Total vegetation cover soil protection Region:NRM Condamine QLD

Date: October 2005

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:

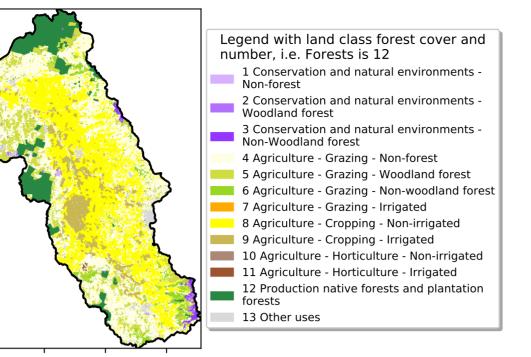
- 1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
- 2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
- 3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
- 4. MODIS Fractional cover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

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



Vegetation Cover Oct 2005

Land use and forest cover



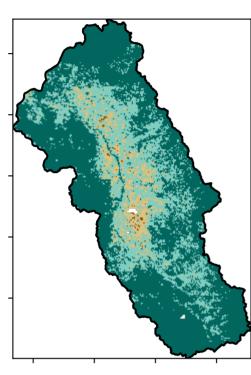
12%100%

52% 70%

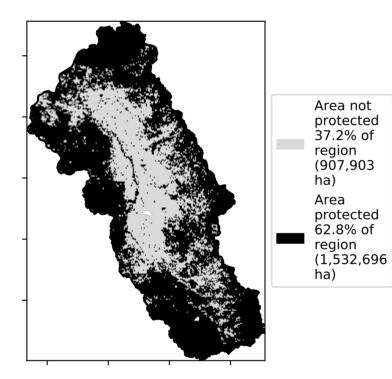
32%50%

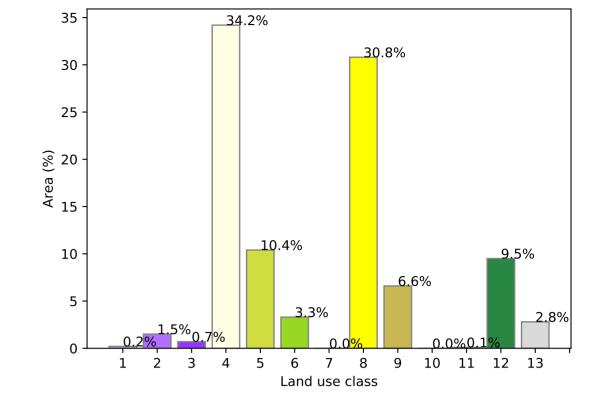
0.30%

Total Vegetation Cover [%]

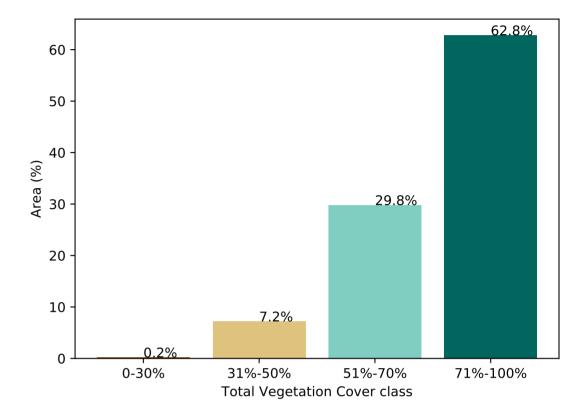


% Area protected from water erosion (>70%)

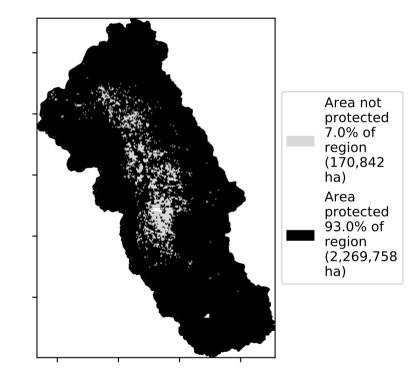




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Proportion of each land class in area

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.

Catchment Scale

of Australia (2018)

(2018) and Forests

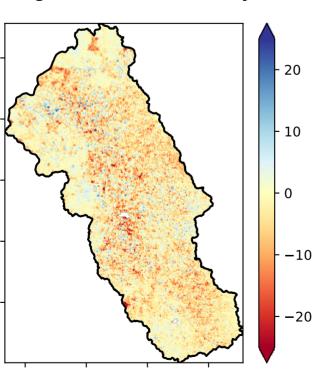
of Australia (2018)

Derived from

Use of Australia

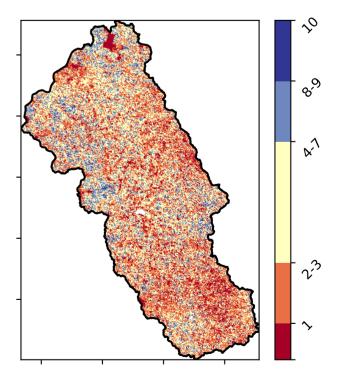
Land Use and Forests

Catchment Scale Land

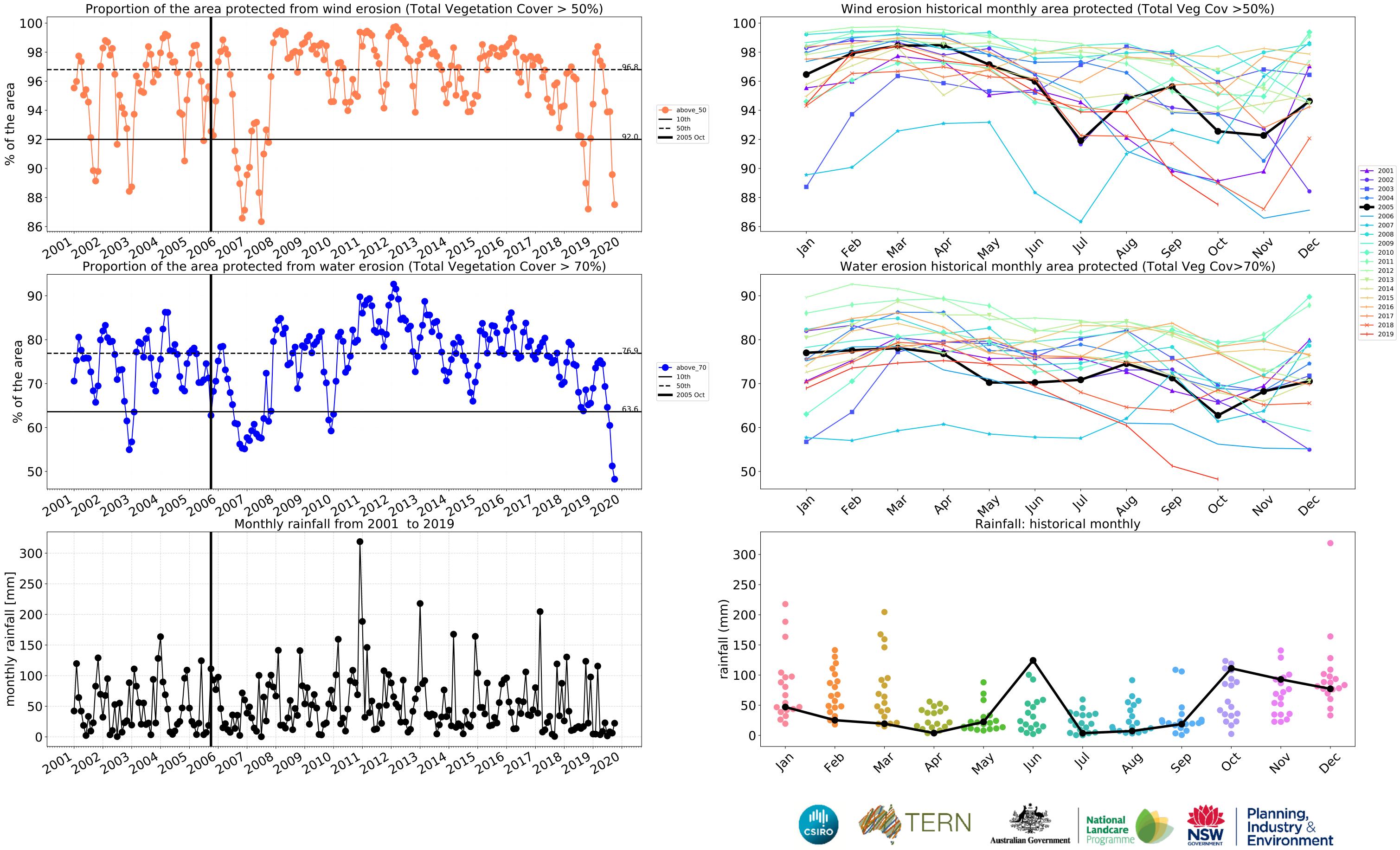


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



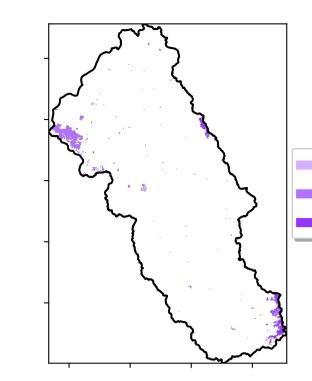




Conservation and natural environments

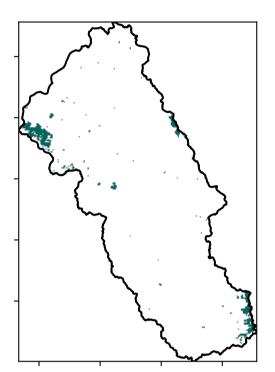
forest

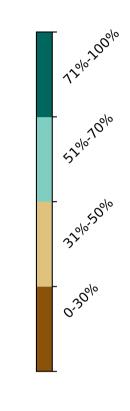
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



Land use and forest cover

Total Vegetation Cover [%]



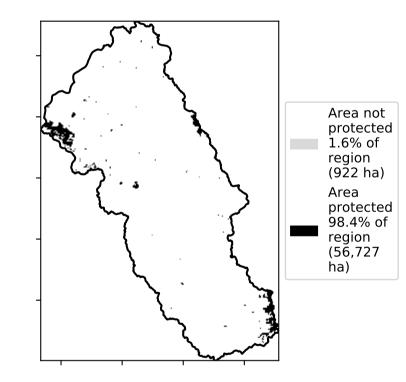


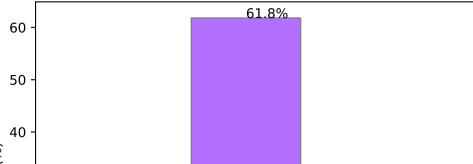
1 Conservation and natural environments - Non-forest

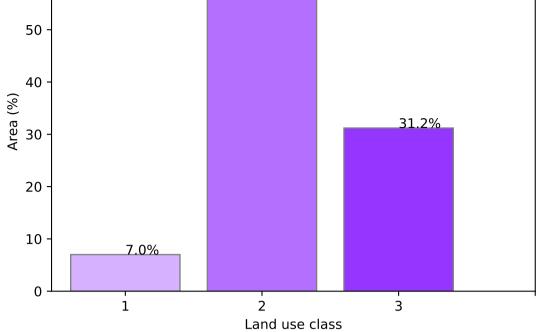
3 Conservation and natural environments - Non-woodland forest

2 Conservation and natural environments - Woodland

% Area protected from water erosion (>70%)

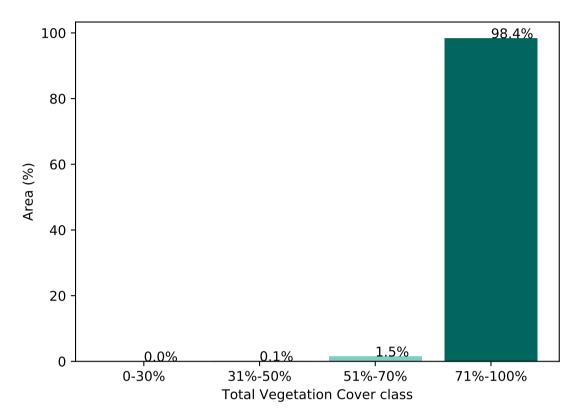




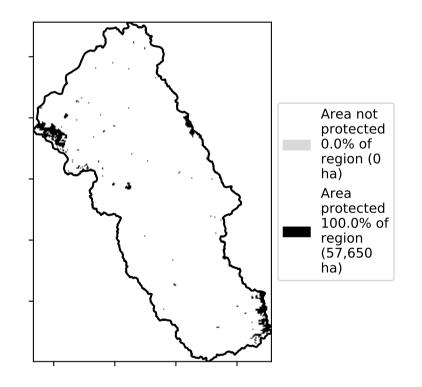


Proportion of each land class in area

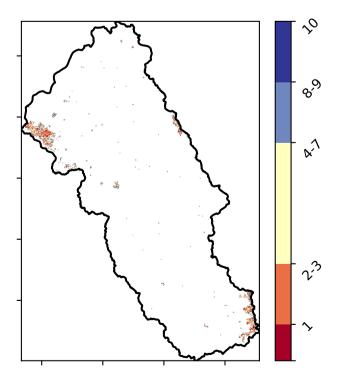
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

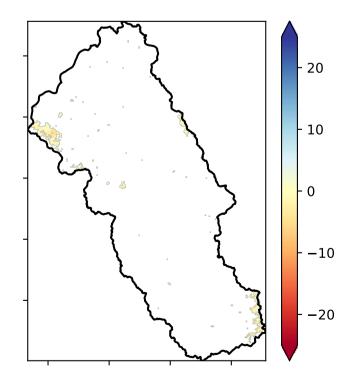


Total Vegetation Cover Decile [%]



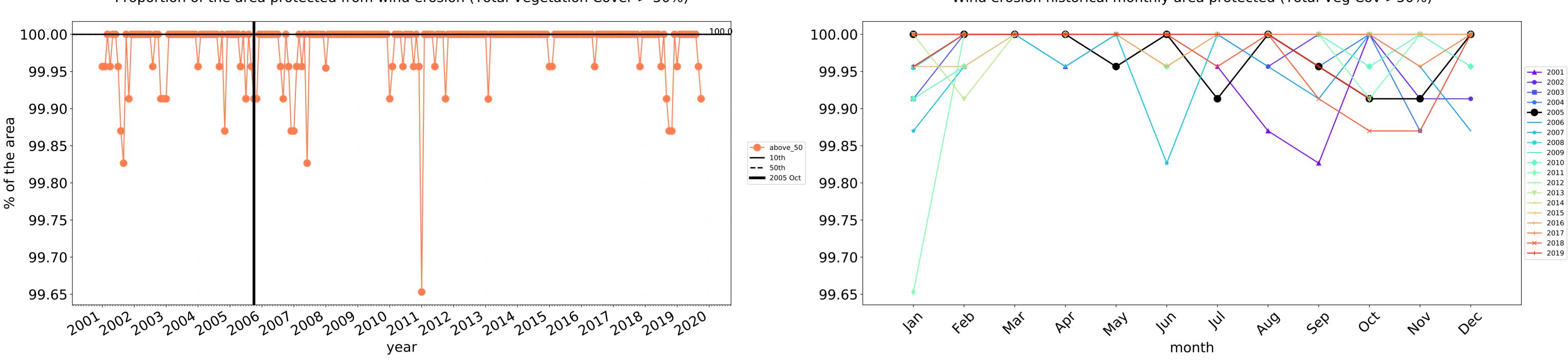
Total Vegetation Cover Anomaly [%]

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.



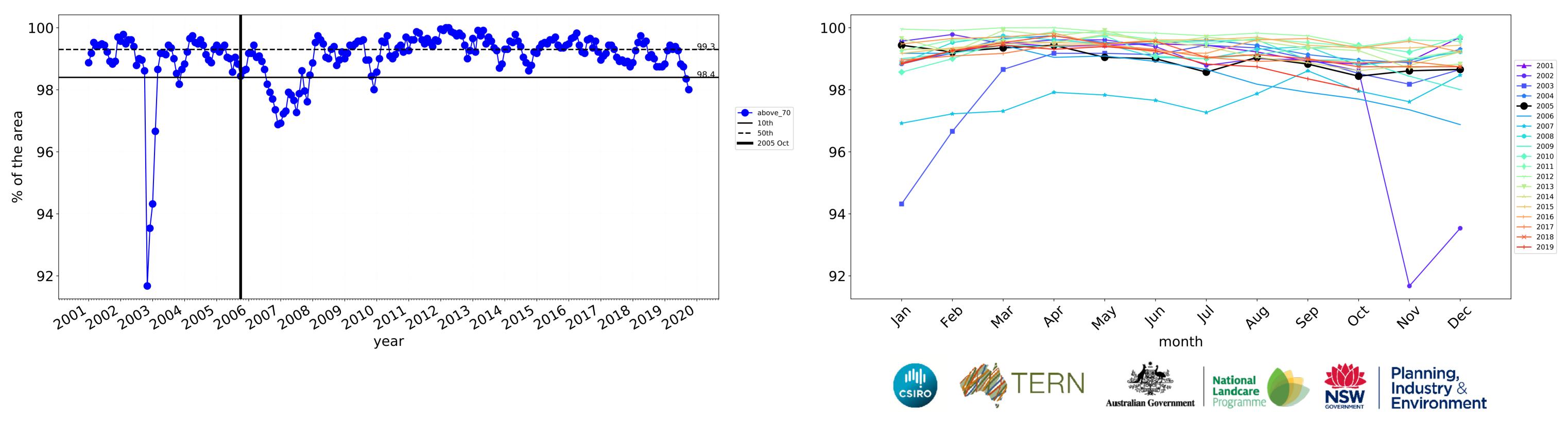
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

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

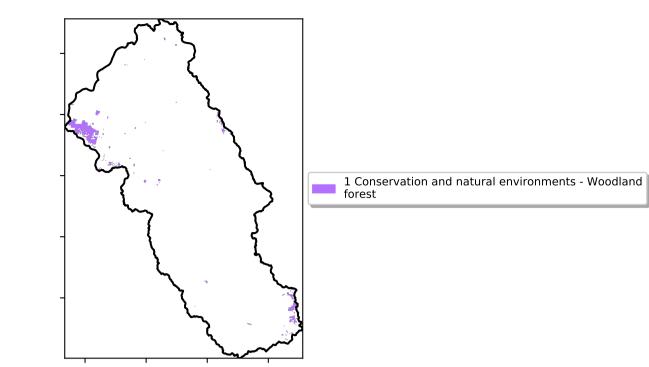


Water erosion historical monthly area protected (Total Veg Cov>70%)

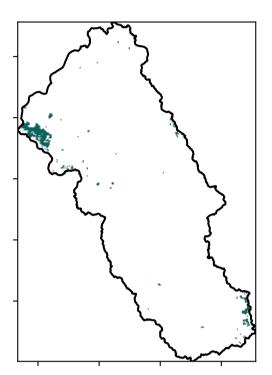


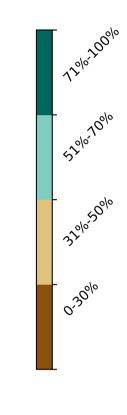
Conservation and natural environments Woodland forest

Land use and forest cover

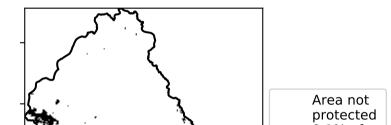


Total Vegetation Cover [%]

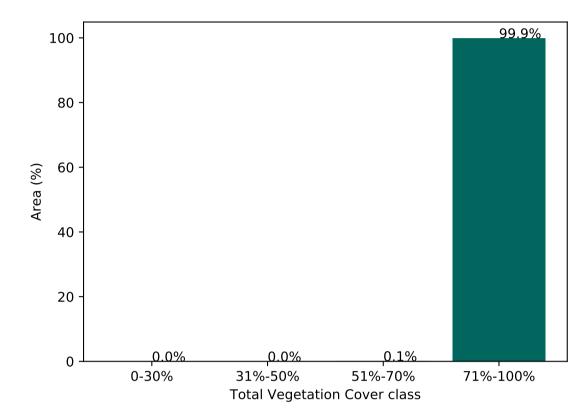




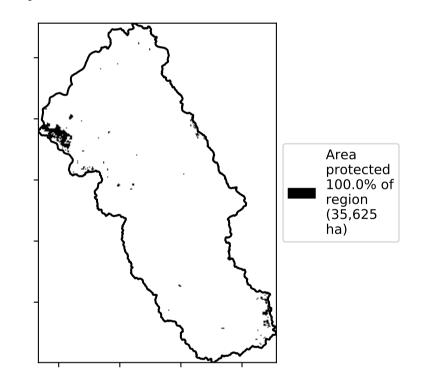
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

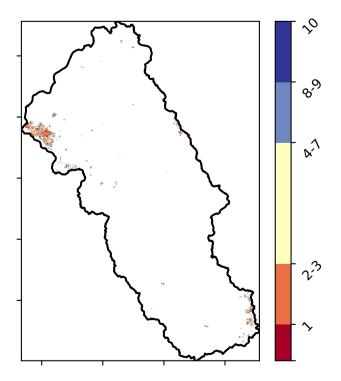


% Area protected from wind erosion (>50%)



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

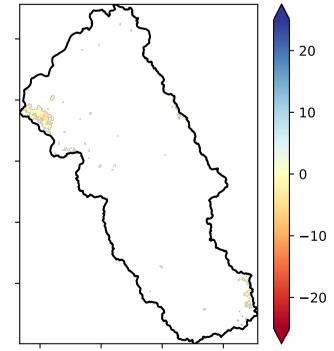
Total Vegetation Cover Decile [%]





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.

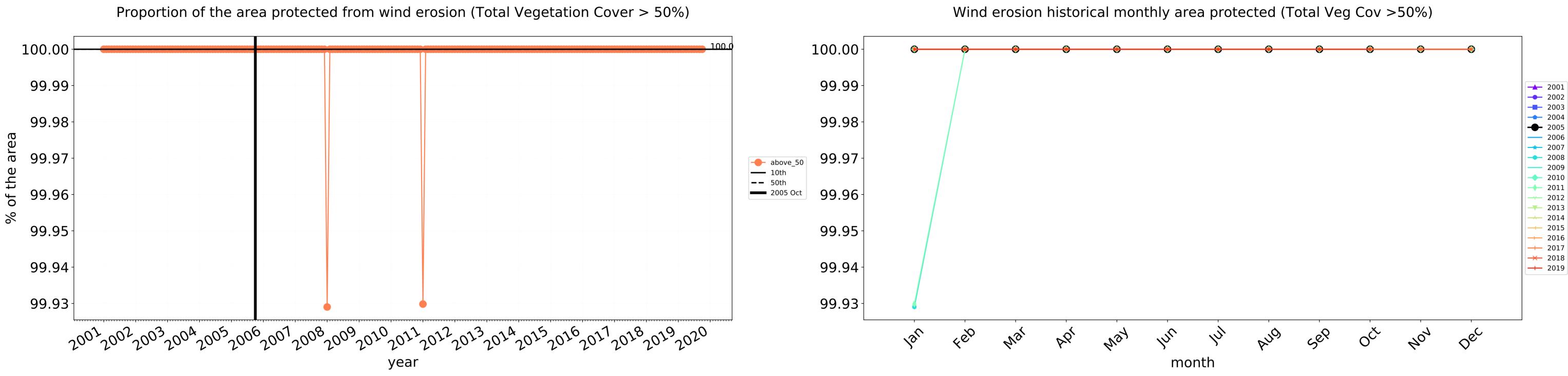




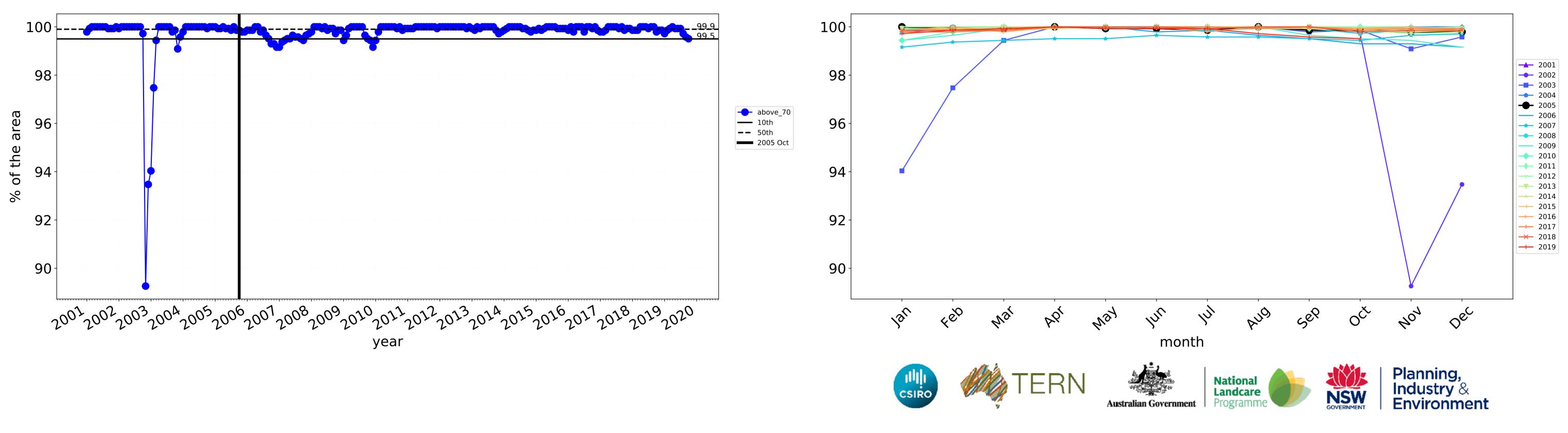
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

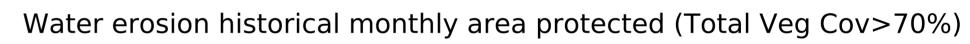
0.1% of region (35 ha) Area protected 99.9% of region (35,589 ha)

Conservation and natural environments Woodland forest timeseries



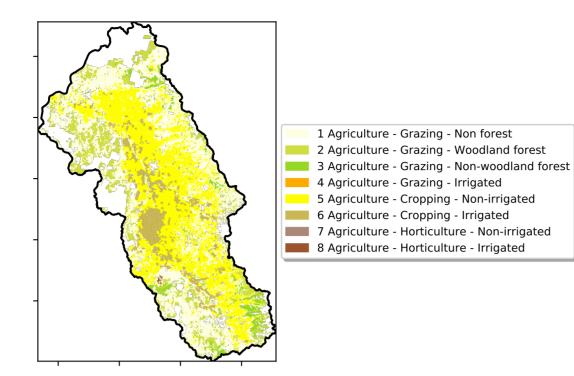
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



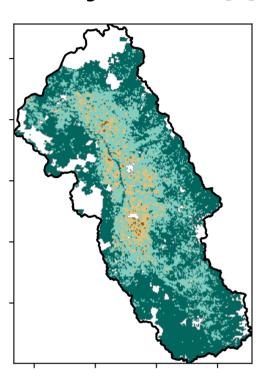


Agriculture

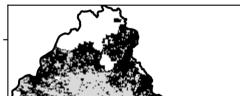
Land use and forest cover

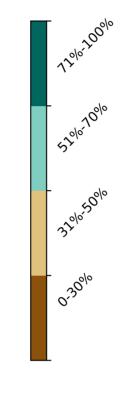


Total Vegetation Cover [%]



% Area protected from water erosion (>70%)







region (885,338

protected

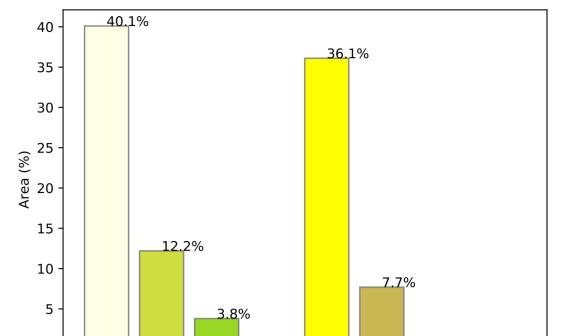
57.5% of

region (1,197,811

ha)

ha)

Area



Proportion of each land class in area

Proportion of vegetation cover class in area

Land use class

5

6

4

0

1

2

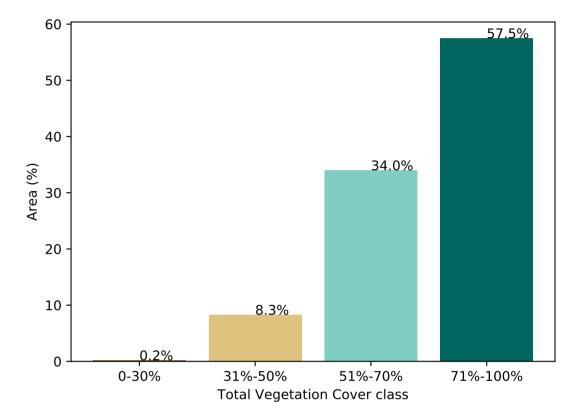
3

0.0%

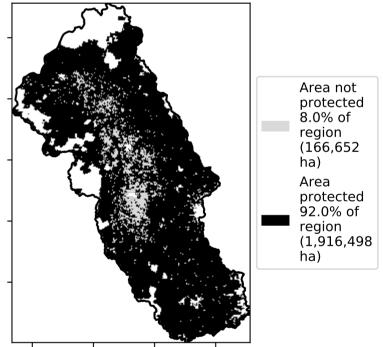
7

0.1%

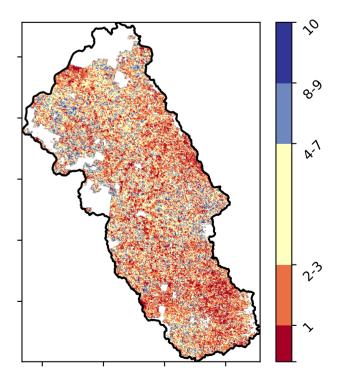
8



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]





Total Vegetation Cover Anomaly [%]

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Catchment Scale

of Australia (2018)

(2018) and Forests

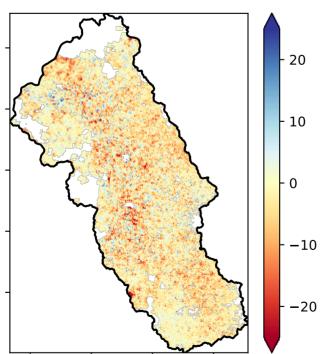
of Australia (2018)

Derived from

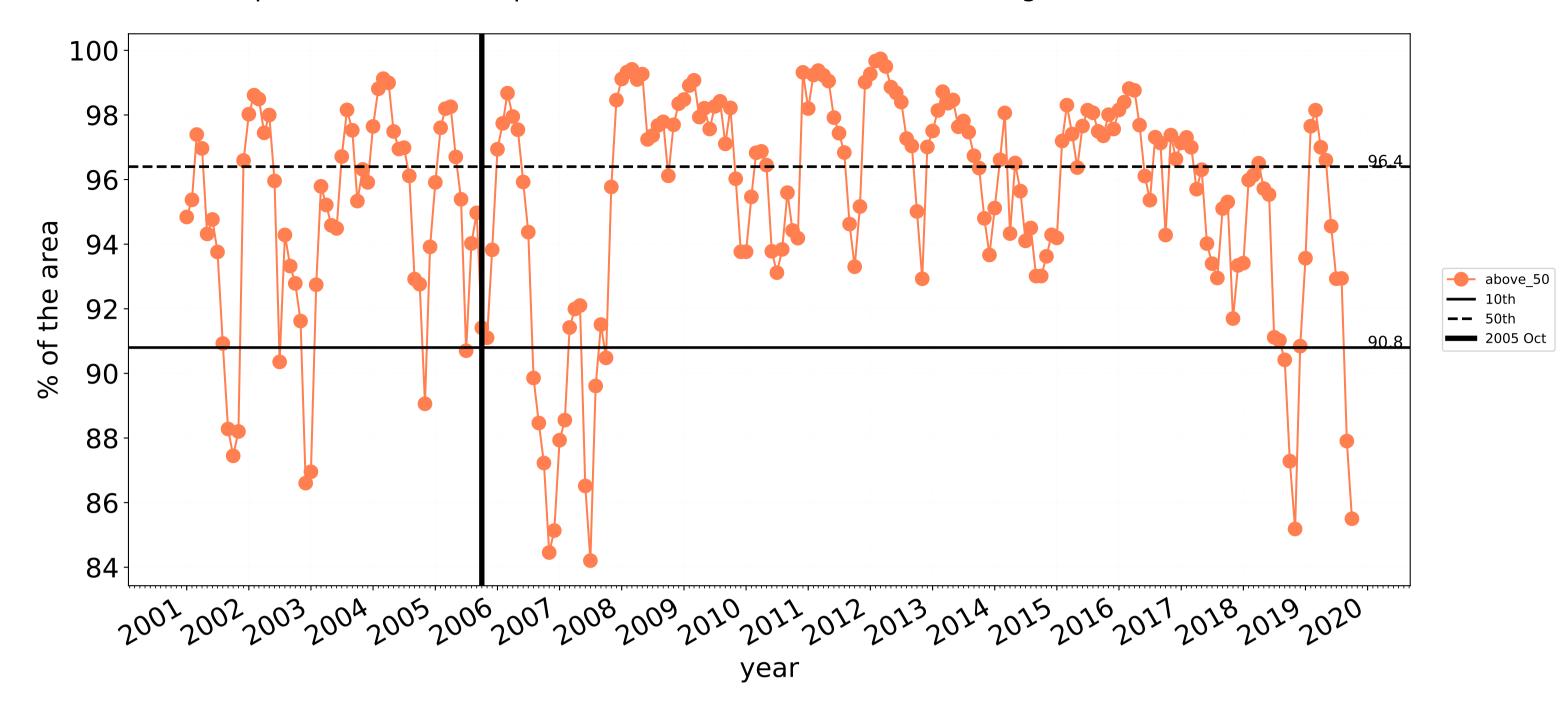
Use of Australia

Land Use and Forests

Catchment Scale Land

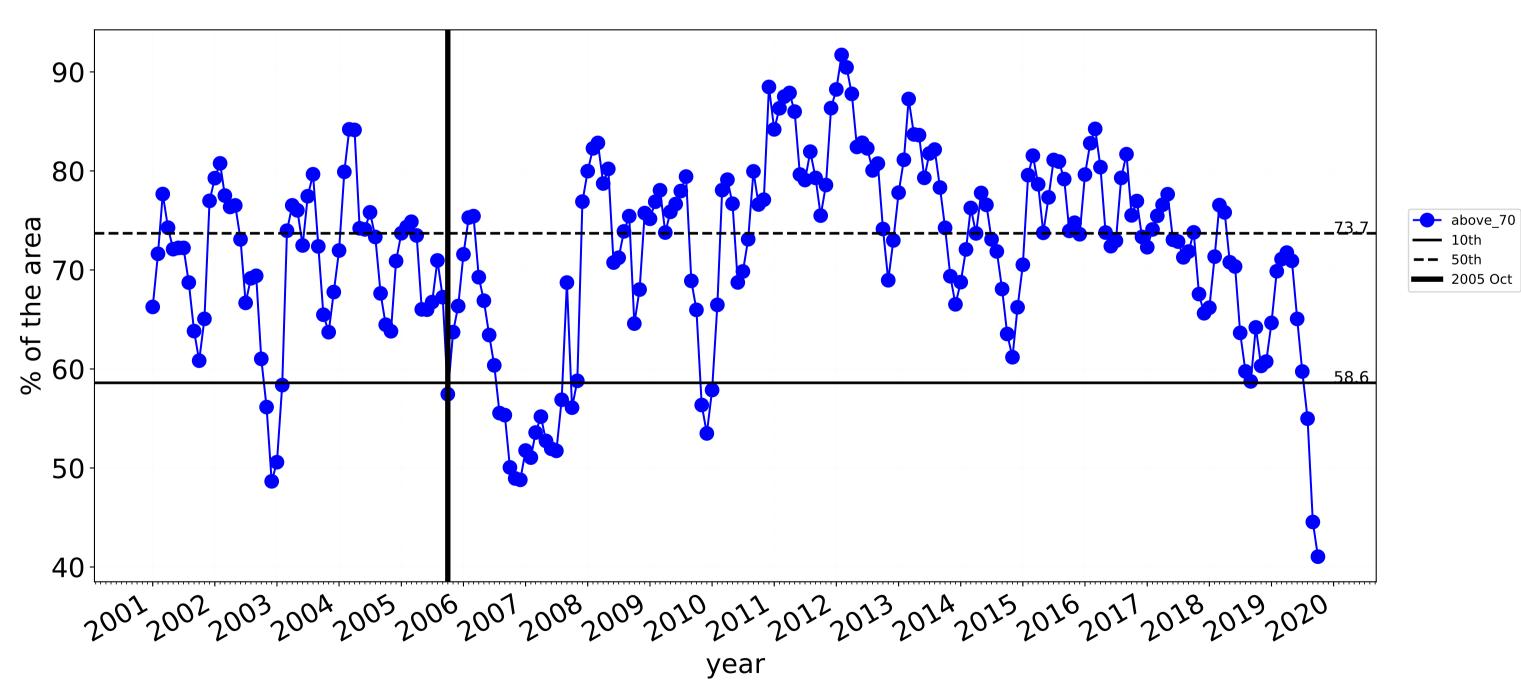


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



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

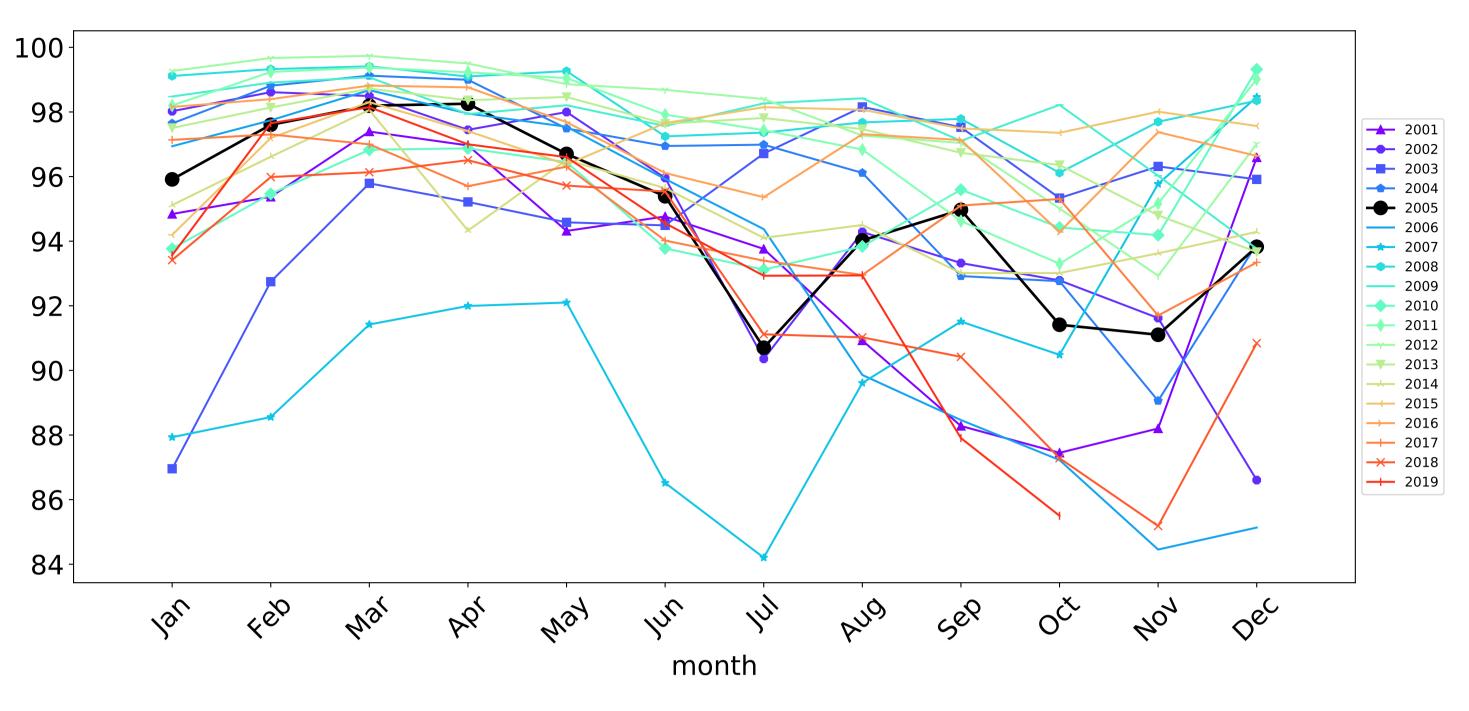
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



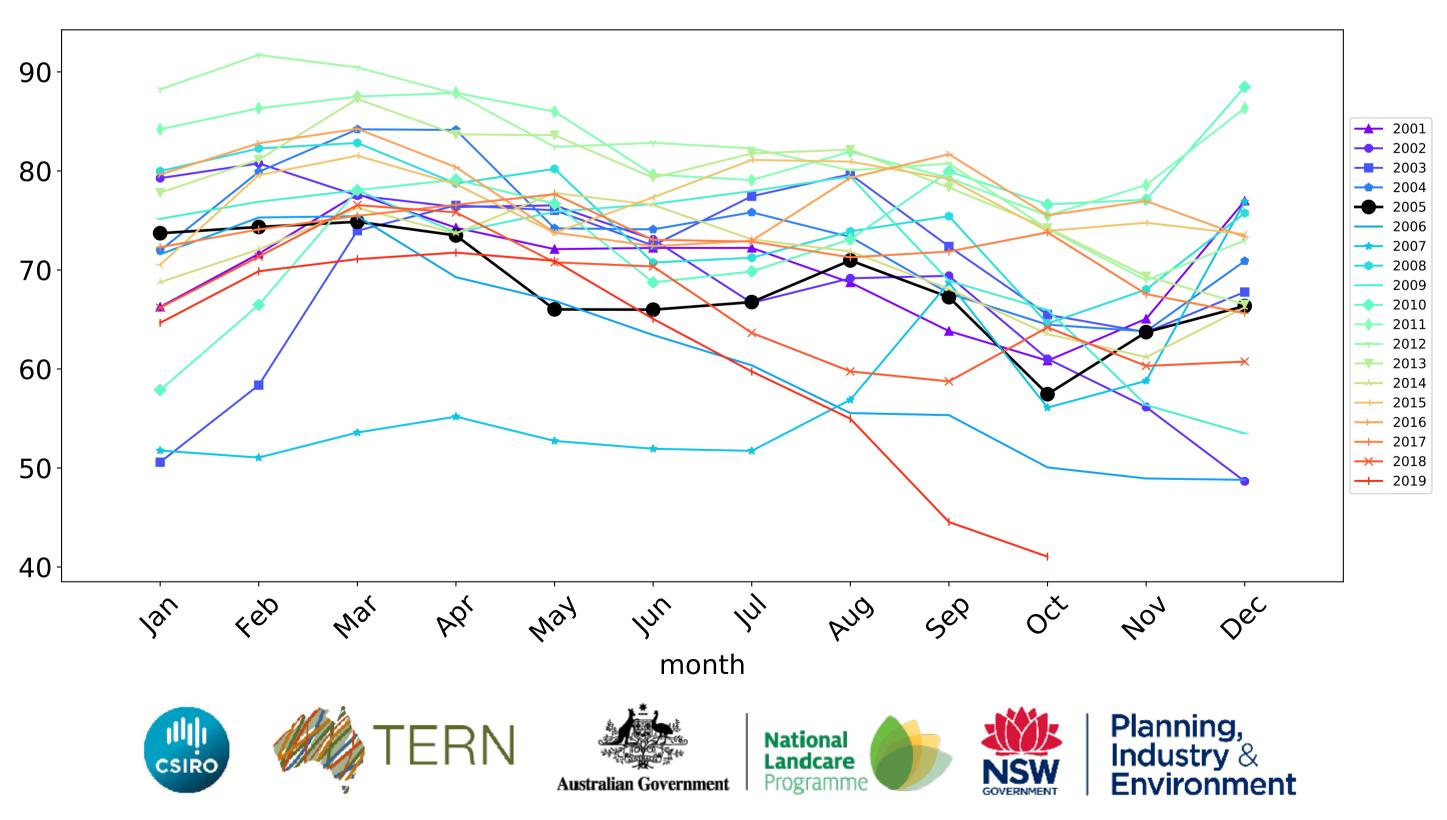
Agriculture timeseries



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

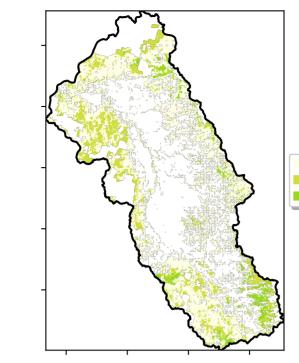


Water erosion historical monthly area protected (Total Veg Cov>70%)

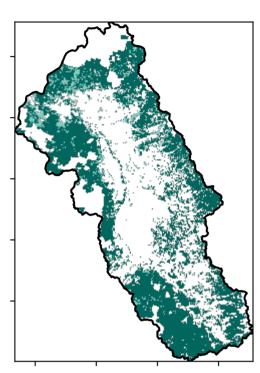


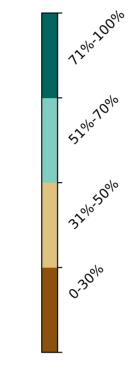
Grazing

Land use and forest cover



Total Vegetation Cover [%]



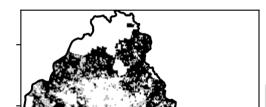


1 Agriculture - Grazing - Non forest

2 Agriculture - Grazing - Woodland forest

3 Agriculture - Grazing - Non-woodland forest

% Area protected from water erosion (>70%)



Area not protected 14.2% of region (166,214

ha)

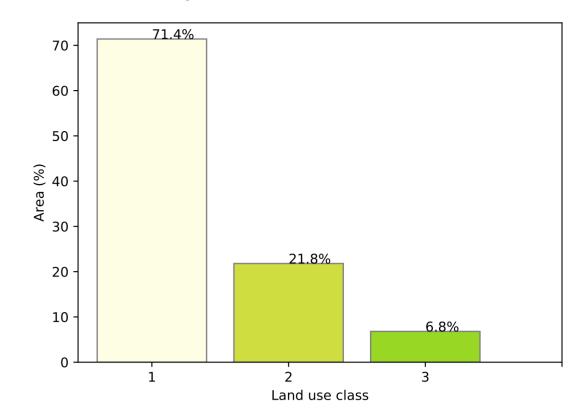
ha)

Area

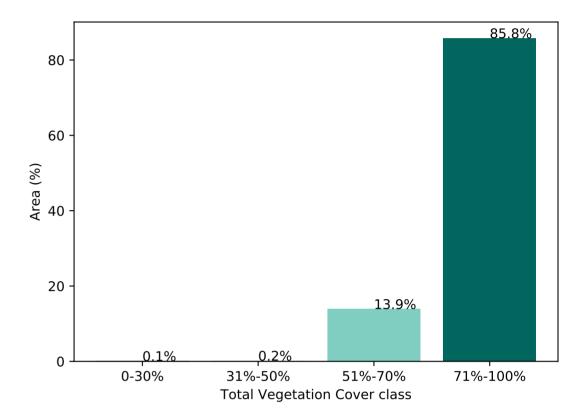
protected 85.8% of

region (1,004,310

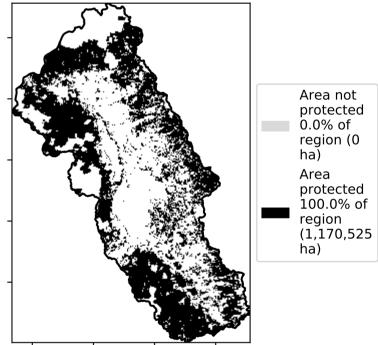
Proportion of each land class in area



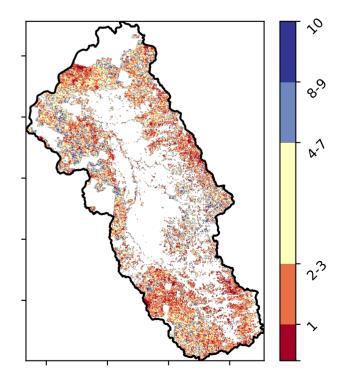
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]





Deciles show where the

pixel value lies in the

record, from highest to lowest, for that month. That is, red pixels are

records for that month of

the map using baseline from 2001 to 2019.

in the lowest 10% of

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.

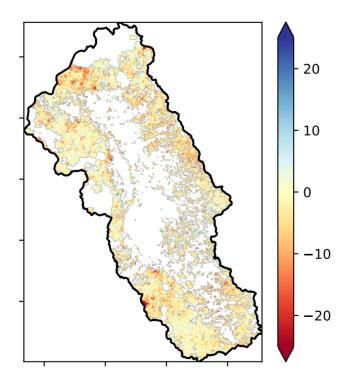
Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

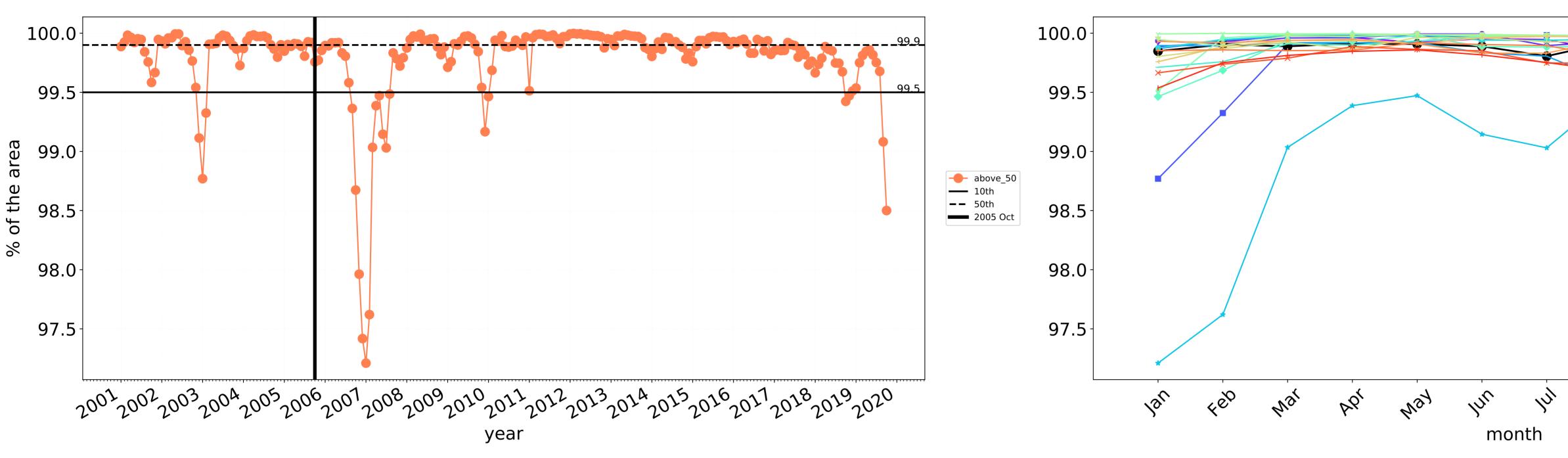
Derived from

Use of Australia

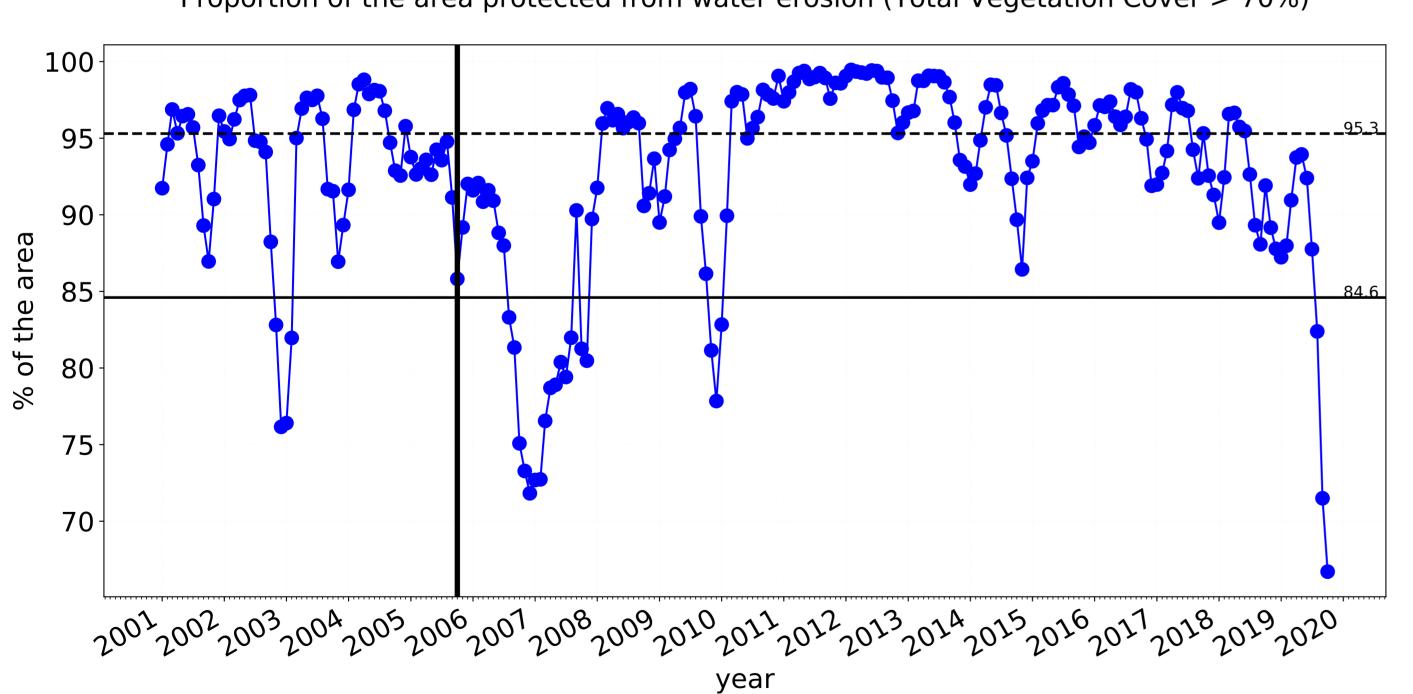
(2018) and Forests of Australia (2018)







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



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

Grazing timeseries

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

--- above_70

— 10th

—— 50th

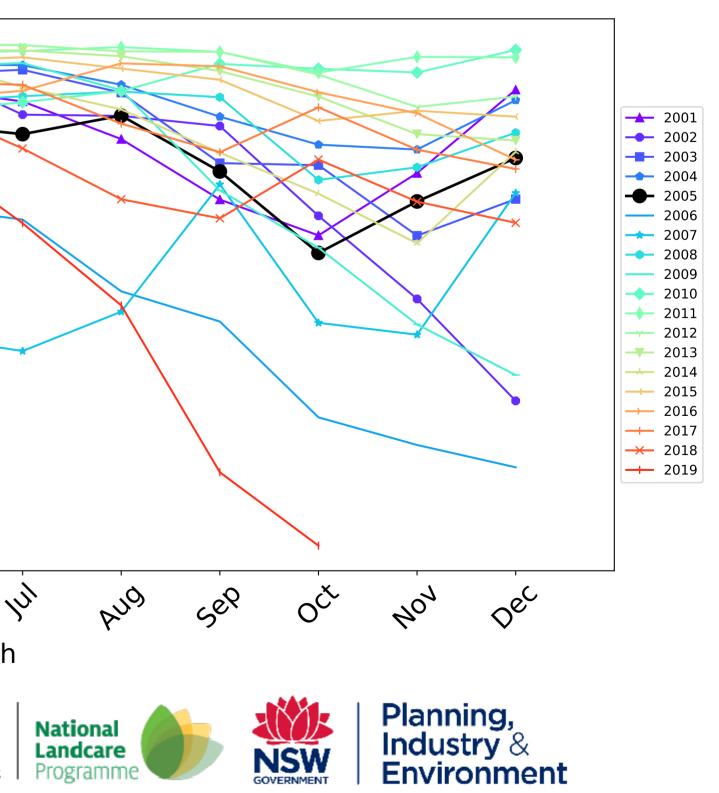
— 2005 Oct

100-95 90 85 80 75 70-Par 4eb In May PP Mai month ERN **HARD** CSIRO Australian Government

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

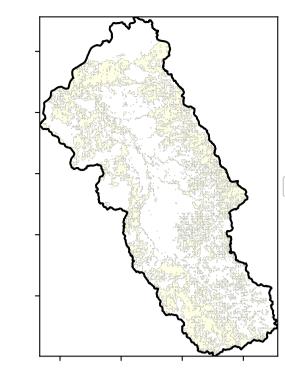
Programme

— 2001 --- 2002 ---- 2003 **---** 2004 ---- 2005 ____ 2006 **----** 2007 - 2008 2009 ---- 2010 ----- 2011 _____ 2012 ---- 2013 ____ 2014 <mark>→</mark> 2015 **→** 2016 <mark>→</mark> 2017 → 2018 **→** 2019 Dec AUG Sel 401 OCt



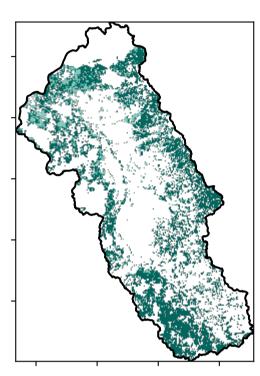
Grazing non forest

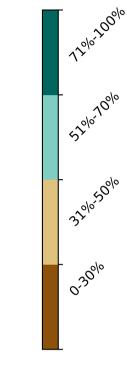
Land use and forest cover



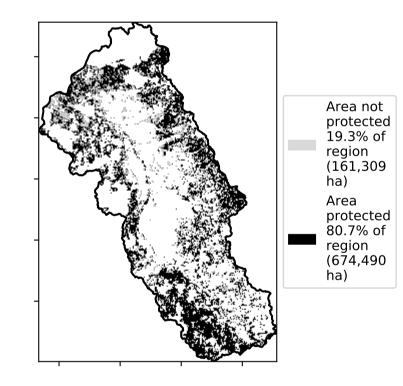
1 Agriculture - Grazing - Non forest

Total Vegetation Cover [%]



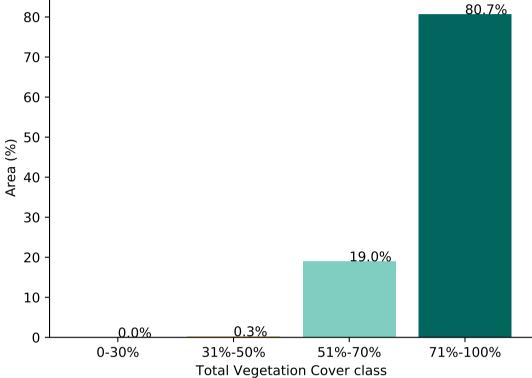


% Area protected from water erosion (>70%)

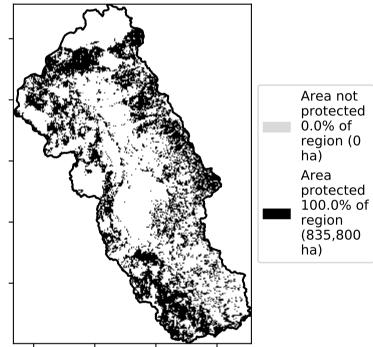


70 60

Proportion of vegetation cover class in area



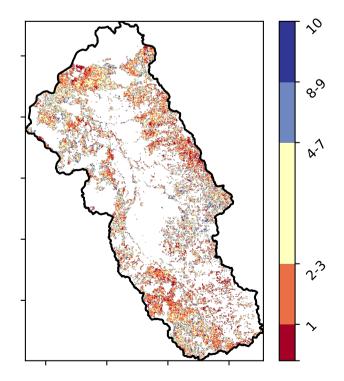
% Area protected from wind erosion (>50%)



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

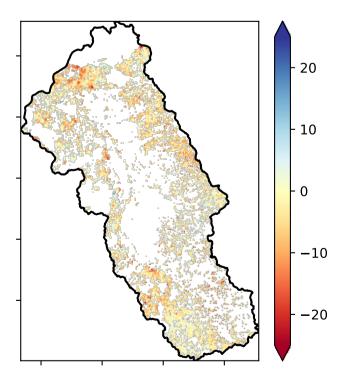
Catchment Scale Land Use and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



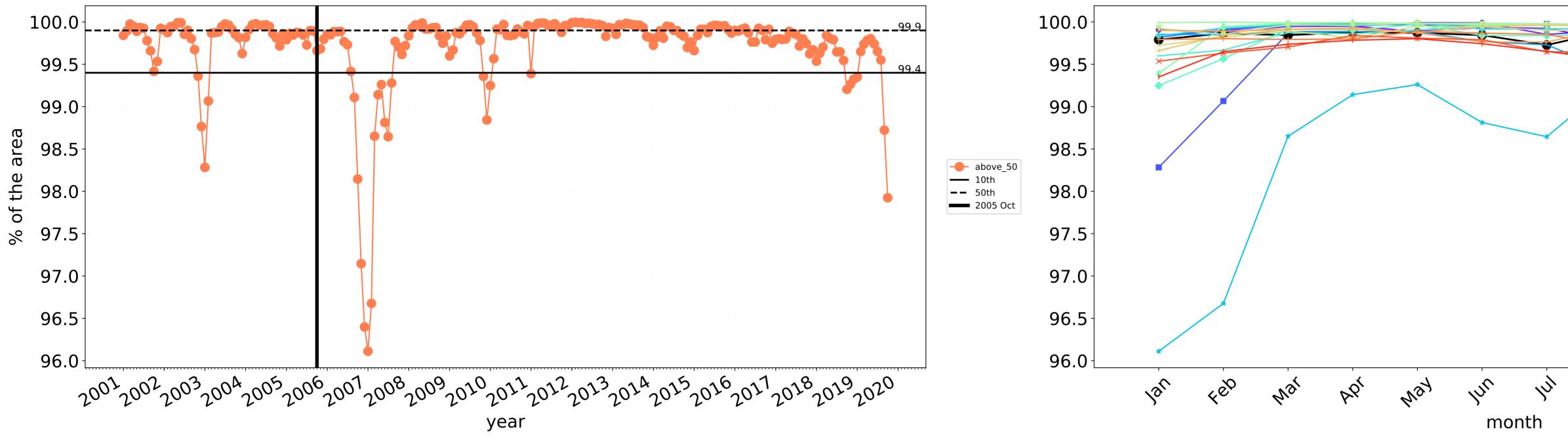
Total Vegetation Cover Anomaly [%]

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 mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

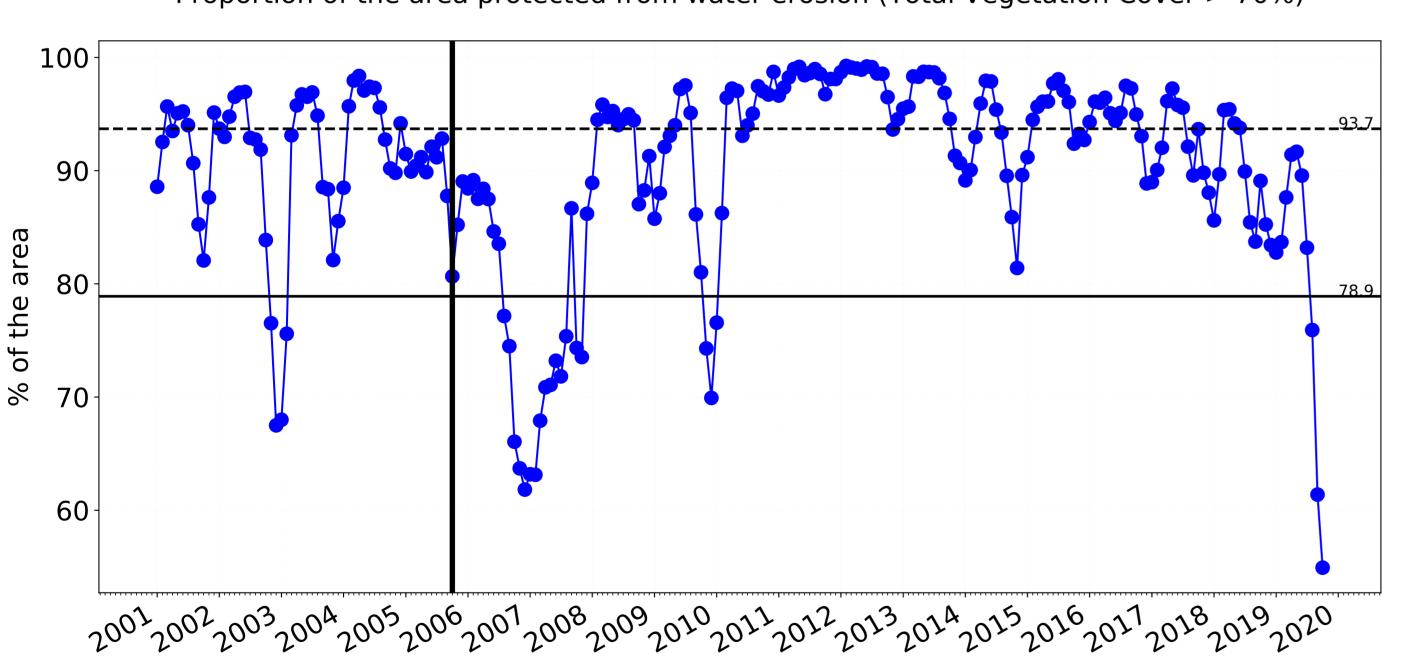


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





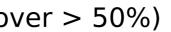
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



year

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

Grazing non forest timeseries



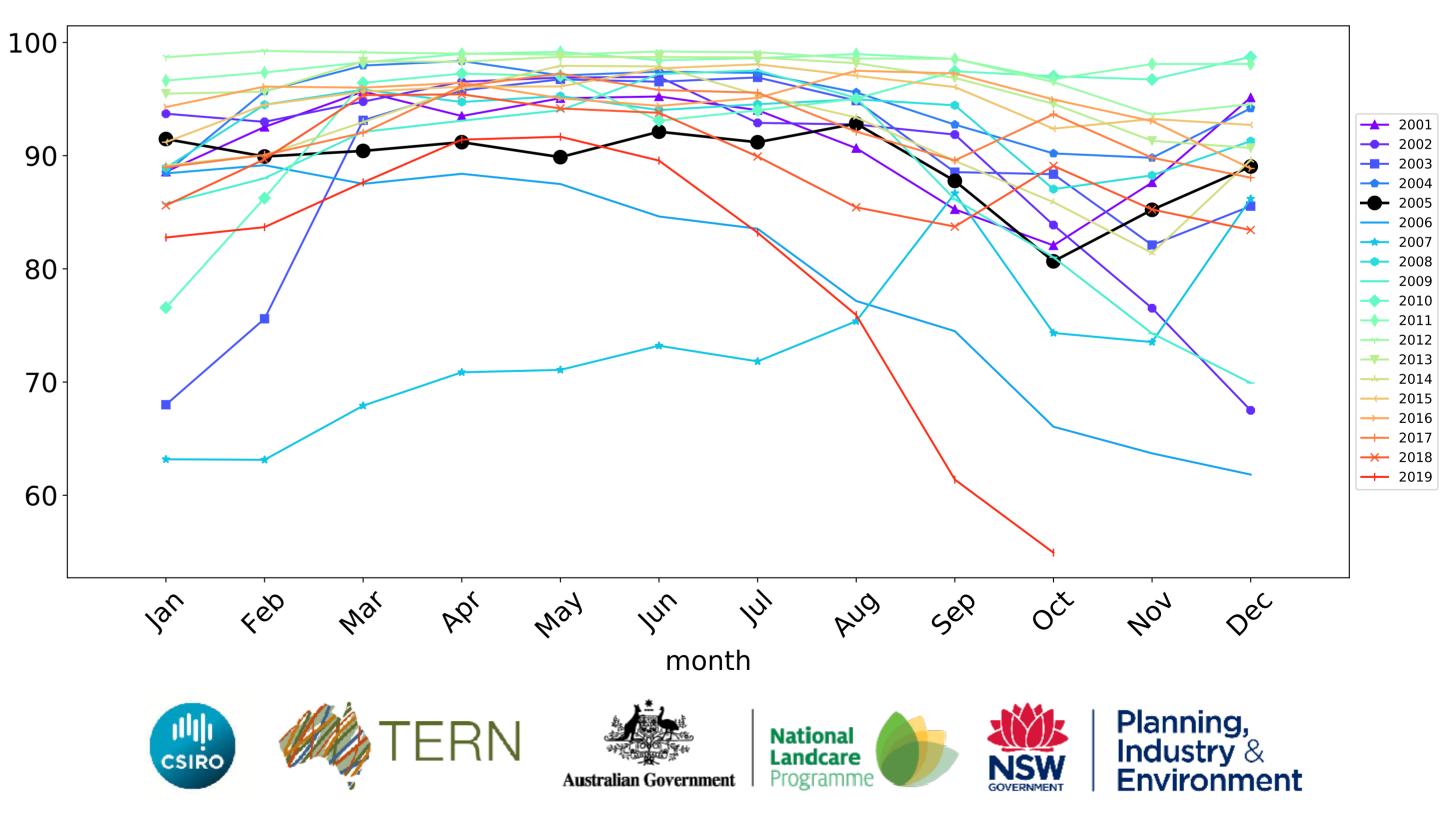
Wind erosion historical monthly area protected (Total Veg Cov >50%)

---- above_70 **—** 10th

— 2005 Oct

—— 50th

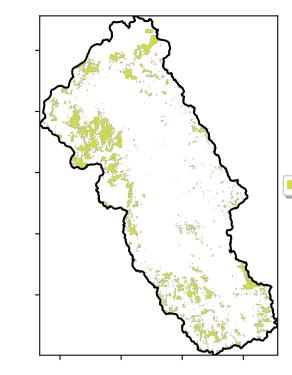
Water erosion historical monthly area protected (Total Veg Cov>70%)



— 2001 --- 2002 ---- 2003 **---** 2004 ---- 2005 ____ 2006 **----** 2007 ---- 2008 ---- 2009 ---- 2010 **—** 2011 ---- 2012 ---- 2013 ____ 2014 <mark>→</mark> 2015 **→** 2016 <mark>→</mark> 2017 → 2018 **→** 2019 Ser OČ 401 AUG Dec

Grazing Woodland forest

Land use and forest cover



1 Agriculture - Grazing - Woodland forest

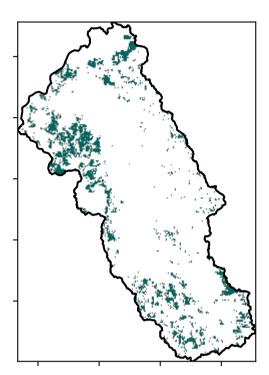
12º0010000

52%70%

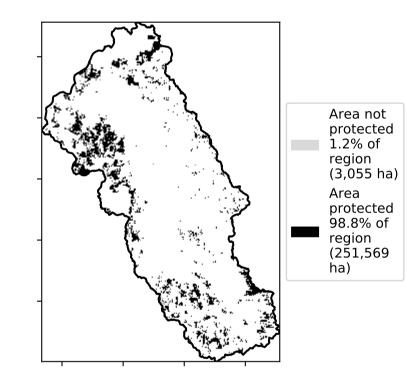
3200

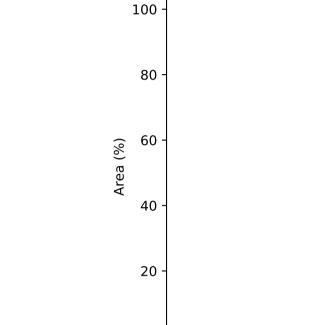
0.30%

Total Vegetation Cover [%]

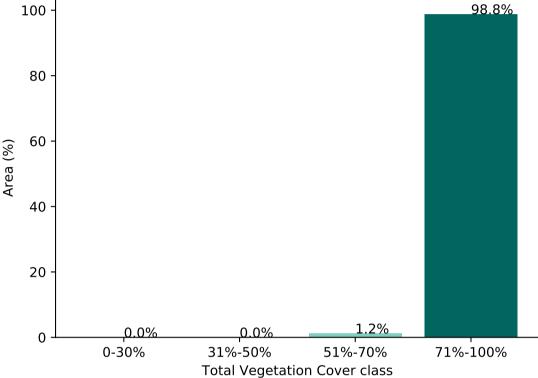




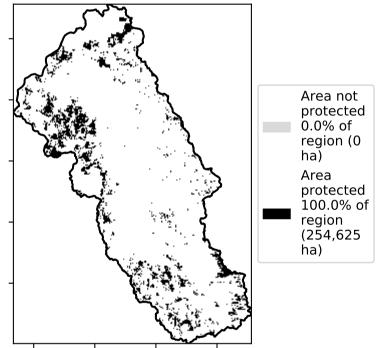




Proportion of vegetation cover class in area

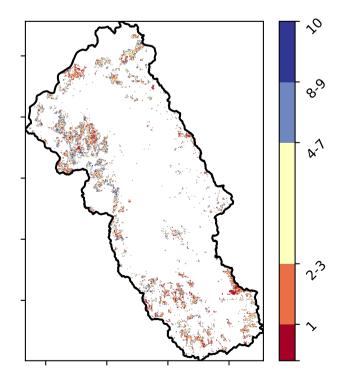


% Area protected from wind erosion (>50%)



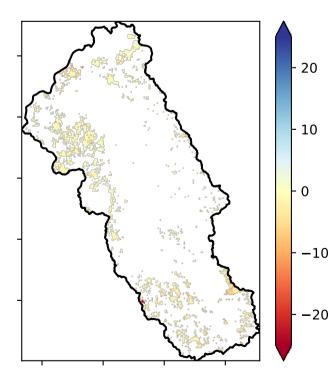
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



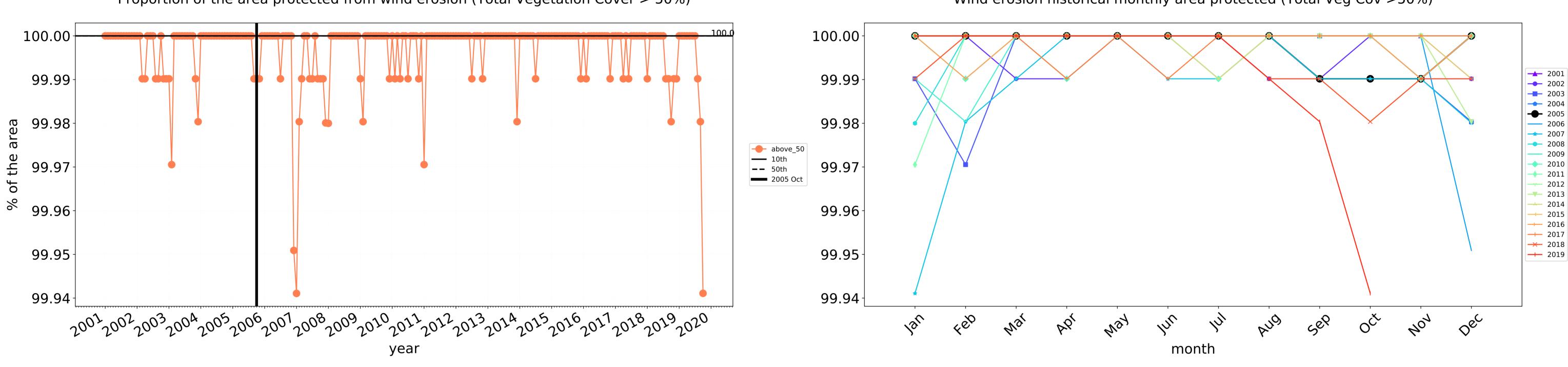
Total Vegetation Cover Anomaly [%]

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



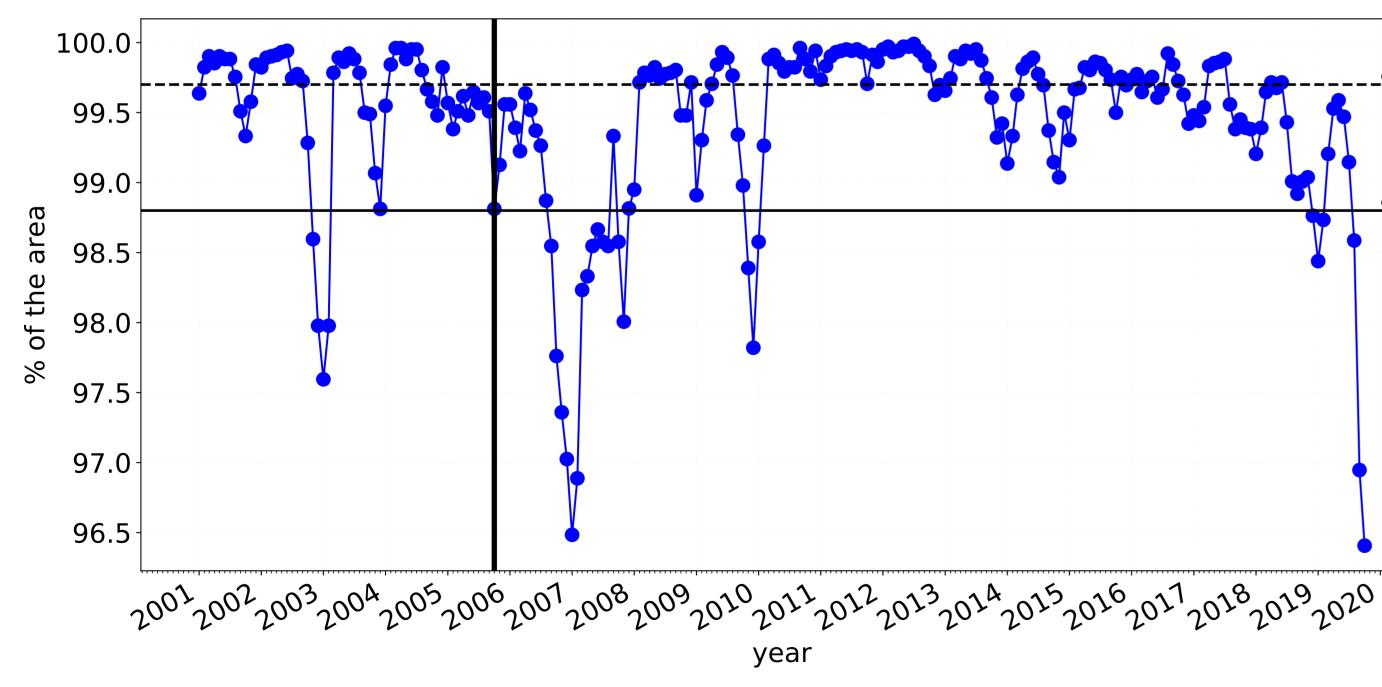
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

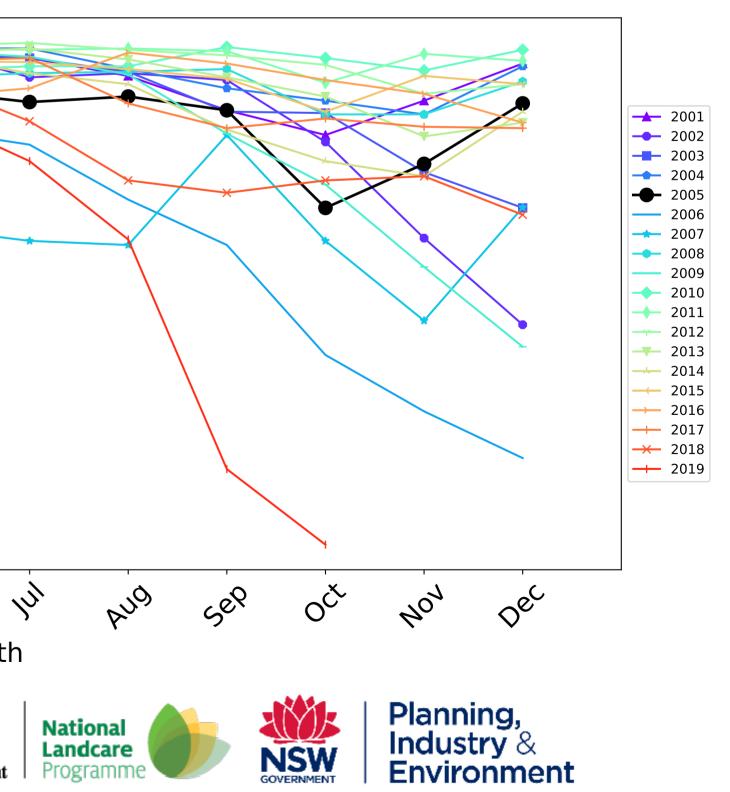
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



100.0-99.5 99.0 ---- above_70 **—** 10th 98.5 **--** 50th **—** 2005 Oct 98.0 97.5 97.0 96.5 feb lar May hill PQ Mai month **FERN** Australian Government

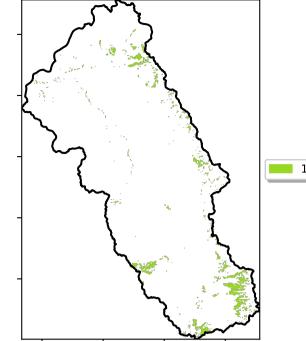
Water erosion historical monthly area protected (Total Veg Cov>70%)

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



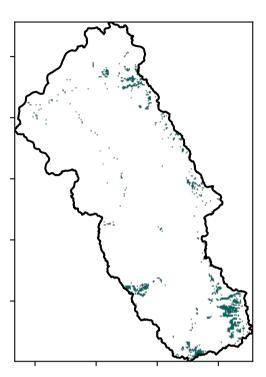
Grazing - Forest (non woodland)

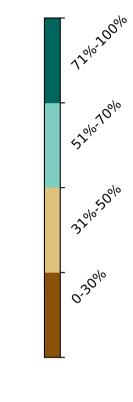
Land use and forest cover



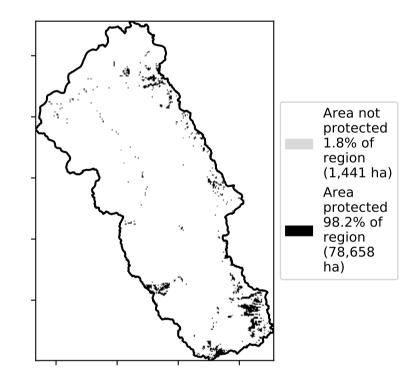
1 Agriculture - Grazing - Non-woodland forest

Total Vegetation Cover [%]

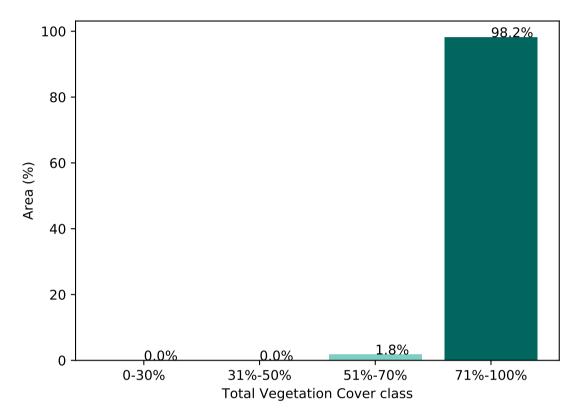




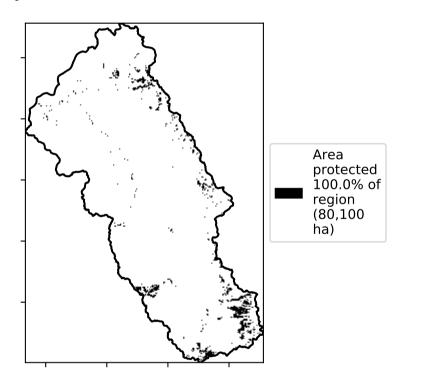
% Area protected from water erosion (>70%)





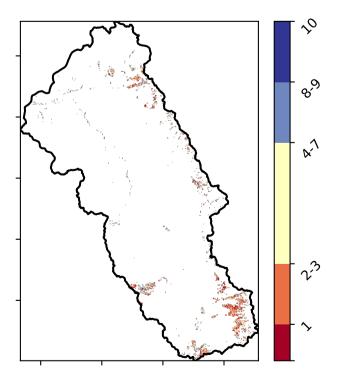


% Area protected from wind erosion (>50%)



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

Total Vegetation Cover Decile [%]

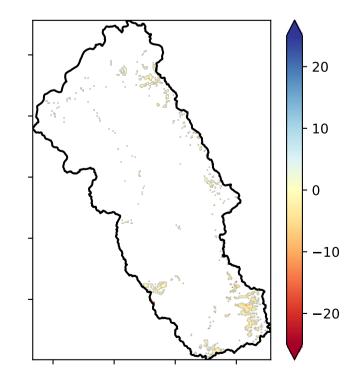


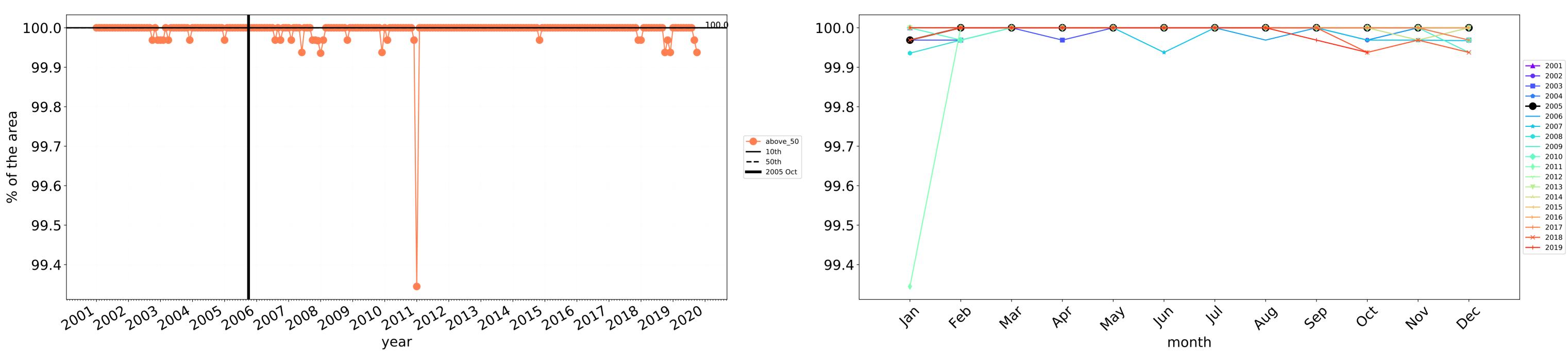


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

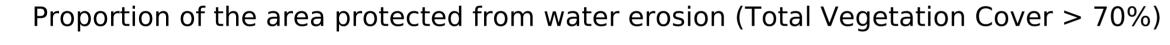
Total Vegetation Cover Anomaly [%]

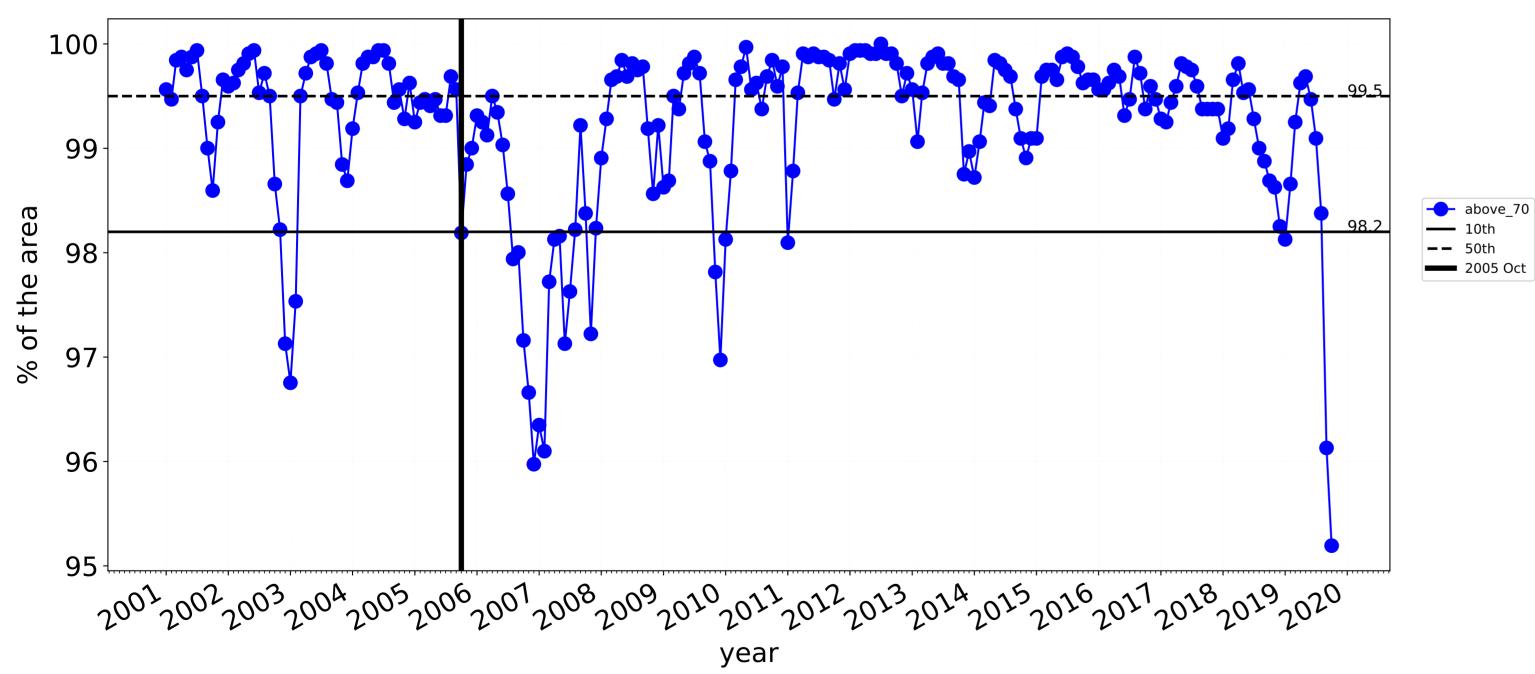
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





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



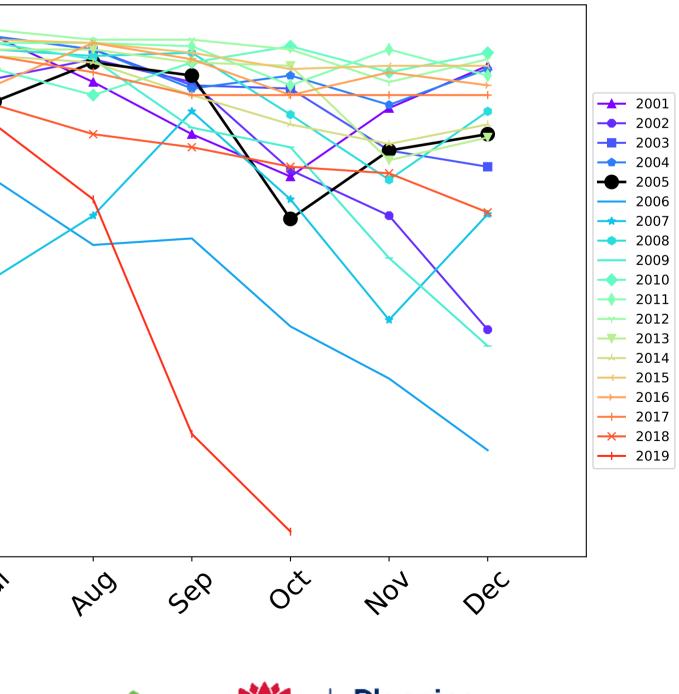


Grazing - Forest (non woodland) timeseries

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

100-99 98 97 96 95 Jan fed In way Mai hy Þ6, month ERN **HOO** CSIRO Australian Government

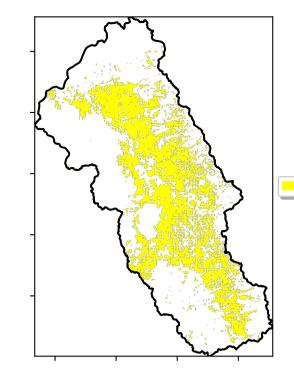
Water erosion historical monthly area protected (Total Veg Cov>70%)





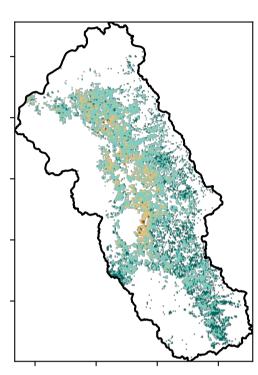
Cropping

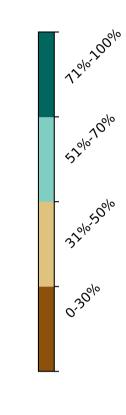
Land use and forest cover



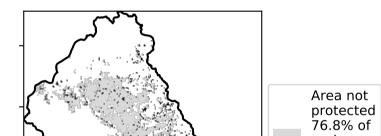
1 Agriculture - Cropping - Non-irrigated

Total Vegetation Cover [%]





% Area protected from water erosion (>70%)





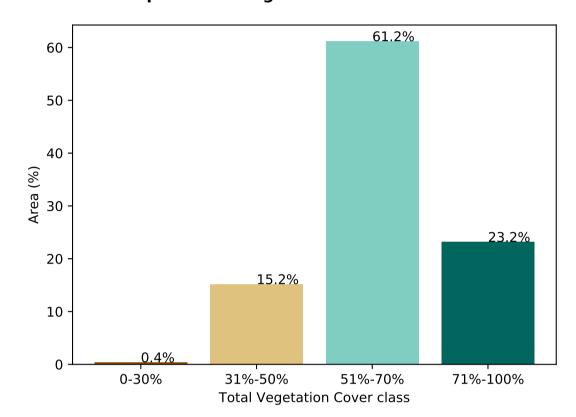
region (577,824 ha)

protected 23.2% of region (174,551

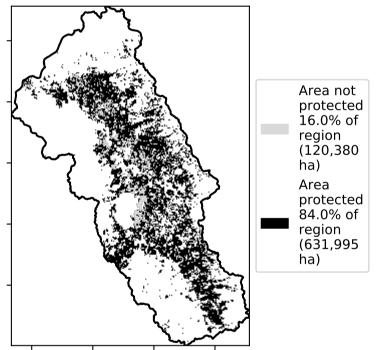
Area

ha)

Proportion of vegetation cover class in area

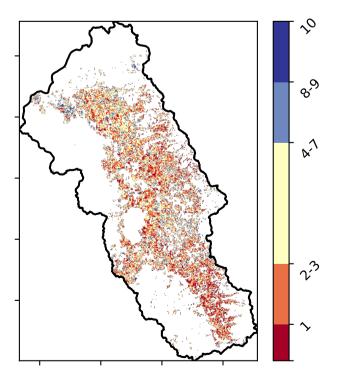


% Area protected from wind erosion (>50%)



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

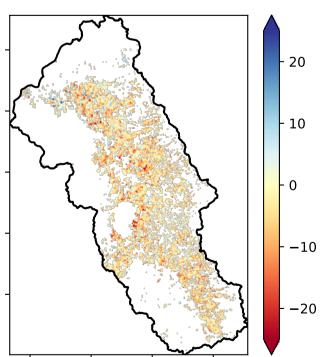
Total Vegetation Cover Decile [%]





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 lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



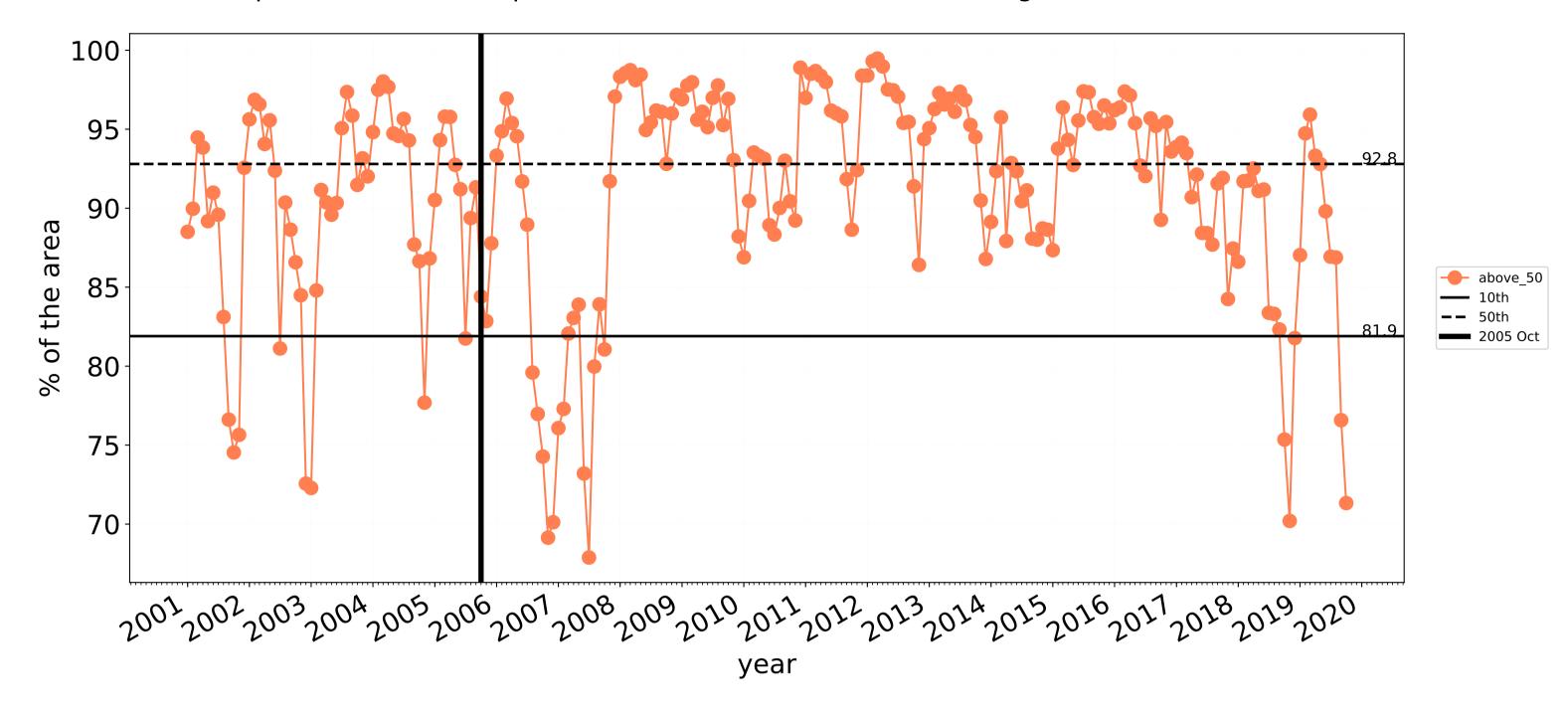
Deciles show where the pixel value lies in the

record, from highest to lowest, for that month. That is, red pixels are

records for that month of

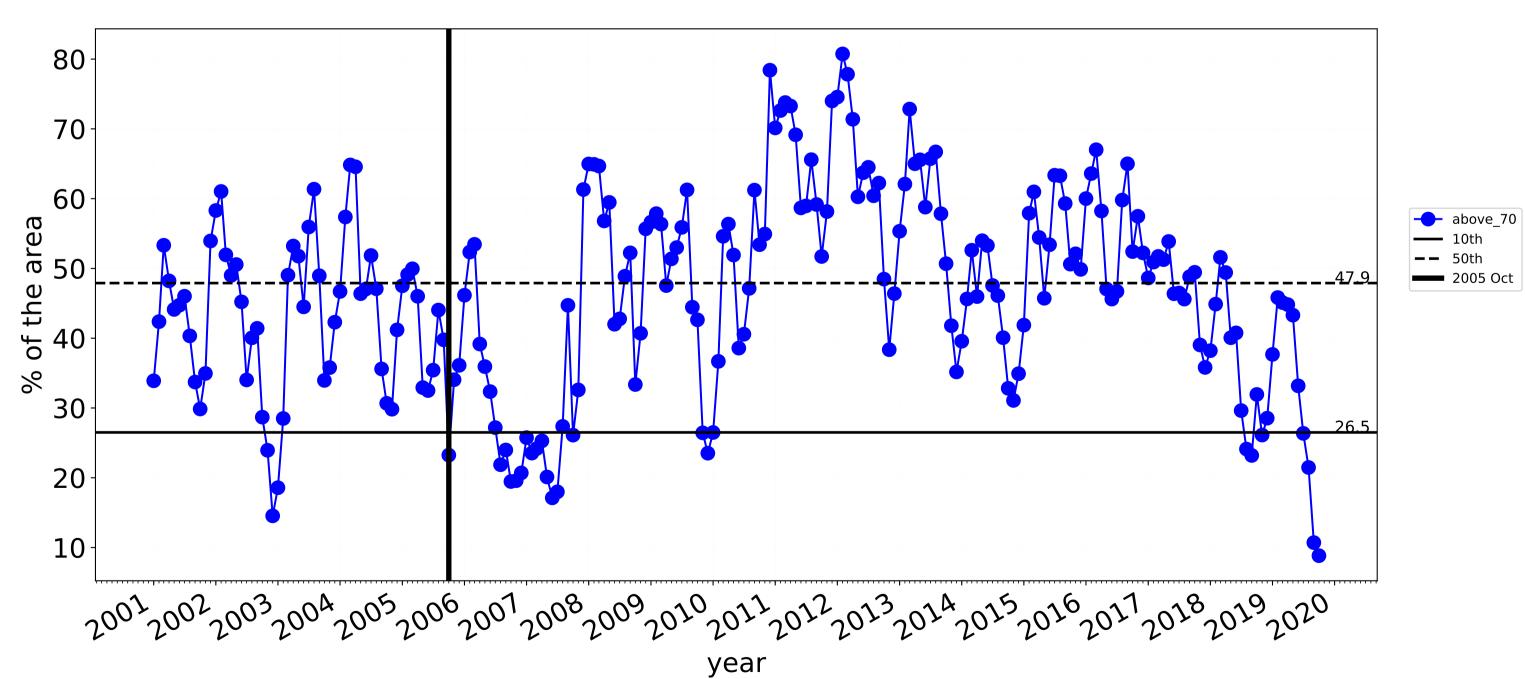
the map using baseline from 2001 to 2019.

in the lowest 10% of



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

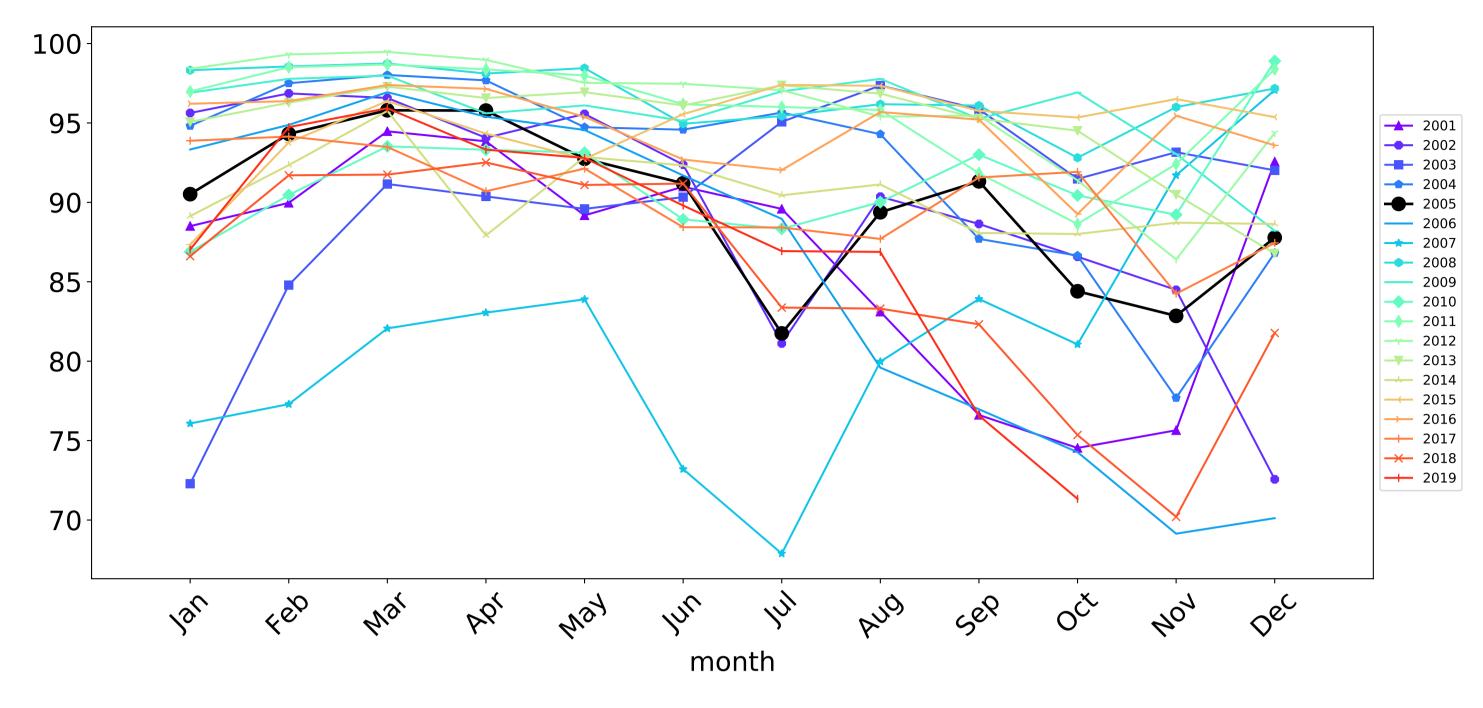
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



Cropping timeseries

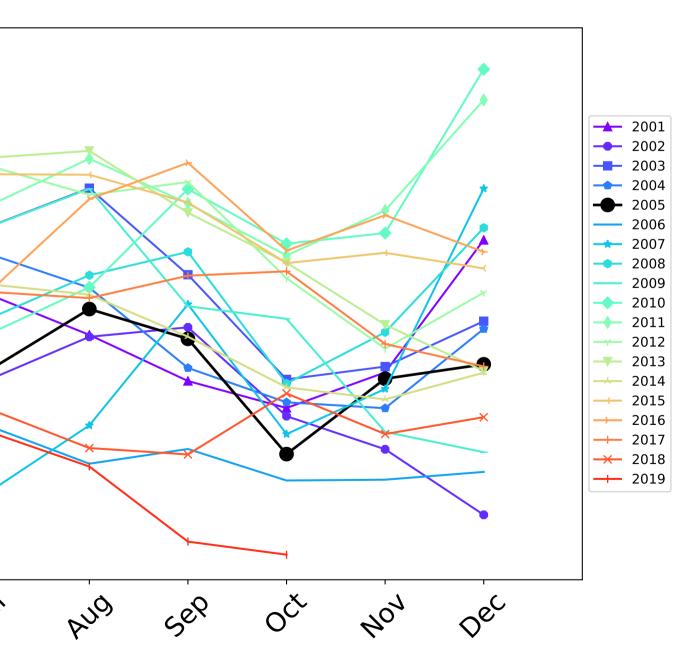


Wind erosion historical monthly area protected (Total Veg Cov >50%)



80-70-60 50-40-30 20 10lar feb May In In In Mai P.Q1 month TERN CSIRO Australian Government

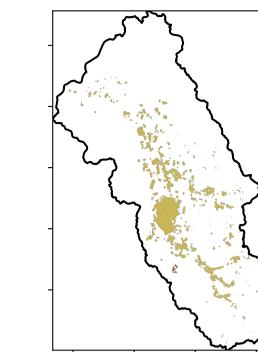
Water erosion historical monthly area protected (Total Veg Cov>70%)





Irrigation

Land use and forest cover



Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

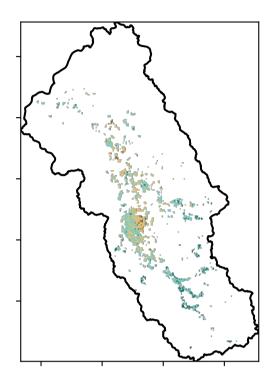
Derived from

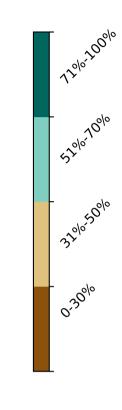
Use of Australia (2018) and Forests

of Australia (2018)

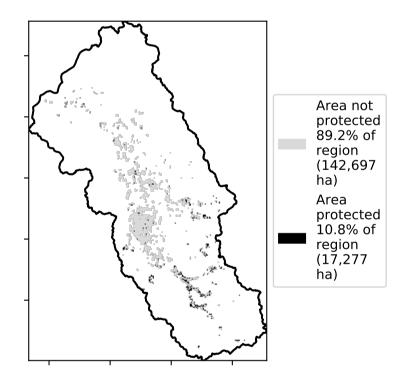
1 Agriculture - Grazing - Irrigated
2 Agriculture - Cropping - Irrigated
3 Agriculture - Horticulture - Irrigated

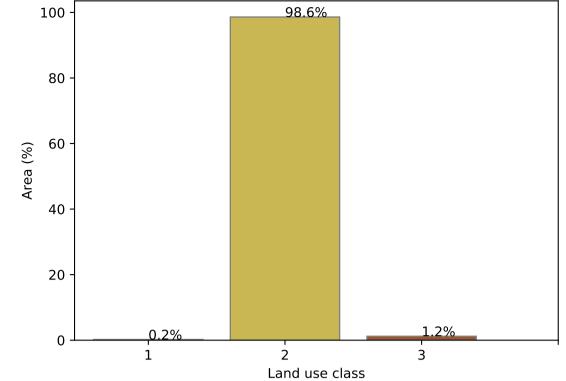
Total Vegetation Cover [%]





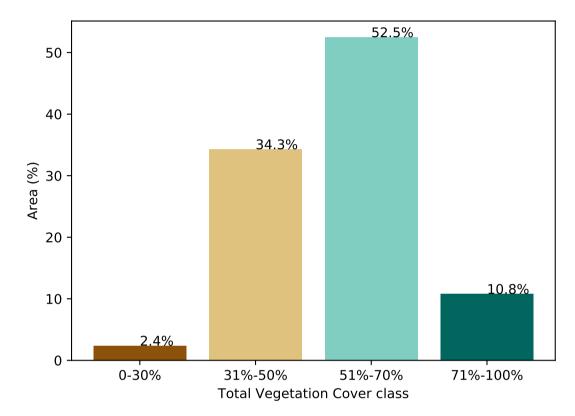
% Area protected from water erosion (>70%)





Proportion of each land class in area

Proportion of vegetation cover class in area

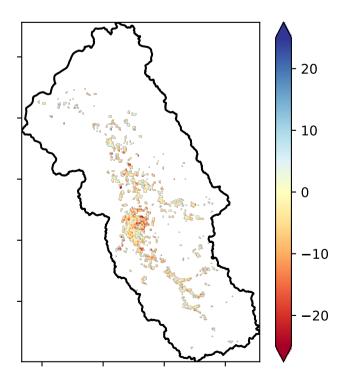


% Area protected from wind erosion (>50%)



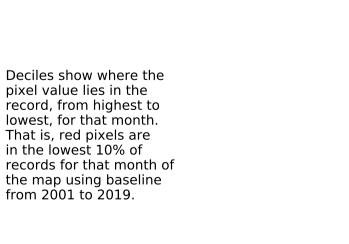
Total Vegetation Cover Anomaly [%]

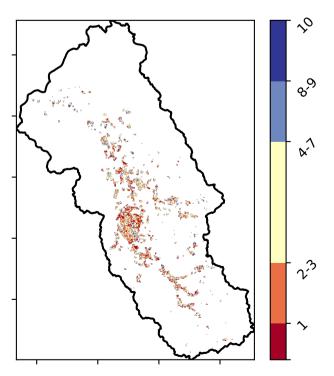
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



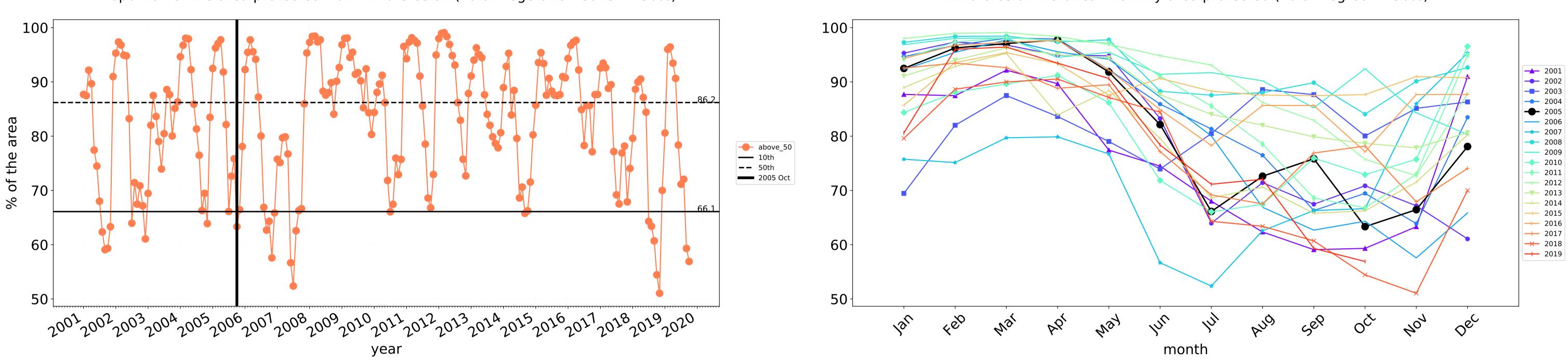
protected 37.0% of region (59,190 ha) Area protected 63.0% of region (100,784 ha)

Total Vegetation Cover Decile [%]



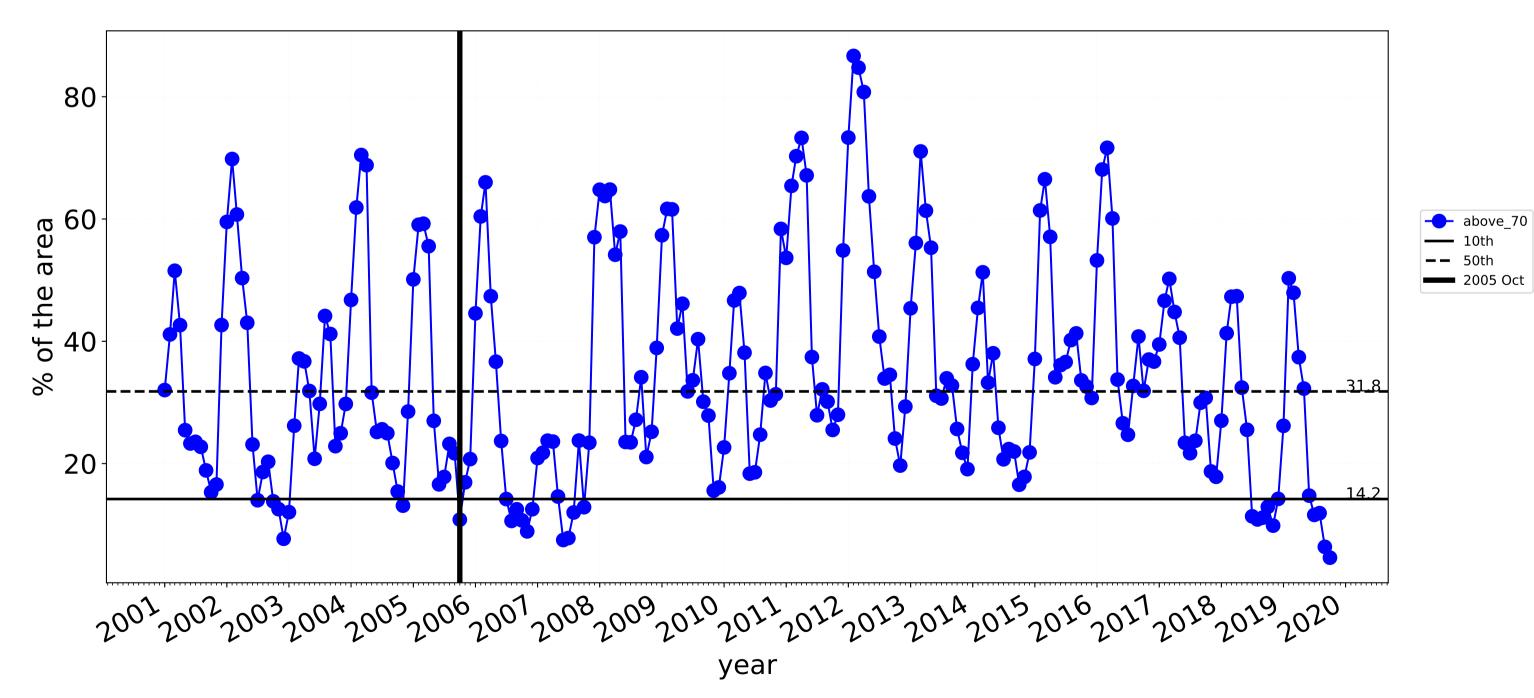






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

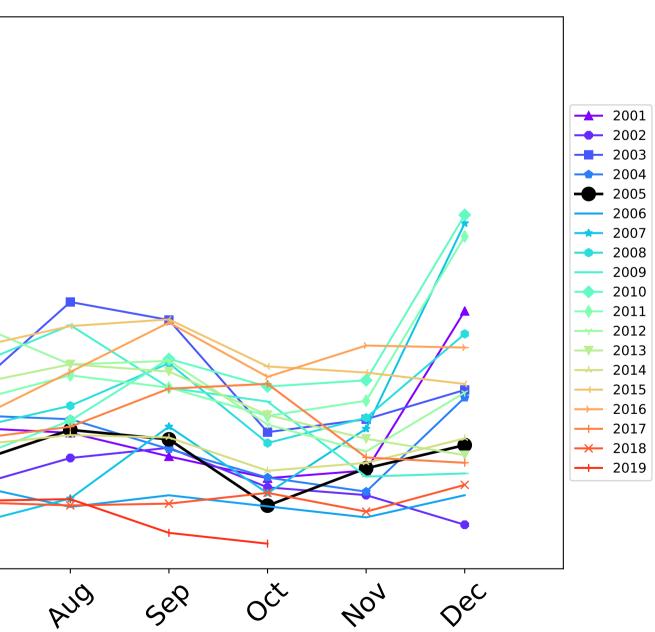


Irrigation timeseries

80-60-40-20 lar feb may In Mai PQ' 1/2/ month TERN CSIRO Australian Government

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

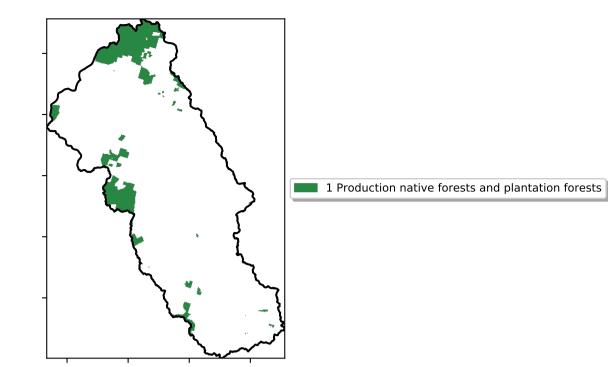
Wind erosion historical monthly area protected (Total Veg Cov >50%)



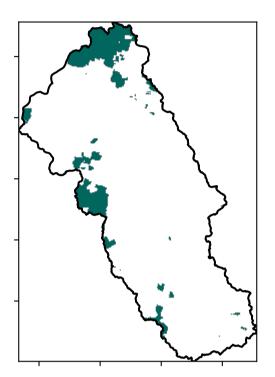


Production native forests and plantation forests

Land use and forest cover

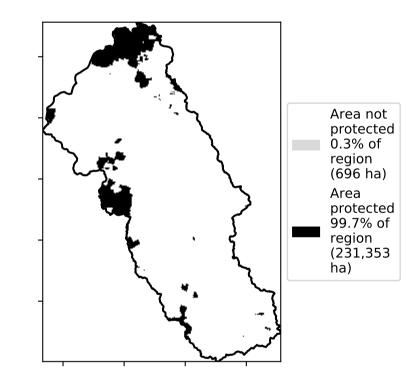


Total Vegetation Cover [%]

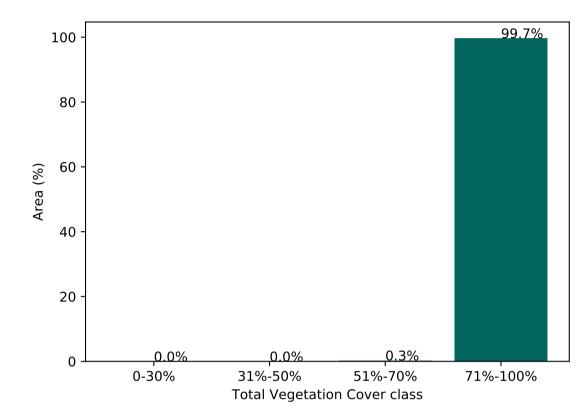




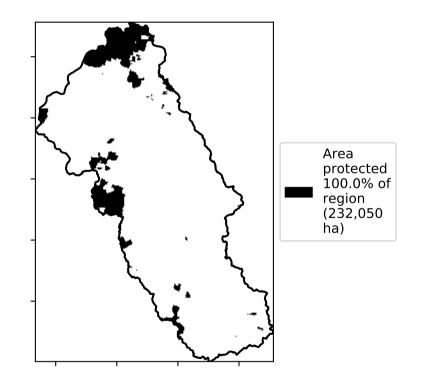
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

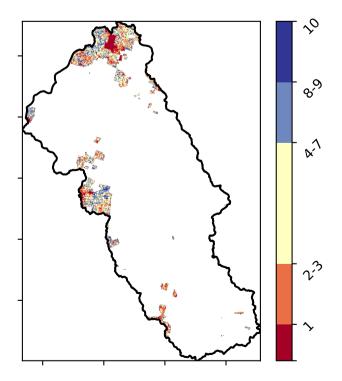


% Area protected from wind erosion (>50%)



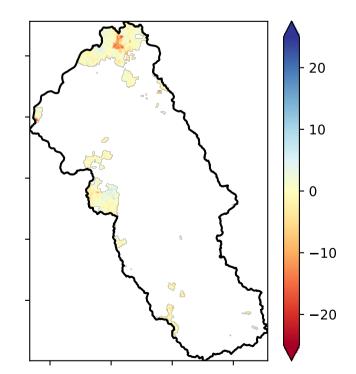
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



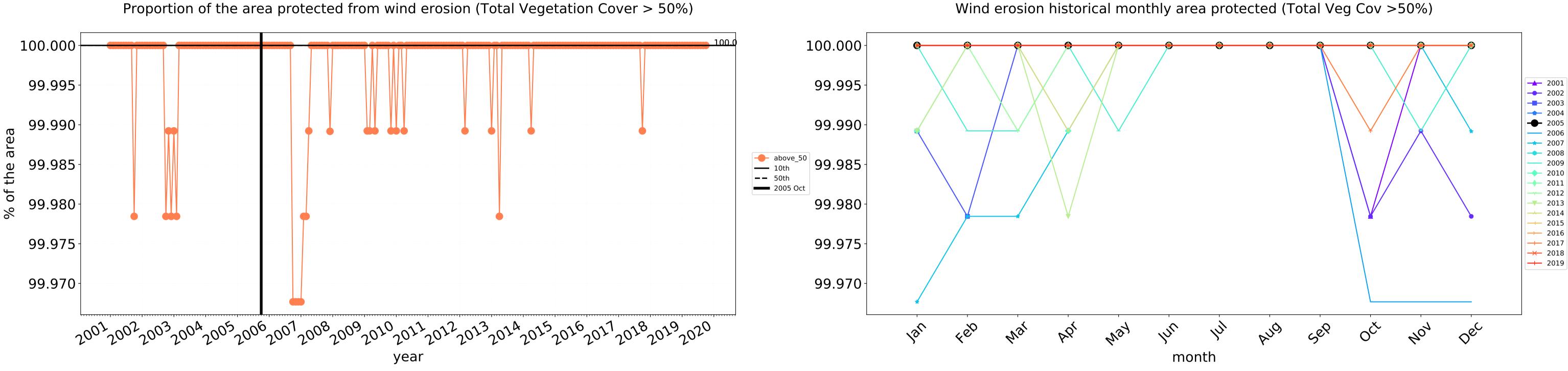
Total Vegetation Cover Anomaly [%]

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.



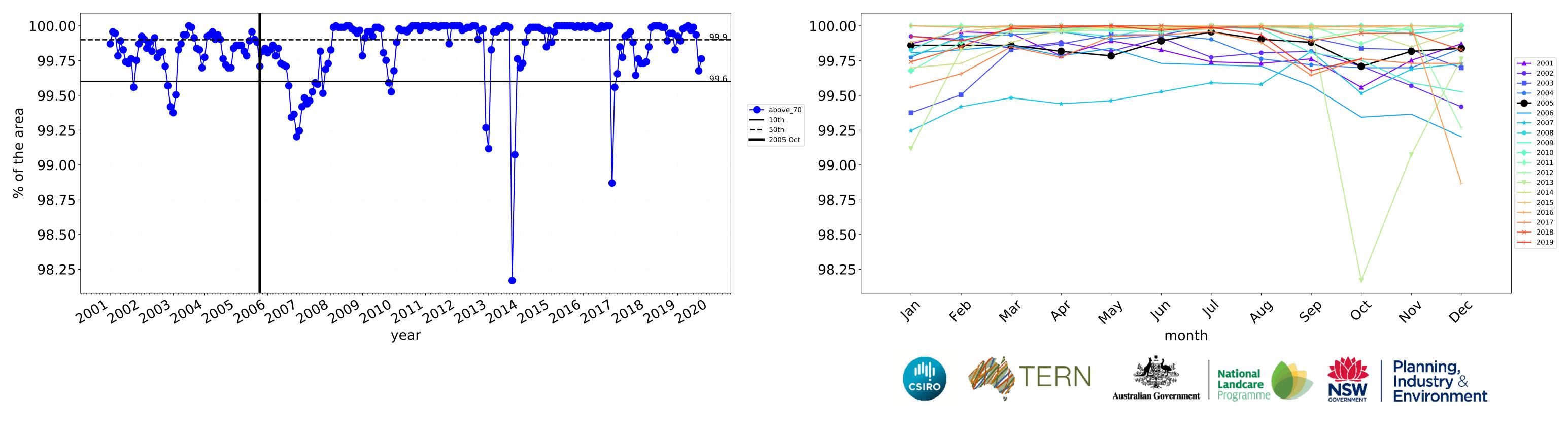
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

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





Condamine (2,440,600 ha and no data 5,012 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	2,440,600	99.7% 2,433,600	92.6% 2,258,818	62.8% 1,531,793	41.7% 1,017,820	17.0% 415,532	1.9% 46,720
Conservation and natural environments	57,650	100.0% 57,650	99.9% 57,600	98.4% 56,750	95.0% 54,775	53.4% 30,775	18.5% 10,675
Conservation and natural environments Woodland forest	35,625	100.0% 35,625	100.0% 35,625	99.9% 35,575	97.0% 34,550	43.4% 15,475	11.4% 4,075
Agriculture	2,083,150	99.7% 2,076,325	91.4% 1,904,275	57.5% 1,196,850	34.1% 709,450	10.4% 216,250	1.3% 26,550
Grazing	1,170,525	100.0% 1,170,500	99.8% 1,167,675	85.8% 1,004,450	57.6% 674,325	18.3% 213,650	2.2% 26,300
Grazing non forest	835,800	100.0% 835,775	99.7% 832,975	80.7% 674,200	44.7% 373,650	10.0% 83,600	1.6% 13,650
Grazing Woodland forest	254,625	100.0% 254,625	100.0% 254,600	98.8% 251,600	90.4% 230,150	39.0% 99,375	3.4% 8,600
Grazing - Forest (non woodland)	80,100	100.0% 80,100	100.0% 80,100	98.2% 78,650	88.0% 70,525	38.3% 30,675	5.1% 4,050
Cropping	752,375	99.6% 749,325	84.4% 635,025	23.2% 174,900	4.3% 32,200	0.3% 2,225	0.0% 225
Irrigation	159,975	97.7% 156,225	63.3% 101,300	10.8% 17,325	1.8% 2,875	0.2% 375	0.0% 25
Production native forests and plantation forests	232,050	100.0% 232,050	100.0% 232,050	99.7% 231,375	97.7% 226,675	70.9% 164,525	3.8% 8,925

