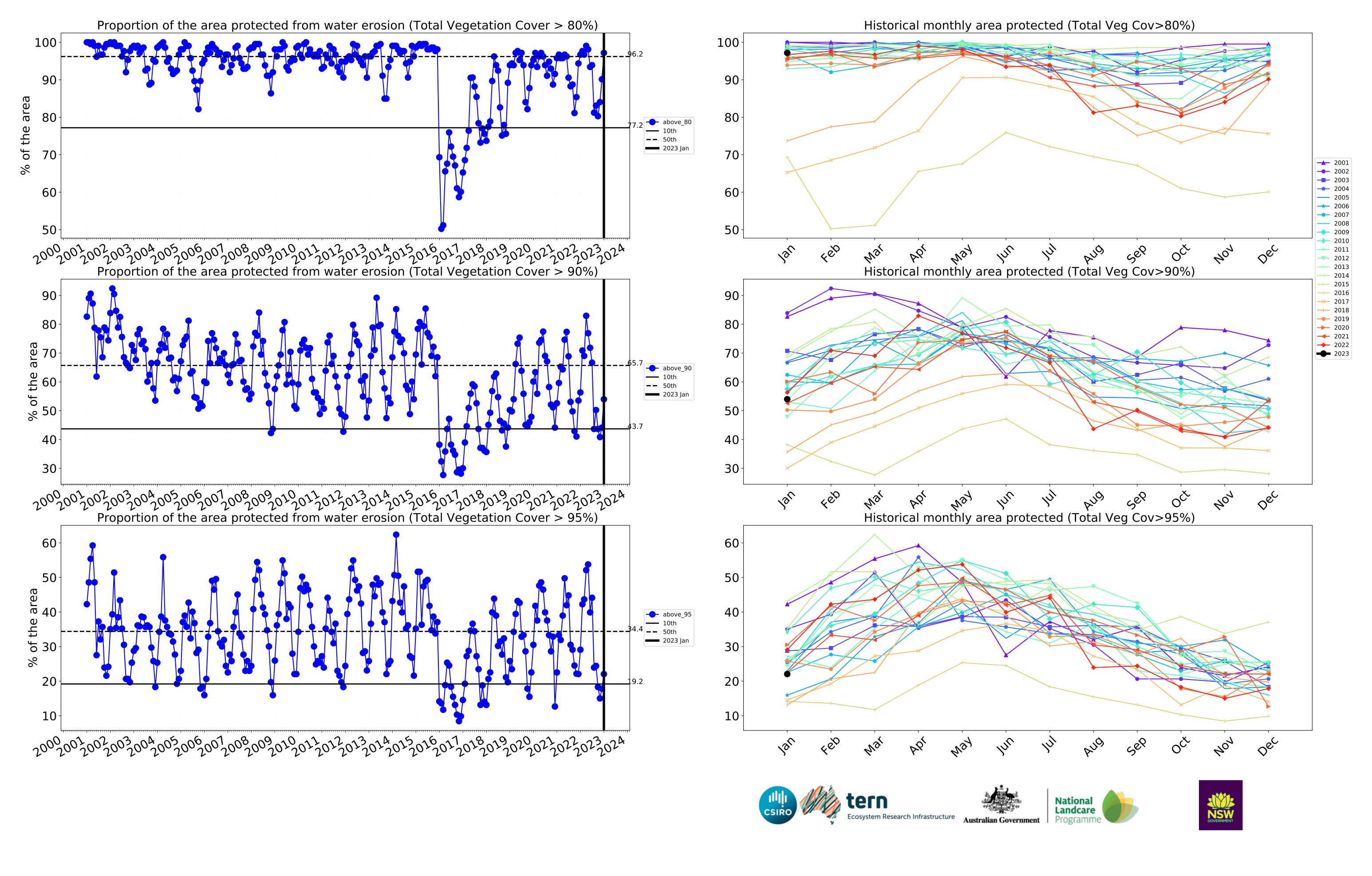








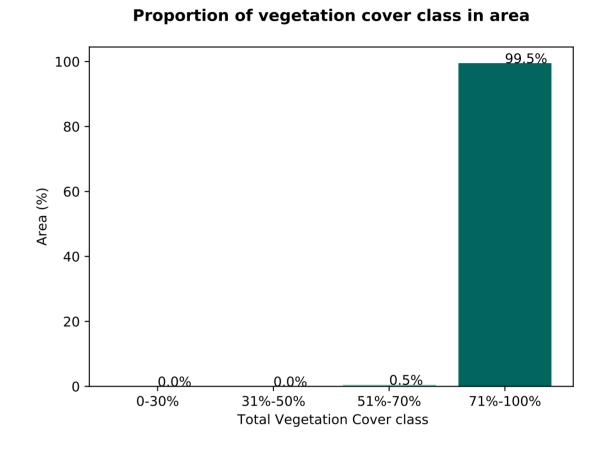


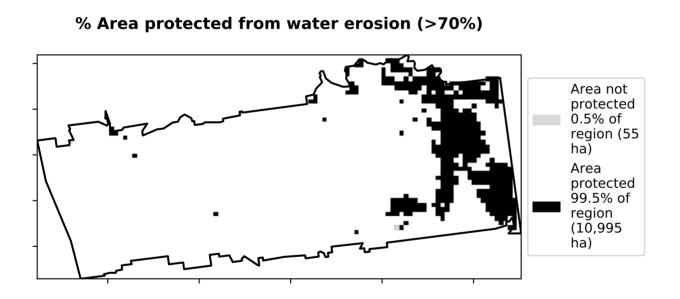


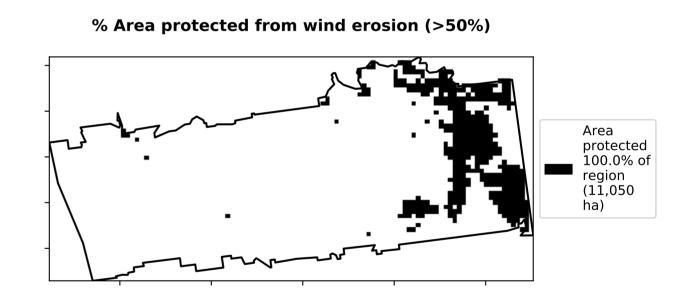
Conservation and natural environments Forest (non woodland)

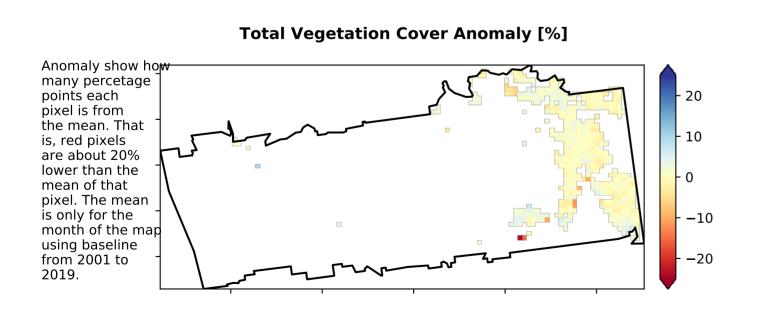
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%]

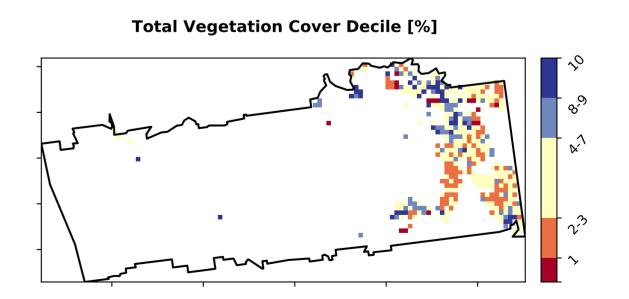








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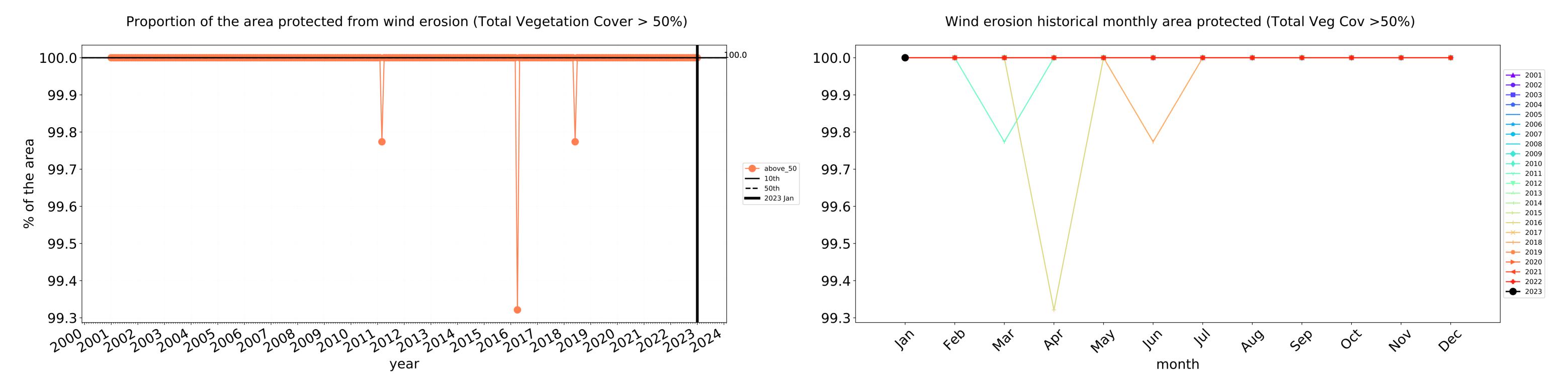


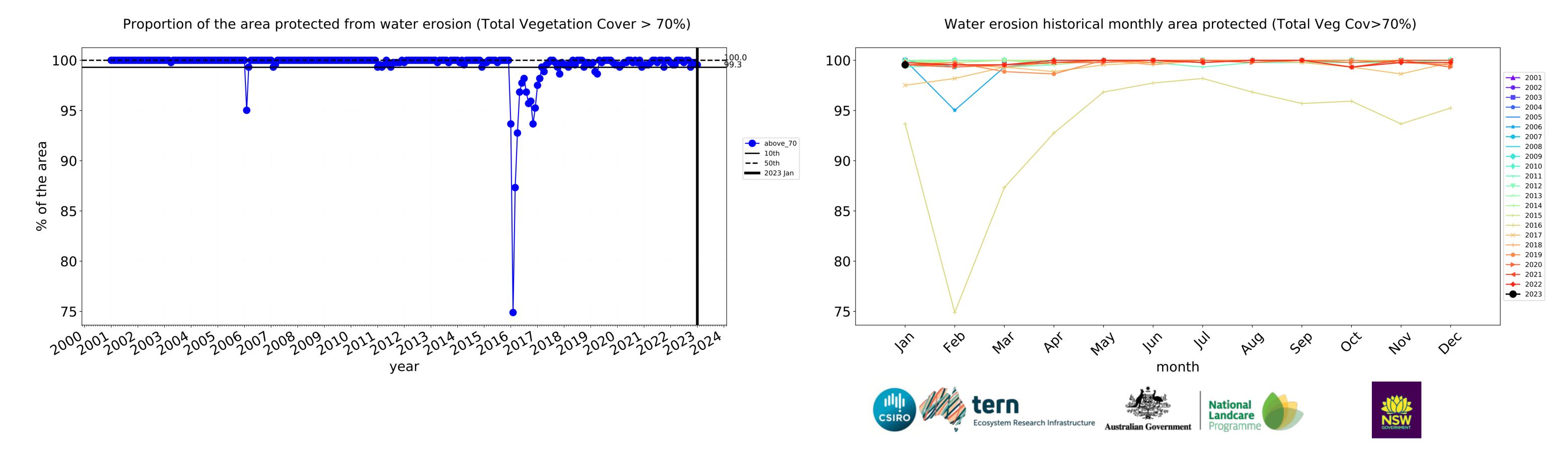


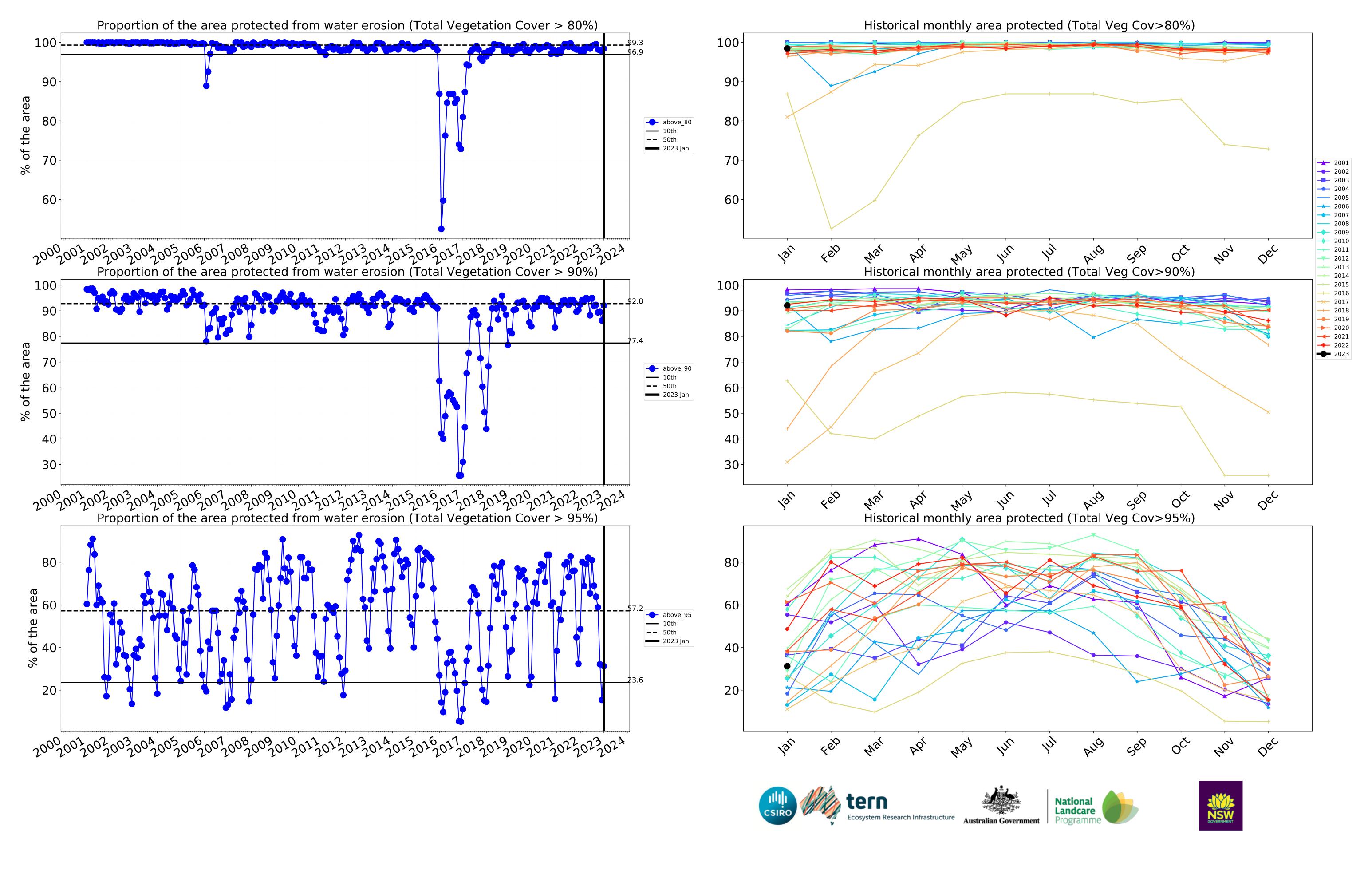








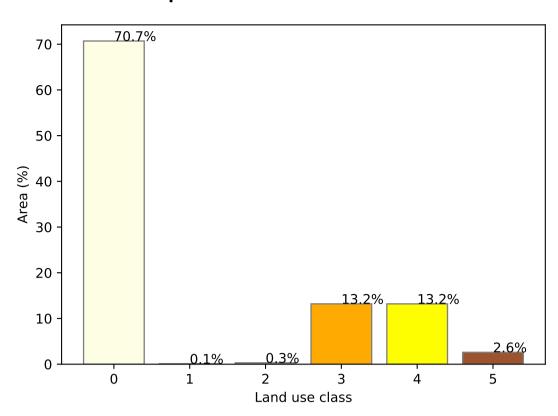




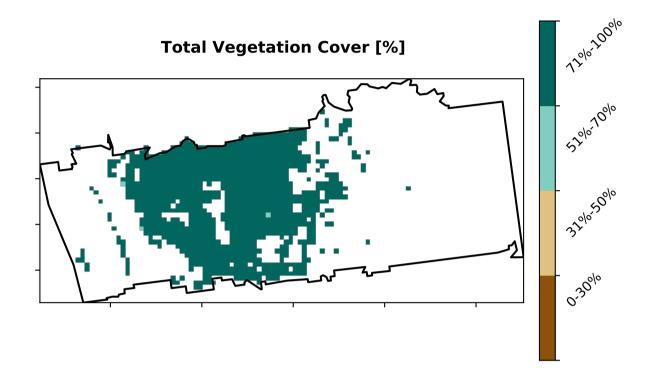
Agriculture

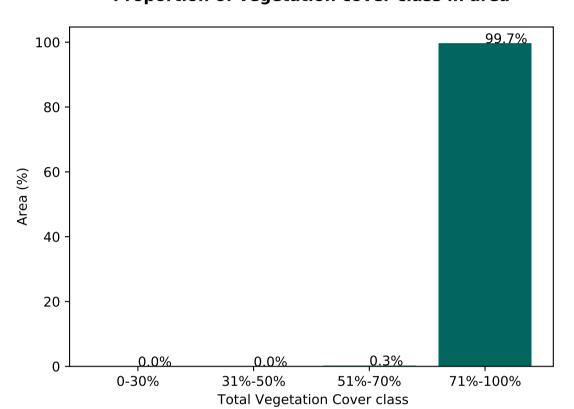
Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated Use of Australia (2018) 5 Agriculture - Cropping - Non-irrigated 5 Agriculture - Horticulture - Irrigated

Proportion of each land class in area

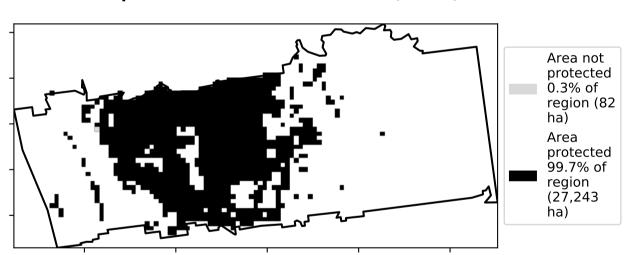


Proportion of vegetation cover class in area

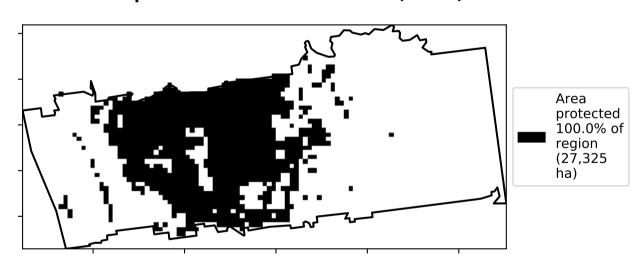




% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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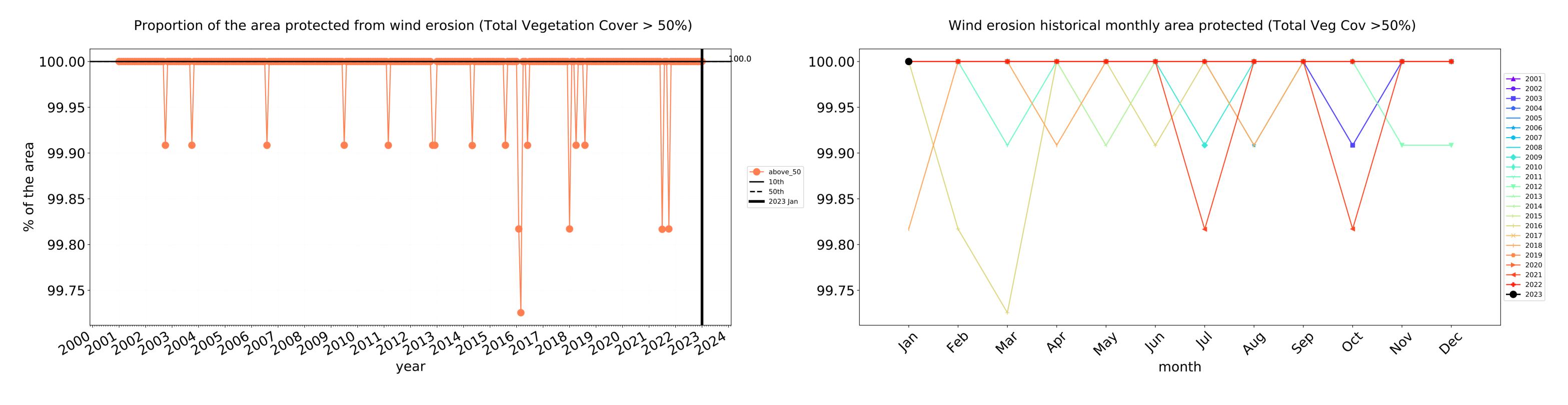


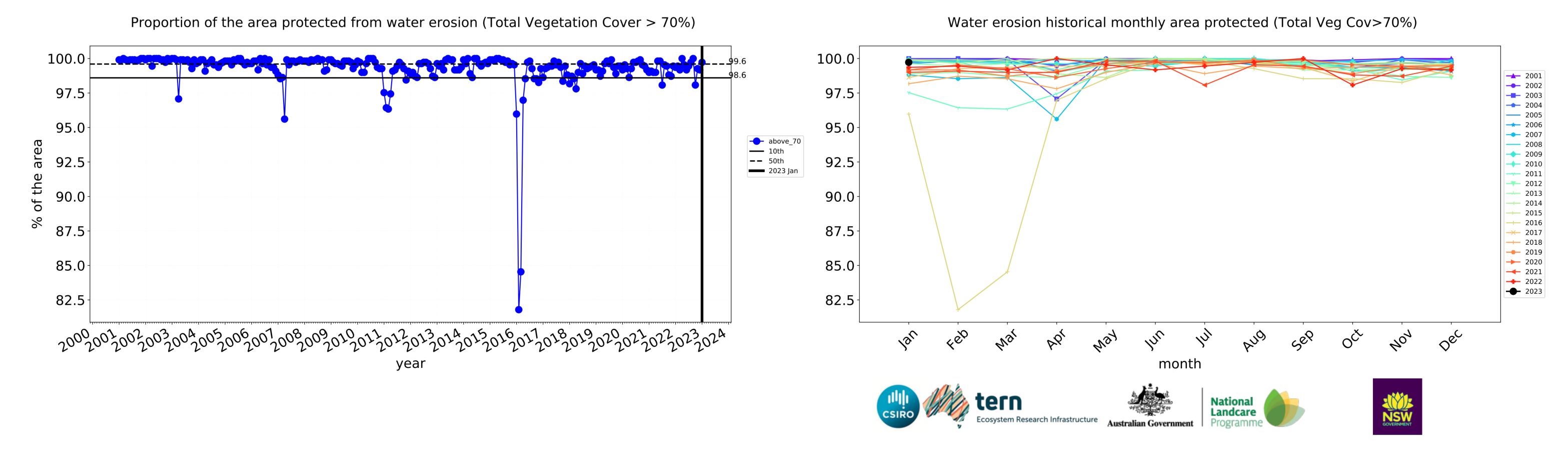


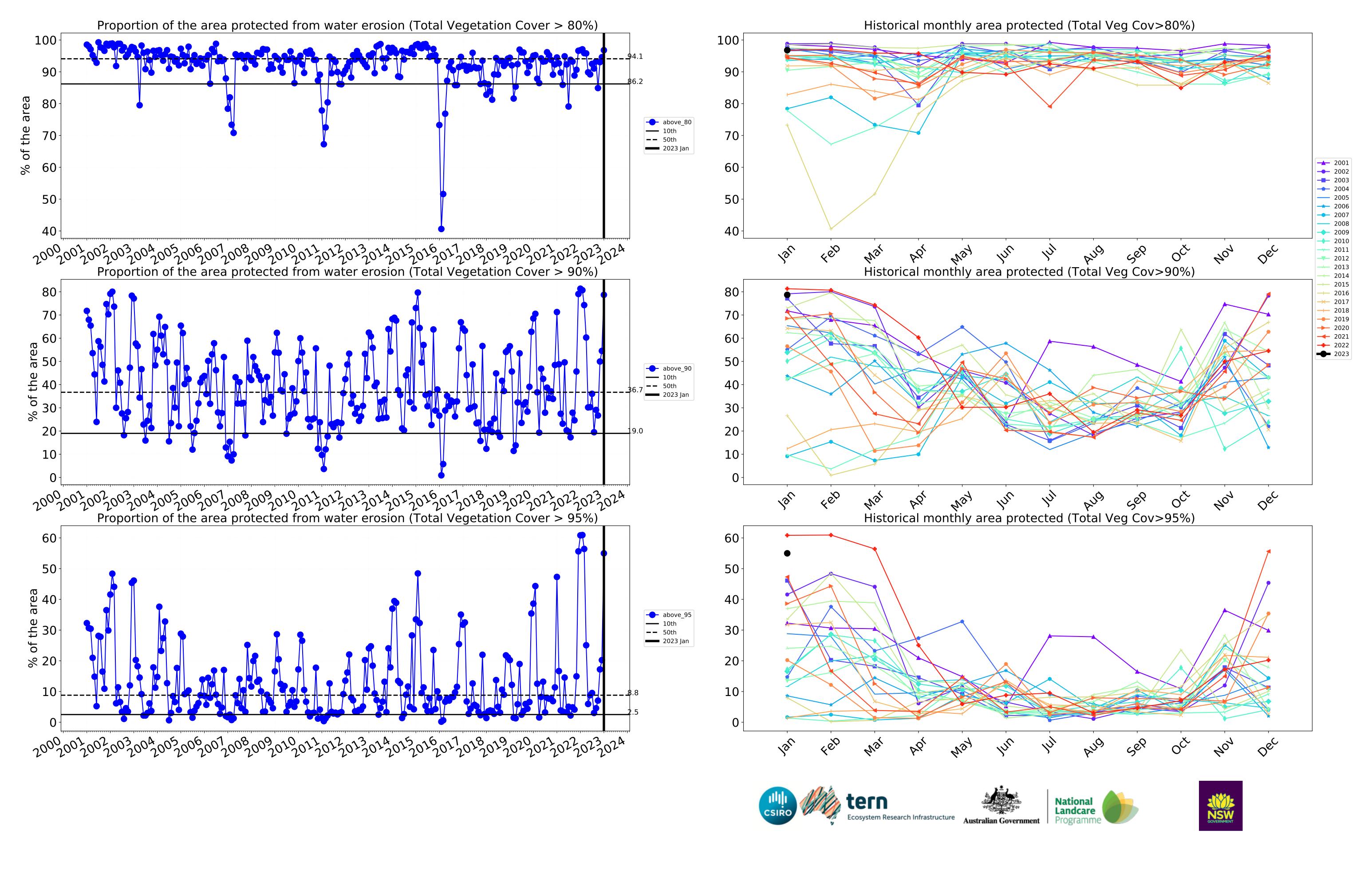




Agriculture timeseries



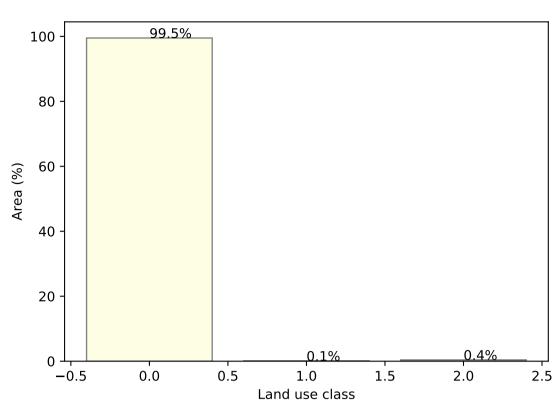




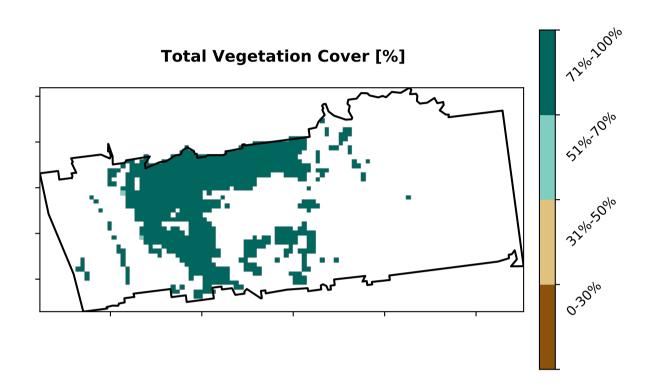
Grazing

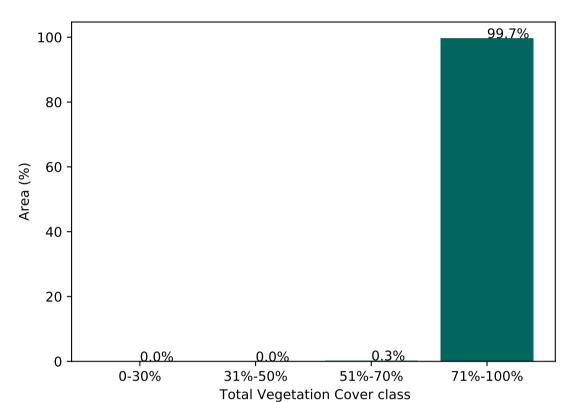
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) 3 Agriculture - Grazing - Non forest Use of Australia (2018) 3 Agriculture - Grazing - Non-woodland forest Use of Australia (2018)

Proportion of each land class in area

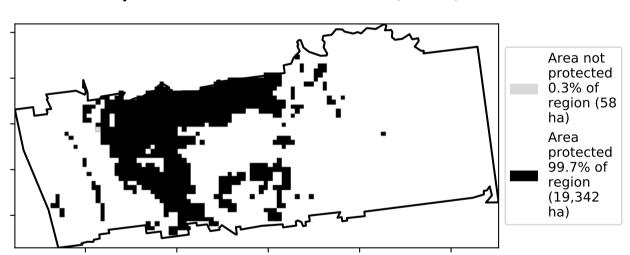


Proportion of vegetation cover class in area

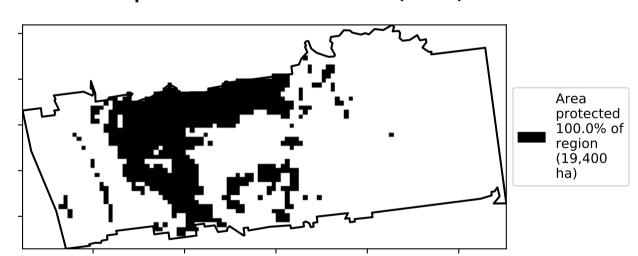




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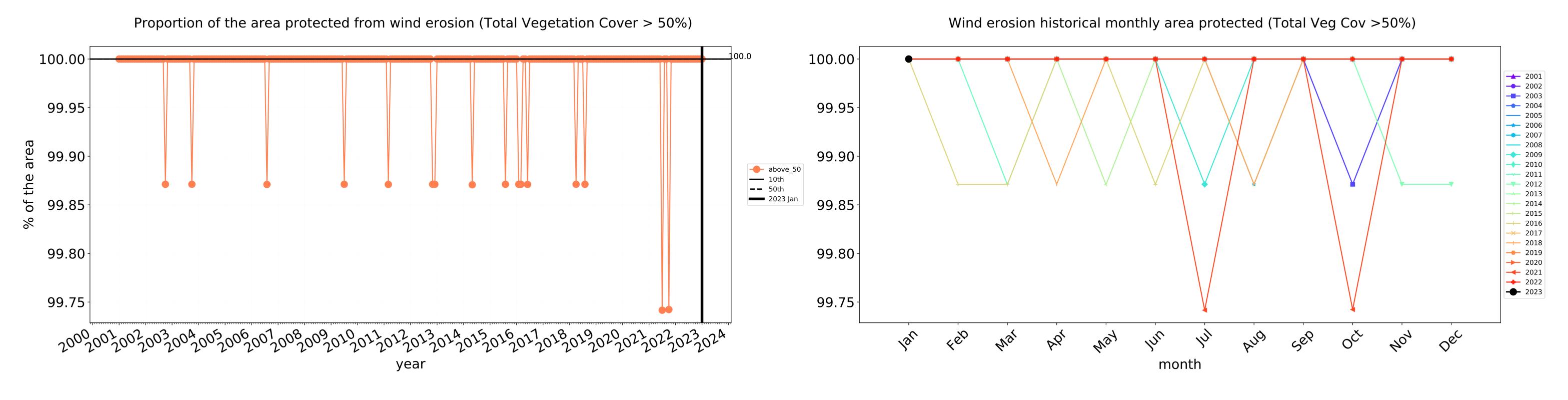


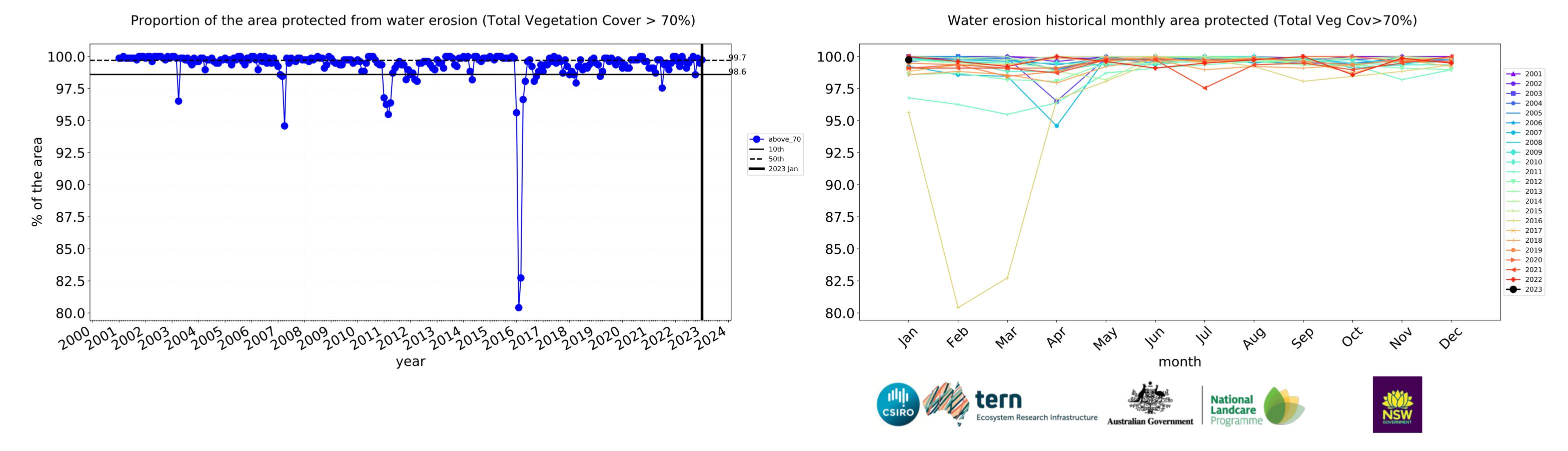


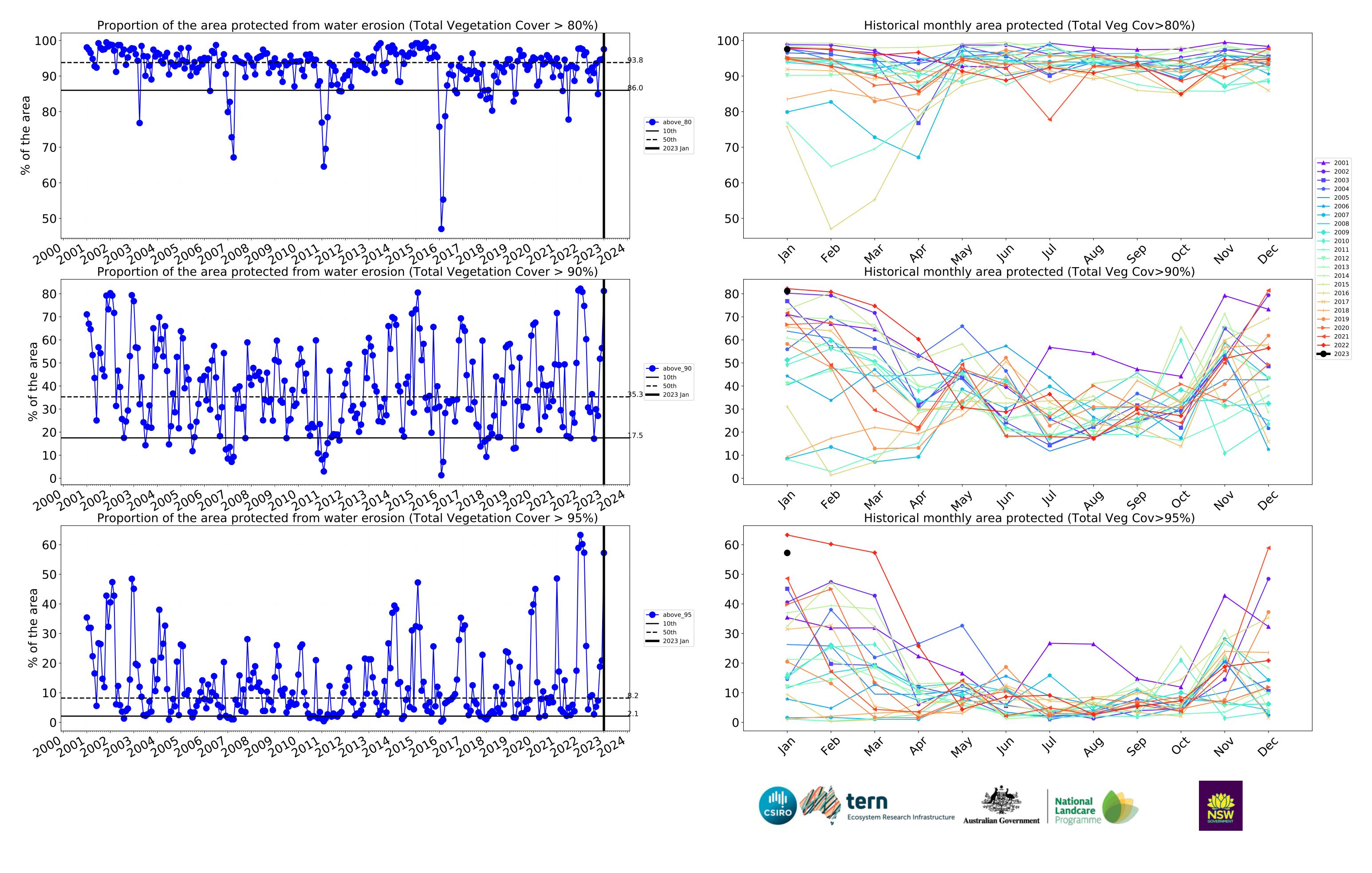




Grazing timeseries

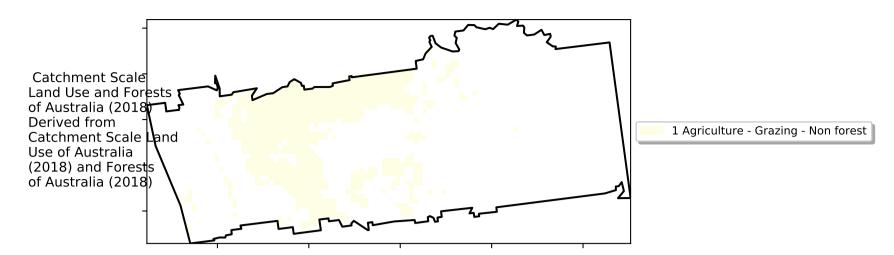






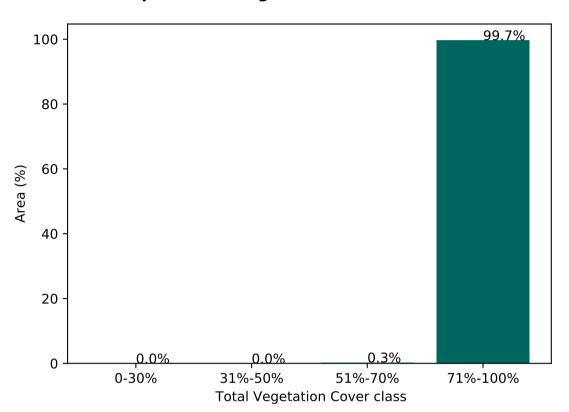
Grazing non forest

Land use and forest cover

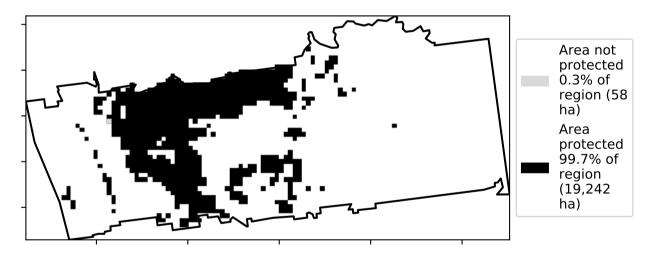


Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%]

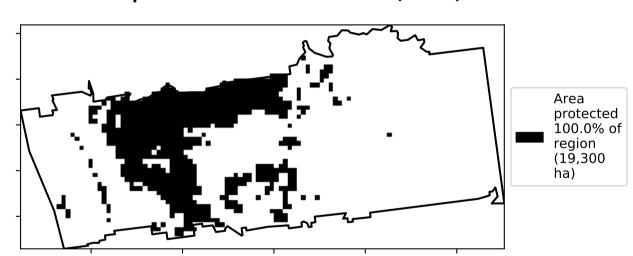
Proportion of vegetation cover class in area



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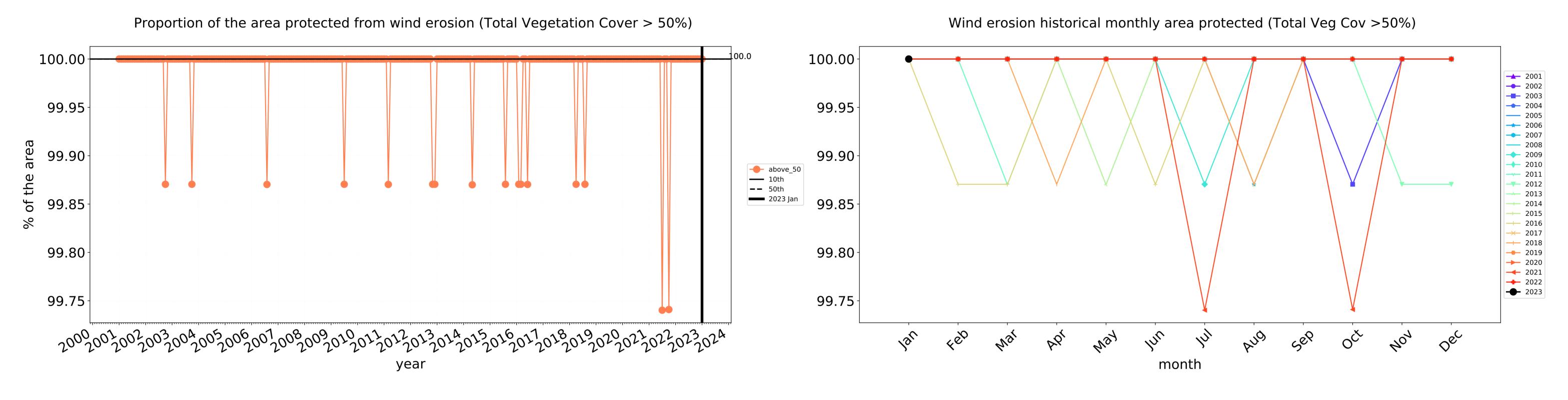


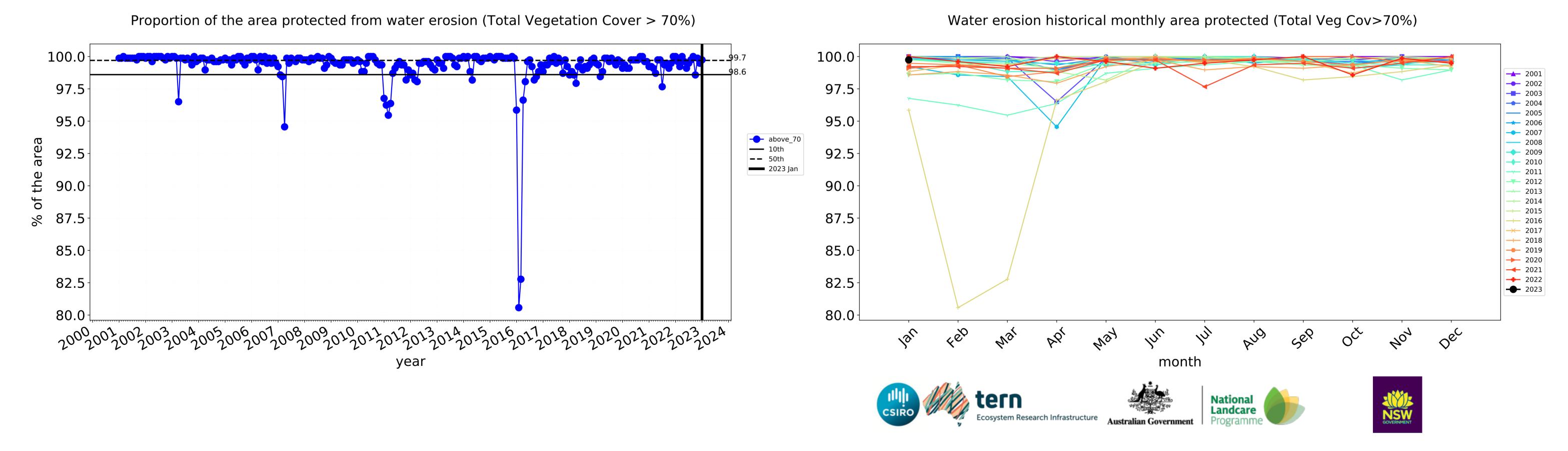


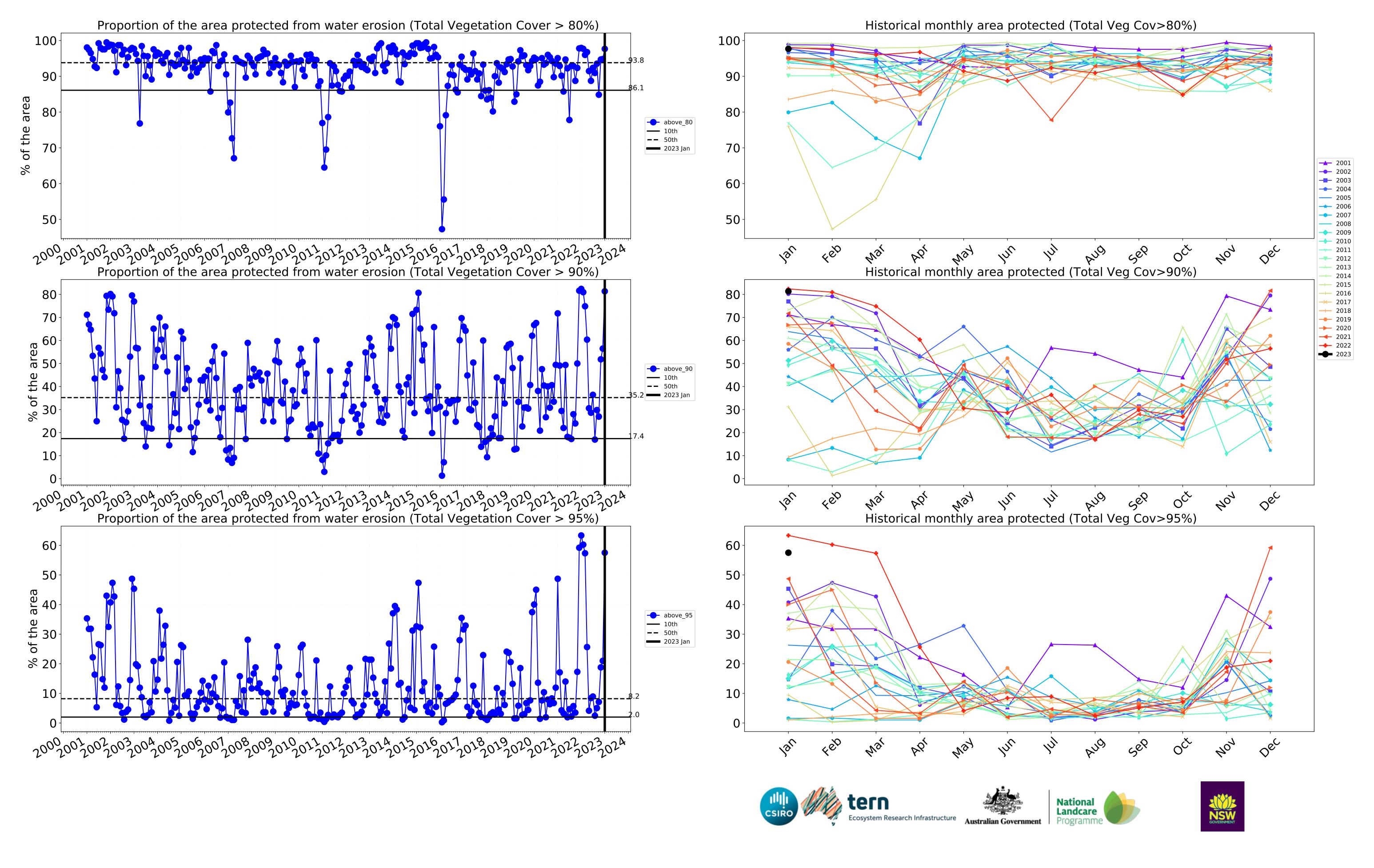




Grazing non forest timeseries

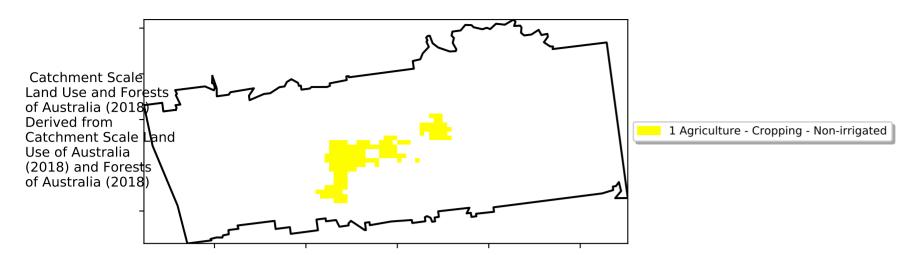






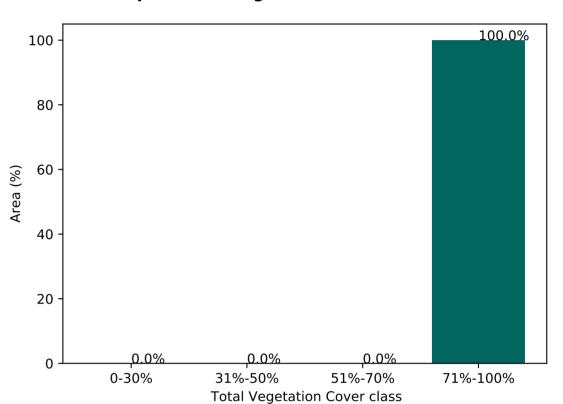
Cropping

Land use and forest cover

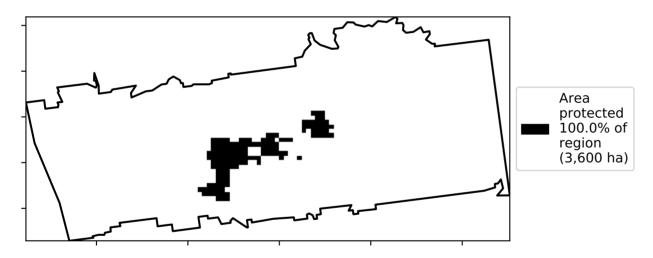


Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%]

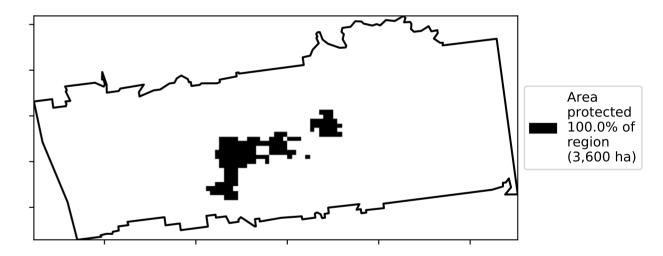
Proportion of vegetation cover class in area



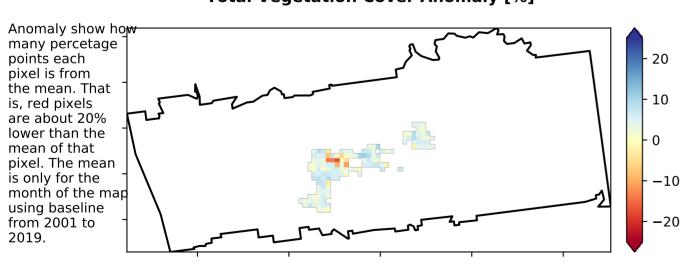
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Total Vegetation Cover Anomaly [%]



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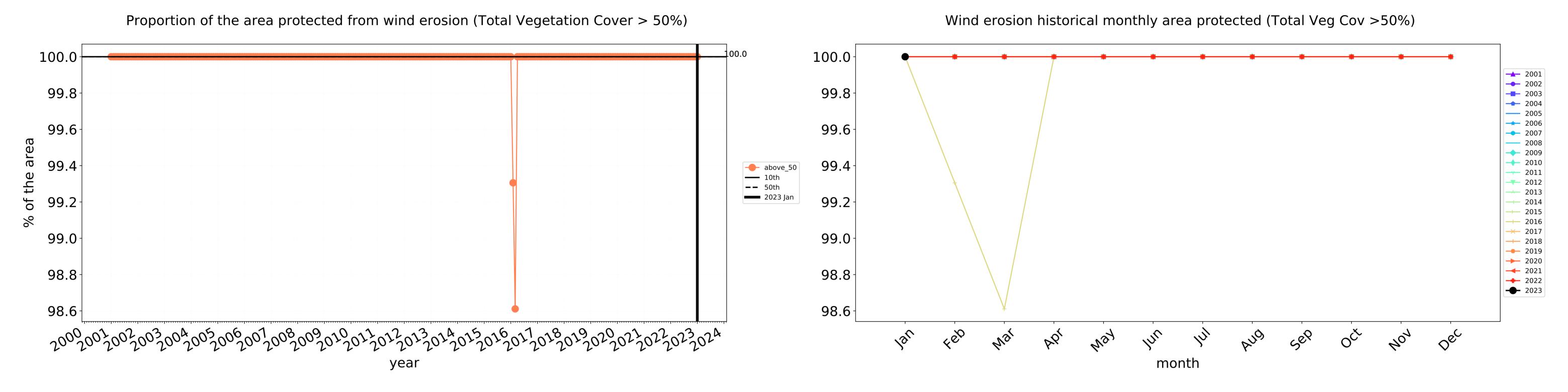


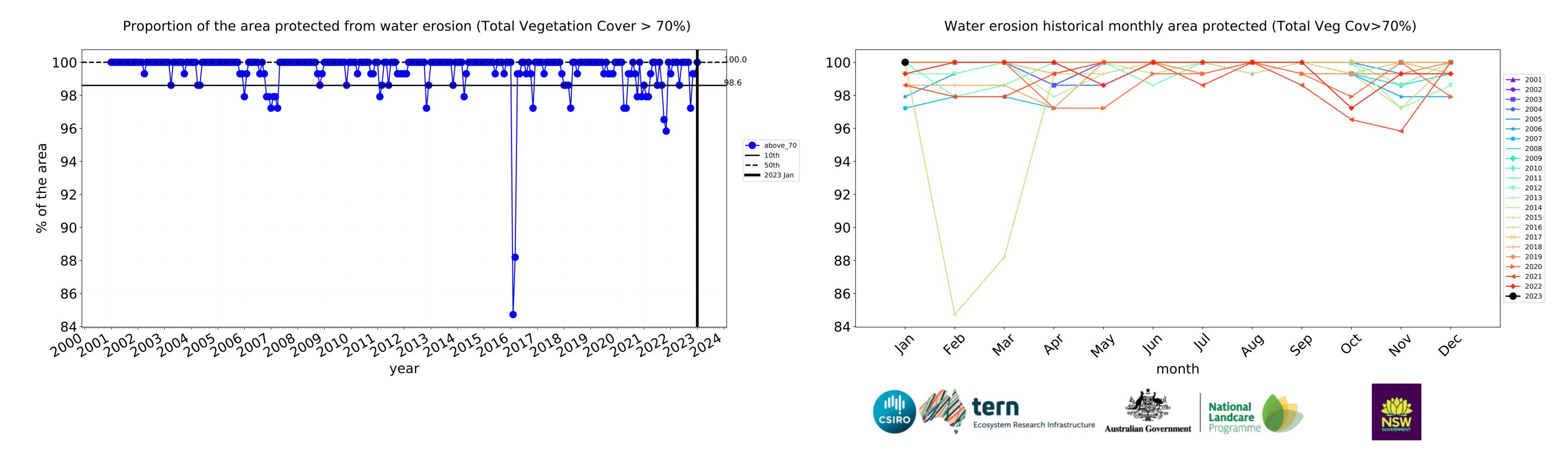


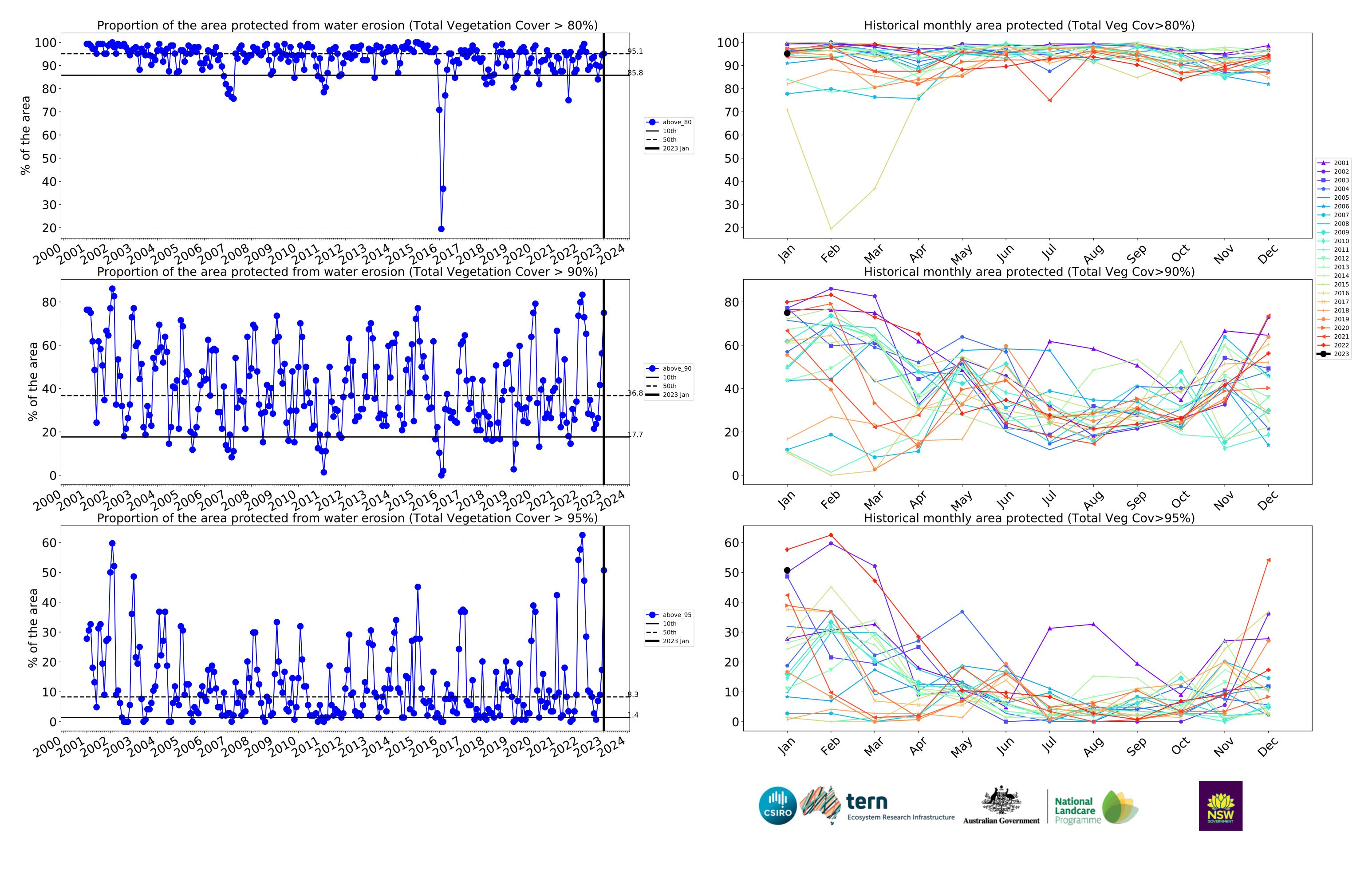




Cropping timeseries





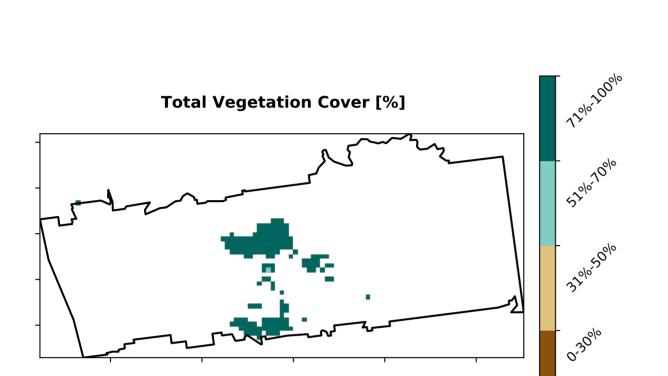


Irrigation

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

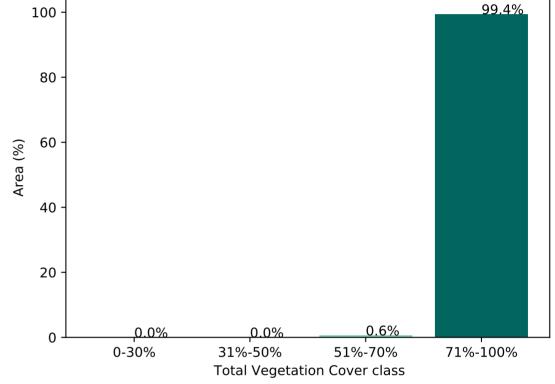
83.8% 80 -70 · 60 Area (%) 30 -20 16.2% 10 0.25 0.50 0.75 1.25 -0.250.00 1.00 Land use class

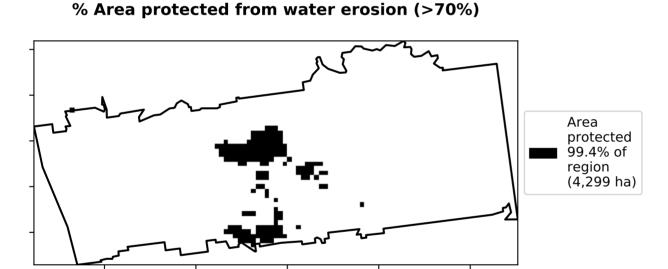
Proportion of each land class in area



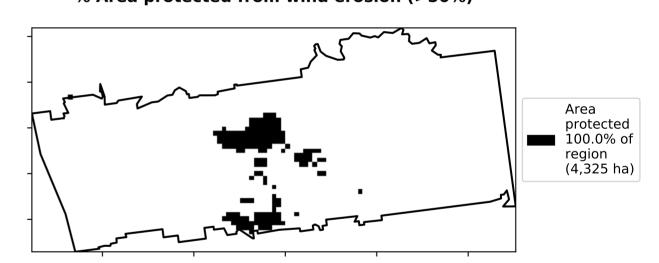


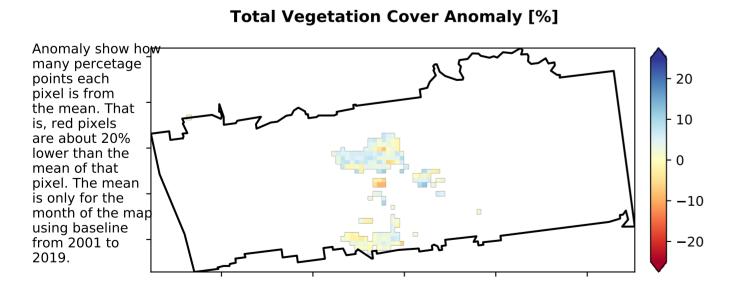
Proportion of vegetation cover class in area



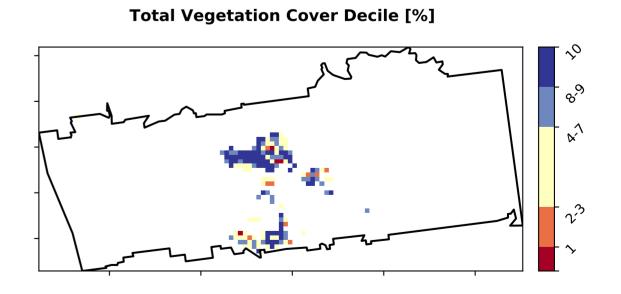


% Area protected from wind erosion (>50%)





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



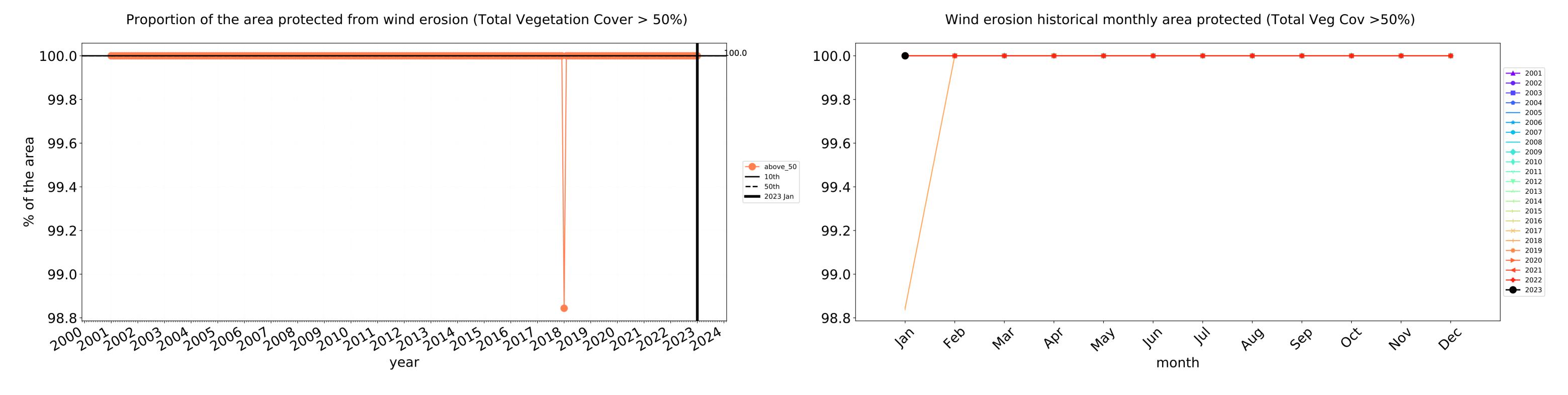


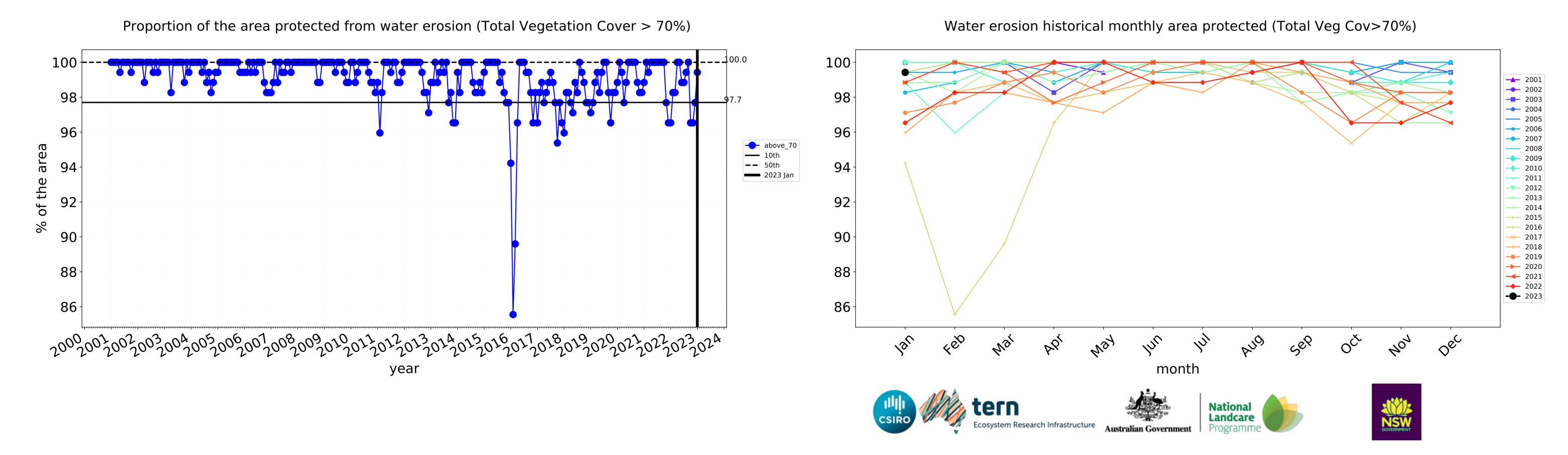


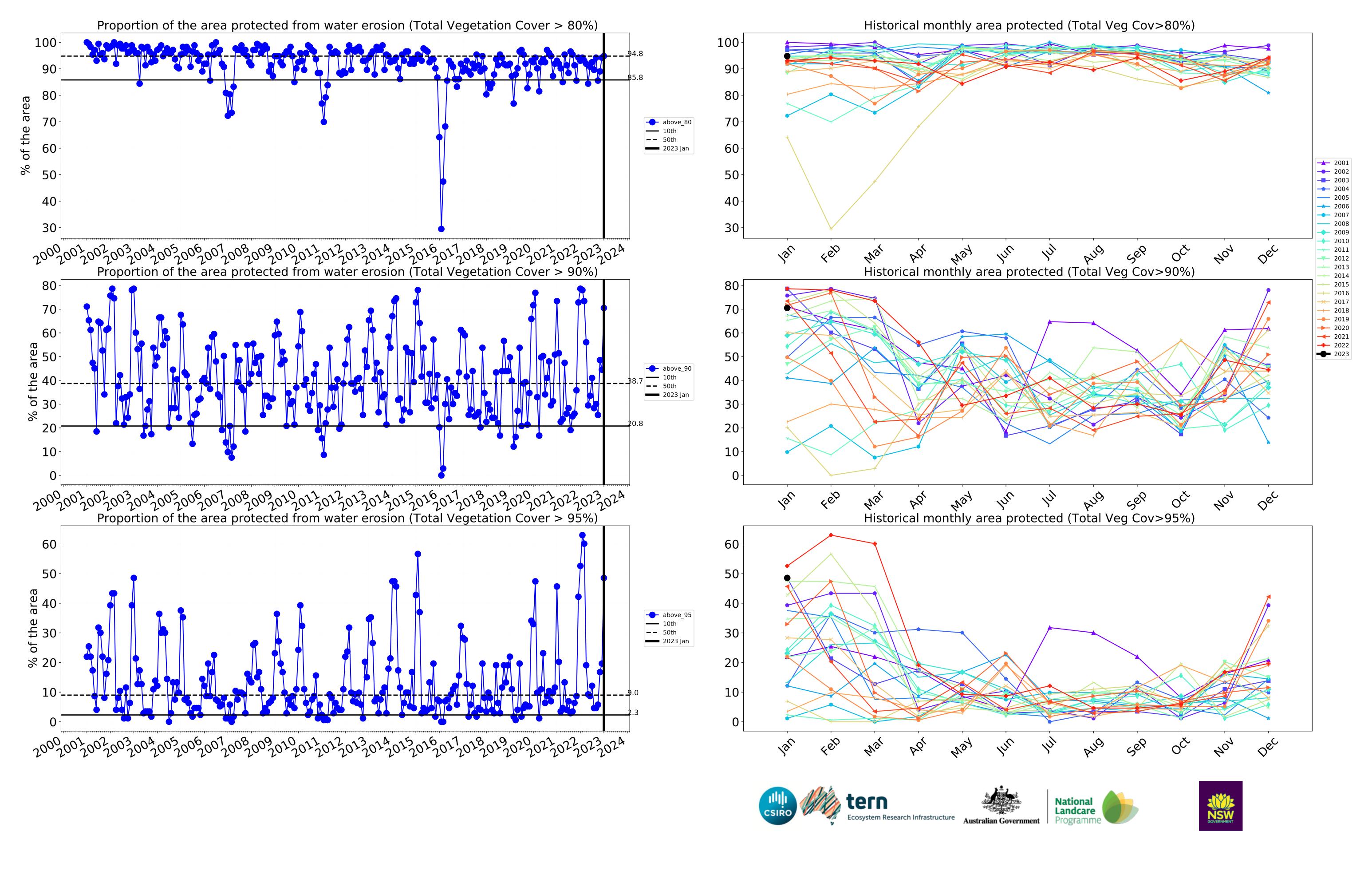




Irrigation timeseries

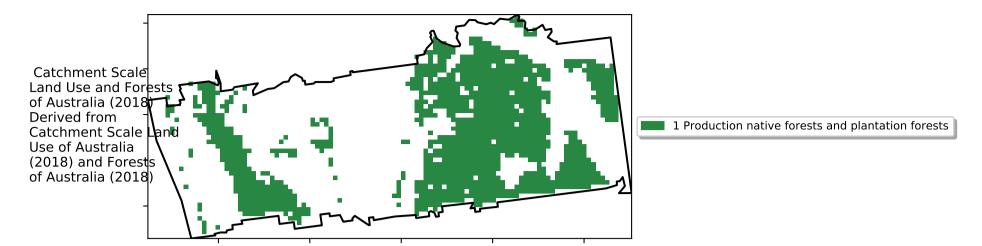






Production native forests and plantation forests

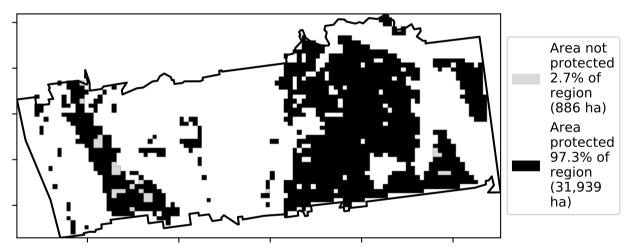
Land use and forest cover

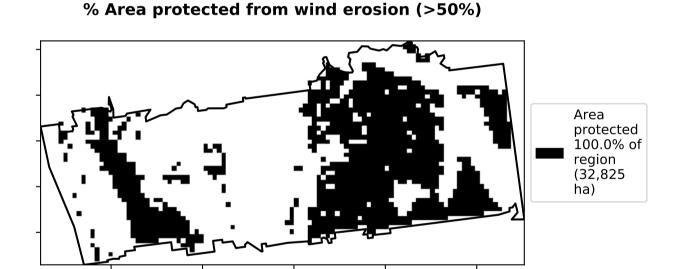


Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%] Total Vegetation Cover [%]

Proportion of vegetation cover class in area 100 - 97.3% 80 - 60 - 40 - 20 - 0.0% 0-30% 31%-50% Total Vegetation Cover class

% Area protected from water erosion (>70%)





Total Vegetation Cover Anomaly [%]

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

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

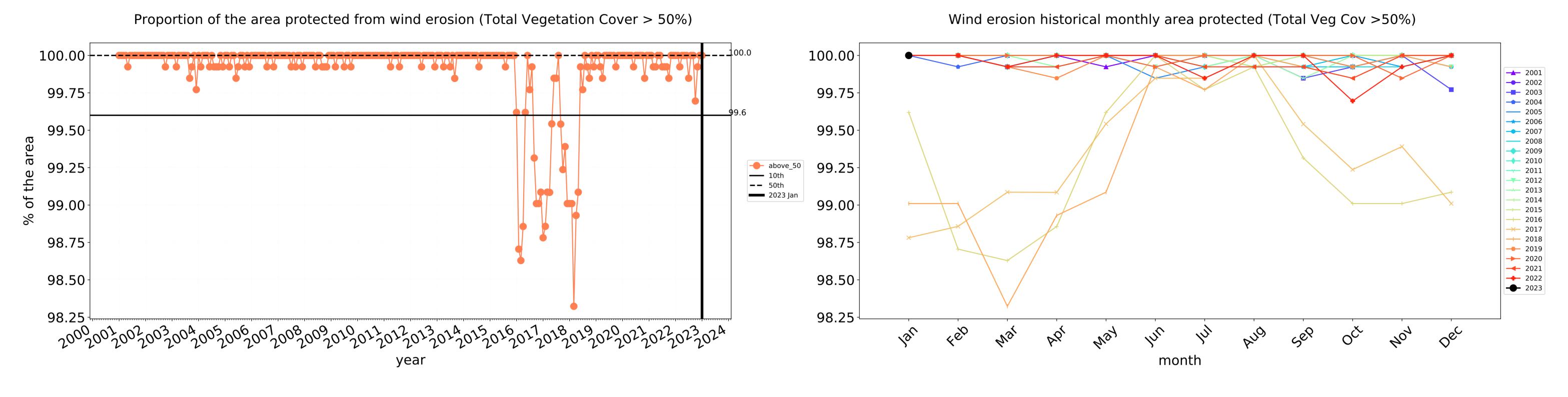


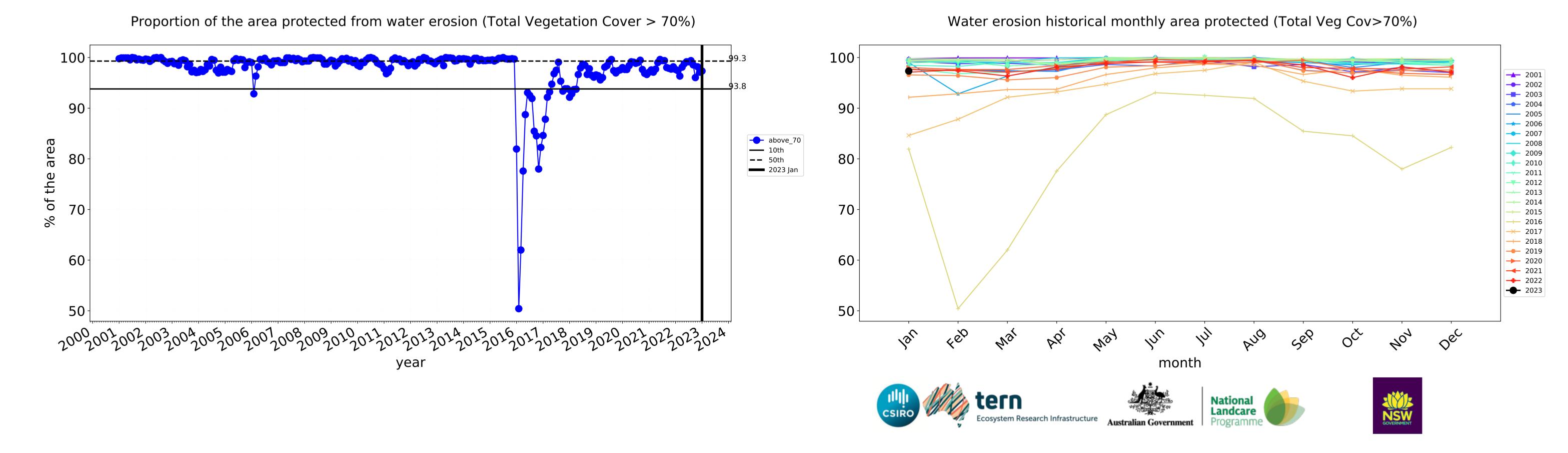


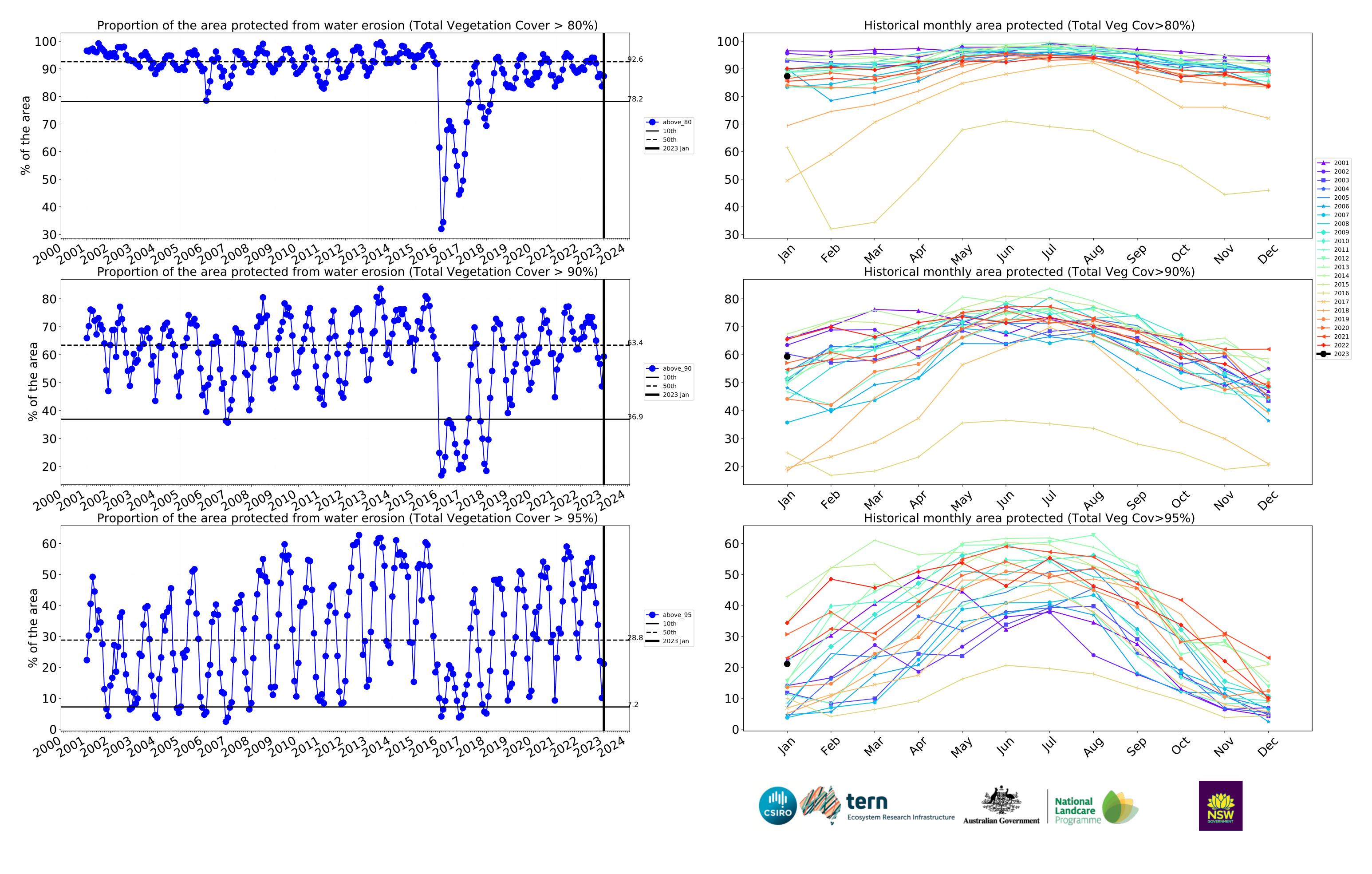




Production native forests and plantation forests timeseries







Waroona_(S) (82,900 ha and no data 363 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	82,900	100.0% 82,900	100.0% 82,900	98.3% 81,525	91.9% 76,175	68.3% 56,625	33.7% 27,900
Conservation and natural environments	18,575	100.0% 18,575	100.0% 18,575	99.5% 18,475	95.3% 17,700	72.0% 13,375	25.3% 4,700
Conservation and natural environments non forest	2,200	100.0% 2,200	100.0% 2,200	97.7% 2,150	75.0% 1,650	14.8% 325	3.4% 75
Conservation and natural environments Woodland forest	5,325	100.0% 5,325	100.0% 5,325	100.0% 5,325	97.2% 5,175	54.0% 2,875	22.1% 1,175
Conservation and natural environments Forest (non woodland)	11,050	100.0% 11,050	100.0% 11,050	99.5% 11,000	98.4% 10,875	92.1% 10,175	31.2% 3,450
Agriculture	27,325	100.0% 27,325	100.0% 27,325	99.7% 27,250	96.8% 26,450	78.7% 21,500	55.0% 15,025
Grazing	19,400	100.0% 19,400	100.0% 19,400	99.7% 19,350	97.6% 18,925	81.2% 15,750	57.2% 11,100
Grazing non forest	19,300	100.0% 19,300	100.0% 19,300	99.7% 19,250	97.7% 18,850	81.3% 15,700	57.5% 11,100
Cropping	3,600	100.0% 3,600	100.0% 3,600	100.0% 3,600	95.1% 3,425	75.0% 2,700	50.7% 1,825
Irrigation	4,325	100.0% 4,325	100.0% 4,325	99.4% 4,300	94.8% 4,100	70.5% 3,050	48.6% 2,100
Production native forests and plantation forests	32,825	100.0% 32,825	100.0% 32,825	97.3% 31,950	87.4% 28,675	59.3% 19,475	21.1% 6,925







