Total vegetation cover soil protection Region:NRM Riverina NSW

Date: November 2009

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:

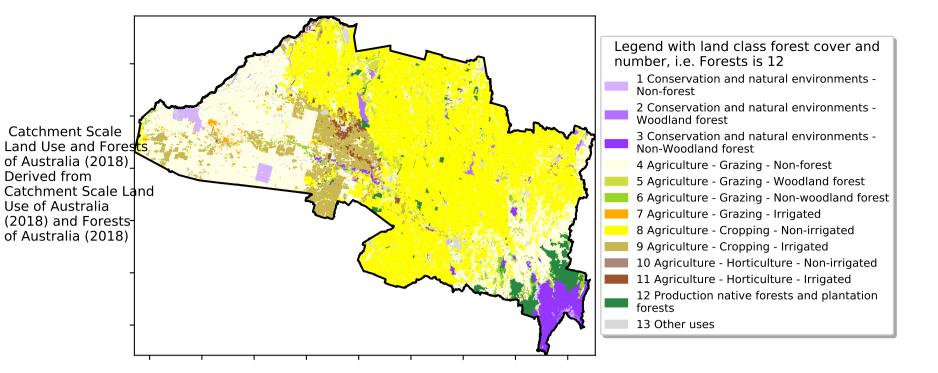
https://doi.org/10.4225/08/5848a3f19a7b3



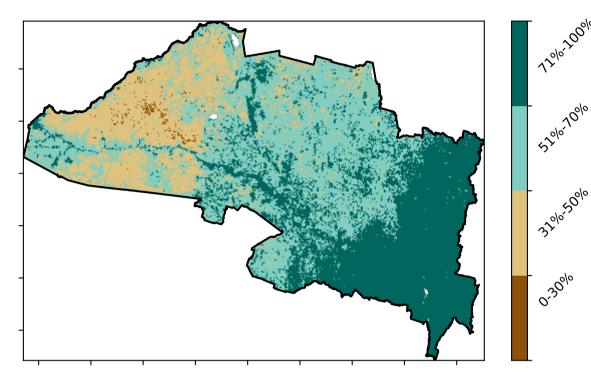
Vegetation Cover Nov 2009

Land use and forest cover

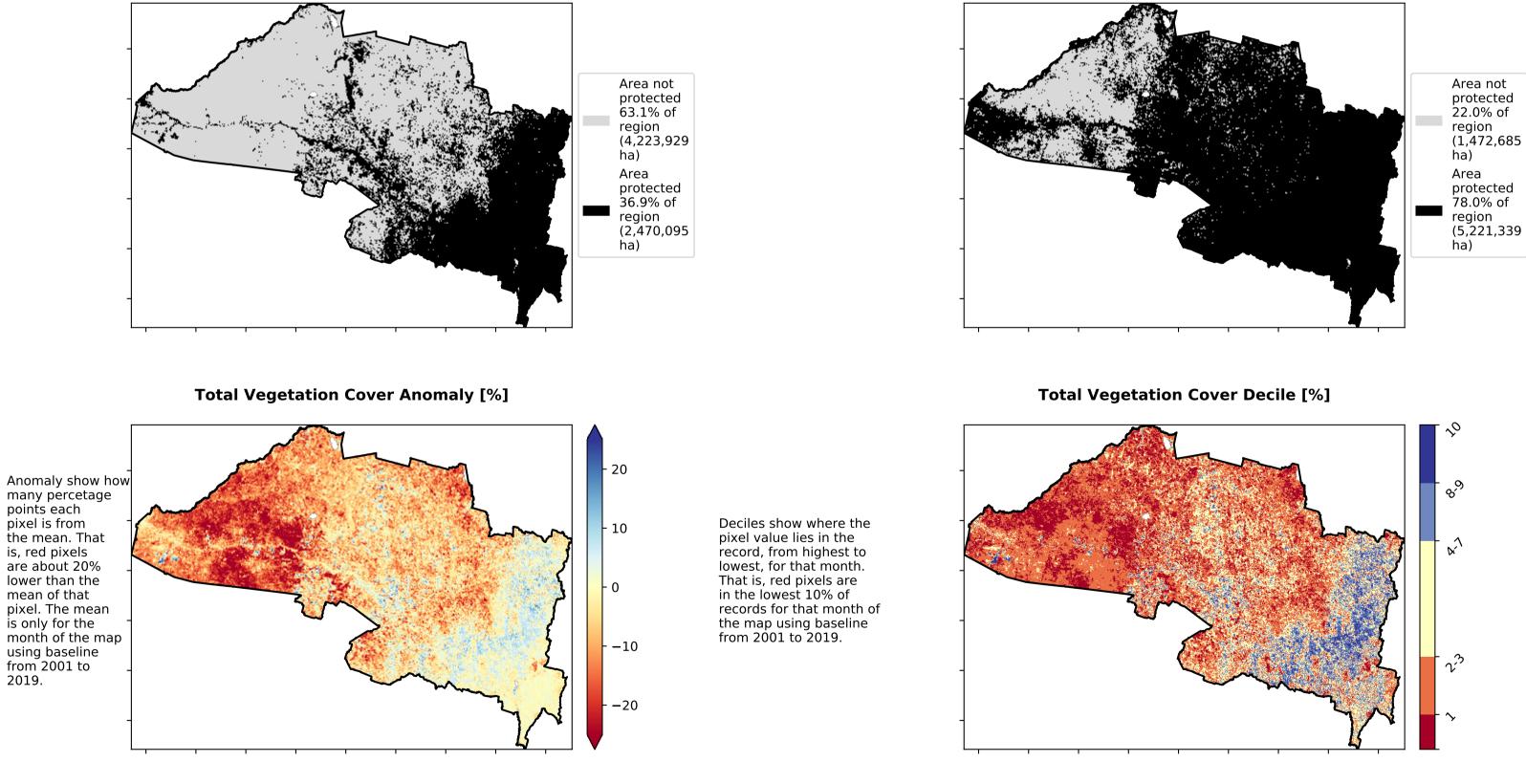
Proportion of each land class in area

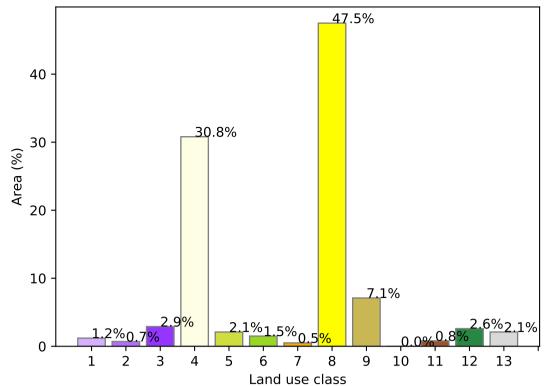


Total Vegetation Cover [%]

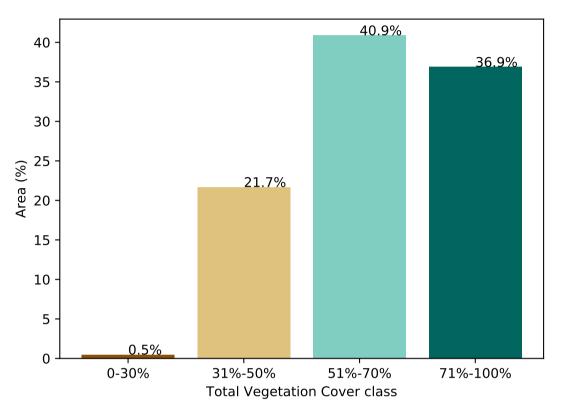


% Area protected from water erosion (>70%)

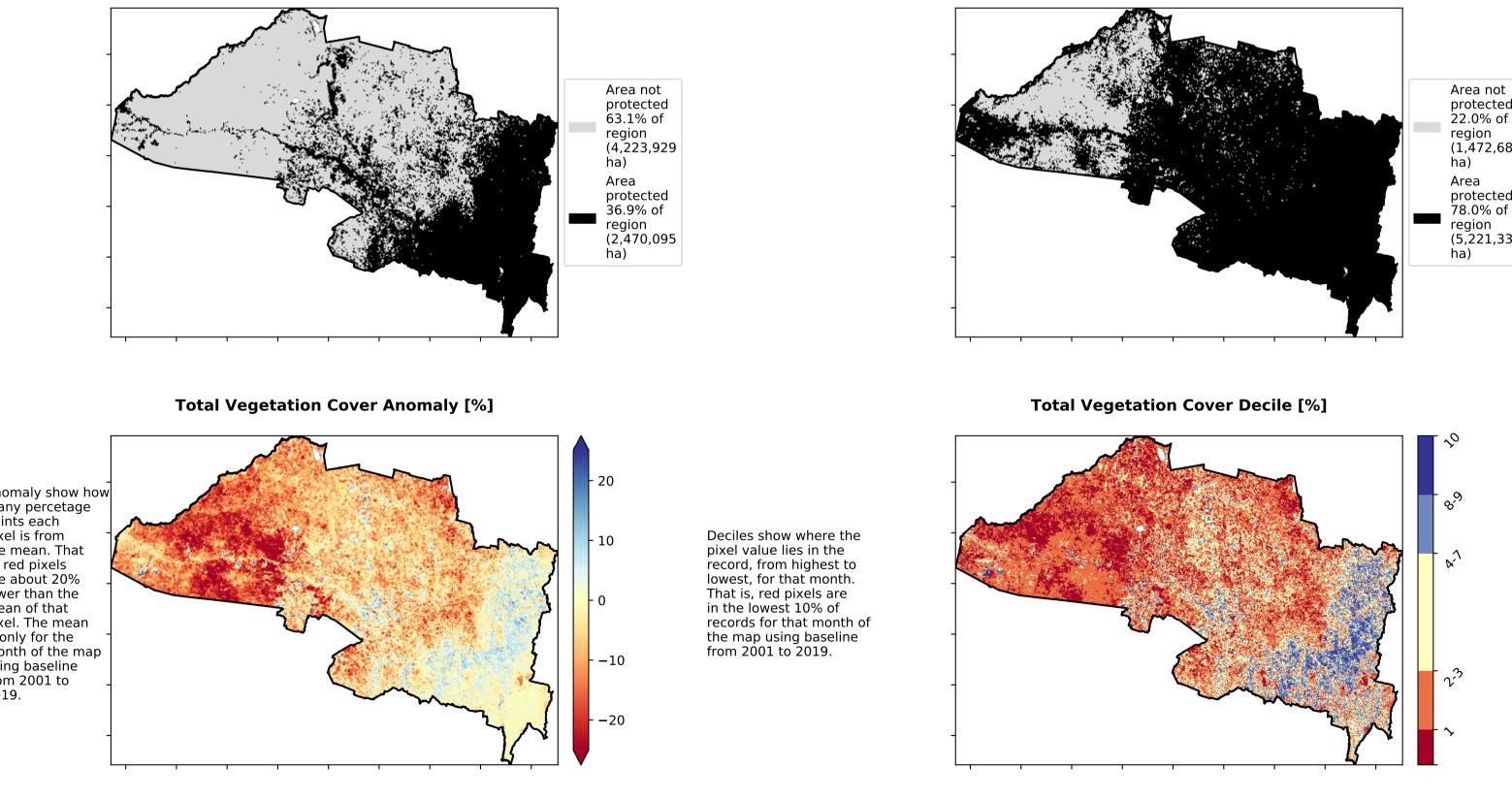




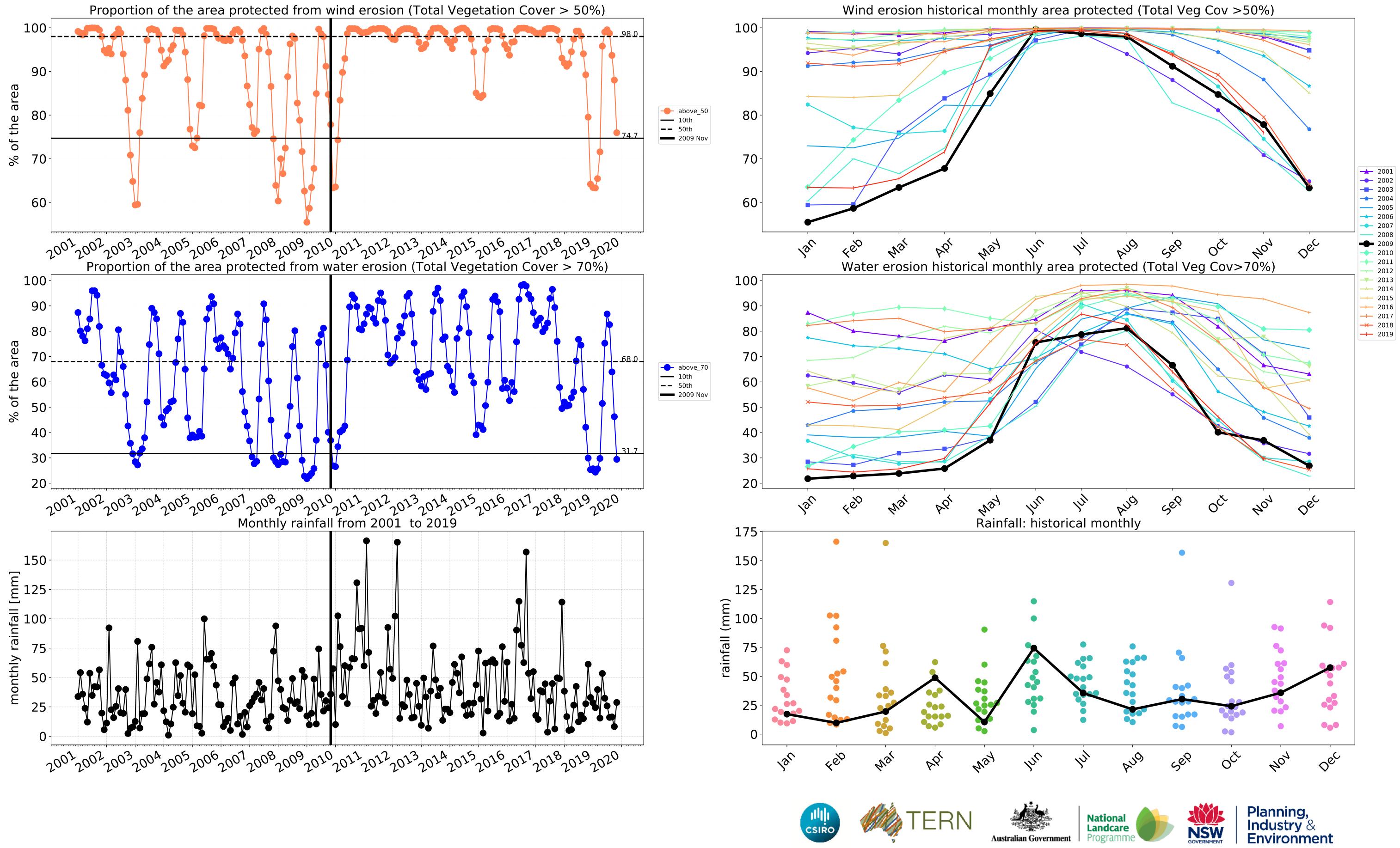
Proportion of vegetation cover class in area



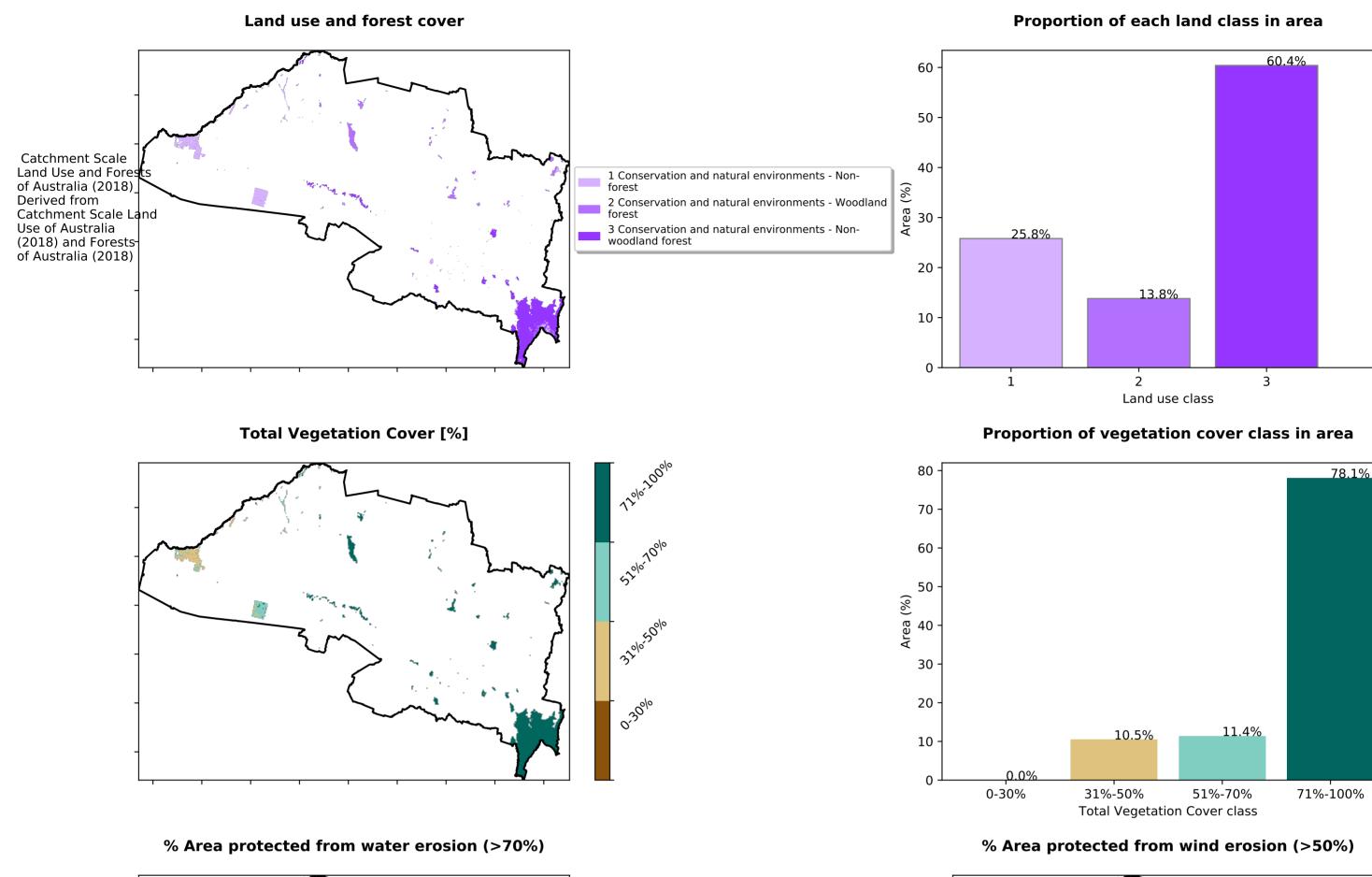
% Area protected from wind erosion (>50%)

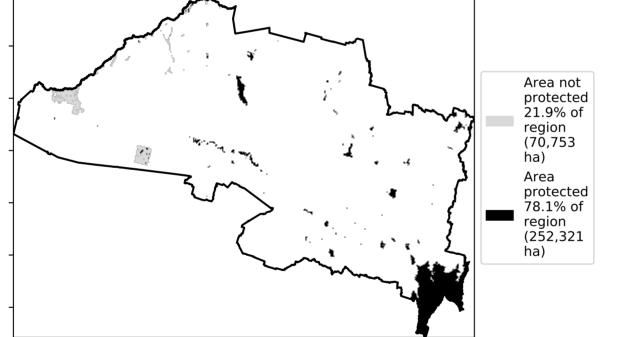






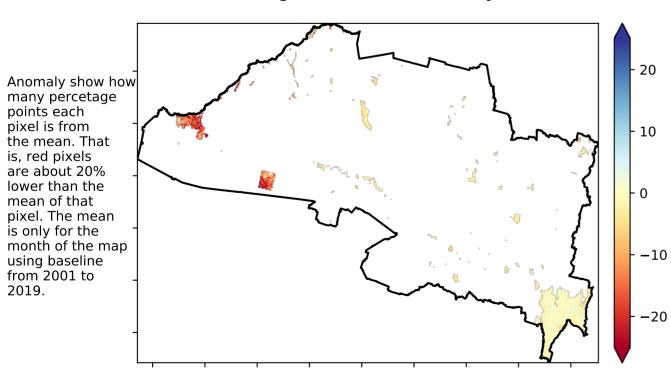
Conservation and natural environments



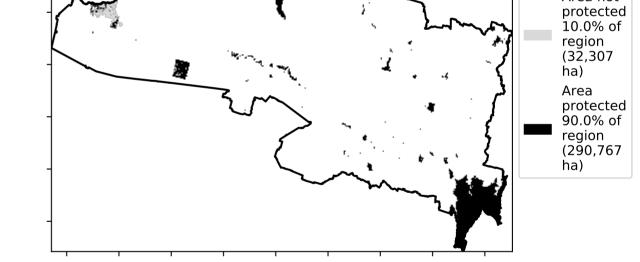


Area not

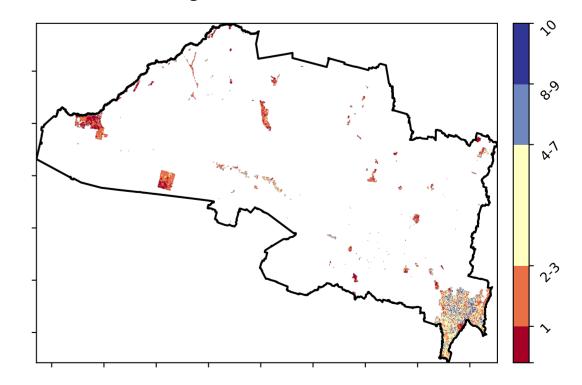
Total Vegetation Cover Anomaly [%]



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.



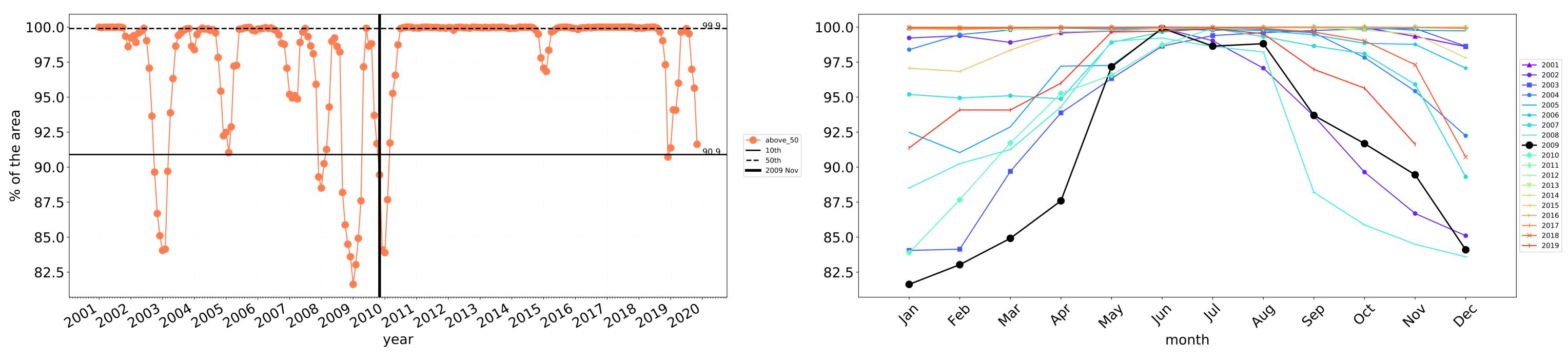
Total Vegetation Cover Decile [%]





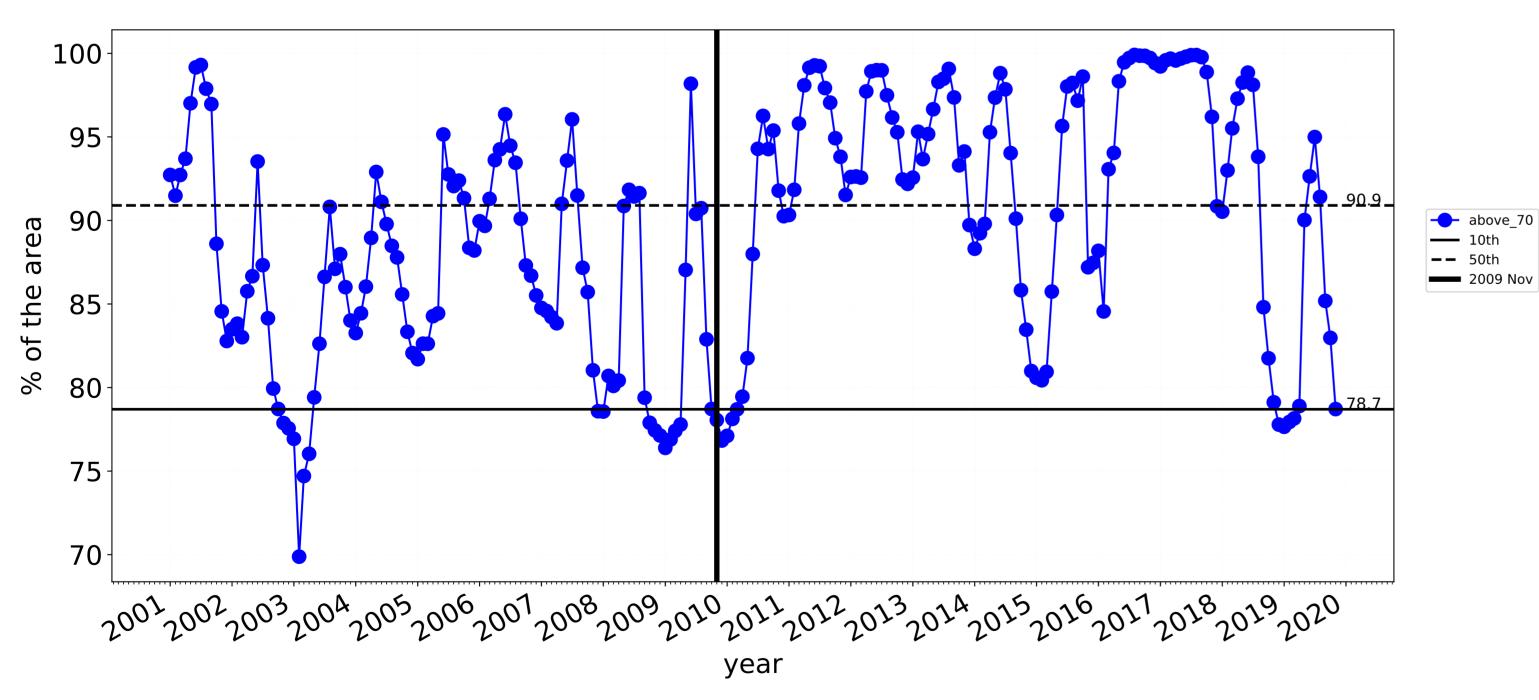
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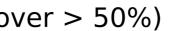
Conservation and natural environments timeseries



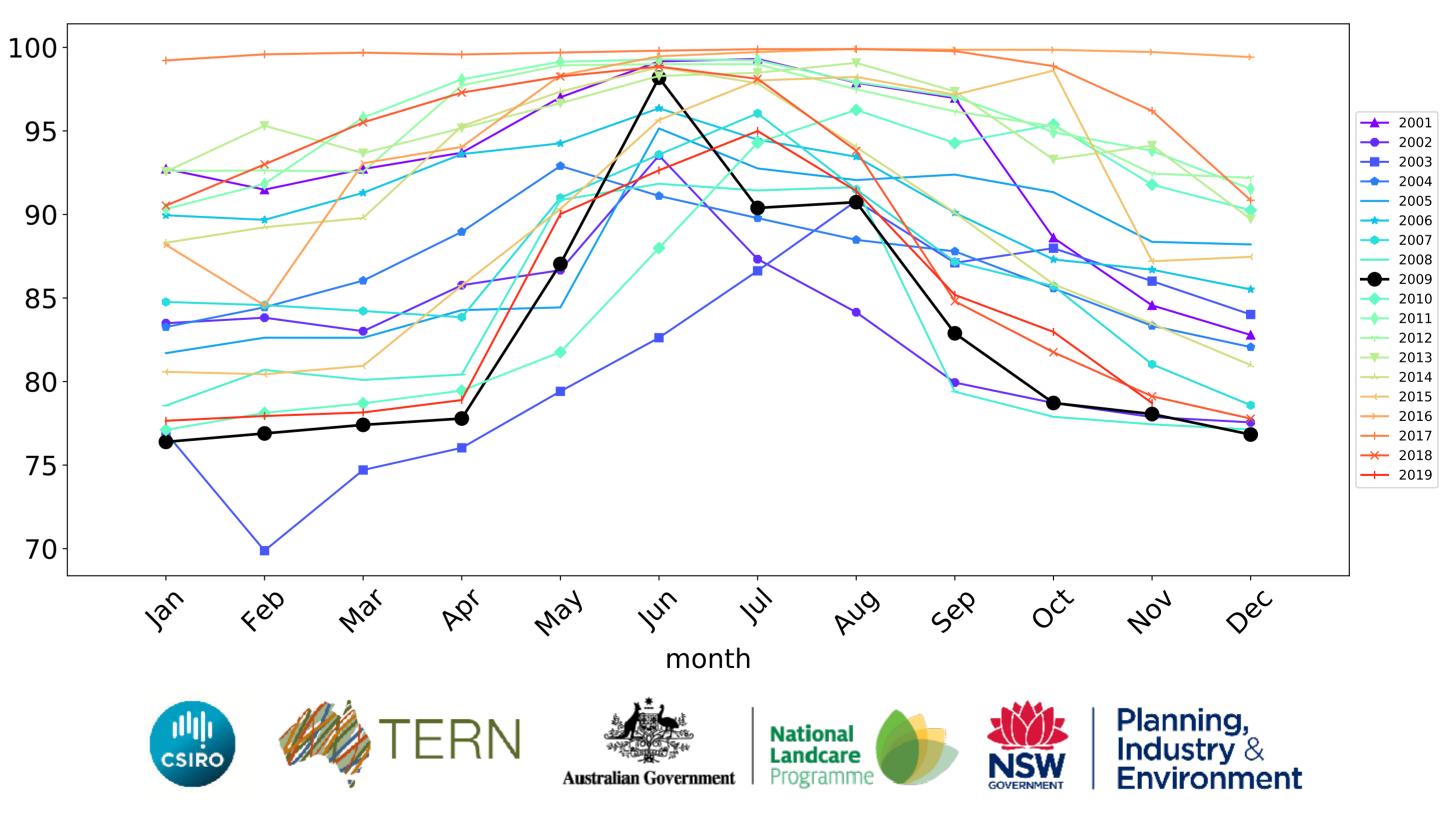
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

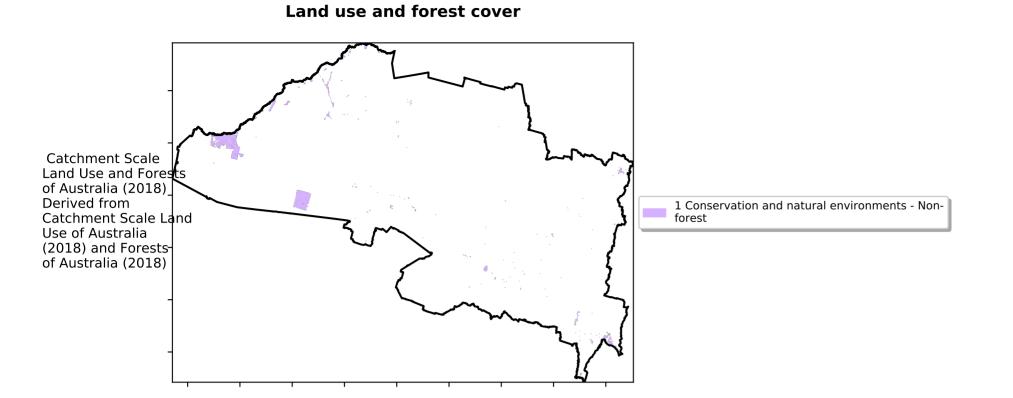




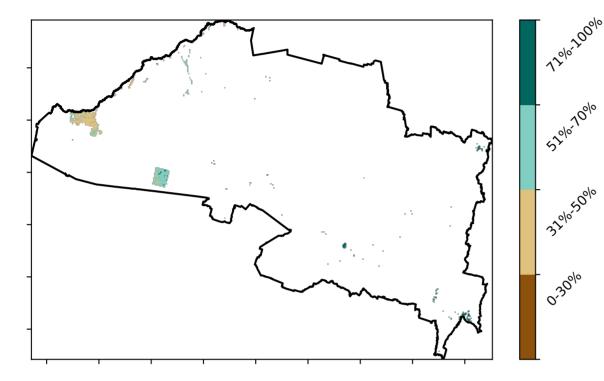
Wind erosion historical monthly area protected (Total Veg Cov >50%)



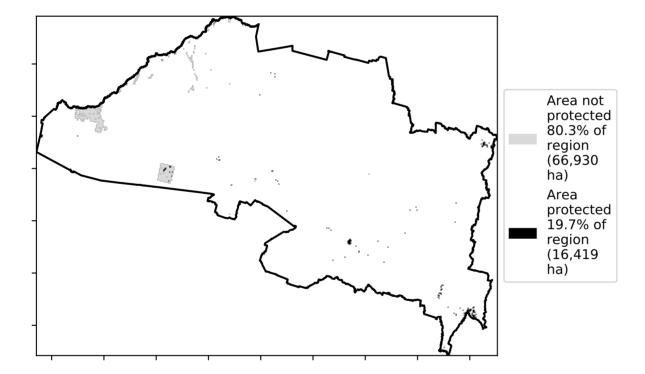
Conservation and natural environments non forest

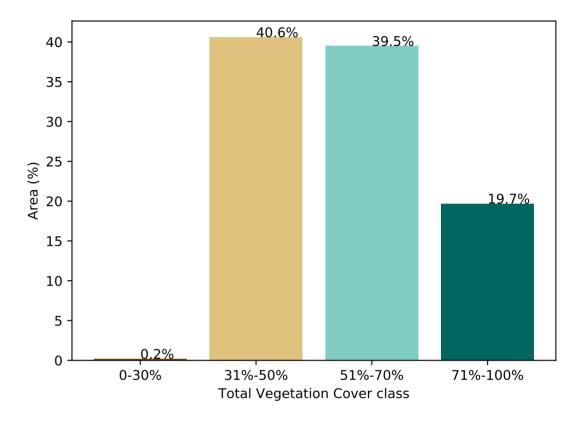


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)





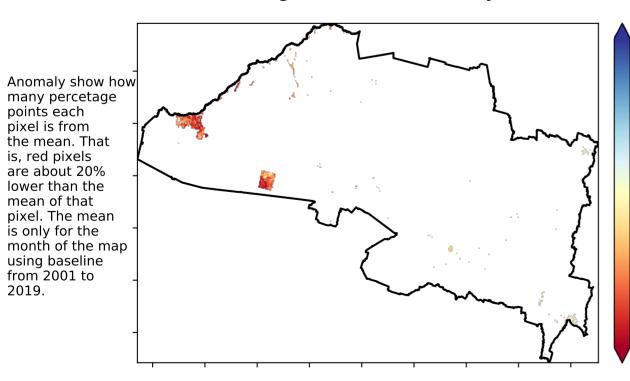
Proportion of vegetation cover class in area

% Area protected from wind erosion (>50%)

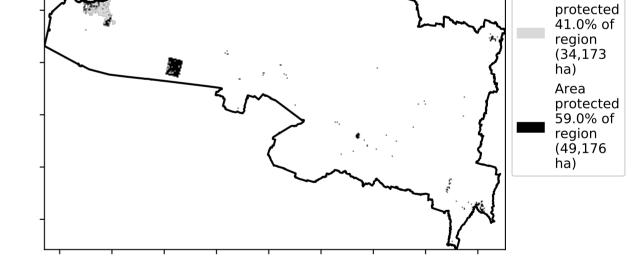


Area not

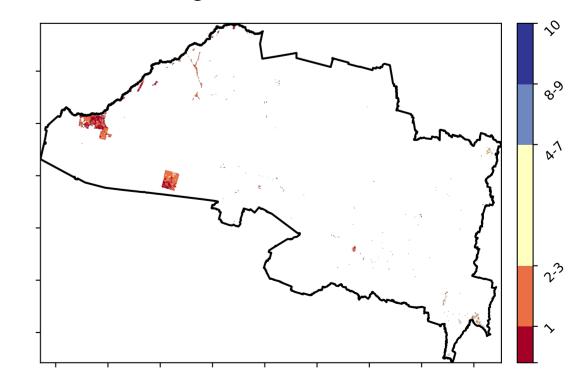
Total Vegetation Cover Anomaly [%]



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 [%]





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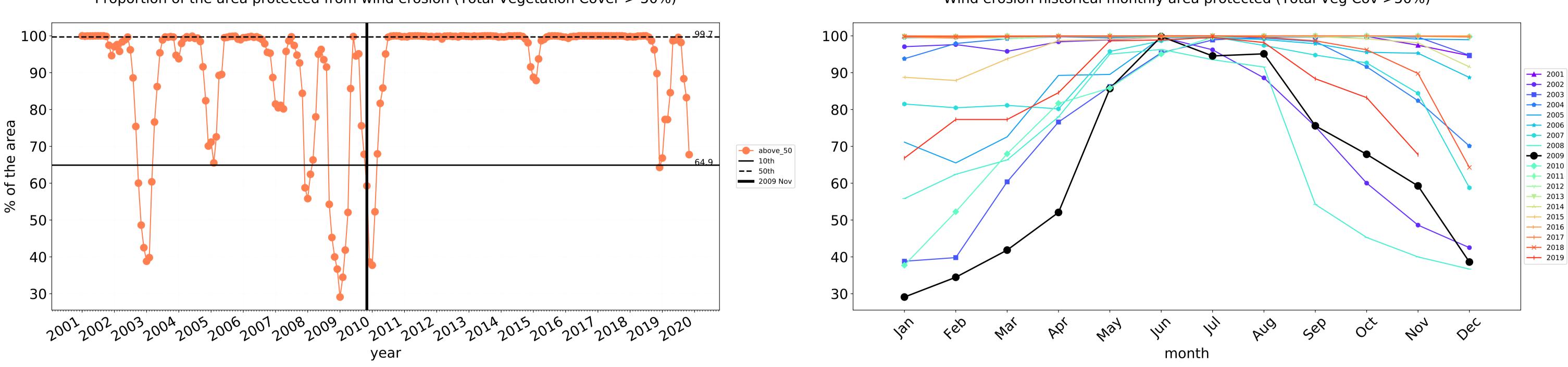
- 20

- 10

0

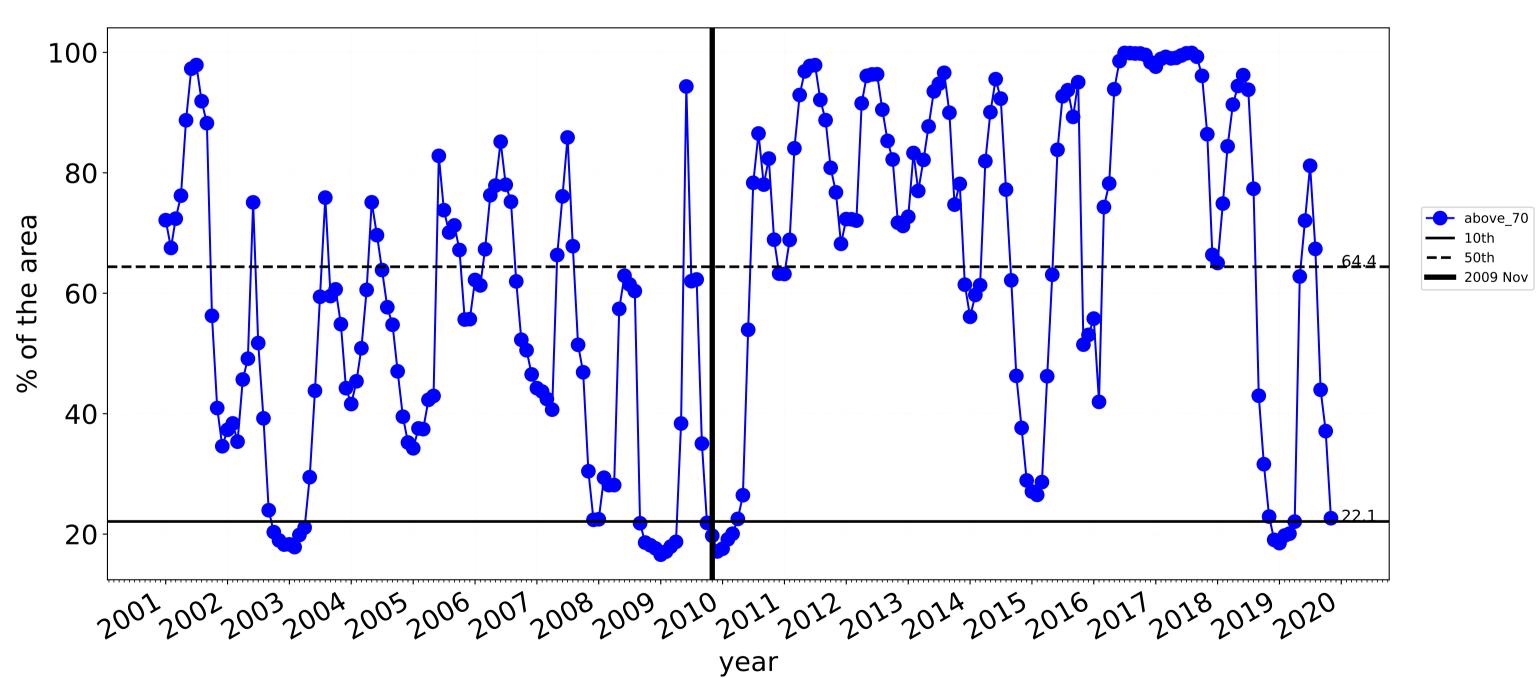
-10

-20

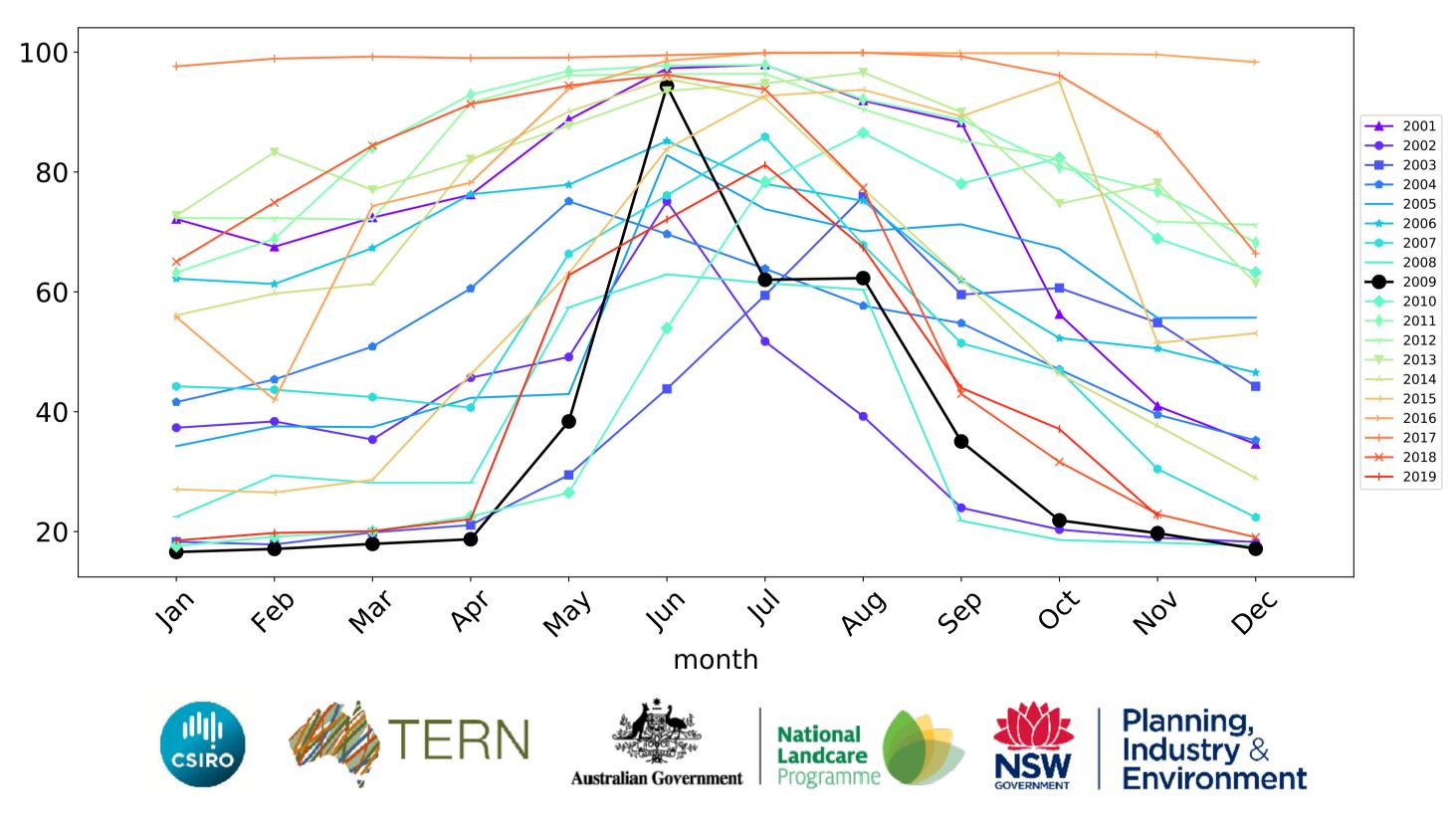


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



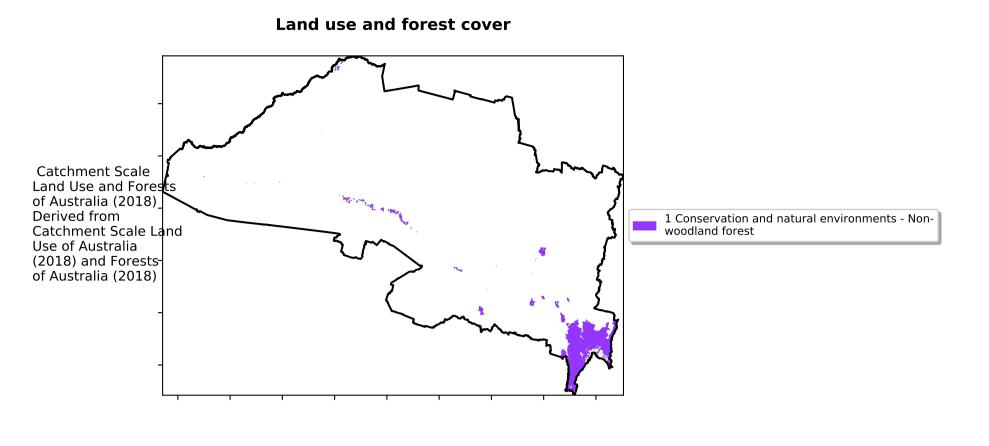


Wind erosion historical monthly area protected (Total Veg Cov >50%)

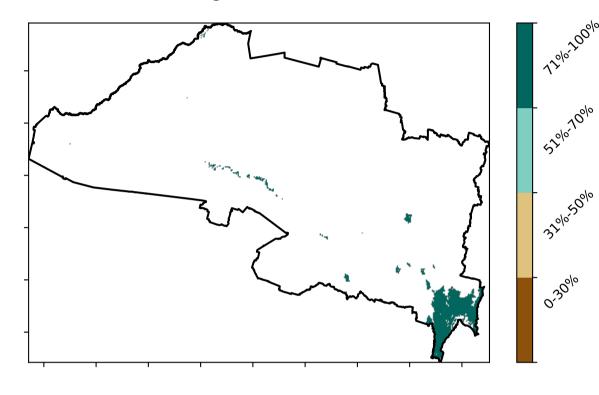




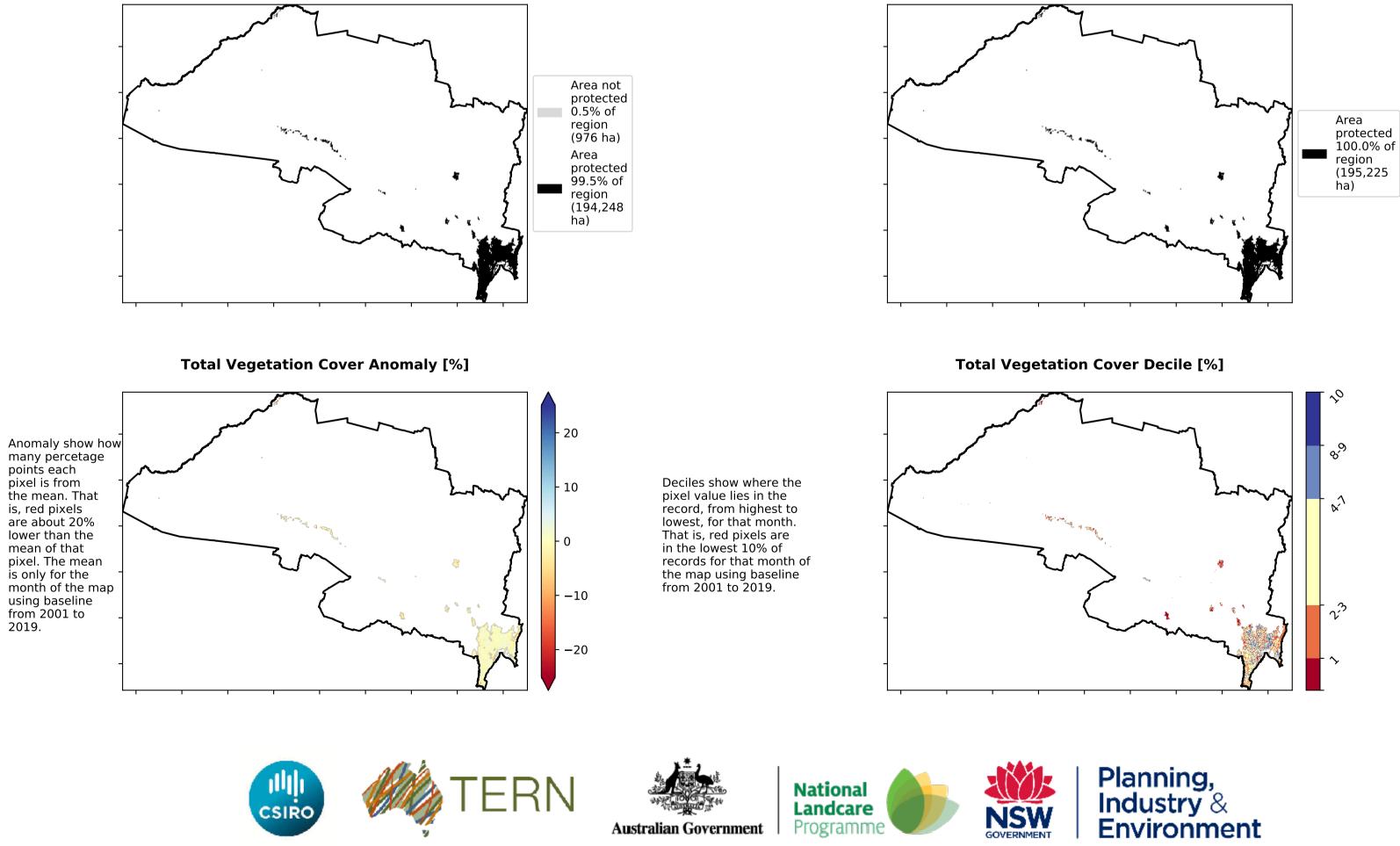
Conservation and natural environments Forest (non woodland)



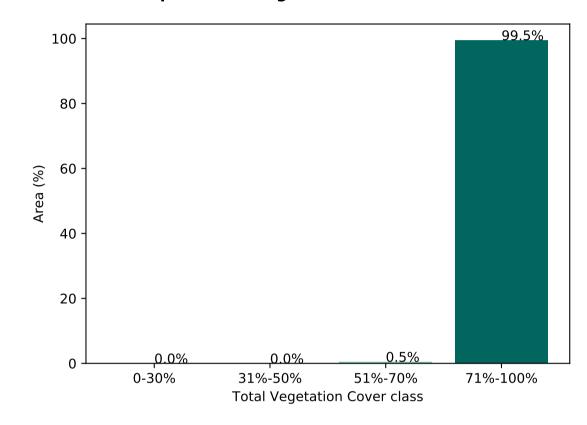
Total Vegetation Cover [%]



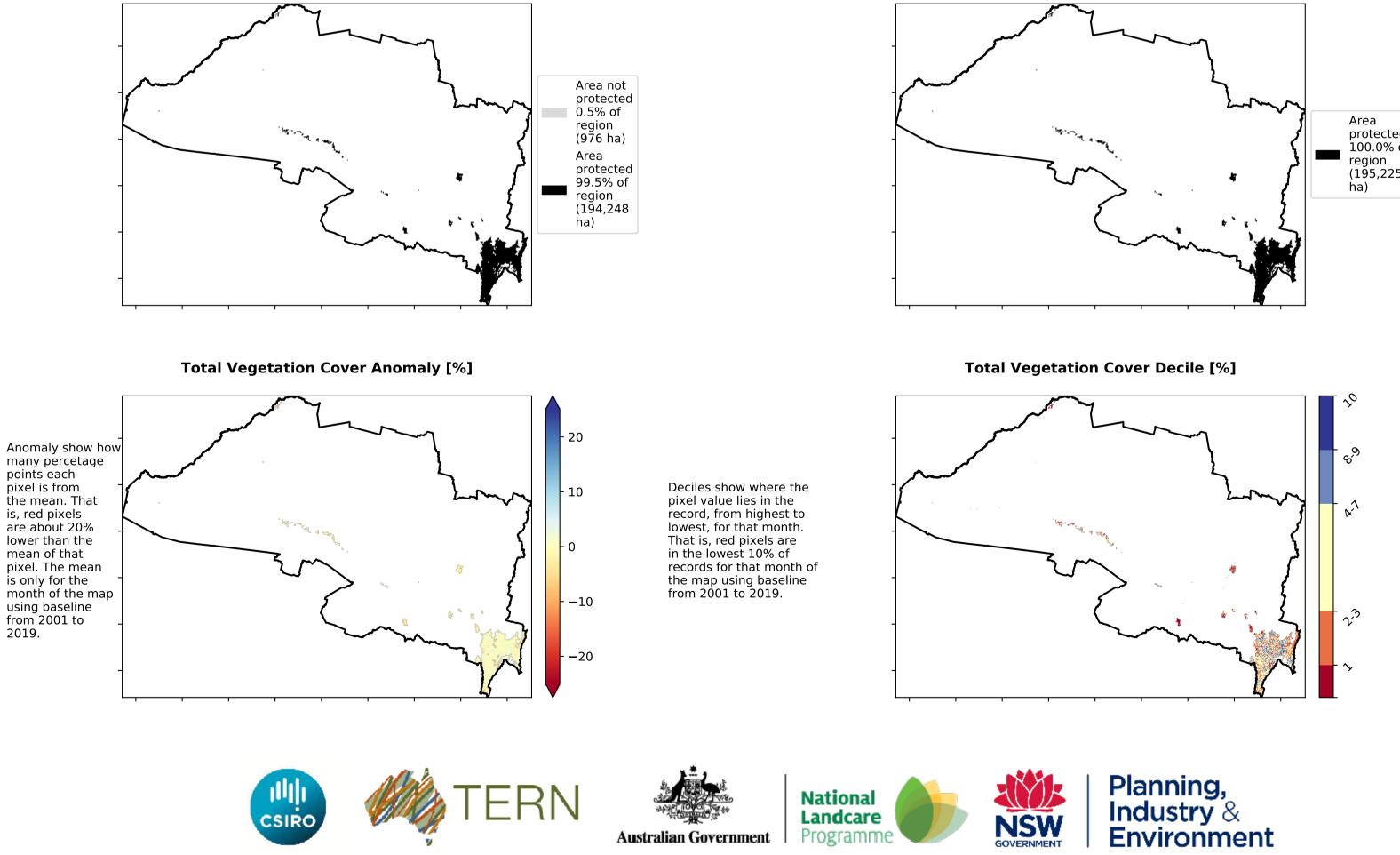
% Area protected from water erosion (>70%)



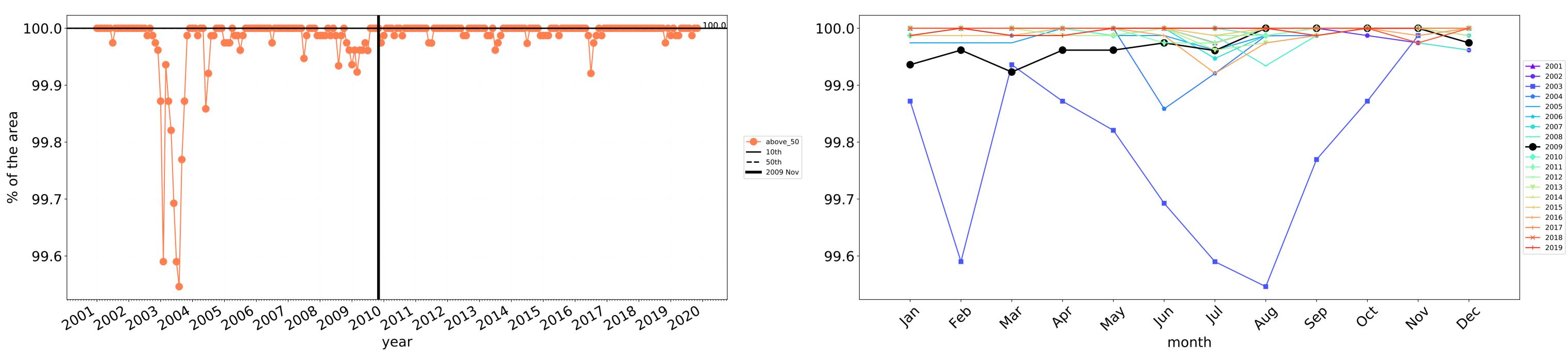
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

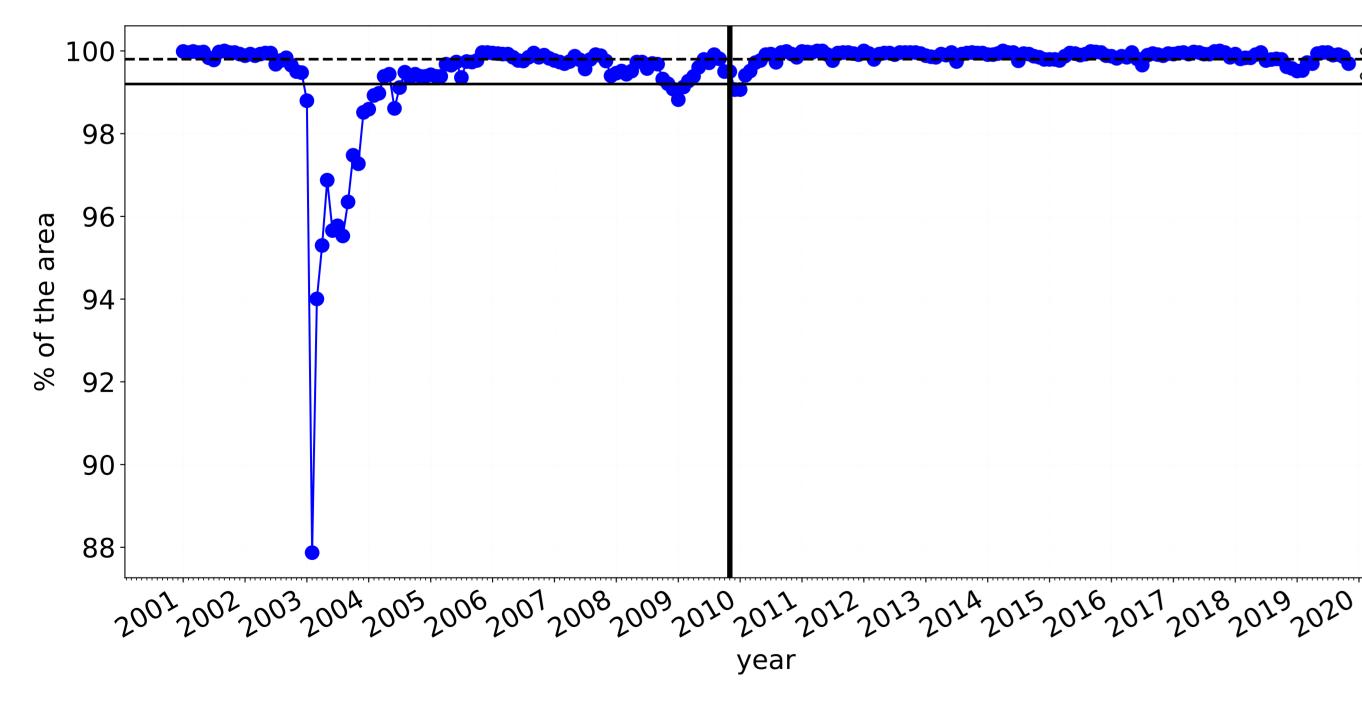


Conservation and natural environments Forest (non woodland) timeseries



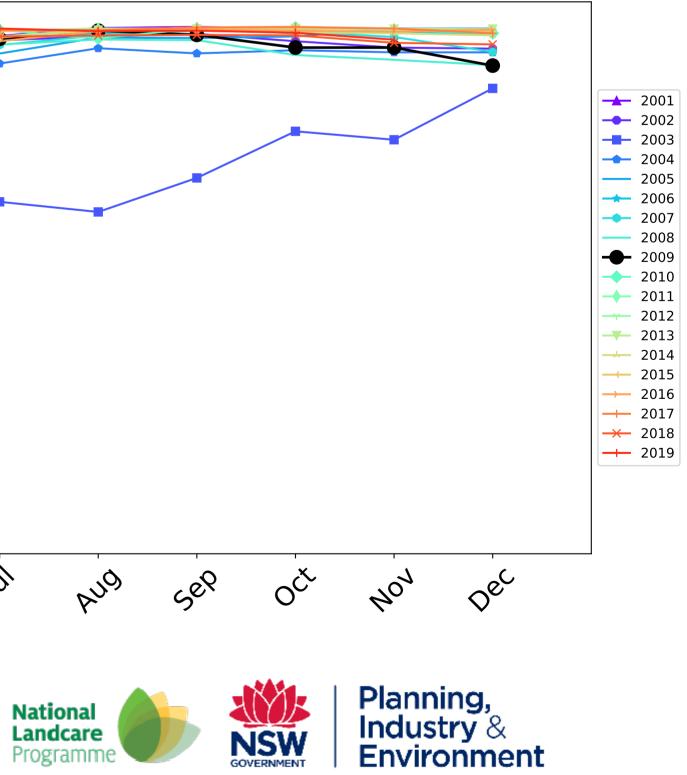
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



100 90 2 98 96 ---- above_70 **—** 10th **——** 50th **—** 2009 Nov 94 92 90 88 lar feb way In PQ 1/2/ Mar month TERN 1900g CSIRO Australian Government

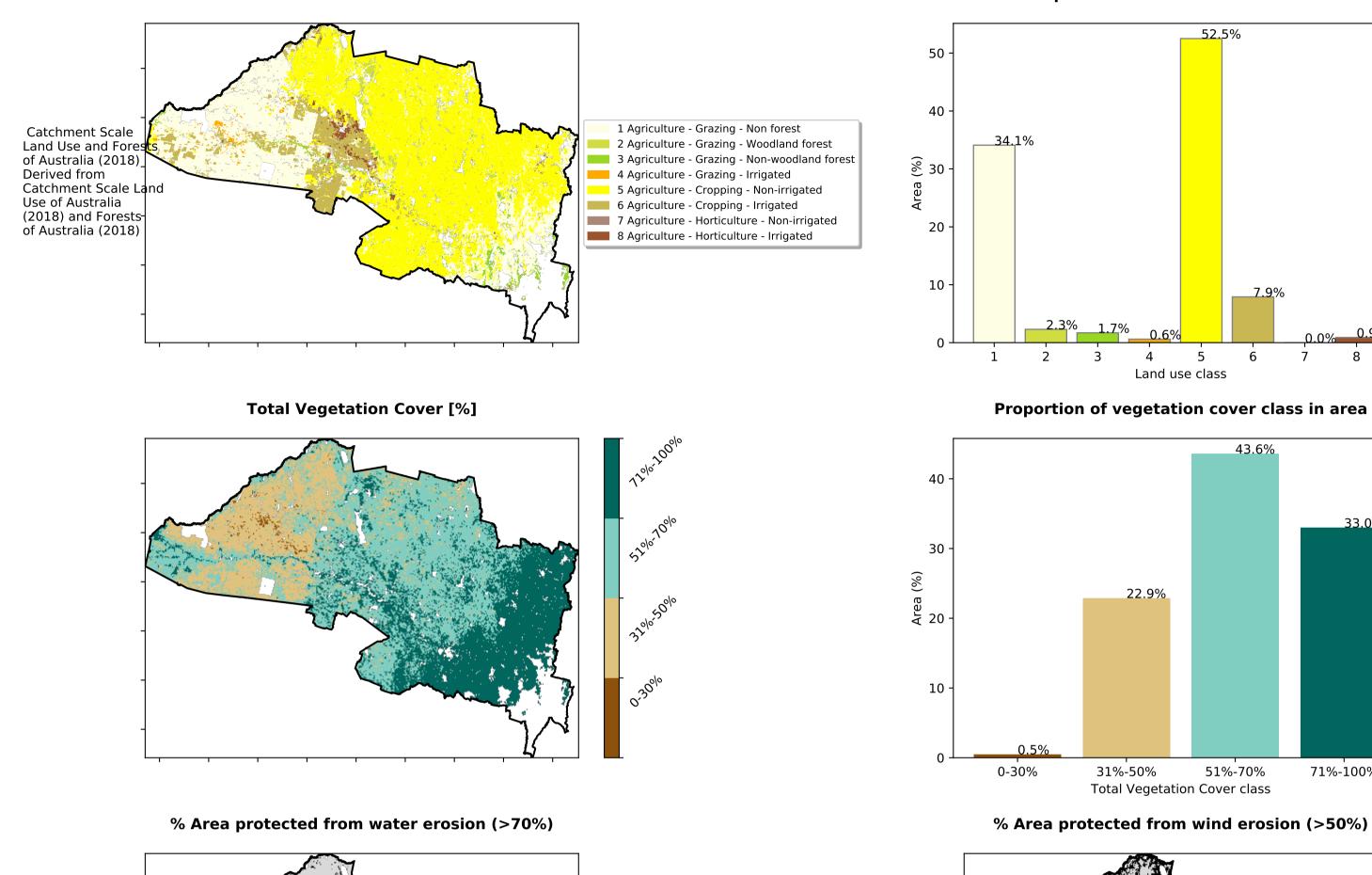
Water erosion historical monthly area protected (Total Veg Cov>70%)

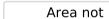


Agriculture

Land use and forest cover

Proportion of each land class in area





0.9%

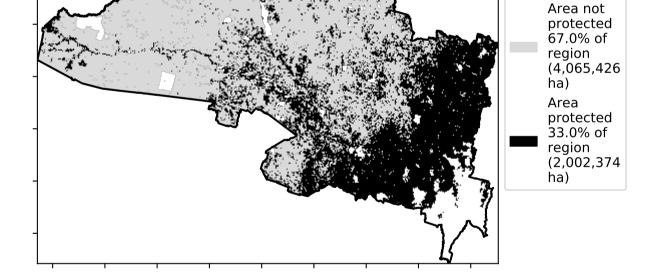
8

33.0%

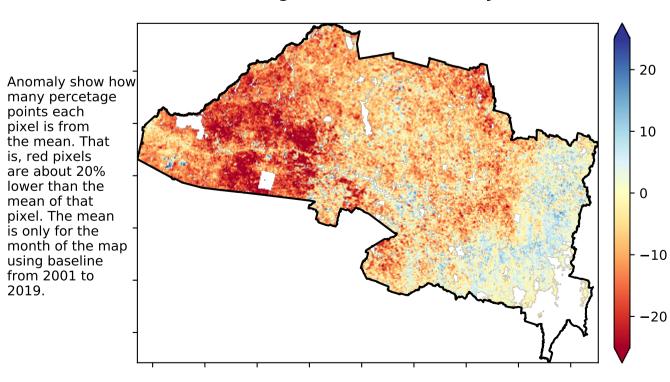
71%-100%

0.0%

7

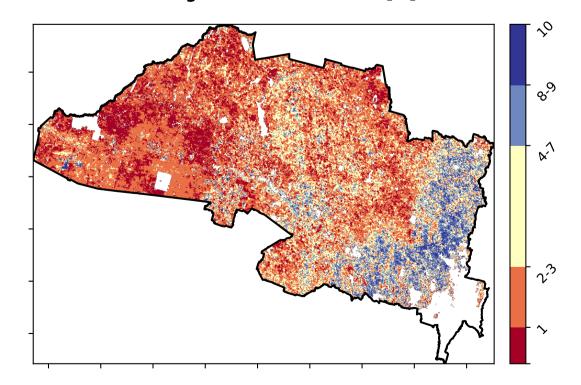


Total Vegetation Cover Anomaly [%]

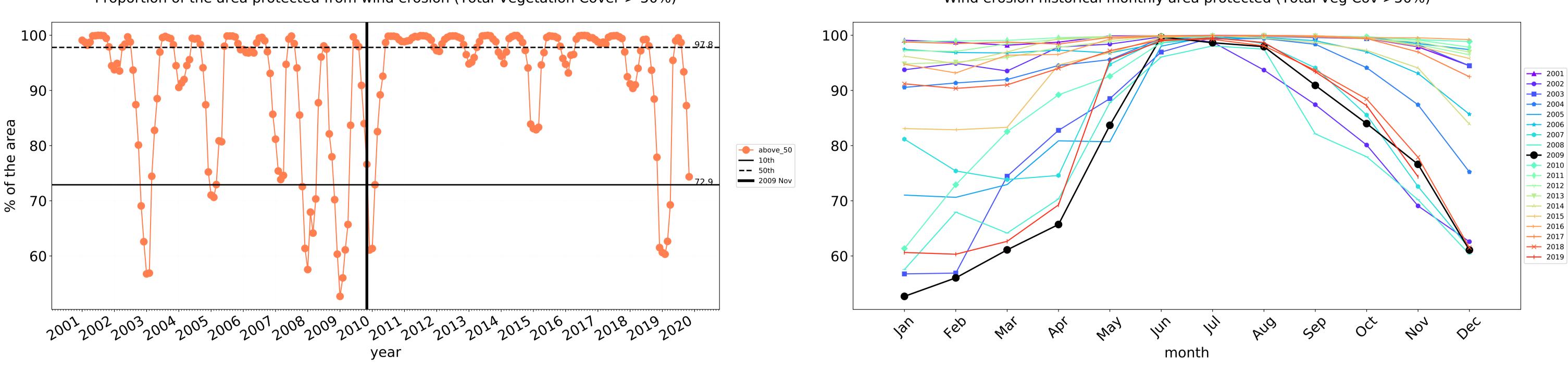


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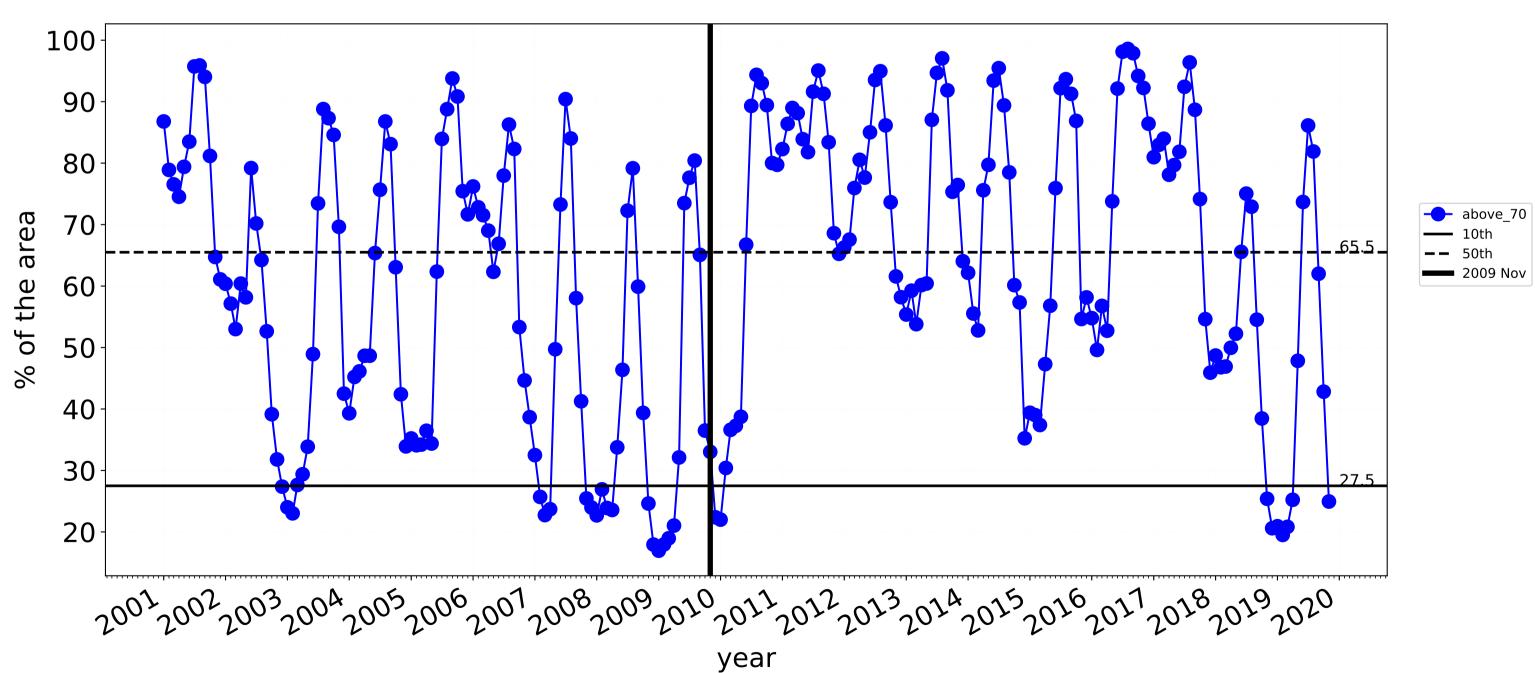






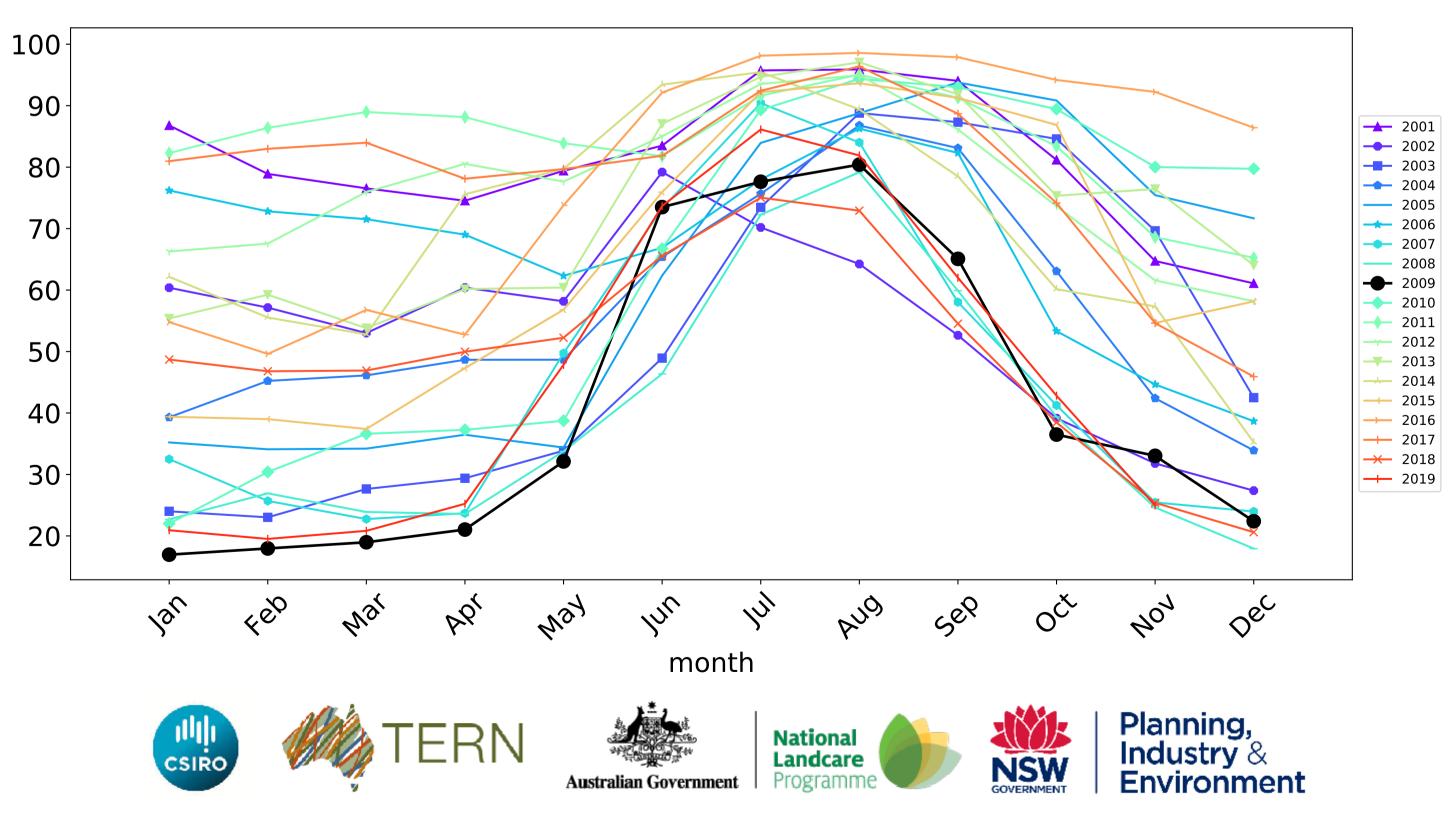
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





Agriculture timeseries

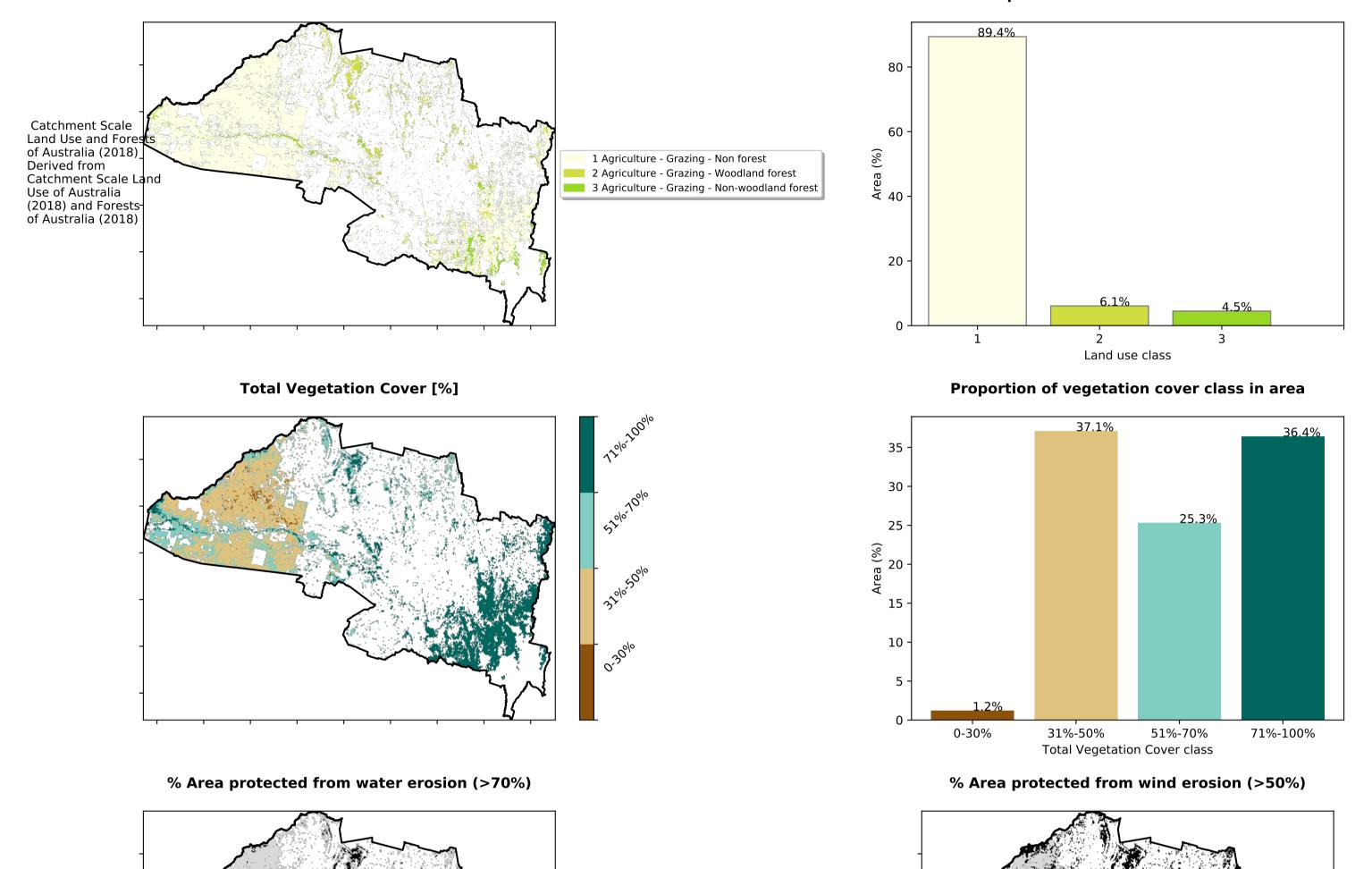
Water erosion historical monthly area protected (Total Veg Cov>70%)

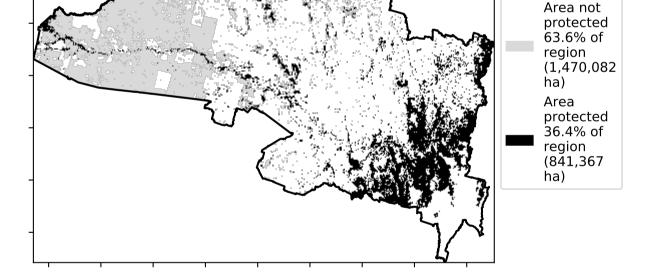


Grazing

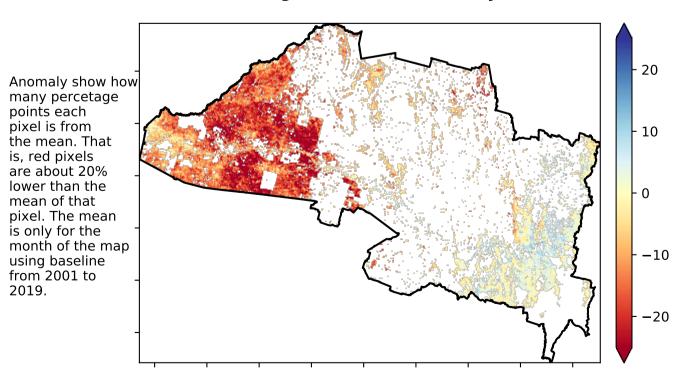
Land use and forest cover

Proportion of each land class in area

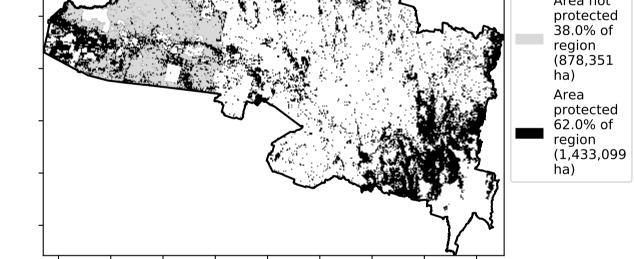


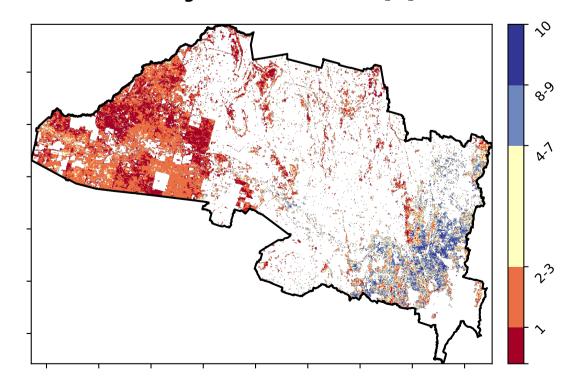


Total Vegetation Cover Anomaly [%]

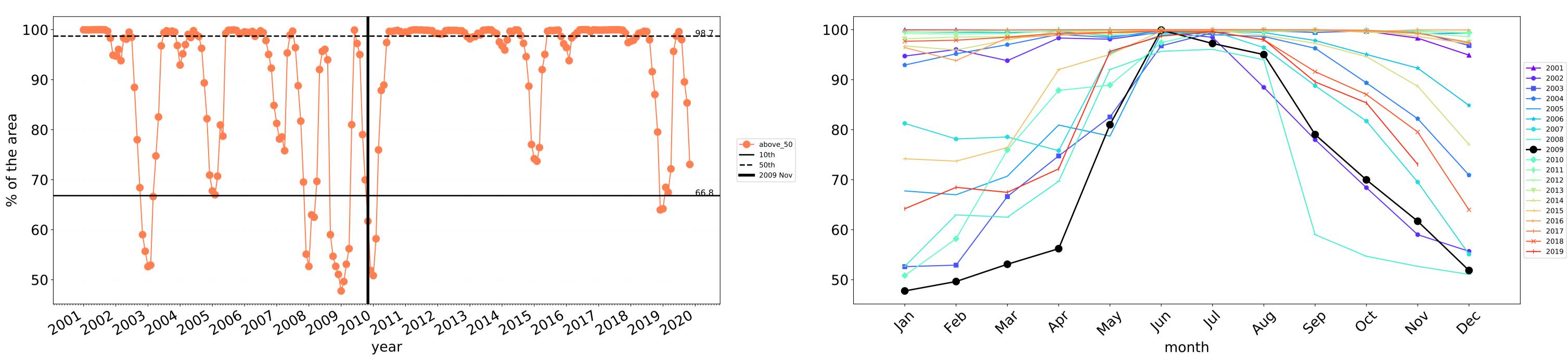


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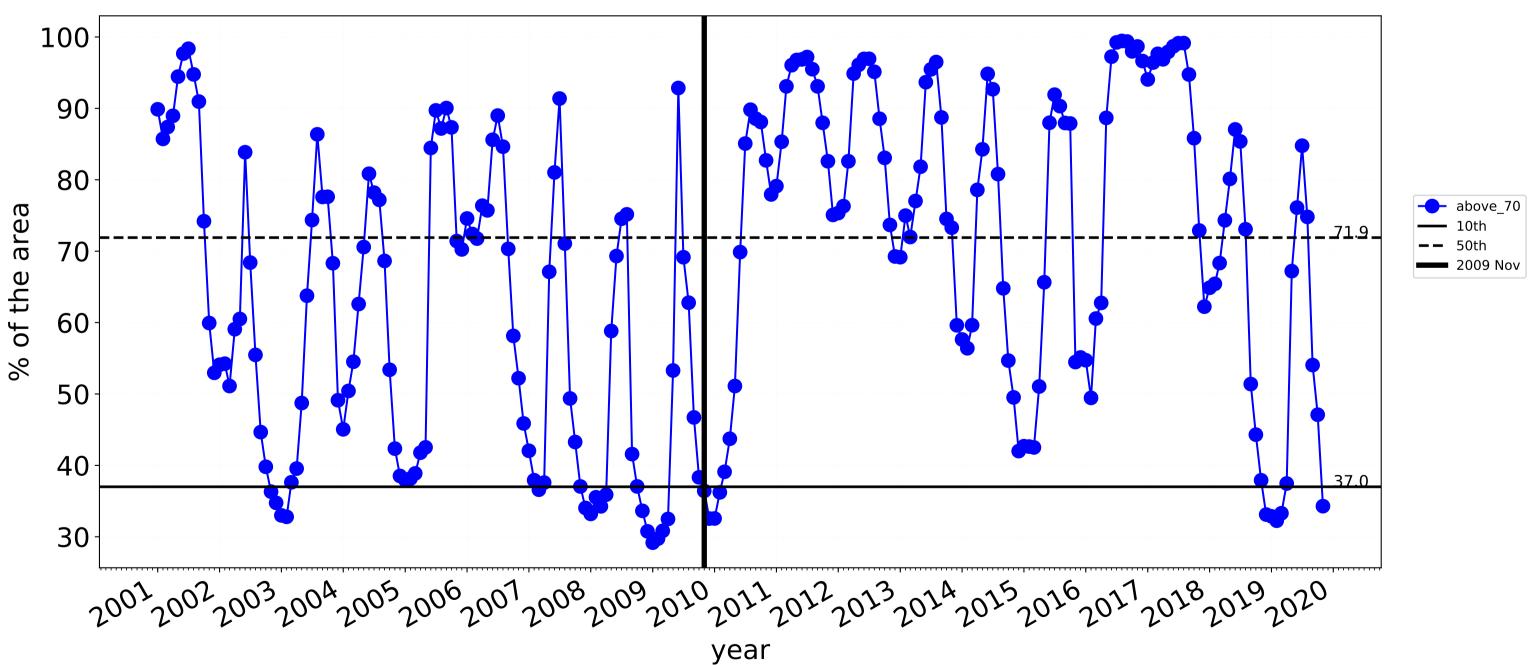






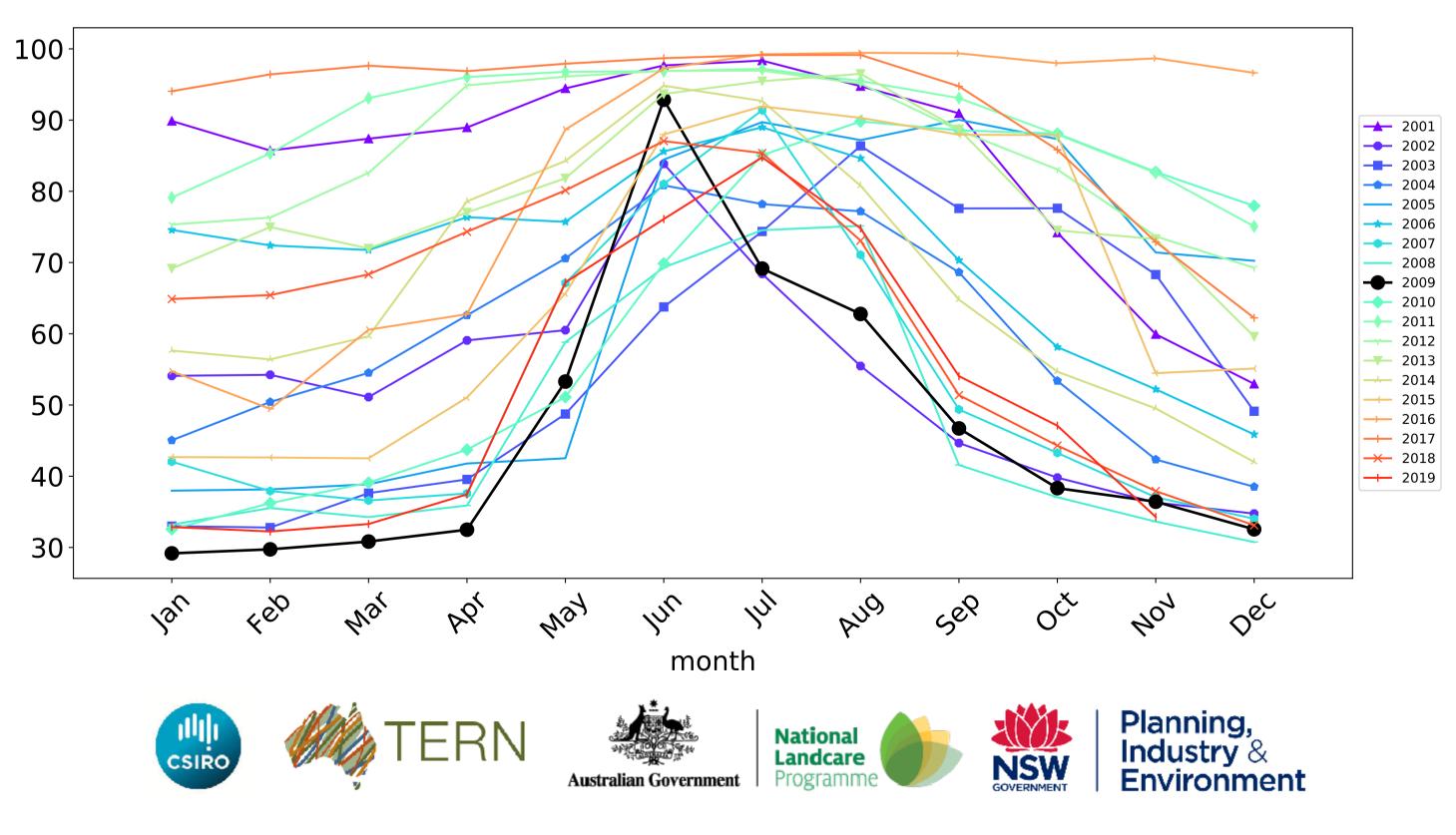
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





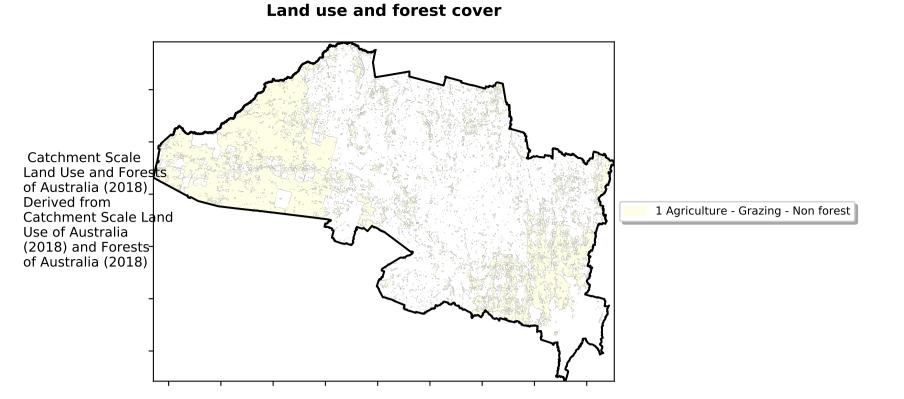
Grazing timeseries

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

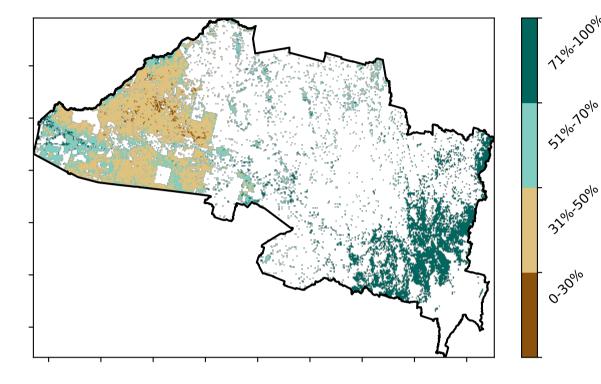


Wind erosion historical monthly area protected (Total Veg Cov >50%)

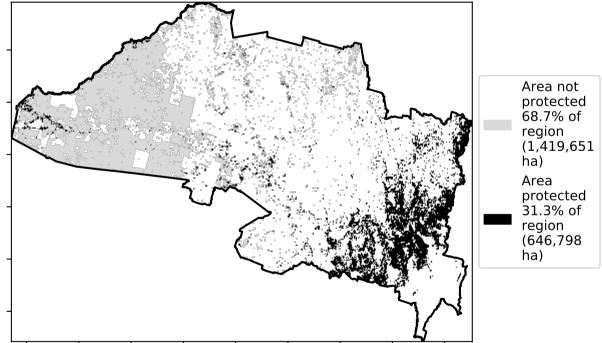
Grazing non forest



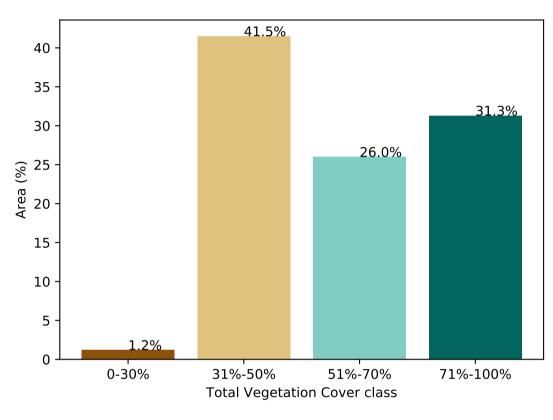
Total Vegetation Cover [%]



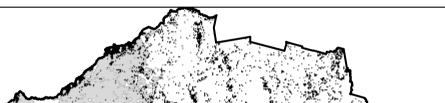
% Area protected from water erosion (>70%)



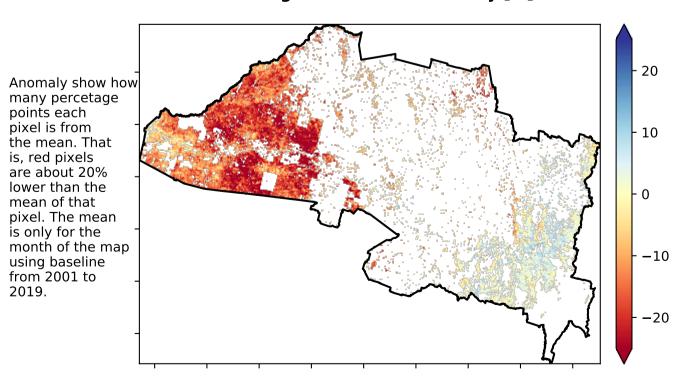
Proportion of vegetation cover class in area



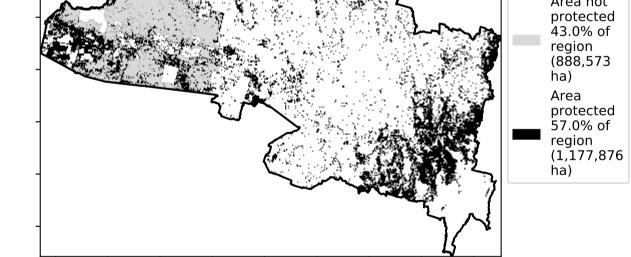
% Area protected from wind erosion (>50%)

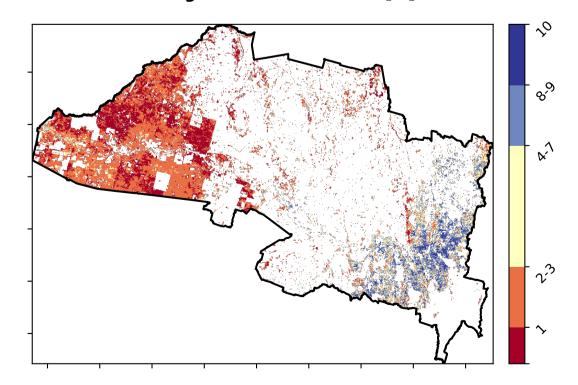


Total Vegetation Cover Anomaly [%]

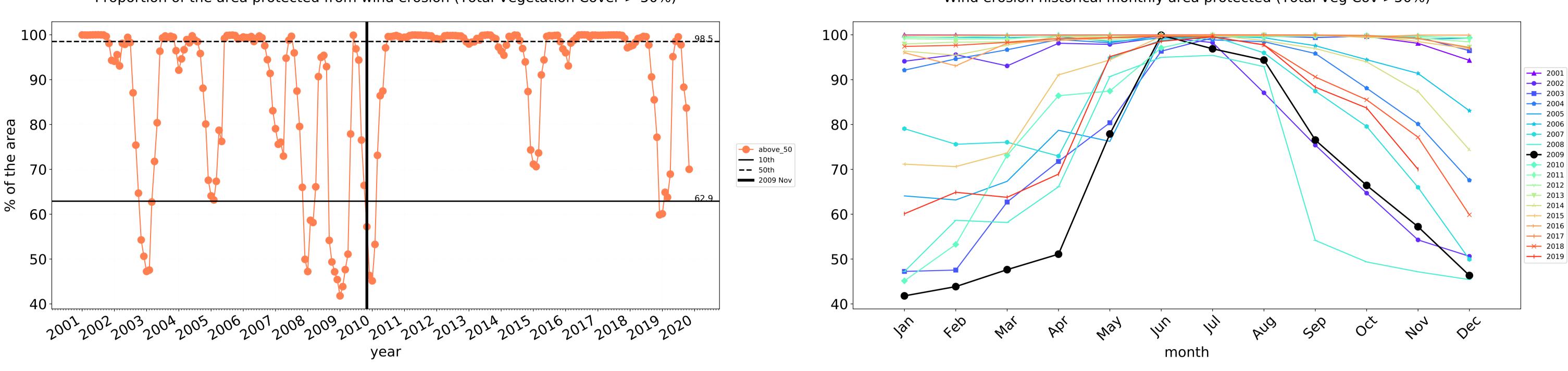


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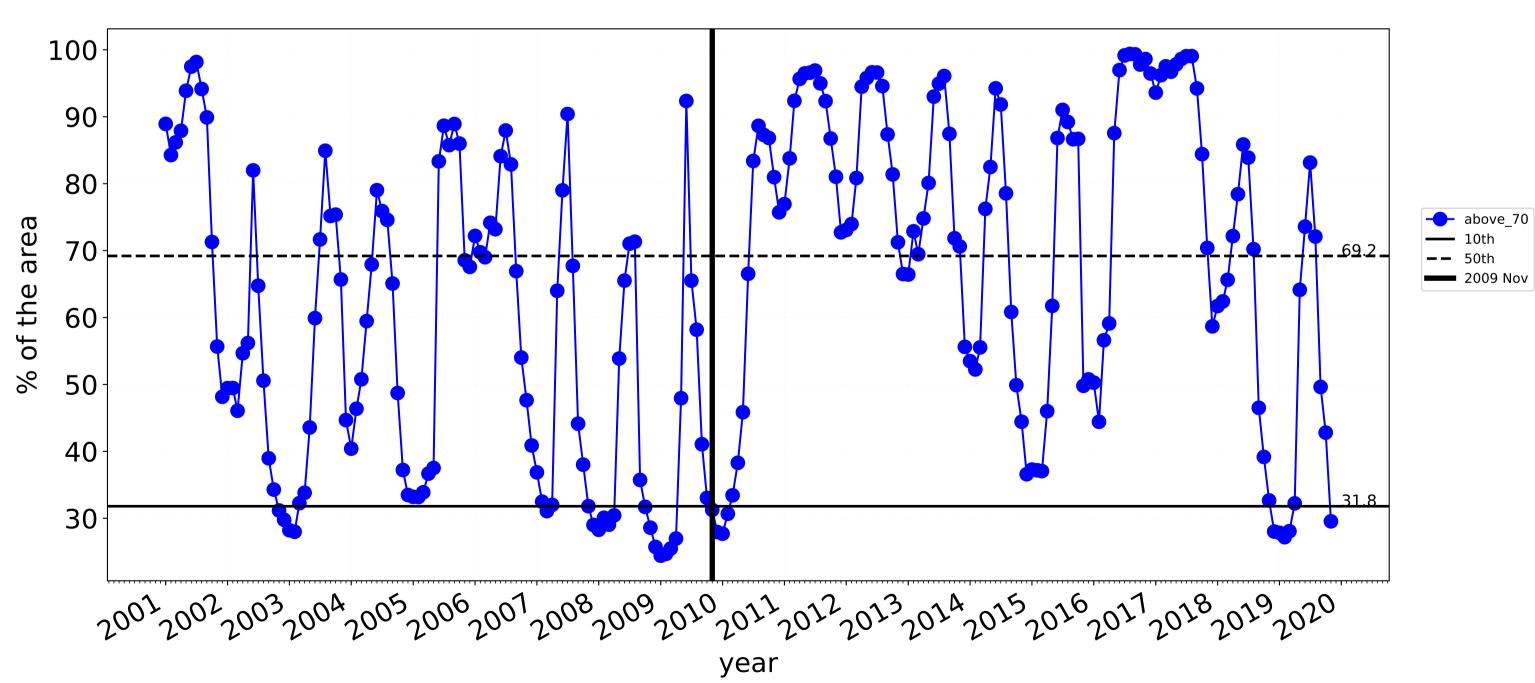






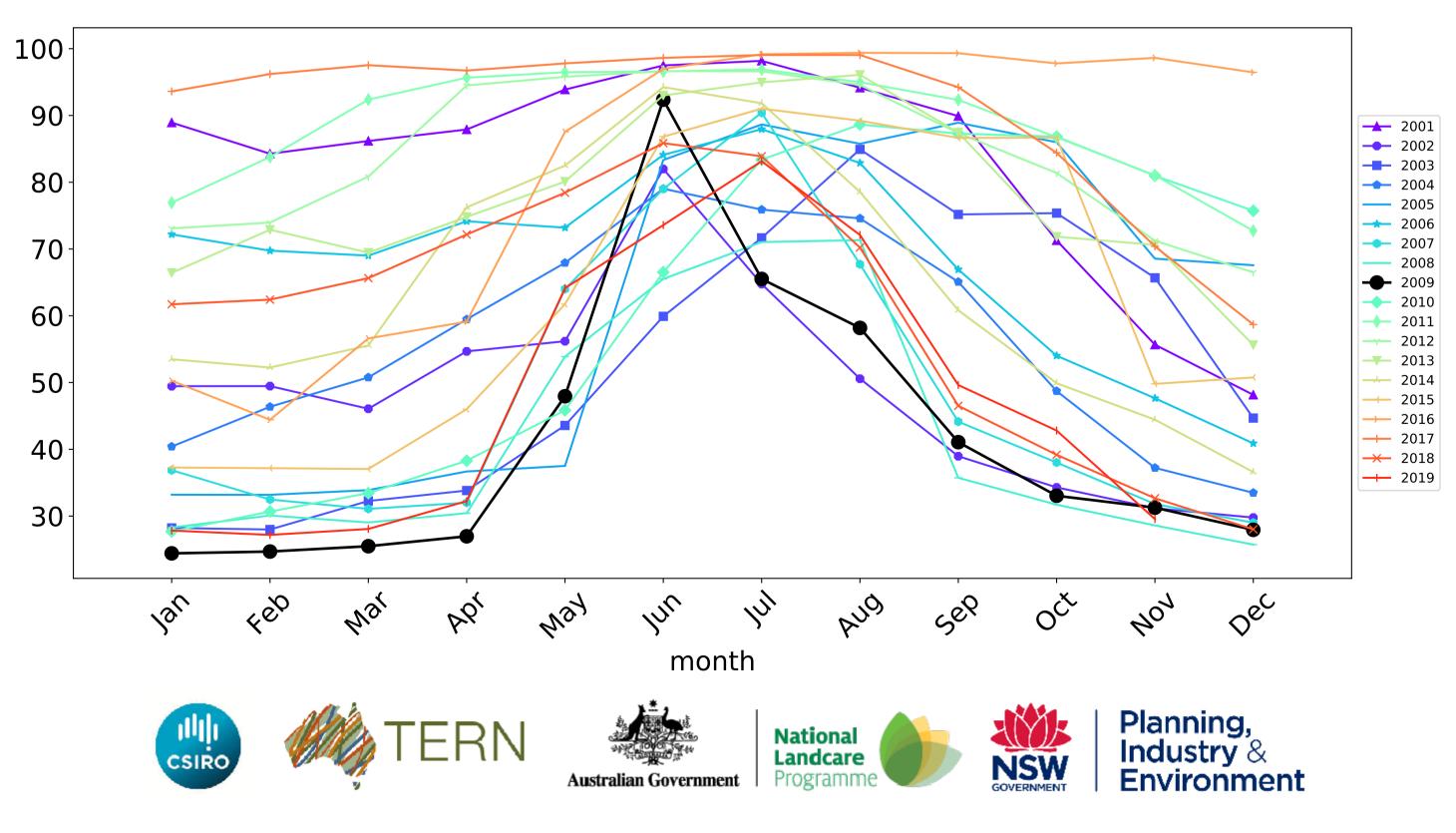
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



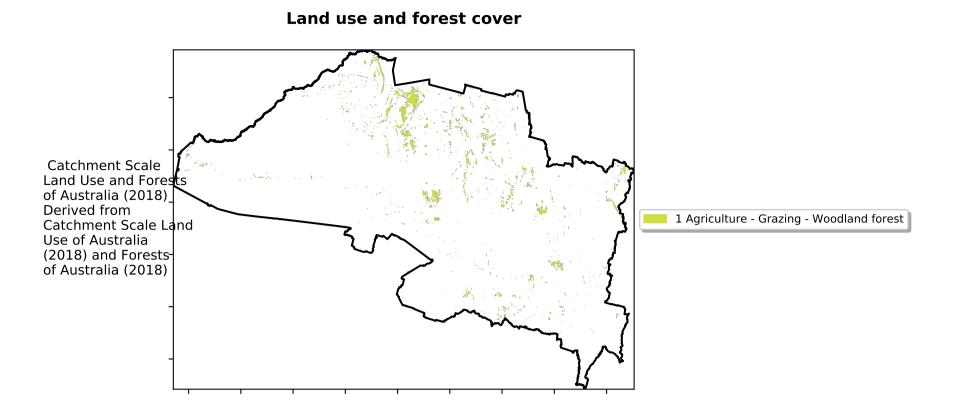


Grazing non forest timeseries

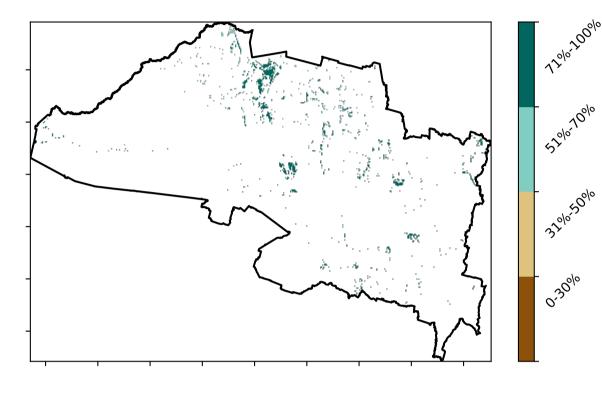
Wind erosion historical monthly area protected (Total Veg Cov >50%)



Grazing Woodland forest



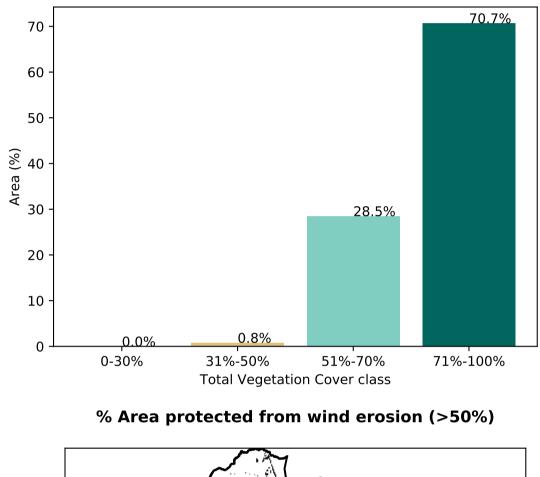
Total Vegetation Cover [%]

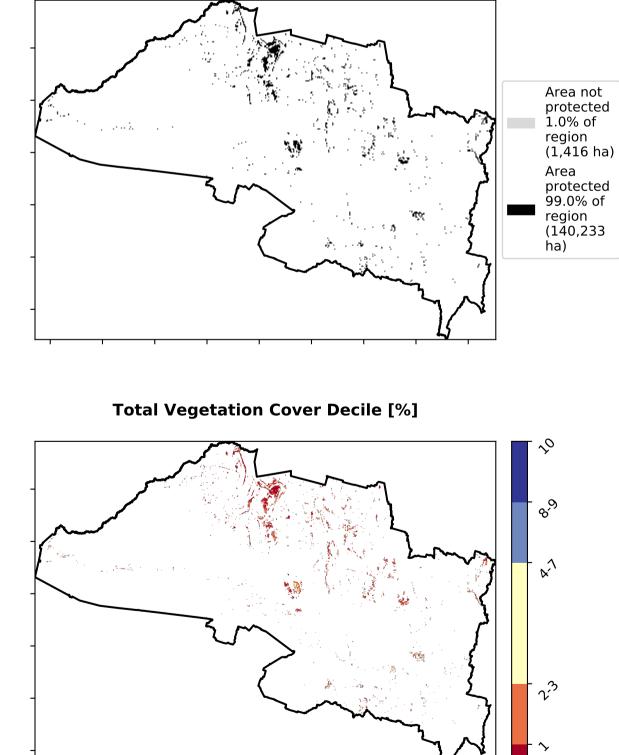


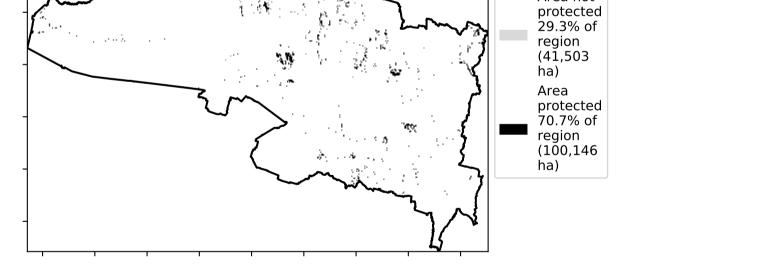
% Area protected from water erosion (>70%)





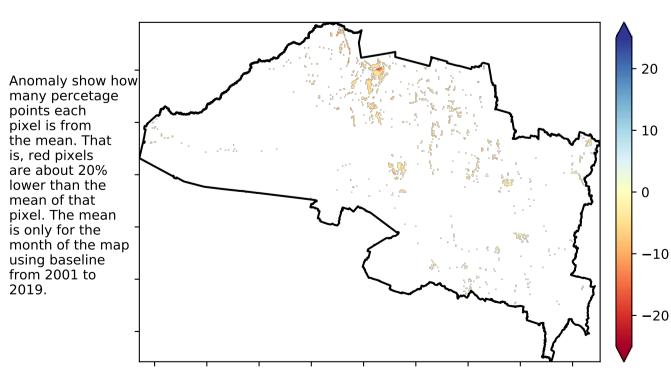






Area not

Total Vegetation Cover Anomaly [%]

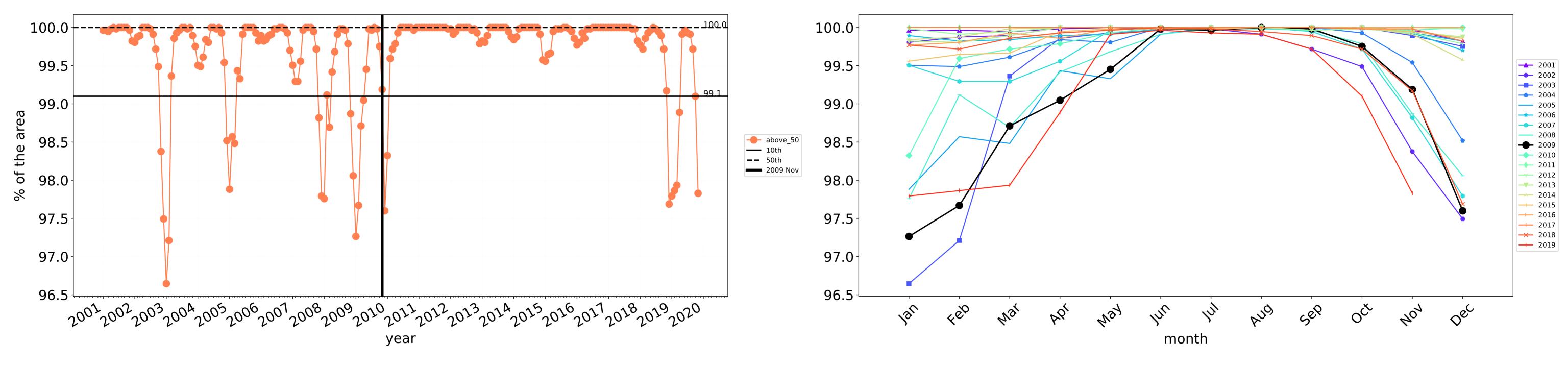


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline the map using baseline from 2001 to 2019.



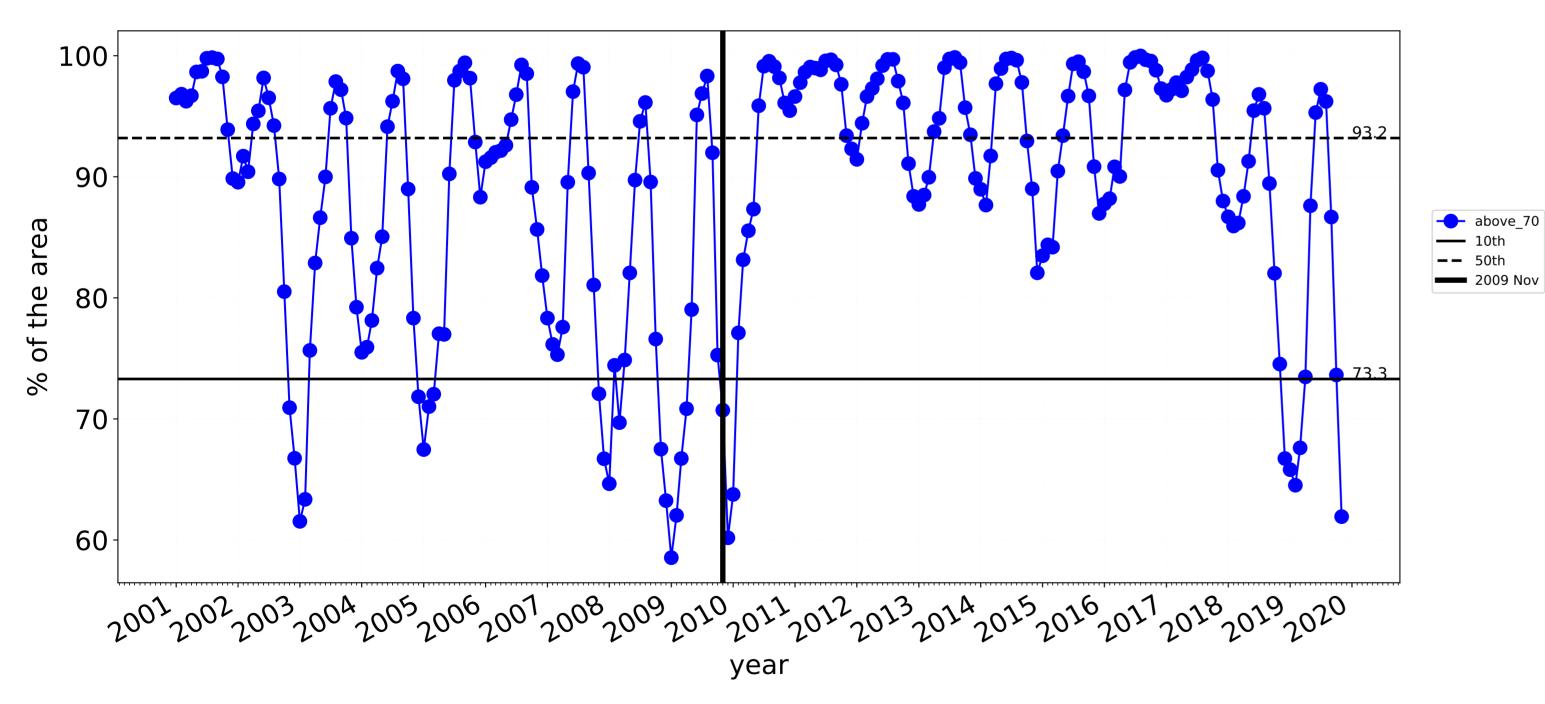
10

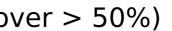
Grazing Woodland forest timeseries



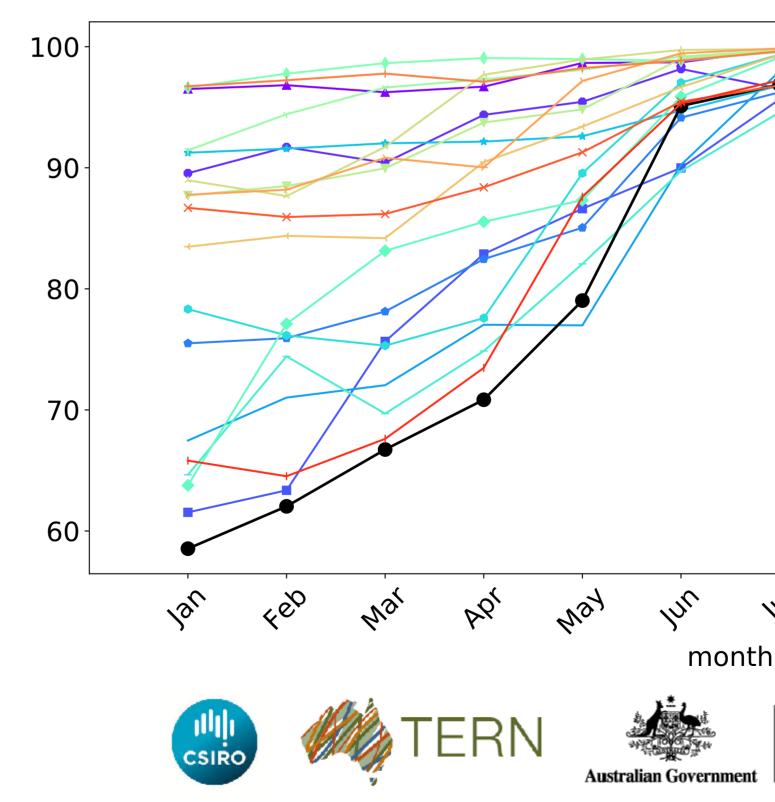
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



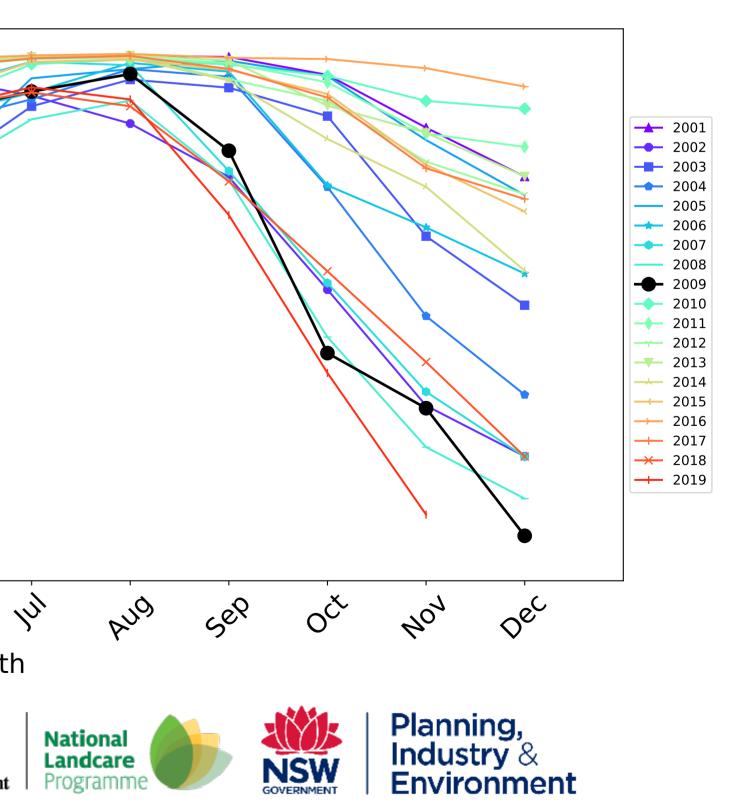


Wind erosion historical monthly area protected (Total Veg Cov >50%)

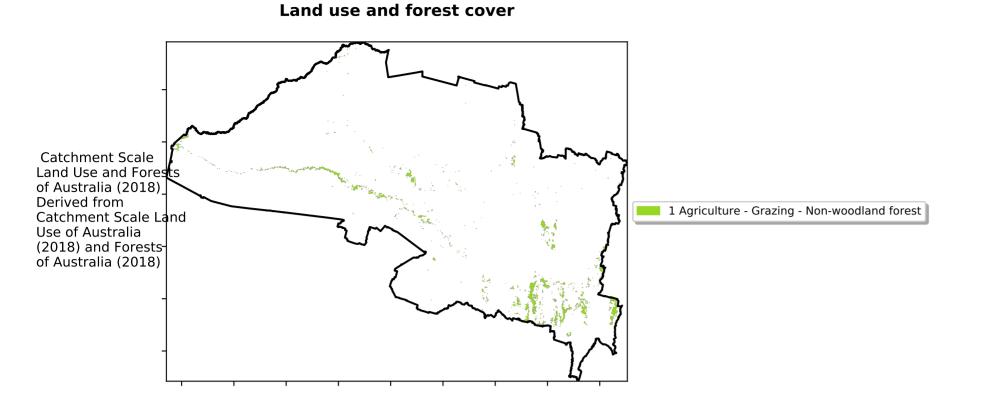


Water erosion historical monthly area protected (Total Veg Cov>70%)

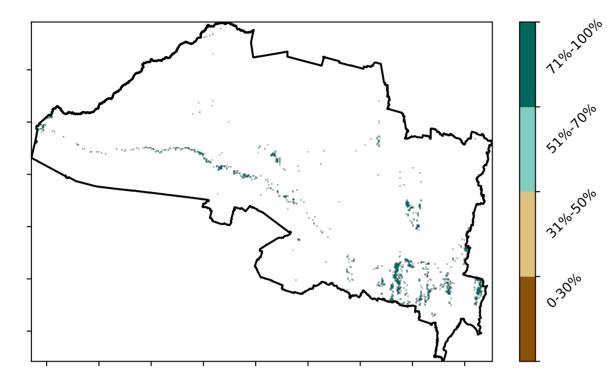
Programme



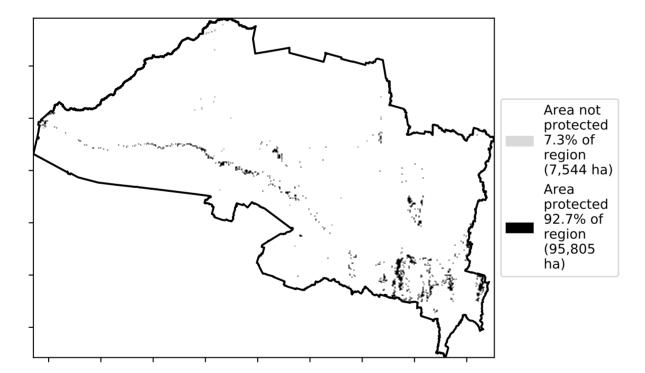
Grazing - Forest (non woodland)



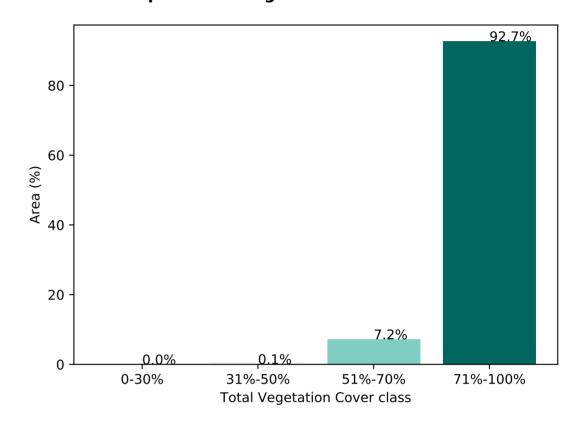
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



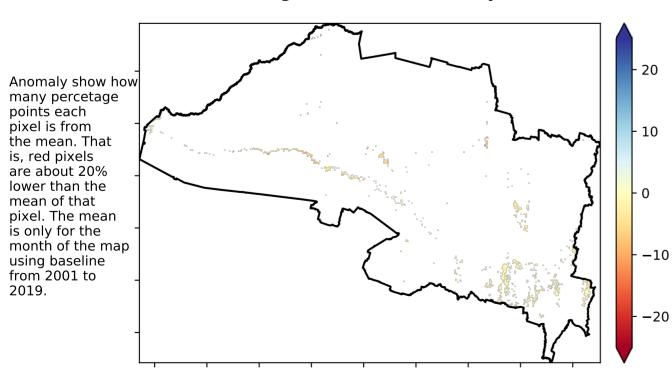
Proportion of vegetation cover class in area



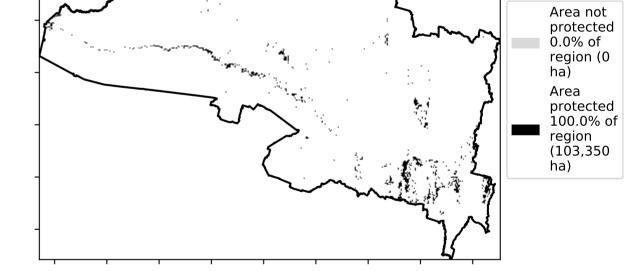
% Area protected from wind erosion (>50%)

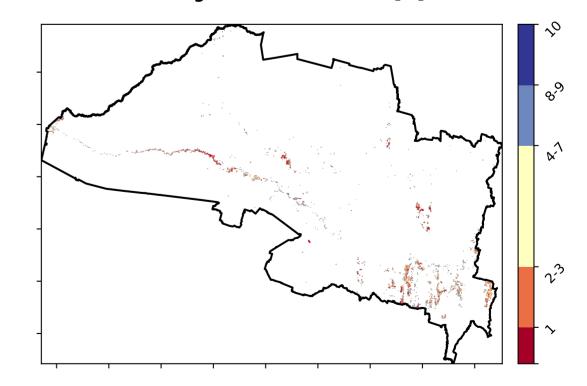


Total Vegetation Cover Anomaly [%]



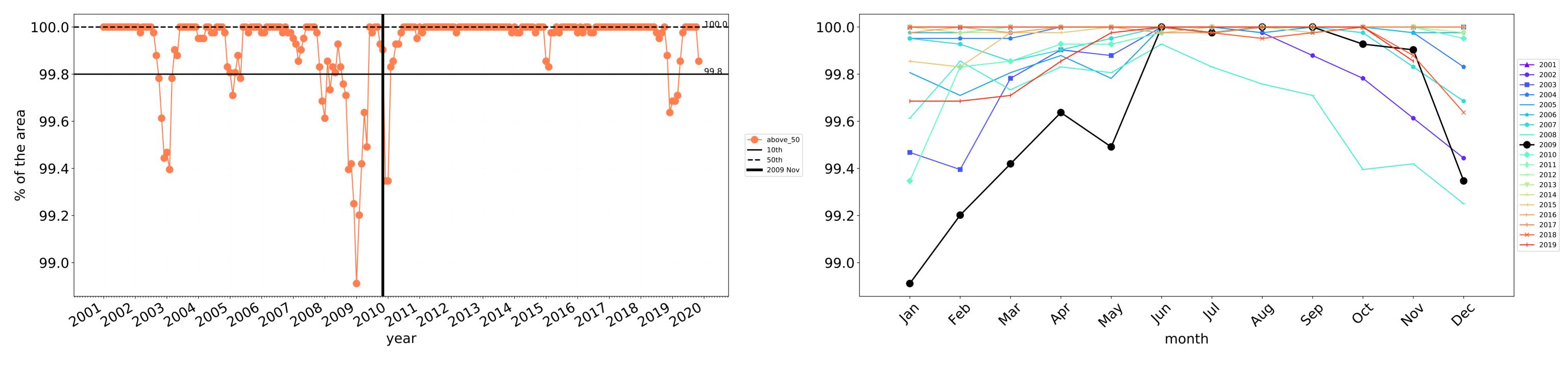
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.





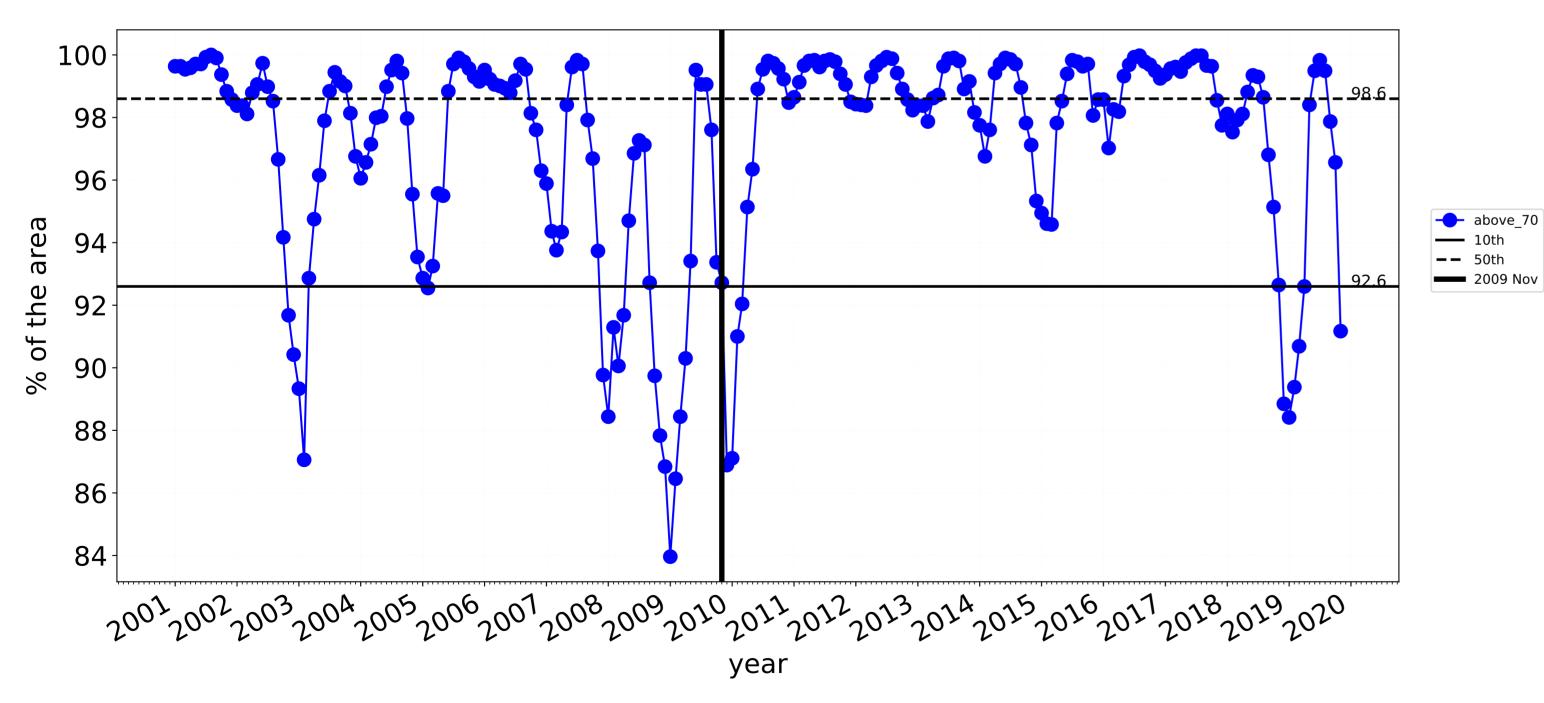


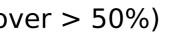
Grazing - Forest (non woodland) timeseries



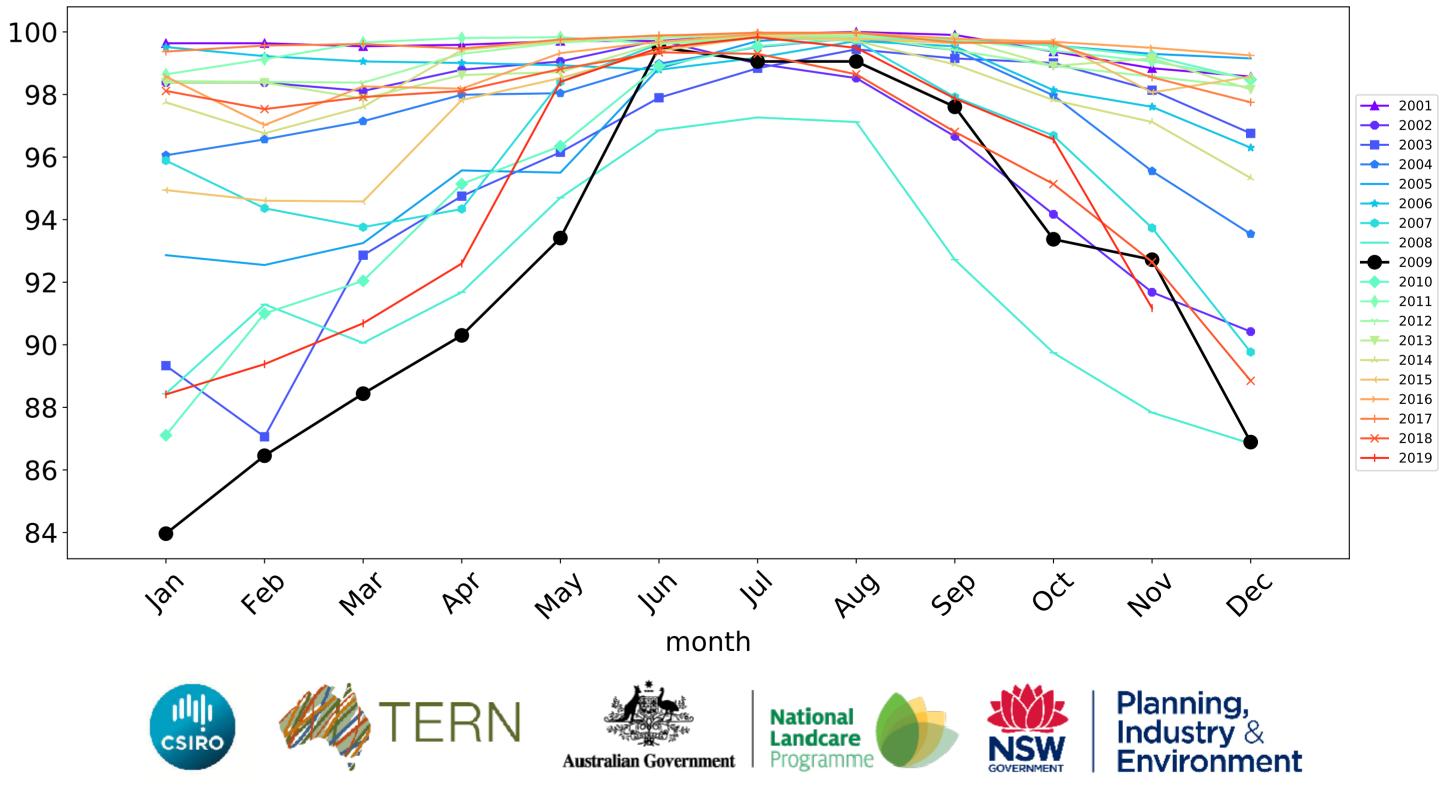
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



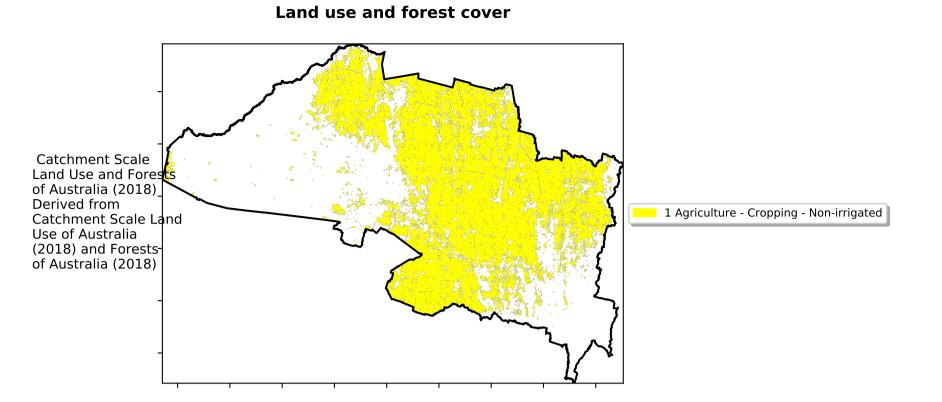


Wind erosion historical monthly area protected (Total Veg Cov >50%)

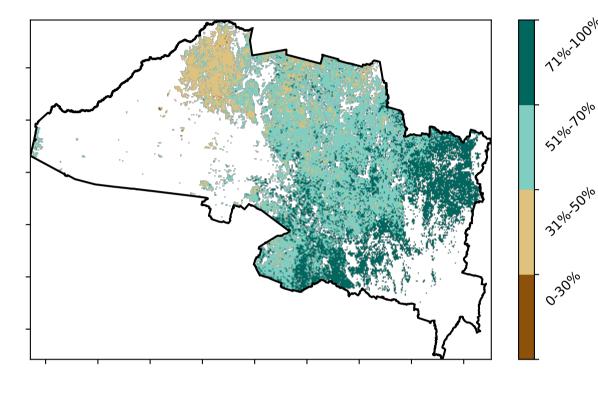


Water erosion historical monthly area protected (Total Veg Cov>70%)

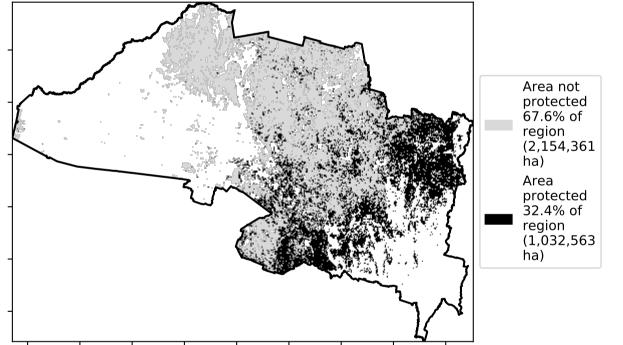
Cropping



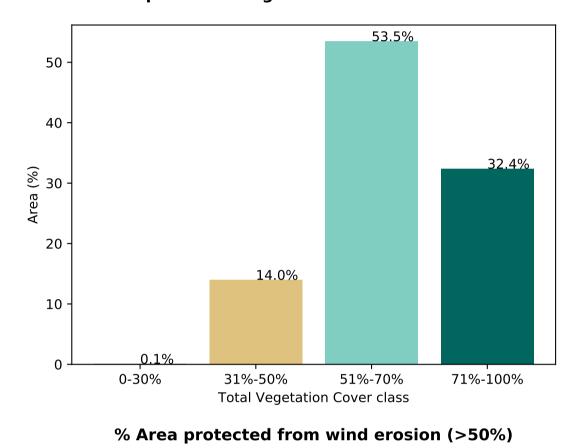
Total Vegetation Cover [%]

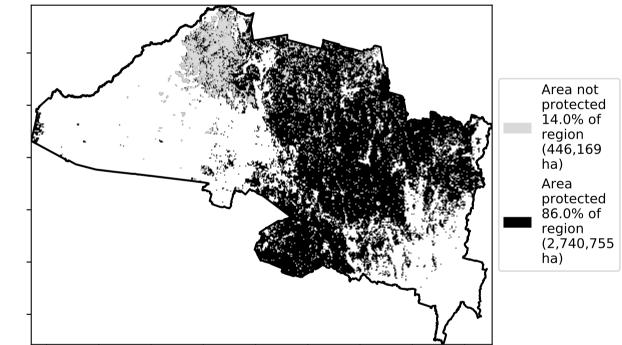


% Area protected from water erosion (>70%)

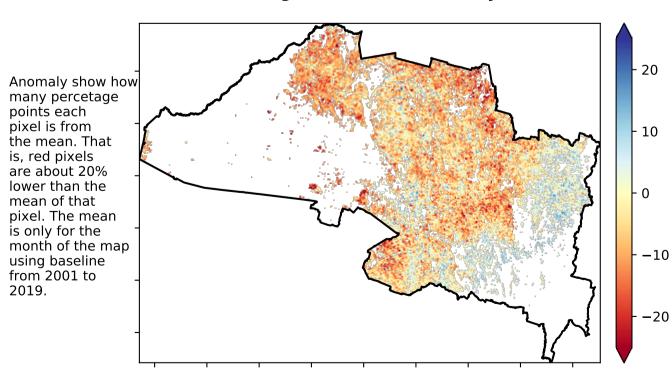


Proportion of vegetation cover class in area

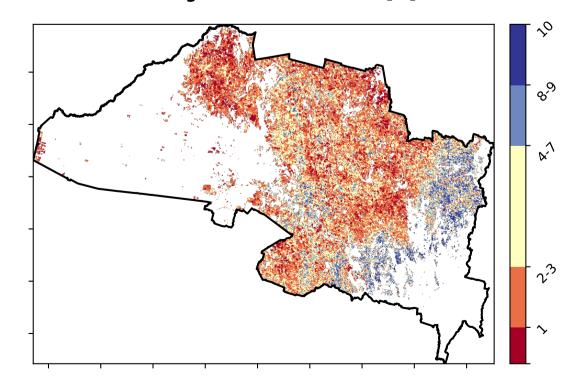




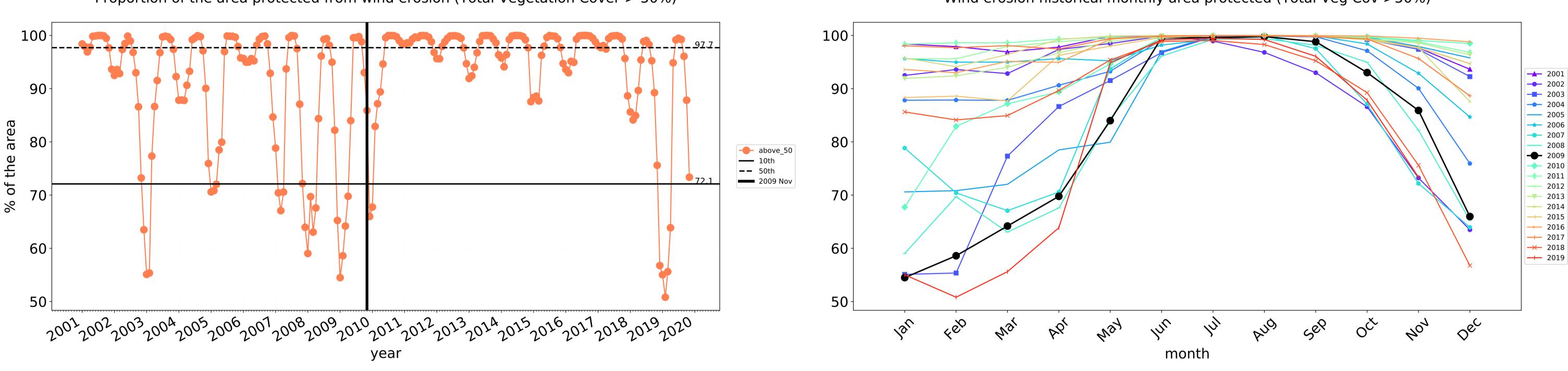
Total Vegetation Cover Anomaly [%]



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.



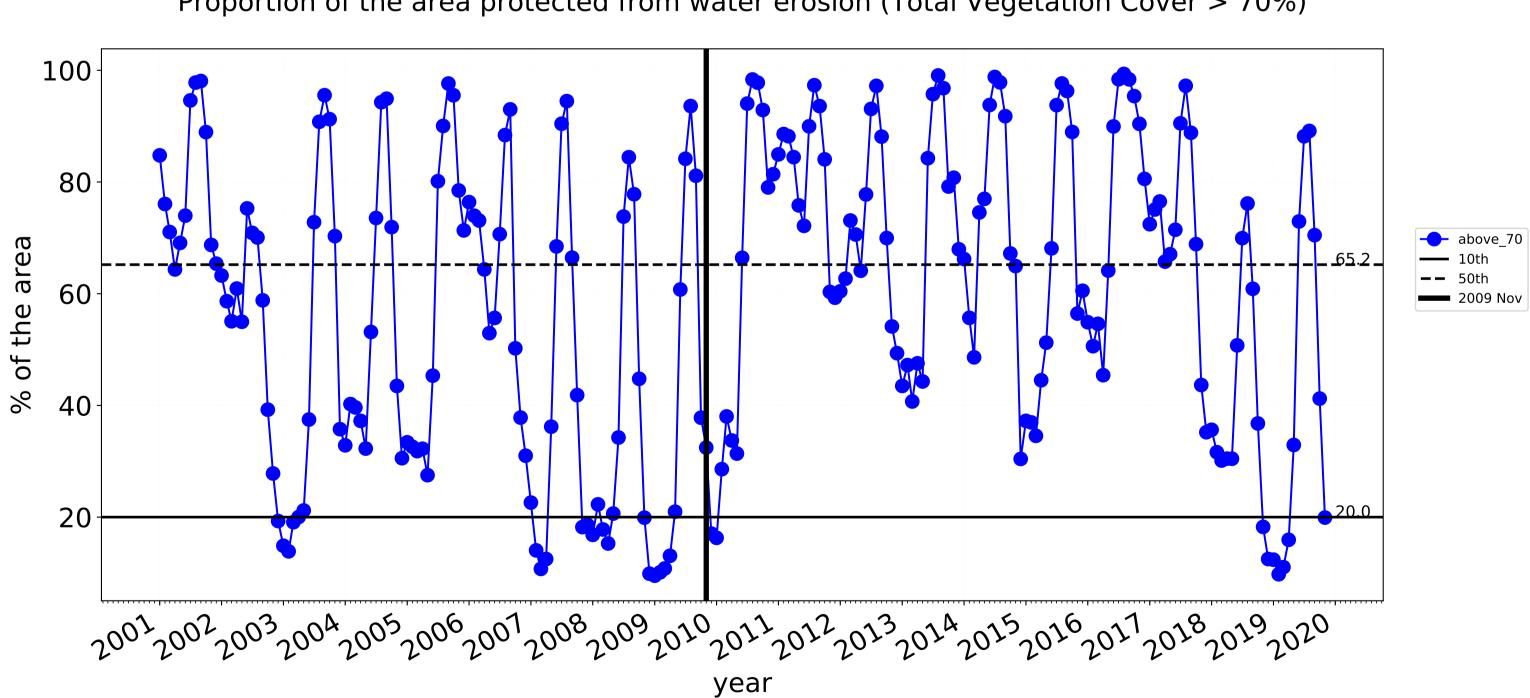




—— 10th

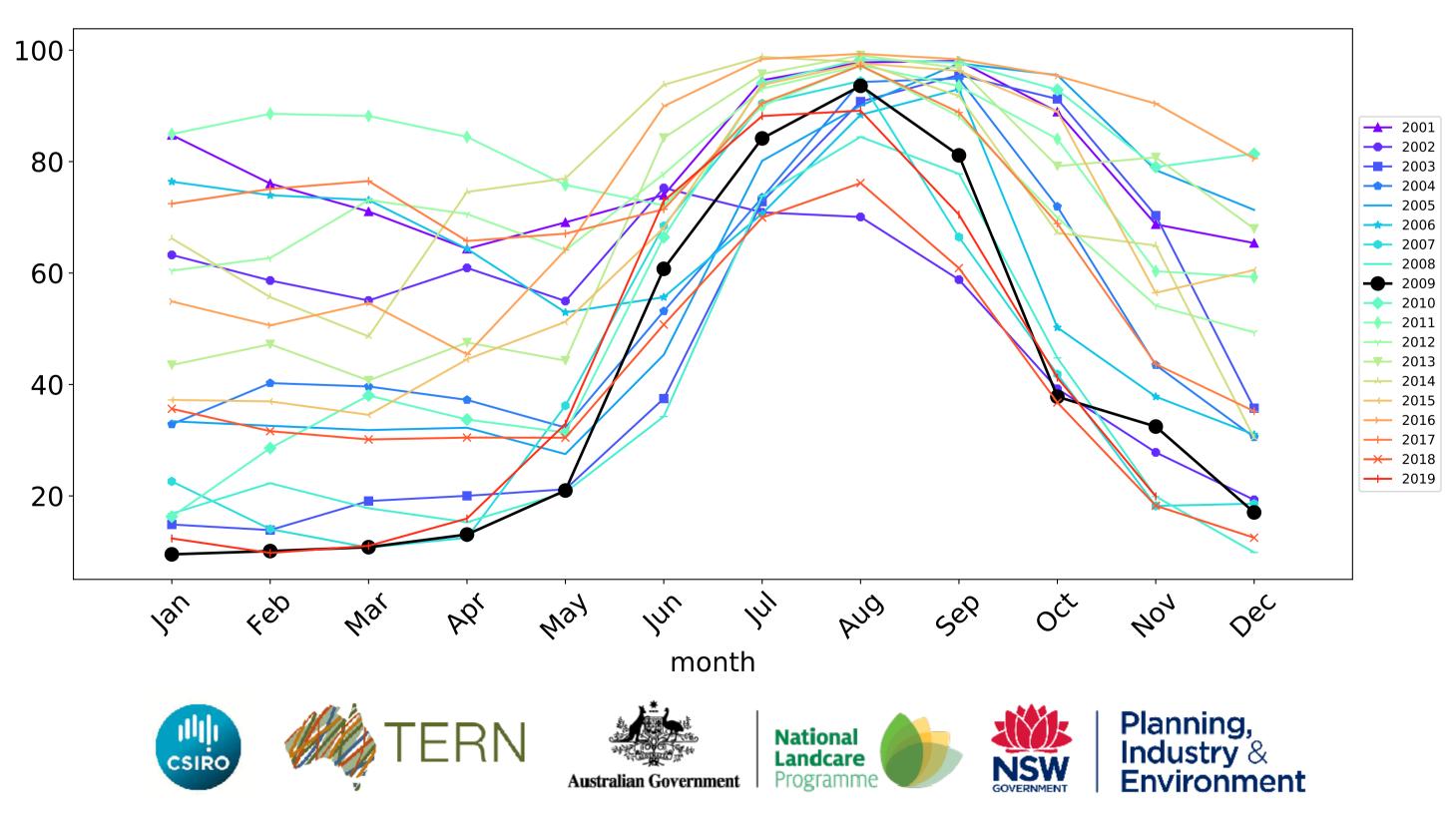
—— 50th

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



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

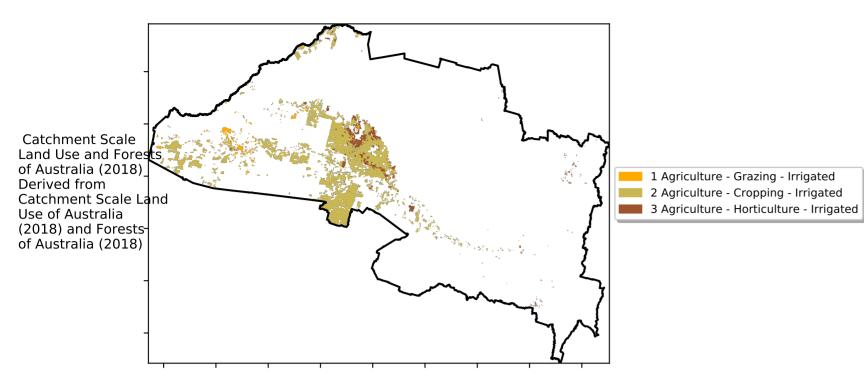
Cropping timeseries



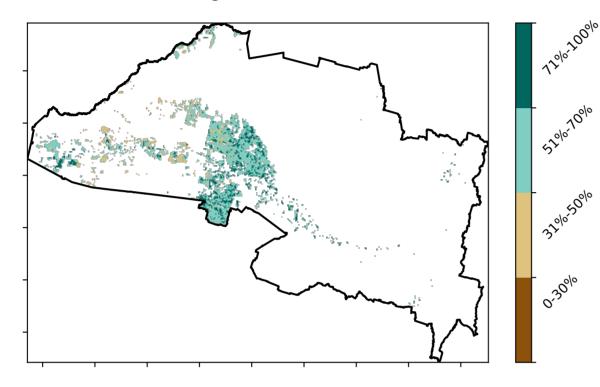
Wind erosion historical monthly area protected (Total Veg Cov >50%)

Irrigation

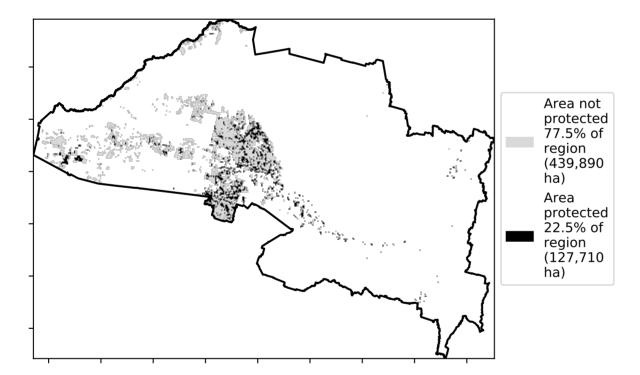
Land use and forest cover

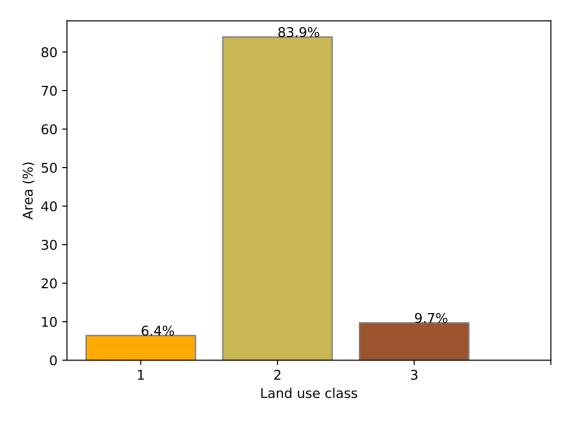


Total Vegetation Cover [%]



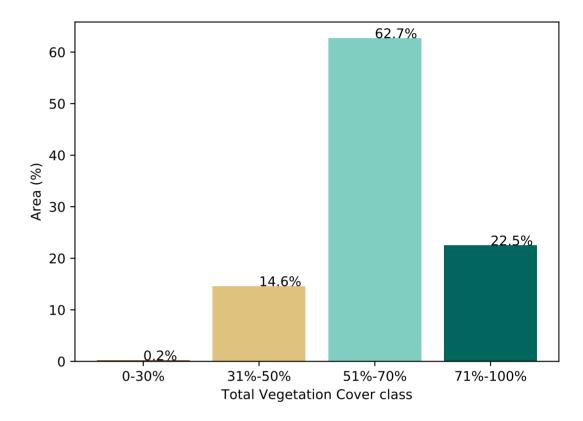
% Area protected from water erosion (>70%)



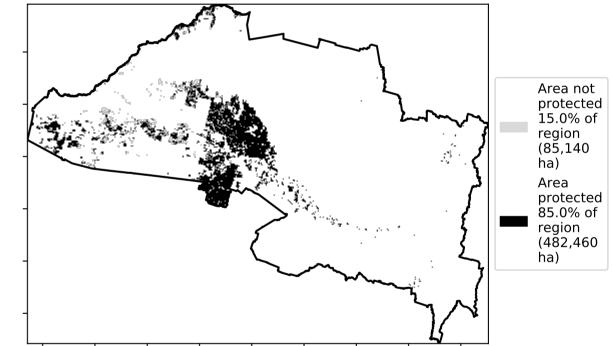


Proportion of each land class in area

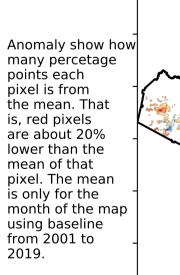
Proportion of vegetation cover class in area

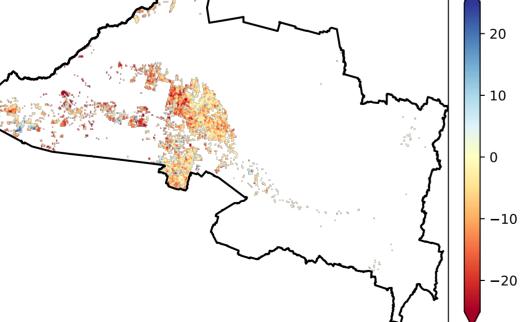


% Area protected from wind erosion (>50%)

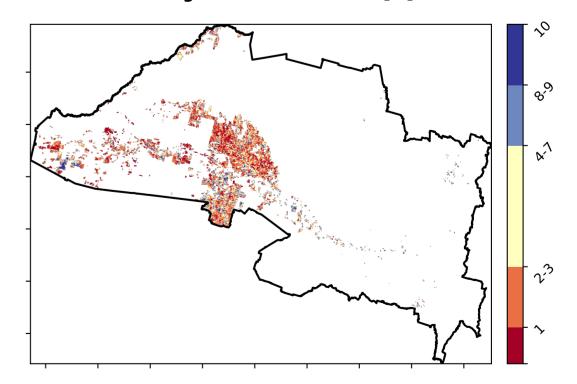


Total Vegetation Cover Anomaly [%]

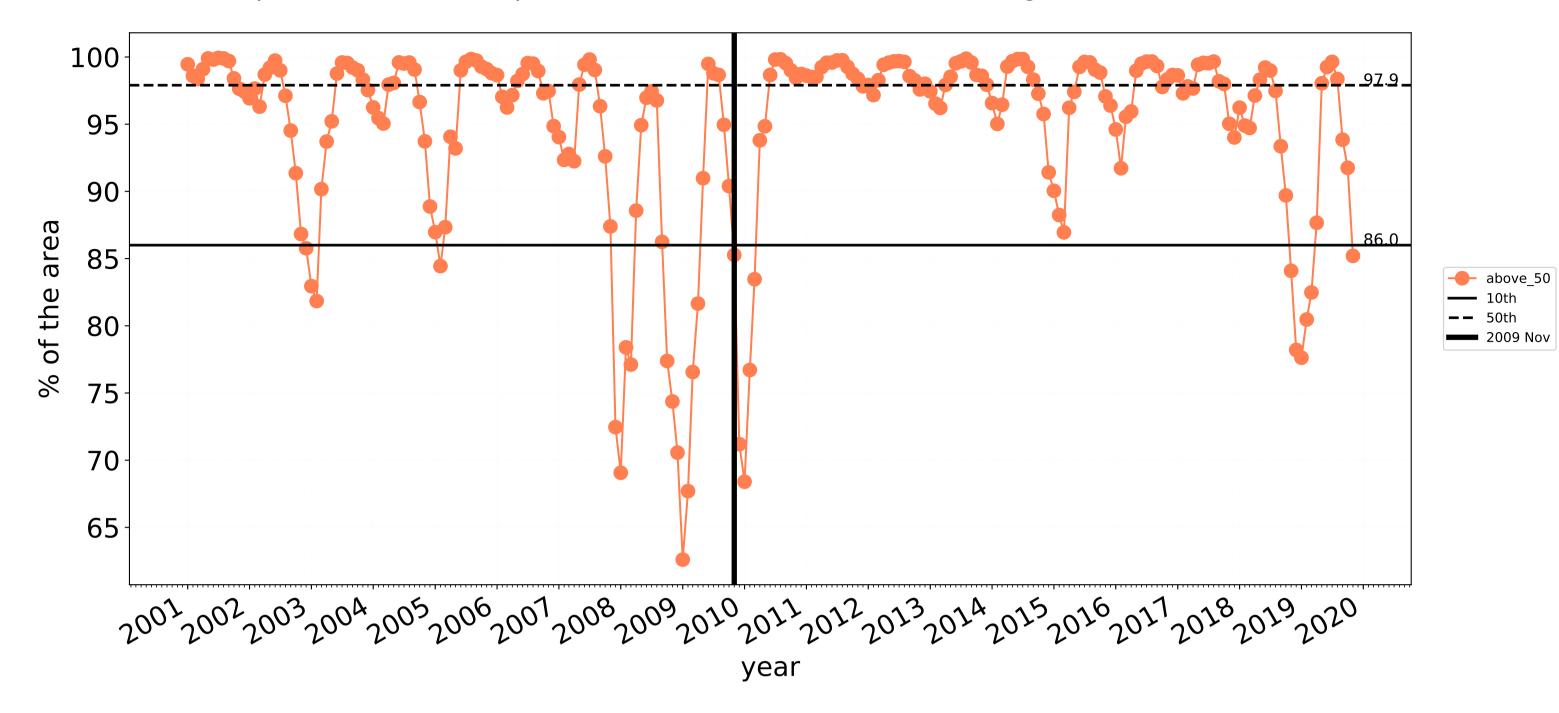




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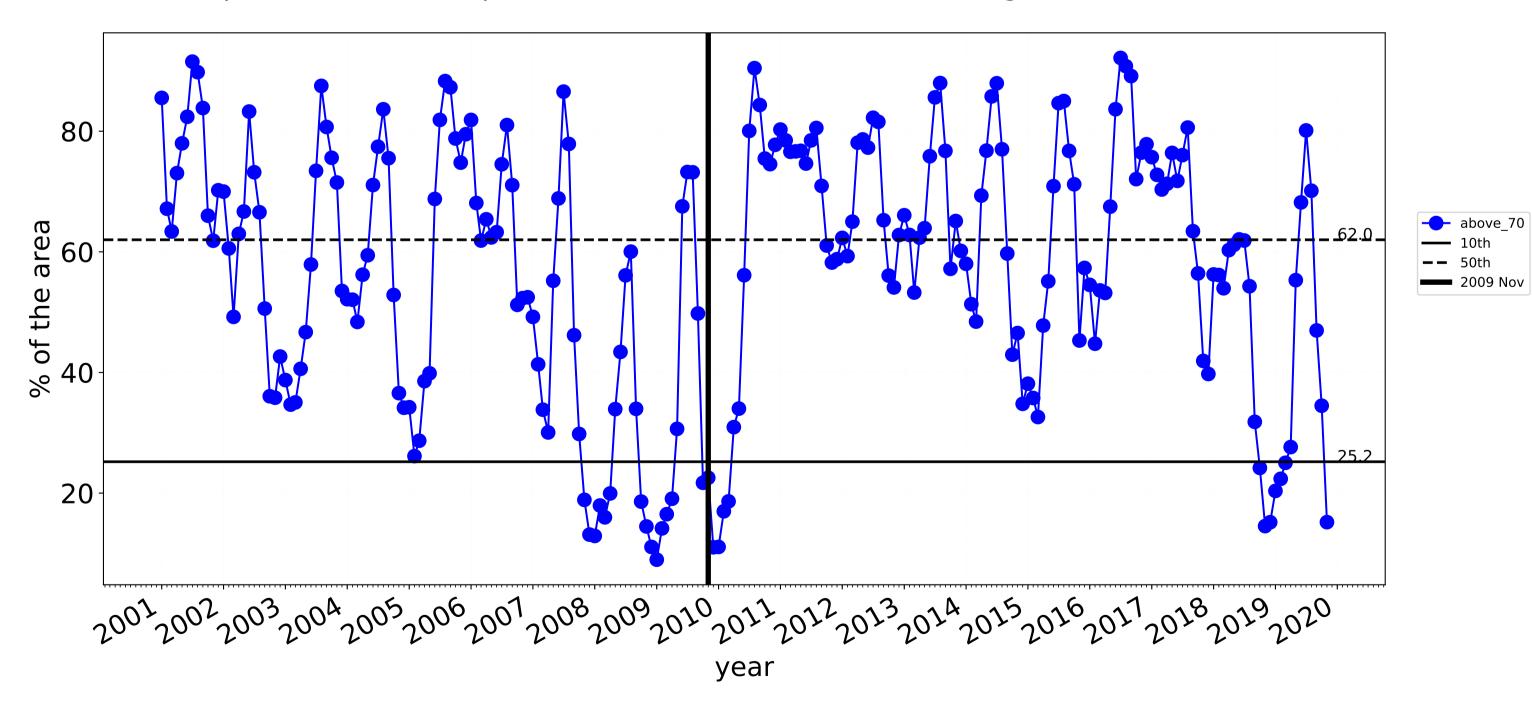






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

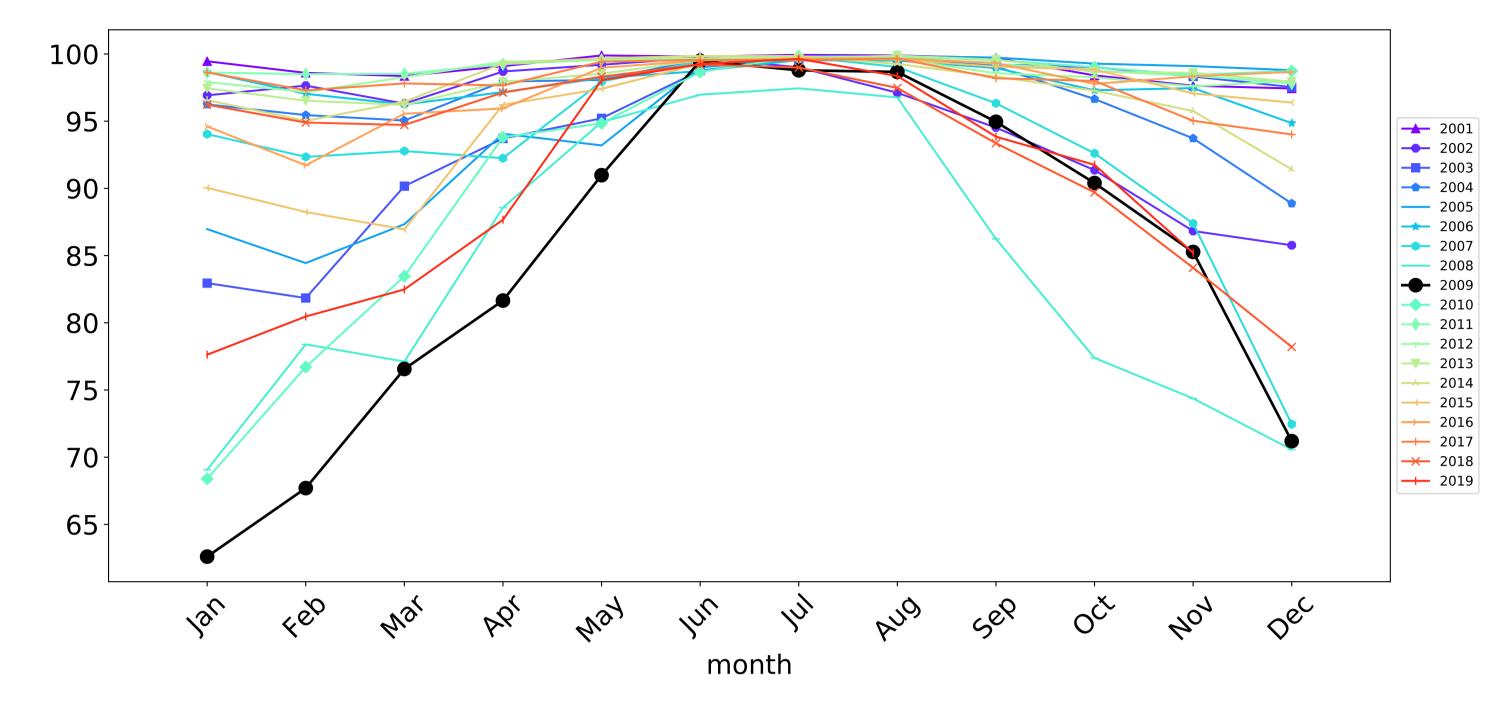
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

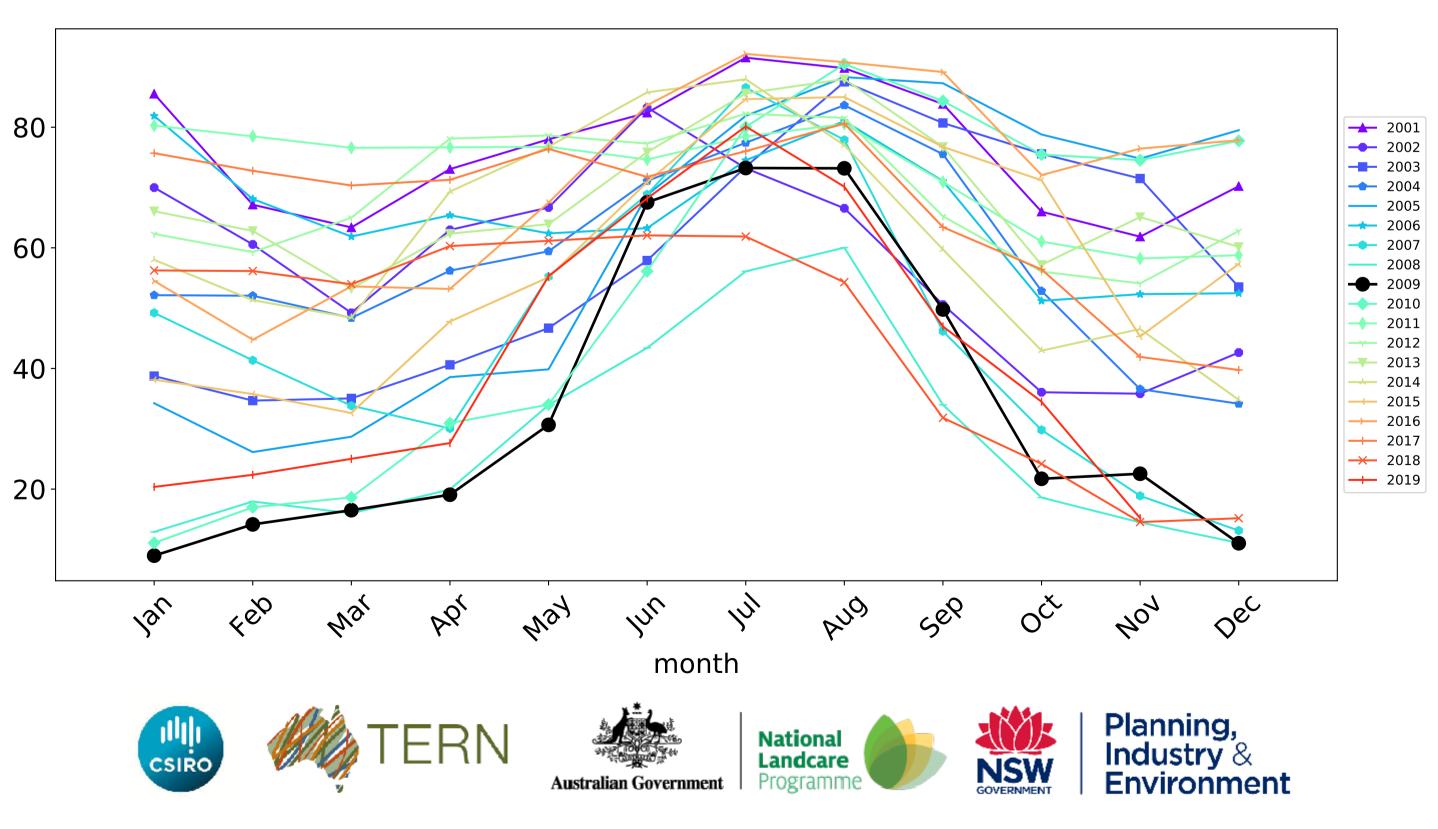


Irrigation timeseries

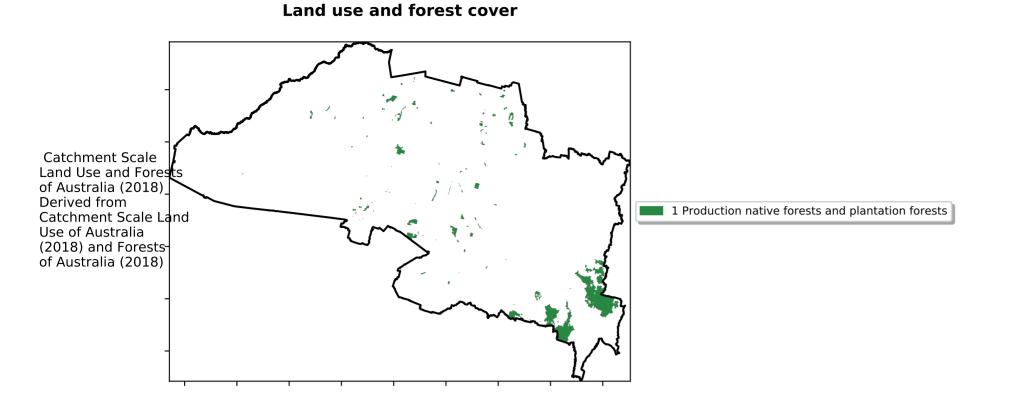


Wind erosion historical monthly area protected (Total Veg Cov >50%)

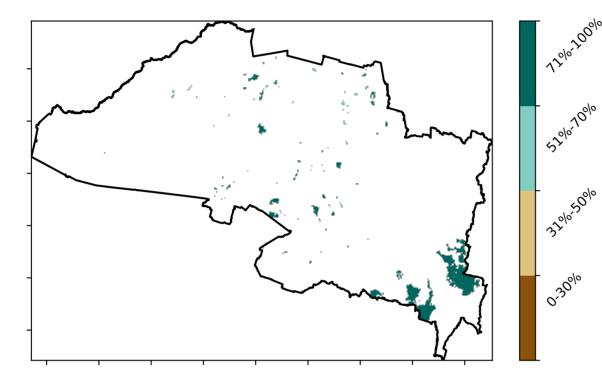




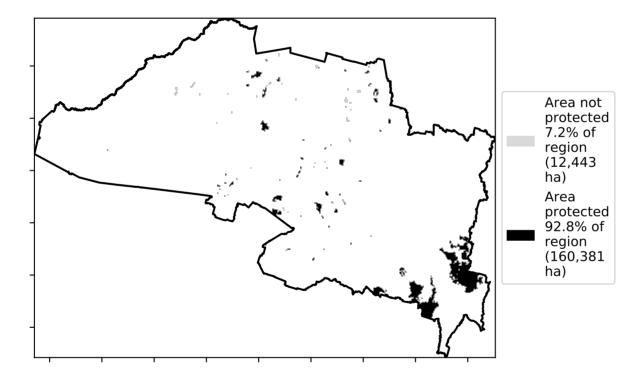
Production native forests and plantation forests



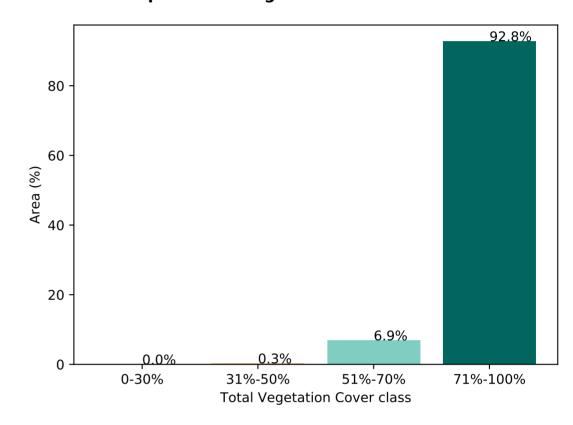
Total Vegetation Cover [%]



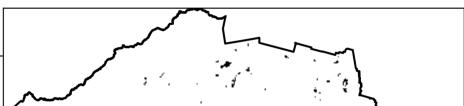
% Area protected from water erosion (>70%)



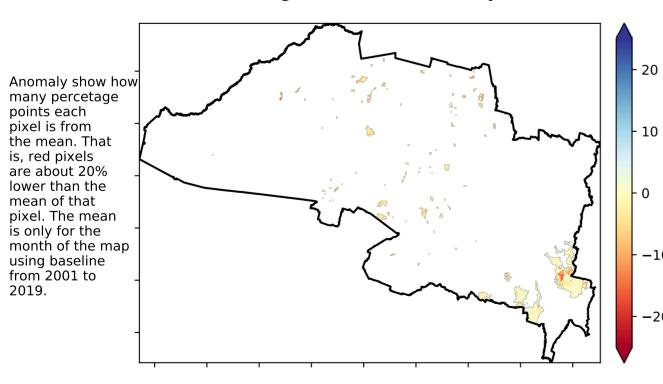
Proportion of vegetation cover class in area



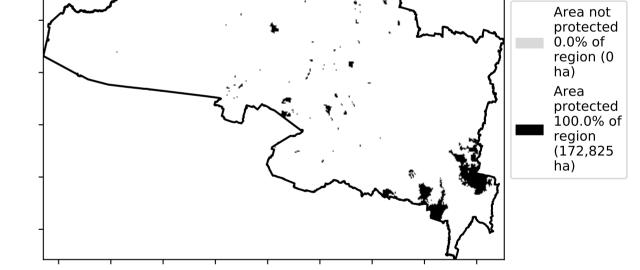
% Area protected from wind erosion (>50%)



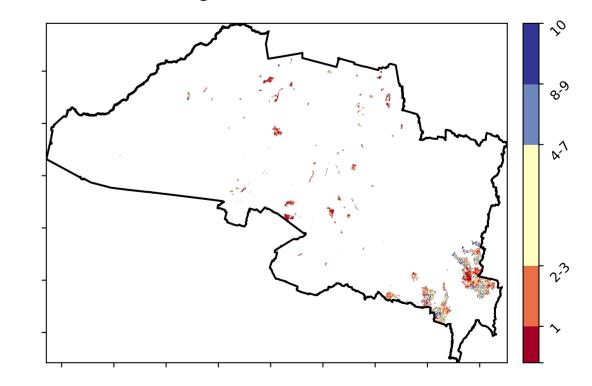
Total Vegetation Cover Anomaly [%]



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Total Vegetation Cover Decile [%]

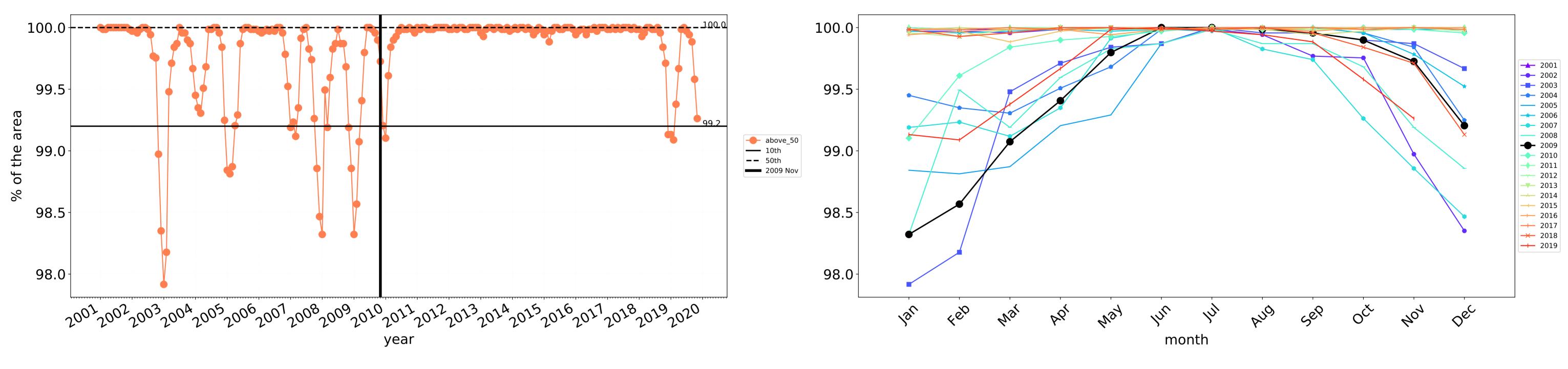




-10

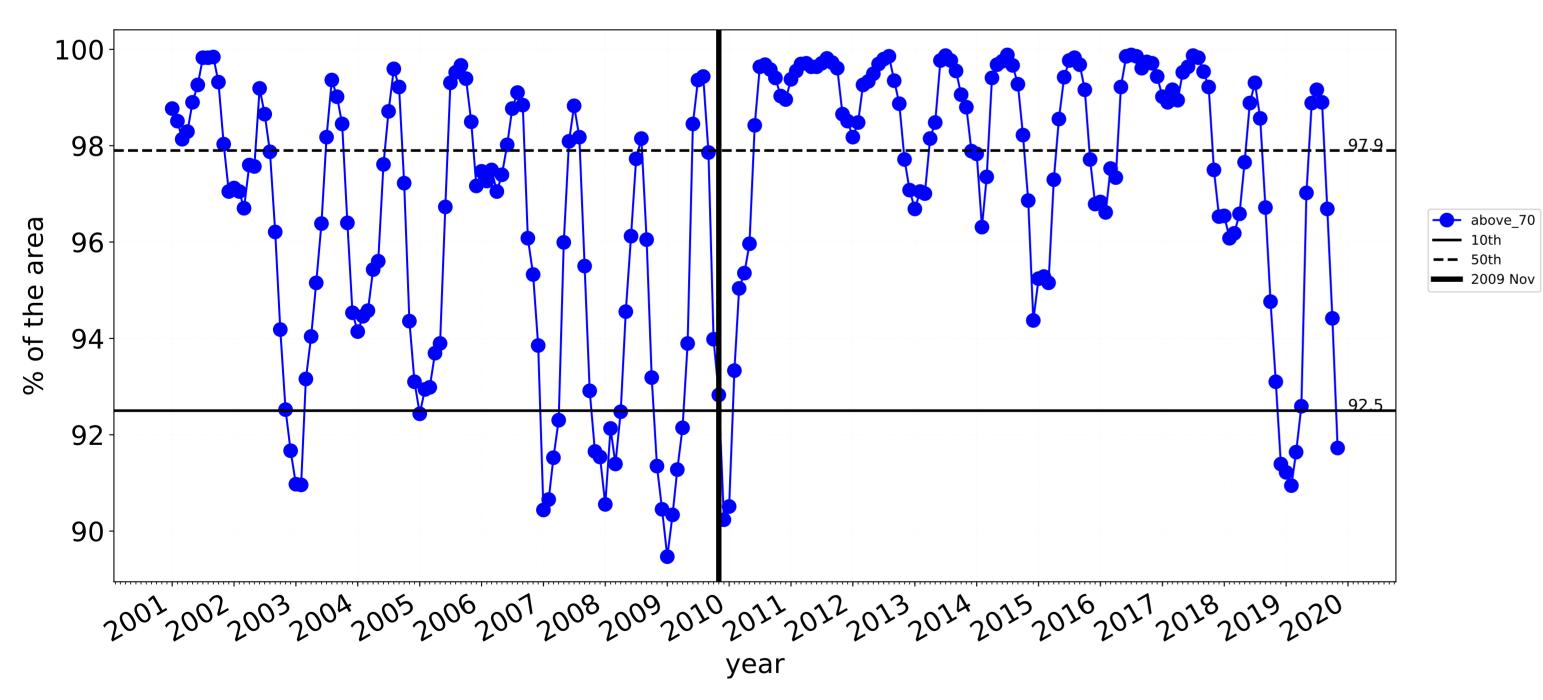
-20

Production native forests and plantation forests timeseries

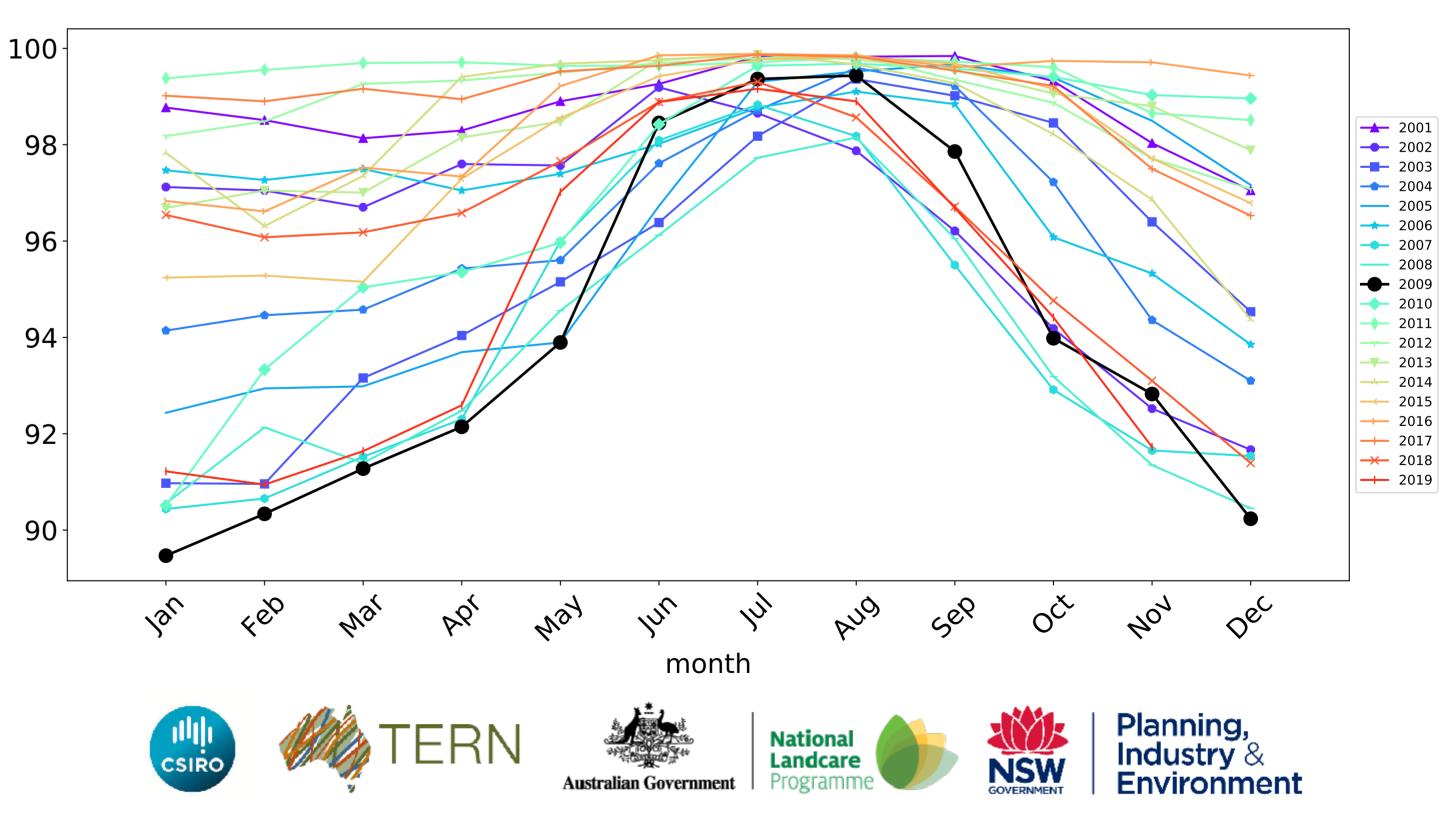


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)





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



Riverina (6,694,025 ha and no data 14,310 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	6,694,025	99.5% 6,662,375	77.8% 5,210,802	36.9% 2,470,278	24.2% 1,621,494	12.5% 835,459	5.2% 348,793
Conservation and natural environments	323,075	100.0% 322,975	89.5% 289,000	78.1% 252,175	72.9% 235,500	48.6% 157,075	20.4% 65,850
Conservation and natural environments non forest	83,350	99.9% 83,250	59.3% 49,400	19.7% 16,450	15.4% 12,800	9.7% 8,125	4.0% 3,350
Conservation and natural environments Forest (non woodland)	195,225	100.0% 195,225	100.0% 195,225	99.5% 194,250	97.9% 191,175	73.0% 142,525	31.4% 61,250
Agriculture	6,067,800	99.5% 6,037,100	76.6% 4,648,500	33.0% 2,004,300	20.1% 1,218,225	9.5% 574,675	3.9% 237,750
Grazing	2,311,450	98.8% 2,283,900	61.7% 1,425,925	36.4% 841,900	28.6% 661,050	16.0% 369,900	6.7% 155,800
Grazing non forest	2,066,450	98.7% 2,038,900	57.2% 1,182,175	31.3% 645,900	26.0% 537,925	16.2% 334,125	7.3% 150,425
Grazing Woodland forest	141,650	100.0% 141,650	99.2% 140,500	70.7% 100,175	31.6% 44,800	4.4% 6,300	0.6% 800
Grazing - Forest (non woodland)	103,350	100.0% 103,350	99.9% 103,250	92.7% 95,825	75.8% 78,325	28.5% 29,475	4.4% 4,575
Cropping	3,186,925	99.9% 3,184,500	85.9% 2,737,625	32.4% 1,034,125	16.5% 526,050	6.3% 199,875	2.5% 80,700
Irrigation	567,600	99.9% 566,875	85.3% 484,000	22.5% 127,975	5.5% 30,975	0.9% 4,900	0.2% 1,250
Production native forests and plantation forests	172,825	100.0% 172,825	99.7% 172,350	92.8% 160,425	79.6% 137,625	55.2% 95,375	24.6% 42,500

