Total vegetation cover soil protection Region:NRM Riverina NSW

Date: May 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:

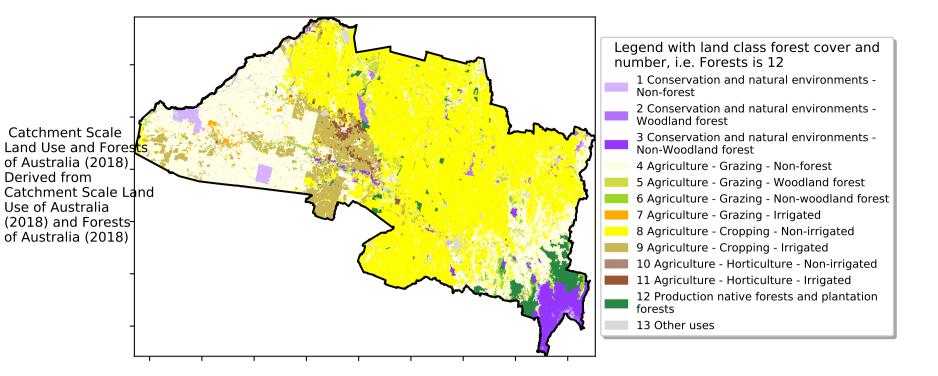
https://doi.org/10.4225/08/5848a3f19a7b3



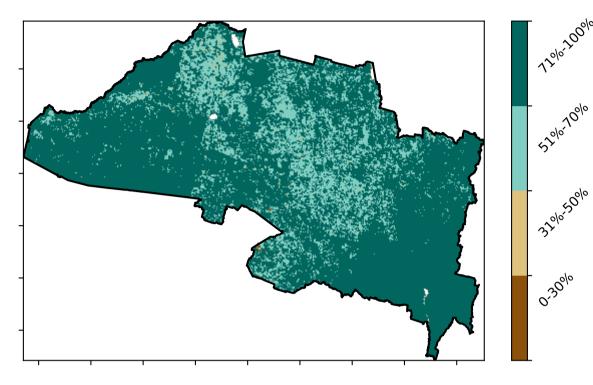
Vegetation Cover May 2012

Land use and forest cover

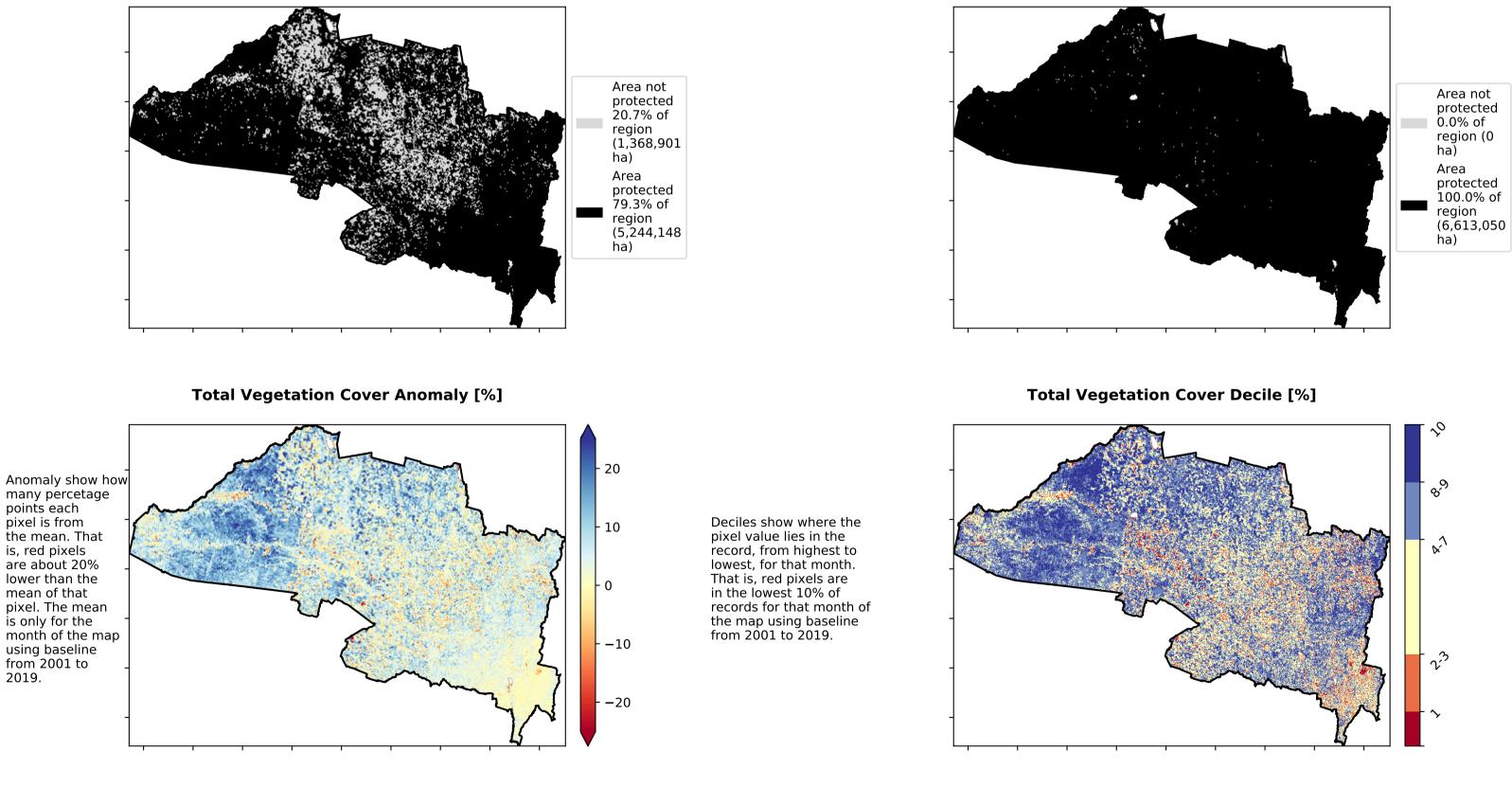
Proportion of each land class in area

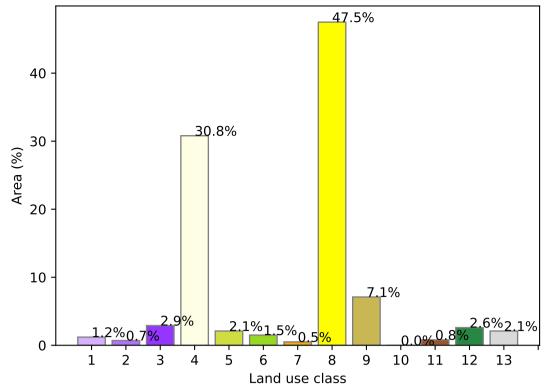


Total Vegetation Cover [%]

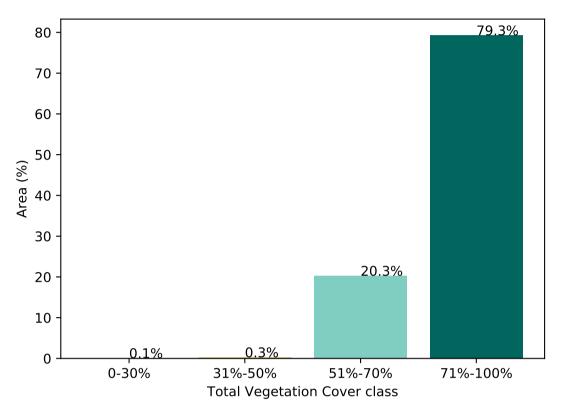


% Area protected from water erosion (>70%)

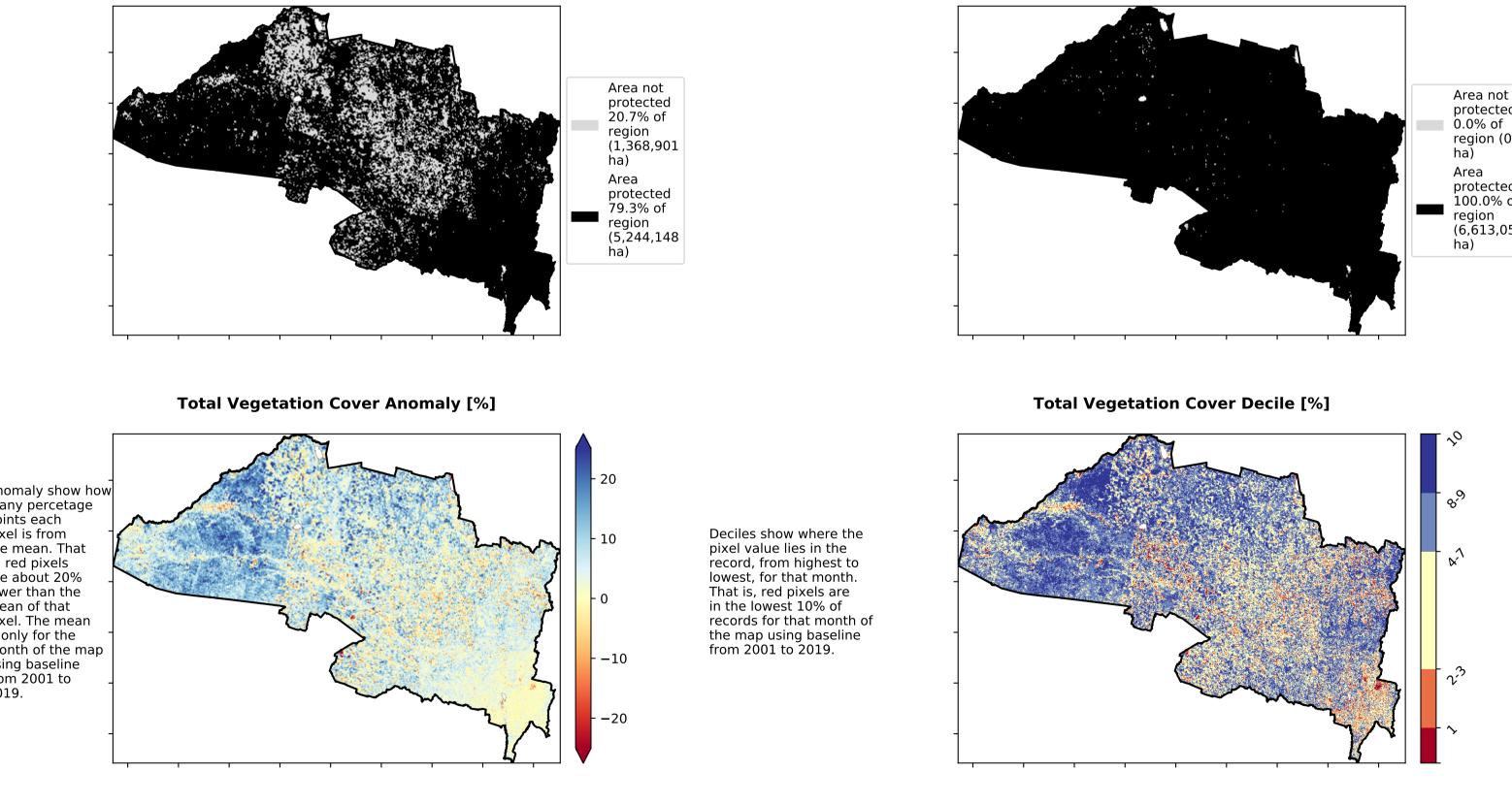




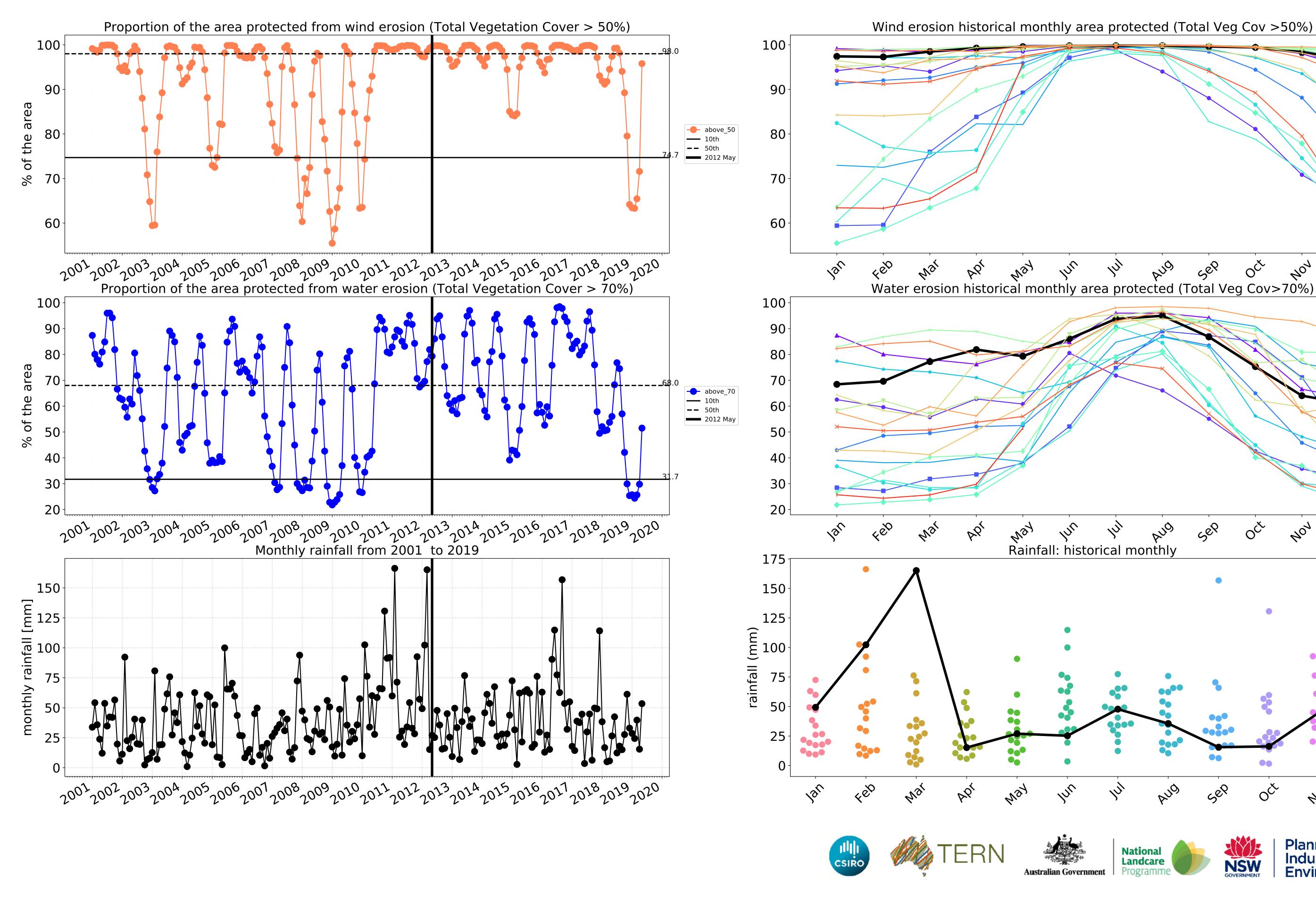
Proportion of vegetation cover class in area

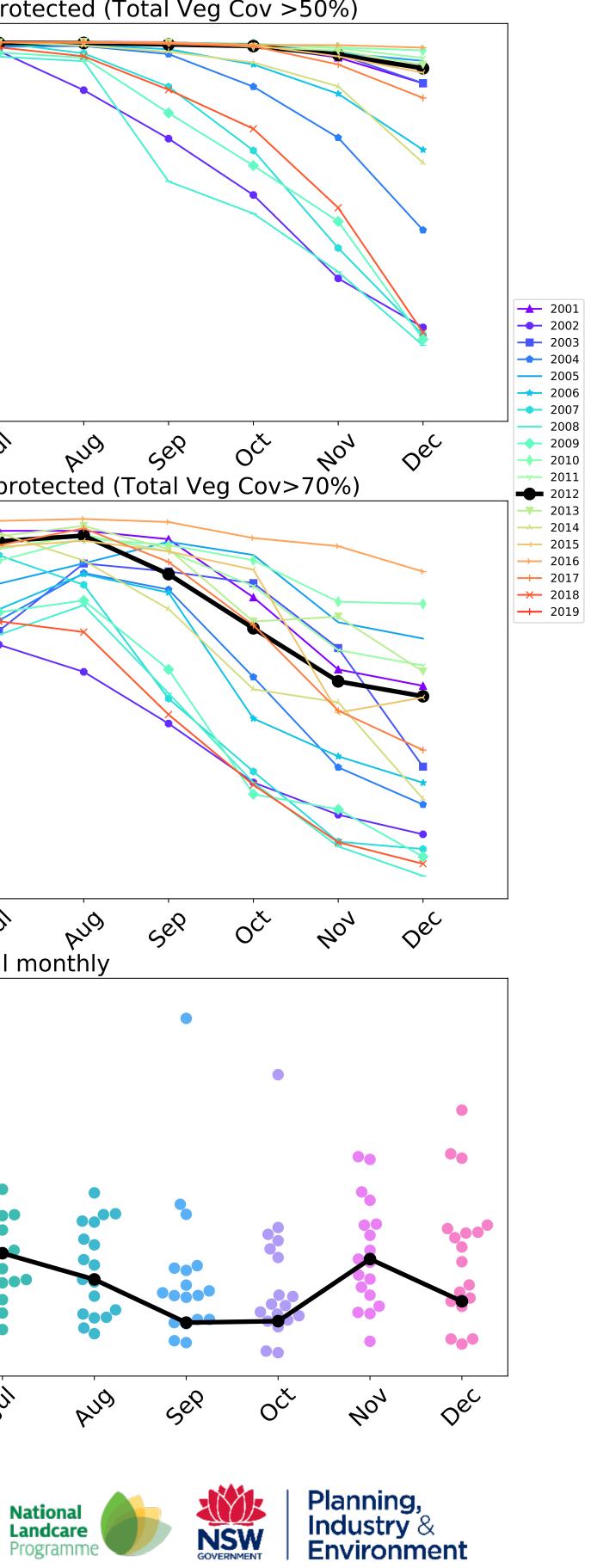


% Area protected from wind erosion (>50%)

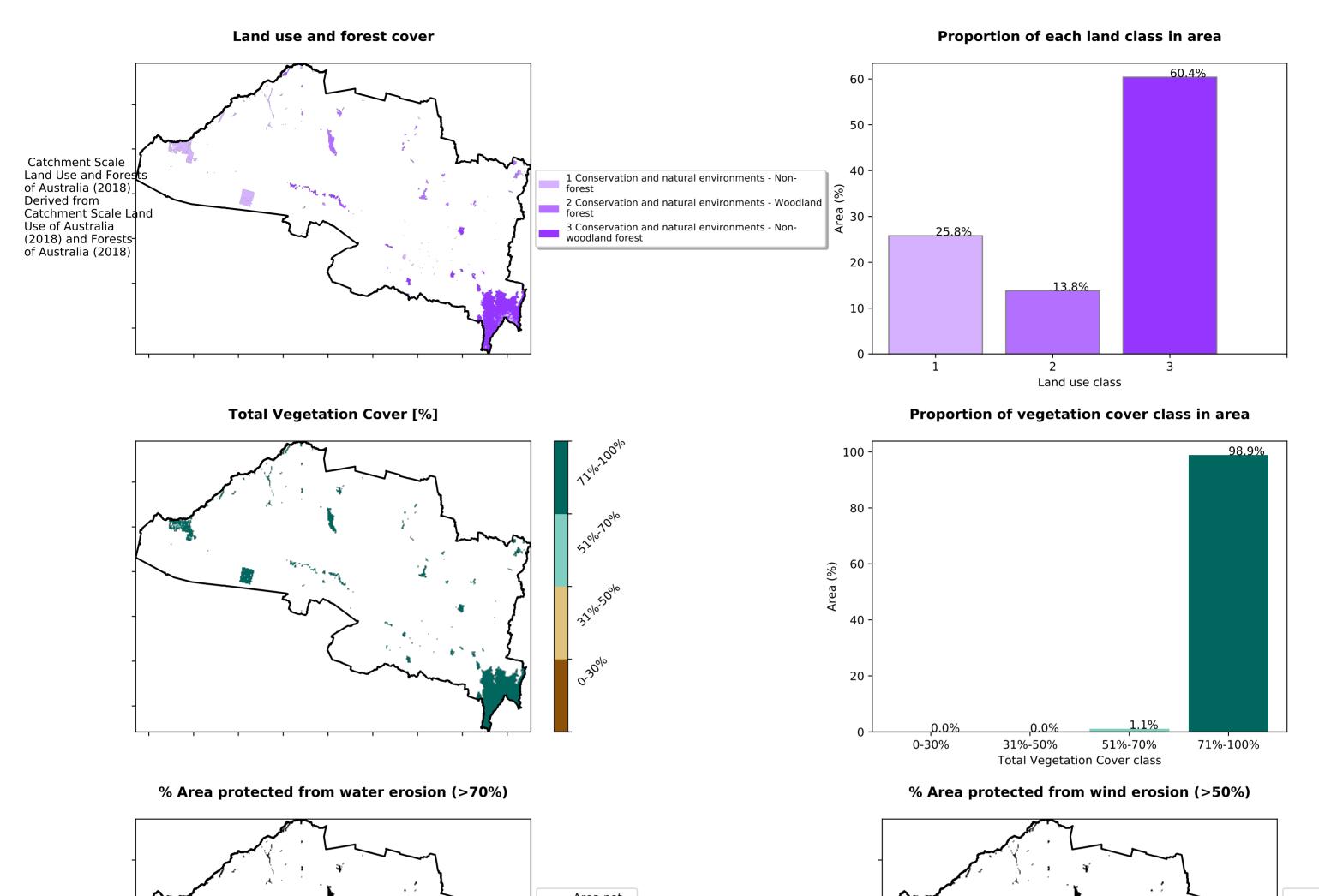






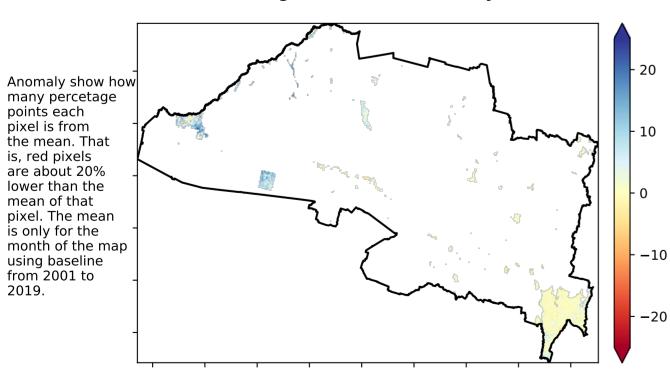


Conservation and natural environments

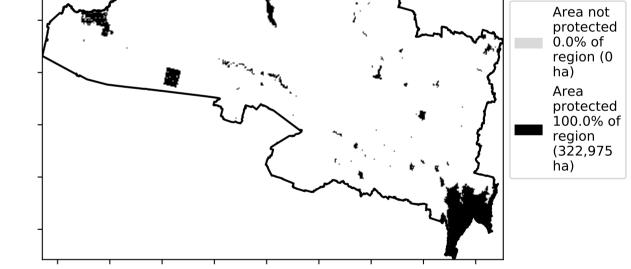




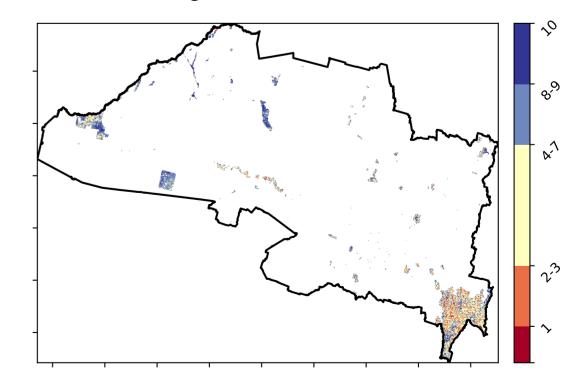
Total Vegetation Cover Anomaly [%]



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.



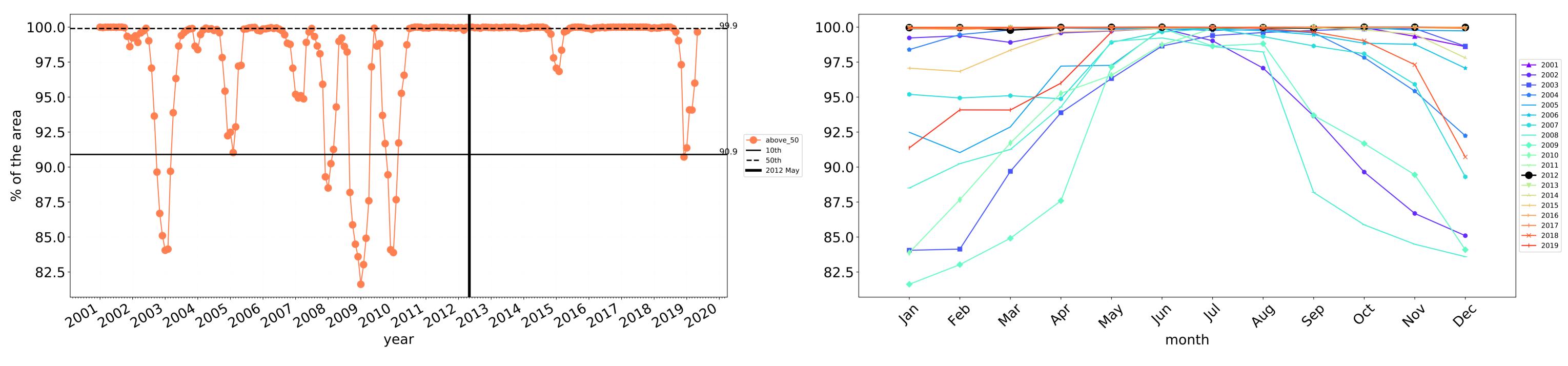
Total Vegetation Cover Decile [%]





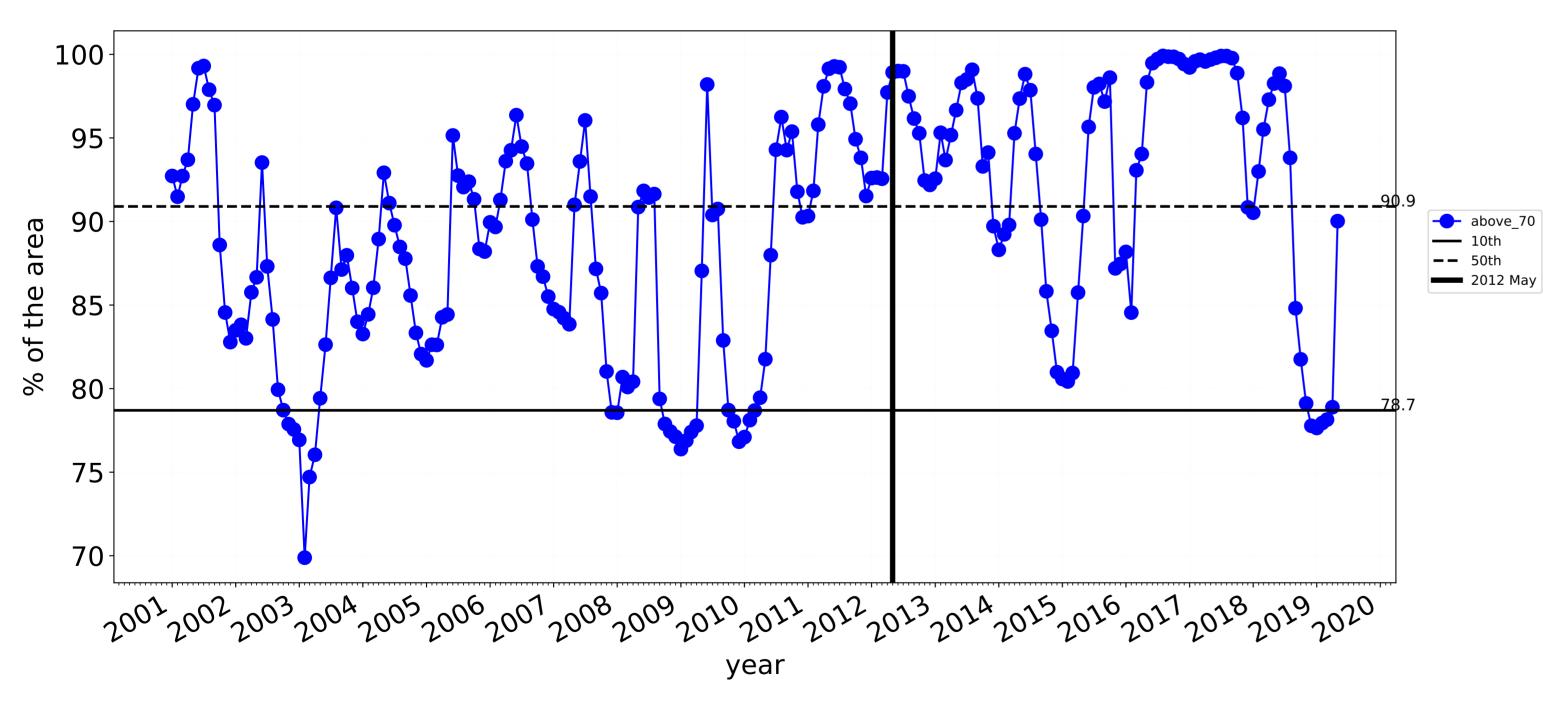
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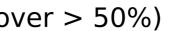
Conservation and natural environments timeseries



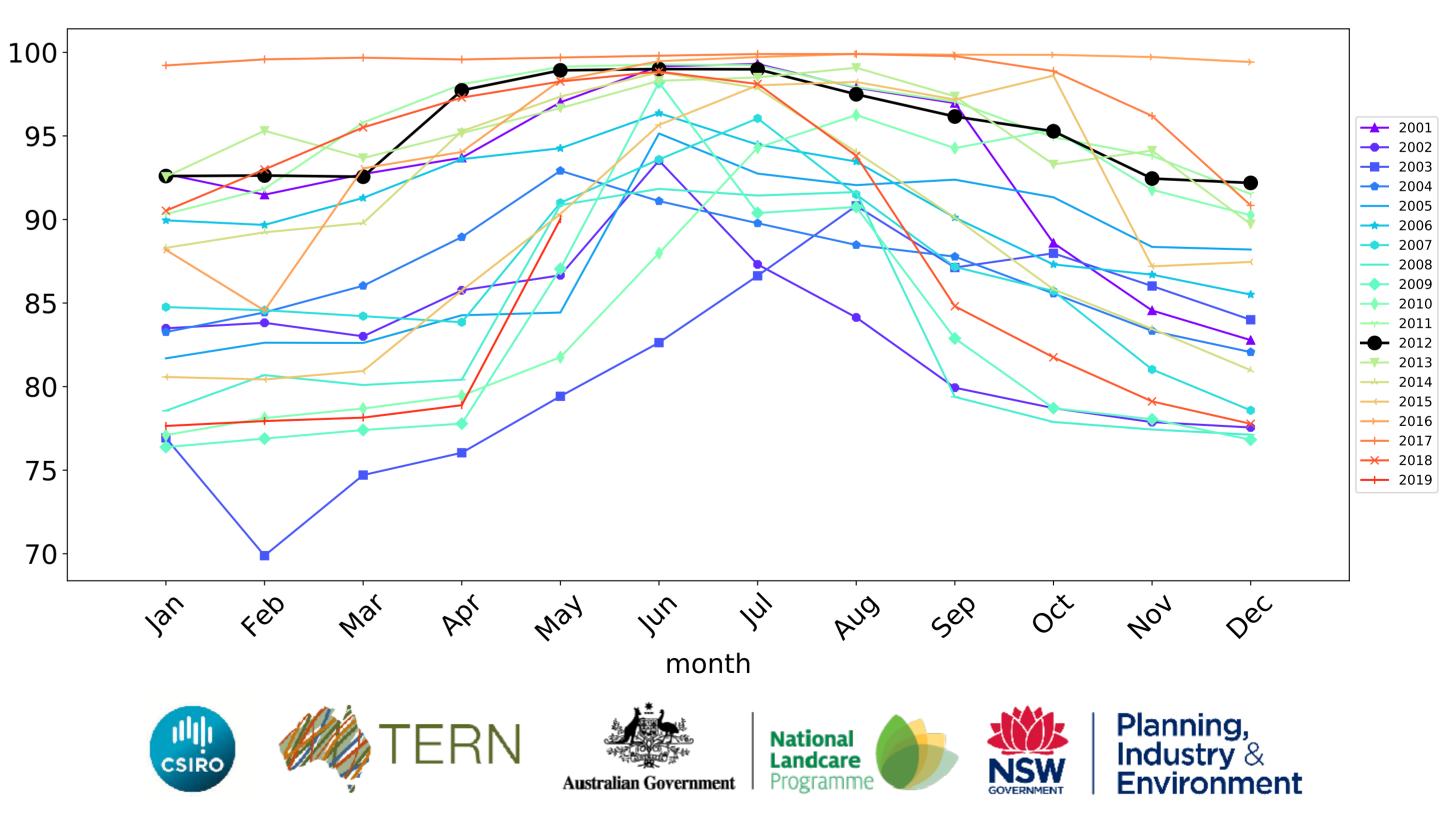
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

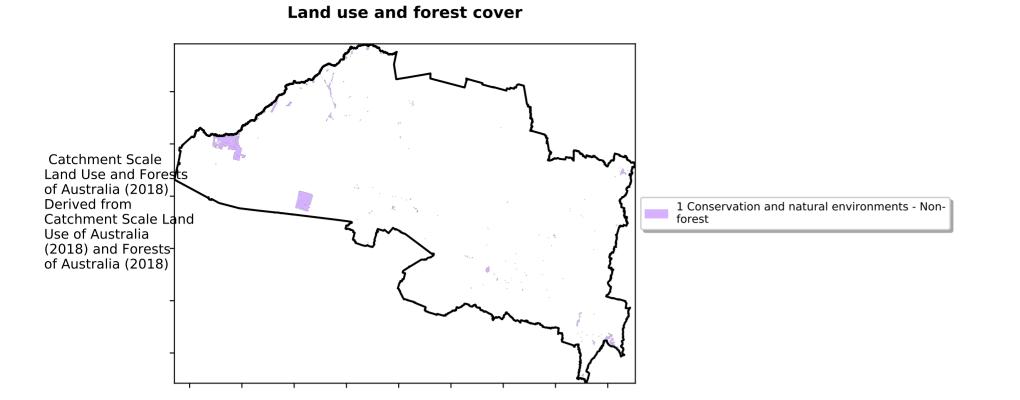




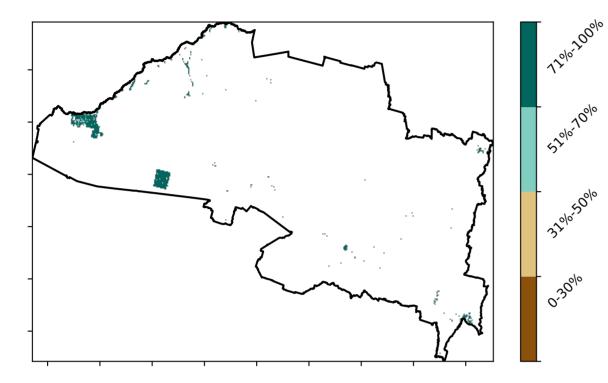
Wind erosion historical monthly area protected (Total Veg Cov >50%)



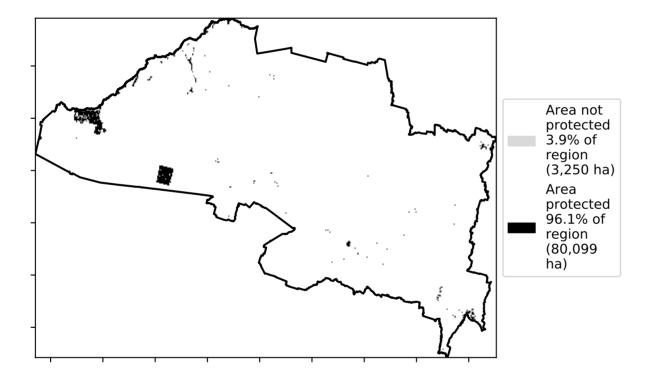
Conservation and natural environments non forest



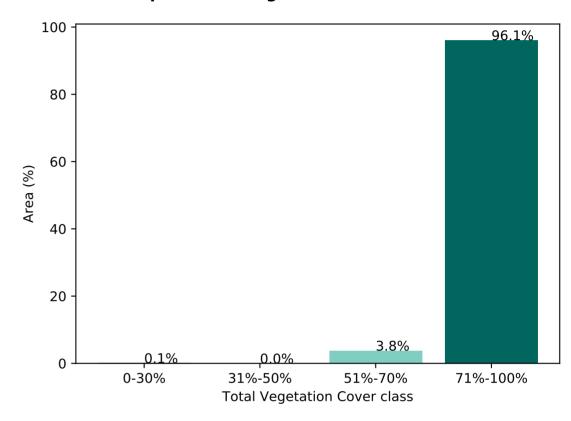
Total Vegetation Cover [%]



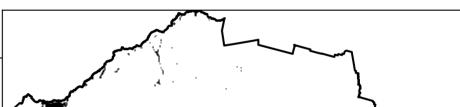
% Area protected from water erosion (>70%)



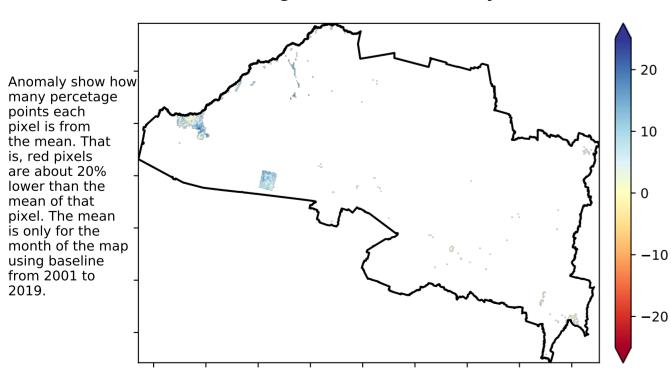




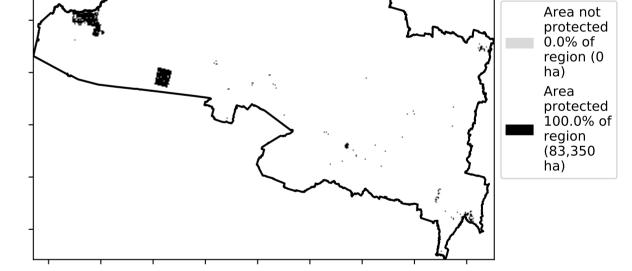
% Area protected from wind erosion (>50%)



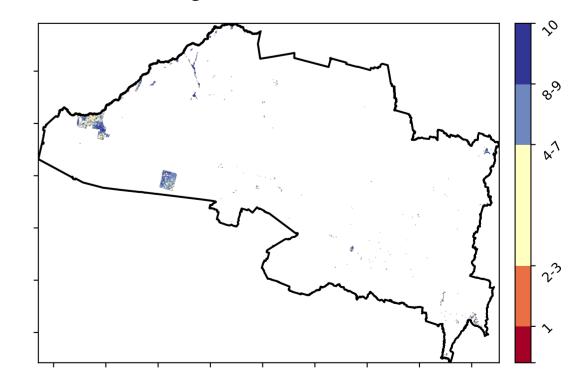
Total Vegetation Cover Anomaly [%]



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.



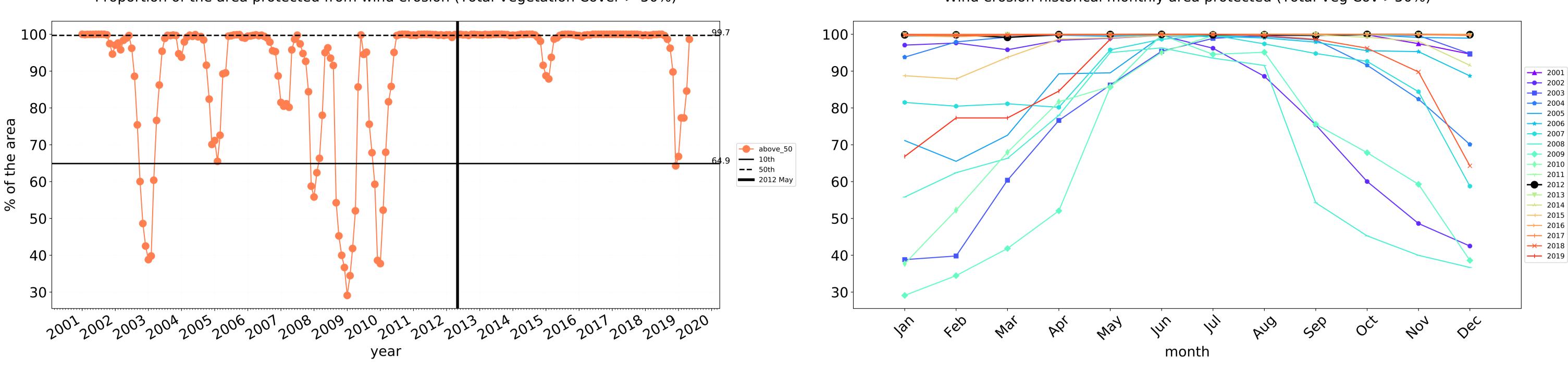
Total Vegetation Cover Decile [%]





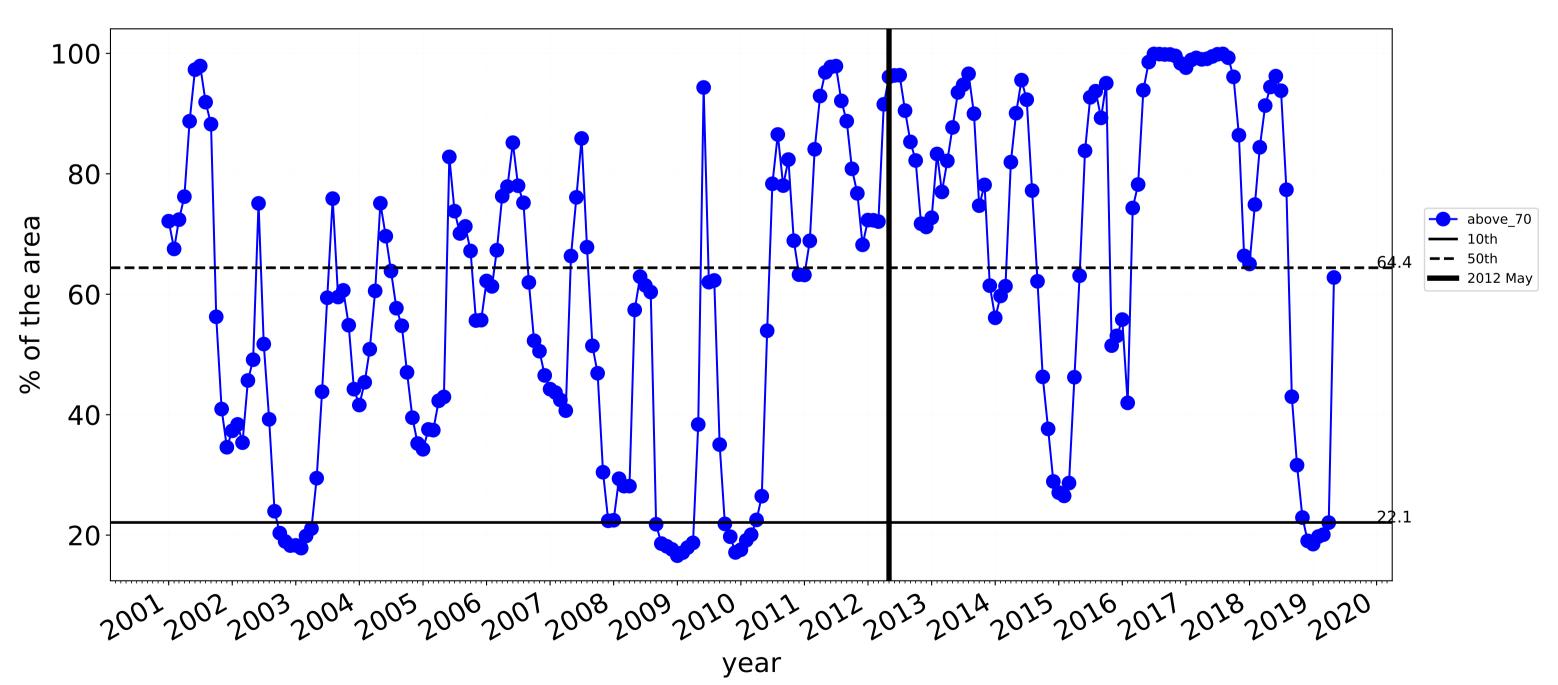
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Conservation and natural environments non forest timeseries

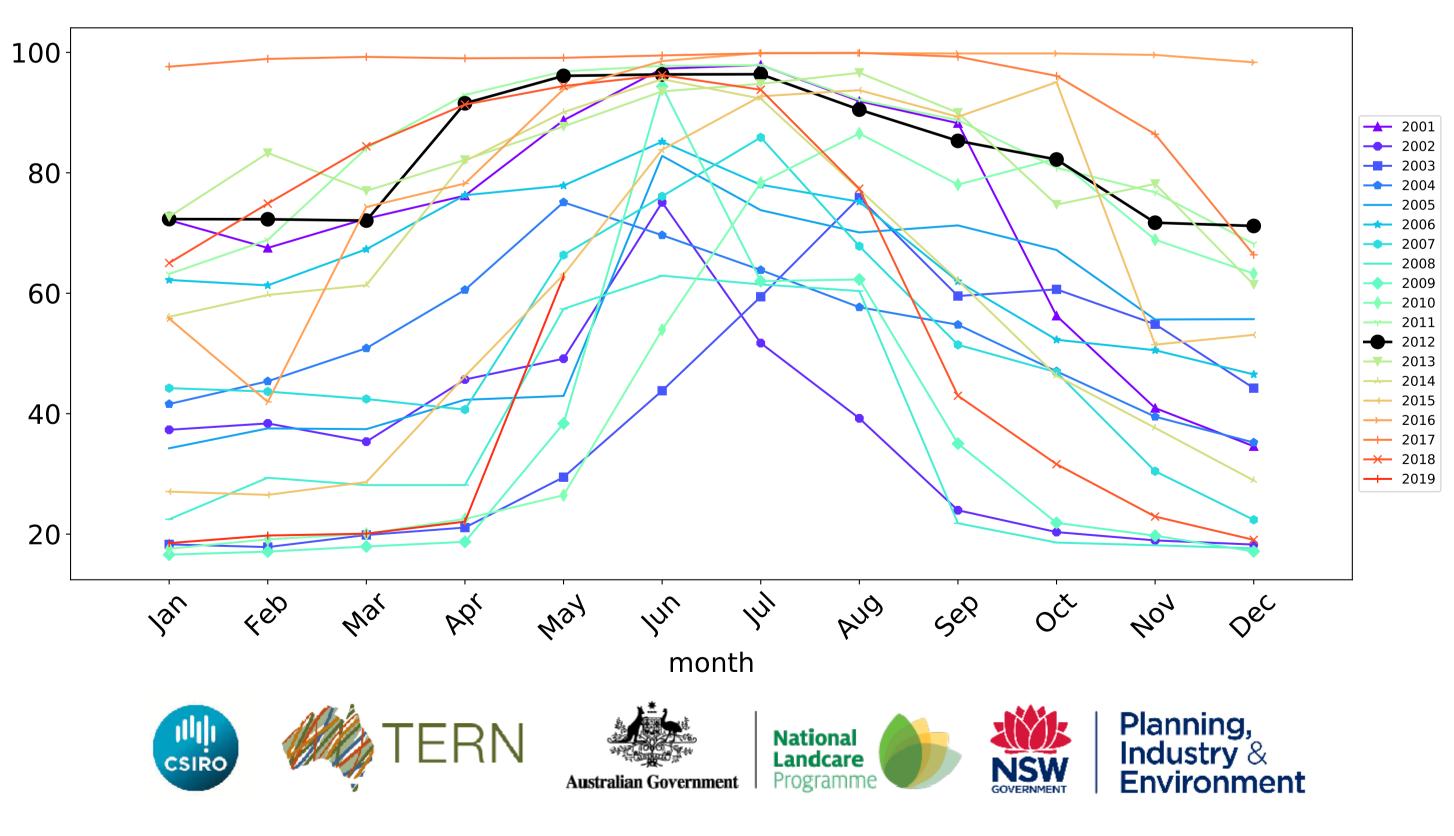


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

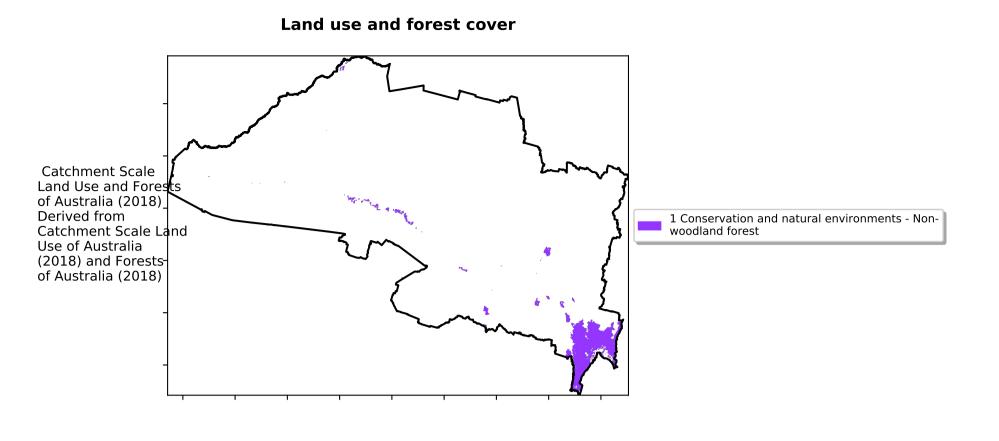




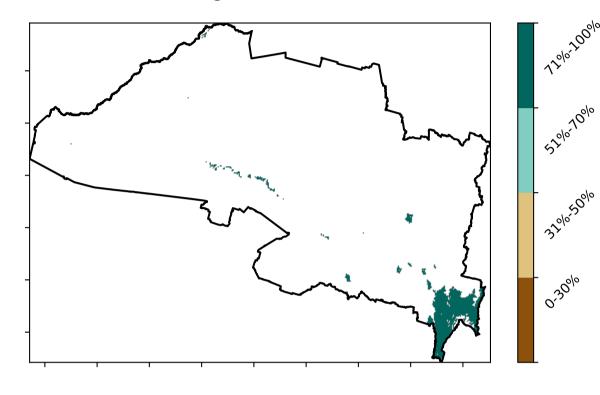
Wind erosion historical monthly area protected (Total Veg Cov >50%)



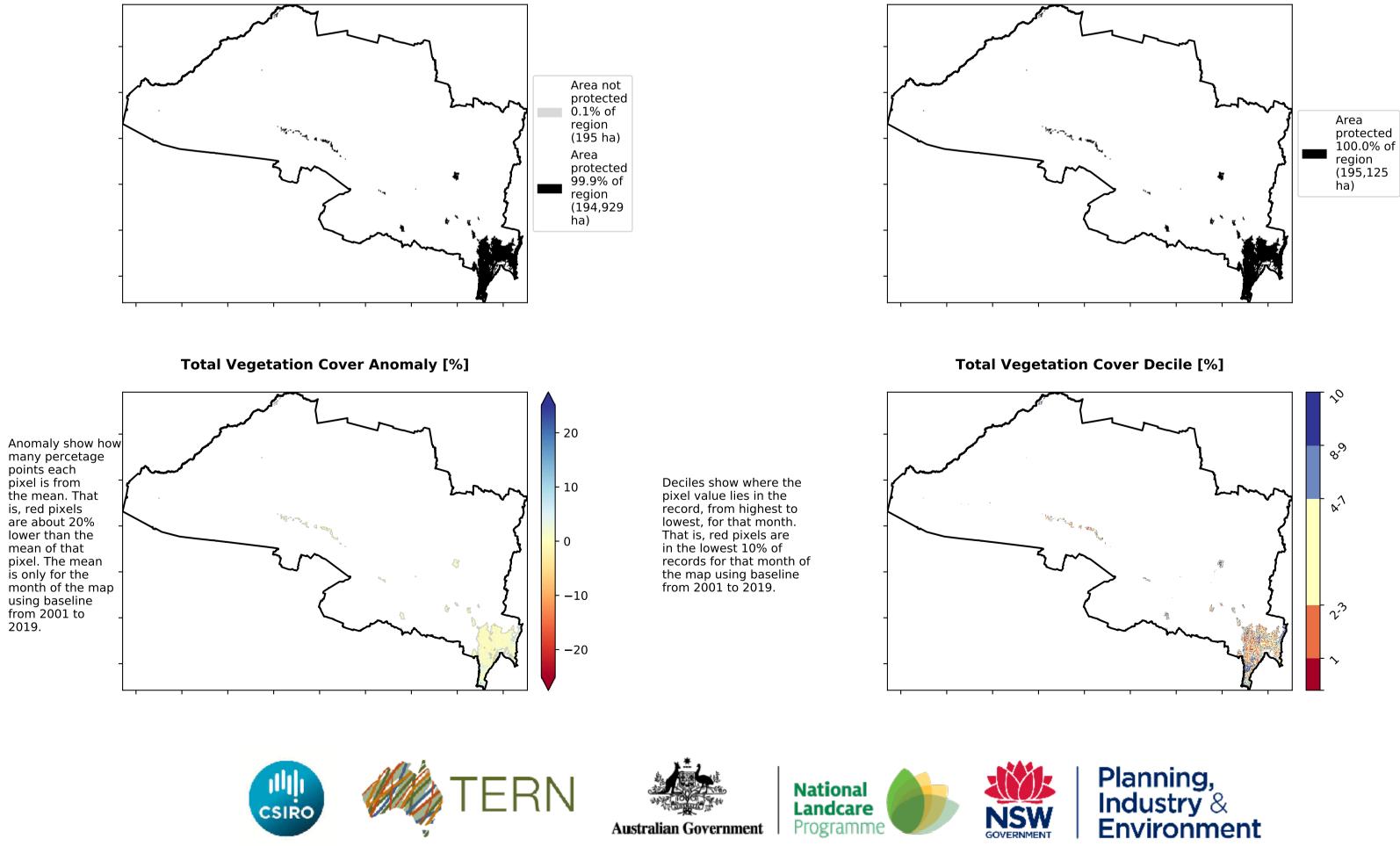
Conservation and natural environments Forest (non woodland)



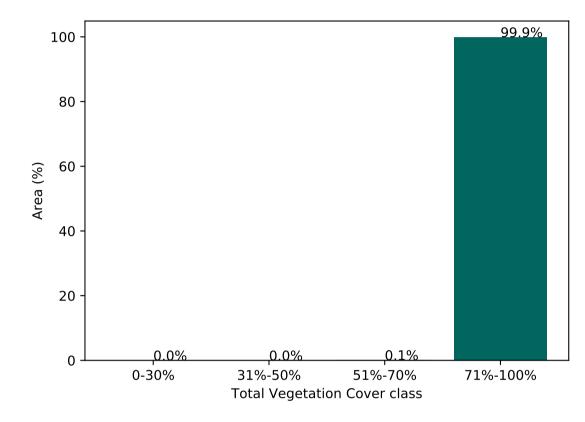
Total Vegetation Cover [%]



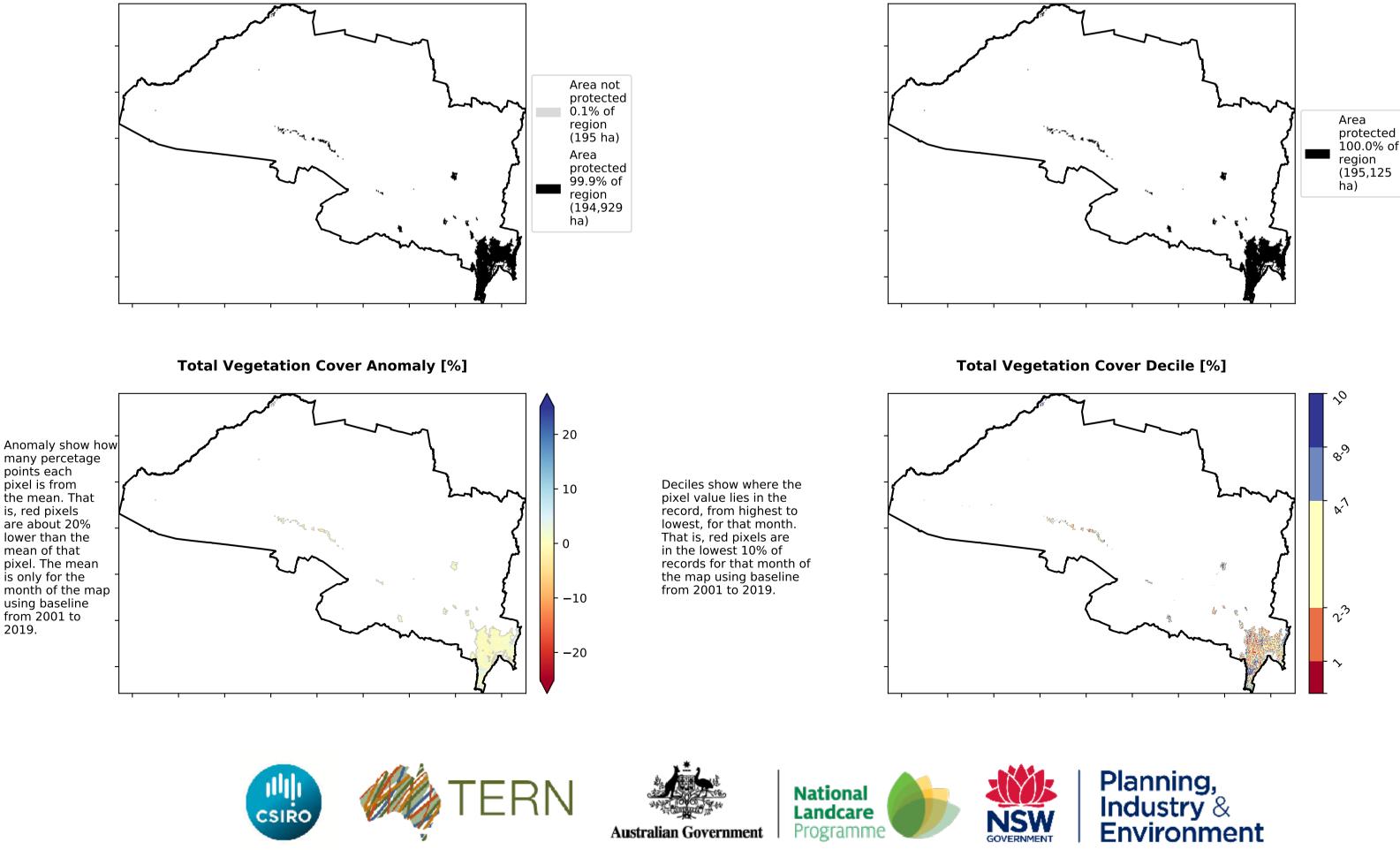
% Area protected from water erosion (>70%)



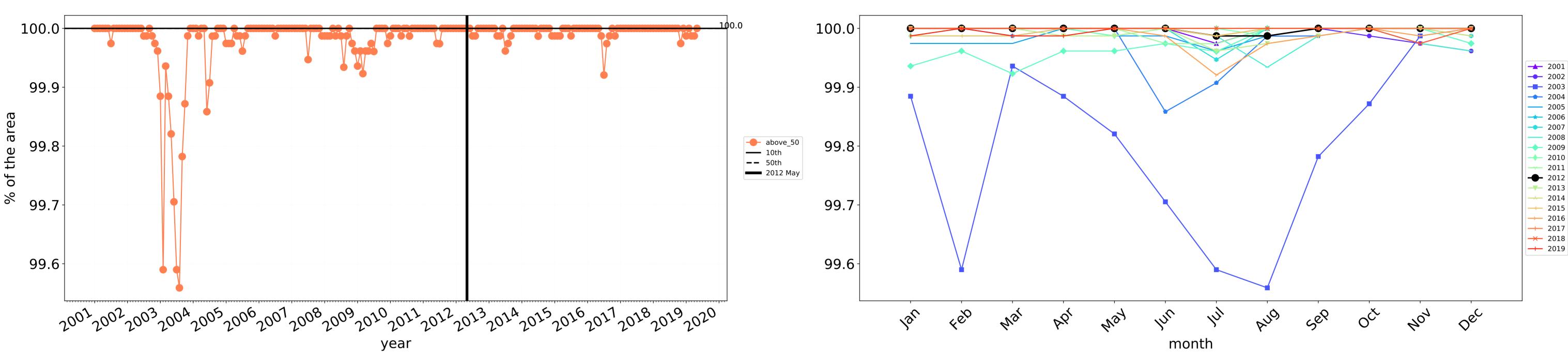
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

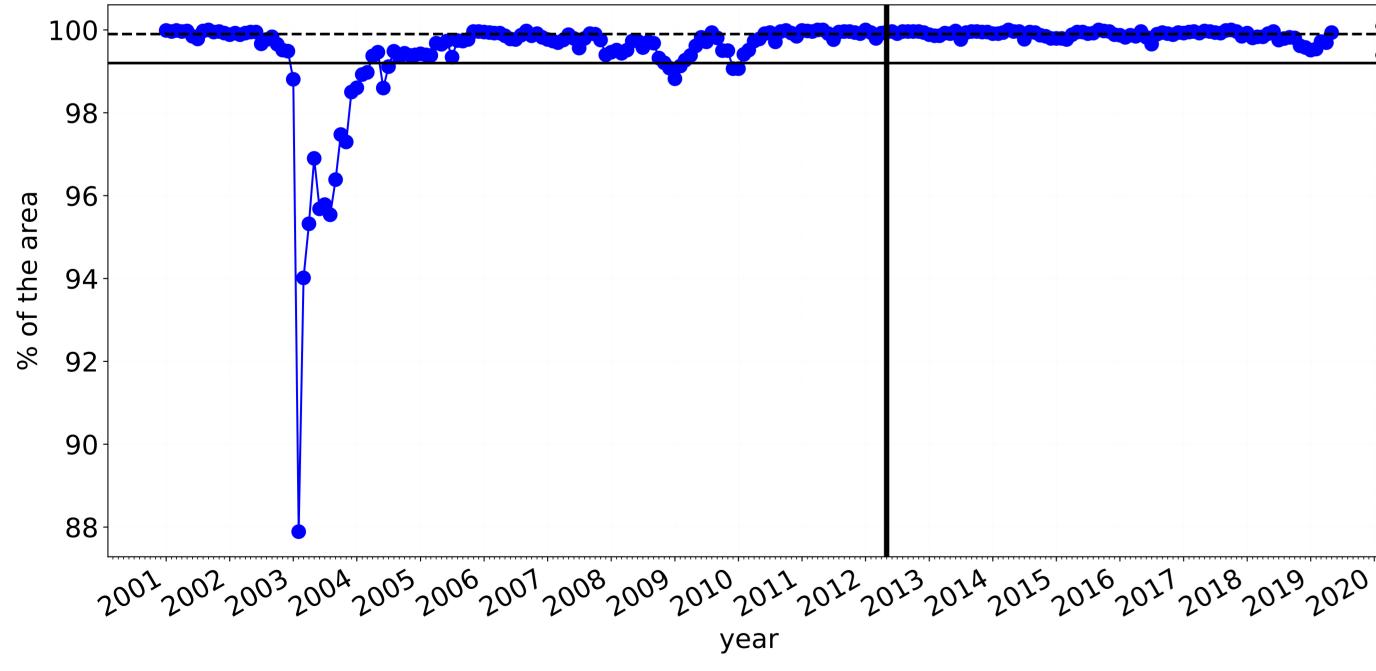


Conservation and natural environments Forest (non woodland) timeseries



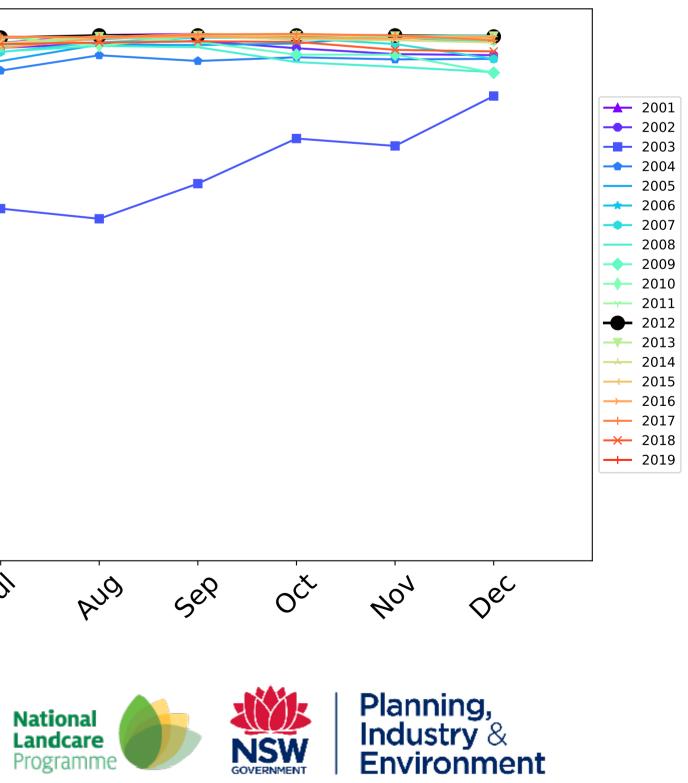
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



100 98 96 ---- above_70 **—** 10th **——** 50th **——** 2012 May 94 92 90 88 lar 4eb way In PQ 1/2/ Mar month TERN CSIRO Australian Government

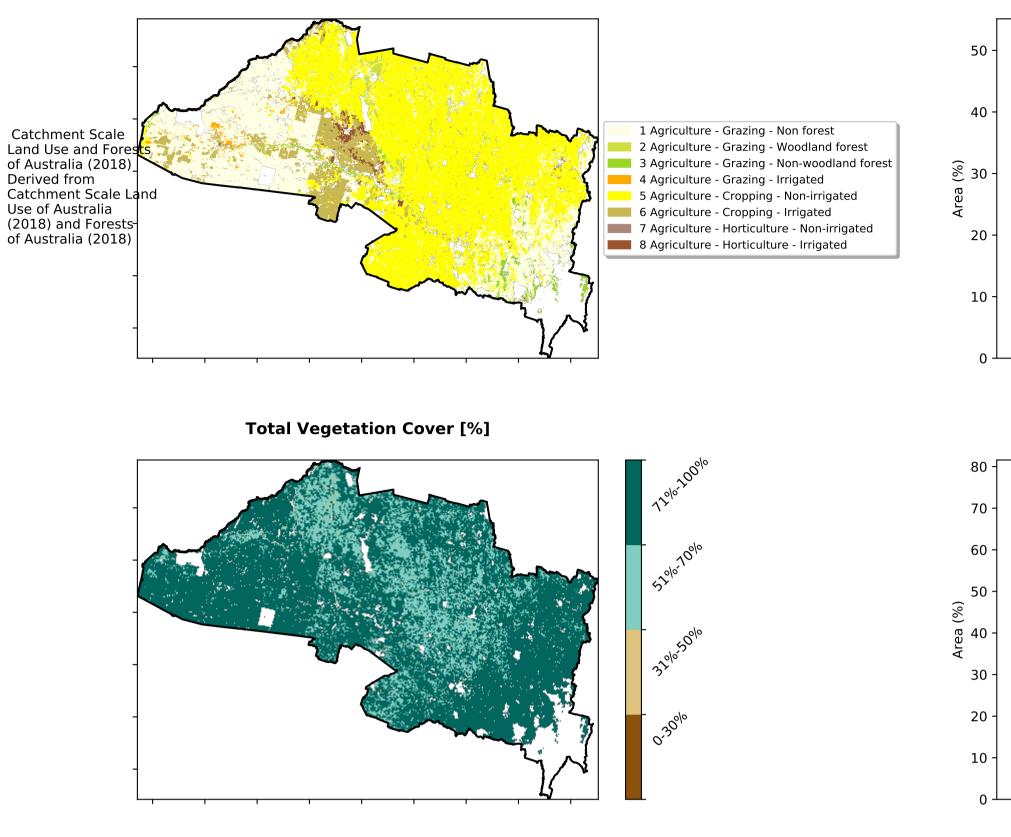
Water erosion historical monthly area protected (Total Veg Cov>70%)



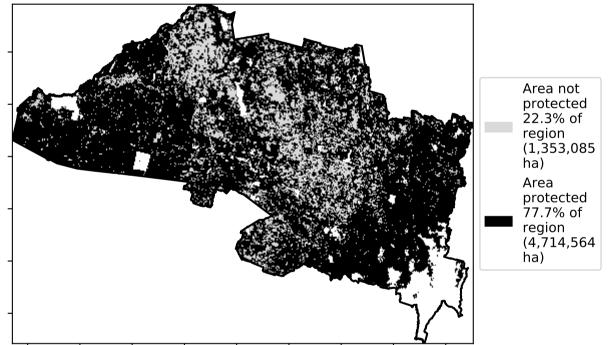
Agriculture

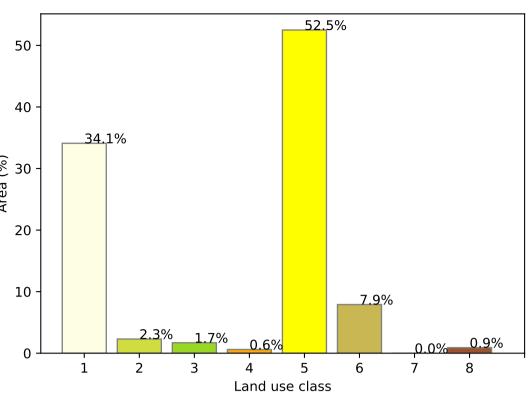
Land use and forest cover

Proportion of each land class in area

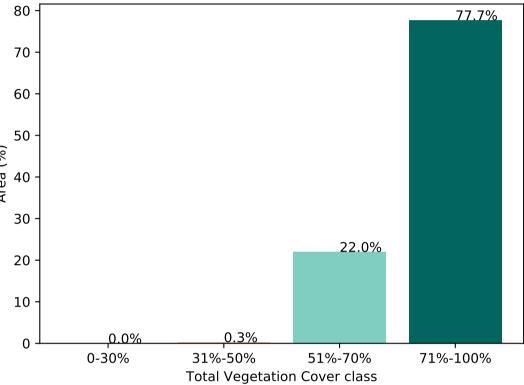


% Area protected from water erosion (>70%)





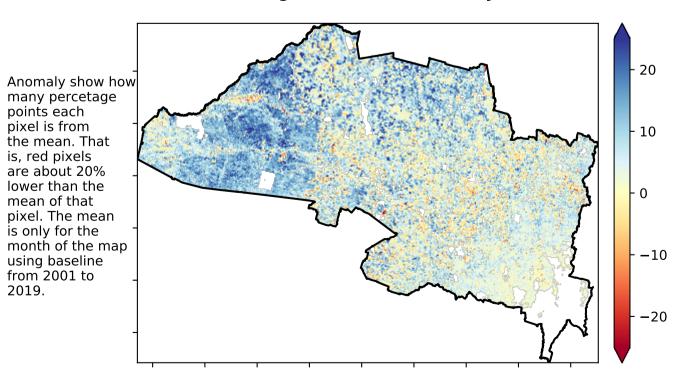
Proportion of vegetation cover class in area



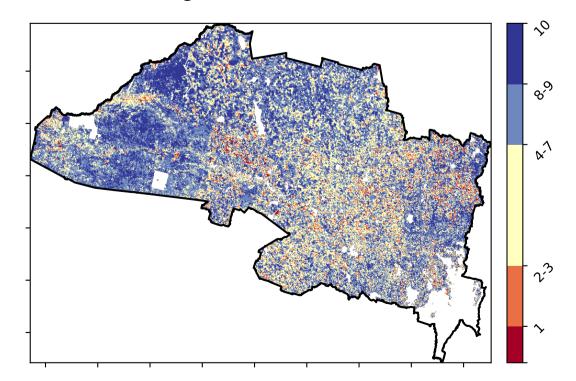
% Area protected from wind erosion (>50%)



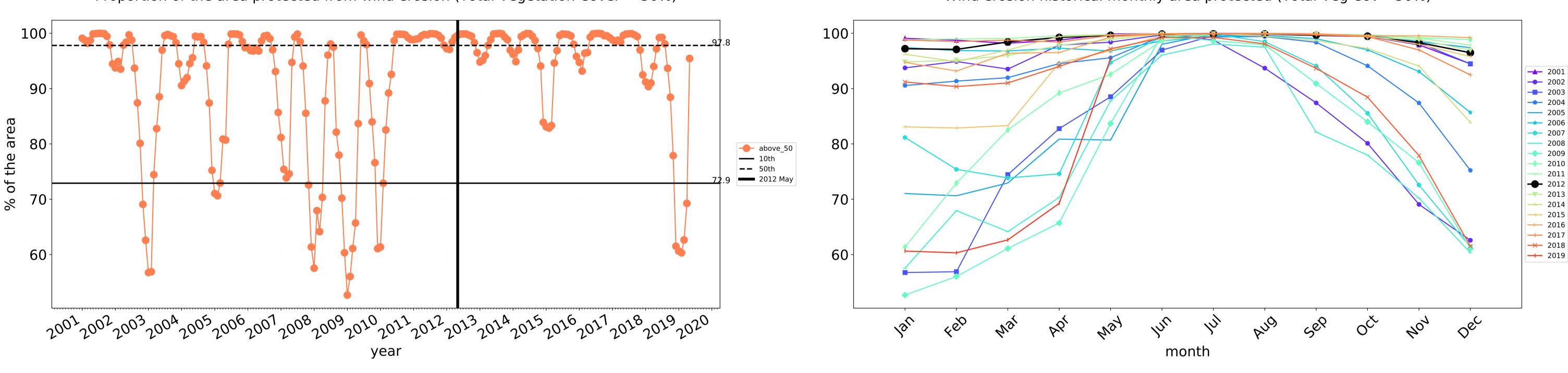
Total Vegetation Cover Anomaly [%]



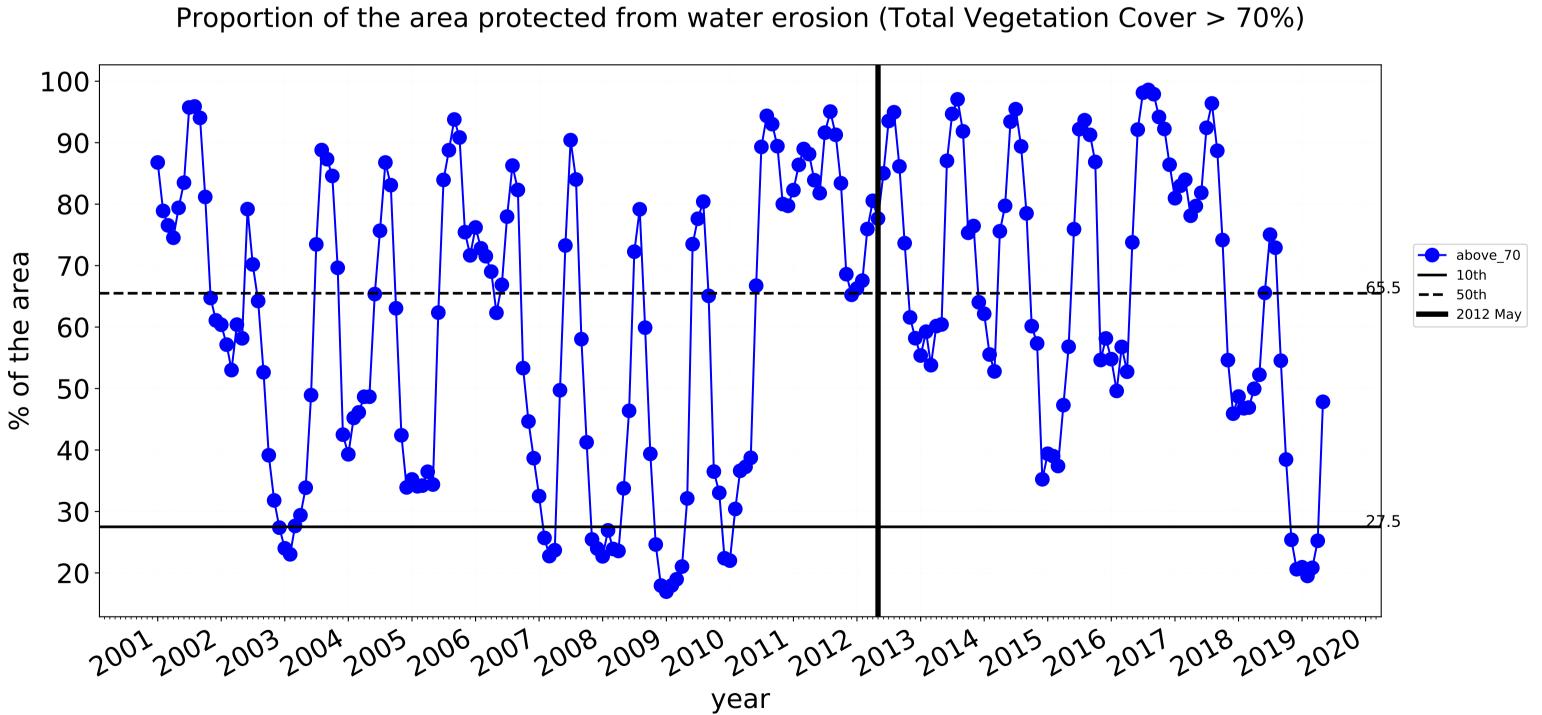
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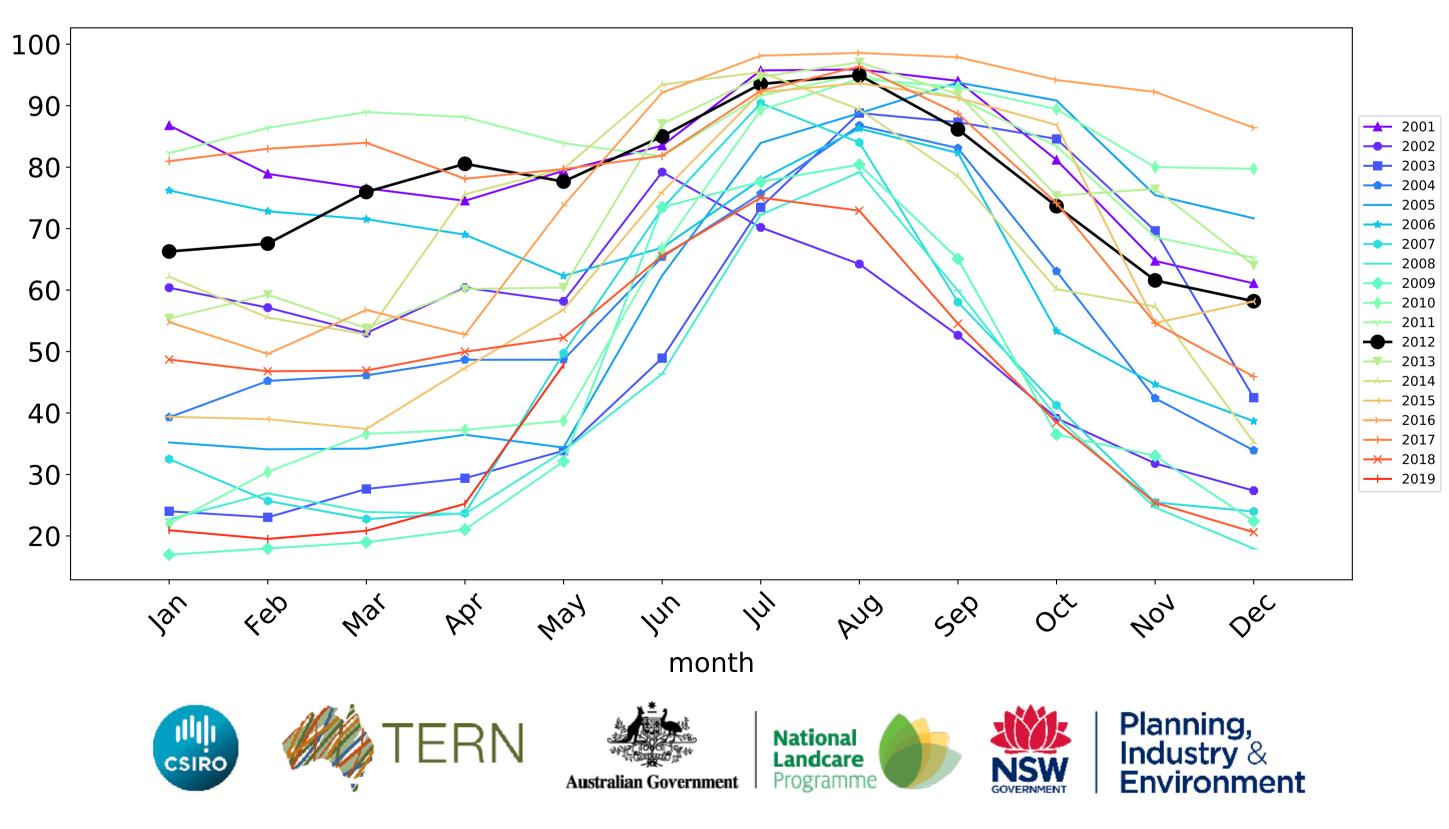


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



Agriculture timeseries

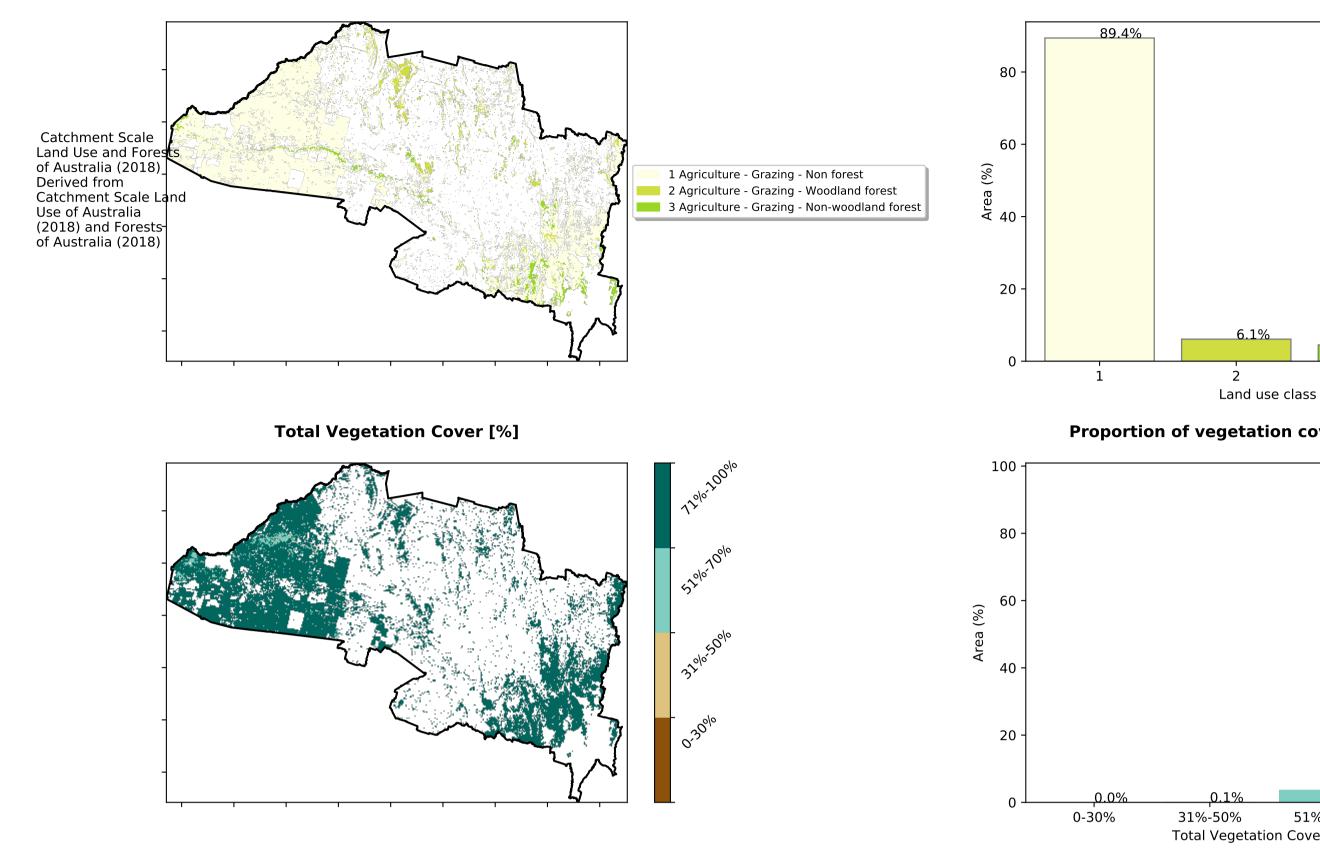
Water erosion historical monthly area protected (Total Veg Cov>70%)



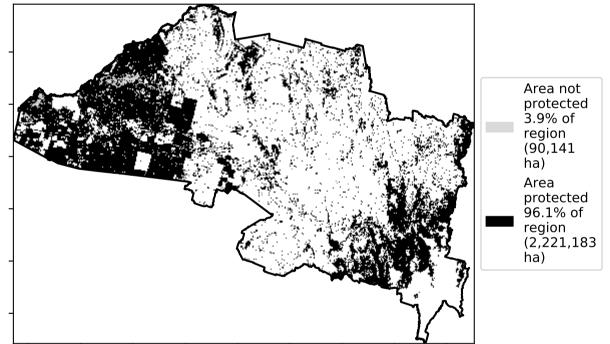
Grazing

Land use and forest cover

Proportion of each land class in area



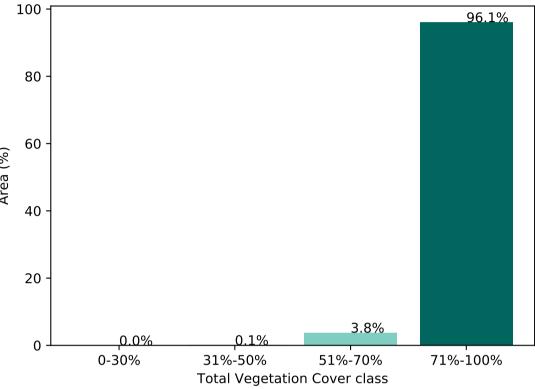
% Area protected from water erosion (>70%)



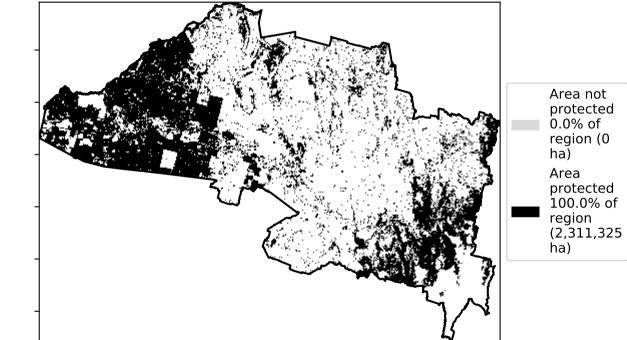
Proportion of vegetation cover class in area

4.5%

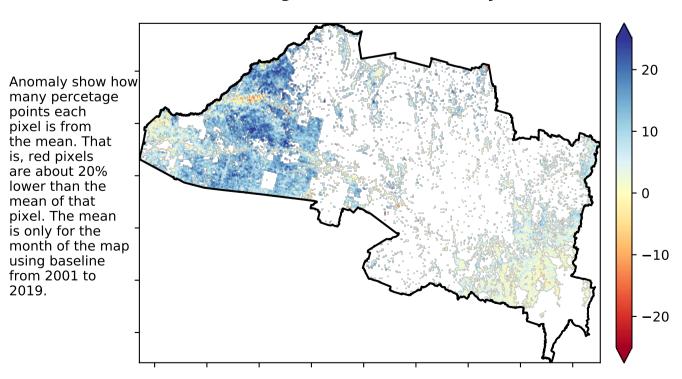
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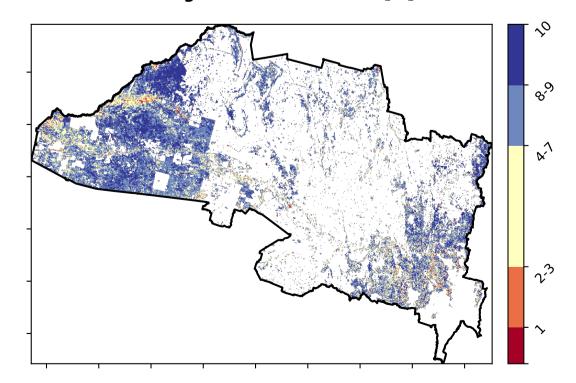
% Area protected from wind erosion (>50%)



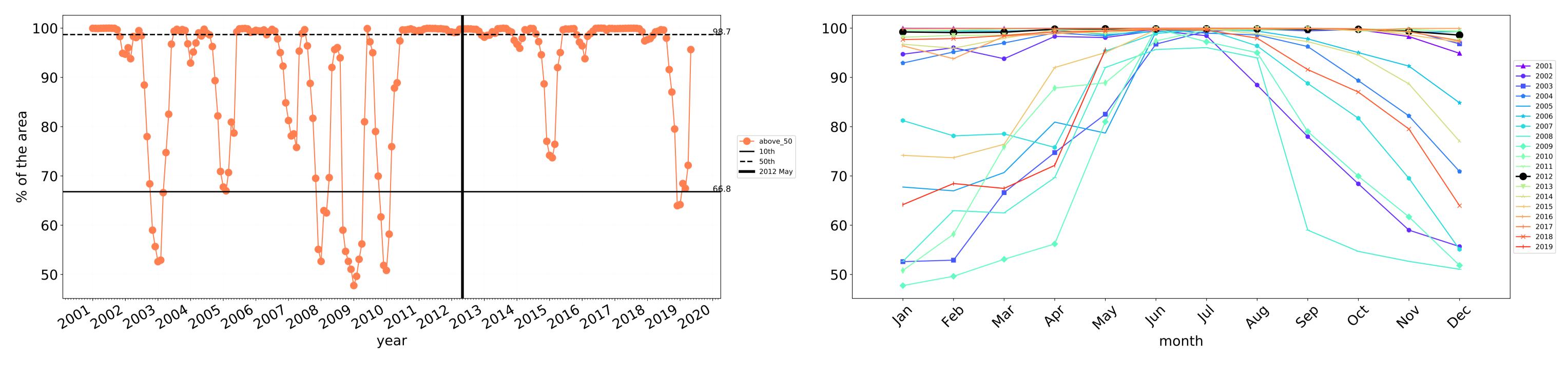
Total Vegetation Cover Anomaly [%]



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.

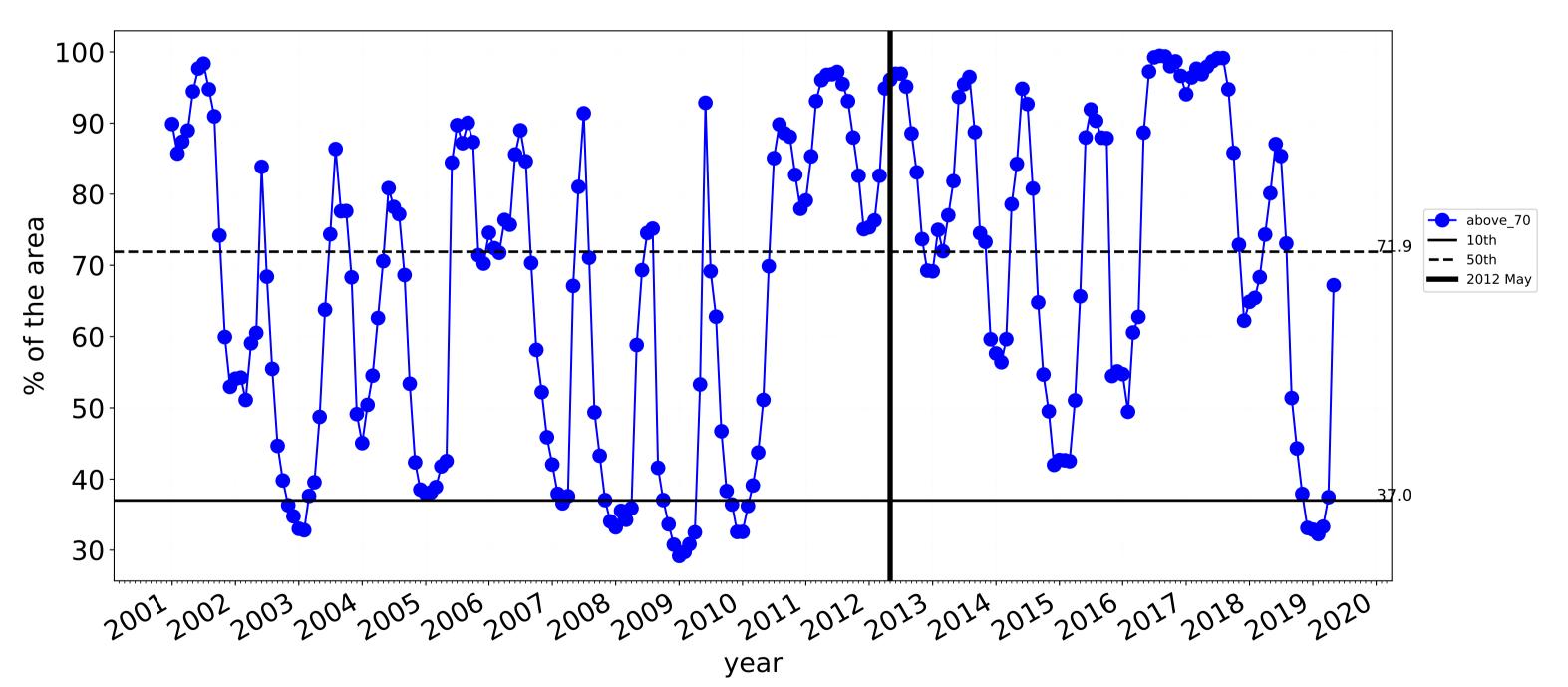






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

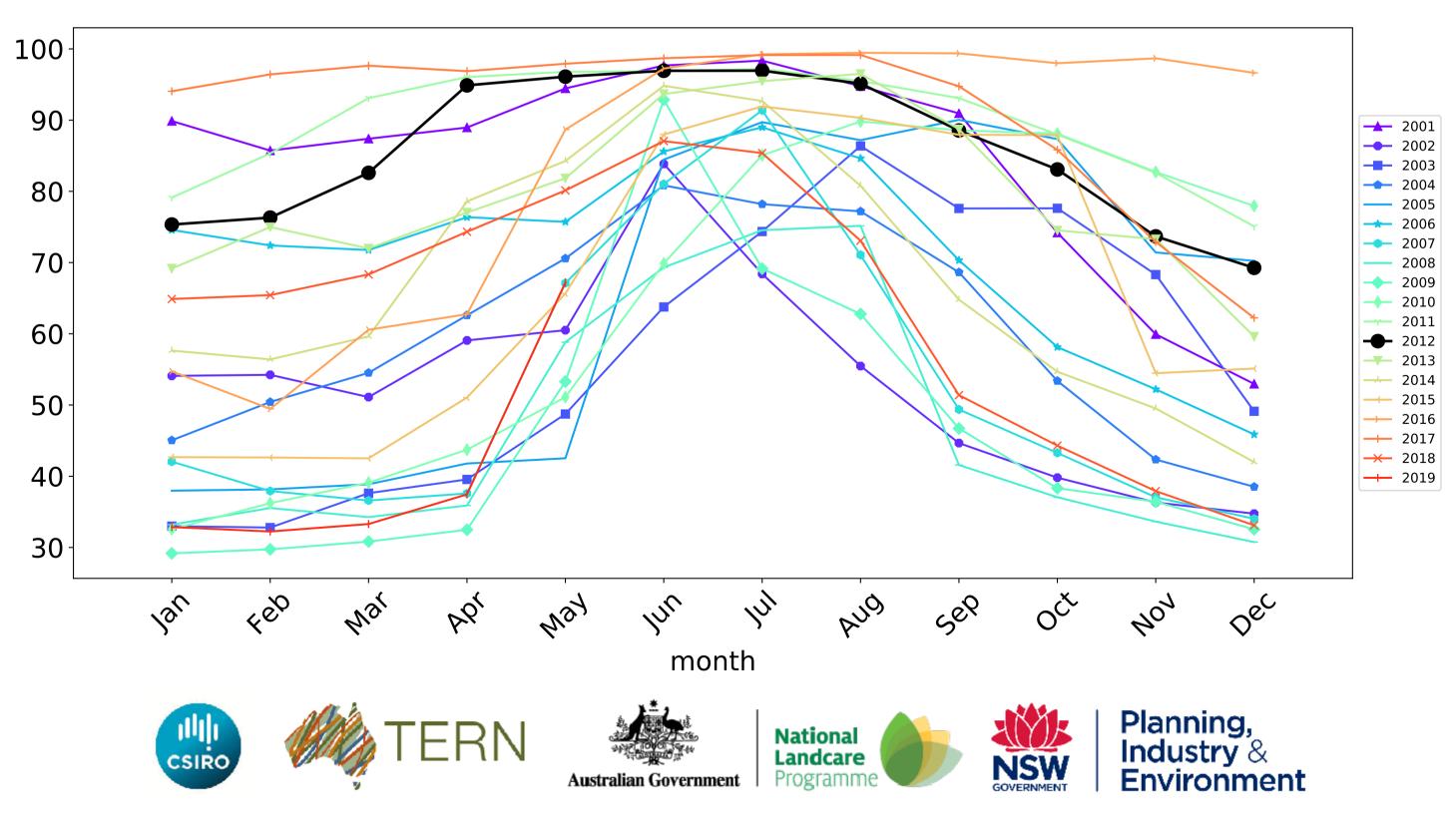




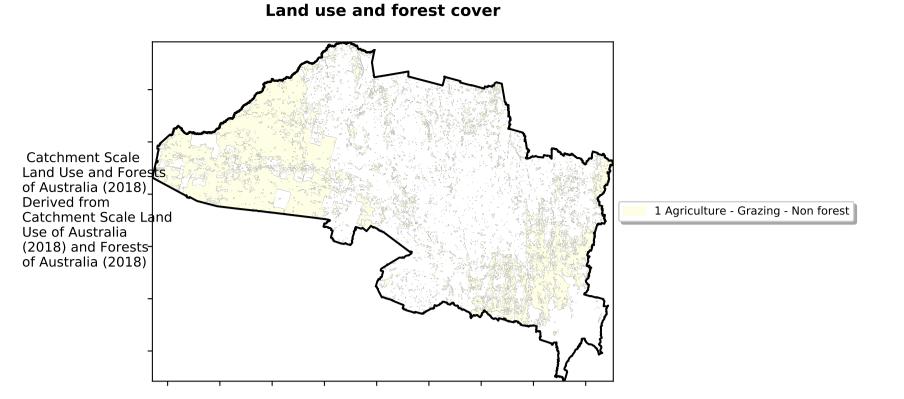
Grazing timeseries



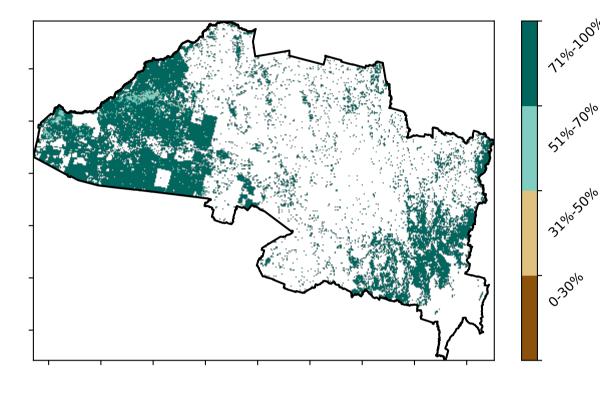
Wind erosion historical monthly area protected (Total Veg Cov >50%)



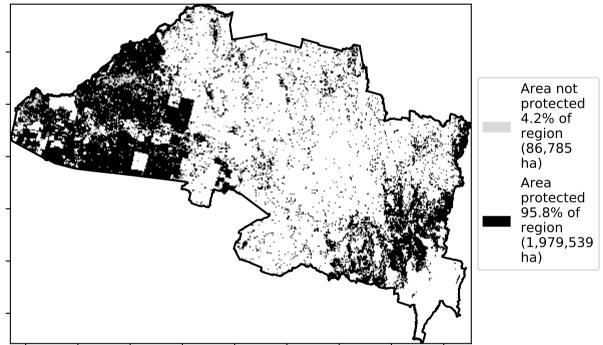
Grazing non forest



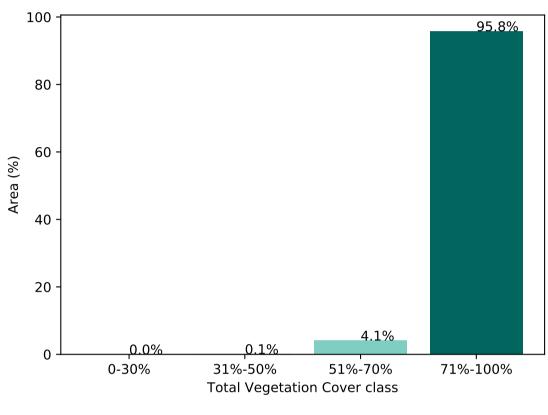
Total Vegetation Cover [%]



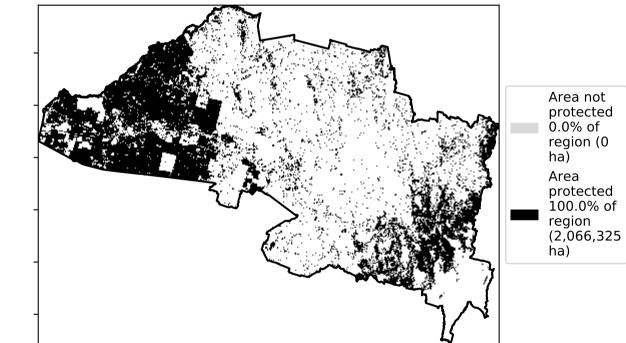
% Area protected from water erosion (>70%)



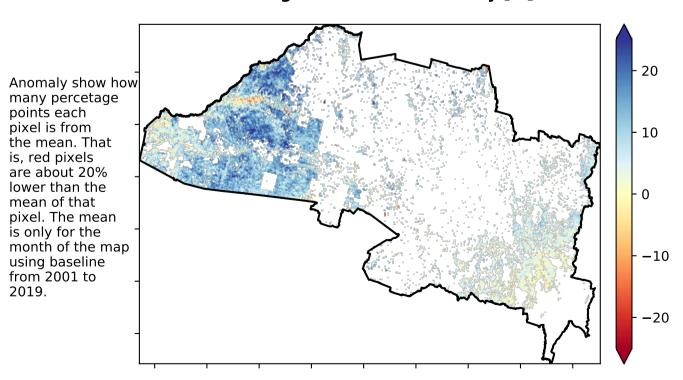
Proportion of vegetation cover class in area



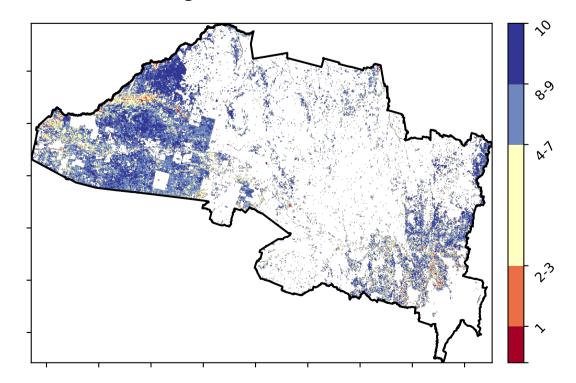
% Area protected from wind erosion (>50%)



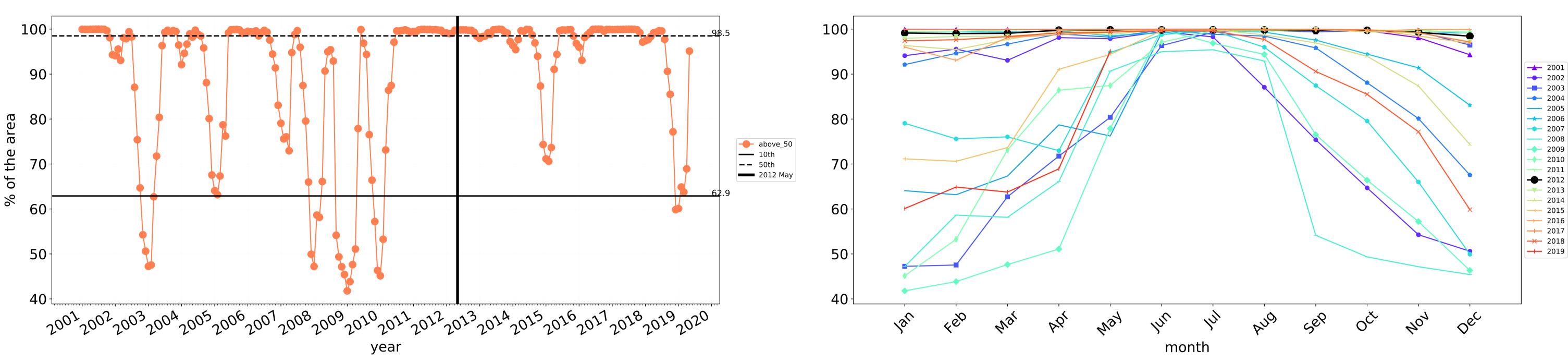
Total Vegetation Cover Anomaly [%]



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

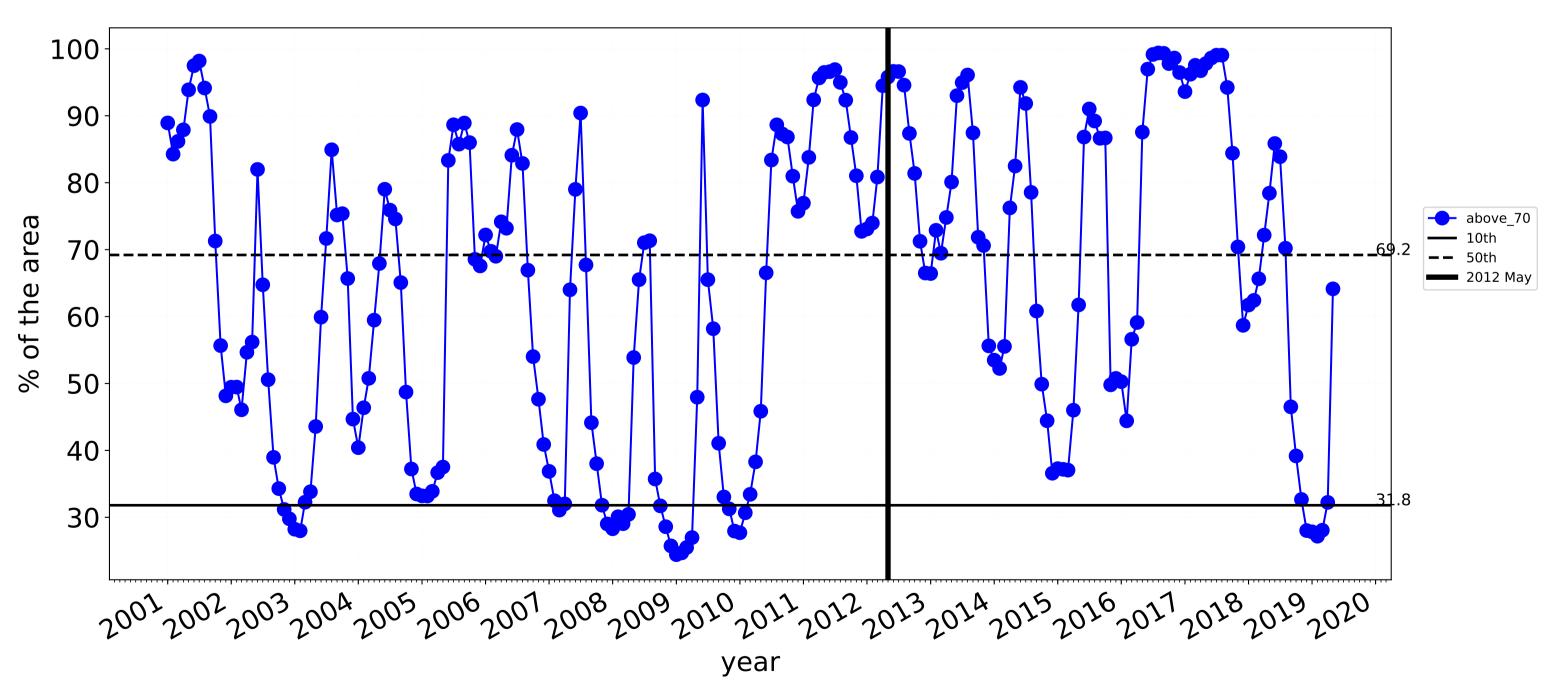






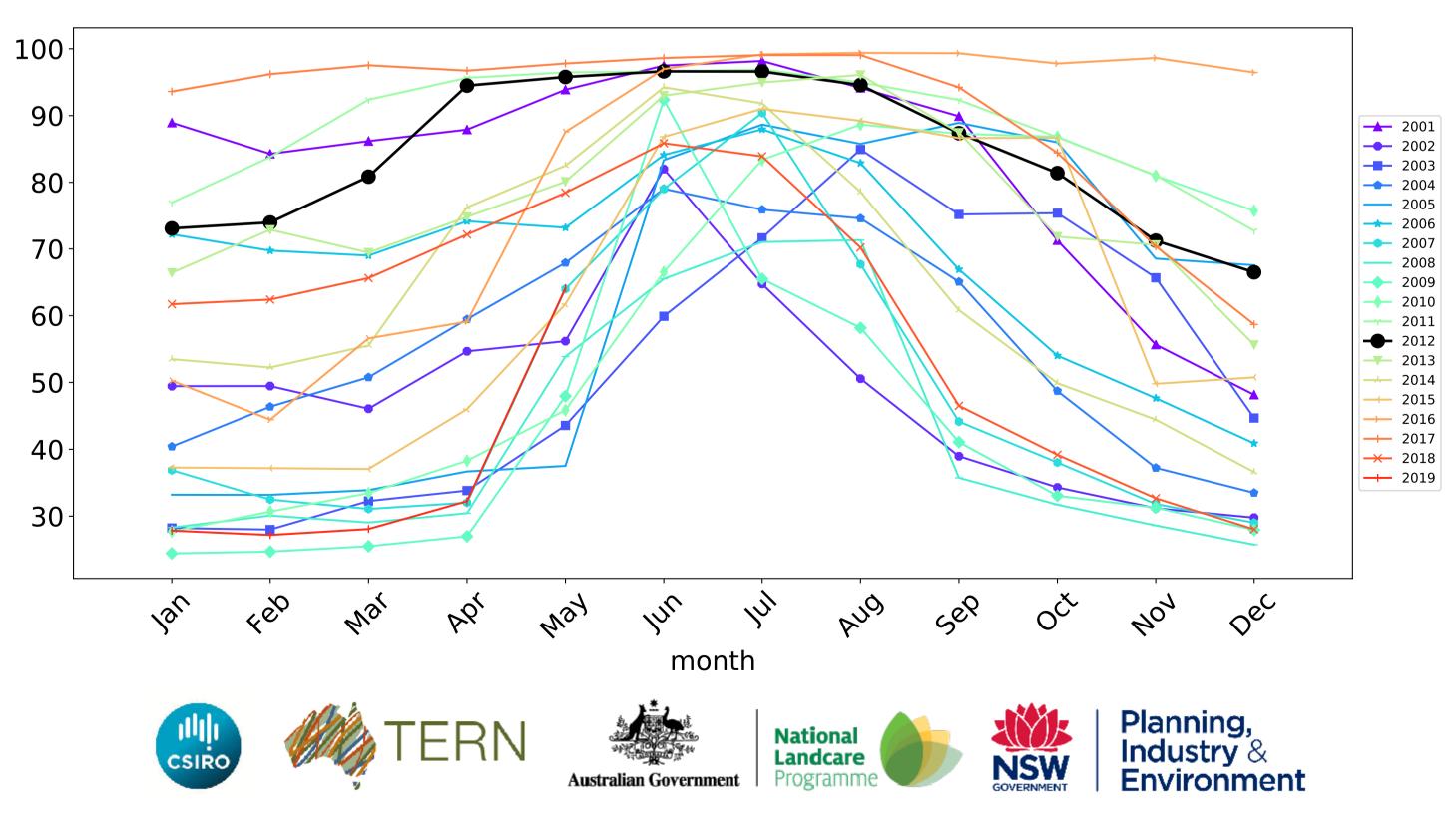
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



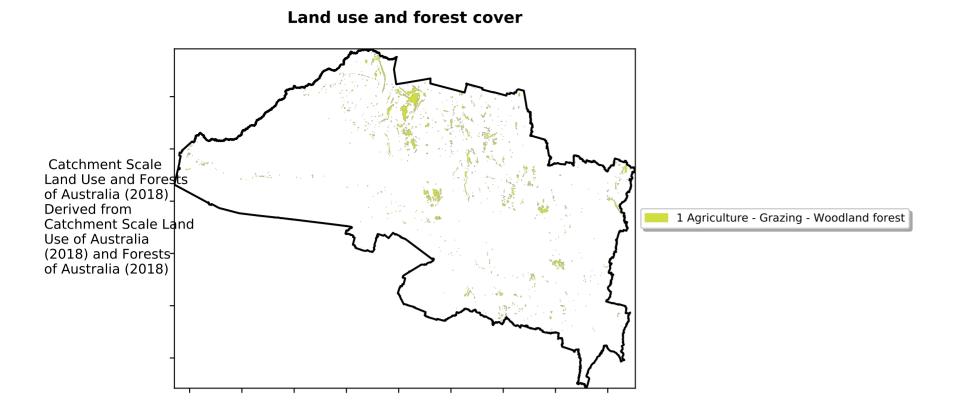


Grazing non forest timeseries

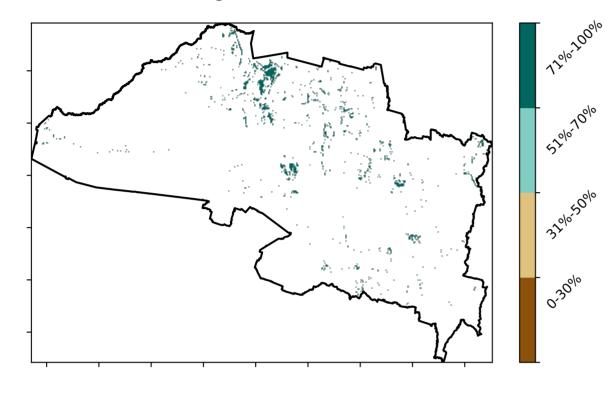
Wind erosion historical monthly area protected (Total Veg Cov >50%)



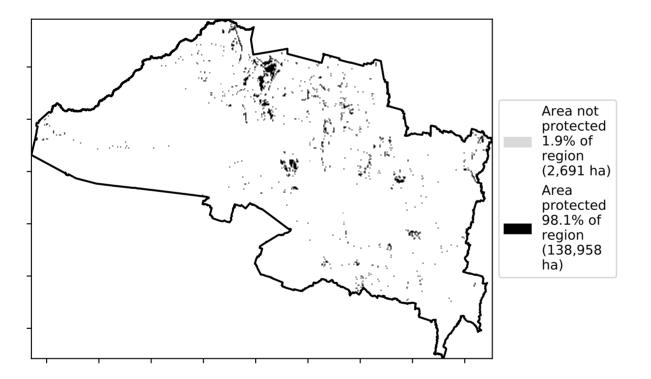
Grazing Woodland forest



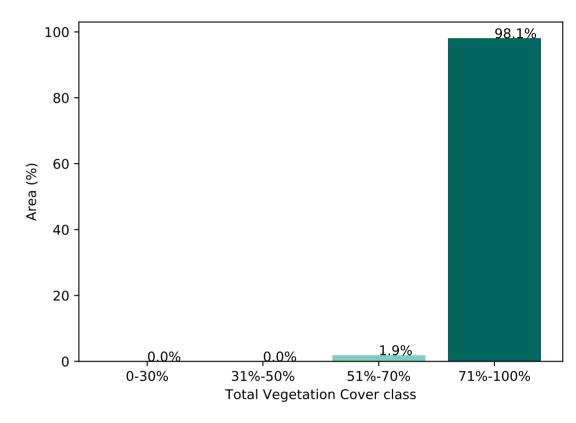
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



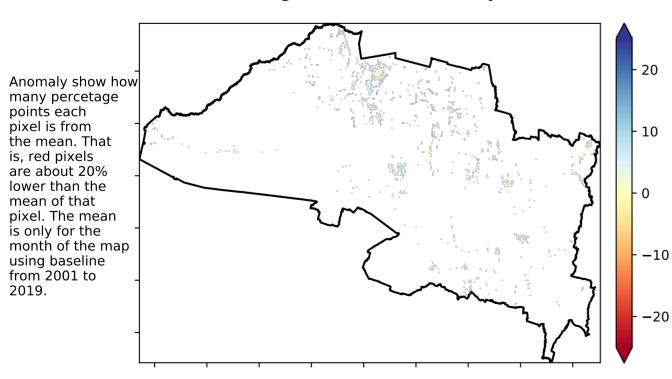
Proportion of vegetation cover class in area



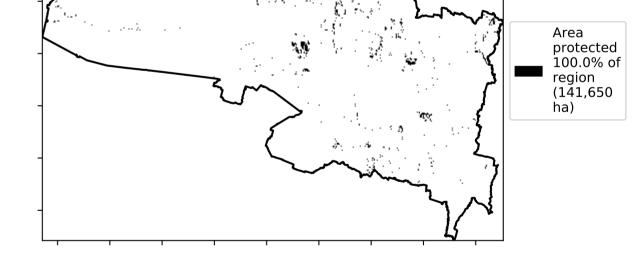
% Area protected from wind erosion (>50%)

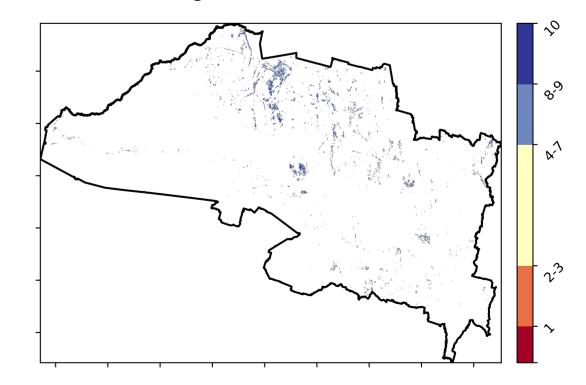


Total Vegetation Cover Anomaly [%]

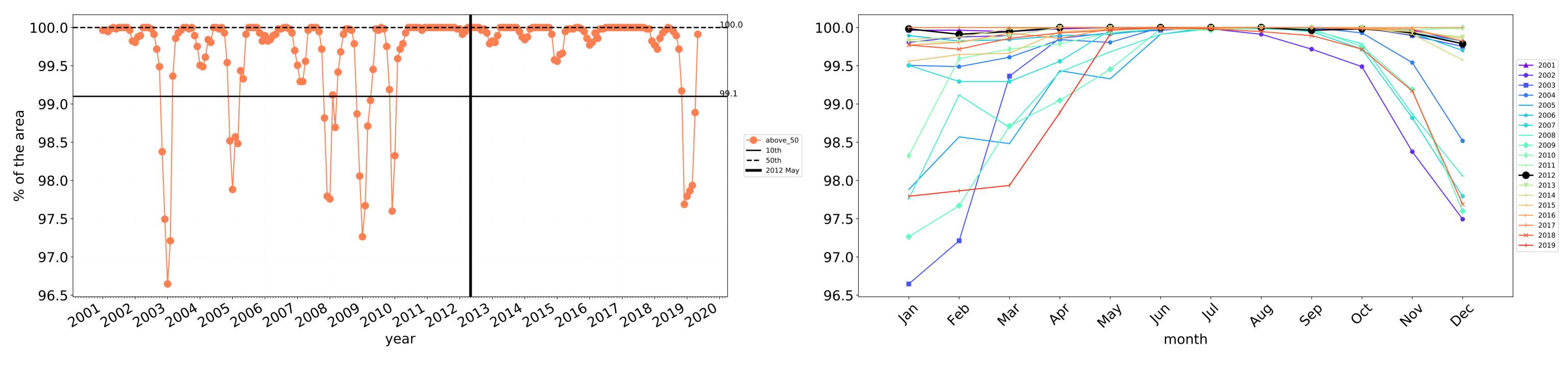


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



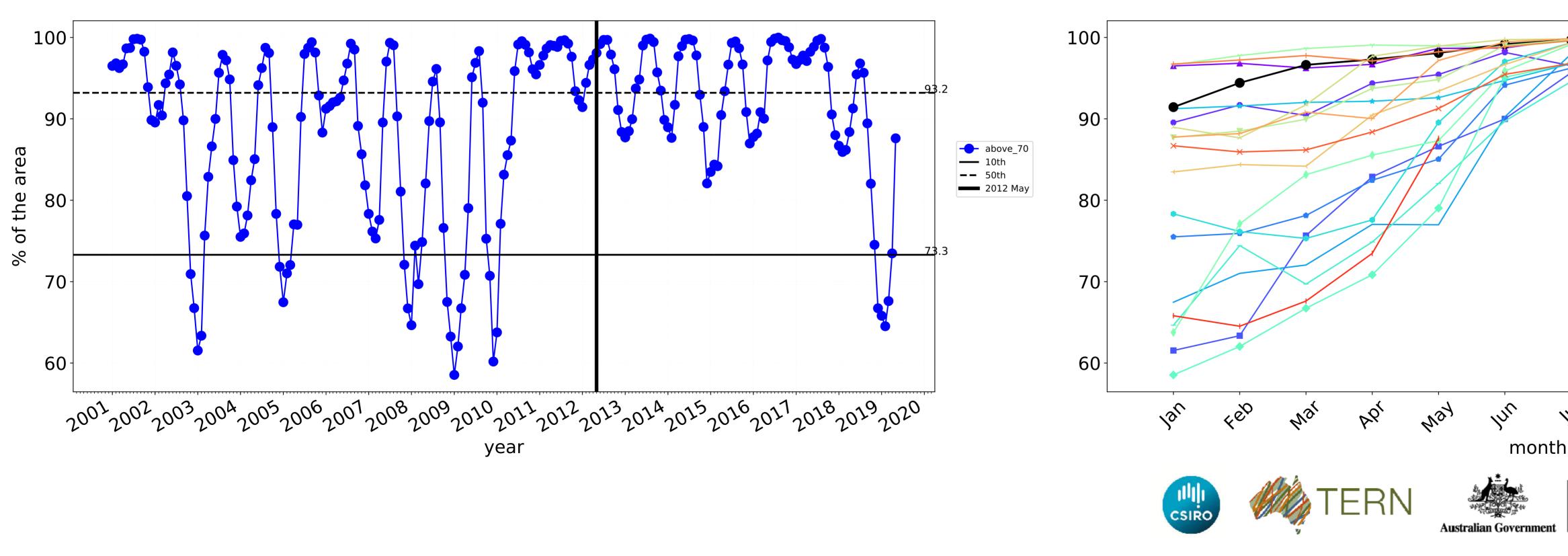


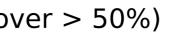




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

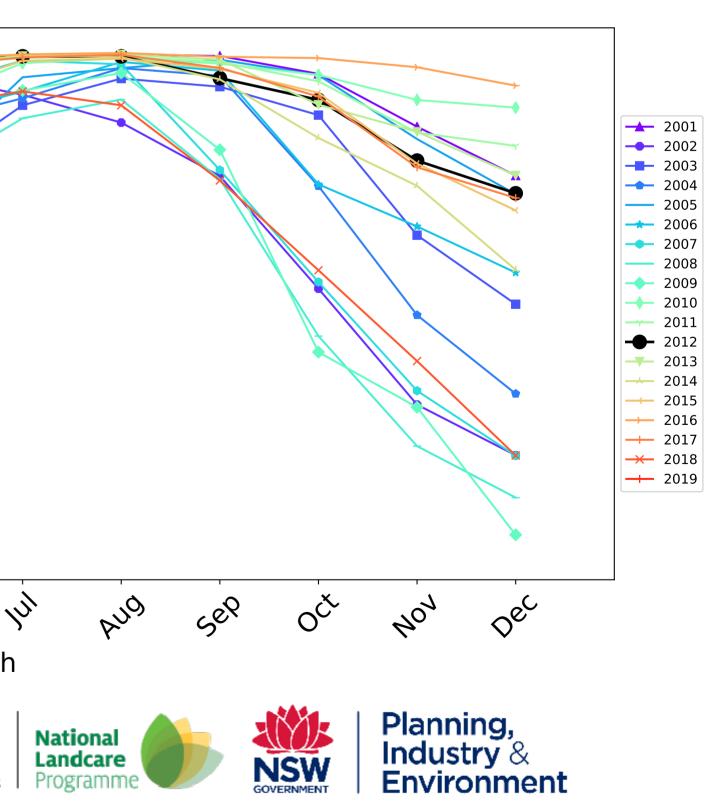




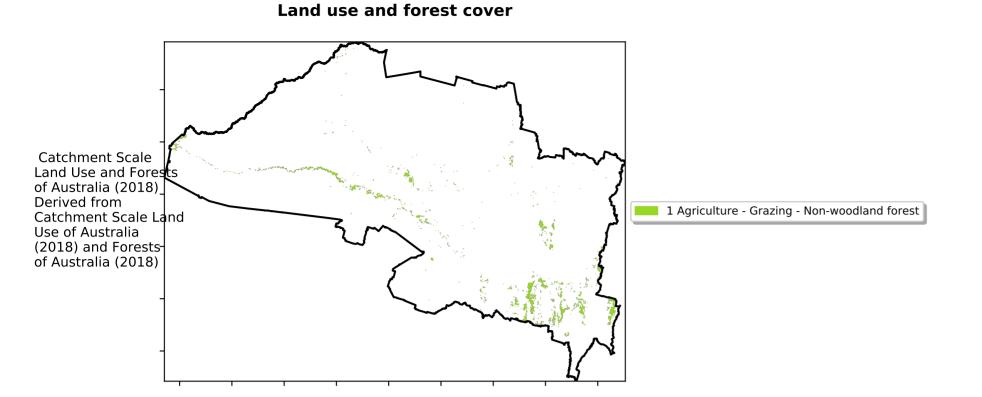


Wind erosion historical monthly area protected (Total Veg Cov >50%)

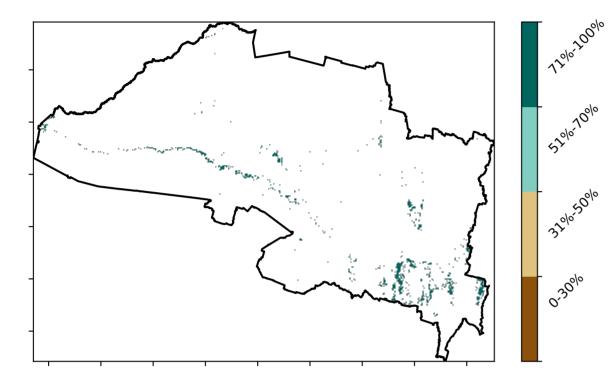
Water erosion historical monthly area protected (Total Veg Cov>70%)



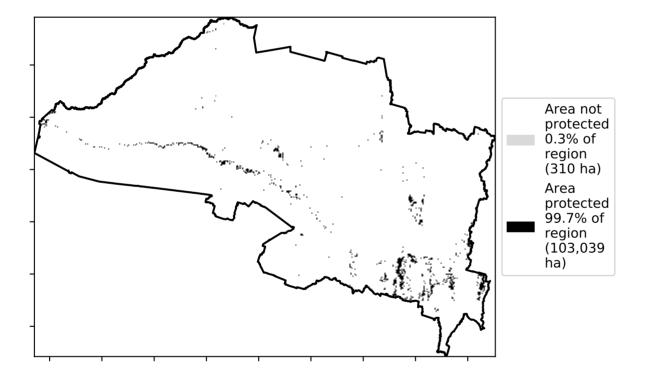
Grazing - Forest (non woodland)



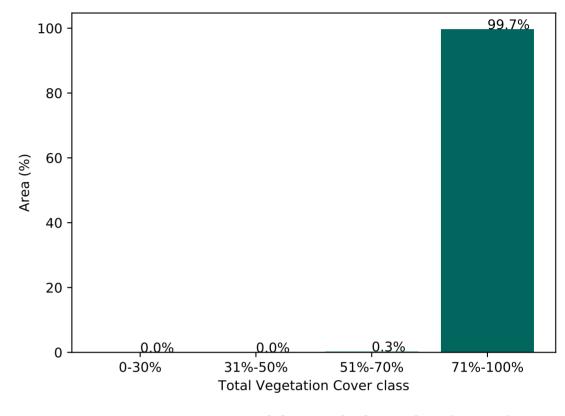
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



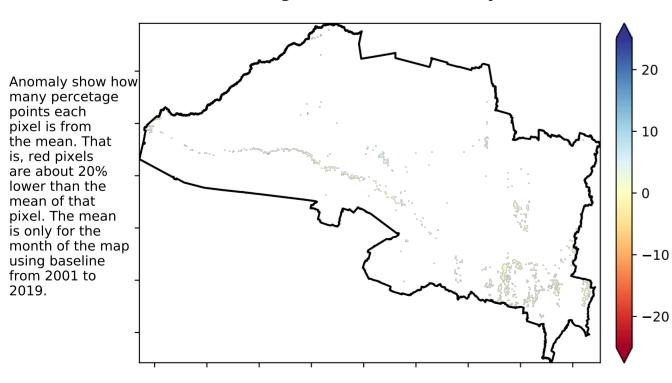
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



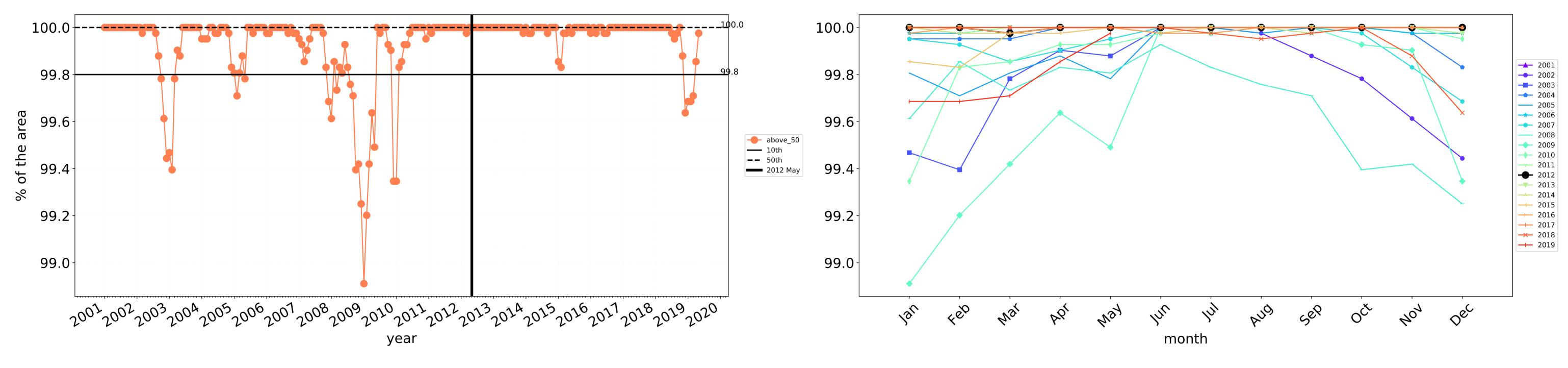
Total Vegetation Cover Anomaly [%]



Area protected 100.0% of region (103,350 ha) **Total Vegetation Cover Decile [%]** $\hat{\mathbf{v}}$ °°, 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 A.1 · 2^{?3}



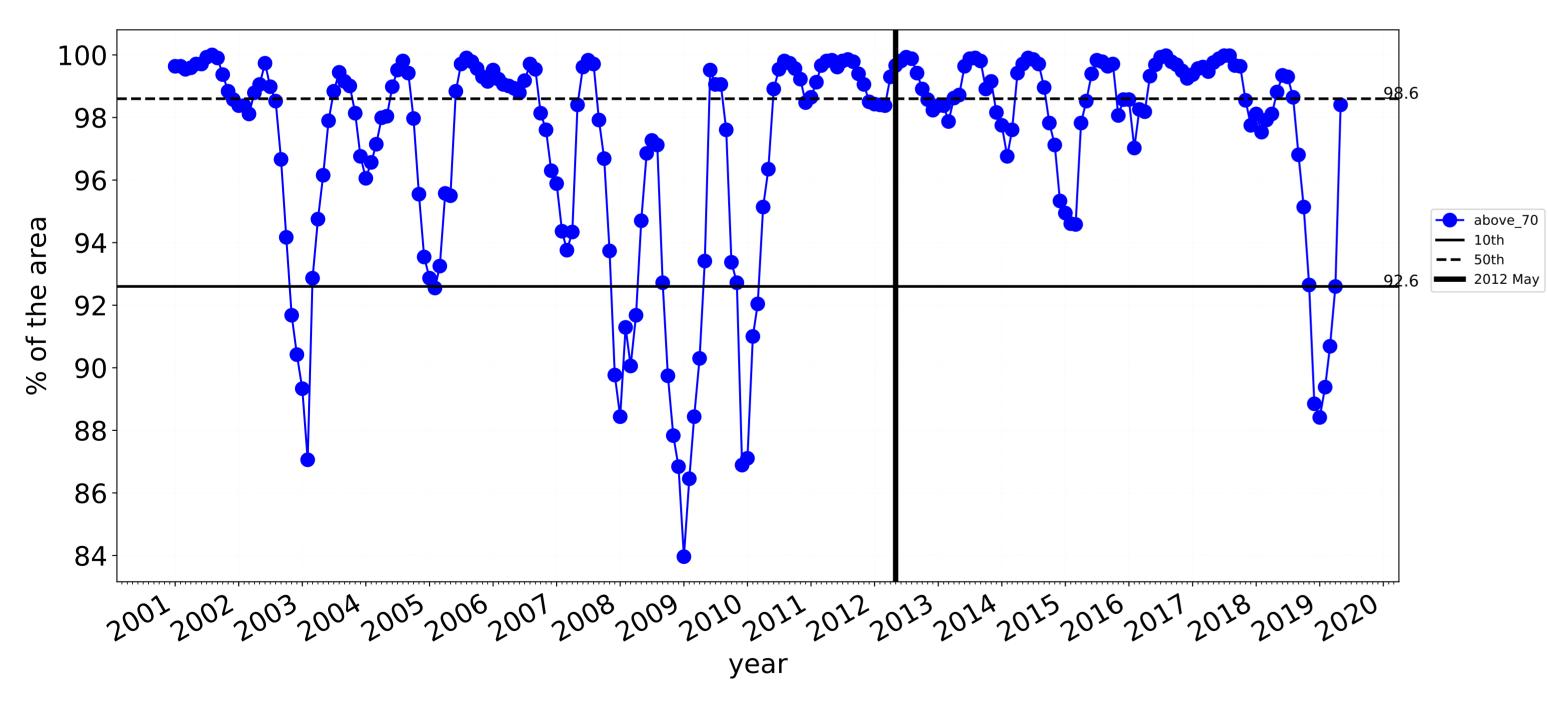
the map using baseline from 2001 to 2019.

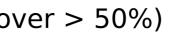


100

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

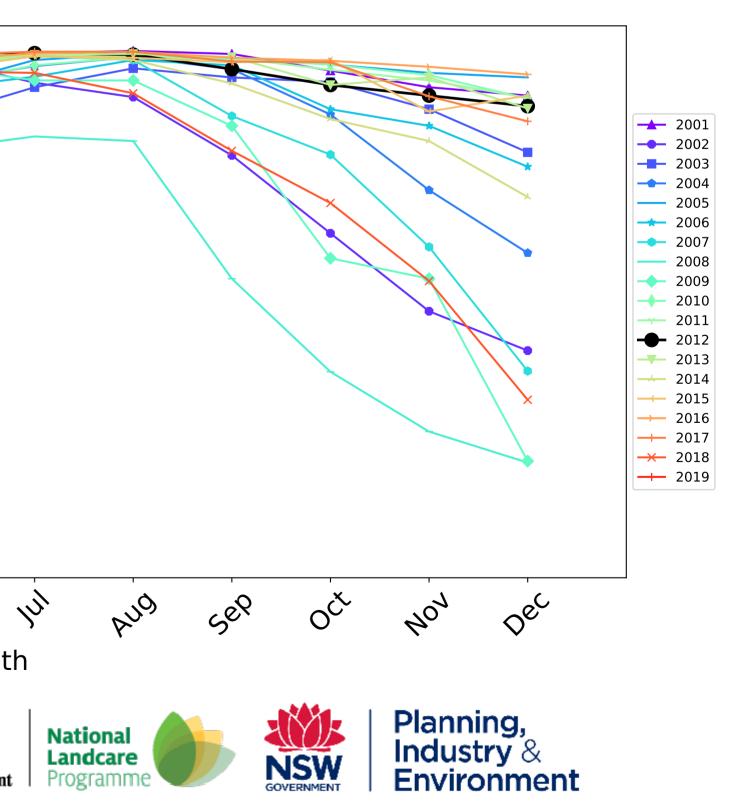
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



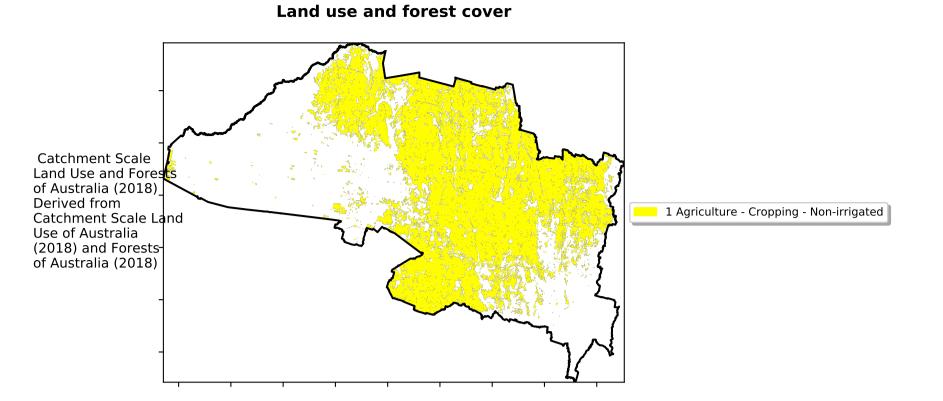


Wind erosion historical monthly area protected (Total Veg Cov >50%)

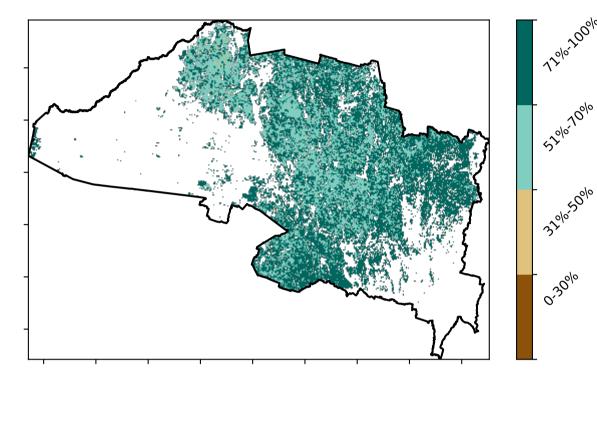
98 96 94 92 90 88 86 84 Par 4eb May In Mai PQ month ERN CSIRC Australian Government



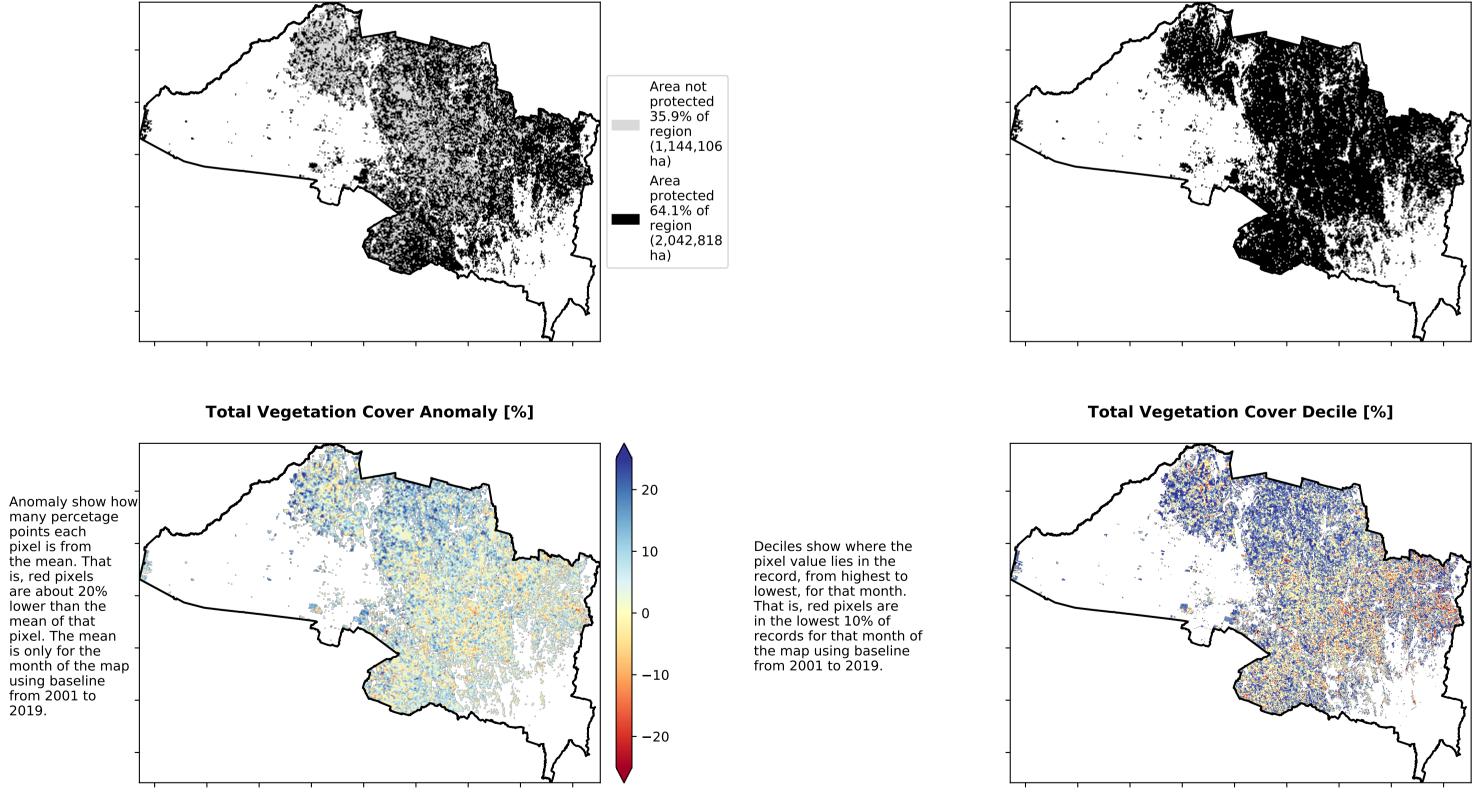
Cropping



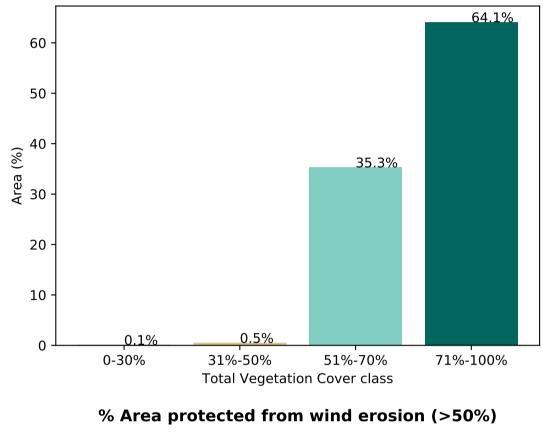
Total Vegetation Cover [%]

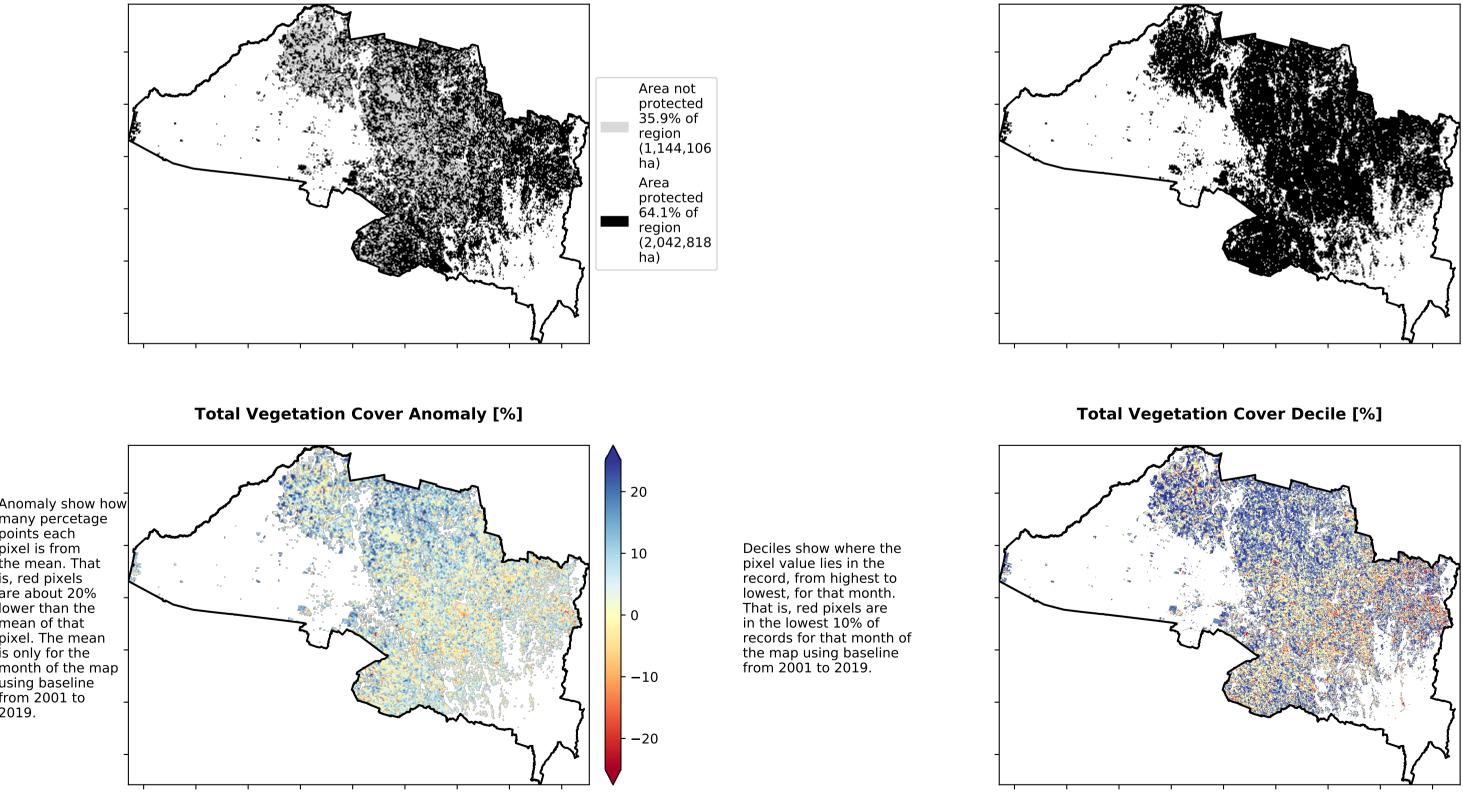


% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area





region (31,869

protected 99.0% of region (3,155,055

ha)

ha)

 $\hat{\mathcal{S}}$

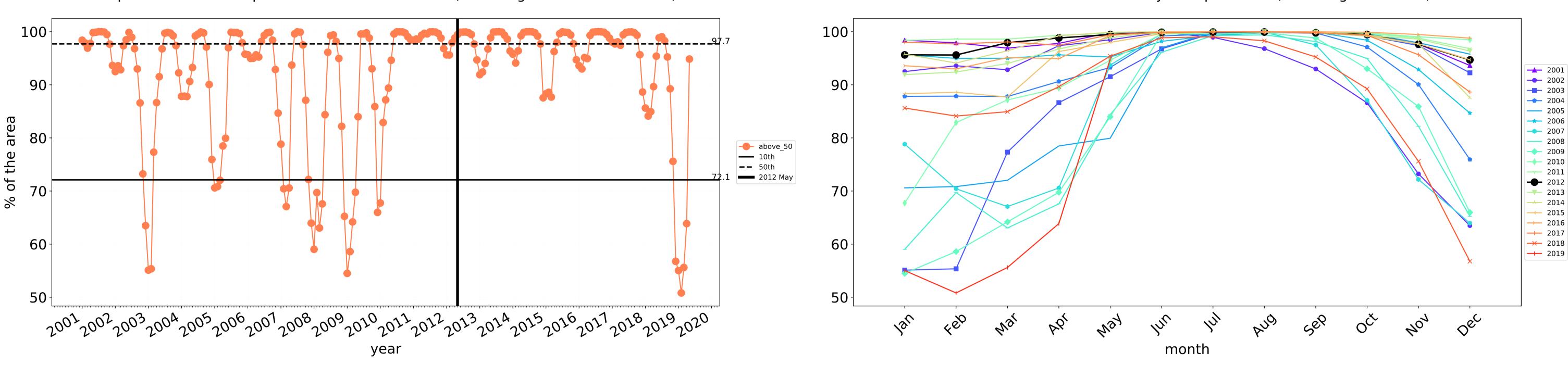
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A-1

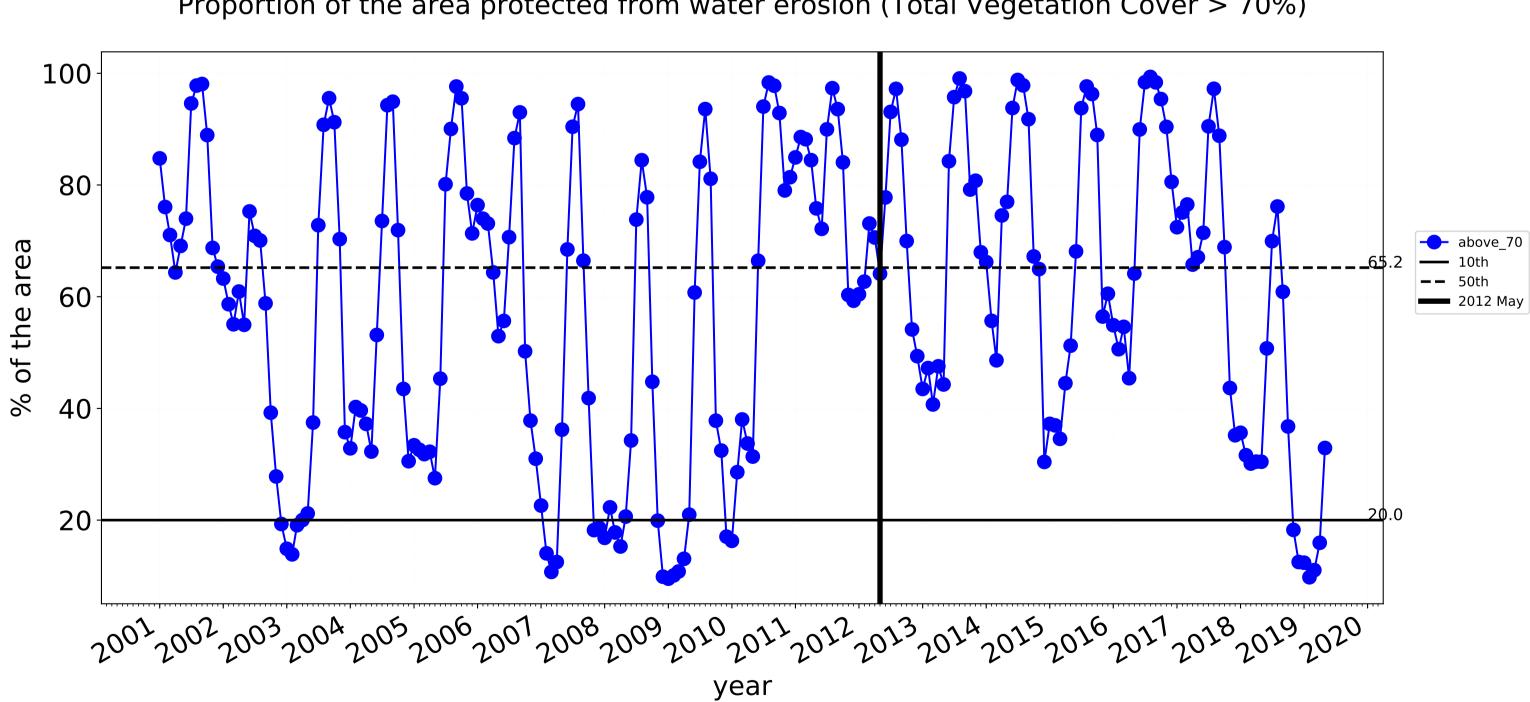
2.3

Area



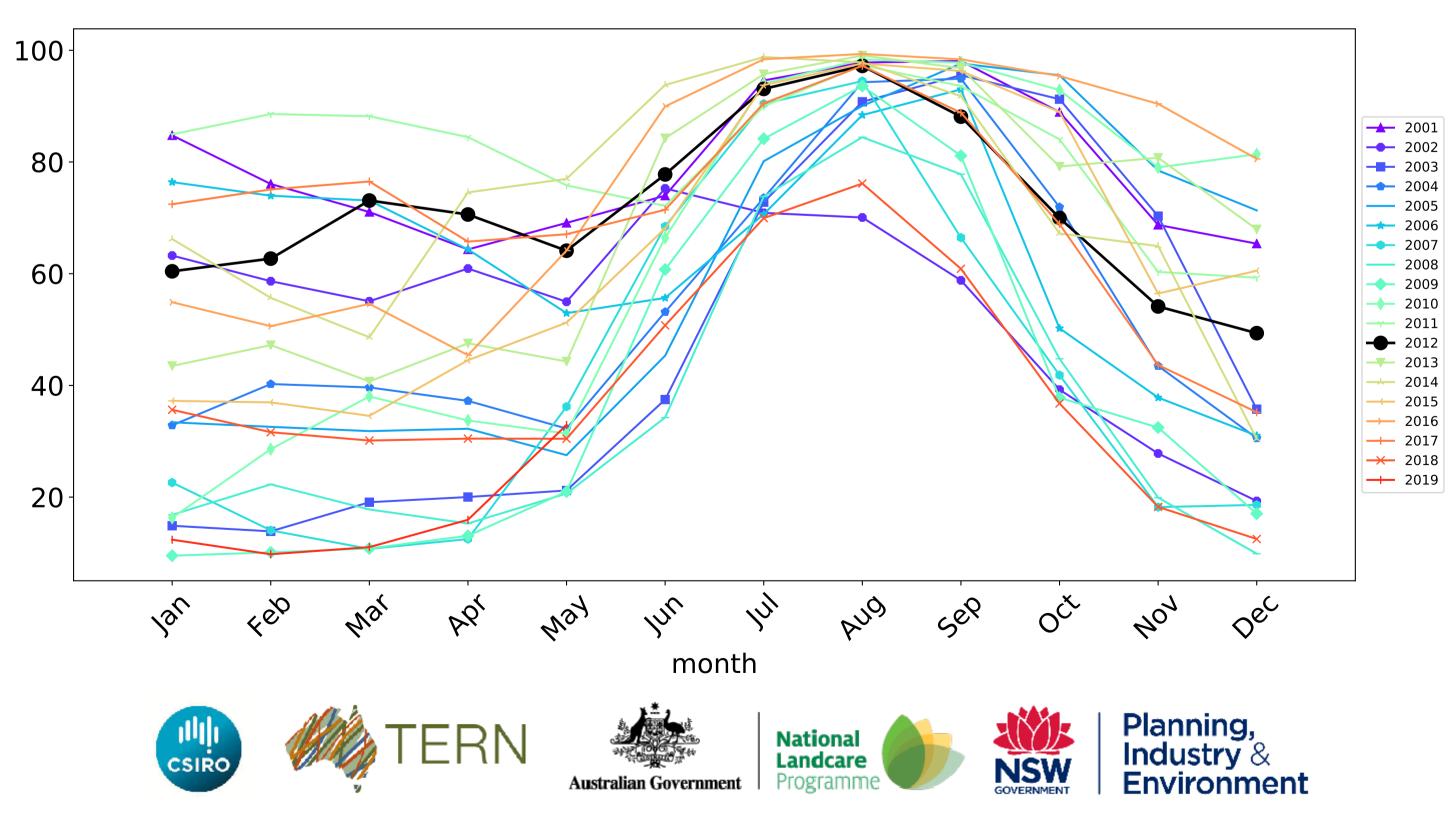


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



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

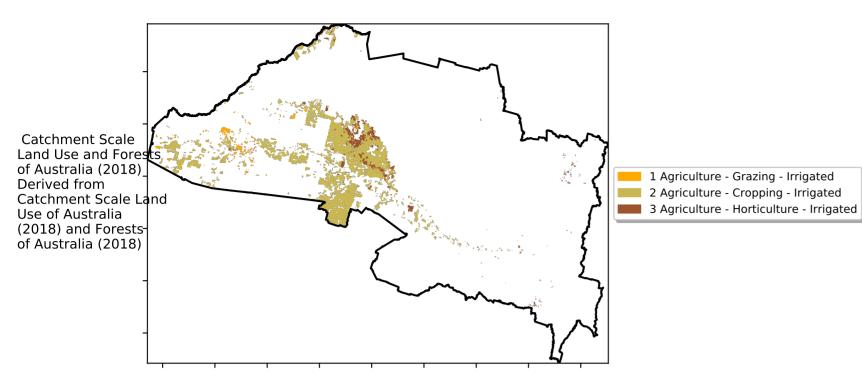
Cropping timeseries



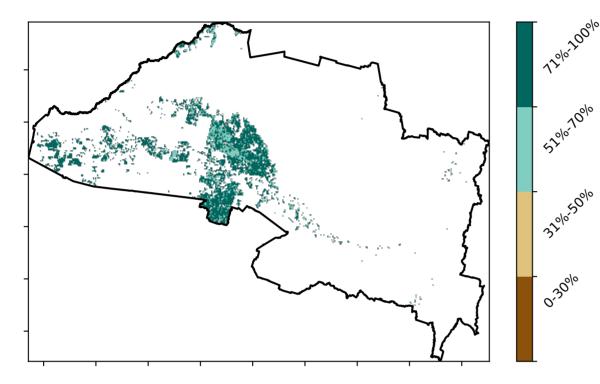
Wind erosion historical monthly area protected (Total Veg Cov >50%)

Irrigation

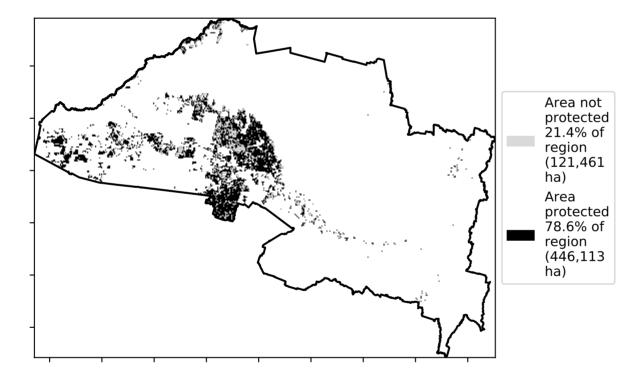
Land use and forest cover

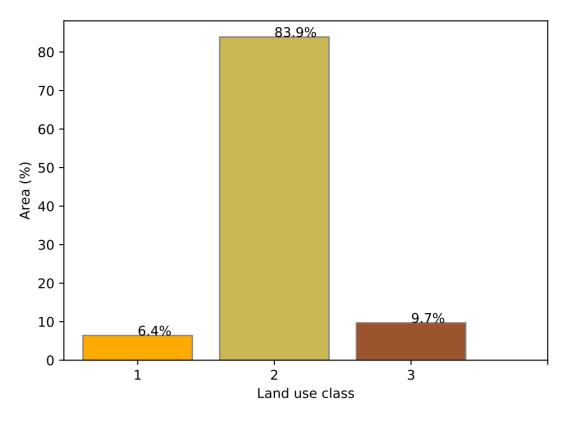


Total Vegetation Cover [%]



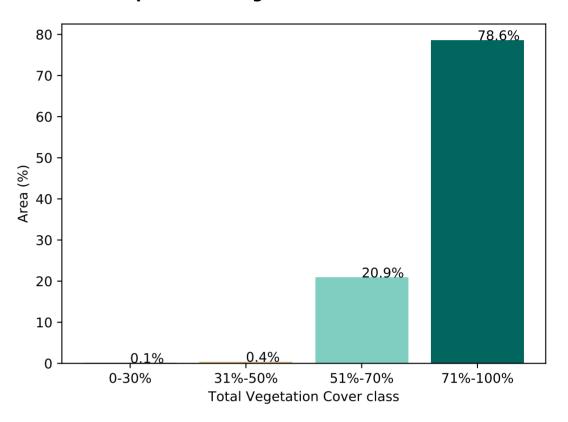
% Area protected from water erosion (>70%)



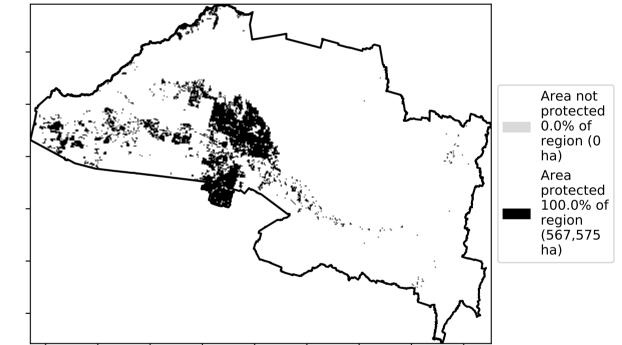


Proportion of each land class in area

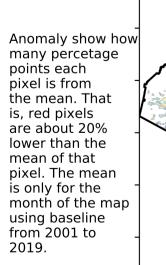
Proportion of vegetation cover class in area

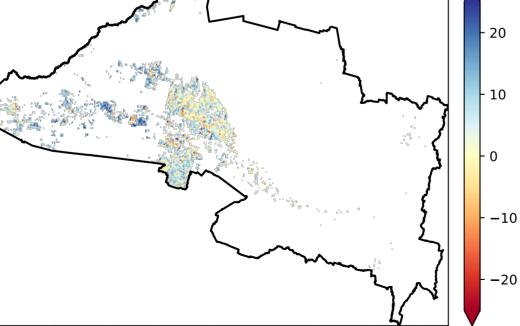


% Area protected from wind erosion (>50%)



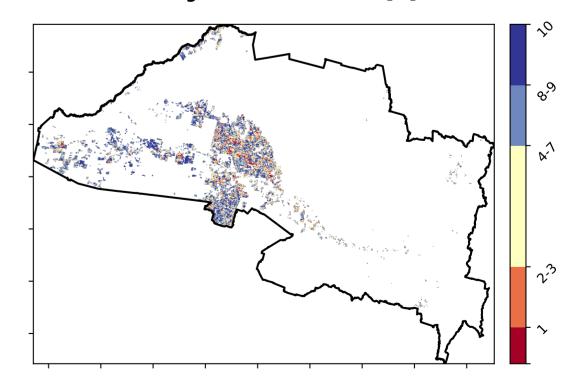
Total Vegetation Cover Anomaly [%]





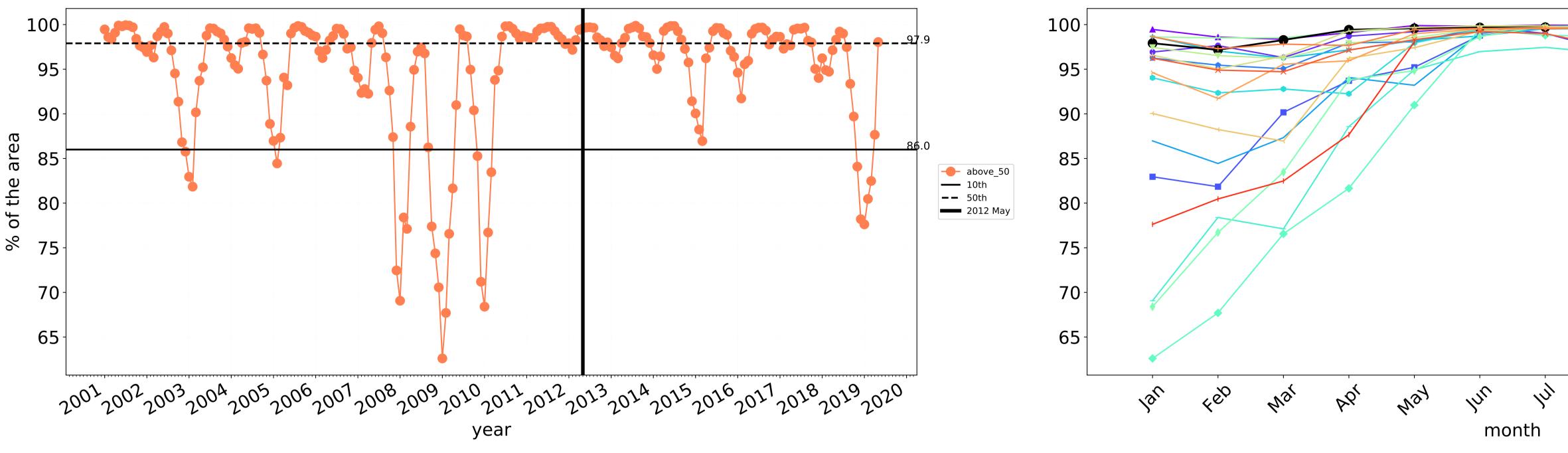
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



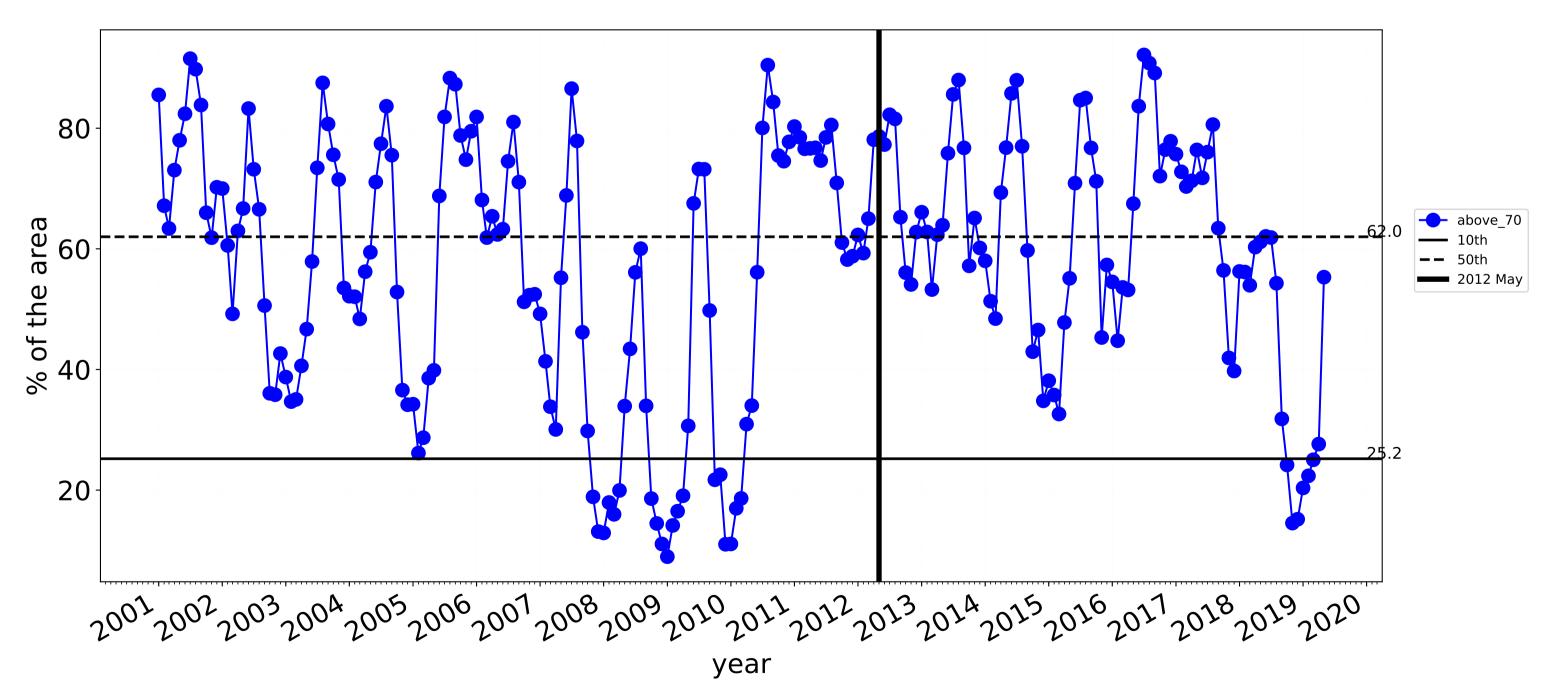


22



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

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



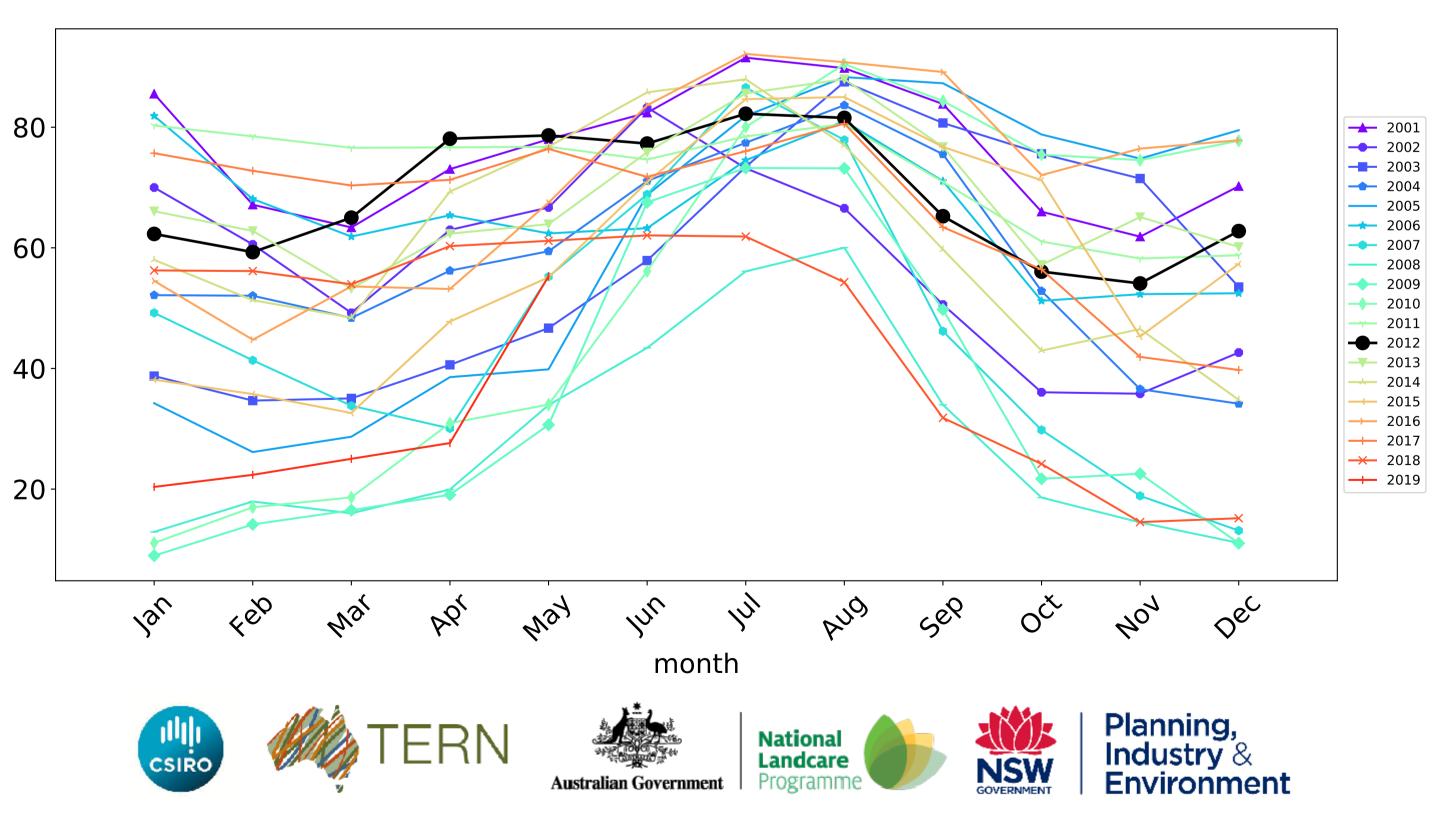
Irrigation timeseries



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

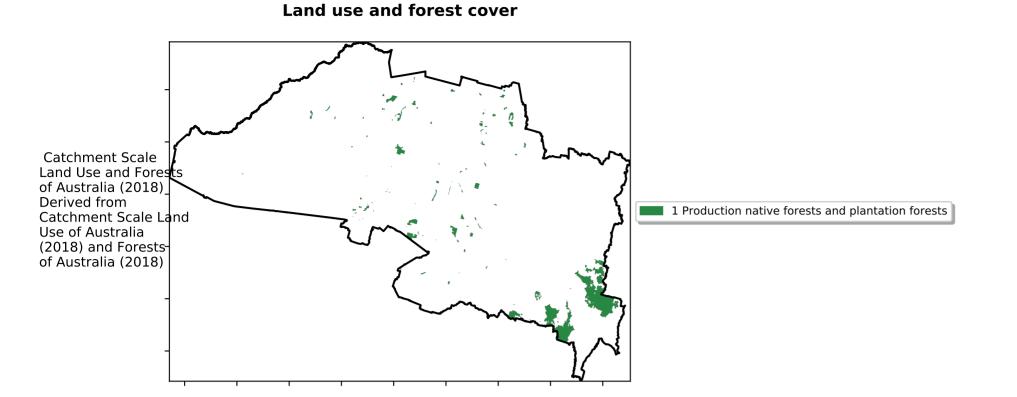


Water erosion historical monthly area protected (Total Veg Cov>70%)

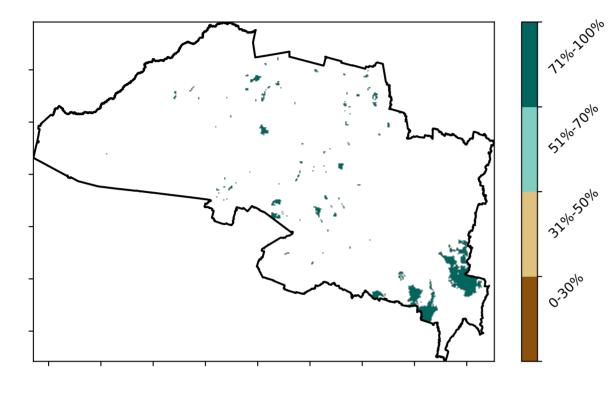


___ 2001 --- 2002 ---- 2003 **---** 2004 2005 **----** 2006 --- 2007 2008 **---** 2009 **—** 2010 2011 ---- 2012 ---- 2013 ____ 2014 <mark>→</mark> 2015 **→** 2016 --- 2017 → 2018 **→** 2019 AUG Sel 404 Dec OČ

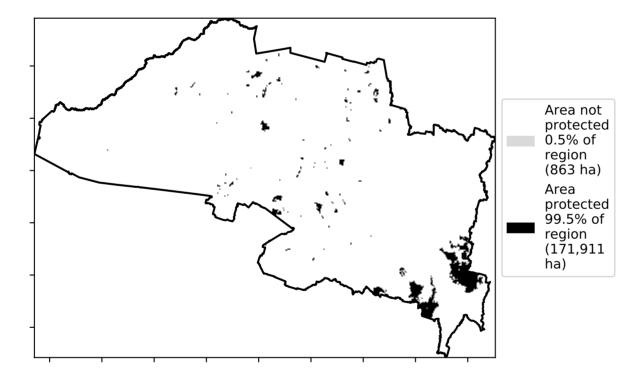
Production native forests and plantation forests



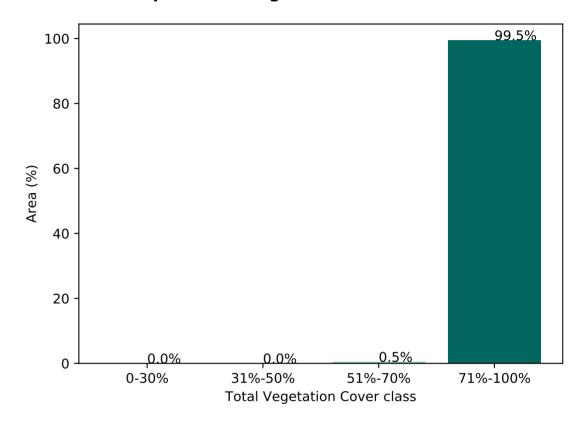
Total Vegetation Cover [%]



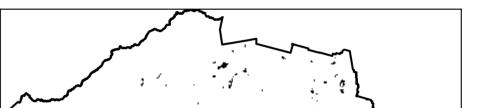
% Area protected from water erosion (>70%)



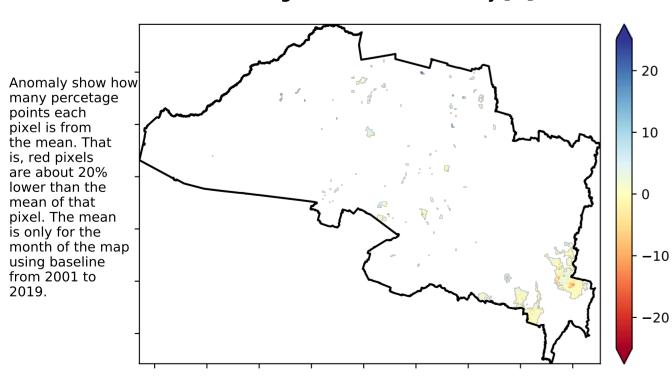




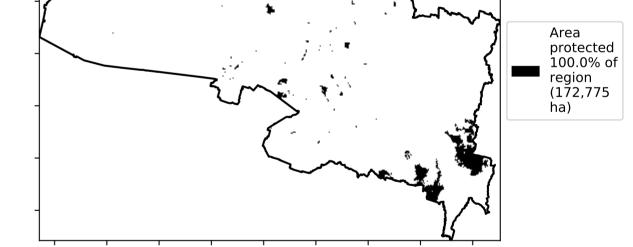
% Area protected from wind erosion (>50%)

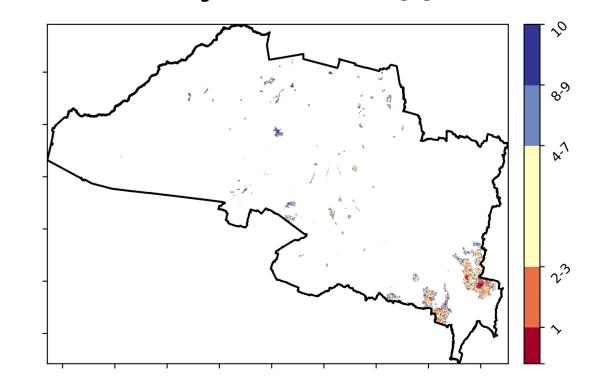


Total Vegetation Cover Anomaly [%]

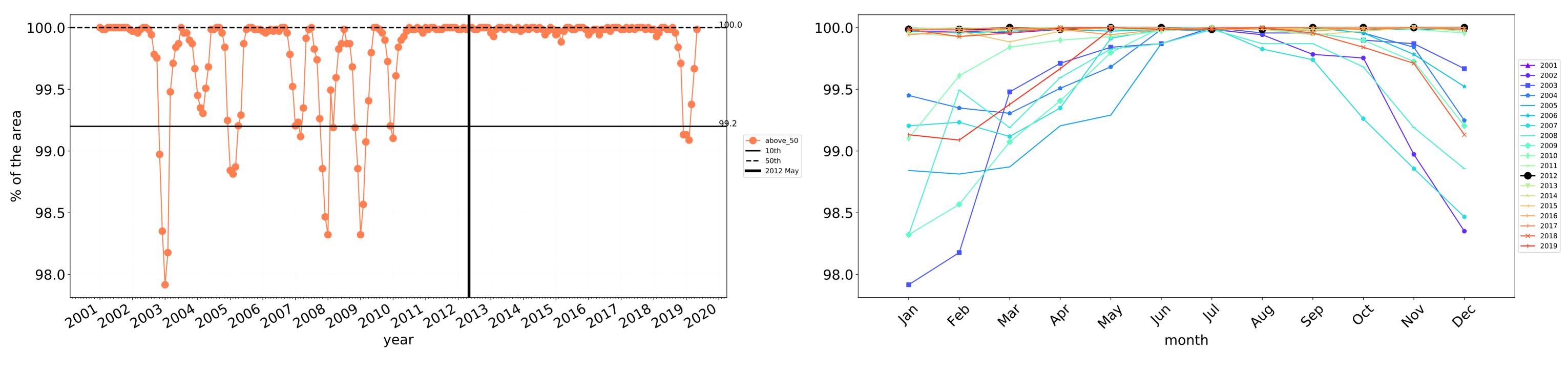


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

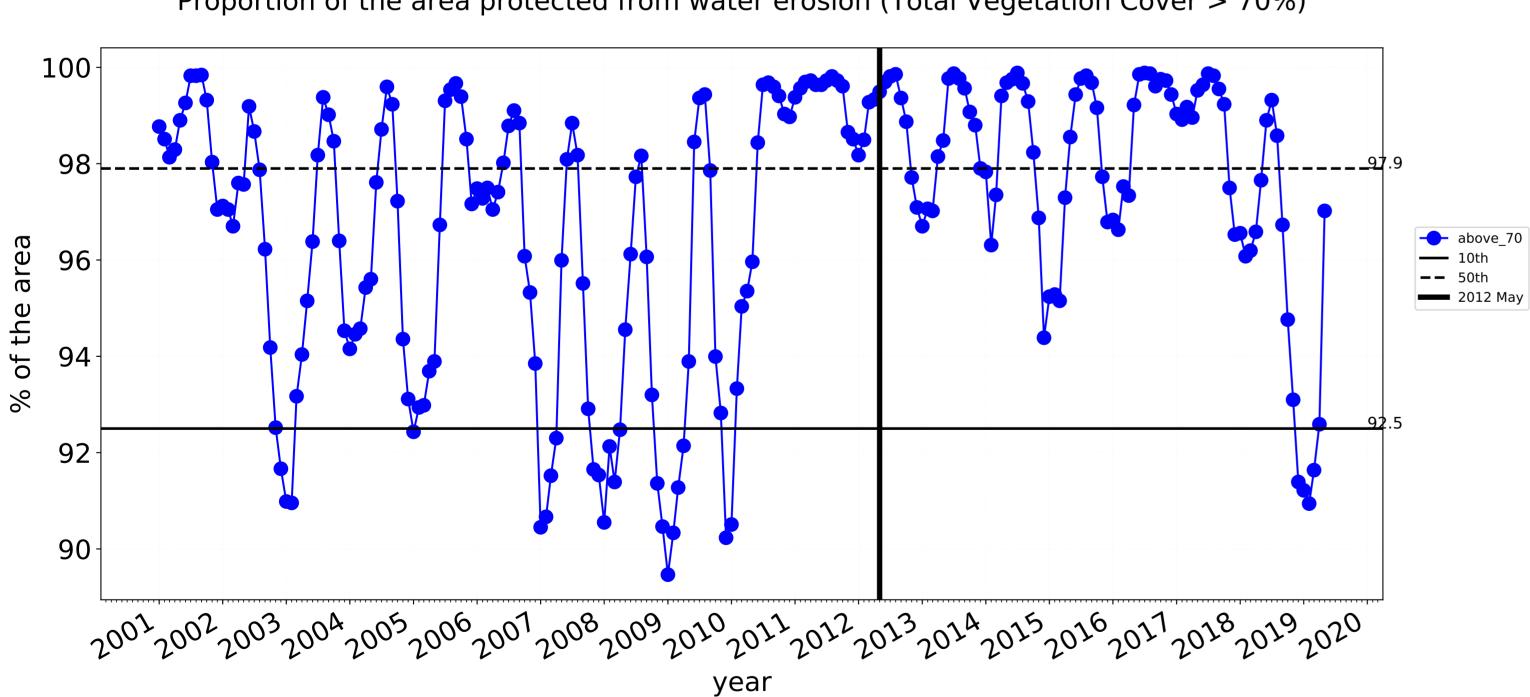






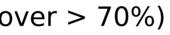


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

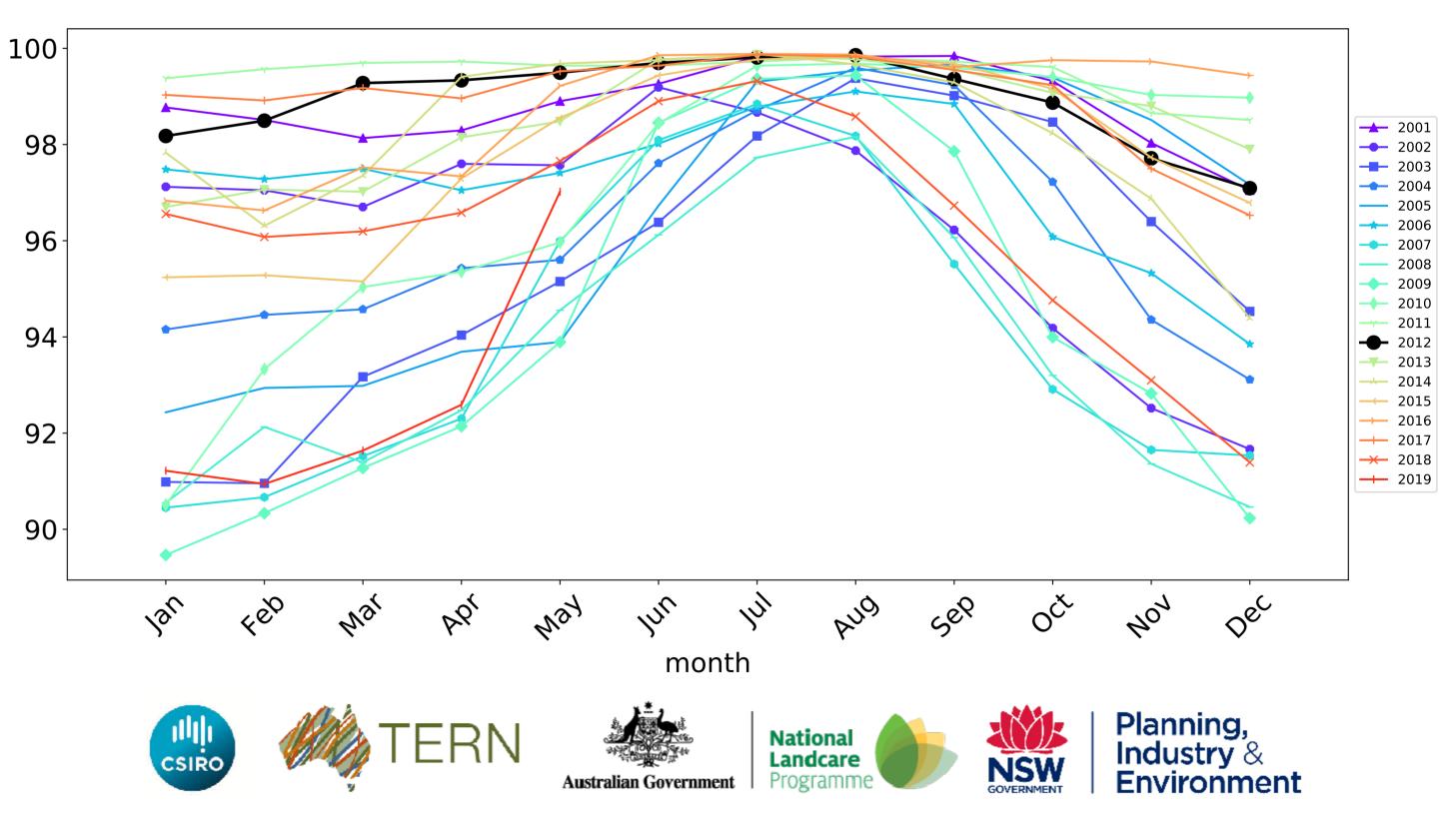


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

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



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



Riverina (6,613,050 ha and no data 95,285 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 | 6,613,050 | 99.9% 6,608,653 | 99.6% 6,585,878 | 79.3% 5,244,530 | 55.2% 3,647,228 | 20.5% 1,358,392 | 7.3% 485,798 |
| Conservation and natural environments | 322,975 | 100.0% 322,950 | 100.0% 322,925 | 98.9% 319,500 | 91.2% 294,525 | 71.7% 231,725 | 43.4% 140,300 |
| Conservation and natural environments non forest | 83,350 | 100.0% 83,325 | 99.9% 83,300 | 96.1% 80,100 | 68.3% 56,925 | 22.8% 19,025 | 9.3% 7,775 |
| Conservation and natural environments Forest (non woodland) | 195,125 | 100.0% 195,125 | 100.0% 195,125 | 99.9% 195,025 | 99.7% 194,550 | 92.9% 181,275 | 62.8% 122,500 |
| Agriculture | 6,067,650 | 100.0% 6,065,550 | 99.6% 6,044,575 | 77.7% 4,711,575 | 52.1% 3,163,175 | 16.3% 992,025 | 4.2% 253,150 |
| Grazing | 2,311,325 | 100.0% 2,310,450 | 99.9% 2,307,975 | 96.1% 2,221,225 | 79.2% 1,831,325 | 29.8% 689,100 | 8.6% 198,300 |
| Grazing non forest | 2,066,325 | 100.0% 2,065,450 | 99.8% 2,062,975 | 95.8% 1,979,275 | 77.9% 1,608,925 | 27.1% 560,950 | 7.6% 157,575 |
| Grazing Woodland forest | 141,650 | 100.0% 141,650 | 100.0% 141,650 | 98.1% 138,950 | 87.3% 123,675 | 41.7% 59,050 | 8.1% 11,450 |
| Grazing - Forest (non woodland) | 103,350 | 100.0% 103,350 | 100.0% 103,350 | 99.7% 103,000 | 95.5% 98,725 | 66.9% 69,100 | 28.3% 29,275 |
| Cropping | 3,186,925 | 100.0% 3,185,800 | 99.5% 3,169,625 | 64.1% 2,043,300 | 33.6% 1,070,925 | 7.9% 252,375 | 1.3% 42,500 |
| Irrigation | 567,575 | 100.0% 567,475 | 99.6% 565,200 | 78.6% 446,325 | 45.9% 260,675 | 8.9% 50,500 | 2.2% 12,350 |
| Production native forests and plantation forests | 172,775 | 100.0% 172,775 | 100.0% 172,775 | 99.5% 171,900 | 96.0% 165,875 | 78.8% 136,150 | 55.4% 95,725 |

